

TECHNICAL MANUAL

AVIATION UNIT AND
AVIATION INTERMEDIATE
MAINTENANCE MANUAL

ENGINE, GAS TURBINE
MODEL T55-L-712
NSN 2840-01-030-4890

HEADQUARTERS, DEPARTMENT OF THE ARMY

26 APRIL 1983

TECHNICAL MANUAL
Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE, GAS TURBINE
MODEL T55-L-712
(NSN 2840-01-030-4890)

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-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax, or the World Wide Web. Our fax number is: DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is: 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028. For the World Wide Web use: <https://amcom2028.redstone.army.mil>.

OZONE DEPLETING CHEMICAL INFORMATION

This document has been reviewed for the presence of class I ozone depleting chemicals. As of the basic through change 10, dated 30 September 1996, all references to Class I ozone depleting chemicals have been removed from this document by substitution with chemicals by the Engineering, Environment, and Logistics Oversight Office that do not cause atmospheric ozone depletion.

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

TABLE OF CONTENTS

	PAGE
HOW TO USE THIS MANUAL	vii
CHAPTER I. INTRODUCTION	1-1
Chapter Overview	1-1
Section I General Information	1-1
Section II Equipment Description and Data	1-3
Section III Principles of Operation	1-13
Section IV Repair Parts; Special Tools; Test, Measurement, and Diagnostic Equipment (TMDE); and Support Equipment	1-41
Section V Service Upon Receipt	1-43
Section VI Hoisting	1-109
Section VII Troubleshooting	1-119
Section VIII Servicing	1-219
Section IX Preventive Maintenance Checks and Services	1-239
Section X Maintenance Procedures	1-443
Section XI Preparation for Storage and Shipment	1-553
Section XII Standard Torque Limits	1-623
Section XIII Standard Practices and Procedures	1-627

NOTE

This manual is printed in four volumes as follows:

TM 55-2840-254-23-1, consisting of Warning Pages, Table of Contents, Chapter 1, and Alphabetical Index.

TM 55-2840-254-23-2, consisting of Warning Pages, Table of Contents, Chapter 2, and Alphabetical Index.

TM 55-2840-254-23-3, consisting of Warning Pages, Table of Contents, Chapter 3 through 5 and Alphabetical index.

TM 55-2840-254-23-4, consisting of Warning Pages, Table of Contents, Chapter 6 through 9, Appendixes A through F, Glossary, and Alphabetical Index.

TABLE OF CONTENTS (Continued)

		Page
CHAPTER 2	COMPRESSOR SECTION - MAINTENANCE INSTRUCTIONS	2-1
	Chapter Overview	2-1
Section I	Interstage Air-Bleed Actuator - Maintenance Procedures	2-5
Section II	Compressor Bleed Band - Maintenance Procedures	2-41
Section III	Anti-Icing Air Gallery Cover - Maintenance Procedures	2-51
Section IV	Compressor Housing - Maintenance Procedures	2-71
Section V	Stator Vane Assemblies - Maintenance Procedures	2-219
Section VI	Compressor Rotor Blades - Maintenance Procedures	2-255
Section VII	Air Diffuser Assembly - Maintenance Procedures	2-351
Section VIII	No. 2 Bearing Package - Maintenance Procedures	2-395
Section IX	Output Shaft Seal and Housing Assembly - Maintenance Procedures . .	2-431
Section X	Inlet Housing Cover Assembly - Maintenance Procedures	2-455
Section XI	Output Shaft Support Housing - Maintenance Procedures	2-465
Section XII	Air Inlet Housing Assembly - Maintenance Procedures	2-497
Section XIII	No. 3 Bearing Package - Maintenance Procedures	2-501
Section XIV	Air Lines Maintenance Procedures	2-525
CHAPTER 3	COMBUSTION SECTION - MAINTENANCE INSTRUCTIONS	3-1
	Chapter Overview	3-1
Section I	Fuel Drain Valve Maintenance Procedures	3-3
Section I I	Combustion Section and Power Turbine - Maintenance Procedures . .	3-11
Section I I I	Combustion Section - Maintenance Procedures	3-151
Section IV	Combustion Chamber Vane Assembly - Maintenance Procedures	3-171
Section V	Combustion Chamber Liner Maintenance Procedures	3-183
Section VI	Combustion Chamber Housing - Maintenance Procedures	3-213
CHAPTER 4	TURBINE SECTION - MAINTENANCE INSTRUCTIONS	4-1
	Chapter Overview	4-1
Section I	Thermocouple Jumper Lead . Maintenance Procedures	4-5
Section II	Left- and Right-Hand Bus Bar Assemblies - Maintenance Procedures .	4-35
Section III	Fireshield Assembly - Maintenance Procedures.	4-65
Section IV	Fireshield Section - Maintenance Procedures	4-79
Section V	Thermocouple Harness Assemblies - Maintenance Procedures	4-97
Section VI	Third Turbine Nozzle and Support - Maintenance Procedures	4-123
Section VI I I	Fourth Stage Power Turbine Rotor - Maintenance Procedures	4-151
Section IX	No. 4 and 5 Bearing Package - Maintenance Procedures	4-185
Section X	Fourth Stage Power Turbine Nozzle - Maintenance Procedures	4-269
Section XI	Third Stage Power Turbine Rotor - Maintenance Procedures	4-303
Section XII	Second Turbine Disc Assembly - Maintenance Procedures	4-313
	Second Turbine Nozzle, Spacer, and Case - Maintenance Procedures	4-335

