ATP Grid Index to Manufacturer's Publications:

Pratt & Whitney
JT12A-6,-6A,-8 And JFTD12A-4A,-5A
Overhaul Manual

Section Topic

General Information

Title Page
Manufacturer's Introduction
Record of Revisions
Record of Temporary Revisions
Letter of Transmittal (Highlights of Changes)
List of Effective Sections
How to use

Aircraft General

05.00.00	lime Limits/Maintenance Checks
05.00.00	List of Effective Pages
05.10.00	General
05.10.00	Instructions for Continued Airworthiness
05 10 01	Airworthiness Limitations

Power Plant

72.00.00	Engines
72.00.00	List of Effective Pages
72.00.00	Highlights
72.00.00	General General
72.00.00	Description
72.00.00	Overhaul Tools
72.00.00	Dismantling/Disassembly
72.00.00	Cleaning
72.00.00	Inspection, Repair, and Replacement
72.00.00	Assembly of Subassemblies

<u>Section</u>	<u>Topic</u>
72.00.00	Temporary Revision No. 72-0001
72.00.00	Final Assembly
72.00.00	Testing
72.00.00	Temporary Revision No. 72-0005
72.00.00	Table of Limits
72.20.00	General
72.20.00	Engine Inlet
72.20.00	Inspection, Repair, and Replacement
72.30.00	General
72.30.00	Eng Compressor
72.30.00	Inspection, Repair, & Replacement-01
72.30.00	Temporary Revision No. 72-0002
72.30.00	Inspection, Repair, & Replacement-02
72.30.00	Temporary Revision No. 72-0003
72.30.00	Inspection, Repair, & Replacement-03
72.30.00	Inspection, Repair, & Replacement-04
72.30.00	Inspection, Repair, & Replacement-05
72.30.00	Inspection, Repair, & Replacement-06
72.30.00	Inspection, Repair, & Replacement-07
72.30.00	Inspection, Repair, & Replacement-08
72.40.00	General
72.40.00	Engine Combustion
72.40.00	Inspection, Repair, and Replacement
72.50.00	General
72.50.00	Engine Turbine
72.50.00	Inspection, Repair, and Replacement-01
72.50.00	Inspection, Repair, and Replacement-02
72.50.00	Inspection, Repair, and Replacement-03
72.50.00	Temporary Revision No. 72-0004
72.50.00	Inspection, Repair, and Replacement-04
72.50.00	Inspection, Repair, and Replacement-05
72.50.00	Inspection, Repair, and Replacement-06
72.50.00	Inspection, Repair, and Replacement-07
72.50.00	Inspection, Repair, and Replacement-08
72.60.00	General
72.60.00	Engine Gearbox
72.60.00	Inspection, Repair, and Replacement
72.60.00	Engine Gearbox Section
72.60.00	Power Lever Cross Shaft
72.60.00	Power Lever Cross Shaft Support
72.60.00	Main Oil Pressure Relief Valve

<u>Section</u>	Topic
72.60.00	Main Oil Pump
72.60.00	Accessory and Component Drive Gearshafts
72.60.00	Accessory and Component Drive Gearbox Housing
72.60.00	Main Component Drive Gearshaft Upper Bearing Support
72.60.00	Main Component Drive Gearshaft Upper Bearing Housing
72.60.00	Generator and Starter Bearing Support
72.60.00	Fuel Control Drive Boss Assembly
72.60.00	Component Drive Main Gearbox Housing Cover Assembly
72.60.00	Hydraulic Pump Drive Bearing Support Assembly
72.60.00	Free Turbine Speed Sensing Flexible Shaft Assembly
73.00.00	Engine Fuel and Control
73.00.00	List of Effective Pages
73.00.00	Highlights
73.00.00	General
73.00.00	Fuel Components - General
73.00.00	Fuel Differential Fluid Pressure Switch
73.00.00	Fuel Diecing Heater
73.00.00	Fuel Deicing Shutoff Valve and Actuator
73.00.00	Fuel Manifolds
73.00.00	Fuel Nozzles
73.00.00	Fuel Pressurizing and Pump Valve
74.00.00	Ignition
74.00.00	List of Effective Pages
74.00.00	Highlights
74.00.00	General
75.00.00	Air
75.00.00	List of Effective Pages
75.00.00	Highlights
75.00.00	General
75.00.00	Accessories
77.00.00	Engine Indicating
77.00.00	List of Effective Pages
77.00.00	Highlights
77.00.00	General
77.00.00	Engine Indicating Components - General
77.00.00	Thermocouples
77.00.00	Thermocouple Cable

