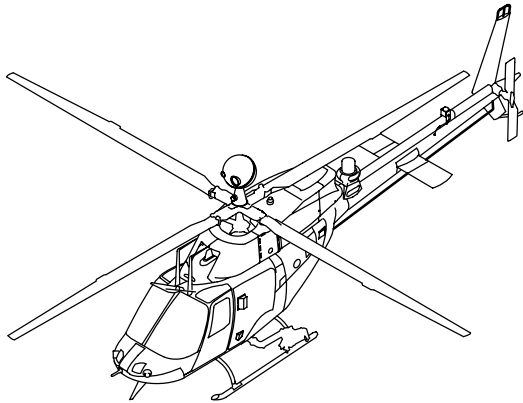

TECHNICAL MANUAL

**AVIATION UNIT AND
INTERMEDIATE
MAINTENANCE
MANUAL**



**ARMY MODEL
OH-58D HELICOPTER**

DISTRIBUTION STATEMENT A.

Approved for public release;
distribution is unlimited.

*This manual together with TM 1-1520-248-23-1, TM 1-1520-248-23-2, TM 1-1520-248-23-4, TM 1-1520-248-23-5, TM 1-1520-248-23-6 and TM 1-1520-248-23-7, all dated 28 February 2000, supersedes TM 55-1520-248-23-1, TM 55-1520-248-23-2, TM 55-1520-248-23-3, TM 55-1520-248-23-4, TM 55-1520-248-23-5, TM 55-1520-248-23-6, TM 55-1520-248-23-7, TM 55-1520-248-23-8-1, TM 55-1520-248-23-8-2, and TM 55-1520-248-23-9, all dated 12 January 1988, including all changes.

THIS VOLUME IS ONE OF A SERIES OF SEVEN VOLUMES AND IS INCOMPLETE WITHOUT TM 1-1520-248-23-1, TM 1-1520-248-23-2, TM 1-1520-248-23-4, TM 1-1520-248-23-5, TM 1-1520-248-23-6, AND TM 1-1520-248-23-7.

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Headquarters, Department of the Army

28 FEBRUARY 2000

CHANGE

NO. 1

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

Aviation Unit and Intermediate
Maintenance Manual
For

**ARMY MODEL
OH-58D HELICOPTER**

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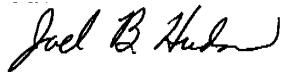
2. Retain these sheets in front of manual for reference purposes.

TM 1-1520-248-23-3
C1

By Order of the Secretary of the Army:

Official:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0022402

DISTRIBUTION:

To be distributed in accordance with initial distribution number (IDN) 311435, requirements for TM 1-1520-248-23-3.

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 APU. 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

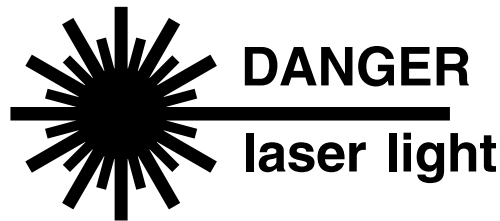
PITOT HEAT

The pitot tube assembly is very hot during and immediately 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 oil is 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.

BATTERY ELECTROLYTE

Corrosive battery electrolyte (potassium hydroxide) requires rubber gloves, apron, and face shield when handling leaking batteries. Potassium hydroxide spilled on clothing or other material shall be washed 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. Seal 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

DRYCLEANING 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 hazardous area of all loaded weapons. 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 long-term bodily harm.

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**AVIATION UNIT AND INTERMEDIATE
MAINTENANCE MANUAL
FOR ARMY MODEL
OH-58D HELICOPTER**

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-P, Redstone Arsenal, AL 35898-5230. You may also submit your recommended changes by E-mail directly to ls-lp@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 the manual is organized, and how to use it.

2. ORGANIZATION

- a. The complete OH-58D/OH-58D(R) Kiowa Warrior helicopter (AVUM/AVIM) maintenance manual consists of a set of seven volumes. These volumes are numbered as follows: TM 1-1520-248-23-1 through TM 1-1520-248-23-7.
- b. Volumes are made up of chapters. Each chapter is numbered in Arabic numerals (1, 2, 3, etc.). Each chapter has maintenance information on a particular helicopter system.
- c. Chapters are broken down into sections. Sections are numbered in Roman numerals (I, II, III, etc.).
- d. Sections are made up of paragraphs and tasks. The first three sections of Chapter 1 are made up of paragraphs that describe and locate the helicopter systems and components. Other sections throughout the manual are made up primarily of tasks, but all sections contain introductory paragraphs that describe the section contents. Sections cover major parts of a system.
- e. Tasks are detailed descriptions of maintenance procedures. 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., Removal, Cleaning, Inspection, Repair, Installation, and others as applicable.
- g. A task starts with an initial setup (content detailed in paragraph 8.) 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” means that the repairer shall stop and check the component. “INSPECT” means that a Technical Inspector (TI) is required. Do not go beyond that point in the procedure until the TI has completed his inspection.
- i. If applicable, a paragraph at the end of a task called “FOLLOW-ON MAINTENANCE” may be seen. The steps listed will be required to place the helicopter in a flyable state following the completion of the maintenance task.
- j. Operational checks and troubleshooting procedures are contained in the three-volume TM 1-1520-248-T manual. A reference to TM 1-1520-248-T will be made if an operational check must be performed to ensure serviceability.

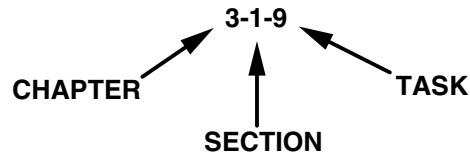
3. PARAGRAPH NUMBERING

- a. Paragraph numbers are assigned to each major information subject.
- b. Paragraphs are individually numbered by chapter and sequence.

4. 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 task's actual sequence in the section. Each number is separated by a (-) as shown in the example:

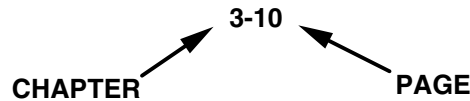
HOW TO USE THIS MANUAL — continued



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

5. PAGE NUMBERING

Except for front matter (all material that precedes Chapter 1), appendices, glossary, alphabetical index, and foldouts, all page numbering is by chapters. 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:



6. MANUAL INDEX

- a. The alphabetical index for the entire manual is located at the end of each volume of volumes 1 through 6. 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 wire cutter, go to the “C” section of the index and look under “Cutter.”

There you will find:

Cutter (Rapid Deployment), Lower Wire — Removal/Installation 2-2-60

The index tells that the wire cutter information for the lower wire cutter is in Chapter 2, section 2, task 60.

- b. You can find your task in the index, even if you only know a single word in the title. In the sample title above you could also find your tasks by looking under “Wire”. Examples:

Wire Cutter (Rapid Deployment), Lower — Removal/Installation 2-2-60

Or, you could look under “Lower”:

Lower Wire Cutter (Rapid Deployment) — Removal/Installation 2-2-60

In using the manual index, many similar task titles will be encountered. Some titles are similar though in different systems. This is true with shafts, brackets, supports, bearings, etc. The index will provide the name of the correct system to help you avoid going to the wrong paragraph/task.

- 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.

7. GLOSSARY

- a. A glossary of words used throughout the manual is located just before the alphabetical index in each volume of volumes 1 through 6. Section I of the glossary is the list of abbreviations and acronyms. Abbreviations are shortened terms for words. Acronyms are shortened terms for several words and use only the first letter of each of the words. Abbreviations and acronyms are defined where first used. The glossary provides a good place to check if there is any doubt.

HOW TO USE THIS MANUAL — continued

- b. Section II of the glossary contains definitions of unusual terms that appear in the manual. Many words have more than one meaning. A word that has a certain meaning in everyday language could have a different meaning for the helicopter. This is the reason for the definitions. If you see an unfamiliar word in the manual, check the list of definitions.
- c. Review the glossary periodically to ensure familiarity with the abbreviations, acronyms, and unusual terms.

8. INITIAL SETUP

The first page of each maintenance task in the manual contains the initial setup. Always check the initial setup before starting a task on the helicopter. 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 h.). Each subparagraph describes initial setup entries in 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. The task is performed at the intermediate level if (AVIM) appears in the title.
- b. **This Task Covers:** This entry appears in the border below the title. The task may require one or more operations (such as removal and installation).
- c. **Applicable Configurations:** This entry specifies the model or models for which the task is used, i.e., OH-58D, OH-58D(R), or All.
- 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 are 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 MOSs, 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., (B127). It is acceptable to use a torque wrench other than that which is 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 H. The index will identify the tool or part by name or part number, and a figure number in Appendix H will be referenced. All information required to construct a part or tool is provided in the figure.

HOW TO USE THIS MANUAL — continued

INITIAL SETUP EXAMPLE

**9-6-1. WEIGHT-ON-GEAR SWITCH (RAPID DEPLOYMENT LANDING GEAR) — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspection (TI) ■
68F Aircraft Electrician

Tools:
Electrical Repairer Tool Kit (B177)

Material:
Sealing Compound (D179)
Lockwire (D132)
Rubber Gloves (D111)

References:
TM 11-1520-248-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Helicopter on Jacks (Task 1-6-8)

e. **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 D. The item number is placed in parentheses following the item name on the initial setup page. A typical example of an expendable item is:

Lockwire (D132)

See the expendable and durable item list in Appendix D 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.

f. **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 (2)	■
67S	Scout Helicopter Technical Inspector (TI)	

This listing would indicate that two 67S repairers 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.

g. **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.

HOW TO USE THIS MANUAL — continued

- h. **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 Task 1-6-7 where 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.

9. 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, which is located immediately after the title page, 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 material. The user of this publication should obtain the material safety data sheets (Occupational Safety and Health Administration (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, 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.

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

NOTES

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 shall be read and remembered when working on the helicopter.

10. 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

HOW TO USE THIS MANUAL — continued

or a nonmandatory but preferred method of accomplishment. The word may is used to indicate an acceptable method of accomplishment.

11. 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. 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.

12. INSPECTION INFORMATION

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.

13. GENERAL MAINTENANCE INFORMATION

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

- a. Lines shall be tagged before they are disconnected. Tubes and parts shall be capped or plugged when they are disconnected.
- b. Used preformed packings, retainers, gaskets, cotter pins, lockwashers, etc., shall be discarded. New parts shall be installed.
- c. Packings shall be lubricated before installation. Specific instructions are provided in each maintenance procedure.
- d. Tubes and related parts shall 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 shall be inspected for serviceable condition before installation.
- h. Guide lines shall be used when any item is hoisted overhead.
- i. When a nut is tightened or loosened on a bolt, the bolt head shall be held with a wrench.
- j. When a coupling nut on a line is tightened or loosened, the mating fitting shall be held with a wrench.
- k. A special torque shall be cited when a direction to torque is given. A standard torque is required when no specific torque is given. Standard torque information is located in Appendix P of this manual and TM 1-1500-204-23.

HOW TO USE THIS MANUAL — continued

- l. 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.

14. ELECTRICAL WIRING AND CABLING

This technical manual contains removal and installation procedures for wiring harness/cable assemblies that are permanently installed in the helicopter. Wiring harnesses/cable assemblies that can or are normally removed with avionics/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.

15. 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 1-1520-266-23 for approved nondestructive inspection methods.

16. APPENDICES

The organization and content of Appendices to this manual are provided for reference as required during performance of maintenance tasks.

- Appendix A is a list of References.
- Appendix B is the Maintenance Allocation Chart and Tool and Test Equipment Requirements List.
- Appendix C is the Helicopter Inventory Master Guide.
- Appendix D is an Expendable Supplies and Materials List.
- Appendix E describes Storage of Helicopter.
- Appendix F is Wiring Data.
- Appendix G provides Weight and Balance Data.
- Appendix H provides Locally Manufactured Items Data.
- Appendices J, K and L are reserved for future use.
- Appendix M provides Electrical Bonding Procedures.
- Appendix N is reserved for future use.
- Appendix P provides Standard Torque Values.
- Appendix Q provides Corrosion Control Information.
- Appendix R is reserved for future use.

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.

HOW TO USE THIS MANUAL — continued

Table 2. Organization and Content of Appendix B

Organization	Content
Section I	Introduction to Maintenance Allocation Chart.
Section II	Maintenance Allocation Chart.
Section III	Tool and Test Equipment Requirements. Tools and test equipment, including special tools and common tool sets required for each maintenance function as referenced in Maintenance Allocation Chart and individual tasks.
Section IV	List of remarks for each maintenance function as referenced in the Maintenance Allocation Chart.

Table 3. Organization and Content of Appendix C

Organization	Content
Helicopter Inventory Master Guide	Paragraph that provides general information.
Security	Normally, helicopter inventory records are not classified.
Inventoriable Items	List of mission equipment, loose equipment, modification kits, and special environment equipment.
Periods of Inventory	Guidelines on the events and frequency of events that mandate an inventory accounting of listed items.

Table 4. Organization and Content of Appendix D

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.

HOW TO USE THIS MANUAL — continued**Table 5. Organization and Content of Appendix E**

Organization	Content
Section I	General Information including components involved in accidents, Requirements, Storage Categories, Procedures, and Inspection.
Section II	Description of procedures required to store the OH-58D in a flyable state.
Section III	Description of procedures required to store the OH-58D for a short term.
Section IV	Description of procedures required to store the OH-58D for an intermediate period of time.

Table 6. Organization and Content of Appendix F

Organization	Content
Wiring Diagrams	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.
Routing and Clamping	Diagrams of OH-58D wire bundle clamping arrangements.

Table 7. Organization and Content of Appendix G

Organization	Content
Section I	General information required for intermediate maintenance personnel to perform their phase of weight and balance control.
Section II	Instruction on proper use of forms and charts required for calculations and documentation of weight and balance data.
Section III	Specific instructions for properly weighing the OH-58D helicopter.

HOW TO USE THIS MANUAL — continued

Table 8. Organization and Content of Appendix H

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

Appendices J, K and L are reserved for future use.

Table 9. Organization and Content of Appendix M

Organization	Content
Section I	Introduction and general information including intended purpose, definitions, electrical bonding classes, and tools.
Section II	Description of tools required.
Section III	Resistance requirements for each class of bonding.
Section IV	Surface preparation and methods of bonding.
Section V	Testing of completed bonds.

Appendix N is reserved for future use.

Table 10. Organization and Content of Appendix P

Organization	Content
Introduction	General information about the Appendix.
Torque Values	General and specific information about torquing procedures including Torque Tables.
Selection and Use of Torque Wrench	Methods of choosing torque wrenches and procedures and calculations.

HOW TO USE THIS MANUAL — continued

Table 11. Organization and Content of Appendix Q

Organization	Content
Section I	An introduction that explains purpose of Appendix and defines corrosion.
Section II	Explanation of Inspection and Corrosion Prone Areas as to Purpose of Inspection and Responsibilities for Corrosion Control.
Section III	Preventive Maintenance described in terms of Prevention and Preservation.
Section IV	Required references to appropriate manuals for Corrosion Control Processes and Equipment Requirements.
Section V	Description of Corrosion Prone Areas. Provision of and reference to Inspection and Repair Procedures. Data is both tabular and pictorial.

Appendix R is reserved for future use.

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.

2. WARNINGS.

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.

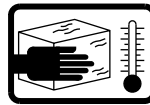
3.1 Hazardous Materials and Operations Icons. Icons are used in this manual to identify dangers associated with hazardous materials and certain conditions. The symbols used and their definitions are as follows.



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

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 solvent-saturated 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

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.



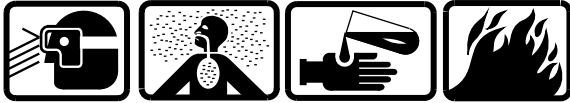
ADHESION PROMOTER

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 eyes 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.



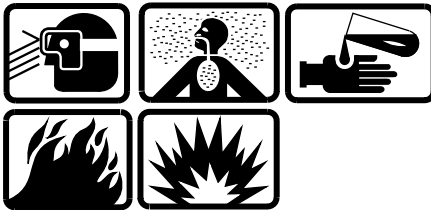
ADHESIVE, EA934NA

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, 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

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.



ADHESIVE VAPORS

Adhesive vapors may cause irritation of eyes, nose, and respiratory system. Eye and skin contact with material may cause irritation. If ingested, may cause gastric distress. Flush eyes with water for 15 minutes. Wash skin with soap and water. If inhaled, move to fresh air. In all cases get immediate medical attention. Work in a well-ventilated area. Wear approved gloves and safety glasses.



ANTI-ICING/DEICING FLUID

Anti-icing/Deicing 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 irritation. 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**

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

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

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

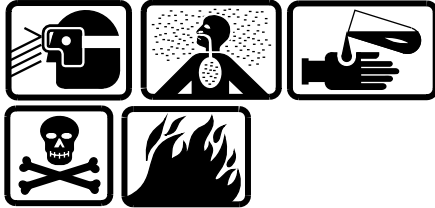
If solution of petrolatum corrosion preventive compound is decomposed by heat, toxic gases are released. Prolonged contact with solution or mist can cause skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. If solution contacts eyes, flush eyes with 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 liquid-soaked 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

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

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.



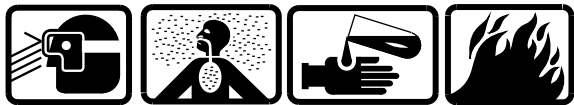
DRILLING OPERATIONS

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

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 air-exhausted, 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

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

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

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

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

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



HYDRAULIC FLUID, MIL-H-5606

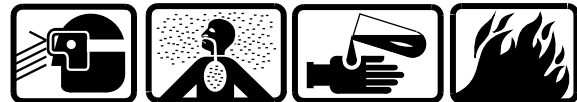
MIL-H-5606 hydraulic fluid is flammable. Flashpoint is 180 °F (82 °C). When hydraulic fluid is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist can cause skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. If liquid 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

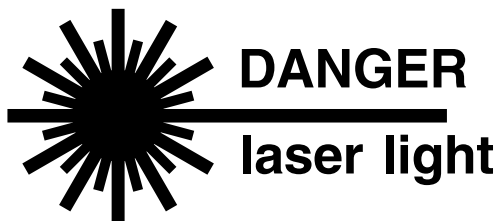
Isopropyl alcohol is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not use while smoking or while others are smoking. Inhalation of vapors can cause drowsiness, dizziness, and headache. Contact with skin may cause irritation. If liquid touches skin or eyes, flush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



JET FUEL

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

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

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

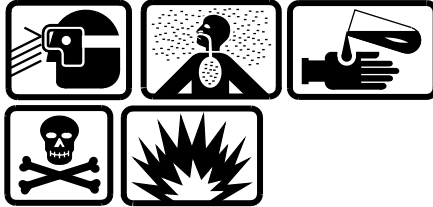
If lubricating oil is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist may cause skin irritation. If there is any prolonged contact with skin, wash area with soap and water. If oil contacts eyes, flush eyes with water immediately. Remove saturated clothing. If oil is 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/NAPHTHALENE

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

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

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

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

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.



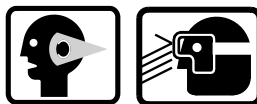
POLYURETHANE CONDUCTIVE COATING

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

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.



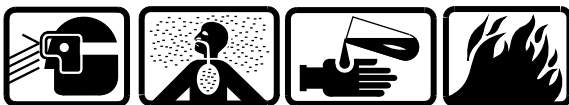
SEALING COMPOUND, MIL-S-22473

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, MIL-S-8802, MIL-S-83249

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.



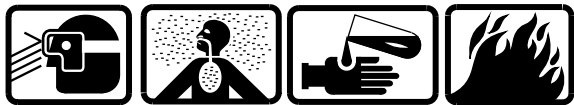
SHELLAC

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

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

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 liquid-soaked 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

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 6

DRIVE TRAIN SYSTEM

6-1. DRIVE TRAIN SYSTEM

This chapter contains maintenance procedures for the drive train system. The chapter is divided into eight sections.

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Section I. SERVICEABILITY CHECKS

6-2. SERVICEABILITY

6-3. INTRODUCTION

This section contains maintenance procedures for checking the serviceability of the following drive train subsystems: main transmission, freewheeling unit, engine to transmission driveshaft, fan shaft assembly, oil system, tail rotor driveshaft, and tail rotor gearbox. Standard torques are provided in Appendix P and TM 1-1500-204-23.

6-4. CONDITIONS

Conditions and possible causes listed below have been limited to those that are reasonably probable (though not necessarily frequent in normal service) and which may be encountered in flight or while performing maintenance. The conditions could be subject to some evaluation at organizational level, although final corrective action by a higher level might be required in some instances. Conditions involving obvious major damage are omitted. Conditions caused by an accident or an unusual chain of events which require additional information not available in troubleshooting are omitted.

1. In main transmission troubleshooting, observe the following:

a. Low oil level will not cause a low oil pressure indication, provided the sump contains enough oil to cover pump inlet. Oil temperature might rise, however. Overfilling above standard oil level may cause low pressure indication due to foaming of the oil caused by excessive churning by the gears.

b. Effects of an oil leak will depend on its location in system and rate of leakage. An external leak can eventually allow sump to be pumped dry, causing failure of main transmission. While oil remains to supply the pump, the pressure regulator valve will tend to maintain normal system pressures, compensating for leakage. This applies especially to leaks located between pump and pressure regulator valve. Leaks occurring beyond pressure regulator valve can cause some indication of low oil pressure. Leakage to interior of main transmission, while not

affecting oil level, can starve lubrication areas beyond the leak. Indicated oil pressure and temperature may be affected.

c. Cumulative clogging of oil filter screens will not be shown by a gradual drop of indicated oil pressure as it may on some other aircraft oil systems. Pressure regulator valve will maintain normal pressure even if filter screens become so clogged as to force oil flow through filter bypass valve.

2. For engine to transmission driveshaft troubleshooting, apply the following:

a. Trouble conditions of engine to transmission driveshaft can seldom be detected in operation, since there are no reliable indications except possibly in an extreme condition. "Suspected vibration" is only partially accurate as a term for such conditions as dynamic out-of-balance or faulty coupling action. Vibration would result, as well as abnormal stresses and wear, but would be absorbed in structure and pylon mounts or effectively masked by normal vibrations of the helicopter providing no distinct indication to the pilot.

b. Engine to transmission driveshaft trouble indications are, therefore, usually those revealed by careful inspection.

c. Principal cause of engine to transmission driveshaft trouble is faulty installation procedure.

3. For tail rotor driveshaft troubleshooting, apply same principles as for engine to transmission driveshaft.

NOTE

Prior to beginning troubleshooting efforts ensure all normal operational checks have been accomplished. If malfunction cannot be identified in TM 1-1520-248-T series manual, notify next higher level of maintenance.

6-5. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Main Transmission — Serviceability Check	6-1-1	6-4
Freewheeling Unit — Serviceability Check	6-1-2	6-10
Tail Rotor Gearbox — Serviceability Check	6-1-3	6-16
Drive Train System — Identification of Foreign Material	6-1-4	6-20

6-1-1. MAIN TRANSMISSION — SERVICEABILITY CHECK

This task covers: Serviceability Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Tool Kit (B180)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)
Drain Hose (B72)

Material:
Wiping Rags (D164)
Lubricating Oil (D139 or D140)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68D Aircraft Powertrain Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Upper Chip Detector Removed (Task 6-3-8)
Lower Chip Detector and Sump Screen
Removed (Task 6-3-11)

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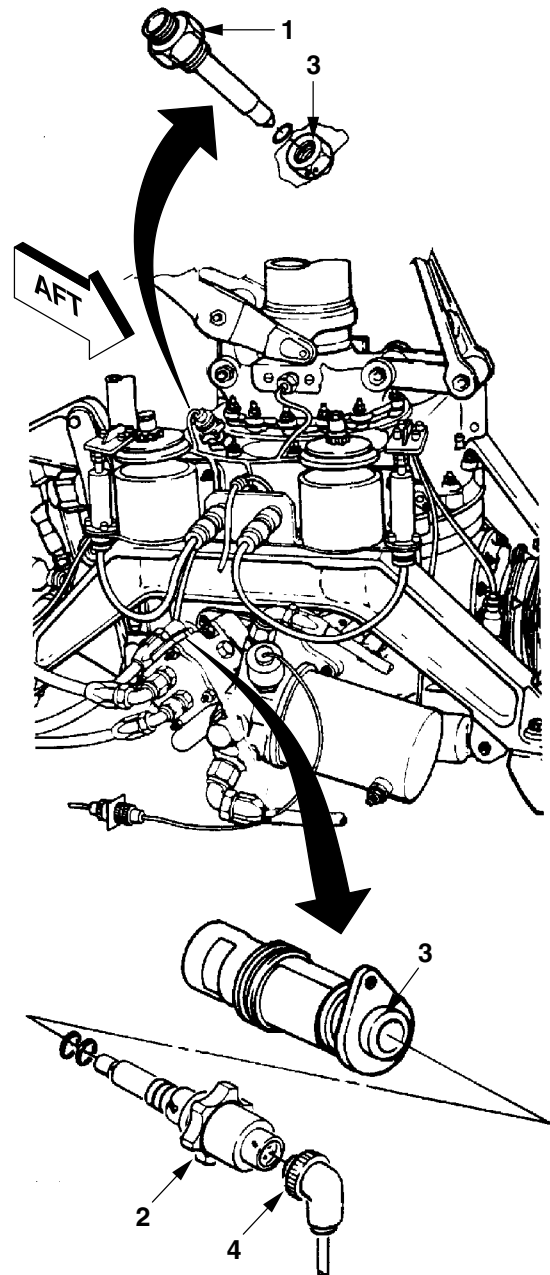
6-1-1. MAIN TRANSMISSION — SERVICEABILITY CHECK (CONT)

1. Inspect electrical magnetic element of upper chip detector (1) for metal particles (Task 6-1-4).
2. Inspect electrical magnetic element of lower chip detector (2) for metal particles (Task 6-1-4).
3. If metal particles are found, identify them (Task 6-1-4).
4. After metal particles are identified, take corrective action (Task 6-1-4, Table 6-1-1).
5. Use wiping rags (D164) to clean self-closing valves (3).
6. Inspect self-closing valves (3) for damage.
7. Install electrical magnetic element of upper chip detector (1) (Task 6-3-8).
8. Install electrical magnetic element of lower chip detector (2) (Task 6-3-11).

NOTE

The electrical connector backshell shall be positioned between 5 and 7 o'clock position. This may require reindexing the lower chip detector by removing it from transmission and indexing it one-third of a turn at a time.

9. Connect electrical connector (4) to lower chip detector (2) with backshell positioned between 5 and 7 o'clock position.



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6-1-1. MAIN TRANSMISSION — SERVICEABILITY CHECK (CONT)



Lubricating Oil

NOTE

Lubricating oil is to be drained into a clean suitable container (B101) and saved for inspection.

10. Remove oil filter elements (5 and 6) (Task 6-8-3).

11. Inspect oil filter elements (5 and 6) for physical damage.

a. Replace primary oil filter element (5) if damaged.

b. Replace secondary oil filter element (6) if damaged.

12. Inspect oil filter elements (5 and 6) for entrapped foreign material (Task 6-1-4).

a. If only minor contamination of filter elements (5 and 6) is found, do the following:

(1) Replace primary oil filter (5).

(2) Clean and install secondary oil filter (6) (Task 6-8-3).

b. If excessive contamination of filter elements (5 and 6) is found and the filter bypass indicator is popped, do the following:

(1) Drain transmission oil system. Flush with clean oil (D139 or D140).

(2) Replace primary oil filter (5).

(3) Clean and install secondary oil filter (6) (Task 6-8-3).

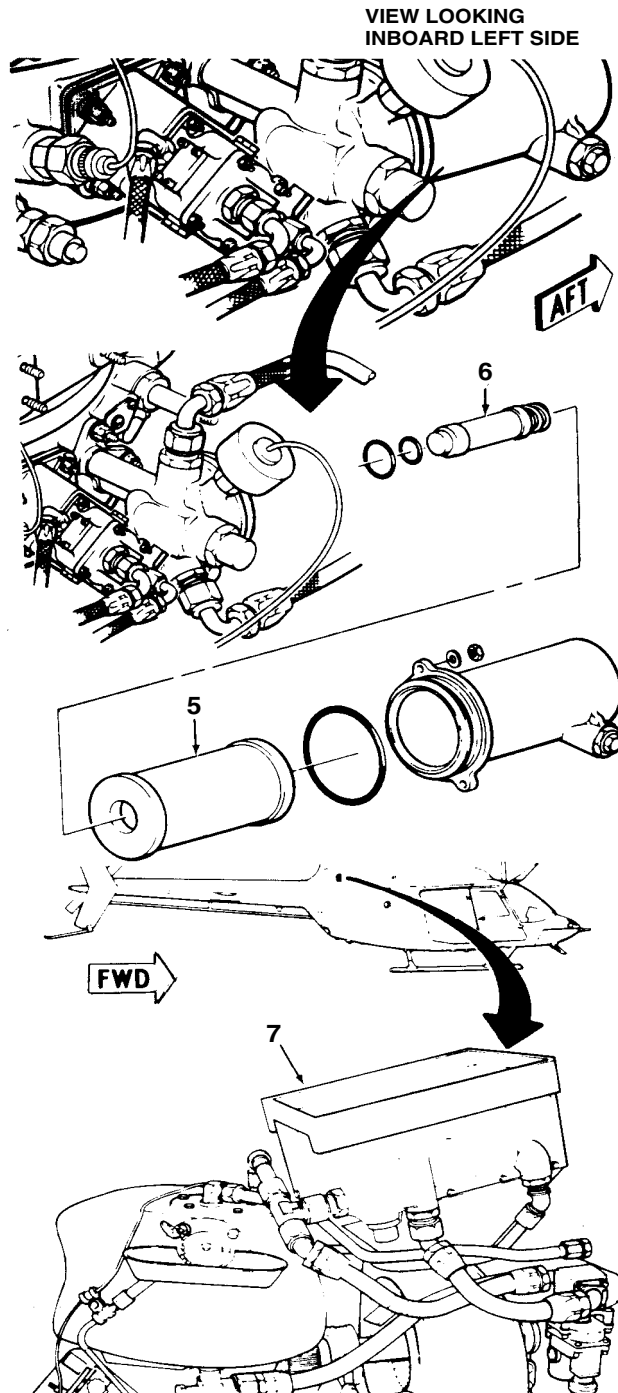
(4) Remove oil cooler (7) (Task 6-8-24).

(5) Identify oil cooler (7) as contaminated.

(6) Build up replacement oil cooler (7) (Task 6-8-25).

(7) Thoroughly flush all oil system lines.

(8) Install oil cooler (7) (Task 6-8-26).



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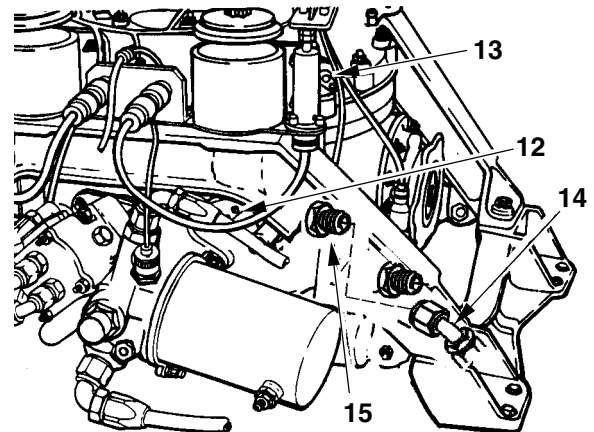
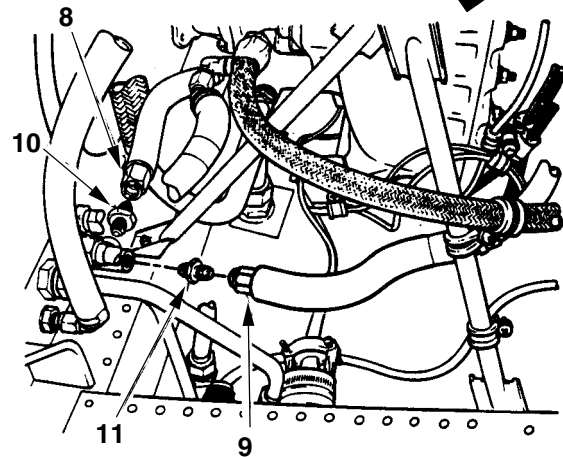
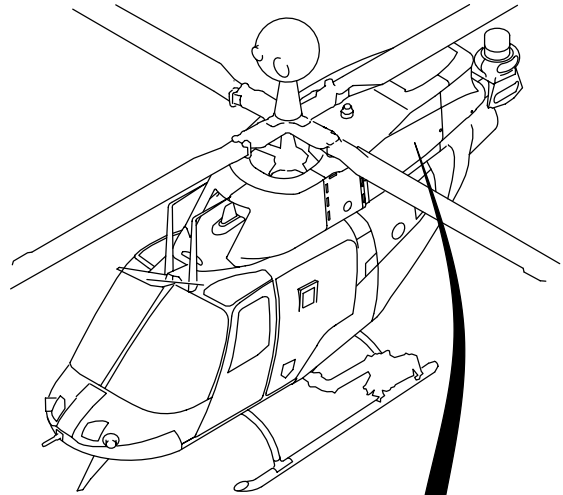
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6-1-1. MAIN TRANSMISSION — SERVICEABILITY CHECK (CONT)



Lubricating Oil

- (9) Disconnect hose assemblies (8 and 9).
- (10) Remove freewheeling unit lubrication restrictors (10 and 11).
- (11) Using wiping rags (D164), clean restrictors (10 and 11).
- (12) Install freewheeling unit lubrication restrictors (10 and 11).
- (13) Connect hose assemblies (8 and 9).
- (14) Remove oil jets (12 and 13) (Task 6-8-11).
- (15) Clean and inspect oil jets (12 and 13) (Task 6-8-12).
- (16) Install oil jets (12 and 13) (Task 6-8-11).
- 13. Remove hose (14) from filter/fitting (15).
- 14. Remove filter/fitting (15).
- 15. Clean and inspect filter/fitting (15).
- 16. Install filter/fitting (15).
- 17. Install hose (14) on filter/fitting (15).
- 18. Service transmission oil system (Task 1-4-8).
- 19. Pilot perform MOC for one hour (TM 1-1520-248-10/CL).



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6-1-1. MAIN TRANSMISSION — SERVICEABILITY CHECK (CONT)

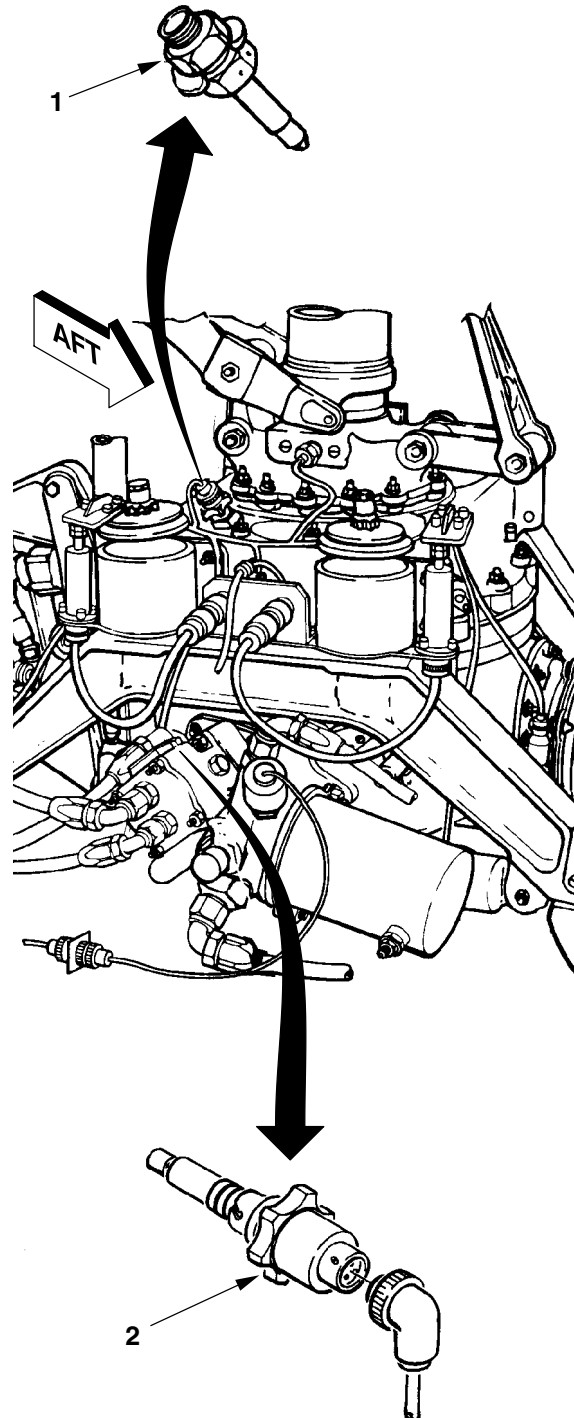


Lubricating Oil

NOTE

Lubricating oil is to be drained into a clean suitable container (B101) and saved for inspection.

20. Drain lubricating oil from transmission (Task 1-4-7).
21. Remove upper chip detector (1) (Task 6-3-8).
22. Inspect upper chip detector (1) for metal particles (Task 6-1-4).
23. If metal particles are found, identify them (Task 6-1-4).
24. After metal particles are identified, take corrective action (Task 6-1-4, Table 6-1-1).
25. Remove lower chip detector (2) (Task 6-3-11).
26. Inspect lower chip detector (2) for metal particles (Task 6-1-4).
27. If metal particles are found, identify them (Task 6-1-4).
28. After metal particles are identified, take corrective action (Task 6-1-4, Table 6-1-1).
29. Inspect lubricating oil for foreign material (Task 6-1-4).
30. If metal particles are found, identify them (Task 6-1-4).
31. After metal particles are identified, take corrective action (Task 6-1-4, Table 6-1-1).



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6-1-1. MAIN TRANSMISSION — SERVICEABILITY CHECK (CONT)

NOTE

If this serviceability check is being conducted because of metal particle contamination and the number of metal particles has increased or particles are large enough to be identified as chips from gears or bearings, replace main transmission. If the number of particles has decreased and only minute particles are found, return transmission to service.

INSPECT**FOLLOW-ON MAINTENANCE**

Install upper chip detector (Task 6-3-8).

Install lower chip detector (Task 6-3-11).

Service main transmission oil system (Task 1-4-8).

END OF TASK

6-1-2. FREEWHEELING UNIT — SERVICEABILITY CHECK

This task covers: Serviceability Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Tool Kit (B180)
Drain Hose (B73)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Material:
Lubricating Oil (D139 or D140)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68D Aircraft Powertrain Repairer
Pilot

References:
TM 1-1520-248-CL
TM 1-1520-248-10

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

6-1-2. FREEWHEELING UNIT — SERVICEABILITY CHECK (CONT)

**Lubricating Oil****CAUTION**

Lubricating oil (D139 or D140) should not be mixed except in an emergency. Mixing of lubricants can cause premature failure. If oils are mixed, oil shall be drained and transmission oil system shall be serviced with proper oil within 5 operating hours.

NOTE

Lubricating oil is to be drained into a clean suitable container (B101) and saved for inspection.

1. Drain lubricating oil from freewheeling unit (1) and main transmission as follows:

a. Remove electrical connector (2) from electrical magnetic element of chip detector (3).

b. Remove electrical magnetic element of chip detector (3) from chip detector housing (4).

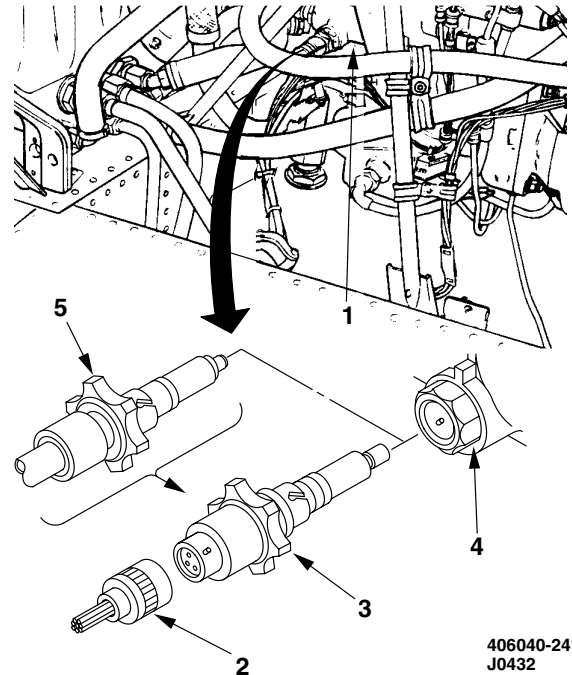
c. Insert drain hose (B73) (5) into chip detector housing (4) and drain oil into a clean, suitable container (B101).

d. When oil is completely drained from freewheeling unit (1) and main transmission, remove drain hose (5).

2. Inspect lubricating oil for metal particles.

3. If metal particles are found, identify them (Task 6-1-4).

4. After metal particles are identified, take corrective action (Task 6-1-4).



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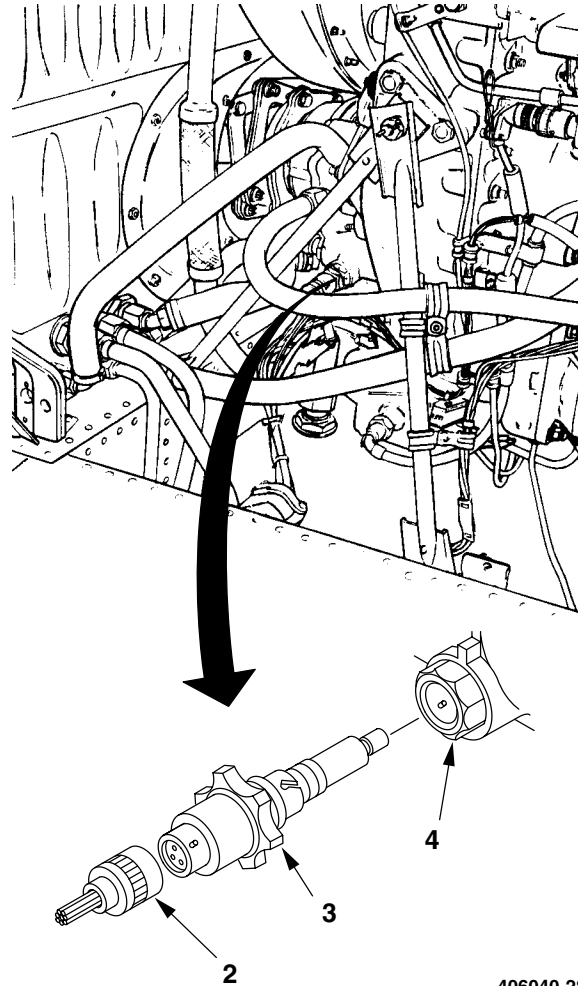
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6-1-2. FREEWHEELING UNIT — SERVICEABILITY CHECK (CONT)

CAUTION

If foreign material is found in the freewheeling unit, main transmission and mast bearing shall be inspected for contamination. Foreign material contamination in main transmission and/or mast bearing will cause serious damage.

5. Use wiping rags (D164) to clean self-closing valve in chip detector housing (4).
6. Inspect self-closing valve in chip detector housing (4) for damage.
7. Inspect electrical magnetic element of chip detector (3) for metal particles.
8. If metal particles are found, identify them (Task 6-1-4).
9. After metal particles are identified, take corrective action (Task 6-1-4).
10. Use wiping rags (D164) to clean electrical magnetic element of chip detector (3).
11. Install electrical magnetic element of chip detector (3) in chip detector housing (4).
12. Install electrical connector (2) on electrical magnetic element of chip detector (3).

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6-1-2. FREEWHEELING UNIT — SERVICEABILITY CHECK (CONT)

13. Remove filter elements (6 and 7) from main transmission (8) (Task 6-8-3).

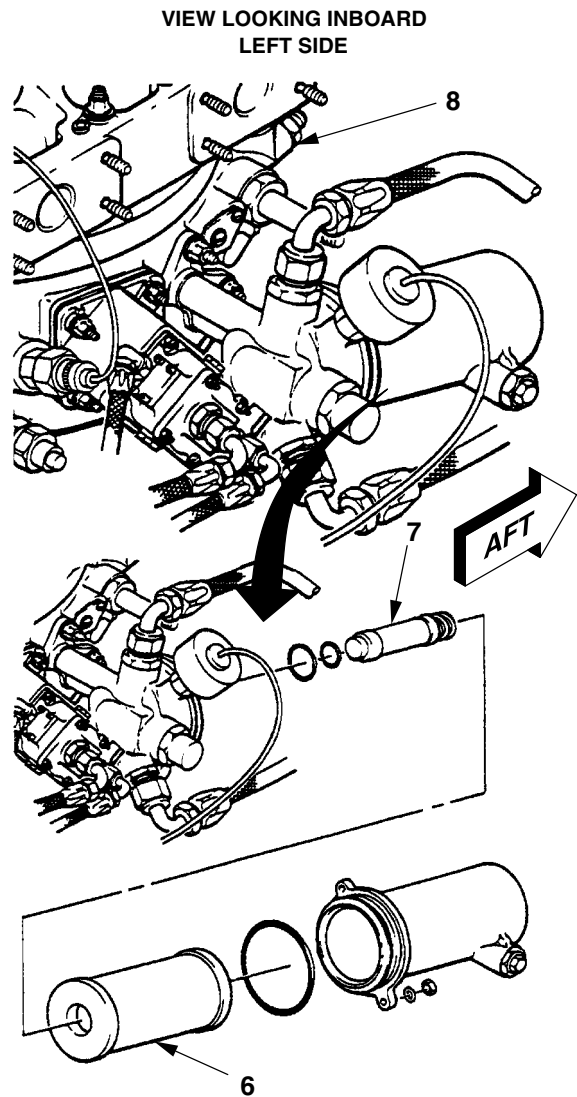
14. Inspect filter elements (6 and 7) for metal particles.

15. If metal particles are found, identify (Task 6-1-4).

16. After metal particles are identified, take corrective action (Task 6-1-4).

17. Clean filter element (7) (Task 6-8-3).

18. Install filter elements (6 and 7) (Task 6-8-3).



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6-1-2. FREEWHEELING UNIT — SERVICEABILITY CHECK (CONT)

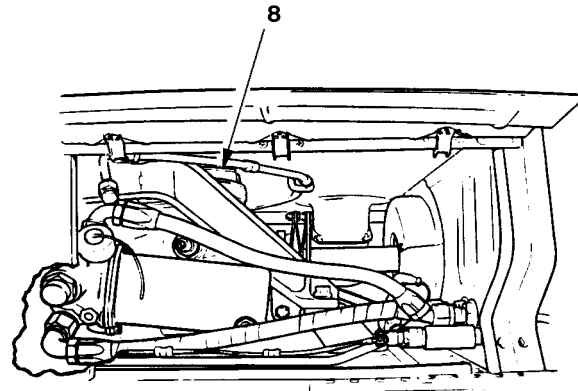
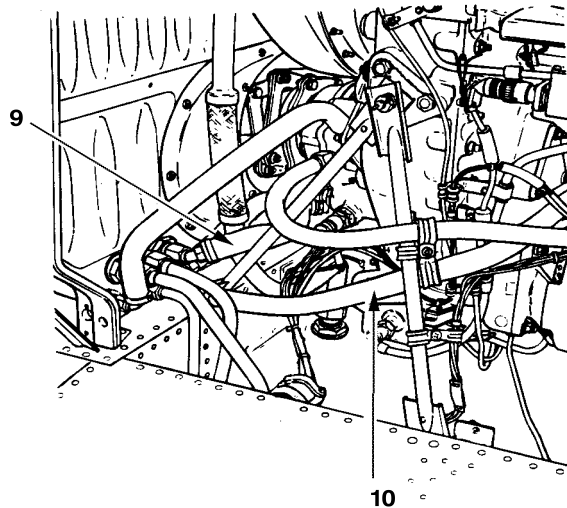
NOTE

Hose assemblies (9 and 10) are the pressure and return lines from the freewheeling unit to the main transmission (8).

19. Use clean lubricating oil (D139 or D140) to thoroughly flush hose assemblies (9 and 10).

20. Service transmission oil system (Task 1-4-8).

21. Pilot perform MOC for one hour (TM 1-1520-248-10/CL).



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6-1-2. FREEWHEELING UNIT — SERVICEABILITY CHECK (CONT)

NOTE

Lubricating oil is to be drained into clean, suitable container (B101) and saved for inspection.

22. Drain lubricating oil from freewheeling unit (1) as follows:

a. Remove electrical connector (2) from electrical magnetic element of chip detector (3).

b. Remove electrical magnetic element of chip detector (3) from chip detector housing (4).

c. Insert drain hose (B73) (5) into chip detector housing (4) and drain one quart of oil into clean, suitable container (B101).

d. Remove drain hose (B73) (5).

23. Inspect lubricating oil for metal particles (Task 6-1-4).

24. If metal particles are found, identify and take corrective action (Task 6-1-4).

25. Inspect electrical magnetic element of chip detector (3) for metal particles.

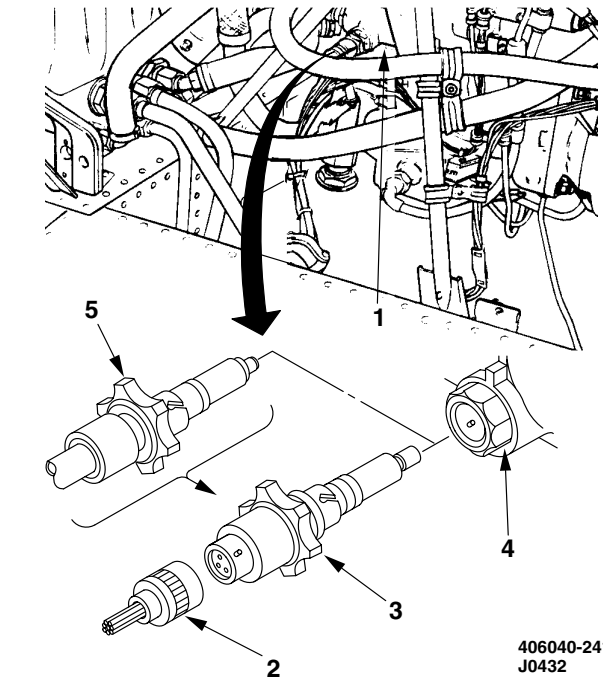
26. If metal particles are found, identify and take corrective action (Task 6-1-4).

NOTE

If this serviceability check is being conducted because of metal particle contamination and number of metal particles has increased or particles are large enough to be identified as chips from gear or bearing, replace freewheeling unit. If number of particles has decreased and only minute particles are found, return freewheeling unit to service.

27. Install electrical magnetic element of chip detector (3) in chip detector housing (4).

28. Install electrical connector (2) on electrical magnetic element of chip detector (3).



29. Service transmission oil system (Task 1-4-8).

INSPECT

END OF TASK

6-1-3. TAIL ROTOR GEARBOX — SERVICEABILITY CHECK

This task covers: Serviceability Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Tool Kit (B180)
Torque Wrench (B241)
Drain Hose (B73)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Material:
Wiping Rags (D164)
Lubricating Oil (D139 or D140)
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68D Aircraft Powertrain Repairer
Pilot

References:
TM 1-1520-248-CL
TM 1-1520-248-10

Equipment Condition:
Helicopter Safed (Task 1-6-7)

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6-1-3. TAIL ROTOR GEARBOX — SERVICEABILITY CHECK (CONT)



Lubricating Oil

NOTE

Lubricating oil is to be drained into a clean, suitable container (B101) and saved for inspection.

1. Remove chip detector (1) from tail rotor gearbox (2) (Task 6-7-10).

2. Insert drain hose (B73) into chip detector housing and allow oil to drain into a clean, suitable container (B101). Remove drain hose (B73).

INSPECT

3. Inspect chip detector (1) for metal particles (Task 6-1-4).

4. If metal particles are found, identify and take corrective action (Task 6-1-4).

5. Inspect bevel gears for damage as follows:

a. Remove lockwire and remove sight glass (3) and packing (4).

b. Discard packing (4).

c. Remove lockwire and remove plug (5) and packing (6).

d. Discard packing (6).

e. Visually inspect bevel gears for damage by looking through sight glass (3) port and plug (5) port.

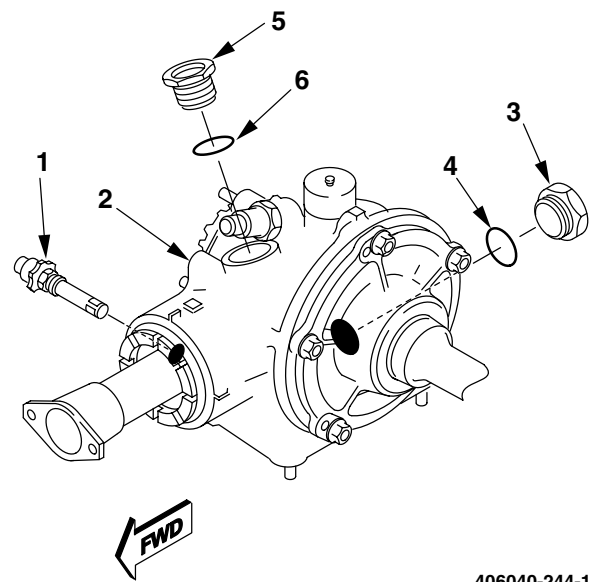
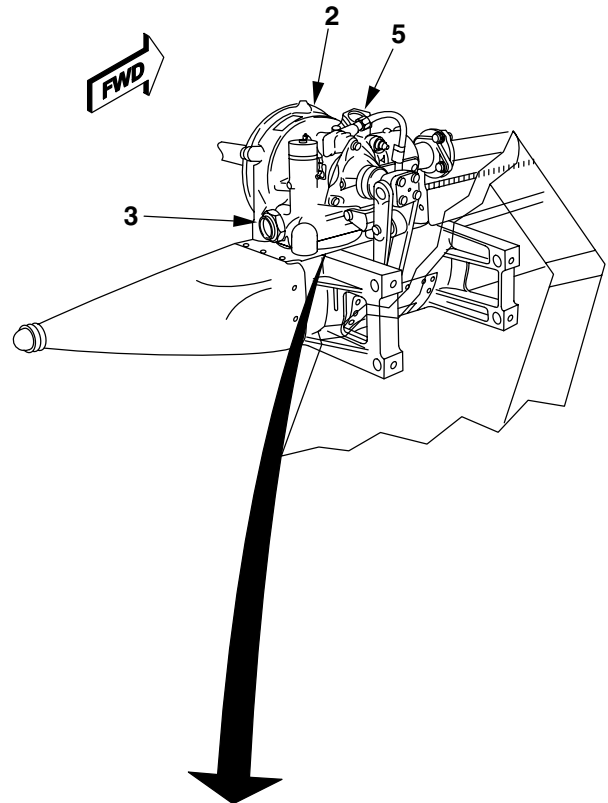
f. Whether bevel gears are or are not damaged, proceed as follows:

(1) Lightly lubricate packing (4) with lubricating oil (D139 or D140).

(2) Install packing (4) on sight glass (3).

(3) Install sight glass (3) and packing (4) on tail rotor gearbox (2).

(4) Torque sight glass (3) **250 TO 400 INCH-POUNDS**.



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6-1-3. TAIL ROTOR GEARBOX — SERVICEABILITY CHECK (CONT)

(5) Secure sight glass (3) with lockwire (D132).



Lubricating Oil

(6) Lightly lubricate packing (6) with lubricating oil (D139 or D140).

(7) Install packing (6) on plug (5).

(8) Install plug (5) and packing (6) on tail rotor gearbox (2).

(9) Torque plug (5) **250 TO 400 INCH-POUNDS**.

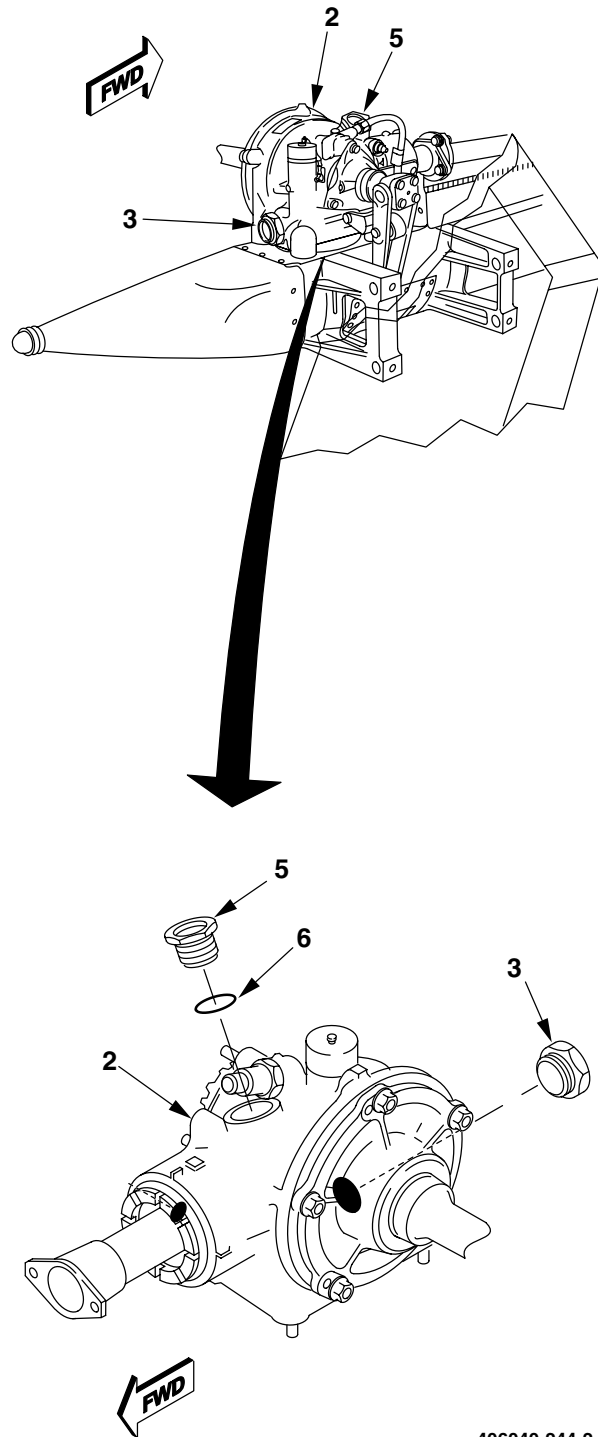
(10) Secure plug (5) with lockwire (D132).

6. If bevel gears are damaged, replace tail rotor gearbox (2) (Task 6-7-1). Route unserviceable tail rotor gearbox (2) to depot for overhaul.

CAUTION

- Lubricating oil D139 or D140 should not be mixed except in an emergency. Mixing of lubricants can cause premature failure. If oils are mixed, oil shall be drained and tail rotor gearbox shall be serviced with proper oil within 5 operating hours.
- Exclusive use of oil D139 is required in the OH-58D at ambient temperatures above -40 degrees F.

7. If bevel gears are not damaged, flush tail rotor gearbox (2) with minimum one quart clean lubricating oil (D139 or D140).



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6-1-3. TAIL ROTOR GEARBOX — SERVICEABILITY CHECK (CONT)

8. Using clean wiping rag (D164), clean chip detector (1).

9. Install chip detector (1) (Task 6-7-10).

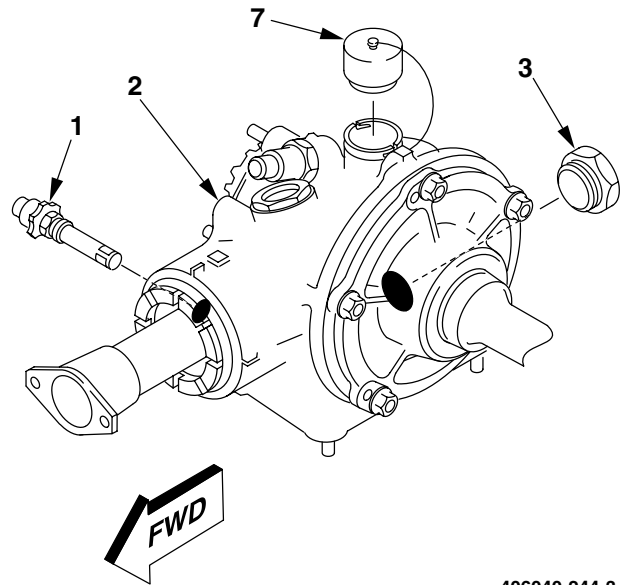
10. Remove filler cap (7) and service tail rotor gearbox (2) to middle of sight glass (3) (Task 1-4-9).

11. Install filler cap (7).

12. Pilot perform ground run of helicopter for one hour (TM 1-1520-248-10/CL).

13. Immediately after ground run, remove chip detector (1) and inspect for metal particles (Task 6-1-4).

14. If metal particles are found, identify and take corrective action (Task 6-1-4).



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INSPECT



Lubricating Oil

NOTE

Lubricating oil is to be drained into a clean, suitable container (B101) and saved for inspection.

15. Drain lubricating oil into clean container (Task 1-4-9).

16. Inspect lubricating oil for metal particles (Task 6-1-4).

17. If metal particles are found, identify and take corrective action (Task 6-1-4).

NOTE

If this serviceability check is being conducted because of metal particle contamination and number of metal particles has increased, or particles are large enough to be identified as chips from gear or bearing, tail rotor gearbox shall be replaced. If number of particles has decreased and only minute particles are found, tail rotor gearbox shall be returned to service.

18. Using clean wiping rag (D164), clean chip detector (1).

19. Install chip detector (1) (Task 6-7-10).

INSPECT

FOLLOW-ON MAINTENANCE

Service tail rotor gearbox to middle of sight glass (Task 1-4-9).

END OF TASK

6-1-4. DRIVE TRAIN SYSTEM — IDENTIFICATION OF FOREIGN MATERIAL

This task covers: Identification of Foreign Material

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Tool Kit (B180)

Material:
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68D Aircraft Powertrain Repairer

References:
TB 43-0106

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Transmission Oil Filters Removed (Task 6-8-3)

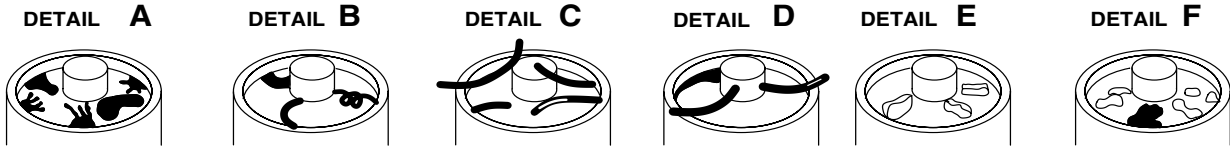
1. Perform visual inspection (see Table 6-1-1) of foreign material particles found during serviceability checks or troubleshooting.

2. Submit oil sample and particles for analysis (TB 43-0106).

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6-1-4. DRIVE TRAIN SYSTEM — IDENTIFICATION OF FOREIGN MATERIAL (CONT)

TABLE 6-1-1. Identification of Foreign Materials



MATERIAL FOUND ON CHIP DETECTORS			
MATERIAL	DESCRIPTION	ACTION REQUIRED	SIGNIFICANCE
Steel	<p>Tiny whisker-like particles. Groups of dark microscopic particles. Chips disappear into large black smudge when removed. Common term for condition is sludge or fuzz (See detail A).</p> <p>Spiral curls or comma-shaped particles. When examined under magnification, particles are often smooth and shiny on their convex surfaces, and quite rough on other surfaces and edges. Color of particles is usually grey on rough surfaces. Common term for condition is manufacturing debris (See detail B).</p> <p>Hair-like ferrous debris. Subject debris may have rectangular or triangular cross sections granularly 0.080 inch or less in thickness. Length may range from 0.10 to over 1.0 inch. Color of debris is usually light grey, although one or more sides may have a black appearance. Common term for condition is hairs (See detail C).</p> <p>Irregular shaped ferrous particles. Particles usually triangular in cross section. Particles often spike-like in appearance. Under magnification, one side of triangular section will usually appear sheared. Color of particles may be silvery grey or black with one or more silver sides. Existence of two or more particles of this type on a chip detector at any one time is rare. Common term for condition is manufacturing debris (See detail D).</p>	<p>No maintenance action required. Clean and reinstall chip detector.</p> <p>Same action as above if found within the first 50 hours of operation of a new or overhauled component. After the first 50 hours perform serviceability check (Task 6-1-1, 6-1-2, or 6-1-3).</p>	<p>Generally microscopic wear particles produced by normal wear within drive system component. Particles are often grouped by the field of the chip detector magnet to assume the shape of apparently larger chips.</p> <p>Particles are fragments of chips or shavings produced during the machining of ferrous components. Such contamination is often introduced into drive system components on tools and during compressed air dusting operations within the component assembly area.</p> <p>Debris is normally scrapings produced as components are interference fitted together during assembly of the drive system component. Debris of this general shape is also produced after long term operation at the corners of wearing surfaces.</p> <p>This type debris can also be produced during the opening of lubricating oil cans and can be introduced into the component during servicing.</p> <p>Particles of this type are commonly the result of tool slippage during assembly of the drive system component.</p>

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6-1-4. DRIVE TRAIN SYSTEM — IDENTIFICATION OF FOREIGN MATERIAL (CONT)

TABLE 6-1-1. Identification of Foreign Materials (Continued)

MATERIAL FOUND ON CHIP DETECTORS			
MATERIAL	DESCRIPTION	ACTION REQUIRED	SIGNIFICANCE
Steel	Irregularly shaped ferrous chunks of various sizes and shapes. Under magnification one or more sides of particles appear rough and grainy. Color of particles is silvery grey often with one or more black sides. No common term for condition (See detail E).	Replace component.	Existence of this type debris indicates likely gear and/or bearing damage within the drive system component.
	Few moderately sized and/or numerous small nearly flat pieces. Under magnification one side of flakes appears very smooth. Flakes are silvery in color with black sides. Common term for condition is flakes (See detail F).	Replace component.	Particles of this description are classic indicators of rolling element bearing failure. They are also less common indicators of gear tooth spalling.
MATERIALS FOUND IN FILTERS OR SCREENS			
MATERIAL	DESCRIPTION	ACTION REQUIRED	SIGNIFICANCE
Steel	SEE CHIP DETECTOR SECTION DETAILS A THROUGH F.		
Aluminum and Magnesium	Particles in granular form or resembling miniature lathe turnings.	No action required if quantity is small and found at first inspection after overhaul or major maintenance. At subsequent inspections or if quantity is large, replace component.	May be result of use of these materials as mallets or drifts during assembly. May indicate wear of oil pump interior surfaces or abnormal interference.
Silver	Small flakes or powder.	No action required if found during first 100 hours of operation since new or overhaul or if found at first inspection since new or overhaul. If found after first inspection or first 100 hours and quantity is large, replace component.	Result from wear of silver plated components such as bearing cages and input pinion gear teeth. Quantity may be relatively large until components fully "break in".
Copper (Bronze)	Particles in granular form.	If quantity is large, replace component.	May indicate excessive wear to oil pump sleeve bearings or bronze bearing cages.
	Chips	None	Results of the use of mallets and drifts during assembly.
Phenolic Rubber	Chips, flakes or powder. Various shapes and sizes. Usually have one rounded side.	None None	Same as above. Material cut from packings during assembly.

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END OF TASK

Section II. ENGINE TO TRANSMISSION DRIVESHAFT

6-6. ENGINE TO TRANSMISSION DRIVESHAFT

installation of engine to transmission driveshaft components. Standard torques are provided in Appendix P and TM 1-1500-204-23.

6-7. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and

6-8. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Engine to Transmission Driveshaft — Removal/Installation	6-2-1	6-24
Engine to Transmission Driveshaft — Cleaning/Inspection/Repair	6-2-2	6-29

6-2-1. ENGINE TO TRANSMISSION DRIVESHAFT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-10

TM 1-1520-248-CL

Applicable Configurations:

All

Equipment Condition:

Helicopter Safed (Task 1-6-7)

Forward Fairing Assembly Removed

(Task 2-2-47)

Engine Cowl Assembly Removed (Task 2-2-50)

Air Induction Cowling Removed (Task 4-2-1)

Tools:

General Mechanic Tool Kit (B178)

Maintenance Stand (B162)

Driveshaft Tool Set (B190)

Torque Wrench (B237)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)

67S Scout Helicopter Repairer

Pilot

GO TO NEXT PAGE

6-2-1. ENGINE TO TRANSMISSION DRIVESHAFT — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove two bolts (1) and two washers (2) from driveshaft cover assembly (3).

2. Remove 12 bolts (4) and 12 washers (5) from driveshaft cover assembly (3). Remove driveshaft cover assembly (3) from forward firewall (6).

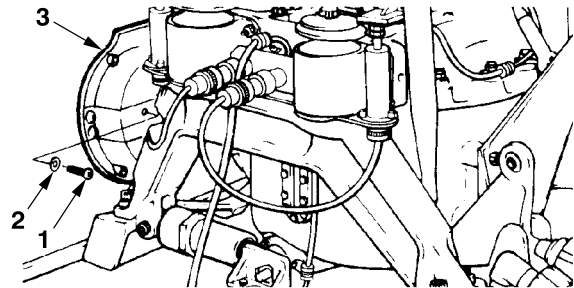
3. Remove six bolts (7) and washers (8) securing forward firewall closure plate (9) to forward firewall (6).

4. Remove 6 nuts (10), 12 washers (11), and 6 bolts (12) connecting aft fitting of driveshaft (13) to freewheeling unit adapter (14).

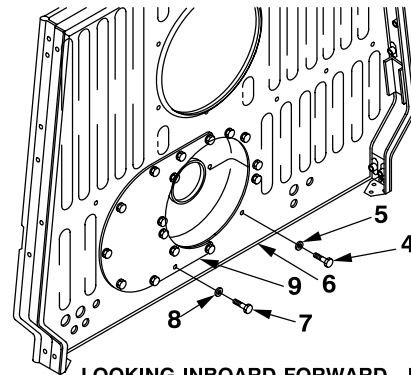
NOTE

The transmission input adapter has a notch that can be used for removing bolts securing driveshaft forward fitting to transmission input quill adapter.

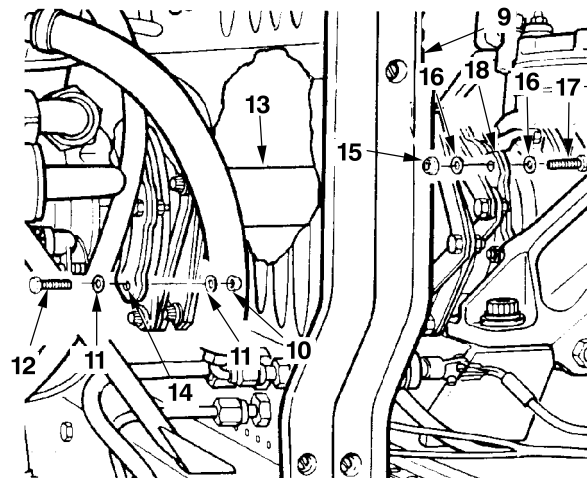
5. Remove 6 nuts (15), 12 washers (16), and 6 bolts (17) connecting forward fitting of driveshaft (13) to transmission input quill adapter (18).



LOOKING INBOARD AFT - RIGHT SIDE



LOOKING INBOARD FORWARD - LEFT SIDE



LOOKING INBOARD FORWARD - RIGHT SIDE

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6-2-1. ENGINE TO TRANSMISSION DRIVESHAFT — REMOVAL/INSTALLATION (CONT)

6. Install tool set (B190) on either end, transmission or engine, of driveshaft (13) by positioning lugs of two puller screws (19) over nuts (20) attaching flex frame to end fitting on driveshaft (13). Tighten nuts (21) fingertight.

NOTE

Engine to transmission driveshaft flex frames should be compressed only to the extent necessary for removal, approximately **0.25 inch**.

7. Free driveshaft (13) from freewheeling unit adapter (14) and transmission input adapter (18) by tightening nuts (21) on tool set (B190) to compress driveshaft (13) flex frame.

NOTE

As puller screws are evenly tightened, main driveshaft may not detach from adapters on either end. If this occurs, puller screws shall be loosened and main driveshaft shall be allowed to return to installed position. Two bolts should be installed in diametrically opposed locations through both end fittings of main driveshaft and adapters of transmission input quill or freewheeling unit. Two nuts shall be installed on the two bolts fingertight. Limited freeplay in these temporary bolts will force detachment of main driveshaft from adapter as pressure is reapplied with puller screws.

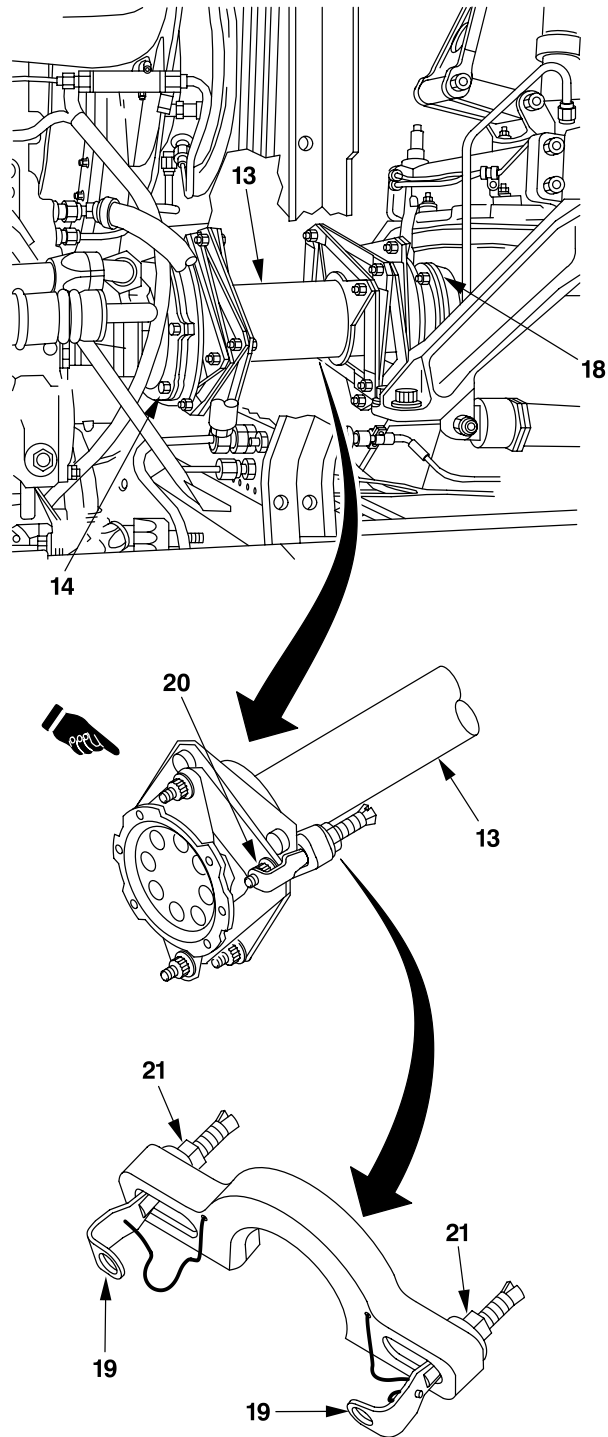
8. Remove driveshaft (13) and place on suitable surface.

9. Remove driveshaft tool set (B190) from driveshaft (13).

INSTALL

10. Install tool set (B190) on either end, transmission or engine, of driveshaft (13) by positioning lugs of two puller screws (19) over nuts (20) attaching flex frame to end fitting on driveshaft (13).

- a. Tighten nuts (21) fingertight.



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6-2-1. ENGINE TO TRANSMISSION DRIVESHAFT — REMOVAL/INSTALLATION (CONT)

NOTE

Engine to transmission driveshaft flex frames should be compressed only to the extent necessary for installation, approximately **0.25 inch**.

b. Tighten nuts (21) evenly to compress driveshaft (13) flex frame enough to allow installation.

11. Install driveshaft (13) between transmission input adapter (18) and freewheeling unit adapter (14) and engage opposite end of driveshaft (13) (end without tool set installed).

REMOVE DRIVESHAFT TOOL SET (B190)

NOTE

To aid in alignment, a bolt can be installed through driveshaft fittings and transmission input adapter (18) or freewheeling unit adapter (14) before tool set is removed.

12. Loosen nuts (21) on puller screws (19) evenly to allow driveshaft (13) flex frame to return to installed position. Remove tool set (B190) from driveshaft (13).

13. Line up bolt holes in aft end fitting of driveshaft (13) with freewheeling unit adapter (14) bolt holes.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct torquing of nuts (10 and 15) is a characteristic critical to flight safety.

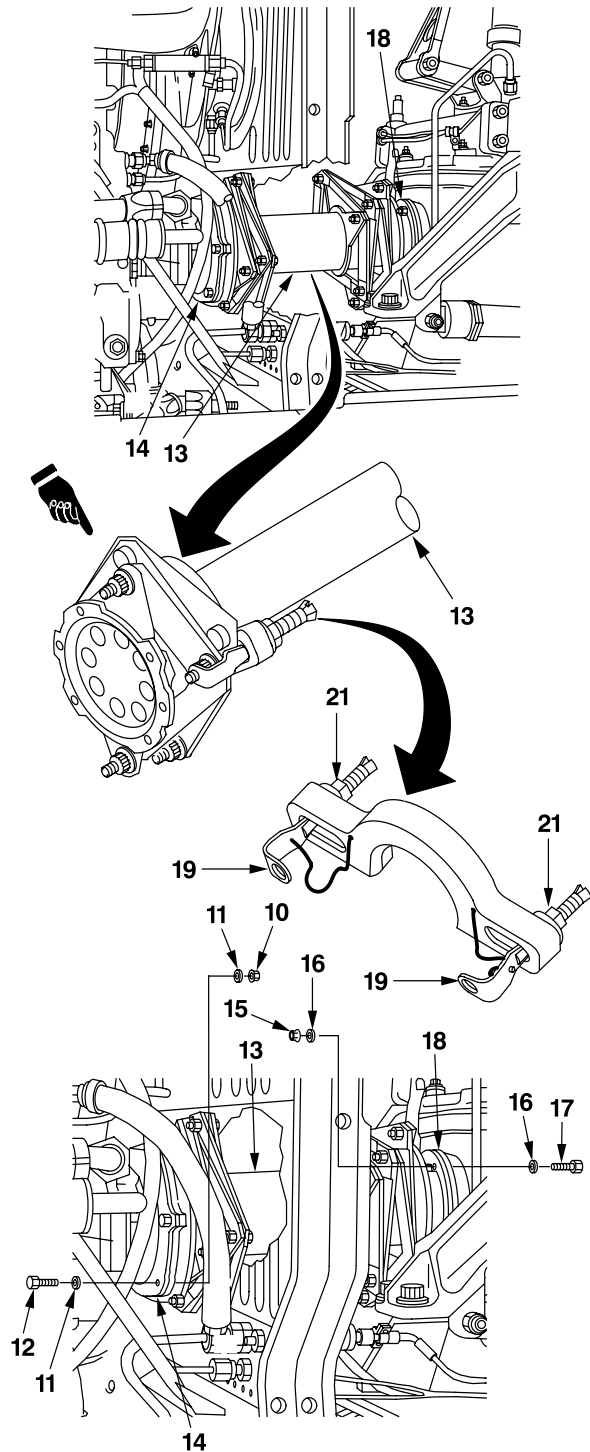
14. Install six washers (11) with six bolts (12) through aft end fitting of driveshaft (13) and freewheeling adapter (14). Install six washers (11) and six nuts (10).

15. Torque nuts (10) **50 TO 70 INCH-POUNDS**.

16. Install six washers (16) with six bolts (17) through transmission of input adapter (18) and forward end fitting of driveshaft (13). Install six washers (16) and six nuts (15).

17. Torque nuts (15) **50 TO 70 INCH-POUNDS**.

GO TO NEXT PAGE



LOOKING INBOARD FORWARD - RIGHT SIDE

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6-2-1. ENGINE TO TRANSMISSION DRIVESHAFT — REMOVAL/INSTALLATION (CONT)

INSTALL DRIVESHAFT COVER

18. Install firewall closure plate (9) on aft side of forward firewall (6). To facilitate subsequent installation of air induction cowling, secure closure plate (9) with only five washers (8) and bolts (7).

INSPECT

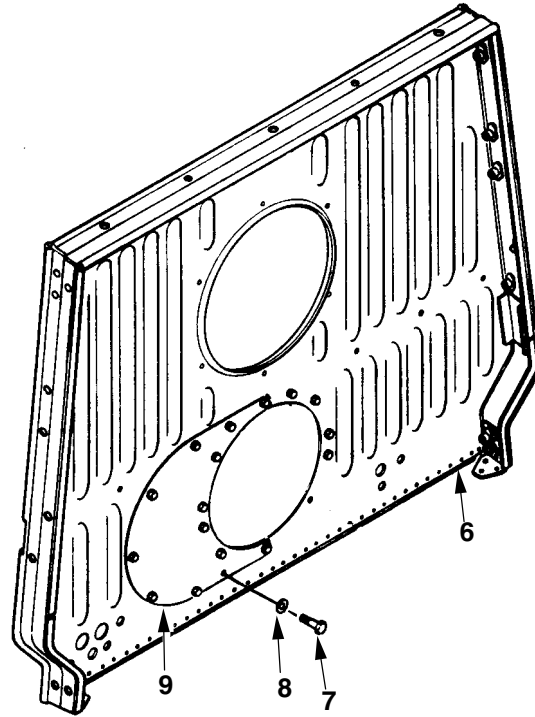
FOLLOW-ON MAINTENANCE

Install air induction cowling (Task 4-2-4 or 4-2-5).

Install engine cowl assembly (Task 2-2-50).

Install forward fairing assembly (Task 2-2-47).

Pilot perform MOC (TM 1-1520-248-10/-CL).



LOOKING INBOARD FORWARD - LEFT SIDE

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END OF TASK

6-2-2. ENGINE TO TRANSMISSION DRIVESHAFT — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Tool Kit (B180)

Material:
Drycleaning Solvent (D199)
Scouring Pad (D147)

Wiping Rag (D164)
Zinc Chromate Primer (D161)
Silver Sermetel Top Coating Paint (D151)
Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 1-1520-266-23 ■

CLEAN



Drycleaning Solvent

1. Clean driveshaft with drycleaning solvent (D199) and wiping rags (D164).

INSPECT

2. Inspect driveshaft to damage limits shown. See figure Engine to Transmission Driveshaft — Damage Limits. If cracks in driveshaft are suspected perform magnetic particle inspection (TM 1-1520-266-23).

CAUTION

Driveshaft assembly is not to be taken apart, and fasteners are not to be disturbed. Disassembly or disturbing of fasteners is cause for replacement.

REPAIR

NOTE

Removal of protective coating during repair shall be minimized. Repair must be within limits shown.

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3. Repair by removing corrosion and damage using abrasive pads (D147).



Zinc Chromate Primer



Silver Sermetel Paint

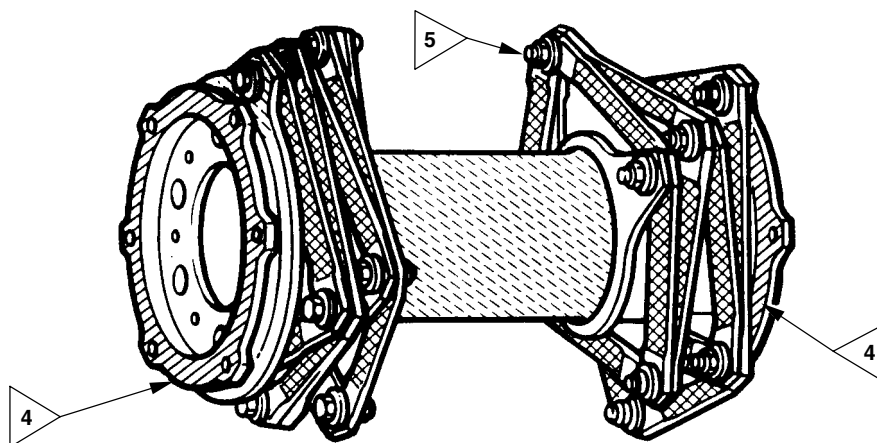
4. Touch up damage to protective coating base metal with zinc chromate primer (D161) and top coat with silver Sermetel paint (D151).

NOTE

Areas left bare, smaller than damage limits shown, will not corrode due to sacrificial properties of original protective coating.

INSPECT

6-2-2. ENGINE TO TRANSMISSION DRIVESHAFT — CLEANING/INSPECTION/REPAIR (CONT)



ENGINE TO TRANSMISSION DRIVESHAFT
(FLEXFRAMES)

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL	0.001 in. before and after repair	0.005 in. before and after repair	0.005 in. before and after repair	0.015 in. before and after repair
CORROSION	Surface, no pits	0.005 in. before and after repair	0.005 in. before and after repair	0.010 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.05 sq. in.	0.10 sq. in.	3 0.25 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One per lug			
EDGE DENTS, NICKS	0.001 in.	0.010 in.	0.010 in.	0.025 in.

NOTE

1. No cracks are permitted.
2. Repairs must be no less than 1.0 inch apart.
- 3 Repairs not to be within 0.50 in. of bolt hole.
- 4 Faying surfaces must be free of any raised metal areas.
- 5 For -107 driveshaft only, there is no requirement for bolt to protrude one to three threads.

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Engine to Transmission Driveshaft — Damage Limits

END OF TASK

Section III. TRANSMISSION

6-9. TRANSMISSION

components. Standard torques are provided in Appendix P and TM 1-1500-204-23.

6-10. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, installation, buildup, and preservation of transmission

6-11. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Transmission Components — Cleaning/Inspection/Repair	6-3-1	6-32
Transmission — Removal	6-3-2	6-38
Transmission Lower Boot Assembly — Removal/Cleaning/Inspection/Installation	6-3-3	6-49
Transmission — Buildup	6-3-4	6-51
Transmission — Preservation and Packaging	6-3-5	6-56
Transmission — Installation	6-3-6	6-60
Input Pinion Magnetic Seal (AVIM) — Removal/Cleaning/Inspection/Repair/Installation	6-3-7	6-68
Upper Chip Detector — Removal/Installation	6-3-8	6-74
Thermostat — Removal/Installation	6-3-9	6-76
Temperature Transducer — Removal/Installation	6-3-10	6-78
Lower Chip Detector — Removal/Installation	6-3-11	6-80
Breather Tube Assembly — Removal/Installation	6-3-12	6-82
Sight Gage — Removal/Installation	6-3-13	6-84
Pylon Fittings — Removal/Installation	6-3-14	6-86
Pylon Fittings — Cleaning/Inspection/Repair	6-3-15	6-89
■ Nr Sensor (OH-58D(R)) — Removal/Installation	6-3-16	6-93
Nr Sensor (OH-58D(R)) — Cleaning/Inspection	6-3-17	6-94

6-3-1. TRANSMISSION COMPONENTS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Electrical Repairer Tool Kit (B177)

Material:
Abrasive Cloth (D44)
Acrylic Lacquer (D126)
Chromic Acid (D61)
Corrosion Preventive Compound (D82)
Crocus Cloth (D90)
Drycleaning Solvent (D199)
Epoxy Primer Coating (D98)
Rubber Gloves (D111)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68F Aircraft Electrician

References:
TM 55-1500-323-24
TM 55-1500-345-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Air Induction Cowling Removed (Task 4-2-1)
Engine Cowl Assembly Removed (Task 2-2-50) ■
Engine-to-Transmission Driveshaft Removed
(Task 6-2-1)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

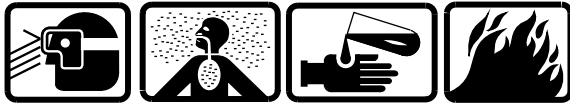
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6-3-1. TRANSMISSION COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)

WARNING

Flight controls shall not be operated from inside the helicopter while work is being performed on the transmission or transmission components. Physical injury can occur. If injury occurs, immediate medical aid should be obtained. "DO NOT MOVE CONTROLS" sign shall be displayed in the cockpit during the performance of this task.

CLEAN



Drycleaning Solvent

1. Using drycleaning solvent (D199) and wiping rags (D164), clean exterior of transmission and transmission components as required to accomplish subsequent inspections.

INSPECT TOP CASE

2. Inspect top case (1) for mechanical damage (nicks, scratches, gouges, and chafing).

3. Inspect top case (1) exposed mating surface area (from outboard edge of installed mast seal retainer plate (2) to outboard edge of top case mast assembly mating surface) for corrosion. If corrosion exceeds **0.002 inch** maximum depth, replace transmission (Tasks 6-3-2 and 6-3-6).

4. Inspect remainder of top case (1) for corrosion. If corrosion damage exceeds **0.030 inch** maximum depth, replace transmission (Tasks 6-3-2 and 6-3-6).

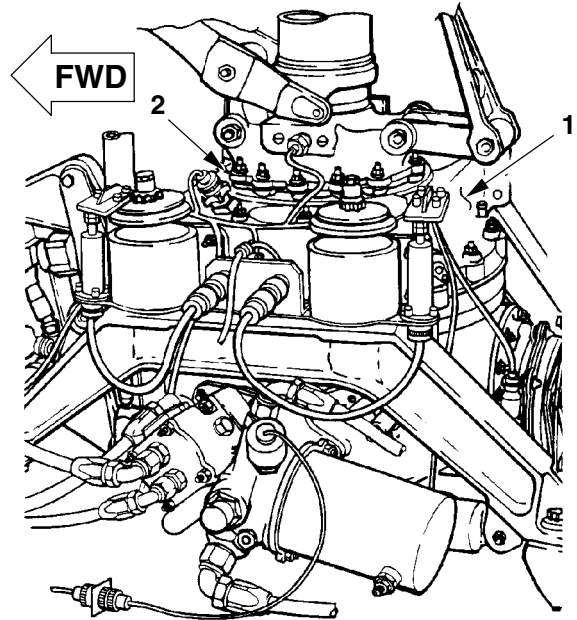
REPAIR TOP CASE

5. Repair top case (1) mechanical damage.

6. Repair top case (1) corrosion damage (steps 7. through 14.).

7. Full depth repairs shall not cover more than 40 percent of an area within one square inch, nor more than 20 percent of the total area of any surface or diameter. If corrosion damage exceeds repair limits, replace transmission (Tasks 6-3-2 and 6-3-6).

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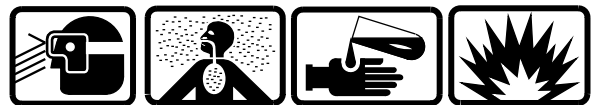


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Sanding Operations

8. Using 240 grit abrasive cloth (D44), sand corroded area; blend repaired area into surrounding area.



Chromic Acid

9. Using chromic acid (D61), treat repaired area (TM 55-1500-345-23).

10. Using clean (potable) water, rinse repaired area.

6-3-1. TRANSMISSION COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)

11. Using clean wiping rags (D164), thoroughly dry repaired area.

12. Using chromate conversion coating (D61), treat repaired area (TM 55-1500-345-23).

13. Apply one coat of epoxy primer coating (D98) to repaired area (TM 55-1500-345-23). Allow to dry from 1 to 8 hours prior to subsequent coating.

14. Apply two coats of acrylic lacquer (D126) to repaired area (TM 55-1500-345-23).

INSPECT GEAR SHAFT SUPPORT CASE

15. Inspect gear shaft support case (3) for mechanical damage (nicks, scratches, and gouges).

16. Inspect gear shaft support case (3) for corrosion. If nonfunctional area corrosion damage will exceed **0.030 inch** maximum depth after repair, replace transmission (Tasks 6-3-2 and 6-3-6).

REPAIR GEAR SHAFT SUPPORT CASE

17. Repair gear shaft support case (3) mechanical damage.

18. Repair gear shaft support case (3) corrosion damage (steps 19. and 20.).

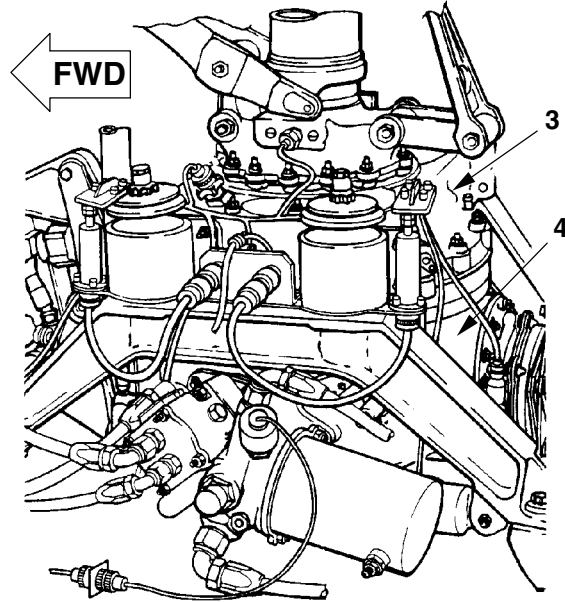
19. Full depth repairs shall not cover more than 40 percent of an area within one square inch, nor more than 20 percent of the total area of any surface or diameter. Maximum permissible repair depth (nonfunctional surfaces) is **0.030 inch** after repair. If corrosion damage exceeds repair limits, replace transmission (Tasks 6-3-2 and 6-3-6).

20. Perform preceding steps 8. through 14.

INSPECT MAIN CASE

21. Inspect main case (4) for mechanical damage (nicks, scratches, and gouges).

22. Inspect main case (4) for corrosion. If nonfunctional cast surface area corrosion damage



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will exceed **0.040 inch** maximum depth after repair, replace transmission (Tasks 6-3-2 and 6-3-6).

REPAIR MAIN CASE

23. Repair main case (4) mechanical damage.

24. Repair main case (4) corrosion damage (steps 25. and 26.).

25. Full depth repairs shall not cover more than 40 percent of an area within one square inch, nor more than 20 percent of the total area of any surface or diameter. Maximum permissible repair depth (nonfunctional cast surfaces) is **0.040 inch** after repair. If corrosion damage exceeds repair limits, replace transmission (Tasks 6-3-2 and 6-3-6).

26. Perform preceding steps 8. through 14.

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6-3-1. TRANSMISSION COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)

INSPECT HYDRAULIC PUMP ADAPTER HOUSING

27. Inspect exposed areas of hydraulic pump adapter housing (5) for mechanical damage (nicks, scratches, and gouges).

28. Inspect exposed areas of hydraulic pump adapter housing (5) for corrosion. If corrosion damage exceeds **0.010 inch** maximum depth, replace hydraulic pump adapter housing (Tasks 7-8-1 and 6-8-1).

REPAIR HYDRAULIC PUMP ADAPTER HOUSING

29. Repair hydraulic pump adapter housing (5) mechanical damage.

30. Repair hydraulic pump adapter housing (5) corrosion damage (steps 31. and 32.).

31. Full depth repairs shall not cover more than 40 percent of an area within one square inch, nor more than 20 percent of the total area of any surface or diameter. If corrosion damage exceeds repair limits, replace hydraulic pump adapter housing (5) (Tasks 7-8-1 and 6-8-1).

32. Perform preceding steps 8. through 14.

INSPECT INPUT HOUSING/MAGNETIC SEAL

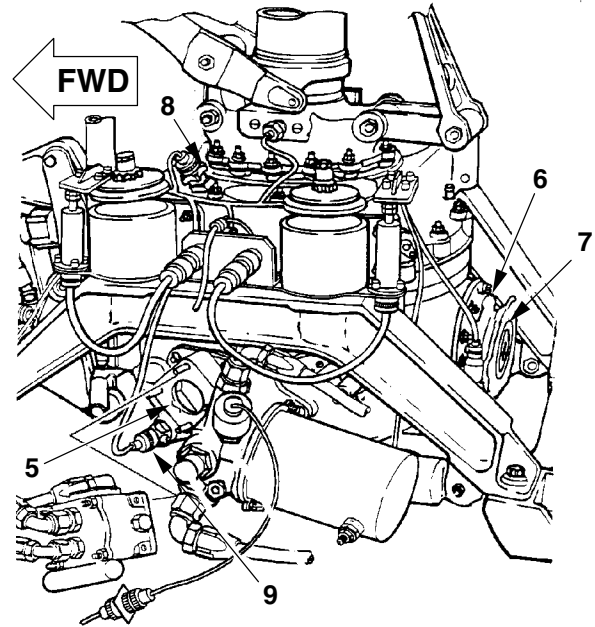
33. Inspect area around input housing (6) for damage, leakage, and security of attachment.

34. Inspect magnetic seal (7) for obvious damage or leakage. Maximum static leakage should not exceed 5 drops per minute. Dynamic leakage should not exceed 1 quart per 3 hours of operation.

REPAIR INPUT HOUSING/MAGNETIC SEAL

35. Replace leaking or damaged input housing (6) (Task 6-3-7).

36. Replace damaged or leaking magnetic seal (7) (Task 6-3-7).



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INSPECT UPPER/LOWER CHIP DETECTOR

37. Inspect upper chip detector (8) and lower chip detector (9) for bent or damaged connector locking pins. No other damage allowed.

REPAIR UPPER/LOWER CHIP DETECTORS

38. Straighten bent connector locking pins.

39. Replace upper chip detector (8) or lower chip detector (9) if any other damage is observed (Task 6-3-8 or 6-3-11, respectively).

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6-3-1. TRANSMISSION COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)

INSPECT OIL FILTER MANIFOLD

40. Inspect oil filter manifold (10) for mechanical damage (Task 6-8-5).

41. Inspect oil filter manifold (10) for corrosion damage (Task 6-8-5).

REPAIR OIL FILTER MANIFOLD

42. Repair oil filter manifold (10) mechanical damage (Task 6-8-5).

43. Repair oil filter manifold (10) corrosion damage (Task 6-8-5).

44. Replace unserviceable oil filter manifold (10) (Task 6-8-4).

INSPECT OIL FILTER HOUSING

45. Inspect oil filter housing (11) for mechanical damage.

46. Inspect oil filter housing (11) for corrosion. If corrosion damage exceeds **0.010 inch** maximum depth, replace oil filter housing (Task 6-8-3).

REPAIR OIL FILTER HOUSING

47. Repair oil filter housing (11) mechanical damage.

48. Repair oil filter housing (11) corrosion damage (steps 49. and 50.).

49. Full depth repairs shall not cover more than 40 percent of an area within one square inch, nor more than 20 percent of the total area of any surface or diameter. If corrosion damage exceeds repair limits, replace oil filter housing (Task 6-8-3).

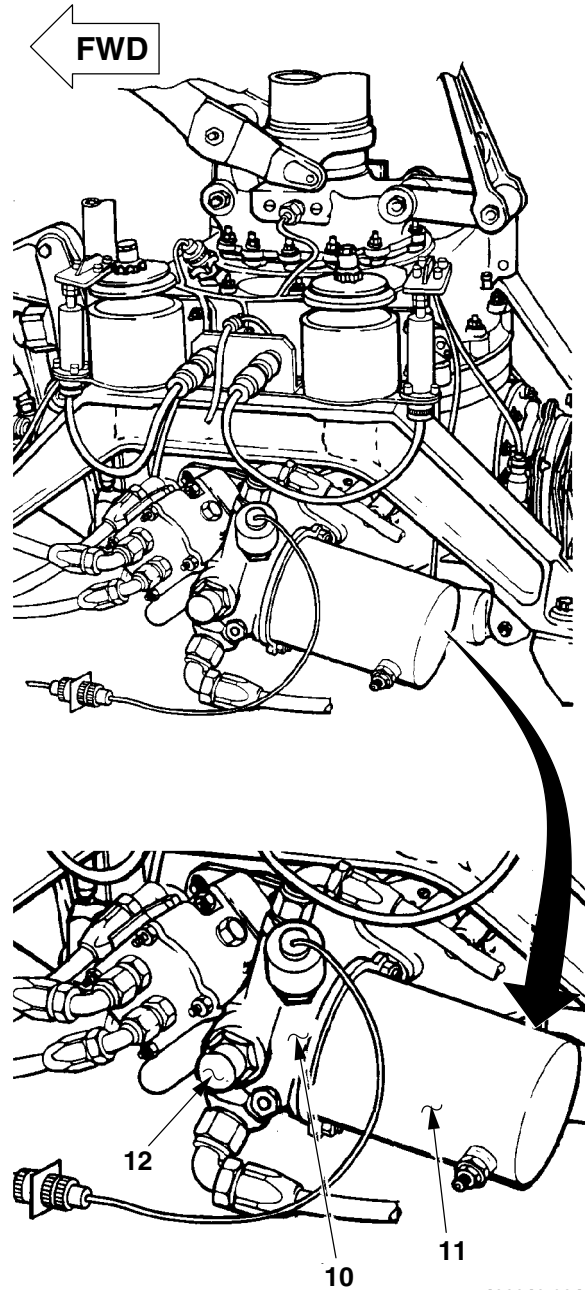
50. Perform preceding steps 8. through 14.

INSPECT OIL FILTER THERMOSTAT

51. Inspect oil filter thermostat (12) for damage. No damage allowed.

REPAIR OIL FILTER THERMOSTAT

52. Replace damaged oil filter thermostat (12) (Task 6-3-9).



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6-3-1. TRANSMISSION COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)

INSPECT OIL TEMPERATURE TRANSDUCER (BULB)

53. Inspect body of oil temperature transducer (bulb) (13). No damage allowed.

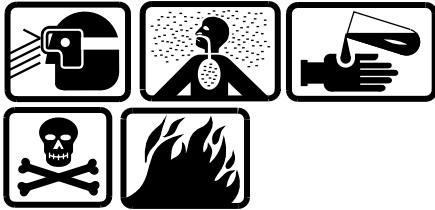
54. Inspect oil temperature transducer (bulb) (13) electrical harness for loose, broken, or damaged wires, connectors, and pins.

REPAIR OIL TEMPERATURE TRANSDUCER (BULB)

55. Replace damaged body or inoperable oil temperature transducer (bulb) (13) (Task 6-3-10).

56. Repair or replace loose, broken, or damaged oil temperature transducer (bulb) (13) electrical harness wires, connectors, and pins (TM 55-1500-323-24).

APPLY CPC

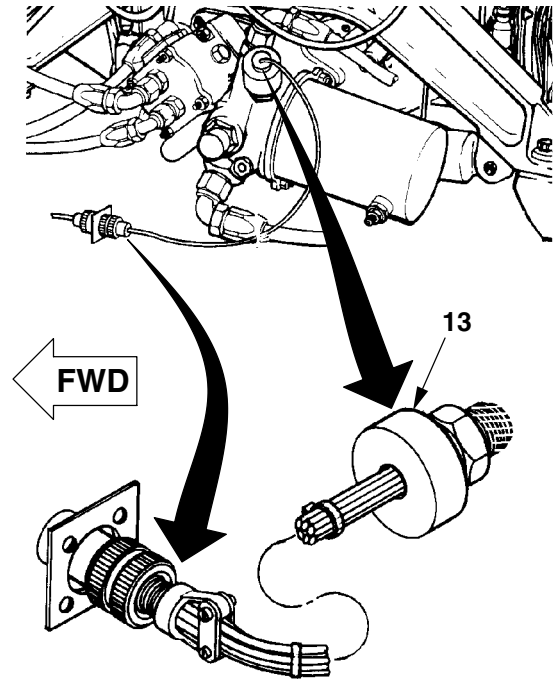


Corrosion Preventive Compound

CAUTION

Corrosion preventive compound (D82) shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals. Premature failure of bearings and seals may result.

57. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.



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INSPECT

FOLLOW-ON MAINTENANCE

- Install forward fairing assembly (Task 2-2-47). ■
- Install air induction cowl (Task 4-2-4).
- Install engine cowl assembly (Task 2-2-50). ■
- Install engine-to-transmission driveshaft (Task 6-2-1).

END OF TASK

6-3-2. TRANSMISSION — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

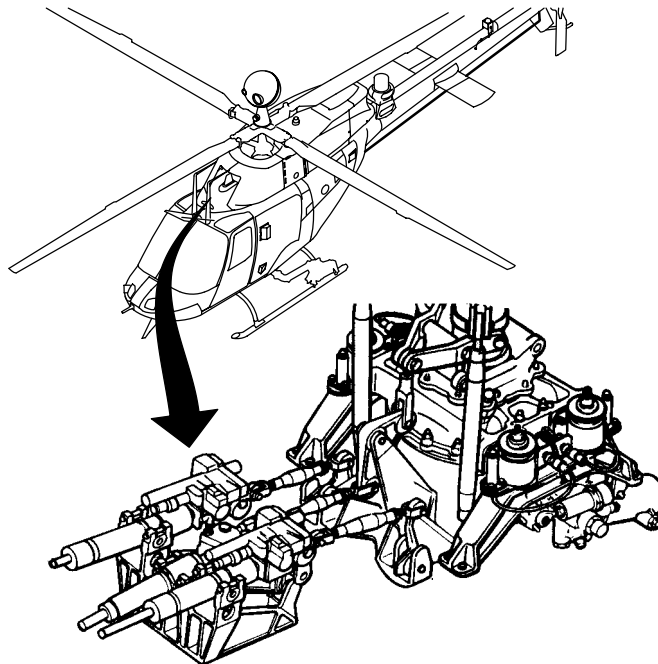
Personnel Required:
67S Scout Helicopter Repairer (3)

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Engine Cowl Assembly Removed (Task 2-2-50)
Air Induction Cowling Removed (Task 4-2-1)
Engine to Transmission Driveshaft Removed
(Task 6-2-1)
Transmission Oil Drained (Task 1-4-7)
Mast Standpipe Removed (Task 6-4-1)
Torquemeter Support and Bearing Assembly
Removed (Task 6-4-5)
Main Rotor Hub and Blades Removed (Task 5-
1-1)

Tools:
General Mechanic Tool Kit (B178)
Transmission Trailer (B6)
Lifting Eye Clevis (B19)
Mast Lifting Clevis (B20)
Hoist (B69)
Rope (B118)
Plastic Scraper (B123)

Material:
Barrier Material (D48 or D49)
Wiping Rags (D164)
Masking Tape (D216)



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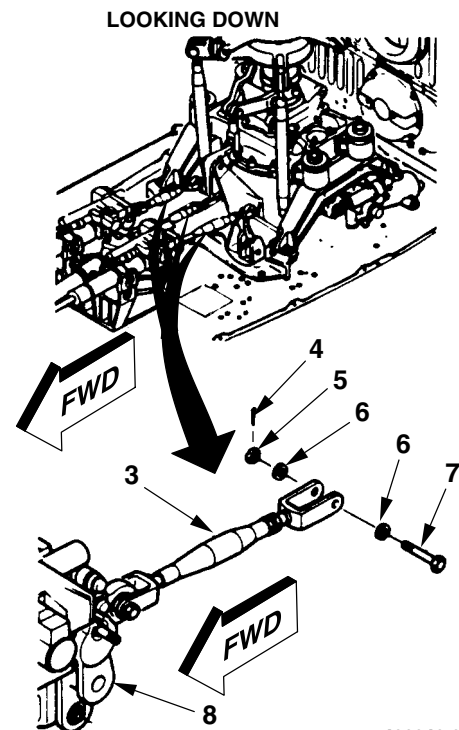
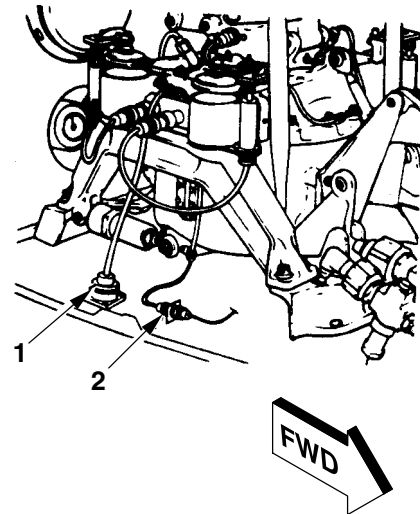
6-3-2. TRANSMISSION — REMOVAL (CONT)

REMOVE

1. Disconnect electrical connectors (1 and 2) from right side of transmission deck and particle separator blower connector.

2. Disconnect cyclic and collective adjustable tube assemblies (3) by removing cotter pin (4), nut (5), two washers (6), and bolt (7).

3. Wrap three tube assemblies (3) with barrier material (D48 or D49) or wiping rags (D164) and tie or tape with masking tape (D216) back to servos (8).

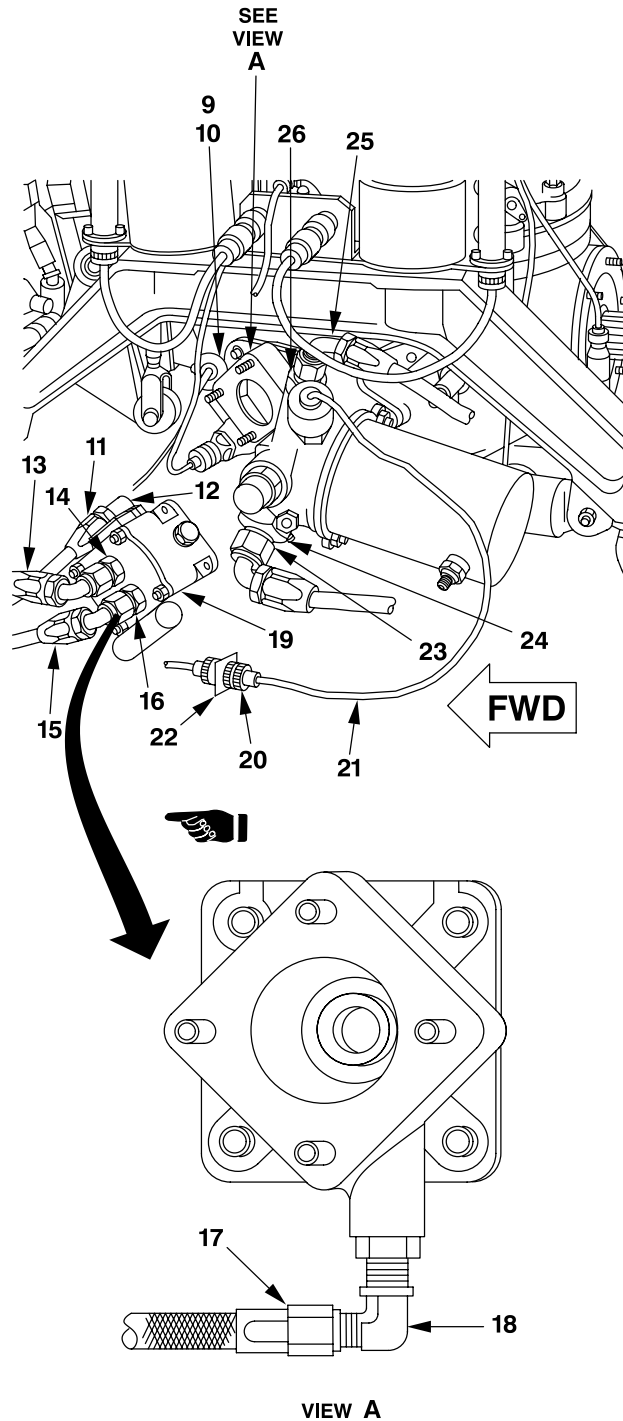


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J0432

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6-3-2. TRANSMISSION — REMOVAL (CONT)

4. Disconnect electrical connector (9) from lower chip detector (10).
5. Disconnect case drain hose (11) from elbow (12).
6. Disconnect suction line hose (13) from union (14).
7. Disconnect pressure line hose (15) from union (16).
8. Disconnect vent line hose (17) from elbow (18).
9. Cap or plug hoses (11, 13, and 15), elbow (12) and unions (14 and 16) on hydraulic pump (19).
10. Disconnect transmission oil temperature transducer electrical connector (20) electrical wiring (21) from roof mounted connector (22).
11. Disconnect oil filter outlet line (23) from fitting (24). Install protective covers on openings.
12. Disconnect oil filter inlet line (25) from fitting (26). Install protective covers on openings.



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J2690

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6-3-2. TRANSMISSION — REMOVAL (CONT)

13. Disconnect freewheeling unit oil line (27) from fitting (28) on transmission (29).

14. Disconnect breather line (30) from breather (31).

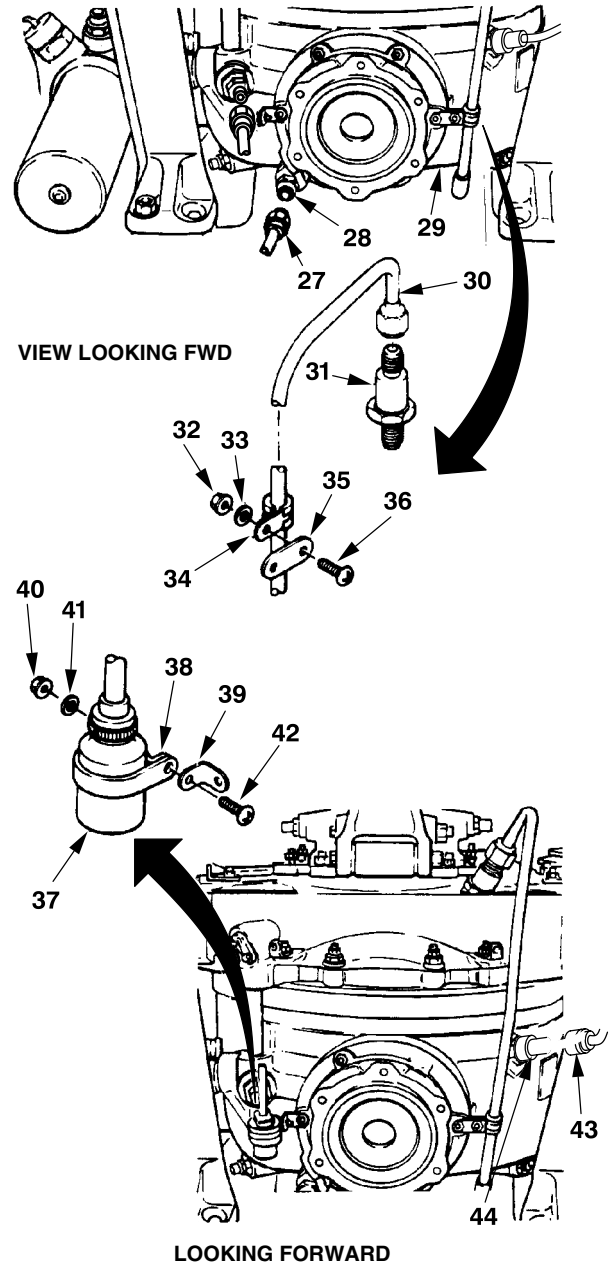
15. Remove nut (32) and washer (33) from clamp (34), adapter (35), and screw (36).

16. Remove mast torque temperature sensor (37) and clamp (38) from bracket (39) by removing nut (40), washer (41) and screw (42).

NOTE

The Nr sensor is only installed on the OH-58D(R).

17. Disconnect electrical connector (43) from Nr sensor (44).



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J0994

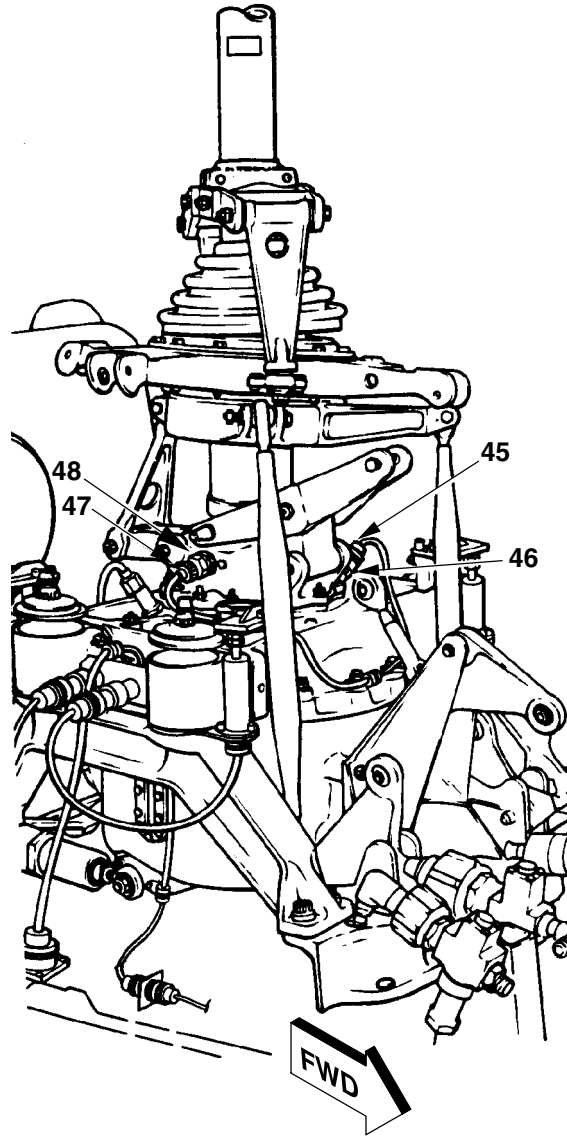
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6-3-2. TRANSMISSION — REMOVAL (CONT)

18. Disconnect electrical connector (45) from upper transmission chip detector (46).

19. Disconnect electrical connector (47) from lower torque transducer (48) on right side.

20. Repeat step 19. for lower torque transducer on left side (typical).



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J0432

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6-3-2. TRANSMISSION — REMOVAL (CONT)

21. Install mast lifting clevis (B20) on mast (49). Use a spanner wrench to tighten holder (part of B20) on upper bracket (part of B20).

WARNING

To prevent injury to personnel and/or damage to equipment ensure pin is properly installed through bolt that connects lifting eye clevis (B19) to mast lifting clevis (B20).

22. Connect lifting eye clevis (B19) to mast lifting clevis (B20) with bolt (part of B19) and pin (part of B19).

23. Connect hoist (B69) to lifting eye clevis (B19).

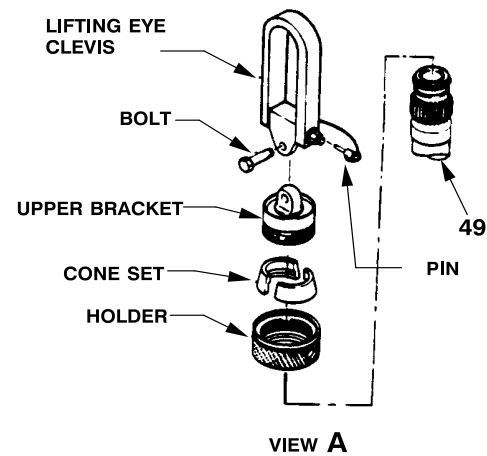
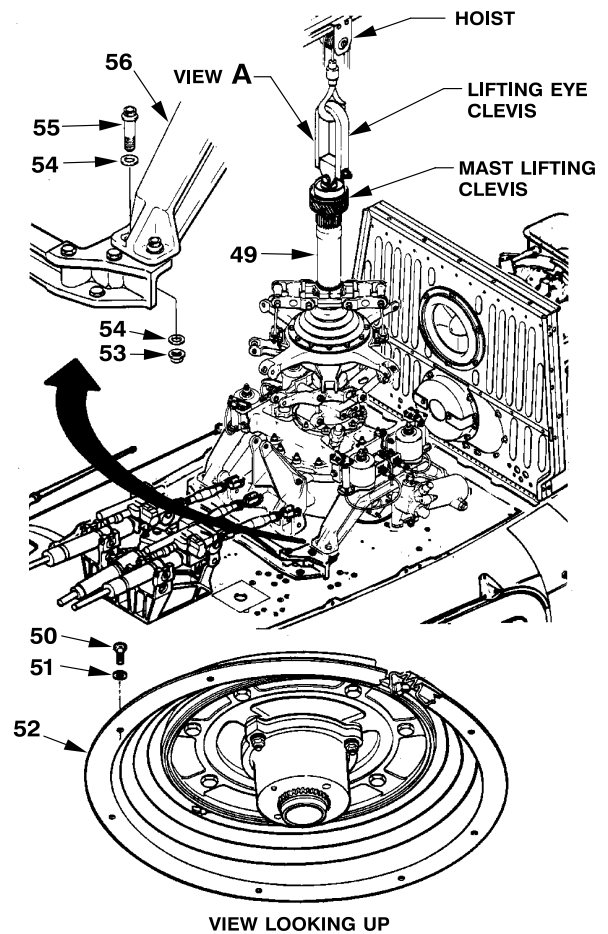
CAUTION

Slack shall be removed from hoist to prevent accidental movement of transmission causing damage to cabin roof mounted components when bolts are removed.

24. Remove eight screws (50) and eight washers (51) attaching boot assembly (52) to cabin roof.

25. Cut or scrape sealant from around boot assembly (52) and cabin roof.

26. Remove 8 nuts (53), 16 washers (54), and 8 bolts (55) from legs of pylon beam assemblies (56).



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J0432

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6-3-2. TRANSMISSION — REMOVAL (CONT)

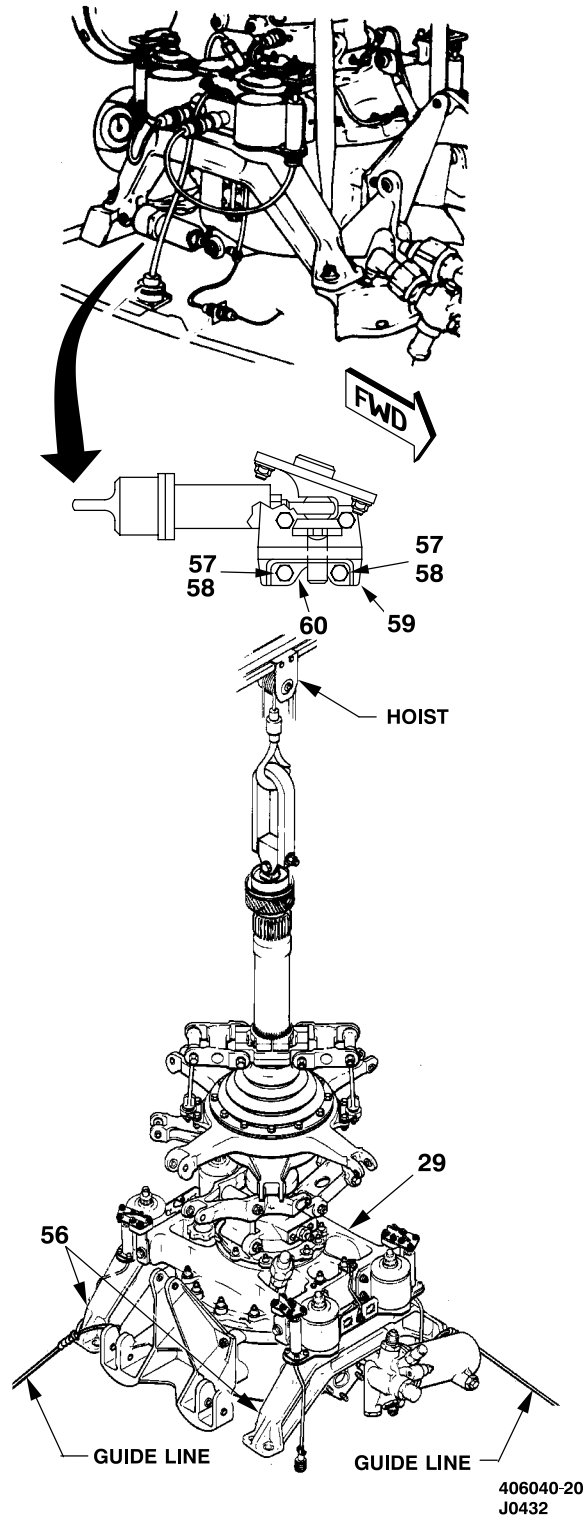
27. Remove four bolts (57) and four washers (58) securing pylon stop fitting (59) from right side of transmission deck. Remove pylon stop fitting (59).

NOTE

Bonded shim (60) below pylon stop fitting (59) shall not be removed.

28. Install guide lines (B118) on forward leg and aft leg of pylon beam assemblies (56).

29. Remove transmission (29) using hoist (B69) with guide lines (B118) to aid in placing transmission on transmission trailer (B6).



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6-3-2. TRANSMISSION — REMOVAL (CONT)

30. Remove two pylon restraint spring assemblies (61) from transmission (29) (Task 2-4-2).

31. Remove guide lines (B118) from pylon beam assemblies (56).

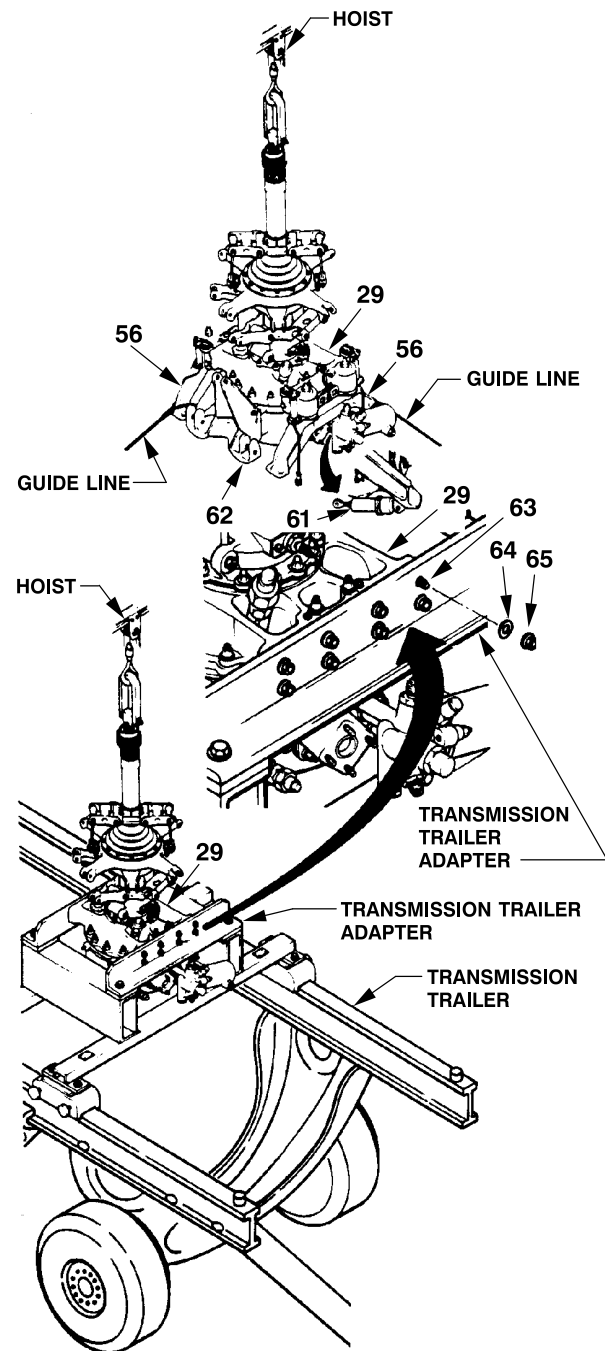
32. Remove left and right pylon beam assemblies (56) from transmission (29) (Task 2-4-2).

33. Remove transmission lower boot assembly (Task 6-3-3).

34. Remove cyclic and collective control support assemblies (62) from transmission (29) (Task 11-2-58).

35. Install transmission (29) on transmission trailer (B6) by lining up transmission studs (63) with holes in transmission trailer adapter (part of B6) and installing 16 washers (64) and 16 nuts (65). Torque nuts **150 TO 180 INCH-POUNDS**.

36. Remove hoist (B69).



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J1567

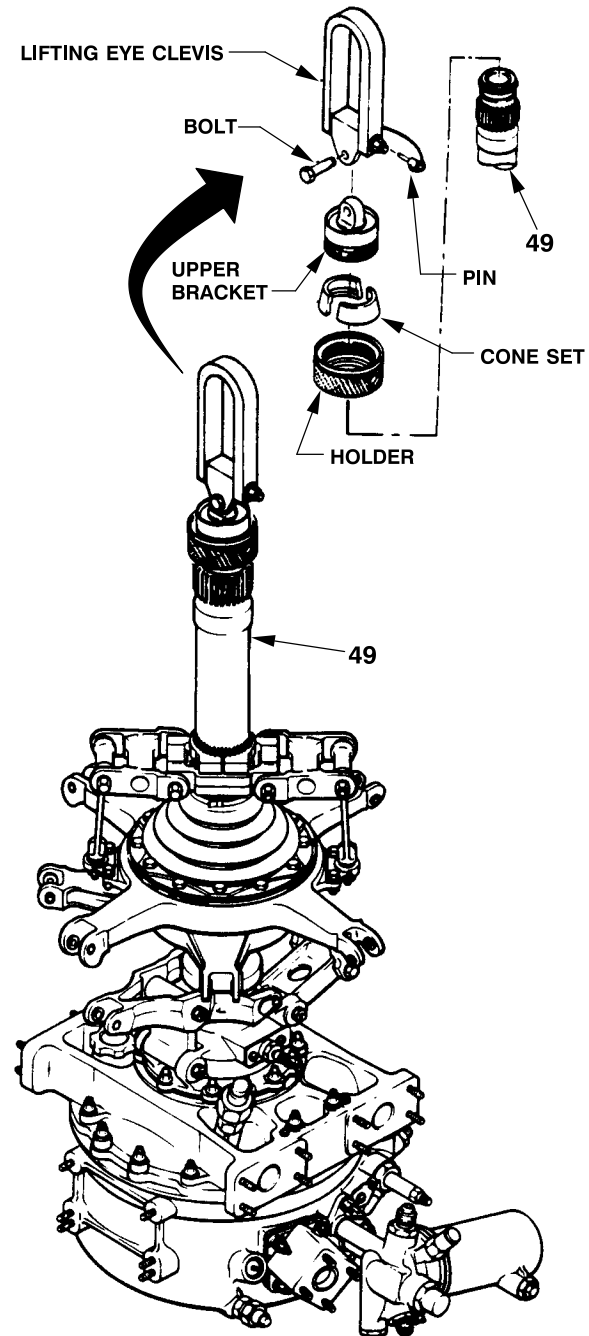
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6-3-2. TRANSMISSION — REMOVAL (CONT)

37. Remove lifting eye clevis (B19) from mast lifting clevis (B20) by removing pin (part of B19) and bolt (part of B19).

38. Remove upper bracket of mast lifting clevis (B20) from holder (part of B20) using a spanner wrench.

39. Remove cone set (part of B20) and holder (part of B20) from mast (49).



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J0432

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6-3-2. TRANSMISSION — REMOVAL (CONT)

40. Remove swashplate and support assembly (66) from transmission (29) (Task 5-2-33).

41. Remove mast assembly (49) from transmission (29) (Task 6-4-15).

42. Remove three nuts (67) and three washers (68) from three studs (69) on bottom of transmission (29).

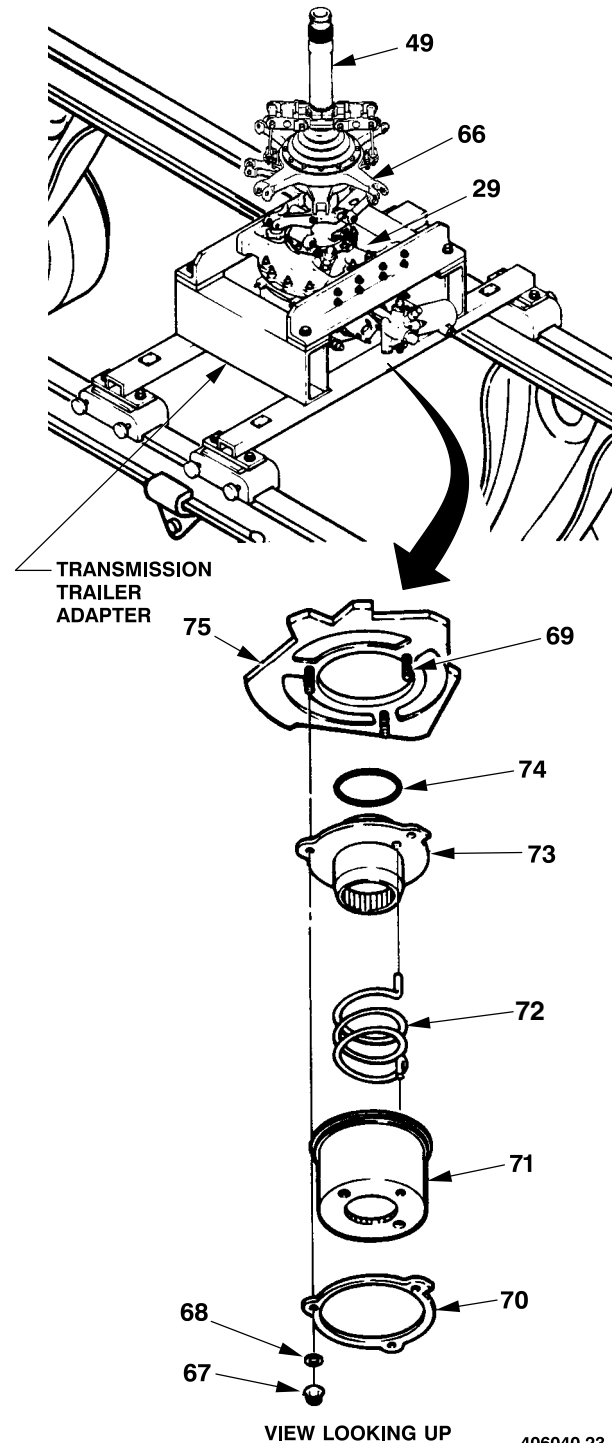
43. Remove retaining plate (70), spring sleeve (71), and spring (72) from standpipe adapter (73).

44. Remove standpipe adapter (73) with packing (74) from support (75). Discard packing (74).

NOTE

Transmission shall be preserved before removing from transmission trailer adapter (part of B6).

45. Preserve unserviceable transmission (29) (Task 6-3-5).



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J0432

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6-3-2. TRANSMISSION — REMOVAL (CONT)

46. Install cover/lift plate (B104) on studs (76).
47. Install 12 washers (77) and 12 nuts (78) on studs (76).
48. Torque nuts (78) **100 TO 140 INCH-POUNDS**.
49. Connect hoist (B69) to lifting eye on cover/lift plate (B104).
50. Remove 16 nuts (65) and 16 washers (64) from 16 studs (63) on transmission trailer adapter (part of B6).
51. Remove Nr sensor (OH-58D(R)) (Task 6-3-16).
52. Remove oil filter manifold (Task 6-8-4).
53. Remove hydraulic pump (Task 7-8-1).
54. Remove TAMS linear variable differential transformer (LVDT) (Task 9-7-15).

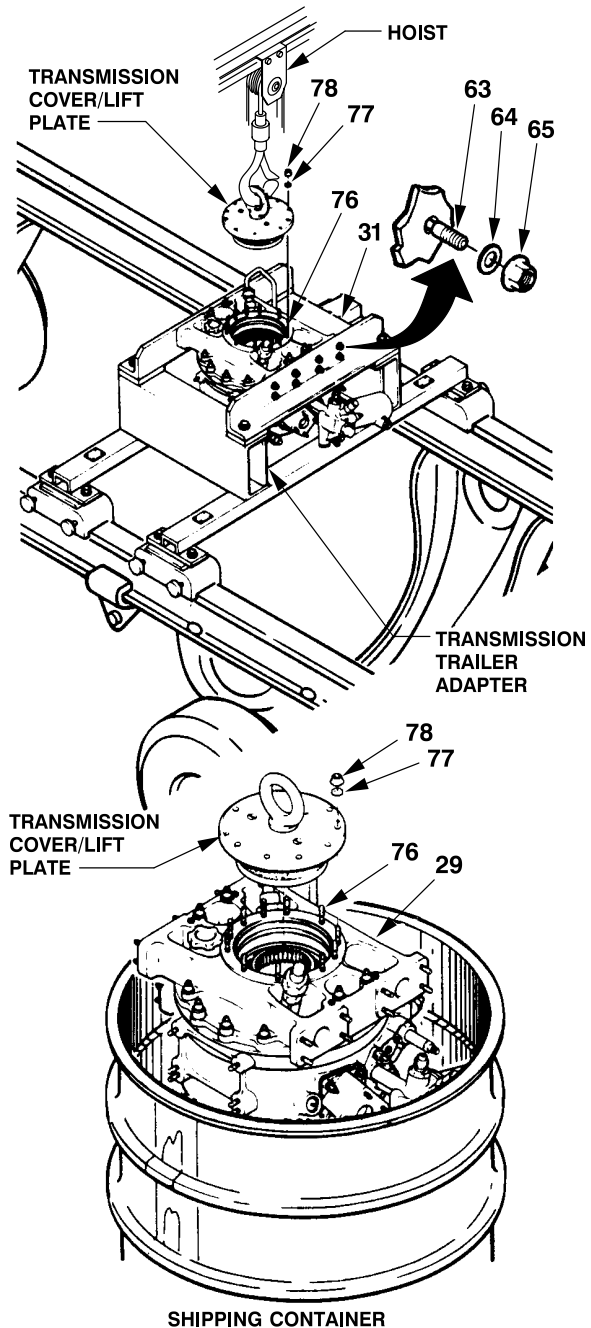
NOTE

- Unserviceable transmission shall be packaged for turn-in before starting buildup of serviceable transmission.
- If transmission is being removed for replacement, the following task shall be performed: Transmission Buildup (Task 6-3-4).

55. Package unserviceable transmission (29) for shipping (Task 6-3-5).

FOLLOW-ON MAINTENANCE

Accomplish requirements of Chapter 1, Section IX.



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J2150

END OF TASK

**6-3-3. TRANSMISSION LOWER BOOT ASSEMBLY — REMOVAL/CLEANING/INSPECTION/
INSTALLATION**

This task covers: Removal, Cleaning, Inspection and Installation (Off Helicopter)

INITIAL SETUP

Material:
Wiping Rag (D164)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Tools:
General Mechanic Tool Kit (B178)

Equipment Condition:
Transmission Removed (Task 6-3-2)

GO TO NEXT PAGE

6-3-3. TRANSMISSION LOWER BOOT ASSEMBLY — REMOVAL/CLEANING/INSPECTION/
INSTALLATION (CONT)

REMOVE

1. From outside boot assembly (1) remove clamp (2) and remove boot assembly (1) and retainer (3) from lower transmission flange.

CLEAN

2. Clean boot assembly (1) and retainer (3) using wiping rag (D164).

INSPECT

3. Inspect boot assembly (1) for cuts, tears, and deterioration.
4. No repair authorized.

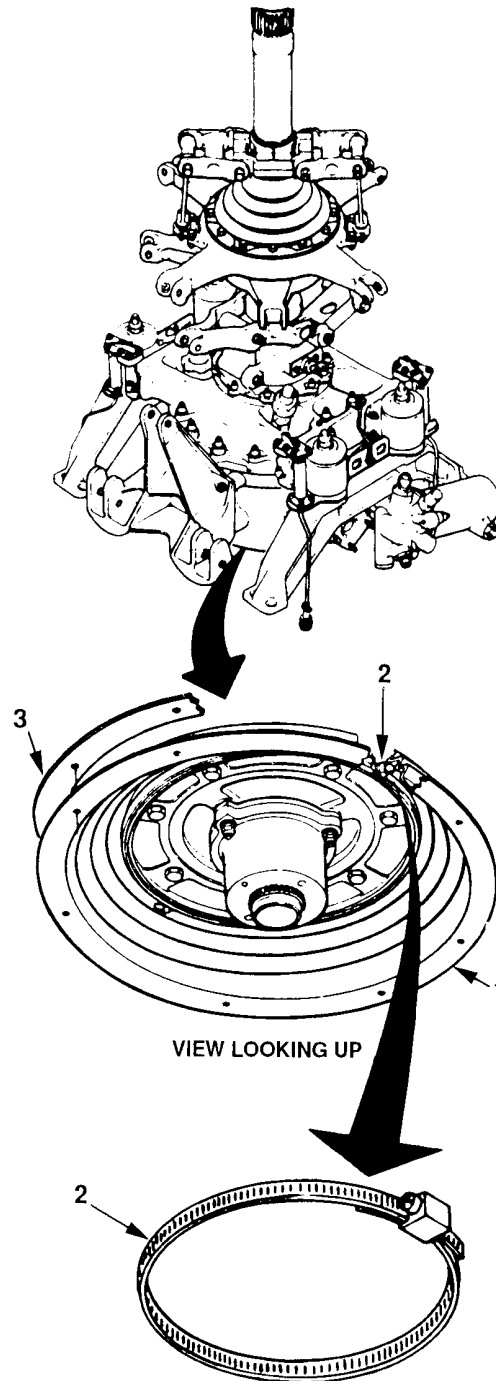
INSTALL

5. Place retainer (3) on top of boot assembly (1) flange. Secure boot assembly (1) to transmission flange from outside boot using clamp (2).

INSPECT

FOLLOW-ON MAINTENANCE

Install transmission (Task 6-3-6).



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J1567

END OF TASK

 6-3-4. TRANSMISSION — BUILDUP

This task covers: Buildup (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
Transmission Trailer (B6)
Lifting Eye Clevis (B19)
Mast Lifting Clevis (B20)
Hoist (B69)
Transmission Drain Hose (B72)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Transmission Cover/Lift Plate (B104)
Rope (B118)
Torque Wrench (B237)

Material:

Wiping Rag (D164)
Lubricating Oil (D139 or D140)
Proseal 890 (D184)

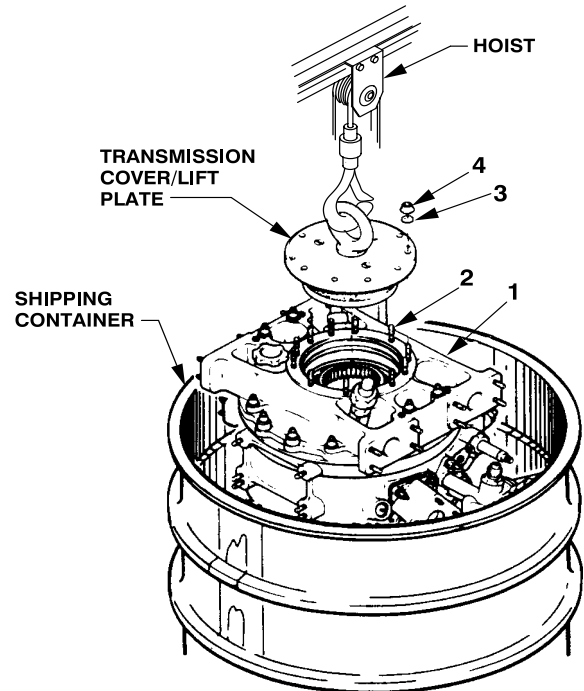
Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer (3)

1. Remove shipping plate (not shown) from serviceable transmission (1) and position transmission cover/lift plate (B104) on 12 studs (2) of serviceable transmission (1).

2. Install 12 washers (3) and 12 nuts (4). Torque nuts (4) **100 TO 140 INCH-POUNDS**.

3. Using hoist (B69), remove transmission (1) from shipping container.



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J2109

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6-3-4. TRANSMISSION — BUILDUP (CONT)

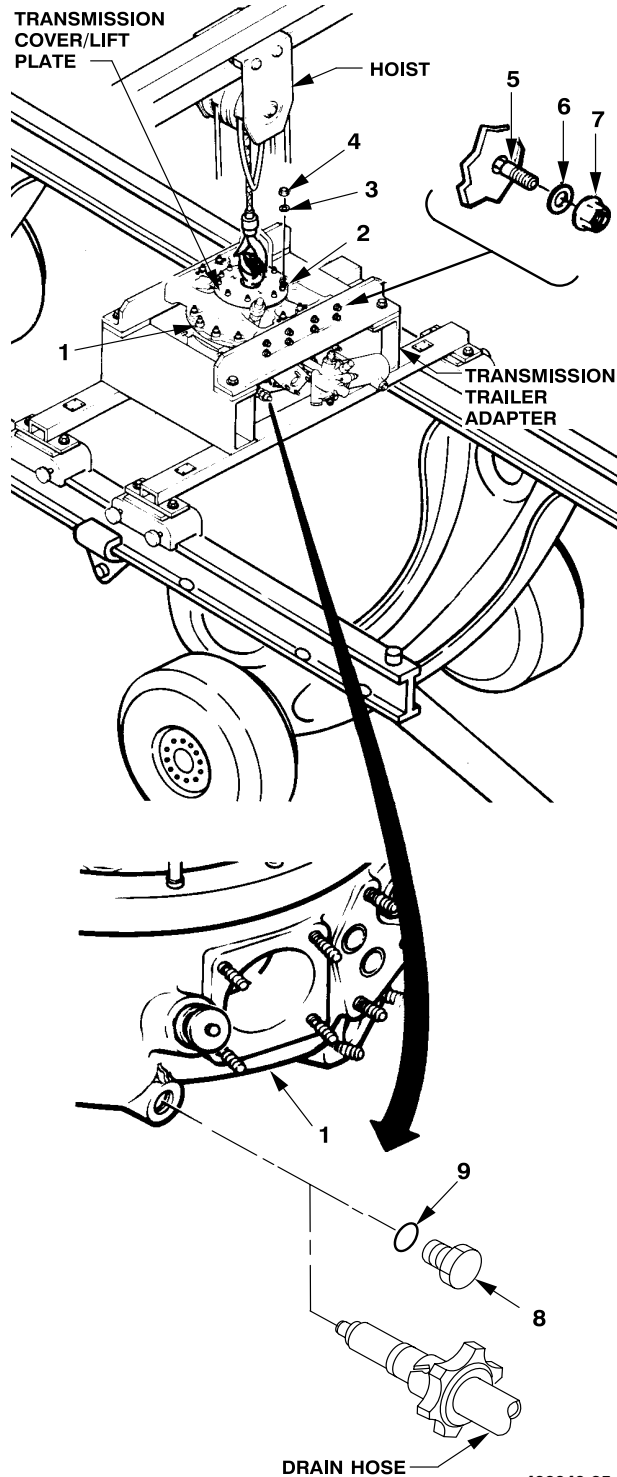
4. Install transmission (1) in transmission trailer adapter (part of B6) by lining up 16 studs (5) on transmission (1) with holes in transmission trailer adapter (part of B6).

5. Install 16 washers (6) and 16 nuts (7) on 16 studs (5). Torque nuts (7) **150 TO 180 INCH-POUNDS**.

6. Disconnect hoist (B69) from transmission cover/lift plate (B104).

7. Remove 12 nuts (4), 12 washers (3), and remove transmission cover/lift plate (B104) from 12 studs (2).

8. Remove shipping plug (not shown) from transmission (1) and install transmission drain hose (B72).



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J2109



Lubricating Oil

9. Flush preservative out of transmission with two quarts of lubricating oil (D139 or D140) and drain into suitable container (B101).

10. Remove transmission drain hose (B72) and install drain plug (8) with packing (9).

11. Remove shipping plate (not shown) from bottom of transmission (1).

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6-3-4. TRANSMISSION — BUILDUP (CONT)

12. Install new packing (10) on standpipe adapter (11). Install standpipe adapter (11) on studs (12) in support (13).

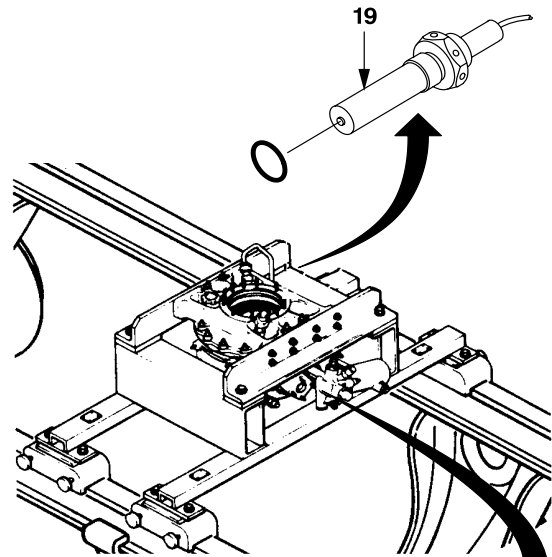
13. Install spring (14) in spring sleeve (15); line up spring end with hole in spring sleeve.

14. Install retaining plate (16) on spring sleeve (15) and spring (14).

15. Line up spring end with hole in standpipe adapter (11) and install spring, spring sleeve, and retaining plate assembly on standpipe adapter (11) and studs (12).

16. Install three washers (17) and three nuts (18) on studs (12).

17. Torque nuts (18) **50 TO 70 INCH-POUNDS**.



Sealing Compound

18. Apply sealant (D184) to outside mating surface of support (13).

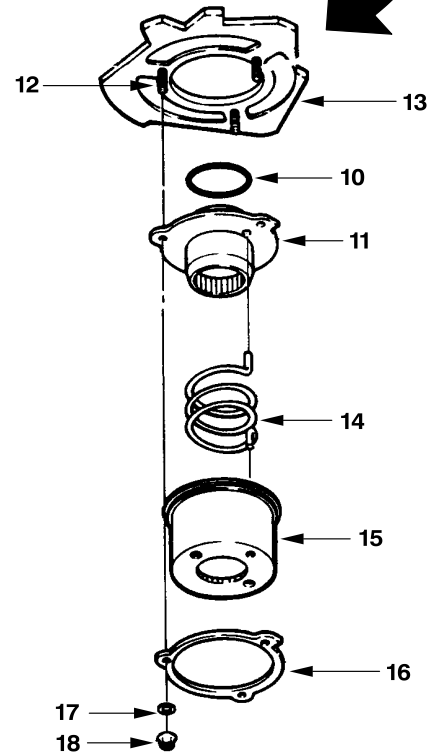
19. Install mast assembly (Task 6-4-20).

20. Install swashplate and support assembly (Task 5-2-38).

NOTE

The Nr sensor is only installed on OH-58D(R).

21. If Nr sensor (19) did not come with new transmission, install Nr sensor (19) (Task 6-3-16).



VIEW LOOKING UP

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J1567

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6-3-4. TRANSMISSION — BUILDUP (CONT)

22. Install oil filter manifold (Task 6-8-4).

23. Install hydraulic pump (Task 7-8-1).

24. Install TAMS linear differential transformer (LVDT) (Task 9-7-15).

25. Slide holder (part of B20) over splines of mast (19). Place cone set (part of B20) inside holder (part of B20) and align with area normally occupied by split cone set.

26. Set upper bracket of mast lifting clevis (B20) in holder (part of B20) and tighten mast lifting clevis (B20) using a spanner wrench.

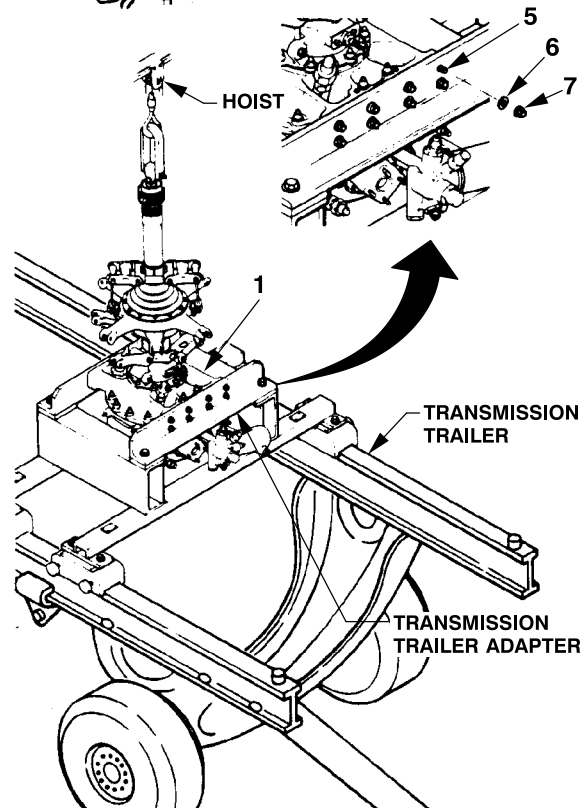
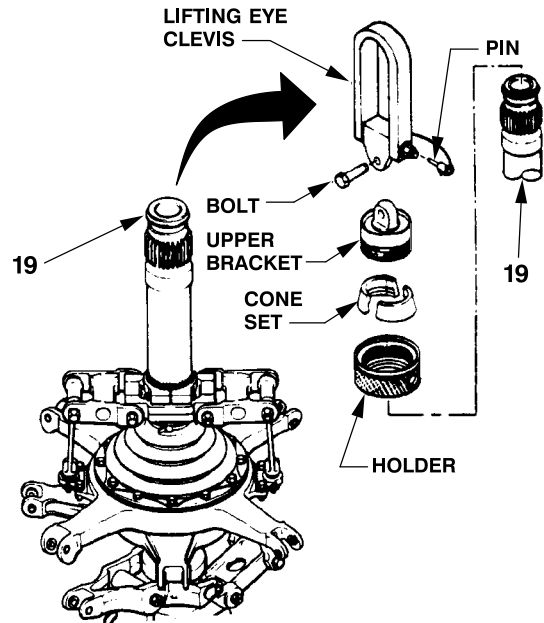
WARNING

Ensure pin is properly installed through bolt that connects lifting eye clevis (B19) to mast lifting clevis (B20).

27. Position lifting eye clevis (B19) onto upper bracket of mast lifting clevis (B20), install bolt (part of B20) and pin (part of B20). Attach hoist (B69) cable to lifting eye clevis (B19) and take up slack.

28. Remove 16 nuts (7) and 16 washers (6) from studs (5) on transmission (1).

29. Remove transmission (1) from transmission trailer adapter (part of B6) mounted on transmission trailer (B6).



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J0432

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 6-3-4. TRANSMISSION — BUILDUP (CONT)

30. Install cyclic and collective control support assemblies (20) on transmission (1) (Task 11-2-58).

31. Install transmission lower boot assembly (Task 6-3-3).

32. Install two pylon beams (21) on transmission (1) (Task 2-4-2).

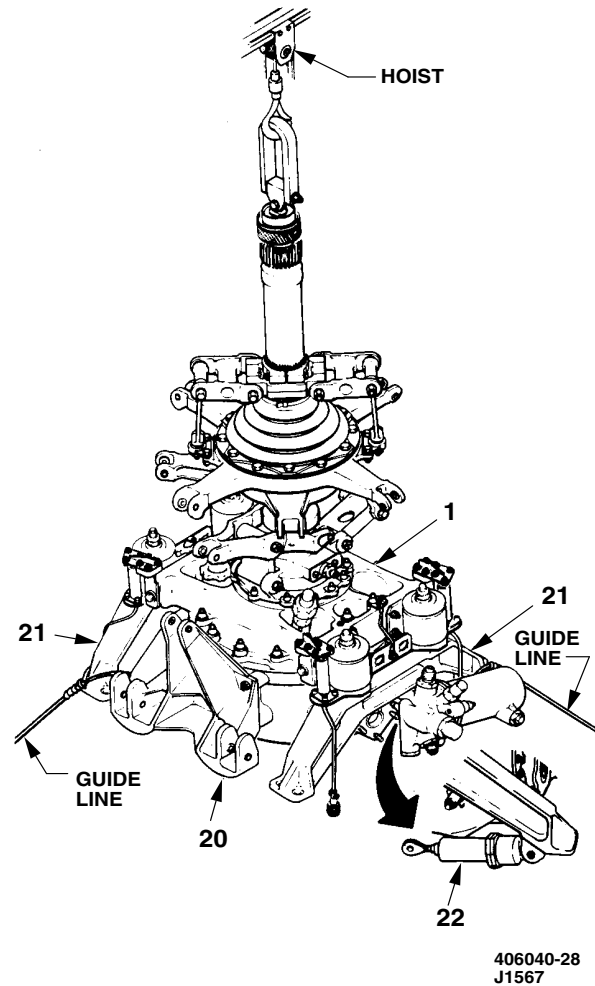
33. Install two pylon restraint spring assemblies (22) on transmission (1) (Task 6-3-14).

34. Connect guide lines (B118) to forward and aft leg of pylon beams (21) to aid in handling.

INSPECT

FOLLOW-ON MAINTENANCE

Install transmission (Task 6-3-6).



END OF TASK

6-3-5. TRANSMISSION — PRESERVATION AND PACKAGING

This task covers: Preservation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Transmission Cover/Lift Plate (B104)
Transmission Drain Hose (B72)
Hoist (B69)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Material:
Barrier Material (D48)
Corrosion Preventive Compound (D82)

Activated Desiccant (D92)
Rubber Gloves (D111)
Lubricating Oil (D139 or D140)
Wiping Rag (D164)
Proseal 706 Sealant (D180)
Sealing Compound (D184)
Drycleaning Solvent (D199)
Adhesive Pressure Tape (D212)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23
DA PAM 738-751

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6-3-5. TRANSMISSION — PRESERVATION AND PACKAGING (CONT)

CAUTION

Extreme care shall be taken while cleaning, preserving, and packaging the transmission to prevent damage to the chip detectors.

1. Install shipping cover (not shown) on bottom of transmission (1).



Lubricating Oil



Compressed Air

2. Working through mast opening, spray interior of transmission (1) with one pint of lubricating oil (D139 or D140). While spraying, manually rotate the internal gears and bearings by turning input drive quill adapter (2).

3. Remove drain plug (3) from transmission (1).

4. Install transmission drain hose (B72). Drain oil into suitable container (B101).

5. Remove transmission drain hose (B72) and install drain plug (3).

6. Install transmission cover/lift plate (B104) on 12 studs (4) on transmission (1).

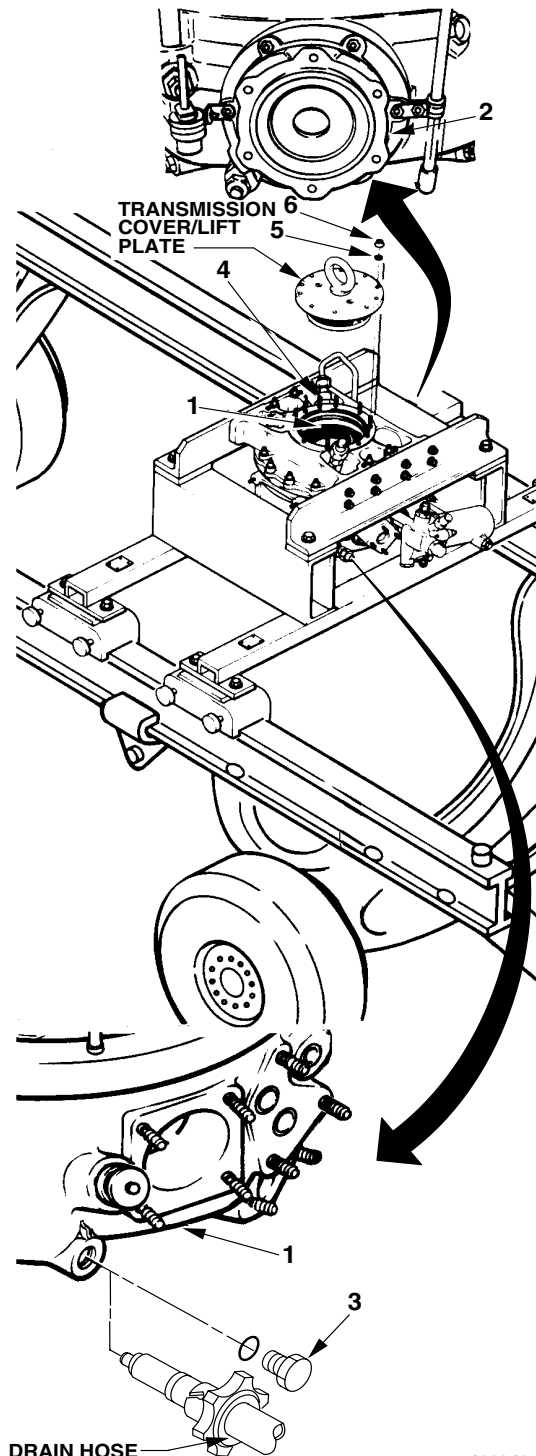
7. Install 12 washers (5) and 12 nuts (6). Torque nuts (6) **100 TO 140 INCH-POUNDS**.



Drycleaning Solvent

8. Clean exterior of transmission (1), including splines and threaded areas, with drycleaning solvent (D199).

9. Air-dry or wipe with a clean dry wiping rag (D164).



DRAIN HOSE

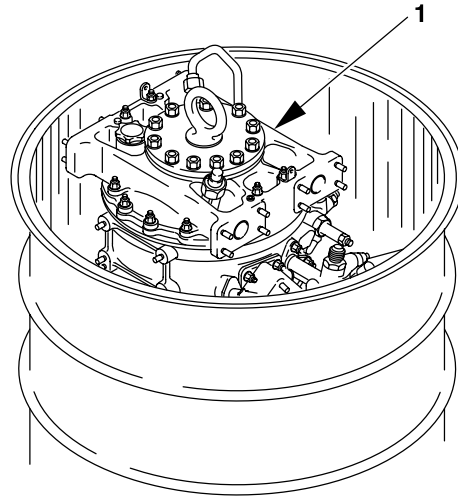
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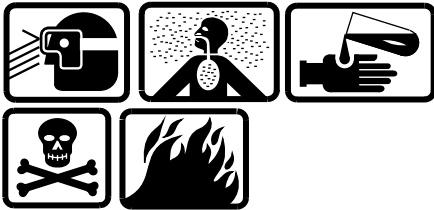
6-3-5. TRANSMISSION — PRESERVATION AND PACKAGING (CONT)

10. Cap or plug all fittings and ports as applicable, in accordance with TM 1-1500-204-23.

11. Cover breather holes and all other openings with barrier material (D48).



SHIPPING CONTAINER



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound shall not be allowed to contact rubber parts, as deterioration of rubber parts will result.

12. Apply corrosion preventive compound (D82) to all exterior bare metal surfaces, including splines, studs and thread areas.

13. Attach a tag to the transmission stating: TRANSMISSION PRESERVED WITH LUBRICATING OIL, DOD-L-85734 or MIL-L-7808.

14. Attach a properly filled out DD Form 1577-2 (Unserviceable/Reparable Tag) to the transmission (1) and a DD Form 1577-3 to exterior of the shipping container. Refer to DA PAM 738-751.

15. Initiate DA Form 2410 (Component Removal and Repair/Overhaul Record) in accordance with DA PAM 738-751.

16. Place copies of DA Form 2410 in grease proof envelope and stow in top of shipping container.

17. Cover input drive spline and hydraulic pump drive spline areas with barrier material (D48) and secure with tape (D212).

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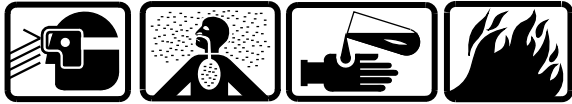
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6-3-5. TRANSMISSION — PRESERVATION AND PACKAGING (CONT)

INSPECT

18. Connect hoist (B69) and lower transmission (1) into shipping container and onto bottom molded pad.

19. Remove 12 nuts (6), 12 washers (5), and transmission cover/lift plate (B104).



Sealing Compound

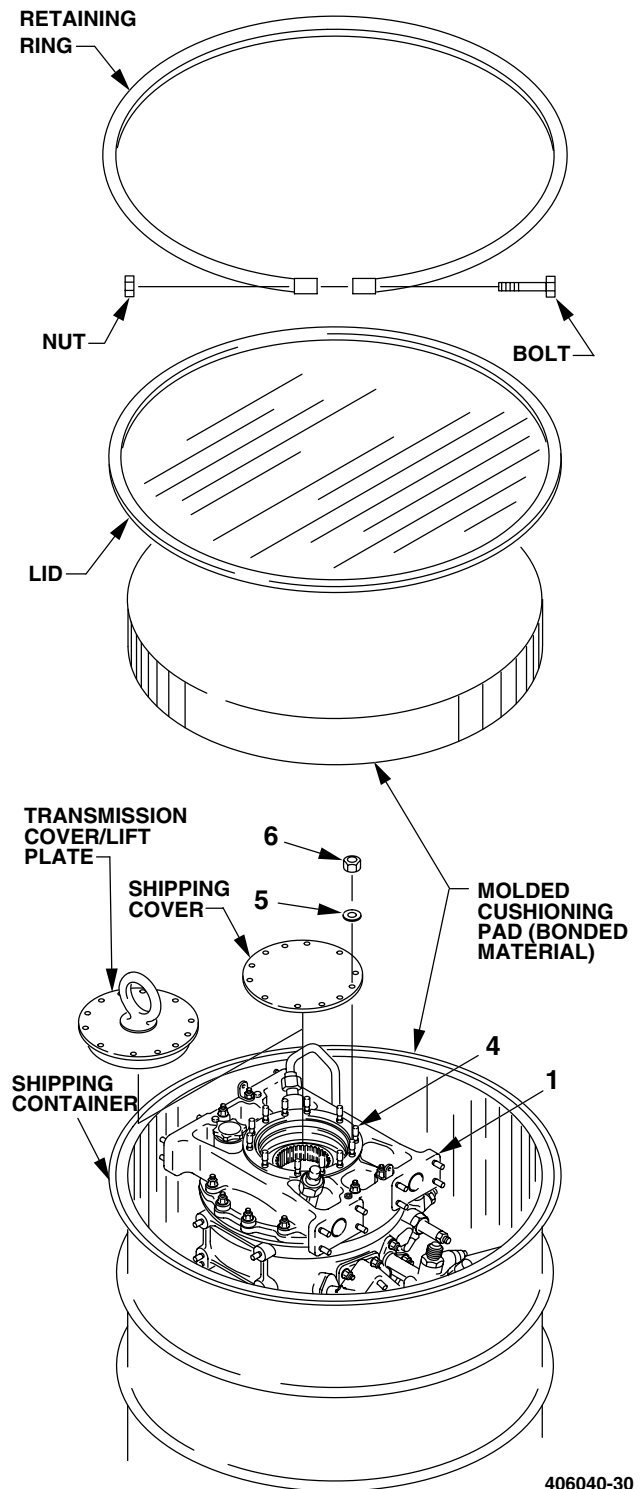
20. Apply a thin layer of sealant (D180) to mating surfaces of shipping cover and transmission (1).

21. Install shipping cover on 12 studs (4) with 12 washers (5) and 12 nuts (6). Torque nuts (6) **100 TO 140 INCH-POUNDS**.

22. Install upper molded pad over top of transmission (1) and install 24 units of desiccant (D92) in top of shipping container.

23. Install records in top of shipping container and secure lid of container in place using retainer ring, bolt, and nut.

INSPECT



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J2155

END OF TASK

6-3-6. TRANSMISSION — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Lifting Eye Clevis (B19)
Mast Lifting Clevis (B20)
Hoist (B69)
Rope (B118)
Torque Wrench (B235)
Torque Wrench (B242)

Material:
Sealant Proseal (D184)
Adhesive (D33)
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (3)
Maintenance Test Pilot

References:

TM 1-1500-204-23
TM 1-1520-248-10
TM 1-1520-248-CL
TM 1-1520-248-MTF

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■
Air Induction Cowling Removed (Task 4-2-1)
Engine Cowl Assembly Removed (Task 2-2-50) ■
Main Rotor Hub and Blades Removed
(Task 5-1-1)
Engine to Transmission Driveshaft Removed
(Task 6-2-1)
Torquemeter Support and Bearing Assembly
Removed (Task 6-4-5)
Mast Standpipe Removed (Task 6-4-1)
Build Up Transmission (Task 6-3-4)

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6-3-6. TRANSMISSION — INSTALLATION (CONT)

INSTALL

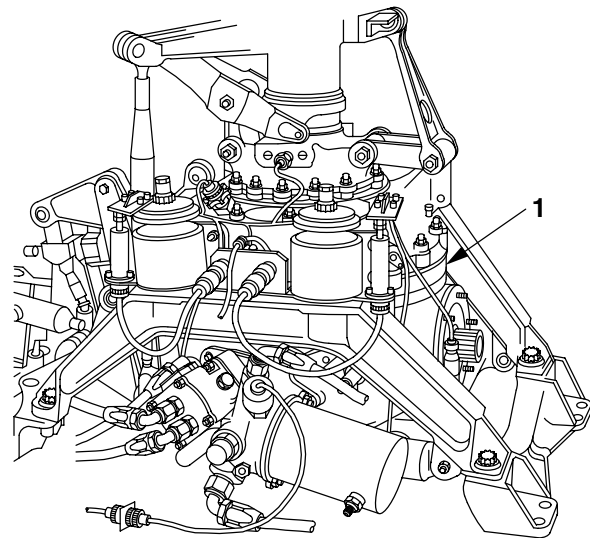
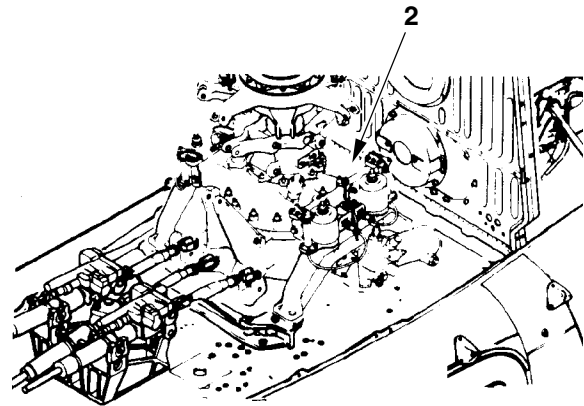
1. Prepare surfaces on transmission assembly (1) and forward and aft transverse beams (2) to ensure a Class H bonding. Refer to Appendix M for electrical bonding instructions.

NOTE

Right pylon stop fitting installation must be taken into consideration when lowering the transmission.

2. Position right pylon stop fitting on transmission before proceeding to next step.

3. Using hoist (B69), position transmission assembly (1) onto forward and aft transverse beams (2).



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J0432

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6-3-6. TRANSMISSION — INSTALLATION (CONT)

4. Secure transmission (1) to transverse beam assemblies (2) with 8 bolts (3), 16 washers (4), and 8 nuts (5).

WARNING

- To ensure proper torque value is applied when torquing is required from the bolthead, refer to TM 1-1520-204-23 (“Tightening on the head end”).
- Tare torque shall be determined for each bolt that requires torquing from the bolthead.
- Tare torque determined for each bolt shall be added to the torque value given in step 5. to ensure proper torque is applied to transmission mount bolt(s) (3).

NOTE

It will be necessary for some of the torquing in step 5. to be accomplished from the bolthead.

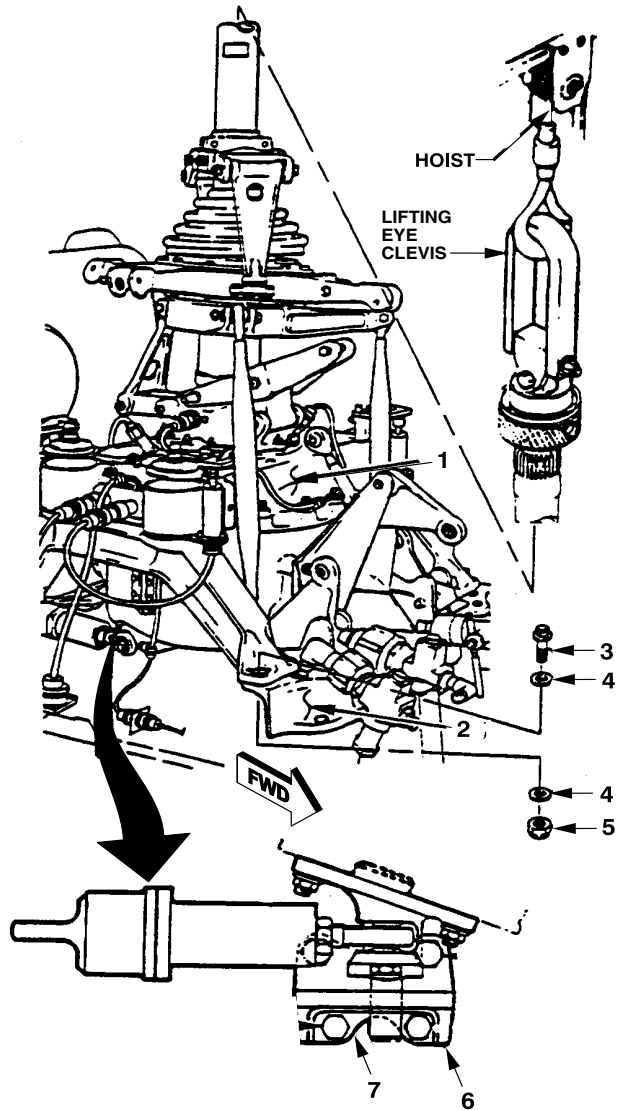
5. Torque accessible nuts (5) **768 TO 840 INCH-POUNDS.**

INSPECT

6. Disconnect hoist (B69) from lifting eye clevis (B19).

7. Install right pylon stop fitting (6) over bonded shim (7) (Task 6-3-14).

INSPECT



LOOKING DOWN

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J2155

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6-3-6. TRANSMISSION — INSTALLATION (CONT)

8. Secure retainer (8) and boot assembly (9) to cabin roof with eight washers (10) and eight screws (11).



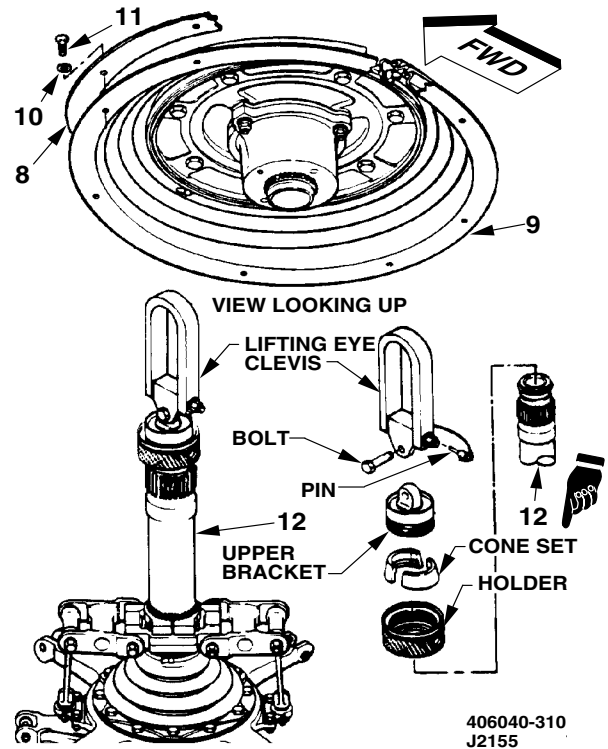
Sealing Compound

9. Apply a bead of sealing compound (D184) to cabin roof and boot assembly (9) mating surface.

10. Remove pin (part of B19) from bolt (part of B19) and lifting eye clevis (B19), from mast lifting clevis (B20).

11. Using a spanner wrench, separate upper bracket (part of B20) from holder (part of B20).

12. Slide holder (part of B20) down mast (12) and lift out cone set (part of B20). Slide holder (part of B20) off mast (12).



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6-3-6. TRANSMISSION — INSTALLATION (CONT)

NOTE

Protective covers, plugs and barrier material shall be removed before connecting lines and installing components.

13. Connect freewheeling unit oil line (13) to fitting (14).

14. Connect breather line (15) to breather (16).

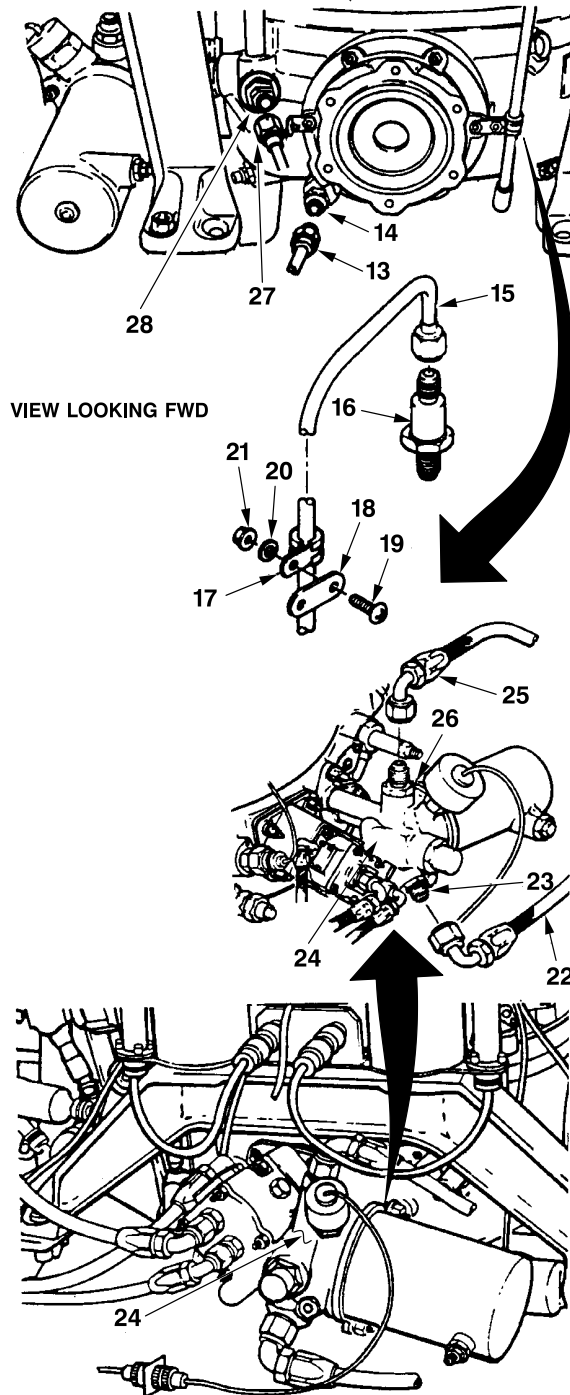
15. Torque line (15) **75 TO 125 INCH-POUNDS.**

16. Install clamp (17) to adapter (18) with screw (19), washer (20) and nut (21).

17. Connect oil filter outlet line (22) to fitting (23) on oil filter manifold (24).

18. Connect oil filter inlet line (25) to fitting (26) on oil filter manifold (24).

19. Connect freewheeling unit oil line (27) to filter/fitting (28).



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6-3-6. TRANSMISSION — INSTALLATION (CONT)

20. Install mast torque temperature sensor (29) with clamp (30) on bracket (31) using bolt (32), washer (33), and nut (34).

21. Torque nut (34) **12 TO 15 INCH-POUNDS**.

INSPECT

22. Connect electrical connector (35) to lower transmission chip detector (36).

NOTE

Nr sensor is only installed on OH-58D(R).

23. Connect electrical connector (37) to Nr sensor (38).

24. Connect transmission oil temperature transducer electrical connector (39) electrical wiring (40) to roof mounted connector (41).

