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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------|
| <b>TECHNICAL MANUAL</b><br><br><b>AVIATION UNIT<br/>AND<br/>AVIATION INTERMEDIATE<br/>MAINTENANCE<br/>MANUAL</b><br><br><b>ENGINE ASSEMBLY<br/>GAS TURBINE<br/>(GTCP36-55[H])</b><br><br><b>PN 3800102-2<br/>(NSN 2835-01-172-6200)</b> | <b>PREVENTIVE MAINTENANCE<br/>CHECKS AND SERVICES</b>     | <b>1-33</b> |
|                                                                                                                                                                                                                                         | <b>COMBUSTION SECTION MAINTENANCE</b>                     | <b>2-1</b>  |
|                                                                                                                                                                                                                                         | <b>FUEL SYSTEM MAINTENANCE</b>                            | <b>3-1</b>  |
|                                                                                                                                                                                                                                         | <b>ELECTRICAL SYSTEM MAINTENANCE</b>                      | <b>4-1</b>  |
|                                                                                                                                                                                                                                         | <b>LUBRICATION SYSTEM MAINTENANCE</b>                     | <b>5-1</b>  |
|                                                                                                                                                                                                                                         | <b>GEARBOX ASSEMBLY MAINTENANCE</b>                       | <b>6-1</b>  |
|                                                                                                                                                                                                                                         | <b>ACCESSORY MAINTENANCE</b>                              | <b>7-1</b>  |
|                                                                                                                                                                                                                                         | <b>CLEANING ENGINE COMPONENTS</b>                         | <b>8-1</b>  |
|                                                                                                                                                                                                                                         | <b>REFERENCES</b>                                         | <b>A-1</b>  |
|                                                                                                                                                                                                                                         | <b>MAINTENANCE ALLOCATION CHART</b>                       | <b>B-1</b>  |
|                                                                                                                                                                                                                                         | <b>REPAIR PARTS AND SPECIAL TOOLS LIST</b>                | <b>C-1</b>  |
|                                                                                                                                                                                                                                         | <b>EXPENDABLE/DURABLE SUPPLIES<br/>AND MATERIALS LIST</b> | <b>D-1</b>  |
|                                                                                                                                                                                                                                         | <b>MANUFACTURED ITEMS LIST</b>                            | <b>E-1</b>  |
|                                                                                                                                                                                                                                         | <b>TORQUE LIMITS</b>                                      | <b>F-1</b>  |

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HEADQUARTERS, DEPARTMENT OF THE ARMY

29 FEBRUARY 1996

TECHNICAL MANUAL  
NO. 1-2835-213-23

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 29 February 1996

Technical Manual  
Aviation Unit  
and  
Aviation Intermediate  
Maintenance Manual

Engine Assembly  
Gas Turbine (GTCP36-55[H])  
PN 3800102-2  
(NSN 2835-01-I 72-6200)

### 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 these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation and Missile Command, ATTN: AMSAM-MMC-LS-LP, Redstone Arsenal, AL 358986000. You may also submit your recommended changes by E-mail directly to [ls-lp@redstone.army.mil](mailto:ls-lp@redstone.army.mil). A reply will be furnished directly to you. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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### TABLE OF CONTENTS

Page

HOW TO USE THIS MANUAL ..... iv

#### CHAPTER 1

#### INTRODUCTION AND ENGINE - GENERAL

|               |                                                                                                             |      |
|---------------|-------------------------------------------------------------------------------------------------------------|------|
| Section I     | General Information .....                                                                                   | 1-1  |
| Section II    | Equipment Description and Data .....                                                                        | I-2  |
| Section I II  | Principles of Operation .....                                                                               | I-5  |
| Section IV    | Repair Parts; Special Tools; Test, Measurement and Diagnostic Equipment (TMDE); and Support Equipment ..... | I-20 |
| Section V     | Service Upon Receipt .....                                                                                  | 1-21 |
| Section VI    | Preventive Maintenance Checks and Services (PMCS) .....                                                     | I-33 |
| Section VII   | Troubleshooting .....                                                                                       | I-33 |
| Section VI II | Preparation for Storage or Shipment .....                                                                   | I-34 |

#### CHAPTER 2

#### COMBUSTION SECTION MAINTENANCE

|           |                                         |     |
|-----------|-----------------------------------------|-----|
| Section I | Remove/Install Combustion Chamber ..... | 2-I |
|-----------|-----------------------------------------|-----|