09/17/2008

Copyright ® Aircraft Technical Publishers Page 3 of 4

Section	Гортс
77.00.00	Free Turbine Pressure Sensing Manifolds
77.00.00	Pt2 Compressure Inlet Total Pressure Probe
79.00.00	0il
	011
79.00.00	List of Effective Pages
79.00.00	Highlights
79.00.00	General
79.00.00	Oil Components - General
79.00.00	Fuel Coolant Oil Cooler
79.00.00	Oil Tank Bracket
79.00.00	0il Tank
79.00.00	Oil Cooler Fuel Outlet Elbow

*** End of Index ***

JT12A-6, -6A, AND -8 TURBOJET ENGINES AND JFTD12A-A AND -5A FREE TURBINE ENGINES

OVERHAUL MANUAL

PART NO. 435108

VOLUME NO. 1 OF 2 VOLUMES

This document, and the information contained herein, is the property of United Technologies Corporation (UTC). UTC produces this document for the purpose of supporting engine certification requirements and, of providing applicable information related to the proper use, maintenance, inspection, repair, servicing and parts application of Pratt & Whitney engine products and services, and not for the purpose of manufacturing parts or developing repairs. By accepting this document recipient agrees to limit distribution of this document within recipient's company or to a third party for providing services to recipient consistent with the permitted uses of this document and information contained therein. You cannot possess, use, copy or disclose this document or any information in it, for any purpose other than that stated above, without UTC's express written permission.

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INITIAL ISSUE DATE JANUARY 1/61

REVISED MAY 1/08

FAA APPROVED/ACCEPTED

The Federal Aviation Administration (FAA) has reviewed the Instructions for Continued Airworthiness (ICA) submitted pursuant to FAA Part 33 for the engine models listed. The ICA were found to be acceptable and the Airworthiness Limitations Section contained therein is hereby approved.



RECORD OF REVISIONS



MFG REV NO	DESCRIPTION	ISSUE DATE	ATP REV DATE	INSERTED BY
72	See Highlights	5/31/95	6/15/95	ATP/MB
73	See Highlights	3/15/97	5/15/97	ATP/ES
	Erratum	4/3/97	5/15/97	ATP/ES
	Correction dated 3/15/97	3/15/97	9/1/04	ATP/JB
74	See Highlights	4/01/2007	9/27/07	ATP/GM
75	See Highlights	5/1/08	7/3/08	ATP/MT
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Pratt & WhitneyJT12A OVERHAUL MANUAL (PN 435108)

RECORD OF REVISIONS

REV. NO	INSERTION DATE BY	REV. NO.	INSERTION DATE	BY	REV. NO.	INSERTION DATE	BY
74	4/01/07 ATP/GM						
7-5	4/3/08 ATP/MT		<u></u>				
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Pratt & Whitney
JT12A OVERHAUL MANUAL (PN 435108)

LIST OF REVISIONS

REV NO.	DATE	REV NO.	DATE	REV NO.	DATE	REV NO.	DATE
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54	AUG 1/72	İ			İ	İ	
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56	AUG 1/73	İ				İ	
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58	MAR 1/74						
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60	SEP 1/74						
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62	NOV 15/76	-					
63	MAY 15/76					1	Į
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RECORD OF TEMPORARY REVISIONS



TEMP REV NO	DESCRIPTION	ISSUE DATE	ATP REV DATE	INSERT BY	DATE REMOVED	REV INCOR	REMOVE BY
18	Section 11:11-20	3/25/98	4/16/98	ATP/JRS	9/24/07	74	ATP/GM
19	Section 7:7-28C/7-28D	3/11/03	5/22/03	ATP/MT	9/24/07	74	ATP/GM
72-0001	72-00-00:704-706,708-710, 713, 715,723,726,729	5/1/08	7/3/08	ATP/MT			
72-0002	713. 715.723.726.729 72-30-00:612,617,619,621- 624	"	п	"			
72-0003	72-30-00:601-612,614-617, 619,621-648,650-686	"	п	"			
72-0004	72-50-00:665-666	*1	11				
72-0005	72-00-00:983-998Q	9/11/08	9/25/08	ATP/RCL		1	
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Pratt & WhitneyJT12A OVERHAUL MANUAL (PN 435108)

