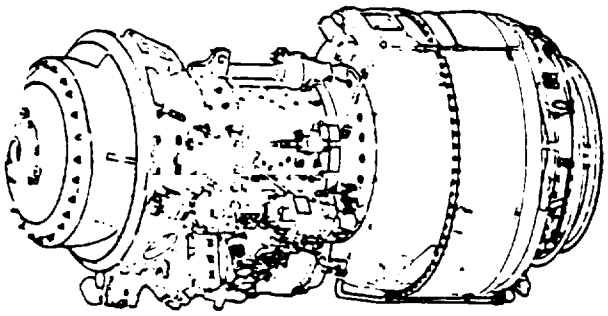
* TM 55-2840-229-23-2
T.O. 2J-T53-16

TECHNICAL MANUAL

AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

ENGINE ASSEMBLY



MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-22

MODEL T53-L-13BA
NSN 2640-01-093-7451
PART NUMBER 1-100-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

*** This manual together with TM 55-2840-229-23-1, 9 March 1981, supersedes TM 55-2840-229-24,23 April 1971.**

HEADQUARTERS, DEPARTMENT OF THE ARMY AND THE AIR FORCE
9 MARCH 1981

URGENT

TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C26

CHANGE

NO. *26*

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 27 JANUARY 2000

Aviation Unit and intermediate Maintenace Manual
for
ENGINE ASSEMBLY

MODEL T53-L-13B
NSN 2840-00-I 34-4803
PART NUMBER I-000-060-22

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER I-1 00-060-i OA

MODEL T53-L-703
NSN 2840-00-621-I 860
PART NUMBER i-000-060-23

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

Remove pages	Insert pages
A thru F	A thru F
G-51/(G-52 blank)	G-51 and G-52

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Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the Secretary of the Army
05916

RONALD R. FOGELMAN
General, USAF

GEORGE T. BABBITT
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CHANGE

NO. 25

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 03 JANUARY 2000

Aviation Unit and Intermediate Maintenance Manual
for
ENGINE ASSEMBLY

MODEL T53-L-13B	MODEL T53-L-13BA	MODEL T53-L-703
NSN 2840-00-134-4803	NSN 2840-01-093-7451	NSN 2840-00-621-1860
PART NUMBER 1-000-060-22	PART NUMBER 1-100-060-10A	PART NUMBER 1-000-060-23

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Remove pages	Insert pages
_____	A thru F
G-51/(G-52 blank)	G-51/(G-52 blank
Index 39 and Index 40	Index 39 and Index 40

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Chief of Staff

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JOEL B. HUDSON
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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C24

CHANGE

NO. 24

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 23 August 1999

Aviation Unit and Intermediate Maintenance Manual
for
ENGINE ASSEMBLY

MODEL T53-L-13B	MODEL T53-L-13BA	MODEL T53-L-703
NSN 2840-00-134-4803	NSN 2840-01-093-7451	NSN 2840-00-621-1860
PART NUMBER 1-000-060-22	PART NUMBER 1-100-060-10A	PART NUMBER 1-000-060-23

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TM 55-2840-229-23-2, dated 09 March 1981, is changed as follows:

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

Remove Pages	Insert Pages
8-53 and 8-54	8-53 and 8-54
8-61 and 8-62	8-61 and 8-62
8-62.1/(8-62.2 blank)	8-62.1/(6-62.2 blank)

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

TM 58-2840-229-23-2
T.O. 2J-T53-16-2
C24

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Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
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Commander, Air Force Materiel Command

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CHANGE

NO. 23

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 31 July 1995

Aviation Unit and Intermediate Maintenance Manual

for

ENGINE ASSEMBLY

MODEL T53-L-13B	MODEL T53-L-13BA	MODEL T53-L-703
NSN 2840-00-134-4803	NSN 2840-01-093-7451	NSN 2840-00-621-1860
PART NUMBER 1-000-060-22	PART NUMBER 1-100-060-10A	PART NUMBER 1-000-060-23

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1. Title is changed as shown above; renumber remaining paragraphs.

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

Remove pages	Insert pages
Cover	Cover
4-8.1 and 4-8.2	4-8.1 and 4-8.2
4-9 and 4-10	4-9 and 4-10
4-115 and 4-116	4-115 and 4-116
4-263 and 4-264	4-263 and 4-264
4-275 through 4-278	4-275 through 4-278
6-177 and 6-178	6-177 and 6-178
9-1 and 9-2	9-1/(9-2 blank
9-3 and 9-4	9-5 and 9-6
9-5 and 9-6	9-5 and 9-6
9-7 and 9-8	9-7/(9-8 blank)
9-9 and 9-10	- - -
9-11 and 9-12	9-13/(9-14 blank)
9-13 and 9-14	9-13/(9-14 blank)
9-15 and 9-16	- - -
9-16.1/(9-16.2 blank)	9-16.1/(9-16.2 blank)
9-17 and 9-18	9-17 and 9-18
9-19 through 9-22	- - -
9-22.1/(9-22.2 blank)	--- ---
9-23 through 9-28	- - -
9-29 and 9-30	9-29 and 9-30
9-31 and 9-32	- - -
9-33 and 9-34	9-33 and 9-34
9-35 and 9-36	9-35 and 9-36
9-36 through 9-40	- - -
9-45 through 9-44	9-47/(9-46 blank)
9-45 and 9-46	9-45/(9-46 blank)
9-47 through 9-50	- - -
9-51 and 9-52	9-51 and 9-52
9-53 and 9-54	9-53/99-54 blank)
9-55 and 9-56	9-55 and 9-56
A-1 and A-2	A-1 and A-2
D-5 and D-6	D-5 and D-6
D-7/(D-8 blank)	D-7/(D-8 blank)
G-43 and G-44	G-43 AND G-44
H-45 and H-46	H-45 and H-46

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

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:

YVONNE M. HARRISON
Administrative Assistant to the
Secretary of the Army
00922

HENRY VICCELLIO, JR.
General, USAF
Commander. Air Force Materiel Command

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TM 55-2840-229-23-2
T.O.2J-T53-16-1
C22

CHANGE

NO. 22

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND AIR FORCE
WASHINGTON, D.C., 28 November 1994

Aviation Unit and Intermediate Maintenance Manual

for

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2040-00-102-3887
PART NUMBER 1-000-080-12

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-22

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-100-060-10A

MODEL T53-L-703
NSN 284040421-1880
PART NUMBER 1-000-060-23

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Remove pages	Insert pages
D-7/(D-8 blank)	D-7/(D-8 blank)

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General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the Secretary of the Army
07039

Official:

RONALD W. YATES
General, USAF
Commander, Air Force Materiel **Command**

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CHANGE

NO. 21

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 31 AUGUST 1994

Aviation Unit and Intermediate
Maintenance Manual

ENGINE ASSEMBLY

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

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-000-080-12

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-100-060-10A

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-22

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16, 9 March 1981, is changed as follows:

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

Remove pages	Insert pages
Cover	Cover
Intro	Intro
4-1 and 4-2	4-1 and 4-2
---	4-2.1/(4-2.2 blank) through 4-2.3/(4-2.4 blank)
4-3 and 4-4	4-3 and 4-4
4-7 and 4-8	4-7 and 4-8
4-8.1/(4-8.2 blank)	4-8.1 and 4-8.2
---	4-16.1/(4-16.2 blank)
4-17 and 4-18	4-17 and 4-18
4-39 and 4-40	4-39 and 4-40
---	4-40.1/(4-40.2 blank)
4-41 and 4-42	4-41 and 4-42
4-51 through 4-54	4-51 through 4-54
---	4-54.1/(4-54.2 blank)
4-55 and 4-56	4-55 and 4-56

Remove pages	Insert pages
4-59 and 4-60	4-59 and 4-60
---	4-82.1/(4-82.2 blank)
4-83 and 4-84	4-83 and 4-84
4-87 and 4-88	4-87 and 4-88
4-91 through 4-94	4-91 through 4-94
4-97 through 4-100	4-97 through 4-100
---	4-100.1(/4-100.2 blank)
4-101 and 4-102	4-101 and 4-102
---	4-102.1/(4-102.2 blank)
4-103 and 4-104	4-103 and 4-104
4-109 and 4-110	4-109 and 4-110
4-115 and 4-116	4-115 and 4-116
4-123 through 4-126	4-123 through 4-126
4-131 and 4-132	4-131 and 4-132
4-132.1 through 4-132.5/(4-132.6 blank)	4-132.1 through 4-132.5/(4-~~132.6~~ blank)
4-133 and 4-134	4-133 and 4-134
---	4-142.1/(4-142.2 blank)
4-143 and 4-144	4-143 and 4-144
4-165 and 4-166	4-165 and 4-166
---	4-166.1/(4-166.2 blank)
4-167 and 4-168	4-167 and 4-168
---	4-210.1/(4-210.2 blank)
4-211 and 4-212	4-211 and 4-212
4-212.1(/4-212.2 blank)	4-212.1/(4-212.2 blank)
4-213 and 4-214	4-213 and 4-214
4-293 and 4-294	4-293 and 4-294
---	4-294.1(/4-294.2 blank)
4-297 and 4-298	4-297 and 4-298
4-298.1 and 4-298.2	4-298.1 and 4-298.2
4-301 and 4-302	4-301 and 4-302
---	4-302.1/(4-302.2 blank)
4-303 through 4-308	4-303 through 4-308
5-31 and 5-32	5-31 and 5-32

Remove pages	Insert pages
5-32.1/(5-32.2 blank)	5-32.1/(5-32.2 blank)
5-33 and 5-34	5-33 and 5-34
6-12.1 and 6-12.2	6-12.1 and 6-12.2
6-13 and 6-14	6-13 and 6-14
6-17 and 6-18	6-17 and 6-18
6-19 and 6-20	6-19 and 6-20
---	6-20.1/(6-20.2 blank)
6-43 and 6-44	6-43 and 6-44
6-133 and 6-134	6-133 and 6-134
7-49 and 7-50	7-49 and 7-50
8-1 through 8-4	8-1 through 8-4
8-10.1/(8-10.2 blank)	8-10.1 and 8-10.2
8-11 and 8-12	8-11 and 8-12
9-33 through 9-36	9-33 through 9-36
B-13 through B-18	B-13 through B-18
C-13 and C-14	C-13 and C-14
D-3 through D-7/(D-8 blank)	D-3 through D-7/(D-8 blank)
G-43 and G-44	G-43 and G-44
G-51/(G-52 blank)	G-51/(G-52 blank)
H-22.1 and H-22.2	H-22.1 and H-22.2
H-55 and H-56	H-55 and H-56
Index 17 and Index 18	Index 17 and Index 18

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

TM 55-2840-229-23-2
T.O. 2J-T53-16
C 21

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General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
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TM 55-2840-229-23-2
T.O. 2J-T53-16-1
C 20

CHANGE

NO. 20

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND AIR FORCE
WASHINGTON, D.C. 1 February 1994

Aviation Unit and Intermediate
Maintenance Manual

For

ENGINE ASSEMBLY

MODEL T53-L- 11C
NSN 2840-00-102-3967
PART NUMBER 1-000-080-12

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-000-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

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

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TM 55-2840-229-23-2
T.O. 2J-T53-16-1
C 20

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Chief of Staff

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Chief of Staff

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 19

CHANGE
NO. 19

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 23 December 1992

Aviation Unit and Intermediate
Maintenance Manual

For

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-000-080-12

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-000-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

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Remove pages	Insert pages
D-5 and D-6	D-5 and D-6

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 19

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Chief of Staff

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MILTON H. HAMILTON
Administrative Assistant to the
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CHANGE NO. 18

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 23 August 1991

Aviation Unit and Intermediate Maintenance Manual

For

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-000-080-12

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-000-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16-2, 9 March 1981, is changed as follows:

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

Remove pages	Insert pages
4-115 and 4-116	4-115 and 4-116
4-305 through 4-308	4-305 through 4-308

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

TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 18

By Order of the Secretaries of the Army and the Air Force:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

PATRICIA P. HICKERSON
Colonel, United States Army
The Adjutant General

LARRY D. WELCH, *General, USAF*
Chief of Staff

Official:

CHARLES C. McDONALD
General, USAF, Commander, Air Force
Logistics Command

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 17

CHANGE NO. 17

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 13 January 1991

AVIATION UNIT AND INTERMEDIATE
MAINTENANCE MANUAL

For

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-00-080-12

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-000-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16-2, 9 March 1981 is changed as follows:

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Remove pages	Insert pages
G-51/G-52	G-51/G-52

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 17

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CARL E. VUONO
General, United States Army
Chief of Staff

Official:

THOMAS F. SIKORA
Brigadier General, United States Army
The Adjutant General

LARRY D. WELCH, ***General, USAF***
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General, USAF, Commander, Air Force
Logistics Command

DISTRIBUTION:
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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 16

CHANGE NO. 16

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 1 August 1990

Aviation Unit and Intermediate
Maintenance Manual

For

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-00-080-12

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-000-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

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Remove pages	Insert pages
4-113 and 4-114	4-113 and 4-114
4-115 and 4-116	4-115 and 4-116

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 16

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 15

CHANGE NO. 15

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 1 June 1990

Aviation Unit and Intermediate
Maintenance Manual

For

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-000-080-12

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-000-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16-2, 9 March 1981, is changed as follows:

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 14

CHANGE NO. 14

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 1 April 1990

Aviation Unit and Intermediate
Maintenance Manual

For

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-000-080-12

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-100-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

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Remove pages	Insert pages
4-113 and 4-114	4-113 and 4-114
-----	4-114.1/4-114.2
4-115 and 4-116	4-115 and 4-116
4-307 and 4-308	4-307 and 4-308

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CHANGE NO. 13

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 13 April 1990

Aviation Unit and Intermediate Maintenance Manual

For

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-000-080-12

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-000-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

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Remove pages	Insert pages
4-1 and 4-2	4-1 and 4-2
4-7 and 4-8	4-7 and 4-8
----	4-8.1/4-8.2
4-9 and 4-10	4-9 and 4-10
4-17 and 4-18	4-17 and 4-18
4-23 and 4-24	4-23 and 4-24
4-31 through 4-34	4-31 through 4-34
4-41 and 4-42	4-41 and 4-42
4-47 through 4-56	4-47 through 4-56
4-61 and 4-62	4-61 and 4-62
4-67 through 4-70	4-67 through 4-70
4-73 through 4-82	4-73 through 4-82
4-103 and 4-104	4-103 and 4-104
4-107 and 4-108	4-107 and 4-108
----	4-108.1/4-108.2
4-111 and 4-112	4-111 and 4-112
4-121 and 4-122	4-121 and 4-122
4-129 and 4-130	4-129 and 4-130
4-132.1 through 4-132.4	4-132.1 through 4-132.4
4-135 and 4-136	4-135 and 4-136
4-161 and 4-162	4-161 and 4-162
4-165 through 4-168	4-165 through 4-168
4-179 and 4-180	4-179 and 4-180
4-183 and 4-184	4-183 and 4-184
4-187 through 4-190	4-187 through 4-190
4-201 through 4-204	4-201 through 4-204
4-219 and 4-220	4-219 and 4-220

Remove pages	Insert pages
4-285 and 4-286	4-285 and 4-286
4-293 and 4-294	4-293 and 4-294
4-299 through 4-306	4-299 through 4-306
4-309 and 4-310	4-309 and 4-310
5-1 and 5-2	5-1 and 5-2
5-4.1 and 5-4.2	5-4.1 and 5-4.2
5-31 and 5-32	5-31 and 5-32
6-1 through 6-8	6-1 through 6-8
----	6-8.1/6-8.2
----	6-12.1 and 6-12.2
6-13 and 6-14	6-13 and 6-14
6-17 and 6-18	6-17 and 6-18
6-18.1/6-18.2	6-18.1/6-18.2
6-21 and 6-22	6-21 and 6-22
6-33 through 6-36	6-33 through 6-36
----	6-38.1 through 6-38.4
6-39 and 6-40	6-39 and 6-40
6-85 and 6-86	6-85 and 6-86
6-117 and 6-118	6-117 and 6-118
6-181 through 6-184	6-181 through 6-184
7-1 and 7-2	7-1 and 7-2
7-7 through 7-10	7-7 through 7-10
7-17 and 7-18	7-17 and 7-18
7-45 through 7-50	7-45 through 7-50
7-57 through 7-68	7-57 through 7-68
----	7-68.1 through 7-68.3/7-68.4
7-69 and 7-70	7-69 and 7-70
7-75 and 7-76	7-75 and 7-76
8-9 and 8-10	8-9 and 8-10
8-11 and 8-12	8-11 and 8-12
8-61 and 8-62	8-61 and 8-62
----	8-62.1/8-62.2
8-63 and 8-64	8-63 and 8-64
9-9 and 9-10	9-9 and 9-10
9-13 through 9-16	9-13 through 9-16
A-1 and A-2	A-1 and A-2
----	B-2.1/B-2.2
B-3 through B-6	B-3 through B-6
C-1 and C-2	C-1 and C-2
C-51/C-52	C-51/C-52
D-1 through D-6	D-1 through D-7/D-8
G-3 and G-4	G-3 and G-4
G-13 through G-16	G-13 through G-16
G-21 through G-24	G-21 through G-24
G-27 and G-28	G-27 and G-28
G-31 and G-32	G-31 and G-32
G-51/G-52	G-51/G-52

Remove pages	Insert pages
Index 5 through Index 10	Index 5 through Index 10
Index 13 and Index 14	Index 13 and Index 14
Index 19 and Index 20	Index 19 and Index 20
Index 25 and Index 26	Index 25 and Index 26
Index 29 through Index 34	Index 29 through Index 34
Index 37 and Index 38	Index 37 and Index 38
----	Index 45 through 48
Index 52.1/Index 52.2	Index 52.1/Index 52.2
Index 53 through Index 56	Index 53 through Index 56
Index 59 and Index 60	Index 59 and Index 60
2028s and envelopes	2028s and envelopes

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 12

CHANGE
NO. 12

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND
THE AIR FORCE
WASHINGTON, DC., 5 July 1989

Aviation Unit and Intermediate
Maintenance Manual
for

ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-00-102-3967
PART NUMBER 1-000-080-12

MODEL T53-L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-10

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-100-060-10A

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

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G-51/G-52	G-51/G-52

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 11

CHANGE NO. 11

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 19 April 1988

Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE ASSEMBLY

MODEL	NSN	PART NUMBER
T53-L-11C	2840-00-102-3967	1-000-080-12
T53-L-11D	2840-00-102-3968	1-000-080-13
T53-L-13B	2840-00-134-4803	1-000-060-10
T53-L-703	2840-00-621-1860	1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16-2, 9 March 1982, is changed as follows:

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Remove pages	Insert pages
4-297 and 4-298	4-297 and 4-298
4-305 and 4-306	4-305 and 4-306
6-17 through 6-20	6-17 through 6-20
D-5 and D-6	D-5 and D-6

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 10

CHANGE NO. 10

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 4 April 1988

Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE ASSEMBLY

MODEL	NSN	PART NUMBER
T53-L-11C	2840-00-102-3967	1-000-080-12
T53-L-11D	2840-00-102-3968	1-000-080-13
T53-L-13B	2840-00-134-4803	1-000-060-10
T53-L-703	2840-00-621-1860	1-000-060-23

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6-13 and 6-14	6-13 and 6-14

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 9

CHANGE NO. 9

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WASHINGTON, D.C., 20 August 1987

Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE ASSEMBLY

MODEL	NSN	PART NUMBER
T53-L-11C	2840-00-102-3967	1-000-080-12
T53-L-11D	2840-00-102-3968	1-000-080-13
T53-L-13B	2840-00-134-4803	1-000-060-10
T53-L-703	2840-00-621-1860	1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16-2, 9 March 1981, is changed as follows:

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Remove pages	Insert pages
4-107 through 4-110	4-107 through 4-110
4-132.3 and 4-132.4	4-132.3 and 4-132.4
8-5 through 8-10	8-5 through 8-10
- - -	8-10.1/8-10.2
8-11 through 8-13/8-14	8-11 through 8-13/8-14

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CHANGE NO. 8

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DEPARTMENTS OF THE ARMY AND THE AIR FORC
WASHINGTON, D.C., 15 August 1987

Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE ASSEMBLY

MODEL	NSN	PART NUMBER
T53-L-11C	2840-00-102-3967	1-000-080-12
T53-L-11D	2840-00-102-3968	1-000-080-13
T53-L-13B	2840-00-134-4803	1-000-060-10
T53-L-703	2840-00-621-1860	1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16-2, 9 March 1981, is changed as follow

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Remove pages	Insert pages
4-1 through 4-12	4-1 through 4-12
4-27 through 4-30	4-27 through 4-30
4-137 through 4-140	4-137 through 4-140
4-189 and 4-190	4-189 and 4-190
4-293 and 4-294	4-293 and 4-294
4-297 and 4-298	4-297 and 4-298
---	4-298.1 and 4-298.2
4-305 and 4-306	4-305 and 4-306
5-27 and 5-28	5-27 and 5-28
6-11 and 6-12	6-11 and 6-12
6-17 and 6-18	6-17 and 6-18
---	6-18.1/6-18.2
6-19 and 6-20	6-19 and 6-20
7-31 and 7-32	7-31 and 7-32
7-47 through 7-50	7-47 through 7-50
8-7 and 8-8	8-7 and 8-8
8-11 and 8-12	8-11 and 8-12
9-5 through 9-8	9-5 through 9-8
9-13 and 9-14	9-13 and 9-14
---	9-16.1/9-16.2
9-17 and 9-18	9-17 and 9-18
---	9-22.1/9-22.2
9-23 and 9-24	9-23 and 9-24
9-41 and 9-42	9-41 and 9-42
9-45 and 9-46	9-45 and 9-46
B-11 and B-12	B-11 and B-12
C-7 and C-8	C-7 and C-8
C-11 through C-14	C-11 through C-14
C-45 and C-46	C-45 and C-46
---	C-51/C-52
D-5 and D-6	D-5 and D-6
G-9 and G-10	G-9 and G-10

Remove pages	Insert pages
G-21 and G-22	G-21 and G-22
G-41 and G-42	G-41 and G-42
G-51/G-52	G-51/G-52
H-21 and H-22	H-21 and H-22
H-39 and H-40	H-39 and H-40
---	H-44.1/H-44.2
H-45 and H-46	H-45 and H-46
---	I-1/I-2
Index 3 through Index 6	Index 3 through Index 6
Index 9 through Index 14	Index 9 through Index 14
Index 21 and Index 22	Index 21 and Index 22
Index 29 through Index 34	Index 29 through Index 34
Index 37 and Index 38	Index 37 and Index 38
Index 41 and Index 42	Index 41 and Index 42
Index 45 through Index 48	Index 45 through Index 48
Index 53 and Index 54	Index 53 and Index 54
Inde Index 57 and Index 58	Index 57 and Index 58

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 7

CHANGE NO. 7

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 30 June 1987

Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE ASSEMBLY

MODEL	NSN	PART NUMBER
T53-L-11C	2840-00-102-3967	1-000-080-12
T53-L-11D	2840-00-102-3968	1-000-080-13
T53-L-13B	2840-00-134-4803	1-000-060-10
T53-L-703	2840-00-621-1860	1-000-060-23

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Remove pages	Insert pages
4-85 and 4-86	4-85 and 4-86
4-99 through 4-102	4-99 through 4-102
4-105 through 4-114	4-105 through 4-114

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 6

CHANGE NO. 6

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 24 February 1987

Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE ASSEMBLY

MODEL	NSN	PART NUMBER
T53-L-11C	2840-00-102-3967	1-000-080-12
T53-L-11D	2840-00-102-3968	1-000-080-13
T53-L-13B	2840-00-134-4803	1-000-060-10
T53-L-703	2840-00-621-1860	1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16-2, 9 March 1981, is changed as follows:

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

Remove pages	Insert pages
G-51/G-52	G-51/G-52

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

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Brigadier General, United States Army
The Adjutant General

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 5

CHANGE NO. 5

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 28 August 1986

Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE ASSEMBLY

MODEL	NSN	PART NUMBER
T53-L-11C	2840-00-102-3967	1-000-080-12
T53-L-11D	2840-00-102-3968	1-000-080-13
T53-L-13B	2840-00-134-4803	1-000-060-10
T53-L-703	2840-00-621-1860	1-000-060-23

TM 55-2840-229-23-2/T.O. 2J-T53-16-2, 9 March 1981, is changed as follows:

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

Remove pages	Insert pages
4-11 and 4-12	4-11 and 4-12
- - -	4-12.1/4-12.2
4-143 and 4-144	4-143 and 4-144
- - -	4-144.1/4-144.2
4-211 and 4-212	4-211 and 4-212
- - -	4-212.1/4-212.2
4-269 and 4-270	4-269 and 4-270
4-273 and 4-274	4-273 and 4-274
- - -	4-274.1/4-274.2
4-283 and 4-284	4-283 and 4-284
4-293 and 4-294	4-293 and 4-294
4-297 and 4-298	4-297 and 4-298
4-321 and 4-322	4-321 and 4-322

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

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TM 55-2840-229-23-2
T.O. 2J-T53-16-2
C 5

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CHANGE
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY AND
THE AIR FORCE
WASHINGTON, D. C. 20 August 1986

Aviation Unit and Aviation Intermediate Maintenance Manual

ENGINE ASSEMBLY

MODEL	NSN	PART NUMBER
T53-L-11C	2840-00-102-3967	1-000-080-12
T53-L-11D	2840-00-102-3968	1-000-080-13
T53-L-13B	2840-00-134-4803	1-000-060-10
T53-L-703	2840-00-621-1860	1-000-060-23

TM 55-2840-229-23-2, 9 March 1981, is changed as follows:

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

Remove pages	Insert pages
4-1 and 4-2	4-1 and 4-2
4-19 and 4-20	4-19 and 4-20
4-23 and 4-24	4-23 and 4-24
4-61 and 4-62	4-61 and 4-62
4-95 through 4-98	4-95 through 4-98
4-103 and 4-104	4-103 and 4-104
4-109 through 4-112	4-109 through 4-112
4-132.1 and 4-132.2	4-132.1 and 4-132.2
4-217 and 4-218	4-217 and 4-218
4-297 and 4-298	4-297 and 4-298
4-305 through 4-308	4-305 through 4-308
5-1 through 5-4	5-1 through 5-4/5-4.1 through 5-4.9/5-4.10
5-19 and 5-20	5-19 and 5-20/5-20.1 through 5-20.12
5-29 and 5-30	5-29 and 5-30
5-32.1/5-32.2	5-32.1/5-32.2
5-35 and 5-36	5-35 and 5-36
6-1 through 6-4	6-1 through 6-4
6-13 and 6-14	6-13 and 6-14
6-17 through 6-20	6-17 through 6-20
6-23 and 6-24	6-23 and 6-24
6-37 through 6-40	6-37 through 6-40
6-59 and 6-60	6-59/6-60
6-61 and 6-62	6-61/6-62
6-69 through 6-72	6-71/6-72
6-85 and 6-86	6-85 and 6-86
6-89 through 6-96	6-89/6-90
6-97 and 6-98	6-97 and 6-98

Remove pages	Insert pages
6-105 and 6-106	6-105/6-106
6-107 and 6-108	6-107 and 6-108
6-119 through 6-128	6-127 and 6-128
6-145 through 6-150	6-145/6-146
6-151 and 6-152	6-151 and 6-152
6-163 through 6-168	6-163 and 6-164
6-169 through 6-172	6-169 and 6-170
6-183 through 6-186	6-183 through 6-186
7-1 and 7-2	7-1 and 7-2
7-7 through 7-10	7-7 through 7-10
7-37 and 7-38	7-37 and 7-38
7-41 through 7-46	7-41 through 7-46
7-73 and 7-74	7-73 and 7-74
7-77 through 7-80	7-79 and 7-80
8-1 and 8-2	8-1 and 8-2
8-7 and 8-8	8-7 and 8-8
8-11 through 8-14	8-11 through 8-13/8-14
8-17 and 8-18	8-17/8-18
8-53 and 8-54	8-53 and 8-54
8-73/8-74	8-73/8-74
9-33 and 9-34	9-33 and 9-34
A-1 and A-2	A-1 and A-2
B-5 and B-6	B-5 and B-6
B-13 through B-16	B-13 through B-16
C-1 through C-6	C-1 through C-6
C-13 and C-14	C-13 and C-14
C-21 and C-22	C-21 and C-22
C-49/C-50	C-49 and C-50
D-1 through D-6	D-1 through D-6
	F-7/F-8
G-13 and G-14	G-13 and G-14
G-23 and G-24	G-23 and G-24
G-43 and G-44	G-43 and G-44
G-51/G-52	G-51/G-52
H-1 and H-2	H-1 and H-2
H-7 and H-8	H-7 and H-8
H-15 and H-16	H-15 and H-16
H-37 through H-40	H-37 through H-40
Index 59 and Index 60	Index 59 and Index 60

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

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LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

Original . . . . . 0 . . . . 9 March 1981
Change . . . . . 1 . . . . 7 April 1982
Change . . . . . 2 . . . . 6 December 1982
Change . . . . . 3 . . . . 7 March 1984
Change . . . . . 4 . . . . 20 August 1986
Change . . . . . 5 . . . . 28 August 1986
Change . . . . . 6 . . . . 24 February 1987
Change . . . . . 7 . . . . 30 June 1987
Change . . . . . 8 . . . . 15 August 1987
Change . . . . . 9 . . . . 20 August 1987
Change . . . . . 10 . . . 4 April 1988
Change . . . . . 11 . . . . 19 April 1988
Change . . . . . 12 . . . 5 July 1989
Change . . . . . 13 . . . 13 April 1990
Change . . . . . 14 . . . 01 April 1990
Change . . . . . 15 . . . 1 June 1990
Change . . . . . 16 . . . 01 August 1990
Change . . . . . 17 . . . 13 January 1991
Change . . . . . 18 . . . 23 August 1991
Change . . . . . 19 . . . 23 December 1992
Change . . . . . 20 . . . 1 February 1994
Change . . . . . 21 . . . 31 August 1994
Change . . . . . 22 . . . 28 November 1994
Change . . . . . 23 . . . 31 July 1995
Change . . . . . 24 . . . 23 August 1999
Change . . . . . 25 . . . 3 January 2000
Change . . . . . 26 . . . 27 January 2000

Page Number	*Change Number
Cover	23
4-1 and 4-2.1	21
4-2.2 blank	21
4-2.3	21
4-2.4 blank	21
4-3 and 4-4	21
4-5 and 4-6	8
4-7 and 4-8.1	21
4-8.2 and 4–9	23
4-10 – 4-12	8
4-12.1	5
4-12.2 blank	5
4-13 – 4-16	0
4-16.1	21
4-16.2 blank	21
4-17	21
4-18	0
4-19 and 4–20	4
4-21 and 4-22	0
4-23	13
4-24 and 4-25	0
4-26	3
4-27	8
4-28 and 4-29	0
4-30	8
4-31	13
4-32	0
4-33	13
4-34 and 4-35	0
4-36	3
4-37 – 4-39	0
4-40 and 4–40.1	21
4-40.2 blank	21
4-41	21
4-42	13
4-43 – 4-46	0
4-47	3
4-48 – 4-51	13
4-52 – 4-54.1	21
4-54.2 blank	21
4-55	21
4-56	3
4-57	0
4-58	1
4-59	0
4-60	21

*Zero in this column indicates an original page.

Page Number	*Change Number
4-61	4
4-62	13
4-63 – 4-66	0
4-67	13
4-68	0
4-69 and 4-70	13
4-71 and 4-72	1
4-73	13
4-74	0
4-75	13
4-76	0
4-77 – 4-81	13
4-82	0
4-82.1	21
4-82.2 blank	21
4-83 and 4-84	21
4-85	0
4-86	7
4-87	0
4-88	21
4-89	0
4-90	15
4-91	3
4-92 and 4-93	21
4-94	0
4-95	4
4-96	0
4-97	21
4-98	0
4-99	7
4-100 and 4–100.1	21
4-100.2 blank	21
4-101	21
4-102	7
4-102.1	21
4-102.2 blank	21
4-103	21
4-104	4
4-105 and 4-106	7
4-107 – 4-108.1	13
4-108.2 blank	13
4-109	7
4-110	21
4-111	13
4-112	7
4-113	14
4-114	16
4-114.1	14
4-114.2 blank	14
4-115	23
4-116	21
4-117 – 4-120	1
4-121	13
4-122 and 4-123	1
4-124	21
4-125	1
4-126	21
4-127 and 4-128	1
4-129	13
4-130 and 4-131	1
4-132 – 4-134	21
4-135	13
4-136	0
4-137 and 4-138	8
4-139	0
4-140	8
4-141 and 4-142	0
4-142.1	21
4-142.2 blank	21
4-143	21
4-144 and 4–144.1	5
4-144.2 blank	5
4-145 – 4-160	0
4-161 and 4-162	13
4-163 and 4-164	0
4-165	13
4-166 and 4–166.1	21
4-166.2 blank	21
4-167 and 4-168	21
4-169	3
4-170 – 4-178	0
4-179	13
4-180 – 4-183	0
4-184	13
4-185	3
4-186	0
4-187	3
4-188 and 4-189	13
4-190	8
4-191 – 4-201	0
4-202	13
4-203	0
4-204	13
4-205 – 4-210	0
4-210.1	21
4-210.2 blank	21
4-211 and 4-212.1	21
4-212.2 blank	21
4-213	21
4-214	3
4-215 and 4-216	0
4-217	4

*Zero in this column indicates an original page.

Page Number	*Change Number
4-218 and 4-219	0
4-220	13
4-221 – 4-262	0
4-263 and 4-264	23
4-265 – 4-268	0
4-269	5
4-270 – 4-273	0
4-274 and 4–274.1	5
4-274.2 blank	5
4-275	0
4-276 and 4-277	23
4-278	1
4-279 – 4-282	0
4-283	5
4-284 and 4-285	0
4-286	13
4-287 – 4-292	0
4-293	13
4-294 and 4–294.1	21
4-294.2 blank	21
4-295 and 4-296	0
4-297	11
4-298	21
4-298.1	8
4-298.2	21
4-299	0
4-300	13
4-301	0
4-302 and 4–302.1	21
4-302.2 blank	21
4-303 – 4-307	21
4-308	14
4-309	13
4-310 – 4-320	0
4-321	5
4-322 – 4-325	0
4-326 blank	0
5-1	13
5-2	3
5-3	0
5-4	4
5-4.2 – 5-4.9	4
5-4.10 blank	4
5-4.1	13
5-5	0
5-6	1
5-7 – 5-18	0
5-19 – 5-20.12	4
5-21 and 5-22	0
5-23	3
5-24 and 5-25	0
5-26	3
5-27	8
5-28	3
5-29	4
5-30 and 5-31	3
5-32 and 5–32.1	21
5-32.2 blank	21
5-33	0
5-34	21
5-35	4
5-36 – 5-42	0
6-1	13
6-2 and 6-3	4
6-4 and 6-5	13
6-6 and 6-7	0
6-8 and 6–8.1	13
6-8.2 blank	13
6-9 and 6-10	0
6-11	8
6-12	1
6-12.1	21
6-12.2 and 6–13	13
6-14	21
6-15	1
6-16	0
6-17 and 6-18	21
6-18.1	13
6-18.2 blank	13
6-19 – 6-20.1	21
6-20.2 blank	21
6-21	13
6-22	0
6-23	4
6-24 – 6-33	0
6-34 – 6-36	13
6-36.1	3
6-36.2 blank	3
6-37	3
6-38	4
6-38.1 – 6-39	13
6-40 – 6-42	0
6-43	21
6-44 – 6-58	0
6-59	4
6-60 blank	4
6-61 blank	4
6-62	4

*Zero in this column indicates an original page.

Page Number	*Change Number
6-63 – 6-68	0
6-69 and 6–70 DELETED	4
6-71 blank	4
6-72	4
6-73 – 6-84	0
6-85	13
6-86 – 6-88	0
6-89	4
6-90 blank	4
6-91 – 6-96 DELETED	4
6-97	4
6-98 – 6-104	0
6-105	4
6-106 blank	4
6-107 and 6-108	4
6-109 – 6-117	0
6-118	13
6-119 – 6-126 DELETED	4
6-127	4
6-128	0
6-129	3
6-130 – 6-132	0
6-133	21
6-134 – 6-144	0
6-145	4
6-146 blank	4
6-147 – 6-150 DELETED	4
6-151	4
6-152 – 6-163	0
6-164	4
6-165 – 6-168 DELETED	4
6-169	0
6-170	4
6-171 and 6-172 DELETED	4
6-173 – 6-176	0
6-177	23
6-178 – 6-180	0
6-181	13
6-182	0
6-183	13
6-184 – 6-186	4
7-1	13
7-2	4
7-3 – 7-6	0
7-7	3
7-8 and 7-9	13
7-10 – 7-14	0
7-15	3
7-16 and 7-17	0
7-18	13
7-19 – 7-26	0

Page Number	*Change Number
7-27 – 7-29	3
7-30	0
7-31	8
7-32 – 7-37	0
7-38	4
7-39 – 7-41	0
7-42 – 7-45	4
7-46 – 7-48	13
7-49	21
7-50 – 7-56	0
7-57 – 7-68.3	13
7-68.4 blank	13
7-69	13
7-70 – 7-72	0
7-73 and 7-74	4
7-75	13
7-76	0
7-77 – 7-79	4
7-80 – 7-102	0
7-103	1
7-104 blank	1
8-1	21
8-2	4
8-3 and 8-4	21
8-5 – 8-8	9
8-9	13
8-10	9
8-10.1 and 8-10.2	21
8-11	13
8-12	21
8-13	9
8-14 blank	9
8-15 and 8-16 DELETED	9
8-17 blank	4
8-18	4
8-18.1	0
8-18.2 blank	0
8-19 – 8-52	0
8-53	24
8-54	4
8-55 – 8-61	0
8-62 and 8-62.1	24
8-62.2 blank	24
8-63	13
8-64 thru 8-72	0
8-73	4
8-74 blank	4
9-1	23
9-2 blank	23
9-3	23
9-4 blank	23

*Zero in this column indicates an original page.

Page Number	*Change Number
9-5	0
9-6 and 9-7	23
9-8 blank	23
9-9 and 9-10 DELETED	23
9-11 blank	23
9-12 and 9-13	23
9-14 blank	23
9-15 and 9-16 DELETED	23
9-16.1	23
9-16.2 blank	23
9-17 and 9-18	23
9-19 – 9-22.1 DELETED	23
9-22.2 blank DELETED	23
9-23 – 9-28 DELETED	23
9-29	0
9-30	23
9-31 and 9-32 DELETED	23
9-33 – 9-36	23
9-37 – 9-40 DELETED	23
9-41 and 9-42	23
9-43	0
9-44 and 9-45	23
9-46 blank	23
9-47 – 9-50 DELETED	23
9-51	23
9-52	0
9-53	23
9-54 blank	23
9-55	23
9-56 and 9-57	0
9-58 blank	0
A-1 and A-2	23
B-1 and B-2	0
B-2.1	13
B-2.2 blank	13
B-3	13
B-4 and B-5	0
B-6	13
B-7 – B-10	0
B-11	8
B-12	0
B-13	4
B-14 – B-17	21
B-18	0
C-1	4
C-2	13
C-3	0
C-4 – C-6	4
C-7	0
C-8	8
C-9 – C-11	0
C-12 and C-13	8
C-14	21
C-15 – C-21	0
C-22	4
C-23 – C-45	0
C-46	8
C-47 and C-48	0
C-49 and C-50	4
C-51	13
C-52 blank	13
D-1	0
D-2	13
D-3 and D-4	21
D-5 and D-6	23
D-7	22
D-8 blank	22
E-1	0
E-2 blank	0
F-1 – F-6	0
F-7	4
F-8 blank	4
G-1 and G-2	0
G-3	13
G-4 – G-8	0
G-9	8
G-10 – G-12	0
G-13	13
G-14	0
G-15	13
G-16 – G-20	0
G-21	13
G-22	8
G-23	4
G-24	13
G-25 and G-26	0
G-27	13
G-28 – G-31	0
G-32	13
G-33 – G-41	0
G-42	8
G-43	0
G-44	23
G-45 – G-50	0
G-51	25
G-52 blank	25
H-1	4
H-2 – H-6	0
H-7	4
H-8 – H-14	0
H-15	4
H-16 – H-20	0
H-21 and H-22	8

*Zero in this column indicates an original page.

Page Number	*Change Number
H-22.1	21
H-22.2	3
H-23 – H-36	0
H-37	4
H-38 and H-39	0
H-40	8
H-41 – H-44	0
H-44.1	8
H-44.2 blank	8
H-45	23
H-46 – H-55	0
H-56	21
H-57 and H-58	0
I-1	8
I-2 blank	8
Glossary-1 – Glossary 11	0
Glossary 12 blank	0
Index-1 and Index-2	0
Index-3 – Index-5	8
Index-6 and Index-7	13
Index-8	0
Index-9	8
Index-10	13
Index-11	0
Index-12	8
Index-13 and Index-14	13
Index-15 and Index-16	0
Index-17	21
Index-18	0
Index-19 and Index-20	13
Index-21	0

Page Number	*Change Number
Index-22	8
Index-23 – Index-25	0
Index-26	13
Index-27 and Index-28	0
Index-29 – Index-31	13
Index-32	0
Index-33	13
Index-34	8
Index-35	3
Index-36	0
Index-37	8
Index-38	13
Index-39	0
Index-40	25
Index-41	0
Index-42	8
Index-43 and Index-44	0
Index-45	8
Index-46	13
Index-47	0
Index-48	13
Index-49 – Index-52	0
Index-52.1	13
Index 52.2 blank	13
Index-53	13
Index-54 and Index-55	0
Index-56	13
Index-57	0
Index-58	8
Index-59 and Index-60	13

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TECHNICAL MANUAL
NO. 55-2840-229-23-2
T.O. 2J-T53-16

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON D.C., 9 MARCH 1981

AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL FOR ENGINE ASSEMBLY

MODEL T53-L-11C
NSN 2840-M-102-3967
PART NUMBER 1-000-080-12

MODEL T53L-11D
NSN 2840-00-102-3968
PART NUMBER 1-000-080-13

MODEL T53-L-13BA
NSN 2840-01-093-7451
PART NUMBER 1-100-060-10A

MODEL T53-L-13B
NSN 2840-00-134-4803
PART NUMBER 1-000-060-22

MODEL T53-L-703
NSN 2840-00-621-1860
PART NUMBER 1-000-060-23

NOTE:

This manual is printed in two volumes as follows:
TM 55-2840-229-23-1, consisting of Warning Page, Table of Contents, Chapters 1 through 3.
TM 55-2840-229-23-2, consisting of Chapters 4 through 9, Appendixes A through H, Glossary, and Alphabetical Index.
The Table of Contents, Warning Page, Alphabetical Index applicable to the -1 and -2.

CHAPTER 4

TURBINE SECTION

OVERVIEW

This chapter contains procedures for the maintenance and preservation of the power turbine. Paragraphs following outline disassembly, inspection, repair, and additional requirements needed to maintain the oil system and related parts. Procedures requiring maintenance on the Aviation Intermediate Maintenance (AVIM) level are specified and must be performed as such. Paragraphs in which the maintenance level Is not specified shall be considered Aviation Unit Maintenance (AVUM) and maybe performed at this level or a higher level of maintenance.

Page

Page

4-1. GENERAL MAINTENANCE INFORMATION.

Visually inspect all subassemblies and accessories removed from the engine's combustion section. Check for loose or missing arts. Note any damage or excessive wear. Repair damaged parts where possible. Replace damage parts that cannot be repaired. Disassembly procedures provided enable required cleaning, inspection, repair or replacement of combustion section and its accessories.

During reassembly of the engines subassemblies and accessories discard all of the following parts and replace with new parts:

Seals	Tabwashers
Gaskets	Lockpins
Packing	Lockwashers
Cotter Pins	Lockwire

4-2. Combustor Turbine Assembly(T53-L-11 Series Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Special Tools
Wrench (LTCT505)
Wrench (LTCT506)
Wrench (LTCT393)
Lifting device (LTCT53)
Lifting device (LTCT87)
Lifting device (LTCT91)
Lifting device (LTCT2089)
Lifting device (LTCT14668-01)

Consumable Materials
Marking Pencil No. 2107 (item 54, Appendix D)

References
Para 4-38

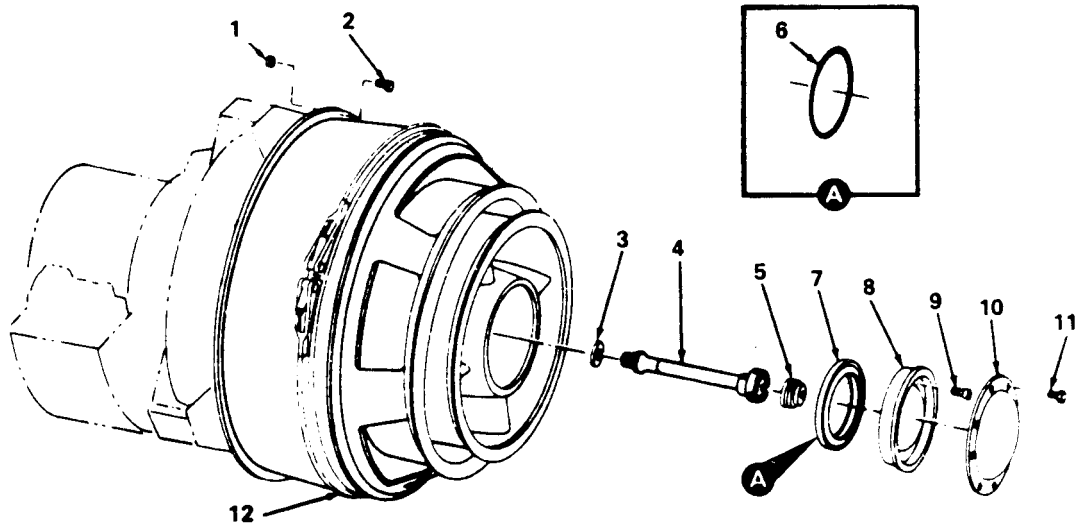
LOCATION/ITEM	REMARKS	ACTION
ENGINE	**WARNING** **FLIGHT SAFETY PARTS** Use of nonaproved marking materials such as common lead pencils on engine components In or near the hot end will cause cracking of those components when subjected to high temperatures. This can lead to engine failure.	

4-2. Combustor Turbine Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued	**WARNING** When handling combustion chamber internal parts that have been exposed to fuels containing tetraethl lead, Insure that the by product (poisonous lead oxide) is not Inhaled or taken Into the body through cuts or other external openings. If accidental exposure occurs, drench affected area with large amounts of clean water and obtain immediate medical attention. NOTE Combustor Turbine assembly may be removed while engine is installed in aircraft. **CAUTION** When disconnecting fuel lines, action for Item 2, disconnect main fuel line at forward end of fuel bypass filter and disconnect filter from diffuser flange. Use extreme care to prevent scoring at sealing surface of connector. Do not disconnect hose from aft end of filter. Secure filter to bracket with short lengths of lockwire. Identify and mark all bolts at which brackets and filter are secured.	

4-2. Combustor Turbine Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
1. Ignition Lead and Coil Assembly		Disconnect.
2. Fuel and Oil Lines		Disconnect as necessary and cap all openings.
3. Bolts (11) and Exhaust Diffuser Cover (10)		Remove.



4-2. Combustor Turbine Assembly (T53-L-11 series Engines) - Removal - Continued

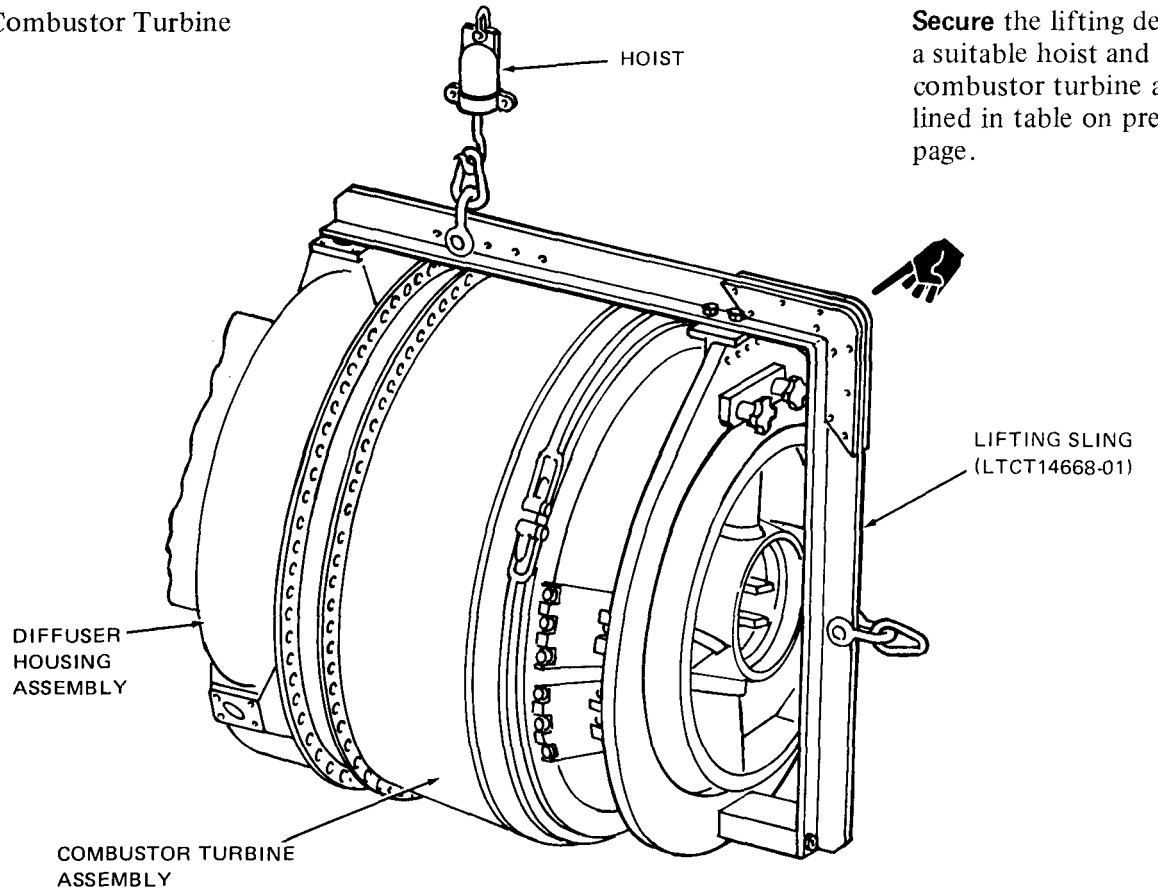
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
4. Bearing Cover (8)		**Remove** bolts (9) which secure rear bearing cover (8) to combustor turbine assembly.
5. Rear Bearing Cover (8) and Seal (7) or Packing (6)	**Discard** packing (6). Seal (7) is reusable.	**Install** three puller screws in cover at approximately 1 -o'clock, 4-o'clock, and 9-o'clock positions. **Tighten** puller screws evenly. **Remove rear** bearing cover (8) and seal (7) or packing (6).
6. Power Shaft Internal Wrenching Nut (5)		**Straighten** deformed rim at four places.
7. Locking Plate Assembly (LTCT248)		**Position** against exhaust diffuser housing with tangs of plate engaging power turbine bearing retainer nut. **Secure** plate with three bolts.
8. Power Shaft Internal Wrenching Nut	Use wrench (LTCT505).	**Remove** and **retain** for reuse.
9. Power Shaft Bolt (4) and Shims (3)	Use wrench (LTCT506). When removing shims, record shim thickness and attach shims, nut, and bolt to air diffuser. Select the lifting device appropriate to the position of the engine (horizontal or vertical) from the table below.	**Remove.**

Combustor Turbine Assembly Lifting Devices and Applications

Lifting Device	Engine Attitude	Location of Device
LTCT53	Vertical	Exhaust Diffuser Support Cone Aft Flange
LTCT87	Horizontal	Around Combustor Housing
LTCT91 LTCT2089 LTCT1 4668-01	Horizontal or Vertical	Exhaust Diffuser Support Cone Aft Flange

4-2. Combustor Turbine Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
10. Combustor Turbine		**Secure** the lifting device to a suitable hoist and to the combustor turbine as outlined in table on preceding page.
	Mark relationship of combustor turbine to air diffuser, using approved marker.	
11. Bolts (2) and Nuts (1)	See figure in item 3. Bolts and nuts secure combustor turbine assembly (12) to diffuser housing.	**Remove** using wrench (LTCT393).
12. Combustor Turbine Assembly	Use marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D).	**Remove** sufficiently to mark relationship of power shaft to power turbine shaft.



4-2. Combustor Turbine Assembly(T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	NOTE **Marking is required for proper reinstallation of same combustor turbine assembly. Do not rotate engine, combustor turbine assembly, or power turbine until marking is accomplished.**	
13. Combustor Turbine Assembly		**Place on suitable work surface.**
14. Combustor Turbine Assembly	**Refer to paragraph 4-38.**	**Perform power shaft bolt flange measurement.**

4-3. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

Appllcable Configuration
T53-L-13B/703 Engines

Special Tools
Torque Adjustment Fixture (LTCT962)
Wrench (LTCT505)
Wrech (LTCT506)
Wrench (LTCT393)
Lifting Device (LTCT53)
Lifting Device (LTCT87)
Lifting Device (LTCT2089)
Lifting Device (LTCT91)
Lifting Device (LTCT14668-01)

Consumable Materials
Marking Pencil No. 2107 (item 54, Appendix D)

References
Para 2-44 and 4-40

4-3. Combustor Turbine Assembly(T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ -	**WARNING** **FLIGHT SAFETY PARTS** **Use of nonapproved marking materials such as common lead pencils on engine com orients In or near the hot end wlf cause cracking of those components when subjected to high tern eratures. This can lead to engine failure.**	
	WARNING **When handling combustion chamber Internal parts that have been exposed to fuels containing tetraethyi lead, insure that the by roduct (poisonous lead oxide) Is not Inhaled or taken Into the body throu h cuts or other externai openings. if accidental exposure occurs, drench affected area with large amounts of clean water and obtain immediate medical attention.**	
	NOTE The combustor turbine assembiy may be removed while the enigne is installed in the aircraft. If combustor turbine is removed for an reason, visually inspect air diffuser third row vanes. (Refer to paragraph 2-44.)	
1. Ignition Coii and Lead Assembly		**Remove** clamps that secure items to combust-tor turbine assembiy.
2. ignition Coii and Lead Assembiy		**Disconnect** from four igniter plugs
3. Oii Pressure and Scavenge Hoses		**Disconnect.**

4-3. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
4. Main Fuel Hose Assembly		**Remove** clamps that secure main fuel hose assembly to combustor turbine assembly.
5. Main Fuel Hose Assembly		**Disconnect** from fuel control and flow divider assembly. Remove hose assembly. Cap all open pats.
6. Clamps	Clamps secure starting fuel hose assembly to combustor turbine assembly.	**Remove.**
7. Starting Fuel Hose Assembly		**Disconnect** from starting fuel solenoid valve and tee between halves of starting fuel manifolds.
8. Cover (11)		**Remove** bolt and tablock that secure cover (11) to rear cover (9).

4-3. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
8.1. Exhaust Diffuser and Cover (9) Gap Clearance inspection	Excessive clearances between the exhaust diffuser rear bore and the power turbine rear cover will cause cracking in the exhaust diffuser. At all eight points, a gap from 0.005 inch (0.013 cm) to 0.007 inch (0.078 cm) is allowed as long as the gap 180 degrees away is no more than 0.003 inch (0.008 cm). If these limits are exceeded. proceed to steps 10.1 and 10.2 after steps 9 and 10 are completed.	Using a suitable feeler gage, measure gap between rear bearing cover (9) and exhaust diffuser at eight equally spaced points.
9. Cover (9)		**Remove** bolts (10) that secure cover (9) to exhaust diffuser.

4-3. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
10. Cover (9). Seal (8) or Packing (7)		**Install** three handling tools (LTCT1430) or 1/4-28 threaded puller screws in cover (9) at approximately 1 -o'clock, 4-o'clock and 9-o'clock positions. **Tighten** handling tools (LTCT1430) or puller screws evenly and remove cover (9) and seal (8) or packing (7). **Discard** packing (7). Seal (8) is reusable.
10.1. Exhaust Diffuser	If the average I.D. exceeds 6.066 inches (15.407 cm). remove and replace.	**Check** inside diameter of rear bore at eight equally spaced points.
10.2. Cover (9)	If the average O.D. exceeds 6.062 inches (15.397 cm) remove and replace.	**Check** outside diameter at eight equally spaced points.
11. Nut (6)		**Straighten** deformed rim at three places.
12. Combustion Turbine Assembly		**Install** torque adjustment fixture (LTCT962) into rear of combustion turbine assembly. **Engage** tangs of locking plate assembly with slots in bearing retainer nut. **Secure** fixture with three bolts.

4-3. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
13. Power Shaft Internal Wrenching Nut	Use wrench (LTCT505). See figure following	**Remove** with wrench. **Retain** for use.
	NOTE When removing shims. record shim thickness and attach shims, nut, and bolt to air diffuser.	
14. Power Shaft Bolt (5) and shims (4)	See figure in item 8. Use wrench (LTCT506).	Remove with wrench.
	Select the lifting device appropriate to the position of the engine (horizontal or vertical) from the following table.	

Combustor Turbine Assembly Lifting Devices and Applications

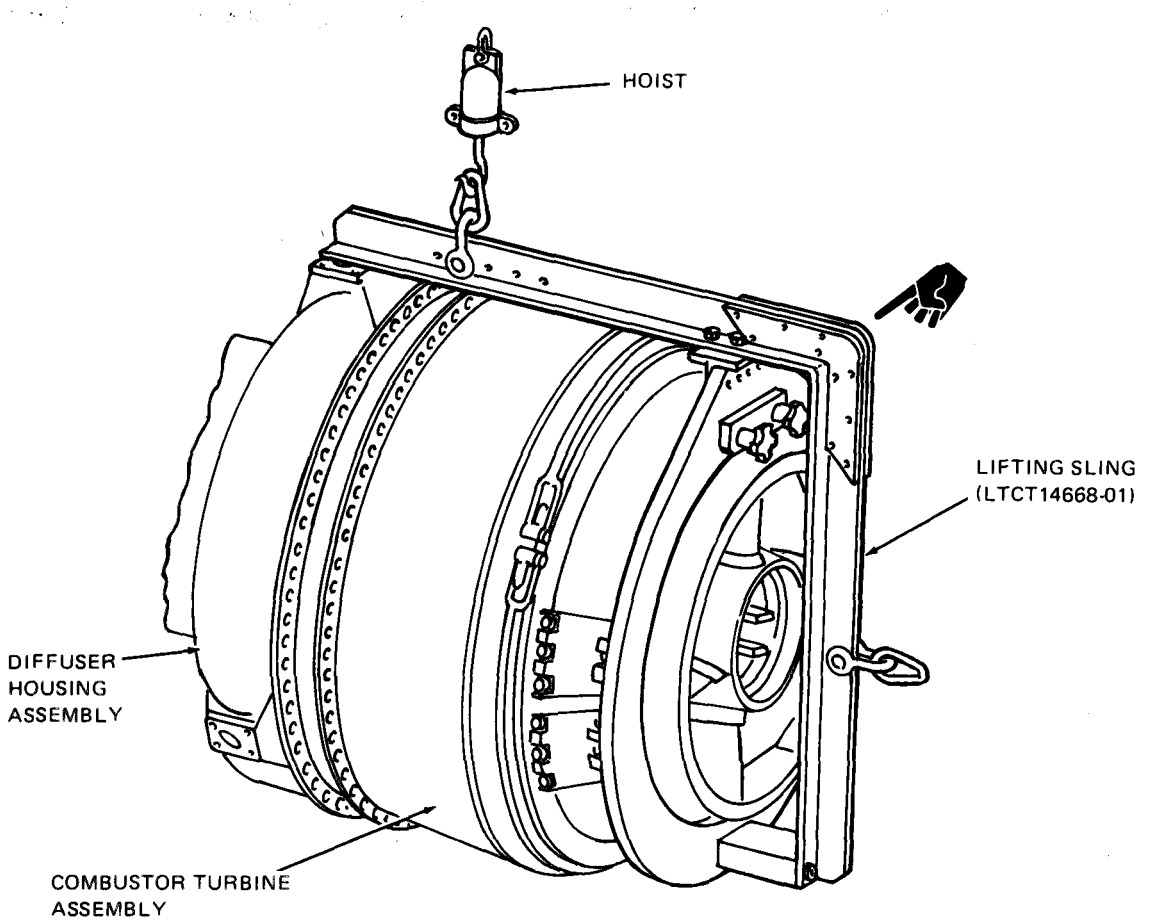
Lifting Device	Engine Attitude	Location of Device
LTCT53	Vertical	Exhaust Diffuser Support Cone Aft Flange
LTCT87	Horizontal	Around Combustor Housing
LTCT91 LTC1-2089 LTCT14668-01	Horizontal or Vertical	Exhaust Diffuser Support Cone Aft Flange

15. Combustor Turbine		Secure the lifting device to a suitable hoist and to the combustor turbine as outlined in preceding table.
	NOTE Using an approved marking pencil. Colorbrite No. 2107 (item 54. Appendix D), identify and mark all bolt holes at which brackets were secured. Mark relationship of combustor turbine assembly to air diffuser using approved marker.	

4-3. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION

ENGINE/ - Continued

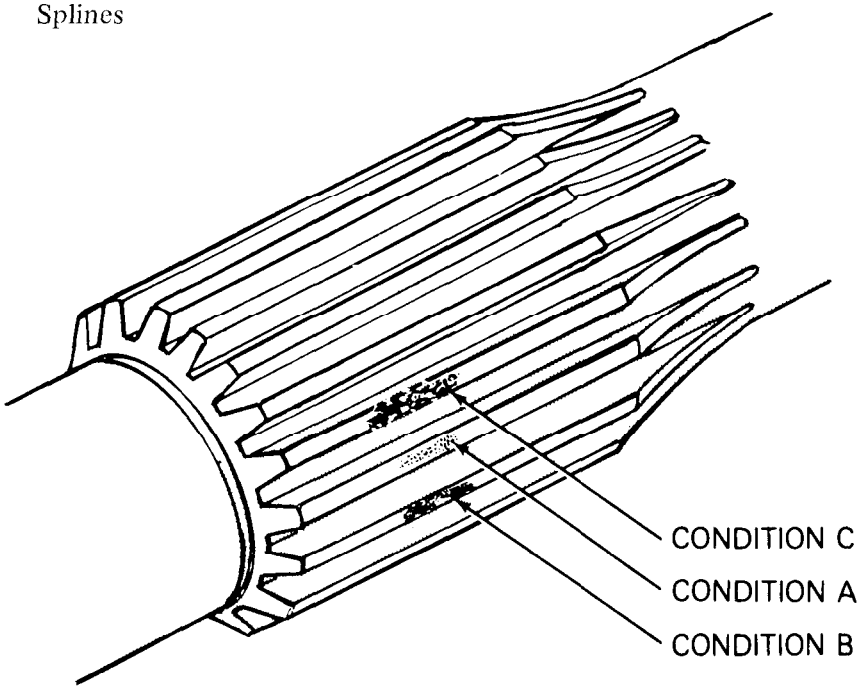


16. Bolts (2), Nuts (1)	These items secure combustor turbine assembly (3) to diffuser housing. (See figure in item 8.)	**Remove** using wrench (LTCT393).
17. Combustor Turbine Assembly	Use approved marker, Colorbrite No. 2107 (item 54, Appendix D).	**Remove** combustor turbine assembly sufficiently to **mark** relationship of power shaft to power turbine shaft.

4-3. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	NOTE Marking with Colorbrite No. 2107 (item 54, Appendix D) is required for proper reinstallation of same combustor turbine assembly. Do not rotate engine, combustor turbine assembly or power turbine until marking is accomplished.	
18. Combustor Turbine Assembly		**Lower** and **place** on a suitable work surface.
19. Combustor Turbine Assembly	Refer to paragraph 4-40.	**Perform** power shaft bolt flange depth measurement.

4-3.1 Combustor Turbine Assembly (T53-L-13B/703 Engines) - Inspection Power Shaft

LOCATION/ITEM	REMARKS	ACTION
1. Power Shaft Mating Splines		Visually **inspect** the power shaft (drive and driven) splines for wear. If wear or fretting is evident as shown in illustration, the following limits will apply . 1. Light to medium (conditions A and B) are acceptable. 2. Heavy wear (condition C) is acceptable up to 0.007 inch depth stepped wear on external (driven) splines, provided metallic build up on mating power turbine (drive) internal splines is cleaned with a stiff wire brush and dry cleaning solvent. **3. Inspect** internal splines (drive) for wear. Wear up to 0.005 inch depth is acceptable.
	NOTE Do not lubricate power shaft splines.	

4-4. Combustor Turbine Assembly (T53-L-11 Series Engines) - Disassembly

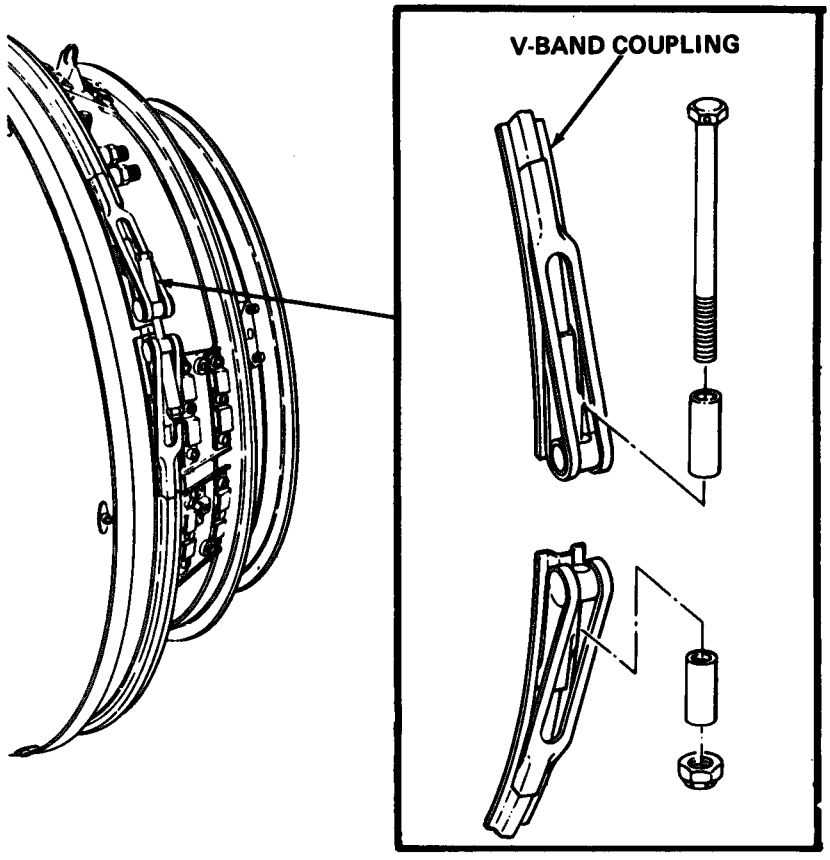
INITIAL SETUP

Applicable Configuration
T53-L11 Series Engines

References
Para 7-9,6-27,6-54,6-40, and 7-41

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**NOTE** Disassemble the combustor turbine assembly only as far as necessary to correct visible damage or replace components.	
1. Exhaust Thermocouple Harness	Refer to paragraph 7-9.	**Remove (if** installed).
2. Main and Starting Fuel Manifolds	Refer to paragraphs 6-27 and 6-54.	**Remove (if installed) as a single unit.**
3. V-Band Coupling		**Remove (if** installed) es a single unit.

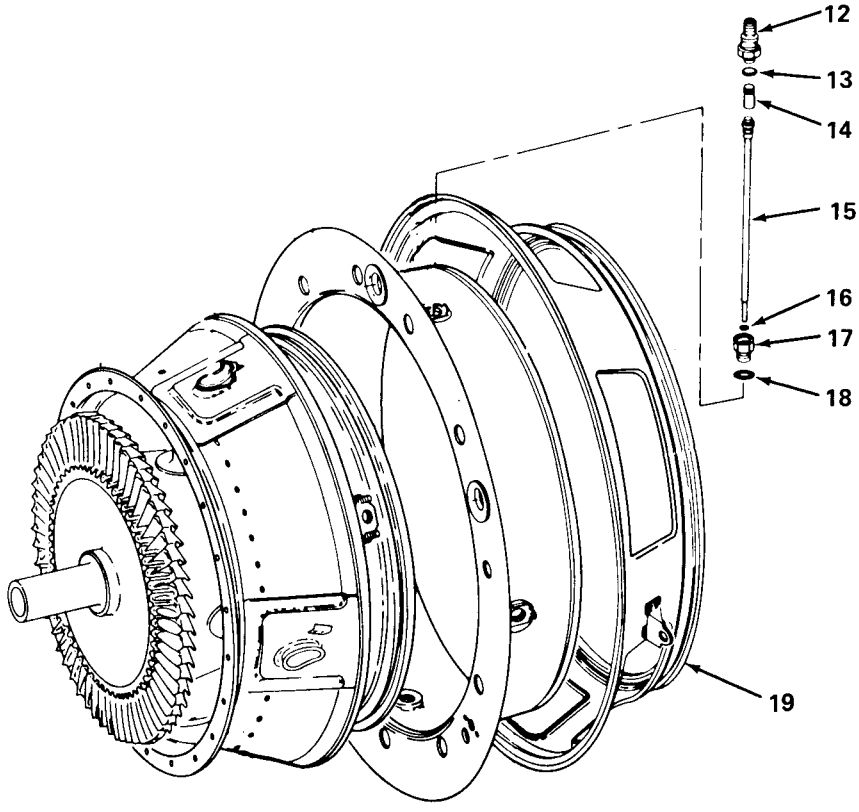
44. Combustor Turbine Assembly (T53-L-11 Series Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
4. Support Cone (19)		Remove.
5. Igniter Plug and Starting Fuel Nozzles	See paragraphs 6-40 and 7-41.	Remove.
	CAUTION Do not twist or turn oil nozzle (15) during removal.	
6. Turbine Oil Strainer Housing (12)	Hold adapter (17) with wrench.	Unscrew. Remove.
7. Power Turbine Oil Strainer (14)		Remove.

4-4. Combustor Turbine Assembly (T53-L-11 Series Engines) - Disassembly - Continued

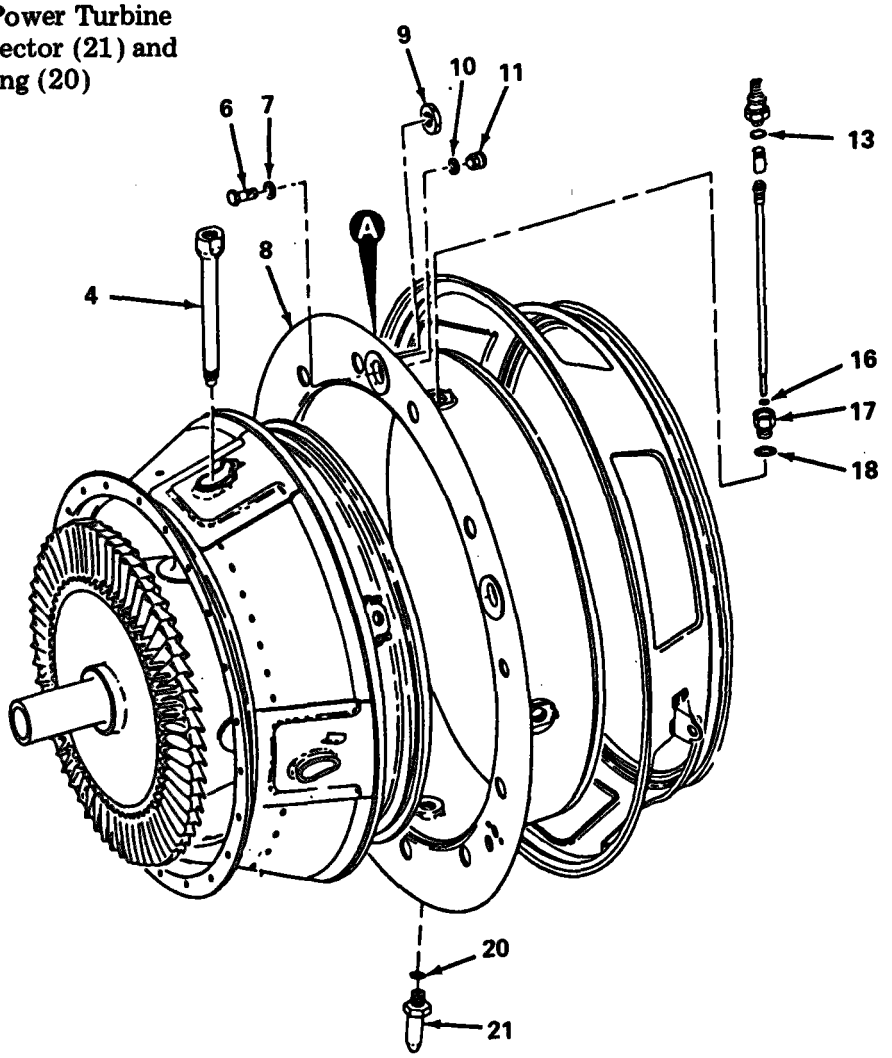
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/--Continued		
8. Oil Nozzle (15)		**Remove. Unscrew** power turbine oil strainer from oil nozzle,
9. Packings (13 and 16)		**Remove.**
10. Adapter (17)		**Remove** from power turbine oil tube (4). **Remove** packing (18).

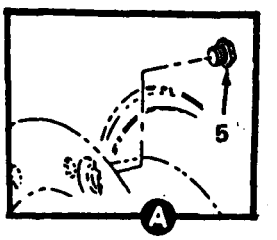
1. Power Turbine Nozzle and Cylinder Assembly
2. Combustion Chamber Assembly
3. Second Stage Turbine Support Assembly
4. Power Turbine Oil Tube
5. Plug
6. Bolt
7. Washer
8. Fireshield
9. Adapter Nut
10. Washer
11. Nut
12. Power Turbine Oil Strainer Housing
13. Packing
14. Power Turbine Oil Strainer
15. Oil Nozzle
16. Packing
17. Adapter
18. Packing
19. Support Cone
20. Packing
21. Connector
22. Special Bolt
23. Screw



4-4. Combustor Turbine Assembly (T53-L-11 Series Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
11. Power Turbine Connector (21) and Packing (20)		Remove.
12. Adapter Nuts (9)		Remove nuts (9) that secure fireshield (8) to fuel vaporizers.
13. Plugs (5)	If installed perform this action.	Remove from three unused igniter plug holes on fireshield.



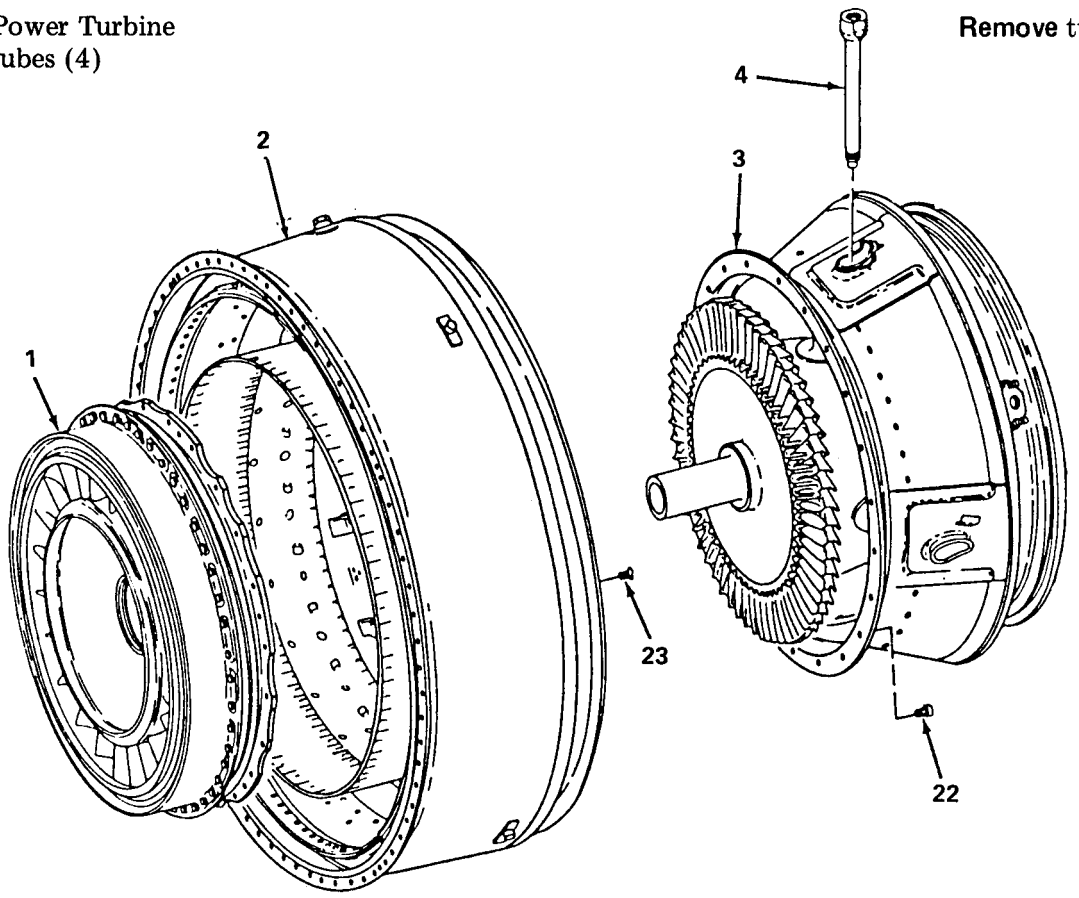


CAUTION

Do not damage threads of fuel vaporizers when removing the shield (8).

4-4. Combustor Turbine Assembly (T53-L-11 Series Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
14. Fireshield (8)	Cap fuel vaporizers to protect threads.	**Remove.**
15. Bolts (6), Nuts (11), Washers (7 and 10)	If installed, perform this action.	**Remove.**
16. Power Turbine Oil Tubes (4)		**Remove** two tubes.



17. Second Stage Turbine Assembly (3)	Set aside support assembly (3).	**Remove** bolts (22) that secure second stage turbine assembly to combustion chamber assembly (2). **Discard** bolts.
18. Power Turbine Nozzle and Cylinder Assembly (1)		**Remove** screws (23). **Remove** power turbine nozzle and cylinder assembly from combustion chamber (2).

4-5. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Disassembly

Applicable Configuration
T53-L-13B/703 Engines

Special Tools
Mechanical Puller (LTCT4680)
Arms (LTCT4682, detail of LTCT4680)
Holding Fixture (LTCT4553)
Mechanical Puller (LTCT4800)

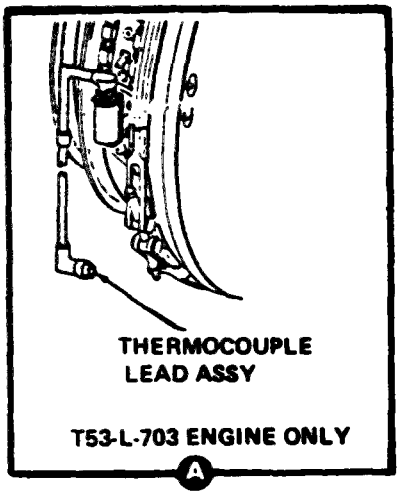
Consumable Materials
Barrier Material (item 9, Appendix D)
Transparent Flexible Bag (item 81, Appendix D)
Marking Pencil No. 2107 (item 54. Appendix D)

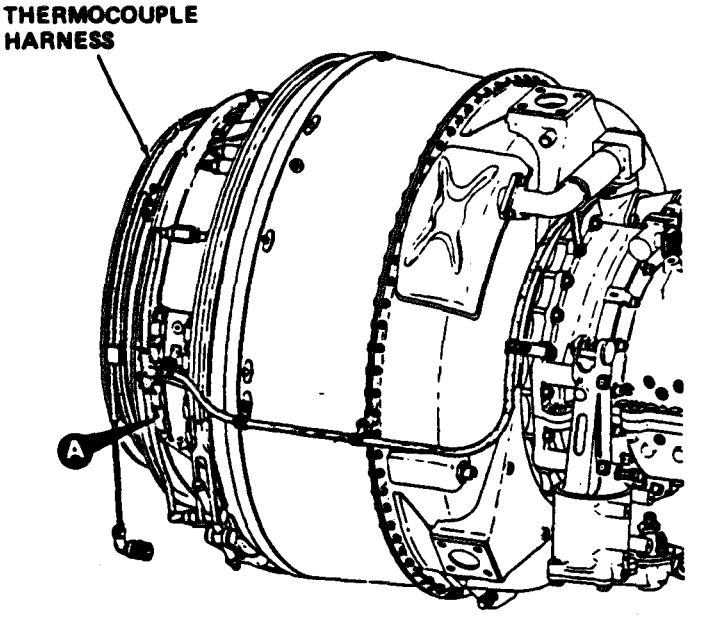
References
Para 7-10, 6-64, 6-74,6-41, 7-42, and 3-17

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**WARNING** FLIGHT SAFETY PARTS Turbine Rotor Spacer (Power Turbine Rotor Spacer Turbine Disk and Hub (Second Stage Power Turbine Rotor Disk) Turbine Turbine Disk (First Stage Power Turbine Disk) Handle with caution and provide protective covering when removed from engine.	

4-5. Combustor Turbine Assembly(T53-L-13B/703 Engines) - Disassembly - Continued

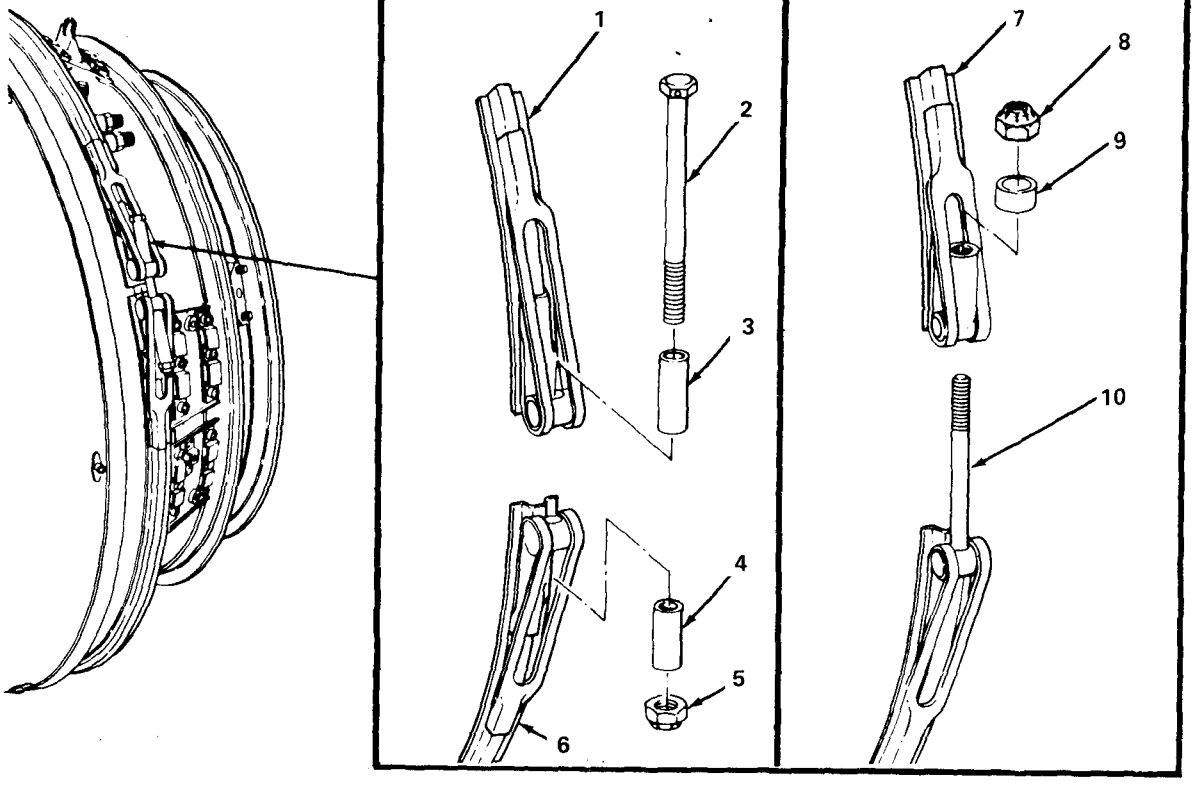
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	NOTE Disassemble the combustor turbine assembly only as required to correct visible damage or to replace components.	
1. Exhaust Thermocouple Harness	T53-L-13B engine only. Refer to paragraph 7-10 for removal.	Remove (if installed).
2. Thermocouple Lead Assembly	T53-L-703 engine only. Refer to paragraph 7-11 for removal and paragraph 7-21 for installation.	Disconnect from connector. Cap ports on divider and manifolds.
2.1. Flow Divider	Refer to paragraph 6-74.	Remove (if installed).





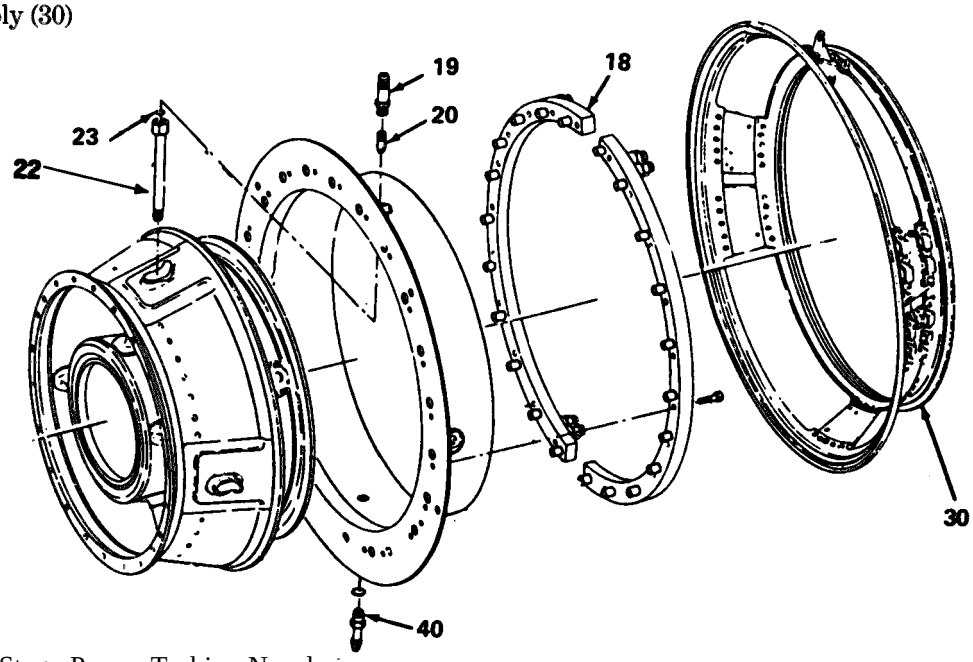
4-5. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	NOTE Items 3 thru 9 pertain to disassembly of the V-band coupling.	
3. V-Band Coupling (1)		Remove.
4. V-Band Coupling Assemblies (1 and 6)	Perform this action if V-band coupling assemblies (1 and 6) are installed.	Remove nuts (5), spacers (4 and 3), and bolts (2) that secure V-band coupling assemblies together.
5. V-Band Coupling Assemblies (1 and 6)	Perform this action if these coupling assemblies are installed.	Separate from diffuser support cone.
6. V-Band Coupling Assemblies (1 and 6)	Perform this action if these coupling assemblies are installed.	Remove.



4-5. COMBUSTOR TURBINE ASSEMBLY (T53-L-13B/703 ENGINES)–DISASSEMBLY–Cojnt.

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
7. V-Band Coupling Assemblies (10-and-7)	Perform this action if V-band coupling assemblies (10 and 7) are installed.	Remove nuts (8) and spacers (9) that secure V-band coupling assemblies together.
8. V-Band Coupling Assemblies (10 and 7)	Perform this action if these coupling assemblies are installed.	Separate from diffuser support cone.
9. V-Band Coupling Assemblies (10 and 7)	Perform this action if these coupling assemblies are installed.	Remove.
9.1. Starting fuel nozzles and igniters	Refer to Paragraph 6-41 and 7-42.	Remove if installed.
10. Diffuser Support Cone Assembly (30)		Remove.

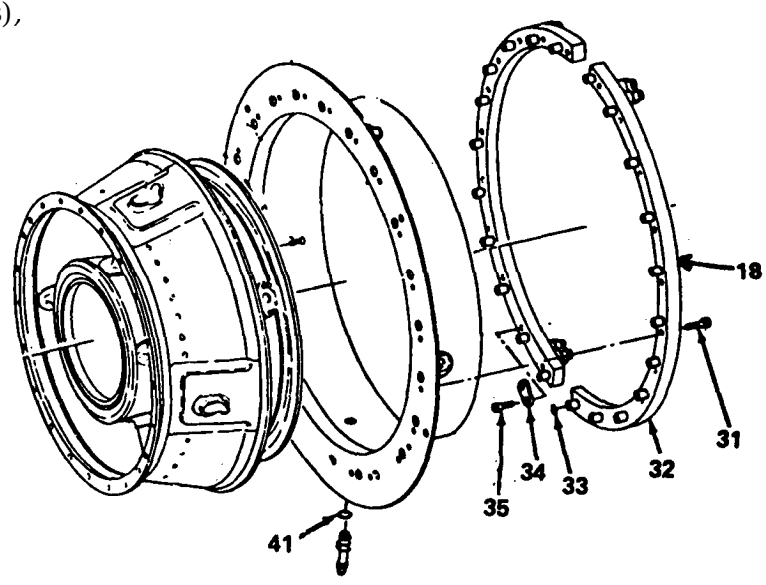


1. First Stage Power Turbine Nozzle
2. Bolt
3. Locking Plate
4. Bolt
5. Locking Plate
6. Sealing Flange
7. First Stage Power Turbine Rotor
8. Power Turbine Spacer
9. Pin
10. Spacer
11. Second Stage Power Turbine Nozzle
12. Ring
13. Spacer
14. Combustion Chamber Assembly
15. V-Band Coupling Assembly
16. Connector (T53-L-703 Engines)
17. Screw (T53-L-703 Engines)
18. Fuel Manifold Assembly
19. Oil Strainer Housing Adapter
20. Strainer
21. Screw
22. Power Turbine Oil Tube
23. Packing

4-5. COMBUSTOR TURBINE ASSEMBLY (T53-L-13B/703 ENGINES) – DISASSEMBLY – Cont.

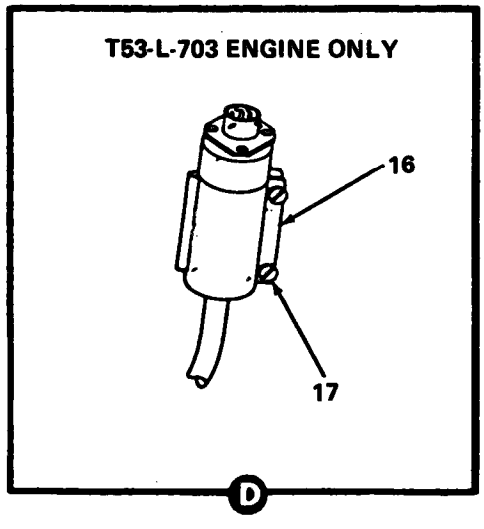
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
11. Oil Strainer Housing Adapter (19)		**Unscrew. Remove** from power turbine oil tube (22) at top of exhaust diffuser.
12. Packing (23) and Strainer (20)		**Remove.**
13. Connector (40)		**Unscrew. Remove** from tube at bottom of exhaust diffuser.
14. Packing (41)		**Remove.**
15. Deleted.		
16. Bolts (31)	Bolts secure fuel manifold assemblies (18 and 32) to combustion chamber assembly.	**Remove**

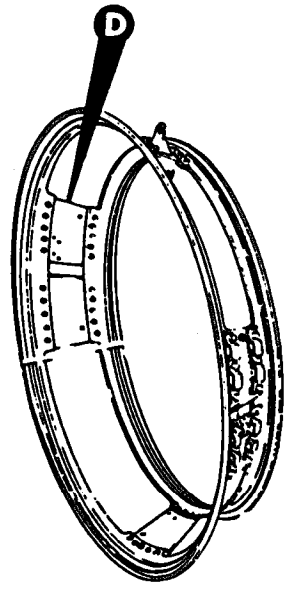
24. Locking Plate
25. Thermocouple Harness (T53-L-703 Engines),
26. Bolt (T53-L-703 Engines)
27. Bolt (T53-L-703 Engines)
28. Plate (T53-L-703 Engines)
29. Bolt
30. Support Cone Assembly
31. Bolt
32. Fuel Manifold Assembly
33. Seal
34. Sealing Gasket
35. Screw
36. Fireshield (T53-L-13B Engine)
37. Fireshield (T53-L-703 Engines)
38. Cover Assembly (T53-L-703 Engines)
39. Screw (T53-L-703 Engines)
40. Connector
41. Packing
42. Exhaust Diffuser Assembly
43. Seal
44. Power Turbine Rotor and Bearing Housing Assembly
45. Gasket
46. Packing



4-5. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

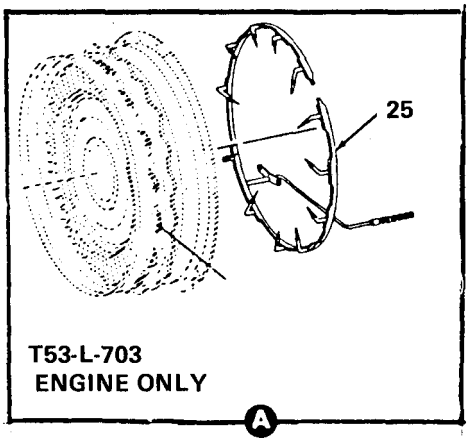
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**CAUTION** The main fuel manifold is a high-value item and must be carefully repacked for return to depot maintenance. If manifold is to be replaced, enclose it in barrier material (item 1, Appendix D) or in a transparent flexible bag (item 81, Appendix D) and secure in a reusable container. The container should then be enclosed in a waterproof cardboard box and identified for shipment.	
17. Manifolds		Carefully remove from combustion chamber housing.
18. Seals (33)		Remove from fuel nozzles.
19. Screws (35)		Remove.
20. Sealing Gaskets (34)		Remove.
	NOTE Actions for items 21 thru 26 pertain to T53-L-703 engine only.	
21. screws (17)		Remove from connector (16).

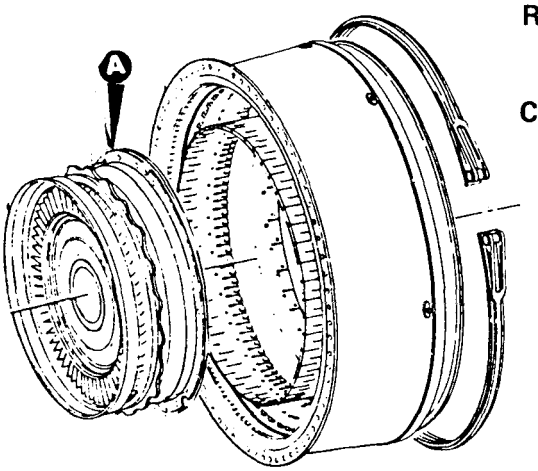




4-5. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

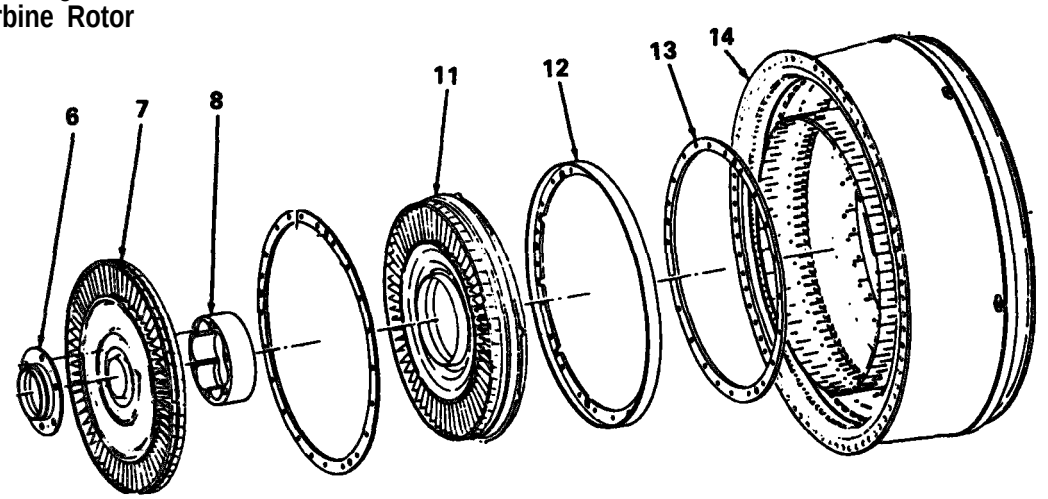
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
22. Connector		Open.
23. Lead Thermocouple Harness (25)		Remove lead.
24. Lockwire		Cut.
25. Screws (39)	**Screws secure cover assembly (38) to fireshield (37).**	Remove.





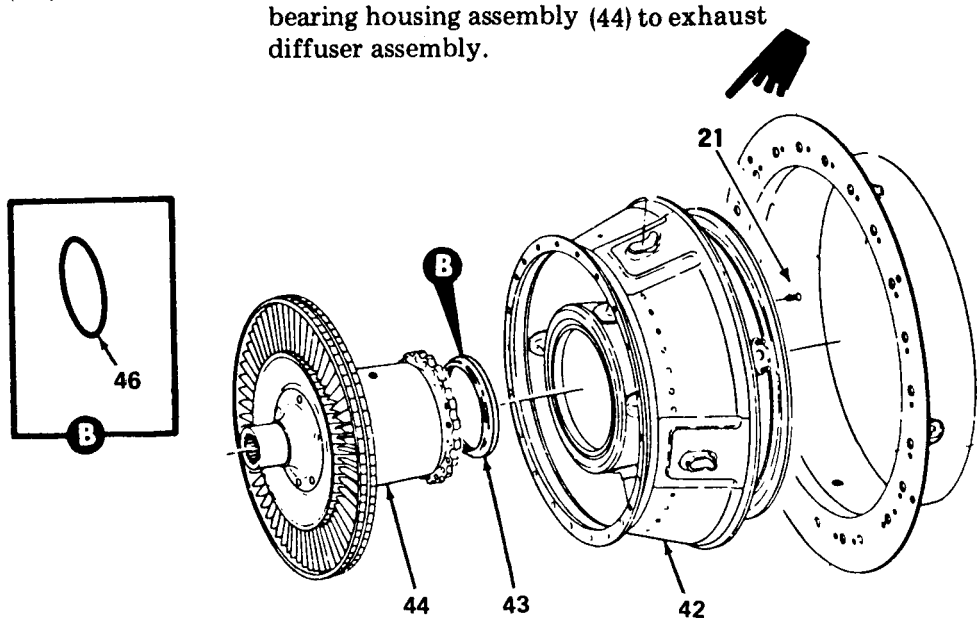
4-5. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/-Continued		
41. Sealing Flange (6), First Stage Power Turbine Rotor (7), Power Turbine Spacer (8), and second Stage Power Turbine Rotor	Use marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D) for this action.	Indicate alinement.
42. Sealing Flange (6)		Remove from face of first stage power turbine rotor.
43. First Stage Power Turbine Rotor (7) and Power Turbine	For this action use mechanical puller (LTCT4680) with arms (LTCT4682, detail of LTCT4680) extended and hooks counterclockwise as viewed form handle end,	Remove as a unit.
44. Rotor and Spacer	Use puller (LTCT4680) with arms retracted and hooks clockwise for removal of spacer.	Turn over. Remove power turbine spacer (8) from rotor.
46. Second Stage Power Turbine Nozzle (11), Ring (12), and Spacer (13)		Remove. Record thickness of spacer for reassembly.
46. Combustion Chamber Assembly (14)		Separate from exhaust diffuser assembly.



4-5. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
47. Exhaust Diffuser	Use holding fixture (LTCT4553).	**Position** in holding fixture with second stage power turbine rotor assembly down.
48. Screws (21)	Screws secure power turbine rotor and bearing housing assembly (44) to exhaust diffuser assembly.	**Remove.**
49. Turbine Rotor Assembly	Use mechanical puller (LTCT4800).	**Raise** assembly slightly from holding fixture. Separate turbine rotor assembly from exhaust diffuser (42) using mechanical puller.
50. Seal (43) or Packing (46)	If packing is removed, discard. Seal is reusable.	**Remove.**



4-6. Combustor Turbine Assembly (T53-L-11 Series Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para 3-16, 4-4, 4-20, 4-49, 4-22, 4-48, 1-55, H-25, H-29

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**WARNING** **When handling combustion chamber internal parts that have been exposed to fuels containing tetraethyl lead, insure that the byproduct (poisonous lead oxide) is not inhaled or taken into the body through cuts or other external openings. If accidental exposure occurs, drench affected area with large amounts of clean water and obtain immediate medical attention.** **NOTE** A thorough visual inspection shall be made using a light and mirror. If the visual inspection reveals a need for repair or replacement, refer to the applicable paragraph for the particular component. Disassemble the combustor turbine assembly only as far as necessary to correct the condition. Refer to paragraphs 3-16, 4-4, 4-20, 4-49 and 4-22.	
	If damage is noted, refer to applicable paragraphs for limits and replacement of damaged components.	**Inspent** for visible damage.
1. Blades	Refer to paragraph 4-22.	**Measure** power turbine blade tip clearance.
2. No. 3 Bearing Seal	Refer to paragraph 1-55.	**Inspect** for seal failure.
3. Power Shaft Bolt	Repair minor thread damage (paragraph H-29) and nicks and burrs (paragraph H-25). Replace bolts if cracks or mutilation are noted.	Visually **inspect** for damaged threads, nicks, burrs) cracks, and mutilation.

4-6. Combustor Turbine Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**NOTE** If cracks are suspected, perform magnetic particle inspection. (Refer to paragraph H-19.)	
4. Seal		**Inspect** for cuts, nicks, tears, cracks, distortion, pliability, and wear. If damage is noted, **replace** seal.

4-7. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

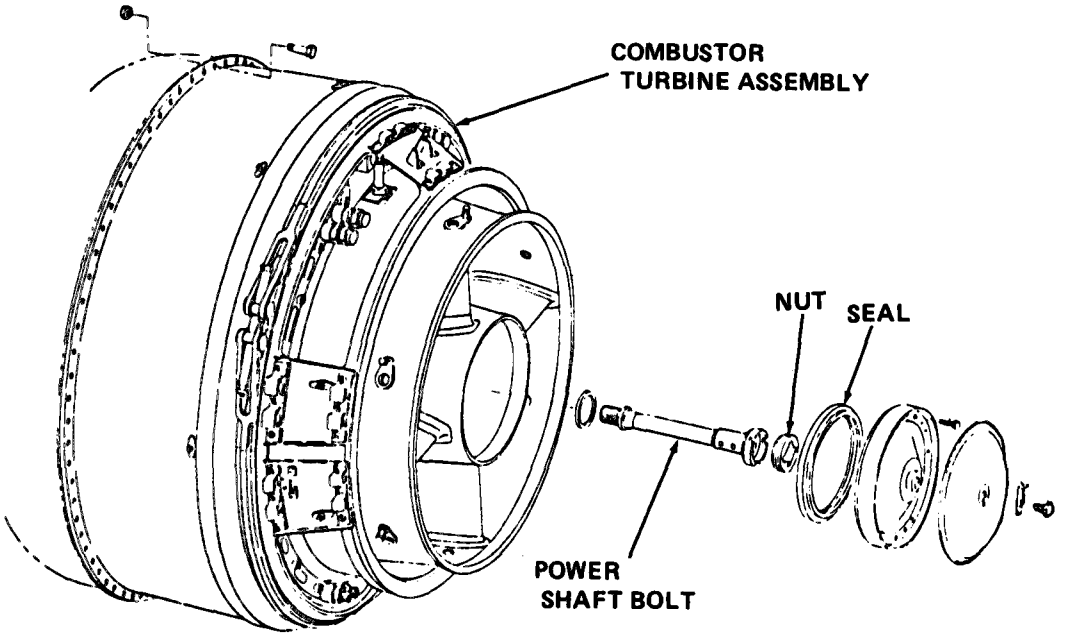
Applicable Configuration
T53-L-13B/703 Engines

References
Para H-17, H-29, and H-26

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**WARNING** **When handling combustion chamber internal parts that have been exposed to fuels containing tetraethyl lead, insure that the byproduct (poisonous lead oxide) is not inhaled or taken into. the body through cuts or other external openings. If accidental exposure occurs, drench affected area with large amounts of clean water and obtain immediate medical attention.**	
1. Combustor Turbine Assembly		Inspect for visible damage.

4-7. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



NOTE

Burning and/or distortion in line with one or more main fuel nozzles or starting fuel nozzles is evidence of clogging of fuel system components. Investigate and replace affected components as outlined in applicable paragraphs.

2. Combustor Turbine Assembly		If damage is noted, refer to applicable paragraphs for limits and replacement of damaged components.
3. Second Stage Gas Producer Turbine Rotor Tip Clearance		Check for 0.020 (0.051 cm) inch minimum clearance using a feeler gage and second stage power turbine rotor tip clearance for 0.025 inch (0.064 cm) minimum clearance using a bent 0.025 inch (0.064 cm) diameter wire.

4-7. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**NOTE** If cracks in power shaft bolt are suspected when performing following item 4, perform magnetic-particle inspection. (Refer to paragraph H-19.)	
4. Power Shaft Bolt		Visually **inspect** for damaged threads, nicks, burrs, cracks and mutilation. **Repair** minor thread damage (refer to paragraph H-29) and nicks and burrs (refer to paragraph H-25). **Replace** bolt if cracks or mutilation are noted.
5. Internal Wrenching Nut		**Inspect** for the following damage: a. Thread damage - **blend-repair** minor damage. (Refer to paragraph H-29.) b. Wrenching surface damage - **reject** if more than one surface exhibits deformation. c. Mating surface damage - **blend** smooth with emery paper. d. Cracks in thin-wall area - **remove** cracks with small file. e. Cracks in any other area - **reject** nut. **Inspect** for cuts, nicks, tears, cracks, distortion, pliability and wear. If damage is noted, **replace** seal.

4-8. Combustor Turbine Assembly (T53-L-11 Series Engines) - Assembly

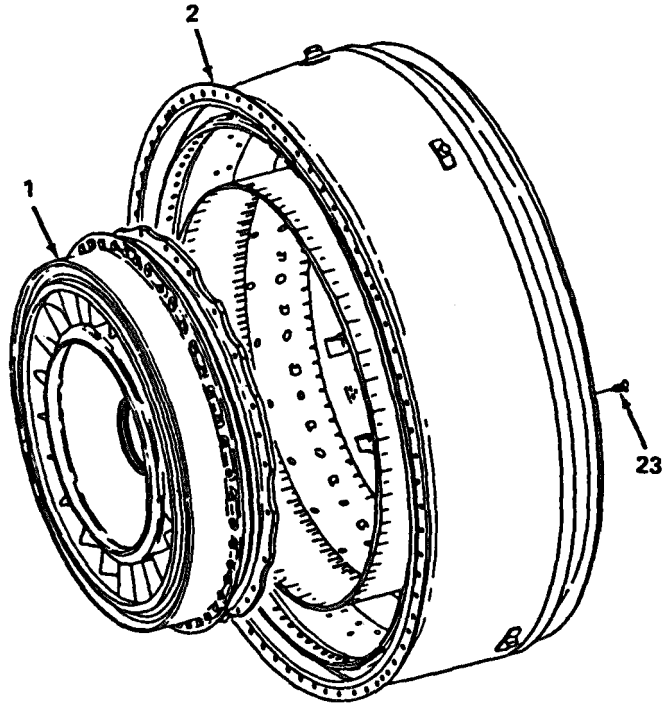
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Anti-Seize, 767 (item 102, Appendix D
Nickel- Ease (Item 103, Appendix D)
Molykote Anti-Seize Thread Compound (Item 58, Appendix D)
Iron-Blue Pigment (item 37, Appendix D)
Lockwire item 41,42, or 43, Appendix D)

References
Appendix G, Table G-5, Reference Numbers 44,47,43,45
Appendix G, Table G-3, Reference Numhers 33,28,31,23,22,29,21

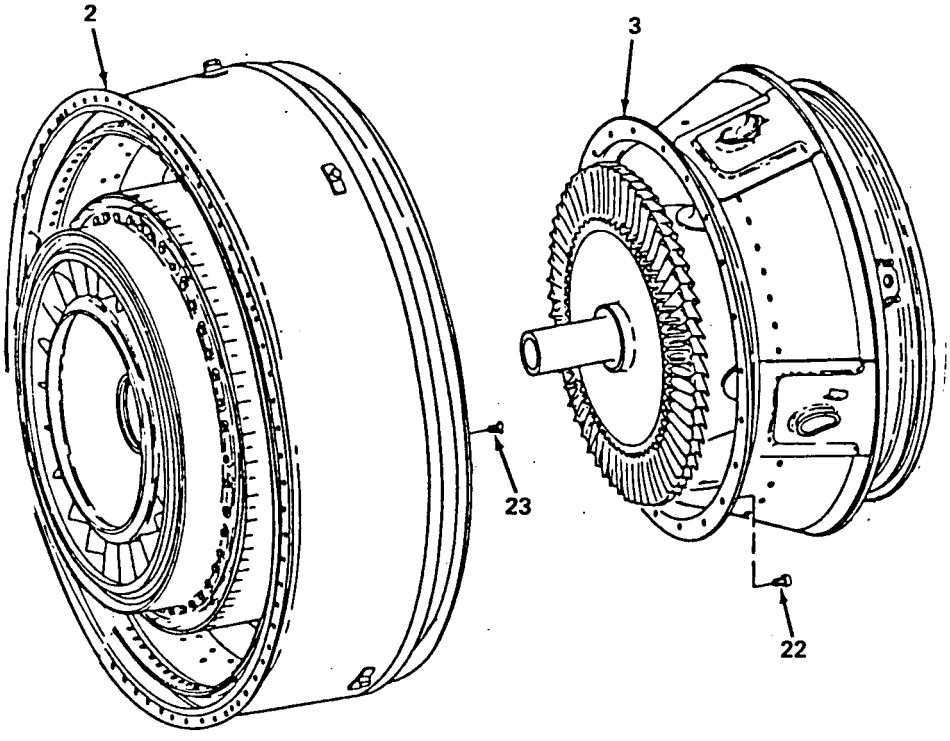
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		
1. Power Turbine Nozzle and Cylinder Assembly (1)		Install into combustion chamber assembly (2) Anne holes.



2. Screw (23)		Support power turbine' nozzle and cylinder assembly. Insert and tighten screw (23).

4-8. Combustor Turbine Assembly (T53-L-11 Series Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
3. Combustion Chamber Housing		**Position** with flange down.
	NOTE Centering of power turbine support assembly in action for item 4 can be accomplished by inserting four feeler gages of equal thickness between blade tips and cylinder at the 12-o'clock, 3-o'clock, 6-o'clock, and 9-o' clock positions before bolts are tightened.	
4. Second Stage Turbine Support Assembly (3)		**Install** on combustion chamber assembly (2). **Aline** holes with exhaust thermocouple mounts located at approximately the l-o'clock, 4-o'clock, and 10-o' clock positions.

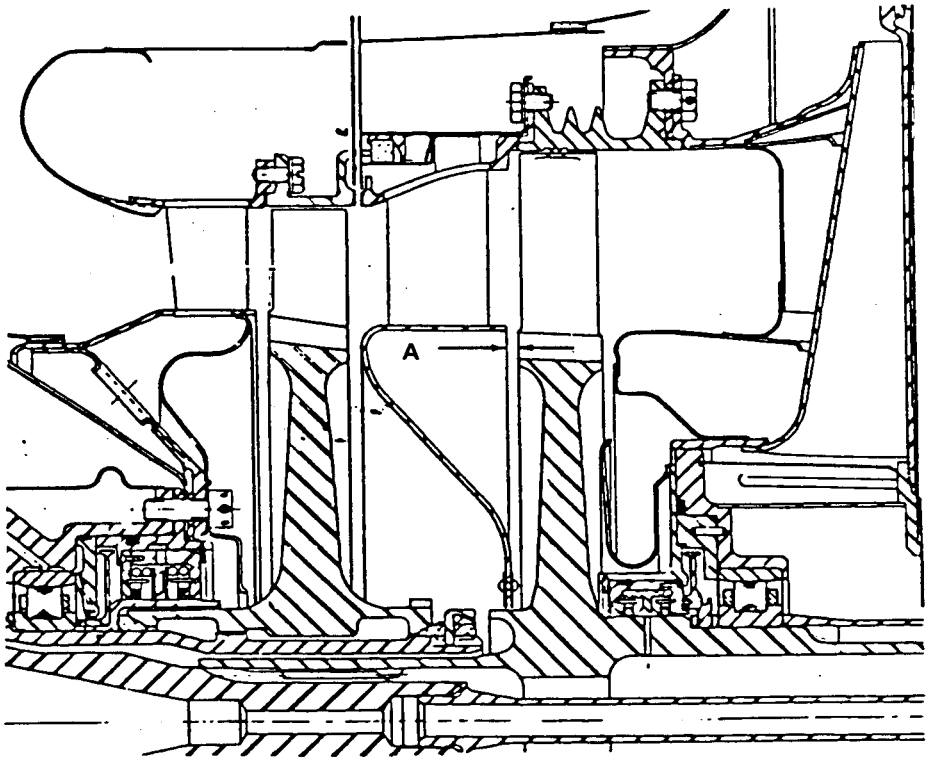


4-8. Combustor Turbine Assembly (T53-L-11 Series Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
5. Bolts (22)	Coat new special bolts with Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease item 103, Appendix D) or Molykote An - Seize Thread Compound (item 58, Appendix D)	Secure second stage tubine support assembly to combustion housing with bolts (22). Tighten bolts only enough to secure parts.
6. Blade Tip		Check clearance at eight positions, 45 degrees apart.
7. Second Stage Turbine Cylinder		Insert feeler age between second stage turbine cylinder and second stage turbine blade tips.
8. Turbine Wheel	Required clearance is given in table G-5, Appendix G, reference number 44.	Rotate one full turn at each position.
9. Bolts (22)	Refer to table G-3, Appendix G, reference number 33. Tabwashers maybe used in lieu of lockwire.	Tighten as required. Lockwire in pairs.
10. Blade Tip		Check clearance to make certain it was not altered by tightening.
11. Power Turbine Nozzle (1)	Required clearance is given in table G-5, Appendix G, reference number 47. If clearance is less than 0.015 inch (0.38 mm), rework nozzle to Increase clearance.	Check clearance between OD of power turbine forward seal flange and ID of power turbine nozzle air seal.
12. Second Stage Turbine Support Assembly (3)	Fabricate suitable length of 0.070 inch diameter wire with 90 degree bend 2 inches from one end.	Insert wire through second eta turbine support assembly (3) aft end.
	Axial clearance shall be as given In G-5, Appendix G, reference number 43.	Check that wire fits (A) between second stage nozzle inner shroud and second stage turbine blade roots (four places 90 degrees apart).

4-8. Combustor Turbine Assembly (T53-L-11 Series Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



NOTE

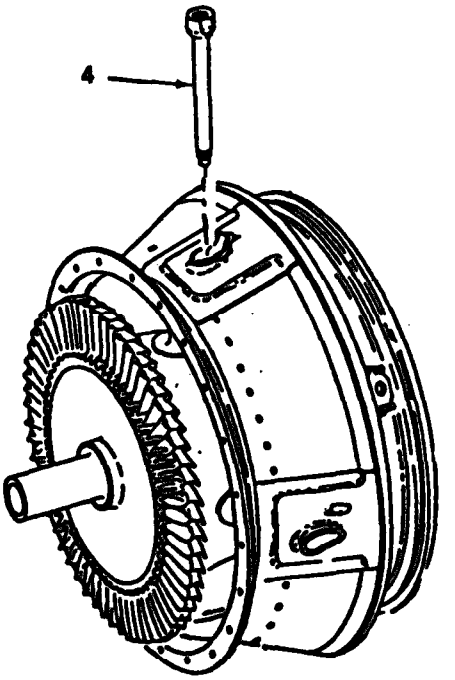
A perfect seat of tubes in following item 13 will be indicated by en unbroken ring on the tapered seat of the power turbine tube.

NOTE

Do not lubricate power turbine oil tubes (4).

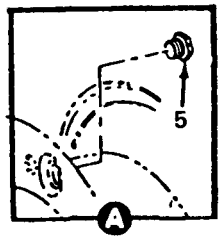
13. Power Turbine Oil Tubes (4)	Lightly coat tapered seats of two power turbine oil tubes with iron-blue pigment (item 37, Appendix D).	**Install into** top and bottom struts of second-stage turbine support assembly. **Thread** finger-tight. **Remove** power turbine oil tubes.

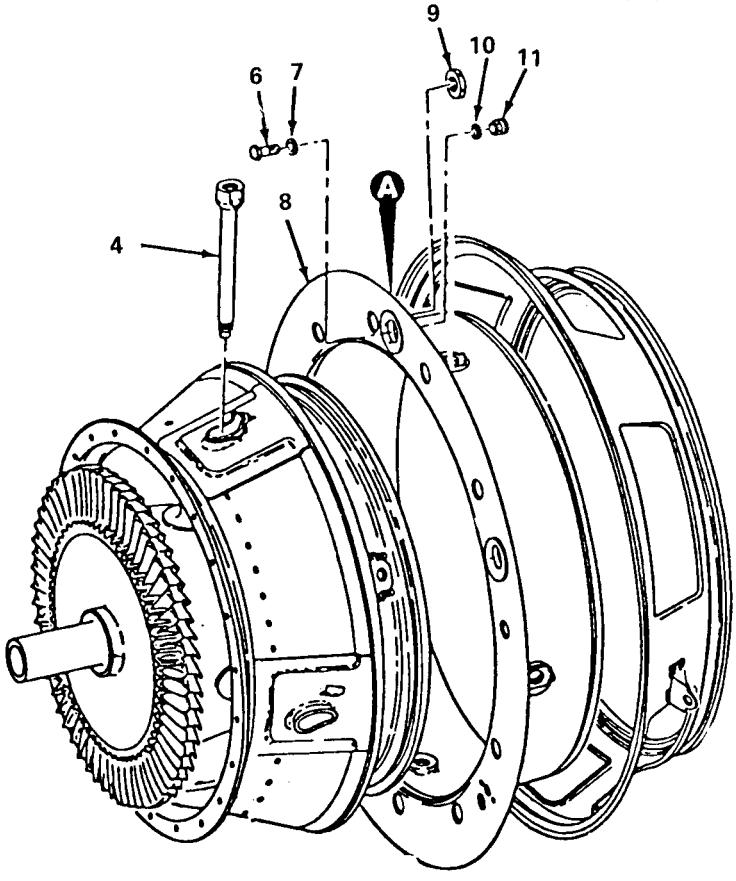
4-8. Combustor Turbine Assembly (T53-L-11 Series Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
14. Seats	If seating is imperfect, check for cleanliness of both power turbine oil tubes and bearing connectors. Interchange tubes and repeat action for item 13.	Inspect.
	CAUTION To prevent oil leaks, the power turbine tubes must seat perfectly. If proper seating has not been obtained, replace tubes and repeat preceding actions for items 13 and 14.	
16. Power Turbine Oil Tube (4)	Refer to table G-3, Appendix G, reference number 28.	Tighten each as required. Lockwire power turbine oil tubes on exhaust diffuser. Turn combustor.
16. Combustor Turbine Assembly		Turn over with power turbine nozzle and cylinder assembly up.

4-8. Combustor Turbine Assembly (T53-L-11 Series Engines) - Assembly . Continued

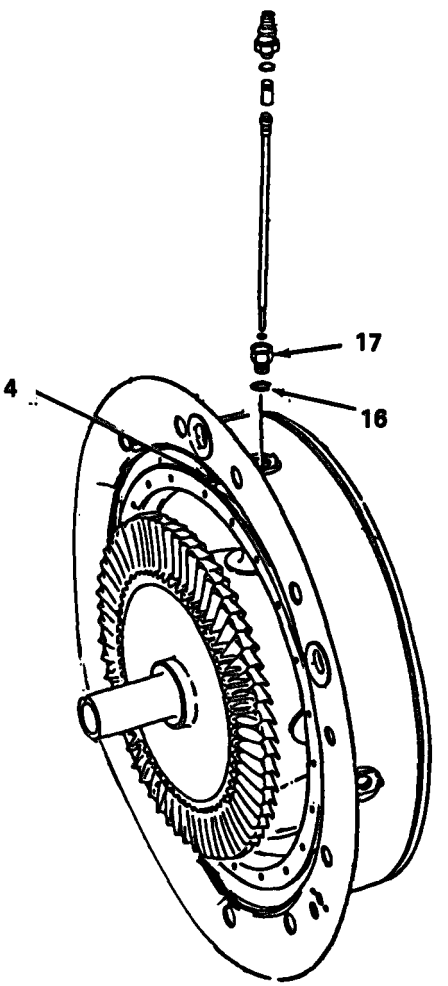
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
17. Bolts (6) and Washers (7)		**Install** washers on bolts and **insert** bolts through forward side of fireshield. **Secure** with washers (10) and nuts (11).
18. Fireshield		**Turn** combustor turbine assembly over with diffuser up. **Position** fireshield (8) on locating pin on outer flange of combustion chamber assembly.
19. Fuel Vaporizer Adapter Nuts (9)	Refer to Appendix G, Table G-3, reference number 31,	Install. **Tighten as required.**



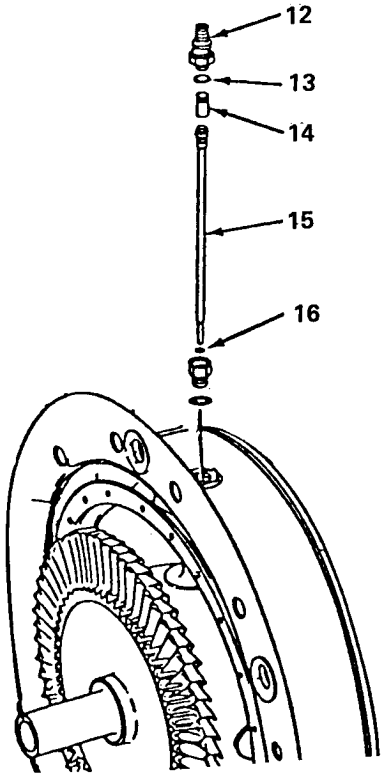


4-8. Combustor Turbine Assembly (T53-L-11 Series Engines) - Assembly - Continued

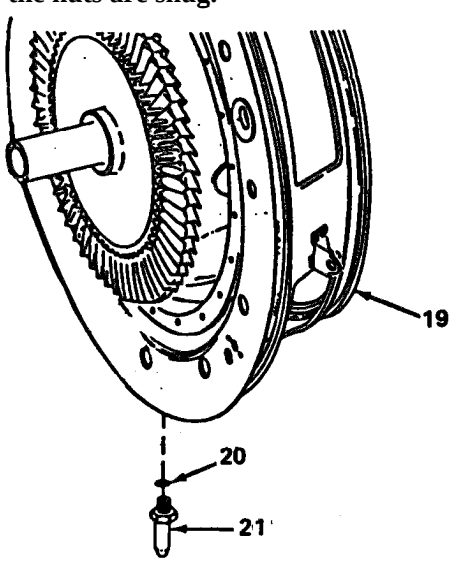
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
20. Plugs (5)		**Install** into unused igniter holes in combustion chamber housing and fireshield. **Tighten** and lockwire plugs.
21. Igniter Plug and Igniter Nozzle		**Install** in each igniter mount.
22. Adapter (17)	Do not lubricate adapter.	**Place** new packing (16) on adapter (17). **Install into** power turbine oil tube (4).



4-8. Combustor Turbine Assembly (T53-L-11 Series Engines) - Assembly - Continued

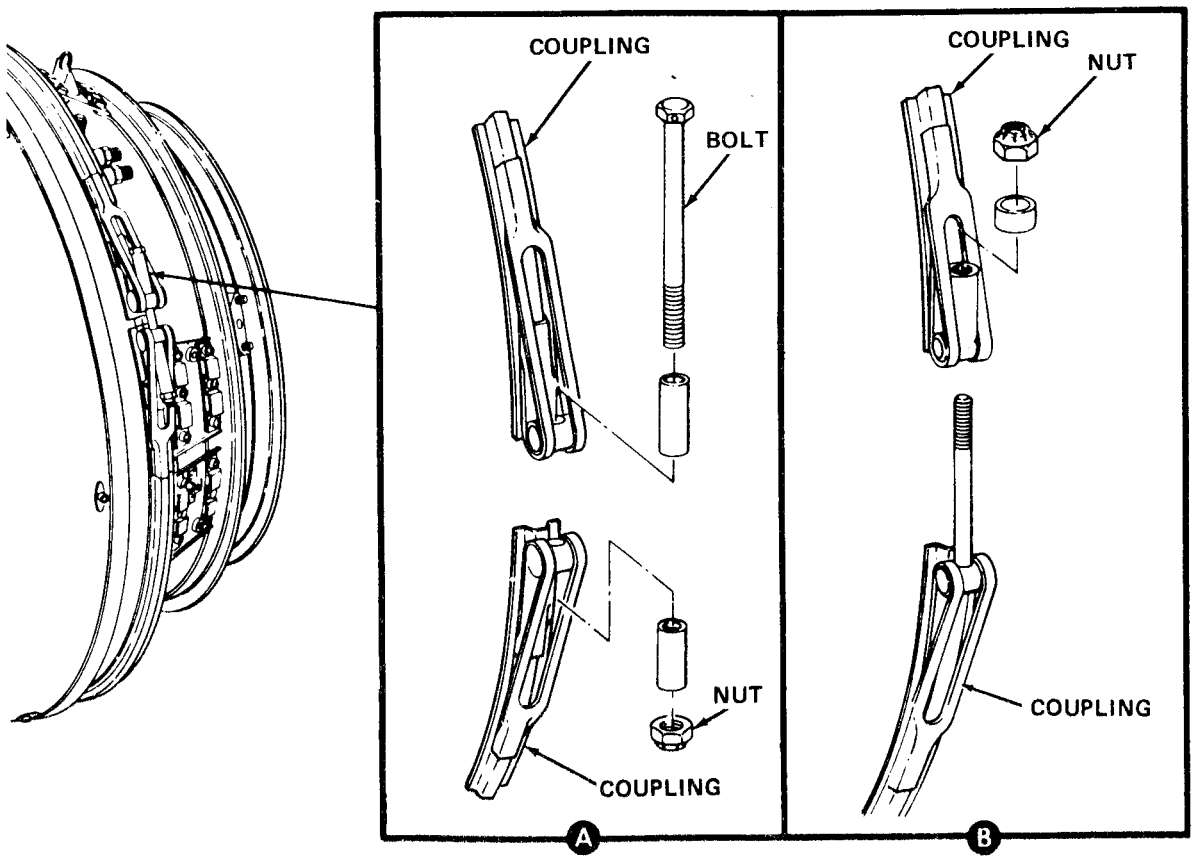
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
23. Adapter (17)	Refer to table G-3, Appendix G, reference number 23.	Tighten as required.
	CAUTION **Position the power turbine oil nozzle in following action for item 24, with tangs 90 degrees to the engine centerline when installing. Install oil nozzle vertically. Do not rotate.**	
	NOTE Do not lubricate oil nozzle (15), oil strainer (14), or power turbine oil strainer housing (12).	
24. Oil Nozzle (15), Packing (16), Power Turbine Oil Strainer (14), Upper Packing (13), and Power Turbine Oil Strainer Housing (12)		**Install** into tube.

4-8. Combustor Turbine Assembly (T53-L-11 series Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
25 Oil Strainer (14)	Refer to table G-3, Appendix G, reference number 22.	Tighten finger-tight. Place one wrench on oil strainer housing and one wrench on adapter. Tighten oil strainer housing as required and lockwire.
	NOTE Do not lubricate connector (21).	
26. Oil Scavenge Tube Connector (21)	Refer to table G-3, Appendix G, reference number 29.	Install packing (20) on oil scavenge tube connector (21). Install in tube. Tighten as required and lockwire.
	NOTE To insure proper seating of the support cone on the combustion chamber in following actions for items 27 and 28, tap the V-band couplings, starting at the middle and moving toward the bolts at the ends. Tighten the nuts. Repeat tapping and tightening until the nuts are snug.	
27. Exhaust Support Cone (19)		Install on exhaust diffuser. Aline cutout with locating pin on combustion chamber assembly (2) outer flange. Position V-band couplings over support cone and combustion chamber flange with attaching ends at approximately the 4-o'clock and 10-o'clock positions as viewed from the rear.

4-8. Combustor Turbine Assembly (T55-L-11 Series Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
28. V-Band		**Secure** with bolts, spacers, and new nuts. **Tighten.**
29. V-Band Coupling Nuts	Refer to table G-3, Appendix G, reference nurnber 21.	**Tighten** as required
30. Bolt (Corfiguration A only)	Use lockwire (item 43, Appendix D).	**Lockwire** on configuration A only.



31, V-Band Couplings	Gap between ends of V-band couplings shall be as given in table **G-5,** Appendix G, reference number 45.	**Check** gap between ends of V-band couplings.

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines - Assembly

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

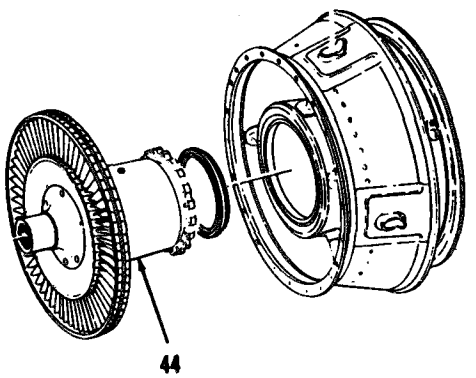
Special-Tools
- Holding Fixture (LTCT4553)
- Locating Bar (LTCT153)
- Torque Adjustment Fixture (LTCT962)
- Alinement Fixture (LTCT4174)
- Crimping Tool (LTCT3981)

Consumable Materials
- Shortening Compound (item 74, Appendix D)
- Ultrachem Assembly Fluid #1 (item 101, Appendix D)
- Molykote Anti-Seize Compound (item 58, Appendix D)
- Anti-Seize, 787 (item 102, Appendix D)
- Nickel-Ease (item 103, Appendix D)
- Iron-Blue Pigment (item 37, Appendix D)
- Molybdenum Disulfide (item 57, Appendix D)
- Lockwire (item 43, Appendix D)
- Marking Pencil No. 2107 (item 54, Appendix D)

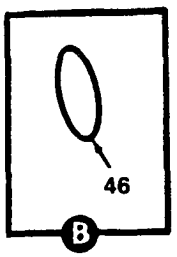
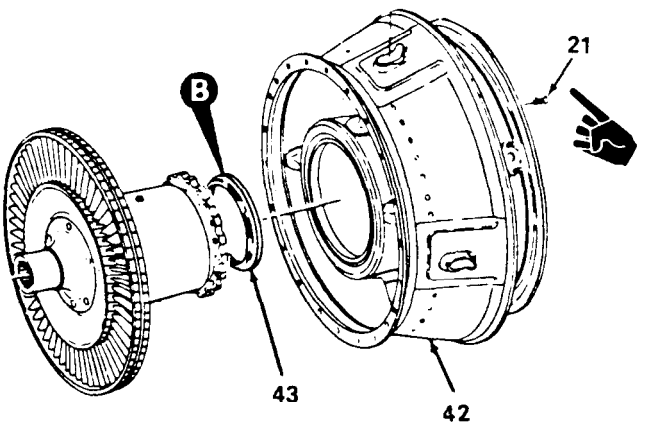
References
- Appendix G, Table G-4, Reference Number 22, 17, 21, 16, 30, 18
- Appendix G, Table G-6, Reference Number 44,39, 37, 36, 46, 41
- Para 4-27,4-33, and 3-18

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		
	WARNING **FLIGHT SAFETY PARTS** **Turbine Rotor Spacer (Power Turbine Rotor Spacer)** **Turbine Disk and Hub (Second Stage Power Turbine Rotor Disk** **Turbine Turbine Disk First Stage Power Turbine Disk)** **After removal of protective covering, handle with caution during Installation.**	
1. Power Turbine Rotor Splined Shaft	**Centerpunch mark will coincide with yellow "H" on disk face indicating heavy point. if punch mark is not evident, use an approved marker (Marking Pencil No. 2107, item 54, Appendix D) to mark position of yellow "H" on outside diameter of splined shaft.**	**Inspect for centerpunch mark.**
2. Power Turbine Rotor and Bearing Housing Assembly (44)	**Use holding fixture (LTCT4553).**	**Place in holding fixture, forward face down.**

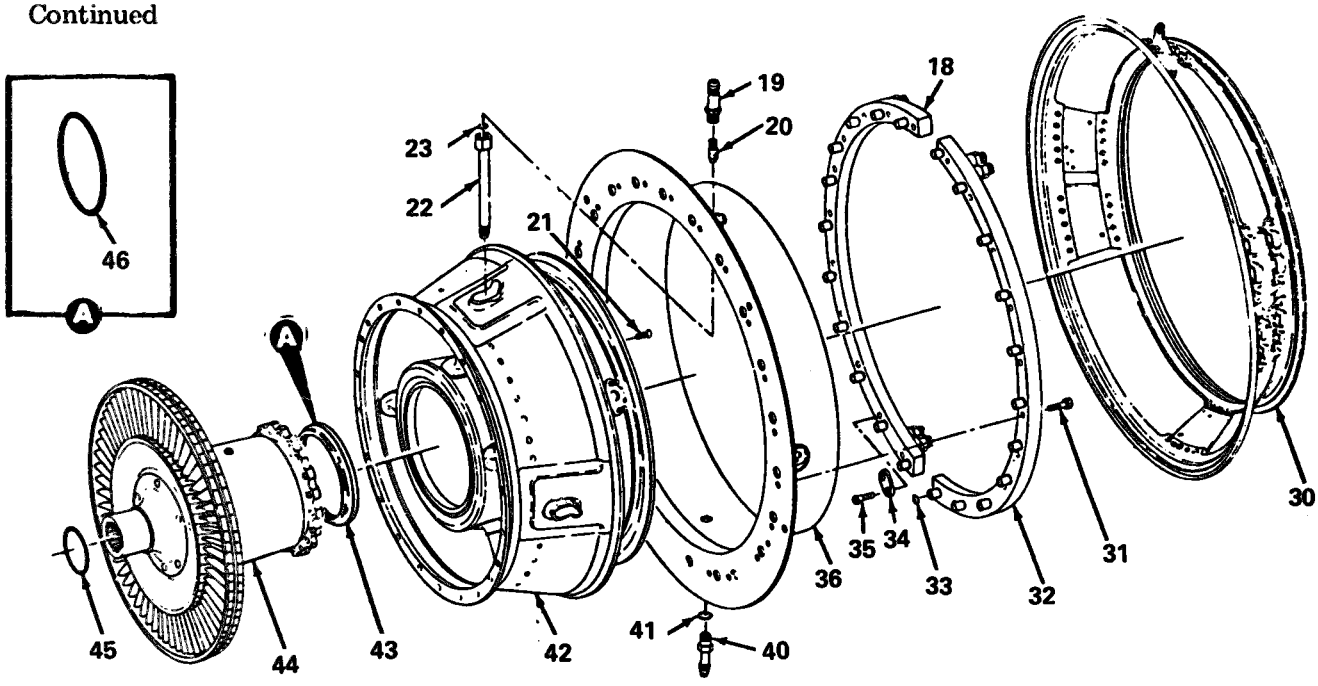


4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
		
3. Seal (43) or Packing (46)	Insure groove in housing is clean. if seal (43) or packing (46) is to be installed, coat groove of housing with shortening compound (item 74, Appendix D) or Ultrachem Assembly Fluid #1 item 101, Appendix D) to facilitate holding seal or packing in groove during assembly.	Install seal (43) or packing (46) in groove on aft end of bearing housing.
4. Exhaust Diffuser Assembly (42)		Place over bearing housing. Aline screw holes.
5. 1/4-28 Bolts and Flat Washers		Install (temporarily) through exhaust diffuser assembly and into bearing housing. Turn bolts evenly and pull exhaust diffuser over bearing housing.
6. Bearing Housing		Secure to exhaust diffuser with screws (21).
7. Screws (21)	Refer to Appendix G, table G-4, reference number 22.	Tighten as required.
8. Second Stage Turbine Rotor	Use bent 0.070 inch diameter wire. Minimum clearance given in table G-6, reference number 42.	Check clearance between second stage turbine rotor and forward face of inner diffuser cone.

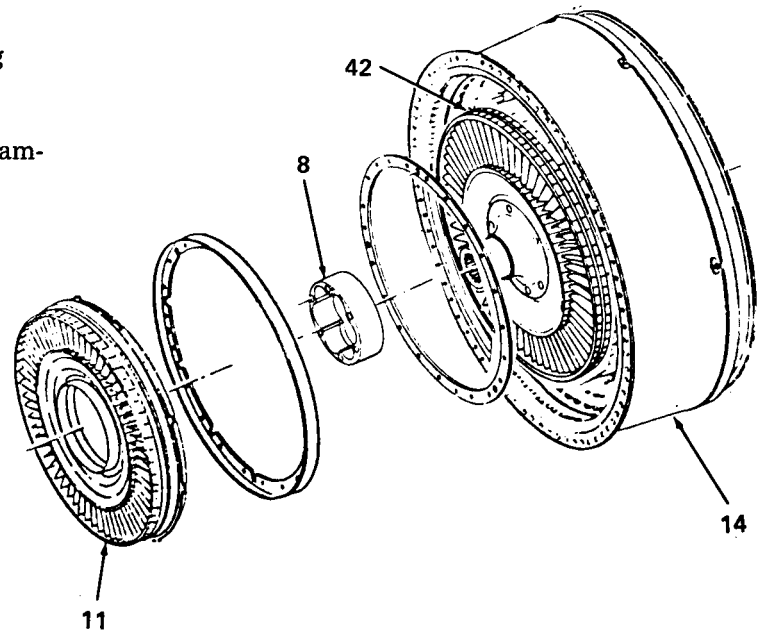
4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		

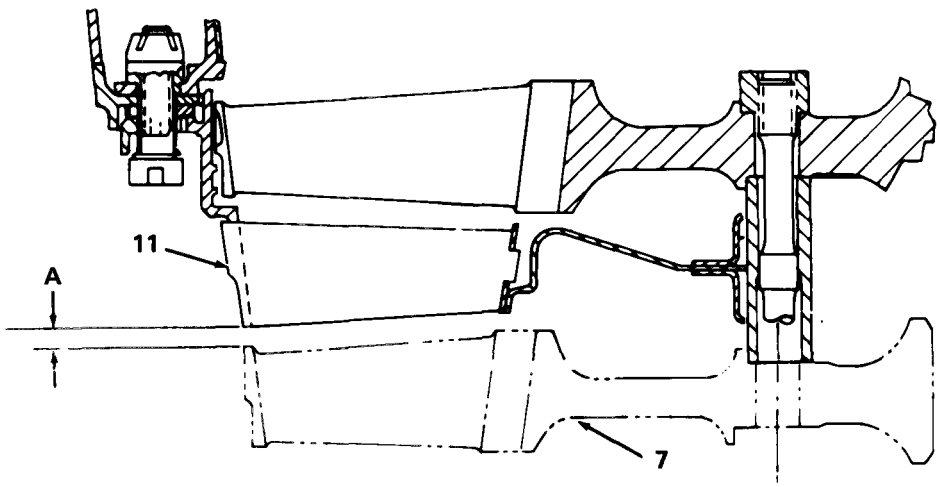


1. First Stage Power Turbine Nozzle
2. Bolt
3. Locking Plate
4. Bolt
5. Locking Plate
6. Sealing Flange
7. First Stage Power Turbine Rotor
8. Power Turbine Spacer
9. Pin
10. Spacer
11. Second Stage Power Turbine Nozzle
12. Ring
13. Spacer
14. Combustion Chamber Assembly
15. V-Band Coupling Assembly
16. Connector (T53-L-703 Engines)
17. Screw (T53-L703 Engines)
18. Fuel Manifold Assembly
19. Oil Strainer Housing Adapter
20. Strainer
21. Screw
22. Power Turbine Oil Tube
23. Packing
24. Locking Plate
25. Thermocouple Harness (T53-L-703 Engines)
26. Bolt (T53-L703 Engines)
27. Bolt (T53-L-703 Engines)
28. Plate (T53-L-703 Engines)
29. Bolt
30. Support Cone Assembly
31. Bolt
32. Fuel Manifold Assembly
33. seal
34. Sealing Gasket
35. Screw
36. Fireshield (T53-L-13B Engine)
37. Fireshield (T53-L-703 Engines)
38. Cover Assembly (T53-L-703 Engines)
39. Screw (T53-L-703 Engines)
40. Connector
41. Packing
42. Exhaust Diffuser Assembly
43. Seal
44. Power Turbine Rotor and Bearing Housing Assembly
45. Gasket
46. Packing

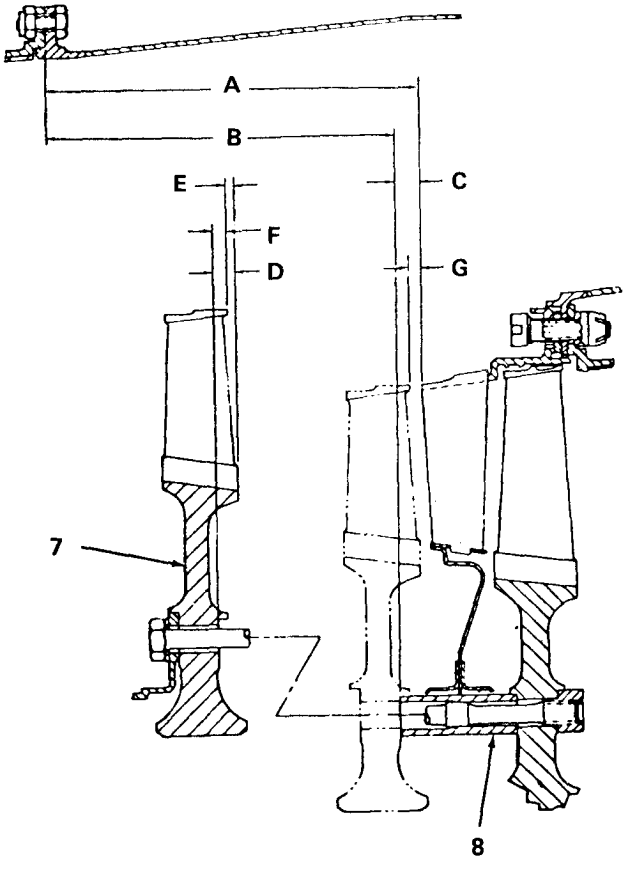
4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	NOTE If installed, combustion chamber liner should be removed to facilitate reassembly of exhaust diffuser and bearing housing (item 9) and combustion chamber assembly (item **10).**	
9. Exhaust Diffuser and Bearing Housing (42) 10. Combustion Chamber Assembly (14)		**Position** on bench with exhaust diffuser rear flange down. **Position** on flange of exhaust diffuser. **Aline** bolt holes on mating flanges.
11. Second Stage Power Turbine Rotor and Second Stage Power Turbine Nozzle	Refer to paragraph 4-27.	**Establish** tip clearance.
	CAUTION **Insure bolts do not bottom against seal housing when performing action for item 12.**	

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

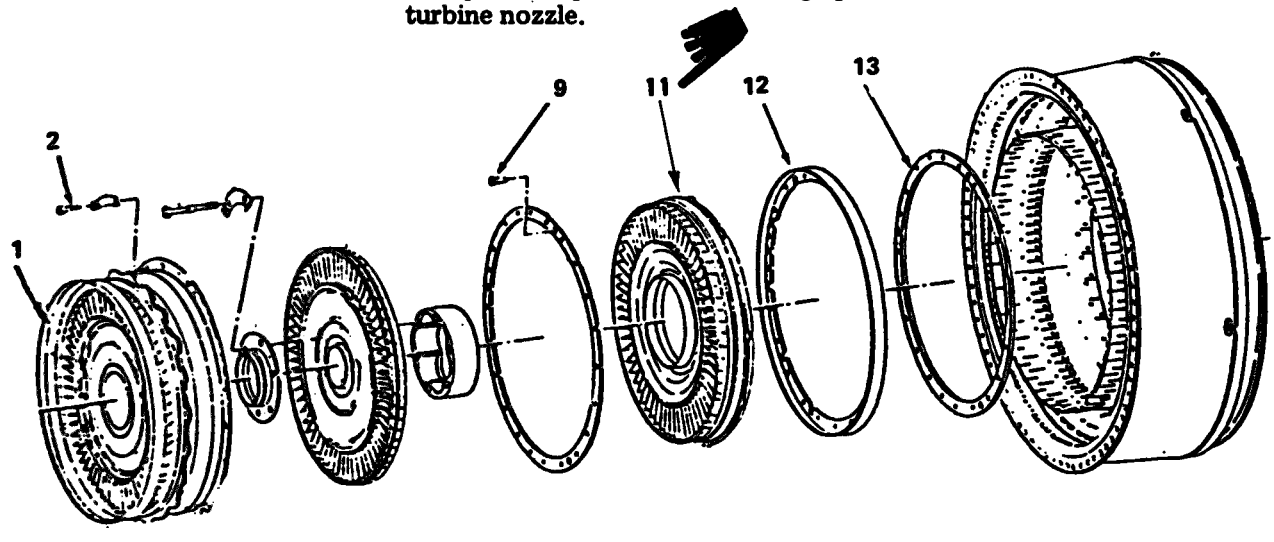
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
12. Power Turbine Spacer (8)		**Install** over end of power turbine rotor. **Aline** bolt holes. **Match** marks. **Secure** spacer with three equally spaced 5/16-24 bolts and washers.
13. Second Stage Power Turbine Nozzle (11)	Use feeler gage. Refer to Appendix G, able G6, reference number 44 for clearance requirements.	**Position. Check clear-** ante between power turbine spacer (8) and second stage power turbine nozzle (11).
14. Second Stage Power Turbine Nozzle (11)	Perform this action if clearance is less than given. Use half-round file.	**Rework** nozzle using half-round file to obtain 0.010 inch (0.25 mm) clearance.
	NOTE The following figure illustrates clearances determined between first stage power turbine rotor assembly and second stage power turbine nozzle assembly. This figure pertains to actions for items 15 thru 21.	
15. First Stage Power Turbine Rotor (7) and Second Stage Power Turbine Nozzle (11)		**Establish** clearance (dimension A).

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

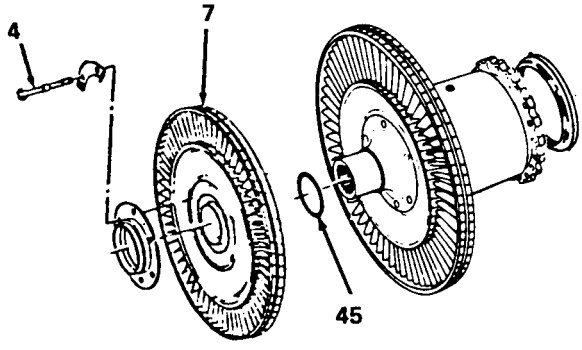
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
16. Combustion Chamber Housing	Use locating bar (LTCT153).	**Place** on flange.
	NOTE On T53-L-703 engines, position a piece of 0.750 inch ground stock or parallel bar on combustion chamber bolt hole flange, under each end of locating bar, to prevent bar from contacting inner lip of combustion chamber liner.	
17. Second Stage Power Turbine Nozzle	Use vernier depth gage.	**Measure** from bar to outer shroud of second stage power turbine nozzle (dimension A).
18. Power Turbine Spacer (8)		**Measure** from bar to power turbine spacer (dimension B). **Subtract** dimension B from dimension A. **Result** is dimension C.

4.9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

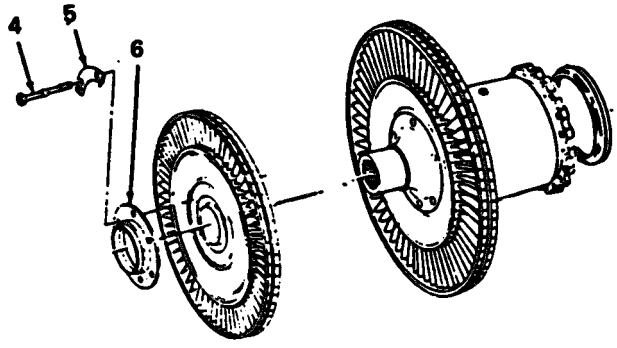
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
19. First Stage Power Turbine Rotor **(7)**	Use locating bar (LTCT153).	**Place** on bench with forward face down. **Position** locating bar on blade disc.
20. spacer	Use vernier depth gage.	**Measure from bar to spacer surface (dimen**sion D).
21. Blade	Use vernier depth gage.	**Measure from bar to** shrouded tip of highest blade (dimension E). a. Subtract dimension E from dimension D. b. Result is dimension F. c. **Subtract dimension** F from dimension C. d. **Result is** dimension G.
22. Spacer (13)	Dimension G must be as given in Appendix **G,** table G-6, reference number 39. If desired dimension is not obtained, spacer is required to position second stage power **turbine nozzle.**	Select and **install neces**sary spacer. (Refer to the following table.)



4-9. Combustor Tubine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
23. Ring (12) and Second Stage Power Turbine Nozzle (11)	Refer to the following table for spacer thickness.	Install. Temporarily secure with bolts (2) and pins (9).
	Spacer Thickness Part Number — Thickness 1-140-276-01 — 0.022 to 0.028 inch 1-140-276-02 — 0.029 to 0.035 inch 1-140-276-03 — 0.036 to 0.044 inch	
	NOTE Shimming of the second stage power turbine nozzle will affect the axial clearance between the first stage power turbine nozzle and the first stage power turbine wheel.	
24. Bolts and Washers		Remove bolts and washers installed in preceding action for item 5.
25. Exhaust Diffuser Assembly	Use torque adjustment fixture (LTCT 962).	Install torque adjustment fixture into rear of exhaust diffuser assembly.
26. Locking Plate Assembly		Engage tangs of locking plate assembly with slots in bearing retainer nut. Secure locking plate assembly with three bolts. Place combustor turbine assembly on bench with exhaust diffuser rear face down.
27. Gasket (45)		Install over end of power turbine rotor shaft.
28. Bolts and Washers		Remove the three bolts and washers installed in preceding step.

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly-Continued

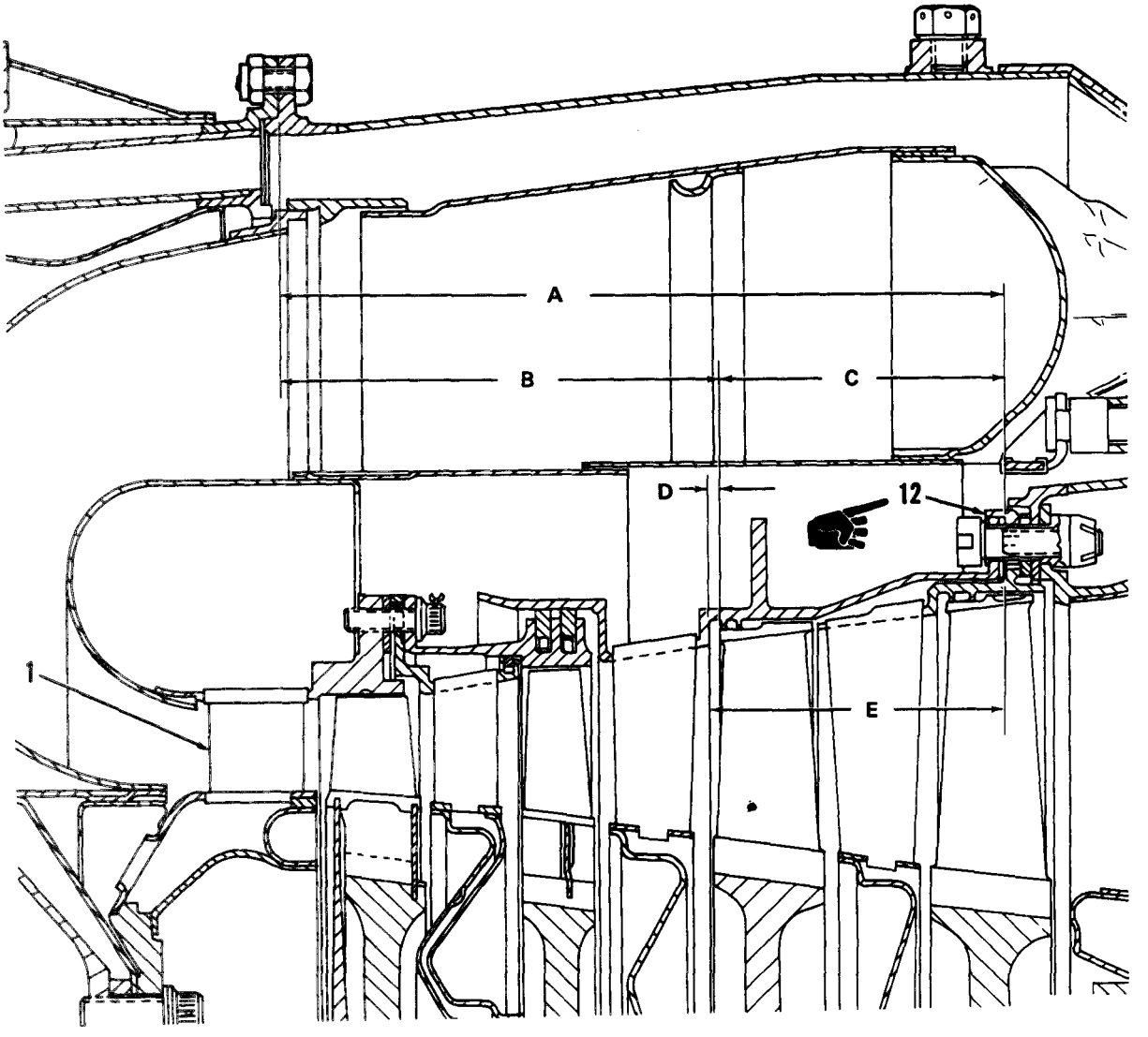
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
29. First Stage Power Turbine Rotor (7)		Position over ends of power turbine rotor shaft. Locate yellow H on disc face 180 degrees from punch mark (or other mark) on power turbine shaft. Anne bolt holes.
30. Bolts (4)	Use Molykote Anti-seize Thread Compound (item 56, Appendix D) or Anti-Seize, 767 (item 102 Appendix D) or Nickel-Ease (item 103, Appendix D).	Apply to bolts.
	NOTE Insure locking plates do not cover the three airbleed holes in sealing flange when performing action for items 31 thru 33.	
31. Sealing Flange (6), Locking Plates (5), and Bolts (4)	Do not bend locking plates at this time.	Secure rotor with sealing flange (6), locking plates (5), and bolts(4).
		
32. Bolts (4)	Refer to Appendix G, table G-4, reference number 17.	Tighten as required.
33. Torque Adjustment Fixture (LTCT962)		Remove.

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	NOTE The following figure illustrates clearances determined between first stage power turbine nozzle and rotor assemblies. This figure pertains to actions for items 33 and 38.	
34. First Stage Power Turbine Nozzle and Tip of First Stage Power Turbine Rotor Blades		Establish clearance between first stage power turbine nozzle and tip of first stage power turbine rotor blades.
35. Flange Combustion Chamber Housing	Use locating bar (LTCT153).	Place locating bar on flange of combustion chamber housing.
	NOTE On T53-L-703 engines, position a piece of 0.750 inch (19.1 mm) ground stock or parallel bar on combustion chamber bolt hole flange, under each end of locating bar, to prevent bar from contacting inner lip of combustion chamber liner.	
36. Ring (12)	Use vemier depth gage.	Measure from bar to inner flat of ring (12) near bolt holes (Dimension A).

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
37. First Stage Power Turbine Blades	Use vernier depth gage,	Measure from bar to shrouded tip of highest first stage power turbine blades (dimension B). a. Subtract dimension B from dimension A. b. Result is dimension C.



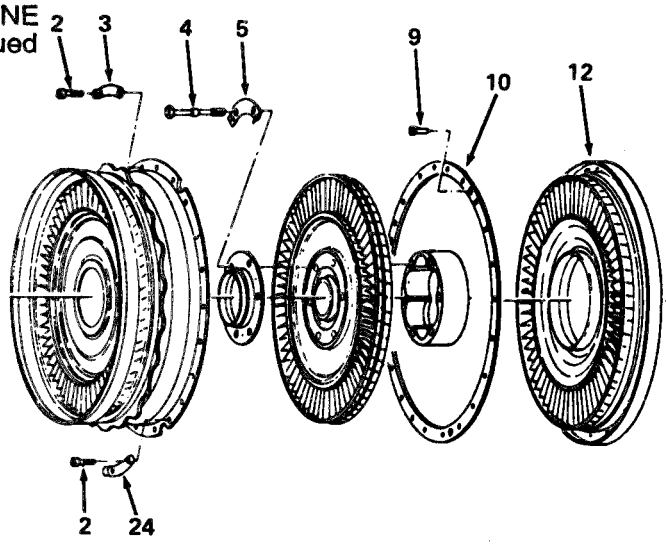
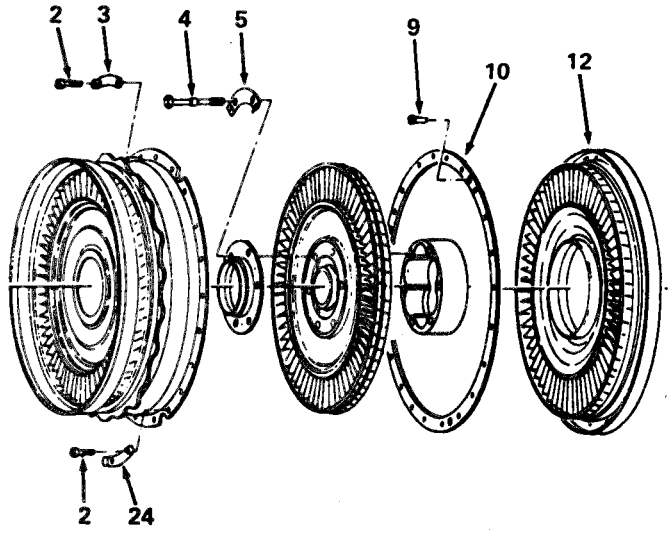
4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
38. First Stage Power Turbine Nozzle (1)	Use locating bar (LTCT153).	Place on bench with forward face down. Posl-tion locating bar on aft flange of nozzle.
39. Outer Shroud	Use vernier depth gage.	Measure from bar to outer shroud (dimension E). a. Subtract thickness of locating bar from dimension E. b. Subtract dimension C from dimension arrived at in step a. above. c. Result is dimension D.
40. Spacer (1 O)	Dimension D must be given in Appendix G, table G-6, reference number 37. If desired dimension is not obtained, spacer is re-quired to position first stage power turbine nozzle. Refer to the following table for spacer thickness.	Select necessary spacer.

Part Number		Thickness	
1-140-276-01	1-140-303-01	0.022 to 0.028 inch	(0.559 to 0.711 mm)
1-140-276-02	1-140-303-02	0.029 to 0.035 inch	(0.737 to 0.889 mm)
1-140-276-03	1-140-303-03	0.036 to 0.044 inch	(0.914 to 1.118 mm)

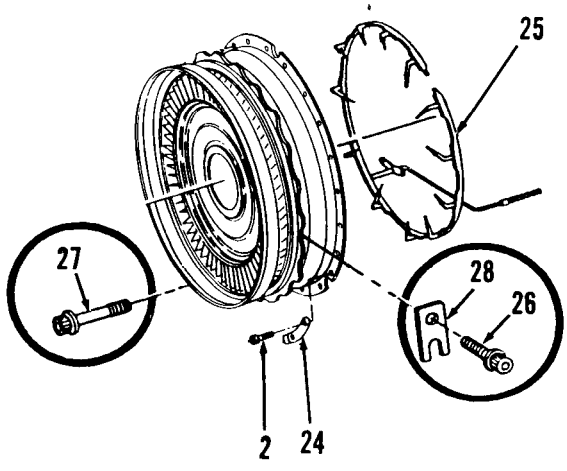
41. First Stage Power Turbine Rotor and First Stage Power Turbine Nozzle	Refer to paragraph 4-33.	Establish tip clearance between first stage power turbine nozzle.
42. Spacer (1 O)	Spacer was selected during ac-tion of items 34 thru 40. Bolts may not extend through retaining nuts on exhaust diffuser.	Position on ring (1 2). install four equally spaced bolts (2) and pins (9) through spacer (10). ring (12), and into ex-haust diffuser.

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
43. Combustor Turbine Assembly		**Position** at 45 degree gree angle. Support it in this position.
44. Dial Indicator		**Position** against a point just inboard of first stage power turbine blade roots.
45. Power Turbine	Required runout is given in Appendix G, table G-6, reference number 36.	Rotate. Record runout.
46. Bolts (4)	Proceed with this action if runout is not within limits.	**Loosen. Retorque.**
47. Combustor Turbine Assembly		**Reposition** on bench.
48. Locking Plate (5)		**Bend** tabs against bolts (4).
49. Spacer (10)	Proper spacer was selected during actions for items 34 thru 40.	**Insure** that proper spacer (10) is installed.
50. Bolts (2) and pins (9)		**Remove** bolts (2) and pins (9) installed in action for item 42.

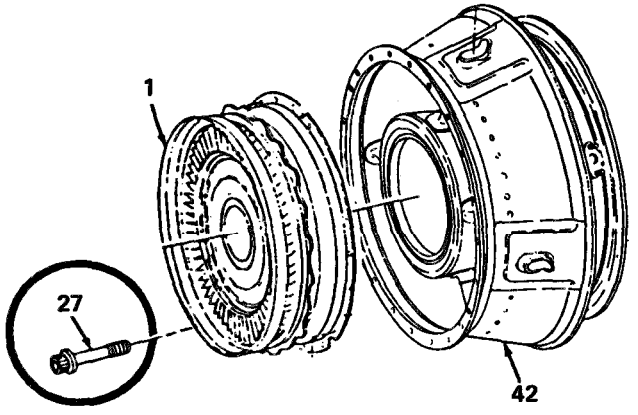
4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
51. First Stage Power Turbine Nozzle (1)		**Install over proper turbine rotor. Anne bolt holes.**
52. Bolts (2 and 27)	**Use Molykote Anti-Seize Thread Compound (item 58, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D)**	**Apply to bolts.**
53. First Stage Power Turbine Nozzle	**NOTE** **It is not required that bolts (2) protrude completely through the corresponding fasteners/ nuts. The bolts must protrude at least half way through the nuts.**	**Secure with bolts (2) and locking plates (3 and 24).**
54. Thermocouple Harness (25)	**T53-L-703 engine only.**	**Position around first stage power turbine nozzle until 12 probes and harness lead are alined. Secure probes with 12 plates (28) and bolts (26). Tighten as required. Lockwire.**

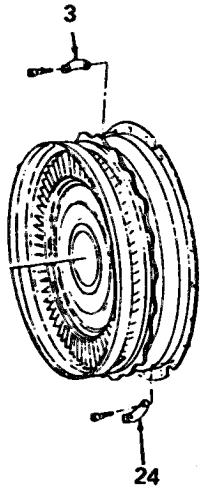


4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

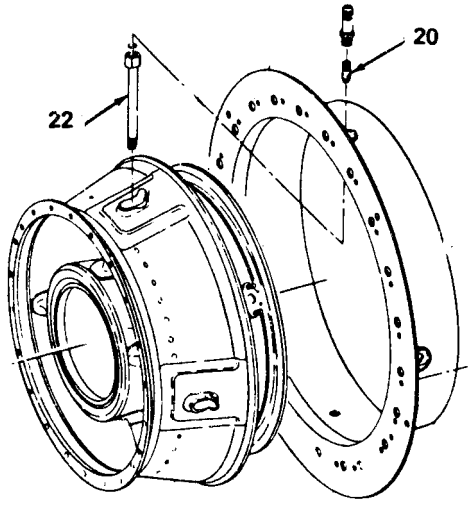
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
55. Harness Lead	**T53-L-703 engine only.**	**Insert through exit hole in flanges of first stage turbine nozzle (1) and exhaust diffuser assembly (42). Secure lead to flanges with two bolts (27). Tighten bolts as required. Lockwire.**



4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

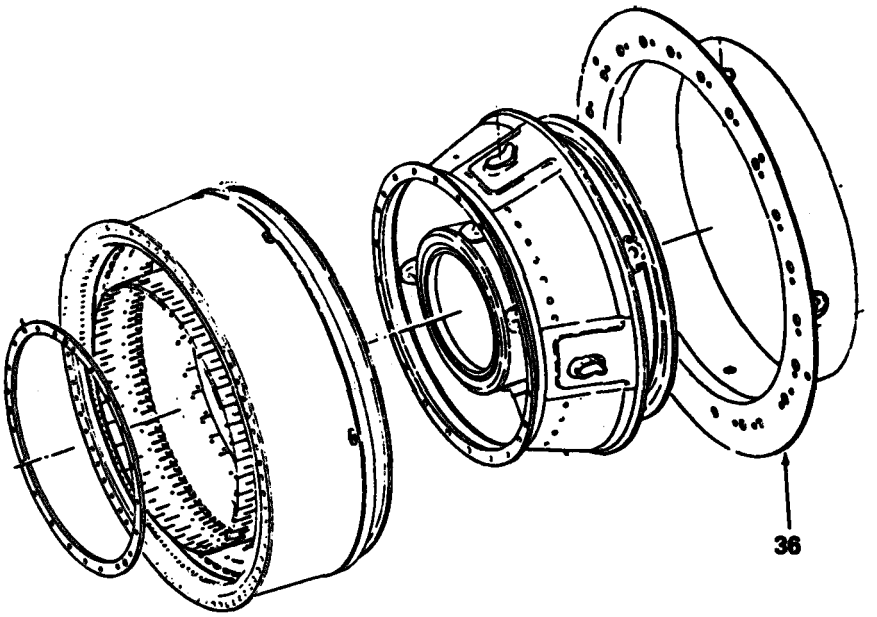
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
56. First Stage Power Turbine Nozzle and Sealing Flange	Use feeler gage. If clearance is less than given in Appendix G, table G-6, reference number 46, rework nozzle, using half-round file to obtain 0.015 inch (0.381 mm) minimum clearance.	Check clearance between first stage power turbine nozzle and sealing flange.
57. Locking Plate (3 and 24)	Use crimping tool (LTCT3981).	Tighten bolts (2) as required. Lockwire. Bend tabs against bolts and stake securely.
	**CAUTION** To prevent 011 leaks, seat power turbine tubes perfectly In power turbine tubes Item 58). Replace tubes If seating is not perfect and repeat action for Item 58. **NOTE** A perfect seal will be indicated by an unbroken ring on the tapered seat of the power turbine tube.	
58. Power Turbine Oil Tubes (22)	Use iron-blue pigment (item 37, Appendix D). Do not lubricate power turbine oil tubes.	Lightly coat tapered seats of two power turbine oil tubes (22). Install tubes into top and bottom struts of exhaust diffuser. Thread finger-tight. Remove tubes. Inspect seats.

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
59. Seating	Perform this action if seating is imperfect.	Check tubes for clean connectors. Interchange tubes. Repeat preceding action for item 58.
60. Power Turbine Tubes (22)	Refer to Appendix G, table G-4, reference number 21.	**Tighten** each power turbine tube as required. **Lockwire** tube.
61. Combustion Chamber Liner	Refer to paragraph 3-19.	**Reinstall.**
62. Combustor Turbine Assembly		**Position** on workbench with exhaust diffuser up.
63. Fireshield (36)		**Position** on combustion chamber housing rear flange. **Aline** pin in combustion chamber housing with hole in fireshield. **Remove** fireshield, **File** as required.

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



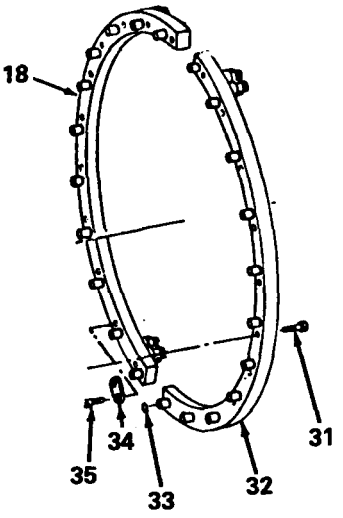
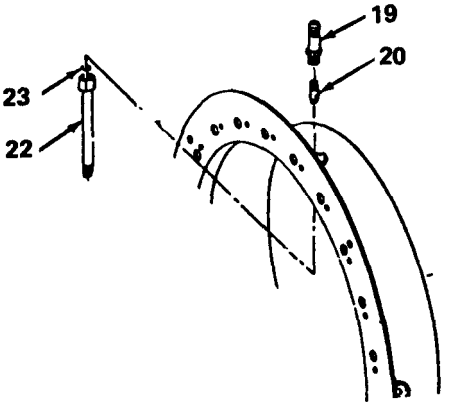
64. Thermocouple Harness	T53-L-703 engine only.	**Push** lead through fireshield access hole.
65. Combustion chamber Liner with Fireshield and Combustion Chamber Housing	Insure proper alinement. Use alinement fixtures LTCT4174.	**Position** alinement fixtures through these components. Remove fixtures.

CAUTION

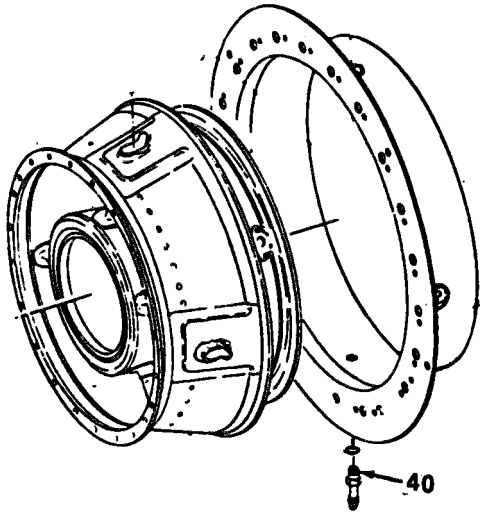
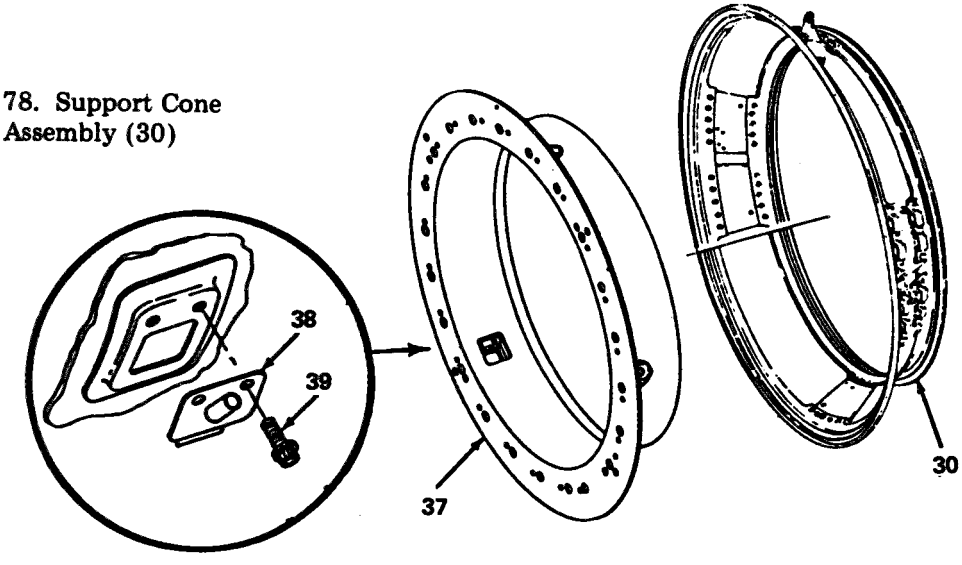
Use care not to damage nozzle seal (33) when performing actions for items 66 thru 68.

66. seals (33)		**Install** on fuel nozzles.

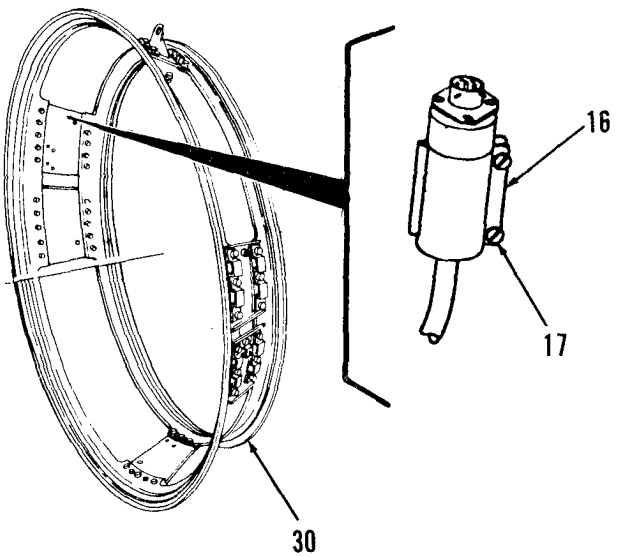
4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
67. Sealing Gaskets (34)		**Install** on fuel manifold assembly (18). **Secure** with screws **(35),**
68. Manifold Assemblies (18 and 32)		**Position over** fireshield, carefully. **Aline** fuel nozzles with port holes. **Install** fuel manifold assemblies. **Secure** with bolts (31). **Tighten** bolts as required and **lockwire.**
69. Oil Strainer Housing Adapter (19)	Use molybdenum disulfide (item 57, Appendix D).	**Apply** molybdenum disulfide to adapter.
70. Strainer (20)		**Install** into oil strainer housing adapter (19) at 12-o'clock position. **Tighten** finger-tight,
71. Oil Strainer Housing Adapter (19) and Packing (23)		**Install** into power turbine oil tube (22).
72. Oil Strainer Housing Adapter	Refer to Appendix G, table G-4, reference number 20.	Tighten as required. Lockwire.

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines). Assembly - Continued

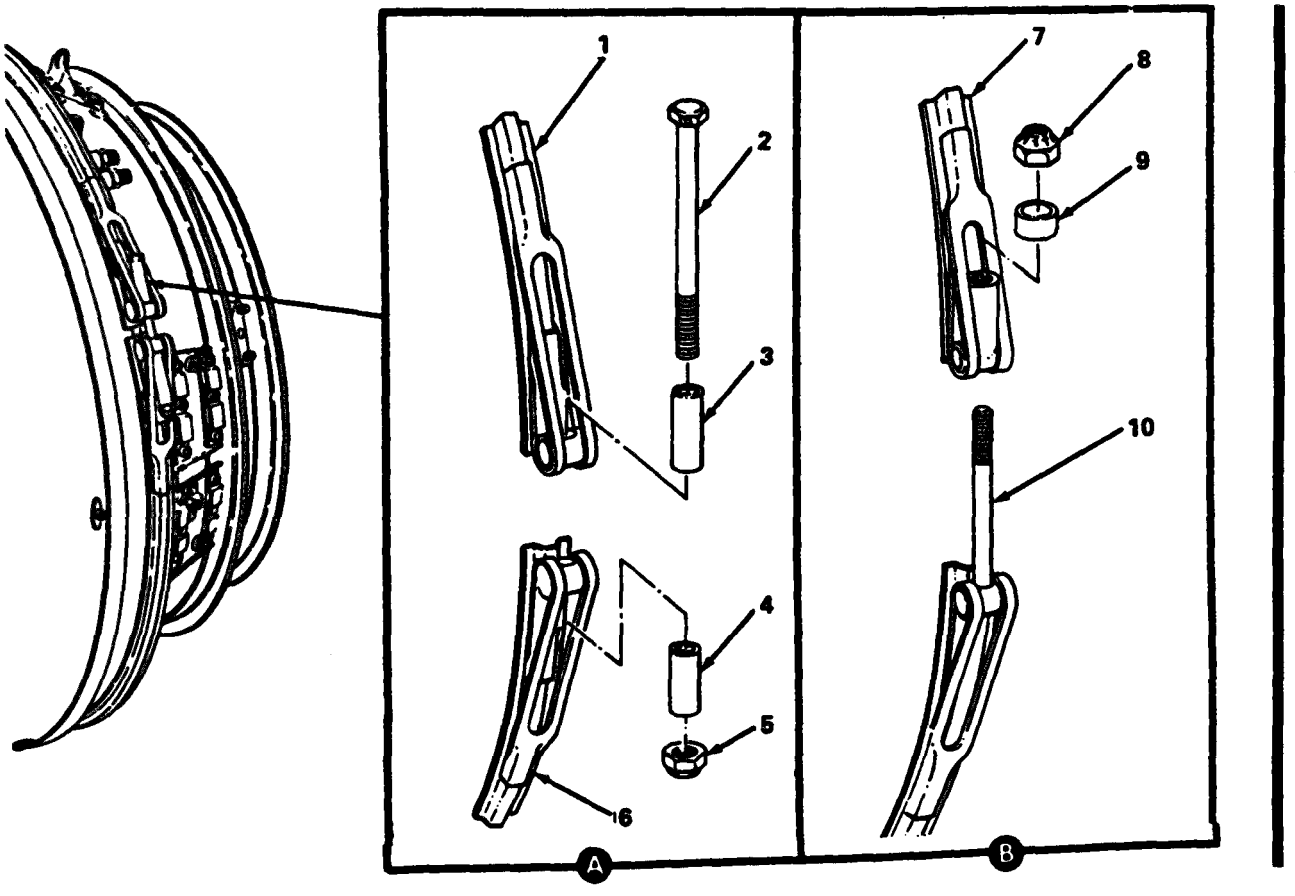
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
73. Connector (40)	Use molybdenum diaulfide (item 57, Appendix D).	Apply molybdenum disulfide to connector.
74. Connector (40) and Packing (41)		Install into power turbine tube at 6-o'clock position.
75. Connector (40)		Tighten as required. Lockwire. Refer to Appendix G, table G-4, reference number 30.
76. Thermocouple Harness	T53-L-703 engine only.	Insert lead through thermocouple harness lead cover assembly (38).
77. Cover Assembly (38)	T53-L-703 engine only.	Install onto fireshield (37). Secure cover assembly with two screws (39). Lockwire screws.
78. Support Cone Assembly (30)		Install over fireshield and exhaust diffuser. Position starting fueling manifold at 12-o'clock position.

4-9. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
79. Thermocouple Harness (T53-L-703 only)		Open cover of connector (16). Install lead.
80. Screws (17) (T53-L-703 only)	Close connector cover. Lead shall bottom in connector.	Secure connector' cover with two screws (1 7). Tighten as required. Lockwire.
81. Support Cone Assembly (30)		Position over support cone and combustion chamber flange with attaching ends at approximately 4-o'clock and 10-o'clock position as viewed from the rear.
82. V-Band Couplings		Insure proper seating on combustion chamber by the following steps: a. Tap V-band couplings starting at the middle and moving toward the bolts at the ends. b. Tighten nuts. c. Repeat tapping and tightening until nuts are snug.
83. V-Band Couplings (1 and 6 or 7 and 10)		Secure with bolts (2), spacers (3 and 4 or 9) and new nuts (5 or 8).
84. V-Band Couplings	Refer to Appendix G, table G-4, reference number 18 for tightening requirements. Use lockwire (item 43, Appendix D).	Tighten as follows: a. Tighten nuts. b. Lockwire drilled bolt head only on configuration A using lockwire.

4-9. COMBUSTOR TURBINE ASSEMBLY (T53-L-13B/703 ENGINES) - ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ – **Continued**		
85. V-Band Ends	Refer to Appendix G, table G-6, reference number 41.	**Insure** given gap exists between V-band coupling ends,



4-10. Combustor Turbine Assembly (T53-L-11 Series Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Special Tools
Wrench (LTCT393)
Socket Wrench (LTCT506)
Socket Wrench (LTCT505)
Locking Plate Assembly (LTCT248)

Consumable Materials
Colorbrite No. 2107 (item 54, Appendix D)
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease (item 103, Appendix D)
Shortening Compound (item 74, Appendix D)
Ultrachem Assembly Fluid #1 (item 101, Appendix D)
Molykote Anti-Seize Thread Compound (item 28, Appendix D)

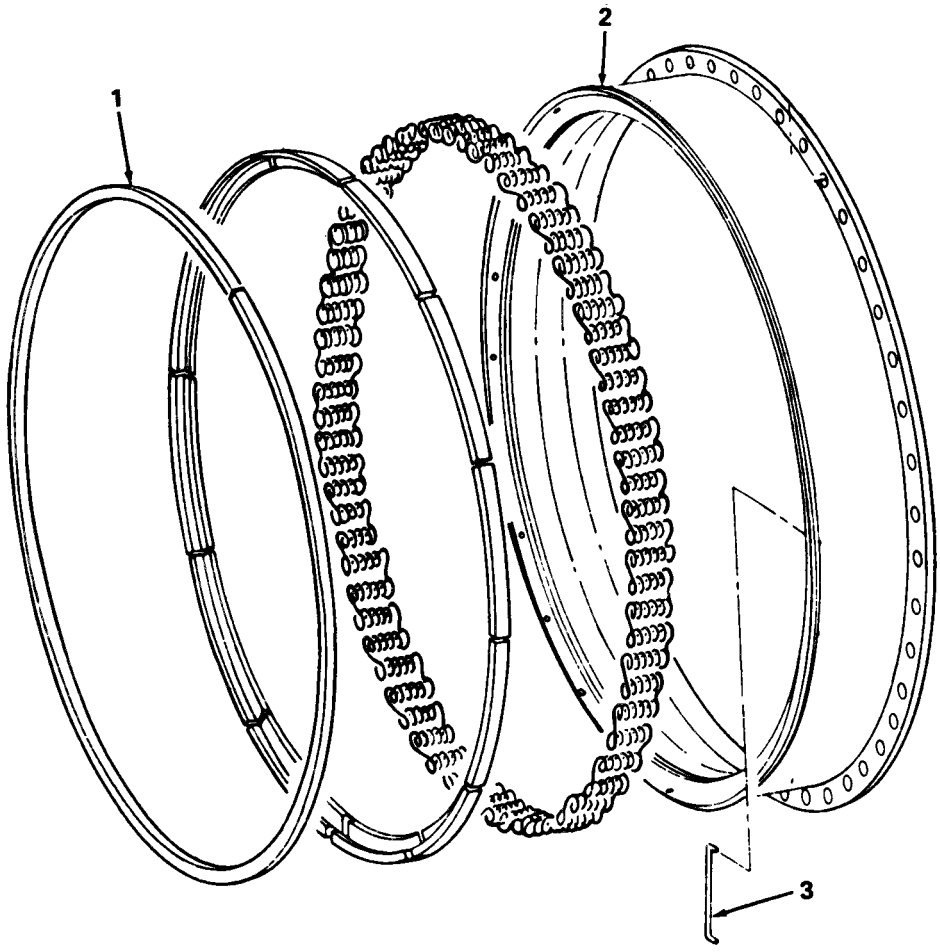
References
Appendix G, Table G-3, Reference Number 34,26, 28,62
Para 3-23, H-25, H-29, 4-11,4-39, 4-38, 1-104

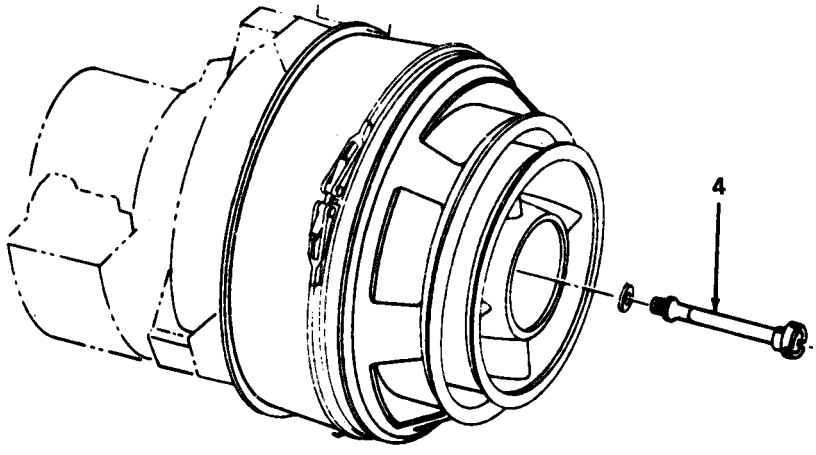
LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**CAUTION** Before Installing combustor turbine assembly, Insure that spring-loaded asbestos power turbine cylinder sealing ring (1) In seal retainer (2) Is firmly seated and that the 12 lockwires (3) that secure It are In position.	
	NOTE Insure that a gap of 0.030 to 0.070 inch (0.76 to 1.78 mm) between the first stage turbine nozzle flange and the second stage nozzle is obtained before installing the combustor turbine assembly. Shim as necessary to obtain or maintain the specific gap. (Refer to paragraph 3-13.)	
1. Power Shaft Bolt		Install into power shaft. Finger-tighten to check for cleanliness and condition of threads. If any tightness or failure of shoulder to bottom on power shaft exists, clean or repair threads. Refer to paragraphs H-25 and H-29.) Clean power shaft aft splines and internal splines in power turbine.

4-10. Combustor Turbine Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION

ENGINE/ - Continued





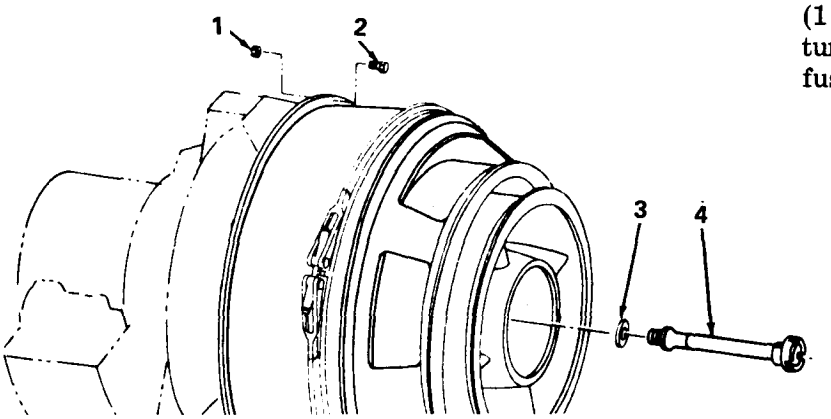
4-10. Combustor Turbine Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. N2 Tachometer		**Remove N2** tachometer (if installed) from overspeed governor and tachometer drive gearbox and **engage** a 1/4 inch drive extension and hinge handle in tachometer drive gear.
	NOTE After performing the engagement check in following item 3, do not allow the power shaft to move forward .	
3. Power Shaft	If engine is in horizontal position perform this action.	**Raise** aft end of power shaft and **pull** the shaft aft. Rotate power shaft and insure that N2 drive train has been engaged by **checking** for rotation of tachometer drive gear. A firm resistance must be felt at the hinge handle.
4. Marking Marks		**Position** mating marks as recorded when combustor turbine was removed. If mating marks were not made at removal, or if a new combustor section or a new power turbine rotor is installed, **accomplish** following actions for items 5 and 6.

4-10. Combustor Turbine Assembly (T53-L-11 series Engines) - Installation - Continued

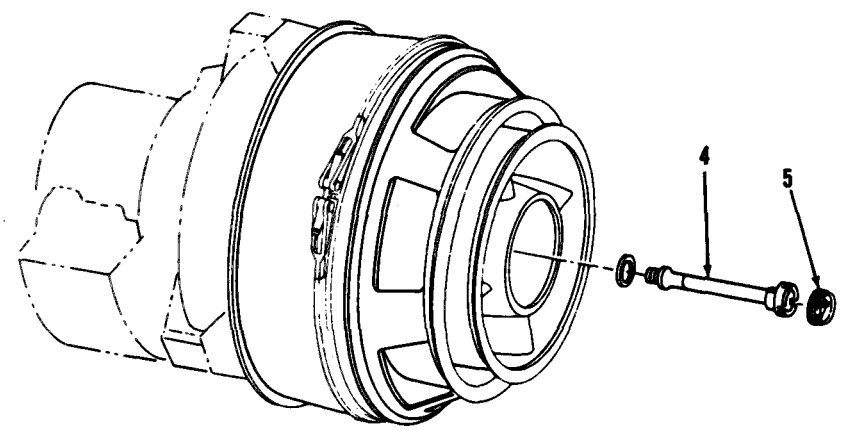
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
5. Mating Mark on Face of Male Spline of Power shaft		**Check** position of mating mark centerpunched on face of male spline of power shaft. Using marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D) **mark** position on face of first stage turbine rotor.
	NOTE Overhauled power turbine rotors may have splines centerpunched two or more times, depending on the number of times the wheel has been rebladed. Use the mating marks with the greatest number of centerpunch marks.	
6. Mating Mark on Face of Female Spline on Power **Turbine Rotor**		**Check** position of mating mark centerpunch on face of female spline on power turbine rotor. Using marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D), **mark** position on outside diameter of shaft.
	NOTE Position mating marks made in actions for items 5 and 6,180 degrees apart during installation.	
	CAUTION **If combustor turbine assembly or major subassembly has been replaced, it is necessary to establish a new power shaft bolt flange depth. Compare original and new flange depth measurements. (Refer to paragraph 4-39.) If they differ by more than 0.010 inch (0.254 mm),**	

4-10. Combustor Turbine Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	change thickness of shims to maintain original flange depth measurement. (See illustration in paragraph 4-39, item 3.) A maximum of three shims may be installed. If original measurements cannot be determined, refer to paragraph 4-38. **Insure shims are flat against shoulder within rotor shaft before installing power shaft bolt. Shims may be held in place with shortening compound (item 74, Appendix D).**	
7. Lifting Device		**Select** suitable lifting device (refer to table in paragraph 4-11, item 12). Install lifting device on combustor turbine assembly and **attach** to a suitable hoist. **Install** combustor turbine assembly on engine with drain valve located in the 6-o'clock position.
	NOTE In item 8, install bolts with their heads facing aft. Install all brackets and bypass fuel filter in proper location as recorded during removal.	
8. Bolts (2), Nuts (1)	**Use wrench (LTCT393).** 	**Install** bolts (2) and nuts (1) securing combustor turbine assembly to diffuser housing flange.