## TABLE OF CONTENTS (CONT)

|                  |                                                      | Page |
|------------------|------------------------------------------------------|------|
| <b>CHAPTER 3</b> | <b>FUEL SYSTEM MAINTENANCE</b>                       |      |
| Section I.       | Remove/Install Fuel Filter Assembly.....             | 3-1  |
| Section II.      | Remove/Install Fuel Control Assembly .....           | 3-3  |
| Section III.     | Remove/Install Fuel Solenoid Valve .....             | 3-9  |
| Section IV.      | Remove/Install Solenoid Valve Bracket .....          | 3-14 |
| Section V.       | Replace Fuel Control to Solenoid Tube Assembly ..... | 3-19 |
| Section VII.     | Remove/Install Relief Valve .....                    | 3-22 |
| Section VIII.    | Remove/Install Fuel Nozzle .....                     | 3-24 |
| <b>CHAPTER 4</b> | <b>ELECTRICAL SYSTEM MAINTENANCE</b>                 |      |
| Section I.       | Remove/Install APU Wiring Harness Assembly .....     | 4-1  |
| Section II.      | Replace Plumbing and Electrical Brackets.....        | 4-9  |
| Section III.     | Remove/Install Igniter Plug Lead .....               | 4-13 |
| Section IV.      | Remove/Install Igniter Plug.....                     | 4-17 |
| Section V.       | Remove/Install Thermocouple .....                    | 4-20 |
| Section VI.      | Remove/Install Monopole .....                        | 4-23 |
| Section VII.     | Remove/Install Ignition Unit.....                    | 4-26 |
| Section VIII.    | Remove/Install Ignition Unit Bracket .....           | 4-28 |
| Section IX.      | Remove/Install Ignition Unit Support Assembly.....   | 4-30 |
| Section X.       | Repair Wiring Harness Assembly.....                  | 4-32 |
| <b>CHAPTER 5</b> | <b>LUBRICATION SYSTEM MAINTENANCE</b>                |      |
| Section I.       | Remove/Install Liquid Level Gage Rod-Cap .....       | 5-1  |
| Section II.      | Collect APU Oil Sample.....                          | 5-3  |
| Section III.     | Service APU Oil .....                                | 5-5  |
| Section IV.      | Replace APU Oil .....                                | 5-7  |
| Section V.       | Magnetic Drain Plug Chip Collector Inspection .....  | 5-9  |
| Section VI.      | Remove/Install Magnetic Drain Plug Assembly.....     | 5-11 |
| Section VII.     | Remove/Install Oil Filter Element .....              | 5-13 |
| Section VIII.    | Remove/Install LOP Switch .....                      | 5-16 |
| Section IX.      | Remove/Install Oil Plug.....                         | 5-19 |
| Section X.       | Remove/Install Oil Level Sight Gage .....            | 5-21 |
| Section XI.      | Remove/Install Oil Pump.....                         | 5-23 |
| Section XII.     | Remove/Install Oil Pump Gear .....                   | 5-26 |
| <b>CHAPTER 6</b> | <b>GEARBOX ASSEMBLY MAINTENANCE</b>                  |      |
| Section I.       | Remove/Install Lifting Lug .....                     | 6-1  |
| Section II.      | Remove/Install Aft Mount Assembly .....              | 6-3  |
| Section III.     | Remove/Install Vent Fitting.....                     | 6-5  |

## TABLE OF CONTENTS (CONT)

|                           |                                                             | Page       |
|---------------------------|-------------------------------------------------------------|------------|
| <b>CHAPTER 7</b>          | <b>ACCESSORY MAINTENANCE</b>                                |            |
| Section I.                | Remove/install Hydraulic Starter.....                       | 7-1        |
| Section II.               | Remove/install Clutch Assembly.....                         | 7-4        |
| Section III.              | Remove/Install Clutch Assembly Solenoid Valve Assembly..... | 7-7        |
| Section IV.               | Replace Plenum Assembly Seal.....                           | 7-11       |
| <b>CHAPTER 8</b>          | <b>CLEANING ENGINE COMPONENTS</b>                           |            |
| Section I.                | Cleaning Process 1 (Solvent.....                            | 8-1        |
| Section II.               | Cleaning Process 2 (Electrical Components).....             | 8-2        |
| <b>APPENDIX A</b>         | <b>REFERENCES</b> .....                                     | A-1        |
| <b>APPENDIX B</b>         | <b>MAINTENANCE ALLOCATION CHART</b>                         |            |
| Section I.                | Introduction.....                                           | B-1        |
| Section II.               | Maintenance Allocation Char.....                            | B-7        |
| Section III.              | Tool and Test Equipment Requirements.....                   | B-14       |
| Section IV.               | Remarks.....                                                | B-21       |
| <b>APPENDIX C</b>         | <b>REPAIR PARTS AND SPECIAL TOOLS LIST</b> .....            | C-1        |
| <b>APPENDIX D</b>         | <b>EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST</b>       |            |
| Section I.                | Introduction.....                                           | D-1        |
| Section II.               | Expendable/Durable Supplies and Materials List.....         | D-2        |
| <b>APPENDIX E</b>         | <b>MANUFACTURED ITEMS LIST</b> .....                        | E-1        |
| <b>APPENDIX F</b>         | <b>TORQUE LIMITS</b> .....                                  | F-1        |
| <b>GLOSSARY</b>           |                                                             |            |
| Section I.                | Abbreviations.....                                          | Glossary-1 |
| Section II.               | Definitions .....                                           | Glossary-2 |
| <b>ALPHABETICAL INDEX</b> | .....                                                       | Index-1    |