RECORD OF TEMPORARY REVISIONS

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TEMP.	ISSUE	INSERT		TEMP.	ISSUE	INSERT	REMOVAL
REV.	DATE	DATE	DATE BY	REV.	DATE	DATE	DATE BY
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72-0001	5/1/08	7/3/08					,
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72-0005	9/11/08	9/25/08					
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JT12 OVERHAUL MANUAL (PN 435108)

TEMPORARY REVISION NO. 72-0005

PURPOSE: This Temporary Revision adds a tool to help with bleed

actuation checks during JFTD12 engine test.

APPLICABLE MANUAL REVISION: Revision Number 075.

TR FILING INSTRUCTIONS: For a printed manual, put this Temporary Revision in the manual location specified below. Write the Temporary Revision Number on the Record of Temporary Revisions adjacent to the Volume 1 Title Page. For a CD-ROM version of this manual, put this Temporary Revision in in the reference file in sequence by Chapter/Section to show that this Temporary Revision is added to the manual.

MANUAL LOCATION:

CHAPTER/SECTION PROCEDU	JRE LOCATION
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72-00-00 Testing 983

CHANGED DATA:

CHAPTER/ SECTION	PAGE NO	DESCRIPTION OF CHANGE	EFFECT OF CHANGE
72-00-00 TESTING	983 -985 994R	Added test probe to help with bleed actu-ation checks during engine test. (EA 08JC007A)	-ALL

JT12A ENGINE MANUAL (PN 435108)

TO: RECIPIENTS OF THE JT12A/JFTD12 OVERHAUL MANUAL, PART NUMBER 435108

REVISION NO. 75 DATED MAY 1/08

TEMPORARY REVISION HIGHLIGHTS

<u>INACTIVE</u>

The Temporary Revisions that follow are now inactive. Remove these Temporary Revisions from all applicable manuals or files.

Temp. Rev. No. Manual Location Remarks Effectivity

None.

ACTIVE

The Temporary Revisions that follow are active. Keep these and all subsequent Temporary Revisions until otherwise directed.

Temp. Rev. No. Manual Location Remarks Effectivity

None.

TEMPORARY REVISION HIGHLIGHTS
PAGE 1



Pratt & Whitney 400 Main Street East Hartford, CT 06108

May 1, 2008

Subject: JT12A-6,-6A,-8/JFTD12A-4A,-5A Overhaul Manual, PN 435108, Revision

Number 75, dated May 1, 2008

Please put these revision pages in the manual and remove the superseded pages as shown in the applicable Lists of Effective Pages.

Make a record on the Record of Revisions Sheet that this revision was put in the manual.

A document evaluation form has been included with this revision to assist us in improving the quality of our technical manuals. Please distribute this form to the end-user of this document for completion.

If there is a question about manual content, please send it to Thomas Mann, Supervisor, Technical Writing, Maintenance Data Engineering. The telephone number is (860) 565-2994 and the fax number is (860) 565-4503.

To be sure that revision service is continuous, please send all changes in address or revision requirements to me.

Sincerely,

Joan C. Olson

Supervison Distribution

Maintenance Data Engineering

JT12 OVERHAUL MANUAL (PN 435108)

LIST OF EFFECTIVE SECTIONS

The current date levels of Lists of Effective Pages in this manual are specified in this List of Effective Sections. Revised or added sections for this revision are indicated by an "R" mark.

This List of Effective Sections records not only the dates of sections revised or added in this revision, but also the dates of all other List of Effective Pages remaining in the manual that are not revised or added. If there is a question about the correct date level of a section in this manual, it is recommended that all Lists of Effective Pages be examined to see if they have the correct dates as specified below.

This list is revised with each revision of the manual.