NOTE

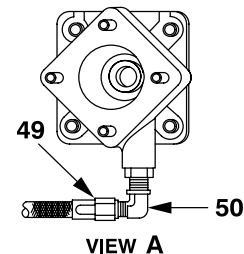
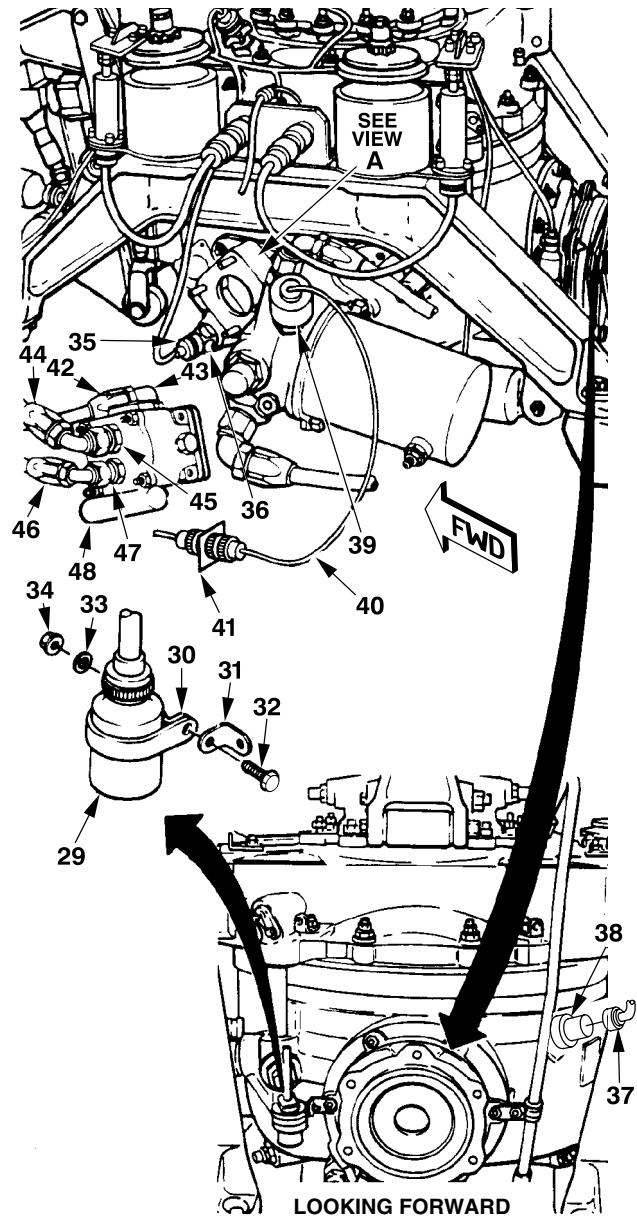
Protective covers, plugs and barrier material shall be removed before connecting lines and installing components.

25. Connect case drain hose (42) to elbow (43).

26. Connect suction line hose (44) to union (45).

27. Connect pressure line hose (46) to union (47) on hydraulic pump (48).

28. Connect vent line hose (49) to elbow (50).



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6-3-6. TRANSMISSION — INSTALLATION (CONT)

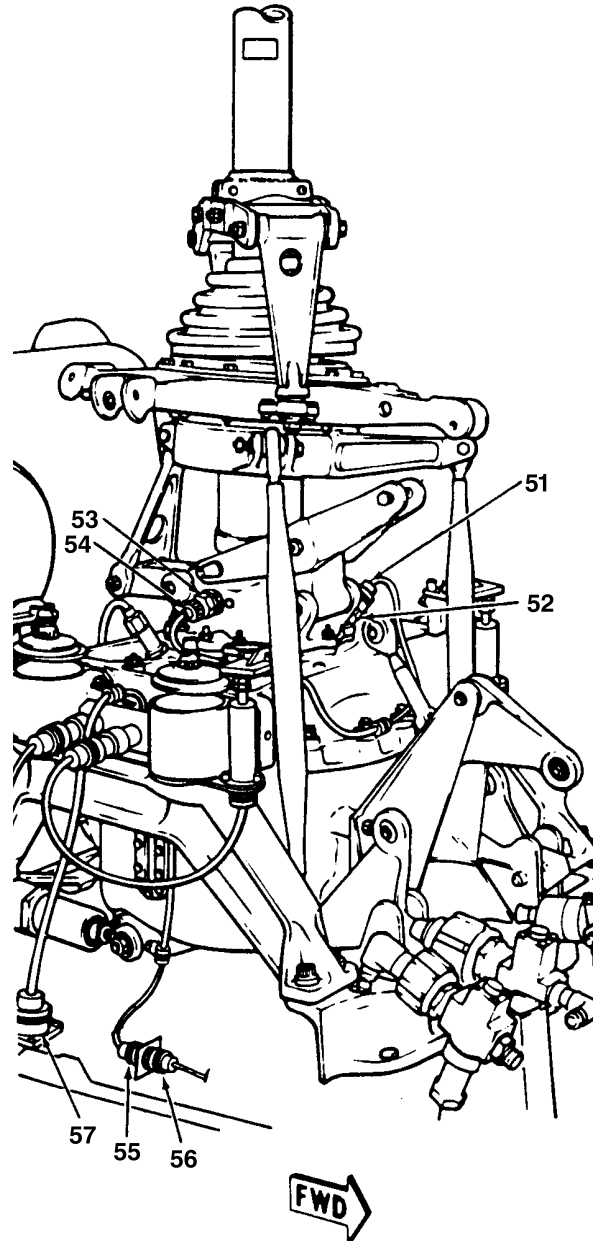
29. Connect electrical connector (51) to upper transmission chip detector (52).

30. Connect electrical connector (53) to lower torque transducer (54), right side.

31. Repeat step 30. for lower torque transducer, left side (Typical).

32. Connect electrical connector (55) to particle separator blower connector (56).

33. Connect electrical connector (57) to connector on right side of transmission deck.



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6-3-6. TRANSMISSION — INSTALLATION (CONT)

34. Connect cyclic and collective adjustable tube assemblies (58) (Task 11-2-60).

INSPECT

FOLLOW-ON MAINTENANCE

Install main rotor hub and blades (Task 5-1-2).

Install torquemeter support and bearing assembly (Task 6-4-11).

Install mast standpipe (Task 6-4-3).

Perform engine-to-transmission alignment (Task 4-7-4).

Install engine to transmission driveshaft (Task 6-2-1).

Service transmission (Task 1-4-8).

Install air induction cowling (Task 4-2-4).

Install engine cowl assembly (Task 2-2-50).

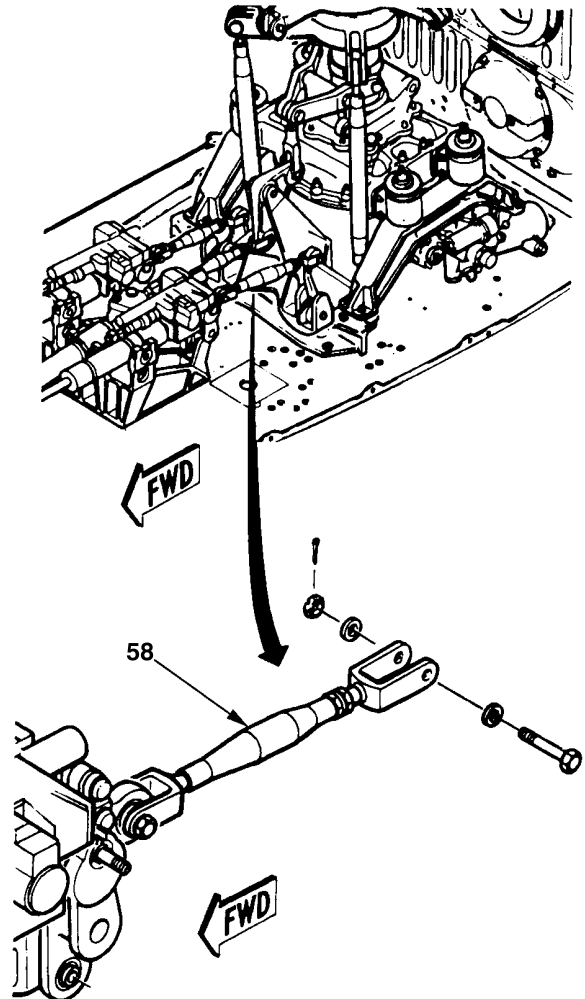
Bleed hydraulic system (Task 7-2-1).

Service hydraulic reservoir (Task 1-4-10).

TAMS Static calibration (Task 9-7-16).

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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END OF TASK

6-3-7. INPUT PINION MAGNETIC SEAL (AVIM) — REMOVAL/CLEANING/INSPECTION/REPAIR/
INSTALLATION

This task covers: Removal, Cleaning, Inspection, Repair, and Installation (On Helicopter)

INITIAL SETUP

Sealing Compound (D184)
Corrosion Preventive Compound (D82)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer
Pilot

Tools:
Powertrain Tool Kit (B180)
Maintenance Stand (B162)
Spanner Set (B133)
Torque Wrench (B237)
Torque Wrench (B233)
Plastic Scraper (B123)
Jackscrew Set (B129)

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Material:
Rubber Gloves (D111)
Assembly Fluid No. 1 (D46)
Acetone (D2)
Lubricating Oil (D139 or D140)
Low-Lint Cleaning Cloth (D67)
Drycleaning Solvent (D199)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47) ■
Air Induction Cowling Removed (Task 4-2-1)
Engine Cowl Assembly Removed (Task 2-2-50) ■
Engine-to-Transmission Driveshaft Removed (Task 6-2-1)
Transmission Drained (Task 1-4-7)

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6-3-7. INPUT PINION MAGNETIC SEAL (AVIM) — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

REMOVE MAGNETIC SEAL ASSEMBLY

1. Remove lock spring (1) from input pinion nut (2) and remove cover (3).
2. Remove input pinion nut (2) from pinion adapter (4) using spanner set (B133).
3. Remove pinion adapter (4) and packing (5) from input pinion (6). Discard packing (5).
4. Remove six nuts (7), four steel washers (8), two brackets (9), and six aluminum washers (10) from housing (11).
5. Remove sealing compound from housing (11) and transmission using suitable plastic scraper (B123).
6. Use jackscrew set (B129) to loosen housing (11) from transmission.
7. Remove housing (11), shim (12), and packing (13) from input pinion bearing liner (14). Discard packing (13).
8. Remove fitting (15).
9. Remove and discard packings (16).

CAUTION

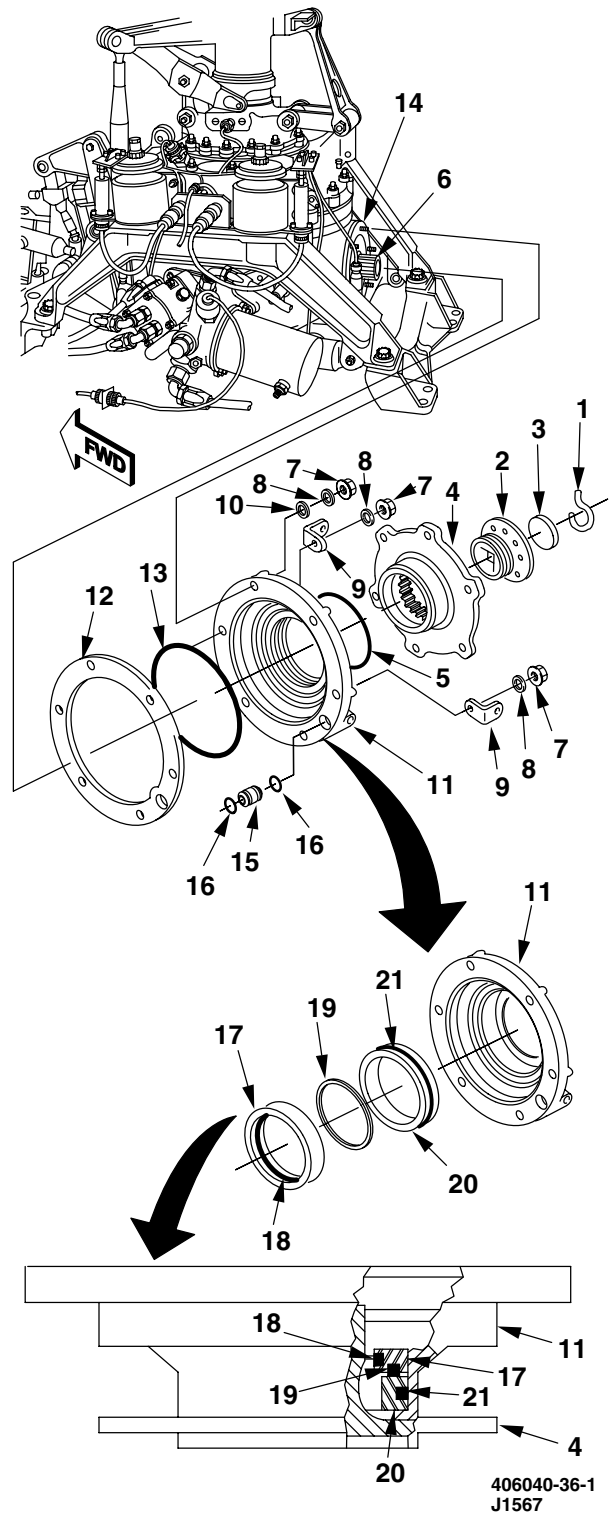
The magnetic ring (20) with packing (21), carbon seal ring (19), and seal case (17) with packing (18) are hard and brittle. Application of other than hand pressure can cause cracks to the carbon seal ring (19), which will render the entire seal unserviceable.

10. Remove seal case (17) with packing (18), carbon seal ring (19) and magnetic ring (20) with packing (21) from housing (11).

INSPECT HOUSING

11. Inspect housing (11) being certain seal cavity is free of burrs.
12. Inspect housing (11) for damage and corrosion (Task 6-3-1).

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6-3-7. INPUT PINION MAGNETIC SEAL (AVIM) — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

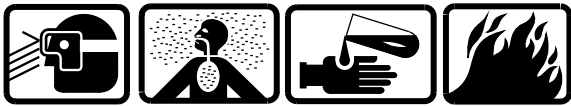
CLEAN HOUSING



Acetone

13. Clean housing (11) and input pinion bearing liner (14) with acetone (D2).

INSPECT SHIM



Drycleaning Solvent

14. Clean shim (12) with drycleaning solvent (D199).

15. Replace shim (12) if damage or debonding is noted.

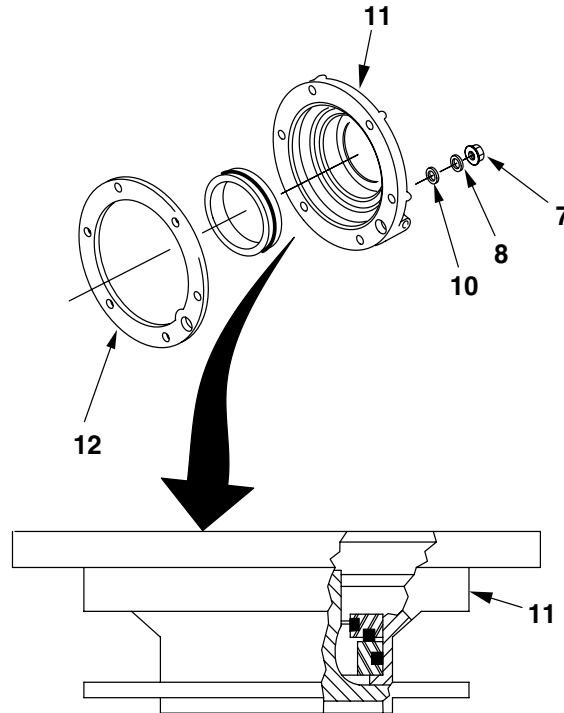
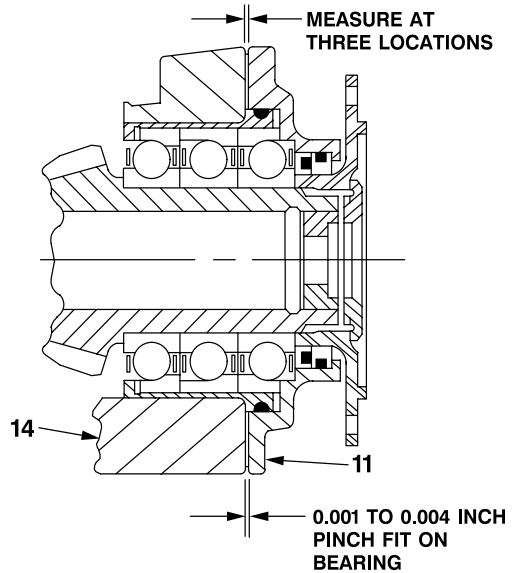
REPLACE SHIM

16. Install housing (11) on input pinion bearing liner (14) using existing nuts (7), and washers (8 and 10).

17. Measure gap between housing (11) and input pinion bearing liner (14), three locations.

18. Peel shim (12) to obtain **0.001 to 0.004 inch** pinch fit on bearing.

19. Remove nuts (7), washers (8 and 10), and housing (11) from input pinion bearing liner.



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6-3-7. INPUT PINION MAGNETIC SEAL (AVIM) — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

BUILD UP SEAL ASSEMBLY

CAUTION

Avoid touching mating surface (highly polished surface) of magnetic ring (20) with bare hands.

NOTE

When magnetic ring (20) and seal case (17) are removed from packaging, they must be separated. Seal case (17) shall be pulled straight away from magnetic ring.



Assembly Fluid

20. Lubricate packing (13) and bore of housing (11). Use a small amount of Assembly Fluid No. 1 (D46).

CAUTION

The magnetic ring (20) with packing (21), carbon seal ring (19), and seal case (17) with packing (18) are hard and brittle. Application of other than hand pressure can cause cracks to the carbon seal ring (19), which will render the entire seal unserviceable.

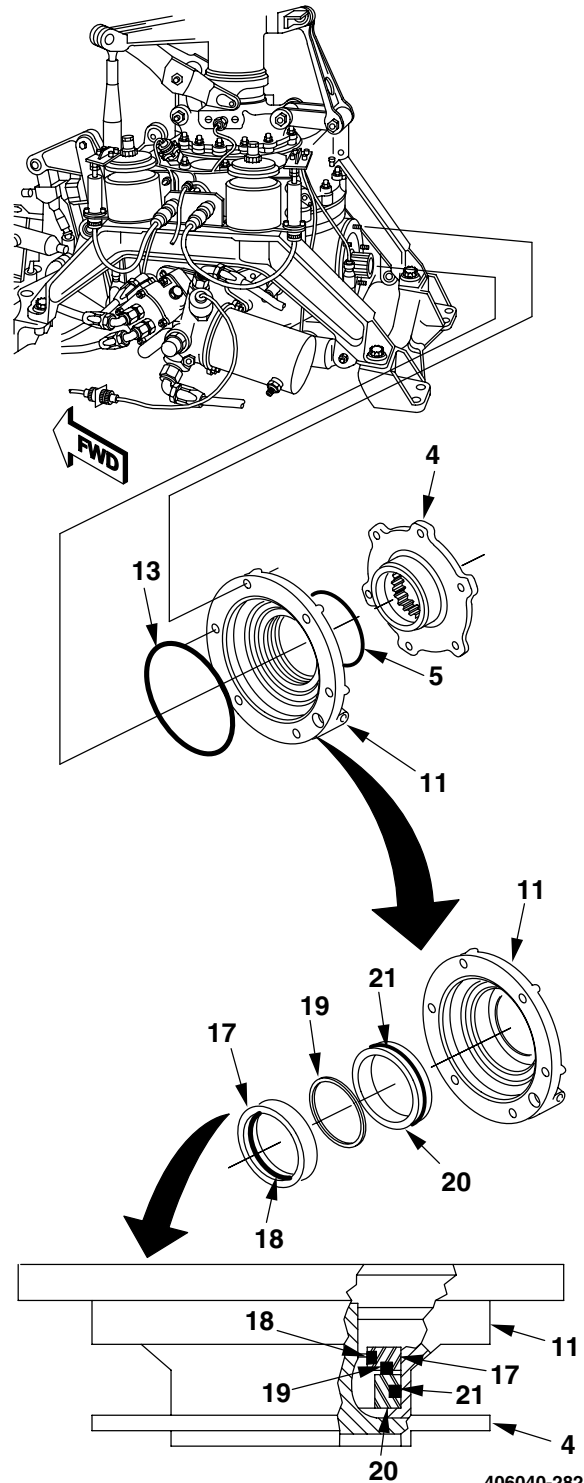
21. Position magnetic ring (20) into bore of housing (11) with mating surface (polished surface) facing up.

22. Cover mating surface with a clean low lint cloth (D67) and hand press magnetic ring (20) squarely into bore of housing (11).

23. Assemble adapter (4) through magnetic ring (20) installed on housing (11), and place assembly face down on adapter (4).

24. Lubricate packing (5) using a small amount of Assembly Fluid No. 1 (D46) and install on outside diameter of adapter (4).

25. Carefully place seal case (17) over adapter (4) with carbon ring adjacent to magnetic ring (20) and hand press seal case (17) into contact with magnetic ring (20).



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6-3-7. INPUT PINION MAGNETIC SEAL (AVIM) — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

INSTALL



Lubricating Oil

NOTE

Proper sealing shall be ensured by pouring small amount of required lubricating oil (D139 or D140) into housing. If leakage occurs, positive contact has not been achieved between seal mating surfaces, or packing damage has occurred.



Assembly Fluid

26. Lubricate packing (13) using a small amount of Assembly Fluid No. 1 (D46) and install into groove of input pinion housing (11).

27. Lubricate inner portion of adapter (4) and packing (5) using a small amount of Assembly Fluid No. 1 (D46).

28. Lubricate packings (16) with same type lubricating oil (D139 or D140) used in transmission.

29. Install packings (16) on fitting (15).

30. Install one end of fitting (15) into housing (11).

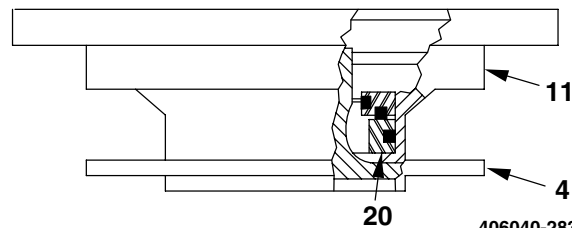
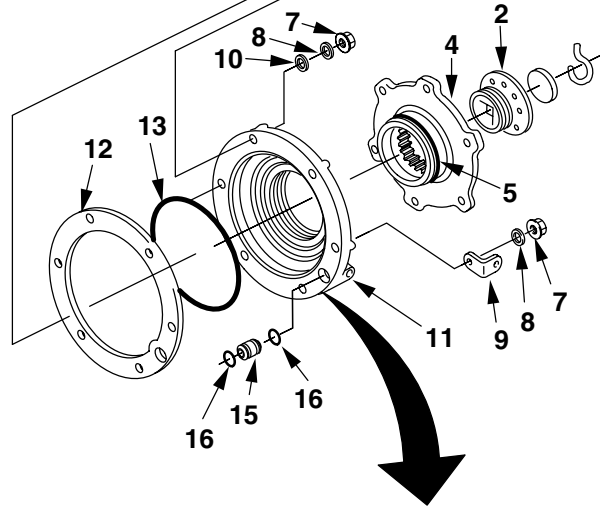
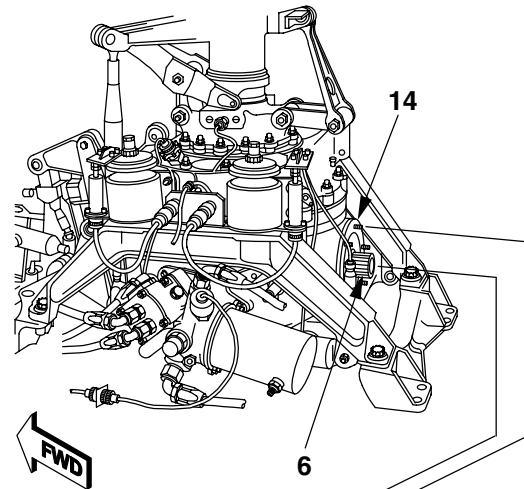
31. Install magnetic ring (20), shim (12), housing (11), fitting (15), and adapter assembly (4) on input pinion (6) and input pinion bearing liner (14).

CAUTION

This procedure, if not strictly followed, may result in seal separation and leakage.

32. Hand press adapter (4) on pinion (6) and packing (5) while guiding housing (11) holes over six studs in transmission. Install six aluminum washers (10), two brackets (9), four steel washers (8), and six nuts (7).

33. While applying pressure to adapter (4), torque nut (2) **150 TO 166 FOOT-POUNDS**.



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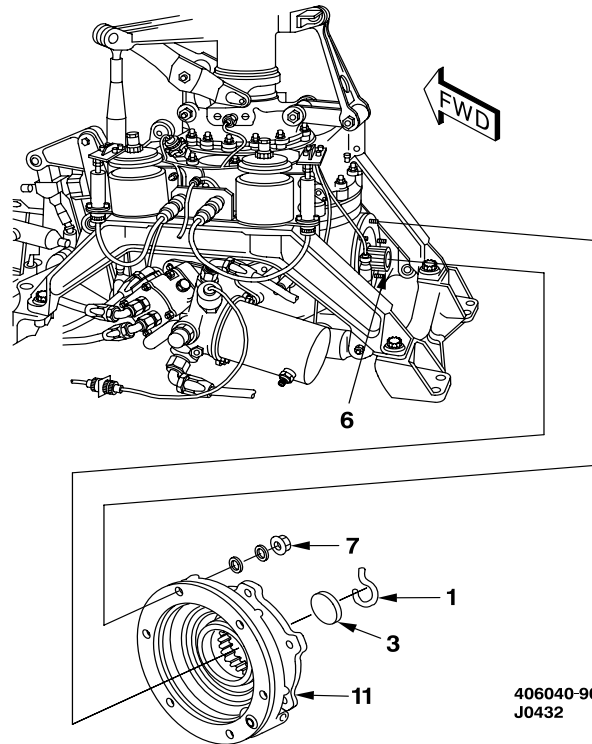
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6-3-7. INPUT PINION MAGNETIC SEAL (AVIM) — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

34. Install housing (11) the rest of way on studs by tightening nuts (7).

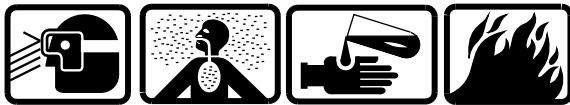
35. Torque nuts (7) **50 TO 70 INCH-POUNDS**.

36. Install cover (3) in input pinion (6) and secure with lockspring (1).



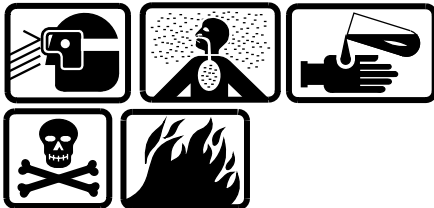
Lubricating Oil

37. Service transmission with two quarts of lubricating oil (D139 or D140) and ensure no static leaks are present before proceeding.



Sealing Compound

38. Apply sealing compound (D184) around housing (11).



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound (D82) shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals. Premature failure of bearings or seals may occur.

39. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.

INSPECT

FOLLOW-ON MAINTENANCE

Install engine-to-transmission driveshaft (Task 6-2-1).

Install engine cowl assembly (Task 2-2-50). ■

Install air induction cowling (Task 4-2-4).

Install forward fairing assembly (Task 2-2-47). ■

Service transmission (Task 1-4-8).

Pilot perform MOC (TM 1-1520-248-10/CL).

END OF TASK

6-3-8. UPPER CHIP DETECTOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)
Crowfoot (B29)
Wrench (B216)

Material:
Lockwire (D132)
Lubricating Oil (D139 or D140)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

6-3-8. UPPER CHIP DETECTOR — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect electrical connector (1) from chip detector (2).
2. Remove chip detector (2) from housing (3).
3. Remove and discard packing (4).
4. Remove lockwire from housing (3).
5. Remove housing (3) from transmission (5).
6. Remove and discard packing (6).

INSTALL

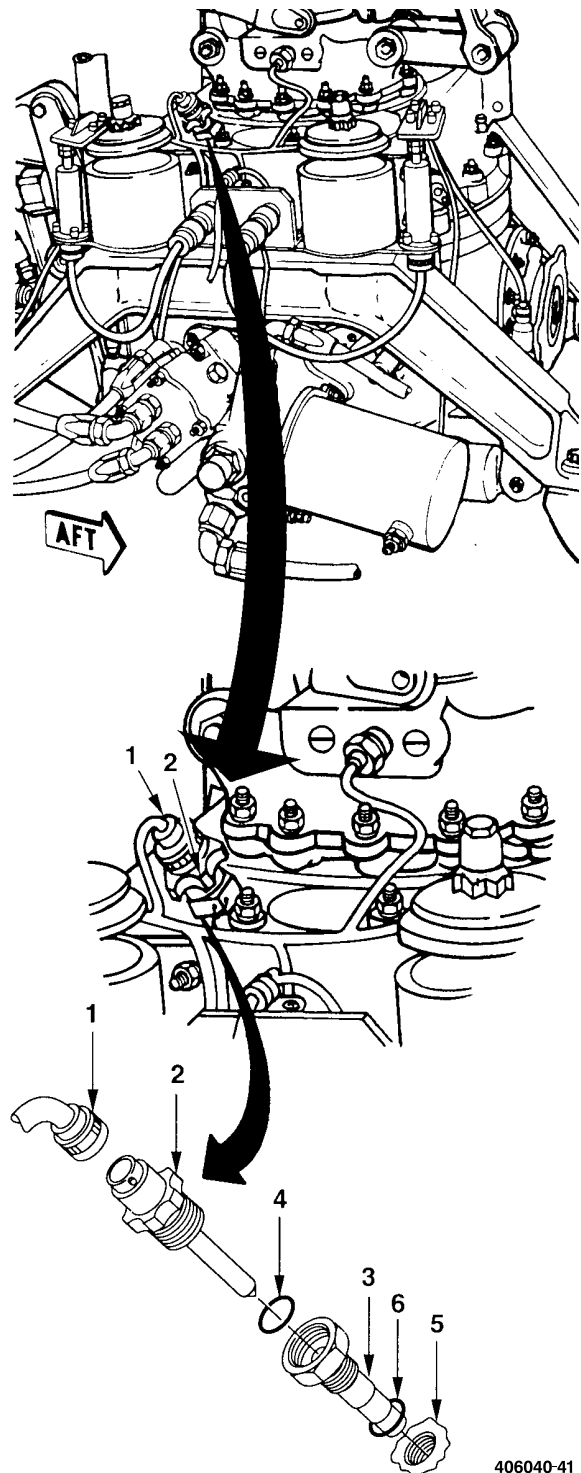
**Lubricating Oil**

7. Lubricate packing (6) using lubricating oil (D139 or D140).
8. Install packing (6) on housing (3).
9. Install housing (3) in transmission (5).
10. Torque housing (3) **75 TO 125 INCH-POUNDS**.
11. Secure housing (3) to transmission (5) with lockwire (D132).
12. Lubricate packing (4) using lubricating oil (D139 or D140).
13. Install packing (4) on chip detector (2).
14. Install chip detector (2) in housing (3).
15. Connect electrical connector (1) to chip detector (2).

INSPECT

FOLLOW-ON MAINTENANCE

- Perform operational check (TM 1-1520-248-T).
- Install forward fairing assembly (Task 2-2-47).

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END OF TASK

6-3-9. THERMOSTAT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Wrench (B219)
Maintenance Stand (B162)

Material:
Lubricating Oil (D139 or D140)
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

6-3-9. THERMOSTAT — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove lockwire (D132) from thermostat (1).
2. Remove thermostat (1) with packing (2) from manifold (3).
3. Remove and discard packing (2).

INSTALL

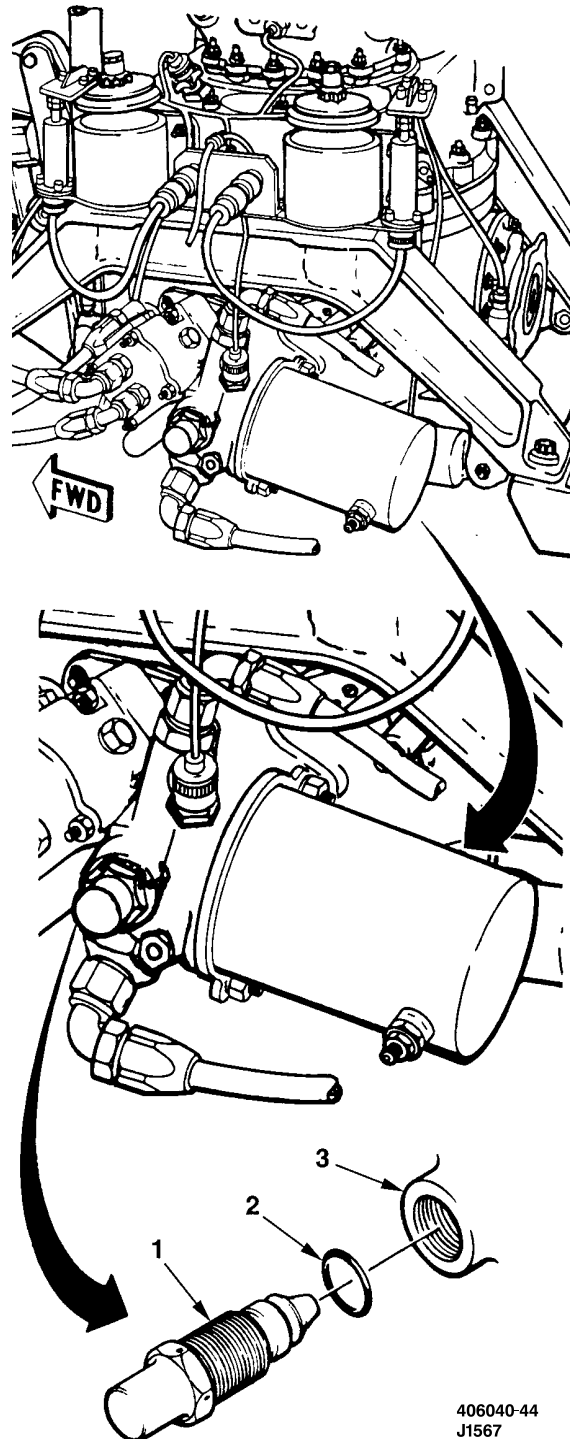
**Lubricating Oil**

4. Lubricate packing (2) with lubricating oil (D139 or D140).
5. Install packing (2) on thermostat (1).
6. Install thermostat (1) with packing (2) on oil filter manifold (3).
7. Secure thermostat (1) with lockwire (D132).

INSPECT

FOLLOW-ON MAINTENANCE

- Install forward fairing assembly (Task 2-2-47).



END OF TASK

6-3-10. TEMPERATURE TRANSDUCER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:

All

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

Tools:

General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:

Lubricating Oil (D139 or D140)
Lockwire (D132)

GO TO NEXT PAGE

6-3-10. TEMPERATURE TRANSDUCER — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect electrical connector (1).
2. Remove lockwire (D132) from temperature transducer (2).
3. Remove temperature transducer (2) with packing (3) from oil filter manifold (4).
4. Remove and discard packing (3).

INSTALL

5. Prepare surfaces on temperature transducer (2) and oil filter manifold (4) to ensure a Class H electrical bond (Appendix M).

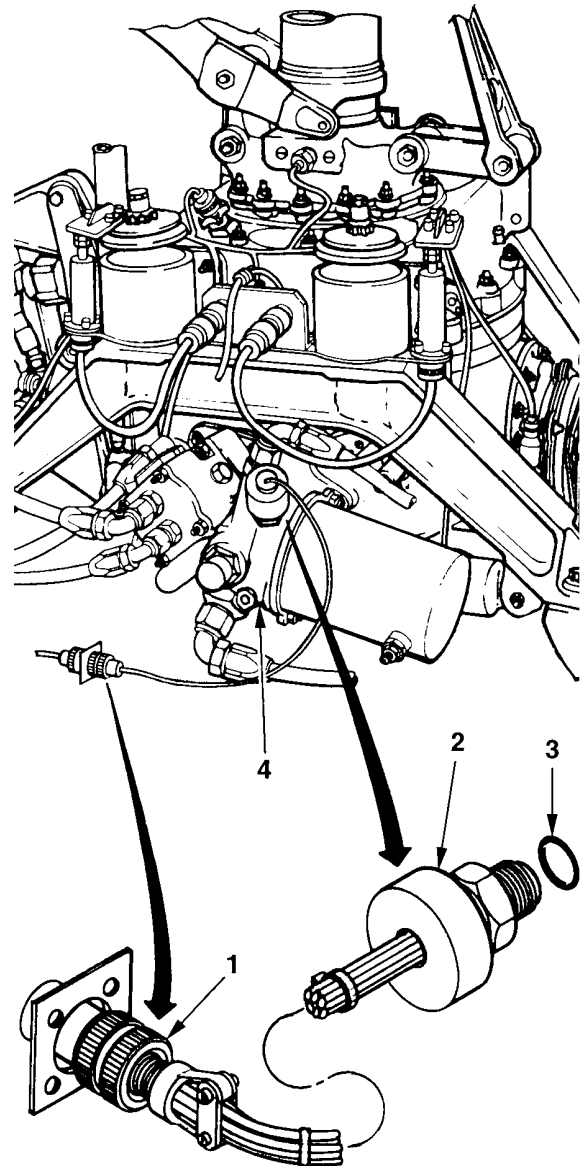
**Lubricating Oil**

6. Lubricate packing (3) with lubricating oil (D139 or D140).
7. Install packing (3) on temperature transducer (2).
8. Install temperature transducer (2) with packing (3) on oil filter manifold (4).
9. Secure temperature transducer (2) with lockwire (D132).
10. Connect electrical connector (1).

INSPECT

FOLLOW-ON MAINTENANCE

- Install forward fairing assembly (Task 2-2-47).

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END OF TASK

6-3-11. LOWER CHIP DETECTOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Lockwire (D132)
Lubricating Oil (D139 or D140)

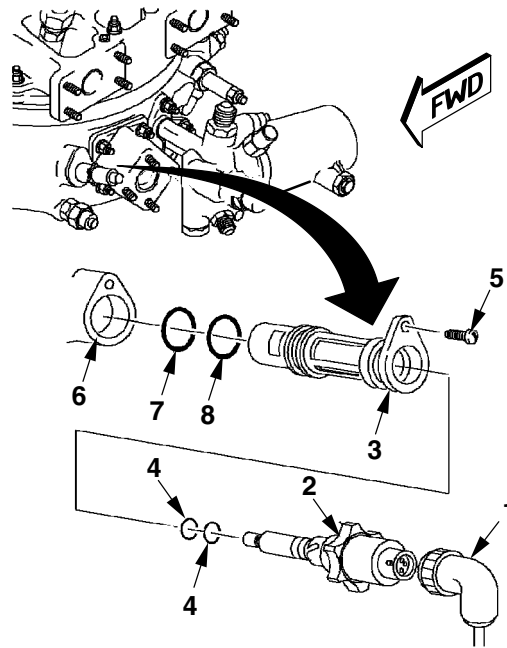
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Transmission Lubricating Oil Drained
(Task 1-4-7)

REMOVE

1. Disconnect electrical connector (1) from chip detector (2).
2. Remove chip detector (2) from housing (3).
3. Remove and discard packings (4).
4. Remove lockwire and screw (5) securing housing (3) to transmission (6).
5. Remove housing (3) from transmission (6).
6. Remove and discard packings (7 and 8).



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6-3-11. LOWER CHIP DETECTOR — REMOVAL/INSTALLATION (CONT)

INSTALL

**Lubricating Oil**

7. Lubricate packings (7 and 8) using lubricating oil (D139 or D140).
8. Install packings (7 and 8) on housing (3).

CAUTION

Failure to fully seat housing can cause total loss of oil pressure.

9. Install housing (3) in transmission (6).
10. Install screw (5).
11. Secure screw (5) with lockwire (D132).
12. Lubricate packings (4) using lubricating oil (D139 or D140).
13. Install packings (4) on chip detector (2).
14. Install chip detector (2) in housing (3).

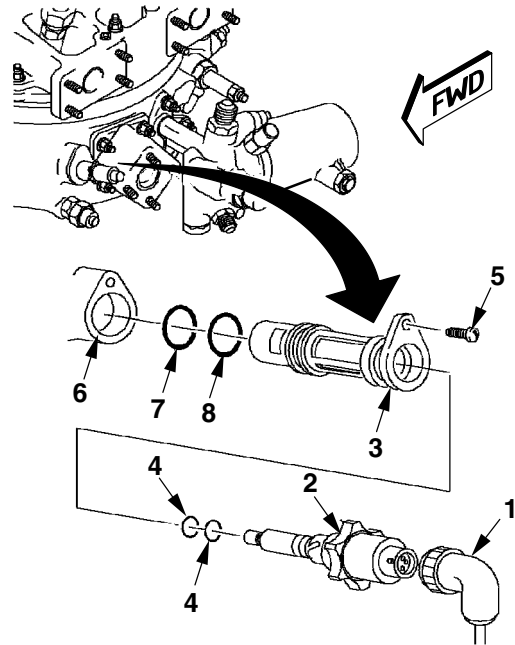
NOTE

Reindexing of the chip detector may be necessary to correct unacceptable position of installed backshell.

15. Connect electrical connector (1) to chip detector (2) with backshell oriented between 5 and 7 o'clock position.

INSPECT**FOLLOW-ON MAINTENANCE**

- Service transmission oil system (Task 1-4-8).
- Perform operational check (TM 1-1520-248-T).
- Install forward fairing assembly (Task 2-2-47).



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END OF TASK

6-3-12. BREATHER TUBE ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

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6-3-12. BREATHER TUBE ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove nut (1), screw (2), washer (3), and clamp (4).
2. Loosen nut (5) and remove breather tube (6).
3. Cut lockwire (D132) and remove breather (7) and packing (8). Discard packing (8).

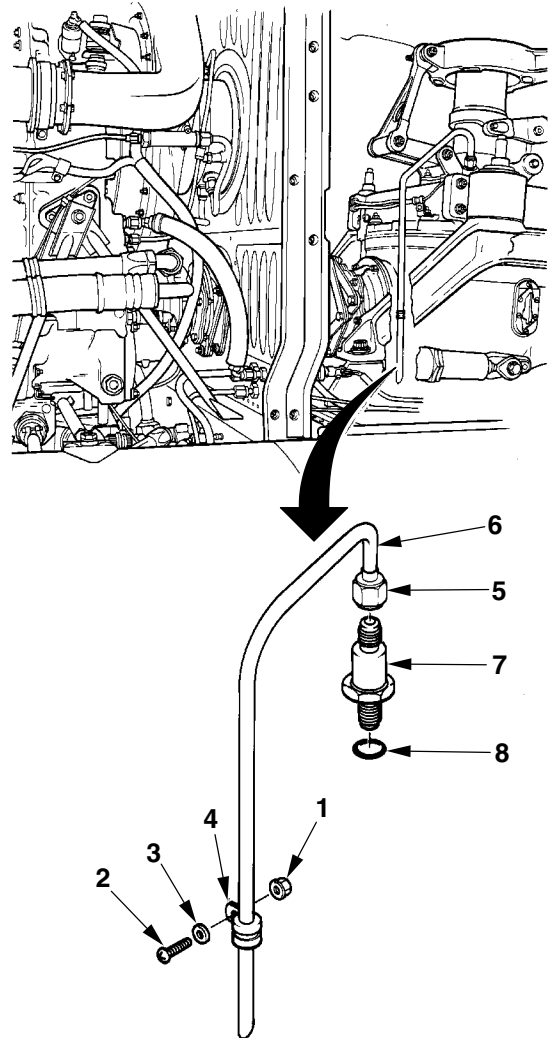
INSTALL

4. Install breather (7) with packing (8).
5. Torque breather **75 TO 125 INCH-POUNDS** and secure with lockwire (D132).
6. Place tube (6) in proper position and tighten nut (5). Torque nut (5) **75 TO 125 INCH-POUNDS**.
7. Install clamp (4) on tube (6) using screw (2), washer (3), and nut (1).

INSPECT

FOLLOW-ON MAINTENANCE

- Install forward fairing assembly (Task 2-2-47).

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END OF TASK

6-3-13. SIGHT GAGE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Plastic Scraper (B123)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Transmission Oil Drained (Task 1-4-7)

GO TO NEXT PAGE

6-3-13. SIGHT GAGE — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove lockwire from sight gage (1).
2. Remove six screws (2) and six washers (3) from OIL LEVEL plate (4) and sight gage (1).
3. Remove OIL LEVEL plate (4), sight gage (1), and gasket (5).
4. Discard gasket (5).

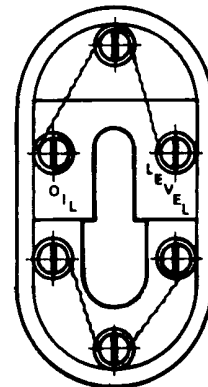
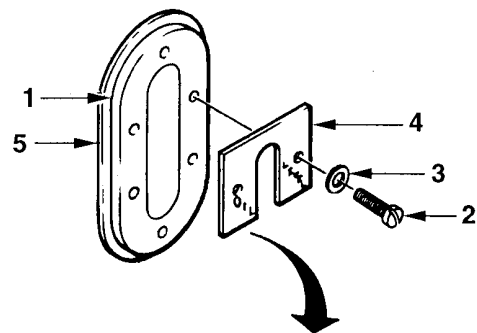
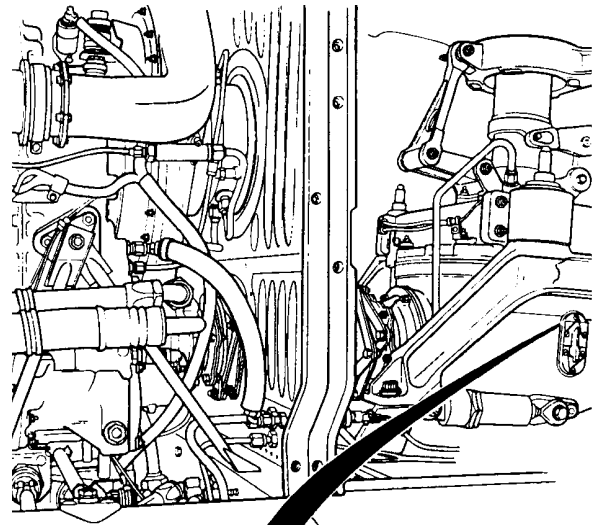
INSTALL

5. Using plastic scraper (B123), clean gasket (5) mating surfaces.
6. Align gasket (5) with screw holes on sight gage (1).
7. Install six washers (3) and six screws (2) in top and three bottom screw holes.
8. Tighten screws (2) fingertight.
9. Position OIL LEVEL plate (4) over remaining two screw holes and install remaining two washers (3) and screws (2).
10. Tighten all screws (2).
11. Secure three top screws (2) together and three bottom screws (2) together using lockwire (D132).

INSPECT

FOLLOW-ON MAINTENANCE

- Service transmission oil system (Task 1-4-8).
- Install forward fairing assembly (Task 2-2-47).



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J1567

END OF TASK

6-3-14. PYLON FITTINGS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B240)
Torque Wrench (B241)

Material:
Corrosion Preventive Compound (D82)

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

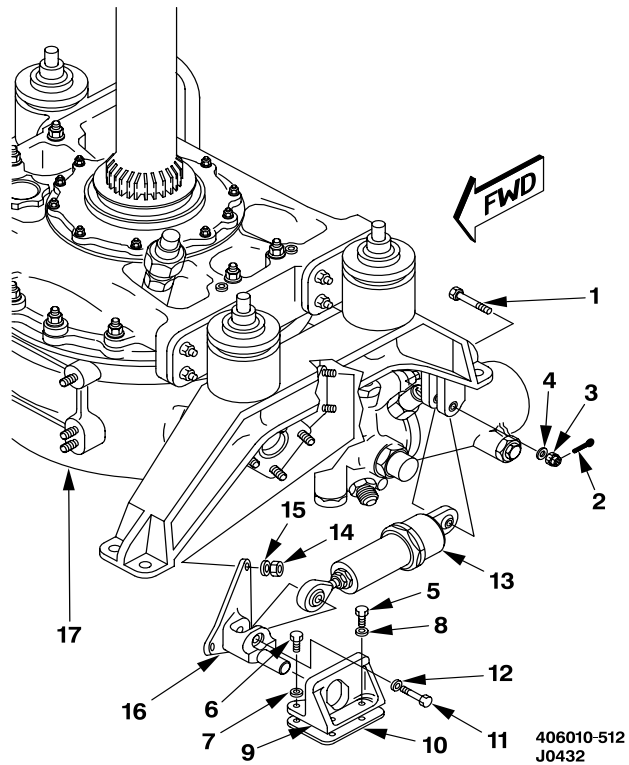
Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Transmission Oil Filter Manifold Removed (for
left side only) (Task 6-8-4)
Main Rotor Hub and Blade Assembly Removed
(Task 5-1-1)

REMOVE

NOTE

Removal procedures are the same for right and left pylon fittings.

1. Remove bolt (1) by removing cotter pin (2), nut (3), and washer (4).
2. Remove four bolts (5 and 6) with four washers (7 and 8) from pylon stop fitting (9).
3. Remove pylon stop fitting (9).
4. Temporarily install shim (10) on transmission deck by installing four bolts (5 and 6) and washers (7 and 8) handtight.
5. Remove bolt (11) and washer (12).
6. Remove spring assembly (13).
7. Remove three nuts (14) and three washers (15) from pylon spring fitting (16).
8. Remove pylon spring fitting (16) from transmission main case (17).



GO TO NEXT PAGE

6-3-14. PYLON FITTINGS — REMOVAL/INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of pylon spring fitting (16) is a characteristic critical to flight safety.

NOTE

Installation procedures are the same for right and left pylon fittings.

9. Install pylon spring fitting (16) with three washers (15) and three nuts (14). Torque nuts (14) **100 TO 140 INCH-POUNDS**.

10. Install forward end of spring assembly (13) in pylon spring fitting (16) by installing bolt (11) and washer (12).

11. Torque bolt (11) **70 TO 95 INCH-POUNDS**.

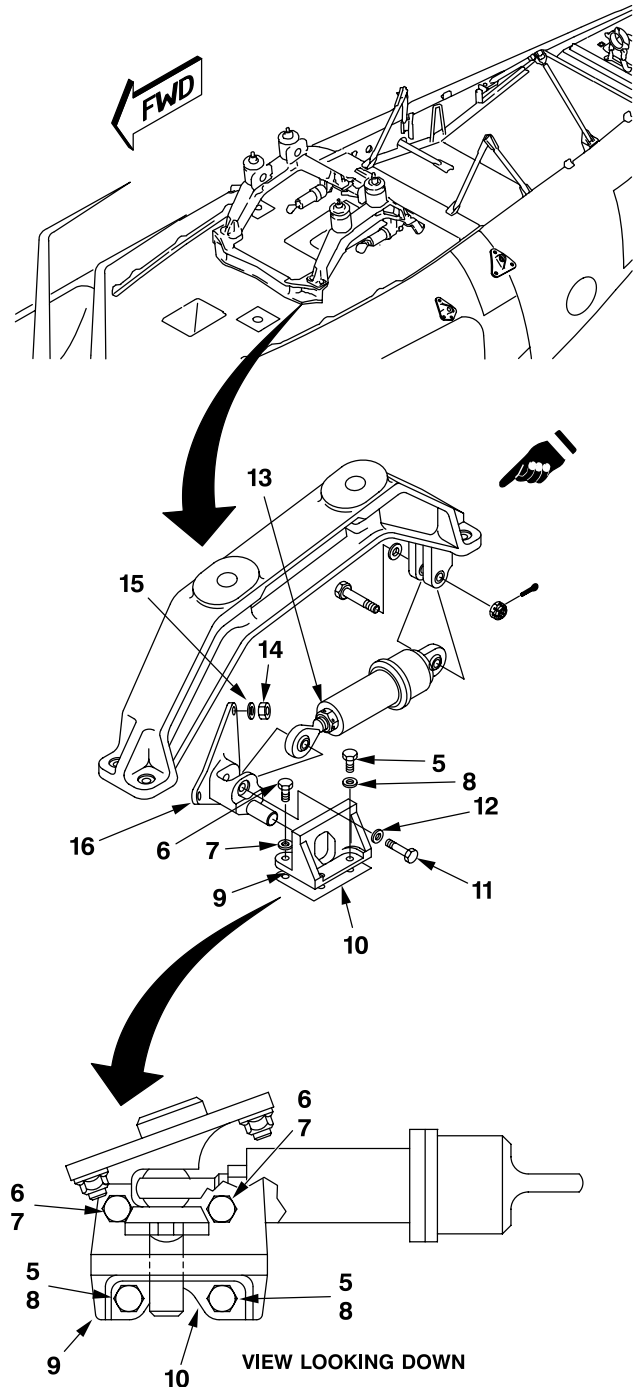
12. Remove temporarily installed bolts (5 and 6) and washers (7 and 8) holding shim (10) to transmission deck.

13. Position pylon stop fitting (9) over shim (10) on transmission deck.

14. Secure pylon stop fitting (9) and shim (10) with four bolts (5 and 6) and four washers (8 and 7).

15. Torque outboard bolts (5) **70 TO 95 INCH-POUNDS**.

16. Torque inboard bolts (6) **95 TO 110 INCH-POUNDS**.



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J1987

GO TO NEXT PAGE

6-3-14. PYLON FITTINGS — REMOVAL/INSTALLATION (CONT)

17. Place eye of spring assembly (13) in fitting on pylon beam assembly (17).

18. If adjustment is required and jamnut is loosened, torque jamnut **480 TO 696 INCH-POUNDS**.

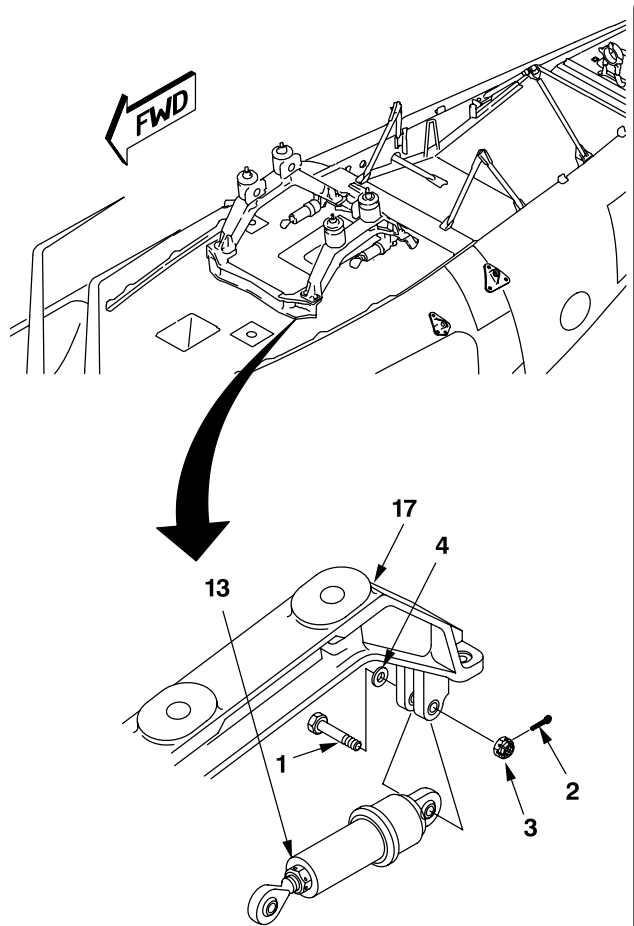
NOTE

- Bolthead must be installed on inboard side of beam.
- Self-locking castellated nuts are to be safetied with a cotter pin or lockwire. The nonmetallic insert is not the primary safetying feature of these nuts. Nuts shall be tested by attempting to insert a matching bolt by hand. Only those nuts that cannot be tightened down with fingers after the locking action engages bolt shall be reused.

19. Install washer (4) (under bolthead), bolt (1), and nut (3).

20. Torque nut (3) **160 TO 190 INCH-POUNDS**.

21. Install cotter pin (2) through nut (3).



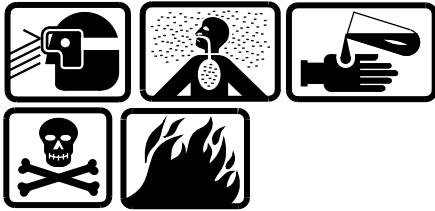
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J2820

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6-3-14. PYLON FITTINGS — REMOVAL/INSTALLATION (CONT)

22. Check for required gap of **0.015 to 0.025 inch** at center of pylon stop fitting (9) and restraint spring fitting (16).

23. Remove or replace shim (10) as needed to obtain required gap by performing removal and installation steps in this task.



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound (D82) shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals. Premature failure of bearings and seals may result.

24. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.

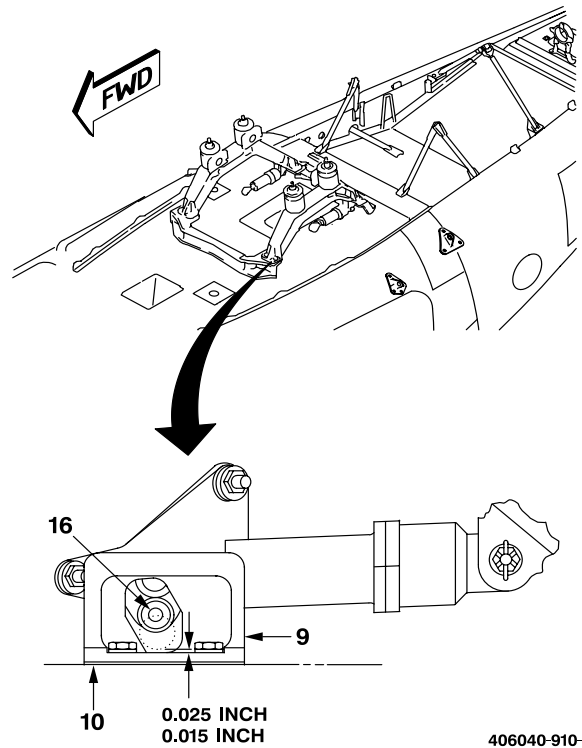
INSPECT

FOLLOW-ON MAINTENANCE

Install transmission oil filter manifold (Task 6-8-4).

■ Install forward fairing assembly (Task 2-2-47).

Install main rotor hub and blade assembly (Task 5-1-2)



406040-910-2
J0430

END OF TASK

6-3-15. PYLON FITTINGS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Acrylic Lacquer (D126)
Aliphatic Naphtha (D141)
Aluminum Oxide Abrasive Cloth (D44)
Corrosion Preventive Compound (D82)

Crocus Cloth (D90)
Paint Remover (D148)
Epoxy Primer Coating (D98)
Sandpaper (D175)
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

References:
TM 55-1500-345-23
TM 1-1520-266-23

CLEAN PYLON SPRING FITTING



Naphtha/Naphthalene, TT-N-97

- Using wiping rag (D164) dampened with aliphatic naphtha (D141), clean pylon spring fitting.
- Using clean wiping rag (D164), dry pylon spring fitting.



Paint Remover

- Using wiping rag (D164) dampened with paint remover (D148), remove paint and epoxy primer coating.

INSPECT PYLON SPRING FITTING

WARNING

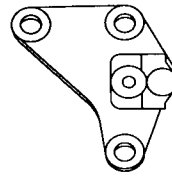
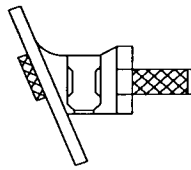
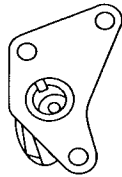
FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of pylon spring fitting is a characteristic critical to flight safety.

- Fluorescent penetrant inspect pylon spring fitting (TM 1-1520-266-23). No cracks allowed.
- Inspect pylon spring fitting to limits shown. Reject pylon spring fitting if limits are exceeded. See figure Pylon Spring Fitting — Damage Limits. If cracks in pylon spring fitting are suspected perform eddy current inspection (TM 1-1520-266-23).

GO TO NEXT PAGE

6-3-15. PYLON FITTINGS — CLEANING/INSPECTION/REPAIR (CONT)



**PYLON SPRING FITTING
(LEFT SHOWN-RIGHT OPPOSITE)**

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

CRACKS

None

None

MECHANICAL

0.005 in. before and after repair

0.020 in. before and after repair

CORROSION

0.005 in. before and after repair

0.010 in. before and after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

20% of surface area

20% of surface area

NUMBER OF REPAIRS

2 per segment

2 per segment

EDGE CHAMFER

0.020 in.

0.020 in.

**BORE DAMAGE:
MOUNTING BORES**

—

0.005 in. for 1/4 circumference

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J1567

Pylon Spring Fitting — Damage Limits

REPAIR PYLON SPRING FITTING

NOTE

Repair procedures are the same for right and left pylon spring fitting.



Sanding Operations

6. Using 400 grit sandpaper (D175), remove damage to pylon spring fitting.

7. Using crocus cloth (D90), blend repaired area into surrounding area.

8. Using wiping rag (D164) dampened with aliphatic naphtha (D141), clean pylon spring fitting.

9. Using clean wiping rag (D164), dry pylon spring fitting.

10. Apply single mist coat of epoxy primer coating (D98) to all surfaces and holes of pylon spring fitting (TM 55-1500-345-23).

11. Apply two coats of acrylic lacquer (D126) to all surfaces and holes of pylon spring fitting (TM 55-1500-345-23).

GO TO NEXT PAGE

6-3-15. PYLON FITTINGS — CLEANING/INSPECTION/REPAIR (CONT)



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound (D82) shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals. Premature failure of bearings and seals may result.

12. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.

INSPECT

CLEAN PYLON STOP FITTING



Naphtha/Naphthalene, TT-N-97

13. Using wiping rag (D164) dampened with aliphatic naphtha (D141), clean pylon stop fitting.

14. Using clean wiping rag (D164), dry pylon stop fitting.

15. Using wiping rag (D164) dampened with paint remover (D148), remove paint and polyamide epoxy primer.

INSPECT PYLON STOP FITTING

16. Fluorescent penetrant inspect pylon stop fitting (TM 1-1520-266-23). No cracks allowed.

17. Inspect pylon stop fitting to limits shown. Reject pylon stop fitting if limits are exceeded. See figure Pylon Stop Fitting — Damage Limits. If cracks in pylon stop fitting are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR PYLON STOP FITTING

NOTE

Repair procedures are the same for right and left pylon stop fitting.



Sanding Operations

18. Using 240 grit abrasive cloth (D44), remove damage to pylon stop fitting.

19. Using 240 grit abrasive cloth (D44), blend repaired area into surrounding area.



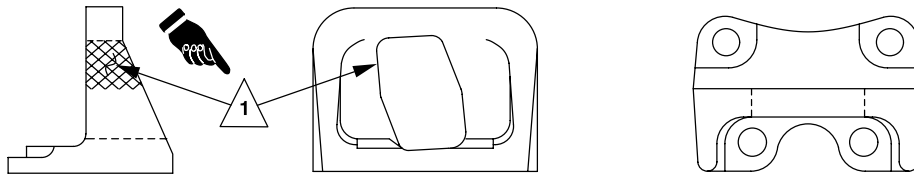
Naphtha/Naphthalene, TT-N-97

20. Using wiping rag (D164) dampened with aliphatic naphtha (D140), clean pylon stop fitting.

21. Using clean wiping rag (D164), dry pylon stop fitting.

GO TO NEXT PAGE

6-3-15. PYLON FITTINGS — CLEANING/INSPECTION/REPAIR (CONT)



**PYLON STOP FITTING
(LEFT SHOWN-RIGHT OPPOSITE)**

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

CRACKS

None

None

MECHANICAL

None

0.010 in. before and after repair

CORROSION

None

0.005 in. before and 0.010 in. after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

—

20% of surface area

NUMBER OF REPAIRS

—

2 per segment

EDGE CHAMFER

0.030 in.

0.030 in.

BORE DAMAGE: MOUNTING BORES

—

0.005 in. for 1/4 circumference



1 THROUGH AREA

406040-913-2
J1567

Pylon Stop Fitting — Damage Limits

22. Apply single mist coat of polyamide epoxy primer (D98) to all surfaces and holes of pylon stop fitting (TM 55-1500-345-23).

23. Apply two coats of acrylic lacquer (D126) to all surfaces and holes of pylon stop fitting (TM 55-1500-345-23).

CAUTION

Corrosion preventive compound (D82) shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals. Premature failure of bearings and seals may result.

24. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.



Corrosion Preventive Compound

INSPECT

END OF TASK

6-3-16. NR SENSOR (OH-58D(R)) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
OH-58D(R)

Tools:

General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)

Material:

Lockwire (D132)
Lubricant (D139)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:

TM 1-1520-248-10/CL

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Air Induction Cowling Removed
(Task 4-2-2)

REMOVE

1. Remove electrical connector (1) from sensor (2).
2. Cut lockwire and remove sensor (2) from transmission case (3).
3. Remove and discard packing (4).
4. Discard unserviceable sensor (2).

INSPECT

5. Inspect sensor (2) (Task 6-3-17).

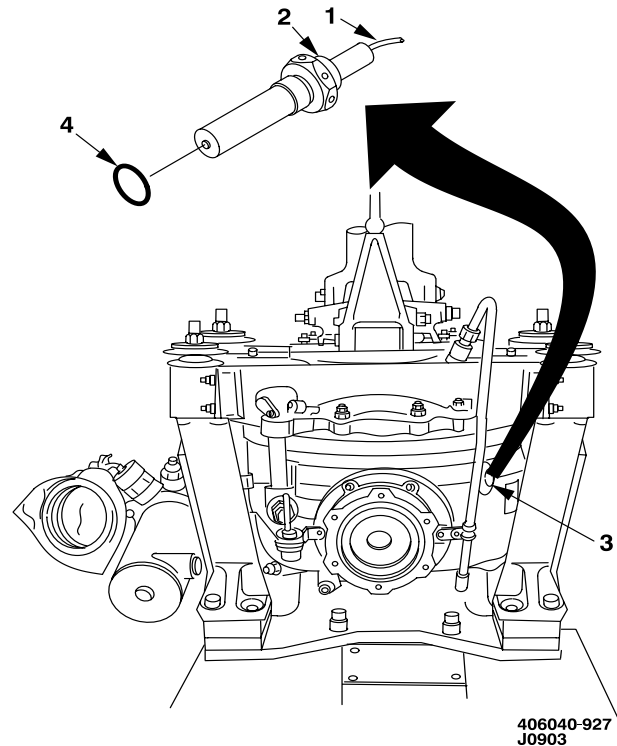
INSTALL



Lubricating Oil

6. Lubricate new packing (4) with lubricant (D139) and install packing on sensor (2).
7. Install serviceable sensor (2) in transmission case (3).
8. Torque sensor (2) **75 TO 125 INCH-POUNDS**.
9. Secure sensor (2) with lockwire (D132).
10. Connect electrical connector (1).

INSPECT



FOLLOW-ON MAINTENANCE

Install air induction cowling (Task 4-2-4).

Pilot perform MOC (TM 1-1520-248-10/CL).

END OF TASK

6-3-17. NR SENSOR (OH-58D(R)) — CLEANING/INSPECTION

This task covers: Cleaning and Inspection (Off Helicopter)

INITIAL SETUP

Material:
Low-Lint Cleaning Cloth (D67)

Applicable Configurations:
OH-58D(R)

Personnel Required:
68F Aircraft Electrician

Tools:
Electrical Repairer Tool Kit (B177)
Multimeter (B98)

Equipment Condition:
Nr Sensor Removed (Task 6-3-16)

CLEAN

1. Using clean low-lint cleaning cloth (D67), wipe oil and dirt residue from sensor, paying particular attention to sensor tip.

INSPECT

2. Visually inspect for loose material or visible corrosion that can cause blisters or pitting. None allowed.

3. Using 10X magnifying glass, inspect sensor tip for any cracks, distortion, or wear that may indicate contact with transmission gear teeth. None allowed.

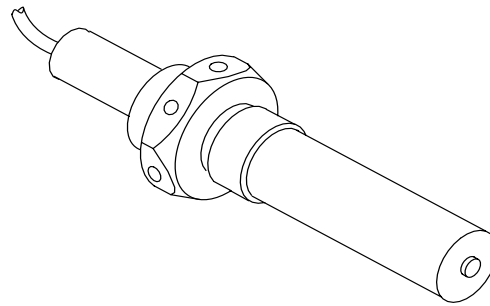
4. Inspect electrical connection and associated wiring for chafing, cut, or broken condition.

NOTE

- If Nr sensor fails to meet any of the above inspection criteria, sensor shall be replaced.
- Prior to installing new Nr sensor, sensor resistance shall be checked using the following step.

5. Using multimeter (B98) check sensor for resistance from pin 1 to 2 and from pin 3 to 4. Acceptable range: 200 - 600 ohms.

6. No repair authorized.



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J0904

END OF TASK

Section IV. STANDPIPE ELECTRICAL ASSEMBLY, TORQUEMETER SYSTEM, AND MAIN ROTOR MAST ASSEMBLY

6-12.

**STANDPIPE ELECTRICAL
ASSEMBLY, TORQUEMETER
SYSTEM, AND MAIN ROTOR
MAST ASSEMBLY**

installation of standpipe electrical assembly, torquemeter system and main rotor mast assembly components. Standard torques are provided in Appendix P and TM 1-1500-204-23.

6-13. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and

6-14. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Standpipe Electrical Assembly — Removal	6-4-1	6-96
Standpipe and Ground Cable Assembly — Cleaning/Inspection/Repair	6-4-2	6-102
Standpipe Electrical Assembly — Installation	6-4-3	6-105
Standpipe Electrical Assembly Electrical Connector — Replacement	6-4-4	6-110
Torque-meter Support and Bearing Assembly — Removal	6-4-5	6-112
Torque-meter Support Bearing Seal — Removal/Installation	6-4-6	6-115
Torque-meter Support Bearing (AVIM) — Removal/Installation	6-4-7	6-116
Torque-meter Support and Bearing Assembly Components (AVIM) — Cleaning/Inspection/Repair	6-4-8	6-122
Torque-meter Temperature Bulb — Removal/Installation	6-4-9	6-132
Torque Transducer — Removal/Installation	6-4-10	6-134
Torque-meter Support and Bearing Assembly — Installation	6-4-11	6-137
Torque-meter System Antibacklash Adapter Assembly — Removal	6-4-12	6-141
Antibacklash Adapter Assembly Components — Cleaning/Inspection/Repair	6-4-13	6-143
Torque-meter System Antibacklash Adapter Assembly — Installation	6-4-14	6-151
Main Rotor Mast Assembly — Removal	6-4-15	6-153
Main Rotor Mast Assembly (AVIM) — Disassembly	6-4-16	6-155
Main Rotor Mast Assembly Components (AVIM) — Cleaning/Inspection/Repair	6-4-17	6-160
Main Rotor Mast Assembly — Cleaning/Inspection	6-4-18	6-175
Main Rotor Mast Assembly (AVIM) — Assembly	6-4-19	6-177
Main Rotor Mast Assembly — Installation	6-4-20	6-184

6-4-1. STANDPIPE ELECTRICAL ASSEMBLY — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Electrical Repairer Tool Kit (B177)
Maintenance Stand (B162)
Preload Tool (B198)
Jackscrew Set (B129)
■ Torque Wrench (B239)
Plastic Scraper (B123)

Material:

Electrical Tape (D214)

Personnel Required:

68N Avionic Mechanic
67S Scout Helicopter Repairer (2)

References:

TM 9-1240-778-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Mast Mounted Sight Removed
(TM 9-1240-778-23)
Transmission Oil Drained (Task 1-4-7)

GO TO NEXT PAGE

6-4-1. STANDPIPE ELECTRICAL ASSEMBLY — REMOVAL (CONT)

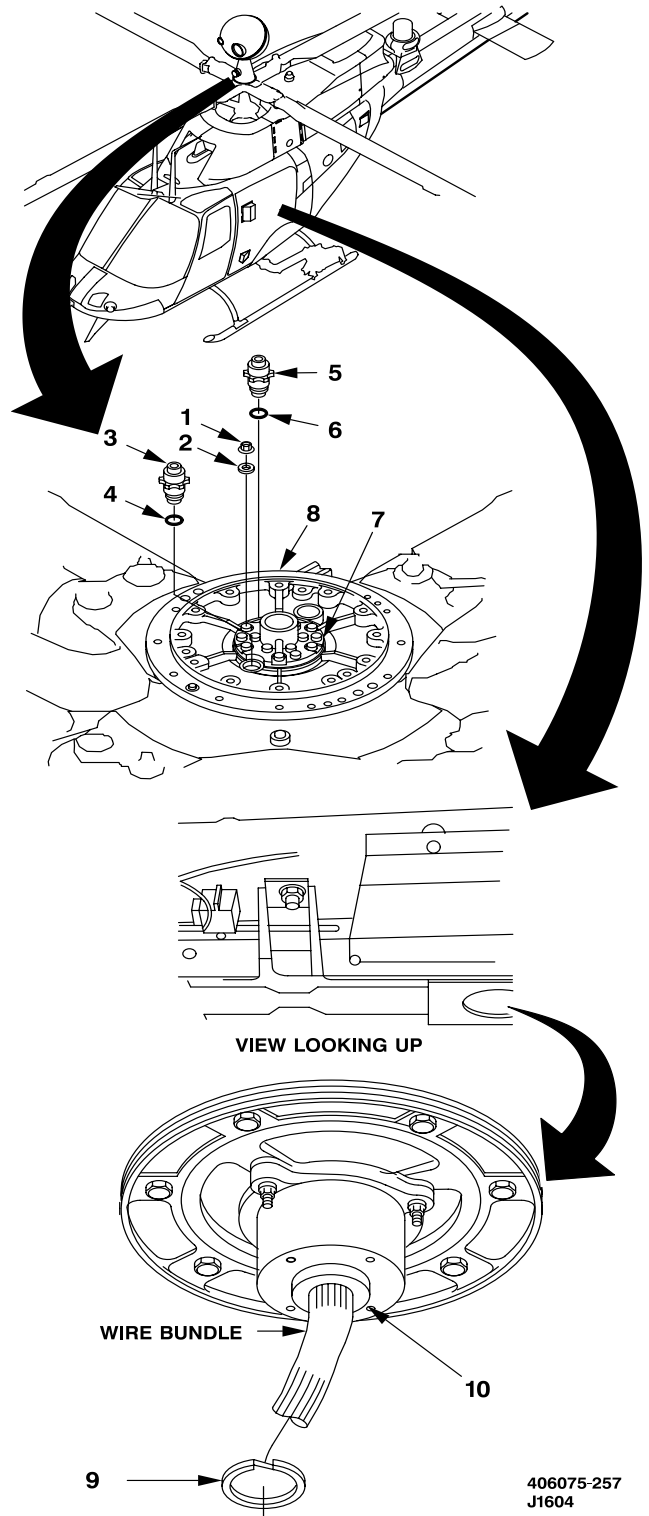
CAUTION

Lubricating oil shall be drained from transmission (Task 1-4-7) and black boxes in avionics compartment covered with plastic sheet prior to removal of standpipe.

NOTE

Transducers shall be marked for proper location during installation.

1. Remove six nuts (1) and six washers (2).
2. From top of main rotor mast, remove lockwire and remove transducer (3) with packing (4). Discard packing.
3. Remove lockwire and remove transducer (5) with packing (6). Discard packing.
4. Remove sealant from adapter (7) and support assembly (8) using plastic scraper (B123).
5. From inside forward avionics compartment remove retainer ring (9) from bottom of standpipe (10).



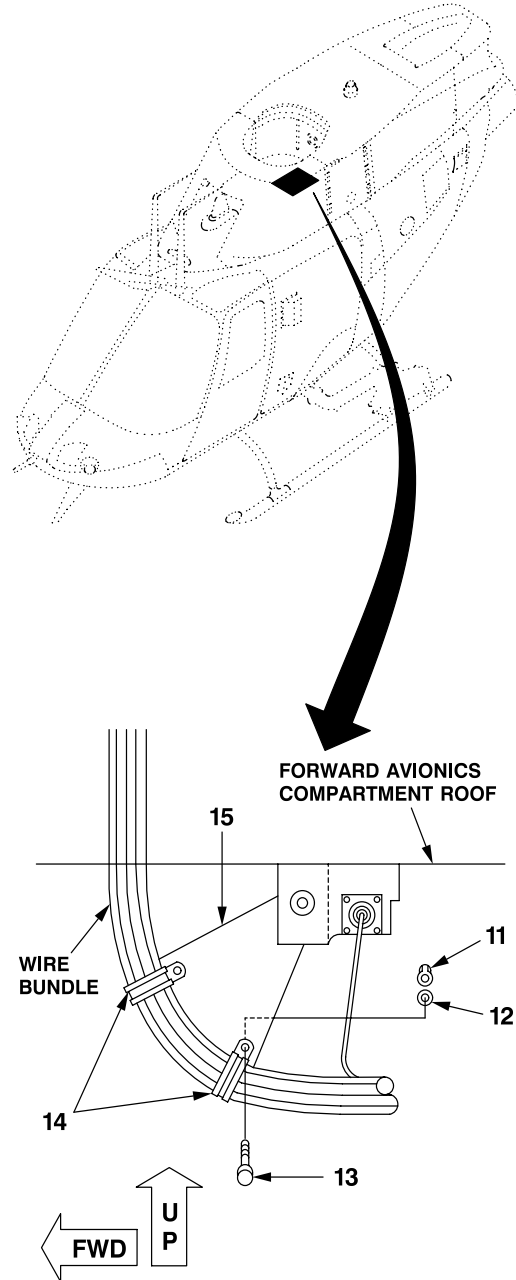
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J1604

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6-4-1. STANDPIPE ELECTRICAL ASSEMBLY — REMOVAL (CONT)

6. Working from inside forward avionics compartment, remove nuts (11), washers (12), and bolts (13) securing clamps (14) to bracket (15).

7. Remove clamps (14) from wire bundle.



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J1604

GO TO NEXT PAGE

6-4-1. STANDPIPE ELECTRICAL ASSEMBLY — REMOVAL (CONT)

CAUTION

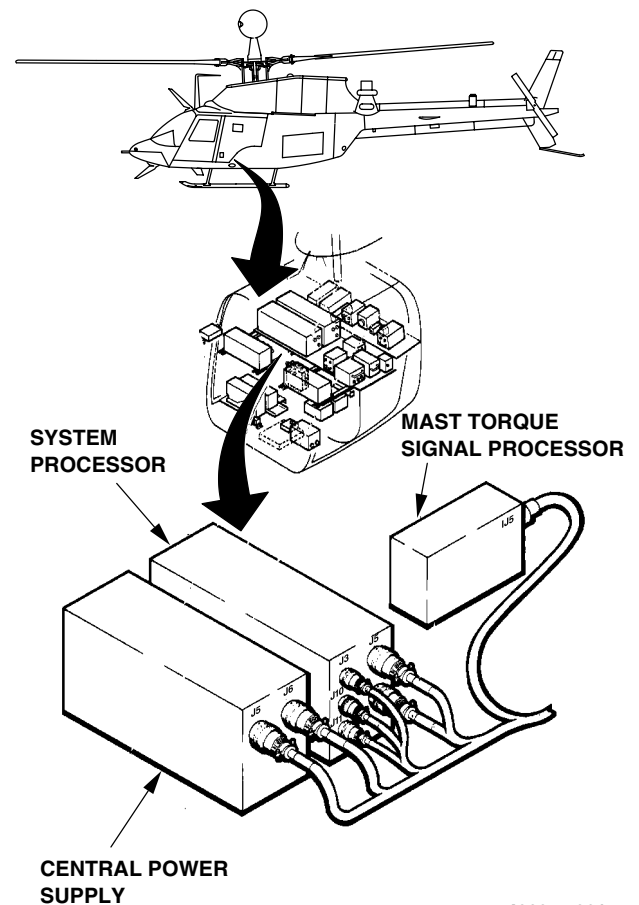
All electrical connectors shall be marked prior to removal. Damage may result if connections are reversed during reinstallation.

8. From inside forward avionics compartment, disconnect electrical cable connectors from system processor junctions J4, J5, J9, J10, and J11, and disconnect ground strap from wire bundle to airframe ground in accordance with TM 9-1240-778-23.

9. Disconnect electrical cable connectors from central power supply junctions J5 and J6.

10. Disconnect electrical cable connector from mast torque signal processor junction J5.

11. Remove ties from cable assemblies to allow nesting of connectors within wire bundle. Wrap electrical leads with slick electrical tape (D214) to allow leads to slip through mast.



406075-331
J1604

GO TO NEXT PAGE

6-4-1. STANDPIPE ELECTRICAL ASSEMBLY — REMOVAL (CONT)

12. Insert three jackscrews (16) into adapter (7).

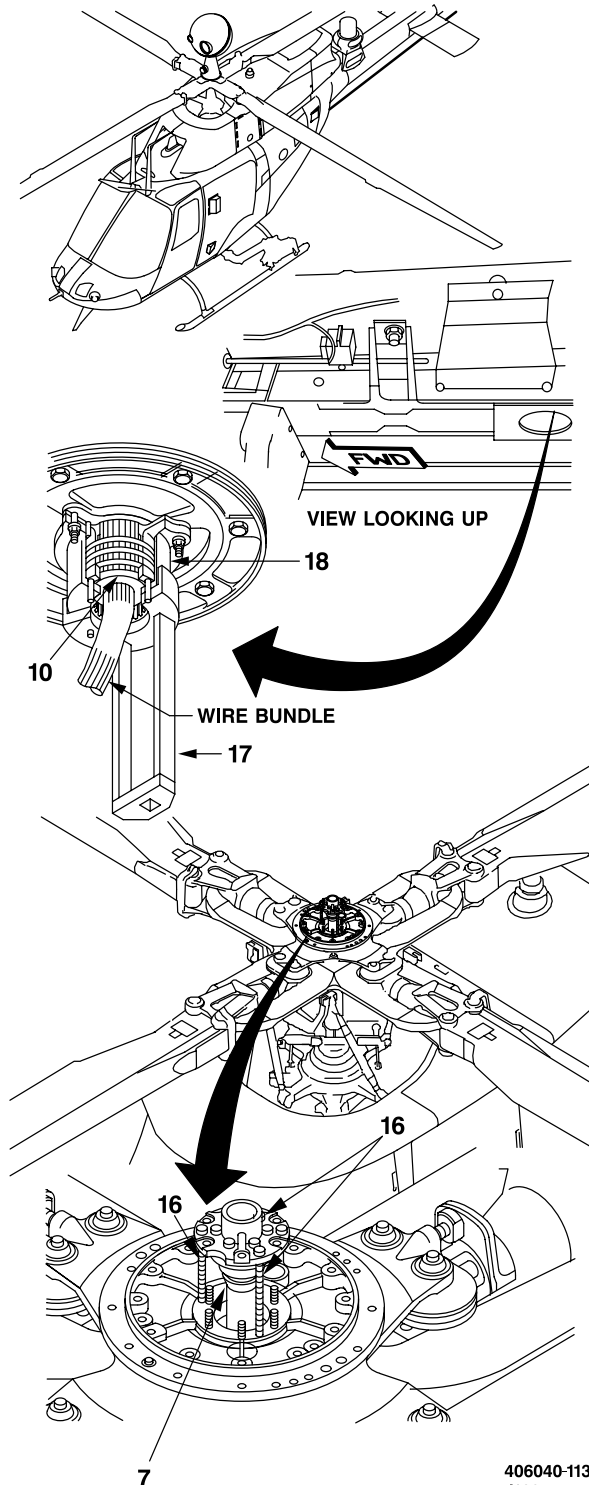
13. Release preload on standpipe (10) by inserting preload tool (17) into sleeve (18) through access hole in forward avionics compartment roof.

NOTE

- Sleeve is torqued in a counterclockwise direction while looking up.
- Only enough torque to overcome preload shall be applied.

14. Torque sleeve (18) **130 TO 150 INCH-POUNDS**.

15. While holding preload torque on sleeve (18), turn jackscrews (16) evenly to pull standpipe up until standpipe splines disengage from the sleeve (18), then release the torsional preload on sleeve (18).



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J1604

GO TO NEXT PAGE

6-4-1. STANDPIPE ELECTRICAL ASSEMBLY — REMOVAL (CONT)

16. Remove three jackscrews (16) from adapter (7).

CAUTION

Extreme care must be used when removing standpipe. Damage to wire bundles, electrical connectors, and interior of mast can result if standpipe is forced out.

17. Remove standpipe (10) and place on suitable surface. Discard packings (19 and 20).

18. Remove lockwire from bolts (21) and screws (22).

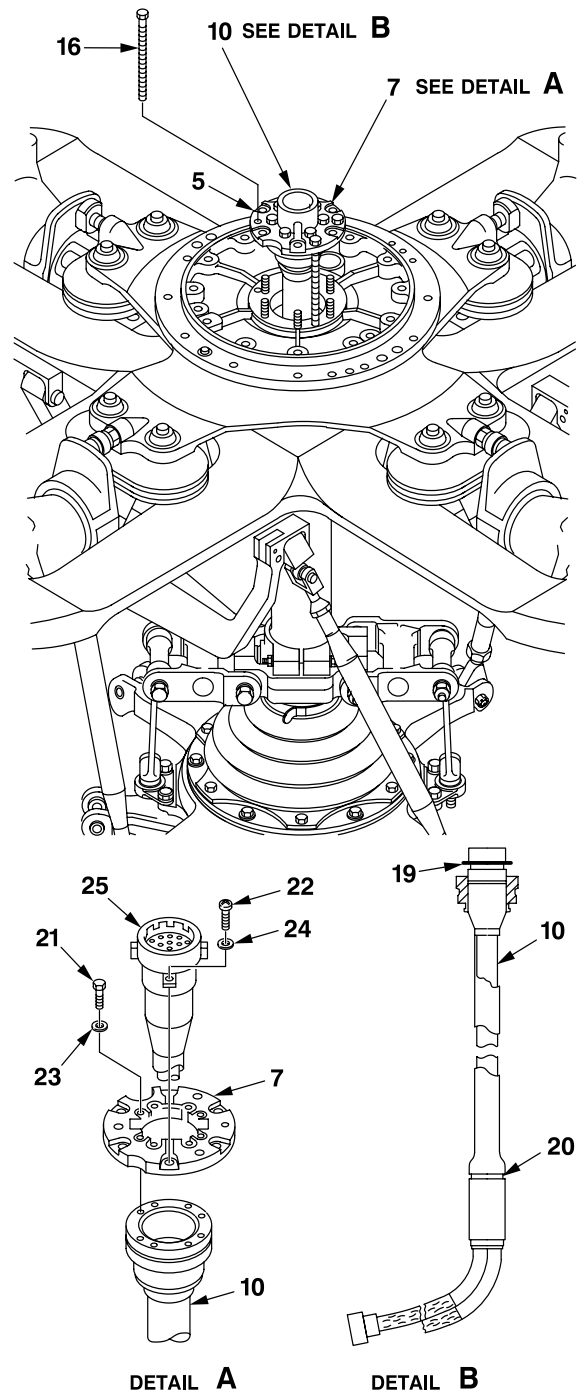
19. Remove eight bolts (21) and eight washers (23) from adapter (7) and standpipe (10).

20. Remove sealant from adapter (7) and standpipe (10) using plastic scraper (B123).

21. Remove two screws (22), two washers (24) connecting electrical connector (25) to adapter (7).

22. Turn adapter (7) 90° so ears on electrical connector (25) will align with slots in adapter (7).

23. Remove adapter (7).



406040-319
J2110

END OF TASK

6-4-2. STANDPIPE AND GROUND CABLE ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning/Inspection/Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

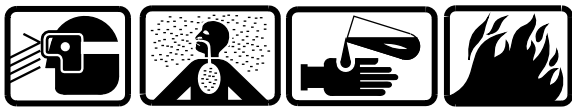
Tools:
Fine India Stone (B163)

Material:
Wiping Rag (D164)
Rubber Gloves (D111)

Solid Film Lubricant (D136)
Drycleaning Solvent (D199)
Aluminum Oxide Abrasive Cloth (D44)
LHE Cadmium Solution (D129)
Corrosion Preventive Oil (D86)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

CLEAN

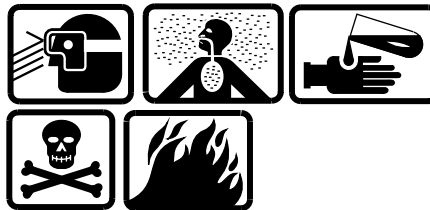


Drycleaning Solvent

1. Clean standpipe with wiping rag (D164) dampened with drycleaning solvent (D199).
2. Rinse standpipe with drycleaning solvent (D199).
3. Dry standpipe with clean wiping rag (D164).

INSPECT

4. If jumper weld is broken, loose or corroded, or if the insulated sleeve is damaged, replace standpipe.
5. Corrosion or damage to the packing grooves is not permitted.
6. Inspect standpipe to limits shown. Reject standpipe if limits are exceeded. See figure Standpipe and Ground Cable Assembly — Damage Limits.



Corrosion Preventive Compound

7. If inspection is not performed within 24 hours of cleaning, apply corrosion preventive oil (D86) to standpipe.

REPAIR



Sanding Operations

8. Use 240 grit abrasive cloth (D44) or a fine India stone (B163) to polish or blend damage. Repairs must have a 32 RMS surface finish and a minimum radius of **0.50 inch**.
9. To remove mechanical damage or corrosion to splines or threads, dress with fine India stone (B163) to blend.

INSPECT

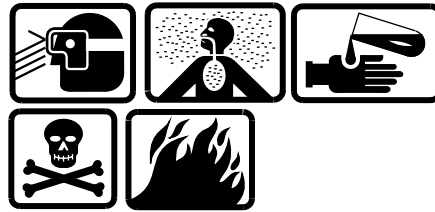
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6-4-2. STANDPIPE AND GROUND CABLE ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



LHE Cadmium Solution

10. Treat repairs in all areas with cadmium plating solution (D129).



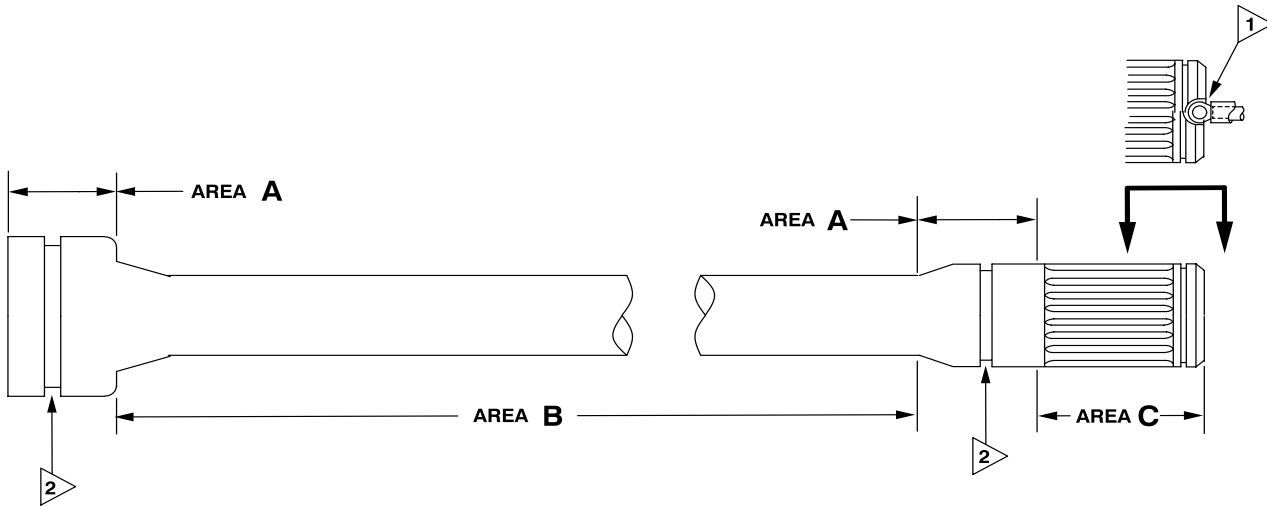
Lubricant

11. Treat repairs in spline area with solid film lubricant (D136) after brush cadmium plate (D129).

INSPECT

GO TO NEXT PAGE

6-4-2. STANDPIPE AND GROUND CABLE ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



STANDPIPE AND GROUND CABLE ASSEMBLY

TYPE OF DAMAGE	AREA A	AREA B	AREA C
	MAXIMUM DAMAGE AND REPAIR DEPTH		
MECHANICAL DAMAGE	0.020 in. after repair	0.005 in. after repair	
CORROSION	0.020 in. after repair	0.005 in. after repair	
MAXIMUM AREA PER FULL DEPTH REPAIR	0.5 sq. in.	0.5 sq. in.	
NUMBER OF REPAIRS	2	1	
SPLINES			
DEPTH:			Not to exceed 0.002 in. after clean up
LENGTH:			Not to exceed 1/3 the length of any 2 spline teeth.

NOTES:

- 1 If ground cable assembly weld is broken, loose or corroded, or if the insulated sleeve is damaged, the standpipe must be returned to BHTI for repair.
- 2 Corrosion or damage to the packing grooves is not permitted.

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Standpipe and Ground Cable Assembly — Damage Limits

END OF TASK

 6-4-3. STANDPIPE ELECTRICAL ASSEMBLY — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
 Electrical Repairer Tool Kit (B177)
 Maintenance Stand (B162)
 Preload Tool (B198)
 Torque Wrench (B240)
 ■ Torque Wrench (B237)

Material:

Lockwire (D131)
 Lockwire (D133)

Electrical Tape (D214)
 Sealing Compound (D184)

Personnel Required:

68N Avionic Mechanic
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer (2)

References:

TM 1-1520-248-T
 TM 9-1240-778-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)

1. Position adapter (1) onto electrical connector (2) by aligning slots in adapter (1) with ears on electrical connector (2).

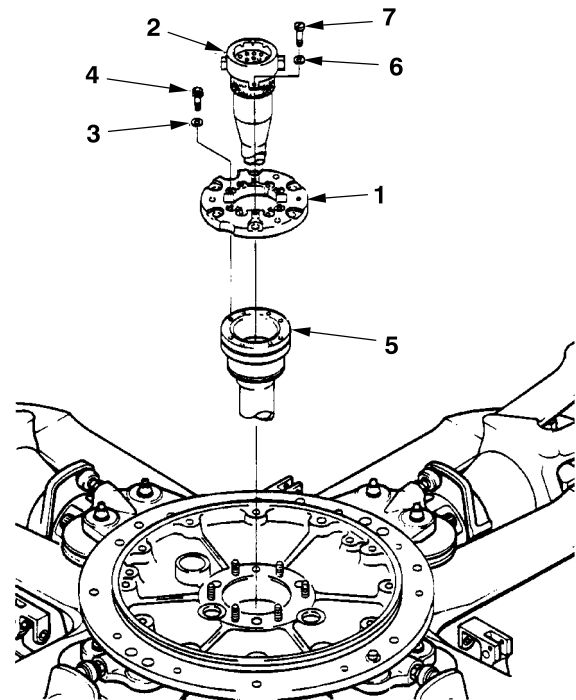
2. Turn adapter (1) 90° (clockwise or counterclockwise) to align forward side of adapter (1) with forward side of electrical connector (2).

3. Install eight washers (3) and eight bolts (4) in adapter (1) and standpipe (5).

4. Torque bolts (4) **60 TO 70 INCH-POUNDS**.

5. Secure bolts (4) with lockwire (D131) in pairs.

6. Attach electrical connector (2) to adapter (1) with two washers (6) and two screws (7).



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6-4-3. STANDPIPE ELECTRICAL ASSEMBLY — INSTALLATION (CONT)

7. Nest connectors (8) within wire bundle (9) and wrap with electrical tape (D214) to allow wire bundle (9) to fit into mast (10).

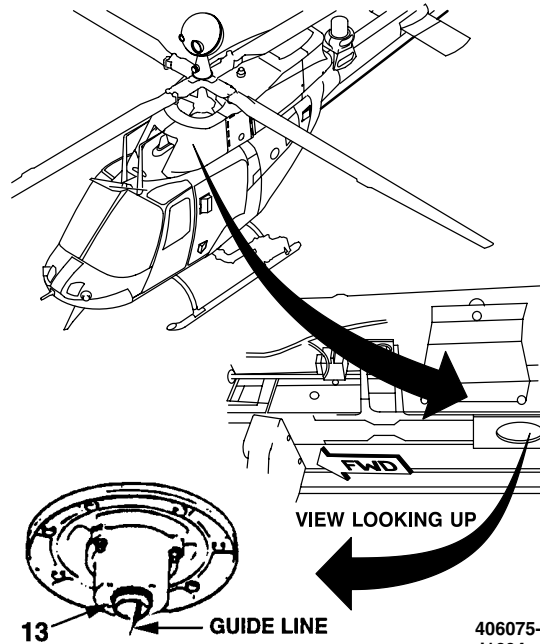
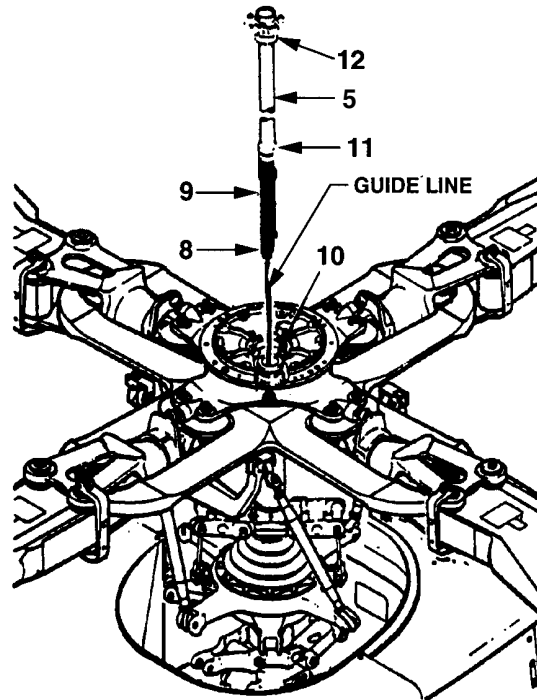
8. On standpipe (5) install new packings (11 and 12).

9. From inside forward avionics compartment, push guide line (lockwire D133) up from bottom of mast (10) and attach to electrical connectors (8).

NOTE

Standpipe has master spline which shall be oriented directly forward.

10. Using guide lines, gently pull standpipe (5) wire bundle (9), and electrical connectors (8) through mast (10) until standpipe (5) contacts splines on sleeve (13).



GO TO NEXT PAGE

6-4-3. STANDPIPE ELECTRICAL ASSEMBLY — INSTALLATION (CONT)

11. Insert preload tool (B198) (14) in forward avionics compartment roof.

12. Align splines on standpipe (5) with splines on sleeve (13) by torquing sleeve **130 TO 150 INCH-POUNDS** counterclockwise as viewed looking up.

13. Using hand pressure, seat standpipe (5) in mast (10) and through sleeve (13).

14. Remove preload tool (14) from sleeve (13).

15. Install retainer ring (15) in groove on bottom end of standpipe (5).

16. Remove electrical tape and guide line from electrical connectors (8).

17. Secure adapter (1) to torquemeter support (16) with six washers (17) and six nuts (18).

18. Torque nuts (18) **75 TO 95 INCH-POUNDS**.

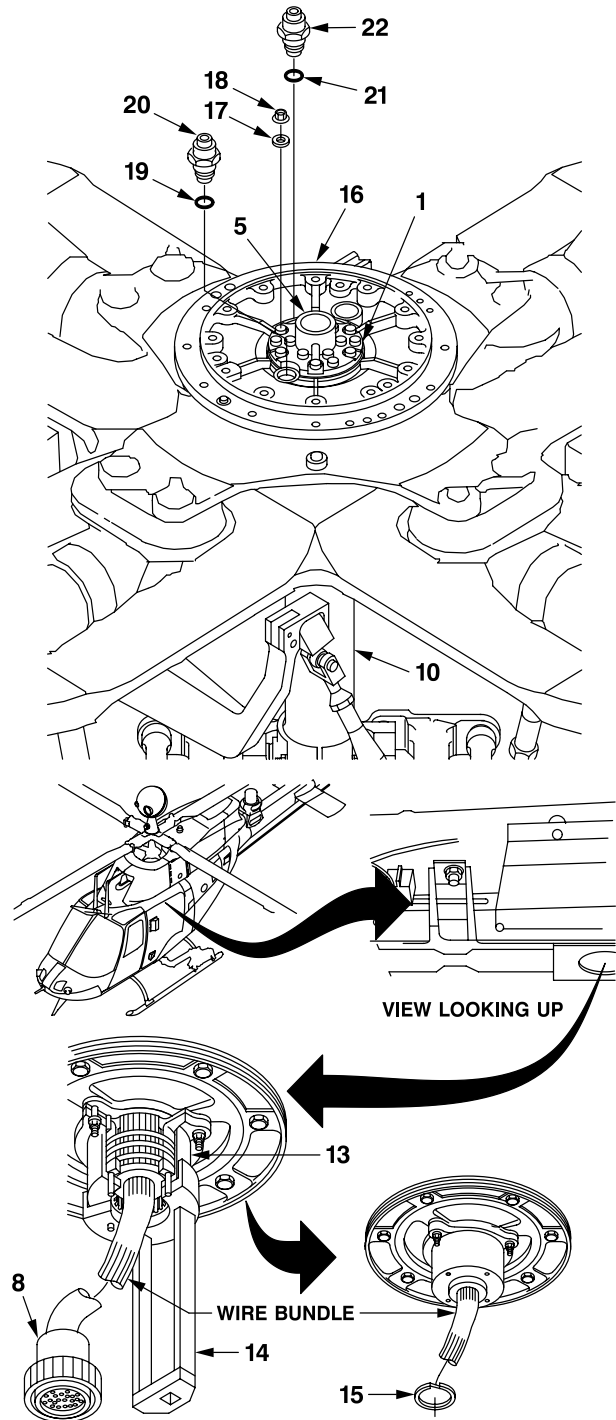
19. Install packing (19) on transducer (20) and install transducer on torquemeter support (16).

20. Torque transducer (20) **80 TO 100 INCH-POUNDS**.

21. Install packing (21) on transducer (22) and install transducer on torquemeter support (16).

22. Torque transducer (22) **80 TO 100 INCH-POUNDS**.

23. Apply bead of sealing compound (D184) to outside mating surface of adapter (1), standpipe (5), and torquemeter support (16).



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6-4-3. STANDPIPE ELECTRICAL ASSEMBLY — INSTALLATION (CONT)

24. Secure transducers (20 and 22), screws (7), and bolts (4) with lockwire (D131).

CAUTION

Equipment damage may result if electrical connections are made incorrectly.

NOTE

Prior to removal, electrical connectors and grounding strap were marked (identified) (Task 6-4-1) to aid in installation process.

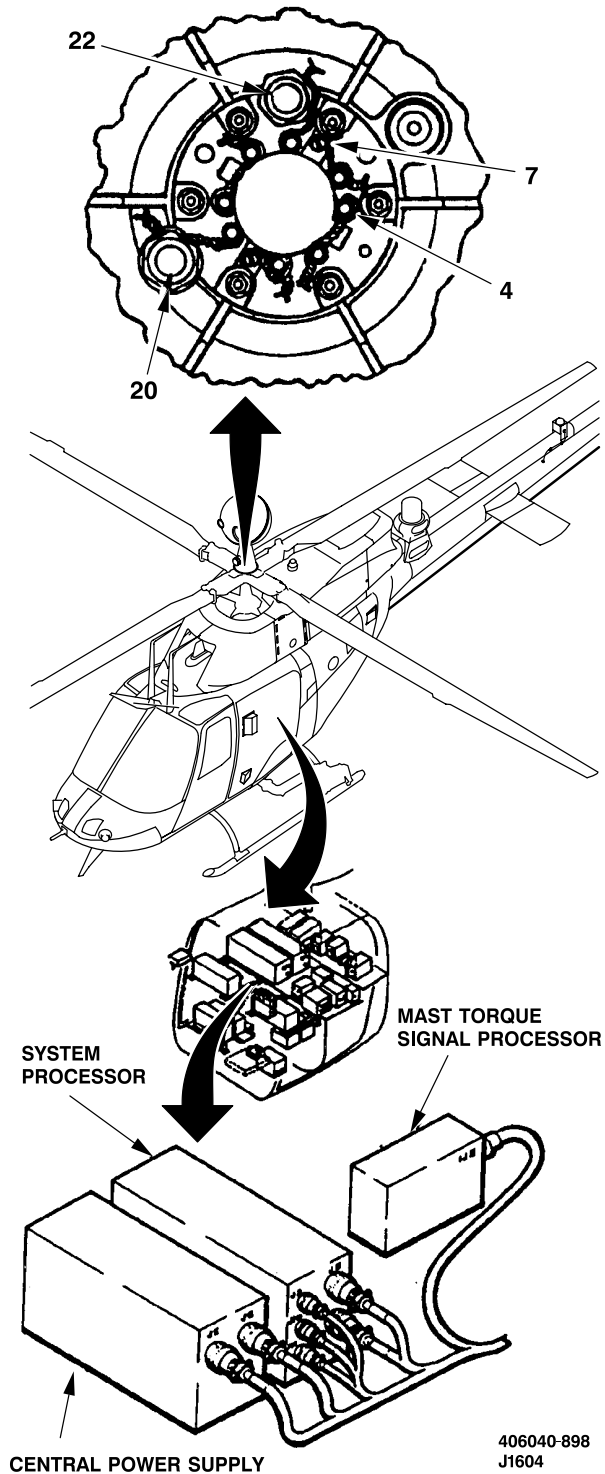
25. Working from inside forward avionics compartment, connect electrical cable connectors to system processor connectors J4, J5, J9, J10, and J11.

26. Connect electrical cable connectors to central power supply connectors J5 and J6.

27. Connect electrical cable connector to mast torque signal processor connector J5.

28. Prepare grounding strap mating surfaces for Class R-1 electrical bond (Appendix M).

29. Connect ground strap from wire bundle to airframe ground.



GO TO NEXT PAGE

6-4-3. STANDPIPE ELECTRICAL ASSEMBLY — INSTALLATION (CONT)

CAUTION

Failure to center wire bundle and allow slack for transmission movement may result in equipment damage.

30. Center wire bundle in opening of forward avionics compartment roof and ensure wire bundle has a service loop (slack) that will allow for transmission movement of **0.4 to 0.7 inch**.

31. Install clamps (23) on wire bundle.

32. Secure clamps (23) to bracket (24) by installing bolts (25), washers (26), and nuts (27).

33. After clamping, ensure conditions in step 29. still exist. Correct as required.

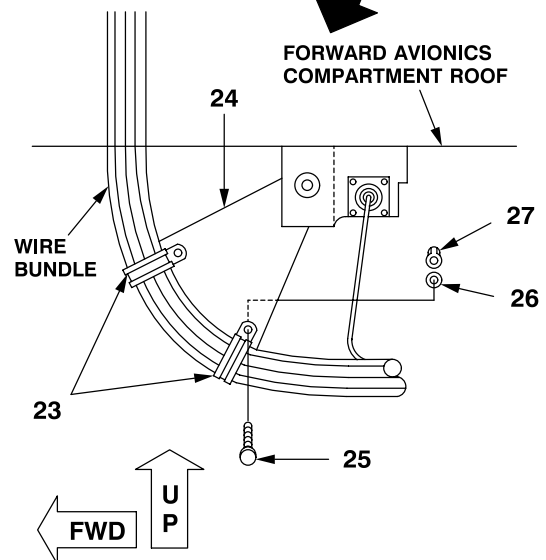
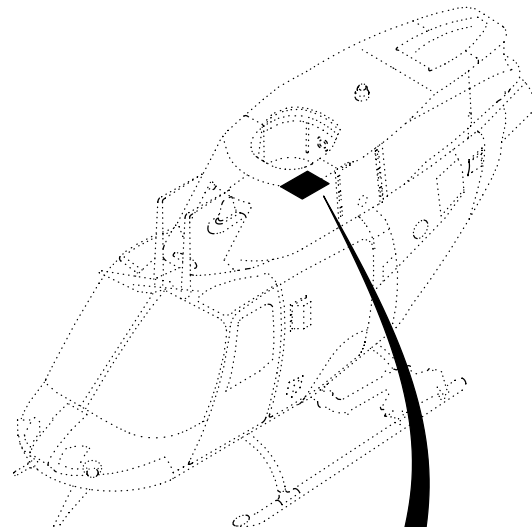
34. Inspect all wires, cables, and wire bundles for chafing condition. Correct as required.

INSPECT**FOLLOW-ON MAINTENANCE**

Install mast mounted sight (TM 9-1240-778-23).

Service transmission (Task 1-4-8).

Perform mast torque system calibration (TM 1-1520-248-T).



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END OF TASK

6-4-4. STANDPIPE ELECTRICAL ASSEMBLY ELECTRICAL CONNECTOR — REPLACEMENT

This task covers: Replacement (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Personnel Required:
68N Avionic Mechanic
67S Scout Helicopter Technical Inspector (TI)

References:
TM 1-1520-248-T
TM 55-1500-323-24

Equipment Condition:
Helicopter Safed (Task 1-6-7)

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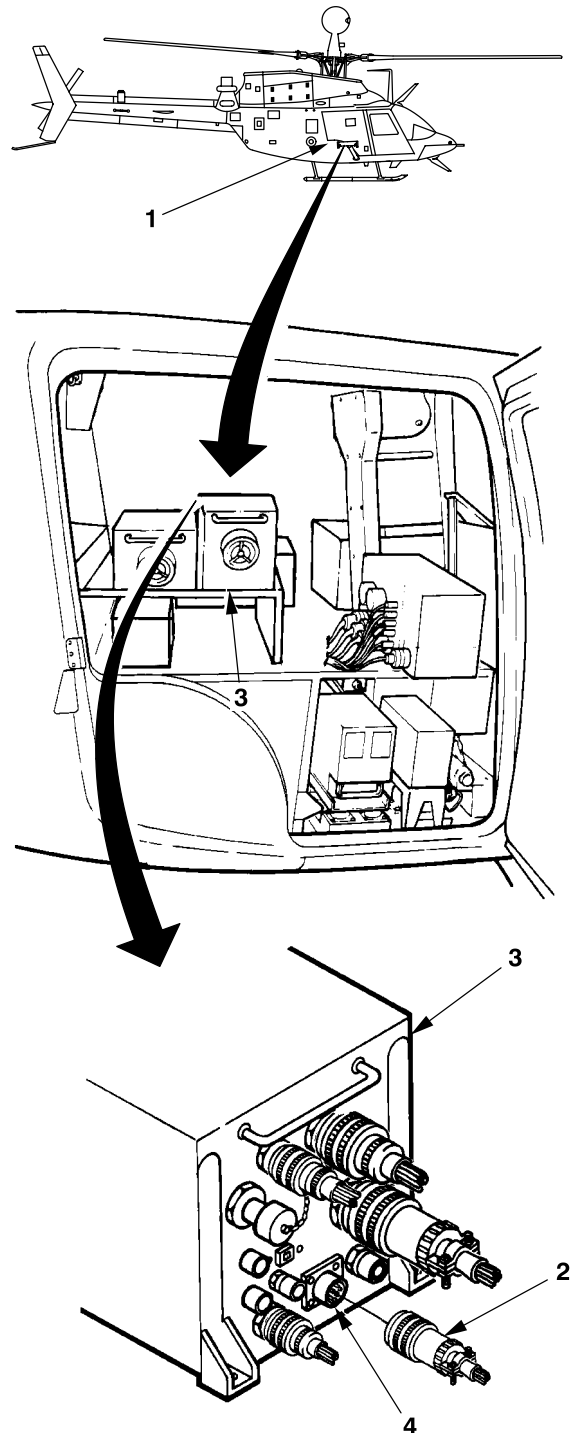
6-4-4. STANDPIPE ELECTRICAL ASSEMBLY ELECTRICAL CONNECTOR — REPLACEMENT (CONT)

1. Open right access door (1) to gain access to forward avionics compartment.
2. Remove electrical connector (2) from mast mounted sight power supply (3).
3. Replace connector in accordance with TM 55-1500-323-24.
4. Connect mating electrical connector (2) to connector (4) on mast mounted sight power supply (3).

INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check of mast mounted sight (TM 1-1520-248-T).



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END OF TASK

6-4-5. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer (2)

Applicable Configurations:
All

References:
TM 9-1240-778-23

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Plastic Scraper (B123)
Jackscrew Set (B129)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Mast Mounted Sight Removed
(TM 9-1240-778-23)

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6-4-5. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — REMOVAL (CONT)

1. Remove six nuts (1) and six washers (2).

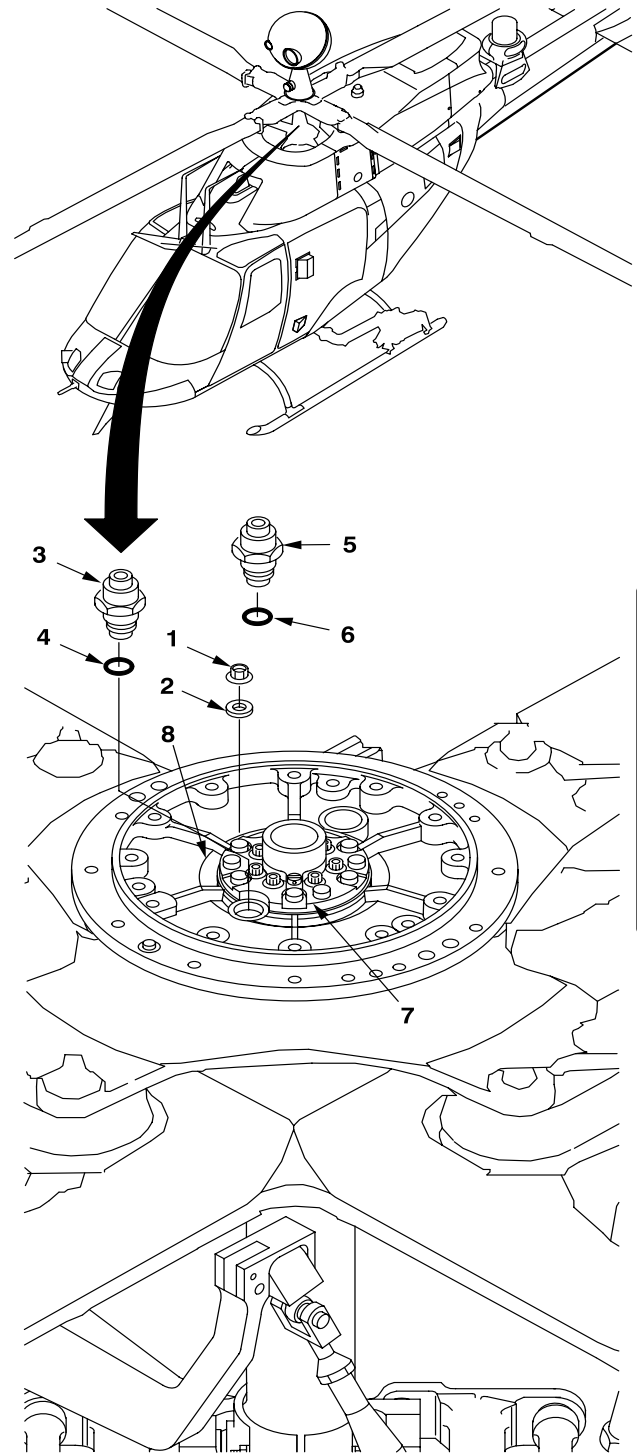
NOTE

Transducers shall be marked for proper location during installation.

2. From top of main rotor mast, remove lockwire and remove transducer (3) with packing (4). Discard packing (4).

3. Remove lockwire and remove transducer (5) with packing (6). Discard packing (6).

4. Remove sealant from adapter (7) and torque-meter support (8) using plastic scraper (B123).



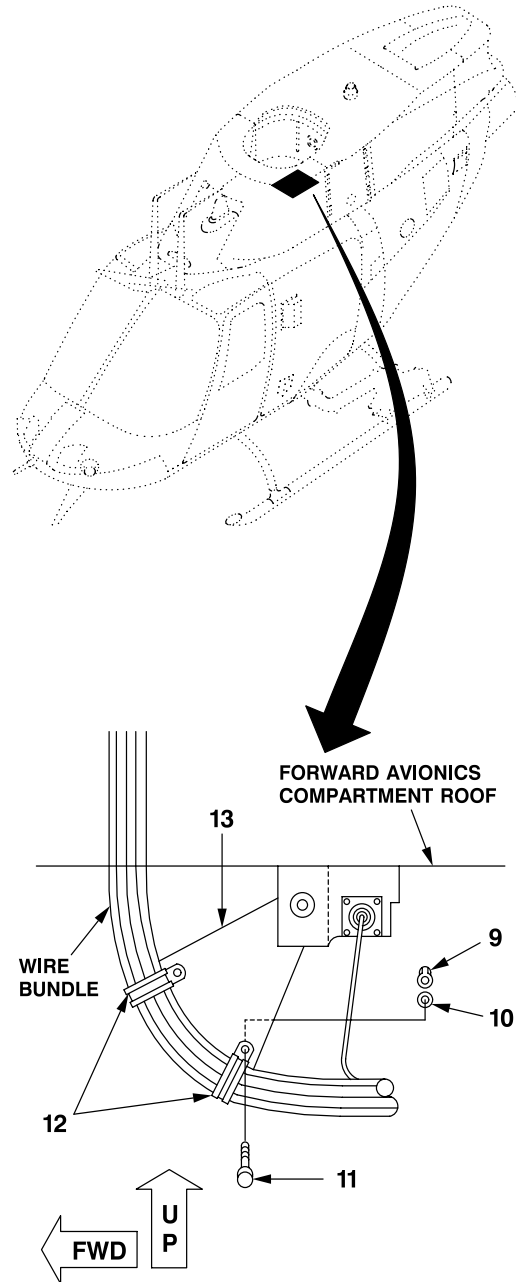
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6-4-5. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — REMOVAL (CONT)

5. Working from inside forward avionics compartment, remove nuts (9), washers (10), and bolts (11) securing clamps (12) to bracket (13).

6. Remove clamps (12) from wire bundle.



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6-4-5. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — REMOVAL (CONT)

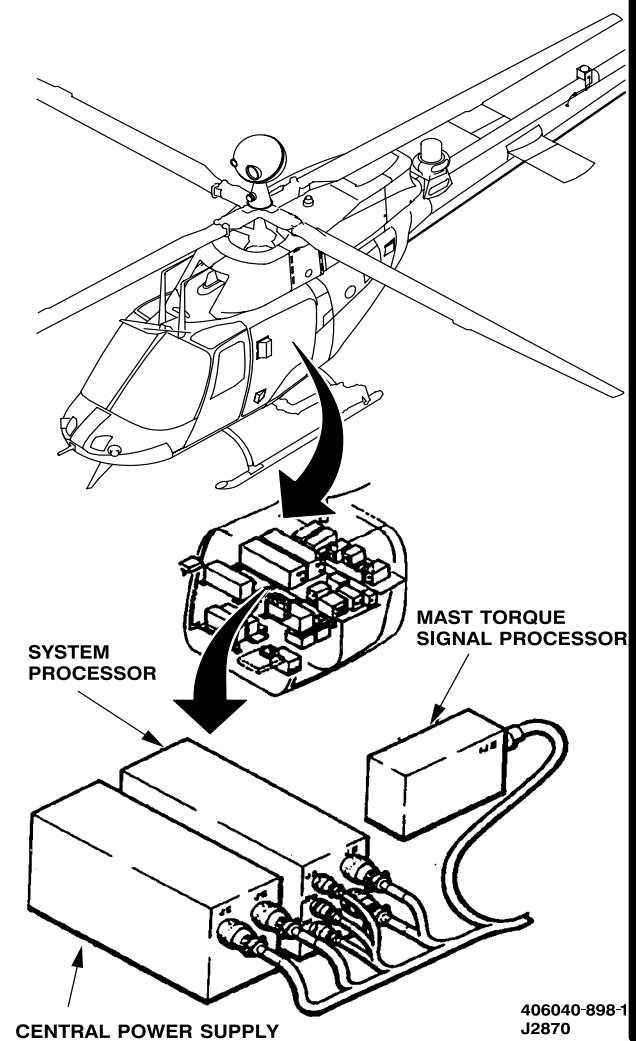
CAUTION

All electrical connectors shall be marked prior to removal. Damage may result if connections are reversed during reinstallation.

7. From inside forward avionics compartment, disconnect electrical cable connectors from system processor junctions J4, J5, J9, J10, and J11, and disconnect ground strap from wire bundle to airframe ground in accordance with TM 9-1240-778-23.

8. Disconnect electrical cable connectors from central power supply junctions J5 and J6.

9. Disconnect electrical cable connector from mast torque signal processor junction J5.



GO TO NEXT PAGE

6-4-5. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — REMOVAL (CONT)

CAUTION

To avoid breaking wires, sharp radius bends in harness shall not be made during handling to obtain upward movement.

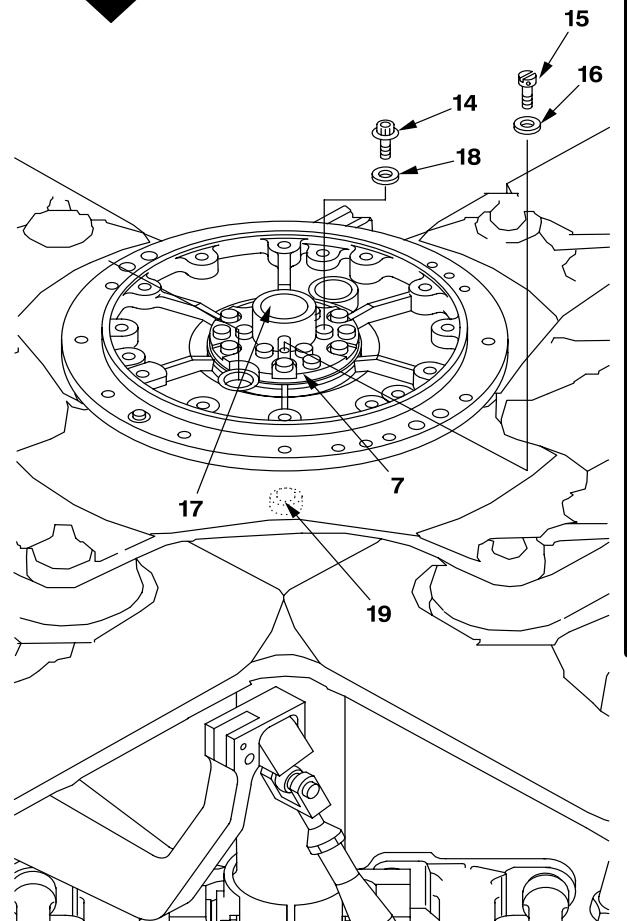
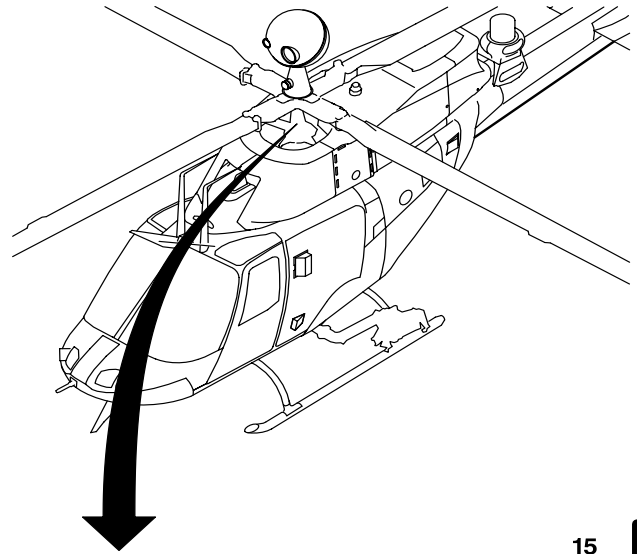
10. Push up on wiring harness enough to enable removal of eight bolts (14).

11. Remove lockwire from eight bolts (14) and two screws (15).

12. Remove two screws (15) and two washers (16) connecting electrical connector (17) to adapter (7).

13. Remove eight bolts (14) and eight washers (18) from adapter (7) and standpipe (19).

14. Remove adapter (7).



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J2870

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6-4-5. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — REMOVAL (CONT)

15. Remove retainer ring (20) from torque-meter support (8) and plug (21).

16. Using jackscrew (B129), remove plug (21) with packing (22) from torque-meter support (8). Discard packing (22).

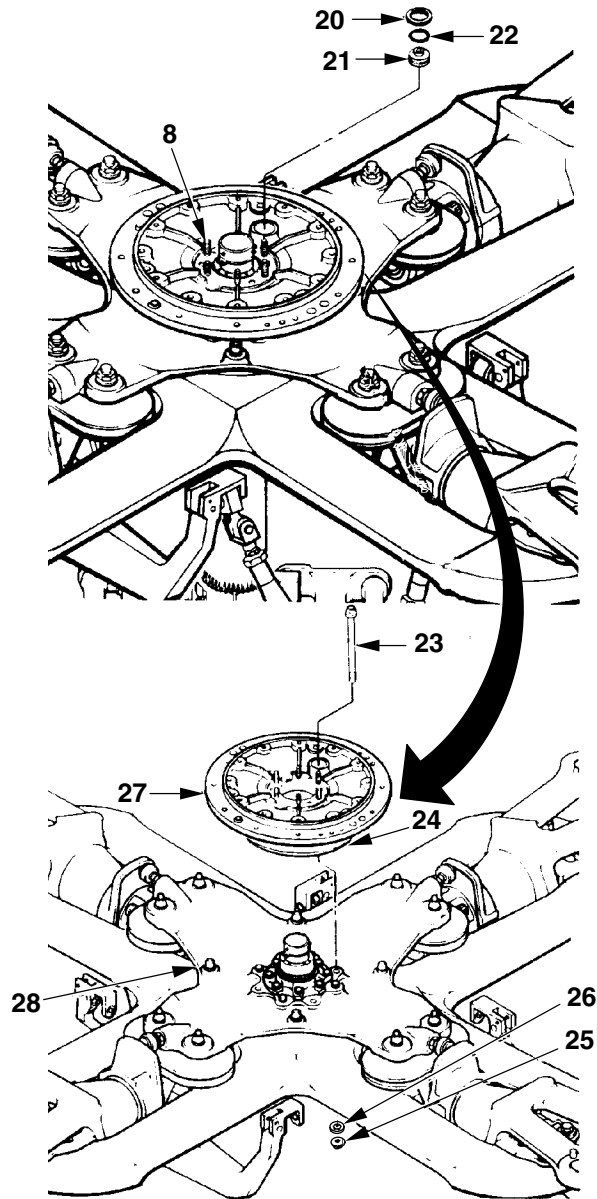
NOTE

The four correct bolts may be located by laying a straight edge from center of hub to the trailing edge bolt of the main rotor blade. The torque-meter adapter bolt adjacent to straight edge, as viewed through inspection hole, is correct bolt to remove.

17. Position inspection hole over the four bolts (23) installed through bearing sleeve (24).

18. Remove four nuts (25), four washers (26), and four bolts (23).

19. Remove torque-meter support (8) and bearing assembly (27) from main rotor hub (28).



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END OF TASK

6-4-6. TORQUEMETER SUPPORT BEARING SEAL — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Drycleaning Solvent (D199)
Rubber Gloves (D111)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer

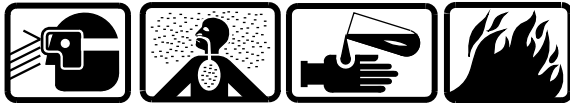
Tools:
Powertrain Tool Kit (B180)

Equipment Condition:
Torquemeter Support and Bearing Assembly
Disassembled (Task 6-4-7)

Material:
Crocus Cloth (D90)
Wiping Rag (D164)

REMOVE SEAL

1. Remove seal (1) from torquemeter support (2).
2. Discard seal (1).

CLEAN**Drycleaning Solvent**

2. Clean seal area (3) of torquemeter support with drycleaning solvent (D199). Dry with wiping rag (D164).

INSPECT

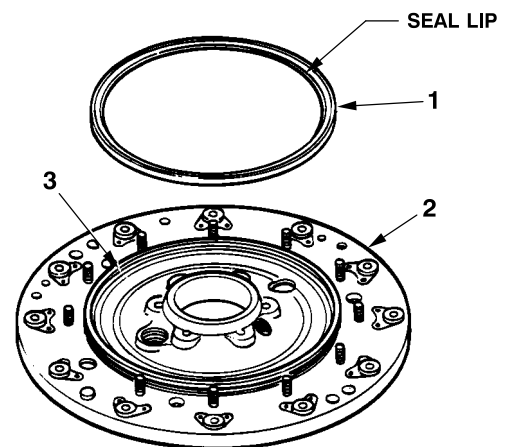
3. Inspect torquemeter support (2) in seal area for burrs and scratches.

REPAIR

4. Remove burrs and scratches with crocus cloth (D90).

INSTALL SEAL

5. Position seal (1) on torquemeter support (2) and use plastic mallet to lightly tap seal (1) in place.

INSPECT

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END OF TASK

6-4-7. TORQUEMETER SUPPORT BEARING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Steel Support, 3 Inches High, I.D. 7.55 Inches,
O.D. 8.50 Inches (Work Aid)

Applicable Configurations:
All

Material:

Zinc Chromate Primer (D161)
Lockwire (D132)
Sealing Compound (D184)
Grease (D113)
Rubber Gloves (D111)

Tools:

Powertrain Tool Kit (B180)
Plastic Scraper (B123)
Jackscrew Set (B129)
Hand Arbor Press (B107)
Steel Sleeve, 5 Inches Long, I.D. 6.570 Inches
Minimum, O.D. 7.320 Inches Maximum (Work
Aid)
■ Torque Wrench (B237)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

GO TO NEXT PAGE

6-4-7. TORQUEMETER SUPPORT BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

PREPARE

1. Place torque-meter support and bearing assembly (1) on maintenance bench.

2. Using plastic scraper (B123) remove sealant from torque-meter support (2) and bearing assembly (3) mating surface.

DISASSEMBLE

3. Remove 11 nuts (4) and 11 washers (5) from 11 studs (6) on torque-meter support (2).

4. Cut lockwire and remove inspection bolt (7) with packing (8). Discard packing (8).

5. Using jackscrew set (B129), remove torque-meter support (2) with packing (9). Discard packing (9).

6. Cut lockwire and remove eight bolts (10) with eight washers (11) from bearing retainer (12).

7. Remove bearing retainer (12) from bearing assembly (3).

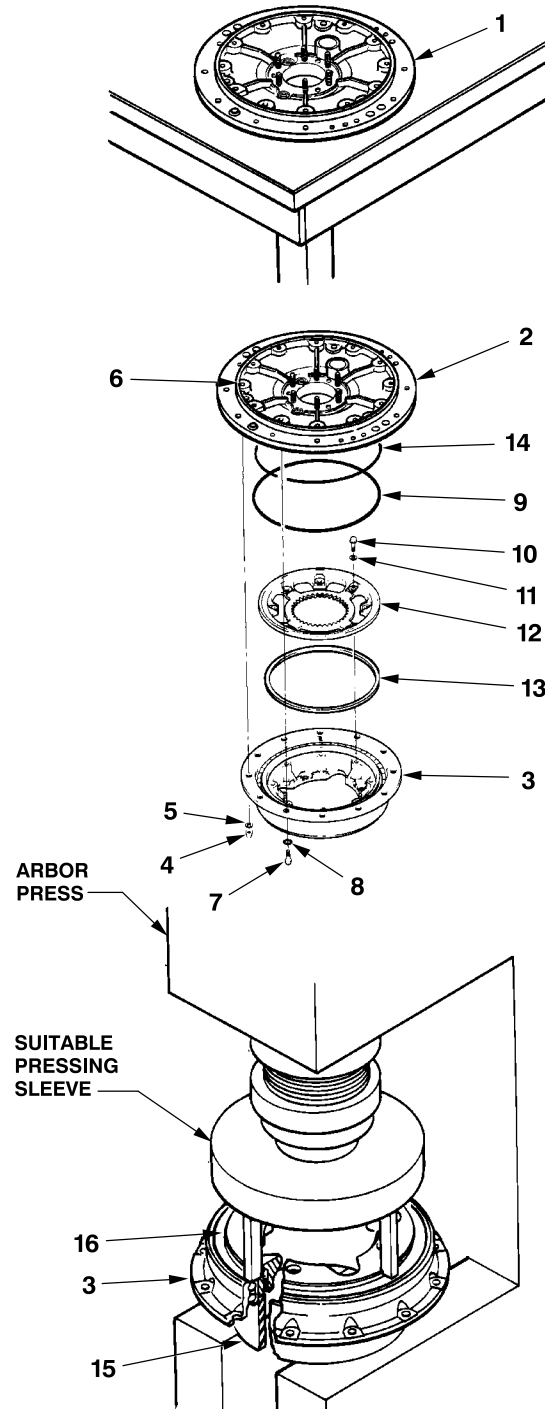
8. Remove shim (13) from bearing assembly (3).

9. Remove seal (14) from torque-meter support (Task 6-4-6).

REMOVE

10. Place bearing assembly (3) on suitable support (15) on arbor press (B107).

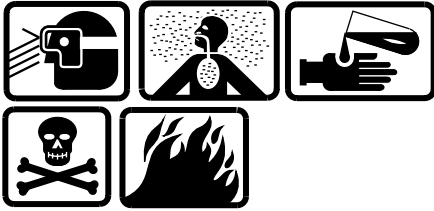
11. Press bearing assembly (3) from bearing sleeve (16), using suitable pressing sleeve (part of B107).

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6-4-7. TORQUEMETER SUPPORT BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

INSTALL



Zinc Chromate Primer

12. Apply wet zinc chromate primer (D161) to bearing mating surface of bearing sleeve (16).

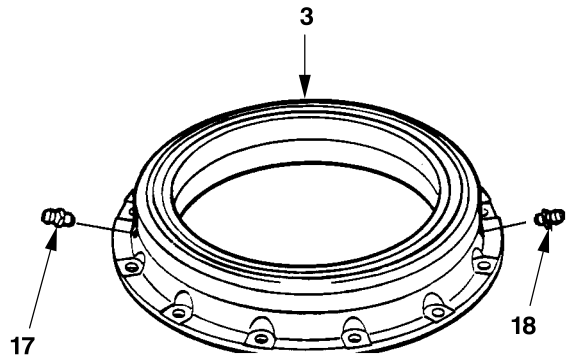
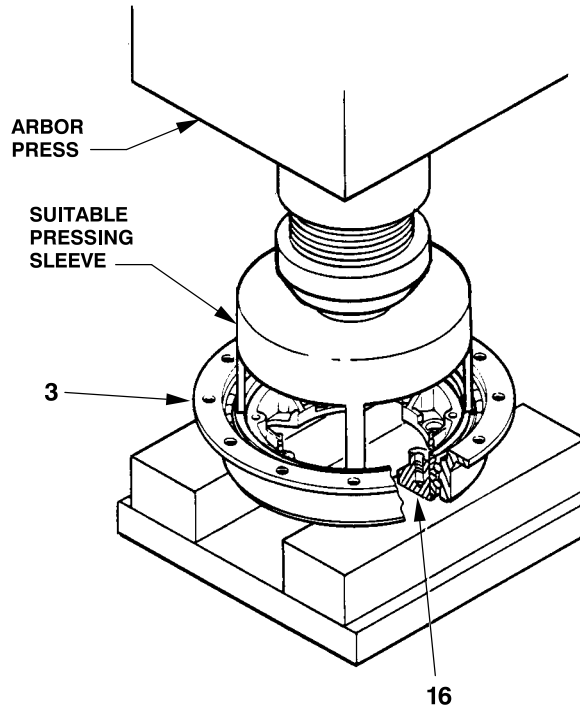
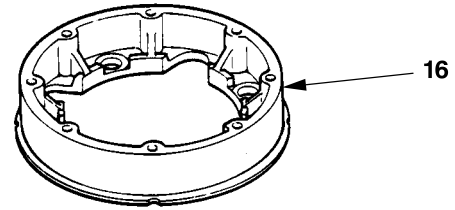
13. Place bearing sleeve (16) on arbor press (B107). Position bearing assembly (3) onto bearing sleeve (16).

14. Using suitable pressing sleeve (part of B107), press bearing sleeve (16) into bearing assembly (3).

INSPECT

15. Remove grease fittings (17 and 18) from unserviceable bearing assembly (3).

16. Install grease fittings (17 and 18) on serviceable bearing assembly (3).



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6-4-7. TORQUEMETER SUPPORT BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

SHIMMING PROCEDURE

17. Set beginning thickness of shim (13) at **0.090 to 0.093 inch**.

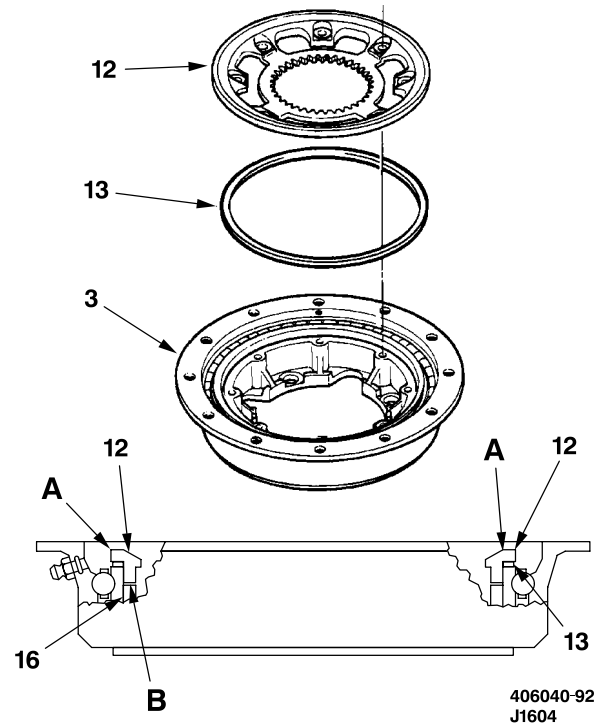
18. Install shim (13) on bearing assembly (3).

19. Install bearing retainer (12) on bearing assembly (3) and against shim (13). Seat shim (13) by applying pressure at area A of bearing retainer (12).

20. Measure gap B between bearing retainer (12) and bearing sleeve (17) through openings (four places) in bearing retainer (13) with feeler gage.

21. Subtract measured gap B from beginning shim (13) measurement (**0.090 to 0.093 inch**) and add **0.001 to 0.003 inch** shim to provide a **0.001 to 0.003** pinch fit on bearing assembly (3).

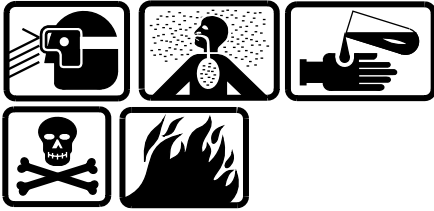
22. Remove bearing retainer (12) and add required shims (13).



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6-4-7. TORQUEMETER SUPPORT BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

ASSEMBLE



Zinc Chromate Primer

23. Apply wet zinc chromate primer (D161) to mating surface of bearing retainer (12) and install bearing retainer (12) in bearing assembly (3).

24. Install eight washers (11) and eight bolts (10).

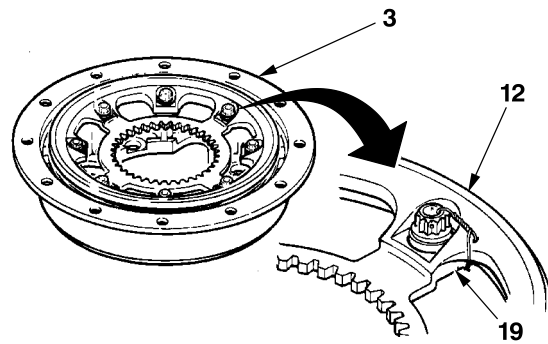
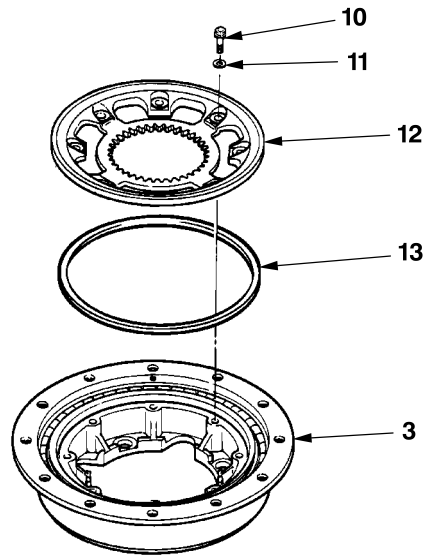
25. Torque bolts (10) **60 TO 70 INCH-POUNDS**.

CAUTION

Failure to lockwire bolts to retainer as instructed may cause damage to support.

26. Secure bolts (10) to retainer (12) with lockwire (D132). Bend ends of lockwire (D132) into pockets (19) of retainer (12) to provide clearance for main rotor hub bolts.

INSPECT



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6-4-7. TORQUEMETER SUPPORT BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

INSTALL TORQUEMETER SUPPORT

27. Install torquemeter seal (Task 6-4-6).

28. Install packing (9) on torquemeter support (2). Lightly lubricate packing (9) with grease (D113) and install torquemeter support (2) on bearing assembly (3).

29. Install 11 washers (5) and 11 nuts (4) on 11 studs (6) of torquemeter support (2).

30. Torque nuts (4) **75 TO 95 INCH-POUNDS**.

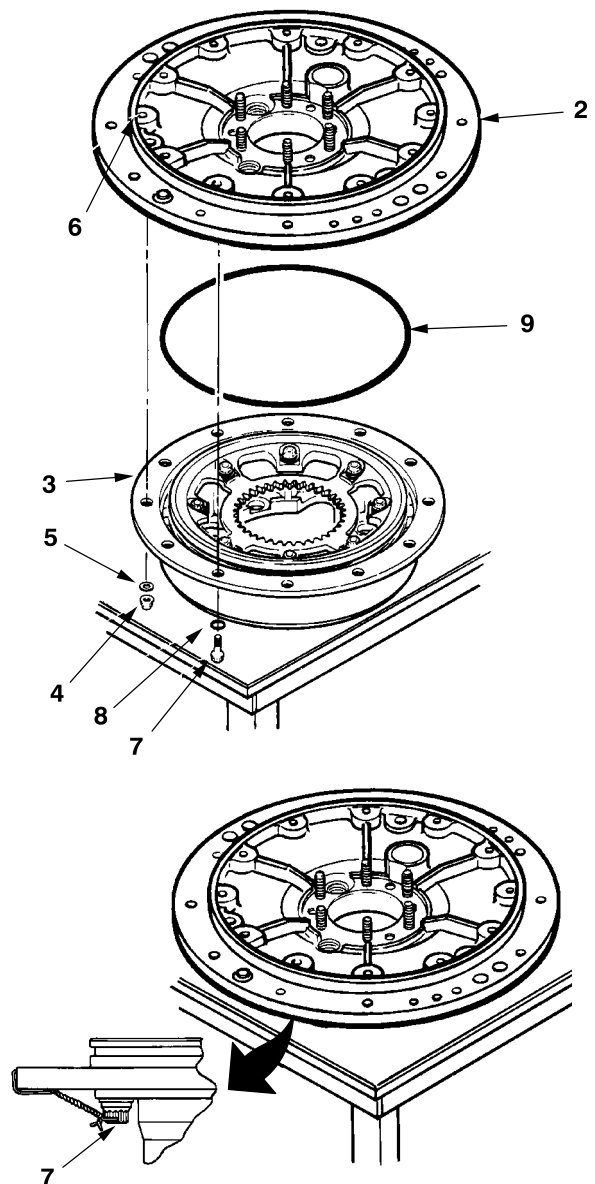
31. Install inspection bolt (7) with packing (8) in bearing assembly (3).

32. Torque bolt (7) **75 TO 95 INCH-POUNDS**.

33. Secure bolt (7) to torquemeter support (2) with lockwire (D132).

INSPECT**Sealing Compound**

34. Apply bead of sealing compound (D184) at mating surface of torquemeter support (2) and bearing assembly (3).



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J1604

END OF TASK

6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Airmobile Powertrain Shop Set (B141)
Paint Spray Gun (B61)

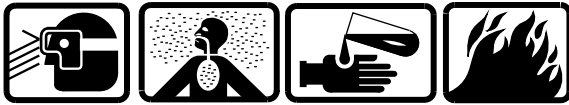
Material:
Nonmetallic Abrasive Mats (D1)
Drycleaning Solvent (D199)
Wiping Rags (D164)
Sandpaper (D175)
Crocus Cloth (D90)

Chemical Conversion Coating (Alodine 1201) (D57)
Epoxy Primer Coating (D98)
Paint Remover (D148)
Rubber Gloves (D111)
Black Acrylic Lacquer (D124)
Steel Wool (D205)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 1-1520-266-23 ■

CLEANING TORQUEMETER SUPPORT ASSEMBLY



Drycleaning Solvent

1. Clean torquemeter support with wiping rag (D164) dampened with drycleaning solvent (D199).
2. Dry torquemeter support assembly with clean wiping rag (D164).



Paint Remover

3. Remove epoxy primer coating finish with paint remover (D148).

INSPECT TORQUEMETER SUPPORT ASSEMBLY

4. Fluorescent penetrant inspect torquemeter support assembly (TM 1-1520-266-23).

5. Inspect torquemeter support to damage limits shown. Reject torquemeter support if limits are exceeded. See figure Standpipe Torquemeter Support Assembly — Damage Limits. If cracks in torquemeter support are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR TORQUEMETER SUPPORT ASSEMBLY

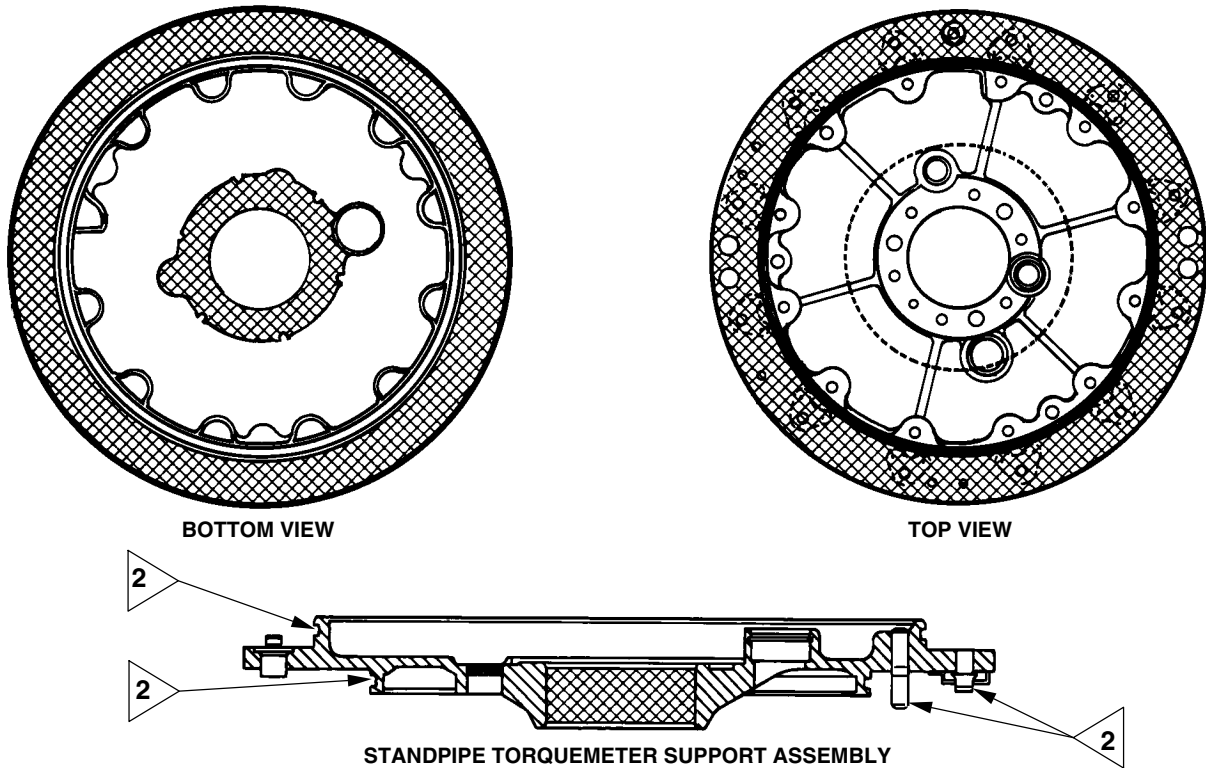



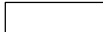
Sanding Operations


6. Repair damage to torquemeter support assembly using 400 grit sandpaper (D175).
7. Blend repaired area into surrounding area with crocus cloth (D90).

GO TO NEXT PAGE

6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



TYPE OF DAMAGE	DAMAGE LOCATION SYMBOLS	
		
	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL DAMAGE	0.005 in. before and after repair	0.010 in. before and after repair
CORROSION	0.003 in. before and after repair	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.5 sq. in.	1.0 sq. in.
NUMBER OF REPAIRS	2	4
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.	0.030 in.

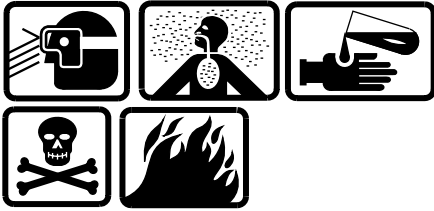
- NOTES: 1. No cracks are permitted.
-  2. No corrosion permitted around stud threads, nutplates, or packing grooves.

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J1604

Standpipe Torquemeter Support Assembly — Damage Limits.

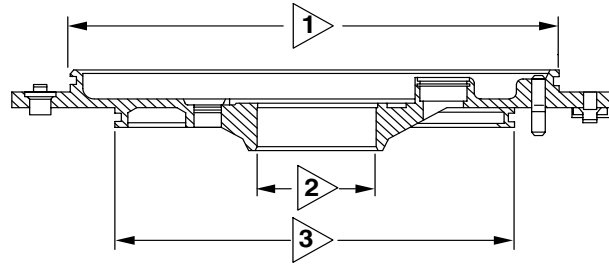
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6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



Chemical Conversion Materials

8. Apply Alodine 1201 (D57) to surface of torquemeter support assembly.



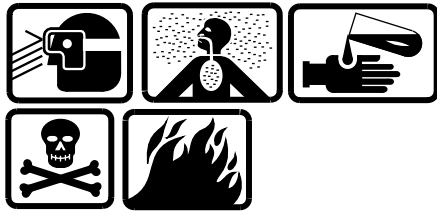
**TORQUEMETER SUPPORT ASSEMBLY
WEAR LIMITS**

AREA	MINIMUM	MAXIMUM	REPLACE
1	9.148 IN. DIA.		9.146 IN. DIA.
2		2.252 IN. DIA.	2.254 IN. DIA.
3	7.496 IN. DIA.		7.495 IN. DIA.

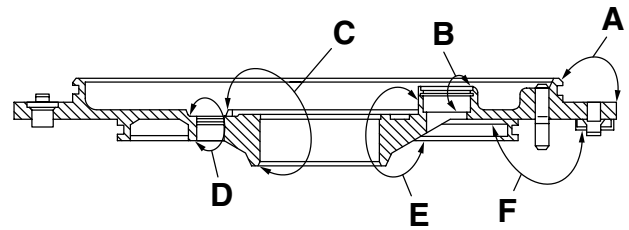
406040-94-2
J1989

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6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



Epoxy Primer Coating



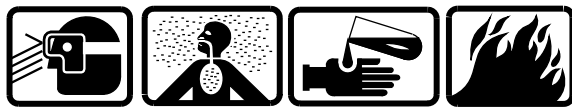
406040-95
J1604

NOTE

Epoxy primer coating should be omitted from areas A, B, C, D, E, and F of torque support.

9. Apply one coat of epoxy primer coating (D98) to surface of torque support assembly.

CLEAN BEARING ASSEMBLY RETAINER



Drycleaning Solvent

10. Clean bearing assembly retainer with wiping rag (D164) dampened with drycleaning solvent (D199).

11. Dry bearing assembly retainer with clean wiping rag (D164).

INSPECT BEARING ASSEMBLY RETAINER

12. Fluorescent penetrant inspect bearing assembly retainer (TM 1-1520-266-23).

13. Inspect bearing assembly retainer to limits shown. Reject bearing assembly retainer if limits are exceeded. See figure Retainer — Damage Limits. If cracks in bearing assembly retainer are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR BEARING ASSEMBLY RETAINER



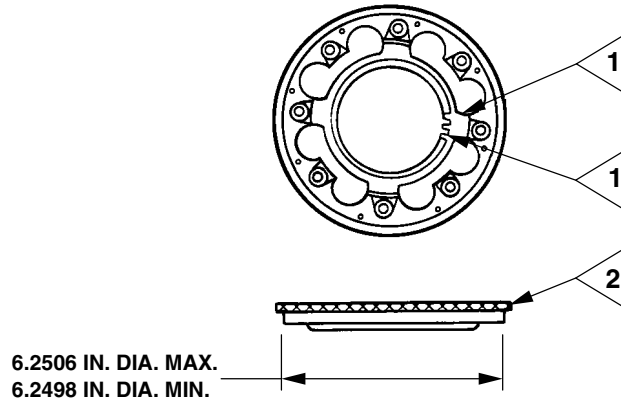
Sanding Operations

14. Repair damage to bearing assembly retainer using 400 grit sandpaper (D175).

15. Blend repaired area into surrounding area with crocus cloth (D90).

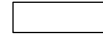
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6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



RETAINER

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL DAMAGE	None	0.005 in. before and after repair
CORROSION DAMAGE	Only that which is removable with steel wool (D57) or abrasive pads (D24).	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	None	0.50 sq. in.
NUMBER OF REPAIRS	None	6
EDGE CHAMFER TO REMOVE DAMAGE	None	0.030 in.

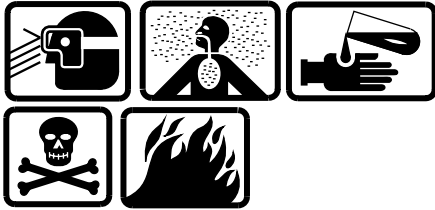
- NOTES:
- 1 The upper edges of the spline teeth and leading edges of the four spokes are limited to 0.003 inch maximum edge break to obtain a sharp output spike from the magnetic pickups. No alteration of edge break is permitted for removal of damage. Repair all areas other than the edge break to limits shown.
 - 2 Seal contact wear allowable is 0.002 inch maximum on diameter.
 - 3. No cracks permitted.

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J1604

Retainer — Damage Limits

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6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



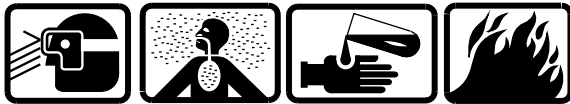
Epoxy Primer Coating

NOTE

Epoxy primer coating should be omitted from areas A and B of bearing assembly retainer.

- 16. Apply one coat of epoxy primer coating (D98) to surface of bearing assembly retainer.

CLEAN BEARING ASSEMBLY



Drycleaning Solvent

- 17. Clean exterior of bearing assembly with a clean wiping rag (D164) dampened with drycleaning solvent (D199).

- 18. Dry bearing assembly with a clean wiping rag (D164).

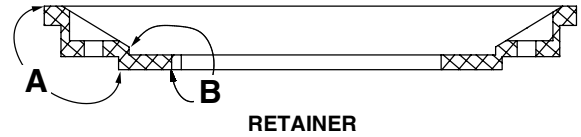
INSPECT BEARING ASSEMBLY

- 19. Inspect bearing assembly to damage limits shown. Reject bearing assembly if limits are exceeded. See figure Ball Duplex Support Bearing — Damage Limits.

REPAIR BEARING ASSEMBLY

CAUTION

Prior to any repair, bearing shall be masked to preclude contaminants entering the interior of the bearing.



RETAINER

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J1604



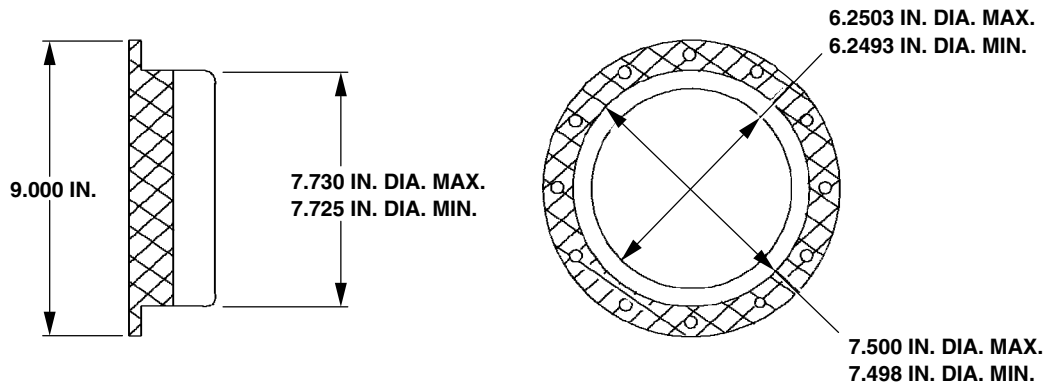
Sanding Operations

- 20. Repair damage to exterior surface of bearing using 400 grit sandpaper (D175).

- 21. Blend repaired area into surrounding area with crocus cloth (D90).

GO TO NEXT PAGE

6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



BALL DUPLEX SUPPORT BEARING

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL DAMAGE

0.003 in. before and after repair

0.006 in. before and after repair

CORROSION DAMAGE

Only that which can be removed with steel wool (D57) or abrasive pads (D24)

MAXIMUM AREA PER FULL DEPTH REPAIR

0.25 sq. in.

0.50 sq. in.

MAXIMUM LENGTH PER REPAIR

0.50 in.

0.75 in.

NUMBER OF REPAIRS

2

5

MINIMUM DISTANCE BETWEEN REPAIRS

2.00 in.

1.00 in.

EDGE CHAMFER TO REMOVE DAMAGE

0.030 in.

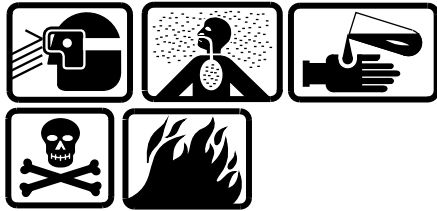
0.060 in.

406040-118
J0430

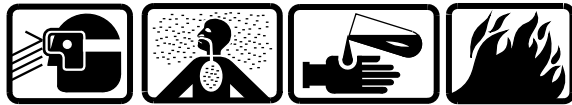
Ball Duplex Support Bearing — Damage Limits

GO TO NEXT PAGE

6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



Epoxy Primer Coating



Acrylic Lacquer

CAUTION

Paint shall not be allowed to enter bearing or to contact seal. Premature failure of bearing or seal may occur.

22. Apply one coat of epoxy primer coating (D98) and two coats of black acrylic lacquer (D124) to repaired area.

CLEAN BEARING SLEEVE



Drycleaning Solvent

23. Clean bearing sleeve with a wiping rag (D164) dampened with drycleaning solvent (D199).

24. Dry bearing sleeve with a clean wiping rag (D164).



Paint Remover

25. Remove epoxy primer coating finish with paint remover (D148).

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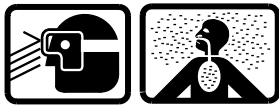
6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

INSPECT BEARING SLEEVE

26. Fluorescent penetrant inspect bearing sleeve (TM 1-1520-266-23).

27. Inspect bearing sleeve to limits shown. Reject bearing sleeve if limits are exceeded or if a crack is found. See figure Bearing Sleeve — Damage Limits. If cracks in bearing sleeve are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR BEARING SLEEVE



Sanding Operations

28. Repair damage to bearing sleeve using 400 grit sandpaper (D175).

29. Blend repaired area into surrounding area with crocus cloth (D90).

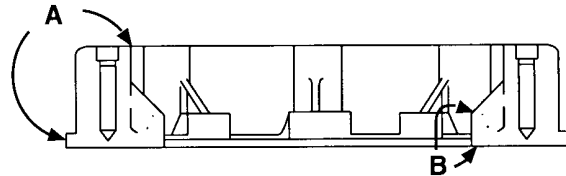


Epoxy Primer Coating

NOTE

Epoxy primer coating should be omitted in area A and B of bearing sleeve.

30. Apply one coat of epoxy primer coating (D98) to surface of bearing sleeve.

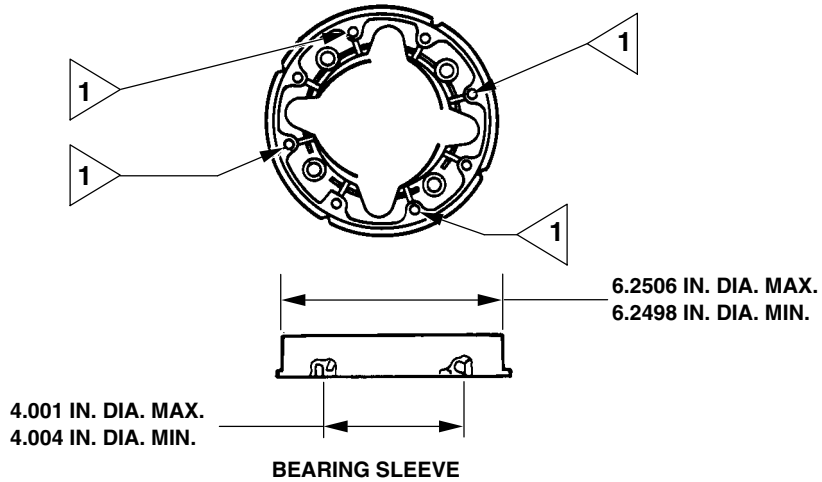


BEARING SLEEVE

406040-97
J1604

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6-4-8. TORQUEMETER SUPPORT AND BEARING ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL DAMAGE	0.005 in. before and after repair
CORROSION DAMAGE	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.50 sq. in.
NUMBER OF REPAIRS	6
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.

NOTES: The countersunk depth of eight tapped holes can be increased from 0.135 inch maximum depth to 0.170 inch maximum depth to remove damage to first thread pitch. Maximum of four holes with no two holes adjacent.

406040-119
J1604

Bearing Sleeve — Damage Limits

END OF TASK

6-4-9. TORQUEMETER TEMPERATURE BULB — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B235)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Engine Cowl Assembly Removed (Task 2-2-50)
Air Induction Cowling Removed (Task 4-2-1)

GO TO NEXT PAGE

6-4-9. TORQUEMETER TEMPERATURE BULB — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove nut (1) and washer (2) from screw (3).
2. Remove screw (3) from clamps (4 and 5) and from bracket (6).
3. Remove clamp (4) from temperature bulb (7).
4. Disconnect electrical connector (8) from temperature bulb (7).
5. Remove temperature bulb (7) from helicopter.

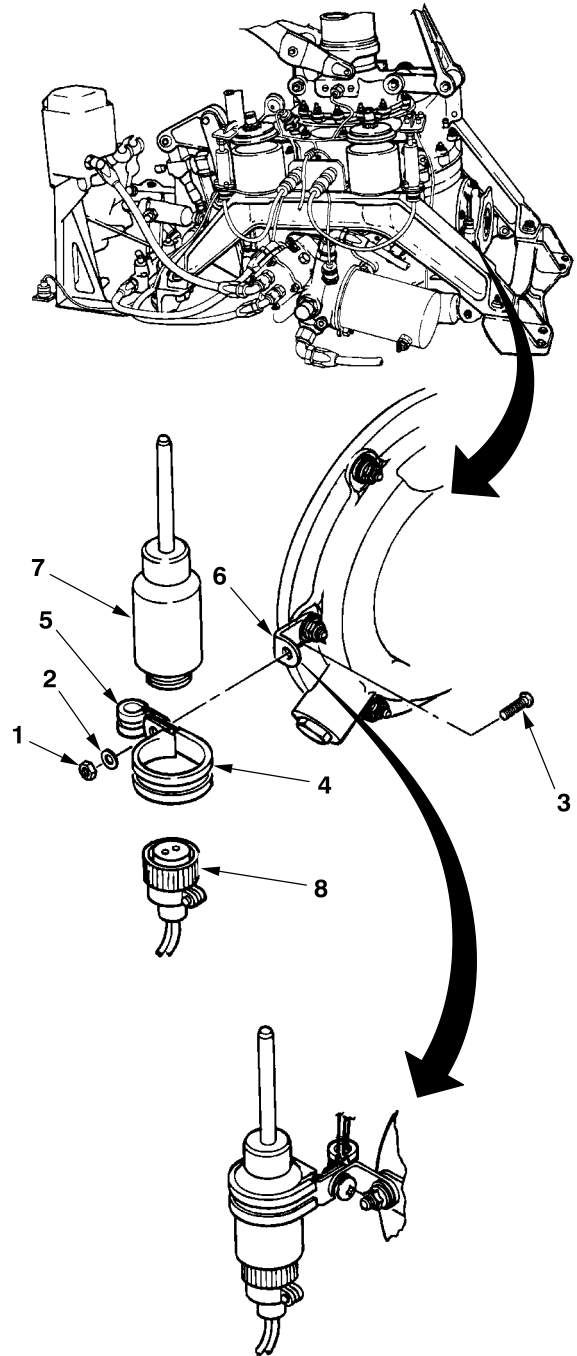
INSTALL

6. Install temperature bulb (7) in clamp (4).
7. Connect electrical connector (8) to temperature bulb (7).
8. Install clamps (5 and 4) with screw (3), washer (2), and nut (1) on bracket (6).
9. Torque nut (1) **12 TO 15 INCH-POUNDS**.

INSPECT

FOLLOW-ON MAINTENANCE

- Install air induction cowling (Task 4-2-4).
- Install forward fairing assembly (Task 2-2-47).
- Install engine cowl assembly (Task 2-2-50).

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J1604

END OF TASK

6-4-10. TORQUE TRANSDUCER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B238)
Outside Micrometer Caliper Set (B12)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47)

CAUTION

The following adjustment procedure is critical. Contact between the monopole pickup end and the mast splines may result in rejection of the mast assembly and monopole pickups. Furthermore, contact of the monopole pickup with the splines may result in erroneous indications.

NOTE

- Procedure same for both transducers.
- If both transducers are going to be removed it is essential that the location of the transducer be identified and that the shims (3) are kept with the proper transducer.

GO TO NEXT PAGE

6-4-10. TORQUE TRANSDUCER — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove electrical connector (1) from transducer (2).
2. Tag and identify transducer location to ensure correct transducer installation.
3. Cut lockwire and remove transducer (2) with shim (3) from swashplate support (4).

NOTE

The tip end of the transducer shall be inspected for evidence of contact with the mast assembly. If contact is indicated further inspection of the mast assembly splines is required.

4. Remove shim (3) from transducer (2). Discard unserviceable transducer (2).

SHIM

5. Install serviceable transducer (2) on swashplate support (4) handtight without shims.

NOTE

Ensure transducer is against mast splines (5).

6. Using a feeler gauge, measure gap (Dimension A) between transducer (2) and swashplate support (4). Record measurement.

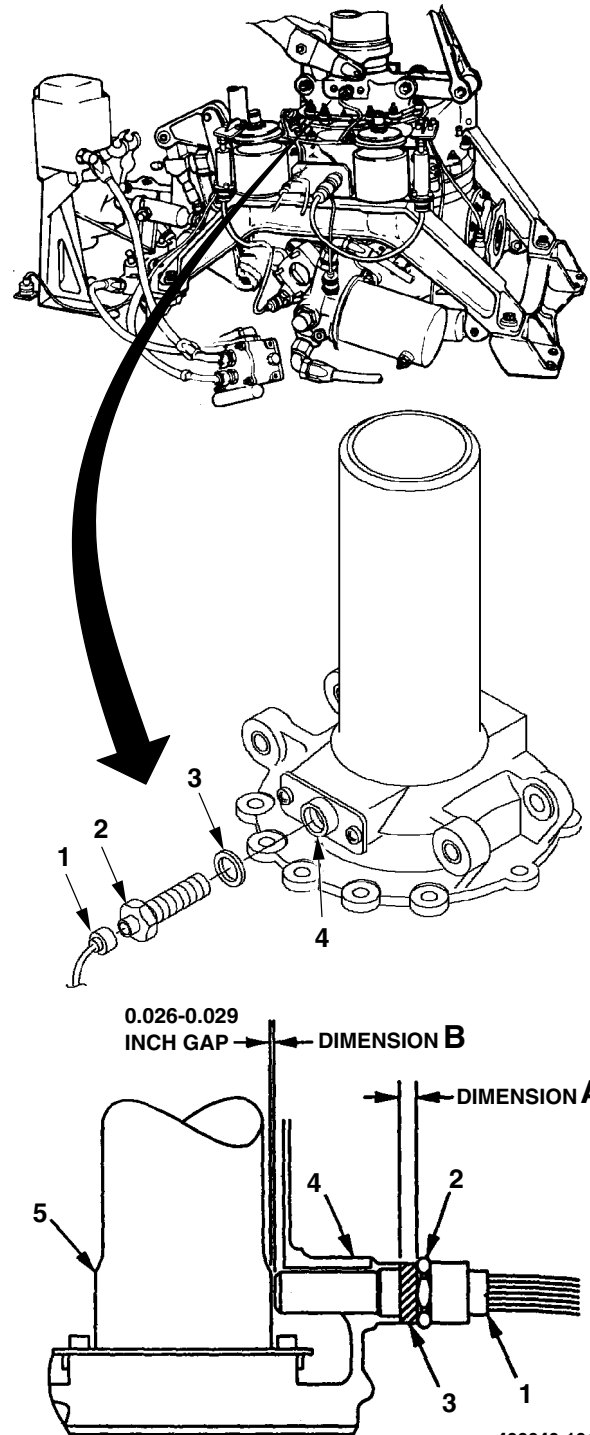
7. Remove transducer (2).

NOTE

Dimension A plus Dimension B equals required thickness of shim (3).

8. Add **0.026 TO 0.029 inch** shims to Dimension A to provide correct clearance between end contact of transducer (2) and mast splines (5) (Dimension B).

9. Install shim (3) on transducer (2).



406040-101
J2586

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6-4-10. TORQUE TRANSDUCER — REMOVAL/INSTALLATION (CONT)

INSTALL

10. Install transducer (2) with shim (3) in swashplate support (4).

11. Torque transducer (2) **80 TO 100 INCH-POUNDS**.

12. Connect electrical connector (1) to transducer (2).

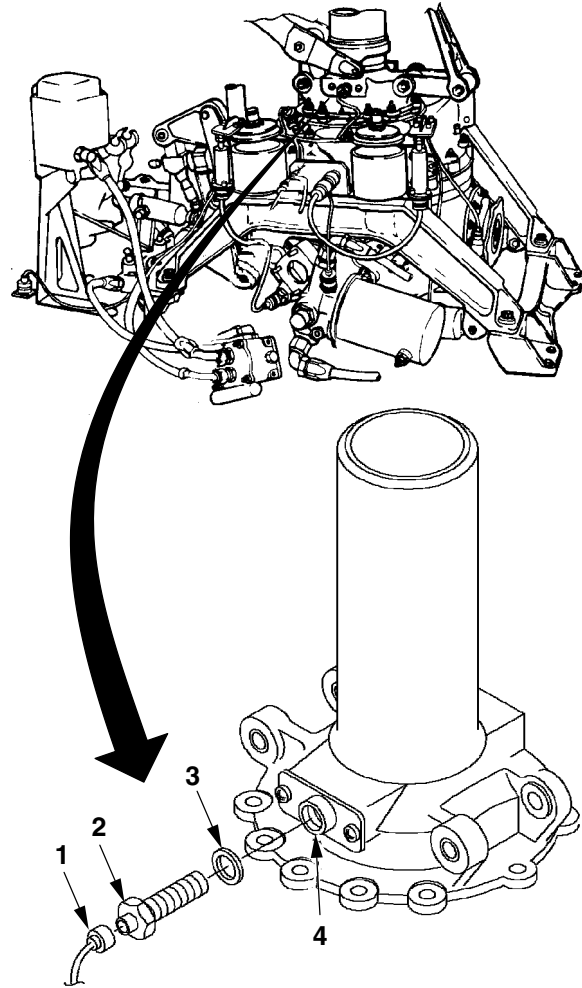
13. Secure transducer (2) with lockwire (D132).

INSPECT

FOLLOW-ON MAINTENANCE

Install forward fairing assembly (Task 2-2-47).

Perform mast torque system calibration (TM 1-1520-248-T).



406040-101
J2111

END OF TASK

6-4-11. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Grease (D113)
Sealing Compound (D184)
Rubber Gloves (D111)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B239)
Torque Wrench (B242)

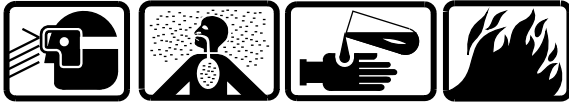
References:
TM 1-1520-248-T
TM 9-1240-778-23

Material:
Lockwire (D131)
Acetone (D2)

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

6-4-11. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — INSTALLATION (CONT)



Acetone

1. Remove any sealant residue from mating surfaces of torque-meter support and bearing assembly (1) and main rotor hub (2) with wiping rag (D164) dampened with acetone (D2).



Grease

2. Lubricate packing (3) on standpipe (4) with grease (D113).

NOTE

All mounting holes in torque-meter shall be aligned with mounting holes in hub prior to installing bolts. One hole in torque-meter is offset to ensure proper alignment.

3. Install torque-meter support and bearing assembly (1) on main rotor hub (2) and standpipe (4).

4. Align inspection hole in torque-meter support (5) with bolt holes in main rotor hub (2).

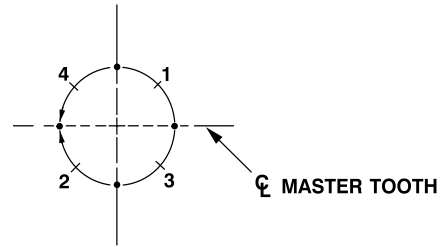
5. Install four bolts (6) through torque-meter support and bearing assembly (1) and main rotor hub (2).

NOTE

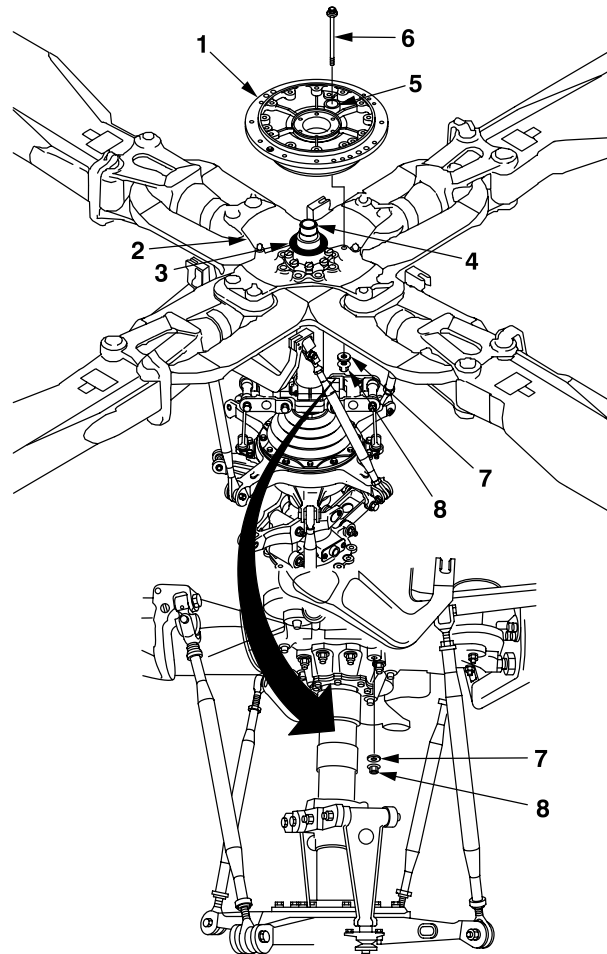
Nuts shall be torqued in a 180 degree sequence.

6. Install four washers (7) and four nuts (8) on four bolts (6).

7. Torque nuts (8) **696 TO 744 INCH-POUNDS.**



TORQUE SEQUENCE DIAGRAM FOR SUPPORT ASSEMBLY

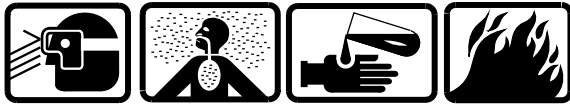


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J1604

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6-4-11. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — INSTALLATION (CONT)

8. Install packing (9) on plug (10).
9. Install plug (10) into inspection hole in torquemeter support (5).
10. Secure plug (10) in torquemeter support (5) with retainer ring (11).



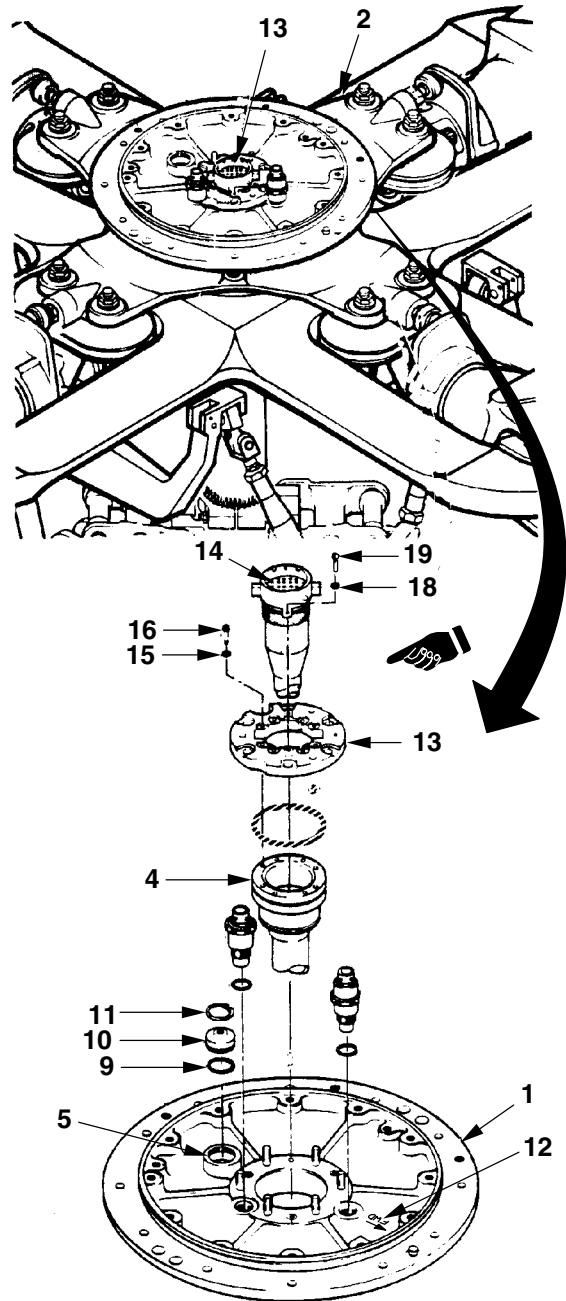
Sealing Compound

11. Apply a bead of sealing compound (D184) at mating surface of torquemeter support and bearing assembly (1) and main rotor hub (2).
12. Ensure the FWD arrow (12) stamped on the torquemeter support and bearing (1) is pointing forward.
13. Position adapter (13) onto electrical connector (14) by aligning slots in adapter (13) with ears on electrical connector (14).
14. Turn adapter (13) 90° (clockwise or counterclockwise) as required to align forward side of adapter (13) with forward side of electrical connector (14).

NOTE

Washers (18) are chamfered and shall be installed with chamfer against head of screws (19).

15. Install eight washers (15) and eight bolts (16) in adapter (13) and standpipe (4).
16. Torque bolts (16) **60 TO 70 INCH-POUNDS**, and secure with lockwire (D131).
17. Attach electrical connector (14) to adapter (13) with two washers (18) and two screws (19).



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J1991

GO TO NEXT PAGE

6-4-11. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — INSTALLATION (CONT)

CAUTION

To avoid breaking wires, sharp radius bends in harness shall not be made during handling.

18. Working from inside forward avionics compartment, pull wiring harness back in place.

CAUTION

Equipment damage may result if electrical connections are made incorrectly.