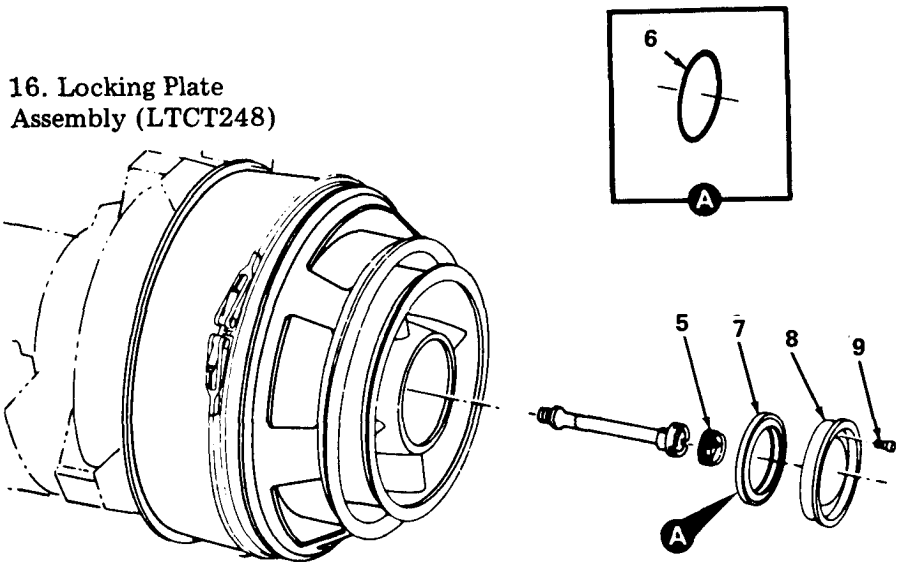
4-10. Combustor Turbine Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
9. Power Locking Plate Assembly (LTCT248)		Install.
	NOTE In item 10, apply Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) or Molykote Anti-Seize Thread Compound (item 58, Appendix D) to bolt (4) prior to installation.	
10. Power Shaft Bolt (4)		Install and adjust its position with shim (3) thickness as recorded during removal and corrected in the CAUTION In item 6.
11. Power Shaft Bolt (4)	Using socket wrench (LTCT506).	Tighten power shaft bolt as required. (Refer to Appendix G, table G-3, reference number 34.)
12. Threads of Power Turbine Shaft and Internal Wrenching Nut		Apply light coating of Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) or Molykote Anti-Seize Thread Compound (item 58, Appendix D) to threads of power turbine shaft and internal wrenching nut (5). Using faces spanner socket wrench (LTCT505), Install internal wrenching nut (5). Tighten nut as required. (Refer to Appendix G, table G-3, reference number 26.)

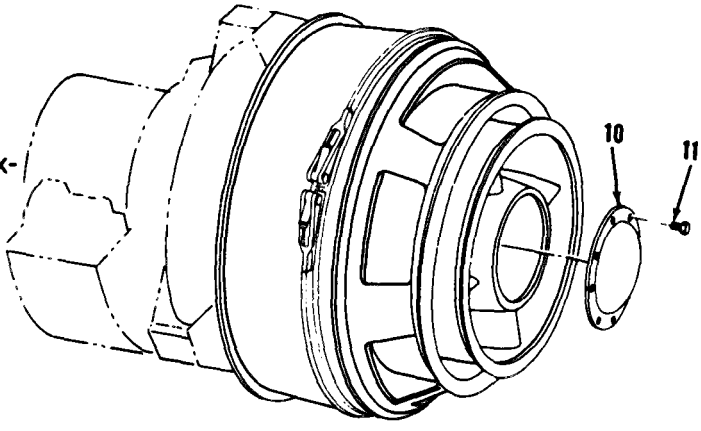


4-10. Combustor Turbine Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
13. Internal Wrenching Nut (5)		**Remove** internal wrenching nut and **retighten** power shaft as required. (Refer to Appendix G, table G-3, reference number 26.) **Reinstall** nut and **tighten as required.** (Refer to Appendix G, table G-3, reference number 26.)
	NOTE When wrenching nut is being reinstalled in the power shaft, deforming of the collar must be accomplished in a new area.	
14. Collar of Nut	Use end of suitably rounded punch or side of tapered drift punch.	**Deform collar** of nut to extend into four slots of power turbine shaft.
15. Collar		Visually **inspect** for cracks or weaknesses that may have occurred as a result of deformations. If nut (5) is cracked or appears unserviceable, it must be **replaced.**
16. Locking Plate Assembly (LTCT248)		**Remove** locking plate assembly (LTCT248). **Install seal** (7) or packing (6) in groove of power turbine rear bearing cover (8).



4-10. Combustor Turbine Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued	NOTE in item 16, insure groove in the power turbine rear bearing cover (8) is clean. if seal (7) or packing (6) is to be installed, coat groove of cover with shortening compound (item 74, Appendix D) or Ultrachem Assembly Fluid #1 item 101, Appendix D) to facilitate holding seal or packing in groove during assembly.	
17. Power Turbine Rear Bearing Cover		Install power turbine rear beating cover (8) and secure with bolts (9). Tighten bolts as required. (Refer to Appendix G, table G-3, reference number 27.) Lockwire bolts.
	NOTE in item 18, prior to installation of bolts(11 , apply Molykote Anti-Seize Thread Compound (item 58, Appendix D or Anti-Seize, 767 item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) to threads of bolts.	
18. Exhaust Diffuser Cover (10)		Install exhaust diffuser cover (10.) Secure with bolts (11); then lockwire.
19. Ignition Lead and Coil Assembly and Exhaust Thermocouple Harness; Fuel, Oil, and Electrical Leads		Install ignition lead and coil assembly and exhaust thermocouple harness. Connect fuel, oil, and electrical lines as necessary. Tighten ignition leads as required. (Refer to Appendix G, table G-3, reference number 62.)

4-10. Combustor Turbine Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
20. N2 Tachometer		Reinstall N2 tachometer (if removed).
	NOTE Perform an engine vibration test upon reinstallation of combustor turbine assembly (hot end), or whenever excessive engine vibration is suspected. (Refer to paragraph 1-105.)	

4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-138/703 Engines

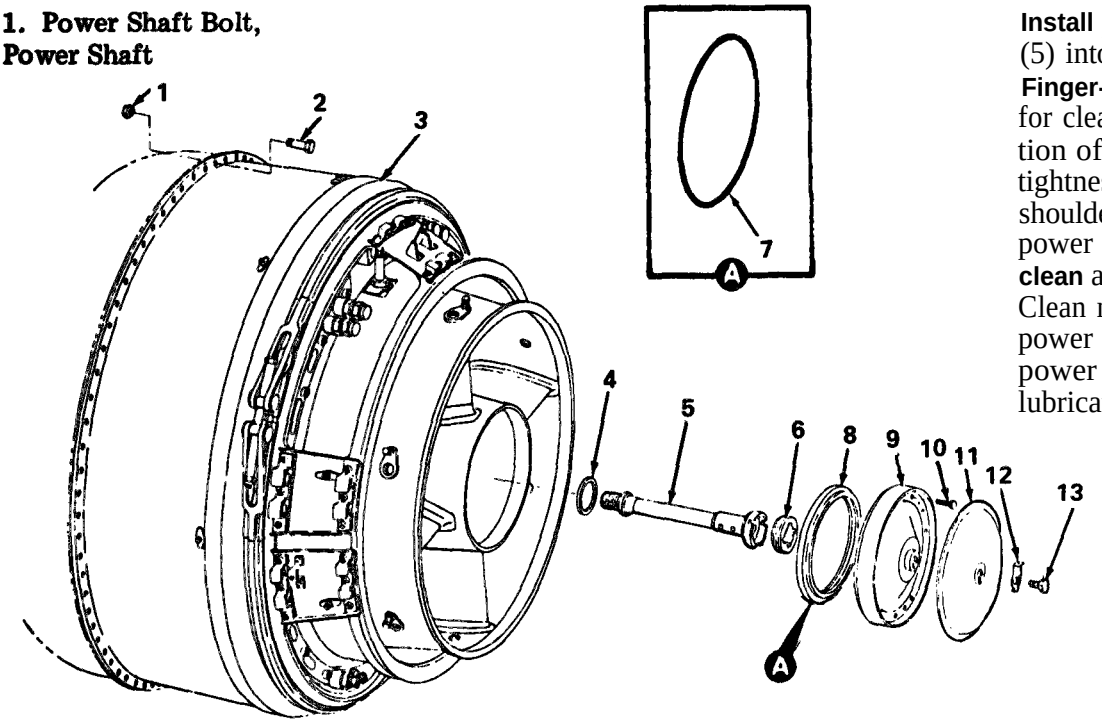
Special Tools
Wrench (LTCT393)
Wrench (LTCT506)
Wrench (LTCT505)
Locating Bar (LTCT153)
Lifting Device (LTCT53)
Lifting Device (LTCT57)
Hoisting Adapter (LTCT3665)
Lifting Device (LTCT2089)
Lifting Device (LTCT91)
Lifting Sling (LTCT14668-01)

Consumable Materials
Colorbrite No.2107 (item 54, Appendix D)
Iron-Blue Pigment (item 37, Appendix D)
Shortening Compound (item 74, Appendix D)
Ultrachem Assembly Fluid #1 (item 101, Appendix D)
Molykote Anti-Seize Thread Compound (item 58, Appendix D)
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease (item 103, Appendix D)
Lockwire (item 41, Appendix D)

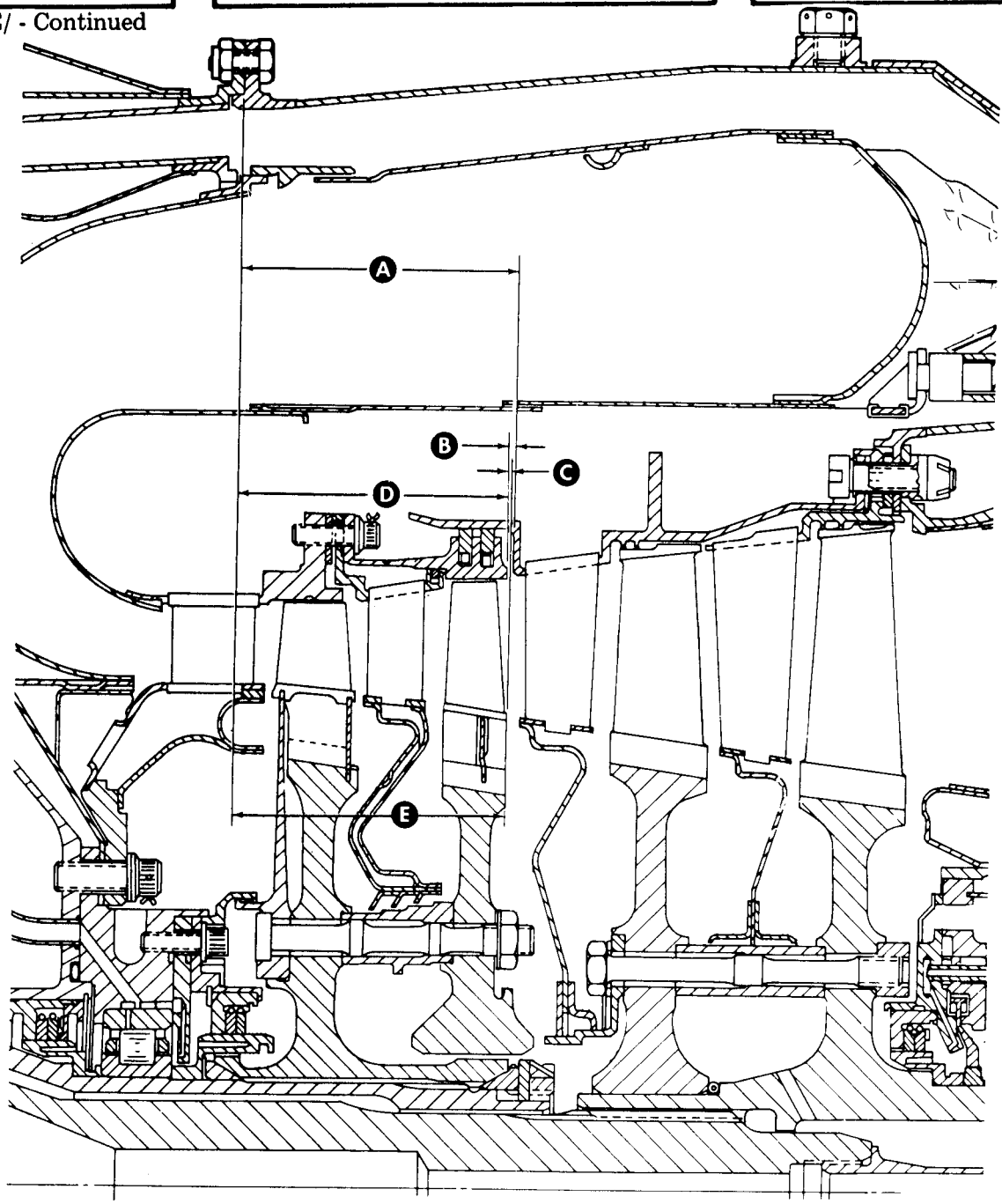
References
Appendix G, Table G-6, Reference Number 34
Appendix G, Table G-4, Reference Numbers 23,25,27
Para 1-104,4-40,4-41

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
	NOTE Lubrication of power shaft bolt and installation of shims is not necessary at this time.	

4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
1. Power Shaft Bolt, Power Shaft		**Install** power shaft bolt (5) into power shaft. **Finger-tighten** to check for cleanliness and condition of threads. If any tightness or failure of shoulder to bottom on power shaft exists, **clean** and **repair** threads. Clean mating splines of power turbine and power shaft. Do not lubricate.
2. Locating Bar (LTCT153)		**Position over** combustion chamber **housing** flange.
	NOTE On T53-L703 engines, position a piece of 0.750 inch ground stock or parallel bar on combustion chamber bolt hole flange, under each end of locating bar, to prevent bar from contacting inner lip of combustion chamber liner.	
3. Dimension A	Use depth vernier.	**Measure** from bar to step at outer shroud of first stage power turbine nozzle. **Subtract** dimension from top of bar to flange. Result is dimension A.

4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
		
4. Locating Bar (LTCT153)		**Position** over second stage gas producer turbine rotor disk.
5. Dimension E		**Measure from bar** to flange of diffuser (dimension E).

4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
5.1. Dimension C		Measure form BAR to second stage as producer cylinder. Result is dimension C.
6. Dimension D		Subtract dimension C from dimension E. Result is dimension D.
7. Dimension B	Dimension B must be as given in Appendix G, table G-6, reference number 34.	Subtract dimension D from dimension A. Result is dimension B.
8. Mating Marks		Position mating marks as recorded when combustor turbine was removed. if mating marks were not made at removal, or if a new combustor section or a new new power turbine wheel is installed, accomplish actions for items 9 and 10.
9. Mating Mark Center-punched on Face of Male Spline of Power Shaft		Check position. Using marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D), mark position of power shaft spline.
	NOTE Overhauled power turbine wheels may have splines center-punched two or more times, depending on the number of times the wheel has been rebladed. Use the mating mark with the greatest number of center-punched marks.	
10. Mating Mark Center-punched on Face of Female Spline		Check position. if not accomplished during assembly, mark position on outside diameter of shaft, using marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D).

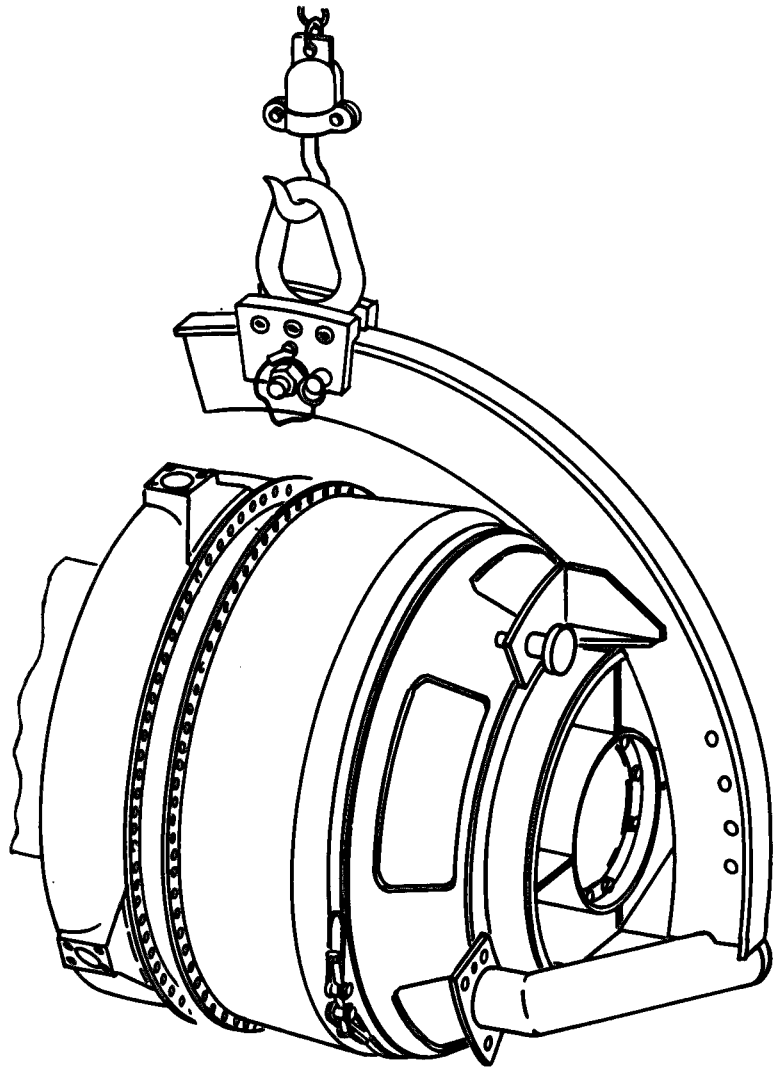
4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	NOTE If a new combustor section or a new power turbine rotor is installed, position mating marks in preceding action for items 9 and 10, 180 degrees apart during installation.	
11. Aft End of Power Shaft	Do not allow power shaft to move aft.	**Center** within the compressor and carefully **push** power shaft full forward.
	CAUTION **If the power shaft is not in the forward position, the spur gear on the forward end of the power shaft may damage the driven (N2 drive) gear during installation of combustor turbine assembly.**	
	CAUTION **If combustor turbine assembly or major subassembly has been replaced it is necessary to establish a new power shaft bolt flange depth. Compare original and new flange depth measurements. (Refer to paragraph 4-40.) If they differ by more than 0.010 inch (0.254 mm), add or remove shims to maintain original flange depth measurement. A maximum of three shims maybe installed. If original measurements cannot be determined, refer to paragraph 4-41.**	

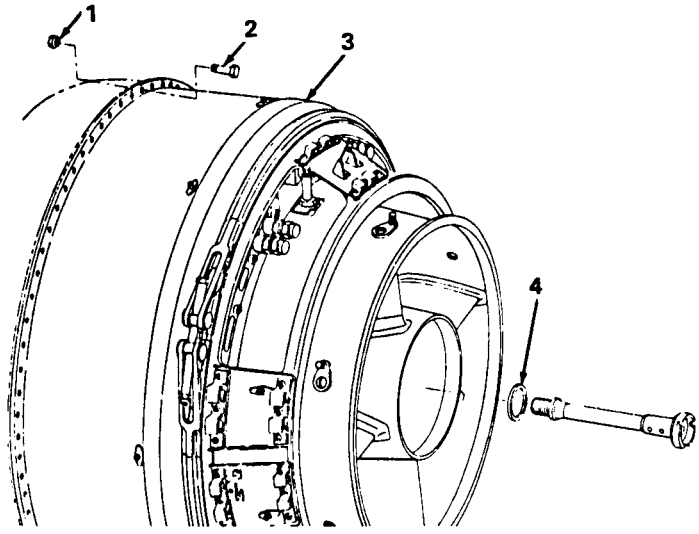
4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
12. Combustor Lifting Device	Combustor Turbine Assembly Lifting Devices and Applications	Position combustor lifting device around flange of-diffuser support cone.

Lifting Device	Engine Attitude	Location of Device
LTCT53	Vertical	Exhaust Diffuser Support Cone Aft Flange
LTCT87	Horizontal	Around Combustor Housing
LTCT91 LTCT2089 LTCT3665	Horizontal or Vertical	Exhaust Diffuser Support Cone Aft Flange
LTCT14668-01	Horizontal or Vertical	Around Combustor Housing



4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation - Continued

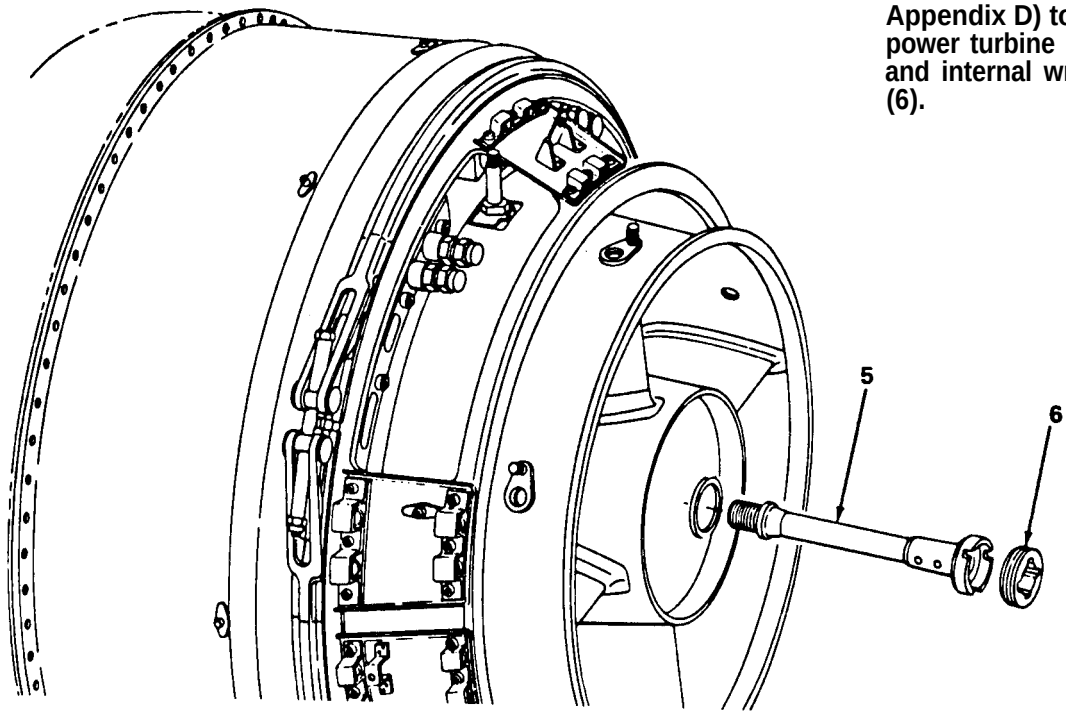
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	CAUTION Before installation in action for item 13, inspect as follows: dimples on ID of combustion chamber liner must contact OD of first stage gas producer nozzle deflector. This may be accomplished by applying iron-blue pigment (item 37, Appendix D) to the liner dimples and mating the nozzle and liner to simulate hot end installation. If contact is not evident through 360 degrees, carefully bend liner tab(s) inward as required.	
13. Hoist, Lifting Device		Attach suitable hoist to lifting device and install combustor turbine assembly on diffuser housing assembly with combustion chamber drain valve located at 6-o'clock position.
14. Bolts (2), Nuts (1)	Use wrench (LTCT393).  	Install bolts (2, in figure in item 1) and nuts (1) that secure combustor turbine assembly (3) to diffuser housing head of bolts towards rear of engine.
	NOTE Reinstall all brackets at areas where indicated during removal.	

4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
15. Shims (4)		Install shims of thickness recorded during removal or as corrected in the CATION preceding item 12.
	CAUTION Number of shims shall not exceed three. The use of an excessive number of shims can result In a cocked bolt and cause excessive power turbine vibration. Insure shims are flat against shoulder within rotor shaft before Installing power shaft bolt Shims may be held in place with shortening compound (Item 74, Appendix D)	
16. N2 Tachometer		Remove N2 tachometer (if installed) from overspeed governor and tachometer drive gearbox and engage 1/4-inch drive extension and handle in tachometer drive gear.
17. Power Shaft Bolt (5)		Apply light coating ofMolykote Anti-Seize Thread Compound (item 58, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (Item 103, Appendix D) to threads of power shaft bolt and Install bolt by hand. When installing bolt, rotate the 1/4-inch drive handle slighty to Insure that the driven (N2 drive) gear and the spur ear are engaged properly.

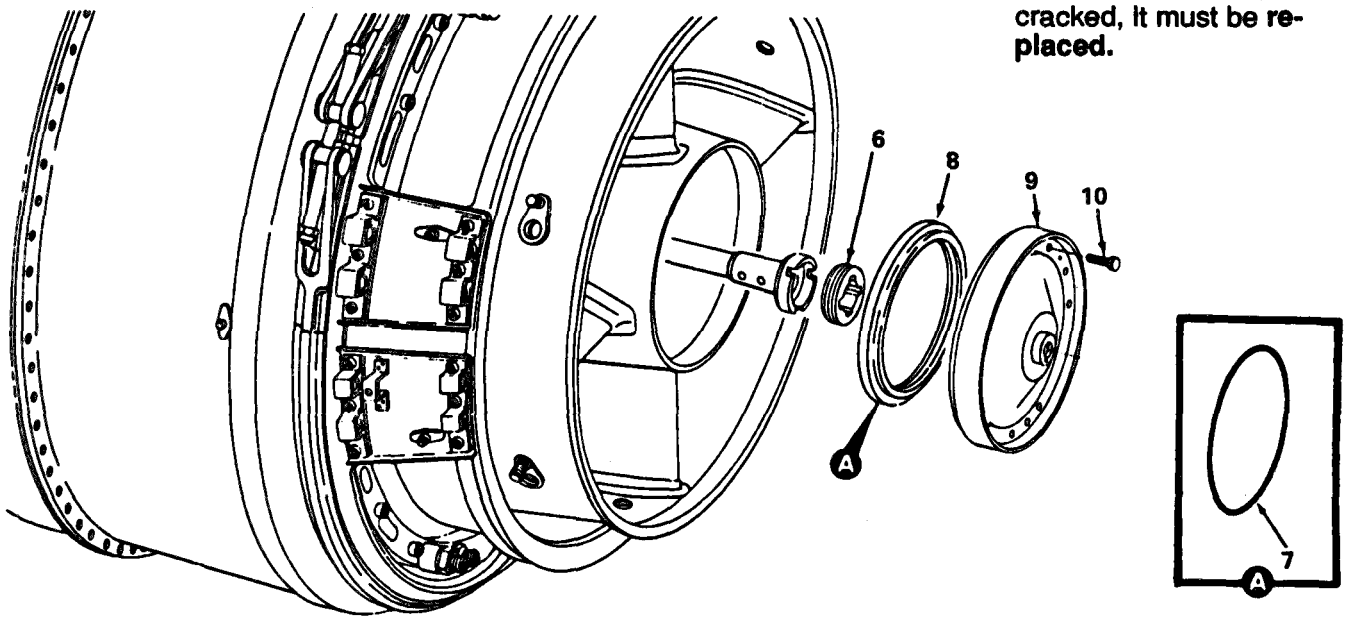
4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued	**CAUTION** Failure to insure engagement may result In damage to the driven gear. A firm resistance must be felt at the handle.	
18. Torque Adjustment Fixture (LTCT962)		Install into rear of combustor turbine assembly and engage tangs of locking plate assembly with slots in bearing retainer nut. Secure plate assembly with three bolts.
19. Power Shaft Bolt (5)	Use wrench (LTCT506).	Tighten bolt as required. Refer to Appendix G, table G-4, reference number 27.),
20. Threads of Power Turbine Rotor Shaft and Internal Wrenching Nut		Apply light coating of Molykote Anti-Seize Thread Compound (item 58, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) to threads of power turbine rotor shaft and internal wrenching nut (6).



4-11. Combustor Turbine Assembly (T53-L-13B/7O3 Engines) - installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
21. Nut (6), Power shaft Bolt (5)	Use wrench (LTCT505),	Install nut (6). Tighten nut. (Refer to Appendix G , table G-4, reference number 23.) Loosen and remove nut. Retighten power shaft bolt (5). (Refer to Appendix G, table G-4, reference number 27.) Install nut (6) and tighten. (Refer to Appendix G, table G-4, reference number 23.)
	NOTE When wrenching nut is being reinstalled In the power shaft, deforming of the collar must be accomplished in a new area.	
22. Collar of Nut	Use end of suitably rounded punch, or the side of tapered drift punch . Do not shear nut.	Deform collar of nut to extend into two slots of power turbine shaft, 180 degrees apart.
23. Nut (6)		Visually **Inspect** nut for cracks that may have occurred as a result of deformations. If nut is cracked, it must be **replaced.**

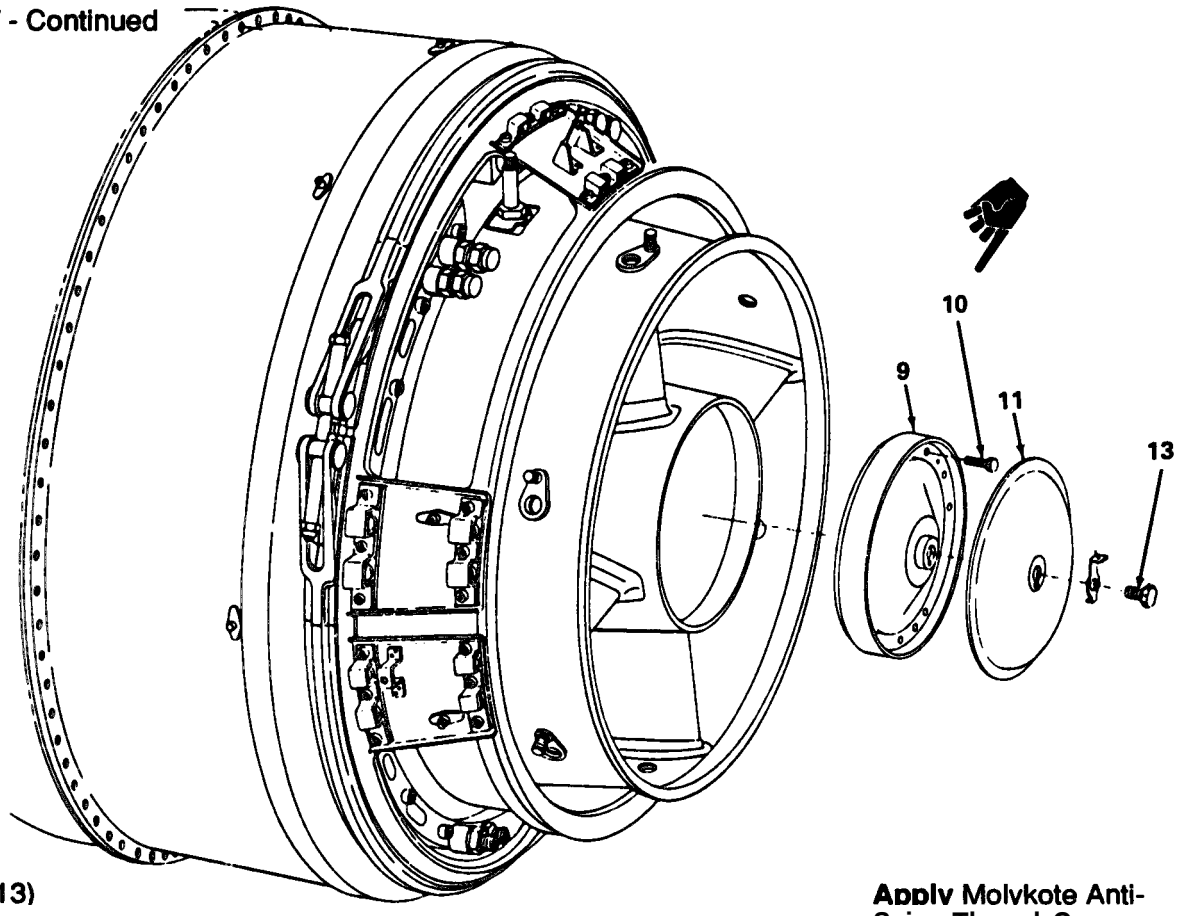


4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
24. Torque Adjustment Fixture (LTCT962)	NOTE In item 25, insure groove in cover (9) is clean. If seal (8) or packing (7) is to be installed, coat groove of cover with shortening compound (item 74, Appendix D) or Ultrachem Assembly Fluid #1 (item 101, Appendix D) to facilitate holding seal or packing in groove during assembly.	Remove.
25. Seal (8) or Packing (7)		Install seal (8) or packing (7) in groove of cover (9).
	NOTE Prior to installation of bolt (10), apply a light coat of Molykote Anti-Seize Thread Compound (Item 58, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) to threads of bolt.	
26. Cover (9)		Install cover (9) and secure with bolts (1 O). Measure gap between cover and exhaust diffuser. Refer to paragraph 4-3. Lockwire (item 41, Appendix D). (Refer to Appendix G, Table G-4, reference number 26.)
	NOTE In item 27, tab with lockwire hole will face out. If tab does not fit into slot, file rear bearing cover locally until tab fits snugly.	
27. Exhaust Diffuser Cover (11)		Position exhaust diffuser cover over rear bearing cover (9). Insure that slots of covers are aligned and Install tablock (1 -1 60-635-01).

4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
28. Bolt (13)		Apply Molykote Anti-Seize Thread Compound (item 56, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) to bolt (13).
29. Bolt (13)		Install bolt (13) and, while holding tablock in position, tighten bolt as required. (Refer to Appendix G, table G-4, reference number 25.)
		Lockwire tablock to bolt.
slots		Reinspect with aid of an inspection light for proper engagement of tablock and cover slots.



4-11. Combustor Turbine Assembly (T53-L-13B/703 Engines) - Installation Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
32. Starting Fuel Nozzles, Igniter Plugs		**Install** four starting fuel nozzles and four igniter plugs.
33. Ignition Leads and Starting Fuel Hose Assembly		**Reconnect** ignition leads and starting fuel hose assembly. **Secure** with clamps and **lockwire as necessary.**
34. Ignition Leads and Starting Fuel Hose Assembly		**Install** thermocouple harness (T53-L13B only). **Connect** fuel, oil, and electrical lines as necessary.
35. N2 Tachometer		**Reinstall N2** tachometer (if removed).
	NOTE Perform an engine vibration test upon re-installation of combustor turbine assembly (hot end) or whenever excessive engine vibration is suspected. (Refer to paragraph 1-104.)	

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Special Tools
Socket Wrench (LTCT13456, detail of LTCT13175)
Socket Wrench (LTCT13175)
Socket Wrench (LTCT4181)
Puller (LTCT691)
Mechanical Puller (LTCT4842)
Locating Pin Removal Tool (LTCT4692)
Power Wrench (PD2501)
Adapter and Guide (LTCT3685)
Puller(LTCT2121)
Mechanical Puller (LTCT4809)
Puller (LTCT4846)
Forward Seal Puller (LTCT4568)
Arbor (LTCT4571)
Shaft Holding Fixture (LTCT576)
Holding Fixture (LTCT4533)
Cone Removing Tool (LTCT6465)

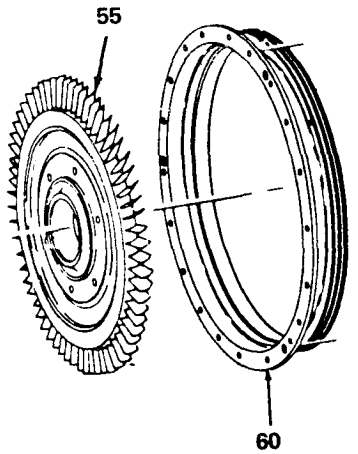
References
Marking Pencil No. 2107 (item 54, Appendix D)

References
Appendix G, Table G-6, Reference Number 29
Para 1-51,5-19 and 4-14

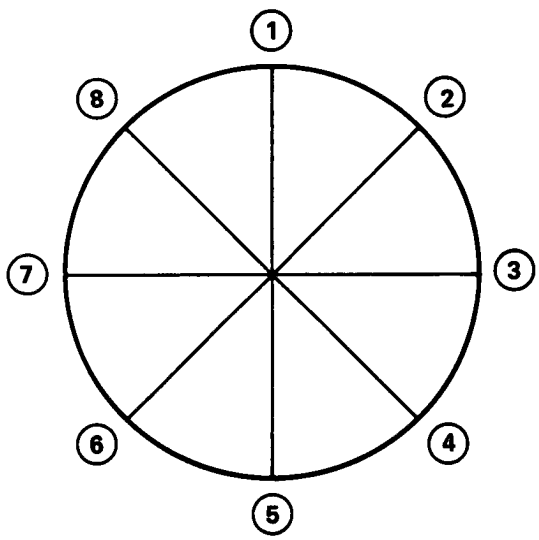
4-12. Gas Producer System Components (T53-L-13B Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**WARNING** **FLIGHT SAFETY PARTS** **Turbine Rotor Disk (First Turbine Rotor Sealing Disk)** **Turbine Turbine Disk (First Stage Gas Producing Turbine Disk)** **Turbine Turbine Disk (Second Stage Gas Producing 'Disk)** **Turbine Rotor Spacer (Gas Producer Turbine Spacer)** **Turbine Rotor Disk (Second Turbine Rotor Sealing Disk)** **Handle with caution and provide protective covering when removed from engine.** **NOTE** Engine must be installed in maintenance stand in order to install gas producer turbine rotor. **NOTE** Removal of gas producer turbine rotor and nozzle assemblies is not required for inspection. Removal is limited to gaining access for necessary repair or replacement of components; however, whenever access is gained to the first stage gas producer turbine rotor assembly, a sand and dust ingestion inspection must be performed. (Refer to paragraph 1-51.) **NOTE** Specific removal differences between the T53-L-13B/703 engines are noted. [terns 1 thru 4 pertain to checking second stage gas producer turbine rotor for minimum tip clearance.	

4-12. Gas Producer System Components (T53-L-13B Engines) - Removal and Disassembly - Continued

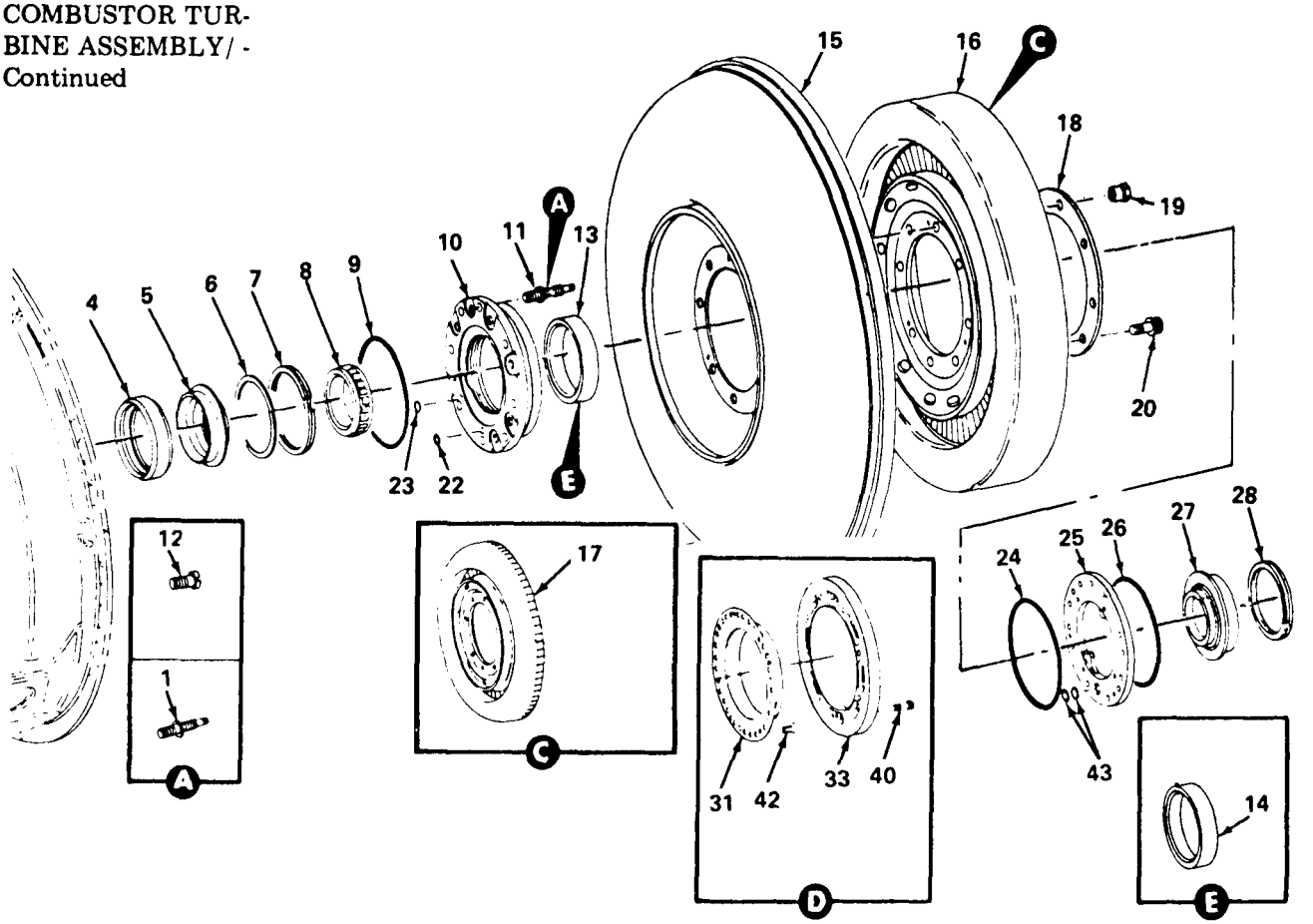
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
1. Second Stage Gas Producer Turbine Rotor Assembly (55) and Second Stage Gas Producer Cylinder (60)		Insert feeler gage between second stage gas producer turbine rotor assembly and second stage gas producer cylinder (60) at 12 o'clock position.
	WARNING FLIGHT SAFETY PARTS Use of nonapproved marking materials such as common lead pencils an engine components In or near the hot end will cause cracking of those components when subjected to high temperatures. This can lead to engine failure.	
2. Turbine Rotor	Use marking pencil No. 2107 (item 54, Appendix D).	Rotate. Check and record minimum tip clearance (longest blade). Mark longest blade with marking pencil (yellow).
	NOTE Minimum acceptable tip clearance at inspection is 0.020 inch (0.051 cm). However, when rework is to be accomplished, establish a minimum tip clearance of 0.027 inch (0.069 cm).	

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
3. **Turbine** Rotor	Refer to paragraph 4-19. 	**Check** clearance between tip of longest blade and flange at seven additional positions. **Hold** feeler gage stationary at each position. **Turn** rotor one full turn. If tip clearance at any position is 0.020 in. (0.051 cm) or less, flange must be reworked at reassembly. If flange is not to be reworked, proceed to action item 5.
4. Flange		**Locate areas** to be reworked as follows: **a. Insert 0.027 in. (0.69** mm) feeler gage between tip of longest blade and second stage gas producer cylinder as near as possible to area of least tip clear. ante. b. Rotate turbine wheel and feeler gage together until stopped by an **area of less clearance.** c. At stopping point, **mark edge** of cylinder flange with approved marker.

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		

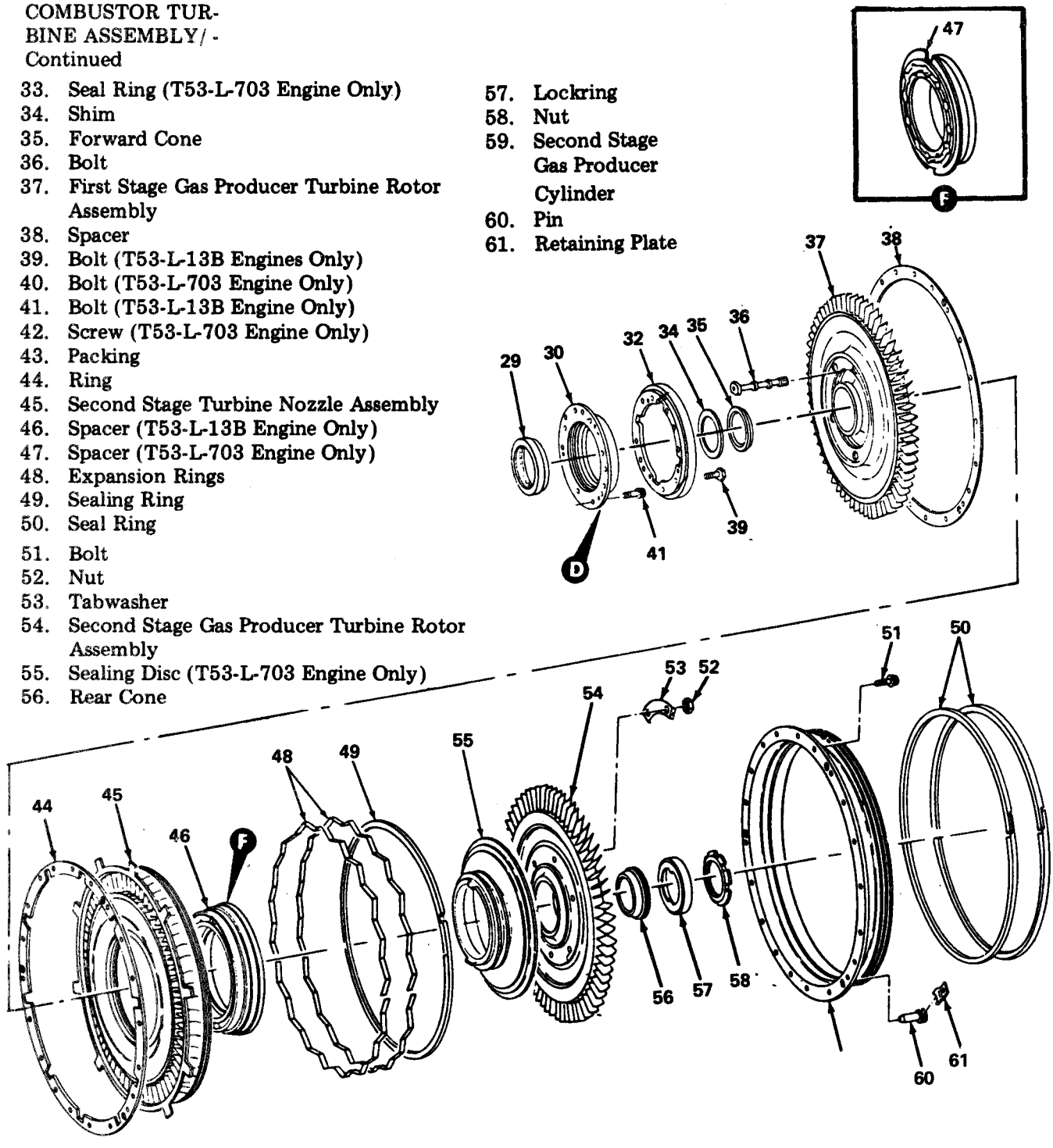


1. Stepped Stud (1-110-131-02) (T53-L-13B Engines Only)
2. Deleted
3. Deleted
4. Forward Seal
5. Forward Oil Ring
6. Spacer
7. Retaining Ring
8. Bearing Inner Race and Rollers
9. Seal
10. Bearing Housing Assembly
11. Stud (1-110-131-04) (T53-L-13B Engines with Air Diffuser (1-110-230-08)
12. Screw (T53-L-13B/703 Engines with Air Diffuser (1-110-230-15)
13. Bearing Outer Race (T53-L-13B Engines only)
14. Bearing Outer Race with Pin
15. Combustion Chamber Deflector
16. First Stage Turbine Nozzle Assembly (T53-L-13B Engines Only)
17. First Stage Turbine Nozzle Assembly (T53-L-703 Engine Only)
18. Support Plate (Use with nozzles 1-110-520-14 and 1-110 -520-21 only.) (T53-L13B Engines Only)
19. Nut (1-110-134-01) (T53-L-13B Engines with Air Diffuser (1-110-230.08)
20. Bolt
21. Deleted
22. Packing
23. Packing
24. Gasket
25. Retaining Plate
26. Gasket
27. Aft Oil Ring
28. Retaining Ring
29. Seal
30. Retainer (T53-L-13B Engines Only)
31. Retainer (T53-L-703 Engine Only)
32. Seal Ring (T53-L-13B Engines Only)

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		

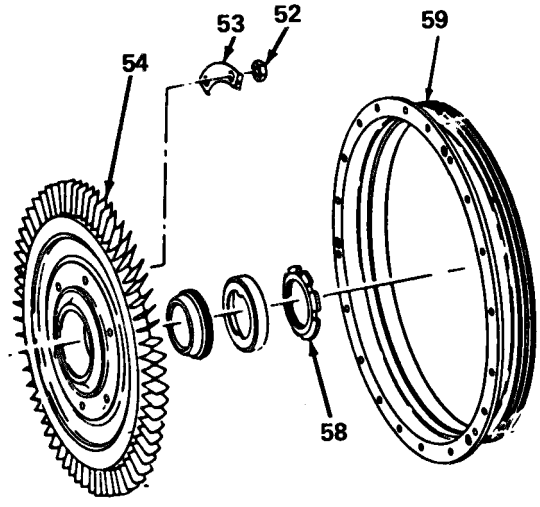
33. Seal Ring (T53-L-703 Engine Only)
34. Shim
35. Forward Cone
36. Bolt
37. First Stage Gas Producer Turbine Rotor Assembly
38. Spacer
39. Bolt (T53-L-13B Engines Only)
40. Bolt (T53-L-703 Engine Only)
41. Bolt (T53-L-13B Engine Only)
42. Screw (T53-L-703 Engine Only)
43. Packing
44. Ring
45. Second Stage Turbine Nozzle Assembly
46. Spacer (T53-L-13B Engine Only)
47. Spacer (T53-L-703 Engine Only)
48. Expansion Rings
49. Sealing Ring
50. Seal Ring
51. Bolt
52. Nut
53. Tabwasher
54. Second Stage Gas Producer Turbine Rotor Assembly
55. Sealing Disc (T53-L-703 Engine Only)
56. Rear Cone
57. Lockring
58. Nut
59. Second Stage Gas Producer Cylinder
60. Pin
61. Retaining Plate

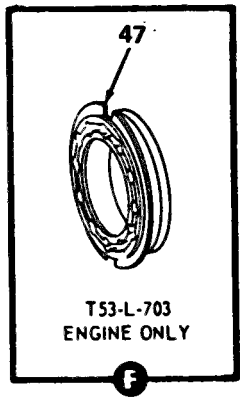


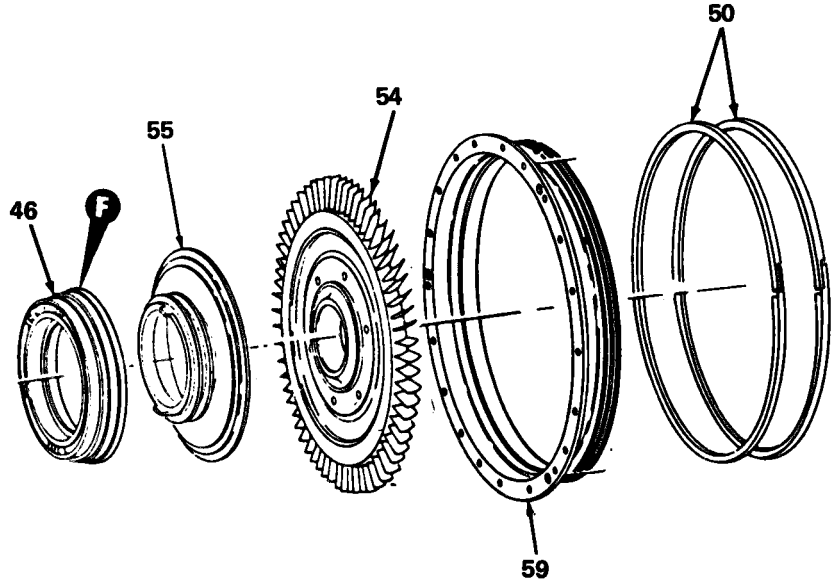
4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
		d. Remove feeler gage. Turn rotor until long blade is past high point far enough to allow the 0.027 in. (0.69 mm) feeler gage to be inserted.
		e. Reinsert feeler gage between long blade and cylinder flange.
		f. Rotate turbine wheel and feeler gage together in the reverse direction, until stopped by an area of less clearance.
		g. Using No. 2107 marking pencil (item 54, Appendix D), mark cylinder flange as before. Connect the two marks to show area to be reworked.
		h. Repeat preceding steps a. thru g. until all areas that must be reworked have been relocated.
	NOTE Disassemble combustor turbine according to items 5 thru 58.	
5. Gas Producer Systems Components	Use No. 2107 marking pencil (item 54, Appendix D)	Using marking pencil (yellow), index second stage rotor to first stage rotor and first stage rotor to rear compressor shaft for correct reassembly.

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - continued		
6. compressor Rotor Shaft	Use socket wrench (LTCT13456, detail of LTCT13175) or (LTCT4181).	Engage tangs of socket wrench with nut (58), using hinge handle to prevent compressor rotor shaft from turning.
7. Second Stage Gas Producer Turbine Rotor Assembly (54)		**Straighten** tabwashers (53). **Remove** nuts (52) and tabwashers (53) that secure second stage gas producer rotor.
8. Second Stage Gas Producer Turbine Rotor Assembly **(54)**	Use puller (LTCT691) T53-L-13B engine only.	Using puller, carefully **remove** with spacer (46).





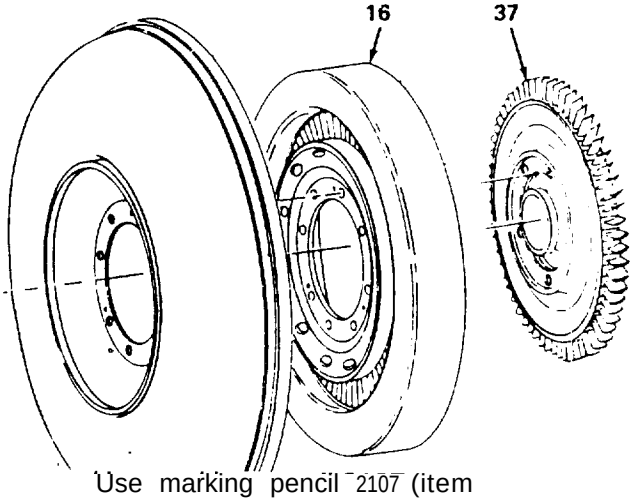
4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
9. Second Stage Gas Reducer Turbine Rotor Assembly (55)	Use puller (LTCT691) T53-L-703 engine only.	Using puller, carefully **remove** with spacer (47) and sealing disc (55).
	NOTE When removing spacer (46 or 47) from rotor, use the thumbscrews to position the arms into spacer. When arms are in position, firmly lock them with knurled cup and back off thumbscrews at least one half turn to allow puller to operate freely and prevent binding of thumbscrews.	
10. Second Stage Gas Producer Turbine Rotor Assembly (54)	T53-L-13B engine only. Use mechanical puller (LTCT4842).	**Remove** spacer (46) from rotor assembly (54).
11. Second Stage Gas Reducer Turbine Rotor Assembly (54)	T53-L-703 engine only. Use mechanical puller (LTCT4842).	**Remove** spacer (47) with sealing disc (55) from rotor assembly (54)
12. Spacer (47)	T53-L-703 engine only.	If required, **remove** from sealing disc (55) using an arbor press.
13. Seal Rings (50)		If required, **remove** from grooves on outside diameter of second stage gas producer cylinder (59).

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
14. Second Stage Gas Producer Cylinder	Bolts (51) secure second stage gas producer cylinder to first stage turbine nozzle assembly (16 or 17).	Remove and discard 20 bolts (51).
15. Three Retaining Plates (61)		Remove,
16. Pins (60)	Use locating pin removal tool (LTCT4692).	Remove.
17. Second Stage Gas Producer Cylinder (59)		Remove.
18. Sealing Ring (49) and Expansion Rings (48)		If required, remove from outside diameter of second stage gas producer nozzle assembly.
19. Ring (44), Spacer (38), and Second Stage Turbine Nozzle Assembly (45)	Record thickness of spacer (38) when removed.	Remove.
20. First Stage Gas Producer Rotor	Refer to Appendix G, Table G-6, reference number 29.	Check for minimum tip clearances.

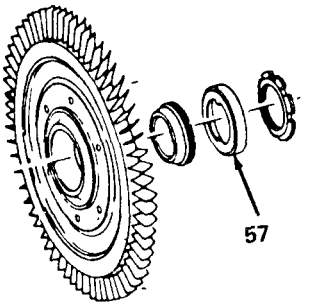
4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	Items 21 thru 23 pertain to checking minimum tip clearances for first stage gas producer rotor.	
21. First Stage Gas Producer Turbine Rotor Assembly (37) and First Stage Turbine Nozzle Assembly (16)		Insert feeler gage with 1/4 inch wide tip, between first stage gas producer turbine rotor assembly (37) and first stage turbine nozzle assembly (16) at 12 o'clock position.
22. First Stage Gas Producer Turbine Rotor Assembly	Use marking pencil 2107 (item 54, Appendix D).	Rotate turbine rotor. Check and record minimum tip clearance (longest blade). Mark longest blade with yellow marking pencil.
	NOTE Minimum acceptable tip clearance at inspection is 0.020 inch (0.051 cm). However, when rework is to be accomplished, establish a minimum tip clearance of 0.027 inch (0.069 cm).	
23. First Stage Gas Producer Turbine Rotor Assembly	If tip clearance at any position is 0.020 in. (0.051 cm) or less, flange must be reworked at reassembly. See paragraph 4-19. If flange is not to be reworked, proceed to item 31.	Check clearance between tip of longest blade and flange at seven additional positions. (See illustration in item 3.) Hold feeler gage stationary at each position and turn rotor one full turn.

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	NOTE **Locate areas to be reworked according to Hems 24 thru 30.**	
24. First Stage Gas Producer Turbine Rotor Assembly		**Insert 0.027 in. feeler gage between longest blade and first stage gas producer nozzle c tinder as near as possible to area of least tip clearance.**
25. First Stage Gas Producer Turbine Rotor Assembly		**Rotate turbine wheel and feeler gage together until stopped by an area of less clearance.**
26. Cylinder Flange	**Use marking pencil 2107 (item 54, Appendix D) .**	**At stopping point, mark edge of cylinder flange with yellow marking pencil.**
27. First Stage Gas Producer Turbine Rotor Assembly		**Remove feeler gage and turn rotor until long blade is past high point far enough to allow 0.027 in. feeler gage to be inserted.**
28. First Stage Gas Producer Turbine Rotor Assembly		**Reinsert feeler gage between long blade and cylinder flange.**
29. First Stage Gas Producer Turbine Rotor Assembly		**Rotate turbine wheel and feeler gage together in reverse direction until stopped by an area of less clearance.**
30. **Cylinder Flange**		**Mark cylinder flange as before, and connect the two marks to show area to be reworked.**

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

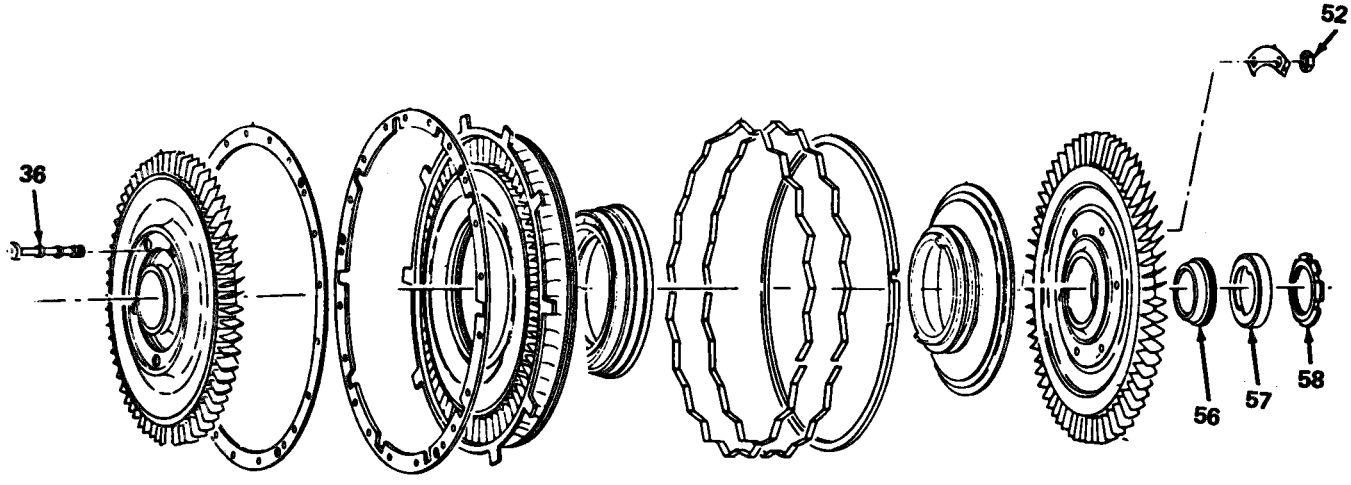
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	Repeat preceding items 24 thru 30 until all areas that must be reworked have been located.	
31. Compressor Shaft Rear lockring (57)		**Straighten** tabs of compressor shaft rear lockring (57).
	NOTE When installing torque fixture in following item 32, insure that bolts are drawn completely through fixture. Refer to the following table for tools necessary to remove the nut and cone in following items 32 thru 34.	

Shaft Holding or Torque Fixture	Wrench Socket	Power Wrench	Hub and Adapter Assembly	Cone Removal Tool
LTCT576	LTCT584, Detail of LTCT576 or LTCT4676		LTCT3076, Detail of LTCT576 or LTCT4676	LTCT786 or LTCT4677, Detail of LTCT4676
LTCT4533	LTCT584, Detail of LTCT576 or LTCT4676		LTCT3076, Detail of LTCT576 or LTCT4676	LTCT4677, Detail of LTCT4676
LTCT13175	LTCT13456, Detail of LTCT13175	PD2501		LTCT6465

NOTE: This table lists the tools necessary for removing and installing the nut and cone in the combinations that can exist.

4-12. GAS PRODUCER SYSTEM COMPONENTS (T53-L-13B/703 ENGINES) – REMOVAL AND DISASSEMBLY – Cont.

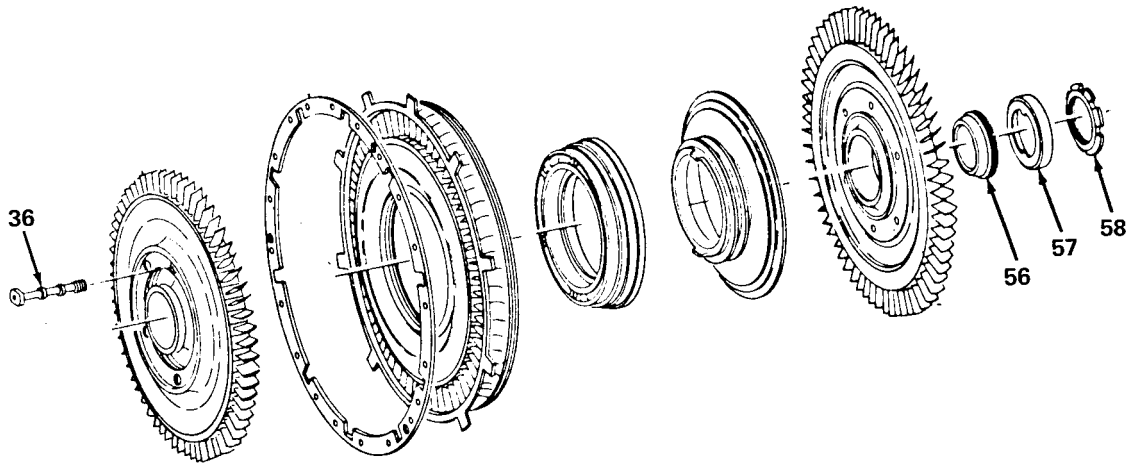
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ – Continued		
32. Bolts (36), First Stage Gas producer Turbine Rotor Assembly, Nut (59, and Nuts (53)		**Install** torque fixture over bolts (36) of first stage gas producer turbine rotor assembly, engaging tangs of wrench socket with slots in nut (58). **Secure** fixture with nuts (52).



33. Nut (58) and Lo&ring (57)	Use power wrench PD2501.	**Remove.**
34. Rear Cone (56)	Use cone removal tool. LTCT 6465	**Remove** rear cone (56). **Remove** torque fixture.

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

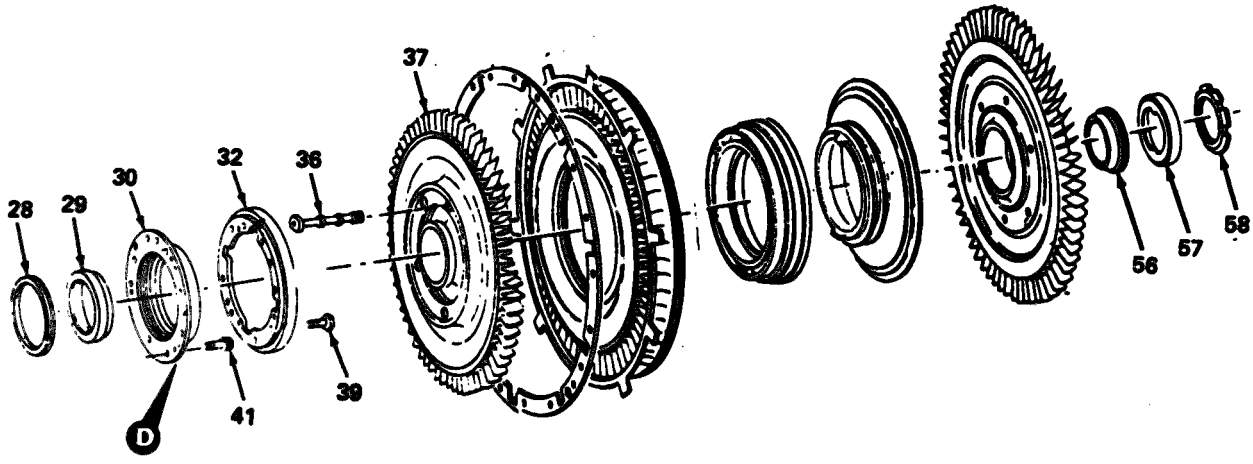
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**NOTE** An alternate method to preceding items 32 thru 34 is contained in items 35 thru 38. When installing hub and adapter assembly in following item 35, insure that bolts are drawn completely through fixture. Refer to preceding table for tools necessary for items 35 thru 38.	



35. Hub and Adapter Assembly		**Install** hub and adapter assembly over bolts (36) of first stage gas producer turbine rotor assembly. **Secure** with nuts.
36. Diffuser Housing		**Position** and **secure** shaft holding fixture to diffuser housing.
37. Nut (58) and Lockring (57)	Use socket wrench.	**Engage** tangs of socket wrench with slots in nut (58). Remove nut and lockring (57).

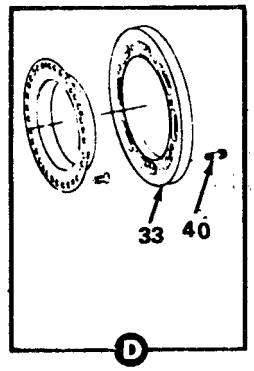
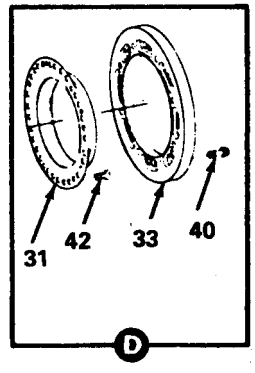
4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
38. Rear Cone (56)	Use cone removal tool LTCT6465.	Remove rear cone (56). Remove shaft holding fixture and hub and adapter assembly.
39. First Stage Gas Producer Turbine Rotor Assembly (37) and Bolts (36)	Use marking pencil No. 2107 (item 54, Appendix D).	Remove first stage gas producer turbine rotor assembly. Using yellow marking pencil, index bolts (36) for correct reassembly. Remove bolts from rotor assembly.



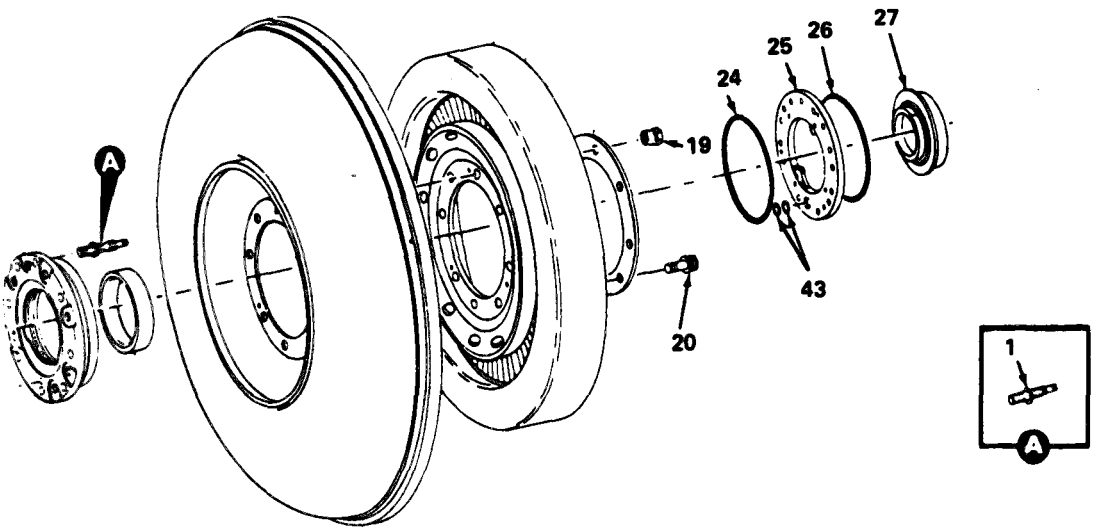
40. Seal Ring (32)	T53-L-13B engine only.	Remove eight bolts (39) which secure seal ring. Remove seal ring.

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
41. Bolts (40) and Seal Ring (33)	T53-L-703 engine only. 	**Remove** eight bolts securing seal ring. **Remove** seal ring.
42. Retainer (30)	**T53-L-13B engine only.**	**Remove** three bolts (41) which secure retainer (30). Remove retaining ring (28), seal (29), and retainer (30) as a unit.
43. Retainer	**T53-L-703 engine only.** 	**Remove** three screws (42) which secure retainer. Remove retaining ring (28), seal (26) and retainer (31) as a unit.
44. Aft Oil Ring (27)	Use adapter and guide (LTCT3685) and puller (LTCT2121).	**Remove.**
46. Gasket (26), Retaining Plate (25), packings (43) and Gasket (24)		**Remove,**

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

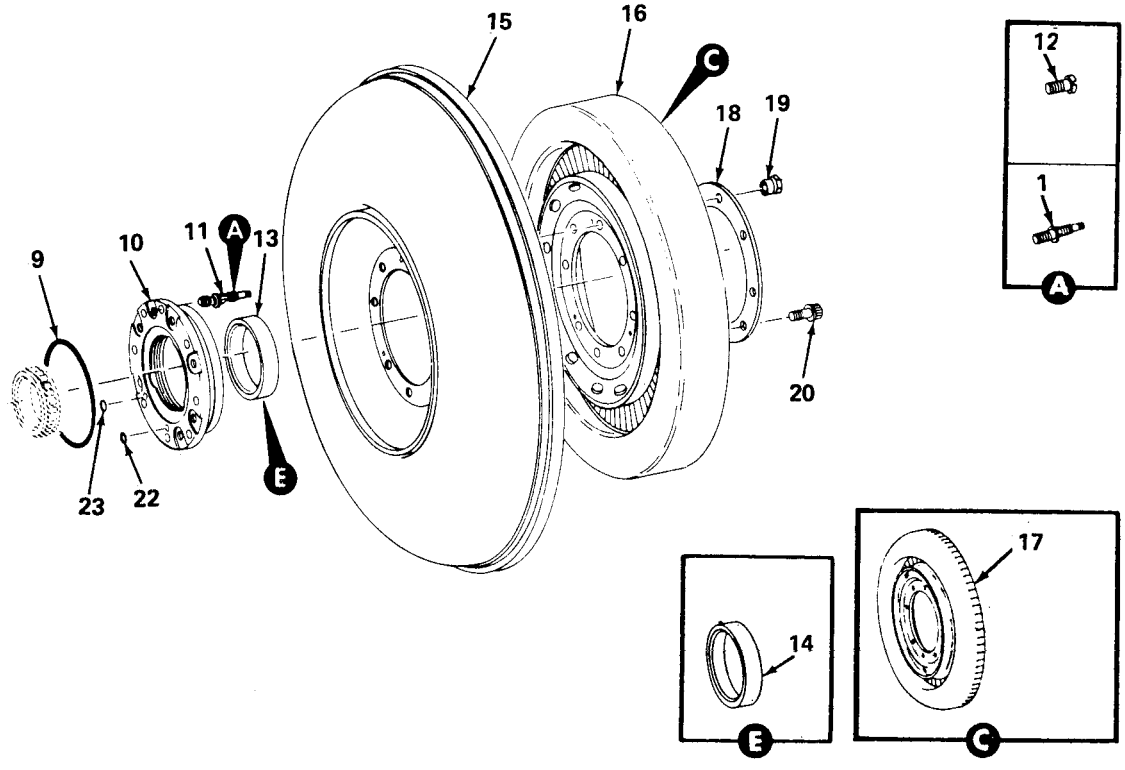
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - **Continued**		



46. Bolts (20) and Nuts(19)	T53-L-13B engine only. Prevent studs from turning while removing these items. There are six bolts to be removed.	**Remove.**
47. Bolts (20) and Nuts (19)	T53-L-13B/703 engines with air diffuser (1-110-203-15). There are eight bolts to be removed,	**Remove.**

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



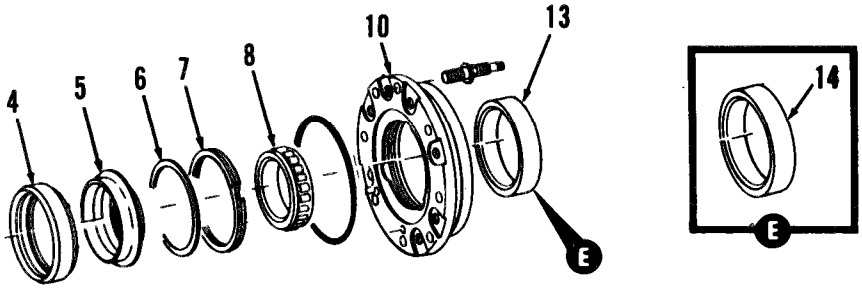
48. Support Plate (18)		**Remove if installed**
49. First Stage Turbine Nozzle Assembly (16 or 17) and Combustor Chamber Deflector (15)		**Remove.**
50. Two Stepped Studs (1) or Studs (11)	**T53-L-13B engine only.**	**Remove.**
51. Screws (12)	**T53-L-13B/703 engines with air diffuser (1 -110-230-1 5).**	**Remove.**

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

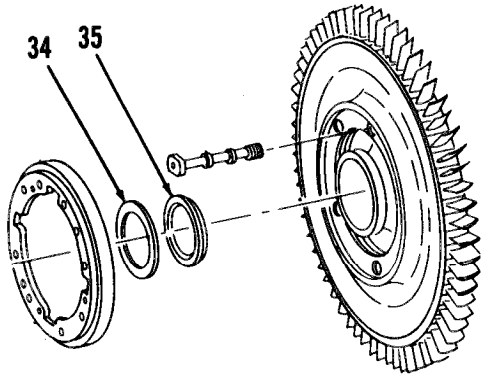
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
52. Bearing Housing Assembly (10), Packings (22 and 23), and Seal (9)	Bearing outer race (13) will remain in rear bearing housing assembly (1 O).	Remove.
53. Bearing Outer Race (13 or 14 With Pin)	Use arbor press and suitable sleeve.	Press from bearing housing assembly (10).

4-12. Gas Producer System Components (T53-L-13B/703 Engines) - Removal and Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	CAUTION When removing bearings, keep bearing inner race and rollers (7) and bearing outer race (13 or 14) (14 with pin) together as a matched set.	
54. Bearing Inner Race and Rollers (8)	Use mechanical puller (LTCT4809).	Remove from compressor rear shaft.



55. Foward Oil Ring (5)	Use puller (LTCT4846).	Remove.
56. Retaining Ring (7) and Spacer (6)		Remove.
57. Forward Seal (4)	Use forward seal puller (LTCT 4568) with arbor (LTCT4571).	Remove.
58. Shim (34) and Forward Cone (35)	Refer to paragraph 4-14.	Remove.



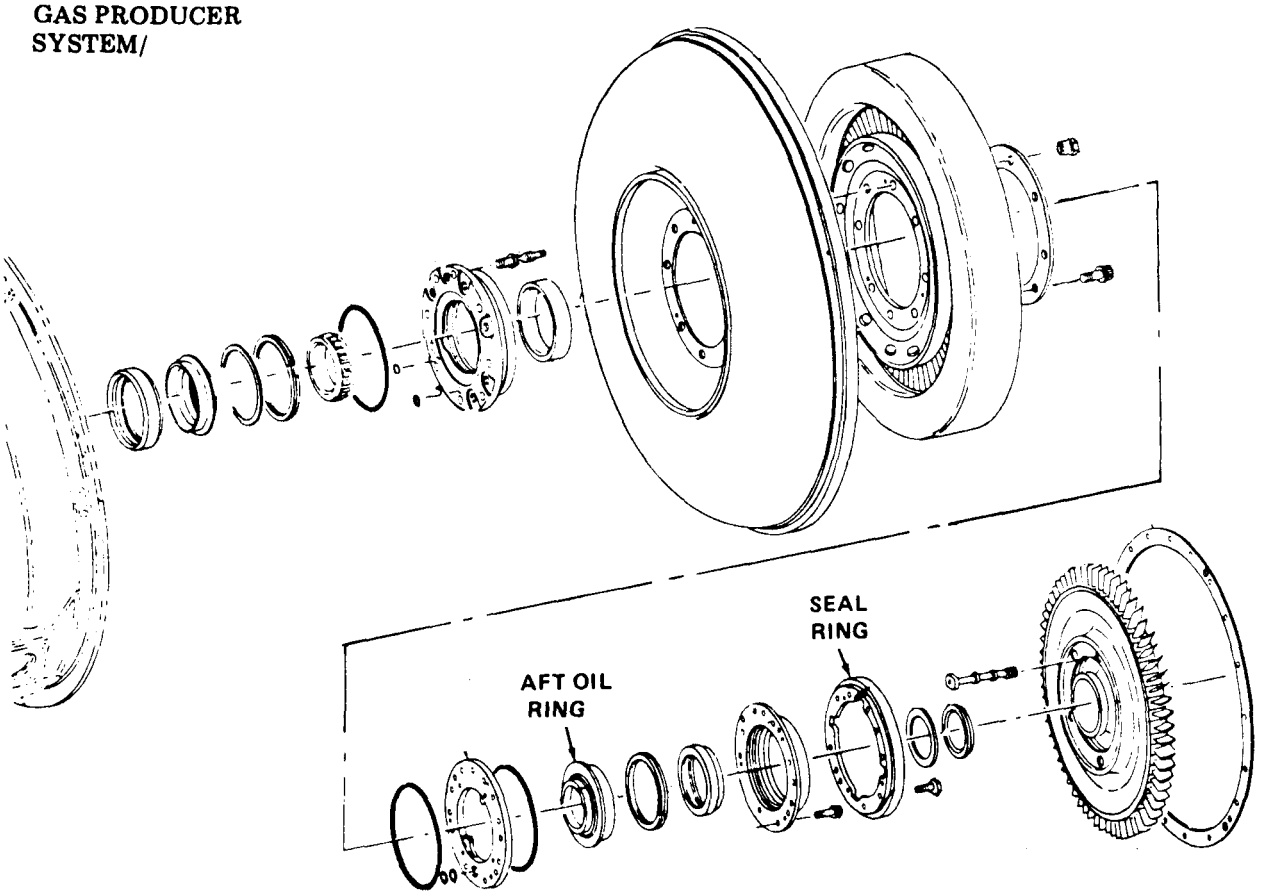
4-13. Gas Producer Oil Ring and Sealing Ring (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L13B/703 Engines

References
Para H-25

LOCATION/ITEM	REMARKS	ACTION
GAS PRODUCER SYSTEM/		
1. Aft Oil Ring, Seal Ring	Refer to paragraph H-25 for blend-repair procedures,	Inspect aft oil ring and seal ring for nicks, burrs, or loss of plating. **Blend-repair** nicks and burrs. **Replace** oil ring if plating is damaged.
2. Sealing Ring		**Inspect** sealing ring for cracks, warpage, or out-of-roundness. **Replace** sealing ring if cracks, warpage, or out-of. roundness is noted.



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

Applicable Configuration
- T53-L-13B/703 Engines

Special Tools
- Installing Tool (LTCT13070)
- Installing Tool (LTCT791)
- Wrench (LTCT1409)
- Adapter and Guide (LTCT3685)
- Installing Tool (LTCT4013)
- Wrench Socket (LTCT13456, detail of LTCT13175)
- Wrench Socket (LTCT4181)
- Locating Bar (LTCT153)
- Shaft Holding Fixture (LTCT576)
- Torque Fixture (LTCT4676)
- Holding Fixture (LTCT4533)
- Torque Fixture (LTCT13175)
- Power Wrench (PD2501)
- Bracket (LTCT3955)

Consumable Materials
- Anti-Seize, 787 (item 102, Appendix D)
- Nickel-Ease (item 103, Appendix D)
- Molykote Anti-Seize Thread Compound (item 58, Appendix D)
- Iron-Blue Pigment (item 37, Appendix D)
- Shortening Compound (item 74, Appendix D)
- Molybdenum Disulfide (item 57, Appendix D)
- Lockwire (item 41, 42, or 43, Appendix D)

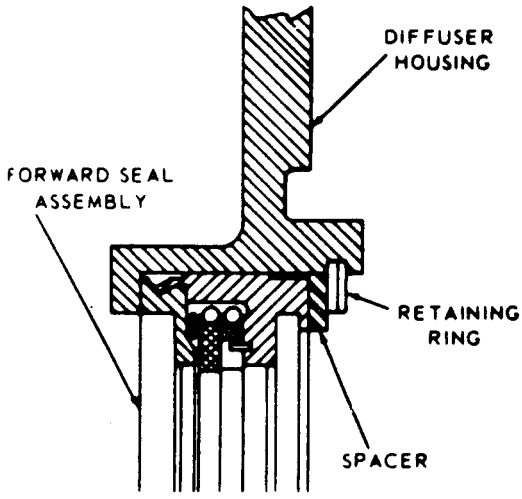
References
- Appendix G, Table G-4, Reference Numbers 14, 15, 33,32, 16,28
- Appendix G, Table G-6, Reference Numbers 27,47, 28,48,31,35,32
- Para 4-56 and 1-41

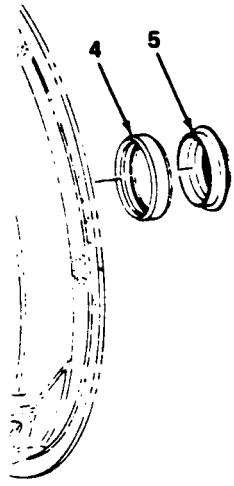
4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**WARNING** FLIGHT SAFETY PARTS Turbine Rotor Disk First Turbine Rotor Sealing Disk) Turbine Turbine Disk (First Stage Gas Producing Turbine Disk) Turbine Turbine Disk (Second Stage Gas Producing Disk Turbine Rotor Spacer (Gas Producer Turbine Spacer) Turbine Rotor Disk Second Turbine Rotor Sealing Disk) After removal of protective covering , handle with caution during Installation. NOTE Mount engine in stand. Engine should be in vertical position while performing items 1 thru 10. NOTE Aft seal (1-300-1 74-02 and -03) (26) is manufactured with a fracture at one of the slot locations on the air side carbon element. The fracture is not a defect and is not considered cause for seal replacement. Forward seals (1-300-1 73-02 and -03) (4 and aft seals (1-300-174-02 an -03) (26) are manufactured with three splits, 120 degrees apart, on the oil side carbon element. Aft seal (1-300-616-01) is manufactured with three splits, 120 degrees apart, on the carbon element. These splits are not considered cause for seal replacement.	

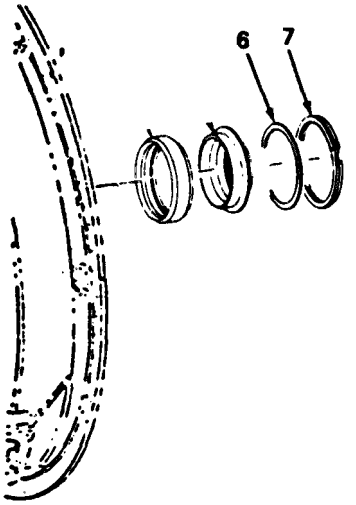
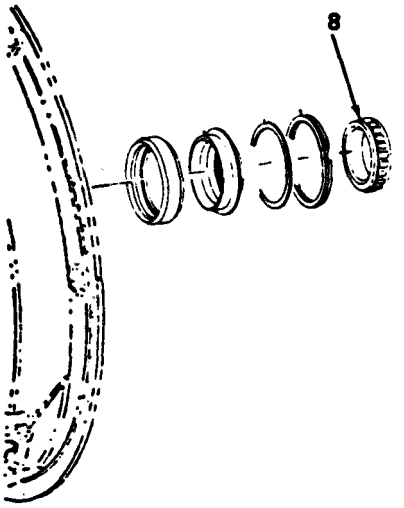
4-14. GAS PRODUCER SYSTEM COMPONENTS (T53-L-13B/703 ENGINES) - INSTALLATION – Cont.

LOCATION/ITEM	REMARKS		ACTION
COMBUSTOR TURBINE ASSEMBLY/ – Continued	To prevent tool rotation during installation, engage tang of installing tool (LTCT13070) with cutouts in seal (4).		
1. Forward Seal	Use installing tool (LTCT13070).		Carefully position forward seal (4) on forward oil ring (5) and install seal and ring as a unit on rear compressor shaft. Insure top marking on seal is located at 12 o'clock position. (See figure at left for proper seal installation.)

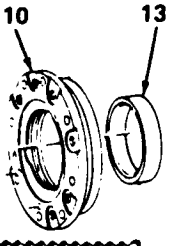
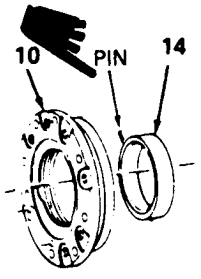
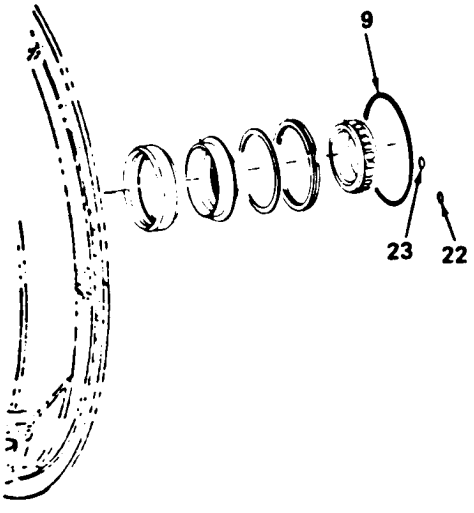




4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

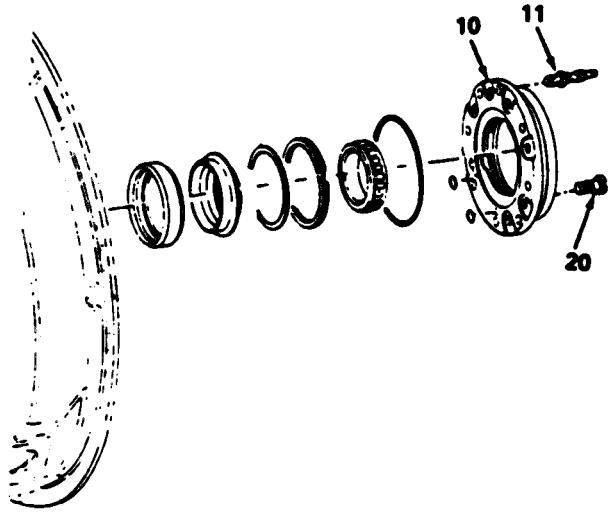
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**CAUTION** To prevent possible axial seal movement, insure that retaining ring **(7)** is seated properly.	
2. Spacer (6) and Retaining Ring **(7)**		Install.
3. Bearing Inner Race and Rollers	Use installing tool (LTCT791).  **CAUTION** In item **4,** insure oil holes in bearing outer race **(13)** line up with oil passage in rear bearing housing assembly (10) with oil holes forward. NOTE Item 4 does not apply to T53-L-703 engines.	Install bearing inner race and rollers (8) on compressor rear shaft.

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**NOTE** To use pin bearing on bearing housing (1-110.590-02), pull pin out of bearing outer race.	
4. Bearing Outer Race (13)	Use arbor press and suitable sleeve.  **CAUTION** On T53-L-703 engines, insure that pin in outer race of bearing engages in slot of bearing housing.	Press bearing outer race (13) into rear bearing housing assembly (10).
5. Bearing Outer Race (14) with Pin	On bearing housing 1-110-470-13 use an arbor press and suitable sleeve. 	Press bearing outer race (14) into rear bearing housing assembly (10).
6. Diffuser Housing		Install seals (9) and packings (23 and 22) in grooves of diffuser housing assembly. (Refer to paragraph 4-56 for replacement of aft seal.)

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

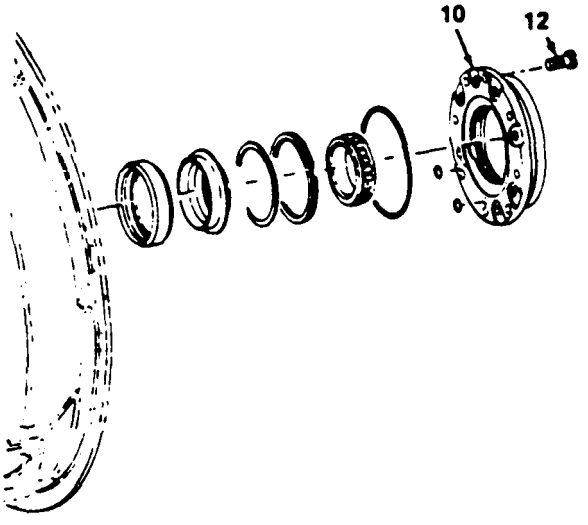
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	NOTE Prior to stud installation, apply Anti-Seize, 767 (Item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) or Molykote Anti-Seize Thread Compound (item 58, Appendix D) to threads.	
7. Bearing Housing Assembly (10) and Stepped Studs (11)	T53-L-13B engine only. Use wrench (LTCT1409) mounted at 90-degree angle with torque wrench.	Position bearing housing assembly (10) over rear compressor shaft. Install two new stepped studs (11) at the two counterbored holes located at the 12 o'clock and 6 o'clock positions.



Tighten stepped studs (11) as required. (Refer to Appendix G, table G-4, reference number 14). DO NOT lockwire at this time. **Remove** bolts (20).

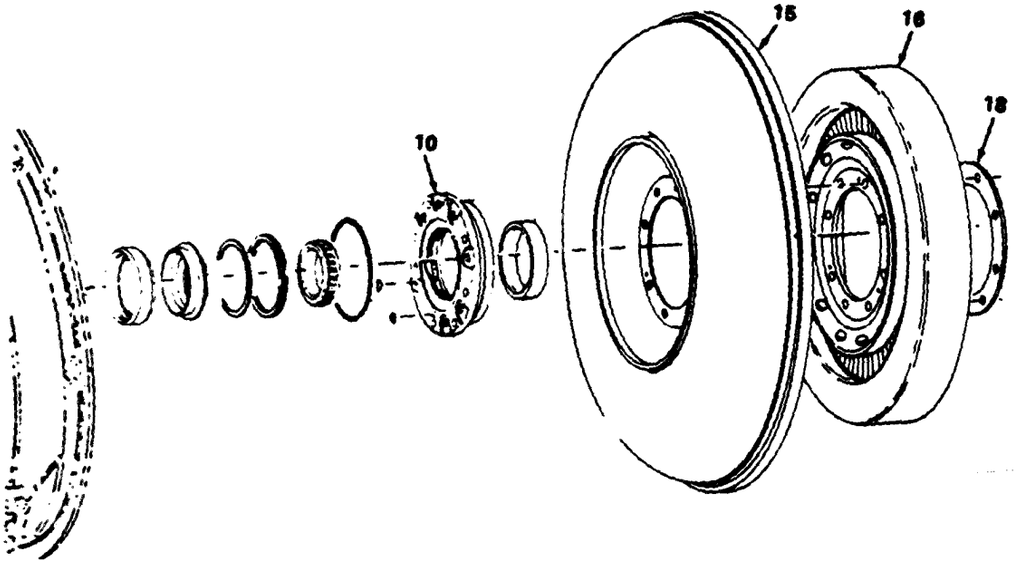
4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	T53-L-13B/703 engines with air diffuser 1-110 -230-15 . Apply Molykote anti-seize thread compound (item 58, Appendix D) to threads of screws (12).	
8. Bearing Housing Assembly (10)		Install screws (12) in two counterbored holes located at the 10 o'clock and 4 o'clock positions on bearing housing assembly (10). lighten as required.



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

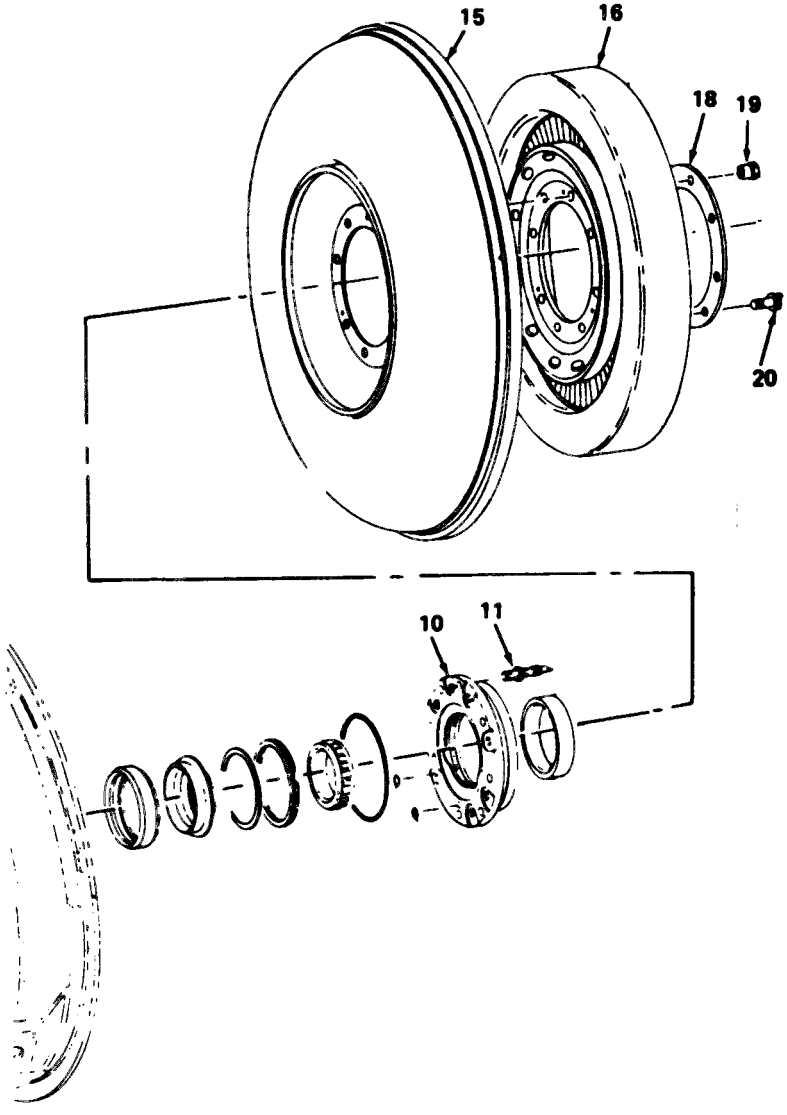
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	CAUTION On T53-L-13B engine, Inspect as follows: Dimples on ID of combustion chamber liner must contact OD of first stage gas producer nozzle deflector. This may be accomplished by applying Iron-blue pigment (Item 37,Appendix D), to the liner dimples and mating the nozzle and liner to simulate hot end Installation. If contact Is not evident through 360 degrees, carefully bend liner tab(s) Inward as required.	
9. Combustion Chamber Deflector(15) and First Stage Turbine Nozzle Assembly (16)	NOTE On T53-L-13B engine, nozzle 1-110-520-19 support plate (18) is not used with nozzles 1-110-520-19, When replacing nozzle 1-110-520-21 with nozzle 1-110-520-19, remove support plate (18). If support plate is not required and is serviceable, return to supply system as a serviceable item. Prior to Installation of bolts (20), coat threads with Molykote anti-seize thread compound (item 58, Appendix D).	(a) Position combustion chamber deflector (15) and first stage turbine nozzle assembly (16) on bearing housing assembly (10) and Into diffuser housing assembly.



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	NOTE On T53-L-13B engine with air diffuser (1-110-230-15). Installed studs (11) and nuts (19) are not used.	(b) Position support plate (18), if required, and secure with nuts (19), at the 12 o'clock and 6 o'clock positions and six bolts (20). Tighten bolts (20) as required. Refer to Appendix G, table G-4, reference number 14. Tighten nuts (19) as required.

T53-L-13B engines only



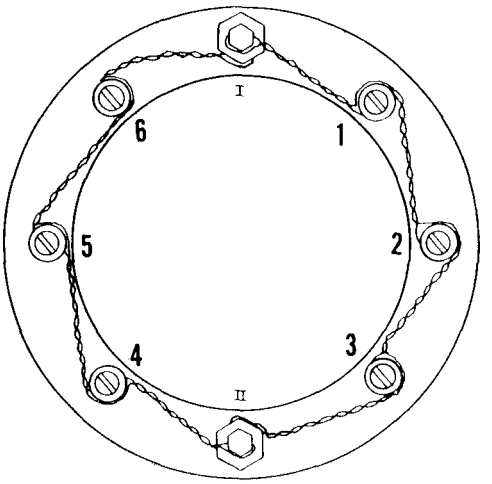
4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

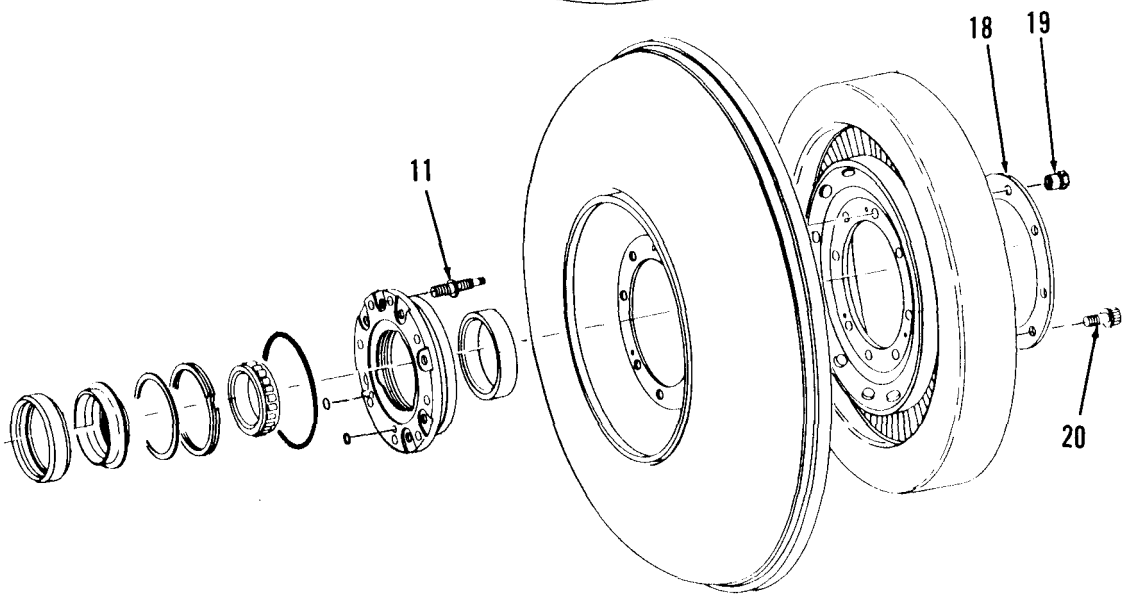
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	T53-L-13B engines only.	(c) Lockwire studs (11), nuts (19) and bolts (20) using lockwire (item 43, Appendix D).

NOTE

Lockwire rear bearing as follows:

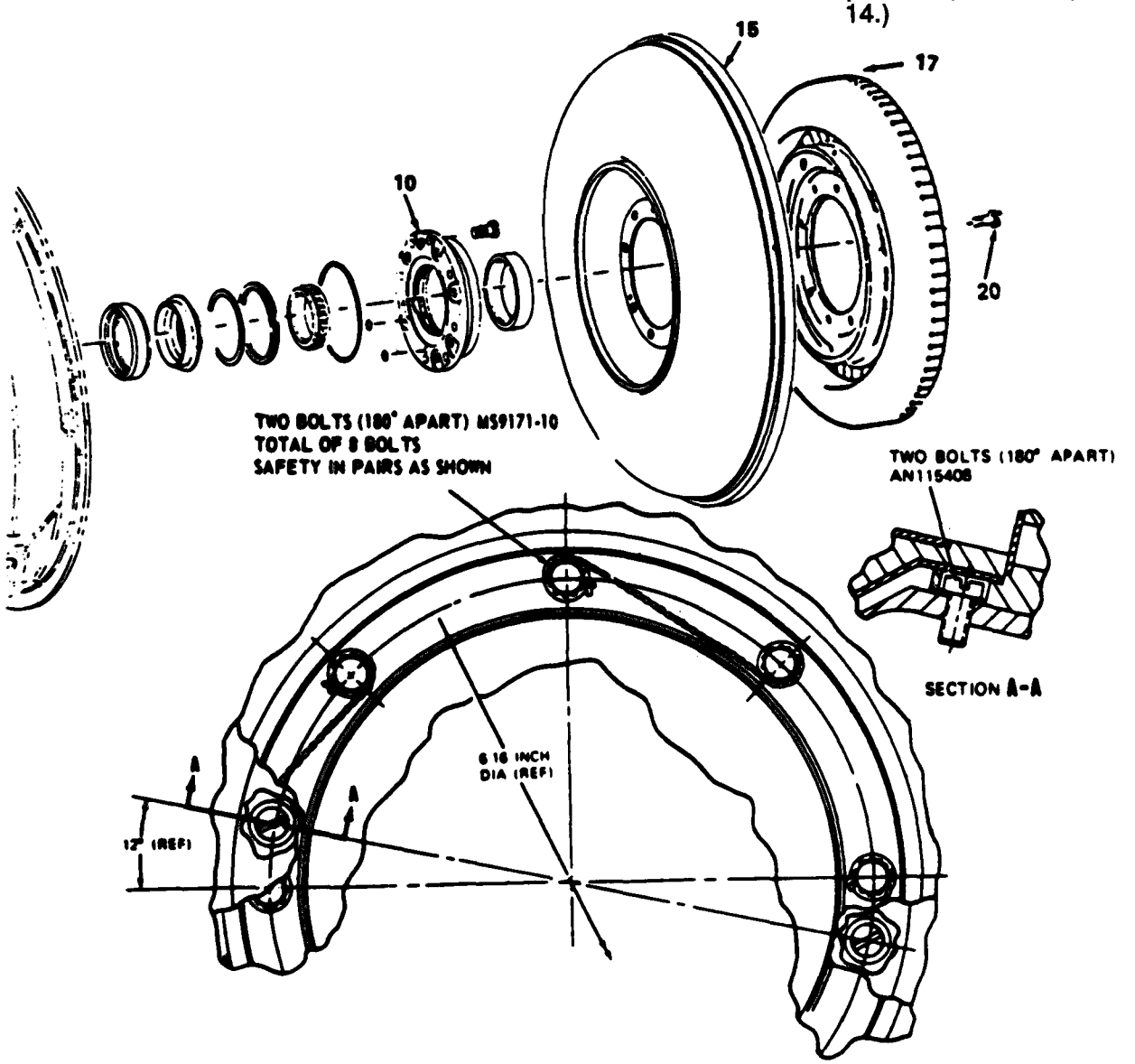
1. **Stud 1 to bolt 6 to bolt 5**
2. **Stud 2 to bolt 3 to bolt 2**
3. **Bolt 2 to bolt 1 to nut on stud 1**
4. **Bolt 5 to bolt 4 to nut on stud 2**





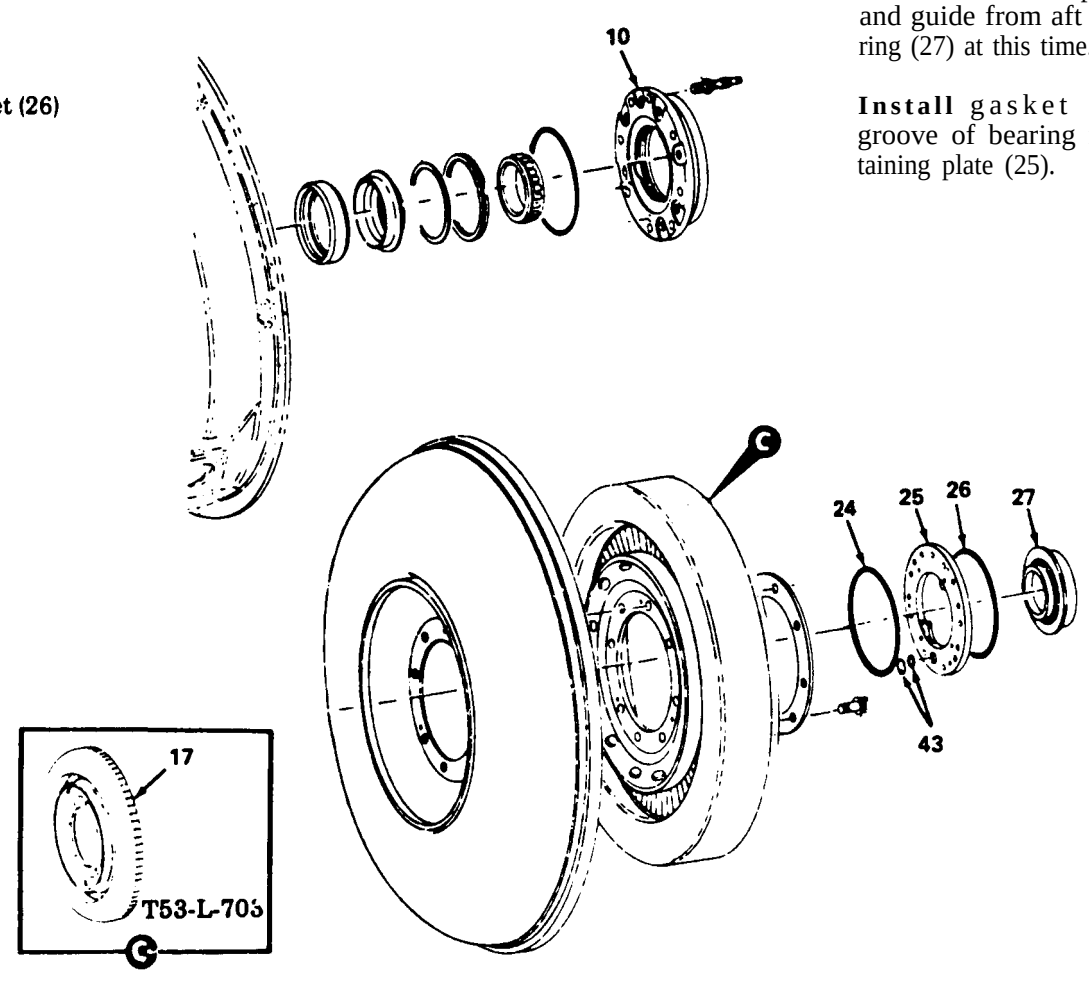
4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
10. Combustion Chamber Deflector (15) and First Stage Turbine Nozzle Assembly (17)	**T53-L-703 engine only. Install nozzle 1-110-710-06. Prior to nut and bolt installation, apply Anti-Seize, 767 item 102, Appendix D or Nickel-Ease (item 103, Appendix D) or Molykote Anti-Seize Thread Compound (item 58, Appendix D) to threads.**	**Position combustion chamber deflector (15) and first stage turbine nozzle assembly (17) on bearing housing assembly (10) and into diffuser housing assembly. Secure with eight bolts (20). (Refer to Appendix G, table G-4, item 14.)**



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

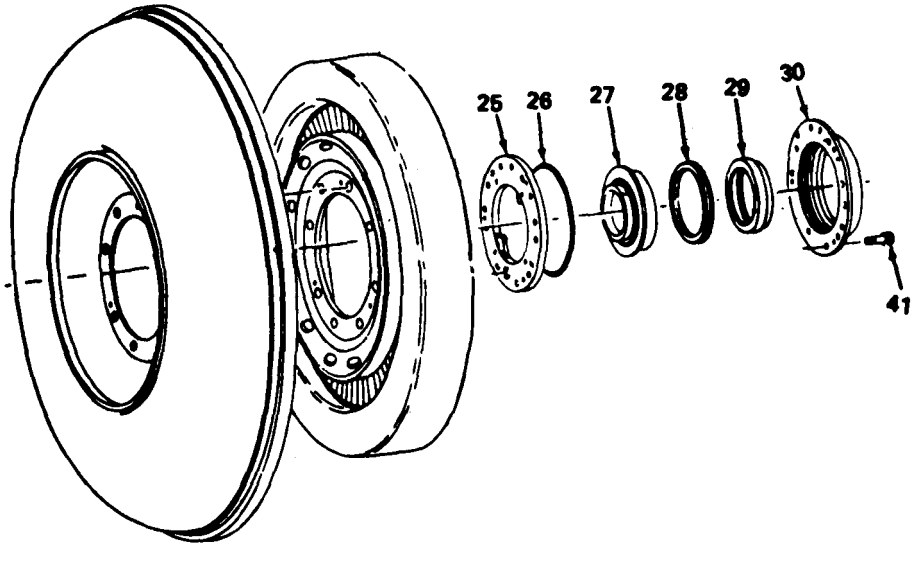
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
11. Gasket (24), Packings (43), Bearing Retaining Plate (25)		Install gasket (24) in groove of rear bearing housing assembly (10). Install packings (43) in groove of bearing retaining plate (25). Install bearing retaining plate (25) taking care not to disturb gasket (24) and packings (43).
12. **Aft Oil Ring (27)**	**Use adapter and guide (LTCT3685).**	Install aft oil ring (27). Do not remove adapter and guide from aft oil ring (27) at this time.
13. **Gasket (26)**		**Install** gasket in groove of bearing retaining plate (25).



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation. Continued

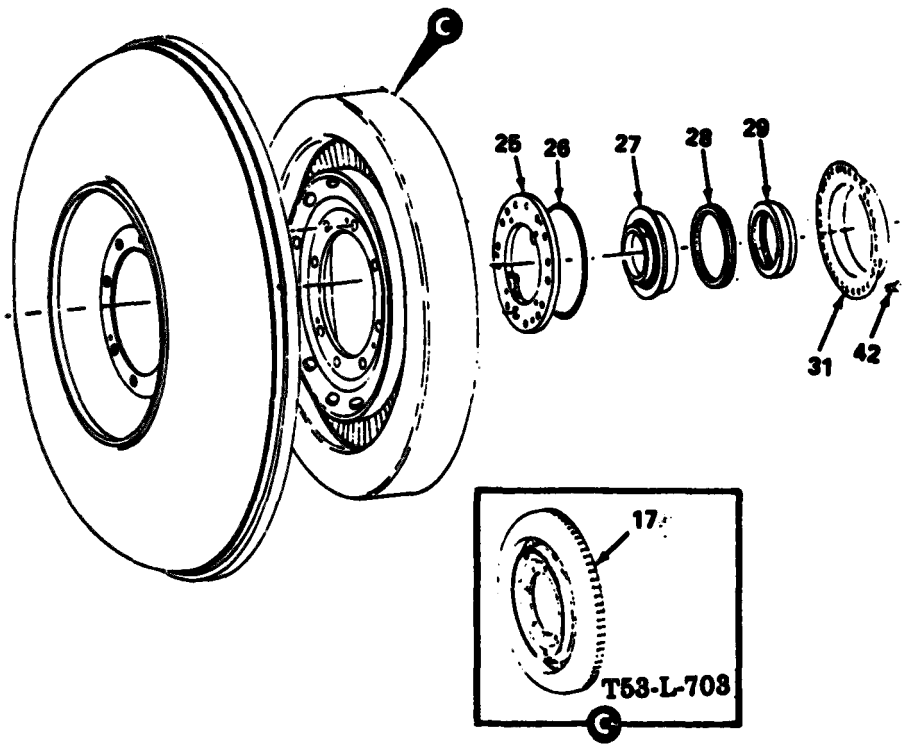
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**NOTE** **Refer to paragraph 4-56 for installation of aft seal (T53-L-13B engine).** **CAUTION** **Exercise care during installation in following item 14 to prevent damage to carbon sealing elements. Carefully guide retainer (30) over adapter and guide (LTCT3685) and onto aft oil ring (27).** **NOTE** **Prior to installation of bolts (41), apply molybdenum disulfide (item 57, Appendix D) to threads.**	

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
14. Retaining Ring (28), Seal (29), and Retainer (30)	NOTE Seal assembly (1-110-720-02) shall be used with bearing housing (1-110-470-13). Either seal assembly (1-110-600-05 or 1-110-720-02) may be used with bearing housing (1-110-590-02). T53-L-13B engine only. NOTE In order to prevent higher engine operating temperatures, when replacing these three P/N's: 1-110-590-02 bearing housing 1-110-600-05 retainer and seal assembly 1-110-161-03 ring, gas producer seal, replace them instead with the -13BR configuration P/N's: 1-110-470-13 bearing housing 1- 110-720-02 retainer and seal assembly 1-110-398-01 ring, gas producer seal.	Position retaining ring (28), seal (29), and retainer (30) as a unit against bearing retaining plate (25) taking care not to disturb gasket (26). Secure with three bolts (41). Tighten bolts, as required. Remove adapter and guide (LTCT3685). Refer to Appendix G, table G-4, reference number 15 for bolt tightening requirements.



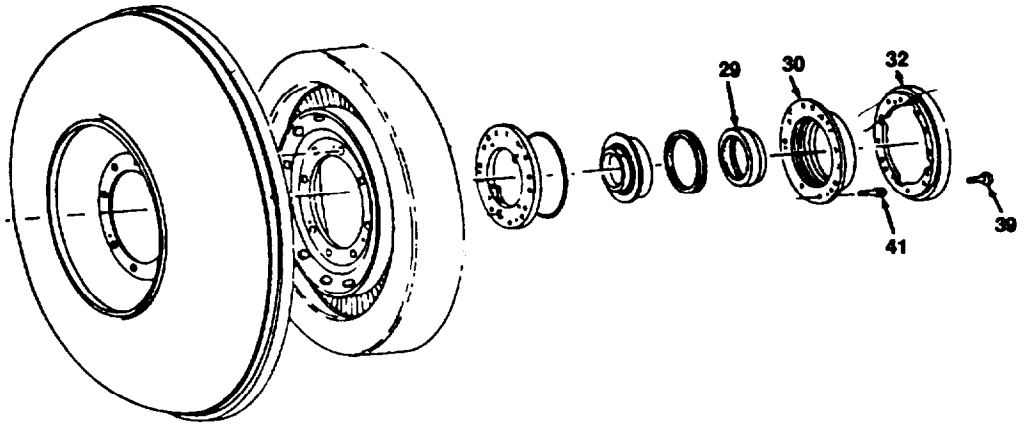
4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
Continued		
15. Retaining Ring (28), Retainer (31), and Seal (29)	T53-L-703 engine only. NOTE To prevent axial seal movement and improper seating of the retaining ring (28), ensure that retaining ring (28) is seated properly when installing.	Position retaining ring (28), retainer (31), and seal (29) as a unit against bearing retaining plate (25) taking care not to disturb gasket (26). Secure with three screws (42). Tighten screws to 18 to 25 pound-inches (0.2 to 0.3 kg/m) torque. Remove adapter and guide.



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

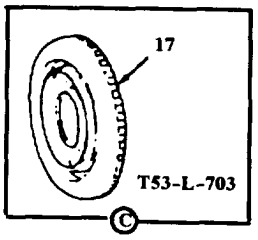
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
16. Bolts (39)	T53-L-13B engine only. Use Molykote Anti-Seize Thread Compound (item 58. Appendix D) or Anti-Seize. 767 (item 102. Appendix D) or Nickel-Ease (item 103, Appendix D).	**Apply** to bolts (39).

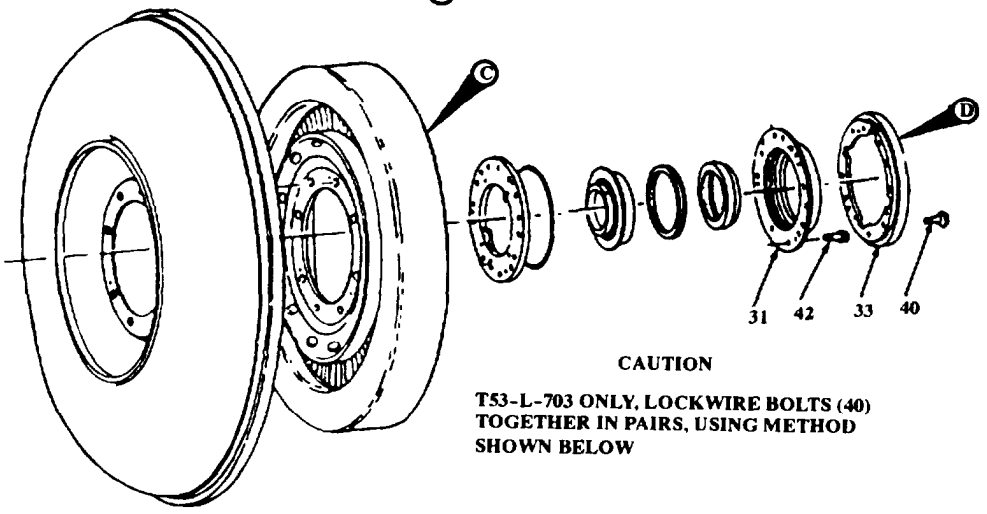


17. Seal Retainer Assembly (32)	Refer to Appendix G. table G-4, reference number 33 for tightening requirements. **NOTE** Bolts (39) do not need to be lockwired until after the procedures in item 28. page 4-121 are completed. **NOTE** In order to prevent higher engine operating temperatures. when replacing these P/Ns: 1-110-590-02 bearing housing 1-110-64&05 retainer and seal assembly 1-110-161-03 ring, gas producer seal Replace them instread with the - 13BR configuration P/Ns: 1-110-470-13 bearing housing 1-110-600-05 retainer and seal assembly 1-110-398-01 ring, gas producer seal	Position sealing ring (32) on aft face of seal retainer (30). aline bolt holes and secure with eight bolts (39). lighten bolts as required. Retighten bolts (41) as required. After 5 minutes, release torque on bolts (39). tighten as required. and lockwire. Do not lockwire until size of shim (34) is determined by step 27.c.

4-14. Gas producer System Components (T53-L-13B/703 Engines) - Installation - Continued

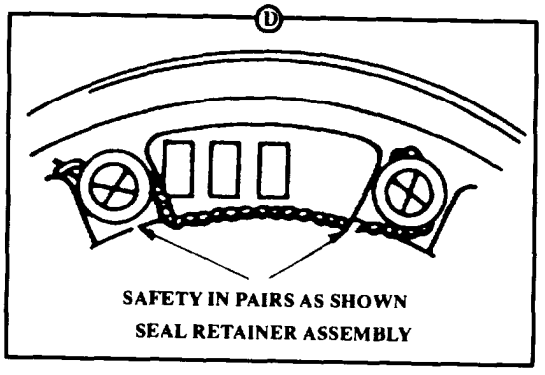
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - continued		
18. Seal Retainer Assembly (33)	T53-L-703 engines only. Coat threads of bolts (40) with antiseize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D). or Molykote antiseize thread compound (item 58, Appendix D).	**Position** sealing ring (33) on aft face of seal retainer (31). aline bolt hole-s and secure with eight bolts (40). lighten bolts to 85 to 95 pound-inches (1.0 to 1.1 kg/m) torque. Retighten screws (42). After 5 minutes. release torque on bolts (40) and tighten 95 to 105 pound-inches (1.1 to 1.2 kg/m) torque. Lockwire (item 43, Appendix D).





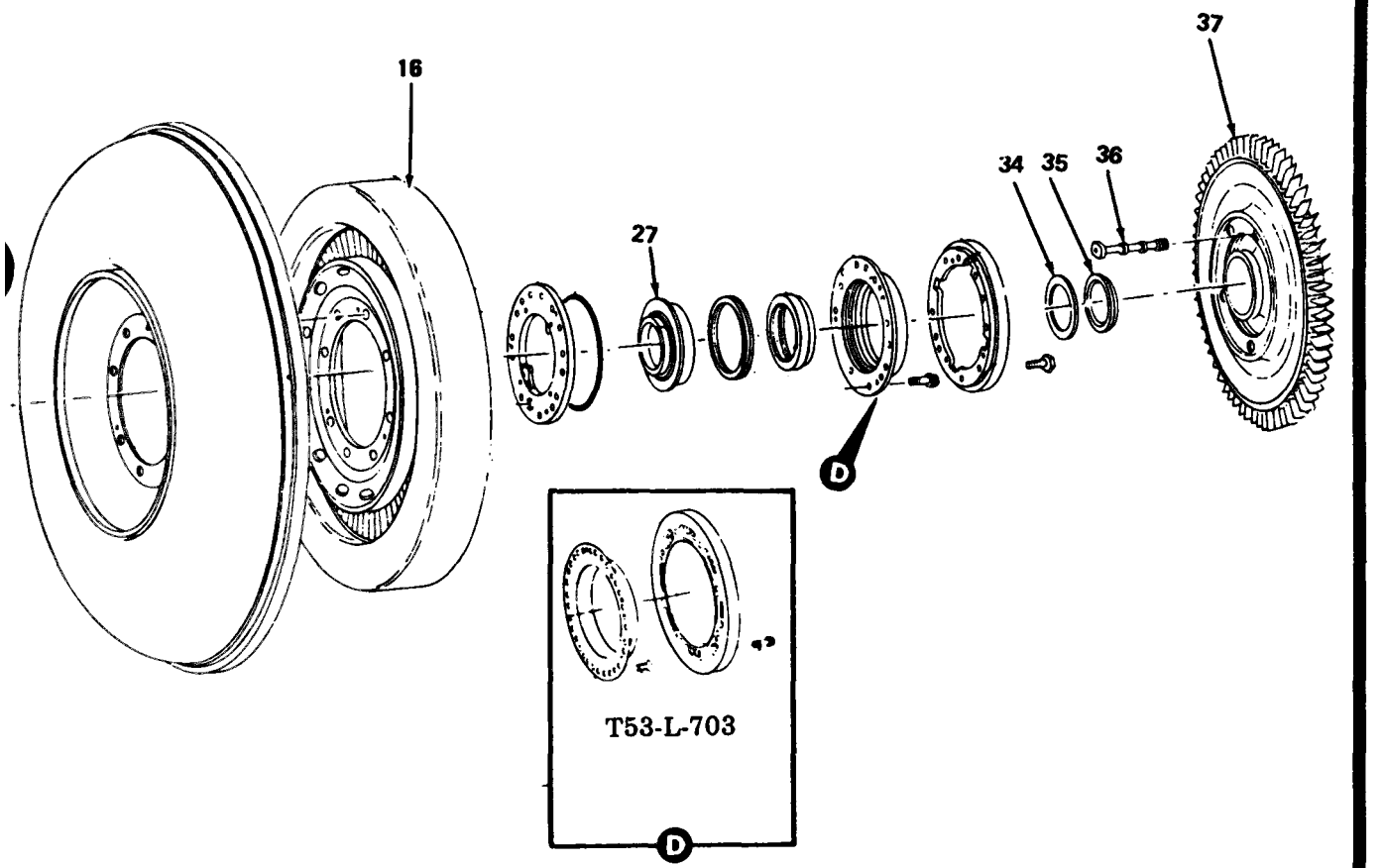
CAUTION

T53-L-703 ONLY, LOCKWIRE BOLTS (40) TOGETHER IN PAIRS, USING METHOD SHOWN BELOW



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

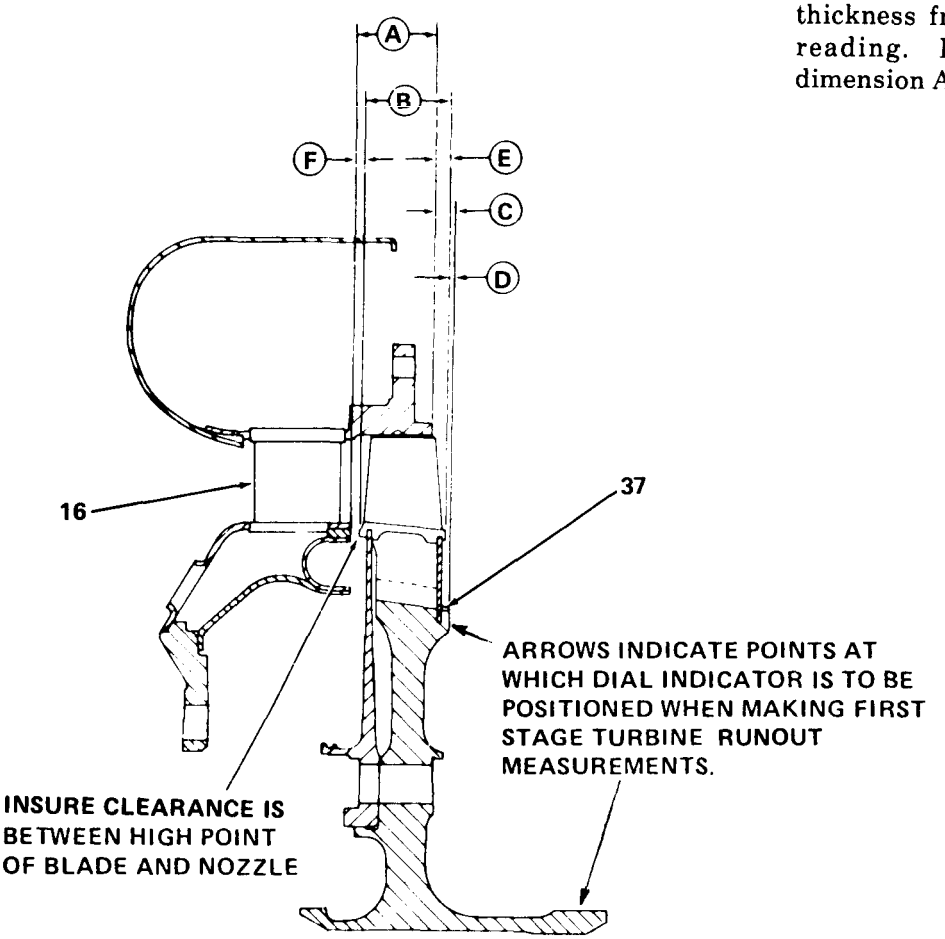
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
19. Shim (34)	Use installing tool (LTCT4013).	**Install** shim **(34)** and forward cone (35). **Insure** parts bottom against aft oil ring (27).



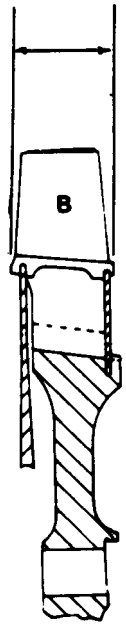
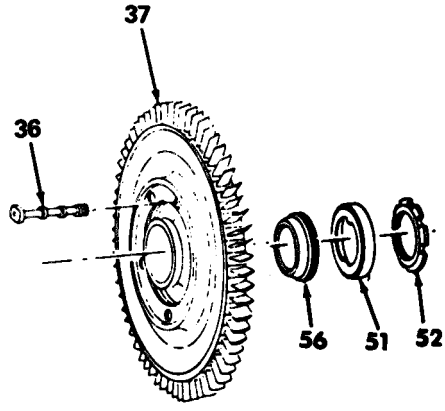
20. First Stage Turbine Nozzle Assembly (16) and First Stage Gas Producer Turbine		Establish clearance between first stage turbine nozzle assembly (16) and first stage gas producer turbine rotor assembly **(37).**

4-14. Gas Producer System Components (T53-L-13B/703 Engines) . Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
21. Locating Bar (LTCT153)		Place on first stage turbine nozzle assembly (16).
22. Bar, Inner Shroud	Use depth micrometer when performing this action.	**Measure** from bar to inner shroud at four equally spaced locations. Subtract bar thickness from lowest reading. Result is dimension A.



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

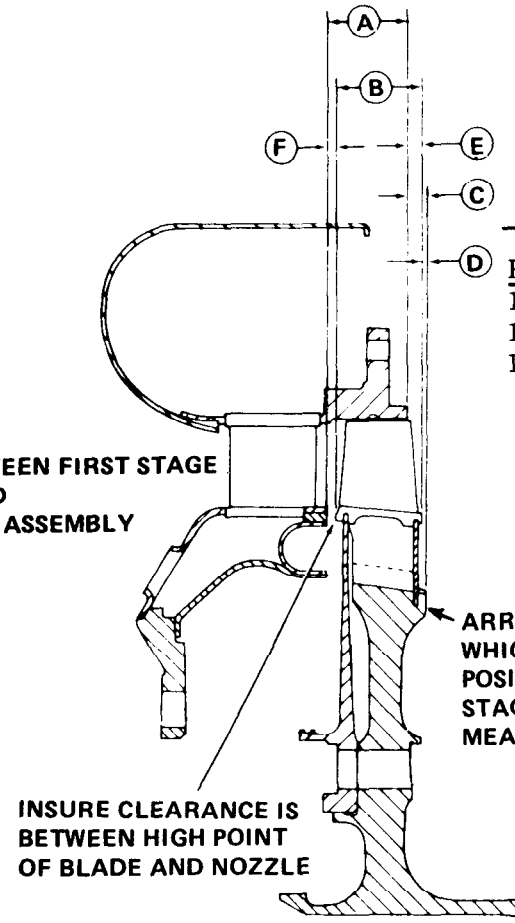
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**CAUTION** Insure measurement is taken at widest point of blade.	
23. Turbine Rotor Blade Roots	Use micrometer. 	a. Measure turbine rotor blade roots to determine thickest blade of rotor. This will be dimension B. b. Subtract dimension A from dimension B. The result is the height the rotor protrudes above the nozzle cylinder on a line to line fit.
24. Turbine Rotor Assembly (37)	Refer to Appendix G, table G-4, reference number 32. 	**Install** turbine rotor assembly on rear compressor shaft splines and torque nut (52), lockring (51), and rear cone (56) as required. Do not deform lockring at this time.

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
25. Rotor Disc	Use locating bar (LTCT153).	Place locating bar on rotor disc.
26. Nozzle Cylinder	Use depth vernier.	Measure from bar to nozzle cylinder (dimension C).
27. Turbine Blades	Use depth vernier.	a. Measure from bar to turbine blades (dimension D).
		b. Subtract dimension D from dimension C. Result will be dimension E.
	Clearance F must be as given in Appendix G, table G-6, reference number 27. If desired clearance is not obtained select shim of correct thickness.	c. **Subtract** result from preceding item 23.b. from dimension E. Result will be clearance F.

Shim Thickness

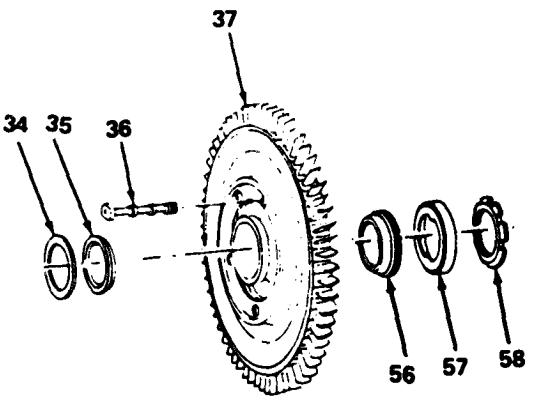
Part Number	Thickness
1-100-289-01	0.020 to 0.025 inch
1-100-289-02	0.030 to 0.035 inch
1-100-289-03	0.040 to 0.045 inch



DETERMINING CLEARANCE BETWEEN FIRST STAGE TURBINE NOZZLE ASSEMBLY AND GAS PRODUCER TURBINE ROTOR ASSEMBLY

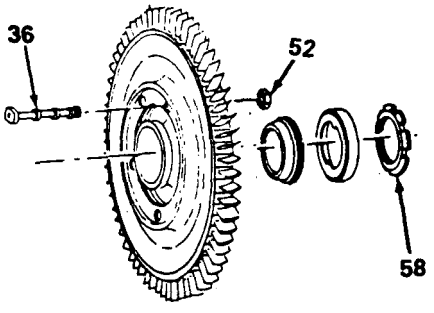
4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLE/ - Continued		
	NOTE **Aft oil ring, seal retainer, and seal ring must be removed to gain access to the nominal shim and forward cone.**	
28. Turbine Rotor Assembly (37) and Forward Cone (35)		**Remove turbine rotor assembly (37) forward cone (35).** **Install shim (34) of size determined in preceding step 27.c.**
29. **First Stage Gas Producer Turbine Rotor Assembly**		**Install bolts (36) through first stage gas producer turbine rotor assembly from forward side.**
30. **First Stage Gas Producer Turbine Rotor Assembly**		**Install over rear compressor shaft splines.**
31. Nut (58)		**Apply Molykote Anti-Seize Thread Compound (item 58, Appendix D) or Anti-Seize, 7 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) to nut (58).**
32. Rear Cone (56), Lock Ring (57), and Nut (58)		**Install.**



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**NOTE** In following item 33, insure that bolts are drawn completely through torque fixture.	
33. Torque Fixture	Use this table when installing nut, lockring, and cone.	**Install** torque fixture over bolts (36) of first stage gas producer turbine rotor, engaging tangs of wrench socket with slots in nut (58) and secure fixture with nuts (52).

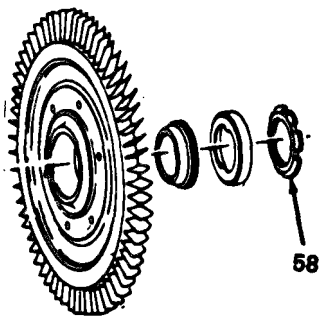


Nut and Cone Removal Installation Tools

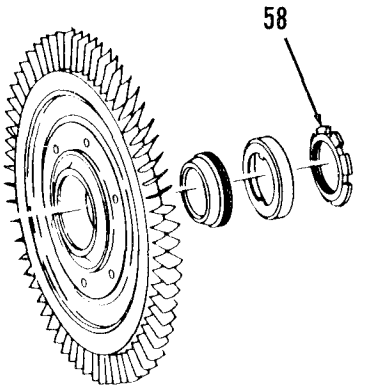
Shaft Holding or Torque Fixture	Wrench Socket	Power Wrench	Hub and Adapter Assembly	Cone Removal Tool
LTCT576	LTCT584, Detail of LTCT 576 or LTCT 4676		LTCT3076, Detail of LTCT576 or LTCT4676	LTCT786, or LTCT4677, Detail of LTCT4676
LTCT4533	LTCT584, Detail of LTCT 576 or LTCT 4676		LTCT3076, Detail of LTCT576 or LTCT4676	LTCT4677, Detail of LTCT 4676
LTCT13175	LTCT13456, Detail of LTCT13175	PD2501		LTCT6465

NOTE: This table lists the tools necessary for removing and installing the nut and cone in the combinations that can exist.

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation . Continued

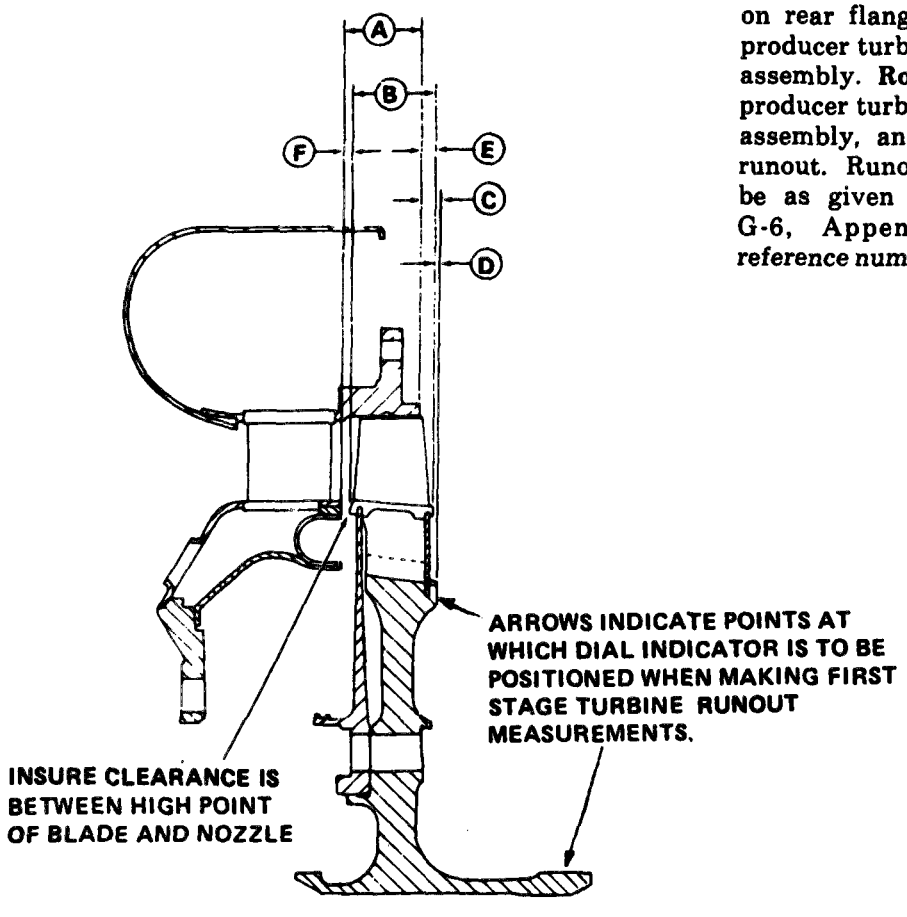
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	NOTE In item 34 nut (58) shall not extend beyond aft face of compressor rotor rear stub shaft, in excess of limits given in Appendix G, table **G-6,** reference number 47.	
34. Torque Fixture	Use power wrench.  NOTE An alternate method to items 33 and 34 is shown in items 35 thru 37. When installing hub and adapter assembly in item 35 insure that bolts are drawn completely through assembly. Refer to preceding tabular matter for tools necessary to install the nut, lockring, and cone in items 35 thru 37.	**Tighten** nut (58) as required. (Refer to Appendix G, table G-4, reference number 32.) Remove torque wrench and torque fixture.
35. Hub and Adapter Assembly		Install hub and adapter assembly over bolts (36) of first stage gas producer turbine rotor assembly and secure with tabwashers (53) and nuts (52).

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
36. Diffuser Housing	**NOTE** Nut (58) shall not extend beyond aft face of compressor, rotor rear stub shaft, in excess of limit given in Appendix G, table G-6, reference number 47.	**Position** and secure holding fixture to diffuser housing.
37. Nut (58)	Refer to table for item 33. Refer to Appendix G, table G-4, reference number 32.	**Engage** tangs of wrench socket with slots in nut (58). **Tighten** nut as required. Remove holding fixture and hub and adapter assembly.
		
	NOTE Bracket used in following action for item 38 is a base for dial indicator while taking runouts.	
38. Air Diffuser	(LTCT3955)	**Mount** bracket on flange of air diffuser.
	NOTE Mount engine in stand. Position engine approximately 45 degree nosedown attitude prior to performing action for items 39 and 40.	

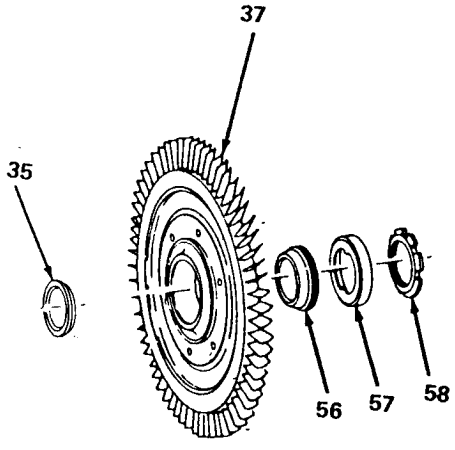
4-14. Gas Producer System Components (T53-L-13B/703 Engined - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - **Continued**		
39, Dial Indicator	NOTE A combination of runouts determined in following item 40 and preceding item 39 shall not exceed 0.006 inch (0.15 mm).	Position dial indicator against point just inboard of first stage gas producer turbine blade roots. Rotate gas producer turbine rotor assembly, and record runout. Runout shall be as given in Appendix G, table G-6, reference number 28.
40. Dial Indicator	**See illustration**	**Position dial indicator on rear flange of gas producer turbine rotor assembly. Rotate gas producer turbine rotor assembly, and record runout. Runout shall be as given in table G-6, Appendix G, reference number 48.**

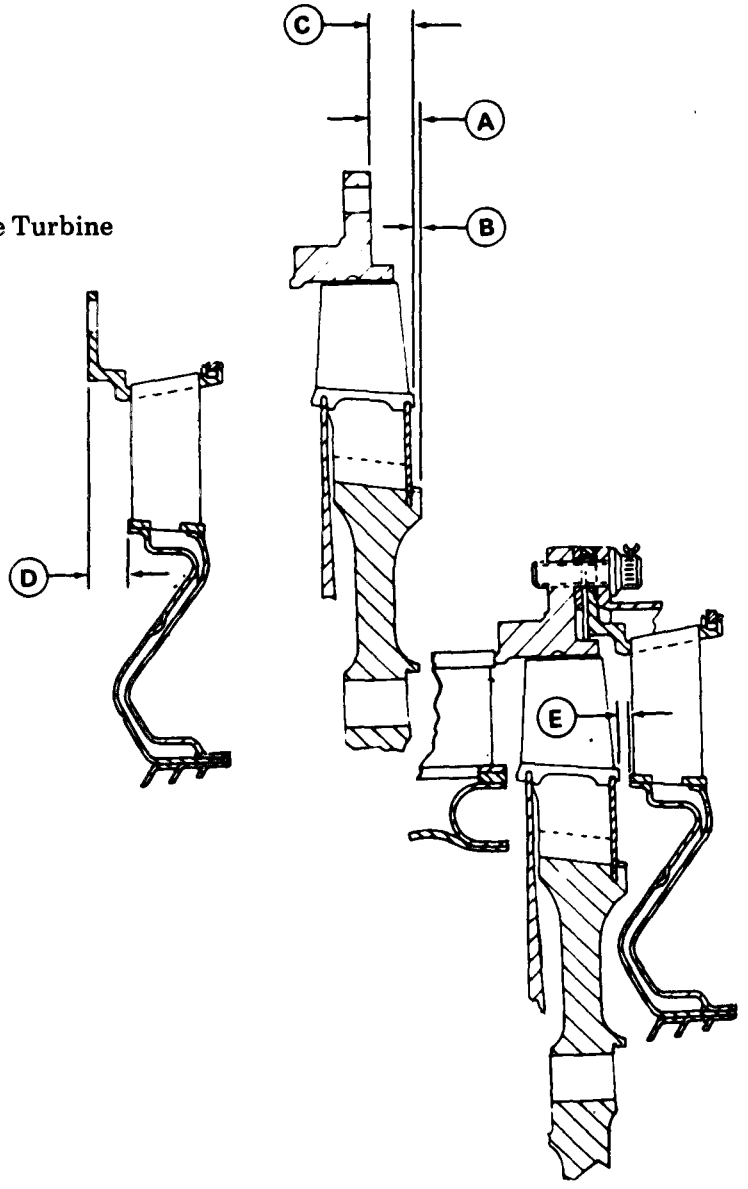


4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
41. First Stage Gas Producer Rotor Assembly	**If runouts are not within limits, perform the following action.**	**Remove first stage gas producer turbine rotor assembly, and reposition at 180 degrees from removed position. Repeat preceding action for item 40. If limits are still exceeded, try 90 degrees or 270 degrees from original position. If limits are still exceeded, inspect and, if necessary, replace forward cone (35) and rear cone (56) and repeat action for item 40. Record information in engine log.**
42. First Stage Gas Producer Rotor		**Check first stage gas producer rotor for minimum tip clearances. (Refer to paragraph 4-12, item 20.)**
43. Lockring (57)	**Do not shear lockring.**	**Bend lockring into slots of nut (58) in two places, 180 degrees apart.**
44. Bracket (LTCT3955)		**Remove from air diffuser.**
45. Clearance Between First Stage Gas Producer Turbine Rotor Assembly and Second Stage Turbine Nozzle		**Establish clearance between first stage gas producer turbine rotor assembly and second stage turbine nozzle.**
46. Gas Producer Turbine Rotor Assembly (37)	**Use locating bar (LTCT153).**	**Place locating bar on disc of gas producer turbine rotor assembly (37)**

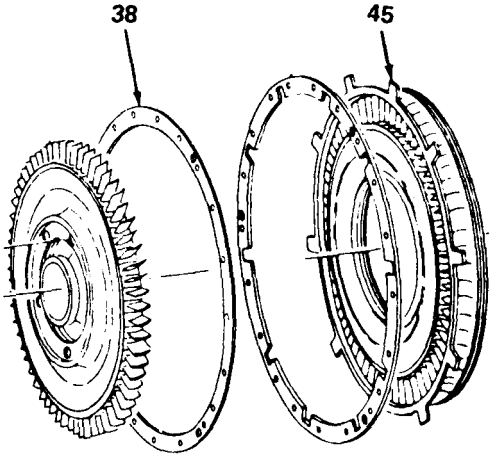


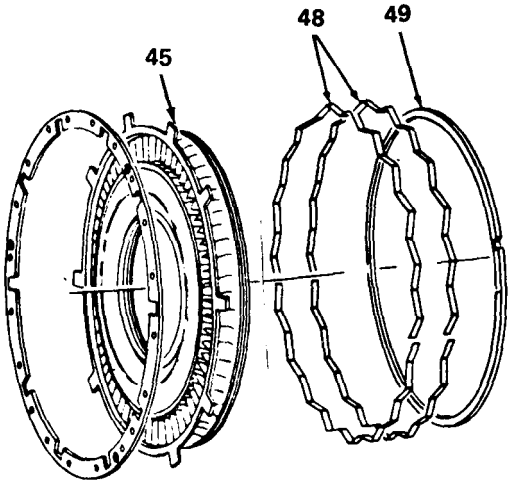
4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
47. Locating Bar to First Stage Nozzle Assembly	**Use vernier depth gage.**	**Measure from locating bar to first stage nozzle assembly (dimension A).**
48. First Stage Gas Producer Turbine Rotor	**Use vernier depth gage.**	**a. Measure from locating bar to base shroud of first stage gas producer turbine rotor blades (dimension B).** **b. Subtract dimension B from dimension A. Result will be dimension C.**
49. Second Stage Turbine Nozzle (45)		**a. Place second stage turbine nozzle forward face up on a bench. Place locating bar across tangs on forward face of nozzle.** **b. Use vernier depth gage.** **Measure from bar to lip on inner shroud of nozzle and subtract thickness of bar (dimension D).** **c. Subtract dimension C from dimension D. Result will be clearance E.**

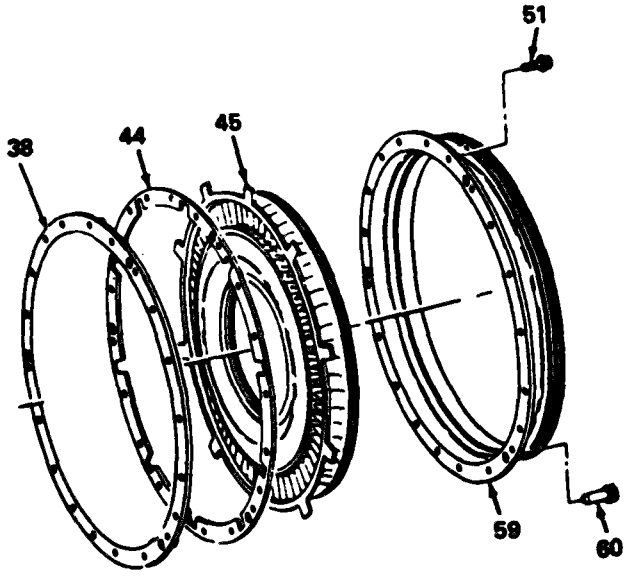
4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
50. Spacer (38)	Clearance E must be as given in Appendix G, table G-6, reference number 30 if desired clearance is not obtained.	Install spacer (38) as required.
51. Expansion Ring (48) and Sealing Ring (49)		**Install** expansion ring (48) and sealing ring **(49)** into groove on OD of second stage turbine nozzle **(45).** Insure binding does not occur when installing sealing ring and expansion ring.



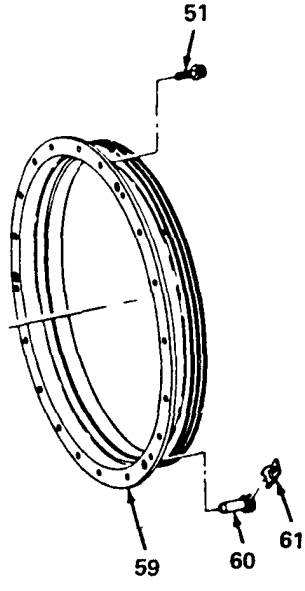


4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**CAUTION** **Due to the "floating" design of the second stage turbine nozzle and the scalloped outer flange of the first stage turbine nozzle, It Is Imperative that a minimum of ones oar (36) (1-120-029-01 or-03) be used. Additional spacers, either -01,-02, or -03, may be used as required; however, an -01 or -03 spacar should always be located against the second stage gas producer nozzle flange.**	
52. Second Stage Turbine Nozzle (45) and Second Stage Gas Producsr Cylinder (59)	**Insure second stage turbine nozzle 1-120-000-14 is installed.**	**Install spacer (38), rings (44), and using ring compressor (LTCT4155), Install second stage turbine nozzle (45) and second stage gas producer cylinder (59). Anne bolt holes and install pins (60).**
		
	CAUTION **Use new bolts 1-110-262-01.**	
53. Bolts (51)	**This action does not apply to T53-L-703 engine.**	**Apply Molykote Anti-Seize Thread Compound (item 58, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) to bolts (57).**

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - **Continued**	**CAUTION** To prevent shearing of bolts in following action for item 54 do not overtorque bolts.	
54. Retaining Plates (61	Refer to Appendix G, table G-4, reference number 16 for bolt tightening requirements.	Install new bolts (51) and position three retaining plates (61) on pins. Tighten all bolts as required and lockwire.

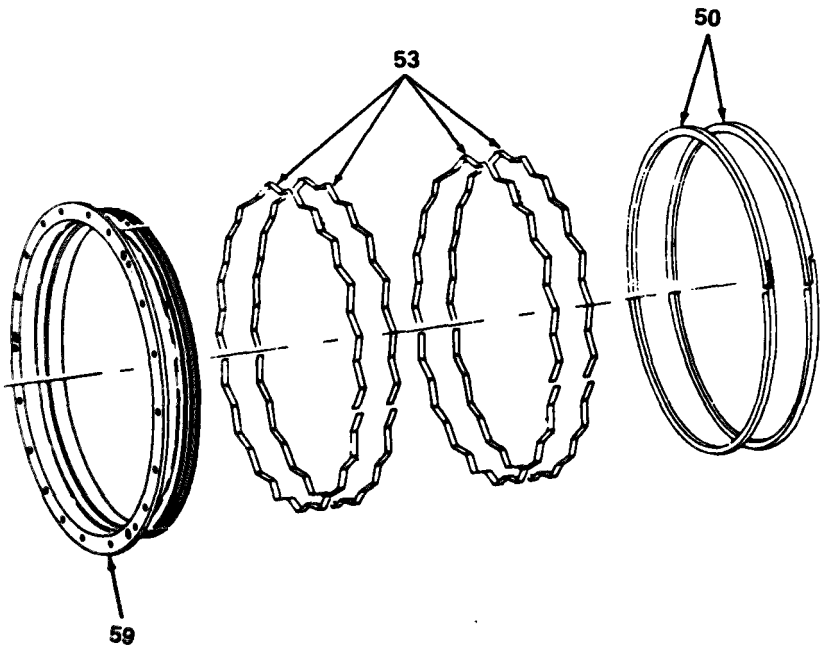


NOTE

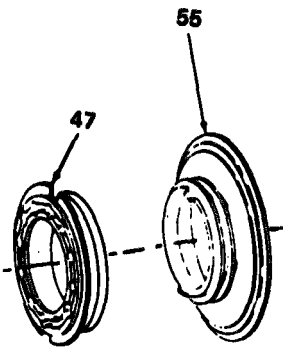
In following item 55 it is necessary to install four expanders (1-300-488-01) when seal rings (1-300-351-01) are installed. When seal rings (1-300-487-01 or -02) are installed, expanders are not required.

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
55. Second Stage Gas Producer Cylinder (59).	T53-L-13 series engines only.	Install four expanders (53) (if required) and two seal rings (50) into grooves on OD of second stage gas producer cylinder (59).
56. Second Stage Gas Producer Cylinder (59).	T53-L-703 engines only.	Install two seat rings (50) into grooves on OD of **second stage gas producer cylinder** (59).

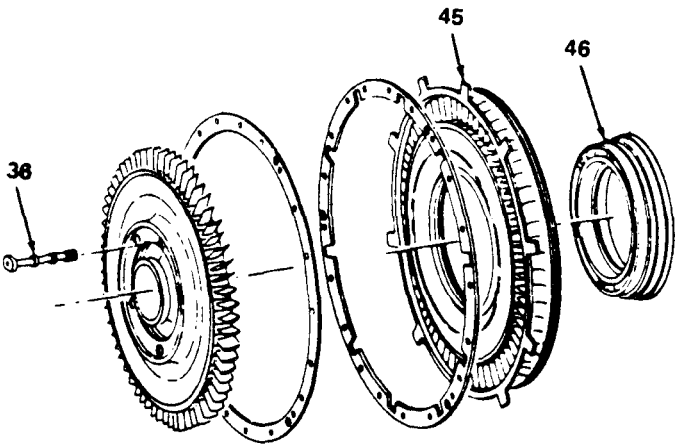


57. Spacer (47)	**T53-L-703 engine only.**	Install spacer (47) into sealing disc (55), using an arbor press.



4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

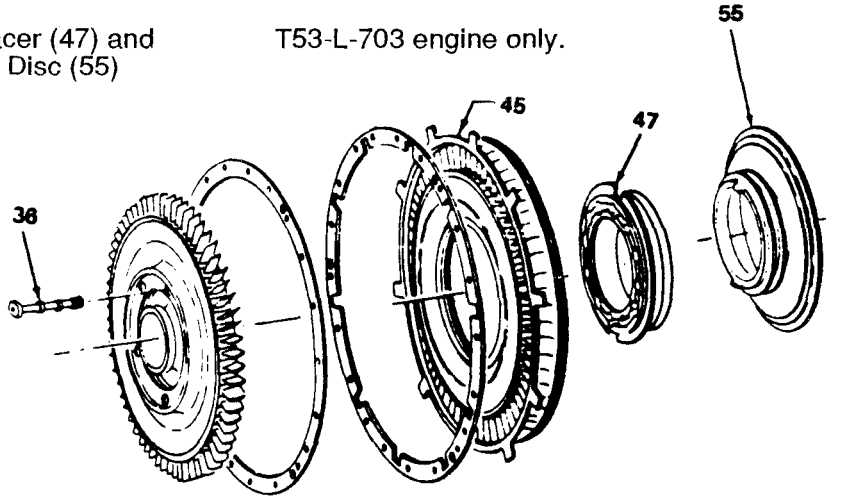
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
58. Spacer (46)	**T53-L-13B engine only.**	**Position spacer (46) on first stage gas producer turbine bolts (36).**



NOTE

If engine is in maintenance stand, position engine in approximately 45 degree nosedown attitude prior to performing following action for items 59 and 60. If engine is still mounted in the airframe, apply moderate forward pressure to center of turbine rotor during run out check to take up normal bearing play.

59. Spacer (47) and Sealing Disc (55)	T53-L-703 engine only.	**Position** spacer (47) and sealing disc (55) on firs stage gas producer turbine bolts (36).

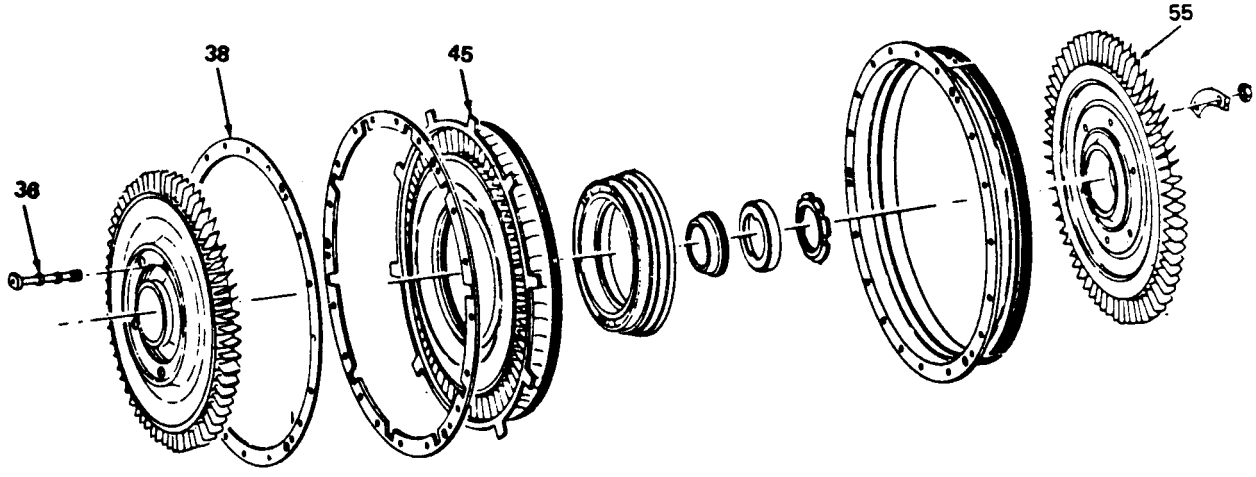


4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
60. Gas Producer Rotor Assembly	T53-L-13B engine only.	Rotate gas producer rotor assembly and check for rubbing between second stage turbine nozzle (45) and spacer (46). If rubbing is detected, rework nozzle, using half-round file to obtain 0.010 inch (0.254 mm) clearance.
61. Gas Producer Rotor Assembly	T53-L-703 engines only. Light, intermittent rub is acceptable. If heavy rub exists, recheck and inspect for distortion.	Rotate gas reducer rotor assemblies. Check for rubbing between second stage nozzle assembly (45) and sealing disc (55).

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

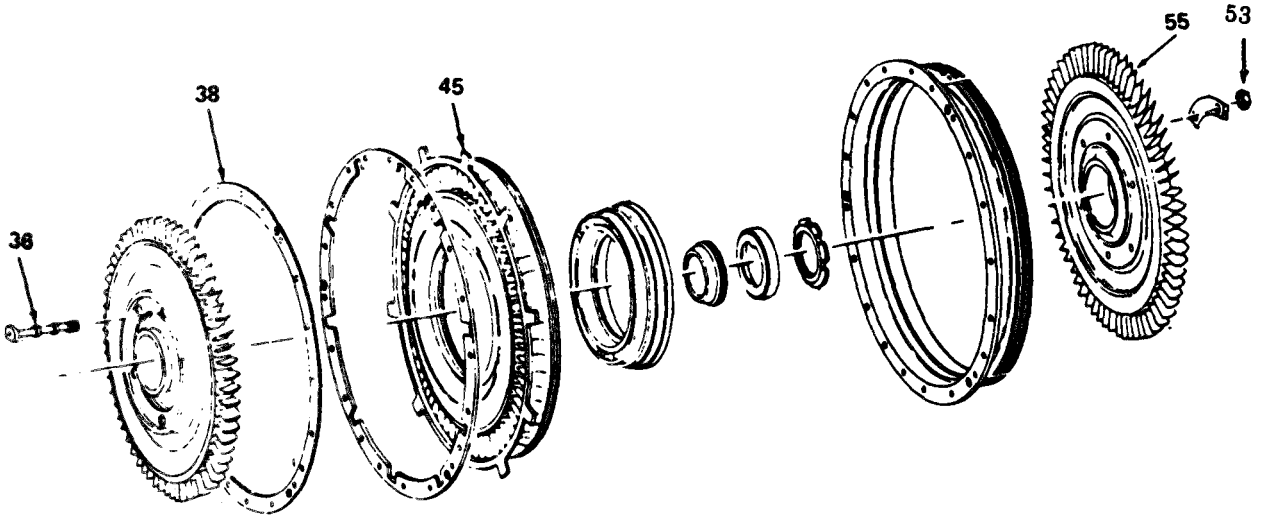
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**CAUTION** In following item 62 insure that forward face of rotor is toward front of engine.	
62. Second Stage Gas Producer Turbine Rotor (55)		Temporarily install second stage gas producer turbine rotor (55).
63. Second Stage Turbine Nozzle (45) Second Stage Gas Producer Turbine Rotor Assembly (55)	On T53-L-13B engines use suitable diameter wire gage. Min 0.120 in.; Max 0.190 In.	Check clearance between second stage turbine nozzle and second stage gas producer turbine rotor assembly. Clearance must be as given in Appendix G, table G-6, reference number 31. If desired clearance is not obtained, select spacer (38) of correct thickness.



Spacer Thickness	
Part Number	Thickness
1-120-029-01	0.022 to 0.025 inch
1-120-029-02	0.010 to 0.016 inch
1-120-029-03	0.018 to 0.084 inch

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

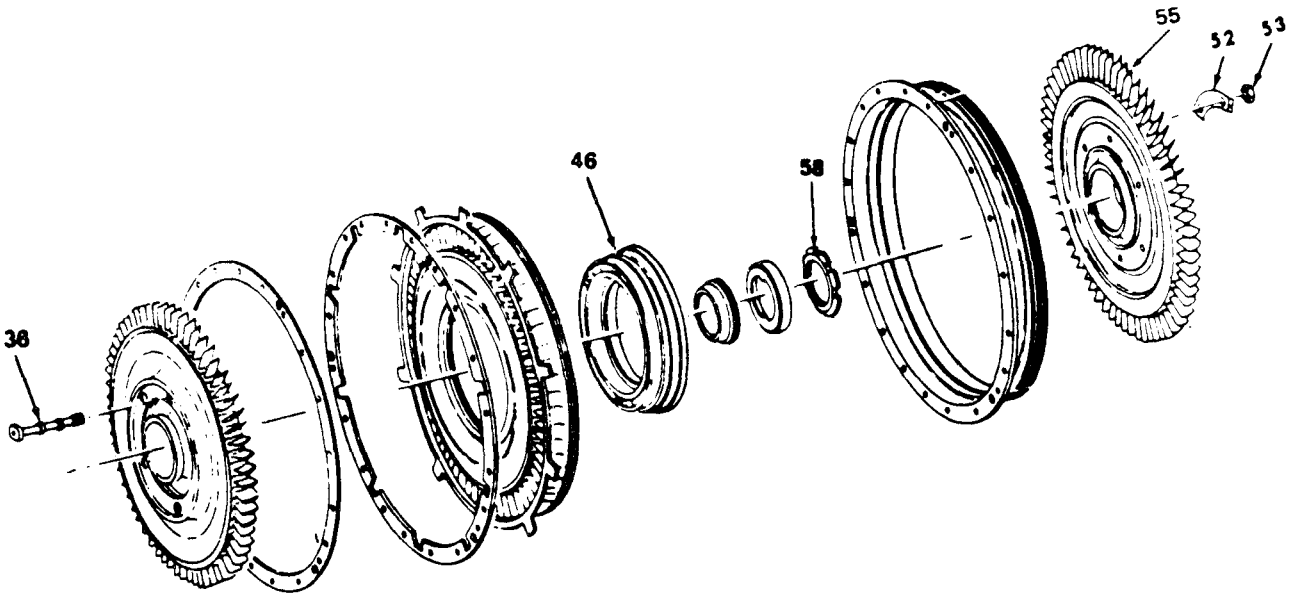
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
64. Second Stage Turbine Nozzle (45) Second Stage Gas Producer Turbine Rotor Assembly (55)	**On T53-L-703 engine, use a 0.050 inch wire gage**	**Check clearance between second stage turbine nozzle and second stage gas producer turbine rotor sealing disk. Clearance must be 0.050 to 0.128 inch (1.27 mm to 3.25 mm). If clearance is not obtained, select spacer (38) to obtain clerance.**



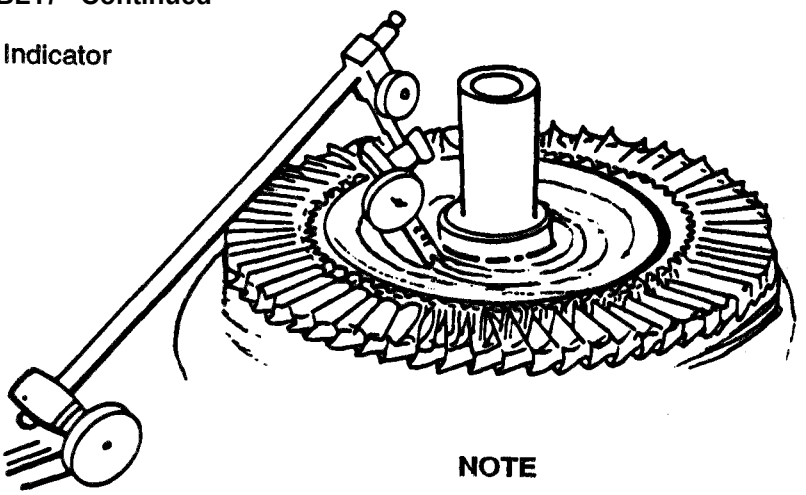
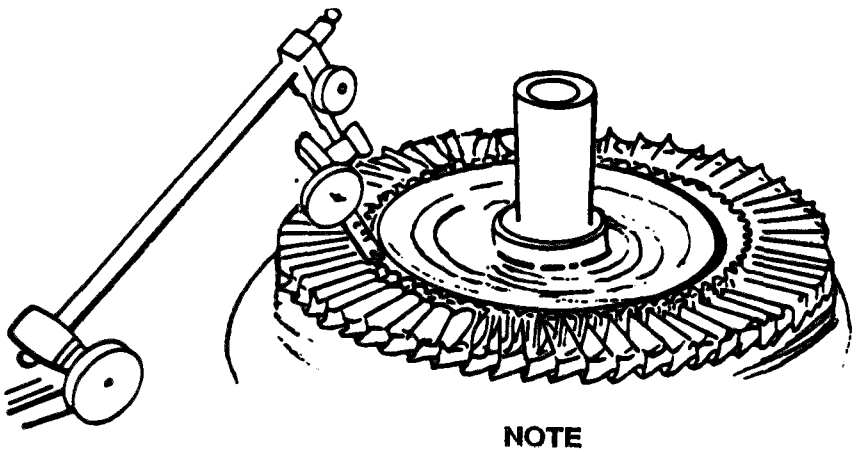
65. Bolts (36)	**Cap screw (4-40 x 3/4-inch long) may be installed in bolts, to facilitate alinement and installation of nut (53) while securing second stage gas producer turbine rotor (55).**	**Lubricate threads of bolts (36) with Anti-Seize, 767 (item 102, Appendix D), Nickel-Ease (item 103, Appendix D) or Molykote anti-seize thread compoundf (item 58, Appendix D).**

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**NOTE**	
	Nuts (53) have a machined washer surface. This surface must be positioned towards the rotor assembly. Do not bend tabwashers at this time.	**Secure rotor with tab-washers (52) and nuts (53). Engage tangs of wrench socket (LTCT 13456, detail of LTCT 131 75) or wrench socket (LTCT4181) with nuts (58) to prevent compressor rotor shaft from turning. Tighten nuts evenly as required.**
66. Rotor (55)	**Refer to Appendix G, table G-4, reference number 28 for nut tightening requirements.**	

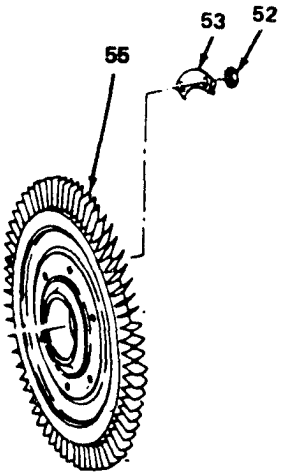


4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCACATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
67. Dial Indicator		a. Position dial indicator on step, Inboard of bolt circle. Rotate gas producer turbine rotor assembly and record runout. Runout shall be as given in Appendix G, table G-6, reference number 35.
	NOTE A combination of runouts between the above illustration and the below illustration shall not exceed 0.006 inch (0.15 mm), if not within limits. Refer to NOTE below.	
		b. Position dial indicator against point just inboard of second stage gas producer turbine blade roots. Rotate gas producer turbine rotor assembly and record runout. Runout shall be given in Appendix G, table G-6, reference number 32.
	NOTE If runouts are not within limits loosen and retighten nuts (52), or relocate or replace spacer (46).	

4-14. Gas Producer System Components (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
68. Second Stage Gas Producer Turbine Rotor (55)	**Refer to paragraph 4-12.**	**a. Check blade clearante.** **b. Bend tangs of tabwashers (53) against flats of nuts (52).**



4-15. Second Stage Gas Producer Turbine Rotor Assembly and Spacer (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

Applicable Configuration	References
T53-L-13B/703 Engines	Para 4-16

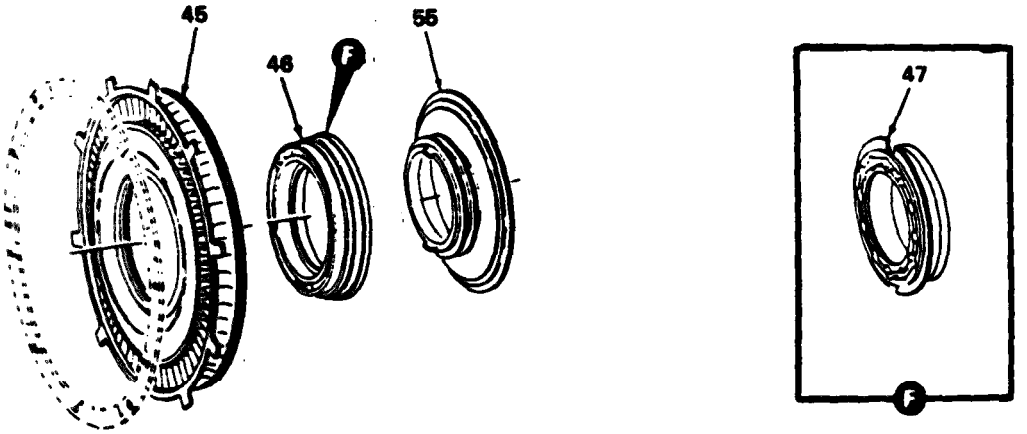
LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER TURBINE ROTOR ASSEMBLY/	**WARNING** FLIGHT SAFETY PARTS Turbine Turbine Disk (Second Stage Gas Producing Disk) Turbine Rotor Spacer (Gas Producer Turbine Spacer) Turbine Rotor Disk (Second Turbine Rotor Sealing Disk) After removal of protective covering, handle with caution during inspection. Inspection limits must be observed.	

4-15. Second Stage Gas Producer Turbine Rotor Assembly and Spacer (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER TURBINE ROTOR ASSEMBLY/ - Continued		
1. Turbine Rotor Blades	Nicks up to 0.010 inch (0.025 cm) in depth are acceptable. Dents are acceptable if blade is not distorted. Replace rotor if depth of nicks exceed 0.010 inch (0.025 cm).	Inspect for nicks and dents.
2. Turbine Rotor Blades and Disk	Cracks are not allowed.	Inspect for cracks.
3. Turbine Rotor Blades	Tip rubs up to 0.030 inch (0.076 cm) deep are acceptable.	Inspect blades for tip rubs.
4. Spacer (46)	Replace spacer if scoring exceeds a depth of 0.022 inch (0.056 cm).	Inspect for scoring.
5. Spacer (46) or (47)	Replace spacer if cracked or distorted.	Inspect for cracks or distortion.
6. Rotor Disk	Rubs up to 0.006 inch (0.015 cm) deep by 0.100 inch (0.254 cm) wide are acceptable.	Inspect for rubs on aft face of rotor disk.
7. Disk and Blades	If one or more blades are recessed more than 0.025 inch (0.064 cm), remove disk and reseat blades as outlined in paragraph 4-16.	Inspect aft side of disk for blades recessed below disk.
8. Disk	Fretting up to 0.005 inch (0.013 cm) deep is acceptable.	Inspect disk for fretting in spacer and sealing disk contact area.
	NOTE Items 9 thru 12 apply to T53-L-703 engines only.	

4-15. Second Stage Gas Producer Turbine Rotor Assembly and Spacer (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER TURBINE ROTOR ASSEMBLY/ - Continued		
9. Sealing Disk (55) Blades	Cracks or distortion are not allowed.	Inspect for cracks or distortion.



WARNING

FLIGHT SAFETY PARTS

Use of nonapproved marking materials such as common lead pencils on engine components In or near the hot end will cause cracking of those components when subjected to high temperatures. This can lead to engine failure.

9.1 Gas Producer Spacer (46) or (47), Sealing Disk (55)	Use marking pencil No. 2107 (item 54, Appendix D)	For correct reassembly, using marking pencil (yellow), index spacer to sealing disk to second stage rotor on T53-L-703, or index spacer to second stage rotor on T53-L-13 models.

4-15. Second Stage Gas Producer Turbine Rotor Assembly and Spacer (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER TURBINE ROTOR ASSEMBLY/ - Continued		
10. Sealing Disk (55)	Rubs are acceptable provided a minimum of one-half of the original land height remains. Measure in relation to unaffected seal. NOTE Material loss on labyrinth seal will not normally be evident unless wear-through of second nozzle felt metal occurs.	**Inspect** for labyrinth seal rubs.
11. Spacer (46) or (47)	Excessive wear is not allowed. Light fretting is acceptable. Replace severely damaged, heavily worn, or mutilated spacers.	**Inspect** spacer for excessive wear or fretting on pilot OD's.
12. Sealing Disk (55)	Rubs on forward outer diameter are not acceptable.	Inspect for nozzle rubs.

4-16. Second Stage Gas Producer Turbine Rotor (T53-L-13B/703 Engines) - Repair (AVIM)

Text Deleted.

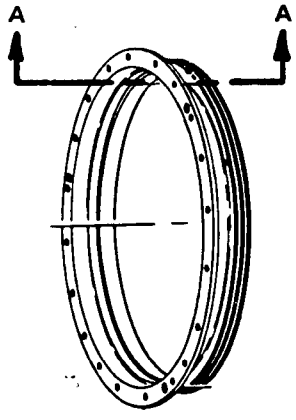
4-17. Second Stage Gas Producer Cylinder and Second Stage Nozzle Assembly (T53-L-13B/703 Engines) - Inspection

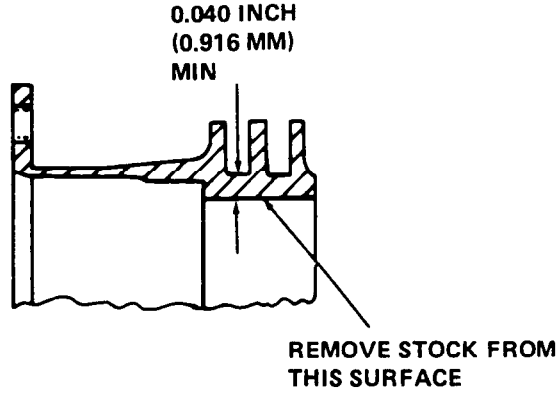
INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

References
Para 4-19, 4-12 and H-25

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER NOZZLE AND CYLINDER ASSEMBLY/		
1. Second Stage Gas Producer Cylinder	Radial cracks from bolt holes to outer edge of cylinder are acceptable.	**Inspect** for cracks.
2. Second Stage Gas Reducer Cylinder Flange	If thickness is less than shown in section A-A, or if removal of material necessary to obtain required tip clearance will decrease wall thickness to less than that shown, replace cylinder. If wall thickness is sufficient for rework, shim cylinder (paragraph 4-19).	**Check wall** thickness at points indicated for rework. (Refer to paragraph 4-12.)
3. Felt Metal Seal	T53-L-703 engines only. Rubs in felt metal seals are acceptable, provided penetration to base metal is not evident and some unaffected portion remains for 360 degrees as viewed axially.	**Inspect** felt metal seal of second stage turbine nozzle for rubs,
4. Second Stage Turbine Nozzle Assembly (1-120-000-06)	Replace assembly if inspection limits are exceeded. a. Any number of l/8-inch (3.2 mm), nonconverging cracks are acceptable on trailing edge of vanes.	Visually **inspect** for cracks.

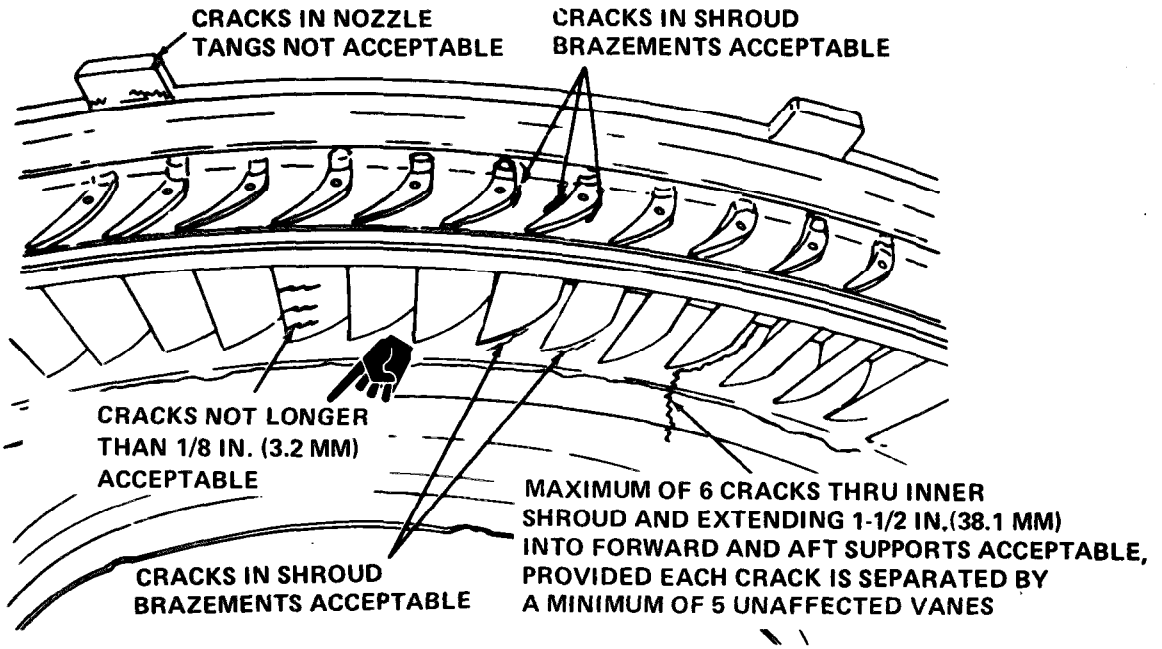




SECTION A-A

4-17. Second Stage Gas Producer Cylinder and Second Stage Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER NOZZLE AND CYLINDER ASSEMBLY/ - Continued	**b.** Any number of 1/16 inch (1.6 mm) cracks are acceptable on leading edge of vanes. Any number of 1/8-inch (3.2 mm) cracks are acceptable on a maximum of 15 vanes. c. No inspection is required of vane-to-shroud brazements. Cracks are acceptable.	



d. A maximum of 40 cracks are allowed in any combination emanating from vane leading and trailing edges and extending into parent metal of outer shroud, provided cracks do not exceed 5/1 6-inch (7.9 mm).

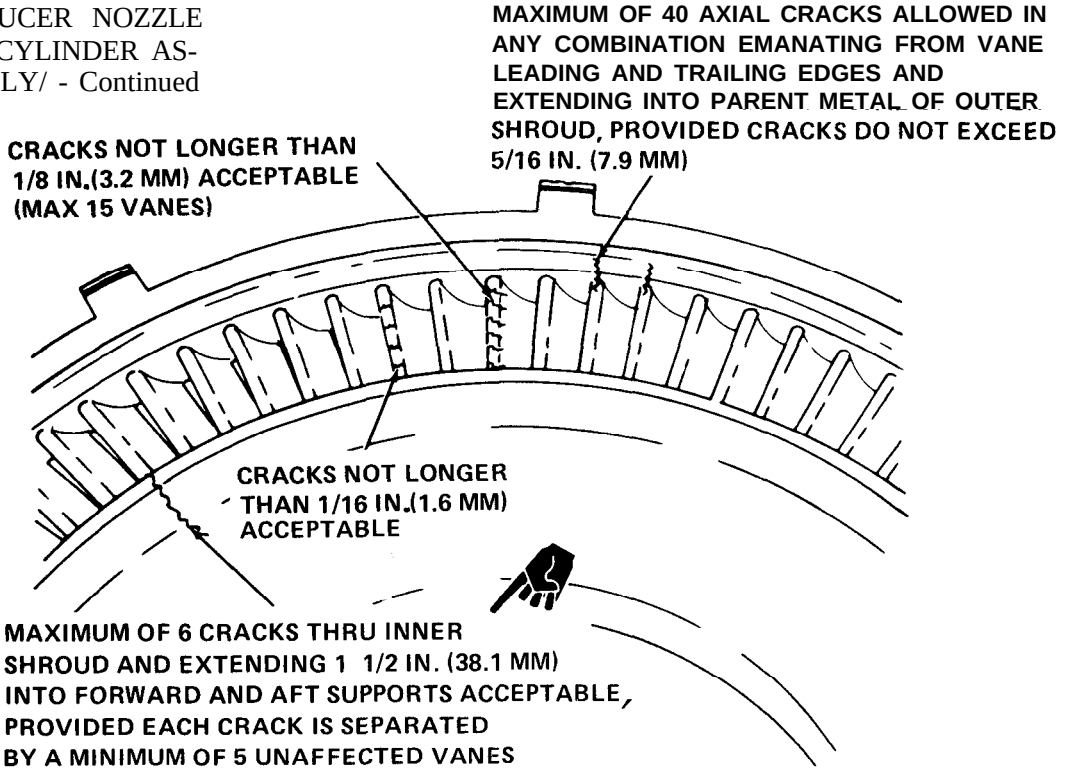
NOTE

When measuring cracks in outer shroud that break out from brazements, measure only parent metal portion of cracks.

e. Vane-to-vane cracks are allowed in two areas of outer shroud, provided 10 vanes minimum separate cracks.

4-17. Second Stage Gas Producer Cylinder and Second Stage Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER NOZZLE AND CYLINDER ASSEMBLY/ - Continued		



f. Two circumferential vane-to-vane cracks are allowed in four areas of outer shroud, provided 10 vanes minimum separate cracks.

g. Circumferential converging cracks are acceptable, provided limits for circumferential vane-to-vane cracks outlined in preceding step f. have not reached maximum limit.

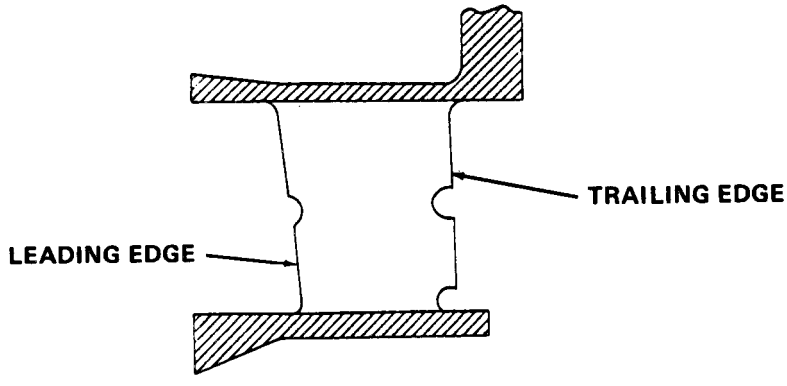
h. Cracks in parent metal of outer shroud emanating from vane trailing edge into seal ring area are acceptable on two nonadjacent vanes.

i. Six cracks through inner shroud (including around or through vane brazements) and extending a maximum of 1-1/2 inch (38.1 mm) into forward and aft support, are acceptable on the same vane, provided a minimum of five vanes separate the defects.

j. Cracks or severe mutilation are not allowed on nozzle tangs.

4-17. Second Stage Gas Producer Cylinder and Second Stage Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER NOZZLE AND CYLINDER ASSEMBLY/ - Continued	k. Inspect forward support to inner shroud brazement area for cracks with accompanying separation. Up to 3 inches (76.20 mm) of cumulative cracking is acceptable provided joint is not widely separated (greater than 1/32 inch (0.8 mm)) and distortion and/or rubbing is not evident.	
5. Second Stage Turbine Nozzle Assembly (1-120-000-14 or 1-120-050-03)	May exhibit areas of vane leading and trailing edges which have been blend-repaired by the manufacturer. These repairs have no significant affect on engine operation. Inspection limits given in following steps a thru c shall be applied only to the manufacturer's repairs.	



a. A maximum of three missing parent material areas are permitted on one vane.

b. No more than 10 missing parent material areas on a nozzle assembly are acceptable.

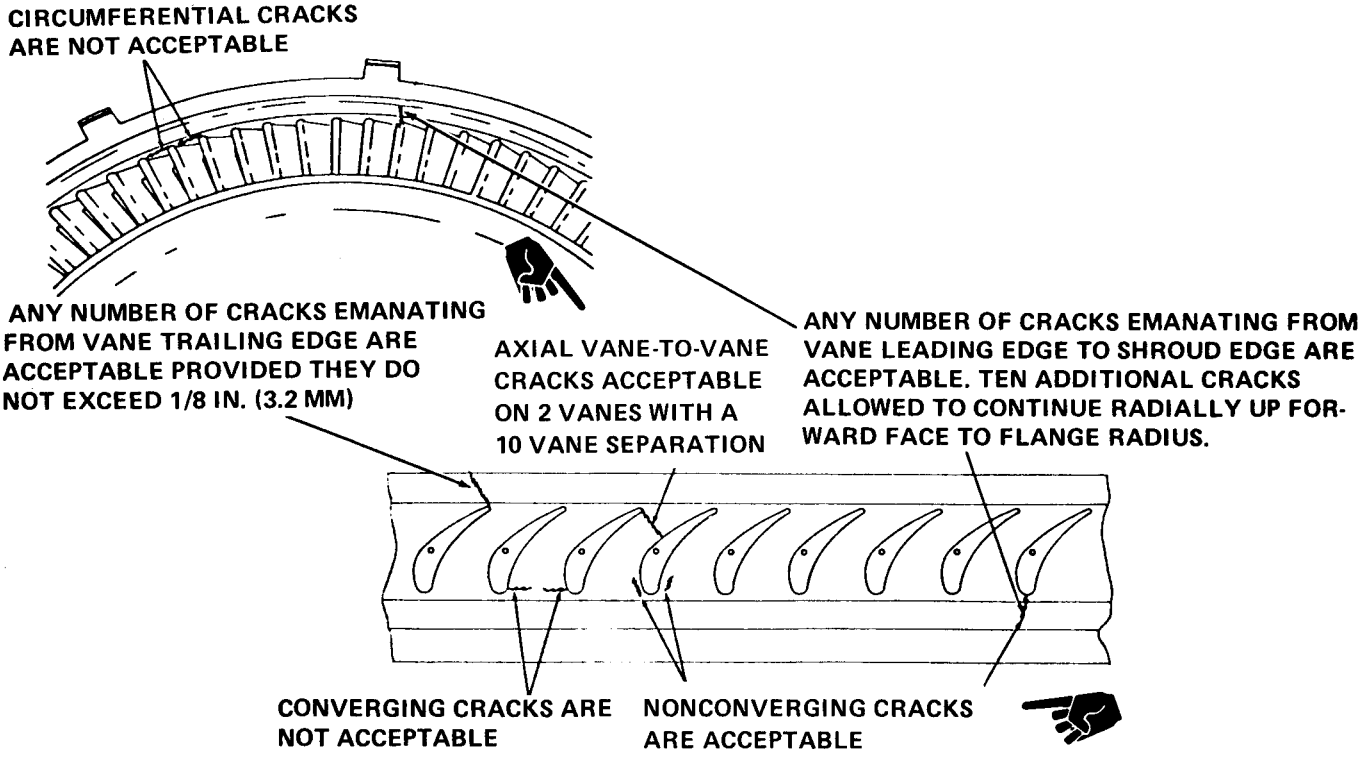
c. Depth of missing parent material shall not exceed 1/16 inch (1.6 mm) on leading edge and 3/16 inch (4.8 mm) on trailing edge as measured from the unaffected portion.

NOTE

In addition, any number of leading edge blends (0.020 inch (0.051 cm) diameter, maximum), or trailing edge blends (0.030 inch (0.076 cm) diameter, maximum), are acceptable.