		Introduction	APR	1/07
		How To Use	APR	1/07
		Time Limits	APR	1/07
R	72-00	Engine General	MAY	1/08
	72-20	Engine Inlet	APR	1/07
R	72-30	Engine Compressor	MAY	1/08
R	72-40	Engine Combustion	MAY	1/08
R	72-50	Engine Turbine	MAY	1/08
R	72-60	Engine Gearbox	MAY	1/08
R	73-00	Fuel	MAY	1/08
	74-00	Ignition	APR	1/07
	75-00	Air	APR	1/07
	77-00	Engine Indicating	APR	1/07
	79-00	Oil	APR	1/07

JT12 OVERHAUL MANUAL (PN 435108)

CHAPTER 72

INTRODUCTION

TABLE OF CONTENTS

SUBJECT	CHP/SEC/SUB	PAGE	EFFECTIVITY
INTRODUCTION			
Introduction		001	-ALL
General		001	
Supplementary Manuals		001	
Customer Technical Serv	rices	002	
Parts Support		002	
returning Parts		003	
Trade Name Products		004	
Equivalent Tools, Fixtu	res		
And Test Equipment		005	
Parts Cleaning/Inspecti	on/		
Repair Sequence		005	
R Repair Vendors		007	
Component Vendors		009	
Revision Symbol		010	
Limits		010	
Directional References		010	
Combustion Chamber Numb	ering	010	
Main Bearing Numbering		010	

JT12 OVERHAUL MANUAL (PN 435108) LIST OF EFFECTIVE PAGES

Please insert the revised pages into this manual and delete obsoleted pages in accordance with the following List of Effective Pages. Revised pages are indicated by the letter "R", added pages by the letter "A", and deleted pages by the letter "D". Superseded pages shall be removed and destroyed.

The List of Effective Pages records not only each page of subject revision but also each previously issued page which is still current. Blank pages and pages which are no longer current do not appear on this list. If there is any question about the currency of the maintained copy, it is recommended that each page of the manual be checked off against this List of Effective Pages. Any page which does not check out with this list, either by number or by date, shall be discarded. This list is reissued in its entirety whenever this manual section is revised.

CHAPTER/				CHAPTER/			
SECTION	PAGE	EFFECTIVITY	DATE	SECTION	PAGE	EFFECTIVITY	DATE

Tab Separator - Introduction

List of Effective Pages - Introduction See end of list.

Table of Contents - Introduction

R	01/ 02		APR	1/07
	001	-ALL	APR	1/07
	002		APR	1/07
	003		APR	1/07
	004		APR	1/07
R	005		APR	1/07
R	006		APR	1/07
R	007		APR	1/07
	008		APR	1/07
	009		APR	1/07
			APR	1/07
				1/07
	012		APR	1/07
	R	R 005 R 006 R 007 R 008 009	001 -ALL 002 003 004 R 005 R 006 R 007	001 -ALL APR 002 APR 003 APR 004 APR 004 APR R 005 APR R 006 APR R 007 APR R 008 APR 009 APR 010 APR 011 APR

LIST OF EFFECTIVE PAGES

APR 1/07

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

1. General

- A. This manual is compiled and issued by the Maintenance Data Engineering (MDE) Department of Pratt & Whitney, a Division of United Technologies Corporation, located in East Hartford, Connecticut USA. It includes approved and recommended procedures required to maintain the JT12 Series engine. The information and instructions contained herein are based upon actual experience acquired under varied and exacting conditions. The utmost in dependable engine performance can be gained by following these instructions.
- B. The descriptive and operational illustrations in this manual are prepared from a basic engine. However, the service operations illustrated are generally applicable in procedure, if not in appearance, to the current model. Unusual problems concerning engine overhaul should be presented to the Customer Technical Services Department, either through a field representative or by direct contact. All possible assistance will be provided toward the solution of these problems.
- C. Pratt & Whitney welcomes requests for pertinent information not covered in this manual, as well as suggestions for modification or amplification of these instructions in order to increase their usefulness.
- D. This manual will be revised as necessary to incorporate the latest approved data.

2. Supplementary Manuals

- A. It is recommended that personnel concerned with engine overhaul also familiarize themselves with the following manuals:
 - (1) The Maintenance Manual, PN 435107, contains the instructions required for the maintenance of engines covered by this manual.
 - (2) The Illustrated Parts Catalog, PN 435109, lists and illustrates all salable parts of the engines covered in this manual.
 - (3) Service Bulletins will be issued, as required, to provide information or instructions for modifying earlier production engines or parts to the latest configuration.