NOTE

Prior to removal, electrical connectors and grounding strap were marked (identified) (Task 6-4-1) to aid in installation process.

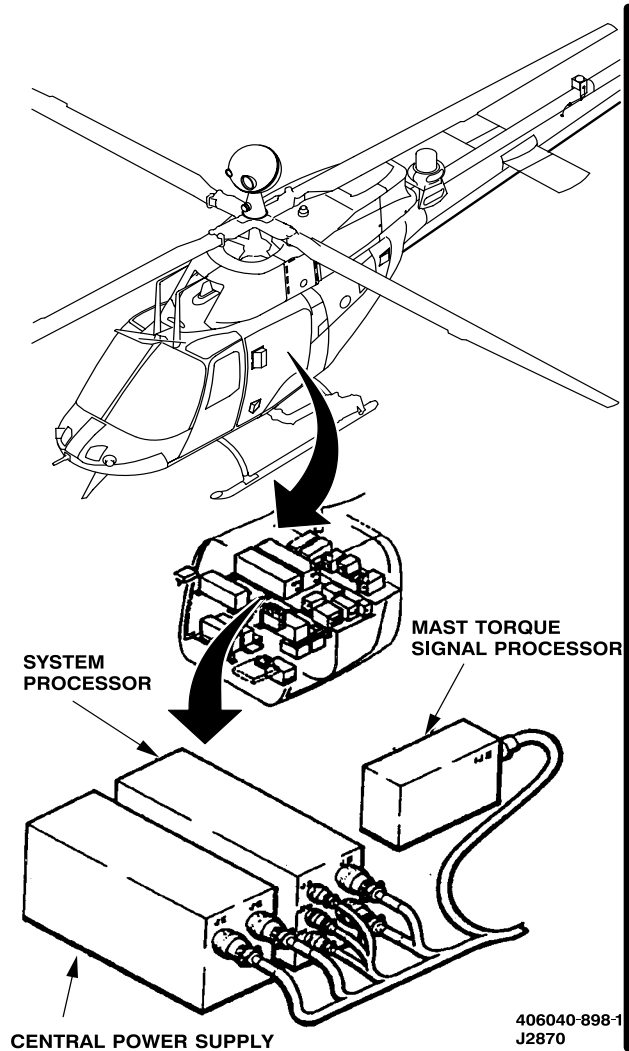
19. Connect electrical cable connectors to system processor connectors J4, J5, J9, J10, and J11.

20. Connect electrical cable connectors to central power supply connectors J5 and J6.

21. Connect electrical cable connector to mast torque signal processor connector J5.

22. Prepare grounding strap mating surfaces for Class R-1 electrical bond (Appendix M).

23. Connect ground strap from wire bundle to airframe ground.



GO TO NEXT PAGE

6-4-11. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — INSTALLATION (CONT)

CAUTION

Failure to center wire bundle and allow slack for transmission movement may result in equipment damage.

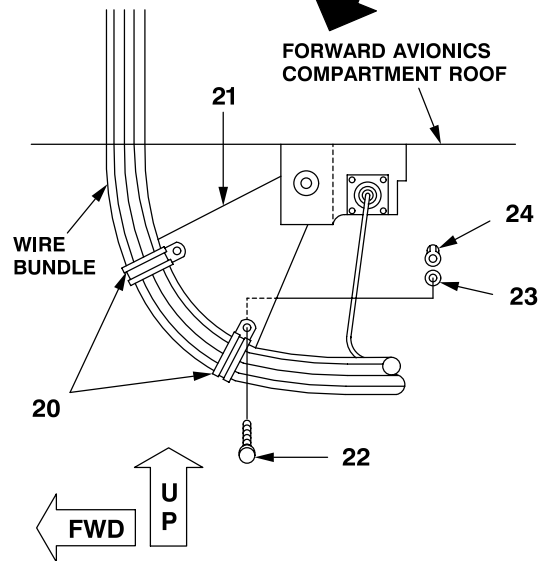
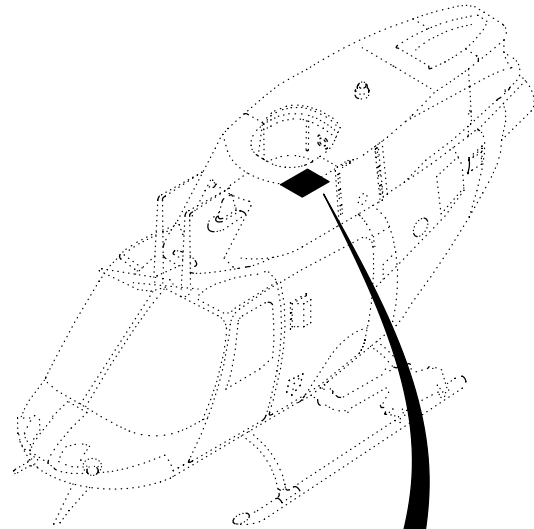
24. Center wire bundle in opening of forward avionics compartment roof and ensure wire bundle has a service loop (slack) that will allow for transmission movement of **0.4 to 0.7 inch**.

25. Install clamps (20) on wire bundle.

26. Secure clamps (20) to bracket (21) by installing bolts (22), washers (23), and nuts (24).

27. After clamping, ensure conditions in step 24. still exist. Correct as required.

28. Inspect all wires cables, and wire bundles for chafing condition. Correct as required.



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J2870

GO TO NEXT PAGE

6-4-11. TORQUEMETER SUPPORT AND BEARING ASSEMBLY — INSTALLATION (CONT)

29. Secure adapter (13) to torque-meter support (5) with six washers (25) and six nuts (26).

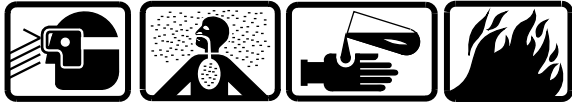
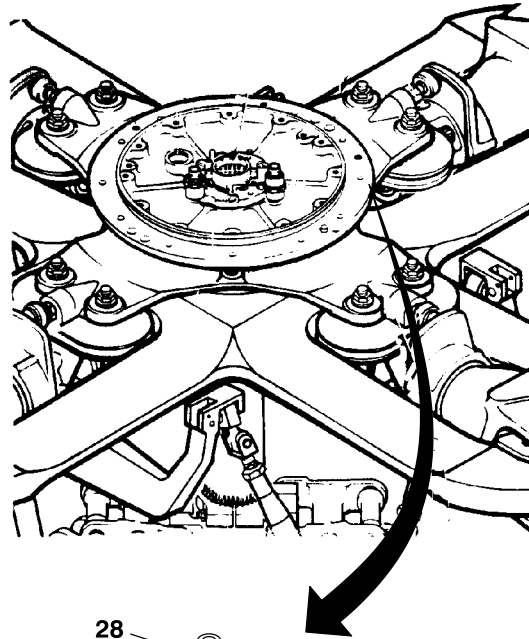
30. Torque nuts (26) **75 TO 95 INCH-POUNDS**.

31. Install packing (27) on transducer (28) and install transducer (28) on torque-meter support (5).

32. Torque transducer (28) **80 TO 100 INCH-POUNDS**.

33. Install packing (29) on transducer (30) and install transducer (30) on torque-meter support (5).

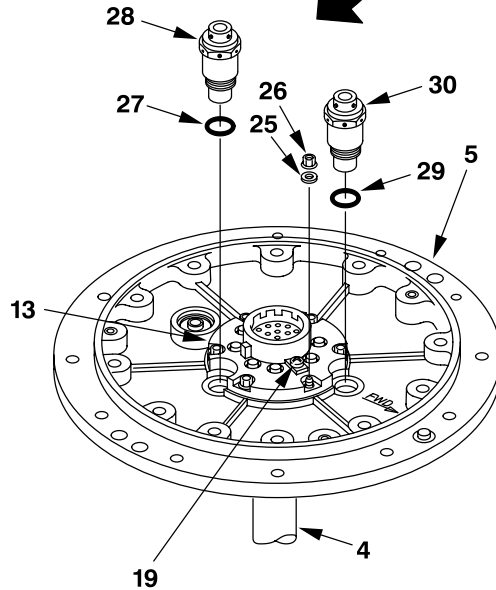
34. Torque transducer (30) **80 TO 100 INCH-POUNDS**.



Sealing Compound

35. Apply bead of sealing compound (D184) to outside mating surface of adapter (13), standpipe (4), and torque-meter support (5).

36. Secure transducers (28 and 30) and screws (19) with lockwire (D131).



INSPECT

FOLLOW-ON MAINTENANCE

Perform mast torque calibration (TM 1-1520-248-T).

Install mast mounted sight (TM 9-1240-778-23).

406040-105-2
J2870

END OF TASK

6-4-12. TORQUEMETER SYSTEM ANTIBACKLASH ADAPTER ASSEMBLY — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer (2)

Applicable Configurations:
All

References:
TM 9-1240-778-23

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Plastic Scraper (B123)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Standpipe Electrical Assembly Removed
(Task 6-4-1)

GO TO NEXT PAGE

6-4-12. TORQUEMETER SYSTEM ANTIBACKLASH ADAPTER ASSEMBLY — REMOVAL (CONT)

1. Gain access to antibacklash adapter through access hole in forward avionics compartment cabin roof.

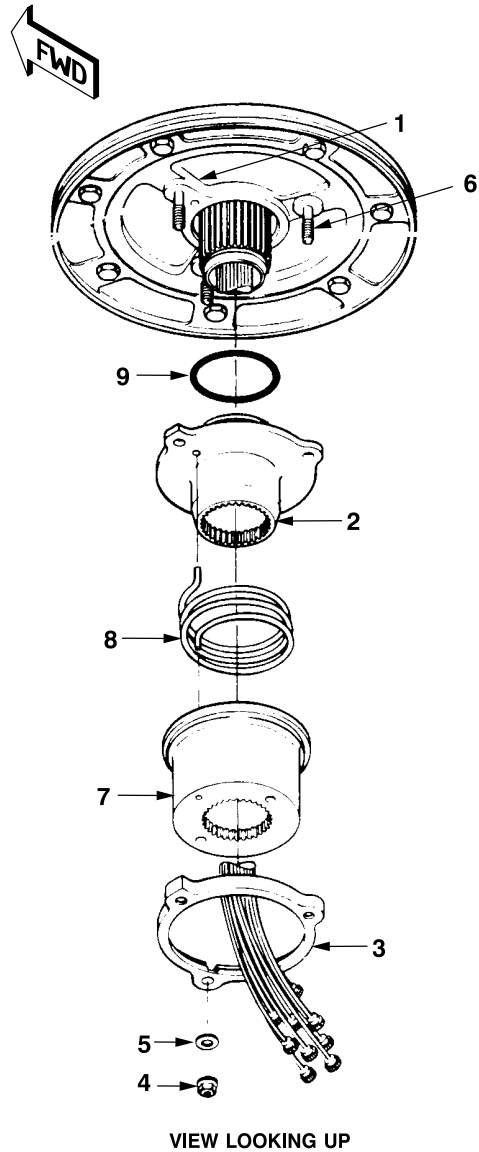
2. Using plastic scraper (B123) remove sealant from mating surfaces of support (1), adapter (2), and retaining plate (3).

3. Remove three nuts (4) and three washers (5) from support studs (6).

4. Remove retaining plate (3), sleeve (7), and spring (8).

5. Loosen adapter (2) by tapping lightly with plastic mallet.

6. Remove adapter (2) with packing (9) from support (1). Discard packing (9).



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J1604

END OF TASK

6-4-13. ANTIBACKLASH ADAPTER ASSEMBLY COMPONENTS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

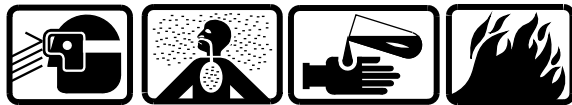
Tools:
General Mechanic Tool Kit (B178)
Dial Indicator (B37)
Outside Micrometer Caliper Set (B12)
Telescoping Gage Set (B47)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Sandpaper (D175)
Crocus Cloth (D90)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 1-1520-266-23 ■

CLEANING RETAINING PLATE



Drycleaning Solvent

1. Clean retaining plate with wiping rag (D164) dampened with drycleaning solvent (D199).
2. Dry retaining plate with clean wiping rag (D164).

INSPECT RETAINING PLATE

3. Fluorescent penetrant inspect retaining plate (TM 1-1520-266-23).
4. Inspect retaining plate to limits shown. Reject retaining plate if limits are exceeded. See

figure Retaining Plate — Damage Limits. If cracks in retaining plate are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR RETAINING PLATE

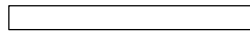
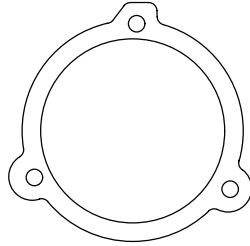


Sanding Operations

5. Repair damage to retainer plate using 400 grit sandpaper (D175).
6. Blend repaired area into surrounding area with crocus cloth (D90).

GO TO NEXT PAGE

6-4-13. ANTIBACKLASH ADAPTER ASSEMBLY COMPONENTS — CLEANING/INSPECTION/REPAIR
(CONT)



RETAINING PLATE

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL DAMAGE	0.010 in. before and after repair
CORROSION	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.
NUMBER OF REPAIRS	2
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.

NOTE: No cracks are permitted.

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J1604

Retaining Plate — Damage Limits

GO TO NEXT PAGE

6-4-13. ANTIBACKLASH ADAPTER ASSEMBLY COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN SPRING SLEEVE**Drycleaning Solvent**

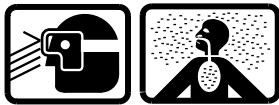
7. Clean spring sleeve with wiping rag (D164) dampened with drycleaning solvent (D199).

8. Dry spring sleeve with clean wiping rag (D164).

INSPECT SPRING SLEEVE

9. Fluorescent penetrant inspect spring sleeve (TM 1-1520-266-23).

10. Inspect spring sleeve to limits shown. Reject spring sleeve if limits are exceeded. See figure Spring Sleeve — Damage Limits. If cracks in spring sleeve are suspected perform eddy current inspection (TM 1-1520-266-23).

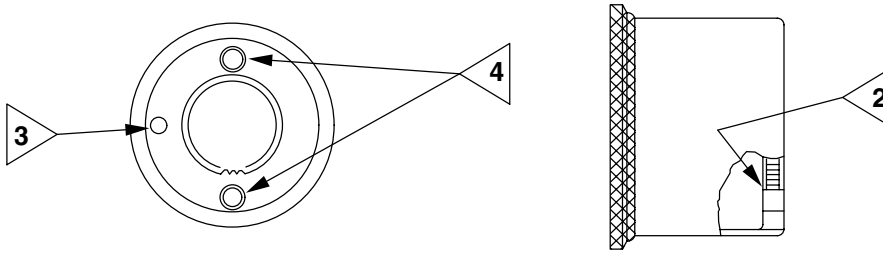
REPAIR SPRING SLEEVE**Sanding Operations**

11. Repair damage to spring sleeve using 400 grit sandpaper (D175).

12. Blend repaired area into surrounding area with crocus cloth (D90).

GO TO NEXT PAGE

6-4-13. ANTIBACKLASH ADAPTER ASSEMBLY COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)



SPRING SLEEVE

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL DAMAGE	0.005 in. before and after repair	0.005 in. before and after repair
CORROSION DAMAGE	0.005 in. before and after repair	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.50 sq. in.
NUMBER OF REPAIRS	2	4
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.	0.030 in.

NOTES: 1. No cracks permitted.

- 2 Edge damage to spline may be removed by chamfering ends of teeth to a minimum of 0.080 inch x 45° on inside edge only. Dimension between 0.054 inch diameter pins should be 1.331 inches minimum and 1.342 inches maximum.
- 3 Hole may be elongated by 0.010 inch maximum.
- 4 Damage to these holes may be reworked by reaming holes to 0.340 inch maximum diameter.

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J0432

Spring Sleeve — Damage Limits

GO TO NEXT PAGE

6-4-13. ANTIBACKLASH ADAPTER ASSEMBLY COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN ANTIBACKLASH SPRING**Drycleaning Solvent**

13. Clean antibacklash spring with wiping rag (D164) dampened with drycleaning solvent (D199).

14. Dry antibacklash spring with clean wiping rag (D164).

INSPECT ANTIBACKLASH SPRING

15. Fluorescent penetrant inspect antibacklash spring (TM 1-1520-266-23).

16. Inspect antibacklash spring to limits shown. Reject antibacklash spring if limits are exceeded. See figure Antibacklash Spring — Damage Limits. If cracks in antibacklash spring are suspected perform eddy current inspection (TM 1-1520-266-23).

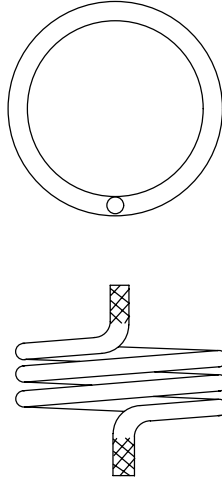
REPAIR ANTIBACKLASH SPRING**Sanding Operations**

17. Repair damage to antibacklash spring using 400 grit sandpaper (D175).

18. Blend repaired area into surrounding area with crocus cloth (D90).

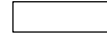
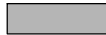
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6-4-13. ANTIBACKLASH ADAPTER ASSEMBLY COMPONENTS — CLEANING/INSPECTION/REPAIR
(CONT)



ANTIBACKLASH SPRING

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.030 in. before and after repair	0.015 in. before and after repair
MECHANICAL DAMAGE	0.030 in. before and after repair	0.015 in. before and after repair
CORROSION	0.005 in. before and after repair	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.25 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	2	4
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.	0.030 in.

NOTE: No cracks permitted.

406040-122
J0432

Antibacklash Spring — Damage Limits

GO TO NEXT PAGE

6-4-13. ANTIBACKLASH ADAPTER ASSEMBLY COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN ANTIBACKLASH ADAPTER**Drycleaning Solvent**

19. Clean spring sleeve with wiping rag (D164) dampened with drycleaning solvent (D199).

20. Clean antibacklash adapter with wiping rag (D164) dampened with drycleaning solvent (D199).

21. Dry antibacklash adapter with clean wiping rag (D164).

INSPECT ANTIBACKLASH ADAPTER

22. Fluorescent penetrant inspect antibacklash adapter (TM 1-1520-266-23).

23. Inspect antibacklash adapter to limits shown. Reject antibacklash adapter if limits are exceeded. See figure Antibacklash Adapter — Damage Limits. If cracks in antibacklash adapter are suspected perform eddy current inspection (TM 1-1520-266-23).

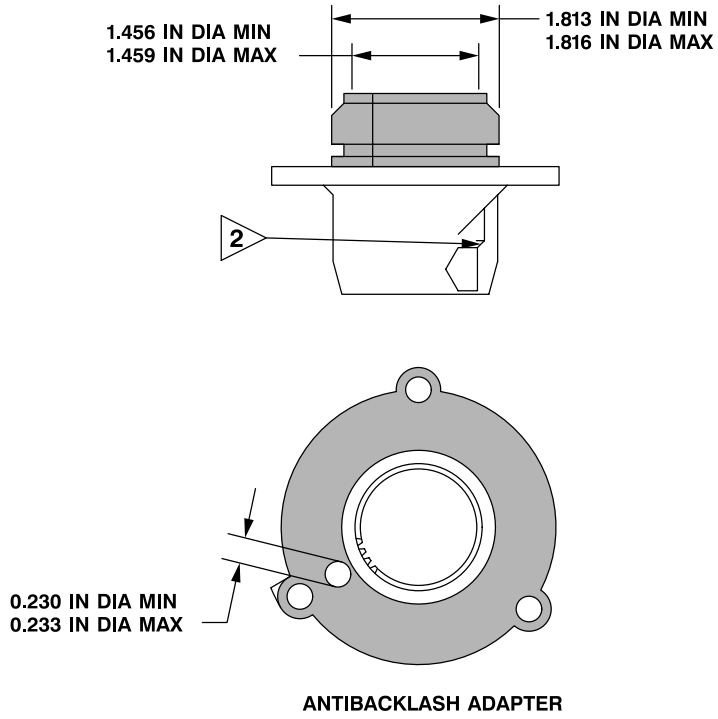
REPAIR ANTIBACKLASH ADAPTER**Sanding Operations**

24. Repair damage to antibacklash adapter using 400 grit sandpaper (D175).

25. Blend repaired area into surrounding area with crocus cloth (D90).

GO TO NEXT PAGE

6-4-13. ANTIBACKLASH ADAPTER ASSEMBLY COMPONENTS — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Shaded Symbol	Unshaded Symbol
MECHANICAL	0.003 in. before and after repair	0.010 in. before and after repair
CORROSION	0.003 in. before and after repair	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	2	4
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.	0.030 in.

NOTES:

1. No cracks are permitted.

2. Spline damage at inner ends may be removed by chamfering ends of teeth to a maximum of 0.06 inch x 30° on inside edge only and not reducing spline length to less than 0.25 inch. Dimension between 0.054 inch diameter pins is 1.330 inches minimum to 1.342 inches maximum.

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Antibacklash Adapter — Damage Limits

END OF TASK

6-4-14. TORQUEMETER SYSTEM ANTIBACKLASH ADAPTER ASSEMBLY — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)
Torque Wrench (B239)

Material:

Sealing Compound (D184)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)

References:

TM 9-1240-778-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47)
Standpipe Electrical Assembly Removed
(Task 6-4-1)

GO TO NEXT PAGE

6-4-14. TORQUEMETER SYSTEM ANTIBACKLASH ADAPTER ASSEMBLY — INSTALLATION
(CONT)

1. Gain access to bottom of standpipe through cabin roof access hole in forward avionics compartment.
2. Install packing (1) on adapter (2) and install adapter (2) with packing (1) on support (3).
3. Install spring (4) and slide spring (4) onto adapter (2).
4. Install spring sleeve (5).
5. Install retainer plate (6).
6. Slide spring sleeve (5) and retainer plate (6) onto spring (4) on adapter (2) and support studs (7).
7. Install three washers (8) and three nuts (9). Do not torque nuts at this time.
8. Ensure spring (4) is seated in retainer hole in adapter (2) and spring sleeve (5) by trying to turn spring sleeve (5) by hand.
9. Install standpipe assembly task (6-4-3).
10. Torque nuts (9) **50 TO 70 INCH-POUNDS**.

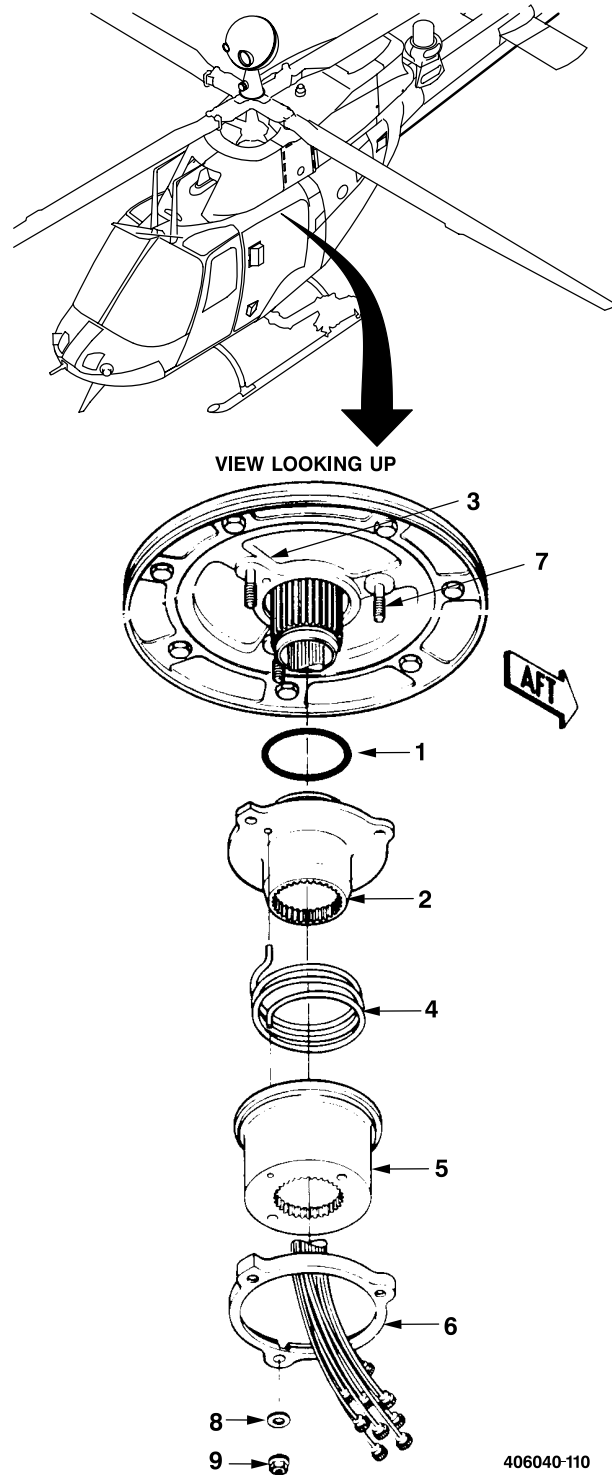
INSPECT

11. Apply bead of sealing compound (D184) to exterior mating surfaces of support (3), adapter (2), and retainer plate (6).

FOLLOW-ON MAINTENANCE

Service transmission (Task 1-4-8).

Install forward fairing assembly (Task 2-2-47).



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J1604

END OF TASK

6-4-15. MAIN ROTOR MAST ASSEMBLY — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Transmission Cover Lift Plate (B104)
Heat Gun (Nitrogen) (B60)
Hoist (B69)
Lifting Eye Clevis (B19)
Maintenance Stand (B162)
Mast Lifting Clevis (B20)
Plastic Scraper (B123)
Rubber Mallet (B97)

Material:

White Cotton Gloves (D112)
Barrier Material (D48)

Personnel Required:

67S Scout Helicopter Repairer (2)

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Mast Mounted Sight Removed
(TM 9-1240-778-23)
Standpipe Electrical Assembly Removed
(Task 6-4-1)
Torquemeter Support and Bearing Assembly
Removed (Task 6-4-5)
Main Rotor Hub and Blades Removed
(Task 5-1-1)
Forward Fairing Assembly Removed (Task 2-2-
47)
Engine Cowl Assembly Removed (Task 2-2-50)
Air Induction Cowling Removed (Task 4-2-1)
Swashplate and Support Removed
(Task 5-2-33)

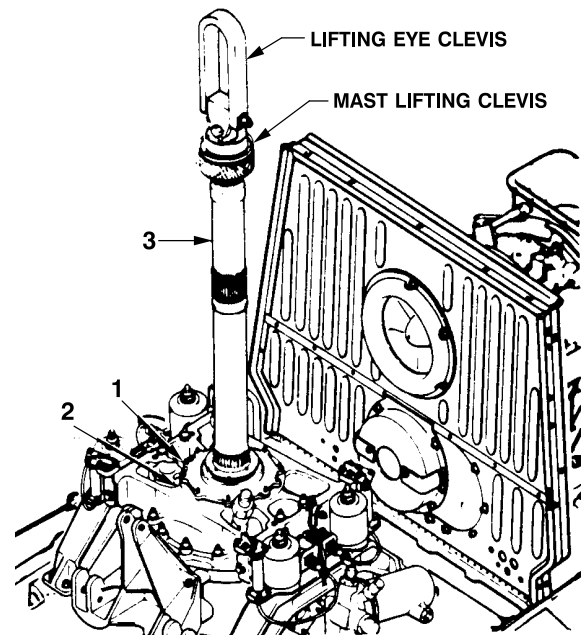
1. Using plastic scraper (B123), remove sealant from the edges of the mating surfaces of the bearing retainer (1) and transmission (2).

CAUTION

To prevent corrosion, bearing or mast assembly shall not be handled with bare hands below the upper mast bearing retainer. White cotton gloves (D112) shall be worn.

2. Install a mast lifting clevis (B20) with lifting eye clevis (B19) on the mast (3) (Task 6-3-2).

3. Attach a hoist (B69) to lifting eye clevis (B19) and draw up the slack.



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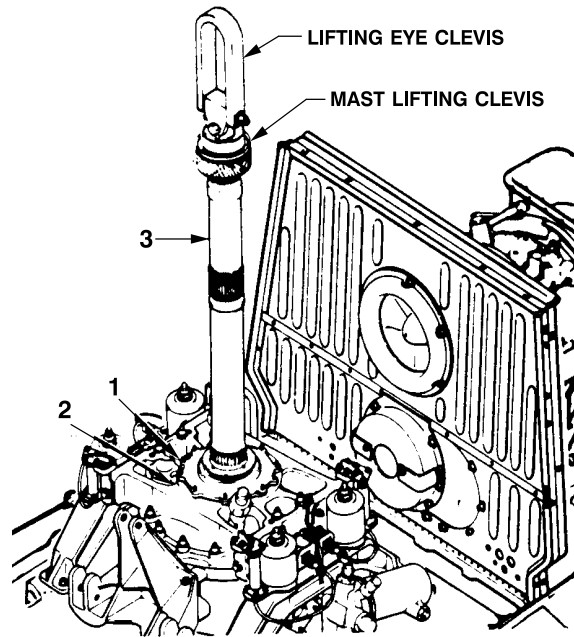
6-4-15. MAIN ROTOR MAST ASSEMBLY — REMOVAL (CONT)

CAUTION

- Materials shall not be heated to more than 250 °F. Overheating materials can cause alterations in the metal annealing characteristics.
- To avoid expansion of the plate area, heat shall not be applied directly to the mast bearing plate.

4. With a heat gun (B60), heat the top case area of the transmission (2) around the mast bearing retainer (1).

5. Apply a very slight pressure on the hoist (B69) (approximately 10 pounds) to start the mast (3) out of the transmission (2). If necessary, tap on the mast and/or mast bearing plate with a rubber mallet (B97) to loosen the mast bearing retainer (1) from the transmission.

406040-66
J1604**CAUTION**

Mast shall not be allowed to hit against the transmission, especially the bottom portion of the mast. The bottom portion of the mast surface acts as the inner race of the lower mast bearing. Any damage over **0.002 inch** on the lower mast surface is cause for replacement of the mast.

6. Once the mast (3) and mast bearing retainer (1) start to move, continue to draw them up and out with the hoist (B69) while guiding the mast (3) until the mast clears the transmission (2).

7. Move the mast (3) clear of the helicopter with the hoist (B69) and lower the mast (3).

8. Disconnect the mast (3) from the hoist (B69) hook and remove the mast lifting clevis (B20). Set mast (3) on suitable surface. Remove and discard the two packings on the mast bearing retainer.

NOTE

If the mast is going to be out of the transmission for any length of time, the bottom portion of the mast shall be enclosed up to the top of the mast bearing plate in barrier material (B48) and transmission cover lift plate (B104) shall be installed to seal the transmission.

END OF TASK

6-4-16. MAIN ROTOR MAST ASSEMBLY (AVIM) — DISASSEMBLY

This task covers: Disassembly (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
Plastic Scraper (B123)
Hand Arbor Press (B107)
Mast Nut Tool Set (B183)
Power Wrench (B223)
Bearing Removal and Installation Plate (B103)
Outside Micrometer Caliper Set (B12)

Vise (B211)
Heat Gun (B59)
Asbestos Cloth Gloves (B53)
Rawhide Mallet (B96)
Nonmetallic Drift (Work Aid)

Material:

Wiping Rag (D164)
White Cotton Gloves (D112)

Personnel Required:

68D Aircraft Powertrain Repairer

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6-4-16. MAIN ROTOR MAST ASSEMBLY (AVIM) — DISASSEMBLY (CONT)

REMOVE LOCK PLATE

1. Cut lockwire and remove two screws (1) from lockplate (2).

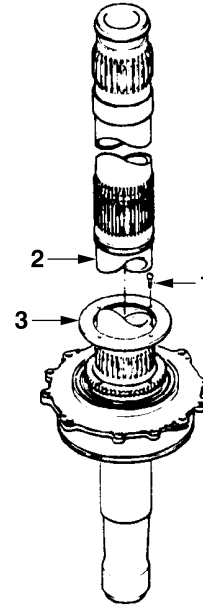
2. Remove lockplate (2) from mast (3).

ASSEMBLE MAST NUT TOOL SET, POWER WRENCH AND MAST

3. Install tube (part of B183) in vise (B211) and tighten vise to secure tube.

4. Slide power wrench (B223) onto tube (Part of B183), being sure to engage studs on power wrench with holes in tube base.

5. Install adapter (part of B183) in power wrench (B223), being sure to mesh splines of adapter and power wrench.



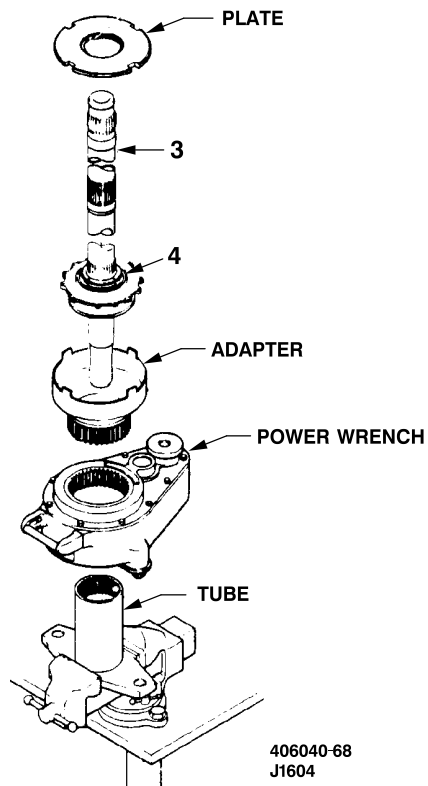
CAUTION

To prevent corrosion, bearing or mast assembly shall not be handled with bare hands below upper mast bearing liner. White cotton gloves (D112) shall be worn.

6. Install mast (3) in adapter (part of B183) being sure to mesh lower mast (3) splines and splines in tube (part of B183).

7. Install plate (part of B183) on mast bearing nut (4) and engage tabs on adapter (part of B183).

8. Ensure that plate (part of B183) is seated against bearing nut (4) and splines are fully engaged.



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6-4-16. MAIN ROTOR MAST ASSEMBLY (AVIM) — DISASSEMBLY (CONT)

CAUTION

To avoid damage to upper mast nut or mast, assurance shall be made that breaking torque is applied to bearing nut in counterclockwise direction.

- Using breaker bar from power wrench kit (B223), break torque on upper mast nut (4).

REMOVE MAST

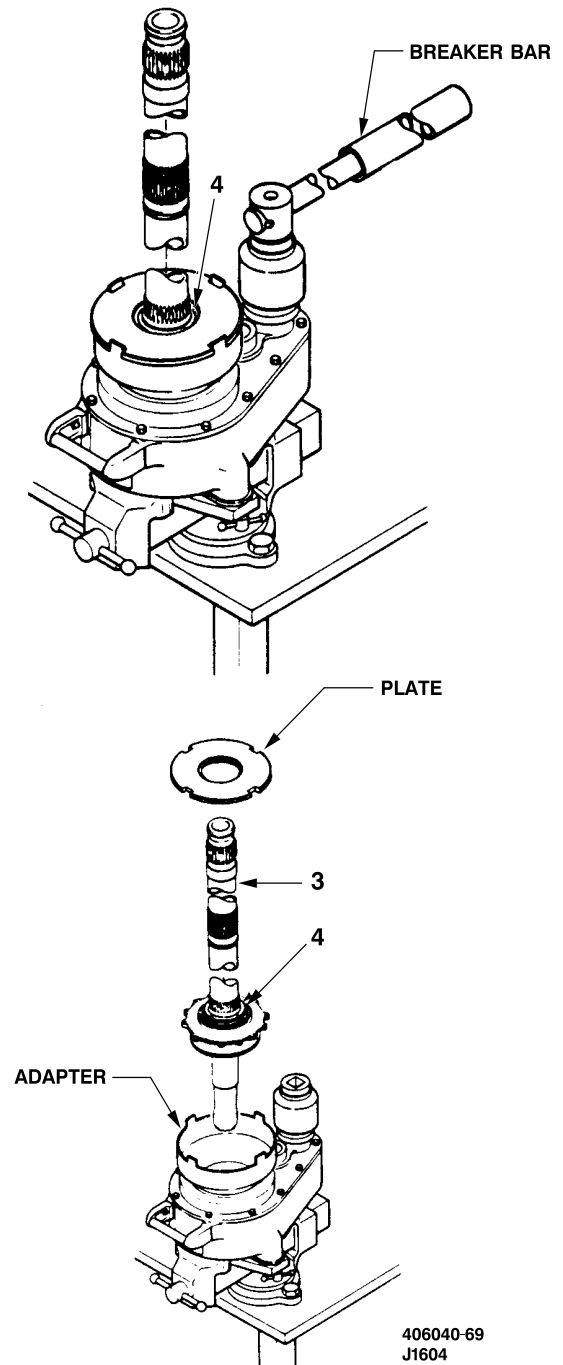
- Remove plate (part of B183) from adapter (part of B183) and mast (3).

CAUTION

To prevent corrosion, bearing or mast assembly shall not be handled with bare hands below upper mast bearing liner. White cotton gloves (D112) shall be worn. After bearing removal, care shall be used to avoid dropping separable pieces.

- Remove mast (3) from adapter (part of B183) and place mast (3) on suitable work bench.

- Disassemble and store power wrench (B223) and mast nut tool set (B183).

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6-4-16. MAIN ROTOR MAST ASSEMBLY (AVIM) — DISASSEMBLY (CONT)

13. Remove upper mast bearing nut (4) from mast (3).

14. Remove four screws (5) from seal and bearing retaining plate (6) and remove seal and bearing retaining plate (6) from mast (3).

15. Remove shim (7) from mast (3).

16. Using **0 to 1 inch** micrometer, measure shims (7) and retain for assembly procedures.

17. Remove packing (8) from bearing liner (9), and mast (3). Discard packing (8).

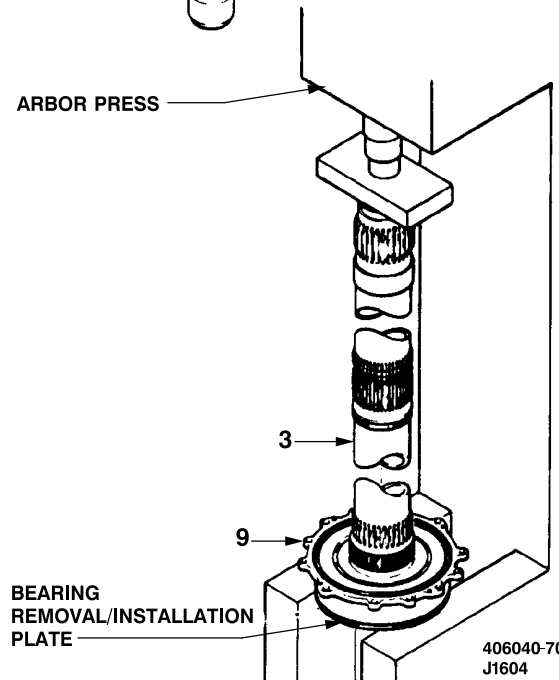
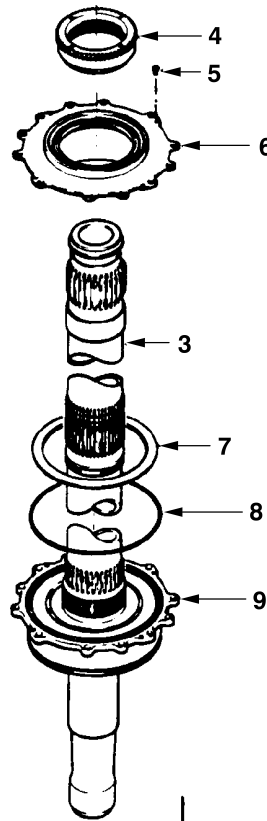
REMOVE BEARING AND LINER

CAUTION

To prevent corrosion, bearing or mast assembly shall not be handled with bare hands below upper mast bearing liner. White cotton gloves (D112) shall be worn.

18. Install bearing removal/installation plate (B103) on bottom end of mast (3). Install over splines with chamfered side toward bearing.

19. Place mast (3), bearing and liner (9) and removal/installation plate (part of B183) upright in hand arbor press (B107). Press bearing and liner (9) from mast (3), being sure to prevent any damage to mast (3).



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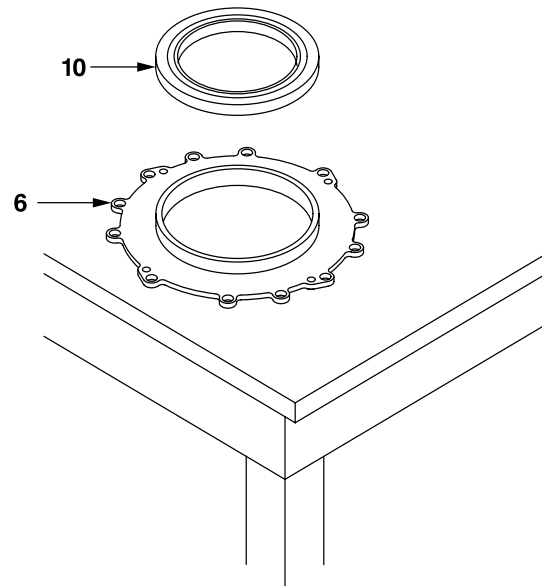
6-4-16. MAIN ROTOR MAST ASSEMBLY (AVIM) — DISASSEMBLY (CONT)

REMOVE UPPER MAST BEARING SEAL

20. Place seal and bearing retaining plate (6) on work bench.

21. Using plastic scraper (B123), remove sealant from seal (10) and seal and bearing retaining plate (6).

22. Remove seal (10) from seal and bearing retaining plate (6) being careful not to damage seal and bearing retaining plate (6), by tapping out with nonmetallic drift and rawhide mallet (B96). Discard seal (10).



REMOVE UPPER MAST BEARING

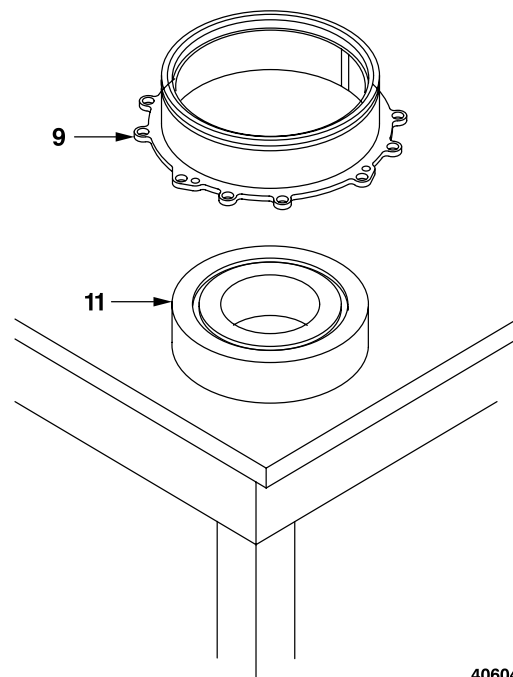
23. Place bearing (11) and bearing liner (9) on work bench.

WARNING

Care shall be exercised when handling heat gun (B59) and heated parts. Asbestos gloves shall be worn to avoid burns. If burn occurs, seek medical aid.

24. Using heat gun (B59), heat bearing liner (9). Remove bearing (11) from bearing liner (9) by tapping out with nonmetallic drift and rawhide mallet (B96).

25. Cover bearing (11) with clean wiping rag (D164) to prevent contamination.



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END OF TASK

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Tool Kit (B180)
Dial Indicator (B37)
Outside Micrometer Caliper Set (B12)
Telescoping Gage Set (B47)
Paint Spray Gun (B61)
Plastic Scraper (B123)
Borescope (B9)

Material:
White Cotton Gloves (D112)
Wiping Rags (D164)
Abrasive Pads (D1)
Sandpaper (D175)

Crocus Cloth (D90)
Rubber Gloves (D111)
Brush Cadmium Plating (D129)
Steel Wool (D205)
Corrosion Preventive Oil (D86)
Epoxy Primer Coating (D98)
Black Acrylic Lacquer (D124)
Fingerprint Removal Compound (D104)
Zinc Phosphate (D229)
Drycleaning Solvent (D199)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
Federal Specification TT-C-490
TM 1-1520-266-23 ■

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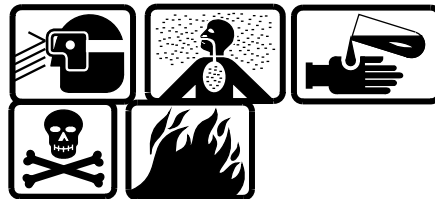
6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

WARNING

Task shall be performed in a well-ventilated area.

CAUTION

To prevent corrosion, mast assembly shall not be handled with bare hands below upper mast bearing liner. White cotton gloves (D112) shall be worn.



Corrosion Preventive Compound

6. If inspection/repair is not performed within 24 hours of cleaning, apply corrosion preventive oil (D86) to mast.

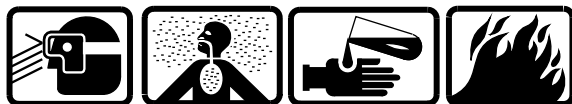
CLEAN MAIN ROTOR MAST



Drycleaning Solvent

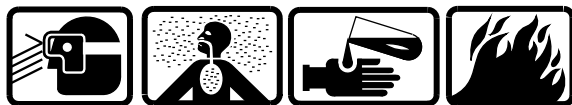
1. Clean main rotor mast with wiping rag (D164) dampened with drycleaning solvent (D199).

2. Dry main rotor mast with clean wiping rag (D164).



Acetone

3. Rinse main rotor mast with drycleaning solvent (D199).



Fingerprint Remover

4. Clean area of main rotor mast below mast bearing journal with fingerprint removal compound (D104).

5. Dry lower area of mast with clean wiping rag (D164).

INSPECT MAIN ROTOR MAST

7. Visually inspect mast for signs of damage or wear. Dimensionally inspect areas that are worn. Reject main rotor mast if limits are exceeded. See figure Main Rotor Mast — Wear Limits.

8. Inspect main rotor mast to damage limits shown. Reject main rotor mast if limits are exceeded or if a crack is found. See figure Main Rotor Mast — Damage Limits. If cracks in main rotor mast are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

9. Perform main rotor mast runout as shown. See figure Main Rotor Mast — Runout Limits.

REPAIR MAIN ROTOR MAST



Sanding Operations

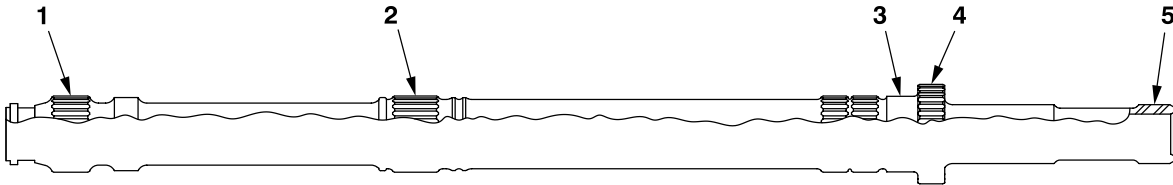
10. Repair damage to main rotor mast using 400 grit sandpaper (D175).

11. Blend repaired area into surrounding area with crocus cloth (D90).

12. Magnetic particle inspect main rotor mast (TM 1-1520-266-23).

GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



MAIN ROTOR MAST
WEAR LIMITS

ITEM	NOMENCLATURE	LOCATION	MINIMUM	MAXIMUM
1.	Spline, upper use 0.1920 dia. pins	Over pins	2.8906	2.8951
2.	Spline, center use 0.0800 dia. pins	Over pins	2.7548	2.7578
3.	Bearing Journal	OD	2.7567	2.7573
4.	Spline, lower use 0.1600 dia. pins	Over pins	3.8225	3.8309
5.	Bearing Journal	OD	1	2.0473

NOTE:

1 Maximum allowable wear on lower journal is 0.0002 inch.
Measure difference in diameter of worn and unworn areas.

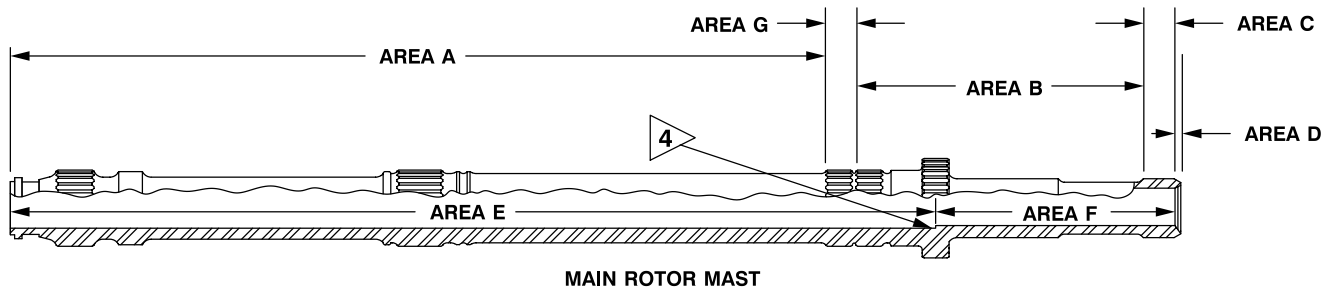
2 Dimensions are in inches.

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Main Rotor Mast — Wear Limits

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6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



MAIN ROTOR MAST

ALLOWABLES:

- | | |
|---|---|
| AREA A - Mechanical and corrosion damage | - 0.005 Inch maximum depth with 0.50 Inch radius. |
| AREA B - Surface corrosion | - Removable with abrasive pads (D1) or steel wool (D205). |
| Axial scratches | - 0.003 inch maximum depth on upper mast bearing journal. No more than eight scratches 0.001-0.003 Inch deep per Inch of circumference. |
| Circumferential scratches | - Surface scratches removable with abrasive pads or steel wool. |
| AREA C - Surface corrosion | - Removable with abrasive pads or steel wool. |
| AREA D - Mechanical and corrosion | - 0.010 Inch maximum depth, with 0.50 inch radius. |
| 3 AREA E - Mechanical and corrosion | - 0.005 inch maximum depth or 1.615 inches maximum inside diameter. |
| 3 AREA F - Mechanical and corrosion | - 0.005 inch maximum depth or 1.515 inches maximum inside diameter. |
| AREA G - Wear to the outside diameter of the spline teeth due to contact with the torque meter transducer is permissible to a minimum diameter of 2.654 inches in the area of contact, provided that: | |
| (1) Top edges of the teeth at outside diameter do not have rolled over material. | |
| (2) Top edges of the teeth have not had their edges broken more than 0.003 inch R. (The edges must remain sharp for the mast torque meter to function properly.) | |
| (3) Wear steps on the spline outside diameter must be blended to 0.50 inch minimum blend radius. | |

NOTES:

1. Maximum area per external repair is one square inch, and maximum number of repairs is five.
2. External repairs shall have a minimum blend radius of 0.50 inch.
- 3 Cleanup, by honing or similar method, material removal to be uniform around diameter, with 0.50 inch maximum blend radius.
- 4 0.62 ± 0.030 Inch radius. If honed, no mismatch is allowed in this area.

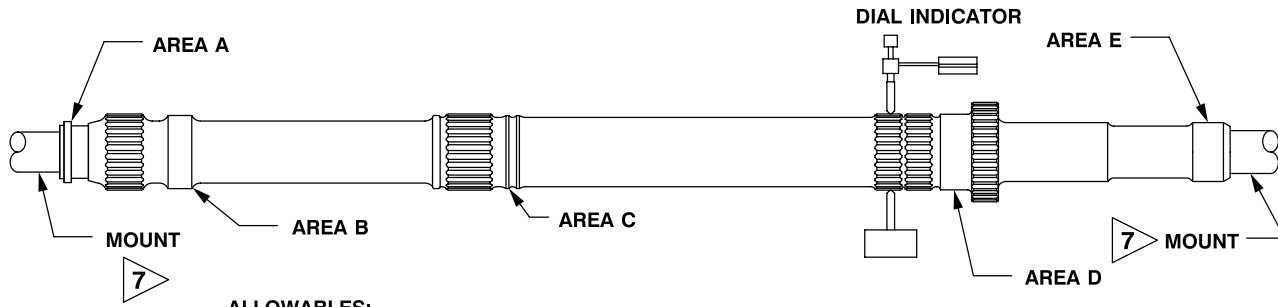
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Main Rotor Mast — Damage Limits

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6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

PREFERRED MAST RUNOUT METHOD (MAIN ROTOR)

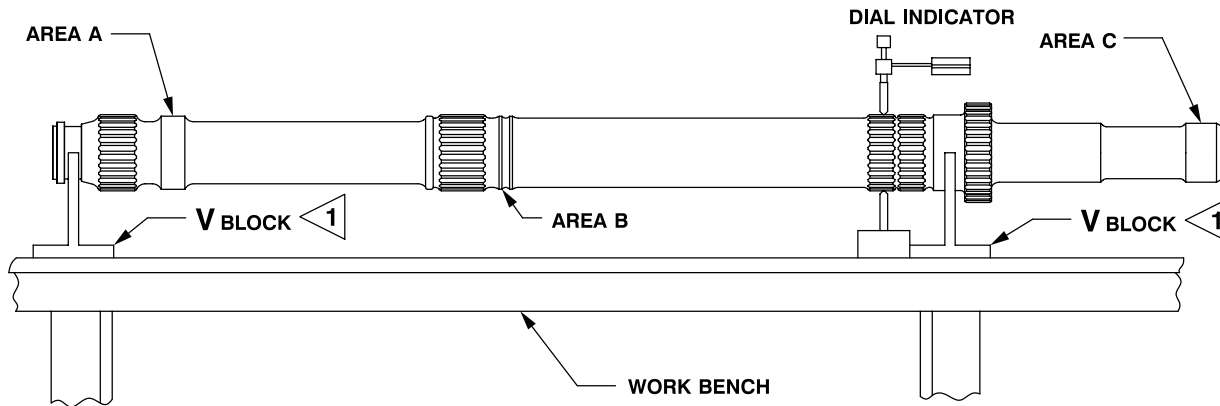


ALLOWABLES:

1. Runout at AREA A (upper cone seat) not to exceed 0.001 inch TIR.
2. Runout at AREA B (lower cone seat) not to exceed 0.001 inch TIR.
3. Runout at AREA C not to exceed 0.005 inch TIR.
4. Runout at AREA D (upper bearing journal) not to exceed 0.002 inch TIR.
5. Runout at AREA E (lower bearing journal) not to exceed 0.001 inch TIR.
6. Runout at all other areas not to exceed 0.010 Inch TIR.

7 Mount mast between centers; turn by hand only.

ALTERNATE MAST RUNOUT METHOD (MAIN ROTOR)



ALLOWABLES:

1. Runout at AREA A (lower cone seat) not to exceed 0.002 inch TIR.
2. Runout at AREA B not to exceed 0.006 inch TIR.
3. Runout at AREA C (lower bearing journal) not to exceed 0.003 inch TIR.
4. Runout at all other areas not to exceed 0.011 inch TIR.

NOTES:

- 1 To prevent binding of mast in "V" blocks when turned, place 1/4 inch square steel stock in groove of "V" blocks.
2. Any runout measured that is greater than specified limits is not cause for replacement. Recheck mast using preferred method.

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Main Rotor Mast — Runout Limits

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6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

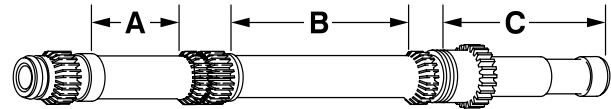
NOTE

Brush cadmium plating, epoxy primer coating, or black acrylic lacquer shall not be applied to area C of mast.



LHE Cadmium Solution

13. Apply brush cadmium plating (D129) to repairs made to mast in areas A or B.



MAIN ROTOR MAST

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J1604



Acetone

14. Protect reworked inside diameter as follows:

- a. Clean with acetone (D2).
- b. Apply zinc phosphate (D229) in accordance with Federal Specification TT-C-490.
- c. Install a non-metallic plug in lower end of mast.



Epoxy Primer Coating

d. Flow epoxy primer coating (D98) into bore while rotating mast. Ensure coverage of all internal surfaces.

e. Position mast upright, remove plug and drain primer. Allow to air dry.



Acrylic Lacquer

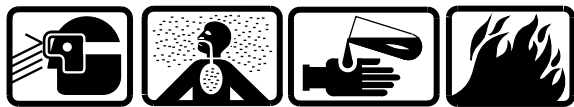
15. Apply one coat of epoxy primer coating (D98), let dry, and apply two coats of black acrylic lacquer (D124) to repairs made in areas A or B. No paint is allowed on splines or threads.

16. Lightly stamp the letter “R” on the center of the data plate between the part number and serial number.

CLEAN MAST BEARING NUT LOCKPLATE

GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



Drycleaning Solvent

17. Clean mast bearing nut lockplate with wiping rag (D164) dampened with drycleaning solvent (D199).

18. Dry mast bearing nut with clean wiping rag (D164).

INSPECT MAST BEARING NUT LOCKPLATE

19. Fluorescent penetrant inspect mast bearing nut lockplate (TM 1-1520-266-23).

20. Inspect mast bearing nut lockplate to damage limits shown. Reject mast bearing nut that exceeds limits or if a crack is found. See figure Mast Bearing Nut Lockplate — Damage Limits. If cracks in mast bearing nut lockplate are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR MAST BEARING NUT LOCKPLATE

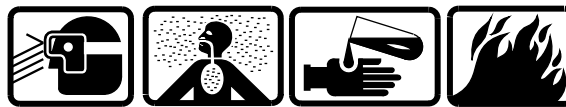


Sanding Operations

21. Repair damage to mast bearing nut lockplate using 400 grit sandpaper (D175).

22. Blend repaired area into surrounding area with crocus cloth (D90).

CLEAN UPPER MAST BEARING NUT



Drycleaning Solvent

23. Clean upper mast bearing nut with wiping rag (D164) dampened with drycleaning solvent (D199).

24. Dry upper mast bearing nut with clean wiping rag (D164).

INSPECT UPPER MAST BEARING NUT

25. Fluorescent penetrant inspect upper mast bearing nut (TM 1-1520-266-23).

26. Inspect mast bearing nut to damage limits shown. Reject upper mast bearing if limits are exceeded or if a crack is found. See figure Upper Mast Bearing Nut — Damage Limits. If cracks in mast bearing nut are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR UPPER MAST BEARING NUT



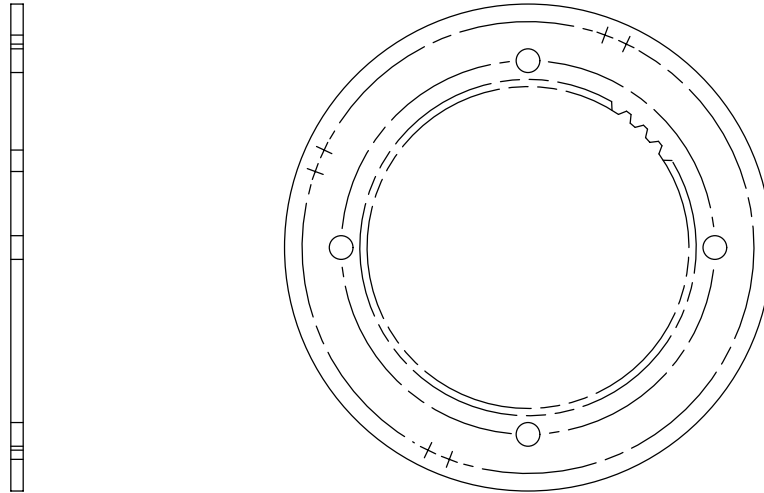
Sanding Operations

27. Repair damage to upper mast bearing nut using 400 grit sandpaper (D175).

28. Blend repaired area into surrounding area with crocus cloth (D90).

GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



MAST BEARING NUT LOCKPLATE

DAMAGE LOCATION SYMBOL



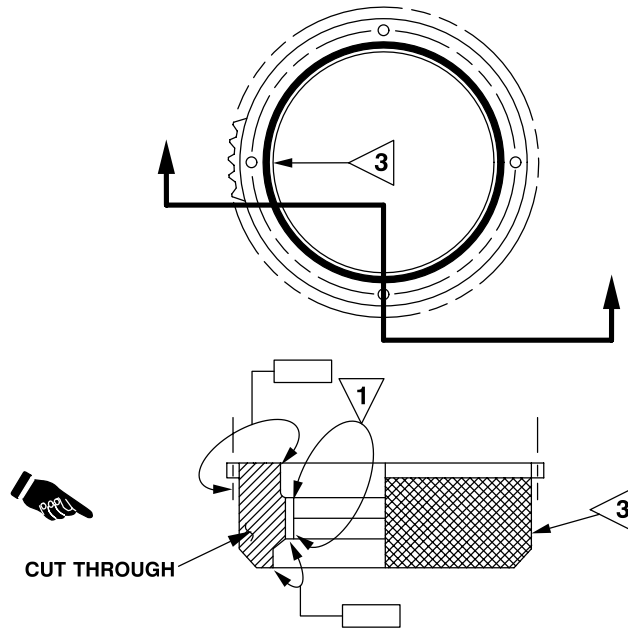
TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL	0.005 in. before and after repair
CORROSION	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	1.0 sq. in.
NUMBER OF REPAIRS	4
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.
SPLINE DAMAGE:	
Depth:	0.005 in.
Length:	Full face width
Number:	40 Total, no more than 10 in 90° quadrant.

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J1604

Mast Bearing Nut Lockplate — Damage Limits

GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



UPPER MAST BEARING NUT

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.003 in. before and after repair	0.010 in. before and after repair
MECHANICAL		
CORROSION	Only that removable with steel wool (D205) or abrasive pads (D1)	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR		0.25 sq. in.
NUMBER OF REPAIRS		4
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.	0.030 in.
SPLINE DAMAGE:		
Depth:	0.010 in.	
Length:	Full face width	
Number:	All	

NOTES:

- 1 One thread maximum at each end may be reworked to remove damage.
- 2. Maximum allowable depth of seal wear groove is 0.002 inch on diameter.
- 3 No mechanical damage allowed on seal mating diameter.

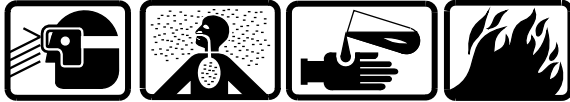
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J1604

Upper Mast Bearing Nut — Damage Limits

GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN MAST SEAL BEARING RETAINING PLATE



Drycleaning Solvent

29. Clean sealant from edge of retaining plate with plastic scraper (B123). Clean mast seal bearing retaining plate with wiping rag (D164) dampened with drycleaning solvent (D199).

30. Dry mast seal bearing with clean wiping rag (D164).

INSPECT MAST SEAL BEARING RETAINING PLATE

31. Fluorescent penetrant inspect mast seal bearing retaining plate (TM 1-1520-266-23).

32. Inspect mast seal bearing retaining plate to damage limits shown. Reject mast seal bearing retaining plate if limits are exceeded. See figure Mast Seal Bearing Retaining Plate — Damage Limits. If cracks in mast seal bearing retaining plate are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

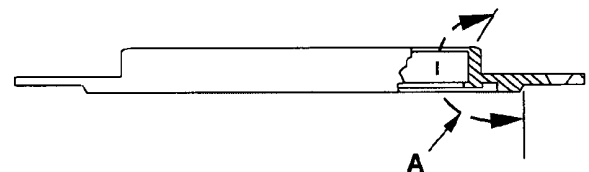
REPAIR MAST SEAL BEARING RETAINING PLATE



Sanding Operations

33. Repair damage to mast seal bearing retaining plate using 400 grit sandpaper (D175).

34. Blend repaired area into surrounding area with crocus cloth (D90).



MAST SEAL BEARING RETAINING PLATE

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LHE Cadmium Solution

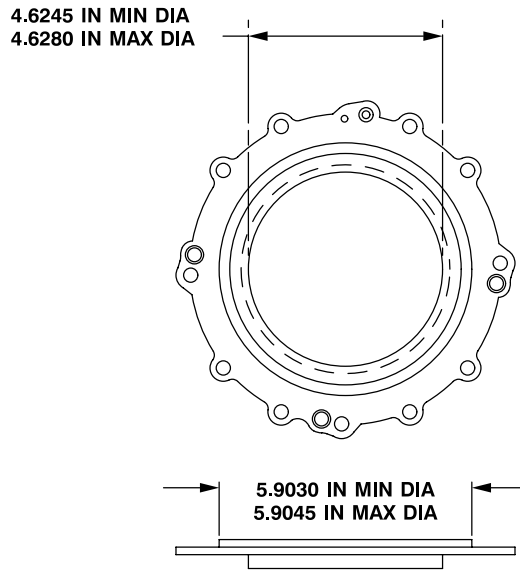
NOTE

Brush cadmium plating shall be omitted from area A of mast seal and bearing retaining plate.

35. Apply brush cadmium plating (D129) to mast seal and bearing retaining plate.

GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



MAST SEAL BEARING RETAINING PLATE

DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL	0.005 in. before and after repair
CORROSION	0.005 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.50 sq. in.
NUMBER OF REPAIRS	6
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.

NOTES:

1. No cracks are permitted.
2. No wear through permitted.

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J1604

Mast Seal Bearing Retaining Plate — Damage Limits

GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN UPPER MAST BEARING



Drycleaning Solvent

36. Clean upper mast bearing using drycleaning solvent (D199) and a brush.

37. Let upper mast bearing air dry and then cover with clean wiping rag (D164) to prevent contamination with foreign particles.

INSPECT UPPER MAST BEARING

CAUTION

To prevent corrosion, bearings shall not be handled with bare hands. White cotton gloves (D112) shall be worn.

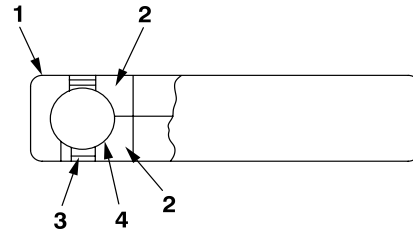
38. Inspect for brinelling, pitting, spalling, corrosion, and burnishing of outer race (1) and inner races (2).

NOTE

Tarnish of cage is not reason for replacement.

39. Inspect for broken cage (3) and pitting, nicks, spalling, corrosion, and scoring of ball bearings (4).

40. Replace upper mast bearing which has been subjected to high impact forces (e.g., crash landing, sudden stoppage, etc.).



UPPER MAST BEARING

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J1604

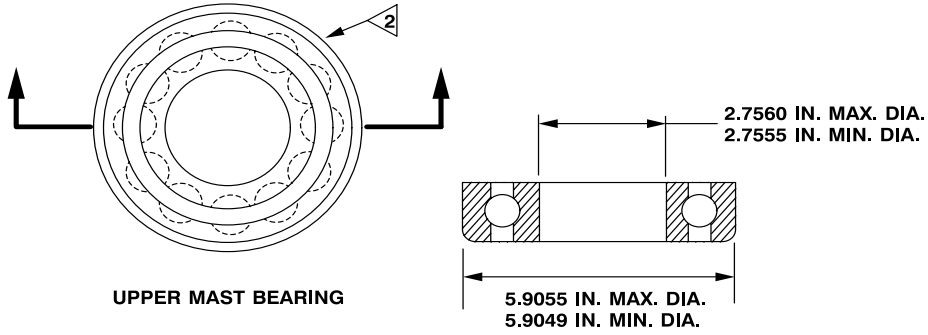
NOTE



Axial and radial play of the upper mast bearing is normal: measurements are not required. Transmission oil sampling, chip detector, and visual inspections are the only methods used to determine the condition of the mast bearing.

41. Inspect upper mast bearing to damage limits shown. Reject bearing if limits are exceeded. See figure Upper Mast Bearing — Damage Limits.


GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



TYPE OF DAMAGE	DAMAGE LOCATION SYMBOLS
MECHANICAL DAMAGE	 MAXIMUM DAMAGE AND REPAIR DEPTH
CORROSION	None
MAXIMUM AREA PER FULL DEPTH REPAIR	None
NUMBER OF REPAIRS	None
EDGE CHAMFER TO REMOVE DAMAGE	 0.015 in.

NOTES:

1. No cracks are permitted.
-  Edge breaks to remove damage are not permitted adjacent to ball paths.

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J1604

Upper Mast Bearing — Damage Limits

GO TO NEXT PAGE

6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN UPPER MAST BEARING LINER**Drycleaning Solvent**

42. Clean upper mast bearing liner with wiping rag (D164) dampened with drycleaning solvent (D199).

43. Dry upper mast bearing liner with clean wiping rag (D164).

INSPECT UPPER MAST BEARING LINER

44. Magnetic particle inspect upper mast bearing liner (TM 1-1520-266-23).

45. Inspect upper mast bearing liner to damage limits shown. Reject upper mast bearing liner if limits are exceeded. See figure Mast Seal Bearing Retaining Plate — Damage Limits. If cracks in upper mast bearing liner are suspected perform eddy current inspection (TM 1-1520-266-23).

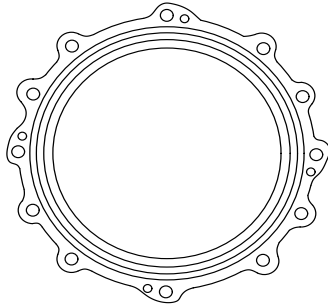
REPAIR UPPER MAST BEARING LINER**Sanding Operations**

46. Repair damage to upper mast bearing using 400 grit sandpaper (D175).

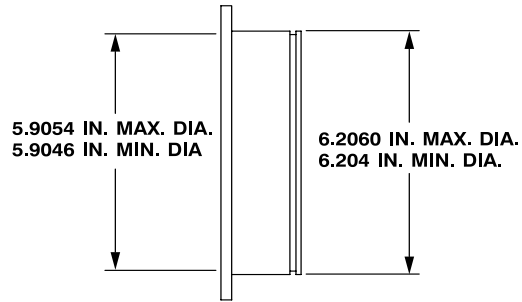
47. Blend repaired area into surrounding area with crocus cloth (D90).

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6-4-17. MAIN ROTOR MAST ASSEMBLY COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



**MAST SEAL BEARING
RETAINING PLATE**



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL DAMAGE

0.005 in. before and after repair

CORROSION

0.005 in. before and after repair

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

0.50 sq. in.

NUMBER OF REPAIRS

4

**EDGE CHAMFER TO
REMOVE DAMAGE**

0.030 in.

NOTE: No cracks are permitted.

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J1604

Mast Seal Bearing Retaining Plate — Damage Limits

END OF TASK

6-4-18. MAIN ROTOR MAST ASSEMBLY — CLEANING/INSPECTION

This task covers: Cleaning and Inspection (On Helicopter).

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
Maintenance Stand (B162)
Borescope (B9)

Material:

Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rags (D164)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Mast Mounted Sight Removed
(TM 9-1240-778-23)
Standpipe Electrical Assembly Removed
(Task 6-4-1)

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6-4-18. MAIN ROTOR MAST ASSEMBLY — CLEANING/INSPECTION (CONT)

CLEAN



Drycleaning Solvent

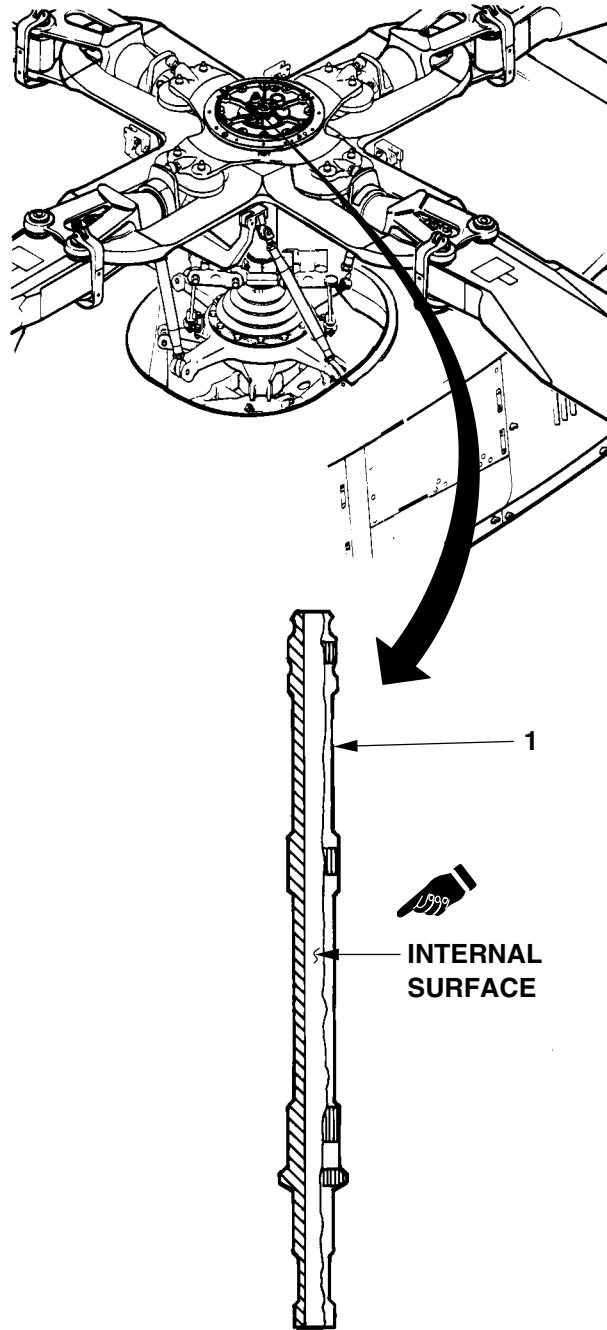
1. Clean internal surfaces of main rotor mast assembly (1) with a wiping rag (D164) dampened with drycleaning solvent (D199) attached to suitable extension handle.

2. Dry internal surfaces of main rotor mast assembly (1) with a clean wiping rag (D164).

INSPECT

3. Using borescope (B9), inspect main rotor mast assembly (1) internal surfaces for signs of damage or corrosion.

4. If damage or corrosion is evident, process main rotor mast assembly (1) to next higher repair facility.



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J1604

END OF TASK

6-4-19. MAIN ROTOR MAST ASSEMBLY (AVIM) — ASSEMBLY

This task covers: Assembly (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Asbestos Cloth Gloves (B53)
Powertrain Tool Kit (B180)
Hoist (B69)
Hand Arbor Press (B107)
Mast Nut Tool Set (B183)
Power Wrench (B223)
Bearing Removal and Installation Plate (B103)
Machine Table Vise (B211)
Outside Micrometer Caliper Set (B12)
Heat Gun (B59)

Material:

Sealant (D180)
Sealing Compound (D184)
White Cotton Gloves (D112)
Corrosion Preventive Compound (D82)
Wiping Rag (D164)
Lockwire (D132)
Lubricating Oil (D139 or D140)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

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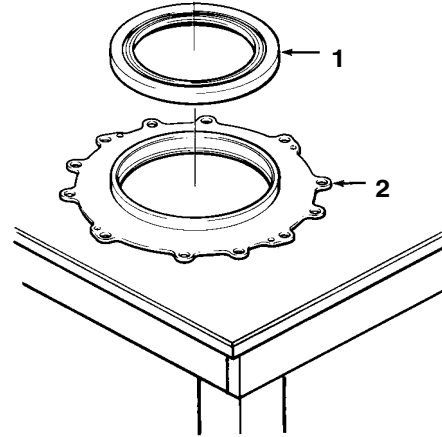
6-4-19. MAIN ROTOR MAST ASSEMBLY (AVIM) — ASSEMBLY (CONT)

INSTALL SEAL IN SEAL AND BEARING RETAINING PLATE



Sealing Compound

1. Apply thin coat of sealant (D180) to outside diameter of seal (1) and bore of seal and bearing retaining plate (2).
2. Press seal (1) into seal and bearing retaining plate (2) using hand arbor press (B107).
3. Use wiping rag (D164) to remove excess sealant.



INSTALL BEARING IN BEARING LINER

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Install mast upper bearing outer race with outside diameter chamfer "UP" and inner race rings with dull burnish marks aligned. Install inner race half marked "THRUST" in "DOWN" position. These characteristics are critical to flight safety.

NOTE

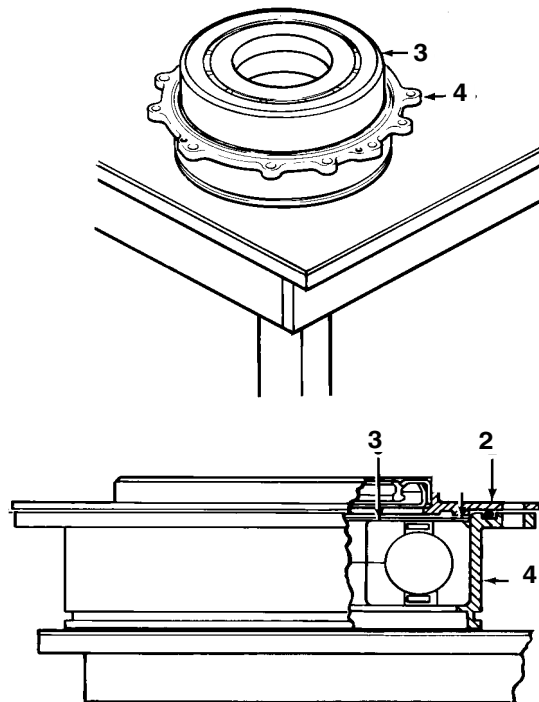
Bearing is a four piece bearing. Outer race is to be pressed into liner first, then bearing cage and split inner race are to be installed just prior to installation of mast.

4. Align bearing (3) with large chamfer up towards flange of bearing liner (4).

WARNING

Care shall be exercised when handling heat gun (B59) and heated parts. Asbestos gloves shall be worn to avoid burns. If burn occurs, seek medical aid.

5. Using heat gun (B59), heat bearing liner (4) until outer race of bearing (3) can be pressed into bearing liner (4) with the aid of a hand arbor press (B107).



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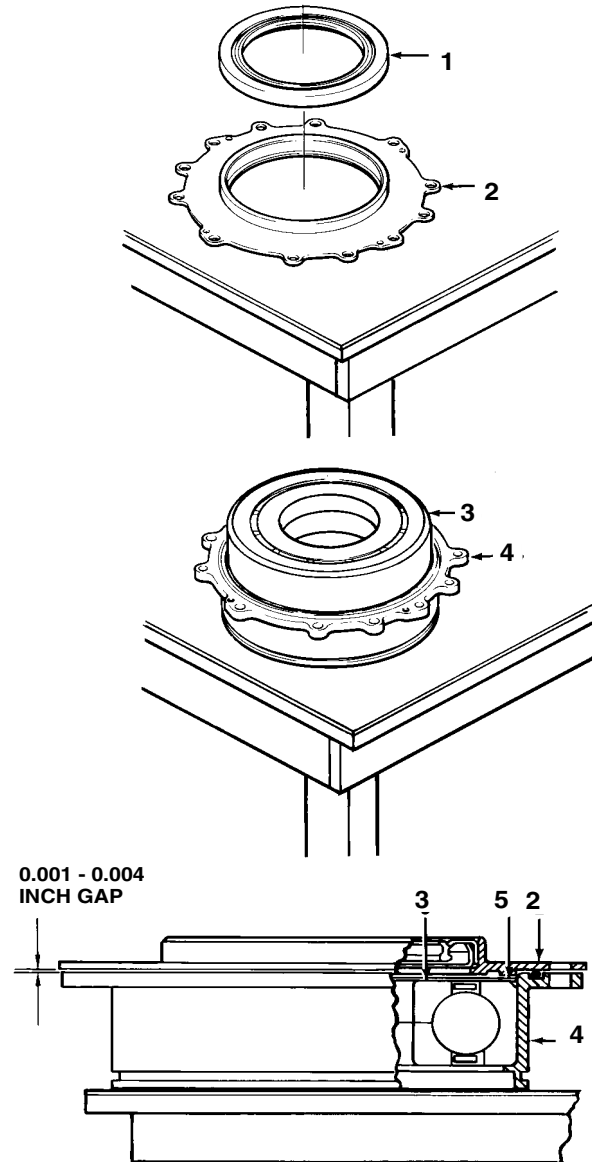
6-4-19. MAIN ROTOR MAST ASSEMBLY (AVIM) — ASSEMBLY (CONT)

PREPARE SHIM

6. Install shim (5) on bearing (3) in bearing liner (4).

7. Install seal (1) and bearing retainer plate (2) on bearing liner (4).

8. Measure gap between seal (1) and bearing retainer plate (2) and bearing liner (4) with feeler gage.



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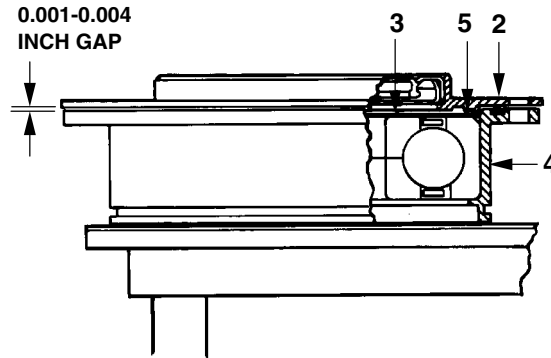
6-4-19. MAIN ROTOR MAST ASSEMBLY (AVIM) — ASSEMBLY (CONT)

9. Measure shim (5) with micrometer (B12) and add or delete shims to achieve a **0.001 to 0.004 inch** gap.

10. Remove seal and bearing retainer plate (2) from bearing liner (4).

11. Remove shim (5) from bearing (3).

12. Cover seal and bearing retainer plate (2) and bearing (3) in bearing liner (4) with a clean wiping rag (D164) to prevent contamination, unit installation.



INSTALL BEARING AND RETAINER ON MAST

13. Place mast bearing removal and installation plate (6) (B103) on base of hand arbor press with chamfered side up.

14. Place bearing and liner (4) on bearing removal and installation plate (6).



Corrosion Preventive Compound

15. Apply corrosion preventive compound (D82) to bearing journal to include the bottom two to three threads of the mast nut retaining threads.

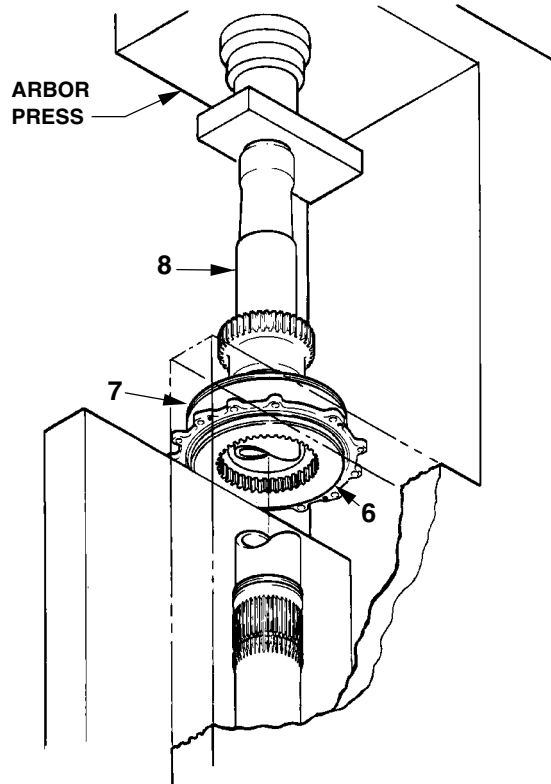
CAUTION

To prevent corrosion, mast shall not be handled with bare hands below upper mast bearing journal. White cotton gloves (D112) shall be worn.

16. Invert mast (8) and install through bearing and liner (7) and removal and bearing installation plate (6).

17. Protect bottom of mast (8) from damage and press mast (8) into bearing and liner (7).

18. Remove excess corrosion preventive compound with clean wiping rag (D164).



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6-4-19. MAIN ROTOR MAST ASSEMBLY (AVIM) — ASSEMBLY (CONT)

INSTALL MAST COMPONENTS



Lubricating Oil

19. Lubricate packing (9) with lubricating oil (D139 or D140).

20. Install packing (9) in groove of bearing liner (4).

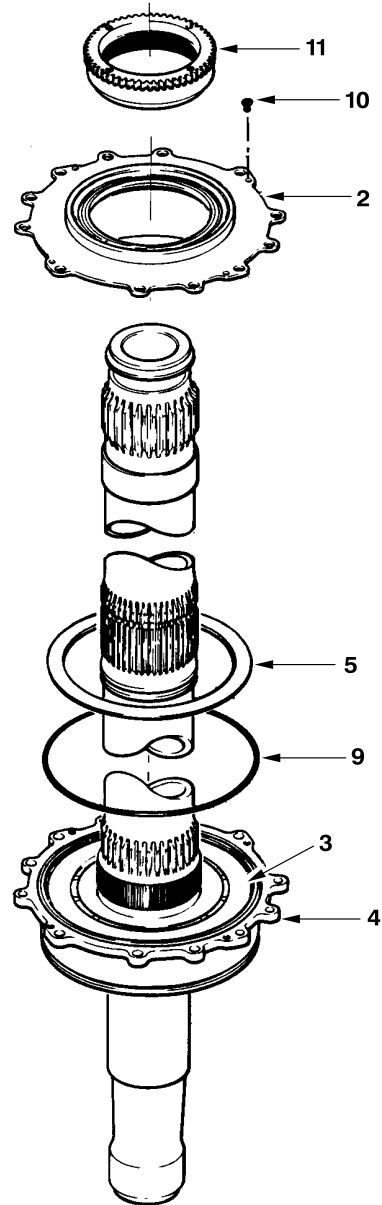
21. Install shim (5) on bearing (3).

INSPECT

22. Install seal and bearing retaining plate (2) on bearing liner (4).

23. Secure seal and bearing retaining plate (2) to bearing liner (4) with four screws (10).

24. Install upper mast bearing nut (11) on retaining threads of mast and hand tighten.



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6-4-19. MAIN ROTOR MAST ASSEMBLY (AVIM) — ASSEMBLY (CONT)

ASSEMBLE MAST NUT TOOL SET (B183),
POWER WRENCH (B223) AND MAST

25. Install tube (part of B183) in vise (B211) and tighten vise to secure tube.

26. Slide power wrench (B223) onto tube (part of B183) being sure to engage studs on power wrench (B223) with holes in tube base.

27. Install adapter (part of B183) in power wrench (B223), being sure to mesh splines of adapter and power wrench.

CAUTION

To prevent corrosion, bearing or mast assembly shall not be handled with bare hands below upper mast bearing liner. White cotton gloves (D112) shall be worn.

28. Install mast assembly (12) in adapter (part of B183) being sure to mesh lower mast splines and splines in tube (part of B183).

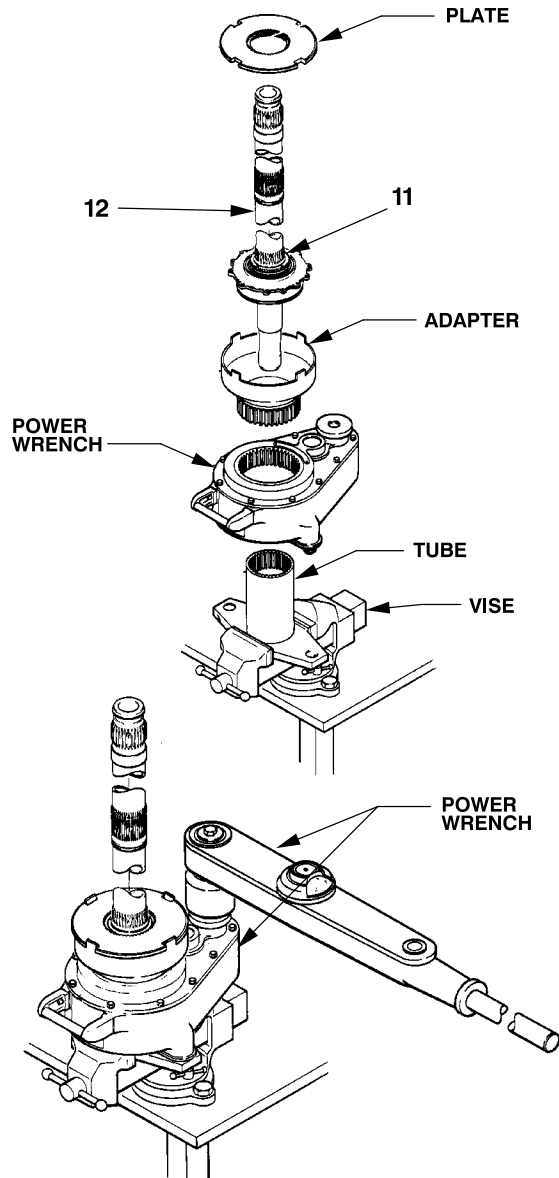
29. Install plate (part of B183) on upper mast nut (11) and engage tabs on adapter (part of B183).

30. Ensure that retaining nut in plate (part of B183) is seated against bearing nut (11) and splines are fully engaged.

CAUTION

To avoid damage due to incorrect torque, power wrench (B223) shall be checked for torque conversion chart.

31. Using torque wrench (B223) in power wrench kit, torque upper mast nut (11) PART NUMBERS: (406-040-090-101) **600 TO 650 FOOT-POUNDS**, (406-040-090-103) **450 TO 500 FOOT POUNDS**.



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6-4-19. MAIN ROTOR MAST ASSEMBLY (AVIM) — ASSEMBLY (CONT)

REMOVE MAST

32. Remove plate from adapter and mast assembly (12).

CAUTION

To prevent corrosion, bearing or mast assembly shall be handled with bare hands below upper mast bearing liner. White cotton gloves (D112) shall be worn.

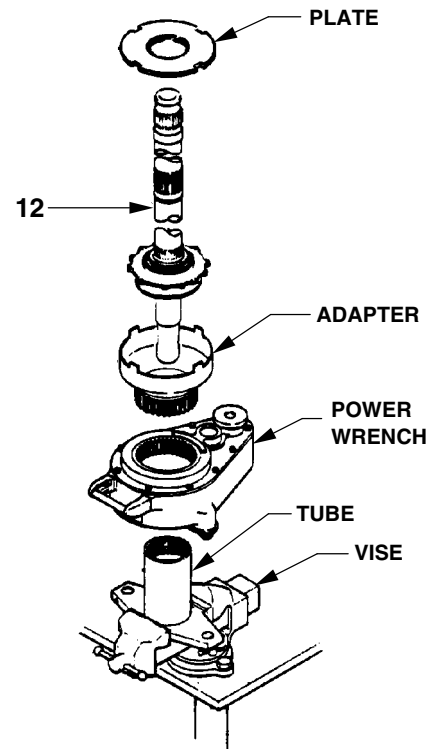
33. Remove mast assembly (12) from adapter and place mast assembly on suitable work bench.

34. Disassemble and store power wrench kit and mast nut tool set.

35. Install lockplate (13) on upper mast nut (11) with two screws (14).

36. Secure two screws (14) to lockplate (13) with lockwire (D132).

37. Remove tube from vise.

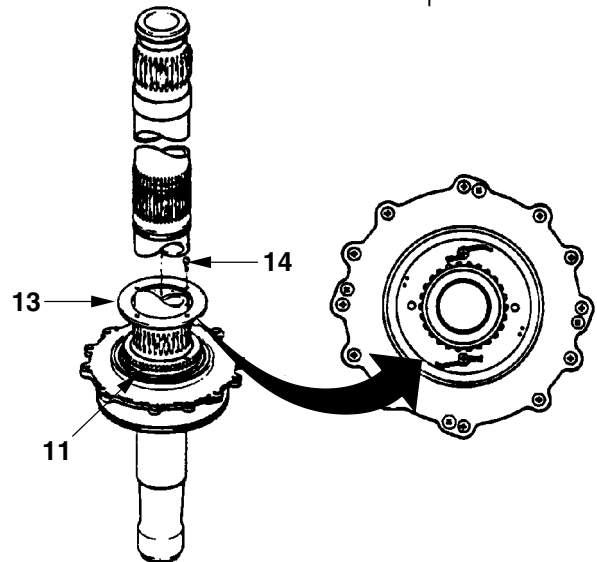


INSPECT



Sealing Compound

38. Apply sealing compound (D184) to mating surface of mast splines and lockplate.



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END OF TASK

6-4-20. MAIN ROTOR MAST ASSEMBLY — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Asbestos Cloth Gloves (B53)
Maintenance Stand (B162)
Mast Lifting Clevis (B20)
Lifting Eye Clevis (B19)
Heat Gun (B59)
Hoist (B69)

Material:
Sealant (D180)
Lubricating Oil (D139 or D140)
White Cotton Gloves (D112)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)

References:
TM 1-1520-248-T
TM 9-1240-778-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

6-4-20. MAIN ROTOR MAST ASSEMBLY — INSTALLATION (CONT)



Lubricating Oil

1. Lubricate packings (1 and 2) with lubricating oil (D139 or D140).
2. Install packings (1 and 2) on bearing retainer (3).

CAUTION

To prevent corrosion, bearing or mast assembly shall not be handled with bare hands below upper mast bearing retainer plate. When handling mast, white cotton gloves (D112) shall be worn.

NOTE

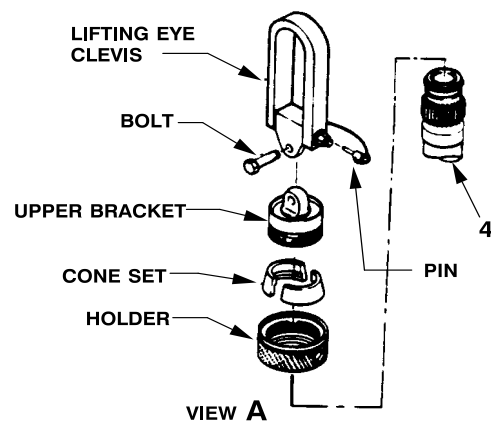
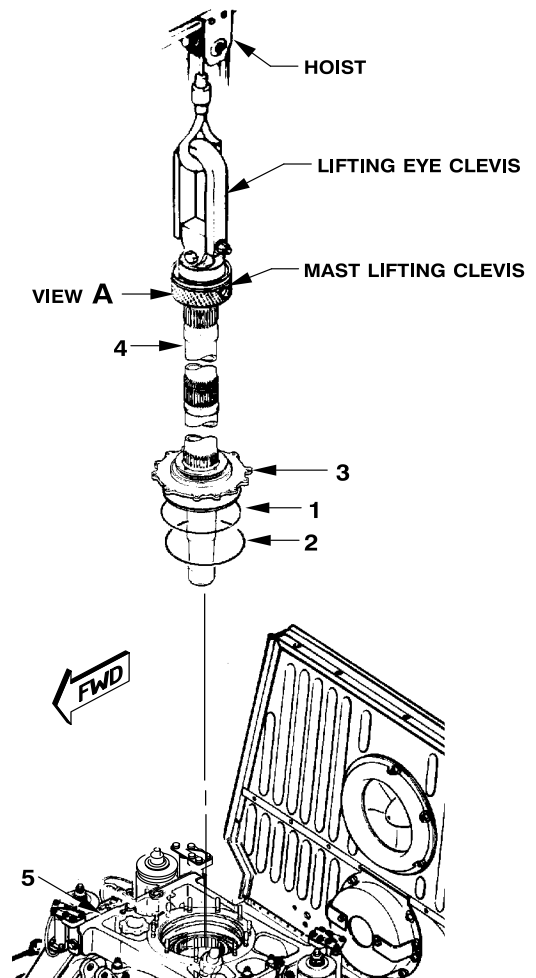
Mast being installed shall be verified as applicable to split cone configuration (Task 5-1-2).

3. Install mast lifting clevis (B20) on mast (4). Use a spanner wrench to tighten holder (part of B20) on upper bracket (part of B20).

WARNING

To prevent injury to personnel and/or damage to equipment ensure pin is properly installed through bolt that connects lifting eye clevis (B19) to mast lifting clevis (B20).

4. Connect lifting eye clevis (B19) to mast lifting clevis (B20) with bolt (part of B19) and pin (part of B19).
5. Connect hoist (B69) to lifting eye clevis (B19), lift and position mast (4) over transmission (5).



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6-4-20. MAIN ROTOR MAST ASSEMBLY — INSTALLATION (CONT)

WARNING

Care shall be exercised when handling heat gun (B59) and heated parts. Asbestos gloves (B53) shall be worn to avoid burns. If burn occurs, seek medical aid.

CAUTION

Top case area shall not be heated to more than 250 °F. Overheating can cause damage to metal.

6. Heat gun (B59) shall be used to heat top case area where mast (4) mounts to transmission (5).



Sealing Compound

7. Apply thin layer of sealing compound (D180) to mating surface of bearing retainer (3) and transmission (5).

CAUTION

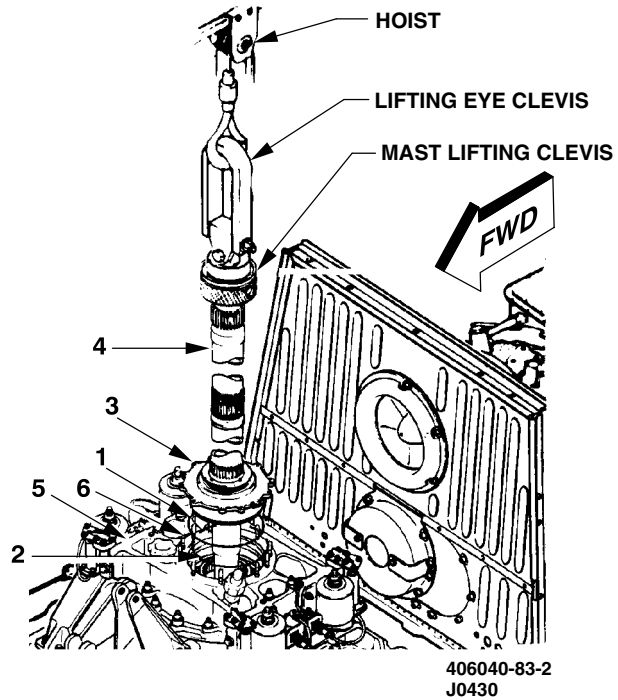
Mast surfaces shall not contact or hit gears in transmission. Inadvertent contact causing scratches or nicks in lower mast surface is cause for inspection and possible replacement of mast.

8. Using hoist (B69), lower mast (4) into transmission (5), guiding mast (4) by hand until bearing retainer (3) contacts transmission (5).

9. Align holes of bearing retainer (3) with studs (6) of transmission (5) and lower mast (4) slightly.

10. Turn mast (4) left and right until mast splines engage sun gear splines in transmission (5).

INSPECT



FOLLOW-ON MAINTENANCE

Install swashplate and support (Task 5-2-38).

Install main rotor hub and blades (Task 5-1-2).

Install torquemeter support and bearing assembly (Task 6-4-11).

Install standpipe electrical assembly (Task 6-4-3).

Install mast mounted sight (TM 9-1240-778-23).

Install air induction cowling (Task 4-2-4).

Install engine cowl assembly (Task 2-2-50).

Install forward fairing assembly (Task 2-2-47).

Perform mast torque system calibration (TM 1-1520-248-T).

Perform TAMS static calibration (TM 1-1520-248-T).

END OF TASK

Section V. FREEWHEELING UNIT

6-15. FREEWHEELING UNIT

Standard torques are provided in Appendix P and TM 1-1500-204-23.

6-16. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and installation of freewheeling unit components.

6-17. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Freewheeling Unit — Removal	6-5-1	6-188
Forward Cap Oil Seal Assembly — Removal/Cleaning/Inspection/ Repair/Installation	6-5-2	6-195
Freewheeling Unit Components (AVIM) — Cleaning/Inspection/ Repair	6-5-3	6-201
Freewheeling Unit Tail Rotor Drive Output Oil Seal (AVIM) — Removal/Installation	6-5-4	6-223
Freewheeling Unit Tail Rotor Output Shaft Support Bearing (AVIM) — Removal/Installation	6-5-5	6-225
Freewheeling Unit Tail Rotor Drive Output Adapter Wear Sleeve (AVIM) — Removal/Installation	6-5-6	6-227
Freewheeling Unit — Installation	6-5-7	6-229

6-5-1. FREEWHEELING UNIT — REMOVAL

This task covers: Removal of Freewheeling Unit (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
General Mechanic Tool Kit (B178)
Input Spanner Adapter (B4)
Spanner (B133)
Spline Wrench (B231)
Drain Hose (B73)
Plastic Scraper (B123)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)
Jackscrew Set (B129)
Maintenance Stand (B162)

Material:

Masking Tape (D216)
Barrier Material (D49)
Tape (D217)
Wiping Rag (D164)
Rubber Gloves (D111)

Personnel Required:

68D Aircraft Powertrain Repairer (2)

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Air Induction Cowling Removed (Task 4-2-1)
Engine to Transmission Driveshaft Removed
(Task 6-2-1)
Forward Shaft Assembly Removed
(Task 6-6-1 or 6-6-2)

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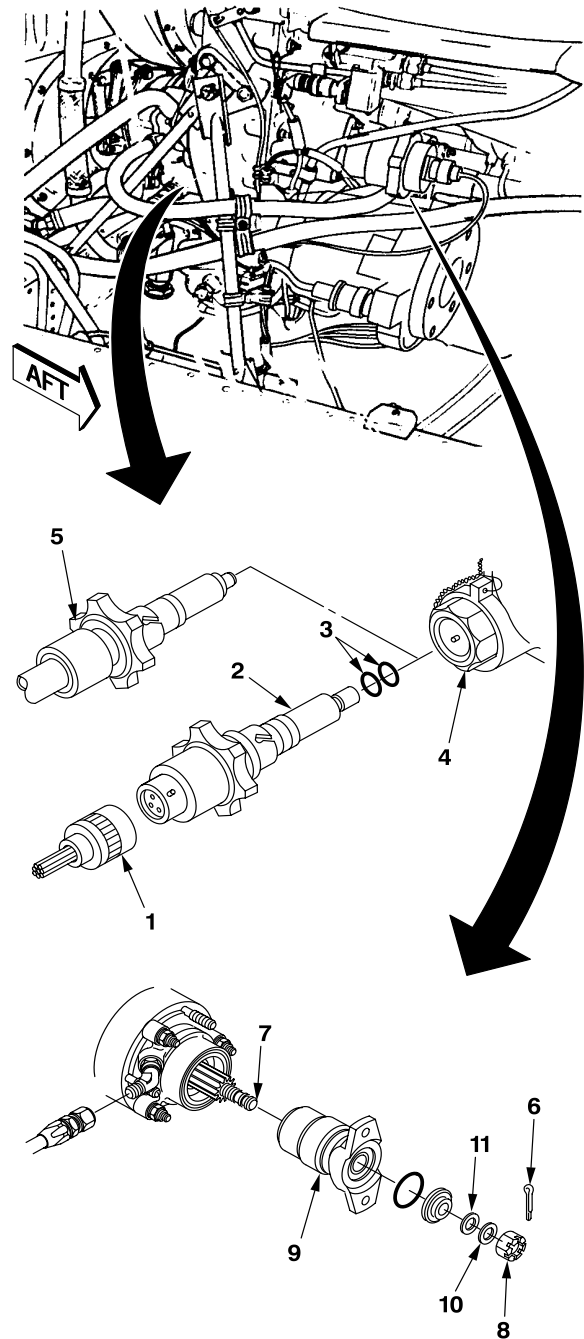
6-5-1. FREEWHEELING UNIT — REMOVAL (CONT)

1. Gain access to freewheeling unit through engine left side panel.
2. Remove electrical connector (1) from chip detector (2).



Lubricating Oil

3. Remove chip detector (2) and two packings (3) from chip detector housing (4).
4. Remove and discard packings (3) from chip detector (2).
5. Install drain hose (B73) (5) in chip detector housing (4) and drain oil into suitable container (B101).
6. When oil is completely drained from free-wheeling unit, remove drain hose (5).
7. Remove and discard cotter pin (6) from output shaft assembly (7) and adapter retaining nut (8).
8. Install input spanner adapter (B4) on output shaft adapter (9) and secure in place with accompanying hardware.
9. While holding output shaft adapter (9) with input spanner adapter (B4), remove nut (8), washer (10), if installed, and washer (11) from output shaft assembly (7).



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6-5-1. FREEWHEELING UNIT — REMOVAL (CONT)

10. Using plastic scraper (B123) remove sealant from spacer sleeve (12), packing (13), and output adapter (9).

11. Remove spacer sleeve (12) with packing (13) from output shaft assembly (7).

12. Remove and discard packing (13) from spacer sleeve (12).



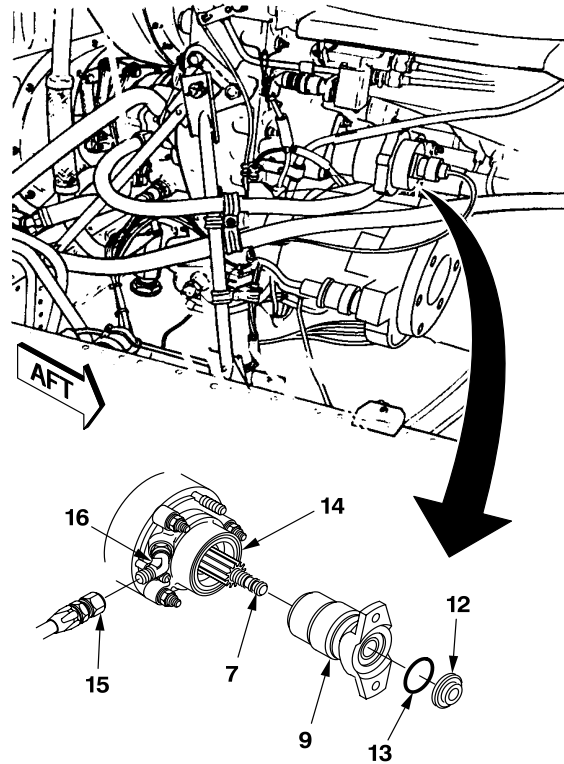
Lubricating Oil

13. Place suitable container (B101) beneath freewheeling unit to catch oil.

14. Remove output adapter (9) from aft bearing and seal cap (14) and output shaft assembly (7).

15. Disconnect oil inlet line (15) from elbow fitting (16) on aft bearing and seal cap (14).

16. Cap oil inlet line (15) and elbow fitting (16). Tag and identify oil inlet line (15) with installation location.



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6-5-1. FREEWHEELING UNIT — REMOVAL (CONT)

17. Remove three nuts (17) and three washers (18) from support studs (19).

18. Using electrical connector slipjoint pliers, remove aft bearing and seal cap (14) and packing (20) from output support (21).

19. Remove and discard packing (20) from bearing and seal cap (14).

CAUTION

To prevent failure of repair and damage to components, cone set shall be removed and installed as a matched set.

20. Remove spacer (22) and cone set (23) from output shaft assembly (7).

21. Remove retainer ring (24) from freewheeling adapter bolt (25).

22. Using a single jackscrew from jackscrew set (B129), remove output shaft plug assembly (26).

23. Remove and discard packing (27).

24. Install spanner (B133) on shaft coupling (28) and secure in place with accompanying hardware.

25. While holding shaft coupling adapter (28) in place, remove freewheeling adapter bolt (25) using spline wrench (B231).

CAUTION

To prevent failure of repair and damage to components, shaft couplings shall not be intermixed between assemblies.

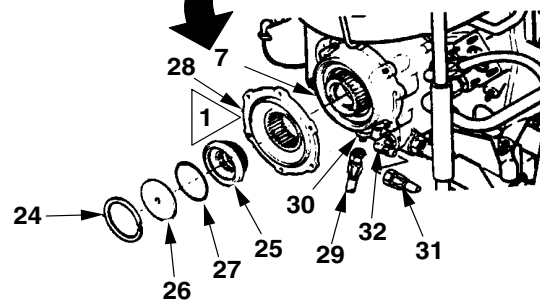
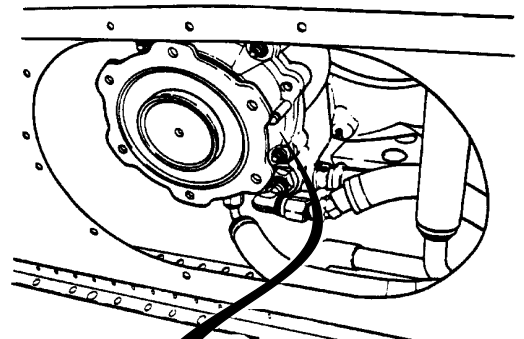
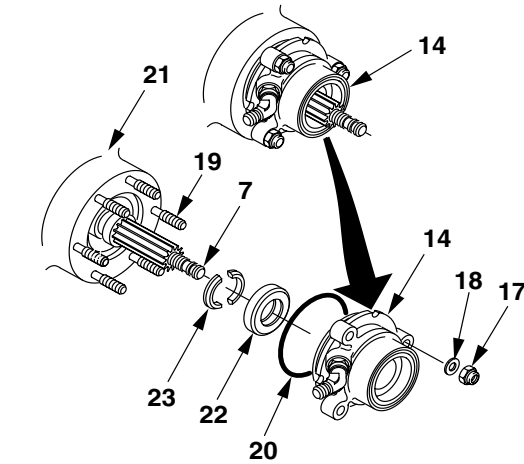
26. Remove shaft coupling adapter (28) from output shaft assembly (7).

27. Disconnect inlet oil line (29) from forward cap fitting (30).

28. Cap inlet oil line (29) and forward cap fitting (30). Tag and identify inlet oil line (29) with installation location.

29. Disconnect oil return line (31) from elbow fitting (32).

30. Cap oil return line (31) and elbow fitting (32). Tag and identify oil return line (31) with installation location.



NOTE:

- 1 Shaft assembly 406-040-500-103 uses main driveshaft adapter 406-040-542-101.
- Shaft assembly 406-040-500-111 uses main driveshaft adapter 406-040-542-103.

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6-5-1. FREEWHEELING UNIT — REMOVAL (CONT)

31. Remove four nuts (33), steel washers (34), and aluminum washers (35) from mounting studs (36) securing output shaft assembly (7) to freewheeling housing assembly (37).

CAUTION

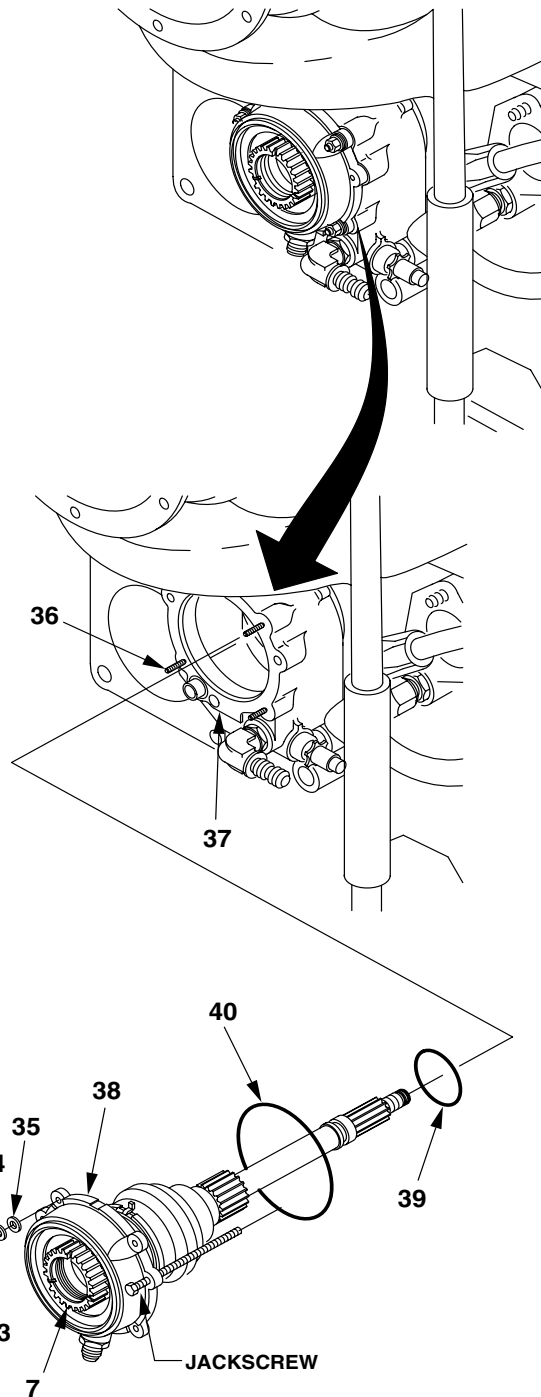
To prevent damage to output shaft or engine accessory gears, jackscrews shall be turned evenly.

32. Install three jackscrews from jackscrew set (B129) in threaded holes in forward seal cap (38).

33. Remove output shaft assembly (7) with packings (39 and 40) using jackscrews (part of B129).

34. Remove and discard packings (39 and 40) from output shaft assembly (7).

35. Wrap output shaft assembly (7) in barrier material (D49) and place on suitable surface.



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6-5-1. FREEWHEELING UNIT — REMOVAL (CONT)

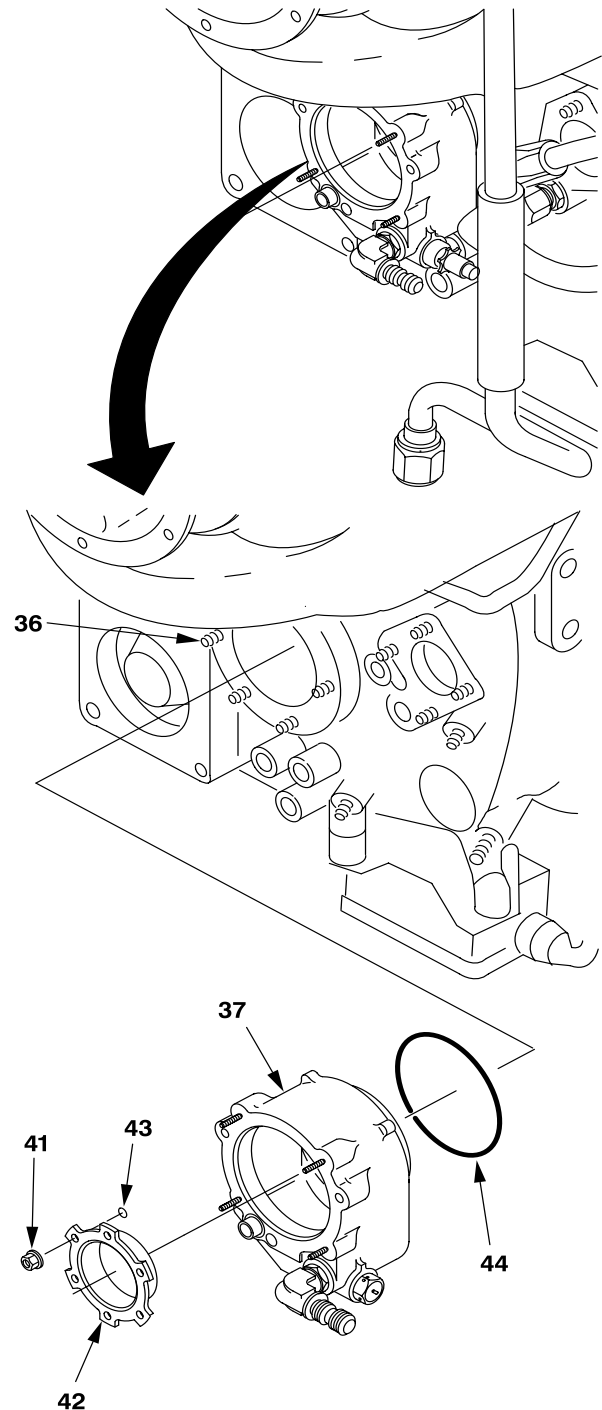
36. Remove six nuts (41) from mounting studs (36) inside freewheeling housing assembly (37).

37. Remove pilot ring (42) from inside freewheeling housing assembly (37).

38. Remove and discard six packings (43) from inside freewheeling housing assembly (37).

39. Remove and discard packing (44) from freewheeling housing assembly (37).

40. Cover openings in engine accessory gear case with barrier material (D49) and secure with tape (D217).



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6-5-1. FREEWHEELING UNIT — REMOVAL (CONT)

41. Loosen jamnut (45) and remove elbow fitting (32), packing (46), and jamnut (45) from freewheeling housing assembly (37).

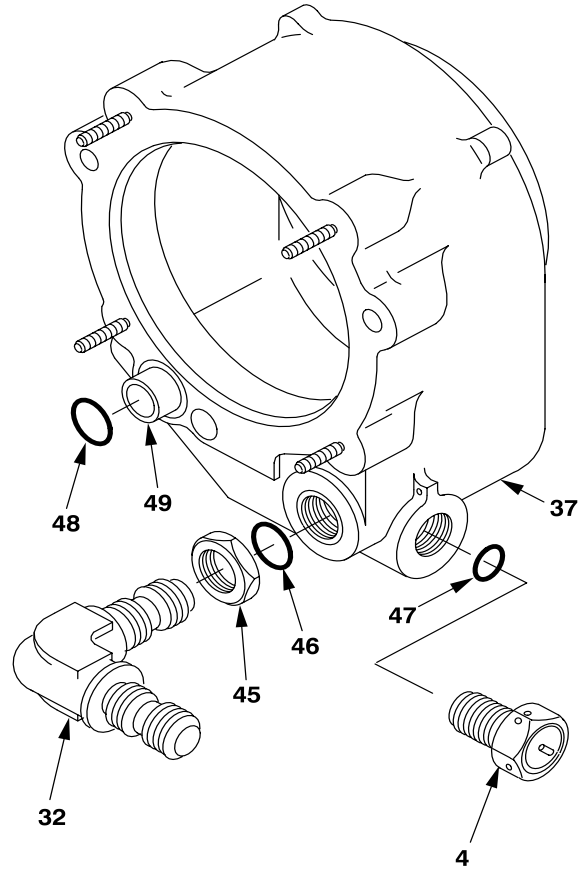
42. Remove and discard packing (46) from elbow fitting (32).

43. Remove jamnut (45) from elbow fitting (32).

44. Cut lockwire and remove chip detector housing (4) with packing (47) from freewheeling housing assembly (37).

45. Remove and discard packing (47) from chip detector housing (4).

46. Remove and discard packing (48) from housing assembly oil transfer tube (49).



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END OF TASK

6-5-2. FORWARD CAP OIL SEAL ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION

This task covers: Removal, Cleaning, Inspection, Repair, and Installation of Oil Seal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
Hand Arbor Press (B107)
Jackscrew Set (B129)
Maintenance Stand (B162)
Plastic Scraper (B123)
Seal Removal Tool (B200)
Input Spanner Adapter (B4)
Hinge Handle (B68)
Driveshaft Tool Set (B190)
Torque Wrench (B233)
Seal Nut Wrench (B215)
Spline Wrench (B230)

Material:

White Cotton Gloves (D112)
Lockwire (D132)

Acetone (D2)
Sealant (D180)
Rubber Gloves (D111)
Low-Lint Cleaning Cloth (D67)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer

References:

TM 1-1520-266-23

Equipment Condition:

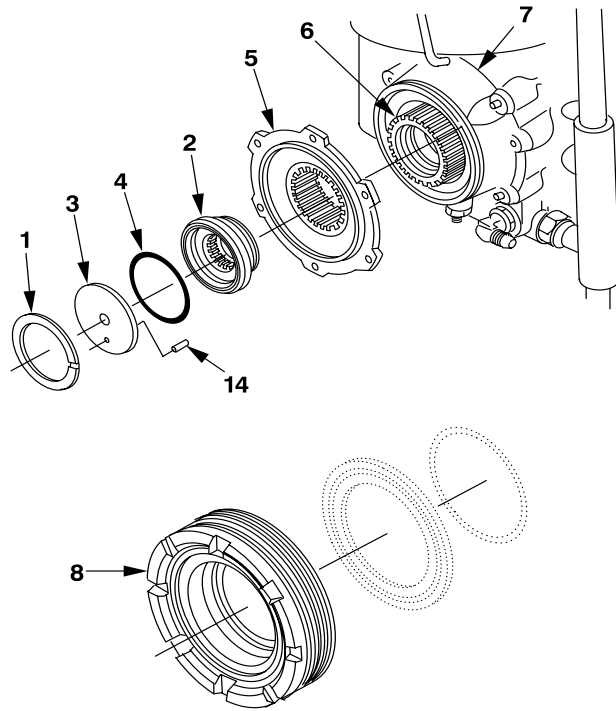
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47)
Air Induction Cowling Removed (Task 4-2-1)
Engine Cowl Assembly Removed (Task 2-2-50)
Aft Fairing Assembly Removed (Task 2-2-55)
Engine-to-Transmission Driveshaft Removed (Task 6-2-1)
Forward Shaft Removed (Task 6-6-1 or 6-6-2)

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6-5-2. FORWARD CAP OIL SEAL ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

REMOVE

1. Gain access to freewheeling unit through left side engine panel.
2. Remove retainer ring (1) from freewheeling bolt adapter (2).
3. Using a single jackscrew from jackscrew set (B129), remove output shaft plug assembly (3) with packing (4). Discard packing (4).
4. Install input spanner adapter (B4) on main driveshaft adapter (5) and secure in place with accompanying hardware.
5. While holding main driveshaft adapter (5) in place, remove freewheeling bolt adapter (2), using external spline wrench (B230).



CAUTION

- Shaft assemblies with 406-040-500-103 part number shall use 406-040-542-101 main driveshaft adapter, 406-040-543-101 duplex bearing nut, and 406-040-581-101 seal assembly.
- Shaft assemblies with 406-040-500-111 part number shall use 406-040-542-103 main driveshaft adapter, 406-040-543-103 duplex bearing nut, and 406-340-102-101 seal assembly.
- Individual parts as stated above shall not be intermixed from one shaft assembly to another. Mixing shaft assemblies/adapters could cause damage and necessitate replacement of freewheeling unit.

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6. Remove main driveshaft adapter (5) from output shaft assembly (6).
7. Remove lockwire, two places, from seal cap assembly (7) and duplex bearing nut (8).
8. Remove duplex bearing nut (8) from seal cap assembly (7) using seal nut wrench (B215) and 1/2-inch square drive hinge handle (B68).

GO TO NEXT PAGE

6-5-2. FORWARD CAP OIL SEAL ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

9. Remove retaining ring (9) from duplex bearing nut (8). Discard packing (10).

NOTE

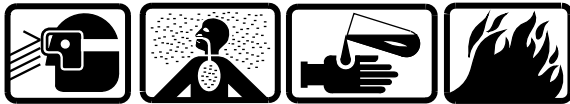
Forward seal consists of two separate pieces: the seal cup (11) assembles into duplex bearing nut (8); the seal ring (12) assembles against duplex ball bearings.

10. Position duplex bearing nut (8) large slot (forward) face down on hand arbor press (B107) work bed. Insert grooved, long shank end seal removal tool (B200) into duplex bearing nut (8) until it contacts inside diameter of forward seal cup (11) from duplex bearing nut (8). Discard seal cup (11).

11. Remove forward seal ring (12) using two phenolic or wood extractors of local manufacture. Insert extractors into gap between cap assembly (7) and seal half and carefully unseat ring (12) and packing (13).

12. Using plastic scraper (B123) remove sealant from duplex bearing nut (8).

CLEAN



Acetone

13. Clean the outside diameter of forward seal and mating surface in duplex bearing nut (8) housing using acetone (D2).

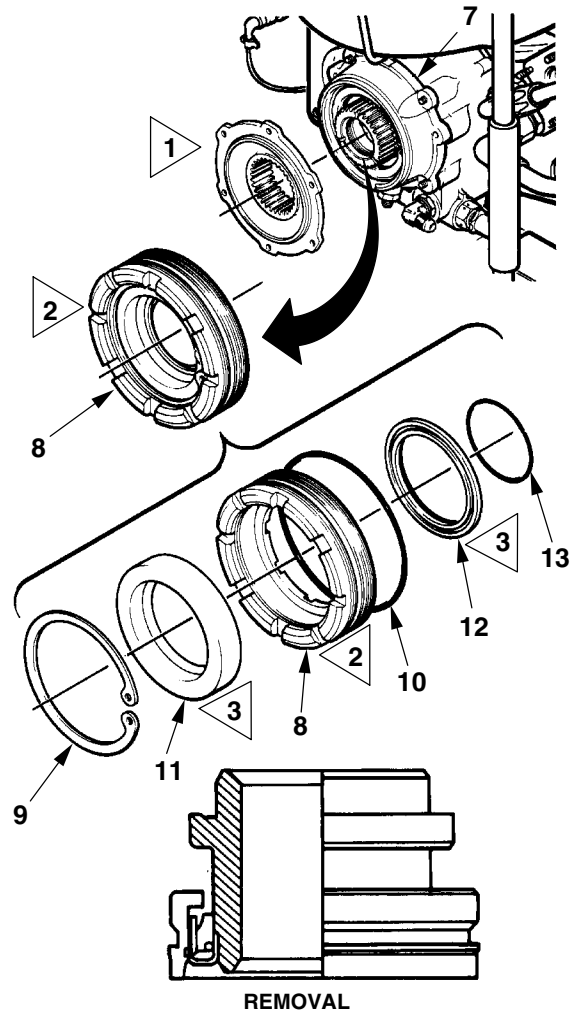
14. Wipe surfaces dry using clean low-lint cleaning cloth (D67).

INSPECT

15. Inspect duplex bearing nut (8) for wear and damage (Task 6-5-3). If cracks in duplex bearing nut are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR

16. Repair duplex bearing nut (8) (Task 6-5-3).



NOTES

- 1 Shaft assembly 406-040-500-103 uses main driveshaft adapter 406-040-542-101. Shaft assembly 406-040-500-111 uses main driveshaft adapter 406-040-542-103.
- 2 Shaft assembly 406-040-500-103 uses duplex bearing nut 406-040-543-101. Shaft assembly 406-040-500-111 uses duplex bearing nut 406-040-543-103.
- 3 Shaft assembly 406-040-500-103 uses seal assembly 406-040-581-101. Shaft assembly 406-040-500-111 uses seal assembly 406-340-102-101.

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6-5-2. FORWARD CAP OIL SEAL ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

INSTALL



Sealing Compound

CAUTION

- Shaft assemblies with 406-040-500-103 part number shall use 406-040-542-101 main driveshaft adapter, 406-040-543-101 duplex bearing nut and 406-040-581-101 seal assembly.
- Shaft assemblies with 406-040-500-111 part number shall use 406-040-542-103 main driveshaft adapter, 406-040-543-103 duplex bearing nut and 406-340-102-101 seal assembly.
- Individual parts as stated above shall not be intermixed from one shaft assembly to another. Mixing shaft assemblies/adapters could cause damage and necessitate replacement of freewheeling unit.

CAUTION

Seals shall not be handled with bare hands. White cotton gloves (D112) shall be worn. Premature failure of seals may occur.

NOTE

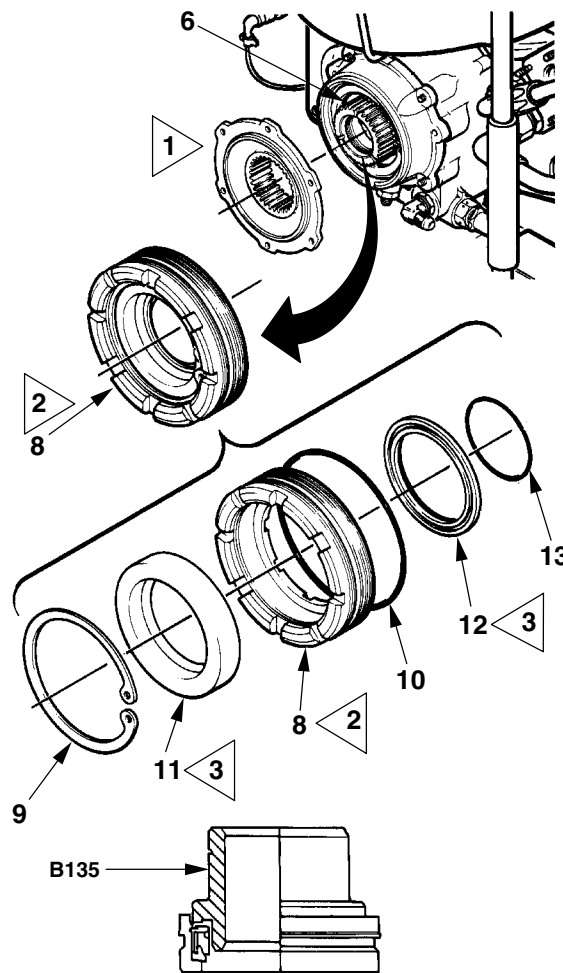
Forward seal consists of two matched halves. Halves shall not be replaced separately.

17. Turn duplex bearing nut (8) over so that small slots (aft) side rests on work bed of hand arbor press (B107). Apply a thin film of sealant (D180) to exterior surface of forward seal cup (11) and adjacent to retaining ring groove of duplex bearing nut (8).

18. Place seal cup (11), open face down, on inside diameter of duplex bearing nut (8). Slide shouldered end of seal removal tool (B200) into duplex bearing nut (8) until seated. Remove seal removal tool (B200) from duplex bearing nut (8) and arbor press.

19. Trim excess sealant (D180) from seal cup (11) and duplex bearing nut (8). Install retaining ring (9).

20. Install packing (10) in groove of duplex bearing nut (8).



INSTALLATION

NOTES

- 1 Shaft assembly 406-040-500-103 uses main driveshaft adapter 406-040-542-101. Shaft assembly 406-040-500-111 uses main driveshaft adapter 406-040-542-103.
- 2 Shaft assembly 406-040-500-103 uses duplex bearing nut 406-040-543-101. Shaft assembly 406-040-500-111 uses duplex bearing nut 406-040-543-103.
- 3 Shaft assembly 406-040-500-103 uses seal assembly 406-040-581-101. Shaft assembly 406-040-500-111 uses seal assembly 406-340-102-101.

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 6-5-2. FORWARD CAP OIL SEAL ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

21. Place packing (13) on output shaft assembly (6) against duplex ball bearing.

22. Seat forward seal ring (12) against duplex ball bearings. Turn seal ring (12) against duplex ball bearings. Turn seal ring (12) to pick up packing (13).

23. Thread duplex bearing nut (8) into seal cap assembly (7). Place seal nut wrench (B215) on duplex bearing nut (8). Attach **1/2-inch** square drive hinge handle (B68). Tighten duplex bearing nut (8). Remove ratchet and adapter. Attach **3/4-inch** square drive torque wrench to duplex bearing nut.

24. Torque duplex bearing nut (8) **150 TO 200 FOOT-POUNDS**.

25. Lockwire duplex bearing nut (8) two places using lockwire (D132).

26. Install main driveshaft adapter (2) on splines of output shaft (6).

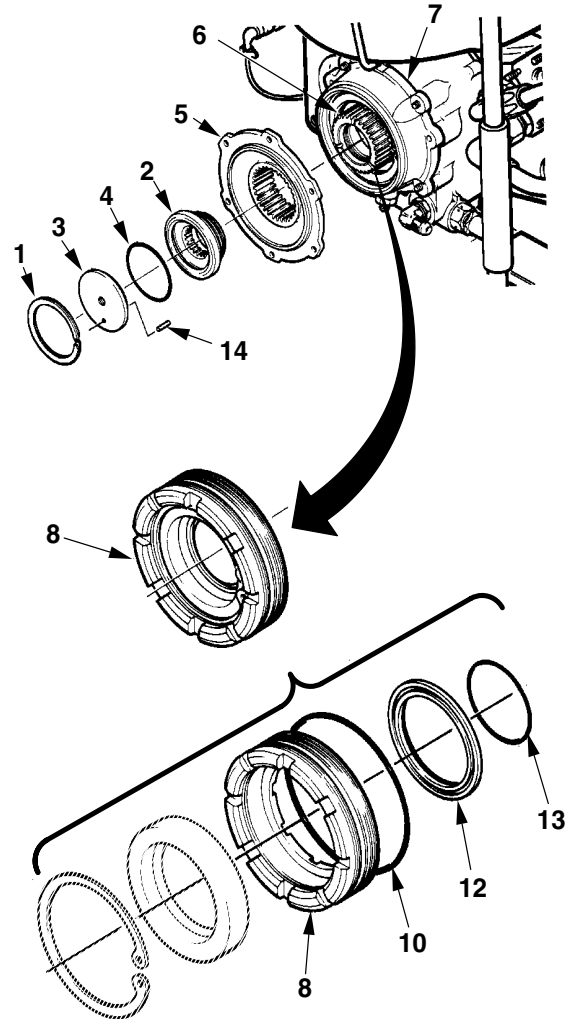
27. Install input spanner adapter (B4) on main driveshaft adapter (2) and secure in place.

28. While holding main driveshaft adapter (2) with input spanner adapter (B4), torque output adapter bolt (5) **150 TO 175 FOOT-POUNDS** with external spline wrench (B230).

29. Install packing (4) on shaft plug assembly (3).

30. Align pin (14) on output shaft plug assembly (3) with an aligned hole in output adapter bolt (5).

31. Secure output shaft plug assembly (3) in output adapter bolt (5) with retainer ring (1).



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J2153

INSPECT

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6-5-2. FORWARD CAP OIL SEAL ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/
INSTALLATION (CONT)

FOLLOW-ON MAINTENANCE

Install forward shaft (Task 6-6-1 or 6-6-2).

Install engine-to-transmission driveshaft (Task 6-2-1).

■ Install aft fairing assembly (Task 2-2-55).

■ Install engine cowl assembly (Task 2-2-50).

Install air induction cowling (Task 4-2-4).

■ Install forward fairing assembly (Task 2-2-47).

END OF TASK

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
Dial Indicator (B37)
Inside Micrometer Caliper (B13)
Outside Micrometer Caliper Set (B12)
Telescoping Gage Set (B47)
Inspection Pin, 0.120 Inch Diameter (2 ea.)
Inspection Pin, 0.096 Inch Diameter (2 ea.)
Inspection Pin, 0.060 Inch Diameter (2 ea.)
Inspection Pin, 0.054 Inch Diameter (2 ea.)
Inspection Pin, 0.108 Inch Diameter (2 ea.)

Material:

Nonmetallic Abrasive Mats (D1)
Drycleaning Solvent (D199)
Wiping Rags (D164)
Sandpaper (D175)

Crocus Cloth (D90)
Rubber Gloves (D111)
Chemical Conversion Coating (Alodine 1201)
(D57)
Paint Remover (D148)
Epoxy Primer Coating (D98)
Lubricating Oil (D139 or D140)
Aluminum Oxide Abrasive Cloth (D44)
Brush Cadmium Plating (D129)
Corrosion Preventive Fingerprint Remover
(D104)
Steel Wool (D205)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:

TM 1-1520-266-23 ■
TM 55-1500-345-23
TM 1-1500-204-23
MIL-STD-865

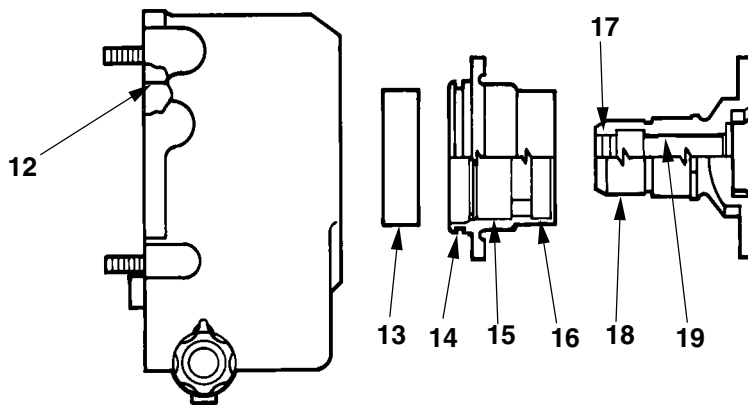
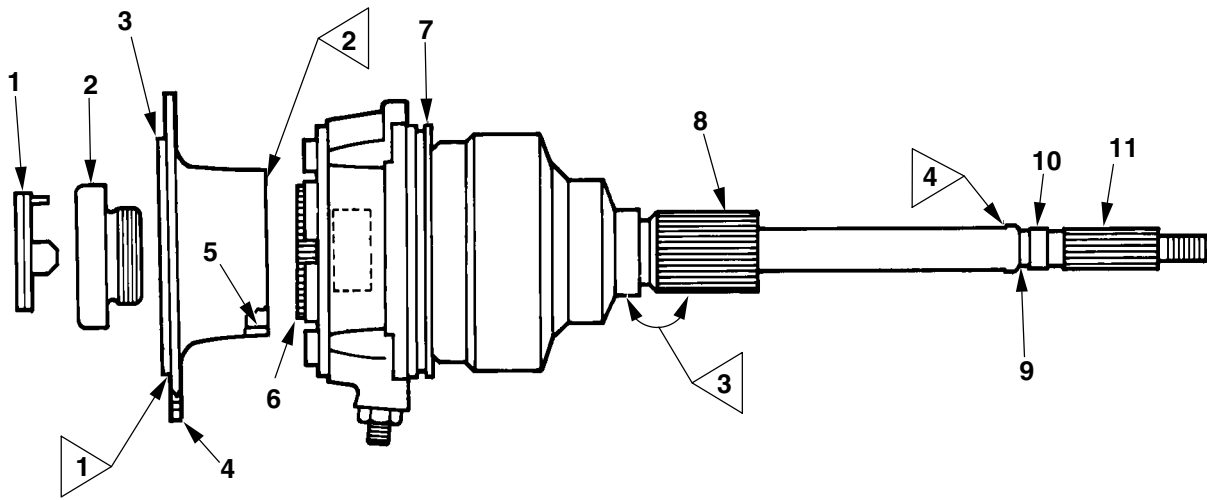
COMPONENT WEAR LIMITS OVERVIEW

Most freewheeling unit components are shown and wear limits and useful information for them are given in figure Freewheeling Unit Components

— Wear Limits (Sheets 1 and 2). Damage limits for each component requiring them are listed separately.

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



FREEWHEELING UNIT OUTPUT SHAFT ASSEMBLY

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J0432

Freewheeling Unit Components — Wear Limits (Sheet 1 of 2)

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

ITEM	NOMENCLATURE		MIN.	MAX.
1	Output Shaft Plug	OD	2.160	2.163
2	Adapter Bolt - Packing Seat	ID	2.165	2.168
3	Main Driveshaft Adapter, Engine to Transmission Drive Shaft Adapter Shoulder	OD	3.917	3.919
4	Main Driveshaft Adapter - Holes	ID	0.265	0.275
5	Transmission Drive Adapter - Spline (use 0.108 inch diameter pins)	Between pins	1.907	1.912
6	Shaft Spline - Outer (use 0.120 inch diameter pins)	Over pins	2.235	2.241
7	Pilot Diameter	OD	4.060	4.062
8	Clutch - Spline (use 0.096 inch diameter pins)	Over pins	1.344	1.347
9	Shaft - Tail Rotor Drive Cone Seat	OD	0.660	0.662
10	Output Adapter - Pilot	OD	0.749	0.749
11	Shaft Spline - Inner (use 0.060 inch diameter pins)	Over pins	0.765	0.770
12	Housing - Forward Seal Cap Seat	ID	4.062	4.064
13	Bearing - Aft	OD	2.046	2.047
14	Aft Bearing and Seal Cap - Pilot	OD	2.500	2.501
15	Aft Bearing and Seal Cap - Bearing Seat	ID	2.046	2.047
16	Aft Bearing and Seal Cap - Seal Seat	ID	1.999	2.002
17	Output Adapter - Mating Bore	ID	0.750	0.750
18	Output Adapter - Aft Bearing Journal	OD	1.239	1.240
19	Output Adapter - Spline (use 0.054 inch diameter pins)	Between pins	0.611	0.615

NOTES

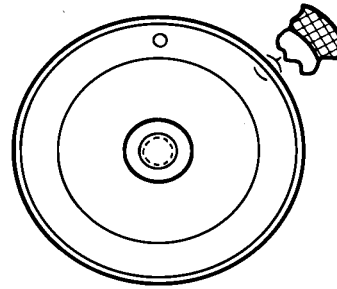
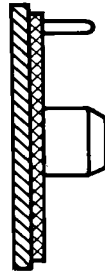
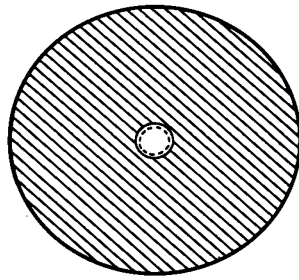
- 1 Total indicated runout of engine to transmission mating surface is 0.0004 inch maximum.
- 2 Total indicated runout of adapter mating surface is 0.0007 inch maximum.
- 3 No repair of damage allowed.
- 4 Total indicated runout of shaft cone set seat is 0.001 inch maximum.
5. Maximum allowable wear in roller bearing path on the diameter is 0.0002 inch determined by the difference in the diameter in the worn and unworn areas.
6. Ensure pins are located in wear area.

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J0432

Freewheeling Unit Components — Wear Limits (Sheet 2 of 2)

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



OUTPUT SHAFT PLUG

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL DAMAGE

TYPE OF DAMAGE	Cross-hatching	Diagonal hatching	Plain white
SCORING	None permitted	0.005 in.	0.005 in.
CORROSION	None permitted	None permitted	0.003 in.

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J0432

Output Shaft Plug — Damage Limits

CLEAN OUTPUT SHAFT PLUG ASSEMBLY



Drycleaning Solvent

1. Clean output shaft plug assembly with wiping rag (D164) dampened with drycleaning solvent (D199).

2. Dry output shaft plug assembly with clean wiping rag (D164).

INSPECT OUTPUT SHAFT PLUG ASSEMBLY

3. Inspect output shaft plug assembly for wear. See figure Freewheeling Unit Components — Wear Limits.

4. Fluorescent penetrant inspect output shaft plug assembly (TM 1-1520-266-23).

5. Inspect output shaft plug assembly for damage to limits shown. Reject output shaft plug if limits are exceeded. See figure Output Shaft Plug — Damage Limits. If a crack in output shaft plug assembly is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR OUTPUT SHAFT PLUG ASSEMBLY



Sanding Operations

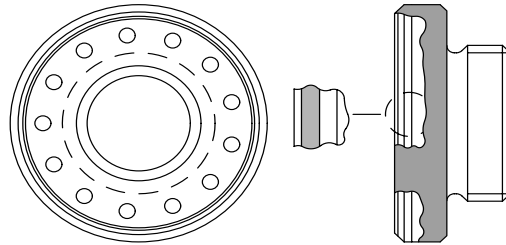
6. Repair damage to output shaft plug assembly using 400 grit sandpaper (D175).

7. Blend repaired area into surrounding area with crocus cloth (D90).

INSPECT

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



ADAPTER BOLT

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL DAMAGE

SCORING

None permitted

0.015 in.

N/A

CORROSION

None permitted

None permitted

None permitted

THREAD DAMAGE

SCORING

None permitted

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J1605

Adapter Bolt — Damage Limits

CLEAN ADAPTER BOLT



Drycleaning Solvent

8. Clean adapter bolt with wiping rag (D164) dampened with drycleaning solvent (D199).

9. Dry adapter bolt with clean wiping rag (D164).

INSPECT ADAPTER BOLT

10. Inspect adapter bolt for wear. See figure Freewheeling Unit — Wear Limits.

11. Magnetic particle inspect adapter bolt (TM 1-1520-266-23).

12. Inspect adapter bolt for damage to limits shown. Reject bolt if limits are exceeded. See figure Adapter Bolt — Damage Limits. If a crack in adapter bolt is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR ADAPTER BOLT



Sanding Operations

13. Repair damage to adapter bolt using 400 grit sandpaper (D175).

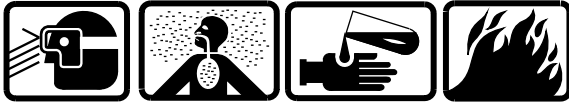
14. Blend repaired area into surrounding area with crocus cloth (D90).

INSPECT

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN MAIN DRIVESHAFT ADAPTER



Drycleaning Solvent

15. Clean main driveshaft adapter with a wiping rag (D164) dampened with drycleaning solvent (D199).

16. Dry main driveshaft adapter with a clean wiping rag (D164).

INSPECT MAIN DRIVESHAFT ADAPTER

17. Inspect main driveshaft adapter for wear. See figure Freewheeling Unit Components — Wear Limits.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Magnetic particle inspection of main driveshaft adapter is a characteristic critical to flight safety.

18. Magnetic particle inspect main driveshaft adapter (TM 1-1520-266-23).

19. Inspect main driveshaft adapter to limits shown. Reject adapter if limits are exceeded or if a crack is found. See figure Main Driveshaft Adapter — Damage Limits. If a crack in main driveshaft adapter is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR MAIN DRIVESHAFT ADAPTER



Sanding Operations

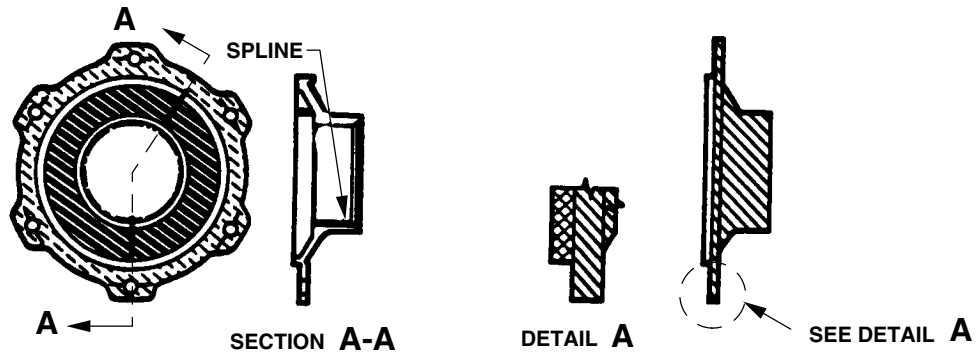
20. Repair damage to main driveshaft adapter using 400 grit sandpaper (D175).

21. Blend repaired area into surrounding area with crocus cloth (D90).

INSPECT

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6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



MAIN DRIVESHAFT ADAPTER

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH			
	Symbol 1	Symbol 2	Symbol 3	Symbol 4
SCORING	N/A	0.002 in.	0.002 in.	0.002 in.
CORROSION	None permitted	0.001 in.	0.002 in.	0.002 in.
SPLINE DAMAGE				
SCORING	0.002 in.			
CORROSION	None permitted			

NOTE:

Inspection data applies to 406-040-542-101/-103 main driveshaft adapters.

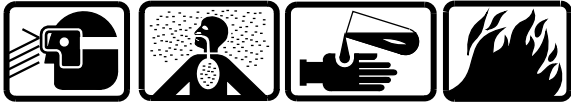
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Main Driveshaft Adapter — Damage Limits

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN FORWARD SEAL CAP, CLUTCH, AND SHAFT ASSEMBLY



Drycleaning Solvent

22. Clean forward seal cap, clutch, and shaft assembly with wiping rag (D164) dampened with drycleaning solvent (D199).

23. Dry forward seal cap, clutch, and shaft assembly with clean wiping rag (D164).

INSPECT FORWARD SEAL CAP, CLUTCH, AND SHAFT ASSEMBLY

24. Inspect forward seal cap, clutch, and shaft assembly for wear. See figure Forward Seal, Cap, Clutch, and Shaft Assembly — Damage Limits.

REPAIR OF SHAFT ASSEMBLY

CAUTION

To prevent corrosion damage on bearing surfaces, care shall be taken to avoid leaving fingerprints on bearing surfaces. Parts should be lubricated immediately after inspection using lubricating oil (D139 or D140). Fingerprints may be removed with fingerprint remover (D104) as required.

25. Inspect forward seal for leakage. Maximum allowable leakage is 2 drops per minute or 9 drops per minute from all sources.

NOTE

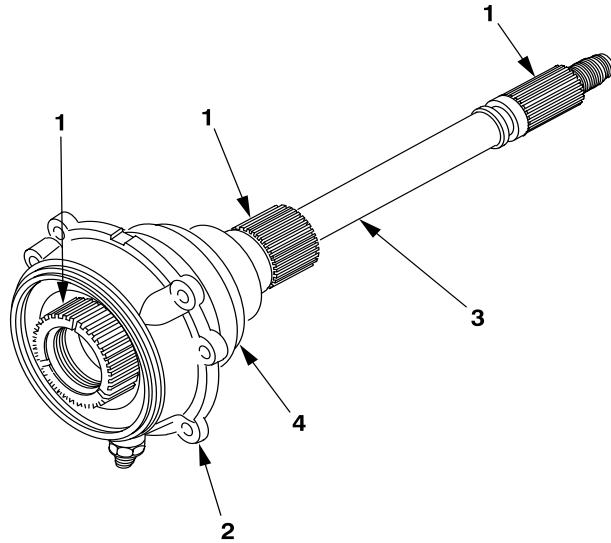
Two drops per minute equals approximately 11 milliliters (0.02 pint) during a 2 hour flight.

26. Visually inspect splines (1) for chipped or broken teeth.

27. Visually inspect forward seal cap (2) for corrosion, scratches, nicks, and cracks. If cracks in forward seal cap are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

28. Inspect shaft (3) for corrosion, wear, and cracks. If cracks in shaft are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

29. Visually inspect clutch assembly (4) for brinnelling or other damage. Inspect clutch (4)



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bearing for smoothness and freedom of rotation by holding shaft (3) and rotating clutch (4) by hand. Inspect forward seal cap (2) bearing for smoothness and freedom of rotation by holding shaft (3) and turning forward cap (2) by hand.

30. Inspect shaft (3) for damage to limits shown. Reject shaft (3) if limits are exceeded. See figure Forward Seal, Cap, Clutch, and Shaft Assembly — Damage Limits.



Sanding Operations

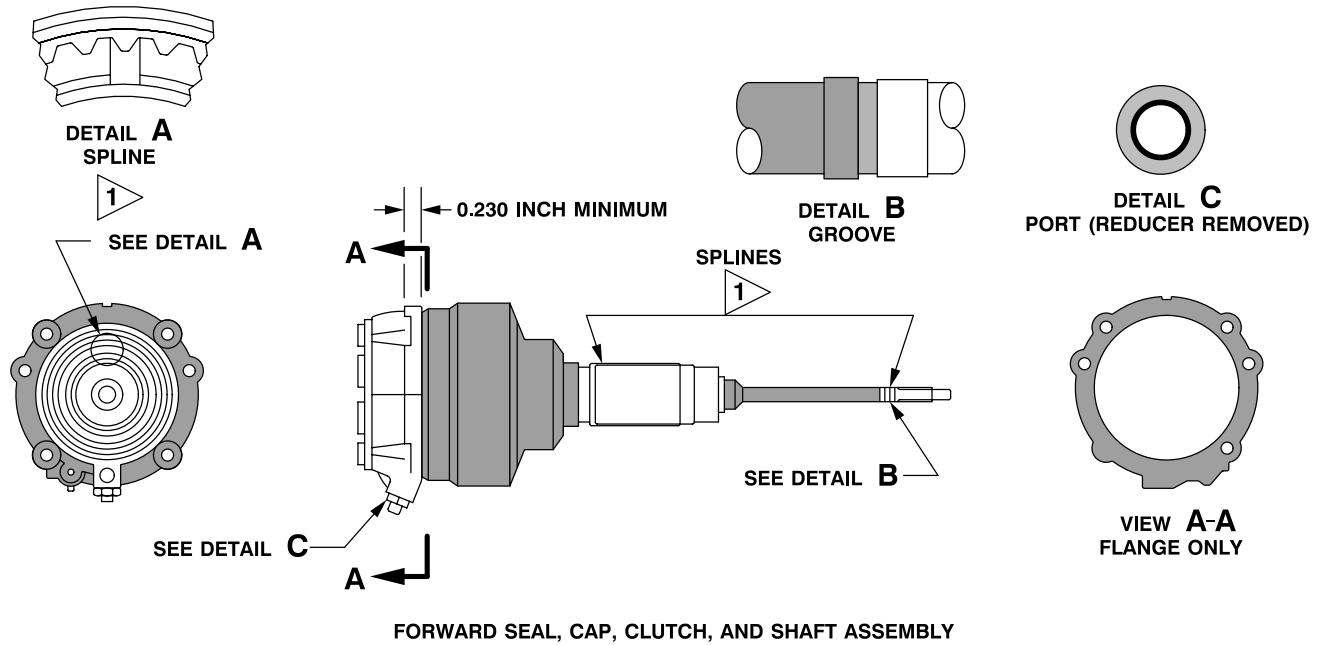
31. Repair damage to shaft (3) using 400 grit sandpaper (D175)

32. Blend repaired area into surrounding area with crocus cloth (D90).

INSPECT

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



TYPE OF DAMAGE	DAMAGE LOCATION SYMBOLS						
	MAXIMUM DAMAGE AND REPAIR DEPTH						
MECHANICAL DAMAGE WEAR	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SCORING	None permitted	0.002 in. deep	0.002 in. deep	0.002 in. deep	0.002 in. deep	0.005 in. deep	N/A
CORROSION	None permitted	None permitted	0.001 in. deep	0.002 in. deep	0.005 in. deep	0.002 in. deep	N/A

SPLINE
 WEAR 0.765-0.770 in. over 0.060 in. diameter pins
 SCORING 0.002 in. deep

NOTES:

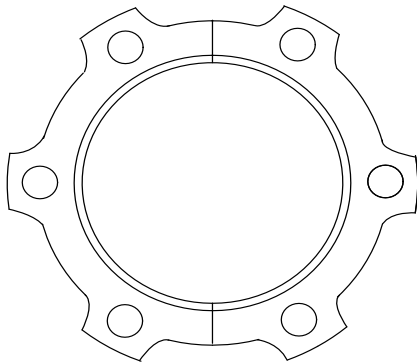
1. For wear limits see figure Freewheeling Unit - Wear Limits.
2. All dimensions are in inches unless otherwise specified.

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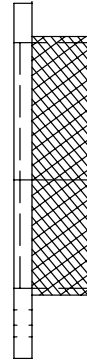
Forward Seal, Cap, Clutch, and Shaft Assembly — Damage Limits

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



PILOT RING



TYPE OF DAMAGE

DAMAGE LOCATION SYMBOLS



MECHANICAL DAMAGE

WEAR

N/A

N/A

SCORING

None permitted

0.010 In.

CORROSION

None permitted

None permitted

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J1605

Pilot Ring — Wear and Damage Limits

CLEAN PILOT RING



Drycleaning Solvent

33. Clean pilot ring with a wiping rag (D164) dampened with drycleaning solvent (D199).

34. Dry pilot ring with clean wiping rag (D164).

INSPECT PILOT RING

35. Fluorescent penetrant inspect pilot ring (TM 1-1520-266-23).

36. Inspect pilot ring to limits shown. Reject pilot ring if limits are exceeded. See figure Pilot

Ring — Wear and Damage Limits. If a crack in pilot ring is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR PILOT RING



Sanding Operations

37. Repair damage to pilot ring using 400 grit sandpaper (D175).

38. Blend repaired area into surrounding area with crocus cloth (D90).

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6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN HOUSING ASSEMBLY



Drycleaning Solvent

39. Clean housing assembly with wiping rag (D164) dampened with drycleaning solvent (D199).

40. Dry housing assembly with clean wiping rag (D164).



Paint Remover

41. Remove epoxy primer coating with paint remover (D148).

INSPECT HOUSING ASSEMBLY

42. Inspect housing assembly for wear. See figure Freewheeling Unit Components — Wear Limits.

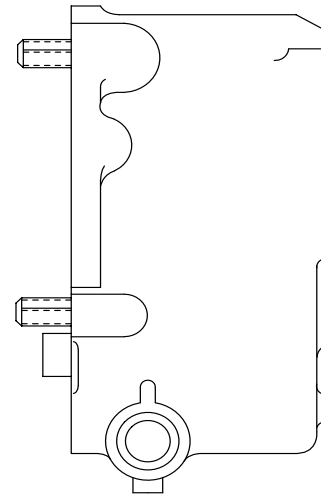
43. Fluorescent penetrant inspect housing assembly (TM 1-1520-266-23).

44. Inspect housing assembly to damage limits shown. Reject housing if limits are exceeded. See figure Freewheeling Housing Assembly — Damage Limits. If cracks in housing assembly are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR HOUSING ASSEMBLY



Sanding Operations



HOUSING - FREEWHEELING UNIT

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J1605

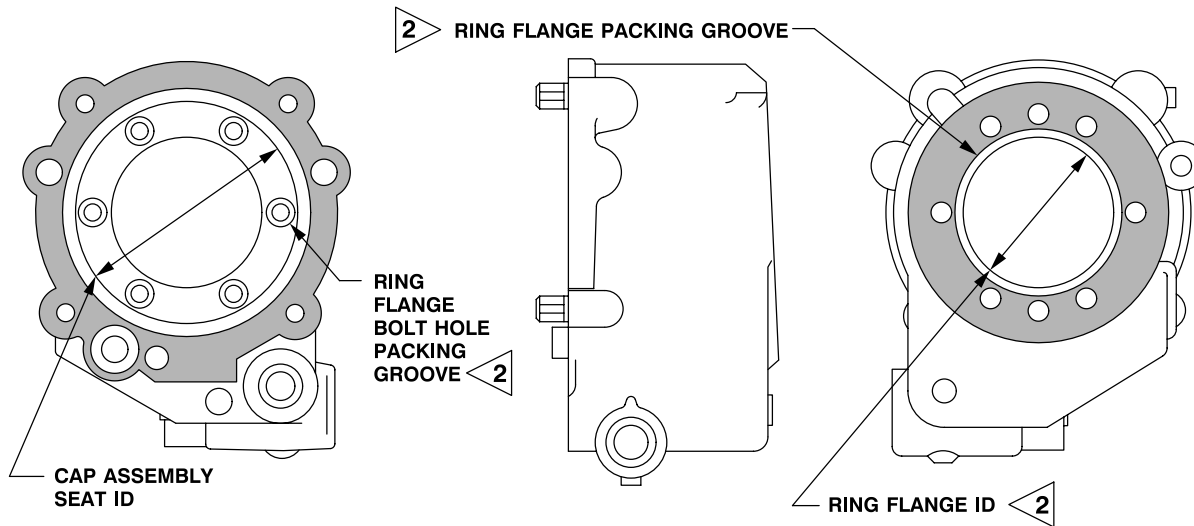
45. Repair damage to housing assembly using 240 grit abrasive cloth (D44).

46. Blend repaired area into surrounding area using 240 grit abrasive cloth (D44).

47. Replace threads damaged studs, or replace studs which must be removed for treatment of corrosion on housing (TM 1-1500-204-23).

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6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



FREEWHEELING HOUSING ASSEMBLY

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Minimum	Maximum
MECHANICAL DAMAGE	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION (PITTING)	0.020 in. before and after repair	0.020 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.25 sq. in.	0.50 sq. in.
NUMBER OF REPAIRS	2	5
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.	0.030 in.
CAP ASSEMBLY SEAT ID	4.062 in.	4.064 in.
RING FLANGE ID	2.502 in.	2.504 in.

NOTES:

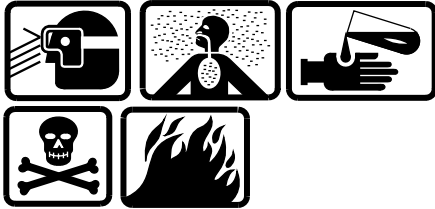
1. Inspect stud threads and bolt holes for corrosion. Any corrosion in the stud threads is cause for rejection of housing assembly. In the area of the bolt holes, maximum pitting depth allowed is 0.030 inch. Not more than 20 percent of the bolt hole wall shall be pitted.
2. Inspect packing grooves on ring flange and ring flange bolt holes for corrosion. Inspect ring flange ID for corrosion. Any corrosion that cannot be removed with abrasive pads (D1) or steel wool (D205) is cause for rejection of housing assembly.
3. No cracks are permitted.

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J1605

Freewheeling Housing Assembly — Damage Limits

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



Chemical Conversion Materials

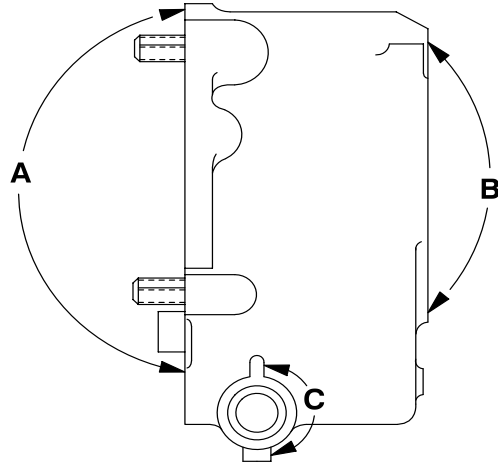
48. Apply Alodine 1201 (D57) to surface of housing assembly (TM 55-1500-345-23).

NOTE

Epoxy primer coating shall be omitted from areas A, B, and C of housing assembly.

49. Apply one coat of epoxy primer coating (D98) to surface of housing assembly (TM 55-1500-345-23).

INSPECT

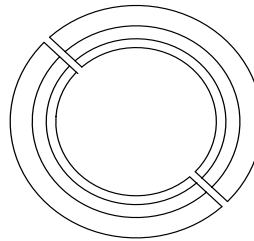


HOUSING - FREEWHEELING UNIT

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J1605

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6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



CONE SET

DAMAGE LOCATION SYMBOLS



MAXIMUM DAMAGE AND REPAIR DEPTH

TYPE OF DAMAGE

MECHANICAL DAMAGE



WEAR

SCORING

CORROSION

None permitted

None permitted

None permitted

None permitted

0.010 In.

None permitted

NOTES:

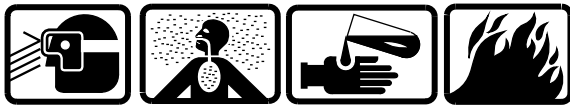
1. Plating wear with no apparent depth is acceptable.

2. Discoloration is not cause for rejection.

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J1605

Cone Set — Wear and Damage Limits

CLEAN CONE SET



Drycleaning Solvent

50. Clean cone set with 240 grit abrasive pad (D44) dampened with drycleaning solvent (D199).

51. Dry cone set with clean wiping rag (D164).

INSPECT CONE SET

52. Magnetic particle inspect cone set (TM 1-1520-266-23).

53. Inspect cone set to wear and damage limits shown. Reject cone set if limits are

exceeded. See figure Cone Set — Wear and Damage Limits. If a crack in cone set is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR CONE SET



Sanding Operations

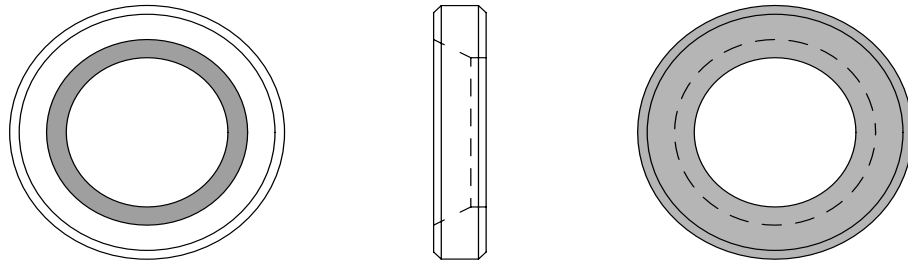
54. Repair damage to cone set using 400 grit sandpaper (D175).

55. Blend repaired area into surrounding area with crocus cloth (D90).

INSPECT

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



CONE SET SPACER

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL DAMAGE

TYPE OF DAMAGE	None permitted	None permitted	N/A
WEAR	None permitted	None permitted	N/A
SCORING	None permitted	None permitted	0.010 in.
CORROSION	None permitted	None permitted	None permitted

406040-165
J1605

Cone Set Spacer — Wear and Damage Limits

CLEAN CONE SET SPACER



Drycleaning Solvent

56. Clean cone set spacer with wiping rag (D164) dampened with drycleaning solvent (D199).

57. Dry cone set spacer with clean wiping rag (D164).

INSPECT CONE SET SPACER

58. Magnetic particle inspect cone set spacer (TM 1-1520-266-23).

59. Inspect cone set spacer to wear and damage limits shown. Reject spacer if limits are

exceeded or if crack is found. See figure Cone Set Spacer — Wear and Damage Limits. If a crack in cone set spacer is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR CONE SET SPACER



Sanding Operations

60. Repair damage to cone set spacer using 400 grit sandpaper (D175).

61. Blend repaired area into surrounding area with crocus cloth (D90).

INSPECT

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN AFT BEARING AND SEAL CAP



Drycleaning Solvent

62. Clean aft bearing and seal cap with wiping rag (D164) dampened with drycleaning solvent (D199).

63. Dry aft bearing and seal cap with clean wiping rag (D164).

64. Inspect aft seal for leakage. Maximum allowable leakage is 1 drop per minute or 9 drops per minute from all sources.

INSPECT AFT BEARING AND SEAL CAP

65. Fluorescent penetrant inspect aft bearing and seal cap (TM 1-1520-266-23).

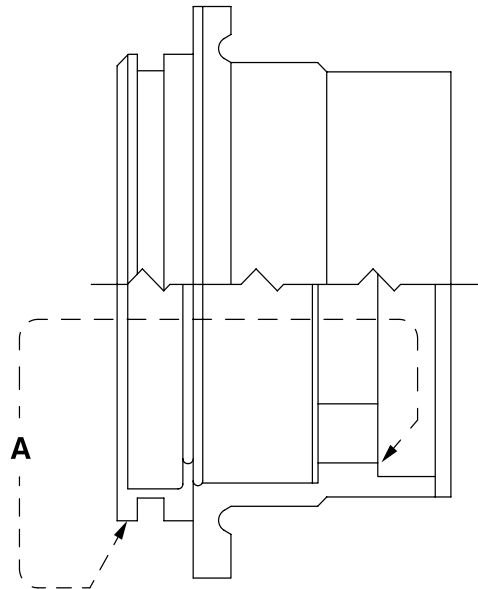
66. Inspect aft bearing and seal cap for wear. See figure Freewheeling Unit Components — Wear Limits.

67. Inspect aft bearing and seal cap for damage to limits shown. Reject cap if limits are exceeded or if crack is found. See figure Aft Bearing and Seal Cap — Damage Limits. If cracks in aft bearing and seal cap are suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR AFT BEARING AND SEAL CAP



Sanding Operations



AFT BEARING AND SEAL CAP

406040-136
J1605

68. Repair damage to aft bearing and seal cap using 400 grit sandpaper (D175).

69. Blend repaired area into surrounding area with crocus cloth (D90).

NOTE

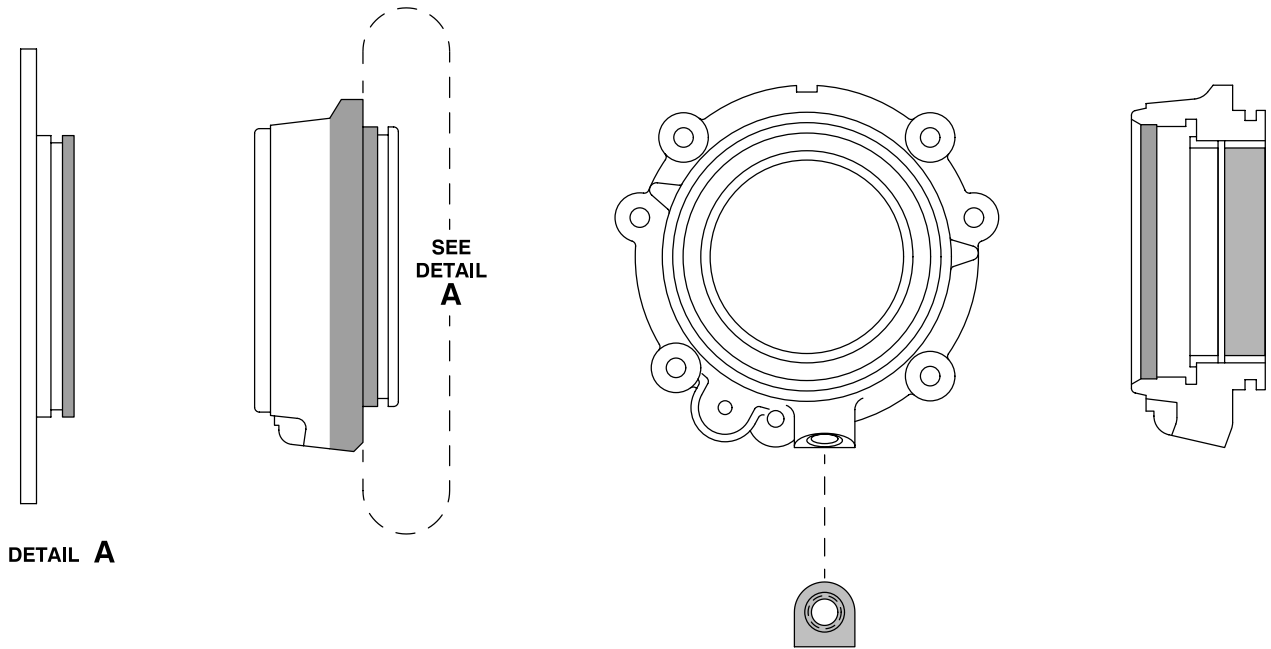
Brush cadmium plating shall be omitted from area A of aft bearing and seal cap.

70. Apply brush cadmium plating (D129) to repaired area (MIL-STD-865).







INSPECT

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



AFT BEARING AND SEAL CAP

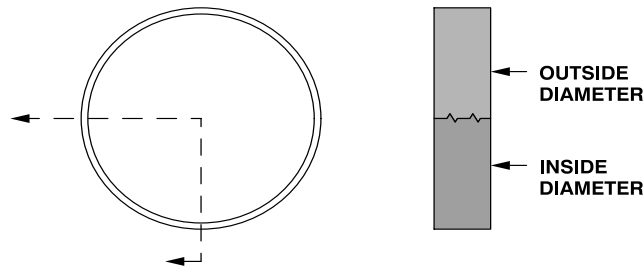
TYPE OF DAMAGE	DAMAGE LOCATION SYMBOLS					
						
	MAXIMUM DAMAGE AND REPAIR DEPTH					
MECHANICAL DAMAGE						
SCORING	0.0002 in.	N/A	N/A	0.003 in.	N/A	N/A
CORROSION	None permitted	None permitted	None permitted	None permitted	None permitted	N/A

406040-166
J1605

Aft Bearing and Seal Cap — Damage Limits

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



WEARSLEEVE

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL DAMAGE

TYPE OF DAMAGE	DAMAGE LOCATION SYMBOL	MAXIMUM DAMAGE AND REPAIR DEPTH	MAXIMUM DAMAGE AND REPAIR DEPTH	MAXIMUM DAMAGE AND REPAIR DEPTH
WEAR		0.002 in.	N/A	N/A
SCORING		None permitted	None permitted	N/A
CORROSION		None permitted	None permitted	N/A

NOTE:

Maximum allowable wear in lip seal path on diameter (0.001 inch per surface) is determined by difference between worn area and unworn area.

406040-167
J1605

Wear sleeve — Wear and Damage Limits

CLEAN WEAR SLEEVE



Drycleaning Solvent

71. Clean wear sleeve with wiping rag (D164) dampened with drycleaning solvent (D199).

72. Dry wear sleeve with clean wiping rag (D164).

INSPECT WEAR SLEEVE

73. Inspect wear sleeve to damage limits shown. Reject sleeve if limits are exceeded.

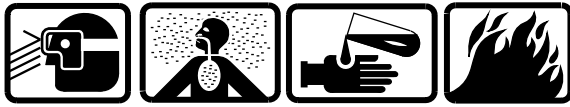
REPAIR WEAR SLEEVE

74. Repair damage to wear sleeve, using crocus cloth (D90) and blend into surrounding area.

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN FREEWHEELING OUTPUT ADAPTER



Drycleaning Solvent

75. Clean freewheeling output adapter with a wiping rag (D164) dampened with drycleaning solvent (D199).

76. Dry freewheeling output adapter with a clean wiping rag (D164).

INSPECT FREEWHEELING OUTPUT ADAPTER

77. Inspect freewheeling output adapter for wear. See figure Freewheeling Output Adapter — Wear and Damage Limits.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Magnetic particle inspection of freewheeling output adapter is a characteristic critical to flight safety.

78. Magnetic particle inspect freewheeling output adapter (TM 1-1520-266-23).

79. Inspect freewheeling output adapter to damage limits shown. Reject adapter if limits are exceeded or if a crack is found. See figure Freewheeling Output Adapter — Wear and Damage Limits. If a crack in freewheeling output adapter is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

REPAIR FREEWHEELING OUTPUT ADAPTER



Sanding Operations

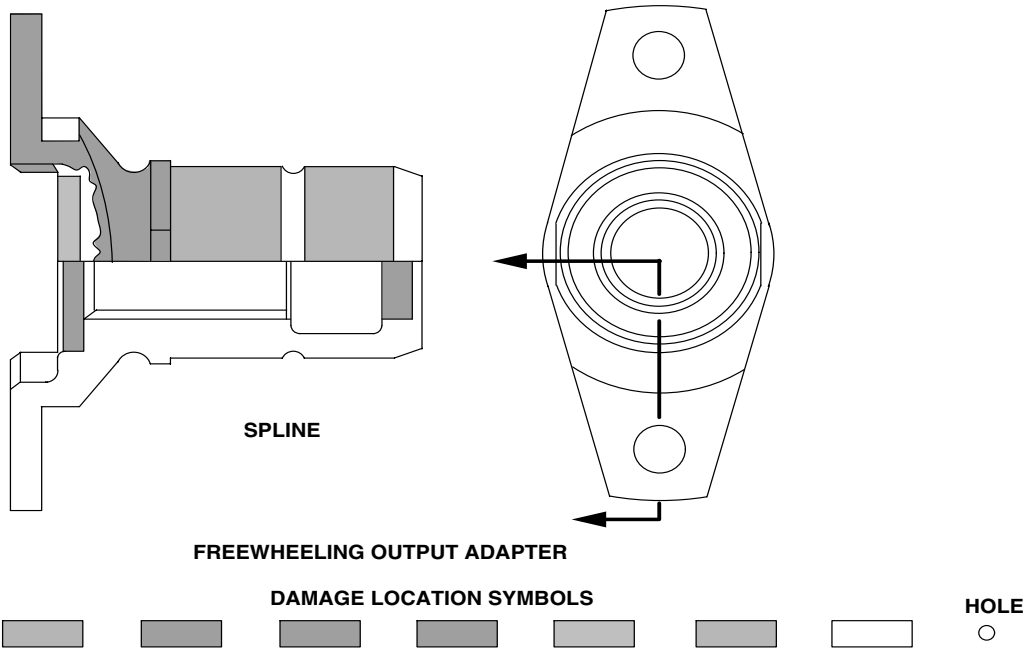
80. Repair damage to freewheeling output adapter using 400 grit sandpaper (D175).

81. Blend repaired area into surrounding area with crocus cloth (D90).

INSPECT

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL

TYPE OF DAMAGE	Symbol 1	Symbol 2	Symbol 3	Symbol 4	Symbol 5	Symbol 6	Symbol 7	Symbol 8
WEAR	N/A	N/A	N/A	0.7507-0.7500 In. diameter	1.1507-1.1500 In. diameter	1.239-1.240 In. diameter	N/A	0.313-0.315 In. diameter
SCORING	None permitted	0.002 In.	None permitted	None permitted	None permitted	None permitted	N/A	N/A
CORROSION	None permitted	None permitted	None permitted	None permitted	None permitted	None permitted	N/A	None permitted

SPLINE DAMAGE

WEAR 0.6117-0.6198 inch diameter measured between 0.054 inch diameter pins

CORROSION None permitted

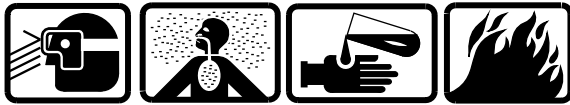
406040-162
J2020

Freewheeling Output Adapter — Wear and Damage Limits

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN DUPLEX BEARING NUT



Drycleaning Solvent

82. Clean duplex bearing nut with a wiping rag (D164) dampened with drycleaning solvent (D199).

83. Dry duplex bearing nut with a clean wiping rag (D164).

INSPECT DUPLEX BEARING NUT

84. Inspect duplex bearing nut for wear. See figure Duplex Bearing Nut — Damage Limits.

85. Fluorescent penetrant inspect freewheeling output adapter (TM 1-1520-266-23).

86. Inspect duplex bearing nut for damage to limits shown. Reject nut if limits are exceeded. See figure Duplex Bearing Nut — Damage Limits.

REPAIR DUPLEX BEARING NUT



Sanding Operations

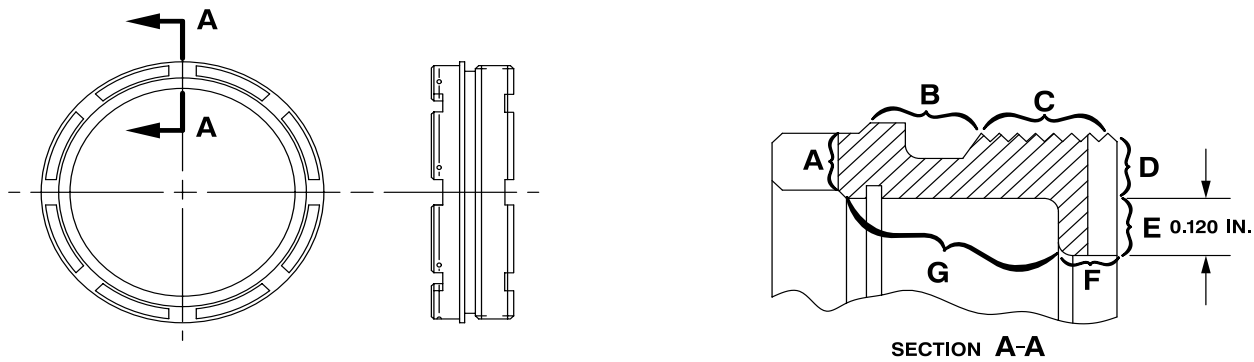
87. Repair damage to duplex bearing nut using 240 grit abrasive pads (D1) or steel wool (D205).

88. Repair duplex bearing nut per limits as shown.

INSPECT

GO TO NEXT PAGE

6-5-3. FREEWHEELING UNIT COMPONENTS (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



DUPLEX BEARING NUT

AREA	MECH OR CORROSION DAMAGE DEPTH BEFORE AND AFTER REPAIR	MAXIMUM AREA PER FULL DEPTH REPAIR	NUMBER OF REPAIRS	EDGE CHAMFER
A	0.060 IN.	0.25 SQ. IN.	8	0.060 X 45°
B	ONLY WHAT CAN BE REMOVED WITH ABRASIVE MATS (D1) OR STEEL WOOL (D205)	100%	N/A	0.030 X 45°
C	SEE NOTE 4			
D	0.060 IN. 7	0.025 SQ. IN.	8	0.060 X 45°
E	0.004 IN. 5	6	4	NONE
F	0.005 IN. 0.002 IN.	0.010 SQ. IN. 100%	3 N/A	NONE
G	ONLY WHAT CAN BE REMOVED WITH ABRASIVE MATS (D1) OR STEEL WOOL (D205)	100%	N/A	NONE

NOTES:

- 1 Inspection data applies to 406-040-543-101/-103 nuts.
- 2 No cracks permitted.
- 3 Touch up coating in repaired areas with brush application of ALODINE 1201 (D57) (Task 2-2-67).
- 4 AREA C - maximum thread damage is as follows: Total length of damaged thread shall not exceed one full wrap (12 inches).
- 5 Contact area with bearing may be worn or reworked equally on lands to this max depth if all are in the same plane.
- 6 Full circumference of nut face.
- 7 Inspect carefully for evidence of contact with liner, particularly if wear is noted in AREA E. If contact is noted, nut is to be rejected.