4-17. Second Stage Gas Producer Cylinder and Second Stage Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER NOZZLE AND CYLINDER ASSEMBLY/ - Continued		
6. Second Stage Turbine Nozzle Assembly (1-120-000-14 and 1-120-050-03)	Replace assembly if inspection limits are exceeded. **NOTE** Do not measure cracks from any portion of manufacturer's blend-repair. When cracks occur in this area, use vane leading or trailing edge as a reference point. a. Any number of 1/8 inch (3.2 mm) cracks are acceptable on trailing edge of vanes. b. Any number of 1/1 6 inch (1.6 mm) cracks are acceptable on leading edge of vanes. Any number of 1/8 inch (3.2 mm) cracks are acceptable on a maximum of 15 vanes.	Visually **inspect** for cracks and spalling



4-17. Second Stage Gas Producer Cylinder and Second Stage Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER NOZZLE AND CYLINDER ASSEMBLY/ - Continued		
	c. Any number of axial cracks originating at vane leading edge and progressing to edge of outer shroud are acceptable. In addition, two cracks are allowed to continue radially up forward face to flange radius. d. Any number of cracks at vane trailing edge/outer shroud areas are acceptable up to 1/8 inch (3.2 mm) in length. e. Circumferential, converging, nonconverging,and vane-to-vane cracking is not acceptable. Cracks in outer shroud locations other than those noted are not acceptable. f. Any number of cracks up to 1/8 inch (3.2 mm) at vane trailing edge/inner shroud radius areas are acceptable. No cracking is allowed in other areas of inner shroud g. A maximum of four radial cracks is acceptable in both forward and aft supports emanating from support to inner shroud junctions, provided length of cracks does not exceed 3/4 inch (19.1 mm) and a minimum of five vanes separates defects. **NOTE** Inspect each support individually with respect to crack separation. h. Cracks or severe mutilation are not allowed on nozzle tangs.	
7. Nozzle Tangs	Bent tangs may be cold straightened. Inspect area for cracks by dye-penetrant method after straightening. Replace nozzle if cracks are evident.	Visually **inspect** for bending.
8. Nozzle Tangs	Blend-repair as outlined in paragraph H-25.	Visually **inspect** for nicks, burrs, or rolled-over effect on edges.

4-17. Second Stage Gas Producer Cylinder and Second Stage Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER NOZZLE AND CYLINDER ASSEMBLY/ - Continued		
9. Vanes	Replace nozzle if inspection limits are exceeded. **NOTE** Do not include manufacturer's blend-repair (see illustration for item 4) in measurement of burned area. a. Burns on leading edge 1/16 by 3/8 inch (1.6 by 9.5 mm) on maximum of 10 vanes are allowed. b. Burns on trailing edge 1/8 by 1/4 inch (3.2 by 6.4 mm) on a maximum of 10 vanes are allowed.	Visually **inspect** for burns. Visually **inspect** for dents, nicks, and burrs.
	Blend-repair as outlined in paragraph H-25. Blend-repair for second stage gas producer nozzles 1-120-000-14 and 1-120-050-03 shall be limited to removal of sharp surface projections. **a.** A maximum of three nicks or dents is allowed on vane leading edge, provided that after blend-repair, depth of any defect does not exceed 1/1 6 inch and length does not exceed 3/32 inch (2.4 mm). Separation of defects shall be at least twice the length of the shortest defect after blend-repair. Smooth dents within limits are acceptable without blend-repair. b. A maximum of three nicks or dents is allowed on vane trailing edge, provided that after blend-repair, depth of any defect does not exceed 3/32 inch (2.4 mm) and length does not exceed 3/1 6 inch (4.8 mm). Separation of defects shall be at least twice the length of the shortest	

4-17. Second Stage Gas Producer Cylinder and Second Stage Nozzle Assembly (T53-L-13B/703 Engines) - inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE GAS PRODUCER NOZZLE AND CYLINDER AS-SEMBLYI - Continued		
	defect after blend-repair. Smooth dents within limits are acceptable without blend-repair. c. Nicks and dents on vane airfoil surfaces are acceptable on all vanes. Blend-repair to remove nicks. d. Burrs are acceptable on vane leading and trailing edges. Blend-repair to remove burrs.	
10. Inner Shroud	Rubs are not allowed.	Visually Inspect for axial and circumferential rubs.

4-18. First Stage Gas Producer Turbine Rotor Assembly (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

Applicable Configuration	References
T53-L-13B/703 Engines	Para 4-12

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE GAS PRODUCER TURBINE ROTOR/	**WARNING** **FLIGHT SAFETY PARTS** Turbine Rotor Disk (First Turbine Rotor sealing Disk) Turbine Turbine Disk (First Stage Gas Producing Turbine Disk) After removal of protective covering. handle with caution during inspection. Inspection limits must be observed. **NOTE** If both first and second stage as producer turbine rotors are to e replaced, new rotors shall be initially installed with the yellow "H" markings (if present) which denote the heavy balance points 180 degrees apart.	
1. Tubine Rotor Blades	Nicks up to 0.010 inch (0.025 cm) in depth are acceptable, Replace rotor if depth of nicks exceeds 0.010 inch (0,.025 cm). Dents are acceptable if blade is not distorted.	Inspect for nicks and dents.

4-18. First Stage Gas Producer Turbine Rotor Assembly (T53-L-13B/703 Engines) - Inspection

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE GAS PRODUCER TURBINE ROTOR/ - Continued		
2. Turbine Rotor Blades and Disc	Cracks are not allowed.	**Inspect** for crocks. **Replace** turbine rotor if blades or disc is cracked or damaged beyond limits.
	Tip rubs shall not exceed 0.030 inch leading edge. Burning and loss of material is unacceptable.	
3. Disc	Rubs 0.006 inch deep by 0.100 inch wide (0.015 cm deep by 0.254 cm wide) are allowed, provided no indication of extreme heat are evident.	**Inspect** for rubs on forward and aft face of disc.
4. Disc	Fretting in spacer contact area up to 0.005 inch (0.01 3 cm) deep is acceptable.	**Inspect** for evidence of fretting.

4-19. First Stage Gas Producer Nozzle Assembly and second Stage Gas Producer Assembly (T53-L-13B/703 Engines) - Skimming Procedure (AVIM)

INITIAL SETUP

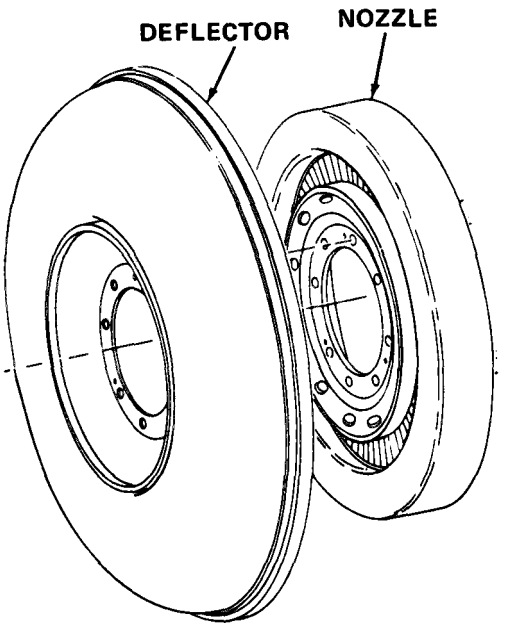
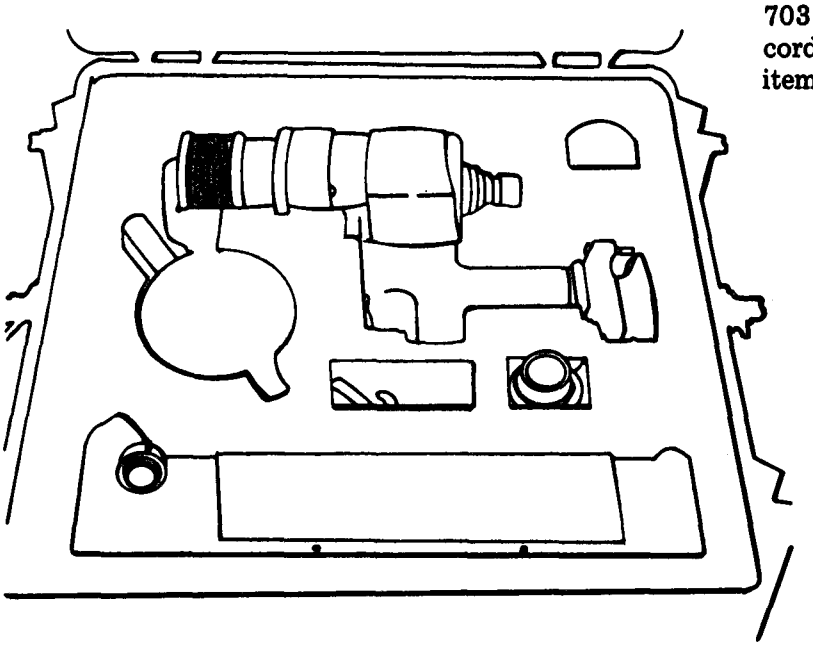
Applicable Configuration
T53-L-13B/703 Engines

Special Tools
Finishing Machine (LTCT2125, detail of LTCT2020)
Nut (LTCT2266)
Washer (LTCT610)
Adapter (LTCT4127)
Bushing (LTCT4379)
Adapter (LTCT4162)
Adapter (LTCT4127, detail of LTCT2020)
Spacer (LTCT4165)
Nut (LTCT2266)
Sleeve Bushing (LTCT4406)
Shaft Adapter (LTCT4946)
Spanner Wrench (LTCT4450)
Spanner Wrench (LTCT4402-02)
Finishing Machine Balance Shaft and Weight (LTCT4989 and LTCT4388)
Cutter (LTCT9261)
Spanner Wrenches (LTCT9263)
Adapter (LTCT4152)
Adapter (LTCT613)

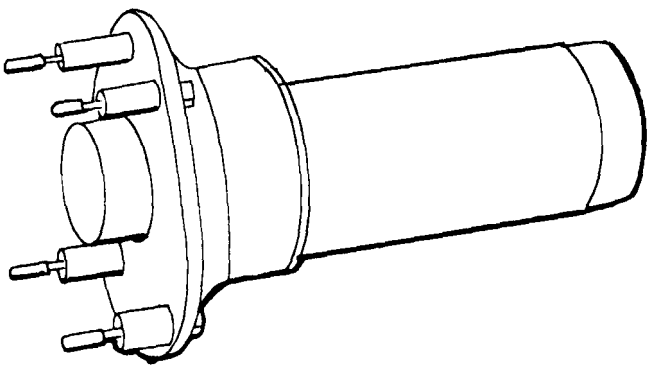
4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (153-1-13B/703 Engines) - skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
Special Tools - Continued		
Finishing Adapter (LTCT4172) **Garter Extension (LTCT9396)** **Spanner Wrench (GGG-W-665B, Type II)**		

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

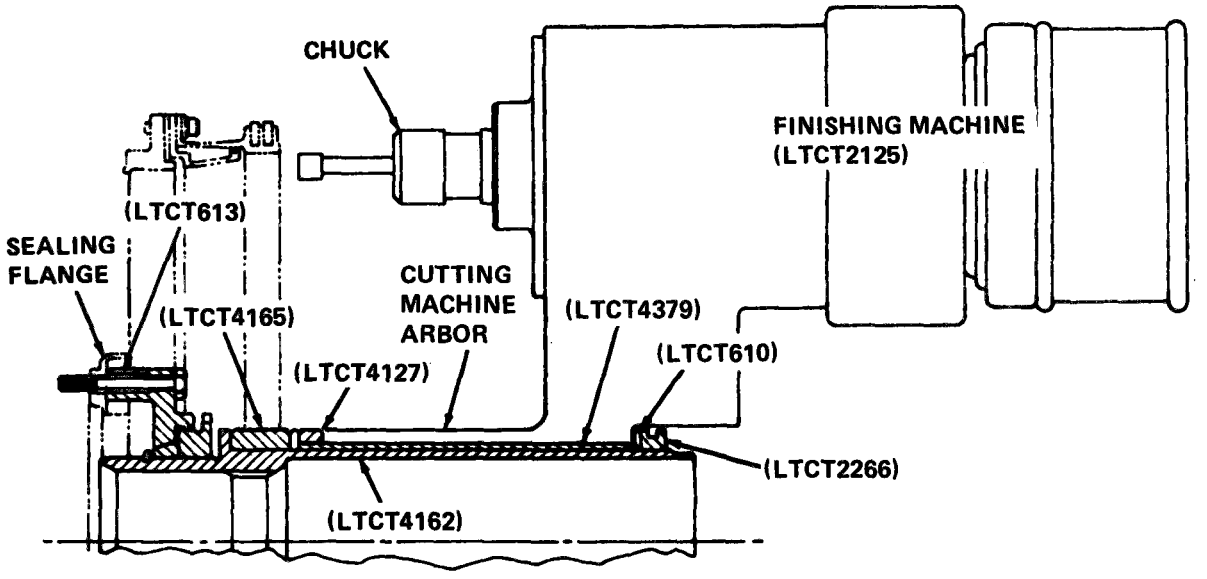
LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Combustion Chamber Deflector, First Stage Gas Producer Nozzle Assembly, and Related Parts		**Install.**
FIRST STAGE TURBINE NOZZLE MAINTENANCE KIT/		
2. First Stage Turbine Nozzle Maintenance Kit (LTCT2020)		**Convert to T53-L-13B/ 703 applications according to actions for items 3 thru 5.**

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE MAINTENANCE KIT/ - Continued		
3. Finishing Machine	Use finishing machine (LTCT2125, detail of LTCT2020).	**Remove** nut (LTCT 2266), washer (LTCT 610), and adapter (LTCT4127).
4. Adapter (LTCT613)		**Remove** adapter from cutting machine arbor.
5. First and Second Stage Turbine Flange Finishing Adapter (LTCT4172)		**Install** as follows: a. **Slide** bushing (LTCT 4379) into finishing machine arbor. b. Position adapter (LTCT4162) into finishing machine arbor. **c. Position** adapter (LCTC4127, detail of LTCT2020), and spacer (LTCT4165) over adapter (LTCT4162). d. **Position** washer (LTCT610) on adapter and **secure** with nut (LTCT2266). **Tighten** nut as required.

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

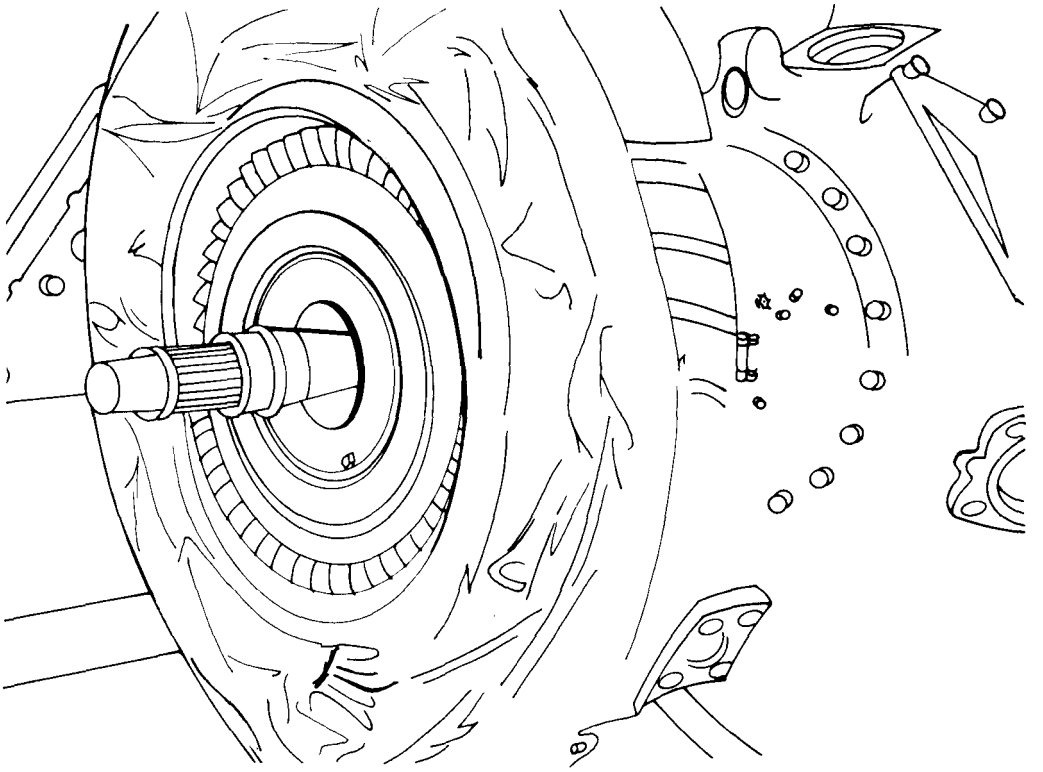
LOCATION/ITEM	REMARKS	ACTION
FLANGE FINISHING KIT/		
6. Flange Finishing Kit		**install according to action 7 thru 24.**
	Safety glasses must be worn during operation of first stage turbine flange finishing machine to protect eyes from flying chips.	



7. **Protective Cover** (LTCT4408, **detail of** LTCT2020)		**Install by placing large end over flange of air diffuser and small end over nozzle.**
8. **Garter Extension Spring (LTCT9396)**	**The garter spring aids in producing a good finish by reducing resonance and dampening vibration during milling operation.**	**Install on nozzle flange.**
9. Seal Ring		**Remove four bolts from 3-,6-,9-, and 12-o'clock positions on seal ring.**

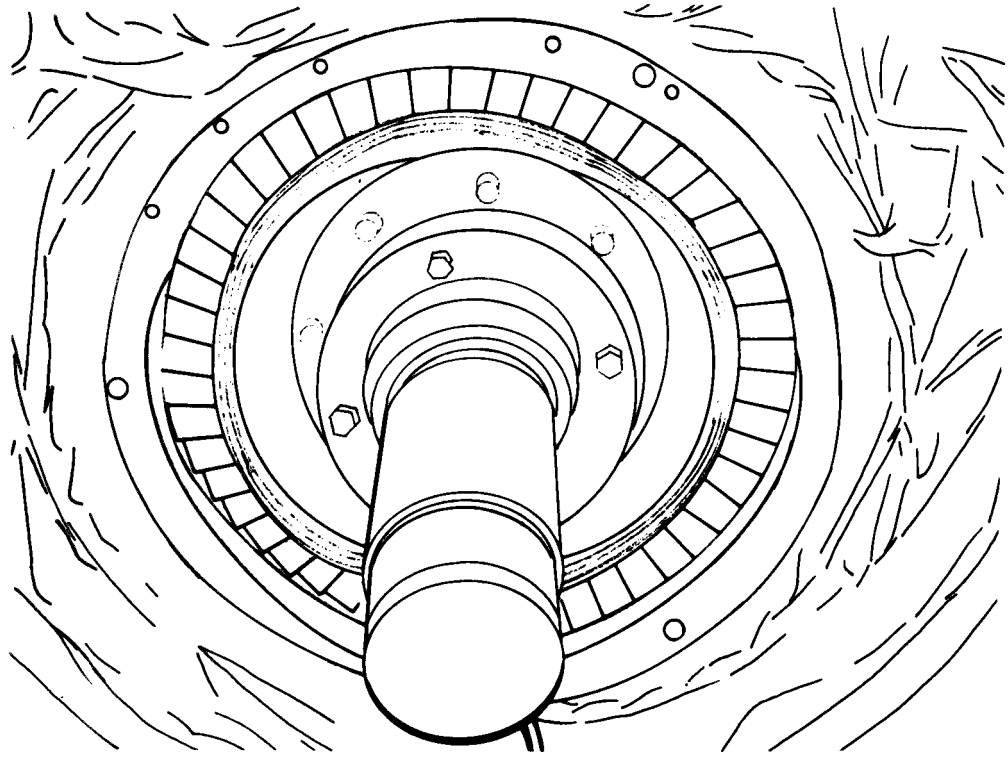
4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FLANGE FINISHING KIT/ - Continued		
10. Finishing Machine and Captive Screws		**Slide** finishing machine onto rear compressor shaft (this requires two men). **Insert** captive screws into open screw holes and **tighten** finger tight,



4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FLANGE FINISHING KIT/ - Continued		
11. Bushing and Adapter		**Insure** bushing and adapter are free on shaft,
12. Finishing Machine		**Push** machine forward until shaft contacts compressor turbine forward cone,

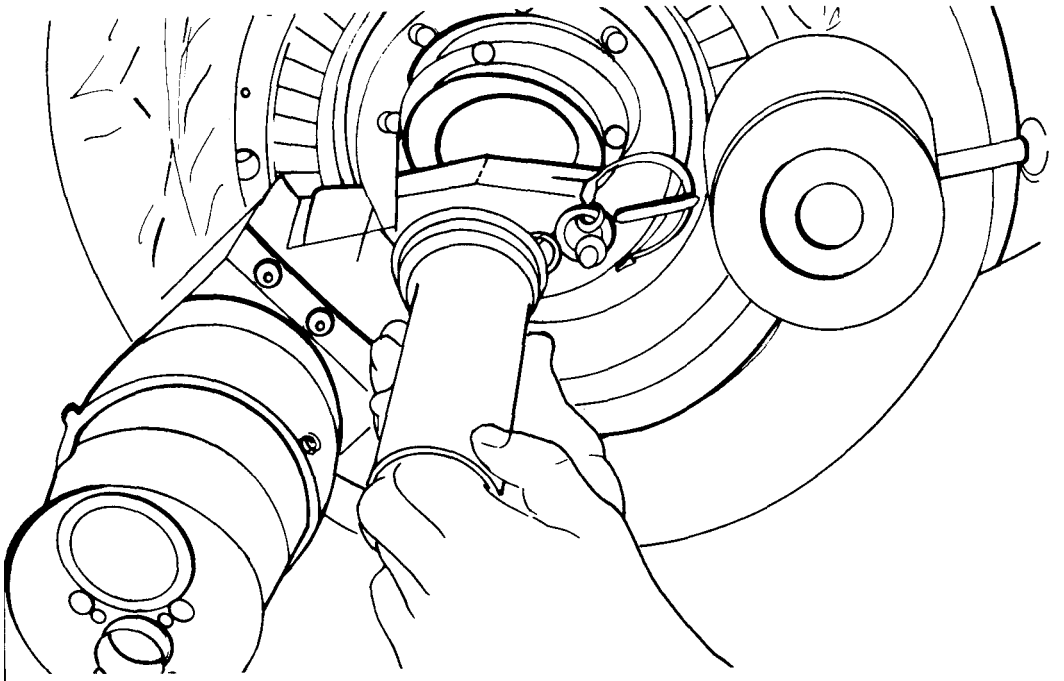


NOTE

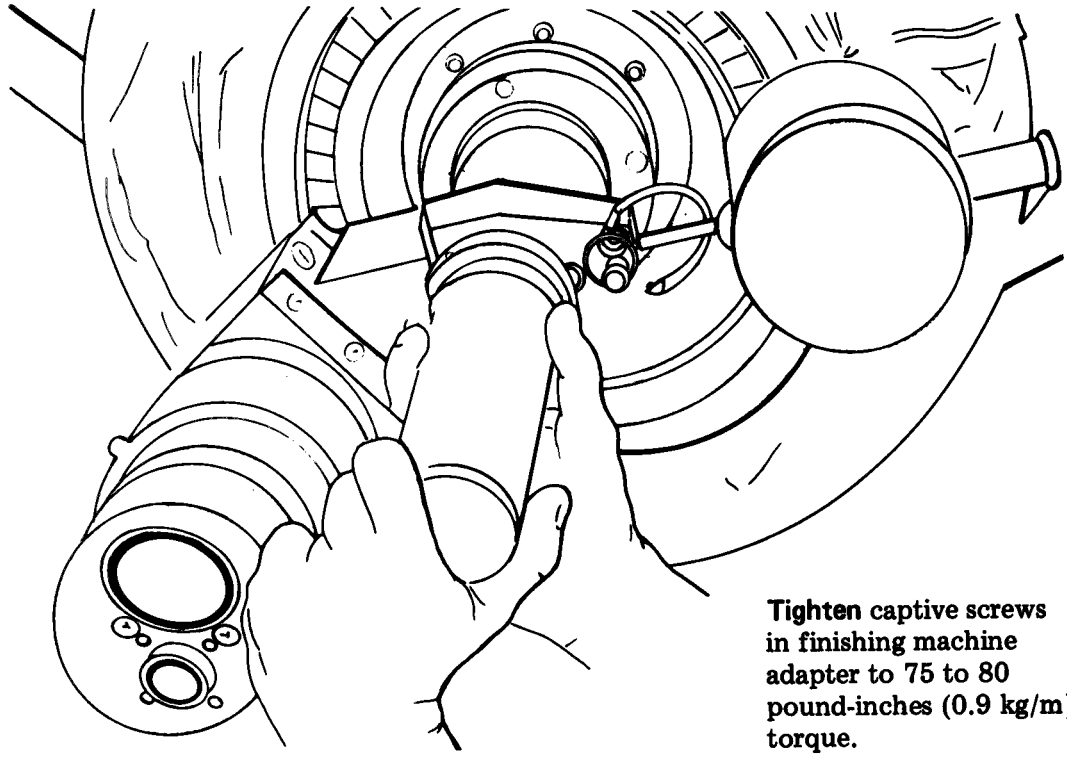
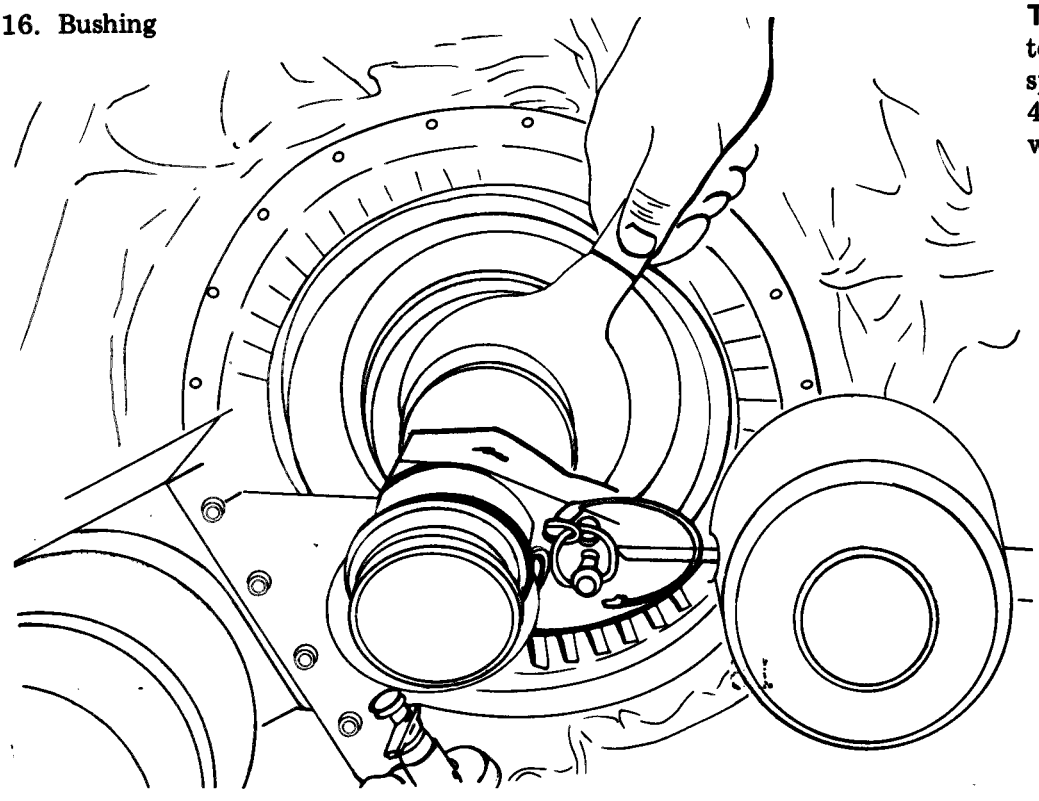
If difficulties are encountered during installation of cone (item 13) and retaining nut (item 15), raise rear end of arbor slightly to make it concentric with stub shaft.

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

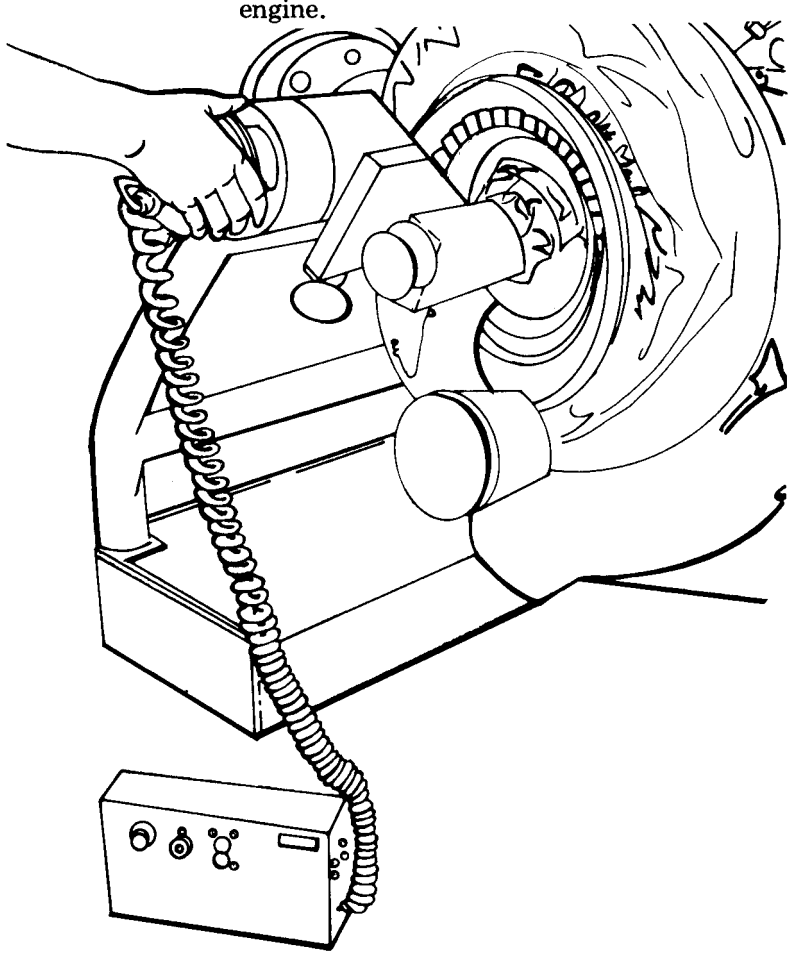
LOCATION/ITEM	REMARKS	ACTION
FLANGE FINISHING KIT/ - Continued		
13. Compressor Turbine Rear Cone (1-110-411-04)		**Install** compressor turbine rear cone (1-110-441-04) furnished with kit, using sleeve bushing (LTCT4406) and shaft adapter (LTCT4946).
14. Bearing Retaining Spanner Nut		**Install** bearing retaining spanner nut. **Tighten** nut to 700 to 800 pound-inches (56 to 66 pound-feet; 8.1 to 9.2 kg/m) torque with face spanner wrench (LTCT 4450). Use spanner wrench (GGG-W-665B, Type II) to **prevent** rotor shaft from turning during tightening operation.



4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

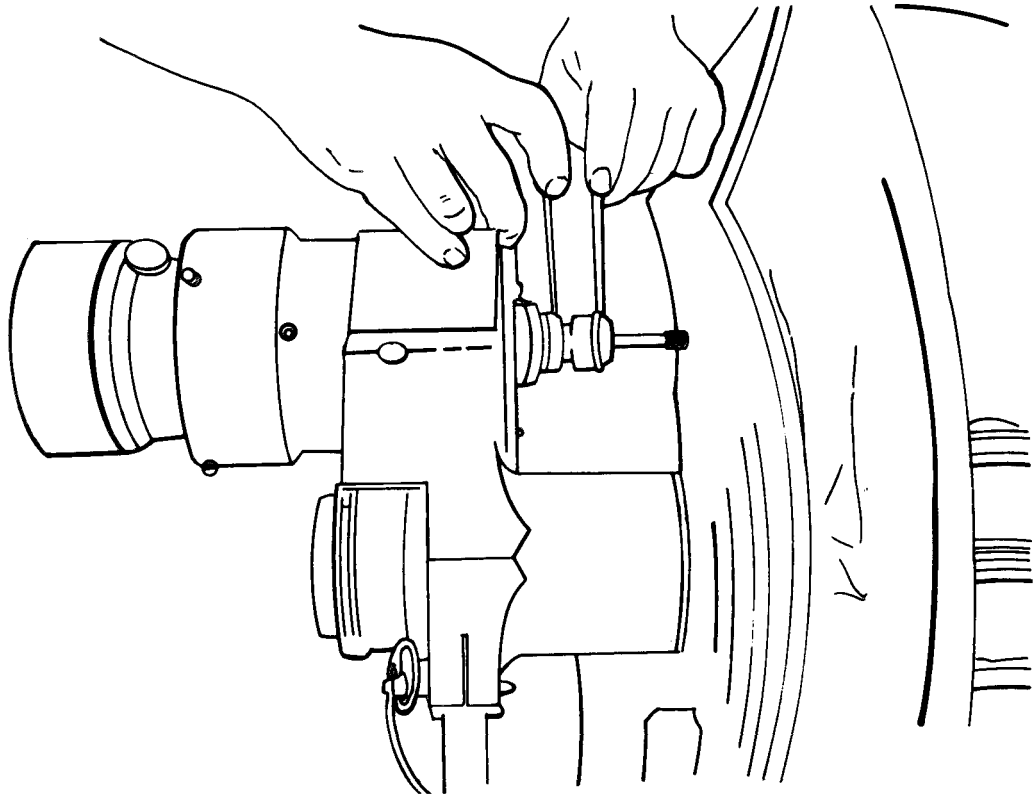
LOCATION/ITEM	REMARKS	ACTION
FLANGE FINISHING KIT/ Continued		
15. Captive Screws		**Tighten** captive screws in finishing machine adapter to 75 to 80 pound-inches (0.9 kg/m) torque.
16. Bushing		**Tighten** bushing (no torque value) with spanner wrench (LTCT 4402-02) furnished with machine.

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FLANGE FINISHING KIT/ - Continued		
17. Openings and Bearing Area		**Mask** openings and bearing area with tape.
18. Finishing Machine Balance Shaft and Weight		**Install** finishing machine balance shaft and weight (LTCT4389 and LTCT 4388). **Secure** with lockpin.
	NOTE The grinder must be held firmly by aft end in following action for item 19. Turning entire machine clockwise will move grinder forward axially (toward front of engine). Turning counterclockwise will move grinder toward aft end of engine.	
19. Grinder		**Hold** grinder **firmly** and **turn** machine **counterclockwise** until feed reaches aft stop.

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FLANGE FINISHING KIT/ - Continued		
20. Cutter (LTCT9261)	**Collet must be tight enough to prevent cutter from moving freely but loose enough to permit it to be moved by hand. Back of cutter head must not be more than one inch from collet.**	**Install cutter (LTCT 9261) in collet of grinder.**



21. Grinder		**Hold grinder by base and turn machine until feed reaches forward stop.**

CAUTION

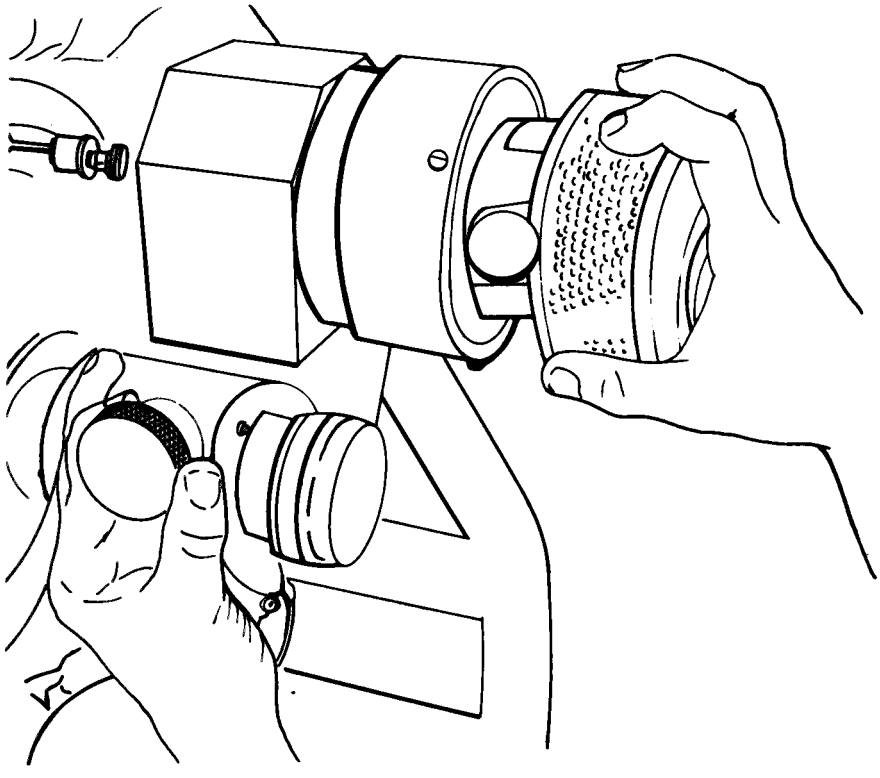
If cutter extends into radius of forward edge of flange in action. for item 22, it will thin the outer shroud excessively during cutting operation.

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FLANGE FINISHING KIT/ - Continued		
22. Cutter		**Adjust** cutter to reach forward edge of flange and **tighten** collet, using spanner wrenches (LTCT9263).
	NOTE To obtain satisfactory finish, the following rules must be obeyed: a. Do not use a tool that vibrates (i.e. does not run true). b. Do not extend a 1/4-inch shank tool more than one inch of shank beyond collet.	
23. Grinder		**Hold** grinder as before and **withdraw** cutter by **turning** machine **counterclockwise** until grinder reaches aft stop.
24. Collet		**Check** collet to **insure** tightness.
FIRST STAGE TURBINE FLANGE FINISHING MACHINE/	**WARNING** **Safety glasses must be worn during operation of first stage turbine flange finishing machine to protect eyes from flying chips.** **NOTE** Operation of first stage turbine flange finishing machine shall be accomplished according to actions for items 25 thru 35.	

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas producer Assembly (T53-L-13B/ 703 Engines) - Skimming procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE FLANGE FINISHING MACHINE/ - Continued		
	CAUTION **The first cut should always be shallow, since the flange may be tapered. A deep first cut may damage the cutter and/or flange.**	
	NOTE **One increment on dial adjusting handle will advance cutter radially approximately 0.001 inch.**	
25. Grinder		**Advance until at least one-half of cutter is within flange.**
26. Cutter		**Station cutter at area of minimum tip clearance (highest point) indicated by markings on edge of flange.**



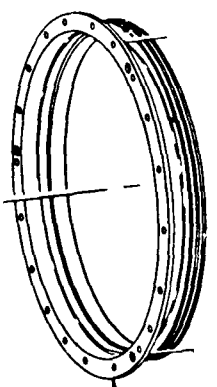
4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE FLANGE FINISHING MACHINE/ - Continued		
27. Cutter		**Advance** cutter radially by **turning** handle until cutter just contacts inner surface of flange; then **sweep** cutter around flange to **insure** adjustment at the highest point.
28. Finishing Machine		**Turn** finishing machine **counterclockwise** until cutter is clear of flange; then **advance radially** 0.001 to 0.002 inch (0.025 mm to 0.051 mm) by **turning** adjusting handle **clockwise.**
	NOTE Electric power required is 110-120 volts ac, 15 amps, 50-60 Hz.	
29. Electric Power Cable	The round prong on the plug acts as the ground.	**Install** electric power cable from grinder to control box and **connect** control box to power source. If socket has no ground connection, **swing** ground prong to one side and wire it to plate screw in junction box.
30. Grinder		**Start** grinder. **Wait** approximately 10 seconds until it reaches maximum speed. Slowly **sweep** cutter **clockwise** around flange until forward stop is reached.

4-19. First Stage Gas Producer Nozzle Assembly and second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE FLANGE FINISHING MACHINE/ - Continued		
	CAUTION **Do not halt sweep between stops (forward and aft) while cutter is in contact with flange. If sweep is halted, cutter will dig into flange causing a scallop in the metal.**	
31. Cutter		**Withdraw** cutter axially by **sweeping counter-clockwise** until cutter is clear of flange.
32. Cutter		**Advance** cutter **radially** 0.001 to 0.002 inch (0.025 mm to 0.051 mm) beyond previous setting
33. Flange	Correction of minimum tip clearance by this method will automatically correct tip clearance at other points.	Repeat preceding actions for items 30 and 32 until ends of reworked area coincide with ends of area indicated on flange.
34. Reworked Areas		**Polish** reworked areas **lightly** with emery cloth (320) grit to remove burrs.
35. Flange Wall		**Check** thickness of flange wall at reworked areas.
	NOTE If second stage gas producer cylinder is to be reworked proceed to actions for items 36 thru 43. If only first stage gas producer nozzle assembly was to be reworked, remove flange finishing machine-by reversing installation procedures.	

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE FLANGE FINISHING MACHINE/ - Continued		
36. Nut (LTCT2266), Washer (LTCT610), Adapter (LTCT4127), and Spacer (LTCT 4165)		**Remove** nut (LTCT 2266), washer (LTCT 610), adapter (LTCT 4127) and spacer (LTCT4165) from adapter (LTCT4152),
	NOTE While performing action for item 37, bushing (LTCT4379) will normally remain on finishing machine adapter. Remove bushing from adapter and install in cutting machine arbor.	
37. Cutting Machine		**Slide** cutting machine away from adapter (LTCT4162).
38. Spacer (LTCT 4165)		**Install** spacer (LTCT 4165) on adapter (LTCT 4162).
39. Second Stage Gas Producer Cylinder	 CYLINDER	**Install** second stage gas producer cylinder on engine, **Secure** cylinder to first stage turbine nozzle assembly with pins and bolts.
40. Finishing Machine		**Position** finishing machine, with bushing installed, on adapter (LTCT4162).
41. Adapter (LTCT 4127), Washer (LTCT610)		**Install** adapter (LTCT 4127) and washer (LTCT610) on adapter (LTCT4162). **Secure** this assembly with nut (LTCT2266). **Tighten** nut as required.

4-19. First Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Assembly (T53-L-13B/ 703 Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FURST STAGE TURBINE FLANGE FINISHING MACHINE/ - Continued		
42. Second Stage Gas Producer Assembly		**Repeat** procedure in actions for items 25 thru 35.
43. Flange Finishing Machine		**Remove** by reversing the installation procedure.

4-20. **Second Stage Turbine Support Assembly (T53-L-11 Series Engines) - Disassembly**

INITIAL SETUP

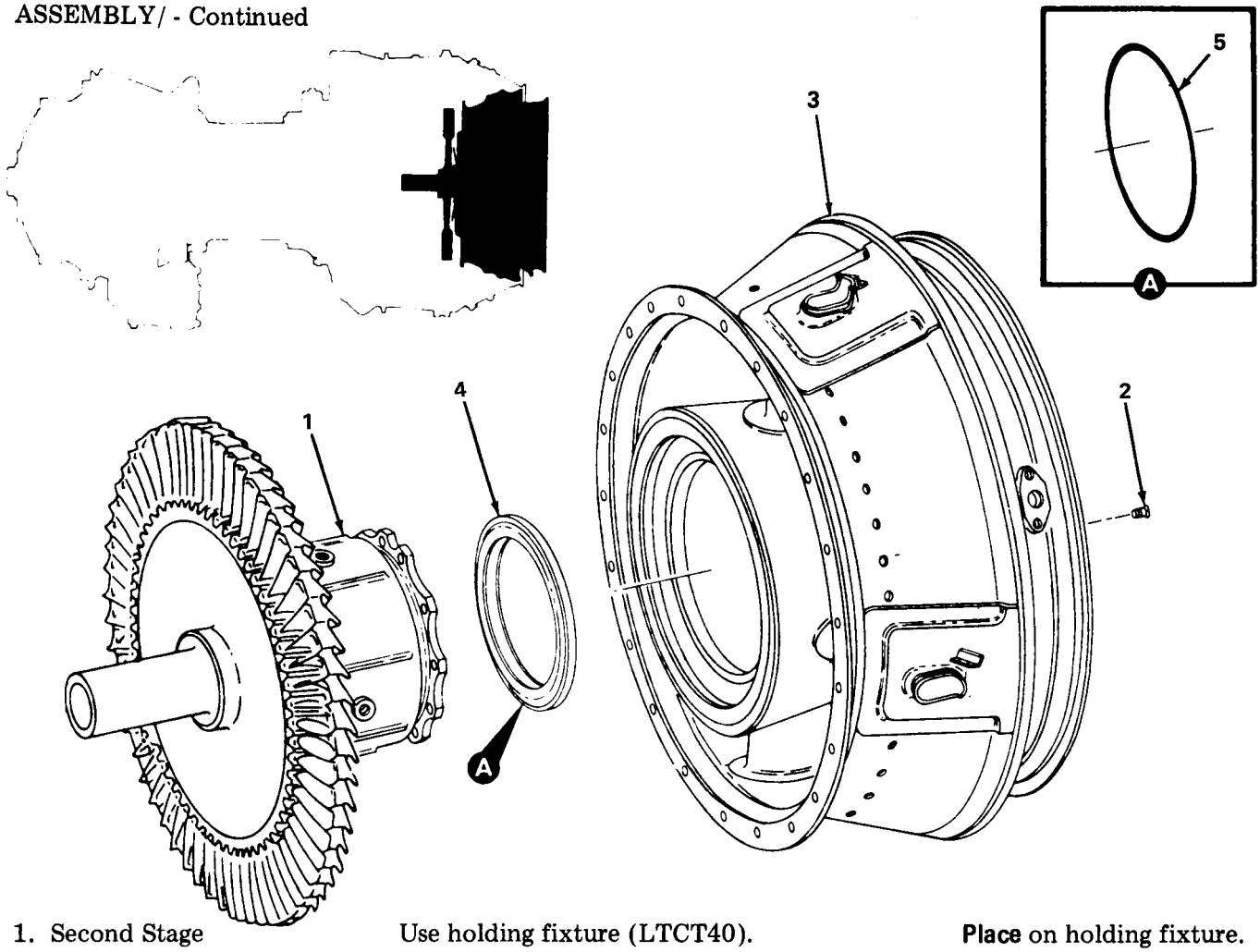
Applicable Configuration
T53-L-11 Series Engines

Special Tools
Holding Fixture (LTCT40)

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE SUPPORT ASSEMBLY/	**NOTE** Disassemble the second stage turbine support assembly only as far as necessary to correct visible damage or replace parts.	

4-20. Second Stage Turbine Support Assembly (T53-L-11 series Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE SUPPORT ASSEMBLY/ - Continued		



1. Second Stage Turbine Rotor Assembly (1)	Use holding fixture (LTCT40).	**Place** on holding fixture. **Remove** screws (2) securing second stage turbine assembly to exhaust diffuser assembly (3). **Raise** support assembly slightly from holding fixture.
	Use plastic hammer to tap sharply.	**Tap** aft end of turbine rotor assembly to separate turbine rotor assembly from exhaust diffuser assembly.
2. Seal (4) or Packing (5)		**Remove. Discard packing (5). (Seal (4)** is reusable.)

4-21. Second Stage Turbine Support Assembly (T53-L-11 Series Engines) - Assembly

INITIAL SETUP

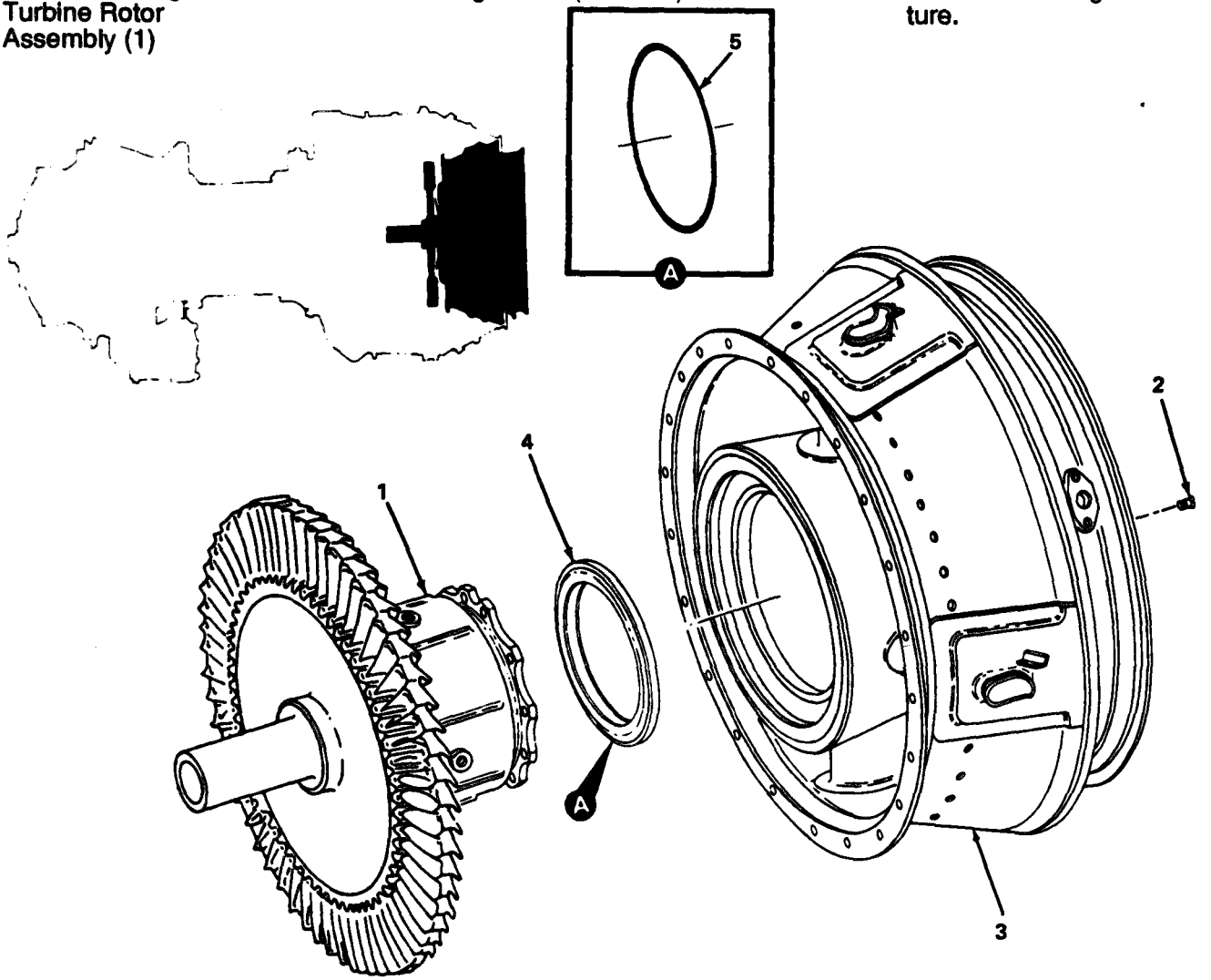
Applicable Configuration
T53-L-11 Series Engines

Special Tools
Holding Fixture (LTCT40)

Consumable Materials
Shortening Compound (item 74, Appendix D)
Ultrachem Assembly Fluid #1 (item 101, Appendix D)

References
Appendix G, Table G-3, Reference Number 24

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE SUPPORT ASSEMBLY/		
1. Second Stage Turbine Rotor Assembly (1)	Use holding fixture (LTCT40).	Place on holding fixture.



4-21. Second Stage Turbine Support Assembly (T53-L-11 Series Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE SUPPORT ASSEMBLY/ - Continued		
2. Seal (4) or Packing (5)	Insure groove in housing is clean. If seal (4) or packing (5) is to be installed, coat groove of housing with shortening compound (item 74, Appendix D) or Ultrachem Assembly Fluid #1 (item 101, Appendix D) to facilitate holding seal or packing in groove during assembly.	Install in groove on aft end of bearing housing.
3. Exhaust Diffuser Assembly (3)		Place over turbine assembly. Aline holes. Secure exhaust diffuser assembly to turbine rotor assembly with screws (2).
4. Screws (2)	Refer to Appendix G, table G-3, reference number 24.	Tighten as required.

4-22. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Disassembly (AVIM)

INITIAL SETUP

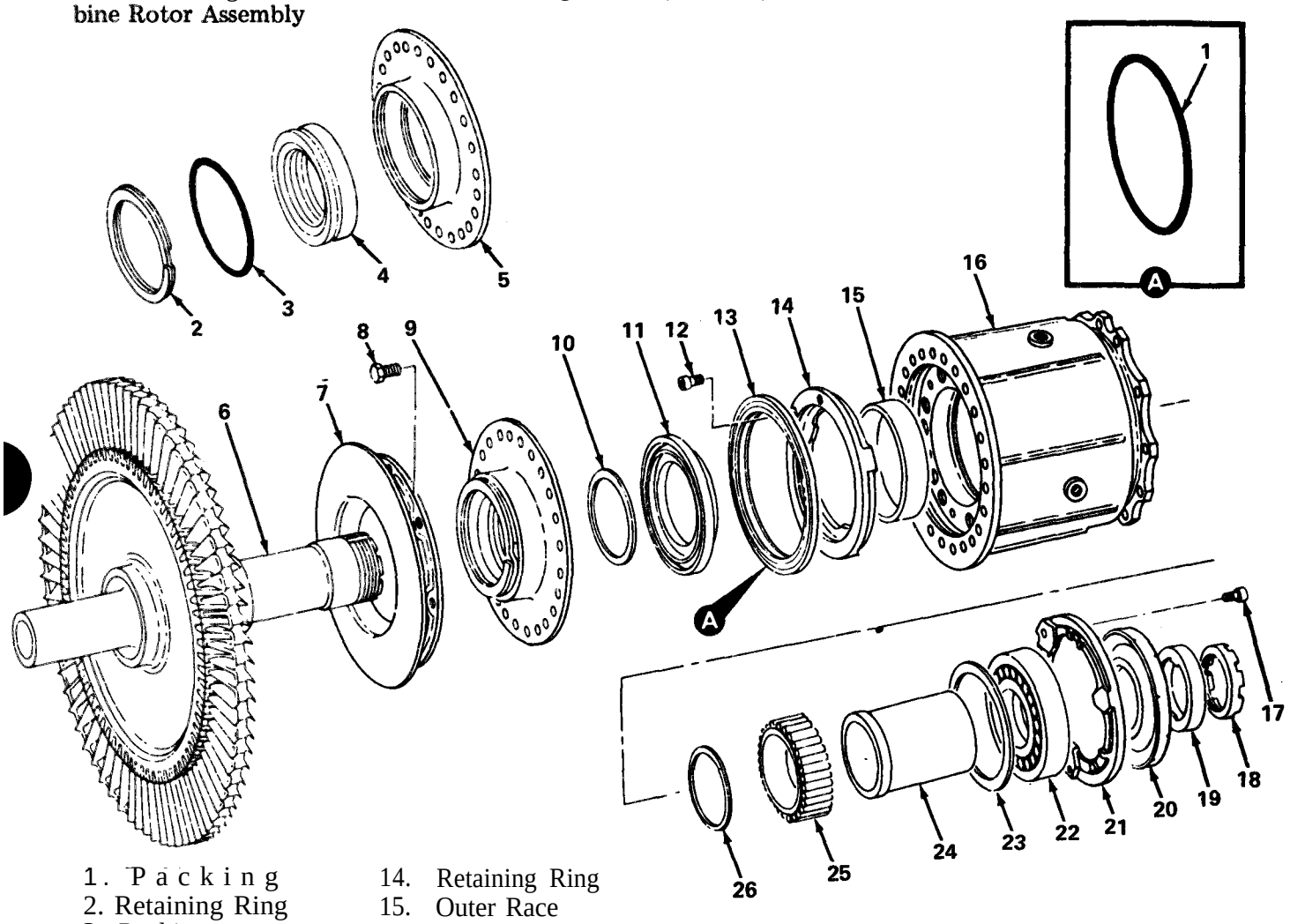
Applicable Configuration
T53-L-11 Series Engines

References
Para 1-56

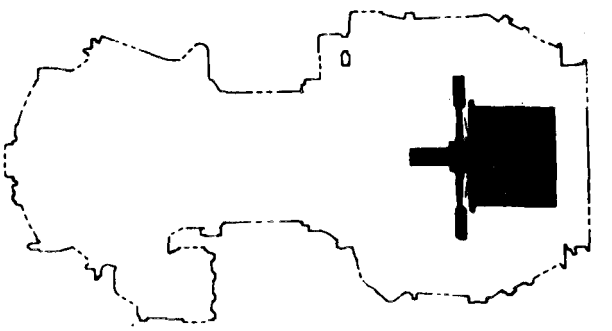
Special Tools
Holding Fixture (LTCT40)
Wrench (LTCT222)
Puller (LTCT4800)
Puller (LTCT2023)
Tool (LTCT482)
Spacer (LTCT4333, detail of LTCT482)
Base (LTCT2637, detail of LTCT482)
Stud (LTCT2639, detail of LTCT482)
Removal Disc (LTCT4334. detail of LTCT482)
Washer (LTCT9023-13, detail of LTCT482)
Handle (LTCT2667, detail of LTCT482)

4-22. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Disassembly (AVIM) - Continued

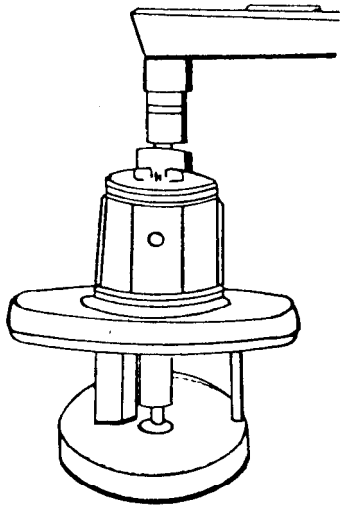
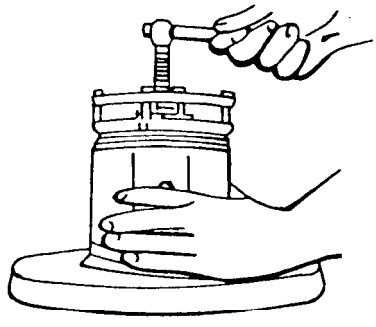
LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE SUPPORT ASSEMBLY/ - Continued		
1. Second Stage Turbine Rotor Assembly	Use holding fixture (LTCT40).	**Place in** holding fixture.



1. Packing
2. Retaining Ring
3. Packing
4. Seal
5. Housing
6. Turbine Rotor
7. Deflector
8. Bolt
9. Seal
10. Shim
11. Forward Impeller
12. Screw
13. Seal
14. Retaining Ring
15. Outer Race
16. Bearing Housing
17. Screws
18. Nut
19. cup
20. Rear Impeller
21. Retaining Ring
22. Bearing
23. Shim
24. Spacer
25. Roller
26. Shim



4-22. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Disassembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE SUPPORT ASSEMBLY/ - Continued		
2. Lock Cup (19)		**Straighten** tabs,
3, Nut (18) and Lock Cup (19)	Use wrench (LTCT222). 	**Position** wrench on nut. **Remove** nut and lock cup.
4. Rear Impeller (20)		**Remove.**
5. Bearing Housing (16)	Use puller (LTCT4800 or LTCT2023). 	**Install** puller on bearing housing (16). **Remove bearing** housing from second stage turbine rotor assembly (6). **Remove** puller from housing.
6. Rear Retaining Ring (21)	Use care when removing bearing. The bearing is a split-type bearing and must be removed as a unit, with inner races held together. If necessary, invert bearing housing and tap out bearing.	**Remove screws (17). Remove** retaining ring, **Lift out No. 4** bearing (22).

4-22. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Disassembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE SUPPORT ASSEMBLY/ - Continued		
7. Shim (23) and Spacer (24)		Remove from inside bearing housing.
8. No. 3 Bearing Inner Race, Rollers (2 5), Shim (26)	No. 3 bearing outer race (15) remains in housing.	Remove carefully.
9. Cooling Air Deflector (7)		Remove bolts (8). Remove deflector (7).
10. Seal, Housing Assembly (9), Forward Impeller (11)		Remove.
11. Forward Retaining Ring (14)		Remove screws (12). Remove retaining ring (14). Remove seal (13) from groove on bearing housing 16) or remove packing 1) from retaining ring 14).
12. Shim (10)	When removing shim record shim thickness for reassembly and attach to forward impeller (11) with lockwire.	Remove from second stage turbine rotor shaft.
13. No. 3 Bearing Outer Race	To remove No. 3 bearing outer race (15), position drift against outer race at points where housing cutouts reveal race.	Position bearing housing, forward end down. Tap from housing with hammer and brass drift.
14. Seal (4)	See paragraph 1-56 for replacement conditions. Prepare installing and removing tool (LTCT482) by installing spacer (LTCT4333, detail of LTCT482) on base (LTCT2637, detail of LTCT 482) and stud (LTCT2639, detail of LTCT482). Use removal disc (LTCT 4334, detail of LTCT482). LTCT9023-13, detail of LTCT482. LTCT2667, detail of LTCT482. **NOTE** Position removal disc to seat firmly on rim of seal and not on seal housing.	Replace as follows: a. Remove retaining ring (2) from seal housing (5). b. Position seal housing ons spacer and base, forward face down.

4-22. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) -Disassembly (AVIM)- Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE SUPPORT ASSEMBLY/ - Continued		**c.install** removal disk. d. **Install** flat washer. **Install handle** on stud. **e. Attach removal disk to handle.** **f. Position handle on base.** **g. Tighten handle. Press out** seal **(4). Remove and discard packing (3).**

4-23. **Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Disassembly**

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Special Tools
Holding Fixture (LTCT4553)
Wrench (LTCT915)
Mechanical Puller (LTCT4800)
Base Assembly (LTCT4947)
Mechanical Puller (LTCT4846)

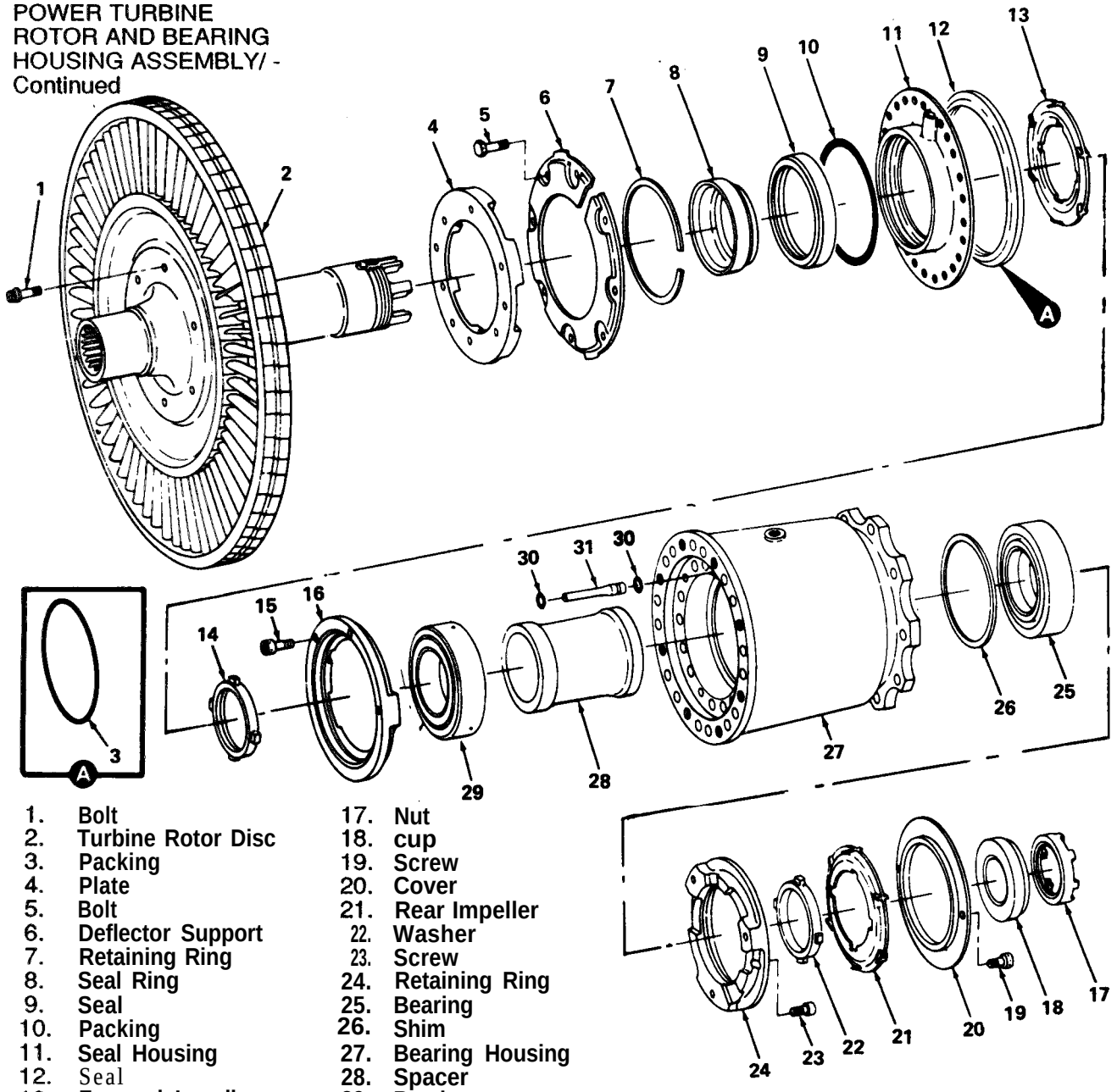
LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE ROTOR AND BEARING HOUSING ASSEMBLY/	**WARNING** **FLIGHT SAFETY PARTS** **Turbine Disk and Hub (Second Stage Power Turbine Rotor Disk)** **Handle with caution and provide protective covering when removed from engine.**	

4-23. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE ROTOR AND BEARING HOUSING ASSEMBLY/ - Continued		
1. Power Turbine Rotor and Bearing l-lousing Assembly	Use holding fixture (LTCT4553).	Place in holding fixture.
2. Lock CUP (18) and Nut (17)	Use wrench (LTCT915).	Remove nut (17) with wrench. Remove lock cup (18).

4-23. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE ROTOR AND BEARING HOUSING ASSEMBLY/ - Continued		



1. Bolt
2. Turbine Rotor Disc
3. Packing
4. Plate
5. Bolt
6. Deflector Support
7. Retaining Ring
8. Seal Ring
9. Seal
10. Packing
11. Seal Housing
12. Seal
13. Forward Impeller
14. Ring
15. screw
16. Ring Assembly
17. Nut
18. cup
19. Screw
20. Cover
21. Rear Impeller
22. Washer
23. Screw
24. Retaining Ring
25. Bearing
26. Shim
27. Bearing Housing
28. Spacer
29. Beating
30. Packing
31. Tube

4-23. Power Turbine Rotor and Bearing f-lousing Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE ROTOR AND BEARING HOUSING ASSEMBLY/ - Continued		
3. Screws (19) and Cover (20)		Remove.
4. Rear impeller (21) and Washer (22)		Remove.
5. Bearing Housing (27)	Use mechanical puller (LTCT4800).	Install puller on bearing housing (27). Pull bearing housing from turbine rotor (2).
6. Bolts (5) and De-flector Support (6)		Remove.
7. Seal Housing (11) and Impeller (13)		Remove.
8. Retaining Ring (7)		Remove from seal housing assembly.
9. Seal (9)	Use arbor press, removal and in-stallation tool bushing, and base assembly (LTCT4947).	Press out of seal housing.
10. Packing (10)		Remove from seal housing.
11. Screws 15) and Ring Assembly(16)		Remove.
12. Packing (3) or Seal (12)	Discard packing (3). Seal (12) is reusable.	Remove packing (3) from ring assembly. Remove seal (12) from groove on bearing housing.
13. Tube (31) and Packing (30)		Remove.
14. Packing (30)		Remove from bearing housing.
15. Seal Ring (8) and Ring (14)	Use mechanical puller (LTCT4846).	Remove with puller.

4-23. Power Turbine Rotor end Bearing Housing Assembly (T53-L-13B/703 Engines) - Disassembly Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE ROTOR AND BEARING HOUSING ASSEMBLY/ - Continued		
16. Spacer (28), Inner Race, and Rollers of Bearing (29)		**Remove from bearing** housing.
17. Bearing (25) and Shim (26)	Use hammer and suitable brass drift.	**Remove** retaining ring (24), screws (23) and **tap** bearing (25) out of bearing housing. **Remove shim (26).**
18. Turbine Rotor Disc (2)		**Remove bolts (1) and** plate **(4).**

4-24. **Second Stage Turbine Rotor Assembly (T53-L-11 series Engines) - Inspection**

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

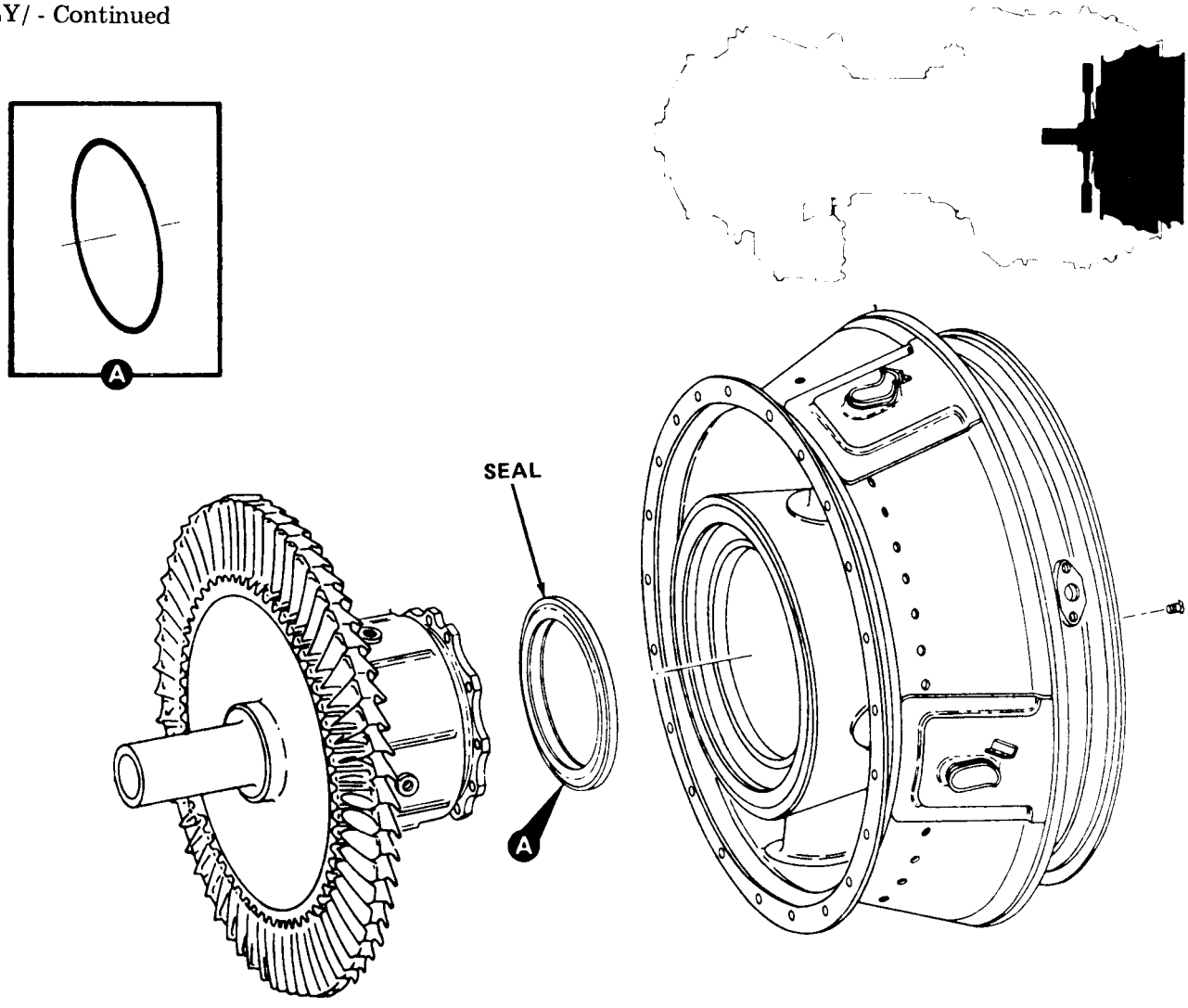
References
Para 4-8

Special Tools
Pressure Teat Fixture (LTCT3694)

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/		
1. **Turbine Rotor Shaft**		**Inspect** for positive contact seal, tracking and residual deposits of coke, varnish, and carbon.

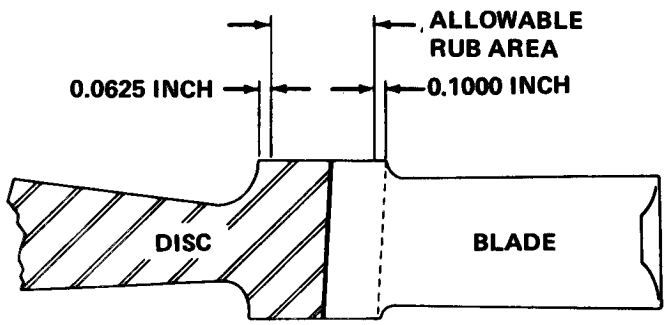
4-24. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) -Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/ - Continued		



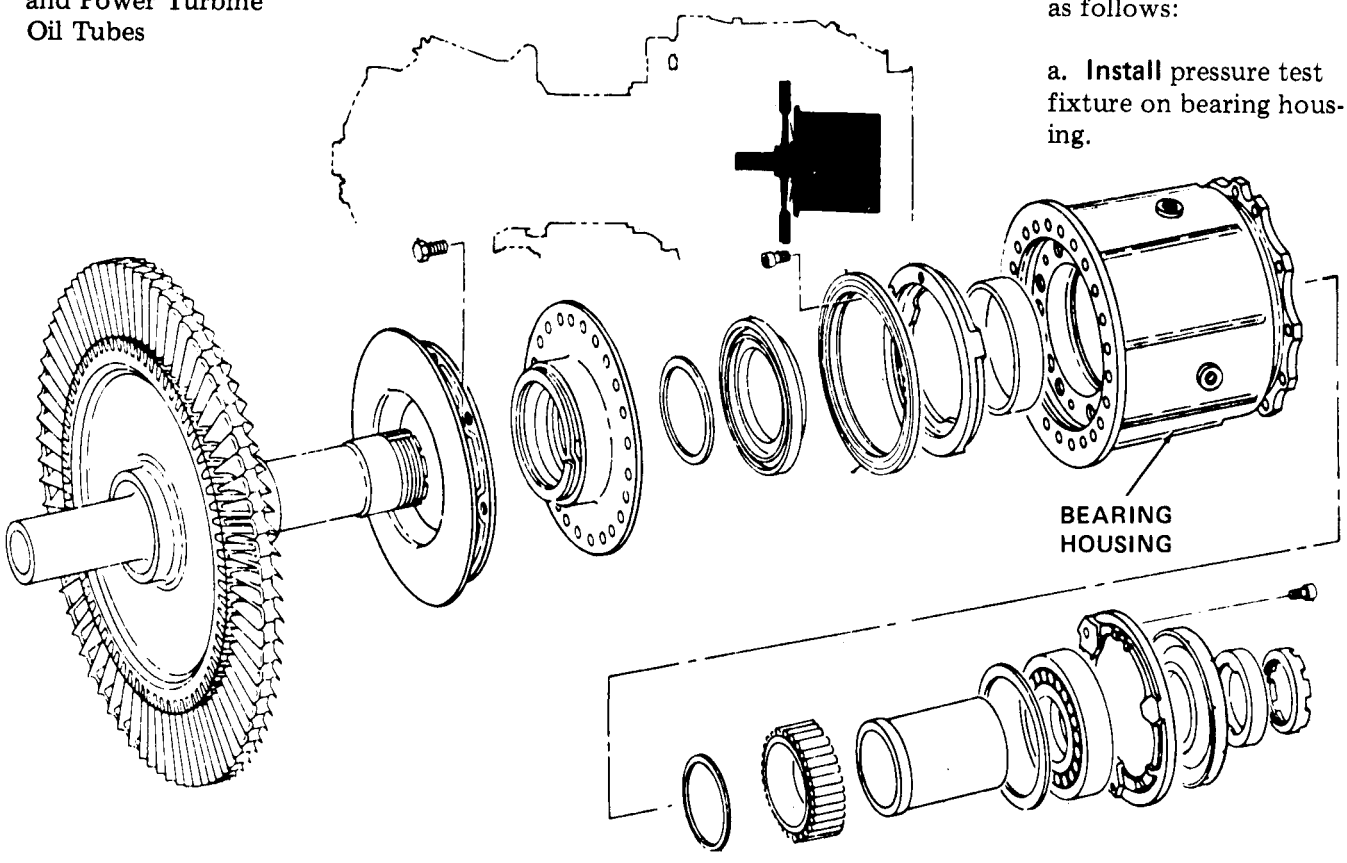
2. Turbine Rotor Shaft		Visually **inspect** all parts for cracks, nicks, dents and other damage.
3. Seal		**Inspect** for cuts, nicks, tears, cracks, distortion, pliability and wear. If darnaged is noted re-**place seal.**
4. Second Stage Turbine Rotor Assembly	Use 7-power magnifying glass.	Visually **inspect as** follows:

4-24. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/ - Continued		a. Blade surfaces and leading trailing edges for nicks, dents, and cracks. No cracks are allowed. No dents are allowed within 0.500 inch (1.270 cm) from blade platform. b. Inspect blade tip (shroud end) for cracks and scoring. No cracks are allowed. c. Inspect turbine disc for cracks. No cracks are allowed.
5. Made Roots and Turbine Disc		**Inspect** for circumferential rubs. Circumferential rubs are acceptable without repair as follows: a. Rubs may extend around entire circumference (360 degrees) of disc face. b. Rubs are permitted only on disc and blade root surfaces. c. Rubs may have maximum depth of 0.003 inch (0.007 cm).
6. Power Turbine Forward Seal Flange and **Nozzle** Air **Seal**	Rubs are permitted if clearance requirements are met as outlined in paragraph 4-8.	Inspect for rubs between OD of power turbine forward seal flange and ID of power turbine nozzle air seal.
7. Engine	If engine oil consumption is excessive and the following conditions exist:	**(AVIM) - Replace** no. 3 bearing seal.

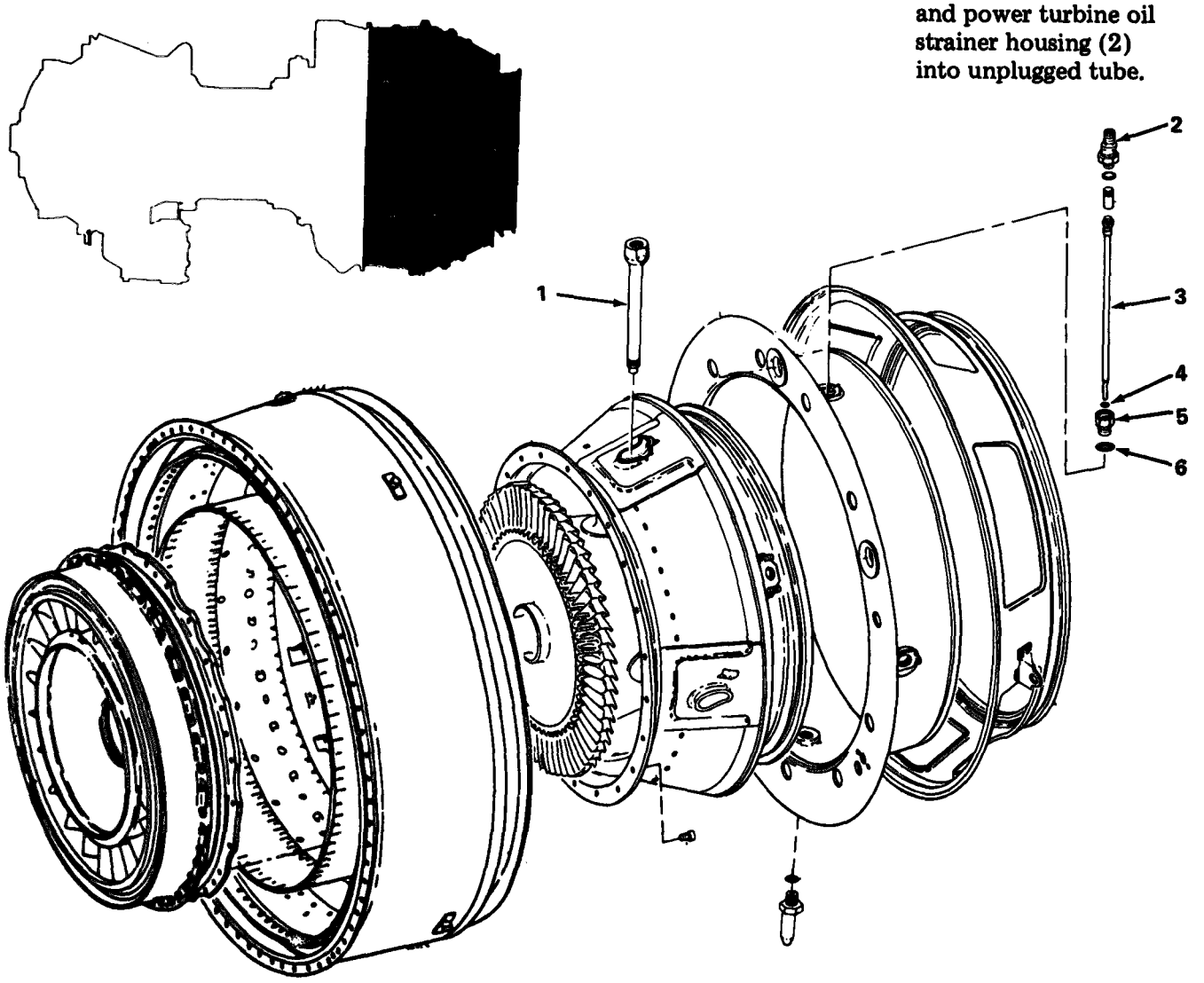
4-24. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/ - Continued		
	a. Oil is observed dripping from aft end of engine or tailpipe after shutdown.	
	b. Excessive exhaust smoke is noticed during engine operation.	
	c. Thick deposit of soft wet carbon is observed on cooling air deflector near the bolt holes.	
8. Blades		(AVIM) - **Inspect** for axial blade movement. Maximum acceptable blade movement is 0.009 inch (0.023 cm) measured at blade root.
9. Bearing Housing and Power Turbine Oil Tubes	Use pressure test fixture (LTCT3694).	(AVIM) - **Pressure-test** as follows: a. **Install** pressure test fixture on bearing housing.



4-24. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		
	To prevent air leakage, plug one of the tubes with packing, P/N NAS617-6 and plug 1-150-001-01.	b. Screw **in** two power turbine oil tubes (1) and **tighten** to 90-110 pound-inches (1.0-1.3 kg/m) torque.
	NOTE **Oil** nozzle **(3) is** not to be installed during pressure-teat.	
		c. Install packing (6), adapter (5), packing (4), and power turbine oil strainer housing (2) into unplugged tube.



4-24. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	**NOTE** **No** leakage is allowed. Replace bearing housing if leakage is evident.	d. **Apply 30** psig (2.11 kg/sq cm) air pressure to power turbine oil strainer housing (12). **Check** for leakage by immersing bearing housing in water or oil. e. **Remove** pressure test fixture. **Remove** power turbine oil strainer housing (2), packing (4), adapter (5), and packing (6). f. **Remove** plug 1-150-001-01 and packing, P/N NAS617-6, from tube. g. **Remove** power turbine oil tubes (1).

4-25. **Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM)**

INITIAL SETUP

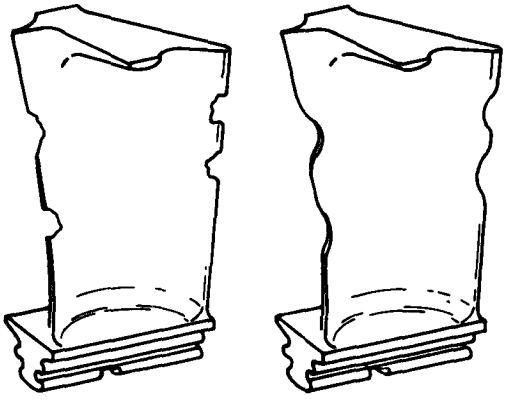
Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Crocus Cloth (item 21, Appendix D)
Sandpaper (No. 320) P-P-101 (item 71, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLYI	**NOTE** Remarks and actions pertaining to items 1 thru 3 are rules to be observed during repair of second stage turbine rotor assembly.	

4-25. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/ - Continued	**NOTE** Use portable power drill or rotary file for repair procedures. **Rotary** file shall be equipped with carbide burr. If these items are not available, Swiss type file, India or Carborundum stone may be substituted. Finish strokes of leading and trailing 'edges of blades shall be parallel to edges of blades.	
1. Leading or Trailing Edges of Blades		**Blend-repair** to smooth radius as part of repair procedures.
	WHEN THE DISTANCE BETWEEN THE DAMAGE IS GREATER THAN TWICE THE DEPTH OF THE DEEPER DAMAGE, MAKE SEPARATE REPAIRS.	
2. Disc Area	Perform this action when touchup painting is required.	**Rework as** follows: a. Lightly **abrade disc** area with sandpaper (item 71, Appendix D). b. **Paint areas using** brush or cloth.

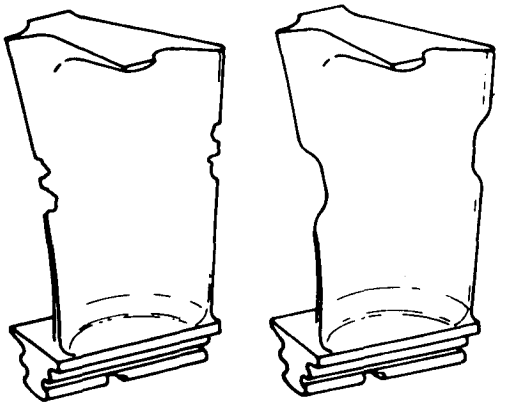


DAMAGED **REPAIRED**

4-25. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/ - Continued		
		c. Air dry with warm air or use infrared lamp at minimum of 30°F (17°C) above ambient temperature for one hour.
	NOTE Repair leading and/or trailing edges of second stage turbine rotor assembly according to the following limits in actions for items 4 thru 7. Finished repair length shall be blended to a minimum of three times depth of damage.	
3. Leading and Trailing Edge	Maximum permissible finished repair depth is 0.125 inch (3.18 mm) from leading edge and 0.090 inch (2.29 mm) from trailing edge at shroud end of blade. Allowable depths decrease as distance between damage and point A on leading edge and point B on trailng edge decreases.	**Observe** allowable limits.

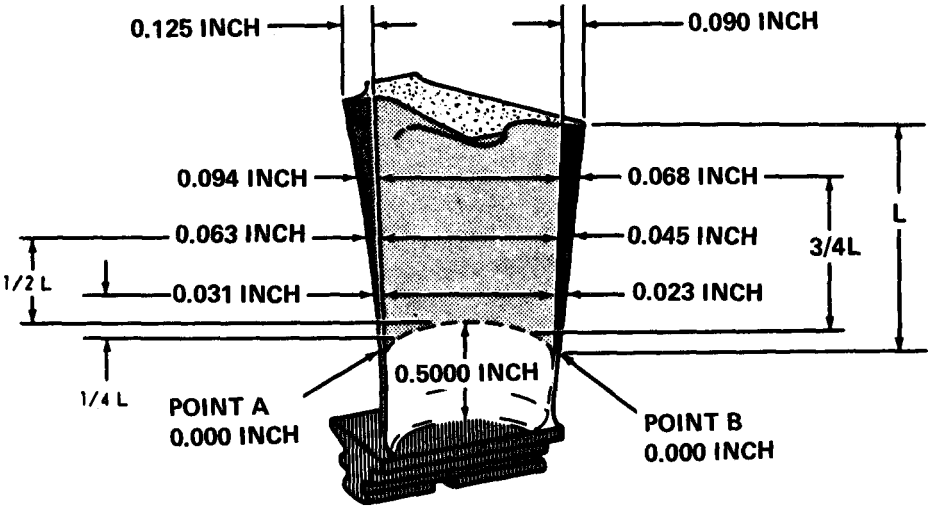
WHEN THE DISTANCE BETWEEN THE DAMAGE IS LESS THAN TWICE THE DEPTH OF THE DEEPER DAMAGE, MAKE ONE REPAIR AREA.

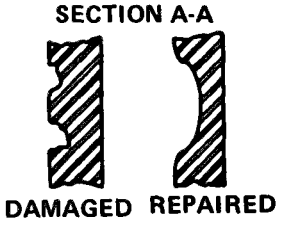


DAMAGED **REPAIRED**

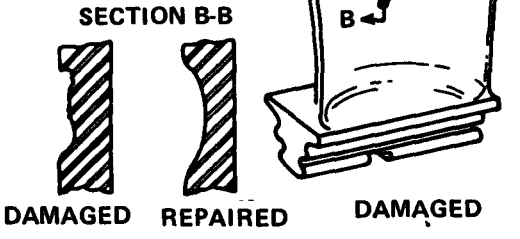
4-25. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM) - Continued

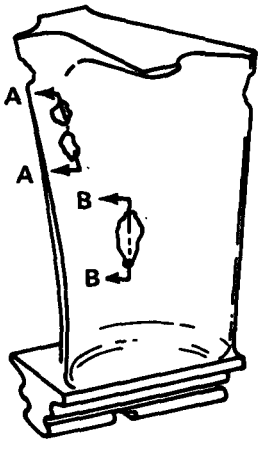
LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/ - Continued		

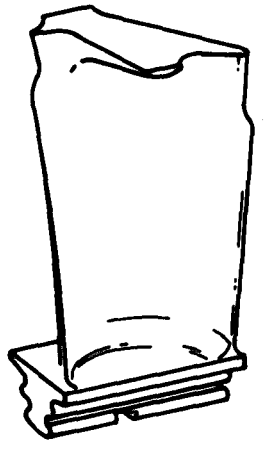




WHEN THE DISTANCE BETWEEN TWO DAMAGED AREAS IS LESS THAN TWICE THE DEPTH OF THE DEEPER DAMAGE, MAKE ONE REPAIR.







4. Round Bottom Dents	**This action pertains to dents 0.010 inch (0.25 mm) deep or less.**	Remove sharp edges only.
5. Shroud End of Blade	**Perform this action if distance between shroud end of blade is less than twice the depth of damage.**	**Extend repair to include shroud end.**

4-25. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/ - Continued		
6. Second Stage Turbine Rotor Assembly	If distance between two damaged areas is less than twice the depth of the deeper damage, make one repair area.	**Repair.**
7. Second Stage Turbine Rotor Assembly	If distance between damaged areas is greater than twice the depth of the deeper damage, make separate repair areas. See figure in item 4.	**Repair.**
	NOTE Repair blade surface area according to the following limits in actions for items 9 thru 15.	
8. Blade	Maximum permissible decrease in thickness at any point on blade shall be 0.010 inch (0.25 mm).	**Observe** allowable limits.
9. Blade Surface	Maximum permissible finished single repair shall be 0.200 square inch (5.08 sq mm) on either concave or convex side.	**Observe** allowable limits.
10. Blade Surface		**Blend-repair** to a minimum of twice the depth of damage.
11. Blade Surface	Total repaired surface area shall not exteed 10 percent of blade surface.	**Observe** allowable limits.
12. Blade Platform	Repairs are not allowed within 0.500 inch (1.27 mm) of blade platform.	**Observe** allowable limits,
13. Blade Surface	If distance between two damaged areas is less than twice the depth of the deeper damage, make one repair.	**Repair.**
14. Blade Surface	If distance between damaged area is greater than twice the depth of deeper damage, make separate repairs.	**Repair.**

4-25. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE TURBINE ROTOR ASSEMBLY/ - Continued	NOTE Shroud end, blade root, blade platform, and second stage turbine disc repair limits are as follows in remarks for items 16 and 17.	
15. Shroud End	Scoring is caused by blade rubbing against the cylinder. Localized burring similar to fits marks ma be distinguished as scoring. Maximum score depth at shroud end is 0.010 Inch (0.25 mm) along one-half blade width.	Observe allowable limlts.
16. Blade Root or Blade Platform Area	No repairs are permitted in these areas.	Do not repair.

4-26 Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Assembly (AVIM)

INITIAL SETUP

Applicable Configuration
T53-L-1 1 Series Engines

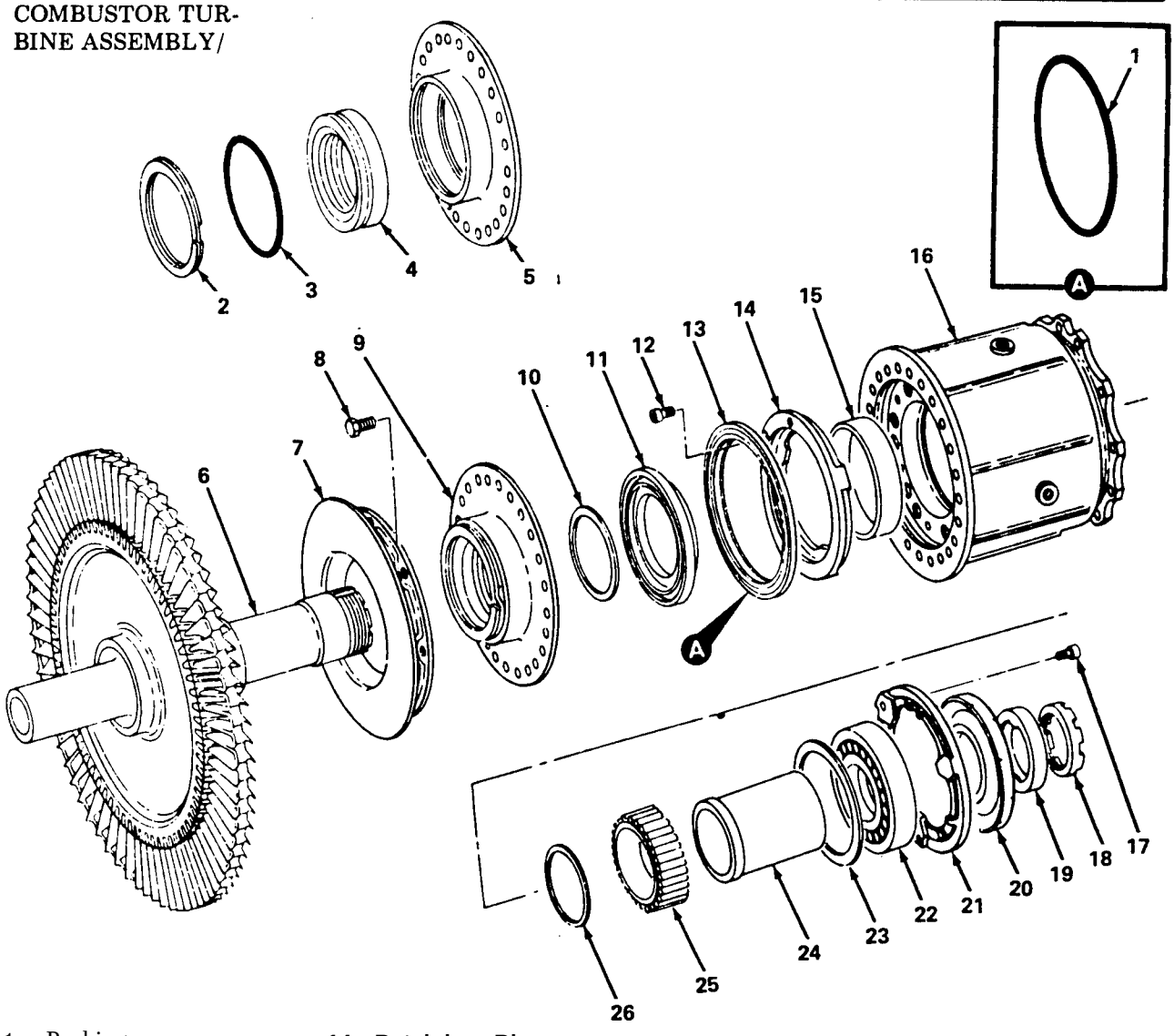
Special Tools
Base (LTCT2637, detail of LTCT482)
Washer (LTCT2638, detail of LTCT 482)
Flat Washer (LTCT9023, detail of LTCT482)
Handle (LTCT2667, detail of LTCT 482)
Handle (LTCT2639, detail of LTCT 482)
Installing Tool (LTCT481)
Adapters (LTCT4311 and LTCT4312, details of LTCT481)
Adapter Bushing (LTCT4310, detail of LTCT481)
Flat Washer (LTCT9023-10, detail of LTCT481)
Screw (MS16187-103, detail of LTCT 481)

Consumable Materials
Shortening Compound (item 74, Appendix D)
Ultrachem Assembly Fluid #1 (item 101, Appendix D)
Molykote Anti-Seize Thread Compound (item 58, Appendix D)
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease (item 103, Appendix D)
Lubricating Oil (item 55 or 56, Appendix D)

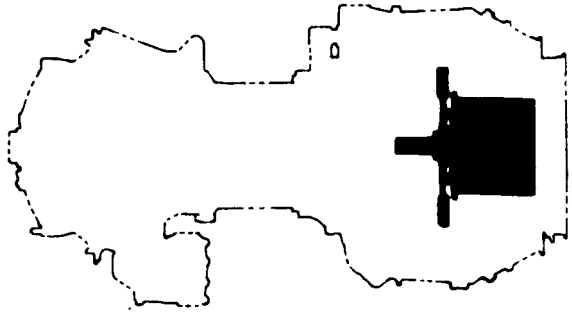
Referneces
Appendix G, Table G-3, Reference Number 30,25
Appendix G, Table G-5, Reference Number 46

4-26. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		



1. Packing
2. Retaining Ring
3. Packing
4. seal
5. Housing
6. Turbine Rotor
7. Deflector
8. Bolt
9.
10. shim
11. Forward Impeller
12. Screw
13. seal
14. Retaining Ring
15. Outer Race
16. Bearing Housing
17. Screws
18. Nut
19. cup
20. Rear Impeller
21. Retaining Ring
22. Bearing
23. Shim
24. Spacer
25. Roller
26. Shim

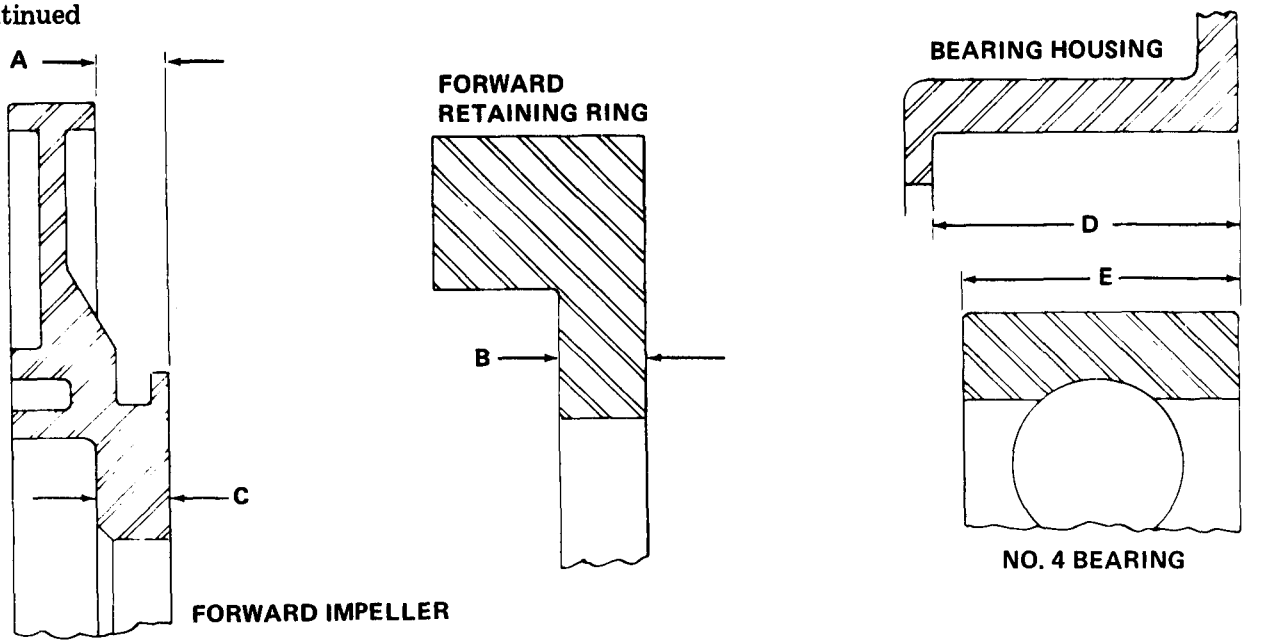


4-26. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
1. Seal (4)	If removed, install new seal in housing (5) in following items 2 thru 8.	**Install.**
2. Seal Housing (5)	Use base (LTCT2637) detail of (LTCT482).	**Position** on base, forward end up.
3. Packing (3)		**Install** in groove on seal.
4. Seal (4)	Position seal.	**Press** into housing.
5. Washer and Flat Washer	Washer (LTCT2638, detail of LTCT482). Flat Washer (LTCT9023-13, detail of LTCT482).	Place over seal.
6. Seal Housing (5)	Use handle (LTCT2667, detail of LTCT482).	**Position** on handle on stud (LTCT2639, detail of LTCT482).
	NOTE Position installation disc to seat firmly on seal surface.	
7. Seal Housing (5)		**Rotate** handle to press seal into housing.
8. Retaining Ring (2)		**Secure** seal.
9. Rear Shim (26)	Establish thickness of rear shim (26) according to actions for items 10 thru 12.	**Establish** thickness,
	NOTE Actions for items 10 thru 12 are necessary only if components have been replaced.	
10. Forward Impeller (11)	Use vernier or micrometer depth gage.	**Measure** distance (Dimension A). **Measure** from aft face of outer flange to aft face of inner flange.

4-26. second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



11. Forward Retaining Ring (14)	Use micrometer. Subtract dimension A from dimension B. Add 0.046 inch (1.17 mm) to result obtained in preceding step 10 to allow for clearance of impeller, bearing end play and No. 4 bearing pinch.	**Measure** thickness of leg (Dimension B).
12. Rear Shim (26)	Select shim that corresponds to thickness determined for items 9 and 10 above. EXAMPLE Dimension A = 0.120 inch (3.05 mm) Dimension B = 0.158 inch (4.01 mm) B - A = 0.158 inch -0.120 inch = 0.038 inch) (4.01 mm -3.05 mm = 0.97 mm) 0.038 inch + 0.046 inch = 0.084 inch (0.97 mm+ 1.17 mm= 2.13 mm) Desired shim thickness = 0.084 inch	Select shim.
13. Forward Shim (10)	Refer to actions for items 14 thru 16. **NOTE** Actions for items 14 thru 16 are necessary only if components have been removed.	**Establish** thickness.

4-26. Second Stage Turbine Rotor Assembly (153-L-11 Series Engines) - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
14. Forward Impeller (11)	Use micrometer. See figure in item 10.	**Measure** thickness (Dimension C) of inner flange.
15. Rear Shim and Impeller Inner Flange		**Add** rear shim thickness determined in preceding item 9 to impeller inner flange thickness. **Subtract** result obtained in preceding item from 0.300 inch (7.62 mm).
16. Shim	Select shim that corresponds to thickness determined for items 14 and 15. EXAMPLE Dimension C = 0.138 inch (3.51 mm) (Rear shim = 0.084 inch) (2.13 mm) 0.084 inch + 0.138 inch= 0.222 inch (2.13 mm+ 3.61 mm= 5.64 mm) 0.300 inch -0.222 inch = 0.078 inch (7.62 mm- 5.64 mm= 1.98 mm) Desired shim thickness = 0.078 inch (1.98 mm)	**Select** shim.
17. Bearing Outer Race (15)	Use plastic mallet. **CAUTION** **Be certain that ring with correct part number is inserted. Do not interchange rings,**	**Tap No.** 3 bearing outer race (15) gently. **Tap** into forward end of bearing housing (16).
18. Forward Retaining Ring (14)	Gently seat ring using plastic mallet (if necessary).	**Position in bearing housing (16). Aline** screw holes.

4-26. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued	NOTE Insure groove in housing (16) or surface of retaining ring (14) is clean. If seal (13) or packing (1) is to be installed, coat groove of housing or surface of retaining ring with shortening compound (item 74, Appendix D) or Ultrachem Assembly Fluid #1 (item 101, Appendix D) to facilitate holding seal in groove or packing on retaining ring during assembly.	
19. Seal (13) or Packing (1)		Install seal (13) in forward groove of bearing housing (16) or Install packing (1) on forward retaining ring (14).
20. Forward Retaining Ring (14)	Insure ring is not cocked.	Secure to housing with two screws (12).
21. Forward Impeller (11)		Install in forward retaining ring (1 4).
22. Seal and Housing Assembly (9)		Install in bearing housing (16). Anne holes.
23. Bolts (8)	Use Molykote Anti-Seize Thread Compound (item 58, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (Item 103, Appendix D).	Apply Molykote Anti-Seize Thread Compound.
24. Cooling Air Deflector (7)		Position over seal and housing assembly (9). Anne holes.
25. Cooling Air Deflector (7) and Seal and Housing Assembly (9)		Secure to bearing housing (16) with eight bolts (8).
26. Bolts (8)	Refer to Appendix G, table G-3, reference number 30.	Tighten as required. Lockwire bolts.
27, Shim (10)	Refer to action for item 16 for desired shim thickness.	Install on turbine rotor shaft.

4-26. Second Stags Turbine Rotor Assembly (T53-L-11 Series Engines) - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TUR BINE ASSEMBLY/ - Continued	**CAUTION** **When performing action for item 28, be careful not to damage carbon seal** (4) when **inserting assembly over shaft.**	
28. Second Stage Turbine Rotor (6)		**Invert and position bearing** housing assembly on second stage turbine rotor (6).
	NOTE Rear shim (item 26) shall seat against aft face of impeller inner flange.	
29. Rear Shim (26)	Refer to action for items 12 and 13 for desired shim thickness.	
30. No. 3 Bearing Inner Race	Use installing tool (LTCT481).	**Press No. 3 bearing** inner race and rollers (25) onto second stage turbine.
		a. **Install** adapter bushing (LTCT4310, detail of LTCT481) in end of second stage turbine rotor shaft.
	Use adapters (LTCT4311 and LTCT4312, details of LTCT481).	b. **Position** inner race and rollers on shaft, followed by adapters.
	Use flat washer (LTCT9023-10, detail of LTCT481) and screw (MS16187-103, detail of LTCT481). Use lubricating oil (Appendix D, item 55 and 56). When performing step e., rotate bearing housing while pressing to insure parts are not binding. Insure inner race and rollers are fully seated.	**c.** Install flat washer on screw. d. **Lubricate screw threads. Turn screw and** handle assembly into plug.

4-26. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TUR BINE ASSEMBLY/ - Continued		e. **Rotate** handle to press inner race and rollers onto shaft. f. **Remove** screw, handle assembly and plug.
31. Spacer (24)		Install on second stage turbine rotor (6).
32. Shim (23)	Maintenance of axial pinch given in Appendix G, table G-5, reference number 46. See figure pertaining to item 10.	**Select** to maintain axial pinch on No. 4 bearing outer race. a, Using vernier or micrometer depth gage, **measure** depth of bearing housing (dimension D). b. Using micrometer, **determine** axial dimension of No. 4 bearing outer race (dimension E). **c. Subtract** dimension E from dimension D. d. **Add** nominal 0.005 inch (0.1 3 mm) to result of step c. to determine thickness of shim.
33. Shim (23)		**Install in** bearing housing.
	CAUTION **When installing bearing in following action for item 34, be certain bearing-to-bearing housing alinement is concentric.**	

4-26. Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/-Continued		
34. Bearing (22)	Use installing tool (LTCT481) with cup.	**Press No. 4 bearing (22)** onto turbine rotor shaft and into bearing housing; simultaneously using installing tool with cup,
35. Installing Tool (LTCT481)		**Remove from shaft.**
36. Rear Retaining Ring (21)		**Insert** into bearing housing until seated against bearing. **Aline** holes in bearing retaining ring with screw holes in-housing.
37. Retaining Ring	Insure retaining ring is not cocked.	**Secure by tightening two screws (17)** snugly,
38. Rear Impeller (20)		Install.
39. Lock Cup (19) and Nut (18)	Do not lubricate nut.	**Install.**
40. Nut **(18)**	Refer to Appendix G, table G-3, reference number 25.	**Tighten** as required.
	CAUTION **Be certain lock cup in following item 41 does not shear.**	
41. Lock Cup (19)		**Bend** tabs into slots 180 degrees apart in spanner nut.

4-27. Second Stage Turbine Rotor (T53-L-13B/703 Engines) - Establishing Tip Clearance

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Special Tools
Hand Crank (LTCT4650)

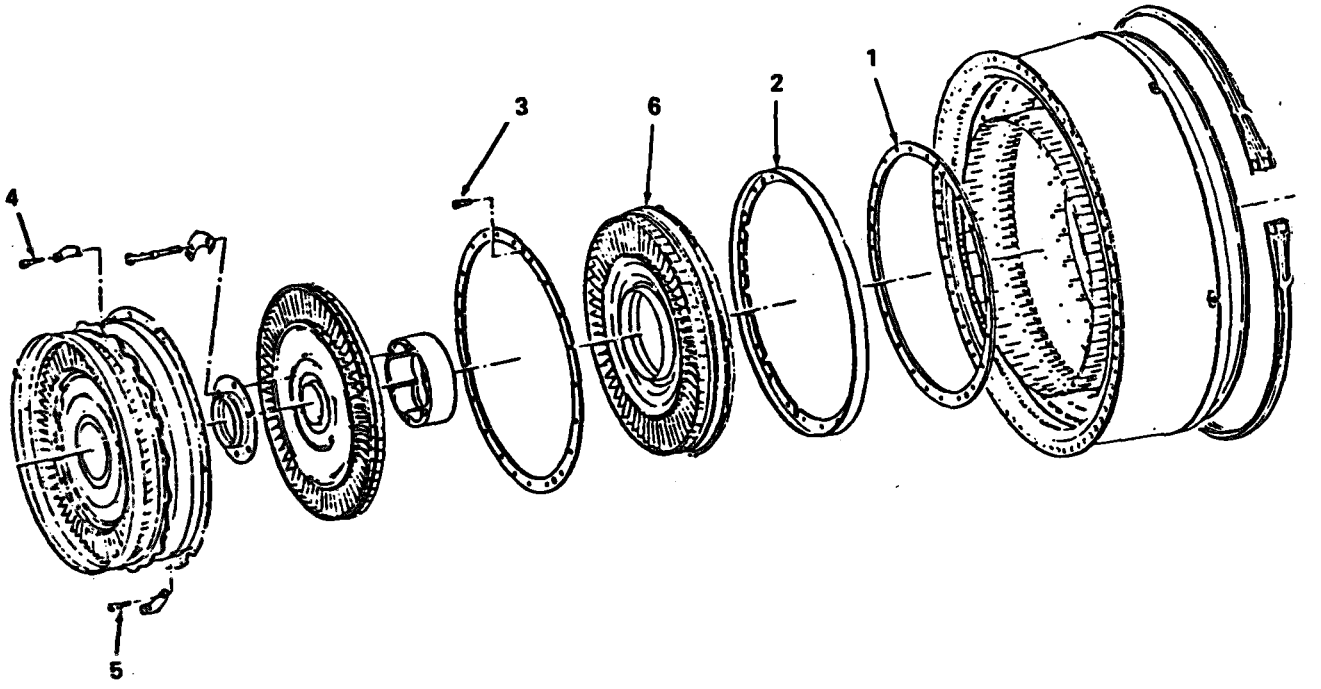
Consumable Materials
Tape (item 79, Appendix D)
iron-Bhe Pigment' (item 37, Appendix D)
Molykote Anti-Seize Thread Compound (item 58, Appendix D)
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease (item 103, Appendix D)

References
Appendix G, Table G-6, Reference Number 40,37

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE POWER TURBINE ROTOR ASSEMBLY/		
1. Second Stage Power Turbine Rotor	Use 0.020 inch copper wire and tape (item 79, Appendix D)	Determine actual tip clearance as follows: a. Measure thickness of tape. bl Secure short length of copper wire on tips of power turbine blade at three locations.
2. Second Stage Power Turbine Rotor	Apply enough thickness of tape on blade tips so that the thickness of the wire plus a single layer of tape on top of the wire equals the minimum tip clearance of 0.025 inch (0.63 mm).	Paint tape with iron-blue pigment (item 37, Appendix D).
3. Spacer(1) and Ring (2)	Spacer shall be 0.032 inch nominal thickness. Refer to the following table for spacer thickness. Part Number / Thickness 1-140-276-01 / 0.022 to 0.028 inch 1-140-276-02 / 0.029 to 0.035 inch 1-140-276-03 / 0.036 to 0.044 inch	Place on combustion chamber flange. Anne bolt holes.

4-27. Second Stage Turbine Rotor (T53-L-13B/703 Engines) - Establishing Tip Clearance - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE POWER TURBINE ROTOR ASSEMBLY/ - Continued		



4. Pins (3)	Three pins shall be installed with same dash number. Select pins to obtain loose fit as given in Appendix G, table G-6, reference number 45.	Install.
5. Bolts (4 and 5)	**Use Molykote Anti-Seize Thread Compound (item 58, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D).**	Apply to **bolts.**
6. Ring 2 and Spacer (1)		Secure with four equally spaced bolts (4 and 5).
7. Bolts (4 and 5)		Tighten evenly to proper torque.
8. Second Stage Power Turbine Nozzle (6)	Use care not to rub against tape while performing this action.	Carefully position over power tubine rotor and into ring (2).

4-27. Second Stage Power Turbine Rotor (T53-L-13B/703 Engines) - Establishing Tip Clearances - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE POWER TURBINE ROTOR ASSEMBLY/ - Continued		
9. Second Stage Power Turbine Nozzle (6)	Maintain downward pressure on nozzle while performing this action.	**Rotate** power turbine rotor one revolution, using hand crank (LTCT4650) installed in second power turbine rotor.
10. Second Stage Power Turbine Nozzle (6)	If rubbing is not evident, tip clearance is acceptable.	Carefully **remove. Check tape** for signs of rubbing.
11. Second Stage Power Turbine Rotor	Perform these actions if rubbing is evident. Tip clearance shall be as given in Appendix G, table G-6, reference number 40, after these steps have been performed.	**Determine** tip clearance as follows : a. **Select** tape from each diameter which has greatest rub. b. If iron-blue pigment has been removed, but tape has not been cut, tip clearance is **equal** to diameter of wire plus total thickness of tape used at that position. c. If tape has been cut completely through, but wire has not been damaged, tip clearance is **equal to** diameter of wire plus thickness of tape under wire. d. If tape has been cut completely through and wire appears damaged, **measure** diameter of wire. Tip clearance is **equal** to minimum wire diameter plus thickness of tape under wire.

4-27. Second Stage Power Turbine Rotor (T53-L-13B/703 Engines) - Establishing Tip Clearances - Continued

LOCATION/ITEM	REMARKS	ACTION
SECOND STAGE POWER TURBINE ROTOR ASSEMBLY/ - Continued		
12. Second Stage Power Turbine Rotor	If desired clearance has not been obtained in preceding action for item 11, perform this action.	Recheck alinement and torquing of bearing housing to exhaust diffuser or **replace** nozzle.
13. All Installed Tapes and Wires		**Remove.**

4-28. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L11 Series Engines

Special Tools
Removal Kit (LTCT4675)
Holding Fixture (LTCT13430)
Holding Fixture (LTCT4533)
Power Wrench (PD2501)
Wrench Assembly (LTCT4797)
Cone Removal Tool (LTCT13676)
Cone Removal Tool (LTCT6465)

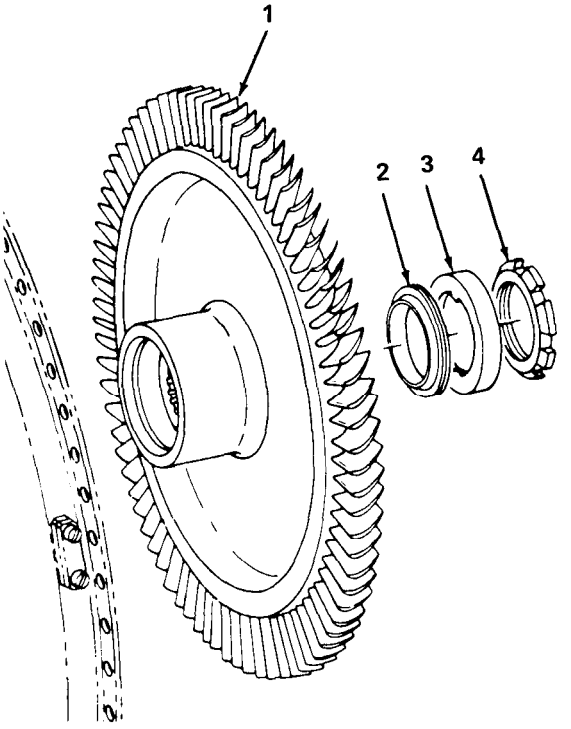
Consumable Materials
Colorbrite No. 2107 (item 54, Appendix D)

References
Para 4-37 and 4-2

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/	**NOTE** Do not remove first stage turbine rotor except to correct visible damage or to replace parts.	

4-28. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued	**NOTE** Before removing the first stage turbine rotor, apply mating marks on turbine wheel and compressor rotor rear shaft, using marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D), Before removing the first stage turbine rotor, check tip clearances, (Refer to paragraph 4-37.) Record these readings for reference at engine assembly.	
1. Combustor Turbine Assembly	Refer to paragraph 4-2.	**Remove.**
2. Compressor Shaft Rear Bearing Lockring (3)		**Straighten,**



NOTE

Refer to table below for tools necessary to remove spanner nut, lockring, and cone for following items 3 thru 7.

4-28. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION

COMPRESSOR ROTOR ASSEMBLY/ - Continued

Spanner Nut and Cone Removal and Installation Tools (T53-L-11 Series Engines)

Shaft Holding or Torque Fixture	Wrench Socket	Power Wrench	Cone Removal Tool Adapter	Cone Removal Tool
LTCT13430	LTCT260 or LTCT4797	-	-	LTCT502 or LTCT 674 or LTCT4069, Details of LTCT 4675
LTCT13430	LTCT587, Detail of LTCT13430 or LTCT4675	-	-	LTCT502 or LTCT 674 or LTCT4069, Detail of LTCT 4675
LTCT4533	LTCT587, Detail of LTCT13430 or LTCT4675	-	-	LTCT502 or LTCT 674 or LTCT4069, Detail of LTCT 4675
LTCT13430	LTCT13435, Detail of LTCT13430	PD2501	LTCT13676	LTCT6465

NOTE : This table lists the tools necessary for removing and installing the spanner nut and cone in the combinations that can exist.

3. First Stage Turbine Rotor Rear Hub

Position and secure torque fixture to first stage turbine rotor rear hub.

4. Torque Fixture

Install wrench socket into torque fixture, engaging tangs of wrench socket with slots in retaining spanner nut (4).

5. First Stage Turbine Rotor Assembly

Remove nut (4) and lockring (3) with power wrench.

6. Compressor Turbine Rear Cone (2)

Remove using cone removal tool and cone removal tool adapter.

7. First **Sage** Turbine Rotor Rear Hub

Remove torque fixture from first stage turbine rotor rear hub.

4-28. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		
	NOTE An alternate method to preceding action for items 3 thru 7 is shown in following actions for items 8 thru 13. Refer to preceding table for tools necessary to remove spanner nut, lockring, and cone in following action for items 8 thru 12.	
8. Diffuser Housing		**Position** and **secure** shaft holding fixture to diffuser housing.
9. Wrench Socket		**Install** into shaft holding fixture, engaging tangs of wrench socket with dots in retaining spanner nut (4).
10. Nut (4) and Lockring (3)		**Remove.**
11. Compressor Turbine Rear Cone (2)		**Remove** using cone removal tool.
12. Diffuser Housing		**Remove** shaft holding fixture from diffuser housing.
13. First Stage Turbine Rotor (1)		**Remove.**

4-29. First Stage Turbine Rotor Assembly (T53-L-11 series Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-11 series Engines

Consumable Materials
Drycleaning Solvent (item 24, Appendix D)

References
Pare 4-30, H-25

LOCATION/ITEM	REMARKS	ACTION
REAR COMPRESSOR SHAFT/		

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 13°F (38°C to 59°C).

CAUTION

Use extreme care when cleaning first stage turbine rotor to prevent abrasion of coating on blades.

NOTE

Before cleaning first stage turbine blades or disc, inspect disc for a thick deposit of hard glazed carbon on forward face. If such a deposit is found, replace rear bearing seal.

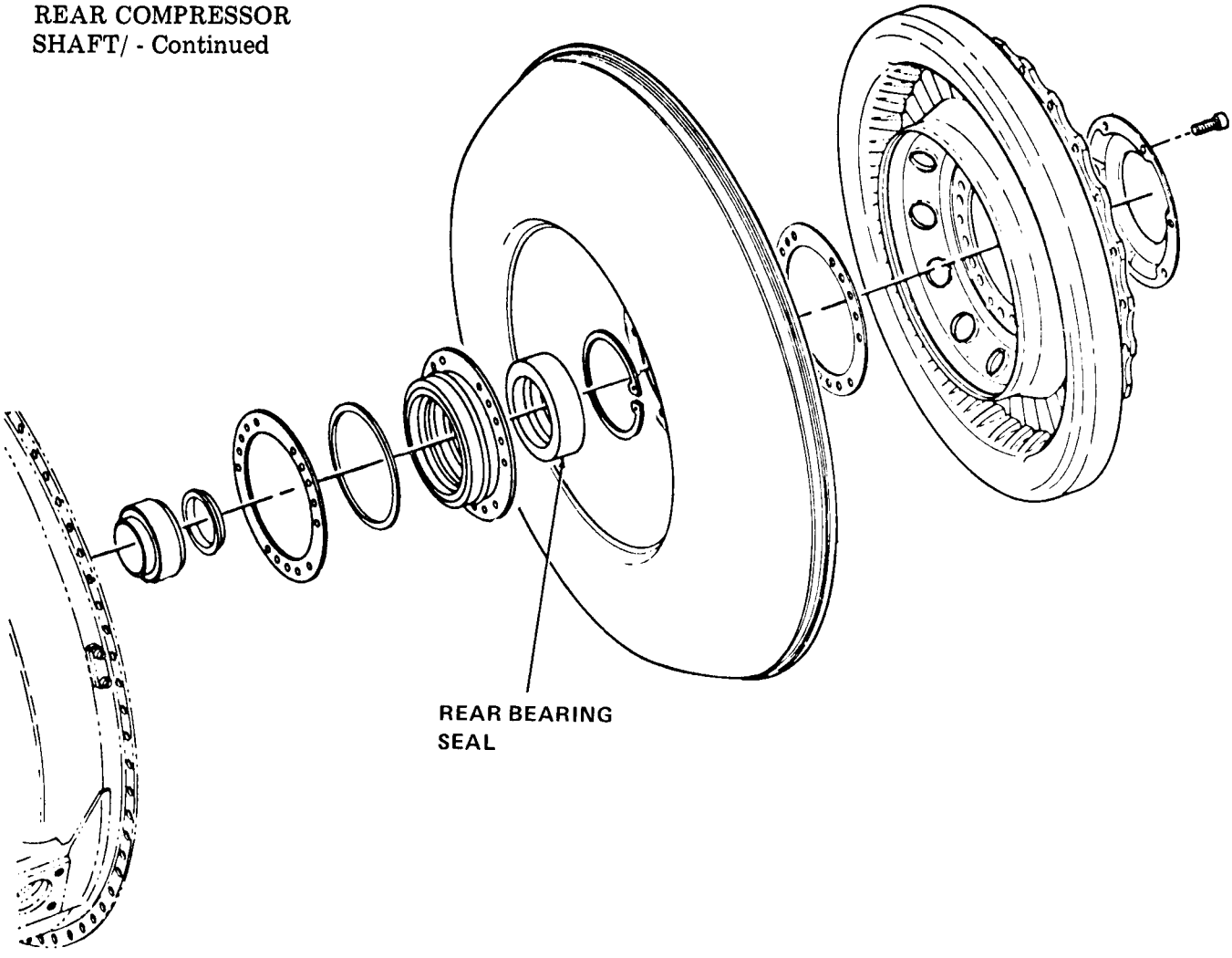
1. Blades	Use drycleaning solvent (item 24, Appendix D).	Clean first stage turbine blades as necessary to expose the metal.
2. Blades	Use 7-power magnifying glass.	Visually inspect each blade for cracks. No cracks are allowed.

NOTE

Actions for items 3 thru 5 pertain to inspection limits for blades.

4-29. First Stage Turbine Rotor Assembly (T53-L-11 series Engines) - Inspection - Continued

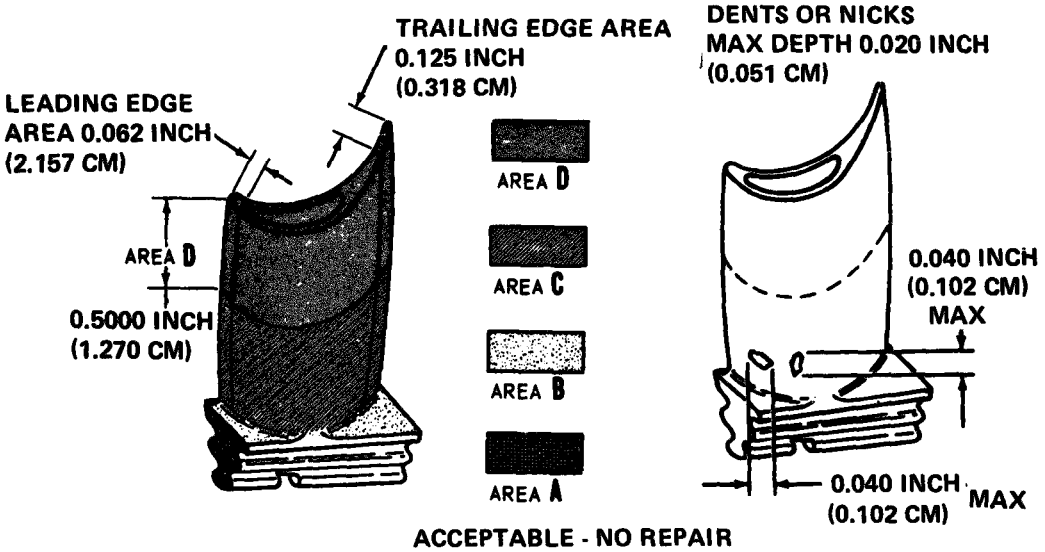
LOCATION/ITEM	REMARKS	ACTION
REAR COMPRESSOR SHAFT/ - Continued		



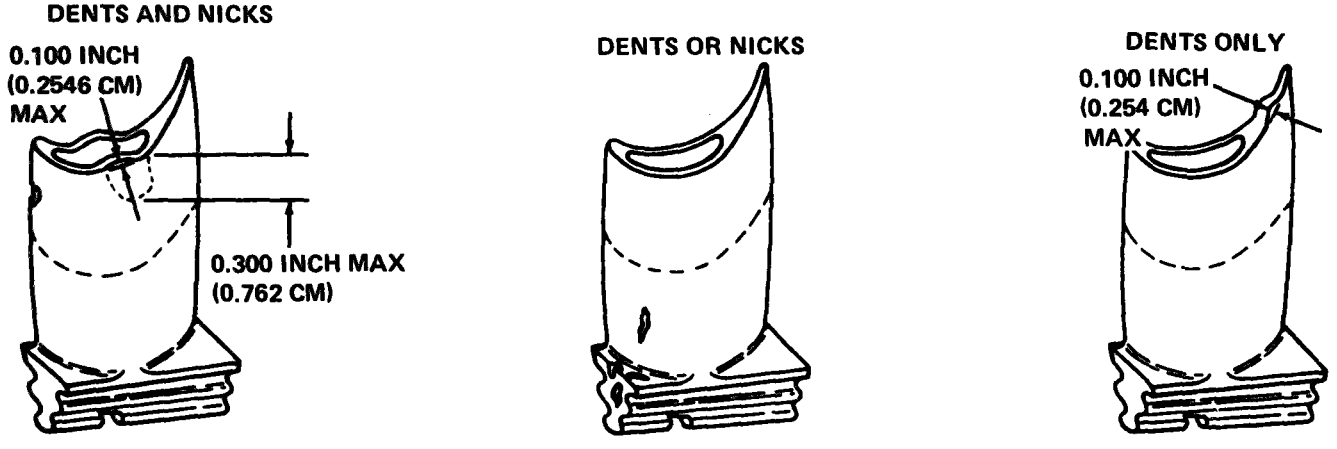
3. Blades	The following limits are acceptable without repair. a. Dents or nicks in blade areas A and B, any length, and maximum depth of 0.020 inch (0.051 cm). b. Dents and/or nicks in blade area C, with maximum length of 0.040 inch (0.102 cm) and maximum depth of 0.020 inch (0.051 cm). c. Dents or nicks in blade area D, with maximum length of 0.300 inch (0.762 cm) and maximum depth of 0.100 inch (0.254 cm).	**Inspect** for dents and nicks.

4-29. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Inspection - Continued

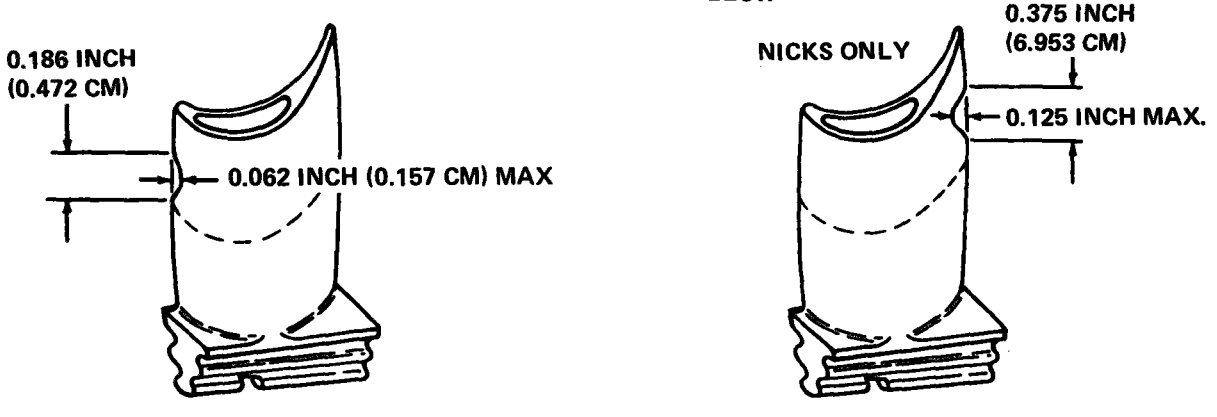
LOCATION/ITEM	REMARKS	ACTION
REAR COMPRESSOR SHAFT/ - Continued		



ACCEPTABLE - NO REPAIR

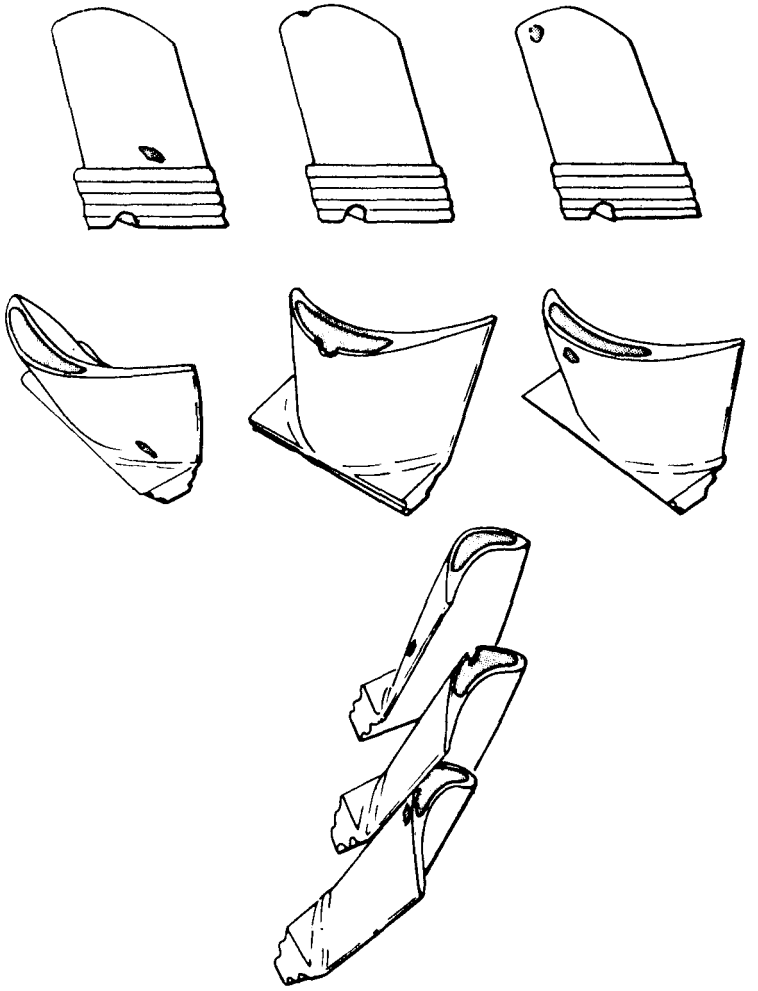


ACCEPTABLE - WITH REPAIR SHOWN BELOW



d. Dents located in trailing edge, with maximum displacement of 0.100 inch (0.254 cm).

4-29. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
REAR COMPRESSOR SHAFT/ - Continued	e. Damage is permissible on both walls of hollow core. 	
4. Leading and Trailing Edges	The following limits are acceptable with minor repairs. a. Dents or nicks in leading edge with maximum depth of 0.062 inch (0.157 cm). b. Nicks in trailing edge, with maximum length of 0.375 inch (0.953 cm) and maximum depth of 0.125 inch (0.318 cm). c. Repair is limited to removal of minor projections without further damage to blade plating.	Blend-repair. (Refer to paragraph H-25.)

4-29. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
REAR COMPRESSOR SHAFT/ - Continued		
5. Tip-ype and Circumferential-Type Rubs	Tip rubs are distinguished by localized scuffing or burring of the tips. Observe the following limits. a. Tip rubs are acceptable without repair when all other blade damage is within limits and tip clearance of 0.025 inch **(0.064** cm) minimum is found during tip clearance check. b. Circumferential rubs are acceptable without repair as follows: (1) Rubs that are located on forward rim face of rotor. (2) Rubs may extend around entire circumference (360 degrees) of rotor. (3) Rubs may have maximum width of 0.100 inch (0.254 cm) and maximum depth of 0.020 inch (0.051 cm).	**Inspect.**
6. Blades		**Inspect** for evidence of environmentally caused erosion. Erosion is acceptable, provided that blades pass all other inspections.
7. Disc		**Inspect** for cracks. No cracks are allowed.
8. Rotor		**Inspect** aft side of rotor for blades or blade wedges recessed below disc in excess of 0.025 inch (0.064 cm). If one or more blades are recessed more than 0.025 inch (0.064 cm) reseat as outlined in paragraph 4-30.

4-30. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM)

INITIAL SETUP

Applicable Configuration
T53-L11 Series Engines

Consumable Materials
Colorbrite No. 2107 (item 54, Appendix D)

Special Tools
Removal Fixture (LTCT548)
Drift (LTCT552)
Staking Tool (LTCT2094)

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/	**NOTE** If one or more blades are recessed more than 0.025 inch (0.635 mm), reseat.	
1. Blades		**Inspect** for blades recessed more than 0.025 inch (0.635 mm).
2. Number One Blade	Number one blade is identified by punch marks on both sides of pin hole. Use marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D).	**Locate** and **mark** number one blade on both sides using marking pencil.
3. Rotor	Use removal fixture (LTCT548).	**Place** forward face up in removal fixture,
4. Blades	Insure blade being tapped is not positioned over slot holding fixture. When performing this action start at number one blade in clockwise position. Use hammer and drift (LTCT552).	**Tap** flush with forward face of disc.
	NOTE If recessed pin 1-140-023-01 is installed, perform actions for items 5 and 6.	
5. Pins	Use hammer and drive punch.	**Redrive,**
6. Rotor		**Place** on holding fixture with forward face down.

4-30. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		
	NOTE If mushroomed pin 1-140-023-05 is installed perform actions for items 7 and 8.	
	CAUTION **staking tool must be held firmly on head of pins to prevent damage to pins. Insure that tool does not contact disc during staking operation.**	
7. All Pins	Use staking tool (LTCT2094).	**Place** staking tool on disc. **Redrive all** pins until mushroomed heads do not exceed 3/32 inch (2.4 mm) in height.
8. Rotor		Remove staking tool. Place rotor on holding fixture with forward face down.
	NOTE Reseat wedges according to actions for items 9 thru 12. If wedges protrude above rear face of disc, use drift (LTCT552) for initial driving. Wedges may be redriven to 0.150 inch (3.81 mm) below the rear face of disc provided wedges 180 degrees opposite are within 0.050 inch (1.27 mm) of being equally driven.	
9. **wedges**	Use only enough force to seat wedges firmly in slots.	**Beginning** with number 1 blade wedge, consecutively **redrive all wedges in** clockwise direction, using hammer and drift ground to fit end of wedge.

4-30. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Repair (AVIM) - Continued

COMPRESSOR ROTOR ASSEMBLY/ - Continued		
10. Wedges	This action pertains to all wedges which are not within required limits.	Replace.
11. Forward End of Wedges	Use drift (LTCT552) to stake wedges.	Stake toward center of turbine disc at 45 degree angle.
	CAUTION Do not file disc or blade roots In the next step.	
12. Protruding Wedges		Grind or file within 0.005 inch (0.1 3 mm) of face of disc.

4-31. First Stage Turbine Rotor Assembly(T53-L-11 Series Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-1 1 Series Engines

Special Tools
Installing Tool (LTCT4013)
Removal Kit (LTCT4675)
Holding Fixture (LTCT13430)
Cone Removal Tool (LTCT6465)
Holding Fixture (LTCT4533)
Power Wrench (PD2501)
Cone Removal Tool Adapter (LTCT 13676)

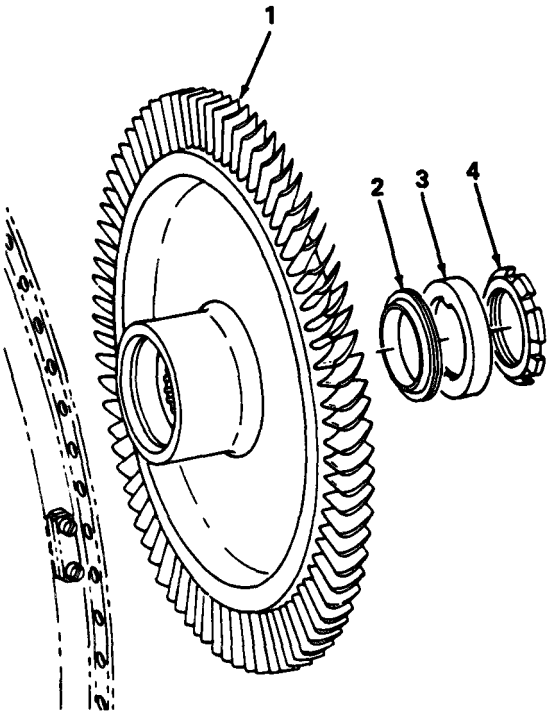
Consumable Materials
Molybdenum Disulfide (item 57, Appendix D)
Molykote Anti-Seize Thread Compound (item 58, Appendix D)
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease (item 103, Appendix D)

References
Para 4-37 and 3-16

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/	**NOTE** The gap between first and second stage nozzles must be established before installing first stage turbine rotor. (Refer to paragraph 3-16.)	

4-31. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		



1. k Compressor Shaft and First Stage Turbine Rotor (1)		Lubricate splines with molybdenum disulfide (57, Appendix D).
	CAUTION Insure that forward compressor cone is in proper position on rear compressor shaft (with beveled edge facing aft). If necessary reposition cone, using installing tool (LTCT 4013).	
2. Forward Compressor Cone		Inspect for marks or abrasions. Wipe cone clean with lint-free cloth.

4-31. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		
3. Turbine Rotor	Insure that match marks on turbine rotor and shaft are aligned.	Position turbine rotor with forward face toward front of engine, on rear compressor shaft, meshing splines of shaft with internal splines of turbine.
4. Face of Rear Compressor Cone (2)		Inspect for marks or abrasions. Wipe cone clean with lint-free cloth.
5. Cone		Install on rear compressor shaft and seat against turbine wheel.
6. Nut		Apply Molykote Anti-Seize Thread Compound (item 58, Appendix D) or Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (Item 103, Appendix D) to nut (4).
7. Compressor Shaft		Install lockring (3) and retaining nut (4).

NOTE

This table pertains to [terns 8 thru 14.

4-31. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION

COMPRESSOR ROTOR ASSEMBLY/ - Continued

Spanner Nut and Cone Removal and Installation Tools

Shaft Holding or Torque Fixture	Wrench Socket	**Power** Wrench	Cone Removal Tool Adapter	Cone Removal Tool
LTCT508	LTCT260	-	-	LTCT502 or LTCT 674, Details of LTCT4675
LTCT13430	LTCT587, Detail of LTCT 860 or LTCT 4675	-	-	LTCT502 or LTCT 674, Detail of LTCT 4675
LTCT4533	LTCT587, Detail of LTCT 13430 or LTCT4675	-	-	LTCT502 or LTCT 674, Detail of LTCT 4675
LTCT13430	LTCT13435, Detail of LTCT 13430	PD2501	LTCT13676	LTCT6465

NOTE: This table lists the tools necessary for removing and installing the spanner nut and cone in the combinations that can exist.

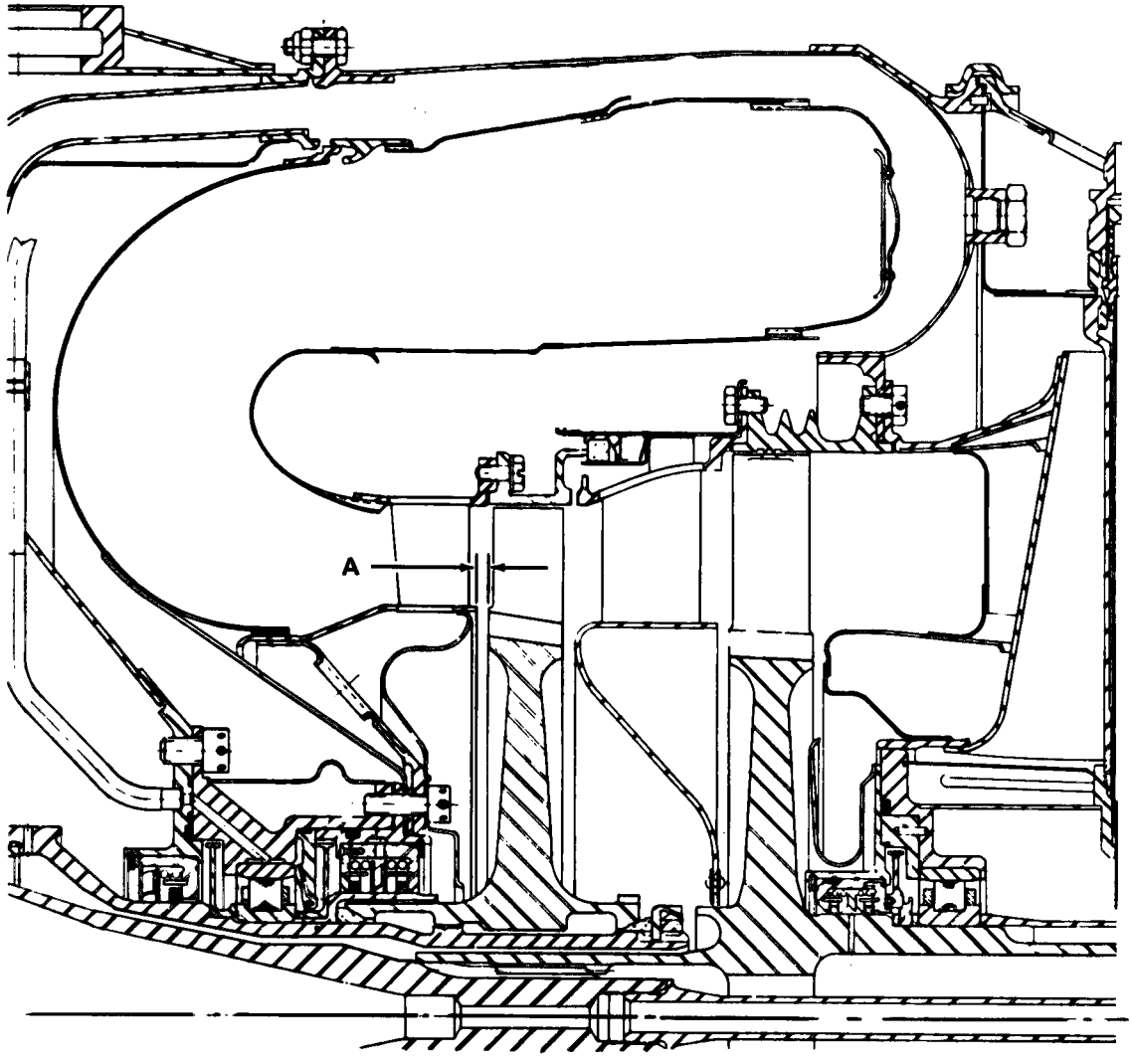
8. Torque Fixture		**Position and secure** to first stage turbine rotor rear hub.
9. Torque Socket Fixture		**Install** into torque fixture, **engaging** tangs of wrench socket with slots in retaining spanner nut (4).
10. Torque Fixture	Use power wrench.	**Tighten** nut as required. (Refer to Appendix G, table G-3, reference number 20.) **Remove** torque wrench and torque fixture from first stage turbine rotor rear hub.

4-31. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		
	NOTE An alternate method to preceding actions for items 8 thru 10 is shown in following actions for items 11 thru 14.	
11. First Stage Turbine Rotor Assembly		**Position** and **secure** shaft holding fixture, engaging tangs of socket wrench with slots in retaining spanner nut (4),
12. First Stage Turbine Rotor Assembly		**Install** wrench socket in shaft holding fixture engaging tangs of socket wrench with slots in retaining spanner nut (4),
13. Nut		**Tighten** nut as required. (Refer to Appendix G, table G-3, reference number 20.)
14. First Stage Turbine Rotor Assembly		**Remove** wrench socket and holding fixture.
15. First Stage Turbine Rim Forward Face and First Stage Turbine Nozzle		Using suitable wire (0.080 inch diameter) (0.21 cm diameter) and bent at 90 degrees at one end, **check** for minimum clearance as given in Appendix G, table G-5, reference number 40, area A in figure, between first stage turbine rim forward face and first stage turbine nozzle. **Rotate** wheel 360 degrees. If minimum clearante cannot be obtained, peel **off** required amount of laminated shim under nozzle.

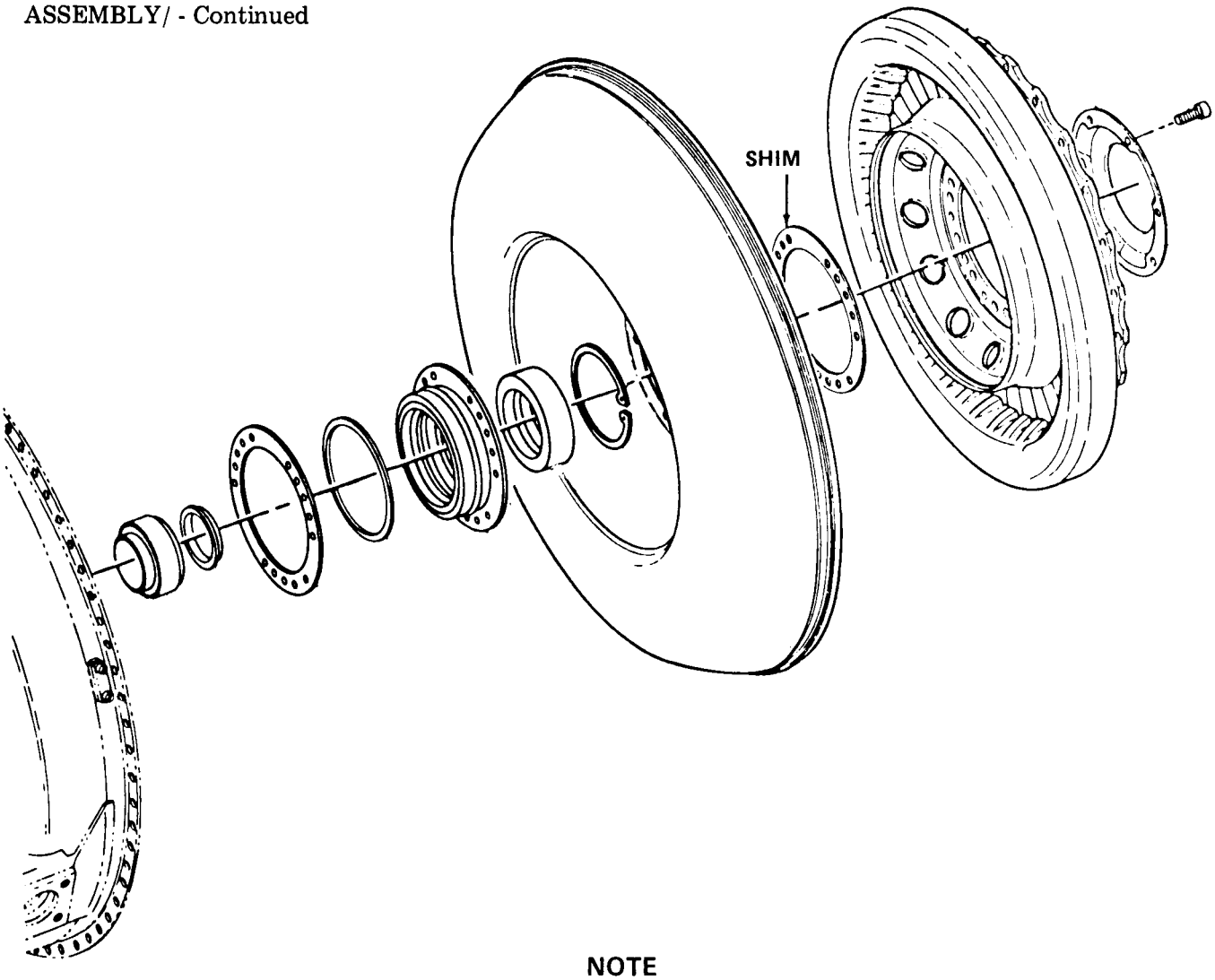
4-31. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		



4-31. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		



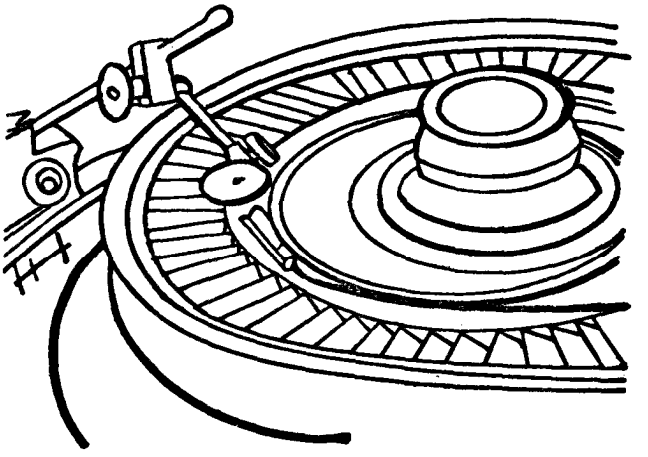
NOTE

When adjusting shim, insure that gap as given in Appendix G, table G-5, reference number 42 between first stage turbine nozzle flange and second stage nozzle is retained. If gap becomes too great, replace nozzle and ship to depot for disposition.

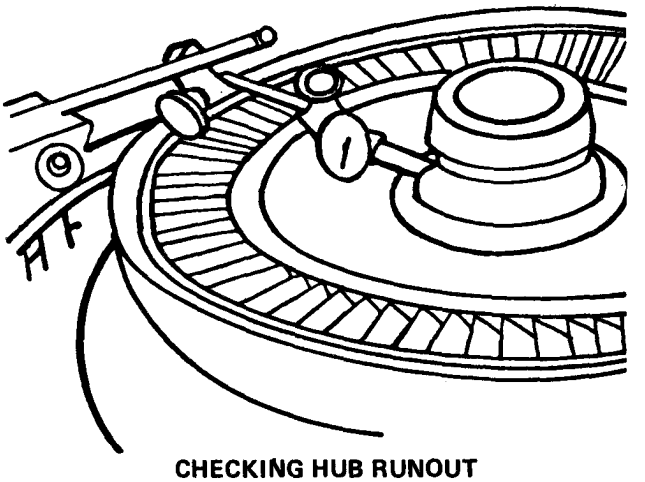
If engine is in maintenance stand, position engine in approximately 45 degree nose down attitude prior to performing action for item 16.

4-31. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		
16. Turbine Disc Face	Use dial indicator.	**Check** turbine disc face runout on rim at a point just inboard of blade roots, and runout on hub of disc immediately forward of the hub lip, Maximum runout shall be as given in Appendix G, table G-5, reference number 42.
17. First **Stage** Turbine Rotor and Cones	If either runout limit is exceeded perform this action. If runouts are within limits, proceed to item 24.	**Remove** first stage turbine rotor and clean cones, cone seats in turbine rotor, and cone seats on rear compressor. shaft, using clean lint-free cloth. **Reinstall** turbine rotor 180 degrees from its original position and recheck hub and rim runouts.



CHECKING FACE RUNOUT



CHECKING HUB RUNOUT

4-31. First Stage Turbine Rotor Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR ROTOR ASSEMBLY/ - Continued		
18. First Stage Turbine Rotor	If runouts are not within limits, perform this action.	**Remove** the first stage turbine rotor, **reposition** it 180 degrees from its original position and **recheck** hub and rim runouts.
19. Turbine Rotor	If the runout limits are still exceeded perform this action.	**Try repositioning** the turbine rotor at 90 degrees and/or 270 degrees from its original position.
20. Forward and Rear Cones, Turbine Rotor	If the limits are still exceeded at these positions, perform this action.	**Replace** the forward and rear cones, **re-install** the turbine rotor and **recheck** runouts.
21. Outer Diameter of the Compressor Rear Shaft of the Rear Cone Seat Area	If the runouts still exceed the limits perform this action.	**Remove** the turbine rotor and, using a dial indicator, **check** the runout on the outer diameter of the compressor rear shaft at the rear cone seat area which must be within a maximum of 0.002 inch (0.05 mm) T.I. R.
22. Rear Compressor Shaft, First Stage Turbine Rotor	If the runout on the rear compressor shaft is within the maximum limit perform this action.	**Replace** the first stage turbine rotor. **Recheck** runouts on the replacement turbine rotor.
23. Engine	If the rear compressor shaft runout on the rear cone seat journal exceeds 0.002 inch (0.05 mm) and if the turbine rotor hub and rim runouts exceed the limits, perform this action.	**Return** the engine to depot for further checking and disposition.
24. First Stage Turbine Blade, Tips and Turbine Nozzle Flange	If hub and rim runouts are within limits, perform this action.	**Check** clearance between these items. **(Refer** to paragraph 4-37.)
25. Nut and Lockring		**Secure** nut and **deform** lockring into slots of nuts at two places.

4-32. First Stage Power Turbine Rotor, Sealing Flange, and Ring Spacer (T53-L-13B/703 Engines) - Inspection

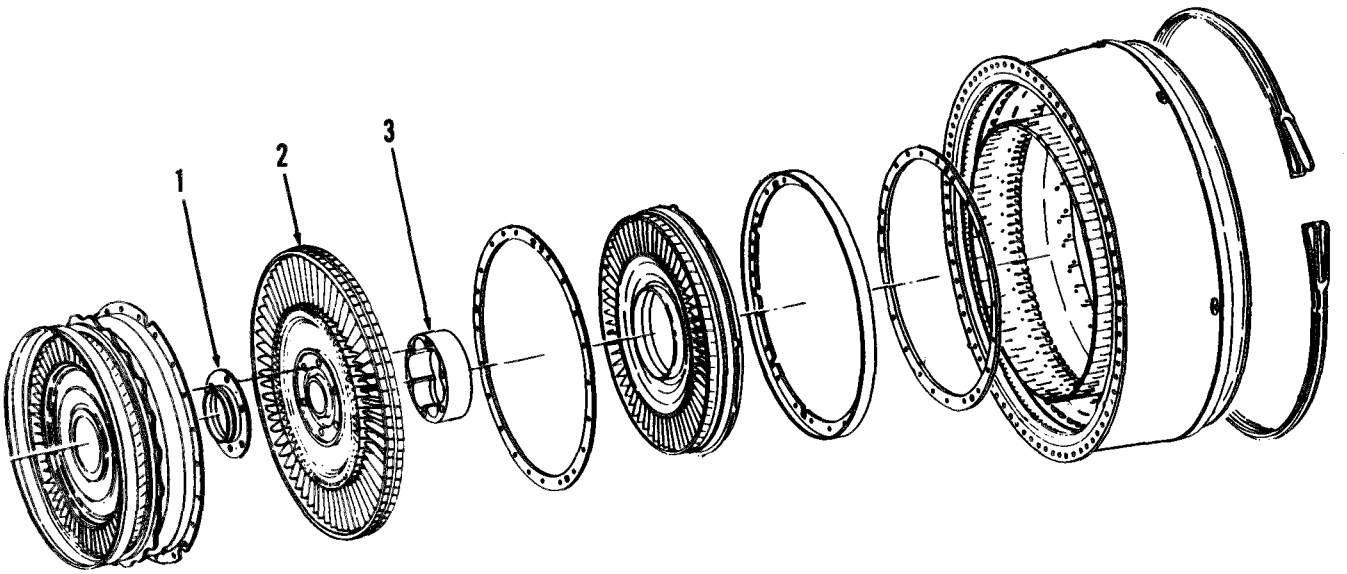
INITIAL SETUP

Applicable Configuration
T53-L-135/703 Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**WARNING** **FLIGHT SAFETY PARTS** Turbine Rotor Spacer (Power Turbine Rotor Spacer) Turbine Turbine Disk (First Stage Power Turbine Disk) After removal of protective covering, handle with cation during inspection. inspection limits must be observed.	

4-32. First Stage Power Turbine Rotor, Sealing Flange, and Ring Spacer (T53-L-13B/703 Engines) - Inspection - Continued

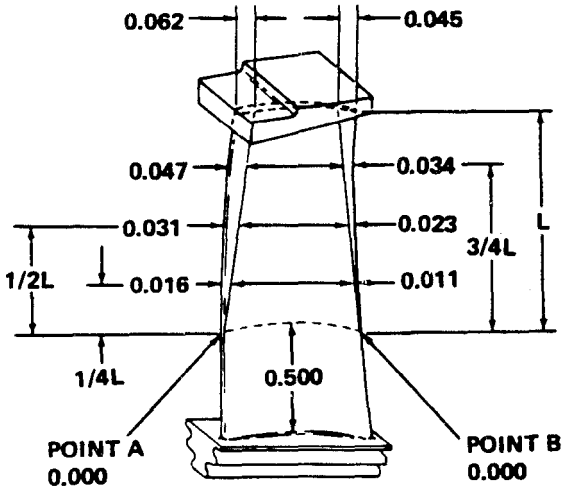
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		
1. Sealing Flange (1)		Inspect for cracks or distortion. Replace flange if cracks or distortion are noted.



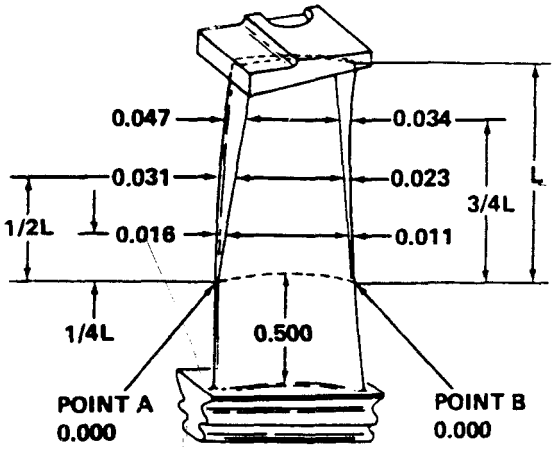
2. Sealing Flange (1)	Replace flange if rubbing exceeds inspection limits.	Inspect for local rubbing. Rub depth shall not exceed 0.015 inch (0.038 cm) for a circumferential length of three inches.
3. Power Turbine Spacer (3)	Replace spacer if scoring exceeds inspection limits, or if distortion is present.	Inspect for scoring; shall not exceed 0.012 inch (0.030 cm) in depth or distortion.
4. First Stage Power Turbine Rotor (2)	Use 7-power magnifying glass.	Visually Inspect as follows: Leading and trailing edges of blade for nicks, dents, cracks, and burns.

4-32. First Stage Power Turbine Rotor, Sealing Flange, and Ring Spacer (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	The maximum permissible finished repair depth is 0.062 inch (0.157 cm) from leading edge and 0.045 inch (0.1 14 cm) from trailing edge. Allowable depths decrease as distance between damage and point A on leading edge or point Bon trailing edge decreases.	



FIRST STAGE POWER TURBINE BLADES



SECOND STAGE POWER TURBINE BLADES

ALL DIMENSIONS ARE IN INCHES

	No foreign object damage defects are allowed within 0.500 inch (1 .270 cm) of blade platform. No cracks are alllowed.	
5. Blades	No foreign object damage defects are allowed within 0.500 inch (1 ,270 cm) of blade platform.	Visually Inspect for nicks, dents, cracks, and burns.
	No cracks are allowed.	
	Burns that result in loss of material.	Reject the assembly.
	Metallization deposits are acceptable.	

4-32. First Stage Power Turbine Rotor, Sealing Flange, and Ring Spacer (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
6. Blade Tip	No cracks are allowed. Tip rubs shall not exceed 0.030 inch (0.076 cm) in depth. If blades are damaged beyond limits, replace.	Visually Inspect blade tip (shroud end) for cracks and scoring.

4-32. First Stage Power Turbine Rotor, Sealing Flange, and Ring Spacer (T53-L-13B/703 Engines)- Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
7. Blade Platform and Root Areas, and Turbine Disk	No cracks are allowed.	Visually Inspect for cracks.
8. Forward and Aft Face of Disk	Rubs 0.006 inch deep by 0.100 inch wide (0.01 5 cm deep by 0.254 cm wide) 'are acceptable provided there is no indication of extreme heat.	Visually Inspect forward and aft face of disk for rubs.
9. Disk	if one or more blades are recessed more than 0.025 inch (0.064 cm), remove rotor assembly and return to depot for reseating or replacement of rotor blades. Refer to paragraph 4-54, item 17.	Inspect aft side of disk for blades recessed below disk.

4-33. First Stage Power Turbine Rotor (T53-L-13B/703 Engines) - Establishlng Tip Clearances

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Special Tools
Handcrank (LTCT4650)

Consumable Materials
Tape item 78, Appendix D)
iron-Blue Pigment (item 37, Appendix D)

References
Para 4-9
Appendix G, Table G-6, Reference Number 45, 38

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE ROTOR ASSEMBLY/		
1. First Stage Power Turbine Rotor Tip	Use 0.020 inch (0.051 cm) copper wire, and tape (item 78, Appendix D).	Determine actual tip clearance as follows: a. Measure thickness of tape. b. Secure short length of copper wire on tip of power turbine blade at

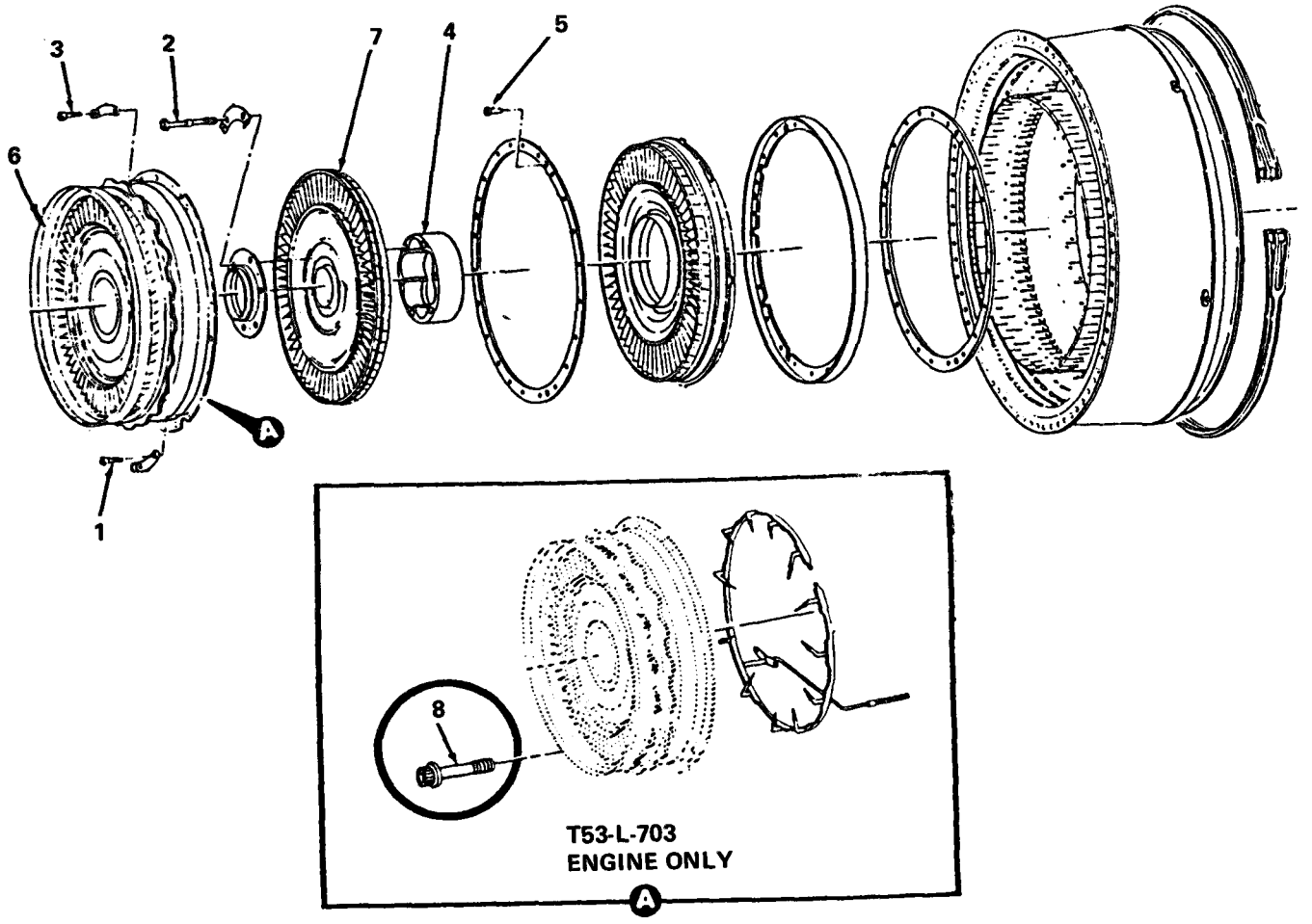
4-33. First Stage Power Turbine (T53-L-13B/703 Engines) - Rotor Establishing Tip Clearances - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE ROTOR ASSEMBLY/ - Continued		three locations 120 degrees apart. Place one short length of wire on forward tip of blade and one on aft tip of the same blade.
	NOTE Apply enough thickness of tape on blade tips so that the thickness of the wire plus a single layer of tape on top of the wire equals the minimum tip clearance of 0.025 inch (0.63 mm).	
2. Tape	Use iron-blue pigment (item 37, Appendix D).	**Paint** tape.
3. **Bolts** (1 and 3)		**Remove** bolts installed in ring.
4. Pins (5)		**Remove.**
5. Spacer (4)	Thickness of spacer is determined in paragraph 4-9.	**Install** on combustion chamber flange. **Aline** bolt holes.
6. Pins (5)	Pins shall be fitted to obtain fit given in Appendix G, table **G-6,** reference number 45. Use three pins of same dash number. Refer to table below for selective pin diameters.	**Install** three pins into spacer.

Part No.	Shank Diameter (Inches)
1-190-021-01	0.2495 to 0.2505
1-190-021-02	0.2510 to 0.2515
1-190-021-03	0.2520 to 0.2525
1-190-021-04	0.2530 to 0,2535

4-33. First Stage Power Turbine (T53-L-13B/703 Engines) - Rotor Establishing Tip Clearances - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE ROTOR ASSEMBLY/ - Continued		



7. First Stage Power Turbine Nozzle (6)	See figure in item 4. Use care not to rub against tape when performing this action.	Carefully **position over** first stage power turbine rotor. **Aline** bolt holes. **Secure** first stage power turbine nozzle to exhaust diffuser with four equally spaced bolts. **Tighten** bolts evenly to proper torque,
8. First Stage Power Turbine Rotor (7)	Use handcrank (LTCT4650).	Rotate one revolution with handcrank fitted into spline of second power turbine rotor.

4-33. First Stage Power Turbine (T53-L-13B/703 Engines) - Rotor Establishing Tip Clearances - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE ROTOR ASSEMBLY/ - Continued		
9. Bolts (8)		Remove bolts that secure first stage power turbine nozzle. Carefully **remove** nozzle.
10. Tape	If rubbing on tape is not evident, tip clearante is acceptable. If rubbing is evident, proceed with item 11.	**Check** for signs of rubbing.
11. Tape	Proceed with these actions if tape rubbing is evident.	**Determine** tip clearance as follows: a. Select tape from each diameter which has greatest rub. b. If iron-blue pigment has been removed but tape has not been cut, tip clearance is equal to diameter of wire plus total thickness of tape used at that position. c. If tape has been cut completely through but wire has not been damaged, tip clearance is equal to diameter of wire plus thickness of tape under wire, d. If tape has been cut completely through and wire appears damaged, **measure** diameter of wire. The tip clearance is equal to minimum wire diameter plus thickness of tape under wire.

4-33. FIRST STAGE POWER TURBINE (T53-L-13B/703 ENGINES)–ROTOR ESTABLISHING TIP CLU.RANCES-Cent.

FIRST STAGE TURBINE ROTOR ASSEMBLY/–Continued		
12. Tip Clearance	Tip clearance determined in preceding item 11 shall be as given in Appendix G, table G-6, reference number 38.	If desired clearance is not obtained, **check** alinement and torquing of bearing to exahust diffuser. **Replace** nozzle if necessary.
13. Tapes and Wires		**Remove** all installed tapes and wires.

4-34. FIRST STAGE POWER TURBINE ROTOR (T53-L-13B/703 ENGINES)–REPAIR

INITIAL SETUP

Applicable Configuration
TM-L-13B/703 Engines

Consumable Materials
Crocus Cloth (item 21, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TUBINE MOTOR ASSEMBLY/		
	NOTE Remarks and actions pertaining to items 1 thru 3 are rules to be observed during first stage power turbine rotor blade repair.	
	NOTE **Use** portable power drill or rotary file for repair procedures. Rotary file shall be equipped with carbide burr. If these items are not available, Swiss file, India or Carborundum stone maybe substituted. Finish strokes for leading and trailing edges of blades are parallel to edges of blades.	

4-34. First Stage Power Turbine Rotor (T53-L-13B/703 Engines) - Repair (AVIM) - Continued

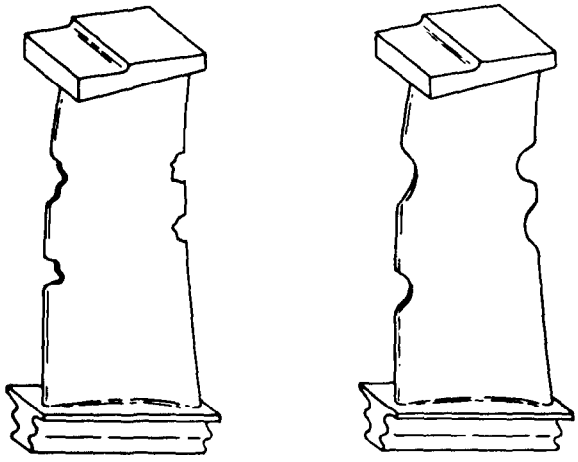
LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE ROTOR ASSEMBLY/ - Continued		

WARNING

Safety glasses must be worn during operation to protect eyes from flying chips.

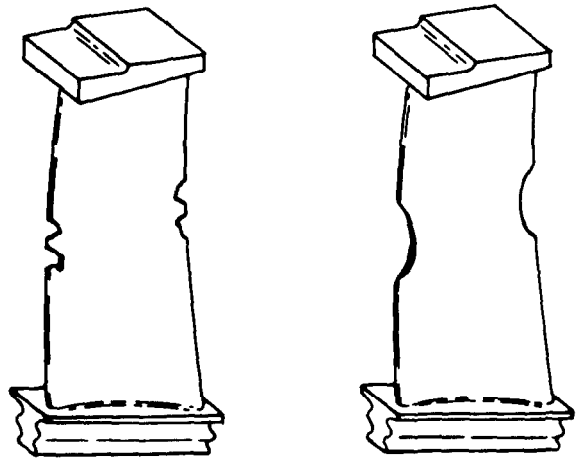
1. First Stage Power Turbine Rotor	Final polishing of area is with crocus cloth (item 21, Appendix D).	**Blend** all repairs and **finish** smoothly.
2. Leading or Trailing Edges of Blades		**Blend** repairs to smooth radius as part of repair procedures.

WHEN THE DISTANCE BETWEEN THE DAMAGE IS GREATER THAN TWICE THE DEPTH OF THE DEEPER DAMAGE, MAKE SEPARATE REPAIRS



DAMAGED **REPAIRED**

WHEN THE DISTANCE BETWEEN THE DAMAGE IS LESS THAN TWICE THE DEPTH OF THE DEEPER DAMAGE, MAKE ONE REPAIR AREA



DAMAGED **REPAIRED**

3. First Stage Power Turbine Rotor		**Blend** finish repair length to a minimum of three times depth of damage.

NOTE

Repair leading and/or trailing edges of first stage power turbine rotor as follows in actions for items 4 thru 8.

4-34. First Stage Power Turbine Rotor (T53-L-13B/703 Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE ROTOR ASSEMBLY/ - **Continued**		
4, Round Bottom Dents	This action pertains to dents 0.010 inch (0.25 mm) deep or less.	**Remove sharp edges** only.
5. Shroud End of Blade	Perform this action if distance between damage and shroud end of blade is less than twice the depth of damage.	**Extend** repair to include shroud end.
6. First **Stage** Power Turbine Rotor	If **distance** between damaged areas is less than twice the depth of deeper damage, make one repair area.	**Repair.**
7. First **Stage** Power Turbine Rotor	If distance between two damaged areas is greater than twice the depth of deeper damage, make separate repair areas. See figure in item 4.	**Repair.**
8. Rotor	Perform this action when damage cannot be completely eliminated by allowable blade repairs.	**Replace.**
	NOTE Repair blade surfaces as follows in actions for items 9 thru 16.	
9. **Blade**	Maximum permissible decrease in thickness at any point on blade shall be 0.010 inch (0.25 mm).	**Observe** repair limits.
10. Blade Surface	Maximum permissible finished single repair on blade surface shall be 0.200 square inch (5.08 square mm) on either concave or convex side.	**observe** allowable repair limits.
11. Blade Surface		**Blend** repairs to a minimum of twice the depth of damage.
12. Blade Surface	Total repaired surface area shall not exceed 10 percent of blade surface.	**Observe** allowable repair limits.
13. Blade Surface	If distance between two damaged areas is less than twice the depth of deeper damage, make one repair area.	**Repair.**

4-34. First Stage Power turbine Rotor (T53-L-13B/703 Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE ROTOR ASSEMBLY/ - Continued		
14. Blade Surface	If distance between two damaged areas is greater than twice the depth of deeper damage, make separate repair areas. See figure in item 2.	Repair.
15. Rotor	Perform this action when damage cannot be completely eliminated by allowable blade repairs.	Replace.
16. Deleted		

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection

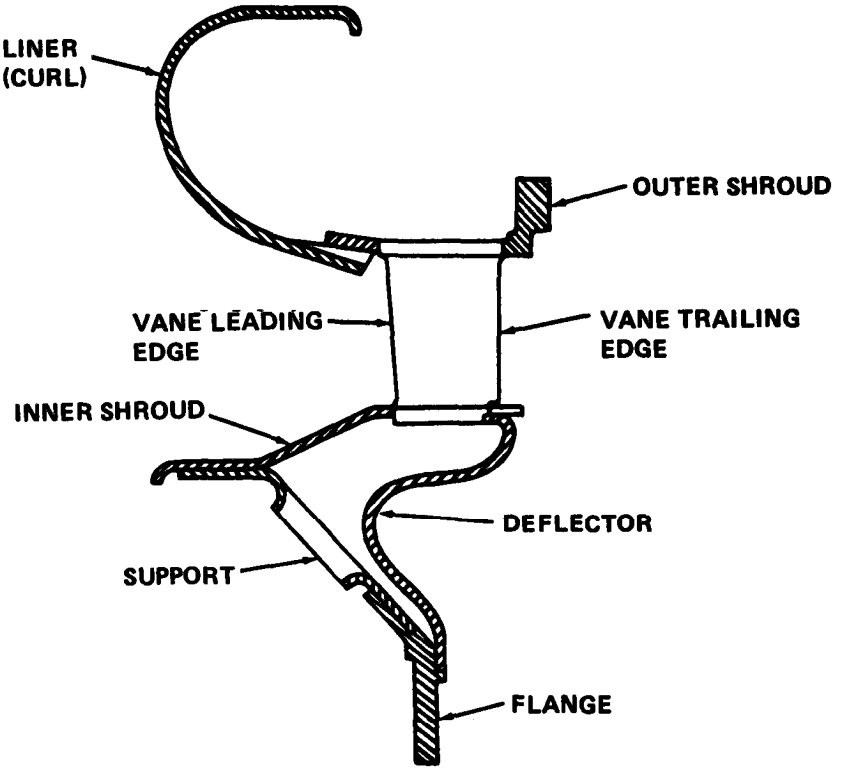
INITIAL SETUP

Applicable Configuration
T53-L-1 1 Series Engines

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/		
1. First Stage Turbine Nozzle and Flange	Use 5- to 7-power magnifying glass. The following figure Illustrates first stage turbine nozzle assembly.	Visually Inspect assembly with aid of magnifying glass.

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TUR - BINE NOZZLE ASSEMBLY/ - Continued		



NOTE

The following tabular matter lists first stage turbine nozzle assembly inspection limits.

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		

Step No.	Defect	Ref	Inspection Limits 1-110-030-28	1-110-030-34	1-110-030-36
			Vane Trailing Edge		
1.	Axial cracks	Detail A	Any number of cracks, each up to 5/8 inch (15.9 mm) long, are acceptable on each vane.	Any number or cracks, each up to 1/2 inch (12.7 mm) long, are acceptable on each vane. **NOTE** One axial crack up to 3/4 inch (19.1 mm) long is acceptable on each vane in addition to above limits.	Any number of cracks, each up to 5/8 inch (15.9 mm) long, are acceptable on each vane.
2.	Diagonal cracks extending from vane trailing edge to inner shroud.		Acceptable. No inspection required.	Acceptable. No inspection required.	Acceptable. No inspection required.
3.	Diagonal cracks extending from vane trailing edge to outer shroud.		Acceptable. No inspection required.	Acceptable. No inspection required.	Acceptable. No inspection required,
4.	Converging trailing edge cracks	Detail B	Acceptable, provided distance between cracks is at least 1/4 inch (6.4 mm).	Acceptable, provialed distance between cracks is at least 1/4 inch (6.4 mm).	Acceptable, provided distance between cracks is at least 1/4 inch (6.4 mm).

Converging cracks which create the possibility of material fallout are not permitted. If cracks appear to be radiating towards one another, reject nozzle.

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

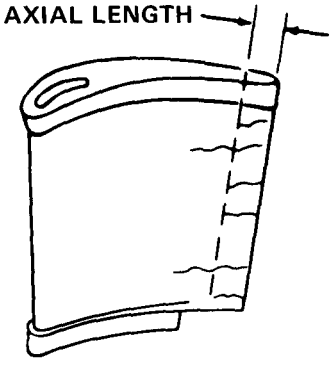
LOCATION/ITEM	REMARKS	ACTION

FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued

step No.	Defect	Ref	Inspection Limits 1-110-030-28	1-110-030-34	1-110-030-36
5.	Converging cracks from opposite edges	Detail C	Acceptable, provided distance between cracks is at least 1/4 inch (6.4 mm).	No inspection required.	Acceptable, provided distance between cracks is at least 1/4 inch (6.4 mm).
6.	**Cracks originating in burned areas**	Detail D	Any number of cracks, each up to 5/8 inch (15.9 mm) long are acceptable on each vane.	Any number of cracks, each up to **1/2 inch (12.7** mm) long, are acceptable on each vane.	Any number of cracks, each up to 5/8 inch (15.9 mm) long, are acceptable on each vane.
			NOTE Crack length shall be measured from unaffected vane trailing edge.		
7.	Burned areas (Loss of material)	Detail E	Burned areas up to 5/8 inch (15.9 mm) radial length by 3/8 inch (9.5 mm) axial length are acceptable on six vanes. **NOTE** **One** of these areas may be 1/2 inch (12.7 mm) by 1/2 inch (12.7 mm) instead of 5/8 inch (15.9 mm) by 3/8 inch (9.5 mm).	Burned areas up to 5/8 inch (15.9 mm) radial length by 3/8 inch (9.5 mm) axial length are acceptable on seven vanes.	Burned areas up to 5/8 inch (15.9 mm) radial length by 3/8 inch (9.5 mm) axial length are acceptable on six vanes. **NOTE** **One** of these areas may be 1/2 inch (12.7 mm) by 1/2 inch (12.7 mm) instead of 5/8 inch (15.9 mm) by 3/8 inch (9.5 mm).

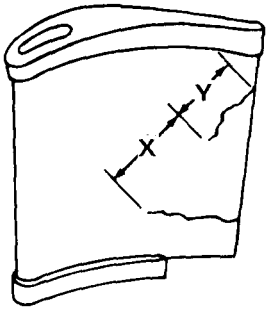
4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		



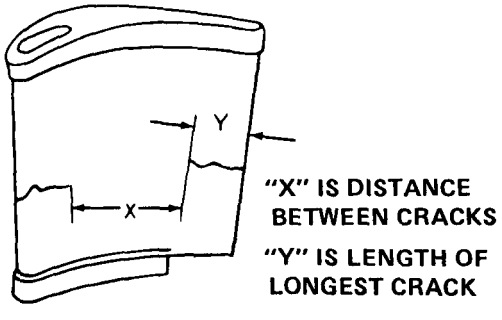
AXIAL CRACKS - TRAILING EDGE

A



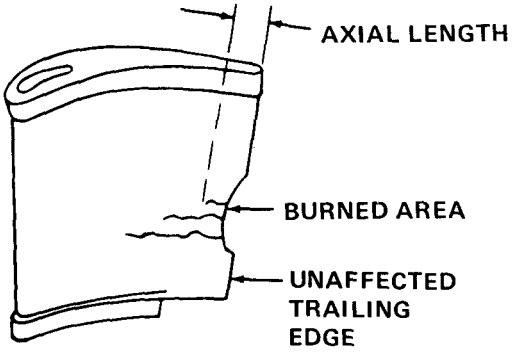
CONVERGING CRACKS FROM TRAILING EDGE

B



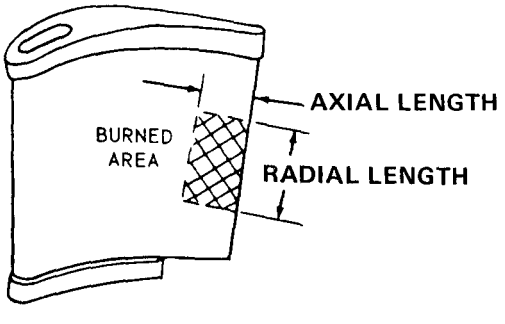
CONVERGING CRACKS FROM OPPOSITE EDGES

C



CRACKS EXTENDING FROM BURNED AREA - TRAILING EDGE

D



BURNED AREA - TRAILING EDGE

E

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		

Step No.	Defect	Ref	Inspection Limits 1-110-030-28	1-110-030-34	1-110-030-36
			Vane Leading Edge		
8.	Axial cracks	Detail F	Any number of cracks are acceptable, protided they do not penetrate vane core.	One crack up to 3/4 inch (19.1 mm) long is acceptable, provided it does not penetrate vane core.	Any number of cracks are acceptable, provided they do not penetrate vane core.
9.	Diagonal cracks extending from vane leading edge to inner shroud		Acceptable. No inspection required.	Acceptable. No inspection required.	Acceptable. No inspection required.
10.	Diagonal cracks extending from vane leading edge to outer shroud		Acceptable. No inspection required.	Acceptable. No inspection required.	Acceptable. No inspection required.
11.	Converging leading edge cracks		Not permitted.	Acceptable.	Not permitted.
12.	Converging cracks from opposite edges		Acceptable, provided distance between cracks is at least 1/4 inch (6.4 mm).	No inspection required.	Acceptable, provided distance between cracks is at least 1/4 inch (6.4 mm).
13.	Radial cracks	Detail G	Any number or size cracks are acceptable, provided they do not penetrate vane core.	Any number or size cracks are acceptable, provided they do not penetrate vane core.	Any number or size cracks are acceptable, provided they do not penetrate vane core.

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

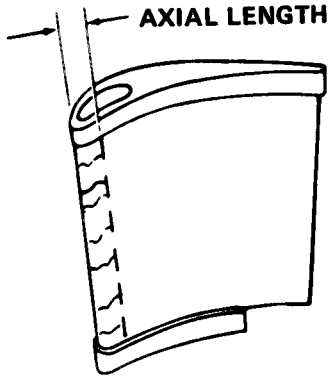
LOCATION/ITEM	REMARKS	ACTION

FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued

Step No.	Defect	Ref	Inspection Limits 1-110-030-28	1-110-030-34	1-110-030-36
14.	Cracks originating in burned areas	Detail H	Any number of cracks are acceptable, provided they do not penetrate vane core.	One crack is acceptable, provided it does not penetrate vane core.	Any number of cracks are acceptable, provided they do not penetrate vane core.
15.	Burned areas	Detail I	Burned areas up to 5/8-inch (15.9 mm) radial length by 1/8-inch (3.2 mm) axial length are acceptable on six vanes.	Burning is acceptable, provided core is not penetrated.	Burned areas up to 5/8-inch (15.9 mm) radial length by 1/8-inch (3.2 mm) axial length are acceptable on six vanes.
16.	Bowing		Acceptable. No inspection required.	Acceptable. No inspection required.	Acceptable. No inspection required.
17.	Nicks, dents, and burrs		Acceptable following blend-repair; no damage limit. **NOTE** Minimize removal of material; blend-repair only to remove surface projections and smooth damaged areas.	Acceptable, No damage limit.	Acceptable following blend-repair; no damage limit. **NOTE** Minimize removal of material; blend-repair only to remove surface projections.
18.	Spalling		No inspection required.	Any amount acceptable on all vanes.	Any amount acceptable on all vanes,
19.	Crazing		No inspection required.	Acceptable on all areas of all vanes.	Acceptable on all areas of all vanes.

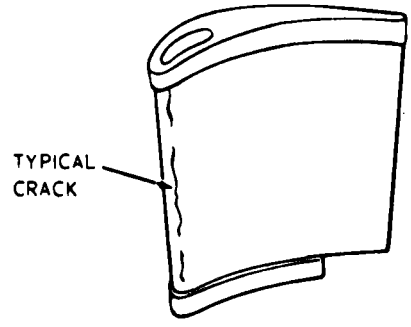
4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		



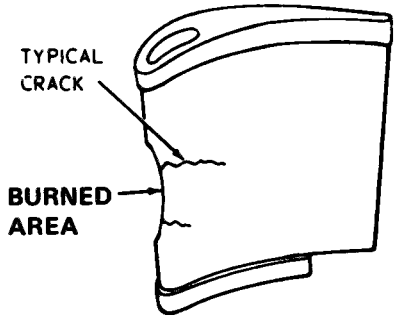
AXIAL CRACKS - LEADING EDGE

F



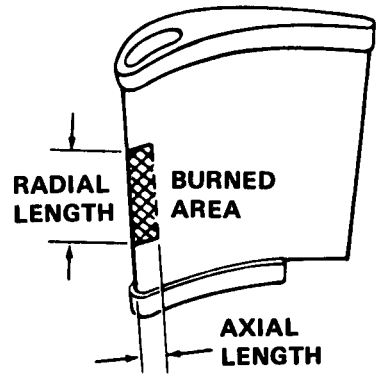
RADIAL CRACKS - LEADING EDGE

G



CRACKS EXTENDING FROM BURNED AREA - LEADING EDGE

H



BURNED AREA - LEADING EDGE

I

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		

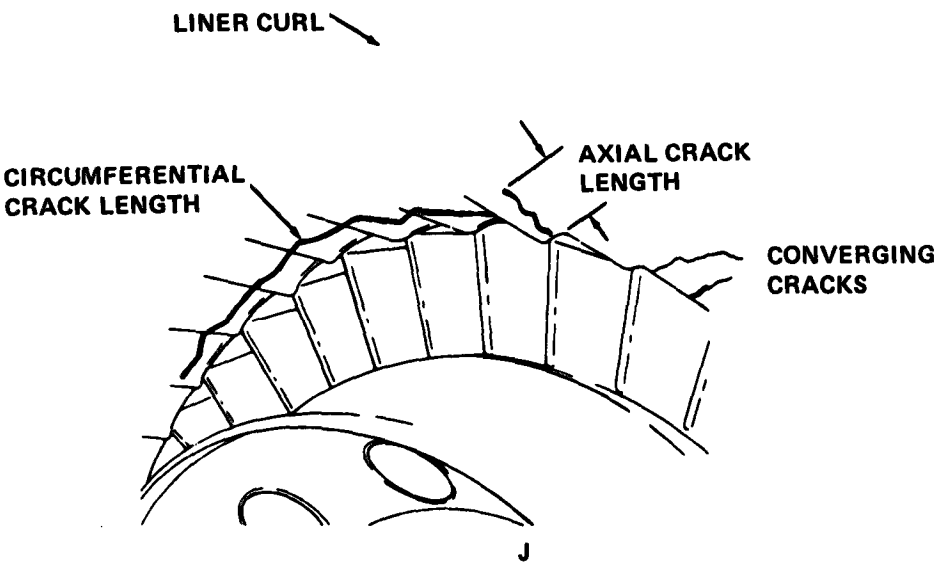
Step No.	Defect	Ref	Inspection Limits 1-110-030-28	1-110-030-34	1-110-030-36
			Outer Shroud		
20.	Outer shroud cracks		Acceptable. No inspection required.	Ten cracks, each up to 1/2 inch (12.7 mm) in length allowed. Converging cracks not permitted.	Acceptable. No inspection required.
			Inner Shroud		
21.	Inner shroud cracks		Acceptable. No inspection required.	Ten cracks, not exceeding 1/2 inch (12.7 mm) in length, allowed. Converging cracks not permitted.	Acceptable. No inspection required.
			Liner (Curl)		
22.	Axial cracks	Detail J	Any number of cracks, each up to 1 inch (2.54 cm) in length, are allowed, provided no circumferential cracks are present.	Any number of cracks, each up to 1 inch in length are allowed, provided no circumferential cracks are present.	Any number of cracks, each up to 1 inch (2.54 cm) in length are allowed, provided no circumferential cracks are present.
23.	Converging cracks	Detail J	Not permitted.	Not permitted.	Not permitted.
24.	Circumferential cracks	Detail J	Any number of cracks up to accumulative crack length of 3 inches (7.6 cm) are acceptable, provided no axial cracks are present.	Any number of cracks, up to accumulative crack length of 3 inches (7.6 cm) are acceptable, provided no axial cracks are present.	Any number of cracks up to accumulative crack length of 3 inches (7.6 cm) are acceptable, provided no axial cracks are present.