## HOW TO USE THIS MANUAL

### 1. DESCRIPTION OF MANUAL.

This manual has several chapters and appendices. Each chapter is divided into sections. Each section in Chapter 1 is divided into paragraphs. The paragraphs have specific information you will need to know. Chapter 2 on is divided into tasks. The tasks tell you what you need and how to do any job. The appendices have general information you will need to know. They list references, maintenance allocation chart, expendable supplies and materials, wiring diagrams and manufactured items.

### 2. HOW TO FIND WHAT YOU ARE LOOKING FOR.

There are three ways to find what you are looking for: (a) the block access index on the cover: (b) the table of contents: and (c) alphabetical index.

a. Block Access Index. The most important and frequently used areas of the manual are identified in the manual cover. The black boxes on the cover line up with corresponding black marks on the edge of the manual to identify location to text.

b. Table of Contents. All chapters, sections and appendices are identified.

(1) Chapter 1 provides general descriptive information and principles of operation of the engine.

(2) Chapter 2 provides maintenance stands and containers information.

(3) Chapters 3 through 8 provides instructions for the major modules and systems that comprise the engine. Each chapter is divide into sections by its major components.

### 3. USING THE MANUAL.

a. Unscheduled Maintenance Procedures. Unscheduled maintenance procedures consist of inspection, adjust, remove, repair and install procedures. These procedures are referred to as tasks. The instructions to perform these tasks are given in a format that provides INITIAL SETUP followed by step-by-step procedures.

(1) Initial Setup. Initial setup is the first part of every task in the manual. It lists what tools, materials and parts you will need before you can do the task. The following headings are used when they apply.

(2) Task Title. The task title after the paragraph number describes the job to be done in the task.

(3) Tools. Tools, tool kits or shop sets needed to do the task are listed here. If tools from your repairman's kit are needed, the kit is listed. Tools you need that are not in the kit or set, are listed by name, type and size. Special tools and test support equipment are listed by a T-number. Find these items in Appendix B.

Example: Shim Checking Gage (T57)

(4) Materials. Expendable items and support materials are listed under this heading. These are items like rags, antiseize compound, non-electrical wire, etc. They are listed by a D-number. Find these items in Appendix D.

Example: Cleaning Cloth (D5)

Find these items in Appendix C.

(5) Parts. All mandatory replacement parts are listed. These are items like gaskets, packings, cotter pins, lockwashers, etc. They are listed by the Repair Parts and Special Tools List (RPSTL) name.

(6) Personnel Required. The people needed to do the task are listed under this heading. They are identified by their MOS. When more than one of any MOS is needed, the number needed is shown in parentheses. The text will tell you when a helper is needed.

(7) References. Related tasks and TM's you will need to do the task are listed under this heading. The task steps tell you when these tasks and TM's are needed.

(8) Equipment Condition. All the items to be done before you start the task are listed under this heading. To help, the number of the task tells you how to do them is given when applicable.

**NOTE**

If a task is other than an on helicopter task, it will be brought to your attention under "Equipment Condition". Example: "APU on Maintenance Stand".

- (9) General Safety Instructions. Safety precautions and warnings that must be observed when you are doing the job are described under this heading.

- b. Procedures. Step-by-step procedures tell you how to do the task. They are arranged in logical sequence to help you get the task done efficiently.