406040-306
J2152

Duplex Bearing Nut — Damage Limits

END OF TASK

**6-5-4. FREEWHEELING UNIT TAIL ROTOR DRIVE OUTPUT OIL SEAL (AVIM) — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
Torque Wrench (B237)
Plastic Scraper (B123)
Nonmetallic Drift (Work Aid)

Material:

Acetone (D2)
Sealant (D180)
Crocus Cloth (D90)
Rubber Gloves (D111)
Wiping Rags (D164)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

GO TO NEXT PAGE

6-5-4. FREEWHEELING UNIT TAIL ROTOR DRIVE OUTPUT OIL SEAL (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

NOTE

It may be necessary to remove elbow fitting from aft bearing and seal cap to prevent damage to elbow fitting.

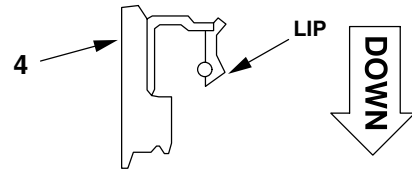
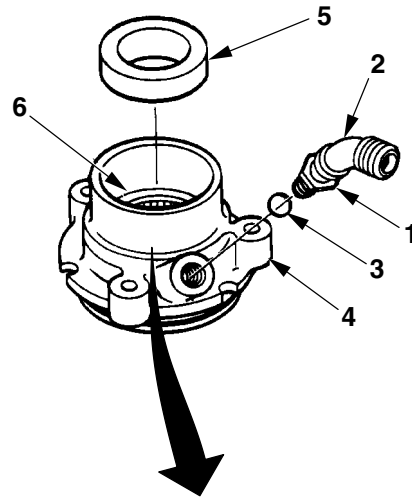
1. Loosen jamnut (1) and remove elbow fitting (2) with packing (3) from aft bearing and seal cap (4). Discard packing (3).

2. Using plastic scraper (B123), remove sealant from mating surface of aft bearing and seal cap (4) and seal (5).

CAUTION

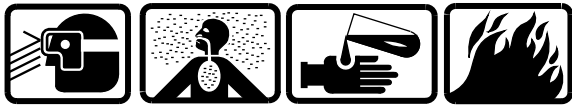
Care shall be exercised when removing seal to prevent damage to output shaft support bearing.

3. Remove seal (5) from aft bearing and seal cap (4) using nonmetallic drift and tapping it with a plastic mallet.



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J0432

CLEAN



Acetone

4. Clean seal mating surface with acetone (D2).

5. Inspect output shaft support bearing (6) for any damage.

6. Inspect seal mating surface for burrs and scratches.

7. Remove burrs and scratches with crocus cloth (D90).

8. If bearing (6) is damaged, replace bearing (6) (Task 6-5-5).

INSTALL

9. Clean exterior of seal (5) with acetone (D2).



Sealing Compound

10. Apply thin film of sealant (D180) to exterior surface of seal (5).

11. Press seal (5) into aft bearing and seal cap (4) with seal lip facing down.

12. Install packing (3) on elbow fitting (2) and install elbow fitting (2) on aft bearing and seal cap (4). Torque jamnut (1) **30 TO 45 INCH-POUNDS**.

INSPECT

13. If aft bearing and seal cap (4) is not being installed at this time, cover aft bearing and seal cap with a clean wiping rag (D164) to prevent contamination.

END OF TASK

**6-5-5. FREEWHEELING UNIT TAIL ROTOR OUTPUT SHAFT SUPPORT BEARING (AVIM) —
REMOVAL/INSTALLATION**

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Tool Kit (B180)
Puller Kit (B84)
Vise (B211)
Torque Wrench (B237)

Material:
Crocus Cloth (D90)
Drycleaning Solvent (D199)
Wiping Rag (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

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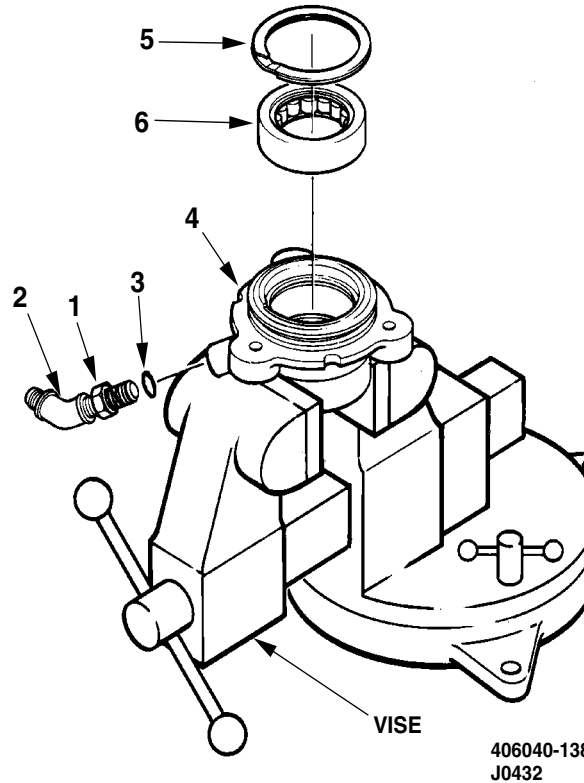
6-5-5. FREEWHEELING UNIT TAIL ROTOR OUTPUT SHAFT SUPPORT BEARING (AVIM) —
REMOVAL/INSTALLATION (CONT)

REMOVE SUPPORT BEARING

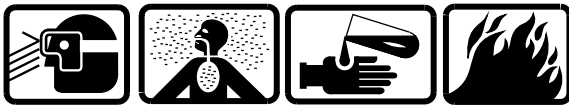
CAUTION

To prevent damage to elbow fitting, it may be necessary at this time to remove the elbow fitting from aft bearing and seal cap.

1. Loosen jamnut (1) and remove elbow fitting (2) with packing (3) from aft bearing and seal cap (4). Discard packing (3).
2. Place aft bearing and seal cap (4) in a vise (B211).
3. Remove retainer ring (5) from aft bearing and seal cap (4).
4. Using bearing puller (B84), remove support bearing (6) from aft bearing and seal cap (4).



CLEAN



Drycleaning Solvent

5. Clean bearing mating surface with a wiping rag (D164) dampened with drycleaning solvent (D199).
6. Inspect support bearing mating surface of aft bearing and seal cap (4) for burrs, nicks, and scratches.

REPAIR

7. Repair aft bearing and seal cap using crocus cloth (D90) and blend repair into surrounding area.

INSTALL SUPPORT BEARING

8. Press support bearing (6) into aft bearing and seal cap (4) and secure with retaining ring (5).
9. Remove aft bearing and seal cap (4) from vise (B211).

10. Install packing (3) on elbow fitting (2) on aft bearing and seal cap (4).

11. Torque jamnut (1) **30 TO 45 INCH-POUNDS.**

INSPECT

END OF TASK

6-5-6. FREEWHEELING UNIT TAIL ROTOR DRIVE OUTPUT ADAPTER WEAR SLEEVE (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Vise (B211)
Rubber Mallet (B97)

Applicable Configurations:
All

Material:
Drycleaning Solvent (D199)
Wiping Rag (D164)
Crocus Cloth (D90)
Rubber Gloves (D111)

Tools:

Powertrain Tool Kit (B180)
Asbestos Cloth Gloves (B53)
Hand Arbor Press (B107)
Rotary Tool Kit (B85)
Heat Gun (B59)
Wear Installation Tool (B184)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

REMOVE OUTPUT ADAPTER WEAR SLEEVE

1. Place output shaft adapter (1) in vise (B211) and ensure that output adapter surface finish is protected from damage by the jaws of vise.

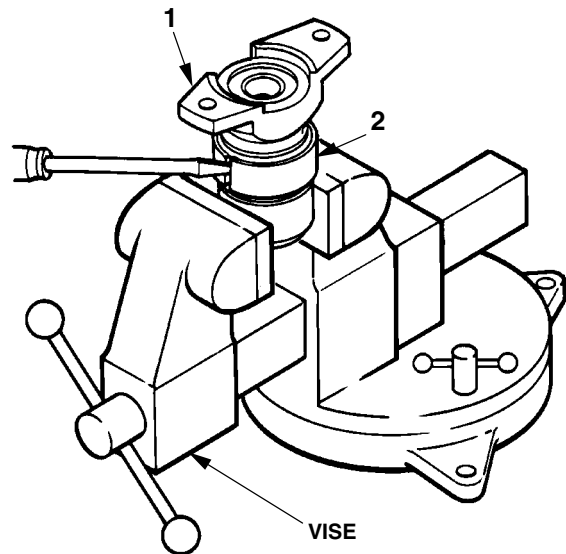
CAUTION

Care shall be used when cutting groove in wear sleeve, or rotary tool will damage output adapter.

2. Using rotary tool (B85), cut a groove in wear sleeve (2) stopping just before cutting through wear sleeve (2).

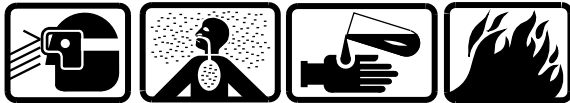
3. Using a blunt chisel and a plastic mallet, strike groove in wear sleeve (2) to separate.

4. Remove wear sleeve (2) from output shaft adapter (1). Discard wear sleeve (2).



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J0432

CLEAN



Drycleaning Solvent

5. Clean output shaft adapter (1) with wiping rag (D164) dampened with drycleaning solvent (D199).

GO TO NEXT PAGE

6-5-6. FREEWHEELING UNIT TAIL ROTOR DRIVE OUTPUT ADAPTER WEAR SLEEVE (AVIM) —
REMOVAL/INSTALLATION (CONT)

6. Inspect wear sleeve area for nicks, scratches, and burrs.

REPAIR

7. Remove nicks, scratches, and burrs with crocus cloth (D90) and blend repairs into surrounding area.

INSTALL

8. Install new wear sleeve (2) on output shaft adapter (1).

9. Install wear sleeve installation tool (B184) on output shaft adapter (1) and mate with wear sleeve (2). The chamfered area of the wear sleeve is to be assembled against shoulder on adapter.

WARNING

Care shall be exercised when handling heat gun (B59) and heated parts. Asbestos gloves (B53) shall be worn to avoid burns. If burns occur, medical aid shall be obtained.

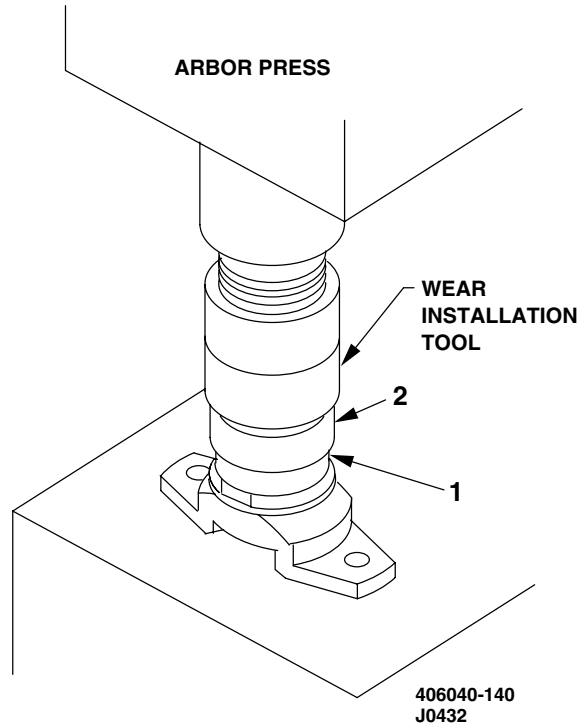
10. Using heat gun (B59), heat wear sleeve (2) until it can be easily pressed onto output shaft adapter (1).

11. Using arbor press (B107), press wear sleeve (2) onto output shaft adapter (1).

INSPECT

12. Remove output shaft adapter (1), with wear installation tool (B184), from arbor press (B107).

13. Remove wear installation tool (B184) from output shaft adapter (1).



END OF TASK

6-5-7. FREEWHEELING UNIT — INSTALLATION

This task covers: Installation of Freewheeling Unit (On Helicopter)

INITIAL SETUP

Sealing Compound (D184)
Rubber Gloves (D111)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer
Maintenance Test Pilot

Tools:

Powertrain Tool Kit (B180)
Input Spanner Adapter (B4)
Input Spanner Set (B133)
Spline Wrench (B230)
Maintenance Stand (B162)
Torque Wrench (B233)
Torque Wrench (B242)
Torque Wrench (B237)
Respirator (B116)

References:
TM 1-1520-248-MTF

Equipment Condition:

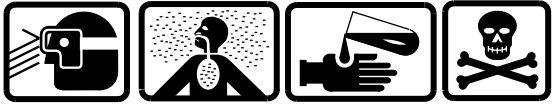
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Air Induction Cowling Removed (Task 4-2-1)
Engine to Transmission Driveshaft Removed
(Task 6-2-1)
Forward Shaft Assembly Removed
(Task 6-6-1 or 6-6-2)

Material:

Lockwire (D132)
Grease (D113)
Lubricating Oil (D139 or D140)

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6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)



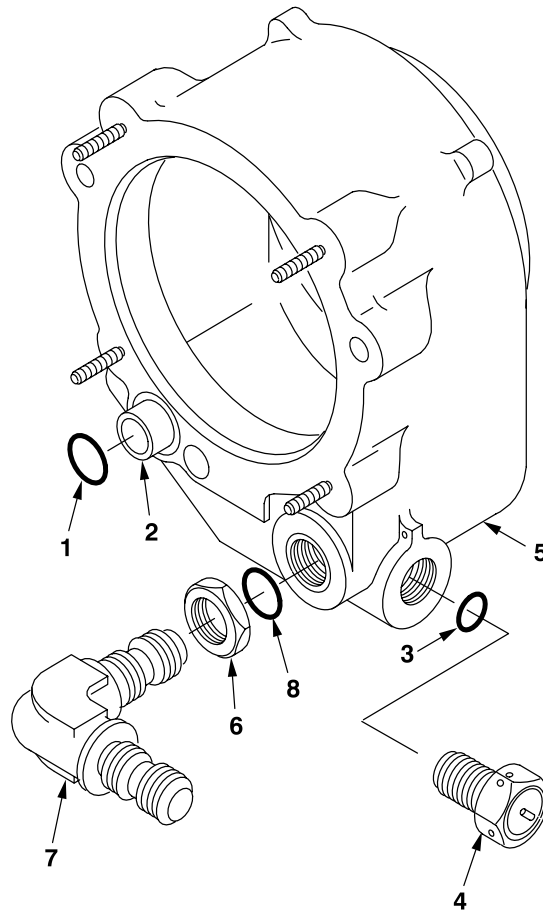
Lubricating Oil

1. Lubricate packing (1) with lubricating oil (D139 or D140).
2. Install packing (1) on housing assembly oil transfer tube (2).
3. Lubricate packing (3) with lubricating oil (D139 or D140).
4. Install packing (3) on chip detector housing (4) and install in housing assembly (5).
5. Torque chip detector housing (4) **75 TO 100 INCH-POUNDS**.
6. Secure chip detector housing (4) to freewheeling housing assembly (5) with lockwire (D132).
7. Install jamnut (6) on elbow fitting (7).
8. Lubricate packing (8) with lubricating oil (D139 or D140).
9. Install packing (8) on elbow fitting (7).
10. Install elbow fitting (7) with jamnut (6) and packing (8) in housing assembly (5).

NOTE

Once elbow fitting has been installed and jamnut torqued to specified limits, fitting should be in a horizontal position.

11. Torque jamnut (6) **75 TO 125 INCH-POUNDS**.



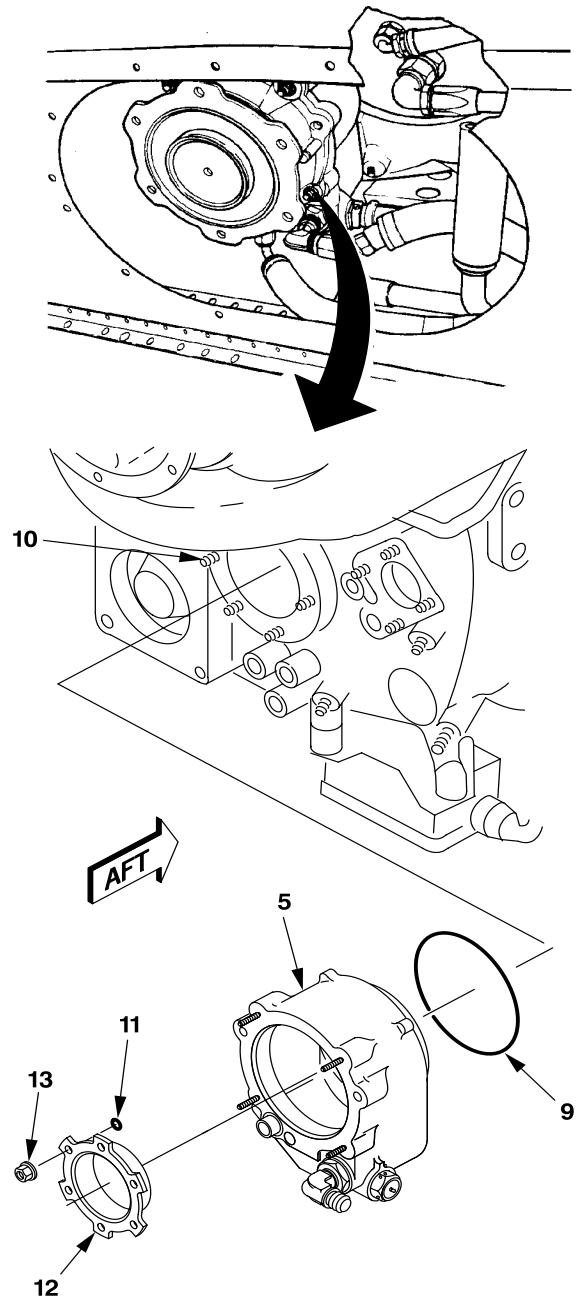
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6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)

**Lubricating Oil**

12. Lubricate packing (9) with lubricating oil (D139 or D140).
13. Install packing (9) in groove on back face of freewheeling housing assembly (5).
14. Place freewheeling housing assembly (5) on six studs (10).
15. Lubricate six packings (11) with lubricating oil (D139 or D140).
16. Install six packings (11) on six mounting studs (10) inside housing assembly (5).
17. Install pilot ring (12) on six mounting studs (10) inside housing assembly (5).
18. Install six nuts (13) on six mounting studs (10) inside housing assembly (5).
19. Torque nuts (13) **50 TO 70 INCH-POUNDS**.

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J0990

GO TO NEXT PAGE

6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)



Lubricating Oil

20. Lubricate packings (14 and 15) with lubricating oil (D139 or D140).

21. Install packing (15) in groove of forward seal cap (16) and packing (14) in groove on aft end of output shaft assembly (17).

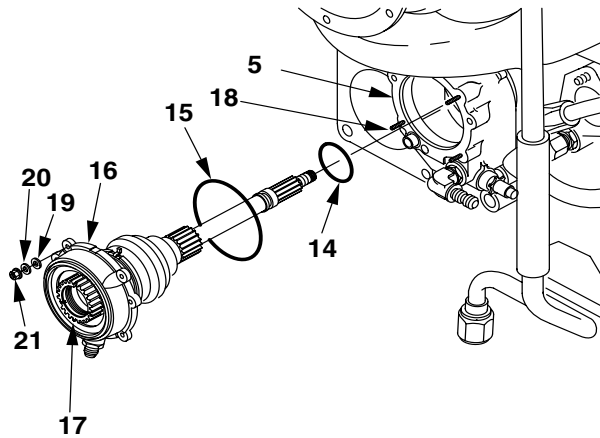
NOTE

All engine shipping gaskets, seals, and hardware shall be removed prior to installing output shaft assembly on a new or overhauled engine.

22. Install output shaft assembly (17) in freewheeling housing assembly (5) on four mounting studs (18).

23. Install four aluminum washers (19), steel washers (20), and nuts (21) on four mounting studs (18).

24. Torque nuts (21) **50 TO 70 INCH-POUNDS**.



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J0990

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6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)

NOTE

- Shaft assemblies with 406-040-500-103 part number shall use 406-040-542-101 coupling shaft.
- Shaft assemblies with 406-040-500-111 part number shall use 406-040-542-103 coupling shaft.
- Coupling shafts shall not be intermixed between shaft assemblies.

25. Remove tag and cap from elbow fitting (7) and return oil line (22).

26. Connect return oil line (22) to elbow fitting (7). Torque oil line to **75 TO 125 INCH-POUNDS**.

27. Remove tag and cap from forward seal cap fitting (23) and inlet oil line (24).

28. Connect inlet oil line (24) to forward seal cap fitting (23).

29. Install shaft coupling (25) on splines of output shaft assembly (17).

30. Install freewheeling bolt adapter (26) on threads of output shaft assembly (17).

31. Install input spanner adapter (B4) on shaft coupling (25) and secure in place with accompanying hardware.

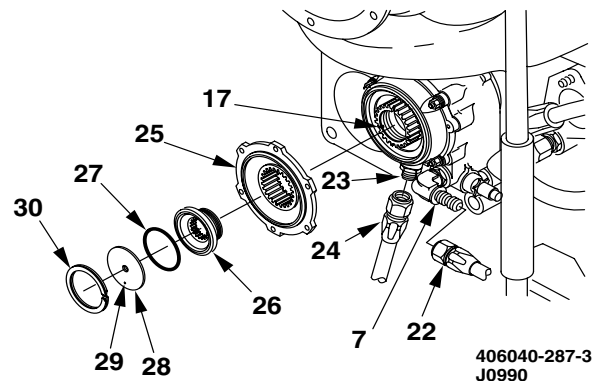
32. While holding shaft coupling (25) secure with input spanner adapter (B4), use spline wrench (B230) and torque freewheeling bolt adapter (26) **150 TO 175 FOOT-POUNDS**.

33. Install packing (27) on output shaft plug assembly (28).

34. Align pin (29) on output shaft plug assembly (28) with an aligned hole in freewheeling bolt adapter (26).

35. Install output shaft plug assembly (28) and packing (27) in freewheeling bolt adapter (26).

36. Secure output shaft plug assembly (28) with retainer ring (30).



GO TO NEXT PAGE

6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of cone set and spacer is a characteristic critical to flight safety.

CAUTION

To prevent damage to accessory drive gears and output shaft, cone set shall not be allowed to become unseated.

37. Install cone set (31) in groove (32) on aft end of output shaft assembly (17). Ensure both halves of cone set are properly seated in groove of output shaft.

CAUTION

To prevent failure of freewheeling unit, spacer (33) shall be fully seated on cone set (31).

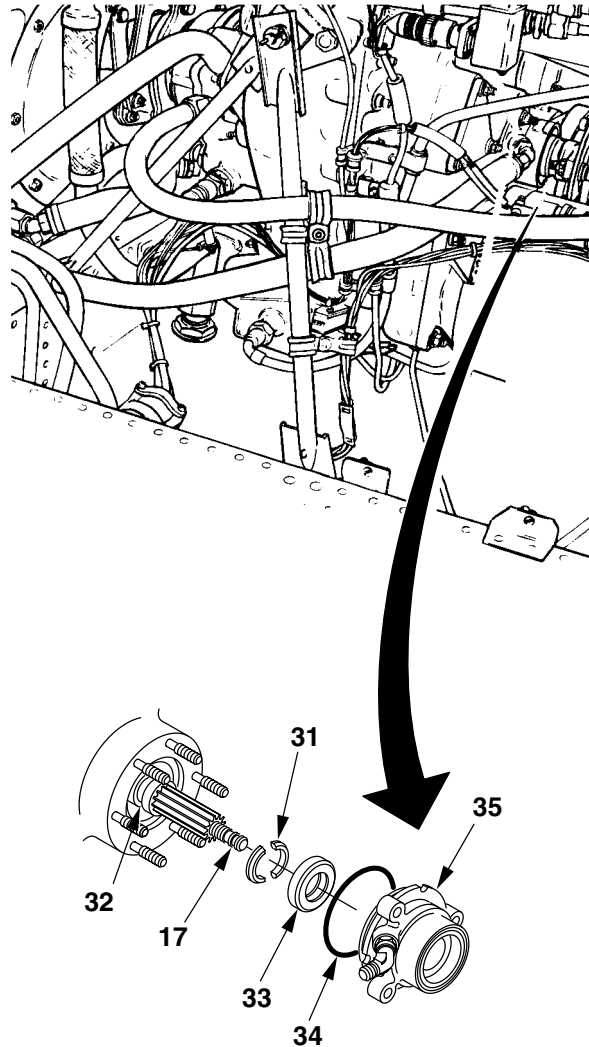
38. Install spacer (33) on output shaft assembly (17) and mate with cone set (31).



Lubricating Oil

39. Lubricate packing (34) with lubricating oil (D139 or D140).

40. Install packing (34) on aft bearing and seal cap (35).



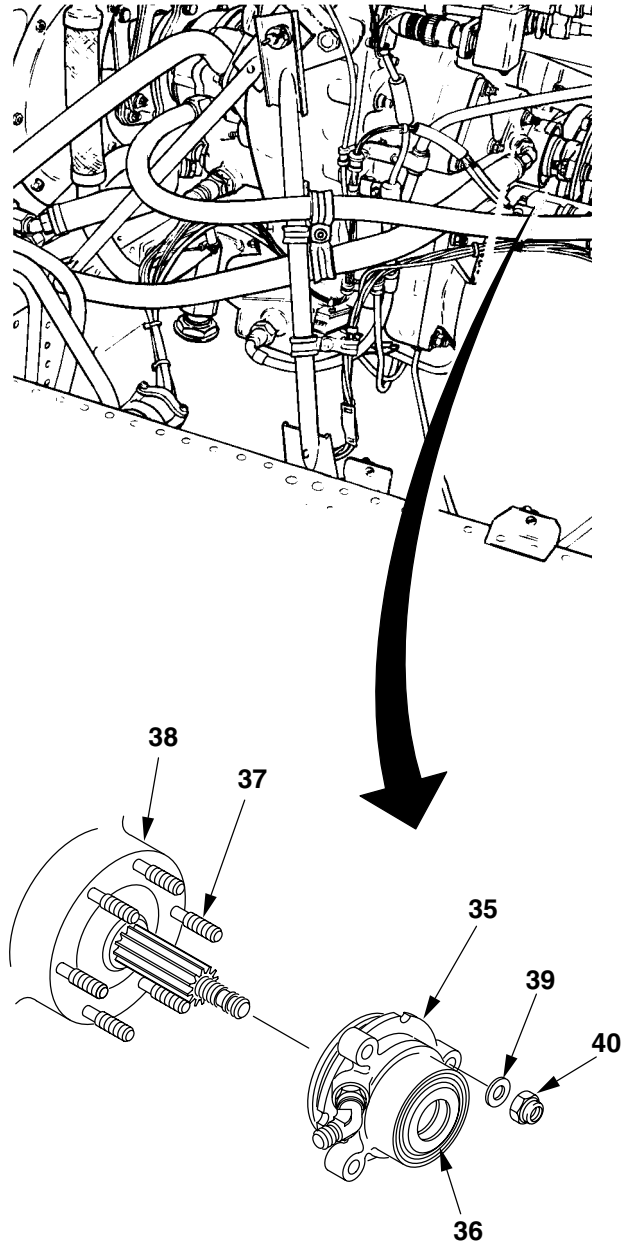
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6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)

**Grease**

41. Fill area between lips of seal (36) with grease (D113).
42. Install aft bearing and seal cap (35) on three support studs (37).
43. Use hand pressure to set aft bearing and seal cap (35) in output support (38).
44. Install three washers (39) and three nuts (40) on three support studs (37).
45. Torque nuts (40) **50 TO 70 INCH-POUNDS**.



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6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)

46. Remove tag and cap from elbow fitting (41) and oil inlet line (42).

47. Connect oil inlet line (42) to elbow fitting (41). Torque inlet line **30 TO 45 INCH-POUNDS**.

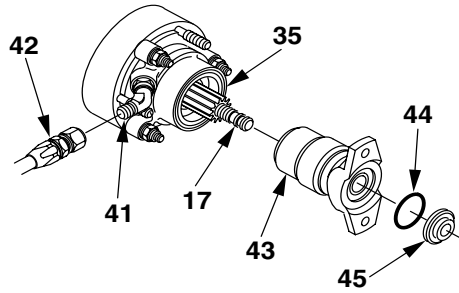
CAUTION

To prevent damage to accessory drive gears and output shaft assembly, output adapter shall not be removed once it has been installed. Movement (in and out) of output adapter may cause cone set to become unseated.

NOTE

If output adapter is moved outboard or removed, cone set shall be checked for seated condition. Check of cone set may require removal of aft bearing and seal cap.

48. Install output adapter (43) on aft end of output shaft assembly (17) and into bearing and seal cap (35).



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Lubricating Oil

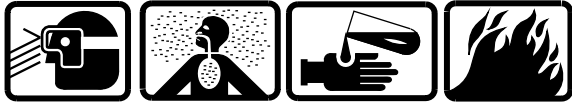
49. Lubricate packing (44) with lubricating oil (D139 or D140).

50. Install packing (44) on spacer sleeve (45).

51. Install spacer sleeve (45) and packing (44) on output shaft assembly (17).

GO TO NEXT PAGE

6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)

**Sealing Compound**

52. Apply a small bead of sealing compound (D184) between aft face of spacer sleeve (45) and threads of output shaft assembly (17).

NOTE

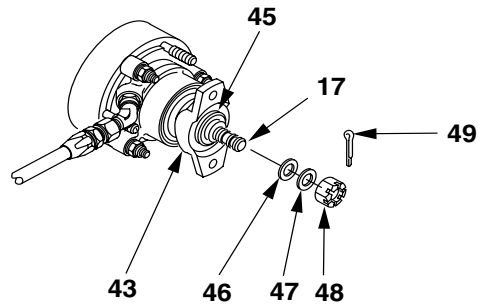
Thick washer may be installed with thin washer to obtain proper cotter pin engagement.

53. Install thin washer (46), thick washer (47), if required, and nut (48).

54. Install spanner (part of B133) on output adapter (43).

55. Torque nut (48) **225 TO 500 INCH-POUNDS.**

56. Install cotter pin (49).



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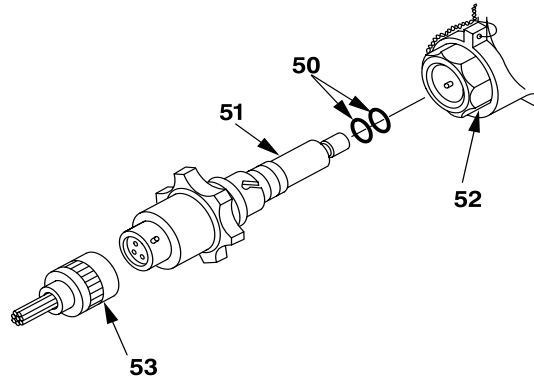
6-5-7. FREEWHEELING UNIT — INSTALLATION (CONT)

57. Lubricate two packings (50) with lubricating oil (D139 or D140).

58. Install two packings (50) on chip detector (51).

59. Install chip detector (51) in chip detector housing (52).

60. Connect electrical connector (53) to chip detector (51).



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INSPECT

FOLLOW-ON MAINTENANCE

Install forward shaft assembly (Task 6-6-1 or 6-6-2).

Install engine to transmission driveshaft (Task 6-2-1).

Install air induction cowling (Task 4-2-4).

Service transmission (Task 1-4-8).

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC.

Maintenance test pilot perform MTF (TM 1-1520-248-MTF).

END OF TASK

Section VI. TAIL ROTOR DRIVESHAFTS

6-18. TAIL ROTOR DRIVESHAFTS

Standard torques are provided in Appendix P and TM 1-1500-204-23.

6-19. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, installation, and alignment of tail rotor driveshaft components.

6-20. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Forward Shaft Assembly (OH-58D) — Removal/Installation	6-6-1	6-240
Forward Shaft Assembly (OH-58D(R)) — Removal/Installation	6-6-2	6-243
Forward Shaft Assembly — Cleaning/Inspection/Repair	6-6-3	6-247
Aft Short Shaft Assembly — Removal/Installation	6-6-4	6-250
Aft Short Shaft Assembly — Cleaning/Inspection/Repair	6-6-5	6-254
■ Coupling Disc Pack — Removal/Cleaning/Installation	6-6-6	6-257
Coupling Disc Pack Assemblies — Inspection	6-6-7	6-263
Shaft and Bearing Hanger Assembly — Removal/Installation	6-6-8	6-266
Adapter/Bearing Hanger/Segmented Shaft (Typical) — Removal/Installation	6-6-9	6-269
Components of Shaft and Bearing Hanger Assembly — Cleaning/Inspection/Repair	6-6-10	6-271
Fan Shaft Assembly — Removal	6-6-11	6-281
Bearing Hangers/Bearings/Impeller/Fan Shaft/Blower Housing — Removal/Installation	6-6-12	6-284
Bearing Hangers/Bearings/Impeller/Fan Shaft/Blower Housing — Cleaning/Inspection/Repair	6-6-13	6-290
Fan Shaft Assembly — Installation	6-6-14	6-300
Fan Shaft Bearing Hanger Brackets (Forward and Aft) — Removal/Installation	6-6-15	6-304
Fan Shaft Bearing Hanger Brackets (Forward and Aft) — Cleaning/Inspection/Repair	6-6-16	6-308
Tail Rotor Bearing Hanger — Alignment	6-6-17	6-311
Tail Rotor Driveshaft Coupling Angle — Inspection and Driveshaft Alignment	6-6-18	6-314

6-6-1. FORWARD SHAFT ASSEMBLY (OH-58D) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
OH-58D

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)

1. Gain access to forward shaft assembly (1) by opening left engine cowling.

REMOVE

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition of the forward shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during removal or handling. Extreme caution shall be used during removal and handling.

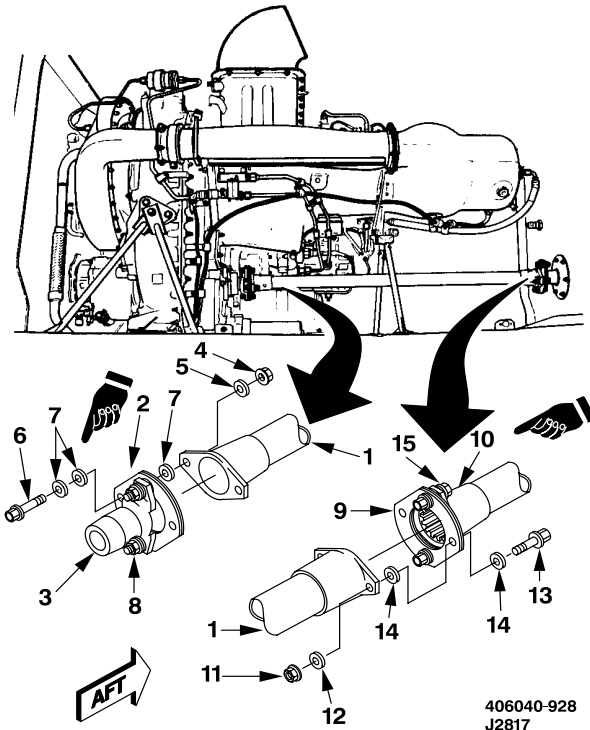
CAUTION

Forward shaft assembly shall be supported to prevent damage to coupling disc packs.

2. Disconnect forward end of forward shaft assembly (1) from coupling disc pack (2) on freewheeling output adapter (3) by removing two nuts (4), two flat washers (5), two bolts (6), and six recessed washers (7).

3. Break torque on two nuts (8).

4. Disconnect aft end of forward shaft assembly (1) from coupling disc pack (9) on fan and shaft adapter (10) by removing two nuts (11), two flat washers (12), two bolts (13), and four recessed washers (14).



5. Remove forward shaft assembly (1).

6. Break torque on two nuts (15).

7. Clean, inspect, and repair forward shaft assembly (1) (Task 6-6-3).

GO TO NEXT PAGE

6-6-1. FORWARD SHAFT ASSEMBLY (OH-58D) — REMOVAL/INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

- Surface condition of the forward shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during handling or installation. Extreme caution shall be used during handling or installation.
- Installation of recessed washers with recessed side against disc packs and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc packs will result.

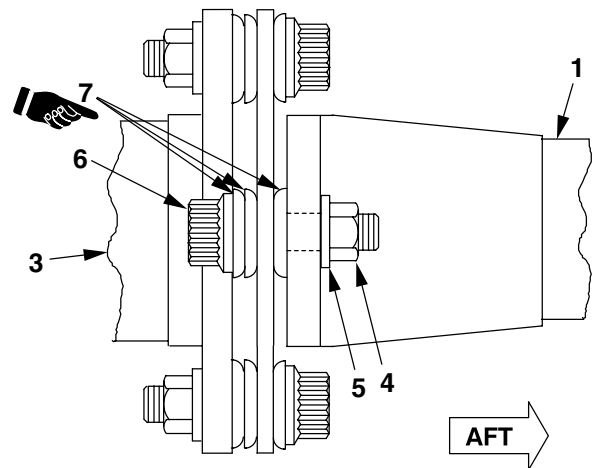
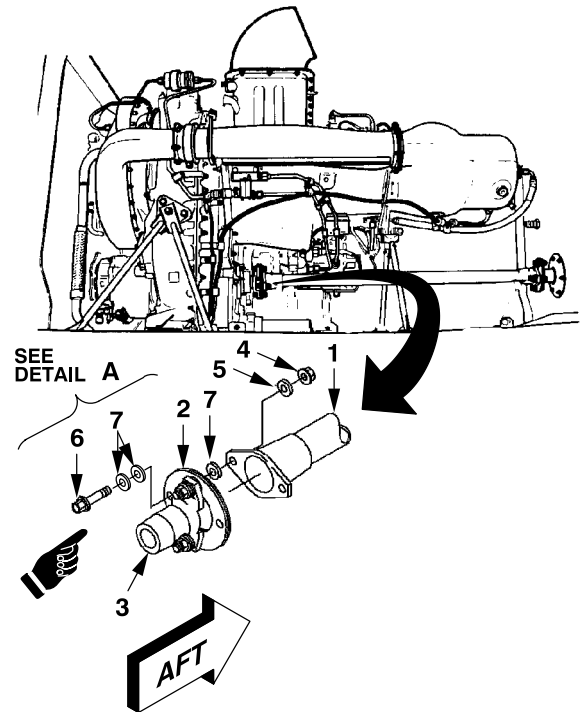
CAUTION

- Only those self-locking nuts that cannot be tightened down with fingers after the locking action engages bolt shall be reused. Nuts shall be tested by attempting to insert a matching bolt by hand. Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.
- Forward shaft assembly shall be supported to prevent damage to coupling disc packs.

NOTE

If disc packs are removed refer to Task 6-6-6 for recessed washer stackup.

8. Connect forward end of forward shaft assembly (1) to coupling disc pack (2) on freewheeling output adapter (3) by installing two bolts (6), six recessed washers (7) (with rounded edges in contact with coupling disc pack), two flat washers (5), and two nuts (4). (See detail A).



DETAIL A
(CORRECT HARDWARE CONFIGURATION)

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GO TO NEXT PAGE

6-6-1. FORWARD SHAFT ASSEMBLY (OH-58D) — REMOVAL/INSTALLATION (CONT)

WARNING

Shaft surface condition, torquing, and recessed washer orientation warning located prior to step 8. shall be observed.

9. Connect aft end of forward shaft assembly (1) to coupling disc pack (9) on fan and shaft adapter (10) by installing two bolts (13), four recessed washers (14) (with rounded edges in contact with coupling disc pack), two flat washers (12), and two nuts (11). (See Detail B.)

10. Torque nuts (4, 8, 11, and 15) and inspect for gaps between discs in both packs (Task 6-6-7).

NOTE

Task 6-6-18 shall be performed only if there has been repetitive spreading or damage that required coupling disc pack change.

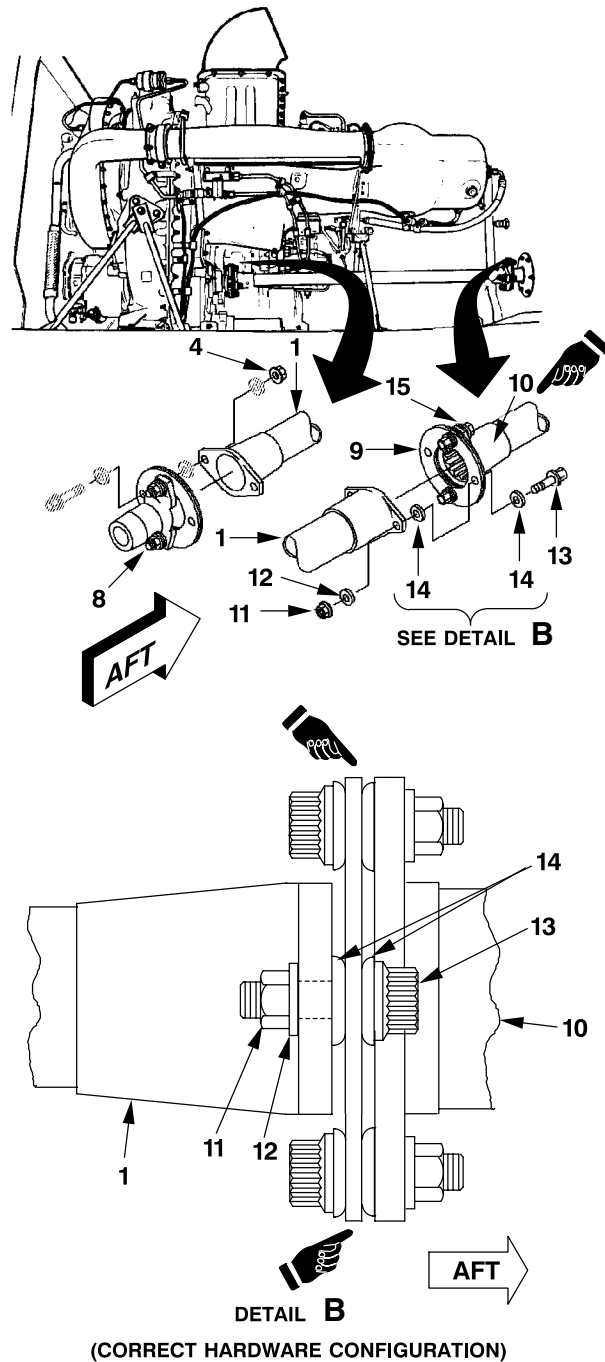
11. Align tail rotor driveshaft (Task 6-6-18).

INSPECT

12. Close left engine cowling.

FOLLOW-ON MAINTENANCE

Pilot perform MOC (TM 1-1520-248-10/-CL).



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END OF TASK

6-6-2. FORWARD SHAFT ASSEMBLY (OH-58D(R)) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
OH-58D(R)

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)

1. Gain access to forward shaft assembly (1) by opening left engine cowling.

REMOVE

WARNING

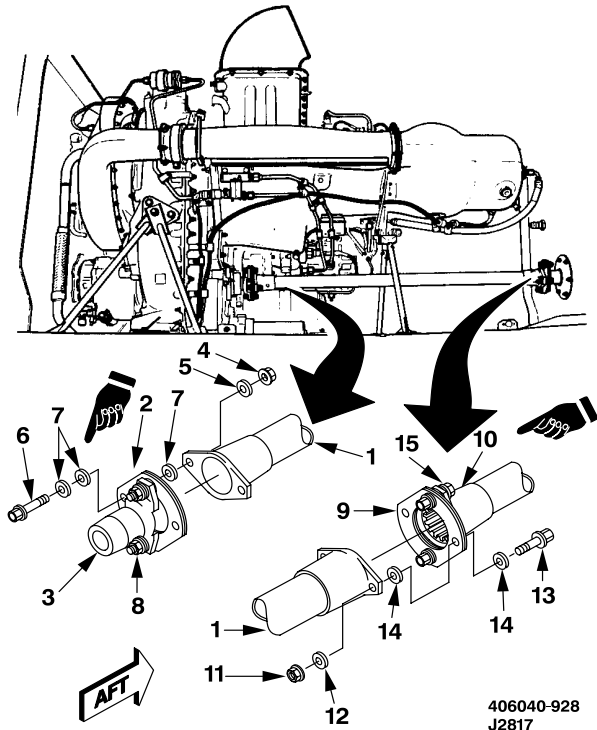
FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition of the forward shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during removal or handling. Extreme caution shall be used during removal and handling.

CAUTION

Forward shaft assembly shall be supported to prevent damage to coupling disc packs.

2. Disconnect forward end of forward shaft assembly (1) from coupling disc pack (2) on freewheeling output adapter (3) by removing two nuts (4), two flat washers (5), two bolts (6), and six recessed washers (7).
3. Break torque on two nuts (8).
4. Disconnect aft end of forward shaft assembly (1) from coupling disc pack (9) on fan and shaft adapter (10) by removing two nuts (11), two flat washers (12), two bolts (13), and four recessed washers (14).



5. Break torque on two nuts (15).
6. Remove forward shaft assembly (1).
7. Clean, inspect, and repair forward shaft assembly (1) (Task 6-6-3).

GO TO NEXT PAGE

6-6-2. FORWARD SHAFT ASSEMBLY (OH-58D(R)) — REMOVAL/INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

- Surface condition of the forward shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during handling or installation. Extreme caution shall be used during handling or installation.
- Installation of recessed washers with recessed side against disc pack and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc packs will result.

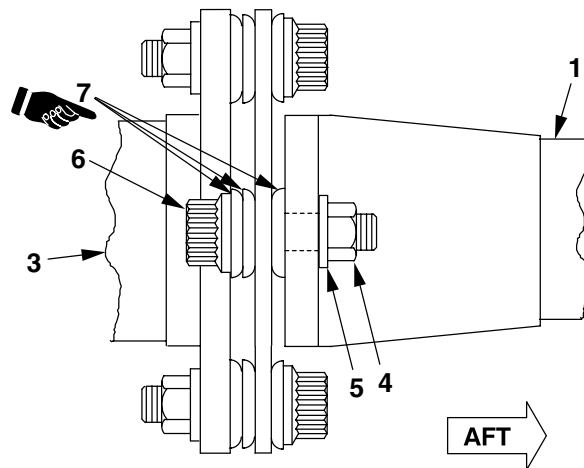
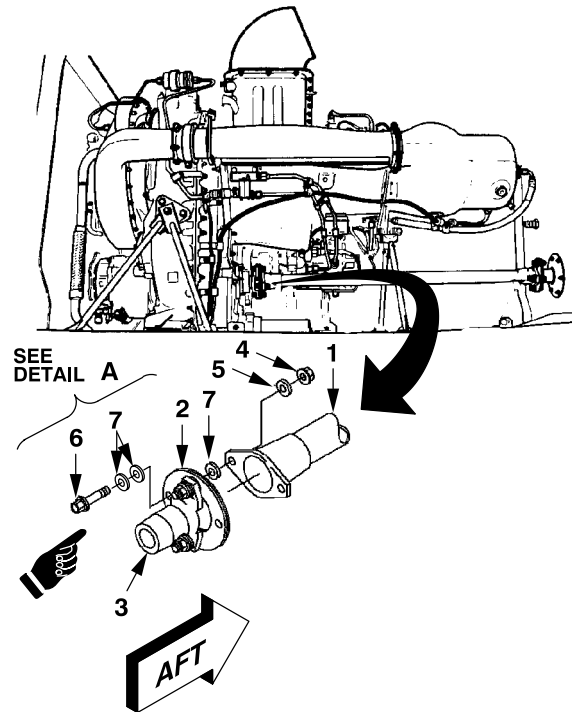
CAUTION

- Only those self-locking nuts that cannot be tightened down with fingers after the locking action engages bolt shall be reused. Nuts shall be tested by attempting to insert a matching bolt by hand. Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.
- Forward shaft assembly shall be supported to prevent damage to coupling disc packs.

NOTE

If disc packs are removed refer to Task 6-6-6 for recessed washer stackup.

8. Connect forward end of forward shaft assembly (1) to coupling disc pack (2) on freewheeling output adapter (3) by installing two bolts (6), six recessed washers (7) (with rounded edges in contact with coupling disc pack), two flat washers (5), and two nuts (4). (See Detail A.)



DETAIL A
(CORRECT HARDWARE CONFIGURATION)

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6-6-2. FORWARD SHAFT ASSEMBLY (OH-58D(R)) — REMOVAL/INSTALLATION (CONT)

WARNING

Shaft surface condition, torquing, and recessed washer orientation warning, located prior to step 8., shall be observed.

9. Connect aft end of forward shaft assembly (1) to coupling disc pack (9) on fan and shaft adapter (10) by installing two bolts (13), four recessed washers (14) (with rounded edges in contact with coupling disc pack), two flat washers (12), and two nuts (11). (See detail B.)

10. Torque nuts (4, 8, 11, and 15) and inspect for gaps between discs in both packs (Task 6-6-7).

INSPECT

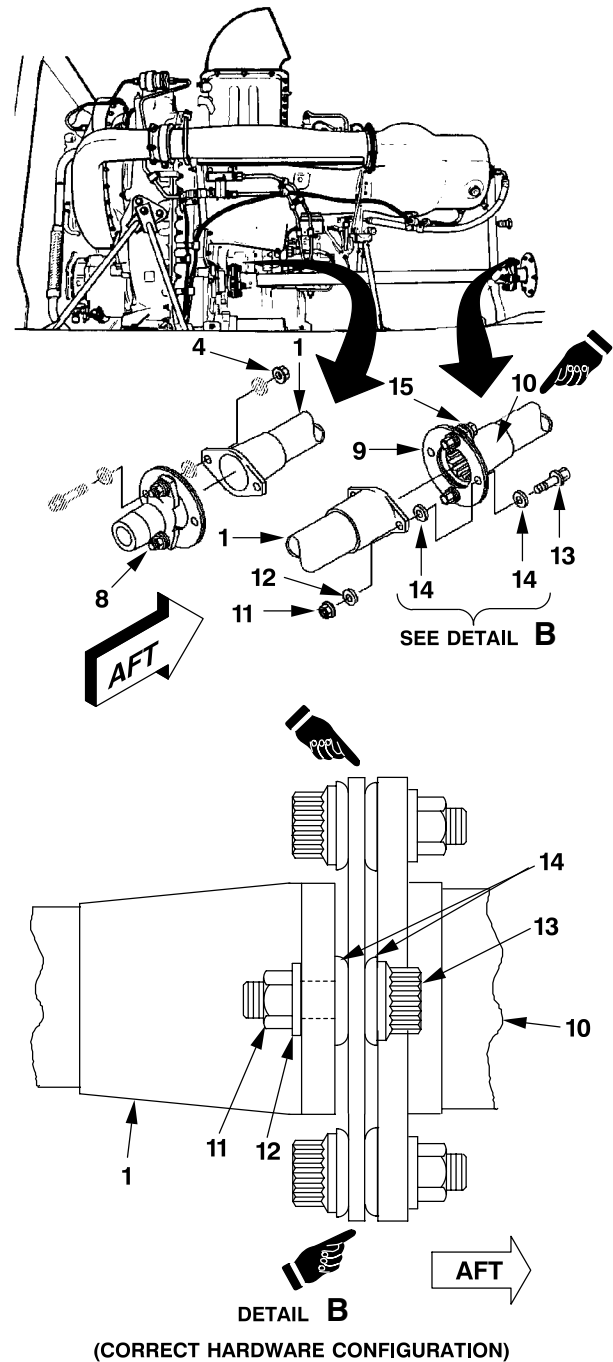
CAUTION

- To prevent metal-to-metal contact resulting in catastrophic failure of forward shaft assembly, there shall be a minimum clearance of **0.070 inch** between hydromechanical unit (HMU) and rotating forward shaft assembly flange and disc pack, including associated hardware.
- Anytime HMU or forward shaft assembly is disturbed in any way, clearance shall be rechecked.

11. Using feeler gage, measure distance between forward shaft assembly including disc pack and associated hardware and HMU housing at its closest point. Record measurement.

12. If clearance is less than **0.070 inch**, verify proper installation of forward shaft assembly coupling including associated hardware.

13. If clearance is still below **0.070 inch** minimum, HMU must be removed and replaced until minimum clearance is obtained.



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6-6-2. FORWARD SHAFT ASSEMBLY (OH-58D(R)) — REMOVAL/INSTALLATION (CONT)

NOTE

Task 6-6-18 shall be performed only if there has been repetitive spreading or damage that required coupling disc pack change.

14. Align tail rotor driveshaft (Task 6-6-18).

INSPECT

15. Close left engine cowling.

FOLLOW-ON MAINTENANCE

Pilot perform MOC (TM 1-1520-248-10/-CL).

END OF TASK

6-6-3. FORWARD SHAFT ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

- General Mechanic Tool Kit (B178)
- Dial Indicator (B37)
- Outside Micrometer Caliper Set (B12)
- Telescoping Gage Set (B47)

Material:

- Aliphatic Naphtha (D141)
- Wiping Rags (D164)

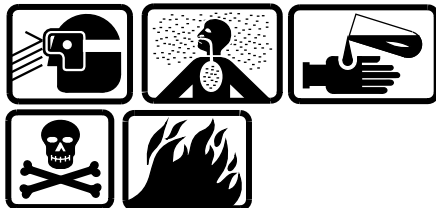
- Rubber Gloves (D111)
- Acetone (D2)
- Corrosion Protective Coating (D88)
- Sandpaper (D175)
- Crocus Cloth (D90)
- Brush Cadmium Plating (D129)

Personnel Required:

- 67S Scout Helicopter Technical Inspector (TI)
- 67S Scout Helicopter Repairer

References:

- TM 1-1520-266-23



Naphtha/Naphthalene, TT-N-97

CLEAN

1. Clean forward shaft assembly with a wiping rag (D164) dampened with aliphatic naphtha (D141).
2. Dry forward driveshaft assembly with a clean wiping rag (D164).



Acetone

3. Remove corrosion protective coating (D88) with a wiping rag (D164) dampened with acetone (D2).

INSPECT

4. Inspect rivets for security and presence.

NOTE

Forward shaft shall be replaced if balance weight is debonded or missing. Shaft shall be returned to Depot Overhaul Facility for repair.

5. Inspect balance weights for security and presence.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of forward shaft assembly is a characteristic critical to flight safety.

6. Fluorescent penetrant inspect forward shaft assembly (TM 1-1520-266-23).

GO TO NEXT PAGE

6-6-3. FORWARD SHAFT ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition, minimum wall thickness, minimum outside diameter, and straightness of the forward shaft assembly are characteristics critical to flight safety. Surface of shaft shall be smooth and unmarred. Scratches may be polished out within minimum wall thickness of **0.044 inch**, minimum outside diameter of **1.240 inches**, minimum radius of **0.25 inch**, and RMS 32 surface finish.

7. Inspect forward shaft assembly to limits shown. See figure Forward Shaft Assembly — Damage Limits. If cracks in forward shaft assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

8. Repair damage to forward shaft assembly using 400 grit sandpaper (D175).



LHE Cadmium Solution

9. Blend repaired area into surrounding area with crocus cloth (D90). Apply brush cadmium plating (D129) to reworked areas prior to applying clear lacquer protective coating.

INSPECT

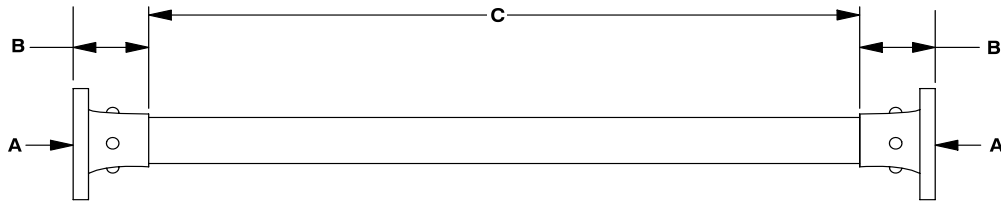


Corrosion Preventive Compound


10. Apply two coats of corrosion protective coating (D88). Allow 30 minutes drying time between first and second coats. Allow to cure at ambient room temperature for 48 hours. Do not apply corrosion protective coating (D88) to end faces of adapters.

GO TO NEXT PAGE

6-6-3. FORWARD SHAFT ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



FORWARD SHAFT ASSEMBLY

TYPE OF DAMAGE	DAMAGE LOCATION SYMBOL	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION		
AREA		
A (Surface)		0.001 in. up to 100 percent of surface area
B (Diameter)		0.005 in. up to 100 percent of circumference
C (Diameter)		0.005 in. up to one sq. in.
C (Diameter)		0.005 in. up to 25 percent of circumference, 0.850 in. wide
C (Diameter)		0.002 in. up to 100 percent of circumference, 0.210 in. wide
NUMBER OF REPAIRS		Five maximum
EDGE CHAMFER TO REMOVE DAMAGE		0.030 in. x 40-50° up to 0.500 in (No more than 2 per quadrant)



NOTES:

1. Repairs are to be made with 0.25 inch minimum radius and 32 RMS surface finish.
2. Check straightness of shaft in area C using a 12 inch straight edge. Maximum gap between tube and straight edge is 0.010 inch.
3. No cracks allowed.

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Forward Shaft Assembly — Damage Limits

END OF TASK

6-6-4. AFT SHORT SHAFT ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-10

TM 1-1520-248-CL

Applicable Configurations:

All

Equipment Condition:

Helicopter Safed (Task 1-6-7)

Aft Fairing Assembly Removed (Task 2-2-55)

Aft Fairing Extension Removed (Task 2-2-56)

AN/ALQ-144 IR Jammer Mount Removed (Task
2-3-13)

Tools:

General Mechanic Tool Kit (B178)

Maintenance Stand (B162)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)

67S Scout Helicopter Repairer

Pilot

GO TO NEXT PAGE

6-6-4. AFT SHORT SHAFT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Gain access to aft short shaft assembly (1) by opening tail rotor driveshaft cover.

WARNING

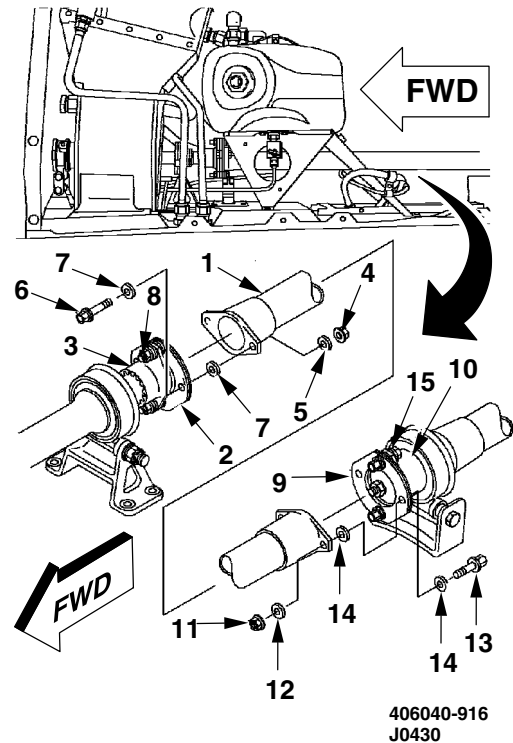
FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition of the aft short shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during removal or handling. Extreme caution shall be used during removal and handling.

CAUTION

Aft short shaft assembly shall be supported to prevent damage to coupling disc packs.

2. Disconnect forward end of aft short shaft assembly (1) from coupling disc pack (2) on adapter (3) by removing two nuts (4), two flat washers (5), two bolts (6), and four recessed washers (7).
3. Break torque on two nuts (8).
4. Disconnect aft end of aft short shaft assembly (1) from coupling disc pack (9) on driveshaft assembly (10) by removing two nuts (11), two flat washers (12), two bolts (13), and four recessed washers (14).
5. Remove aft short shaft assembly (1).
6. Break torque on two nuts (15).
7. Clean, inspect, and repair aft short shaft assembly (1) (Task 6-6-5).



GO TO NEXT PAGE

6-6-4. AFT SHORT SHAFT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

- Surface condition of the shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during installation or handling. Extreme caution shall be used during installation and handling.
- Installation of recessed washers with radiused or rounded side against coupling disc packs and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc packs will result.

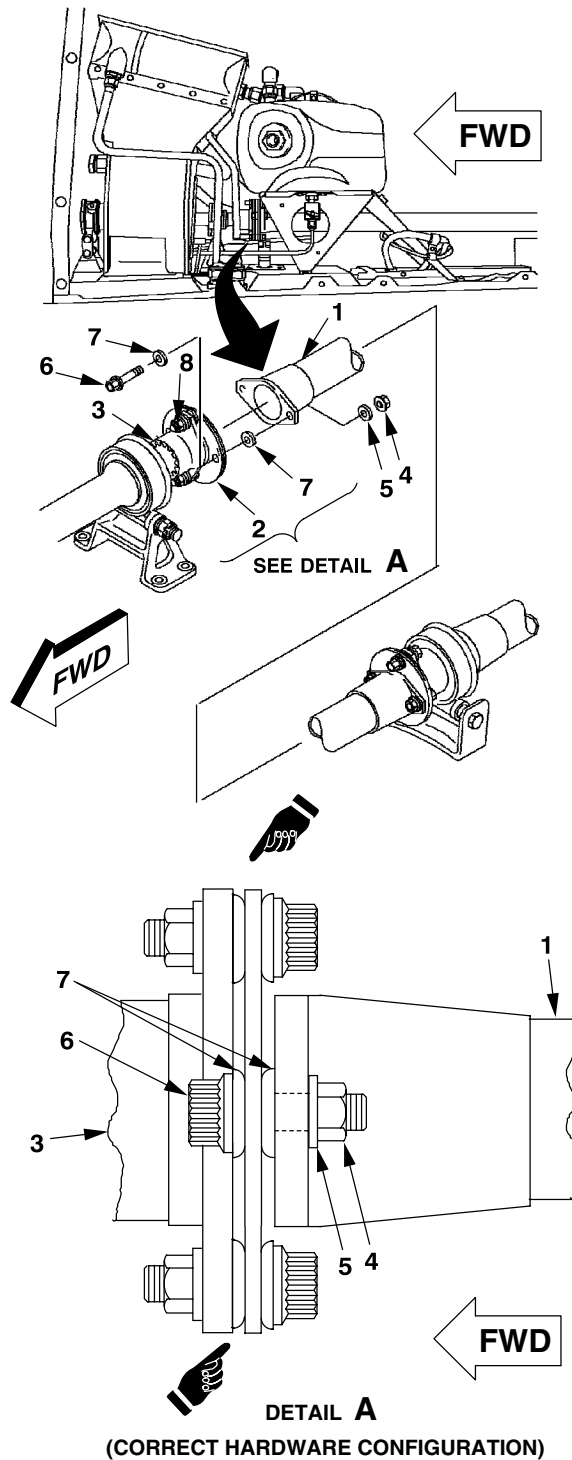
CAUTION

- Only those self-locking nuts that cannot be tightened down with fingers after the locking action engages bolt shall be reused. Nuts shall be tested by attempting to insert a matching bolt by hand. Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc packs.
- Aft short shaft assembly shall be supported to prevent damage to coupling disc packs.

NOTE

If disc packs are removed, see Task 6-6-6 for recessed washer stackup.

8. Connect forward end of shaft assembly (1) to coupling disc pack (2) on adapter (3) by installing two bolts (6), four recessed washers (7), two flat washers (5), and two nuts (4).



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GO TO NEXT PAGE

6-6-4. AFT SHORT SHAFT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

- Surface condition of shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during installation or handling. Extreme caution shall be used during installation and handling.
- Installation of recessed washers with radiused or rounded side against coupling disc packs and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc packs will result.

9. Connect aft end of shaft assembly (1) to coupling disc pack (9) on driveshaft assembly (10) by installing two bolts (13), four recessed washers (14) (with rounded edges in contact with coupling disc pack), two washers (12), and two nuts (11).

10. Torque nuts (4, 8, 11, and 15) and inspect for gaps between discs in both packs (Task 6-6-6).

NOTE

Task 6-6-18 shall be performed only if there has been repetitive spreading or damage that required coupling disc pack change.

11. Align tail rotor driveshaft (Task 6-6-18).

INSPECT

FOLLOW-ON MAINTENANCE

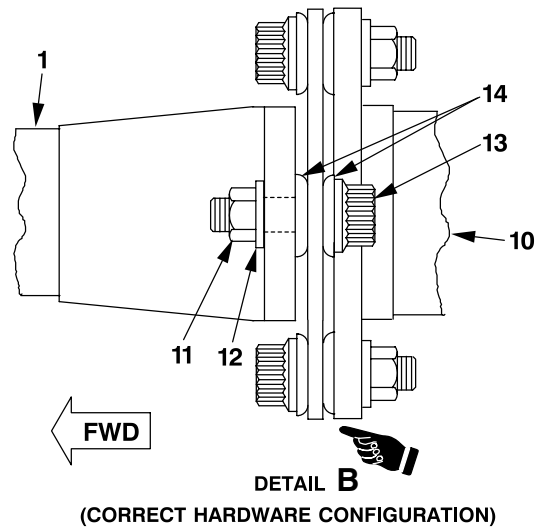
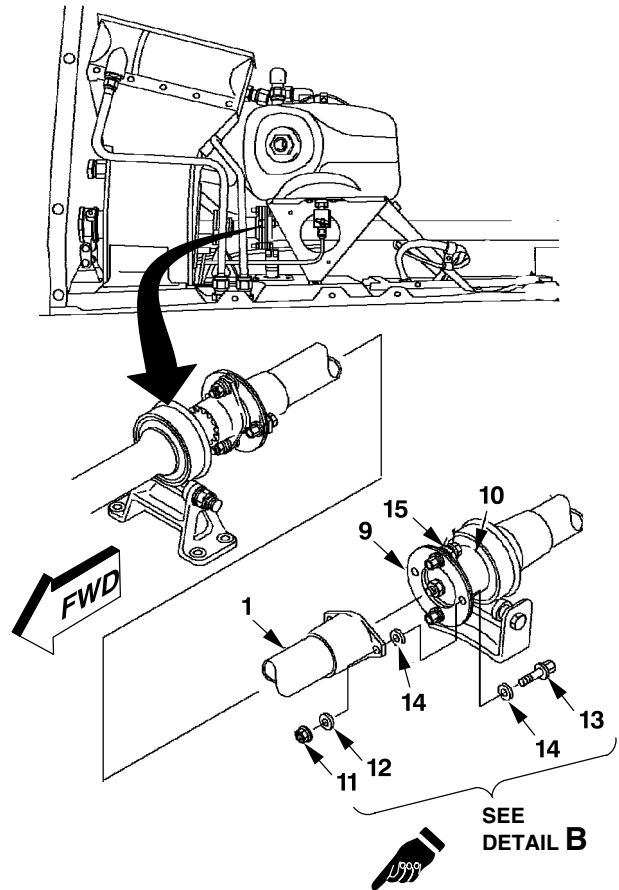
Install aft fairing assembly (Task 2-2-55).

Install aft fairing extension (Task 2-2-56).

Install AN/ALQ-144 IR jammer mount (Task 2-3-13).

Close tail rotor driveshaft cover.

Pilot perform MOC (TM 1-1520-248-10/-CL).



406040-288-2
J2817

END OF TASK

6-6-5. AFT SHORT SHAFT ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)
Outside Micrometer Caliper Set (B12)

Material:
Aliphatic Naphtha (D141)
Wiping Rags (D164)
Sandpaper (D175)

Crocus Cloth (D90)
Gloves, Rubber (D111)
Acetone (D2)
Corrosion Protective Coating (D88)
Chemical Conversion Coating (Alodine 1201) (D57)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN

WARNING



Naphtha/Naphthalene, TT-N-97

1. Clean aft short shaft assembly with a wiping rag (D164) dampened with aliphatic naphtha (D141).
2. Dry aft short shaft assembly with a clean wiping rag (D164).



Acetone

3. Remove corrosion protective coating from aft short shaft assembly with a wiping rag (D164) dampened with acetone (D2).

INSPECT

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition, minimum wall thickness, minimum outside diameter, and straightness of the aft short shaft assembly are characteristics critical to flight safety. Surface of shaft shall be smooth and unmarred. Scratches may be polished out within minimum wall thickness of **0.055 inch**, minimum outside diameter of **1.495 inches**, minimum radius of **0.25 inch**, and 32 RMS surface finish.

4. Inspect end fittings for proper bonding and security.

WARNING

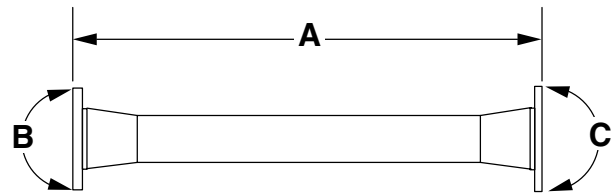
FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of aft short shaft assembly is a characteristic critical to flight safety.

5. Fluorescent penetrant inspect aft short shaft assembly (TM 1-1520-266-23).

GO TO NEXT PAGE

6. Inspect aft short shaft assembly to limits shown. See figure Aft Short Shaft Assembly — Damage Limits. If a crack in aft short shaft assembly is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.



AFT SHORT SHAFT ASSEMBLY

406040-193
J0432

REPAIR



Sanding Operations

7. Repair damage to aft short shaft assembly using 400 grit sandpaper (D175).

8. Blend repaired area into surrounding area with crocus cloth (D90).



Chemical Conversion Materials

9. Brush Alodine 1201 (D57) on repaired areas.



Corrosion Preventive Compound

NOTE

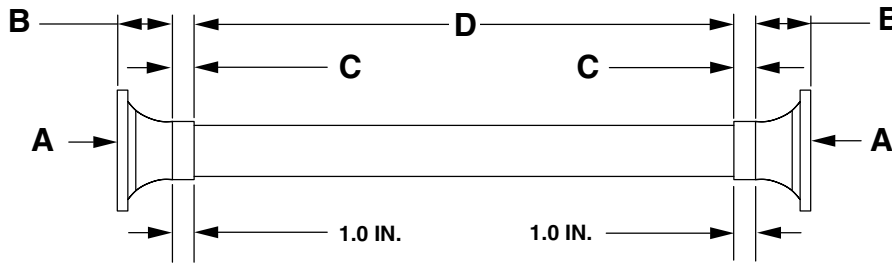
Corrosion protective coating (D88) shall be omitted from areas B and C of aft short shaft assembly.

10. Apply two coats of corrosion protective coating (D88) to area A of aft short shaft assembly. Allow 30 minutes drying time between first and second coats. Allow to cure at ambient room temperature for 48 hours.

INSPECT

GO TO NEXT PAGE

6-6-5. AFT SHORT SHAFT ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



AFT SHORT SHAFT ASSEMBLY

TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	
AREA	
A (Surface)	0.001 in. up to 100 percent of surface area
B (Diameter)	0.005 in. up to 100 percent of circumference
C (Diameter)	0.001 in. up to 100 percent of circumference
D (Diameter)	0.005 in. up to one sq. in.
D (Diameter)	0.005 in. up to 25 percent of circumference, 0.850 in. wide
D (Diameter)	0.002 in. up to 100 percent of circumference, 0.210 in. wide
NUMBER OF REPAIRS	Five maximum
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 40-50° up to 0.500 in. (No more than 2 per quadrant)
NOTES	<ol style="list-style-type: none"> Repairs are to be made with 0.25 inch minimum radius and 32 RMS surface finish. Check straightness of shaft in area D using a 12 inch straight edge. Maximum gap between tube and straight edge is 0.005 inch. No cracks allowed.

406040-858
J1610

Aft Short Shaft Assembly — Damage Limits

END OF TASK

6-6-6. COUPLING DISC PACK — REMOVAL/CLEANING/INSTALLATION

This task covers: Removal, Cleaning, Inspection and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

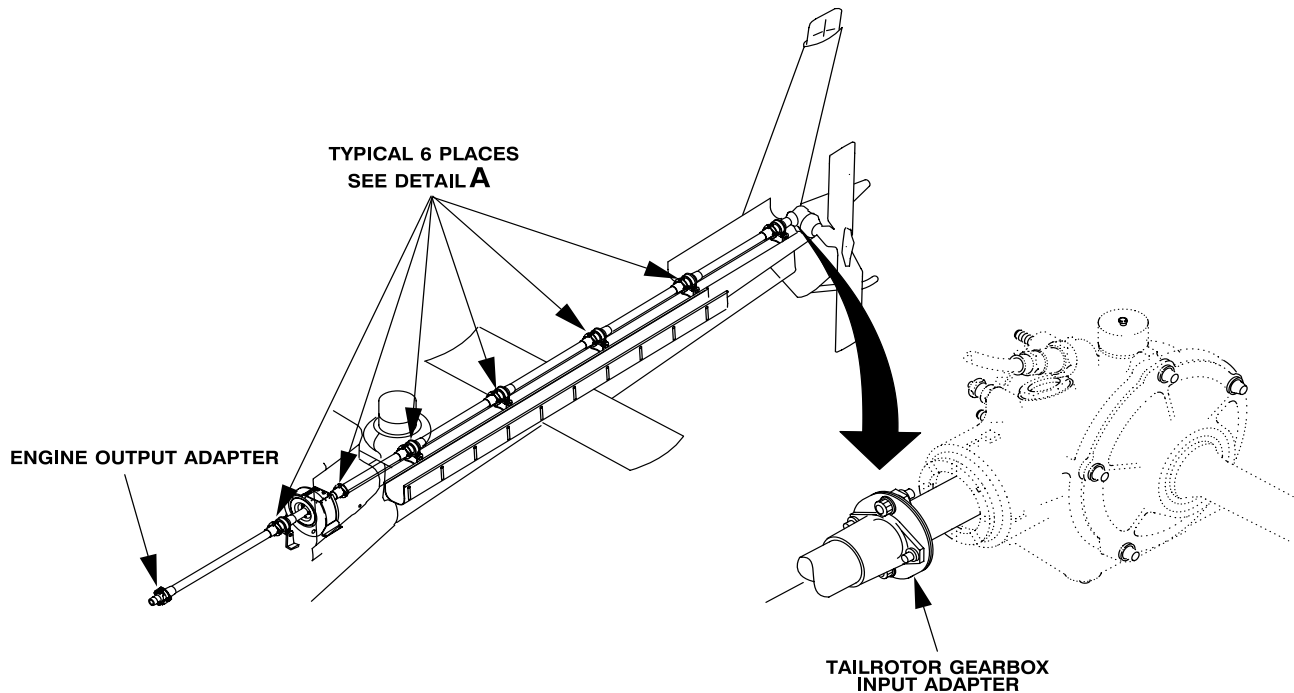
Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B239)
Torque Wrench Adapter (B5)

Material:
Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Tail Rotor Driveshaft Cover Opened as needed
AN/ALQ-144 IR Jammer Mount Removed as needed (Task 2-3-13)
Aft Fairing Assembly Removed as needed (Task 2-2-55)
Aft Fairing Extension Removed as needed (Task 2-2-56)



406040-914-2
J2699

GO TO NEXT PAGE

6-6-6. COUPLING DISC PACK — REMOVAL/CLEANING/INSTALLATION (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition of the driveshaft assemblies is a characteristic critical to flight safety. Surface of driveshafts shall be smooth and unmarred. Surface shall not be damaged during removal, handling, or installation. Extreme caution shall be used during removal, handling, or installation.

CAUTION

Driveshaft assemblies shall be supported to prevent damage to driveshafts, tailboom, or coupling disc packs.

NOTE

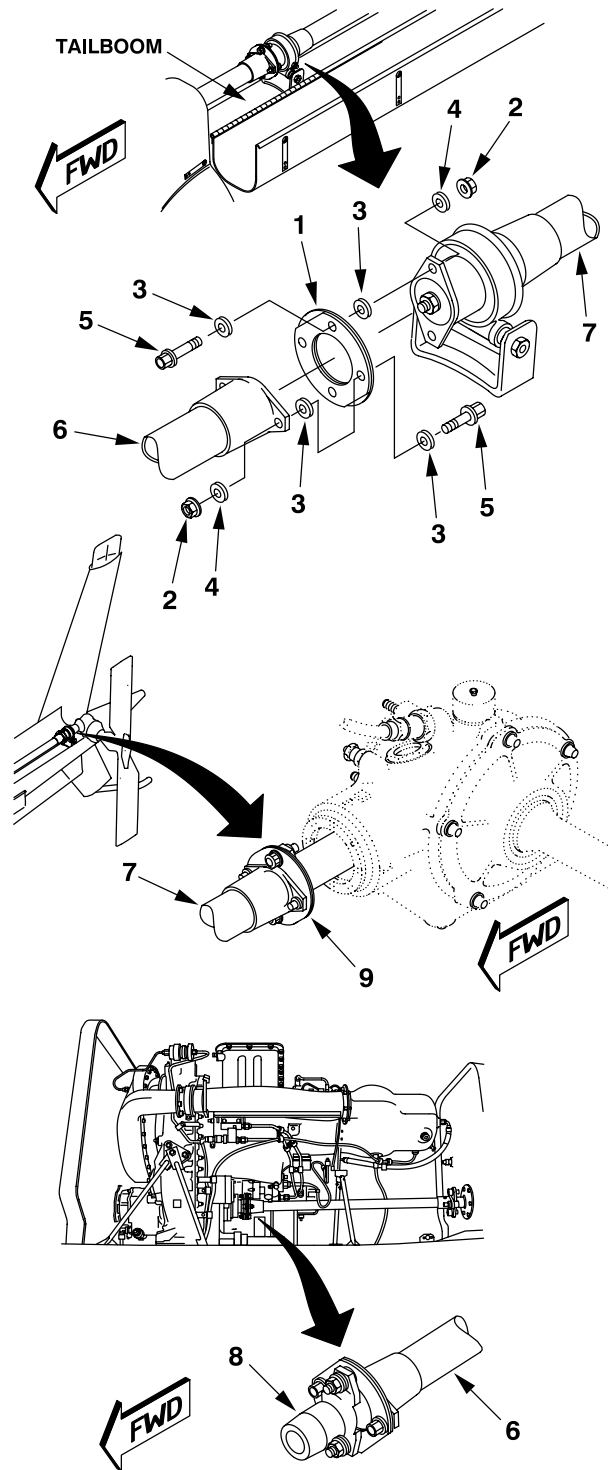
- Coupling disc pack on engine output adapter has 12 recessed washers installed.
- Coupling disc pack on tail rotor gearbox input adapter has 10 recessed washers installed.
- All other coupling disc packs have eight recessed washers installed.

REMOVE

1. Remove coupling disc pack (1) by removing 4 nuts (2); 8, 10, or 12 recessed washers (3); 4 flat washers (4); and 4 bolts (5) connecting coupling disc pack (1) to driveshaft assemblies (6 and 7), driveshaft assembly (6) and engine output adapter (8), or driveshaft assembly (7) and tailrotor gearbox input adapter (9).

CLEANING

2. Clean discs with solvent (D199) using wiping rags (D164).



406040-195
J2814

GO TO NEXT PAGE

6-6-6. COUPLING DISC PACK — REMOVAL/CLEANING/INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Installation of recessed washers with recessed side against coupling disc pack and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc packs will result.

CAUTION

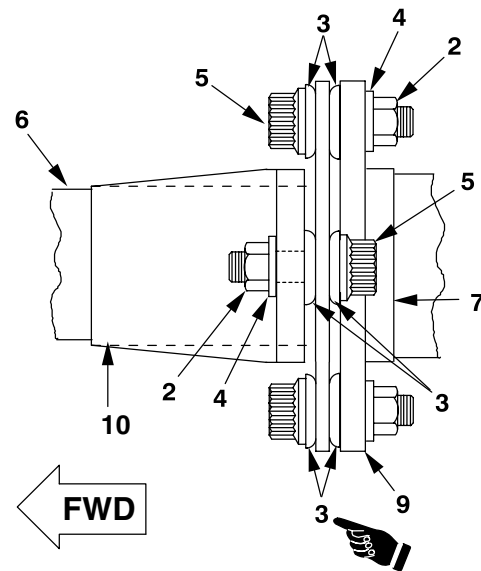
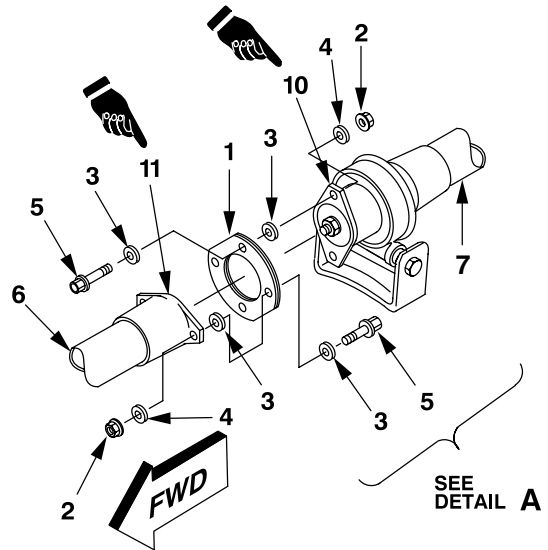
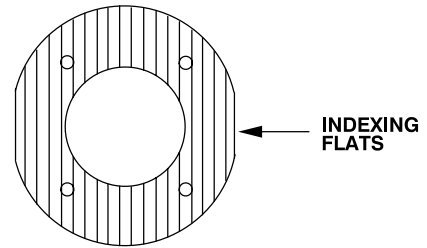
- Driveshaft assemblies shall be supported to prevent damage to driveshafts, tailboom, or coupling disc packs.
- To prevent damage to helicopter, drive system is rotated by turning main rotor hub.
- If coupling disc pack is to be reused, stackup shall not be altered.
- Only those self-locking nuts that cannot be tightened down with fingers after locking action engages bolt shall be reused.

3. Check new coupling disc pack (1) to ensure indexing flats are alternated 90 degrees.

NOTE

- Refer to step 4. for washer stack up of all disc packs located between driveshaft assemblies (6) and (7).
- Refer to step 5. for washer stackup on engine output adapter.
- Refer to step 6. for washer stackup on tail rotor gearbox input adapter.

4. Install coupling disc pack (1) between driveshaft assemblies (6 and 7 typical) and connect with four bolts (5), eight recessed washers (3) (with rounded edges in contact with coupling disc pack (1) and flat side in contact with adapters (10 and 11), four flat washers (4), and four nuts (2) (with nuts on flange side). Ensure attaching hardware at 9, 12, and 3 o'clock positions is seated before rotating driveshaft to seat attaching hardware at 6 o'clock position.



DETAIL A
(CORRECT HARDWARE CONFIGURATION)

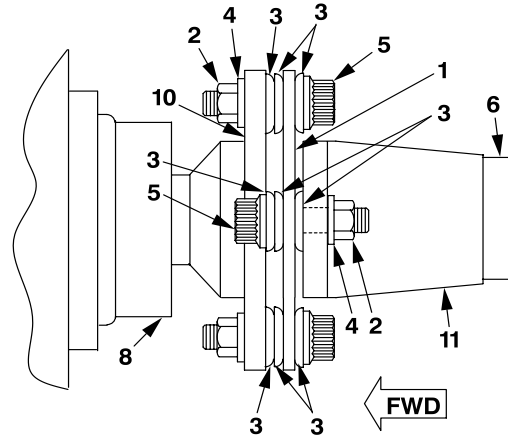
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J2814

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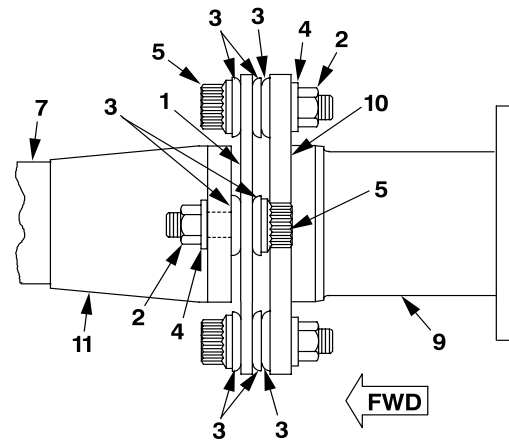
6-6-6. COUPLING DISC PACK — REMOVAL/CLEANING/INSTALLATION (CONT)

5. Install coupling disc pack (1) between driveshaft assembly (6) and engine output adapter (8) and connect with 4 bolts (5), 12 recessed washers (3) with rounded edges in contact with coupling disc pack (1) and flat side in contact with adapters (10 and 11), 4 flat washers (4), and 4 nuts (2). Ensure attaching hardware at 9, 12, and 3 o'clock positions is seated before rotating driveshaft to seat attaching hardware at 6 o'clock position.

6. Install coupling disc pack (1) between driveshaft assembly (7) and tail rotor input adapter (9) and connect with 4 bolts (5), 10 recessed washers (3) with rounded edges in contact with coupling disc pack (1) and flat side in contact with adapters (10 and 11), 4 flat washers (4), and 4 nuts (2). Ensure attaching hardware at 9, 12, and 3 o'clock positions is seated before rotating driveshaft to seat attaching hardware at 6 o'clock position.



ENGINE OUTPUT ADAPTER
(CORRECT HARDWARE CONFIGURATION)



TAILROTOR GEARBOX
INPUT ADAPTER
(CORRECT HARDWARE CONFIGURATION)

406040-914-1
J2814

GO TO NEXT PAGE

6-6-6. COUPLING DISC PACK — REMOVAL/CLEANING/INSTALLATION (CONT)

CAUTION

- To prevent damage to helicopter, adequate clearance shall exist around helicopter to allow full rotation of main and tail rotors before attempting following torquing procedures.
- To prevent gaps in coupling disc packs, torque shall be applied to nut with bolt held stationary.

NOTE

- Torquing of four nuts (2) shall be alternated in 20 inch-pound increments until correct torque value is reached.
- If use of torque wrench adapter (B5) is required, calculation of corrected torque (Appendix P) may be necessary.

7. Looking forward, torque 9 o'clock position nut (2) to **20 INCH-POUNDS**.

CAUTION

To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

8. Looking forward, rotate driveshaft assemblies (6 and 7) 180 degrees clockwise.

9. Looking forward and using socket or torque wrench adapter (B5), torque 9 o'clock position nut (2) to **20 INCH-POUNDS**.

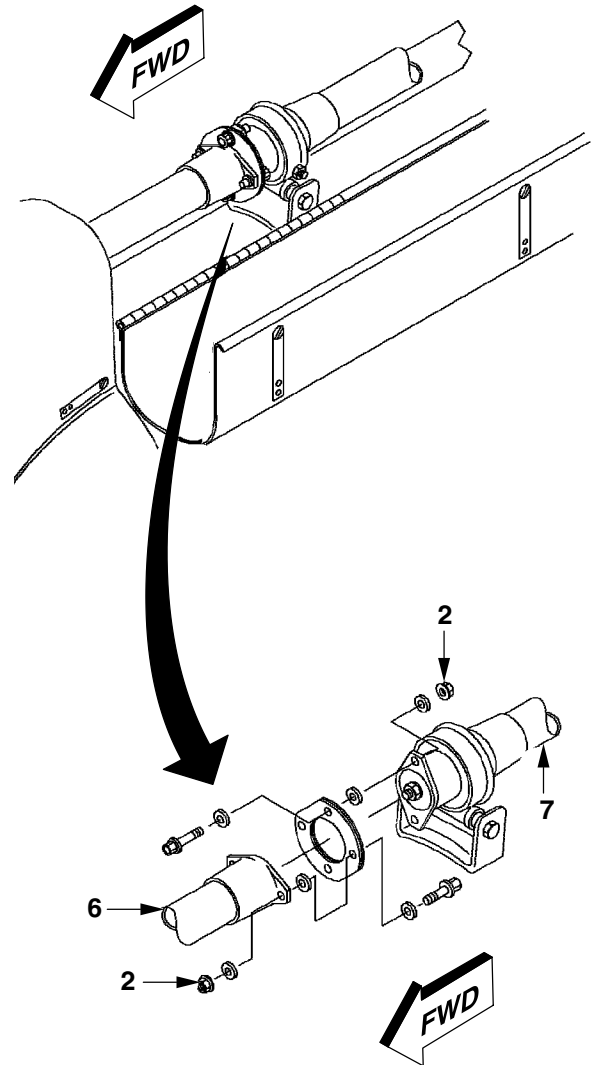
CAUTION

To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

10. Looking forward, rotate driveshaft assemblies (6 and 7) 90 degrees clockwise.

11. Repeat step 7.

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J0430

6-6-6. COUPLING DISC PACK — REMOVAL/CLEANING/INSTALLATION (CONT)

CAUTION

To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

12. Looking forward, rotate driveshaft assemblies (6 and 7) 180 degrees clockwise.

13. Repeat step 7.

CAUTION

To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

14. Looking forward, rotate driveshaft assemblies (6 and 7) 270 degrees clockwise.

15. Increase torque by **20 INCH-POUNDS** and repeat steps 5. through 12.

16. Repeat step 13. until nuts (2) have been torqued **150 TO 180 INCH-POUNDS**.

17. Inspect for gaps between individual laminations in installed coupling disc pack (1) and adjacent coupling disc packs (1). Gaps in excess of **0.015 inch** are unacceptable.

18. Correct unacceptable gaps as follows:

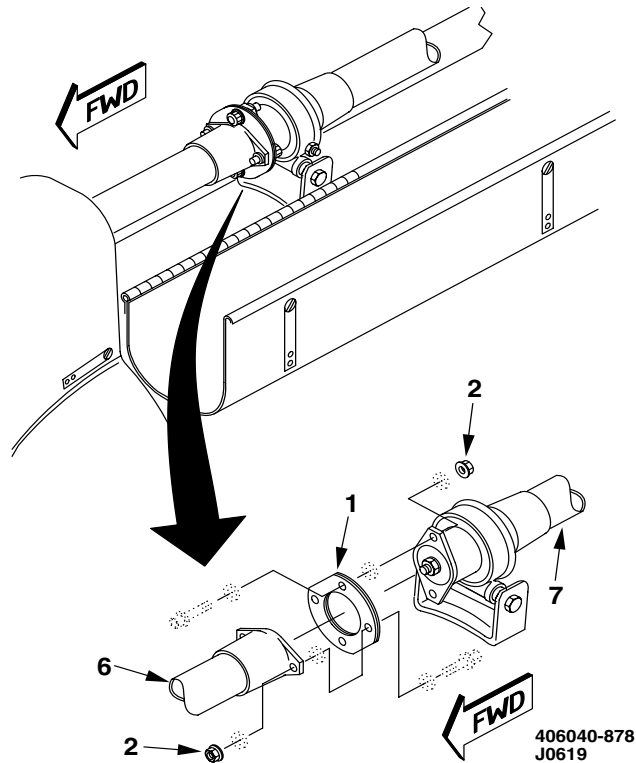
a. Loosen nuts (2) of affected coupling disc packs (1) only enough to permit disc pack realignment.

CAUTION

To prevent damage to helicopter, drive system is rotated by turning main rotor hub.

b. Looking forward, rotate driveshaft assemblies several revolutions clockwise.

c. Repeat steps 5. through 15.



NOTE

Task 6-6-18 shall be performed only if there has been repetitive spreading of disc pack.

19. Align tail rotor driveshaft (Task 6-6-18).

INSPECT

FOLLOW-ON MAINTENANCE

Install AN/ALQ-144 IR Jammer mount (Task 2-3-13).

Install aft fairing assembly as needed (Task 2-2-55).

Install aft fairing extension as needed (Task 2-2-56).

Pilot perform MOC (TM 1-1520-248-10/-CL).

Close tail rotor driveshaft cover.

END OF TASK

6-6-7. COUPLING DISC PACK ASSEMBLIES — INSPECTION

This task covers: Inspection (On Helicopter)

INITIAL SETUP

Personnel Required:
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer

Applicable Configurations:
 All

References:
 TM 1-1520-266-23

Tools:
 General Mechanic Tool Kit (B178)
 Maintenance Stand (B162)

Equipment Condition:
 Helicopter Safed (Task 1-6-7)
 Aft Fairing Assembly Removed as needed
 (Task 2-2-55)
 Aft Fairing Extension Removed as needed
 (Task 2-2-56)
 AN/ALQ-144 IR Jammer Mount Removed as
 needed (Task 2-3-13)
 Tail Rotor Driveshaft Cover Opened as needed

Material:
 Corrosion Preventive Compound (D82)

GO TO NEXT PAGE

6-6-7. COUPLING DISC PACK ASSEMBLIES — INSPECTION (CONT)

INSPECT

1. Inspect coupling disc packs (1) for scratches, nicks, and cracks. See figure Coupling Disc Pack Assemblies — Locator. If a crack in coupling disc pack is suspected, refer to TM 1-1520-266-23 for nondestructive inspection procedures.

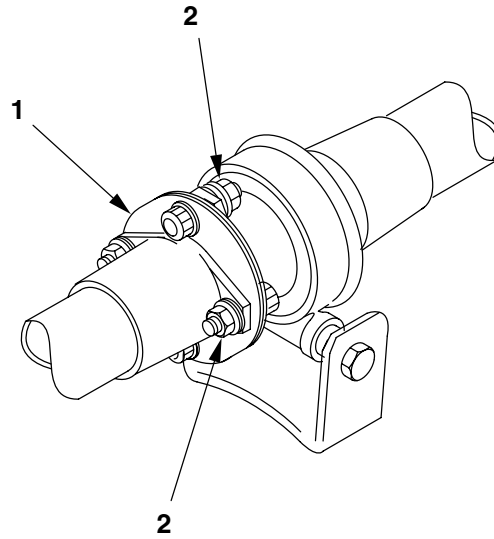
2. Damage limits: Maximum removal not to exceed **0.001 inch**; cracks or nicks are not allowed.

3. Inspect coupling disc packs (1) for corrosion. If corrosion is present, remove corrosion from disc pack using a pink eraser.

4. Inspect for gaps between discs within each coupling disc pack (1). Gaps in excess of **0.015 inch** are unacceptable.

5. Inspect coupling disc pack (1) for dirt buildup between discs.

6. If excessive dirt buildup is present, clean or replace disc pack (1) (6-6-6).



TYPICAL INSTALLATION

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J0432

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct torquing of nuts (2) is a characteristic critical to flight safety.

CAUTION

Torque shall be applied only to nut with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

7. If required, correct unacceptable gaps and properly torque nuts (2) (Task 6-6-6).

8. Replace defective coupling disc packs (1) (Task 6-6-6).

APPLY CORROSION PREVENTIVE COMPOUND



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals. Premature failure of bearings and seals may occur.

9. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.

INSPECT

GO TO NEXT PAGE

6-6-7. COUPLING DISC PACK ASSEMBLIES — INSPECTION (CONT)

FOLLOW-ON MAINTENANCE

Install aft fairing assembly (Task 2-2-55).

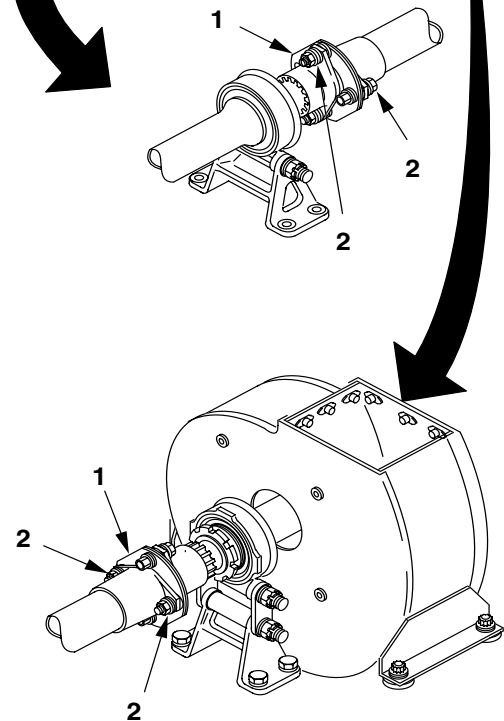
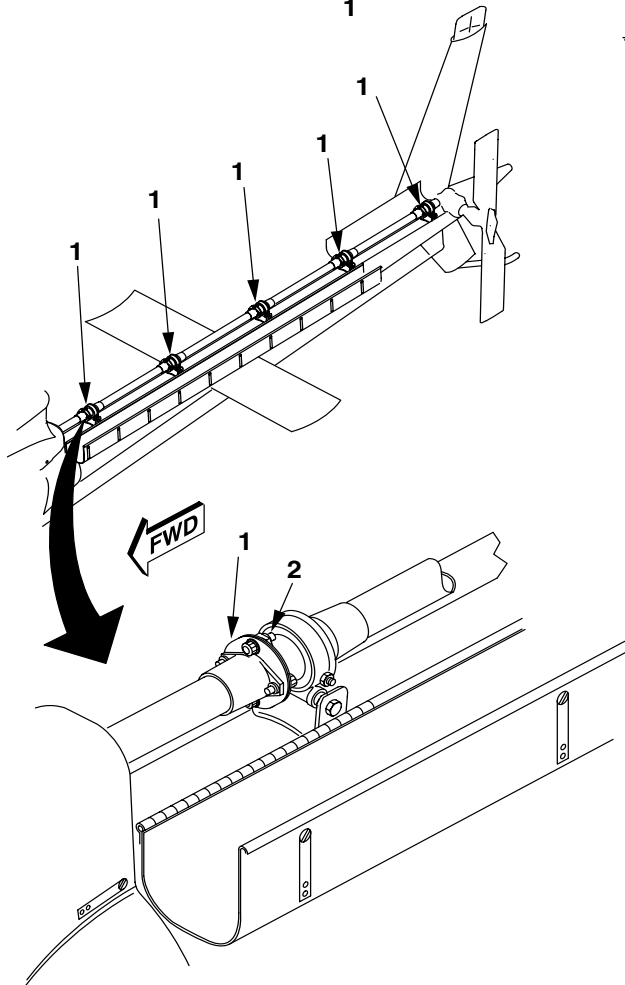
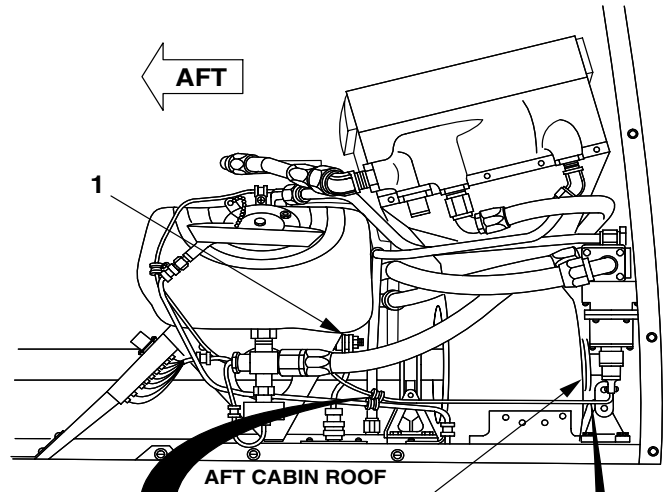
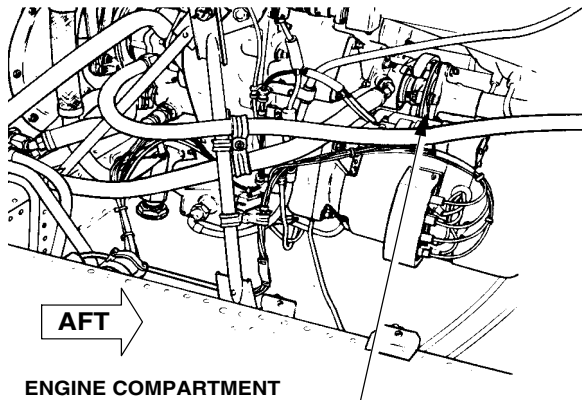
Install aft fairing extension assembly (Task 2-2-56).

Install AN/ALQ-144 IR jammer mount (Task 2-3-13).

Close tail rotor driveshaft cover.

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6-6-7. COUPLING DISC PACK ASSEMBLIES — INSPECTION (CONT)



406040-880
J0432

Coupling Disc Pack Assemblies — Locator

END OF TASK

6-6-8. SHAFT AND BEARING HANGER ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B238)
Torque Wrench (B242)
Hand Lubrication Gun (B58)

Material:
Grease (D113)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Tail Rotor Driveshaft Covers Opened

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition of shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during removal, handling, or installation. Extreme caution shall be used during removal, handling, or installation.

CAUTION

- When any boom-mounted shafts are changed, all bolt and nut combinations securing bearing hanger to brackets located forward of replaced shaft shall be loosened so tolerance buildup can be properly absorbed. Retorquing of bolts then begins from replaced shaft forward.
- Because of tailboom deflections, tail rotor driveshaft bearings were designed with larger-than-normal internal clearance. Because of internal clearance, each of these bearings must be aligned any time torque is removed on bolt holding hanger to tailboom. Task 6-6-17 contains procedures for proper bearing hanger alignment.

NOTE

- These procedures may be used to replace any shaft and bearing hanger assembly on tailboom.
- The tail rotor drive system is to be installed from tail rotor gearbox forward. All dimensional tolerance stackup is absorbed by two features:
 - Slotted mounting brackets on tailboom at each hanger.
 - Sliding splined adapter at aft end of oil cooler blower.

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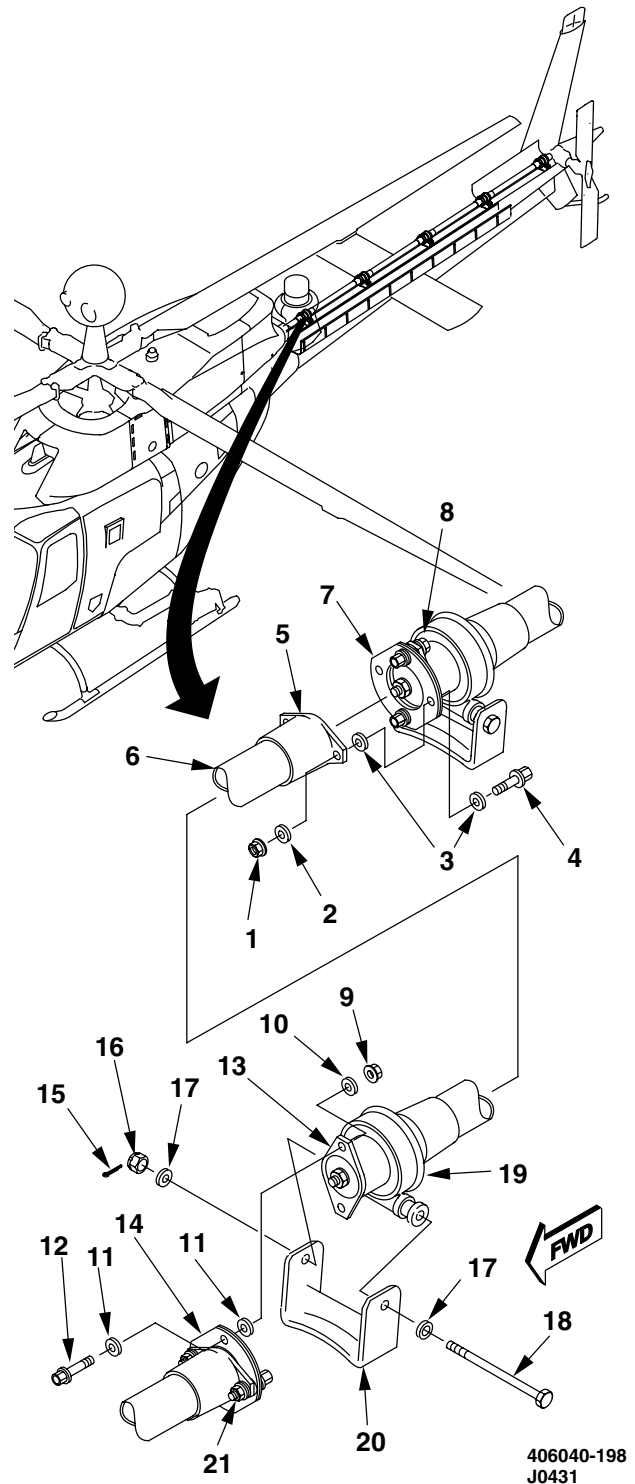
6-6-8. SHAFT AND BEARING HANGER ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

CAUTION

Shaft assembly shall be supported to prevent damage to coupling disc packs.

1. Remove two nuts (1), two washers (2), four recessed washers (3), and two bolts (4) to disconnect adapter (5) and aft end of shaft assembly (6) from coupling disc pack (7).
2. Break torque on nuts (8).
3. Remove two nuts (9), two washers (10), four recessed washers (11), and two bolts (12) to disconnect adapter (13) and forward end of shaft assembly (6) from coupling disc pack (14).
4. Remove cotter pin (15) and discard.
5. Remove nut (16), two washers (17), and bolt (18) to disconnect bearing hanger (19) from bracket (20).
6. Lift shaft assembly (6) from tailboom.
7. Break torque on nuts (21).
8. Repeat steps 1. through 7., as required, to remove remaining shaft assemblies and bearing hanger assemblies from tailboom.



GO TO NEXT PAGE

6-6-8. SHAFT AND BEARING HANGER ASSEMBLY — REMOVAL/INSTALLATION (CONT)

INSTALL

CAUTION

Shaft assembly shall be supported to prevent damage to coupling disc packs.

9. Install shaft assembly (6) with bracket (20) aligned with bearing hanger (19) on tailboom.

10. Install bolt (18), two washers (17), and nut (16). Do not tighten nut (16) at this time (accomplished in Task 6-6-17).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

- Installation of recessed washers (3 and 10) with recessed side against coupling disc packs (7 and 14) and correct torquing of nuts (1, 8, 9, and 21) are characteristics critical to flight safety. If recessed washers (3 and 11) are installed incorrectly, damage to coupling disc packs (7 and 14) will result.

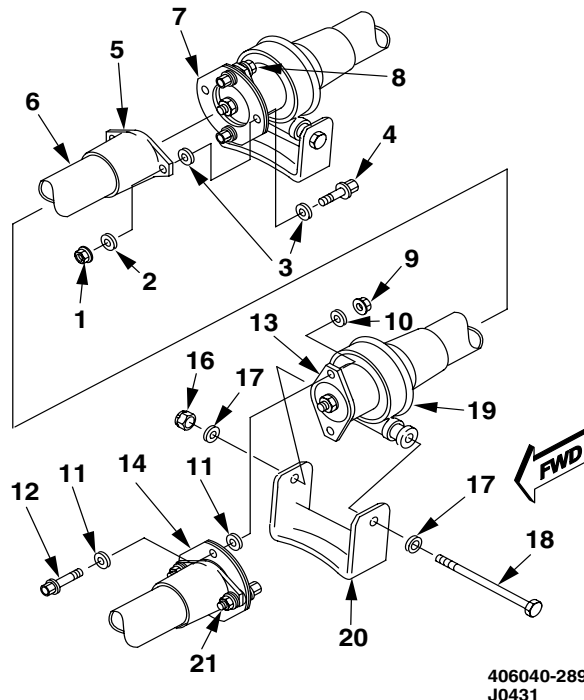
- Locking feature of self-locking nuts is a characteristic critical to flight safety. Only those nuts that cannot be tightened down with fingers after locking action engages bolt shall be reused.

NOTE

Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

11. Connect adapter (13) and forward end of shaft assembly (6) to coupling disc pack (14) by installing two bolts (12), four recessed washers (11) (with rounded edges in contact with coupling disc pack and flat side in contact with adapters), two flat washers (10), and two nuts (9).

12. Connect adapter (5) and aft end of shaft assembly (6) to coupling disc pack (7) by installing two bolts (4), four recessed washers (3) (with rounded edges in contact with coupling disc pack and flat side in contact with adapters), two flat washers (2), and two nuts (1).



13. Torque nuts (1, 8, 9, and 21) and inspect for gaps between discs in both packs (Task 6-6-6).



Grease

14. Lubricate bearing in bearing hanger (19) with grease (D113) (Chapter 1, Section V).

FOLLOW-ON MAINTENANCE

Align tail rotor bearing hanger (Task 6-6-17).

Align tail rotor driveshaft (Task 6-6-18).

Pilot perform MOC (TM 1-1520-248-10/-CL).

Close tail rotor driveshaft covers.

END OF TASK

6-6-9. ADAPTER/BEARING HANGER/SEGMENTED SHAFT (TYPICAL) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Hand Arbor Press (B107)
Step Plate Set (B135)
Torque Wrench (B237)

Material:

Corrosion Preventive Compound (D83)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68D Aircraft Powertrain Repairer

DISASSEMBLE

WARNING

**FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)**

Surface condition of shaft assembly is a characteristic critical to flight safety. Surface of shaft shall be smooth and unmarred. Surface shall not be damaged during disassembly or assembly. Extreme caution shall be used during disassembly, handling, or assembly.

1. Remove nut (1), washer (2), washer (3), adapter (4), and hanger (5) from shaft (6).

NOTE

It may be necessary to use an arbor press to push shaft out of hanger and bearing assembly. Stud threads shall be protected during pressing operation.

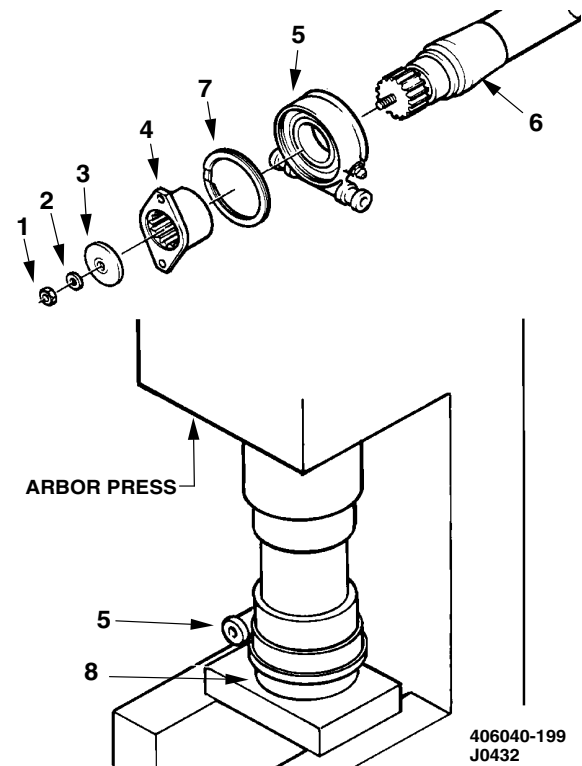
2. Remove retaining ring (7) from hanger (5).

3. Place hanger (5) in hand arbor press (B107) with plates under edge of hanger to allow room for bearing removal.

4. Press bearing (8) from hanger (5) using step plate set (B135).

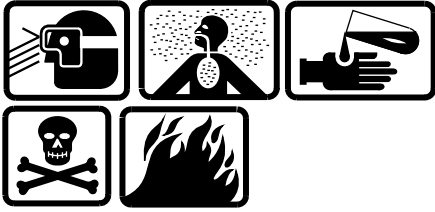
INSPECT

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6-6-9. ADAPTER/BEARING HANGER/SEGMENTED SHAFT (TYPICAL) — REMOVAL/INSTALLATION (CONT)

ASSEMBLE



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound shall not be allowed to contact seal in bearing. Compound can cause seal to deteriorate.

5. Apply corrosion preventive compound (D83) to outside surface of bearing (8) and inside surface of hanger (5).

6. Press bearing (8) into hanger (5) using step plate set (B135) and hand arbor press (B107).

7. Install retainer ring (7) in hanger (5).

8. Apply corrosion preventive compound (D83) to inside surface of bearing (8) and mating surface of shaft (6).

NOTE

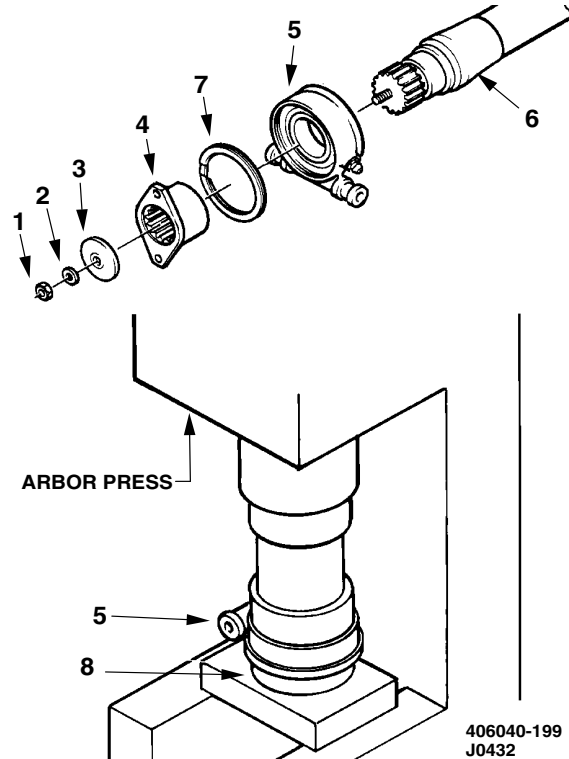
- Bearing and hanger assembly shall be installed with retainer ring side forward so that grease fitting will be on the right side when installed on tailboom.
- It may be necessary to use an arbor press to push hanger and bearing onto shaft.

9. Install hanger (5), adapter (4), washer (3), washer (2), and nut (1) on shaft (6).

10. Torque nut (1) **30 TO 50 INCH-POUNDS**.

11. Install shaft on helicopter (Task 6-6-8).

INSPECT



FOLLOW-ON MAINTENANCE

Align tail rotor driveshaft (Task 6-6-18).

Align hanger bearings (Task 6-6-17).

END OF TASK

6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)
Outside Micrometer Caliper Set (B12)
Telescoping Gage Set (B47)
Torque Wrench (B237)

Material:
Acetone (D2)
Chemical Conversion Coating (Alodine 1201) (D57)
Corrosion Protective Coating (D88)

Aliphatic Naphtha (D141)
Wiping Rags (D164)
Sandpaper (D175)
Crocus Cloth (D90)
Rubber Gloves (D111)
Zinc Chromate Primer (D161)
Steel Wool (D205)
Brush Cadmium Plating (D129)
Drycleaning Solvent (D199)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 55-1500-345-23
TM 1-1520-266-23 ■

CLEAN SHAFT ASSEMBLY WASHER

WARNING

Task shall be performed in a well-ventilated area.



Drycleaning Solvent

1. Clean shaft assembly washer with wiping rag (D164) dampened with drycleaning solvent (D199).
2. Dry shaft assembly washer with clean wiping rag (D164).

INSPECT

3. Fluorescent penetrant inspect shaft assembly washer (TM 1-1520-266-23).
4. Inspect shaft assembly washer for surface corrosion and cracks. No cracks allowed. If cracks

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in shaft assembly washer are suspected perform eddy current inspection (TM 1-1520-266-23). ■

REPAIR



Sanding Operations

5. Remove surface corrosion from shaft assembly washer using 400 grit sandpaper (D175).
6. Blend repaired area into surrounding area with crocus cloth (D90).
7. Apply Alodine 1201 (D57) (TM 55-1500-345-23).

6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN COUPLING ADAPTER



Drycleaning Solvent

8. Clean coupling adapter with wiping rag (D164) dampened with drycleaning solvent (D199).

9. Dry coupling adapter with clean wiping rag (D164).

INSPECT

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of coupling adapter is a characteristic critical to flight safety.

10. Fluorescent penetrant inspect coupling adapter (TM 1-1520-266-23).

11. Inspect coupling adapter to limits shown. See figure Coupling Adapter — Damage Limits. No cracks allowed. If cracks in coupling adapter are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

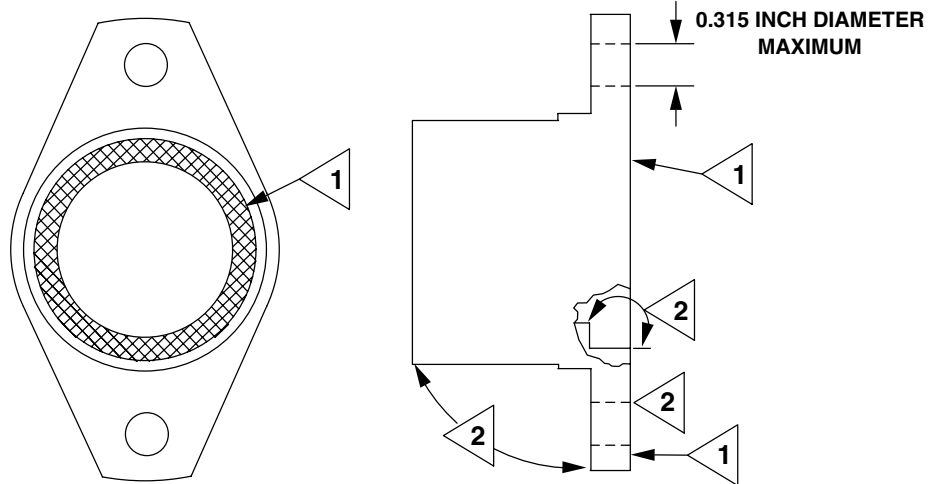
12. Repair damage to coupling adapter using 400 grit sandpaper (D175).

13. Blend repaired area into surrounding area with crocus cloth (D90).

14. Apply Alodine 1201 (D57) to coupling adapter (TM 55-1500-345-23).

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6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



COUPLING ADAPTER

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

1	0.001 in. before and after repair	2	0.005 in. before and after repair
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MAXIMUM AREA PER FULL DEPTH REPAIR

1	0.250 sq in.	2	1.000 sq.in.
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NUMBER OF REPAIRS

Two per area

EDGE CHAMFER TO REMOVE DAMAGE

0.030 in. x 40-50° up to 0.500 in. (No more than two per quadrant)

NOTES

1. Using 0.108 inch diameter pins, the measurement between pins should be 1.2212 inches minimum to 1.2257 inches maximum.
2. TIR not to exceed 0.004 inch maximum when mounted on tail rotor driveshaft splines.

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Coupling Adapter — Damage Limits

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6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN HANGER BEARING



Drycleaning Solvent

15. Clean hanger bearing exterior surface with a wiping rag (D164) dampened with drycleaning solvent (D199).

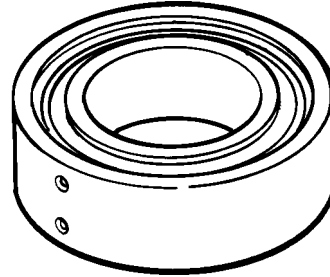
16. Dry hanger bearing with a clean wiping rag (D164).

INSPECT

17. Inspect hanger bearing for roughness by holding outer race and turning inner race. If any roughness or ratcheting is noted replace bearing.

18. Inspect hanger bearing for any signs of overheating. Overheating of hanger bearing will be indicated by discoloration of the races and heat damage to the seal. If any signs of overheating are noted, replace bearing. Inspect seals for evidence of excess leakage or deterioration. If signs of deterioration are found, replace bearing.

19. Repair of damage to hanger bearing is not allowed.



HANGER BEARING

	MAX.	MIN.
	INCHES	
O.D.	2.6772	2.6766
I.D.	1.5752	1.5748

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6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN BEARING HANGER



Drycleaning Solvent

20. Clean bearing hanger with a wiping rag (D164) dampened with drycleaning solvent (D199).

CAUTION

Bearing shall be purged after reassembly to remove any possible residual solvent. Premature bearing failure may result.

21. Dry bearing hanger with a clean wiping rag (D164).

INSPECT

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of bearing hanger is a characteristic critical to flight safety.

22. Fluorescent penetrant inspect bearing hanger (TM 1-1520-266-23).

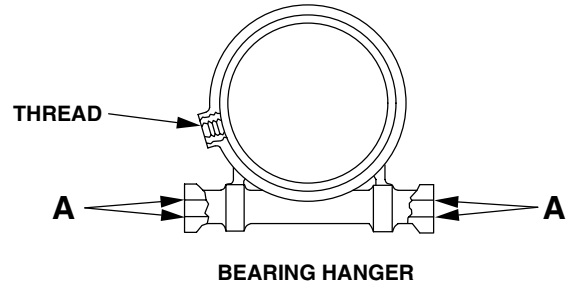
23. Inspect bearing hanger to limits shown. See figure Bearing Hanger Assembly — Damage Limits. If cracks in bearing hanger are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

24. Repair damage to bearing hanger using 400 grit sandpaper (D175).



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25. Blend repaired area into surrounding area using crocus cloth (D90).

NOTE

Brush cadmium plating shall be omitted from hole A and grease fitting tapped threads of bearing hanger.

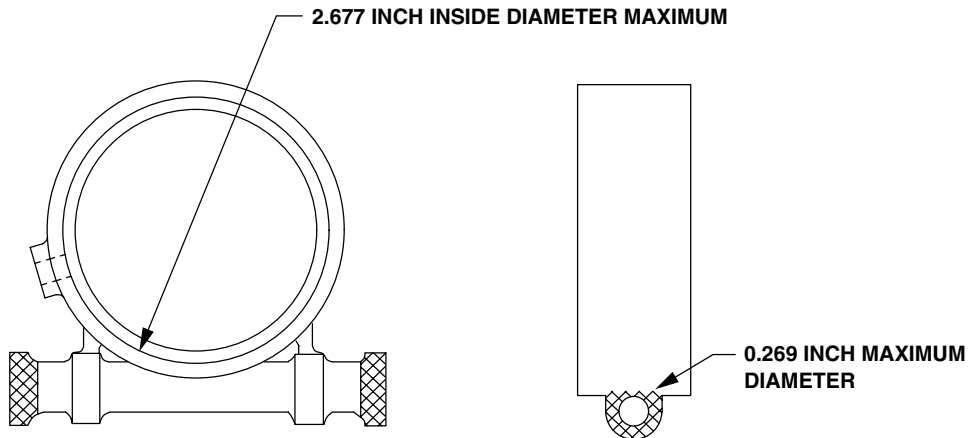


LHE Cadmium Solution

26. Apply brush cadmium plating (D129) to repaired area.

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6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



BEARING HANGER ASSEMBLY

DAMAGE LOCATION SYMBOLS



ALL EXTERIOR SURFACES

TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

THREAD DAMAGE

EDGE CHAMFER TO REMOVE DAMAGE

NOTE: Cracks are not permitted.

MAXIMUM DAMAGE AND REPAIR DEPTH

0.001 in. before and after repair

0.10 sq. in.

Two maximum

0.030 in. x 40-50° for 0.500 in.

0.005 in. before and after repair

1.000 sq. in.

Two maximum

No thread damage allowed



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Bearing Hanger Assembly — Damage Limits

GO TO NEXT PAGE

6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN SEGMENTED SHAFT ASSEMBLY

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Surface condition, minimum wall thickness, minimum outside diameter, and straightness of segmented shaft assembly are characteristics critical to flight safety. Surface of shaft shall be smooth and unmarred. Scratches may be polished out within minimum wall thickness of **0.055 inch**, minimum outside diameter of **1.495 inches**, minimum radius of **0.25 inch**, and 32 RMS surface finish.



Naphtha/Naphthalene, TT-N-97

27. Clean segmented shaft assembly with a wiping rag (D164) dampened with aliphatic naphtha (D141).

28. Dry segmented shaft assembly with a clean wiping rag (D164).



Acetone

29. Remove corrosion protective coating (D88) from segmented shaft assembly with a wiping rag (D164) dampened with acetone (D2).

INSPECT

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of segmented shaft assembly is a characteristic critical to flight safety.

30. Fluorescent penetrant inspect segmented shaft assembly (TM 1-1520-266-23).

31. Inspect segmented shaft assembly to limits shown. See figure Segmented Shaft — Damage Limits. No cracks allowed. If cracks in segmented shaft assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

32. Inspect splines to limits shown.

33. Inspect for bond separations in Area B (Segmented Shaft — Damage Limits).

34. Inspect stud for thread damage.

NOTE

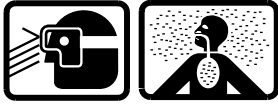
Segmented shaft shall be replaced if balance weight is debonded or missing. Return shaft to depot overhaul facility for repair.

35. Inspect balance weights for security and presence.

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6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

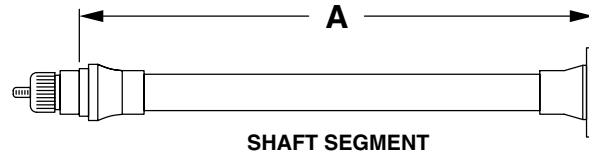
REPAIR



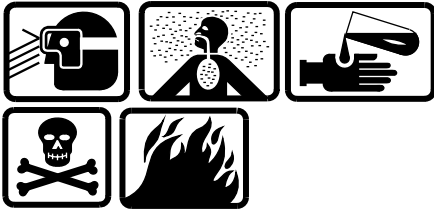
Sanding Operations

36. Repair damage to segmented shaft assembly using 400 grit sandpaper (D175).

37. Blend repaired area into surrounding area with crocus cloth (D90).



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Chemical Conversion Materials

38. Brush Alodine 1201 (D57) on repaired areas.



Corrosion Preventive Compound

39. Apply two coats of corrosion protective coating (D88) to repairs in area A of segmented shaft assembly. Allow 30 minutes drying time between first and second coats. Allow to cure at ambient room temperature for 48 hours.

INSPECT

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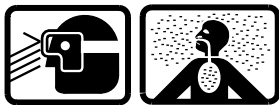
 6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

SPLINE WEAR AND DAMAGE LIMITS

40. Remove damage to upper edges of teeth using edge break of **0.030 inch** (maximum) x 40 to 50 degrees. Repair may extend to full length of teeth. One side only may be recessed on any tooth. No more than two adjacent teeth may be reworked.

41. Repair of damage to top surfaces of teeth is limited to maximum of one repair per tooth **0.010 inch** maximum up to **0.250 inch** long on all teeth; **0.0001 inch** maximum up to 100 percent of surface on all teeth.

42. Damage to ends (stud ends only) of all teeth may be removed by chamfer up to **0.060 inch** x 40 to 50 degrees.



Sanding Operations

43. Only damage which can be removed using steel wool (D204) or 400 grit sandpaper (D175) is allowed for sides and roots of all teeth.

STUD

44. Replace damaged stud with AN125969 through AN125974 stud.



Zinc Chromate Primer

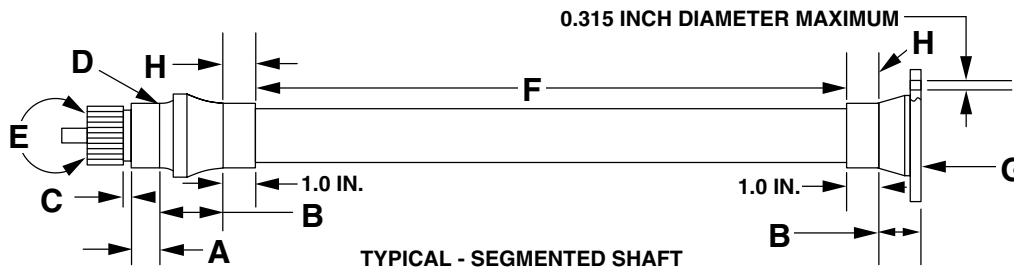
45. Install stud with unreduced zinc chromate primer (D161) to an installed height of **0.610 to 0.670 inch**.

46. Torque **50 TO 95 INCH-POUNDS**.

INSPECT

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6-6-10. COMPONENTS OF SHAFT AND BEARING HANGER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	
AREA	
A (Surface)	0.0001 in. up to 100 percent of circumference
B (Diameter)	0.005 in. up to 100 percent of circumference
C (Diameter)	0.001 in. up to 100 percent of circumference
D (Shoulder)	0.001 in. up to 100 percent of circumference
E (Surface)	0.010 in. up to 100 percent of surface area
F (Diameter)	0.005 in. up to one sq. in.
F (Diameter)	0.005 in. up to 25 percent of circumference, 0.850 in. wide
F (Diameter)	0.002 in. up to 100 percent of circumference, 0.210 in. wide
G (Surface)	0.001 in. up to 100 percent of surface area
H (Diameter)	0.001 in. up to 100 percent of circumference
NUMBER OF REPAIRS	Five maximum
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 40-50° up to 0.500 in. (No more than 2 per quadrant)

- NOTES**
- Repairs are to be made with 0.25 inch minimum radius and 32 RMS surface finish.
 - Using 0.1200 inch diameter pins, the measurement over pins minimum is 1.5525 inches and maximum is 1.5560 inches.
 - Check straightness of shaft in area F using a 12 inch straight edge. Maximum gap between tube and straight edge is 0.005 inch.
 - No cracks allowed.

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Segmented Shaft — Damage Limits

END OF TASK

6-6-11. FAN SHAFT ASSEMBLY — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Aft Fairing Assembly Removed (Task 2-2-55) ■
Engine Scavenge Oil Filter Assembly Removed
(Task 4-4-17)
Oil Cooler Removed (Task 6-8-24)
Forward Shaft Assembly Removed (Task 6-6-1)
Aft Short Shaft Assembly Removed
(Task 6-6-4)

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

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6-6-11. FAN SHAFT ASSEMBLY — REMOVAL (CONT)

1. Remove screw (1) and washer (2) from clamp (3) securing transmission oil outlet line (4) to transition duct (5) and bracket (6).

CAUTION

All disconnected lines and fittings shall be capped. Failure to cap lines or fittings can lead to oil system contamination.

2. Disconnect transmission oil outlet line fitting (7) from fitting (8).

3. Remove transmission oil outlet line (4).

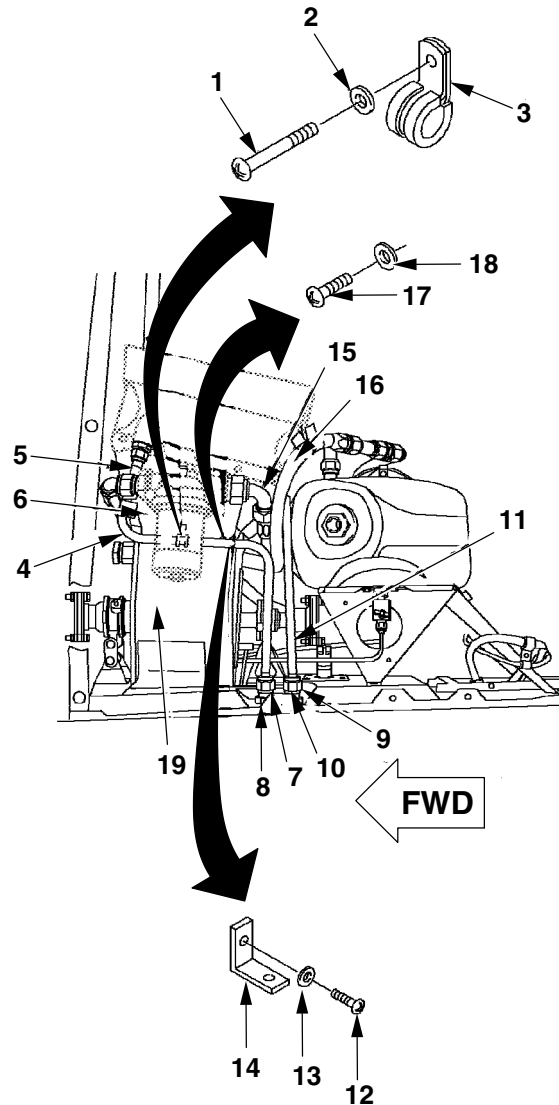
4. Disconnect transmission oil inlet line fitting (9) from fitting (10).

5. Remove transmission oil inlet line (11).

6. Remove screw (12) and washer (13) from bracket (14), securing oil lines (15 and 16) to transition duct (5).

7. Remove screws (17) and washers (18) securing transition duct (5) and bracket (6) to blower housing (19).

8. Remove transition duct (5) and bracket (6).



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6-6-11. FAN SHAFT ASSEMBLY — REMOVAL (CONT)

9. Working from forward side of engine aft firewall (20), remove coupling disc pack (21) and adapter (22) from forward end of fan shaft assembly (23).

10. Remove coupling disc pack (21) and adapter (22) from aft end of fan shaft assembly (23).

NOTE

Fan shaft assembly should be supported at both ends to aid in removing bearing hangers from brackets.

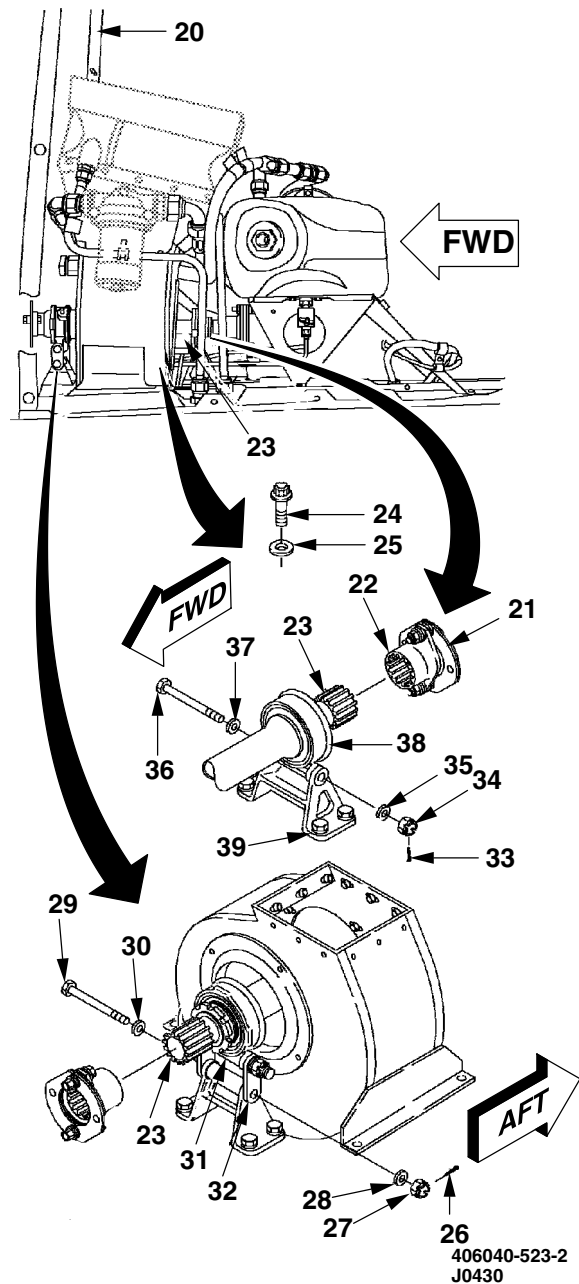
11. Remove nuts, washers, screws, and firewall ring halves from forward side of firewall (20).

12. Cut lockwire and remove four bolts (24) and four washers (25).

13. Remove cotter pin (26), nut (27), washer (28), bolt (29), and washer (30) securing forward bearing hanger (31) to links (32).

14. Remove cotter pin (33), nut (34), washer (35), bolt (36), and washer (37) securing aft bearing hanger (38) to bracket (39).

15. Remove fan shaft assembly (23) from aft cabin roof and place on suitable surface.



END OF TASK

6-6-12. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Pressing Sleeve (Part of B189)
Bearing Puller (Part of B191)

Applicable Configurations:
All

Material:
Corrosion Preventive Compound (D83)
Grease (D113)

Tools:

General Mechanic Tool Kit (B178)
Spanner Attachment Set (B132)
Spanner Wrench (B229)
Step Plate Set (B135)
Hand Arbor Press (B107)
Knife Edge Balancer (H-26)
Torque Wrench (B237)
Torque Wrench (B240)
Torque Wrench (B241)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
67S Scout Helicopter Repairer
68D Aircraft Powertrain Repairer

Equipment Condition:
Fan Shaft Assembly Removed (Task 6-6-11)

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6-6-12. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — REMOVAL/INSTALLATION (CONT)

REMOVE BLOWER HOUSING

1. Remove four screws (1) from inlet (2) and remove inlet (2) from blower housing (3).

2. Remove blower housing (3) from fan shaft (4), forward and aft bearing and hanger assemblies (6 and 7), and impeller (8).

REMOVE FORWARD BEARING AND HANGER ASSEMBLY

3. Lift tangs of key washer (9) from slots in spanner nut (10).

4. While holding splines of fan shaft (4) with spanner output adapter (B132) and splined adapter (5), remove spanner nut (10) with spanner wrench (B229).

5. Remove and discard key washer (9).

6. Remove forward bearing and hanger assembly (6) from fan shaft (4) using suitable plug for end of fan shaft (4) and bearing puller (part of B191).

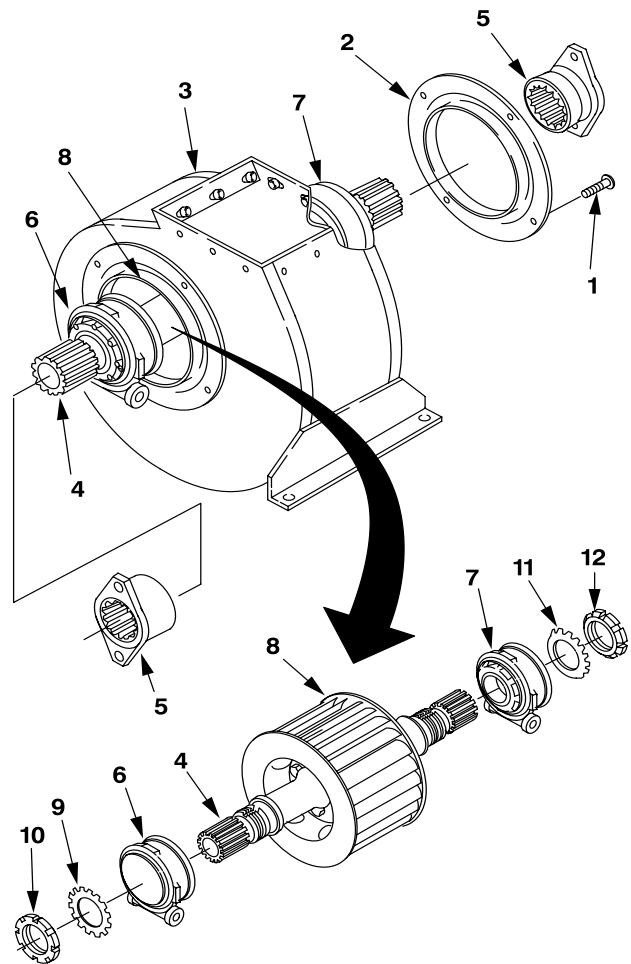
REMOVE AFT BEARING AND HANGER ASSEMBLY

7. Lift tangs of key washer (11) from slots in spanner nut (12).

8. While holding splines of fan shaft (4) with output spanner adapter (B132) and splined adapter (5), remove spanner nut (12) with spanner wrench (B229).

9. Remove and discard key washer (11).

10. Remove aft bearing and hanger (7) from fan shaft (4) using step plate set (B135) for end of fan shaft (4) and hand arbor press (B107). Pressure applied to outer race of bearing during removal requires replacement of bearing.



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6-6-12. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — REMOVAL/INSTALLATION (CONT)

REMOVE HANGER BEARING (TYPICAL)

11. Remove retaining ring (13) securing bearing (14) to bearing hanger (6 or 7).

12. Press bearing (14) from bearing hanger (6 or 7) using hand arbor press (B107) (Task 6-6-9).

REMOVE IMPELLER

NOTE

Impeller and hardware shall be indexed prior to removal to facilitate minimum effort in balancing impeller upon installation.

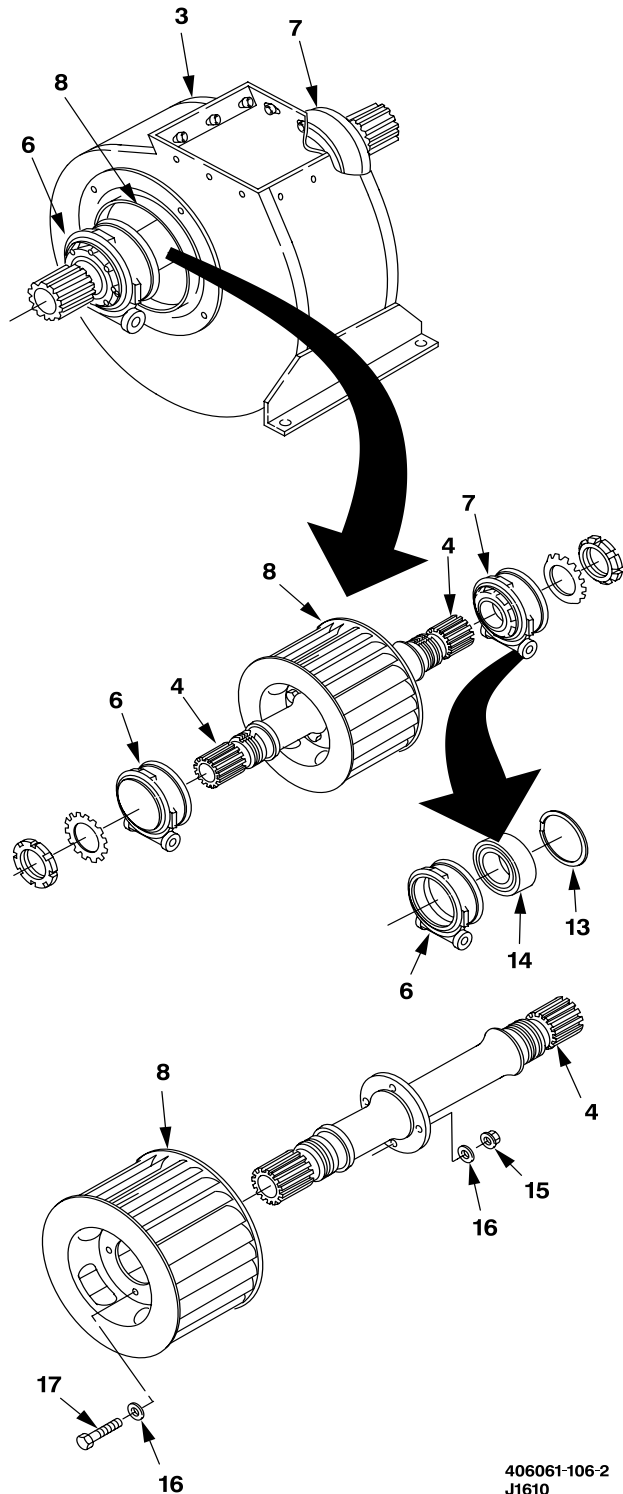
13. Remove four nuts (15), eight washers (16), and four bolts (17).

14. Remove impeller (8) from fan shaft (4).

15. Clean, inspect, and repair bearing hanger (7), bearing (14), impeller fan shaft (4), and blower housing (3) (Task 6-6-13).

INSTALL IMPELLER

16. Install impeller (8) on fan shaft (4) with four bolts (17), eight washers (16), and four nuts (15); do not torque four nuts (15) at this time.



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6-6-12. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — REMOVAL/INSTALLATION (CONT)

BALANCE IMPELLER AND FAN SHAFT

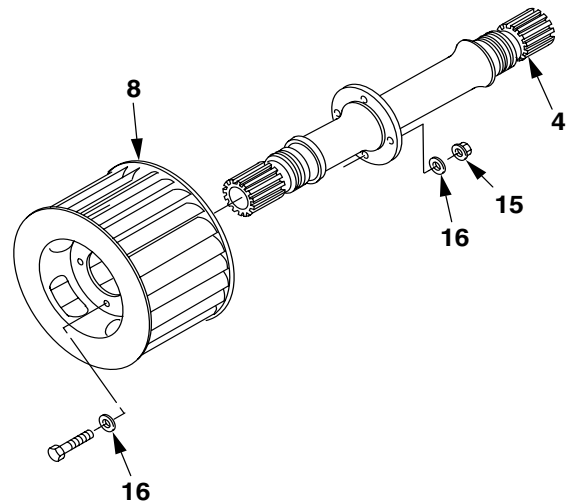
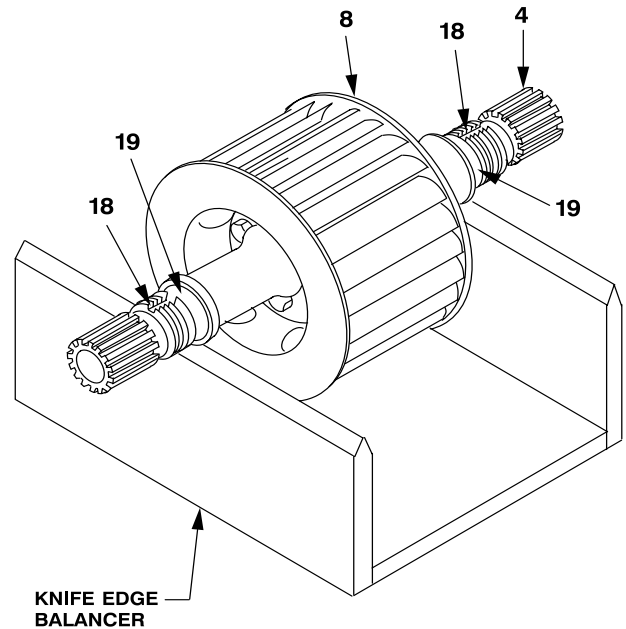
17. Place impeller (8) and fan shaft (4) on a knife edge balancer (H-26) with balancer blades positioned inboard of the keyway slots (18) on bearing journal (19) surfaces.

NOTE

A maximum of nine AN960-416L or equivalent thickness of AN960-416 washers may be used on one bolt, and a maximum of two NAS6604-4 bolts may be substituted for NAS6604-3 bolts to obtain balance.

18. Add additional washers (16) to balance impeller (8) and fan shaft (4) as nearly as possible within limits obtained with one final AN960-416L washer (16) (equal to 0.02 inch-ounce in respect to bearing journal (19) axis).

19. Once balance of impeller (8) and fan shaft (4) is achieved, torque nuts (15) **50 TO 70 INCH-POUNDS**.

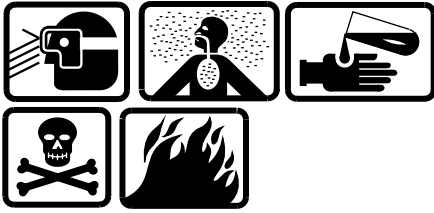


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6-6-12. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — REMOVAL/INSTALLATION (CONT)

INSTALL HANGER BEARING (TYPICAL)



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound shall not be allowed to contact bearing seal, as deterioration of seal will result.

20. Apply a thin coat of corrosion preventive compound (D83) to inner diameter of bearing hangers (6 and 7) and inner and outer diameter of bearing (14).

21. Press bearing (14) into bearing hanger (6 or 7) with hand arbor press (B107), using step plate set (B135).

22. Secure bearing (14) in bearing hanger (6 or 7) with retainer ring (13).

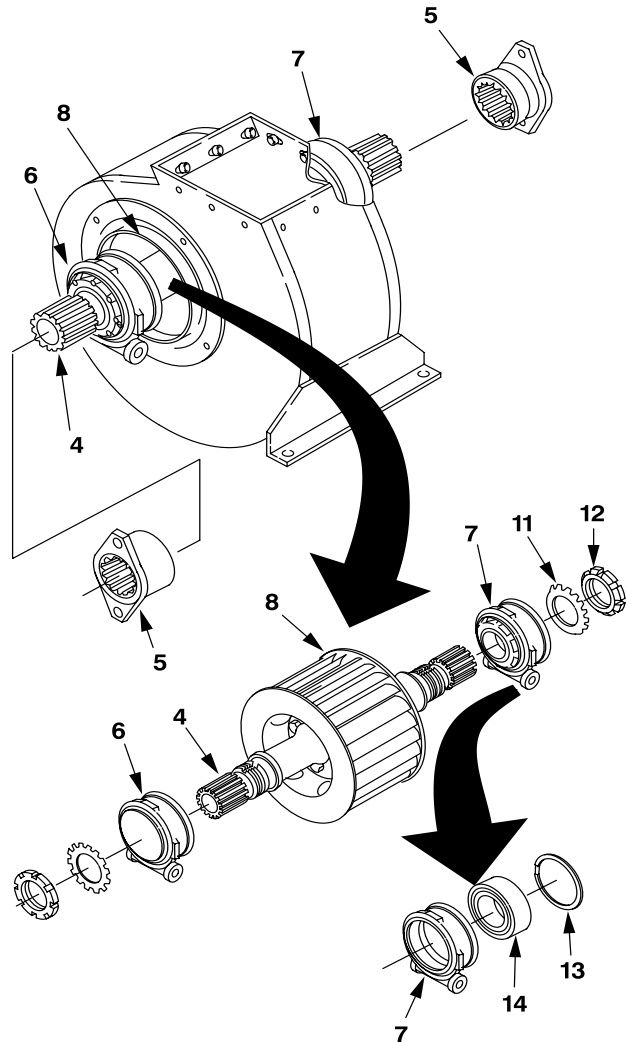
INSTALL AFT BEARING HANGER

23. Using pressing sleeve (part of B189) and only pressing against inner race of bearing (14), press aft bearing hanger (7) onto aft end of fan shaft (4) (towards open end of impeller (8)) until fully seated.

24. Install key washer (11) and spanner nut (12) on fan shaft (4).

25. While holding forward end of fan shaft (4) with output spanner adapter (B132) and splined adapter (5), torque spanner nut (12) **200 TO 300 INCH-POUNDS** and secure by bending tang of key washer (11) into slot of spanner nut (12).

INSPECT



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6-6-12. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — REMOVAL/INSTALLATION (CONT)

INSTALL FORWARD BEARING HANGER

26. Using pressing sleeve (part of B189) with hand arbor press (B107) and only pressing against inner race of bearing (14), press forward bearing hanger (6) onto forward end of fan shaft (4) until bearing hanger (6) is fully seated.

27. Install spanner nut (10) with key washer (9) on forward end of fan shaft (4).

28. While holding aft end of fan shaft (4) with output spanner adapter (B132) and splined adapter (5), torque spanner nut (10) **200 TO 300 INCH-POUNDS** and secure by bending tang of key washer (9) into slot of spanner nut (10).

INSPECT

INSTALL BLOWER HOUSING

29. Install blower housing (3) on fan shaft (4) forward and aft bearing and hanger assemblies (6 and 7) and impeller (8).

30. Install inlet (2) on blower housing (3) with four screws (1).



Grease

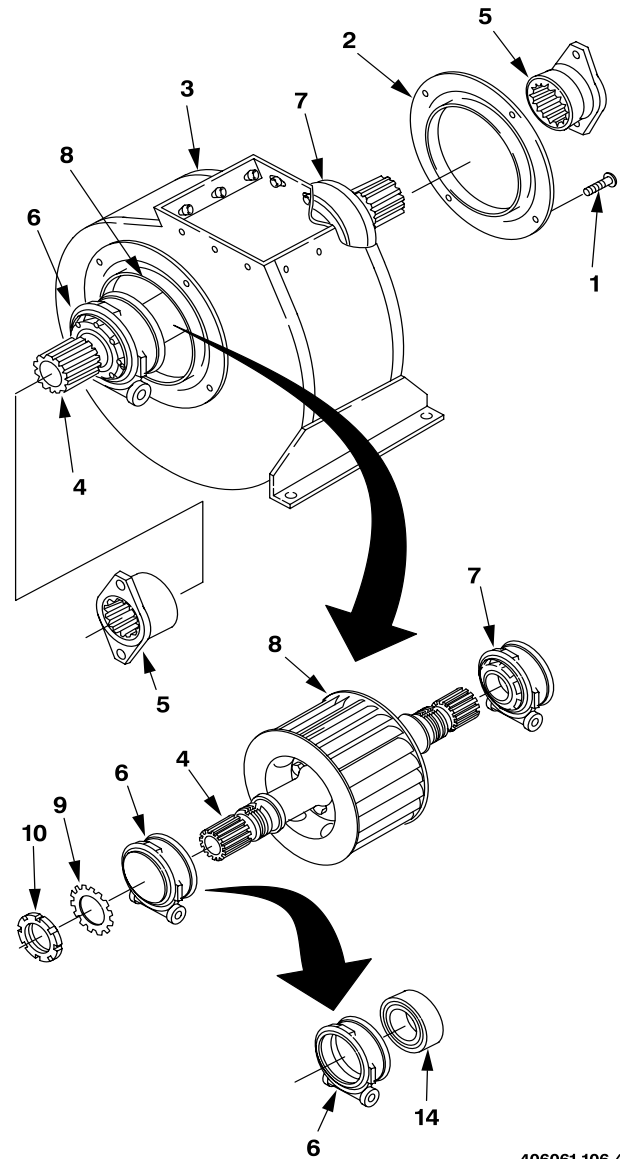
31. Purge bearing with grease (D113) after installation.

NOTE

If fan shaft assembly is not being installed at this time, fan shaft should be wrapped with suitable material to prevent fan shaft from rubbing blower housing openings.

FOLLOW-ON MAINTENANCE

Install fan shaft assembly (Task 6-6-11).



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J1610

END OF TASK

6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

- Powertrain Tool Kit (B180)
- General Mechanic Tool Kit (B178)
- Outside Micrometer Caliper Set (B12)
- Fine India Stone (B163)
- Dial Indicator (B37)
- Air Blow Gun (B56)

Material:

- Sandpaper (D175)
- Crocus Cloth (D90)
- Drycleaning Solvent (D199)
- Wiping Rags (D164)

- Brush Cadmium Plating (D129)
- Epoxy Zinc Coating (D99)
- Chemical Conversion Coating (Alodine 1201) (D57)
- Zinc Chromate Primer (D161)
- Rubber Gloves (D111)
- Paint Brush (D54)

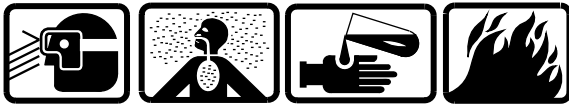
Personnel Required:

- 67S Scout Helicopter Technical Inspector (TI)
- 67S Scout Helicopter Repairer
- 68D Aircraft Powertrain Repairer

References:

- TM 55-1500-345-23
- TM 1-1500-204-23
- TM 1-1520-266-23

CLEAN BEARING HANGER



Drycleaning Solvent

1. Clean bearing hanger with wiping rag (D164) dampened with drycleaning solvent (D199).
2. Dry bearing hanger with clean wiping rag (D164).

INSPECT BEARING HANGER

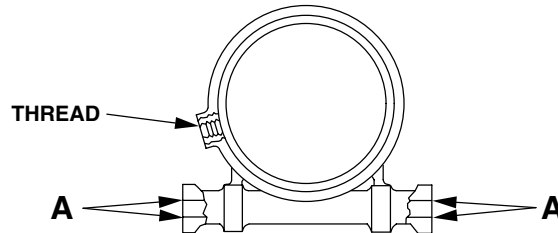
WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

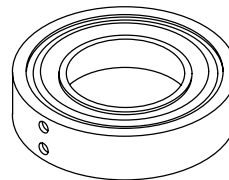
Fluorescent penetrant inspection of bearing hanger is a characteristic critical to flight safety.

3. Fluorescent penetrant inspect bearing hanger (TM 1-1520-266-23).

4. Inspect bearing hanger to limits shown. See figure on this page for wear limits, for damage limits see figure(s) Fan Shaft Forward (or Aft) Bearing Hanger — Damage Limits.



BEARING HANGER



HANGER BEARING

	MAX. INCHES MIN.	
O.D.	2.6772	2.6766
I.D.	1.5752	1.5748

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GO TO NEXT PAGE

6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR BEARING HANGER



Sanding Operations

5. Repair damage to bearing hangers using 400 grit sandpaper (D175).

6. Blend repaired area into surrounding area using crocus cloth (D90).



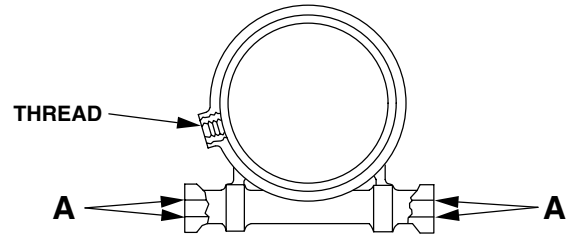
LHE Cadmium Solution

NOTE

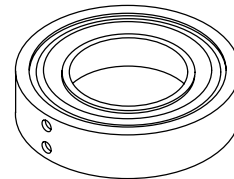
Brush cadmium plating should be omitted from hole A and grease fitting threads of bearing hangers.

7. Apply brush cadmium plating (D129) to repaired area.

INSPECT



BEARING HANGER



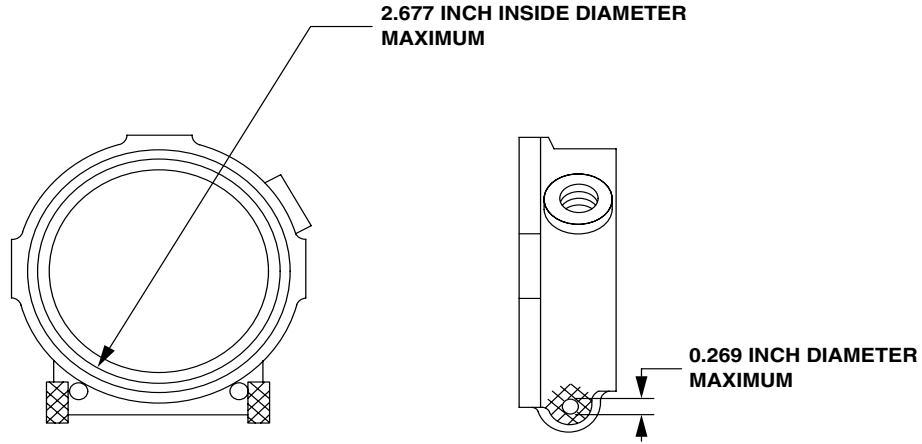
HANGER BEARING

	MAX. INCHES	MIN.
O.D.	2.6772	2.6766
I.D.	1.5752	1.5748

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GO TO NEXT PAGE

6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/INSPECTION/REPAIR (CONT)



FORWARD BEARING HANGER-FAN SHAFT

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

0.001 in. before and after repair

0.005 in. before and after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

0.100 sq. in.

1.000 sq. in.

NUMBER OF REPAIRS

Two maximum

Two maximum

THREAD DAMAGE

No thread damage allowed

EDGE CHAMFER TO REMOVE DAMAGE

0.030 X 40-50° for 0.500 in.

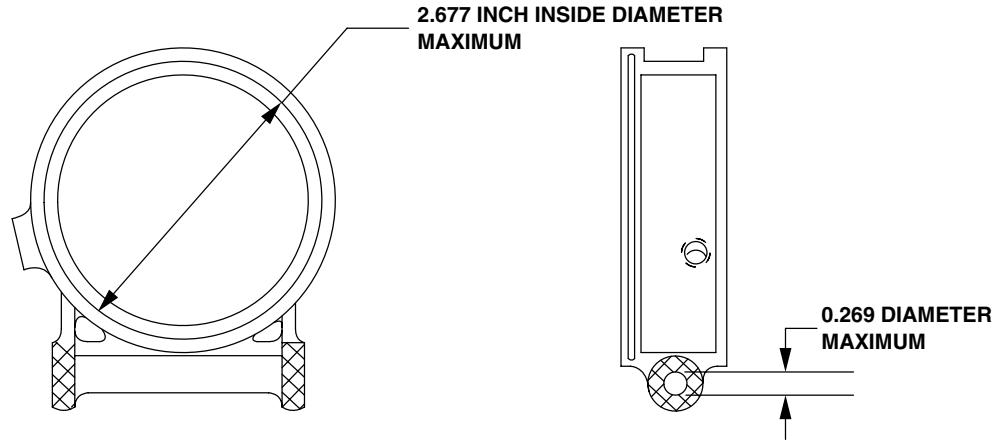
NOTE: All dimensions are in inches.

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J0432

Fan Shaft Forward Bearing Hanger — Damage Limits

GO TO NEXT PAGE

6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/INSPECTION/REPAIR (CONT)



BEARING HANGER-AFT FAN SHAFT

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

0.001 in. before and after repair

0.005 in. before and after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

0.100 sq. in.

1.000 sq. in.

NUMBER OF REPAIRS

Two maximum

Two maximum

THREAD DAMAGE

No thread damage allowed

EDGE CHAMFER TO REMOVE DAMAGE

0.030 X 40-50° for 0.500 in.

0.030 X 40-50° for 0.500 in.

NOTE: All dimensions are in inches.

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J0432

Fan Shaft Aft Bearing Hanger — Damage Limits

GO TO NEXT PAGE

6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN HANGER BEARING



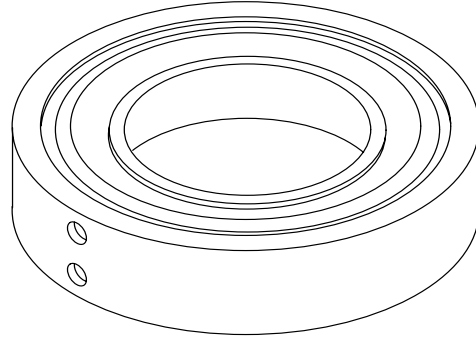
Drycleaning Solvent

CAUTION

Bearing shall be purged after reassembly to ensure removal of any residual solvent.

8. Clean hanger bearing exterior surface with a wiping rag (D164) dampened with drycleaning solvent (D199).

9. Dry hanger bearing with a clean wiping rag (D164).



HANGER BEARING

INSPECT HANGER BEARING

NOTE

- Grease expelled from hanger bearing is not cause for rejection.
- Bearing or hanger assembly shall not be washed, cleaned, or sprayed with any type solution during inspection.
- Only clean cloths or shop towels shall be used to clean assembly.

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J2010

10. Inspect hanger bearing for roughness by holding outer race and turning inner race. If any roughness or ratcheting is noted, replace bearing. Inspect seals for evidence of excess leakage or deterioration. If signs of deterioration are found, replace bearing.

11. Inspect hanger bearing for any signs of overheating. Overheating of hanger bearing will be indicated by discoloration of races and heat damage to seal. If any signs of overheating are noted, replace bearing.

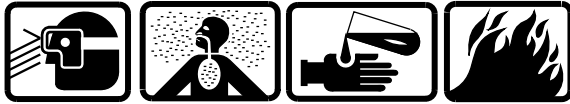
12. Inspect outside and inside diameter of hanger bearing for excessive wear.

13. Repair of damage to hanger bearing is not allowed.

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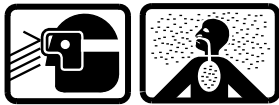
6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN IMPELLER



Drycleaning Solvent

14. Clean impeller with drycleaning solvent (D199) and paint brush (D54).



Compressed Air

15. Dry impeller with filtered compressed air.

INSPECT

16. Inspect aluminum alloy impeller housing using fluorescent penetrant inspection (TM 1-1520-266-23).

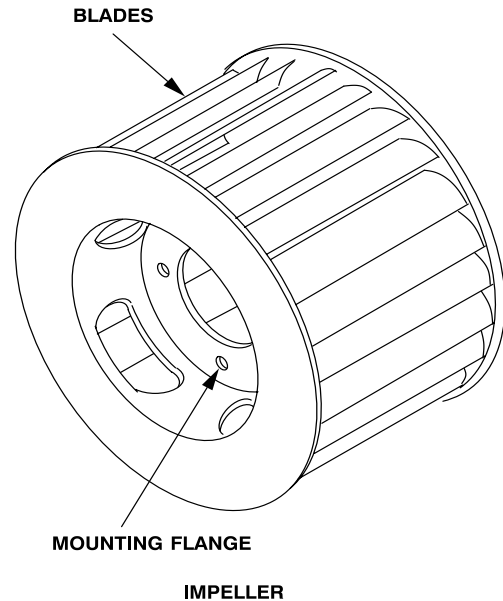
17. Inspect impeller for cracks, particularly at mounting flange and individual blades. If any blades are cracked, dented, bent or missing, replace impeller. If cracks in steel impeller are suspected perform magnetic particle inspection (TM 1-1520-266-23).

18. Inspect impeller for missing primer.

REPAIR



Zinc Chromate Primer



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CAUTION

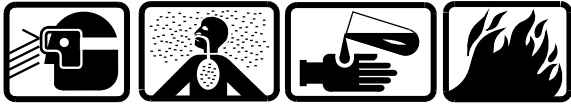
To prevent damage to tail rotor drive train, care shall be exercised that zinc chromate primer does not run into corners and form thick deposits that could disturb dynamic balance of impeller.

19. Apply a very thin uniform coat of zinc chromate primer (D161) in accordance with TM 55-1500-345-23.

GO TO NEXT PAGE

6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/INSPECTION/REPAIR (CONT)

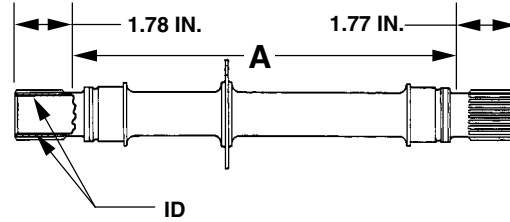
CLEAN FAN SHAFT



Drycleaning Solvent

20. Clean fan shaft with a wiping rag (D164) dampened with drycleaning solvent (D199).

21. Dry fan shaft with a clean wiping rag (D164).



FAN SHAFT

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INSPECT FAN SHAFT

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

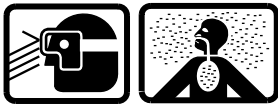
Magnetic particle inspection of fan shaft is a characteristic critical to flight safety. Any rateable inclusion is cause for rejection. Inclusions **1/64 (0.0156) inch** in length or greater are rateable.

22. Magnetic particle inspect fan shaft (TM 1-1520-266-23).

23. Inspect fan shaft to limits shown. See figure Fan Shaft — Damage Limits. No cracks allowed. If cracks in fan shaft are suspected perform magnetic particle inspection (TM 1-1520-266-23).

REPAIR FAN SHAFT

24. Repair damage to inside diameter of fan shaft by honing to limits shown.



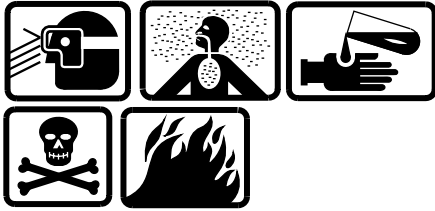
Sanding Operations

25. Repair damage to fan shaft using 400 grit sandpaper (D175).

26. Blend repaired area into surrounding area using crocus cloth (D90).

GO TO NEXT PAGE

 6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/
 INSPECTION/REPAIR (CONT)



Zinc Chromate Primer

CAUTION

To prevent imbalance condition, fan shaft shall be stood on end while draining.

27. Protect reworked inside diameter of fan shaft by filling and draining with epoxy/zinc coating (D99).



LHE Cadmium Solution

NOTE

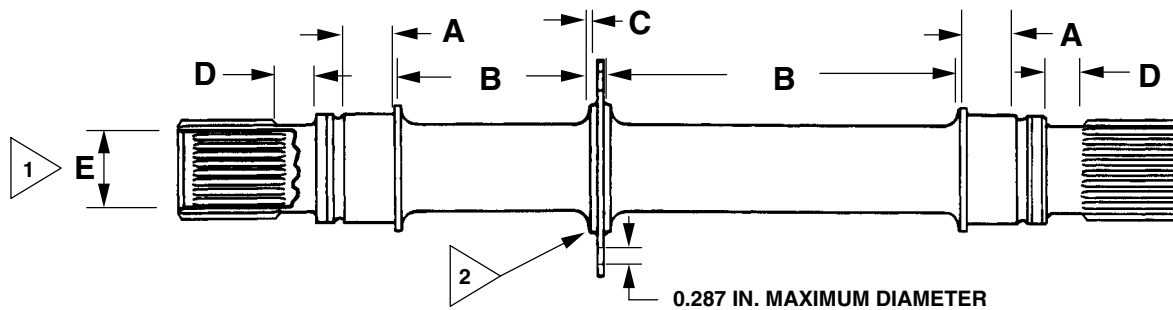
Brush cadmium plating shall be omitted from inside diameter of fan shaft.

28. Apply brush cadmium plating (D129) to repairs in area A. See figure Fan Shaft — Damage Limits.

INSPECT

GO TO NEXT PAGE

6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/INSPECTION/REPAIR (CONT)



FAN SHAFT

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

AREA

MINIMUM

MAXIMUM

A
B

OD 1.574
OD 1.245

OD 1.575
OD 1.260 with maximum
repair of 0.005 inch in a 1 square inch area

C
D

OD 1.842
OD 1.240

OD 1.844
OD 1.260 with maximum
repair of 0.005 inch in a 1 square inch area

E

ID 1.085

ID 1.110

NUMBER OF REPAIRS

Five maximum

EDGE CHAMFER TO REMOVE DAMAGE

0.030 in. x 40-50° for 0.500 in., two per quadrant maximum

NOTES



Repair to be uniform by honing.



Check runout TIR, 0.001 inch maximum on pilot diameter and 0.005 inch maximum on face with shaft mounted on V blocks at bearing journals.

3. Using 0.1200 inch diameter pins, the measurement over pins minimum is 1.546 inches and maximum is 1.556 inches. Blend step, if any, between worn and unworn areas of spline teeth using fine India stone.

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Fan Shaft — Damage Limits

GO TO NEXT PAGE

 6-6-13. BEARING HANGERS/BEARINGS/IMPELLER/FAN SHAFT/BLOWER HOUSING — CLEANING/
 INSPECTION/REPAIR (CONT)

CLEAN BLOWER HOUSING

**Drycleaning Solvent**

29. Clean blower housing with a wiping rag (D164) dampened with drycleaning solvent (D199).

30. Dry blower housing with a clean wiping rag (D164).

INSPECT BLOWER HOUSING

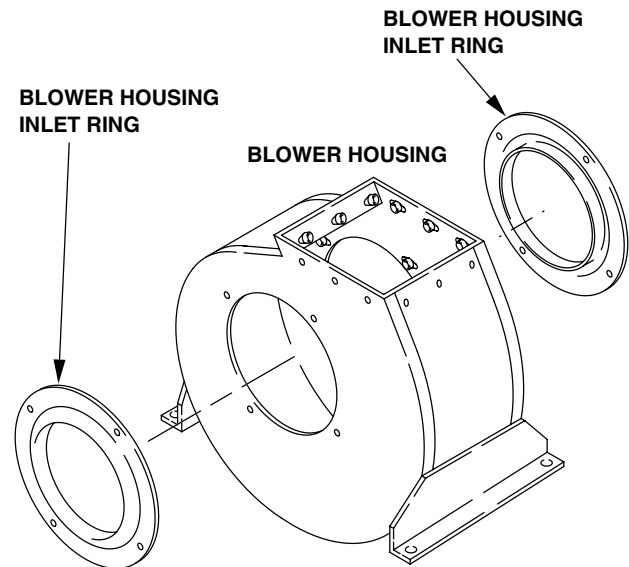
31. Inspect blower housing for cracks, dents, loose rivets, loose nutplates, and missing primer. No cracks allowed. If cracks in blower housing are suspected perform magnetic particle inspection (TM 1-1520-266-23).

REPAIR BLOWER HOUSING

32. Repair blower housing using standard sheetmetal repair procedures in accordance with TM 1-1500-204-23.

33. Apply Alodine 1201 (D57) to repaired area in accordance with TM 55-1500-345-23.

34. Apply zinc chromate primer (D161) to repaired area in accordance with TM 55-1500-345-23.

INSPECT

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J0432

END OF TASK

6-6-14. FAN SHAFT ASSEMBLY — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B235)
Torque Wrench (B237)
Crowfoot, 7/8 Inch (B27)
Crowfoot, 1 Inch (B29)
Crowfoot, 1 1/4 Inch (B30)

Material:
Antiseize Compound (D45)
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Aft Fairing Assembly Removed (Task 2-2-55) ■
Engine Scavenge Oil Filter Assembly Removed
(Task 4-4-17)
Oil Cooler Removed (Task 6-8-24)
Forward Shaft Assembly Removed (Task 6-6-1
or 6-6-2)
Aft Short Shaft Assembly Removed (Task 6-6-
4)
AN/ALQ-144 IR Jammer Mount Removed (Task
2-3-13) ■

GO TO NEXT PAGE

6-6-14. FAN SHAFT ASSEMBLY — INSTALLATION (CONT)

NOTE

Fan shaft assembly should be supported at both ends to aid in installation.

1. Install fan shaft assembly (1) with blower housing (2) seated in hole in aft cabin roof and large opening of blower housing (2) facing aft.

NOTE

Alignment of fan shaft hanger bearing inner and outer races is not required, since airframe deflections at fan shaft are very small.

2. Install forward bearing hanger (3) between links (4) and secure with bolt (5), washers (6 and 7), and nut (8).

WARNING

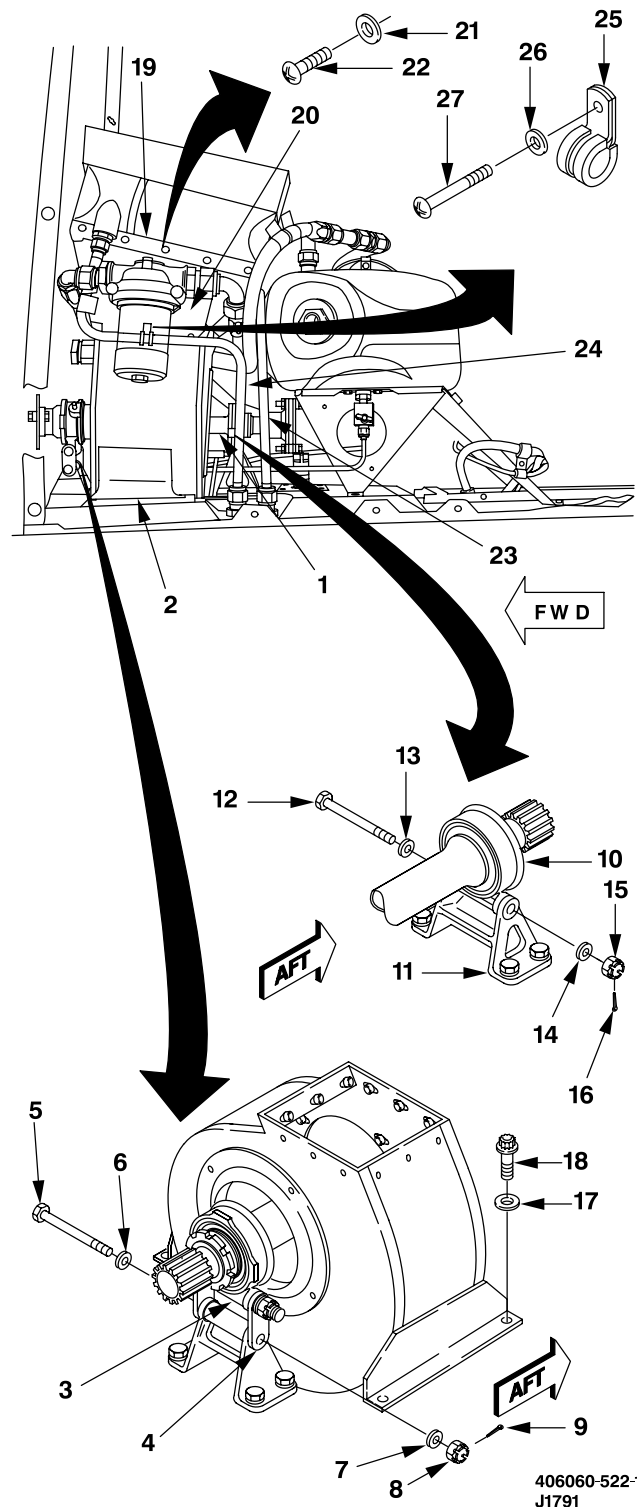
FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct torquing of nuts (8 and 15) is a characteristic critical to flight safety.

3. Torque nut (8) **50 TO 70 INCH-POUNDS**.
4. Install cotter pin (9) through nut (8).
5. Install aft bearing hanger (10) on bracket (11) and secure with bolt (12), washers (13 and 14), and nut (15).
6. Torque nut (15) **50 TO 70 INCH-POUNDS**.
7. Install cotter pin (16) through nut (15).
8. Install blower housing (2) on aft cabin roof with four washers (17) and four bolts (18).
9. Torque bolts (18) **20 TO 25 INCH-POUNDS**.
10. Secure bolts (18) in pairs with lockwire (D132).

INSTALL TRANSITION DUCT

11. Install transition duct (19) and bracket (20) on blower housing (2) with washers (21) and screws (22).
12. Install transmission oil outlet line (23).
13. Install transmission oil inlet line (24).
14. Secure transmission oil inlet line (24) to transition duct (19) with clamp (25), washer (26), and screw (27).



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J1791

GO TO NEXT PAGE

6-6-14. FAN SHAFT ASSEMBLY — INSTALLATION (CONT)

15. Connect transmission oil inlet line fitting (28) to aft cabin roof mounted fitting (29).

16. Connect oil outlet line fitting (30) to aft cabin roof mounted fitting (31).

17. Secure engine oil lines (32 and 33) to transition duct (19) with screw (34), washer (35), and bracket (36).

NOTE

Fan shaft assembly (with coupling disc packs and adapters attached) may be installed with aft firewall pan removed.



Antiseize Compound, MIL-A-907

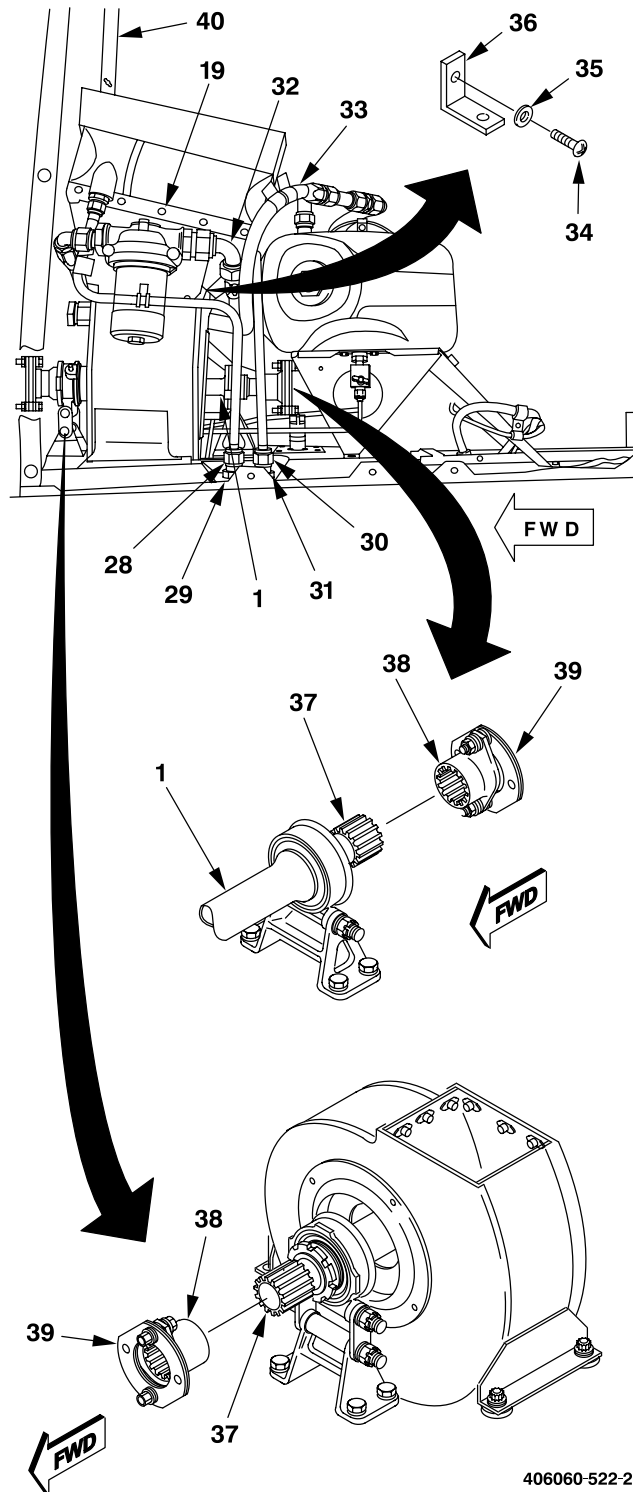
18. Apply light coat of antiseize compound (D45) to both fan shaft assembly splines (37) and splines of two adapters (38), with attached coupling disc packs (39).