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION

FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued

Step No.	Defect	Ref	Inspection Limits 1-110-030-28	1-110-030-34	1-110-030-36
25.	Wear depressions, cracks in curl OD		Wear depressions caused by rubbing of combustion chamber liner dimples are acceptable provided no breakthrough or raised impressions are evident on curl ID. Circumferential cracks are not allowed. Repair axial cracks or unacceptable wear depressions.	Wear depressions caused by rubbing of combustion chamber liner dimples are acceptable provided no breakthrough or raised impressions are evident on curl ID. Circumferential cracks are not allowed. Repair axial cracks or unacceptable wear depressions.	Wear depressions caused by rubbing of combustion chamber liner dimples are acceptable provided no breakthrough or raised impressions are evident on curl ID. Circumferential cracks are not allowed. Repair axial cracks or unacceptable wear depressions.



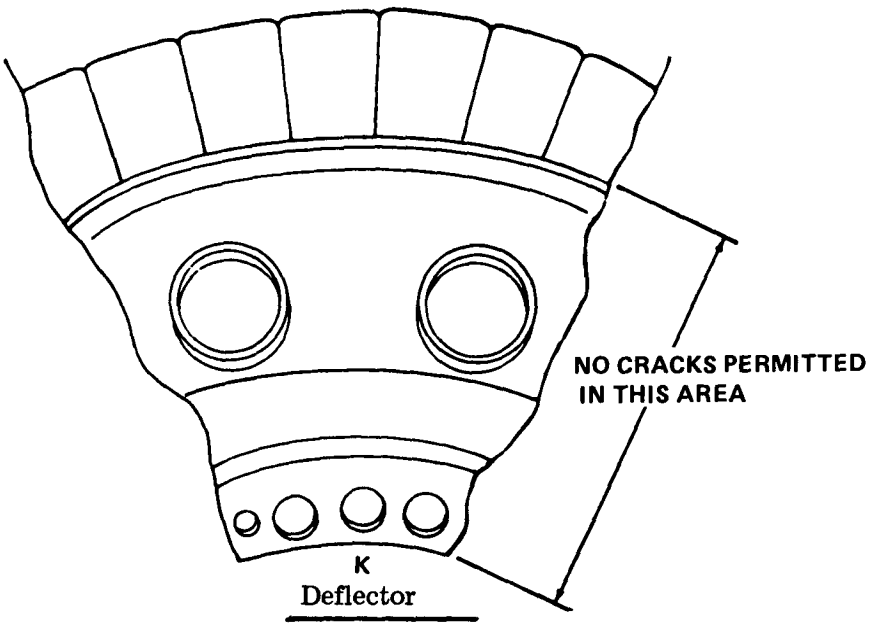
Support to Inner Shroud

26.	Cracks		No cracks permitted; forward nozzle to depot for repair.	No cracks permitted; forward nozzle to depot for repair.	No cracks permitted; forward nozzle to depot for repair.

435. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION

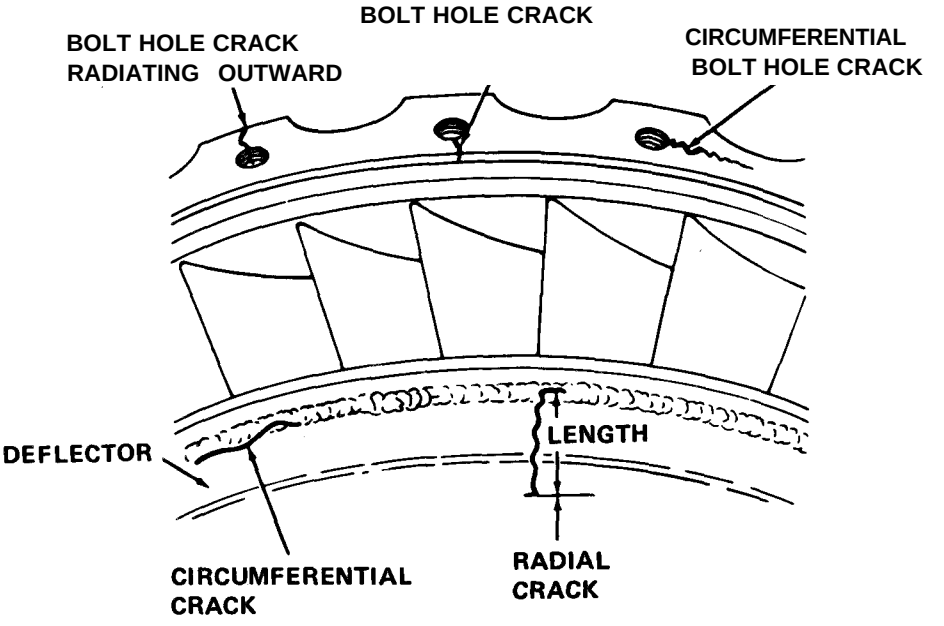
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued

Step No.	Defect	Ref	Inspection Limits 1-110-030-28	1-110-030-34	1-110-030-36
					
27.	Radial cracks	L	Any number of cracks, each up to 1.500 inch (3.810 cm) in length, are acceptable.	Any number of cracks, each up to 1.500 inch (3.810 cm) in length, are acceptable.	Any number of cracks, each up to 1.500 inch (3.810 cm) in length, are acceptable.
28.	Circumferential cracks	L	Not permitted in deflector-to-inner shroud brazement.	Not permitted in deflector-to-inner shroud brazement.	Not permitted in deflector-to-inner shroud brazement.
29.	Converging cracks	L	Not permitted.	Not permitted.	Not permitted.
30.	Rubbing	L	Not permitted on trailing edge of inner shroud; replace nozzle.	Not permitted on trailing edge of inner shroud; replace nozzle.	Not permitted on trailing edge or inner shroud; replace nozzle.

4-35. First Stage Turbine Nozzle and Flange Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		

Step No.	Defect	Ref	Inspection Limits 1-110-030-28	1-110-030-34	1-110-030-36
31.	Radial cracks at bolt holes of nozzle and flange	L	Cracks radiating inward or outward from bolt holes are acceptable.	Cracks radiating inward or outward from bolt holes are acceptable.	Cracks radiating inward or outward from bolt holes are acceptable.
32.	Circumferential cracks at bolt holes of nozzle and flange	L	Not permitted.	Not permitted.	Not permitted.



L

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM)

INITIAL SETUP

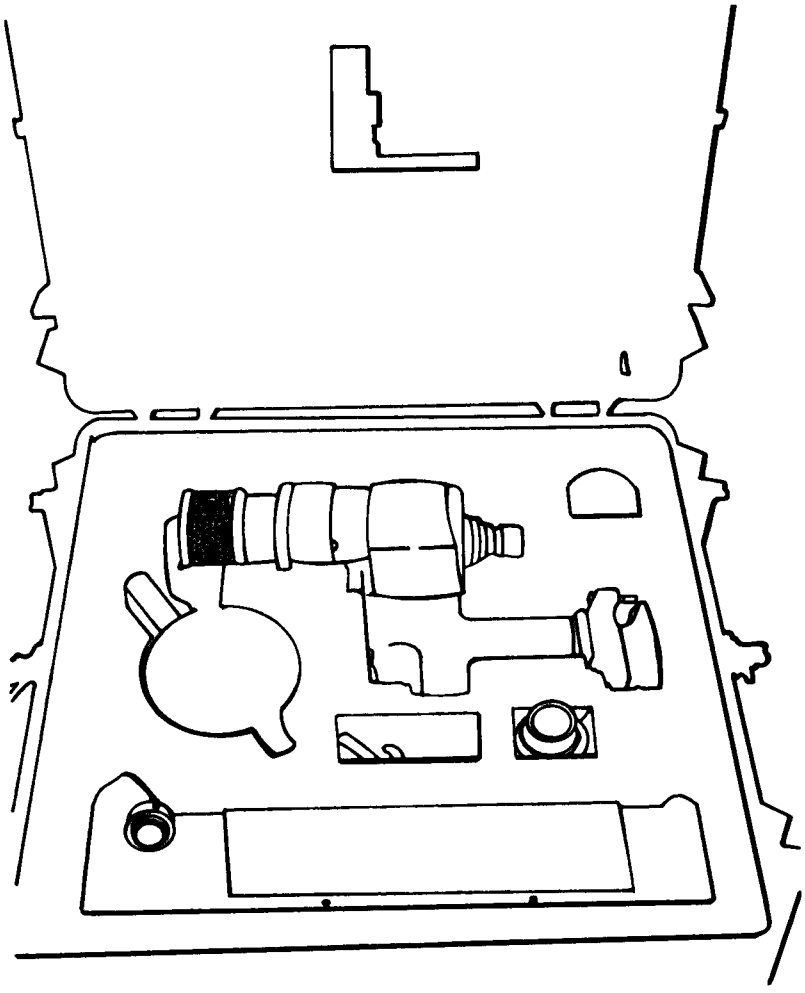
Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Colorbrite No. 2107 (item 54, Appendix D)

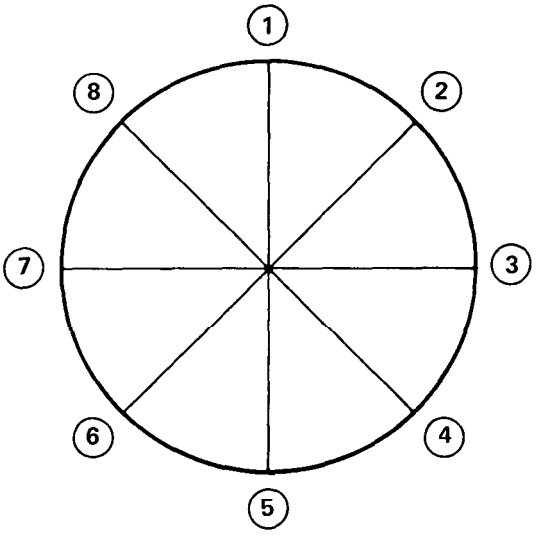
Special Tools
Maintenance Kit (LTCT2020)
Finishing Machine (LTCT2125)
Protective Cover (LTCT4408, detail of LTCT2020)
Garter Extension Spring (LTCT9396, detail of LTCT2020)
Sleeve Bushing (LTCT4406, detail of LTCT2020)
Shouldered Shaft (LTCT4405, detail of LTCT2020)
Face Spanner Wrench (LTCT4450, detail of LTCT2020)
Spanner Wrench (LTCT4402-02, detail of LTCT2020)
Balance Shaft Weight (LTCT4389 and LTCT4388, detail of LTCT2125)
Spanner wrenches (LTCT9263, detail of LTCT2020)

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/		
1. First Stage Turbine Wheel Assembly and First Turbine Flange	Use first stage turbine nozzle maintenance kit (LTCT2020) illustrated in the following figure.	**Obtain** allowable tip clearance. **Rework flange.**
	NOTE Locate longest turbine rotor blade as follows in actions for items 2 thru 4.	
2. First Stage Turbine Blade Tip and First Stage Turbine Nozzle	Use feeler gage (Starret Number 172E taper or equivalent). The blade with least tip clearance at this position will be longest blade in rotor assembly.	Insert feeler gage between first stage turbine blade tips and turbine nozzle flange at 12-o'clock position.

4-36. First Stage Turbine Nozzle Flange (T53-L-11 series Engines) - Skimming Procedure (AVIM) - Continued

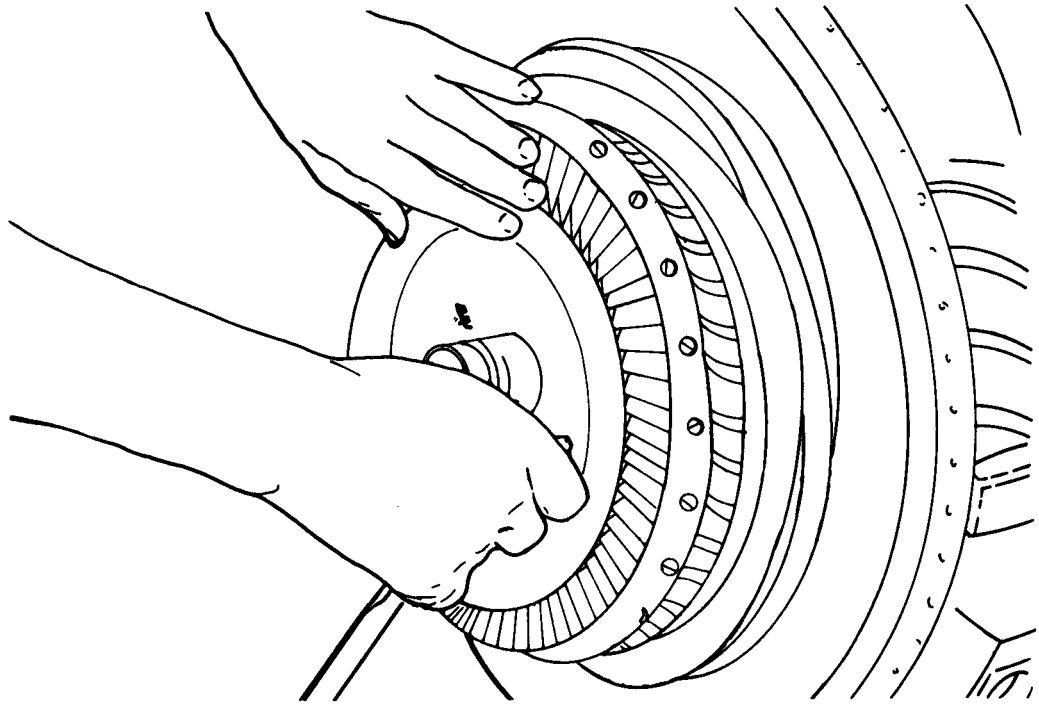
LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
		
	Do not use lead pencil to mark blades in following action for item 3.	
3. Longest Blade	Use marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D).	Mark with marking pencil so that it can be recognized during succeeding operations.

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
4. Longest Blade	If tip clearance at any position is 0.025 inch (0.64 mm) or less, flange must be reworked. The following figure is an eight-point tip clearance check diagram.  **NOTE** Minimum acceptable tip clearance at inspection is 0.025 inch (0.64 mm). However, when rework is to be accomplished, it is suggested that a tip clearance of 0.032 inch (0.81 mm) be established. **NOTE** Locate areas to be reworked as follows in actions for items 5 thru 12.	**Check** clearance between tip of longest blade and flange at seven additional positions. **Hold** feeler gage stationary at each position and **turn** rotor one full turn. Note position of least tip clearance.
5. Longest Blade and First Stage Turbine Nozzle Flange	Use 0.032 inch feeler gage.	**Insert** feeler gage between tip of longest blade and turbine nozzle flange as near as possible to area of least tip clearance.

436. First Stage Turbine Nozzle Flange (T53-L-11 Series Engined - Skimming Procedure (AVIM) - Continued

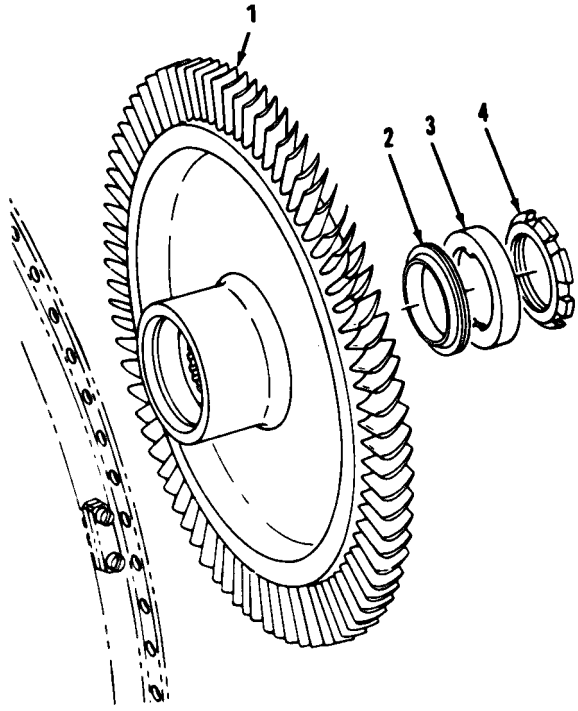
LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
6. Turbine Wheel and Feeler Gage		**Rotate** together until **stopped** by an area of less clearance.
7. Turbine Wheel		At stopping point, **mark edge** of nozzle flange with marking pencil (yellow) Color-brite No. 2107 (item 54, Appendix D).
8. Turbine Wheel		**Remove** feeler gage. • **Turn** rotor until long blade is past high point far enough to allow the **0.032** inch feeler gage to be inserted.
9. Long Blade and Turbine Nozzle Flange		**Reinsert** feeler gage between long blade and turbine nozzle flange.

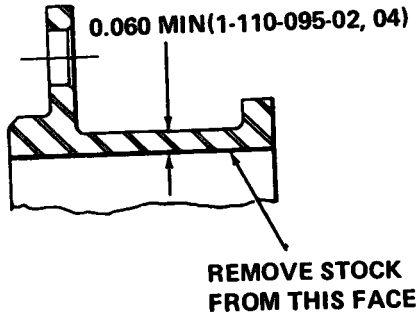


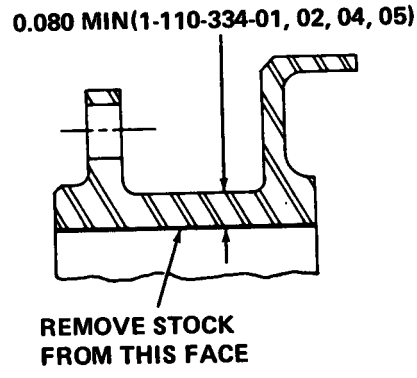
4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
10. Turbine Wheel and Feeler Gage		**Rotate** together in the **reverse** direction, until **stopped** by an area of less clearance.
11. Turbine Nozzle Flange		**Mark** as before. **Connect** the two marks to show area to be reworked.
12. Turbine Nozzle Flange		**Repeat** preceding actions for items 5 thru 11 until all areas that must be reworked have been located.
	NOTE When removing first stage turbine rotor assembly in action for item 13 illustrated in following figure, do not remove cone.	

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

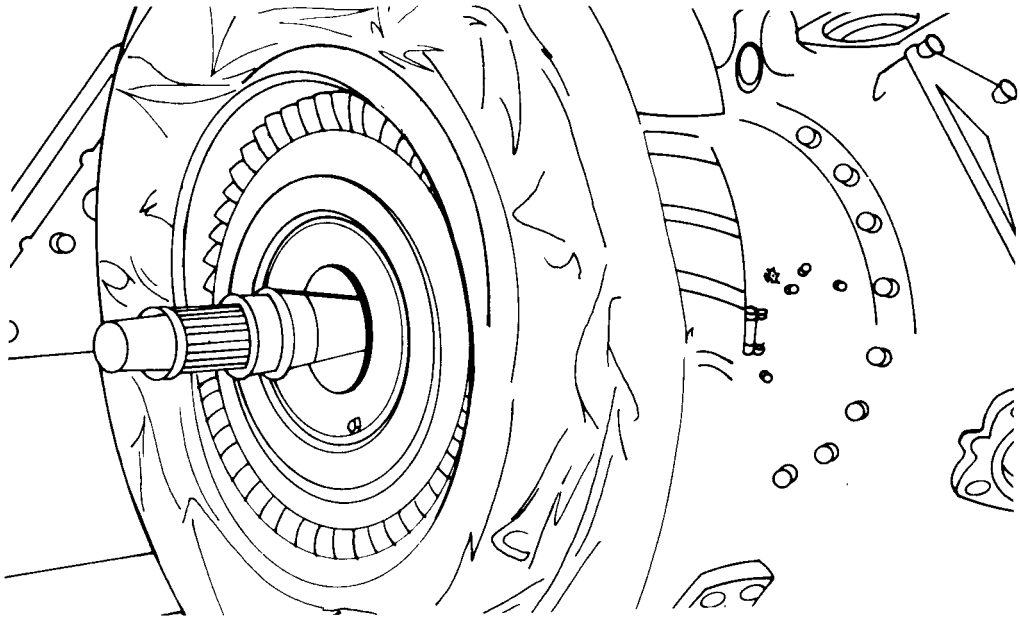
LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
13. First Stage Tur-bine Rotor Assembly (1)	Do not discard lockring (2). 	**Remove.**
14. Turbine Nozzle Flange	If thickness is less than that shown in the following figure or if removal of material necessary to obtain required tip clearance will decrease wall thickness to less than that shown, replace turbine nozzle flange.	**Check wall** thickness of flange at points indicated for rework.





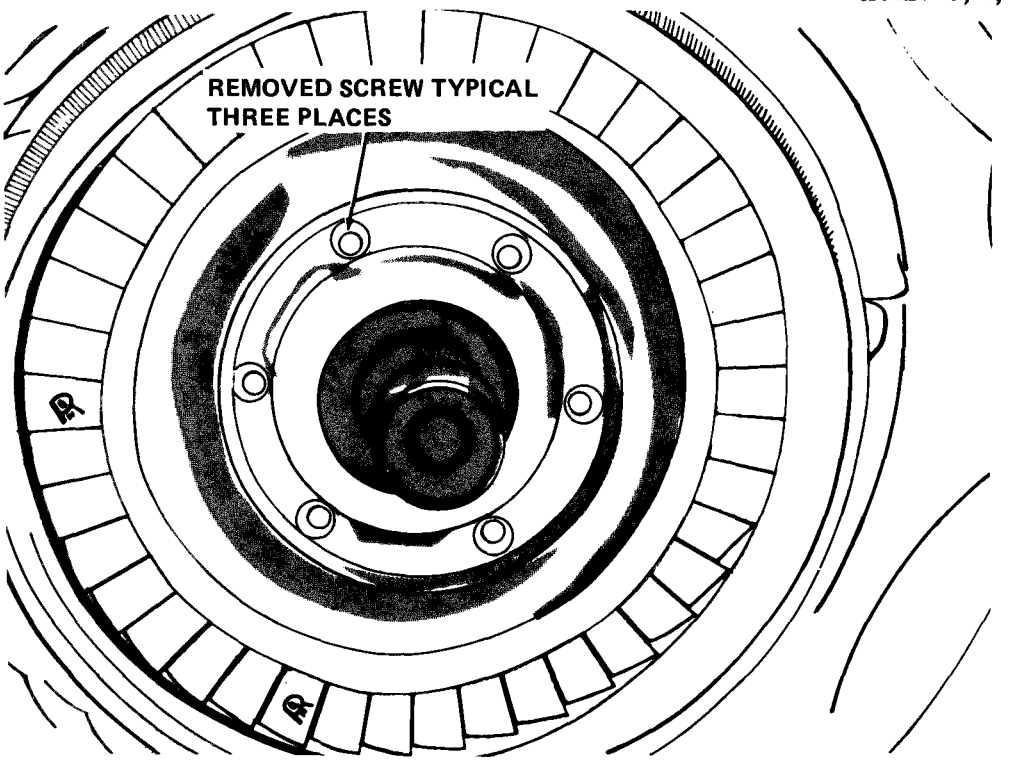
4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
	NOTE Install first stage turbine nozzle flange finishing machine (LTCT2125) as follows in actions for items 15 thru 21.	
	WARNING **Safety glasses must be worn during operation of finishing machine to protect eyes from flying chips.**	
15. Protective Cover	Use protective cover (LTCT4408, detail of LTCT2020).	**Install. Place** large end over flange of air diffuser and small end over nozzle.
16. Garter Extension Spring	The garter spring aids in producing a good finish by reducing resonance and dampening vibration during milling operation. Use garter extension spring (LTCT9396, detail of LTCT2020).	**Install** on nozzle flange.



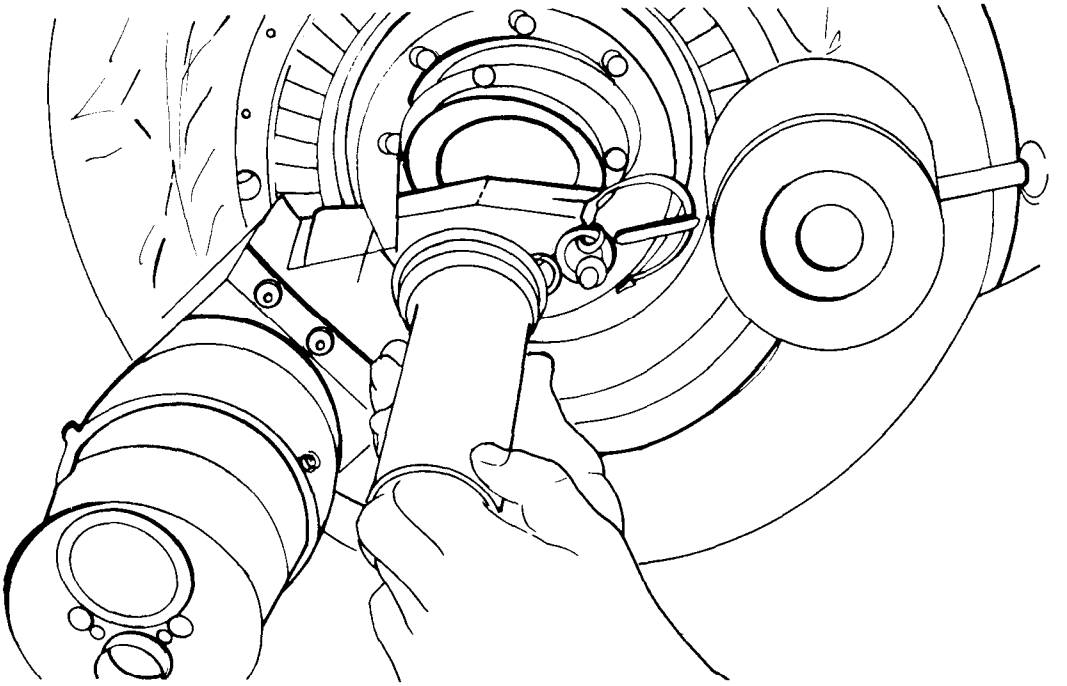
4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
17. Lockwire		**Cut.**
18. Air Deflector Retaining Screw		**Remove** from each of the following clock positions: 3, 7, and 11.
19. Captive Screws	Two men are required to slide machine onto stub shaft.	**Slide** finishing machine onto stub shaft. Insert captive screws into open screw holes and **tighten** finger-tight.
20. Bushing and Adapter		**Insure** these items are free on shaft.
21. Machine		**Push** forward until shaft contacts compressor turbine forward cone.



4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
22. Compressor **Turbine Rear** Cone	Use compressor turbine rear cone 1-110-411-03 furnished with kit. Use sleeve bushing (LTCT4406, detail of LTCT2020). Use shouldered shaft (LTCT4405, detail of LTCT2020). If difficulties are encountered during installation of cone and retaining nut, raise rear end of arbor slightly to make it concentric with stub shaft.	**Install.**



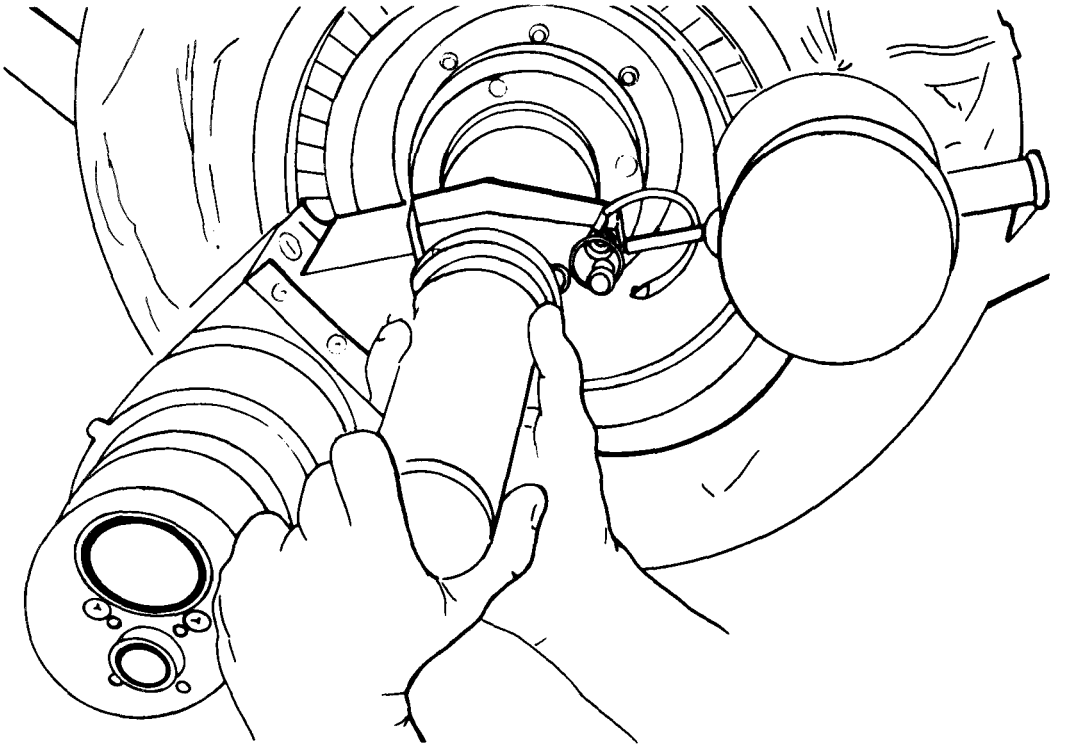
23. Bearing Retaining Nut	Torque with face spanner wrench (LTCT 4450, detail of LTCT2020). Use spanner wrench (GGG-W-665B, Type II) to prevent rotor shaft from turning during tightening operation.	**Install. Tighten** to 700 pound-inches to 800 pound-inches (8.1 kg/m to 9.2 kg/m) or 56 pound-feet to 66 pound-feet.

NOTE

The following figure illustrates installation of bearing nut.

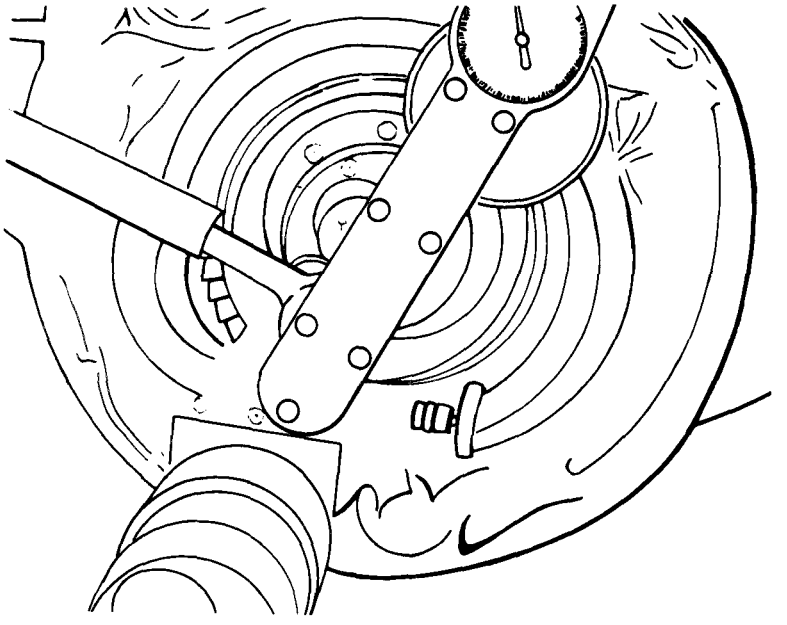
4-36. **First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued**

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		



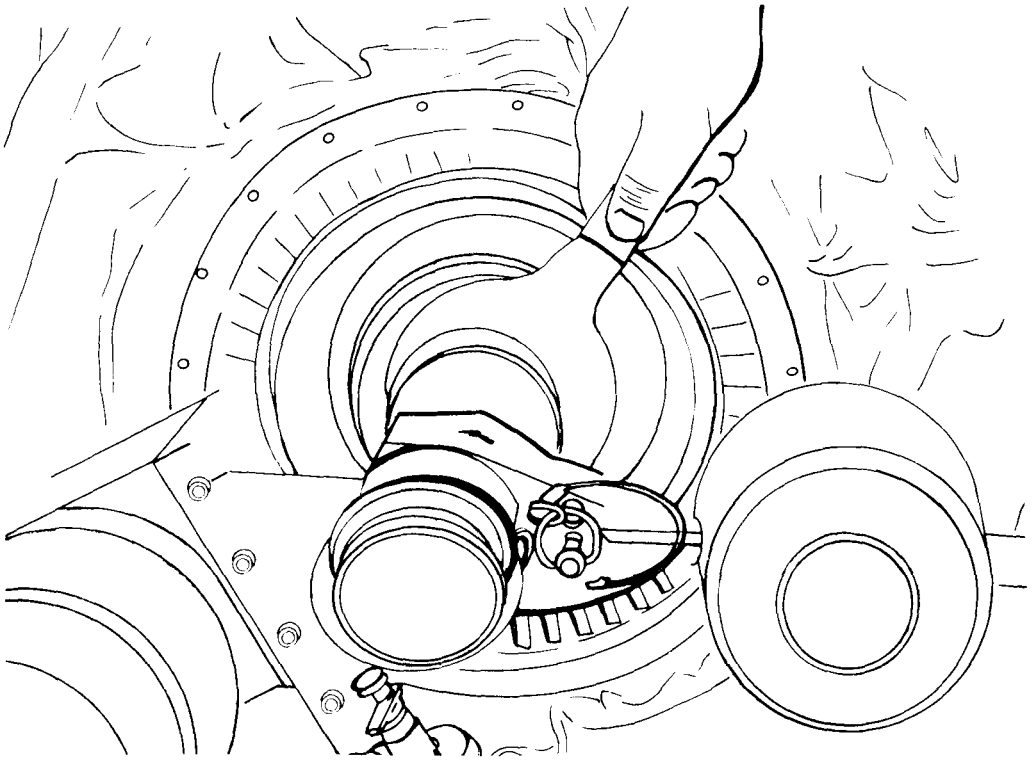
NOTE

The following figure illustrates tightening of bearing retaining nut.



4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) -Skimming Procedure(AVIM)- Continued

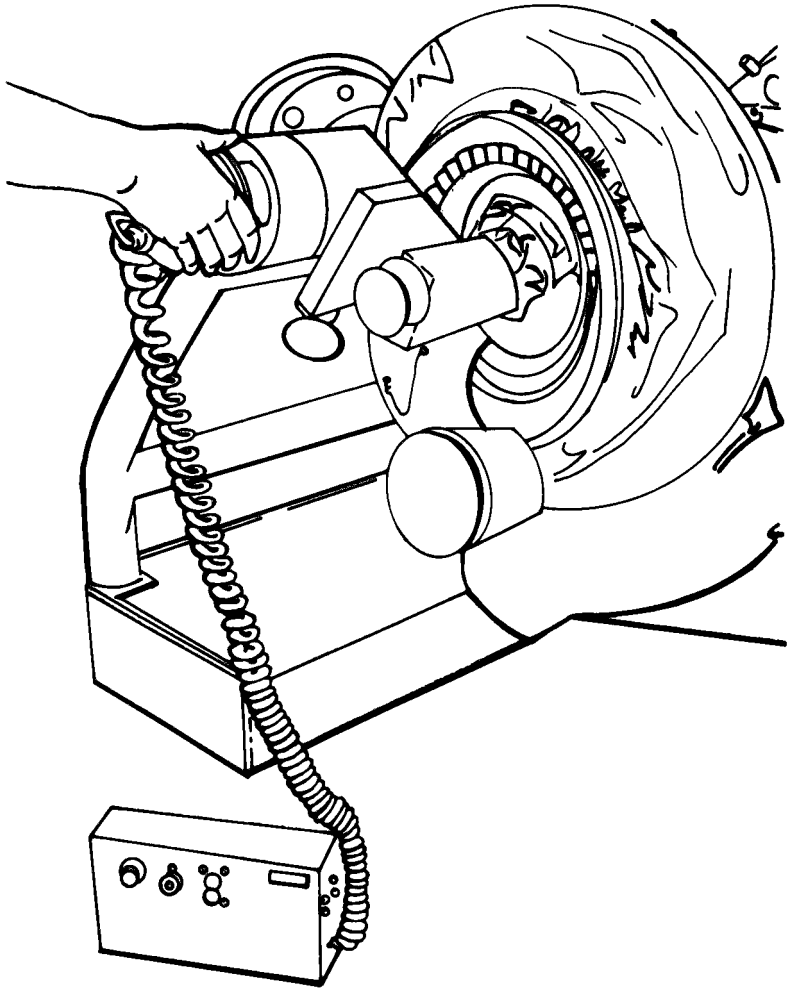
LOCATION/ITEM	REMARKS	ACTION
24, Captive Screws		**Tighten** in finishing machine adapter to 75 to 80 pound-inches (0.9 kg/m) torque.
25. Bushing	Use spanner wrench (LTCT4402-02, detail of LTCT2020) furnished with machine.	**Tighten** with spanner wrench.



26. Openings and Bearings Area		**Mask** openings and bearing area with tape.
27. Finishing Machine Balance Shaft and Weight	Use finishing machine and balance shaft weight (LTCT4389 and LTCT4388, detail of LTCT2125).	**Install. Secure** with lock pin.

36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) Continued

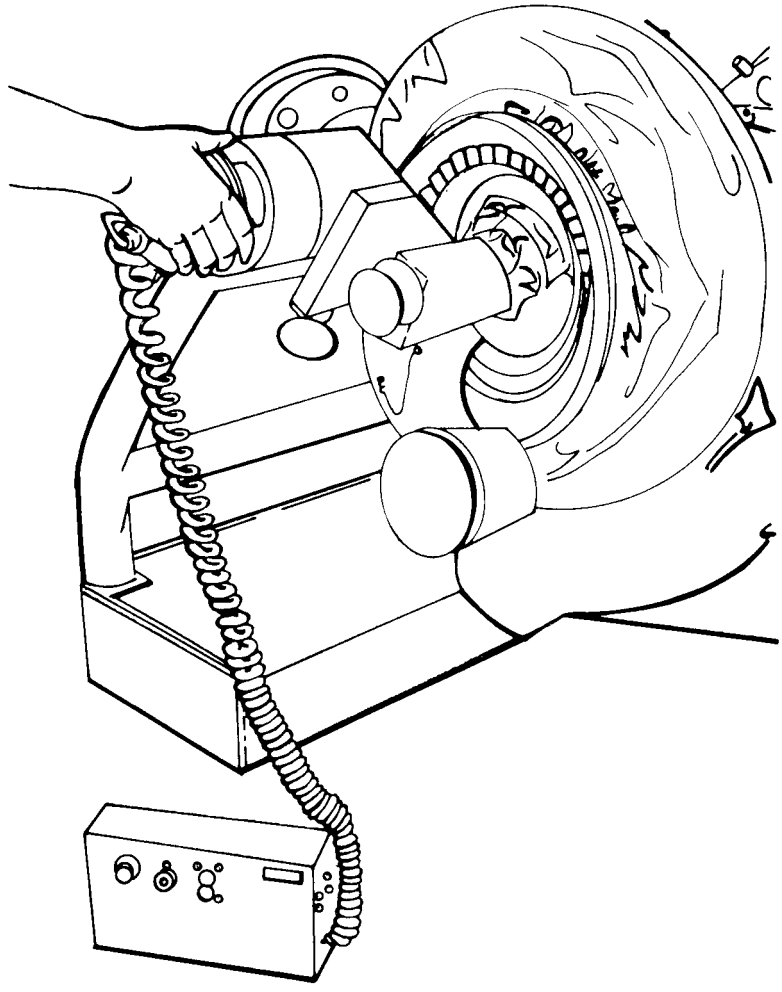
LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - continued		



28. Grinder	The grinder must be held firmly by aft end in the following action for item 28. Turning entire machine clockwise will move grinder forward axially (toward front of engine). Turning counterclockwise will move grinder toward aft end of engine.	**Hold** firmly. **Turn** machine counterclockwise until feed reaches aft stop.

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		



29. Collet of Grinder	The collet must be tight enough to prevent cutter from moving freely but loose enough to permit it to be moved by hand. Back of cutter head must not be more than one inch (25.4 mm) from collet.	Install cutter (LTCT 9261, detail of LTCT 2020) in collet of grinder.
30. Grinder		**Hold** by base. **Turn** machine **clockwise** until feed reaches forward stop,

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

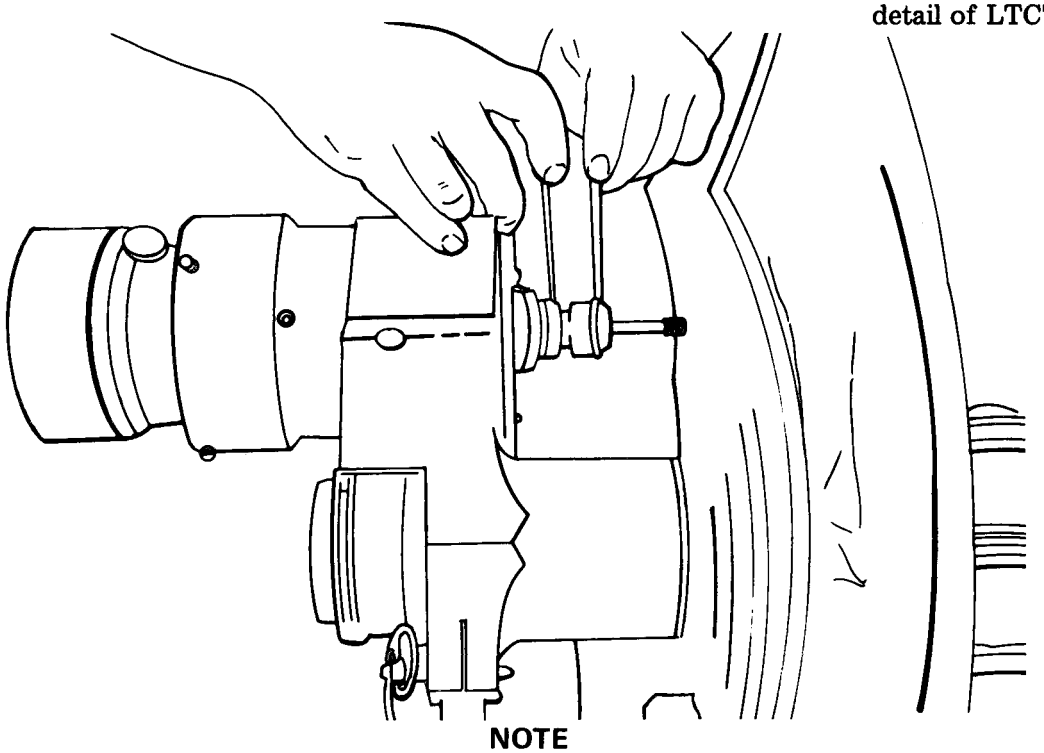
LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		

CAUTION

If cutter extends beyond forward edge of flange in action for item 31, it will damage nozzle vanes during cutting operation.

31. Cutter

Adjust to reach forward edge of flange. **Tighten** collet, using spanner wrench (LTCT9263, detail of LTCT2020).



NOTE

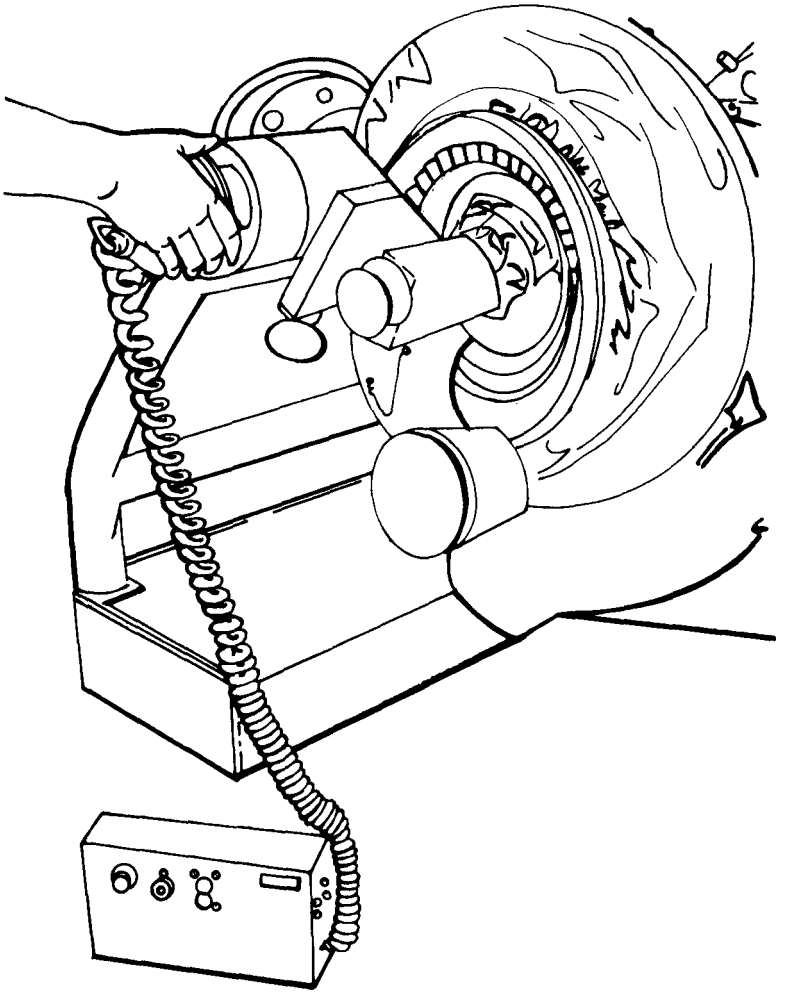
To obtain satisfactory finish, the following rules must be obeyed: Do not use a tool that vibrates (i.e. does not run true). Do not extend a 1/4 inch shank tool more than one inch of shank beyond collet.

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
32. Grinder and Cutter		**Hold** grinder as before. **withdraw** cutter by **turning** machine **counter. clockwise** until grinder reaches aft stop.
33. Collet		**Check** to **insure** tightness.

NOTE

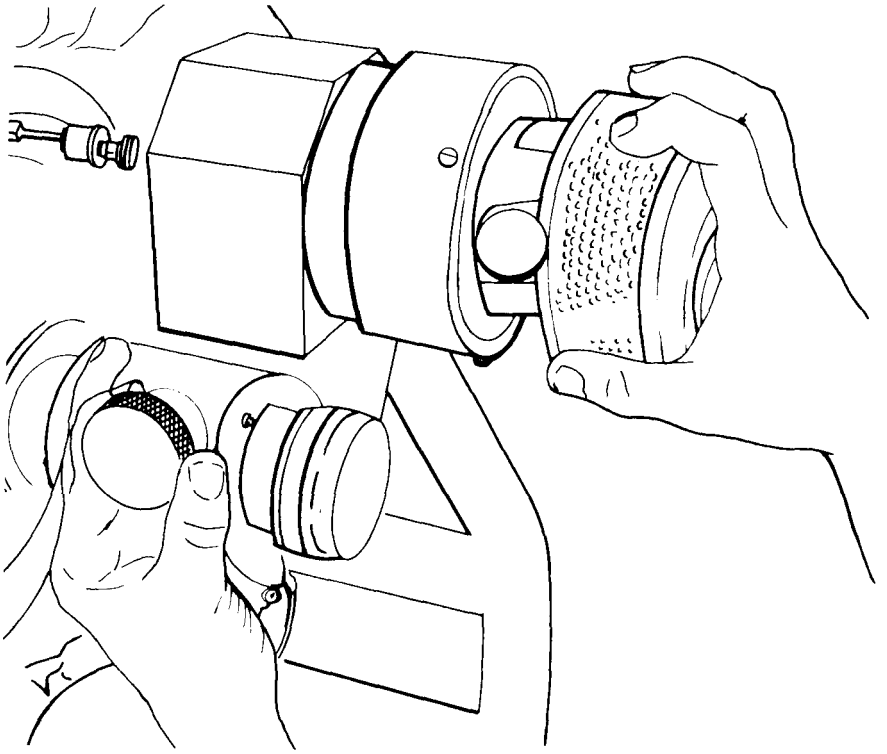
This figure illustrates Installed Flange Finishing Machine.



4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
	WARNING **Safety glasses must be worn during operation of finishing machine to protect eyes from flying chips.**	
	CAUTION **The first cut should always be shallow, since the flange may be tapered. A deep first cut may damage the cutter and/or flange.**	
	NOTE One increment on dial of adjusting handle will advance cutter radially approximately 0.001 inch (0.025 mm).	
34. Grinder		**Advance** grinder until at least one-half of cutter is within flange.
35. Cutter		**Station** cutter at area of minimum tip clearance (highest point) indicated by markings on edge of flange.
36. Cutter		**Advance** cutter radially by **turning** adjusting handle until cutter just contacts inner surface of flange, Sweep cutter around flange to **insure** adjustment to the highest point

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
		
37. Finishing		**Turn** finishing machine **counterclockwise** until cutter is clear of flange; then **advance** radially 0.001 to 0.002 inch (0.025 mm to 0.51 mm) by **turning** adjusting handle **clockwise.**
38. Electric Power Cable	Electric power required is 110-120 volts ac, **15** amps, 50-60 Hz. The round prong on plug is the ground.	**Connect from** grinder to control box. **Connect** control box to power source. If socket has no ground connection, **switch** ground prong to one side and **wire** it to plate screw in junction box, or use adapter with ground wire.

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) -Skimming Procedure (AVIM)- Continued

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
39. Grinder		Start grinder. Wait approximately 10 seconds until it reaches maximum speed. Slowly **sweep** cutter **clockwise** around flange until forward stop is reached.
	CAUTION **Do not halt sweep between stops (forward and aft) while cutter is in contact with flange. If sweep is halted, cutter will dig into flange causing a scallop in the metal.**	
40. Cutter		**Withdraw** axially by **sweeping** counterclockwise until cutter is clear of flange.
41. Cutter		**Advance** radially 0.001 inch to 0.002 inch (0.3 mm to 0.05 mm) beyond previous setting.
	NOTE Repeat preceding actions for items 38 through 41 until ends of reworked area coincide with ends of area indicated on flange. Correction of minimum tip clearance by this method will automatically correct tip clearance at other points.	
42. Reworked Areas		**Polish** lightly with emery cloth 320 grit to **remove burrs.**

4-36. First Stage Turbine Nozzle Flange (T53-L-11 Series Engines) - Skimming Procedure (AVIM) - Continued

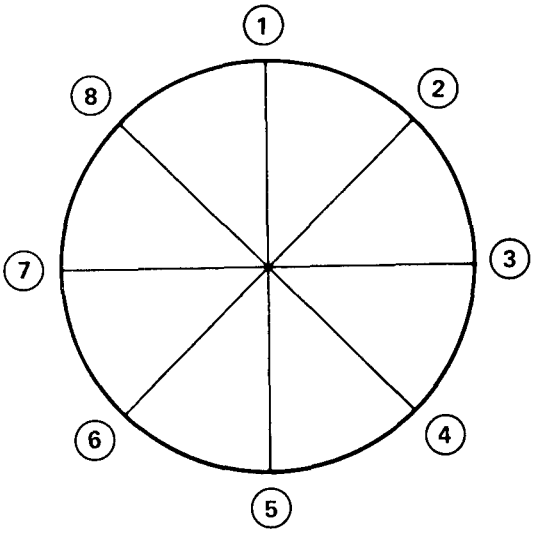
LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE ASSEMBLY/ - Continued		
43. Flange Wall	Refer to action for item 14.	**Check** thickness of flange wall at reworked areas.
44. Flange Finishing Machine	When rework is completed, perform this action.	**Remove** by reversing the installation procedure.

4-37. First Stage Turbine Blade Tip (T53-L-11 Series Engines) - Clearance Check

INITIAL SETUP

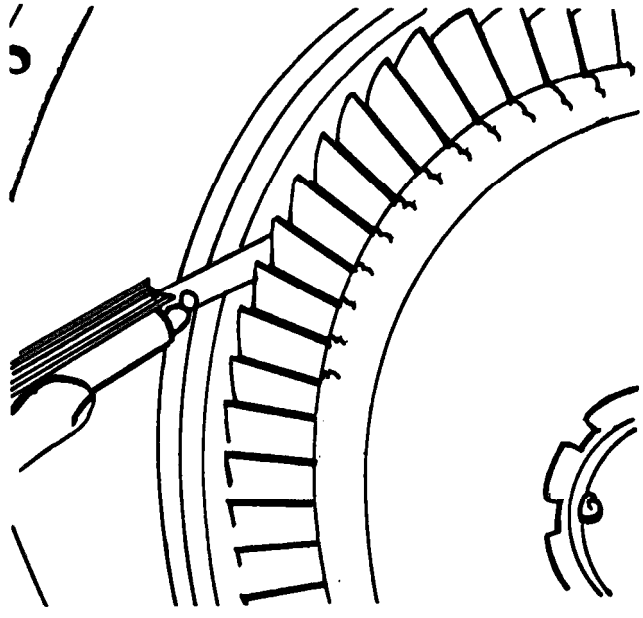
Applicable Configuration
T53-L-11 Series Engines

References
Para 4-2, 4-36 and 4-10

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		
1. Combustor Turbine Assembly	Refer to paragraph 4-2.	**Remove.**
2. Blade Tip Clearance		**Check** blade tip clearance at eight positions, 45 degrees apart.

4-37. First Stage Turbine Tip (T53-L-11 Series Engines) - Clearance Check - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
3. First Stage Turbine Blade Tip and Turbine Nozzle Flange	Use a 12-inch feeler gage (Starrett number 172E or equivalent). Rotate turbine wheel one full turn and record minimum clearance over longest turbine blade at each position. See figure below.	**Check** radial clearance between blade tip and flange.
4. Tip Clearance	Refer to paragraph 4-36, tip clearance shall be as given in Appendix G, reference no. 40.	If less than 0.025 inch (0.63 mm) on any blade, remove stock from inside diameter of first stage turbine nozzle flange.
5.Combustor Turbine Assembly	Refer to paragraph 4-10.	Install.



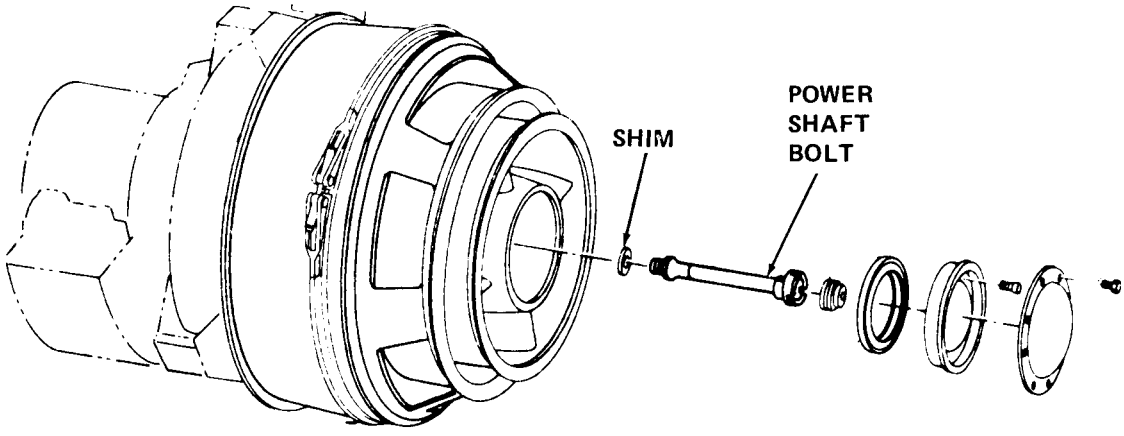
4-38. Power Shaft Bolt Flange (T53-L-11 Series Engines) - Depth Measurement

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Special Tools
Locating Button Bar (LTCT153)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**NOTE** If original flange depth measurements or flange shims have been lost, determine flange depth measurement according to actions in this paragraph.	
1. Power Shaft Bolt and Locating Shim		If installed, **remove.**



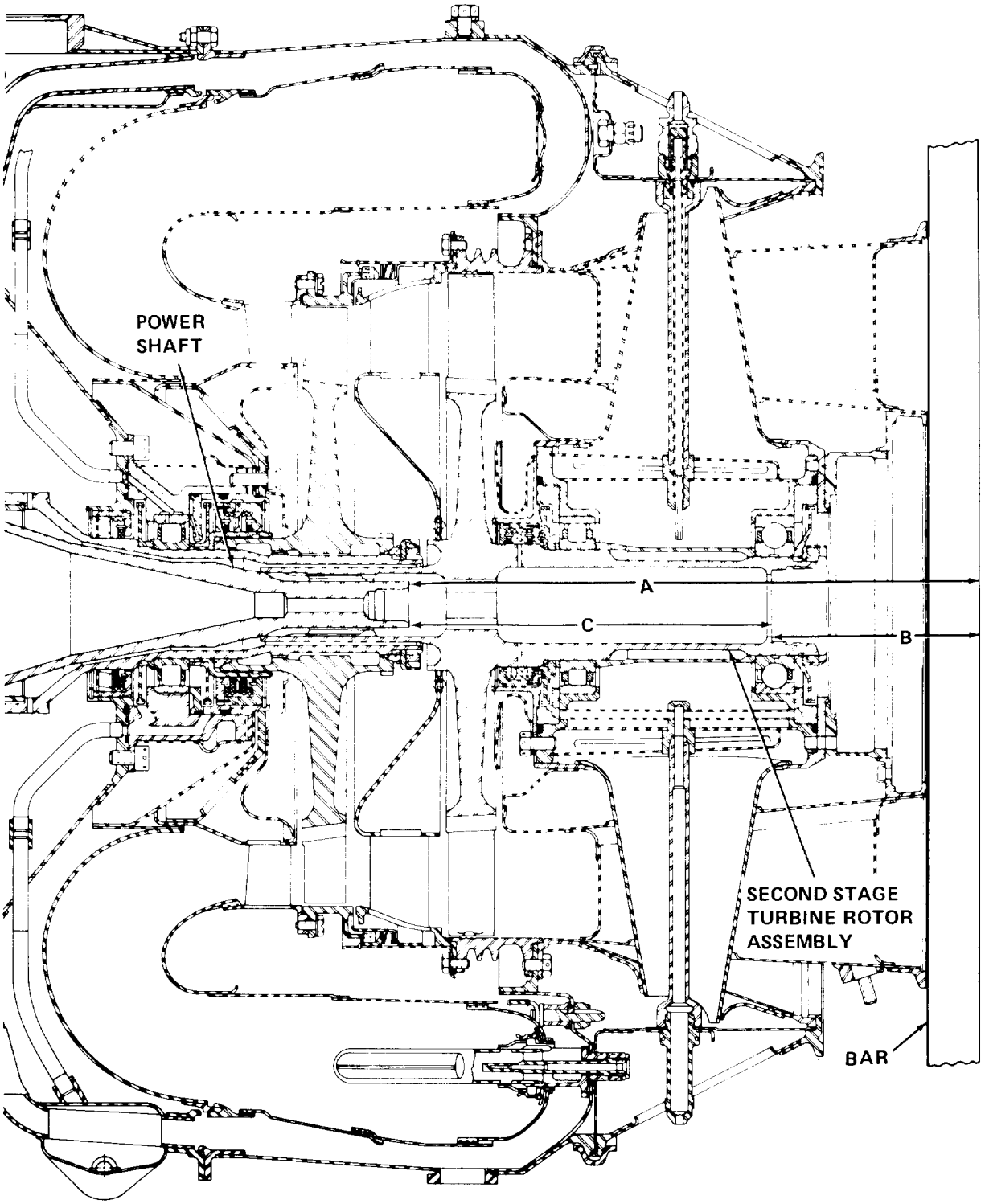
CAUTION

If power shaft is not in extreme forward position in following action for item 2, engine failure can result.

2. Power Shaft Bolt	Use clean rod (wood or phenolic dowel) when performing this action.	Gently, but firmly **push** to extreme forward position.
3. Exhaust Diffuser	Use locating button bar (LTCT153).	Place locating button bar across back of exhaust diffuser. Note dimension from bar to aft end of power shaft. This is dimension A.

4-38. Power Shaft Bolt Flange (T53-L-11 Series Engines) - Depth Measurement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		



4-38. Power Shaft Bolt Flange (T53-L-11 Series Engines) - Depth Measurement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
4. Second Stage Turbine Rotor Assembly		With bar in same position, **note** dimension from bar to power shaft bolt **seating** shoulder in second stage turbine rotor assembly. This is dimension B.
5. Power Shaft Bolt Flange		**Subtract** dimension B from dimension A to **obtain** dimension C.
6. Power Shaft Bolt Flange		**Subtract 0.230** inch (5.84 mm) from dimension C to obtain dimension D.
7. Power Shaft Bolt Flange		**Subtract** dimension D from the power shaft bolt length 7.290 inches (18.517 cm) to **obtain** required thickness of shim.

4-39. Power Shaft Bolt Flange (T53-L-11 Series Engines) - Depth Measurement (AVIM)

INITIAL SETUP

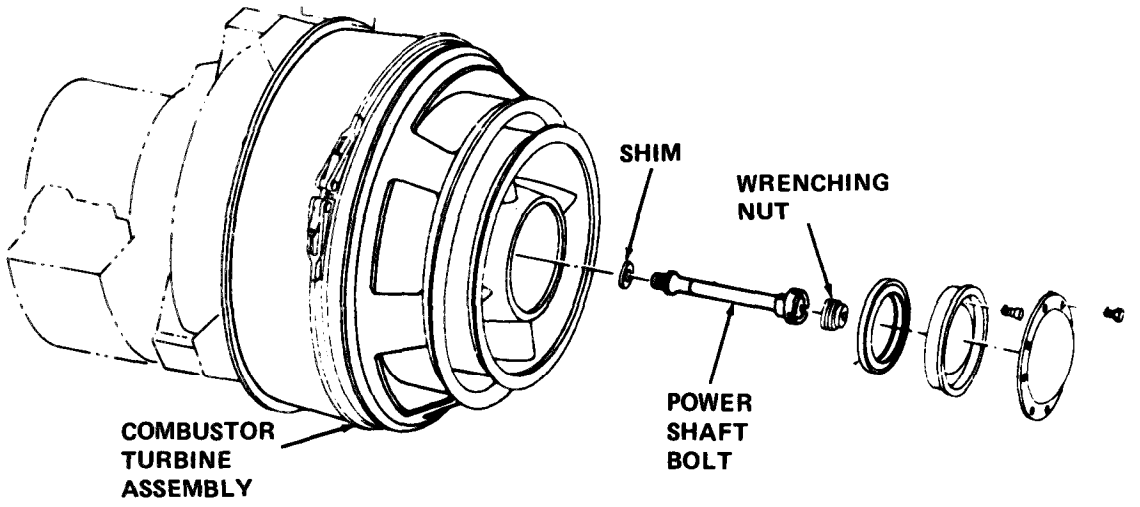
Applicable Configuration
T53-L-11 Series Engines

Special Tools
Socket Wrench (LTCT505)
Locking Plate Assembly (LTCT248)
Locating Button Bar (LTCT153)
Alinement Tool (LTCT503)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		
1. Power Shaft Bolt		**Record** depth of original power shaft bolt for reference during reassembly.

4-39. Power Shaft Bolt Flange (T53-L-11 Series Engines) - Depth Measurement - (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		

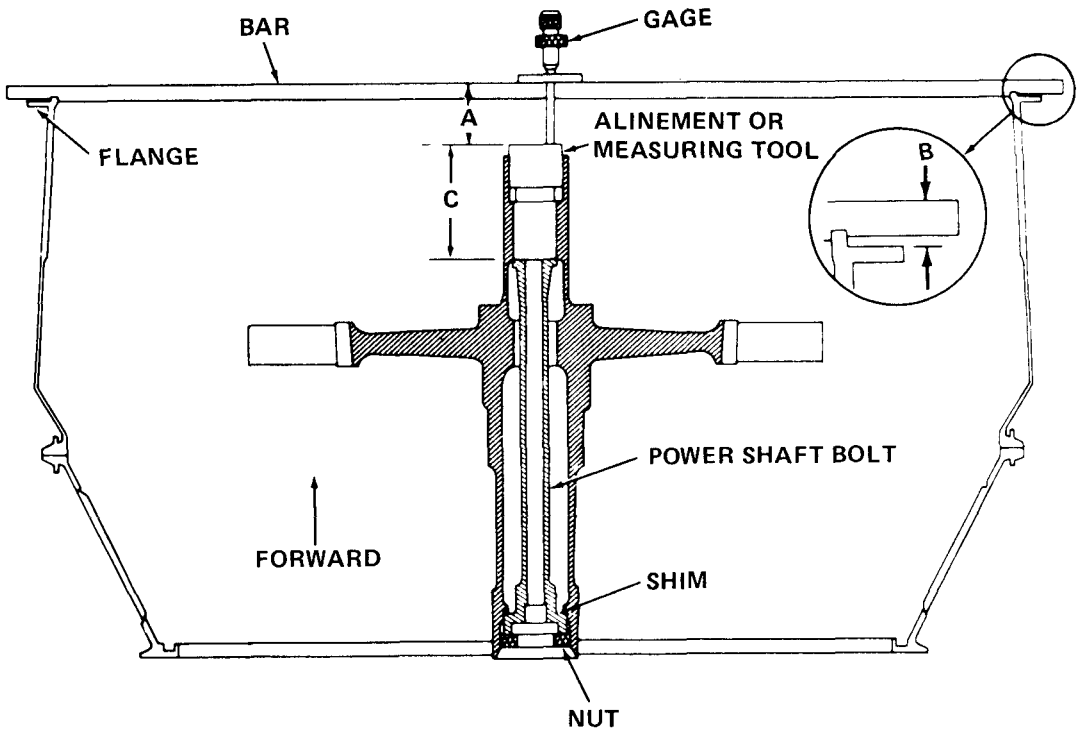


If the power turbine support assembly, combustion chamber housing, or exhaust diffuser is disassembled or replaced, the flange depth measurement governs the size of shims to be placed under the head of power shaft bolt to correctly position the power shaft with the compressor rotor assembly.

2. Shims, Power Shaft Bolt, and Wrenching Nut	Combustor turbine assembly on a bench. Use socket wrench (LTCT505), locking plate assembly (LTCT248), locating button bar (LTCT153) and alinement tool (LTCT503).	**Install** original shims, power shaft bolt, and internal wrenching nut. **Tighten** nut snugly, using socket wrench. **Remove** locking plate assembly. **Position exhaust** diffuser down and place locating button bar on combustor flange and alinement tool in power turbine spline.
3. Power Shaft Bolt Flange		With vernier depth gage, **measure** from top of bar to top of alinement tool (dimension A).

4-39. Power Shaft Bolt Flange (T53-L-11 Series Engines) - Depth Measurement - (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



4. Power Shaft Bolt Flange		With vernier depth gage, **measure** from top of bar to combustor flange (dimension B).
5. Power Shaft Bolt Flange	The resulting dimension plus the length of the alinement tool (dimension C) will be the flange depth.	**Subtract** dimension B from dimension A. **Record** and **return** this measurement for reference during assembly.
6. Power Shaft Bolt Flange	Use locking plate assembly (LTCT248).	**Install** locking plate assembly. **Remove** internal wrenching nut power shaft bolt, and shims. **Record** number and thickness of shims and **secure** shims to bolt with wire. **Remove** locking plate assembly.

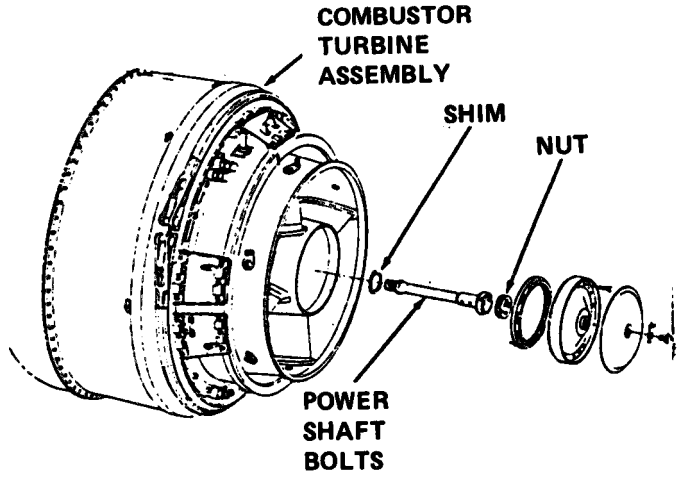
4-40. Power Shaft Bolt Flange (T53-L-13B/703 Engines) - Depth Measurement

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

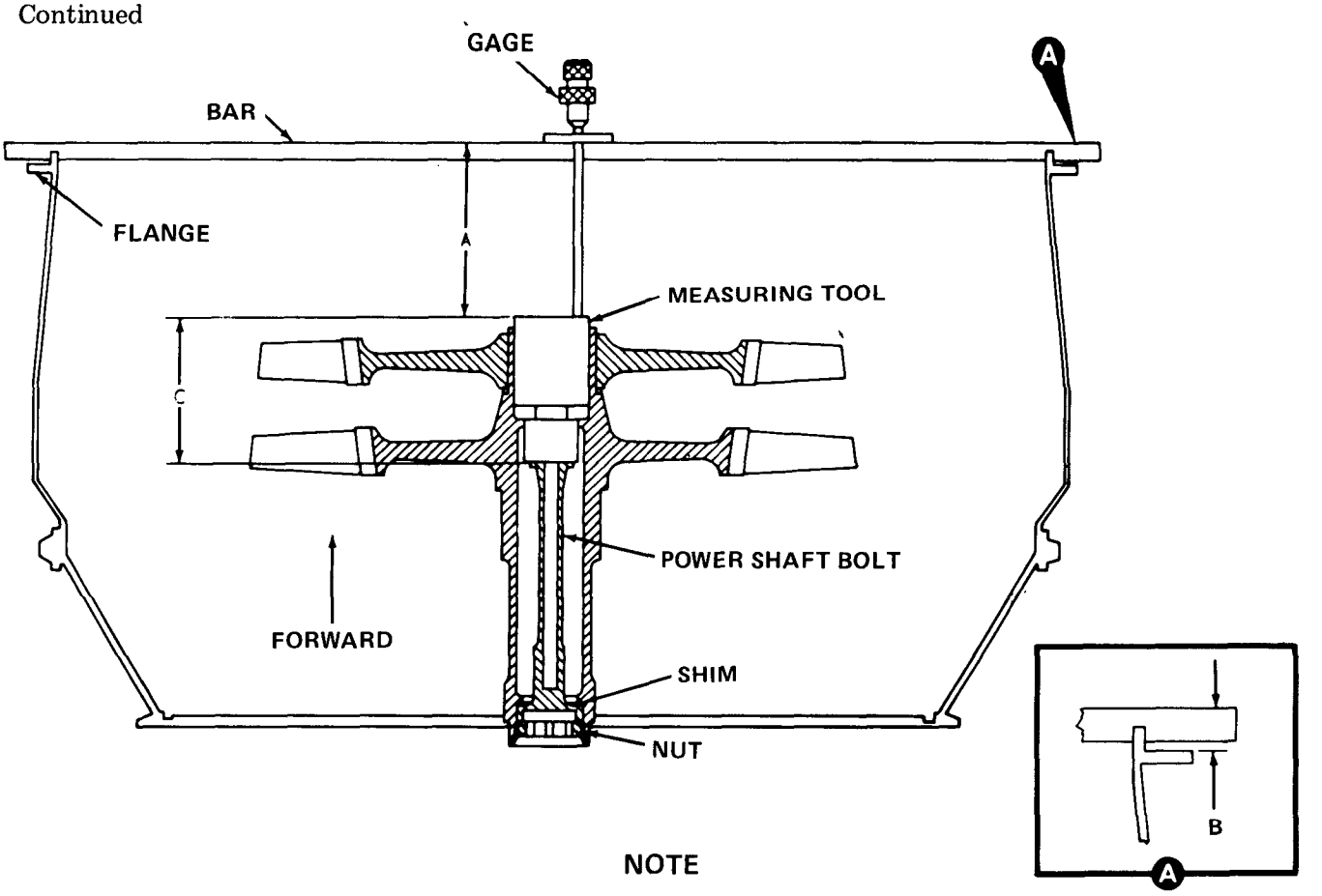
Spatial Tools
Locating Bar **(LTCT153)**
Measuring Tool (LTCT6124)
Wrench (LTCT505)
Torque Adjustment Fixture (LTCT962)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		
1. Power shaft Bolt	Flange depth measurement governs size of shims placed under head of power shaft bolt to locate power shaft within engine correctly.	**Measure and record** original power shaft bolt flange depth for reference during reassembly.
2. Shim Power Shaft Bolt, and Nut	Place combustor turbine assembly on bench.	**Install** original shims, power shaft bolt, and nut. **Tighten** nut **snugly,** using wrench (LTCT 505). **Remove** toruqe adjustment fixture (LTCT962).
3. Exhaust Diffuser		With exhaust diffuser down, set locating bar (LTCT153), on combustor housing flange and **install measuring tool (LTCT6124)** in power turbine splines as illustrated in the following figure.



4-40. Power Shaft Bolt Flange (T53-L-13B/703 Engines) - Depth Measurement - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



NOTE

On T53-L-703 engines, position a piece of 0.750 inch (19.05 mm) ground stock or parallel baron combustion chamber bolt hole flange, under each end of locating bar, to prevent bar from contacting inner lip of combustion chamber liner.

4. Power Shaft Bolt Flange	Use vernier depth gage.	**Measure** from top of bar to top of measuring tool (dimension A).
5. Power Shaft Bolt Flange		**Find** flange depth as follows:

4-40. Power Shaft Bolt Flange (T53-L-13B/703 Engines) - Depth Measurement - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		a. **Subtract** distance from top of locating bar to top of flange (dimension B from dimension A). Resulting dimension, plus length of measuring tool (dimension C), is flange depth. b. **Record** and **retain** this measurement for reference during assembly. **c. Install** torque adjustment fixture (LTCT962). d. Remove nut, bolt and shims. Secure shims to bolt with lockwire. e. **Remove** torque adjustment fixture (LTCT 962).

4-41. Power Shaft Bolt Flange (T53-L-13B/703 Engines) - Depth Measurement (AVIM)

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Special Tools
Locating Bar (LTCT153)

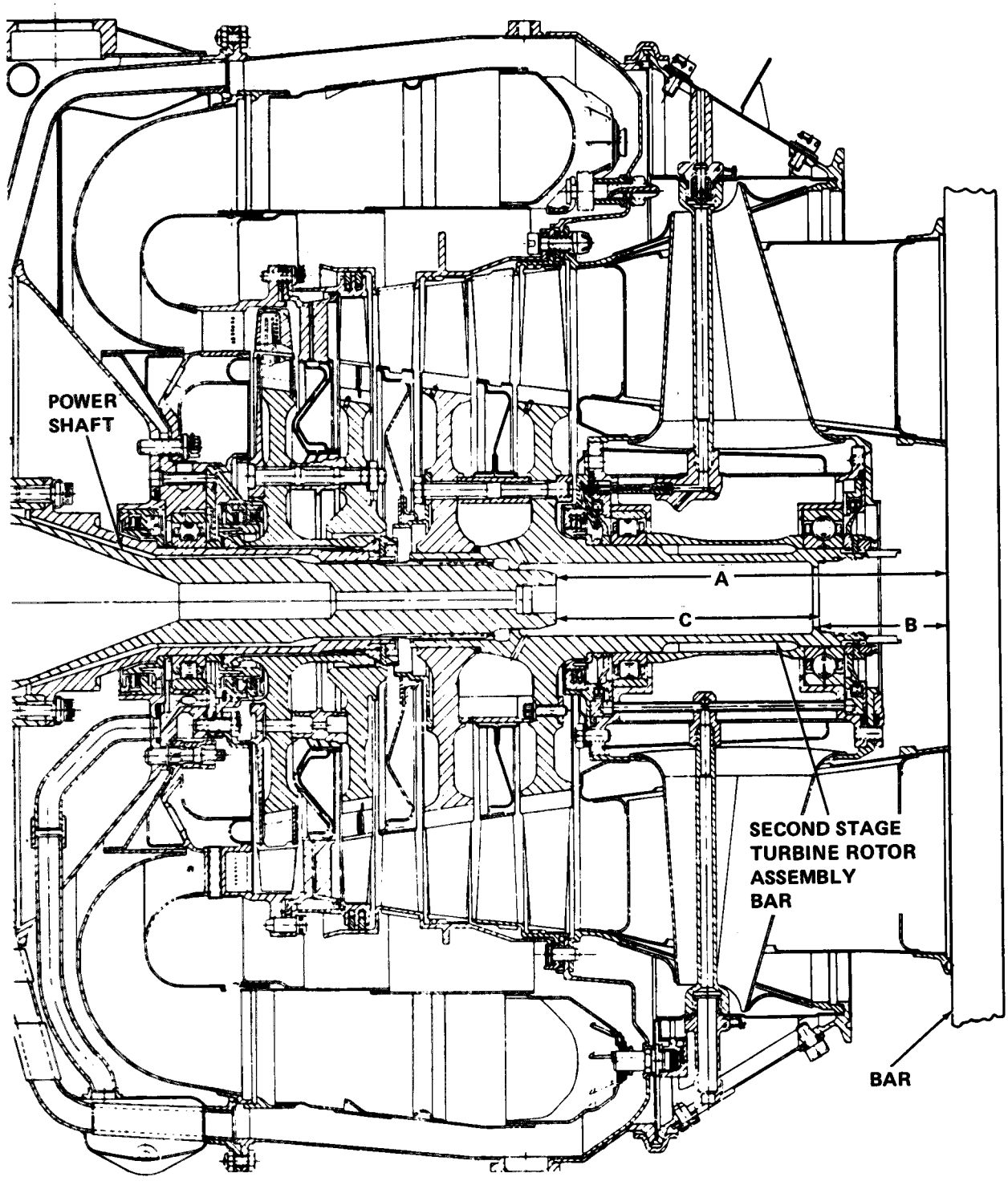
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**NOTE** If original flanged depth measurements or flange shims have been lost, determine flange depth measurement according to actions within this paragraph.	

4-41. Power Shaft Bolt Flange (T53-L-13B/703 Engines) - Depth Measurement (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
1. Power Shaft Bolt		**Remove** power shaft bolts and locating shim.
	CAUTION **If power shaft is not in extreme forward position in following step, engine failure can result.**	
2. Power Shaft		**Use** a clean rod (wood or phenolic dowel), gently but firmly **push** power shaft to extreme forward position.
3. Exhaust Diffuser		**Place** locating bar (LTCT153) across back of exhaust diffuser, and **note** dimension from bar to aft end of power shaft. This is dimension A.
4. Power Shaft Bolt	Locating bar (LTCT153) is in same pattern as indicated in action for item 3.	**Note** dimension from bar to power shaft bolt seating shoulder in second stage turbine rotor assembly. This is dimension B. **Obtain** required shim thickness as follows: a. **Subtract** dimension B from dimension A to **obtain** dimension C. b. **Subtract 0.230** inch **(5.84** mm) from dimension C to **obtain** dimension D.

4-41. Power Shaft Bolt Flange (T53-L-13B/703 Engines) - Depth Measurement (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



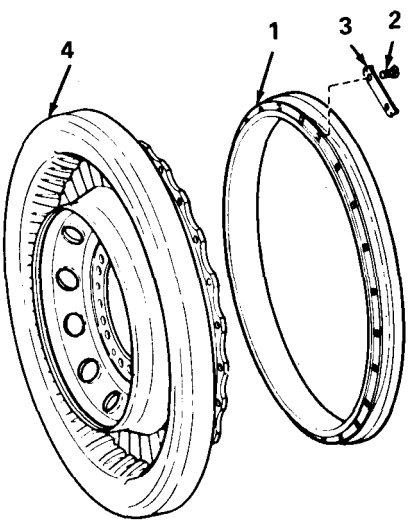
4-41. Power Shaft Bolt Flange (T53-L-13B/703 Engines) - Depth Measurement (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		**c. Subtract** dimension D from the power shaft bolt length (5.400 inches (13.71 cm)) to **obtain** required thickness of shim.

4-42. First Stage Turbine Nozzle Assembly (T53-L-11 Series Engines) - Disassembly

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/	**NOTE** Do not disassemble first stage turbine nozzle assembly except to correct visible damage or to replace parts.	
1. First Stage Turbine Nozzle Flange (1)		**Remove** screws **(2)** and tabwashers (3) securing first stage turbine nozzle flange (1) to first stage turbine nozzle (4). **Discard** screws and tabwashers.
2. Nozzle Flange		**Remove.**

4-43. First Stage Turbine Node Assembly (T53-L-13B/-703 Engine) - Inspection

INITIAL SETUP

Applicable Configuration

T53-L-13B Engine

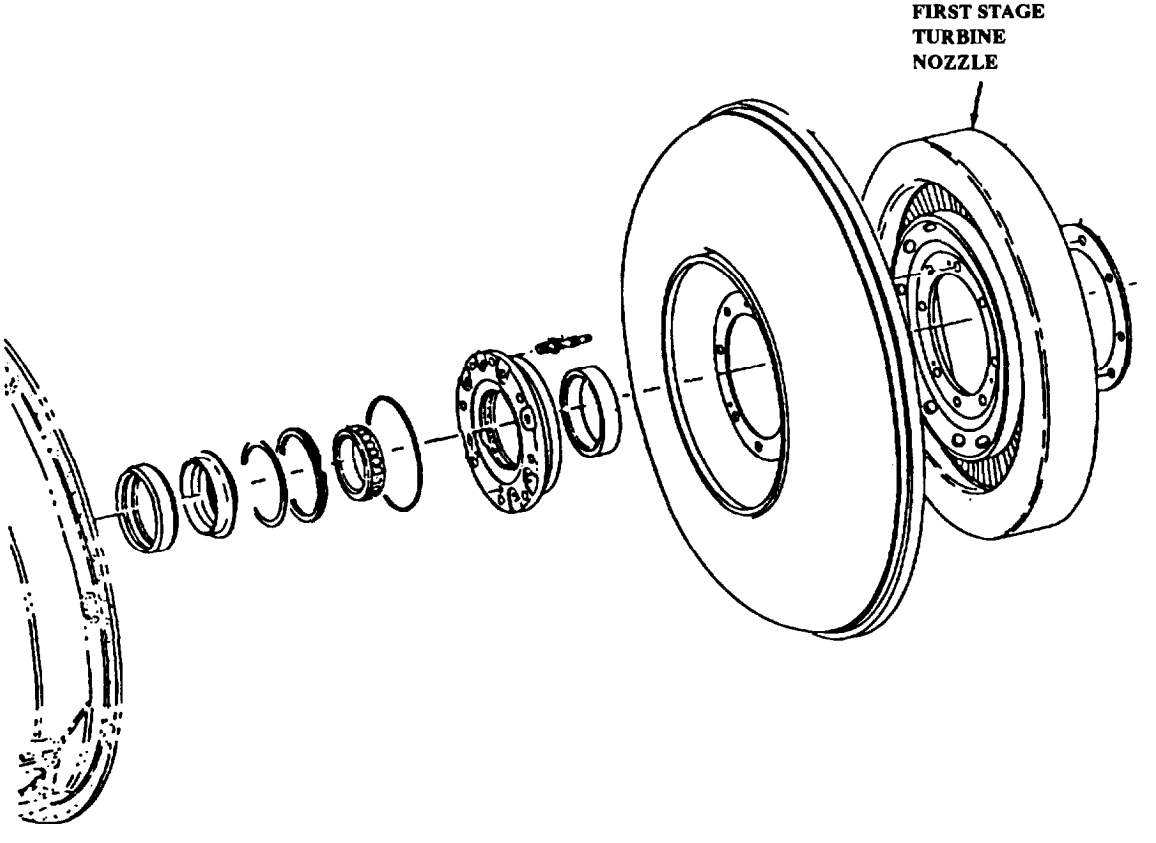
Consumable Materials

Transparent Bag (item 81, Appendix D)

References

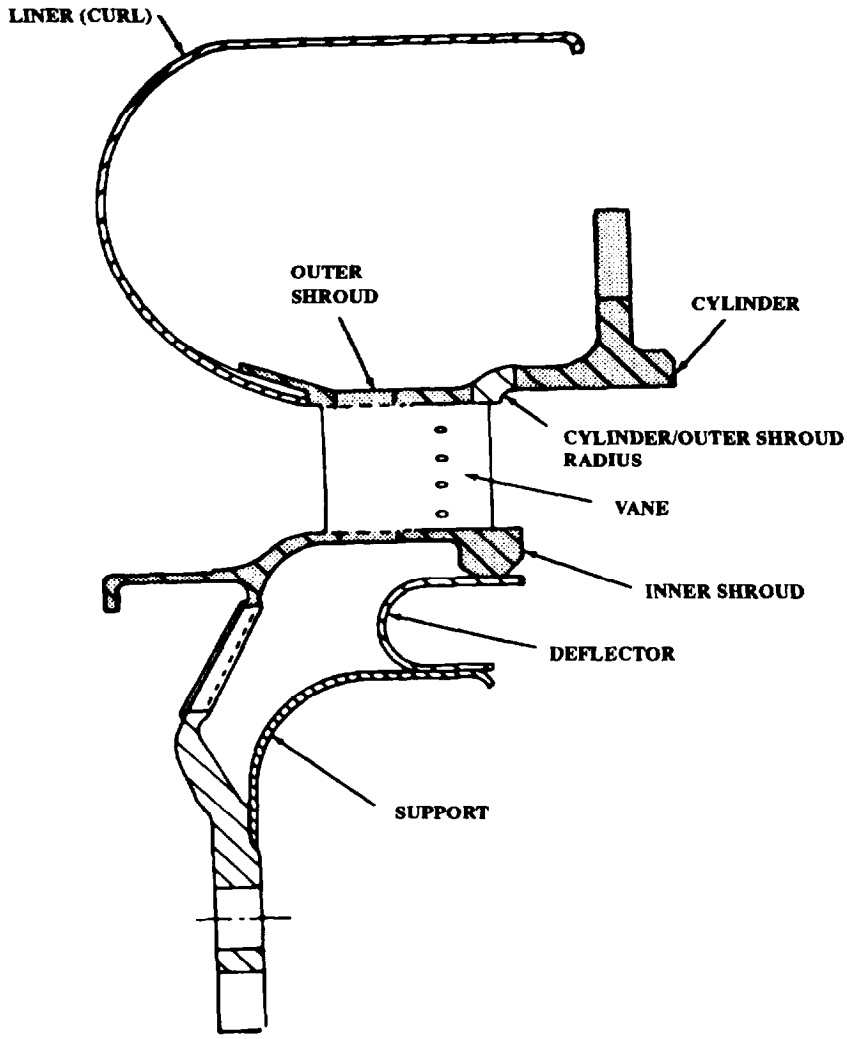
Para H-20, 4-12, 4-19, 4-46, and 1-118

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING		
1. First Stage Turbine Nozzle Assembly		**Inspect** for defects. See table for specific defects. **Replace** with nozzle 1-110-520-19 or 1-110-520-21 if inspection limits are exceeded.



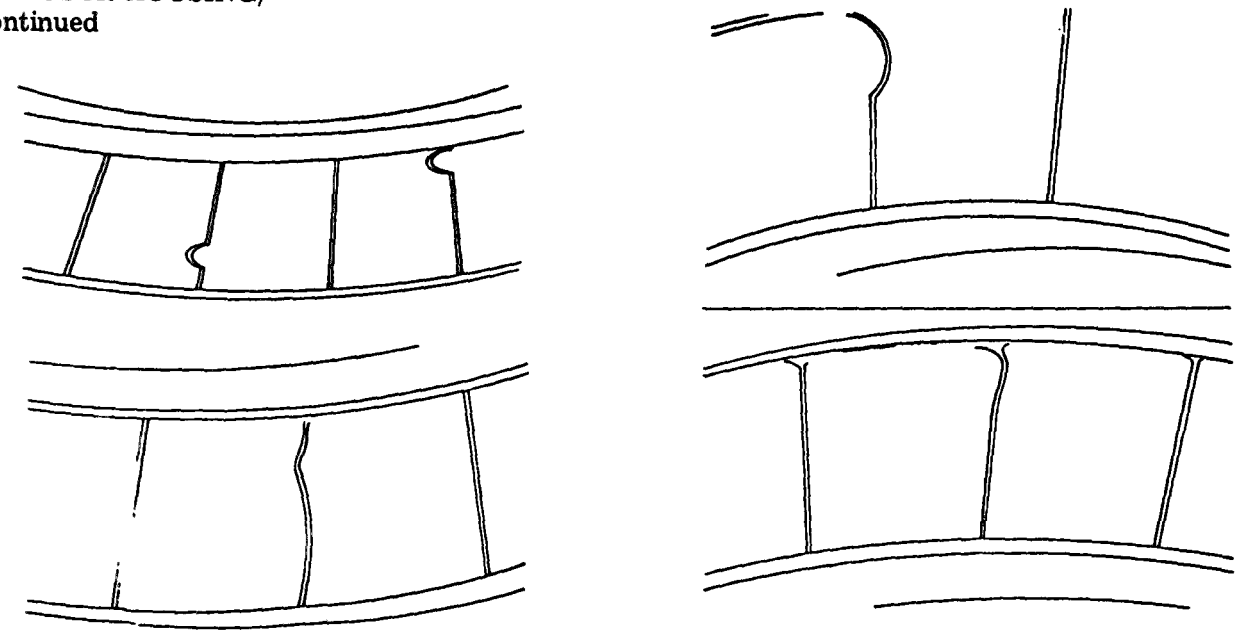
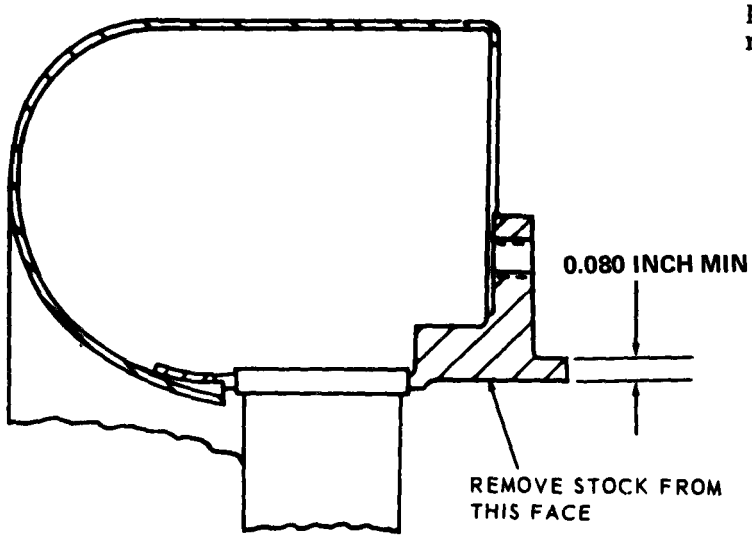
4-43. First Stage Turbine Nozzle Assembly (T53-L-13B/-703 Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
	Inspection locations are illustrated in figure below.	

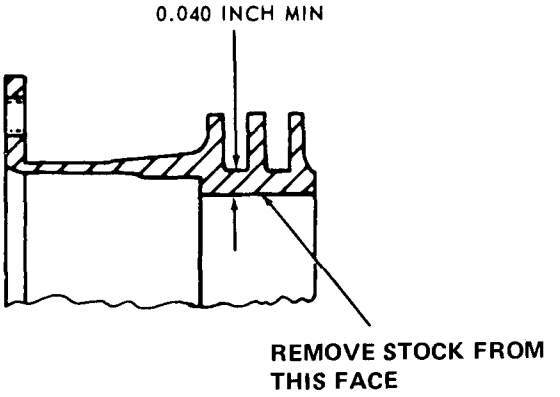


2. First Stage Nozzle Assembly	Nozzle 1-110-520-19 may exhibit areas of vane trailing edges which have been blend repaired by manufacturer. (See figure below.) These repairs have no significant affect on engine performance.	Inspection limits given in table following shall be applied only to those defects caused by engine operation. Perform fluorescent-pew trant inspection (refer to paragraph H-20) to detect cracks in nozzle curl OD.

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
	NOTE If first stage turbine nozzle assembly must be replaced, perform power check and trim adjustment of fuel control after replacement. (Refer to paragraph 1-118.)	
3. First Stage Turbine Nozzle Cylinder Flange	Refer to paragraph 4-12. 	**Check** wall thickness at points indicated for rework. **Replace** with

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		nozzle 1-110-520-19 or 1-110-520-21 if thickness is less than shown in this figure. Removal of material necessary to obtain required tip clearance will decrease wall thickness to less than that shown in this figure.
4. First Stage Turbine Nozzle Cylinder Flange	Refer to paragraph 4-19.	**Skim** if wall thickness is sufficient for rework.

NOTE

The first stage turbine nozzle assembly is a high-value item and should be carefully packaged for shipment in a suitable reusable container. Wrap nozzle in transparent bag (item 81, Appendix D) in accordance with Military Specification MIL-F-22191, Type II. Install in cushioning material of container, close container, secure, and properly tag for shipment.

NOTE

The following table lists inspection limits for first stage turbine nozzle assembly.

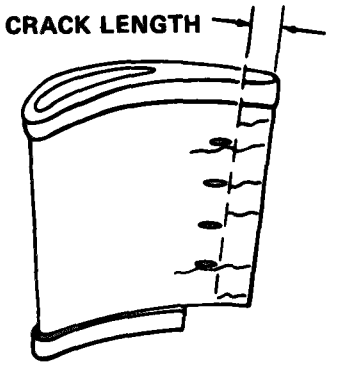
4-43 First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ -
Continued

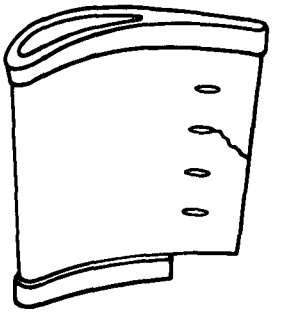
step No.	Defect	Ref	Inspection Limit 1-110-520-21	1-110-520-19

Vane Trailing Edge



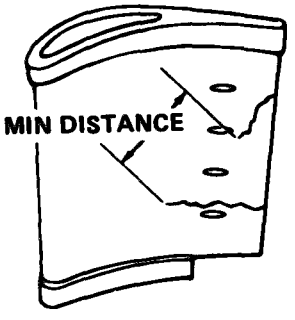
AXIAL CRACKS - TRAILING EDGE

A



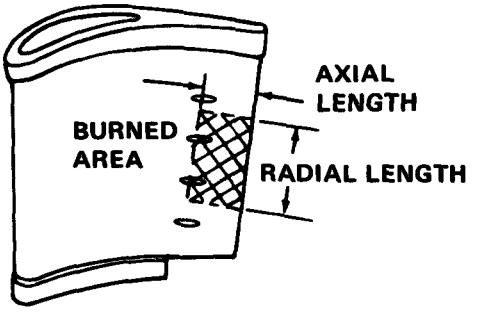
CRACK PROGRESSING FROM COOLING HOLES - TRAILING EDGE

B



CONVERGING CRACKS FROM TRAILING EDGE

C



BURNED AREA - TRAILING EDGE

D

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ - Continued

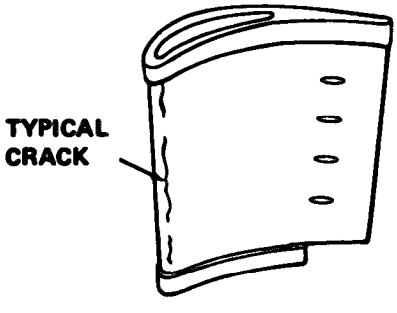
Step No.			Inspection Limit 1-110-520-21	Inspection Limit 1-110-520-19
1.	Cracks	A	**NOTE** All inspection limits specified for first stage turbine nozzle assembly 1-110-520-19, used on T53-L-13B engines, will also apply to first stage turbine nozzle assembly 1-110-710-06, used on T53-L-703 engines, unless otherwise indicated.	**NOTE** Do not measure cracks from any portion of manufacturer's blend-repair (see figure in item 2). When cracks occur in this area, use vane trailing edge as a reference point.
			a. Any number of cracks less than 1/8 inch (3,2 mm) long are acceptable on each vane.	a. Any number of cracks up to 1/4 inch (6,4 mm) long are acceptable on each vane.
		A	b. Maximum of two 3/8 inch (9.5 mm) nonconverging tight-lipped cracks are acceptable on each vane.	b. One crack 1/4 to 1/2 inch (6,4 to 12.7 mm) long is acceptable on each vane.
				c. Cracks at junction of vane trailing edge and outer shroud are acceptable on all vanes.
		B		d. Cracks progressing to vane cooling holes are acceptable.
		C		e. Cracks radiating toward one another are not acceptable. Minimum distance between converging cracks is 1/4 inch (6.4 mm).

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

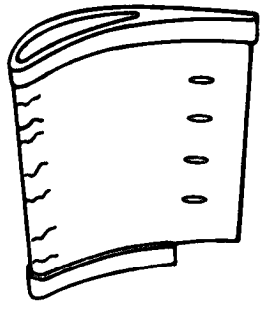
LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ - Continued

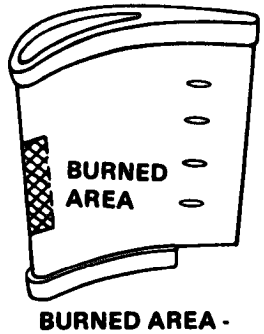
step No.	Defect	Ref	Inspection Limit 1-110-520-21	Inspection Limit 1-110-520-19
2.	Burning	D		NOTE Do not include manufacturer's blend-repair (see figure in item 2) in measurement of burned area.
			A burned area up to 3/8 inch (9.5 mm) radial length by 1/4 inch (6.4 mm) axial length is acceptable on a maximum of five vanes.	A burned area up to 3/8 inch (9.5 mm) radial length by 1/4 inch (6.4 mm) axial length is acceptable on a maximum of five vanes.



RADIAL CRACKS - LEADING EDGE
E



AXIAL CRACKS - LEADING EDGE
F



BURNED AREA - LEADING EDGE
G

3.	Material loss		Erosion is acceptable through the vane at the	NOTE Do not consider manufacturer's blend-repair as loss of material. Loss of material caused by other than burning or foreign object damage is acceptable provided vane distortion is not evident and core penetration has not occurred.

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ - Continued

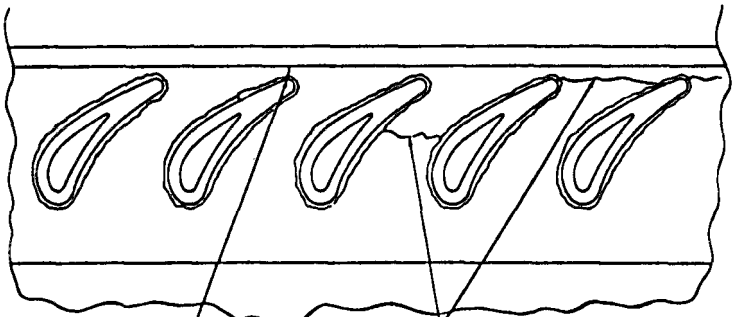
Step No.	Defect	Ref	Inspection Limit 1-110-520-21	Inspection Limit 1-110-520-19
4.	Radial cracks	E	Any number and size of cracks is acceptable on each vane provided core is not penetrated.	Any number and size of cracks is acceptable on each vane provided core is not penetrated,
			NOTE Core is considered to be penetrated when crack is breached and core is visible.	
5.	Axial cracks	F	Any number and size of cracks is acceptable on each vane provided core is not penetrated.	One crack up to 1/2 inch (12.7 mm) in length is acceptable on each vane provided core is not penetrated.
6.	Burning	G	Burning is acceptable provided core is not penetrated.	Burning is acceptable provided core is not penetrated.
			Vane Surface	
7.	Warpage and Distortion	--	Warpage or distortion of vane surface is not acceptable.	Warpage or distortion of vane surface is not acceptable.
8.	Nicks, Dents, and Burrs	--	Minor light nicks, dents, and burrs are acceptable. Repair not permitted because of possible damage to vane coating.	Minor light nicks, dents, and burrs are acceptable. Repairs not permitted because of possible damage to vane coating.
9.	Spalling	-	Any amount of spalling is acceptable on all vanes.	Any amount of spalling is acceptable on all vanes.
			Outer Shroud and Cylinder	

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ - Continued

step No.	Defect	Ref	Inspection Limit 1-110-520-21	Inspection Limit 1-110-520-19



PARENT METAL CRACK VANE-TO-VANE CRACKS

H

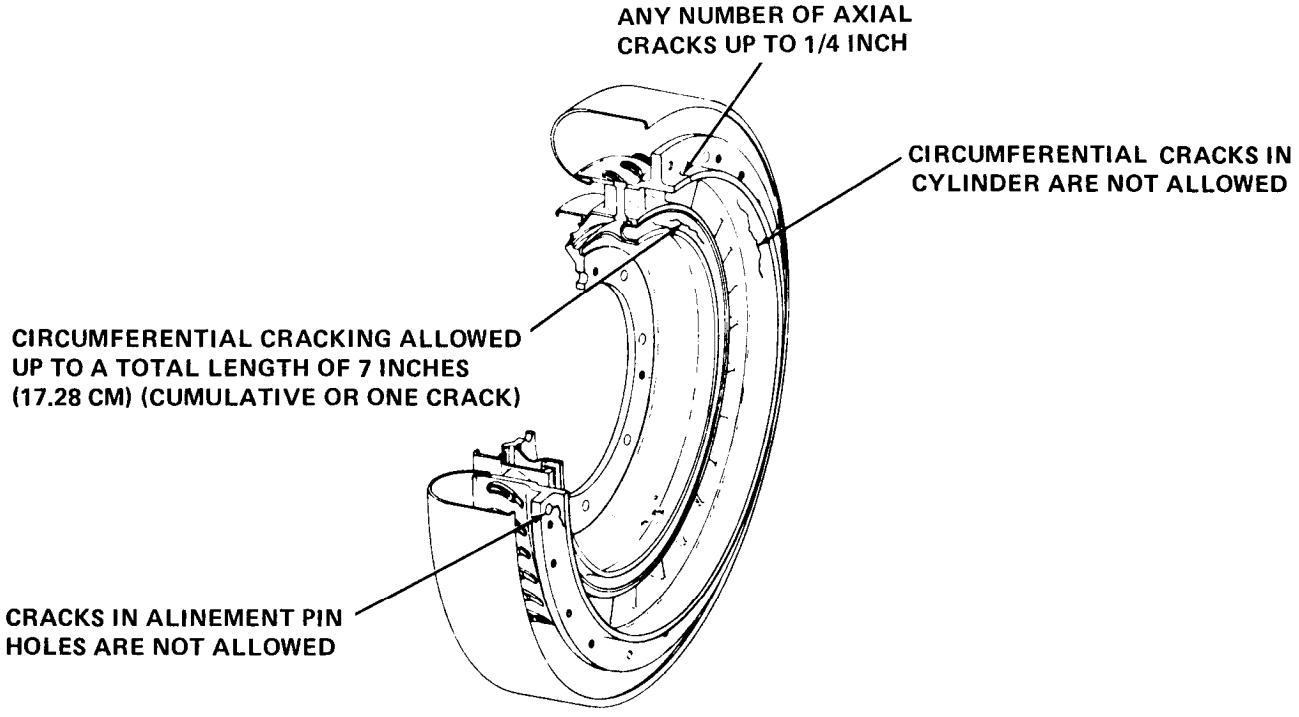
10.	Shroud to Vane Brazement Cracks	H	Cracks up to 3/4 inch (19.1 mm) long are acceptable on all vane brazements. Cracks up to 1-1/4 inch (3.17 cm) long are acceptable on a maximum of 10 vanes.	
11.	Parent Metal Cracks	H	On repaired nozzles (identified by markings PSK 11617-01), any number of cracks not exceeding 3/16 inch (4,8 mm) in length extending from trailing edge of vanes are acceptable. On all other nozzles, any number of cracks up to 1/16 mm) long extending from trailing edge of vanes are acceptable.	
12.	Vane-to-Vane Cracks	H	On repaired nozzles (identified by markings PSK 11617-01) a maximum of 10 vanes are acceptable provided no more than four vanes are cracked" adjacent to each other in any one group. On all other nozzles, no cracks are acceptable.	Not acceptable.

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ - Continued

Step No.	Defect	Ref	Inspection Limit 1-110-520-21	Inspection Limit 1-110-520-19
13.	Cylinder Cracks	I	Any number of axial cracks up to 1/4 inch (6.4 mm) long extending forward from aft face of flange are acceptable. Circumferential cracks are not allowed.	



I

J

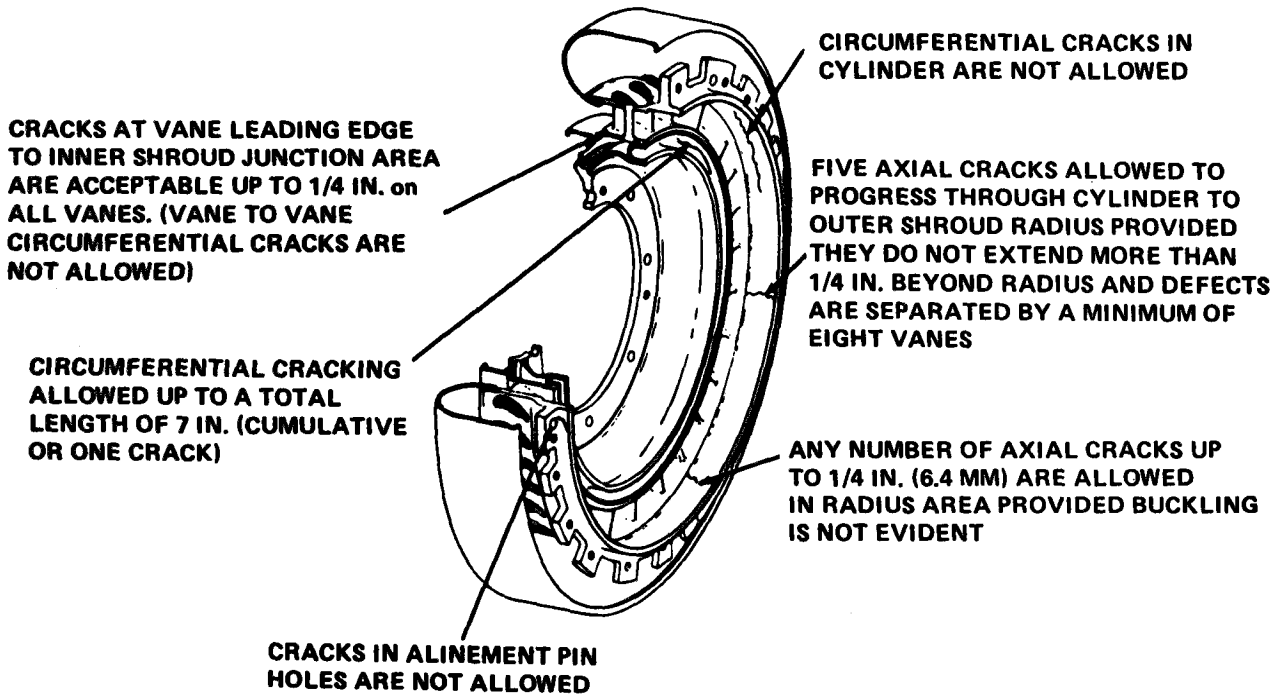
A maximum of five tight-lipped axial cracks progressing from trailing edge of cylinder through the cylinder/outer shroud radius are acceptable, provided they do not extend more than 1/4 inch (6.4 mm) beyond

4-43 First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ - Continued

Step No.	Defect	Ref	Inspection Limit 1-110-520-21	Inspection Limit 1-110-520-19



13.	Cylinder Cracks (Cont)	J	J		radius and defects are separated by a minimum of eight vanes. Any number of small axial cracks in radius area up to 1/4 inch (6.4 mm) in length are allowed provided no buckling is evident. Circumferential cracks are not allowed.
		I, J	Cracks in alinement pin holes not allowed.		Cracks in alinement pin holes not allowed.

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

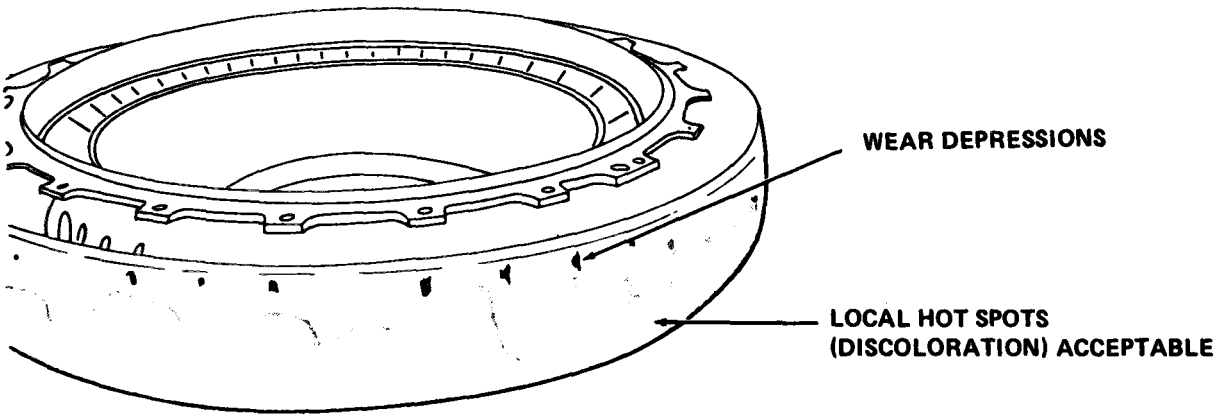
LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ - Continued

Step No.	Defect	Ref	1-110-520-21	1-110-520-19
			Inner Shroud and Deflector	
14.	Inner Shroud Cracks	J		Cracks at vane leading edge to inner shroud junction area are acceptable up to 1/4 inch (6.4 mm) on all vanes. Vane to vane and circumferential cracking is not allowed.
15.	Defector Cracks	I,J	Circumferential cracking is acceptable up to a total length of 7 inches (17.7 cm) (cumulative or one crack).	Circumferential cracking is acceptable up to a total length of 7 inches (17.7 cm) (cumulative or one crack).
15.1	Inner Shroud -- Braze Joints		1. Rubs are acceptable. 2. Circumferential cracks are not allowed. 3. Cracks associated with braze joints is unacceptable.	Visually inspect.

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B Engine) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/- Continued		
step No. **Defect** **Ref**	**1-110-520-21**	**1-110-520-19**
	Support and Curl	
16. Buckling of - support	**Acceptable provided tip clearances are maintained.**	**Acceptable provided tip clearances are maintained.**



K

4-43. First Stage Turbine Nozzle Assembly (T53-L-13B/-703 Engine) - Inspection

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/-
Continued

Step No.	Defect	Ref	Inspection 1-110-520-21	Inspection 1-110-520-19
17.	Hot Spots. Cracks, and Wear Depressions in Curl OD	K	Local hot spots caused by contact with combustion chamber liner are acceptable as shown Wear depressions caused by rubbig of combustion chamber liner dimples am acceptable provided no breakthrough or raised impressions are evident on curl ID. Circumferential cracks are not allowed. Repair axial cracks or unacceptable wear depressions as outlined in paragraph 4-46.	Local hot spots caused by contact with combustion chamber liner are acceptable as shown. Wear depressions caused by rubbing of combustion chamber liner dimples are acceptable provided no breakthrough or raised impressions are evident on curl ID. Circumferential cracks are not allowed. Repair axial cracks or unacceptable wear depressions as outlined in paragraph 4-46.
			NOTE The following inspections, in steps 18 thru 23 apply to first stage turbine nozzle assembly 1-110-710-06 used on T53-L-703 engines.	

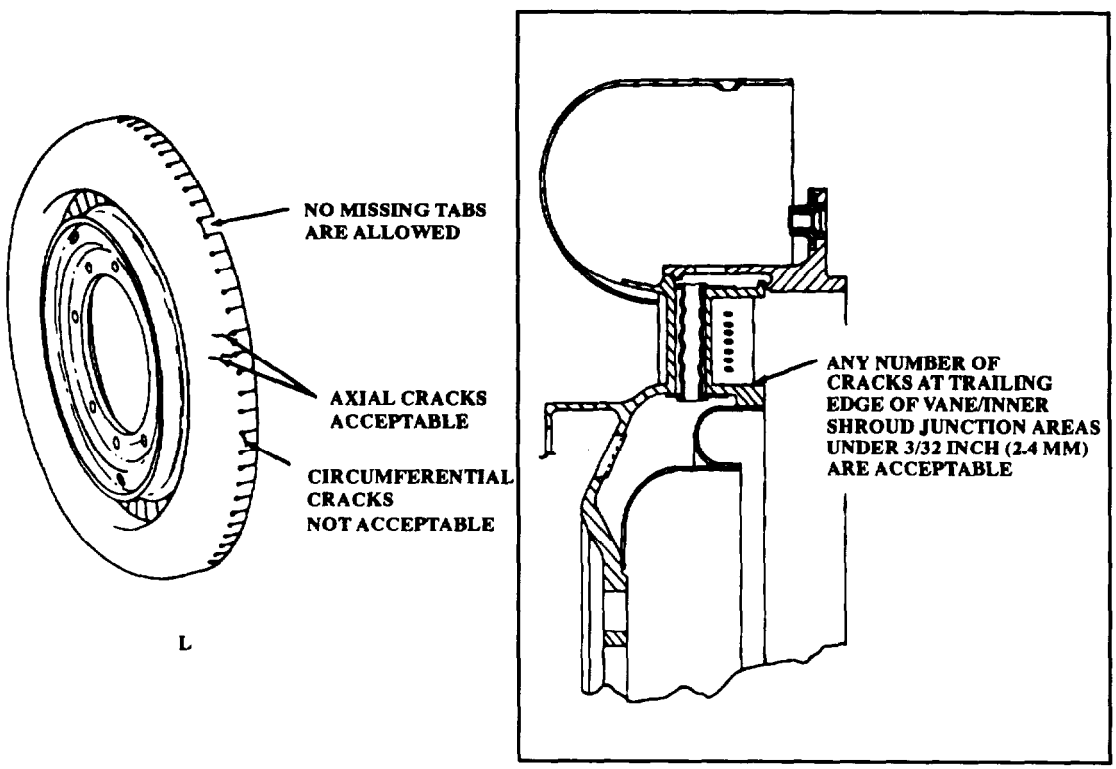
4-43. First Stage Turbine Nozzle Assembly (T53-L-703 Engine) - Inspection

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/ - continued

Step No.	Defect	Ref	Inspection l-110-710-06

LINER AND CURL



18.	Liner for Fretting and Wear at Aft Edge	L	Fretting and wear is acceptable where it mates with the combustion chamber liner. provided no metal breakthrough is evident.
19.	Liner for Missing Tabs	L	Missing tabs are not acceptable.
20.	Liner Tab Area for Axial and Circumferential Cracks	L	Axial cracks are acceptable in liner tab area. Circumferential cracks are not permitted.

4-43. First Stage Turbine Nozzle Assembly (T53-L-703 Engine) - Inspection

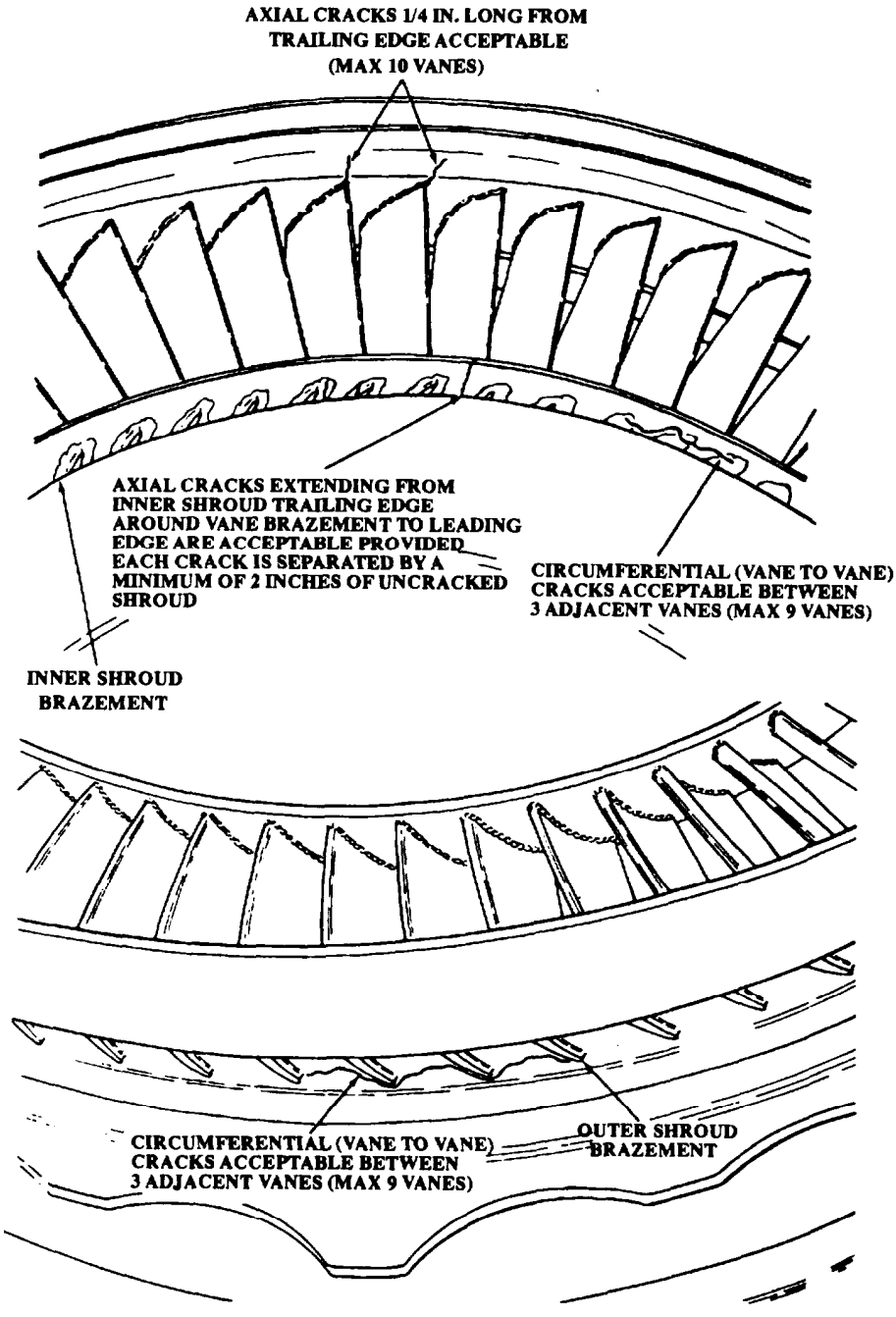
LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING/-
continued

Step No.	Defect	Ref	Inspection Limit 1-110-710-06
21.	Cracks and Wear Depressions in Curl OD	L	Circumferential cracks are not allowed. Repair axial cracks or uuacceptable wear depressions as outlined in paragraph 4-46
		Inner Shroud	
22.	Cracks at Trailing Edge of Vane/Inner Shroud Junction Areas	L	Any number of cracks under 3/32 inch (2.4 mm) are acceptable.
23.	Loose or Damaged Second Gas Producer Cylinder Mount Nuts		Not acceptable. Restake or replace nuts.

4-44. First Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		

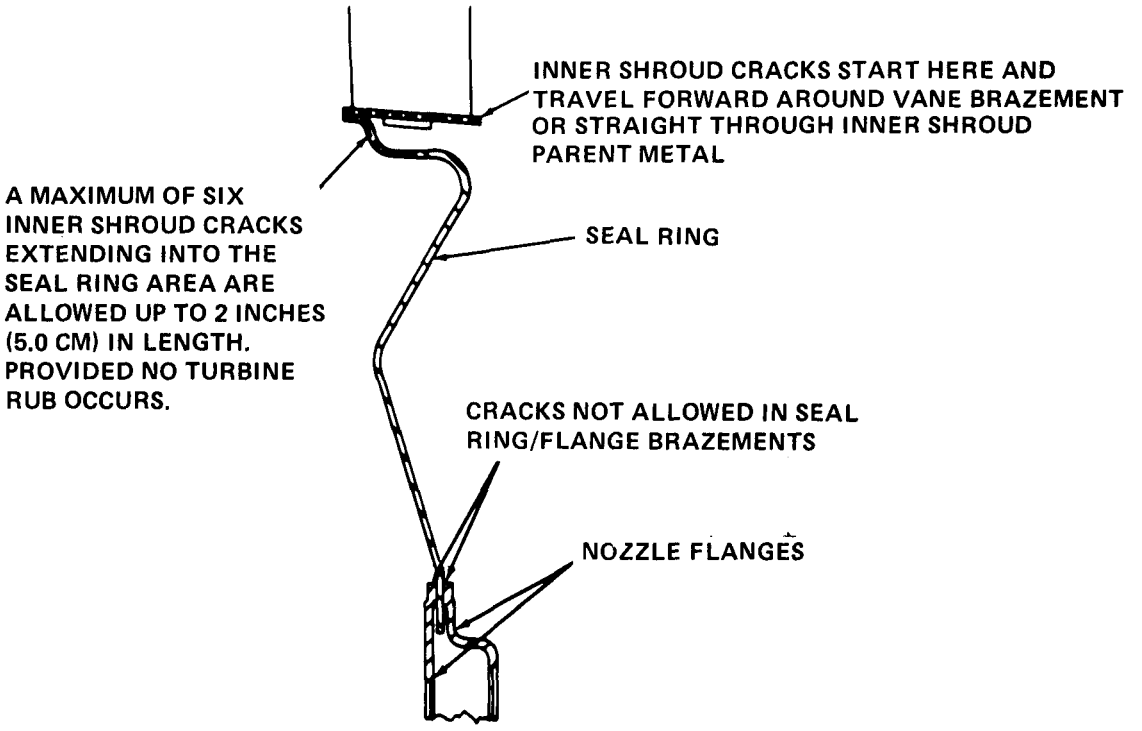


4-44. First Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

DIFFUSER HOUSING/ - **Continued**		
1. First Stage Power Turbine Nozzle		Visually **inspect** for cracks. **Replace** nozzle if inspection limits are exceeded. a. Any number of 3/16-inch (4.8 mm) cracks are acceptable on trailing edge of vanes. b. Any number of 1/8-inch (3.2 mm) cracks are acceptable on leading edge of vanes. c. On T53-L-13B engines, no inspection is required on inner and outer shroud to vane brazements. Cracks are allowed. d. Circumferential crocks at inner shroud/ seal ring joint up to one inch in length (cumulative) at joint or adjacent to joint are permitted. In addition, defects at joint or adjacent to joint, associated with crocks that travel through the inner shroud and into the seal ring area, are acceptable up to 5/8 inch (1.59 cm) in length (either side) as measured from radial portion of crack.
2. Vane Trailing Edge	T53-L-703 engine only. Small multiple cracks under 1/8 inch (3.2 mm) are allowed at all junctions.	Inspect vane trailing edge to outer shroud junction areas for cracks.
3. Outer Shroud	1-190-050-06/07 only.	**Inspect.** Limits are as follows :

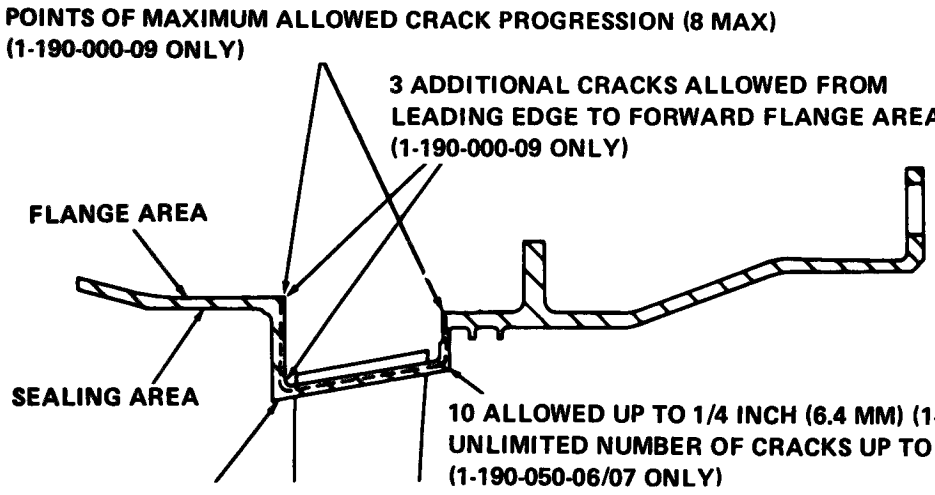
4-44. First Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		a. On outer shroud aft flange area axial/radial cracks up to 1/4 inch (6.4 mm) are allowed. b. On outer shroud forward flange area three 1/4-inch (6.4 mm) radial cracks are allowed. Circumferential cracks are not allowed in outer shroud other than small cracks mentioned in item 2 above.
4. Inner Shroud	1-190-000-09 only.	Maximum of 6 cracks extending into seal ring area are allowed up to 2 inches (50.8 mm) in length, provided no turbine rub occurs.



4-44. First Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

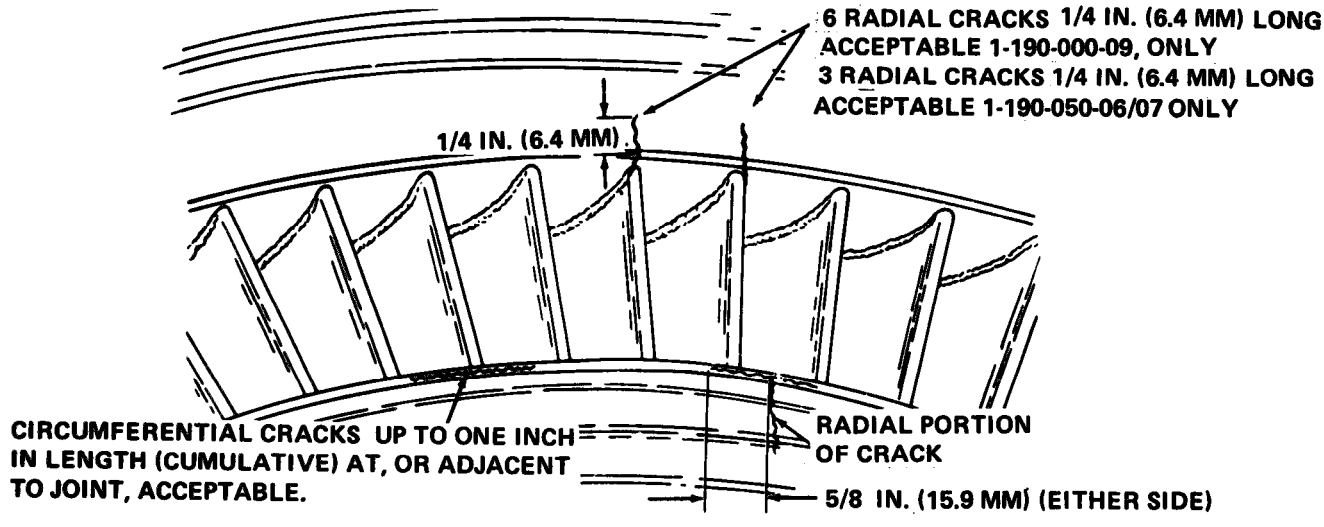
LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
5. Outer Shroud	1-190-000-09 only.	ID and OD may contain a maximum of eight cracks that progress axially and then radially. No crack may progress into flange or sealing area. Three additional cracks exclusive of those that travel to aft sealing flange are allowed to progress from vane leading edge areas to the forward flange.



NOTE

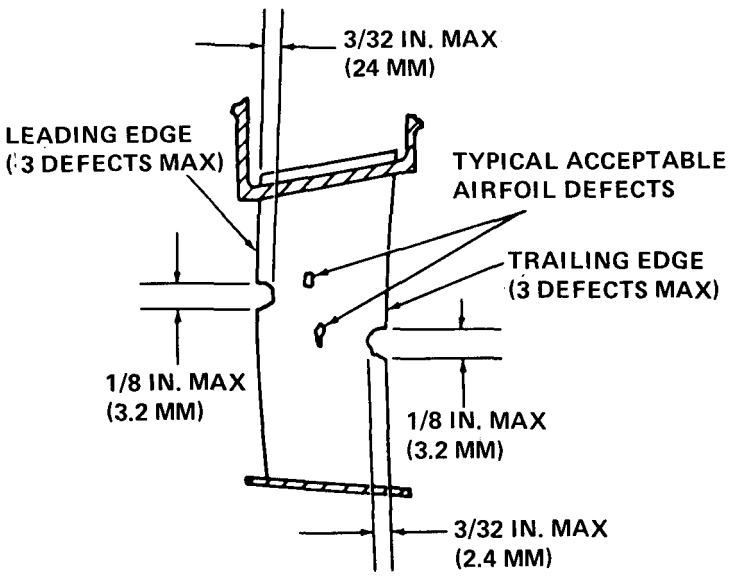
Cracks noted in actions for items 6 and 7 are allowed to be either part of or separate from preceding action for item 5 cracking conditions. When inspecting, consider all possible combinations.

6. Outer Shroud Leading Edge	1-190-000-09 only. See figure for item 5.	Six 1/4 inch (6.4 mm) cracks are allowed.



4-44. First Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
7. Outer Shroud Trailing Edge	1-190-000-09 only. See items 1 and 5 for figures.	Ten 1/4 inch (6.4 mm) cracks are allowed.
8. Outer Shroud	1-190-000-09 only. See item 1 for figure.	Circumferential (vane-to-vane) cracks in outer shroud between three adjacent vanes (maximum of nine vanes) are allowed.
9. Second Stage Power Turbine Nozzle	1-190-000-09 only.	Radial cracks at bolt holes are permitted.
10. Seal Brazement		Cracks are not acceptable.
11. First Stage Power Turbine Nozzle	Axial rubs resulting from contact with turbine rotor are not permitted.	Visually **inspect** for rubs.
12. Nozzle	Grooves up to 0.020 inch (0.051 cm) in depth are acceptable for use, provided that sharp edges are blended to form a smooth contour. See figure in item 5.	Visually **inspect** nozzle sealing area for grooves caused by the sealing rings.
13. Vanes	Blend-repair as outlined in paragraph H-25.	Visually **inspect vanes** for dents, nicks, and burrs as follows:



a. A maximum of three nicks or dents are allowed on vane leading edge, provided that after blend-repair, depth of any defect does not exceed 3/32 inch (2.4 mm) and length does not exceed 1/8 inch (3.2 mm).

Separation of defects shall be at least twice the length of the shortest defect after blend-repair. Smooth dents within limits are acceptable without blend-repair.

4-44. First Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

DIFFUSER HOUSING/ -
Continued

13. Vanes (Cont)

	Smooth dents within limits are acceptable without blend-repair.	b. A maximum of three nicks or dents are allowed on vane trailing edge, provided that after blend-repair depth of any defect does not exceed 3/32 inch (2.4 mm) and length does not exceed 1/8 inch (3.2 mm). Separation of defects shall be at least twice the length of the shortest defects after blend-repair.
	Blend-repair to remove nicks.	c. Random nicks and dents on vane airfoil surfaces are acceptable on all vanes.
	Blend-repair to remove burrs.	d. Burrs are not acceptable on vane leading and trailing edges.
	Burned vanes are not allowed.	e. Visually **inspect** nozzle vanes for burns.
		f. Metallization deposits are acceptable.

4-45. First Stage Turbine Nozzle (T53-L-11 Series Engines) - Repair (AVIM)

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Welding Wire (item 91, Appendix D)

References
Para H-20, H-26 and H-25

LOCATION/ITEM	REMARKS	ACTION
FIRST STAGE TURBINE NOZZLE AND FLANGE ASSEMBLY/	**NOTE** Repair axial cracks in liner (curl) or unacceptable wear depressions or breakthrough caused by rubbing of combustion liner dimples.	
1. Nozzle Liner		**Perform** a flourescent-penetrant inspection. **Refer** to paragraph H-20.
2. Nozzle Liner	Use rotary file (air drill) and carbide burr. Where breakthrough or wear depressions exist due to liner dimple rubbing, insure that no sharp edges exist at depression on inner or outer diameter of liner.	**Route out cracks** indicated in inspection.
3. Nozzle	Refer to paragraph H-12.	**Vapor-degrease.**
4. Nozzle Liner	Use welding wire (item 91, Appendix D) when performing this action. Refer to paragraph H-26 for fusion-weld procedures.	**Fusion-weld crocks or** depressions.
5. Nozzle	Do not reduce repaired thickness below that of adjacent sound metal when blending.	**Blend** weld beads. Refer to paragraph H-25.
6. Repaired Area		**Inspect** visually. **Perform** fluorescent-penetrant. **Refer to** paragraph H-20.
7. Nozzle Liner	**Cracks** and crack-like indications are not acceptable. If cracks are indicated, perform this action.	**Repeat** repair procedures.

WARNING

Safety glasses must be worn during operation to protect eyes from flying chips.

4-46. First Stage Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Repair (AVIM)

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Alloy Wire (item 93, Appendix D)

References
Para H-20, H-25 and H-26

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/	NOTE Repair axial cracks in nozzle liner (curl) or unacceptable wear depressions or breakthrough caused by robbing of combustion liner dimples as prescribed in actions for items 1 thru 7.	
1. Nozzle Liner		Perform a fluorescent-penetrant inspection.
2. Nozzle Liner	Use rotary file (air drill) and carbide burr.	Route out cracks indicated in inspection. Where breakthrough or wear depressions exist due to liner dimple rubbing, insure that no sharp edges exist at depression on inner or outer diameter of liner.
3. Nozzle		Vapor-degrease nozzle (refer to paragraph H-12).
4. Nozzle Liner		Fusion-weld cracks or depressions in nozzle liner as outlined in paragraph H-26 using alloy wire (item 43, Appendix D).
5. Nozzle	When blending during this action, do not reduce repaired thickness below that of adjacent sound metal.	Blend weld beads (refer to paragraph H-25).

4-46. First Stage Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued	**WARNING** Safety glasses must be worn during operation to protect eyes from flying chips.	
6. Repaired Area		Perform thorough visual inspection on repaired area.
7. First Stage Turbine Nozzle Assembly	Cracks and crack-like indications are not acceptable.	Repeat repair procedure if cracks are indicated.

4-47. First Stage Turbine Nozzle Assembly (T53-L-11 Series Engines) - Assembly

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease (item 103, Appendix D)

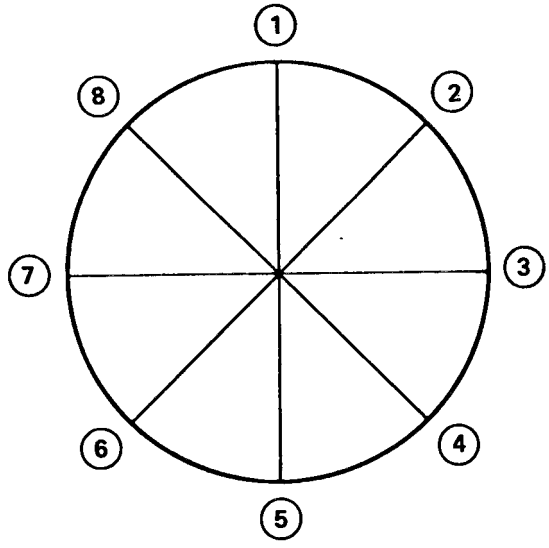
LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/	NOTE After a hot end inspection, use new bolts and tabwashers. Because of excessive wear of hot end internal hardware, the use of new bolts and tabwashers helps to minimize maintenance and engine failure.	
1. First Stage Turbine Nozzle	Place on a suitable work area.	Place forward face down.
2. First Stage Turbine Nozzle Flange	Apply Anti-Seize, 767 (item 102, Appen ix D) or Nickel Ease (item 103, Appendix D) to threads of bolts before installation.	Attach to first stage turbine nozzle. Install new bolts and tabwashers.

4-48. Power Turbine Blade Tip (T53-L-11 Series Engines) - Clearance Check

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para **4-51** and 1-43

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER AS-SEMBLY/		
1. Power Turbine Cylinder and Blade Tip Clearance		**Insert** feeler gage (1/4 inch wide) between power turbine cylinder and tip of longest power turbine blade.
2. Turbine Wheel		**Rotate** turbine wheel one full revolution at each position, and **measure** minimum blade tip clearance at eight points, 45 degrees apart.
	NOTE Blade-tip clearance is affected by No. 3 bearing wear.	
3. Power Turbine Blade Tip		**Clearance** at all points shall not be less than 0.025 inch (0.63 mm). If clearance is below limits, at one or more points, **check** for blade growth or cylinder warpage.
4. Power Turbine Blade Tip		**Check** for blade growth as follows:

4-48. Power Turbine Blade Tip (T53-L-11 Series Engines) - Clearance Check - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/ - Continued		a. Insert feeler gage (1/4 inch wide) between turbine rotor blade tips and power turbine cylinder at one location. Insure that feeler gage is equal to gap at that point. b. Without moving feeler gage, carefully **rotate** turbine rotor one complete revolution. If dimension varies (turbine rotor binds or gap becomes wider), local blade growth is indicated. **Mark** long blades with approved marking pencil (paragraph 1-43). **c. Remove** power turbine nozzle and cylinder, if blade growth is indicated. d. Using 13-to 14-inch micrometer, **measure** OD of turbine rotor at minimum of eight points. Make certain that measurements are made at areas of growth as noted in preceding step 1, **Record** the measurements. The outside diameter should not exceed 13.161 inches (33.43 cm) maximum, nor vary more than 0.005 inch (0.0127 cm) from minimum to maximum.

4-48. Power Turbine Blade Tip (T53-L-11 Series Engines) - Clearance Check - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/ - Continued		
		e. If blade growth is not indicated, **insert** feeler gage between tip of longest blade and power turbine cylinder. **Insure** that gage thickness is equal to gap at that point.
		f. Carefully **rotate** both turbine rotor and feeler gage one complete revolution. If dimension varies, cylinder warpage is indicated.
	NOTE If no local blade growth was indicated in preceding action item 2, use any blade as a reference when performing following action item 5.	
5. Cylinder	Refer to paragraph 4-51.	**Repair warpage.**

4-49. Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Disassembly

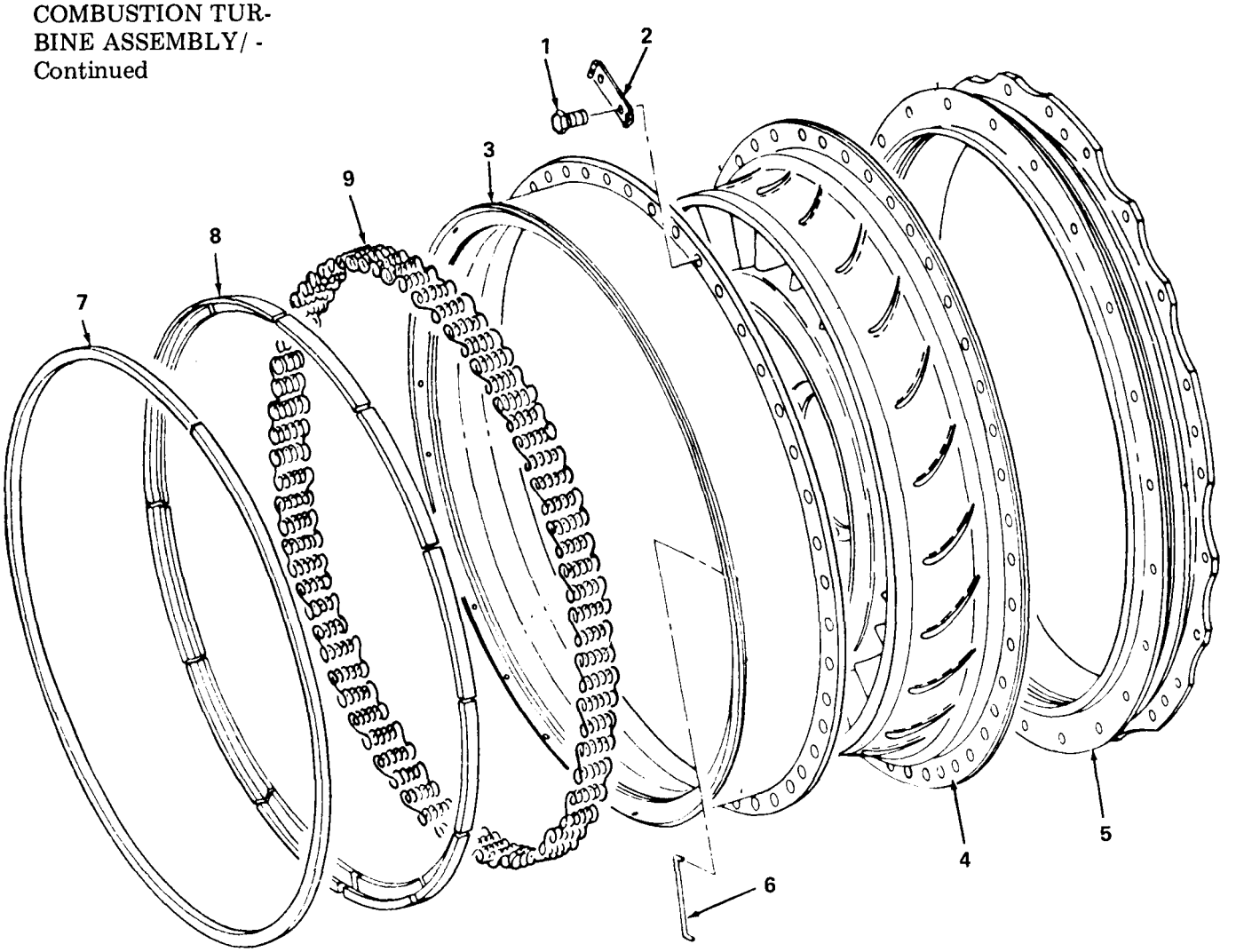
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION TURBINE ASSEMBLY/		

4-49. Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION TURBINE ASSEMBLY/ - Continued		



1. Bolts (1) and Tabwashers (2)		Remove bolts (1) and tabwashers (2) securing seal retainer (3) and turbine nozzle (4) to turbine cylinder (5). **Discard** bolts and tabwashers.
2. Turbine Nozzle Seal Retainer Assembly		**Separate** from turbine nozzle assembly. Remove special lockwire (6). **Remove** power turbine cylinder sealing ring (7). **Remove** turbine seal segment (8). **Remove** seal spring (9).

4-50. Power Turbine Cylinder (T53-L-11 Series Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para 4-48 and 4-51

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**NOTE** In following action for item 1, measure cylinder at forward, middle, and aft areas at each of the four points.	
1. Blade Tip Clearante	If minimum tip clearance was not obtained during turbine blade tip clearance measurement (paragraph 4-48).	**Measure** cylinder ID at four points.
2. Cylinder	If warpage is noted, rework cylinder as outlined in paragraph 4-51.	Check for warpage.

4-51. Power Turbine Cylinder (T53-L-11 Series Engines) - Repair (AVIM)

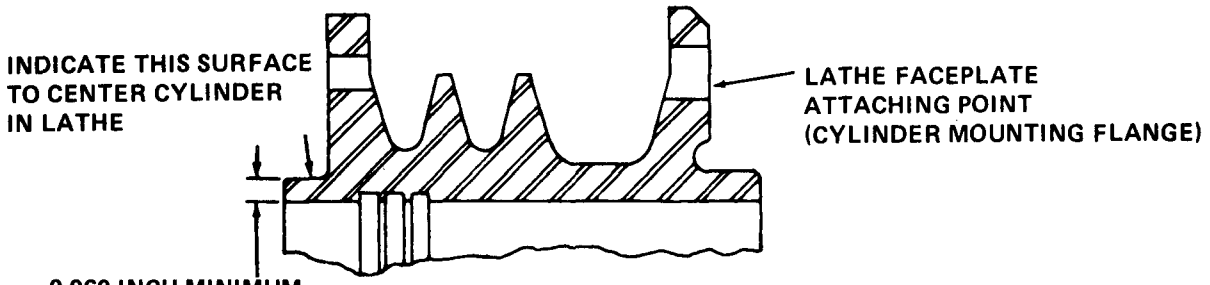
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**NOTE** If warpage was noted during inspection, perform actions for items 1 thru 7.	
1. Power Turbine Cylinder		**Rework** to obtain **0.032** inch (0.81 mm) minimum tip clearance.
2.. Power Turbine Cylinder	Determine minimum amount of material to be removed.	**Subtract** smallest tip clearance from 0.032 inch (0.81 mm). Result will be the approximate amount of material to be removed in order to **obtain** tip clearance requirements.
3. Cylinder Wall		**Measure** thickness at point of smallest tip clearance.

4-51. Power Turbine Cylinder (T53-L-11 Series Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



CAUTION

The resulting wall thickness determined in following action for item 4 shall not be less than 0.060 inch (1 .52 mm) after one or more machining operations.

4. Cylinder Wall	Thickness of material to be removed was obtained in action for item 2. Wall dimension was obtained in action for item 3.	**Subtract** thickness of material to be removed from wall dimension. **Result will** be the approximate cylinder wall thickness after machining.
5. Cylinder	Any suitable setup fixture may be used when performing this action. Cylinder shall be attached to the lathe at minimum of eight bolt points.	**Attach** to faceplate of lathe with spacers between mounting flange and faceplate.
6. Cylinder	See figure for item 3.	Indicate. **Reposition as** necessary to center cylinder on lathe.

CAUTION

Do not exceed a minimum wall thickness of 0.060 inch (1.52 mm) in following action for item 7.

7. Cylinder	Use carbide tip boring tool or equivalent.	**Skim** out the inside diameter as required.
8. Blade Tip		**Recheck clearances** following installation of reworked cylinder.

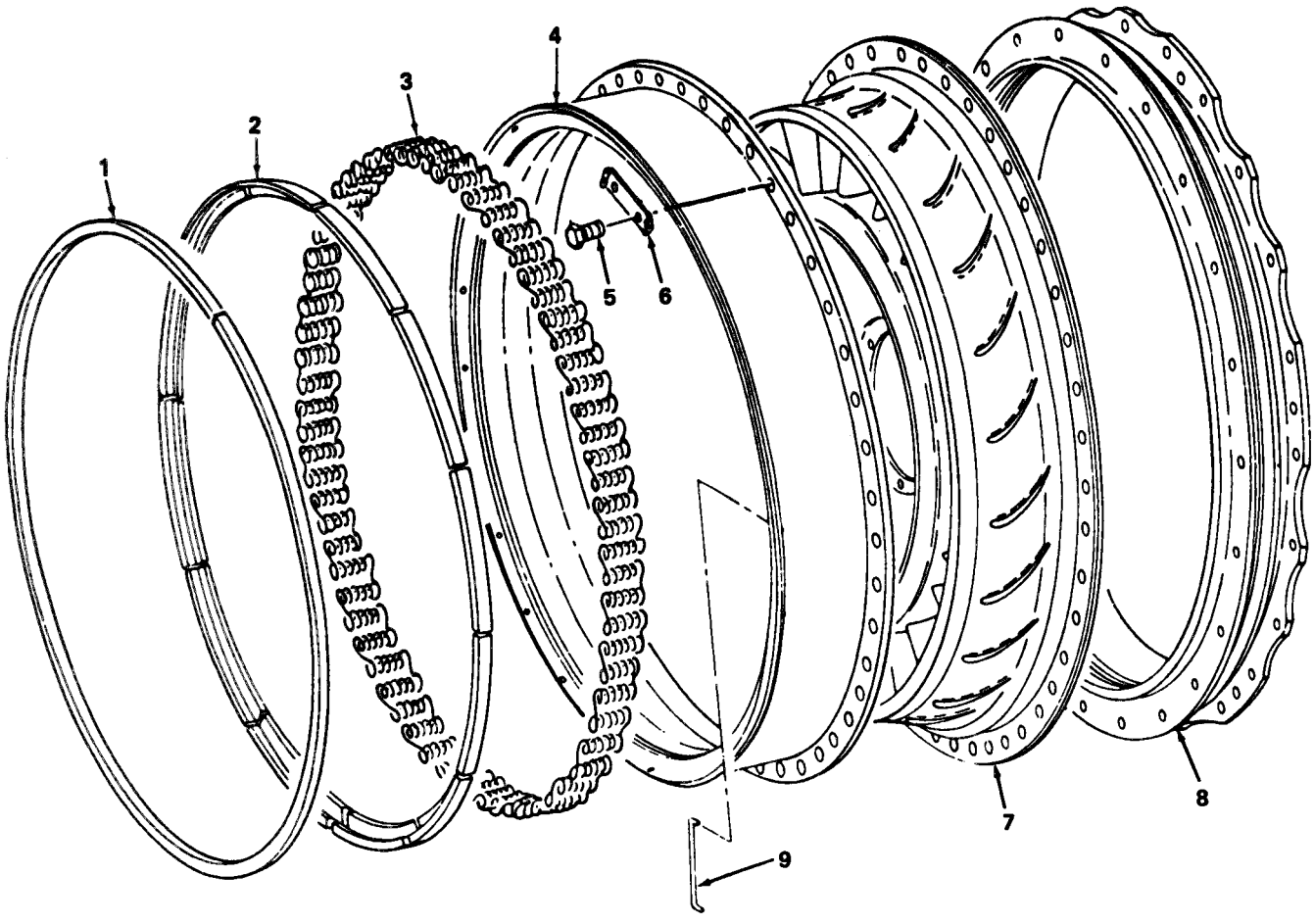
4-52. Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Assembly

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease item 103, Appendix D)
Molykote Ant-Seize Thread Compound (item 56, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**CAUTION** Position joint where sealing ring mating ends overlap, as close to the center of a seal segment as possible to prevent failure of power turbine nozzle and cylinder assembly.	



4-52. Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
1. Turbine Seal Spring (3), Turbine Seal Segments, and Power Turbine Cylinder Sealing Ring (1)	If a new power turbine cylinder sealing ring is installed, it may be locally fabricated (Appendix C). Color spots on sealing ring must be visible after installation.	Install into turbine nozzle seal retainer assembly.
2. Lockwire (9)		Install special lockwire (9).
3. Seal Retainer (4)	Use new nozzle seal retainer bolts.	Position onto power turbine nozzle (7).
4. Turbine Cylinder (8)	Coat bolts with anti-seize, 767 item 102, Appendix D), Nickel-Ease (item 103, Appendix D) or Molykote Anti-Seize Thread Compound (item 58, Appendix D).	Position nozzle and retainer onto turbine cylinder (8). Anne holes.
5. Seal Retainer (4) and Turbine Nozzle (7)		Secure to cylinder with tabwashers (6) and new bolts (5).

4-53. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Crocus Cloth (item 21, Appendix D)

References
Para 4-54

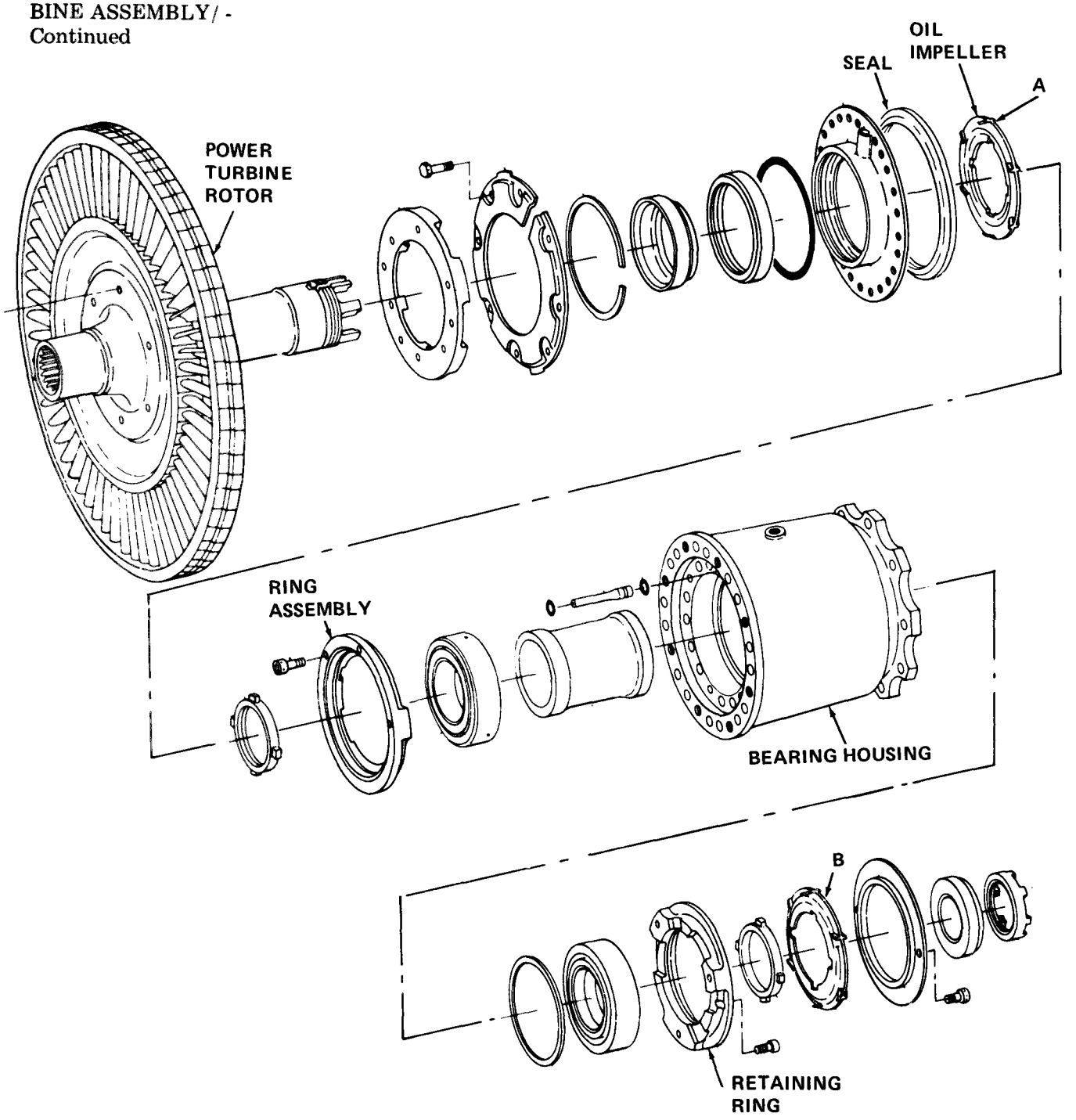
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/		
	WARNING FLIGHT SAFETY PARTS Turbine Disk and Hub (Turbine Rotor Disk) After removal of protective covering, handle with caution during inspection. Inspection limits must be observed.	

4-53. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Inspection-Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/-Continued		
1. Ring Assembly, Retaining Ring, and Bearing Housing		**Inspect oil passages for clogging.** **inspect bearing housing for corrosion and cracking on baffle. Loss of metal is acceptable up to 6 square inches.** **Inspect pins on T53-L-703. Loose fitting pins are acceptable.**

4-53. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Inspection - Continued

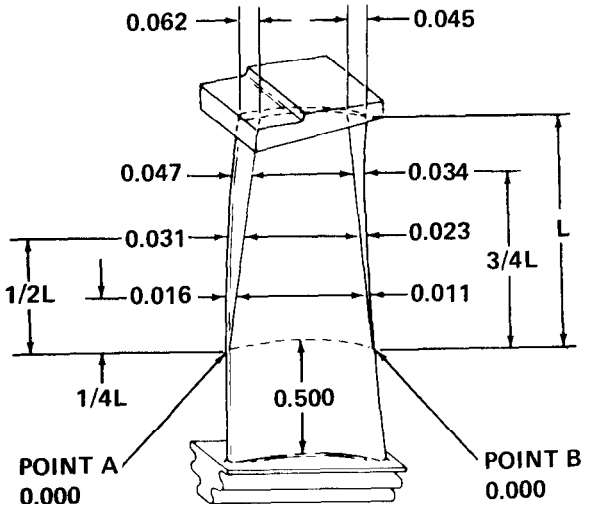
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



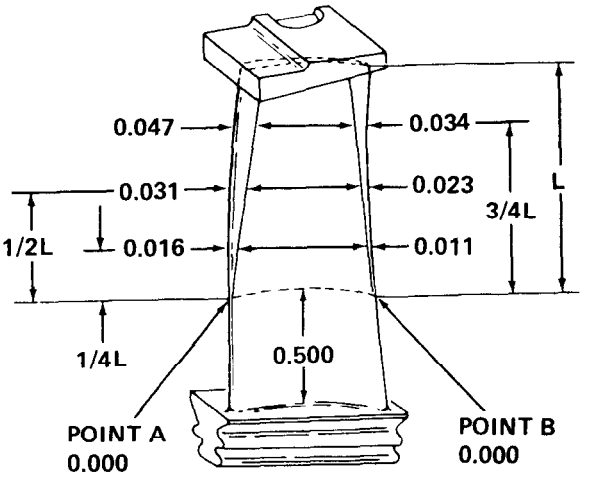
Reclean parts if oil passages are clogged.

4-53. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
2. Seal	If damage is noted, replace seal.	**Inspect** for cuts, nicks, tears, cracks, distortion, pliability, and wear.
3. Power Turbine Rotor	Use 7-power magnifying glass. Repair as outlined in paragraph 4-54.	**Inspect** as follows:
	a. Maximum permissible finish repair depth is 0.047 inch (0.119 cm) from leading edge and 0.034 inch (0.086 cm) from trailing edge. Allowable depths decrease as distance between damage and point A on leading edge or point B on trailing edge decreases.	Visually **inspect** blade leading and trailing edges for nicks, dents, cracks, and burns.



FIRST STAGE POWER TURBINE BLADES



SECOND STAGE POWER TURBINE BLADES

ALL DIMENSIONS ARE IN INCHES

b. No cracks are allowed.

c. No burns allowed.

d. No dents are allowed within 0.500 inch (1.270 cm) from blade platform.

4-53. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines)-Inspection-Continued

LOCATION/ITEM	REMARKS	ACTION

e. Visually inspect blade surface for nicks, dents, cracks, and burns as follows and re pair as outlined in paragraph 4-54.

(1) No dents are allowed within 0.000 inch (1.27 cm) of blade platform.

(2) No cracks are allowed.

(3) No burns resulting in loss of material. Metallization deposits are acceptable.

f. Visually inspect blade tip (shroud end) for craks and scoring.

(1) Cracks are cause for rotor replacement

(2) Tip rubs still not exceed 0.030 inch (0.076 mm) depth.

g. Visually inspect blade platform and root areas, and turbine disc for cracks. No cracks allowed.

(1) Visually inspect oil impellers (A and B, item (1) for loss of protective surface finish.

a. This condition is acceptable to any degree provided loose particles of coating are removed by lightly abrading with crocus cloth (item 21, Appendix D).

CAUTION

Insure that turbine bearing housing area is free of all contaminents prior to reassembly. If inspection in following step (2) reveals coating loss or main oil filter exhibits contamination, flush engine. (Refer to Chapter 1, Troubleshooting.

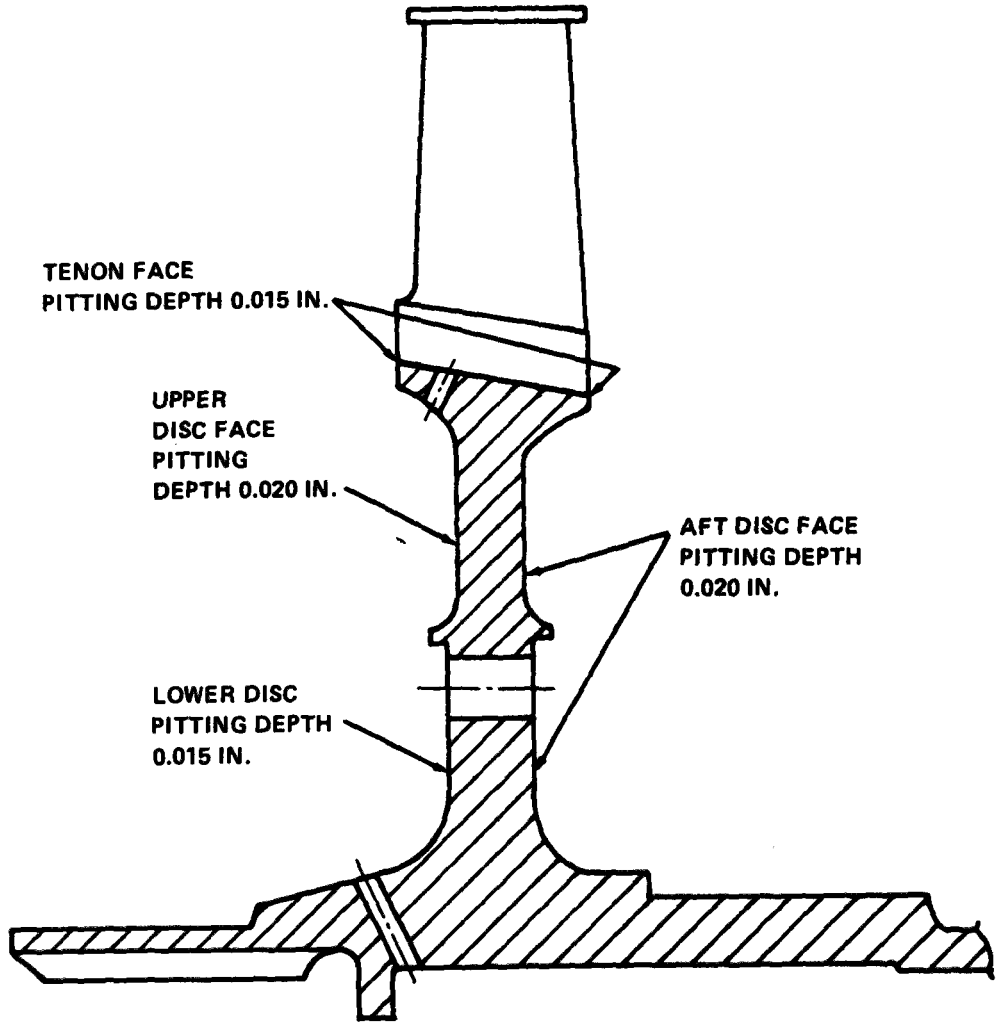
b. Impelllers which are galled or deeply seated into parent metal shall be replaced.

4-53. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	(2) Visually inspect forward and aft face of disk for rubs. Rubs 0.006 inch (0.01 5 cm) deep by 0.100 inch (0.254 cm) wide are acceptable, providing there is no indication of heat (discoloration).	
	(3) Visually inspect aft side of rotor disk for blades accessed below disk. If one or more blades is recessed more than 0.025 inch (0.063 cm), remove disk and reset blades. (Refer to paragraph 4-54.)	
	(4) Deleted.	

4-53. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



4-54. Power Turbine Rotor and Bearing Houslng (T53-L-13B/703 Engines)-Repair

INITIAL SETUP

Applicable Conflguratlon
T53-L-13B/763 Engines

Special Tools
Fixture Assembly (LTCT2072)
Staking Tool Assembly (LTCT3738)
Punch and Drift Kit (LTCT552)

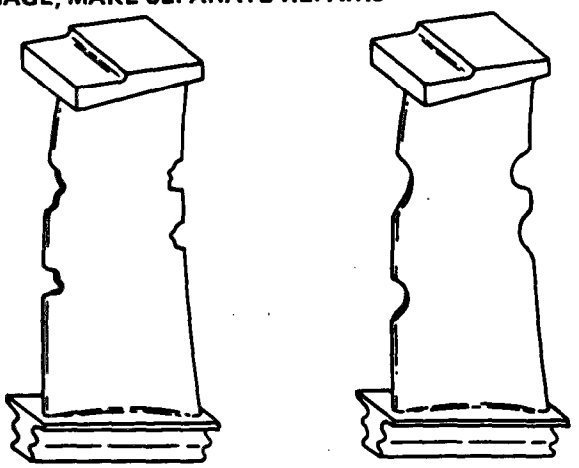
Consumable Materials
Crocus Cloth (item 21, Appendix D)
Marking Pencil No. 2107 (item 54, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**WARNING** **FLIGHT SAFETY PARTS** Turbine Disk and Hub (Second Stage Power Turbine Rotor Disk) After removal of protective covering, handle with caution during repair.	
	NOTE Remarks and actions pertaining to items 1 thru 4 are rules to be observed during repair of power turbine rotor blade.	
	NOTE Use portable power drill or rotary file for rep air procedures. Rotary file shall be equipped with carbide burr. If these items are not available Swiss type file, India or carborundum stone may be substituted.	

4-54. Power Turbine Rotor and Bearing Housing (T53-L-13B/703 Engines) - Repair (AVIM) - Continued

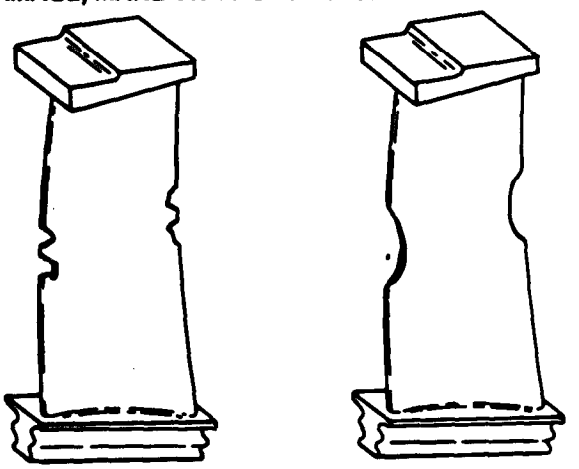
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
	WARNING **Safety glasses must be worn during operation to protect eyes from flying chips.**	
1. Leading and Trailing Edges of Blades	Finish strokes shall be parallel to edges of blades.	Observe repair limits.
2. Power Turbine Rotor and Bearing Housing	Final polishing of area is done with crocus cloth (item 21, Appendix D).	Blend all repairs and finish smoothly.
3. Leading or Trailing Edge of Blades		**Blend repair** to smooth radius as part of repair procedures.

WHEN THE DISTANCE BETWEEN THE DAMAGE IS GREATER THAN TWICE THE DEPTH OF THE DEEPER DAMAGE, MAKE SEPARATE REPAIRS



DAMAGED REPAIRED

WHEN THE DISTANCE BETWEEN THE DAMAGE IS LESS THAN TWICE THE DEPTH OF THE DEEPER DAMAGE, MAKE ONE REPAIR AREA



DAMAGED REPAIRED

4. Power Turbine Rotor and Bearing Housing	**NOTE** Repair leading and/or trailing edges of first stage power turbine rotor as follows in actions for items 6 thru 10.	

4-54. Power Turbine Rotor and Bearing Housing (T53-L-13B/703 Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
5. Round Bottom Dents	This action pertains to dents 0.010 inch (0.25 mm) deep or less.	Remove sharp edges only.
6. Shroud End of Blade	Perform this action if distance between damage and shroud end of blade is less than twice the depth of damage.	Extend repair to include shroud end.
7. Power Turbine Rotor and Bearing Housing	When distance between damage is less than twice the depth of deeper damage, make one repair area.	Repair.
8. Power Turbine Rotor and Bearing Housing	When distance between two damaged areas is greater than twice the depth of deeper damage, make separate repair areas. See figure in item 4.	Repair.
9. Rotor	Perform this action when damage cannot be completely eliminated by allowable repairs.	Replace.
	NOTE Repair blade surfaces as follows in actions for items 11 thru 17.	
10. Blade	Maximum permissible decrease in thickness at any point on blade shall be 0.010 inch (0.25 mm).	Observe allowable repair limits.
11. Blade Surface	Maximum permissible finished repair on blade surface shall be 0.200 square inch (5.08 sq mm) on either concave or convex side.	Observe allowable repair limits.
12. Blade Surface		Blend repairs to a minimum" of twice the depth of damage.
13. Blade Surface	Total repaired surface area shall not exceed 10 percent of blade surface.	Observe allowable repair limits.
14. Blade Surface	If distance between two damaged areas is less than twice the depth of deeper damage, make one repair area.	Repair.

4-54 Power Turbine Rotor and Bearing Housing (T53L-138/703Engines) -Repair (AVIM)-Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
15. Blade Surface	If distance between two damaged areas is greater than twice the depth of deeper damage, make separate repair areas. See figure in item 3.	**Repair.**
16. Rotor	Perform this action when damage cannot be completely eliminated by allowable blade repairs.	**Replace.**
	NOTE Reseat blades recessed more than 0.025 inch (0.63 mm) in actions for items 17 thru 21.	
17. Number One Blade	Number one blade is first blade counterclockwise from balancing "O" marking on forward face of disc.	**Locate and mark** on both sides using marking pencil (yellow, Colorbrite No. 2107 (item 54, Appendix D)).
18. Rotor	Use fixture assembly (LTCT2072).	**Plain** face up in fixture assembly.
19. All Blades	Insure that blade being tapped is not positioned over dot in fixture. When performing this action start with number one blade.	**Tap** flush with aft face of disc using hammer and suitable drift from punch and drift kit (LTCT552).
	CAUTION **Insure that staking tool used in following action for item 21 does not contact disc or blades during operation.**	
20. Pins	To perform this action use staking tool assembly (LTCT3738) on mushroomed pins, or hammer and drive punch on recessed pins.	**Redrive.**
21. Staking Tool		**Remove (if used).**

4-55. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Assembly

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Special Tools
Removing and Installing Tool LTCT4947)
Power Turbine Fixture (LTCT58)
Bushing (LTCT3492)
Holding Fixture (LTCT4553)
Wrench (LTCT915)

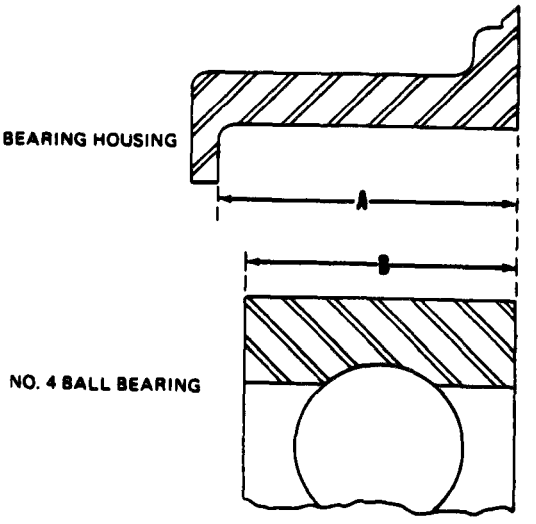
Consumable Materials
Shortening Compound (item 74, Appendix D)
Ultrachem Assembly Fluid #1 (item 101, Appendix D)
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease (item 103, Appendix D)
Molykote Anti-Seize Thread Compound (item 58, Appendix D)

References
Appendix G, Table G-6, Reference Number 43
Appendix G, Table G-4, Reference Number 29, 31

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/	**WARNING** **FLIGHT SAFETY PARTS** **Turbine Dlsk and Hub (Second Stage Power Turbine Rotor Disk)** **After removal of protective covering, handle with caution during Installation.**	
	CAUTION **Insure bearing housing area is free of all contaminants prior to reassembly. Drain and flush engine If Inspection reveals oil impeller coating loss or main oil filter exhibits contamination.**	
1. Shim (26)	Appendix G, table G-6, reference number 43.	**Select** shim (26) to maintain axial pinch on outer race of bearing (25). Refer to following actions, items 2 and 3.

4-55. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION TURBINE ASSEMBLY/ - Continued		
2. Bearing Housing (27)	The following figure illustrates the establishment of shim thickness. Use vernier depth gage.	**Measure depth (dimension A).**



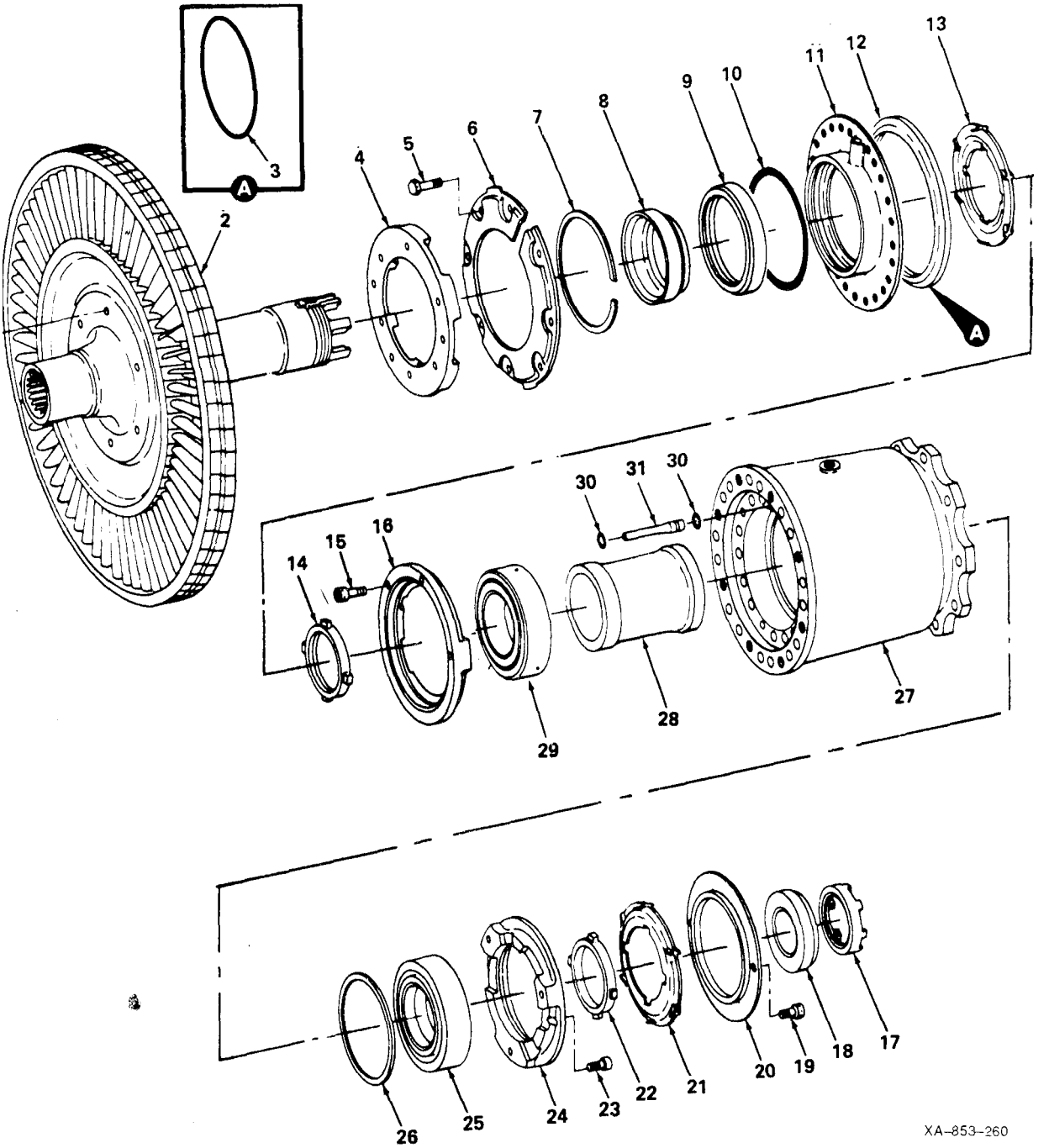
4-55. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/-Continued		
3. Bearing Outer Race	Use micrometer.	**Determine** axial dimension (dimension B). Subtract dimension B from dimension A. **Add** nominal 0.005 inch (0.1 3 mm) to result of subtraction to determine thickness of shim.
	CAUTION **To prevent possible axial seal movement in actions for Items 4 thru 6, Insure retaining ring (7) Is seated properly.**	
4. Packing (10)	**Lubricate recess in seal housing with shortening compound (Appendix D, item 74).**	**Install into seal housing (11) with part number facing up (away from housing).**
5. Seal Housing (11)	**Use arbor press or removing and installing tool (LTCT4947).**	**Press seal into seal housing (11).**
6. Retaining Ring (7)		**Install into seal housing assembly.**
7. Patting (30)		**Install on tube (31).**

1. Bolt
2. Turbine Rotor
3. Packing
4. Plate
5. Bolt
6. Deflector Support Retaining Ring
7. Seal Ring Seal
9. Packing
11. Seal Housing
12. Seal
13. Forward Impeller
14. Ring
15. Screw
16. Ring Assemblv
17. Nut
18. Lock Cup
19. Screw
20. Cover
21. Rear Impeller
22. Washer
23. Screw
24. Retaining Ring
25. Bearing
26. Shim
27. Bearing Housing Spacer_
28. Bearing
30. Packing
31. Tube

4-55. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines)- Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		



4-55. Power Turblne Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines) - Assembly-Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/-Continued		
8. Tube (31)	**CAUTION** **Insure In In outer race of action for Hem, en ages In slot of housing (27) .**	**Install in bearing housing (27).**
9. Bearing (29)	Use arbor press and suitable brass bushing.	Press outer race of bearing 29) into bearing housing (27).
10. Fling Assembly (16) and Bearing Housing (27)		Anne screw holes in ring assembly (16) with with screw holes in bearing housing (27). Insert ring assembly into bearing housing.
11. Seal (12) or Packing (3)	Insure groove in housing (27) or surface of ring assembly 16) is clean. If seal 12) or packi ng (3) is to be installed, coat groove of housing or surface of ring assembly with shortening compound (item 74, Appendix D or Ultrathem Assembly Fluid #1 (item 101, Appendix D) to facilitate holding seal in groove or packing on ring assembly during assembly.	Install seal (12) in forward groove of bearing housing (27) or Install packing (3) on ring assembly (16).
12. Packing (30)		**Install** on end of tube (31).
13. Impeller (13)		**Install** in ring assembly (16).
14. Seal Housing (11)		**Install** over impeller.
15. Tube (31)		**Insure** that tube (31) is properly seated in seal housing.

4-55. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines)- Assembly - Continued

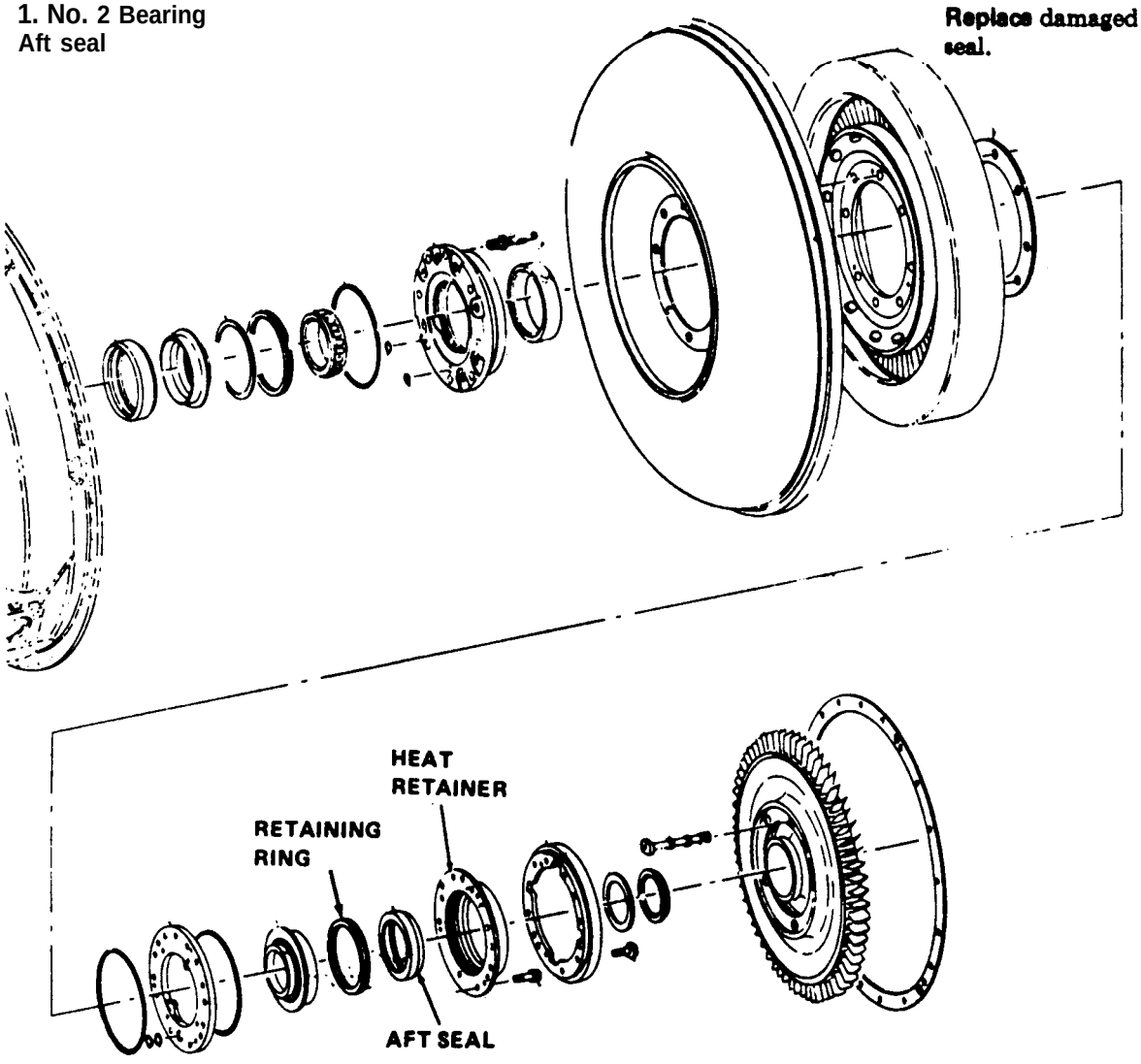
LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
16. Deflector Support (6)		**Position** on seal housing (1 1). Aline cutout deflector with boss on seal housing.
17. Bolts (5)	Coat threads with Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) or Molykote Anti-Seize Thread Compound (item 58, Appendix D). Refer to Appendix G, table G-4, reference number 29 for bolt tightening requirements.	**Thread** into bearing housing (27). **Tighten** as required. **Lockwire**
18. Plate (4)	Refer to Appendix G, table G-4, reference number 31 for bolt tightening requirements. Do not lubricate bolts.	**Position** on turbine rotor (2). **Secure** plate with bolts (1). **Tighten** bolts as required,
19. Bearing (29) (Inner Race and Rollers)		**Install** inner race and rollers into outer race.
20. Spacer (28)		**Place** inside bearing housing (27) large OD first.
21. Shim (26)	Use shim thickness determined in actions 2 and 3.	**Install** into bearing housing (27).
22. Bearing (25)	NOTE Ensure scribe match lines (V-mark) across bearing bores are aligned.	**Install** into bearing housing (27).
23. Retaining Ring (24)		a. **Install** into bearing housing (27). b. **Align** screw holes.
	NOTE Insure retaining ring (24) is not cocked.	**c. Secure** to bearing housing with screws (23), Then back off screws 1/4 to 1/2 turn.

4-55. Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B/703 Engines)- Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE ASSEMBLY/ - Continued		
24. Washer (22)		**Install.**
25. Impeller (21)	**Make sure slots in impeller (21) align with tangs on washer (22).**	**Install** impeller (21) onto washer (22).
26. Cover (20)		**Secure** cover (20) to retaining ring (24) with screws (19).
27. Ring (14)		**Install** into bearing housing (27).
28. Impeller (13)	Make sure slots in impeller(13) align with tangs on ring (14)	**Install** impeller (13) onto ring (14).
29. Seal Ring (8) and Seal (9)	Use care not to damage seal (9).	**Install** seal (9) into seal ring (8).
	NOTE Make sure seal ring (8) remains seated properly when pressing housing (27) onto turbine rotor (2).	
30. Bearing Housing (27)	Use arbor press and a suitable bushing or LTCT481 & LTCT3494.	**Press** bearing housing (27) onto shaft of turbine rotor (2).
31. Lock Cup(18) and Nut (17)	Refer to Appendix G, table G-4, reference number 24 for torque required. Use wrench (LTCT915)	**Install** lock cup (18) and nut (17) on shaft of turbine rotor (2) and torque.
32. Lock Cup(18) and Nut (17)		**Secure** by deforming lock cup (18) into slots of nut (17) in two places 180 degrees apart.

4-56. No. 2 Bearing Aft Sal (TB3-L-13B/703 Engined - Replacement (AVIM)

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE ROTOR AND BEARING HOUSING		
1. No. 2 Bearing Aft seal		Replace damaged aft seal.

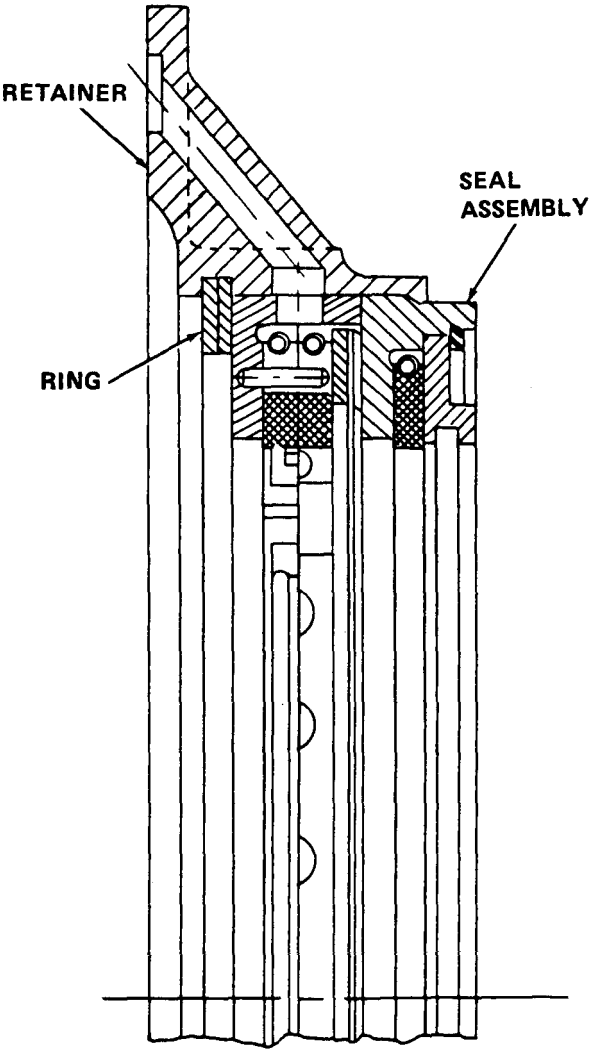


4-56. No. 2 Bearing Aft Seal (T53-L-13B/703 Engines) - Replacement (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE ROTOR AND BEARING ASSEMBLY/ - (Continued)	**NOTE** Aft seal 1-300-174-02 and -03 (29) is manufactured with a fracture at one of the slot locations on air side carbon element. This fracture is not a defect and is not considered cause for seal replacement. Aft seal 1-300-616-01 is manufactured with three splits, 120 degrees art on the carbon element . These splits are not defects and are not considered cause for replacement.	
2. Retaining Ring		**Remove.**
3. Seal	Use stir press and installation tool (LTCT3825).	**Remove.**
4. No. 2 Bearing Aft Seal	Use base LTCT3826 (detail of LTCT 3825. Use clamp LTT3875 (detail of LTCT3825).	**Install** new seal on base. **Secure** with clamp. **Place** seal with base and ciamp in arbor press.
5. Heat Retainer		**Heat** in oven to 300°F to 380°F(149°C to 193°C) for 20 to 30 minutes.
6. Retainer	**Use anvil LTCT3827 (detail of LTCT** 3825).	**Remove** from oven and . lace onto seal. Position anvil onto retainer and seat firmly with arbor press.
	CAUTION **To prevent possible axial seal movement, Insure that retaining seal (28) Is seated properly when Installed In following action for Item 7.**	

4-56. No. 2 Bearing Aft Seal (T53-L-13B/703 Engines) - Replacement (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE ROTOR AND BEARING HOUSING/ - Continued		
7. Retaining Ring		**Reinstall.**
8. Aft Seal		**Inspect** for proper installation.



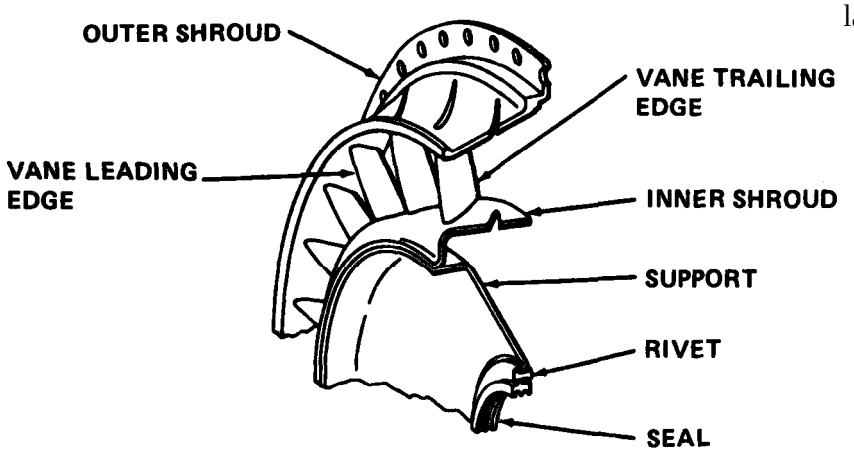
4-57. Second Stage Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para H-20

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/	**NOTE** All inspections of the second stage turbine nozzle assembly shall be performed using fluorescent-penetrant inspection method (refer to paragraph H-20). Use a 5- or 7-power magnifying glass.	
1. Nozzle Assembly		**Inspect** as outlined in the tabular data and figure below indicates.
2. Second Stage Turbine Nozzle		**Replace if** any of the conditions in the tabular data below indicates.