TABLE OF CONTENTS (Continued)

	Page
CHAPTER 4 (Continued)	
Section XIII First Turbine Disc Assembly - Maintenance Procedures	4-397
Section XIV First Turbine Nozzle - Maintenance Procedures	4-429
Section XV Field Replacement First and Second Turbine Disc Assembly - Maintenance Procedures	4-469
Section XVI Diffuser Curl - Maintenance Procedures	4-479
Section XVII Exit Vane Assembly - Maintenance Procedures	4-489
CHAPTER 5 ACCESSORY GEAR SECTION - MAINTENANCE INSTRUCTIONS.....	5-1
Chapter Overview	5-1
Section I Accessory Gearbox Assembly - Maintenance Procedures	5-3
Section II Accessory Gear Assembly - Maintenance Procedures	5-45
Section III Starter Drive Assembly - Maintenance Procedures	5-81
Section IV Overspeed Drive and Outlet Cover Assembly - Maintenance Procedures	5-99
CHAPTER 6 FUEL SYSTEM - MAINTENANCE INSTRUCTIONS	6-1
Chapter Overview	6-1
Section I Fuel Control - Maintenance Procedures	6-5
Section II Fuel Control - Preparation for Storage or Shipment	6-31
Section III Fuel Boost Pump Assembly - Maintenance Procedures	6-39
Section IV Fuel Boost Pump Assembly - Preparation for Storage or Shipment	6-55
Section V Left- and Right-Hand Fuel Manifold Assemblies - Maintenance Procedures	6-57
Section VI Primer Tube Assembly - Maintenance Procedures	6-101
Section VII Start Fuel Nozzles - Maintenance Procedures	6-111
Section VIII Main Fuel Filter and Bracket - Maintenance Procedures	6-119
Section IX In-Line Fuel Filter Assembly - Maintenance Procedures	6-141
Section X Flow Divider and Bracket - Maintenance Procedures	6-159
Section XI Fuel Check Valve - Maintenance Procedures	6-171
Section XII Starting Fuel Solenoid Valve - Maintenance Procedures	6-177
Section XIII Fuel Lines - Maintenance Procedures	6-189
CHAPTER 7 ELECTRICAL AND IGNITION SYSTEMS - MAINTENANCE INSTRUCTIONS	7-1
Chapter Overview	7-1
Section I Ignition Coil and Cable Assembly - Maintenance Procedures	7-3
Section II Spark Igniters - Maintenance Procedures	7-69
Section III Ignition Exciter - Maintenance Procedures	7-85
Section IV Main Electrical Cable Assembly - Maintenance Procedures	7-99

TABLE OF CONTENTS (Continued)