19. From forward side of aft engine firewall (40), install assembled coupling disc pack (39) and adapter (38) on fan shaft assembly splines (37).

20. Install firewall ring halves on forward side of aft engine firewall (40) using screws, washers, and nuts.

21. From aft end of fan shaft assembly (1), install assembled coupling disc pack (39) and adapter (38) on fan shaft assembly splines (37).

INSPECT



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J1791

GO TO NEXT PAGE

6-6-14. FAN SHAFT ASSEMBLY — INSTALLATION (CONT)

FOLLOW-ON MAINTENANCE

Install oil cooler (Task 6-8-26).

Install engine oil scavenge filter assembly (Task 4-4-17).

Install coupling disc pack (Task 6-6-6).

Install aft short shaft assembly (Task 6-6-4).

Install forward shaft assembly (Task 6-6-1 or 6-6-2).

Align tail rotor hanger bearings (Task 6-6-17).

Align tail rotor driveshaft (Task 6-6-18).

Install aft fairing assembly (Task 2-2-55).

Install AN/ALQ-144 IR jammer mount (Task 2-3-13).

Install aft fairing extension (Task 2-2-56).

Pilot perform MOC (TM 1-1520-248-10/-CL).

END OF TASK

6-6-15. FAN SHAFT BEARING HANGER BRACKETS (FORWARD AND AFT) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)

Material:
Lockwire (D132)
Corrosion Preventive Compound (D82)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Aft Fairing Assembly Removed (Task 2-2-55) ■
Aft Firewall Pan Removed (Task 4-9-3)
Tailboom Access Panel Removed (Task 2-3-2) ■

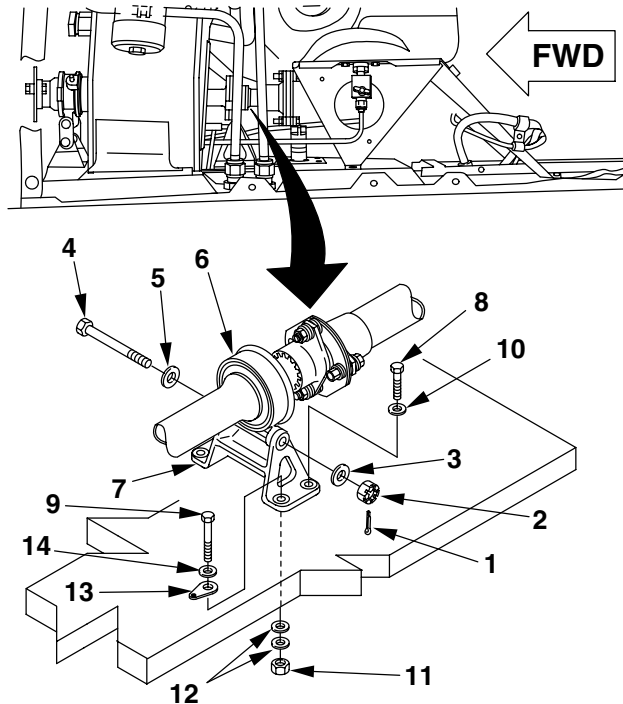
REMOVE AFT BEARING HANGER BRACKET

1. Remove cotter pin (1), nut (2), washer (3), bolt (4), and washer (5) securing aft bearing hanger (6) to aft bearing hanger bracket (7).
2. Cut and remove lockwire from bolts (8 and 9).
3. Remove two aft bolts (8) and two washers (10).
4. Remove two nuts (11), four washers (12), two forward bolts (9), two terminal lugs (13), and two washers (14).

CAUTION

Fan shaft shall be supported to avoid damage to disc packs.

5. Remove aft bearing hanger bracket (7) from aft cabin roof.
6. Inspect aft bearing hanger bracket (7) (Task 6-6-16).



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J0432

GO TO NEXT PAGE

6-6-15. FAN SHAFT BEARING HANGER BRACKETS (FORWARD AND AFT) — REMOVAL/INSTALLATION (CONT)

INSTALL AFT BEARING HANGER BRACKET

CAUTION

Fan shaft shall be supported to avoid damage to disc packs.

7. Place aft bearing hanger bracket (7) on aft cabin roof; install two washers (10) and two aft bolts (8).

8. Install two terminal lugs (13), two washers (14), and two forward bolts (9). Secure forward bolts by installing four washer(s) (12), as required for correct grip, and two nuts (11).

9. Torque aft bolts (8) and nuts (11) **50 TO 70 INCH-POUNDS**.

10. Using lockwire (D132), secure (in pairs) aft bolts (8) to forward bolts (9).

11. Place aft bearing hanger (6) on aft bearing hanger bracket (7); install washer (5), bolt (4), washer (3), and nut (2).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct torquing of nut (2) is a characteristic critical to flight safety.

12. Torque nut (2) **50 TO 70 INCH-POUNDS**.

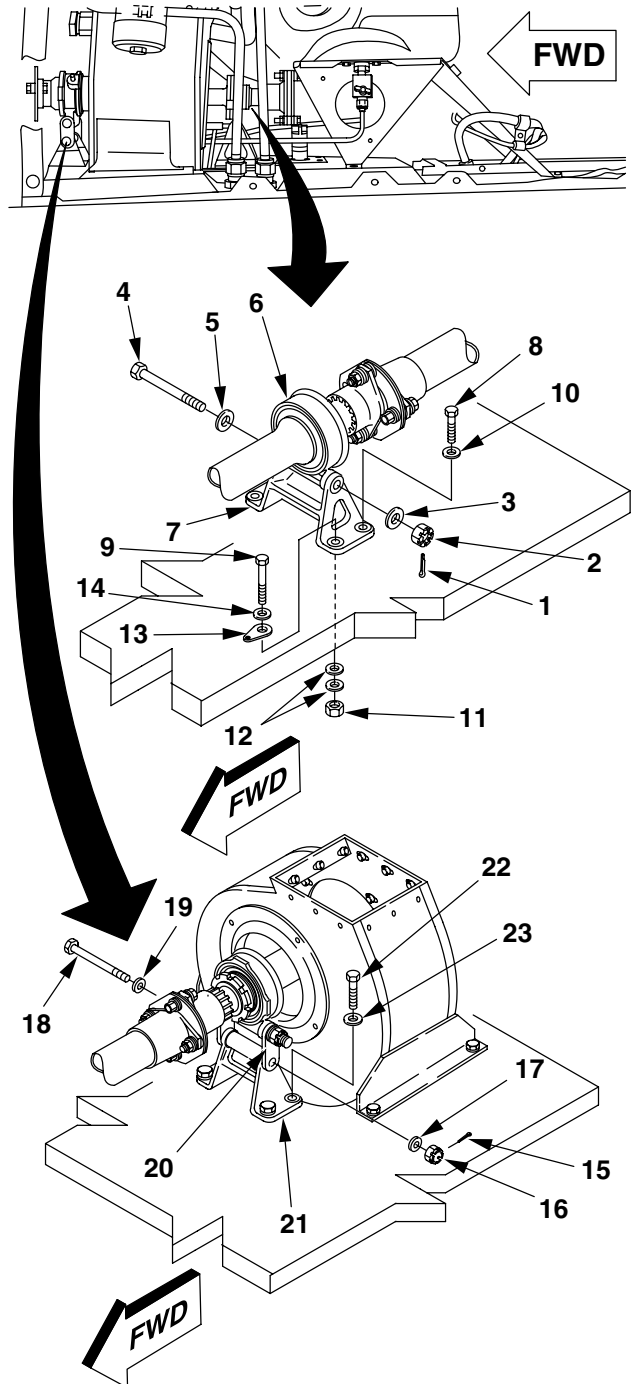
13. Install cotter pin (1) through nut (2).

REMOVE FORWARD BEARING HANGER BRACKET

14. Remove cotter pin (15), nut (16), washer (17), bolt (18), and washer (19) securing two links (20) to forward bearing hanger bracket (21).

15. Cut and remove lockwire from bolts (22).

16. Remove four bolts (22) and four washers (23).



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J0432

GO TO NEXT PAGE

6-6-15. FAN SHAFT BEARING HANGER BRACKETS (FORWARD AND AFT) — REMOVAL/
INSTALLATION (CONT)

CAUTION

Fan shaft shall be supported to avoid damage to disc packs.

17. Remove forward bearing hanger bracket (21) from aft cabin roof.

18. Inspect forward bearing hanger bracket (21) (Task 6-6-16).

INSTALL FORWARD BEARING HANGER BRACKET

CAUTION

Fan shaft shall be supported to avoid damage to disc packs.

19. Place forward bearing hanger bracket (21) on aft cabin roof; install four washers (23) and four bolts (22).

20. Torque bolts (22) **50 TO 70 INCH-POUNDS**.

21. Using lockwire (D132), secure bolts (22) in pairs.

22. Place two links (20) on forward bearing hanger bracket (21); install washer (19), bolt (18), washer (17), and nut (16).

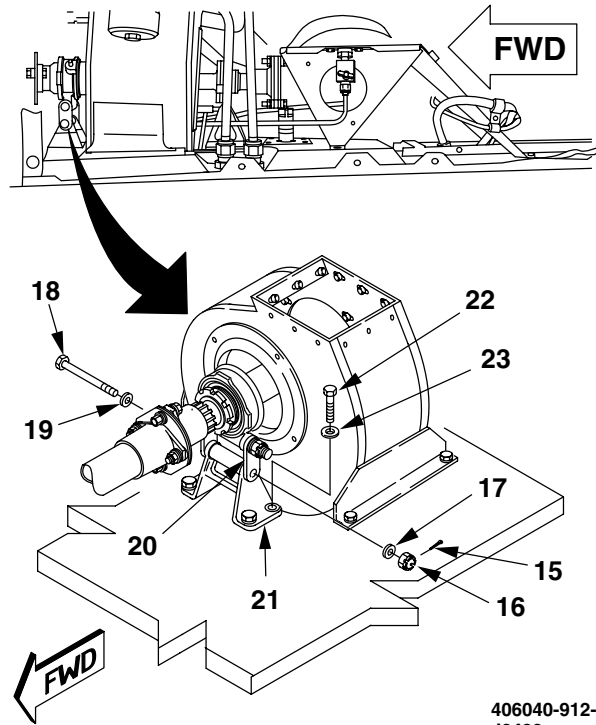
WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct torquing of nut (16) is a characteristic critical to flight safety.

23. Torque nut (16) **50 TO 70 INCH-POUNDS**.

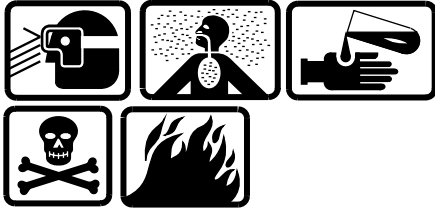
24. Install cotter pin (15) through nut (16).



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**6-6-15. FAN SHAFT BEARING HANGER BRACKETS (FORWARD AND AFT) — REMOVAL/
INSTALLATION (CONT)**

INSPECT**Corrosion Preventive Compound****CAUTION**

Corrosion preventive compound shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals. Premature failure of bearings and seals may occur.

25. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.

FOLLOW-ON MAINTENANCE

Align tail rotor driveshaft (Task 6-6-18).

Install aft firewall pan (Task 4-9-3).

Install tailboom access panel (Task 2-3-8).

Install aft fairing assembly (Task 2-2-55).

END OF TASK

6-6-16. FAN SHAFT BEARING HANGER BRACKETS (FORWARD AND AFT) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Fluorescent Inspection Kit (B81)

Material:
Chemical Conversion Coating (Alodine 1201) (D57)
Drycleaning Solvent (D199)

Wiping Rags (D164)
Sandpaper (D175)
Crocus Cloth (D90)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer

References:
TM 55-1500-345-23
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean bearing hanger brackets with a wiping rag (D164) dampened with drycleaning solvent (D199).
2. Dry bearing hanger bracket with a clean wiping rag (D164).

INSPECT

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of bearing hanger brackets is a characteristic critical to flight safety.

3. Fluorescent penetrant inspect bearing hanger brackets (TM 1-1520-266-23).

4. Inspect bearing hanger brackets to limits shown. See figure Forward Support Bracket — Damage Limits. No cracks allowed. If cracks in bearing hanger brackets are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR



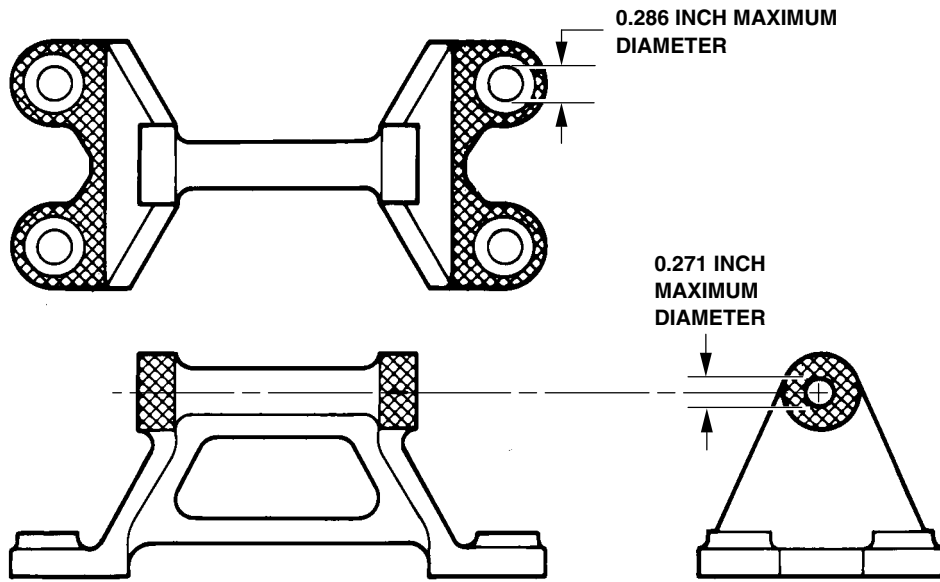
Sanding Operations

5. Repair damage to bearing hanger brackets using 400 grit sandpaper (D175).
6. Blend repaired area into surrounding area with crocus cloth (D90).
7. Apply Alodine 1201 (D57) to bearing hanger brackets in accordance with TM 55-1500-345-23.

INSPECT

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6-6-16. FAN SHAFT BEARING HANGER BRACKETS (FORWARD AND AFT) — CLEANING/INSPECTION/REPAIR (CONT)



SUPPORT BRACKET - FORWARD BEARING HANGER

DAMAGE LOCATION SYMBOLS



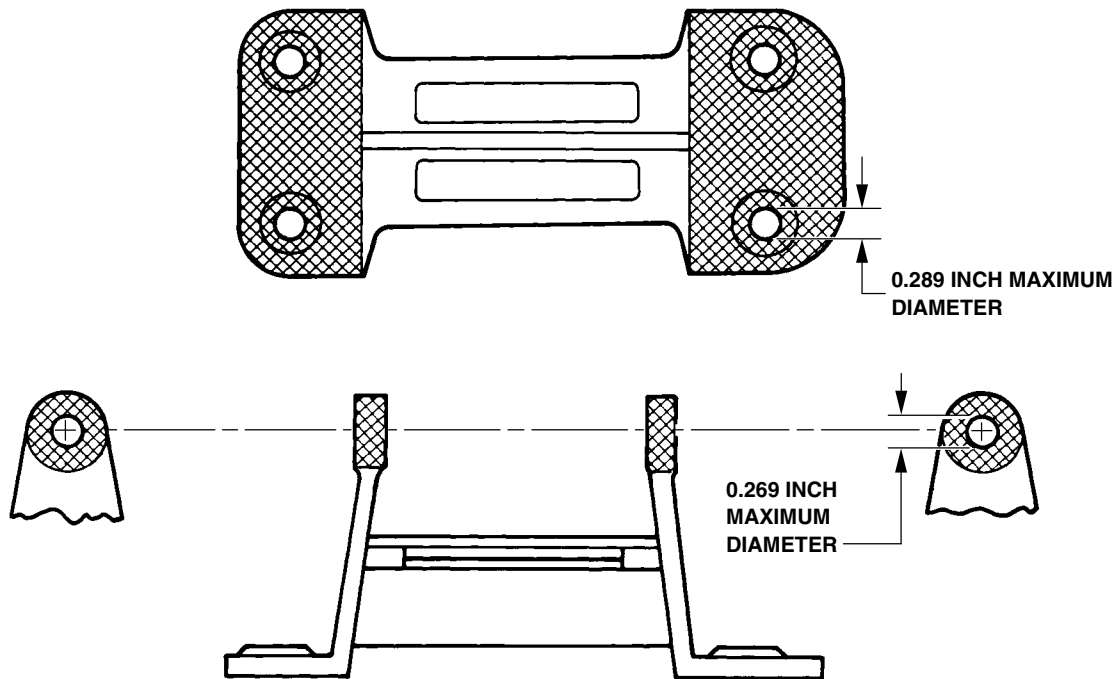
TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.001 in. before and after repair	0.010 in. before and after repair
MECHANICAL AND CORROSION	0.001 in. before and after repair	0.010 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	0.250 sq. in.
NUMBER OF REPAIRS	Two per area	Two per area
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 40-50°	0.500 in.

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J2077

Forward Support Bracket — Damage Limits

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6-6-16. FAN SHAFT BEARING HANGER BRACKETS (FORWARD AND AFT) — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

0.001 in. before and after repair

0.100 sq. in.

Two per area

0.030 in. x 40-50°

0.010 in. before and after repair

0.250 sq. in.

Two per area

0.500 in.

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J2077

Aft Support Bracket — Damage Limits

END OF TASK

6-6-17. TAIL ROTOR BEARING HANGER — ALIGNMENT

This task covers: Alignment of Segmented Tail Rotor Hanger Bearing Inner Race to Outer Race (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B235)
Torque Wrench (B237)
Plate Set Assembly (B102)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

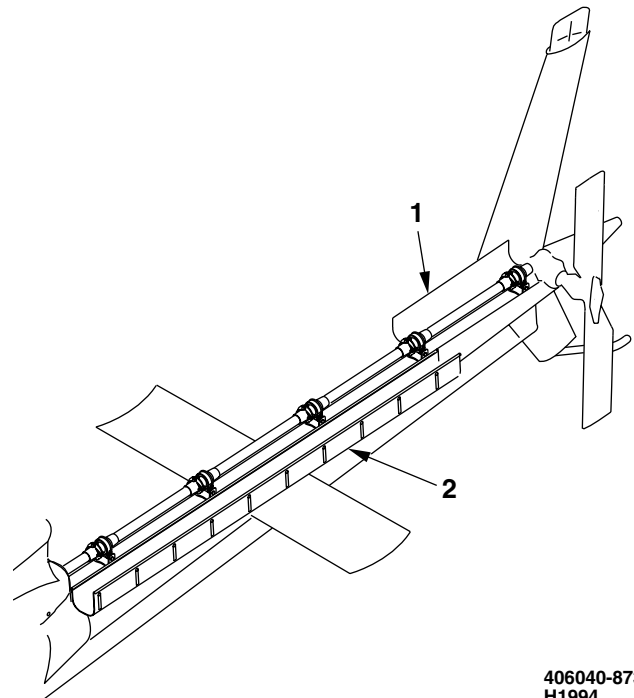
Equipment Condition:
Helicopter Safed (Task 1-6-7)
AN/ALQ-144 IR Jammer Mount Removed (Task 2-3-13)
Aft Fairing Extension Removed (Task 2-2-56)
Aft Fairing Assembly Removed (Task 2-2-55)

1. Place maintenance stand (B162) on right side of helicopter.

WARNING

No attempt shall be made to unlatch aft cover while tail rotor is in operation; personal injury or death could result.

2. Open or remove (as applicable) aft tail rotor cover (1).
3. Open forward tail rotor cover (2).



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6-6-17. TAIL ROTOR BEARING HANGER — ALIGNMENT (CONT)

ALIGNMENT

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct alignment of inner and outer races of hanger bearing prior to torquing hanger (4) retaining nut (10) is a characteristic critical to flight safety.

NOTE

- Alignment of fan shaft hanger bearing inner and outer races is not required since airframe deflections at fan shaft are small.
- All bearing hangers forward of the hanger affected shall also be aligned.

4. Remove cotter pin (11). Loosen nut (10) on bearing hanger supports.

5. Remove retaining ring (3) from bearing hanger (4). Rest retaining ring (3) on adapter coupling (5).

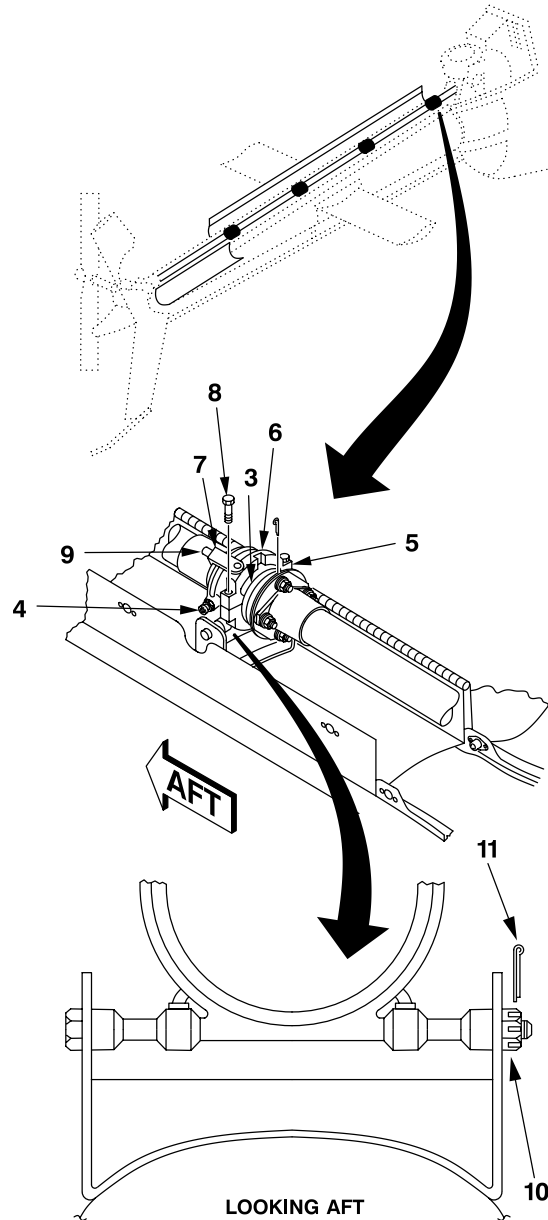
6. Install two halves of plate set assembly (B102) (6) over bearing hanger (4). Ensure that two clips (7) face aft.

7. Establish firm contact between bearing hanger (4) and plate set assembly (B102) (6) before tightening two shoulder screws (8).

8. Evenly torque two shoulder screws (8) **30 TO 50 INCH-POUNDS.**

9. Run two swivel screw clamps (9) in against bearing hanger (4).

10. Evenly torque two swivel screw clamps (9) **20 INCH-POUNDS.**



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6-6-17. TAIL ROTOR BEARING HANGER — ALIGNMENT (CONT)

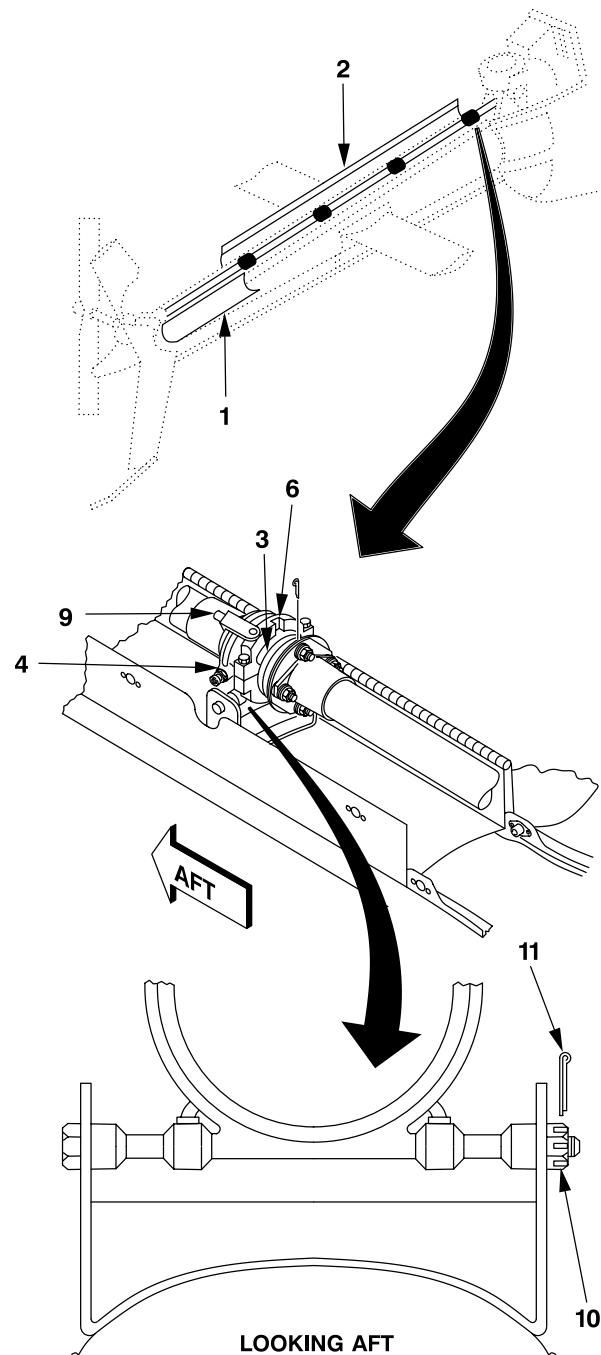
WARNING**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

Correct torquing of nut (10) and correct installation of cotter pin (11) are characteristics critical to flight safety.

11. Torque nut (10) **50 TO 70 INCH-POUNDS**.
12. Install cotter pin (11) through nut (10).
13. Loosen two swivel screw clamps (9) and back off enough to clear flange of bearing hanger (4).
14. Remove plate set assembly (B102) (6) from bearing hanger (4).
15. Install retaining ring (3) in groove of bearing hanger (4) to secure bearing.
16. Close tail rotor cover (2).
17. Close or install (as applicable) tail rotor cover (1).

INSPECT**FOLLOW-ON MAINTENANCE**

- Inspect tail rotor coupling angles (Task 6-6-18).
 - Install aft fairing assembly (Task 2-2-55).
 - Install aft fairing extension (Task 2-2-56).
 - Install AN/ALQ-144 IR jammer mount (Task 2-3-13).
- Pilot perform MOC (TM 1-1520-248-10/-CL).



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END OF TASK

6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT

This task covers: Inspection of Tail Rotor Driveshaft Disc Pack Operating Angles and Reshimming of Tail Rotor Driveshafts to Bring Disc Pack Operating Angles Within Limits (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

- Tools:
- General Mechanic Tool Kit (B178)
 - Maintenance Stand (B162)
 - Torque Wrench (B237)
 - Torque Wrench (B239)
 - Boresight Device (B34)
 - Alignment Tool Set (B188)
 - Hydraulic Jack (B75)
 - Dial Indicator (B37)
 - Dial Test Indicator Sleeve (B148)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
AN/ALQ-144 IR Jammer Mount Removed (Task 2-3-13)
Aft Fairing Assembly Removed (Task 2-2-55)
Aft Fairing Extension Removed (Task 2-2-56)

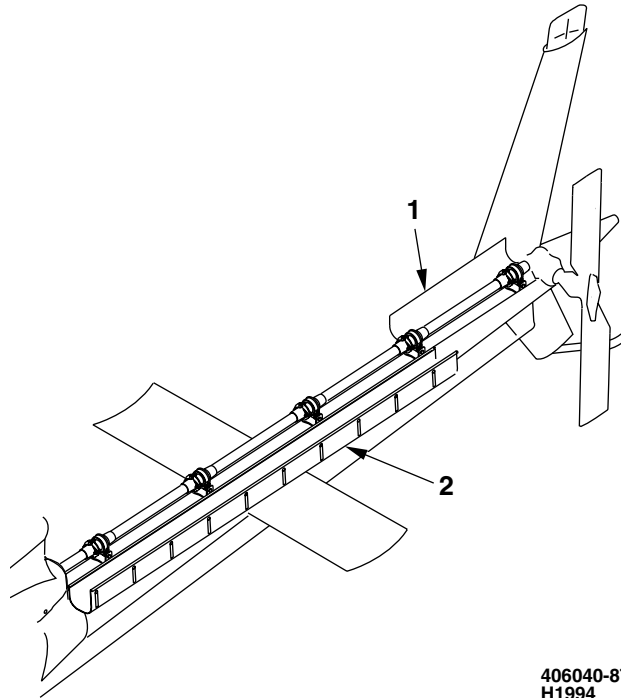
COUPLING INSPECTION

1. Place maintenance stand (B162) on right side of helicopter.

WARNING

No attempt shall be made to unlatch aft cover while tail rotor is in operation; injury or death to personnel could result.

2. Open or remove (as applicable) aft tail rotor driveshaft cover (1).
3. Open forward tail rotor driveshaft cover (2).



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INSPECT

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 6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

NOTE

If this inspection is being accomplished due to the reshimming of engine mounts to align the engine to the transmission, only the angle at the forward end of the fan shaft requires inspection.

4. Inspect coupling angles as follows:

WARNING

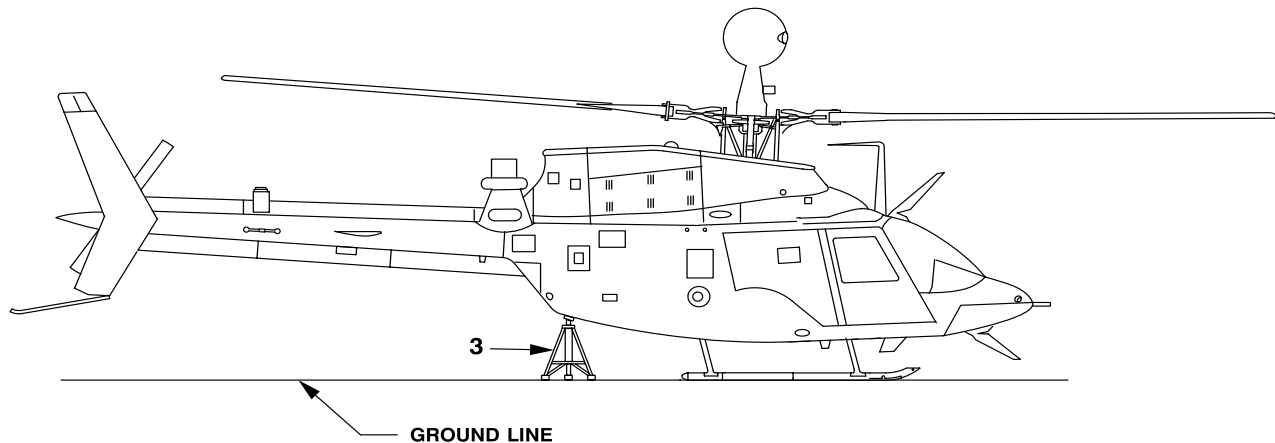
- Helicopter shall be placed in relatively wind-free area prior to jacking. Sustained wind or sudden wind gusts may topple helicopter from jacks. Injury or death to personnel could result.
- Helicopter shall not be left unattended when using jacks without positive locks.

CAUTION

The following precautions shall be observed while helicopter is on jacks, or damage to helicopter could result:

- Helicopter shall not be climbed on or entered.
- Caution shall be used to avoid bumping or otherwise disturbing helicopter.
- Area around helicopter shall be roped off and signs displayed to warn: THIS HELICOPTER ON JACKS.

- a. Place a tripod jack (3) under aft fuselage jack point. Jack helicopter enough to support weight and prevent rocking during coupling inspection.



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6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

b. Use a gunners quadrant to measure angle of horizontal plane of driveshaft assembly (4) and bearing hanger (5). The difference in angles between two adjacent driveshaft assemblies shall not exceed **12.60 milliradians (mils) (0.71°)**. Record angles measured in milliradians.

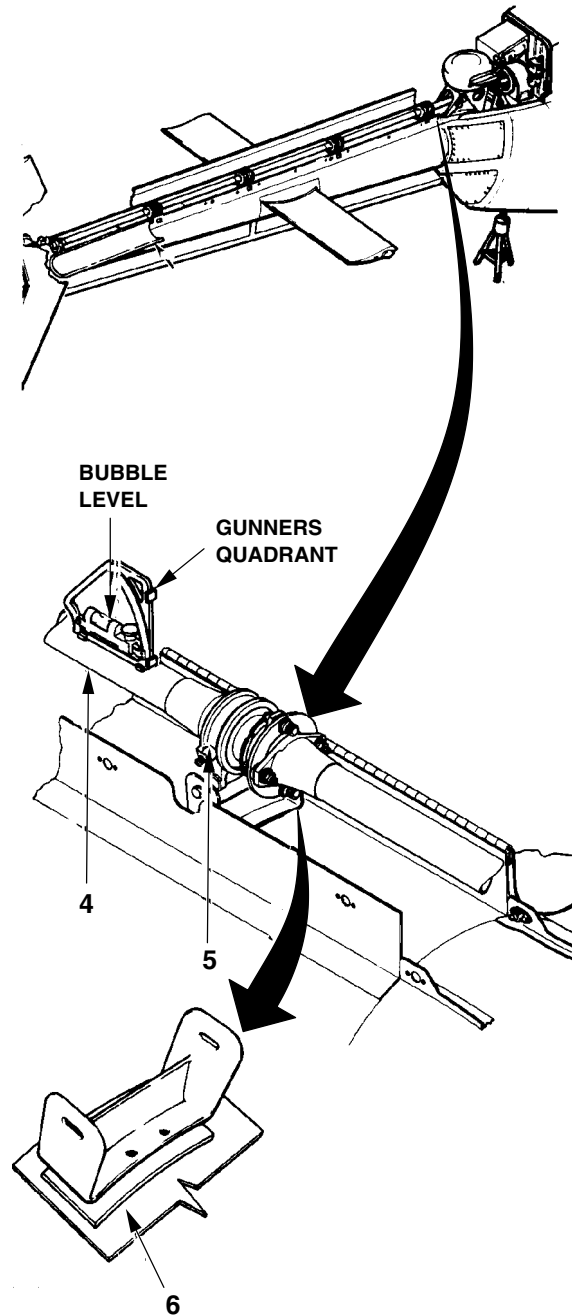
c. If difference in reading between two adjacent driveshaft assemblies (4) exceeds limits, bearing hanger support shims (6) shall be removed or added to acquire proper milliradian difference.

5. To gain proper difference in angles, measured in mils, between two adjacent driveshaft assemblies (4), proceed as follows:

NOTE

A typical procedure is described. Procedures for driveshaft assemblies other than fan shaft are similar.

a. Remove driveshaft assemblies (4) and bearing hanger (5) (Task 6-6-8).



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6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

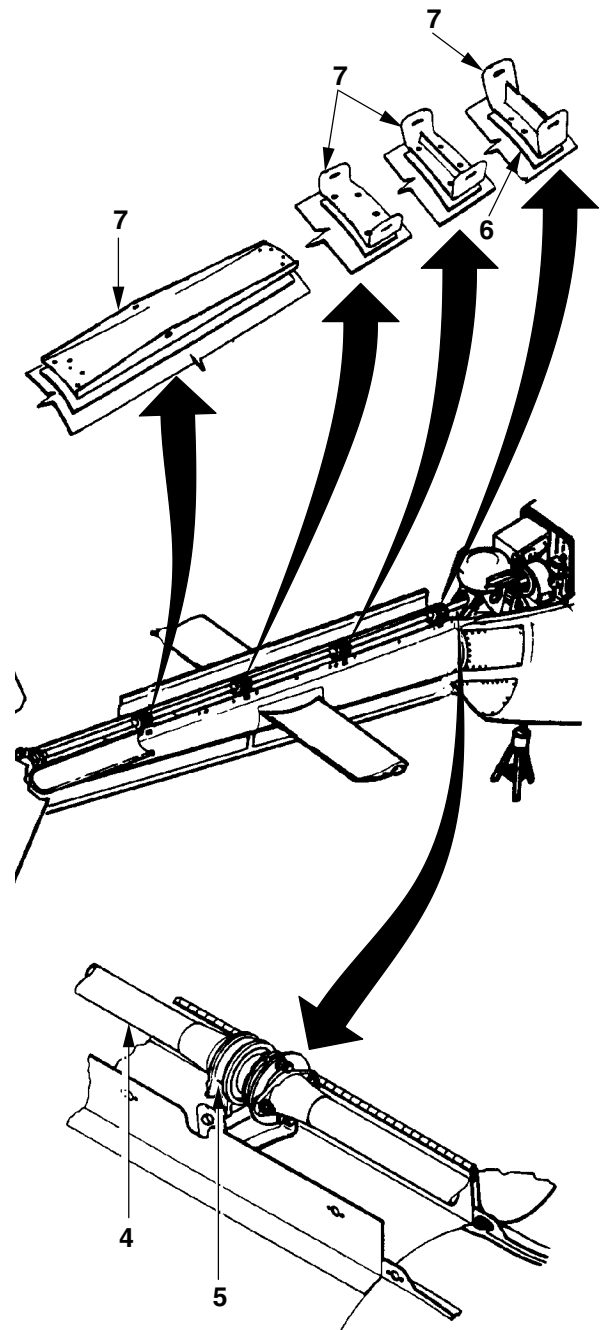
b. Remove support (7) from shim (6) (Task 2-3-10).

c. Remove or add shims (6) as needed to correct difference in readings between two adjacent driveshaft assemblies (4).

d. Install support (7) (Task 2-3-10).

e. Install bearing hanger (5) and driveshafts (4) (Task 6-6-8).

f. Recheck difference in readings between two adjacent driveshaft assemblies (4). Use gunners quadrant. If limit is exceeded, repeat steps a. through e.



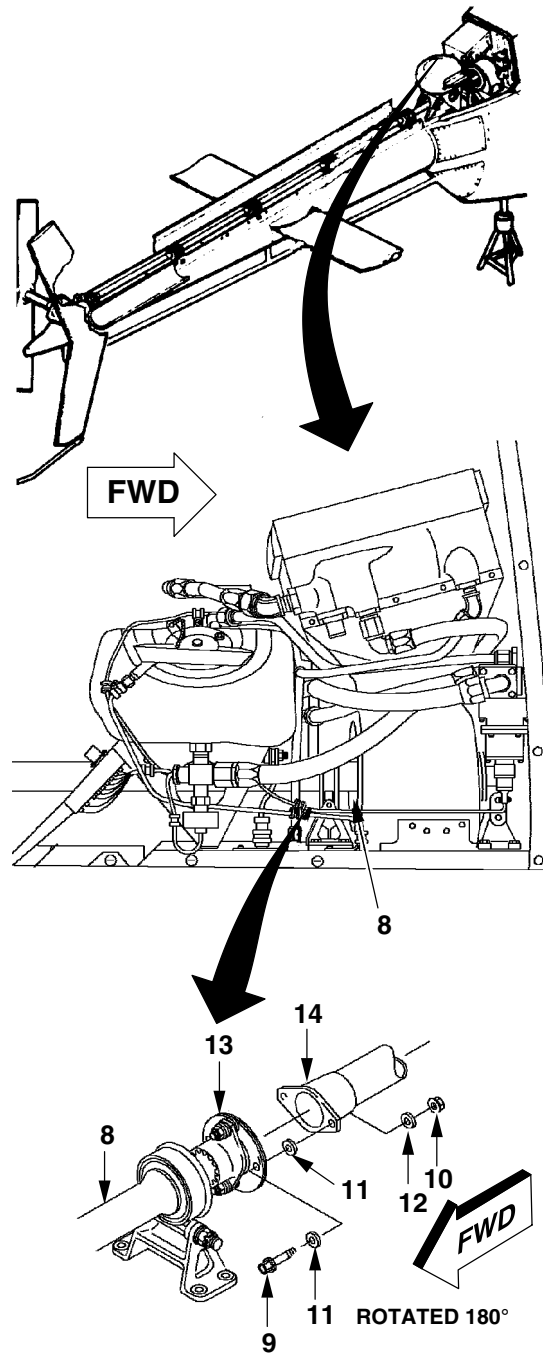
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6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

6. Use dial indicator (B37), alignment tool set (B188), and dial test indicator sleeve (B148) to inspect coupling angles on fan shaft (8) as follows:

a. Remove one bolt (9), one nut (10), and associated washers (11 and 12) from disc pack (13) and adapter coupling (14) located at aft end of fan shaft (8). Save hardware for installation.



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J0430

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 6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Installation of recessed washers with rounded side against coupling disc pack and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc pack will result.

CAUTION

Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

NOTE

Short end of bolt (part of B188) (15) shall be facing forward.

b. Install bolt (part of B188) (15) with two recessed washers (11) (with rounded edges in contact with coupling disc pack and flat side in contact with adapters) and washer (12) through bolt hole in disc pack (13) and adapter coupling (14). Secure bolt (15) with nut (10).

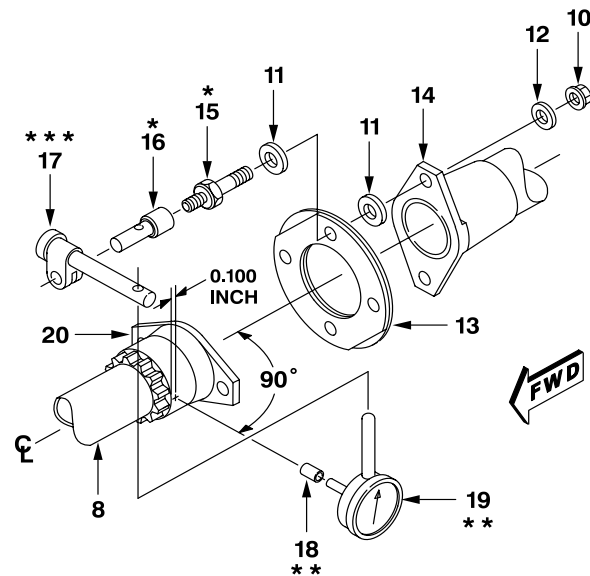
c. Torque nut (10) **150 INCH-POUNDS**.

d. Thread post (part of B188) (16) onto bolt (part of B188) (15) and place dial test indicator sleeve (B148) (17) on post (16).

e. Install ball tip (part of B37) (18) on dial indicator (B37) (19). Install dial indicator (B37) (19) on dial test indicator sleeve (B148) (17).

f. Position dial indicator (B37) (19) with stem at 90 degrees to centerline of fan shaft (8). Dial indicator ball tip (part of B37) (18) shall contact splined adapter (20) **0.100 inch** from edge.

g. Set travel (preload) of dial indicator (B37) (19) so it can sweep **±0.04 inch** without bottoming.



- * PART OF ALIGNMENT TOOL SET (B188)
- ** PART OF DIAL INDICATOR (B37)
- *** SLEEVE, DIAL TEST INDICATOR (B148)


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6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

CAUTION

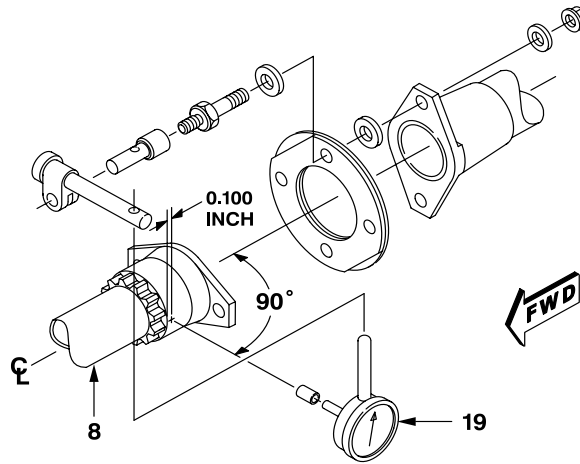
- Main rotor blades and tail rotor blades shall be clear before rotating fan shaft. Damage to blades may occur if they strike an object.
- To prevent damage to tail rotor driveshaft or dial indicator, clearance shall be observed while main rotor hub is rotated very slowly.
- To prevent damage to helicopter, drive system shall be rotated by turning main rotor hub.

NOTE

Care shall be exercised in reading dial indicator. Stem shall always be more depressed (clockwise needle motion at top of total indicator reading (T.I.R.) sweep) than at bottom. This will avoid reversing curvature of driveshaft. With angles as small as 0.6 degree, the eye cannot readily detect whether angle is up or down.

h. Using an inspection mirror to read dial indicator (B37) (19), slowly rotate fan shaft (8) until indicator stem is contacting lower side of shaft and the indicator needle stops and reverses direction. By rotating the indicator face, zero the indicator at the reversal point. Continue to slowly rotate fan shaft (8) until indicator stem is contacting the upper side of the shaft and the indicator needle again stops and reverses direction. Record reading. If reading is not within limits, take no remedial action until coupling at opposite end of fan shaft (8) is checked.

Maximum allowable indicator reading
0.035 inch (0.71°).
 Minimum recommended indicator reading
0.024 inch (0.49°).



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6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Installation of recessed washers with rounded side against disc pack is a characteristic critical to flight safety.

WARNING

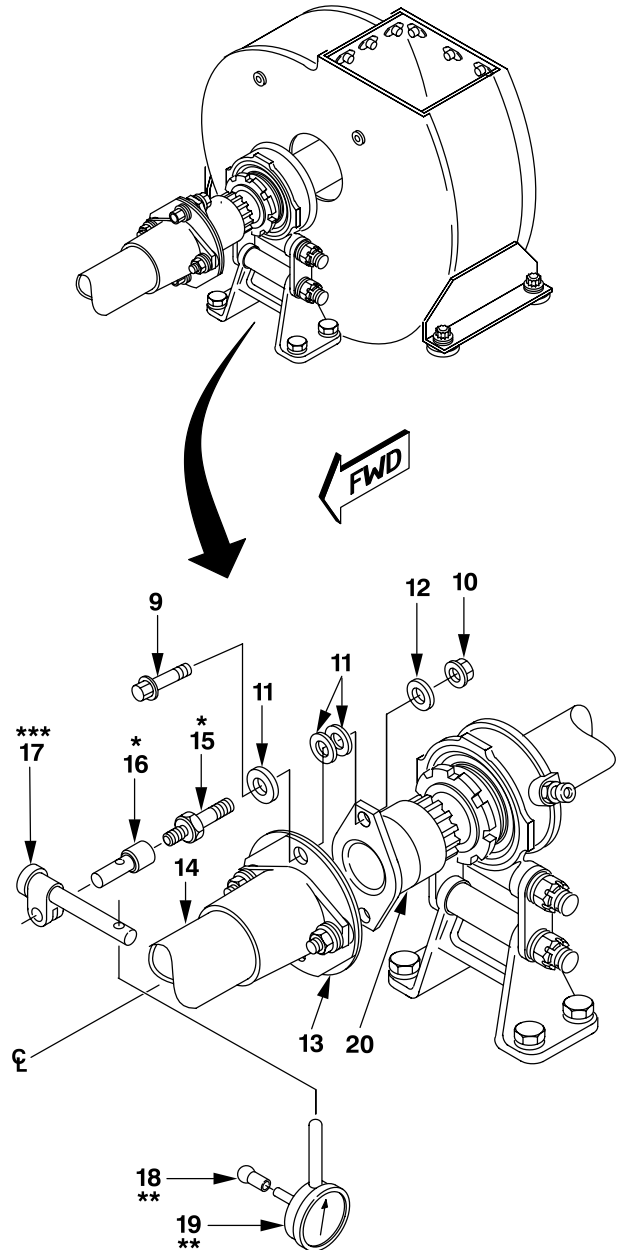
- Only those self-locking nuts that cannot be tightened down with fingers after locking action engages bolt shall be reused. Test nuts by attempting to insert matching bolt by hand.
- Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

i. Remove nut (10), washer (12), dial indicator set (B37) (18 and 19), dial test indicator sleeve (B148) (17), post (part of B188) (16), bolt (part of B188) (15) from aft disc pack (13), and adapter coupling (14). Ensure three recessed washers (11) are in proper position (with rounded edges in contact with coupling disc pack and flat side in contact with adapters). Install bolt (9), washer (12), and nut (10).

j. Break torque on remaining three nuts (10) for aft fan shaft coupling.

k. Torque nuts (10) and inspect for gaps in coupling disc packs (Task 6-6-6).

l. Remove one bolt (9), one nut (10), and associated washers (11 and 12) from disc pack (13) and splined adapter (20) at forward end of fan shaft. Save hardware for installation.



- * PART OF ALIGNMENT TOOL SET (B188)
- ** PART OF DIAL INDICATOR (B37)
- *** SLEEVE, DIAL TEST INDICATOR (B148)

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GO TO NEXT PAGE

6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Installation of recessed washers with rounded side against coupling disc pack and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc pack will result.

CAUTION

Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

NOTE

Short end of bolt (part of B188) (15) shall be facing forward.

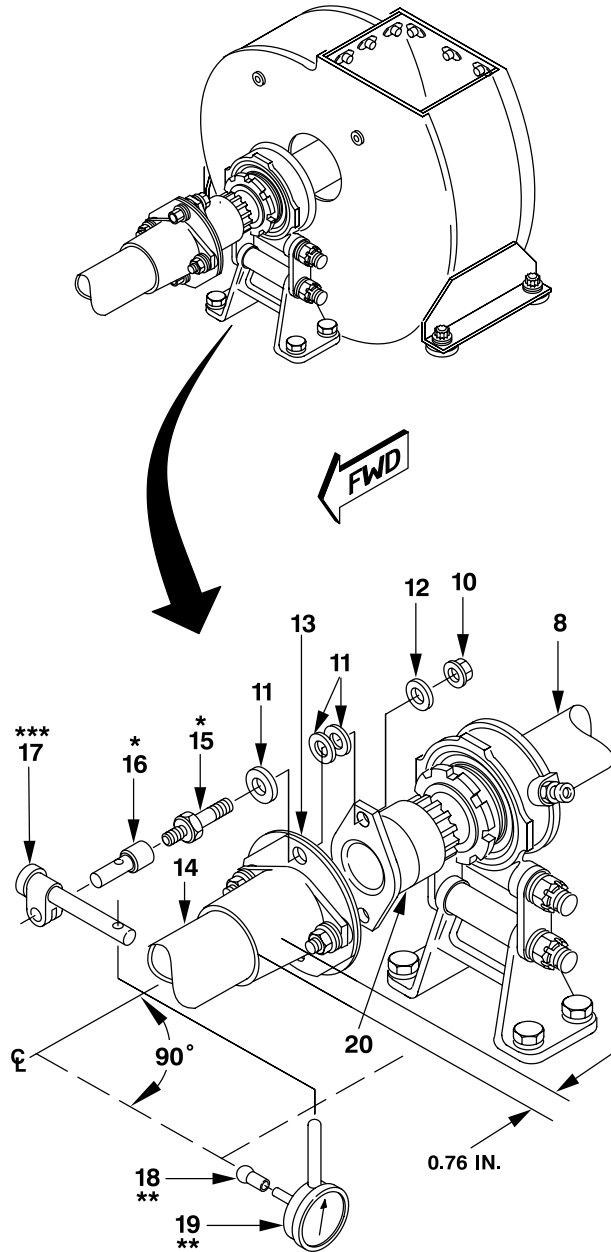
m. Install bolt (part of B188) (15) with three recessed washers (11) (with rounded edges in contact with coupling disc pack and flat side in contact with adapters) and washer (12) through bolt hole in coupling disc pack (13) and splined adapter (20). Secure bolt (part of B188) with nut (10).

n. Torque nut (10) **150 INCH-POUNDS**.

o. Thread post (part of B188) (16) onto bolt part of B188) (15) and place dial test indicator sleeve (B148) (17) on post (16).

p. Install ball tip (part of B37) (18) on dial indicator (B37) (19). Install dial indicator (19) on dial test indicator sleeve (B148) (17).

q. Position dial indicator (B37) (19) with stem at 90 degrees to centerline of fan shaft (8). Dial indicator (B37) (19) shall contact adapter coupling (14) **0.76 inch** from edge. Point of contact is on tapered portion of coupling adapter (14).



- * PART OF ALIGNMENT TOOL SET (B188)
- ** PART OF DIAL INDICATOR (B37)
- *** SLEEVE, DIAL TEST INDICATOR (B148)

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 6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

CAUTION

- Main rotor blades and tail rotor blades shall be clear before rotating fan shaft. Damage to blades may occur if they strike an object.
- To prevent damage to tail rotor driveshaft or dial indicator, clearance shall be observed while main rotor hub is rotated very slowly.
- To prevent damage to helicopter, drive system shall be rotated by turning main rotor hub.

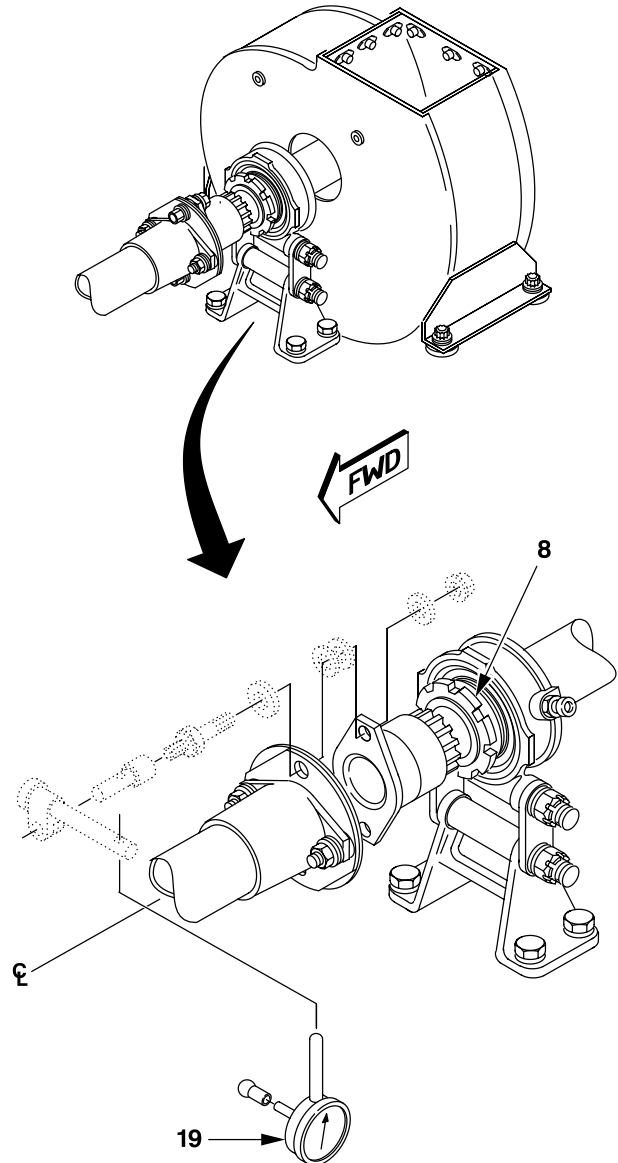
NOTE

Care shall be exercised in reading dial indicator. Stem shall always be more depressed (clockwise needle motion at top of total indicator reading (T.I.R.) sweep) than at bottom. This will avoid reversing curvature of driveshaft. With angles as small as 0.6 degree, the eye cannot readily detect whether angle is up or down.

r. Using an inspection mirror to read dial indicator (B37) (19), slowly rotate fan shaft (8) until indicator stem is contacting lower side of shaft and the indicator needle stops and reverses direction. By rotating the indicator face, zero the indicator at the reversal point. Continue to slowly rotate fan shaft (8) until indicator stem is contacting the upper side of the shaft and the indicator needle again stops and reverses direction. Record reading.

Maximum allowable indicator reading
0.039 inch (0.80°).

Minimum recommended indicator reading
0.028 inch (0.57°).



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 J2696

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6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

s. If both adapter couplings are within limits, remove nut (10), washer (12), dial indicator set (B37) (18 and 19), dial test indicator sleeve (B148) (17), post (part of B188) (16), bolt (part of B188) (15) from forward coupling disc pack (13), adapter coupling (14), and splined adapter (20). Ensure three recessed washers (11) are in proper position (with rounded edges in contact with coupling disc pack and flat side in contact with adapters). Install bolt (9), washer (12), and nut (10).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

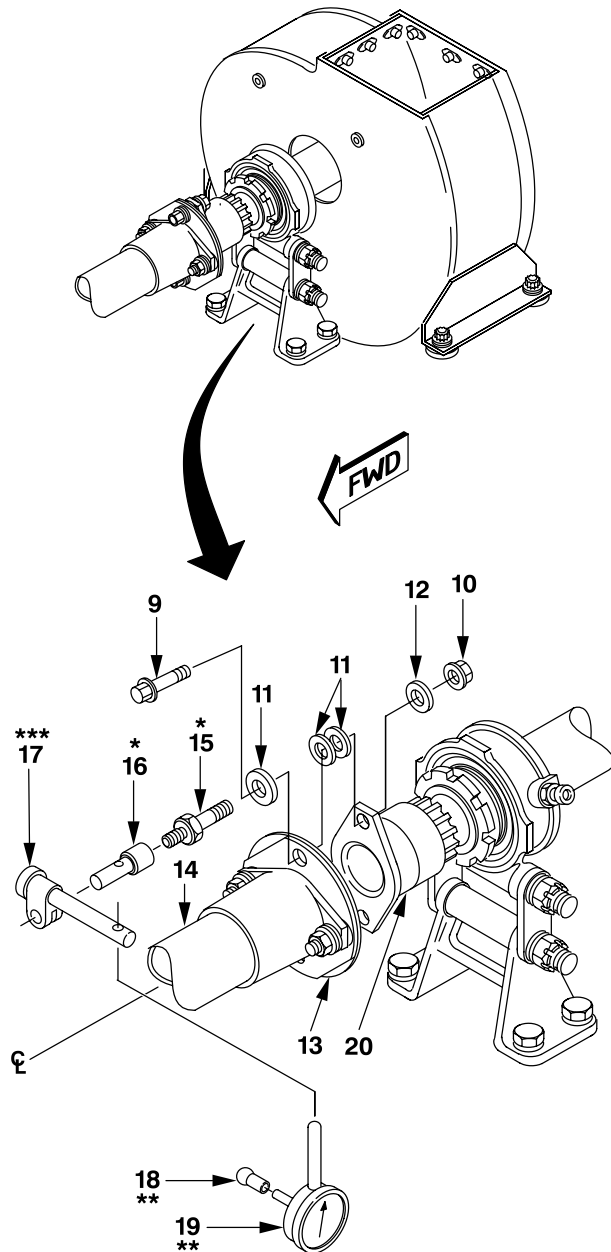
Installation of recessed washers with rounded side against coupling disc pack and correct torquing of nuts are characteristics critical to flight safety. If recessed washers are installed incorrectly, damage to coupling disc pack will result.

WARNING

- Only those self-locking nuts that cannot be tightened down with fingers after locking action engages bolt shall be reused. Test nuts by attempting to insert matching bolt by hand.
- Torque shall be applied only to nut, with bolt held stationary. Turning bolt during torquing may cause gaps in coupling disc pack.

t. Break torque on remaining three nuts (10) of forward fan shaft coupling.

u. Torque nuts (10) and inspect for gaps in coupling disc packs (Task 6-6-7).



- * PART OF ALIGNMENT TOOL SET (B188)
- ** PART OF DIAL INDICATOR (B37)
- *** SLEEVE, DIAL TEST INDICATOR (B148)

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J0430

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6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

v. If the disc pack coupling angle at either end of the fan shaft is less than the recommended minimum, the angle between the third driveshaft and first segmented driveshaft may exceed the maximum allowable limits. Inspection of the angle between these shafts is required. If the angle is high, do not take action to align the shafts until steps are taken to optimize the fan shaft disc pack coupling. Remove shim from hanger mount and add shim to the opposite hanger mount.

CAUTION

After shimming procedure is completed, fan impeller shall not rub on impeller housing. Reshimming of housing may be necessary.

NOTE

Shims may have to be adjusted under both hanger mounts to maintain limits on both ends of shaft.

(1) Remove hanger bracket (21) and/or hanger bracket (22) (Task 6-6-15).

(2) Remove or add thickness of shims (23).

(3) Install hanger bracket (21) and/or hanger bracket (22) (Task 6-6-15).

(4) Repeat procedure for inspection of coupling angles (steps a. through r.).

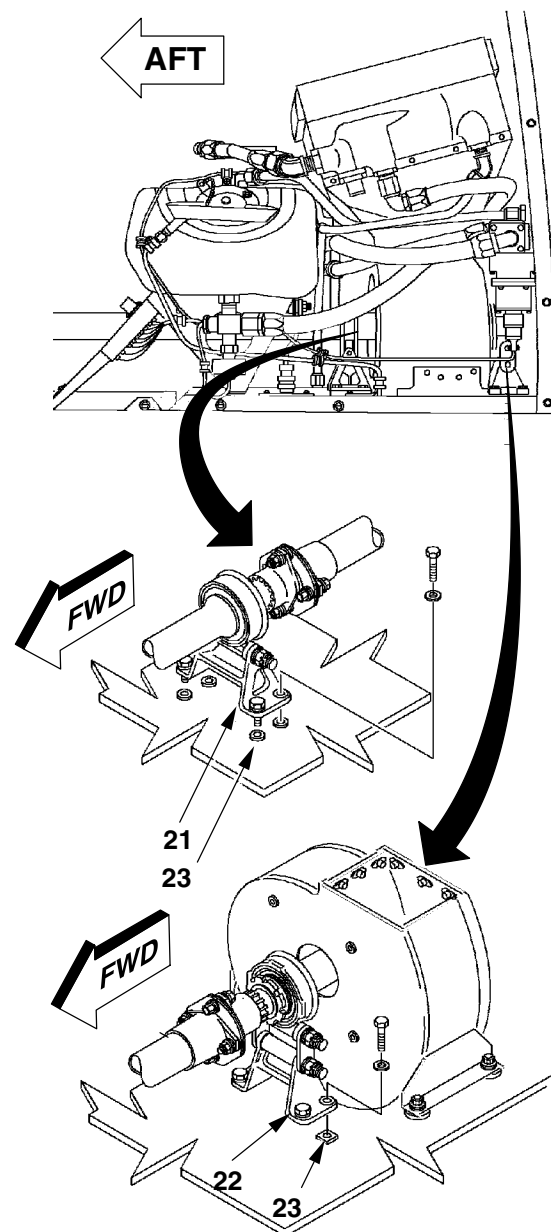
(5) If adapter couplings are within limits, remove dial indicator (B37), dial test indicator sleeve (B148), and alignment tool set (B188) (step s.).

(6) If adapter couplings are not within limits, adjust shim thickness (step v.).

(7) Continue repeating procedure for inspection of coupling angles until both adapter couplings are within limits.

INSPECT

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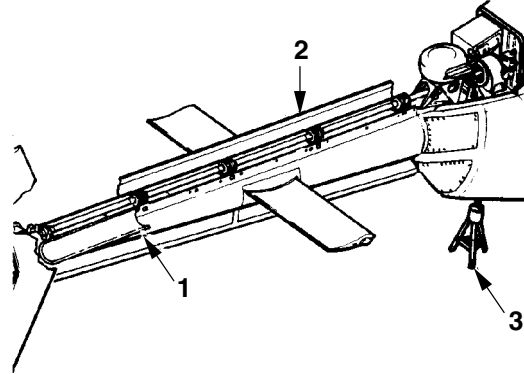
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6-6-18. TAIL ROTOR DRIVESHAFT COUPLING ANGLE — INSPECTION AND DRIVESHAFT ALIGNMENT (CONT)

7. Lower helicopter and remove tripod jack (3).
8. Close tail rotor driveshaft cover (2).
9. Close or install (as applicable) tail rotor driveshaft cover (1).

FOLLOW-ON MAINTENANCE

- Install aft fairing assembly (Task 2-2-55).
 - Install aft fairing extension (Task 2-2-56).
 - Install AN/ALQ-144 IR jammer mount (Task 2-3-13).
- Pilot perform MOC (TM 1-1520-248-10/-CL).



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END OF TASK

Section VII. TAIL ROTOR GEARBOX

6-21. TAIL ROTOR GEARBOX

Standard torques are provided in Appendix P and TM 1-1500-204-23.

6-22. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and installation of tail rotor gearbox components.

6-23. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Tail Rotor Gearbox — Removal/Installation	6-7-1	6-328
Tail Rotor Gearbox — Cleaning/Inspection/Repair	6-7-2	6-333
Tail Rotor Gearbox Breather — Removal/Cleaning/Installation	6-7-3	6-337
Tail Rotor Gearbox Oil Temperature Thermoswitch — Removal/Installation	6-7-4	6-338
Tail Rotor Gearbox Input Seal — Removal/Installation	6-7-5	6-339
■ Tail Rotor Gearbox Input Seal — Removal/Installation	6-7-6	6-345
Input Adapter Nut/Input Duplex Bearing Nut — Cleaning/Inspection/Repair	6-7-7	6-353
Tail Rotor Gearbox Output Shaft Seal (AVIM) — Removal/Installation	6-7-8	6-357
Cap Assembly — Cleaning/Inspection/Repair	6-7-9	6-362
Tail Rotor Gearbox Chip Detector — Removal/Installation	6-7-10	6-365

6-7-1. TAIL ROTOR GEARBOX — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)
Torque Wrench (B239)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)
Work Aid (H-31)

Material:
Lubricating Oil (D139 or D140)
Rubber Gloves (D111)
Dissimilar Metal Separation Tape (D213)
Sealing Compound (D184)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1500-204-23
TM 1-1520-248-10
TM 1-1520-248-CL
TM 1-1520-248-MTF

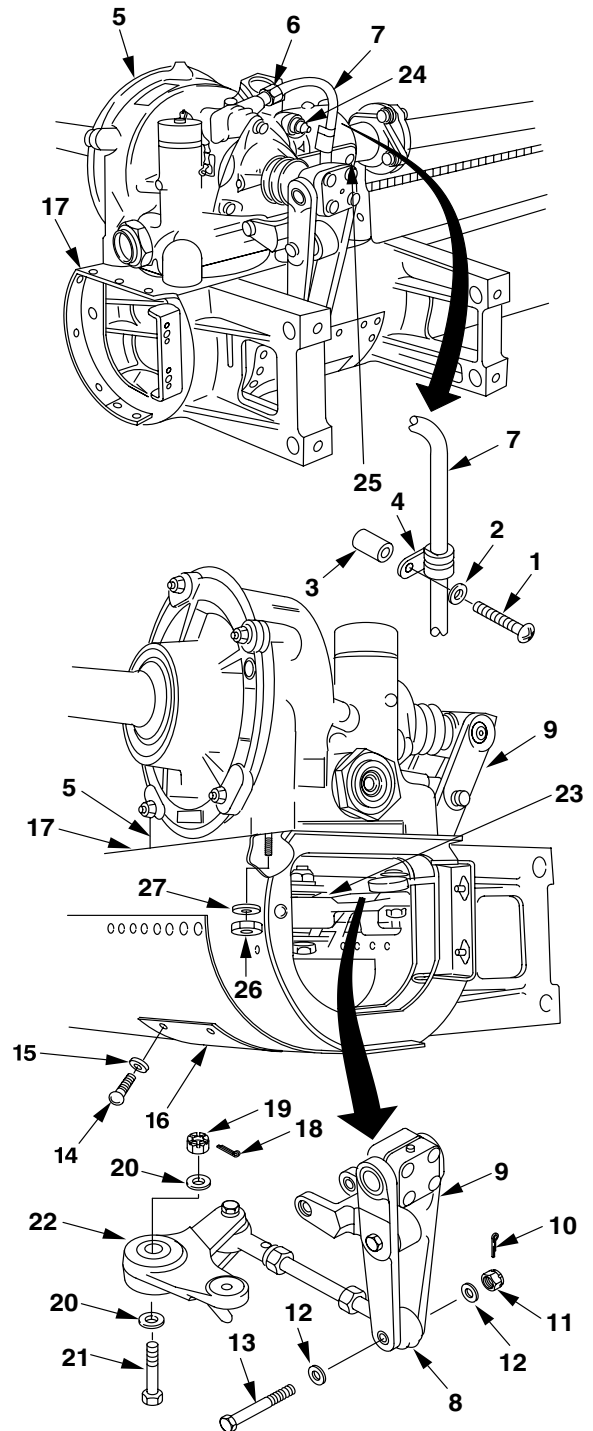
Equipment Condition:
Tail Rotor Gearbox Drained (Task 1-4-9)
Tail Rotor Assembly Removed (Task 5-4-11)
Taillight Support Removed (Task 2-3-31)
Fin Assembly Removed (Task 2-3-22)
Coupling Disc Pack Removed (Typical)
(Task 6-6-6)

GO TO NEXT PAGE

6-7-1. TAIL ROTOR GEARBOX — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove screw (1), washer (2), and spacer (3) securing clamp (4) to tail rotor gearbox (5).
2. Loosen nut (6) and remove tube assembly (7).
3. Disconnect rod end (8) from lever assembly (9) by removing cotter pin (10), nut (11), two washers (12), and bolt (13).
4. Remove 12 screws (14) and 12 washers (15) securing access panel (16) to tailboom (17).
5. Remove access panel (16).
6. Remove cotter pin (18), nut (19), two washers (20), and bolt (21) securing bellcrank (22) to support (23).
7. Disconnect thermoswitch electrical lead by removing nut (24).
8. Disconnect chip detector electrical connector (25).
9. Secure gearbox wire connectors, brackets, and clamps to the gearbox support assembly using tape or safety wire. Do not kink wire.
10. Remove two forward nuts (26) and two washers (27).
11. Remove two aft nuts (26) and two washers (27) using work aid (H-31).
12. Remove tail rotor gearbox (5) from tailboom (17).
13. Remove tail rotor control housing packing (Task 5-5-18).
14. Remove tail rotor control tube from tail rotor output shaft by hand (Task 5-5-13).

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6-7-1. TAIL ROTOR GEARBOX — REMOVAL/INSTALLATION (CONT)

PRESERVATION AND STORAGE



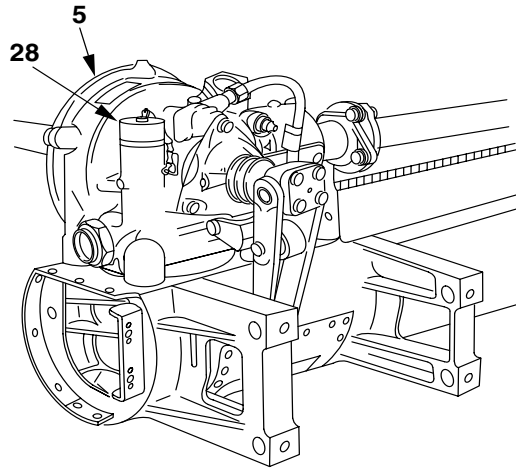
Lubricating Oil

15. Open filler cap (28), turn tail rotor gearbox (5) upside down, and drain lubricating oil into suitable container (B101).

16. Preserve unserviceable tail rotor gearbox (5) (TM 1-1500-204-23).

17. Remove serviceable tail rotor gearbox (5) from shipping container and set on suitable working surface.

18. Place unserviceable tail rotor gearbox (5) in shipping container and seal.



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PREPARATION

19. Open filler cap (28). Turn tail rotor gearbox (5) upside down and drain preservative oil into suitable container (B101).



Lubricating Oil

20. Pour one quart of lubricating oil (D139 or D140) into tail rotor gearbox (5).

21. Close filler cap (28).

22. Shake tail rotor gearbox (5) vigorously for 15 seconds.

23. Repeat step 19.

GO TO NEXT PAGE

6-7-1. TAIL ROTOR GEARBOX — REMOVAL/INSTALLATION (CONT)

INSTALLATION

24. Install tail rotor control housing packing and tail rotor control tube (Task 5-5-18 and Task 5-5-15).

25. Prepare surfaces of gearbox (5) and tailboom (17) to ensure Class S electrical bond (Appendix M).

26. Wrap dissimilar metal separation tape (D213) around tail rotor gearbox studs (29) (four places) and trim excess tape for thread clearance.

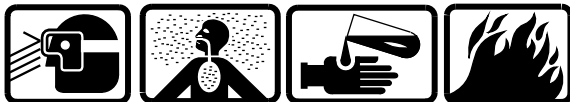
27. Install tail rotor gearbox (5) on tailboom (17) and secure with four washers (27) and four nuts (26).

WARNING**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

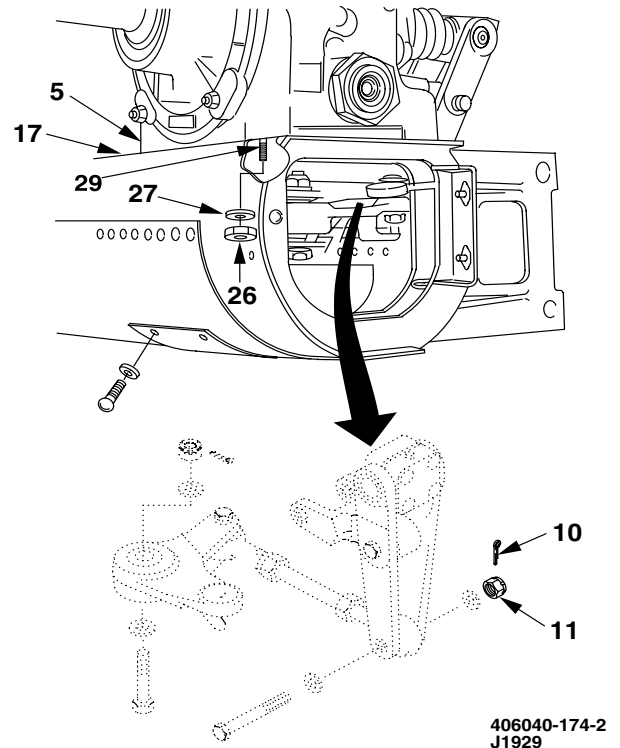
Correct torquing of nuts (26 and 11) and correct installation of cotter pin (10) are characteristics critical to flight safety.

28. Torque two forward nuts (26) **100 TO 140 INCH-POUNDS**.

29. Torque two aft nuts (26) **110 INCH-POUNDS** using work aid (H-31).

**Sealing Compound**

30. Apply a bead of sealing compound (D184) around mating surfaces of gearbox (5) and tailboom (17).



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6-7-1. TAIL ROTOR GEARBOX — REMOVAL/INSTALLATION (CONT)

31. Secure bellcrank (22) to support (23) with bolt (21), two washers (20), and nut (19).

32. Torque nut (19) **60 TO 80 INCH-POUNDS**.

33. Install cotter pin (18) through nut (19).

34. Connect rod end (8) to lever assembly (9) with bolt (13), two washers (12), and nut (11).

35. Torque nut (11) **60 TO 80 INCH-POUNDS**.

36. Install cotter pin (10) through nut (11).

37. Connect tube assembly (7) to tail rotor gearbox (5) with nut (6). Torque nut (6) **75 TO 125 INCH-POUNDS**.

38. Secure clamp (4) to tail rotor gearbox (5) with spacer (3), washer (2), and screw (1).

39. Install thermoswitch electrical lead by installing nut (24). Torque nut (24) not more than **6 INCH-POUNDS**.

40. Install chip detector electrical connector (25).

41. Install access panel (16) to tailboom and secure with 12 washers (15) and 12 screws (14).

INSPECT

FOLLOW-ON MAINTENANCE

Service tail rotor gearbox (Task 1-4-9).

Install tail rotor assembly (Task 5-4-16).

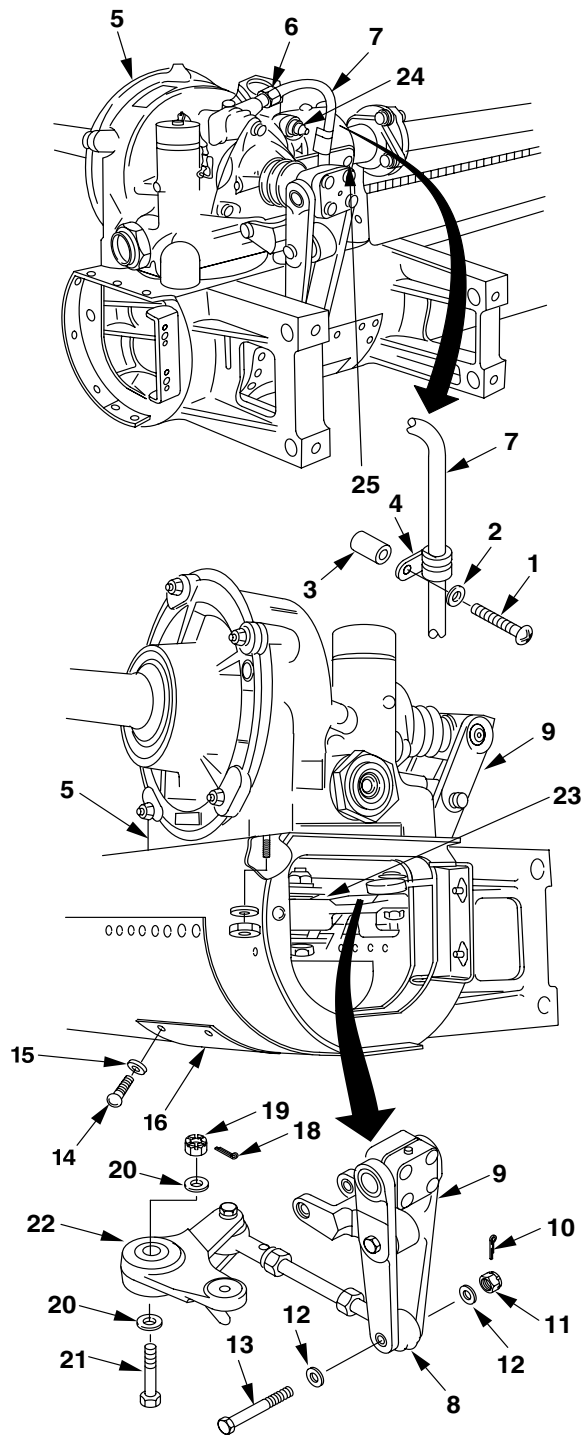
Install fin assembly (Task 2-3-22).

Install taillight support (Task 2-3-31).

Install coupling disc pack (Task 6-6-6).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

Perform retorques (Chapter 1, Section IX).



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END OF TASK

 6-7-2. TAIL ROTOR GEARBOX — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Dial Indicator (B37)
Torque Wrench (B242)

Material:

Rubber Gloves (D111)
Wiping Rag (D164)
Epoxy Primer Coating (D98)
Aluminum Oxide Abrasive Cloth (D44)

Lockwire (D132)
Corrosion Preventive Compound (D82)
Acrylic Lacquer (D126)
Chromate Conversion Coating (D59)
Chromic Acid (D61)
Drycleaning Solvent (D199)

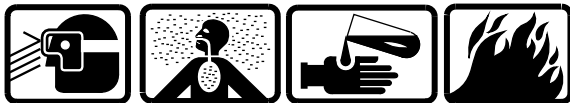
Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:

TM 55-1500-345-23
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean tail rotor gearbox (1) with wiping rag (D164) and drycleaning solvent (D199). Use suitable nonmetallic scrub brush on stubborn deposits.

2. Dry tail rotor gearbox (1) with clean wiping rags (D164).

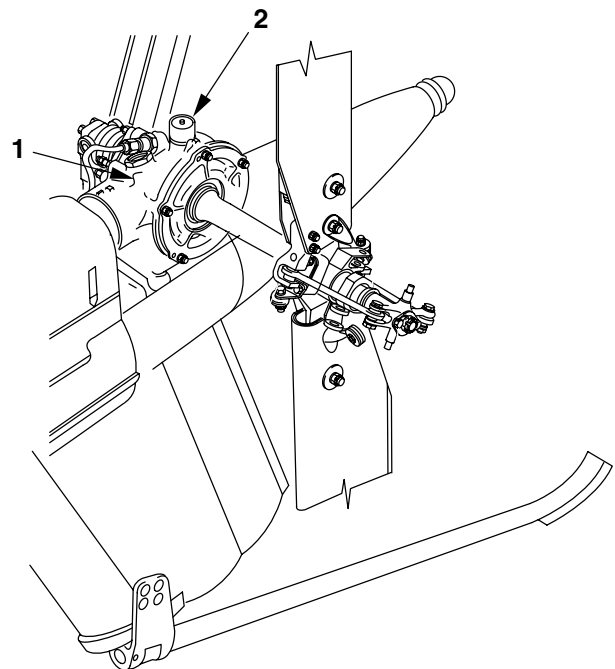
INSPECT

3. Inspect tail rotor gearbox (1) for leaking seals, cracks, nicks, scratches, gouges, and security. No cracks allowed. If cracks in tail rotor gearbox are suspected perform eddy current inspection (TM 1-1520-266-23).

4. Inspect tail rotor gearbox (1) case for corrosion. If nonfunctional area corrosion damage will exceed **0.040 inch** maximum depth after repair, replace tail rotor gearbox (Task 6-7-1).

5. Inspect tail rotor gearbox (1) for metal contamination (Task 6-1-4).

6. Inspect filler cap (2) for proper locking and security.



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6-7-2. TAIL ROTOR GEARBOX — CLEANING/INSPECTION/REPAIR (CONT)

7. Inspect tail rotor gearbox (1) oil for evidence of water. When water is present, oil has dirty, milky appearance. If water is present or suspected, drain and flush tail rotor gearbox until water contamination is removed, then service tail rotor gearbox (Task 1-4-9). In event contamination cannot be cleared, replace tail rotor gearbox (Task 6-7-1). Condensation on inside of sight glass is acceptable, providing oil does not have dirty, milky appearance.

8. Inspect sight glass (3) for security, cracks, crazing, or discoloration. If any of these conditions are found, replace sight glass (3).

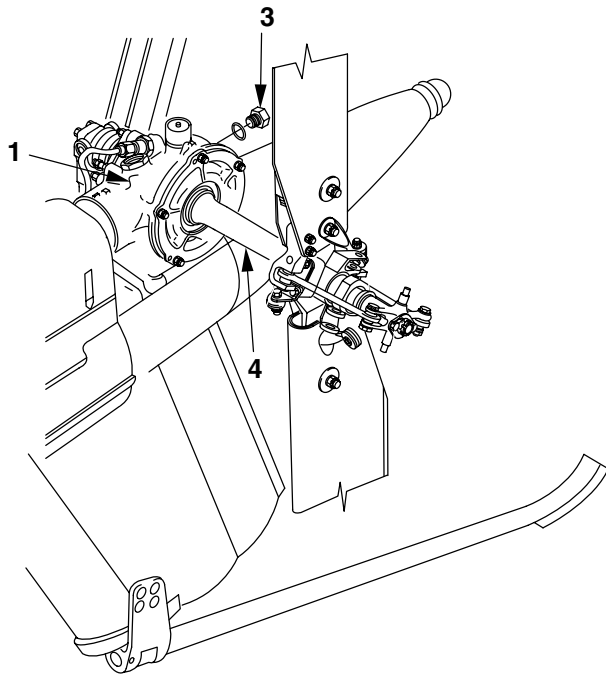
9. Inspect exposed area of output shaft (4) for corrosion. If corrosion exceeds **0.005 inch** maximum depth, replace tail rotor gearbox (1) (Task 6-7-1).

10. Inspect output shaft (4) for excessive movement as follows:

a. Measure by installing dial indicator (B37) **1 inch** outboard of gearbox output seal. Total radial movement of output shaft (4) when moved up and down shall not exceed **0.003 inch** at this point. This movement should be performed by applying thumb and index finger to outboard end of shaft and enough up and down pressure to check actual looseness. Movement in excess of **0.003 inch** warrants replacement of tail rotor gearbox (1).

b. Axial movement of output shaft (4) is not permitted. Replace tail rotor gearbox (1) for any axial movement of output shaft.

11. Inspect tail rotor gearbox (1) for leakage. Maximum static leakage for input or output seals should not exceed 2 drops per minute. Total static leakage should not exceed 6 drops per minute from all sources. Dynamic leakage should not exceed 50% of the normal sight glass level in 3 hours of operation.



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6-7-2. TAIL ROTOR GEARBOX — CLEANING/INSPECTION/REPAIR (CONT)

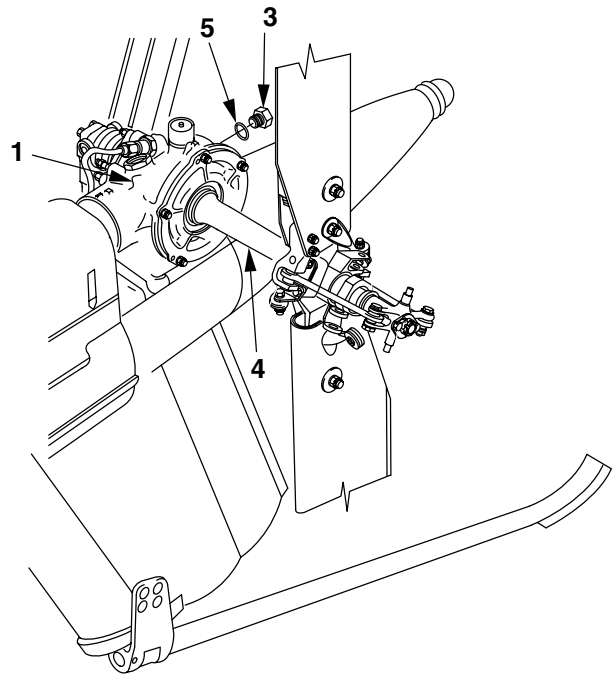
REPAIR

12. Replace damaged or discolored sight glass (3) as follows:

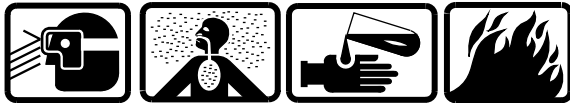
- a. Remove lockwire.
- b. Remove sight glass (3) and packing (5).
- c. Install new sight glass (3) and packing (5).
- d. Torque sight glass (5) **250 TO 400 INCH-POUNDS**.
- e. Secure sight glass (5) with lockwire (D132).

13. Replace cracked or leaking tail rotor gearbox (1) (Task 6-7-1).

14. Remove scratches, nicks, and gouges on tail rotor gearbox (1) case using 240 grit aluminum oxide abrasive cloth (D44).



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**Drycleaning Solvent**

15. Remove sanding residue with wiping rag (D164) moistened with drycleaning solvent (D199).

**Epoxy Primer Coating**

16. Touch up repaired areas of tail rotor gearbox (1) with epoxy primer coating (D98).

17. Repair tail rotor gearbox (1) case corrosion damage (steps 18. through 24.).

GO TO NEXT PAGE

6-7-2. TAIL ROTOR GEARBOX — CLEANING/INSPECTION/REPAIR (CONT)



Sanding Operations

CAUTION

Damage limits shall not be exceeded during repair.

18. Using 240 grit aluminum oxide abrasive cloth (D44), sand corroded area; blend repaired area into surrounding area.

19. Using chromic acid (D61), treat repaired area (TM 55-1500-345-23).

20. Using clean (potable) water, rinse repaired area.

21. Using clean wiping rags (D164), thoroughly dry repaired area.

22. Using chromate conversion coating (D59), treat repaired area (TM 55-1500-345-23).

23. Apply one coat of epoxy primer coating (D98) to repaired area (TM 55-1500-345-23). Allow to dry for 1 to 8 hours prior to subsequent coating.

24. Apply two coats of acrylic lacquer (D126) to repaired area (TM 55-1500-345-23).

25. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.

INSPECT



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals.

END OF TASK

6-7-3. TAIL ROTOR GEARBOX BREATHER — REMOVAL/CLEANING/INSTALLATION

This task covers: Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Material:
Lubricating Oil (D139 or D140)
Drycleaning Solvent (D199)
Lockwire (D132)
Rubber Gloves (D111)

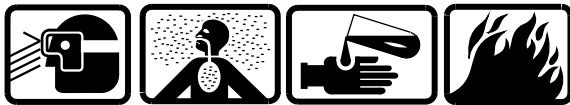
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

1. Disconnect tube (1) from breather (2).
2. Cut lockwire and remove breather (2) and packing (3) from port on tail rotor gearbox (4).
3. Discard packing (3).

CLEAN



Drycleaning Solvent

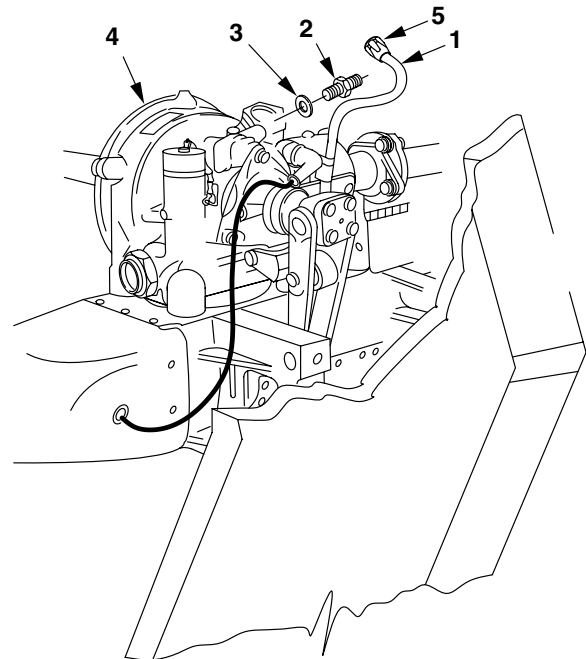
4. Wash breather (2) with drycleaning solvent (D199).
5. Allow breather (2) to air dry.

INSTALL



Lubricating Oil

6. Coat packing (3) with lubricating oil (D139 or D140).
7. Install packing (3) on breather (2).
8. Install breather (2) in port on tail rotor gearbox (4).
9. Torque breather (2) **75 TO 125 INCH-POUNDS**.



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10. Secure breather (2) to tail rotor gearbox (4) with lockwire (D132).
11. Connect tube (1) to breather (2). Torque nut (5) on tube (1) **75 TO 125 INCH-POUNDS**.

INSPECT

END OF TASK

6-7-4. TAIL ROTOR GEARBOX OIL TEMPERATURE THERMOSWITCH — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Material:
Lockwire (D132)
Lubricating Oil (D139 or D140)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

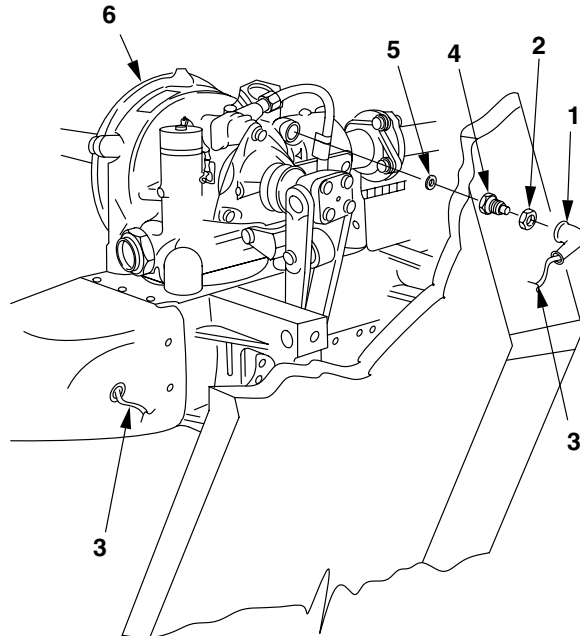
1. Move nipple (1) back to expose nut (2).
2. Remove nut (2) to disconnect electrical cable (3).
3. Remove lockwire from thermoswitch (4).
4. Remove thermoswitch (4) and packing (5) from port in tail rotor gearbox (6).
5. Discard packing (5).

INSTALL



Lubricating Oil

6. Coat packing (5) with lubricating oil (D139 or D140).
7. Install packing (5) on thermoswitch (4).
8. Install thermoswitch (4) in port in tail rotor gearbox (6).
9. Torque thermoswitch (4) **15 TO 25 INCH-POUNDS**.
10. Secure thermoswitch (4) with lockwire (D132).
11. Connect electrical cable (3) to thermoswitch (4) with nut (2).
12. Torque nut (2) not more than **6 INCH-POUNDS**.
13. Install nipple (1) over nut (2).



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INSPECT

FOLLOW-ON MAINTENANCE

Pilot perform MOC (TM 1-1520-248-10/CL).

END OF TASK

6-7-5. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
Maintenance Stand (B162)
Extension (B41)
Hinge Handle (2) (B68)
Torque Wrench (B232)
Retaining Ring Pliers (B105)
Plastic Scraper (B123)
Jackscrew Set (B129)
Input Spanner Adapter (B4)
Input Seal Tool (B204)
Hand Arbor Press (B107)
Spanner Wrench (B229)

Material:

Aliphatic Naphtha (D141)
Corrosion Preventive Compound (D82)

Lockwire (D132)
Sealing Compound (D184)
Sealant (D180)
Lubricating Oil (D139 or D140)
Wiping Rag (D164)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer
Pilot

References:

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

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Aft Tail Rotor Driveshaft Cover Opened or
Removed (Task 2-3-11)
Tail Rotor Gearbox Drained (Task 1-4-9)
Coupling Disc Pack Removed (Typical)
(Task 6-6-6)

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6-7-5. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

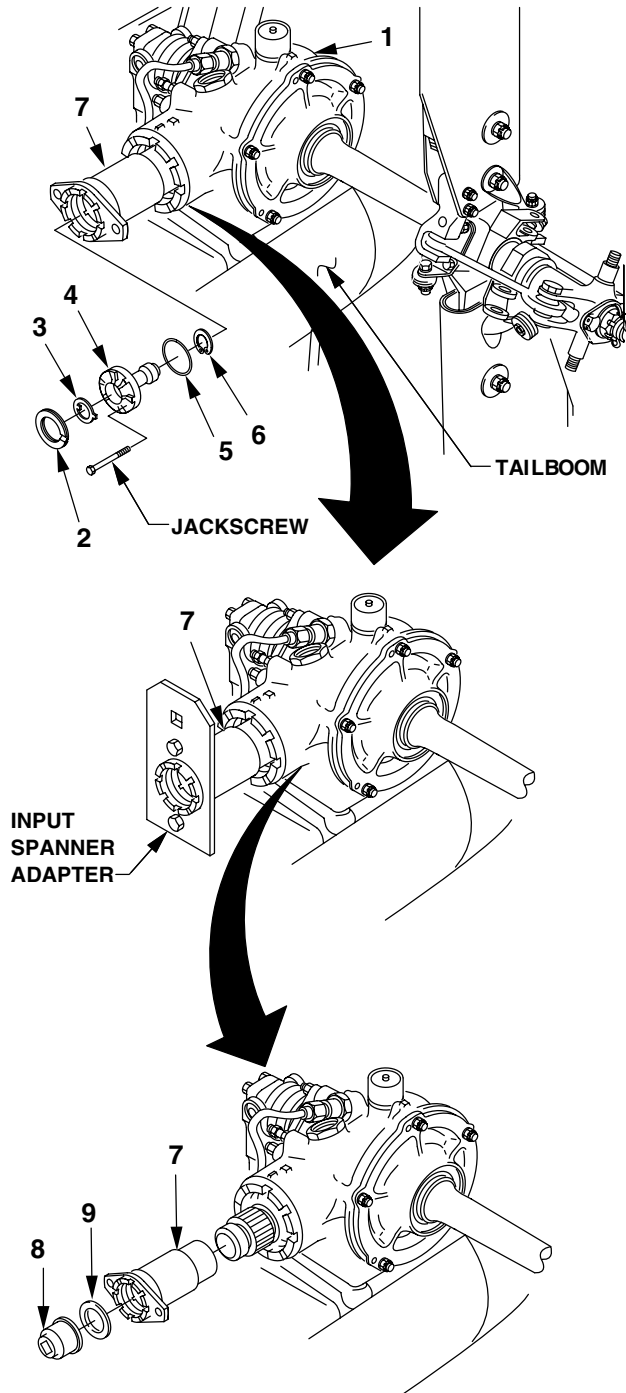
REMOVE

1. Ensure tail rotor gearbox (1) is securely mounted to tailboom.
2. Remove retaining ring (2).
3. Remove lockring (3).

CAUTION

To prevent possible breakage and/or damage to plug (4), avoid excessive side to side pressure.

4. Install jackscrew set (B129), remove plug (4).
5. Remove jackscrew set (B129) from plug (4).
6. Remove packing (5) from plug (4); discard packing.
7. Remove retaining ring (6) from groove inside adapter (7).
8. Using bolts, washers, and nuts provided with spanner wrench (B229), install spanner wrench on adapter (7).
9. Insert **6-inch** extension (B41) through input spanner adapter (B4) and engage nut (8) inside adapter (7).
10. Using hinge handles (B68) on extension (B41) and input spanner adapter (B4), loosen nut (8) inside adapter (7).
11. Remove nut (8) and washer (9).
12. Remove tools from adapter (7).
13. Remove adapter (7).



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6-7-5. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

14. Using plastic scraper (B123), remove sealant from nut (10).

15. Cut and remove lockwire from nut (10); discard lockwire.

16. Using spanner wrench (B229), remove nut (10).

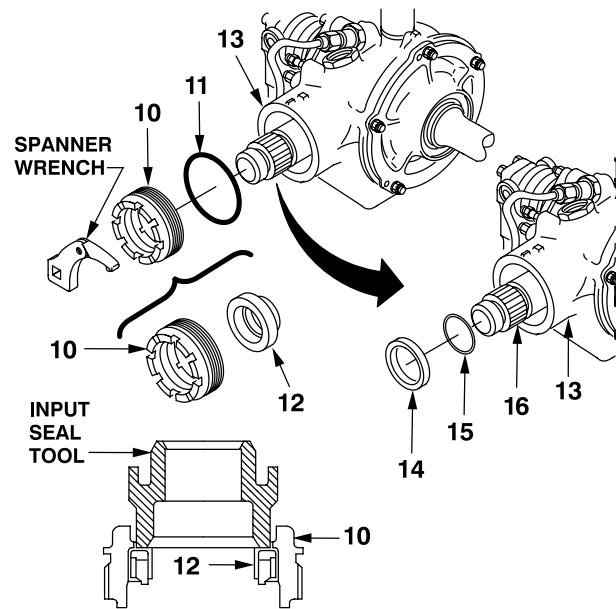
17. Remove packing (11) from nut (10); discard packing.

18. Position nut (10) and input seal tool (B204) as shown.

19. Using hand arbor press (B107), remove seal (12) from nut (10).

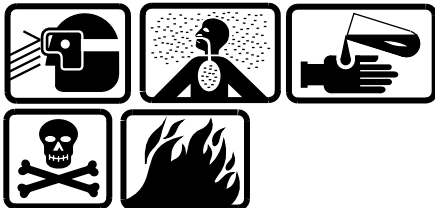
20. Using plastic scraper (B123), remove sealant from nut (10).

21. Using plastic scraper (B123), remove sealant from ID of housing (13).



CROSS SECTION OF NUT, SEAL, AND SEAL DRIVER FOR SEAL REMOVAL

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J2157



Naphtha/Naphthalene, TT-N-97

22. Using wiping rag (D164), wipe nut (10) and ID of housing (13) with aliphatic naphtha (D141). Wipe dry before solvent dries.

23. Remove mating ring (14) and packing (15) from pinion shaft (16).

GO TO NEXT PAGE

6-7-5. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

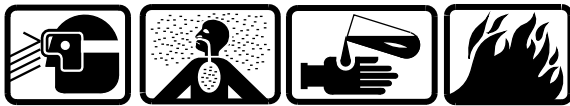
24. Discard mating ring (14), seal (12), and packing (15).

INSTALL

NOTE

Input pinion seal consists of two parts, seal and mating ring. These parts are a matched set and are not replaced separately.

25. Ensure seal (12) and mating ring (14) are parts of a matched set.



Sealing Compound

26. Apply sealant (D180) to outside surface of seal (12).

27. Position nut (10), seal (12), and input seal tool (B204), as shown.

28. Using hand arbor press (B107), press seal (12) into nut (10).

29. Remove excess sealant (D180) from seal (12).

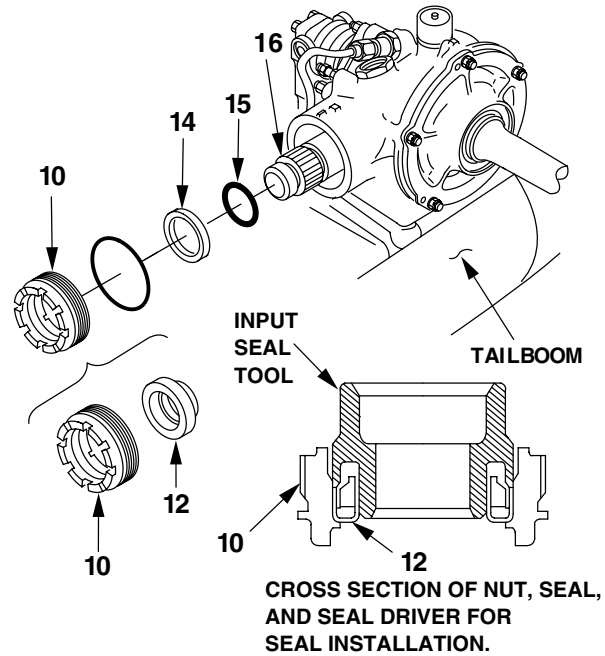


Lubricating Oil

30. Using lubricating oil (D139 or D140), coat packing (15).

31. Install packing (15) in groove on pinion shaft (16).

32. Install mating ring (14) on pinion shaft (16) over packing (15). Mating surface of mating ring (14) must face out to properly seat with mating surface of seal (12).



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J2157

GO TO NEXT PAGE

6-7-5. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

33. Using lubricating oil (D139 or D140), coat packing (11).
34. Install packing (11) in groove on nut (10).
35. Install nut (10) in housing (13).
36. Using spanner wrench (B229), torque nut (10) **100 TO 150 FOOT-POUNDS**.
37. Using lockwire (D132), secure nut (10) to tangs on housing (13) in two places.



Sealing Compound

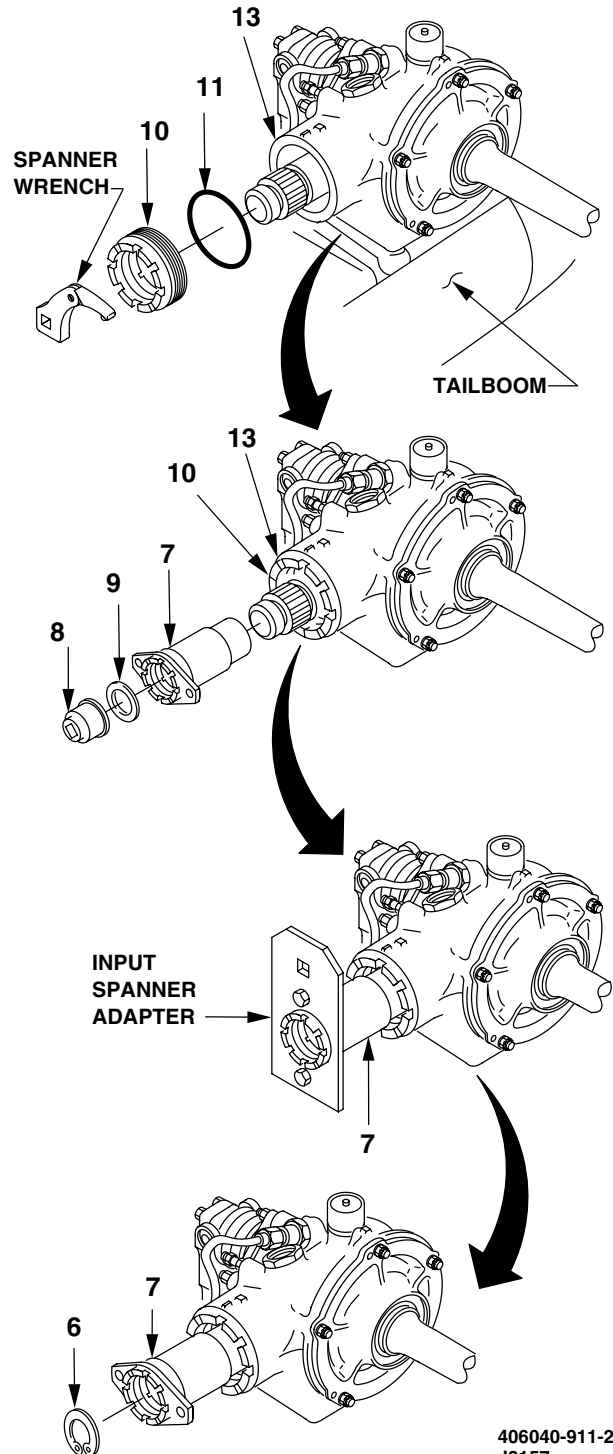
38. Apply bead of sealing compound (D184) to mating surfaces of nut (10) and housing (13).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of adapter (7) is a characteristic critical to flight safety.

39. Install adapter (7), washer (9), and nut (8).
40. Using bolts, washers, and nuts provided with input spanner adapter (B4), install spanner on adapter (7).
41. Insert **6-inch** extension (B41) through input spanner adapter (B4) and engage nut (8).
42. Hold input spanner adapter (B4) and torque nut (8) **80 TO 100 FOOT-POUNDS**.
43. Remove input spanner adapter (B4) from adapter (7).
44. Install retaining ring (6) in groove inside adapter (7).



406040-911-2
J2157

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6-7-5. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)



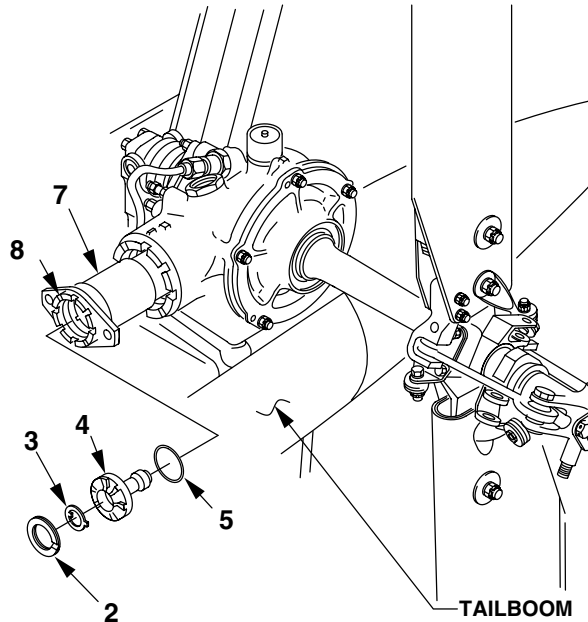
Lubricating Oil

45. Using lubricating oil (D139 or D140), coat packing (5).
46. Install packing (5) in groove on plug (4).
47. Install plug (4), engaging installed nut (8).

NOTE

If locking will not engage slots in plug and adapter, plug may be removed and rotated one-quarter turn.

48. Install locking (3) to engage slots in plug (4) and adapter (7).
49. Install retaining ring (2).



406040-911-5
J2157

INSPECT



Corrosion Preventive Compound

CAUTION

Corrosion preventive compound shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals.

50. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.

FOLLOW-ON MAINTENANCE

Install coupling disc pack (Task 6-6-6).

Service tail rotor gearbox (Task 1-4-9).

Close or install (as applicable) tail rotor driveshaft cover (Task 2-3-11).

Pilot perform MOC (TM 1-1520-248-10/CL).

END OF TASK

6-7-6. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Hand Arbor Press (B107)
 Vice (B211)
 Spanner Wrench (B229)

Applicable Configurations:
 All

Material:

Aliphatic Naphtha (D141)
 Lockwire (D132)
 Sealing Compound (D184)
 Sealant (D180)
 Lubricating Oil (D139 or D140)
 Wiping Rag (D164)

Tools:

Powertrain Tool Kit (B180)
 Extension (B41)
 Hinge Handle (2) (B68)
 Torque Wrench (B232)
 Retaining Ring Pliers (B105)
 Plastic Scraper (B123)
 Maintenance Fixture (B44)
 Jackscrew Set (B129)
 Input Spanner Adapter (B4)
 Input Seal Tool (B204)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
 68D Aircraft Powertrain Repairer

GO TO NEXT PAGE

6-7-6. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

PREPARE

1. Install tail rotor gearbox (1) in maintenance fixture (B44) with four washers and nuts.

2. Mount support fixture in vise (B211).

REMOVE

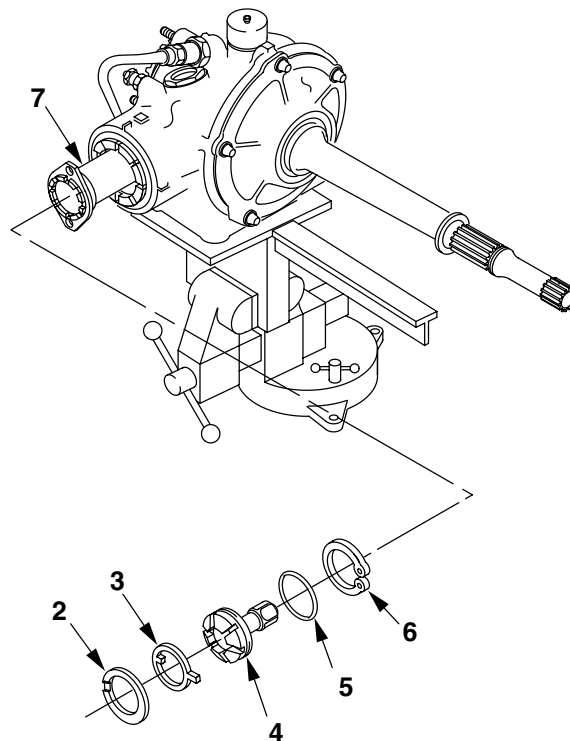
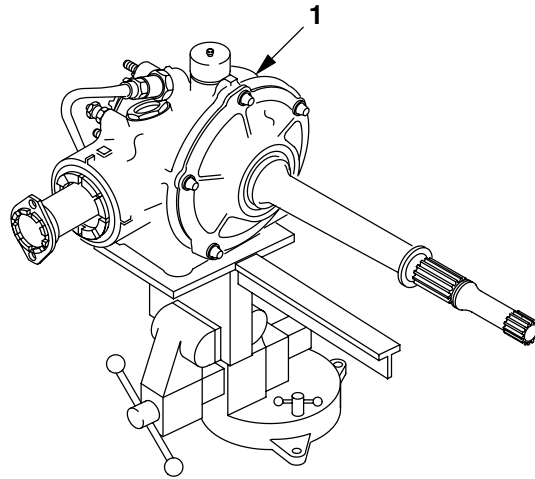
3. Remove retaining ring (2).

4. Remove lockring (3).

5. Remove plug (4) using jackscrew set (B129).

6. Remove packing (5) from plug (4) and discard.

7. Remove retaining ring (6) from groove inside adapter (7).



406040-175
J0432

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6-7-6. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

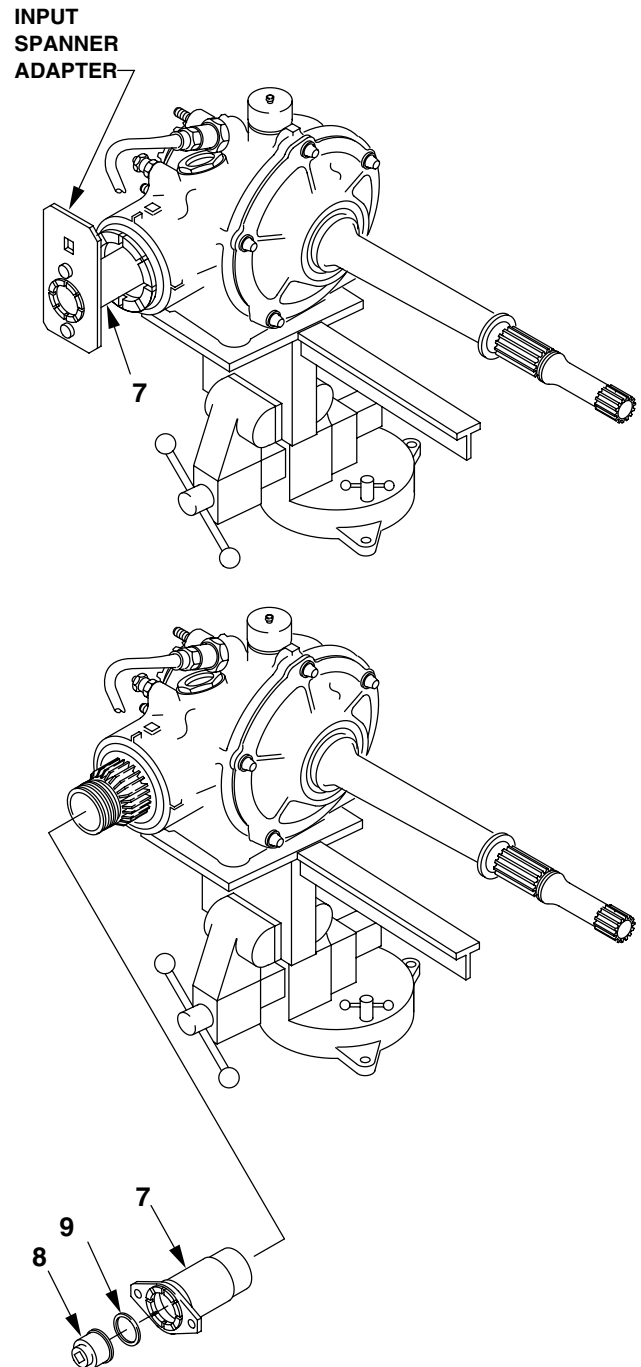
8. Install input spanner adapter (B4) on adapter (7), using bolts, washers, and nuts provided with input spanner adapter (B4).

9. Insert **6-inch** extension (B41) through input spanner adapter (B4) and engage nut inside adapter (7).

10. Use hinge handles (B68) on extension (B41) and input spanner adapter (B4) and loosen nut (8) inside adapter (7).

11. Remove nut (8) and washer (9). Remove tools from adapter (7).

12. Remove adapter (7).

406040-176
J2157

GO TO NEXT PAGE

6-7-6. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

13. Remove sealant from nut (10) with plastic scraper (B123).

14. Cut lockwire and remove nut (10) with spanner wrench (B229).

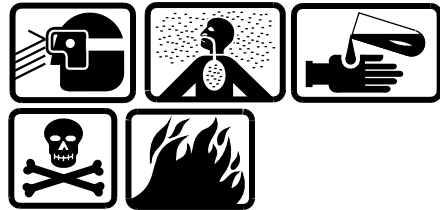
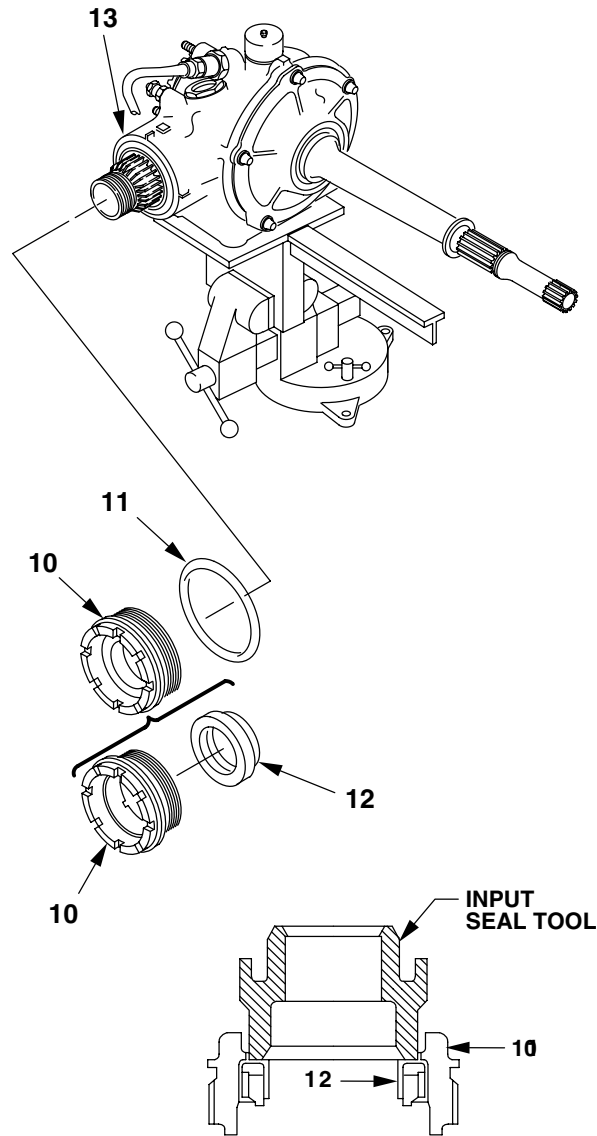
15. Remove packing (11) from nut (10) and discard.

16. Position nut (10) and input seal tool (B204) as shown.

17. Remove seal (12) from nut (10) using hand arbor press (B107).

18. Remove sealant from nut (10) with plastic scraper (B123).

19. Remove sealant from I.D. of housing (13) using plastic scraper (B123).



Naphtha/Naphthalene, TT-N-97

20. Using wiping rag (D164), wipe nut (10) and I.D. of input housing (13) with aliphatic naphtha (D141). Wipe dry before solvent dries.

CROSS SECTION OF NUT, SEAL, AND SEAL DRIVER FOR SEAL REMOVAL

406040-177-2
J2157

GO TO NEXT PAGE

6-7-6. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

21. Remove mating ring (14) and packing (15) from pinion shaft (16).

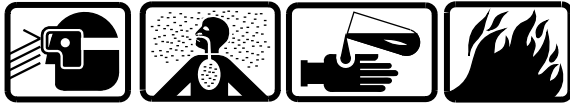
22. Discard mating ring (14), seal (12), and packing (15).

INSTALL

CAUTION

Input pinion seal consists of two parts, seal and mating ring. These parts are a matched serialized set and are not replaced separately.

23. Ensure serial number of seal (12) and mating ring (14) match.



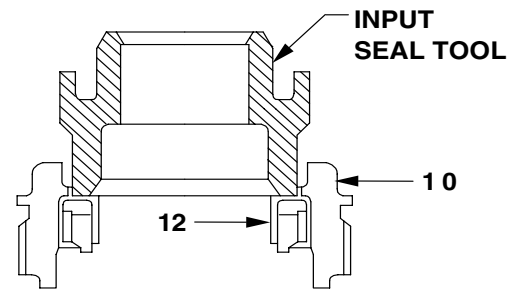
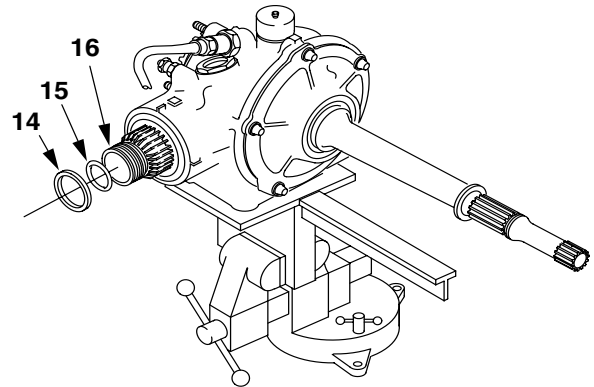
Sealing Compound

24. Apply sealant (D180) to outside surface of seal (12).

25. Position nut (10), seal (12), and input seal tool (B204), as shown.

26. Using hand arbor press (B107), press seal (12) into nut (10).

27. Remove excess sealant from seal (12).



CROSS SECTION OF NUT, SEAL, AND SEAL DRIVER FOR SEAL REMOVAL

406040-178
J1611

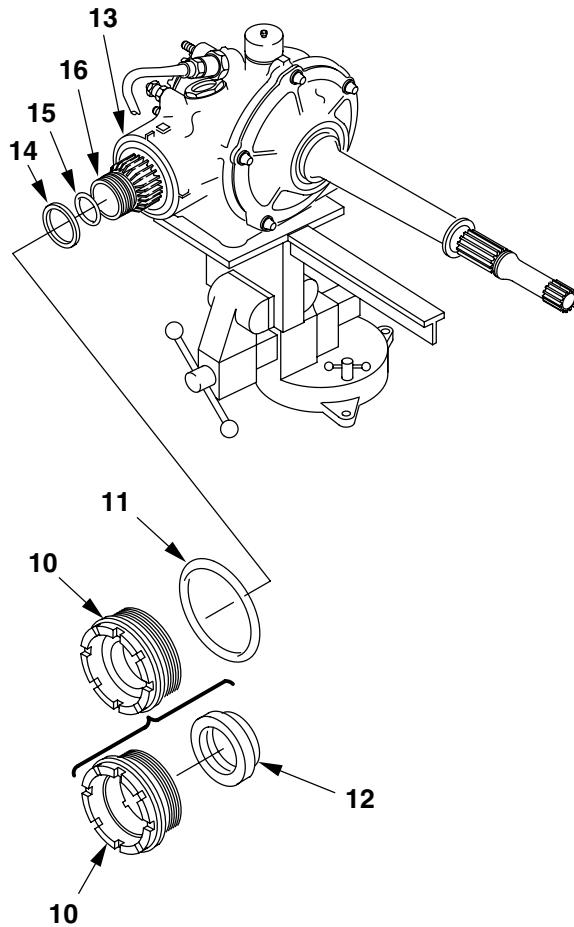
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6-7-6. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)



Lubricating Oil

28. Coat packing (15) with lubricating oil (D139 or D140).
29. Install packing (15) in groove on pinion shaft (16).
30. Install mating ring (14) on pinion shaft (16) over packing (15). Mating surface of mating ring (14) must face out to properly seat with mating surface of seal (12).
31. Coat packing (11) with lubricating oil (D139 or D140).
32. Install packing (11) in groove on nut (10).
33. Install nut (10) in housing (13).
34. Using spanner wrench (B229), torque nut (10) **100 TO 150 FOOT-POUNDS**.
35. Secure nut (10) to tangs on housing (13) in two places with lockwire (D132).



Sealing Compound

36. Apply bead of sealing compound (D184) to mating surfaces of nut (10) and housing (13).

406040-177-1
J2157

GO TO NEXT PAGE

6-7-6. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

WARNING

**FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)**

Correct installation of adapter (7) is a characteristic critical to flight safety.

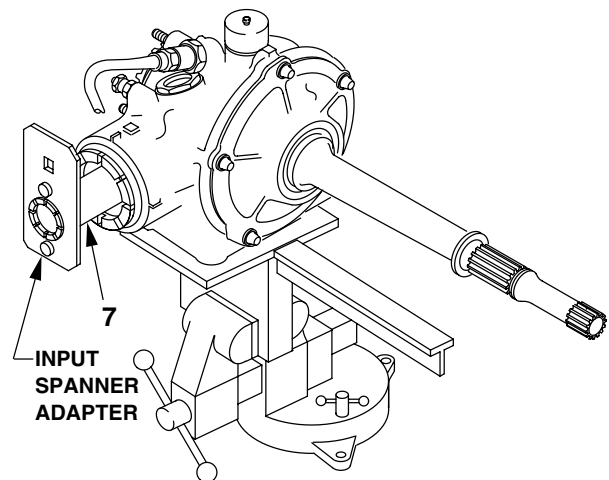
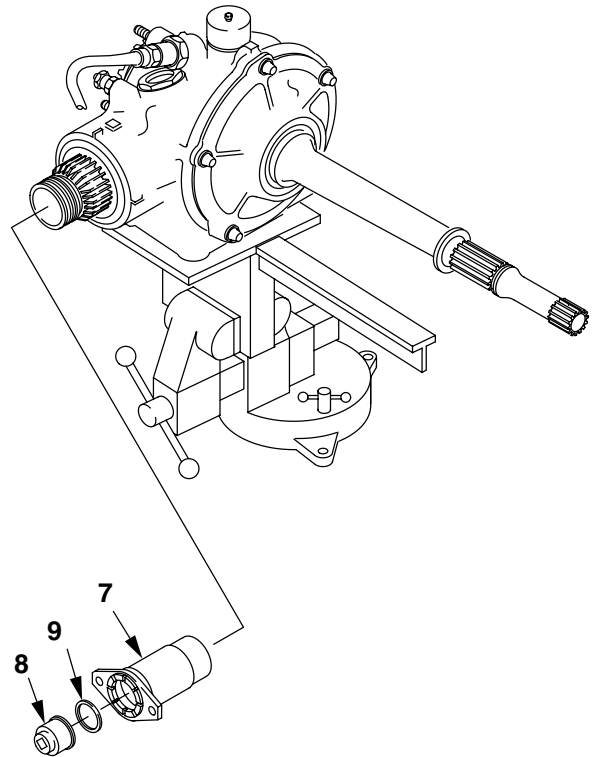
37. Install adapter (7), washer (9), and nut (8).

38. Install input spanner adapter (B4) on adapter (7), using bolts, washers, and nuts provided with input spanner adapter.

39. Insert 6-inch extension (B41) through input spanner adapter (B4) and engage nut (8).

40. Hold input spanner adapter (B4) and torque nut (8) **80 TO 100 FOOT-POUNDS**.

41. Remove input spanner adapter (B4) from adapter (7).



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J2157

GO TO NEXT PAGE

6-7-6. TAIL ROTOR GEARBOX INPUT SEAL — REMOVAL/INSTALLATION (CONT)

42. Install retaining ring (6) in groove inside adapter (7).



Lubricating Oil

43. Coat packing (5) with lubricating oil (D139 or D140).

44. Install packing (5) in groove on plug (4).

45. Install plug (4) and engage adapter retaining nut (8).

NOTE

If lockring will not engage slots in plug and adapter, plug may be removed and rotated one-quarter turn.

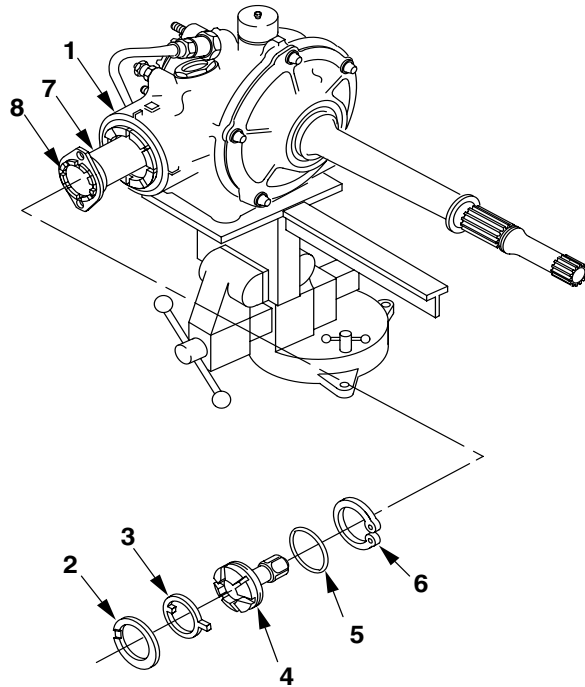
46. Install lockring (3) to engage slots in plug (4) and adapter (7).

47. Install retaining ring (2).

INSPECT

48. Remove tail rotor gearbox (1) and maintenance fixture (B44) from vise (B211).

49. Remove maintenance fixture (B44) from tail rotor gearbox (1).



406040-168
J2157

END OF TASK

6-7-7. INPUT ADAPTER NUT/INPUT DUPLEX BEARING NUT — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)
Outside Micrometer Caliper Set (B12)

Material:

Aliphatic Naphtha (D141)
Wiping Rags (D164)
Sandpaper (D175)

Crocus Cloth (D90)
Rubber Gloves (D111)
Acetone (D2)
Corrosion Protective Coating (D88)
Steel Wool (D205)
Aluminum Oxide Abrasive Cloth (D44)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:

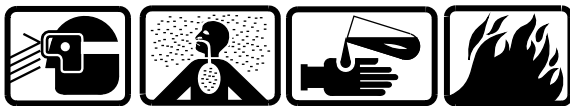
TM 1-1520-266-23

CLEAN INPUT ADAPTER NUT



Naphtha/Naphthalene, TT-N-97

1. Clean input adapter nut with wiping rag (D164) dampened with aliphatic naphtha (D141).
2. Dry input adapter nut with clean wiping rag (D164).



Acetone

3. Remove corrosion protective coating (D88) with wiping rag (D164) dampened with acetone (D2).

INSPECT

4. Deleted
5. Inspect input adapter nut to limits shown. See figure Input Adapter Nut — Damage Limits. No cracks allowed. If cracks in input adapter nut are suspected perform magnetic particle inspection (TM 1-1520-266-23).

REPAIR

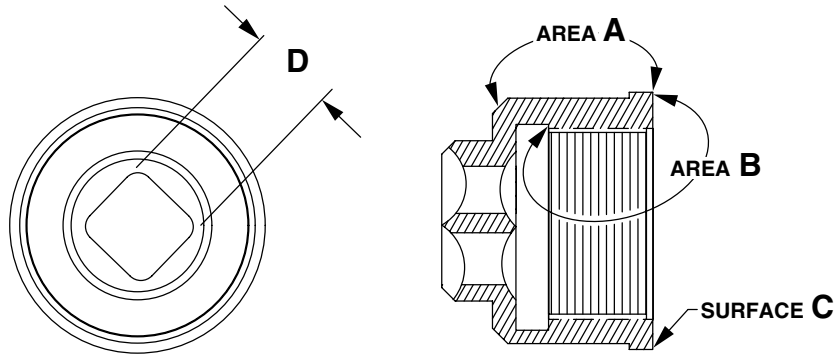


Sanding Operations

6. Repair damage to input adapter nut using 400 grit sandpaper (D175) and steel wool (D205) or equivalent.
7. Blend repaired area into surrounding area with crocus cloth (D90).
8. Ensure limits are not exceeded while part is being repaired.

GO TO NEXT PAGE

6-7-7. INPUT ADAPTER NUT/INPUT DUPLEX BEARING NUT — CLEANING/INSPECTION/REPAIR (CONT)



INPUT ADAPTER NUT

TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

AREA	MINIMUM	MAXIMUM
A		0.005 in.
B	None Allowed	
C		0.002 in.
D		0.533 in.
Flat to flat		
Damaged threads	None allowed	
Maximum area per full depth repair	No more than 40% of area within 1 square inch or more than 20% of total area of any surface or diameter may be reworked.	

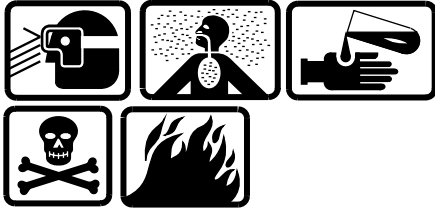
406040-622
J0432

Input Adapter Nut — Damage Limits

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6-7-7. INPUT ADAPTER NUT/INPUT DUPLEX BEARING NUT — CLEANING/INSPECTION/REPAIR (CONT)

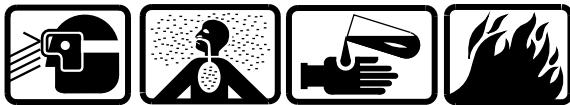
CLEAN INPUT DUPLEX BEARING NUT



Naphtha/Naphthalene, TT-N-97

9. Clean input duplex bearing nut with wiping rag (D164) dampened with aliphatic naphtha (D141).

10. Dry input duplex bearing nut with clean wiping rag (D164).



Acetone

11. Remove corrosion protective coating (D88) with wiping rag (D164) dampened with acetone (D2).

INSPECT

12. Fluorescent penetrant inspect input duplex bearing nut (TM 1-1520-266-23).

13. Inspect input duplex bearing nut to limits shown. See figure Input Duplex Bearing Nut — Damage Limits. If cracks in input duplex bearing nut are suspected perform magnetic particle inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

14. Repair damage to input duplex bearing nut using 400 grit sandpaper (D175) and steel wool (D205) or equivalent.

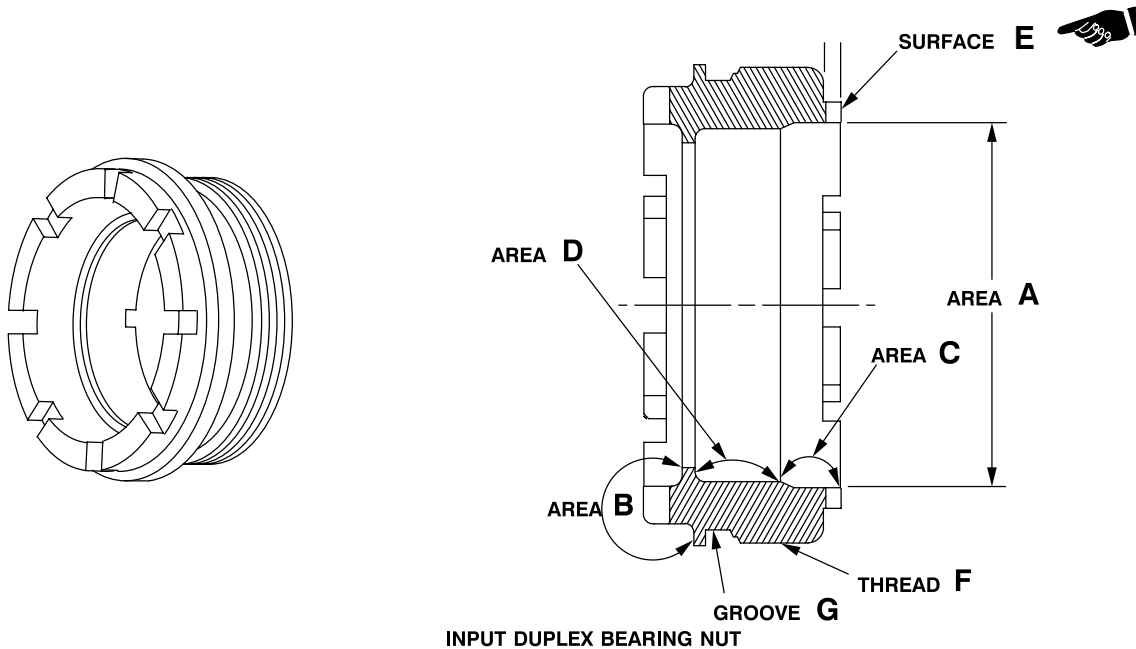
15. Ensure limits are not exceeded while part is being repaired.

16. Blend repaired area into surrounding area with 240 grit aluminum oxide abrasive cloth (D44).

INSPECT

GO TO NEXT PAGE

6-7-7. INPUT ADAPTER NUT/INPUT DUPLEX BEARING NUT — CLEANING/INSPECTION/REPAIR (CONT)



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

AREA		MINIMUM	MAXIMUM
A	Seal Seat	2.4345 in.	2.4360 in.
B	Corrosion		0.005 in.
C	Corrosion		0.005 in.
D	Corrosion	None allowed	
E	Corrosion	None allowed	
E	Galling		0.002 in.
F	Corrosion	None allowed	
F	Damaged threads	None allowed	
G	Corrosion	None allowed	
	Cracks	None allowed	
	Nicks, scratches and sharp dents	None allowed on areas E, F or G	0.005 in. allowed on areas A, B, C, D
	Maximum area per full depth repair.	No more than 40% of area within 1 square inch or more than 20% of total area of any surface or diameter may be reworked.	

406040-623
J0432

Input Duplex Bearing Nut — Damage Limits

END OF TASK

6-7-8. TAIL ROTOR GEARBOX OUTPUT SHAFT SEAL (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Tool Kit (B180)
Maintenance Fixture (B44)
Jackscrew Set (B129)
Heat Lamp (B91)
Puller Kit (B84)
Torque Wrench (B237)
Plastic Scraper (B123)
Hand Arbor Press (B107)

Material:

Aliphatic Naphtha (D141)
Sealing Compound (D185)

Lubricating Oil (D139 or D140)
Sealant (D180)
Grease (D113)
Rubber Gloves (D111)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:

TM 1-1500-204-23
TM 1-6625-724-13&P

Equipment Condition:

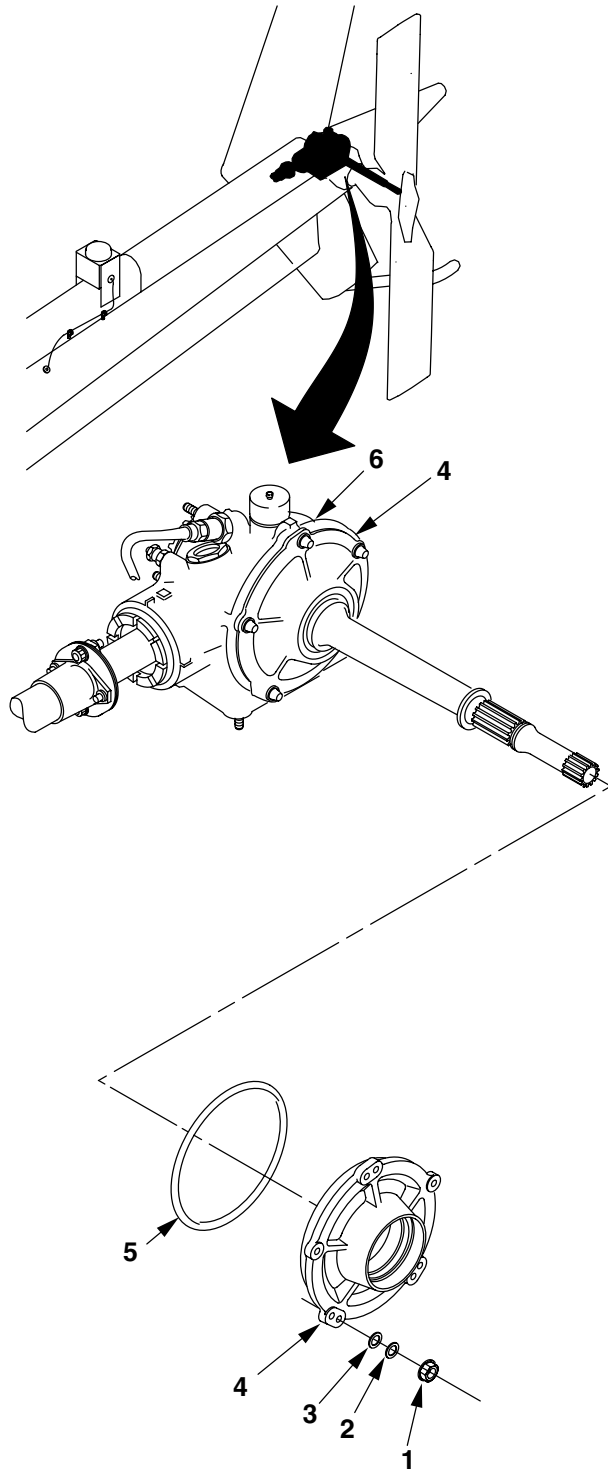
Helicopter Safed (Task 1-6-7)
Tail Rotor Assembly Removal (Task 5-4-11)

GO TO NEXT PAGE

6-7-8. TAIL ROTOR GEARBOX OUTPUT SHAFT SEAL (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove five nuts (1), steel washers (2), and aluminum washers (3).
2. Remove sealing compound from cap assembly (4).
3. Remove sealing compound from threaded jackscrew holes.
4. Install three jackscrews (B129) in threaded holes in cap assembly (4).
5. Apply equal pressure to each jackscrew (B129), and remove cap assembly (4) and packing (5) from tail rotor gearbox (6). Discard packing (5).
6. Remove jackscrews (B129) from cap assembly (4).



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J2739

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6-7-8. TAIL ROTOR GEARBOX OUTPUT SHAFT SEAL (AVIM) — REMOVAL/INSTALLATION (CONT)

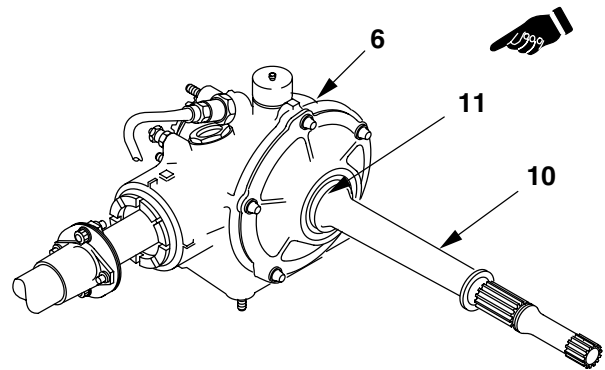
7. Remove retaining ring (7) from cap assembly (4).

WARNING

Care shall be used when handling heated parts to prevent burns. If burns occur seek medical aid.

8. Apply heat lamp (B91) to face of cap assembly (4). When heated, tap cap assembly on hard wood surface to remove roller bearing (8).

9. Place cap assembly (4) on hand arbor press (B107) and using an appropriate plug, press seal (9) out of cap assembly (4).



Naphtha/Naphthalene, TT-N-97

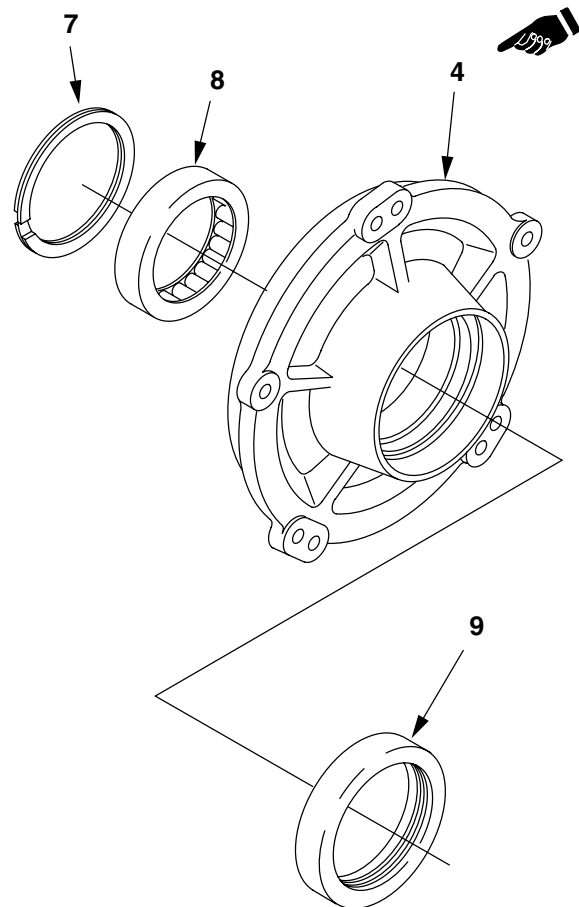
10. Clean old sealant from cap assembly (4) and tail rotor gearbox (6) with plastic scraper (B123). Wipe both cleaned areas with aliphatic naphtha (D141). Wipe dry before solvent evaporates.

11. Inspect all visible parts of output shaft (10) for damage.

12. Inspect wear sleeve (11) on output shaft (10) for wear in contact area by seal (9). If sleeve has any groove greater than **0.002 inch** deep, sleeve must be replaced. Also, if nicks, dents, or scratches are present or evidence of oil leakage is noted, sleeve must be replaced. If sleeve is worn beyond limits, replace gearbox (Task 6-7-1).

13. Inspect gearbox case (6) and cap assembly (4) for wear, damage and corrosion. Check studs in gearbox case (6) for condition in accordance with TM 1-1500-204-23.

14. Inspect roller bearing (8) for freedom of movement and damage.



406040-170
J2739

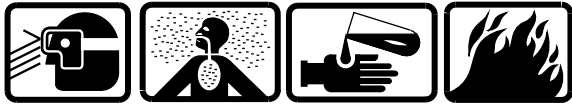
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6-7-8. TAIL ROTOR GEARBOX OUTPUT SHAFT SEAL (AVIM) — REMOVAL/INSTALLATION (CONT)

INSTALL

CAUTION

Tail rotor gearbox 406-040-400-113 shall use new oil seal 406-340-105-101 in place of oil seal 2810-51832 for compatibility with the use of lubricating oil (D139 or D140).



Sealing Compound

15. Apply sealant (D180) to outside surface of seal (9).

16. Press seal (9) into cap assembly (4) with hand arbor press (B107) and appropriate pressing plug. Remove excessive sealant.



Lubricating Oil

17. Coat bearing (8) with oil (D139 or D140).

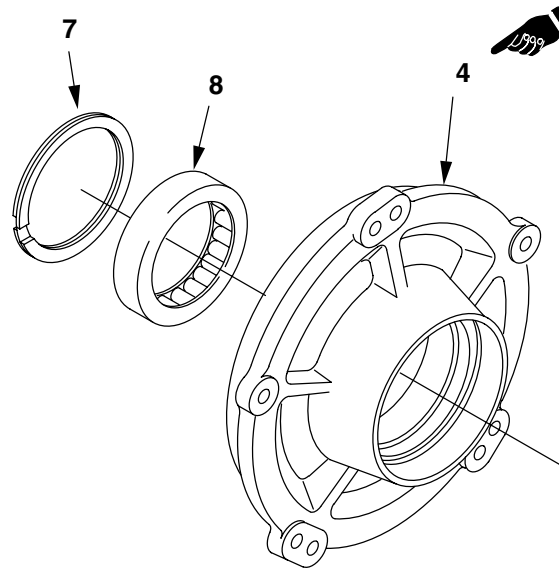
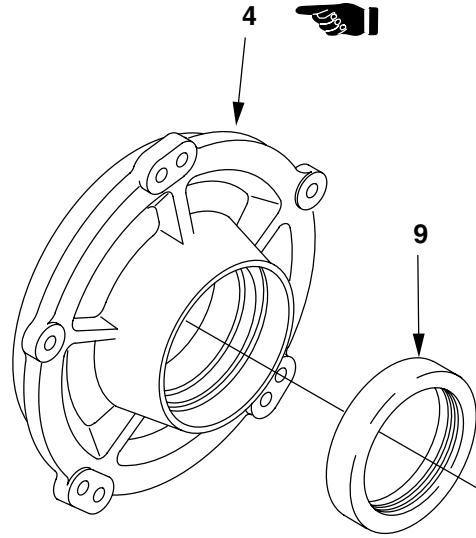
WARNING

Care shall be used when handling heated parts to prevent burns. If burns occur seek medical aid.

18. Heat cap assembly (4) with heat lamp (B91).

19. Install bearing (8) in cap assembly (4).

20. Install retaining ring (7) in groove in cap assembly (4).



406040-171
J0432

GO TO NEXT PAGE

6-7-8. TAIL ROTOR GEARBOX OUTPUT SHAFT SEAL (AVIM) — REMOVAL/INSTALLATION (CONT)



Lubricating Oil

21. Install packing (5) on cap assembly (4). Coat packing (5) and flange of cap assembly (4) with oil (D139 or D140).

22. Fill area between lips of seal (9) with grease (D113).

23. Install cap assembly (4) on tail rotor gearbox with five aluminum washers (3), steel washers (2) and nuts (1).

24. Torque nuts (1) **50 TO 70 INCH-POUNDS**.



Sealing Compound

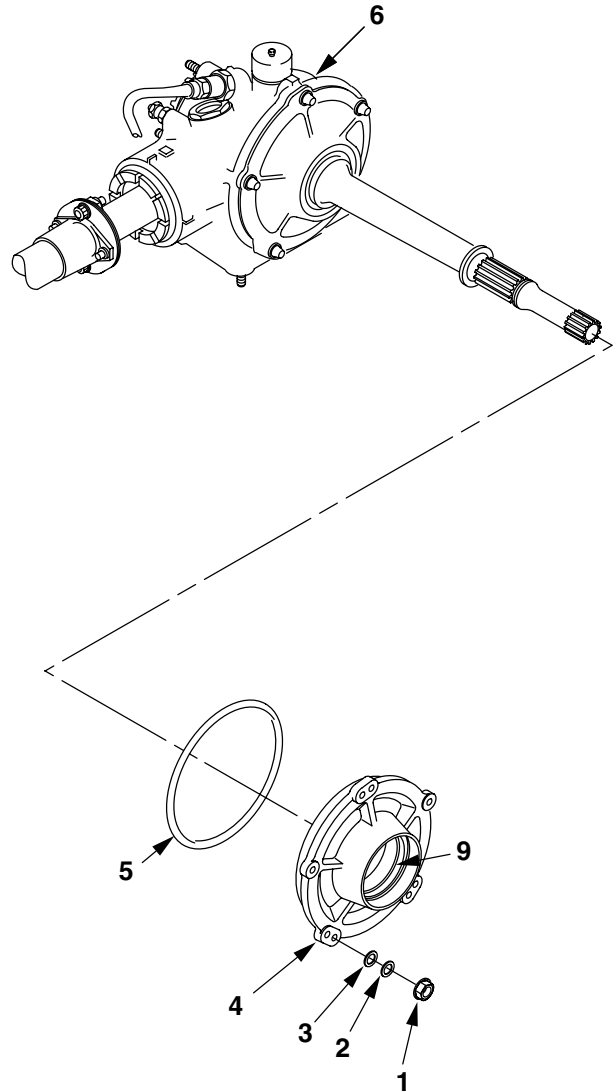
25. Apply a bead of sealing compound (D184) around mating surface of cap assembly (4) and case of tail rotor gearbox (6).

26. Cover holes in cap assembly with sealing compound (D184).

INSPECT

FOLLOW-ON MAINTENANCE

Install tail rotor assembly (Task 5-4-16).



406040-921
J2739

END OF TASK

6-7-9. CAP ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)
Outside Micrometer Caliper Set (B12)

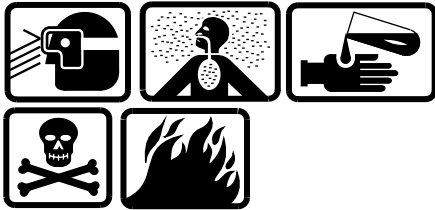
Material:
Aliphatic Naphtha (D141)
Wiping Rags (D164)
Sandpaper (D175)

Rubber Gloves (D111)
Acetone (D2)
Corrosion Protective Coating (D88)
Nonmetallic Abrasive Mats (D1)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

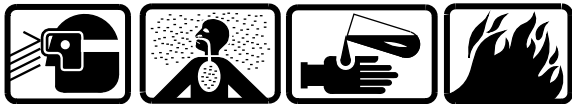
References:
MIL-M-3171C
TM 1-1520-266-23 ■
TM 55-1500-345-23

CLEAN CAP ASSEMBLY



Naphtha/Naphthalene, TT-N-97

1. Clean cap assembly with a wiping rag (D164) dampened with aliphatic naphtha (D141).
2. Dry cap assembly with a clean wiping rag (D164).



Acetone

3. Remove corrosion protective coating (D88) with a wiping rag (D164) dampened with acetone (D2).

INSPECT

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of cap assembly is a characteristic critical to flight safety.

4. Fluorescent penetrant inspect cap assembly in accordance with TM 1-1520-266-23. ■
5. Inspect cap assembly to limits shown. See figure Cap Assembly — Damage Limits. If cracks in cap assembly are suspected perform eddy current inspection (TM 1-1520-266-23). ■

REPAIR



Sanding Operations

6. Remove surface corrosion from cap assembly using 400 grit sandpaper (D175) and nonmetallic abrasive mats (D1).

GO TO NEXT PAGE

6-7-9. CAP ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

CAUTION

To prevent component failure, limits shall not be exceeded while part is being repaired.

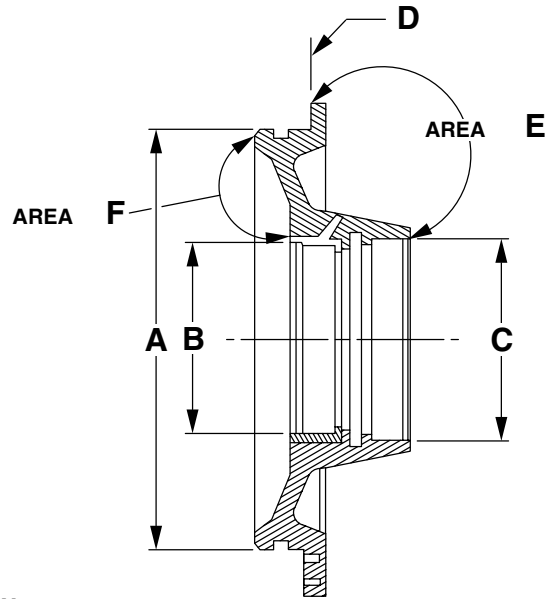
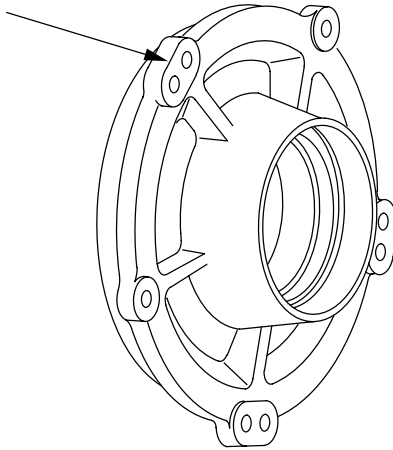
7. Touch up small areas when coating is removed by scratches, abrasions, or minor rework in accordance with MIL-M-3171C and TM 55-1500-345-23.

INSPECT

GO TO NEXT PAGE

6-7-9. CAP ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

AREA G
BOSS FACES
5 PL (TYP)



CAP ASSEMBLY

TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

NO.	AREA		MINIMUM	MAXIMUM
1	A	Mounting seat outer diameter	5.8755 in.	5.8770 in.
2	B	Bearing liner inner diameter	2.6771 in.	2.6778 in.
3	C	Seal retainer inner diameter	2.8730 in.	2.8755 in.
4		Cracks		None allowed
5		Corrosion		Surface corrosion that is removable with a fine abrasive pad or fine steel wool on diameter A. None allowed diameters B, C. 0.002 in. on surface D. 0.010 in. on areas E (except boss faces) and F. 0.005 in. on area G (boss faces).
6		Maximum area per full depth repair	No more than 40% of area within 1 square inch or no more the 20% of total area of any surface or diameter may be reworked.	

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Cap Assembly — Damage Limits

END OF TASK

6-7-10. TAIL ROTOR GEARBOX CHIP DETECTOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)

Material:
Lubricating Oil (D139 or D140)
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

6-7-10. TAIL ROTOR GEARBOX CHIP DETECTOR — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect electrical connector (1) from chip detector (2).

2. Remove chip detector (2) from tail rotor gearbox (3). Remove and discard packings (4 and 5).

NOTE

Self-closing valve does not require removal every time chip detector is removed for inspection.

3. Remove lockwire and remove self-closing valve (6). Remove and discard packing (7) from self-closing valve.

INSTALL

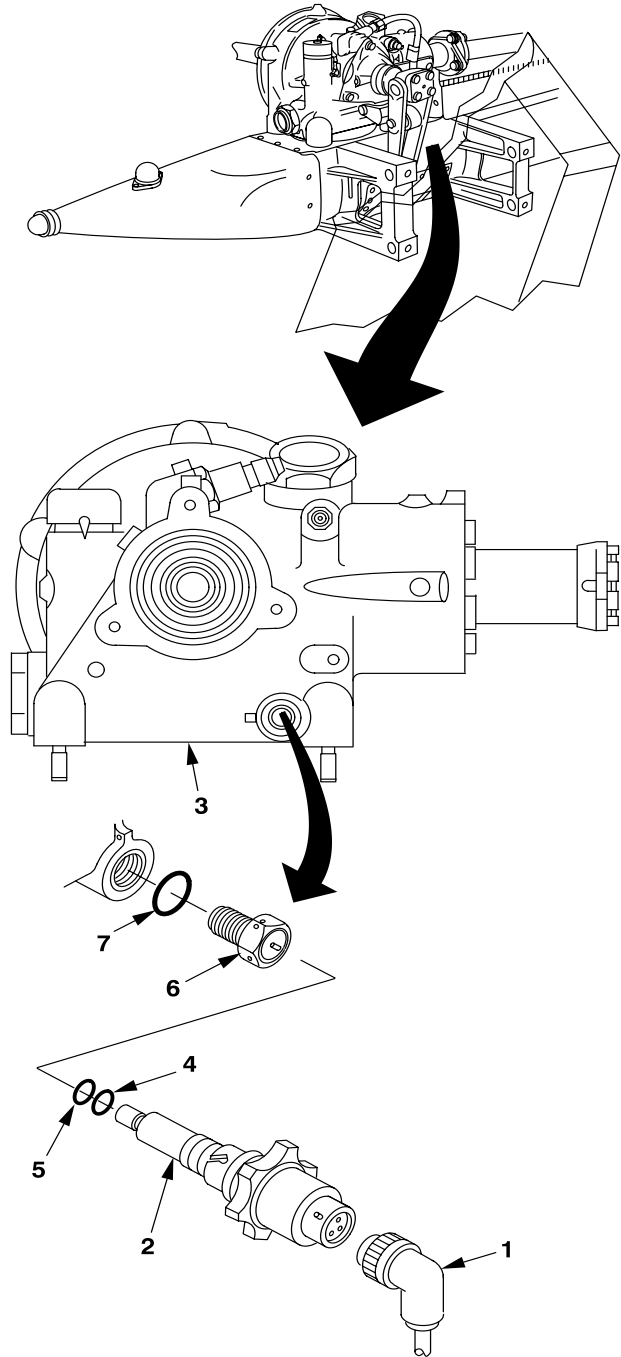
4. Install packings (4 and 5) on chip detector (2).



Lubricating Oil

5. Lubricate packing (7) using oil (D139 or D140) and install packing on self-closing valve (6).

6. Install self-closing valve (6) in tail rotor gearbox (3). Torque self-closing valve **75 TO 125 INCH-POUNDS** and secure with lockwire (D132).



VIEW LOOKING INBOARD RIGHT SIDE

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GO TO NEXT PAGE

6-7-10. TAIL ROTOR GEARBOX CHIP DETECTOR — REMOVAL/INSTALLATION (CONT)



Lubricating Oil

7. Lubricate packings (4) and (5) using lubricating oil (D139 or D140).

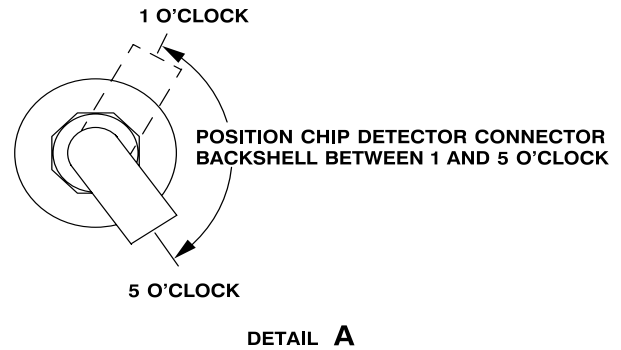
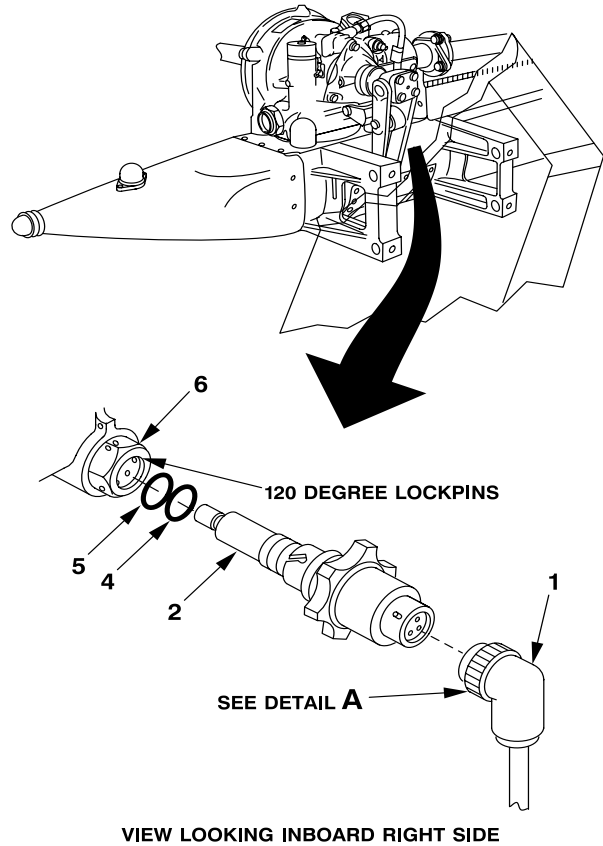
CAUTION

To prevent possible loss of oil pressure and failure of tail rotor gearbox, chip detector shall be fully seated.

8. Install chip detector (2) in self-closing valve (6).

9. Connect electrical connector (1) to chip detector (2).

10. Visually check security of backshell of the electrical connector (1). The backshell of the electrical connector (1) shall be finger tight plus one-eighth turn.



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GO TO NEXT PAGE

6-7-10. TAIL ROTOR GEARBOX CHIP DETECTOR — REMOVAL/INSTALLATION (CONT)

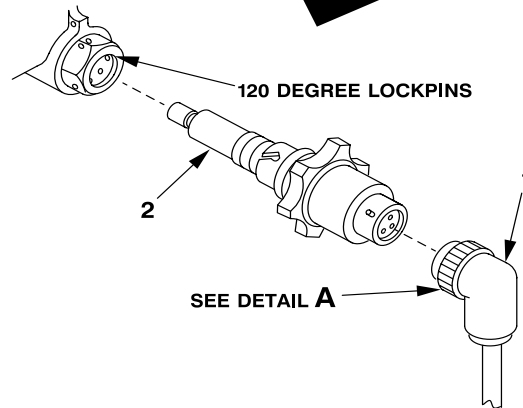
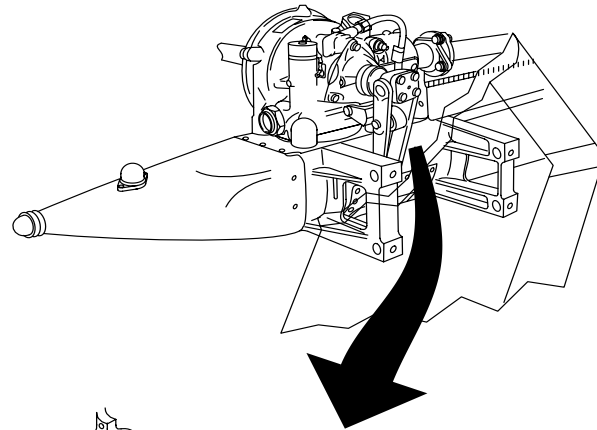
11. Check that backshell of electrical connector is located between the 1 and 5 o'clock positions (looking inboard right side). (See detail A.)

a. If not, remove chip detector (2) and install at one of three 120 degree positions until the 90 degree connector backshell is between the 1 and 5 o'clock positions.

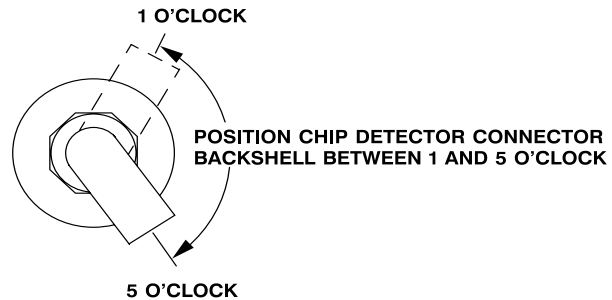
b. If correct position cannot be attained as in step a. above, loosen backshell, orient backshell to correct position, and secure as in step 10.

12. Upon completion of step 9., ensure chip detector (2) is fully seated and locked, and the electrical connector (1) is seated and locked.

13. Actuate tail rotor pedals through full left and right extremes of travel. Ensure that no contact or interference exists between tail rotor assembly and chip detector electrical connector (1), with special emphasis at full right pedal position.



VIEW LOOKING INBOARD RIGHT SIDE



DETAIL A

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END OF TASK

Section VIII. OIL SYSTEM

6-24. OIL SYSTEM

components. Standard torques are provided in Appendix P and TM 1-1500-204-23.

6-25. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, installation, build up, and adjustment of oil system

6-26. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Transmission Oil Pump — Removal/Installation	6-8-1	6-370
Transmission Oil Pump — Cleaning/Inspection/Repair	6-8-2	6-373
Transmission Oil Filters — Removal/Cleaning/Installation	6-8-3	6-375
Oil Filter Manifold — Removal/Installation	6-8-4	6-382
Oil Filter Manifold — Cleaning/Inspection/Repair	6-8-5	6-386
Oil Pressure Regulator Valve — Removal/Installation	6-8-6	6-389
Oil Pressure Regulator Valve — Adjustment	6-8-7	6-391
Oil Pressure Regulator Valve — Disassembly/Assembly	6-8-8	6-394
Oil Filter Bypass Valve Assembly — Removal/Installation	6-8-9	6-396
Oil Filter Bypass Valve Assembly — Cleaning/Inspection	6-8-10	6-398
Transmission Oil Jets (Number One and Two) — Removal/Installation	6-8-11	6-399
Transmission Oil Jets (Number One and Two) — Cleaning/Inspection/Repair	6-8-12	6-403
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Oil Pressure Switch — Removal/Installation	6-8-14	6-405
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Oil Pressure Switch (AVIM) — Testing/Checking	6-8-16	6-408
Oil Pressure Transducer — Removal/Installation	6-8-17	6-410
Oil Pressure Transducer — Cleaning/Inspection/Repair	6-8-18	6-412
Oil Pressure Transducer (AVIM) — Testing/Checking	6-8-19	6-413
Oil Drain Valve — Removal/Installation	6-8-20	6-415
Oil Drain Valve — Cleaning/Inspection/Repair	6-8-21	6-417
Temperature Control Valve (Engine Oil System) — Removal/Installation	6-8-22	6-418
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Oil Cooler — Removal	6-8-24	6-422
Oil Cooler — Cleaning/Inspection/Repair/Buildup	6-8-25	6-424
Oil Cooler — Installation	6-8-26	6-427
Oil Cooler Duct — Removal/Installation	6-8-27	6-429
Oil Cooler Duct — Cleaning/Inspection/Repair	6-8-28	6-430

6-8-1. TRANSMISSION OIL PUMP — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)
Slide Hammer (B67)
Maintenance Stand (B162)
Heat Lamp (B91)
Flange Puller (B110)
Plastic Scraper (B123)

Material:
Sealing Compound (D184)
Lubricating Oil (D139 or D140)
Grease (D113)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47)
Engine Cowl Assembly Removed (Task 2-2-50)
Air Induction Cowling Removed (Task 4-2-1)
Transmission Oil Drained (Task 1-4-7)
Hydraulic Pump Removed (Task 7-8-1)

1. Position maintenance stand (B162), as required, to allow access to transmission oil pump.

REMOVE HYDRAULIC PUMP ADAPTER HOUSING

2. Remove sealing compound from around edge of hydraulic pump adapter housing (1) and transmission oil pump (2).

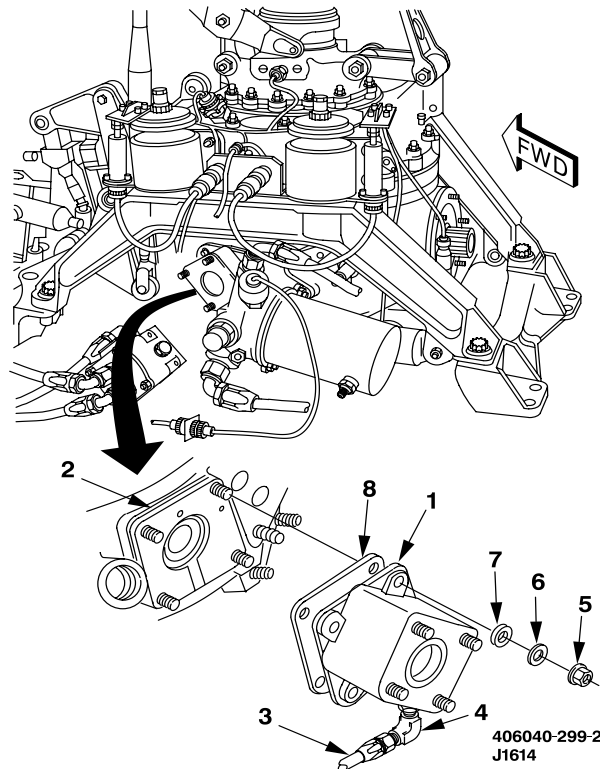
3. Remove drain line hose (3) from elbow (4).

4. Remove four nuts (5), four steel washers (6), and four aluminum washers (7) from hydraulic pump adapter housing (1).

5. Remove hydraulic pump adapter housing (1).

6. Remove gasket (8) from transmission oil pump (2).

7. Discard gasket (8).



GO TO NEXT PAGE

6-8-1. TRANSMISSION OIL PUMP — REMOVAL/INSTALLATION (CONT)

REMOVE TRANSMISSION OIL PUMP

8. Thread bolts of flange puller (B110) into two threaded inserts (9) of transmission oil pump (2). Do not tighten bolts (part of B110) completely at this time.

9. Thread slide hammer (B67) into flange puller (B110) and secure with accompanying locknuts.

10. Tighten bolts (part of B110).

11. Heat transmission oil pump area with heat lamp (B91).

12. Remove transmission oil pump (2) with slide hammer (B67).

13. Remove and discard packing (10).

14. Remove flange puller (B110) and slide hammer (B67) from unserviceable transmission oil pump (2).

15. Remove old sealant from around pump mounting pad using plastic scraper (B123).

INSTALL TRANSMISSION OIL PUMP

16. Secure flange puller (B110) and slide hammer (B67) to serviceable transmission oil pump (2) with two bolts (part of B110) threaded into two threaded inserts (9).

17. Heat transmission opening (11) with heat lamp (B61).



Lubricating Oil

18. Lubricate packing (10) with lubricating oil (D139 or D140).

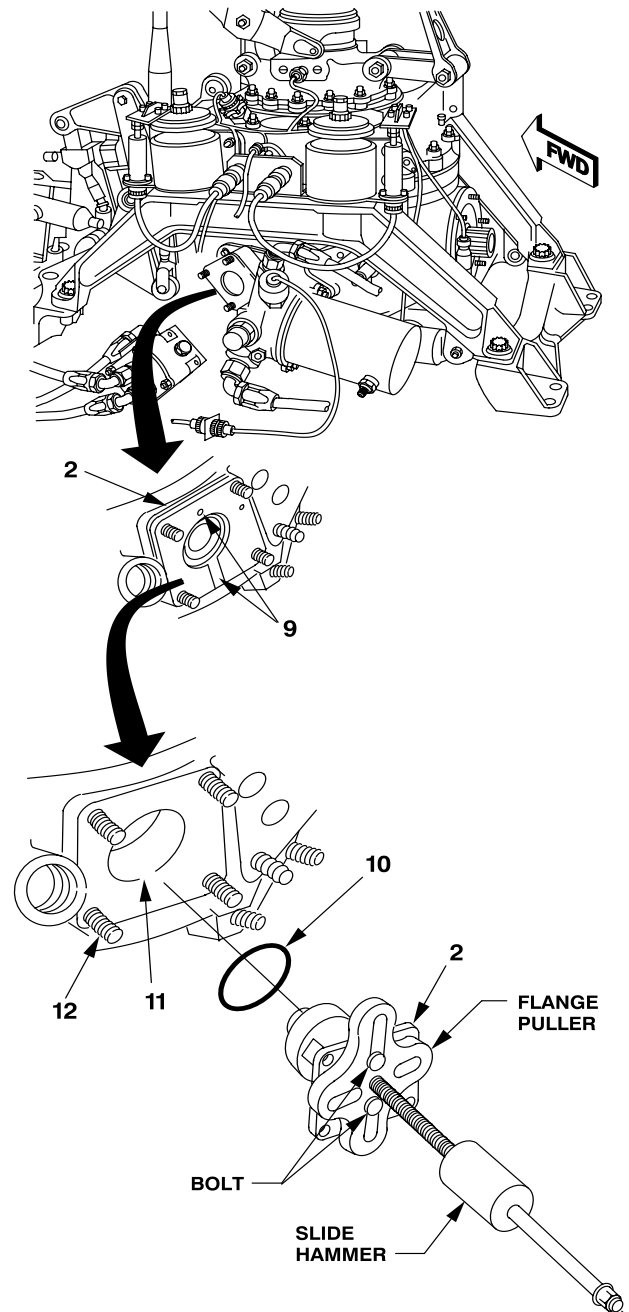
19. Install packing (10) on transmission oil pump (2).

20. Align transmission oil pump (2) with four mounting studs (12) and transmission opening (11).

21. While slowly rotating input adapter (to ensure spline engagement), use slide hammer (B67) to install transmission oil pump (2).

22. Remove slide hammer (B67) from transmission oil pump (2).

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6-8-1. TRANSMISSION OIL PUMP — REMOVAL/INSTALLATION (CONT)



Grease

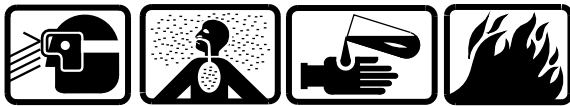
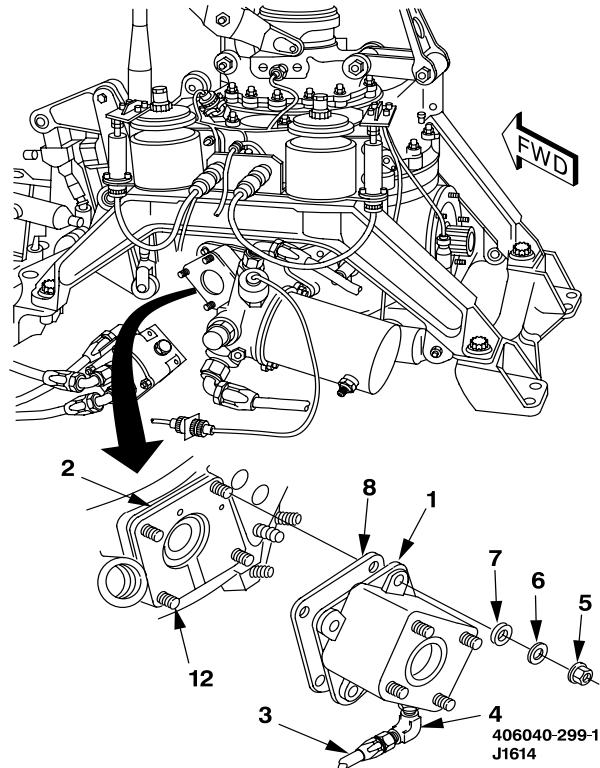
23. Apply thin coat of grease (D113) around external splines of transmission oil pump (2).

INSTALL HYDRAULIC PUMP ADAPTER HOUSING

24. Install gasket (8) on transmission oil pump (2) and four mounting studs (12).

25. Install hydraulic pump adapter housing (1) on four mounting studs (12) with four aluminum washers (7), four steel washers (6), and four nuts (5).

26. Connect vent line hose (3) to elbow (4).



Sealing Compound

27. Apply sealing compound (D184) around edges of pump, adapter flanges, and transmission case.

28. Torque four nuts (5) **50 TO 70 INCH-POUNDS**.

INSPECT

FOLLOW-ON MAINTENANCE

Install hydraulic pump (Task 7-8-1).

Service transmission oil system (Task 1-4-8).

Install air induction cowling (Task 4-2-4).

Install engine cowl assembly (Task 2-2-50).

Install forward fairing assembly (Task 2-2-47).

Pilot perform MOC (TM 1-1520-248-10/CL).

END OF TASK

6-8-2. TRANSMISSION OIL PUMP — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Paint Brush (D54)
Rubber Gloves (D111)

Sandpaper (D175)
Wiping Rag (D164)
Chemical Conversion Coating (Alodine 1201)
(D57)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

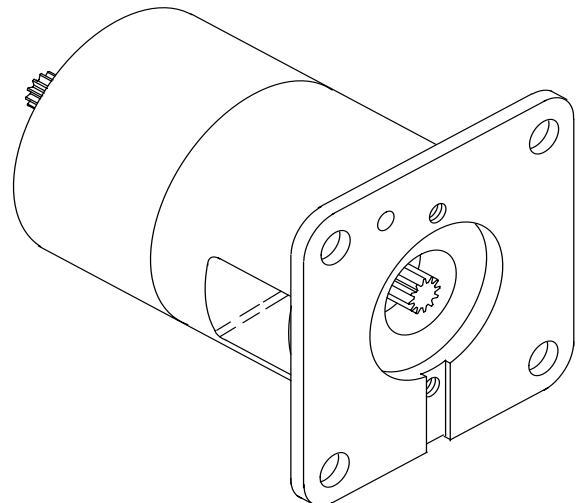
References:
TM 1-1500-344-23

CLEAN



Drycleaning Solvent

1. Clean transmission oil pump with drycleaning solvent (D199) using paint brush (D54).
2. Dry transmission oil pump with wiping rag (D164).



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6-8-2. TRANSMISSION OIL PUMP — CLEANING/INSPECTION/REPAIR (CONT)

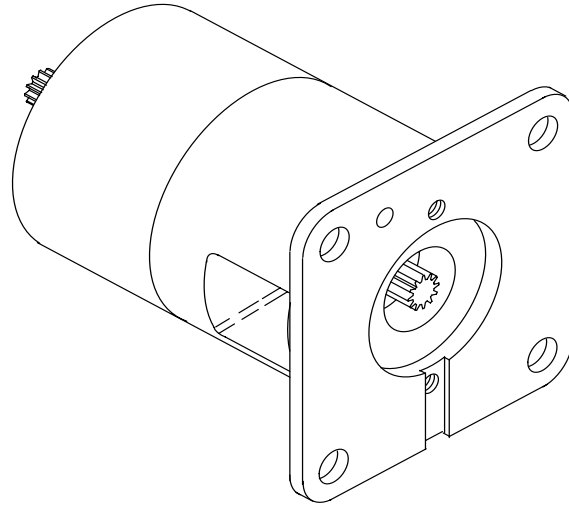
INSPECT

3. Inspect transmission oil pump for minor nicks, scratches, and corrosion (TM 1-1500-344-23).

4. Inspect transmission oil pump external splined shaft teeth using two **0.60 inch** diameter pins, placing pins 180° apart.

5. Measuring from outside edge of pins, determine dimensions between pins.

6. Minimum measurement across pins is **0.519 inch**.



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REPAIR



Sanding Operations

7. Minor nicks, scratches, or surface corrosion damage may be blended out using 400 grit sandpaper (D175).



Chemical Conversion Materials

8. Apply Alodine 1201 (D57) to reworked areas.

9. Further repair of unserviceable oil pump at AVUM/AVIM level not authorized. Replace if unserviceable (Task 6-8-1) and forward defective oil pump to depot.