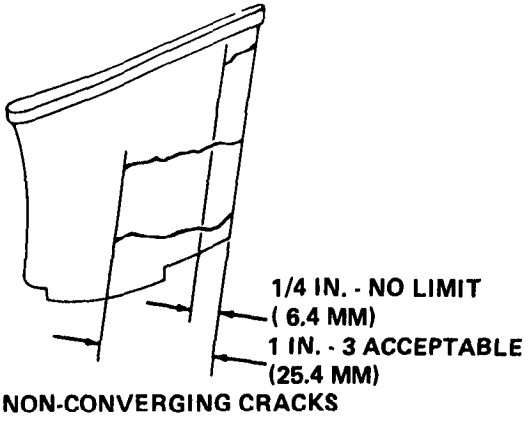
NOTE

The following table lists inspection limits for second stage turbine nozzle assembly.

4-57. Second Stage Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/- Continued		

Step No.	Defect	Ref	Inspection Limit
			Vane Trailing Edge



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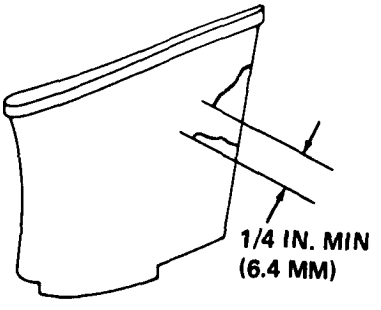

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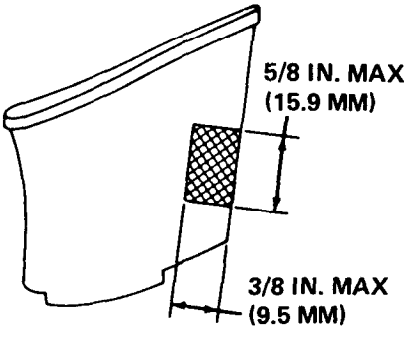

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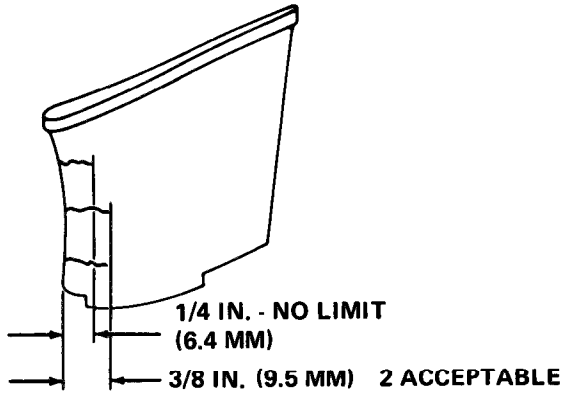
4-57. Second Stage Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Inspection - Continued

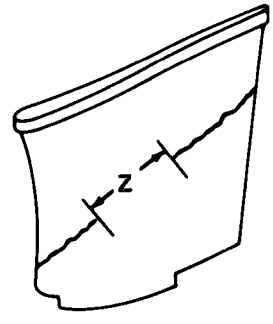
LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/- Continued		

Step No.	Defect	Ref	Inspection Limit
	Vane Trailing Edge Crack and Burn Limits - Second Stage Turbine Nozzle Assembly		
1.	Axial cracks (Nonconverging)	Detail A	a. Any number of cracks, each less than 1/4 inch (6.4 mm) long, are acceptable on each vane. b. In addition, three cracks, each up to 1 inch long are acceptable on each vane.
2.	Axial cracks (Converging)	Detail B	**Converging cracks that create possibility of material fallout are not permitted.** Converging cracks are acceptable provided minimum distance between cracks is 1/4 inch (6.4 mm).
3.	Burned Areas	Detail C	Burned areas up to 5/8 inch (15.9 mm) radial length by 3/8 inch (9.5 mm) axial length are acceptable on four vanes.



NON-CONVERGING CRACKS

D



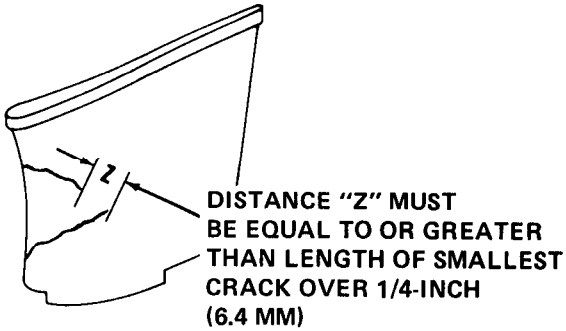
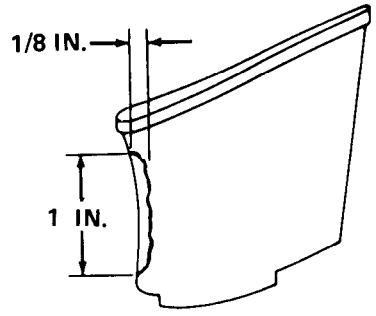
DISTANCE "Z" MUST NOT BE LESS THAN 3/4 IN. (19.1 MM)

CONVERGING CRACKS

E

4-57. Second Stage Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/- Continued		

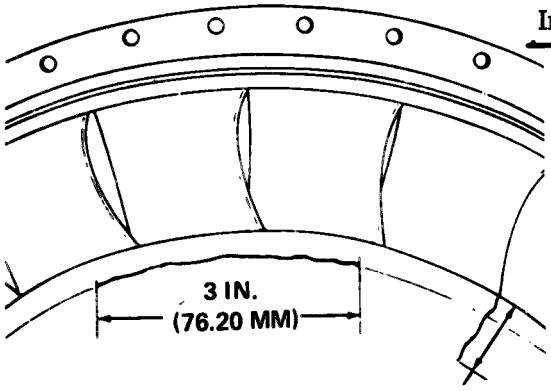
Step No.	Defect	Ref	Inspection Limit
	 CONVERGING CRACKS F		 ACCEPTABLE BURNS (12 VANES MAXIMUM) G
4.	Axial cracks (Nonconverging)	Detail D	Two cracks, each up to 3/8 inch (9.5 mm) long, are acceptable on each vane.
5.	Axial cracks (Converging)	Detail E	**Converging cracks that create possibility of material fallout are not permitted.**
			a. A crack extending from leading edge is not permitted if it is closer than 3/4 inch (19.1 mm) to crack extending from trailing edge.
		Detail F	b. Converging cracks are acceptable provided minimum distance between cracks is 1/4 inch (6.4 mm) or greater.
6.	Burned areas	Detail G	Burned areas up to 1 inch (25.4 mm) radial length by 1/8 inch (3.2 mm) axial length are acceptable on 12 vanes.
		Vanes	
7.	Bowing		Bowing is acceptable; no inspection is required.
8.	Nicks, dents, and burrs		Defects are acceptable provided sharp edges or protrusions are blend-repaired.

4-57. Second Stage Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/- Continued		

Step No.	Defect	Ref	Inspection Limit

Inner and Outer Shrouds



ONE CIRCUMFERENTIAL CRACK NOT EXCEEDING 3 INCHES IN LENGTH ALLOWED,

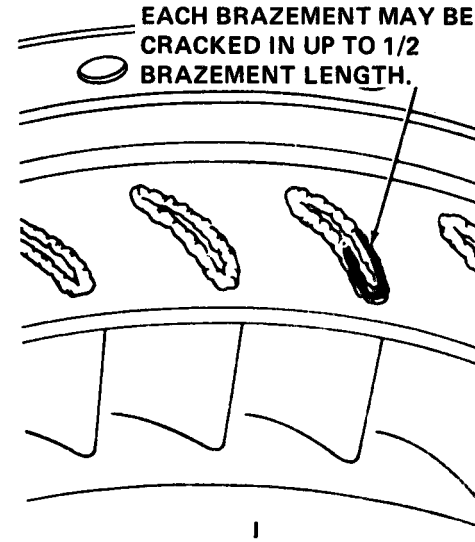
OR

3 RADIAL CRACKS NOT EXCEEDING ONE INCH IN LENGTH ALLOWED, PROVIDED CRACKS ARE SEPARATED BY 3 UNAFFECTED VANES.

NOTE

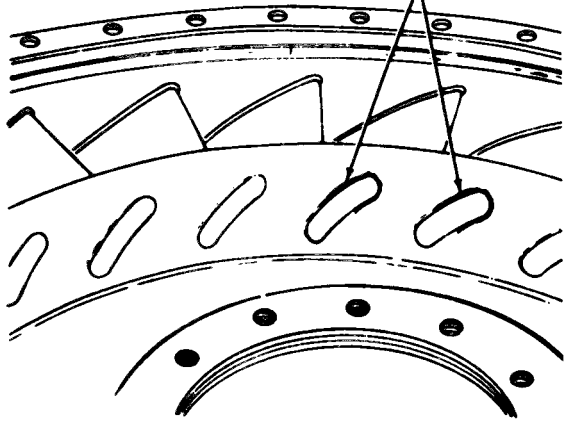
A COMBINATION OF CIRCUMFERENTIAL AND RADIAL CRACKS NOT ALLOWED.

H



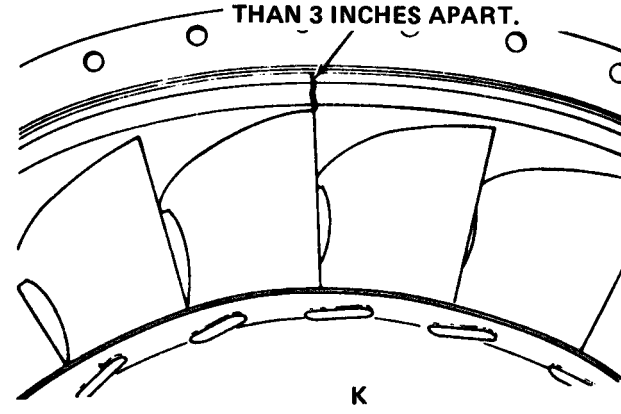
EACH BRAZEMENT MAY BE CRACKED IN UP TO 1/2 BRAZEMENT LENGTH.

I



EACH BRAZEMENT MAY BE CRACKED IN UP TO 1/2 BRAZEMENT LENGTH.

J



5 AXIAL CRACKS EXTENDING FROM VANE TRAILING EDGE TO MOUNTING FLANGE ARE ALLOWED, PROVIDED CRACKS DO NOT PENETRATE FLANGE. CRACKS MUST NOT BE CLOSER THAN 3 INCHES APART.

K

4-57. Second Stage Power Turbine Nozzle and Cylinder Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/-Continued		

Step No.	Defect	Ref	Inspection Limit
		Inner and Outer Shrouds (Cent)	
9.	Inner shroud OD cracks	Detail H	a. One circumferential crack up to 3 inches (76.20 mm) long is allowed. **A combination of circumferential and radial cracks is not permitted.** b. Three l-inch radial cracks extending from vane leading edge are allowed provided cracks are separated by at least three unaffected vanes.
10.	Inner shroud ID cracks	Detail I	Each vane-to-inner-shroud joint may be cracked in up to 1/2 the joint length.
11.	Outer shroud OD cracks	Detail J	Each vane-to-outer-shroud joint may be cracked in up to 1/2 the joint length.
12.	Outer shroud ID cracks	Detail K	Five axial cracks extending from vane trailing edge to mounting flange are acceptable, provided that cracks are no closer than 3 inches apart and do not penetrate the flange.
13,	Cracks		a. Cracks in seal are not permitted. b. Cracks in rivet heads are acceptable provided rivet remains intact. Replace rivet if otherwise damaged or missing,

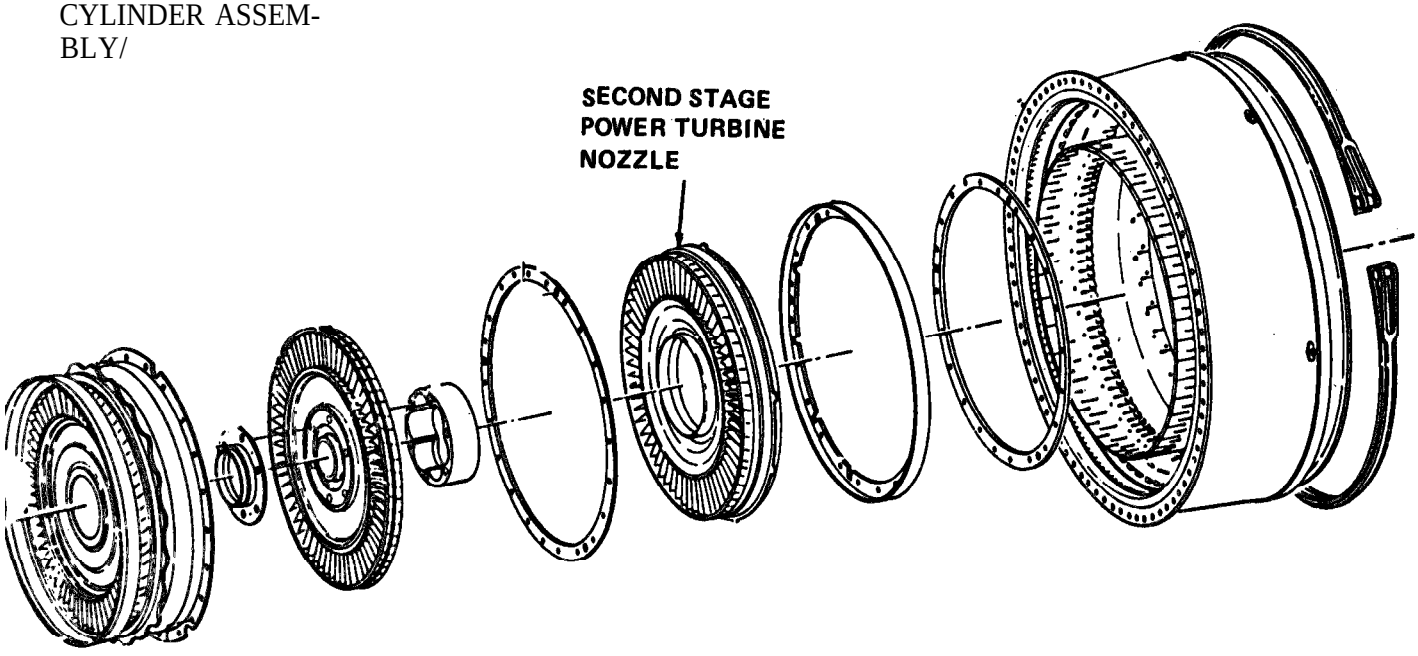
4-58. Second Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

References
Para H-25

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/		



Visually **inspect** for cracks.

Replace nozzle if any of the following limits are exceeded:

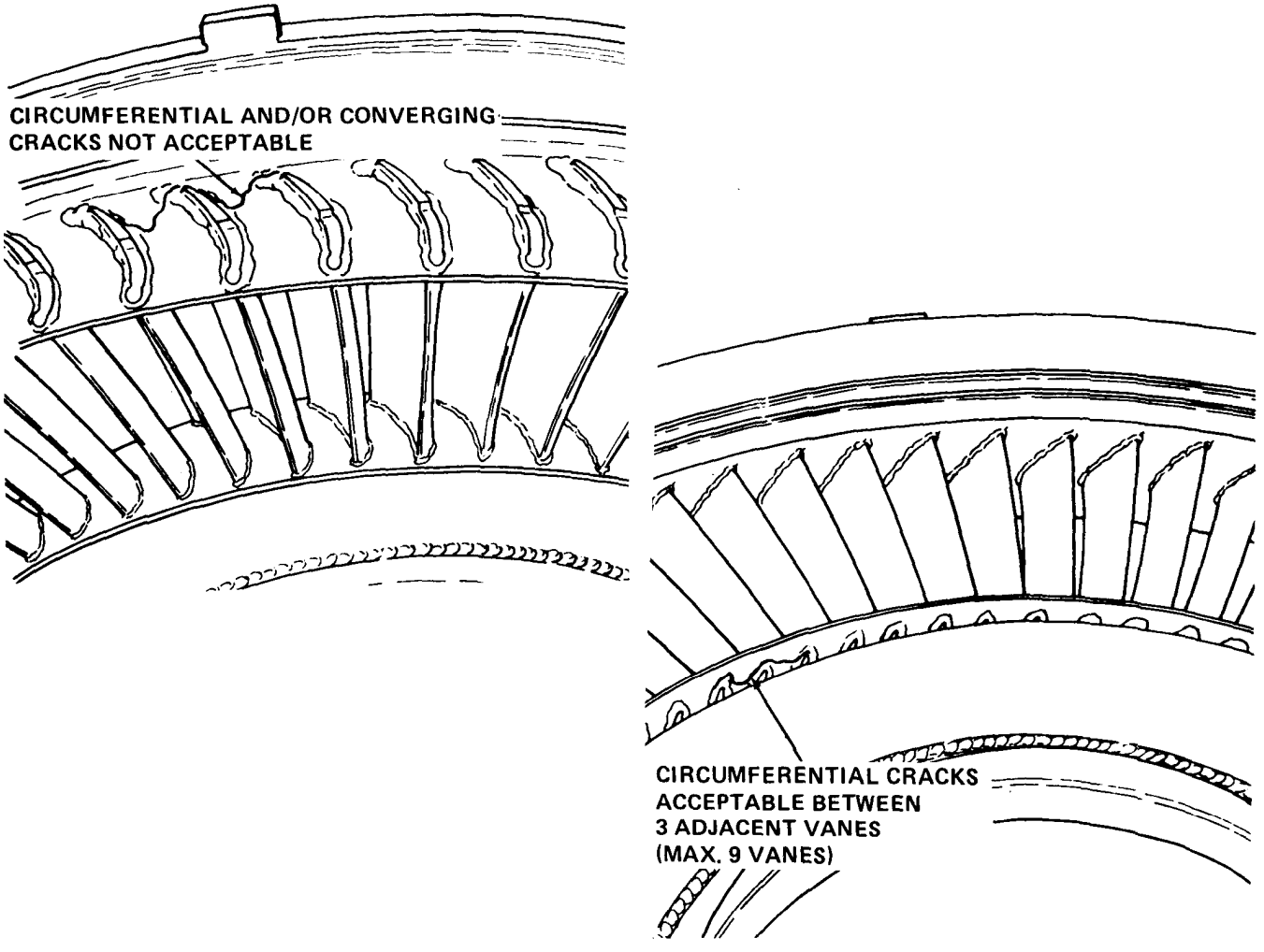
a. Any number of 3/16 inch (4.8 mm) cracks are acceptable on trailing edge of vanes.

b. Any number of 1/8 inch (3.2 mm) cracks are acceptable on leading edge of vanes.

c. No **inspection is required** on shroud to vane brazements (including overhang). Cracks are allowed.

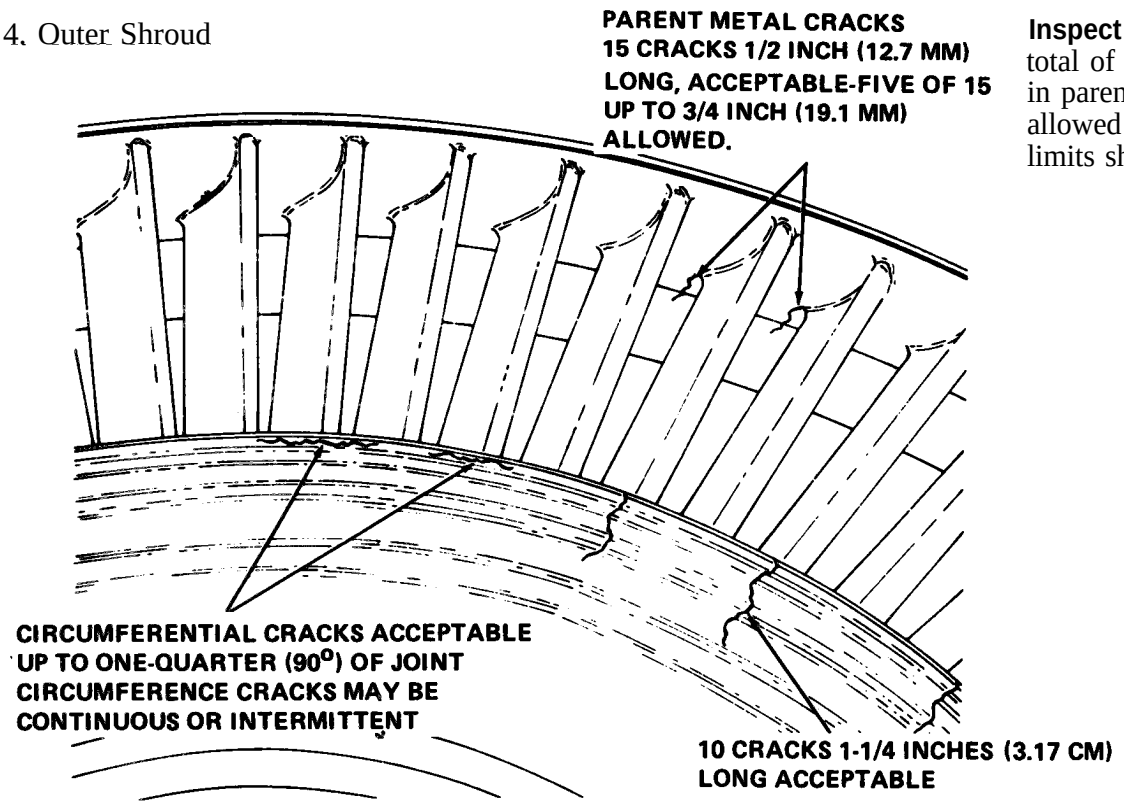
4-58. Second Stage Power Turbine Nozzle Assembly {T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/ - Continued		
	CAUTION **When inspecting for circumferential cracks in following step, any evidence of turbine wheel rubbing on support is unacceptable regardless of circumferential crack length.**	
2. Inner Shroud to Support Joint	Cracks are acceptable provided the cumulative crack length does not exceed 1/4 the circumference of the joint.	**Inspect** for circumferential cracks.



4-58. Second Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/- Continued		
3. Inner Shroud to vanes		**Inspect** for circumferential cracks in the parent metal on inner shroud between three adjacent vanes are permitted (maximum of nine vanes).
4. Outer Shroud		**Inspect** outer shroud, a total of 15 axial cracks in parent metal are allowed within the limits shown.



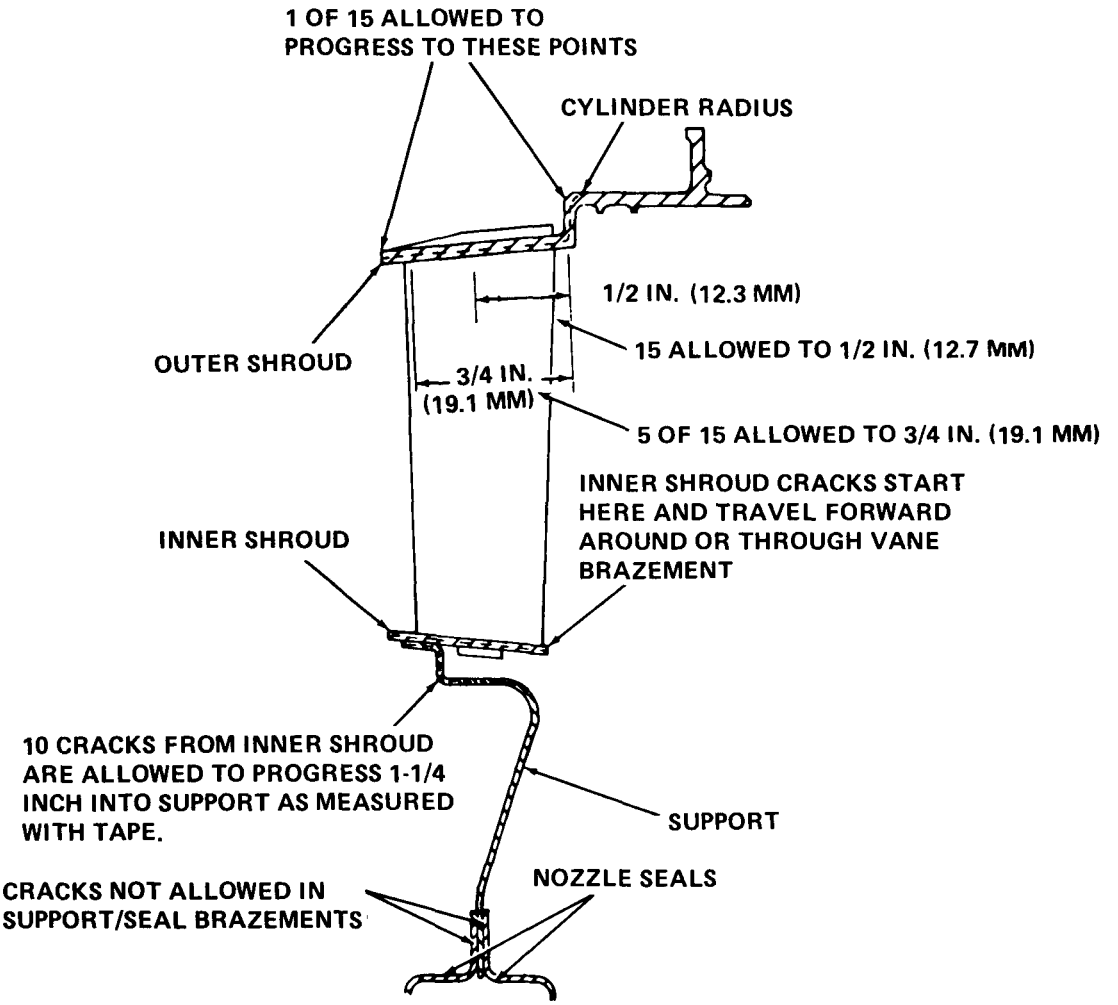
a. A maximum of five are allowed to be cracked up to 3/4 inch (19.1 mm).

b. One crack is permitted which progresses from the shroud leading edge, travels adjacent to vane and terminates at cylinder radius.

c. Any remaining cracks are allowed to be cracked up to 1/2 inch (12.7 mm).

4-58. Second Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) -Inspection - continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER ASSEMBLY/-Continued		
5. Outer Shroud	Circumferential and/or converging cracks are not allowed. See figure in item 3.	**Inspect** for circumferential and/or converging cracks in outer shroud.
6. Shroud Trailing Edge Around Vane Brazements to Leading Edge	A maximum of ten cracks are acceptable provided each crack is separated by at least two vanes, Each of these cracks are allowed to extend up to 1-1/4 inch (3.17 cm) into the support provided no turbine rub is evident.	**Inspect** for cracks.



7. Inner Shroud	Converging cracks in inner shroud not allowed.	**Inspect** for converging cracks.

4-58. Second Stage Power Turbine Nozzle Assembly (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLE AND CYLINDER AS8EMBLY/-Continued		
8. Support/Seal Brazement	Cracks are not acceptable.	Inspect for cracks.
9. Second Stage Power Turbine Nozzle	Axial rubs resulting from contact with turbine rotor are not permitted.	Visually inspect for axial rubs.
10. vanes	Blend-repair nicks, dents, and burrs as out lined in paragraph H-25. a. A maximum of four nicks or dents are allowed on vane leading edge, provided that after blend-repair, depth of any defect does not exceed 3/32 inch (2.4 mm) and length does not exceed 3/16 inch (4.8 mm). Separation of defects shall be at least twice the length of the shortest defect after blend-repair. Smooth dents within limits are acceptable without blend-repair. b. A maximum of four nicks or dents are allowed on vane trailing edge, provided that after blend-repair, depth of any defect does not exceed 3/32 inch (2.4 mm) and length does not exceed 3/16 inch (4.8 mm). Separation of defects shall be at least twice the length of the shortest defect after blend-repair. Smooth dents within limits are acceptable without blend-repair. c. Minor nicks and dents on vane airfoil surfaces are acceptable on all vanes. Blend-repair to remove nicks. d. Burrs are acceptable on vane leading and trailing edges. Blend-repair to remove burrs.	Visually inspect for dents, nicks, and burrs.
11. Nozzle	**1. Burns in leading and trailing edges of vanes with loss of metal are not allowed.** **2. Metallization deposits are acceptable.**	Visually **inspect** for burns.

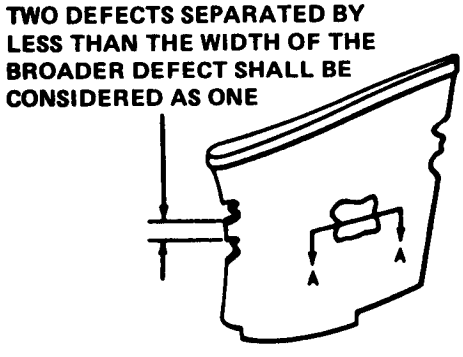
4-59. Second Stage Turbine Nozzle Assembly (T53-L-11 Series Engines) - Repair (AVIM)

INITIAL SETUP

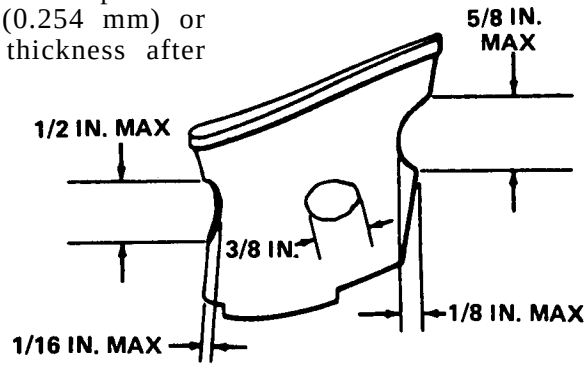
Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Crocus Cloth (item 21, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLES AND CYLINDER ASSEMBLY/		
1. Vanes	Vanes with surface nicks or dents that can be removed by blending maybe repaired, provided dimensions after repair do not exceed the following limits. a. Repair of leading edge shall not exceed 1/2 inch (12.7 mm) in length and 1/16 inch (1.6 mm) in depth. b. Repair of trailing edge shall not exceed 5/8 inch (15.9 mm) in length and 1/8 inch (3.2 mm) in depth. c. Repair of airfoil shall not exceed 3/8 inch (9.5 mm) in diameter and depth shall not exceed 0.010 inch (0.254 mm) or 30 percent of original thickness after repair	**Repair.** (See following figure.)

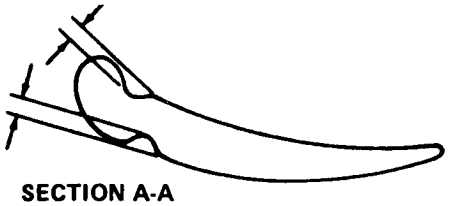


DAMAGED VANE



REPAIRED VANE

REPAIR DEPTH SHALL NOT EXCEED 0.010 INCH OR 30 PERCENT OF ORIGINAL THICKNESS AFTER REPAIR



SECTION A-A

4-59. Second Stage Turbine Nozzle Assembly (T53-L-11 Series Engines) - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER TURBINE NOZZLES AND CYLINDER ASSEMBLY/- Continued		
2. Second Stage Turbine Nozzle Assembly	Use Swiss type files, carbide rotary files, or Carborundum stones for repairs. Use crocus cloth (item 21, Appendix D) for final polishing.	**Repair. Polish.**
3. Second Stage Turbine Nozzle Assembly	Scratches are not permitted.	**Make** finish strokes of all repair work parallel with leading and trailing edge of the vane

4-60. Rear Bearing Seal, Seal Housing, Liner, and Diffuser Housing Oil Tubes (T53-L-11 Series Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para H-27

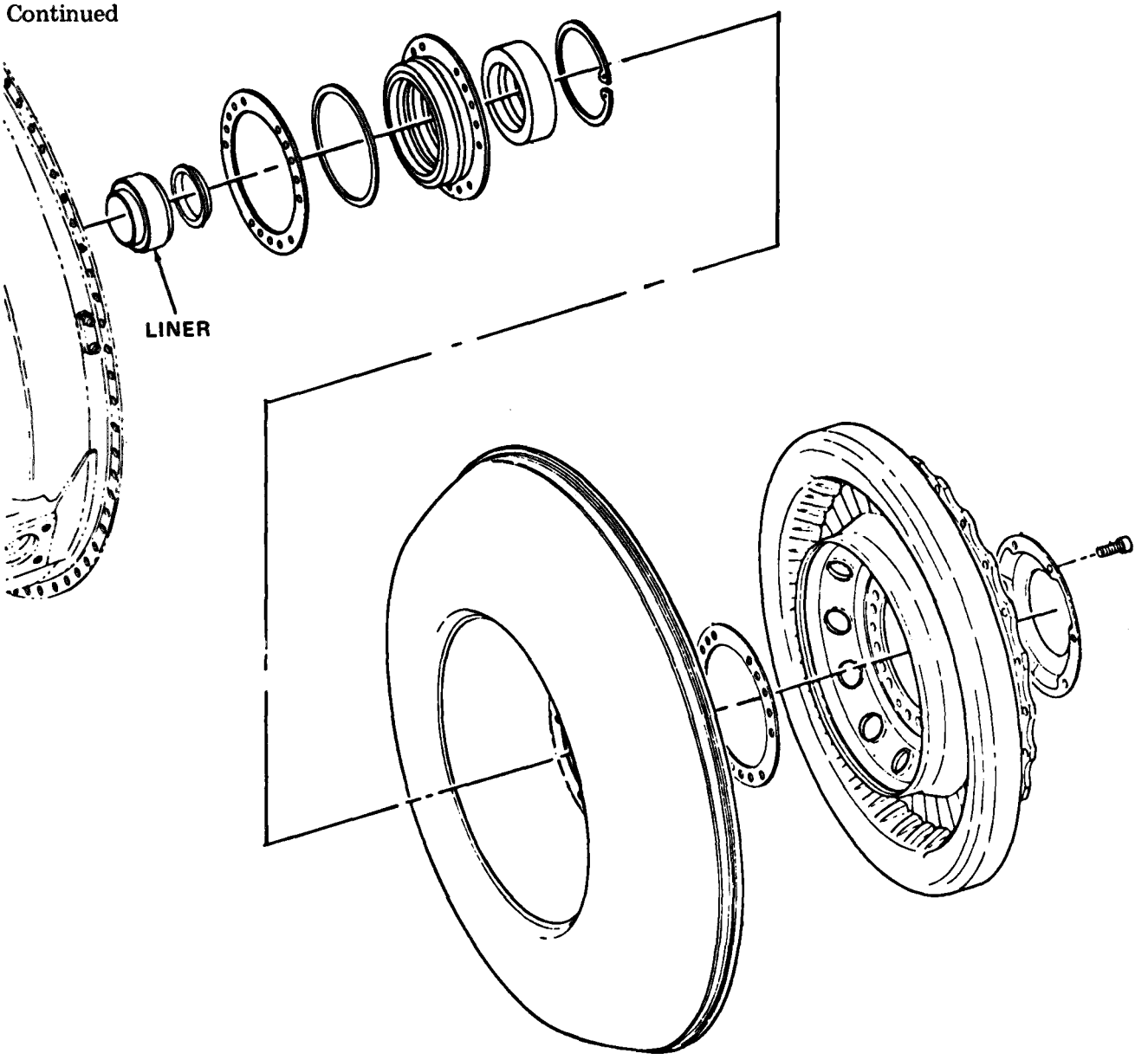
LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
1. First Stage Turbine Rotor Disc	**NOTE** Fresh oil on forward face of first stage turbine rotor disc or carbon residue from oil adhering to aft face of rear bearing seal or seal housing is allowed. A thick deposit of hard, glazed carbon on either the forward face of the first stage turbine rotor disc or the aft face of the rear bearing seal or seal housing is not allowed.	**Inspect** forward face of first stage turbine rotor disc and aft faces of rear bearing seal and seal housing.

4-60. Rear Bearing Seal, Seal Housing, Liner, and Diffuser Housing Oil Tubes (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
2. Seal Housing		**Inspect** for nicks, dents, cracks, scratches, liner burrs, and other damage. **Replace** seal and/or seal housing, if damaged. **Replace** seal if conditions established in preceding action for item 1 cannot be met, or if during engine operation, acceptable rate of oil consumption is exceeded and excessive smoke is noticed from exhaust end or tailpipe.
3. Diffuser Housing Oil Tubes		**Inspect** for cracks and braze failures at mating points of tubes to housing. **Braze-repair** cracks as outlined in paragraph H-27
4. Liner		**Inspect** liner for scoring of plated area. **Replace** liner if scoring of plated area is observed or if other damage is noted.

4-60. Rear Bearing Seal, Seal Housing, Liner, and Diffuser Housing Oil Tubas (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		



CHAPTER 5

ACCESSORY GEARBOX

OVERVIEW

This chapter contains procedures for the maintenance and preservation of the accessory gearbox. Paragraphs following outline disassembly, inspection, repair, and additional requirements needed to maintain the accessory gearbox and related parts. Procedures requiring maintenance on the Aviation Intermediate Maintenance (AVIM) level are specified and must be performed as such. Paragraphs in which the maintenance level is not specified shall be considered Aviation Unit Maintenance (AVUM) and may be performed at this level or a higher level of maintenance.

5-1. GENERAL MAINTENANCE INFORMATION

Visually inspect the Accessory Gearbox Assembly for loose or missing parts, cracks and distortion, corrosion and damaged threads. Procedures for removal, cleaning, inspection, repair and installation are provided to maintain the accessory gearbox assembly.

During installation of the assembly on the engine discard all of the following parts and replace with new parts:

Seals
Gaskets
Packing
Cotter Pin
Tabwashers
Lockpins
Lockwashers
Lockwire

5-2. Accessory Drive Gearbox Assembly - Removal

INITIAL SETUP

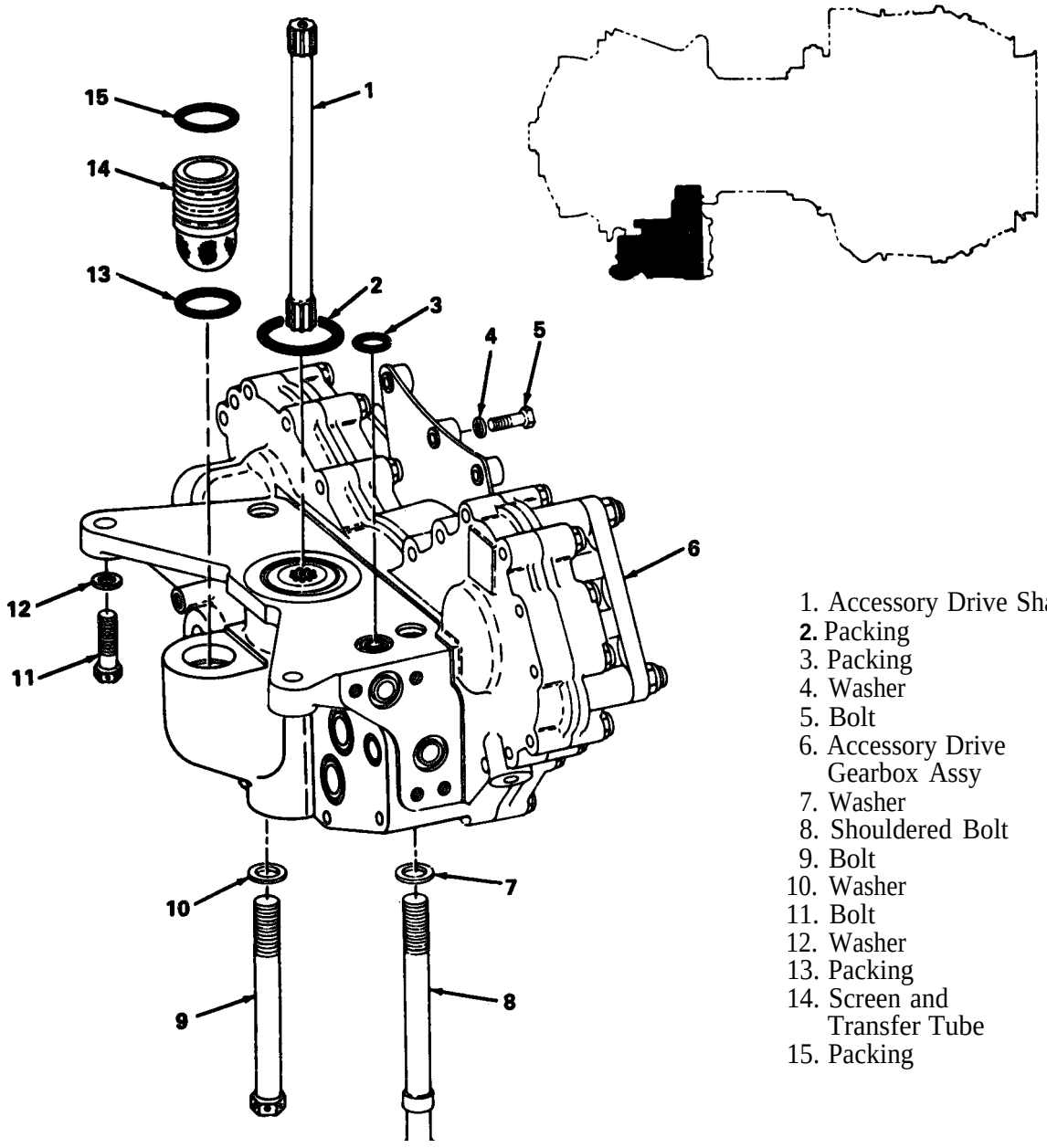
Applicable configuration
All

References
Para 8-29 and 6-2

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING/	**WARNING** **Prolonged contact with lubricating oil (item 46 or 47, Appendix D) may cause a skin rash. Those areas of skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be adequately ventilated to keep mist and fumes to a minimum.** **NOTE** If accessory drive gearbox is to be replaced, retain the power-drive rotary (oil) pump, oil filter, screen and transfer tube (14), and chip detector. Remove and retain support, support gaskets, and mounting nuts, bolts, and washers for installation.	
1. Lubricating Scavenge Hose Assemblies	Lube oil.	**Tag** and **disconnect from** accessory drive gearbox assembly.
2. Inlet Guide Vane Actuator Seal Drain Hose Assembly	T53-L-13B/703 engines only.	**Disconnect** and **remove** from accessory drive gearbox assembly.
3. Power-Driven Rotary Pump	Refer to paragraph 8-29.	**Remove** from accessory drive gearbox assembly.
4. Fuel Control	Refer to paragraph 6-2.	**Remove.**
5. Starter Generator and N1 Tachometer Generator		**Remove, if** installed.
6. Three Bolts (5) and Washers (4)	Bolts and washers secure gearbox support to rear flange of inlet housing assembly.	**Remove.**

5-2. Accessory Drive Gearbox Assembly - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING/ - Continued		



1. Accessory Drive Shaft
2. Packing
3. Packing
4. Washer
5. Bolt
6. Accessory Drive Gearbox Assy
7. Washer
8. Shouldered Bolt
9. Bolt
10. Washer
11. Bolt
12. Washer
13. Packing
14. Screen and Transfer Tube
15. Packing

7. Shouldered Bolt (8), Bolt (9), Two Bolts (11) (one Not Illustrated) and Washers (7, 10 and 12)	Support accessory drive gearbox assembly	**Remove.**

5.2 ACCESSORY DRIVE GEARBOX ASSEMBLY – REMOVAL – Cont.

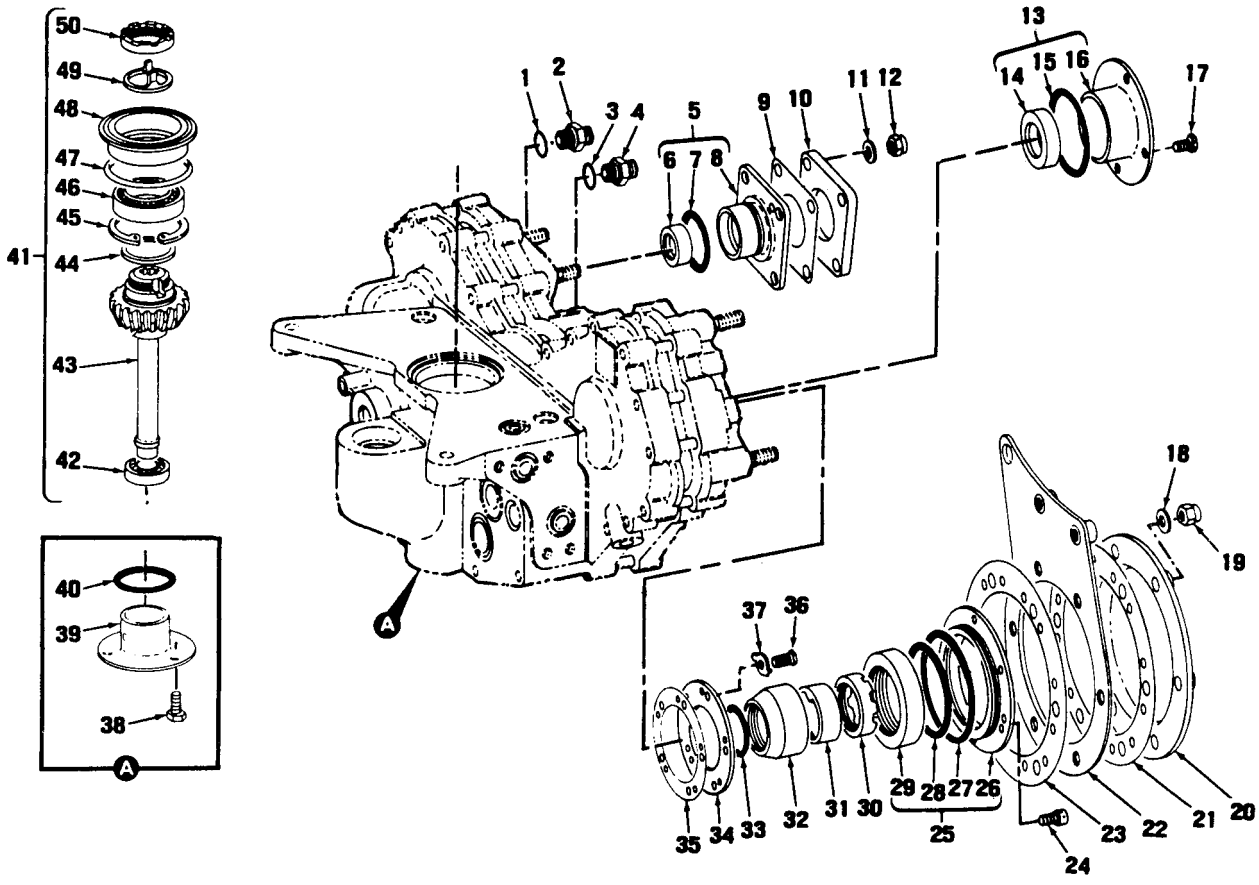
LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING/ - Continued		
8. Accessory Drive Gearbox Assembly (6) and Accessory Drive Shaft (1)		**Remove** from inlet housing.
ACCESSORY DRIVE GEARBOX ASSEMBLY/		
9. Packings (2 and 3)		**Remove** from mounting face of gearbox.
10. Accessory Drive Shaft (l), Packings (13 and 15) and Screen and Transfer Tube (14)		**Remove** from top of accessory drive gearbox.

5-2.1 Accessory Drive Gearbox Assembly - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued	**NOTE** Following step applies to T53-L-13B and T53-L-703 engines which incorporate radial floor-ing housing (39).	
1. Bolts (36), Hous-ing (39), Packing (40)		**Remove** bolts (38) that secure housing (39) to accessory gearbox housing assembly. **Remove** hous-ing (39) and packing (40).
	NOTE The accessory drive pinion gear-shaft and beating assembly is removed as a unit.	
2. Pinion Gearshaft and Bearing Assembly (41)		**Withdraw** pinion gear-shaft and bearing assembly (41) from accessory gear-box housing assembly.
3. Packing (47)		**Remove** packing (47).
4. Holder Assembly (LTCT3833 or LTCT2039)		**Install** holder assembly in bench type vise.
		Position gearshaft and bearing assembly (41) in holder assembly.
5. Washer (49)		**Straighten** tabs of washer (49).
6. Nut (50 and Washer (49)	Use spanner wrench LTCT107.	**Remove** nut (50) and washer (49).
		Remove assembly from holder assembly, and sup port assembly on table of arbor press.
7. Gearshaft Assembly (43) and Pinion Liner (48)	**Use long brass drift and arbor press.**	**Press** gearshaft assembly (43) from pinion liner (48).

5-2.1 ACCESSORY DRIVE GEARBOX ASSEMBLY –DISASSEMBLY – Cont.

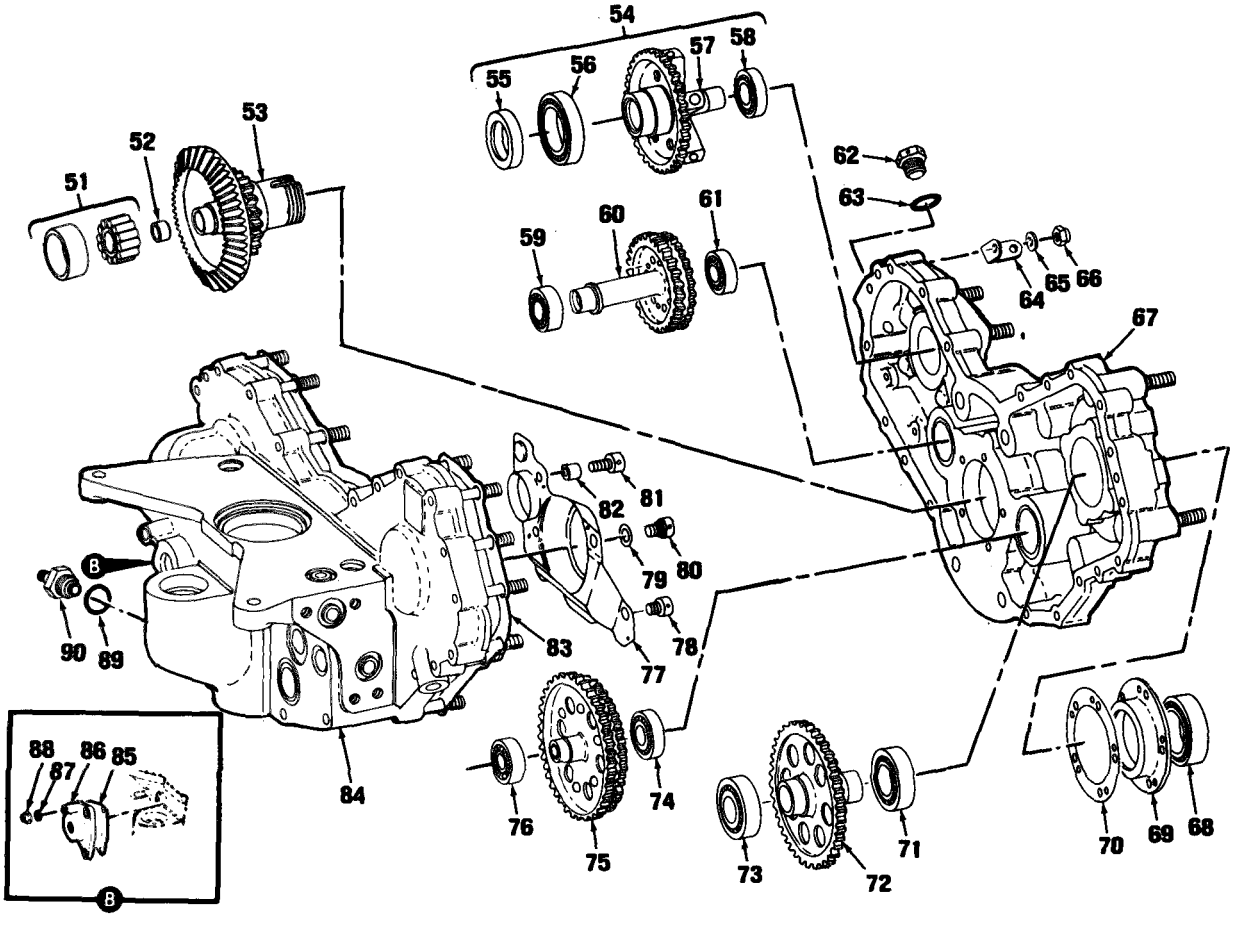
LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY– Continued		



1. Packing
2. Union
3. Packing
4. Union
5. Flange and Seal Assembly
6. Seal
7. Packing
8. Bearing Retainer
9. Gasket
10. Cover
11. Washer
12. Nut
13. Seal and Liner Assembly
14. Seal
15. Packing
16. Fuel Control Drive Liner
17, Bolt
18. Washer
19. Nut
20. Cover
21. Gasket
22. support
23. Gasket
24. Bolt
25. Seal and Housing Assembly
26. Oil Seal Housing
27. Packing
28. Packing
29. seal
30. Spanner Nut
31. Lock cup
32. Spacer
33. Packing
34. Retaining Plate
35. shim
36. Bolt
37. Tabwasher
38. Bolt
39. Radial Bearing Housing
40. Packing
41. Pinion Gearshaft and Bearing Assembly
42. Ball Bearing
43. Gearshaft Assembly
44. Shim
45. Retaining Ring
46. Ball Bearing
47. Packing
48. Pinion Liner
49. Washer
50. Nut

5-2.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – DISASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued		



51. Roller Bearing Outer Race
52. Roller Bearing Inner Race
53. Zerol Gear
54. Gearshaft and Bearing Assembly
55. Seal
56. Ball Bearing
57. Tachometer Drive Gearshaft
58. Ball Bearing
59. Ball Bearing
60. Oil-Air Separator Drive Gearshaft
61. Ball Bearing
62. Plug
63. Packing
64. Bracket
65. Washer
66. Nut
67. Accessory Gearbox Cover Assembly
68. Ball Bearing
69. Thrust Bearing Liner
70, Shim
71. Ball Bearing
72. Gearshaft Assembly
73. Ball Bearing
74. Ball Bearing
75. Oil Pump Drive Gearshaft
76. Ball Bearing
77. Baffle
78. Screw
79. Packing
80. Screw
81. Bolt
82. Spacer
83. Gasket
84. Accessory Gearbox Housing Assembly
85. Gasket
86. Pad Cover
87. Washer
88. Nut
89. Packing
90. Chip Detector

5-2.1 **ACCESSORY DRIVE GEARBOX DISASSEMBLY – Cont.**

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued	**NOTE** To facilitate reassembly, record thickness of shim (44) when removed.	
8. Shim (44) and retaining ring (45)		**Remove** shim (44) and retaining ring (45).
9. Ball bearing (46) and pinion liner (48)	Use arbor press and bushing from bushing set LTCT68).	**Press** ball bearing (46) from pinion liner (48).
10. Ball bearing (42) and gearshaft assembly (43)	Use puller (LTCT675).	**Remove** ball bearing (42) from gearshaft assembly (43).
11. Nuts (19), washers (18), cover (20), support (22), accessory cover gearbox cover assembly (67).		**Remove** nuts (19) and washers (18) that secure cover (20) and support (22) to accessory gearbox cover assembly (67).
12. Cover (20), gasket (21) support (22) and gasket (23)		**Remove** cover (20), gasket (21) support (22) and gasket (23).
13. Bolts (24) seal and housing assembly (25)		**Remove** bolts (24) that secure seal and housing assembly (25) to accessory gearbox cover.
	NOTE When performing the following step, tighten both puller screws simultaneously to prevent oil seal housing from jamming in gearbox.	
14. Seal (29) housing (26) and packing (27)	Using two 10-32 puller screws.	**Remove** seal (29) and housing (26) from accessory gearbox cover. **Remove** packing (27).
15. Seal (29)	Use arbor press and removal tool (LTCT3648)	**Press** seal (29) from housing (26).
16. Packing (28)		**Remove** packing (28),
17. Lock cup (31)		**Straighten** rim of lock cup (31).

5-2.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – DISASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY – Continued		
18. Nut (30).	Use holding fixture (LTCT115)	**Position** holding fixture on cover mounting pad studs. **Check** to ensure that tangs of holding fixture engage slots of spanner nut (30).
19. Zerol gear (53)	Use splined tool (part of holding fixture).	**Insert** splined tool in holding fixture and engage with internal splines of zerol gear (53).
19.1 Spanner nut (30) and lock cup (31)	Use suitable wrench	**Turn** splined tool clockwise to remove spanner nut (30) and lock cup (31).
20. Spacer (32) and packing (33)		**Remove** spacer (32) and packing (33).
21. Tabwashers (37)		**Straighten** tabs of tabwashers (37).
22. Bolts (36) and tabwashers (37)		**Remove** bolts (36) and tabwashers (37).
23. Retaining plate (34) and shim (35)	Record thickness of shim (35) and secure to retaining plate	**Remove** retaining plate (34) and shim (35).
24. Nuts (12), washers (11), cover (10), gasket (9)		**Remove** nuts (12), washers (11) cover (10) and gasket (9).
	NOTE When performing the following step, tighten both puller screws simultaneously to prevent bearing retainer from jamming in gearbox.	
25. Flange and seal assembly(5)	Use two 10-32 screws.	**Remove** flange and seal assembly (5)

5-2.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – DISASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY – Continued		
26. Packing (7) and bearing retainer (8)		**Remove** packing (7) from bearing retainer (8)
27. Seal (6)	Use installing tool (LTCT501) or suitable drift and arbor press.	**Press** seal (6) from bearing retainer (8).
28. Bolts (17)		**Remove** bolts (17) that secure seal and liner assembly (13) to gearbox cover.
	NOTE When performing the following step, tighten both puller screws simultaneously to prevent fuel liner from jamming in gearbox.	
29. Seal and liner assembly (13)	Use two 10-32 puller screws.	**Remove** seal and liner assembly (13).
30. Packing (15)		**Remove** packing (15)
31. Seal (14) and fuel control drive liner.	Use sleeve bushing (LTCT3654) or installing tool (LTCT100) and arbor press.	**Press** seal (14) from fuel control drive liner (16).
32. Unions (2 and 4) and packings (1 and 3)		**Remove** unions (2 and 4) and packings (1 and 3).
33. Plug (62) and packing (63)		**Remove** plug (62) and packing (63).
34. Nuts (66), washers (65) and brackets (64)	Applies to T53-L-13B engines.	**Remove** nuts (66), washers (65) and brackets (64) that secure accessory gearbox cover assembly (67) to accessory gearbox housing assembly (84).

5-2.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – DISASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued	NOTE If, when removing cover assembly, one side sticks, tap high side with soft-faced mallet. When gap of 1/2 inch between cover and housing is obtained, check to ensure that oil-air separator drive gearshaft (60), and gearshaft assembly (72) are separated. Lightly tap cover assembly with soft-faced mallet to free stuck gearshaft assemblies.	
35. Accessory gearbox cover assembly (67)	Use puller (LTCT142)	**Secure** puller to accessory gearbox cover assembly (67). **Tighten** handle slowly until cover separates from housing. **Lift** accessory gearbox cover assembly (67) from accessory gearbox housing assembly (84) and **remove** puller.
36. Gasket (83)		**Remove** gasket (83).
37. Thrust bearing liner (69), and ball bearing (68)	Use soft-faced mallet.	**Turn** accessory gearbox cover assembly (67) over and **tap** thrust bearing liner (69) and ball bearing (68) out of cover assembly.
38. Shim (70)	Record thickness of shim (70).	**Remove** shim (70).
39. Thrust bearing liner (69) and ball bearing (68)	Use puller (LTCT916)	**Remove** bearing (68) from liner (69).
40. Tachometer drive gearshaft (51)		**Carefully lift** tachometer drive gearshaft (57) out of accessory gearbox housing assembly (84).
41. Seal (55)	Use puller (LTCT2067)	**Remove** seal (55).
42. Ball bearings (56) and (58)	Use puller (LTCT675)	**Remove** ball bearings (56) and (58).
43. Oil-air separator drive gearshaft (60)		**Remove** oil-air separator drive gearshaft (60).

5-2.1 **ACCESSORY DRIVE GEARBOX ASSEMBLY – DISASSEMBLY – Cont.**

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY (Continued)		
44. Ball bearings (59) and (61)	Use puller (LTCT675)	**Remove** ball bearings (59) and (61).
45. Gearshaft assembly (72)		**Remove** gearshaft assembly (72),
46. Ball bearings (71) and (73)	Use puller (LTCT675)	**Remove** ball bearings (71) and (73).
47. Oil pump drive gearshaft (75)		**Remove** oil pump drive gearshaft (75).
48. Ball bearings (74) and (76)	Use puller (LTCT675)	**Remove** ball bearings (74) and (76)
	NOTE When removing zerol gear (53), roller bearing outer race (51) will usually remain in accessory gearbox housing assembly (84). The outer race must be extracted and kept with roller bearing inner race (52) as a matched set.	
49. zerol gear (53)		**Remove** zerol gear (53).
50. Roller bearing inner race (52)	Use puller (LTCT916 or LTCT97).	**Remove** roller bearing inner race (52).
51. Roller bearing outer race (51).	Use brass drift and hammer.	**Tap** roller bearing outer race (51) out of accessory gearbox assembly (84).
52. Screws (78 and 80), bolts, (81) and spacers (82)		**Remove** screws (78 and 80), bolts (81) and spacers (82) that secure baffle (77).
53. Baffle (77) and packing (79).	Remove oil filter and oil pump, if installed.	**Remove** baffle (77) and packing (79).
54. Chip detector (90) and packing (89)		**Remove** chip detector (90) and packing (89).
55. Nuts (8$) and washers (87)		If installed, **remove** nuts (88) and washers (87) that secure pad cover (86).
56. Pad cover (86) and gasket (85)		**Remove** pad cover (86) and gasket (85).

5-3. ACCESSORY DRIVE GEARBOX ASSEMBLY – INSPECTION

INITIAL SETUP

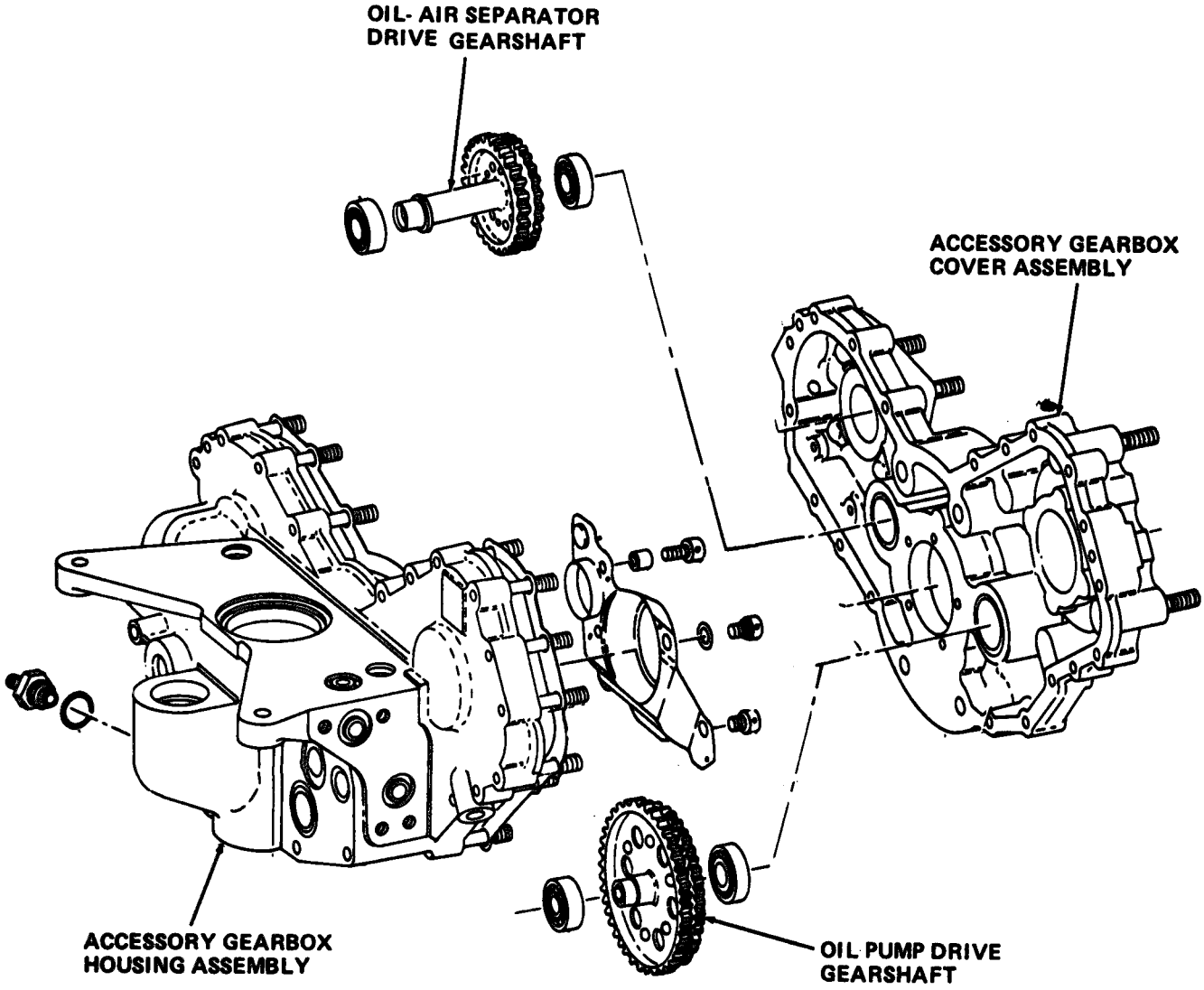
Applicable Configuration
All

References
Para H-13, H-25, H-23 and H-29

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/		
1. Accessory Drive Gearbox Assembly	Refer to paragraph H-2 and H-25 for blend repair.	**Inspect** all parts for nicks, burrs and scratches. **Blend-repair.**
2. Accessory Drive	Refer to paragraph H-22 and H-29 for	**Inspect** all threaded parts for damaged threads. **Repair** damaged threads. **Replace** parts having threads damaged beyond repair.

5-3. Accesssory Drive Gearbox Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/-Continued		



3. Accessory Drive Gearbox Assembly		Visually inspect all parts for cracks, distortion, and excessive wear. Replace all cracked, distorted or excessively worn parts.

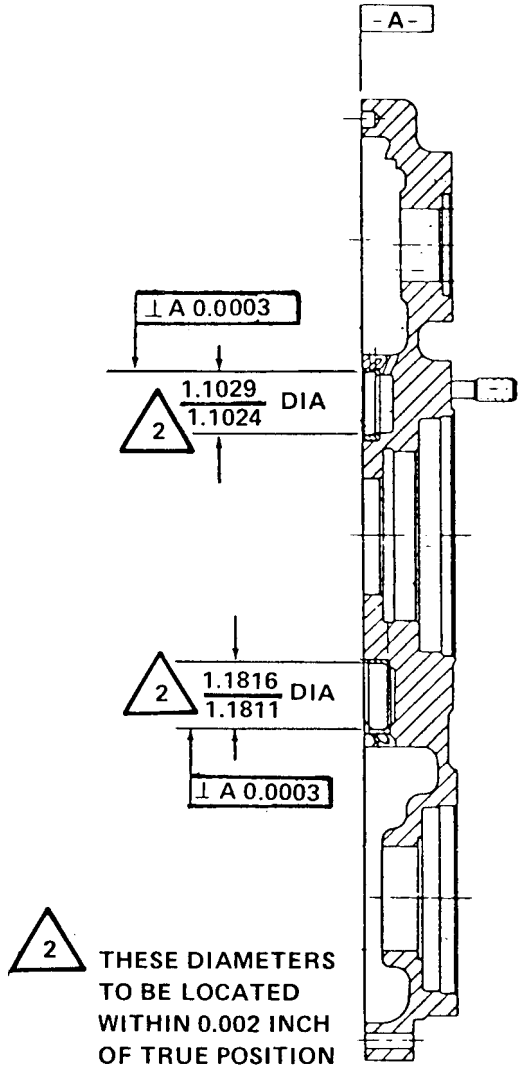
5-3. Accessory Drive Gearbox Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued		
4. Accessory Drive Gearbox Assembly	Refer to paragraph H-22 for gear and spline inspection.	a. **Inspect** gears and splined parts for chipping or flaking, excessive spline or tooth wear, journal wear or damage, surface damage, thread damage and nicked or burred keyways. **Repair** of gears and splined parts is limited to blend-repair of damaged keyways and threads. **Refer** to paragraph H-25 **Replace** parts if damage is beyond repair.
	Corrosion including light pitting to a depth of 0.020 inch (0.51 mm) without breakthrough or causing external leakage is acceptable after repair. Proceed as follows:	b. **Inspect** mating flanges of gearbox housing halves for corrosion. **Observe** repair limits.
	CAUTION **Use care when brushing with fiber brush so as not to mar finish of non-affected surrounding parts.**	
	a. Refinish according to items 1 thru 5 of paragraph H-13.	
	b. Finish repair according to item 9 of paragraph H-13.	
	c. Corrosion with pitting greater than 0.020 inch (0.51 mm) in depth but not causing external leakage or possibility of material fallout. Should be repaired according to paragraph H-13 instructions but using Preferred Method-Epoxy Sealant application.	
	d. Ccrrosion, creating external leakage or a possibility of material fallout, is nonrepairable and is cause for part replacement.	

5-3. Accessory Drive Gearbox Assembly - Inspection - Continued

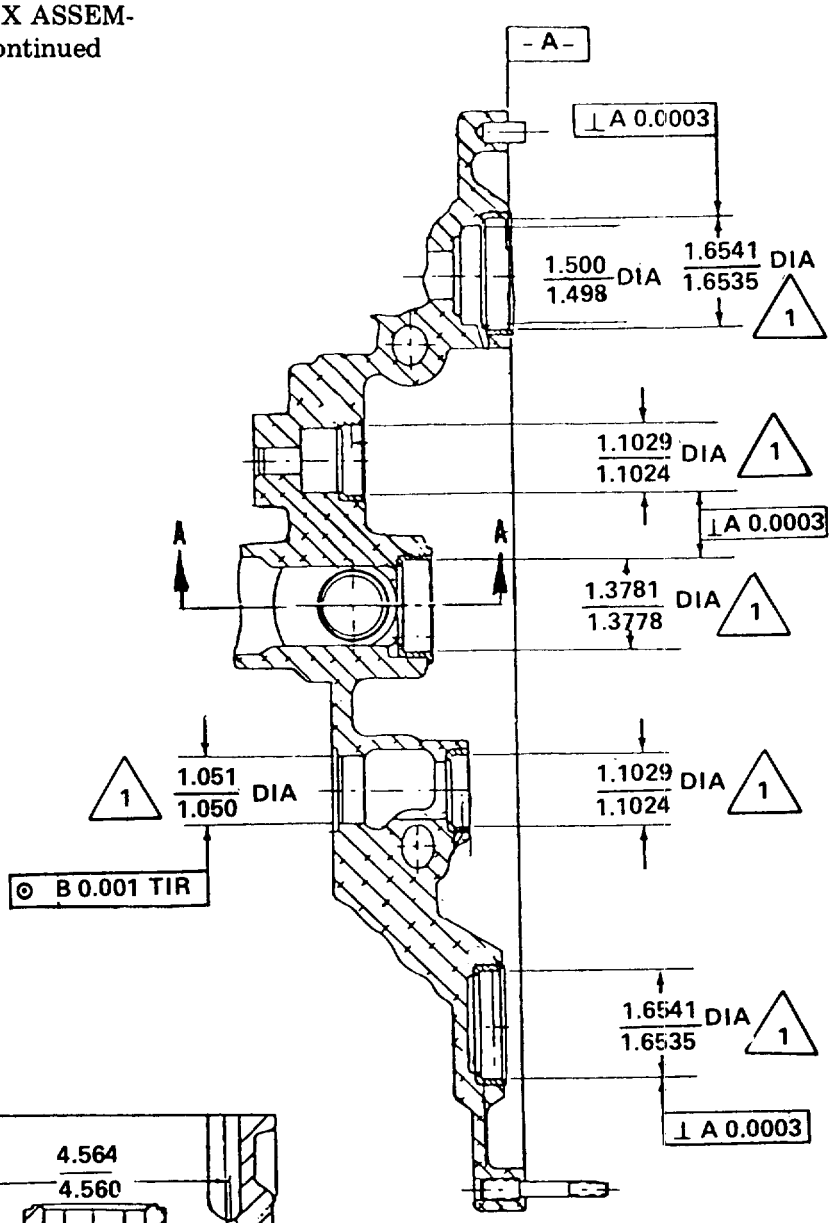
LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued		
5. Accessory Gearbox Cover Assembly and Accessory Gearbox Housing Assembly		**Inspect** for damaged screw thread inserts. **Replace** damaged screw thread inserts as outlined in paragraph H-29.
6. Accessory Gearbox Housing Assembly		**Inspect** for damaged threads in chip detector port. **Repair** damaged threads as outlined in paragraph 5-4.
7. Accessory Drive Gearbox Assembly		**Inspect** painted surfaces for worn, chipped or eroded paint. **Repair** painted surfaces as specified in paragraph H-15
8. Accessory Drive Gearbox Assembly		**Inspect** all bearings as outlined in paragraph H-23 **Replace** all defective bearings.
9. Oil-Air Separator Drive Gearshaft Oil Pump Drive Gearshaft		**Inspect** for cracked, loose or missing rivets. **Repair** as outlined in paragraph 5-4.
10. Accessory Gearbox Housing Assembly		**Inspect** baffle mounting tapped hole for damage. **Repair** as outlined in paragraph 5-4.
11. Accessory Gearbox Cover Assembly and Housing Assembly		**Inspect** for scored bearing liners.

5-3. Accessory Drive Gearbox Assembly - Inspection - Continued

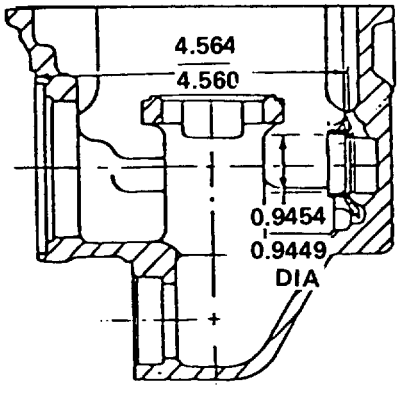
LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/-Continued		
12. Accessory Gearbox Cover Assembly	 ALL DIMENSIONS ARE IN INCHES COVER	**Measure** ID of bearing liners. If any measurement is 0.0002 inch (0.05 mm) greater than the maximum dimensions shown in figure, the unacceptable liner must be replaced.

5-3. Accessory Drive Gearbox Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		



HOUSING



SECTION A-A

1 THESE DIAMETERS TO BE LOCATED WITHIN 0.001 INCH OF TRUE POSITION

5-4. Accessory Drive Gearbox Assembly (AVIM) - Repair

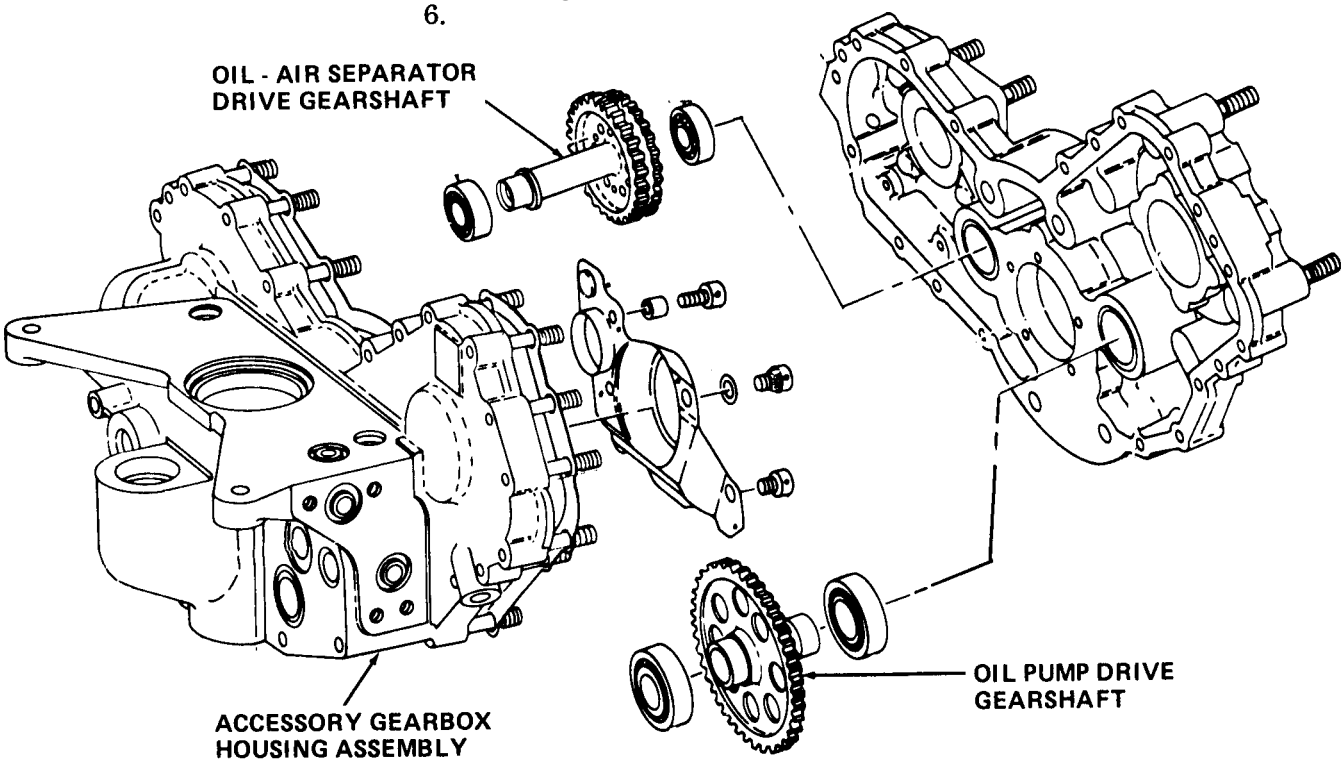
INITIAL SETUP

Applicable Configuration
All

References
Para H-17
TM 55-1500-204-15/1

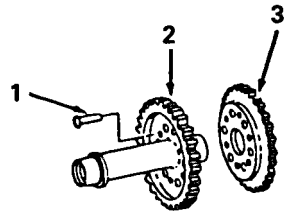
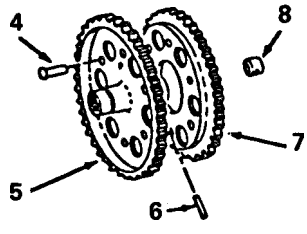
Consumable Materials
Magnesium Alloy (item 49, Appendix D)
Zinc-Chromate Primer (item 96, Appendix D)
Colorbrite No. 2107 (item 54, Appendix D)
Drycleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/	**NOTE** It will be necessary to remove accessory drive gearbox from the engine to make the following repairs.	
	NOTE Repair damage to oil-air separator drive gearshaft (see following figure) as following in actions for items 1 thru 6.	



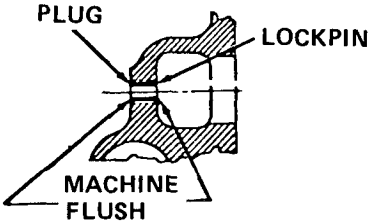
1. Rivets (1)

5-4. Accessory Drive Gearbox Assembly (AVIM) - Repair - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/-Continued		
		
2. Gear (3)		Carefully **separate** from gearshaft (2).
3. Gear and/or Gearshaft	If these items are replaced, angular relationship between teeth of gear and spline of gearshaft may vary slightly.	**Replace** defective component.
4. **Gear** and Gearshaft		**Aline** rivet holes.
5. Rivets (1)	Use new rivets.	**Assemble** oil-air separator gearshaft assembly.
	CAUTION **Do not damage surface of gears when peening rivets in following action for item 6.**	
6. Rivet		**Back up** with suitable tool and **head** over by peening.
	NOTE Repair damaged oil pump drive gearshaft (see figure in NOTE above item 1) and actions indicated in items 7 thru 14.	
7. Rivets (4)	Use l/8-inch drill.	**Drill** out six rivets.
8. Gear (7)		Carefully **separate** from gearshaft (5).

5-4. Accessory Drive Gearbox Assembly (AVIM) - Repair - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/-Continued		
9. Cup (8)	Use suitable drift and mallet.	**Remove** by driving out pill (6).
10. Defective Components		**Replace.**
11. Pin (6)	Use new pin.	**Install. Stake** both sides.
12. Gear (7) and Gearshaft (5)		**Aline** rivet holes.
13. Oil Pump Drive Gearshaft		**Assemble** using rivets (4).
	CAUTION **Do not damage surface of gears when peening rivets in following action for item 14.**	
14. Rivets (4)	Use suitable tool to backup rivet. Angular relationship between gear teeth of gear (7) and spline of gearshaft (5) may vary slightly.	**Head** over by peening.
	NOTE Repair damaged baffle mounting tapped hole in accessory gearbox housing (see figure given in first NOTE) as follows in actions for items 15 thru 26.	
15. Accessory Gearbox Housing	Use 0.3299 inch to 0.3372 inch diameter drill.	**Drill** baffle mounting hole.



5-4. Accessory Drive Gearbox Assembly (AVIM) - Repair - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/-Continued		
16. Accessory Drive Gearbox Assembly	Use 0.375-24 UNF tap.	**Tap** baffle mounting hole through material.
17. Plug	Use magnesium alloy (item 49, Appendix D). Use 0.625 inch diameter hex stock.	**Use** materials given to **fabricate** plug with 0.375-24 inch thread, 0.750 inch long.
	NOTE Machine thread size to obtain 0.0005 inch to 0.0010 inch tight fit in tapped hole.	
18. Plug Shank		**Undercut** at end of 0.750 inch thread length, 0.072 inch wide to 0.308 to 0.312 inch diameter.
19. Tapped Hole	Use zinc-chromate primer (item 96, Appendix D).	**Coat** plug with zinc-chromate primer.
20. Plug		**Install. Machine** flush at both surfaces.
21. Lockpin Hole	When drilling lockpin hole, half of hole shall extend into the parent metal and the other half shall extend into the plug. Use 0.0607 inch to 0.0617 inch diameter drill.	**Drill** hole 0.125 inch deep.
22. Lockpin	Use magnesium alloy (item 49, Appendix D) 0.0625 inch ±0.0005 inch diameter round stock.	**Fabricate** to length of 0.125 inch.
23. Lockpin		**Install** flush with surface. **Stake** securely.
24. Baffle Mounting Hole	Use 0.2113 inch drill to 0.2190 inch drill.	**Drill** new hole. **Countersink** hole 90 degrees.
25. Baffle Mounting Hole	Use 0.250-28 UNF-3B tap.	**Tap** completely through plug.
26. Accessory Drive Gearbox Assemmbly	Refer to paragraph H-17.	**Touch up** reworked areas.

5-4. Accessory Drive Gearbox Assembly {AVIM) - Repair - Continued

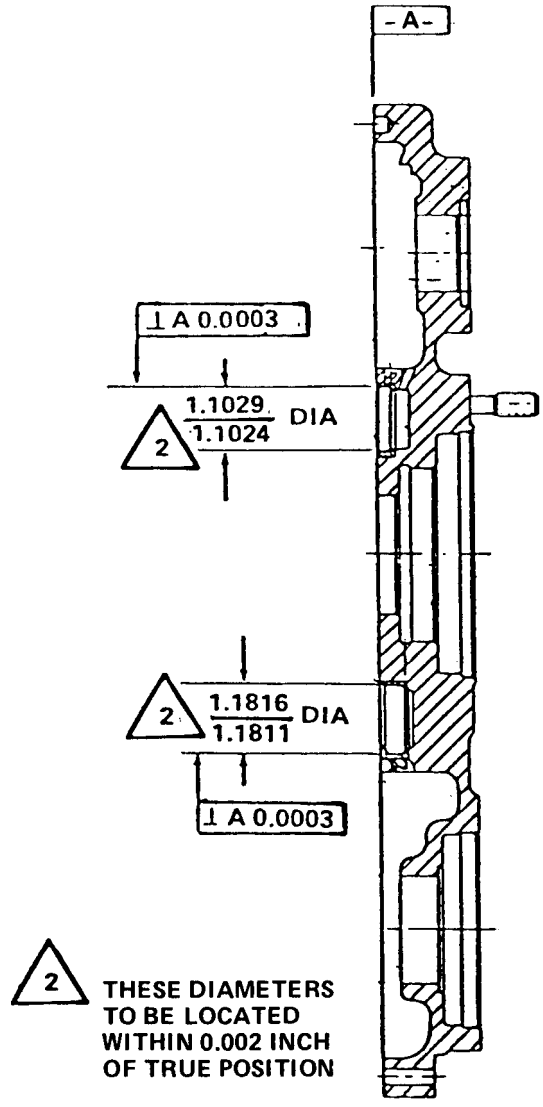
LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		
	CAUTION **Do not nick or score the bore of the casting when machining in following action for item 27.**	
	NOTE If scored bearing liners are found, replace liners as follows in actions to items 27 thru 38.	
27. Bearing Liner Wall		**Machine** to thickness of 0.012 inch to 0.014 inch (0.30 mm to 0.36 mm) or until wall is thin enough to buckle and peel from casting.
28. Pins	Mark position of pins on surface of casting with a marking pencil (yellow) Colorbrite No. 2107 (item 54, Appendix D).	**Grind** two pins in casting flush with bore.
29. Casting		**Place** into temperature controlled oven at 132°F (56°C) for 30 minutes.
	WARNING **In the items 31 and 32, to prevent injury to the operator, thermally insulated gloves must be used.**	
30. Bearing Liner		**Place** new liner in mixture of dry ice and alcohol for 30 minutes.
31. Casting	Use zinc-chromate primer (item 96, Appendix D).	**Remove** from oven. Apply thin coat of zinc-chromate primer to surface that will mate the new liner.

5-4. Accessory Drive Gearbox Assembly (AVIM) - Repair - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/-Continued		
	CAUTION **Insure that casting is supported below bore prior to pressing operation in following action for item 32.**	
32. Bearing Liner	Use suitable adapter and press.	**Remove** from dry ice and alcohol mixture. Place into casting with chamfer down. **Press** liner into casting until it bottoms.
33. Bearing Liner	Use number 43 drill.	**Drill** two holes through liner 180 degrees apart and 90 degrees from original pin location marked on casting. **Drill** to depth of 0.360 inch (9.14 mm).
34. Holes		**Ream** to diameter of 0,091 inch to 0.092 inch (2.31 mm to 2.34 mm) and depth of 0.330 inch (8.38 mm).
	WARNING **Use approved personnel protective equipment to protect eyes and face when using compressed air.** **Maximum allowable air pressure for cleaning operations is 30 psi. Do not direct air stream towards yourself or toward another person.**	
35. Chips	Use dry compressed air to perform this action.	**Remove all chips from hole.**
	CAUTION **When driving pins in following action for item 36, be careful not to damage liner.**	

5-4. Accessory Drive Gearbox Assembly (AVIM) - Repair - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		
36. Lockpins	Use zinc-chromate primer (item 96, Appendix D). Use suitable drift.	**Apply** thin coat of zinch-chromate primer. **Drive** pins flush with ID of liner.
37. Accessory Gearbox Cover Assembly		**Finish-grind** liners. (See following figure.)



ALL DIMENSIONS ARE IN INCHES

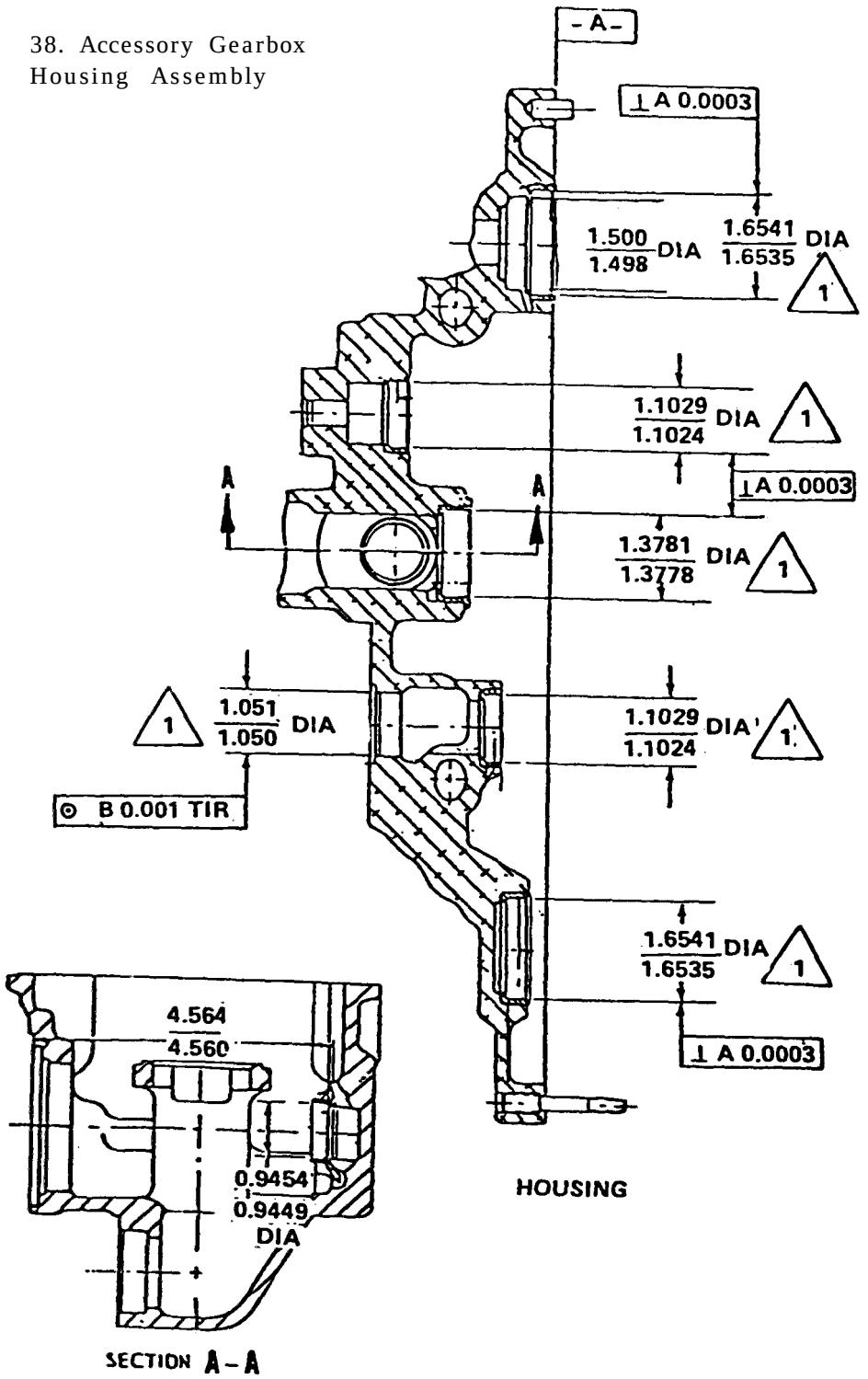
COVER

5-4. Accessory Drive Gearbox Assembly (AVIM) - Repair - Continued

ACCESSORY DRIVE GEARBOX ASSEMBLY/-Continued

38. Accessory Gearbox Housing Assembly

Finish-grind liners. (See following figure.)



1 THESE DIAMETERS TO BE LOCATED WITHIN 0.001 INCH OF TRUE POSITION

5-4. Accessory Drive Gearbox Assembly (AVIM) - Repair - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		
39. Accessory Gearbox Cover Assembly	The 1.1029 inch to 1.1024 inch diameter and the 1.1816 inch to 1.1811 inch diameter must be square with the A surface within 0.0003 inch.	Inspect after repair.
40. Accessory Gearbox Housing Assembly	The 1.6541 inch to 1.6535 inch diameter, the 1.1029 inch to 1.1024 inch diameter, and the 1.3781 inch to 1.3778 inch diameter must be square with the A surface within 0.0003 inch. The 1.051 inch to 1.050 inch diameter must be concentric with 1.1029 inch to 1.1024 inch diameter with 0.001 TIR. The 1.500 inch to 1.498 inch diameter must be concentric with 1.6541 inch to 1.6535 inch diameter with 0.0013 inch.	**Inspect** after repair.
	NOTE Repair damaged threads of chip detector port on accessory drive gearbox as follows in actions for items 41 thru 43. It will be necessary to remove the accessory gearbox from the engine to make the following repairs.	
41. Threads	Use a 0.577 inch to 0.586 inch diameter drill.	**Remove** damaged threads.
42. Chip Detector Port	Use a 0.650 inch diameter counterbore.	**Counterbore** to a depth of 0.083 inch to 0.098 inch.
43. Chip Detector Port	Use Tap No. 38193-9 (Heli-Coil Corporation, Insert Products Division or equivalent).	**Tap** through material.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F to 138°F (39°C to 59°C).

5-4. ACCESSORY DRIVE GEARBOX ASSEMBLY – (AVIM) – REPAIR – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ –Continued		
44. Gearbox	Use drycleaning solvent (item 24, Appendix D)	**Flush out** to remove any chips.
45. Heli Coil	Last coil of insert, P/N 1191-9CN x 0.438, (Heli-Coil Corporation, Insert Products Division or equivalent).	**Cut off 1/8** to 1/4 coil, measured from the last coil of insert. **Remove** burrs.
46. Insert	Refer to TM 55-1500-204-25/1.	**Install.**
47. Heli Coil	Use tang breakoff tool P/N 1196-9, Heli-Coil Corporation, Insert Products Division or equivalent).	Remove from gearbox.

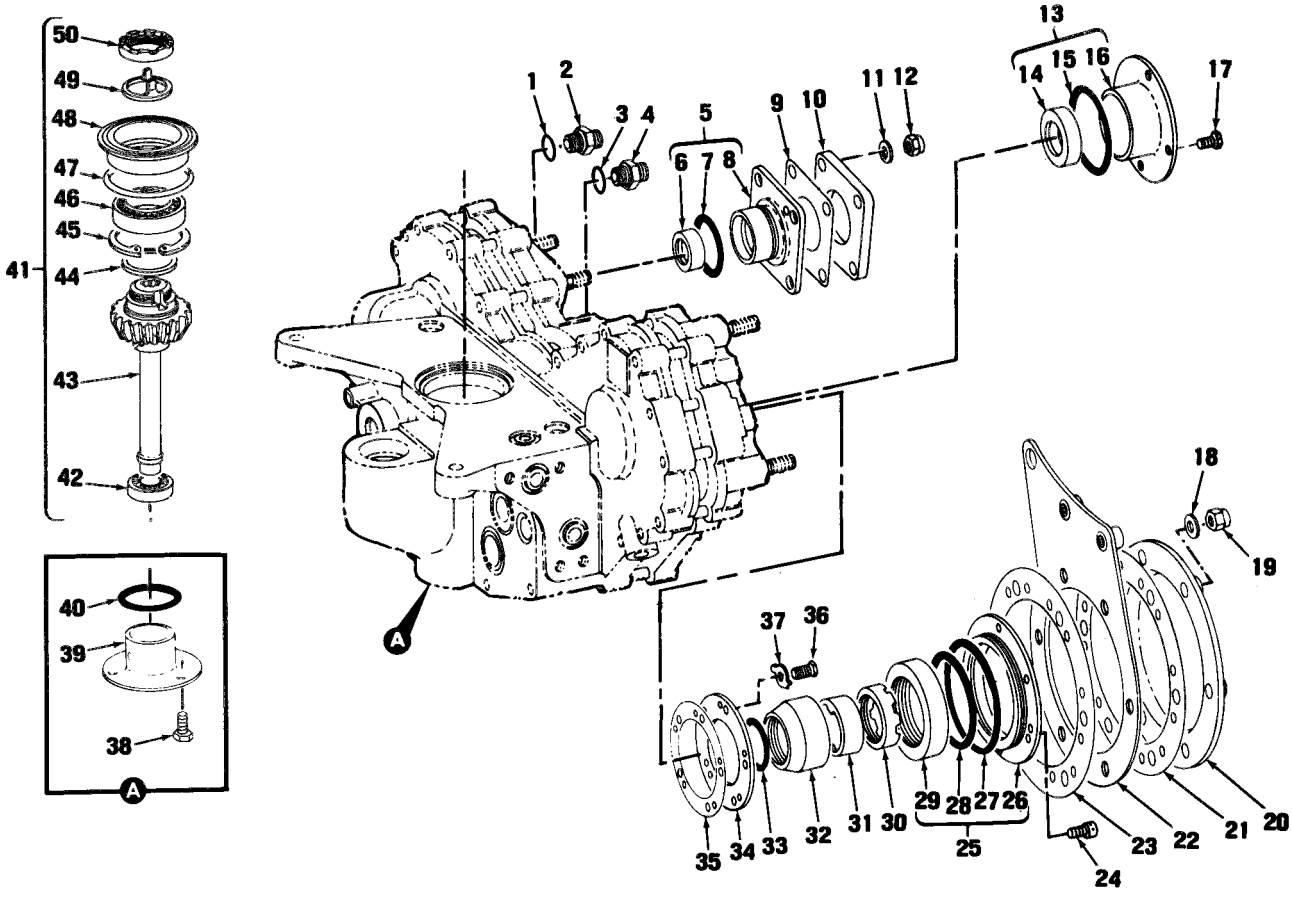
5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY - ASSEMBLY - Cont

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued		
1. Baffle (77) screws (78 and 80), spacers (82), packing (79), bolts (81)	To facilitate lockwiring, insert precut strands of wire into applicable holes in baffle before installation	**Install** baffle (77) and **secure** with screws (78 and 80), spacers (82), new packing (79) and bolts (81). **Lockwire** screws and bolts.
2. Roller bearing outer race (51)	Use soft-faced mallet	**Tap** roller bearing outer race (51) into accessory gearbox housing assembly (84).
3. Roller bearing inner race (52), zerol gear (53)	Use arbor press and sleeve bushing (LTCT3640).	**Press** roller bearing inner race (52) onto journal of zerol gear (53).
4. Zerol gear (53)		**Coat** teeth of gear assembly with red lead. (Item 69, Appendix D).
5. Gearshaft assembly (43).	Use holder assembly (LTCT3833 or LTCT2039).	**Position** gearshaft assembly (43) in holder assembly.
6. Ball bearing (42)	Use arbor press and sleeve bushing (LTCT3636).	**Press** ball bearing (42) onto gearshaft assembly (43).
7. Ball bearing (46) and pinion liner (48)	Use arbor press and sleeve bushing (LTCT3654)	**Press** ball bearing (46) into pinion liner (48).
8. Retaining ring (45)	Use snapring pliers	**Insert** and seat retaining ring (45) in groove of pinion liner (48).
9. Packing (47)		**Install** new packing (47).
	NOTE In following step, shim shall correspond in thickness to shim removed during disassembly.	
10. Shim (44)		**Install** shim (44) on gearshaft assembly (43).
	Use arbor press and suitable sleeve.	**Press** assembled pinion liner onto journal of gearshaft assembly (43).

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION

ACCESSORY DRIVE GEARBOX ASSEMBLY

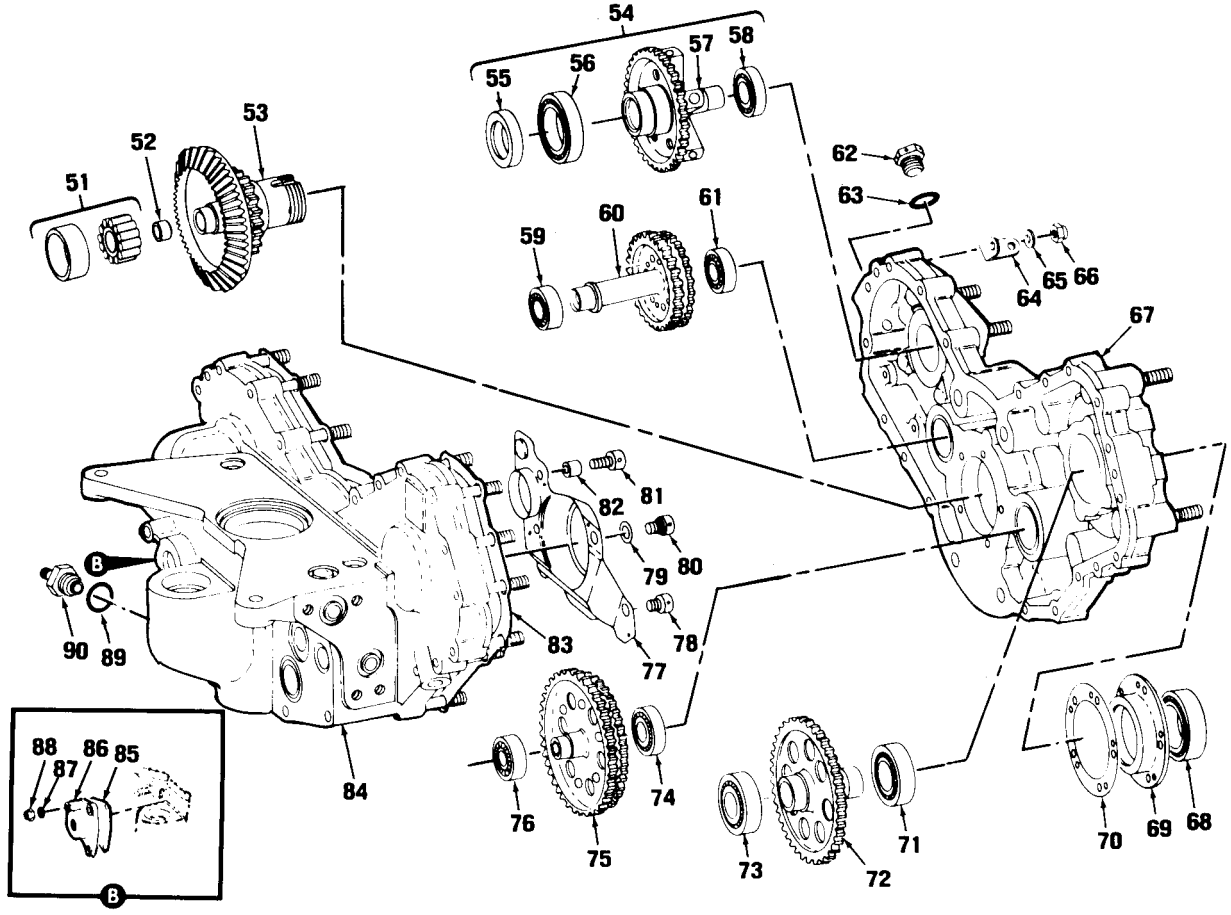


1. Packing
2. Union
3. Packing
4. Union
5. Flange and Seal Assembly
6. Seal
7. Patting
8. Bearing Retainer
9. Gasket
10. Cover
11. Washer
12. Nut
13. Seal and Liner Assembly
14. Seal
15. Packing
16. Fuel Control Drive Liner
17. Bolt
18. Washer
19. Nut
20. Cover
21. Gasket
22. support
23. Gasket
24. Bolt
25. Seal and Housing Assembly
26. Oil Seal Housing
27. Packing
28. Packing
29. Seal
30. Spanner Nut
31. Lock Cup
32. Spacer
33. Packing
34. Retaining Plate
35. Shim
36. Bolt
37. Tabwasher
38. Bolt
39. Radial Bearing Housing
40. Packing
41. Pinion Gearshaft and Bearing Assembly
42. Ball Bearing
43. Gearshaft Assembly
44. Shim
45. Retaining Ring
46. Ball Bearing
47. Packing
48. Pinion Liner
49. Washer
50. Nut

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION

ACCESSORY DRIVE GEARBOX ASSEMBLY – Continued



51. Roller Bearing Outer Race
52. Roller Bearing Inner Race
53. Zerol Gear
54. Gearshaft and Bearing Assembly
55. Seal
56. Ball Bearing
57. Tachometer Drive Gearshaft
58. Ball Bearing
59. Ball Bearing
60. Oil-Air Separator Drive Gearshaft
61. Ball Bearing
62. Plug
63. Packing
64. Bracket
65. Washer
66. Nut
67. Accessory Gearbox Cover Assembly
68. Ball Bearing
69. Thrust Bearing Liner
70. Shim
71. Ball Bearing
72. Gearshaft Assembly
73. Ball Bearing
74. Ball Bearing
75. Oil Pump Drive Gearshaft
76. Ball Bearing
77. Baffle
78. Screw
79. Packing
80. Screw
81. Bolt
82. Spacer
83. Gasket
84. Accessory Gearbox Housing Assembly
85. Gasket
86. Pad Cover
87. Washer
88. Nut
89. Packing
90. Chip Detector

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY-Continued		
11. Washer (49) and nut (50)		**Install** washer (49) and nut (50).
	Use holder assembly (LTCT3833 or LTCT2039).	**Install** holder assembly in bench vise.
12. Pinion gearshaft and bearing assembly (41)		**Position** pinion gearshaft and bearing assembly (41) in holding tool.
	Use spanner wrench (LTCT107).	**Tighten** nut (50) as required. (Refer to Appendix G, Table G-3, reference number 13, or Table G-4, reference number 6).
13. Washer (49)		**Remove** pinion gearshaft and bearing assembly from holder assembly.
	NOTE The following step applies to T53-L-13B engines which incorporate radial bearing housing (39).	
14. Packing (40)		**Install** packing (40) on radial bearing housing (39).
15. Bolts (38)		**Insert** housing into accessory gearbox housing assembly and secure with bolts (38). **Tighten** bolts.
16. Gearshaft assembly (43)		**Coat** teeth of gearshaft assembly (43) with iron blue pigment (item 37, Appendix D) and install pinion gearshaft and bearing assembly (41) into accessory gearbox housing assembly. Gently tap with soft face mallet until properly seated.

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued	**NOTE**	
17. Zerol gear (53), roller bearing inner race (52), roller bearing outer race (51).	Ensure that teeth of zerol gear mesh with teeth of gearshaft assembly (43), in the following step.	**Carefully install** zerol gear (53) and roller bearing inner race (52) into roller bearing outer race (51).
18. Thrust bearing liner (69), ball bearing (68), and shims (35).	Refer to Appendix G, table G-5 reference number 14 or table G-6 reference number 7.	Measure bore depth of thrust bearing liner (69). Measure width of outer race of ball bearing (68). Subtract bore depth from bearing width and select shim (35) to obtain bearing pinch.
	Use arbor press and sleeve bushing (LTCT3654).	**Press** ball bearing (68) into thrust bearing liner (69).
19, Shim (70), retaining plate (34), accessory gearbox cover assembly (67), bolts (36) and tabwashers (37).		**Position** shim (70), thrust bearing liner (69), shim (35) and retaining plate (34) on accessory gearbox cover assembly (67) and **secure** with tabwashers (37) and bolts (36). Lock bolts with tabwashers.
20. Gasket (83)		**Install** gasket (83) on accessory gearbox housing assembly.
21. Ball bearing (68), accessory gearbox housing assembly (84, and zerol gear (53).	Use arbor press	**Press** accessory gearbox cover assembly and ball bearing (68) onto accessory gearbox housing assembly (84) and journal of zerol gear (53).
22. Nuts (66) and washers (65)		**Secure** with nuts (66) and washers (65).

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued		
23. Packing (33), spacer (32), lock cup (31), and spanner nut (30)		**Install** new packing (33), spacer (32), lock cup (31) and spanner nut (30).
	Use holding fixture (LTCT115).	**Position** holding fixture on accessory gearbox cover assembly. **Ensure** that tangs of fixture engage slots of spanner nut.
	NOTE Do not deform lock cup in the following step.	
24. Spanner nut (30)	Use splined tool (part of holding fixture LTCT115).	**Insert** splined tool in holding future, turn counterclockwise, and **tighten** spanner nut (30) as required. (Refer to Appendix G, Table G-3, reference number 12, or Table G-4, reference number 5). **Remove** holding fixture and rotate gear several times.
	Use holding fixture (LTCT4904 or LTCT44)	**Install** holding fixture on accessory gearbox cover assembly and in zerol gear (53).
25. Pinion gearshaft and bearing assembly (41)	Use backlash gage (LTCT 2099).	**Install** backlash gage in pinion, gearshaft and bearing assembly (41).
26. Zerol gear (53) and gearshaft assembly (43).	Use dial indicator.	**Check** backlash of zerol gear (53) and gem-shaft assembly (43).

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued		
27. Shim (44)	Refer to Appendix G, Table G-5, reference number 13 or Table G-6, reference number 6 for backlash limits.	If backlash exceeds limits, **remove** and disassemble pinion gearshaft and bearing assembly (41) and select more suitable shim (44). Reassemble pinion gearshaft and bearing assembly, install, and repeat backlash check.
	Use holding fixture (LTCT115).	When acceptable backlash has been established, **position** holding fixture on cover assembly mounting pad studs and check to ensure that tangs of holding fixture engage slots of spanner nut.
	Use splined tool (part of holding fixture).	**Insert** splined tool into holding fixture and into splines of zerol gea] (53)
28. Spanner nut (30)	Use a suitable wrench.	**Turn** splined tool clockwise to remove spanner nut (30).
29. Lock cup (31)		**Remove** lock CUp (31).
30. Spacer (32)		**Remove** spacer (32) and packing. Do not remove packing from spacer.
	Use puller (LTCT142)	**Secure** puller to accessory gearbox cover assembly.
31.		**Turn** handle to separate cover assembly from housing assembly. Remove puller.
32. Zerol gear (53)	Refer to Appendix H paragraph H-32 for acceptable pattern.	**Remove** zerol geal (53). Examine tooth pattern on gear teeth.

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY - ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ASSEMBLY DRIVE GEARBOX ASSEMBLY – Continued		
33. Pinion gearshaft and bearing assembly (41).	Refer to Appendix H paragraph H-32 for acceptable pattern.	Remove pinion gearshaft and bearing assembly (41) from housing assembly and examine tooth pattern on gearshaft assembly (43). When correct backlash and gear pattern is accomplished, clean gears in drycleaning solvent (item 24, appendix D).
	Use soft-faced mallet.	**Install** pinion gearshaft and bearing assembly (41) into accessory gearbox housing assembly. Tap gently until seated properly.
	NOTE Ensure that teeth of gear mesh with teeth of gearshaft assembly (43), in following step.	
34. Zerol gear (53)		Install zerol gear (53) and roller bearing inner race into roller bearing outer race.
35. Ball bearings (74 and 76) and oil pump drive gearshaft (75).	Use arbor press and sleeve bushing (LTCT3640).	**Install** ball bearings (74 and 76) on oil pump drive
36. Accessory gearbox housing assembly (84)		**Install** oil pump drive gearshaft into accessory gearbox housing assembly (84) and carefully mesh gear teeth with spur gear teeth
37. Ball bearings (59 and 61), oil-air separator drive gearshaft (60).	Use arbor press and sleeve bushing (LTCT3640).	**Install** ball bearings (59 and 61) on oil-air separator drive gearshaft (60).

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY - ASSEMBLY - Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued		
		Install oil-air separator drive gearshaft (60), shaft first, into housing assmnbly and carefully mesh gear teeth with spur gear teeth of zerol gear (53). Gently tap bearings to ensure proper seating.
38. Seal (55)		**Dip** seal (55) in lubricating oil (item 46 or 47, Appendix D).
	Use arbor press and sleeve bushing (LTCT3654)	**Install** seal (55) in accessory gearbox housing assembly (84).
39. Ball bearings (56), and tachometer drive gearshaft (57).	Use arbor press and sleeve bushing (LTCT3637).	**Install** ball bearings (56) on tachometer drive gearshaft (57).
40. Ball bearing (58)	Use arbor press and sleeve bushing (LTCT3640).	**Install** ball bearing (58) on tachometer drive gearshaft (57).
		Install tachometer drive gearshaft into housing assembly, gear side first, carefully meshing gear teeth with gear teeth of oil-air separator drive gearshaft. Gently tap bearing to ensure proper seating.
41. Ball bearings (71 and 73), and gearshaft assembly (72)	Use arbor press and sleeve bushing (LTCT3637).	**Install** ball bearings (71 and 73) on gearshaft assembly (72).
		Install gearshaft assembly, short hub first, into housing assembly, carefully meshing gear teeth with gear teeth of oil pump drive gearshaft.
		Gently tap gearshaft assembly to ensure proper seating of bearing.

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY - ASSEMBLY - Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - continued		
42. Accessoy gearbox cover assembly (67) and accessoy gearbox housing assembly (84)		**Position** accessory gearbox cover assembly (67) on accessory gearbox housing assembly ($4), taking care to align bearings properly.
43. Zerol gear (53)	Use arbor press and installing tool (LTCT142).	**Press** cover assembly onto housing assembly bearings, and zerol gear (53).
44. Nuts (66), washers (65) and brackets (64).		**Secure** with nuts (66), washers (65) and two brackets (64).
45. Patting (63) and plug (62).		**Install** packing (63) and plug (62).
46. Spacer (32) patting (33) lock cup (31), and spanner nut (30)		**Install** spacer (32) with new packing (33), lock cup (31) and spanner nut (30).
	Use holding fixture (LTCT1L5).	**Position** holding fixture on accessory gearbox cover assembly. **Ensure** that tangs of fixture **engage** slots of spanner nut.
	Use splined tool (part of holding fixture LTCT115).	**Insert** splined tool. **Turn** counterclockwise and **tighten** spanner nut as required. (Refer to Appendix G, Table G-3, reference number 12 or Table G-4, reference number 5).
		Deform lock cup into spanner nut in three places, 120 degrees apart.
47. Packing (28) and oil seal housing (26).		**Install** packing (28) into oil seal housing (26).

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY – ASSEMBLY – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY - Continued	**NOTE** In following step, seal must be installed with solid side of seal case (side with part number) facing oil seal housing (26).	
48. Seal (29).	Use arbor press and installer (LTCT 270). **Press** seal (29) into oil seal housing (26).	**Press** seal (29) into oil seal housing (26).
49. Packing (27).		**Install** packing (27) on hub of oil seal housing.
50. Seal and housing assembly (25) and bolts (24).	Use installing tool (LTCT511)	**Press** seal and housing assembly (25) into cover assembly and **secure** with bolts (24). **Lockwire** bolts.
51. Packing (7) and bearing retainer (8)		**Install** packing (7) and bearing retainer (8).
52. Seal (6)	Use installing tool (LTCT501) or arbor press and suitable drift.	**Press** seal (6) into bearing retainer.
	NOTE In following step, use as many washers as necessary to secure flange and seal assembly for pressure test.	
53. Flange and seal assembly (5) washers (11) and nuts (12)		**Install** flange and seal assembly (5) over studs of cover assembly and secure with washers (11) and nuts (12).
54. Seal (14) and fuel control drive liner (16)	Use arbor press and sleeve bushing (LTCT3654) or installing tool (LTCT100).	**Press** seal (14) into fuel control drive liner (16).
55. Packing (15)		**Install** packing (15) in groove in accessory gearbox cover.
56. Fuel control drive liner (16) and bolts (17)		**Install** fuel control drive liner (16) over studs and into housing assembly. **Secure** with bolts (17).

5-4.1 ACCESSORY DRIVE GEARBOX ASSEMBLY - ASSEMBLY - Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE **GEARBOX** ASSEMBLY - Continued		
57. Gasket (85), pad cover (86), washers (87) and nuts (88)		If removed, **install** gasket (85) and pad cover (86) on studs of gearbox housing and **secure** with washers (87) and nuts (88).
	NOTE In following step, if threads on chip detector port were repaired as outlined in paragraph 5-4, install packing P/N AN62270-10 in place of packing (89).	
58. Packing (89) chip detector (90)		**Install** packing (89) on chip detector (90) and **install** chip detector in housing assembly.
59. Packings (1 and 3) and unions (2 and 4)		**Install** packings (1 and 3) on unions (2 and 4). **Install** unions into accessory drive gearbox cover assembly. **Tighten** as required.

5-5. ACCESSORY DRIVE GEARBOX ASSEMBLY - PRESSURE TEST

INITIAL SETUP

Applicable Configuration
All

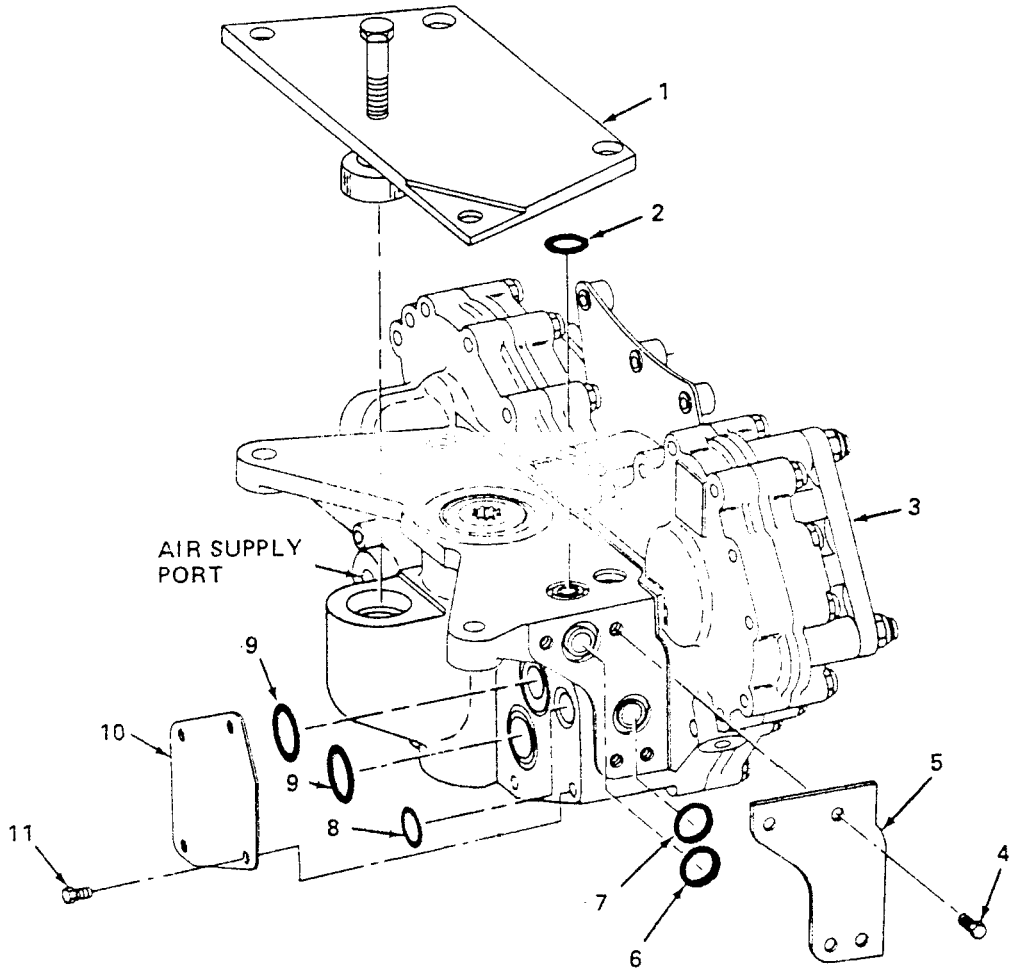
Test Equipment
Test Fixture (LTCT207)

Consumable Materials
Lubricating Oil (items 46 and 46, Appendix D)
Leak Test Solution (item 39, Appendix D)
Plastilube Moly No. 3 (item 67, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX **ASSEMBLY** - Continued		
1. Packings (8 and 9)		**Install** into accessory drive gearbox assembly (3).
2. Packings (6 and 7)		**Install** into accessory drive gearbox assembly.

5-5. ACCESSORY DRIVE GEARBOX ASSEMBLY - PRESSURE TEST - Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ –Continued		



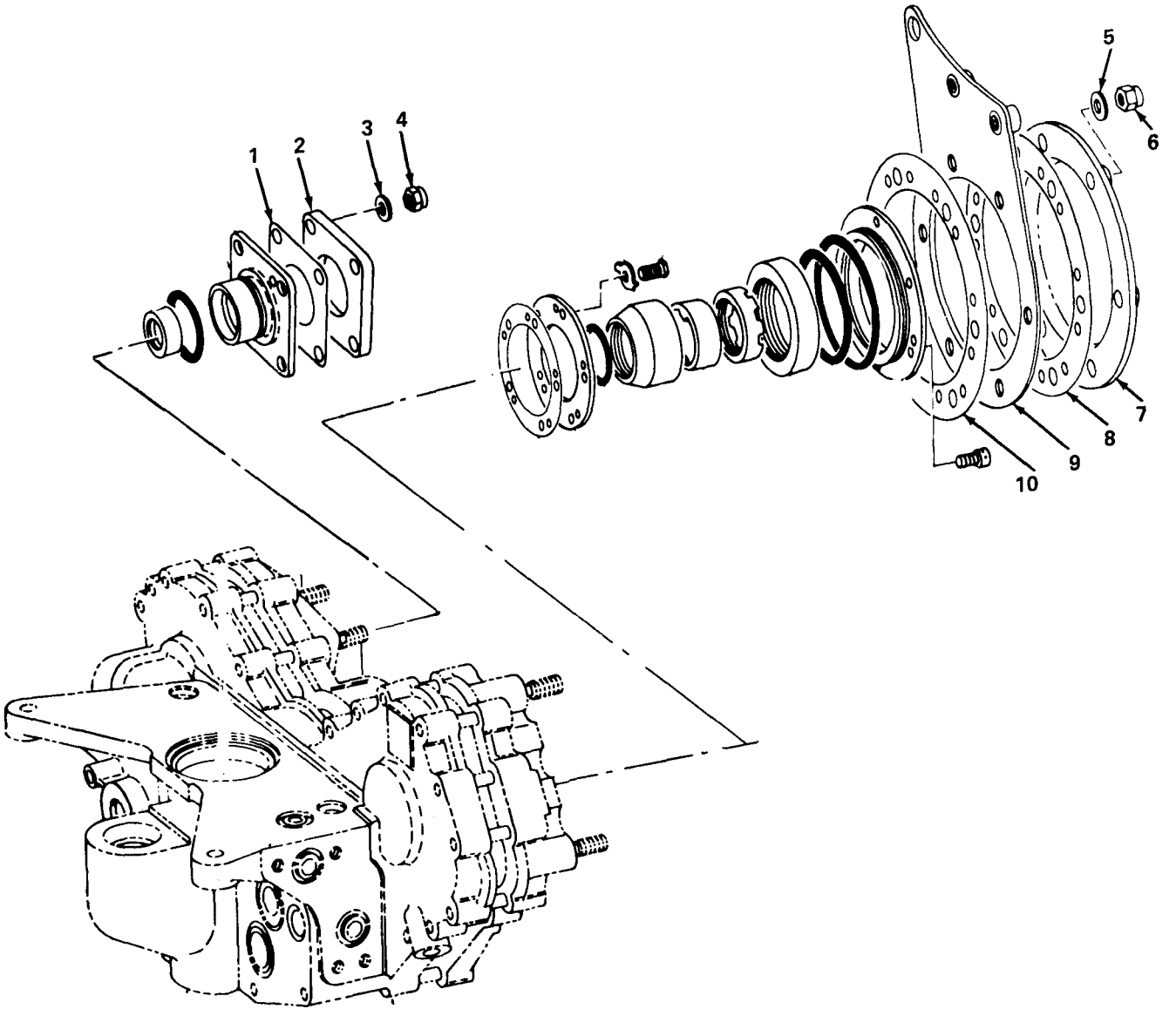
3. Metal Blank-Off Plates (5 and 10)	**Install** on accessory drive gearbox assembly. **Secure** with bolts (4 and 11).
4. Packing (2)	**Install.**
5. Air Supply Port	**Install** a suitable fitting.
6. Test Fixture (1) (LTCT207)	**Install** as shown.

5-5. Accessory Drive Gearbox Assembly - Pressure Test - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued	**WARNING** **Use safety glasses when using compressad air to protect the eyes from injury.**	
7. **Air Line**		**Attach to air** supply port.
8. Accessory Drive Gearbox Assembly		**Pressurize** using 8 psig to 12 psig (0.56 kg/sq cm to 0.84 kg/sq cm) air pressure. **Apply** lubricating oil (items 46 and 47, Appendix D) or leak test solution (item 39, Appendix D) to all seals and mating surfaces. Visually **inspect** for air leakage around all seals and around gasket between cover and housing assemblies. No leaks are allowed.
9. **Accessory Drive Gearbox Assembly**		**Disassemble** if leakage is noted. **Inspect** for defective packings and seals. **Replace** defective part and **reassemble. Repeat** pressure test after reassembly.
	NOTE **When accessory drive gearbox 1-080-250-13,1-080-250-14, or 1-080-250-16 is installed omit following action for item 10.**	

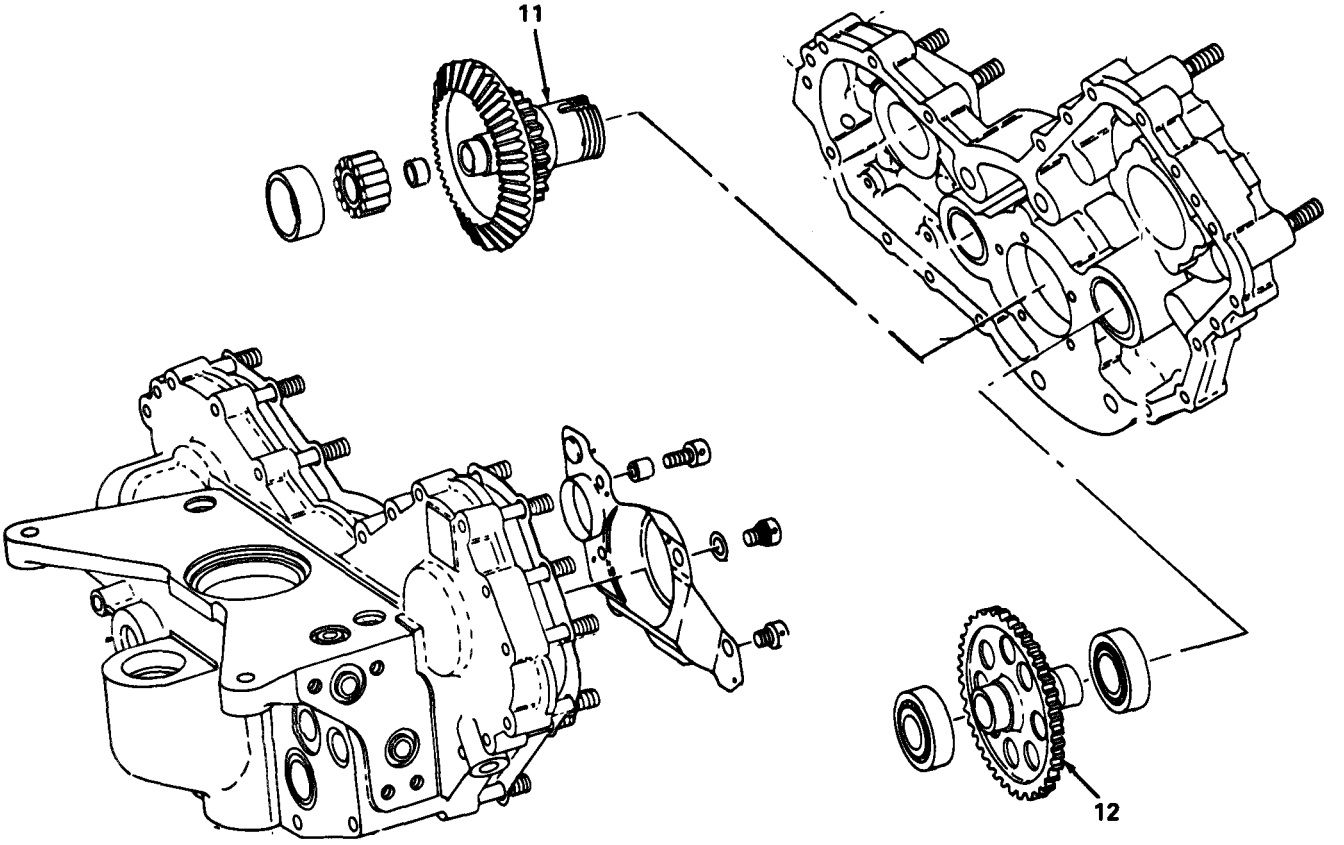
5-5. Accessory Drive Gearbox Assembly - Pressure Test - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		
10. Gearshaft Assembly (12)		**Lubricate** internal splines after completion of pressure test with Plastilube Moly No. 3 (item 67, Appendix D) or Multi Fax EP2.



5-5. Accessory Drive Gearbox Assembly - Pressure Test - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		
10A. Zerol Gear (11)		**Lubricate** splines with Plastilube Moly No. 3 (item 67, Appendix D) or Multi Fax EP2.



11. Gasket Support (10), Gasket (8), Cover (7)		**Install** over studs of accessory drive gearbox assembly. **Secure** with washers (5) and nuts (6).
12. Nut (4), Washers (3)		**Remove.**
13. Gasket (1), Cover (2)		**Install. Secure** with washers (3) and nuts (4). **Tighten** nuts as required.

5-6. Accessory Drive Gearbox Assembly - Installation.

INITIAL SETUP

Applicable Configuration
All

Test Equipment
Test Fixture (LTCT207)

Consumable Materials
Plastilube Moly No. 3 (item 67 Appendix D)
Lockwire (item 41, 42, or 43, Appendix D)

References
Para 6-5 and 8-34
Appendix G, Table G-3, Reference Numbers 65, 66, and 11
Appendix G, Table G-4, Reference Numbers 63, 64, and 4

When accessory drive gearbox 1-080-250-13 is installed, a fuel regulator, P/N 81700C3, P/N 81700C4, P/N 81700C5, or P/N 81700C6 (T53-L-11 series engines), with a long splined shaft and special seal 1-300-368-01 must be installed. On T53-L-13B/703 engines, when accessory drive gearbox 1-080-250-14 or -16 is installed, a fuel regulator, P/N 84200A7A series or 100770A4, with a long splined shaft and special seal 1-300-368-01 must be installed. If an accessory drive gearbox other than the 1-080-250-13, -14, or -16 is installed, it is permissible to use a fuel regulator with either a long or short splined shaft; however, seal 1-300-368-01 must be removed from the long splined shaft.

NOTE

Accessory drive gearbox 1-080-250-16 may be used on T53-L-11 series engines, provided the No. 2 bearing scavenge fitting, AN815-6D, is replaced with fitting AN919-12D, and VIGV actuator drain line fitting (1-160-626-01) is capped with flared tube seal, AN929-4, and nut, AN818-4.

5-8. Accessory Drive Gearbox Assemby - Installation - Continued

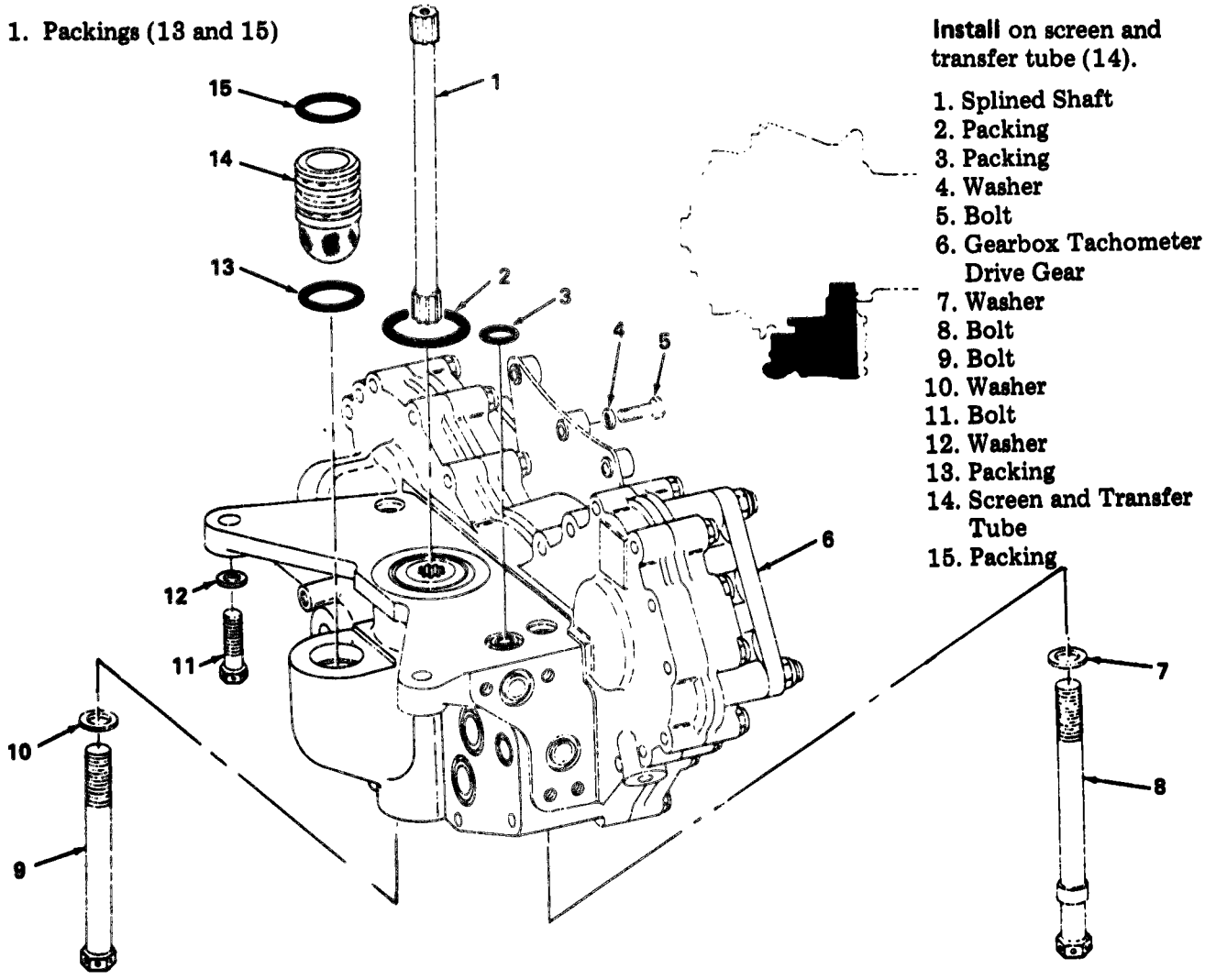
LOCATION/ITEM	REMARKS	ACTION

INLET HOUSING/ - Continued

CAUTION

Under no circumstances will a fuel control with a short splined shaft replace a fuel control with a long splined shaft on accessory drive gearbox 1-080-250-13, -14, or -16. Accessory drive gearbox 1-080-250-13, 14, or -16 may be readily identified by the additional dowel pin on the fuel control mount pad. This pin must not be removed.

1. Packings (13 and 15) Install on screen and transfer tube (14).



1. Splined Shaft
2. Packing
3. Packing
4. Washer
5. Bolt
6. Gearbox Tachometer Drive Gear
7. Washer
8. Bolt
9. Bolt
10. Washer
11. Bolt
12. Washer
13. Packing
14. Screen and Transfer Tube
15. Packing

5-6. Accessory Drive Gearbox Assembly - Installation - Continued

INLET HOUSING/ - Continued		
2. Screen and Transfer Tube (14)		**Install** in accessory drive gearbox assembly.
3. Packing (2)		**Position** in groove around drive gear.
4. Packing (3)		**Position** in recessed area around duct leading to oil filter.
5. Accessory Drive Gearbox		**Position** on engine, insuring that drive shaft drops and meshes with gearbox.
6. Gearbox		Carefully **raise** gearbox, inserting exposed end of drive shaft into inlet housing until spline meshes with accessory drive gear and gearbox mates with inlet housing.
7. Washer (1-080-051--01) (7)		**Place** on shouldered bolt (8). **Insert** bolt and **finger-tighten.**
8. Washer (1-080-051-01) (l0)		**Place** on bolt (9). **Insert** bolt and **finger-tighten.**
9. Washers (12), Bolts (11)		**Place** washers (12) on bolts (11). **Insert** bolts and **finger-tighten.**
10. Washers (4), Bolts (5)		**Place** washers (4) on bolts (5). **Insert** bolts and **finger-tighten.**
11. Gearbox Tachometer Drive Gear (6)	Use l/4-inch drive extension and ratchet.	**Turn** gearbox tachometer drive gear. **Check** through inlet housing to **insure** that compressor rotor is turning. This indicates proper meshing of drive shaft.

5-6. Accessory Drive Gearbox Assembly - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING/ - Continued		
12. Bolts (8 and 99	Refer to Appendix G, table G-3, reference number 65 or refer to table G-4, reference number 63 for tightening requirements.	**Tighten** as required.
13. Bolts (11)	Refer to Appendix G, table G-3, reference number 66 or refer to table G-4, reference number 64 for tightening requirements.	**Tighten** as required.
14. Bolts (5)	Refer to Appendix G, table G-3, reference number 11 or refer to table G-4, reference number 4 for tightening requirements.	**Tighten** as required. **Lockwire.**
15. Mating Female Splines for Tachometer and Starter Generator		**Pack** mating female splines for tachometer and starter generator, two-thirds full with spline lubricant (item 67, Appendix D).
16. Starter Generator and N1 Tachometer Generator		**Install.**
17. Fuel Control	Refer to paragraph 6-5.	**Install.**
18. Inlet Guide Vane Actuator Seal Drain Hose Assembly	T53-L-13B/703 engines.	**Connect** to adapter fitting on gearbox. **Tighten** connector as required.
19. Power-Driven Rotary (Oil) Pump	Refer to paragraph 8-34,	**Install.**
20. Lubrication Scavenge Hose Assemblies		**Reconnect** to accessory drive gearbox assembly.

5-7. Accessory Drive Gearbox Seals - Replacement

INITIAL SETUP

Applicable Configuration
All

Special Tools
Installing Tool (LTCT501)
installing Tool (LTCT100)
Seal Removal Tool (LTCT3648)
Seal Installer (LTCT270)
Seal Installation Tool (LTCT511)
Holding Fixture (LTCT115)

Consumable Materials
Lubricating Oil (item 46 or 47, Appendix D)

REFERENCES
Appendix G, Table G-3, Reference Number 12

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/	**NOTE** Replace tachometer drive seal according to actions for items 1 thru 9. It is not necessary to remove accessory drive gearbox from engine to replace tachometer drive seal.	
1. Nuts (8) and Washers (7)	Nuts and washers secure shipping cover (6), gasket **(5)** if installed, and tachometer drive flange and seal assembly (1) to accessory drive gearbox (30).	Remove.
2. Tachometer Drive Flange and Seal Assembly (1)	Use two 10-32 puller screws.	**Withdraw** from accessory drive gearbox.
3. Packing (3)		**Remove.**
4. Seal (2)	Use installing tool (LTCT501) and an arbor press.	**Remove** from bearing retainer (4).

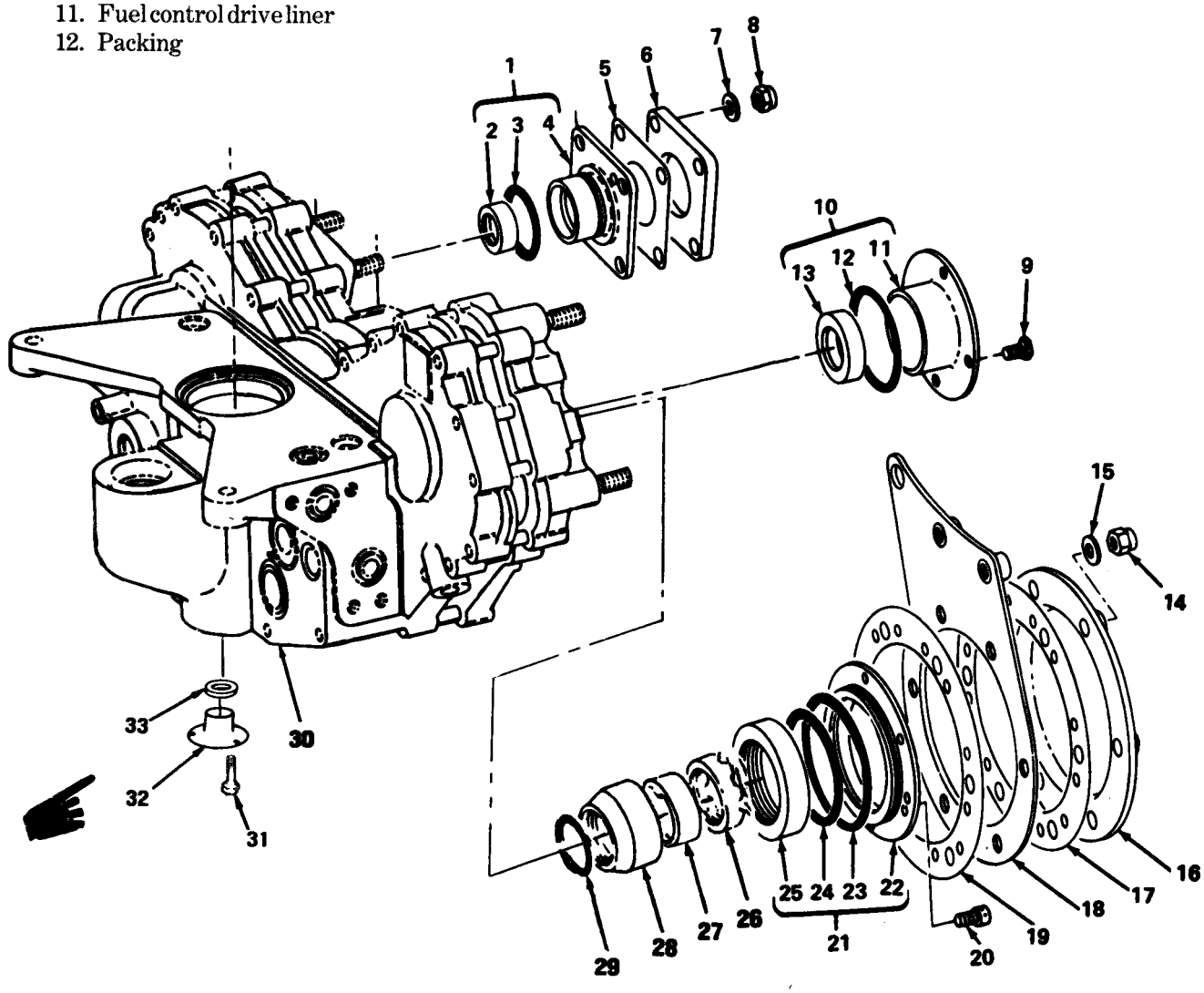
WARNING

Prolonged contact with lubricating oil (item '46 or 47, Appendix D) may cause a skin rash. Those areas of skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. saturated clothing should be removed immediately. Areas in which lubricating oil is used should be adequately ventilated to keep mist and fumes to a minimum.

5-7. ACCESSORY DRIVE GEARBOX SEALS – REPLACEMENT – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVER GEARBOX/ - Continued		

1. Tachometer drive flange and seal assembly
2. Seal
3. Packing
4. Retainer
5. Gasket
6. Cover
7. Washer
8. Nut
9. Bolt
10. Liner assembly
11. Fuel control drive liner
12. Packing
13. Seal
14. Nut
15. Washer
16. Cover
17. Gasket
18. Support
19. Gasket
20. Bolt
21. Packing
22. Oil seal housing
23. Packing
24. Packing
25. Seal
26. Nut
27. Lock Cup
28. Spacer
29. Packing
30. Accessory Gearbox
31. Bolt
32. Housing
33. Packing



5-7. Accessory Drive Gearbox Seals - Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
5. Seal (2)	Use new seal. Use lubricating oil (item 46 or 47, Appendix D).	**Dip** in lubricating oil.
6. Seal (2)	Use installing tool (LTCT501).	**Press** into tachometer drive flange and seal assembly (1).
7. Packing (3)		**Position** on outside of bearing retainer (4).
8. Flange and Seal Assembly (1)		**Place** over mounting stud. Seat by tapping lightly.
9. Gasket (5) and Shipping Cover (6)	Perform this action if these items were removed.	**Install. Fasten** with nuts (8) and washers (7).
	NOTE Replace fuel control drive seal according to actions for items 10 thru 17. It is not necessary to remove accessory drive gearbox from engine to replace fuel control drive seal.	
10. Bolts (9)	Bolts secure seal and liner assembly (10) to **accessory drive gearbox (30).**	**Remove.**
11. Seal and Liner Assembly (10)	Use two 10-32 puller screws.	**Remove** from accessory drive gearbox.
12. Packing (12)		**Remove.**
13. Seal (13)	Use installing tool (LTCT100) and an arbor press. **WARNING** **Prolonged contact with lubricating oil (item 46 or 47, Appendix D) may cause a skin rash. Those areas of skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be adequately ventilated to keep mist and fumes to a minimum.**	**Remove** from fuel control drive linder (11).

5-7. Accessory Drive Gearbox Seals - Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
14. **Seal** (13)	Use new seal. Use lubricating oil (item 46 or 47, Appendix D).	Dip in lubricating oil.
15. Seal (13)	Use installing tool (LTCT100) or suitable drift.	Press sa into fuel control drive liner (11).
16. Packing (12)		Install into groove in accessory drive gearbox. Seat by tapping lightly.
17. Seal and Liner Assembly (10)		**Secure** with bolts (9).
	NOTE Replace engine starter drive seal according to actions for items 18 thru 39. It is **not necessary to remove accessory drive gearbox from engine to** replace engine starter drive seal.	
18. Nuts (14) and **Washers (15)**	Nuts and washers secure gaskets (17 and 19), shipping cover (16) if installed, and sup port (18) to accessory drive gearbox (30).	**Remove.**
19. Bolts (20)	Bolts secure seal and housing assembly (21).	**Remove.**
20. Seal and Housing Assembly (21)	Use two 10-32 puller screws. When performing this action turn puller screws simultaneously and evenly to prevent oil seal housing from cocking or jamming in accessory drive gearbox.	**Remove** by turning screws clockwise until seal and housing assembly separates from accessory drive gearbox.
21. Packing (23)		**Remove.**
22. Seal (25)	Use an arbor press and seal removal tool (LTCT3648).	**Press** from oil seal housing (22).

5-7. Accessory Drive Gearbox Seals - Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
	Prolonged contact with lubricating oil (Item 46 or 47, Appendix D) may cause a skin rash. Those areas of skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil Is used should be adequately ventilated to keep mist and fumes to a minimum.	
23. Packing (24)		**Remove.**
24. Seal (25)	Use new seal. Use lubricating oil (item 46 or 47, Appendix D).	**Dip** in lubricating oil.
25. Packing (24) and Seal (25)	Seal must be installed with solid side of seal case (side with part number) facing back of oil seal housing (22). Use seal installer (LTCT270) and arbor press.	**Position** inside seal oil housing. **Press** seal into housing with seal installer and arbor press.
26. Packing (23)	**NOTE** **If necessary to replace spacer (28) because of leaking, replace according to actions for items 27 thru 35.**	**Place** on housing.
27. Lock Cup (27)		**Straighten** rim.
28. Nut (26)	**Use holding fixture (LTCT115)**	**Position** holding fixture on cover mounting pad studs. **Make sure** that tangs of fixture engage slots of nut. **Insert** splined tool (part of LTCT115) in holding fixture. Using a suitable wrench. **turn** splined tool clockwise to **remove** nut (26).

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX - Continued		
29. Lock cup (27)		**Remove**
30. Spacer (28)		**Remove**
31. Packing (29)		
32. Spacer (28) and Packing (29)	Use new spacer and packing.	**Install** packing (29) in spacer (28).
33. Spacer (28). Lock cup (27) and nut (26)	Use new lock cup.	**Install** on shaft of of starter drive gear.
34. Nut (26)		**Inserts** splined tool (part of LTCT115) in holding fixture. **Tighten** nut (26) by turning counter-clockwise. (Refer to Appendix G, Table G-3, reference number 12.)
35. Lock Cup (27)		**Deform** into nut (26) in three places 120 degrees apart.
36. Seal and Housing Assembly (21)	Use seal installation tool (LTCT 511).	**Install** in accessory drive gearbox cover.
37. Seal and Housing Assembly (21)		**Secure** with bolts (20). Lockwire.
38. Suppot (18), Gaskets (17 and 18) and Shipping Cover (16)	Perform this action if all these items were removed.	**Install** on starter generator drive pad. Secure with nuts (14) and washers (15).
39. Nuts (14)		**Tighten** to standard torque.
40. Housing (32)		**Remove** lockwire, three bolts (31), housing (32) and packing (33).
41. Packing (33)		**Discard.**
42. Housing (32)		**Install** bolts (31), tighten as required and lockwire.

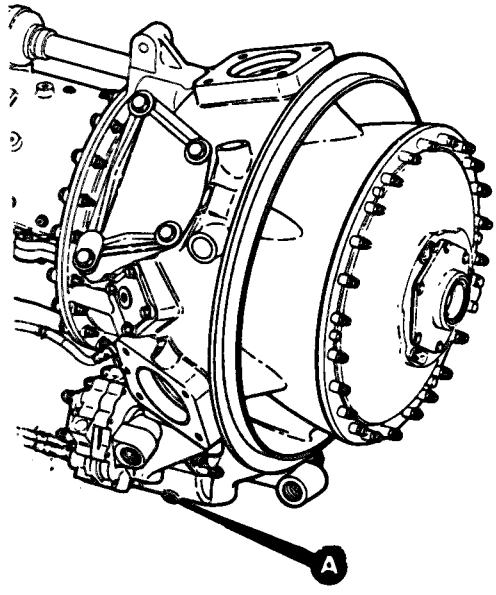
5-8. Chip Detector - Removal

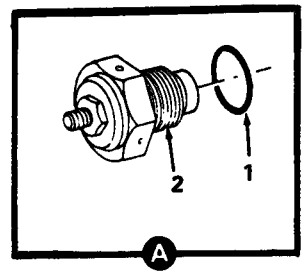
INITIAL SETUP

Applicable Configuration
All

References
Troubleshooting, Chapter 1, Section VI

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOXY ASSEMBLY/		
1. Chip Detector (2)		**Remove** from accessory gearbox.
2. Packing (1)		**Remove** from accessory gearbox.
3. Chip Detector (2)	Perform this action if contamination is evident upon removal. Refer to Troubleshooting, Chapter 1, Section VI.	**Record** type and amount of contamination on engine historical record.





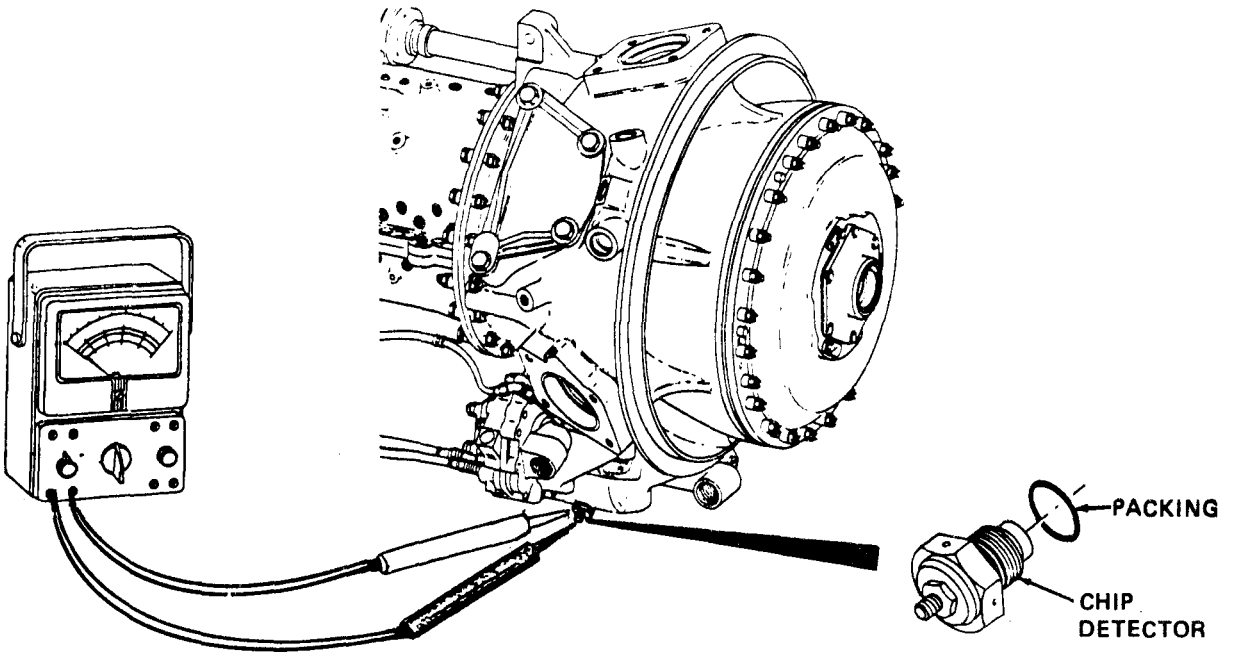
5-9. Chip Detector - Inspection

INITIAL SETUP

Applicable Configuration
All

Test Equipment
Ohmmeter

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/		



1. Chip Detector	Use ohmmeter.	**Measure** resistance. If less than 400,000 ohms, remove wire from chip detector and measure resistance again. If more than 400,000 ohms with wire removed, chip detector inspection is good, but the wire is probably shorted, requiring troubleshooting. If less than 400.000 ohms with wire removed, remove chip detector and replace. Refer to paragraphs 5-8 and 5-10.

5-10. CHIP DETECTOR – INSTALLATION

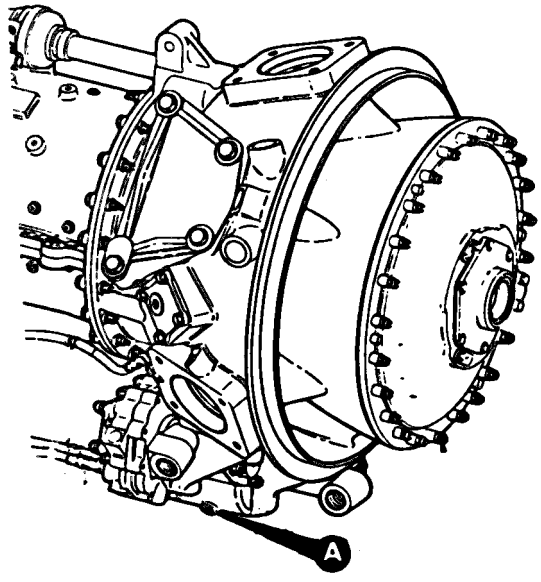
INITIAL SETUP

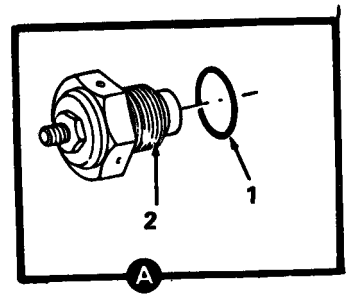
Applicable Configuration
All

Consumable Materials
Lockwire (item 41,42 or 43, Appendix D)

References
Para 5-4
Appendix G, Table G-3, Reference Number 58
Appendix G, Table G-4, Reference Number 34

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY		
1. Chip Detector (2)	If threads on chip detector port were repaired as outlined in paragraph 5-4, perform this action.	**Install** packing (1) AN6227-10, NSN 5330-00-350-9013 on Chip detector (2).
2. Chip Detector (2) and Packing (1)		**Install** into accessory drive gearbox.
3. Chip Detector (2)	Refer to Appendix G, table G-3, reference number 58, or table G-4, reference number 34.	**Tighten as** required. **Lockwire.**





CAUTION

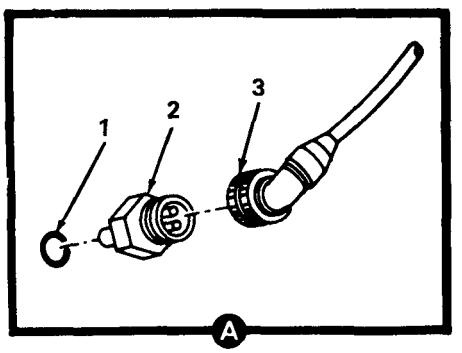
No more than 15 pound-inches (0.2 kg-m) of torque shall be applied to the chip detector centermost nut when installing the chip detector wire.

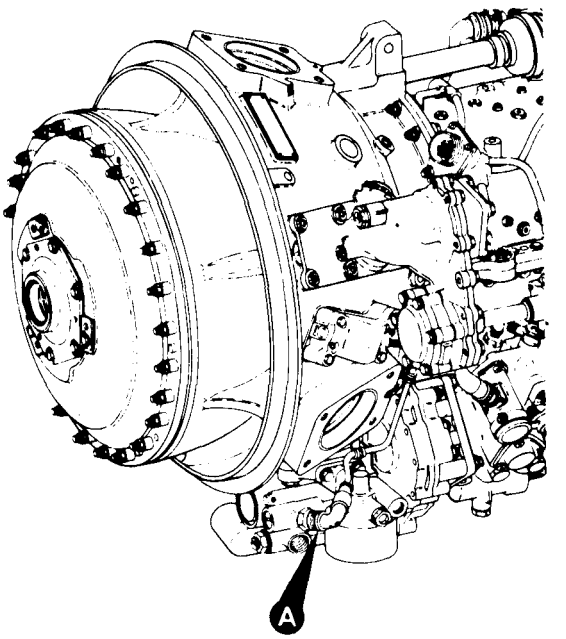
5-11. Oil Temperature Bulb - Removal

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
POWER DRIVEN ROTARY (OIL) PUMP/		
	WARNING **Disconnect electrical power before removing oil temperature bulb.**	
1. Oil Temperature Bulb Electrical Connector		**Disconnect** from oil temperature bulb (2).
2. Oil Temperature Bulb and Packing (1)		**Remove** from power-driven rotary (oil) pump.



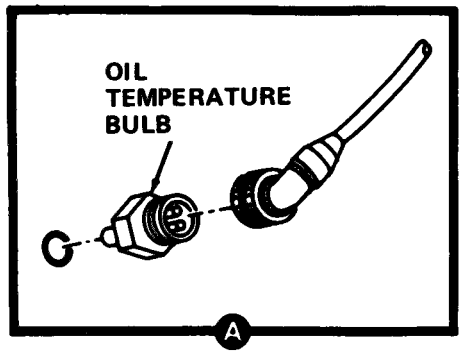


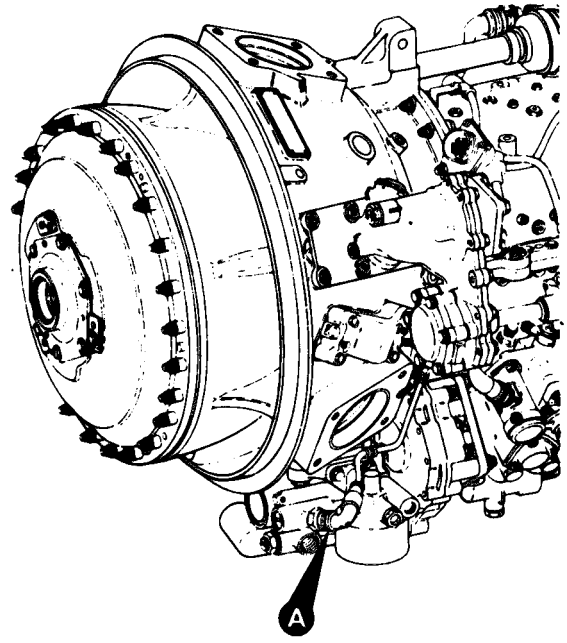
5-12. Oil Temperature Bulb - Inspection

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
POWER DRIVEN ROTARY (OIL) PUMP/		
1. Oil Temperature Bulb		**Inspect** for damaged threads. Bent or broken pin, and bent probe. **Replace** bulb if damage is noted.





5-13. Oil Temperature Bulb - Functional Test (AVIM)

INITIAL SETUP

Applicable Configuration
All

Consumable Material
Lubricating Oil (item 46, Appendix D)

Test Equipment
Test Unit (LTCT1452)

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/		

WARNING

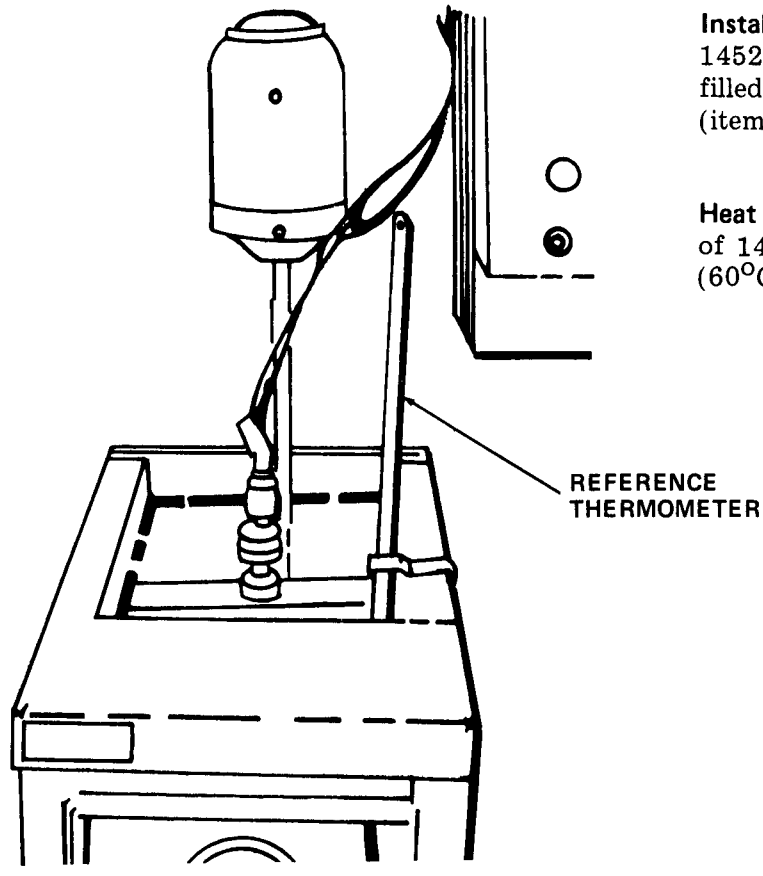
Prolonged contact with lubricating oil (item 46 or 47, Appendix D) may cause a skin rash. Those areas of skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be adequately ventilated to keep mist and fumes to a minimum.

1. Reference Thermometer

Install in test unit (LTCT 1452) or equivalent, filled with lubricating oil, (item 46, Appendix D).

2. Oil

Heat to a temperature of 140°F to 200°F (60°C to 93°C).



5-13. Oil Temperature Bulb - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/ - Continued	**NOTE** In following action for item 3, the two test leads connect internally to the OIL TEMP gage.	
3. Test Stand		**Connect** two test leads internally to the OIL TEMP gage.
4. Test Stand		**Connect** lead to bulb.
5. Bulb Probe		**Submerge** in heated Oil.
6. OIL TEMP Indicato		**Observe** temperature indications of OIL TEMP indicator and reference thermometer. Reading on OIL TEMP indicator shall be within plus or minus 10°F (6°C) of reading in reference thermometer. **Reject** temperature bulb if requirements cannot be met.

5-14. Oil Temperature Bulb - Installation

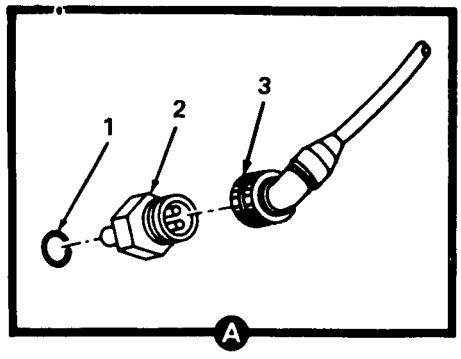
INITIAL SETUP

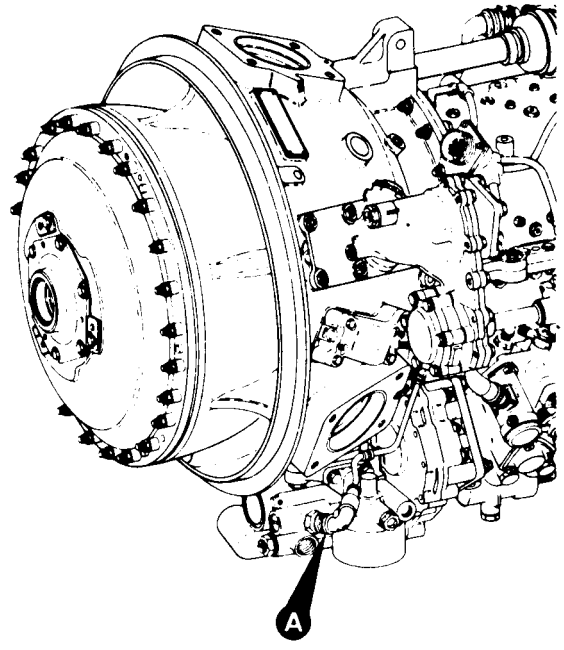
Applicable Configuration
All

Consumable Materials
Lockwire (item 41,42, or 43, Appendix D)

5-14. Oil Temperature Bulb - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/		





1. Oil Temperature Bulb

Install oil temperature bulb (2) and packing (1) in the oil pump.

CAUTION

Do not twist wiring harness connector during installation.

NOTE

When installing wiring harness 10-166280, which contains a molded straight connector in lieu of a metal elbow, omit following actions for items 2 and 3 and lockwire the connector.

2. Electrical Connector

Connect oil temperature bulb electrical connector (3). **Lockwire** connection.

5-14. Oil Temperature Bulb - Installation - Continued

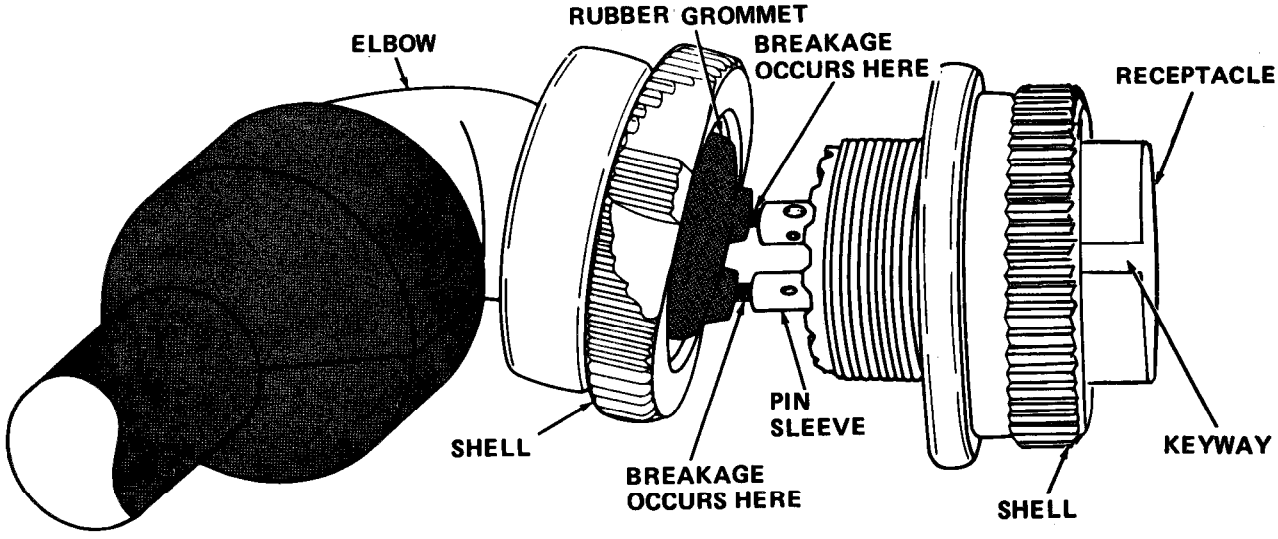
LOCATION/ITEM	REMARKS	ACTION
POWER DRIVEN ROTARY (OIL) PUMP/ - Continued		
3. Keyway	If after several attempts the key and keyway fail to aline proceed as follows:	If keyway in harness connector does not aline with key on oil temperature bulb, **replace** bulb. **Repeat** replacement until key and keyway aline.

CAUTION

To prevent damage to wiring, do not rotate receptacle unless grommet in elbow is free to turn.

NOTE

The wiring harness oil temperature bulb connector shown below incorporates an elbow with a knurled shell (nut) retained at one end by a shoulder, and a receptacle with a knurled shell (nut) similarly retained. Internal wiring extends from a rubber grommet inside elbow to two pin sleeves installed in receptacle. Breakage of wires during repositioning can occur at the point between grommet and pin sleeves.



5-14. Oil Temperature Bulb - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER DRIVEN ROTARY (OIL) PUMP/ - Continued		
4. Knurled Shell		**Hold** elbow and receptacle in alinement and **loosen** knurled shell on elbow until internal wiring between elbow and receptacle is exposed. **Determine** amount of slack in internal wiring by gently **rotating** receptacle in both directions. **Install** the oil temperature bulb that offers the best alinement with rotated receptacle. **Install** receptacle on bulb and **tighten** shells. **Lockwire** bolts.

CHAPTER 6

FUEL SYSTEM

OVERVIEW

This chapter contains procedures for the maintenance and preservation of the Fuel System. The following paragraphs outline disassembly, inspection, repair, and additional requirements needed to maintain the Fuel System and related parts. Procedures requiring maintenance on the Aviation Intermediate Maintenance (AVIM) level are specified and must be performed as such. Paragraphs in which the maintenance level is not specified shall be considered Aviation Unit Maintenance (AVUM) and maybe performed at this level or a higher level of maintenance.

Page

Page

6-1. GENERAL MAINTENANCE INFORMATION.

Visually inspect all assemblies and accessories of the engine Fuel System. Check for loose or missing parts. Note any damage or excessive wear. Repair damaged parts where possible. Replace damaged parts that cannot be repaired. Disassembly procedures provided enable required cleaning, inspection, repair or replacement of Fuel System components.

During reassembly of the fuel system assemblies and accessories discard all of the following parts and replace with new parts:

Seals	Tabwashesrs
Gaskets	LockPins
Packing	Lockwashers
Cotter Pins	LockWire

6-2. Fuel Control - Removal

INITIAL SETUP

Applicable Configuration
All

References
Para 6-8,8-36 and 6-7

LOCATION / ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/		

CAUTION

The fuel control is considered a high-value item and is easily damaged if improperly packed for shipment. (Refer to paragraph 6-8.)

WARNING

To prevent injury to personnel the fuel system of all engines that are to be placed in containers (less accident-involved engines) will be thoroughly drained, purged, and preserved. All disconnected lines will be capped or plugged. Tape will not be used in place of caps or plugs.

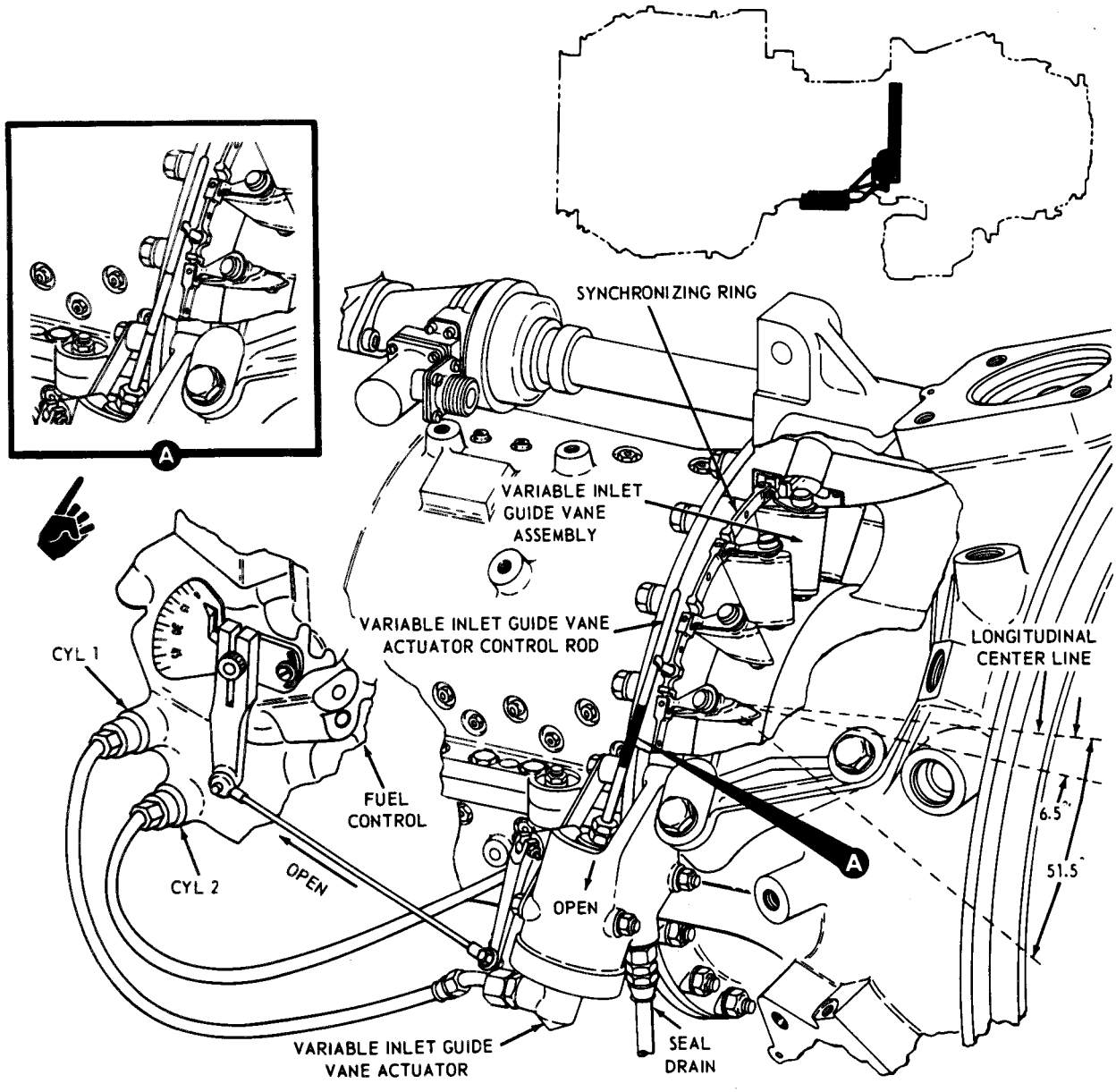
CAUTION

Care shall be taken when handling the fuel regulator during unpacking, removing, installing and trouble-shooting to prevent damage to regulator and its components. If regulator is damaged, engine failure may occur.

1. Cylinder 1 and Cylinder 2 "B" Nuts	T53-L-13B/703 engines only.	**Loosen.**
2. Inlet Guide Vane Actuator		**Move** to vane full open position. **Record** variable inlet guide position on fuel control indicator plate.
3. Levers		**Do not remove.**
4. Rod Ends		**Disconnect.**

6-2. Fuel Control - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		



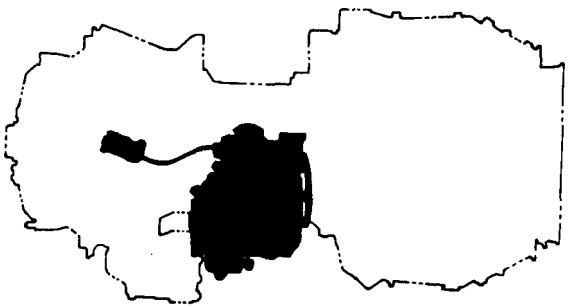
WARNING

Insure that all electrical power Is disconnected.

5. Fuel, Air, Mechanical and Elecrical Connections	**Disconnect Tag. Cap all open ports**

6-2. Fuel Control - Removal - Continued

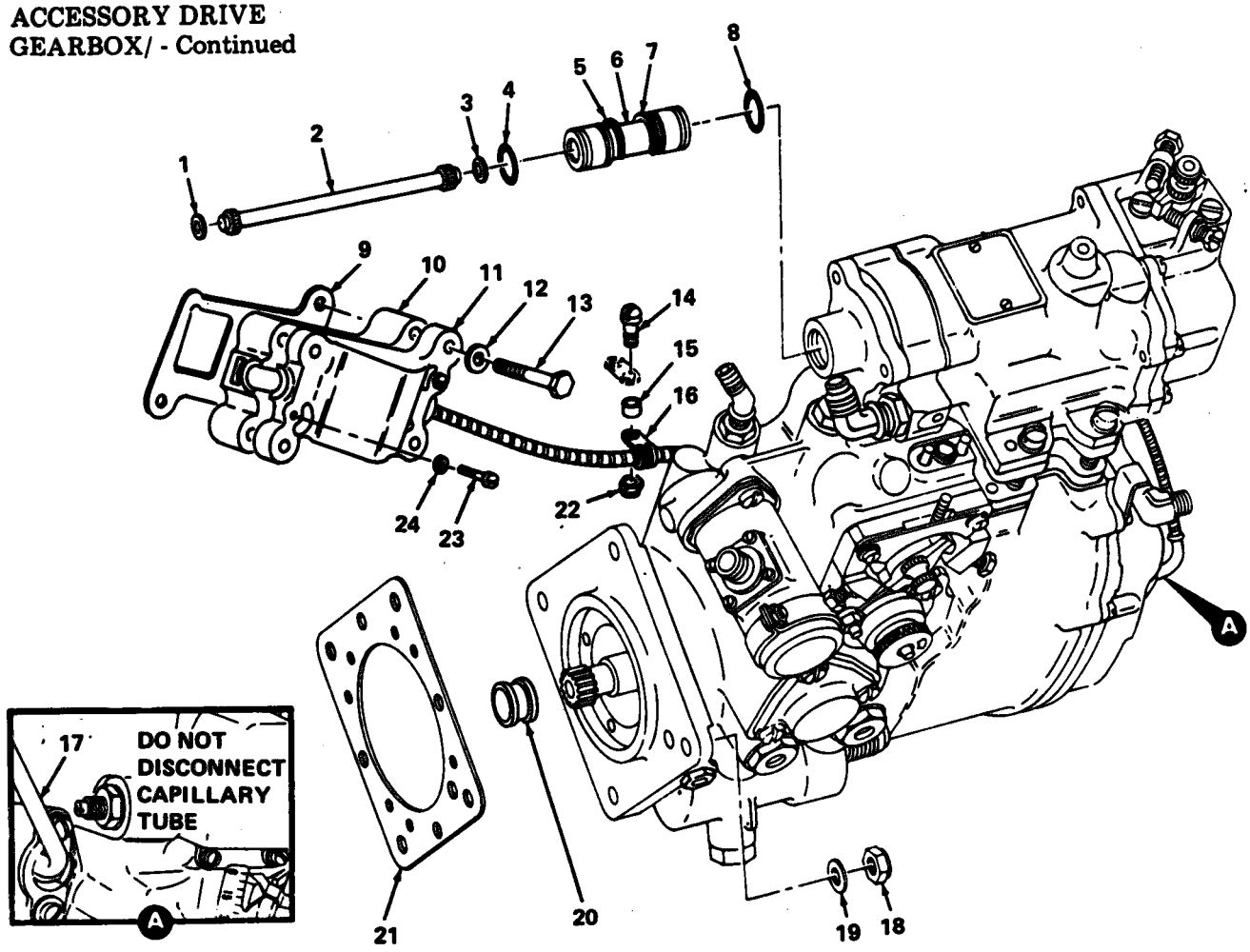
LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued	**CAUTION** **Insure that all fuel, air, mechanical, and electrical connections are correctly tagged at both ends of disconnection.** **CAUTION** **Insure that P1 air fitting on the fuel control is capped securely to prevent loss of silicone oil.**	
6. Screw (14), Spacer (15) and Nut (22)		**Remove items that secure clamp (16) to bracket.**



1. Spline Nut
2. Shaft
3. Spline Nut
4. Packing
5. Snapring
6. Tube
7. Snapring
8. Packing
9. Gasket
10. Lower Housing
11. Upper Housing
12. Washer
13. Bolt
14. Screw
15. Spacer
16. Clamp
17. Temperature-Sensing Element Capillary Tube
18. Nut
19. Washer
20. Seal
21. Gasket
22. Nut
23. Screw
24. Washer

6-2. Fuel Control - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		



CAUTION

Exercise extreme care in removing and handling the housings (10 and 11) which contain the temperature-sensing element. Nicks, dents, or sharp bends may destroy the capillary action of the tube.

The temperature-sensing element and capillary tube are calibrated to the fuel control. Do not disconnect capillary tube (17) from the fuel control. The temperature-sensing assembly and housing shall be removed along with the fuel control.

6-2. Fuel Control - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
7. Bolts (13) and Washers (12)		**Remove** bolts (13) and washers (12) that secure upper housing (1 1) and lower housing (10) to inlet housing.
8. Housings and Gasket (9)		**Remove.**
8.1. Screws 23) and Washers (24)		**Remove** screws (23) and washers (24) that secure upper housing (11) to lower housing (10) and separate housings.
9. Power-Driven Rotary (Booster) Pump	Refer to paragraph 8-36.	**Remove.**
10. Shaft (2) and Spline Nuts (1 and 3)	Use 8-32 threaded rod.	**Pull** through overspeed governor and tachometer drive housing.
11. Snapring (5 and 7)		**Slide** aft toward center of tube (6). **Push** tube forward into overspeed governor and tachometer drive housing.
12. Ignition Lead and Coil Assembly Mount Bracket	To eliminate interference with aft movement of fuel control during removal, perform this action.	**Cut** lockwire. **Remove** two bolts that secure item.
13. Nuts (18) and Washers (19)	Support fuel control assembly when aft movement of fuel control during removal, perform this action.	**Remove.**
14. Fuel Control		**Withdraw. Keep** as level as possible to **prevent** damage to shaft seal.
15. Gasket (21)		**Remove.**
16. Seal (20)		**Remove** if installed.

6-2 Fuel Control - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
	NOTE **If fuel control is to be removed for more than 48 hours reserve it in accordance with intsructions in paragraph 6-7.**	
17. Housings with Temperature-Sensing		**Retain** for protection during shipment.

63. Fuel Control Assembly - Flushing on Engine

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Fuel (item 31, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/	**NOTE** Provide a clean container for drained fuel.	
1. Main and Starting Fuel Hoses		**Disconnect** at manifold connection.
2. Drain Hoses		**Connect** to hose ends.
3. Wiring Harness		**Disconnect** from ignition unit.
4. Fuel Control in Inlet Port		**Provide** source of clean fuel (item 31, Appendix D), to fuel control inlet port.
	CAUTION **To prevent damage to starter, do not exceed starter limits when motoring the engine.**	
5. Engine		**Motor** engine.
6. Power and Condition Levers		**Open** and **close** power and condition levers while motoring engine.

To prevent injury to personnel the fuel system of all engines that are to be placed in containers (less accident-involved engines) will be thoroughly drained, purged, and preserved. All disconnected lines will be capped or plugged. Tape will not be used in place of caps or plugs.

6-3. Fuel Control Assembly - Flushing on Engine - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
7. Container		**Check** for contamination of flushing fuel.
8. Fuel Control		**Replace** fuel control if it cannot be flushed clean in three 30-second motoring attempts.

6-4. Fuel Control - Inspection

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Drycleaning Solvent (item 24, Appendix D)

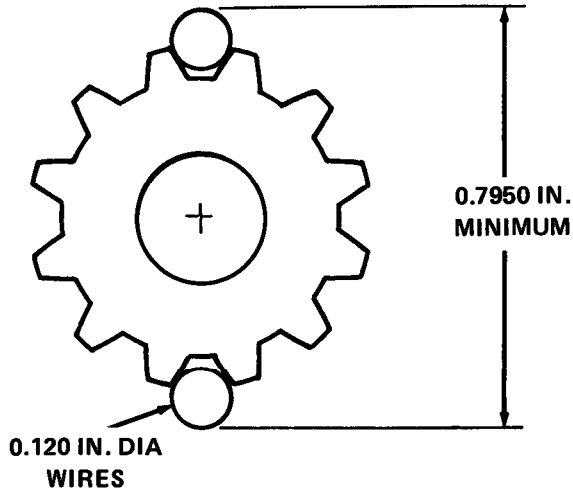
References
Para 6-2, 6-14, 6-16, 6-86 and H-29

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/	**NOTE** Refer to figure in paragraph 6-2, item 6.	
1. All Fittings	Repair threads as outlined in paragraph H-29.	**Inspect** for damaged or crossed threads.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F to 138° F (38°C to 59°C).

6-4. Fuel Control - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
2. Fuel Control Drive Shaft		**Inspect** for chipped or worn splines as follows and **replace** defective parts. a. Thoroughly **clean** drive gearshaft with dry cleaning solvent (item 24, Appendix D). b. **Inspect** fuel control drive gearshaft male splines for wear by measuring over 0.120 inch (0.305 cm) diameter wires. **See** illustration. c. If measurement over wire is less than 0.7950 inch (20.19 mm), **replace** fuel control drive gearshaft.

WARNING

Use approved personnel protective equipment to protect eyes and face when using compressed air.

Maximum allowable air pressure for cleaning operations is 30 psi.

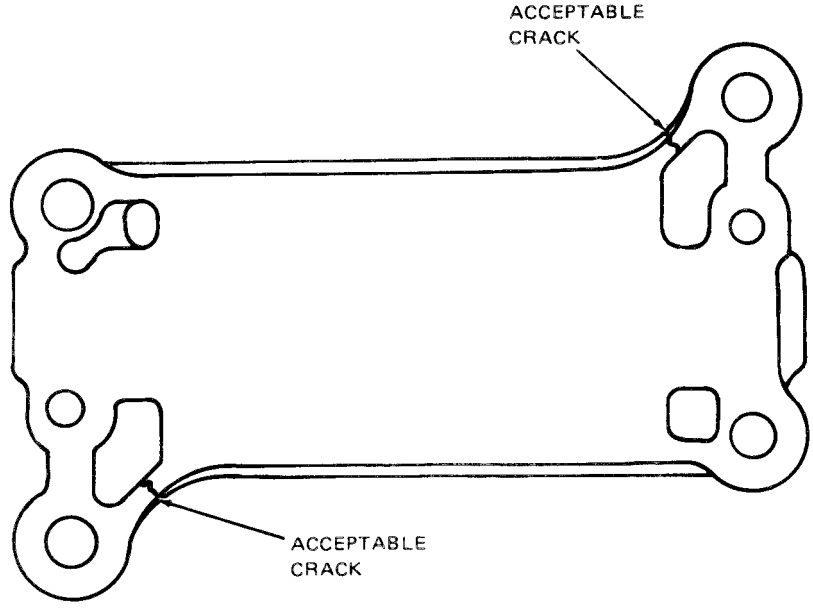
Do not direct air stream toward yourself or toward another person.

6-4. Fuel Control - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
3. Accessory Drive Gearshaft	**NOTE** **It is not necessary to remove or lock the gearshaft for inspection purposes.** **NOTE** **Ensure the four oil ports in the female splines are clear.** **NOTE** **Any wear on the fuel control drive splines or the mating gear splines that indicate a definite wear pattern, or a ridge resulting from material removal is cause for rejection. Any splines that show just a shiny area is acceptable.** **NOTE** **Do not use any grease on the fuel control splines upon installation of the fuel control.**	**Inspect** female spline as follows and **replace** defective parts. a. **Clean** female spline using a fiber brush (one inch diameter round) and drycleaning solvent (item 24, Appendix D). **Dry** with compressed air. b. **Visually** or by using a sharp instrument **probe** or **pick. Inspect** spline teeth for worn area. c. **Replace** if wear is evident on accessory drive gearshaft.
4. Mounting Flange	Replace control if defective.	**Inspect** for elongated mounting holes and warpage.
5. Solenoid Valve	If mounting is loose, tighten. If contact pins are bent or broken, replace solenoid valve.	**Inspect** for security of mounting, bent or broken contact pins and damaged insulator.

6-4. Fuel Control - Inspection - Continued

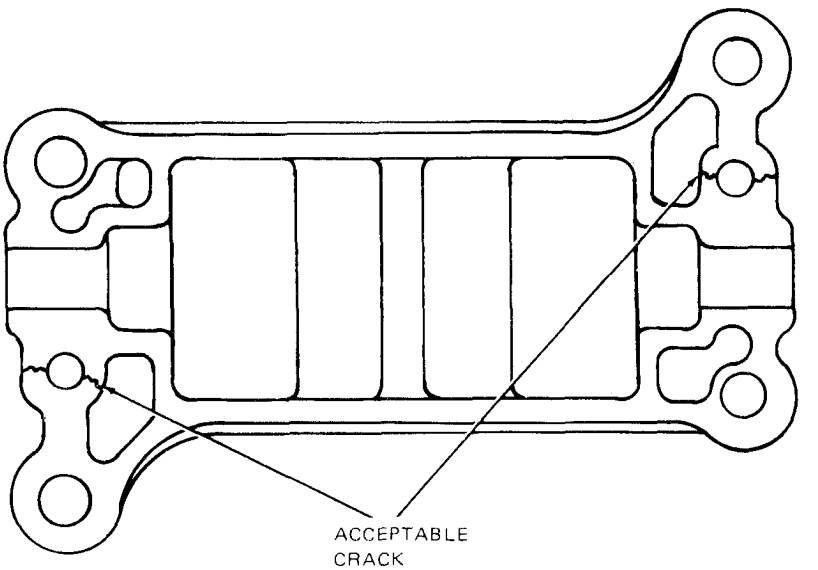
LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
6. Temperature-Sensing Assembly Housing	Replace housing if defective.	Inspect for warpage and elongation of mount holes. Inspect for cracks through mount holes and mount tangs, converging cracks or cracks more than 30% across housing. All other cracks acceptable provided function IS not affected.
6.1. Upper and Lower Housings (11 and 10)	Limits are as follows: a. Cracks in upper housing. (1) One crack per end, total of two cracks per housing. (2) Replace housing if limits are exceeded.	Inspect for cracks.



UPPER HOUSING

6-4. Fuel Control - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX - Continued		
6.1. Upper and Lower Housings (11 and 10) - Continued	b. Cracks in lower housing. (1) Two cracks per insert area, cracks shall not be on same side, total of four cracks per housing. (2) Replace housing if limits are exceeded.	