**4. HOW TO PREPARE FOR A TASK.**

Read the initial setup carefully before starting. It tells you what you will need and what you have to know to start the task. **DO NOT START A TASK UNTIL:**

You know what is needed  
You have the items you need  
You understand what to do

- a. If a tool has a T-code after it, go to Appendix B. Read down the far left-hand column to your T-code. This is the tool you need for your task.

- b. If an expendable material has an D-number after it, go to the Expendable Supplies and Materials List in Appendix D. Read down the Item Number column to your D-number. This is the expendable you need for your task.

- c. If parts are listed, they can be drawn from tech supply. Before you start the task, check and make sure you can get the needed parts; National Stock Numbers (NSN) and part numbers are listed in TM 1-2835-213-23P

- d. Check for personnel required.

- e. If preliminary procedures are listed under "Equipment Conditions", BE SURE THE LISTED TASKS ARE DONE"; then do this task.

**5. HOW TO DO THE TASK.**

Before starting, read the entire task. Familiarize yourself with the entire procedure before you begin the task. As you read, remember the following:

- a. PAY ATTENTION TO WARNINGS, CAUTIONS AND NOTES.
- b. When values are in bold type or followed by the word INSPECT, an inspector must OK the completed step.
- c. Key procedural steps are underlined for ease of task completion for those familiar with the manual.
- d. A GLOSSARY is provided. It lists the special words and unusual terms used in this manual and gives their meaning. Check it out. It may help you understand the instructions.
- e. The following are considered standard maintenance practices. Instructions about these practices will not normally be included in task steps. Task steps will tell you when standard maintenance practices do not apply.

- (1) Lines will be tagged before they are disconnected. Tubes and parts will be capped or plugged when they are disconnected.
- (2) Used packings, retainers, gaskets, cotter pins, lockwashers, etc are discarded. New parts shall be installed.
- (3) Packings are coated before installation in accordance with the task.
- (4) Tubes and related parts will be tied out of the way with twine, not lockwire.
- (5) In disassembly tasks, components are removed and wires disconnected.
- (6) 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.
- (7) Before a components or the disassembled parts of a components are inspected, they are cleaned as required.

- (8) Components and mating surface area will be inspected for serviceable condition before installation.
- (9) Guidelines will be used when any item is hoisted overhead.
- (10) When a nut is tightened or loosened on a bolt, the bolt head will be held with a wrench.
- (11) A special torque will be cited when the words TORQUE TO are used. A standard torque is required when the word INSTALL is used.
- (12) 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.
- (13) Appendix F provides standard torque limits for general type screws, nuts, bolts, fittings and coupling nuts. These standard torque values apply only when special torque values are not specified in procedures. Included in the torque tables are the applicable torque wrenches.
- (14) If additional setup tools are required such as crowfoot wrenches, they will be listed in the task INITIAL SETUP.
- (15) When cotter pin is required, cotter pin holes will be aligned within allowable torque range.
- (16) Following installation, paint will be touched up as required.
- (17) Following maintenance, inspect for foreign objects.

f. General maintenance procedures (e.g. "replace studs and inserts") are not included in the maintenance instructions. A reference is made to General Aircraft Maintenance Manual (TM 1-1500-204-23, Volumes 1 through 9) for these procedures.

## 6. APPENDICES.

a. Appendix A- References. This appendix lists all referenced publications needed to perform the maintenance procedures in this manual.

b. Appendix B - Maintenance Allocation Chart (MAC). This appendix consists of four sections as follows:

Section I - Introduction. This section is a summary of what is in the MAC.

Section II - This section is the MAC. The MAC assigns maintenance functions in accordance with the Three levels of Maintenance concept for Army Aviation. The MAC has six columns, containing the following information:

Column 1 and 2- Functional Groups. These columns identify maintenance significant components, assemblies, subassemblies and modules.

Column 3 - Maintenance Function. This column lists the maintenance functions to be performed on the items listed in column 2.

Column 4 - Maintenance Categories. The maintenance categories (levels) AVUM, AVIM and DEPOT are listed with individual columns. These columns identify the maintenance level at which each maintenance function is to be performed. Numbers in parenthesis identify the corresponding numbered remarks in Section IV.

Column 5 - Tools and Equipment. This column lists the reference code identifying the tools or test equipment required, as listed in Section III.

Column 6 - Remarks. Remarks identified by an alphabetical code, where applicable and listed in Section IV and identified in column 6.

Section III - Tool and Test Equipment Requirements. This section consists of five columns, containing the following information:

Tool or Test Equipment Reference Code. This column lists the reference code listed in column 5 - Tools and Equipment in the MAC.