		Page
CHAPTER 8	LUBRICATION SYSTEM -MAINTENANCE INSTRUCTIONS	8-1
	Chapter Overview	8-1
Section I	Main Oil Pump and Scavenge Oil Screen - Maintenance Procedures	8-7
Section II	Oil Cooler Assembly - Maintenance Procedures	8-21
Section II.1	Check Valve Assembly - Maintenance Procedures	8-40.1
Section III	Oil Temperature Transmitter - Maintenance Procedures	8-41
Section IV	Oil Filler Assembly and Oil Filler Strainer - Maintenance Procedures	8-47
Section V	Oil Filter Cap and Stem Assembly and Oil Filter Element - Maintenance Procedures	8-63
Section VI	Dual Chip Detector - Maintenance Procedures	8-73
Section VII	Oil Lines - Maintenance Procedures	8-93
Section VIII	Starter Gearbox Filter - Maintenance Procedures	8-249
Section IX	No. 2 Bearing Pressure Oil Strainer - Maintenance Procedures	8-257
Section X	No. 4 and 5 Bearing Filter - Maintenance Procedures	8-263
Section XI	Oil Drain Cock - Maintenance Procedures	8-279
Section XII	Chip Detector - Maintenance Procedures	8-287
Section XIII	Oil Level Detector - Maintenance Procedures	8-301
Section XIV	Oil Level Float Assembly - Maintenance Procedures	8-335
CHAPTER 9	TORQUEMETER SYSTEM - MAINTENANCE INSTRUCTIONS	9-1
	Chapter Overview	9-1
Section I	Torquemeter Junction Box - Maintenance Procedures	9-3
Section II	Output Shaft - Maintenance Procedures	9-19
Section III	Torquemeter Junction Box - Maintenance Procedures	9-39

TABLE OF CONTENTS (Continued)

		Page
APPENDIX A	REFERENCES	A-1
APPENDIX B	MAINTENANCE ALLOCATION CHART	B-1
APPENDIX C	EXPENDABLE SUPPLIES AND MATERIALS LIST	C-1
APPENDIX D	WIRING DIAGRAMS	D-1
APPENDIX E	ILLUSTRATED LIST OF MANUFACTURED ITEMS	E-1
APPENDIX F	ABBREVIATIONS	F-1
	GLOSSARY	GLOSSARY-1
	SUBJECT INDEX	INDEX-1

HOW TO USE THIS MANUAL

OVERVIEW

This information gives a general description of the entire manual and how to use it along with the repair parts and special tools list (TM 55-2840-254-23P). If you cannot find information, you cannot do the job. Learning how to use this manual can help. Check how the manual is put together and how its system works.

1. DESCRIPTION OF MANUAL

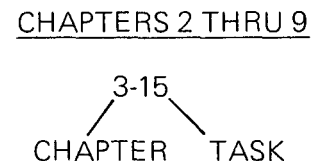
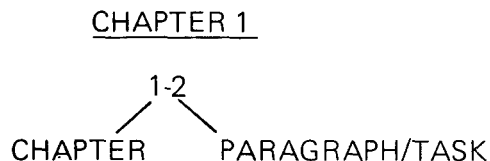
This manual has nine chapters and six appendixes. Each chapter is divided into sections. Each section in Chapter 1 is divided into paragraphs or tasks. Each section in Chapters 2 thru 9 is divided into tasks. The tasks tell you what you need and how to do any job. The paragraphs have specific information you will need to know. The appendixes have general information you will need to know. They list references, expendable supplies and materials etc.

A. Chapters. Chapters divide the manual into usable engine maintenance groups. They align with standard groupings shown in the MAC chart. Refer to Appendix B.

B. Sections. Sections divide the chapters into smaller groups. They have information about the components of parts for which the chapter is titled. They align with components shown in the MAC chart. Refer to Appendix B.

C. Paragraphs/Tasks. Paragraphs make up some of the sections in Chapter 1. They contain specific information about the engine. Tasks make up some of the sections in Chapter 1 and the sections in Chapters 2 thru 9. It is the tasks that have the information you need to do any job. The upper heading after the task number is the task name. It tells the job to be done in the task. The task heading at the top of each page specifies the task to be performed and the lowest maintenance level authorized to perform that task. Tasks to be accomplished by the Aviation Intermediate Maintenance level only will be reflected by the term (AVIM) at the end of the task heading. If the term (AVIM) is not at the end of the task heading, then either the Aviation Unit or Aviation Intermediate Maintenance (AVUM) or (AVIM) level can accomplish that task. All paragraphs and tasks are numbered. This helps you find what you need when you need it. **USE THE INDEX TO FIND THE PARAGRAPH OR TASK YOU NEED. DO NOT USE PAGE NUMBERS.** Paragraphs and tasks are numbered as follows:

(1) Two-element numbers are used as shown in the examples:

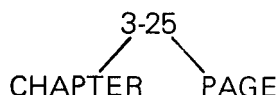


(2) The first number is the number of the chapter. The second number is the paragraph or task in that chapter. The two elements are separated by a dash.