INSPECT

END OF TASK

6-8-3. TRANSMISSION OIL FILTERS — REMOVAL/CLEANING/INSTALLATION

This task covers: Removal, Cleaning, and Installation (On Helicopter)

INITIAL SETUP

Acetone (D2)
 Rubber Gloves (D111)
 Ultrasonic Cleaner (D64)

Applicable Configurations:
 All

Personnel Required:
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer
 Pilot

Tools:

General Mechanic Tool Kit (B178)
 Maintenance Stand (B162)
 Drain Hose (B74)
 Plastic 12 Qt. Pail (or suitable substitute)
 (B101)
 Torque Wrench (B235)
 Torque Wrench (B239)
 Ultrasonic Cleaner (B18)
 Air Blow Gun (B56)

References:
 TM 1-1520-248-10
 TM 1-1520-248-CL

Material:

Drycleaning Solvent (D199)
 Plastic Bag (D153)
 Lubricating Oil (D139 or D140)
 Lockwire (D132)

Equipment Condition:
 Helicopter Safed (Task 1-6-7)
 Forward Fairing Assembly Removed (Task 2-2-47)
 Upper Chip Detector Removed (Task 6-3-8)
 Lower Chip Detector Removed (Task 6-3-11)
 Identify Foreign Material in Drive Train System
 (Task 6-1-4)

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6-8-3. TRANSMISSION OIL FILTERS — REMOVAL/CLEANING/INSTALLATION (CONT)

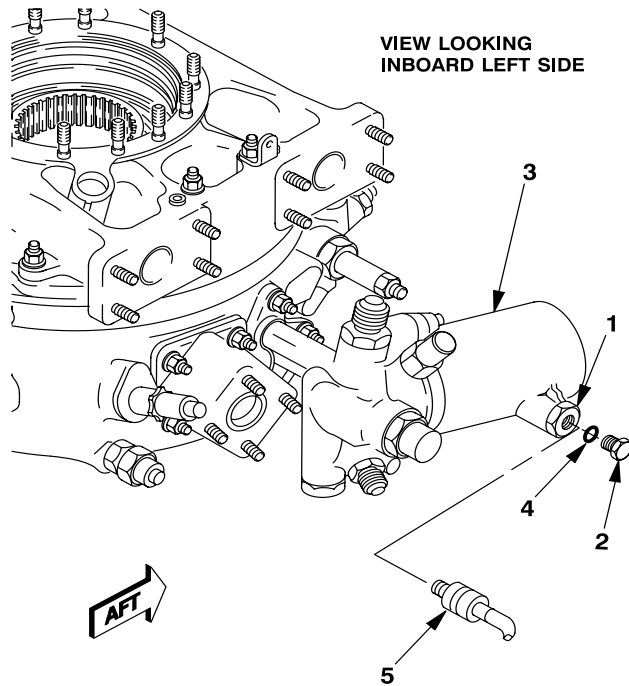
DRAIN TRANSMISSION OIL FILTER

1. Cut and remove lockwire from drain valve (1).



Lubricating Oil

2. Remove drain plug (2) from drain valve (1) installed in oil filter housing (3).
3. Remove packing (4) from drain plug (2). Discard packing (4).
4. Install drain hose (B74) (5) in drain valve (1).
5. Drain oil into suitable container (B101).
6. Remove drain hose (B74) (5) from drain valve (1).
7. Apply light coat of lubricating oil (D130 or D140) to packing (4).
8. Install packing (4) on drain plug (2).
9. Install drain plug (2) in drain valve (1).
10. Torque drain plug (2) **7 TO 12 INCH-POUNDS**.
11. Secure drain plug (2) with lockwire (D132).



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6-8-3. TRANSMISSION OIL FILTERS — REMOVAL/CLEANING/INSTALLATION (CONT)

REMOVE DISPOSABLE FILTER AND HOUSING

12. Remove two nuts (6) and two washers (7) securing oil filter housing (3) to oil filter manifold (8).

13. Remove oil filter housing (3) and filter element (9) from oil filter manifold (8).

14. Remove packing (10) from oil filter housing (3).

15. Discard packing (10).

16. Inspect filter element (9) for contamination.

17. Inspect upper and lower chip detectors for metal (Task 6-3-8 & Task 6-3-11).

NOTE

If metal is found on chip detectors or filter element (9), oil sample shall be taken. Foreign material shall be identified (Task 6-1-4, Table 6-1-1).

18. After inspection, discard filter element (9).

NOTE

- Removal of bypass indicator valve not required on filter change unless packing is leaking or bypass indicator is defective.
- If removal of bypass indicator valve and retainer is not required, go to step 23.

19. Remove outer lockring (11) from oil filter housing (3).

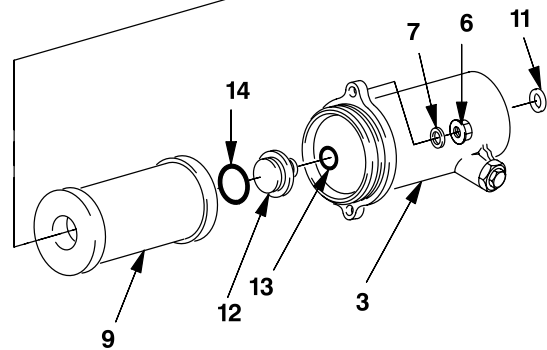
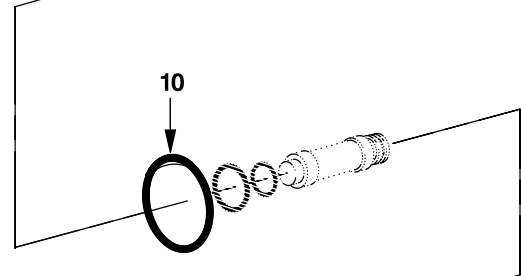
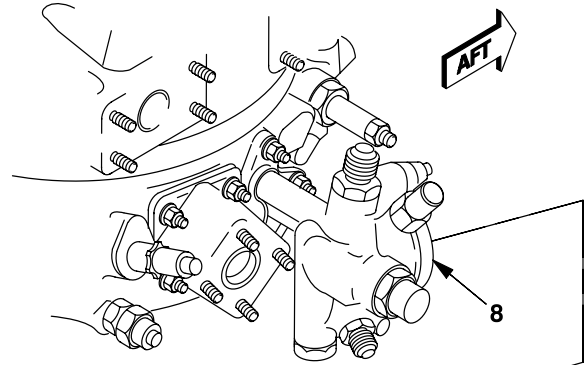
20. Remove bypass indicator valve and retainer (12) from oil filter housing (3).

21. Remove packing (13) from bypass indicator valve and retainer (12).

22. Discard packing (13).

23. Remove packing (14) from bypass indicator valve and retainer (12).

24. Discard packing (14).



VIEW LOOKING
INBOARD LEFT SIDE

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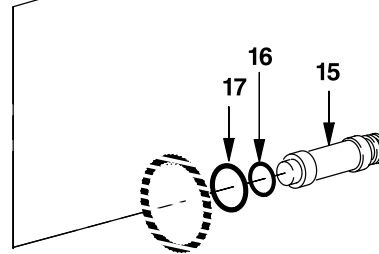
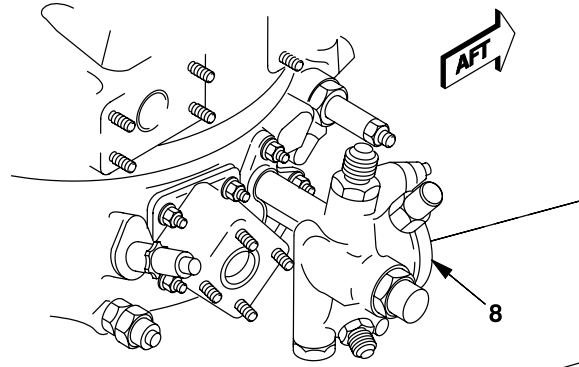
6-8-3. TRANSMISSION OIL FILTERS — REMOVAL/CLEANING/INSTALLATION (CONT)

REMOVE 45-MICRON METAL FILTER

25. Remove 45-micron metal filter (15) with packing (16).

26. Remove packing (17) from oil filter manifold (8).

27. Discard packings (16) and (17).



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INBOARD LEFT SIDE

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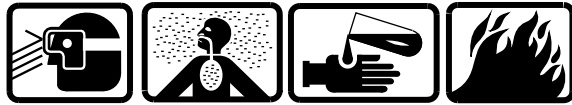
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6-8-3. TRANSMISSION OIL FILTERS — REMOVAL/CLEANING/INSTALLATION (CONT)

CLEAN 45-MICRON METAL FILTER

28. Clean 45-micron metal filter as follows:

a. Preferred Method.



Drycleaning Solvent



Acetone

(1) Using drycleaning solvent (D199) or acetone (D2), ultrasonically clean 45-micron filter at 140 to 150 °F. Continuously filter ultrasonic cleaner (D64) at low pressure through 45-micron filter. Maintain minimum of 7 psi at bottom of tank area. Fluid depth within cleaning tank not to exceed **14 inches**.

(2) Allow 10 to 30 minutes for cleaning time.



Compressed Air

CAUTION

Use of common shop grade compressed air can result in contaminated filter. Only filtered compressed air shall be used.

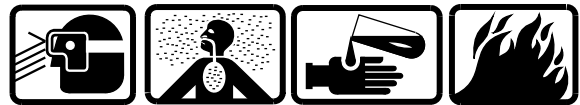
(3) To dry filter, place in oven at 120 ±10 °F or use filtered, compressed air.

(4) When filter is dry, place in clean, sealed plastic bag (D153).

b. Alternate Method.



Drycleaning Solvent



Acetone

(1) Use drycleaning solvent (D199) or acetone (D2), vigorously agitate filter in solution. Repeat cycle three times using new solvent solution each time.



Compressed Air

CAUTION

Use of common shop grade compressed air can result in contaminated filter. Only filtered compressed air shall be used.

(2) Using flushing nozzle and filtered, compressed air, backflush element during cleaning procedure.

(3) Apply air to filter to produce flow from inside to outside filter. This reverse flow will result in more thorough cleaning of filter.

(4) To dry filter use filtered compressed air or dry in oven at 120 ±10 °F.

29. Inspect 45-micron filter visually for damage to filter media, end fittings, or spring.

30. Replace 45-micron filter if any defects are visible on filter media, end fittings, or bond joints.

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6-8-3. TRANSMISSION OIL FILTERS — REMOVAL/CLEANING/INSTALLATION (CONT)

INSTALL 45-MICRON METAL FILTER

CAUTION

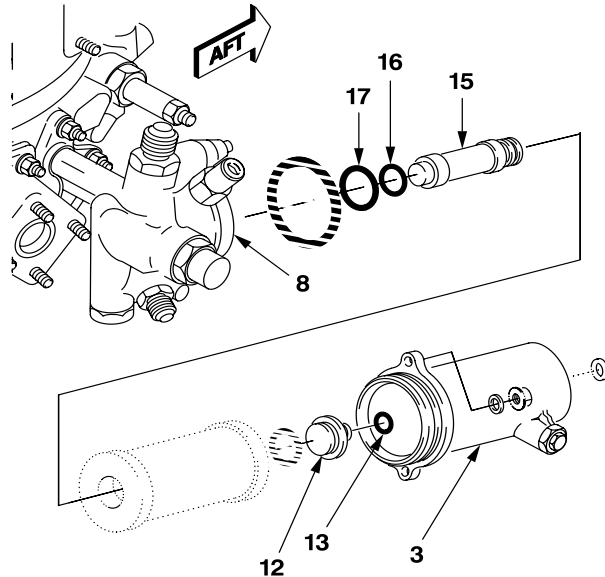
Lubricating oils DOD-L-85734 (D139) and MIL-L-7808 (D140) shall not be mixed. Oil type currently being used in transmission shall be the same oil used to lubricate packings.

31. Install packing (17) on filter manifold (8).



Lubricating Oil

32. Apply lubricating oil (D139 or D140) to packing (16).
33. Install packing (16) on 45-micron metal filter (15).
34. Install 45-micron metal filter (15) with packing (16) in oil filter manifold (8).



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INSTALL DISPOSABLE OIL FILTER ELEMENT AND HOUSING



Lubricating Oil

NOTE

If bypass indicator valve and retainer has not been removed from oil filter housing, steps 35. through 38. shall be omitted.

35. Apply lubricating oil (D139 or D140) to packing (13).
36. Install packing (13) on bypass indicator valve and retainer (12).
37. Install bypass indicator valve and retainer (12) in oil filter housing (3).

GO TO NEXT PAGE

6-8-3. TRANSMISSION OIL FILTERS — REMOVAL/CLEANING/INSTALLATION (CONT)

38. Secure bypass indicator valve and retainer (12) by installing outer locking (11).

NOTE

Oil filter housing is designed so that it is necessary to place it in a vertical position to reset the bypass indicator.

39. If oil filter is being changed because of extended bypass indicator, place housing (3) in vertical position and reset bypass indicator.

40. Apply lubricating oil (D139 or D140) to packing (14).

41. Install packing (14) on bypass indicator valve and retainer (12).

42. Install filter element (9) in oil filter housing (3), seated on packing (14) of bypass indicator valve and retainer (12).

43. Apply lubricating oil (D139 or D140) to packing (10).

44. Install packing (10) on oil filter housing (3).

45. Install oil filter element (9) and oil filter housing (3) on oil filter manifold (8).

46. Secure oil filter housing (3) with two washers (7) and two nuts (6).

47. Torque nuts (6) **100 TO 140 INCH-POUNDS**.

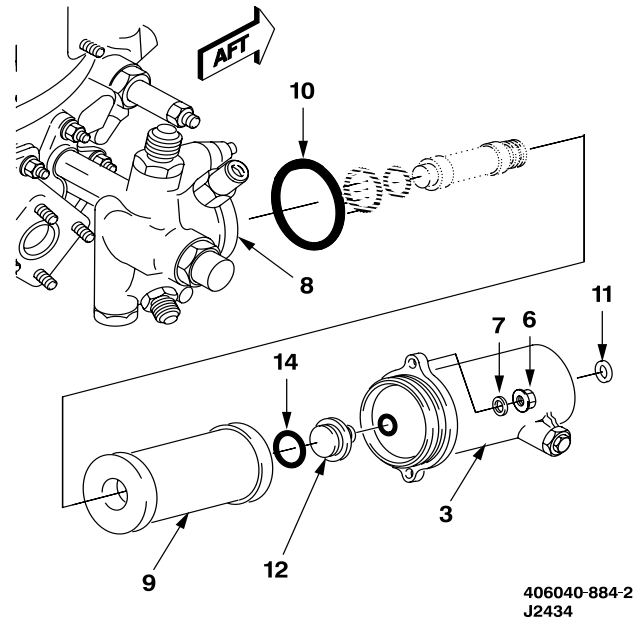
INSPECT

FOLLOW-ON MAINTENANCE

Service transmission oil system (Task 1-4-8).

■ Install forward fairing assembly (Task 2-2-47).

Pilot perform MOC (TM 1-1520-248-10/CL).



END OF TASK

6-8-4. OIL FILTER MANIFOLD — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)

Material:
Lockwire (D132)
Lubricating Oil (D139 or D140)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Engine Cowl Assembly Removed (Task 2-2-50)
Forward Fairing Assembly Removed (Task 2-2-47)
Air Induction Cowling Removed (Task 4-2-1)
Transmission Oil Drained (Task 1-4-7)

GO TO NEXT PAGE

6-8-4. OIL FILTER MANIFOLD — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect oil filter inlet hose fitting (1) from oil filter manifold inlet fitting (2). Cap oil filter inlet hose fitting (2).

2. Disconnect oil filter outlet hose fitting (3) from oil filter manifold outlet fitting (4). Cap oil filter outlet hose fitting (3).

3. Remove oil filters and filter housing (5) (Task 6-8-3) from oil filter manifold (6).

4. Disconnect electrical connector (7) from cabin roof mounted connector (8).

5. Remove three nuts (9), three steel washers (10), and three aluminum washers (11) securing oil filter manifold (6) to transmission (12).

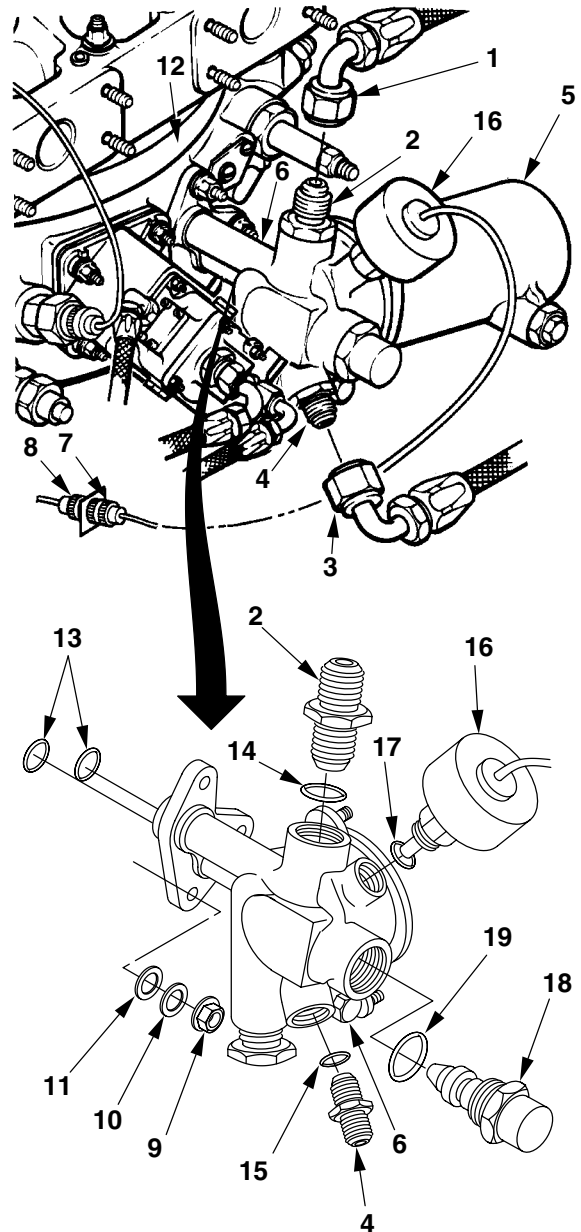
6. Remove unserviceable oil filter manifold (6) with two packings (13) and place on suitable work surface.

7. Remove oil filter manifold inlet fitting (2) with packing (14) from oil filter manifold (6). Discard packing (14).

8. Remove oil filter manifold outlet fitting (4) with packing (15) from oil filter manifold (6). Discard packing (15).

9. Cut lockwire and remove oil temperature transducer (16) with packing (17) from oil filter manifold (6). Discard packing (17).

10. Cut lockwire and remove thermostat (18) with packing (19) from oil filter manifold (6). Discard packing (19).



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6-8-4. OIL FILTER MANIFOLD — REMOVAL/INSTALLATION (CONT)

11. Cut lockwire and remove oil filter bypass valve (20) with packing (21) from oil filter manifold (6).

12. Discard packing (21).

INSTALL



Lubricating Oil

NOTE

All packings shall be lubricated with lubricating oil (D139 or D140).

13. Install packing (21) on oil filter bypass valve (20) and install oil filter bypass valve (20) in oil filter manifold (6).

14. Secure oil filter bypass valve (20) with lockwire (D132).

15. Install packing (19) on thermostat (18) and install thermostat (18) in oil filter manifold (6).

16. Secure thermostat (18) with lockwire (D132).

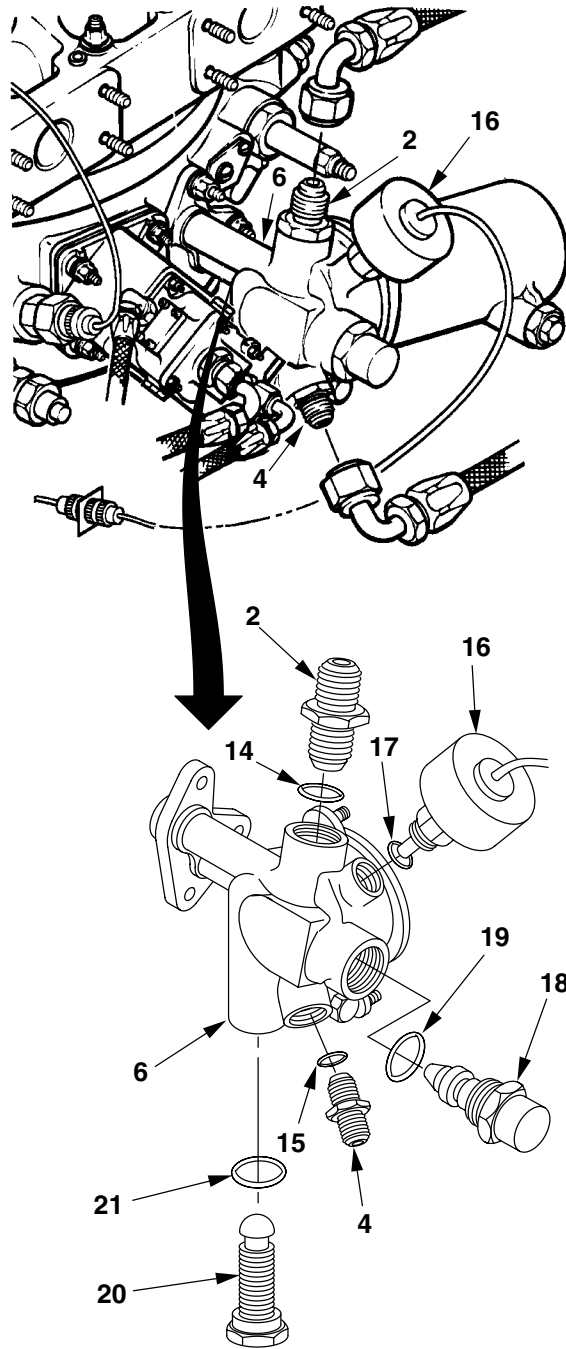
17. Prepare surfaces on oil temperature transducer (16) and oil filter manifold (6) to ensure Class H electrical bond (Appendix M).

18. Install packing (17) on oil temperature transducer (16) and install oil temperature transducer (16) in oil filter manifold (6).

19. Secure oil temperature transducer (16) with lockwire (D132).

20. Install packing (15) on oil filter manifold outlet fitting (4) and install fitting (4) in oil filter manifold (6).

21. Install packing (14) on oil inlet fitting (2) and install fitting (2) into oil filter manifold (6).



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6-8-4. OIL FILTER MANIFOLD — REMOVAL/INSTALLATION (CONT)

22. Install two packings (13) on oil filter manifold (6).

23. Install oil filter manifold (6) on transmission (12) and secure with three aluminum washers (11), three steel washers (10), and three nuts (9).

24. Torque nuts (9) **50 TO 70 INCH-POUNDS**.

25. Connect electrical connector (7) to cabin roof mounted electrical connector (8).

26. Connect oil filter outlet hose fitting (3) to oil filter manifold outlet fitting (4).

27. Connect oil filter inlet hose fitting (1) to oil filter manifold inlet fitting (2).

28. Replace oil filter and reinstall filter housing (5) to oil filter manifold (6) (Task 6-8-3).

INSPECT

FOLLOW-ON MAINTENANCE

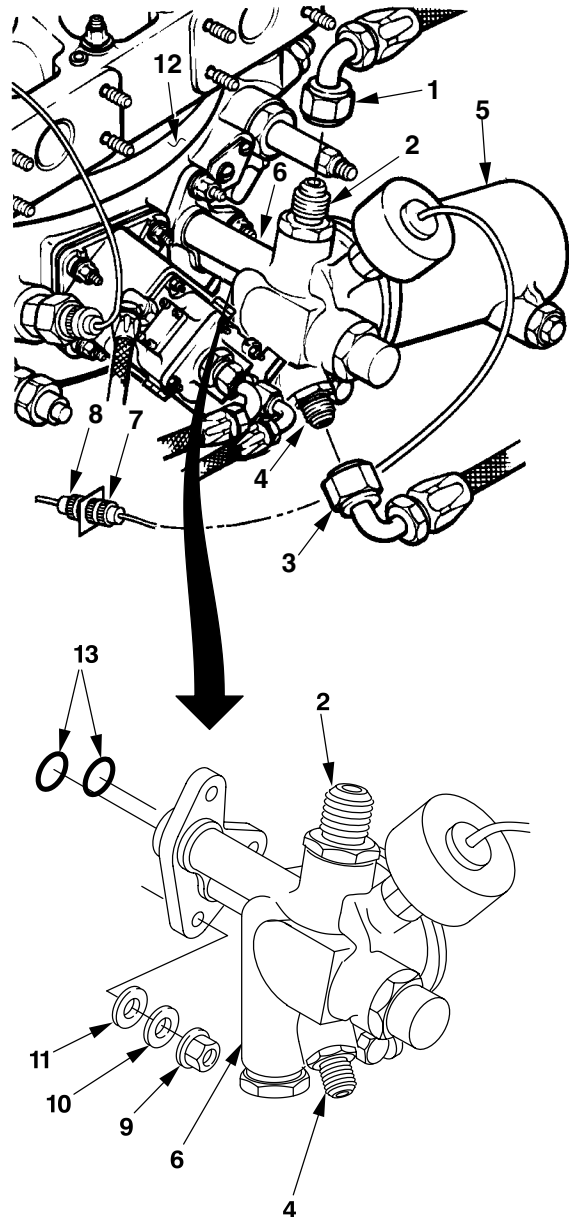
Service transmission oil system (Task 1-4-8).

Install air induction cowling (Task 4-2-4).

Install engine cowl assembly (Task 2-2-50).

Install forward fairing assembly (Task 2-2-47).

Pilot perform MOC (TM 1-1520-248-10/CL).



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END OF TASK

6-8-5. OIL FILTER MANIFOLD — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B240)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)

Aluminum Oxide Abrasive Cloth (D44)
Epoxy Primer Coating (D98)
Chromic Acid 5% Solution (D61)
Chromate Conversion Coating (D59)
Acrylic Lacquer (D126)
Corrosion Preventive Compound (D82)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

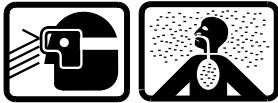
References:
TM 55-1500-345-23

CLEAN



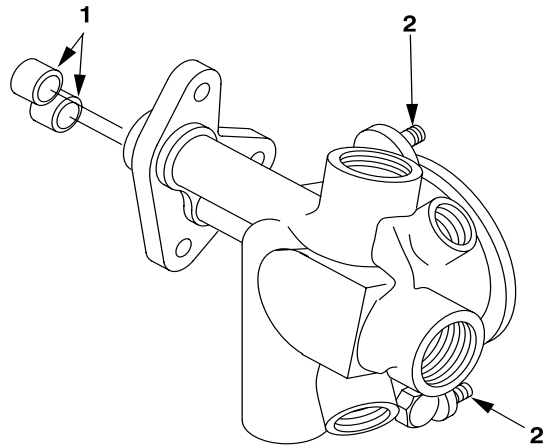
Drycleaning Solvent

1. Clean oil filter manifold with drycleaning solvent (D199).



Compressed Air

2. Dry oil filter manifold with filtered compressed air.



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INSPECT

3. Inspect oil filter manifold for cracks, nicks, scratches, burrs, chafing, and general condition.

4. Inspect oil filter manifold for corrosion. If corrosion damage exceeds **0.030 inch** maximum depth on nonfunctional surfaces or **0.005 inch** maximum depth in mounting (stud) holes, replace oil filter manifold.

5. Inspect for damaged, loose, or worn bushings (1).

6. Inspect for damaged, loose, or worn stud (2).

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6-8-5. OIL FILTER MANIFOLD — CLEANING/INSPECTION/REPAIR (CONT)

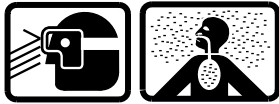
REPAIR

7. Using 240 grit aluminum oxide abrasive cloth (D44), burnish small nicks, scratches, burrs, and chafing.

8. Apply epoxy primer coating (D98) after repair is completed (TM 55-1500-345-23).

CAUTION

Damage limits shall not be exceeded during repair.

**Sanding Operations**

9. Using 240 grit aluminum oxide abrasive cloth (D44), sand corroded area; blend repaired area into surrounding area.

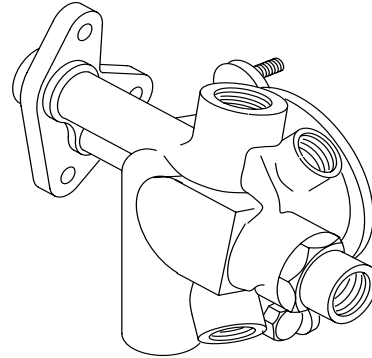
10. Using chromic acid 5% solution (D61), treat repaired area (TM 55-1500-345-23).

11. Using clean (potable) water, rinse repaired area.

12. Using clean wiping rags (D164), thoroughly dry repaired area.

13. Using chromate conversion coating (D59), treat repaired areas (TM 55-1500-345-23).

14. Apply one coat of epoxy primer coating (D98) to repaired area (TM 55-1500-345-23). Allow to dry for 1 to 8 hours prior to subsequent coating.



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6-8-5. OIL FILTER MANIFOLD — CLEANING/INSPECTION/REPAIR (CONT)

15. Apply two coats of acrylic lacquer (D126) to repaired area (TM 55-1500-345-23).

16. Replace damaged, loose, or worn stud (2) as follows:

NOTE

These instructions are applicable to standard type studs which thread directly into cases and sleeves.

a. Measure and record height of damaged stud (2) before removal. Use suitable tool to grip stud. Turn stud out slowly to avoid seizure and breakage. If stud is broken off, drill hole in center of broken stud and use easy-out type extractor.

b. Select replacement stud (2); generally, the next larger oversize will be required to obtain correct driving torque.

c. Driving torque for 5/16-inch stud is **100 TO 225 INCH-POUNDS**.

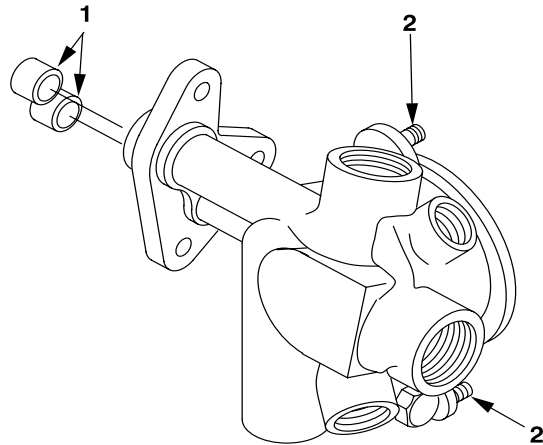
17. Replace damaged or loose bushings (1) as follows:

a. Using suitable tool, grip bushing (1); pull bushing out of oil filter manifold.

b. Inspect oil filter manifold bushing bore for **0.688 to 0.689 inch** maximum diameter.

c. Replace oil filter manifold if damage exceeds limits.

d. Align and press new bushing (1) into oil filter manifold.



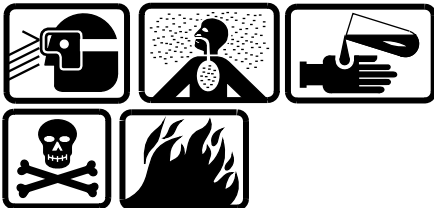
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CAUTION

Corrosion preventive compound shall not be allowed to enter metallic or elastomeric bearings or come in contact with seals.

18. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals that are exposed to the environment.

INSPECT



Corrosion Preventive Compound

END OF TASK

6-8-6. OIL PRESSURE REGULATOR VALVE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Open End Wrench (B216)

Material:
Lockwire (D132)
Lubricating Oil (D139 or D140)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

6-8-6. OIL PRESSURE REGULATOR VALVE — REMOVAL/INSTALLATION (CONT)

1. Gain access to oil pressure regulator valve (1) through left side panel of air induction cowling.

REMOVE

2. Cut lockwire and remove oil pressure regulator valve (1) with packings (2 and 3) from transmission (4).

3. Remove packing (2) from groove (5) at bottom of oil pressure regulator valve (1).

4. Remove packing (3) from transmission mating surface (6) of oil pressure regulator valve (1).

5. Discard packings (2 and 3).

6. Inspect oil pressure regulator mounting area of transmission (4) for any damaged threads.

INSPECT

7. Inspect oil pressure regulator valve (1) (Task 6-8-8).

INSTALL

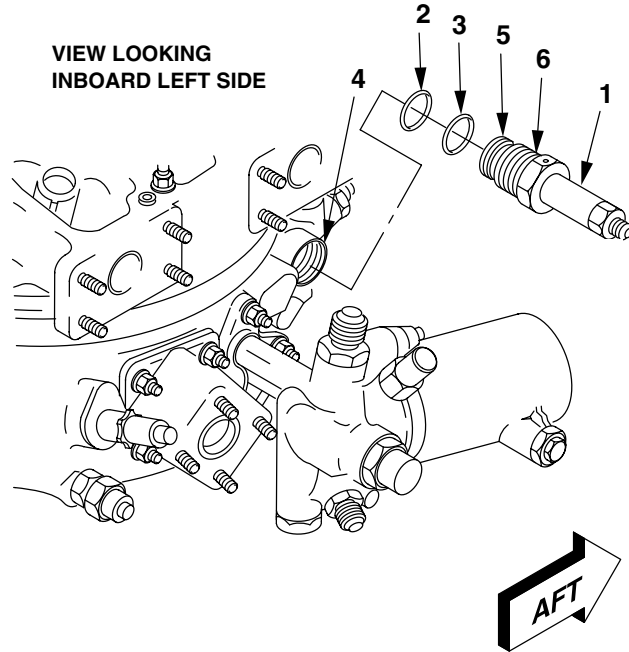


Lubricating Oil

NOTE

All packings should be lubricated with lubricating oil (D139 or D140) before installing.

8. Install packing (3) against transmission mating surface (6) of oil pressure regulator valve (1).



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9. Install packing (2) in groove (5) at bottom of oil pressure regulator valve (1).

10. Install oil pressure regulator valve (1) in transmission (4).

11. Secure oil pressure regulator valve (1) with lockwire (D132).

INSPECT

FOLLOW-ON MAINTENANCE

Pilot perform MOC (TM 1-1520-248-10/CL).

Adjust oil pressure regulator valve (Task 6-8-7).

END OF TASK

6-8-7. OIL PRESSURE REGULATOR VALVE — ADJUSTMENT

This task covers: Adjustment (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Pressure Gage (B50)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

6-8-7. OIL PRESSURE REGULATOR VALVE — ADJUSTMENT (CONT)

WARNING

MAIN AND TAIL ROTOR BLADES

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

1. Gain access to oil pressure regulator valve through air induction cowling left side panel.
2. Remove oil pressure transmitter switch (1) (Task 6-8-14).
3. Install tee (2) in oil pressure line tee (3) in place of oil pressure transmitter switch.
4. Install oil pressure transmitter switch (1) on tee (2).
5. Install 0 to 200 psi direct reading oil pressure gage (B50) on tee (2).
6. Pilot start helicopter and run up to normal operating rpm (TM 1-1520-248-10/CL).

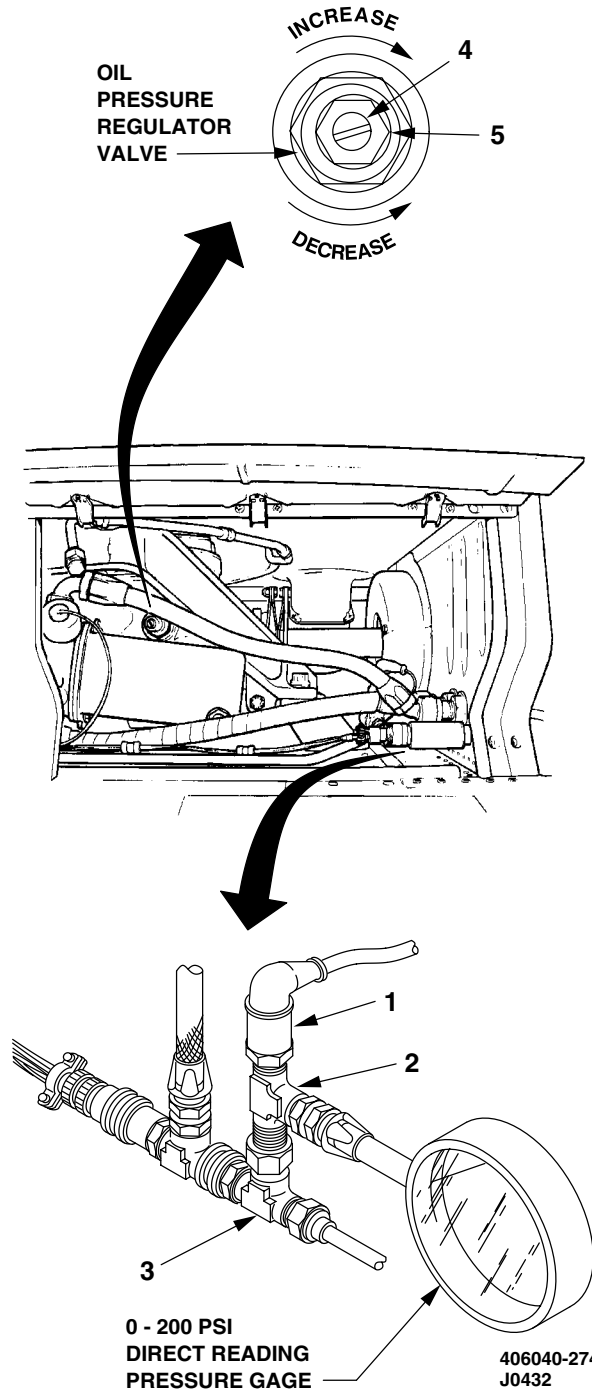
NOTE

Oil pressure regulator valve adjustment shall not be attempted until oil is hot or unless pressure is below 30 psi at normal operating rpm.

7. Check oil pressure gage (B50) for indicated range of 40-60 psi.

ADJUST

8. While holding adjustment screw (4), back off jamnut (5) just enough to adjust oil pressure.

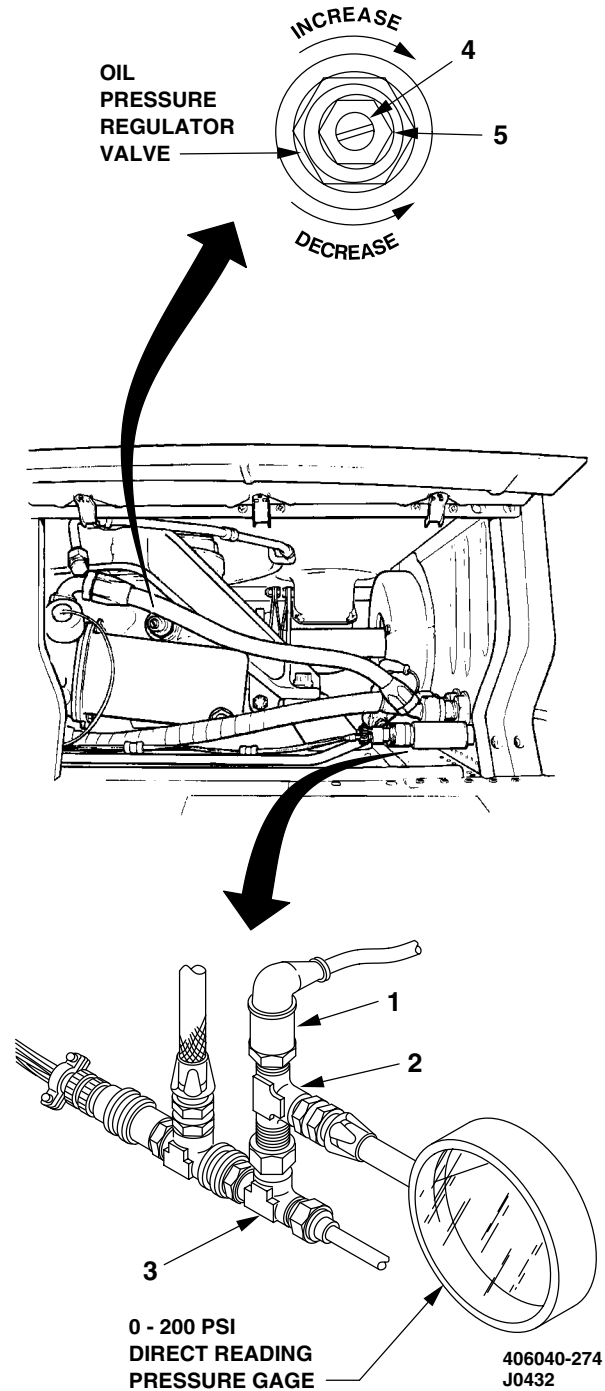


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6-8-7. OIL PRESSURE REGULATOR VALVE — ADJUSTMENT (CONT)

9. Turn adjustment screw (4) clockwise to increase oil pressure to a range of 45 to 55 psi.
10. When correct pressure is achieved hold adjustment screw (4) with a flat tip screwdriver and tighten jamnut (5).
11. Pilot shut down helicopter (TM 1-1520-248-10/CL).
12. Remove 0 to 200 psi direct reading oil pressure gage (B50) from tee (2).
13. Remove oil pressure transmitter switch (1) from tee (2).
14. Remove tee (2) from oil pressure line tee (3).
15. Install oil pressure transmitter switch (1) (Task 6-8-14).

INSPECT



END OF TASK

6-8-8. OIL PRESSURE REGULATOR VALVE — DISASSEMBLY/ASSEMBLY

This task covers: Disassembly, Cleaning, Inspection, and Assembly (Off Helicopter)

INITIAL SETUP

Rubber Gloves (D111)
Paint Brush (D54)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

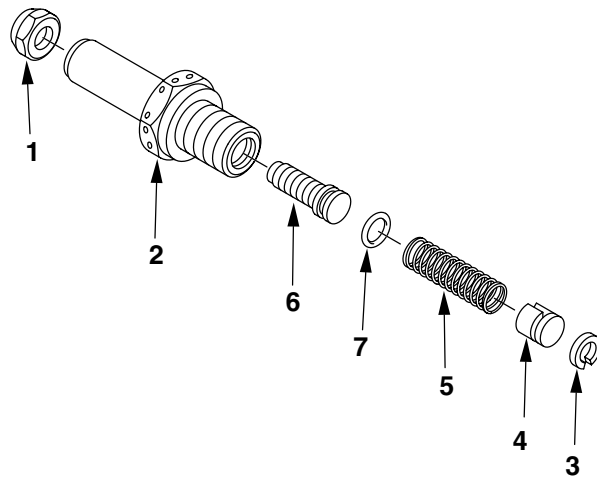
Tools:
General Mechanic Tool Kit (B178)

References:
TM 1-1500-344-23

Material:
Drycleaning Solvent (D199)
Wiping Rag (D164)

DISASSEMBLE

1. Remove jamnut (1) from regulator valve (2).
2. Remove retaining ring (3), piston (4), and spring (5) from regulator valve (2).
3. Remove screw (6).
4. Remove and discard packing (7).

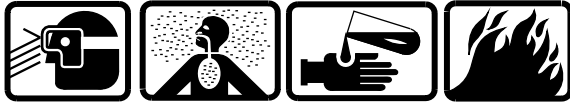


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6-8-8. OIL PRESSURE REGULATOR VALVE — DISASSEMBLY/ASSEMBLY (CONT)

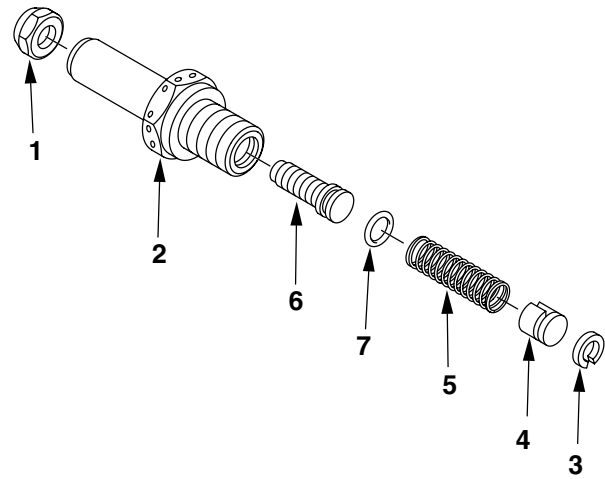
CLEAN

**Drycleaning Solvent**

5. Clean regulator valve (2) with drycleaning solvent (D199) using paint brush (D54).
6. Clean jamnut (1) with drycleaning solvent (D199) using paint brush (D54).
7. Clean piston (4) with drycleaning solvent (D199) using wiping rag (D164).
8. Dry regulator valve (2) with wiping rag (D164).
9. Dry jamnut (1) with wiping rag (D164).
10. Dry piston (4) with wiping rag (D164).

INSPECT

11. Inspect jamnut (1) for damaged threads and corrosion (TM 1-1500-344-23).
12. Replace jamnut (1) if damaged.
13. Inspect regulator valve (2) for cracks, thread damage, and corrosion (TM 1-1500-344-23).
14. Replace regulator valve (2) if cracked or thread area damaged.
15. Inspect piston (4) and spring (5) for freedom of movement and any visible damage.
16. Replace regulator valve (2) if piston (4), spring (5), or screw (6) show evidence of damage.

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ASSEMBLE

17. Install packing (7) on screw (6).
18. Install screw (6) in regulator valve (2).
19. Install spring (5), piston (4), and retaining ring (3) in regulator valve (2).
20. Install jamnut (1) on regulator valve (2).

INSPECT

END OF TASK

6-8-9. OIL FILTER BYPASS VALVE ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Material:

Lockwire (D132)

Lubricating Oil (D139 or D140)

Applicable Configurations:

All

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)

67S Scout Helicopter Repairer

Tools:

General Mechanic Tool Kit (B178)

Open End Wrench (B216)

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6-8-9. OIL FILTER BYPASS VALVE ASSEMBLY — REMOVAL/INSTALLATION (CONT)

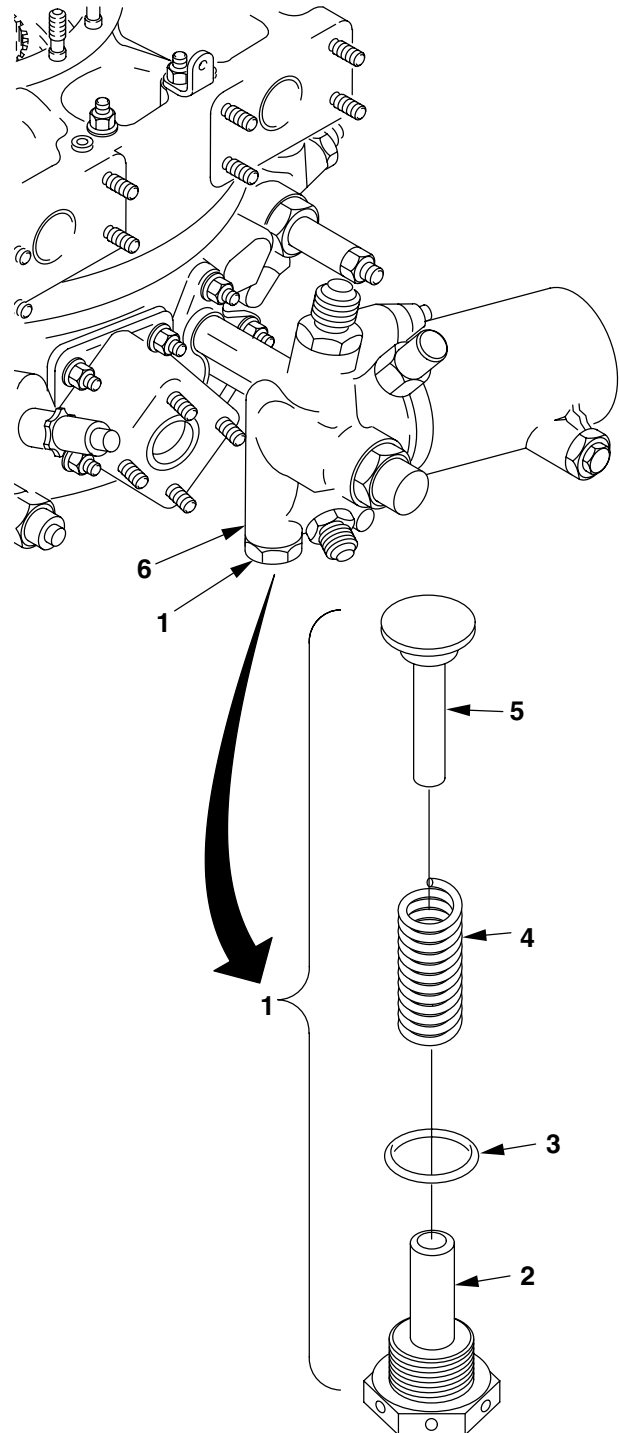
REMOVE

1. Cut lockwire and remove oil filter bypass valve assembly (1) with; bypass valve retainer (2), packing (3), bypass valve spring (4), and bypass valve (5) from oil filter manifold (6).
2. Discard packing (3).
3. Inspect bypass valve (5) (Task 6-8-10).
4. Inspect bypass valve spring (4) (Task 6-8-10).
5. Inspect bypass valve retainer (2) (Task 6-8-10).

INSTALL

**Lubricating Oil**

6. Lightly lubricate packing (3) with lubricating oil (D139 or D140).
7. Install packing (3) on oil filter bypass valve retainer (2).
8. Install oil filter bypass valve assembly (1) with; bypass valve retainer (2), packing (3), bypass valve spring (4), and bypass valve (5) in oil filter manifold (6).
9. Secure oil filter bypass valve assembly (1) with lockwire (D132).

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END OF TASK

6-8-10. OIL FILTER BYPASS VALVE ASSEMBLY — CLEANING/INSPECTION

This task covers: Cleaning and Inspection (Off Helicopter)

INITIAL SETUP

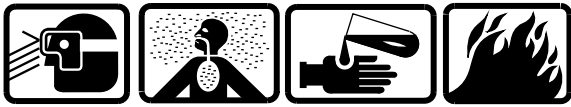
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean bypass valve (1) with drycleaning solvent (D199) using a nonmetallic brush.
2. Clean bypass valve spring (2) with drycleaning solvent (D199) using a nonmetallic brush.
3. Clean bypass valve retainer (3) with drycleaning solvent (D199) using a nonmetallic brush.

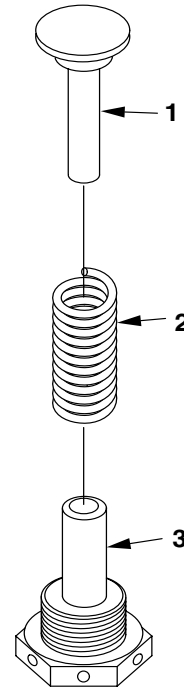
INSPECT

NOTE

Parts not meeting inspection requirements shall be rejected.

4. Inspect bypass valve (1) for wear and damage.
5. Inspect bypass valve spring (2) for free length of **2.90 inches**.
6. Inspect bypass valve retainer (3) for damaged threads.
7. Detail parts of the oil filter bypass valve assembly are nonrepairable. Replace any bypass valve which fails inspection (Task 6-8-9).

INSPECT



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END OF TASK

6-8-11. TRANSMISSION OIL JETS (NUMBER ONE AND TWO) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Lockwire (D132)
Lubricating Oil (D139 or D140)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47)
Engine Cowl Assembly Removed (Task 2-2-50)
Air Induction Cowling Removed (Task 4-2-1)

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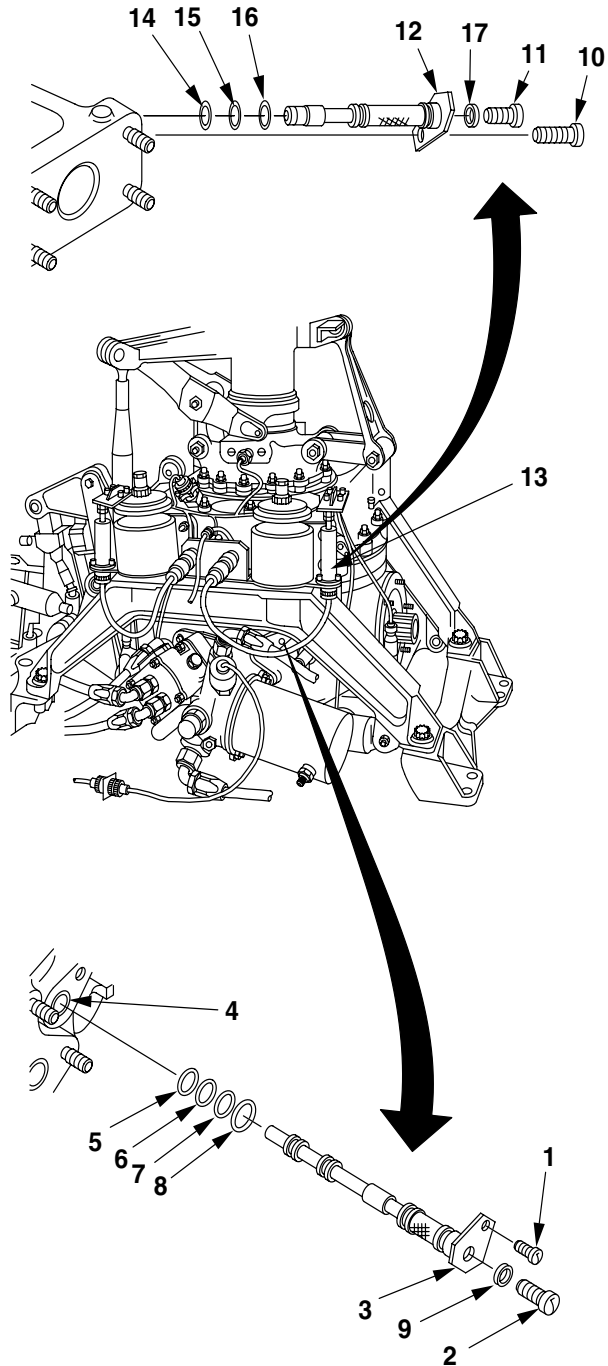
6-8-11. TRANSMISSION OIL JETS (NUMBER ONE AND TWO) — REMOVAL/INSTALLATION (CONT)

REMOVE OIL JET NUMBER ONE

1. Cut lockwire securing screw (1) to screw (2).
2. Remove screw (1) securing oil jet number one (3) to transmission oil jet mounting port (4).
3. Remove oil jet number one (3) with packings (5, 6, 7, and 8) from transmission oil jet mounting port (4).
4. Discard packings (5, 6, 7, and 8).
5. Remove screw (2) and sealing washer (9) from oil jet number one (3).
6. Discard sealing washer (9).

REMOVE OIL JET NUMBER TWO

7. Cut lockwire securing screw (10) to screw (11).
8. Remove screw (10) securing oil jet number two (12) to transmission oil jet mounting port (13).
9. Remove oil jet number two (12) with packings (14, 15, and 16) from transmission oil jet mounting port (13).
10. Discard packings (14, 15, and 16).
11. Remove screw (11) and sealing washer (17).
12. Discard sealing washer (17).



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6-8-11. TRANSMISSION OIL JETS (NUMBER ONE AND TWO) — REMOVAL/INSTALLATION (CONT)

INSTALL OIL JET NUMBER TWO



Lubricating Oil

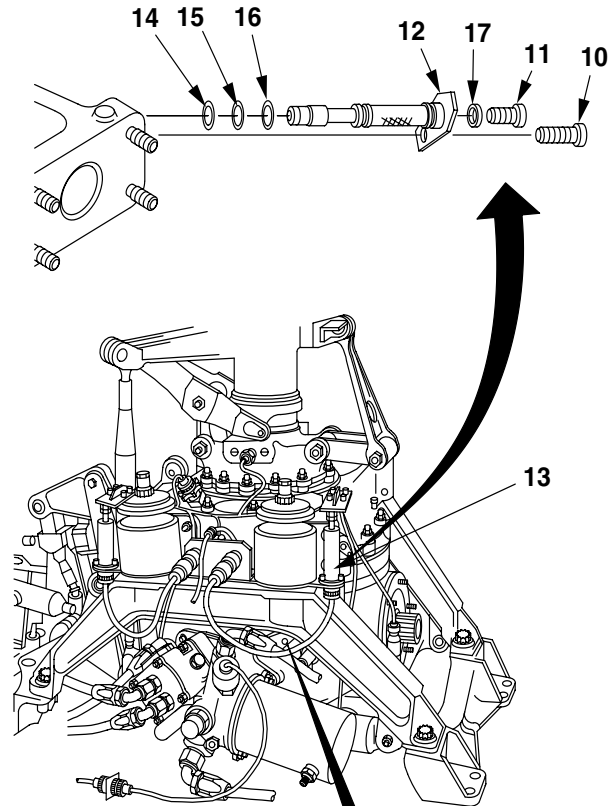
13. Lightly lubricate packings (14, 15, and 16) with lubricating oil (D139 or D140) and install on oil jet number two (12).

14. Lightly lubricate packing portion of sealing washer (17) with lubricating oil (D139 or D140) and install on screw (11).

15. Install screw (11) with sealing washer (17) on oil jet number two (12).

16. Install oil jet number two (12) in transmission oil jet mounting port (13) with screw (10).

17. Secure screw (10) to screw (11) with lockwire (D132).



INSTALL OIL JET NUMBER ONE



Lubricating Oil

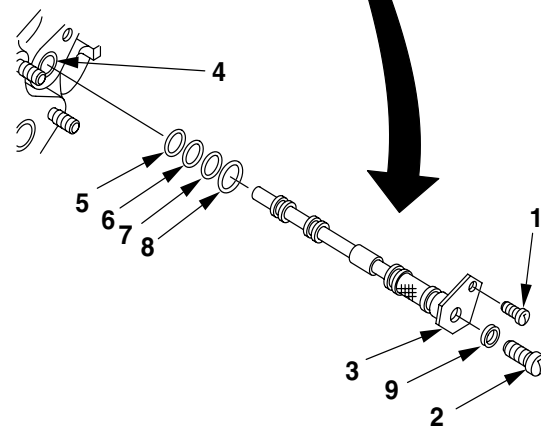
18. Lightly lubricate packings (5, 6, 7, and 8) with lubricating oil (D139 or D140) and install on oil jet number one (3).

19. Lightly lubricate packing portion of sealing washer (9) with lubricating oil (D139 or D140) and install on screw (2).

20. Install screw (2) with sealing washer (9) on oil jet number one (3).

21. Install oil jet number one (3) in transmission oil jet mounting port (4) with screw (1).

22. Secure screw (1) to screw (2) with lockwire (D132).



406040-232
J1614

GO TO NEXT PAGE

6-8-11. TRANSMISSION OIL JETS (NUMBER ONE AND TWO) — REMOVAL/INSTALLATION (CONT)

INSPECT

FOLLOW-ON MAINTENANCE

Install air induction cowling (Task 4-2-4).

Install engine cowl assembly (Task 2-2-50).

Install forward fairing assembly (Task 2-2-47).

END OF TASK

6-8-12. TRANSMISSION OIL JETS (NUMBER ONE AND TWO) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

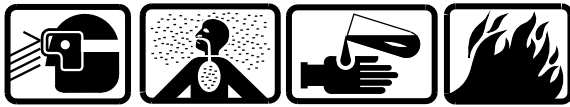
Applicable Configurations:
All

Tools:
Air Blow Gun (B56)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)

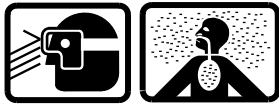
Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

CLEAN



Drycleaning Solvent

1. Clean oil jets (1 and 2) with drycleaning solvent (D199).



Compressed Air

2. Dry oil jets (1 and 2) with filtered compressed air.

INSPECT

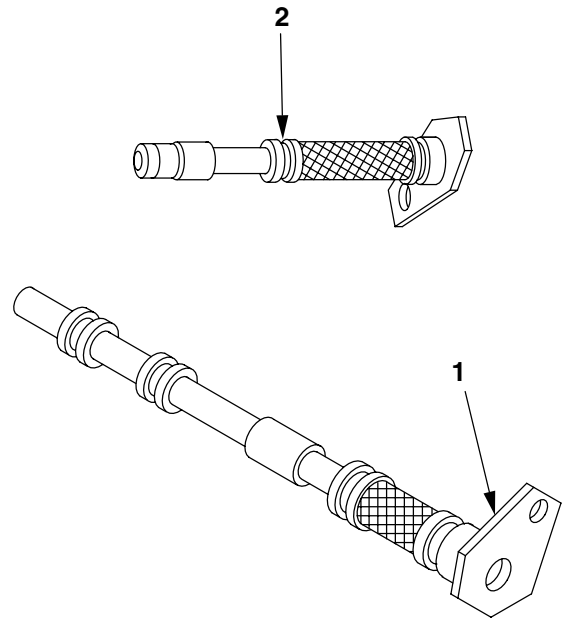
3. Inspect oil jets (1 and 2) for bends, burrs, and clogged condition.

REPAIR

4. Replace oil jet if bends or burrs are detected.

5. Unclog jets by backflushing with drycleaning solvent (D199) and filtered compressed air.

INSPECT



406040-270
J0432

END OF TASK

6-8-13. OIL FILTER INLET HOSE — REMOVAL/INSTALLATION

This task covers: Replace (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Aircraft Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

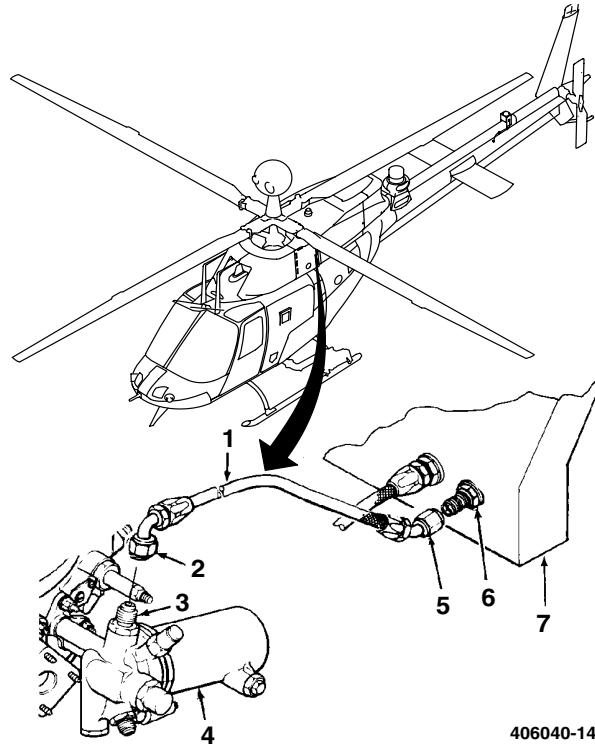
1. Gain access to oil filter inlet hose (1) through access door, left side induction cowling.
2. Disconnect forward fitting (2) from inlet fitting (3) installed on oil filter manifold (4).
3. Disconnect aft fitting (5) from fitting (6) installed on forward firewall assembly (7).

CLEAN

4. Clean oil filter inlet hose (1) with a clean dry wiping rag (D164).

INSTALL

5. Install oil filter inlet hose (1) forward fitting (2) on inlet fitting (3) oil filter manifold (4).
6. Install aft fitting (5) on fitting (6) installed on forward firewall assembly (7).
7. Close left induction cowling access door.



406040-148
J2012

INSPECT

FOLLOW-ON MAINTENANCE

Pilot perform MOC (TM 1-1520-248-10/CL).

END OF TASK

6-8-14. OIL PRESSURE SWITCH — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Lockwire (D132)
Lubricating Oil (D139 or D140)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

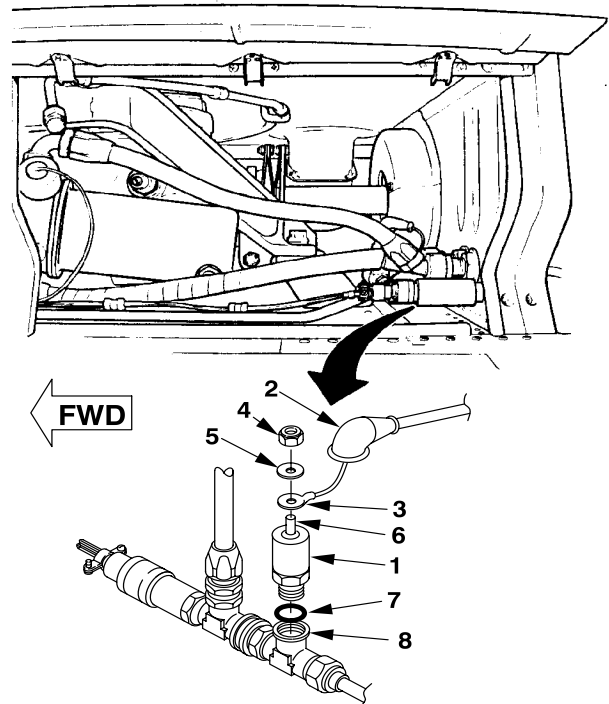
1. Gain access to oil pressure switch (1) through access door on left side of air induction cowling.

2. Remove boot (2) from top of oil pressure switch (1) and slide boot (2) down wire of electrical connector (3).

3. Remove nut (4), washer (5), and electrical connector (3) from terminal (6) on oil pressure switch (1).

4. Cut lockwire and remove oil pressure switch (1) with packing (7) from T-fitting (8).

5. Discard packing (7).



406040-150
J1614

GO TO NEXT PAGE

6-8-14. OIL PRESSURE SWITCH — REMOVAL/INSTALLATION (CONT)

INSTALL

6. Prepare surfaces on oil pressure switch (1) and T-fitting (8) to ensure Class S electrical bond (Appendix M).



Lubricating Oil

7. Lightly lubricate packing (7) with lubricating oil (D139 or D140).

8. Install packing (7) on oil pressure switch (1).

9. Install oil pressure switch (1) with packing (7) on T-fitting (8).

10. Install electrical connector (3), washer (5), and nut (4) on terminal (6).

11. Install boot (2) on terminal (6) of oil pressure switch (1).

12. Secure oil pressure switch (1) to T-fitting (8) as follows:

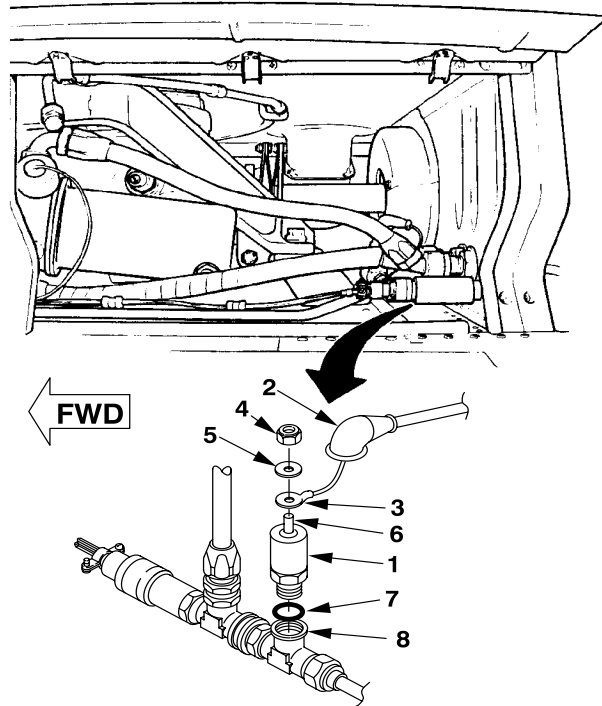
a. Double loop lockwire (D132) around T-fitting (8).

b. Twist lockwire (D132) and pig-tail at oil pressure switch (1).

INSPECT

FOLLOW-ON MAINTENANCE

Pilot perform MOC (TM 1-1520-248-10/CL).



406040-150
J1614

END OF TASK

6-8-15. OIL PRESSURE SWITCH — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

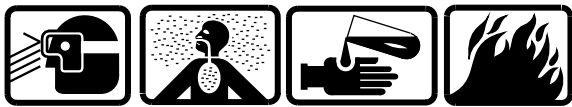
INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN**Drycleaning Solvent**

1. Clean oil pressure switch (1) using drycleaning solvent (D199) and a nonmetallic brush.
2. Dry oil pressure switch (1) with a wiping rag (D164).

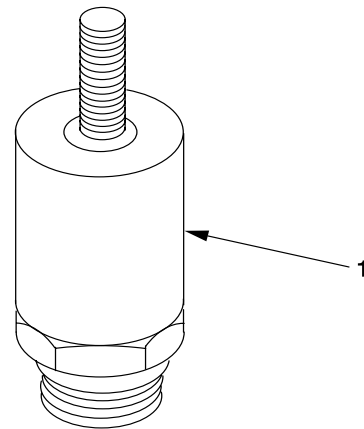
INSPECT**NOTE**

Part not meeting inspection requirements shall be rejected.

3. Inspect oil pressure switch (1) for leakage and thread damage.

REPAIR

4. Oil pressure switch (1) is nonrepairable and shall be replaced if damaged (Task 6-8-14).

INSPECT

406040-930
J2175

END OF TASK

6-8-16. OIL PRESSURE SWITCH (AVIM) — TESTING/CHECKING

This task covers: Test/Check (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Pressure Tester (B174)
Ohmmeter (B99)

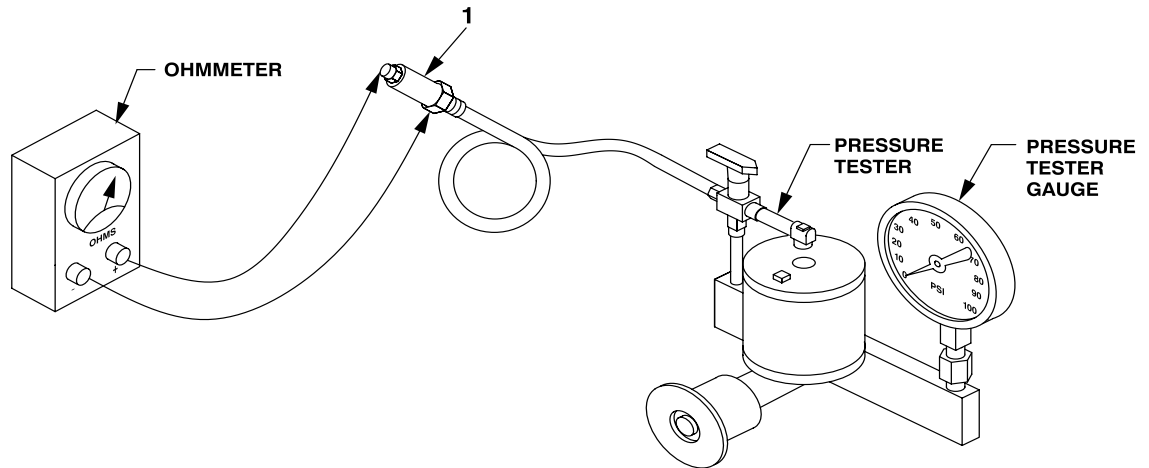
Material:
Lubricating Oil (D139 or D140)
Wiping Rag (D164)

Personnel Required:
68H Aircraft Pneudraulics Repairer
67S Scout Helicopter Technical Inspector (TI) ■

Equipment Condition:
Oil Pressure Switch Cleaned/Inspected (Task
6-8-15)

GO TO NEXT PAGE

6-8-16. OIL PRESSURE SWITCH (AVIM) — TESTING/CHECKING (CONT)

406076-133-1
J0607**Oil Pressure Switch — Test Configuration****TEST/CHECK****Lubricating Oil**

1. Attach pressure tester (B174) and ohmmeter (B99) to oil pressure switch (1).
2. Verify that pressure tester gauge (part of B174) has appropriate range (0 to 100 psi).
3. Set up pressure tester (B174) per manufacturer's instructions.
4. Verify that ohmmeter (B99) indicates continuity (switch closed).

5. While observing ohmmeter (B99) and gauge on pressure tester (B174), increase pressure to 36 psi. Oil pressure switch (1) should open at 36 psi, or sooner. Do not exceed 60 psi.

6. While observing ohmmeter (B99) and gauge on pressure tester (B174), decrease pressure. Oil pressure switch (1) should close at 30 ± 2 psi.

7. Discard oil pressure switch (1) if it fails either test.

8. If oil pressure switch (1) passes tests, return to stock.

INSPECT

END OF TASK

6-8-17. OIL PRESSURE TRANSDUCER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Lockwire (D132)
Lubricating Oil (D139 or D140)

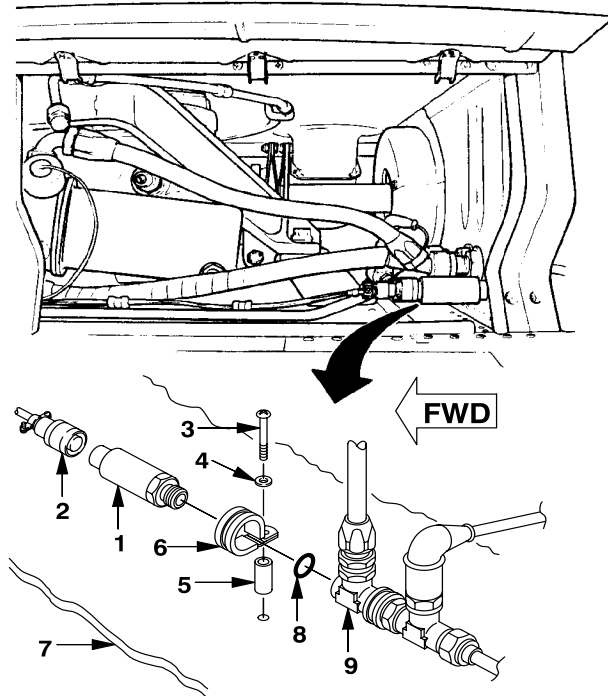
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

1. Gain access to oil pressure transducer (1) through access door on left side of air induction cowling.
2. Disconnect electrical connector (2) from oil pressure transducer (1).
3. Remove screw (3), washer (4), and spacer (5) from clamp (6) supporting oil pressure transducer (1) on cabin roof (7).
4. Remove clamp (6) from oil pressure transducer (1).
5. Cut lockwire and remove oil pressure transducer (1) with packing (8) from T-fitting (9).
6. Discard packing (8).



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J0430

GO TO NEXT PAGE

6-8-17. OIL PRESSURE TRANSDUCER — REMOVAL/INSTALLATION (CONT)

INSTALL

**Lubricating Oil**

7. Lightly lubricate packing (8) with lubricating oil (D139 or D140).

8. Install packing (8) on oil pressure transducer (1).

9. Install oil pressure transducer (1) on T-fitting (9).

10. Install clamp (6) on oil pressure transducer (1) and secure to cabin roof (7) with screw (3), washer (4), and spacer (5).

11. Connect electrical connector (2) to oil pressure transducer (1).

12. Secure oil pressure transducer (1) to T-fitting (9) as follows:

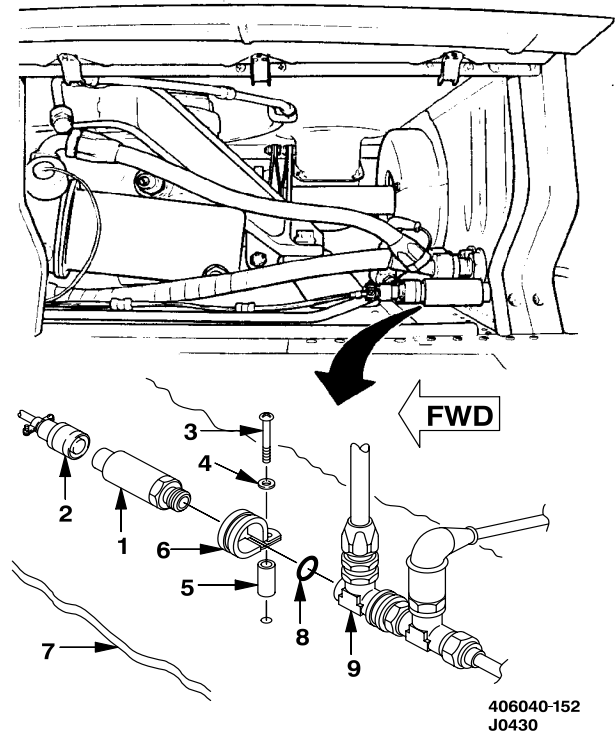
a. Double loop lockwire (D132) around T-fitting (9).

b. Twist lockwire (D132) and pig-tail at oil pressure transducer (1).

INSPECT

FOLLOW-ON MAINTENANCE

Pilot perform MOC (TM 1-1520-248-10/CL).



END OF TASK

6-8-18. OIL PRESSURE TRANSDUCER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Nonmetallic Abrasive Mats (D1)
Paint Brush (D54)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rag (D164)

References:
TM 1-1500-344-23

CLEAN



Drycleaning Solvent

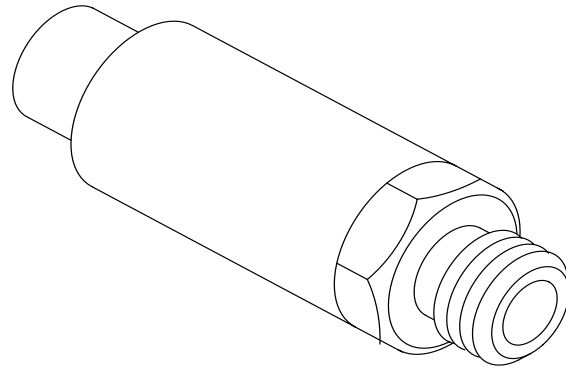
1. Using paint brush (D54), clean oil pressure transducer with drycleaning solvent (D199).
2. Dry oil pressure transducer with wiping rag (D164).

INSPECT

3. Inspect oil pressure transducer for minor nicks and scratches.
4. Inspect oil pressure transducer for corrosion (TM 1-1500-344-23).
5. Inspect oil pressure transducer for cracks and thread damage.

REPAIR

6. Remove minor nicks, scratches, and corrosion with nonmetallic abrasive mats (D1).
7. Replace oil pressure transducer for following conditions:
 - a. Cracks
 - b. Thread damage



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J1614

- c. Excessive corrosion
- d. Any damage rendering oil pressure transducer unserviceable.

END OF TASK

6-8-19. OIL PRESSURE TRANSDUCER (AVIM) — TESTING/CHECKING

This task covers: Test/Check (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Pressure Tester (B174)
Digital Multimeter (B98)

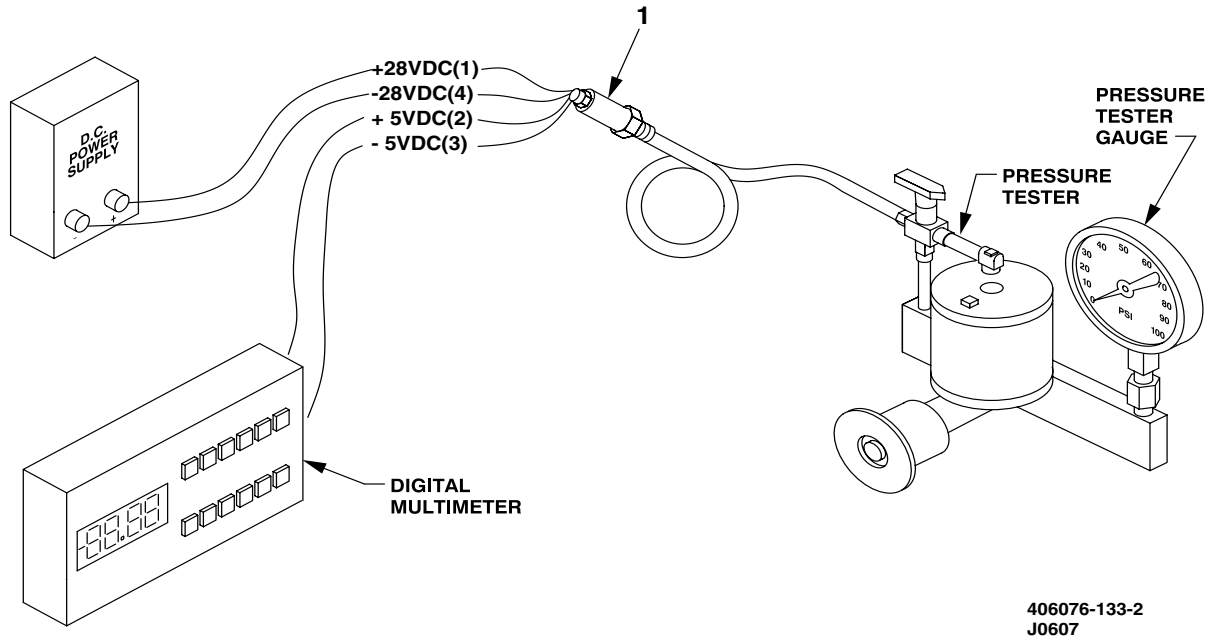
Material:
Lubricating Oil (D139 or D140)
Wiping Rag (D164)

Personnel Required:
68H Aircraft Pneudraulics Repairer
67S Scout Helicopter Technical Inspector (TI) ■

Equipment Condition:
Oil Pressure Transducer Cleaned/Inspected
(Task 6-8-18)

GO TO NEXT PAGE

6-8-19. OIL PRESSURE TRANSDUCER (AVIM) — TESTING/CHECKING (CONT)



Transducer — Test Configuration

TEST/CHECK



Lubricating Oil

- 1. Attach pressure tester (B174), 28 Vdc power supply, and digital multimeter (B98) to transducer (1).
- 2. Verify that pressure tester gauge (part of B174) has appropriate range (0 to 100 psi).
- 3. Set up pressure tester (B174) per manufacturer's instructions.

- 4. Adjust power supply output for 28 Vdc.

5. While monitoring digital multimeter (B98) and gauge on pressure tester (B174), adjust pressure tester to slowly increase pressure. Assure that transducer (1) output voltage, as indicated on digital multimeter (B98), increases as the pressure is increased and is approximately 5 Vdc when the pressure is 75 psi.

- 6. Discard transducer (1) if it fails test.

7. If transducer (1) passes test, return to stock.

INSPECT

END OF TASK

6-8-20. OIL DRAIN VALVE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Open End Wrench (B216)

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

NOTE

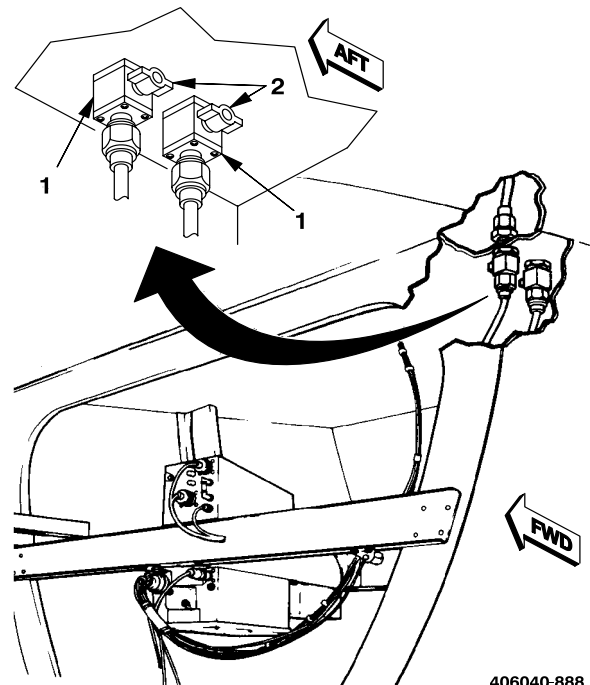
Removal procedures are same for both oil drain valves.

1. Gain access to oil drain valve (1) through aft electrical compartment door.



Lubricating Oil

2. Turn drain valve selector (2) to open position and drain oil into suitable container (B101).



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J0430

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6-8-20. OIL DRAIN VALVE — REMOVAL/INSTALLATION (CONT)

3. Disconnect fitting (3) from lower end of oil drain valve (1).

4. Gain access to fitting (4) on upper end of oil drain valve (1) through either access hole inside aft electrical compartment or through access panel above aft electrical compartment.

5. Disconnect fitting (4), jamnut (5), and washer (6) from upper end of oil drain valve (1).

6. Remove oil drain valve (1) from hole in rib.

INSTALL

7. Install oil drain valve (1) through hole in rib and secure with washer (6) and jamnut (5).

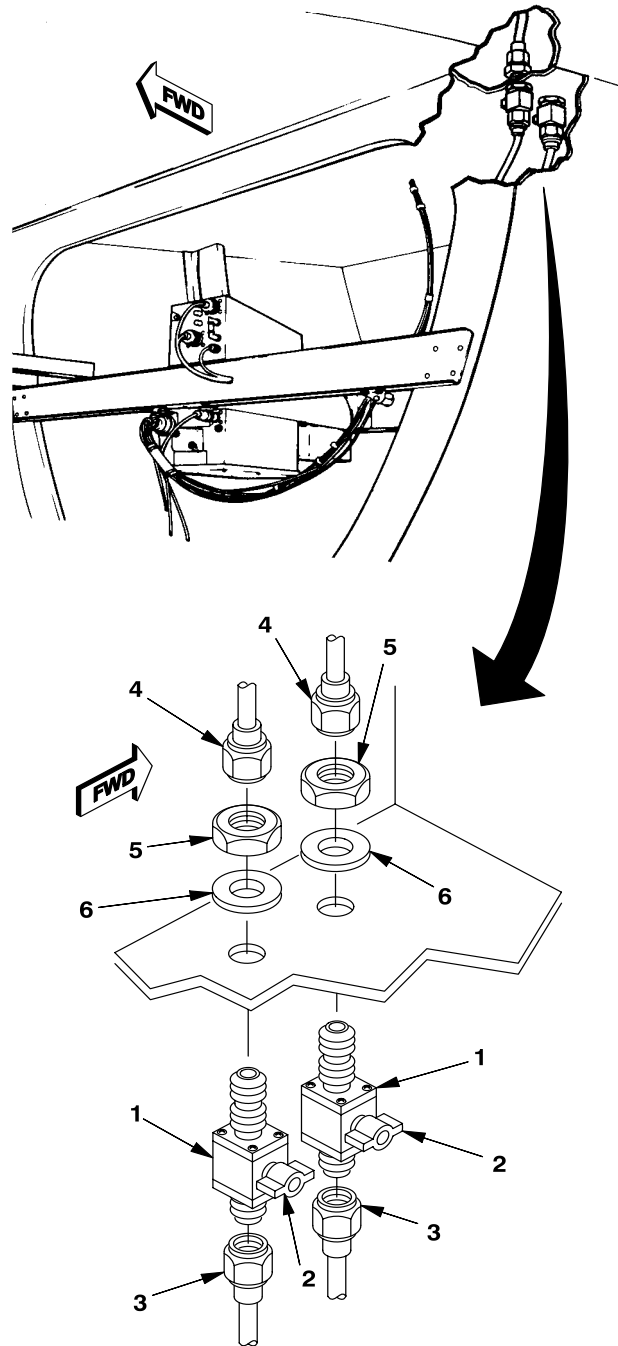
8. Connect fitting (4) to upper end of oil drain valve (1).

9. Connect fitting (3) to lower end of oil drain valve (1).

10. Turn drain valve selector (2) to closed position.

11. Service transmission oil system (Task 1-4-8).

INSPECT



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END OF TASK

6-8-21. OIL DRAIN VALVE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Nonmetallic Abrasive Mats (D1)
Paint Brush (D54)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer

Material:

Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rag (D164)

References:
TM 1-1500-344-23

CLEAN**Drycleaning Solvent**

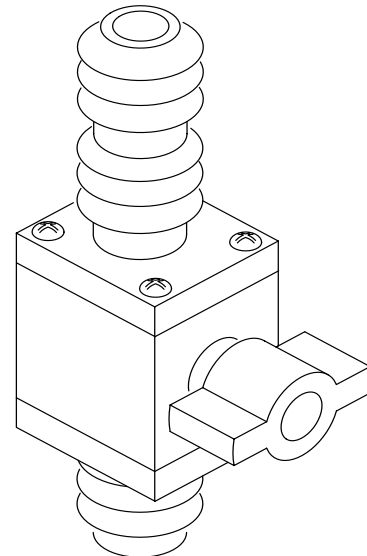
1. Using paint brush (D54), clean oil drain valve with drycleaning solvent (D199).
2. Dry oil drain valve with wiping rag (D164).

INSPECT

3. Inspect oil drain valve for minor nicks and scratches (permissible only if mechanical actuation of the valve is not interfered with).
4. Inspect oil drain valve for corrosion (TM 1-1500-344-23).
5. Inspect oil drain valve for cracks and thread damage.
6. Inspect for external or internal leakage. No leakage allowed.

REPAIR

7. Remove minor nicks, scratches, and corrosion with nonmetallic abrasive mats (D1).
8. Replace oil drain valve for following conditions:
 - a. Cracks



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- b. Thread damage
- c. Excessive corrosion
- d. Evidence of leakage
- e. Any damage rendering oil drain valve unserviceable.

END OF TASK

6-8-22. TEMPERATURE CONTROL VALVE (ENGINE OIL SYSTEM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Socket (B154)
Torque Wrench (B241)

Material:
Lockwire (D132)
Lubricating Oil (D231 or D140)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Aft Fairing Assembly Removed (Task 2-2-55) ■

GO TO NEXT PAGE

6-8-22. TEMPERATURE CONTROL VALVE (ENGINE OIL SYSTEM) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove lockwire securing temperature control valve (1).
2. Using 1 1/8 inch socket (B154), remove temperature control valve (1) and packing (2) from oil cooler (3).
3. Remove packing (2) and discard.

INSTALL



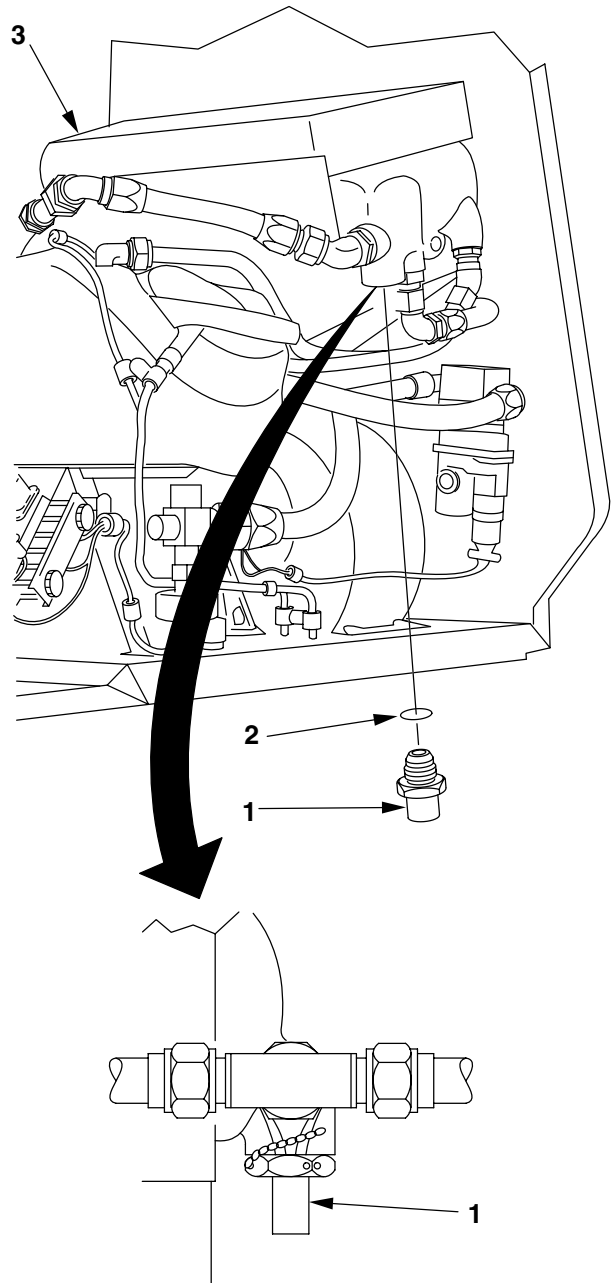
Lubricating Oil

4. Lubricate packing (2) with lubricating oil (D231 or D140).
5. Install packing (2) on temperature control valve (1).
6. Using 1 1/8 inch socket (B154), install temperature control valve (1) on oil cooler (3).
7. Torque temperature control valve (1) **375 TO 425 INCH-POUNDS**.
8. Secure temperature control valve (1) with lockwire (D132).

INSPECT

FOLLOW-ON MAINTENANCE

- Pilot perform MOC (TM 1-1520-248-10/-CL).
- Install aft fairing assembly (Task 2-2-55).



VIEW LOOKING FORWARD
RIGHT SIDE

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J0432

END OF TASK

6-8-23. TEMPERATURE CONTROL VALVE (ENGINE OIL SYSTEM) — CLEANING/INSPECTION/
REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

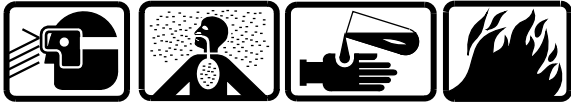
Tools:
Thermometer (B175)
Micrometer Depth Gage (B48)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rags (D164)
Nonmetallic Abrasive Mats (D1)

Personnel Required:
67S Scout Helicopter Repairer

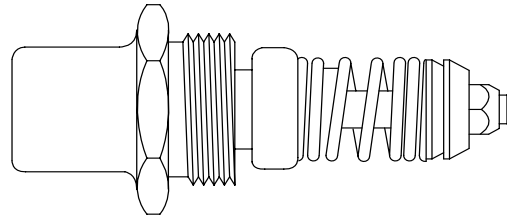
References:
TM 1-1500-344-23

CLEAN



Drycleaning Solvent

1. Clean temperature control valve with drycleaning solvent (D199).
2. Dry temperature control valve with wiping rag (D164).



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J1614

GO TO NEXT PAGE

 6-8-23. TEMPERATURE CONTROL VALVE (ENGINE OIL SYSTEM) — CLEANING/INSPECTION/REPAIR (CONT)

INSPECT

3. Inspect temperature control valve for minor nicks and scratches (allowed on all portions of valve except threads and valve seat).

4. Inspect temperature control valve for corrosion (TM 1-1500-344-23).

5. Inspect temperature control valve for cracks.

6. Inspect threaded area and valve seat of temperature control valve for damage.

WARNING

Handling of hot parts with bare hands may cause reddening and blistering of skin, or third degree burns. If skin is burned, injured area should be immersed in cold water for 10 minutes. If pain persists, immediate medical attention shall be obtained. When handling hot parts, approved gloves shall be worn.

7. Inspect temperature control valve for proper operation as follows:

a. Submerge temperature control valve in water heated 68 to 74 °C (155 to 165 °F) for 5 minutes.

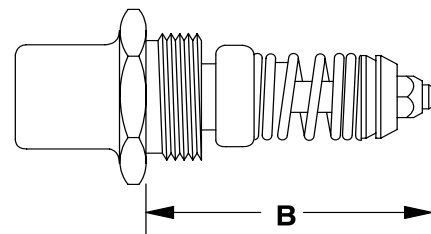
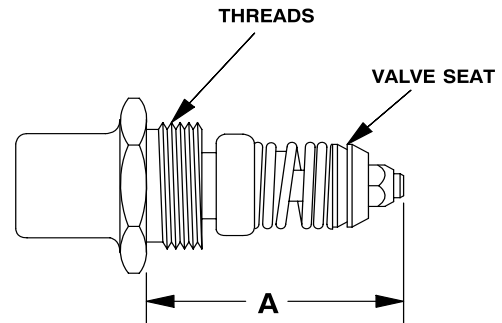
b. Remove temperature control valve from water and measure length (length A) as shown.

c. Submerge temperature control valve in water heated 78 to 84 °C (173 to 183 °F) for 5 minutes.

d. Remove temperature control valve from water and measure length (length B) as shown.

e. The difference between measurements of length (A and B) must show a minimum increase of **0.080 inch**.

REPAIR

406360-7-1
J1614

8. Remove minor nicks, scratches, and corrosion with nonmetallic abrasive mats (D1).

9. Replace temperature control valve for following conditions:

- a. Cracks
- b. Nicks or scratches on valve seat
- c. Thread damage
- d. Excessive corrosion

e. Temperature control valve fails to operate properly (step 7.)

f. Any damage rendering temperature control valve unserviceable.

END OF TASK

6-8-24. OIL COOLER — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Material:
Wiping Rags (D164)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Open End Wrench (B216)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Aft Fairing Assembly Removed (Task 2-2-55) ■

GO TO NEXT PAGE

6-8-24. OIL COOLER — REMOVAL (CONT)

REMOVE



Lubricating Oil

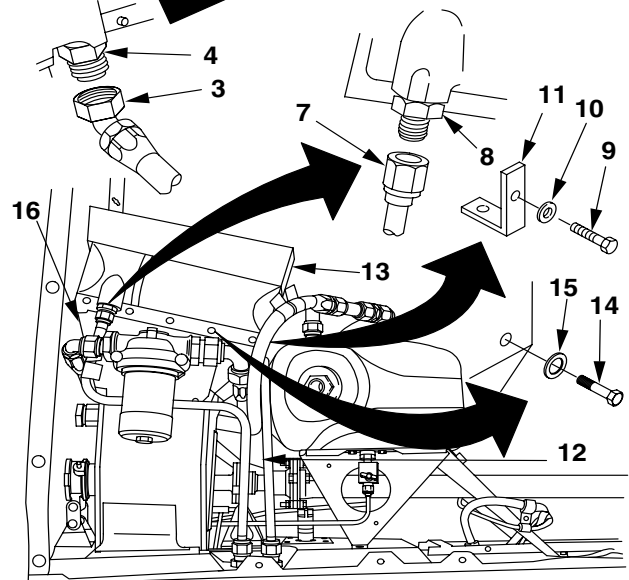
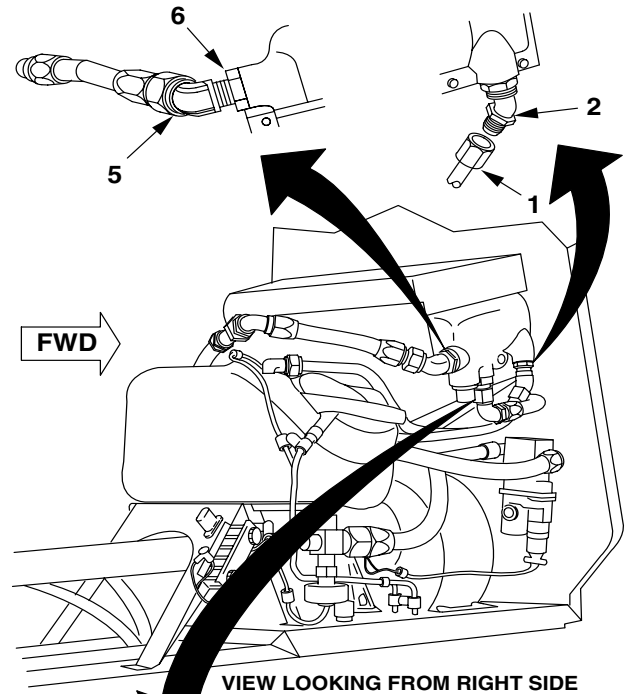
CAUTION

All disconnected lines and fittings shall be capped. Failure to cap lines or fittings can lead to oil contamination.

NOTE

Wiping rags (D164) should be used to absorb spilled oil.

1. Disconnect transmission outlet oil line fitting (1) from oil cooler inlet fitting (2).
2. Disconnect engine inlet oil line fitting (3) from oil cooler inlet fitting (4).
3. Disconnect engine oil outlet tank line (5) from engine oil fitting (6).
4. Disconnect transmission inlet line fitting (7) from oil cooler outlet fitting (8).
5. Remove bolt (9), washer (10), and bracket (11) securing transmission oil inlet line (12) to oil cooler (13).
6. Remove 17 bolts (14) and 17 washers (15) from oil cooler (13).
7. Remove oil cooler (13) from transition duct (16).
8. Place oil cooler (13) on suitable surface.



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END OF TASK

6-8-25. OIL COOLER — CLEANING/INSPECTION/REPAIR/BUILDUP

This task covers: Cleaning, Inspection, Repair, and Buildup (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Open End Wrench (B218)
Open End Wrench (B216)

Material:

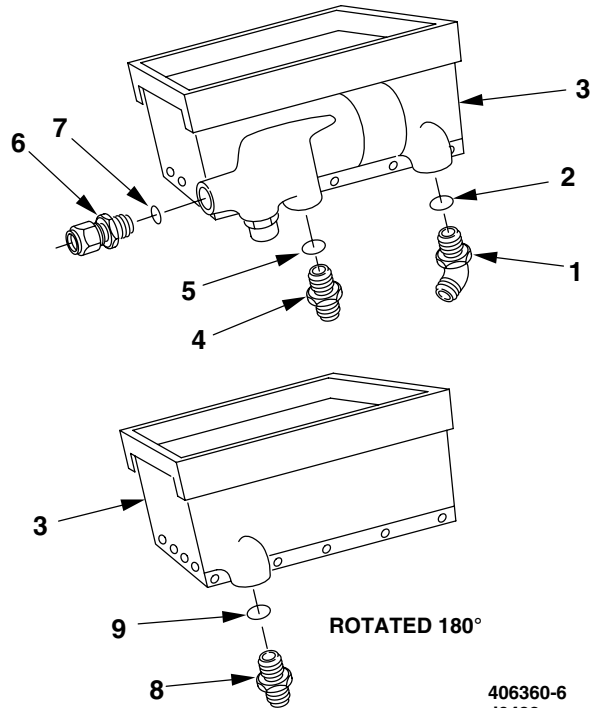
Drycleaning Solvent (D199)
Lubricating Oil (D139, D140, or D231)
Adhesive (D6)
Acetone (D2)
Rubber Gloves (D111)
Low-Lint Cleaning Cloth (D67)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

REMOVE COMPONENTS

1. Remove transmission oil inlet fitting (1) with packing (2) from oil cooler (3). Discard packing (2).
2. Remove engine oil inlet fitting (4) with packing (5) from oil cooler (3). Discard packing (5).
3. Remove engine oil check valve (6) with packing (7) from oil cooler (3). Discard packing (7).
4. Remove transmission oil outlet fitting (8) and packing (9). Discard packing (9).

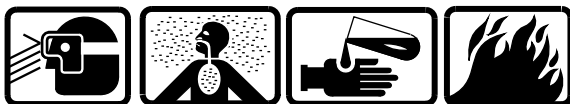


CLEAN

CAUTION

- No attempt shall be made to clean an oil cooler which has been installed with an engine which incurred mechanical failure resulting in metal particles in the oil.
- Oil coolers which have been contaminated with metal particles shall be condemned.

5. Install plugs in inlet and outlet ports of oil cooler.



Drycleaning Solvent

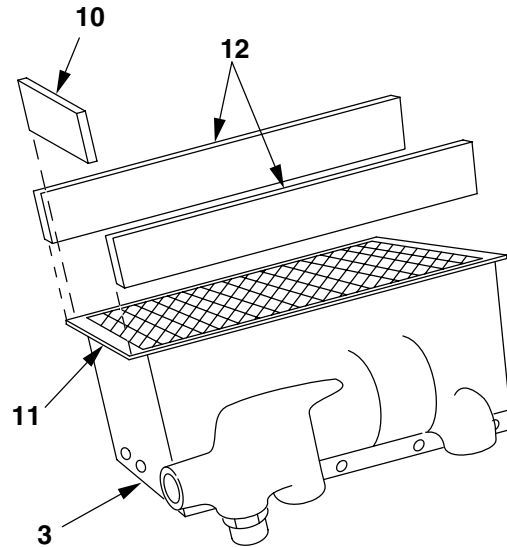
6. Clean exterior of oil cooler with drycleaning solvent (D199).

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6-8-25. OIL COOLER — CLEANING/INSPECTION/REPAIR/BUILDUP (CONT)

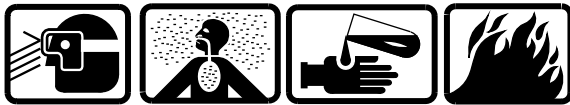
INSPECT

7. Inspect oil cooler for cleanliness.
8. Inspect oil cooler for unserviceable or damaged fittings, oil passage leaks, and elongated mount holes.
9. Inspect oil cooler seals for damage and security.
10. Inspect air fins and air passages for distortion and foreign particles that may obstruct air flow.
11. Inspect cooler for damaged and bulged plates, cracked castings and flanges, broken welds, and stripped threads.
12. Inspect for foreign matter inside cooler through open ports.
13. Inspect area around each port for scoring that could prevent packings from sealing.



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REPAIR



Acetone

14. Clean seal mating areas with acetone (D2).
15. Dry seal mating areas with low-lint cleaning cloth (D67).



Resins and Hardeners

16. Install aft seal (10) on lip (11) of oil cooler (3) with adhesive (D6).
17. Install two seals (12) to left and right sides of oil cooler (3) with adhesive (D6).

GO TO NEXT PAGE

6-8-25. OIL COOLER — CLEANING/INSPECTION/REPAIR/BUILDUP (CONT)

BUILD UP

18. Prepare surfaces on oil cooler (3), oil inlet fitting (1), and oil outlet fitting (8) to ensure Class S electrical bond (Appendix M).



Lubricating Oil

19. Lubricate packing (2) with lubricating oil (D139 or D140) and install on transmission oil inlet fitting (1).

20. Install transmission oil inlet fitting (1) with packing (2) on oil cooler (3).

21. Lubricate packing (5) with lubricating oil (D231 or D140) and install on engine oil inlet fitting (4).

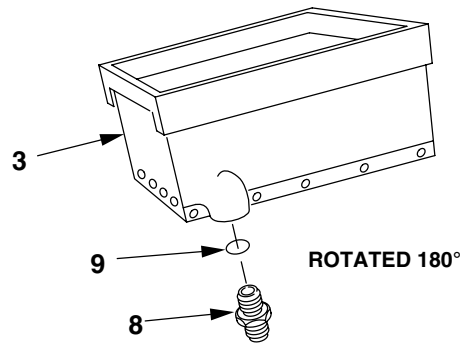
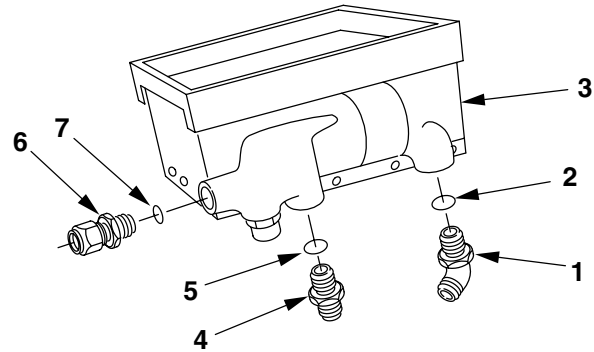
22. Install engine oil inlet fitting (4) with packing (5) on oil cooler (3).

23. Lubricate packing (7) with lubricating oil (D231 or D140) and install on engine oil check valve (6).

24. Install engine oil check valve (6) with packing (7) on oil cooler (3).

25. Lubricate packing (9) with lubricating oil (D139 or D140) and install on transmission oil outlet fitting (8).

26. Install transmission oil outlet fitting (8) with packing (9) on oil cooler (3).



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INSPECT

END OF TASK

6-8-26. OIL COOLER — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Open End Wrench (B216)
Open End Wrench (B218)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Aft Fairing Assembly Removed (Task 2-2-55) ■

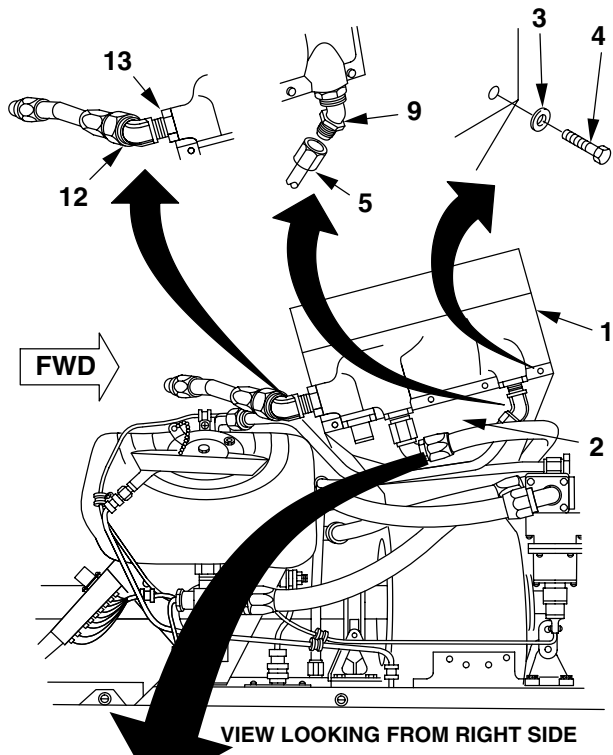
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6-8-26. OIL COOLER — INSTALLATION (CONT)

WARNING

Task shall be performed in a well-ventilated area.

1. Install oil cooler (1) on transition duct (2).
2. Install 17 washers (3) and 17 bolts (4) to secure oil cooler (1) to transition duct (2).
3. Secure transmission outlet oil line (5) to oil cooler (1) with bracket (6), washer (7), and bolt (8).
4. Connect transmission outlet oil line (5) to oil cooler inlet fitting (9).
5. Connect engine inlet oil line fitting (10) to oil cooler inlet fitting (11).
6. Connect engine oil tank bypass fitting (12) to engine oil fitting (13).
7. Connect transmission oil inlet line fitting (14) to oil cooler outlet fitting (15).



INSPECT

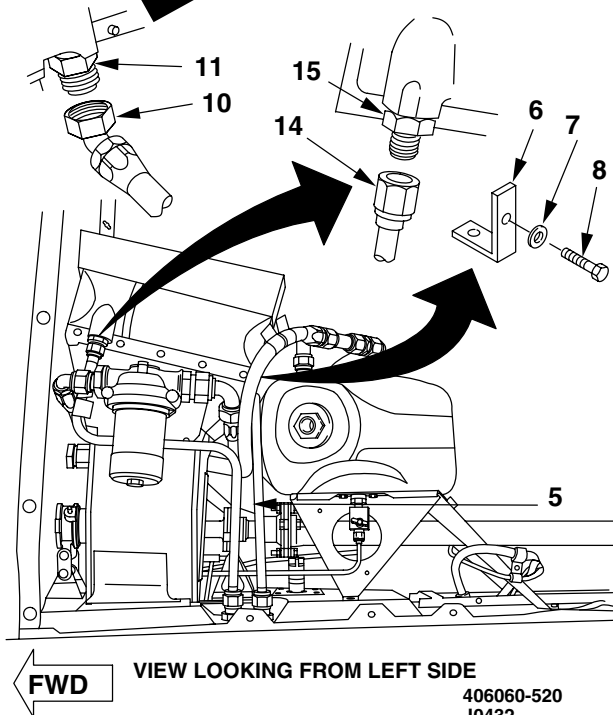
FOLLOW-ON MAINTENANCE

- Service transmission oil system (Task 1-4-8).
- Service engine oil system (Task 1-4-6).
- Install aft fairing assembly (Task 2-2-55).

CAUTION

To prevent damage to engine, engine shall be shut down immediately if oil pressure is low.

Pilot perform MOC (TM 1-1520-248-10/-CL).



END OF TASK

6-8-27. OIL COOLER DUCT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Aft Fairing Assembly Removed (Task 2-2-55)
Oil Cooler Removed (Task 6-8-24)

REMOVE

1. Position maintenance stand (B162) next to helicopter as required.
2. Remove 12 screws (1) and 12 washers (2) from oil cooler duct (3).
3. Remove oil cooler duct (3) from oil cooler blower (4).

INSTALL

4. Position maintenance stand (B162) next to helicopter as required.
5. Position oil cooler duct (3) onto oil cooler blower (4).
6. Align screw holes on oil cooler duct (1) with oil cooler blower (4).
7. Install 12 washers (2) and 12 screws (1).

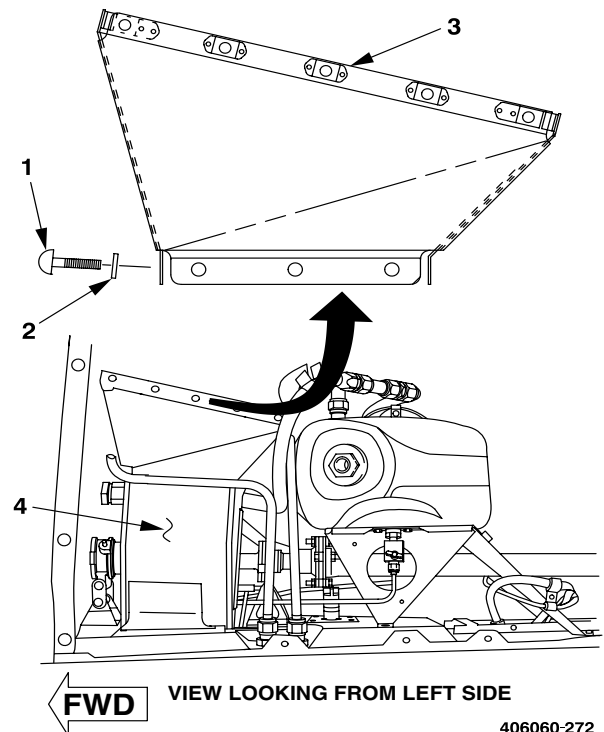
INSPECT**FOLLOW-ON MAINTENANCE**

Install oil cooler (Task 6-8-26).

Service transmission oil system (Task 1-4-8).

■ Install aft fairing assembly (Task 2-2-55).

Service engine oil system (Task 1-4-6).



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END OF TASK

6-8-28. OIL COOLER DUCT — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

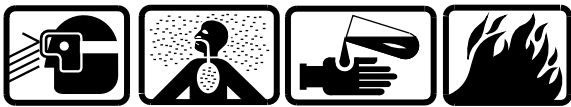
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean oil cooler duct with drycleaning solvent (D199) and wiping rag (D164).
2. Dry with wiping rags (D164).

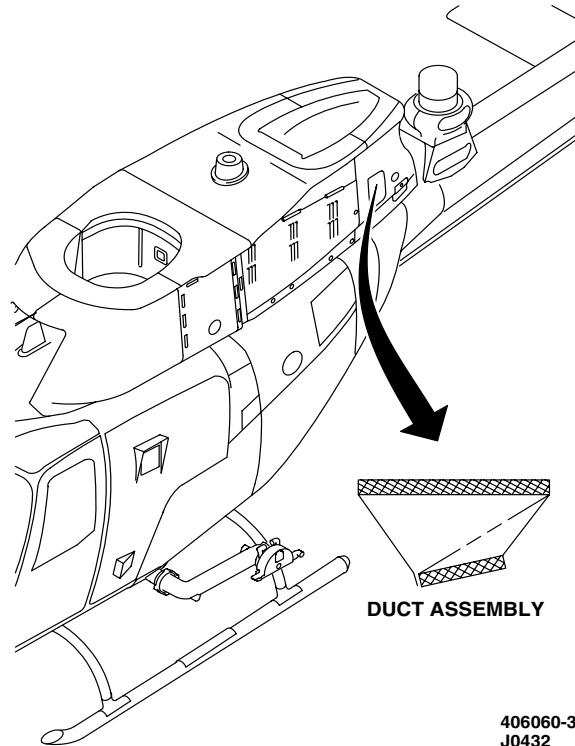
INSPECT

3. Inspect oil cooler duct for cracks, dents, and other damaged areas.
4. Inspect oil cooler duct to limits as shown. Replace if limits are exceeded. See figure Oil Cooler Duct — Damage Limits.

REPAIR

5. Repair damage on oil cooler duct to limits shown. See figure Oil Cooler Duct — Damage Limits.

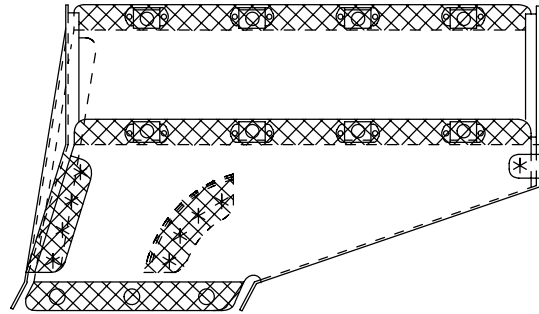
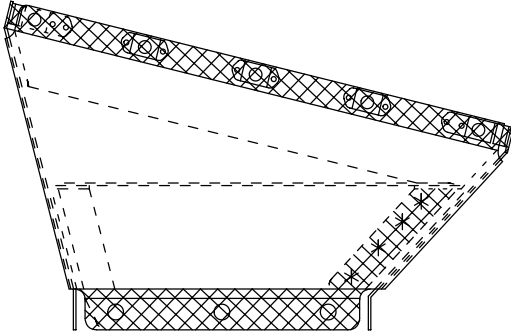
INSPECT



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6-8-28. OIL COOLER DUCT — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL

0.004 in. before and
0.008 in. after repair

0.010 in. before and
0.015 in. after repair

CORROSION

0.004 in. before and
0.008 in. after repair

0.010 in. before and
0.015 in. after repair

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

0.15 sq in.

0.30 sq.in.

**EDGE CHAMFER TO
REMOVE DAMAGE**

0.005 in.

0.010 in.

BORE DAMAGE

0.004 in for 1/4
circumference

NOTES

1. No cracks are permitted.
2. All dimensions are in inches.

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Oil Cooler Duct — Damage Limits

END OF TASK

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CHAPTER 7

HYDRAULIC SYSTEM

7-1. **HYDRAULIC SYSTEM**

This chapter contains maintenance procedures for the hydraulic system. The chapter is divided into eight sections.

		Page
Section I	Actuators	7-2
Section II	Hydraulic System Bleeding	7-36
Section III	Hydraulic Filter Assemblies	7-39
Section IV	Hydraulic Hoses, Lines, Tubes, Fittings, and Quick-Disconnects	7-47
Section V	Pressure Switch, Manifolds, and Relief Valve	7-61
Section VI	Hydraulic Solenoid Valve	7-75
Section VII	Hydraulic Reservoir	7-86
Section VIII	Hydraulic Pump	7-108

Section I. ACTUATORS

7-2. ACTUATORS

control system actuators. Standard torques are provided in Appendix P and TM 1-1500-204-23.

7-3. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and installation of the collective, cyclic, and directional

7-4. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Directional Control Servoactuator — Removal/Installation	7-1-1	7-3
Cyclic/Collective/Directional Control Servoactuators (Typical) — Cleaning/Inspection/Repair	7-1-2	7-10
Directional Control Servoactuator Trunnion Bearing — Removal/ Installation	7-1-3	7-13
Directional Control Servoactuator Trunnion Bearing — Cleaning/ Inspection/Repair	7-1-4	7-15
Directional Control Servoactuator Trunnion Bushings — Removal/ Installation	7-1-5	7-17
Directional Control Servoactuator Trunnion Bushings — Cleaning/ Inspection/Repair	7-1-6	7-19
Clevis Adapter — Removal/Installation	7-1-7	7-20
Clevis Adapter — Cleaning/Inspection/Repair	7-1-8	7-22
Collective Hydraulic Actuator — Removal/Installation	7-1-9	7-25
Cyclic Hydraulic Actuator — Removal/Installation	7-1-10	7-30

7-1-1. DIRECTIONAL CONTROL SERVOACTUATOR — REMOVAL/INSTALLATION

This task covers: Removal/Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

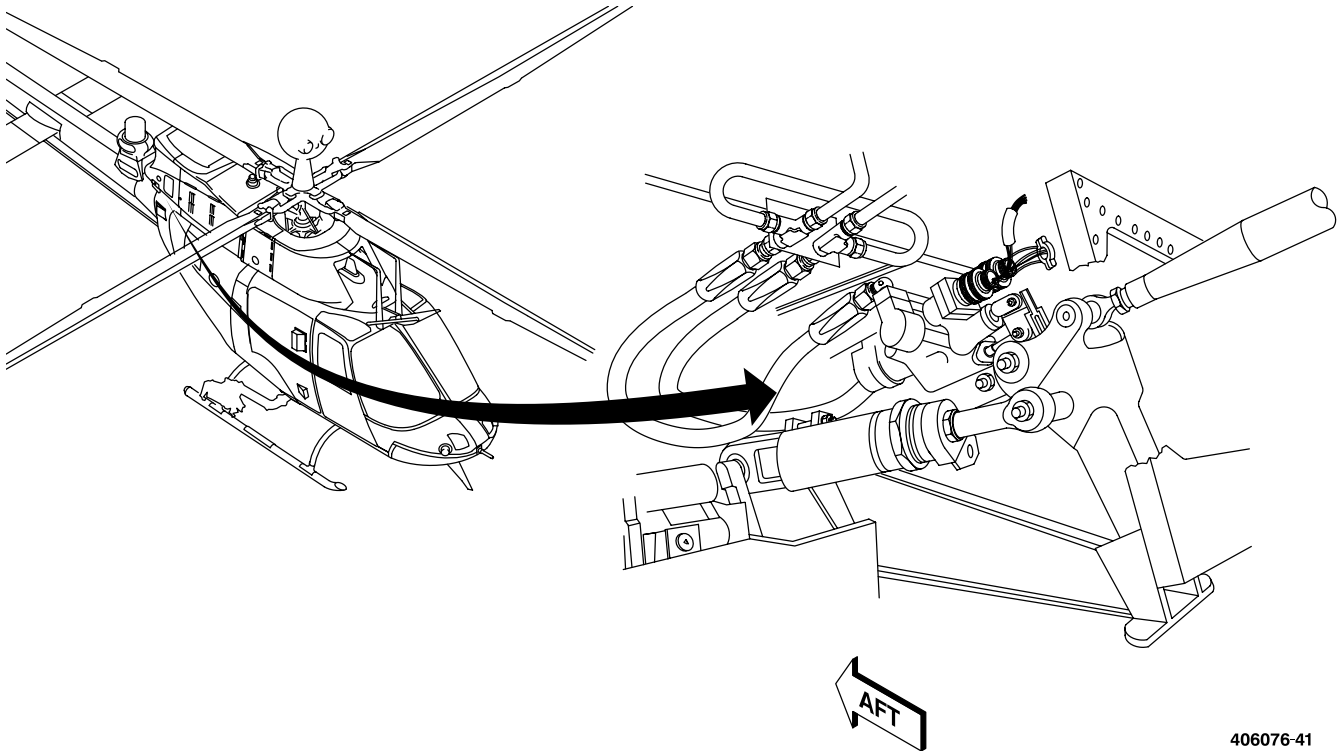
Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)
■ Torque Wrench (B236)

Material:
Hydraulic Fluid (D106 or D107)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)



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Directional Control Servoactuator — Locator

GO TO NEXT PAGE

7-1-1. DIRECTIONAL CONTROL SERVOACTUATOR — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

- Controls shall not be operated from inside of helicopter during removal of directional control servoactuator. Physical injury can occur. If injury occurs, immediate medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

CAUTION

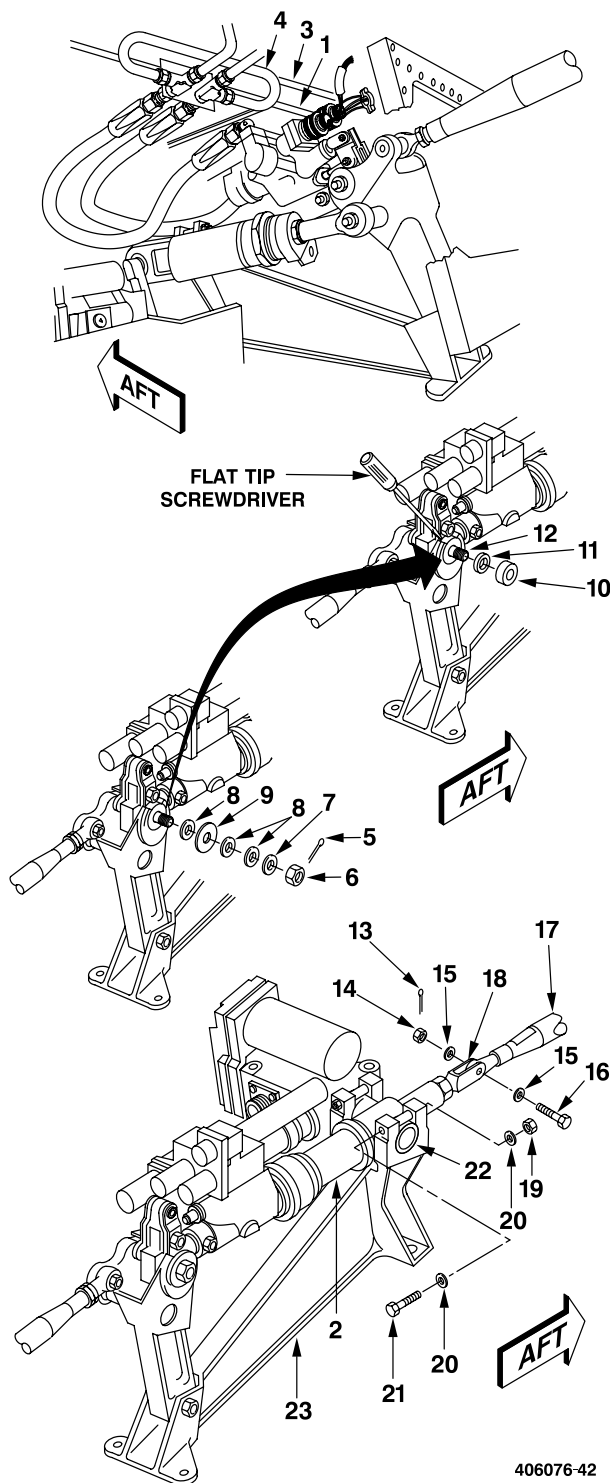
Directional controls shall not be operated during servoactuator removal. Damage to servoactuator could occur.

1. Remove left and right directional control servoactuator access panels (Task 2-2-83).
2. Disconnect and cap two electrical connectors (1).



Hydraulic Fluid

3. Place wiping rags (D164) under actuator (2).
4. Disconnect and cap hydraulic pressure line (3) and return line (4).
5. Remove cotter pin (5), nut (6), washer (7), three washers (8), and thrust washer (9).
6. Push bearing (10) and spacer (11) out of idler (12) using flat-tip screwdriver.
7. Repeat step 5. for opposite trunnion.
8. Remove cotter pin (13), nut (14), two washers (15), and bolt (16). Discard cotter pin.
9. Disconnect boosted tube (17) from adapter clevis (18).
10. Remove two nuts (19), four washers (20), and two bolts (21).
11. Rotate bushings (22) 90 degrees, lift actuator (2) from support (23) and remove two bushings.
12. Remove actuator (2) from helicopter.



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7-1-1. DIRECTIONAL CONTROL SERVOACTUATOR — REMOVAL/INSTALLATION (CONT)

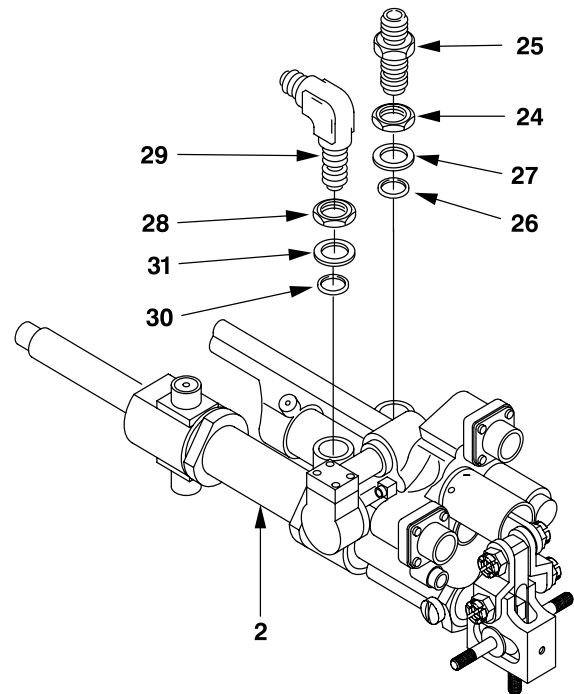
NOTE

If actuator will be replaced, steps 13. through 15. shall be performed to retain unions for installation. If actuator will be reinstalled, proceed to step 20.

13. Loosen jamnut (24) and remove union (25) with packing (26), packing retainer (27), and jamnut. Discard packing (26).

14. Loosen jamnut (28) and remove union (29) with packing (30), packing retainer (31), and jamnut. Discard packing (30).

15. Install protective plugs in actuator (2) ports.



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GO TO NEXT PAGE

7-1-1. DIRECTIONAL CONTROL SERVOACTUATOR — REMOVAL/INSTALLATION (CONT)

INSTALL

WARNING

- Controls shall not be operated from inside of helicopter during removal of directional control servoactuator. Physical injury can occur. If injury occurs, immediate medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.



Hydraulic Fluid

CAUTION

Directional controls shall not be operated during servoactuator installation. Damage to servoactuator could occur.

NOTE

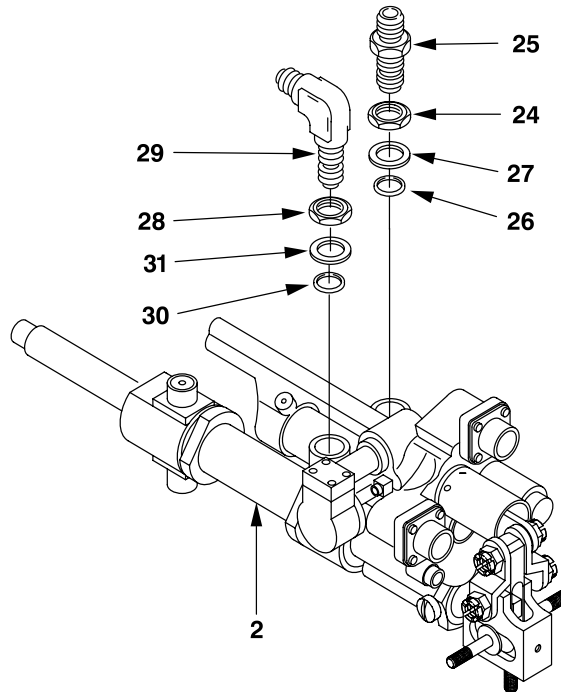
If actuator is being replaced, steps 16. through 19. shall be performed. If actuator is being reinstalled, proceed to step 20.

16. Install jamnut (24), packing retainer (27), and packing (26) lubricated with hydraulic fluid (D106 or D107) on union (25).

17. Install jamnut (28), packing retainer (31), and packing (30) lubricated with hydraulic fluid (D106 or D107) on union (29).

18. Remove protective plugs from actuator (2) ports.

19. Install unions (25 and 29) in actuator (2) ports.



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J2435

GO TO NEXT PAGE

7-1-1. DIRECTIONAL CONTROL SERVOACTUATOR — REMOVAL/INSTALLATION (CONT)

20. Install bushings (22) on actuator (2) trunnion.

21. Position actuator (2) in support (23) and rotate bushings (22) 90 degrees.

22. Secure actuator (2) to support (23) with two bolts (21), four washers (20), and two nuts (19).

23. Torque nuts (19) **75 TO 95 INCH-POUNDS**.

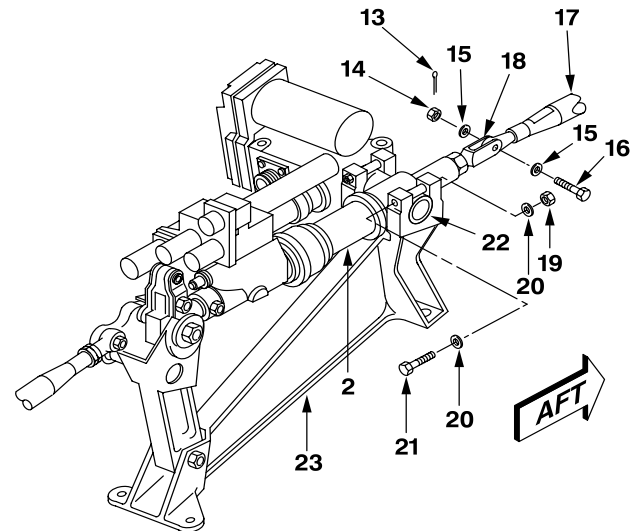
NOTE

Self-locking castellated nuts shall be reused only if they meet the minimum breakaway torque value specified in TM 1-1500-204-23.

24. Connect boosted tube (17) to adapter clevis (18) with bolt (16), two washers (15), and nut (14).

25. Torque nut (14) **30 TO 40 INCH-POUNDS**.

26. Install cotter pin (13) through nut (14).



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GO TO NEXT PAGE

7-1-1. DIRECTIONAL CONTROL SERVOACTUATOR — REMOVAL/INSTALLATION (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Installation of thrust washers (9) with treated surface toward idler (12) and correct installation of cotter pins (5) are characteristics critical to flight safety.

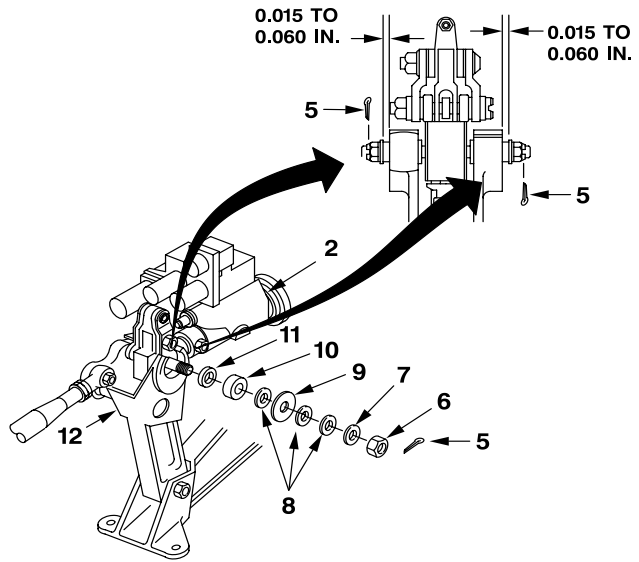
NOTE

- Washers (8) and thrust washer (9) may be installed in any sequence to provide **0.015 to 0.060 inch** gap between idler (12) and thrust washer (9) to both sides.
- Self-locking castellated nuts shall be reused only if they meet the minimum breakaway torque value specified in TM 1-1500-204-23.

27. Connect actuator (2) to idler (12) with two spacers (11), two bearings (10), six washers (8), two thrust washers (9) (treated surface towards idler), two washers (7), and two nuts (6).

28. Torque nuts (6) **60 TO 80 INCH-POUNDS**.

29. Install two cotter pins (5) through nuts (6).



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GO TO NEXT PAGE

7-1-1. DIRECTIONAL CONTROL SERVOACTUATOR — REMOVAL/INSTALLATION (CONT)

**Hydraulic Fluid**

30. Remove caps and connect hydraulic return line (4) and pressure line (3).

31. Remove caps and connect two electrical connectors (1).

32. Remove wiping rags (D164) from under actuator (2). Properly dispose of/discard wiping rags.

INSPECT

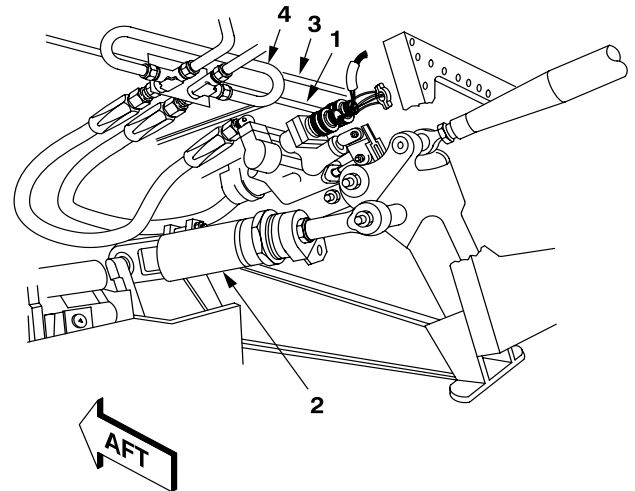
33. Install left and right directional control servoactuator access panels.

FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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END OF TASK

7-1-2. CYCLIC/COLLECTIVE/DIRECTIONAL CONTROL SERVOACTUATORS (TYPICAL) —
CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection and Repair (On/Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Drycleaning Solvent (D199)
Wiping Rags (D164)
Hydraulic Fluid (D106 or D107)
Low-Lint Cleaning Cloth (D67)
Crocus Cloth (D90)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pseudraulics Repairer

References:
TM 1-1500-344-23
TM 1-1520-266-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

NOTE

The fittings referenced and illustrated are typical and will vary (union - reducer - tee - elbow) depending upon application.

1. Clean exterior of servoactuator with wiping rag (D164) and drycleaning solvent (D199). Avoid contacting exposed portion of servo extension shaft.

CLEAN



Drycleaning Solvent



Hydraulic Fluid

2. Clean exposed portion of servo extension shaft with a low-lint cleaning cloth (D67) moistened with hydraulic fluid (D106 or D107).

GO TO NEXT PAGE

7-1-2. CYCLIC/COLLECTIVE/DIRECTIONAL CONTROL SERVOACTUATORS (TYPICAL) —
CLEANING/INSPECTION/REPAIR (CONT)

INSPECT

3. Inspect servoactuator (1) for cracks and other signs of obvious damage. No obvious damage allowed. If cracks in servoactuator are suspected perform eddy current inspection (TM 1-1520-266-23).

4. Inspect servoactuator upper bolt (2) and servovalve bolt (3) for freedom of rotation (must rotate with finger pressure).

WARNING

Adjustment of the servovalve drive (4) is critical. Any rotation of the locknut (5) (in either direction) is cause for removal of the servoactuator.

NOTE

Dual slippage marks are still required with tab washer (6). All tabs shall be bent over flat surfaces of link (7) and locknut (5).

5. Verify two tabs of tab washer (6) are bent over link (7) and remaining tabs are bent over locknut (5).

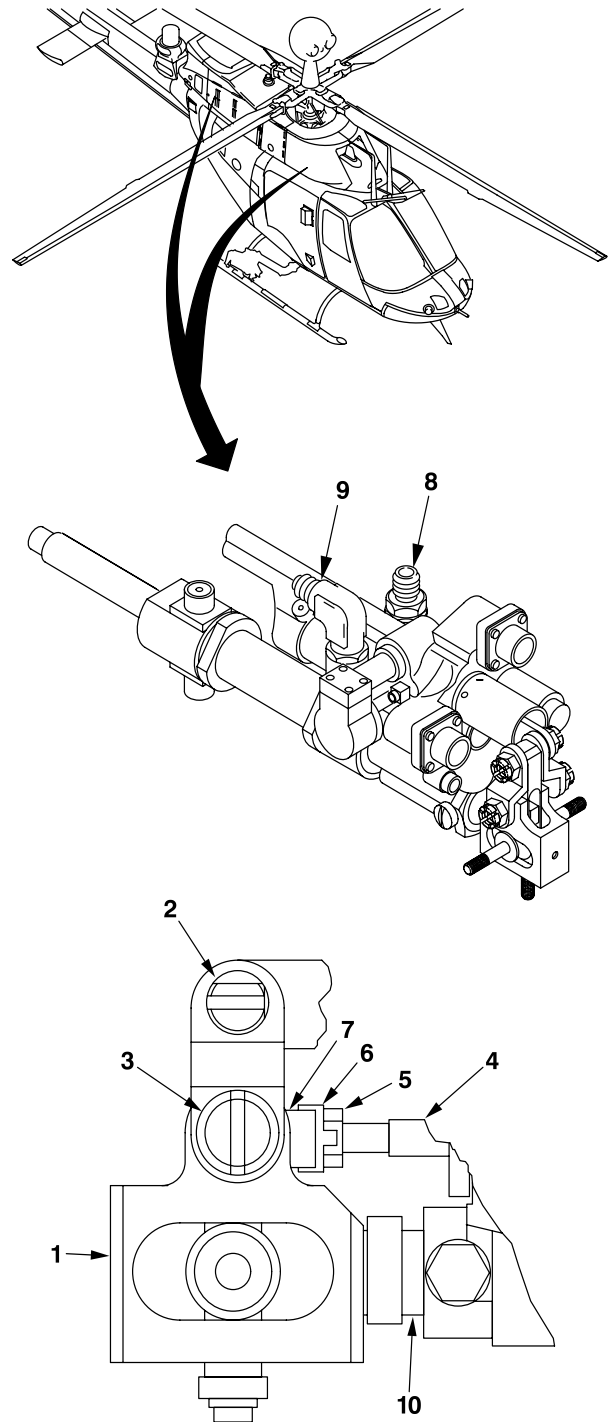
6. Verify dual slippage marks from locknut (5) to link (7) and servovalve drive (4) (top and bottom).



Hydraulic Fluid

7. Inspect pressure line union (8) and return line reducer (9) for damaged threads and leakage.

8. Inspect exposed portion of actuator rod (10) for cracks, scoring, and corrosion (TM 1-1500-344-23). If cracks in actuator rod are suspected perform eddy current inspection (TM 1-1520-266-23).



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7-1-2. CYCLIC/COLLECTIVE/DIRECTIONAL CONTROL SERVOACTUATORS (TYPICAL) —
CLEANING/INSPECTION/REPAIR (CONT)

REPAIR

CAUTION

All shims and washers shall be reinstalled in their original position. One bolt at a time shall be removed and first bolt shall be installed prior to removing the second bolt. Nut shall not be reused. Servovalve drive (4) shall not be moved in excess of **0.030 inch**.

9. Polish servoactuator upper bolt (2) and servovalve bolt (3) with crocus cloth (D90). If damage cannot be removed with crocus cloth, replace bolt.

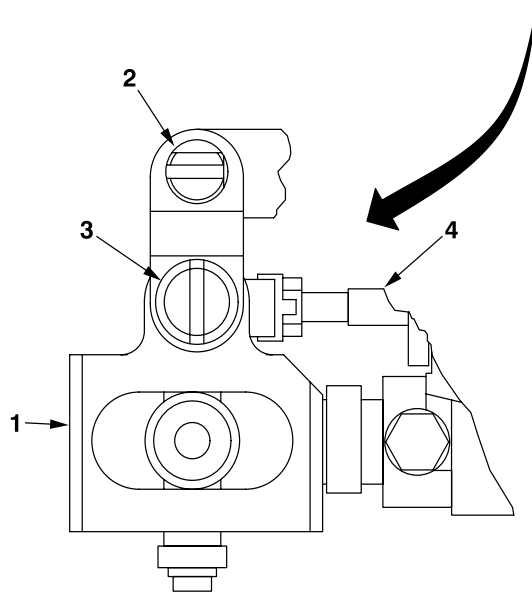
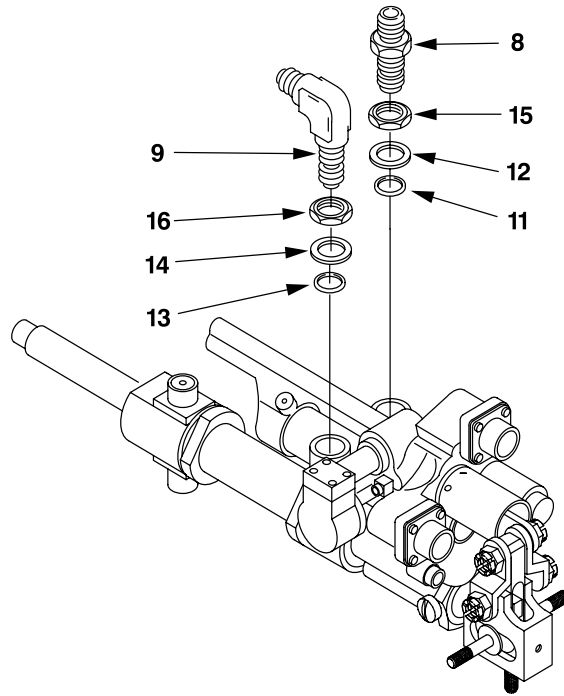


Hydraulic Fluid

10. Replace pressure line union packing (11) and backup (12), and return line reducer packing (13) and backup (14) that leak as follows:

- a. Loosen jamnut (15) and remove pressure line union (8), packing (11), and backup (12).
- b. Loosen jamnut (16) and remove return line reducer (9), packing (13), and backup (14).
- c. Install pressure line union (8) with serviceable packing (11) and backup (12). Tighten jamnut (15) while holding union (8) stationary.
- d. Install return line reducer (9) with serviceable packing (13) and backup (14). Tighten jamnut (16) while holding reducer (9) stationary.

11. Replace servoactuator (1) that does not meet inspection requirements.



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INSPECT

END OF TASK

7-1-3. DIRECTIONAL CONTROL SERVOACTUATOR TRUNNION BEARING — REMOVAL/ INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pseudraulics Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

1. Open aft electrical compartment door and access panel.

WARNING

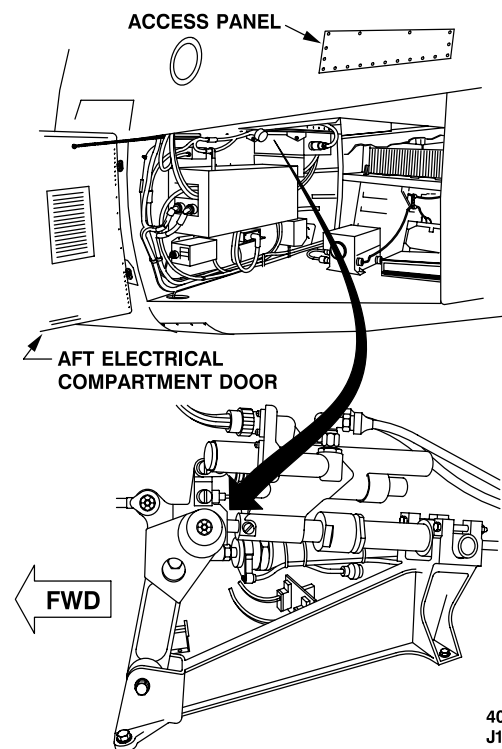
- Controls shall not be operated from inside of helicopter during replacement of servo trunnion bearing. Physical injury can occur. If injury occurs, immediate medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

CAUTION

Directional controls shall not be operated during trunnion bearing replacement. Damage to servoactuator could occur.

NOTE

The aft electrical compartment or the access door can be used to gain access to directional control servoactuator.



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7-1-3. DIRECTIONAL CONTROL SERVOACTUATOR TRUNNION BEARING — REMOVAL/
INSTALLATION (CONT)

REMOVE TRUNNION BEARINGS

2. Remove cotter pin (1), nut (2), washer (3), thrust washer (4), and three washers (5).
3. Push spacer (6) and trunnion bearing (7) out of idler (8) using flat-tip screwdriver (9).
4. Repeat step 2. for opposite trunnion.

INSTALL TRUNNION BEARINGS

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Installation of thrust washer (4) with treated surface toward idler (8) and correct installation of cotter pin (1) are characteristics critical to flight safety.

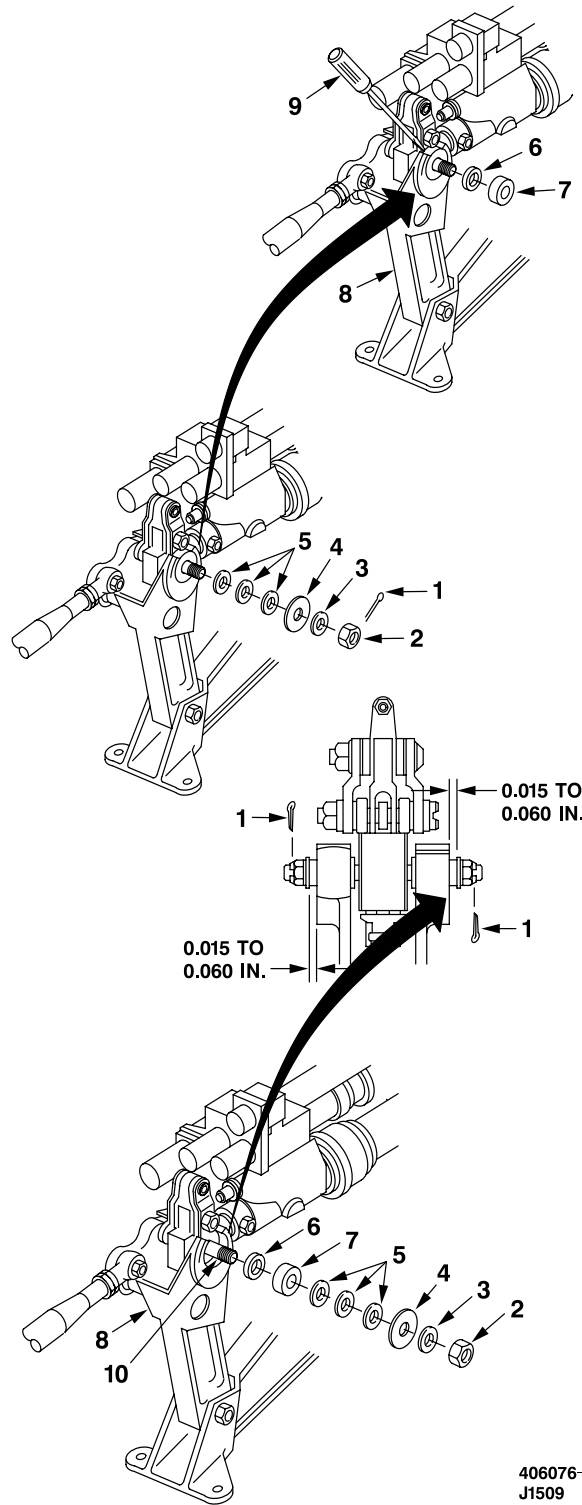
NOTE

Washers (5) may be installed in any sequence to provide **0.015 to 0.006 inch** gap between thrust washer (4) and idler (8). Feeler gage may be used to check.

5. Install spacer (6), replacement bearing (7), three washers (5), thrust washer (4) (treated surface toward idler (8)), and washer (3) on trunnion (10).
6. Install nut (2).
7. Torque nut (2) **60 TO 80 INCH-POUNDS**.
8. Install cotter pin (1) through nut (2) and check trunnion (10) for free movement without binding.
9. Repeat steps 4., 5., 6., and 7. for opposite trunnion.

INSPECT

10. Close aft compartment door and access panel.



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END OF TASK

**7-1-4. DIRECTIONAL CONTROL SERVOACTUATOR TRUNNION BEARING — CLEANING/
INSPECTION/REPAIR**

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Grease (D113)
Rubber Gloves (D111)
Low-lint Cleaning Cloth (D67)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68H Aircraft Pseudraulics Repairer

References:
TM 1-1500-344-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Directional Control Servoactuator Trunnion
Bearings Removed (Task 7-1-3)

GO TO NEXT PAGE

7-1-4. DIRECTIONAL CONTROL SERVOACTUATOR TRUNNION BEARING — CLEANING/
INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

1. Clean trunnion bearing using drycleaning solvent (D199) and nonmetallic brush. Air dry.

INSPECT

2. Inspect trunnion bearing for smoothness and freedom of rotation by holding inner race and rotating outer race by hand.

3. Inspect trunnion bearing for spalling, scoring, brinelling, looseness, and corrosion damage (TM 1-1500-344-23).

4. Inspect trunnion bearing for maximum wear limits of **0.005 inch** radial and **0.030 inch**.

REPAIR



Grease

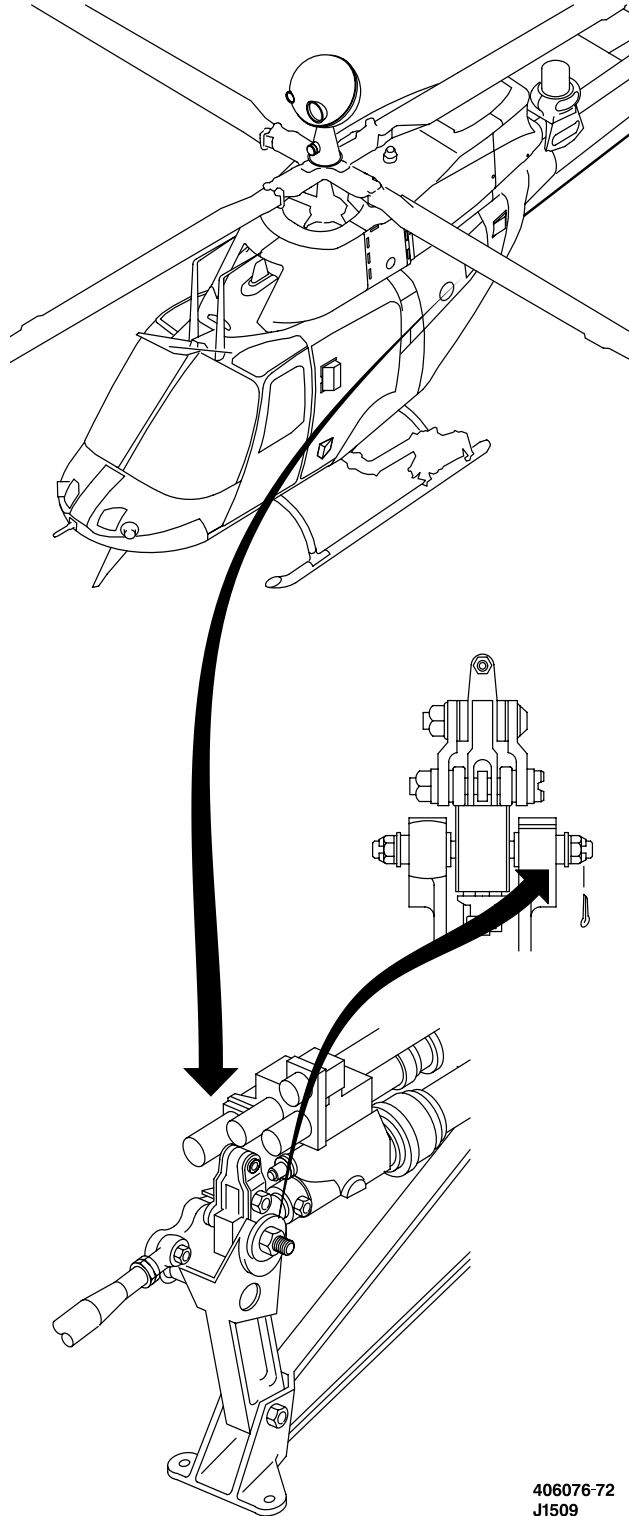
5. Hand pack trunnion bearing with grease (D113) until grease comes out other side. Wipe off excess grease using low-lint cleaning cloth (D67).

6. No repair authorized. Replace trunnion bearing if inspection requirements are not met.

INSPECT

FOLLOW-ON MAINTENANCE

Install directional control servoactuator trunnion bearings (Task 7-1-3).



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END OF TASK

7-1-5. DIRECTIONAL CONTROL SERVOACTUATOR TRUNNION BUSHINGS — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

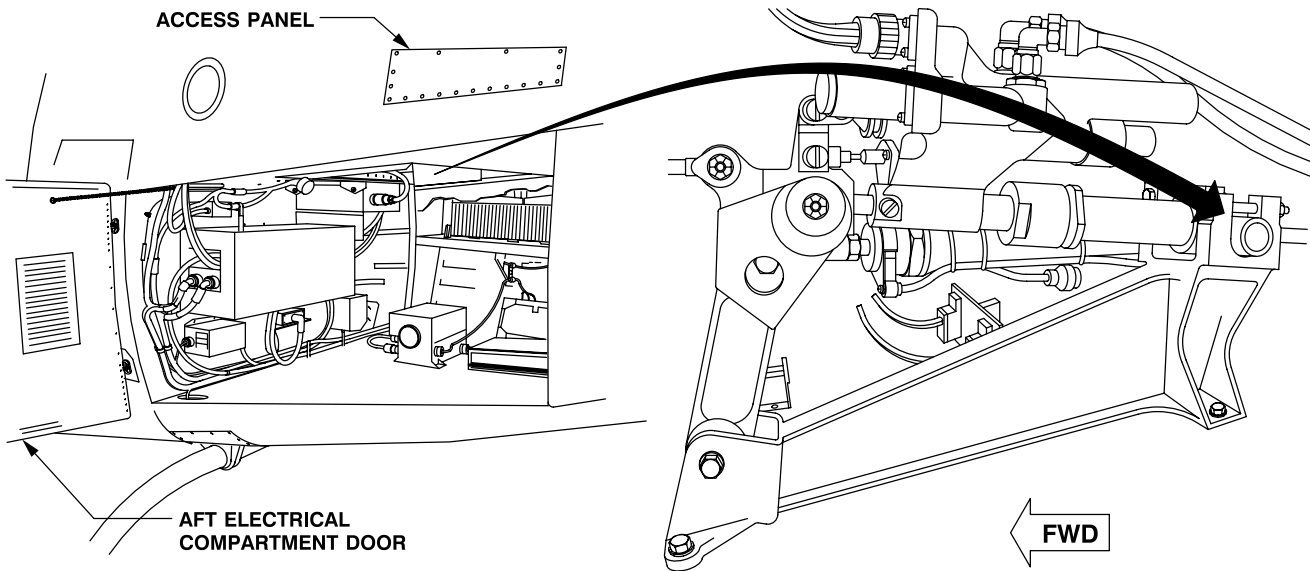
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68H Aircraft Pneudraulics Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)



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Directional Control Servoactuator — Locator

GO TO NEXT PAGE

7-1-5. DIRECTIONAL CONTROL SERVOACTUATOR TRUNNION BUSHINGS — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

- Controls shall not be operated from inside of helicopter during replacement of trunnion bushings. Physical injury can occur. If injury occurs, immediate medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

CAUTION

Directional controls shall not be operated during trunnion bushing replacement. Damage to servoactuator could occur.

1. Open aft electrical compartment door and access panel.

NOTE

The aft electrical compartment door or the access door can be used to gain access to directional control servoactuator.

2. Disconnect boosted tube (1) from adapter clevis (2) by removing cotter pin (3), nut (4), two washers (5), and bolt (6). Discard cotter pin.

3. Remove two actuator trunnion bushings (7) by removing two nuts (8), four washers (9), and two bolts (10).

4. Rotate bushings (7) 90 degrees, lift actuator (11) from support (12), and slide bushings (7) off trunnion.

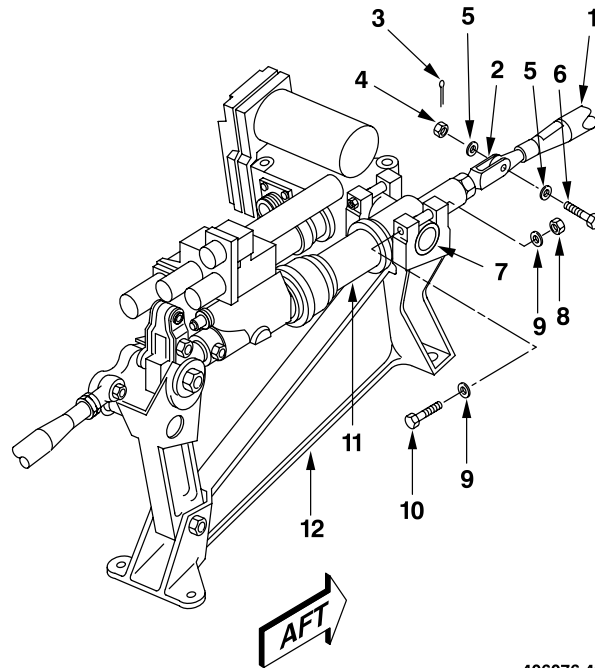
INSTALL

5. Place replacement bushings (7) on trunnion of actuator (11). Rotate bushings (7) until actuator can be lowered into slot of support (12).

6. Rotate bushings (7) 90 degrees. Flats on bushings (7) shall be up for bolt clearance.

7. Secure bushings (7) with two bolts (10), four washers (9), and two nuts (8).

8. Torque nuts (8) **75 TO 95 INCH-POUNDS**.



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NOTE

Self-locking castellated nuts shall be reused only if they meet the minimum breakaway torque value specified in TM 1-1500-204-23.

9. Connect boosted tube (1) to adapter clevis (2) with bolt (6), two washers (5), and nut (4).

10. Torque nut (4) **30 TO 40 INCH-POUNDS** and install cotter pin (3) through nut (4).

INSPECT

11. Close aft electrical compartment door and access panel.

FOLLOW-ON MAINTENANCE

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

7-1-6. DIRECTIONAL CONTROL SERVOACTUATOR TRUNNION BUSHINGS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

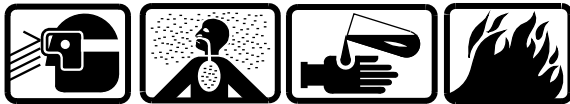
Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pseudraulics Repairer

References:
TM 1-1500-344-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

CLEAN



Drycleaning Solvent

1. Clean bushing (1) using drycleaning solvent (D199) and nonmetallic brush. Dry with wiping rag (D164).

INSPECT

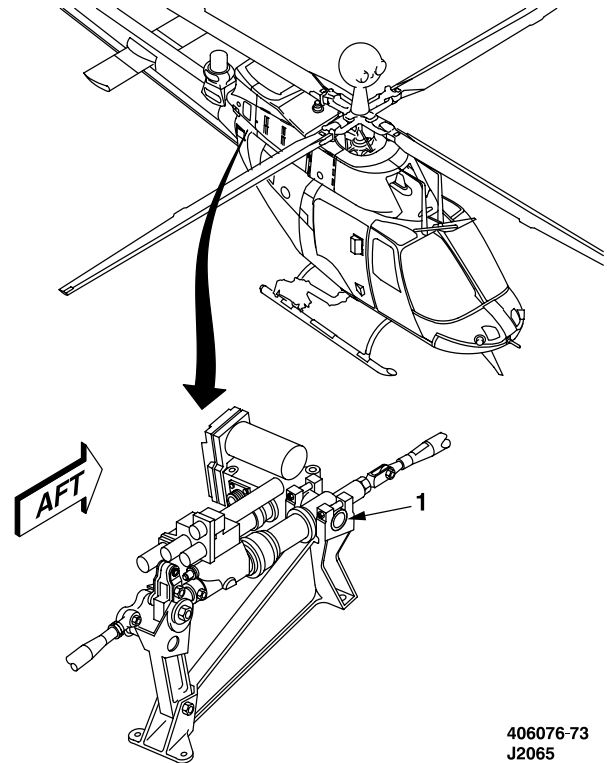
2. Inspect bushing (1) for wear, damage, and looseness in housing. Maximum elongation to bushing holes is not to exceed **0.003 inch**.

3. Inspect bushing (1) for corrosion damage (TM 1-1500-344-23).

REPAIR

4. No repair authorized. Replace bushing (1) if inspection requirements are not met.

INSPECT



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END OF TASK

7-1-7. CLEVIS ADAPTER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pseudraulics Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

WARNING

- Controls shall not be operated from inside helicopter during replacement of actuator adapter. Physical injury can occur. If injury occurs, immediate medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in cockpit during performance of this task.

GO TO NEXT PAGE

7-1-7. CLEVIS ADAPTER — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Open aft electrical compartment door and access panel.

NOTE

Aft electrical compartment door or access door can be used to access directional control servoactuator.

2. Disconnect boosted tube (1) from clevis adapter (2) by removing cotter pin (3), nut (4), two washers (5), and bolt (6). Discard cotter pin.

3. Loosen jamnut (7) on clevis adapter (2) and screw out adapter.

INSTALL

4. Install jamnut (7) on replacement clevis adapter (2) and screw clevis adapter into end of actuator (8).

5. Set dimension of **1.22 inches** between end of actuator (8) and centerline of bolt holes in clevis adapter (2). Tighten jamnut (7).

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

6. Connect boosted tube (1) to clevis adapter (2) with bolt (6), two washers (5), and nut (4).

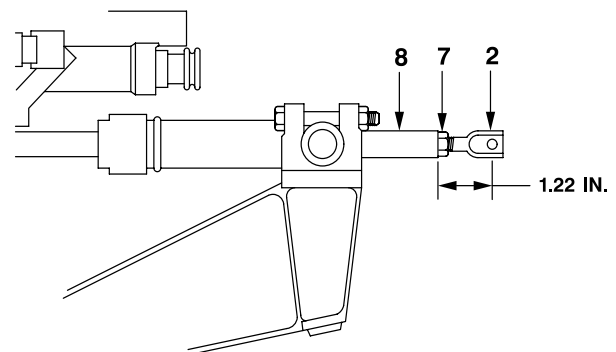
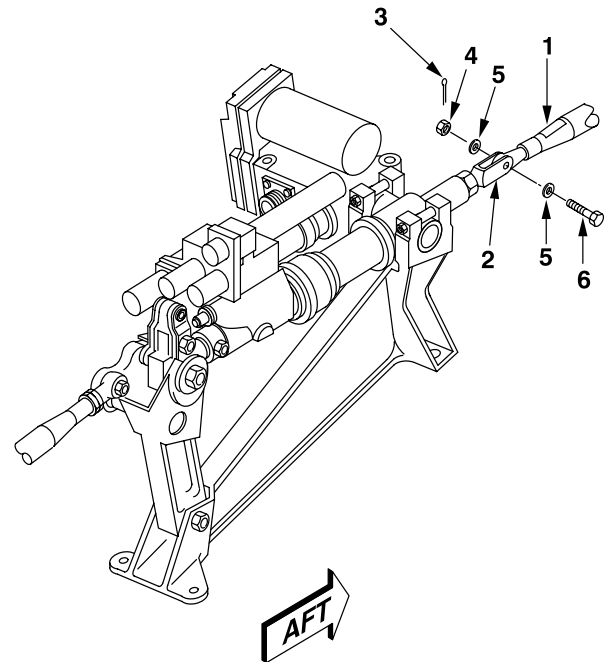
7. Torque nut (4) **30 TO 40 INCH-POUNDS**. Install cotter pin (3) through nut (4).

INSPECT

8. Close aft electrical compartment door and access panel.

FOLLOW-ON MAINTENANCE

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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END OF TASK

7-1-8. CLEVIS ADAPTER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On/Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Acetone (D2)
Wiping Rags (D164)
Rubber Gloves (D111)
Sandpaper (D174)
Polyamide Epoxy Primer (D98)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

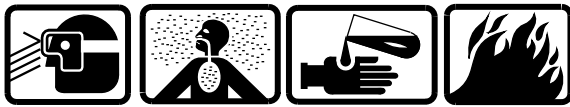
References:
TM 1-1520-266-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

7-1-8. CLEVIS ADAPTER — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Acetone

1. Clean the threaded shank of clevis adapter with acetone (D2). Dry with wiping rag (D164).

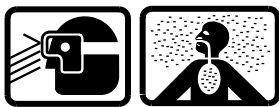
INSPECT

2. Inspect clevis adapter to limits shown in figure Clevis Adapter — Damage Limits. Replace if limits are exceeded. If cracks in clevis adapter are suspected perform magnetic particle inspection (TM 1-1520-266-23).

3. Inspect threaded shank for cracks using a minimum 10-power magnifying glass.

4. Inspect clevis adapter ends for bending and note for elongation.

REPAIR



Sanding Operations

5. Remove all scratches within prescribed limitations with 320 grit wet or dry sandpaper (D174) or finer to obtain a smooth, scratch-free surface.



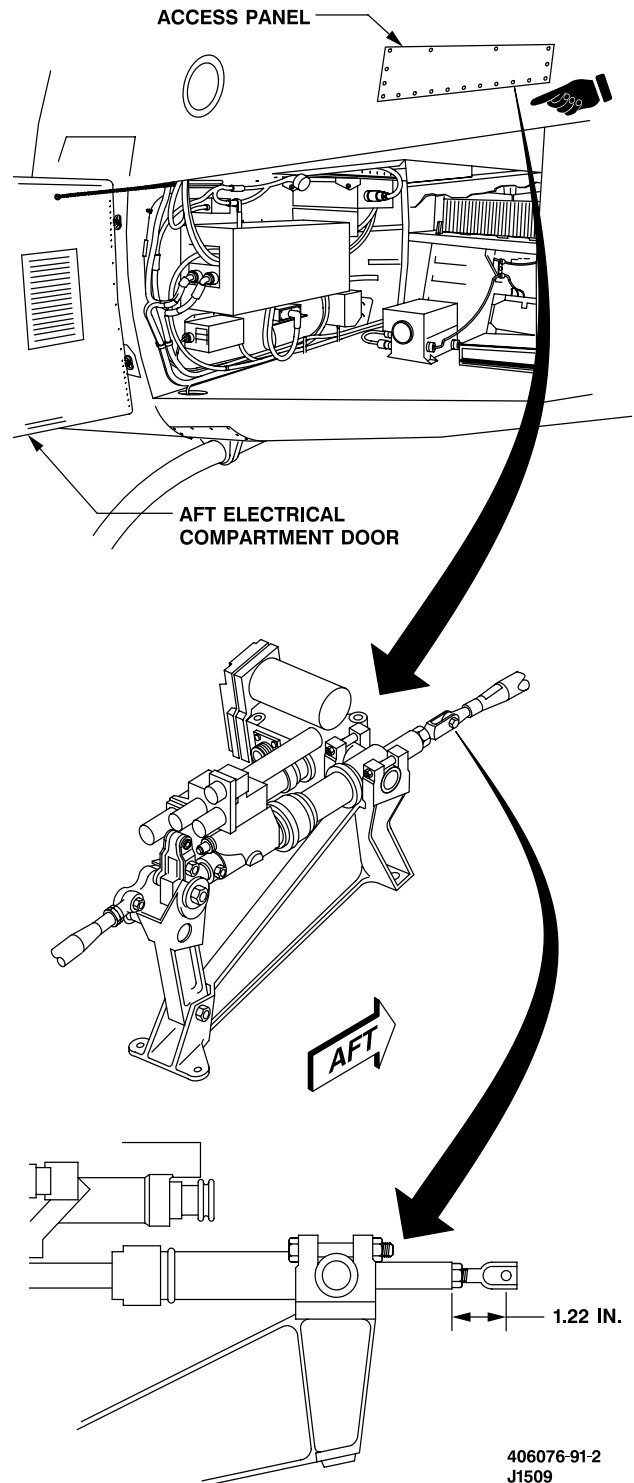
Epoxy Primer Coating

6. Apply one coat of epoxy polyamide primer (D98) to repaired area.

7. Replace clevis adapter if holes are elongated more than **0.003 inch**.

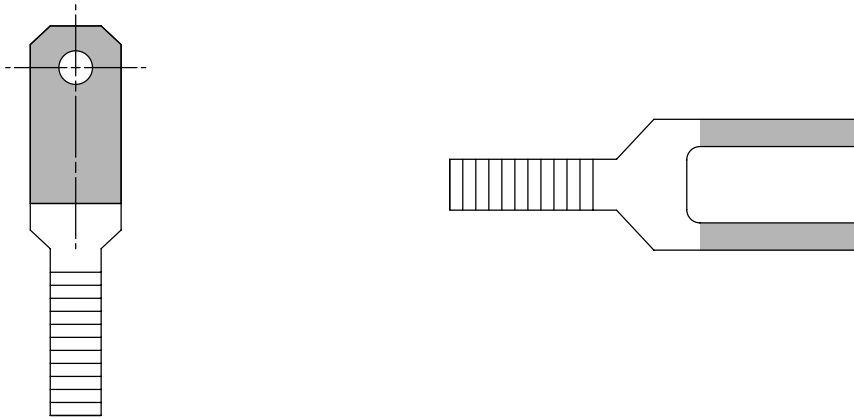
INSPECT

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7-1-8. CLEVIS ADAPTER — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Symbol 1 (Shaded)	Symbol 2 (Unshaded)
MECHANICAL	0.005 in. before and after repair	0.010 in. before and after repair
CORROSION	0.0025 in. before and 0.005 in. after repair	0.005 in. before and 0.010 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	1.00 sq. in.
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER	0.020 in.	0.040 in.
BORES	0.002 in. for 1/4 circumference	
THREAD:		
Depth:	1/3 of thread	
Length:	1/4 inch	
Number:	Two per segment	

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Clevis Adapter — Damage Limits

END OF TASK

7-1-9. COLLECTIVE HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

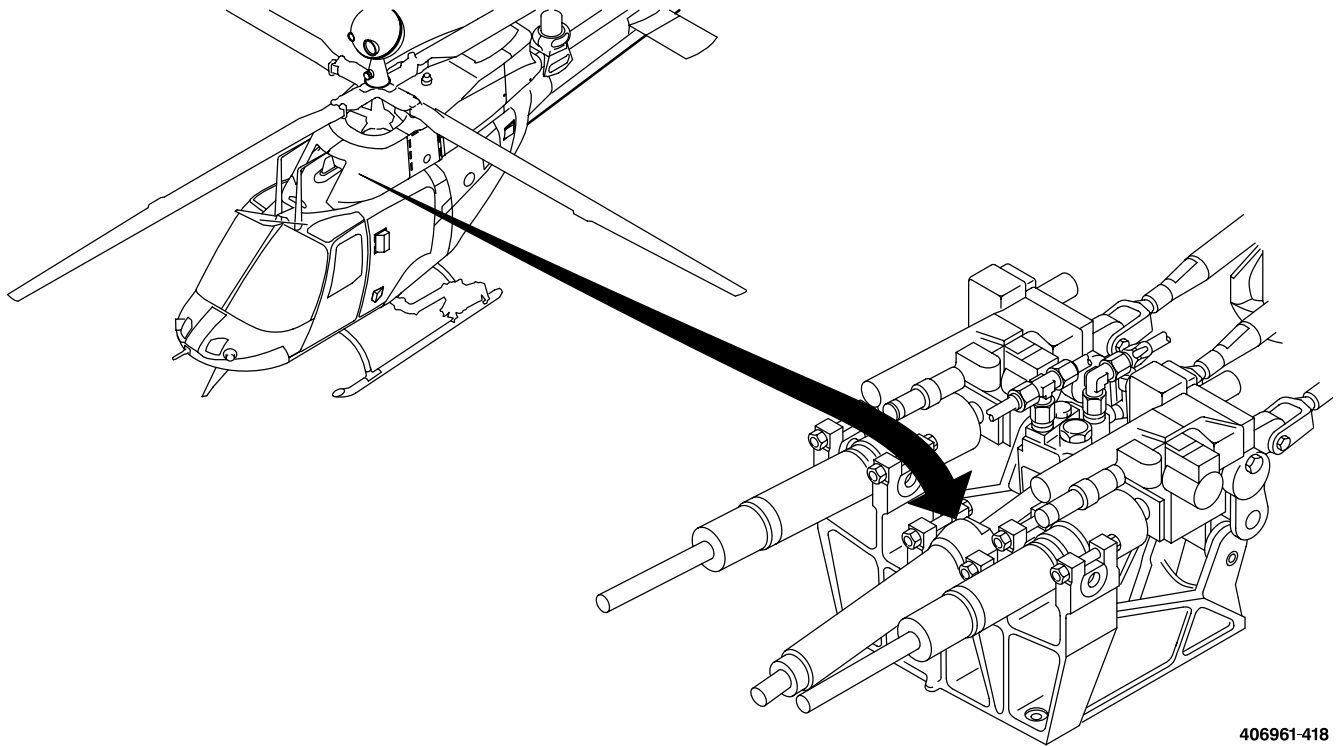
Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)

Material:
Hydraulic Fluid (D106 or D107)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47)



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Collective Hydraulic Actuator — Locator

GO TO NEXT PAGE

7-1-9. COLLECTIVE HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

- Controls shall not be operated from inside of helicopter during replacement of collective hydraulic actuator. Physical injury can occur. If injury occurs, immediate medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be placed in the cockpit during the performance of this task.

NOTE

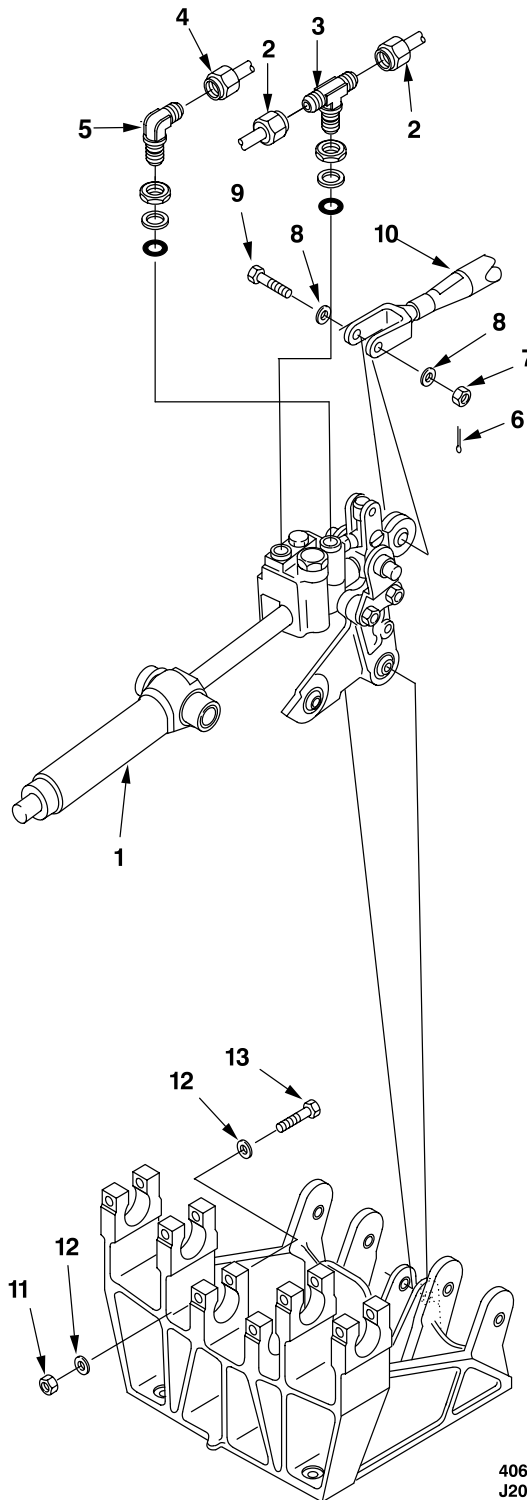
If all actuators are to be removed, cyclic actuators should be removed first (Task 7-1-10).

1. Position maintenance stand (B162) at side of helicopter adjacent to transmission frontal area.



Hydraulic Fluid

2. Place wiping rags (D164) under actuator (1) and disconnect pressure lines (2).
3. Install protective covers on lines (2) and tee (3).
4. Disconnect return line (4).
5. Install protective covers on return line (4) and on elbow (5).
6. Remove cotter pin (6), nut (7), two washers (8) and bolt (9). Discard cotter pin (6).
7. Disconnect tube assembly (10) from actuator (1).
8. Remove two nuts (11), four washers (12), and two bolts (13).



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7-1-9. COLLECTIVE HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

9. Rotate bushings (14) 90 degrees.

10. Remove actuator (1) from support assembly (15).

11. Remove two bushings (14) from actuator (1).

12. Remove two nuts (16), four washers (17), two bolts (18), and two shims (19) securing two plate assemblies (20) to bellcrank assembly (21).