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

(4) The Turbojet Engine Overhaul Standard Practices Manual, PN 585005, contains approved and recommended standard practices information, instructions, and procedures, which are used repeatedly on engines covered by this manual. Repair processes, inspection procedures, and accept/reject criteria contained herein should be used together with the Pratt & Whitney Standard Practices Manual. In the event of a conflict, the information specified in this manual takes precedence.

NOTE: In many cases, supplementary information (such as coating thicknesses, cleaning processes, non-destruction inspections, riveting requirements, and other specific information) is necessary when you perform the procedures in this manual. In each case, use the information specified in the Pratt & Whitney Standard Practices Manual, PN 585005 together with the instructions in this manual.

3. <u>Customer Technical Services</u>

A. Pratt & Whitney maintains a Customer Technical Services
Department to assist its customers in the operation,
maintenance, and overhaul of Pratt & Whitney engines.
Customer Technical Services representatives maintain contact
with operators and engine service activities and are
available for the investigation of any specific difficulty or
problem. All requests for assistance should be addressed
directly to the Customer Technical Services Department, Pratt
& Whitney, East Hartford, Connecticut USA.

4. Parts Support

- A. Refer to the Illustrated Parts Catalog to order parts whenever possible. If a parts list is not available, then supply the engine model, the manufacturer's engine serial number, and a full description of the part and where it is used. All spare parts orders should be addressed to the Commercial Parts Support Department, Pratt & Whitney, East Hartford, Connecticut USA.
- B. Parts that require special or expensive equipment for assembly and must be fabricated in a specially equipped shop are not furnished individually, but must be purchased as assemblies. When orders are received for units of assemblies that fall under this classification, the complete assembly is shipped.

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

,	JT12A-6		A and JT12A-8 North American(N)	JFTD12A -4A and -5A
Nose Cone	Standard	Standard	Optional	(Free Turbine) Standard
Oil Tank	Side Mounted	Side Mounted	Saddle	Saddle
Tachometer Drive	At Main Oil Pump	At Main Oil Pump	On Gearbox	On Gearbox
Top Engine Mount	Combustion Case	Combustion Case	Inlet Case	Free Turbine Case

Model Differences Table 1

5. Returning Parts

A. When returning parts eligible for material or labor credits under the terms of the Engine and Parts Service Policy of the Warranty, P&WA Form 3296, Request for Support Allowance (RSA), must be prepared and submitted as directed. The fifth copy of the RSA form can be used as the packing slip that will accompany the returned parts.

NOTE: A separate RSA is required for each referenced engine serial number.

B. Ship material returned for investigation to the following address:

USA Based Operators

Pratt & Whitney
Receiving Well No. 11
Experimental Assembly Floor (D-955)
Attn: Service Material Investigation
400 Main Street
East Hartford, CT 06108-0969

Non-USA Based Operators

United Technologies International c/o Pratt & Whitney Receiving Well No. 11 (D-955) Attn: Service Material Investigation 400 Main Street East Hartford, CT 06108-0969 USA

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

C. Ship material returned for repair to the following address, and when necessary, accompanied by a charge Purchase Order:

USA Based Operators

Pratt & Whitney
Engine Center
500 Knotter Drive
Cheshire, CT 06410

Non-USA Based Operators

United Technologies International c/o Pratt & Whitney Engine Center 500 Knotter Drive Cheshire, CT 06410 USA

6. Trade Name Products

- A. Certain products not supplied by the engine manufacturer are mentioned by trade name in this manual only to assist overhaul personnel in identifying the type of products recommended for use in connection with engine overhaul.
- B. These product names are considered only as representative examples, and do not necessarily exclude the use of other equivalent products.
- C. The singling out of certain products by name does not constitute unconditional approval or guarantee of these products by the engine manufacturer, unless specifically stated. Primarily, the determination of the quality and suitability of the products used at overhaul must be the responsibility of the overhaul activity.
- D. The sources of the trade name products referred to in this manual are listed in the Overhaul Standard Practices Manual.