HOW TO USE THIS MANUAL (Continued)

D. Page Numbers. Pages are numbered by order of chapters, from front to back of manual. They are used as follows:

- (1) Two-element numbers are used as shown in the example:



- (2) The first number is the number of the chapter. The second number is the page in that chapter.

E. Initial Setup Tables. An initial setup table is the first part of every task in the manual. It lists information you will need to know before you can do the job. How to prepare the work area, what tools will be needed, and other critical information are listed when they apply. The following headings are used when they apply.

- (1) Applicable Configuration. If the task does not apply to all engine configurations, different configurations covered by the same procedure will be brought to your attention.

- (2) Tools. Tools, tool kits, or shop sets needed to do the task are listed here. If tools from your repairman's tool kit are needed, the kit is listed. Individual tools from your shop set are listed, as needed, by name, type, and size. Tools you need that are not in the kit or set, are listed by name, type, and size. Special tools and test and support equipment are listed by a T-number. Find these items in Table 1-1.

- (3) Materials. This heading lists all expendable items and support materials (things you normally use up doing a job). These are things like solvent, rags, grease, safety wire, etc. They are listed by an E-number; example: Grease (E23). Find these items in Appendix C.

- (4) Parts. This heading lists all mandatory replacement parts (parts you must replace if you expose or remove them during the task). These are things like gaskets, packings, cotter pins, lockwashers, etc. They are listed by RPSTL nomenclature.

- (5) personnel Required. This heading lists the people needed to do the job. They are identified by their MOS. The heading identifies the MOS and the recommended skill level to accomplish the subject task. The assigned skill level should not be construed as the only skill level authorized to accomplish that task. The Maintenance Allocation Chart (MAC) (Ref. Appendix B) assigns maintenance functions to the authorized maintenance level without regard to the MOS skill level. When more than one of any MOS is needed, the number needed is shown in parentheses. The text will tell you when the additional MOS is needed.

- (6) References. This heading lists related tasks and TM's you will need to do the job. The task steps tell you when these tasks and TM's are needed.

- (7) Equipment Condition. This heading lists all the things to be done before you start the job. To help, the number of the task that tells you how to do them is given when applicable.

HOW TO USE THIS MANUAL (Continued)

NOTE

All tasks covered in this manual are off helicopter tasks. If a task is an off engine task, it will be brought to your attention under "Equipment Condition." Example: "Off Engine Task."

(8) **General Safety Instructions.** Safety precautions that must be observed when you are doing the job are described under this heading. Warnings also include basic first aid instructions.

F. **Locator Illustrations.** When needed (for removal, installation and other procedures) a locator illustration is included on or facing initial setup pages. They show you the area of the engine to be worked on. Parts involved in the task are called out.

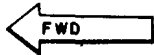
G. **Illustration Arrows.** You will find five types of arrows used. They are shown below:



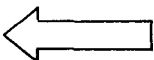
Locator arrow used to show parts that cannot be easily seen or to indicate area of engine being worked on.



Index arrow used to identify parts on artwork.



Direction arrow used to indicate position; i.e., fwd, aft.



Movement arrow used to indicate direction of movement.