Maintenance Category. This column lists the maintenance category (level) authorized to use the tool or test equipment.

Nomenclature. This column lists the nomenclature of the tools and test equipment.

National Stock Number. This column lists the stock number applicable to each tools or test equipment.

Tool Number. The tool number is listed to aid in identifying the tool or test equipment.

Section IV - Remarks. This section has two columns, containing the following information.

Reference Code. This column contains alphabetical codes or numbers in parentheses corresponding to the codes appearing in the applicable columns in the MAC.

Remarks/Notes. This column contains the actual notes as referenced by the reference codes to the MAC.

c. Appendix C - Repair Parts and Special Tools List. This appendix contains a reference to TM 1-2835-213-23P.

d. Appendix D - Expendable Supplies and Materials List. This appendix consists of two sections as follows:

Section I - Introduction. This section is a summary of what is in the Expendable Supplies and Materials List.

Section II - This section is the Expendable Supplies and Materials List and has four columns, containing the following information:

Column 1 - Item Number. This is the D-number assigned to the expendable item. It is referred to in the detail procedures.

Example: "With lockwire (D15)."

Column 2 - National Stock Number. This is the National Stock Number (NSN) assigned to item. Use it to request or requisition the item.

Column 3 - Description. This column lists the name and if required, a description to identify the item. The last line for each item shows the part number followed by the Commercial and Government Entity Codes (CAGEC) in parentheses, if there is no NSN in column 2.

Column 4 - U/M. This column lists the measure used in performing the maintenance function, expressed as a two-character alphabetical abbreviation (e.g., ea, in., pr).

e. Appendix E - Manufactured Items List. This appendix lists and illustrates any parts you may have to locally manufacture to do a task.

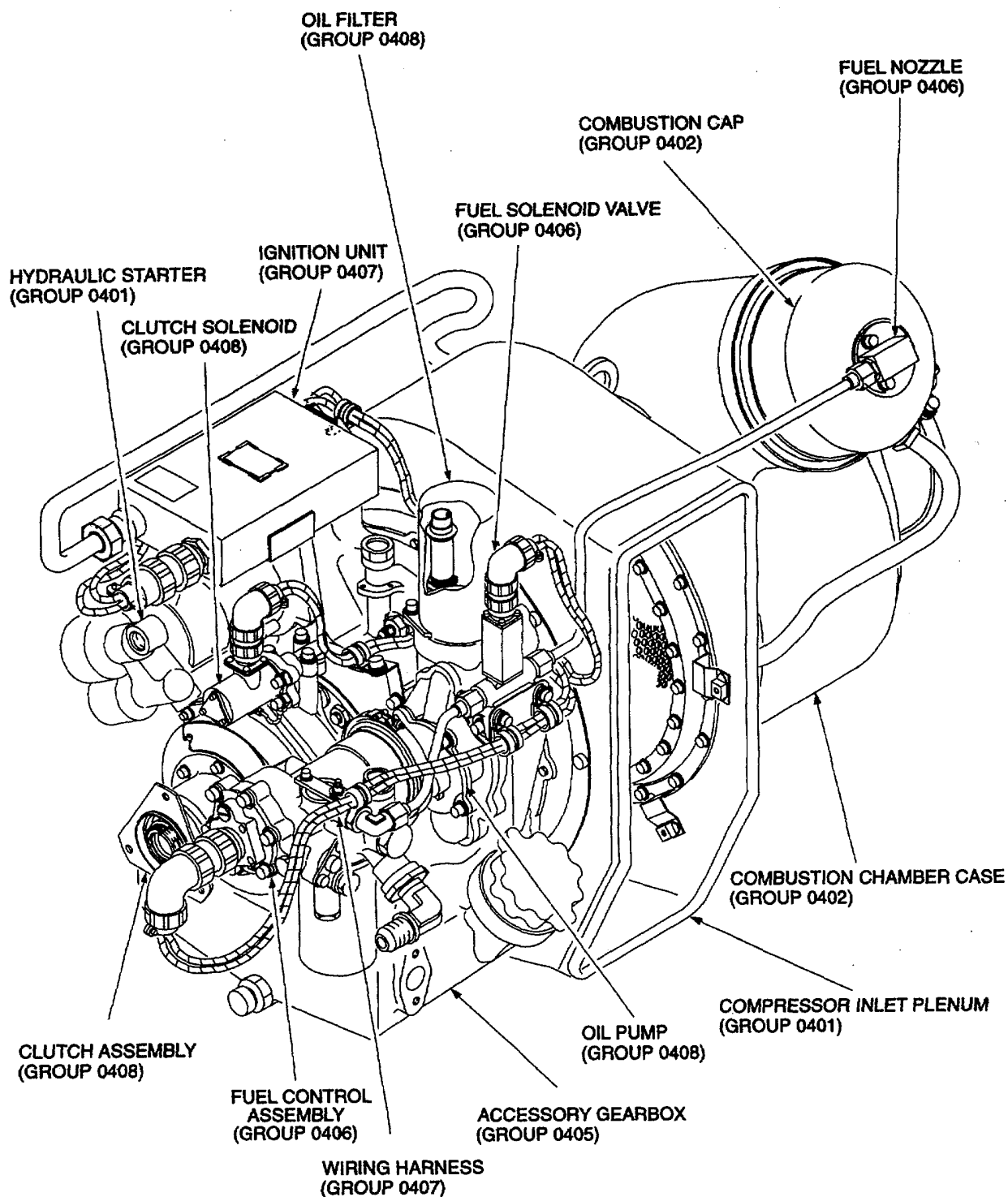
f. Appendix F - Torque Limits. This appendix provides standard torque limits for general type screws, nuts, bolts, fitting and coupling nuts.