LOWER HOUSING

6-4 Fuel Control - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
7. Temperature-sensing Bulb	Limits areas follows:	
	a. A maximum of four (4) cracks or broken fins are allowed.	**Inspect** for bent, cracked, or broken fin.
	b. A maximum of three (3) missing or bent fins are allowed.	**Straighten** bent fins.
	c. If limits are exceeded, replace fuel control.	
8. Temperature-Sensing Tube and Shielding	Replace fuel control if defective.	Inspect for security of installation, dents and sharp ends.
9. Temperature-Sensing Tube and Shielding	Crack limits are as follows:	**Inspect** for cracks.
	a. Cracks that are not a result of the shielding being crushed are al-	
	b. Cracks that do not chafe or cut into the tube creating the possibility of a rupture are allowed.	
	NOTE **Rupture of the tube will be readily discerible the odor caused by leakage fluid contained in the tube. Also, engine surge problems will be encountered.**	
	c. Cracks that do not result in circumferential separation of the shielding allowing a twist or sharp bend in the tube and possible tube rupture are al-	
10. Fuel Control		**Replace** if crack limits are exceeded or if temperature-sensing tube is leaking.
11. Overspeed Governor	If contamination is found. flush fuel control.	If removed, **Inspect** fuel control for corrosion or contamination.

6-4. Fuel Control - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued	**NOTE** **Corrosion is a rust-like deposit on surface of internal parts that are exposed when main fuel regulator and overspeed governor are separated. Refer to paragraph 6-87, Contamination is any foreign matter found in fuel or clinging to surfaces of internal parts that are exposed when main fuel regulator and overspeed governor are separated.**	

6-5. Fuel Control - installation

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Damping Fluid (Silicone) (item 100, Appendix D)
Lockwire (item 41, Appendix D)
Bottle Dropper (item 104, Appendix D)

References
Appendix G, Table G-4, Reference Number 49, 54, Table G-3, Reference Number 43
Para 2-11, 8-39, 6-89, 6-5, 1-117, 1-116and 1-118

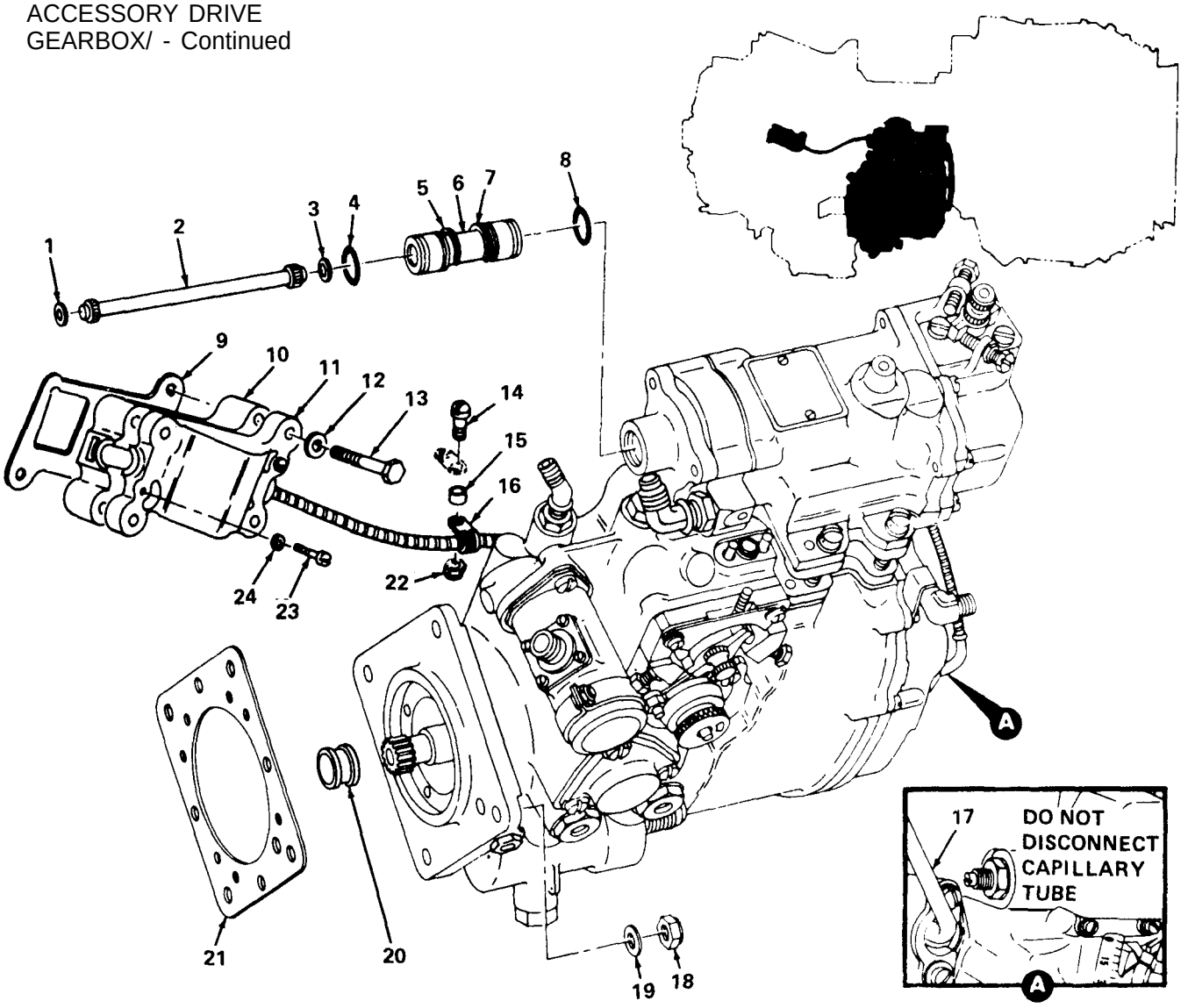
LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/	**NOTE** **If a new fuel control is being installed, and endfloat check of overspeed governor shaft is required. (Refer to paragraph 6-89.) On T53-L-11 series engines when accessory drive gearbox 1-080-250-13 is installed, a fuel regulator P/N 81700C3, P/N 81700C4, or P/N 81700C5, or P/N 81700C6, with a long driven splined shaft and special seal 1-300-368-01 must be installed. On T53-L-13B/703 engines when accessory drive gearbox 1-080-250-14 or 1-080-250-16 is installed, a fuel regulator P/N 100770A series or 106500A series with a long splined shaft and**	

6-5. Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued	special seal 1-300-368-01, must be installed. If an accessory drive gearbox other than 1-080-250-13,-14, or -16 is installed it is permissible to use a fuel regulator with either a long or short splined shaft; however, seal 1-300-368-01 must be removed from the long splined shaft. **CAUTION** **Under no circumstances will a fuel regulator with a short splined shaft replace a fuel regulator with a long splined shaft on accessory drive gearbox 1-080-250-13, -14, or -16. Accessory drive gearbox 1-080-250-13, -14, or -16 may be readily identified by the additional dowel pin on the fuel regulator mount pad. This pin must not be removed.** **The temperature-sensing element and capillary tube are calibrated to the fuel control. Assure that capillary tube has not been disconnected from the fuel control. The temperature-sensing assembly shall be installed along with the fuel control. Use extreme care to avoid damage to the tube, Do not separate the tube from the fuel control.**	
1. Packings (4 and 8)		**Install** in groove of tube (6).
2. Tube (6)		**Insert** into overspeed governor and tachometer drive gearbox.
3. Gasket (21)		**Position** on fuel control pad of accessory drive gearbox.

6-5. Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		



1. Spline Nut
2. Shaft
3. Spline Nut
4. Packing
5. Snapring
6. Tube
7. Snapring
8. Packing
9. Gasket
10. Lower Housing
11. Upper Housing
12. Washer
13. Bolt
14. Screw
15. Spacer
16. Clamp
17. Temperature-Sensing Element Capillary Tube
18. Nut
19, Washer
20. Seal
21. Gasket
22. Nut
23. Screw
24. Washer

6-5. Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
4. Seal (20)	When installing fuel regulator P/N 81700C3, P/N 81700C4, P/N 81700C5, or P/N 81700C6 (T53-L-11 Series Engines); or fuel regulator, P/N 84200A7A, P/N 100770A or P/N 106500A Series (T53-L-13B engines); or P/N 100770A or P/N 106500A Series (T53-L-703 engines); install seal. **CAUTION** **In action for Item 5, do not use Plastilube Moly No. 3 or Multi-Fax EP2 on splines of fuel regulator drive shaft and accessory drive gearbox fuel regulator drive gearshaft mating splines.**	
5. Drive Shaft Male Splines and Accessory Drive Gearbox Fuel Control Drive Gearbox Mating Splines	**CAUTION** **Care shall be taken when installing fuel regulator to prevent damage to the drive shaft carbon seal. If carbon seal Is damaged, serious fuel leakage may occur.** **NOTE** To mesh the splines of the regulator with drive gearshaft, remove N1 tachometer generator and using 1/4-inch drive extension and ratchet, turn tachometer drive gearshaft until splines mesh with splines on fuel control Reinstall tachometer generator.	**Deleted.**

6-5. Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued	**WARNING** **Adjustments to the fuel control may affect safety of flight. Only qualified personnel shall be permitted to perform the adjustments.**	
	CAUTION **Fuel control P/N 100770A4 Is trimmed for T53-L-703 engines (approximately 106%). If P/N 100770A4 is to be used on T53-L-13B engines, decrease N1 percent by turning the maximum trim screw three-quarters of a turn clockwise (equal to approximately 6% decrease In N1.)**	
	NOTE For fuel control adjustment procedures, refer to paragraph 1-117.	
6. Fuel Control		**Install** on accessory drive gearbox.
7. Fuel Control		**Secure** with washers (19) and nuts (18). **Tighten** as required. **Refer** to Appendix G, table G-4, reference number 49.
8. Lead and Coil Assembly Mounting Bracket		**Reinstall** and **secure** with two bolts. **Tighten** bolts as required and **lockwire.**
9. Shaft	Refer to paragraph 6-89.	**Install** through tube (6) utilizing nuts (1 and 3) as necessary.
10. Tube		**Slide** into overspeed governor.

6.5 Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX - Continued		
11. Snaprings (5 and 7)		**Position** into grooves on both ends of tube. **Adjust** tube to allow snaprings to position properly.

CAUTION

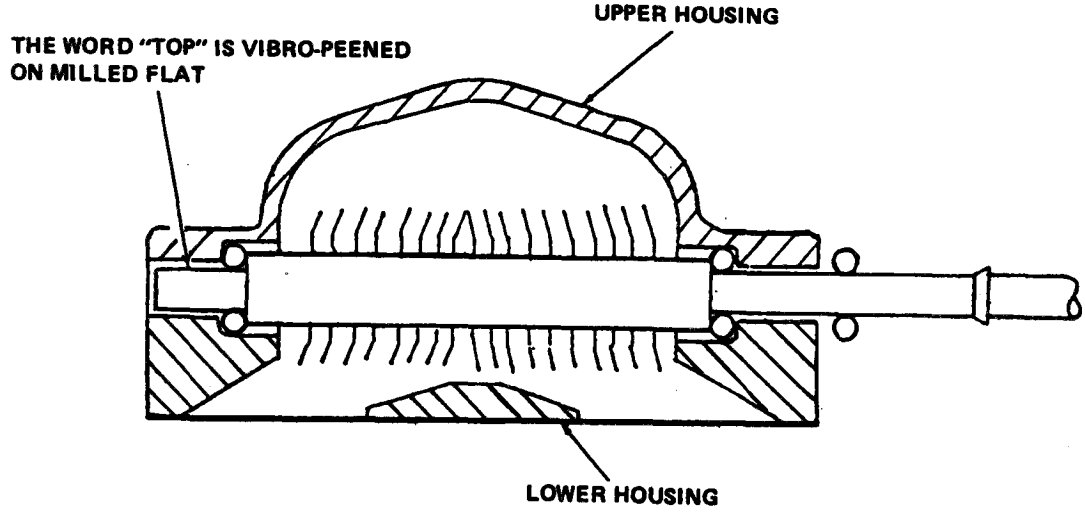
Do not damage packings on temperature-sensing element,

NOTE

Top is vibro-peened on the end of the termperature-sensing element. This is marking is to establish proper location of fins when Installing and must face the upper temperature housing cover for the element to function property.

6-5. Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		



12. Upper and Lower Housing (11 and 10)		**Assemble.** Secure with screws (23) and washers (24).
13. End Float Check.		**Perform** as outlined in paragraph 6-89. **Install** drive shaft.
14. Upper and Lower Housing (11 and 10) and Gasket (9)		**Position** on inlet housing and **secure** with washers 12) and bolts (13). Tlghten bolts as required. **Refer** to Appendix G, table Q-3, reference number 43, or table G-4, reference number 54.. **Lockwire** bolts (13) and screws (23). Appendix D, item number 41)
15. Clamp (16)		**Secure** to bracket with screw (14), spacer (15) and nut (22).
16. Power Driven Rotary (Booster) Pump	Refer to paragraph 8-39.	Install.

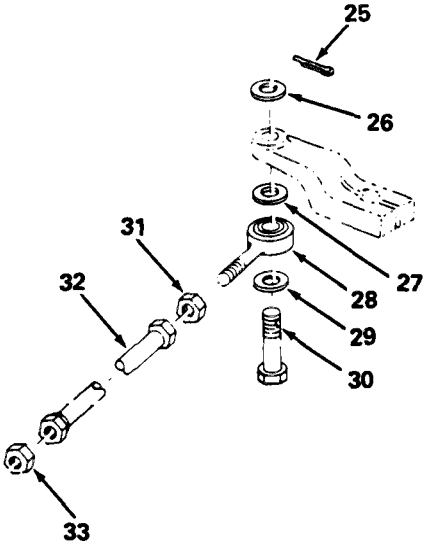
6-5. Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued	**CAUTION** **If P1 sensor line and N2 governor overflow purge line are crossed, fuel will be pumped into engine inlet area resulting in an engine fire.**	
	Make sure that P1 bellow cavity is filled with damping fluid (silicone) (item 100, Appendix D) before installation of P1 line to the fuel control.	Add damping fluid with bottle dropper (item 104, Appendix D) until fluid is visible.
17. Fuel, Air Mechanical, and Electrical Connections	Assure that P1 sensor line is connected to fuel control and that N2 governor overflow purge line is connected to N2 governor.	
	NOTE Make sure that a minimum of fie rod end threads are engaged in the feedback rod ends. If the thread engagement is insufficient and if the main fuel regulator feedback cam arm is indexed with the scribe line on the feedback cam shaft, the feedback cam arm may be re-indexed one or two teeth counterclockwise. This will allow increased thread engagement.	
	NOTE Washer (27) may be omitted if it causes tube assembly to contact fuel control. If on T53-L-13B/703 engines the fuel control is a new replacement, adjust VIGV feedback rod ends until VIGV indicator aligns with the zero degree marking, and perform an operational check of inlet guide vane actuator. Refer to paragraph 2-11.	

6-5. Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESS0RY DRIVE GEARBOX - Continued		
	NOTE If fuel control 100770A or 106500A series is being installed, perform rigging and operational check of inlet guide vane actuator. (Refer to paragraph 2-11.	
18. Feedback Rod (32)	If the same fuel control is being installed on T53-L-13B/703 engines, position inlet guide vane actuator to vane full open position.	**Adjust** until indicator on fuel control alines with previously noted position.

6-5. Fuel Control - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX - Continued		
19. Feedback Rod (32)	T53-L-13B/703 engines only.	**Position** inlet guide vane actuator to vane full open position.
20. Feedback Rod (32)		**Connect Insert** bolt (30) through washer (29), rod end bearing (28) and washer (27) to secure rod end bearing (28) to inboard side of fuel control arm. **Install** one or more washers (26) and secure with cotter pin (25. **Secure** jam-nuts (31 and 33) on ends of tube with **lockwire.**
21. Fuel Control	Refer to paragraphs 6-6, 1-117, 1-116, 1-118 and 2-11.	**Prime, adjust** and operationally **check.**

6-6. Fuel Control - Priming

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/	**NOTE** This check is to be performed only if fuel control has been drained of fuel or is removed and replaced. **WARNING** **To prevent accidental firing, disconnect 28-vdc power supply from ignition unit.**	

6-6. Fuel Control - Priming - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
1. Main and Starting Fuel Hoses	T53-L-11 series engines only.	**Disconnect** from manifolds,
2. Starting Fuel Hose Assembly	T53-L-13B/703 engines only.	**Disconnect from starting** fuel manifold. **Disconnect** two primary fuel hose assemblies on flow divider to fuel manifold. **Place** ends of hose assemblies into suitable container.
3. Power Lever		**Set** to flight idle.
4. Fuel Boost Pump		**Turn** ON.
	CAUTION **To prevent damage to starter, do not exceed starter limitations.**	
5. Engine		**Motor** with starter.
	WARNING **To prevent injury to personnel the fuel system of all engines that are to be placed in containers (less accident-involved engines) will be thoroughly drained, purged, and preserved. All disconnected lines will be capped or plugged. Tape will not be used in place of caps or plugs.**	
6. Starting Fuel Solenoid		**Energize** and hold.
7. Power Level		**Cycle** from flight idle to maximum and back several times. **Continue** until clear fuel is flowing from main and starting fuel discharge lines.

6.6 FUEL CONTROL – PRIMING – Cont.

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX - Continued		
8. Starter	Engine speed should beat least 12 percent N1 rpm. Engine should coast down with no indication of rubbing or unusual noises.	**Reenergize.**
9. Starting Fuel Valve		**Turn off. Move** power level to OFF position. **Turn** fuel boost pump OFF.
10. Ignition Unit		**Reconnect** 28-vdc power source. **Lockwire.**
1l. Fuel Hoses		**Connect** to proper manifold connections.
12. Engine		Visually inspect for leaks at next start.
13. Fuel Control	Refer to paragraph 6-12 for fuel control strainer and filter inspection.	

6-7. FUEL CONTROL – PRESERVATION OF AND PREPARATION FOR STORAGE OR SHIPMENT

INITIAL SETUP

Applicable Configuration
All

References
Para 6-11, 6-13, 6-86,6-8 and 6-90

Consumable Materials
Drycleaning Solvent (item 24, Appendix D)
Lubricating Oil (item 44, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/		
	When a fuel contol has been removed from an engine and is not to be reinstalled within 48 hours, preserve according to the following actions.	

6-7. Fuel Control - Preservation of and Preparation for Storage or Shipment - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		

CAUTION

The fuel control is considered a high value item and must be secured in a shipping container and adequately packed for shipment.

Exercise extreme care in handling the temperature sensing element housing. Mashing, dents, or sharp bends will destroy the capillary action of the tube.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F to 138° F (38°C to 59°C).

WARNING

Use approved personnel protective equipment to protect eyes and face when using compressed air.

Maximum allowable air pressure for cleaning operations is 30 psi.

Do not direct air stream toward yourself or toward another person.

6-7. Fuel Control - Preservation of and Preparation for Storage or Shipment - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
1. Fuel Control Shaft, Mounting Flange, Overspeed Governor Drive Shaft Port, and All Threaded Areas		Thoroughly **clean** with drycleaning solvent (item 24, Appendix D). **Blow out** all crevices with dry filtered compressed air. **Airdry** or **wipe** with a clean lint-free cloth.
2. Servo Supply Filter and Pump Discharge Strainers	Refer to paragraph 6-11.	**Remove.**
8. High Pressure Caps		**Install** on main and starting fuel outlets, fuel inlet fittings, and on pump discharge pressure ports.
4. Hose	Use lubricating oil (item 44, Appendix D).	**Attach** from a source of clean, lubricating oil to fuel inlet.
5. Fuel Control		**Position** in operating attitude.
6. Fuel Control	When performing this action use rotary gun and spline adapter which will not damage fuel control N1 drive.	**Motor** at 250 to 350 rpm. **Continue** until fuel is flushed out by the oil.
	NOTE **Drive fuel control N1 drive in counterclockwise direction. Drive adapter can be made of heavy rubber hose or a spline welded to a standard 3/8 inch square drive socket or adapter.**	
	NOTE **If impractical to accomplish preceding action for items 4 thru 6 (preferred method), accomplish method in following actions for items 7 thru 11.**	

6-7. Fuel Control - Preservation of and Preparation for Storage or Shipment - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
7. Fuel Control		**Pour** lubricating oil (item 44, Appendix D) into fuel control through pump discharge strainer port (fuel control inlet).
8. Cap		**Install.**
9. Fuel Control Drive Shaft		If possible, **rotate** by hand.
10. Fuel Control		**Turn over** several times allowing oil to penetrate all sections.
11. Cap		**Remove, Add** oil as necessary.
	CAUTION **Controls preserved according to the preceding instructions, must be flushed with fuel prior to engine test. Failure to do this will result in varnish deposits in fuel nozzles.**	
12. Servo Supply Filter and Pump Discharge Strainer	Refer to paragraph 6-13.	**Reinstall.**
13. Fuel Control	Perform this action if fuel control is serviceable and is to be stored for a short period of time.	**Place** in a plastic bag. **Store** in a clean dry area.
14. Fuel Control	Perform this action if fuel control is serviceable and is to be shipped.	**Remove** overspeed governor (para 6-86). **Package** fuel regulator and overspeed governor (para 6-8 and 6-90).

6-7. Fuel Control - Preservation of and Preparation for Storage or Shipment - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
15. Fuel Regulator and Overspeed Governor	If either item is defective and is being forwarded to higher maintenance for repair or overhaul, perform this action.	**Remove** overspeed governor (para 6-86). **Package** defective part (para 6-8 or 6-90). If the remaining component of fuel control is serviceable, **cap** and **plug** openings. Place in plastic bag. Store in a clean, dry place.

6-8. Fuel Regulator - Packing for Shipment

INITIAL SETUP

Applicable Configuration
All

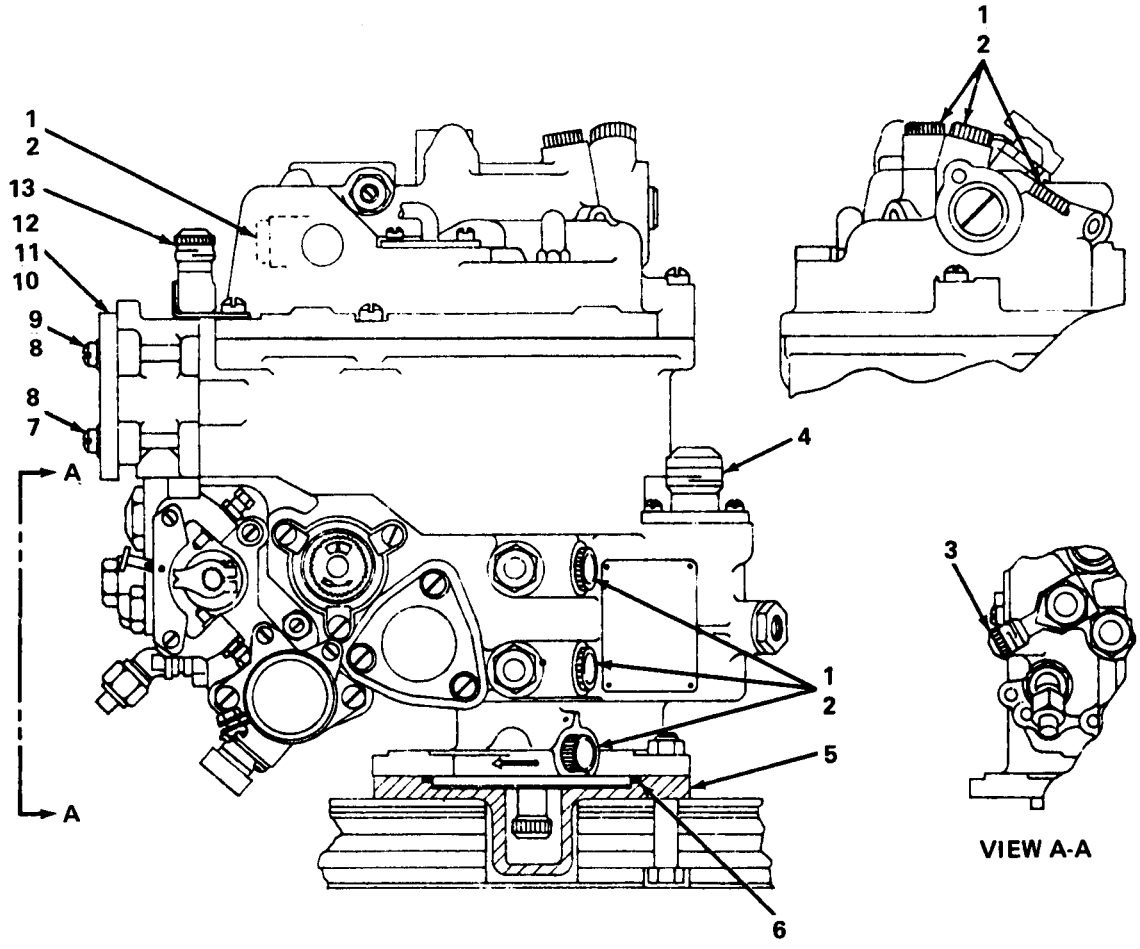
References
Para 6-7

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/		
	The shipping container for the fuel regulator is a standard type, P/N 87439. Package fuel regulator for storage or shipment as follows:	
	NOTE Preserve fuel regulator in accordance with paragraph 6-7 as applicable.	
1. Fuel Regulator Openings	The following figure illustrates the location of protective caps and plugs in the fuel regulator.	**Cap** and **plug.**

6-8. Fuel Regulator - Packing for Shipment - Continued

LOCATION/ITEM	REMARKS	ACTION

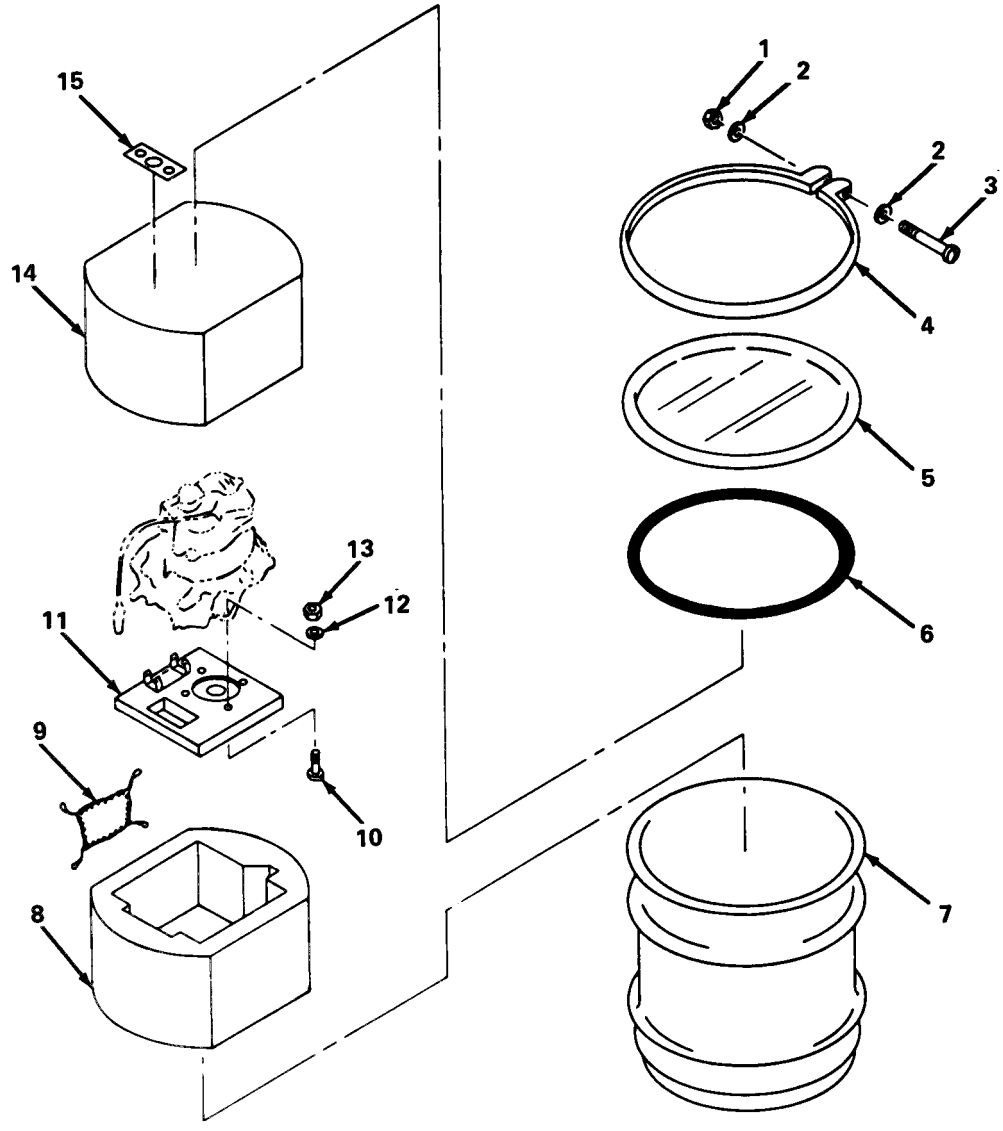
FUEL REGULATOR/ - Continued



1. Shipping Plug	(P/N UNF-3B. 4375-24)	8. Washer	(P/N AN960C416L)
2. Packing	(P/N MS29512-04)	9. Screw	(P/N AN500AD416-12)
3. Shipping Cap	(P/N UNF-3B. 4375-20)	10. Packing	(P/N 28992-010)
4. Shipping Cap	(P/N UNF-3B. 875-14)	11. Seal	(P/N 86014)
5. Shipping Cover	(P/N 78339)	12. Shipping Cover	(P/N 77382)
6. Packing	(P/N MS29513-152)	13. Shipping Cap	(P/N UNF-3B.5625-18)
7. Screw	(P/N AN500AD416-32)		

6-8. Fuel Regulator - Packing for Shipment - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
2. Fuel Regulator		**Mount** on plate (11), using nut (13), washer (12), and bolt (10).



Fuel Regulator - Packing for Shipment - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
	NOTE **Retain T1 sensing housing with fuel control to protect T1 sensing element from damage during shipment.**	
3. T1 Sensing Housing		**Secure** T1 sensing housing to plate (11) with screws and bolts.
4. Lower Dunnage (8), Fuel Control, and Upper Dunnage (14)		**Position** in shipping container (7).
5. Humidity Indicator (15)		**Place** on top of upper dunnage (14).
6. Desiccant (9)		**Insert** 32 units of desiccant in shipping container.
7. Cover (5)		**Place over** gasket (6) on shipping container (7), and seal with locking ring (4), nut (l), washers (2), and bolt (3).
8. Shipping Container		**Store** in upright position.

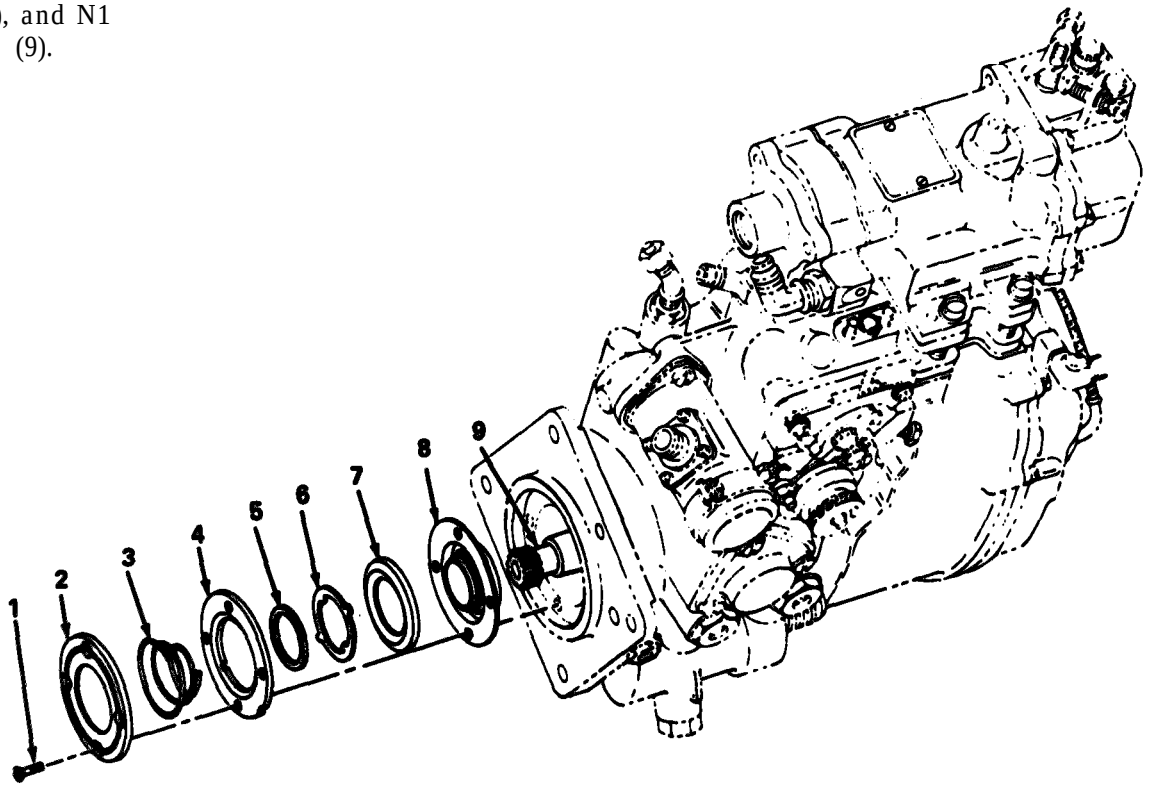
6-9. Fuel Control N1 Driveshaft and Seal - Replacement

INITIAL SETUP

Applicable Configuration
All

References
Appendix G, Table G-3, Reference Number 51 and Table G-4, Reference Number 51

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL ASSEMBLY/		
1. Screws (1), Cover (2), Spring (3), Plate (4), Thrust Washer (S), Key Washer (6), Ring (7), Diaphragm Assembly (8), and N1 Driveshaft (9).		**Remove.**
2. Diaphragm Assembly end Other Parts		**Replace** if damaged or if excessive wear is evident.



6-9. Fuel Control N1 Driveshaft and Seal - Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL ASSEMBLY/ - Continued		
3. N1 Driveshaft (9), Diaphragm Assembly (8), Ring (7), Key Washer (6), Thrust Washer (5), Plate (4), Spring (3), Cover (2) and Screws (1)		**Install.**
4. Screws (1)	Refer to Appendix G, table G-3, reference number 51 and table G-4, reference number 51.	**Tighten as** required. **Stake.**
5. Fuel Control N1 Driveshaft and Seal	Perform this action after assembly.	**Rotate** shaft. **Check** for binding.

6-10. Emergency (Manual) Fuel System - Operational Check

INITIAL SETUP

Applicable Configuration
All

References
Para 1-89, 6-14 and 6-16

LOCATION/ITEM	REMARKS	ACTION
	NOTE **After installing an engine, or a fuel control or when a special verification of the proper operation of the fuel control emergency (manual) system is required, perform the following check.**	
1. Engine	Refer to paragraph 1-89.	**Start.**
2. Fuel Control Selector Switch		With fuel control selector in AUTO position, **stabilize** at 70 to 72 percent N1 speed.

6-10. Emergency (Manuel) Fuel System - Operational Check - Continued

LOCATION/ITEM	REMARKS	ACTION
	CAUTION **Do not move power lever with fuel selector switch in EMER position.**	
8. Fuel Control Selector Switch	Note indicated N1 speed; it should drop 2 to 5 percent.	**Move** to EMER position.
4. Fuel Control Selector Switch	If fuel control fails to return to AUTO, remove and replace emergency solenoid valve and sleeve assembly in accordance with paragraphs 6-14 and 6-16.	**Return** to AUTO position within 5 seconds.
5. Power Lever	If power lever has not been moved, N1 speed should return to 70 and 72 percent, and then stabilize.	
	NOTE **These instructions apply only to this operational check of the fuel control.**	

6-11. Fuel Inlet Strainer, Cover end Strainer, and Servo Supply Filter - Removal

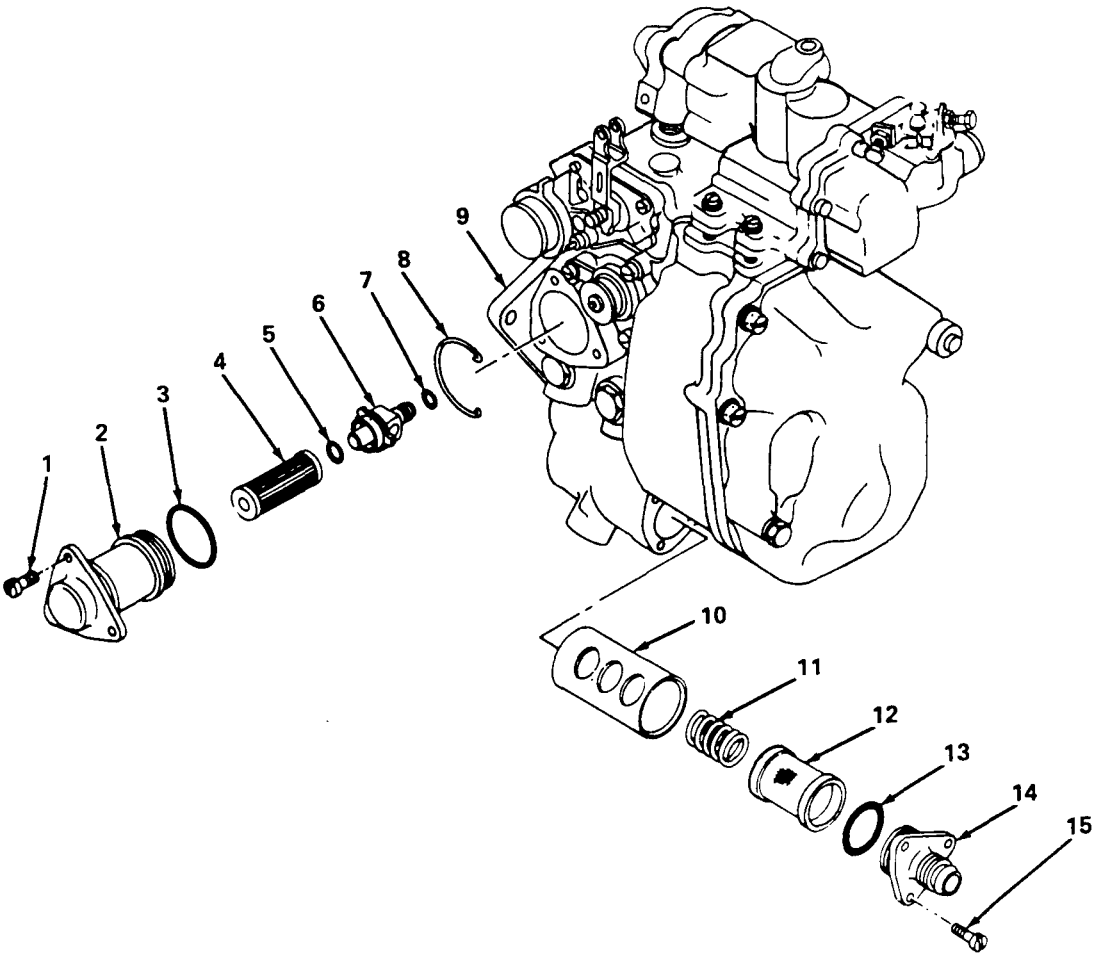
INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/		
1. Cover and Strainer Assembly		**Remove** screws (1) from cover and pump discharge strainer (2) and **withdraw** cover and strainer assembly from fuel control (9).

6-11. Fuel Inlet Strainer, Cover and Strainer, and Servo Supply Filter - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
	For fuel control P/N 106500A1, refer to paragraph 6-13.1.	



2. Retaining Ring (8)	**Remove** retaining ring (8) from cover and strainer.
3. Servo Supply Filter Element (4)	Using a twisting motion, carefully **pull** servo supply filter element (4) and filter housing (6) from cover and strainer.
4. Packing (3)	**Remove** packing (3),

6-11. Fuel Inlet Strainer, Cover and Strainer, and Servo Supply Filter - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
5. Servo Supply Filter Housing (6)		Remove packing 7) from servo supply filter housing (6). Pull servo supply filter element (4) from housing and remove packing (5).
6. Fuel inlet Fitting (14)		**Remove** screws (15) from fuel inlet fitting (14). **Remove** fitting from fuel control. Remove packing (13) from fitting. **Remove** retainer (10) from fuel control. Carefully **withdraw** fuel inlet strainer (12) ands ring (11) from retainer 10).

6-12. Fuel Inlet Strainer, Cover and Strainer, and Servo Supply Filter - Inspection

INITIAL SETUP

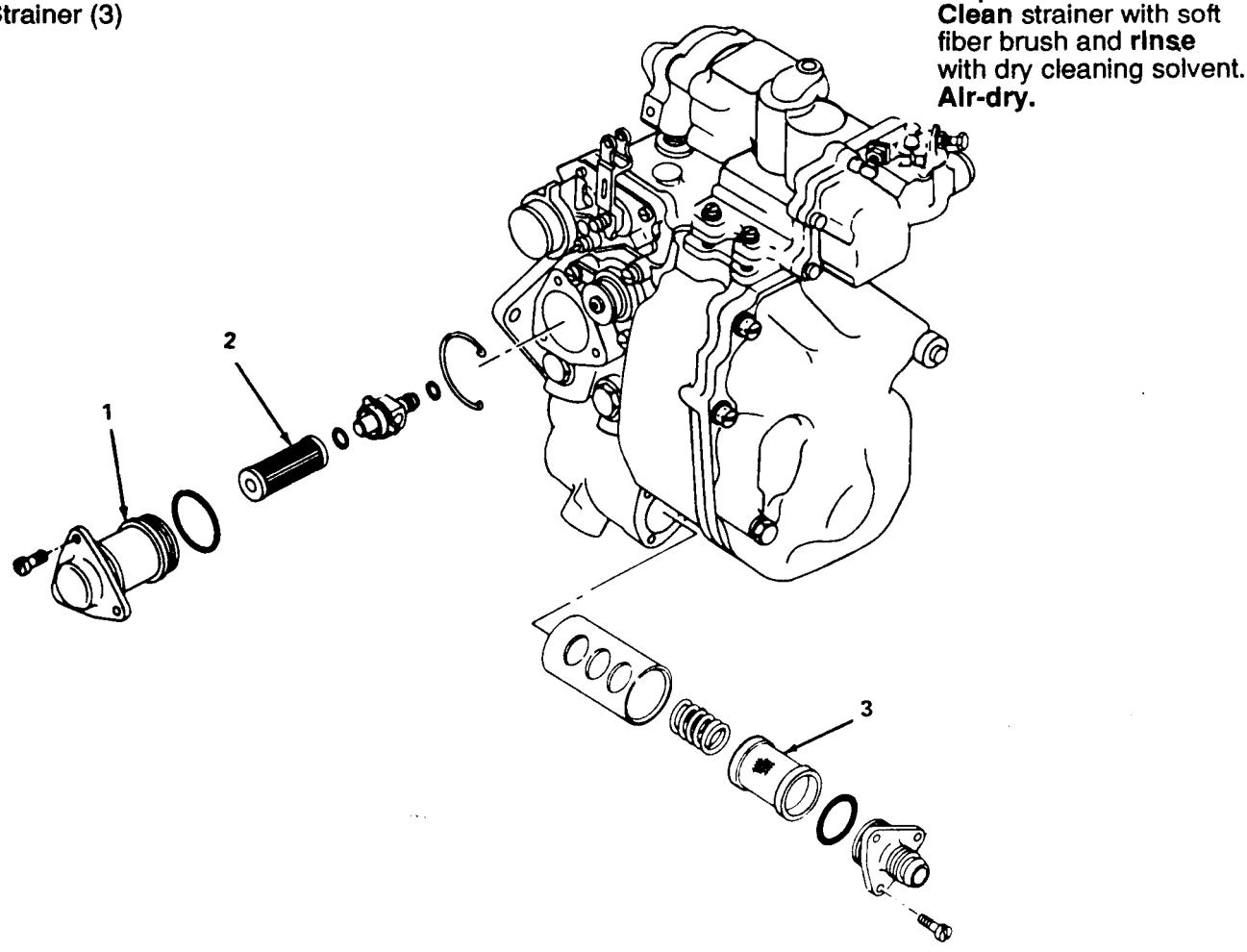
Applicable Configuration
All

Consumable Materials
Dry Cleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/	**WARNING** **Dry cleaning solvent, P-D-680 used to clean parts Is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent Is 100°F to 138°F (38°C to 59°C).** NOTE Inspect and clean fuel inlet strainer, cover and pump discharge strainer, and replace servo supply filter element at the following intervals: a. Initial installation of new or overhauled engine in aircraft.	

6-12. Fuel inlet Strainer, Cover and Strainer and Servo Supply Filter-Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
	b. Initial installation of fuel control after priming.	
	c. As required by applicable aircraft phased maintenance manual or as reruired by paragraph 1-64, Contaminated Fuel Control Strainers and Filter.	
	d. initial installation of new or overhauled fuel control.	
	e. For fuel control P/N 106500A1, refer to paragraph 6-13.1.	
1. Fuel Inlet Strainer (3)		**Inspect** for cleanliness. **Clean** strainer with soft fiber brush and **rinse** with dry cleaning solvent. **Air-dry.**



6-12. Fuel Inlet Strainer, Cover and Strainer and Servo Supply Filter - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/-Continued		
2. Fuel Inlet Strainer (3)	Straighten kinks with fingers. Replace strainer only if it is damaged, marred, or cleaning does not completely remove contamination.	**Inspect** for broken, bent or kinked mesh.
3. Cover and Pump Discharge Strainer (1)	Drycleaning solvent (item 24, Appendix D).	**Inspect** for cleanliness. **Clean** strainer with soft fiber brush and rinse with trichloroethylene.
4. Cover and Pump Discharge Strainer (1)	Replace cover and strainer only if they are damaged, punctured, or marred, or cleaning does not completely remove contaminates.	**Inspect** for damage.
5. Servo Supply Filter Element (2)	**NOTE** Replacement of Servo Supply Filter after completion of **initial check run** (para 1-89) is not required if contamination is **not** noted.	**Replace** at each inspection.

6-13. Fuel Inlet Strainer, Cover end strainer, and Servo Supply Filter - Installation

INTIAL SETUP

Applicable Configuration
All

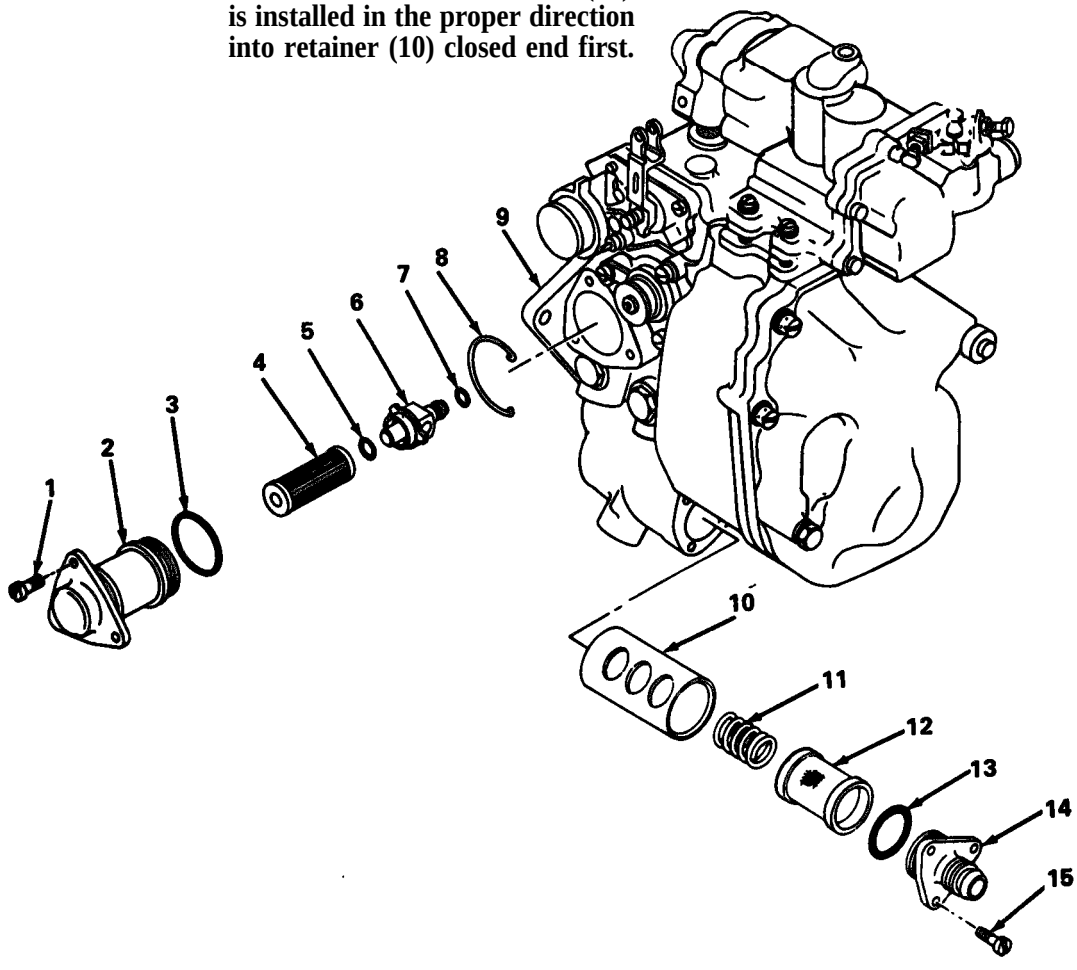
Consumable Materials
Petrolatum (item 66, Appendix D)
Lockwire (item 41,42, or 43, Appendix D)

References
Appendix G, Table G-3, Reference Number 46, 50 or table G-4, reference number 47

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/		
1. Fuel Inlet Strainer (12)		**Install.**

CAUTION

Insure that fuel inlet strainer (12) is installed in the proper direction into retainer (10) closed end first.



6-13. FUEL INLET STRAINER, COVER AND STRAINER, AND SERVO SUPPLY FILTER - INSTALLATION - Cont.

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		a. Carefully **install** spring (11) and fuel inlet strainer (12) into retainer (10). **Install** retainer into fuel control. b. **Coat** packing (13) with petrolatum (item 66, Appendix D) and **place** on fuel inlet fitting (14). **Install** fuel inlet fitting into fuel control and **secure** with screws (15). **Tighten** screws as required. (Refer to Appendix G, table G-3, reference number 46, or table G-4, reference number 47.) **Lockwire** (item 41, Appendix D) screws.
	NOTE Install new servo supply filter element and packing from kit 1-200-030-27.	
2. Packing (7)		**Install** on servo supply filter housing (6) then **install** packing (5) in servo supply filter element (4) using twisting motion. **Install** element onto filter housing.
3. Packing (3)		**Install** on cover and pump discharge strainer (2). **Install** servo supply filter element (4) and filter housing (6) into cover and pump discharge strainer (2).
4. Retainer Ring (8)		**Install** on cover and pump discharge strainer (2).

6-13. Fuel Inlet Strainer, Cover and Strainer, and Servo Supply Filter - Installation - Continued

LOCAIION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
5. Cover and Pump Discharge Strainer (2)		**Install** into fuel control. **Secure** with screws (1).
6. Screws		**Tighten** as required. **(Refer** to Appendix G. table G-3, reference number 50 or table G-4, reference number 50.) **Lockwire** (item 41, Appendix D) Screws.

6-13.1 Servo Filter and Strainer Assembly - Inspection

INITIAL SETUP

Applicable Configuration
P/N 106500A1

References
Para 6-11 and 6-13

Consumable Materials
Petrolatum (item 66, Appendix D)
Dry Cleaning solvent (item 24, Appendix D)

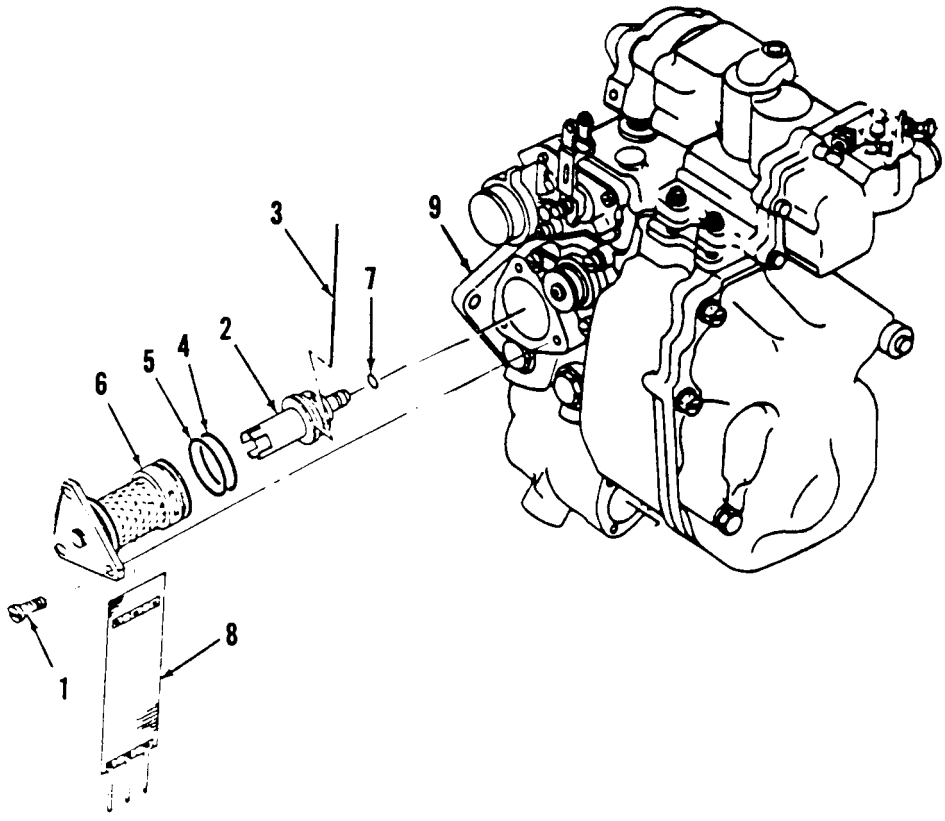
LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/		
1. Servo Filter Aesembly (2) and Strainer Assembly (6)	**Refer to paragraph 6-11.**	**Remove.**
2. Servo Filter Assembly (2)		a. **Remove** flex retaining ring (3) by rotating servo filter assembly (2).

CAUTION

Under no circumstances should wash flow servo filter assembly (2) be cleaned. This filter assembly must be Inspected and cleaned at depot maintenance only.

6-13.1. Servo Filter and Strainer Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
2. Servo Filter Assembly (2) - Continued		b. **Separate** servo filter assembly (2) from strainer assembly (6).
3. Packings (7, 4, and 5)		**Remove** packings (7, 4, and 5) and discard.



6-13.1. Servo Filter and Strainer Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
4. Strainer Assembly (6)		a. **Unfasten** filter strap (8) from around strainer assembly (6) only when particies are lodged between ID of filter strap (8) and OD of strainer assembly (6).
		b. **Inspect** strainer assembly (6) and filter strap (8) for cleanliness. Immerse parts in dry cleaning solvent (item 24, Appendix D). Dry parts using moisture-free compressed air.
5. Servo Filter Assembly (2)		a. **Insert** servo filter assembly (2 into strainer assembly (6).
	CAUTION **Insure that ends of flex retaining ring (3) are not visible through accessory slot In strainer assembly housing.**	
		b. **Place** hooked end of flex retaining ring (3) into acceptance hole of servo filter assembly (2). **Rotate** servo filter assembly (2) with flex retaining ring (3) inserted with ring circumventing groove.

6-13.1. Servo Filter and Strainer Assembly - Inspection - Contlnued

LOCATION/ITEM	REMARKS	ACTION
FUEL REGULATOR/ - Continued		
6. Packing (7, 4, and 5)		Coat new packings (7, 4, and 5) with petrolatum (item 66, Appendix D) and Install packing (7) on servo filter assembly (2) and packings (4 and 5) on strainer assembly (6).
7. Servo Filter Assembly (2) and Strainer Assembly (6)	Refer to paragraph 6-13.	Install.

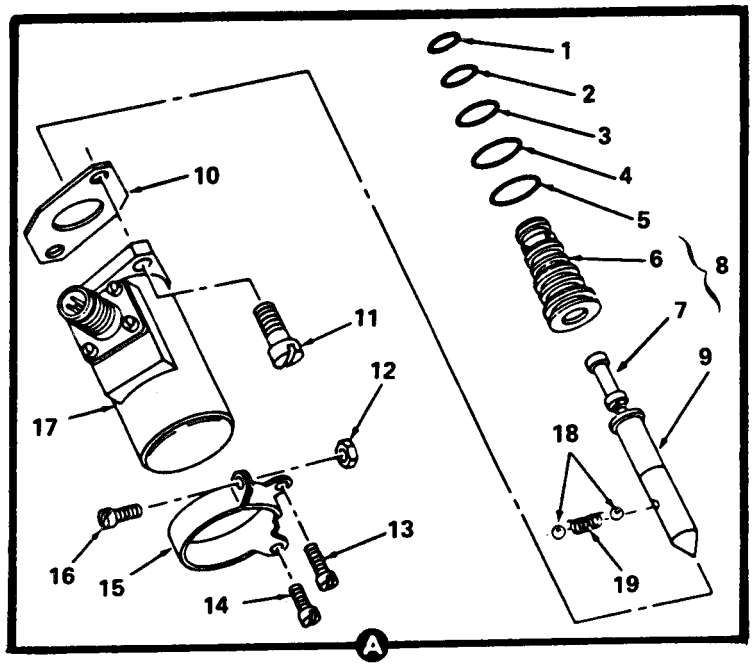
6-14. Fuel Control Solenoid valve - Removal

INITIAL SETUP

Aplicable Configuratlon
All

Special Tools
Sleeve Puller STD63557 (MC 11599)

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/		
1. Solenoid Support Bracket (15)		**Remove screws (13 and 14) that secure bracket (15) to fuel control. Loosen nut (12) and screw (16) and slide bracket from solenoid.**



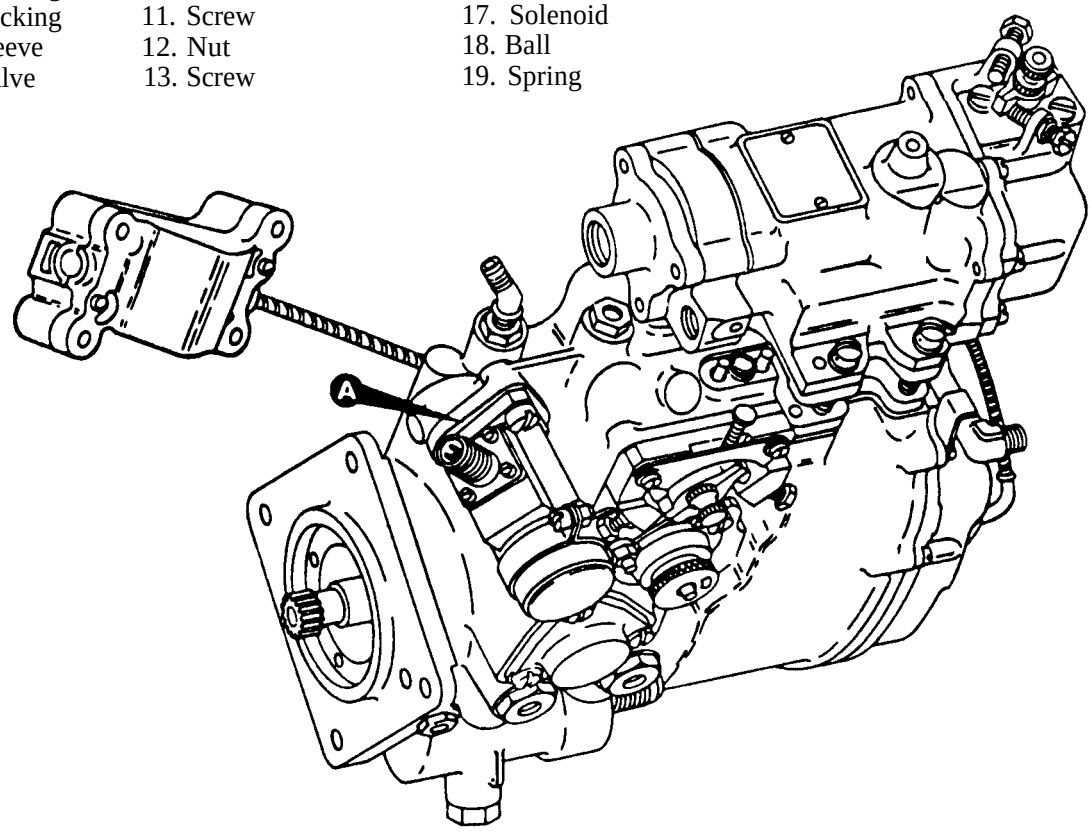
2. Solenoid (17)		**Remove screws (11) that secure solenoid to fuel control.**

6-14. Fuel Control Solenoid Valve - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION

ACCESSORY DRIVE
GEARBOX/ - Continued

1. Packing
2. Packing
3. Packing
4. Packing
5. Packing
6. Sleeve
7. Valve
8. Valve and Sleeve Assembly
9. Insert
10. Shim
11. Screw
12. Nut
13. Screw
14. Screw
15. Solenoid Support Bracket
16. Screw
17. Solenoid
18. Ball
19. Spring



NOTE

Withdraw solenoid (17) only enough to insert finger to secure insert (9). Holding finger on insert, continue to remove solenoid and insert. If solenoid and insert are not removed together, balls (18) will be lost. The insert shall remain in the solenoid until the solenoid is installed.

6-14. Fuel Control Solenoid Valve-Removal-Continual

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
3. Solenoid (17) and Shim (10)		**Remove. Record** thickness of shim, **Lockwire** shim to solenoid to facilitate installation.
	NOTE Valve and sleeve assembly (8) is a matched assembly and must be replaced as an assembly.	
4. Sleeve (6), Valve (7) or insert (9)		**Replace** if any of these items are damaged.
5. Valve and Sleeve Assembly (8)	Use sleeve puller STD63557 (MC 11599).	**Remove** as follows: a. **Remove** valve and sleeve assembly from fuel control. b. **Remove** packings (1, 2, 3, 4 and 5).

6-15. Fuel Control Solenoid Valve - Inspection

INITIAL SETUP

Applicable Configuration
All

References
Para 6-14, 6-16 and H-28

Consumable Materials
Crocus Cloth (item 21, Appendix D)
Drycleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/		
	Refer to figure in paragraph 6-14, item 1.	

6-15. Fuel Control Solenoid Valve - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued	**WARNING** **Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).**	
1. Electrical Connector on Solenoid	Remove corrosion with crocus cloth (item 21, Appendix D) and drycleaning solvent (item 24, Appendix D).	**Inspect** for corrosion.
2. Electrical Connector	Repair minor thread damage as outlined in paragraph H-28.	**Inspect** for damaged threads.
3. Electrical Connector	Replace solenoid if insulator is cracked or if pins are bent or broken.	**Inspect** for cracked insulator and bent or broken pins.
4. Solenoid and Solenoid Support Bracket	Replace solenoid or bracket if evidence of cracks or breaks is noted.	**Inspect** for cracks or breaks.
5. Insert, Valve and Sleeve Assembly	If either valve and sleeve assembly or insert is damaged, both parts must be replaced. Refer to paragraphs 6-14 and 6-16.	**Inspect** for damage,

6-16. Fuel Control Solenoid Valve - Installation

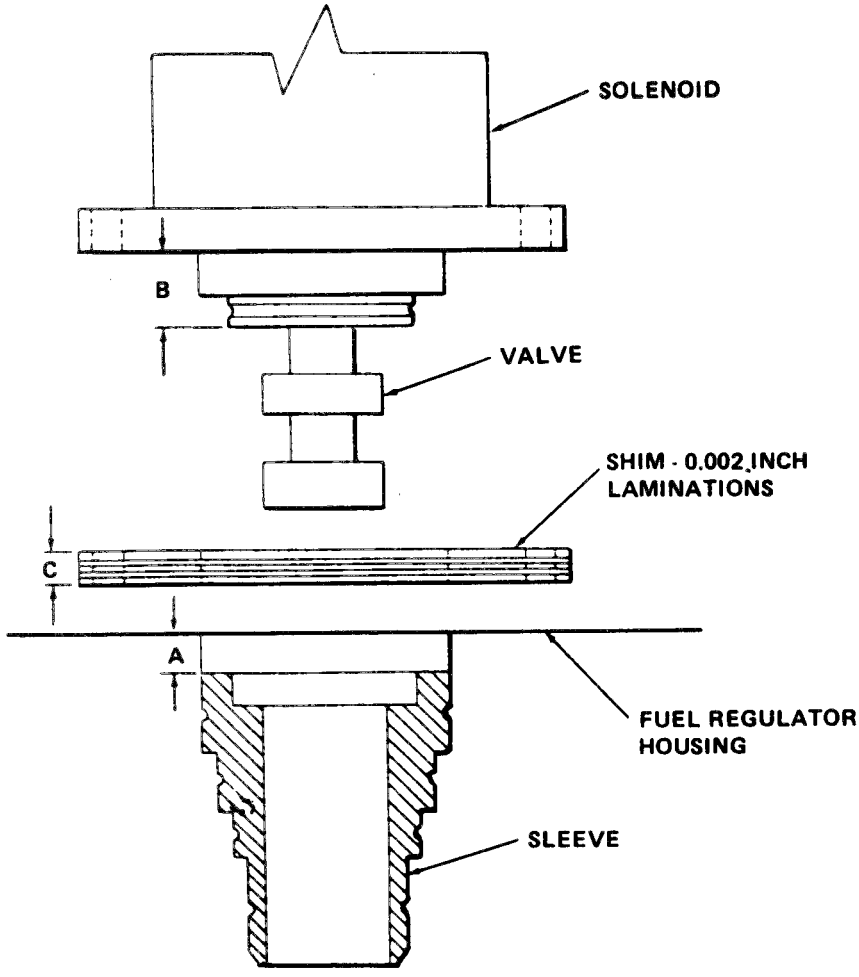
INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Petrolatum (item 66, Appendix D)

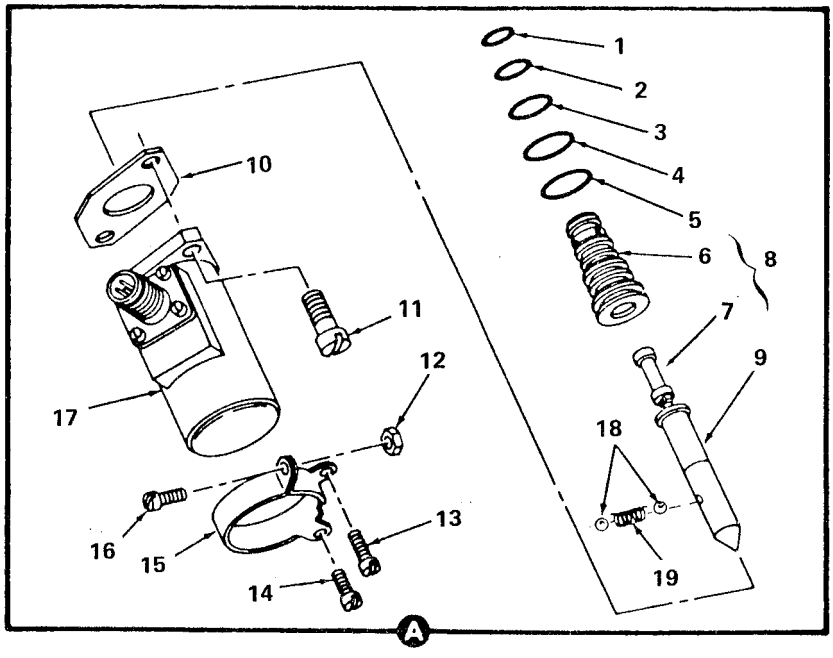
Special Tools
Sleeve Puller - STD63557

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/		
1. Valve and Sleeve Assembly	Perform this action if Item has been replaced. If original valve and sleeve assembly that was removed is used, proceed to action for item 2.	**Compute** thickness of shim as follows: a. **Install** new valve and sleeve assembly without packings into fuel regulator. b. **Install** new Insert into solenoid. c. Using depth micrometer, **measure** distance from fuel control solenoid mounting face to top of valve and sleeve assembly (dimension A). d. Using depth micrometer, **measure** height of boss of solenoid (dimension B). e. **Subtract** dimension A from dimension B. The difference, minus 0.0000 to 0.0025 inch, is required thickness of shim (dimension C . f. Using sleeve puller STD63557 (Federal Manufacturer's Code 11599), **remove** sleeve with petrolatum (item 66, Appendix D).

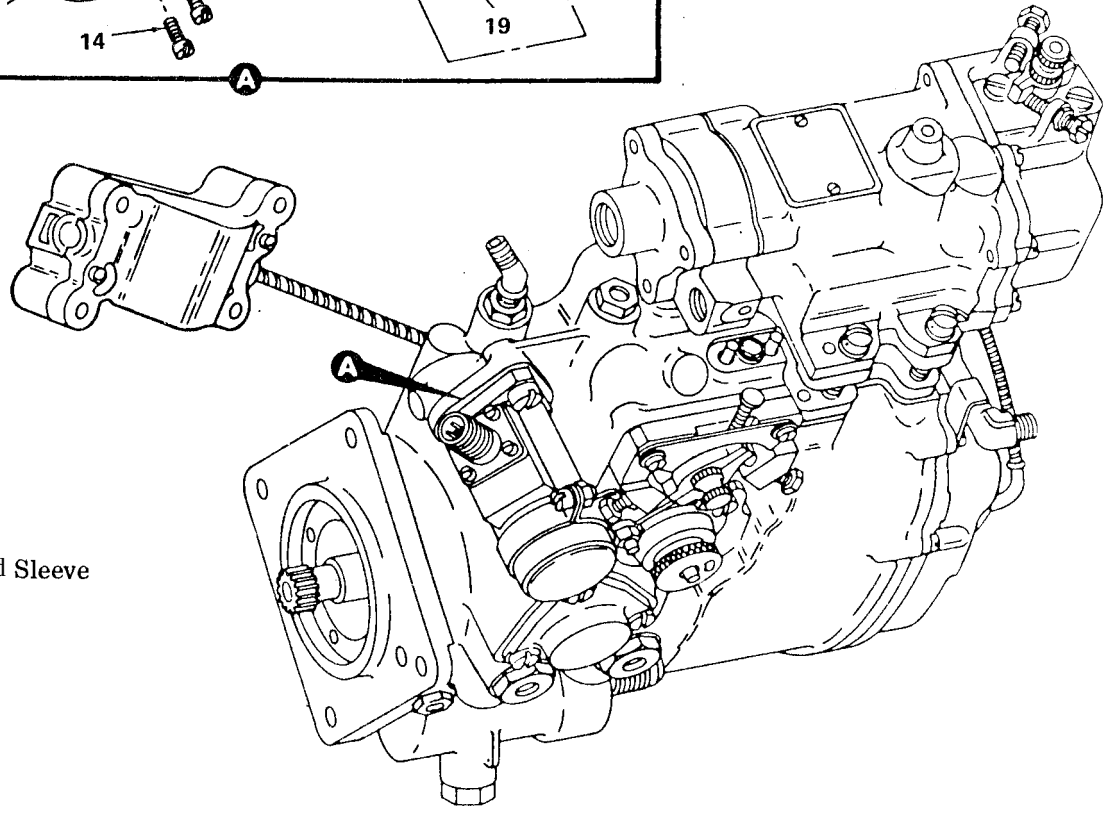


6-16. Fuel Control Solenoid Valve - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		g. **Lubricate** and install packings (1, 2, 3, 4, 5) onto valve and sleeve assembly. h. **Install** valve and sleeve assembly into fuel regulator housing.



15. Solenoid Support Bracket
16. Screw
17. Solenoid
18. Balls
19. Spring



1. Packing
2. Packing
3. Packing
4. Packing
5. Packing
6. Sleeve
7. Valve
8. Valve and Sleeve Assembly
9. Insert
10. Shim
11. Screw
12. Nut
13. Screw
14. Screw

6-16. Fuel Control Solenoid Valve - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		
2. Shim (10)		Install on fuel regulator.
	CAUTION **Insert (7) incorporates retaining bells in its shaft. Exercise care to insure that insert remains in solenoid. If it is necessary to install insert into solenoid, exercise extreme caution so that balls on insert do not spring free during installation. Loss of these bells will cause solenoid to function improperly.**	
8. Solenoid (17) end Insert (9)		**Install. Secure** with screws (11). **Tighten** screws as required and **lockwire.**
4. Solenoid Support Bracket (15)		**Install** and **secure** with screws (13 and 14).
5. Bracket		**Secure** to solenoid with screw (16) and nut (12).

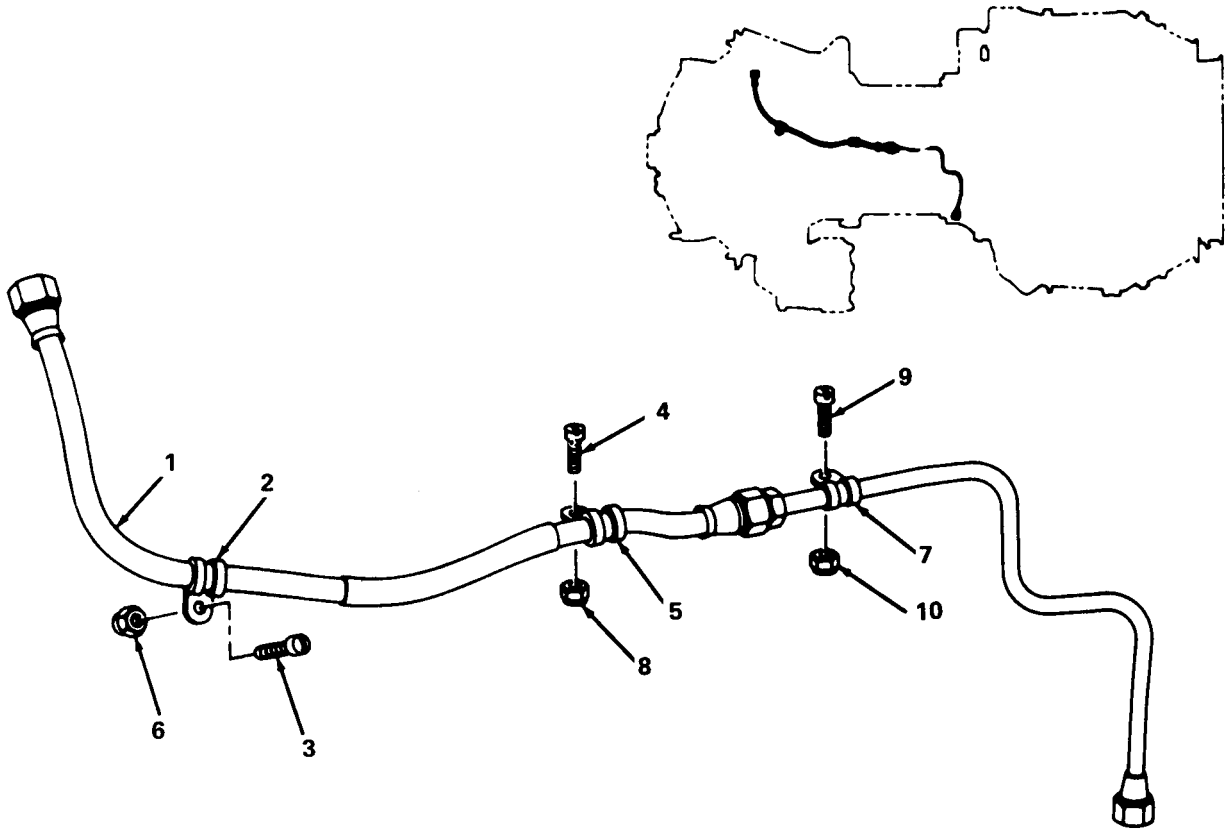
6-17. Fuel Control Air Pressure Sensing Hose (T53-L-11 Series Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION

ENGINE/



CAUTION

When hose is disconnected, immediately cap all openings.

1. Fuel Control Air Pressure Sensing Hose (1)

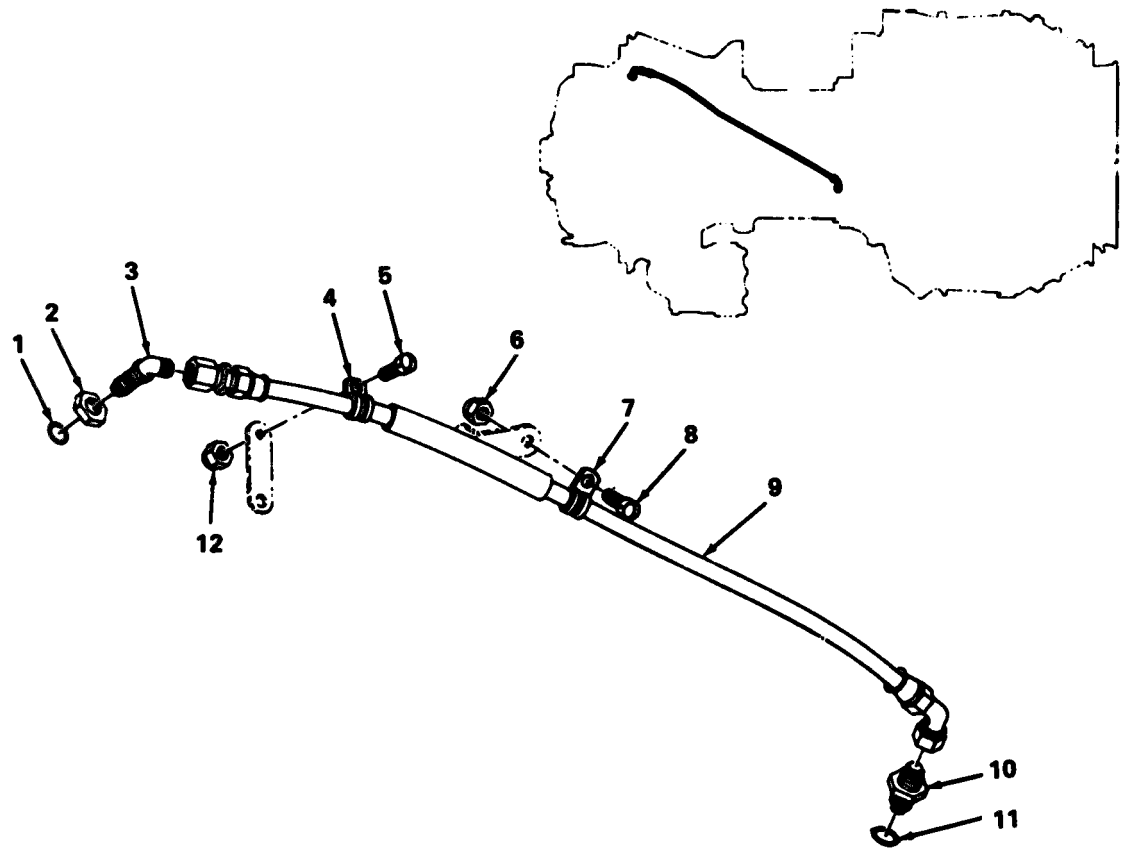
Disconnect from inlet housing fitting and fuel control fitting. **Remove** screws (3, 4 and 9) and nuts (6, 8 and 10) that secure hose clamps (2, 5 and 7) to engine. **Remove** hose (l).

6-18. Fuel Control Air Pressure Sensing Hose (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engine

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Screw (5) and Nut (12)		**Remove** from clamp (4).
2. Screw (8) and Nut **(6)**		**Remove** from clamp **(7).**



CAUTION

When hose is disconnected, immediately cap all openings.

3. Hose Assembly (9)		**Disconnect** from elbow (3) and union (10).

6-18. Fuel Control Air Pressure Sensing hose (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
4. Inlet Housing Assembly		**Loosen** nut (2) and **remove** elbow (3) with nut and packing (1) from inlet housing assembly. **Remove** packing and nut from elbow.
5. Fuel Control		**Remove** union (10) with packing (11) from fuel control. **Remove** packing from union.

6-19. Fuel Control Air Pressure Sensing Hose - Inspection

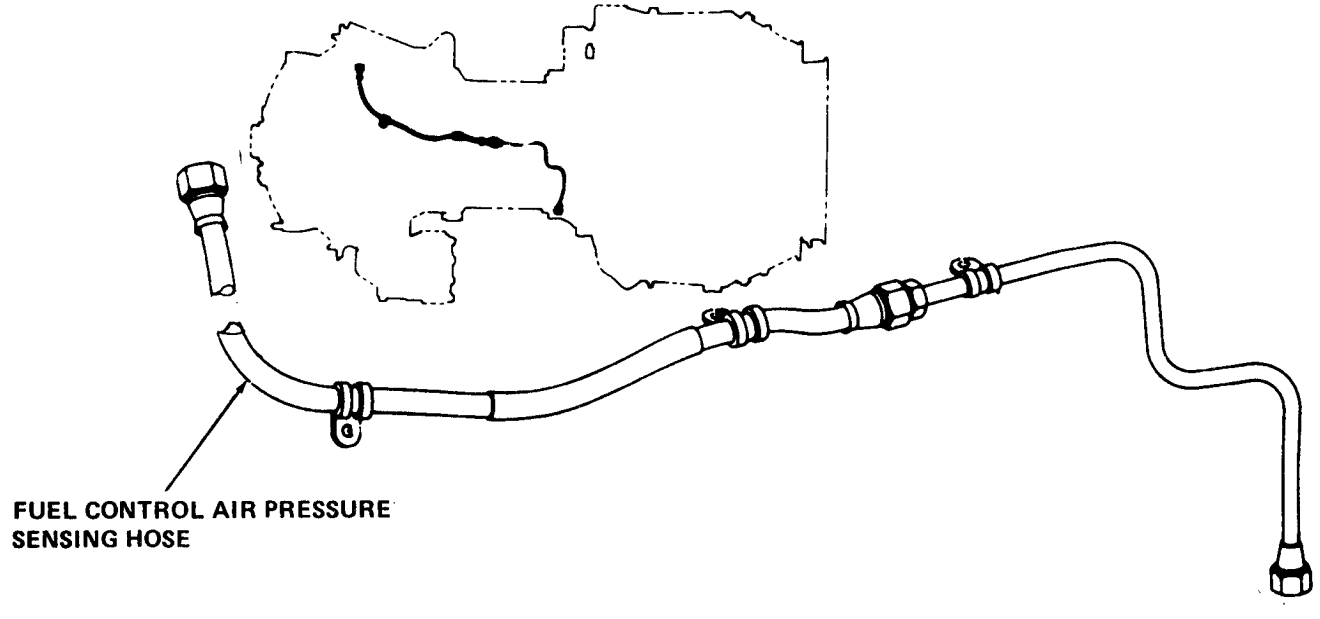
INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Welding Wire (item 90, Appendix D)

References
Para H-21 and 7-5

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Fuel Control Air Pressure Sensing Hose	Refer to paragraph H-21 and 7-5 for inspection and repair procedures.	**Inspect and repair.**

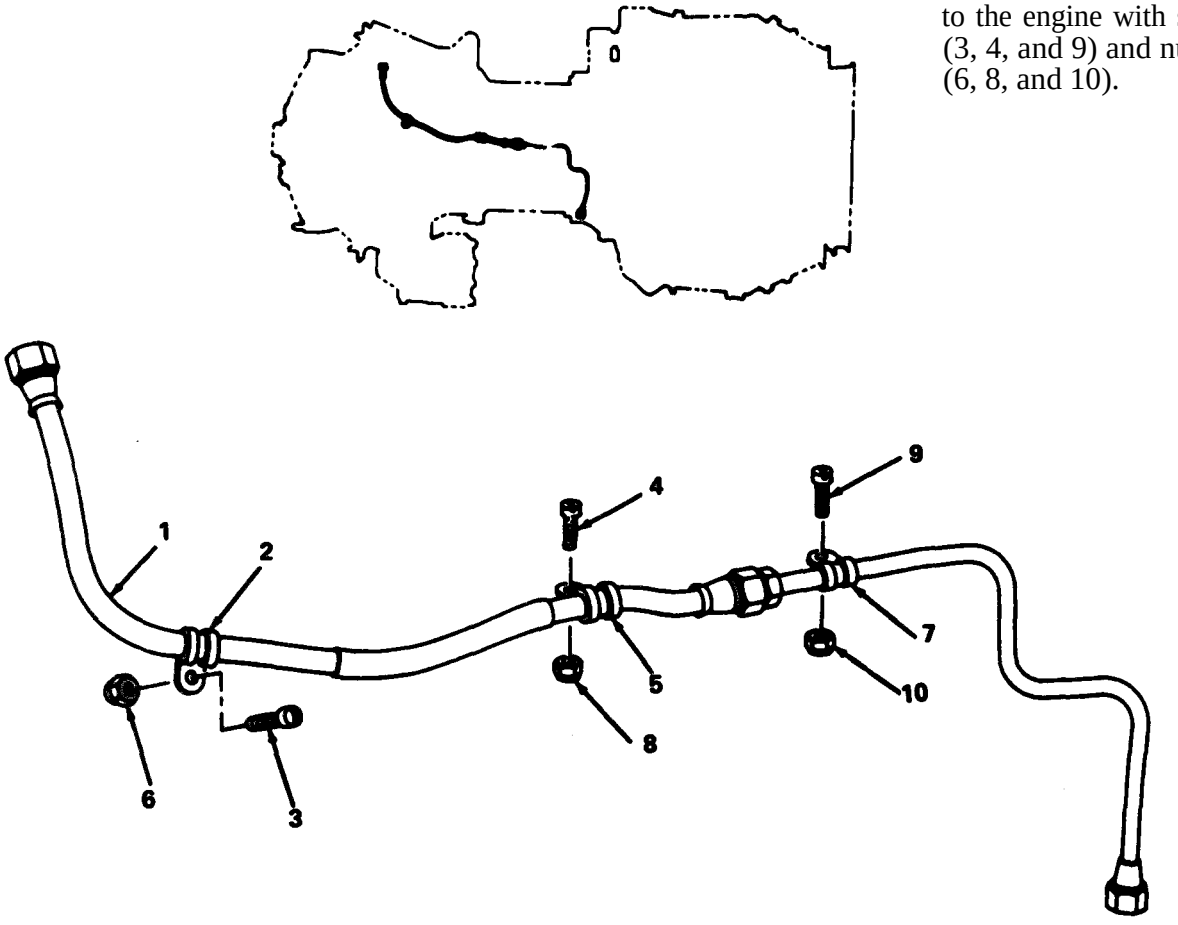


6-20. Fuel Control Air Pressure Sensing Hose (T53-L-11 Series Engines) - Installation

INITIAL SETUP

Applicable Configuration
T56-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ -	**NOTE** **Prior to installation of fuel control air pressure sensing hose (1) insure that chafing sleeve is positioned where hose may come in contact with overspeed governor and tachometer drive gearbox.**	
1. Fue Control Air pressure Sensing Hose (1)		**Connect** to inlet housing fitting and fuel control fitting.
2. Clamp (2,5, and 7)		**Position** and **secure** hose to the engine with screws (3, 4, and 9) and nuts (6, 8, and 10).

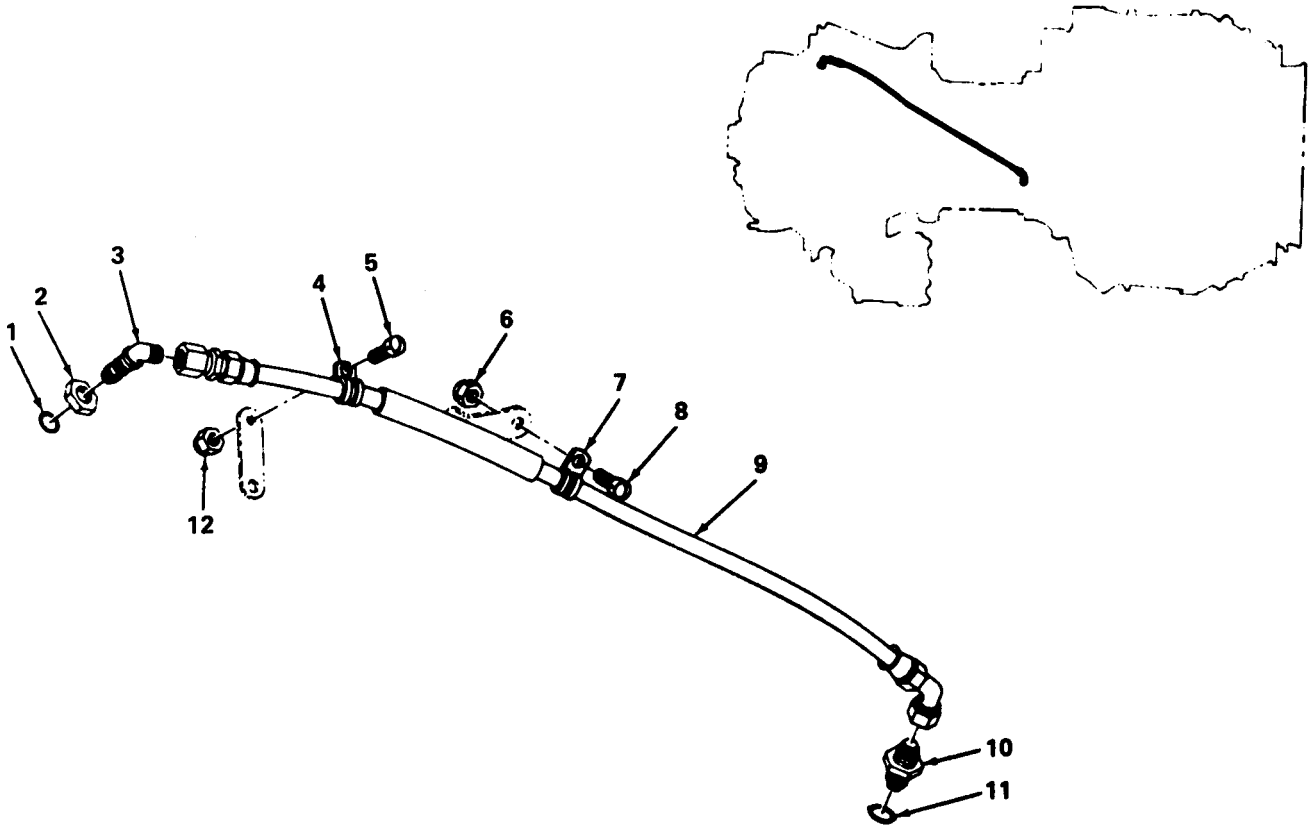


6-21. Fuel Control Air Pressure Sensing Hose (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**NOTE** **Prior to installation of hose assembly (9), insure that chafing sleeve is positioned where hose may come in contact with overspeed governor and tachometer drive gearbox.**	
1. Packing (11)		**Position** onto union and **install** union (10) into fuel control. **Tighten** union as required.



6-21. Fuel Control Air Pressure Sensing Hose (T53-L-13B/703 Engines) - Installation - Continued

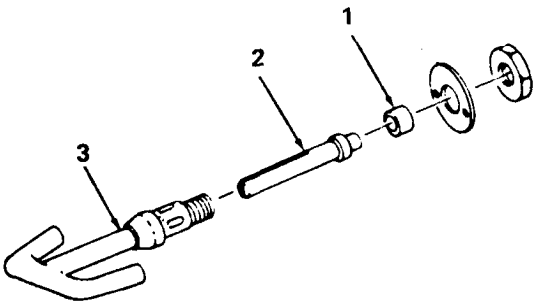
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Nut (2)		**Thread** onto elbow (3) and position packing (1) on elbow. **Install** elbow with nut and packing into inlet housing assembly. **Tighten** nut as required.
3. Hose Assembly (6)		**Connect** to union (10) and to elbow (3).
4. clamp (4)		**Secure** to bracket on overspeed governor and tachometer drive assembly with screw (5) and nut (12).
5. clamp (7)		**Secure** to bracket on forward flange of compressor housing with screw (8) and nut (6).

6-22. Fuel Vaporizer Assembly (T53-L-11 Series Engines) - Disassembly

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER ASSEMBLY/	**NOTE** **It is not necessary to remove fuel vaporizer assemblies for inspection. However, if one vaporizer assembly requires removal for cleaning or closer evaluation of damage, all fuel vaporizer assemblies shall be removed, disassembled, and cleaned prior to further inspection. Insure that threaded end of vaporizer is capped during cleaning and inspection to prevent entry of contaminants into fuel divider.**	
1. Bushing (1) and Fuel Divider (2)	Use number 8-32 screw.	**Remove** from fuel vaporizer (3).
2. Bushing (1)		**Remove** from fuel divider (2). **Discard** bushing.



6-23. Fuel Vaporizers (T53-L-11 Series Engines) - Cleaning

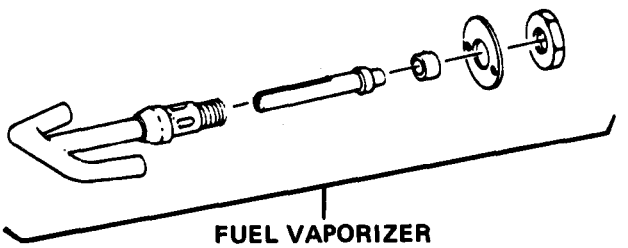
INITIAL SETUP

Applicable Configuration
T53-L-11 series Engines

References
Para 2-2

Consumable Materials
Drycleaning Solvent (item 24, Appendix D)
Trichloroethane (item 83, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER ASSEMBLY/		
1. Engine	Refer to paragraph 2-2.	When operated on alternate or emergency fuel or when coke deposits are excessive, **clean** fuel vaporizer assemblies.
	WARNING **Drycleaning solvent, P-D-680, used to clean parts is potentially dangarous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).**	
2. Fuel Vaporizer	Use drycleaning solvent (item 24, Appendix D).	Fully **immerse** in drycleaning solvent. **Soak** as long as necessary to soften carbon deposits.



6-23. Fuel Vaporizers (T53-L-11 Series Engines) - Cleaning - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER ASSEMBLY/ - Continued		
	CAUTION **Do not use a stainless steel brush in following action for item 3. Do not damage ceramic-coating on fuel vaporizer.**	
3. Fuel Vaporizer		Thoroughly **clean** with stiff fiber brush giving particular attention to insides of vaporizer exit legs. **Dry** with dry compressed air.
	WARNING **Use approved personnel protective equipment to protect eyes and face when using compressed air.** **Maximum allowable air pressure for cleaning operations is 30 psi.** **Do not direct air stream toward yourself or toward another person.**	
4. Fuel Vaporizer		**Rinse** with cold water. Then rinse with hot water. **Dry** with dry compressed air.
5. Divider		**Clean** as follows: a. **Loosen** carbon and other foreign material using stiff fiber brush. b. **Remove** carbon by **soaking** divider in trichloroethane (item 83, Appendix D) for 5 minutes. c. **Dry** divider with compressed air.

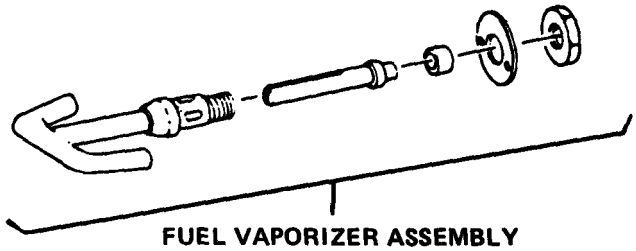
6-24. Fuel Vaporizer Assembly (T53-L-11 Series Engines) - Inspection

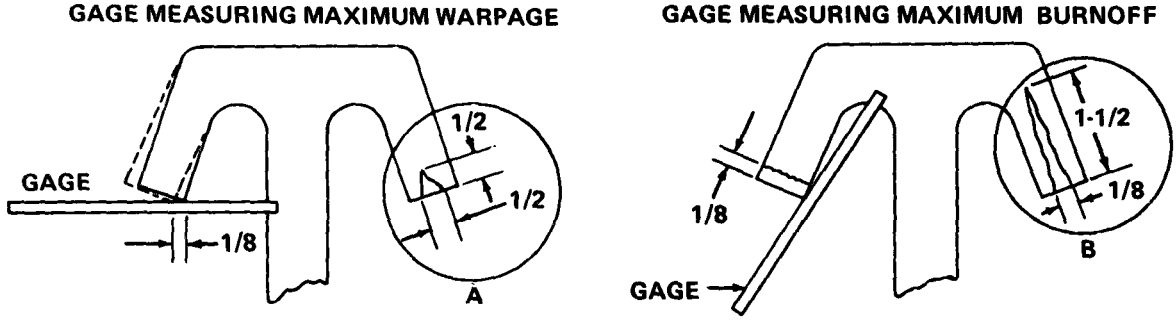
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para H-20 and 6-26

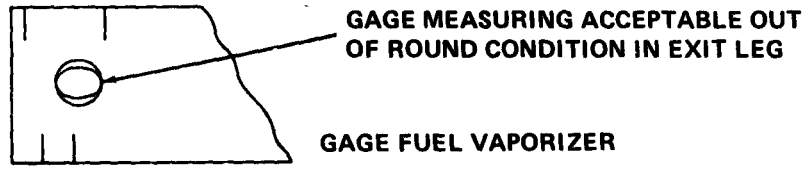
Consumable Materials
Trichloroethane (item 83, Appendix D)
Fluorescent-Penetrant H-20

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER ASSEMBLY/	 FUEL VAPORIZER ASSEMBLY	
	Using lights, mirrors, and 7-power magnifying glass inspect as follows:	
	NOTE	
	Fuel vaporizer inspection gage (shown in following figure) maybe fabricated locally. (Refer to Appendix F.)	

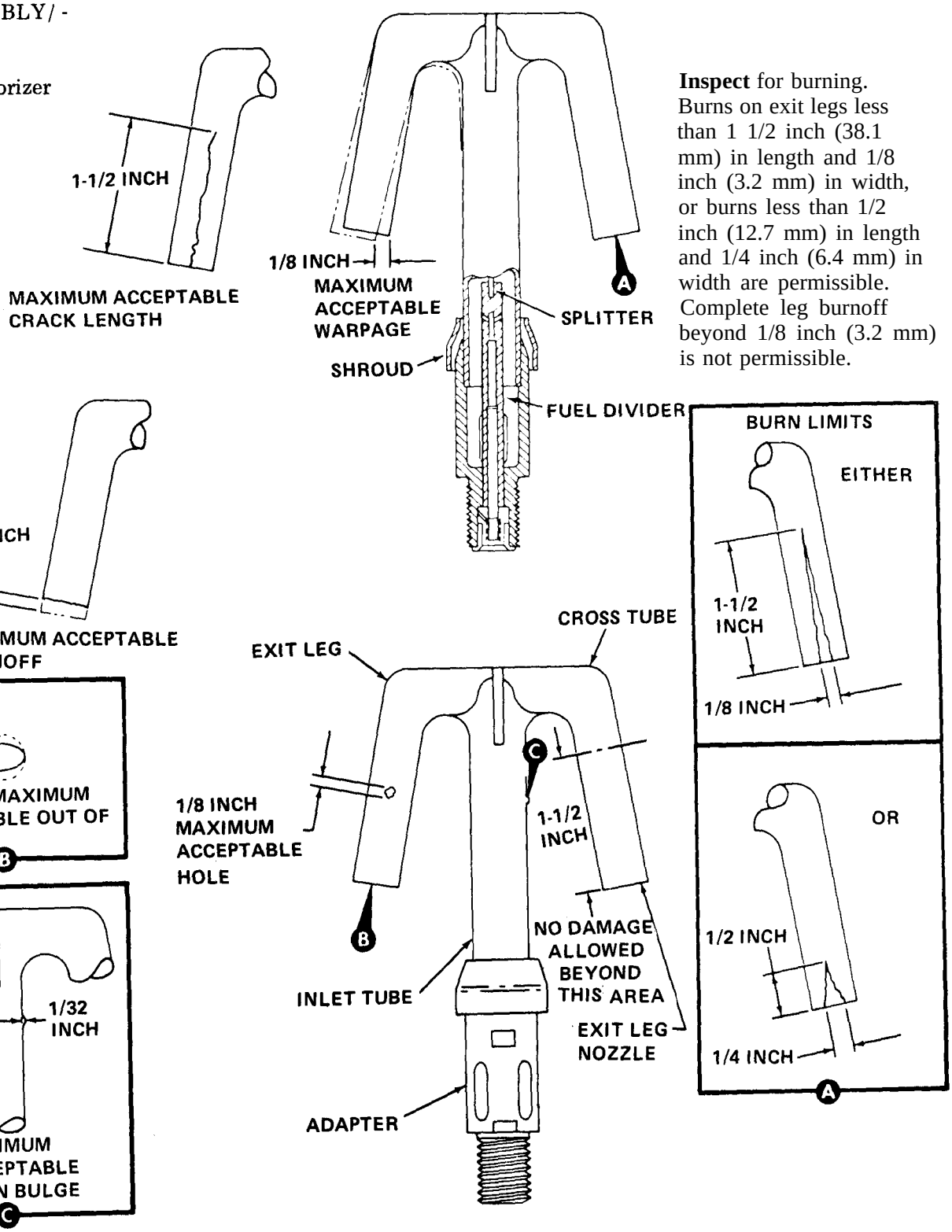


DETAIL A AND B WILL BE MEASURED BY USING 1/4, 1/2, 1/8 AND 1-1/2 INCH SCRIBE MARKS ON UPPER END OF GAGE

ALL DIMENSIONS ARE IN INCHES



6-24. Fuel Vaporizer Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER ASSEMBLY/ - Continued 1. Fuel Vaporizer Assembly		**Inspect** for burning. Burns on exit legs less than 1 1/2 inch (38.1 mm) in length and 1/8 inch (3.2 mm) in width, or burns less than 1/2 inch (12.7 mm) in length and 1/4 inch (6.4 mm) in width are permissible. Complete leg burnoff beyond 1/8 inch (3.2 mm) is not permissible.

6-24. Fuel Vaporizer Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER ASSEMBLY/ - Continued	Observe the following limits: a. Holes with 1/8 inch (3.2 mm) maximum diameter are allowed in all exit legs within 1/2 inch (12.7 mm) from end of exit leg. b. Not more than 1/8 inch (3.2 mm) warpage or tilt (in any direction) of entire vaporizer or of exit legs is allowed in all vaporizers and in all exit legs. **NOTE** Inlet tube and exit legs must be parallel and symmetrical. Warpage may be judged by deviation from parallel or from symmetry. To check, place used vaporizer assembly against an outline drawn from a new assembly. c. Cracks up to 1 1/2 inch (38.1 mm) long are allowed in end of exit leg. d. Burn bulges are acceptable up to 1/2 inch (12.7 mm) provided that no cracks appear on bulge. Fuel vaporizer shall be rejected if burn bulge cracks are questionable. e. Fuel vaporizer exit leg out-of-roundness up to 1/8 inch (3.2 mm) is allowable.	
2. Divider	To clean: Use a stiff fiber brush to loosen carbon and other foreign material. Remove carbon by soaking in trichloroethane (item 83, Appendix D) for 5 minutes. Dry with clean, dry compressed air.	**Inspect** divider for clogging. **Clean.**
8. Splitter		**Inspect** splitter for distortion. If divider can be inserted into splitter properly, distortion is acceptable. If divider cannot be inserted into splitter, it is unacceptable and fuel vaporizer must be **replaced.**

6-24. Fuel Vaporizer Assembly (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER ASSEMBLY/ - Continued		
4. Weldments Joining Shroud to Adapter	If no crack indications are noted, vaporizers may be reinstalled, provided that no other damage is suspected. If visual inspection of shroud weldments discloses any crack-like indications, additional inspection of weldments should be accomplished, using fluorescent-penetrant inspection. (Refer to paragraph H-20.) If cracks are noted in shroud weld area, replace vaporizer.	**Inspect** four weldments joining shroud to adapter.
5. Fuel Vaporizer Bushing	Burring or distortion which would affect mating surfaces is not permitted. If limits given in preceding action for items 1 through 5 are exceeded, replace fuel vaporizer as follows: **NOTE** If inspection of divider reveals no malfunction, change only the vaporizer.	**Inspect** the fuel vaporizer bushing for damage in the area where it contacts the fuel manifold.
6. Divider, Sleeve		**Insert 8-32** sockethead screw into divider. **Remove** divider and sleeve.
7. Divider and New Bushing		**Install** divider and new bushing into new vaporizer and **reinspect.**
8. Fuel Vaporizer Assembly	Refer to paragraph 6-26.	**Perform** functional test of fuel vaporizer assembly.

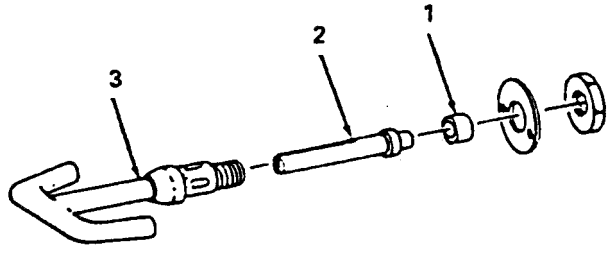
6-25. FUEL VAPORIZER ASSEMBLY (T53-L-11 SERIES ENGINES) – ASSEMBLY

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER ASSEMBLY/		
1. Bushing (1) (1-130-176-01)		**Install** on fuel divider (2)
	CAUTION An improperly installed fuel divider in action for item 2 can deflect all fuel through one fuel vaporizer exit leg. This condition will cause rapid burnoff of the remaining leg and subsequent damage to the combustion chamber.	
2. Bushing (1) and Fuel Divider (2)		**Insert** into fuel vaporizer (3).
3. Fuel Vaporizer (3)		**Hold** up and **sight** through louvers to **insure** that fuel vaporizer splitter slides into slot in fuel divider. **Replace** fuel vaporizer if divider cannot be properly installed because of distortion of splitter.
4. Fuel Vaporizer Assembly		**Perform** functional test.
5. Fuel Vaporizer Assembly		**Cap** and **place** in a suitable rack until installation.



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6-26. DELETED.

6-27. STARTING FUEL MANIFOLD (T53-L-11 Series Engines) - REMOVAL

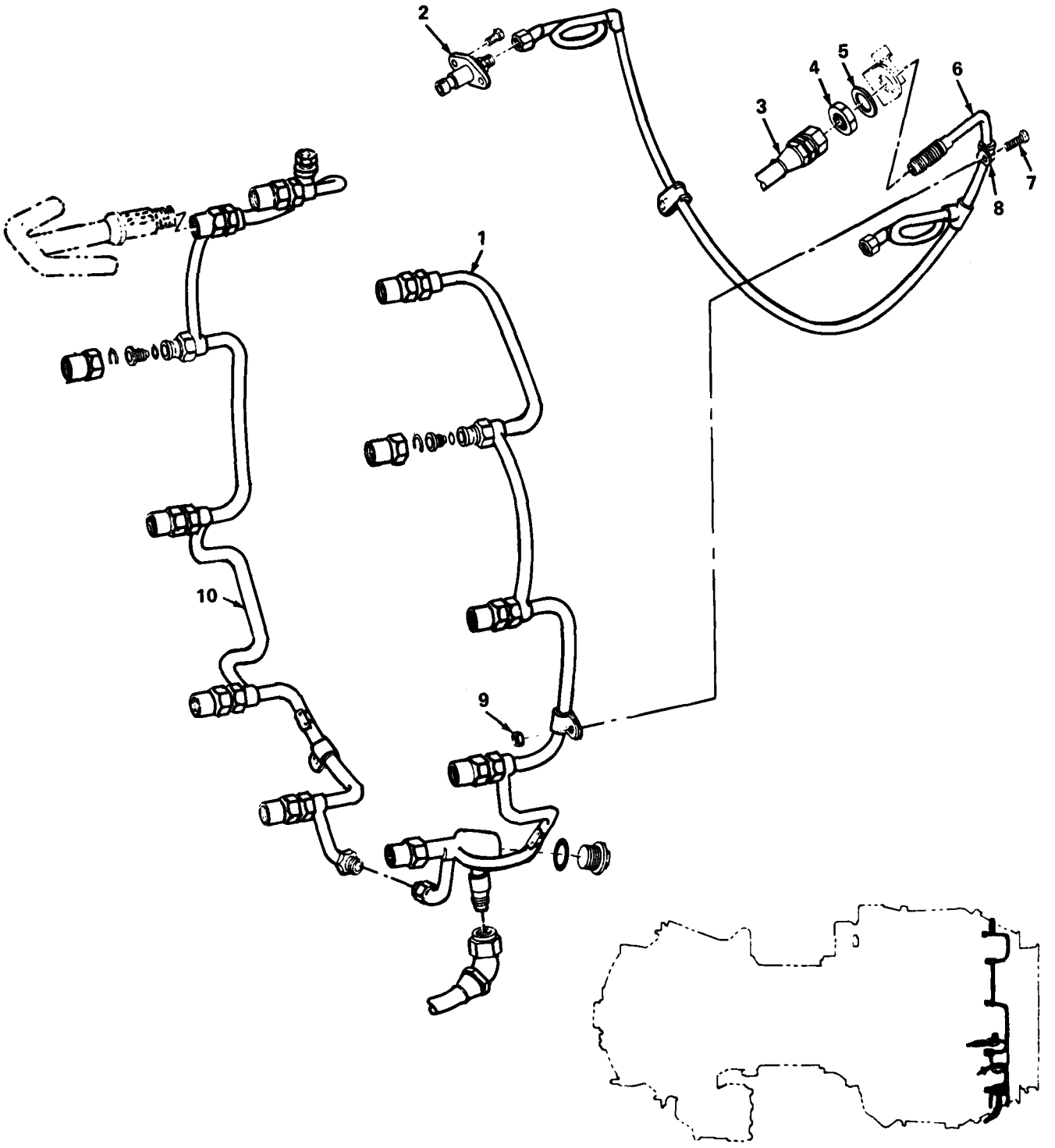
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Hose Assembly (3)		**Disconnect** from starting fuel manifold (6).
2. Nut (4) and Washer (5)		**Remove.**
	CAUTION To prevent disassembly of fuel nozzle assembly, hold nozzle retainer with a suitable wrench while loosening connector nut in following action for item 3.	

6-27. Starting Fuel Manifold (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



6-27. Starting Fuel Manifold (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
3. Starting Fuel Manifold Connectors		**Disconnect** from starting fuel nozzle assemblies (2).
4. Starting Fuel Manifold (6)		**Separate** from main fuel manifold (1 and 10).
5. Screws (7) and Nuts (9)		**Remove** screws and nuts that secure clamps (8).
	CAUTION **Immediately cap manifold and cover all exposed openings.**	
6. Starting Fuel Manifold (6)		Carefully **lift** off,

6-28. Starting Fuel Manifold (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

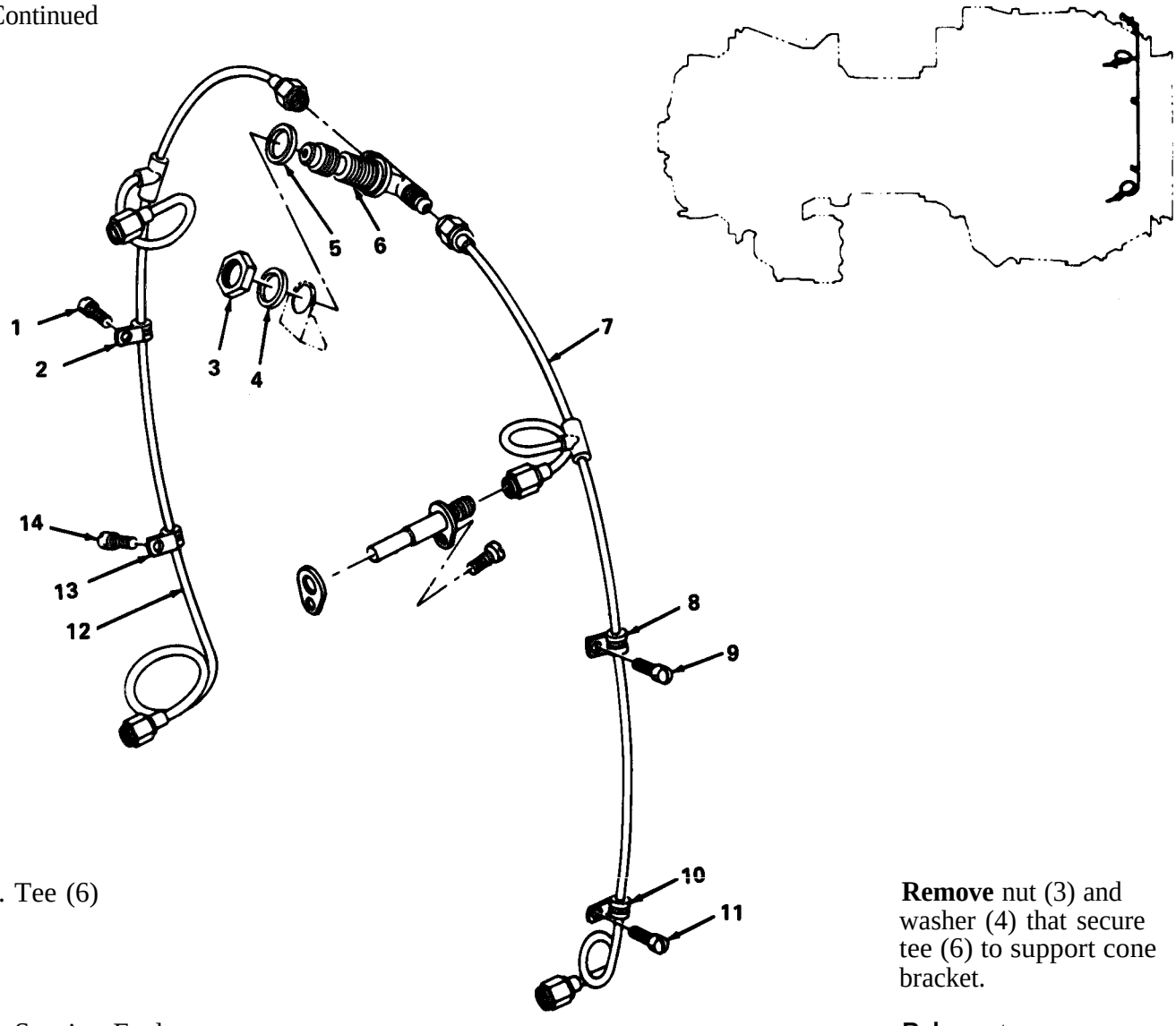
Applicable Configuration
T53-L-13B/703 Engines

References
Para 6-37

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Hose	Refer to paragraph 6-37 for removal.	**Remove,**
2. Support Cone		**Remove** screws (1, 9, 11 and 14) that secure clamps (2, 8, 20 and 13) to support cone.

6-28. Starting Fuel Manifold (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
8. Tee (6)		**Remove** nut (3) and washer (4) that secure tee (6) to support cone bracket.
4. Starting Fuel Manifold (7 and 12)		**Release** torque on connector nuts that hold manifold to starting fuel nozzles, **Remove** left, and right-hand starting fuel manifold (7 and 12) and tee (6) as a unit.
5. Washer (5)		**Remove. Cap** all openings,



6-28. Starting Fuel Manifold (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
	NOTE **Further disassembly is not normally required unless a manifold or tee is to be replaced.**	
6. Connector Nuts and Tee		**Loosen** connector nuts and **separate** left hand starting fuel manifold (7) and right hand starting fuel manifold (12) from tee (6).

6-29. Starting Fuel Manifolds - Inspection

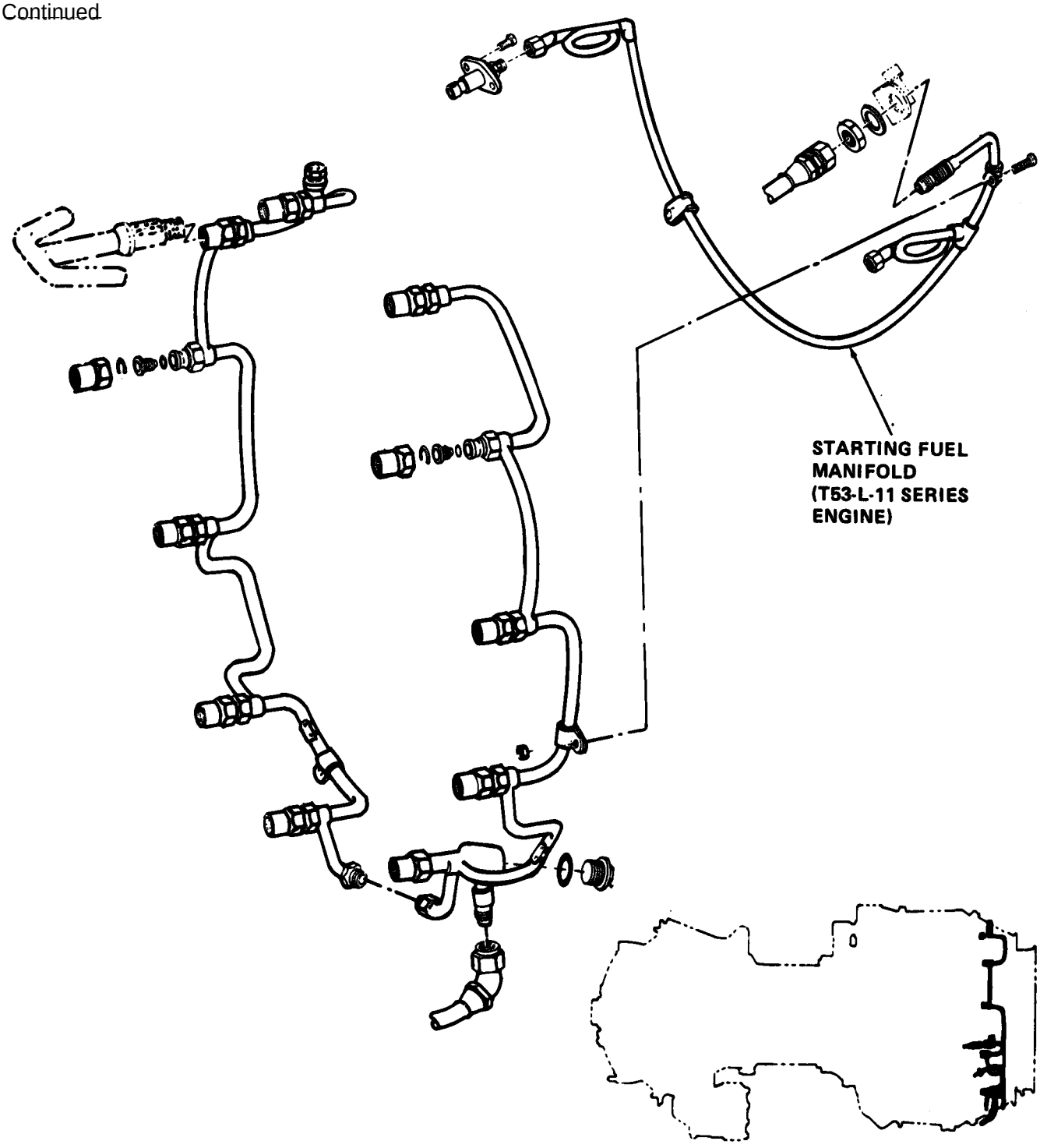
INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Manifolds	Replace manifolds that are damaged or show evidence of clogging.	**Inspect** for breaks, cracks, damaged connectors and other conditions that would make manifolds unsatisfactory for future use. **Replace** those that are damaged or show evidence of clogging.

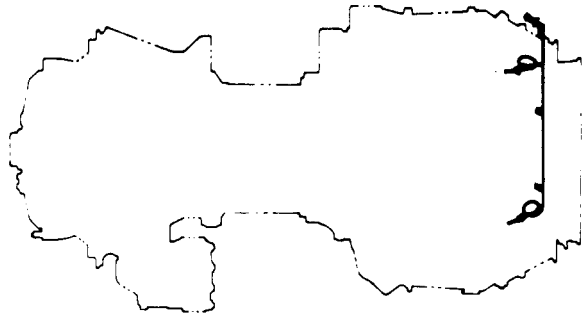
6-29. Starting Fuel Manifolds - Inspection - Continued

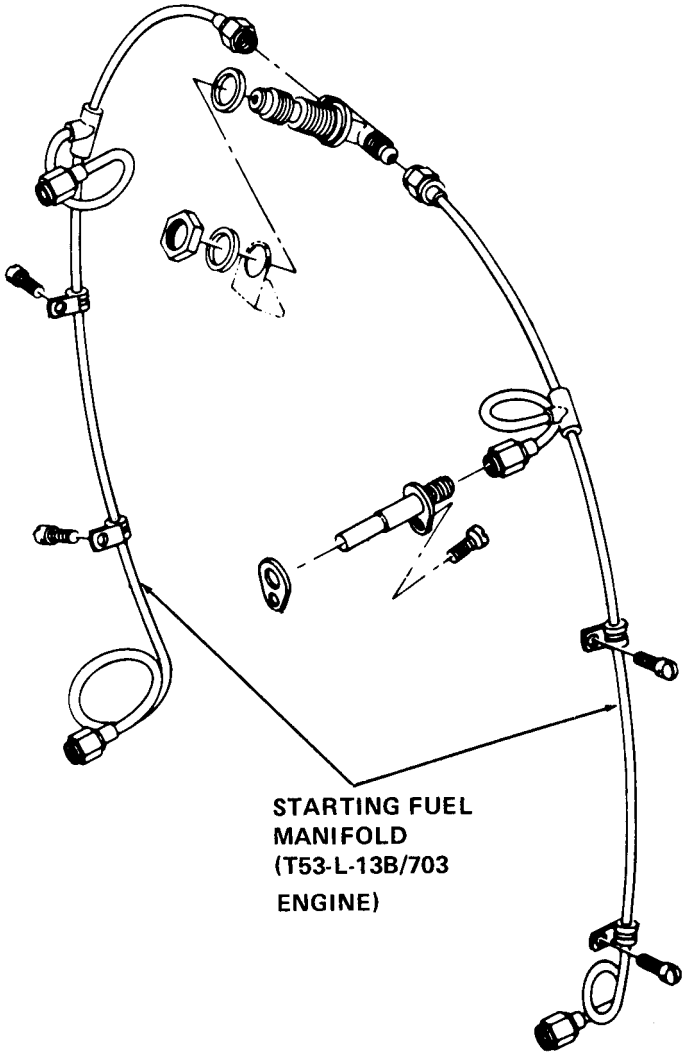
LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



6-29. Starting Fuel Manifolds - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		





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6-30. **DELETED.**

6-31. **DELETED.**

6-32. STARTING FUEL MANIFOLD (T53-L-11 Series Engines) - INSTALLATION

INITIAL SETUP

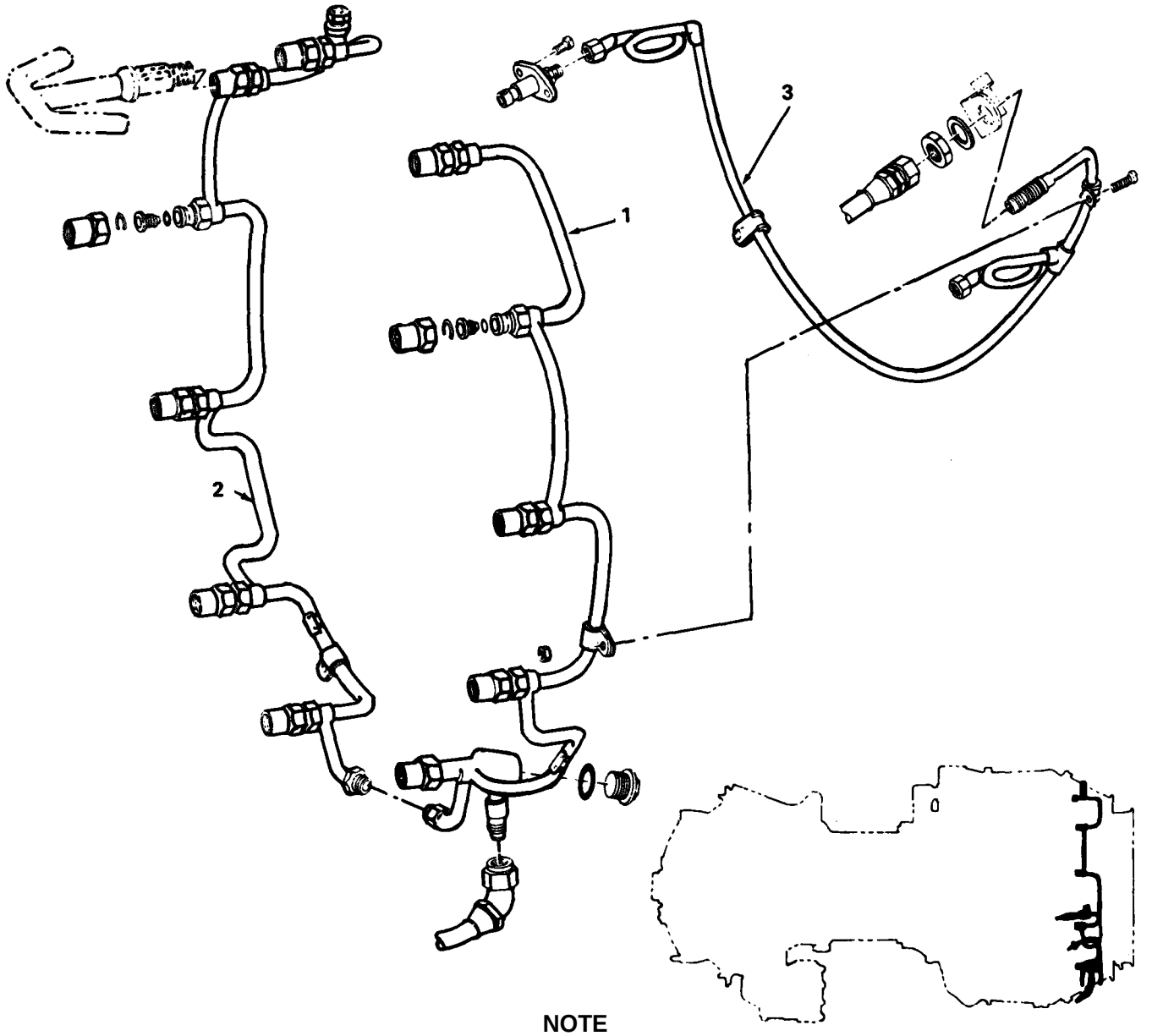
Applicable Configuration
T53-L-11 Series Engines

References
Appendix G, Table G-3, Reference Number 64
Para 6-61

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Main Fuel Manifold (1 and 2)	Refer to paragraph 6-61,	**Install.**

6-32. Starting Fuel Manifold (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



NOTE

Remove coverings from manifold and inspect openings to insure cleanliness.

2. Starting Fuel Manifold (3)	**Place in** position over rear support cone.

6-32. Starting Fuel Manifold (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
3. Starting Fuel Manifold		**Secure** to support cone bracket with washer and nut. **Tighten** nut. **Connect** starting fuel. hose assembly to starting fuel manifold.
4. Starting Fuel Manifold.		**Secure** to main fuel manifold with screws and nuts.
5. Starting Fuel Manifold		**Check** installation for chafing or rubbing.
6. Starting Fuel Manifold		**Connect** connectors to starting fuel nozzles. **Tighten** connectors as required. **(Refer** to Appendix G, table G-3, reference number 64.)

6-33. Starting Fuel Manifold (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

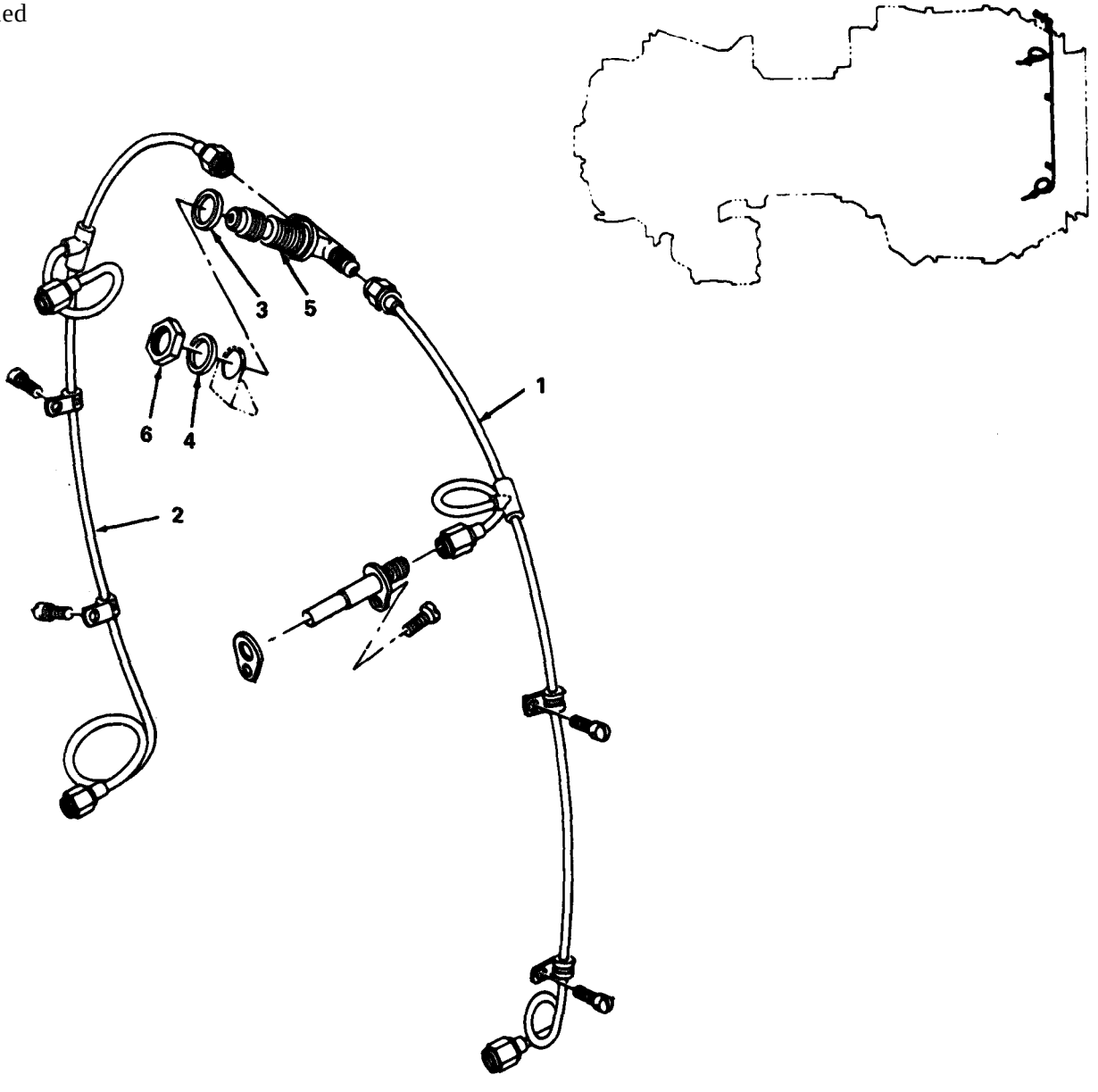
Applicable Configuration
T53-L-13B/703 Engines

References
Appendix G, Table G-4, Reference Number 42

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Manifolds (1 and 2)		**Position** on tee and **hand-tighten** connector nuts.

6-33. Starting Fuel Manifold (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



NOTE

Do not tighten connector nuts to full torque at this time.

2. Washers (3) — **Position** on tee (5).

6.33. Starting Fuel Manifold (T53-L-13B/703 Engines) - installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
3. Manifolds		**Position** over support cone and **insert** tee into support cone bracket. **Aline** connector nuts with starting fuel manifolds end **hand-tighten** connector nuts.
4. All Connector Nuts		**Tighten** as required **(refer** to Appendix G, table G-4, reference number 42).
5. Washer and Nut (4 and 6)		**Install** on tee and **tighten.**
6. Clamps		**Secure** with screws to support cone. **Tighten** screws as required and **lockwire.**

6-34. Starting Fuel Hoses (T53-L-11 Series Engines) - Removal

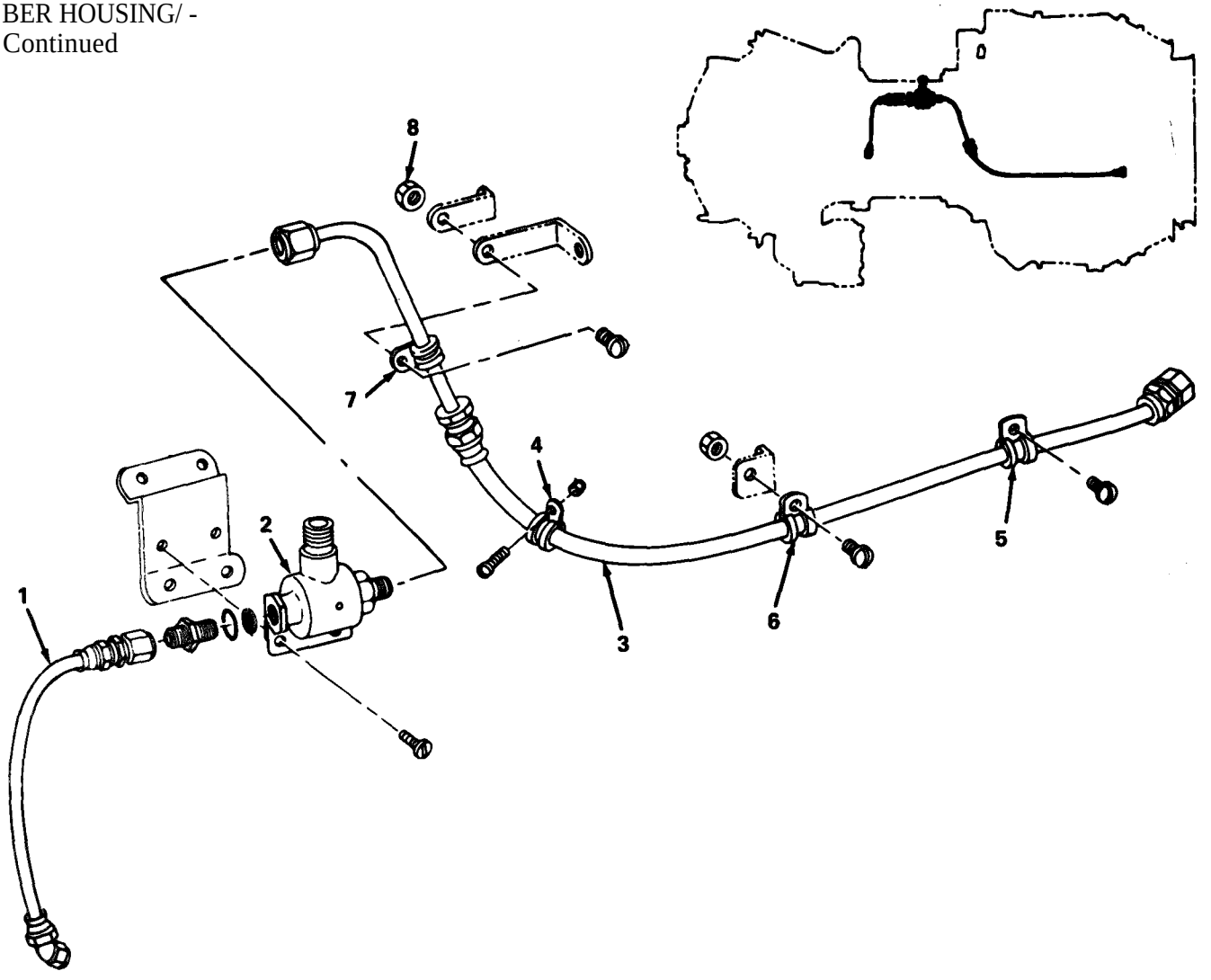
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Hose Assembly (1)		**Disconnect** from fuel control fitting and starting fuel solenoid valve (2). **Remove** hose.

6-34. Starting Fuel Hoses (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



2. Starting Fuel Hose Assembly (3)		**Disconnect** from fuel control fitting and starting fuel solenoid valve (2) and starting fuel manifold (see following figure).
3. Hose Clamps		**Remove all** nuts and screws that secure hose clamps (4, 5, 6, and 7). **Remove hose.**
4. Nut and Screw		**Reinstall** nut and screw.

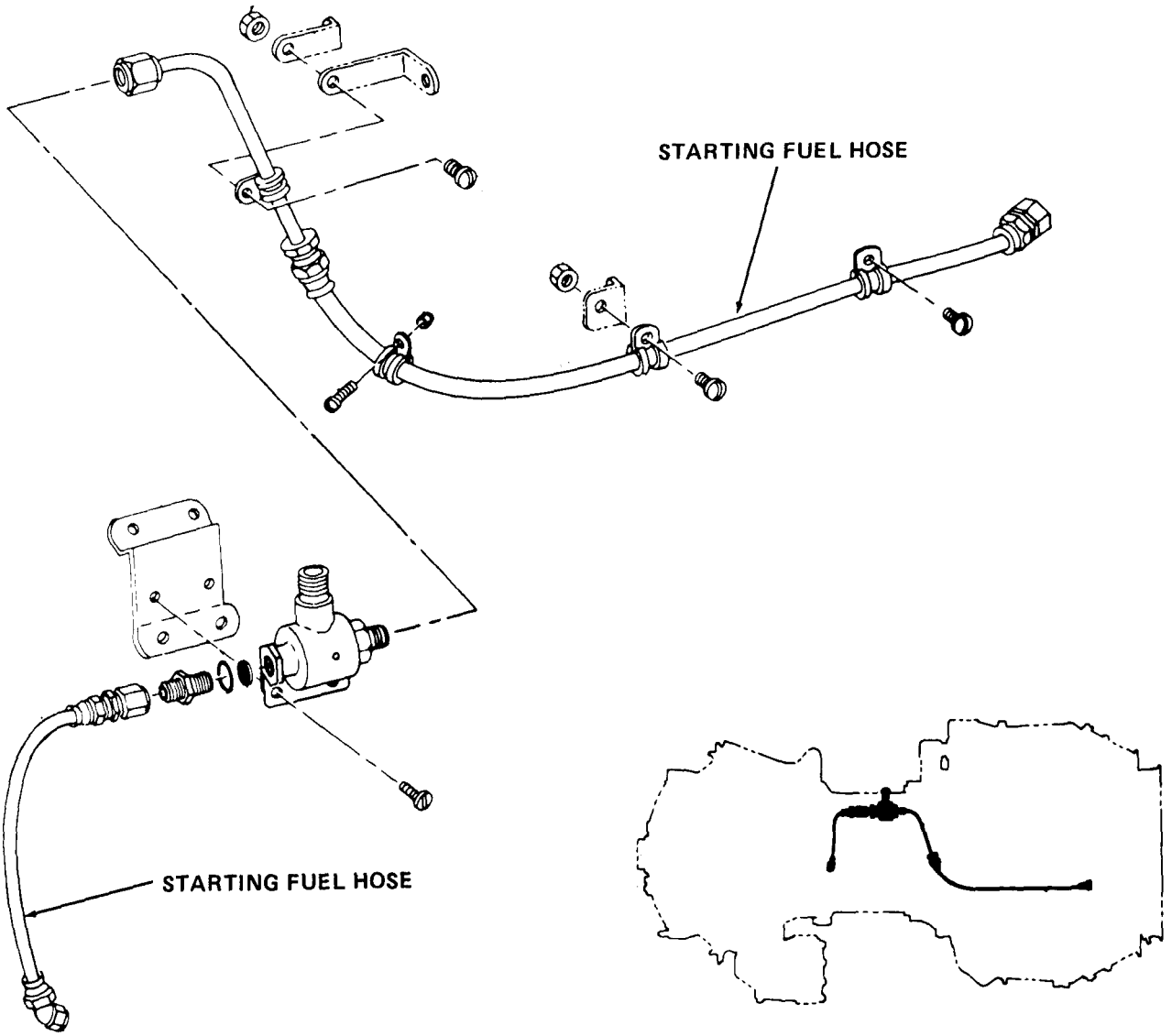
6-35. Starting Fuel Hoses (T53-L-11 Series Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para H-21 and 7-5

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Hoses	Refer to paragraph H-21.	**Inspect.**
2. Hoses	Refer to paragraph 7-5.	**Repair.**



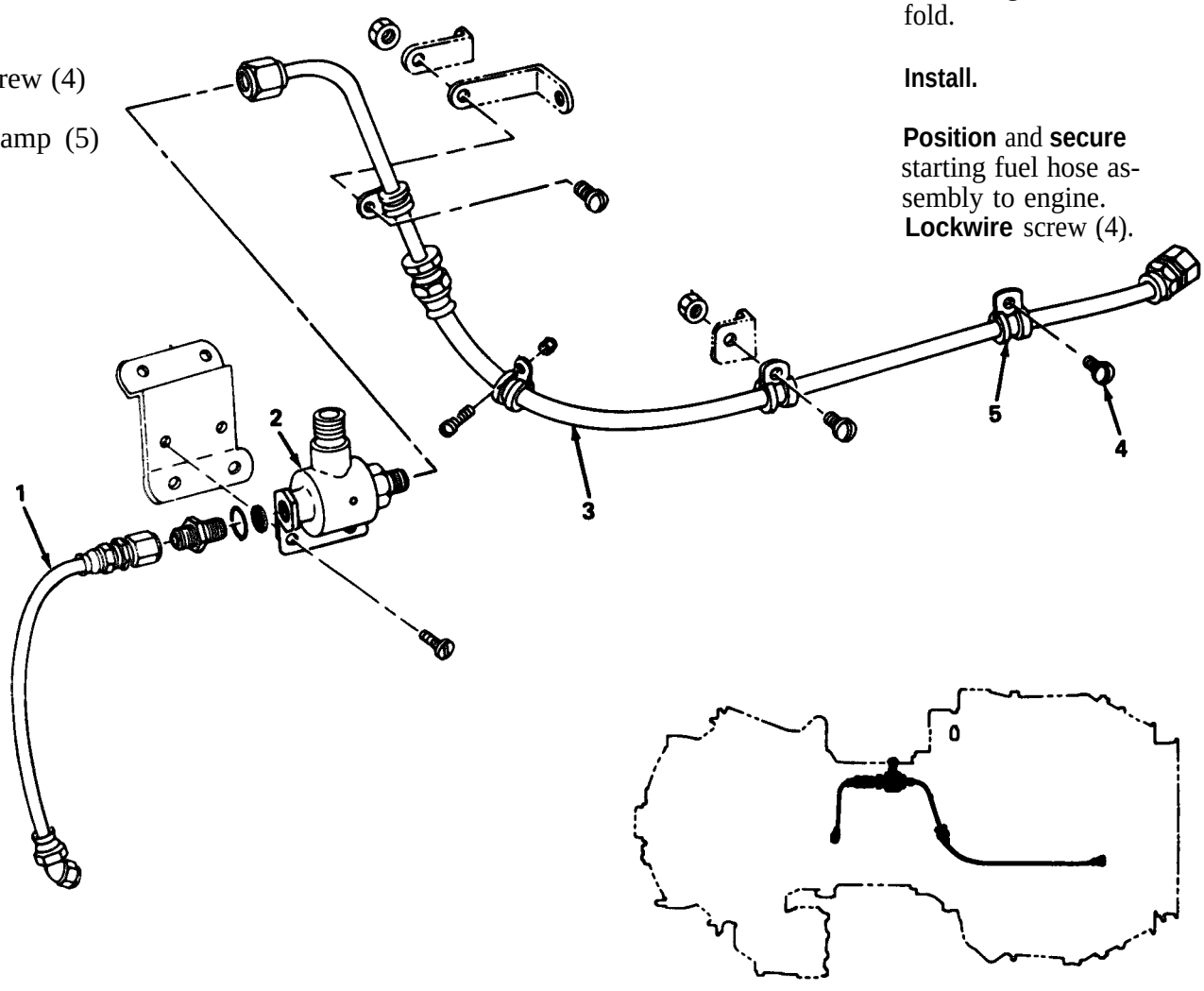
6-36. Starting Fuel Hoses (T53-L-11 Series Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Lockwire (item 41,42, or 43, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Hose Assembly (1)		**Connect** to fuel control fitting and to starting fuel solenoid valve (2).
2. Starting Fuel Hose Assembly (3)		**Connect** to starting fuel solenoid valve (2) and to starting fuel manifold.
3. Screw (4)		**Install.**
4. Clamp (5)		**Position** and **secure** starting fuel hose assembly to engine. **Lockwire** screw (4).

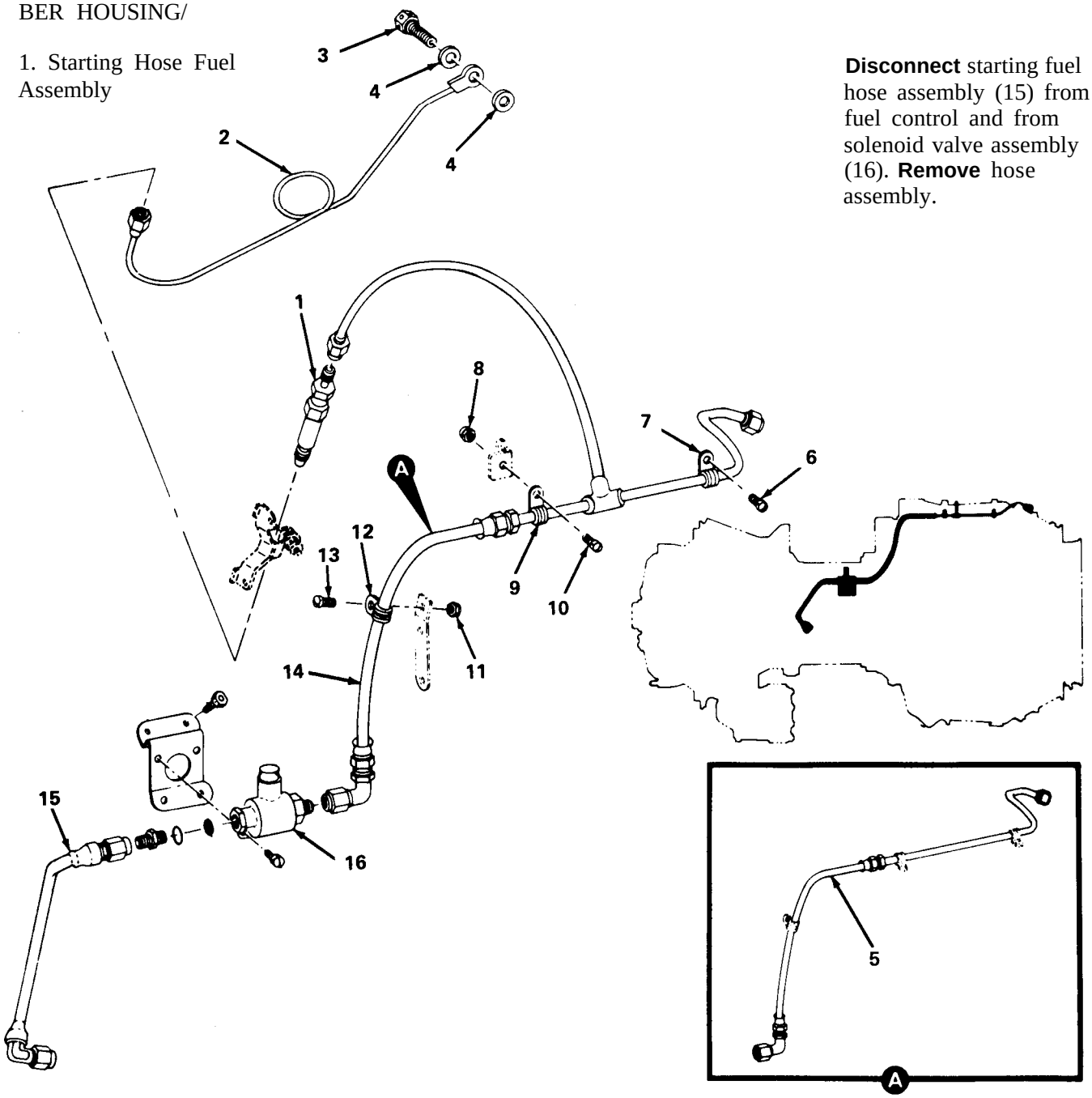


6-37. Starting Fuel Hose Assembly and Check Filter Valve (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Hose Fuel Assembly		**Disconnect** starting fuel hose assembly (15) from fuel control and from solenoid valve assembly (16). **Remove** hose assembly.



6-37. Starting Fuel Hose Assembly and Check Filter Valve (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
2. Screws (10 and 13) and Nuts (8 and 11)		**Remove** screw (10) and nut (8) from clamp (9). **Remove** screw (6) from clamp (7). **Remove** screw (13) and nut (11) from clamp (12),
	NOTE If check filter valve (1) is installed, omit item 3 and continue with item 4.	
3. Starting Fuel Hose Assembly		**Disconnect** starting fuel hose assembly (5) from solenoid valve assembly (16) and from starting fuel manifold. **Remove** hose assembly.
4. Starting Fuel Hose Assembly (14)		**Disconnect** starting fuel hose assembly (14) from check filter valve (1). **Disconnect** solenoid valve assembly (16) from starting fuel manifold. **Remove** hose assembly.
5. Bolt (3) and Gasket (4)		**Remove** from boss on combustion chamber housing. **Discard** gaskets.
6. Tube Assembly (2)		**Disconnect** from check filter (l). **Remove** tube assembly.
7. Check Filter Valve		**Loosen** screw and nut on bracket and clamp assembly that secures check filter valve, **Remove** valve.

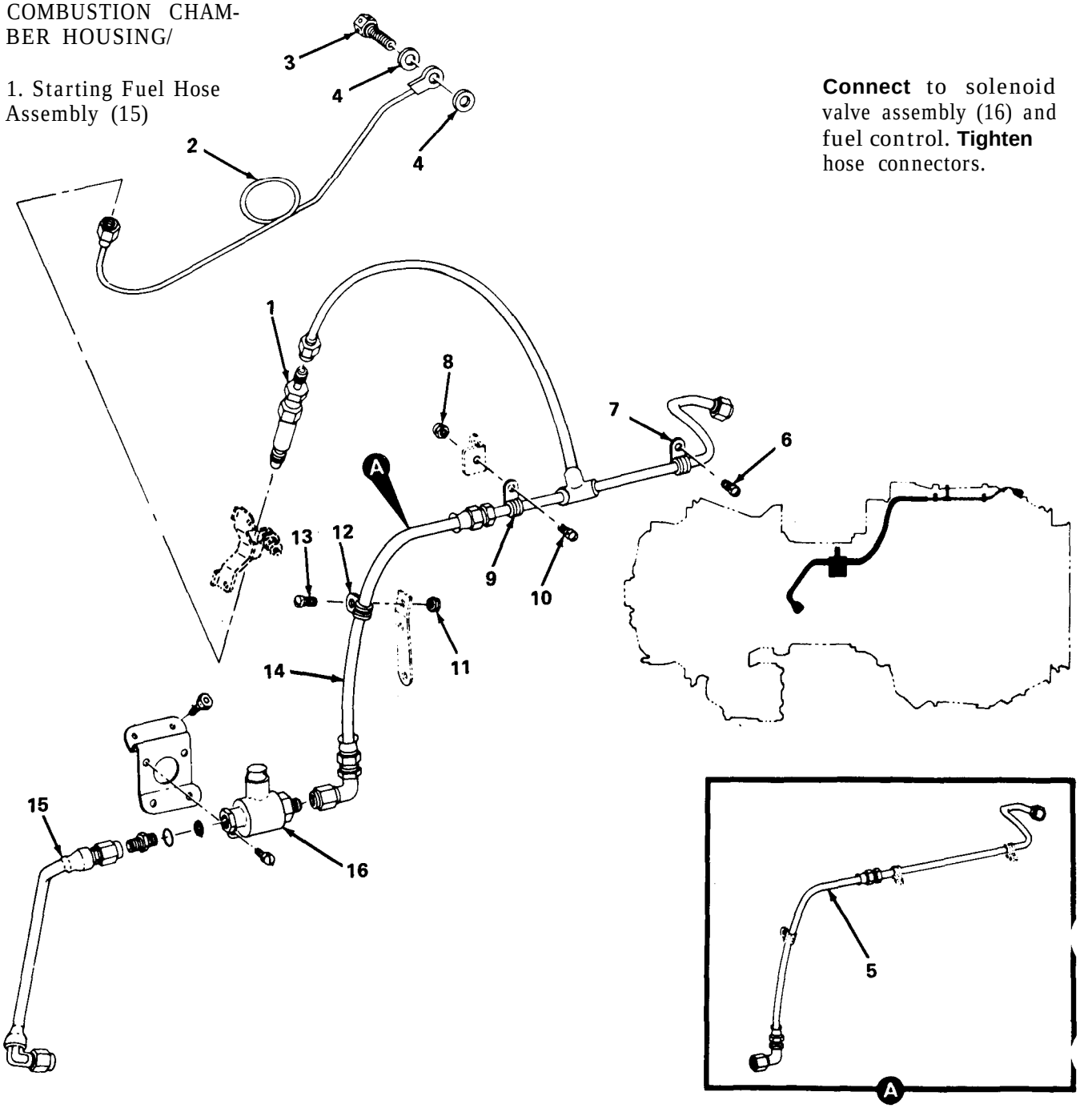
6-38. Starting Fuel Hose Assembly and Check Filter Valve (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

References
Appendix G, Table G-4, Reference Number 57

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Hose Assembly (15)		**Connect** to solenoid valve assembly (16) and fuel control. **Tighten** hose connectors.



6-38. Starting Fuel Hose Assembly and Check Filter Valve (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
	NOTE If check filter valve (1) was removed, omit following action for item 2, (Starting Fuel Hose Assembly). If check filter valve was not installed, disregard action for items 3 thru 9 (Tube and Fuel Hose Assemblies).	
2. Starting Fuel Hose Assembly (5)		**Connect** to solenoid valve assembly and starting fuel manifold. **Tighten** hose connectors.
	NOTE Do not lubricate bolt (3) in installation of Tube Assembly, item 3, insure that gaskets STD3027C5 are installed.	
3. Tube Assembly (2)		**Position** on combustion chamber housing. **Secure** with bolt (3) and gaskets (4). Do not tighten bolt at this time.
	NOTE A filter is located at the air "IN" side of check filter valve.	
4. Check Filter Valve (1)		**Position** in bracket. **Clamp** assembly with arrow on top of valve and pointing away from tube assembly. **Tighten** screw and nut on bracket and **clamp** assembly lightly.
5. Tube Assembly (2)		**Connect** to check filter valve. **Torque** as required.

6-38. Starting Fuel Hose Assembly and Check Filter Valve (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
6. Starting Fuel Hose Assembly (14)		**Connect** to solenoid valve assembly (16) starting fuel manifold and check filter valve (l). **Tighten** connections as required.
7. Bolt (3)	Refer to Appendix G, table G-4, reference number 57.	**Tighten** as required. **Lockwire.**
8. Screw		**Tighten** screw that secures check filter valve in bracket and **clamp** assembly.
9. Clamp (12)		**Secure** to bracket at forward face of diffuser housing with screw (13) and nut (11).
10. Clamp (9)		**Secure** to bracket on for ward flange of combustion chamber housing with screw and nut. **Secure** clamp with screw.

6-39. Starting Fuel Hose Assembly and Filter Valve (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

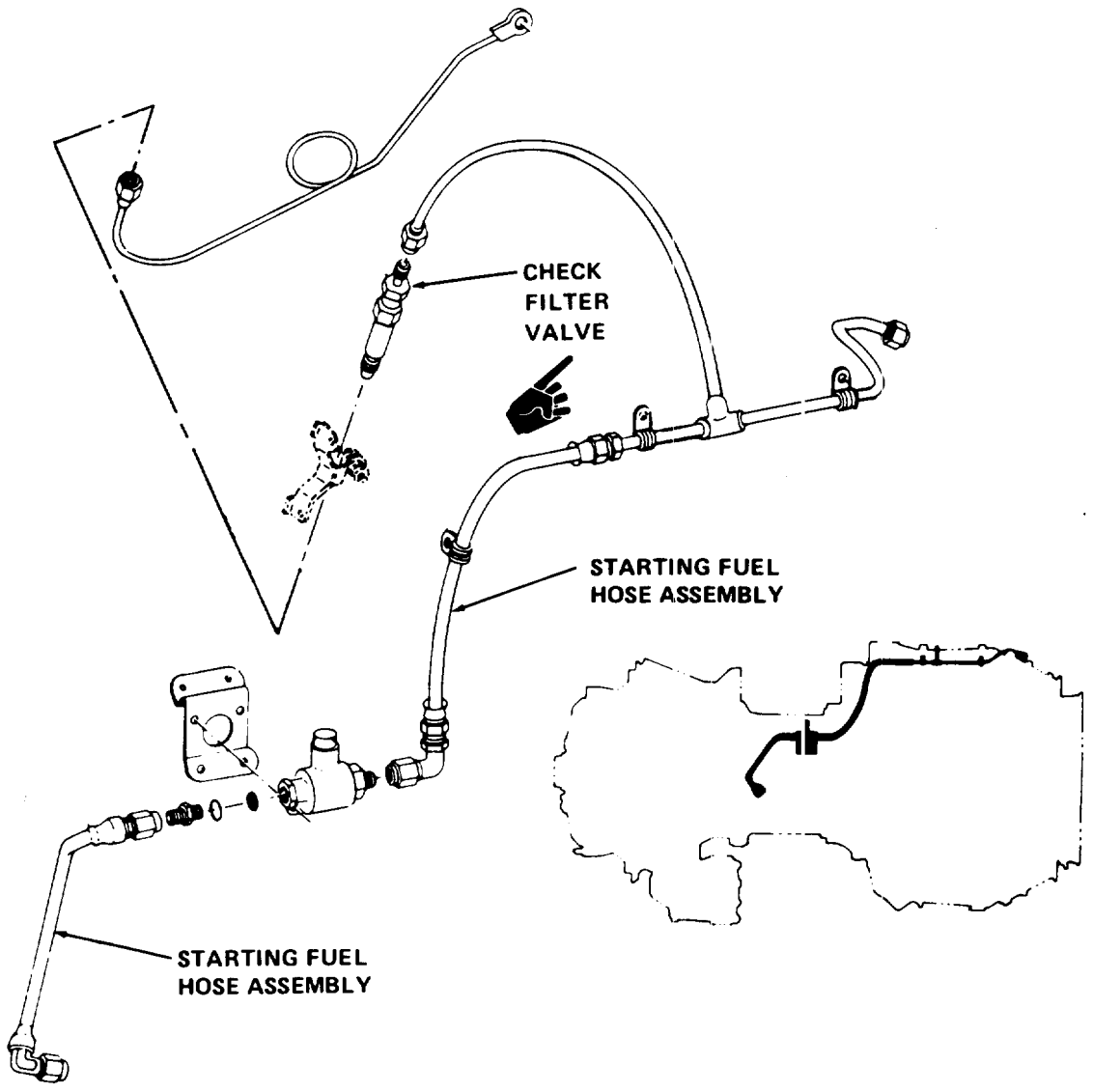
Applicable Configuration
T53-L-13B/703 Engines

References
Para H-21, 7-5 and H-29

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Hose Assemblies	Refer to paragraph H-21 for inspection procedures. Refer to paragraph 7-5 for repair and replacement procedures.	**Inspect. Repair** or **replace** hose assemblies.
2. Check Filter Valve	Refer to paragraph H-29 for repair procedures.	**Inspect.** Check for crossed or damaged threads. **Repair** minor thread damage on valve. **Replace** valve if other than minor thread damage is noted.

6-39. Starting Fuel Hose Assembly and Filter Valve (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
3. Fuel Nozzles	**If during inspection, heavy coking with clogging was evident, apply light air ressure first to the valve in direction of flow arrow and then to the opposite end. Valve is acceptable for further use provided an unrestricted flow is evident when pressure is applied in direction of flow arrow, and valve closes when pressure is applied to opposite end .**	**Inspect**



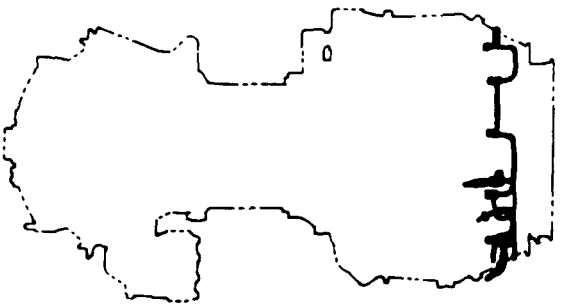
6-40. Starting Fuel Nozzles (T63-L-11 Series Engines) - Removal

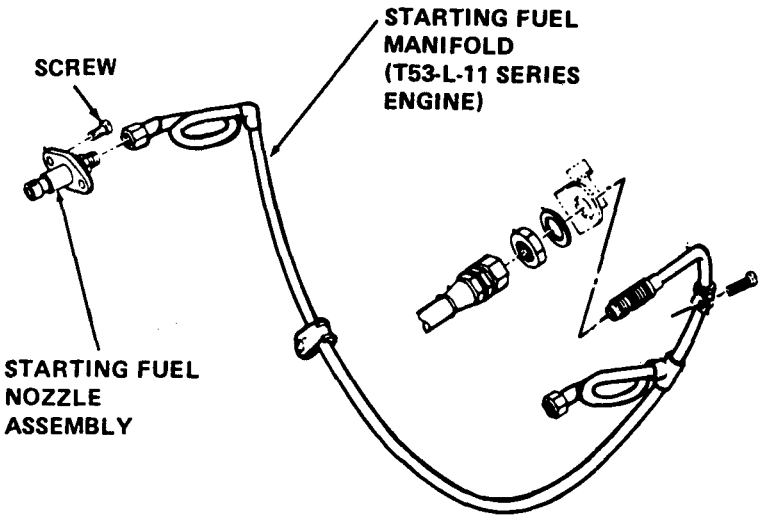
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para 6-27

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Manifold	Refer to paragraph 6-27.	**Disconnect.**
2. Starting Fuel Nozzle Assemblies		**Remove** screws and **withdraw** nozzle assemblies.





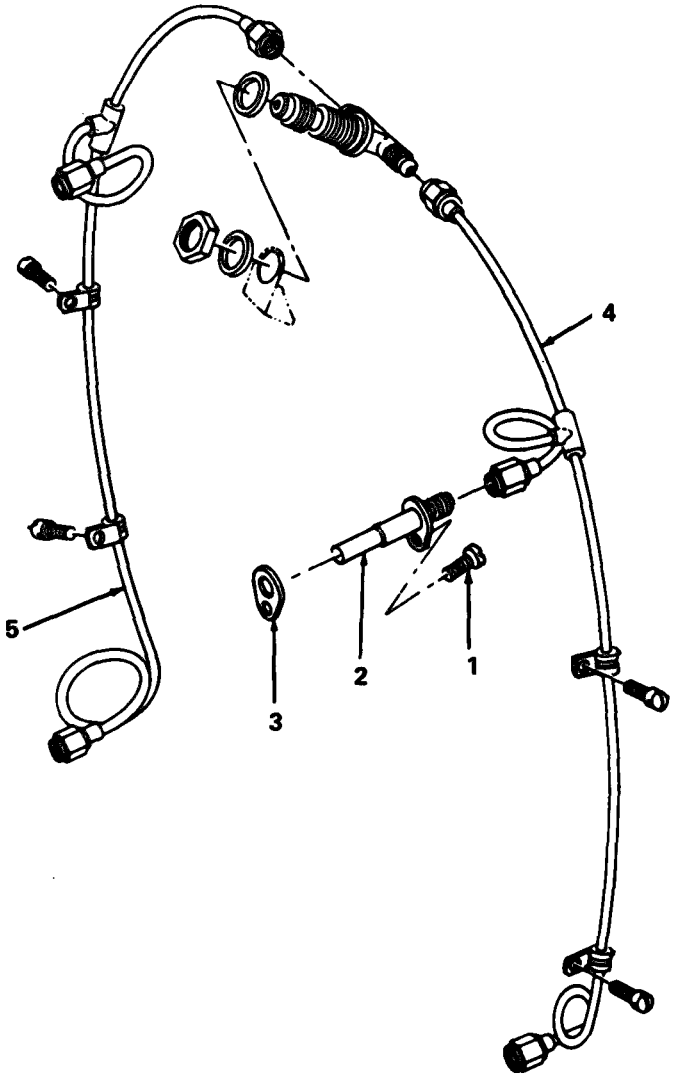
6-41. Starting Fuel Nozzles (T53-L-13B/703 Engines) - Removal

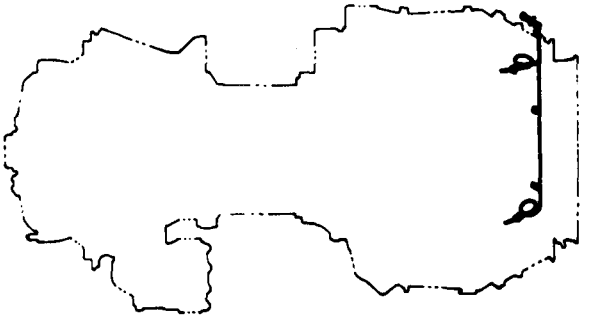
INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Reference
Para 6-28

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Manifolds (4 and 5)		**Disconnect** (refer to paragraph 6-28).
2. Starting Fuel Nozzles (2)		**Remove** screws (1) and **withdraw** nozzles (1) from combustion chamber. **Remove** sealing gasket (3).



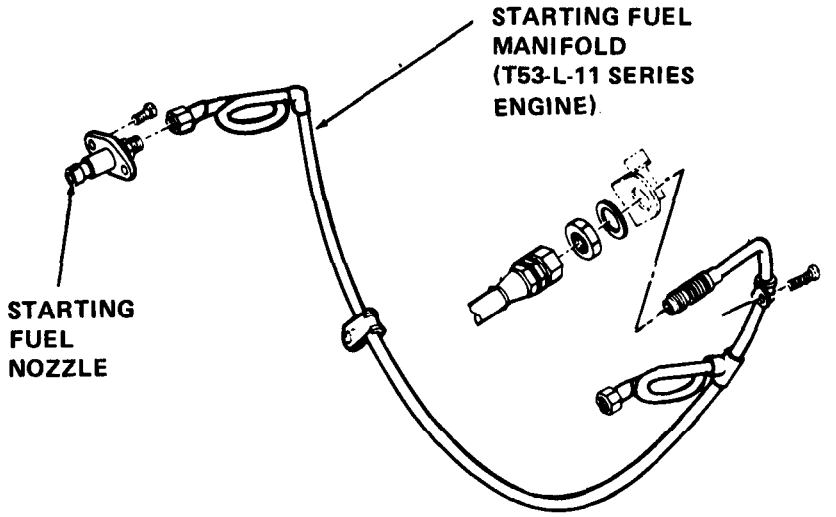


6-42. Starting Fuel Nozzles (T53-L-11 Series Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

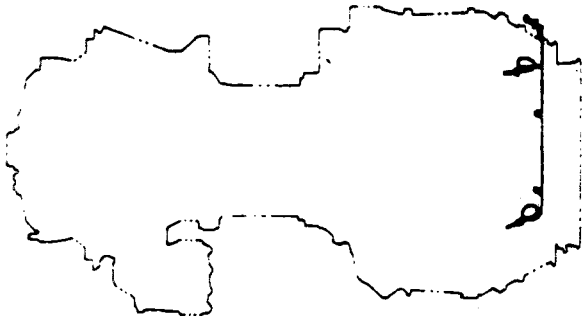
LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/	**NOTE** Slight nicks, dents, or scratches in the upper and lower 10 percent of the cone portion of the retainer are acceptable. The cone is defined as the retainer inlet section forward of the threads to which the starting fuel manifold attaches.	
Nozzles		Using 8- to 15-power magnifying glass, **examine** each part for nicks, pits, scratches, galling, roughness, and wear. Nicks, pits, scratches, galling, roughness, and wear are not allowed. Using micrometer, **check** largest OD of nozzle body subassembly. **Replace** subassembly of OD if not within 0.432 to 0.442 inch, (10.97 mm to 11.23 mm). **Inspect** threaded areas for damaged or crossed threads. **Repair** of starting fuel nozzle assembly is limited to replacement of component parts.

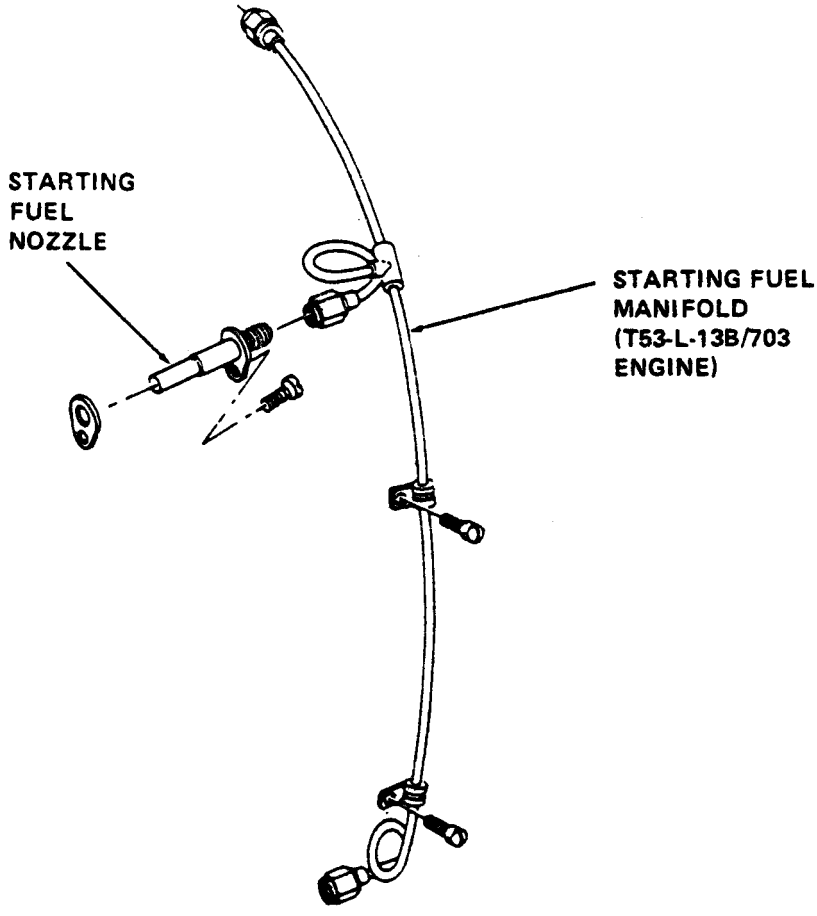


6-43. STARTING FUEL NOZZLES (T53-L-13B/703 ENGINES) - INSPECTION

INITIAL SETUP

Applicable Configuration
T53-L-13B Series Engines

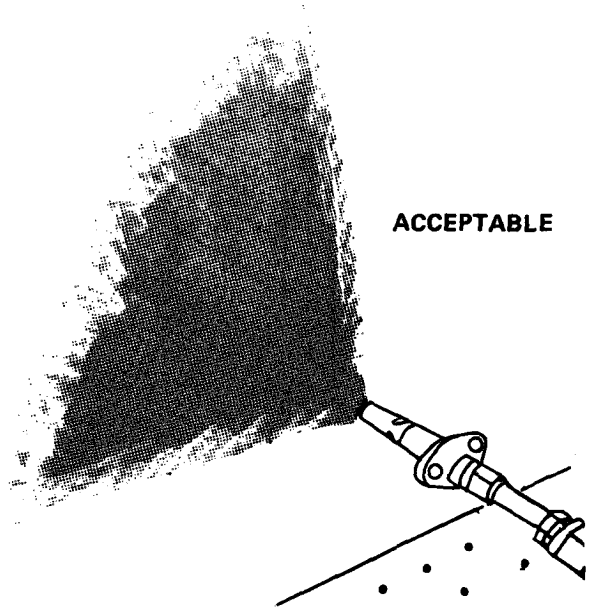
LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ Starting Fuel Nozzle		**Inspect** for heavy coking, clogging and damage. **Replace** nozzle if damaged, clogging cannot be removed or is heavily coked.



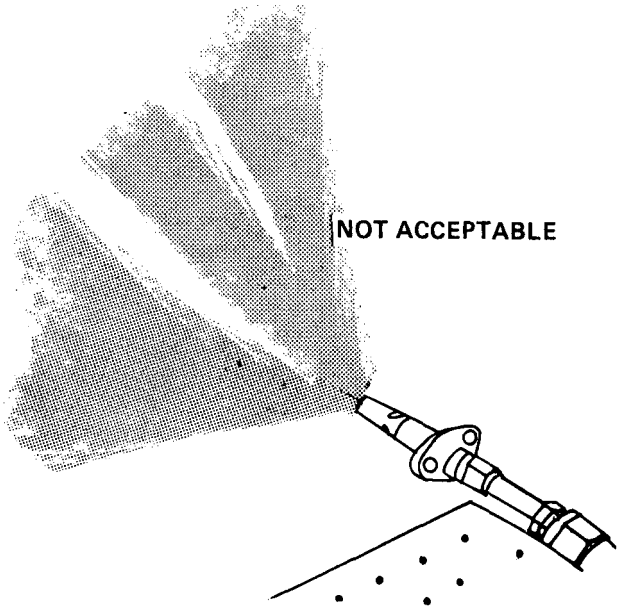
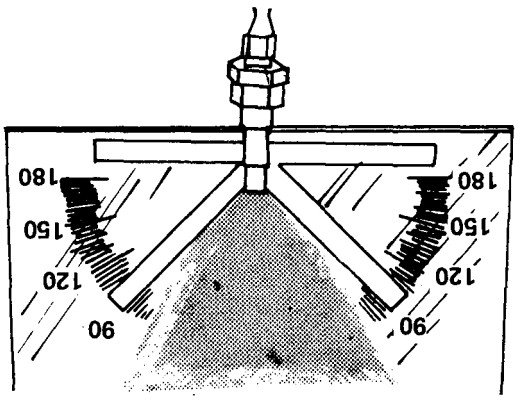
All data on pages 6-90 through 6-96 deleted.

6-44. Starting Fuel Nozzle Assembly (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		been obtained with nozzle in horizontal position, **check** that leakage through four purge holes does not exceed 40 drops per minute.
5. FUEL BYPASS VALVE Knob	When performing this action spray cone from new starting fuel nozzle assemblies shall be hollow, uniform, and free from streaks. Spray cone from used starting fuel nozzle assemblies shall be hollow, well atomized, and free of void sections; slight streaks are permitted.	**Turn** until INLET PRESSURE-TO-NOZZLE gage indicates 15 psig to 16 psig. **Check** starting fuel nozzle assembly spray cone (see following figure).
6. Starting Fuel Nozzle Assembly		**Position** just above and close to test set protractor. **Check** that spray cone angle is 70 degrees minimum.

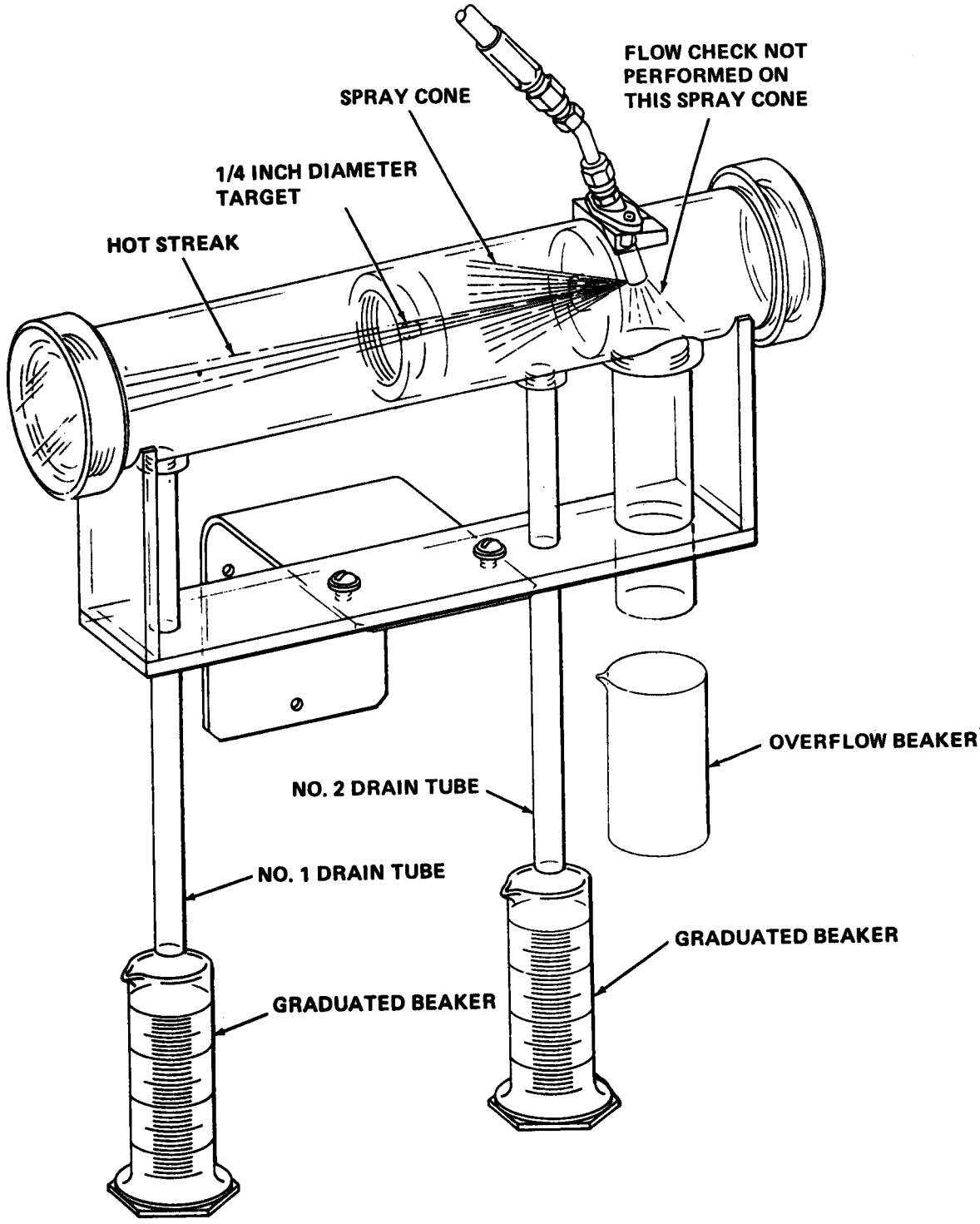


6-44. Starting Fuel Nozzle Assembly (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
7. FUEL BYPASS VALVE Knob		**Turn** until INLET PRESSURE-TO-NOZZLE gage indicates 30 psi to 31 psi.
8. Starting Fuel Nozzle Assembly		**Position** just above and close to test set protractor. **Check** that spray cone angle is 90 to 100 degrees.
9. FUEL BYPASS VALVE Knob		**Turn** until INLET PRESSURE-TO-NOZZLE gage indicates 100 psig to 105 psig. **Repeat** action for item 8.
TEST SET CHAMBER/		
10. Starting Fuel Nozzle Assembly	Use test chamber (LTCT873).	**Insert** in test chamber. **Secure** with integrated clamp.
11. FUEL SHUTOFF TO NOZZLE LEVER		**Pull** FUEL SHUTOFF-TO-NOZZLE lever on test stand.

6-44. Starting Fuel Nozzle Assembly (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST SET CHAMBER/ - Continued		



6-44. Starting Fuel Nozzle Assembly (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST SET CHAMBER/ - Continued		
12. FUEL BYPASS VALVE Knob		**Turn** until INLET PRESSURE-TO-NOZZLE gage indicates that fuel pressure of 100 psi to 105 psi has been obtained.
13. Graduated Beaker		**Position** under No. 1 fixture drain tube. **Allow** fuel to drain into beaker for one minute. Hot-streak flow shall be 88 cc to 149 cc per minute.
14. No. 2 Fixture Drain Tube	Spray cone flow shall be 83 cc to 109 cc per minute	**Position** graduated beaker under No. 2 fixture drain tube. **Allow** fuel to drain into beaker for one minute.
15. FUEL BYPASS VALVE Knob		**Turn** until INLET PRESSURE-TO-NOZZLE gage indicates 70 psig to 75 psig. **Check** that fuel quantity of hot streak passing through 1/4 inch diameter target 4 inches away from starting fuel nozzle assembly (No. 2 drain tube) is at least 50% greater than fuel quantity not passing through the target.
16. Starting Fuel Nozzle Assembly	Perform this action if limits cannot be met.	**Reject.**

6-45. Starting Fuel Nozzles (T53-L-13B/703 Engines) - Functional Test (AVIM)

INITIAL SETUP

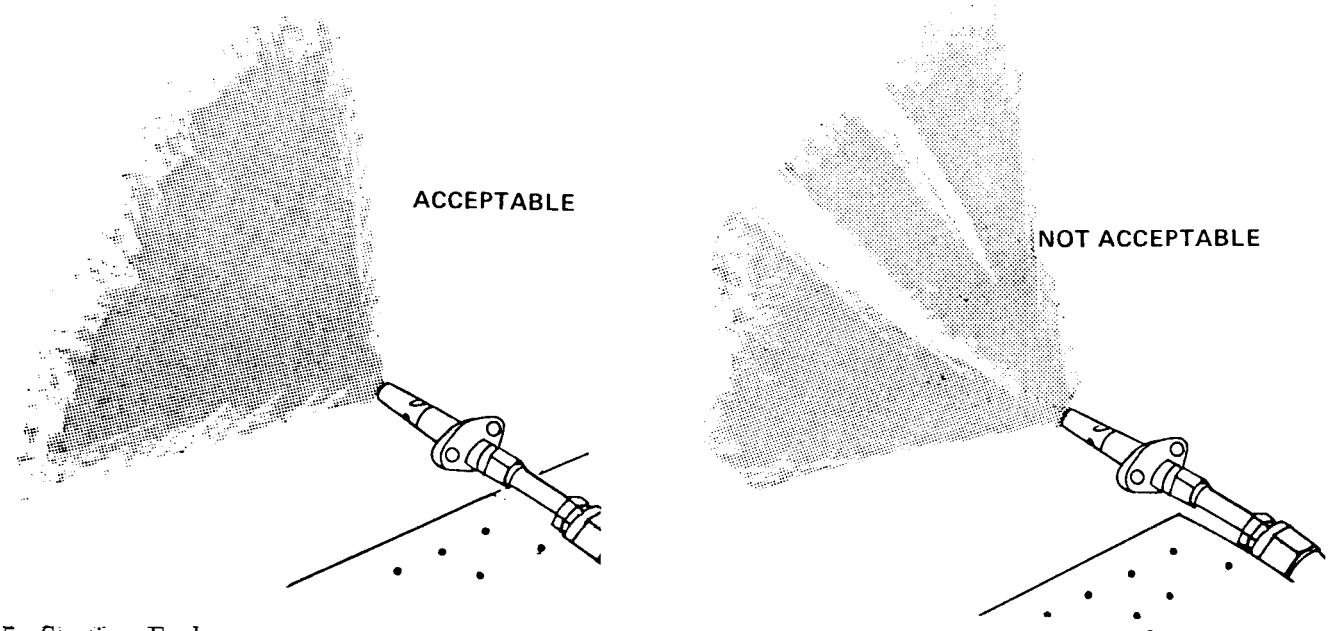
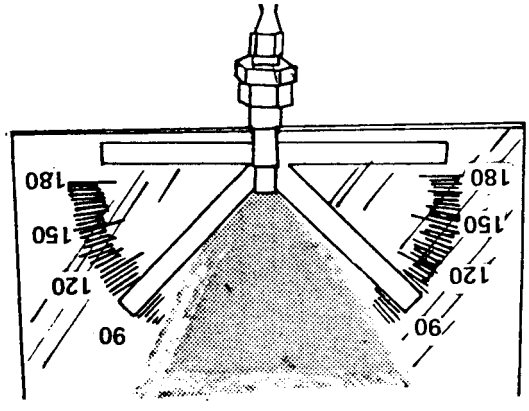
Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Calibrating Fluid (item 11, Appendix D)

Test Equipment
Test Stand (LTCT314)

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/		
	NOTE Actions contained within this paragraph are to be performed using calibrating fluid (item 11, Appendix D) heated to 78°F to 80°F (26°C to 28°C).	
1. Starting Fuel Nozzles		**Shake** to **insure** freedom of ball movement,
2. Hose	Use hose that is l/4-inch in diameter with a 1/8-inch diameter adapter. Use test stand (LTCT314).	**Connect** from FUEL OUTLET-TO-NOZZLE port of test stand. **Connect** adapter of hose to starting fuel nozzle.
3. Starting Fuel Nozzle	Any evidence of leakage shall be cause for rejection.	**Leak-test. Apply** fluid at 500 psi (35.15 kg/sq cm) for a period of one minute.
4. FUEL BYPASS VALVE Knob	When performing this action spray cone from new starting fuel nozzle assemblies shall be well atomized, hollow, uniform, and free from streaks. Spray cone from used starting fuel nozzle assemblies shall be well atomized, hollow, and free of void sections; slight streaks are permitted.	**Turn** until INLET PRESSURE-TO-NOZZLE gage indicates 14 psig to 16 psig. **Check** starting fuel nozzle spray cone.

6-45. Starting Fuel Nozzles (T53-L-13B/703 Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
5. Starting Fuel Nozzle		**Position** above test set protractor. **Check** that spray cone angle is 70 degrees minimum.
6. FUEL BYPASS VALVE Knob	Spray cone angle shall cover a spray area of 70 to 90 degrees. See following figure.	**Turn** until INLET PRESSURE-TO-NOZZLE gage indicates 29 psig to 31 psig.
7. FUEL BYPASS VALVE Knob	Angle must cover an area of 75 to 85 degrees.	**Turn** until INLET PRESSURE-TO-NOZZLE gage indicates 99 psig to 101 psig.
		**Insert** in suitable fixture. **Pull** lever on test stand.

6-44. **DELETED.**

6-45. **DELETED.**

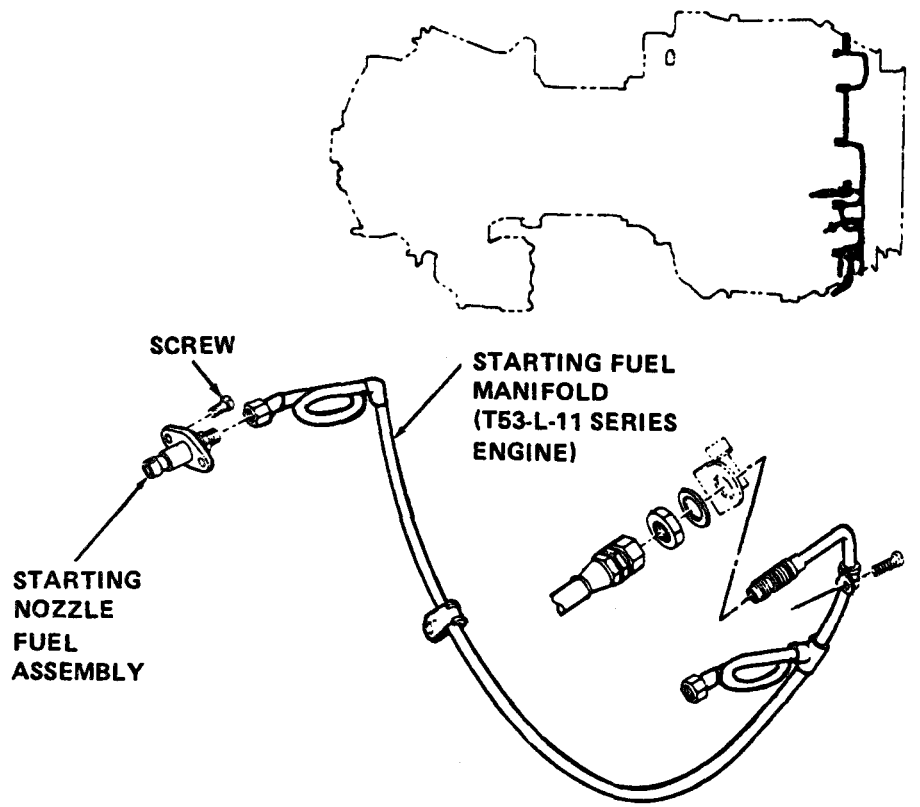
6-46. STARTING FUEL NOZZLE (T53-L-11 SERIES ENGINES) – INSTALLATION

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Appendix G, Table G-3, Reference Number 64

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Starting Fuel Nozzle Assemblies		**Secure** to fire shield at 4-8-o'clock positions, with screws. **Lockwire** screws.
2. Starting Fuel Manifold Connectors		**Secure** to starting fuel nozzles. **Tighten** connectors as required **(refer** to Appendix G, table G-3, reference number 64).