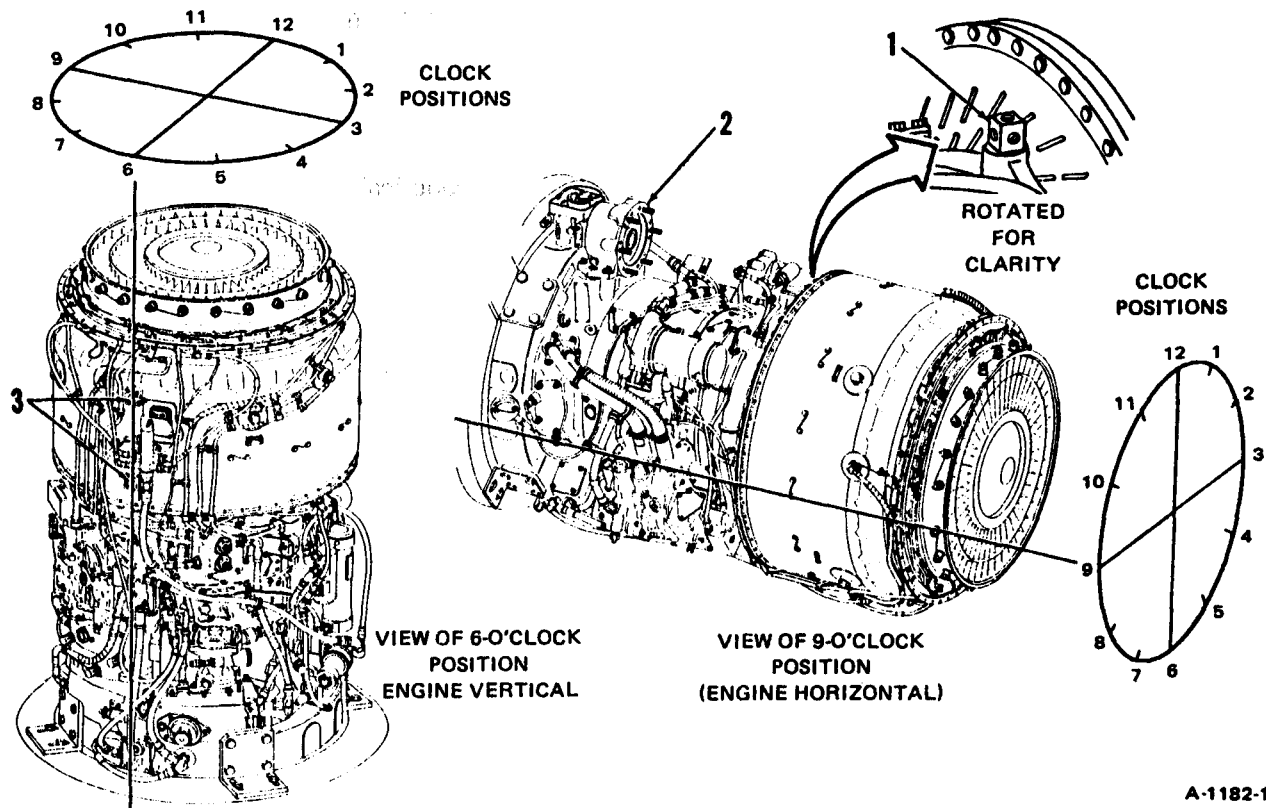
Movement arrow used to indicate direction of rotation.

H. **Procedures.** Step by step procedures tell you how to do the job. They are arranged in logical sequence to help you get the job done efficiently.

HOW TO USE THIS MANUAL (Continued)

I. Use of Clock Positions. Many procedures contain references to or views of clock positions. Comparing engine to face of clock is an easy way to locate specific engine areas. To help find clock positions on the engine, remember the following:

- (1) Clock position is always determined from rear of engine.
- (2) Once a clock position is determined from rear of engine, visualize that clock position along entire length of engine.
- (3) Hoist adapter (1) and starter drive assembly (2) are mounted at the 12-o'clock position.
- (4) Two fuel drain valves (3) are mounted at the 6-o'clock position.
- (5) Some procedures show engine mounted vertical in maintenance stand. This does not change the method for finding clock positions on the engine.



A-1182-1

HOW TO USE THIS MANUAL (Continued)

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

K. 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:

Columns 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.

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

Column 6 - Remarks. Remarks identified by an alphabetical code, where applicable, are 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/NATO Stock Number. This column lists the stock number applicable to each tool 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 cross-referenced by the reference codes to the MAC.

HOW TO USE THIS MANUAL (Continued)

L. Appendix C - Expendable Supplies and Materials List. This appendix lists all expendable supplies and materials called out in the manual. The following columns are provided.

(1) Item Number. This is the E-number assigned to the expendable item. It is referred to in the detail procedures. Example: "Use cleaning solution (E11)."

(2) National Stock Number. This is the national stock number assigned to the item. Use it to request or requisition the item.

(3) Description. This column lists the Federal name and, if required, a description to identify the item. The last line for each item shows the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

M. Appendix D - Wiring Diagrams. This appendix contains the engine wiring diagram. Use this appendix to help you understand the description of the engine electrical system.

N. Appendix E - Illustrated List of Manufactured Items. This appendix lists and illustrates any parts or tools you may have to make to do a job.