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

7. Equivalent Tools, Fixtures And Test Equipment

- A. In accordance with federal regulations (14CFR43.13), anyone performing work on an engine covered by this manual under the jurisdiction and authority of the Federal Aviation Administration (FAA) must use tools, equipment and test apparatus that will assure that the work will be completed in accordance with industry standards.
- B. If Pratt & Whitney recommends special equipment or test apparatus, then each person performing the work must use the equipment, apparatus or its equivalent that is acceptable to the Administrator of the FAA. Special provisions of the FAA regulation regarding tools, equipment, and test apparatus apply to holders of certain air carrier operating certificates and certificates issued under specific parts of the regulations.

8. Parts Cleaning/Inspection/Repair Sequence

R A. It is possible that repair procedures will have a Prerequisite section with these or similar statements:

"Make sure (verify) that all cleaning and inspection procedures are done before this repair."

- (1) For parts that will get inspections in accordance with all applicable Overhaul Manual inspections (parts which will get overhaul):
 - (a) Clean (refer to the applicable Overhaul Manual section).
 - (b) Remove coating as necessary (refer to Section 70-32-00 and 70-33-00 for coating removal requirements).
 - (c) Do all applicable inspections (refer to the applicable Overhaul Manual section).
 - (d) Repair (refer to the applicable Overhaul Manual section).
- (2) For parts that will get inspections in accordance with an approved owner/operator's maintenance plan in which full compliance with all Overhaul Manual inspections are not necessary (limited workscope): Inspection

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JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

R	_	rements of the approved owner/operator's
R	main	cenance plan are applicable.
R R R	NOTE:	workscopes are not intended to be, nor are they acceptable as, a substitute for the overhaul of
R		a part or component.
R R R	(a)	When a repair is applicable in local areas, clean the local repair area(s) by the Overhaul Manual requirements.
••		204422301100.
R R R R R R R		NOTE: Typical examples of local repairs are blend, weld, detail replacement, cold work, touch-up (and there can be more). Tank stripping, plating, and plasma coating for example do not have the definition of local repairs. If there are questions about whether a local repair is applicable, send questions to the Customer Technical Service Department either through its field
R		representative or by direct contact.
R R R R R		NOTE: When SPOP 203 or SPOP 18 and SPOP 209 are specified (refer to Section 70-20-00, Selection of Cleaning Procedures in the Standard Practices Manual), a local application of SPOP 209 or SPOP 208 is sufficient before the initial FPI or FMPI.
R R R R R R R	(b)	Visually examine and do non-destructive inspection (if applicable to the part) by the Overhaul Manual requirements on the area for which the repair is necessary. Other cleaning and/or dimensional inspection of the repair area(s) can be necessary as the result of the visual inspection or processing requirements. Local cleaning and inspection must be as specified in the Standard Practices Manual and Overhaul Manual.
R R R R R R		NOTE: SPOP 70 is permitted for local repairs. The local fluorescent penetrant sensitivity level must agree with the sensitivity level of the fluorescent penetrant inspection requirements (SPOP 62, SPOP 82, or SPOP 84) specified in the Fluorescent Penetrant Inspection part list of detail parts in the Overhaul Manual for the part that gets the repair.

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

R	(c)	If in addition to step (2) above there are other
R		prerequisites to a repair (detail removal, coating
R		removal, etc.), it will be necessary to do these
R		operations.

(d) Repair the part by the procedure steps in the Overhaul Manual.

R 9. Repair Vendors

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A. Master Repair Vendors List

(1) For the master list of repair vendors, refer to Section 70-40-00, General-01 (Task 70-40-00-990-001) in the Standard Practices Manual, PN 585005.

OTE: Except for work or supplies to be performed or furnished by Pratt & Whitney, Pratt & Whitney does not endorse the work performed by the company or companies identified in the above list or any other company and does not accept responsibility to any degree for the selection of such company or companies for the performance of any work or procurement of supplies.

B. Proprietary/Source Demonstration Repairs

- (1) Because Source Demonstration repairs are critical, repair sources must show Pratt & Whitney that they can do a repair and must have a license for this repair from Pratt & Whitney. If you are interested in being considered by Pratt & Whitney for a license to do a Source Demonstration repair, send a request to the address in Figure 1.
- (2) Repair sources must have a license from Pratt & Whitney to do a Proprietary Repair. If you are interested in being considered by Pratt & Whitney for a license to do a Proprietary repair, send a request to the address in Figure 1.