6-47. Starting Fuel Nozzle (T53-L-13B/703 Engines) - Installation

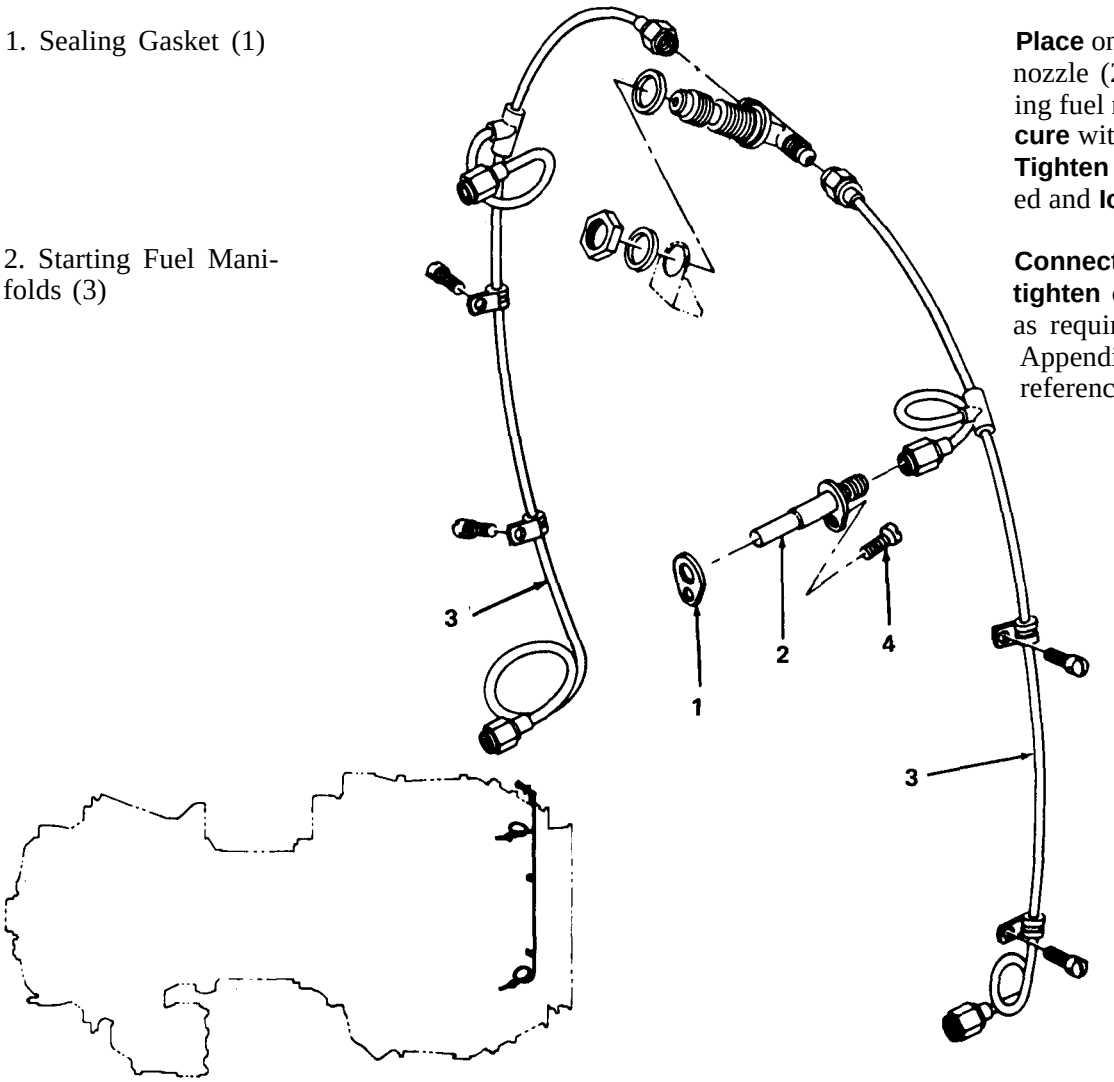
INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Lockwire (item 41, 42 or 43, Appendix D)

References
Appendix G, Table G-4, Reference Number 42

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/	**NOTE** The starting fuel nozzles are installed through mounting pads on the main fuel manifolds at approximately the 2-, 4-, 8-, and 10-o'clock positions.	
1. Sealing Gasket (1)		**Place** on starting fuel nozzle (2). **Install** starting fuel nozzles and **secure** with screws (4). **Tighten** screws as required and **lockwire.**
2. Starting Fuel Manifolds (3)		**Connect** to nozzles and **tighten** connector nuts as required. **(Refer** to Appendix G, table G-4, reference number 42.)

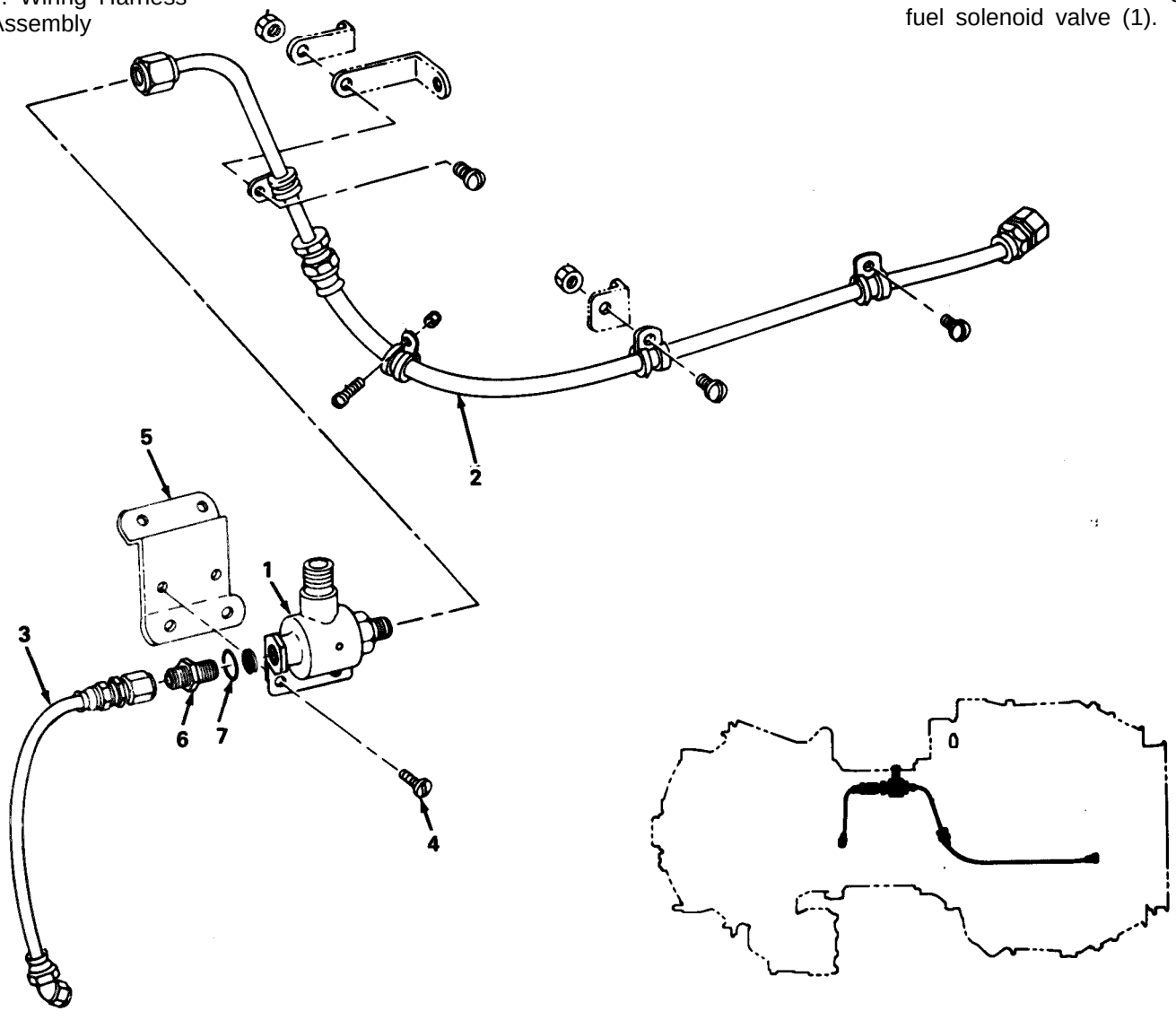


6-48. Starting Fuel Solenoid Valve (T53-L-11 Series Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/	**WARNING** **Insure that all electrical power is disconnected.**	
1. Wiring Harness Assembly		**Disconnect** from starting fuel solenoid valve (1).



6-48. Starting Fuel Solenoid Valve (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
2. Starting Fuel Hose Assembly		**Disconnect** starting fuel hose assembly (2 and 3) from solenoid valve (1).
3. Solenoid Valve		**Remove** two screws (4) that secure solenoid valve to starting fuel solenoid bracket (5). **Remove** solenoid valve from bracket.
4. Union and Gasket		**Remove** union (6) and gasket (7) from valve.

6-49. Starting Fuel Solenoid Valve - Inspection

INITIAL SETUP

Applicable Configuration
All

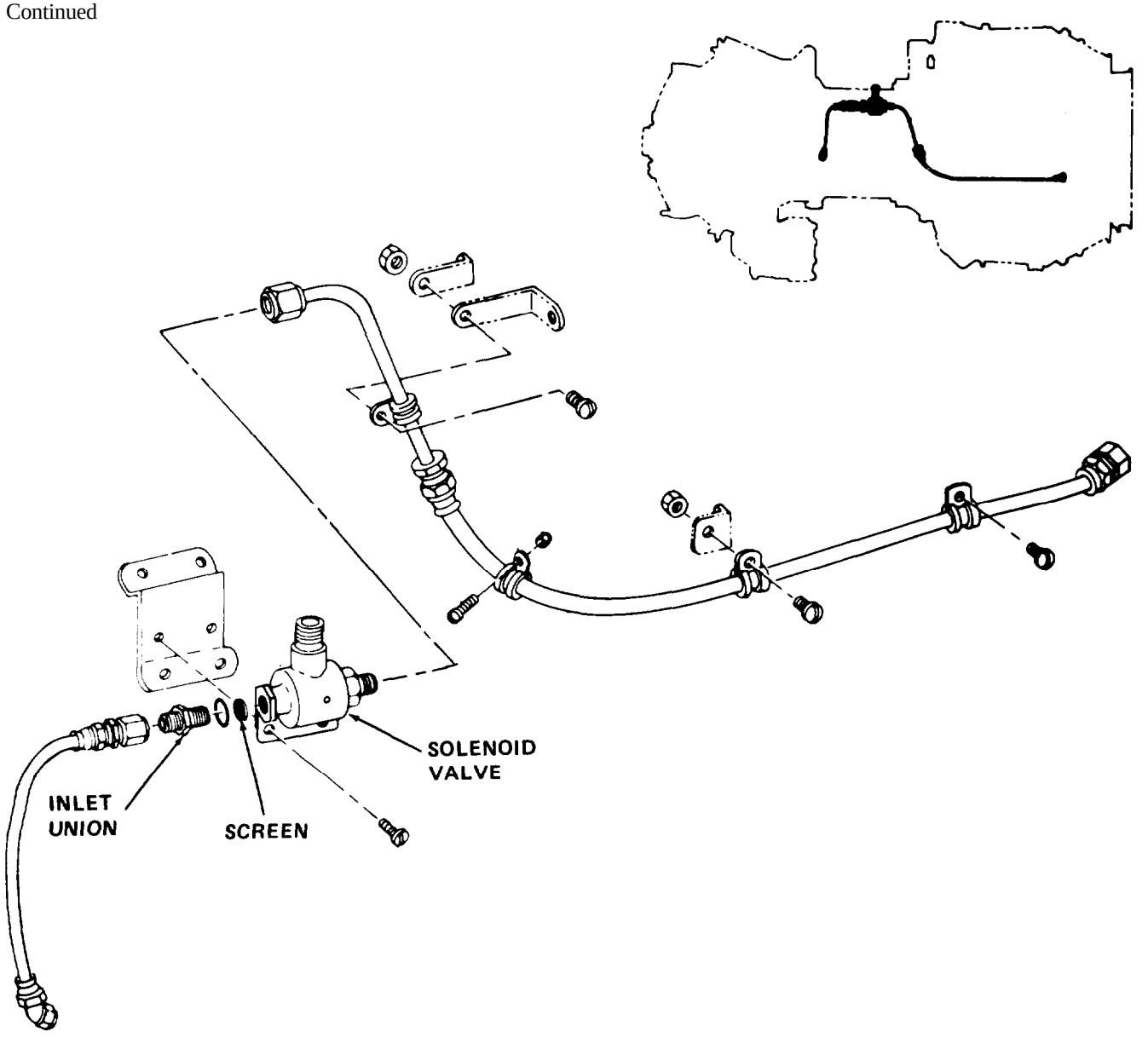
References
Para H-28

Consumable Materials
Crocus Cloth (item 21, Appendix D)
Drycleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/	**NOTE** The following figure pertains to the T53-L-11 series engine only.	

6-49. Starting Fuel Solenoid Valve - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR CHAMBER HOUSING/ - Continued		



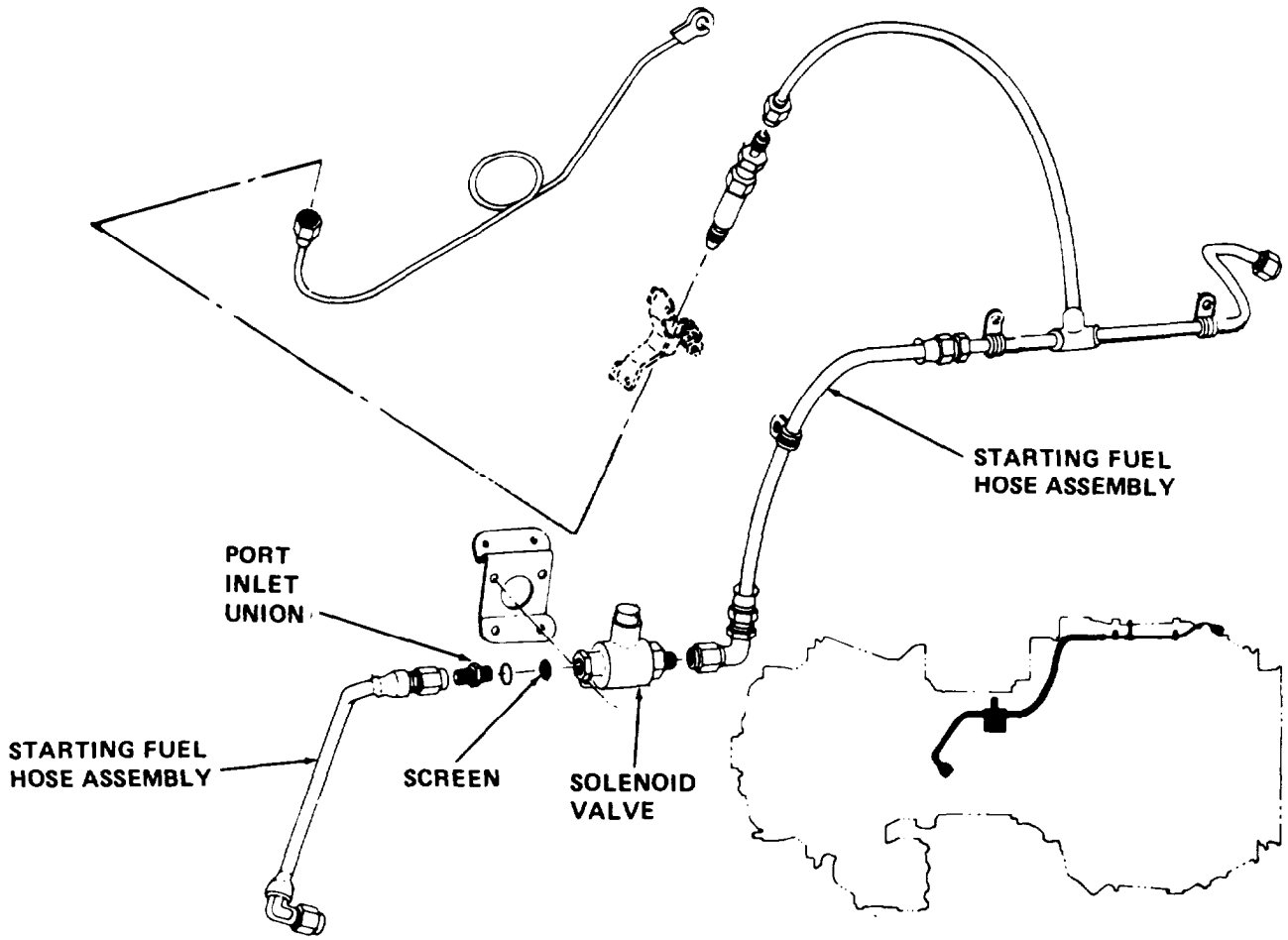
1. Electrical Connector Solenoid Valve	Remove corrosion with crocus cloth (item 21, Appendix D) and drycleaning solvent (item 24, Appendix D).	**Inspect** for corrosion.
2. Electrical Connector	Refer to paragraph H-28 for repair of minor thread damage. Replace solenoid valve if thread damage on electrical connector cannot be repaired.	**Inspect** for damaged threads. **Repair.**

6-49. Starting Fuel Solenoid Valve - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		

NOTE

The following figure pertains to the T53-L-13B/703 engines only.



3. Electrical Connector	Replace solenoid valve if insulator is cracked or pins are bent or broken.	**Inspect** for cracked insulator and bent or broken pins.
4. Screen	Replace screen if damaged. Insert new screen using rubber end of pencil.	**Inspect** on inlet port of solenoid valve to insure that screen is not damaged.
5. Inlet Port Union	Replace inlet port union if threads are damaged. Replace packing.	**Inspect** for damaged threads.

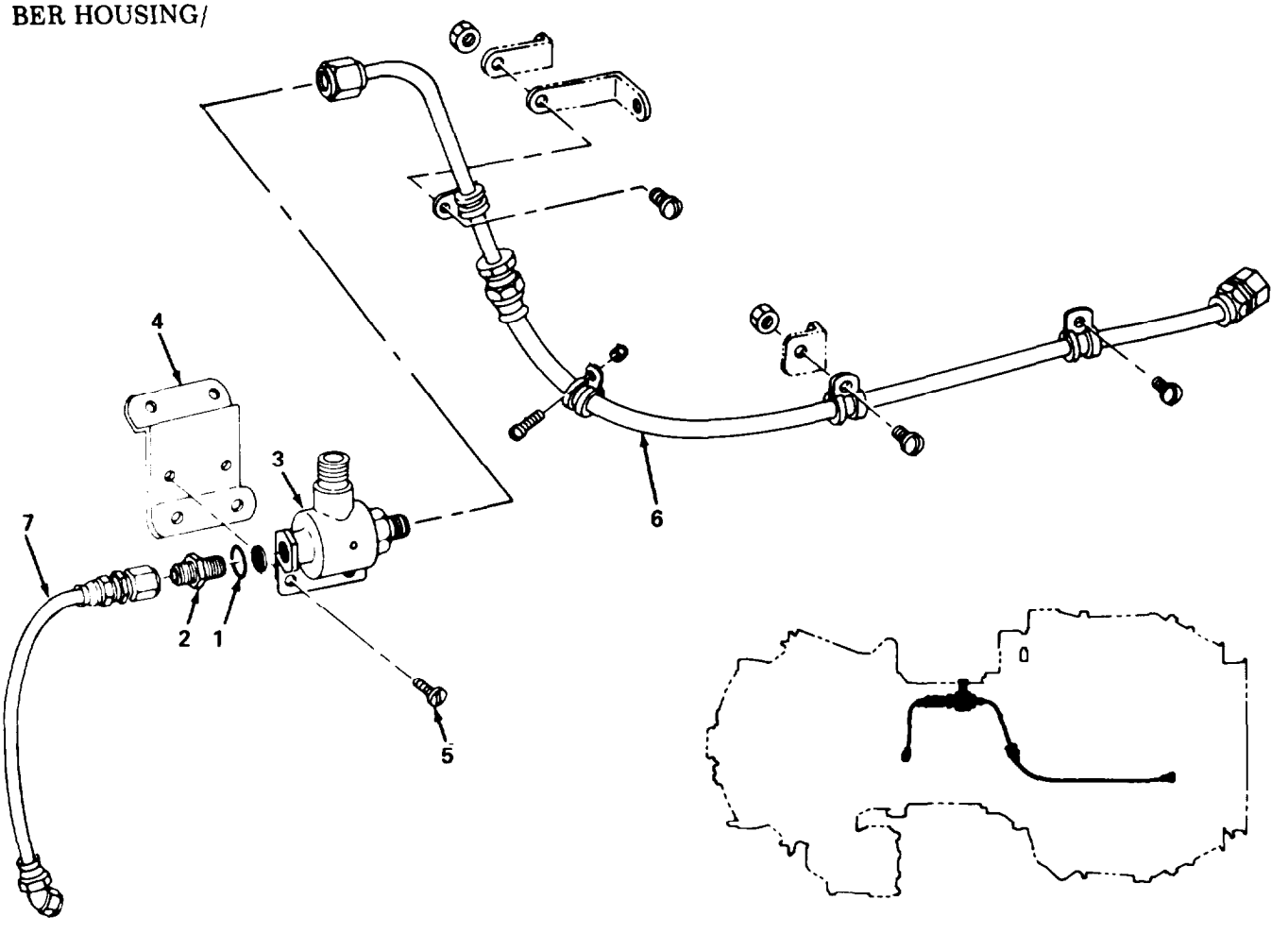
6-50. Starting Fuel Solenoid Valve Assembly (T53-L-11 Series Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		



1. Packing and Union		**Install** packing (1) and union (2) on inlet port of starting fuel solenoid valve (3).
2. Starting Fuel Solenoid Valve		**Secure** starting fuel solenoid valve to starting fuel solenoid valve bracket (4) with screws (5). **Lockwire** screws.

6-50. Starting Fuel Solenoid Valve Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
3. Starting Fuel Hose Assemblies		**Connect** starting fuel hose assemblies (6 and 7) to starting fuel solenoid valve (3).
4. Wiring Harness Connector		**Connect** to solenoid valve. **Tighten** and **lockwire.**

6-51. Solenoid Valve Assembly (T53-L-13B/703 Engines) - Removal

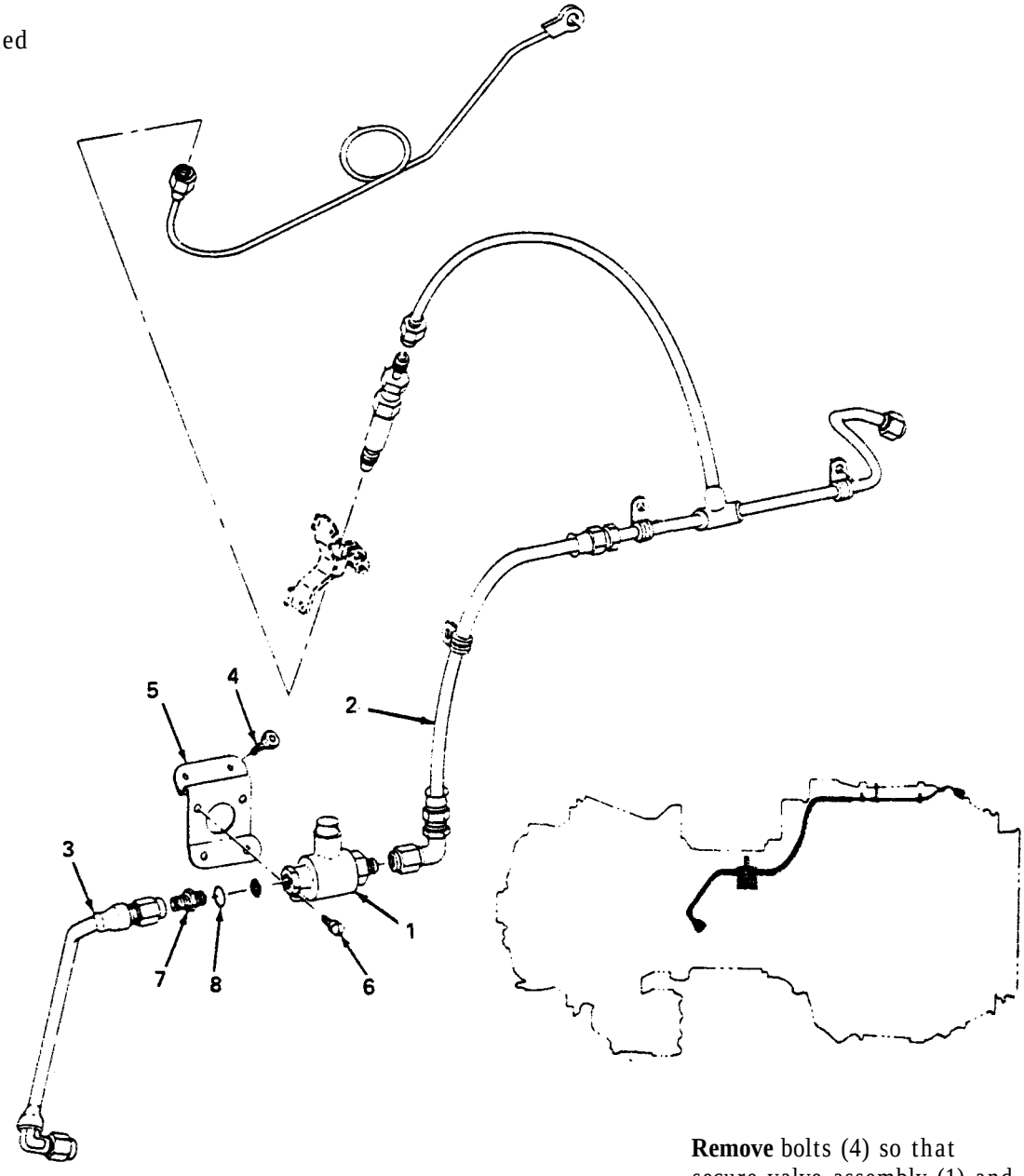
INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR HOUSING/		
1. Electrical Connector	**WARNING** **Insure that all electrical power is disconnected.**	Disconnect from solenoid valve assembly (1).
2. Starting Fuel Hose Assemblies (2 and 3)		Disconnect starting fuel hose assemblies (2 and 3) from solenoid valve assembly.

6-51. SOLENOID VALVE ASSEMBLY (T53-L-13B/703 ENGINES)- REMOVAL - Cont.

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR HOUSING/-Continued		
3. Solenoid Valve Assembly (1)		**Remove** bolts (4) so that secure valve assembly (1) and bracket (5) to compressor housing. **Remove** screws (6) and **separate** valve assembly and bracket.
4. Union (7) and Packing (8)		**Remove** union (7) and packing (8) from solenoid valve assembly.



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6-52. **DELETED**

6-53. **SOLENOID VALVE ASSEMBLY (T53-L-13B/703 ENGINES) - INSTALLATION**

INITIAL SETUP

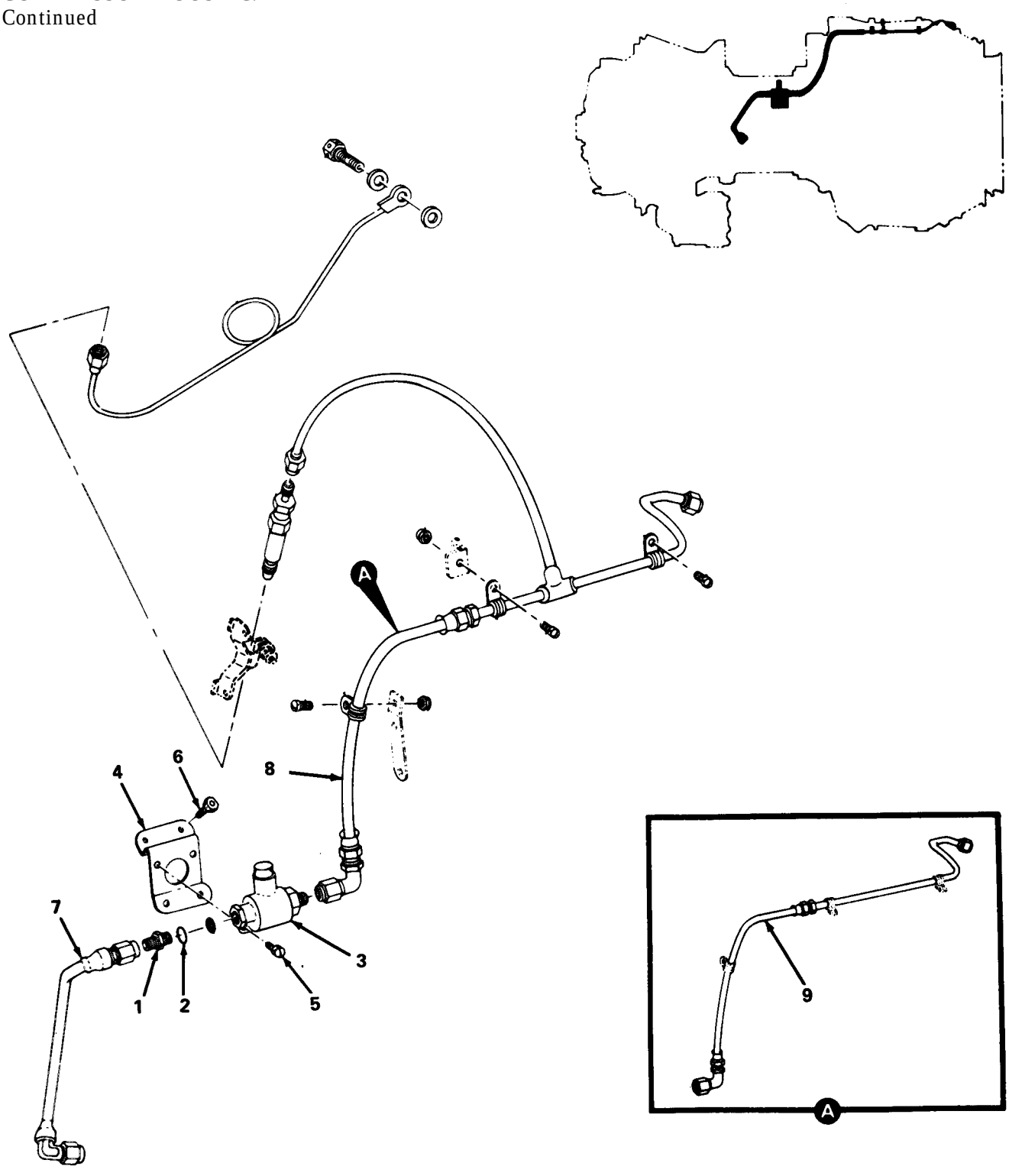
Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Lockwire (item 41,42, or 43, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR HOUSING/		
1. Union (1) and Packing (2)		**Install** into inlet port of solenoid valve assembly.
2. Solenoid Valve Assembly (3)		**Secure** to bracket (4) with screws (5). **Tighten** screws as required and **lockwire.**
3. Solenoid Valve Assembly and Bracket		**Secure** to compressor housing with bolts (6). **Tighten** bolts as required and **Lockwire.**
4. Starting Fuel Hose Assemblies (7 and 8)		**Connect** to solenoid valve assembly (3). **Tighten** hose connector.
5. Connector		**Connect** from main wiring harness to solenoid valve assembly and **lockwire.**

6-53. Solenoid Valve Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR HOUSING/ - Continued		



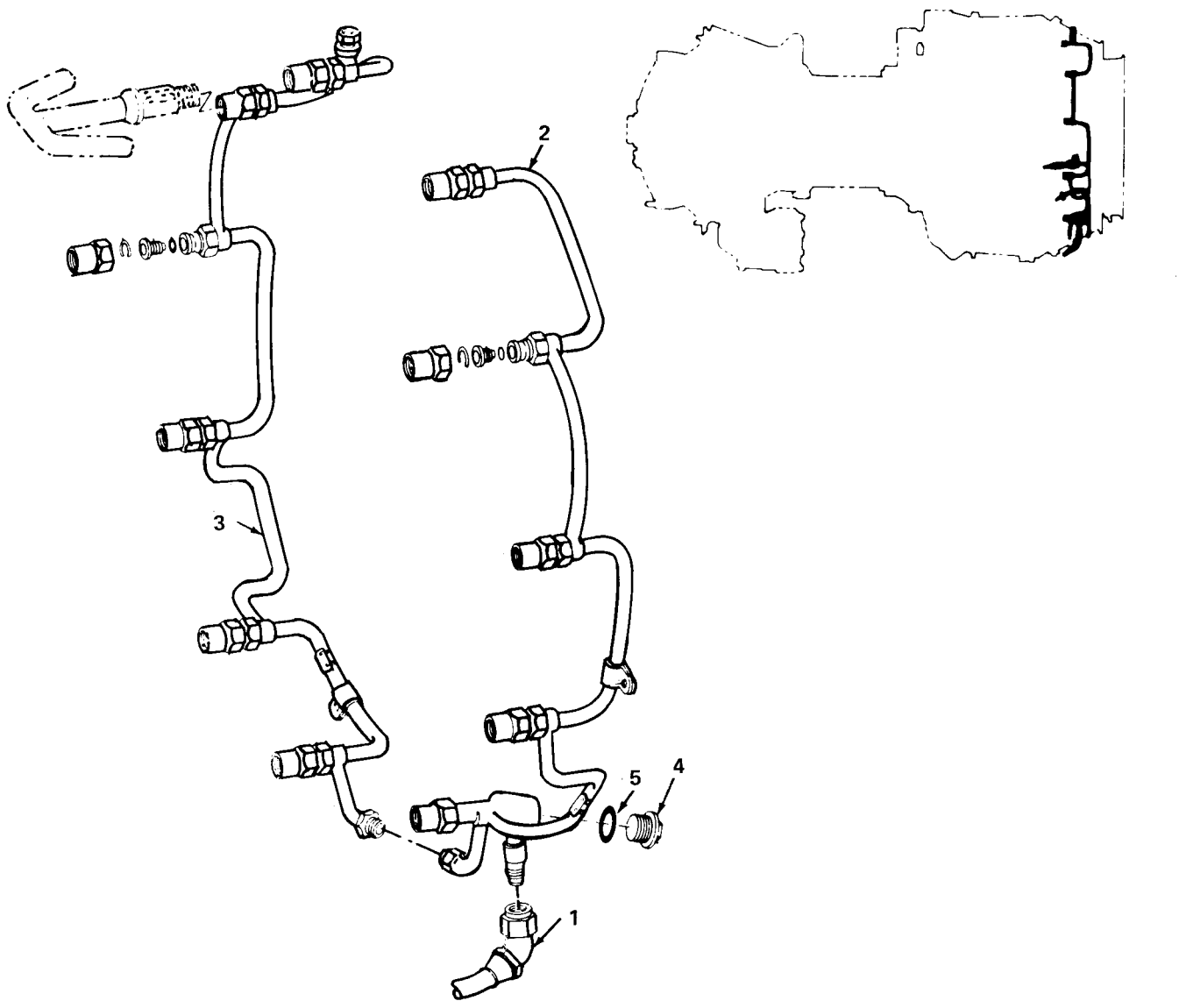
6-54. Main Fuel Manifold (T53-L-11 Series Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para 6-27

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Main Fuel Hose Assembly (1)		**Disconnect** from main fuel manifold (2).



6-54. Main Fuel Manifold (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
	NOTE When removing manifolds, hold manifold fittings with one wrench while loosening connectors with second wrench. If no wrench flats exist at the 7-o'clock position (fuel strainer housing) hold housing using slip-joint pliers with taped jaws.	
2. Main Fuel Manifolds (2 and 3)		**Disconnect** from fuel vaporizers.
3. Starting Fuel Manifold	Refer to paragraph 6-27.	**Remove.**
	CAUTION **Immediately cap manifold and fuel vaporizers and cover all exposed openings.**	
4. Main Fuel Manifold		Carefully **lift** off.
5. Plug (4), Packing (5)		**Remove** from main fuel manifold (2).

6-55. Main Fuel Manifold Assembly (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

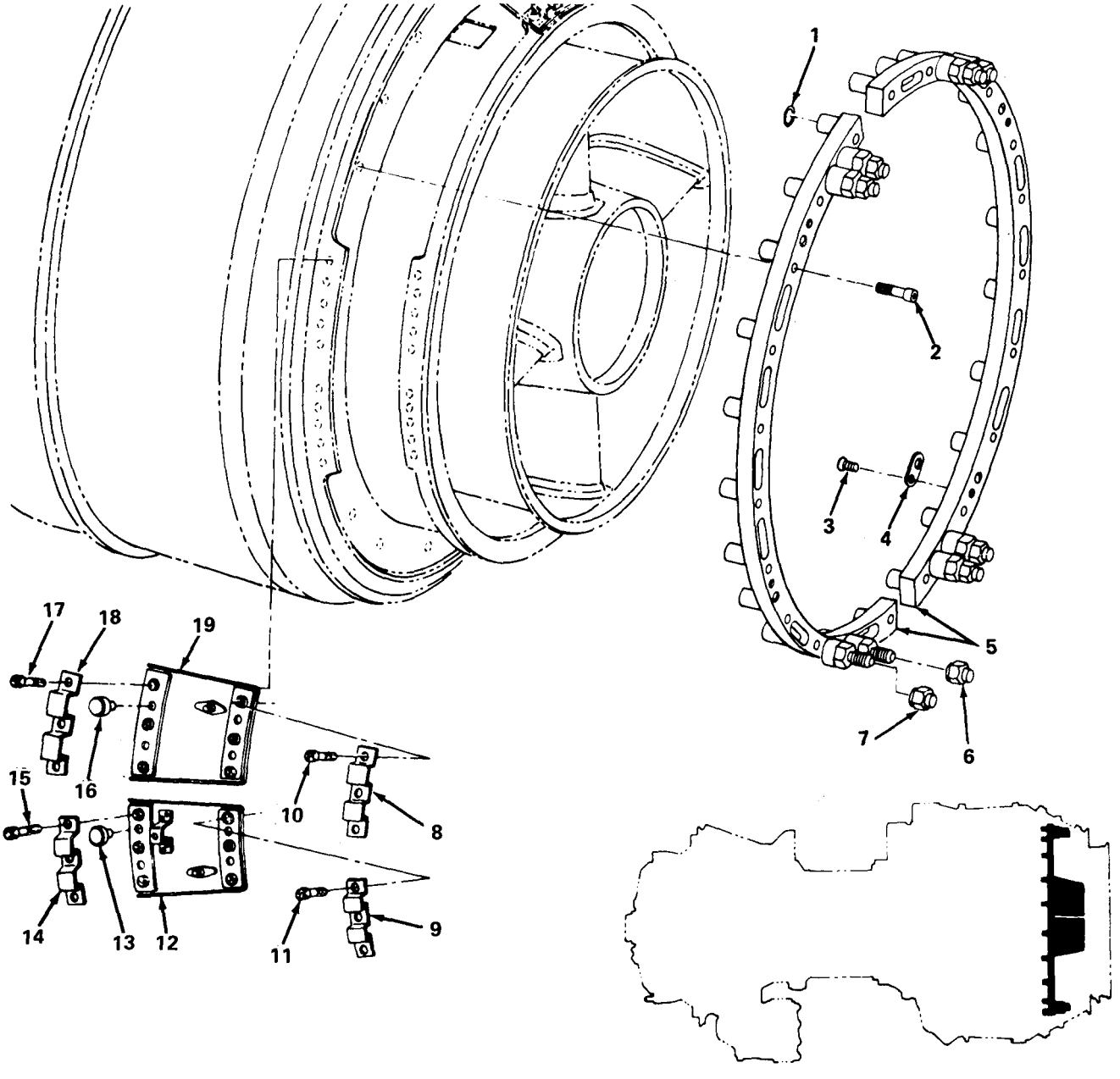
Applicable Configuration
T53-L-13B/703 Engines

References
Para 7-3, 6-28, 6-41 and 4-5

Consumable Materials
Barrier Material (item 9, Appendix D)
Transparent Flexible Bag (item 81, Appendix D)

6-55. Main Fuel Manifold Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		



1. Seal
2. Bolt
3. Screw
4. Sealing Gasket
5. Main Fuel Manifold Assemblies
6. Cap
7. Cap
8. Retainer
9. Retainer
10. Bolt
11. Bolt
12. Support Assembly
13. Pin
14. Retainer
15. Bolt
16. Pin
17.
18. Retainer
19. Support Assembly

6-55. Main Fuel Manifold Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued	**CAUTION** **The main fuel manifold is a high-value item and must be carefully repacked for return to depot maintenance. If manifold is to be replaced, enclose manifold in barrier material (item 9, Appendix D) or in a transparent flexible bag (item 81, Appendix D) and secure in reusable container. The container should then be enclosed in a waterproof cardboard box and identified for shipment.**	
	NOTE If replacement of fuel manifold is intended, replace one half at a time while the other half is secured.	
1. Ignition Leads	Refer to paragraph 7-3.	**Disconnect** from igniter plugs and **remove** screws that secure leads to support cone.
2. Starting Fuel Manifolds	Refer to paragraphs 6-28 and 6-41.	**Remove.**
3. Starting Fuel Nozzles		**Remove.**
	NOTE The support cone assembly may be removed as a unit in lieu of item 4. (Refer to paragraph 4-5.)	
4. Support Assemblies (12 and 19)		**Remove** bolts (10, 11, 15, and 17) and retainers (8, 9, 4 and 18) that secure support assemblies (12 and 19) to Support cone assemblies. **Withdraw** pins (13 and 16) and support assemblies from support cone.

6-55. Main Fuel Manifold Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
5. Hose Assemblies		**Disconnect** from main fuel manifold assemblies (5).
6. Caps (6 and 7)		**Use** to cap all open ports.
7. Fuel Manifold Assembly		**Remove** bolts (2) that secure fuel manifold assembly to rear face of combustion chamber housing. Carefully **withdraw** manifold assembly from combustion chamber to avoid damage to parts.
8. Seals (1)		**Remove** from nozzles.
9. Sealing Gaskets (4)		**Remove** screws (3) securing sealing gaskets (4) to fuel manifold. **Remove** gaskets.

6-56. Main Fuel Manifold (T53-L-11 Series Engines) - Cleaning

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Drycleaning Solvent (item 24, Appendix D)
Trichloroethane (item 83, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Main Fuel Manifold		**Flush** inside and out, with drycleaning solvent (item 24, Appendix D). **Air-dry.**

6-56. Main Fuel Manifold (T53-L-11 Series Engines) - Cleaning - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR CHAMBER HOUSING/ - Continued	**WARNING** **Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).**	
2. Plugged Fuel Metering Injectors		**Clear** by **reverse flushing** with drycleaning solvent (item 24, Appendix D). **Air-dry.**

6-57. Main Fuel Manifolds (T53-L-11 Series Engines) - Inspection

INITIAL SETUP

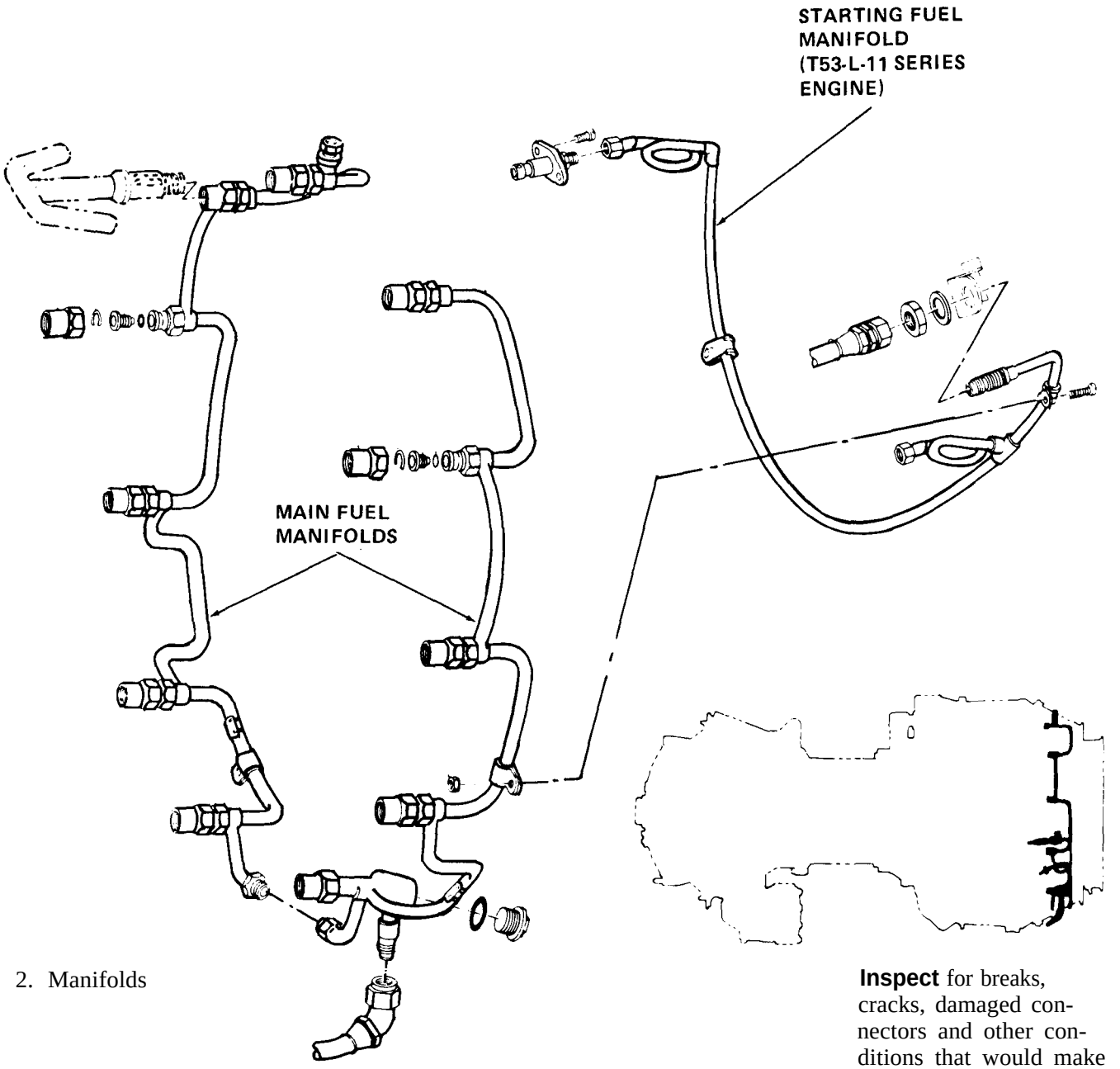
Applicable Configuration
T53-L-11 series Engines

References
Para H-25

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Main Fuel Manifolds	Blend-repair nicks and burrs as outlined in paragraph H-25.	**Inspect** for nicks and burns.

6-57. Main Fuel Manifolds (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



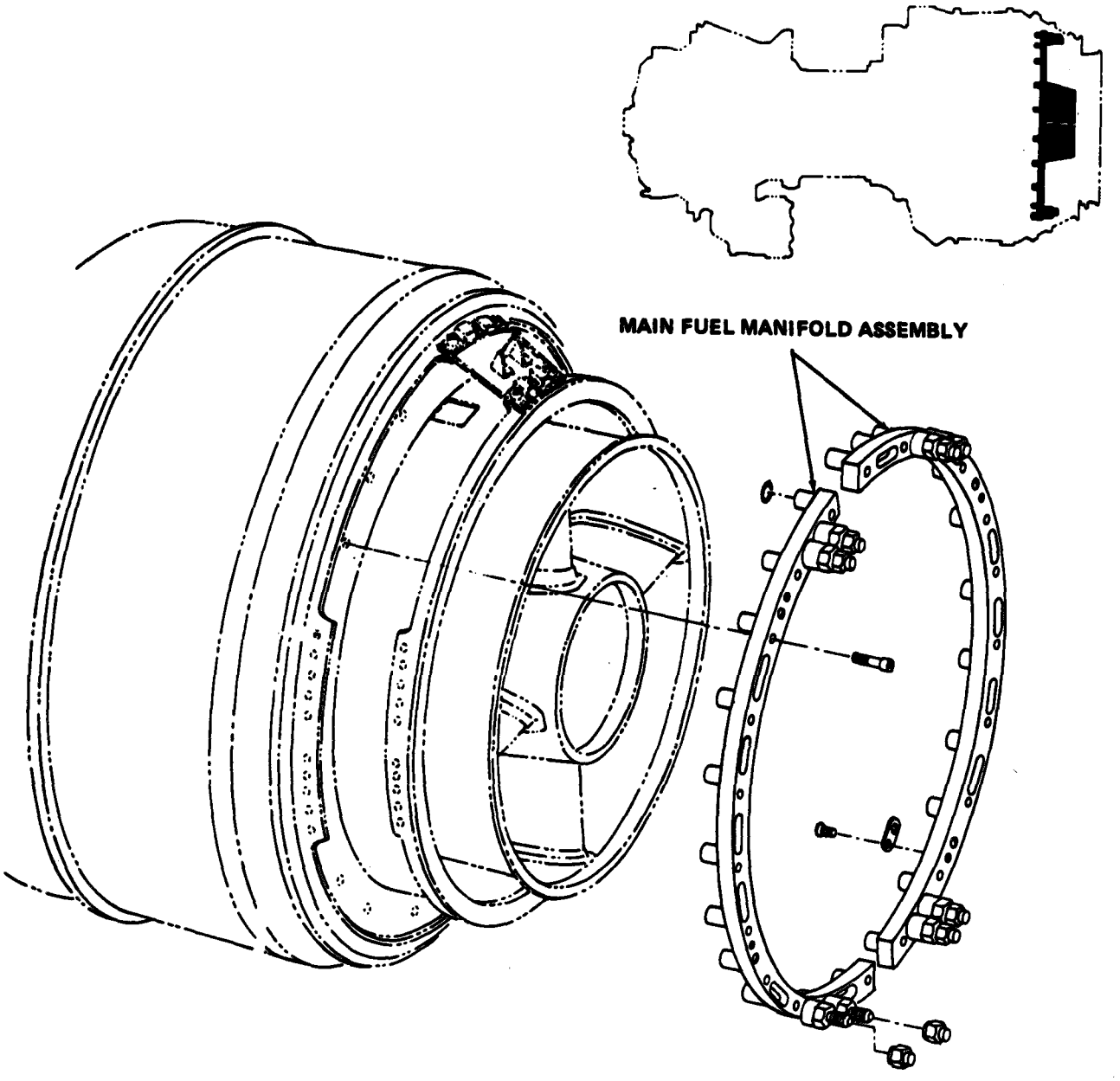
2. Manifolds		**Inspect** for breaks, cracks, damaged connectors and other conditions that would make manifolds unsatisfactory for further use. **Replace** manifolds that are damaged or show evidence of clogging.

6-58. Main Fuel Manifolds (TB3-L-13B/703 Engines) - Inspection

INITIAL SETUP

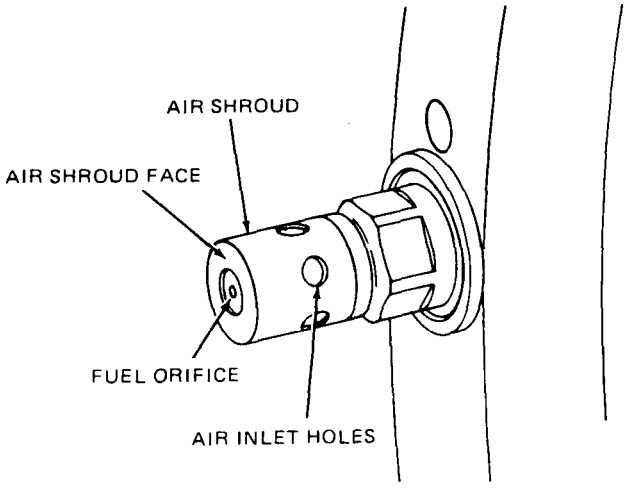
Applicable Configuration
T53-L13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		



6-58. Main Fuel Manifolds (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
	NOTE Inspect fuel manifold while it is installed.	
1. Fuel Manifold	Replace if leakage is noted.	**Inspect** for leakage.
2. Fuel Manifold	Replace if cracks or damage are noted.	**Inspect** for cracks or damage.
3. Main Fuel Nozzles	Limits are as follows: a. Chafing or rub damage in front of air inlet holes is acceptable, provided air shroud is not broken through. b. Any evidence of crushing at air inlet holes is unacceptable. c. Evidence of heavy coking at the nozzle fuel orifice outlet or at air inlet holes is unacceptable. Coke buildup on air shroud face is acceptable, provided it does not extend into the shroud. d. Inspect nozzle for proper torque of 80 to 90 pound-inches (0.9 to 1.0 kg/m.)	**Inspect** for chafing or excessive coke buildup.



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6-59. DELETED.

6-60. DELETED.

6-61. MAIN FUEL MANIFOLD (T53-L-11 SERIES ENGINES) - INSTALLATION

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Special Tools
LTCT4810 Fuel Harness Wrench
LTCT2051 Fuel Harness Wrench

Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

References
Appendix G, Table G-3, Reference Number 63

6-61. Main Fuel Manifold (T53-L-11 series Engines) - Installation - Continued

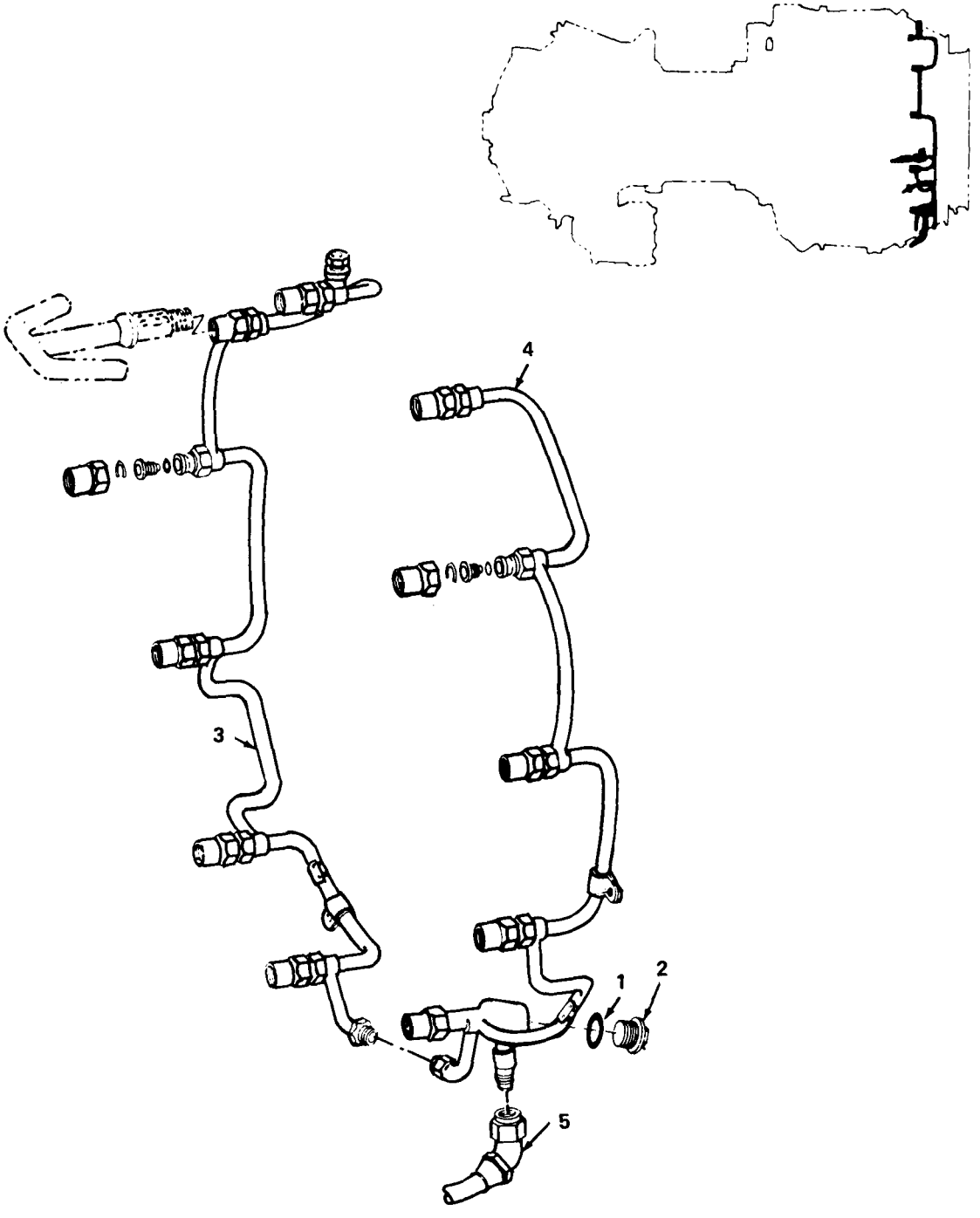
LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
	NOTE **Remove coverings from manifold and inspect openings to insure cleanliness.**	
1. Packing (1)		**Install** on plug (2) and **install** in main fuel manifold (4). **Tighten** plug as required. **(Refer** to table G-3, reference number 39.) **Lockwire** plug.
2. Main Fuel Manifolds (3 and 4)		**Place** in position over rear support cone.
3. Main Fuel Manifold Connectors	Use fuel harness wrench (LTCT4810 or LTCT2051).	**Connect** to fuel vaporizers as follows: a. **Tighten** connector nuts by hand.
	NOTE **Before installation of main fuel manifold, check torque on injectors. Torque injectors 115 to 125 pound-inches (1.3 to 1.4 kg/m).** **When tightening nuts at the 7-o'clock position (Fuel Strainer Housing), hold strainer housing, using dip-joint pliers with taped jaws.**	
		b. Starting with connector nut at the 7-o'clock position (fuel strainer housing), sequentially **tighten** nuts with wrench in 180 degree opposite pairs until snug.

6-61. Main Fuel Manifold (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued	**CAUTION** **When tightening connector nut, hold manifold lag securely. If manifold leg is allowed to turn with the connector nut, unnecessary high stresses are created.** **NOTE** When torquing nuts in following, hold fuel strainer housing using slipjoint pliers with taped jaws. Starting with the nut at fuel strainer housing (7-o'clock position).	c. **Tighten** nuts in 180 degree opposite pairs as required, **(Refer** to table G-3, reference number 63,) d. **Lockwire connector** nuts.
4. Main Fuel Hose Assembly (5)		**Connect to** left main fuel manifold.
5. Installation		**Check** for chafing or rubbing of main fuel manifold tubes.

6-61. Main Fuel Manifold (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



6-62. Main Fuel Manifold Assembly (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

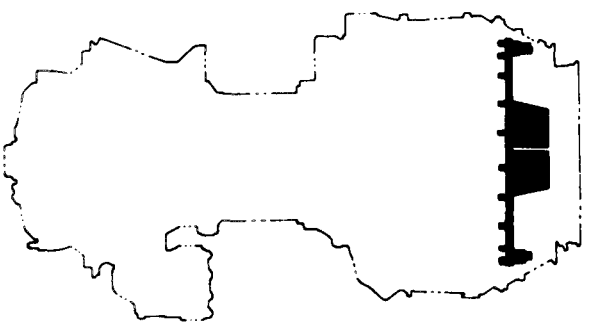
Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

Spatial Tools
LTCT4174 Alinement Fixture

References
Para 4-9, 6-33, 6-47 and 7-49

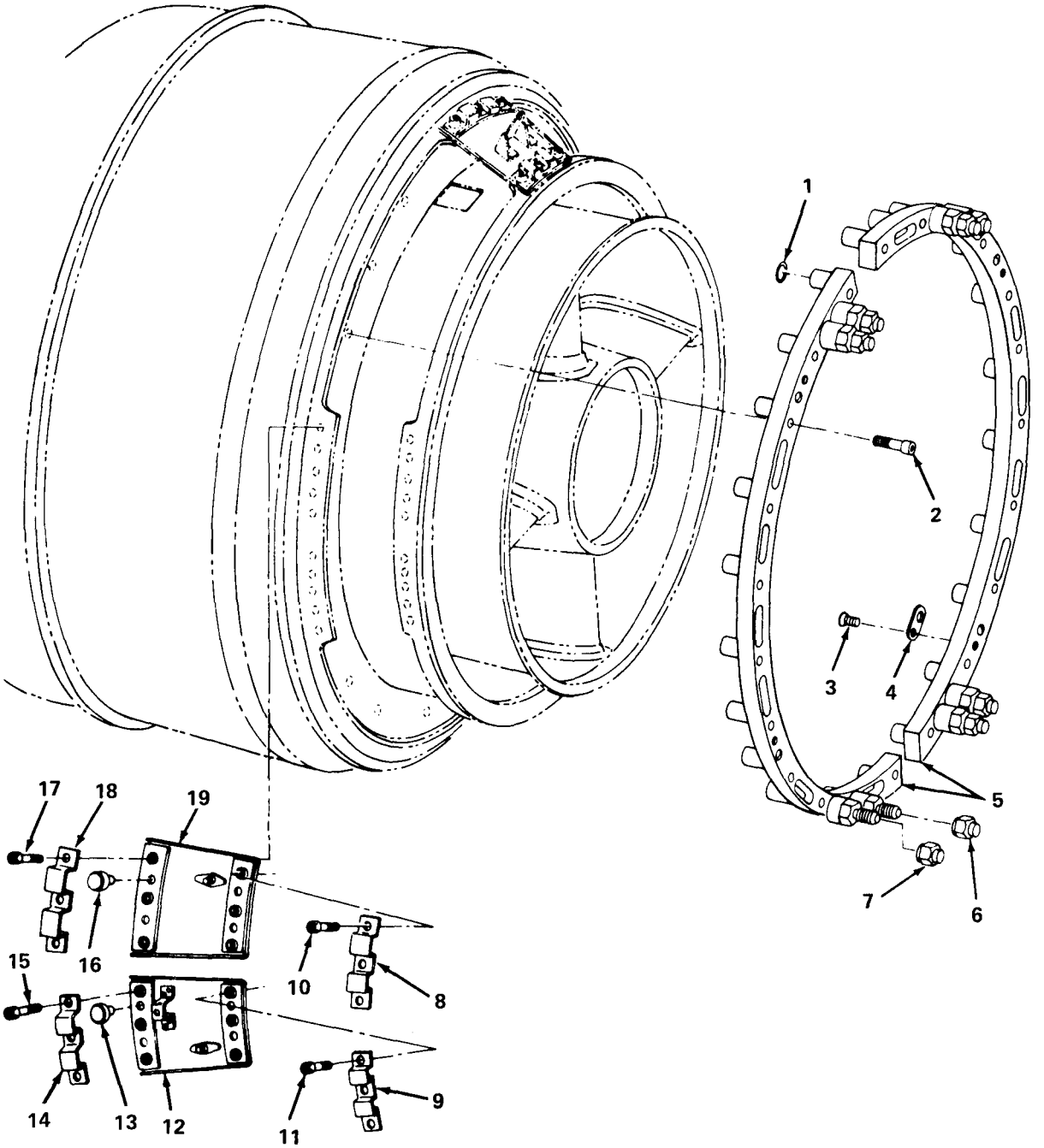
LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
	NOTE Manifold assemblies can be used interchangeably on either right or left side of engine.	
1. Sealing Gaskets (4)		**Position** on fuel manifold at 1-,4- and 10-o' clock position and **secure** with screws (3). **Tighten** screws as required.



1. Seal
2. Bolt
3. Screw
4. Sealing Gasket
5. Main Fuel Manifold Assemblies
6. Cap
7. Cap
8. Retainer
9. Retainer
10. Bolt
11. Bolt
12. Support Assembly
13. Pin
14. Retainer
15. Bolt
16. Pin
17. Bolt
18. Retainer
19. Support Assembly

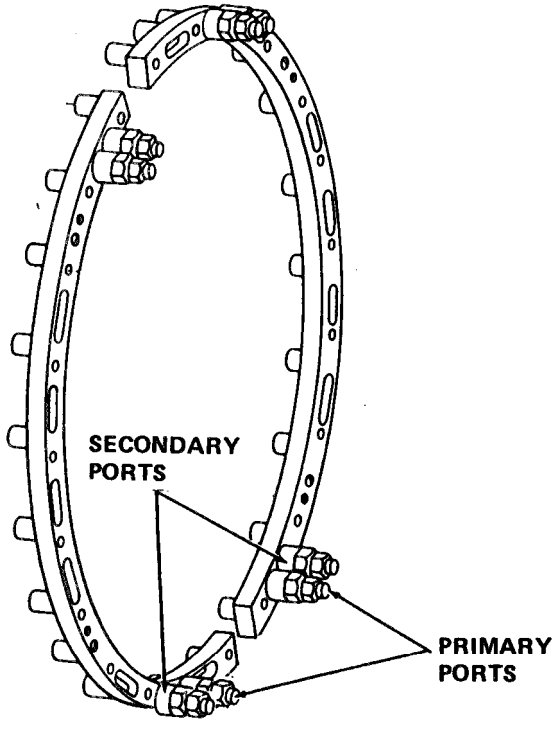
6-62. Main Fuel Manifold Assembly T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



2. Seals (1)	**Position** on each nozzle.

6-62. Main Fuel Manifold Assembly (T53-L-13B703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
3. Caps (6 and 7)	**NOTE** Lockwire (item 43, Appendix D) caps on unused manifold ports in pairs.	Remove from ports to be used on main fuel manifold assemblies (5).
4. Combustion Chamber and Combustion Chamber Housing	Use alinement fixture LTCT41 74.	**Aline** nozzle ports on combustion chamber liner with ports on combustion chamber housing. **Remove** fixture.
5. Primary Port of Manifold		**Aline** primary ports of manifold with primary ports of flow divider and dump valve on rear face of combustion chamber housing. **Secure** manifold assembly to housing with bolts (2). **Tighten** bolts as required and **lockwire.**
6. Hose Assemblies		**Connect** from flow divider to fuel manifold.
	NOTE If the support cone assembly was removed as a unit, reinstall as outlined in paragraph 4-9 and proceed to following action for item 8.	

6-62. Main Fuel Manifold Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
7. Support Assemblies (12 and 19)		**Position** on support cone and **install** pins (13 and 16). **Secure** support assemblies to support cone with retainers (8, 9, 14 and 18) and bolts (10, 11, 15, and 17). **Tighten** bolts as required and **lockwire.**
8. Starting Fuel Manifolds and Starting Fuel Nozzles	Refer to paragraph 6-33 and 6-47.	**Install.**
9. Ignition Leads	Refer to paragraph 7-49.	**Connect** to igniter plugs.

6-63. Main Fuel Hoses (T53-L-11 Series Engines) - Removal

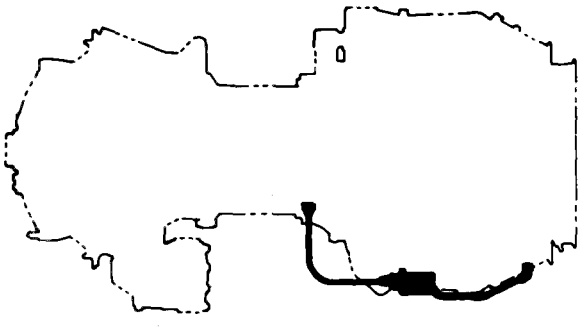
INITIAL SETUP

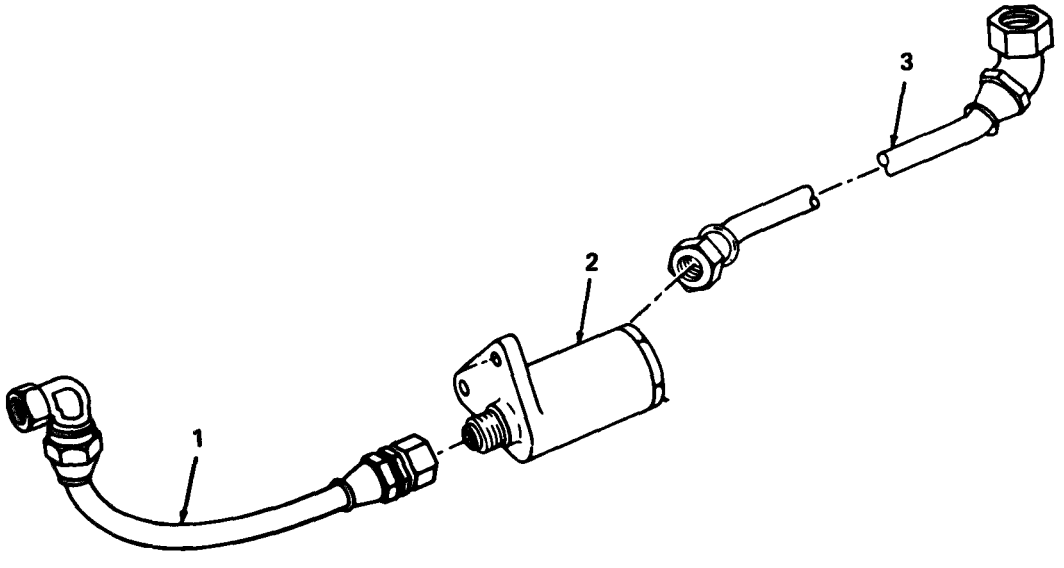
Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Main Fuel Hose Assembly (1)		**Disconnect** from fuel control fitting and bypass fuel. filter (2). **Remove** hose.

6-63. Main Fuel Hoses (T53-L-11 Series Engines) - Removal - Continued

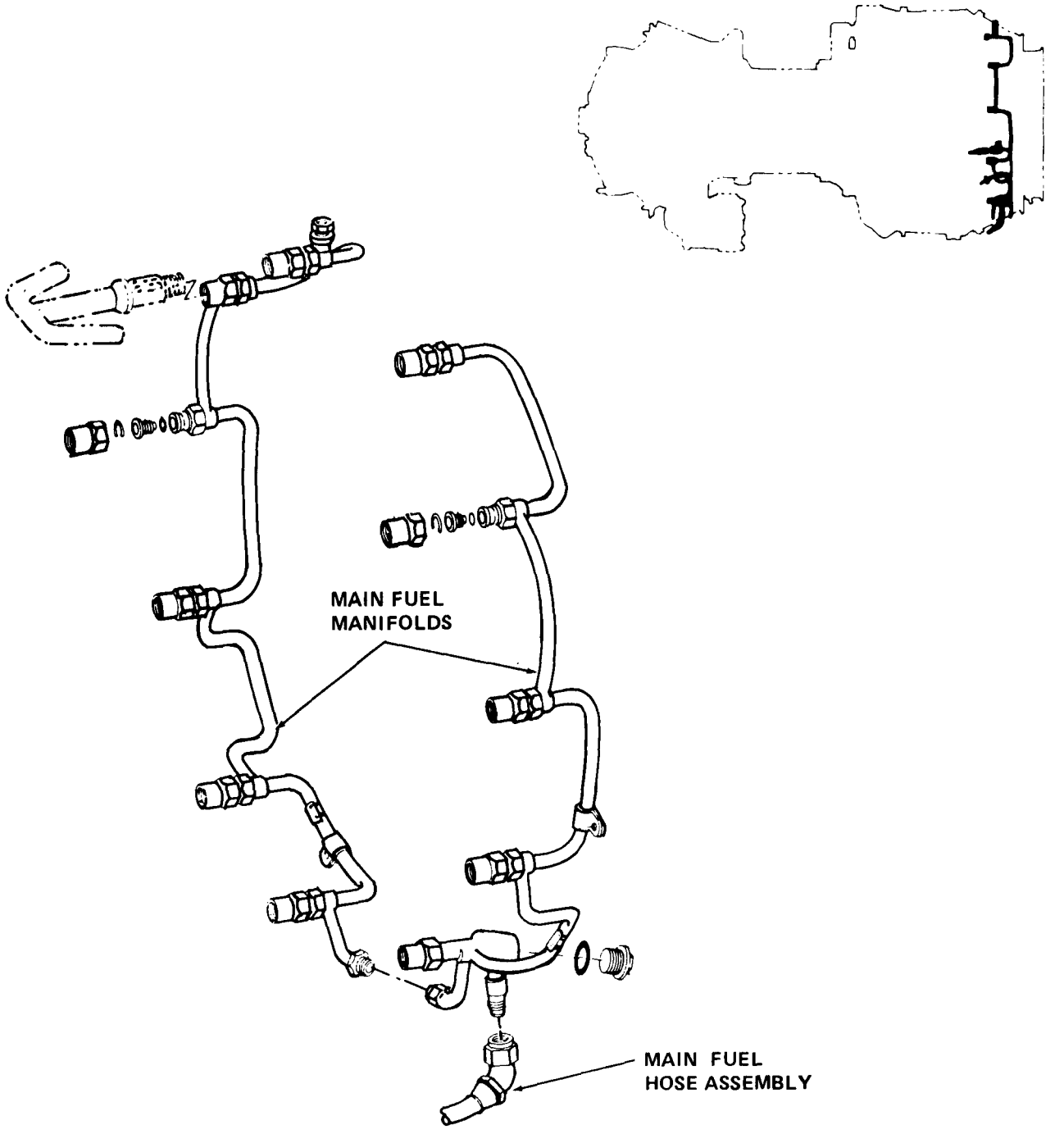
LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
2. Main Fuel Hose Assembly (3)		**Disconnect** from bypass fuel filter (2) and main fuel manifold. **Cover** all openings.





6-63. Main Fuel Hoses (T53-L-11 Series Engines) - Removal - Continued

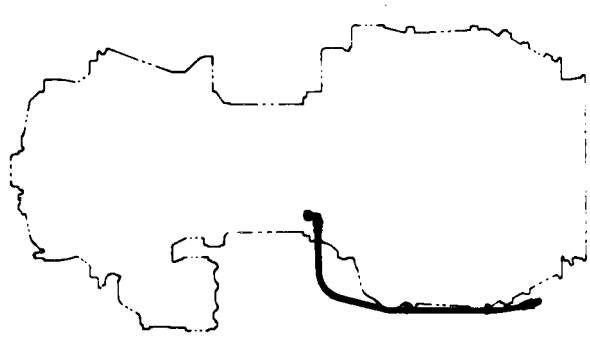
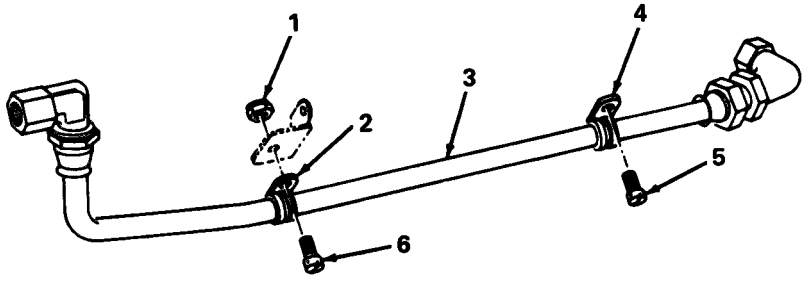
LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



6-64. Main Fuel Hoses (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Screw (6) and Nut (1)		**Remove** from clamp (2).
		
		
2. Screw (5)		**Remove** from clamp (4).
Hose Assembly (3)		**Disconnect** from fuel control and flow divider assembly.
4. Hose Assembly (3)		**Remove.**

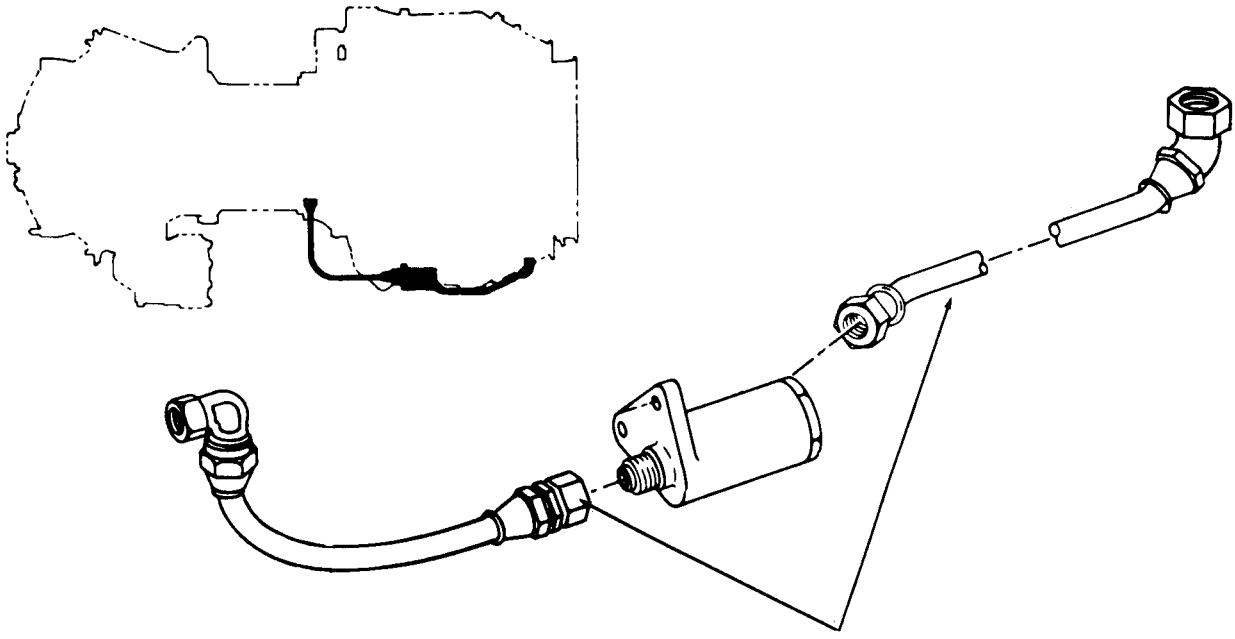
6-65. Main Fuel Hoses - Inspection

INITIAL SETUP

Applicable Configuration
All

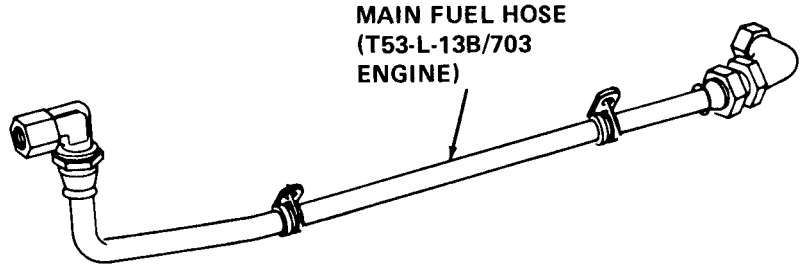
References
Para H-21 and 7-5

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		



MAIN FUEL HOSES
(T 53-L-11 SERIES ENGINE)

1. Main Fuel Hoses	Refer to paragraph H-21 for inspection procedures. Refer to paragraph 7-5 for repair procedures.	**Inspect. Repair.**



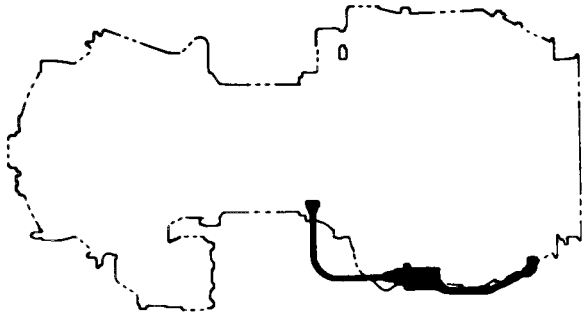
MAIN FUEL HOSE
(T53-L-13B/703
ENGINE)

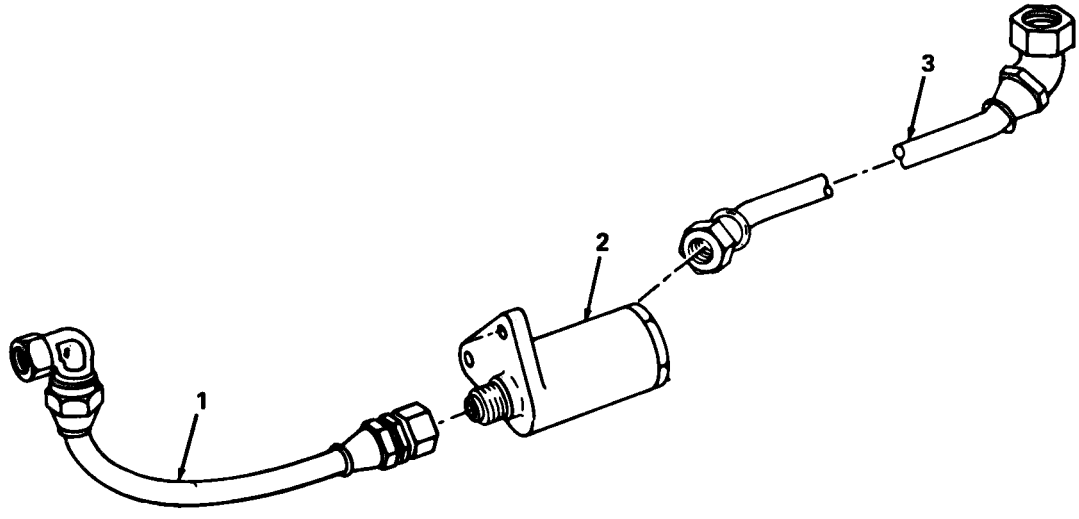
6-66. Main Fuel Hoses (T53-L-11 Series Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ -		
1. Main Fuel Hose Assembly (1)		**Connect** to fuel control fitting and to bypass fuel filter (2).
2. Main Fuel Hose Assembly (8)		**Connect** to bypass fuel filter (2) and to main fuel manifold.





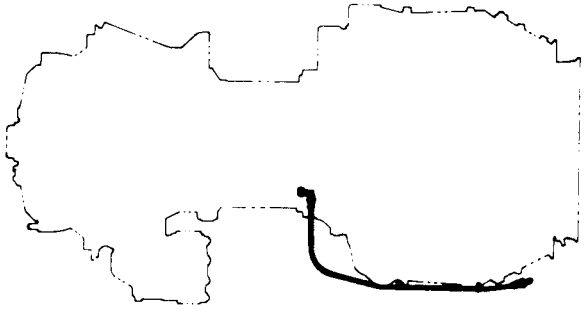
6-67. Main Fuel Hoses (T53-L-13B/703 Engines) - Installation

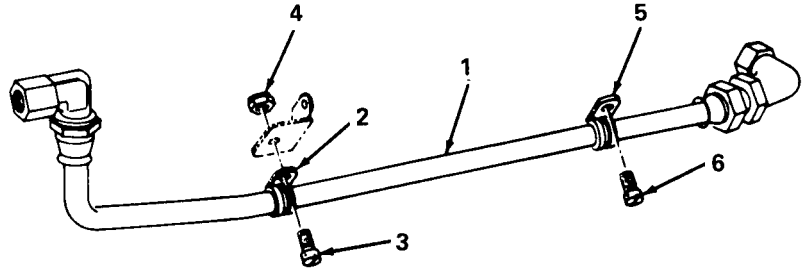
INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Hose Assembly (1)		**Connect** to fuel control and to flow divider assembly. **Tighten** hose connectors.
2. Clamp (2)		**Secure** to bracket on forward flange on combustion chamber housing with screw (3) and nut (4). **Secure** clamp with screw.
3. Clamp (5)		**Attach** to engine with screw (6). **Lockwire.**





6-68. Bypass Fuel Filter (T53-L-11 Series Engines) - Minor Servicing

INITIAL SETUP

Applicable Configuration
T53-L-11 series Engines

Consumable Materials
Drycleaning Solvent (item 24, Appendix D)

References
Para H-29 and 6-11

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/	**NOTE** Before cleaning bypass fuel filter, visually inspect filter element for contamination.	
1. Servo Supply Filter	Refer to paragraph 6-11. If initial inspection reveals contamination perform this action.	**Determine** source of contamination. **Inspect.**
2. Bypass Filter and Fuel Line	If either or both inspections reveal no contamination perform this action.	**Clean** bypass filter and line to fuel control.
3. Main Fuel Filter	If contaminated, perform this action.	**Check** aircraft fuel system. **Remedy** as required.
	CAUTION **To prevent damage to screen, use low air pressure to dry filter element in following action for item 4.**	
	WARNING **Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 136°F (38°C to 59°C).**	
4. Filter Element, Plug, Spring, and Housing	Use drycleaning solvent (item 24, Appendix D).	**Clean. Air-dry.**

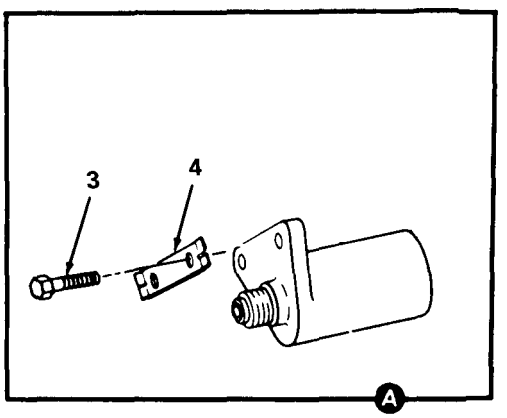
6-68. Bypass Fuel Filter (T53-L-11 Series Engines) - Minor Servicing - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		
5. All Parts		**Inspect** for cracks, distortion, and other damage. **Replace** parts that are damaged.
6. Threads	Refer to paragraph H-29.	**Repair** minor damage.
7. All Parts	Perform this action if parts are damaged or have irreparable thread damage.	**Replace.**

6-69. **Bypass Fuel Filter (T53-L-11 Series Engines) - Removal**

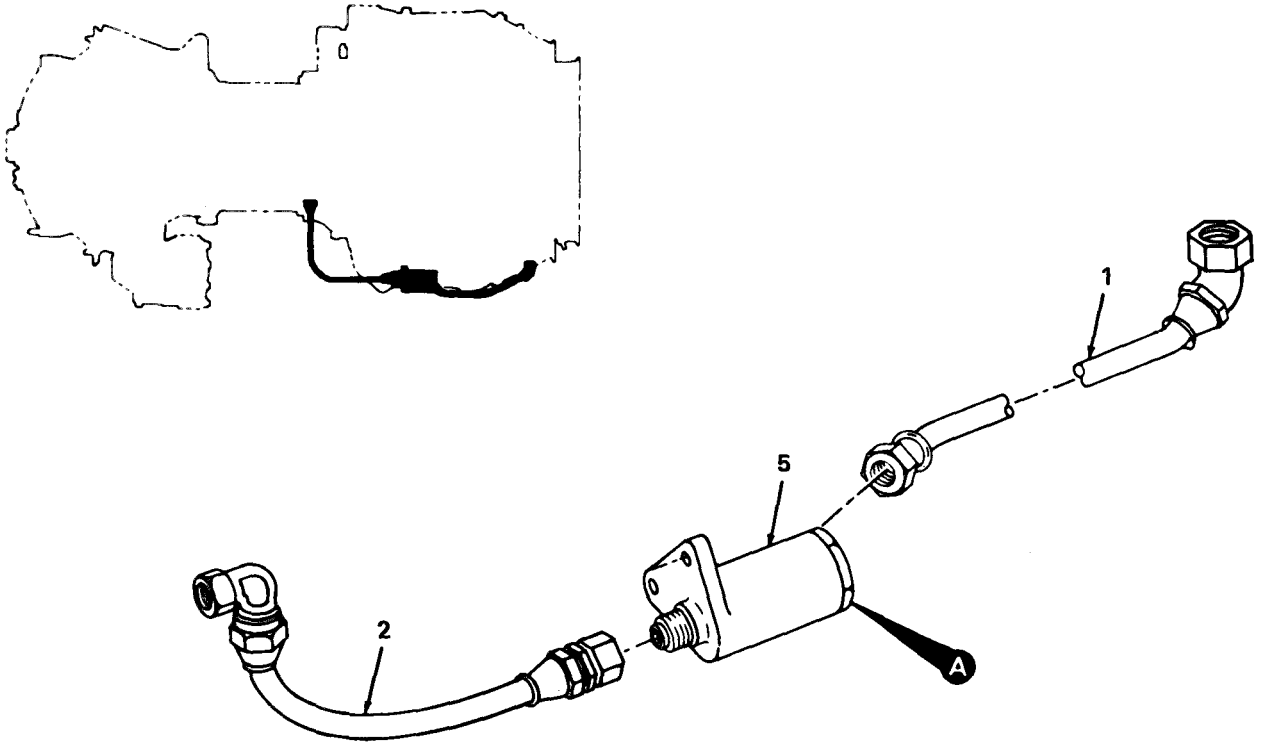
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Main Fuel Hose Assemblies (1 and 2)		**Disconnect** at filter,
2. Bypass Fuel Filter (5)		**Remove** bolts (3) and locking plate (4). **Remove** filter (5) from engine.

6-69. Bypass Fuel Filter (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



6-70. Bypass Fuel Filter (T53-L-11 Series Engines) - Disassembly

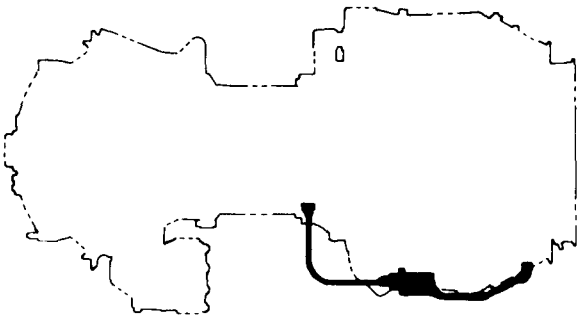
INITIAL SETUP

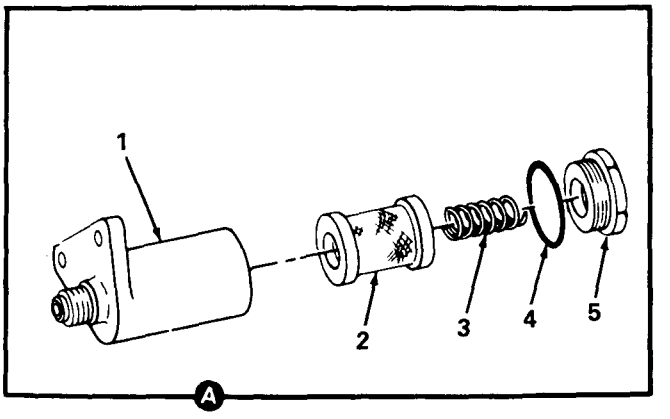
Applicable Configuration
T53-L-11 Series Engines

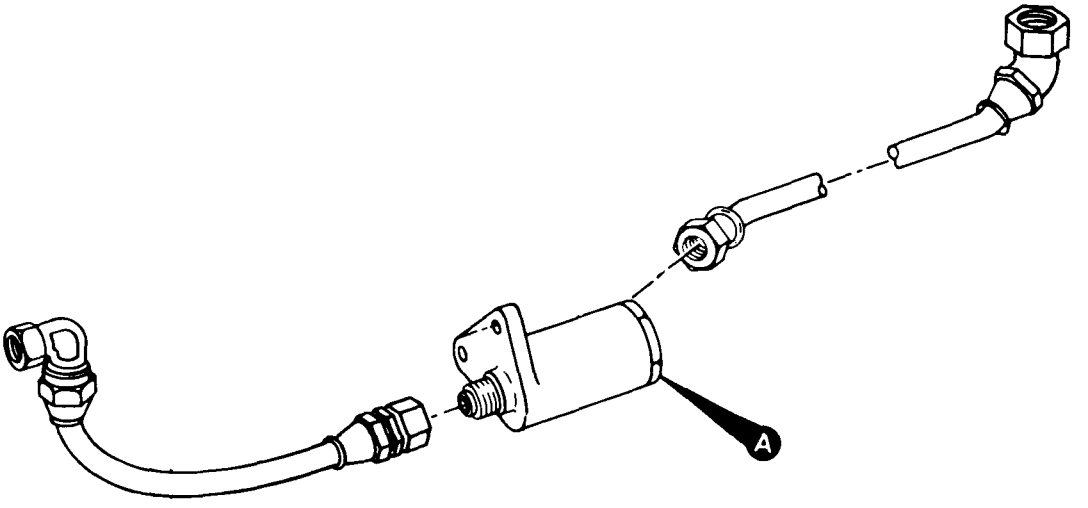
LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/	**NOTE** Perform actions for items 1 thru 3 only if it is necessary to remove fuel filter element (2).	
1. Plug (5) and Packing (4)		**Remove** plug (5) and discard packing (4).

6-70. Bypass Fuel Filter (T53-L-11 Series Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION







2. Packing (4) — **Remove.**

3. Spring (3) — **Remove.**

4. Filter Element (2) — **Remove** from filter housing (1).

6-71. BYPASS FUEL FILTER (T53-L-11 SERIES ENGINES) - ASSEMBLY

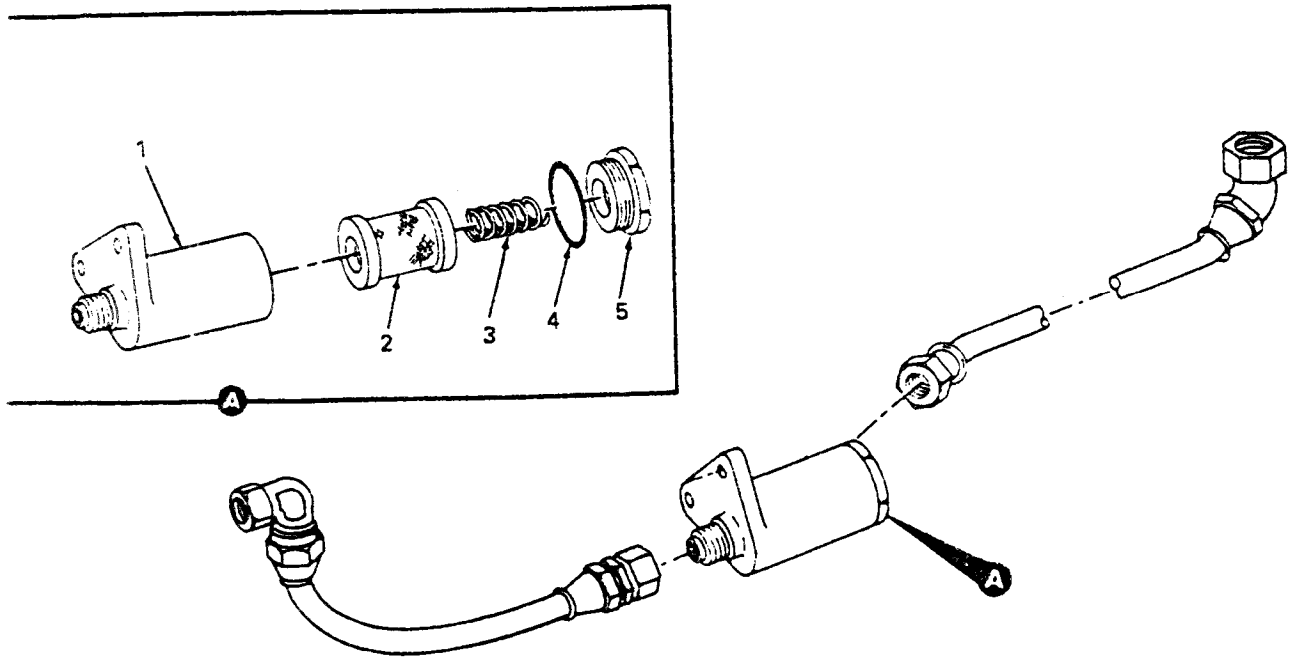
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Oil (item 45, Appendix D)

References
Appendix G, Table G-3, Reference Number 40

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/		
1. Filter Element (2) and spring (3)		**Insert** into fuel filter housing (l).

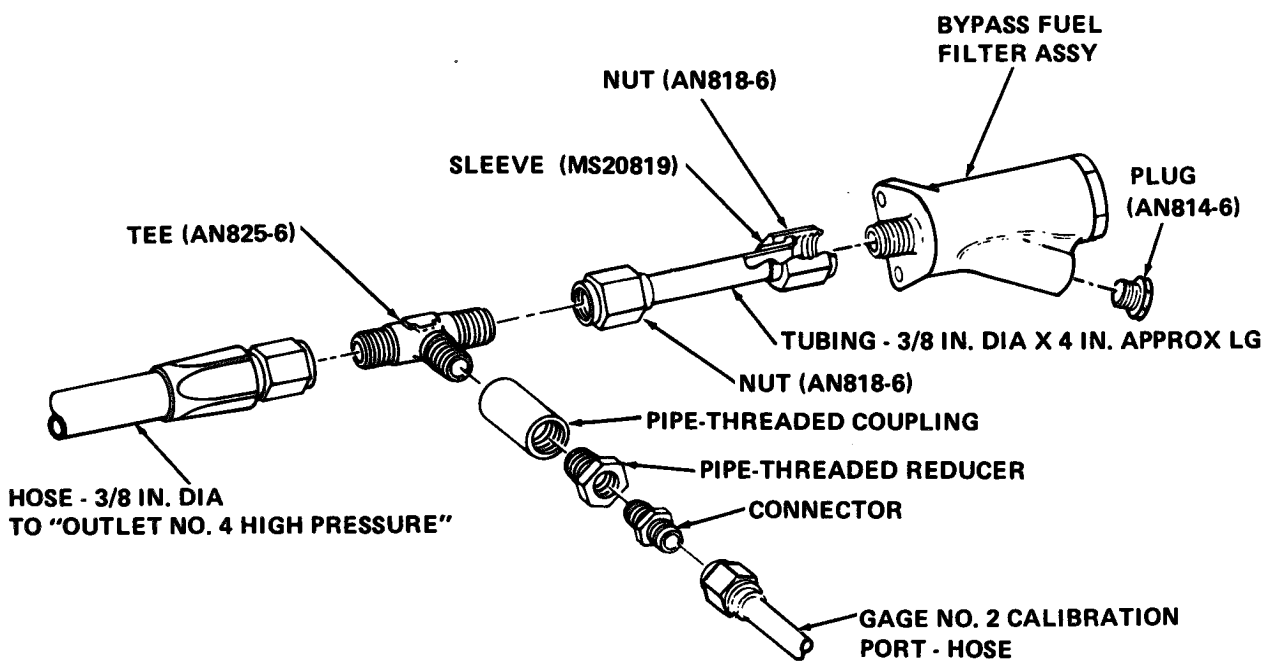


2. Packing (4)	Use oil (item 45, Appendix D) to lubricate threads of plug.	**Install** on plug (5).
3. Plug (5) and Packing (4)		**Install** in housing.
4. Plug (5)	Refer to Appendix G, table G-3, reference number 40.	**Tighten** as required.

All data on pages 6-146 through 6-150 deleted.

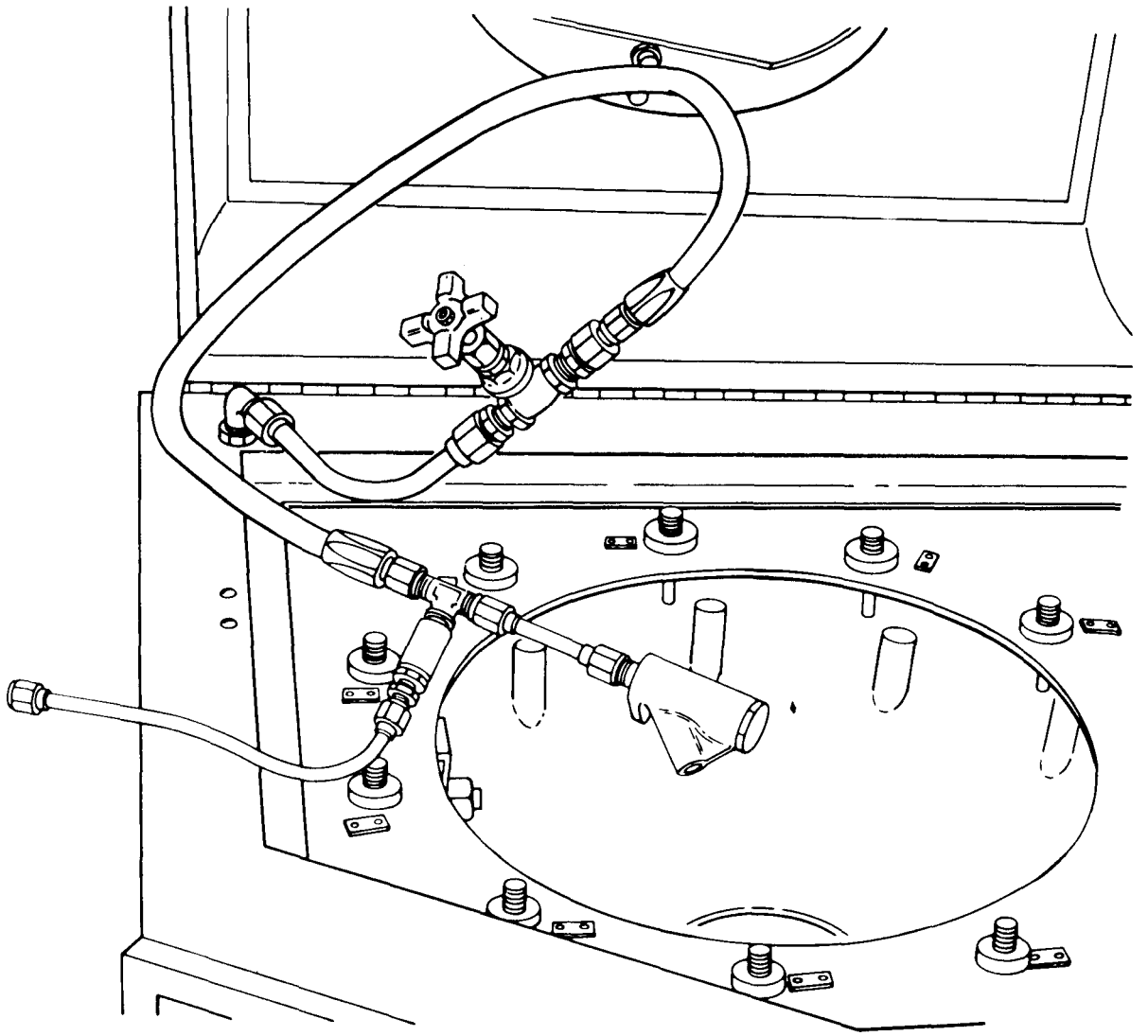
6-72. Bypass Fuel Filter (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
6. STATIC BYPASS Valve		**Open. Observe** to **insure** pressure on GAGE NO. 4 STATIC PRESSURE gage drops to zero.
7. Plug		**Remove** plug previously installed in action for item 1.
8. Bypass Fuel Filter		**Connect** to assembled test fitting attached to No. 6 (3/8-inch diameter) hose from OUTLET NO. 4 HIGH PRESSURE port of test stand.



6-72. Bypass Fuel Filter (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
9. Bypass Fuel Filter		**Position** (fuel-out opening down) over drain basin of test stand.



6-72. Bypass Fuel Filter (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
10. MAIN PUMP ON Switch		**Press.**
11. PRESSURE CONTROL Valve		**Open** valve until maximum pressure of 20 psi is indicated on GAGE NO. 2.
12. BYPASS Valve Control		**Adjust flow** rate until TOTAL FLOW gage indicates 990 phr to 1010 phr. If flow rate cannot be obtained, **reject** bypass fuel filter assembly.
13. PRESSURE CONTROL Valve		**Close.**
14. BYPASS Valve		**Open.**
15. MAIN PUMP OFF switch		**Press.**
16. Bypass Fuel Filter Assembly		**Remove** test fittings.
	NOTE To simulate a clogged condition of the filter element perform actions for items 17 thru 19.	
17. Bypass Fuel Filter		**Disassemble.**
18. Filter Housing		**Inspect** teflon coating on interior surfaces for chipping and flaking. If chipping or flaking is noted, reject bypass fuel filter assembly. If no chipping or flaking is noted, **proceed** to action for item 19.

6-72. Bypass Fuel Filter (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
19. Filter Element		**Install** a teflon plug into inlet orifice.
20. Bypass Fuel Filter	See figure in item 8.	**Reassemble. Attach** test fittings that were removed in action for item 16.
21. PRESSURE CONTROL Valve	This action indicates that test fluid is beginning to flow through the bypass fuel filter assembly.	**Open. Observe** to **insure** that pointer on GAGE NO. 2 begins to rise.
22. BYPASS Valve		**Adjust** until TOTAL FLOW gage indicates 49 phr to 51 phr. **Check** that the pressure reading on GAGE NO. 2 is between 20 psig and 35 psig.
23. Main PUMP ON Switch		**Press.**
24. BYPASS Valve		**Adjust** until TOTAL FLOW gage indicates 790 phr to 810 phr. **Check** that pressure reading on GAGE NO. 2 is between 20 psig and 50 psig.
25. BYPASS Valve		**Open.**
26. PRESSURE CONTROL Valve		**Close.**
27. MAIN PUMP OFF Switch		**Press.**
28. Test Fittings		**Remove.**
29. Bypass Fuel Filter Assembly		**Disassemble.**

6-72. DELETED

6-73. BYPASS FUEL FILTER (T53-L11 SERIES ENGINES) - INSTALLATION

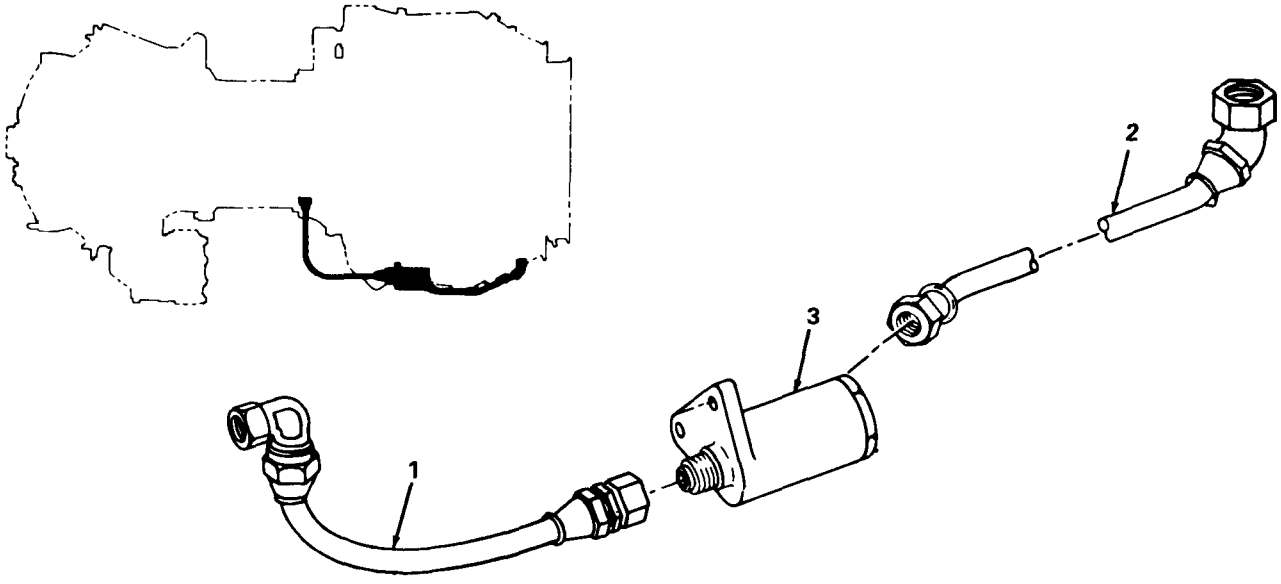
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
CONBUSTION CHAMBER HOUSING/		
1. Bypass Fuel Filter (3)		**Position** on engine. **Insert** bolt through locking plate and engine mounting holes. **Screw** bolts into bypass fuel filter mounting flange and **tighten.**
2. Main Fuel Hose Assemblies (1 and 2)		**Connect** to bypass fuel filter (3).

6-73. Bypass Fuel Filter (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER HOUSING/ - Continued		



6-74. Flow Divider and Dump Valve Hose Assembly (T53-L-13B/703 Engines) - Removal

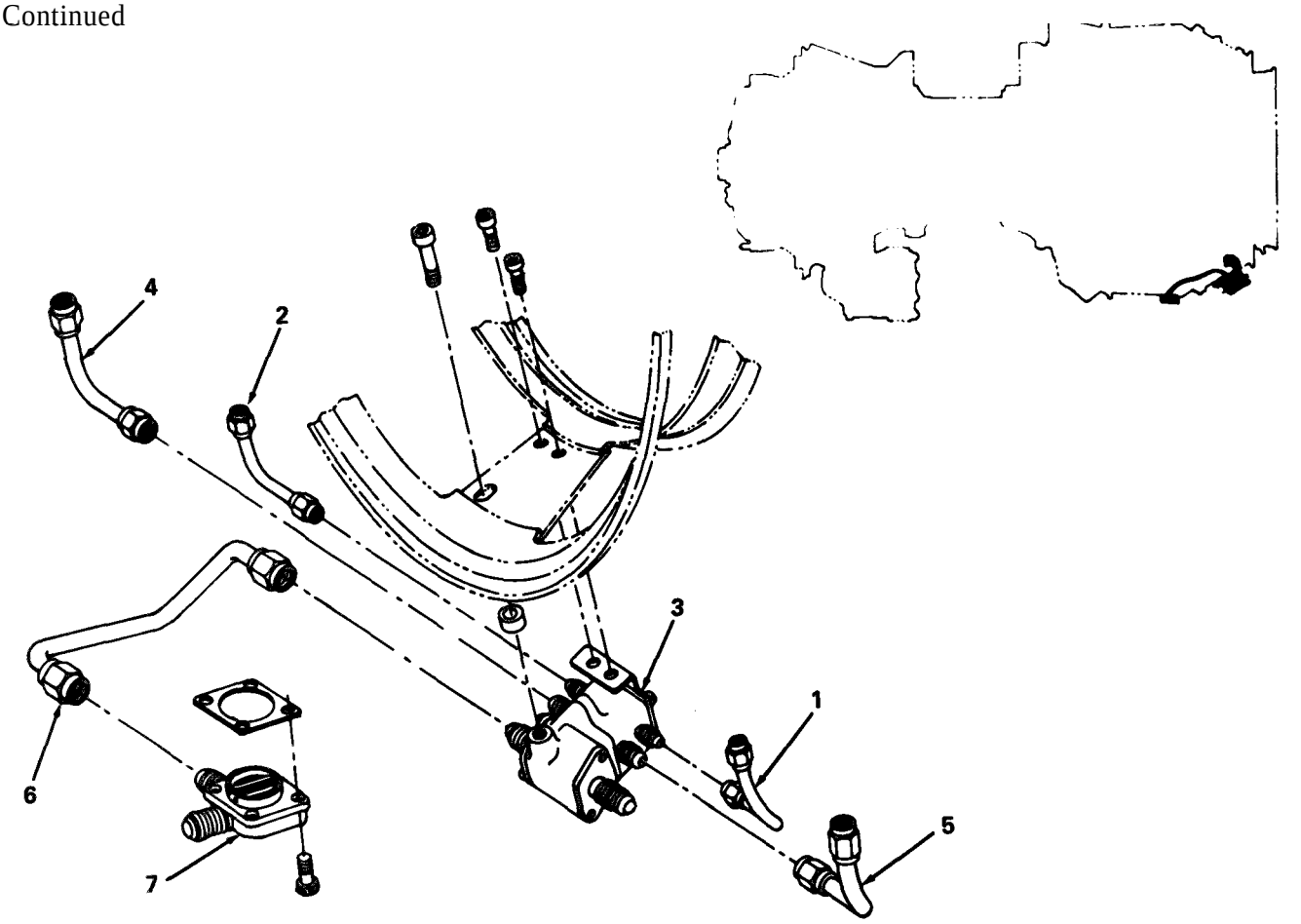
INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/	**CAUTION** **When hose assemblies are disconnected, immediately cap flow divider and fuel manifold ports.**	
1. Primary Hose Assemblies (1 and 2)		**Disconnect** from primary ports of fuel manifold and from primary ports of flow divider and dump valve assembly (3). **Remove** hose assemblies.

6-74. Flow Divider and Dump Valve Hose Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/ - Continued		



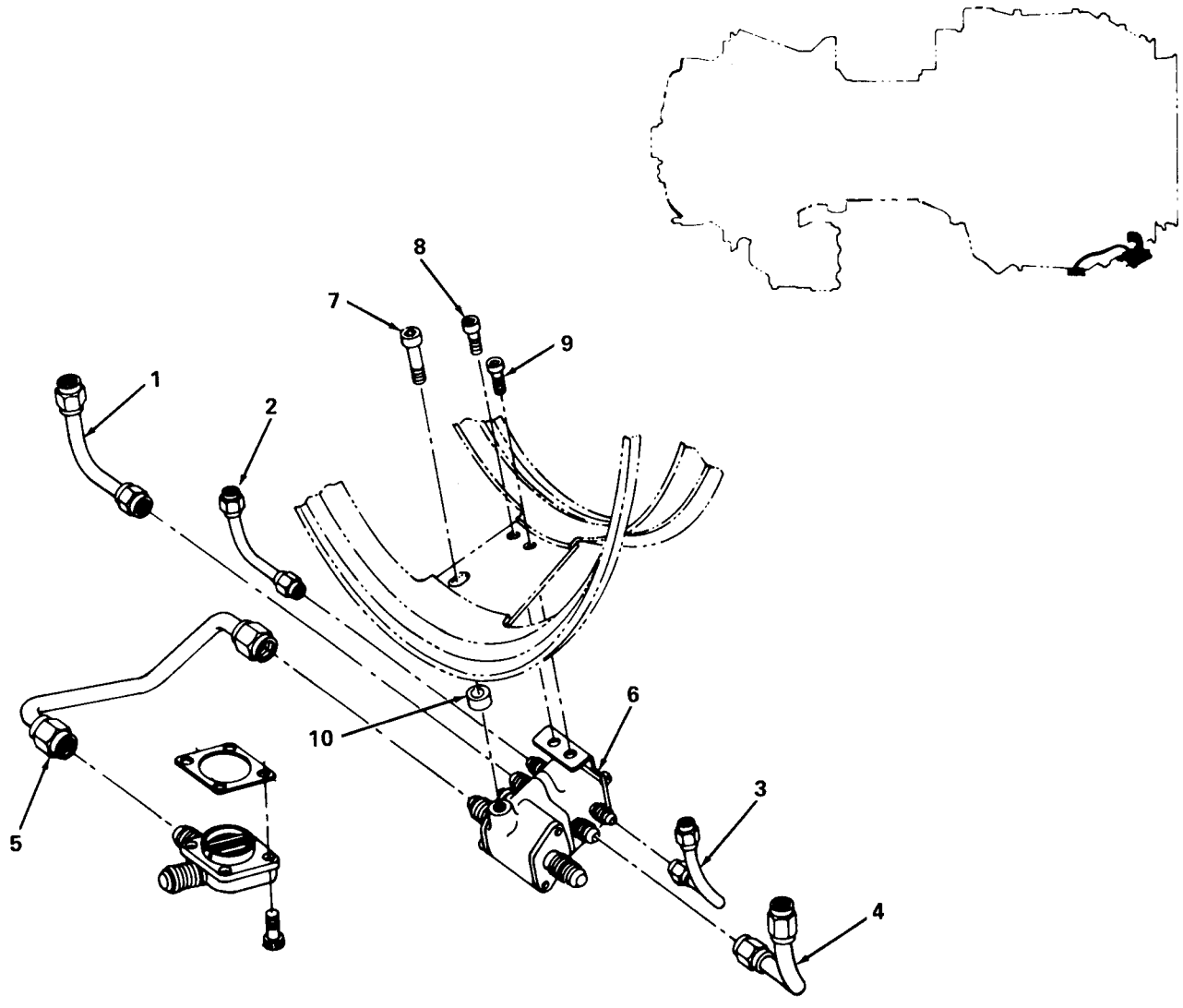
2. Secondary Hose Assemblies (4 and 5)		**Disconnect** assemblies (4 and 5) from secondary port of fuel manifold and from secondary ports of flow divider and dump valve assembly. **Remove** hose assemblies.
3. Hose Assembly (6)		**Disconnect** assembly (6) from flow divider and from combustion chamber drain valve assembly (7). **Remove** hose assembly.

6-75. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

Applicable Configuration	References
T53-L-13B/703 Engines	Para 4-5

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/		



6-75. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Removal - Continued

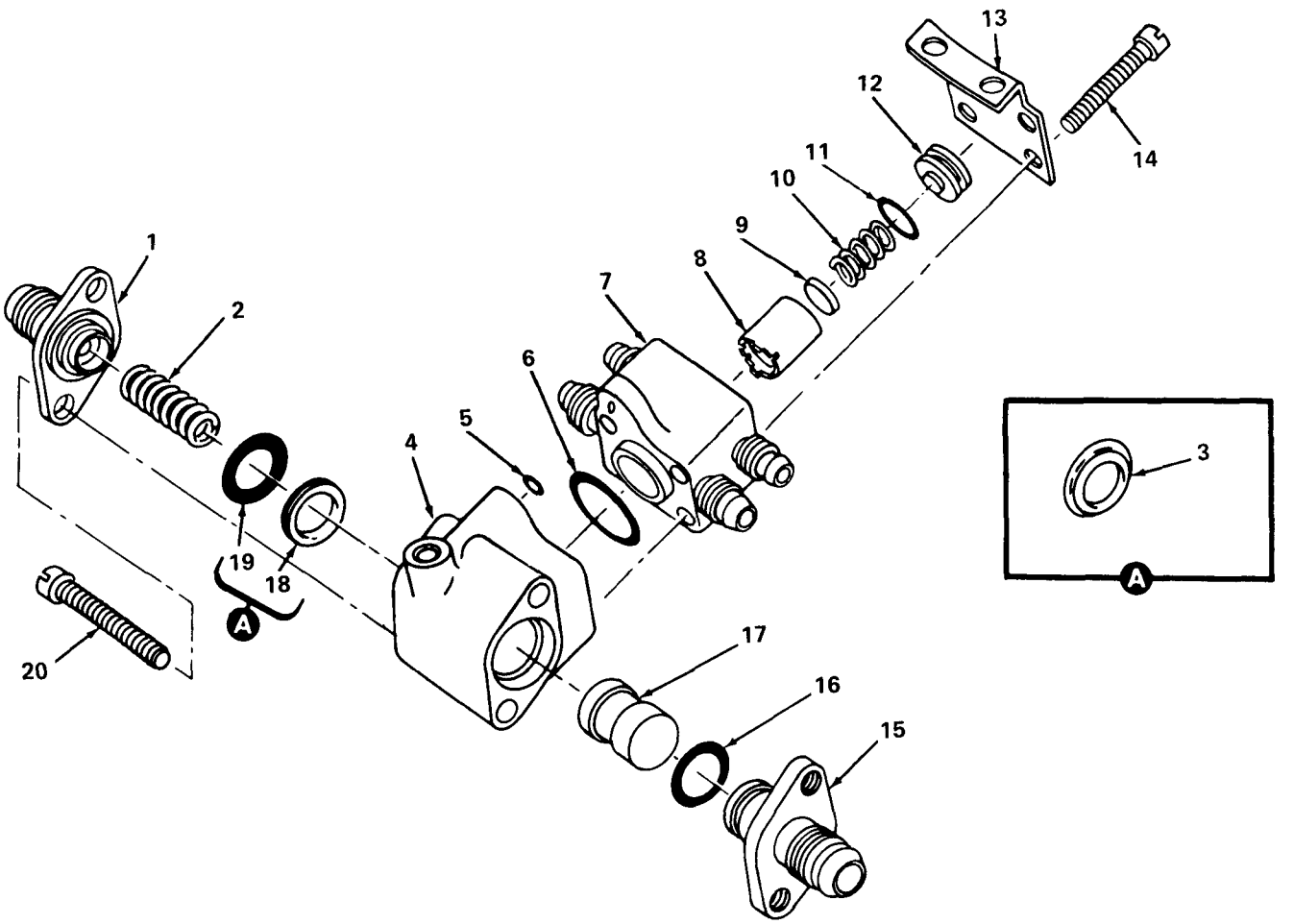
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/ - Continued		
	CAUTION **When hoses are removed, immediately cap hose assembly ports.**	
	NOTE Removal of flow divider and dump valve assembly shall not be accomplished unless replacement is intended.	
1. Fuel Inlet Line and Hose Assemblies		**Remove** assemblies (1, 2, 3, 4 and 5) from flow divider and dump valve assembly (6).
2. Support Assembly	Refer to paragraph 4-5 for removal procedures.	**Remove.**
3. screws		**Remove** screws (7, 8, and 9) that secure flow divider and dump valve assembly to support assembly.
4. Flow Divider and Dump Valve Assembly		**Remove** assembly (6) and spacer (10) from support assembly.

6-76. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Disassembly

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/	**NOTE** To insure proper reassembly, note position of bracket (13).	



1. Union Half
2. Spring
3. Seal Assembly
4. Lower Housing
5. Packing
6. Packing
7. Upper Housing
8. Plunger
9. Shim
10. Spring
11. Packing
12. Cap
13. Bracket
14. Screw
15. Union Half
16. Packing
17. Plunger
18. Seal
19. Packing
20. Screw

6-76. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Disassembly - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/ - Continued		
1. Lower Housing (4)		**Remove** screws (14) that secure bracket (13) and upper housing (7) to lower housing (4).
	CAUTION **Use care when removing bracket. Cap (12) beneath bracket is under spring tension.**	
2. Bracket (13), Cap (12), Packing (11), and Spring (10)		**Remove. Separate** upper housing (7) from lower housing (4).
3. Plunger (8)		**Shake** shim (9) out of plunger (8). **Remove** plunger from upper housing (7).
4. Packings (6 and 5)		**Remove** from lower housing (4).
	CAUTION **Use care when removing screws (20). Union halves are under spring tension.**	
5. Union Half (1 and 15)		**Remove** screws (20) securing union half (1 and 15) to lower housing (4).
6. Union Half (1 and 15), Seal Assembly (3) or Packing (19) and Seal (18), and Packing (16)		**Remove** from lower housing (4).
7. Spring (2) and Plunger (17)		**Remove** from lower housing (4).

6-77. Flow Divider and Dump Valve Hose Assembly (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

References
Para H-21 and 7-5

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/		
1. Flow Divider and Dump Valve Hoses	Refer to paragraph H-21 for inspection procedures. Refer to paragraph 7-5 for repair procedures.	**Inspect. Repair.**

6-78. Flow Divider and Dump Valve Hose Assembly (T53-L-13B/703 Engines) - Installation

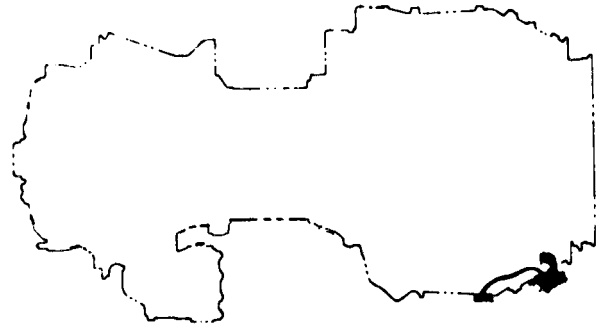
INITIAL SETUP

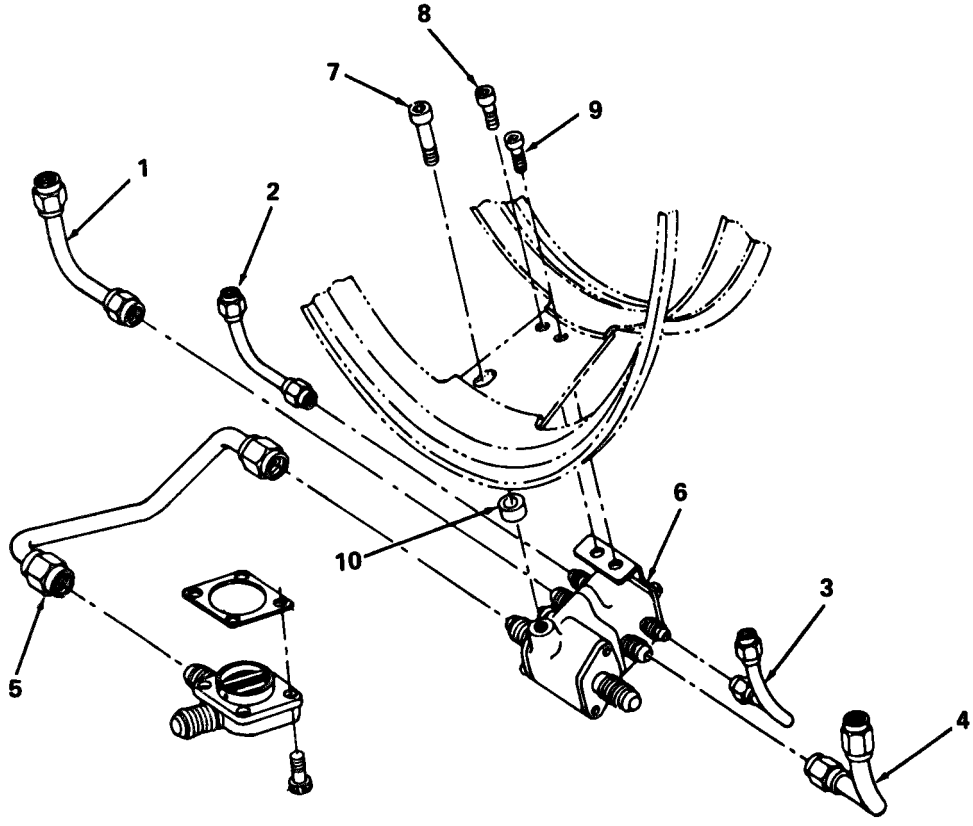
Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/	**CAUTION** **Do not remove caps from ports until the hose assembly for the port is to be connected.**	
1. Hose Assembly (5)		**Connect** to combustion chamber drain valve assembly and to flow divider and dump valve assembly (6).
2. Primary Hose Assemblies (2 and 3)		**Connect** to primary ports of fuel manifold and primary ports of flow divider and dump valve assembly (6).
3. Secondary Hose Assemblies (1 and 4)		**Connect** to secondary ports of fuel manifold and secondary port of flow divider (6).

6-78. Flow Divider and Dump Valve Hose Assembly (T53-L-13B/703 Engines) - Installation- Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/ - Continued		

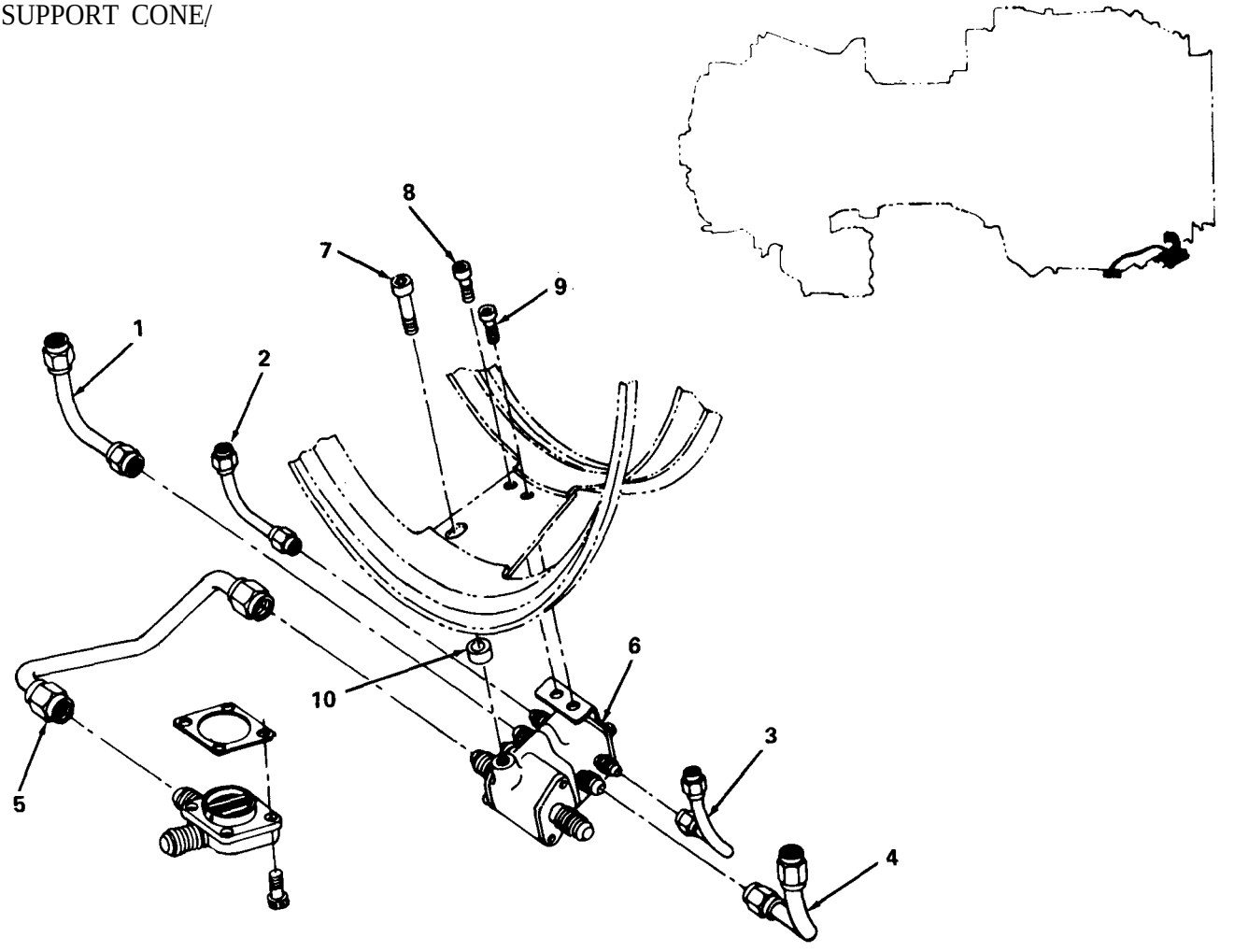




6-79. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Series Engines

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/		
	NOTE Inspect flow divider while it is installed.	
1. Flow Divider (6)	Replace flow divider if leakage is noted.	**Inspect** for leakage.
2. Flow Divider (6)	Replace flow divider if damage is noted.	**Inspect** for damage.

6-80. Flow Divider and Dump Valve Assembly (153- L-13B/703 Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

References
Para H-25

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/		
1. All Parts	Blend-repair nicks, burrs and scratches as outlined in paragraph H-25.	**Inspect** for nicks, burrs and scratches.
2. All Threaded Parts	Repair damaged threads.	**Inspect** for damaged threads.
3. All Parts	Replace all cracked, distorted or excessively worn parts.	**Inspect** for cracks, distortion, and excessive wear.

6-81. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Assembly

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

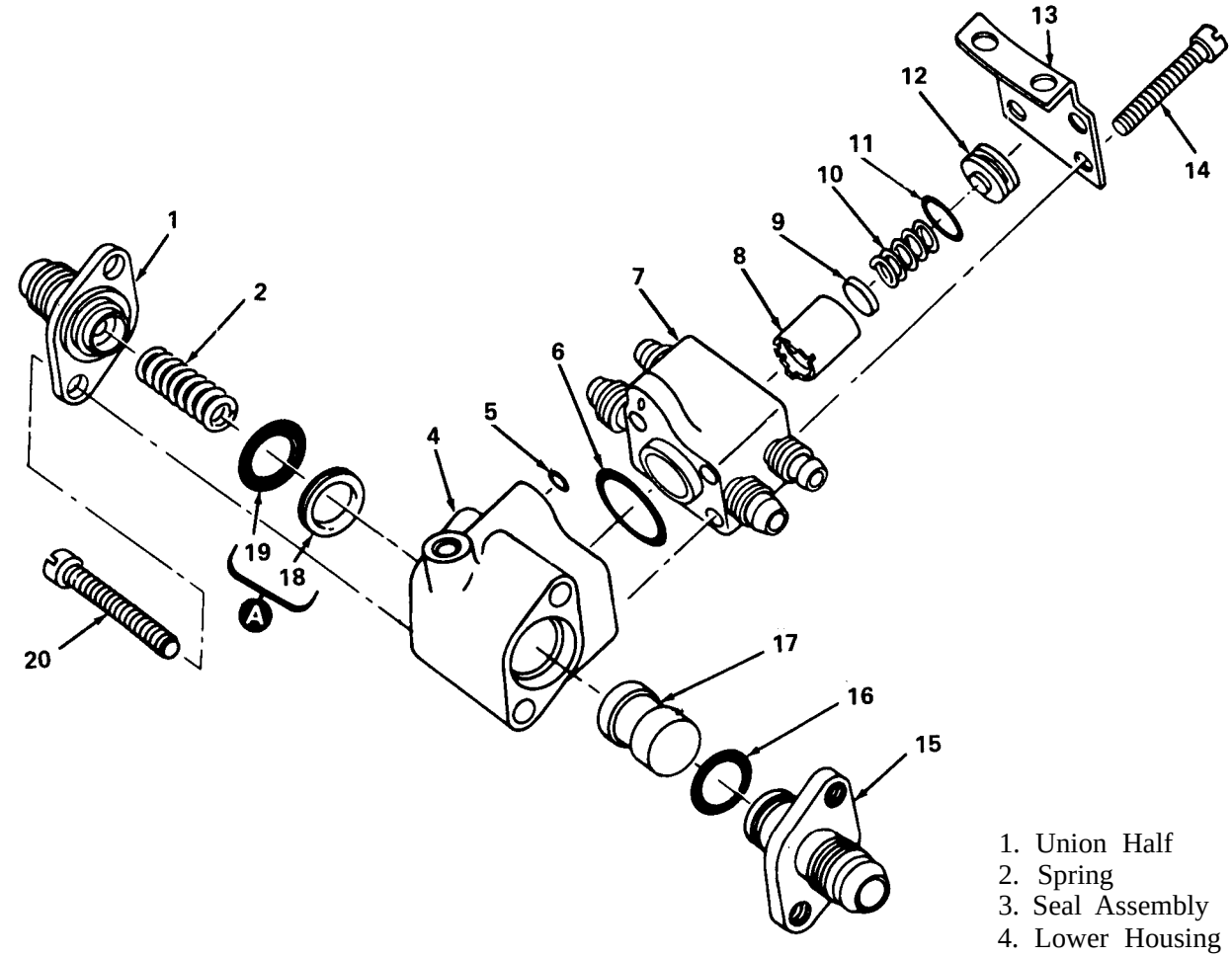
Consumable Materials
Lockwire (item 41,42, or 43, Appendix D)

References
Appendix G, Table G-4, Reference Number 62

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/		
1. Plunger (17)		**Install,** blind end out, through inlet port of lower housing (4).

6-81. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/ - Continued		



1. Union Half
2. Spring
3. Seal Assembly
4. Lower Housing
5. Packing
6. Packing
7. Upper Housing
8. Plunger
9. Shim
10. Spring
11. Packing
12. Cap
13. Bracket
14. Screw
15. Union Half
16. Packing
17. Plunger
18. Seal
19. Packing
20. Screw

6-81. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/ - Continued		
2. spring (2)		**Insert** into open end of plunger.
3. Inlet Union (15)		**Install** packing (16) on union half (15) and **install** lower housing (4).
4. Seal Assembly (3) or Seal (18), and Packing (19)		**Install** on union half (l).
5. Inlet Union Half (15)		**Rest** on flat surface.
6. Lower Housing (4)		**Align** holes with lower housing (4). **Secure** unions to housing with screws (20).
7. Screws (20)		**Tighten** as required.
8. Packing (5)		**Install** lower housing (4).
9. Packing (6)		**Install** on upper housing (7).
10. Upper Housing (7)		**Position** on lower housing (4).
11. Plunger (8)		**Install** blind end, into upper housing (7).
12. Shim (9)		**Position** into bottom of plunger (8).
13. spring (10)		**Insert** into open end of plunger (8).
14. Packing (11)		**Install** on cap (12). **Position** stepped end of cap on spring.
15. Cap (12)		**Compress** spring with cap until top of cap is flush with surface of upper housing.

6-81. FLOW DIVIDER AND DUMP VALVE ASSEMBLY (T53-L-13B/703 ENGINES) – ASSEMBLY – Cont.

EXHAUST DIFFUSER SUPPORT CONE/– Continued	
16. Bracket (13)	Place on upper housing (7) in same position from which it was removed.
17. Screws (14)	Secure. Tighten as required. Lockwire.

6-82. DELETED

6-83. FLOW DIVIDER AND DUMP VALVE ASSEMBLY (T53-L-13B/703) ENGINES) – INSTALLATION

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

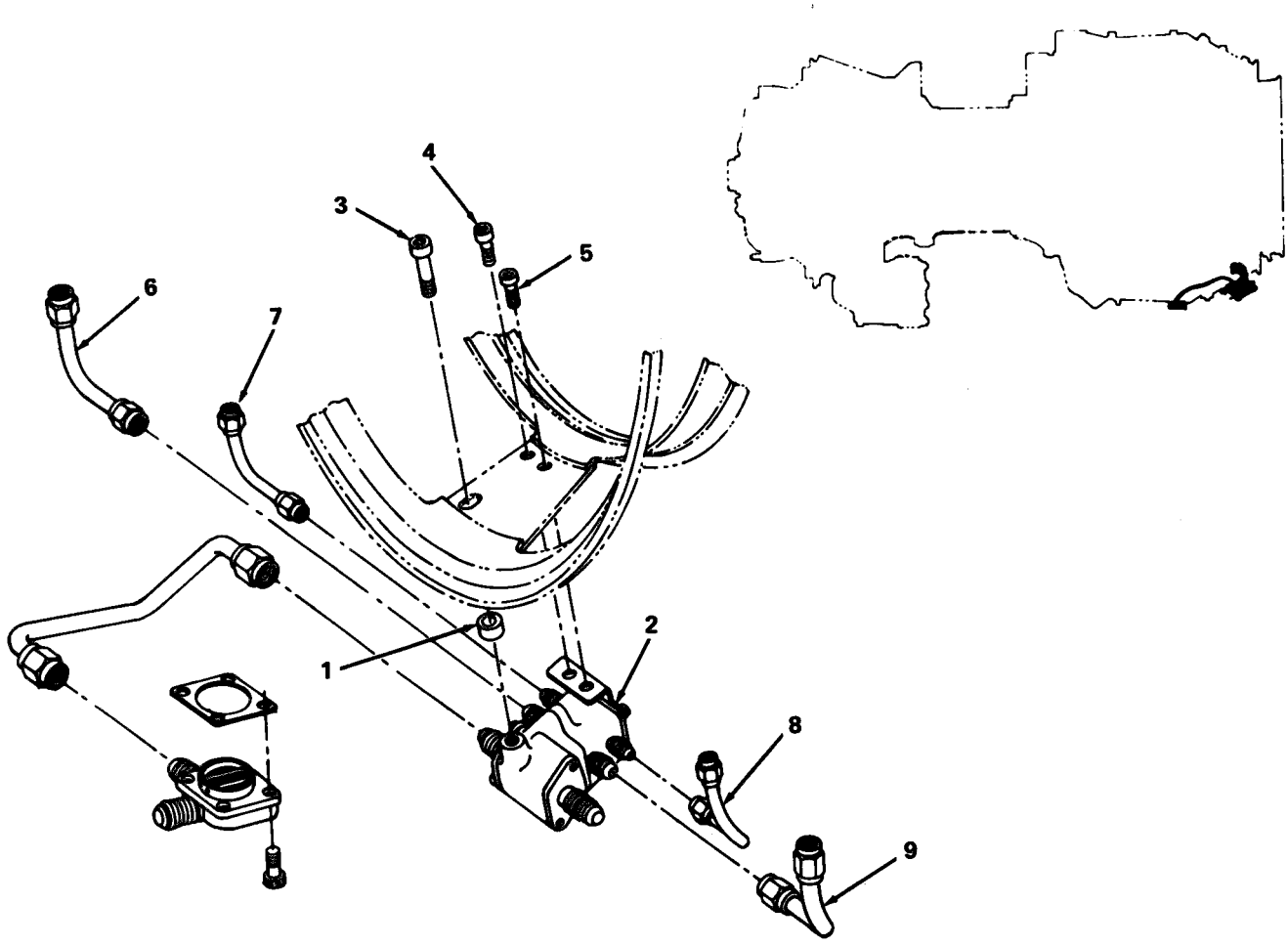
References
Para 4-9

Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

All data on pages 6-165 through 6-168 deleted.

6-83. Flow Divider and Dump Valve Assembly (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER SUPPORT CONE/		
1. Spacer (l), Flow Divider and Dump Valve Assembly (2)		**Position** on support assembly.
2. Flow Divider		**Secure** with screws (3, 4, and 5). **Tighten** screws as required and **lockwire.**
3. Support Cone Assembly.	Refer to paragraph 4-9.	**Reinstall.**
4. Hose Assemblies (6, 7, 8 and 9) and Fuel Inlet Line		**Connect** to flow divider.



6-84. CHECK FILTER VALVE (T53-L-13B/703) ENGINES) – FUNCTIONAL TEST (AVIM)

INTIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Calibrating Fluid (item 11, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR HOUSING/		
1. Valve Opening	Suitable air supply valve should open at a pressure of 0.5 psig to 1.0 psig.	**Check** pressure.
2. Check Filter Valve	Use calibrating fluid (item 11, Appendix D) heated to a temperature of 50°F to 90°F (10°C to 32°C). Internal leakage shall not exceed 6 cc per minute. External leakage is not allowed.	**Apply** a pressure of 95 psig to 105 psig (6.68 kg/sq cm to 7.38 kg/sq cm) in the opposite direction of flow.
3. Check Filter Valve		**Reject** if assembly does not pass test.

6-85. DELETED.

All data on pages 6-171 through 6-172 deleted.

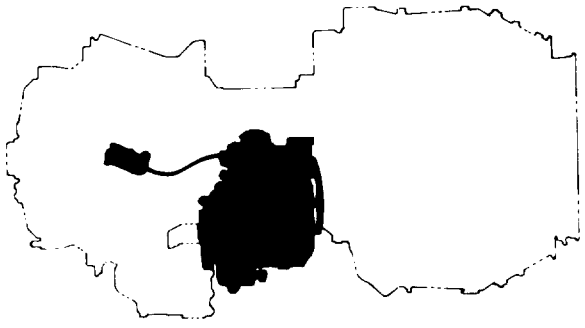
6-86. Overspeed Governor - Removal

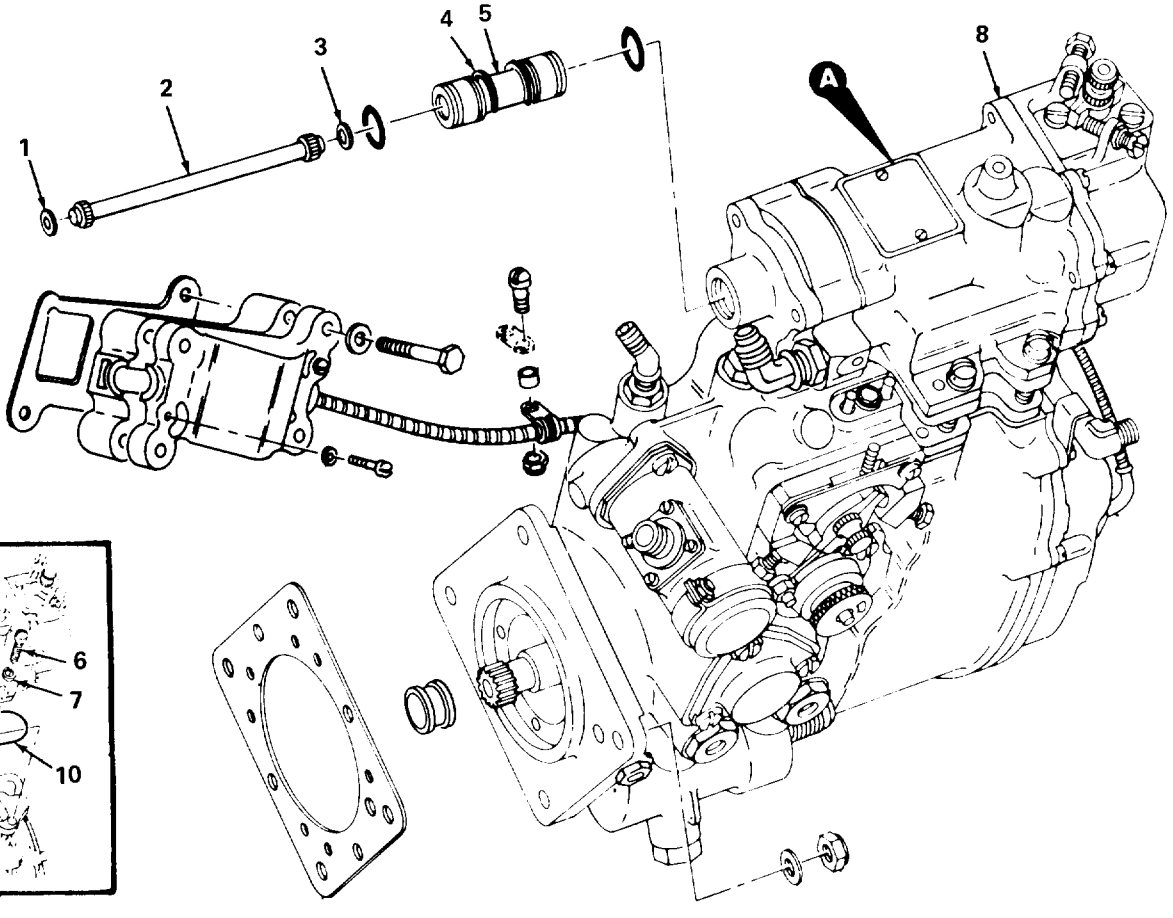
INITIAL SETUP

Applicable Configuration
All

Reference
Para 8-36

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/		
1. Power-Driven Rotary Booster Pump		**Remove** (refer to para 8-36).





6-86. Overspeed Governor - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/ - Continued		
2. Forward End of Overspeed Governor Drive Shaft (2)		**Remove** any spline nuts (l). Record thickness and number of nuts.
3. Overspeed Governor and Tachometer Drive Housing	Use an 8-32 threaded rod.	Pull shaft (2) and spline nut (3) through overspeed governor and tachometer drive housing, **Record** thickness and number of nuts.
4. Overspeed Governor and Tachometer Drive Housing	***NOTE*** ***Disconnect and tag overspeed governor fuel and drain lines. Cap all open ports.***	**Open** snapring (4) and slide it towards center of tube (5). Push tube into overspeed governor and tachometer drive housing.
5. Overspeed Governor (8)		**Remove** screws (6), washers (7) and temperature-sensing element line clamp.
6. Overspeed Governor (8)		**Carefully** raise 1/4 inch (6.4 mm). Lift above locating pin.
7. Overspeed Governor (8)		Pull towards rear of engine until it is free. Remove packings (9 and l0).

6-87. Overspeed Governor - Inspection

INITIAL SETUP

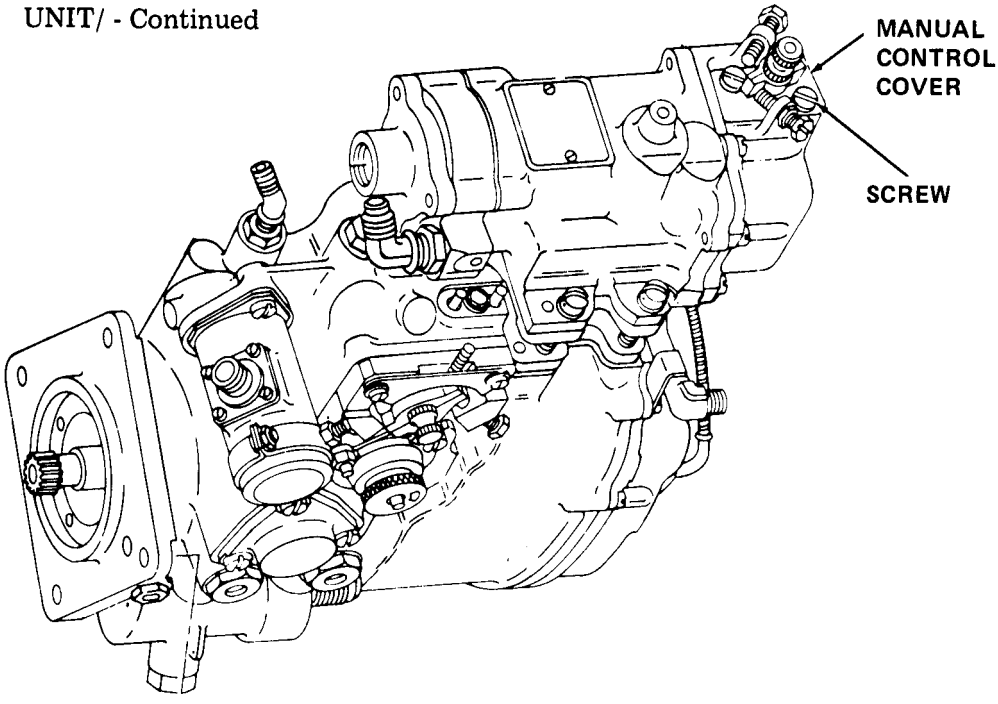
Applicable Configuration
All

Consumable Materials
Fuel JP-4 or JP-5 (item 31, Appendix D)
Retaining Compound (item 73, Appendix D)

References
Appendix G, Table G-3,
Reference Number 47
Appendix G, Table G-4,
Reference Number 55

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT	**NOTE** Corrosion is a rust-like deposit on surface of internal parts that are exposed when main fuel regulator and overspeed governor are separated. Contamination is any foreign matter found in fuel or clinging to surfaces of internal parts that are exposed when main fuel regulator and overspeed governor are separated.	
1. Overspeed Governor		**Inspect** for corrosion. **Replace** governor if corrosion is found.
2. Fuel Regulator		**Inspect** for corrosion. **Replace** regulator if corrosion is found.
3. Overspeed Governor and Fuel Regulator		**Inspect** for contamination. If contamination is found, **flush** governor and regulator as follows:
	Use fuel JP-4 or JP-5 (Appendix D, item 31).	a. **Pour** clean fuel into engine overspeed governor through openings in surface that mates with fuel regulator.
		b. **Shake** components by hand for 10 to 15 seconds.

6-87. Overspeed Governor - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/ - Continued		c. **Pour** flushing fuel from overspeed governor into clean container, **Check** for contamination in fuel. d, **Discard** contaminated fuel. **Clean** containers thoroughly after each flushing. e. **Flush** governor five times. **Replace** if it cannot be flushed clean in five attempts.
4. Screw		**Inspect** screw securing manual cover to **insure** adequate staking.
5. Screw	Stake screws if the following applies: a. they do not provide a mechanical lock. b. they are excessively loose C. they have been removed. Screws that are slightly loose do not require retorqueing, provided the staking is adequate to prevent further loosening of screws. Refer to Appendix G, table G-3, reference number 47; and table G-4, reference number 55 tor tightening requirements. Use staking tool that will take up full width of slot of screws.	**Stake** as follows: a. **Apply** sealing and retaining compound (Appendix D, item 73). **Tighten** screws as required. b. **Stake** screws in two places.
6. Overspeed Governor		**Inspect** all exposed parts for wear and damage. **Replace** if exposed parts are damaged or excessively worn.

6-88. Overspeed Governor - Installation

INITIAL SETUP

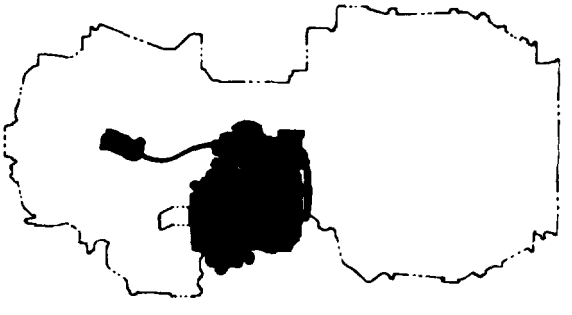
Applicable Configuration

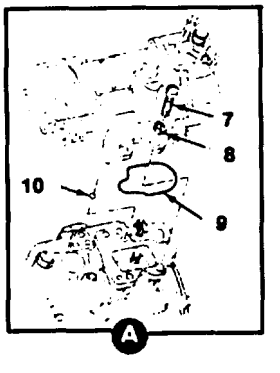
All

References

Para 6-89, 8-37

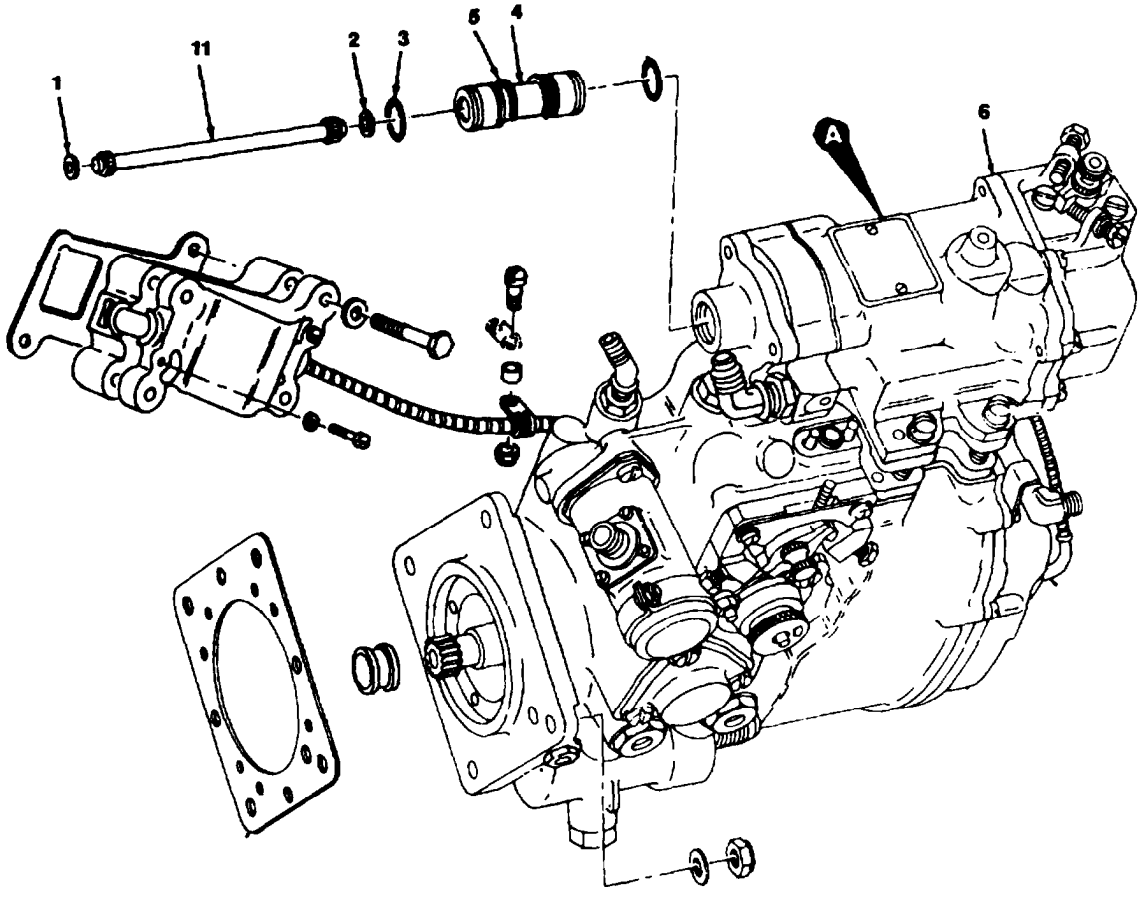
LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/	**NOTE** On all T53-L-11 series engines, overspeed governors, P/N 81800A1, shall be used only on fuel regulators P/N 81700B1 through 81700B2 and 81700C2 through 81700C6. On T53-L-13B engines, overspeed governor, P/N 81800A1 or P/N 103100A1. shall be used an fuel regulator, P/N's 84200A7A and 100770A Series. On T53-L-703 engines, overspeed governor, P/N 103100A1. shall be used on fuel regulator, P/N 100770A Series.	
1. Tube (4)		Install packing (3) and insert tube into overspeed governor and tachometer drive housing. Push tube forward into housing.





6-88. Overspeed Governor - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/ - Continued		



2. Overspeed Governor (6)		Install packing (9 and 10). Position overspeed governor over splined shaft in fuel control.

CAUTION

Before closing the opening between overspeed governor and fuel control, make sure governor packing is properly seated.

6-88. Overspeed Governor - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/ - Continued		
3. Overspeed Governor (6)		**Secure** to fuel regulator. **Secure** temperature-sensing element line clamp under top rear screw. **Install** three remaining screws and washers. **Lockwire** screws.
4. Covering Tube (4)	***NOTE*** ***Remove all caps and plugs from overspeed governor fuel and drain lines. Install lines and tighten as required.***	**Position** snapring (5) in aft groove on covering tube and **pull** tube aft until rearward motion is stopped by ring. **Secure** tube with second ring in forward groove on tube.
5. Overspeed Governor	Refer to paragraph 6-89.	**Perform** end float check.
Overspeed Governor Tachometer Drive Housing Covering Tube and Overspeed Governor Housing	Use 8-32 threaded rod.	If required, **insert** spline nut(s) (2). **Mesh** splines and remove rod.
	NOTE Overspeed governor shaft spline may be meshed with spline of overspeed governor by rotating power turbine.	
7. Overspeed Governor shift (11)	Use fabricated rod.	**Insert** either end through overspeed governor, tachometer drive housing, covering tube and into overspeed governor. **Mesh** splines and **remove** rod.
8. Overspeed Governor Shaft		**Install** spline nuts (1) on forward end of overspeed governor shaft with 8-32 threaded rod.
9. Power-Drive Rotary Booster) Pump	Refer to paragraph 8-37.	**Install.**

6-89. Overspeed Governor Drive Shaft - End Float Establishment

INITIAL SETUP

Applicable Configuration
A l l

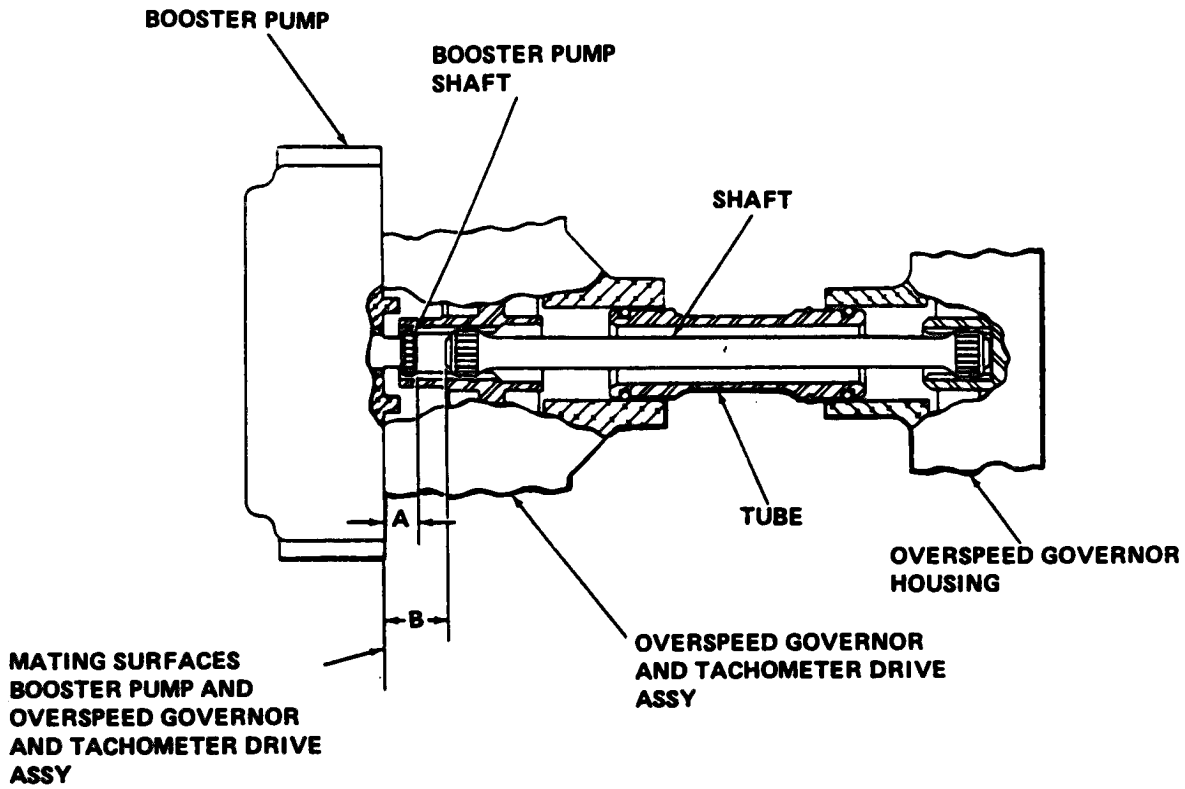
References
Para 8-36 and 8-37

Special Tools
8-32 Threaded Rod Clamping Tool
(LTCT14503)

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/	**NOTE** When the power-driven rotary (booster) pump, engine overspeed governor or the fuel control is to be installed, the end float of the overspeed governor drive shaft must be established. Excessive end float can cause wear of the shaft splines and may lead to malfunction or failure of the engine overspeed governor.	
1. Power-Driven Rotary (Booster) Pump	Refer to paragraph 8-36.	**Remove.**
2. Overspeed Governor Drive Shaft		**Remove** nuts, if any, from forward end of shaft. **Record** number of nuts.
3. Overspeed Governor Drive Shaft	Use 8-32 threaded rod to perform this action.	**Pull** through drive shaft tube.
4. Overspeed Governor Housing		**Remove** aft nuts, if any, using same rod. **Record** number of nuts.
5. Overspeed Governor Drive Shaft		**Reinstall** and **push** as far into overspeed governor housing as possible.

6-89. Overspeed Governor Drive Shaft - End Float Establishment - Contlnued

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/ - Continued		
6. Booster Pump Drive Shaft		**Measure** and **note** (in thousandths of an inch) the distance designated A.



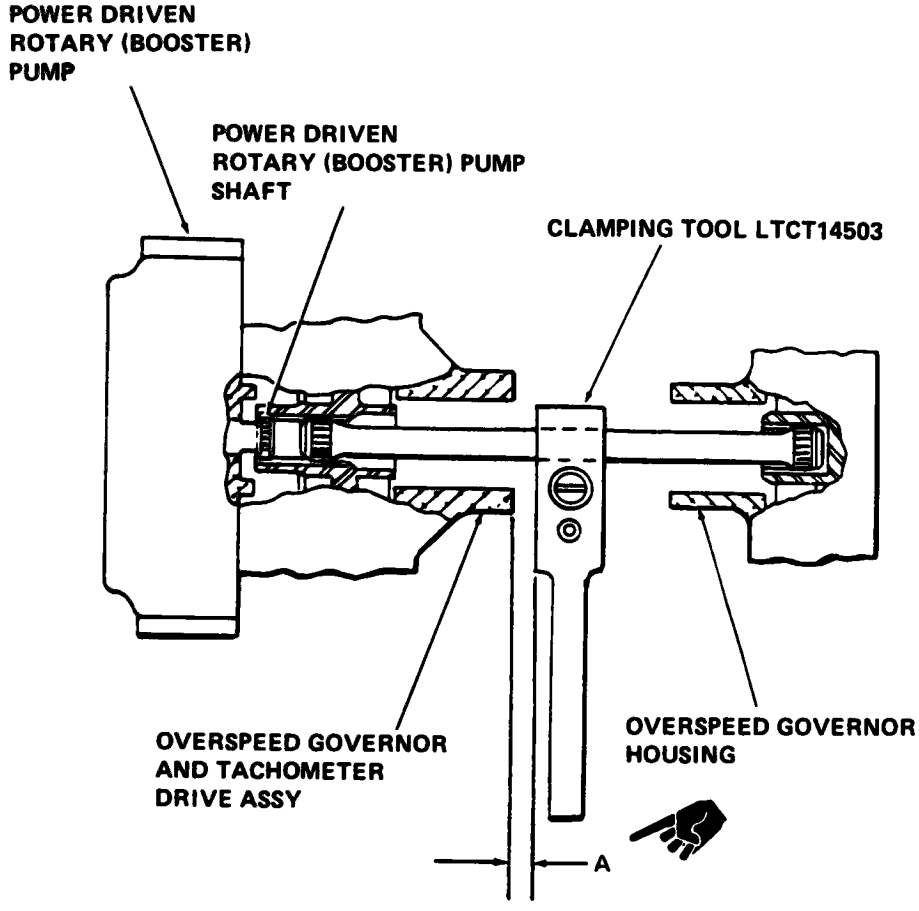
7. Overspeed Governor Drive Shaft		Using depth micrometer, **measure** and **note** (in thousandths of an inch dimension designated B in preceding figure.
8. Overspeed Governor Drive Shaft		**Subtract** dimension A from B. This will indicate total existing end float.
9. Overspeed Governor Drive Shaft		**Do not Install** nut on drive shaft if end float is less than 0.090 inch (2.29 mm).

6-89. Overspeed Governor Drive Shaft - End Float Establishment - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/ - Continued		
	CAUTION **Minimum end float tolerance is not established; however, it is important that some end float exists to preclude jamming the overspeed governor drive shaft against the housing and booster pump splined shaft.**	
10. Overspeed Governor Drive Shaft		If end float is between 0.090 and 0.280 inch (2.29 mm and 7.11 mm), **install** one nut at fuel control (aft) end of drive shaft.
	NOTE Nut used during installation is 1-160-589-02. The number of nuts required is either none, one or four.	
11. Overspeed Governor Drive Shaft		If end float is more than 0.280 inch (7.11 mm), **install** two nuts at each end.
12. Overspeed Governor Drive Shaft		**Alternate** method of performing end float adjustment. **Proceed** as follows a. Temporarily **install** fuel control on accessory drive gearbox without inserting tube. b. **Install** clamping tool (LTCT14503) onto overspeed governor drive shaft so it rests on mating face of overspeed governor and tachometer drive assembly housing.

6-89. Overspeed Governor Drive Shaft - End Float Establishment - Continued

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/ - Continued		



c. With tool securely attached to shaft, **push** shaft as far into overspeed governor housing as possible.

d. **Measure** and record the distance between mating face of overspeed governor and tachometer drive assembly housing and tool surface (A, fig. for step b).

e. If end float is less than 0.090 inch, **do not shim** drive shaft.

NOTE

Minimum end float tolerance is not established; however, it is important that some end float exists to preclude jamming the overspeed governor drive shaft against the housing and booster pump splined shaft.

6-89. OVERSPEED GOVERNOR DRIVE SHAFT - END FLOAT ESTABLISHMENT - Cont.

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/- Continued		f. If end float is between 0.090 and 0.280 inch, **install** one splined nut at control (aft) end of drive shaft. g. If end float is more than 0.280 inch, **install** two splined nuts (1) at each end of drive shaft. h. **Remove** clamping tool (LTCT14503) and fuel control.
13. Power-Driven Rotary (Booster) Pump	Refer to paragraph 8-37.	**Proceed** with installation.

6-90. OVERSPEED GOVERNOR - PRESERVATION OF AND PACKAGING FOR SHIPMENT

INITIAL SETUP

Applicable Configuration
All

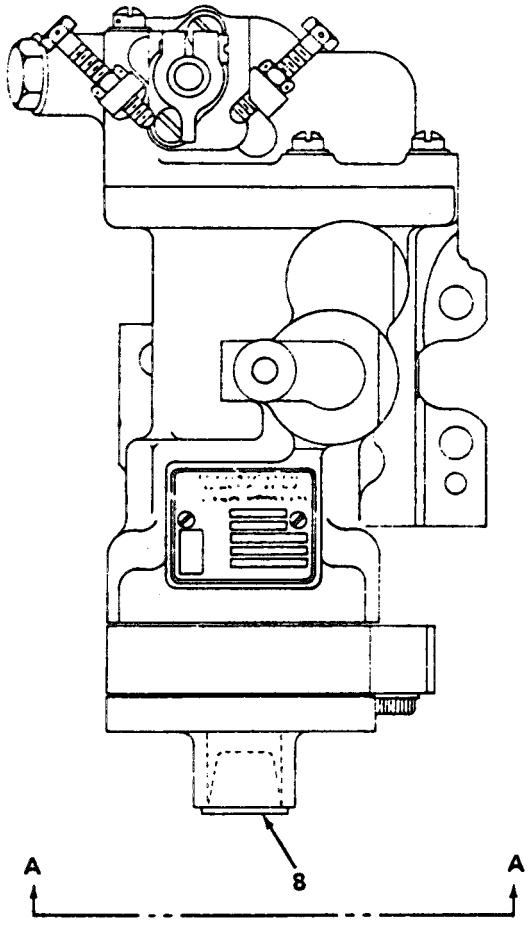
References
Para 6-7

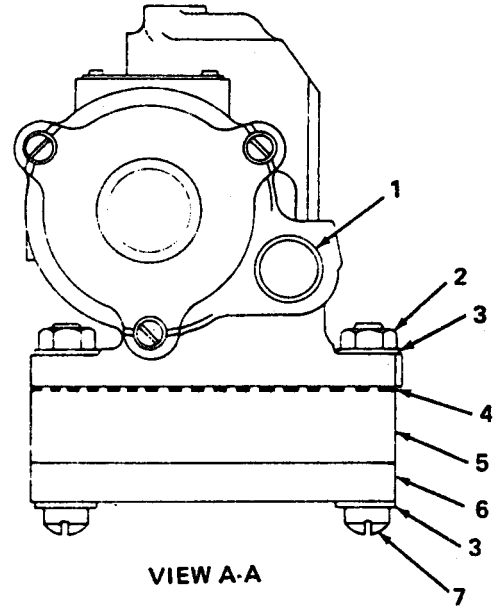
LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/	The shipping container for the governor is a standard type P/N 85586. **NOTE** **Preserve overspeed governor in accordance with paragraph 6-7 as applicable.**	
1. Governor	Use lubricating oil (Item 44, Appendix D).	Pour lubricating oil into engine overspeed governor through openings in surface that mates with fuel control. Shake component for 10 to 15 seconds, then pour out excess.
2. Governor Openings	The following figure illustrates the location of the governor's protective caps and plugs.	**Cap** and **plug.**

6-90. OVERSPEED GOVERNOR - PRESERVATION OF AND PACKAGING FOR SHIPMENT - Cont.

LOCATION/ITEM	REMARKS	ACTION

FUEL CONTROL
UNIT/-Continued

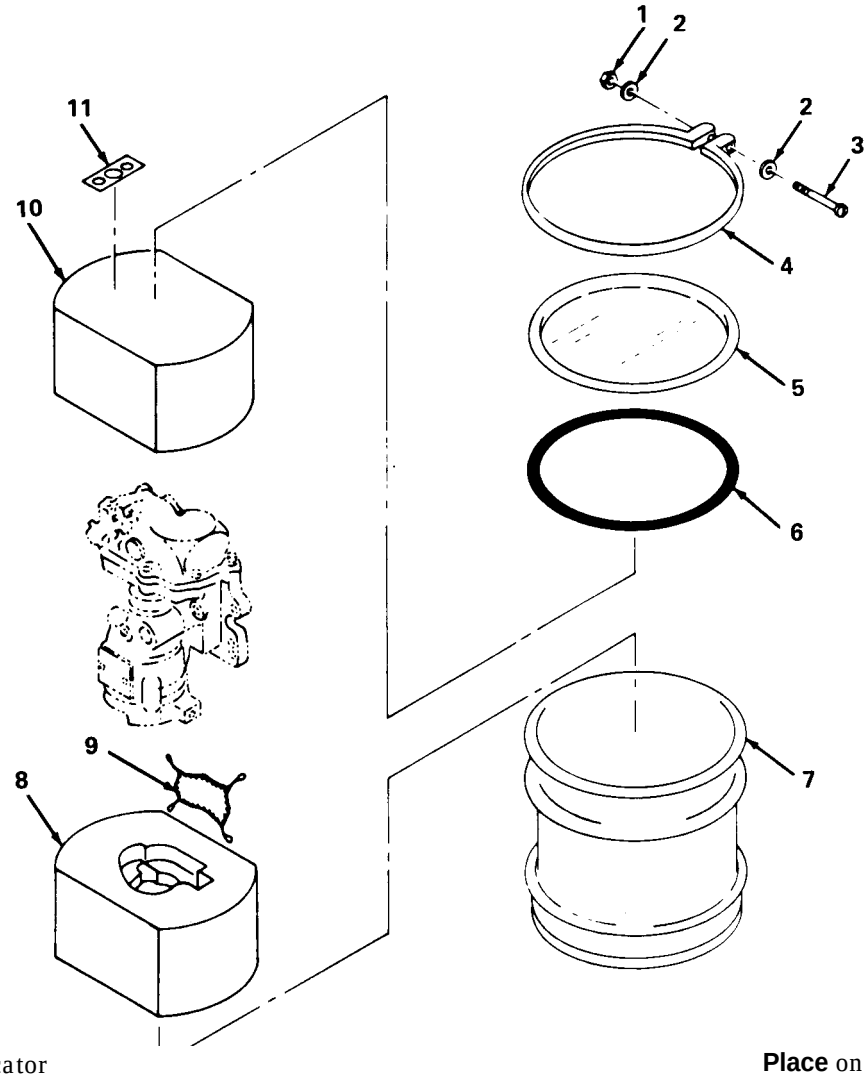




1. Shipping Plugs (P/N 28953-2)
2. Nut (P/N AN340-416)
3. Washer (P/N AN960C416L)
4. Gasket (P/N 49442)
5. Shipping Cover (P/N 74252)
6. Shipping Cover (P/N 49441)
7. Screw (P/N AN500AD416-28)
8. Shipping Plug (P/N 28901-14)

6-90. OVERSPEED GOVERNOR - PRESERVATION OF AND PACKAGING FOR SHIPMENT - Cont.

LOCATION/ITEM	REMARKS	ACTION
FUEL CONTROL UNIT/–Continued		
3. Lower Dunnage (8) Governor, and Upper Dunnage (10)		**Position** in shipping container (7).
4. Humidity Indicator		**Place** on top of upper dunnage (10).
5. Dessicant (9)		**Insert** 16 units of desiccant (9) in shipping container (7).
6. Cover (5), Gasket (6)		**Place** cover (5) over gasket (6) on shipping container (7).
7. Nut (1), Washers (2), and Bolt (3)		**Seal** with locking ring (4).
8. Entire Item		**Store** in upright position.



CHAPTER 7

ELECTRICAL SYSTEM

OVERVIEW

This chapter contains procedures for the maintenance and preservation of the electrical system. The following paragraphs outline disassembly, inspection, repair, and additional requirements needed to maintain the electrical system and related parts. Procedures requiring maintenance on the Aviation intermediate Maintenance (AVIM) level are specified and must be performed as such. Paragraphs in which the maintenance level Is not specified shall be considered Aviation Unit Maintenance (AVUM) and may be performed at this level or a higher level of maintenance.

7-1. GENERAL MAINTENANCE INFORMATION

Inspect all of the electrical system assemblies and subassemblies removed from the engine. Check for loose or missing parts. Note any fraying, damage, or excessive wear. Replace parts that cannot be repaired. Disassembly procedures provided enable cleaning, inspection, servicing, repair or replacement.

During reassembly of the electrical system assemblies and subassemblies discard all the following parts and replace with new parts:

Seals	Tabwashers
Gaskets	Lockpins
Packing	Lockwashers
Cotter Pin	Lockwire

7-2. IGNITION LEAD AND COIL ASSEMBLY (T53-L-11 SERIES ENGINES) - REMOVAL

INITAL SETUP

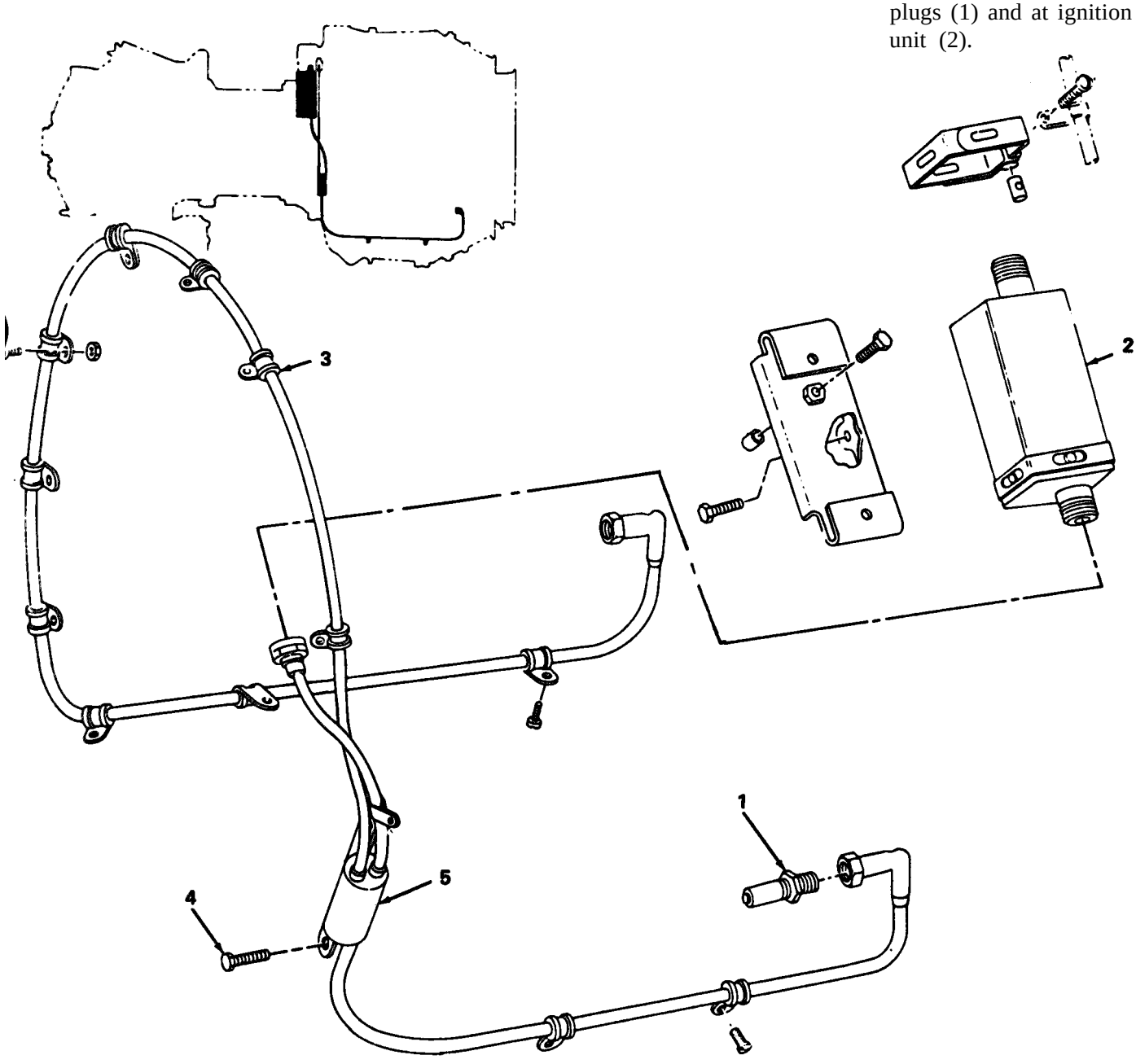
Applicable Configuration
T53-L-11 Series Engines

Special Tools
LTCT445-Socket Adapter

LOCATION/ITEM	REMARKS	ACTION
IGNITION UNIT/	**WARNING** Insure that all electrical power is disconnected.	

7-2. Ignition Lead and Coil Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
IGNITION UNIT/ - Continued		
	NOTE **The ignition coil, bracket, and three leads are remove as a unit.**	
1. Electrical Leads	Use socket adapter (LTCT4457).	**Disconnect** at igniter plugs (1) and at ignition unit (2).



7-2. Ignition Lead and Coil Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
IGNITION UNIT/ - Continued		
	NOTE Unless ignition is to be removed at this time, reinstall screw that secures clamp to ignition unit loop clamp.	
2. Clamps (3)		**Remove** clamps (3) that secure ignition lead and coil to engine.
3. Ignition Lead and Coil (5)		**Remove** bolts (4) that secure ignition lead and coil (5) to engine.
4. Ignition Lead and coil (5)		**Remove.**

7-3. Ignition Lead and Coil Assembly (T53-L-13B/703 Engines) - Removal

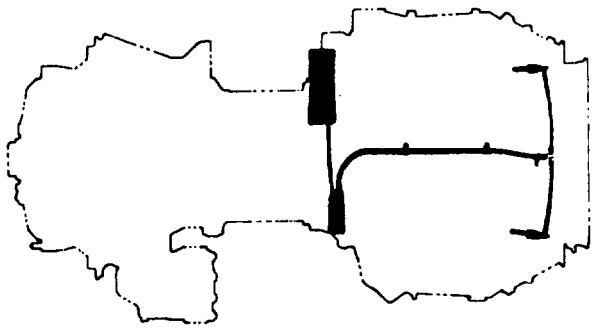
INITIAL SETUP

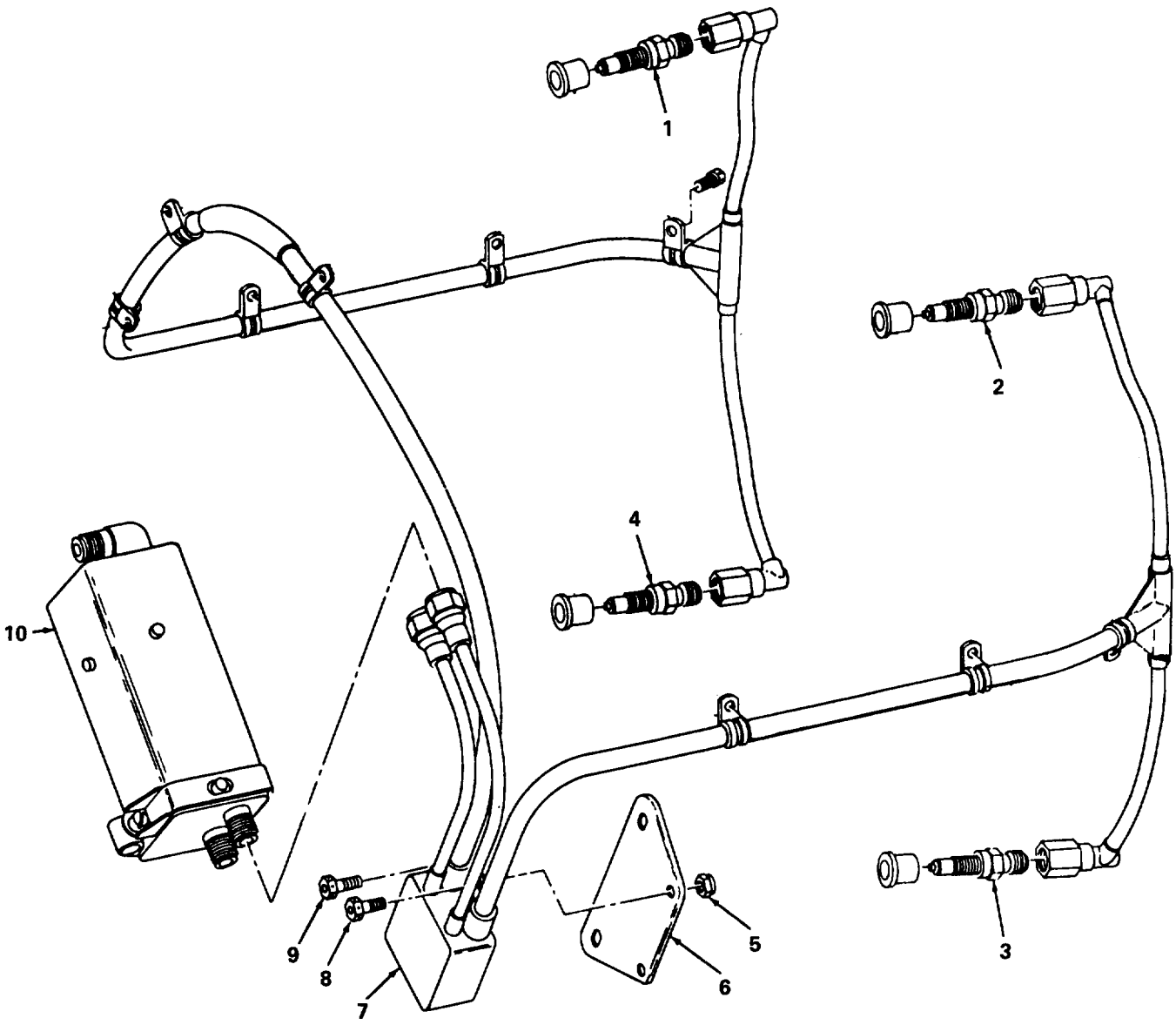
Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
	WARNING **Make certain that all electrical power is disconnected.**	
1. Electrical Leads		**Disconnect** at igniter plugs (1, 2, 3, and 4) and ignition unit (10).

7-3. Ignition Lead and Coil Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		





7-3. Ignition Lead and Coil Assembly (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Ignition Lead and Coil Assembly (7)		**Remove all screws** that secure clamps on items.
3. Bolts (9)		**Remove** bolts (9) that secure ignition lead and coil assembly to engine.
4. Ignition Lead and Coil Assembly (7)		**Remove** from engine.
	NOTE Further disassembly is not required unless the ignition lead and coil assembly is being replaced.	
5. Ignition Lead and Coil Assembly		**Remove** bolts (8) and nuts (5) that secure ignition lead and coil assembly (7) to bracket (6).
6. Ignition Lead and Coil Assembly		**Separate** from bracket.

7-4. Ignition Lead and Coil Assembly - Inspection

INITIAL SETUP

Consumable Materials
Crocus Cloth (item 21, Appendix D)
Drycleaning Solvent (item 25, Appendix D)

Applicable Configuration
All-

References
Pare H-29

LOCATION/ITEM	REMARKS	ACTION
IGNITION UNIT/		
1. Connector	Refer to paragraph H-29 for repair.	**Inspect** for damaged threads. **Repair** damaged threads.
2. connectors		**Inpect** connectors for broken or cracked ceramic insulator and damaged or missing springs. **Repair** or **replace** parts using parts from kit, P/N 10-88584 10.
3. Connector	Wear to extent causing clearance up to 0.032 inch (0.081 cm) between ferrule and connector is acceptable. One crock, not exceeding 0.0937 inch (0.2390 cm) in length in each connector is acceptable. Replace ignition lead and coil assembly damaged beyond such limits. Also replace ignition lead and coil assembly if connector lockwire holes are pulled out.	**Inspect** for wear, cracks or damaged lockwire holes.
4. Cable	Reduction of the cross-sectional area up to 1/5 of the original area is acceptable, providing the inner steel jacket is not pierced or cracked. Frayed or worn outer steel braid over 3/4 of the cable circumference is acceptable providing continuity for ground remains over 1/4 of the braid.	Visually **inspect** for crushed, worn, and frayed condition. **Replace** cable if limits given are exceeded.
5. Cable	Uee crocus cloth (item 21, Appendix D) and drycleaning solvent (item 26, Appendix D) to remove corrosion	**Visually inspect** for corrosion. **Remove** corrosion.

7-5. Nonrigid Hoses, Ignition Lead and Coil Assembly, and Wiring Harness - Repair and Replacement

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Crocus Cloth (item 21, Appendix D)

References
Para H-29

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**CAUTION** Any twisting of hoses Is unacceptable. When loosening or replacing connections, always use two wrenches. Use one on the "B" nut and the other on the hexagonal portion of the nipple to avoid twisting the hose.	
1. Hose	This action pertains to hose with teflon spiral sleeve.	Repair minor cuts, fraying, and chafing. See the following table.

NOTE

The following table lists chafing sleeve specifications.

Hose Size	Spiral Constant	Chafing Sleeve
-3	1.2	94835-1
-4	1.5	
-5	1.8	
-6	2.1	
-8	1.7	94835-2
-10	2.0	
-12	2.4	
-16	2.4	94835-3
-20	2.9	
-24	3.6	

EXAMPLE: To determine the proper length of spiral sleeve required to cover a 6 inch length of -5 hose, multiply the hose length (6 inches) by the spiral constant (1.8). The sleeve length is the product of these two 6 x 1.8= 10 inches) using the 94835-1 sleeve.

7-5. Nonrigid Hoses, Ignition Lead and Coil Assembly, and Wiring Harness - Repair and Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	NOTE The use of chafing sleeve is not limited to hoses. Where operating temperatures permit, it maybe used to prevent chafing of harnesses and wiring.	
2. Fittings	This action pertains to repair of fittings, using small diesinker-type file, India, or Carborundum stone. Refer to paragraph H-29 for repair of damaged threads.	Repair minor nicks and burrs. Blend repairs using crocus cloth (item 21, Appendix D). Repair damaged threads.
3. Hoses		Visually Inspect for leaks on first engine runup.

7-6. Ignition Lead and Coil Assembly- Functional Test (AVIM)

INITIAL SETUP

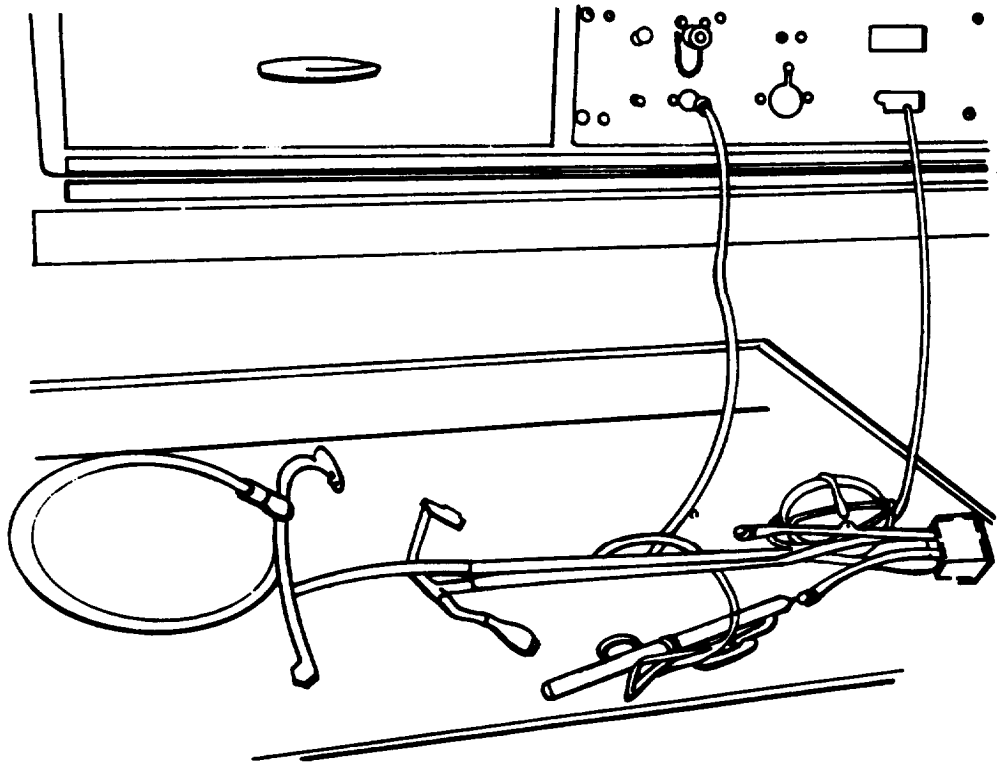
Applicable Configuration
All

Special Tools
Test Unit (LTCT315)
Lead (LTCT9271) '

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT		
1. Power Switch	Use test unit (LTCT315).	Place POWER SWITCH on test unit to ON. Observe red indicator lamp to insure it lights.
2. Continuity Switch		Position CONTINUITY switch to ON. Insure red indicator lamp lights.
3. Test Leads		Connect to CONTINUITY jack.
4. Leads	Red Indicator lamp should light and warning buzzer should sound when performing this action.	Momentarily short together.

7-6. Ignition Lead and Coil Assembly - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/-Continued		
5. Lead		**Connect** one test lead to input lead of separator.
6. Test Leads	Red indicator lamp should light and warning buzzer should sound when performing this action.	**Touch** remaining test leads to tips of igniter plug connectors.
7. Ignition Lead and Coil Assembly		**Check** lead shielding for continuity (electrical leakage) leads by tracing shielding with test leads used in action for item 6. If indicator lamp lights or warning buzzer sounds, reject lead and coil assembly.
8. Ground Lead		**Connect** ground lead from jack to lead and coil assembly.