## 7. GLOSSARY.

Definitions of abbreviations and unusual terms you find in the manual are listed here to help you.

## 8. INDEX.

This appears at the end of the manual. It lists all subjects in the manual by alphabetical order and the entries are in everyday language of the user. This index contains many possible ways of locating the subject, i.e., pressure fluid filter; fuel inlet filter; filter, fuel; filter, pressure fluid. This is necessary since the official nomenclature is not always readily recognized by the user.



(Group numbers identify the parts to their Functional Code as stated in the Maintenance Allocation Chart (Appendix B))

# CHAPTER 1

## INTRODUCTION AND ENGINE - GENERAL

### SECTION I GENERAL INFORMATION

1-1 **SCOPE**

Type of Manual: Aviation Unit and intermediate Maintenance

Model Number and Equipment Name:  
**GTCP36-55(H)** Shaft Power Gas Turbine Engine Assembly

The **GTCP36-55(H)** auxiliary power unit (APU) is designed to provide shaft power. The APU is coupled through a dry friction output clutch to the aircraft accessory gearbox.

1-2 **MAINTENANCE FORMS, RECORDS AND REPORTS**

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

1-3 **DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE**

#### NOTE

Decision to destroy an APU shall be made by appropriate authority.

Destroy APU to prevent use by enemy when evacuating to safety is not possible. Refer to TM 750-244-I -5.

1-4 **QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)**

Refer to FM 1-511.

1-5 **REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)**

If your auxiliary power unit (APU) needs improvement, let us know. Send us a SF 368 Product Quality Deficiency Report (QDR). You, the user, are the only one ' who can tell us what you don' t like about our equipment. Let us know why you don' t like the design or performance. Mail it to this address:

Commander  
USAAMCOM  
ATTN: **AMSAM-MMC-RE-FD**  
Redstone Arsenal, AL 358986000

1-6 **OFFICIAL NOMENCLATURE NAMES AND DESIGNATIONS**

This listing includes nomenclature cross-references used in this manual.

| <u>Common Name</u>  | <u>Official Nomenclature</u>                   |
|---------------------|------------------------------------------------|
| APU                 | Auxiliary Power Unit                           |
| Compressor Housing  | Gas Turbine Engine Compressor Housing          |
| Fuel Solenoid Valve | Normally Closed Solenoid Valve                 |
| ID Plate            | Identification Plate                           |
| Igniter Plug        | High Voltage, Air Gap Igniter Plug             |
| Igniter Plug Lead   | Electrical Igniter Plug Lead                   |
| Ignition Unit       | High Voltage Capacitor Discharge Ignition Unit |
| <b>Lockwire</b>     | Non-Electrical Wire                            |
| LOP Switch          | Low Oil Pressure Switch                        |
| <b>Monopole</b>     | <b>Motional</b> Pickup Transducer              |
| Oil Pump            | Rotary Pump Assembly                           |
| Plenum Assembly     | Compressor Inlet Plenum Assembly               |
| Relief Valve        | Pressure Relief Valve Assembly                 |
| Thermocouple        | Immersion Thermocouple                         |

1-7 **WARRANTY INFORMATION**

There is no manufacturers warranty provided on this gas turbine engine assembly or its components. Report all defects in material or workmanship to your supervisor who will take appropriate action.