13. Slide two plate assemblies (20) off trunnion of actuator (1) and remove actuator.

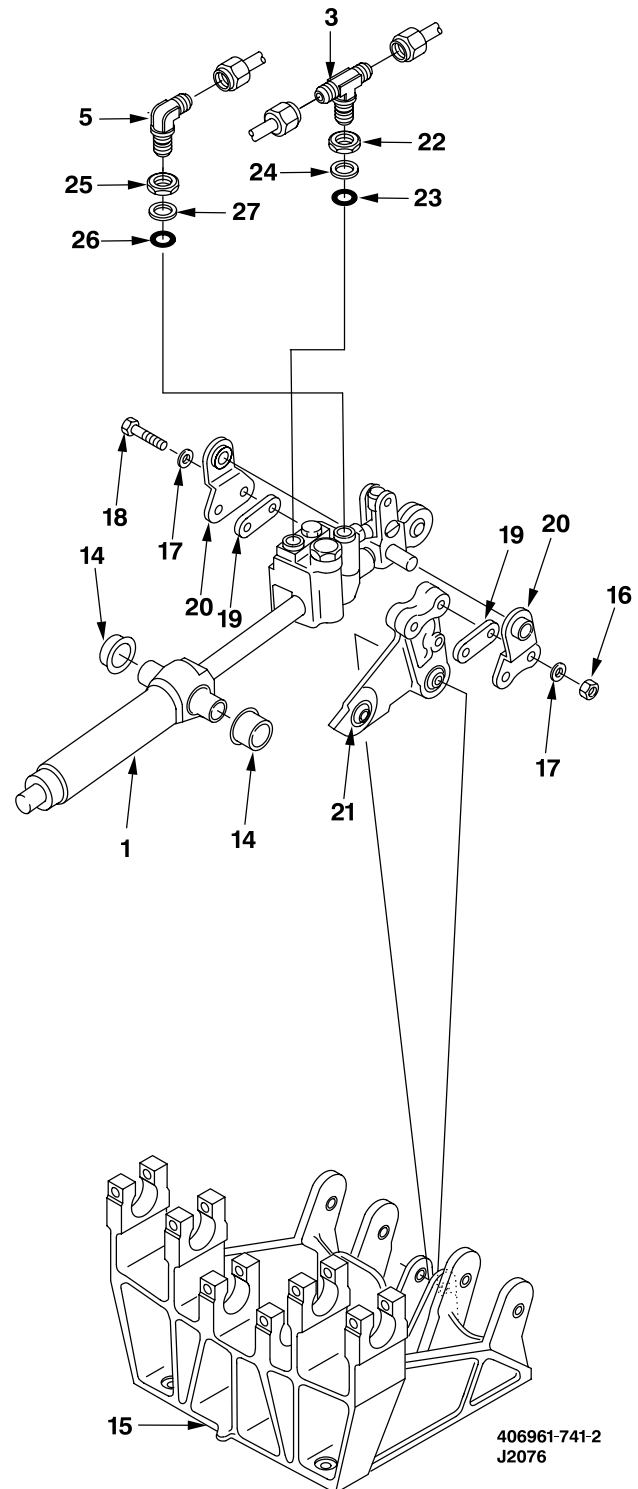
NOTE

If actuator will be replaced, steps 14. through 16. shall be performed. If actuator will be reinstalled, proceed to step 21.

14. Loosen jamnut (22) and remove tee (3), packing (23), packing retainer (24), and jamnut. Discard packing.

15. Loosen jamnut (25) and remove elbow (5), packing (26), packing retainer (27), and jamnut.

16. Install protective plugs in actuator (1) ports.



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J2076

GO TO NEXT PAGE

7-1-9. COLLECTIVE HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

INSTALL

WARNING

- Controls shall not be operated from inside of helicopter during removal of directional control servoactuator. Physical injury can occur. If injury occurs, medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be placed in the cockpit during the performance of this task.

NOTE

- If all actuators are to be installed, cyclic actuators should be installed first (Task 7-1-10).
- If actuators are being replaced, steps 17. through 20. shall be performed. If actuators are being reinstalled, proceed to step 21.



Hydraulic Fluid

17. Install jamnut (25), packing retainer (27), and packing (26) lubricated with hydraulic fluid (D106 or D107) on elbow (5).

18. Install elbow (5) in actuator (1) port.

19. Install jamnut (22), packing retainer (24), and packing (23) lubricated with hydraulic fluid (D106 or D107) on tee (3).

20. Install tee (3) in actuator (1) port.

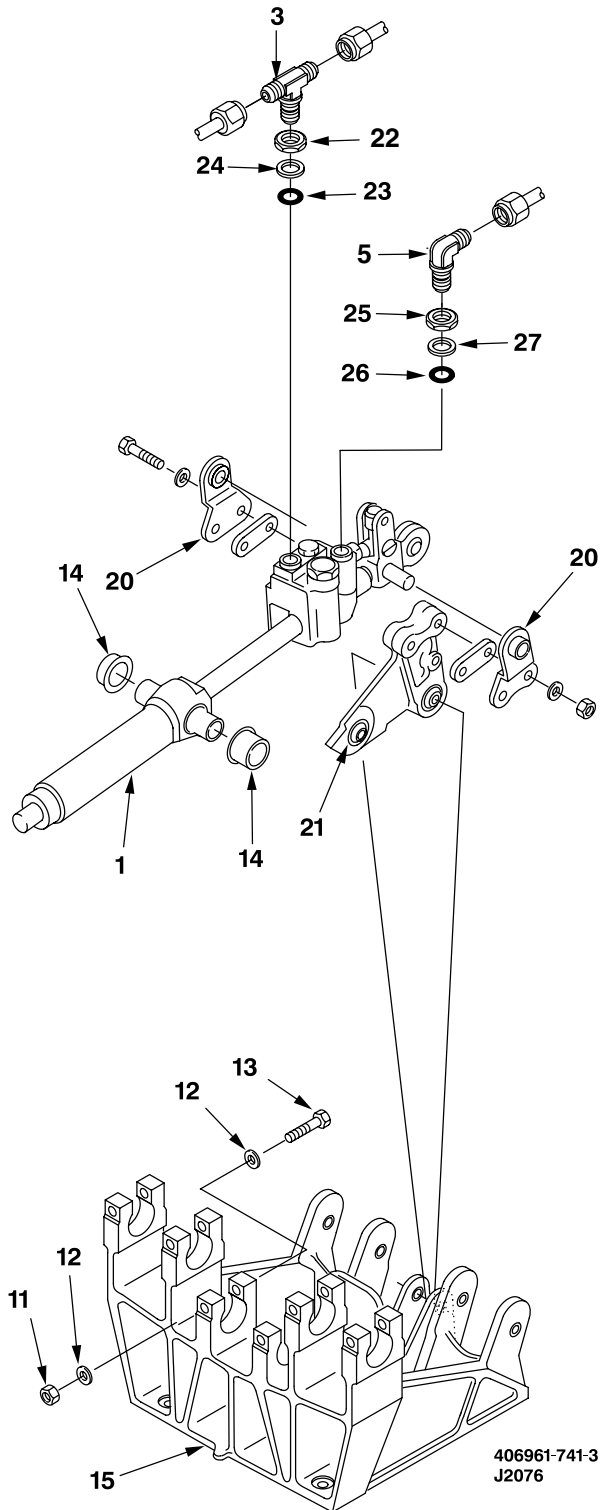
21. Install two bushings (14) on actuator (1).

22. Position actuator (1) into support (15) and rotate bushings (14) 90 degrees.

23. Secure actuator (1) to support assembly (15) with two bolts (13), four washers (12), and two nuts (11).

24. Torque nuts (11) **75 TO 95 INCH-POUNDS.**

25. Position two plate assemblies (20) and bellcrank (21) on trunnion of actuator (1).



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J2076

GO TO NEXT PAGE

7-1-9. COLLECTIVE HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

26. Install plate assemblies (20) on bellcrank assembly (21) with two bolts (18), four washers (17), shims (19), and two nuts (16).

27. Shim until a gap of **0.030 to 0.070 inch** exists between each side of trunnion of actuator (1) and plate assemblies (20).

28. Torque nuts (16) **75 TO 95 INCH-POUNDS**.

NOTE

- Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.
- Clearance shall be checked at both ends of bellcrank travel.

29. Connect tube assembly (10) to actuator (1) with bolt (9), two washers (8), and nut (7).

30. Torque nut (7) **65 TO 85 INCH-POUNDS**.

31. Install cotter pin (6) through nut (7).



Hydraulic Fluid

32. Remove protective caps from pressure lines (2).

33. Connect pressure lines (2) to tee (3).

34. Remove protective cap from return line (4).

35. Connect return line (4) to elbow (5).

36. Remove wiping rags from under actuator (1). Properly dispose of/discard wiping rags.

INSPECT

FOLLOW-ON MAINTENANCE

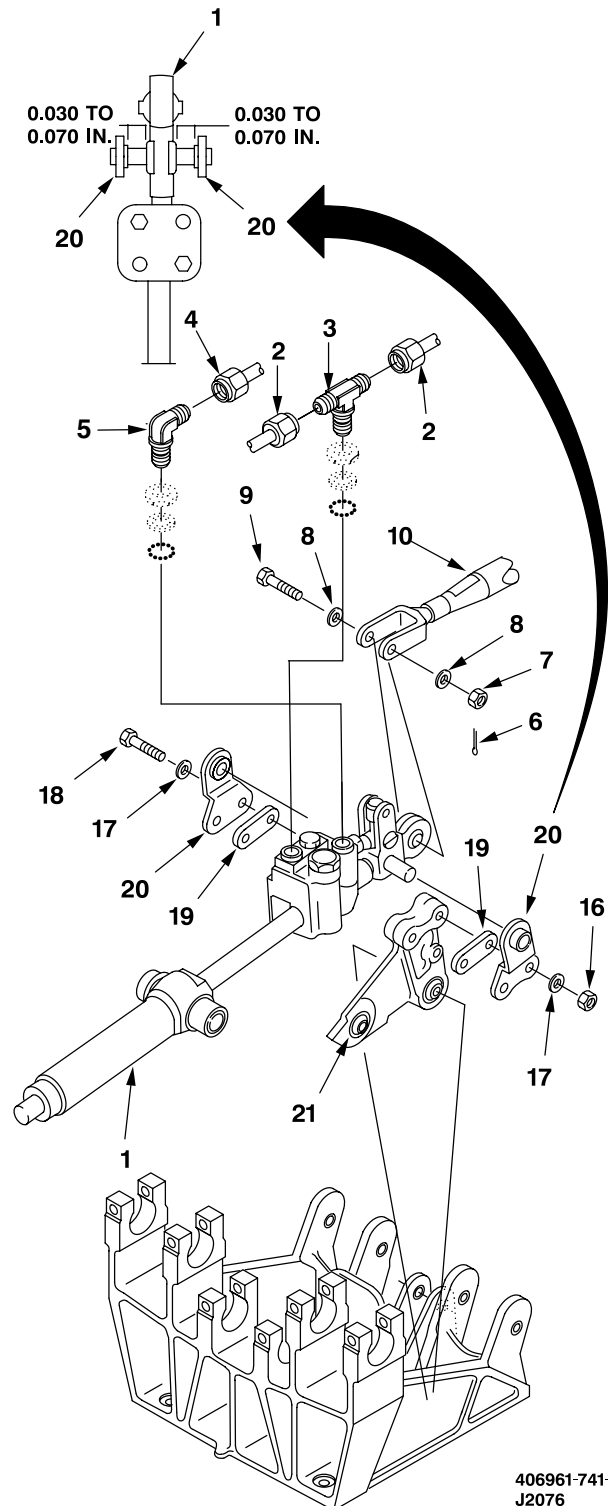
Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

Perform retorques (Chapter 1, Section IX).



END OF TASK

7-1-10. CYCLIC HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

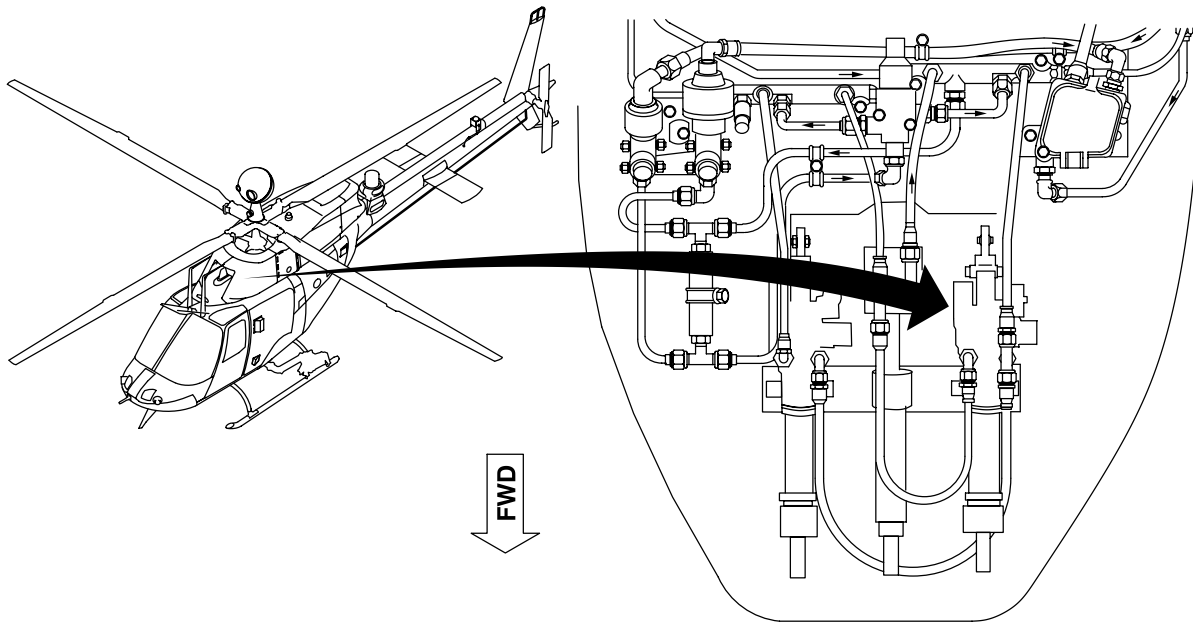
Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)

Material:
Hydraulic Fluid (D106 or D107)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



VIEW LOOKING DOWN

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Cyclic Hydraulic Actuator — Locator

GO TO NEXT PAGE

7-1-10. CYCLIC HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

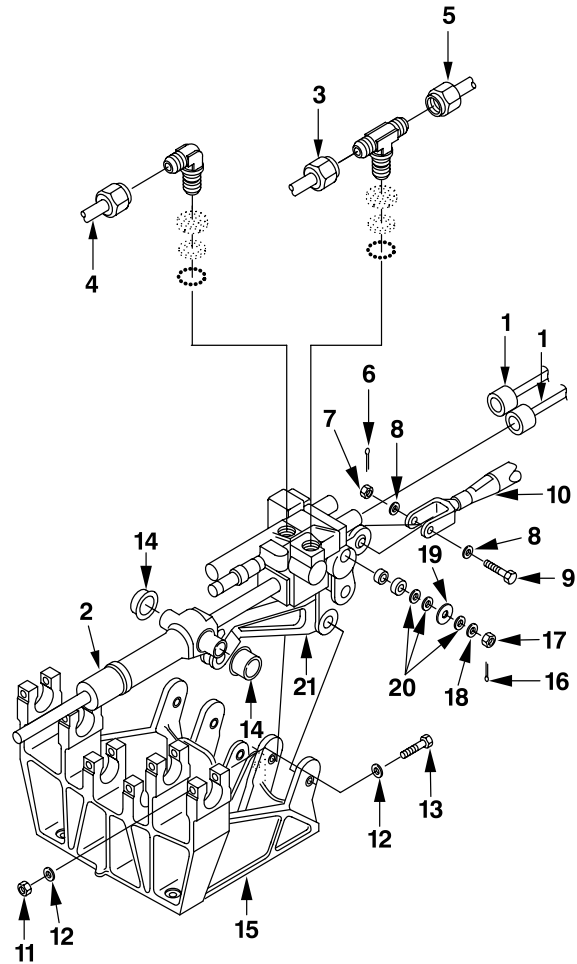
- Controls shall not be operated from inside of helicopter during replacement of cyclic hydraulic actuator. Physical injury can occur. If injury occurs, immediate medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be placed in the cockpit during the performance of this task.

1. Position maintenance stand (B162) at side of helicopter forward of transmission.
2. Disconnect electrical connectors (1) from SCAS unit.



Hydraulic Fluid

3. Place wiping rags (D164) under actuator (2) and disconnect hose assemblies (3, 4, and 5).
4. Place protective caps on hoses (3, 4, and 5) and plugs in ports of actuator (2).
5. Remove cotter pin (6), nut (7), two washers (8), and bolt (9). Discard cotter pin.
6. Disconnect tube assembly (10) from actuator (2).
7. Remove two nuts (11), four washers (12), and two bolts (13).
8. Rotate bushings (14) 90 degrees and remove actuator (2) from support assembly (15).
9. Remove two bushings (14) from actuator (2) and retain for reinstallation.
10. Remove cotter pin (16), nut (17), washer (18), thrust washer (19), and washers (20). Discard cotter pin.
11. Repeat step 10. for opposite side of bellcrank (21).



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GO TO NEXT PAGE

7-1-10. CYCLIC HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

12. Slide bearings (22) out of bellcrank (21) far enough to allow actuator (2) to be removed from bellcrank.

13. Remove two bearings (22) and two spacers (23).

14. Remove actuator (2) from bellcrank (21) and support assembly (15).

NOTE

- If actuator is being replaced, steps 15. and 16. shall be performed.
- If actuator will be reinstalled, removal procedure is complete.

15. Loosen jamnut (24) and remove elbow (25), packing (26), and packing retainer (27).

16. Loosen jamnut (28) and remove tee (29), packing (30), and packing retainer (31).

INSTALL

WARNING

- Controls shall not be operated from inside helicopter during replacement of cyclic hydraulic actuator. Physical injury can occur. If injury occurs, immediate medical aid shall be obtained.
- A “DO NOT MOVE CONTROLS” sign shall be placed in cockpit during performance of this task.

NOTE

- If actuator is being replaced, steps 17. and 18. shall be performed.
- If actuator is being reinstalled, step 19. is next.

17. Install packing retainer (31), new packing (30) lubricated with hydraulic fluid (D106 or D107), and tee (29).

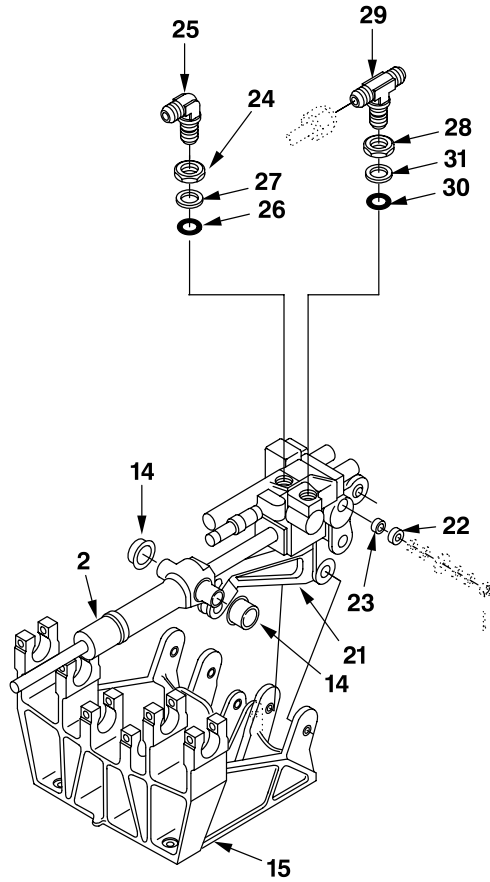
18. Install packing retainer (27), new packing (26) lubricated with hydraulic fluid (D106 or D107), and elbow (25).

19. Ensure presence of dual slippage marks (Task 7-1-2).

20. Install two bushings (14) on actuator (2).

21. Install actuator (2) in support assembly (15).

22. Rotate bushings (14) 90 degrees to lock in support assembly (15).



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7-1-10. CYCLIC HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

- 23. Install two spacers (23) and two bearings (22) on actuator.
- 24. Slide bearings (22) into bore of bellcrank (21).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Installation of thrust washers (19) with treated surface toward bellcrank (21) and correct installation of cotter pins (16) are characteristics critical to flight safety.

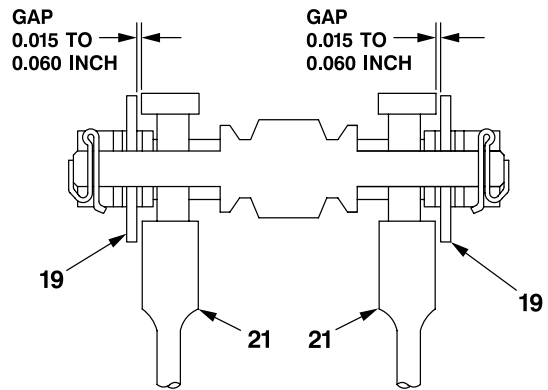
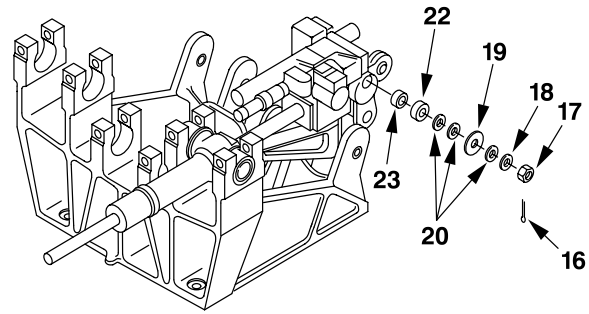
NOTE

Self-locking castellated nuts shall be reused only if they meet the minimum breakaway torque value specified in TM 1-1500-204-23.

- 25. Install washers (20), two thrust washers (19) (treated surface towards bellcrank), two washers (18), and two nuts (17).

- 26. Adjust number of washers (20) to obtain **0.015 to 0.060 inch** gap between bellcrank (21) tangs and thrust washers (19) on both sides as shown.

- 27. Torque nuts (17) **65 TO 85 INCH-POUNDS**.



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7-1-10. CYCLIC HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

28. Install two cotter pins (16) through two nuts (17).

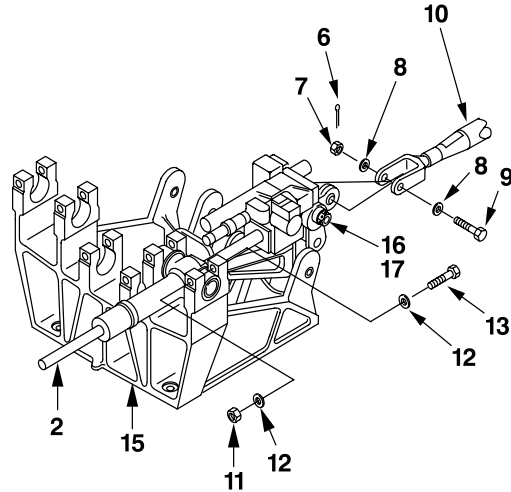
29. Secure actuator (2) to support (15) with two bolts (13), four washers (12), and two nuts (11).

30. Torque nuts (11) **75 TO 95 INCH-POUNDS**.

31. Connect tube assembly (10) to actuator (2) with bolt (9), two washers (8) and nut (7).

32. Torque nut (7) **65 TO 85 INCH-POUNDS**.

33. Install cotter pin (6) through nut (7).



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7-1-10. CYCLIC HYDRAULIC ACTUATOR — REMOVAL/INSTALLATION (CONT)

**Hydraulic Fluid**

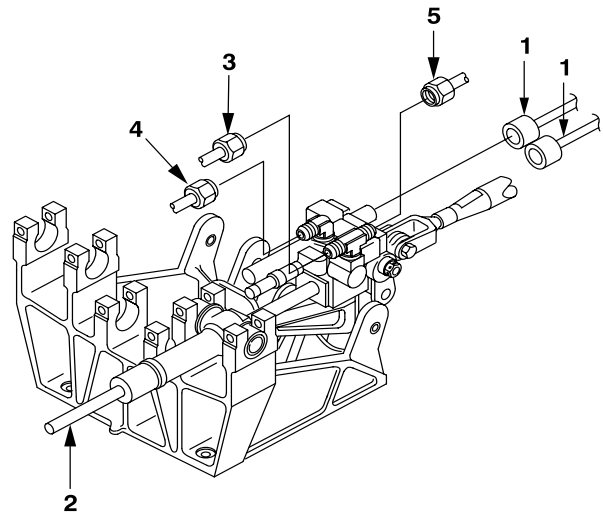
34. Remove protective caps from hose assemblies (3, 4, and 5) and plugs from ports in actuator (2).

35. Install return hose assemblies (3 and 5) and pressure hose assembly (4) on actuators (2).

36. Connect electrical connectors (1) to SCAS unit.

37. Remove wiping rags (D164) from under actuator (2). Properly dispose/discard wiping rags (D164).

38. Clean area with wiping rags (D164).



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INSPECT

FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

■ Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

Section II. HYDRAULIC SYSTEM BLEEDING

7-5. **HYDRAULIC SYSTEM BLEEDING**

hydraulic system. Standard torques are provided in Appendix P and TM 1-1500-204-23.

7-6. INTRODUCTION

This section contains: maintenance procedures for using a hydraulic test stand to bleed air from the

7-7. TASK LIST

The task list lists the task required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Hydraulic System — Bleeding	7-2-1	7-37

7-2-1. HYDRAULIC SYSTEM — BLEEDING

This task covers: Bleeding (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Hydraulic Test Stand

Material:
Hydraulic Fluid (D106 or D107)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

7-2-1. HYDRAULIC SYSTEM — BLEEDING (CONT)

1. Move maintenance stand (B162) into position to gain access to right side of roof forward of the transmission.



Hydraulic Fluid

2. Connect APU (Task 1-6-5).

CAUTION

To prevent system contamination, the hydraulic test stand shall be thoroughly cleaned and serviced with the required hydraulic fluid for helicopter being serviced.

3. Disconnect hose couplings (1 and 2) from coupling halves (3 and 4).

4. Connect the hydraulic test stand to quick-disconnect coupling halves (3 and 4) located on right side of helicopter roof at hydraulic filters.

5. Visually inspect the complete hydraulic system before turning on hydraulic test stand to ensure all components and lines are securely attached.

6. Set the hydraulic test stand to provide a flow rate of $3.0 \pm 1/2$ GPM with the pressure compensator adjusted to 1000 psig and maintain for a minimum of 15 minutes. Bleed, leakage and clearance checks shall be accomplished during this period.

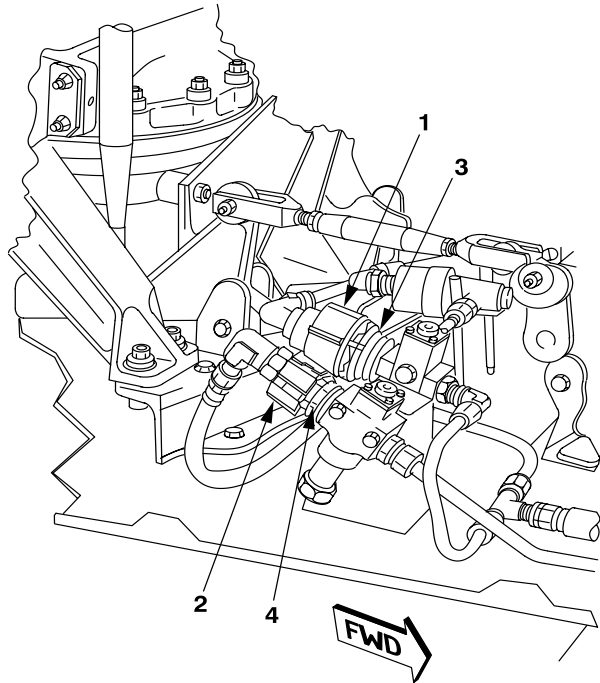
7. Rapidly cycle the cyclic collective and directional actuators through their full strokes a minimum of 10 times to bleed air from system.

8. Perform operational check (TM 1-1520-248-T).

9. Reduce pressure to zero psig and disconnect the hydraulic test stand.

10. Connect helicopter hose couplings (1 and 2) to coupling halves (3 and 4).

11. Disconnect APU (Task 1-6-5).



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SERVICE



Hydraulic Fluid

12. Service hydraulic reservoir (Task 1-4-10).

13. Clean area with wiping rags (D164).

FOLLOW-ON MAINTENANCE

Install forward fairing assembly (Task (2-2-47). ■

Perform MOC (TM 1-1500-328-23).

INSPECT

END OF TASK

Section III. HYDRAULIC FILTER ASSEMBLIES

7-8. HYDRAULIC FILTER ASSEMBLIES

replacement of filter elements. Standard torques are provided in Appendix P and TM 1-1500-204-23.

7-9. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and installation of hydraulic filter assemblies and

7-10. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Hydraulic Filter Assembly — Removal/Cleaning/Inspection/Repair/Installation	7-3-1	7-40
Filter Elements — Replacement	7-3-2	7-44

7-3-1. HYDRAULIC FILTER ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/
INSTALLATION

This task covers: Removal, Cleaning, Inspection, Repair and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Rubber Gloves (D111)
Hydraulic Fluid (D106 or D107)
Wiping Rags (D164)
Drycleaning Solvent (D199)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pseudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

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7-3-1. HYDRAULIC FILTER ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

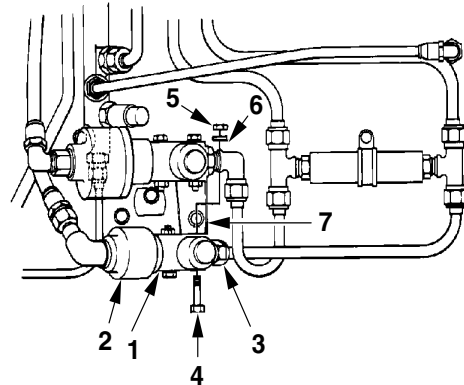
REMOVE

1. Move maintenance stand (B162) into position to gain access to right side of roof forward of transmission.

NOTE

There are two filter element assemblies in the hydraulic system. One is located in the pressure line and one in the return line. Maintenance procedures are the same for both.

2. Place wiping rags (D164) under filter assembly (1) to catch hydraulic fluid.



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Hydraulic Fluid

3. Disconnect quick-disconnect (2) aft of filter assembly (1) and place protective cap on line.

4. Disconnect hydraulic line (3) forward of filter assembly (1) and place protective cap on line.

5. Remove two bolts (4), two nuts (5), and two washers (6), securing filter assembly to mounting bracket (7) and remove filter assembly from bracket.



Hydraulic Fluid

6. Clean filter assembly using one of the following:

- a. Drycleaning solvent (D199).
- b. Hydraulic fluid (D106 or D107).

CLEAN

7. Back flush filter assembly during cleaning (inside to outside).



Drycleaning Solvent

GO TO NEXT PAGE

 7-3-1. HYDRAULIC FILTER ASSEMBLY — REMOVAL/CLEANING/INSPECTION/REPAIR/INSTALLATION (CONT)

INSPECT

8. Check threads and ports for damage.

REPAIR

9. Replace filter assembly if inspection requirements are not met. Reset the red pop-out button by pressing down.

INSTALL

10. Position filter assembly (1) onto mounting bracket (7) and install two bolts (4), two washers (6), and two nuts (5).

11. Remove cap from line (3) and install line.

12. Remove cap and connect hydraulic quick-disconnect (2) to the aft side of filter assembly (1).

13. Remove wiping rags and clean area.

INSPECT

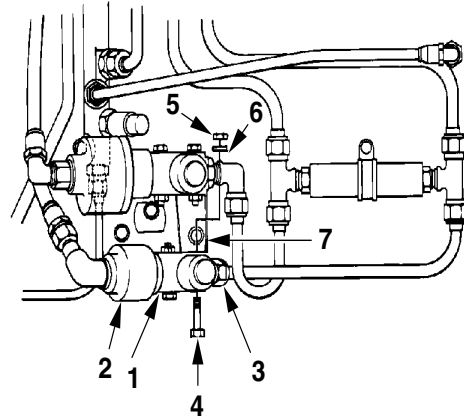
FOLLOW-ON MAINTENANCE

Bleed hydraulic system (Task 7-2-1).

Service hydraulic reservoir (Task 1-4-10).

- Install forward fairing assembly (Task 2-2-47).

Perform MOC (TM 1-1500-328-23).



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END OF TASK

7-3-2. FILTER ELEMENTS — REPLACEMENT

This task covers: Replacement (On Helicopter)

INITIAL SETUP

Lockwire (D131)
Hydraulic Fluid (D106 or D107)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer
Maintenance Test Pilot

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Open End Wrench (B216)
Torque Wrench (B237)
Crowfoot (B29)
Torque Wrench (B236)

References:
TM 1-1520-248-MTF

Material:
Rubber Gloves (D111)
Drycleaning Solvent (D199)
Wiping Rags (D164)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

7-3-2. FILTER ELEMENTS — REPLACEMENT (CONT)

REMOVE

1. Move maintenance stand (B162) into position to gain access to the right side of roof forward of the transmission.



Hydraulic Fluid

NOTE

There are two filter elements in the hydraulic system, one in the pressure line filter assembly and one in return line filter assembly. Remove/Install procedures are same for both. The bypass valve, located in return line filter assembly, prevents excessive pressure in the return system if the filter assembly becomes clogged.

2. Place wiping rags (D164) under filter bowl (1) to catch hydraulic fluid

3. Cut lockwire on filter bowl (1). Remove filter bowl with element (2).

4. Press end of springs on element (2) to disengage from retention groove in filter bowl. Remove filter element with packing (3). Discard packing.

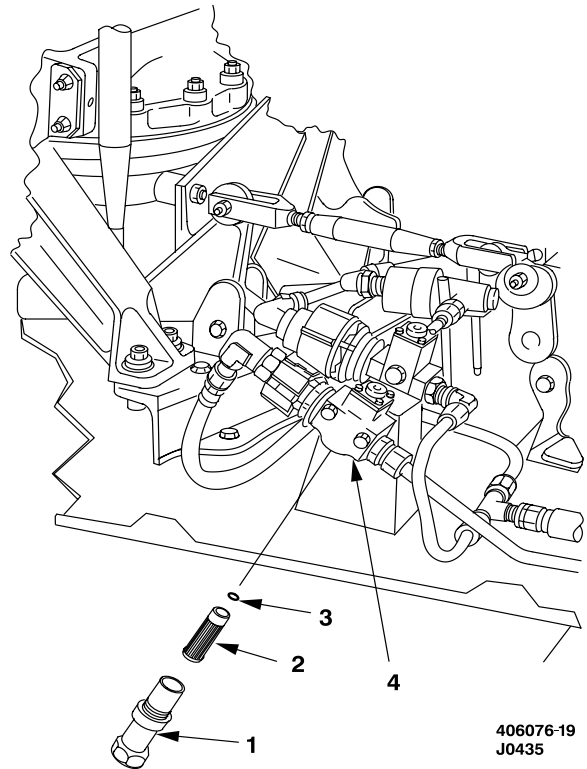
NOTE

After removal of element, do not remove retainer and packing inside filter assembly (4).

INSPECT

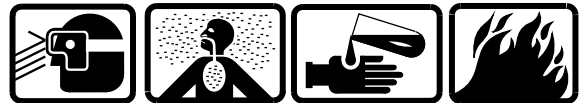


Hydraulic Fluid



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5. Check filter element (2) for contamination.



Drycleaning Solvent

6. Clean element (2) by vigorous agitation in a container of drycleaning solvent (D199).

7. Inspect element visually for damage. If any defects are found on filtering surfaces or on sealing area, replace with new element.

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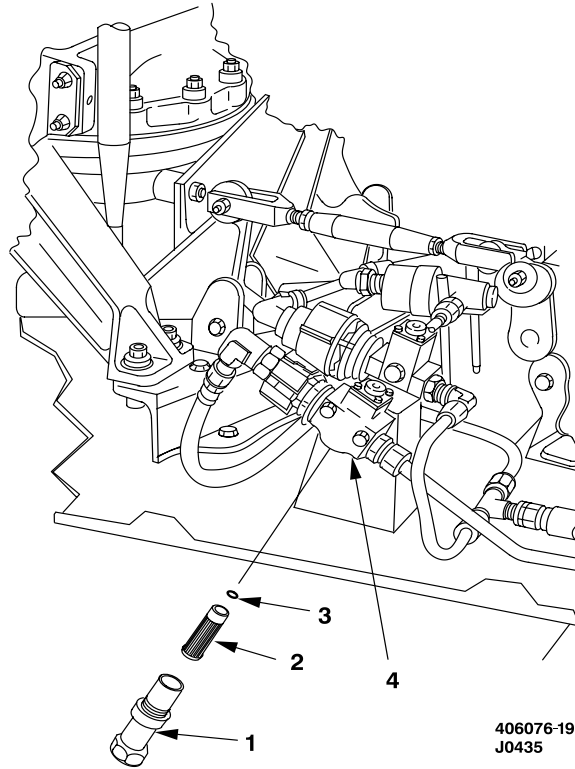
7-3-2. FILTER ELEMENTS — REPLACEMENT (CONT)

INSTALL



Hydraulic Fluid

8. Lubricate packing (3) with hydraulic fluid (D106 or D107).
9. Install packing (3) (supplied with new element) on element (2).
10. Inspect springs on element for satisfactory condition to retain element in filter bowl (1).
11. Fill filter bowl half full with hydraulic fluid (D106 or D107).
12. Insert element (2) into filter bowl (1) to ensure that springs will engage in retention groove.
13. Screw filter bowl (1) into body of filter assembly (4).
14. Torque filter bowl (1) **20 TO 60 INCH-POUNDS**.
15. Secure filter bowl (1) to filter assembly with lockwire (D131).
16. Remove wiping rags and clean area.



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INSPECT

FOLLOW-ON MAINTENANCE

Bleed hydraulic system (Task 7-2-1).

Service hydraulic reservoir (Task 1-4-10).

■ Install forward fairing assembly (Task 2-2-47).

Perform MOC (TM 1-1520-248-MTF).

END OF TASK

Section IV. HYDRAULIC HOSES, LINES, TUBES, FITTINGS, AND QUICK-DISCONNECTS

7-11. HYDRAULIC HOSES, LINES, TUBES, FITTINGS, AND QUICK-DISCONNECTS

installation of hydraulic hoses, lines, tubes, quick-disconnects, and fittings. Standard torques are provided in Appendix P and TM 1-1500-204-23.

7-12. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and

7-13. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Rigid Tube Assembly (Typical) — Removal/Installation	7-4-1	7-48
Hydraulic System Tubing — Cleaning/Inspection/Repair	7-4-2	7-50
Flex Hose (Typical) — Removal/Installation	7-4-3	7-52
Hydraulic Hoses — Cleaning/Inspection/Repair	7-4-4	7-55
Tee/Retainer/Packing/Nut — Removal/Installation	7-4-5	7-56
Quick-Disconnect Self-Sealing Coupling Half (Typical) — Removal/Installation	7-4-6	7-58
Quick-Disconnect Coupling Halves — Cleaning/Inspection/Repair	7-4-7	7-60

7-4-1. RIGID TUBE ASSEMBLY (TYPICAL) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Airmobile Hydraulic Shop Set (B139)
Maintenance Stand (B162)

Material:
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23
TM 1-1520-248-23P

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

7-4-1. RIGID TUBE ASSEMBLY (TYPICAL) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Move maintenance stand (B162) into position to gain access to roof forward of transmission.
2. Place wiping rag (D164) under manifold (1) and tube (2) to absorb fluid.



Hydraulic Fluid

3. Loosen fittings on each end of tube (2) and remove.

NOTE

Removal and installation procedures are typical for all rigid tubing assemblies. Refer to TM 1-1520-248-23P for identification of replacement parts by part number.

INSTALL



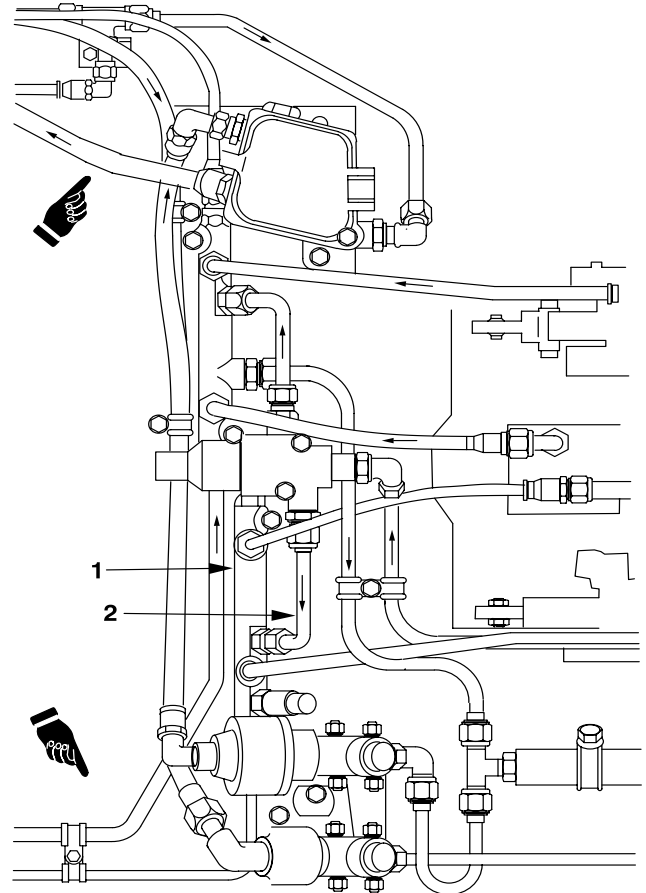
Hydraulic Fluid

4. Install tube (2).
5. Remove wiping rag and clean area.

INSPECT

FOLLOW-ON MAINTENANCE

- Bleed hydraulic system (Task 7-2-1).
- Service hydraulic reservoir (Task 1-4-10).
- Install forward fairing assembly (Task 2-2-47).
- Perform MOC (TM 1-1500-328-23).



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END OF TASK

7-4-2. HYDRAULIC SYSTEM TUBING — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Airmobile Hydraulic Shop Set (B139)
Pressure Tester (B174)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-204-23
TM 1-1520-248-23&P

GO TO NEXT PAGE

7-4-2. HYDRAULIC SYSTEM TUBING — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN

**Drycleaning Solvent**

1. Clean tubing using drycleaning solvent (D199). Dry with wiping rags (D164).

INSPECT

2. Inspect tubing for cracks, nicks, dents, and damaged threads (TM 1-1500-204-23).

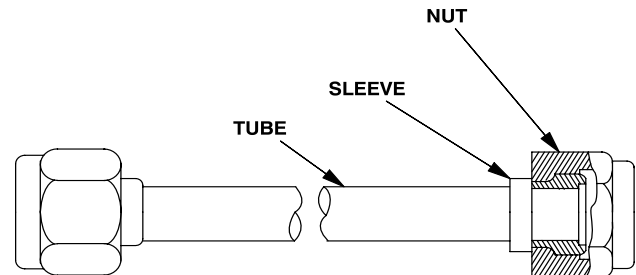
REPAIR

NOTE

Refer to (TM 1-1520-248-23&P) for identification of replacement parts by part number.

3. No repair authorized.

4. Perform hydrostatic test with pressure tester (B174) (TM 1-1500-204-23).

INSPECT**TYPICAL FLARELESS TUBE ASSEMBLY**

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END OF TASK

7-4-3. FLEX HOSE (TYPICAL) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Airmobile Hydraulic Shop Set (B139)
Maintenance Stand (B162)
■ Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Material:
Lockwire (D132)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

GO TO NEXT PAGE

7-4-3. FLEX HOSE (TYPICAL) — REMOVAL/INSTALLATION (CONT)

NOTE

This procedure is for removal of pressure hose. Procedure applies to all lines identified in figure.

REMOVE

1. Move maintenance stand (B162) into position to gain access to right and left sides of roof forward of transmission.

2. Place suitable container (B101) under hydraulic reservoir (1).



Hydraulic Fluid

3. Cut lockwire from drain plug (2). Remove plug (2) and packing (3) and drain reservoir. Discard packing (3).

4. Place wiping rag (D164) under hydraulic pump (4) to absorb fluid that leaks from suction line hose (5) or pressure hose (6).

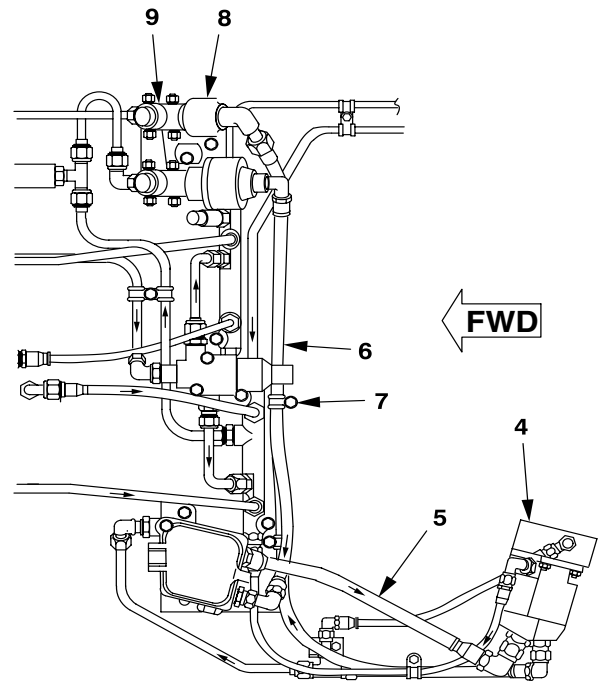
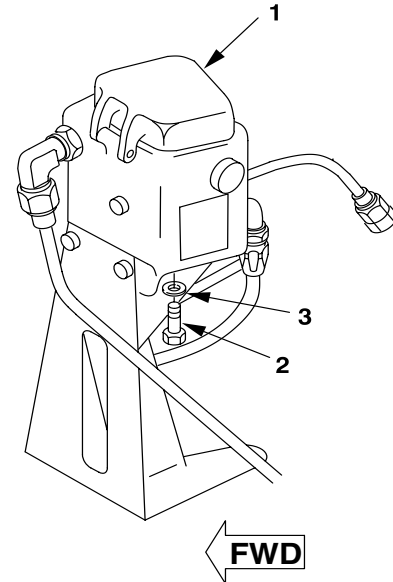
5. Remove suction hose (5) from pump (4) and reservoir (1).

6. Remove butterfly clamp (7) from pressure hose (6).

7. Disconnect quick-disconnect (8) from filter assembly (9).

8. Remove quick-disconnect (8) from pressure hose (6).

9. Remove pressure hose (6) from pump (4).



VIEW LOOKING DOWN

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7-4-3. FLEX HOSE (TYPICAL) — REMOVAL/INSTALLATION (CONT)

CAUTION

Hose routing shall be followed as shown in figure. Clamps shall be positioned correctly and tightened.

INSTALL



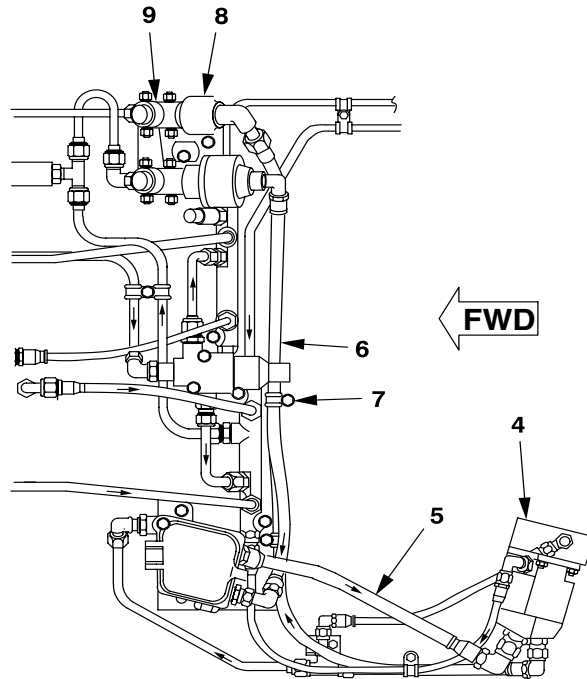
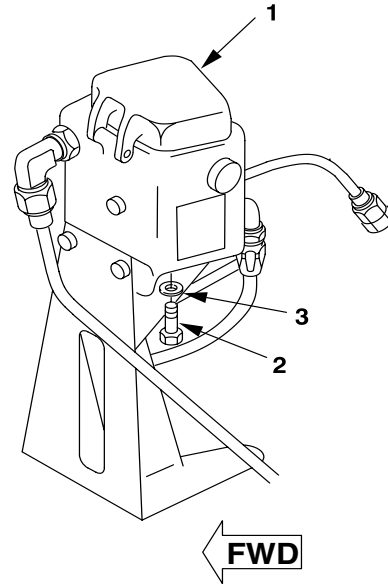
Hydraulic Fluid

10. Install quick-disconnect (8) on pressure hose (6).
11. Position pressure hose (6) onto deck and install on pump (4).
12. Connect quick-disconnect (8) to filter assembly (9).
13. Install clamp (7).
14. Install suction hose (5) on pump (4) and reservoir (1).
15. Install drain plug (2) and new packing (3) and lockwire (D132).
16. Remove wiping rags, container (B101), and clean area.

INSPECT

FOLLOW-ON MAINTENANCE

- Bleed hydraulic system (Task 7-2-1).
- Service hydraulic reservoir (Task 1-4-10).
- Install forward fairing assembly (Task 2-2-47).
- Perform MOC (TM 1-1500-328-23).



VIEW LOOKING DOWN

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END OF TASK

7-4-4. HYDRAULIC HOSES — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Airmobile Hydraulic Shop Set (B139)
Pressure Tester (B174)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-204-23
TM 1-1520-248-23&P

CLEAN



Drycleaning Solvent

1. Clean hydraulic hoses using drycleaning solvent (D199). Dry with wiping rag (D164).

INSPECT

2. Inspect hoses for cracks, nicks, cuts, damaged flares, and damaged threads (TM 1-1500-204-23).

REPAIR

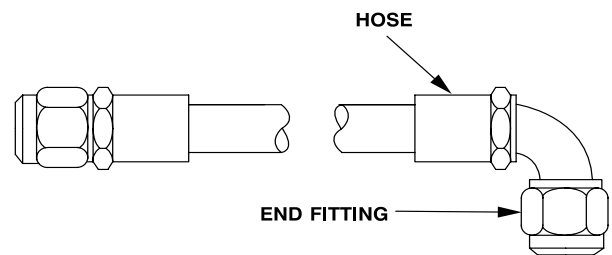
NOTE

Refer to (TM 1-1520-248-23&P) for identification of replacement parts by part number.

3. No repair authorized.

4. Perform hydrostatic test with pressure tester (B174) (TM 1-1500-204-23).

INSPECT



TYPICAL HOSE ASSEMBLY

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END OF TASK

7-4-5. TEE/RETAINER/PACKING/NUT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

7-4-5. TEE/RETAINER/PACKING/NUT — REMOVAL/INSTALLATION (CONT)

REMOVE

NOTE

Removal procedure is similar for tee at opposite end of relief valve (1).

1. Move maintenance platform (B162) into position to gain access to right side of roof forward of transmission.



Hydraulic Fluid

2. Place a wiping rag (D164) under relief valve (1). Disconnect B nuts (2) from each end of tee (3).
3. Loosen B nuts (4).
4. Loosen clamp (5) on relief valve (1) by removing screw.
5. Loosen locknut (6) on tee (3). Raise relief valve (1) enough to turn tee counterclockwise.
6. Remove tee (3) with nut (6), retainer (7), and packing (8). Discard packing and replace other parts, if damaged.

INSTALL

NOTE

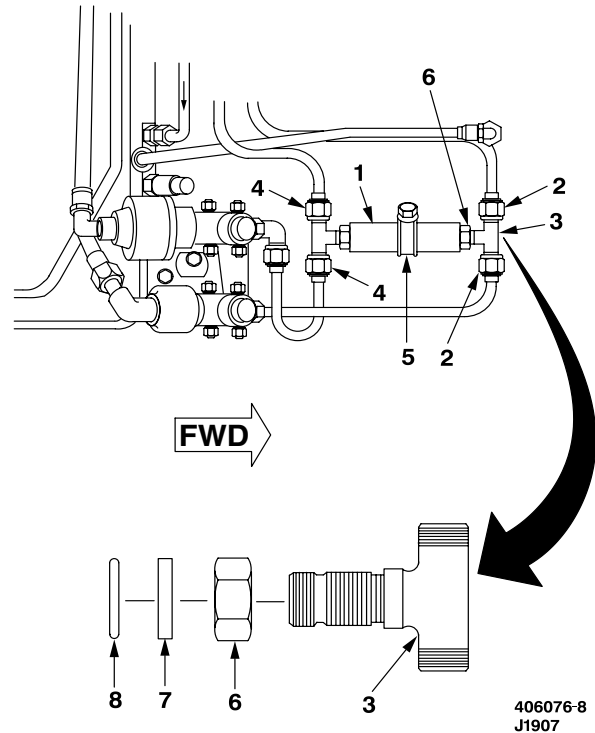
Installation procedure is similar for tee at opposite end of relief valve (1).

7. Install nut (6) and retainer (7) on tee (3).



Hydraulic Fluid

8. Lubricate packing (8) and install on tee (3).
9. Raise relief valve (1) enough to position tee (3) and turn tee clockwise in valve.
10. Install and secure clamp (5).



11. Place B nuts (2) on each end of tee (3) and tighten.
12. Tighten two B nuts (4).
13. Tighten locknut (6) against relief valve (1).
14. Remove wiping rag and clean area.

INSPECT

FOLLOW-ON MAINTENANCE

Bleed hydraulic system (Task 7-2-1).

Service hydraulic reservoir (Task 1-4-10).

Install forward fairing assembly (Task 2-2-47).

Perform MOC (TM 1-1500-328-23).

END OF TASK

7-4-6. QUICK-DISCONNECT SELF-SEALING COUPLING HALF (TYPICAL) — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
■ Plastic 12 Qt. Pail (or suitable substitute)
(B101)
Open End Wrench (B219)

Material:
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

GO TO NEXT PAGE

7-4-6. QUICK-DISCONNECT SELF-SEALING COUPLING HALF (TYPICAL) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Move maintenance stand (B162) into position to gain access to right side of roof forward of the transmission.
2. Place suitable container (B101) or wiping rags (D164) under couplings.



Hydraulic Fluid

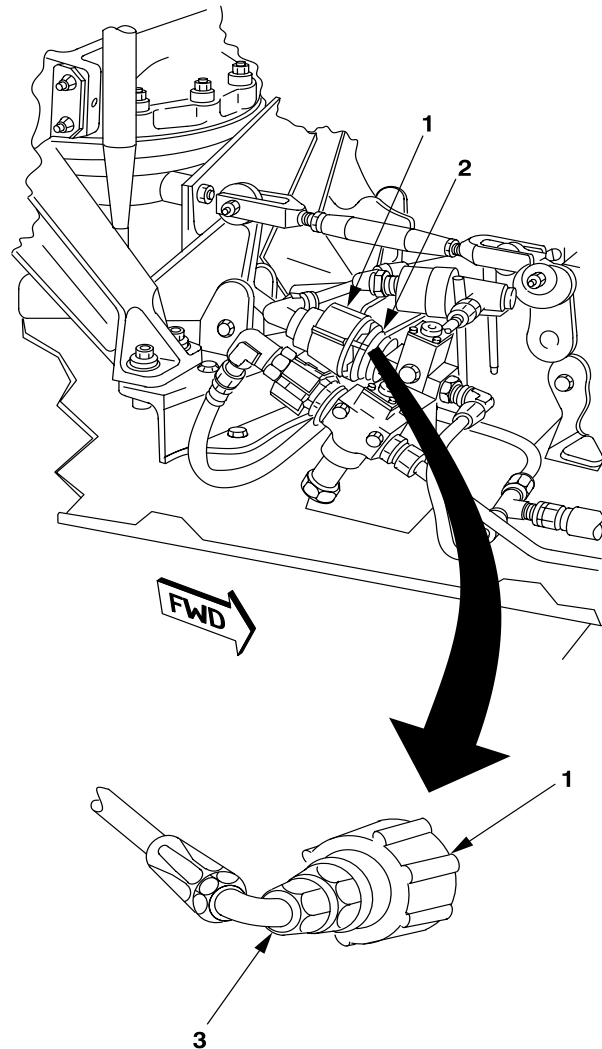
3. Release quick-disconnect coupling half (1) by turning counterclockwise until coupling releases from coupling half (2).
4. Loosen fitting (3) and remove coupling half (1).
5. Discard leaking coupling half (1).

INSTALL



Hydraulic Fluid

6. Screw fitting (3) onto quick-disconnect coupling half (1) and tighten.
7. Connect coupling half (1) to coupling half (2) by turning coupling half (1) clockwise until hand tight. A clicking noise will be heard and the detents will be felt.
8. Remove container (B101) or wiping rags (D164) and clean area.



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INSPECT

FOLLOW-ON MAINTENANCE

- Bleed hydraulic system (Task 7-2-1).
- Service hydraulic reservoir (Task 1-4-10).
- Install forward fairing assembly (Task 2-2-47).
- Perform MOC (TM 1-1500-328-23).

END OF TASK

7-4-7. QUICK-DISCONNECT COUPLING HALVES — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

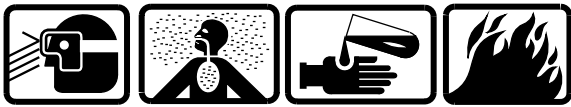
INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer



Drycleaning Solvent

CLEAN

1. Clean quick-disconnect coupling halves with drycleaning solvent (D199) and brush. Dry with wiping rags (D164).

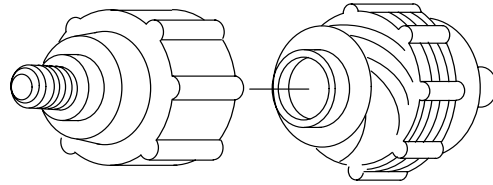
INSPECT

2. Inspect quick-disconnect coupling halves for thread damage. None allowed.

3. Inspect quick-disconnect coupling halves for proper locking and damage.

REPAIR

4. Replace quick-disconnect coupling halves if damaged or unserviceable. No repair authorized.



QUICK-DISCONNECT COUPLING HALVES (TYPICAL)

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END OF TASK

Section V. PRESSURE SWITCH, MANIFOLDS, AND RELIEF VALVE

7-14.

**PRESSURE SWITCH, MANIFOLDS,
AND RELIEF VALVE**

return manifold, hydraulic pressure manifold, and hydraulic relief valve. Standard torques are provided in Appendix P and TM 1-1500-204-23.

7-15. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and installation of hydraulic pressure switch, hydraulic

7-16. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Pressure Switch — Removal/Installation	7-5-1	7-62
Hydraulic Pressure Switch — Cleaning/Inspection/Repair	7-5-2	7-64
Return Manifold — Removal/Installation	7-5-3	7-65
■ Return Manifold — Cleaning/Inspection/Repair	7-5-3.1	7-68.1
Pressure Manifold — Removal/Installation	7-5-4	7-69
■ Pressure Manifold — Cleaning/Inspection/Repair	7-5-4.1	7-72.1
Relief Valve — Removal/Installation	7-5-5	7-73
■ Relief Valve — Cleaning/Inspection/Repair	7-5-5.1	7-74.1

7-5-1. PRESSURE SWITCH — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopters)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23

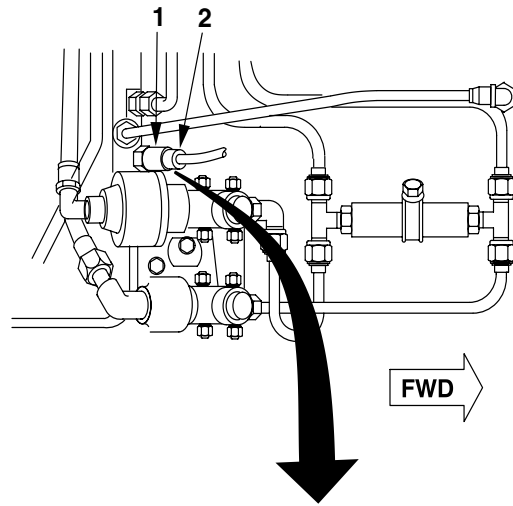
Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

7-5-1. PRESSURE SWITCH — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Move maintenance stand (B162) into position to gain access to right side of roof forward of the transmission.
2. Place wiping rags (D164) under and around pressure switch (1).
3. Disconnect electrical connector (2).



Hydraulic Fluid

4. Turn pressure switch (1) counterclockwise and remove.
5. Discard packing (3).

INSTALL



Hydraulic Fluid

6. Install packing (3) on pressure switch (1).
7. Place pressure switch (1) into position. Turn clockwise and tighten.
8. Connect electrical connector (2).

INSPECT

9. Remove wiping rags and clean area.

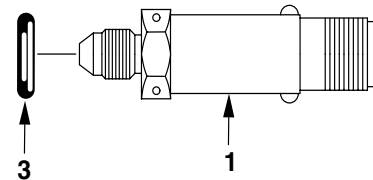
FOLLOW-ON MAINTENANCE

Bleed hydraulic system (Task 7-2-1).

Service hydraulic reservoir (Task 1-4-10).

Install forward fairing assembly (Task 2-2-47).

Perform MOC (TM 1-1500-328-23).



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END OF TASK

7-5-2. HYDRAULIC PRESSURE SWITCH — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Rubber Gloves (D111)
Brush (D51)

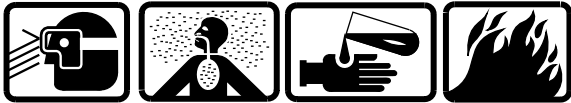
Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

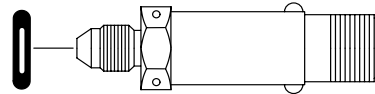
Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)

CLEAN



Drycleaning Solvent



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1. Clean hydraulic pressure switch with drycleaning solvent (D199) using a nonmetallic brush (D51).

2. Dry hydraulic pressure switch with a wiping rag (D164).

INSPECT

3. Inspect hydraulic pressure switch for damaged threads and any other visible damage. Any visible damage such as nicks and grooves in threads and sealing area of pressure switch is not acceptable.

REPAIR

4. Replace hydraulic pressure switch if damaged or defective (Task 7-5-1).

INSPECT

END OF TASK

7-5-3. RETURN MANIFOLD — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
■ Torque Wrench (B237)

Material:
Sealing Compound (D184)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

GO TO NEXT PAGE

7-5-3. RETURN MANIFOLD — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Move maintenance stand (B162) into position to gain access to left side of roof forward of transmission.

2. Place wiping rags (D164) under hydraulic system return manifold (1).



Hydraulic Fluid

NOTE

To facilitate the removal of the return manifold when disconnecting tube and hose assemblies, it may be necessary to loosen opposite end of tubes, hoses, and clamping.

3. Disconnect hoses (2, 3, and 4) and tubes (5, 6, and 7) from return manifold (1). Cap hoses and tubes.

4. Remove following components from return manifold (1):

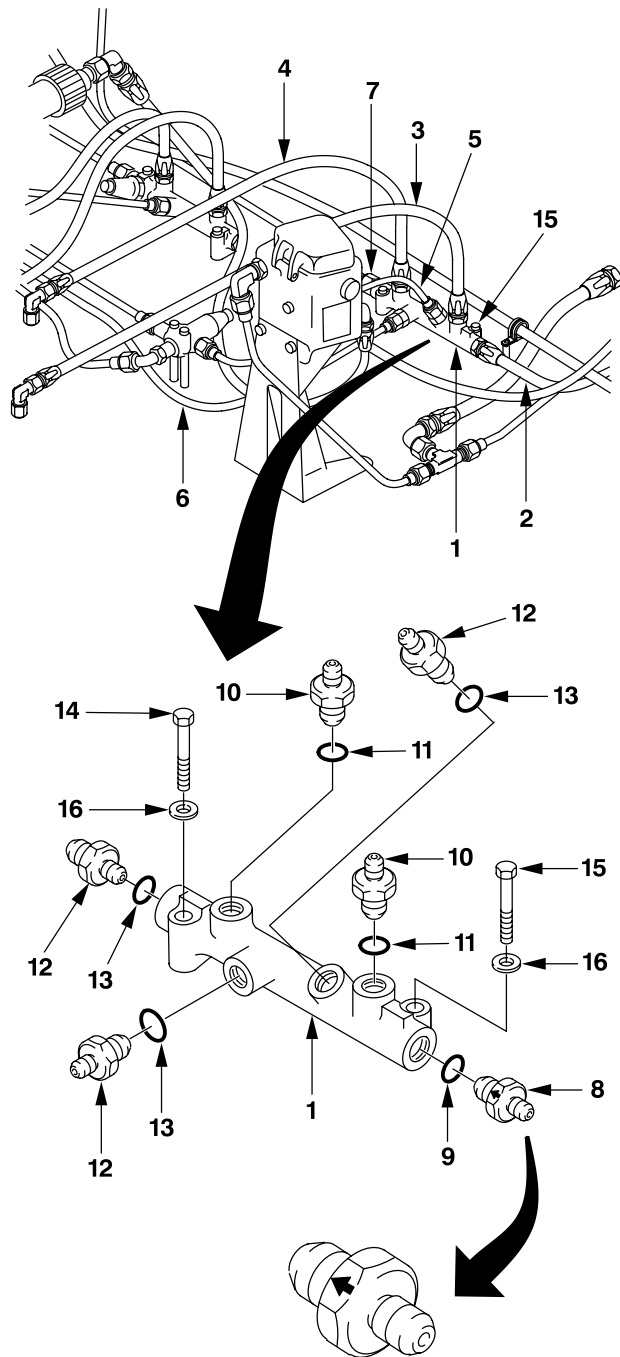
a. Check valve (8) and packing (9). Discard packing.

b. Two unions (10) and packings (11). Discard packings.

c. Three unions (12) and packings (13). Discard packings.

5. Remove bolts (14 and 15) and washers (16).

6. Remove return manifold (1).



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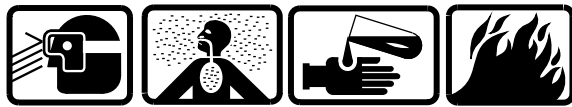
7-5-3. RETURN MANIFOLD — REMOVAL/INSTALLATION (CONT)

INSTALL

CAUTION

The check valve in case drain line at return manifold shall be installed with arrow pointing away from pump. Improper installation (backward) will cause the pump to overheat and can result in precautionary or forced landings.

7. Install packing (9) on check valve (8), two packings (11) on two unions (10), and three packings (13) on three unions (12). Install components in ports of return manifold (1) as shown.



Sealing Compound

8. Clean edge of return manifold (1) and mounting surfaces using wiping rags (D164). Apply sealing compound (D184) to edge of return manifold (1) and bolts (14 and 15).

NOTE

Inboard bolt (14) is longer than bolt (15).

9. Position return manifold (1) over mounting inserts and install bolts (14 and 15) with washers (16). Torque bolts (14 and 15) **50 TO 70 INCH-POUNDS**.

10. Allow sealing compound (D184) to cure for 24 hours at room temperature.



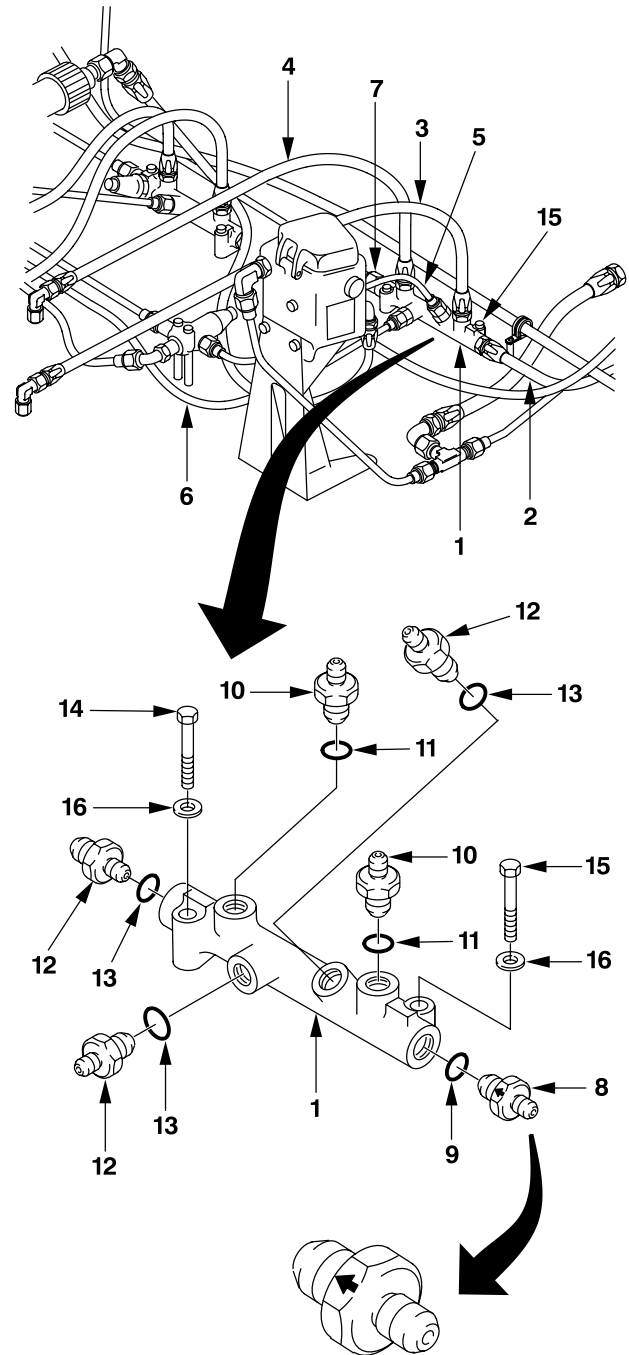
Hydraulic Fluid

11. Connect hoses (2, 3, and 4) and tubes (5, 6, and 7) to return manifold (1) as shown.

12. Remove wiping rags and clean area.

INSPECT

GO TO NEXT PAGE



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7-5-3. RETURN MANIFOLD — REMOVAL/INSTALLATION (CONT)

FOLLOW-ON MAINTENANCE

Bleed hydraulic system (Task 7-2-1).

Service hydraulic reservoir (Task 1-4-10).

■ Install forward fairing assembly (Task 2-2-47).

Perform MOC (TM 1-1500-328-23).

END OF TASK

7-5-3.1. RETURN MANIFOLD — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning/Inspection/Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

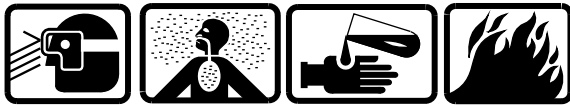
Material:
Acid Brush (D51)
Drycleaning Solvent (D199)
Wiping Rags (D164)
400 Grit Sandpaper (D175)

Chemical Conversion Coating (Alodine 1201)
(D57)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Return Manifold Removed (Task 7-5-3)



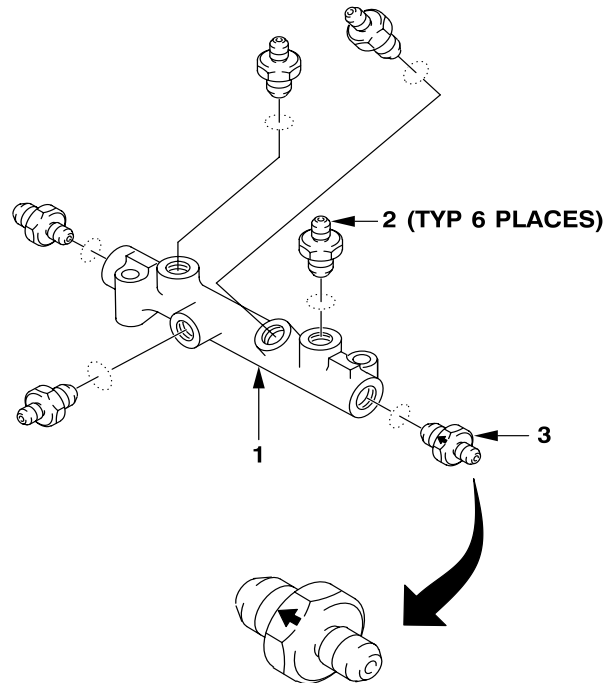
Drycleaning Solvent

CLEAN

1. Using brush (D51) clean manifold (1) and all unions (2) with drycleaning solvent (D199).
2. Clean check valve (3).
3. Using wiping rag (D164), dry cleaned parts.

INSPECT

4. Examine manifold (1) and unions (2) and check valve (3) for cracks, wear, or external damage.
5. Check for evidence of corrosion.
6. Inspect all manifold ports for damage to threads.



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J2783

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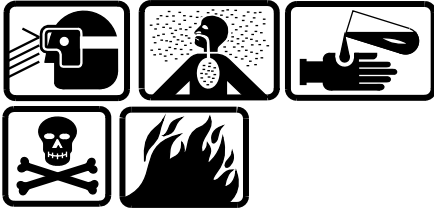
7-5-3.1. RETURN MANIFOLD — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR

7. Using 400 grit sandpaper (D175), remove corrosion to twice the depth of original corrosion damage.

8. For repair of small surface scratches, refer to TM 1-1500-204-23 for cleanup procedures.

INSPECT



Chemical Conversion Materials

9. Using brush (D51) coat repaired areas with Alodine 1201 (D57)

END OF TASK

7-5-4. PRESSURE MANIFOLD — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
 General Mechanic Tool Kit (B178)
 Maintenance Stand (B162)
 ■ Torque Wrench (B237)

Material:
 Sealing Compound (D184)
 Wiping Rags (D164)

Personnel Required:
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer
 68H Aircraft Pneudraulics Repairer

References:
 TM 1-1500-328-23

Equipment Condition:
 Helicopter Safed (Task 1-6-7)
 Forward Fairing Assembly Removed
 (Task 2-2-47) ■

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7-5-4. PRESSURE MANIFOLD — REMOVAL/INSTALLATION (CONT)

REMOVE

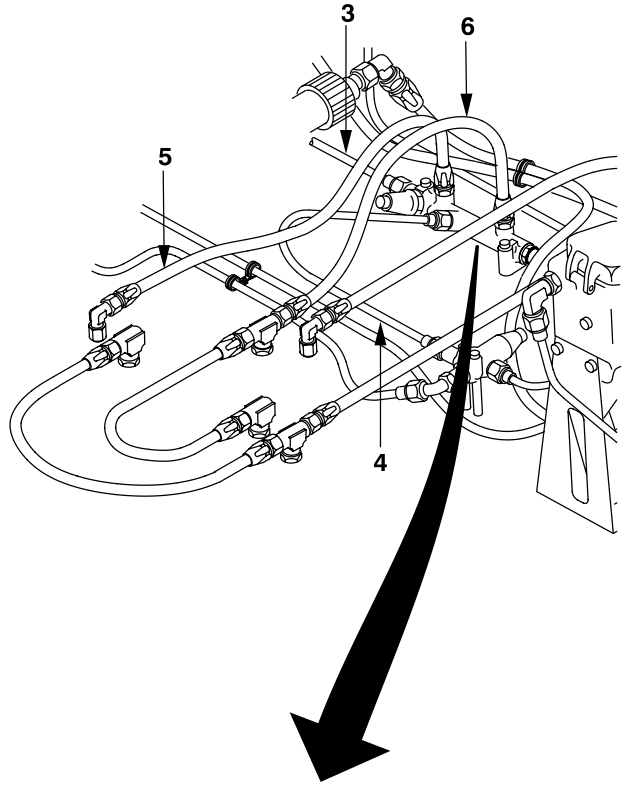
1. Move maintenance stand (B162) into position to gain access to right side of roof forward of transmission.

2. Place wiping rags (D164) under hydraulic system pressure manifold (1).

NOTE

To facilitate the removal of the pressure manifold, it may be necessary to loosen opposite end of tubes, hoses, and clamping when disconnecting tube and hose assemblies

3. Disconnect electrical connector from pressure switch (2) on pressure manifold (1).



Hydraulic Fluid

4. Disconnect tubes (3 and 4) and hoses (5 and 6) from pressure manifold (1). Cap tubes and hoses.

5. Remove the following components from manifold (1):

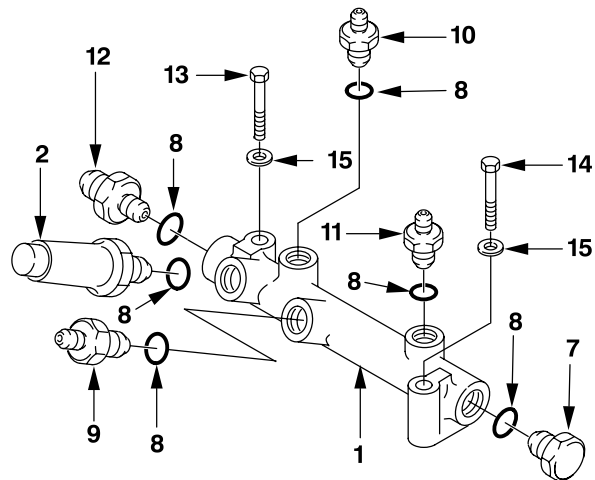
a. Plug (7) and packing (8). Discard packing (8).

b. Reducer (9) and unions (10, 11, and 12). Discard packings (8).

c. Pressure switch (2). Discard packing (8).

6. Remove bolts (13 and 14) and washers (15).

7. Remove pressure manifold (1).

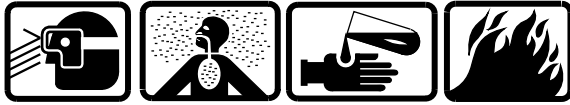


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7-5-4. PRESSURE MANIFOLD — REMOVAL/INSTALLATION (CONT)

INSTALL



Sealing Compound

8. Clean edge of pressure manifold (1) and mounting surfaces. Apply sealing compound (D184) to edge of pressure manifold (1) and bolts (13 and 14).

NOTE

Inboard bolt (13) is longer than bolt (14).

9. Position pressure manifold (1) over mounting inserts and install bolts (13) and (14) with washers (15). Torque bolts (13 and 14) **50 TO 70 INCH-POUNDS**.

10. Allow sealing compound (D184) to cure for 24 hours at room temperature.



Hydraulic Fluid

11. Install packings (8) on plug (7), reducer (9), unions (10, 11, and 12), and pressure switch (2). Install components in ports of pressure manifold (1) as shown.

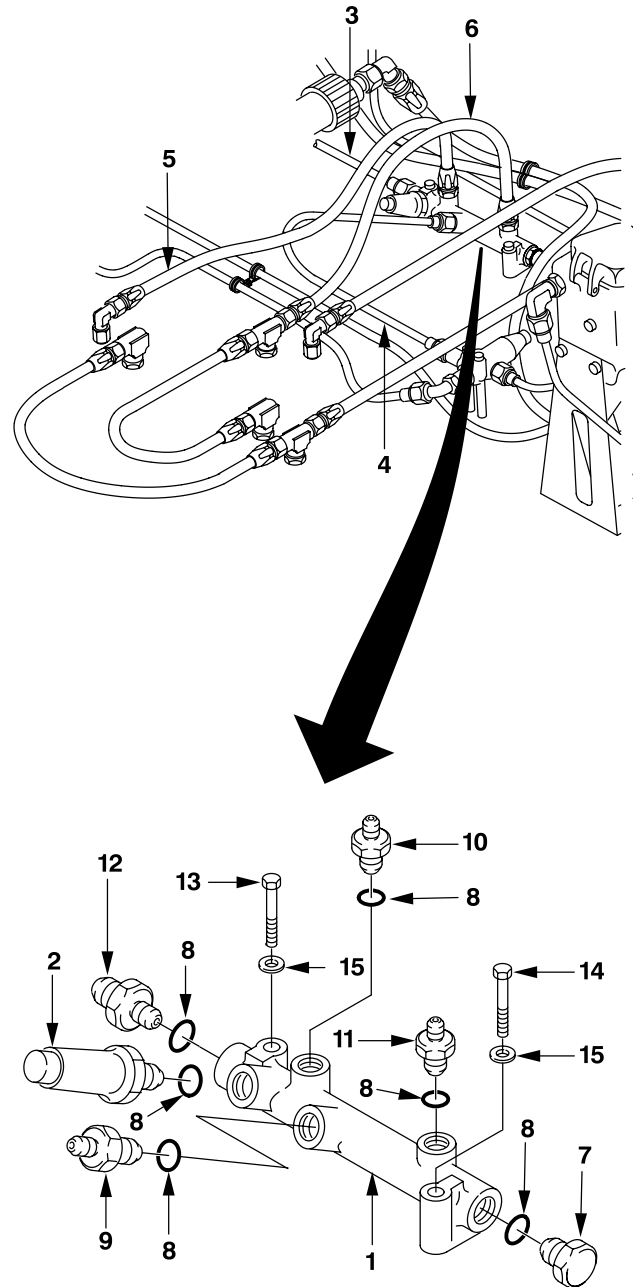
12. Connect electrical connector to pressure switch (2).

13. Connect tubes (3 and 4) and hoses (5 and 6) as shown.

NOTE

If clamps or fittings were loosened, they shall be secured as required.

14. Remove wiping rags and clean area.



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INSPECT

GO TO NEXT PAGE

7-5-4. PRESSURE MANIFOLD — REMOVAL/INSTALLATION (CONT)

FOLLOW-ON MAINTENANCE

Bleed hydraulic system (Task 7-2-1).

Service hydraulic reservoir (Task 1-4-10).

■ Install forward fairing assembly
(Task 2-2-47).

Perform MOC (TM 1-1500-328-23).

END OF TASK

7-5-4.1. PRESSURE MANIFOLD — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning/Inspection/ Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Acid Brush (D51)
Drycleaning Solvent (D199)
Wiping Rags (D164)
400 Grit Sandpaper (D175)

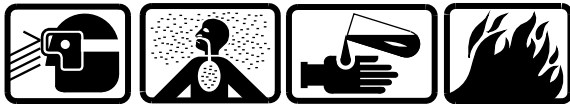
Chemical Conversion Coating (Alodine 1201) (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Pressure Manifold Removed (Task 7-5-4)

CLEAN



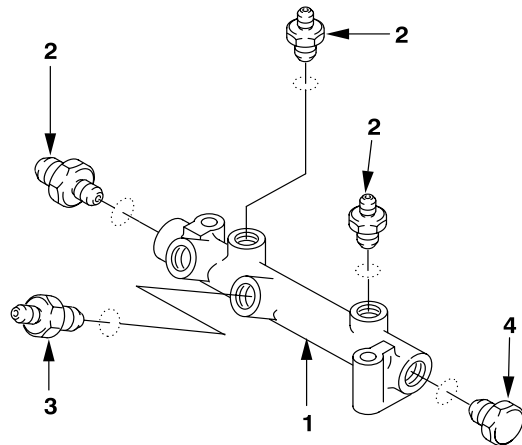
Drycleaning Solvent

CLEAN

- Using brush (D51) clean pressure manifold (1), all unions (2), reducer (3), and plug (4) with drycleaning solvent (D199).
- Using wiping rag (D164), dry cleaned parts.

INSPECT

- Examine pressure manifold (1), and unions (2), reducer (3), and plug (4) for cracks, wear, or external damage.
- Check for evidence of corrosion.
- Inspect all pressure manifold ports for damage to threads.



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J2783

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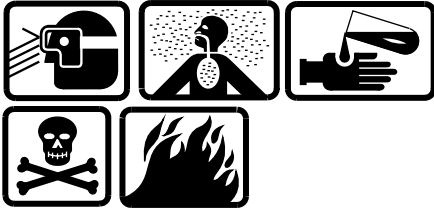
7-5-4.1. PRESSURE MANIFOLD — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR

6. Using 400 grit sandpaper (D175), remove corrosion to twice the depth of original corrosion damage.

7. For repair of small surface scratches, refer to TM 1-1500-204-23 for cleanup procedures.

INSPECT



Chemical Conversion Materials

8. Using brush (D51) coat repaired areas with Alodine 1201 (D57)

END OF TASK

7-5-5. RELIEF VALVE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Wiping Rags (D164)
Hydraulic Fluid (D106 or D107)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1520-248-T
TM 1-1500-328-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

7-5-5. RELIEF VALVE — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Move maintenance stand (B162) into position to gain access to right side of roof forward of the transmission.
2. Place wiping rags (D164) around relief valve.



Hydraulic Fluid

3. Disconnect return lines (1) and pressure lines (2). Remove screw (3) and washer (4) securing relief valve to roof. Remove relief valve (5). Cap off open lines.
4. Hold valve (5) by wrench flats and loosen jamnuts (6) at both ends of relief valve.
5. Remove two tee fittings (7), retainers (8), and packings (9). Discard packings (9). Slide clamp (10) from relief valve (5).

INSTALL

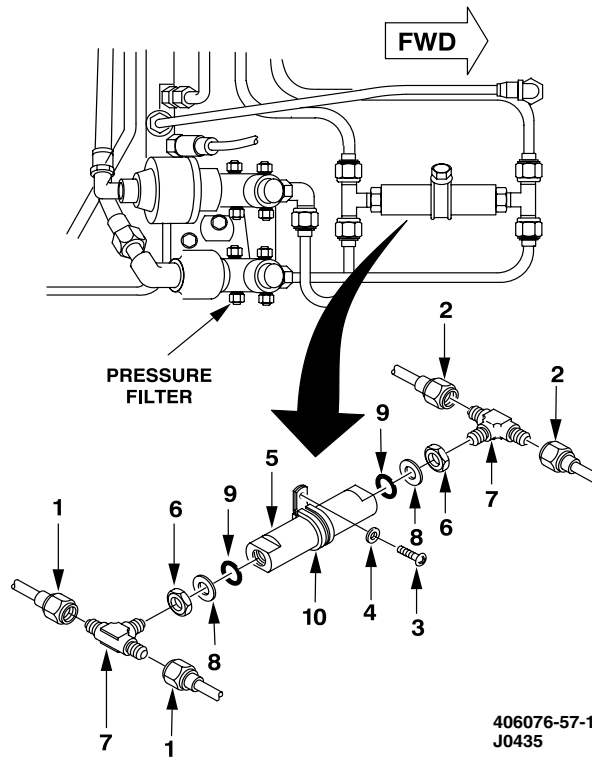
6. Position clamp (10) onto relief valve (5).



Hydraulic Fluid

7. Lubricate packing (9) with hydraulic fluid (D106 or D107) and place packing (9) and retainer (8) in relief valve (5).
8. Install tee (7) in end of relief valve (5). Tighten jamnut (6) against relief valve (5).
9. Repeat steps 7. and 8. on opposite end of relief valve (5).
10. Position relief valve (5) onto helicopter roof between lines (1) and (2). Remove caps from lines. Connect lines (1) and (2) to tees (7).
11. Position hole in clamp (10) over roof insert and install screw (3) and washer (4).
12. Remove wiping rags and clean area.

INSPECT



FOLLOW-ON MAINTENANCE

- Bleed hydraulic system (Task 7-2-1).
- Service hydraulic reservoir (Task 1-4-10).
- Install forward fairing assembly (Task 2-2-47).
- Perform operational check (TM 1-1520-248-T).
- Perform MOC (TM 1-1500-328-23).

END OF TASK

7-5-5.1. RELIEF VALVE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning/Inspection/Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Acid Brush (D51)
Drycleaning Solvent (D199)
Wiping Rags (D164)
400 Grit Sandpaper (D175)

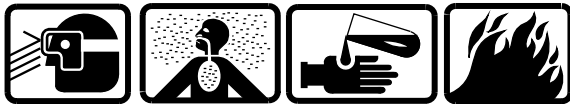
Chemical Conversion Coating (Alodine 1201)
(D57)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Relief Valve Removed (Task 7-5-5)

Clean



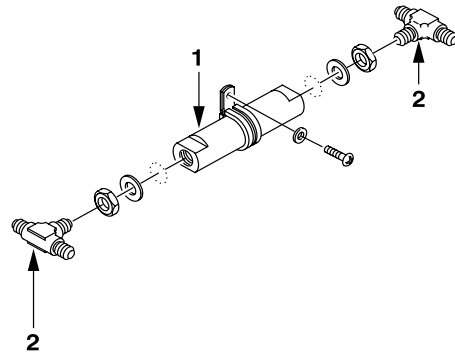
Drycleaning Solvent

CLEAN

1. Using brush (D51) clean relief valve (1), tee fittings (2) and attaching hardware with drycleaning solvent (D199).
2. Using wiping rag (D164), dry cleaned parts.

INSPECT

3. Examine relief valve (1), tee fittings (2) and attaching hardware for cracks, wear, or external damage.
4. Check for evidence of corrosion.
5. Inspect all ports for damage to threads.



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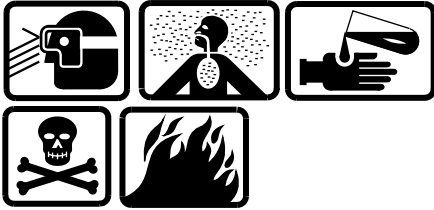
7-5-5.1. RELIEF VALVE — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR

6. Using 400 grit sandpaper (D175), remove corrosion to twice the depth of original corrosion damage.

7. For repair of small surface scratches, refer to TM 1-1500-204-23 for cleanup procedures.

INSPECT



Chemical Conversion Materials

8. Using brush (D51) coat repaired areas with Alodine 1201 (D57)

END OF TASK

Section VI. HYDRAULIC SOLENOID VALVE

7-17. HYDRAULIC SOLENOID VALVE

Standard torques are provided in Appendix P and TM 1-1500-204-23.

7-18. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and installation of the hydraulic solenoid valve.

7-19. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Hydraulic Solenoid Valve — Removal/Installation	7-6-1	7-76
Hydraulic Solenoid Valve Solenoid — Removal/Installation	7-6-2	7-79
Hydraulic Solenoid Valve — Cleaning/Inspection/Repair	7-6-3	7-81

7-6-1. HYDRAULIC SOLENOID VALVE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B236)

Material:
Hydraulic Fluid (D106 or D107)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

7-6-1. HYDRAULIC SOLENOID VALVE — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Move maintenance stand (B162) into position to gain access to right side of roof forward of transmission.
2. Disconnect quick-release electrical connector (1) from solenoid valve (2).
3. Place wiping rags (D164) around solenoid valve (2) to catch fluid.



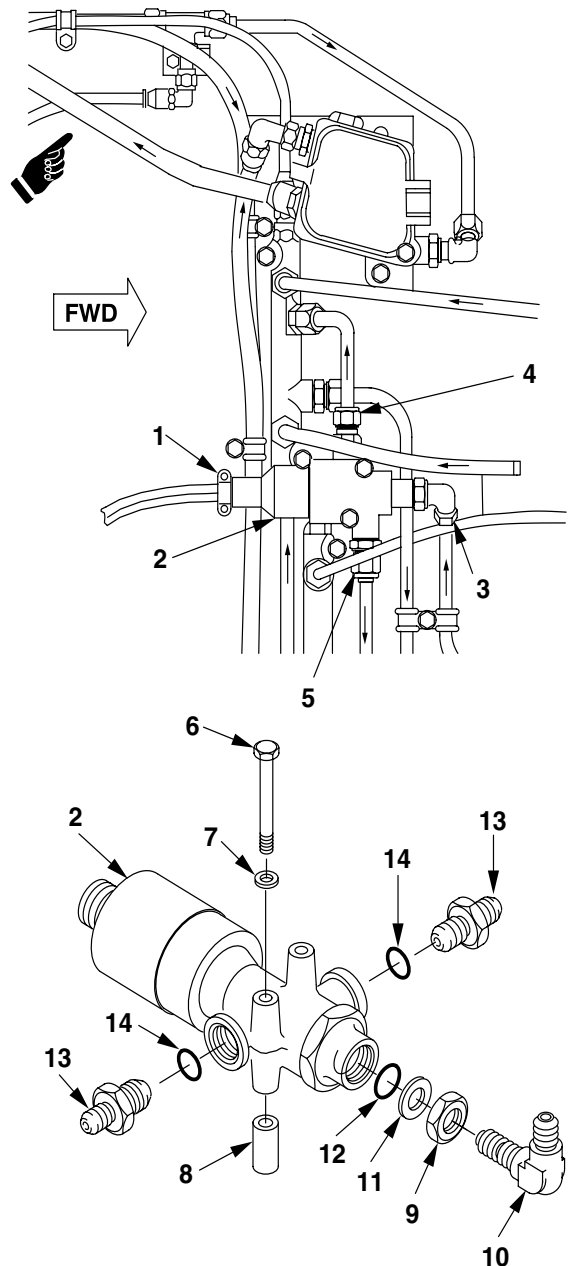
Hydraulic Fluid

4. Disconnect pressure line (3), return line (4), and cylinder line (5) from solenoid valve (2).
5. Cap hydraulic lines and openings on solenoid valve (2).
6. Remove two bolts (6), two washers (7), and two spacers (8) from solenoid valve (2).

NOTE

If solenoid valve is leaking, damaged, or replacement is necessary, proceed with steps 7. and 8.

7. Loosen nut (9) and unscrew elbow (10) with nut, retainer (11), and packing (12). Discard retainer and packing.
8. Remove two unions (13) and packings (14). Discard packings.



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7-6-1. HYDRAULIC SOLENOID VALVE — REMOVAL/INSTALLATION (CONT)

NOTE

If fittings were removed, accomplish step 9. If not, proceed to step 10.

INSTALL



Hydraulic Fluid

9. Lubricate two unions (13) and packings (14) with hydraulic fluid (D106 or D107) and install in solenoid valve (2).

10. Install solenoid valve (2).

11. Assemble nut (9), retainer (11), and packing (12) on elbow (10). Lubricate assembly and install in solenoid valve (2).

12. Remove protective caps from hydraulic lines and solenoid valve openings.

13. Position solenoid valve (2) onto transmission work deck and install two bolts (6) with washers (7) and spacers (8). Torque bolts (6) **30 TO 40 INCH-POUNDS**.

14. Connect pressure line (3), return line (4), and cylinder line (5) to solenoid valve (2).

15. Connect quick-release electrical connector (1) to solenoid valve (2).

16. Remove wiping rags and clean area.

INSPECT

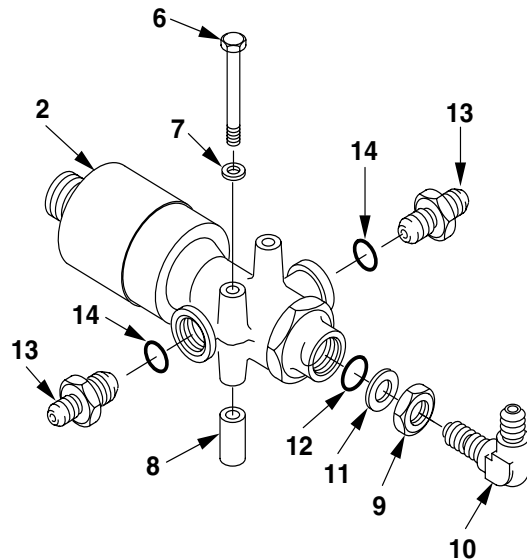
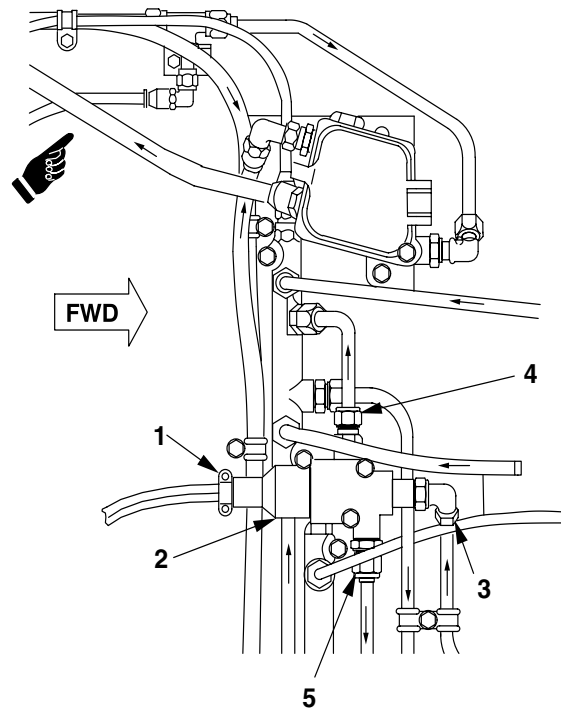
FOLLOW-ON MAINTENANCE

Bleed hydraulic system (Task 7-2-1).

Service hydraulic reservoir (Task 1-4-10).

Install forward fairing assembly (Task 2-2-47).

Perform MOC (TM 1-1500-328-23).



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END OF TASK

7-6-2. HYDRAULIC SOLENOID VALVE SOLENOID — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Lockwire (D131)
Hydraulic Fluid (D106 or D107)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pseudraulics Repairer

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

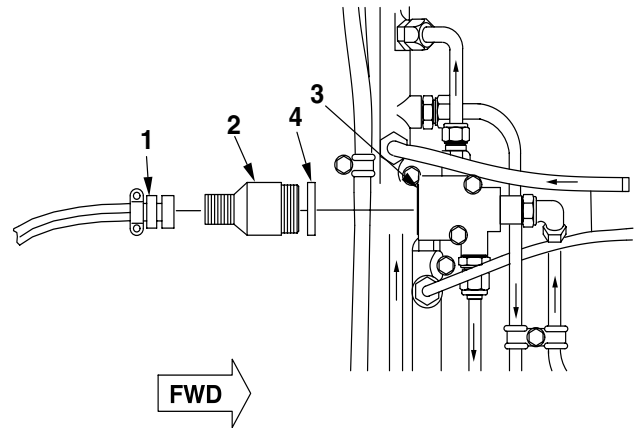
REMOVE

1. Move maintenance stand (B162) into position to gain access to right side of roof forward of transmission.
2. Disconnect electrical connectors (1) from solenoid (2).
3. Cut lockwire from solenoid (2) to valve body (3).



Hydraulic Fluid

4. Unscrew solenoid (2) from valve body (3). Do not remove internal parts of valve. Discard solenoid (2).
5. Remove and discard packing (4).



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7-6-2. HYDRAULIC SOLENOID VALVE SOLENOID — REMOVAL/INSTALLATION (CONT)

INSTALL

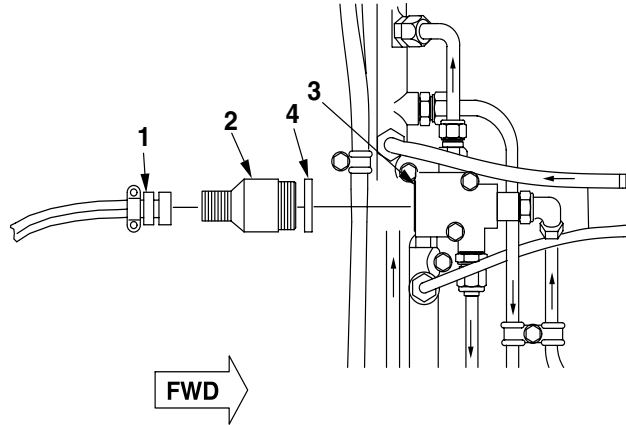


Hydraulic Fluid

6. Lubricate packing (4) with hydraulic fluid (D106 or D107) then place packing in valve body (3) and screw solenoid (2) into valve body.

7. Secure solenoid (2) to valve body (3) with lockwire (D131).

8. Install electrical connector (1).



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INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check (TM 1-1520-248-T).

Install forward fairing assembly (Task 2-2-47).

END OF TASK

7-6-3. HYDRAULIC SOLENOID VALVE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B241)

Material:
Lockwire (D131)
Hydraulic Fluid (D106 or D107)
Wiping Rags (D164)
Rubber Gloves (D111)
Drycleaning Solvent (D199)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1520-248-T

Equipment Condition:
Hydraulic Solenoid Valve Removed
(Task 7-6-1)

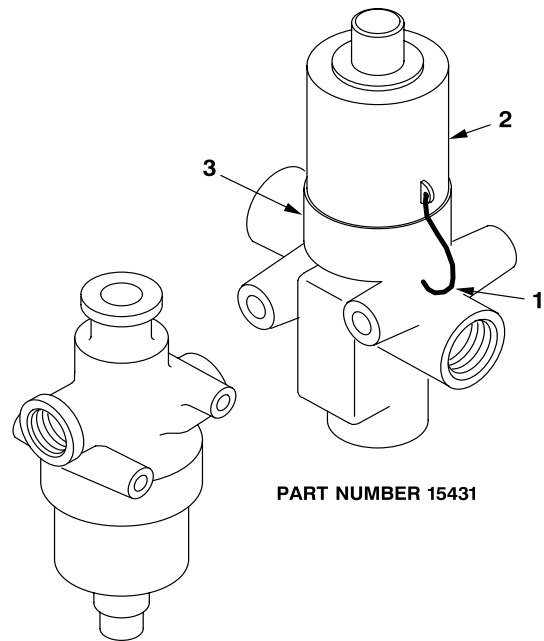
NOTE

The hydraulic solenoid valve P/N 206-076-037 has two vendor part numbers. Correct part number procedure shall be used.

Part Number 15431.

DISASSEMBLE

1. Cut lockwire (1) from solenoid assembly (2) to valve body (3).
2. Unscrew solenoid assembly (2) from valve body (3).



PART NUMBER 15431

PART NUMBER 42C42650

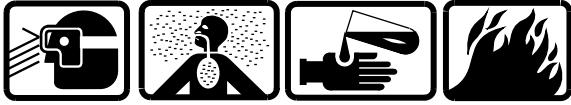
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7-6-3. HYDRAULIC SOLENOID VALVE — CLEANING/INSPECTION/REPAIR (CONT)

3. Remove and discard packing (4).
4. Remove spool (5) and spring (6) from valve body (3).

CLEAN



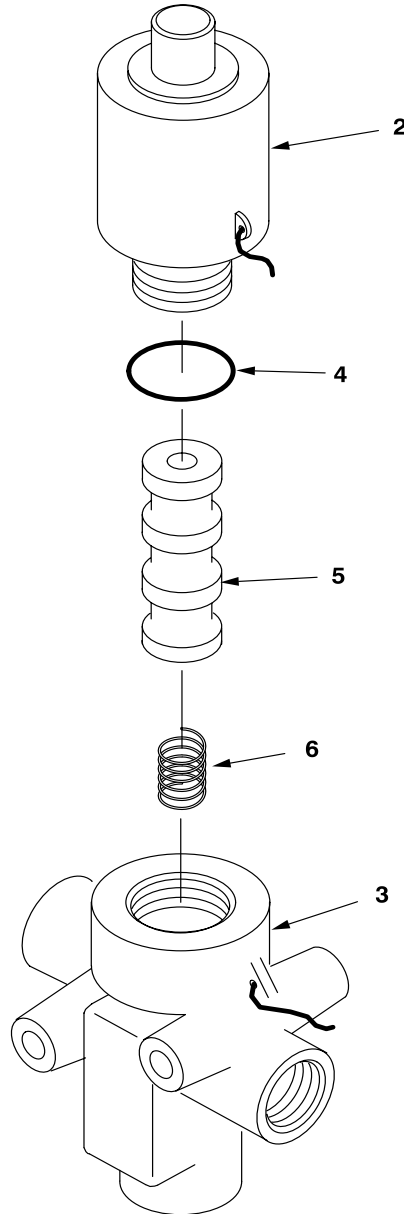
Drycleaning Solvent

5. Clean valve body (3), spool (5), and spring (6) by vigorous agitation in a container of drycleaning solvent (D199).

6. Clean solenoid assembly (2) with wiping rag (D164) dampened in drycleaning solvent (D199).

INSPECT

7. Inspect solenoid assembly (2) for:
 - a. Bent or broken connector pin(s). None allowed.
 - b. Thread damage. None allowed.



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7-6-3. HYDRAULIC SOLENOID VALVE — CLEANING/INSPECTION/REPAIR (CONT)

8. Inspect valve body (3) for cracks, scoring, and damaged threads. None allowed.

9. Inspect spool (5) for scoring and pitting. None allowed.

10. Inspect spring (6) for chafing. None allowed.

REPAIR

11. Replace solenoid assembly (2) and/or spring (6) if defective.

12. Replace valve body (3) or spool (5) if defective.

ASSEMBLE

13. Assemble hydraulic solenoid valve as follows:



Hydraulic Fluid

a. Lubricate packing (4) with hydraulic fluid (D106 or D107) and install on solenoid assembly (2).

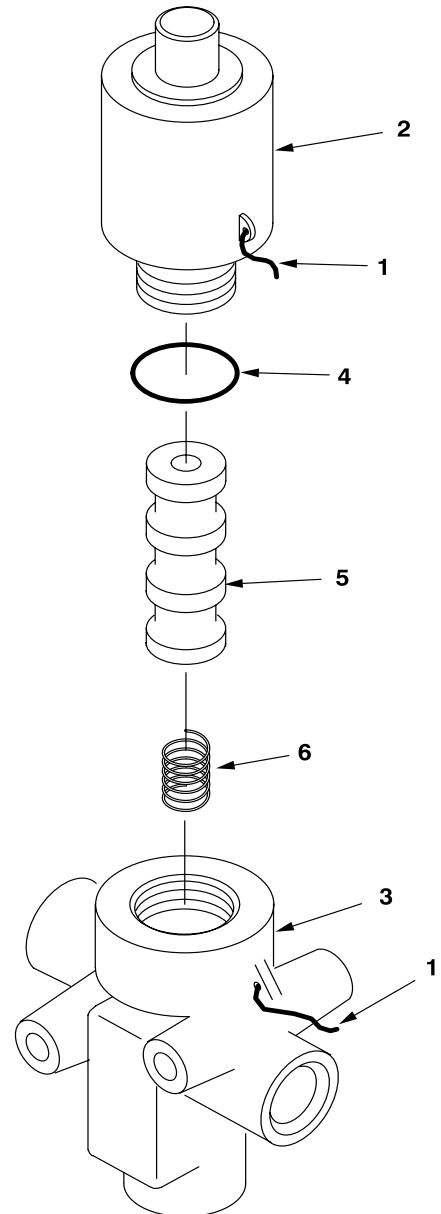
b. Lubricate spool (5) and spring (6) with hydraulic fluid (D106 or D107).

c. Install spring (6) and spool (5) in valve body (3).

d. Screw solenoid assembly (2) into valve body (3).

e. Secure solenoid assembly (2) to valve body (3) with lockwire (D131) (1).

INSPECT



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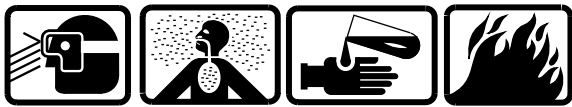
7-6-3. HYDRAULIC SOLENOID VALVE — CLEANING/INSPECTION/REPAIR (CONT)

Part Number 42C42650

DISASSEMBLE

1. Cut lockwire (1) from coil assembly (2) to valve body (3).
2. Remove nut (4) and separate coil assembly (2) from valve body (3).
3. Remove lap assembly (5) from valve body (3).
4. Remove and discard six retainers (6) and four packings (7) from lap assembly (5).
5. Remove spring (8) from lap assembly (5).
6. Remove pin (9) from coil assembly (2).

CLEAN



Drycleaning Solvent

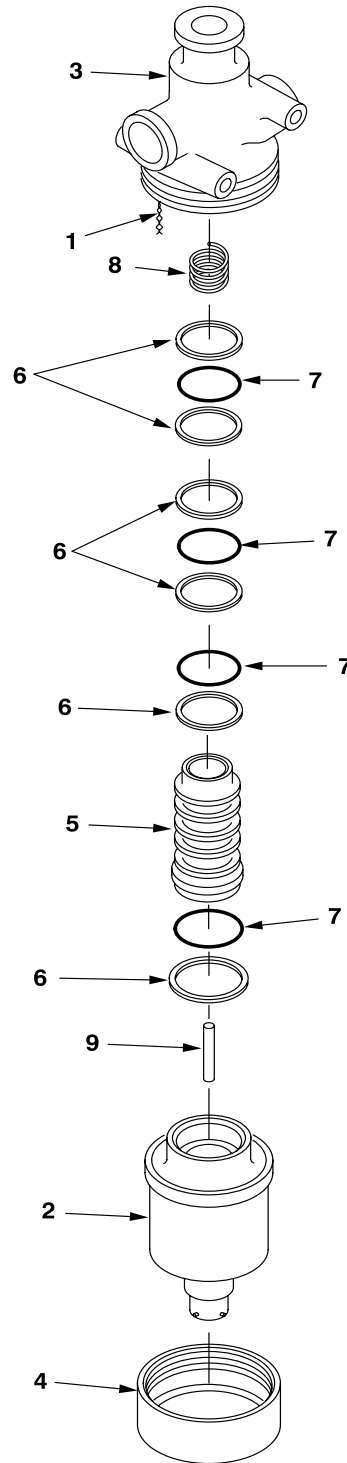
7. Clean valve body (3), lap assembly (5), spring (8), and nut (4) by vigorous agitation in a container of drycleaning solvent (D199).
8. Clean coil assembly (2) and pin (9) with wiping rag (D164) dampened with drycleaning solvent (D199).

INSPECT

9. Inspect coil assembly (2) for bent or broken connector pin(s). None allowed.
10. Inspect nut (4) and valve body (3) for cracks, scoring, and damaged threads. None allowed.
11. Inspect lap assembly (5) for scoring and pitting and grooves for scratches. None allowed.
12. Inspect spring (8) and pin (9) for chafing. None allowed.

REPAIR

13. Replace coil assembly (2), spring (8), and/or pin (9) if defective.
14. Replace valve body (3), nut (4), or lap assembly (5) if defective.



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7-6-3. HYDRAULIC SOLENOID VALVE — CLEANING/INSPECTION/REPAIR (CONT)

ASSEMBLE

15. Assemble hydraulic solenoid valve as follows:



Hydraulic Fluid

NOTE

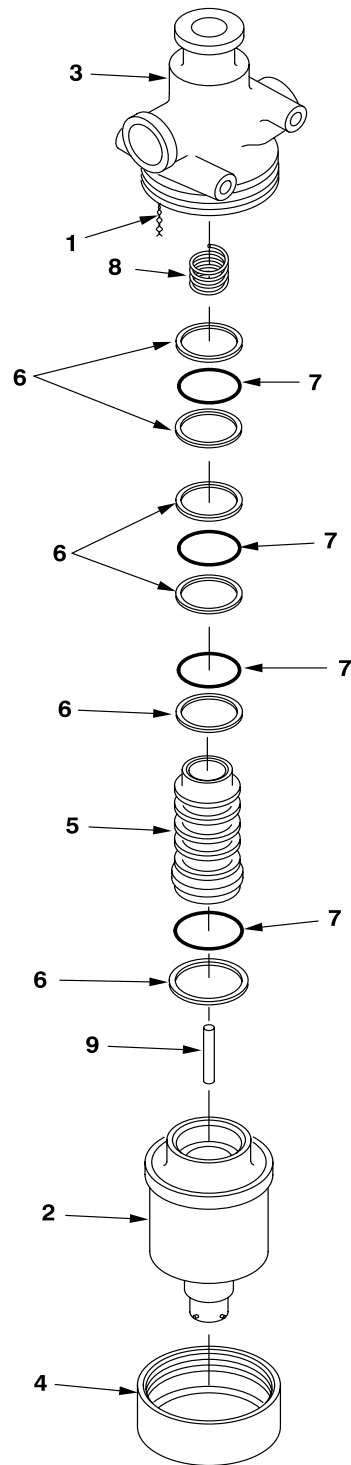
Parts shall be lubricated with hydraulic fluid (D106 or D107) before assembly.

- a. Install six retainers (6) and four packings (7) on lap assembly (5).
- b. Install pin (9) in coil assembly (2).
- c. Install spring (8) in lap assembly (5).
- d. Install lap assembly (5) in valve body (3).
- e. Mate coil assembly (2) with valve body (3).
- f. Install nut (4).
- g. Torque nut (4) **280 TO 320 INCH-POUNDS.**
- h. Secure nut (4) to valve body (3) with lockwire (D131) (1).

INSPECT

FOLLOW-ON MAINTENANCE

- Install hydraulic solenoid valve (Task 7-6-1).
- Perform operational check (TM 1-1520-248-T).
- Bleed hydraulic system (Task 7-2-1).
- Service hydraulic reservoir (Task 1-4-10).
- Install forward fairing assembly (Task 2-2-47).



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END OF TASK

Section VII. HYDRAULIC RESERVOIR

7-20. HYDRAULIC RESERVOIR

and replacement of some of its components. Standard torques are provided in Appendix P and TM 1-1500-204-23.

7-21. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair, and installation of the hydraulic reservoir assembly

7-22. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Hydraulic Reservoir — Removal/Installation	7-7-1	7-87
Hydraulic Reservoir Cover Pin and Cap Gasket — Removal/Installation	7-7-2	7-90
Hydraulic Reservoir Cover Latch Assembly — Removal/Installation	7-7-3	7-92
Hydraulic Reservoir Return Port Union — Removal/Installation	7-7-4	7-95
Hydraulic Reservoir Sight Plug — Removal/Installation	7-7-5	7-97
Hydraulic Reservoir Strainer and Cover Gasket — Removal/Installation	7-7-6	7-99
Hydraulic Reservoir Screen — Removal/Installation	7-7-7	7-102
Hydraulic Reservoir — Cleaning/Inspection/Repair	7-7-8	7-103
Hydraulic Reservoir Support Bracket — Removal/Installation	7-7-9	7-106

7-7-1. HYDRAULIC RESERVOIR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

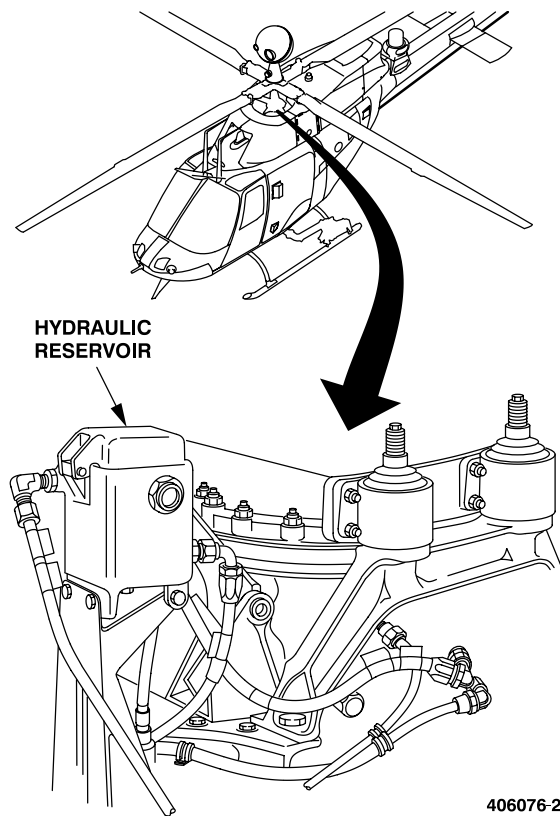
Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)
Torque Wrench (B238)

Material:
Wiping Rags (D164)
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pseudraulics Repairer

References:
TM 1-1500-328-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



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7-7-1. HYDRAULIC RESERVOIR — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) at forward left side of helicopter to gain access to transmission.

2. Position suitable container (B101) under reservoir (1).



Hydraulic Fluid

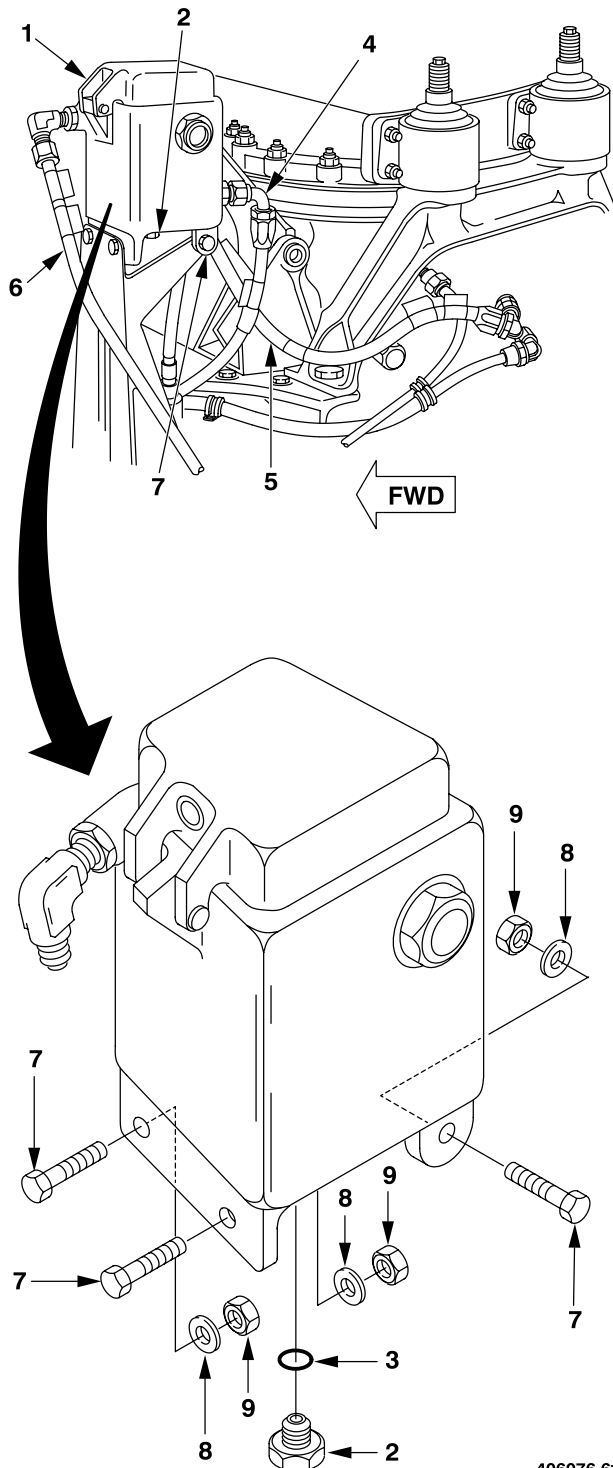
3. Cut lockwire and remove plug (2) and packing (3). Discard packing (3).

4. Disconnect return hose (4), suction hose (5), and drain tube (6).

5. Cap hoses, tube, and fittings.

6. Remove three bolts (7), washers (8), and nuts (9).

7. Remove reservoir. Clean deck with wiping rags (D164) and discard used fluid.



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 7-7-1. HYDRAULIC RESERVOIR — REMOVAL/INSTALLATION (CONT)

INSTALL

8. Remove protective caps from serviceable reservoir (1) fittings.

9. Prepare mating surfaces for class S electrical bond (Appendix M).

10. Position reservoir (1) onto bracket and secure with three bolts (7), washers (8), and nuts (9). Torque nuts (9) **75 TO 95 INCH-POUNDS**.

**Hydraulic Fluid**

11. Remove protective caps from hoses (4 and 5) and drain tube (6).

12. Connect return hose (4), suction hose (5), and drain tube (6) to reservoir (1).

13. Install new packing (3) on drain plug (2). Install drain plug (2) in reservoir (1).

14. Secure drain plug (2) with lockwire (D132).

15. Clean area using wiping rags (D164).

INSPECT

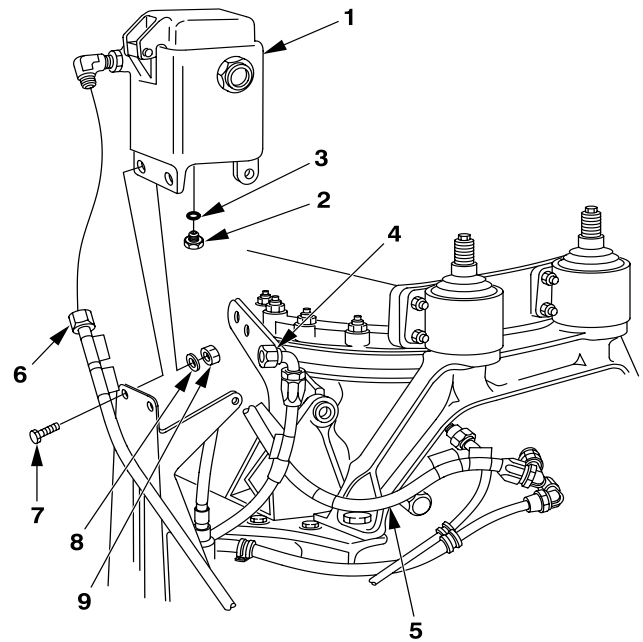
FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

■ Install forward fairing assembly (Task 2-2-47).

Perform MOC (TM 1-1500-328-23).



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END OF TASK

7-7-2. HYDRAULIC RESERVOIR COVER PIN AND CAP GASKET — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

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7-7-2. HYDRAULIC RESERVOIR COVER PIN AND CAP GASKET — REMOVAL/INSTALLATION (CONT)

REMOVE

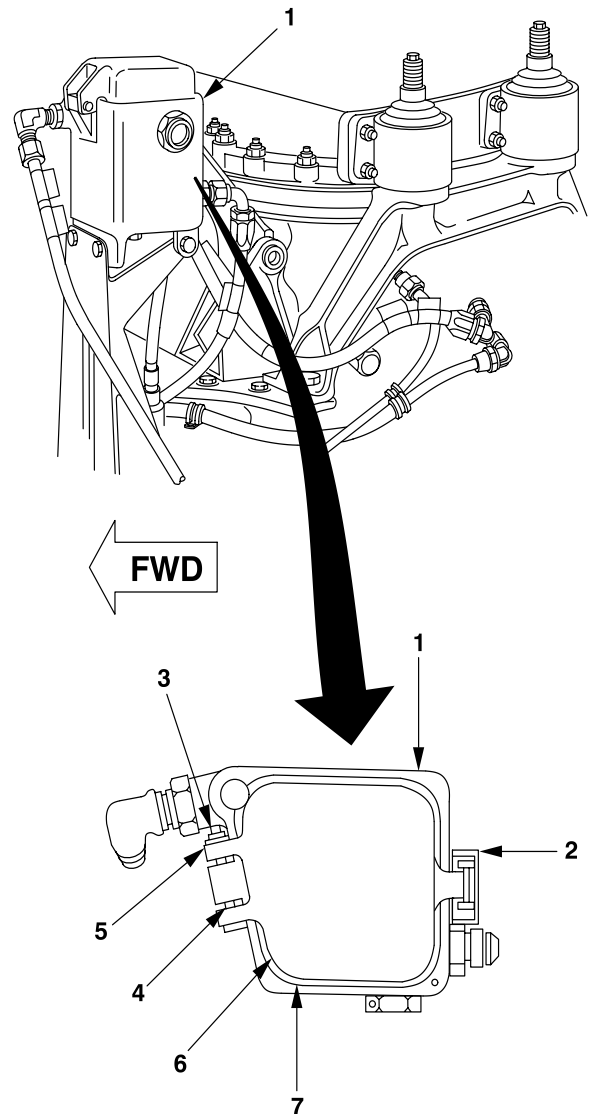
1. Position maintenance stand (B162) at left side of helicopter forward of transmission.
2. At hydraulic reservoir assembly (1) unlock latch (2).
3. Remove cotter pin (3) from hinge pin (4). Discard cotter pin.
4. Remove hinge pin (4) and washer (5) from cover (6).
5. Remove cover (6) from reservoir (1).
6. Remove and discard gasket (7).

INSTALL

7. Install new gasket (7).
8. Position cover (6) onto reservoir (1).
9. Install hinge pin (4) and washer (5). Secure with cotter pin (3).
10. Close cover (6) and lock latch (2).

INSPECT**FOLLOW-ON MAINTENANCE**

1. Install forward fairing assembly (Task 2-2-47).

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END OF TASK

7-7-3. HYDRAULIC RESERVOIR COVER LATCH ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Wiping Rag (D164)
Hydraulic Fluid (D106 or D107)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68G Aircraft Structural Repairer

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
■ Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

Material:
Dissimilar Metal Separation Tape (D213)
Lockwire (D132)

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7-7-3. HYDRAULIC RESERVOIR COVER LATCH ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) at left side of helicopter forward of transmission.



Hydraulic Fluid

2. Position suitable container (B101) under drain plug (1). Cut lockwire and remove drain plug (1) and packing (2). Drain fluid into suitable container (B101). Discard packing (2).

3. Disconnect return hose (3), suction hose (4), and drain tube (5) from hydraulic reservoir (6).

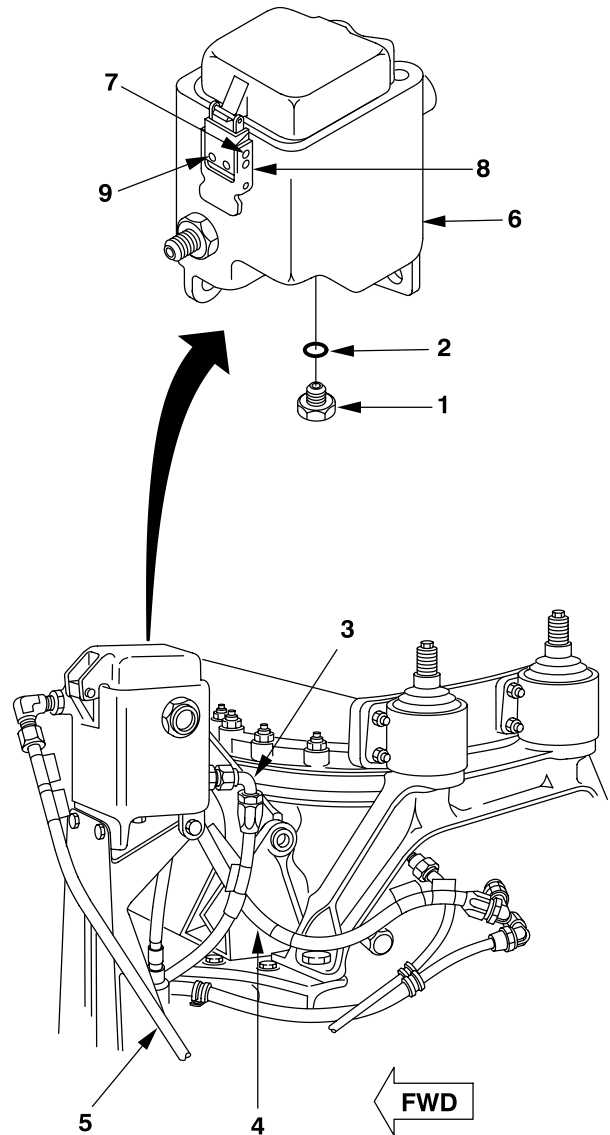
4. Remove lockpin (7) from latch assembly (8) and hydraulic reservoir (6).

5. Open latch assembly (8) and remove two rivets (9).



Hydraulic Fluid

6. Flush hydraulic reservoir with hydraulic fluid (D106 or D107) to remove metal chips caused by rivet removal.



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7-7-3. HYDRAULIC RESERVOIR COVER LATCH ASSEMBLY — REMOVAL/INSTALLATION (CONT)

INSTALL

7. Apply dissimilar metal separation tape (D213) to latch assembly (8) mounting area.

8. Position and install two rivets (9) through latch assembly (8) and hydraulic reservoir (6).



Hydraulic Fluid

9. Connect return hose (3), suction hose (4), and drain tube (5) to hydraulic reservoir (6).

10. Install new packing (2) on drain plug (1). Install drain plug (1) in bottom of hydraulic reservoir (6).

11. Lockwire (D132) drain plug (1) to hydraulic reservoir (6).

12. Remove container (B101) from under hydraulic reservoir (6).

13. Clean deck using wiping rag (D164).

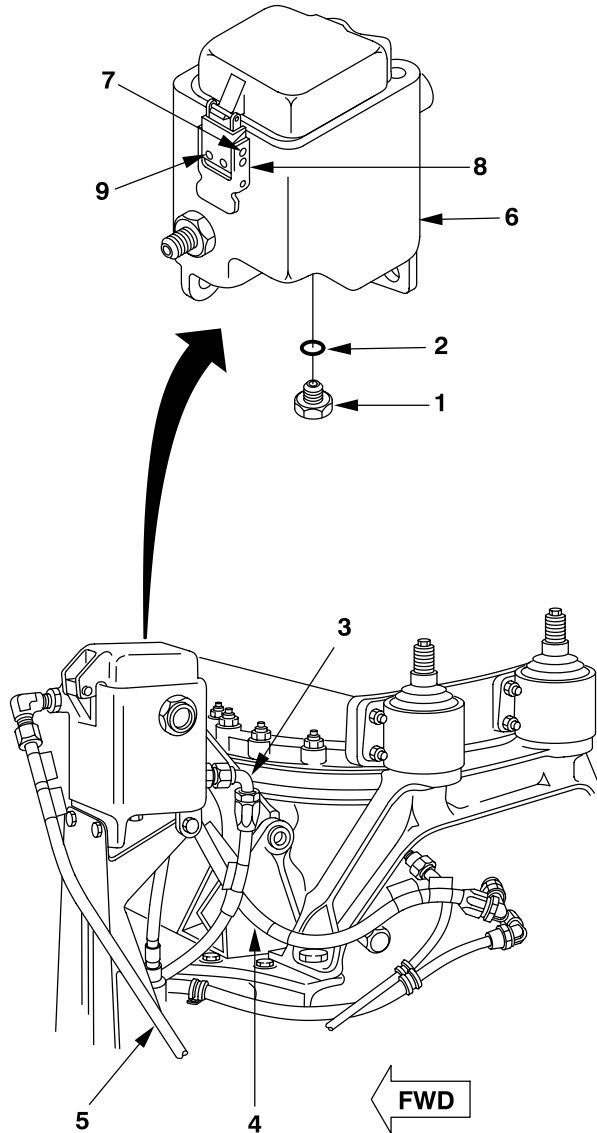
INSPECT

FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

Install forward fairing assembly (Task 2-2-47).



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END OF TASK

7-7-4. HYDRAULIC RESERVOIR RETURN PORT UNION — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
■ Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Material:
Hydraulic Fluid (D106 or D107)
Lockwire (D132)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

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7-7-4. HYDRAULIC RESERVOIR RETURN PORT UNION — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) at left side of helicopter forward of transmission.

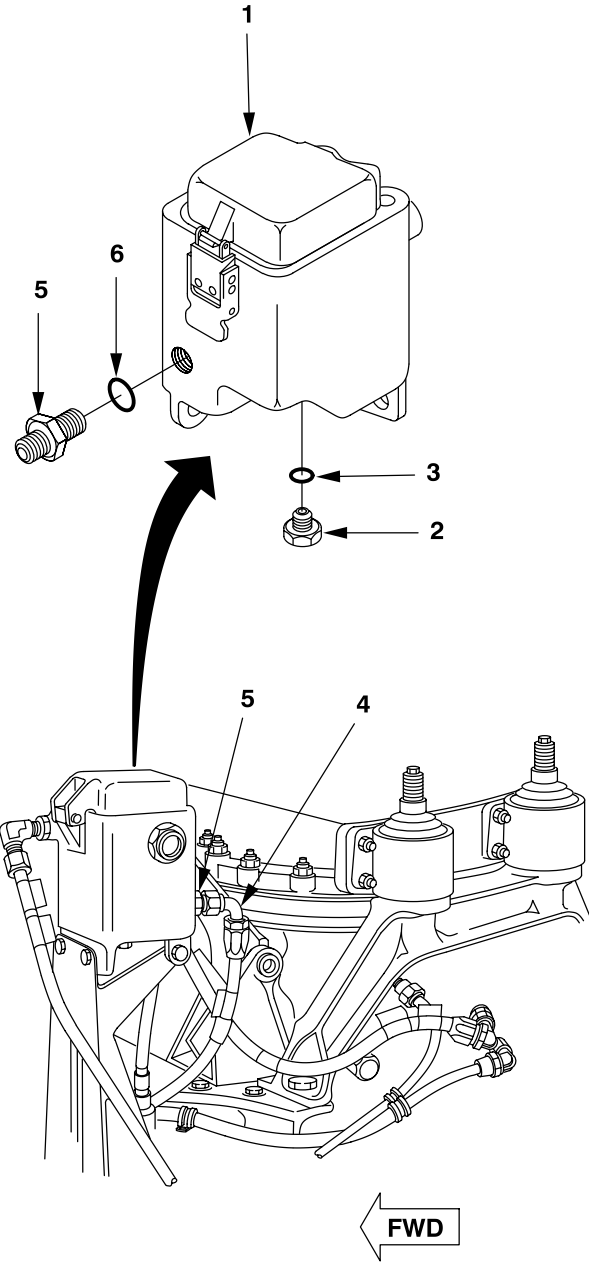


Hydraulic Fluid

2. Position suitable container (B101) under reservoir (1). Cut lockwire and remove drain plug (2) packing (3). Discard packing (3). Drain fluid into suitable container (B101).

3. Disconnect hose (4) from union (5).

4. Remove union (5) and packing (6). Discard packing (6).



INSTALL



Hydraulic Fluid

5. Lubricate packing (6) with hydraulic fluid (D106 or D107).

6. Install packing (6) on union (5).

7. Install union (5) in reservoir (1).

8. Install hose (4) on union (5).

9. Install new packing (3) on drain plug (2). Screw drain plug (2) into bottom of hydraulic reservoir (1) and tighten drain plug (2).

10. Lockwire (D132) drain plug (2) to hydraulic reservoir (1).

11. Remove container (B101) from under hydraulic reservoir (1).

12. Clean area using wiping rags (D164).

INSPECT

FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

Install forward fairing assembly (Task 2-2-47).

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END OF TASK

7-7-5. HYDRAULIC RESERVOIR SIGHT PLUG — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)
■ Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Material:

Hydraulic Fluid (D106 or D107)
Lockwire (D132)
Wiping Rags (D164)

Personnel Required:

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

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

GO TO NEXT PAGE

7-7-5. HYDRAULIC RESERVOIR SIGHT PLUG — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) at left side of helicopter forward of transmission.



Hydraulic Fluid

2. Position suitable container (B101) under drain plug (1) of reservoir (2). Cut lockwire and remove drain plug (1) and packing (3). Drain fluid into suitable container (B101) and discard packing (3).

3. Cut lockwire and remove sight plug (4) with packing (5). Discard packing (5).

INSTALL



Hydraulic Fluid

4. Lubricate packing (5) with hydraulic fluid (D106 or D107) and install on sight plug (4).

5. Screw sight plug (4) into reservoir (2).

6. Torque sight plug (4) **95 TO 105 INCH-POUNDS.**

7. Install new packing (3) on drain plug (1). Screw in drain plug (1) and tighten.

8. Lockwire (D132) drain plug (1) and sight plug (4) to reservoir (2).

9. Remove container (B101) from under hydraulic reservoir (2).

10. Clean area using wiping rags (D164).

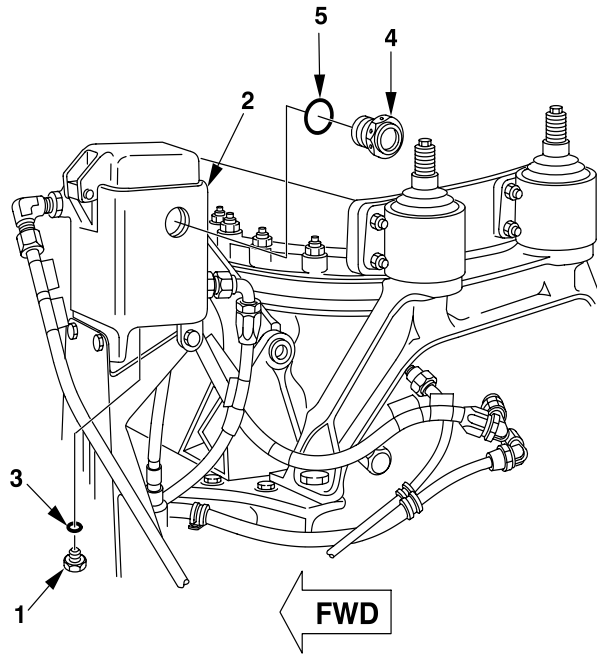
INSPECT

FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

■ Install forward fairing assembly (Task 2-2-47).



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END OF TASK

7-7-6. HYDRAULIC RESERVOIR STRAINER AND COVER GASKET — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Wiping Rags (D164)
 RTV Adhesive (D31)

Applicable Configurations:
 All

Personnel Required:
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer
 68H Aircraft Pneudraulics Repairer

Tools:
 General Mechanic Tool Kit (B178)
 Maintenance Stand (B162)
 ■ Plastic 12 Qt. Pail (or suitable substitute)
 (B101)

Equipment Condition:
 Helicopter Safed (Task 1-6-7)
 Forward Fairing Assembly Removed
 (Task 2-2-47) ■

Material:
 Hydraulic Fluid (D106 or D107)
 Lockwire (D132)

GO TO NEXT PAGE

7-7-6. HYDRAULIC RESERVOIR STRAINER AND COVER GASKET — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) at left side of helicopter forward of transmission.

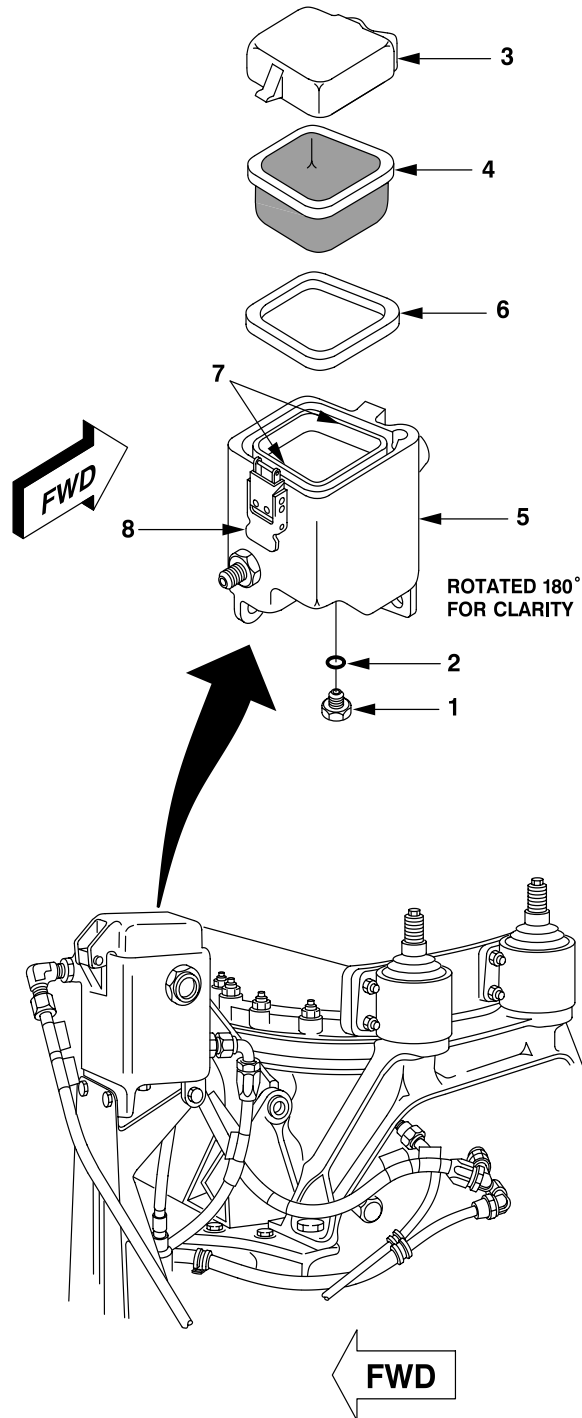


Hydraulic Fluid

2. Position suitable container (B101) under drain plug (1). Cut lockwire and remove drain plug (1). Discard packing (2). Drain fluid into suitable container (B101).

3. Open hydraulic reservoir cover (3) and remove strainer (4) from hydraulic reservoir (5).

4. Remove hydraulic reservoir cover gasket (6) from hydraulic reservoir (5). Discard hydraulic reservoir gasket (6).



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GO TO NEXT PAGE

7-7-6. HYDRAULIC RESERVOIR STRAINER AND COVER GASKET — REMOVAL/INSTALLATION (CONT)

INSTALL

5. Install new hydraulic reservoir cover gasket (6) in groove in top of hydraulic reservoir (5).

6. Apply a bead of adhesive (D31) (7) on two opposite sides as shown.

7. Place strainer (4) on bead of adhesive (7) and press firmly in place.

8. Close hydraulic reservoir cover (3) and secure with latch (8).



Hydraulic Fluid

9. Lubricate packing (2) with hydraulic fluid (D106 or D107) and install on drain plug (1). Screw drain plug (1) into bottom of hydraulic reservoir (5) and tighten drain plug (1).

10. Lockwire (D132) drain plug (1) to hydraulic reservoir (5).

11. Remove container (B101) from under hydraulic reservoir (5).

12. Clean area using wiping rags (D164).

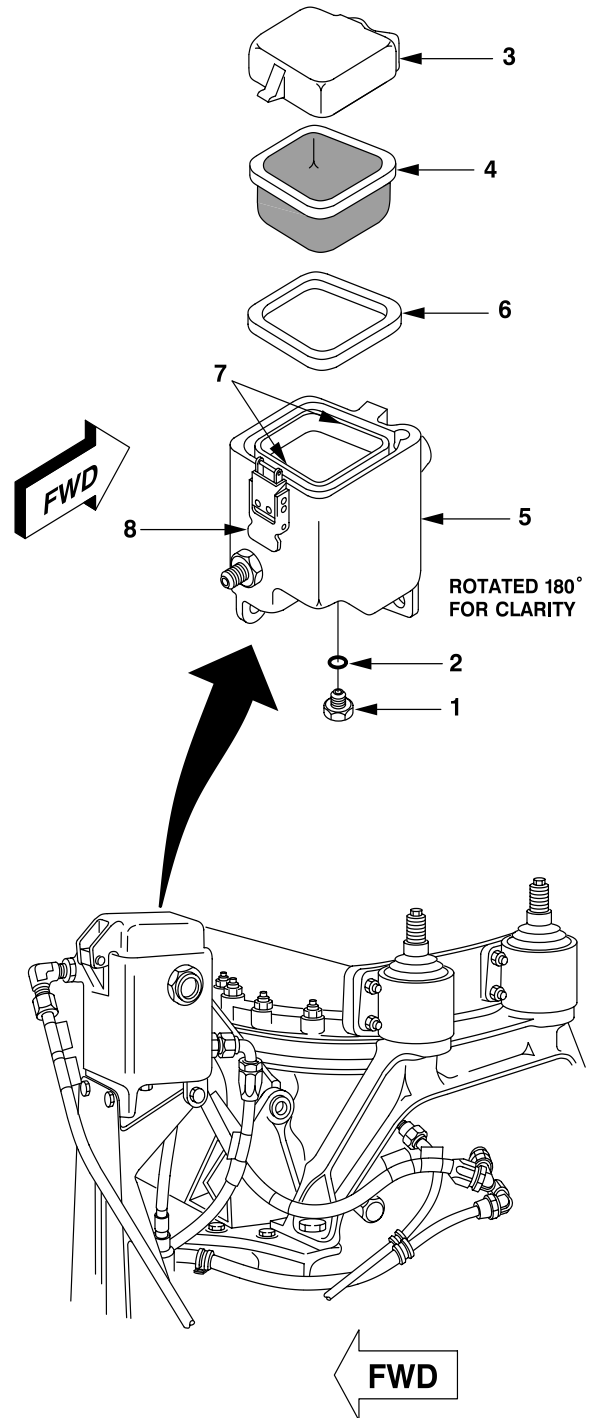
INSPECT

FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

Install forward fairing assembly (Task 2-2-47).



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END OF TASK

7-7-7. HYDRAULIC RESERVOIR SCREEN — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pseudraulics Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

REMOVE

1. Position maintenance stand (B162) at left side of helicopter forward of transmission.
2. Remove hydraulic reservoir cover (1) from hydraulic reservoir (2) (Task 7-7-2).

CAUTION

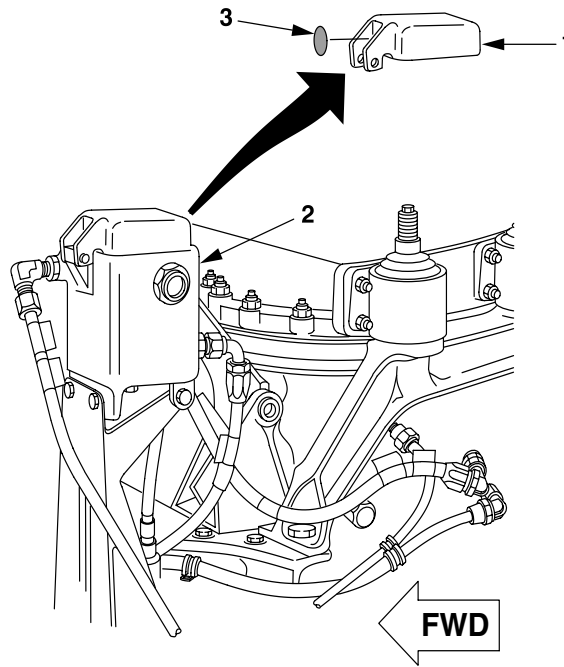
Reservoir shall be covered to preclude contamination.

3. Pry screen (3) from hydraulic reservoir cover (1) and discard screen.

INSTALL

4. Clean out counterbore for screen in hydraulic reservoir cover.
5. Install screen (3) in hydraulic reservoir cover (1).
6. Pin stake screen (3) in hydraulic reservoir cover (1). Pin stake three places, equally spaced. Pin stake depth **0.025 inch** maximum.
7. Install hydraulic reservoir cover (1) on hydraulic reservoir (2) (Task 7-7-2).
8. Clean area using wiping rags (D164).

INSPECT



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FOLLOW-ON MAINTENANCE

Install forward fairing assembly (Task 2-2-47).

END OF TASK

7-7-8. HYDRAULIC RESERVOIR — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

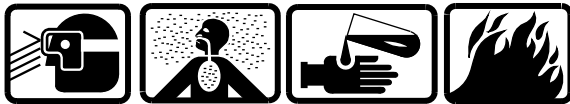
Material:
Acetone (D2)
Wiping Rags (D164)
Rubber Gloves (D111)
Sandpaper (D174)

Chromic Acid (D61)
Chrome Pickle Solution (D60)
Polyamide Epoxy Primer (D98)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 55-1500-344-23
TM 1-1500-204-23

CLEAN



Acetone



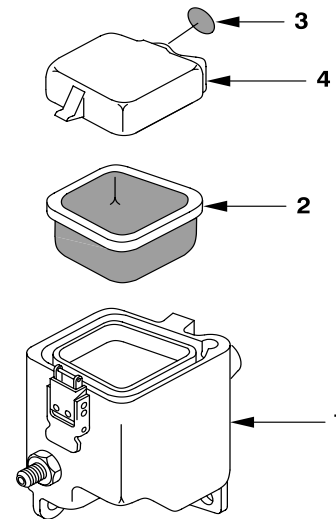
Hydraulic Fluid

1. Clean hydraulic reservoir (1) using acetone (D2). Dry with wiping rag (D164).

INSPECT

2. Inspect reservoir strainer (2) and vent screen (3) for rust, corrosion (TM 55-1500-344-23), cleanliness, cuts, and breaks.

3. Inspect reservoir (1) for possible leaks and check filler cap (4) for proper locking and security.



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7-7-8. HYDRAULIC RESERVOIR — CLEANING/INSPECTION/REPAIR (CONT)

4. Inspect drain plug (5) for proper locking and security.

5. Inspect return port union (6) for security and possible leakage.

6. Inspect sight gage (7) for cracks and discoloration.

REPAIR

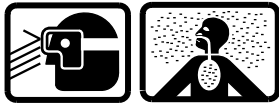
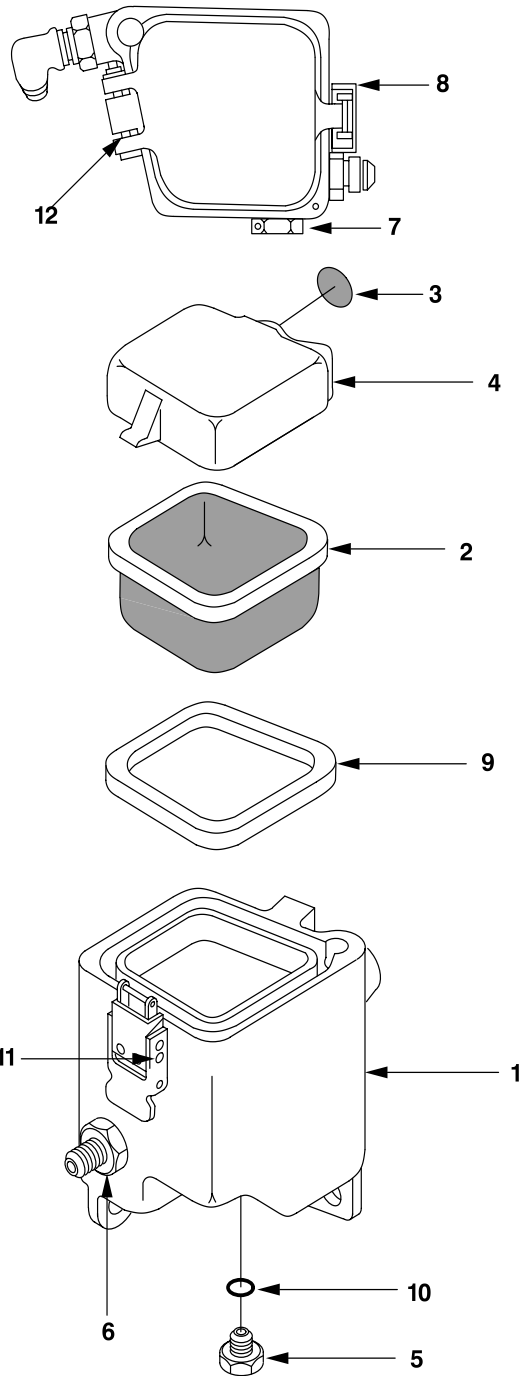
7. Replace defective sight gage (7) (Task 7-7-5).

8. Replace defective cover latch (8) (Task 7-7-3).

9. Replace damaged or unserviceable gasket (9), packing (10), lockpin (11), hinge pin (12), and union (6) (Tasks 7-7-2, 7-7-4, 7-7-6, and 7-7-7).

10. Replace unserviceable strainer (2) (Task 7-7-6).

11. Replace unserviceable vent screen (3) (Task 7-7-7).



Sanding Operations

12. Hydraulic reservoir (1) external corrosion pitting should be removed with sandpaper (D174) or hand buffing wheel. If depth of repaired area exceeds **0.020 inch**, replace reservoir (1) (Task 7-7-1).

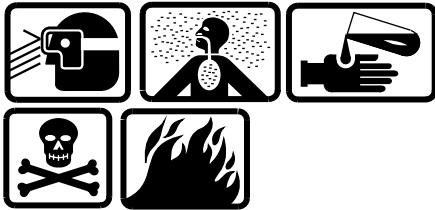
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7-7-8. HYDRAULIC RESERVOIR — CLEANING/INSPECTION/REPAIR (CONT)

**Chromic Acid**

13. Treat repaired magnesium surfaces with chromic acid (D61) or chrome pickle solution (D60). Thoroughly rinse with clean water and dry completely (TM 1-1500-204-23).

**Epoxy Primer Coating**

14. Touch up exterior surface with polyamide epoxy primer (D98).

END OF TASK

7-7-9. HYDRAULIC RESERVOIR SUPPORT BRACKET — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Maintenance Stand (B162)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer
68G Aircraft Structural Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

GO TO NEXT PAGE

7-7-9. HYDRAULIC RESERVOIR SUPPORT BRACKET — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Move maintenance stand (B162) into position to gain access to left side of transmission.
2. Remove hydraulic reservoir assembly (Task 7-7-1).
3. Remove two bolts (1), two washers (2), and bracket (3) from hydraulic reservoir bracket (4).
4. Remove hydraulic reservoir bracket (4) from fuselage deck (5).

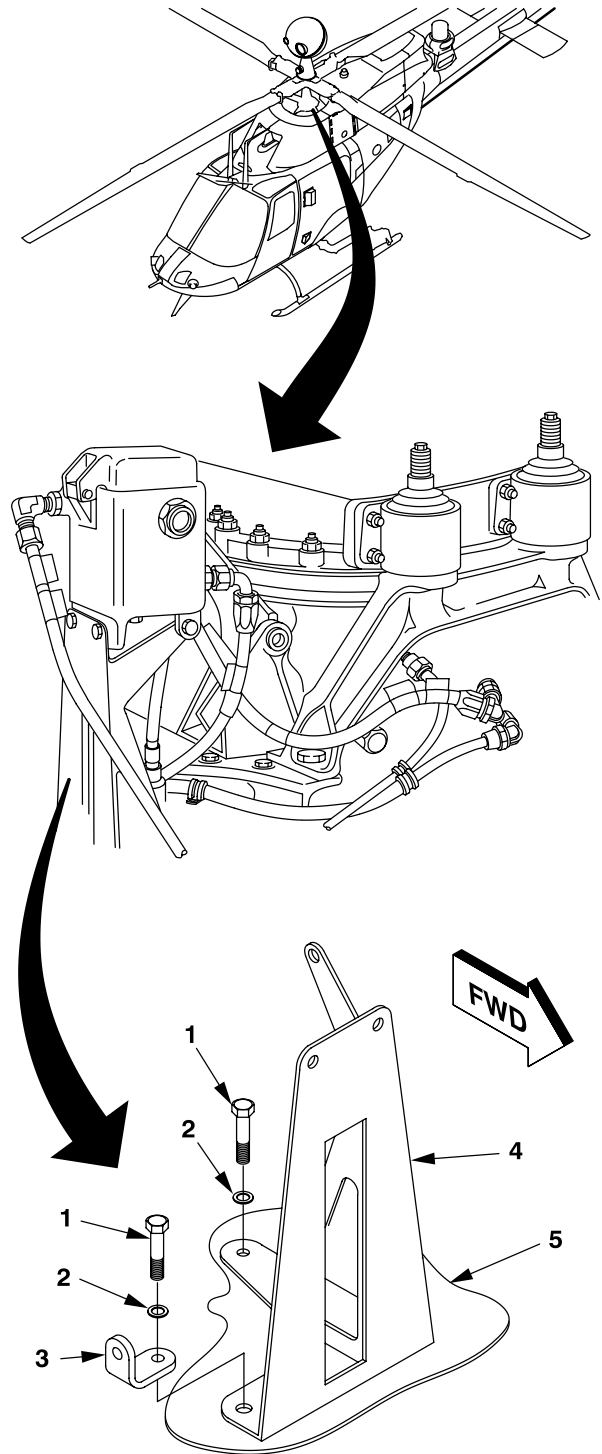
INSTALL

5. Prepare mating surfaces for Class S electrical bond (Appendix M).
6. Install new hydraulic reservoir bracket (4) on fuselage deck (5).
7. Install two bolts (1), two washers (2), and bracket (3) in hydraulic reservoir bracket (4) and fuselage deck (5). Torque bolts (1) **50 TO 70 INCH-POUNDS**.
8. Install hydraulic reservoir assembly (Task 7-7-1).

INSPECT

FOLLOW-ON MAINTENANCE

- Install forward fairing assembly (Task 2-2-47).



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END OF TASK

Section VIII. HYDRAULIC PUMP

7-23. HYDRAULIC PUMP

the hydraulic system. Standard torques are provided in Appendix P and TM 1-1500-204-23.

7-24. INTRODUCTION

This section contains: maintenance procedures for removal, cleaning, inspection, repair and installation of the hydraulic pump, and flushing of

7-25. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Hydraulic Pump — Removal/Installation	7-8-1	7-109
Hydraulic Pump — Cleaning/Inspection/Repair	7-8-2	7-113
Contaminated Hydraulic System — Flushing	7-8-3	7-115
Hydraulic Pump Driveshaft Assembly — Cleaning/Inspection/Repair	7-8-4	7-121
Hydraulic Pump Driveshaft Assembly Alternate Method — Inspection	7-8-5	7-123

7-8-1. HYDRAULIC PUMP — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Lockwire (D132)
Wiping Rags (D164)

Applicable Configurations:
All

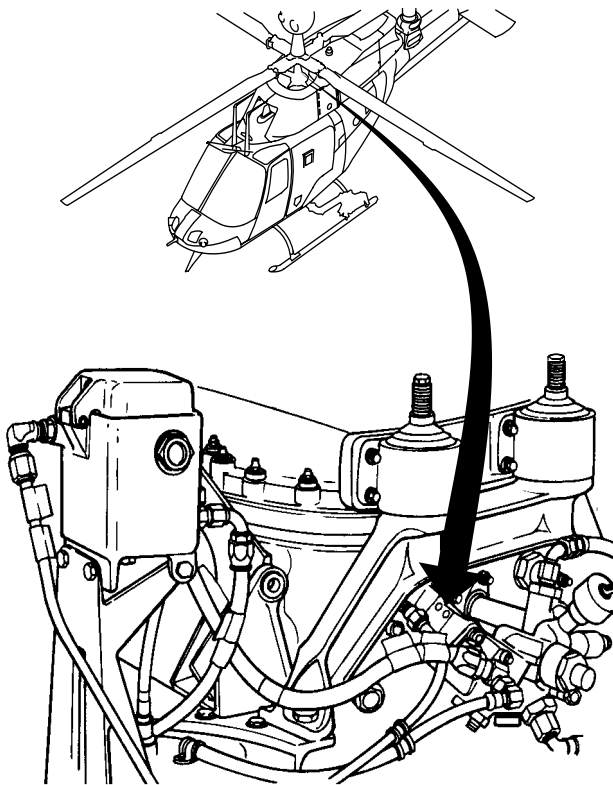
Personnel Required:
67S Scout Helicopter Technical Instructor (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Open End Wrench (B216)
Plastic 12 Qt. Pail (or suitable substitute)
(B101)
■ Torque Wrench (B237)

References:
TM 1-1500-328-23

Material:
Hydraulic Fluid (D106 or D107)
Grease (D113)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



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7-8-1. HYDRAULIC PUMP — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) at left side of transmission.



Hydraulic Fluid

2. Place suitable container (B101) under drain plug (1). Cut lockwire from drain plug (1) in hydraulic reservoir (2). Remove plug (1) with packing (3). Drain fluid into suitable container (B101). Discard packing (3).

3. Install new packing (3) on drain plug (1). Install drain plug (1) and lockwire (D132).

4. Place wiping rags (D164) under hydraulic pump (4) to catch fluid when hose assemblies are disconnected.

5. Hold union (5) and disconnect pressure line hose (6).

6. Hold union (7) and disconnect suction line hose (8).

7. Hold elbow (9) and disconnect case drain hose (10).

8. Remove four nuts (11) and four washers (12) securing hydraulic pump (4) to transmission adapter housing (13).

9. Remove pump (4) with gasket (14) and discard gasket.

10. Remove hydraulic pump driveshaft assembly (15) from transmission adapter housing (13).

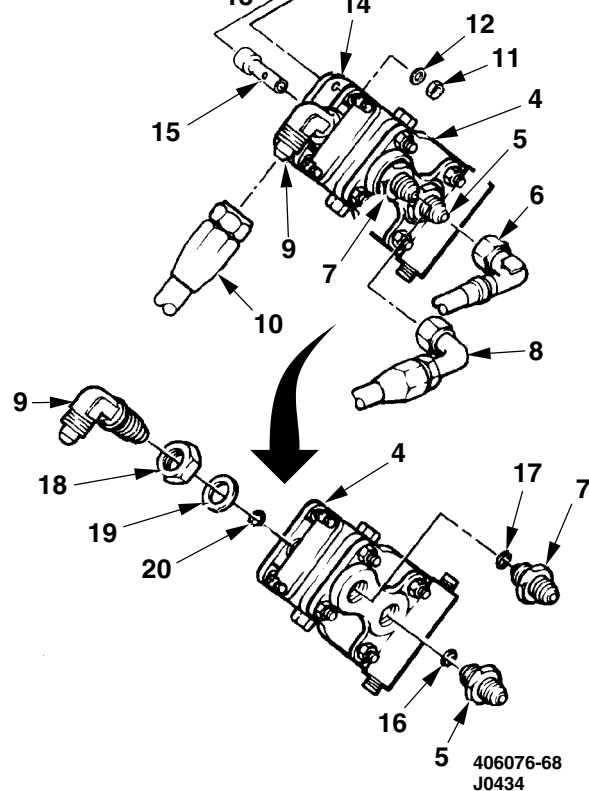
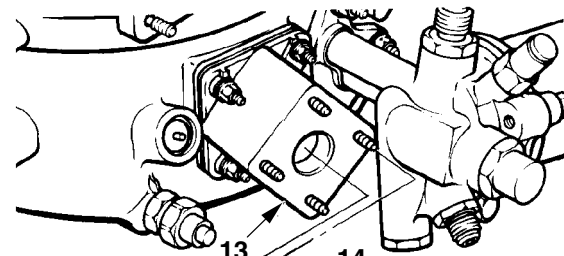
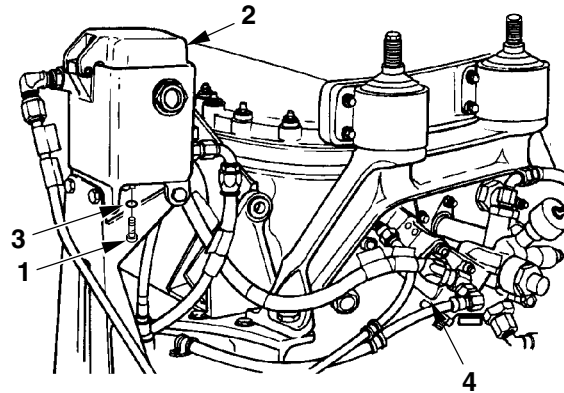
11. Remove unions (5 and 7) with packing (16 and 17). Discard packings (16 and 17).

12. Loosen nut (18) and remove elbow (9) with nut (18), retainer (19), and packing (20).

13. Discard packing (20) and retainer (19).

14. Cap hoses and hydraulic pump ports.

15. Inspect hydraulic pump driveshaft (Task 7-8-4).



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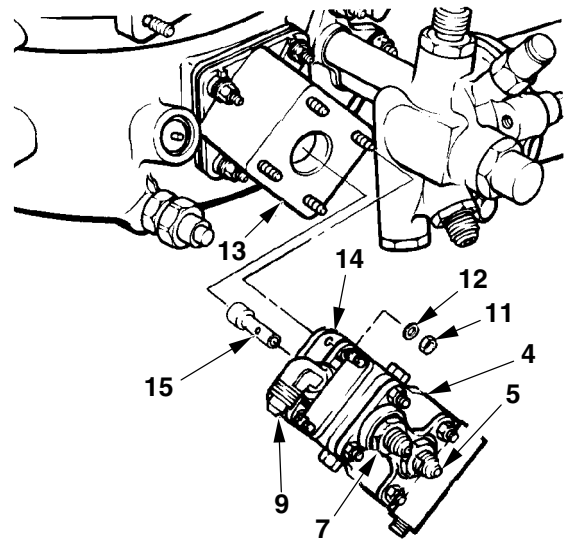
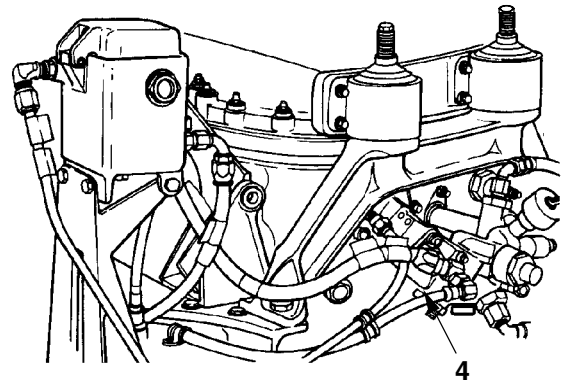
7-8-1. HYDRAULIC PUMP — REMOVAL/INSTALLATION (CONT)

INSTALL



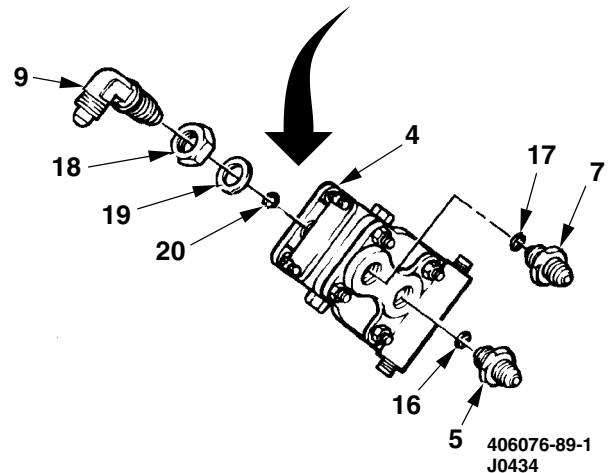
Hydraulic Fluid

16. Remove shipping plugs and allow preservative fluid to drain from hydraulic pump (4) into suitable container (B101).
17. Lubricate packing (16) and threads of union (5) with hydraulic fluid (D106 or D107).
18. Install packing (16) on union and install union (5) in hydraulic pump (4).
19. Lubricate packing (17) and threads of union (7) with hydraulic fluid (D106 or D107).
20. Install packing (17) on union and install union (7) in hydraulic pump (4).
21. Lubricate packing (20), threads on nut (18), and elbow (9) with hydraulic fluid (D106 or D107).
22. Fill hydraulic pump case with hydraulic fluid (D106 or D107).
23. Loosely install nut (18), retainer (19), and packing (20) on elbow (9). Install elbow in hydraulic pump (4).



Grease

24. Apply thin coating of grease (D113) to splines of hydraulic pump (4) and pack both splined cavities of the hydraulic pump driveshaft assembly (15).
25. Position hydraulic pump driveshaft assembly (15) onto transmission male spline located inside transmission pump adapter housing (13).
26. Install gasket (14) and hydraulic pump (4) on transmission pump adapter housing (13). Secure with four washers (12) and four nuts (11).
Torque nuts (11) 50 TO 70 INCH-POUNDS.



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INSPECT

GO TO NEXT PAGE

7-8-1. HYDRAULIC PUMP — REMOVAL/INSTALLATION (CONT)

27. Remove cap from case drain hose (10), lubricate threads of elbow (9) with hydraulic fluid (D106 or D107), and align elbow with drain hose (10).

CAUTION

Check valve in case drain line at return manifold must be installed with arrow pointing away from pump. Improper installation (backward) will cause the pump to overheat and can result in precautionary or forced landings.

28. Torque hose (10) **95 TO 105 INCH-POUNDS** and tighten locknut (18).

29. Remove cap from suction line hose (8) and lubricate threads of union (7) with hydraulic fluid (D106 or D107).

30. Start hose (8) by hand; hold union (7) and tighten hose (8).

31. Remove cap from pressure line hose (6) and lubricate threads of union (5) with hydraulic fluid (D106 or D107).

32. Start hose (6) by hand; hold union (5) and tighten hose (6).

33. Remove container (B101) and clean area with wiping rags (D164).

INSPECT

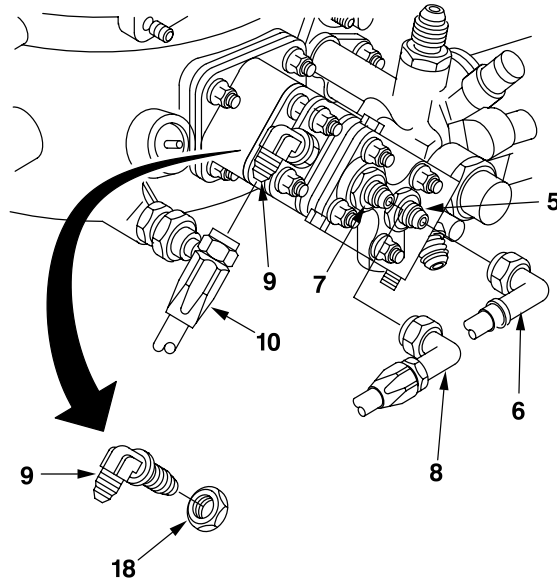
FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

■ Install forward fairing assembly (Task 2-2-47).

Perform MOC (TM 1-1500-328-23).



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END OF TASK

7-8-2. HYDRAULIC PUMP — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

References:
TM 1-1520-266-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

CLEAN



Drycleaning Solvent

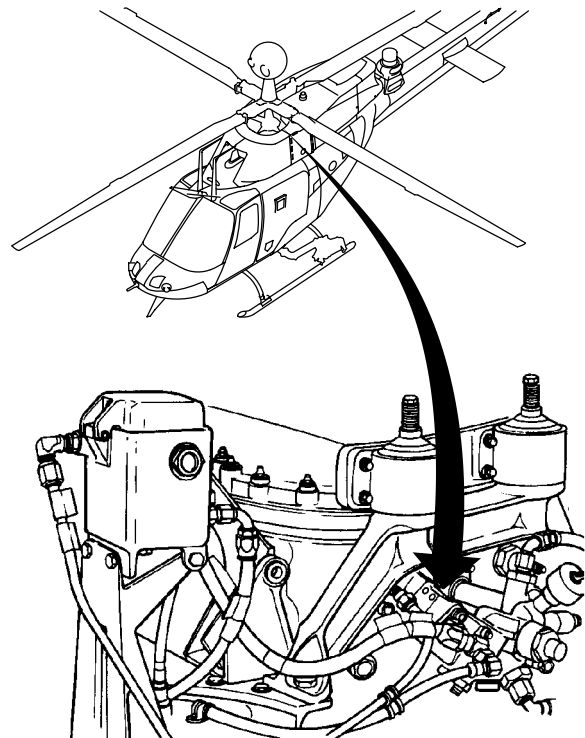


Compressed Air



Hydraulic Fluid

1. Clean hydraulic pump with drycleaning solvent (D199). Dry with moisture-free compressed air at approximately 20 psi pressure.



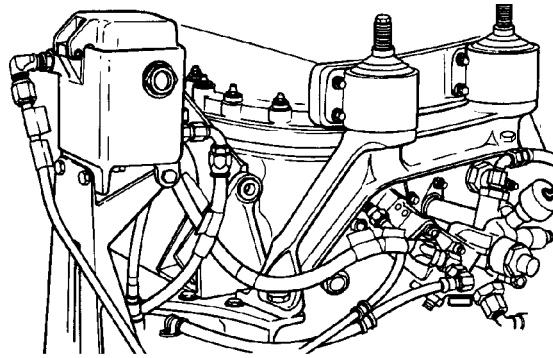
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7-8-2. HYDRAULIC PUMP — CLEANING/INSPECTION/REPAIR (CONT)

INSPECT

2. Inspect hydraulic pump for leakage.
3. Inspect hydraulic pump for security of installation.
4. Inspect hydraulic pump for cracked housing.
If cracks in hydraulic pump are suspected perform eddy current inspection (TM 1-1520-266-23).
5. Ensure plugs and screws are properly lockwired.
6. Inspect connecting lines and hose for security and leakage.

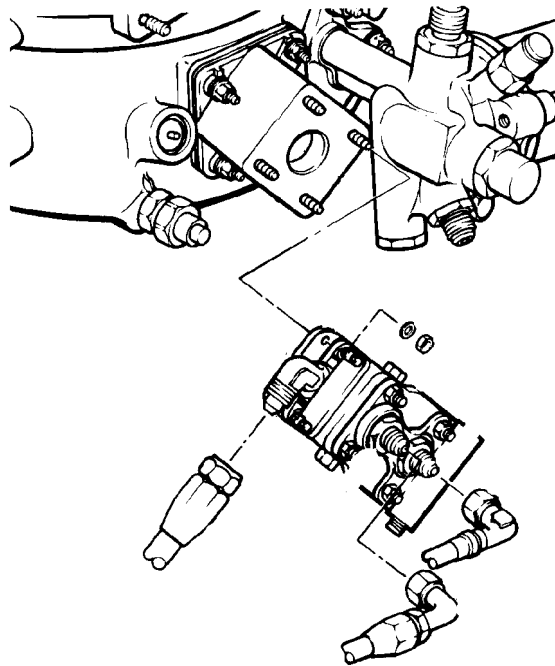


REPAIR

7. Replace defective hydraulic pump (Task 7-8-1).

FOLLOW-ON MAINTENANCE

- Install forward fairing assembly (Task 2-2-47).



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END OF TASK

7-8-3. CONTAMINATED HYDRAULIC SYSTEM — FLUSHING

This task covers: Flushing (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Open End Wrench (B216)
■ Plastic 12 Qt. Pail (or suitable substitute)
(B101)

Material:

Hydraulic Fluid (D106 or D107)
Wiping Rags (D164)

Personnel Required:

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

References:

TM 1-1500-328-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

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7-8-3. CONTAMINATED HYDRAULIC SYSTEM — FLUSHING (CONT)

1. Move maintenance stand (B162) into position to gain access to roof forward of the transmission.

PREPARE

2. Remove and discard the filter elements (Task 7-3-2).

3. Immediately install filter bowls without elements.

NOTE

If flushing hydraulic system due to metal contamination or failed hydraulic pump, complete step 4. If not, proceed to step 5.

4. Replace hydraulic pump (Task 7-8-1).



Hydraulic Fluid

NOTE

Reservoir shall be drained and flushed with clean hydraulic fluid (D106 or D107) before proceeding.

5. Disconnect hose (1) from union (2) on right servoactuator (3). Cap union (2).

6. Disconnect end of hose (4) from elbow (5) on right servoactuator (3). Cap elbow (5).

7. Connect hose (1) to hose (4) using reducer (6).

8. Disconnect hose (7) from tee (8) on center servoactuator (9). Cap end of tee (8).

9. Disconnect end of hose (10) from other side of tee (8). Cap tee (8).

10. Connect hose (7) to hose (10) using union (11).

11. Disconnect hose (12) from elbow (13). Cap elbow (13).

12. Disconnect hose (10) from elbow (14) on left servoactuator (15). Cap elbow (14).

13. Connect hose (10) to hose (12) using reducer (16).

14. Disconnect hose (17) from end of tee (18) on left servoactuator (15).

15. Disconnect hose (4) from other end of tee (18). Cap tee.

16. Connect hose (4) to hose (17) using union (19).

17. Disconnect hose (20) from union (21) on directional actuator (22). Cap union (21).

18. Disconnect hose (23) from union (24). Cap union (24).

19. Connect hose (23) to hose (20) using reducer (25).

20. Disconnect quick-disconnect coupling halves (26 and 27).

21. Connect hydraulic test stand to quick-disconnect coupling (male) halves (28 and 29).

22. Disconnect return line at hydraulic test stand. Return line is attached to quick-disconnect coupling (male) half (28).

23. Remove quick-disconnect coupling from hydraulic test stand end of return line.

NOTE

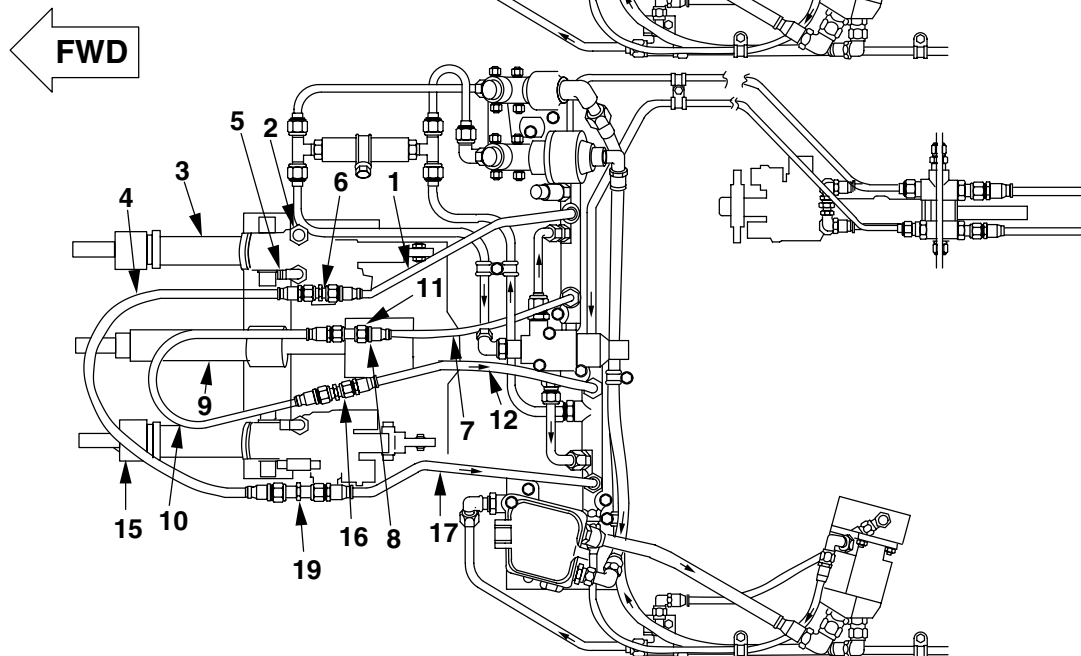
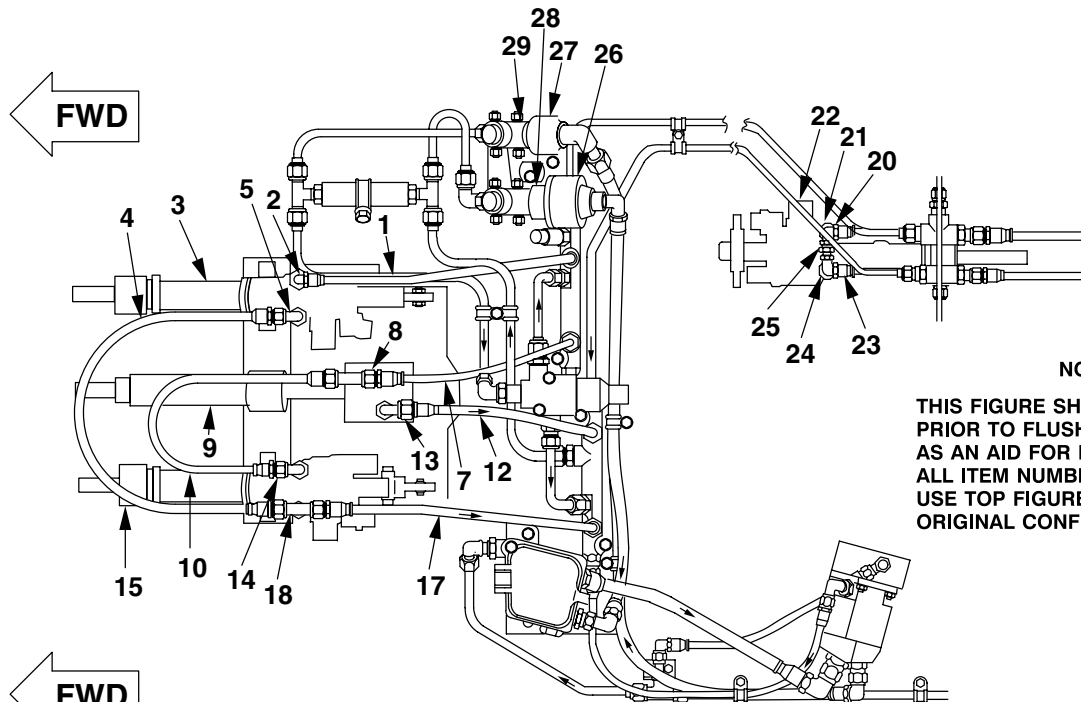
Return line shall be secured with hand pressure to prevent return line escaping from container.

24. Place end of return line into suitable container (B101).

25. Inspect hydraulic system to ensure flushing components and hose are securely attached.

GO TO NEXT PAGE

7-8-3. CONTAMINATED HYDRAULIC SYSTEM — FLUSHING (CONT)



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 J2115

GO TO NEXT PAGE

7-8-3. CONTAMINATED HYDRAULIC SYSTEM — FLUSHING (CONT)

FLUSH

CAUTION

Test stand shall be fully serviced with same type fluid as used in helicopter system.

26. Set hydraulic test stand to provide flow rate of $3.0 \pm 1/2$ GPM using pressure setting of 1000 PSI to maintain flow through helicopter hydraulic system for minimum of 5 minutes to flush out system. Operate shutoff valve minimum of 3 times during 5 minutes.

27. Inspect all portions of system for evidence of leakage throughout flushing operation.

28. Shut down hydraulic test stand.

DISCONNECT/CONNECT



Hydraulic Fluid

29. Disconnect hose (23) and hose (20) from reducer (25). Remove reducer from helicopter.

30. Remove cap from union (24) on directional actuator (22) and connect hose (23) to union (24).

31. Remove cap from union (21) on directional actuator (22) and connect hose (20).

32. Disconnect hose (4) and hose (17) from union (19). Remove union from helicopter.

33. Remove caps from tee (18) on left servoactuator (15). Connect one end of hose (4) to forward side of tee (18) and connect hose (17) to other side of tee (18).