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

R R	Pratt & Whitney, A United Technologies Company
R	Manager, Joint Ventures, Partnerships and Licensing
R	400 Main Street, Mail Stop 133-58
R	East Hartford, CT 06108 USA
R	E-Mail: gppwlicng@pw.utc.com
R	- main gppmiong@pmato.com
R	E-FAX: (860) 557-7197
R	E-FAX. (600) 557-7197

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INTRO

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

10. Component Vendors

A. The list that follows shows the manufacturers that supply components (and documentation) for the JT12/JFTD12 engine:

Fuel Control

Hamilton Sundstrand Division United Technologies Corporation Windsor Locks, Connecticut 06096

Goodrich Pump & Engine Control Systems, Inc. (formerly Chandler Evans, Inc.)
Charter Oak Boulevard
West Hartford, Connecticut 06133

Fuel Pump

Goodrich Pump & Engine Control Systems, Inc. (formerly Chandler Evans, Inc.)
Control Systems Division
Charter Oak Boulevard
West Hartford, Connecticut 06133

Ignition Exciters and Leads

General Laboratory Associates, Inc. 17 East Railroad Street Norwich, New York 13815

Solenoid and Switch

Dynasciences Corporation Controls Division 13035 Saticoy Street North Hollywood, California 91605

Actuator Assembly

ITT Aerospace Controls 1200 South Flower Street Burbank, California 91502

JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

11. Revision Symbol

A. Text that contains current changes is indicated by the revision symbol "R" in the outer page margin.

12. Limits

A. Make frequent reference to the Table of Limits (1000 Page Block) during all operations that involve measurement or the use of gages.

13. Directional References

A. Unless otherwise specified in procedural text, directional references such as right and left, clockwise and counterclockwise, upper and lower, etc. apply to the engine viewed from the rear (exhaust duct end), with the engine in a horizontal position and the accessory section at the bottom of the engine. Rotor assemblies rotate clockwise, with the exception of free turbine rotors, which rotate counterclockwise.

14. Combustion Chamber Numbering

A. The combustion chambers are numbered one to eight in a clockwise direction (See Figure 2) with the uppermost combustion chamber to the right of the engine vertical centerline designated as No. 1. the No. 3 and the No. 6 chambers have igniter plug cutouts.

15. Main Bearing Numbering

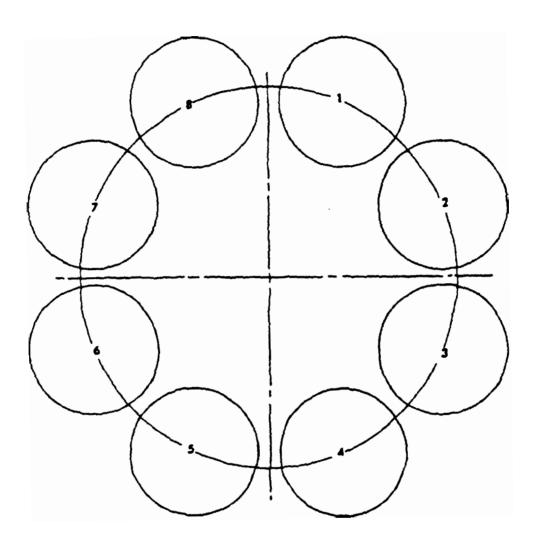
A. In this manual, main bearings are referred to by number.