O. Appendix F - Abbreviations. This appendix lists abbreviations you will find in the manual.

P. Glossary. Definitions of terms you find in the manual are listed hereto help you.

Q. Index. This appears at the end of the manual. It lists all subjects in the manual by alphabetical order. Items are listed as follows:

(1) Each paragraph/task number is listed with the subject it applies to:

Example:

	<u>Para./ Task</u>	<u>Page</u>
Fuel Boost Pump Assembly		
Clean	.6-10	6-42
Inspect	.6-11	6-43
Install	.6-13	6-48
Package	6-15	6-56
Preserve	.6-14	6-55
Remove	.6-9	6-39
Repair	.6-12	6-44

HOW TO USE THIS MANUAL (Continued)

(2) Some tasks are listed by the job to be done. The subjects or components are listed under them.

Example:

	Para./ Task	Page
Remove		
Accessory Gear Assembly (AVIM)	5-8	5-45
Accessory Gearbox Assembly	5-1	5-3
Air Diffuser Assembly (AVIM)	2-36	2-351
Anti-Icing Air Gallery Cover	2-14	2-51

Check over the index and see how it can work for you. It can make finding information easy.

R. Part Numbers. Part numbers are not listed in this manual except where absolutely needed for clarity. You can find the part number you need in the Repair Parts and Special Tools List (RPSTL) (TM 55-2840-254-23P).

2. HOW TO FIND WHAT YOU NEED

A. General Information (Troubleshooting).

(1) Look at the "INDEX." Find "Symptom Index." The "INDEX" gives the paragraph number for the symptom index. Go to the Symptom Index.

(2) Find your symptom in the "Symptom Index." Next to the symptom is the page number of the troubleshooting procedure that will help you solve your problem. Turn to the troubleshooting procedure page.

(3) Follow the troubleshooting procedure until you find the problem. The troubleshooting procedure gives you the task number of the maintenance procedure needed to fix the engine. Turn to that task.

(4) Follow the maintenance procedure and complete all work. Check again and make sure you are right. When the job is done, recheck that the trouble has been corrected.

B. Part Numbers. To find a part number go to the RPSTL (TM 55-2840-254-23P). Find the "How To Locate Repair Parts" paragraph in the introduction. It will tell you how to find your part number.

C. Tasks. To find any task, use the "INDEX." Find the subject you want. The "INDEX" gives you the task number you want.

HOW TO USE THIS MANUAL (Continued)

3. HOW TO PREPARE FOR A TASK

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

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

A. If a tool has a T-number in front of it, go to the Special Tools and Test and Support Equipment List in Table 1-1. Read down the far left-hand column to your T-number. This is the tool you need for your task.

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

C. If parts are listed, they can be drawn from supply. Before you start the job, check and make sure you can get the needed parts. Part numbers are listed in TM 55-2840-254-23P.

D. Check for personnel required.

E. If preliminary procedures are listed under "Equipment Conditions," BE SURE THE LISTED JOBS ARE DONE; then do this job.

4. HOW TO DO THE JOB

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. Always follow standard maintenance practices (Chapter 1, Section XIII).

C. When values are underlined or followed by the word INSPECT, an inspector must OK the completed step.

D. Major steps and key words are printed in bold type for experienced repairers.

E. A GLOSSARY is provided. It lists the special words and terms used in this manual and gives their meaning. Use it. It may help you understand the instructions.

CHAPTER 1

INTRODUCTION AND ENGINE GENERAL

CHAPTER OVERVIEW

This chapter contains standard data and information about forms, records, reports, and general procedures. It also contains descriptions and other data about the engine and its major components. The chapter is divided into the following sections:

SECTION	<u>TITLE</u>	PAGE
I	General Information	1-1
II	Equipment Description and Data	1-3
III	Principles of Operation	1-13
IV	Repair Parts; Special Tools; Test, Measurement, and Diagnostic Equipment (TMDE); and Support Equipment	1-41
V	Service Upon Receipt	1-43
VI	Hoisting	1-109
VII	Troubleshooting	1-119
VIII	Servicing	1-219
IX	Preventive Maintenance Checks and Services	1-239
X	Maintenance Procedures	1-443
XI	Preparation for Storage and Shipment	1-553
XII	Standard Torque Limits	1-623
XIII	Standard Practices and Procedures	1-627