34. Disconnect hose (10) and hose (12) from reducer (16). Remove reducer (16) from helicopter.

35. Remove cap from elbow (14) on left servoactuator (15). Connect one end of hose (10) to elbow (14).

36. Remove cap from elbow (13) on center servoactuator (9). Connect hose (12) to elbow (13).

37. Disconnect hose (7) and hose (10) from union (11). Remove union (11) from helicopter.

38. Remove caps from tee (8) on center servoactuator (9). Connect hose (7) to aft side of tee (8) and connect loose end of hose (10) to forward end of tee (8).

39. Disconnect hose (1) and hose (4) from reducer (6). Remove reducer (6) from helicopter.

40. Remove cap from elbow (5) on right servoactuator (3). Connect hose (4) to elbow (5).

41. Remove cap from union (2) and connect hose (1) to union.

42. Remove end of return line from container.

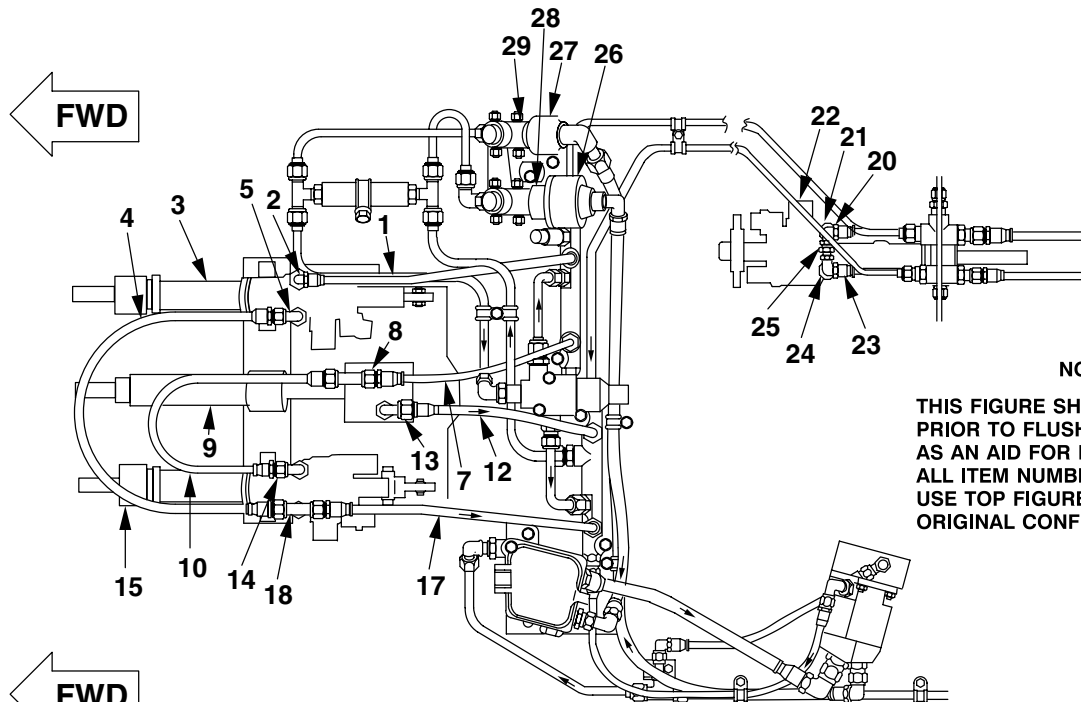
43. Attach quick-disconnect coupling to end of return line.

44. Connect return line to test stand.

45. Remove caps and clean area.

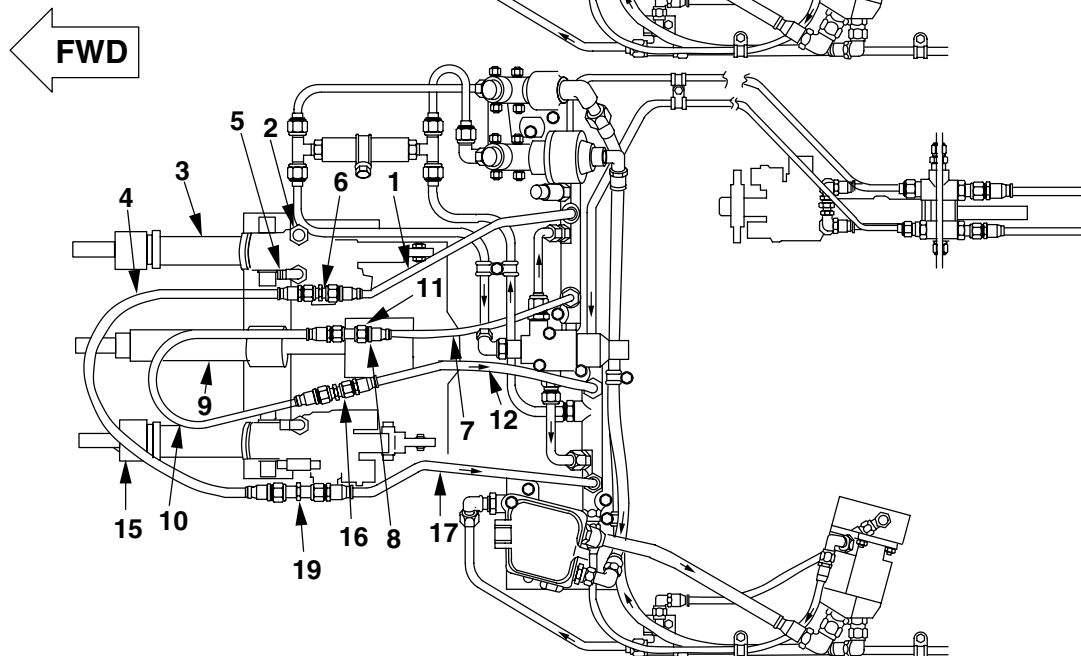
GO TO NEXT PAGE

7-8-3. CONTAMINATED HYDRAULIC SYSTEM — FLUSHING (CONT)



NOTE

THIS FIGURE SHOWS HYDRAULICS PRIOR TO FLUSHING CONFIGURATION AS AN AID FOR REFERENCE. NOT ALL ITEM NUMBERS ARE DEPICTED. USE TOP FIGURE TO RESTORE ORIGINAL CONFIGURATION.



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J2115

GO TO NEXT PAGE

7-8-3. CONTAMINATED HYDRAULIC SYSTEM — FLUSHING (CONT)

CHECK

46. Set hydraulic test stand pump to provide minimum flow of 3.0 GPM with pressure compensator adjusted to 1000 psig.

47. Cycle cyclic, collective, and directional controls.

48. Check for leaks.

49. Shut down hydraulic test stand.

50. Remove filter bowls and drain fluid.

51. Check new elements for defects.

52. Install new filter elements (Task 7-3-2).

53. Disconnect hydraulic test stand couplings from helicopter male quick-disconnect coupling halves (28 and 29).

54. Connect quick-disconnect couplings (26 and 27).

55. Clean area using wiping rag (D164).

INSPECT

FOLLOW-ON MAINTENANCE

Service hydraulic reservoir (Task 1-4-10).

Bleed hydraulic system (Task 7-2-1).

Install forward fairing assembly (Task 2-2-47). ■

Perform MOC (TM 1-1500-328-23).

END OF TASK

7-8-4. HYDRAULIC PUMP DRIVESHAFT ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer

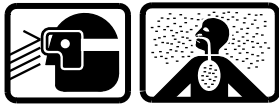
CLEAN

WARNING

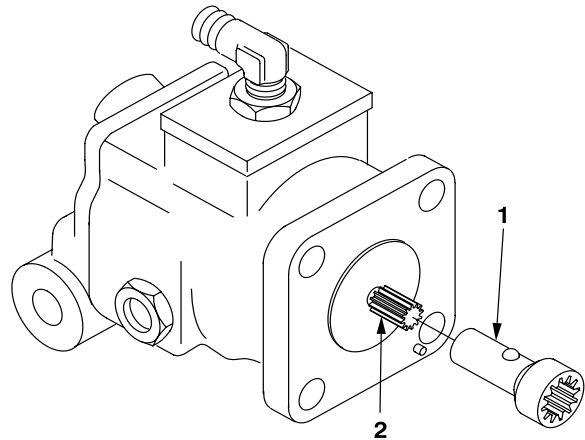
Task shall be performed in a well-ventilated area.



Drycleaning Solvent



Compressed Air

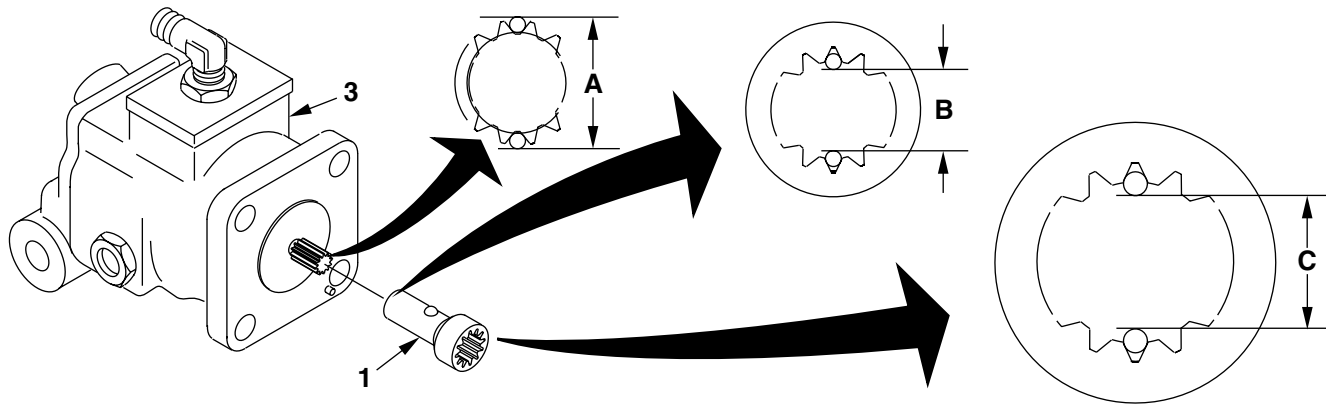


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1. Clean hydraulic pump driveshaft assembly (1) and hydraulic pump input external splined shaft (2) using drycleaning solvent (D199) and nonmetallic brush. Dry with moisture-free compressed air at approximately 20 psi.

GO TO NEXT PAGE

7-8-4. HYDRAULIC PUMP DRIVESHAFT ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



AREA/ ITEM NO.	TYPE OF DAMAGE	NOMENCLATURE	INSPECTION METHOD	LIMITS	
A	WEAR	GEAR TEETH	MEASURE OVER TWO 0.0400 INCH DIA. PINS	0.3142 INCH MIN.	
B	WEAR	SPLINE TEETH	MEASURE BETWEEN TWO 0.0400 INCH DIA. PINS	0.2114 INCH MAX.	
C	WEAR	SPLINE TEETH	MEASURE BETWEEN TWO 0.0600 INCH DIA. PINS	0.3488 INCH MAX.	406076-129 H1787

INSPECT

CAUTION

It is critical that all splines be thoroughly cleaned of any metallic particles prior to reassembly.

2. Inspect hydraulic pump driveshaft assembly (1) to ensure riveted plug is still secure inside driveshaft assembly by pressing on plug, in both directions, using hand pressure.

3. Inspect hydraulic pump (3) input external splined shaft teeth using two **0.0400 inch** diameter pins and placing them 180 degrees apart. Determine dimension between pins by measuring from outside edge of pins.

4. Inspect hydraulic pump driveshaft assembly (1) using two **0.0400 inch** diameter pins or two

0.0600 inch diameter pins and placing them 180 degrees apart. Check spline wear by checking dimension between pins as follows:

a. On 14 tooth spline (larger diameter), check dimension between **0.0600 inch** diameter pins with pins seated in worn area of spline only.

b. On 13 tooth spline, check dimension between **0.0400 inch** diameter pins with pins seated in worn area of spline only.

REPAIR

5. Replace defective hydraulic pump driveshaft assembly (1) (Task 7-8-1).

6. Replace defective hydraulic pump (3) (Task 7-8-1).

END OF TASK

7-8-5. HYDRAULIC PUMP DRIVESHAFT ASSEMBLY ALTERNATE METHOD — INSPECTION

This task covers: Inspect Hydraulic Pump Driveshaft Assembly (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
■ Torque Wrench (B237)

Material:
Grease (D113)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68H Aircraft Pneudraulics Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47) ■

INSPECT

WARNING

Task shall be performed in a well-ventilated area.

CAUTION

It is critical that all splines be thoroughly cleaned prior to reassembly. Failure to do so will cause hydraulic pump shaft damage.

NOTE

This inspection procedure is provided to serve as a guide for field inspections of the hydraulic pump driveshaft assembly and hydraulic pump input external splined shaft. It is tailored for inspection without the use of measuring tools or gages. It should not be considered a substitute for new replacement components when they are available.

GO TO NEXT PAGE

7-8-5. HYDRAULIC PUMP DRIVESHAFT ASSEMBLY ALTERNATE METHOD — INSPECTION (CONT)

1. Position maintenance stand (B162) at forward left side of helicopter to gain access to transmission.

2. Remove four nuts (1) and four washers (2) securing hydraulic pump (3) to transmission pump adapter housing (4).

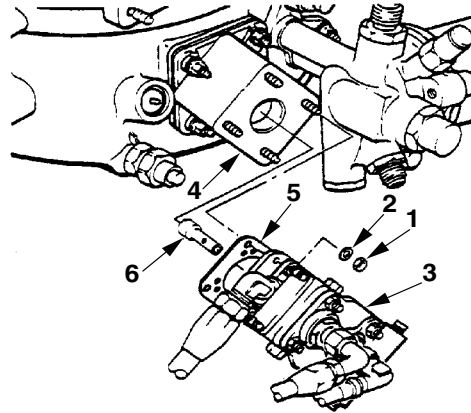
3. Remove hydraulic pump (3) with gasket (5) and discard gasket (5).

4. Remove hydraulic pump driveshaft assembly (6) from transmission pump adapter housing (4).

5. Clean hydraulic pump driveshaft assembly (6) (Task 7-8-4).

6. Clean hydraulic pump input external splined shaft (Task 7-8-4).

7. Visually inspect hydraulic pump driveshaft assembly (6) splines (both ends) for wear steps. See figure Hydraulic Driveshaft Assembly — Damage Limits.



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GO TO NEXT PAGE

7-8-5. HYDRAULIC PUMP DRIVESHAFT ASSEMBLY ALTERNATE METHOD — INSPECTION (CONT)

8. Visually inspect hydraulic pump input external splined shaft for wear (Task 7-8-4).

9. Replace defective hydraulic pump driveshaft assembly (6) or hydraulic pump (3) (Task 7-8-1).

10. Visually inspect transmission male splined shaft located inside transmission pump adapter housing (4) for obvious damage/wear.

**Grease**

11. Apply thin coating of grease (D113) to splines of transmission male splined shaft and hydraulic pump input external splined shaft.

12. Pack hydraulic pump driveshaft assembly (6) splines (both ends) with grease (D113).

13. Position hydraulic pump driveshaft assembly (6) on transmission male splined shaft located inside transmission pump adapter housing (4).

14. Install gasket (5) and hydraulic pump (3) on transmission pump adapter housing (4). Secure with four washers (2) and four nuts (1).

■ Torque nuts (1) **50 TO 70 INCH-POUNDS**.

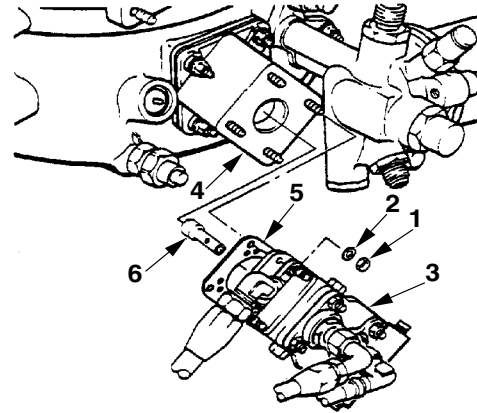
15. Inspect connecting lines and hose for security and leakage.

INSPECT

FOLLOW-ON MAINTENANCE

■ Install forward fairing assembly (Task 2-2-47).

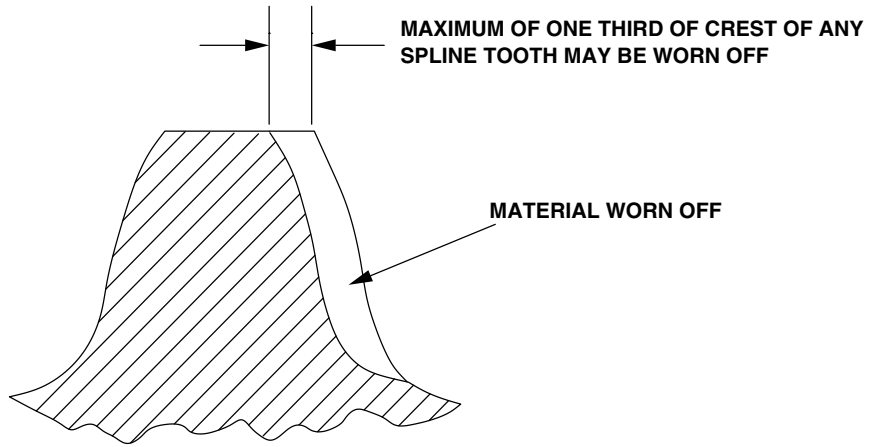
Perform MOC (TM 1-1520-248-MTF).



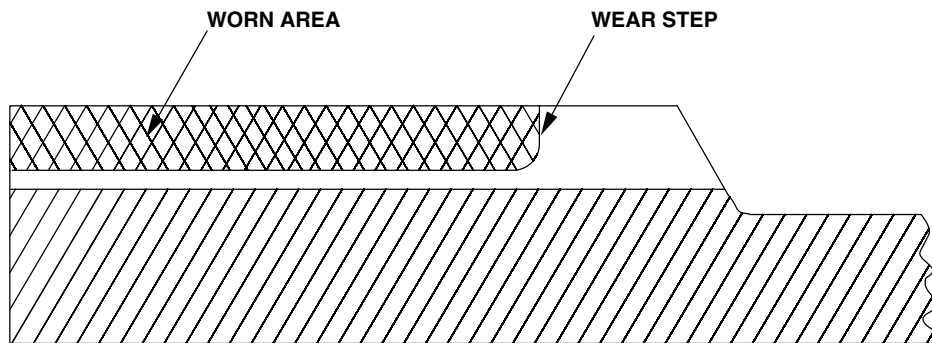
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7-8-5. HYDRAULIC PUMP DRIVESHAFT ASSEMBLY ALTERNATE METHOD — INSPECTION (CONT)



END VIEW OF SPLINE - TYPICAL



SIDE VIEW OF SPLINE - TYPICAL

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J0435

Hydraulic Driveshaft Assembly — Damage Limits

END OF TASK

CHAPTER 8

INSTRUMENT SYSTEMS

8-1. INSTRUMENT SYSTEMS

This chapter contains maintenance procedures for the instrument systems. The chapter is divided into five sections.

		Page
Section I	Engine, Rotor and Transmission Instruments	8-2
Section II	Flight Instruments	8-45
Section III	Pitot-Static Instrument and Air Data Systems	8-59
Section IV	Navigation Instruments	8-77
Section V	Miscellaneous Instruments	8-77

Section I. ENGINE, ROTOR AND TRANSMISSION INSTRUMENTS

8-2. ENGINE, ROTOR, AND TRANSMISSION INSTRUMENTS

maintenance of the engine, rotor, and transmission instruments. Standard torques are provided in Appendix P and TM 1-1500-204-23.

8-3. INTRODUCTION

This section contains: maintenance procedures for inspection, cleaning, removal, installation, disassembly, assembly, and follow-on

8-4. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Engine/Rotor/Transmission Instruments — Cleaning/Inspection	8-1-1	8-3
Multiparameter Display BRT Control Knob — Removal/Installation	8-1-2	8-5
Multiparameter Display Fuses (Typical) — Removal/Installation	8-1-3	8-7
Multiparameter Display (MPD) — Removal/Installation	8-1-4	8-8
Multiparameter Display Front Panel (MPD) — Removal/Installation	8-1-5	8-9
Multiparameter Display Lamps (MPD) — Replacement	8-1-6	8-10
■ Multiparameter Display (MPD) — Disassembly/Assembly	8-1-7	8-12
Multiparameter Display (MPD) — Cleaning/Inspection/Repair	8-1-8	8-15
■ Deleted	8-1-9	8-18
TGT/TRQ Indicator — Removal/Installation	8-1-10	8-22
TGT/TRQ Indicator — Disassembly/Assembly	8-1-11	8-24
TGT/TRQ Lamps — Replacement	8-1-12	8-28
TGT/TRQ Indicator — Cleaning/Inspection/Repair	8-1-13	8-30
Dual Tachometer — Removal/Installation	8-1-14	8-33
Dual Tachometer — Disassembly/Assembly	8-1-15	8-35
Dual Tachometer Lamps — Replacement	8-1-16	8-37
Dual Tachometer — Cleaning/Inspection/Repair	8-1-17	8-38
Instrument Panel Glareshield — Removal/Installation	8-1-18	8-41
Instrument Panel Glareshield — Cleaning/Inspection/Repair	8-1-19	8-43

8-1-1. ENGINE/ROTOR/TRANSMISSION INSTRUMENTS — CLEANING/INSPECTION

This task covers: Cleaning and Inspection (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer

Applicable Configurations:
All

References:
TM 1-1520-248-10

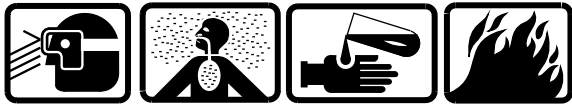
Material:
Drycleaning Solvent (D199)
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-1-1. ENGINE/ROTOR/TRANSMISSION INSTRUMENTS — CLEANING/INSPECTION (CONT)

CLEAN

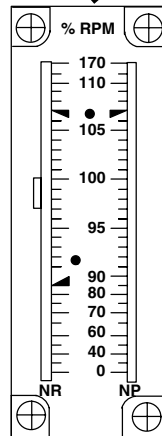
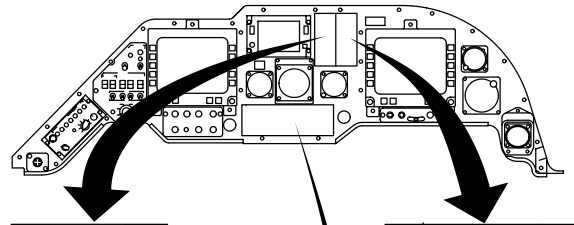


Drycleaning Solvent

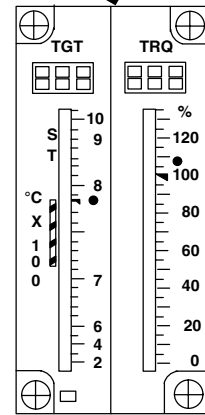
1. Clean face of indicators with drycleaning solvent (D199).
2. Dry face of indicators with a dry low-lint cleaning cloth (D67).

INSPECT

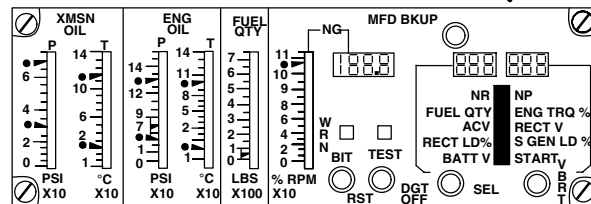
3. Inspect for loose, cracked, or broken switches and face covers.
4. Inspect for proper and secure mounting.
5. Inspect all markings and decals for completeness and legibility (TM 1-1520-248-10).



DUAL TACHOMETER



TGT/TRQ INDICATOR



MULTIPARAMETER DISPLAY

406075-81
J0438

END OF TASK

8-1-2. MULTIPARAMETER DISPLAY BRT CONTROL KNOB — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Personnel Required:
68F Aircraft Electrician
67S Scout Helicopter Technical Inspector (TI) ■

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-1-2. MULTIPARAMETER DISPLAY BRT CONTROL KNOB — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Gain access to multiparameter display (1) through either crew door.
2. Loosen two setscrews (2) holding BRT control knob (3) on brightness control shaft (4).
3. Slide control knob (3) from control shaft (4).

INSTALL

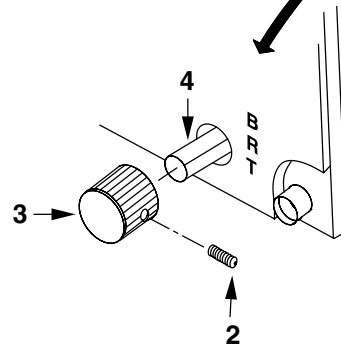
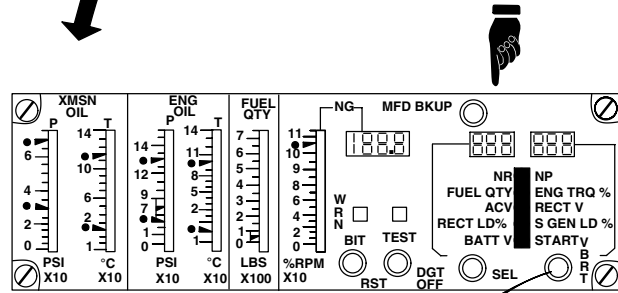
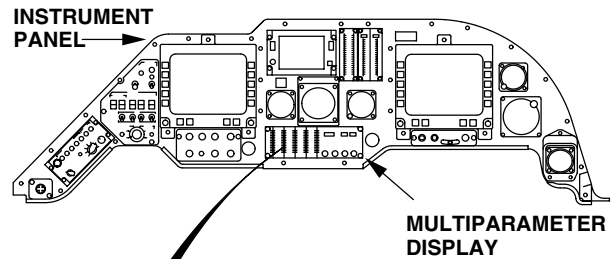
4. Slide BRT control knob (3) onto the brightness control shaft (4).
5. Tighten two setscrews (2) in BRT control knob (3) until knob is secure.

INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check. (Refer to TM 1-1520-248-T and verify that digital display indicates 888 (left and right).)

Check BRT control knob by turning and ensuring brightness varies.



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J0438

END OF TASK

8-1-3. MULTIPARAMETER DISPLAY FUSES (TYPICAL) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Personnel Required:
 68F Aircraft Electrician
 67S Scout Helicopter Technical Inspector (TI) ■

Applicable Configurations:
 All

Tools:
 Ohmmeter (B99)

REMOVE

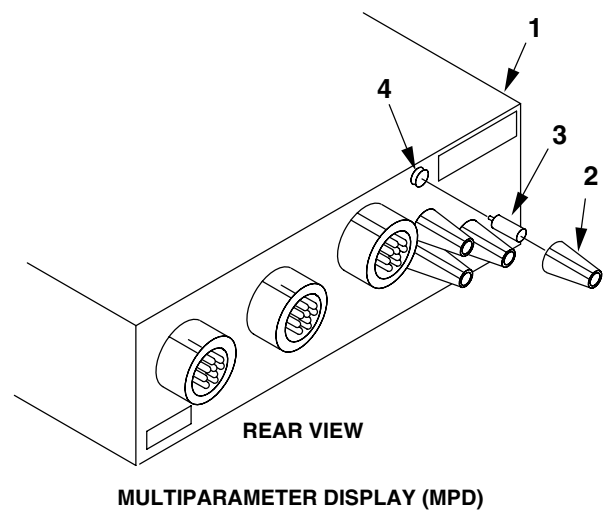
1. At the rear of multiparameter display (1), remove fuseholder(s) (2) and fuse(s) (3).

2. Using ohmmeter, check for continuity of fuse.

INSTALL

3. Insert fuse(s) (3) into appropriate socket (4) of multiparameter display (1).

4. Place fuseholder(s) (2) over fuse(s) and turn clockwise.



406075-309
 J0438

END OF TASK

8-1-4. MULTIPARAMETER DISPLAY (MPD) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

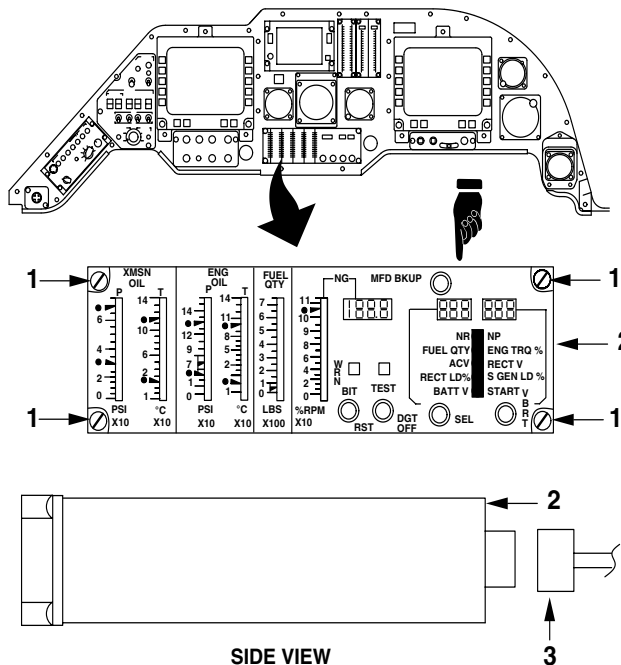
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68F Aircraft Electrician

References:
TM 1-1520-248-T
TM 1-1427-779-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Keyboard Removed (TM 1-1427-779-23)

REMOVE

1. Gain access to instrument panel and pedestal console through either crew door.
2. Loosen four Dzus fasteners (1) in front panel of MPD (2).
3. Disconnect three electrical connectors (3) at the rear of MPD (2).
4. Remove MPD (2) from its mount.



INSTALL

5. Prepare MPD (2) and mount for Class S electrical bonding per Appendix M.
6. Place serviceable MPD (2) in its mount.
7. Identify and connect three electrical connectors (3) on MPD.
8. Tighten four Dzus fasteners (1) in front of MPD.

INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check (TM 1-1520-248-T).
Install keyboard (TM 1-1427-779-23).

406075-79
J0438

END OF TASK

8-1-5. MULTIPARAMETER DISPLAY FRONT PANEL (MPD) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

1. Loosen two setscrews (1) and remove BRT control knob (2).
2. Remove six short screws (3) and two countersunk screws (4).
3. Remove front panel (5) from case assembly (6).

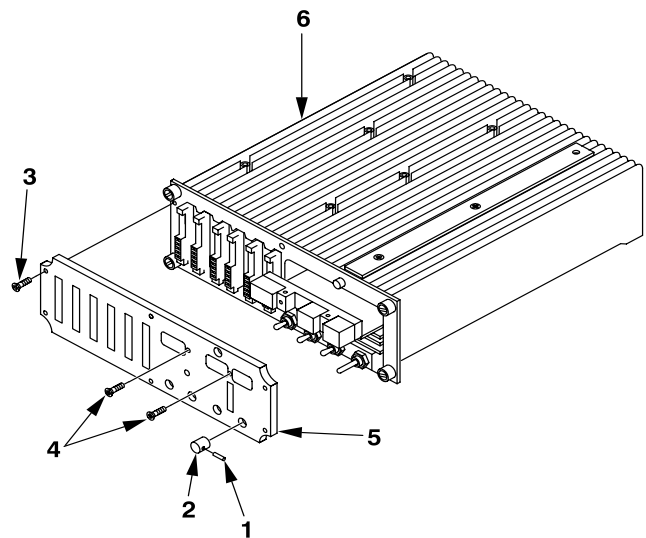
INSTALL

4. Install front panel (5) on case assembly (6) with six short screws (3) and two countersunk screws (4).

CAUTION

To prevent damage to front panel, a delicate feel shall be used when tightening screws.

5. Install BRT control knob (2) and tighten two setscrews (1).

INSPECT

406075-552-1
J2163

END OF TASK

8-1-6. MULTIPARAMETER DISPLAY LAMPS (MPD) — REPLACEMENT

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Card Extractor Tool (B194)
Electrical Repairer Tool Kit (B177)

Personnel Required:

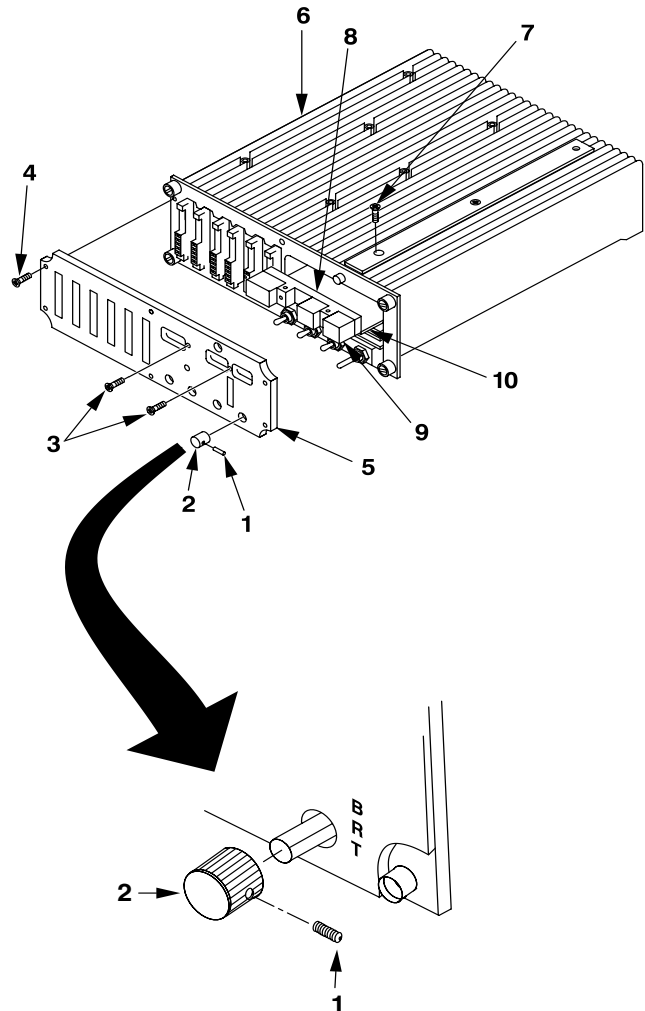
67S Scout Helicopter Technical Inspector (TI)
68F Aircraft Electrician

GO TO NEXT PAGE

8-1-6. MULTIPARAMETER DISPLAY LAMPS (MPD) — REPLACEMENT (CONT)

REMOVE

1. Loosen two setscrews (1) and remove BRT control knob (2).
2. Remove six short screws (3) and two countersunk screws (4).
3. Remove front panel (5) from case assembly (6).
4. Remove two screws (7) from digital driver card (8).
5. Remove digital driver card (8) using card extractor tool (B194).
6. Remove lamps (9) from lamp holder (10). Discard lamps.

**INSTALL**

7. Install new lamps (9) in lamp holder (10).
8. Press digital driver card (8) into its motherboard connector and secure with two screws (7).
9. Align front panel (5) with its mounting holes in case assembly (6) and install two long screws (3) and six short screws (4).

CAUTION

To prevent damage to front panel, a delicate feel shall be used when tightening screws.

10. Install BRT control knob (2) and tighten two locking setscrews (1).

INSPECT

406075-552-3
J2163

END OF TASK

8-1-7. MULTIPARAMETER DISPLAY (MPD) — DISASSEMBLY/ASSEMBLY

This task covers: Disassembly and Assembly (Off Helicopter)

INITIAL SETUP

Retaining Compound (D170)
Solder (D196)

Applicable Configurations:
All

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

Tools:
Card Extractor Tool (B194)
Soldering Iron (B159)
Electrical Repairer Tool Kit (B177)

Equipment Condition:
Multiparameter Display Front Panel Removed
(Task 8-1-5)

Material:
Flux (D109)
Quick Primer (D163)

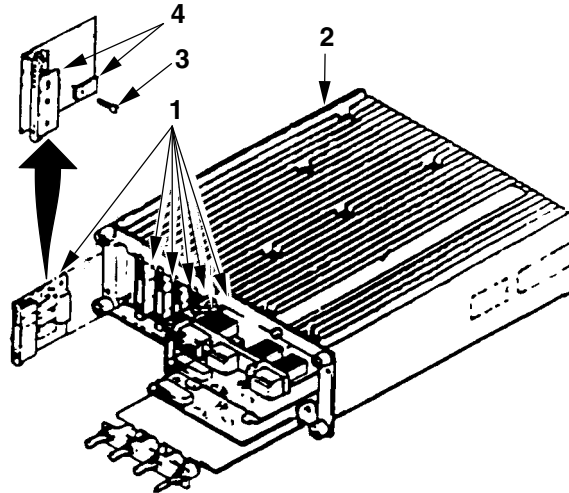
DISASSEMBLY

NOTE

- Disassembly of the MPD shall be accomplished only to the extent necessary to clean, inspect, or repair by replacing inoperative assembly, subassembly, etc., indicated by the maintenance form failure code(s). Failure codes are depicted in Task 8-1-8.
- Steps 1. through 10. may be accomplished out of sequence or may be disregarded when not required by the maintenance action.

1. Remove six analog driver cards (1) from case assembly (2) Using card extractor tool (B194).

2. Remove four screws (3) and disconnect four lamp boards (4) from each analog driver card (1).



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8-1-7. MULTIPARAMETER DISPLAY (MPD) — DISASSEMBLY/ASSEMBLY (CONT)

3. Remove two screws (5) and pull digital driver card (6) from case assembly (2).

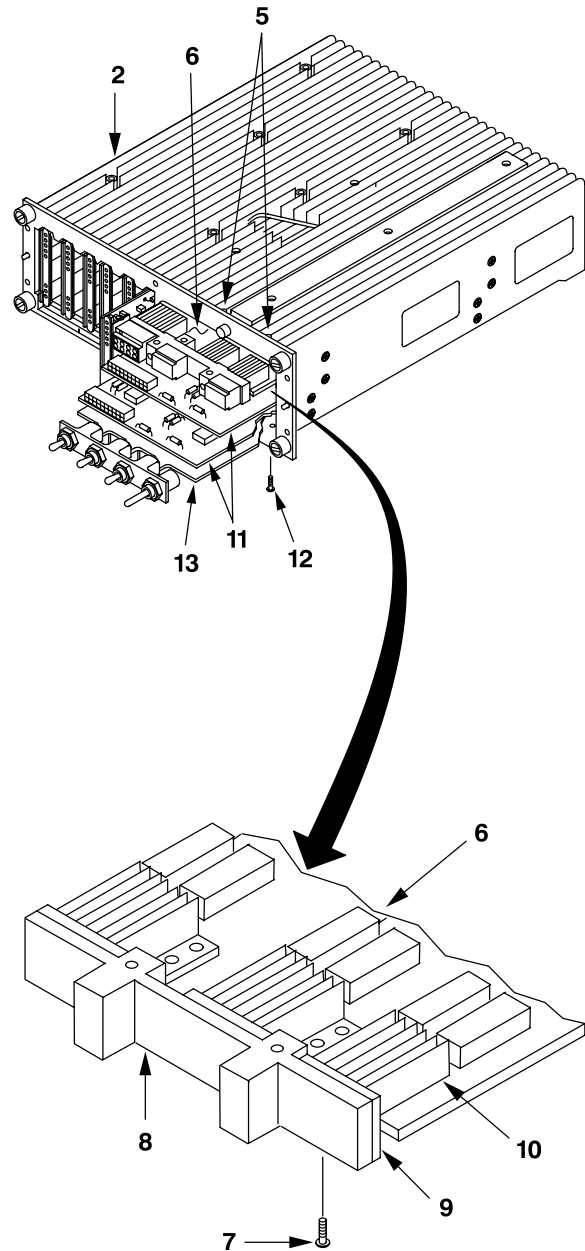
4. Remove four screws (7) securing lamp holder (8).

5. Remove lamp holder (8) and RTV gasket (9) from digital driver card (6).

6. Using soldering iron (B159) desolder lamp board assembly (10) and remove from digital driver card (6).

7. Pull two receiver cards (11) from case assembly (2).

8. Remove three screws (12) and pull processor card (13) from case assembly (2).



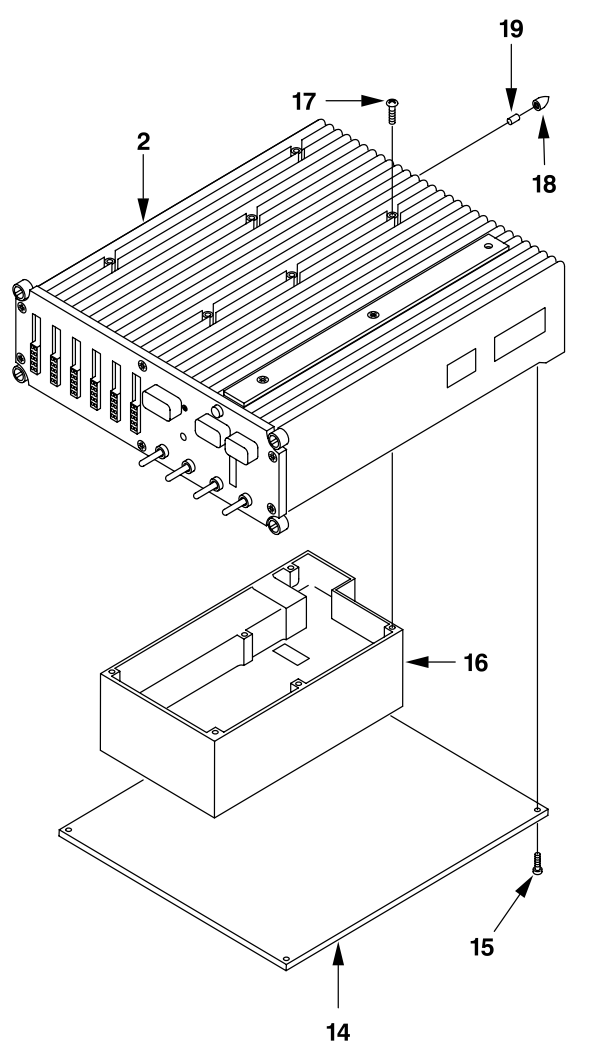
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8-1-7. MULTIPARAMETER DISPLAY (MPD) — DISASSEMBLY/ASSEMBLY (CONT)

9. Remove bottom cover (14) by removing 10 screws (15). Loosen two captive screws and disengage connector from underside of power supply (16). Then remove six screws (17) and remove power supply (16) from case assembly (2).

10. Unscrew four fuseholders (18) and remove four fuses (19).



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8-1-7. MULTIPARAMETER DISPLAY (MPD) — DISASSEMBLY/ASSEMBLY (CONT)

ASSEMBLE

NOTE

Steps 11. through 16. may be performed out of sequence or disregarded if units were not removed.

11. Install four fuses (19) and twist four fuseholders (18) into place at rear of case assembly (2).

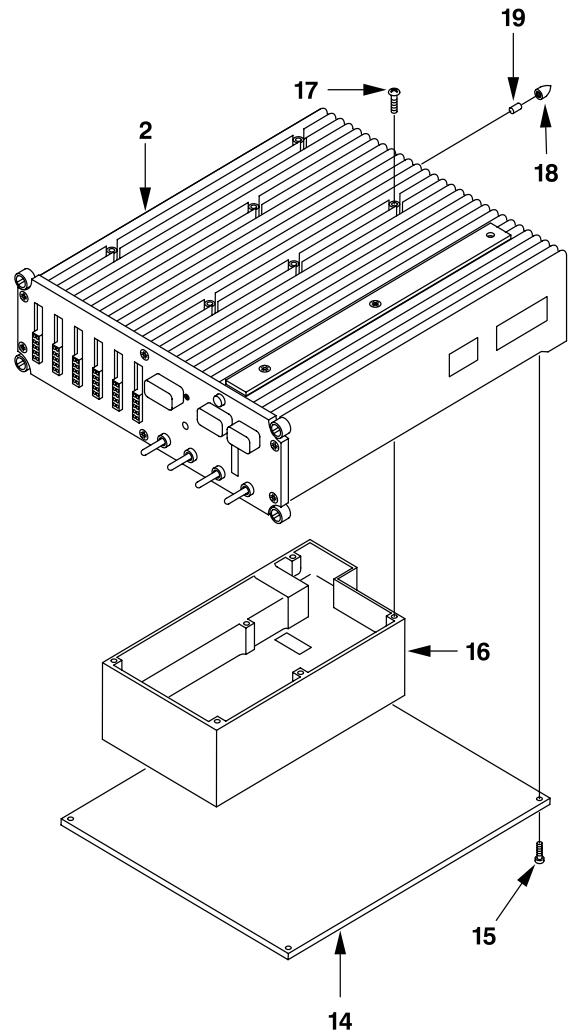
CAUTION

All screws shall be lock-sealed during assembly. Failure to comply with this requirement may result in failure of instruments and possible electrical hazards.

NOTE

Lock-sealing of screws requires soaking screws in quick primer (D163) for at least 1 hour and then dipping in retaining compound (D170) at time of installation.

12. Install power supply (16) in bottom of case assembly (2) with six screws (17). Connect electrical connector on underside of power supply (16). Then install bottom cover (14) using 10 screws (15).



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8-1-7. MULTIPARAMETER DISPLAY (MPD) — DISASSEMBLY/ASSEMBLY (CONT)

CAUTION

All screws shall be lock-sealed during assembly. Failure to comply with this requirement may result in failure of instruments and possible electrical hazards.

NOTE

- Lock-sealing of screws requires soaking of screws in quick primer (D163) for at least 1 hour and then dipping in retaining compound (D170) at time of installation.
- Motherboard and motherboard connectors are located within MPD case assembly. The motherboard interconnects various assemblies of MPD.

13. Press processor card (13) into its motherboard connector and secure with three screws (12) in case assembly (2).

14. Install two receiver cards (11) and press each receiver card into its motherboard connector.

15. On digital driver card (6), install lamp board assembly (10).

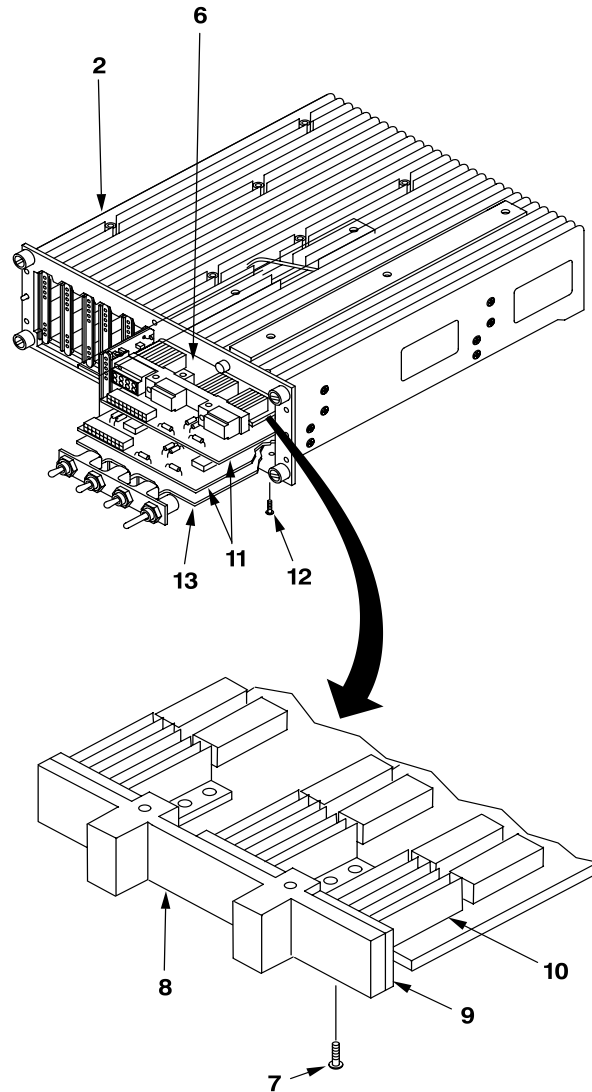
NOTE

When replacing lamp holder, lamps shall not be forced into lamp holder.

16. Install RTV gasket (9) and lamp holder (8).

17. Apply slight pressure to lamp holder (8) against RTV gasket (9) and secure lamp holder (8) to digital driver card (6) with four screws (7).

18. Attach lamp board assembly (10) to digital driver card (6) using soldering iron (B159), flux (D109), and solder (D196).



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8-1-7. MULTIPARAMETER DISPLAY (MPD) — DISASSEMBLY/ASSEMBLY (CONT)

CAUTION

All screws shall be lock-sealed during assembly. Failure to comply with this requirement may result in failure of instruments and possible electrical hazards.

NOTE

Lock-sealing of screws requires soaking screws in quick primer (D163) for at least 1 hour and then dipping in retaining compound (D170) at time of installation.

19. Press digital driver card (6) into its motherboard connector and secure with two screws (5).

NOTE

The upper end of analog scale utilizes two three-lamp boards and the lower end utilizes two five-lamp boards.

20. Connect four lamp boards (4) to each of the six analog driver cards (1) and install four screws (3).

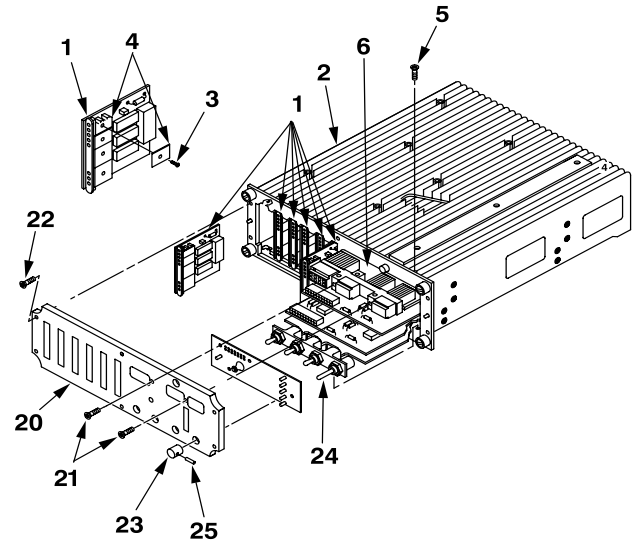
21. Install six analog driver cards (1), pressing each into its motherboard connector in case assembly (2).

22. Align front panel (20) with its mounting holes in case assembly (2) and install two long screws (21) and six short screws (22).

CAUTION

To prevent damage to front panel (20) or BRT control knob (23) when installing screws (21, 22, and 25), delicate feel shall be used while tightening.

23. Install BRT control knob (23) on its shaft (24) and tighten two locking setscrews (25).



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J2753

END OF TASK

8-1-8. MULTIPARAMETER DISPLAY (MPD) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Material:
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)
Cleaning Compound Soap (D192)

Black Paint (D97)
Isopropyl Alcohol (D39)
Stencil Marking Ink (D122)
Acid Swabbing Brush (D51)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68F Aircraft Electrician

References:
TM 1-1500-204-23

CLEAN



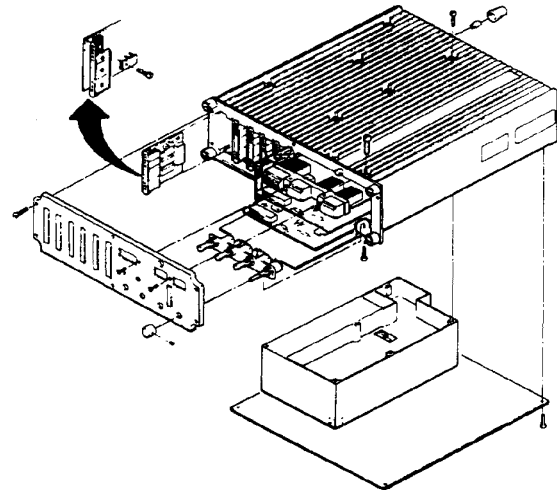
Compressed Air

CAUTION

Compressed air (25 psi maximum) at the nozzle shall be held no closer than **6 inches** to item being cleaned. Failure to comply with this requirement may result in damage to MPD.

1. Remove dust, dirt, and other foreign matter from components, wiring, and surface areas of subassemblies and assemblies using acid swabbing brush (D51) and clean, dry, compressed air.

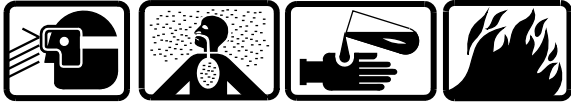
2. Remove ground-in and caked-on dirt from components, subassemblies and assemblies using acid swabbing brush (D51) and soap (D192) mixed with water (mix 2 ounces of soap per gallon of water).



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8-1-8. MULTIPARAMETER DISPLAY (MPD) — CLEANING/INSPECTION/REPAIR (CONT)



Isopropyl Alcohol

CAUTION

Alcohol shall NOT be used to clean front panel or resistors with color-code value bands. Failure to comply with this requirement may cause markings and codes to be obliterated.

3. Remove grease and film from components, subassemblies, and assemblies using low-lint cleaning cloth (D67) moistened with isopropyl alcohol (D39) (TM 1-1500-204-23).

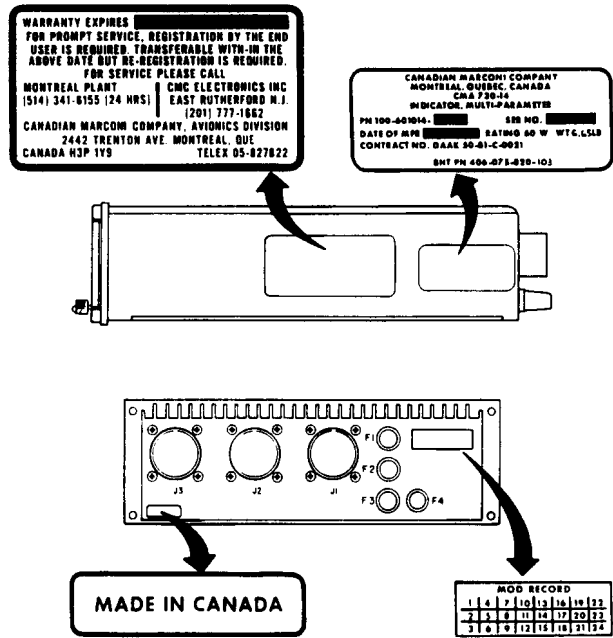
4. Dry all components, subassemblies, and assemblies with clean, dry, compressed air after cleaning with soap and water solution or isopropyl alcohol (D39).

INSPECT

5. Ensure stenciled markings (reference designators) on rear of case assembly are properly located and legible.

6. Check electrical connectors on rear of case assembly for bent or broken pins, bent shells, and broken or missing hardware.

7. Check assemblies and subassemblies for loose or missing hardware; for signs of discoloration and blistering that would indicate overheating or arcing; for broken wiring and component leads; and for scratches, dents, and broken components.



MULTIPARAMETER DISPLAY (MPD)

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8-1-8. MULTIPARAMETER DISPLAY (MPD) — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR



Acrylic Lacquer

8. Repair painted surfaces using black lusterless enamel (D97) to touch up scratches and scraped areas.

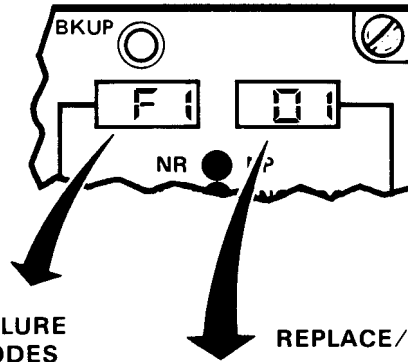
9. Repair reference designator markings using white stencil ink (D122). Make letters and numerals **0.09 inch** high.

NOTE

Failure codes entered on equipment tag are from display on MPD indicator.

10. Repair of all other components, assemblies, subassemblies, and attaching hardware is accomplished by replacement per failure code(s) on equipment tag.

INSPECT



FAILURE CODES	REPLACE/REPAIR
F1	01 PROCESSOR
F1	02 PROCESSOR
F1	03 PROCESSOR
F1	04 PROCESSOR
F1	05 PROCESSOR
F1	06 RECEIVER (LOWER)
F1	07 RECEIVER (LOWER)
F1	08 RECEIVER (UPPER)
F1	09 RECEIVER (UPPER)
F1	10 DIGIT DRIVER
F1	11 DIGIT DRIVER
F1	12 FUSE(S) REAR (4)*
—	— ANALOG DRIVER (6)*
—	— FRONT PANEL*
—	— CASE ASSEMBLY*
—	— VERTICAL INDICATOR LAMP*
—	— DIGITAL DISPLAY LAMP*

*AS REQUIRED

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H1712

8-1-10. TGT/TRQ INDICATOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

References:
TM 1-1520-248-T

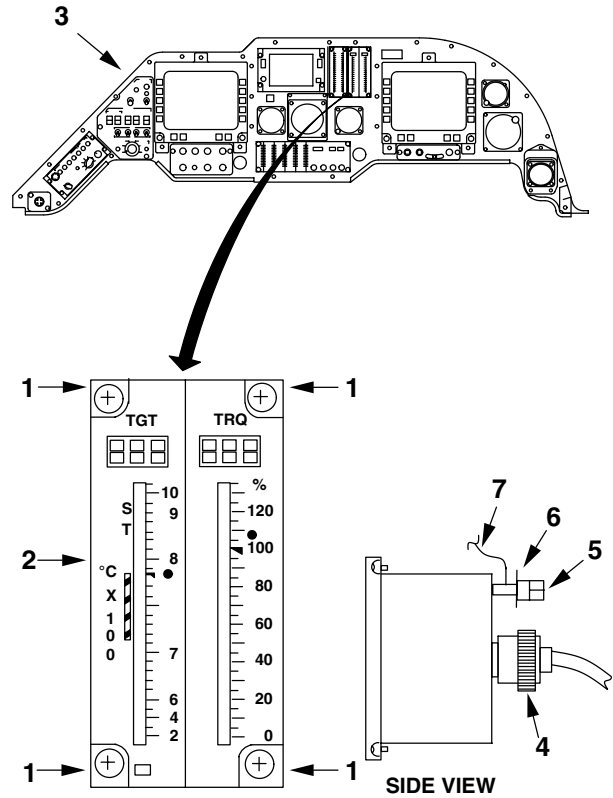
Equipment Condition:
Helicopter Safed (Task 1-6-7)

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8-1-10. TGT/TRQ INDICATOR — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Gain access to instrument panel through either crew door.
2. Remove four screws (1) from indicator (2).
3. Pull indicator (2) out of instrument panel (3) as far as electrical cable allows.
4. Disconnect electrical connector (4).
5. Remove nut (5) and washer (6). Disconnect bonding strip (7) from stud on indicator.
6. Remove indicator (2).



INSTALL

7. Clean and visually inspect mating surfaces for damage which may affect Class S electrical bond.
8. Repair any damage and prepare mating surfaces for Class S electrical bond per Appendix M.
9. Prepare TGT/TRQ indicator (2) for electrical bonding per Appendix M.
10. Connect bonding strip (7) to stud on indicator. Install washer (6) and nut (5).
11. Connect electrical connector (4) to TGT/TRQ indicator (2).
12. Place indicator (2) in its mount and align mounting holes.
13. Install four screws (1).

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INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check (TM 1-1520-248-T).

Perform power assurance check (Chapter 1, Section IX).

END OF TASK

8-1-11. TGT/TRQ INDICATOR — DISASSEMBLY/ASSEMBLY

This task covers: Disassembly and Assembly (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)
Card Extractor Tool (B194)
Soldering Iron (B159)

Material:
Flux (D109)
Quick Primer (D163)
Retaining Compound (D170)
Sealing/Locking Compound (D186)
Solder (D196)

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

References:
TM 1-1520-248-T

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8-1-11. TGT/TRQ INDICATOR — DISASSEMBLY/ASSEMBLY (CONT)

DISASSEMBLE

NOTE

Disassembly shall be accomplished only to the extent necessary to clean, inspect, and repair by replacing inoperative assembly, subassembly, etc., indicated by the attached maintenance form failure code(s). Failure codes are depicted in TM 1-1520-248-T.

1. Remove front panel (1) by removing four bushings (2) and screw (3).

NOTE

Steps 2. through 7. may be accomplished out of sequence or may be disregarded when not required by the maintenance action.

2. Using card extractor tool (B194), pull two receiver cards (4) from case assembly (5). Remove six screws (6) and unplug six lamp boards (7).

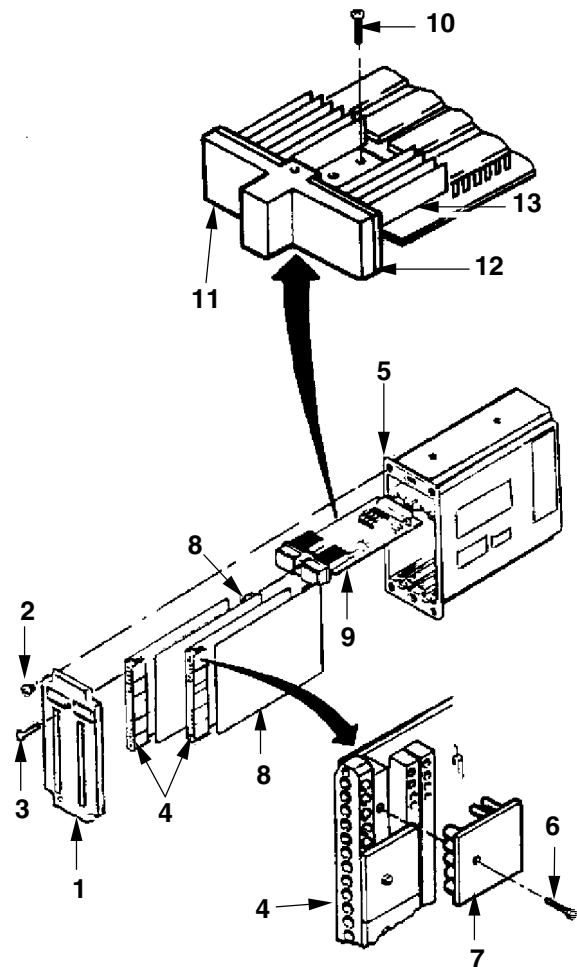
3. Pull two lamp driver cards (8) from case assembly (5).

4. Pull digital driver card (9) from case assembly (5).

5. Remove two screws (10) securing lamp holder (11).

6. Remove lamp holder (11) and RTV gasket (12) from digital driver card (9).

7. Using soldering iron (B159), desolder lamp board assembly (13) and remove from digital driver card (9).



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8-1-11. TGT/TRQ INDICATOR — DISASSEMBLY/ASSEMBLY (CONT)

ASSEMBLE

NOTE

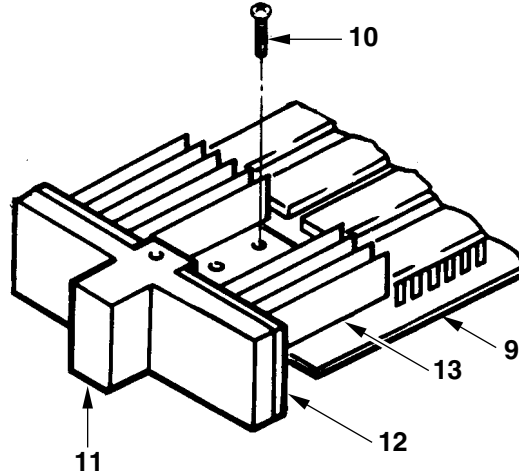
Steps 8. through 16. may be accomplished out of sequence or may be disregarded when not required by maintenance action.

8. On digital driver card (9) install lamp board assembly (13).

NOTE

When replacing lamp holder, lamps shall not be forced into lamp holder.

9. Install RTV gasket (12) and lamp holder (11).

**CAUTION**

All screws shall be lock-sealed during assembly. Failure to comply with this requirement may result in failure of flight instruments and possible electrical hazards.

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NOTE

Lock-sealing of screws requires soaking screws in quick primer (D163) for at least 1 hour and then dipping in retaining compound (D170) at time of installation.

10. Apply slight pressure to lamp holder (11) against gasket (12) and secure lamp holder (11) to digital driver card (9) with two screws (10).

11. Attach lamp board assembly (13) to digital driver card (9) using soldering iron (B159), flux (D109), and solder (D196).

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8-1-11. TGT/TRQ INDICATOR — DISASSEMBLY/ASSEMBLY (CONT)

NOTE

Motherboard and motherboard connectors are located within case assembly. The motherboard interconnects TGT/TRQ indicator and various assemblies of MPD.

12. Install digital driver card (9) and press into its motherboard connector in case assembly (5).

13. Install two lamp driver cards (8) and press each into its motherboard connectors in case assembly (5).

NOTE

The upper end of analog scale utilizes two three-lamp boards and the lower end utilizes two five-lamp boards.

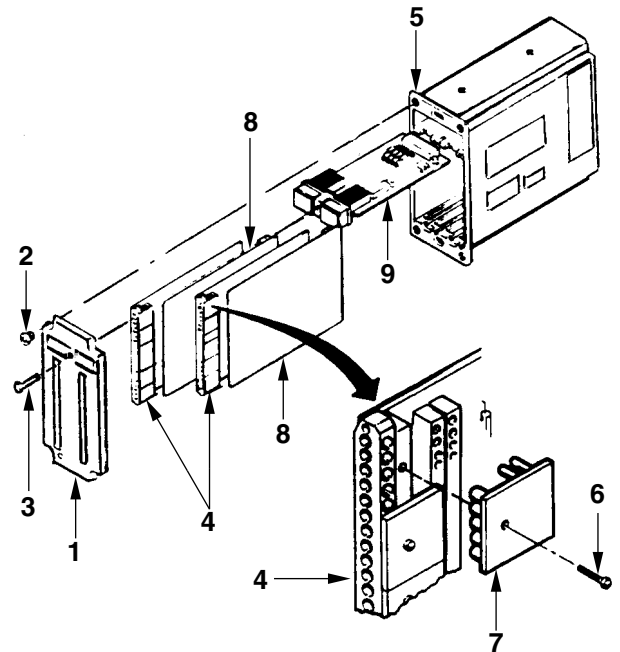
14. Connect six lamp boards (7) to each of two receiver cards (4) and install six screws (6); then install two cards (4), pressing each into its motherboard connector in case assembly (5).

15. Apply light coat of sealing/locking compound (D186) to surface of bushings.

CAUTION

To prevent damage to front panel (1), a delicate feel shall be used when installing screw (3) and bushings (2).

16. Place front panel (1) in its mounting position and install screw (3) and four bushings (2).

INSPECT

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H1712

END OF TASK

8-1-12. TGT/TRQ LAMPS — REPLACEMENT

This task covers: Remove and Replace (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Card Extractor Tool (B194)
Electrical Repairer Tool Kit (B177)
Soldering Iron (B159)

Material:
Sealing/Locking Compound (D186)
Flux (D109)
Solder (D196)

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

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 8-1-12. TGT/TRQ LAMPS — REPLACEMENT (CONT)

REMOVE

1. Remove front panel (1) by removing four bushings (2) and screw (3).
2. Using card extractor tool (B194), pull digital driver card (4) from case assembly (5).
3. Using soldering iron (B159), desolder lamps (6) from lamp holder (7), and discard lamps.

REPLACE

4. Install new lamps (6) to lamp holder (7) using soldering iron (B159), flux (D109), and solder (D196).

NOTE

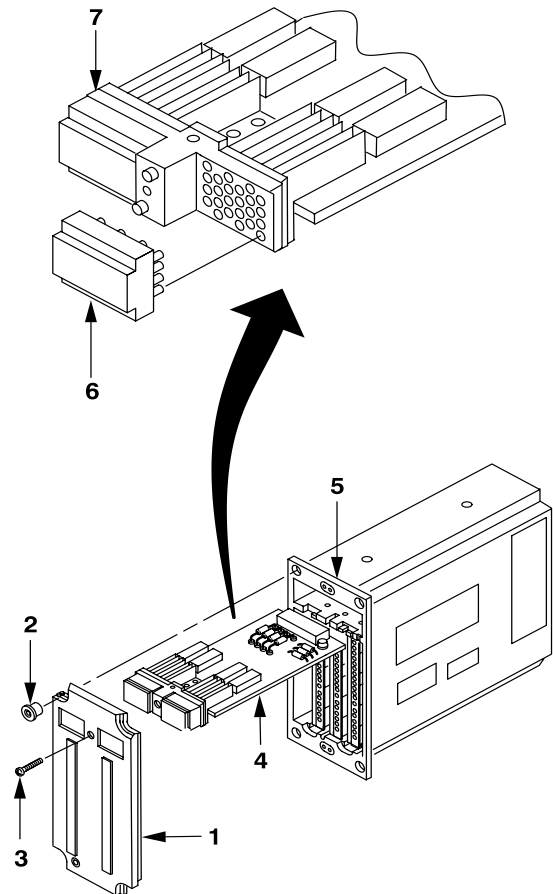
When replacing lamps, lamps shall not be forced into lamp holder.

5. Apply light coat of sealing/locking compound (D186) to surface of bushings.

CAUTION

To prevent damage to front panel (1), a delicate feel shall be used when installing screw (3) and bushings (2).

6. Place front panel (1) in its mounting position and install screw (3) and four bushings (2).

INSPECT

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J2185

END OF TASK

8-1-13. TGT/TRQ INDICATOR — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

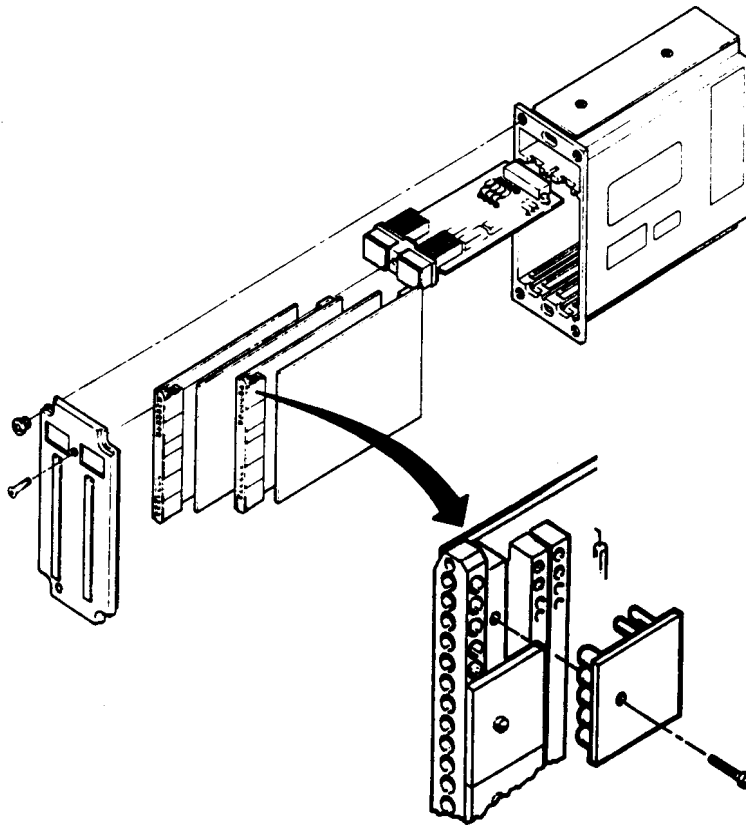
Tools:
Electrical Repairer Tool Kit (B177)

Material:
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)
Cleaning Compound Soap (D192)

Black Paint (D97)
Isopropyl Alcohol (D39)
Stencil Marking Ink (D122)
Acid Swabbing Brush (D51)

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

References:
TM 1-1500-204-23



TGT/TRQ INDICATOR — EXPLODED VIEW

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8-1-13. TGT/TRQ INDICATOR — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



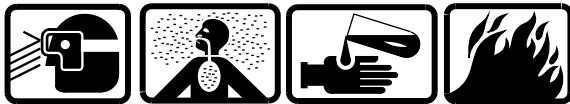
Compressed Air

CAUTION

Compressed air (25 psi maximum) at the nozzle shall be held no closer than **6 inches** to item being cleaned. Failure to comply with this requirement may result in damage to TGT/TRQ indicator.

1. Remove dust, dirt, and other foreign matter from components wiring, and surface areas of subassemblies, assemblies, etc., using acid swabbing brush (D51) and clean, dry, compressed air.

2. Remove ground-in and caked-on dirt from components, subassemblies, and assemblies using acid swabbing brush (D51) and soap (D192) mixed with water (mix 2 ounces of soap per gallon of water).



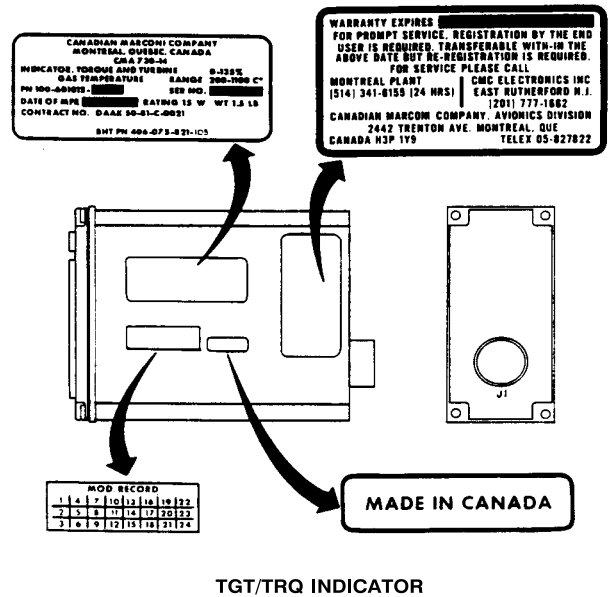
Isopropyl Alcohol

CAUTION

Alcohol shall NOT be used to clean front panel or resistors with color-code value bands. Failure to comply with this requirement may cause markings and codes to be obliterated.

3. Remove grease and film from components, subassemblies, and assemblies using low-lint cleaning cloth (D67) moistened with isopropyl alcohol (D39) (TM 1-1500-204-23).

4. Dry all components, subassemblies, and assemblies with clean, dry, compressed air after



TGT/TRQ INDICATOR

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J0435

cleaning with soap and water solution or isopropyl alcohol (D39).

INSPECT

5. Ensure stenciled marking (reference designator) on rear of case assembly is properly located and legible.

6. Check electrical connector for bent or broken pins, bent shells, and broken or missing hardware.

7. Check assemblies and subassemblies for loose or missing hardware; for signs of discoloration and blistering that would indicate overheating or arcing; for broken wiring and component leads; and for scratches, dents, and broken components.

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8-1-13. TGT/TRQ INDICATOR — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR

8. Repair painted surfaces using black lusterless enamel (D97) to touch up scratches and scraped areas.

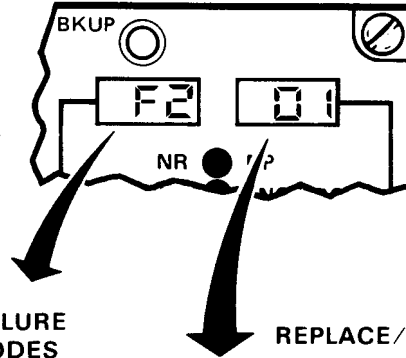
9. Repair reference designator marking using white stencil ink (D122). Make letter and numeral **0.09 inch** high.

NOTE

Failure codes entered on equipment tag are from display on MPD indicator.

10. Repair of all other components, subassemblies, assemblies, and attaching hardware is accomplished by replacement per failure code(s) on equipment tag.

INSPECT



FAILURE CODES	REPLACE/REPAIR
F2	01 RECEIVERS TGT/TRQ
F2	02 RECEIVER TGT
F2	03 RECEIVER TRQ
F2	04 DIGIT DRIVER AND BOTH LAMP DRIVERS
F2	05 INDICATOR NOT CONNECTED
F2	06 RECEIVER (LEFT)
F2	07 RECEIVER (RIGHT)
—	— FRONT PANEL*
—	— CASE ASSEMBLY*
—	— VERTICAL INDICATOR LAMP*
—	— DIGITAL DISPLAY LAMP*

*AS REQUIRED

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H1712

END OF TASK

8-1-14. DUAL TACHOMETER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

References:
TM 1-1520-248-T

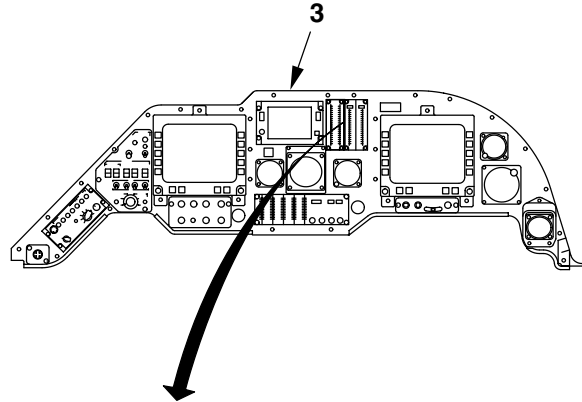
Equipment Condition:
Helicopter Safed (Task 1-6-7)

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8-1-14. DUAL TACHOMETER — REMOVAL/INSTALLATION (CONT)

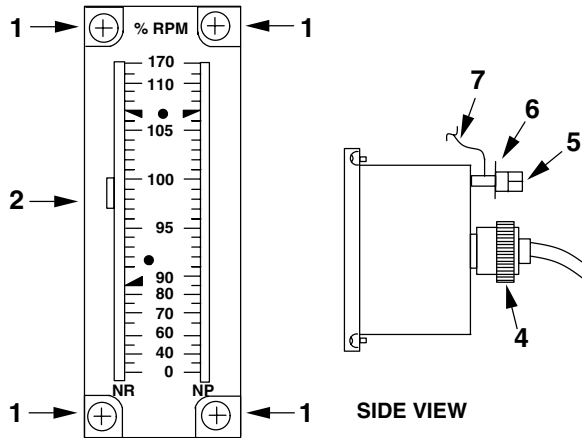
REMOVE

1. Gain access to instrument panel through either crew door.
2. Remove four screws (1) from dual tachometer (2).
3. Pull dual tachometer (2) from instrument panel (3) as far as cable allows.
4. Disconnect electrical connector (4).
5. Remove one nut (5) and one washer (6). Disconnect bonding strip (7) from stud on indicator.
6. Remove dual tachometer (2).



INSTALL

7. Gain access to instrument panel (3) through either crew door.
8. Prepare dual tachometer (2) for Class S electrical bonding per Appendix M.
9. Connect bonding strip (7) to stud on indicator. Install one washer (6) and one nut (5) on stud.
10. Connect electrical connector (4) to dual tachometer (2).
11. Place dual tachometer (2) in its mount and align mounting holes.
12. Install four screws (1).



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J0438

INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check (TM 1-1520-248-T).

END OF TASK

8-1-15. DUAL TACHOMETER — DISASSEMBLY/ASSEMBLY

This task covers: Disassembly and Assembly (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)
Card Extractor Tool (B194)

Material:
Quick Primer (D163)
Retaining Compound (D170)
Sealing/Locking Compound (D186)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68F Aircraft Electrician

References:
TM 1-1520-248-T

DISASSEMBLE

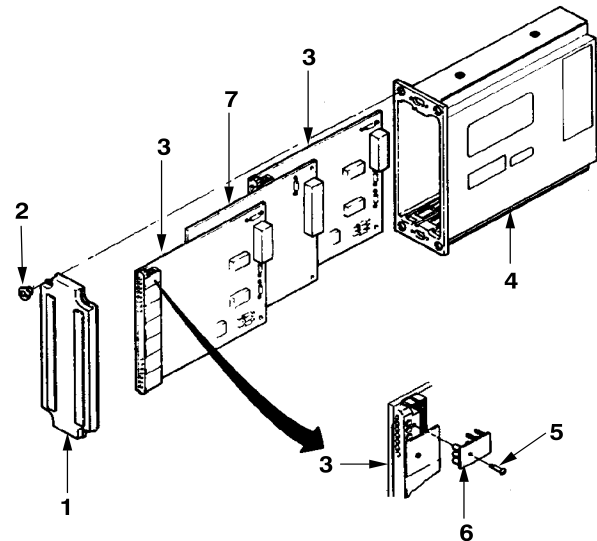
NOTE

- Disassembly of dual tachometer shall be accomplished only to the extent necessary to clean, inspect, or repair by replacing inoperative assembly, subassembly, etc., indicated by the attached maintenance form failure code(s). Failure codes are depicted in TM 1-1520-248-T.
- Steps 2. and 3. may be accomplished out of sequence or may be disregarded when not required by the maintenance action.

1. Remove front panel (1) by removing four bushings (2).

2. Using card extractor tool (B194), pull two lamp driver cards (3) from case assembly (4). Remove seven screws (5) and disconnect lamp boards (6).

3. Pull out receiver card (7) from case assembly (4).



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J0438

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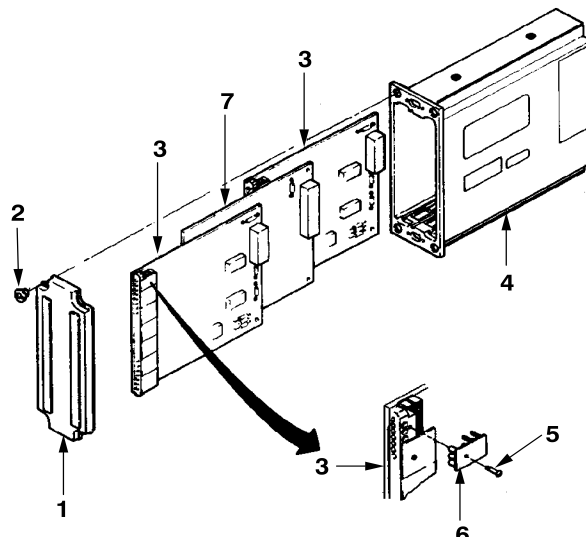
8-1-15. DUAL TACHOMETER — DISASSEMBLY/ASSEMBLY (CONT)

ASSEMBLE

NOTE

- Steps 4. and 5. may be accomplished out of sequence or disregarded when not required by maintenance action.
- Motherboard and motherboard connectors are located within case assembly. The motherboard interconnects various assemblies of MPD.

4. Install receiver card (7) and press into its motherboard connector in case assembly (4).



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J0438

CAUTION

All screws shall be lock-sealed during assembly. Failure to comply with this requirement may result in failure of instruments and possible electrical hazards.

NOTE

- Lock-sealing of screws requires soaking screws in quick primer (D163) for at least 1 hour and then dipping in retaining compound (D170) at time of installation.
- The upper end of analog scale utilizes one three-lamp board followed by six five-lamp boards.

5. Connect seven lamp boards (6) to each of two lamp driver cards (3) and install seven screws (5).

6. Press two lamp driver cards (3) into their motherboard connector in case assembly (4).

7. Apply light coat of sealing/locking compound (D186) to surface of bushing.

8. Place front panel (1) in its mounting position on case assembly (4) and install four bushings (2).

INSPECT

CAUTION

To prevent damage to front panel (1), a delicate feel shall be used when installing bushings (2).

END OF TASK

8-1-16. DUAL TACHOMETER LAMPS — REPLACEMENT

This task covers: Replacement of Lamps (Off Helicopter)

INITIAL SETUP

Material:
Sealing/Locking Compound (D186)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68F Aircraft Electrician

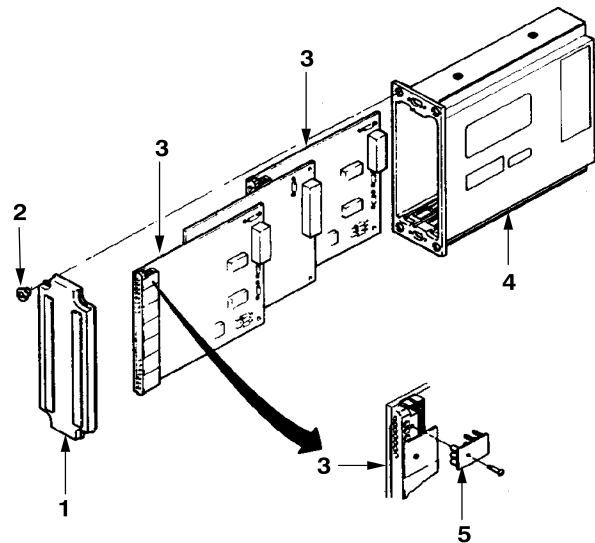
Tools:
Electrical Repairer Tool Kit (B177)
Card Extractor Tool (B194)

REMOVAL

1. Remove front panel (1) by removing four bushings (2).
2. Using card extractor tool (B194), pull two lamp driver cards (3) from case assembly (4).
3. Remove lamps (5) from lamp driver cards (3).

INSTALL

4. Install new lamps (5) in lamp driver cards (3).
5. Press two lamp driver cards (3) into their motherboard connector in case assembly (4).
6. Apply light coat of sealing/locking compound (D186) to surface of bushing (2).

**CAUTION**

To prevent damage to front panel (1), a delicate feel shall be used when installing bushings (2).

7. Place front panel (1) in its mounting position on case assembly (4) and install four bushings (2).

INSPECT

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END OF TASK

8-1-17. DUAL TACHOMETER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

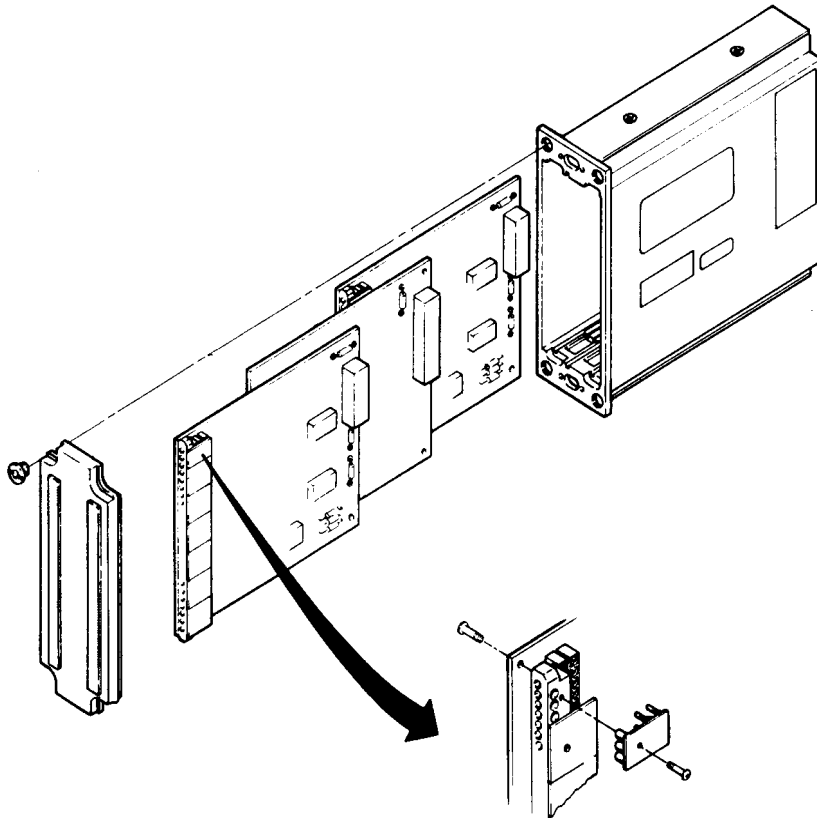
Tools:
Electrical Repairer Tool Kit (B177)

Material:
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)
Cleaning Compound Soap (D192)

Black Paint (D97)
Isopropyl Alcohol (D39)
Stencil Marking Ink (D122)
Acid Swabbing Brush (D51)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68F Aircraft Electrician

References:
TM 1-1500-204-23

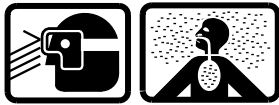


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8-1-17. DUAL TACHOMETER — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Compressed Air

CAUTION

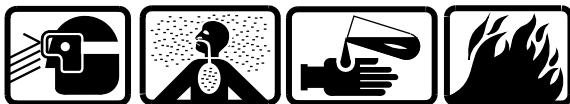
Compressed air (25 psi maximum) and the nozzle shall be held no closer than **6 inches** to item being cleaned. Failure to comply with this requirement may result in damage to dual tachometer.

1. Remove dust, dirt, and other foreign matter from components, wiring, and surface areas of assemblies and subassemblies, using acid swabbing brush (D51) and clean, dry, compressed air.



Cleaning Compound

2. Remove ground-in and caked-on dirt from components, assemblies, and subassemblies using acid swabbing brush (D51) and soap (D192) mixed with water, (mix 2 ounces of soap per gallon of water).

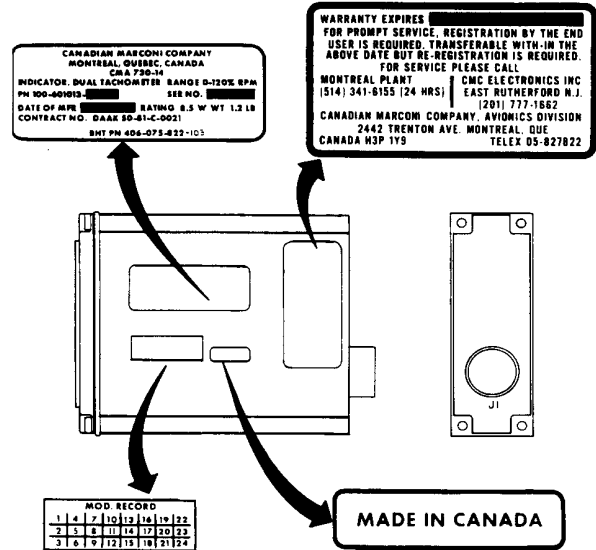


Isopropyl Alcohol

CAUTION

Alcohol shall NOT be used to clean front panel or resistors with color-code value bands. Failure to comply with this requirement may cause markings and codes to be obliterated.

3. Remove grease and film from components, assemblies, and subassemblies using low-lint cleaning cloth (D67) moistened with isopropyl alcohol (D39) (TM 1-1500-204-23).



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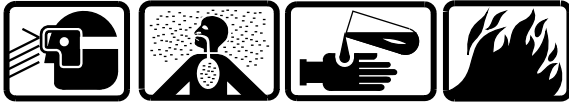
4. Dry all components, subassemblies, and assemblies with clean, dry, compressed air after cleaning with soap and water solution or isopropyl alcohol (D39).

INSPECT

5. Ensure stenciled marking (reference designator) on rear of case assembly is properly located and legible.
6. Check electrical connector for bent or broken pins, bent shell, and broken or missing hardware.
7. Check assemblies and subassemblies for loose or missing hardware; for signs of discoloration and blistering that would indicate overheating or arcing; for broken wiring and component leads; and for scratches, dents, and broken components.

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8-1-17. DUAL TACHOMETER — CLEANING/INSPECTION/REPAIR (CONT)



Acrylic Lacquer

REPAIR

8. Repair painted surfaces using black lusterless enamel (D97) to touch up scratches and scraped areas.

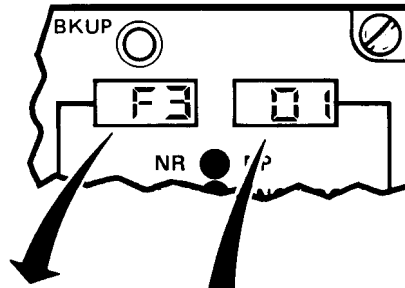
9. Repair reference designator marking using white stencil ink (D122). Make letter and numeral **0.09 inch** high.

NOTE

Failure codes entered on equipment tag are from display on MPD indicator.

10. Repair of all other components, subassemblies, assemblies, and attaching hardware is accomplished by replacement per failure code(s) on equipment tag.

INSPECT



FAILURE CODES

REPLACE/REPAIR

F3	01	POWER FAIL
F3	02	RECEIVER
F3	03	LAMP DRIVER (LEFT OR RIGHT)
F3	04	RECEIVER
F3	05	NOT CONNECTED
—	—	FRONT PANEL*
—	—	CASE ASSEMBLY*
—	—	VERTICAL INDICATOR LAMP*

*AS REQUIRED

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H1712

END OF TASK

8-1-18. INSTRUMENT PANEL GLARESHIELD — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

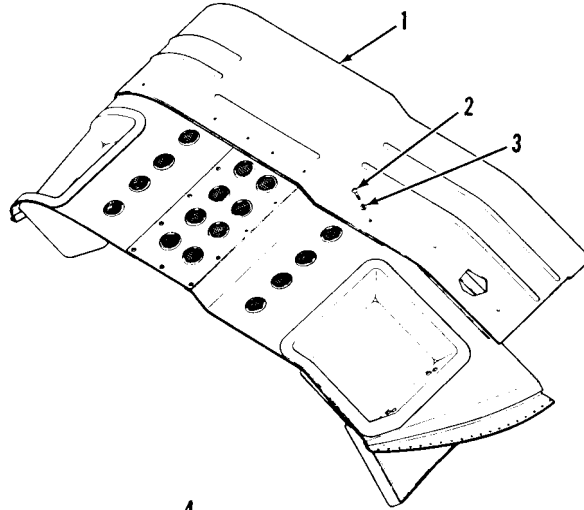
Equipment Condition:
Helicopter Safed (Task 1-6-7)

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8-1-18. INSTRUMENT PANEL GLARESHIELD — REMOVAL/INSTALLATION (CONT)

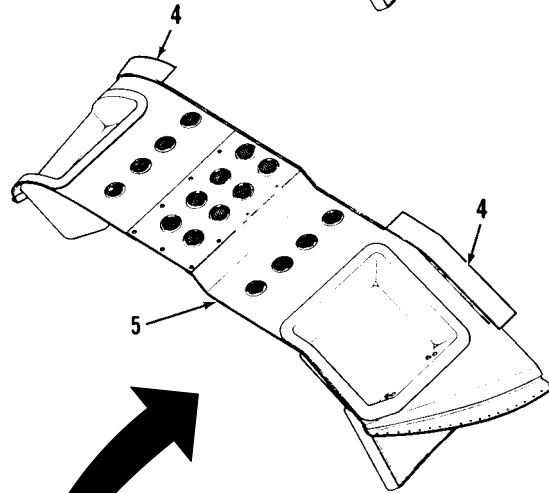
REMOVE

1. Open right or left crew door to gain access to instrument panel glareshield (1).
2. Remove nine screws (2) and washers (3) from top of glareshield (1).
3. Carefully pull glareshield aft from shroud.
4. Remove glareshield from helicopter.



INSTALL

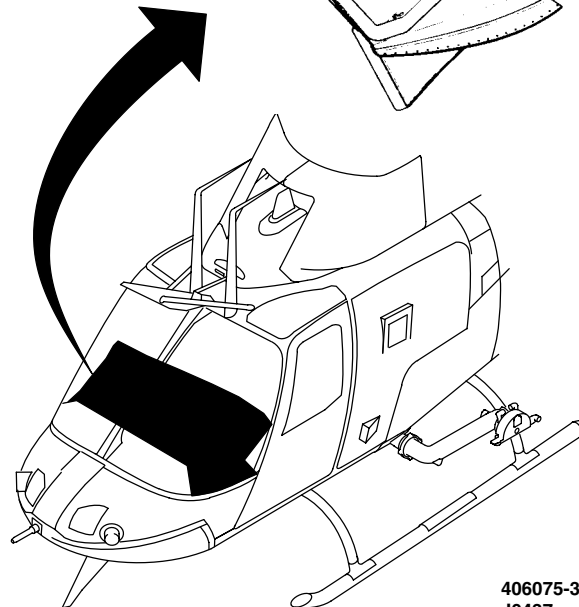
5. Carefully position glareshield (1) onto guides (4) of shroud (5).
6. Secure glareshield (1) by installing nine washers (3) and screws (2) into top of glareshield (1).



INSPECT

FOLLOW-ON MAINTENANCE

Close right or left crew door.



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END OF TASK

8-1-19. INSTRUMENT PANEL GLARESHIELD — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Rubber Gloves (D111)
 Sandpaper (D175)
 Wiping Rag (D164)
 Black Epoxy Enamel (D97)

Applicable Configurations:
 All

Tools:
 Airframe Repairer Tool Kit (B176)
 General Mechanic Tool Kit (B178)

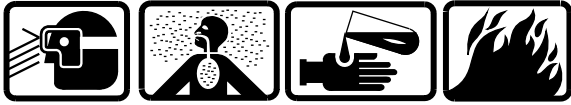
Personnel Required:
 67S Scout Helicopter Technical Inspector (TI) ■
 67S Scout Helicopter Repairer
 68G Aircraft Structural Repairer

Material:
 Low-Lint Cleaning Cloth (D67)
 Drycleaning Solvent (D199)

References:
 TM 1-1500-204-23

8-1-19. INSTRUMENT PANEL GLARESHIELD — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

1. Remove grease, fungus, and dirt with a clean, low-lint cleaning cloth (D67) dampened with drycleaning solvent (D199).

2. Remove moisture, dust, and loose dirt with a wiping rag (D164).

INSPECT

3. Inspect plastic for scratches, cracks, and tears.

REPAIR

4. Repair scratches, cracks, and tears in plastic in accordance with instructions in TM 1-1500-204-23.

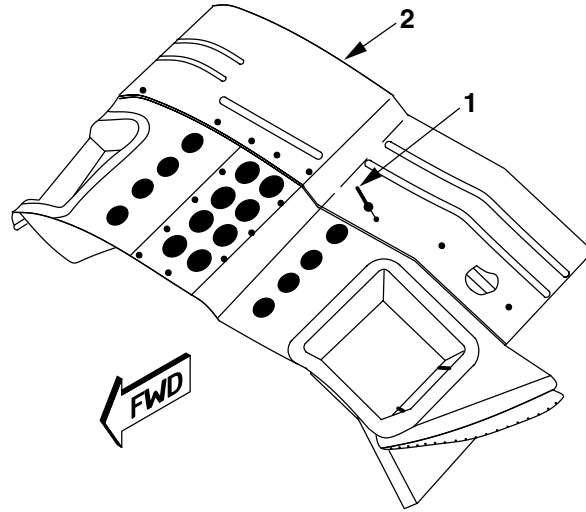
5. Remove minor scratches with 400 grit sandpaper (D175).

6. Touch up sandpapered area with black epoxy enamel (D97).

7. Tighten loose mounting screws (1).

8. Replace glareshield (2) if defective.

INSPECT



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END OF TASK

Section II. FLIGHT INSTRUMENTS

8-5. FLIGHT INSTRUMENTS

Standard torques are provided in Appendix P and TM 1-1500-204-23.

8-6. INTRODUCTION

This section contains: maintenance procedures for cleaning, inspection, removal, installation, and follow-on maintenance of flight instruments.

8-7. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Standby Altimeter — Cleaning/Inspection/Repair	8-2-1	8-46
Standby Altimeter — Removal/Installation	8-2-2	8-48
Standby Attitude Indicator — Cleaning/Inspection/Repair	8-2-3	8-50
Standby Attitude Indicator — Removal/Installation	8-2-4	8-52
Standby Airspeed Indicator — Cleaning/Inspection/Repair	8-2-5	8-54
Standby Airspeed Indicator — Removal/Installation	8-2-6	8-55
Deleted	8-2-7	8-57

8-2-1. STANDBY ALTIMETER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Material:
Drycleaning Solvent (D199)
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)

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

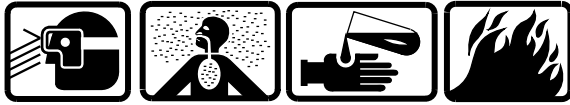
References:
TM 1-1520-248-T
TM 1-1520-248-10

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-2-1. STANDBY ALTIMETER — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN

**Drycleaning Solvent**

1. Clean face of indicator with drycleaning solvent (D199).

2. Dry face of indicator with a dry, low-lint cleaning cloth (D67).

INSPECT

3. Inspect for loose, cracked, or broken BARO PRESS/SET control and face cover.

4. Inspect pitot-static lines and connections for security and damage (Task 8-3-1).

5. Inspect electrical connector for damage and security.

6. Inspect for proper and secure mounting.

7. Inspect all markings and decals for completeness and legibility (TM 1-1520-248-10).

REPAIR

8. Secure in mount (Task 8-2-2).

9. Repair pitot-static lines as needed (Task 8-3-1).

10. Repair electrical connector and wiring as needed.

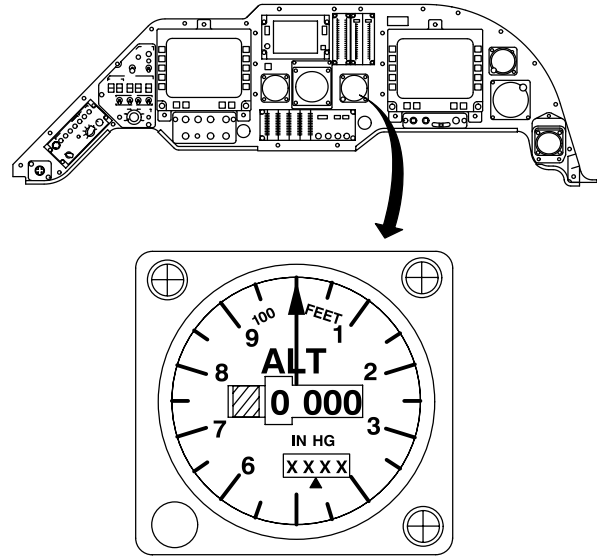
11. Replace altimeter if face cover or control knob is broken.

INSPECT

FOLLOW-ON MAINTENANCE

Perform pitot-static and air data system operational check (TM 1-1520-248-T).

Perform standby altimeter operational check (TM 1-1520-248-T).



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END OF TASK

8-2-2. STANDBY ALTIMETER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

References:
TM 1-1520-248-T

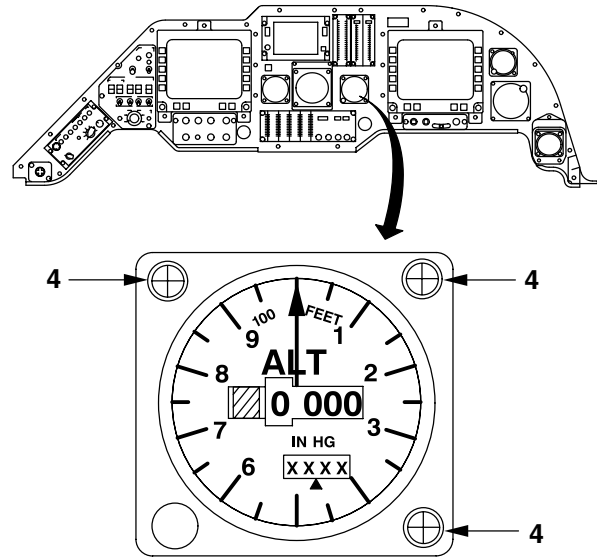
Equipment Condition:
Helicopter Safed (Task 1-6-7)
MPD Removed (Task 8-1-4)

GO TO NEXT PAGE

8-2-2. STANDBY ALTIMETER — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Gain access to instrument panel by opening pilot crew door.
2. Access rear of altimeter through MPD mount and remove static line nut (1) at rear of altimeter (2).
3. Disconnect electrical connector (3).
4. Remove three screws (4) and altimeter (2).
5. Remove reducer (5) and discard packing (6).

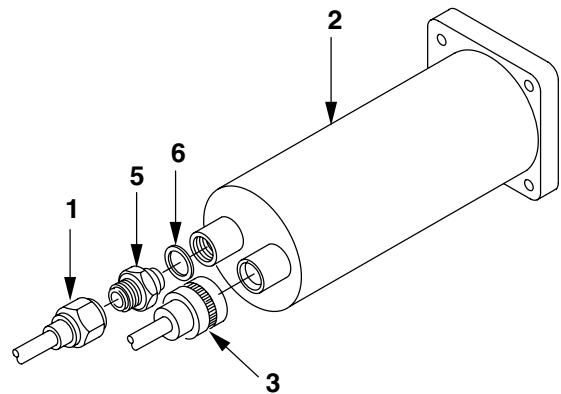


INSTALL

NOTE

A check shall be made for conditions which may affect resistance of electrical bond (dirt, grease, paint, corrosion).

6. Clean and visually inspect mating surfaces for damage which may affect Class S electrical bond.
7. Repair any damage and prepare mating surfaces for Class S electrical bond per Appendix M.
8. Prepare altimeter (2) and mount for electrical bonding per Appendix M.
9. Insert new packing (6) on reducer (5).
10. Install reducer (5) in altimeter (2).
11. Connect static line nut (1) and electrical connector (3).
12. Position altimeter (2) into its mount align mounting holes and install three screws (4).



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INSPECT

FOLLOW-ON MAINTENANCE

Install MPD (Task 8-1-4).

Perform standby altimeter operational check (TM 1-1520-248-T).

Perform pitot-static and air data system operational check (TM 1-1520-248-T).

END OF TASK

8-2-3. STANDBY ATTITUDE INDICATOR — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Material:
Drycleaning Solvent (D199)
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)

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

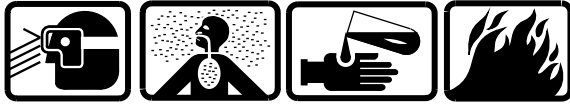
References:
TM 1-1520-248-T
TM 1-1520-248-10

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-2-3. STANDBY ATTITUDE INDICATOR — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN

**Drycleaning Solvent**

1. Clean face of indicator with drycleaning solvent (D199).
2. Dry face of indicator with a dry, low-lint cleaning cloth (D67).

INSPECT

3. Inspect for loose, cracked, or broken PULL TO CAGE control and face cover.
4. Inspect electrical connector and wiring for damage and security.
5. Inspect for proper and secure mounting.
6. Inspect all markings and decals for completeness and legibility (TM 1-1520-248-10).

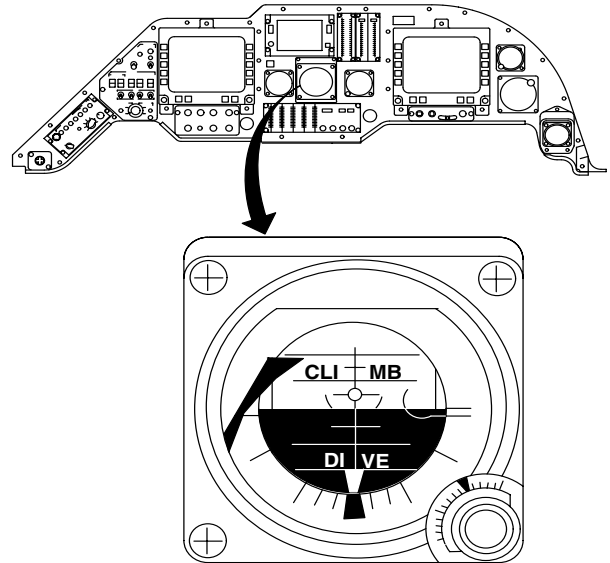
REPAIR

7. Secure indicator in mount as needed (Task 8-2-4).
8. Repair electrical connector and wiring as needed.

INSPECT

FOLLOW-ON MAINTENANCE

Perform standby attitude indicator operational check (TM 1-1520-248-T).



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END OF TASK

8-2-4. STANDBY ATTITUDE INDICATOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

References:
TM 1-1520-248-T

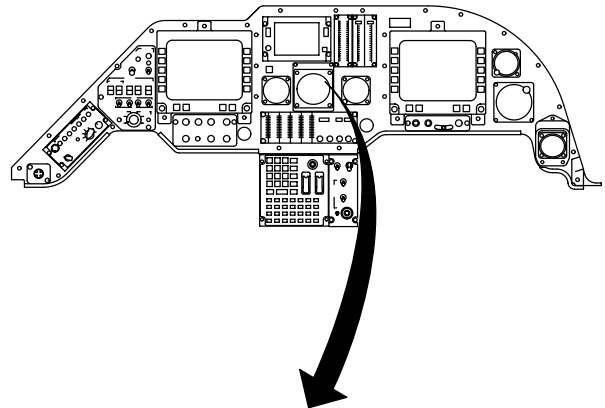
Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-2-4. STANDBY ATTITUDE INDICATOR — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Gain access to instrument panel through either crew door.
2. Remove three screws (1) and pull indicator (2) from its mount as far as wiring (3) will allow.
3. Disconnect electrical connector (4) and remove indicator (2).



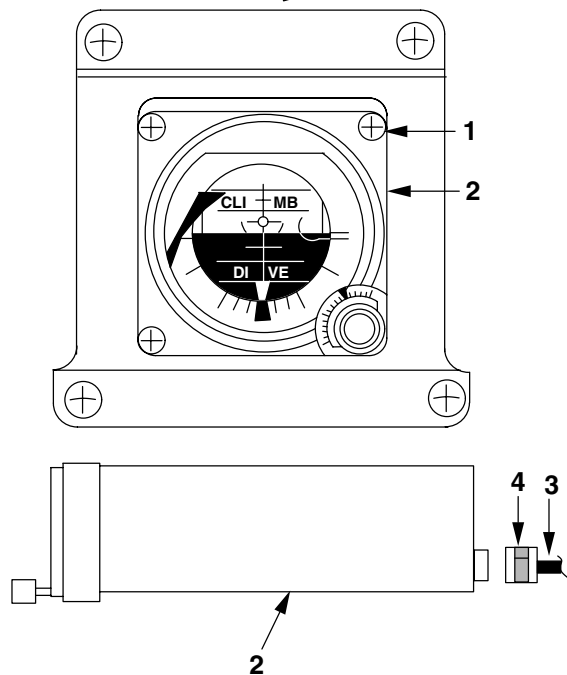
INSTALL

4. Gain access to instrument panel through either crew door.

NOTE

A check shall be made for conditions which may affect resistance of electrical bond (dirt, grease, paint, corrosion).

5. Clean and visually inspect mating surfaces for damage which may affect Class S electrical bond.
6. Repair any damage and prepare mating surfaces for Class S electrical bond per Appendix M.
7. Connect electrical connector (4) and place indicator (2) in its mount.
8. Install three screws (1).



INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check (TM 1-1520-248-T).

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END OF TASK

8-2-5. STANDBY AIRSPEED INDICATOR — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

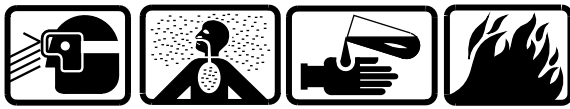
Material:
Drycleaning Solvent (D199)
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)

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

References:
TM 1-1520-248-10

Equipment Condition:
Helicopter Safed (Task 1-6-7)

CLEAN



Drycleaning Solvent

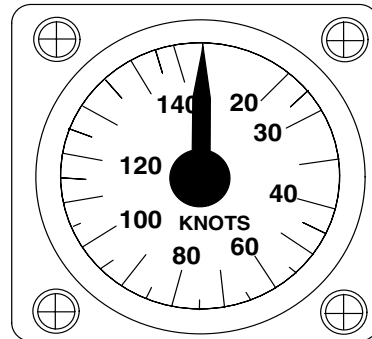
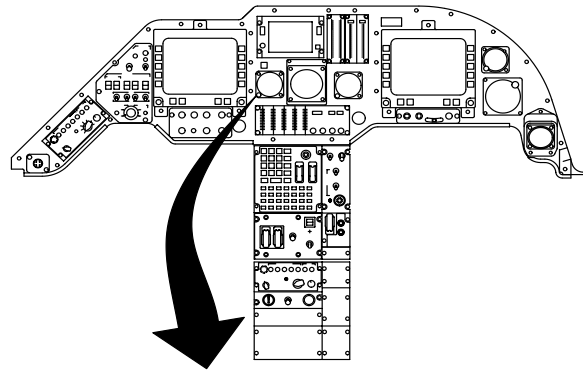
1. Clean face of indicator with drycleaning solvent (D199).
2. Dry face of indicator with a dry, low-lint cloth (D67).

INSPECT

3. Inspect for loose, cracked, or broken face cover.
4. Inspect pitot-static lines and connections for security and damage (Task 8-3-1).
5. Inspect for proper and secure mounting.
6. Inspect electrical connector and wiring for damage and security.
7. Inspect all markings and decals for completeness and legibility (TM 1-1520-248-10).

REPAIR

8. Replace pitot-static lines as needed (Task 8-3-1).
9. Repair electrical connector and wiring as needed.
10. Secure indicator in mount as needed (Task 8-2-7).
11. Replace airspeed indicator if face cover is loose, cracked, or broken.



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INSPECT

FOLLOW-ON MAINTENANCE

Perform pitot-static and air data system operational check as required (TM 1-1520-248-T).

Perform standby airspeed indicator operational check (TM 1-1520-248-T).

END OF TASK

8-2-6. STANDBY AIRSPEED INDICATOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

References:
TM 1-1520-248-T

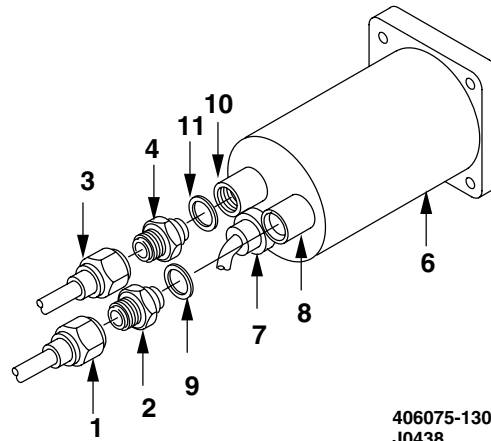
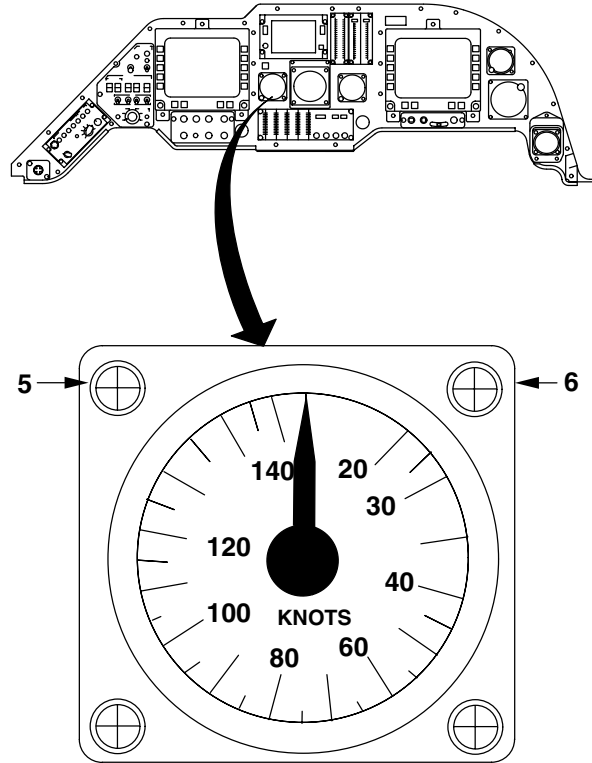
Equipment Condition:
Helicopter Safed (Task 1-6-7)
MPD Removed (Task 8-1-4)

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8-2-6. STANDBY AIRSPEED INDICATOR — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Gain access to instrument panel by opening either crew door.
2. Access rear of airspeed indicator through MPD mount and remove pitot tube nut (1) from pitot union (2).
3. Remove static tube nut (3) from static reducer (4).
4. Remove four screws (5) from face of indicator (6).
5. Pull indicator (6) from instrument panel as far as wiring and tubing will allow.
6. Disconnect electrical connector (7).
7. Remove pitot union (2) from pitot coupling (8) of indicator (6) and discard packing (9).
8. Remove reducer (4) from static coupling (10) of indicator (6) and discard packing (11).



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GO TO NEXT PAGE

8-2-6. STANDBY AIRSPEED INDICATOR — REMOVAL/INSTALLATION (CONT)

INSTALL

9. Install packing (11) on static reducer (4) and install static reducer (4) in static coupling (10).

10. Install packing (9) on pitot union (2) and install pitot union (2) into pitot coupling (8).

NOTE

A check shall be made for conditions which may affect resistance of electrical bond (dirt, grease, paint, corrosion).

11. Clean and visually inspect mating surfaces for damage which may affect Class S electrical bond.

12. Repair any damage and prepare mating surfaces for Class S electrical bond per Appendix M.

13. Prepare indicator (6) and mount for electrical bonding per Appendix M.

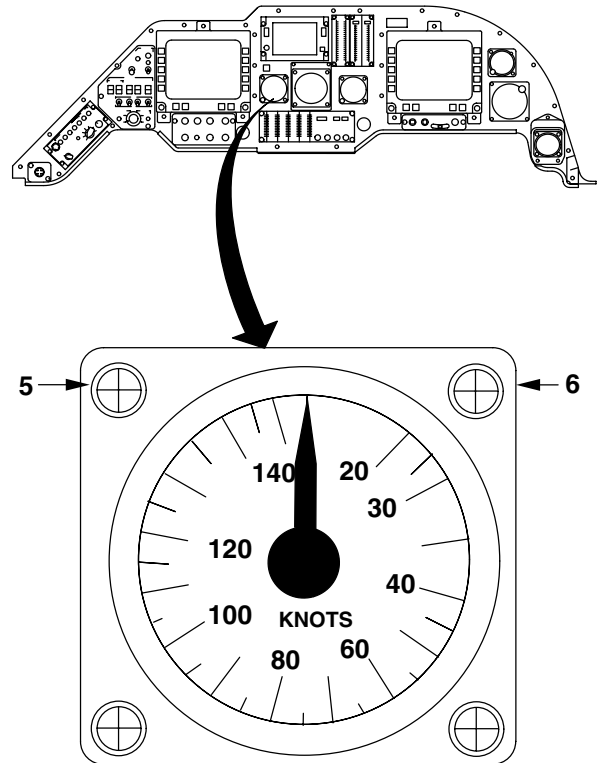
14. Position indicator (6) near its mounting hole and connect electrical connector (7).

15. Position airspeed indicator into its mount.

16. Access rear of indicator thru MPD mount and connect static tube nut (3) to static reducer (4).

17. Connect pitot tube (1) to pitot union (2).

18. Install four screws (5).



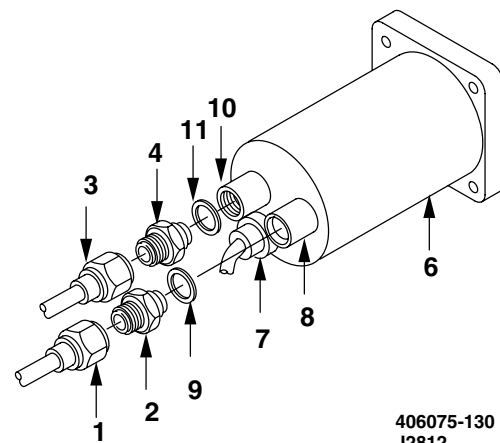
INSPECT

FOLLOW-ON MAINTENANCE

Install MPD (Task 8-1-4).

Perform pitot-static and air data system operational check (TM 1-1520-248-T).

Perform airspeed indicator operational check (TM 1-1520-248-T).



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J2812

Section III. PITOT-STATIC INSTRUMENT AND AIR DATA SYSTEMS

8-8. PITOT-STATIC INSTRUMENT AND AIR DATA SYSTEM

static and air data system instruments. Standard torques are provided in Appendix P and TM 1-1500-204-23.

8-9. INTRODUCTION

This section contains: maintenance procedures for cleaning, repairing, inspection, removal, installation, and follow-on maintenance of pitot-

8-10. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Pitot-Static Tubing and Fittings — Cleaning/Inspection/Repair	8-3-1	8-60
Pitot-Static Tubing and Fittings — Removal	8-3-2	8-62
Pitot-Static Tubing and Fittings — Installation	8-3-3	8-68
Pitot Tube — Removal/Installation	8-3-4	8-74
Pitot Tube — Cleaning/Inspection/Repair	8-3-5	8-76

8-3-1. PITOT-STATIC TUBING AND FITTINGS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Material:
Drycleaning Solvent (D199)
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)

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

References:
TM 1-1520-248-T

GO TO NEXT PAGE

8-3-1. PITOT-STATIC TUBING AND FITTINGS — CLEANING/INSPECTION/REPAIR (CONT)

WARNING

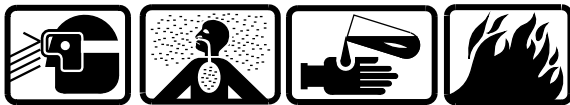
PITOT HEAT

The pitot tube assembly is very hot during and immediately after operations requiring pitot heat. Hands and other parts of body should be kept away from this area. If burn occurs, seek medical aid.

NOTE

All pitot and static lines shall be free of water traps.

CLEAN



Drycleaning Solvent

1. Clean area by each static port (left and right surface of helicopter) using drycleaning solvent (D199) and low-lint cleaning cloth (D67).
2. Dry each area cleaned with low-lint cleaning cloth (D67).

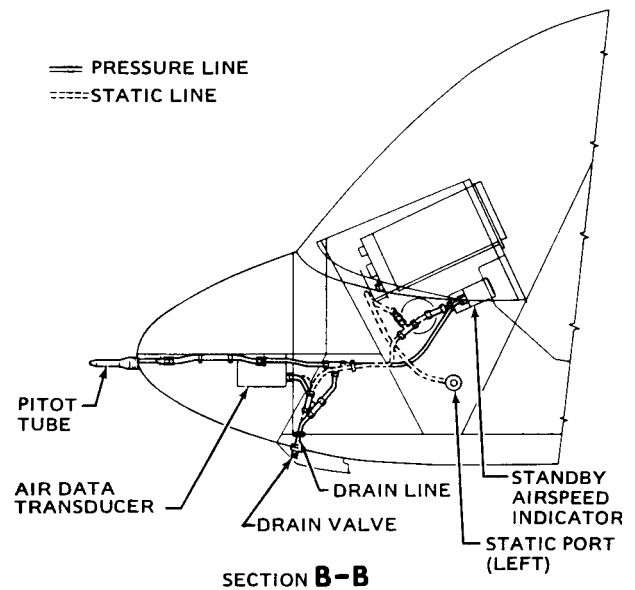
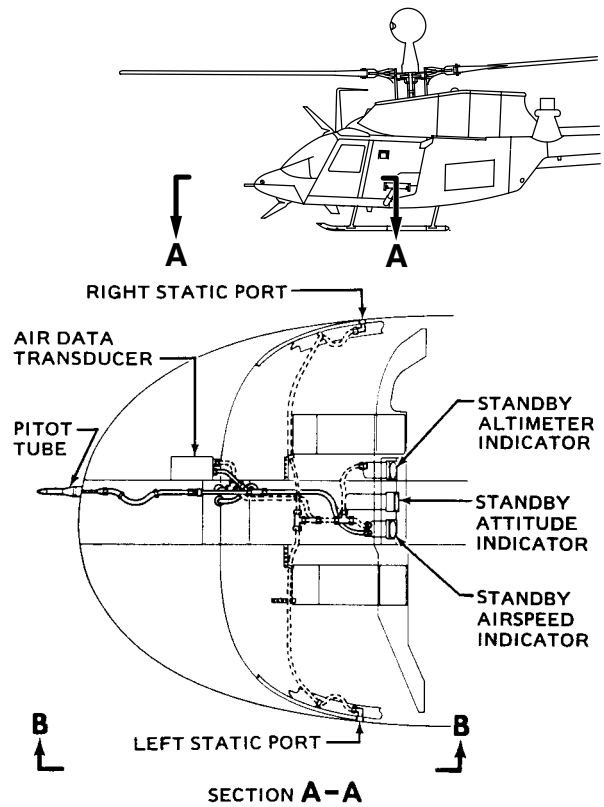
INSPECT

3. Inspect for loose or broken pitot pressure and static lines.
4. Inspect for cracked or broken nuts and fittings.
5. Inspect for presence of water and missing drain plugs.

REPAIR

6. Repair by replacing pitot-static tubing and fittings.

INSPECT



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END OF TASK

8-3-2. PITOT-STATIC TUBING AND FITTINGS — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Personnel Required:
68F Aircraft Electrician

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)

Tools:
Electrical Repairer Tool Kit (B177)

GO TO NEXT PAGE

8-3-2. PITOT-STATIC TUBING AND FITTINGS — REMOVAL (CONT)

NOTE

It is unlikely that all pitot and static lines will require maintenance at the same time. Therefore, this task is arranged such that each paragraph may be used as a subtask. Use only the paragraph(s) required.

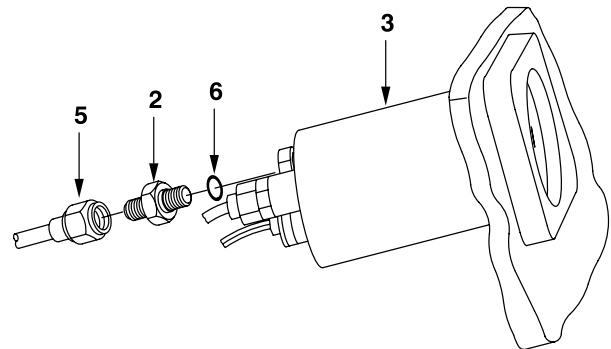
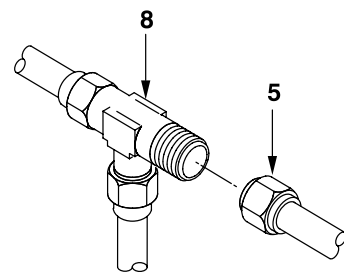
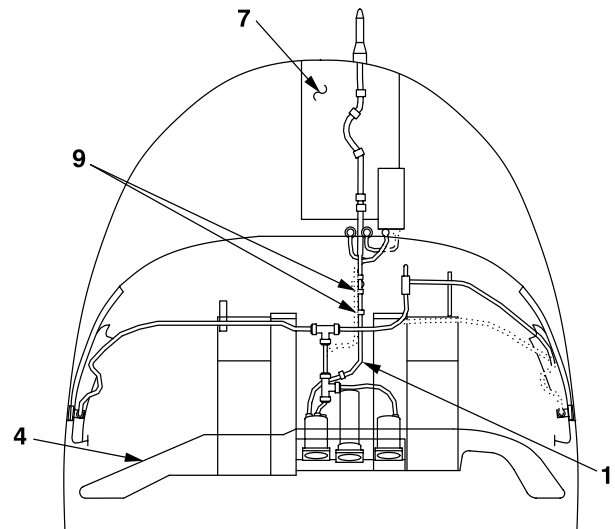
1. Remove pitot pressure tubing (1) as follows:

a. Gain access to pitot pressure tubing (1) union assembly (2) on airspeed indicator (3) from under the left side of the instrument panel (4).

b. Remove connector nut (5), union assembly fitting (2), and packing (6) from airspeed indicator (3).

c. Gain access to forward end of pitot pressure tubing (1) through door (7).

d. Remove connector nut (5) from union tee assembly (8), cut two straps (9), slide pitot pressure tubing (1) forward, and remove pitot pressure tubing (1) from helicopter.



(TYPICAL)

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GO TO NEXT PAGE

8-3-2. PITOT-STATIC TUBING AND FITTINGS — REMOVAL (CONT)

2. Remove pitot pressure tubing (10) and adapter (11) as follows:

- a. Gain access to pitot pressure tubing (10) through door (7).
- b. Remove connector nut (5) from forward end of union tee assembly (12).
- c. Perform extend portion of searchlight operational check (TM 1-1520-248-T).
- d. Remove connector nut (5) from aft end of pitot pressure hose (13) and adapter (11). Slide pitot pressure tubing (10) forward, and remove from helicopter.

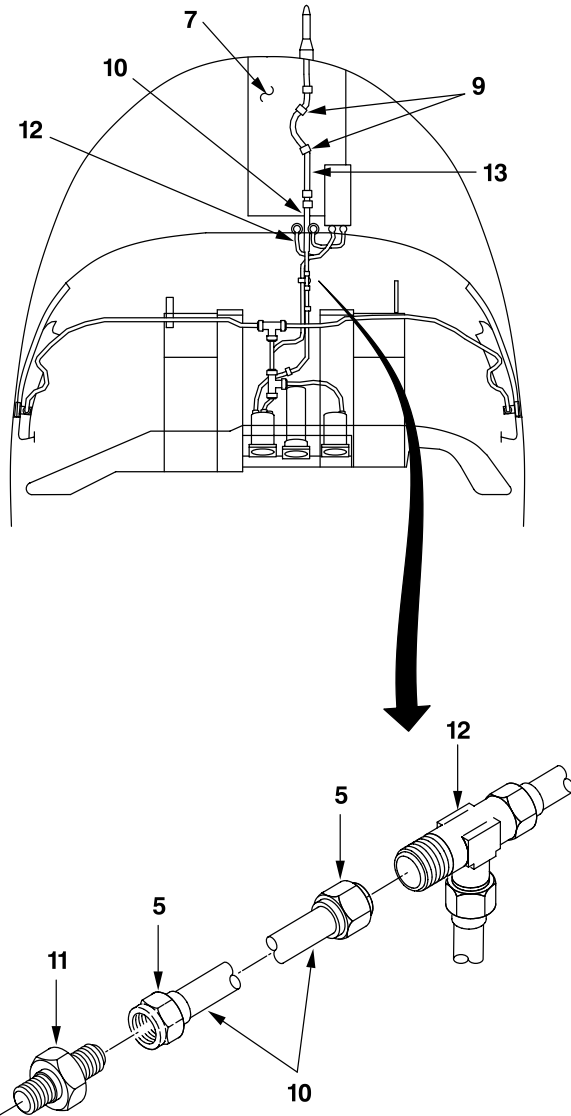
3. Remove pitot pressure hose (13) as follows:

- a. Gain access to pitot pressure hose (13) by extending searchlight (Task 9-5-16).
- b. Remove forward end of pitot pressure hose (13) (step 2.d).

NOTE

Adapter (11) shall be removed and retained for use on replacement hose (13).

- c. Remove hose connector nut (5) for pitot pressure tubing (10), cut two straps (9), and remove pitot pressure hose (13) from helicopter.



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8-3-2. PITOT-STATIC TUBING AND FITTINGS — REMOVAL (CONT)

4. Remove static tubes (14, 15, 16, 17, 18, and 19) as follows:

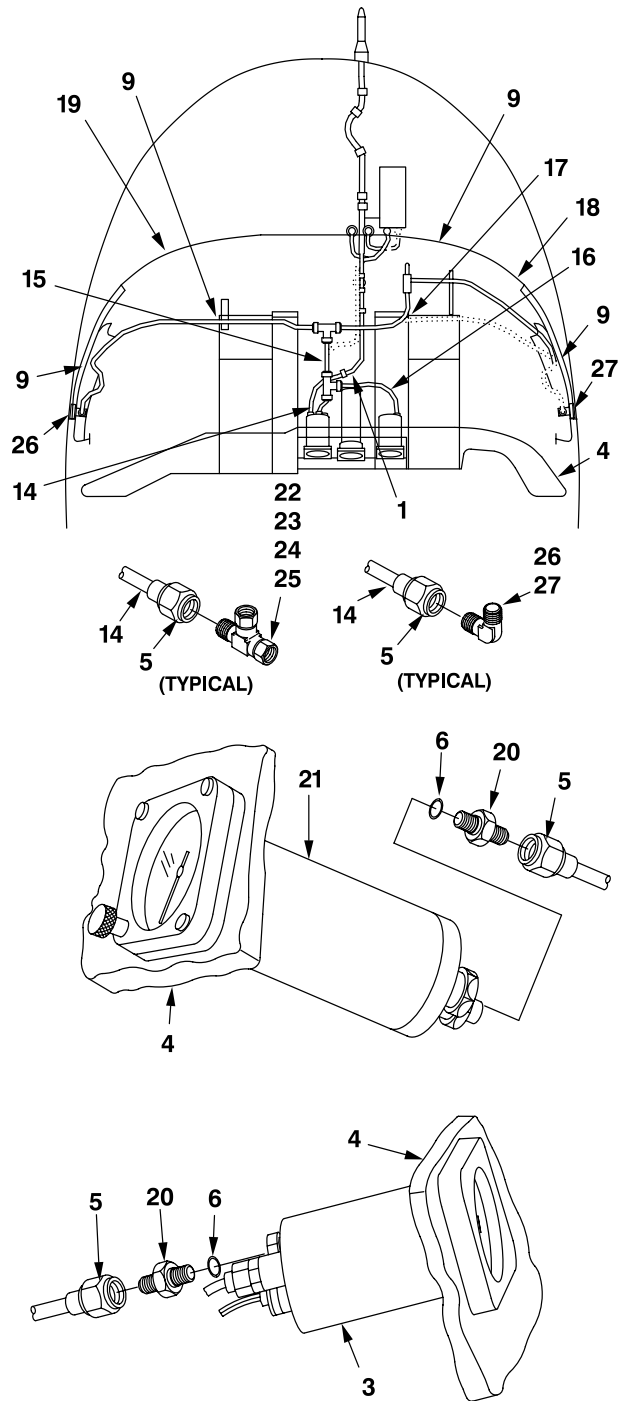
a. Gain access to static tubes (14, 15, 16, 17, 18, and 19) and reducer (20) behind the altimeter (21) right side of instrument panel (4) or airspeed indicator (3) under left side of instrument panel (4).

b. Disconnect pitot pressure tube (1) (step 1) from airspeed indicator (3).

c. Remove connector nuts (5) from altimeter (21) and airspeed indicator (3).

d. Remove reducer (20) and packing (6) and cut four straps (9).

e. Remove connector nuts from union tee assemblies (22, 23, 24, and 25) and elbows (26 and 27), remove from helicopter.



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8-3-2. PITOT-STATIC TUBING AND FITTINGS — REMOVAL (CONT)

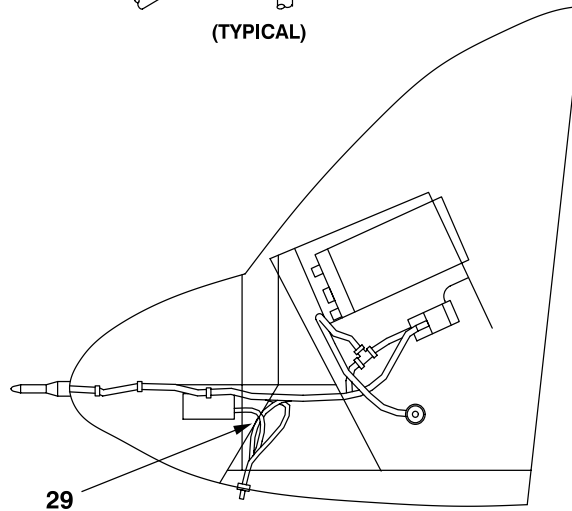
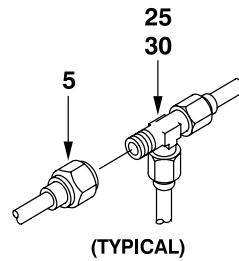
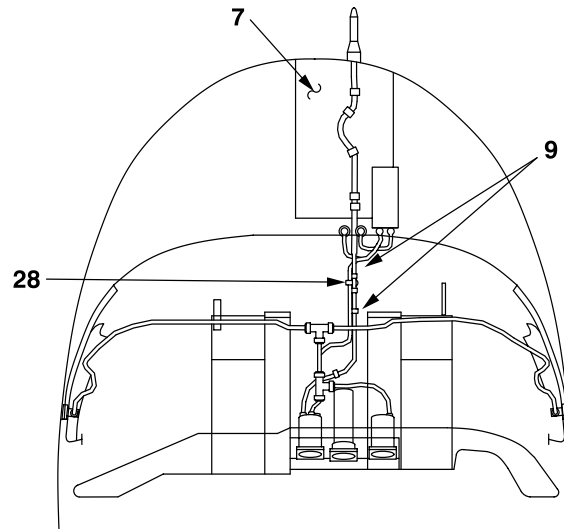
5. Remove static tubes (28 and 29) as follows:

a. Gain access to static tube union tee assemblies (25 and 30) from under console.

b. Remove connector nuts (5) from union tee assemblies (25 and 30).

c. Gain access to forward end of static tubes (28 and 29) through door (7).

d. Cut two straps (9) and slide static tubes (28 and 29) forward through door (7) and remove from helicopter.



VIEW LOOKING INBD LH SIDE

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GO TO NEXT PAGE

8-3-2. PITOT-STATIC TUBING AND FITTINGS — REMOVAL (CONT)

6. Remove pitot pressure tubing (31) and static tube (32) as follows:

a. Gain access to pitot pressure tubing (31) and static tube (32) through pilot door and access panel on right side of console.

b. Remove connector nuts (5) from air data transducer (34), adapter (33), union assembly (2), and packing (6).

c. Remove connector nut (5) from union tee assemblies (35 and 36) and remove both the pitot pressure tubing (31) and static tube (32) from helicopter.

7. Remove static drain tube (37) and pitot drain tube (38) as follows:

a. Gain access to static drain tube (37) and pitot drain tube (38) through access panel on right side of console.

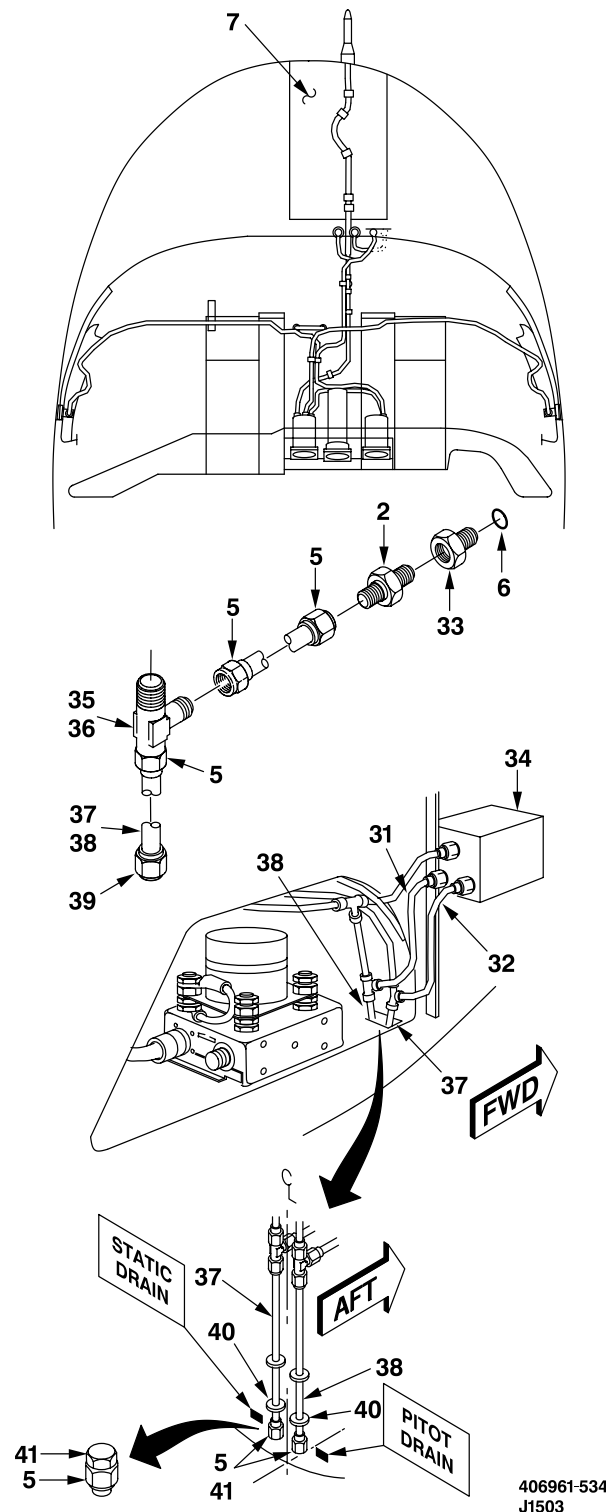
b. Remove connector nut(s) (5) from union tee assemblies (35 and 36) and remove inserts and adapter (39) from static drain tube (37) and pitot drain tube (38).

c. Pull static drain tube (37) and pitot drain tube (38) until both clear grommets (40).

d. Remove plugs (41) from connector nuts (5).

FOLLOW-ON MAINTENANCE

Clean, inspect, and repair pitot-static tubing and fittings (Task 8-3-1).



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END OF TASK

8-3-3. PITOT-STATIC TUBING AND FITTINGS — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

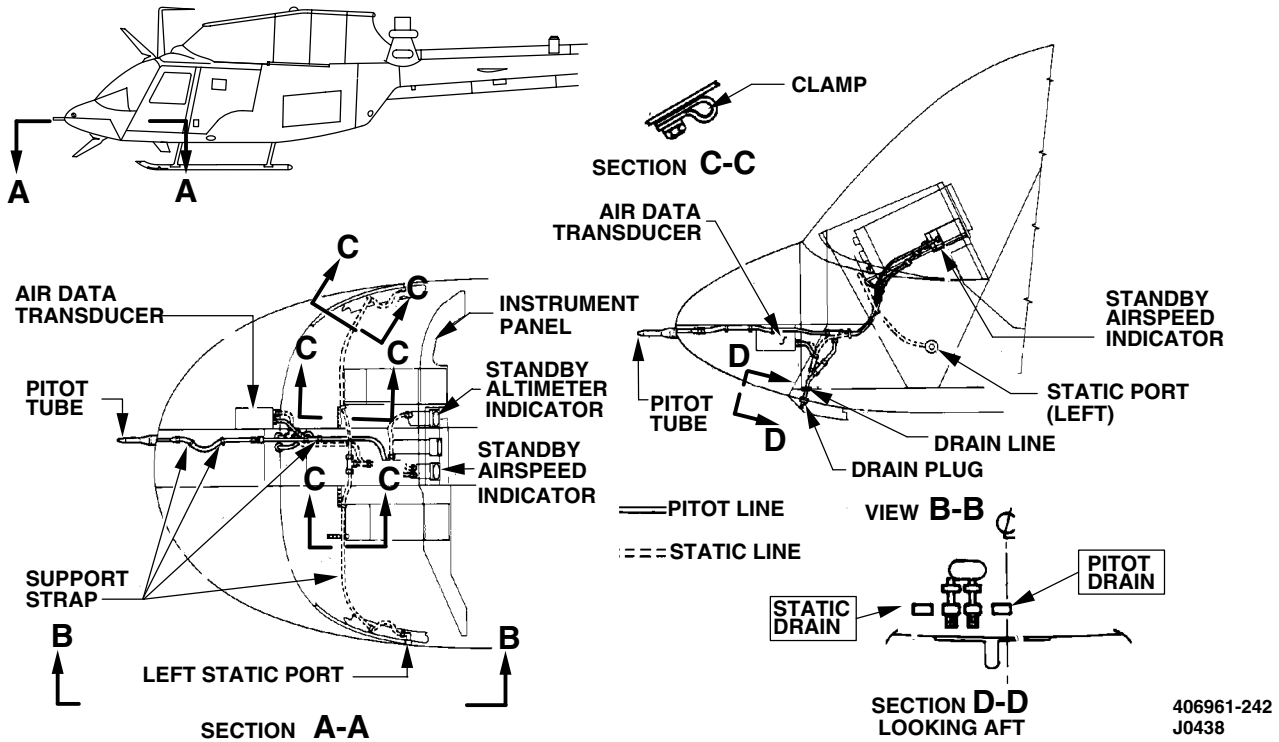
Tools:
Electrical Repairer Tool Kit (B177)
Heat Gun (Nitrogen) (B60)

Material:
Tiedown Strap (D206)

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

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)



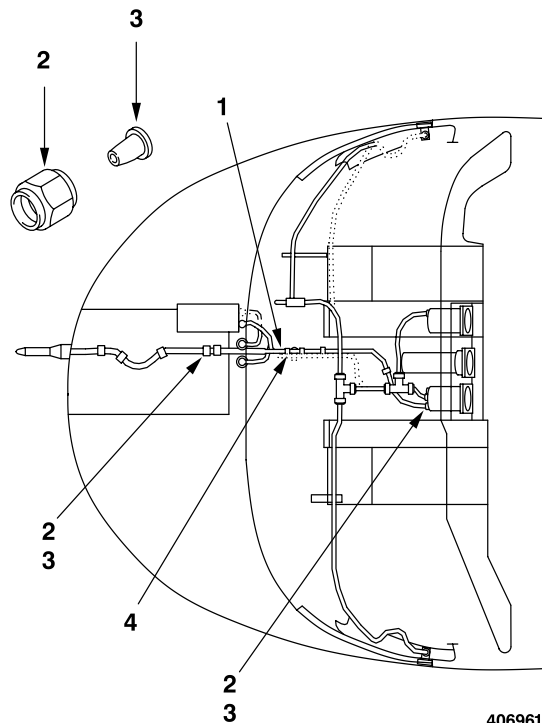
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8-3-3. PITOT-STATIC TUBING AND FITTINGS — INSTALLATION (CONT)

NOTE

- All pitot or static lines shall be installed free of water traps. Water trapped in lines will cause improper readings.
- It is unlikely that all pitot and static lines will require maintenance at the same time. Therefore, this task is arranged such that each paragraph may be used as a subtask. Use only the paragraph(s) required. Then perform follow-on maintenance.

1. Install pitot pressure tube (1) as follows:
 - a. Cut new tubing to exact length and form (using heat gun (B60)) to same shape as tubing removed.
 - b. Install two nut and sleeve assemblies (2), back to back, and install two inserts (3) ahead of nut and sleeve assemblies.
 - c. Gain access to forward console structural panel opening and feed line through console to connector (P) on airspeed indicator.
 - d. Connect nut to "T" fitting then install instrument air and pitot identification tape as required.
 - e. Install two tiedown straps (D206) on the parallel portion of static tube (4).
 - f. Install forward console structural panel.
 - g. Gain access to airspeed indicator adapter (P) connector from under left side of instrument panel, connect nut and install instrument air and pitot identification tape as required.

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GO TO NEXT PAGE

8-3-3. PITOT-STATIC TUBING AND FITTINGS — INSTALLATION (CONT)

2. Install pitot pressure tube (5) as follows:

a. Cut new tubing to exact length and form (using heat gun (B60)) to same shape as tubing removed.

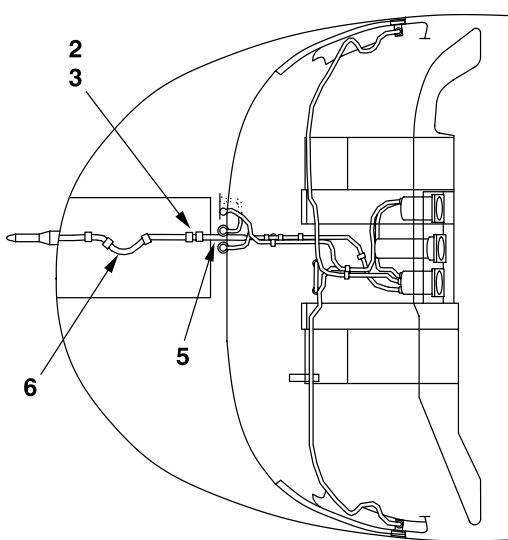
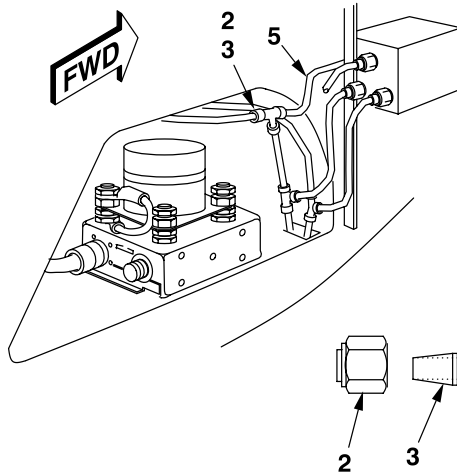
b. Install two nut and sleeve assemblies (2), back to back, and install two inserts (3) ahead of nut and sleeve assemblies.

c. Gain access to forward console structural panel opening and feed line forward to the pitot pressure hose.

d. Connect nut to "T" fitting and install forward console structural panel.

e. Gain access to pitot pressure hose (6) by extending searchlight (TM 1-1520-248-T) and connect line nut to aft end of pitot pressure hose adapter.

f. Install instrument air and pitot identification tape as required and perform retract portion of searchlight operational check (TM 1-1520-248-T).



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GO TO NEXT PAGE

8-3-3. PITOT-STATIC TUBING AND FITTINGS — INSTALLATION (CONT)

3. Install static line(s) (7), (8), (9), and (10) as follows:

a. Cut new tubing to exact length and form (using heat gun (B60)) to same shape as tubing removed.

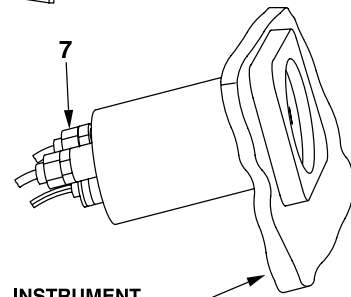
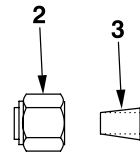
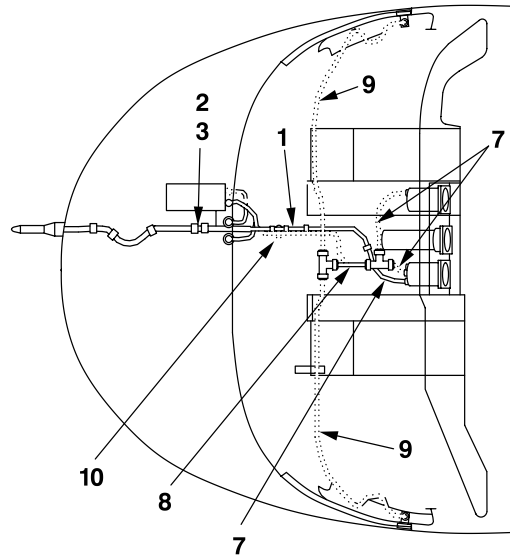
b. Install two nut and sleeve assemblies (2), back to back, and install two inserts (3) ahead of nut and sleeve assemblies.

c. Install instrument air and static identification tape as required.

d. Gain access under instrument panel to appropriate instrument and connect nut to reducer (fitting(s) on airspeed indicator) on instrument(s).

e. Gain access to “T” fitting from under instrument panel and connect nut(s) to “T” fitting.

f. Connect pitot pressure tubing (1) (step 1) to airspeed indicator (fitting (P) union).



INSTRUMENT
PANEL (REFERENCE)

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8-3-3. PITOT-STATIC TUBING AND FITTINGS — INSTALLATION (CONT)

4. Install pitot pressure hose (6) (with adapter) as follows:

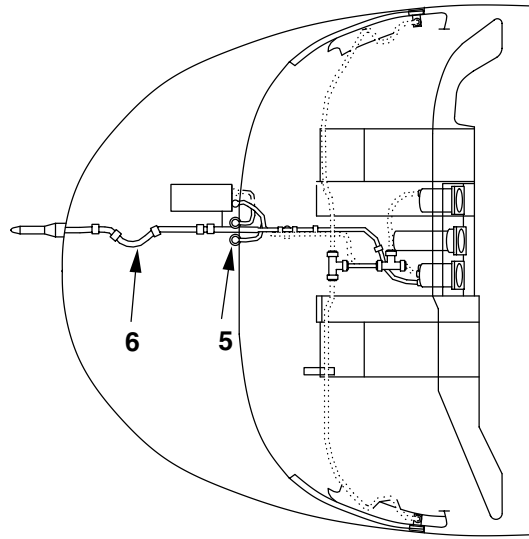
a. Gain access to pitot line and pitot tube. Perform extend portion of searchlight operational check (TM 1-1520-248-T).

b. Install instrument air and pitot identification tape as required.

c. Connect pitot hose (adapter end) to forward end of pitot pressure tubing (5) and other end to pitot tube.

d. Install two tiedown straps (D206) such that all hose slack is concentrated between straps.

e. Perform retract portion of searchlight operational check (TM 1-1520-248-T).



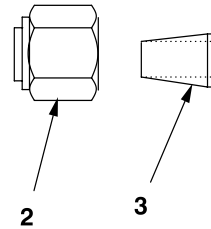
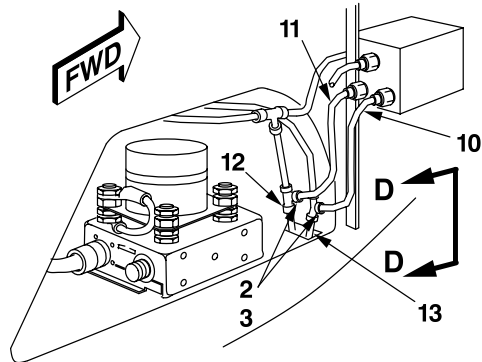
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8-3-3. PITOT-STATIC TUBING AND FITTINGS — INSTALLATION (CONT)

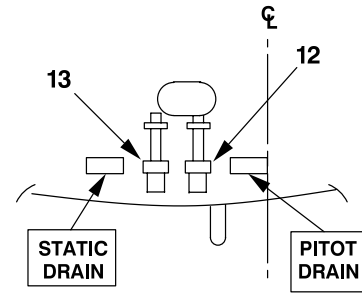
5. Install static tube (10) and pitot pressure tubing (11) as follows:

- a. Cut new tubing to exact length and form (using heat gun (B60)) to same shape as tubing removed.
- b. Install two nut and sleeve assemblies (2), back to back, and install two inserts (3) ahead of nut and sleeve assemblies.
- c. Install instrument air and static identification tape or instrument air and pitot identification tape as required.
- d. Gain access to “T” fitting(s) through forward console structural panel opening and connect nut(s) to appropriate “T” fitting(s).
- e. Connect other nut(s) to appropriate air data transducer (fitting PT adapter for pitot and fitting PS bushing for static) connector(s).
- f. Install forward console structural panel.



6. Install pitot drain tube (12) or static drain tube (13) as follows:

- a. Cut new tubing to exact length and form (using heat gun (B60)) to same shape as tubing removed.
- b. Install lower nut(s), sleeve(s), insert(s), and drain plug(s).
- c. Feed tube(s) upward through appropriate “T” fitting(s).
- d. Gain access to appropriate “T” fitting(s) through forward console structural panel opening.
- e. Install upper nut(s), sleeve(s), and insert(s), then connect nut(s) to appropriate “T” fitting(s).
- f. Install instrument air and static identification tape or instrument air and pitot identification tape as required.
- g. Install forward console structural panel.



SECTION D-D
LOOKING AFT

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J2165

INSPECT

FOLLOW-ON MAINTENANCE

Perform pitot-static and air data operational check (TM 1-1520-248-T).

END OF TASK

8-3-4. PITOT TUBE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-3-4. PITOT TUBE — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

PITOT HEAT

The pitot tube assembly is very hot during and for several minutes after operations requiring pitot heat. Hands and other parts of body should be kept away from this area. If burn occurs, seek medical aid.

1. Remove three screws (1) and three washers (2) while holding pitot tube (3) in its mount. Then pull out slowly on pitot tube and disconnect pressure hose connector (4).

2. Remove pitot heater wiring quick-disconnects (5) and remove pitot tube (3) from helicopter.

INSTALL

NOTE

The word "TOP", on pitot tube, shall face upward.

3. Connect pitot tube heater wiring quick-disconnects (5) and pitot tube pressure hose connector (4).

4. Position pitot tube (3) into its mounting position.

5. Install three screws (1) and three washers (2).

NOTE

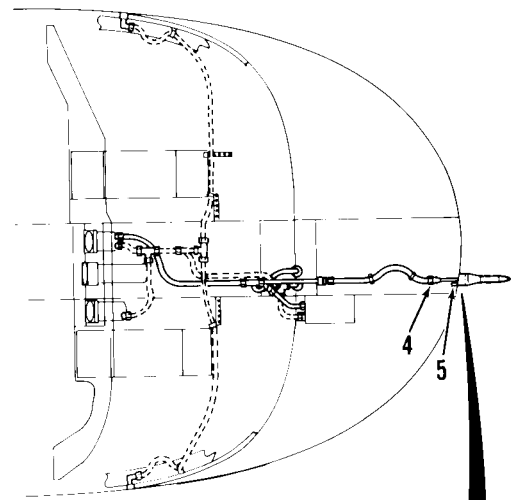
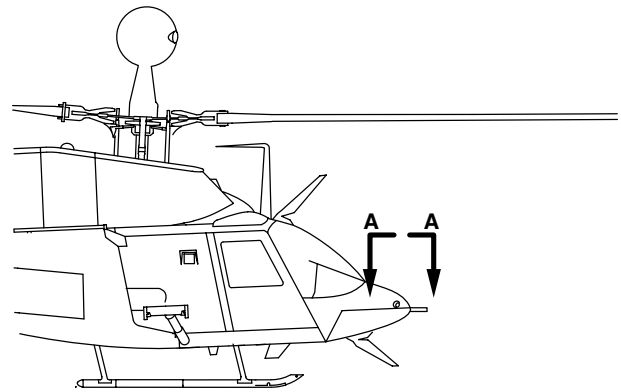
All pressure lines shall be free of water traps.

INSPECT

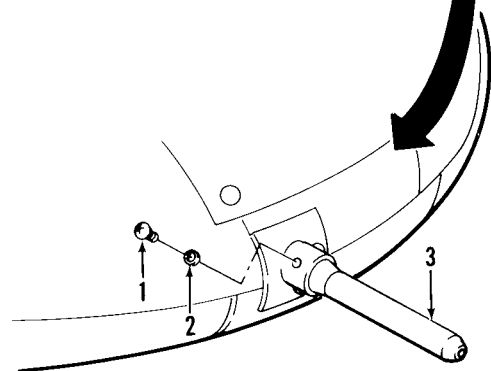
FOLLOW-ON MAINTENANCE

Perform pitot-static and air data system operational check (TM 1-1520-248-T).

Perform pitot tube heater operational check (TM 1-1520-248-T).



SECTION A-A



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J0437

END OF TASK

8-3-5. PITOT TUBE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

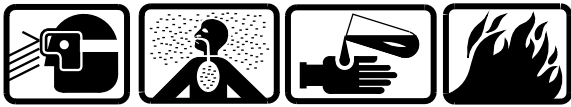
Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Material:
Drycleaning Solvent (D199)
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)

Personnel Required:
68F Aircraft Electrician

CLEAN



Drycleaning Solvent

1. Clean pitot tube head and sleeve with a clean, low-lint cleaning cloth (D67) dampened with drycleaning solvent (D199). Dry with clean, low-lint cleaning cloth (D67).

INSPECT

2. Inspect surface of pitot tube for clogged or obstructed opening and clogged drain hole at bottom of tube.

3. Inspect electrical receptacle, pins, and sockets of pitot tube for damage.

REPAIR

4. Repair pitot tube head if inlet opening is clogged or obstructed, drain hole is clogged, or electrical connector is damaged.

5. Replace pitot tube head if cracked or damaged to the extent it would restrict impact air pressure.

6. Replace defective or damaged pitot tube electrical connector.

END OF TASK

Section IV. NAVIGATION INSTRUMENTS

8-11. NAVIGATION INSTRUMENTS

Maintenance procedures for navigation instruments and systems are contained in TM 11-

1520-248-23. All navigation functions are integrated into the Control Display Subsystem (CDS). Refer to Section V for miscellaneous instruments and TM 1-1427-779-23 for CDS.

Section V. MISCELLANEOUS INSTRUMENTS

8-12. MISCELLANEOUS INSTRUMENTS

miscellaneous instruments. Standard torques are provided in Appendix P and TM 1-1500-204-23.

8-13. INTRODUCTION

This section contains: maintenance procedures for cleaning, repairing, inspection, removal, installation, and follow-on maintenance of

8-14. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Standby Compass — Cleaning/Inspection/Repair	8-5-1	8-78
Standby Compass — Removal/Installation	8-5-2	8-80
Clock — Cleaning/Inspection/Repair	8-5-3	8-81
Clock — Removal/Installation	8-5-4	8-82
Outside Air Thermometer — Cleaning/Inspection/Removal/Installation	8-5-5	8-84

8-5-1. STANDBY COMPASS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Material:
Rubber Gloves (D111)
Drycleaning Solvent (D199)
Wiping Rags (D164)

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

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-5-1. STANDBY COMPASS — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

1. Clean face of indicator with drycleaning solvent (D199).
2. Dry face of indicator with a wiping rag (D164).

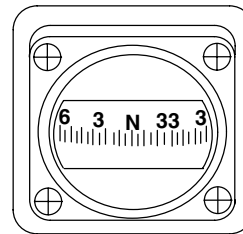
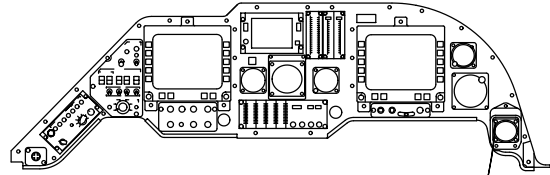
INSPECT

3. Inspect for secure and proper mounting.
4. Inspect electrical connector and wiring for damage and security.
5. Inspect float chamber for insufficient fluid or leakage. If card element will not float, replace standby compass.
6. Inspect for detached or unlevel compass card.
7. Inspect compass correction card (form DD 1613) installation and ensure that information is current. Refer to Chapter 1 for the interval.
8. If standby compass fails to meet inspection standards and will not adjust on compass adjustments, replace compass.

REPAIR

9. Secure compass in mount as needed.
10. Repair electrical connector and wiring as needed.

INSPECT



STANDBY COMPASS

_____ COMPASS			
SWUNG: _____		BY: _____	
TO FLY	STEER	TO FLY	STEER
N		180	
15		195	
30		210	
45		225	
60		240	
75		255	
90		270	
105		285	
120		300	
135		315	
150		330	
165		345	

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END OF TASK

8-5-2. STANDBY COMPASS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

References:
TM 1-1500-204-23
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

1. Gain access to instrument panel through the pilot crew door.
2. Remove four screws (1) and remove compass (2) from instrument panel.
3. Disconnect electrical connector (3) at the rear of standby compass (2).

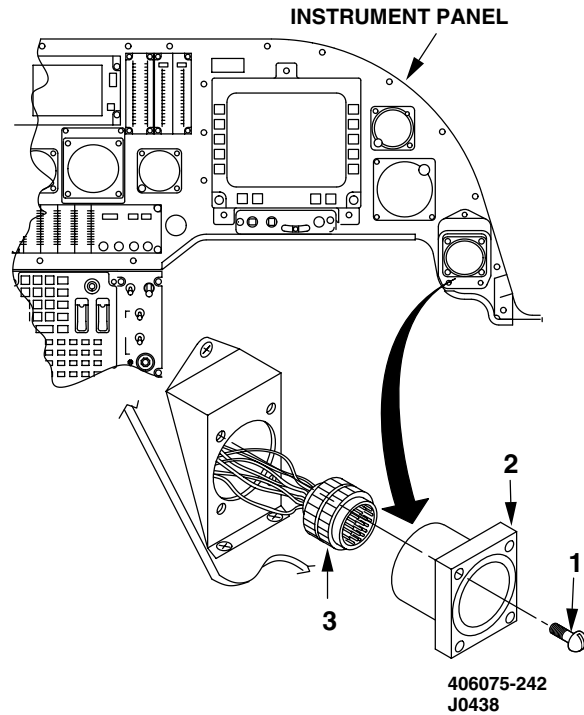
INSTALL

4. Gain access to instrument panel through pilot crew door.
5. Connect electrical connector (3) to compass (2).
6. Align compass (2) with mounting holes and install four screws (1).

FOLLOW-ON MAINTENANCE

Perform standby compass lighting operational check (TM 1-1520-248-T).

Perform standby magnetic compass compensation (TM 1-1500-204-23).



END OF TASK

8-5-3. CLOCK — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rags (D164)

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

Equipment Condition:
Helicopter Safed (Task 1-6-7)

CLEAN

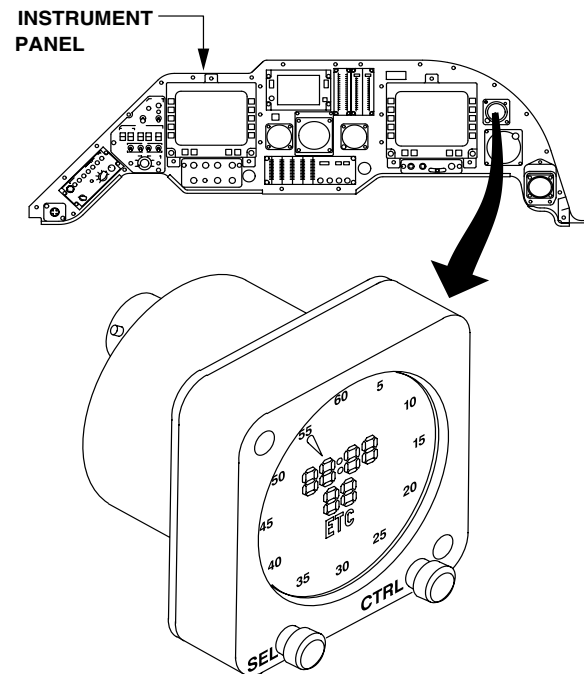
1. Clean face of clock with drycleaning solvent (D199).
2. Dry face of clock with a dry wiping rag (D164).

INSPECT

3. Inspect for secure and proper mounting.
4. Inspect electrical connection and wiring for security and damage.
5. Apply side pressure to rear of clock to determine if mounting hardware is tight.
6. Inspect for loose, cracked, or broken face cover.
7. Inspect SEL and CTRL knobs for proper operation.

REPAIR

8. Secure clock in mounting as needed.
9. Repair electrical connection and wiring to clock panel as needed.

INSPECT

406075-247
J0438

END OF TASK

8-5-4. CLOCK — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

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

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-5-4. CLOCK — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Gain access to instrument panel through the pilot crew door.
2. Remove two screws (1) and pull clock (2) away from instrument panel as far as wiring will allow.
3. Disconnect electrical connector (3) at the rear of clock (2).
4. Remove clock (2) from instrument panel.

INSTALL

5. Gain access to instrument panel through pilot crew door.

NOTE

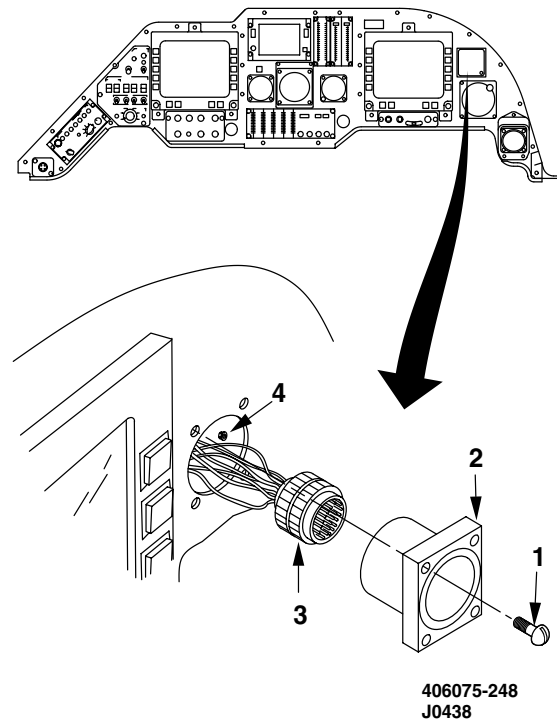
Check for conditions which may affect resistance of electrical bond (dirt, grease, paint, corrosion).

6. Clean and visually inspect mating surfaces for damage which may affect Class S electrical bond.
7. Repair any damage and prepare mating surfaces for Class S electrical bond per Appendix M.
8. Prepare clock (2) and mount for electrical bonding per Appendix M.
9. Install two self-locking nuts (4) in panel, if necessary.
10. Connect electrical connector (3).
11. Position clock (2) into mount and install two screws (1).

INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check (TM 1-1520-248-T).



END OF TASK

8-5-5. OUTSIDE AIR THERMOMETER — CLEANING/INSPECTION/REMOVAL/INSTALLATION

This task covers: Cleaning, Inspection, Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Material:
Low-Lint Cleaning Cloth (D67)

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

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

8-5-5. OUTSIDE AIR THERMOMETER — CLEANING/INSPECTION/REMOVAL/INSTALLATION (CONT)

CLEAN

1. Clean parts with a low-lint cleaning cloth (D67).

INSPECT

Refer to TM 1-1500-204-23.

REMOVE

1. Unscrew and remove sunshield (1), dished washer (2) and case washer (3) from outside of windshield.

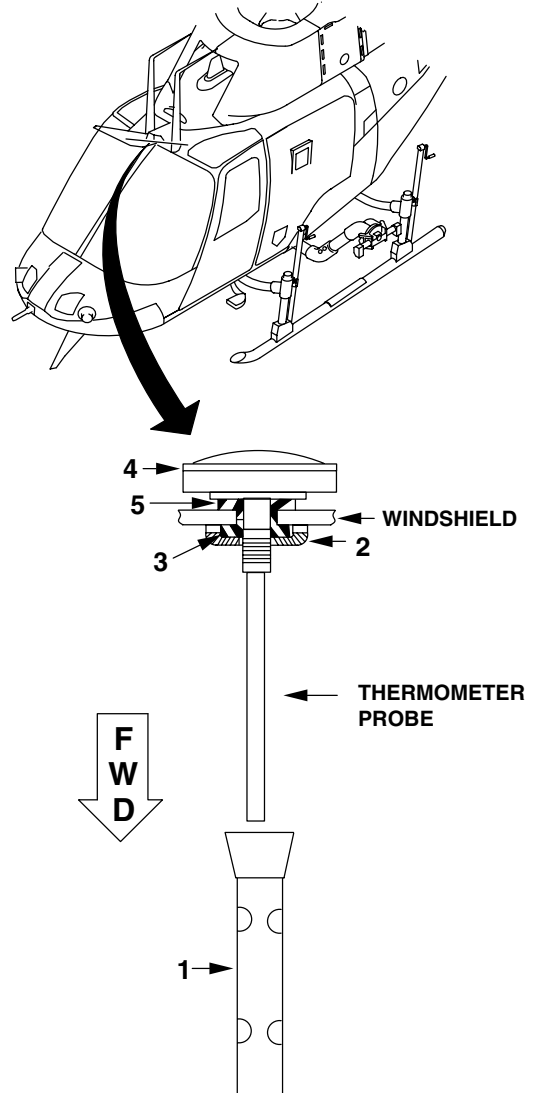
2. Remove thermometer (4) and case washer (5) from inside of windshield.

INSTALL

3. Place case washer (5) over probe of thermometer (4) with flat side of washer next to thermometer case. Insert stem and washer through mounting hole from inside windshield.

4. Place case washer (3) flat side out, on probe outside windshield. Seat washer shoulders in mounting hole. Install dished washer (2) with outside edge curving toward windshield. Position thermometer dial correctly before tightening.

5. Place sunshield (1) over probe and tighten securely.

INSPECT

406070-18
J0438

END OF TASK

8-85/(8-86 blank)

GLOSSARY

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
AC	Alternating Current
ACK	Acknowledge
ADF	Automatic Direction Finder
ADS	Air Data System
ADSS	ANVIS Display Symbology System
ADU	Audio Distribution Unit
ADV	Advisory
AEU	Armament Electronic Unit
AI	Airborne Intercept
AJ	Antijamming
ALSE	Aviation Life Support Equipment
ALT	Altitude
AM	Amplitude Modulation
AMP	Ampere
AMP	Amplifier
ANVIS	Aviators Night Vision Imaging System
AOAP	Army Oil Analysis Program
APU	Aircraft Power Unit
AR	Army Regulation
ARMT	Armament
ASE	Aircraft Survivability Equipment
ATAS	Air-to-Air Stinger
ATHS	Airborne Target Handover System
ATTD	Attitude
AUTO	Automatic
AUX	Auxiliary
AVIM	Aviation Intermediate Maintenance
AVTR	Airborne Video Tape Recorder
AVUM	Aviation Unit Maintenance
AWG	American Wire Gauge
BATT	Battery
B HOT	Black Hot
BIT	Built-In Test
BITE	Built-In Test Equipment
BKUP	Backup

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
BL	Butt Line
BLWR	Blower
BNR	Burner
BRSIT	Boresight
BRT	Bright
CAGE	Commercial and Government Entity Code
CARC	Chemical Agent Resistant Coating
CB	Circuit Breaker
CDS	Control Display System
CFT	Captive Flight Trainer
CG	Center of Gravity
CHGR	Charger
CIPH	Cipher
CIT	Compressor Inlet Temperature Sensor
CKPT	Cockpit
CKPT LT	Cockpit Light
CL	Center Line
CLR	Clear
COLL	Collision
COMSEC	Communication Security
CPC	Corrosion Preventive Compound
CPG	Copilot/Gunner
CRES	Corrosion Resistant Steel
CTRL	Control
DA PAM	Department of the Army Pamphlet
DC	Direct Current
DEFOG	Windshield Defogger System
DES	Designation
DETR	Detector
DIGT	Digital
DIR	Directional
DISENG	Disengage
DN	Down
DOD	Department of Defense
DRA	Data Rate Adapter
DSC	Digital Scan Converter

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
DSPL	Display
DTS	Data Transfer System
DX	Direct Exchange
ECU	Electronic Control Unit
ECUIC	Electronic Control Unit Interface Computer
EGI	Embedded Global Position/Inertial Navigation
ELEV	Elevation
EMI	Electromagnetic Interference
ENG	Engine
ENGA	Engage
ESC	Electronic Supervisory Control
ESNTL	Essential
EU	Electronics Unit
EXT	External
FADEC	Full Authority Digital Electronic Control
FCU	Fuel Control Unit
FDLS	Fault Detection and Locating System
FFAR	Folding Fin Aerial Rocket
FM	Frequency Modulation
FOC	Focus
FOV	Field-of-View
FR	Frame
FREQ	Frequency
FRZ	Freeze
FS	Fuselage Station
FWD	Forward
FXD	Fixed
GEN	Generator
GRBX	Gearbox
GSE	Ground Support Equipment
HDG	Heading
HF	High Frequency
HHM	Heading Hold Mode
HLFR	Hellfire
HMS	HELLFIRE Missile System
HMU	Hydromechanical Unit

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
HOM	Homing (FM)
HSD	Horizontal Situation Display
HSF	Hot Section Factor
HTR	Heater
HYD	Hydraulic
ICS	Internal Communication System
ID	Inside Diameter
IDM	Improved Data Modem
IEU	Interface Electronics Unit
IFF	Identification Friend or Foe
IFM	Improved Frequency Modulation
IGN	Ignition
INIT	Initiate
INST	Instrument
INST LT	Instrument Light
INTCOM	Intercommunication
INV	Inverter
IR	Infrared
ISP	Integrated Systems Processor
JETT	Jettison
KM	Kilometer
KPH	Kilometers Per Hour
KTS	Knots
KYBD	Keyboard
LAT	Latitude
LCF	Low Cycle Fatigue
LDS	Laser Detecting System
LOAL	Lock On After Launch
LOBL	Lock On Before Launch
LRF/D	Laser Rangefinder/Designator
LRU	Line Replaceable Unit
LT	Light
L/H	Left Hand
LVDT	Linear Variable Differential Transformer
MAC	Maintenance Allocation Chart
MAINT	Maintenance

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
MAPS	Maintenance Action Precise Symptom
MCPS	MMS Central Power Supply
MCPU	Master Controller Processor Unit
MFD	Multifunction Display
MFK	Multifunction Keyboard
MLM	Multipurpose Lightweight Missile
MMS	Mast Mounted Sight
MMSS	Mast Mounted Sight Subsystem
MNL	Manual
MOC	Maintenance Operational Check
MOM	Moment
MPD	Multiparameter Display
MPLH	Multi Purpose Light Helicopter
M/R	Main Rotor
MOS	Military Occupational Specialty
MSDS	Material Safety Data Sheets
MSP	MMS System Processor
MSS	Missile Sight System
MSSEU	Missile Sight System Electronics Unit
MTA	Mast Turret Assembly
MTF	Maintenance Test Flight
MWO	Modification Work Order
MUX	Multiplex
NAV	Navigation
NBC	Nuclear Biological and Chemical
NG	Gas Generator Speed
NICAD	Nickel-Cadmium Battery
NOE	Nap-of-the-Earth
NP	Power Turbine RPM
NR	Main Rotor RPM
NSN	National Stock Number
NVG	Night Vision Goggles
OAT	Outside Air Temperature
OD	Outside Diameter
ODA	Optical Display Assembly
OPR	Operate

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
OS	Overspeed
OSET	Offset
OSHA	Occupational Safety and Health Administration
PART SEP	Particle Separator
PDU	Pilot Display Unit
PLT	Pilot
PMA	Permanent Magnet Alternator
POS	Position
POS LT	Position Light
PPM	Progressive Phase Maintenance
PSI	Pounds Per Square Inch
PSID	Pounds Per Square Inch Differential
PSIG	Pounds Per Square Inch Gauge
PWR	Power
QAD	Quick Attach-Detach
QE	Engine Torque
QM	Mast Torque
QTY	Quantity
RALT	Radar Altimeter
RAST	Raster
RCCB	Remote Control Circuit Breaker
RCPT	Receptacle
RDS	Radar Detecting System
REC	Receive
RECT	Rectifier
REL	Release
RET	Retract
RFD	Remote Frequency Display
RHE	Remote HELLFIRE Electronics Unit
RKT	Rocket
RPM	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
RST	Reset
RT	Receiver/Transmitter
R/H	Right Hand
SAM	Surface-To-Air Missile

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
SCAS	Stability and Control Augmentation System
SCTY	Security
SEL	Select
SEU	Sight Electronics Unit
SINCGARS	Single Channel Ground/Air Radio System
SMR	Source, Maintenance, and Recoverability
SRCH	Search
STA	Station
STBY	Standby
SYMB	Symbology
TACFIRE	Tactical Fire Direction
TAMS	Transmission Attitude Measurement System
TB	Technical Bulletin
TBD	To Be Designated
TBO	Time Between Overhaul
TCU	Thermal Control Unit
TEMP	Temperature
TGT	Turbine Gas Temperature
TGT/TRQ	Turbine Gas Temperature/Torque
TI	Technical Inspector
TIS	Thermal Imaging Sensor
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
TMOPS	Torquemeter Oil Pressure Sensor
T/R	Tail Rotor
TRK	Track
TRQ	Torque
TRU	Transformer Rectifier Unit
TVS	Television System
UHF	Ultra High Frequency
U/M	Unit of Measure
UTM	Universal Transverse Mercator
UUT	Unit Under Test
UWP	Universal Weapons Pylon
VAC	Volts Alternating Current
VAR	Variation

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
VDC	Volts Direct Current
■ VDU	Video Downlink/Uplink
VHF	Very High Frequency
VID	Video
VSD	Vertical Situation Display
VSI	Vertical Scale Instrument
VTR	Video Tape Recorder
VTS	Video Tracker System
VTVM	Vacuum Tube Voltmeter
WDC	Water Displacing Compound
WL	Water Line
WRN	Warning
WSPS	Wire Strike Protection System
XDCR	Transducer (Sensor)
XFMR	Transformer
XMSN	Transmission

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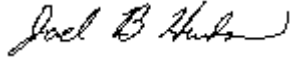
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Z

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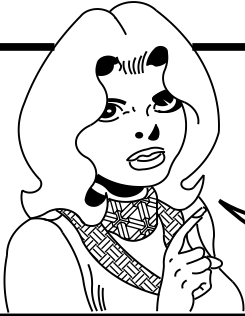
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BE EXACT...PIN-POINT WHERE IT IS

PAGE NO

6

PARA-GRAPH

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a

FIGURE NO

4-3

TABLE NO

B 1

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

Callout 16 on figure 4-3 is pointed at a bolt. In key to figure 4-3, item 16 is called a shim—Please correct one or the other

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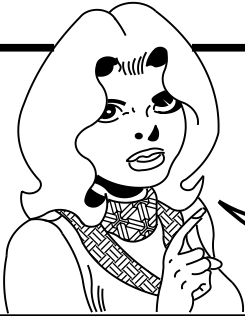
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