Tables 2 and 3 are provided to familiarize personnel with the full nomenclature, location, and number of bearings:

Bearing Name	Location	Number
Compressor Front (Roller)	Compressor inlet case: compressor front hub	1
Compressor Rear (Ball)	Diffuser case: compressor rear hub	2
Turbine (Roller)	Combustion chamber inner case: turbine shaft	3

Bearing Numbering (Turbojet Engines)
Table 2

JT12 OVERHAUL MANUAL (PN 435108)
INTRODUCTION



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JT12 OVERHAUL MANUAL (PN 435108)

INTRODUCTION

Bearing Name	Location	Number
Compressor Front (Roller)	Compressor inlet case: compressor front hub	1
Compressor Rear	Diffuser case: compressor rear hub	2
Turbine (Roller)	Combustion chamber inner case: turbine shaft	3
Free Turbine Front (Ball)	Free turbine case: free turbine share	ft 4
Free Turbine Rear (Roller)	Free turbine shaft inner case: free turbine shaft	5

Bearing Numbering (Free Turbine Engines)
Table 3

JT12 OVERHAUL MANUAL (PN 435108)

HOW TO USE

TABLE OF CONTENTS

SUBJECT	CHP/SEC/SUB	PAGE	EFFECTIVITY
HOW TO USE			
How To Use		001	-ALL

JT12 OVERHAUL MANUAL (PN 435108) LIST OF EFFECTIVE PAGES

Please insert the revised pages into this manual and delete obsoleted pages in accordance with the following List of Effective Pages. Revised pages are indicated by the letter "R", added pages by the letter "A", and deleted pages by the letter "D". Superseded pages shall be removed and destroyed.

The List of Effective Pages records not only each page of subject revision but also each previously issued page which is still current. Blank pages and pages which are no longer current do not appear on this list. If there is any question about the currency of the maintained copy, it is recommended that each page of the manual be checked off against this List of Effective Pages. Any page which does not check out with this list, either by number or by date, shall be discarded. This list is reissued in its entirety whenever this manual section is revised.

CHAPTER/				CHAPTER/			
SECTION	PAGE	EPPECTIVITY	DATE	SECTION	PAGE	EFFECTIVITY	DATE

Tab Separator - How To Use

List of Effective Pages - How To Use See end of list.

Table of Contents - How To Use

	0:	1/ 02	APR	1/07
HOW TO USE	R R	001 -ALL 002		1/07 1/07
LIST OF EFFE	CTIVE PAGES	A	APR	1/07

JT12 OVERHAUL MANUAL (PN 435108)

HOW TO USE

- R This section describes the JT12 Overhaul Manual organization.
- R ATA NUMBERING SYSTEM
- R A three-element code number appears at the lower right-hand corner
- R of each page. The first number is the chapter number which
- R identifies where the instructions are found in an airframe manual.
- R The second and third number elements (when used) are the engine
- R section and sub-section.
- R Chapters used in this manual are:
- R 05-10-00 Time Limits
- R 72-00-00 Engine General
- R 72-20-00 Engine Inlet
- R 72-30-00 Engine Compressor
- R 72-40-00 Engine Combustion
- R 72-50-00 Engine Turbine
- R 72-60-00 Engine Gearbox
- R 73-00-00 Fuel
- R 74-00-00 Ignition
- R 75-00-00 Air
- R 77-00-00 Engine Indicating
- R 79-00-00 Oil
- R Page number blocks are assigned as shown:

R	Introduction	Pages	001 t	hru	099
R	How To Use	Pages	001 t	hru	099
R	Time Limits	Pages	101 t	hru	199
R	Description	Pages	201 t	hru	299
R	Overhaul Tools	Pages	301 t	hru	399
R	Dismantling & Assembly	Pages	401 t	hru	499
R	Cleaning	Pages	501 t	hru	599
R	<pre>Inspect/Repair/Replace</pre>	Pages	601 t	hru	699
R	Assembly of Subassemblies	Pages	701 t	hru	799
R	Final Assembly	Pages	801 t	hru	899
R	Testing	Pages	901 t	hru	999
R	Table of Limits	Pages	1001	thru	1099
R	Accessories	Pages	1101	thru	1199

- R REVISION SYMBOLS
- R Pages which are revised identify new or changed material with "R"
- R symbols in the left hand margin. These "R" symbols are seen on
- R the page when the data is added or changed and are removed when the
- R page is revised during subsequent revisions.
- R STANDARD PROCEDURES

JT12 OVERHAUL MANUAL (PN 435108)

HOW TO USE

- R References are made in procedures in this manual to specifications
- R like PWA (Pratt & Whitney), PMC (Process Material Control), and SPOP
- R (Service Process Operating Procedure). For all specification
- R references like these, refer to the Overhaul Standard Practices
- R Manual (PN 585005) for further information.