Section I. GENERAL INFORMATION

1-1 SCOPE

Type of Manual:

Aviation Unit and Aviation Intermediate Maintenance Manual

Model Numbers and Equipment Name:

T55-L-712 - Engine, Gas Turbine

Purpose of Equipment:

Powerplant for CH-47 Helicopter

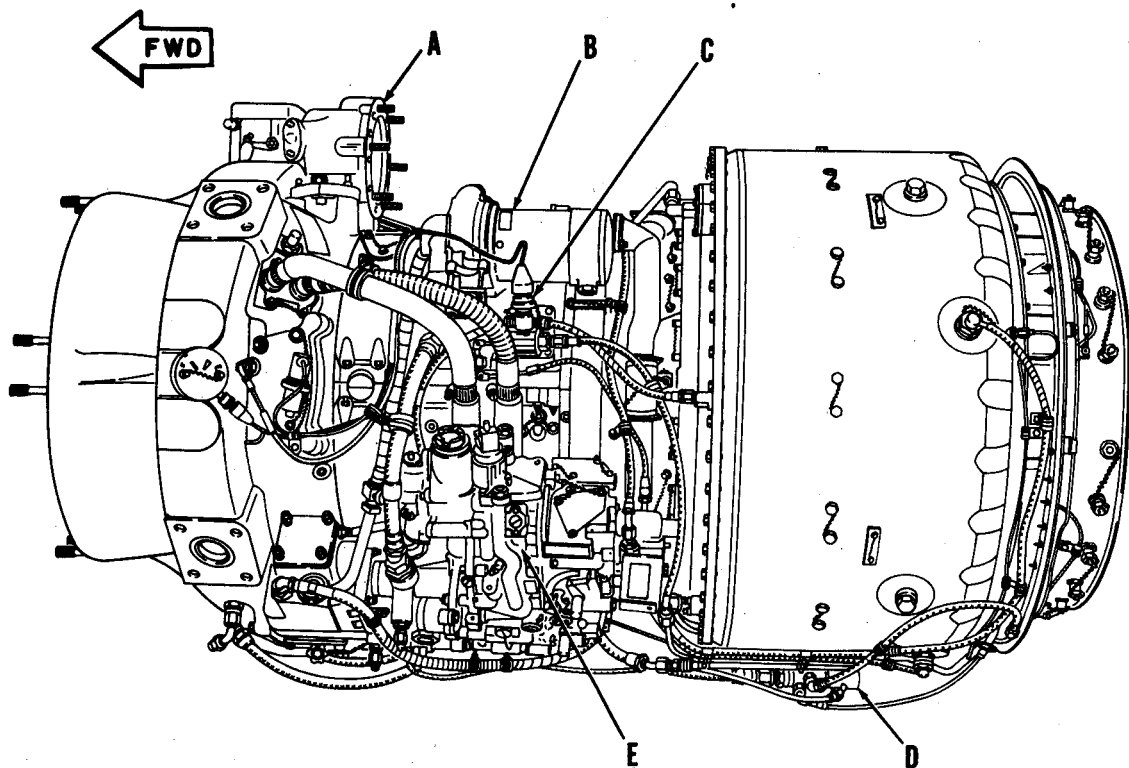
1-2 MAINTENANCE FORMS, RECORDS, AND REPORTS

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

1-9 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Get to know your engine. The major components are listed and keyed in the following diagrams.

- A STARTER DRIVE ASSEMBLY. Mounts at the 12-o'clock position on the inlet housing and provides the mounting pad for the starter. Internally connects to a shaft which is connected by gearing to the compressor rotor.
- B MAIN FUEL FILTER. Filters fuel prior to delivery to the engine fuel control. Provides a visual indication when it is close to bypassing its element because of clogging.
- C STARTING FUEL SOLENOID VALVE. Controls fuel flow to the starting fuel primer tube and start fuel nozzles. Activated by airframe-mounted switch.
- D FLOW DIVIDER. Mounts at the bottom of the combustion section. Divides fuel flow from in-line fuel filter into primary and secondary flows to the main fuel manifolds.
- E FUEL CONTROL. Mounts on the accessory drive gearbox. Isa hydromechanical device containing a fuel pump, gas producer and power turbine speed governors, an acceleration and deceleration control, an air-bleed signal mechanism, and a fuel shutoff valve.



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