9. Lead (LTCT9271, detail of LTCT315)		Connect lead to L.V. OUTPUT jack.

7-6. Ignition Lead and Coil Assembly - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/ - Continued		
10. Voltage Selector		**Turn** to H.V. TEST.
11. Meter Selector		**Turn** to 5 ADC.
12. 60 Cycle **AC** Button		**Press** to insure red indicator lamp lights.
13. Test Selector Switch		**Position** TEST SELECTOR switch to 2 KV.
14. Filament Switch		**Press** FILAMENT switch on. **Wait 15** seconds then **press** PLATE switch ON.
15. Lead and Coil Assembly		**Connect** remaining end of lead (LTCT9271, detail of LTCT315) to input lead of lead and coil assembly.
16. Variac Knob		**Advance** VARIAC knob until a 2000 volt indication is observed on kilovoltmeter M-8.
17. Indicator **M-9**		**Check** indicator M-9 for evidence of leakage. No leakage is allowed.
18. Indicator M-9		If electrical leakage is noted, reject lead and coil assembly.
19. Variac Knob		**Turn** VARIAC knob to O and **observe** kilovoltmeter M-8. As voltage indication passes through 1000 volts, touch lead (LTCT9271 detail of LTCT315) to ground. **Discharge** remaining voltage.
20. Test Unit		**Return** test unit to pretest conditions.

7-7. Ignition Lead and Coil Assembly (T53-L-11 Series Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Lockwire (item 41, 42 or 43, Appendix D)

Special Tools
LTCT4457 - Socket Adapter

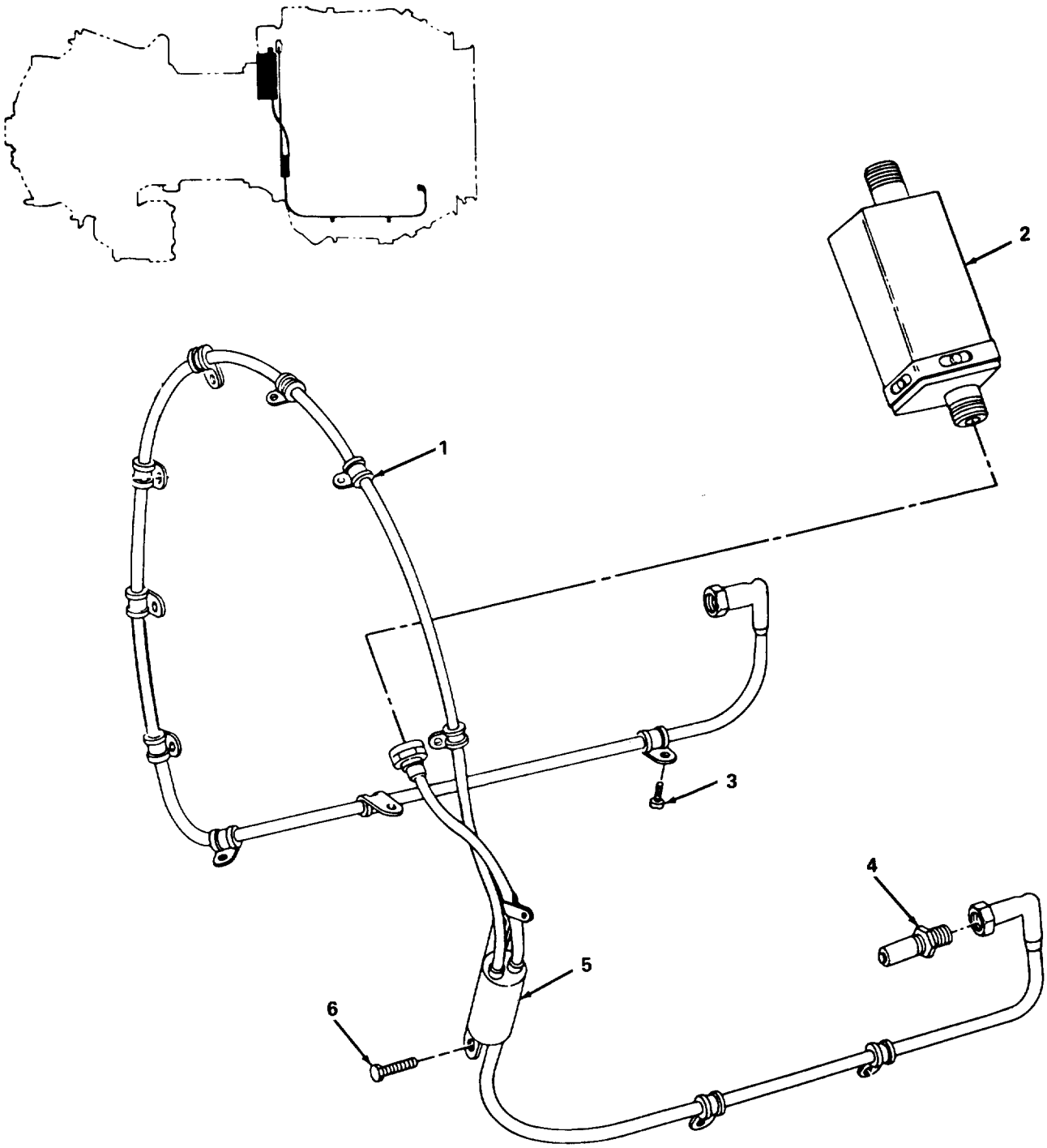
References
Appendix G-3, reference number 62

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
	NOTE The ignition coil, bracket, and three electrical leads are installed as a unit.	
1. Bracket, Ignition Lead and Coil (5)		**Position** on engine and **secure** with bolts (6). **Lockwire** bolts.
2. Electrical **Leads**	**Use** socket adapter LTCT4457.	**Connect** leads to ignition unit (2) and igniter **plugs** (4). **Tighten** connectors as required (refer to table G-3, Appendix G, item 62). **Lockwire** connectors.
3. Clamps (1)		**Position all** clamps (1) and **secure** the lead and coil assembly to engine. **Tighten** and **lockwire screws (3).**

7-7. Ignition Lead and Coil Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION

ENGINE/ - Continued



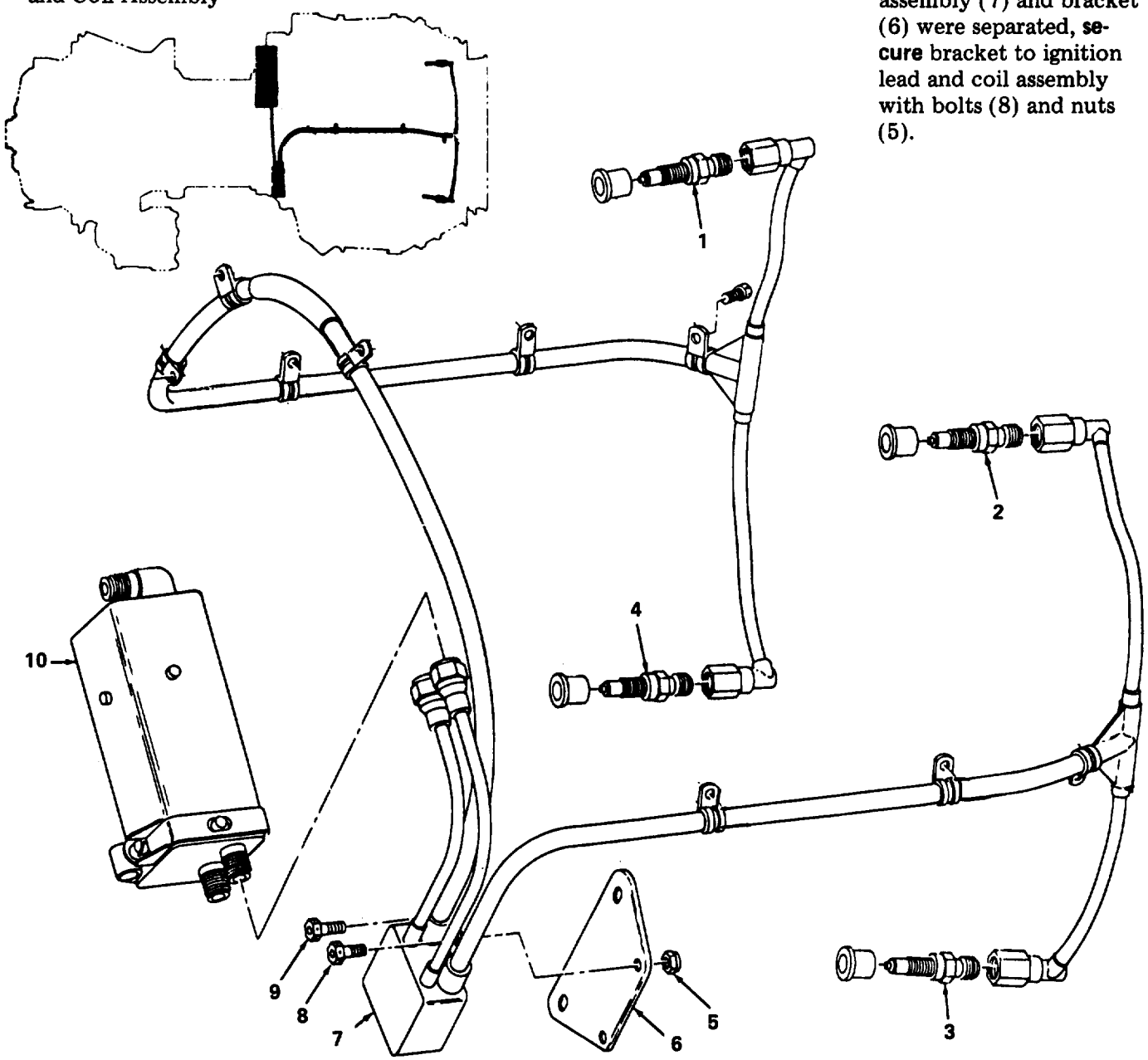
7-8. Ignition Lead and Coil Assembly (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

References
Appendix G, table G-4, reference number 44

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Bracket, Ignition Lead and Coil Assembly		If ignition lead and coil assembly (7) and bracket (6) were separated, **secure** bracket to ignition lead and coil assembly with bolts (8) and nuts (5).



7-8. Ignition Lead and Coil Assembly (T53-L-13B/703 Engines). Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Ignition Lead and Coil Assembly		**Position** on engine and **secure** with bolts (9). **Lockwire** bolts.
3. Electrical Leads		**Connect** two short leads to ignition unit (10). **Tighten** and **lockwire** connectors. **Connect** ignition leads to igniter plugs (1, 2, 3 and 4). **Tighten** connectors. **(Refer** to Appendix G, table G-4, reference number 44). **Lockwire** connectors.
4. Clamps		**Secure** ignition lead and coil assembly clamps to engine with screws and nuts.

7-9. Three-Probe Exhaust Thermocouple Assembly (T53-L-11 Series Engines) - Removal

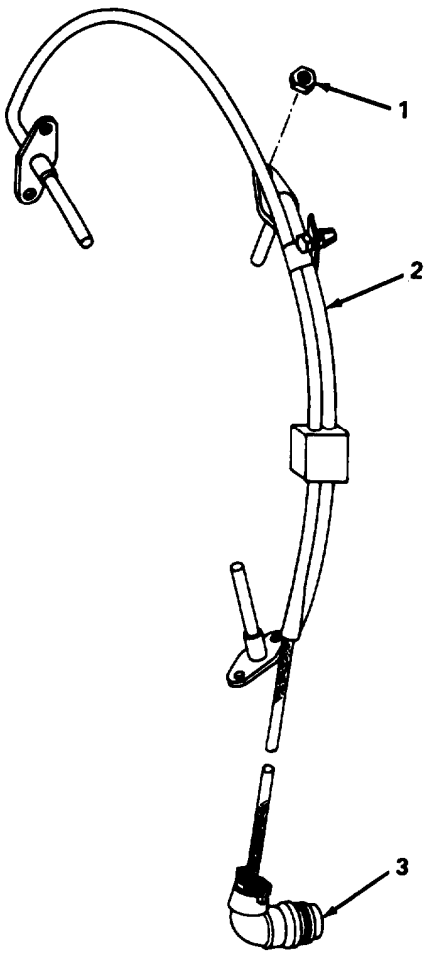
INITIAL SETUP

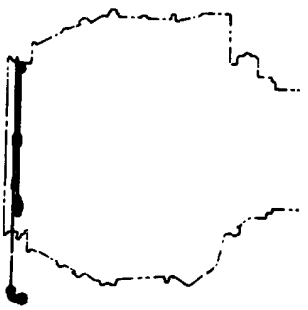
Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/		
	Extreme caution shall be taken when removing thermocouple assembly from exhaust diffuser (always remove and probes first). Excessive flexing of thermocouple assembly, specifically at probe locations can result in internal breakage and shortage. Never use pliers or sharp objects to pry probe or adjacent harness loose from diffuser.	

7-9. Three-Probe Exhaust Thermocouple Assembly (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
1. Thermocouple Assembly Connectors (3)		**Disconnect.**
2. Thermocouple Assembly Connector (2)		**Remove** nuts (1) that retain thermocouple assembly (2) to exhaust diffuser. Carefully lift thermocouple assembly off exhaust diffuser studs.





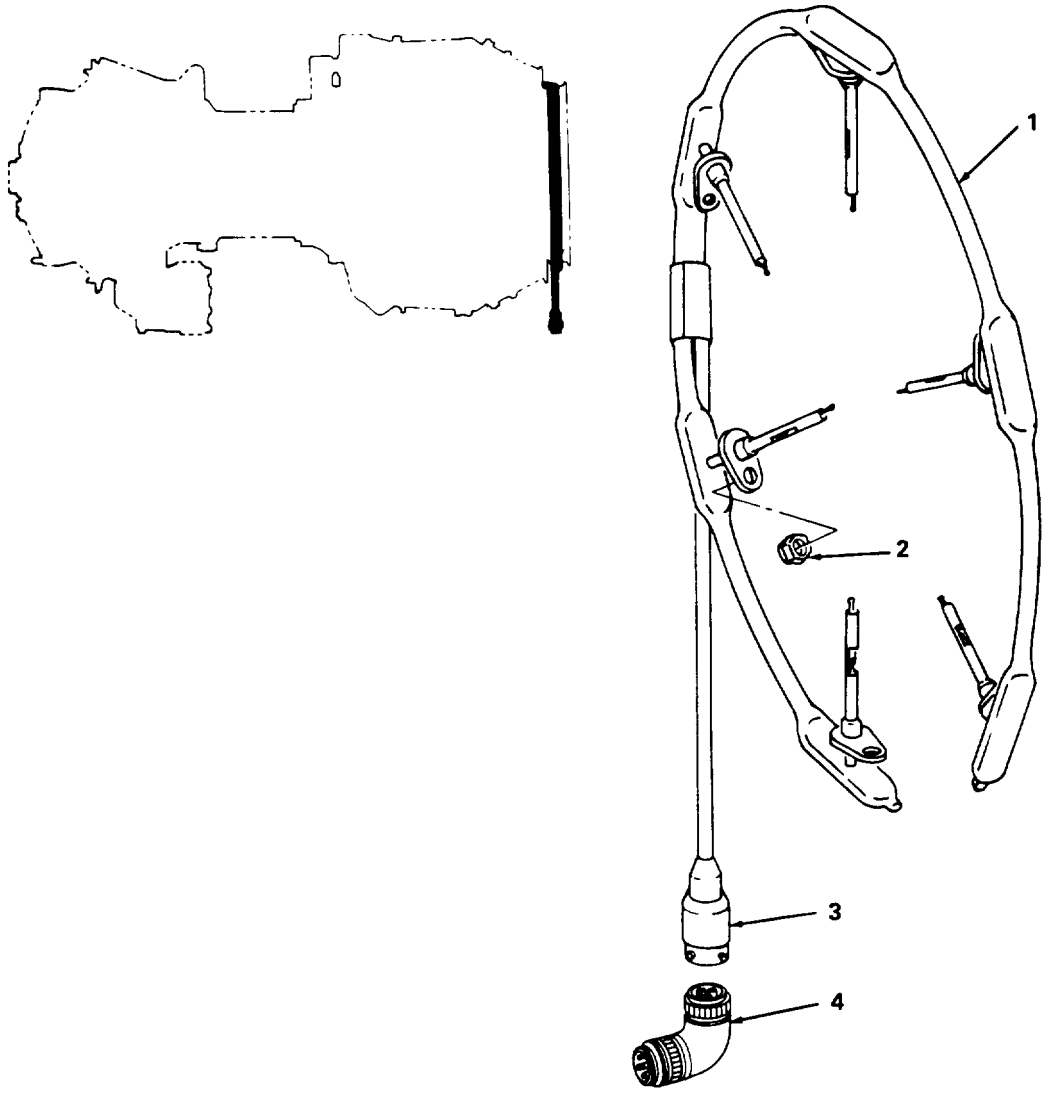
7-10. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engine) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-13B Engine

References
Appendix C

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/		



7-10. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engine) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued	**CAUTION** **Extreme caution shall be taken when removing thermocouple assembly from exhaust diffuser (always remove end probes first). Excessive flexing of thermocouple assembly, specifically at probe location can result In Internal breakage and shorting. Never use pliers or sharp objects to pry probes or adjacent harness loose from diffuser.** **CAUTION** **In following step, loosen each nut one turn, then progress to next nut. Do not attempt to remove harness until all nuts are loose.**	
1. Six-Probe Exhaust Thermocouple Assembly	To remove, disconnect connector (3) from adapter connector (4).	When engine is to be removed from airframe, **disconnect** exhaust thermocouple assembly from firewall cannon plug with adapter (4) attached to connector (3).
2. Six-Probe Exhaust Thermocouple Assembly	Use a 5/16-inch combination wrench with box end modified (by grinding) to 3/32-inch maximum thickness for a length approximately one inch. (Refer to Appendix C.)	**Remove** nuts (2) that retain exhaust thermocouple assembly (1) to exhaust diffuser. Carefully lift thermocouple assembly off exhaust diffuser studs.

7-11. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Removal

INITIAL SETUP

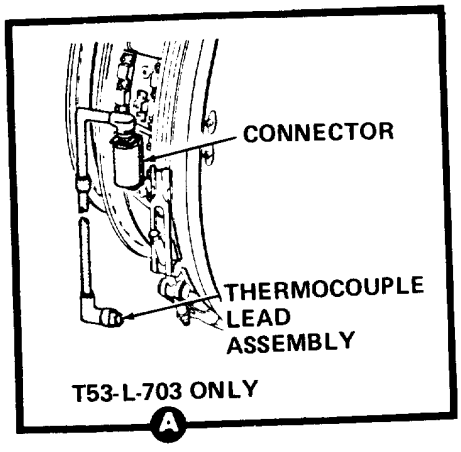
Aplicable Configuration
T53-L-703 Engines

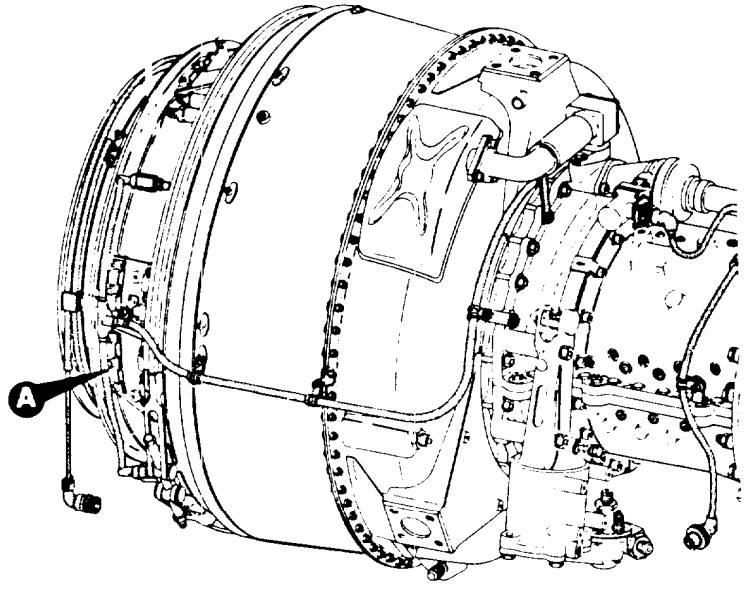
References
Para 4-3, 6-28, 6-41, 6-74, and 7-42

Consumable Materials
Barrier Material (item 9, Appendix D)
Transparent Flexible Bag (item 81, Appendix D)

7-11. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Removal - Continued

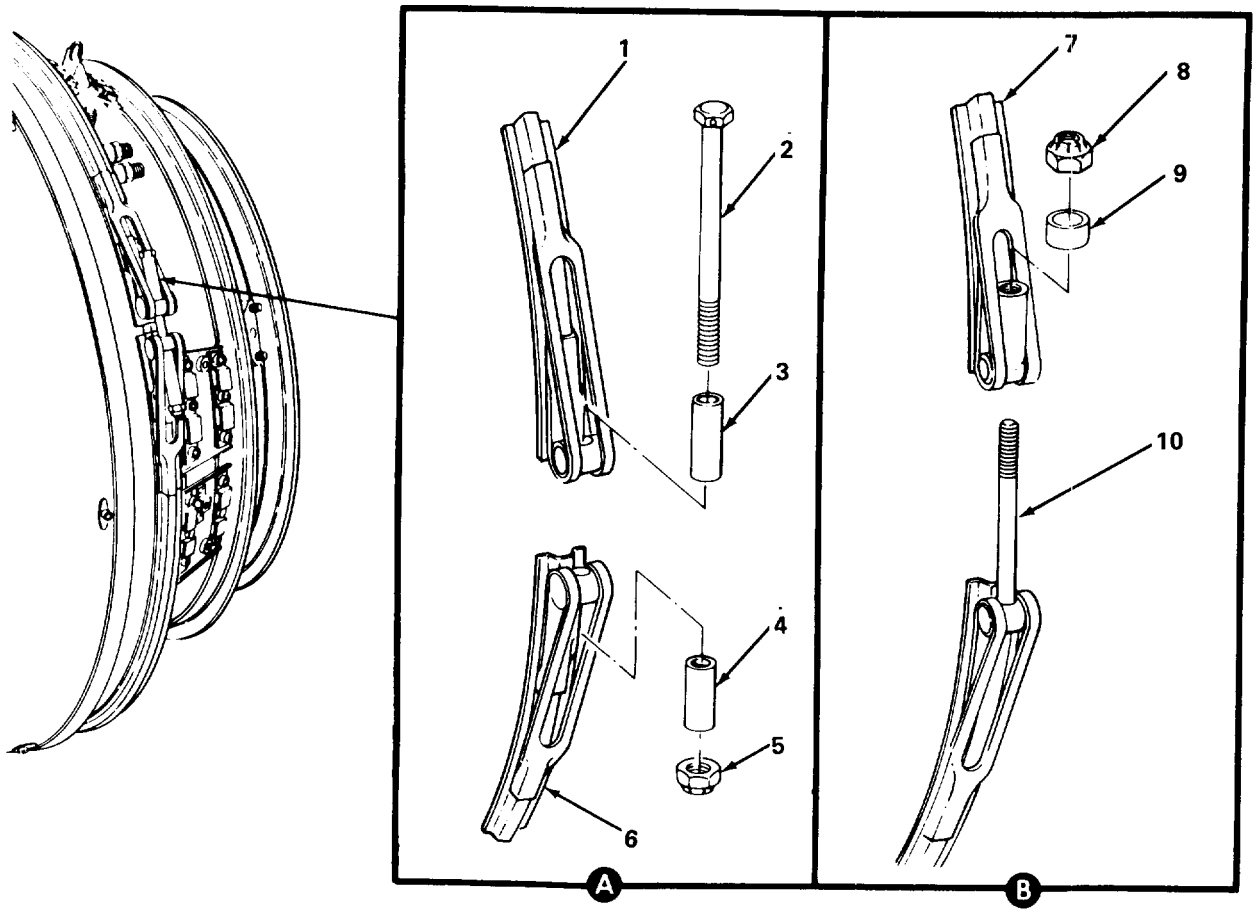
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/		
1. Combustor Turbine Assembly	Refer to paragraph 4-3 for removal.	**Remove.**
2. Thermocouple Lead Assembly		**Disconnect** from connector.
3. Starting Fuel Manifolds and Flow Divider and Dump Assemblies	Refer to paragraphs 6-28 and 6-74 for removal.	Remove. **Cap** ports on divider and manifolds.
	NOTE If V-band coupling assemblies (1 and 6) are installed, remove as outlined in following action for item 4. If V-band coupling assemblies (10 and 7) are installed, remove as outlined in action for item 5.	
4. V-Band Coupling Assemblies (1 and 6)		**Remove** nuts (5), spacers (4 and 3), and bolts (2) securing V-band coupling assemblies together. **Separate** coupling assemblies from diffuser cone. **Remove V-band** coupling assemblies.





7-11. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Removal - Continued

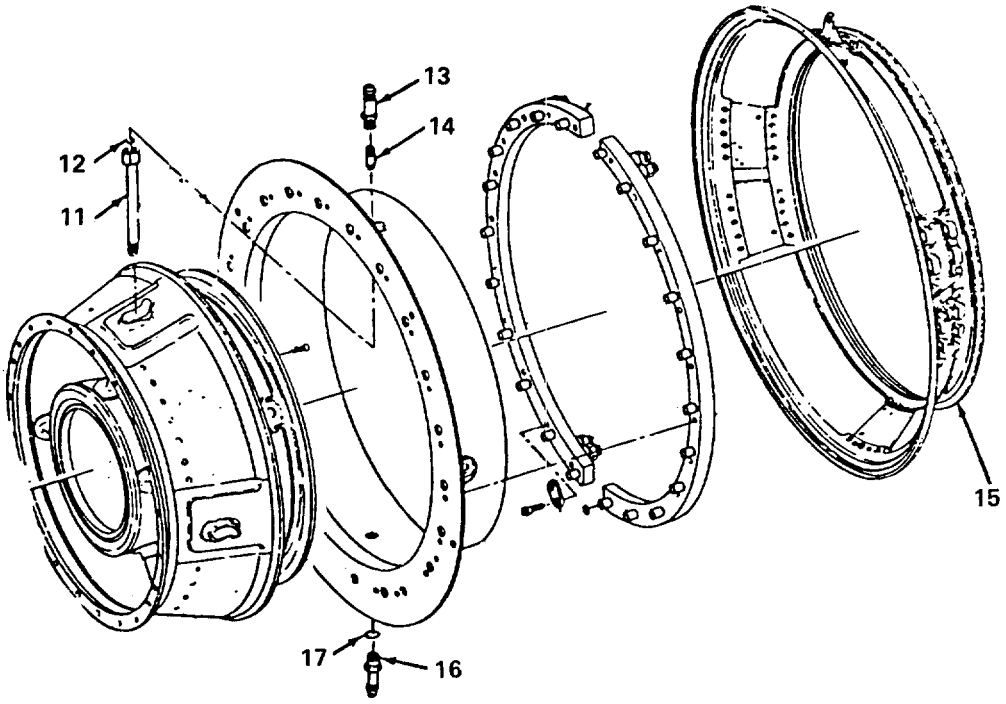
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		



5. V-Band Coupling Assemblies (10 and 7)		**Remove** nuts (8) and spacers (9) securing V-band coupling assemblies together. **Separate** coupling assemblies from diffuser support cone. **Remove** V-band coupling assemblies.
6. Diffuser Support Cone Assembly (15)		**Remove.**
7. Oil Strainer Housing Adapter (13)		**Unscrew. Remove** from power turbine oil tube (11) at top of exhaust diffuser.

7-11. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		



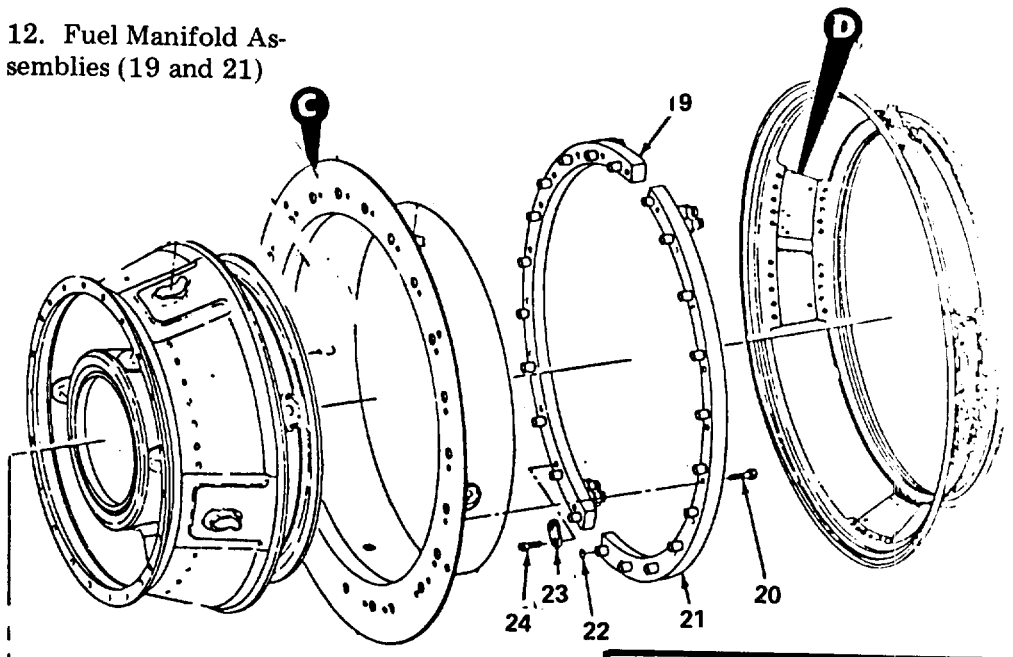
8. Packing (12) and Strainer (14)		**Remove.**
9. Connector (16)		**Unscrew. Remove** from tube at bottom of exhaust diffuser.
10. Packing (17)		**Remove.**
11. Starting Fuel Nozzles and Igniter Plugs	Refer to paragraphs 6-41 and 7-42 for removal procedures.	**Remove** if installed.

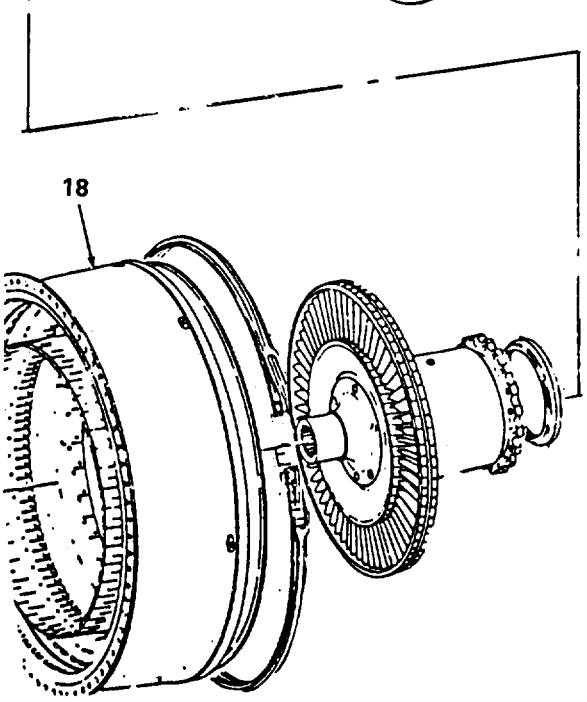
CAUTION

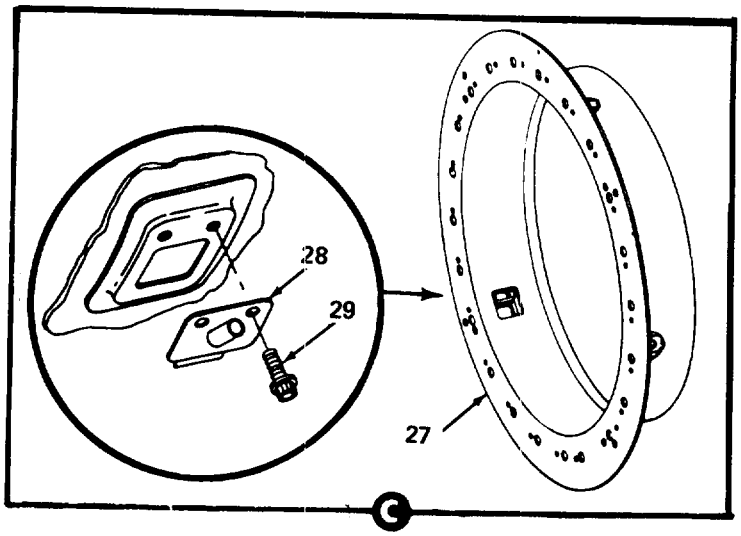
Use care when removing manifold in following action for item 12 to prevent damage to nozzles. Cap open ports and set manifold in dust-free area or in plastic bag.

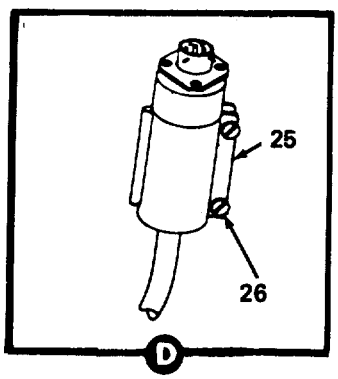
7-11. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION:
EXHAUST DIFFUSER/ - Continued		
12. Fuel Manifold Assemblies (19 and 21)		**Remove** bolts (20) that secure fuel manifold to rear of combustion chamber (18). Carefully **remove** manifolds from combustion chamber housing. **Remove** seals (22) from fuel nozzles. **Remove** screws (24) that secure sealing gaskets (23) to fuel manifold assembly (19). **Remove** gaskets.

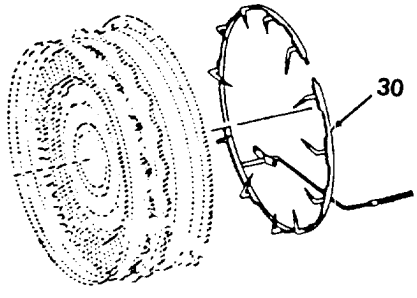






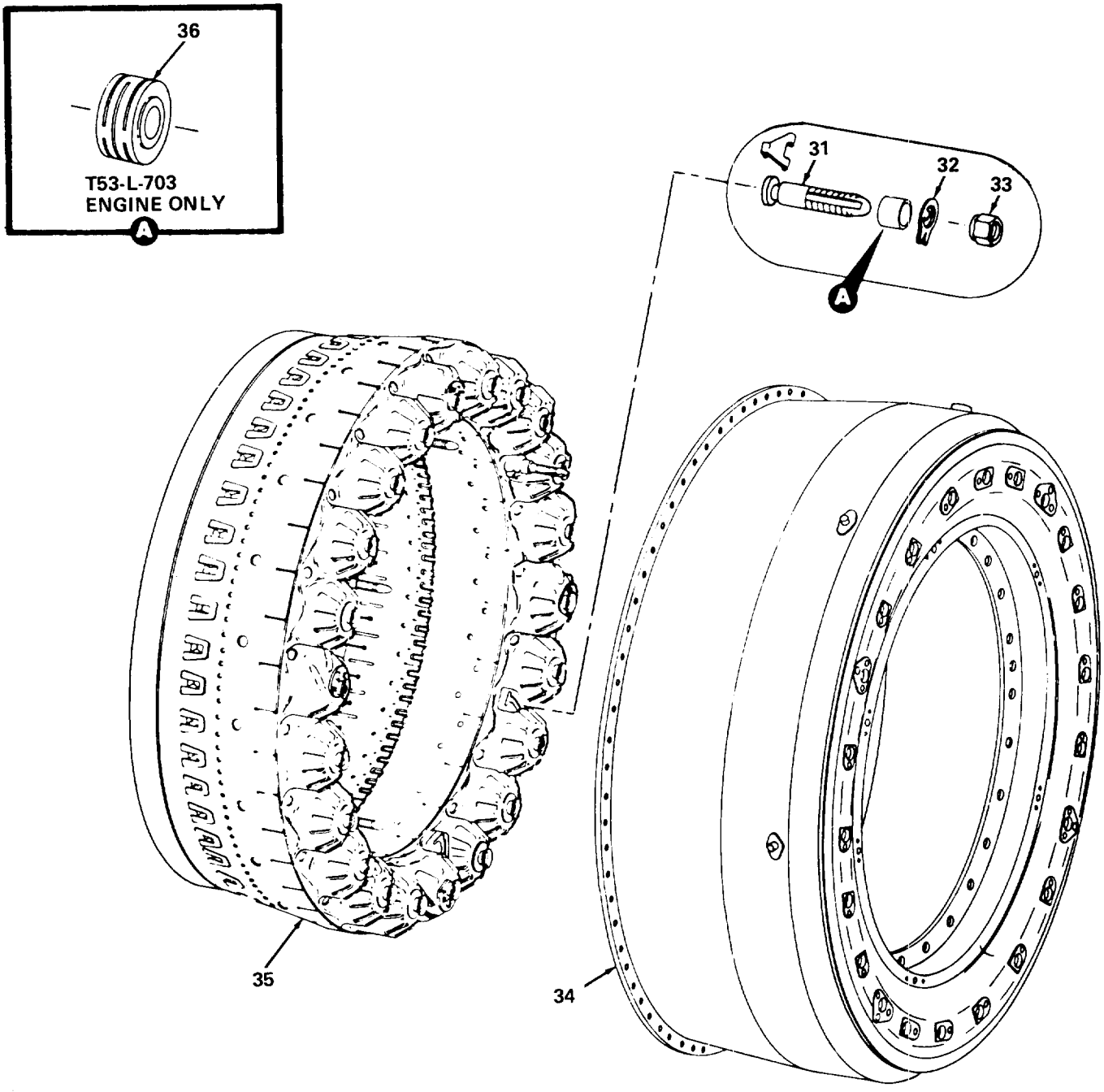


7-11. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Removal - Continued

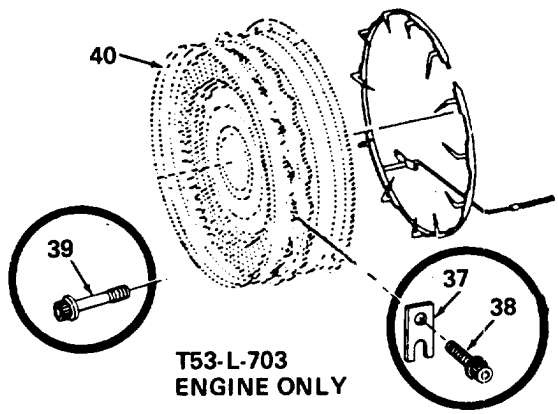
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
	CAUTION **The main fuel manifold is a high-value item and must be carefully repacked for return to depot maintenance. If manifold is to be replaced, enclose manifold in barrier material (item 9, Appendix D) or in transparent flexible bag (item 81, Appendix D) and secure in reusable container. The container should then be enclosed in a waterproof cardboard box and identified for shipment.**	
13. Connector (25)		**Remove** screws (26) from connector (25).
14. Connector (25)		**Open. Remove** lead of thermocouple harness (30).
15. Cover Assembly (28)		**Cut** lockwire. **Remove screws (29)** that secure cover assembly (28) to fireshield (27).
16. Cover Assembly (28)		**Remove** from fireshield and lead of thermocouple harness (30).
17. Fire Shield (27)		**Remove** from around exhaust diffuser,

7-11. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
18. Key Washers (32)		Straighten tabs.



7-11. Twelve-Probe Thermocouple Harness (T53-L-703 ENGINE) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/-Continued		
19. Combustion Chamber Liner Assembly (35)		**Remove** nuts (33) and key washers that secure combustion chamber liner assembly (35) to combustion chamber housing assembly (34).
20. Liner Assembly (35)		**Remove.**
21. Springs (36)		**Remove** from six liner assembly studs (31)
		
22. First Stage Power Turbine Nozzle (40) and Exhaust Diffuser Assembly		**Cut** lockwire and **remove** two bolts (39). **Secure** harness lead to flanges of first stage power turbine nozzle (40) and exhaust diffuser assembly.
23. Harness Assembly (30)	Use care when removing harness lead from flanges to avoid damaging contacts. There are 12 bolts to be removed.	Cut lockwire. **Remove** bolts (38) and plates (37) securing harness probes to first stage power turbine nozzle (40). **Remove** harness assembly (30).

7-12. Exhaust Thermocouple Assembly - Inspection

INITIAL SETUP

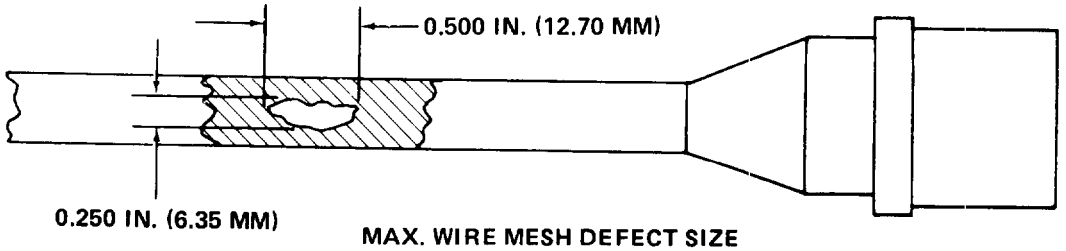
Applicable Configuration
All

Consumable Materials
Crocus Cloth (item 21, Appendix D)
Drycleaning Solvent (item 24, Appendix D)

Test Equipment
Multimeter (AN/PSM6B)

References
Para 7-14, 7-16, 7-18 and 7-13

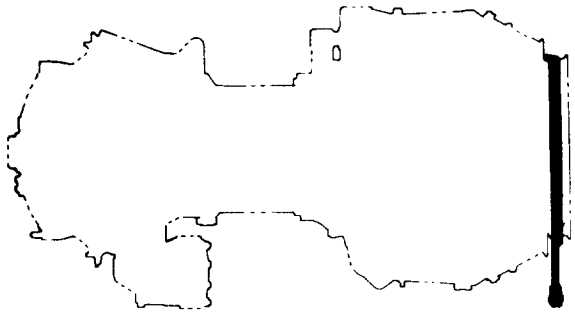
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/	**CAUTION** **Extreme caution shall be taken when handling the thermocouple assembly, Excessive flexing of the assembly, specifically at the probe locations, can result in internal breakage and shorting. Never use pliers or sharp objects on probes or adjacent harness.**	
1. Thermocouple Harness		**Inspect** for wear, fraying, and loose connectors. **Inspect** probes for binding, cracks and burned spots.
2. Thermocouple Assembly	Refer to paragraphs 7-14, 7-16 or 7-18.	**Perform** a functional test to insure observance of shorting and internal damage.
	NOTE A thermocouple assembly that fulfills requirements of the functional check but has chafe damage (not exceeding limits shown in following figure) may be repaired as instructed in paragraph 7-13. Assemblies having damage exceeding such limits must be replaced.	

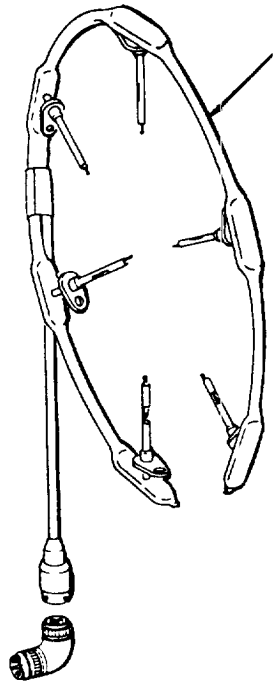


MAX. WIRE MESH DEFECT SIZE

7-12. Exhaust Thermocouple Assembly - Inspection - Continued

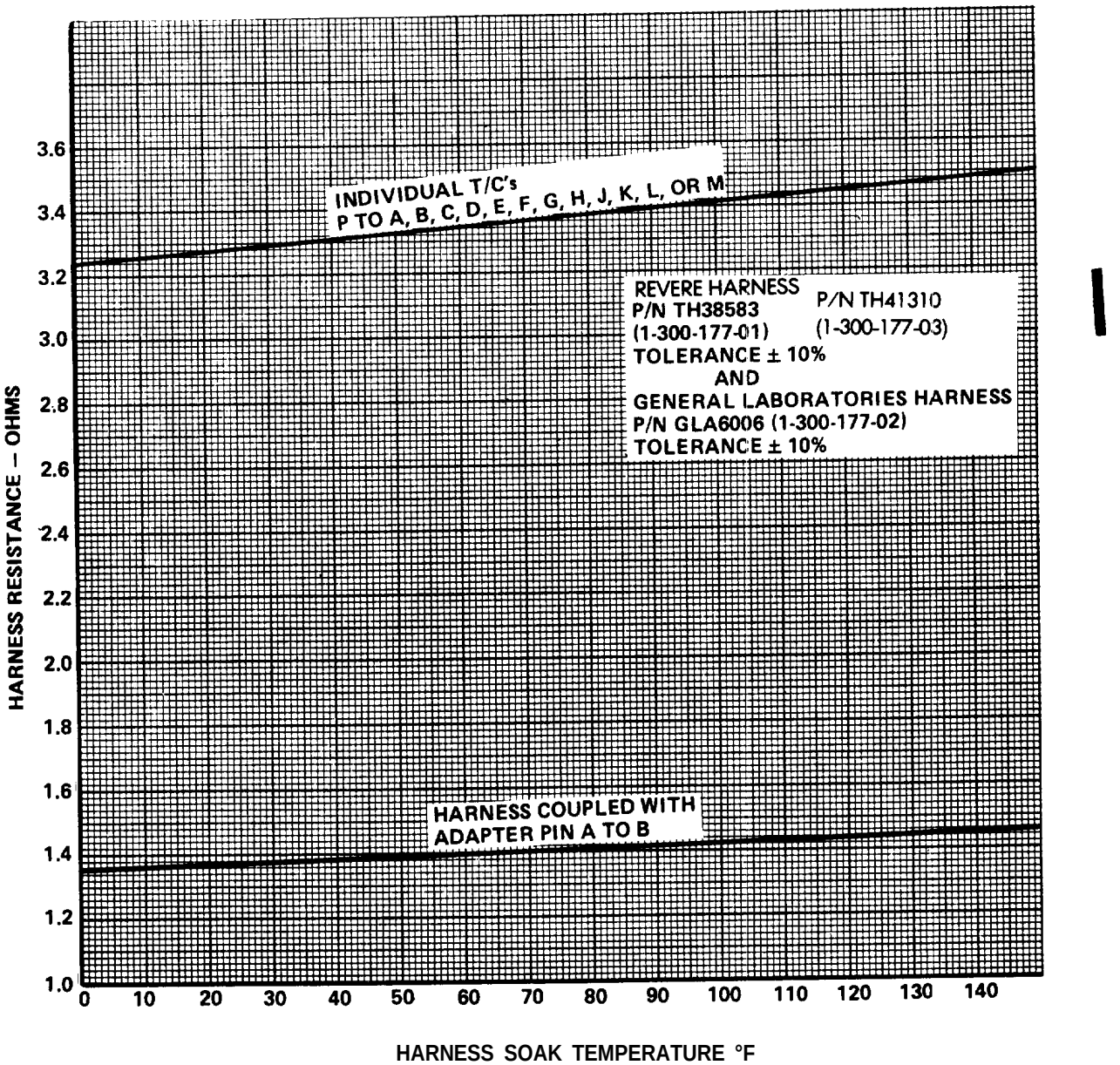
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
3. Connector		**Inspect** for damaged threads and cracked insulator.
4. Thermocouple		**Replace** if damaged.
5. Connector	**WARNING** **Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not usa near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).** Use crocus cloth (item 21, Appendix D) and drycleaning solvent (item 24, Appendix D) to remove corrosion.	**inspect** for corrosion. **Remove corrosion.**
6. Six-Probe Exhaust Thermocouple Assembly	T53-L-13B engine only. **Use** Multimeter AN/PSM6B or equivalent.	**Check** for continuity.





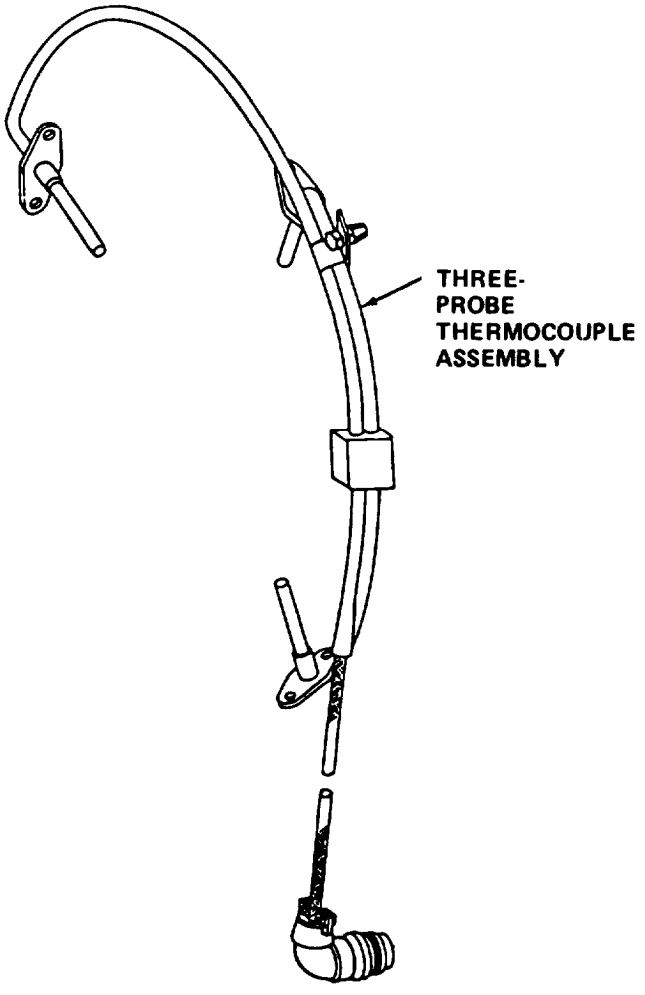
7-12. Exhaust Thermocouple Assembly - Inspection - Continued

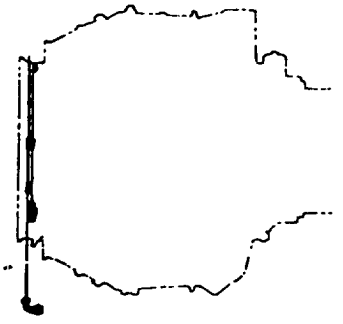
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/-Continued		
7. Six-Probe Exhaust Thermocouple Assembly	Resistance shall be as shown in following figure.	If resistance is not within limits as shown in following figure, **replace** thermocouple assembly.



7-12. Exhaust Thermocouple Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
8. Three-Probe Exhaust Thermocouple Assembly	T53-L-11 series engines only. Use Multimeter AN/PSM6B or equivalent.	**Check** for continuity.

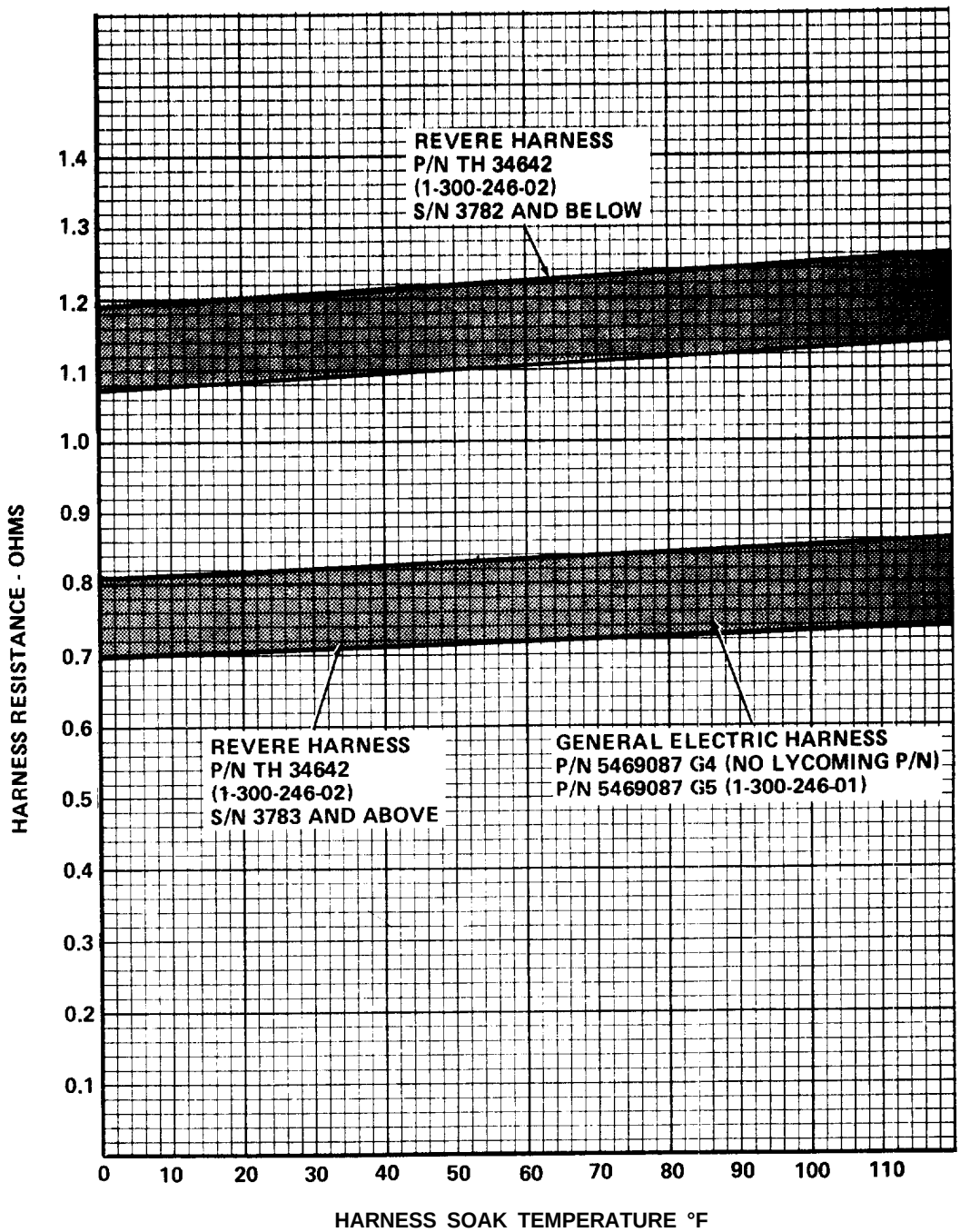




9. Three-Probe Exhaust Thermocouple Assembly	Resistance shall be as shown in following figure.	If resistance is not within limit as shown in following figure, **replace** thermocouple assembly.

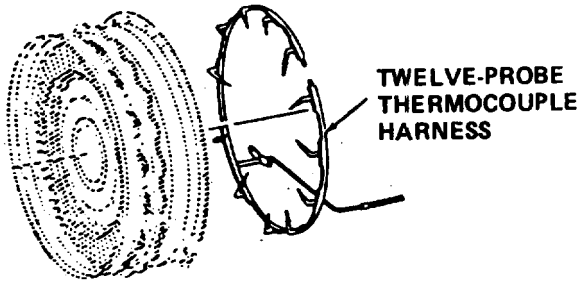
7-12. Exhaust Thermocouple Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		



7-12. Exhaust Thermocouple Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
10. Twelve-Probe Thermocouple Harness	T53-L-703 engine only. Use Multimeter AN/PSM6B or equivalent.	**Check** for continuity.
11. Twelve-Probe Thermocouple Harness	Resistance shall be as shown in following figure.	If resistance is not within limits as shown in following figure, **replace** thermocouple harness.
12. Thermocouple Probes		**inspect** for bums and cracks. Minor bums and cracks are acceptable **provided** functional test is passed. **Replace** damaged thermocouple.



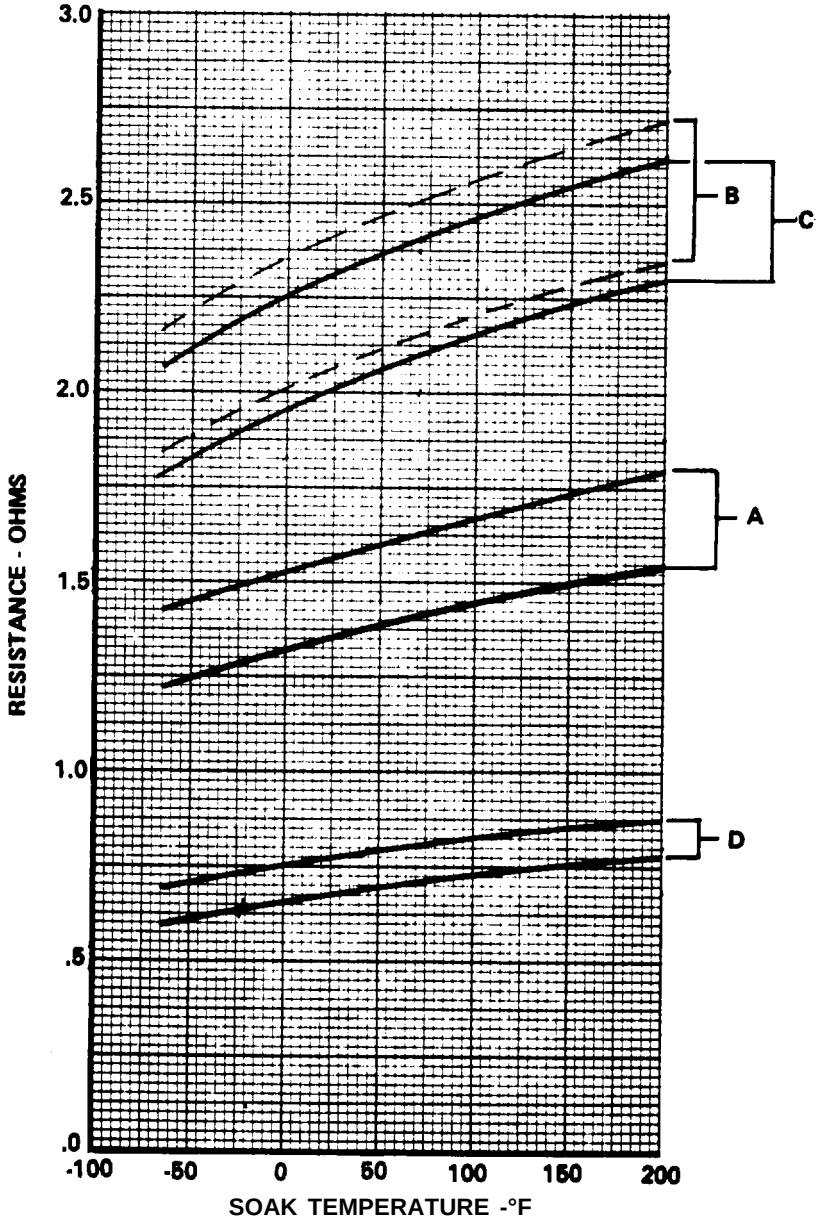
**T53-L-703
ENGINE ONLY**

7-12. Exhaust Thermocouple Assembly - Inspection . Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/- Continued		

T53-L-103 TEMPERATURE MEASURING SYSTEM
ELECTRICAL RESISTANCE VS SOAK TEMP.
HARNESS P/N 1-300-563-01 (TH40513X)
JUNCTION BOX P/N 1-300-564-01 (TLM40510)
LEAD P/N 1-300-599-01 (TLM-41089)

A . TOTAL SYSTEM RESISTANCE MEASURED AT AIRFRAME INTERFACE CONNECTOR
B - INDIVIDUAL T/C CIRCUIT RESISTANCE MEASURED AT JUNCTION BOX CONNECTOR
C - INDIVIDUAL T/C CIRCUIT RESISTANCE MEASURED AT 'T/C HARNESS CONNECTOR (RINGS)
D - LEAD RESISTANCE (TOTAL BOTH CONDUCTORS)



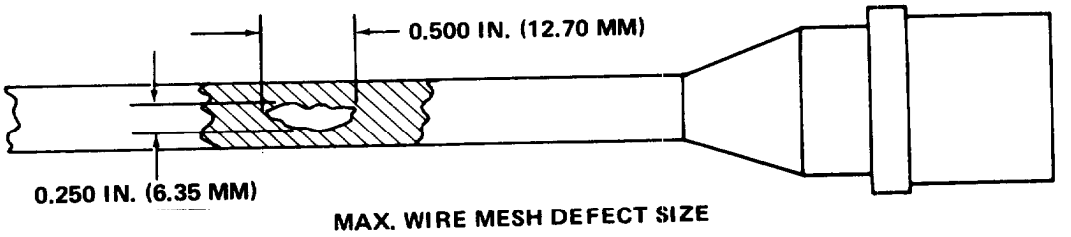
7-13. Exhaust Thermocouple Assembly - Repair (AVIM)

INITIAL SETUP

Applicable Configuration
All

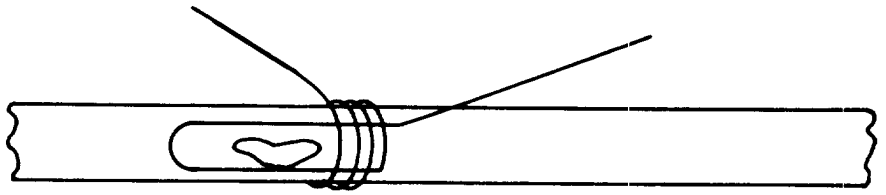
Consumable Materials
Lockwire (item 41 or 42, Appendix D)

References
Para 7-14 and 7-16

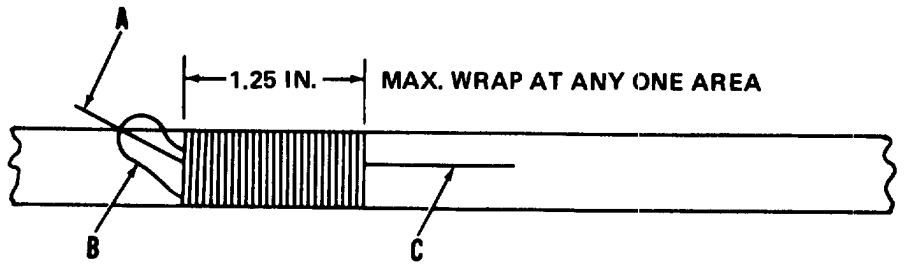
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/		
	NOTE An exhaust thermocouple assembly that fulfills the functional test requirements of paragraph 7-14 or 7-16 but exhibits chafed or fraying damage to limits shown in following figure, may be repaired according to actions for items within this paragraph.	
	 MAX. WIRE MESH DEFECT SIZE	
	CAUTION Extreme caution shall be taken when handling the thermocouple assembly. Excessive flexing of thermocouple assembly, specifically at probe locations can result in internal breakage and shorting. Never use pliers or sharp objects on probes or adjacent harness.	
1. Exhaust Thermocouple Assembly		Remove projecting wire strands of braid at damaged area.

7-13. Exhaust Thermocouple Assembly - Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/. Continued		
2. Exhaust Thermocouple Assembly	Use lockwire (item 41 or 42, Appendix D). Lockwire wrappings should extend 3/8 inch (9. 5 mm) beyond extremities of damage but should not exceed maximum wrap limit shown in following figure.	**Apply** and **wind** lockwire around damaged cable.



APPLY WIRE AND WIND AS SHOWN



AFTER WINDING, PUT END "A" THROUGH LOOP "B" PULL END "C"

3. Exhaust Thermocouple Assembly	When performing this action, use care when pulling end C. Pull only far enough to firmly anchor end A beneath several wraps of wire.	**Finish** wrap with whip finish technique by **inserting ,wire** end A through loop B. **Hold A** taut while **pulling C** to close loop. Release A and carefully **pull C** until end A is anchored beneath wrapping. Remove excess wire ends,
4. Exhaust Thermocouple Assembly	Refer to paragraph 7-14 or 7-16 for functional-test procedures.	**Functional-test.**

7-14. Three-Probe Exhaust Thermocouple Assembly (T53-L-11 Series Engines) - Functional Test Setup

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para 7-15

Test Equipment
Console Tester (LTCT318)
Jetcal Analyzer (BH112JA36)
Junction Box (HG361-5 or BH361-8)
Heater Probes - LTCT415 or BH996-40

LOCATION/ITEM	REMARKS	ACTION
CONSOLE TESTER/		
1. Console Tester (LTCT318 or equivalent)	This action pertains to this item only.	**Connect** heater probes (LTCT415 or BH996-40) to console tester.
JETCAL ANALYZER/		
2. Jetcal Analyzer (BH112JA36)	This action pertains to this item only.	**Connect** heater probes (LTCT415 or BH996-40) to junction box HG361-5 or BH361-8. **Connect** junction box to Jetcal Analyzer.
3. Exhaust Thermocouple Assembly	Refer to paragraph 7-15.	**Functional-test.**

7-15. Three-Probe Exhaust Thermocouple Assembly (T53-L-11 Series Engines) - Functional Test (AVIM)

INITIAL SETUP

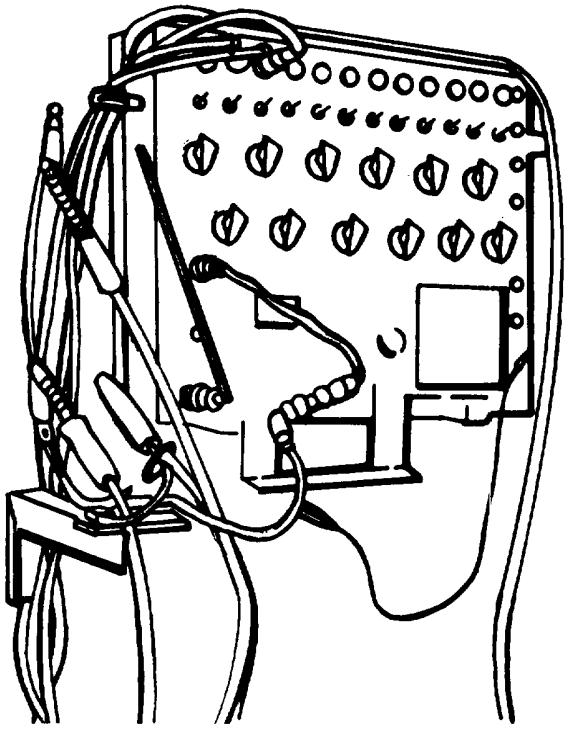
Applicable Configuration
T53-L-11 Series Engines

References
Para 7-14

Special Tools
Test Set - LTCT317

LOCATION/ITEM	REMARKS	ACTION
TEST SET/		

7-15. Three-Probe Exhaust Thermocouple Assembly (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST SET/ - Continued		
	CAUTION **Extreme caution shall be taken when handling thermocouple assembly. Excessive flexing of thermocouple assembly, specifically at probe locations, can result in internal breakage and shorting. Never use pliers or sharp objects on probes or adjacent harness,**	
1. Exhaust Thermocouple Assembly		**Set up** for functional test as outlined in paragraph 7-14.
2. Exhaust Thermocouple Assembly Connector		**Connect test cable** between exhaust thermocouple assembly connector and P-2 receptacle of test set.
3. Test Set	**NOTE** Test set has no ON-OFF switch.	**Connect to an external** 100 vat, 60-cycle power source.
4. SW-1 Switch		Set to RANGE position.
5. SW-2 Switch		Set to EXTERNAL T/C position.

7-15. Three-Probe Exhaust Thermocouple Assembly (T53-L-11 Series Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST SET/ - Continued		
6. Heater Probe Switches	Potentiometer window should illuminate when performing this action.	Set switches 1, 2 and 3 to ON position.
7. SW-1 Switch		Set to MECH. ZERO position.
8. R-1 Switch		**Adjust** until pointer indicates zero.
9. SW-1 Switch		Sat to RANGE position.
10. Temperature Regulator Controls		**Turn** controls 1,2 and 3 to 80 for warmup.
11. Temperature Recorder Control		**Adjust** until pointer is visible.
12. EGT Heater Probe Element No. 1		**Touch** to each thermocouple individually. Galvanometers pointer should move to right on scale.
13. Exhaust Thermocouple Assembly		Reject if no movement or movement to left on scale is noted.
14. SW-2 Switch		Set to HEATER PROBE T/C position.
15. Heater Probes		**Install** on thermocouples.
16. Temperature Recorder Control		**Adjust** for 1094°F to 1130°F (590°C to 610°C) indication in recorder window.
	NOTE After short warmup period, pointer should become visible in illuminated potentiometer window.	
17. Temperature Regulator		Set controls 1,2 and 3 and **permit** pointer to stabilize at temperatures obtained in preceding action for item 16.

7-15. THREE-PROBE EXHAUST THERMOCOUPLE ASSEMBLY (T53-L-11 SERIES ENGINES) - FUNCTIONAL TEST (AVIM) - **Cont.**

LOCATION/ITEM	REMARKS	ACTION
TEST SET/-Continued		
18. Temperature Recorder Control		Adjust control until pointer indicates zero. Record setting of temperature recording control.
19. SW-2 Switch		Set to EXTERNAL T/C position. Permit pointer to stabilize.
20. Temperature Recorder Control		Adjust until pointer indicates zero.
	NOTE The difference between recorded setting obtained in preceding action for item 18 and following item 21 must not exceed plus 50°F or minus 50°F (plus 10°C or minus 46°C).	
21. Temperature Recorder Control		Record setting.
22. Thermocouple Assembly		Allow to cool to ambient temperature and **connect** thermocouple assembly to test set (LTCT317).
23. Multiple Circuit Selector Switch		**Set** to normal.
24. Test Selection		**Set** to **LO VOLTAGE** position.
25. Meter Selection		**Set** to SHORT RES position.
26. Meter Range		**Set** to RX100 position.
27. Ohmmeter		Place at zero setting.
28. Ohmmeter		Record resistance readings.
29. Resistance Reading		If reading is below 400 ohms, **reject** assembly.

7-16. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engine) - Functional Test Setup (AVIM)

INITIAL SETUP

Applicable Configuration
T53-L-13B Engine

References
Para 7-17

Test Equipment
Console Tester (LTCT318)
Jetcal Analyzer (BH112JA36)
Junction Box (BH361-8)
Probe Elements (BH7434L-40, BH7434R-40)

LOCATION/ITEM	REMARKS	ACTION
CONSOLE TESTER/		
1. Heater Probe Element (BH7434-40)	If console tester **is** to be used, perform this action.	**Connect** to console tester.
2. Heater Probe Element (BH7434-40)	If exhaust thermocouple assembly is not installed on engine and jetcal analyzer (BH112JA36) is to be used, perform this action.	**Connect** to junction box (BH361-8) connect junction box to jetcal analyzer.
JETCAL ANALYZER/		
3. Exhaust Thermocouple Assembly	If installed on engine and jetcal analyzer (BH112JA36) is to be **used,** perform this action.	**Connect** heater probe elements BH7434L-40 and BH7434R-40 to junction box BH361-8. **Connect** junction box to jetcal analyzer.
4. Exhaust Thermocouple Assembly		**Function-test as outlined** in paragraph 7-17.

7-17. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engines) - Functional Test (AVIM)

INITIAL SETUP

Applicable Configuration
T53-L-13B Engines

References
Para 7-16

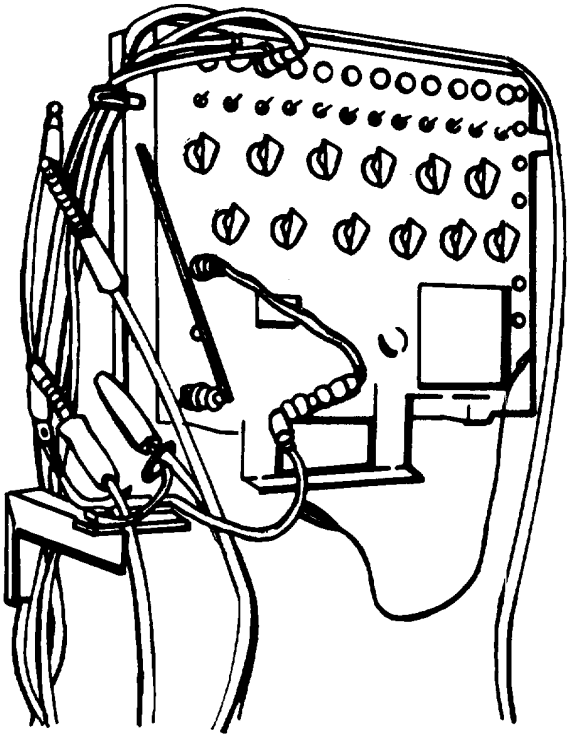
Test Equipment
Test Set (LTCT317)

7-17. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST SET/ - Continued		

CAUTION

Extreme caution shall be taken when handling thermocouple assembly. Excessive flexing of thermocouple assembly, specifically at probe locations can result in internal breakage and shorting. Never use pliers or sharp objects on probes or adjacent harness.

1. Exhaust Thermocouple	Refer to paragraph 7-16.	Set up for functional test.
2. Test Cable		Connect between exhaust thermocouple assembly connector and P-2 receptacle of test set.
3. Test Set		Connect to an external 110 vat, 60 cycle power source.

NOTE

Test set has no ON-OFF switch.

7-17. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engines) - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST SET/ - Continued		
4. SW-1 Switch		Set to RANGE position.
5. SW-2 Switch		Set to EXTERNAL T/C position.
6. Heater Probe	Potentiometer window should illuminate when performing this action.	Set switches 1,2,3,4,5 and 6 to ON position.
7. SW-1 Switch		Set switch to MECH. ZERO position.
8. Potentiometer Knob		**Adjust** until pointer indicates zero.
9. SW-1 Switch		Set to ELEC. ZERO position.
10. R-1 Switch		**Adjust** until pointer indicates zero.
11. SW-1 Switch		Set to RANGE position.
12. Temperature Regulator		**Turn** controls 1, 2, 3, 4, 5 and 6 to 80 for warm-up.
13. Temperature Recorder Control		**Adjust** until pointer is visible.
14. EGT Heater Probe Element No. 1		**Touch** to each thermocouple individually. Galvanometers pointer should move to right on scale.
15. Exhaust Thermocouple Assembly		**Reject** if no movement or movement to left on scale is noted.
16. SW-2 Switch		Set to HEATER PROBE T/C position.
17. Thermocouples		**Install** heater probe.

7-17. SIX-PROBE EXHAUST THERMOCOUPLE ASSEMBLY (T53-L-13B ENGINES) -- FUNCTIONAL TEST (AVIM) – Cont.

LOCATION/ITEM	REMARKS	ACTION
TEST SET/–Continued		
18. Temperature Recorder Control		**Adjust** control for 1094°F to 1130°F (590°C to 610°C) indication in recorder window.
	NOTE After short warmup period, pointer should become visible in illuminated potentiometer window.	
19. Temperature Regulator Controls		**Set** controls 1,2,3,4,5 and 6 and **permit** pointer to stabilize at temperatures obtained in action for item 18.
20. Temperature Recorder Control		**Adjust** until pointer indicates zero. **Record** setting of temperature recorder control.
21. SW-2 Switch		**Set** switch in EXTERNAL T/C position. Permit pointer to stabilize.
22. Temperature Recorder Control		**Adjust** until pointer indicates zero.
	NOTE The difference between recorded setting obtained in preceding item 20 and following item 23 must not exceed plus 50°F or minus 50°F (plus 10°C or minus 46°C).	
23. Temperature Recorder Control		**Record** setting.
24. Thermocouple Assembly		**Allow** to **cool** to ambient temperature and **connect** thermocouple assembly to test set (LTCT317).
25. Multiple Circuit Selector		**Set** switch to NORMAL.

7-17 SIX-PROBE EXHAUST THERMOCOUPLE ASSEMBLY (T53-L-13B ENGINES) – FUNCTIONAL TEST (AVIM) – Cont.

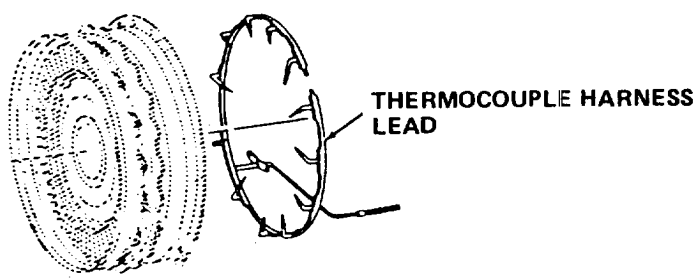
LOCATION/ITEM	REMARKS	ACTION
TEST SET/-Continued		
26. Test Selection		**Set** to LO-VOLTAGE position.
27. Meter Selection		**Set** to SHORT RES position.
28. Meter Range		Set to RX100 position.
29. Ohmmeter		Zero.
30. Resistance Reading.		**Record** on ohmmeter.
31. Resistance Reading.		If below 400 ohms, **reject** thermocouple assembly.

7-18. TWELVE-PROBE THERMOCOUPLE HARNESS ASSEMBLY (T53-L-703 ENGINE) – FUNCTIONAL TEST

INITIAL SETUP

Applicable Configuration
T53-L-703 Engine

Test Equipment
Console Tester (LTCT318)
Megohmmeter
Ohmmeter

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/		
1. Thermocouple Harness Assembly		**Perform** temperature check according to actions for items 2 thru 4.
2. Thermocouple Harness Lead	Use test connector 1-300-564-01. 	**Connect** test connector to test unit. **Install** thermocouple lead in connector. **Secure** with two screws.
3. Harness Lead Probes	Use heaters P/N BH7454AHO, BY7454BH-40 and Jetcal P/N BH7454.	**Turn** on test unit. **Connect** heaters to twelve harness lead probes.

7-18. TWELVE-PROBE THERMOCOUPLE HARNESS ASSEMBLY (T53-L-703 ENGINE) – FUNCTIONAL TEST – Cont.

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/–Continued		
4. Thermocouples	Difference between recorded settings obtained must not exceed plus 11°F or minus 11°F (plus 6°C or minus 6°C) for the new harness. For used harness difference between recorded settings obtained must not exceed plus 18°F or minus 18°F (plus 10°C or minus 10°).	Check accuracy at 1094°F to 1130°F (590°C to 610°C).
	NOTE Perform insulation resistance check of thermocouple harness assembly according to action for item 5.	
5. Probe Thermocouple Harness Assembly	Use megohmmeter. Minimum recorded resistance shall be 25,000 ohms when assembly is dry. Assembly may be oven dried if necessary.	Apply 50 vdc potential using megohmmeter. **Check** insulation resistance between each of the four circuits and braiding. **Check** four circuits and connectors.
6. Probe Thermocouple Harness Assembly	When performing this action, temperature shall be stabilized at 65°F to 75°F (18.3°C to 24°C). Resistance through each circuit shall be 2.1.0 ohms to 2.40 ohms.	**Perform** resistance check. **Use** ohmmeter to **check** resistance between alumel and chromel circuits (A, B, and C).
7. Probe Thermocouple Harness Assembly	All heated probes should affect readout of indicator.	**Perform** individual thermocouple heat check as follows: a. **Connect** suitable millivolt readout to appropriate output connections. b. Heat individual probes. **c. Check** millivolt readout for indicator movement.
8. Connector	Perform step a. using a megohmmeter and applying 50 vdc potential. Minimum recorded resistance shall be 25,000 ohms when connector is dry. Oven dry connector if necessary.	**Perform** resistance check as follows: a. Check connector insulation resistance between alumel V contacts, A to B. then A to C.

7-18. TWELVE-PROBE THERMOCOUPLE HARNESS ASSEMBLY (T53-L-703 ENGINE) - FUNCTIONAL TEST – Cont.

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/–Continued		b. Repeat resistance check between contacts B and C.
9. Connector	Use a voltmeter to perform steps a. and b.	Perform continuity check as follows: a. Check continuity between connector receptacle pin D to chromel V contact A. b. Repeat preceding step a. between connector receptacle A to alumel V contact A, pin B to alumel V contact B, pin E to chromel V contact C, pin F to alumel V contact C.
10. Thermocouple Lead Assembly	Resistance shall be 0.70 ohms to 0.80 ohms at 65°F to 75°F(18.3°C to 24°C).	Perform resistance check as follows: a. Connect a short length of wire across output connector sockets. b. Using a digital readout, check resistance between input connector circuit A and DEF; B and DEF; and C and DEF.
11. Thermocouple Lead Assembly	Oven dry lead assembly.	Perform insulation resistance check as follows: a. Apply a 50 vdc potential between the chromel and alumel contacts. b. Using a megohmmeter, check that minimum recorded resistance is 25,000 ohms when lead assembly is dry. c. Replace defected unit if limits given cannot be met.

7-19. Three-Probe Exhaust Thermocouple Assembly (T53-L-11 series Engines) - Installation

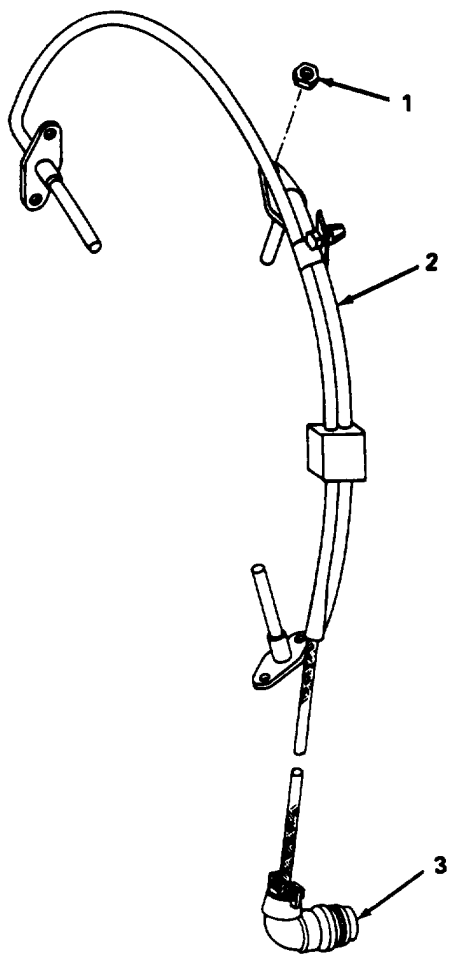
INITIAL SETUP

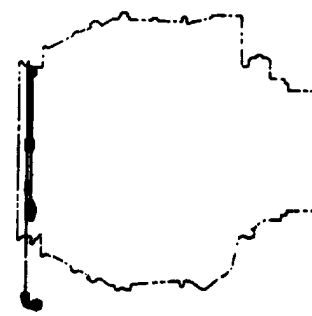
Applicable Configuration
T53-L-11 Series Engines

References
Appendix G, table G-3, reference number 37

Consumable Materials
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease item 103, Appendix D)
Molykote Anti-Seize Thread Compound (item 56, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
EXHAUSE DIFFUSER/		





7-19. Three-Probe Exhaust Thermocouple Assembly (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued	**CAUTION** Extreme caution shall be taken when Installing thermocouple assembly on exhaust diffuser. Excessive flexing of thermocouple assembly, specifically at robe locations can result in internal breakage and shorting. Never use pliers or sharp objects on probes or adjacent harness.	
1. Thermocouple Assembly (2)		Position over exhaust diffuser with thermocouple assembly connector (3) to right of engine.
2. Thermocouple		Insert probes in exhaust diffuser at 2-,4-, and 10-o'clock mounting positions.
3. Exhaust Thermocouple Assembly (2)	Refer to Appendix G, table G-3, reference number 37 for tightening requirements.	Apply Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) or Molykote Anti-Seize Thread Compound (Item 58, Appendix D) to nuts (1). Secure exhaust thermocouple assembly to exhaust diffuser with nuts. Tighten nuts as required.
	NOTE When installed on airframe connector, the knurled ring nut on the thermocouple assembly connector (3) shall be hand-tightened only and lockwired.	

7-20. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engines) - Installation

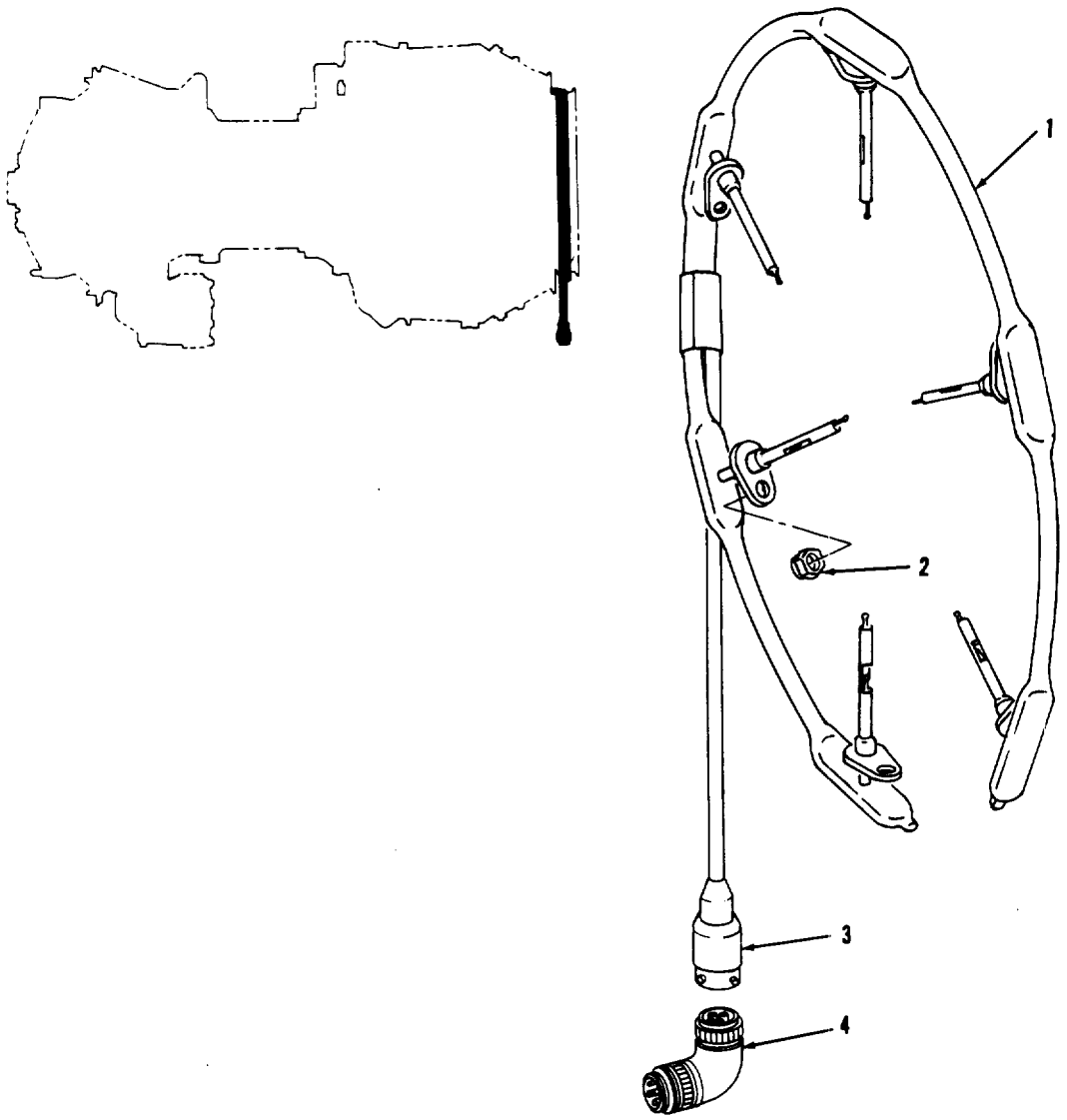
INITIAL SETUP

Applicable Configuration
T53-L-13B Engines

Consumable Materials
Anti-Seize, 767 (item 102, Appendix D)
Nickel-Ease (item 103, Appendix D)
Molykote Anti-Seize Thread Compound (item 56, Appendix D)

References
Appendix G, table G-4, reference number 56
Appendix C

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/		



7-20. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued	**CAUTION** **Extreme caution shall be taken when installing thermocouple assembly on exhaust diffuser. Excessive flexlng of thermocouple assembly, specifically at probe locations, can result In internal breakage and shorting. Never use pllers or sharp objects on probes or adjacent harness.**	
1. Six-Probe Exhaust Thermocouple Assembly (1)		**Insert** thermocouple probes into exhaust diffuser bosses, starting with the end nearest to the thermocouple connector, inserting it into the 6-o'clock position and working counterclockwise.
2. Exhaust Thermocouple Assembly		**Apply** Anti-Seize, 767 (item 102, Appendix D) or Nickel-Ease (item 103, Appendix D) or Molykote Anti-Seize Thread Compound (item 58, Appendix D) to nuts (2). **Secure** exhaust thermocouple assembly to exhaust diffuser with nuts. Tighten nuts as required. **(Refer** to Appendix G, table G-4, reference number 56.)
3. Exhaust Thermocouple Assembly	Use crowfoot flare nutwrench with open end modified (by grinding) to 5/32-inch maximum thickness for a length of 7/8-inch to one inch (refer to Appendix C). **NOTE** In preceding action for item 3, position torque wrench 90° to wrench axis; a direct torque can be applied.	**Secure** exhaust thermocouple assembly (1) to exhaust diffuser with nuts (2). Tighten nuts as required. (Refer to Appendix G, table G-4, reference number 56.)

7-20. Six-Probe Exhaust Thermocouple Assembly (T53-L-13B Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		

CAUTION

When attaching adapter connector (4) to firewall cannon plug, the knurlad ring nut shall be hand-tightened only and lockwired. Extreme caution shall be taken when connecting or disconnecting connector (3) to adapter connector (4) or knurled ring nut of adapter (4) to firewall cannon plug. Excessive flexing of adapter connector (4) can result in internal breakage and shorting.

7-21. TwelveProbe Thermocouple Harness (T53-L-703 Engine) - Installation

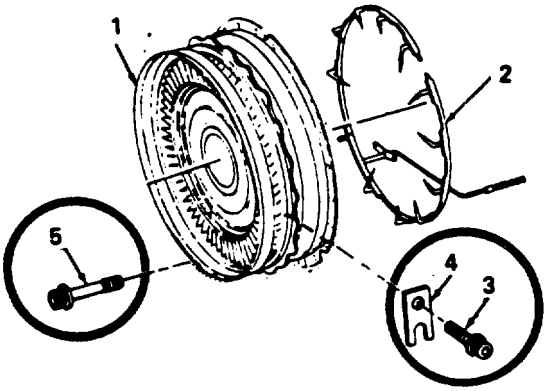
INITIAL SETUP

Applicable Configuration
T53-L-703 Engine

Special Tools
LTCT4174 - Alinement Fixtures

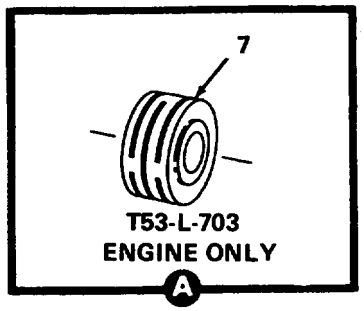
Consumable Materials
Petrolatum (item 66, Appendix D)
Molybdenum Disulfide (item 57, Appendix D)
Lockwire (item 43, Appendix D)

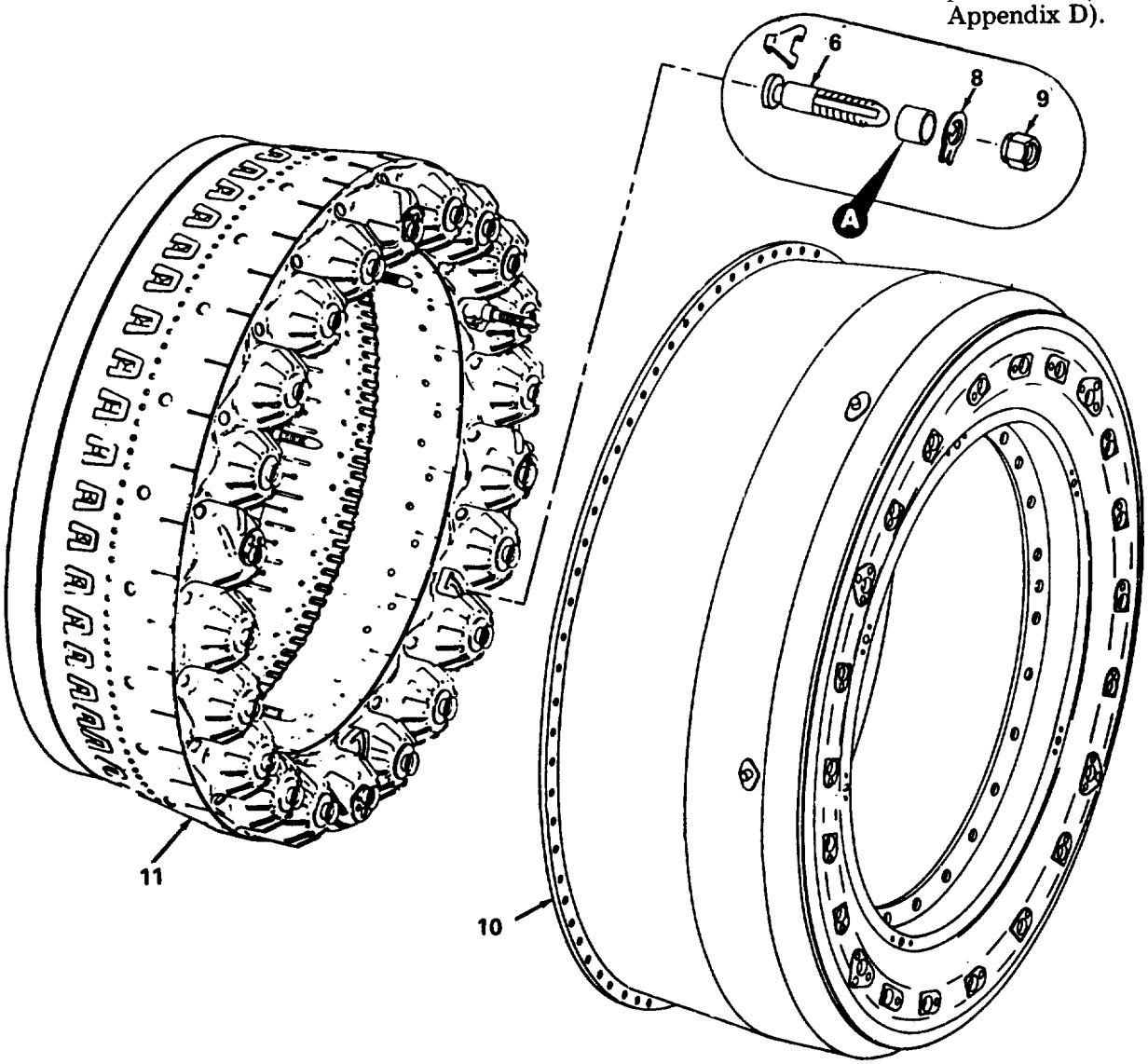
References
Appendix G, table G-4, reference number 30, 18
Para 6-33 and 6-78

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/		
1. Thermocouple Harness **(2)**		**Position** around first stage power turbine nozzle (1) until 12 probes and harness lead are properly alined.
2. Plates **(4)**		**Secure** probes with 12 plates (4) and bolts (3). **Tighten as** required. **Lockwire.**

7-21. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ Continued		
3. Harness Lead		**Insert** through exit holes in flanges of first stage turbine nozzle (1) and exhaust diffuser assembly (19). **Secure** lead to flanges with two bolts (5). **Tighten** bolts as required. **Lockwire.**
4. Springs (7)		**Install** on six liner assembly studs (2). **Retain with** petrolatum (item 66, Appendix D).



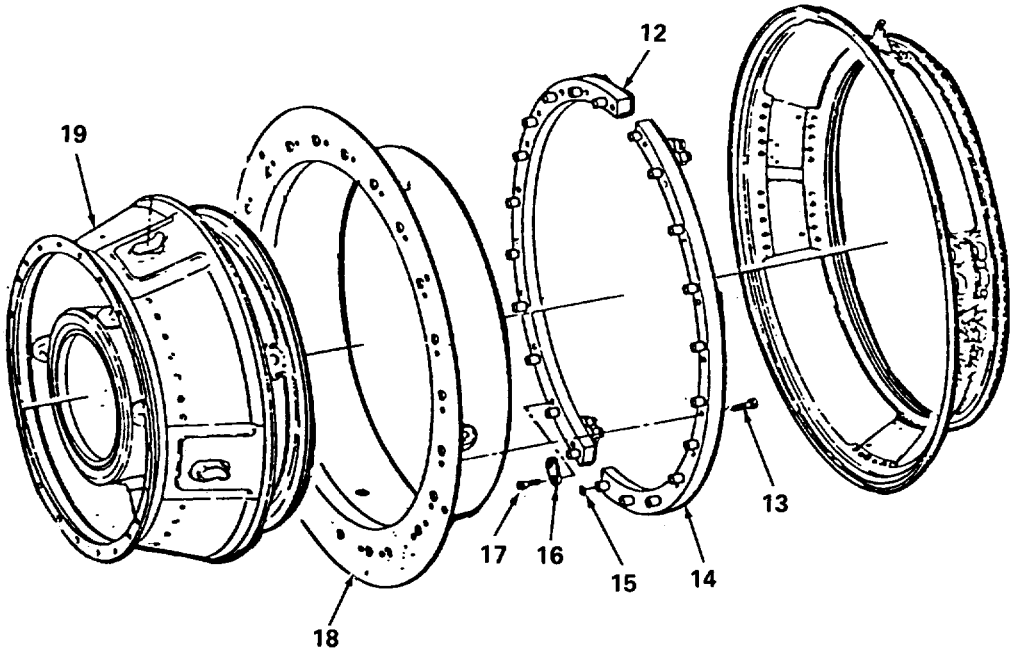


7-21. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued	**CAUTION** **In following item 5, slots in studs must face radially inward or tangs in housing will be damaged.** **Do not force liner into housing, Check and reposition studs if required.**	
5. Liner Assembly (11)		**Install** into combustion chamber housing (10) with TOP index at 12-o'clock on housing and igniter ports alined.
6. Key Washers (8) and Nuts (9)	Do not lubricate studs (6).	**Install** on liner assembly studs. **Do not tighten** nuts.
7. Combustion Chamber Liner Assembly (11)	Use alinement fixtures (LTCT4174).	**Insure** proper alinement with combustion chamber housing assembly (10). **Install** alinement fixtures on housing assembly.
8. Nuts		**Tighten** on studs to 20 pound-inches to 30 pound-inches (0.2 kg/m to 0.3 kg/m). **Bend** tabs of keywashers to **secure** nuts.
9. Alinement Fixtures (LTCT4174)	Protrusion of stud threads beyond nut is not required.	**Remove.**
10. Fireshield (18)		**Position** on combustion chamber housing rear flange. **Aline** pin in combustion chamber housing with hole in fireshield. If oil tubes are not concentric with holes in fire shield, remove fireshield. **File** as required.
11. Thermocouple Harness Lead		**Push** through fireshield access hole.

7-21. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		



12. Combustion Chamber Liner	Use alinement fixture (LTCT4174).	**Insure** proper alinement with fireshield and combustion chamber housing. **Position** alinement fixtures through these components. **Remove** fixtures.

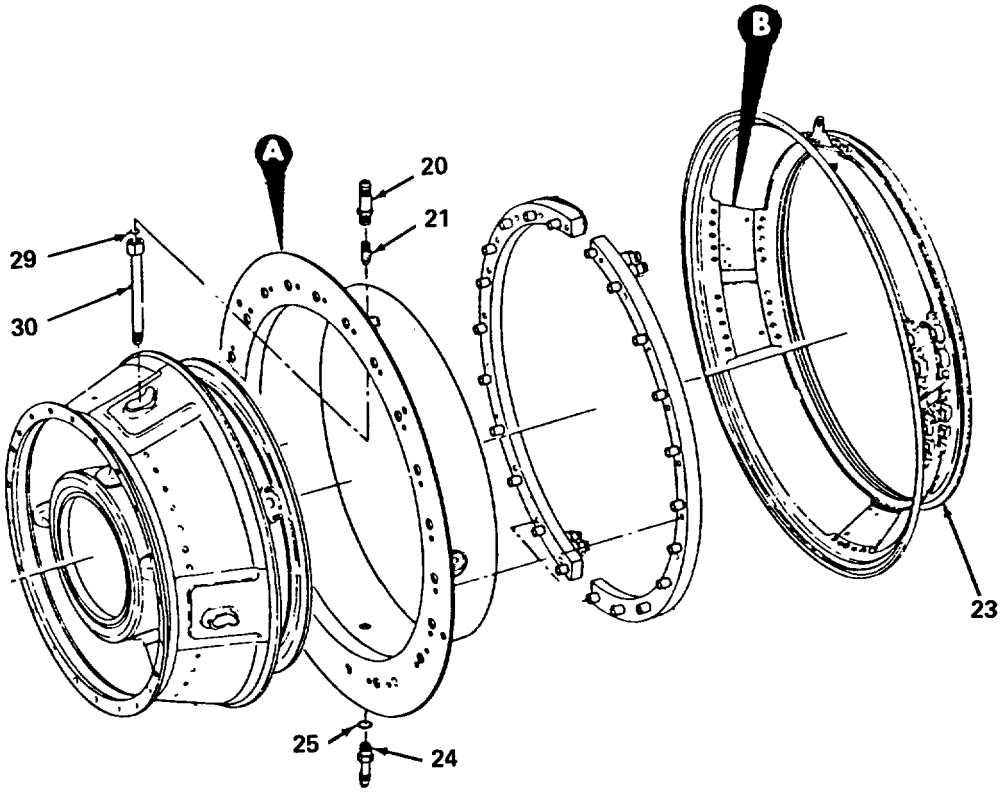
CAUTION

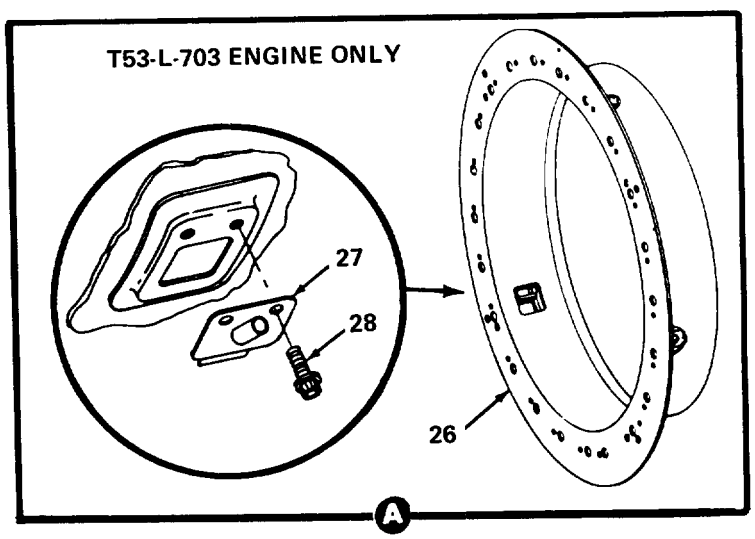
In following item 13, use care to prevent damage to nozzle seal (15).

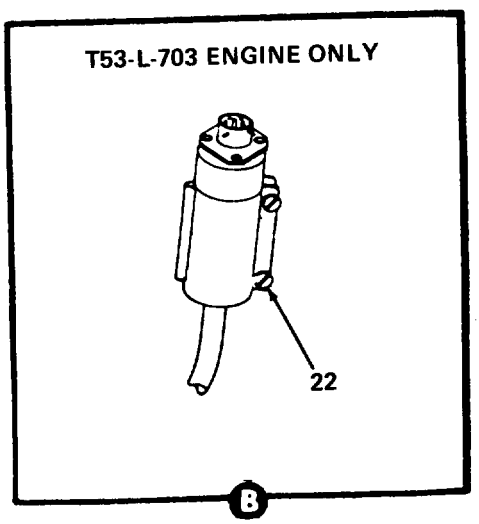
13. Seal (15)		**Install** on fuel nozzles.
14. Sealing Gaskets (16)		**Install** on fuel manifold assembly (12). **Secure** with screws (17).
15. Fuel Manifold Assemblies (12 and 14)		Carefully **position** over fireshield. **Aline** fuel nozzles with port holes. **Install** fuel manifold assemblies. **Secure** with bolts (13). **Tighten** bolts as required. **Lockwire.**

7-21. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Installation - Continued

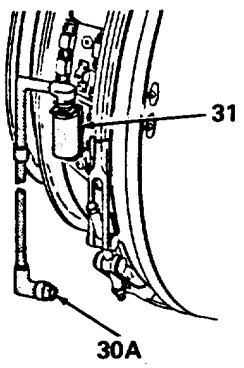
LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
16. Oil Strainer Housing Adapter (20)	Use molybdenum disulfide (item 57, Appendix D).	Apply molybdenum disulfide to oil strainer housing adapter.





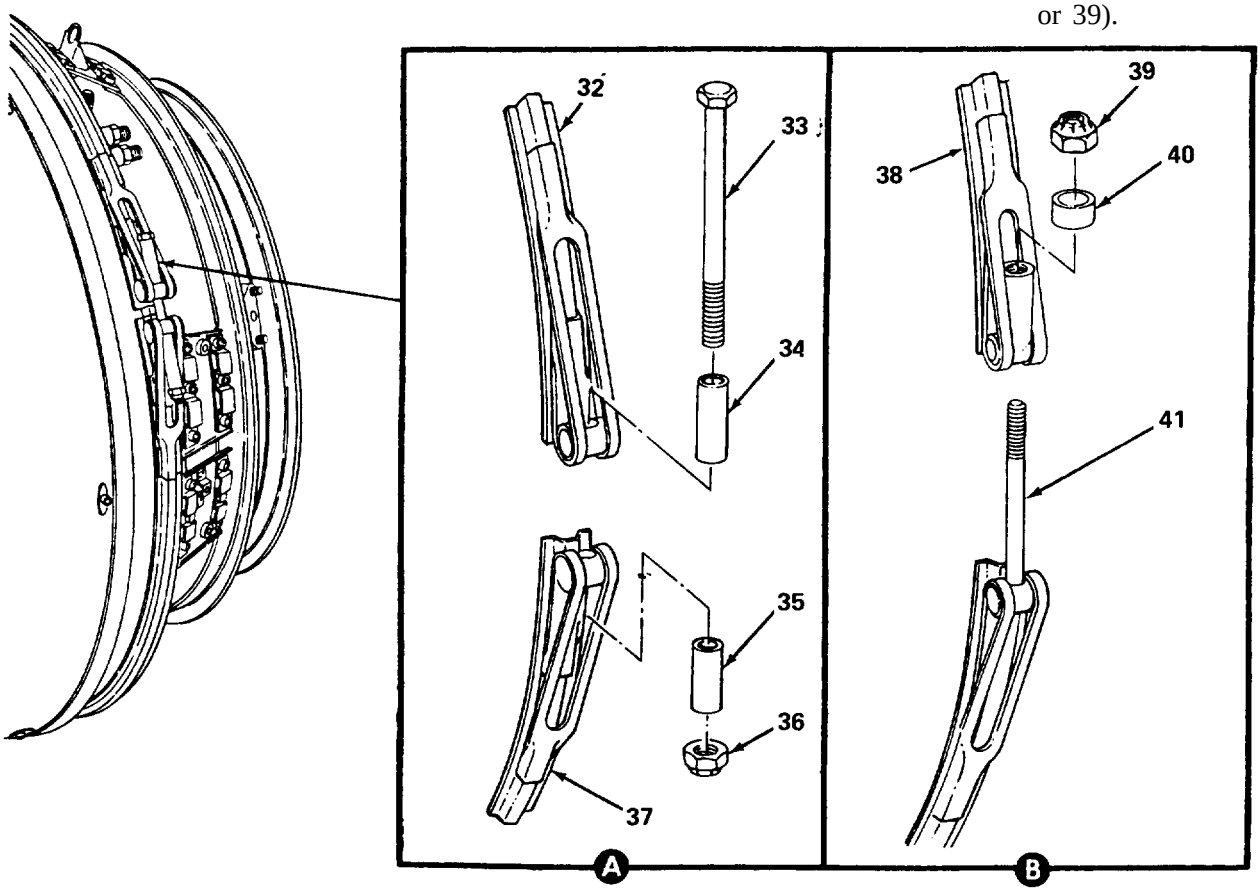


7-21. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) -Installation -Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
17. Strainer (21)		**Install** into oil strainer housing adapter (20) at 12-o'clock position. **Tighten** fingertight.
18. Oil Strainer Housing Adapter (20) and Packing (29)	Refer to Appendix G, table G-4, reference number 30 for tightening requirements.	**Install** into tube (30). **Tighten** adapter as required. **Lockwire** adapter.
19. Connector (24)	Use molybdenum disulfide (item 57, Appendix D).	**Apply** molybdenum disulfide to connector.
20. Connector (24) and Packing (25)	Refer to Appendix G, table G-4, reference number 30 for tightening requirements.	**Install** into power turbine tube at 6-o'clock position. **Tighten** connector as required. **Lockwire** connector.
21. Thermocouple Harness (2)		**Insert** lead through thermocouple harness lead cover assembly (27).
22. Thermocouple Harness Lead Cover Assembly		**Install** onto fireshield (26). Secure cover assembly with two screws (28). **Lockwire** screws.
23. Support Cone Assembly (23)		**Install** over fireshield and exhaust diffuser. **Position** starting fuel manifold bracket at 12-o'clock position.
24. Thermocouple Lead Assembly (30A)		**Reconnect** to connector (31).

7-21. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER/ - Continued		
25. Connector (31)		**Open cover. Install** lead of thermocouple harness (2).
26. Connector (31)	Lead shall bottom in connector.	Close cover. **Secure** with two screws (22). **Tighten** screws as required. **Lockwire.**
27. V-Band Couplings (32 and 37 or 38 and 41)	To insure proper seating of the support cone on the combustion chamber, tap the V-band couplings starting at the middle and moving toward the bolts at the ends. Tighten the nuts. Repeat tapping and tightening until the nuts are snug.	**Position** over support cone and combustion chamber flange with attaching ends at approximately 4-o'clock and 10-o'clock positions as viewed from the rear.
28. Couplings		**Secure** with bolts (33), spacers (34 and 35 or 40), and new nuts (36 or 39).



7-21. Twelve-Probe Thermocouple Harness (T53-L-703 Engine) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
EXHAUST DIFFUSER-Continued		
29. V-Bands	Refer to Appendix G, table G-4, reference number 18 for tightening requirements.	Tighten as follows: a. Tighten V-band coupling nuts as required. b. Lockwlre drilled boit head only on configuration A, using lockwire (item 43, Appendix D).
30. V-Band Coupling	Refer to Appendix G, table G-6, reference number 41 for gap requirements.	Insure gap exists between coupling ends.
31. Starting Fuel Manifold and Flow Divider and Dump Valve Hose Assemblies	Refer to paragraphs 6-33 and 6-78.	Install.

7-22. Wiring Harness (T53-L-11 Series Engines) - Removal

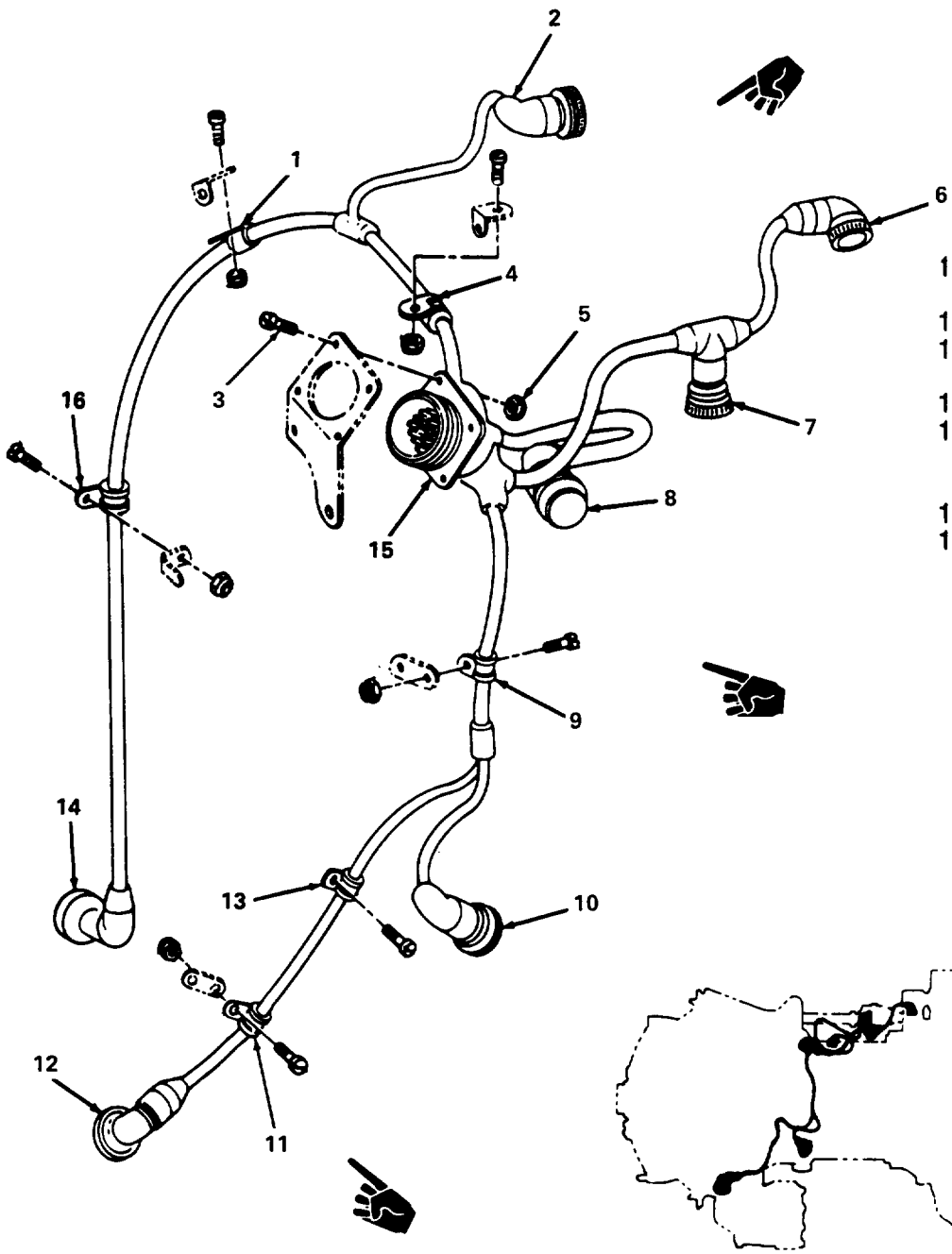
INITIAL SETUP

Applicable Configuration
T53-L-11 series Engines

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	WARNING Make certain that all electrical power is disconnected.	

7-22. Wiring Harness (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
1. Wiring Harness Clamps 1, 4, 9, 11, 13, and 16)		**Remove** all screws and **nuts that secure clamps.**



1. Wiring Harness Clamp
2. Hot-Air Solenoid Valve Connector
3. Screw
4. Wiring Harness Clamp
5. Nut
6. Ignition Unit Connector
7. Starting Fuel Solenoid Valve Connector
8. Power Turbine (N2) Tachometer Generator Connector
9. Wiring Harness Clamp
10. Transfer Solenoid Valve Connector
11. Wiring Harness Clamp
12. Oil Temperature Bulb Connector
13. Wring Harness Clamp
14. Compressor Rotor (N1) Tachometer Generator Connector
15. Airframe Main Connector
16. Wiring Harness Clamp

7-22. Wiring Harness (T53-L-11 Series Engines) - Removal - Continued

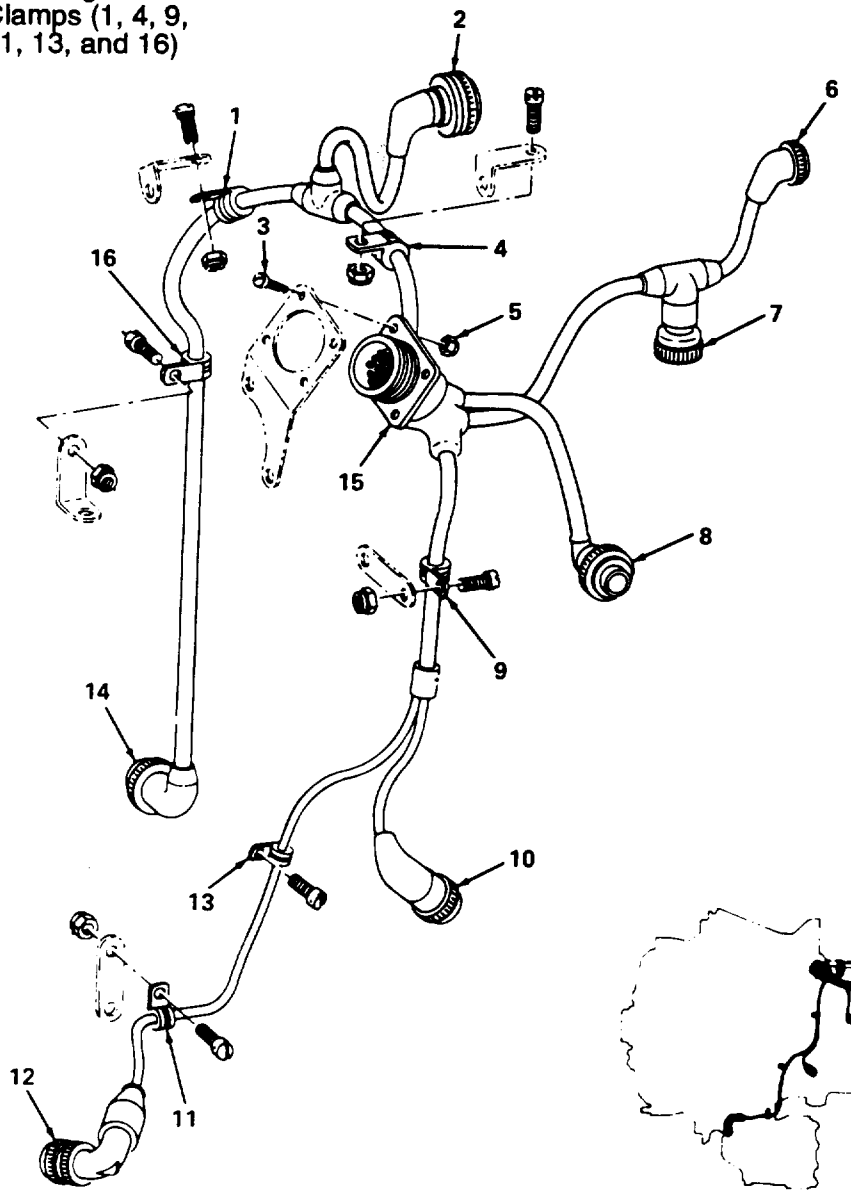
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	NOTE Index each connector to facilitate reassembly.	
2. Airframe Main Connector (15)		**Disconnect** electrical plug.
3. Wiring Harness		**Disconnect** at each of the following connectors: a. compressor rotor (N1) tachometer generator (14). b. hot-air solenoid valve (2). c. ignition unit (6). d. starting fuel solenoid valve (7). e. power turbine (N2) tachometer generator (8). f. transfer solenoid valve (10). g. oil temperature bulb (12).
4. Airframe Main Connector (15)		**Remove** screws (3) and nuts (5) that secure airframe main connector (15) to bracket.
5. Airframe Main Connector (15)		**Remove** from bracket.
6. Wiring Harness		**Remove** wiring harness. **Remove** sealing washer, if installed, from each connector. **Discard** sealing washers.

7-23. Wiring Harness (T53-L-13B/703 Engines)- Removal

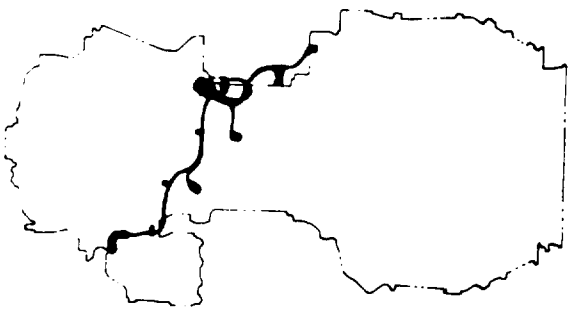
INITIAL SETUP

Applicable Configuration
TT53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**WARNING** **Make certain that all electrical power is disconnected.**	
1. Wiring Harness Clamps (1, 4, 9, 11, 13, and 16)		**Remove** all screws and nuts that secure clamps.



1. Wiring Harness Clamp
2. Hot-Air Solenoid Valve Connector
3. Screw
4. Wiring Harness Clamp
5. Nut
6. Ignition Unit Connector
7. Starting Fuel Solenoid Valve Connector
8. Power Turbine (N2) Tachometer Generator Connector
9. Wiring Harness Clamp
10. Transfer Solenoid Valve Connector
11. Wiring Harness Clamp
12. Oil Temperature Bulb Connector
13. Wiring Harness Clamp
14. Compressor Rotor (N1) Tachometer Generator Connector
15. Airframe Main Connector
16. Wiring Harness Clamp



7-23. Wiring Harness (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	NOTE Index each connector to facilitate reassembly.	
2. Airframe Main Connector (15)		Disconnect electric plug.
3. Wiring Harness		Disconnect at each of the following connectors: a. compressor rotor (N1) tachometer generator (14). b. hot-air solenoid valve (2). c. ignition unit (6). d. starting fuel solenoid valve (7). e. power turbine (N2) tachometer generator (8). f. Transfer solenoid valve (10). g. oil temperature bulb 12 .
4. Airframe Main Connector (15)		Remove screws (3) and nuts (5) that secure airframe main connector (15) to bracket.
5. Airframe Main Connector (15)		Remove from bracket.
6. WMng Harness		Remove wiring harness. Remove sealing washer, if installed, from each connector. Discard sealing washers.

7-24. Wiring Harness and Exhaust Thermocouple Assembly - Cleaning

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Dry Cleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**CAUTION** Do not immerse cable or thermocouple assemblies In solvent. Solvent may cause malfunction of electric cable and thermocouple Internal wiring Insulation.	
1. Wiring Harness and Exhaust Thermocouple Assembly		Clean by Wiping with a clean, lint-free cloth slightly dampened with dry cleaning solvent (item 24, Appendix D). After cleaning , wipe with a clean, dry, lint-free cloth to remove residual solvent.

7-25. Wiring Harness - Inspection

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Crocus Cloth (item 21, Appendix D)

References
Para H-28 and 7-5

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Connectors	Refer to paragraph H-28 for repair procedures.	Inspect for damaged threads. Repair damaged threads.
2. Connectors	Use crocus cloth (item 21, Appendix D).	Inspect for corrosion. Remove corrosion with crocus cloth (item 21, Appendix D).

7-25. Wiring Harness - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
3. Connectors		Inspect for cracked insulators and bent or broken pins.
4. Wring Harness		Replace if insulators or pins are defective.
5. Wiring Harness	Minor chafing or fraying is acceptable following repair. Severe fraying is unacceptable. Cable distortion that does not break the braid or impair operation is allowable. Refer to paragraph 7-5 for repair procedures.	Inspect for loose connectors, chafing and fraying. Repair minor or localized fraying with chafing sleeve.

7-26. Wiring Harness - Functional Test (AVIM)

INITIAL SETUP

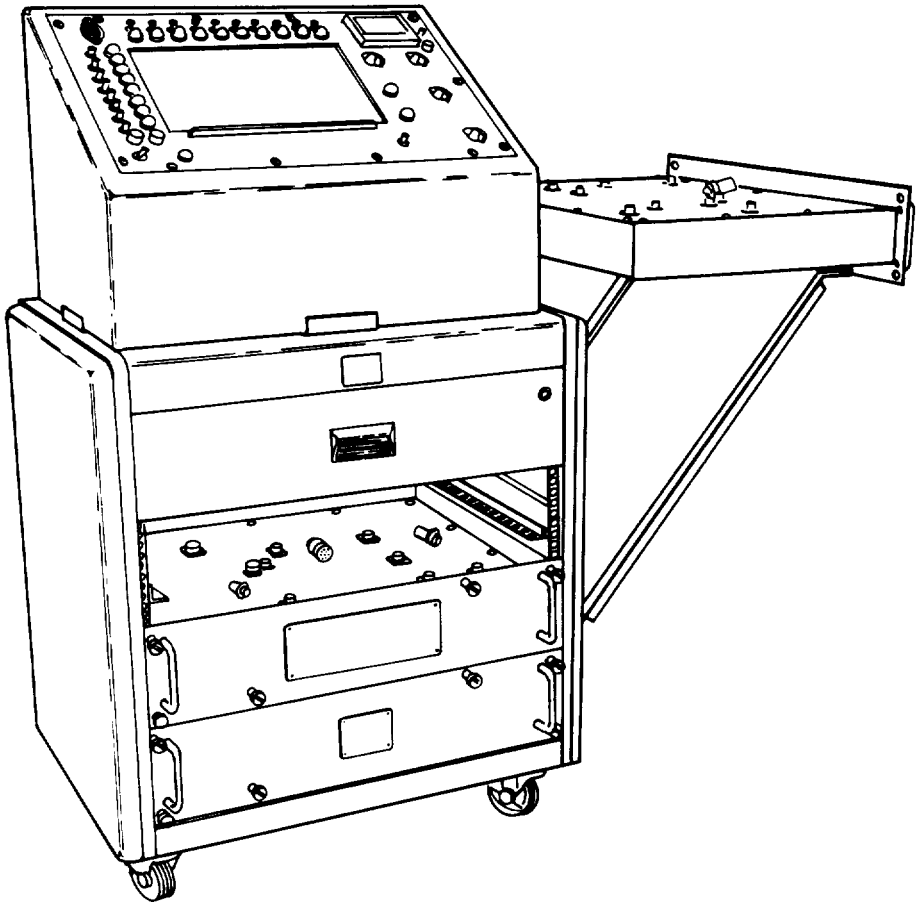
Applicable Configuration
All

Special Tools
Test Set (LTCT317)

LOCATION/ITEM	REMARKS	ACTION
TEST SET/		
1. Wiring Harness		Connect to test board of test set (LTCT317).
2. Test Board Electrical Connector		Connect to receptacle 1 of test unit.
3. Test Unit		Connect to a 110-volt ac external power supply.
4. AC Power Switch		Position to ON.
5. Test Selection Knob		Turn to LO-VOLTAGE.

7-26. Wiring Harness - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST SET/ - Continued		



6. Meter Selection Knob	NOTE The automatic sequence of testing should begin. Amber SHORT and OPEN indicator lamps should flicker and red circuit indicator lamps should flash as the analyzer moves through the test cycle. If a circuit is defective, the amber OPEN or SHORT (whichever is applicable) will remain glowing and the automatic se uence will stop. The red indicator lamp will glow, identifying the defective circuit.	
7. Wiring Harness		Reject if defective.

7-26. Wiring Harness - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST SET/ - Continued		
8. Reset Switch		Press to advance analyzer to next circuit.
9. Test Selection Knob		Turn to Hi-VOLTAGE then repeat preceding actions for items 6 and 7.
10. AC Power Switch		Position to OFF. Disconnect power source, remove harness from test board.

7-27. Wiring Harness(T53-L-11 Series Engines)- Installation

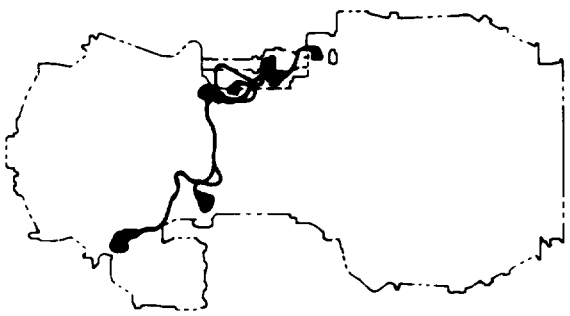
INITIAL SETUP

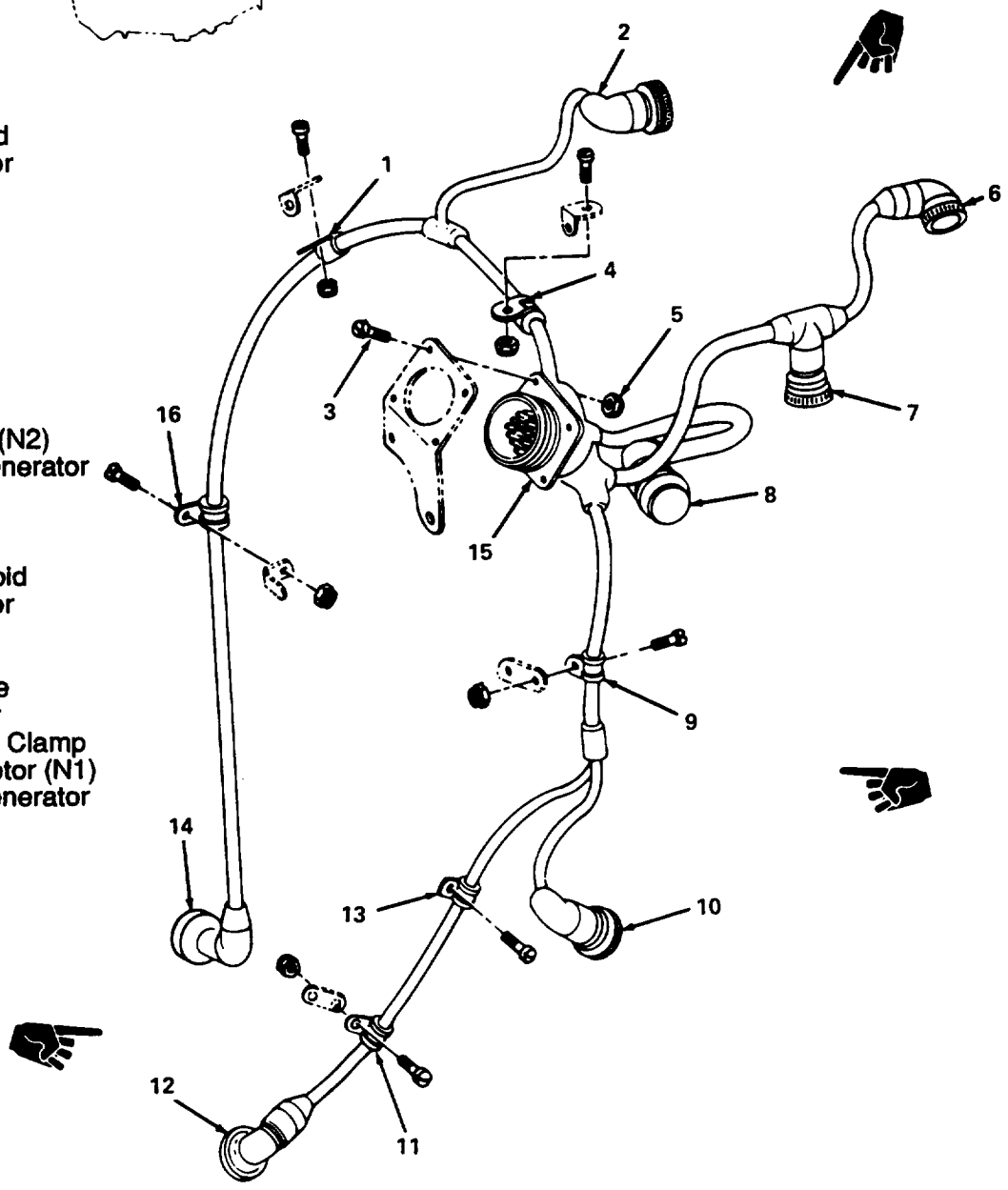
Applicable Configuration	References
T53-L-11 Series Engines	Para 5-14

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Wiring Harness		Position on engine so that connectors (6, 7,8, 10, and 12) are on the ieft side and connectors (2 and 14) are on the right side of the engine.
2. Airframe Main Connector (15)		Position and secure to engine bracket with screws (3) and nuts (5). Tighten screws.

7-27. Wiring Harness (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		





1. Wiring Harness Clamp
2. Hot-Air Solenoid Valve Connector
3. Screw
4. Wiring Harness Clamp
5. Nut
6. Ignition Unit Connector
7. Starting Fuel Solenoid Valve Connector
8. Power Turbine (N2) Tachometer Generator Connector
9. Wiring Harness Clamp
10. Transfer Solenoid Valve Connector
11. Wiring Harness Clamp
12. Oil Temperature Bulb Connector
13. Wiring Harness Clamp
14. Compressor Rotor (N1) Tachometer Generator Connector
15. Airframe Main Connector
16. Wiring Harness Clamp

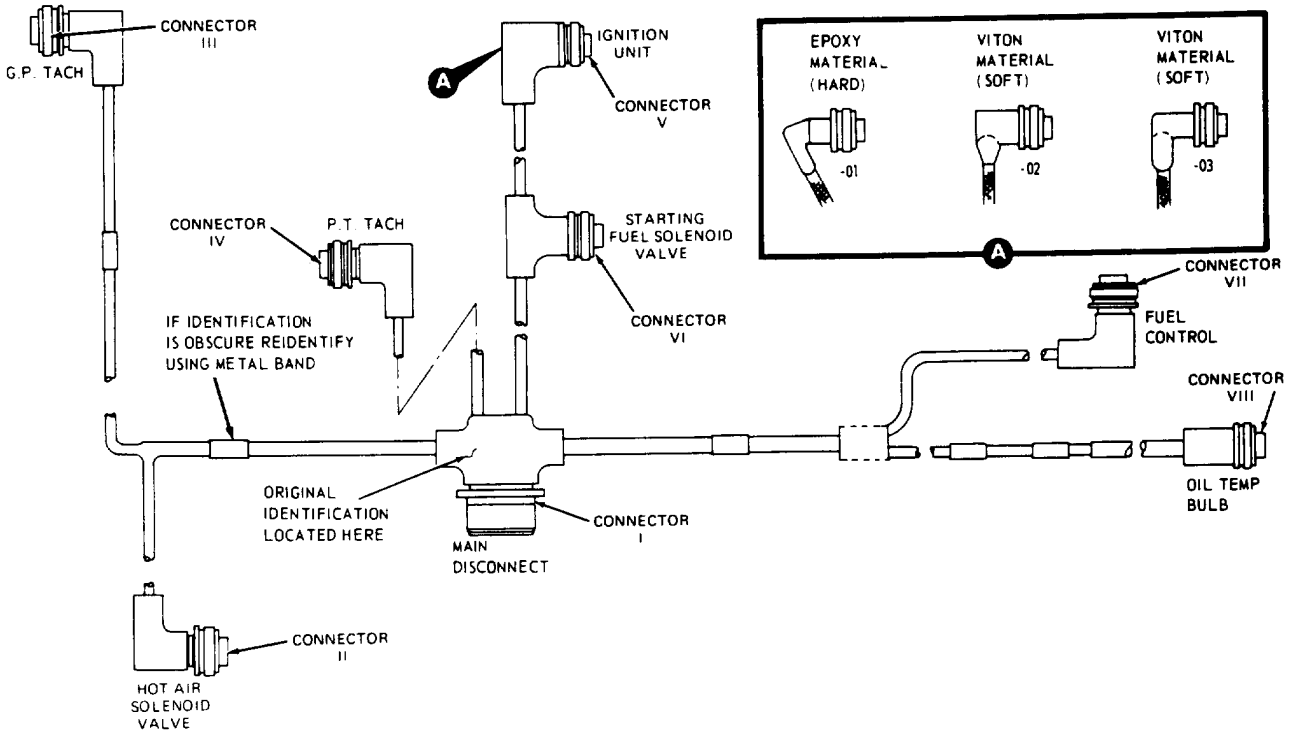
7-27. Wiring Harness (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
3. Wiring Harness	Refer to paragraph 5-14 if difficulty is encountered when installing the oil temperature bulb connector.	Use new sealing washers, where applicable, and connect wiring harness to components with each of the following connectors: a. Oil temperature bulb (12). b. Transfer solenoid valve (10). c. Power turbine (N2) tachometer generator (8). d. Starting fuel solenoid valve (7). e. ignition unit (6). f. Hot-air solenoid valve (2). g. Compressor rotor (N1) tachometer generator (14). Lockwire all connectors.
4. Wiring Harness		Position clamps (1, 4, 9, 11, 13, and 16) and secure wiring harness to engine with screws and nuts. Tighten screws and lockwire.
5. Airframe Main Connector (15)		Connect electrical plug.

7-27. Wiring Harness(T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION

ENGINE/ - Continued



LYCOMING P/N	VENDOR P/N	
1-300-242-01	BENDIX 10-166290-4	CONNECTOR I DOES NOT REQUIRE A SEALING WASHER CONNECTORS II, III, IV, AND VIII REQUIRE SEALING WASHER P/N 10-35957-101; ONE WASHER PER CONNECTOR. CONNECTORS V, VI, AND VII REQUIRE SEALING WASHER P/N 10-35957-81; ONE WASHER PER CONNECTOR. NOTE: SEALING WASHER MATERIAL IS SYNTHETIC RUBBER, AMS3209.
1-300-242-02	COOPERATIVE INDUSTRIES 59359	CONNECTOR I DOES NOT REQUIRE A SEALING WASHER CONNECTORS II, III, IV, AND VIII REQUIRE TEFLON SEALING WASHER P/N 50109; ONE WASHER PER CONNECTOR. CONNECTORS V, VI, AND VII REQUIRE TEFLON SEALING WASHER P/N 50107; ONE WASHER PER CONNECTOR.
1-300-242-03	BENDIX 10-321720-1	CONNECTOR I DOES NOT REQUIRE A SEALING WASHER. CONNECTORS II, III, IV, AND VIII REQUIRE SEALING WASHER P/N 10-229957-101; ONE WASHER PER CONNECTOR. CONNECTORS V, VI, AND VII REQUIRE SEALING WASHER P/N 10-229957-81; ONE WASHER PER CONNECTOR. NOTE: SEALING WASHER MATERIAL IS DUPONT VITON OR EQUIVALENT.

7-28. Wiring Harness(T53-L-13B/703 Engines) - Installation

INITIAL SETUP

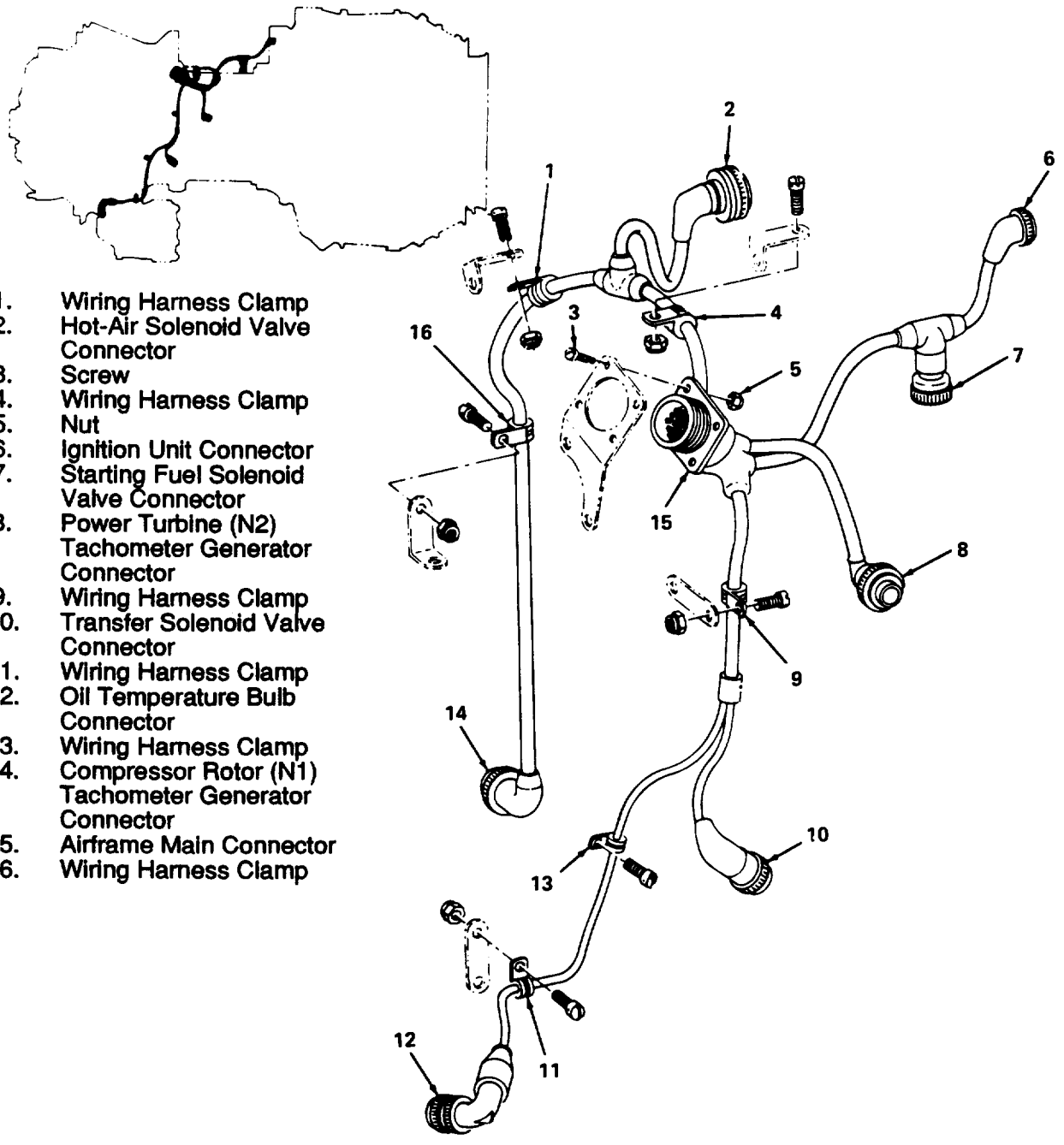
Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Wiring Harness		Position on engine so that connectors (6, 7, 8, 10, and 12) are on the left side and connectors (2 and 14) are on the right side of the engine.
2. Airframe Main Connector (15)		Position and secure to engine bracket with screws (3) and nuts (5). Tighten screws.
3. Wiring Harness		Use new sealing washer, where applicable, and connect wiring harness to components with each of the following connectors: a. oil temperature bulb (12). b. transfer solenoid valve (10). c. power turbine (N2) tachometer generator (8). d. starting fuel solenoid valve (7). e. ignition unit (6). f. hot-air solenoid valve (2). g. compressor rotor (N1) tachometer generator (14). Lockwire all connectors.

7-28. Wiring Harness (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION

ENGINE/ - Continued



1. Wiring Harness Clamp
2. Hot-Air Solenoid Valve Connector
3. Screw
4. Wiring Harness Clamp
5. Nut
6. Ignition Unit Connector
7. Starting Fuel Solenoid Valve Connector
8. Power Turbine (N2) Tachometer Generator Connector
9. Wiring Harness Clamp
10. Transfer Solenoid Valve Connector
11. Wiring Harness Clamp
12. Oil Temperature Bulb Connector
13. Wiring Harness Clamp
14. Compressor Rotor (N1) Tachometer Generator Connector
15. Airframe Main Connector
16. Wiring Harness Clamp

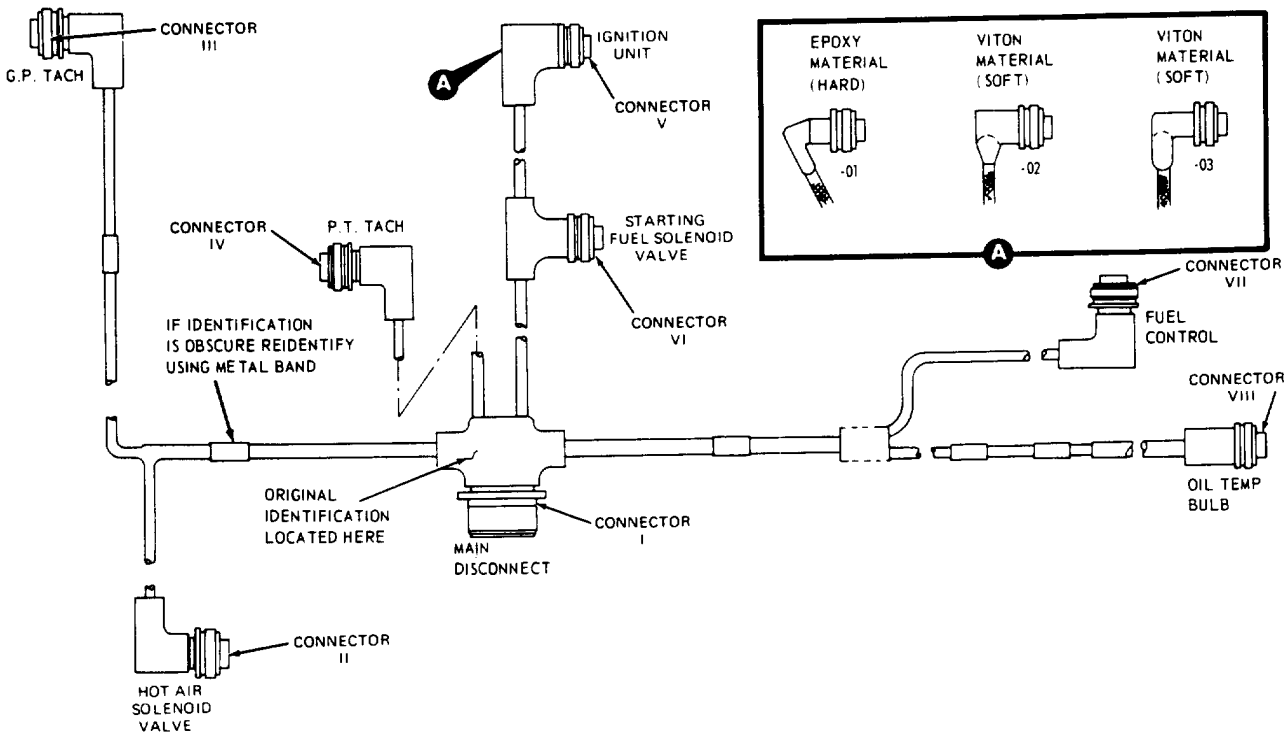
7-28. Wiring Harness (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
4. Wiring Harness		Position clamps (1, 4, 9,11, 13, and 16) and secure wiring harness to engine with screws and nuts. Tighten screws and lockwire.
5. Airframe Main Connector (15)		Connect electrical plug.

7-28. Wiring Harness (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION

ENGINE/ - Continued



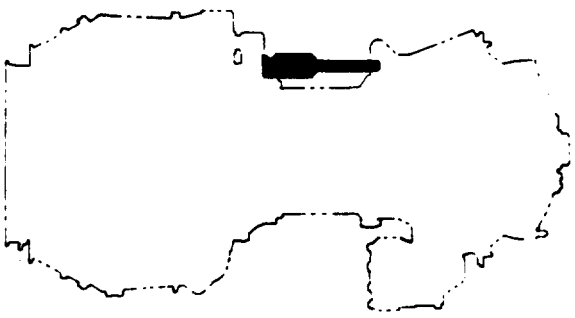
LYCOMING P/N	VENDOR P/N	
1-300-242-01	BENDIX 10-166280-4	CONNECTOR I DOES NOT REQUIRE A SEALING WASHER CONNECTORS II, III, IV, AND VIII REQUIRE SEALING WASHER P/N 10-35957-101; ONE WASHER PER CONNECTOR. CONNECTORS V, VI, AND VII REQUIRE SEALING WASHER P/N 10-35957-81; ONE WASHER PER CONNECTOR. NOTE: SEALING WASHER MATERIAL IS SYNTHETIC RUBBER, AMS3209.
1-300-242-02	COOPERATIVE INDUSTRIES 59359	CONNECTOR I DOES NOT REQUIRE A SEALING WASHER CONNECTORS II, III, IV, AND VIII REQUIRE TEFLON SEALING WASHER P/N 50109; ONE WASHER PER CONNECTOR. CONNECTORS V, VI, AND VII REQUIRE TEFLON SEALING WASHER P/N 50107; ONE WASHER PER CONNECTOR.
1-300-242-03	BENDIX 10-321720-1	CONNECTOR I DOES NOT REQUIRE A SEALING WASHER. CONNECTORS II, III, IV, AND VIII REQUIRE SEALING WASHER P/N 10-229957-101; ONE WASHER PER CONNECTOR. CONNECTORS V, VI, AND VII REQUIRE SEALING WASHER P/N 10-229957-81; ONE WASHER PER CONNECTOR. NOTE: SEALING WASHER MATERIAL IS DUPONT VITON OR EQUIVALENT.

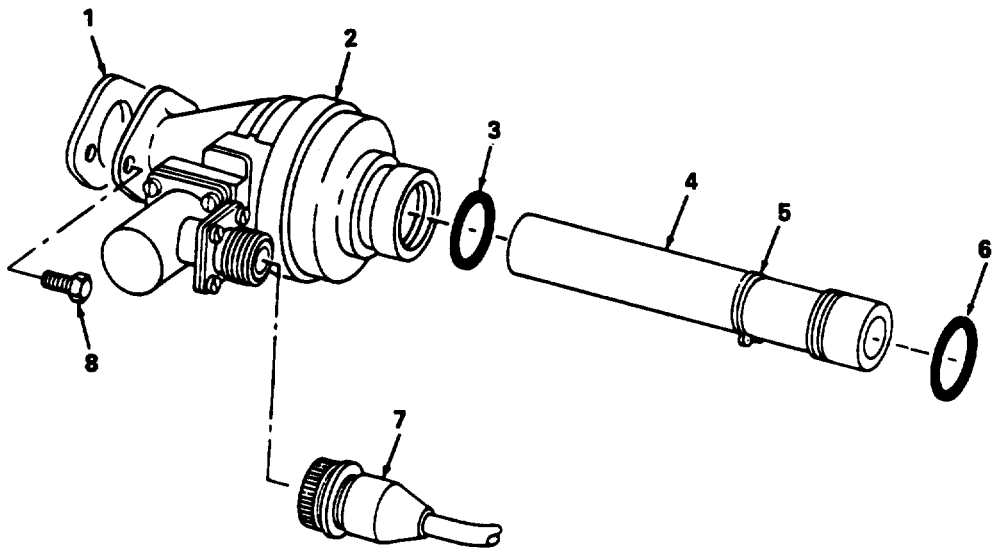
7-29. Hot-Air Solenoid Valve and Air Regulator Tuba - Removal

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR AND IMPELLER HOUSING/		
	WARNING **Make certain that all electrical power is disconnected.**	
1. Connector (7)		**Disconnect from hot-air solenoid valve connector.**





7-29. Hot-Air Solenoid Valve and Air Regulator Tube - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR AND IMPELLER HOUSING/ - Continued		
2. Retaining Ring(5)		**Expand** at forward end of anti-icing air regulator tube (4). **Slide** ring toward rear of tube.
3. Anti-icing Regulator Tube		**Remove** from hot-air solenoid valve (2) by **twisting** and **sliding** it toward front of engine.
4. Bolts (8)		**Remove** bolts (8) that secure flange of hot-air solenoid valve to impeller housing.
5. Hot-Air Solenoid Valve (2) and Gasket (1)		**Remove,**
6. Anti-Icing Air Regulator Tube (4)		**Remove** from inlet housing and **remove** retaining ring (5) from tube.
7. Packings (3 and 6)		**Remove** from hot-air solenoid valve housing and inlet housing.

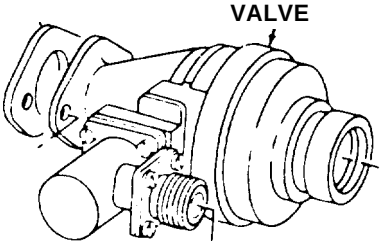
7-30. Hot-Air Solenoid Valve and Air Regulator Tube - Inspection

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Crocus cloth (item 21, Appendix D)
Drycleaning Solvent (item 24, Appendix D)

References
Para 7-29 and H-29

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR AND IMPELLER HOUSING/	**HOT AIR SOLENOID VALVE**  **NOTE** See figure in paragraph 7-29.	
1. Hot-Air Solenoid Valve		**Inspect** electrical connector for corrosion.
	WARNING **Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).**	
2. Electrical Connector	Use crocus cloth (item 21, Appendix D). Use drycleaning solvent (item 24, Appendix D).	**Remove** corrosion with crocus cloth and drycleaning solvent. **Do not submerge** valve in cleaning solvent.
3. Electrical Connector		**Inspect** for damaged threads.
4. Electrical Connector	Refer to paragraph H-29 for repair requirements.	**Repair** minor thread damage.
5. Hot-Air Solenoid Valve		**Replace** if threads cannot be repaired.

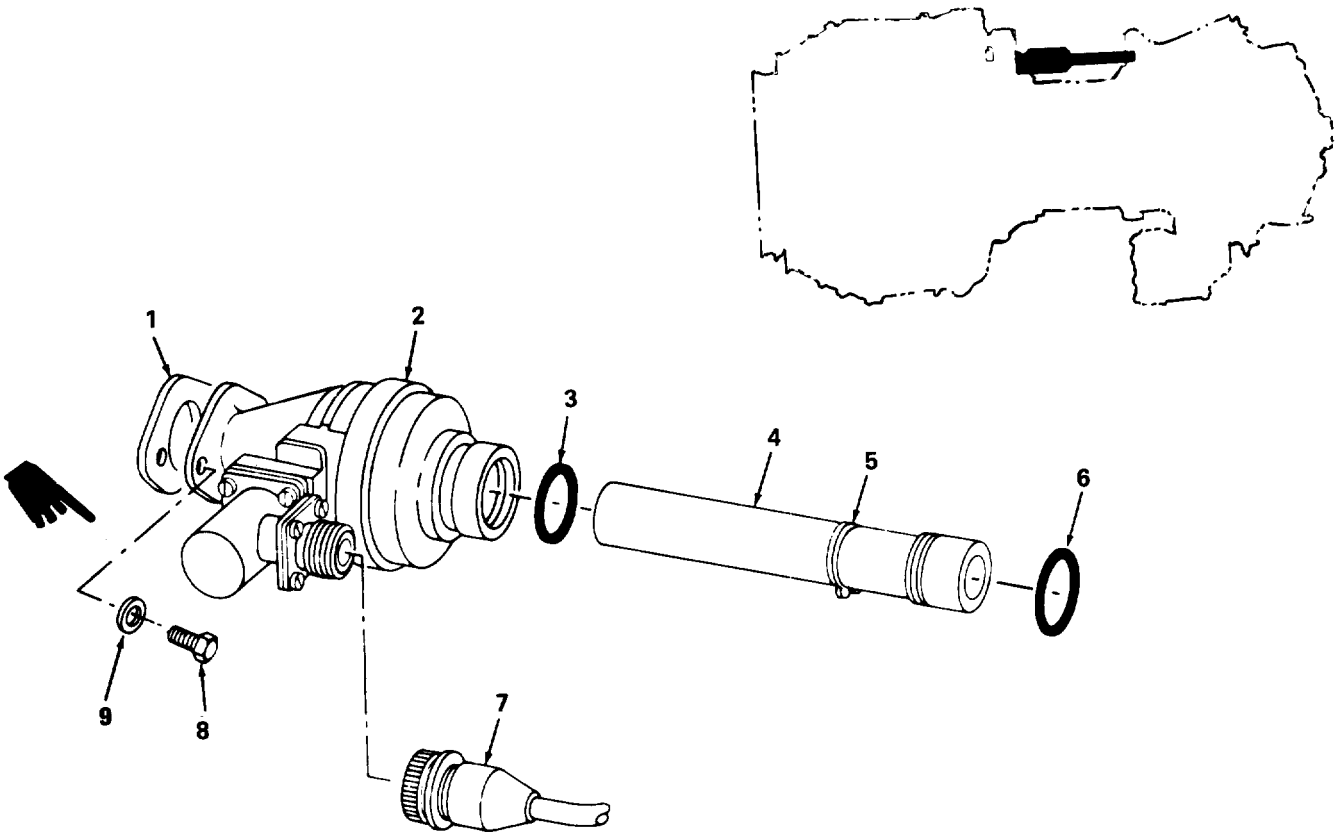
7-31. HOT-AIR SOLENOID VALVE AND AIR-REGULATOR TUBE – INSTALLATION

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Pneumatic system Grease
MIL-G-4343 (item 68, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR AND IMPELLER HOUSING ASSEMBLY/		



1. Retaining Ring (5)		Slide retaining ring (5) onto anti-icing air regulator tube (4) to about midpoint of tube.
2. Packing (6)	Use Pneumatic system Grease (item 68, Appendix D)	Place packing (6) in the recessed area within inlet housing.
3. Packing (3)	Use Pneumatic system Grease (item 68, Appendix D)	Place packing (3) in recessed area of hot-air solenoid valve.

7-31. HOT-AIR SOLENOID VALVE AND AIR REGULATOR TUBE – INSTALLATION – **Cont.**

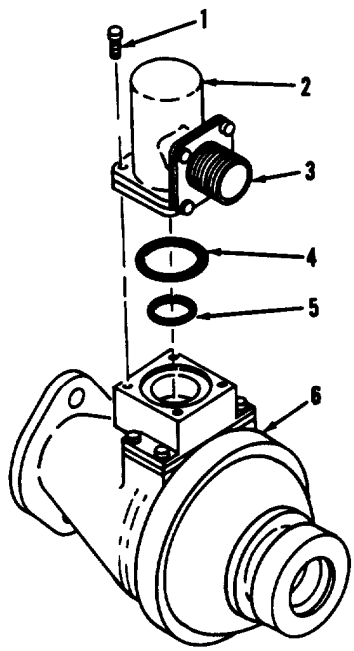
LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR AND IMPELLER HOUSING ASSEMBLY/ Continued		
4. Anti-Icing Air Regulator Tube		**Insert** anti-icing air regulator tube in inlet housing and, using revolving motion, **push** tube forward to engine inlet housing.
5. Anti-Icing Valve (2) Gasket (1)		Place in position on impeller housing.
6. Bolts (8)		Insert bolts (8) and washers (9) through holes in flange of hot-air solenoid valve and screw into mating surface on impeller housing of engine.
7. Air Regulator Tube		**Slide** air regulator tube rearward into hot-air solenoid valve and **install** retaining ring (5) in groove of large end of tube.
8. Connector (7)		**Connect** connector (7) and **lockwire.**
9. Bolts (8)		**Tighten** and **lockwire** bolts (8).

7-32. Hot-Air Solenold Valve - Disassembly

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR AND IMPELLER HOUSING/	NOTE Disassembly of the hot-air solenoid valve is limited to the removal and replacement of the solenoid valve.	
1. Body Assembly (6)		Remove screws (1) securing hot-air solenoid valve (2) to body assembly (6).
2. Hot-Air Solenoid Valve (2)		Remove.
3. Packings (4 and 5)		Remove.

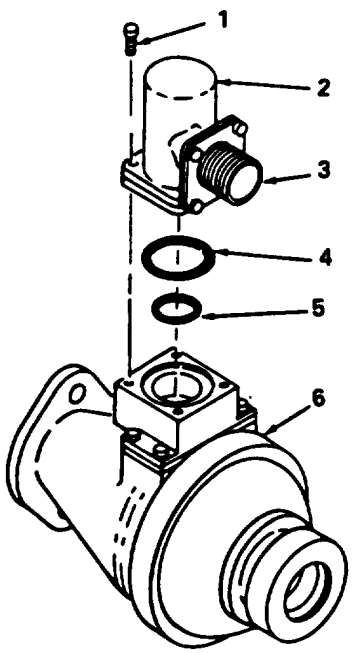


7-33. Hot-Air Solenoid Valve - Assembly

INITIAL SETUP

Applicable Configuration	References
All	TM 55-2840-214-40 TM 55-2840-223-40

LOCATION/ITEM	REMARKS	ACTION
COMPRESSOR AND IMPELLER HOUSING/		
1. Packings (4 and 5)		**Install** new packings (4 and 5).
2. Hot-Air Solenoid Valve Assembly (2)		**Position** on body assembly (6), secure with screws (1). **Lockwire** screws.



3. Electrical Connector (3)	For further reassembly, refer to TM 55-2840-214-40 or TM 55-2840-223-40.	**Install.**

7-34. **DELETED** **All data on pages 7-77 and 7-78 deleted.**

7-35. **IGNITION UNIT (T53-L-11 Series Engines) – REMOVAL**

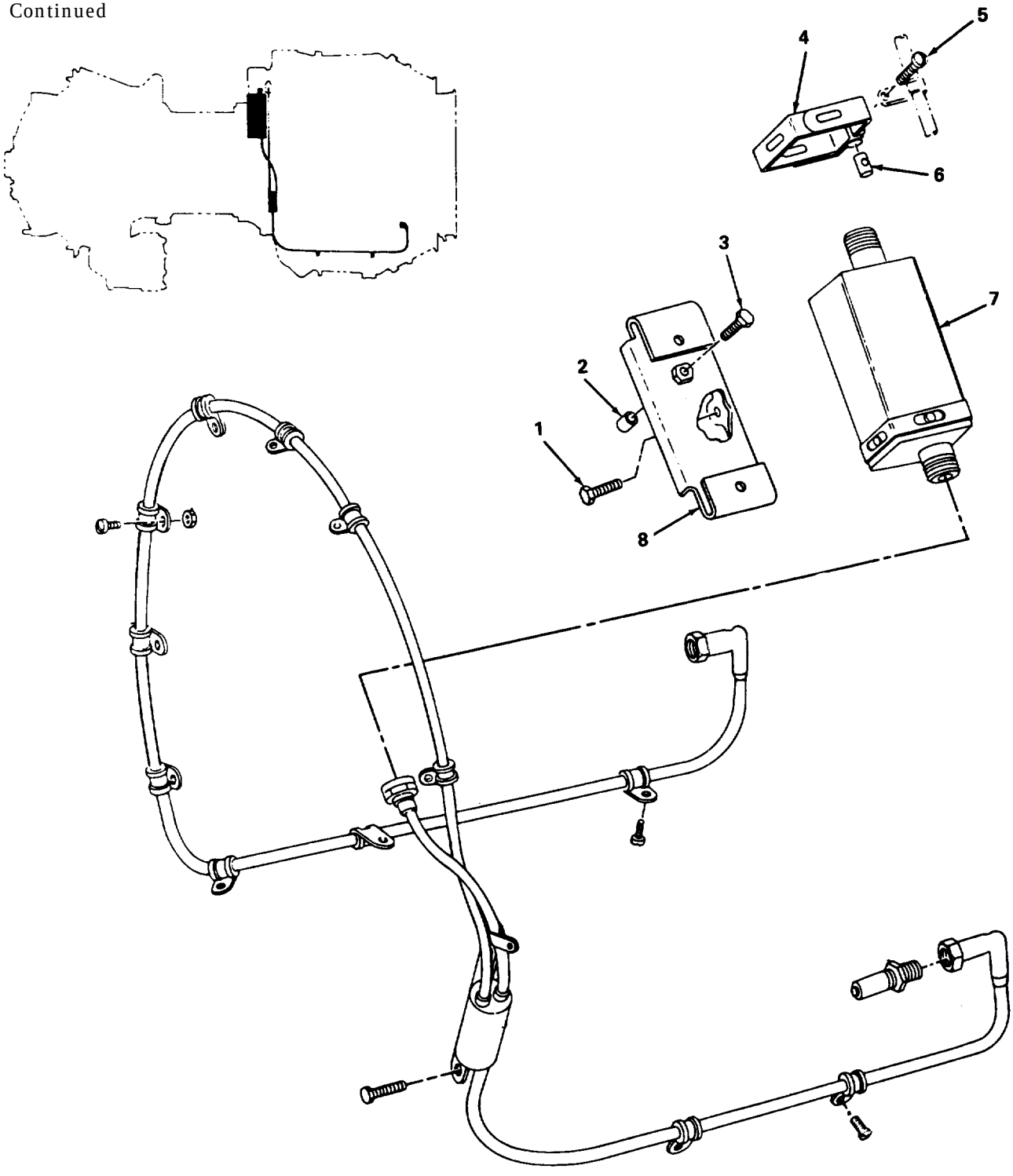
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engine

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/		
	WARNING The ignition unit contains a very small amount of radioactive material (Cesium-Barium 137) and normally requires no handling precautions. However, severely damaged units that have been broken open, must be handled with forceps or lead gloves and disposed of in accordance with AR755-15, and TB55-1500-314-25. Make certain that all electrical power is disconnected.	
1. Lead and Coil Assembly		**Disconnect** electrical connectors and lead and coil assembly from ignition unit (7).

7-35. Ignition Unit (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/- Continued		



7-35. Ignition Unit(T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/ - Continued		
2. Clamps (4)	This action releases ignition unit for removal.	**Remove** screws (5) and nuts (6) that secure ends of loop clamps (4). **Spread** loop clamps until slots in the clamps clear the positioning lugs on both sides of the ignition unit ends. **Slide** clamps toward each other.
3. Bracket (8)		If bracket (8) must be removed, **remove** three bolts (1) and bolt (3); then **remove** bracket and spacer.

7-36. Ignition Unit (T53-L-13B/703 Engines) - Removal

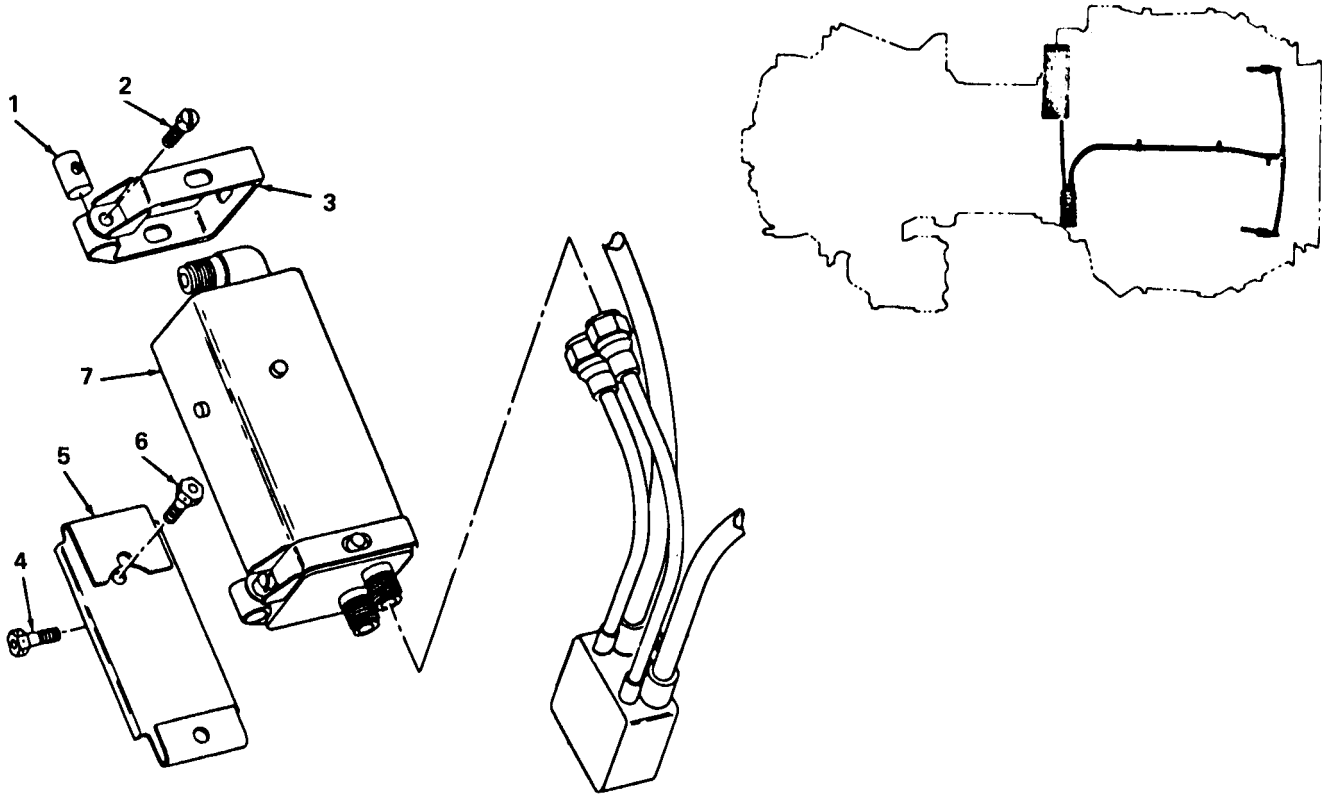
INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/ -	**WARNING** **Make certain that all electrical power is disconnected.**	

7-36. Ignition Unit (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/ -Continued		



1. Ignition Unit (7)		**Disconnect** electrical connectors.
2. Loop Clamps (3)	This action will release ignition unit for removal.	**Remove** screws (2) and nuts (1) that secure ends of loop champs (3). **Spread** loop clamps until slots in clamps clear positioning lugs on both sides of ignition unit. **Slide** clamps toward each other.
3. Bracket (5)		If bracket (5) must be removed, **remove** three bolts (4) and bolt (6). **Remove** bracket from compressor housing assembly.

7-37. Ignition Unit - Inspection

INITIAL SETUP

Applicable Configuration
All

References
Para H-29 and 7-35

Consumable Materials
Crocus cloth (item 21, Appendix D)
Drycleaning solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/	**WARNING** **The ignition unit contains a very small amount of radioactive material (Cesium-Barium 137) and normally requires no handling precautions. However, severely damaged units that have been broken open must be handled with forceps or lead gloves and disposed of in accordance with AR755-15, and TB55-1500-314-25.**	
1. Connector	**Remove** corrosion with crocus cloth (item 21, Appendix D) and drycleaning solvent (item 24, Appendix D).	**Inspect** for corrosion.
2. Connector	**Repair** minor thread damage as outlined in paragraph H-29. **Replace** ignition unit if threads cannot be repaired.	**Inspect** for damaged threads.
3. Connector	**Replace** ignition unit if insulation is cracked or pins are bent or broken.	**Inspect** for cracked insulator and bent or broken pins.
4. Mounting Bracket	**Replace** bracket if defective. Refer to paragraph 7-35 for location of parts.	**Inspect.**

7-38. Ignition Unit - Functional Test (AVIM)

IGNITION SETUP

Applicable Configuration
All

Special Tools
Test Stand - LTCT315

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/		
1. Cable Assembly (LTCT9272, detail LTCT315)		**Connect** to CONN 1 (Panel 1) of test stand (LTCT315)
2. Adapter (LTCT9268 detail of LTCT315)	The inlet terminal of the ignition unit is identified by the absence of the thick insultion.	**Connect** between cable assembly and inlet receptacle of ignition unit.
3. Outlet Receptacles of Ignition Unit	Use adapters P/N 11-6532.	**Connect** two adapters,.
4. Test Leads (LTCT 9277, detail of LTCT 315)		**Connect** between adapters (previously installed in action of item 3) and CONN 3 and CONN 4 receptacles (Panel 5).
5. Ground Lead		**Connect** from GROUND JACK on test stand to case of ignition unit.
6. Power Switch		**Turn** to ON.
7. Voltage Select Switch		**Turn** to DC VOLTS.
8. Meter Sel Switch		**Turn** to 5 ADC. **Observe** red indicator lamps to **insure** they light.
9. Power Output Switch		**Press** DC bottom. **Turn** POWER OUTPUT switch to ON.
10. Power Switch		**Position** power switch on counter panel to ON. **Turn** counter dial to Xl. **Turn** on external power supply.
11. Test Selector Knob		**Turn** to 2KV.
12. Polarity Selector		**Turn** to A.
13. Output Range Switch		**Turn** to A.

7-38. Ignition Unit - Functional Test (AVIM) - Continued

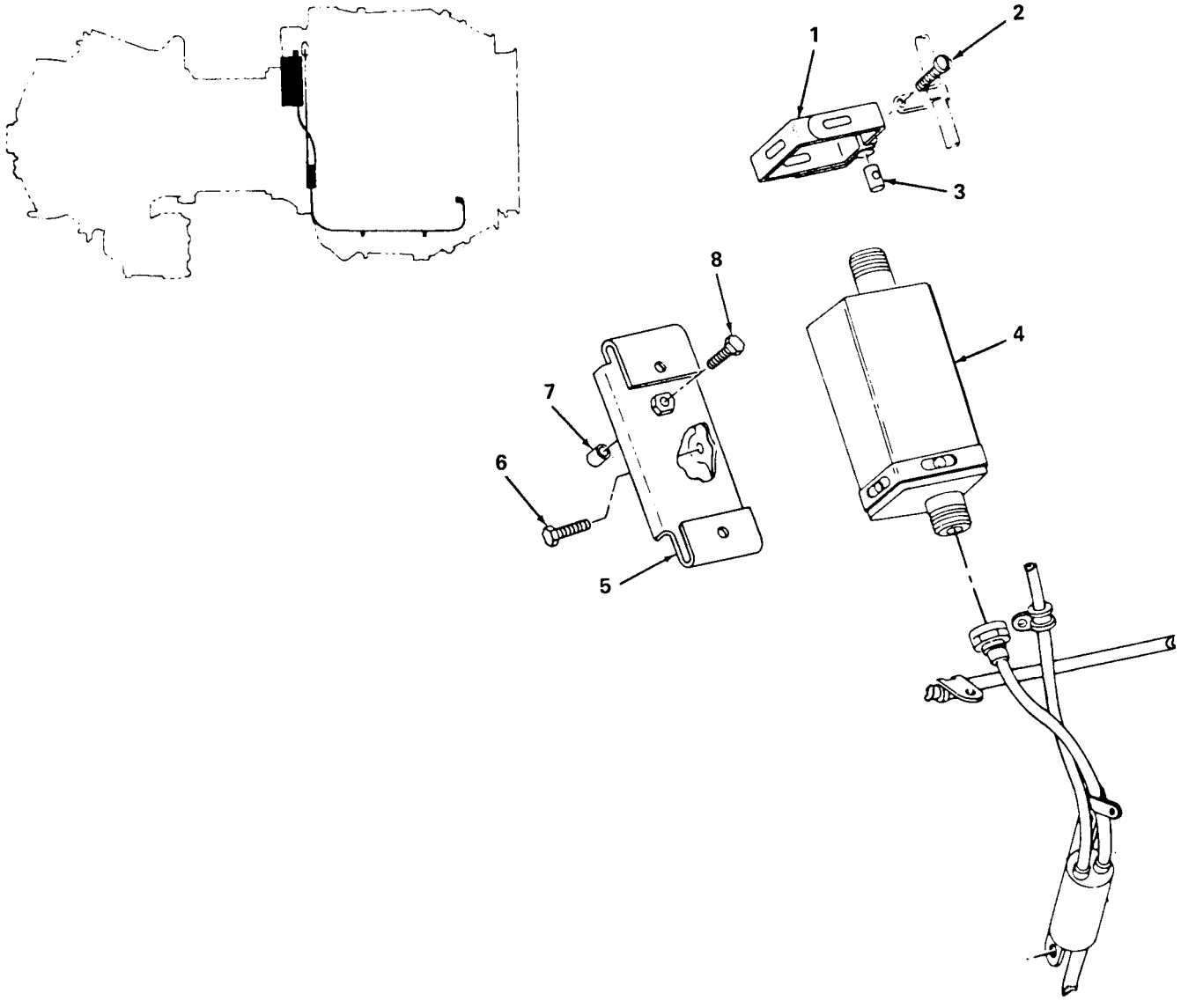
LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
14. Compensator	T53-L-11 series engines only. This action applies to testing ignition unit 1-300-245-01 (Scintilla, 10-353700-1).	**Turn** to 350.
15. Compensator	T53-L-11 series engines only. This action applies to testing ignition unit 1-300-245-02 (GLA4054).	**Turn** to 310.
16. Output Selector to Low Tension		**Turn,**
17. Power Stat	Spark rate shall be 1.5 sparks per second minimum.	**Bring** voltage up to 14 as indicated on gage M-7. **Check** sparks per second on gage M-1. **Turn** OUTPUT SELECTOR to OUTPUT 1. **Read** output voltage on gage M-10.
	NOTE Output voltage shall not be less than 2000 volts (T53-L-11 series engines) or 2400 volts (T53-L-13B/703 engines) minimum at 14 to 29 volts.	
18. Output Selector		**Turn** to OUTPUT 1. **Turn** DISCHARGE CALIBRATE switch to DISCHARGE position.
19. Ignition Unit	Spark rate shall be 2.8 (T53-L-11 series engines) or 2.5 (T53-L-13B/703 engines) per second minimum.	**Allow** to cool approximately one minute. **Bring** unit up to 24 vdc. **Check** for sparks per second on gage M-1.
20. Ignition Unit	When testing ignition unit 1-300-245-01 (Scintilla 10-353700-1) or 1-300-363-01 (Scintilla 10-371440-1), observe that spark emission is regular and that no skips are apparent. When testing ignition unit 1-300-245-02 (GLA4054) or 1-300-363-02 (GLA42416), irregularities are not reason enough for rejection.	**Check** for spark emission. **Operate** ignition unit at each specified voltage input for approximately one minute.
21. Ignition Unit		**Replace** if specific requirements cannot be met.

7-39. Ignition Unit (T53-L-11 Series Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/		



7-39. Ignition Unit (T53-L-11 Series Engine - Installation - Continual

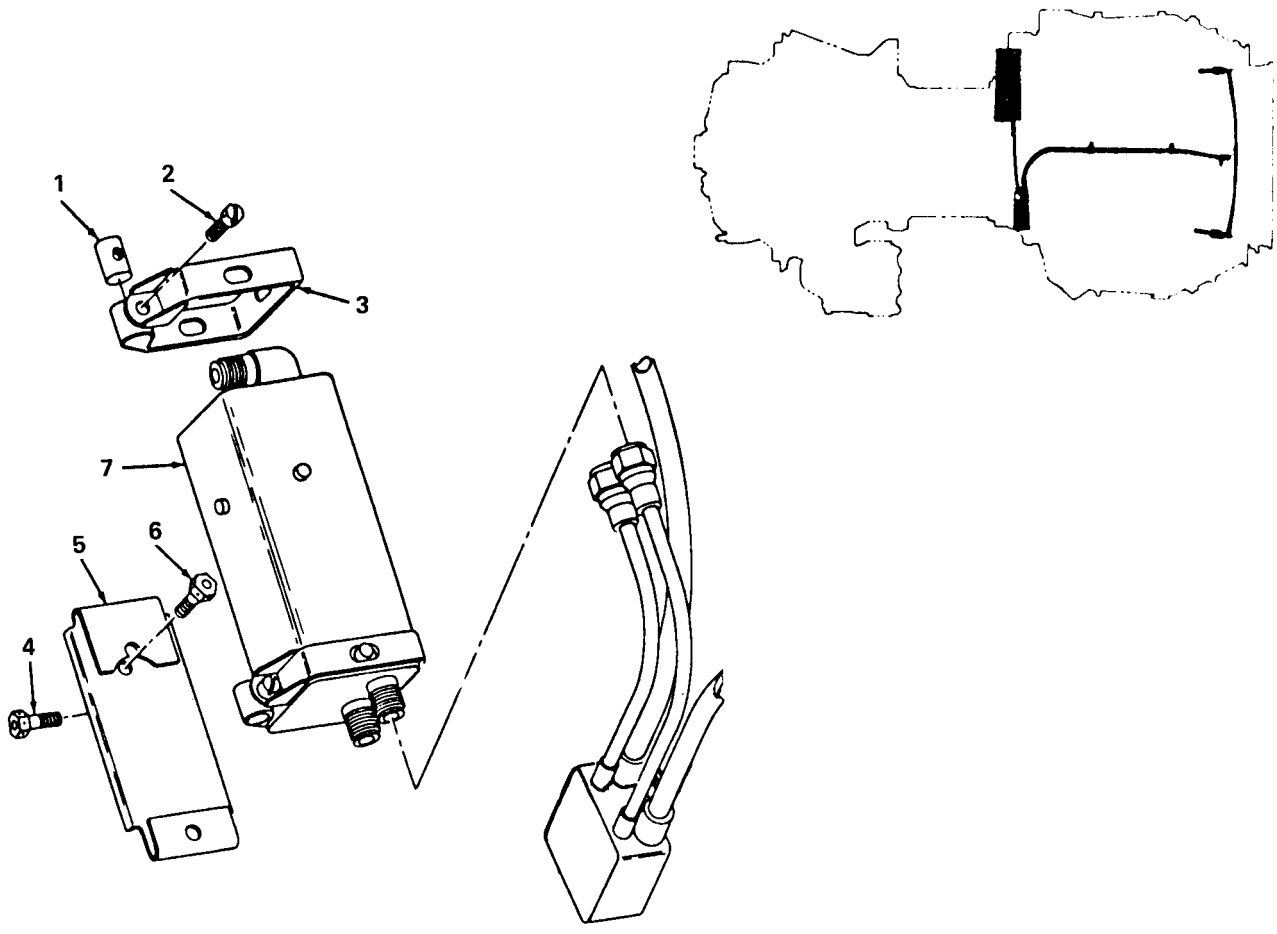
LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/ - Continued		
1. Bracket (5)		**Position** bracket (5) against impeller housing and **secure with** three bolts (6). **Lockwire** bolts.
2. spacer (7)		**Position** spacer (7) under bracket and **secure** spacer and bracket with bolt (8). **Lockwire** bolt.
3. Ignition Unit (4)		**Place** ignition unit (4) on bracket. **Position** loop clamps (1) around unit so that lugs on unit fit into slots on loop clamps. **Position** clamps on ignition lead under upper screw and **secure** loop clamp ends with screws (2) and nuts (3). **Lockwire** screws.
4. Electrical Connector		**Connect** electrical connector. **Lockwire** connector.
5. Lead and Coil Assembly		**Connect** lead and coil assembly.

7-40. Ignition Unit (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/		
1. Bracket (5)		**Position** bracket (5) on compressor housing and **secure** with three bolts (4) and bolt (6).



7-40. Ignition Unit (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
IMPELLER HOUSING REAR FLANGE/ - Continued		
2. Ignition Unit (7)		**Place** ignition unit (7) on bracket. **Position** loop clamps (3) around unit so that lugs on unit fit into slots in loop clamps. **Secure** loop clamps with screws (2) and nuts (1). **Tighten** screws as required and **lockwire.**
3. Electrical Connectors		**Connect** all electrical connectors to ignition unit. **Tighten** connectors and **lockwire.**

7-41. Igniter Plugs (T53-L-11 Series Engines) - Removal

INITIAL SETUP

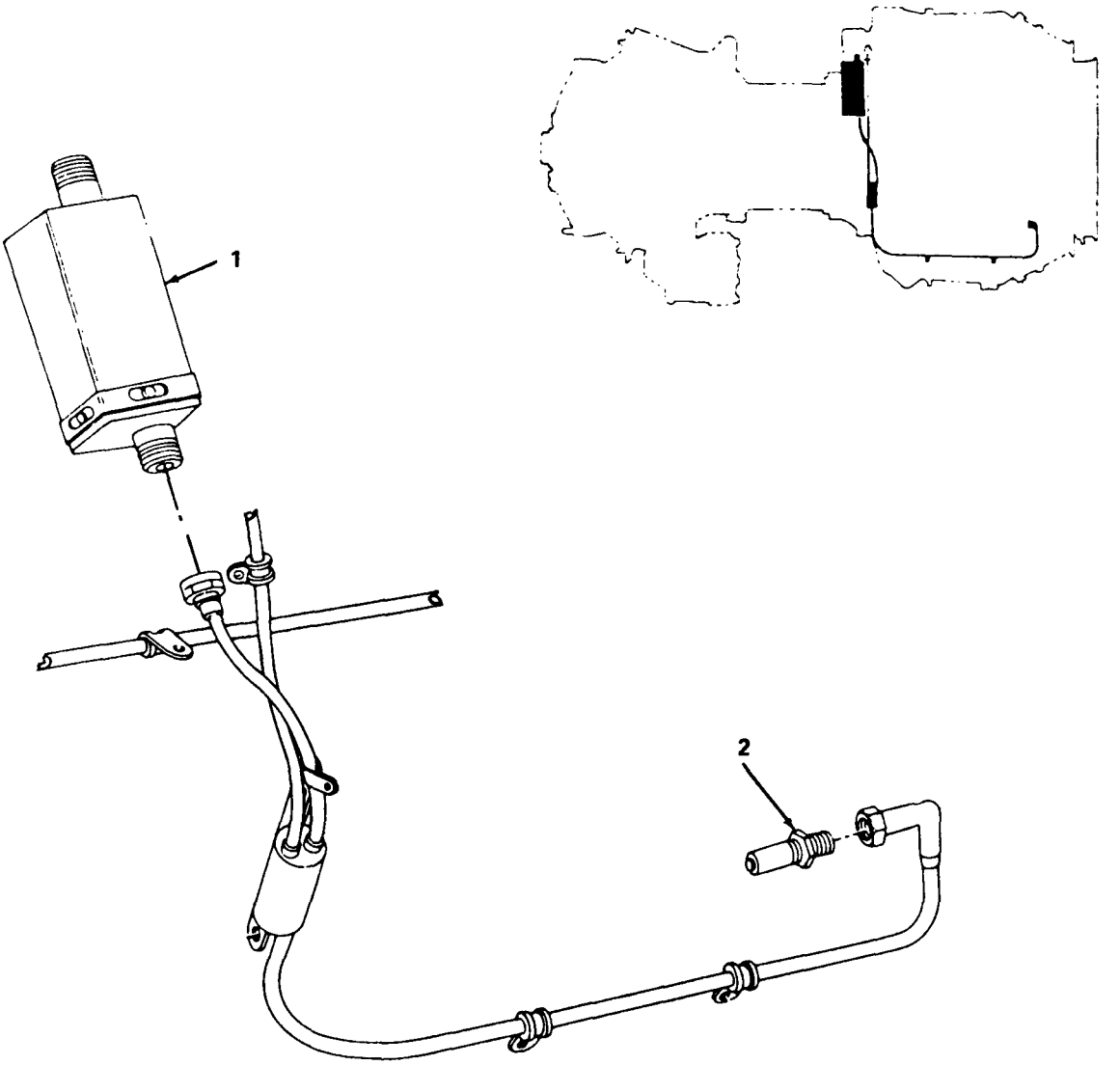
Applicable Configuration
T53-L-11 Series Engines

Special Tools
LTCT4457 - Socket Adapter

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/		

7-41. Igniter Plugs (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/ Continued		



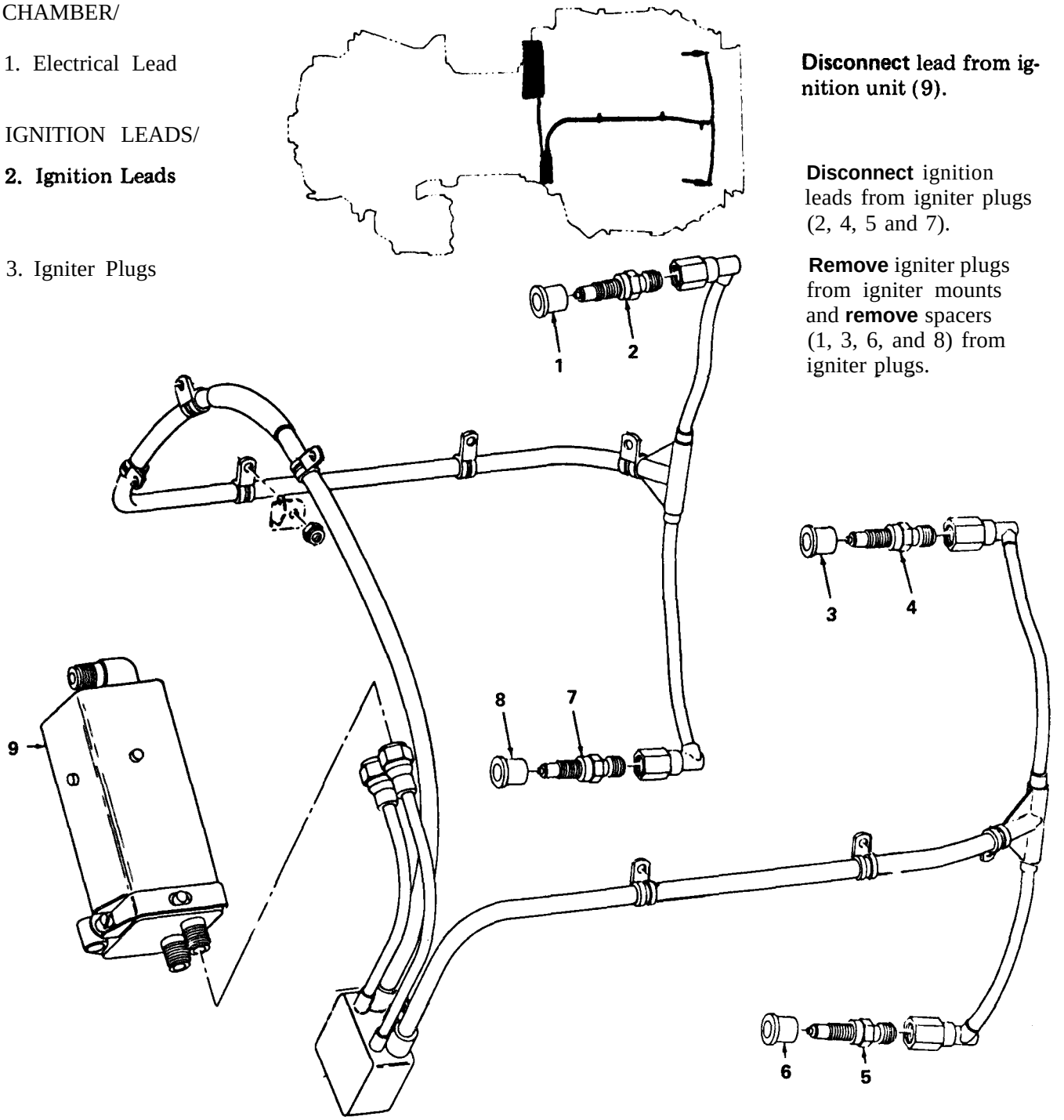
1. Electrical Lead		**Disconnect** electrical lead from ignition unit (1).
2. Ignition Leads	Use socket adapter (LTCT4457).	**Disconnect** ignition leads from igniter plugs (2).
3. Igniter Plugs (2)		**Remove** from combustion chamber.

7-42. Igniter Plugs (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/		
1. Electrical Lead		**Disconnect** lead from ignition unit (9).
IGNITION LEADS/		
2. Ignition Leads		**Disconnect** ignition leads from igniter plugs (2, 4, 5 and 7).
3. Igniter Plugs		**Remove** igniter plugs from igniter mounts and **remove** spacers (1, 3, 6, and 8) from igniter plugs.



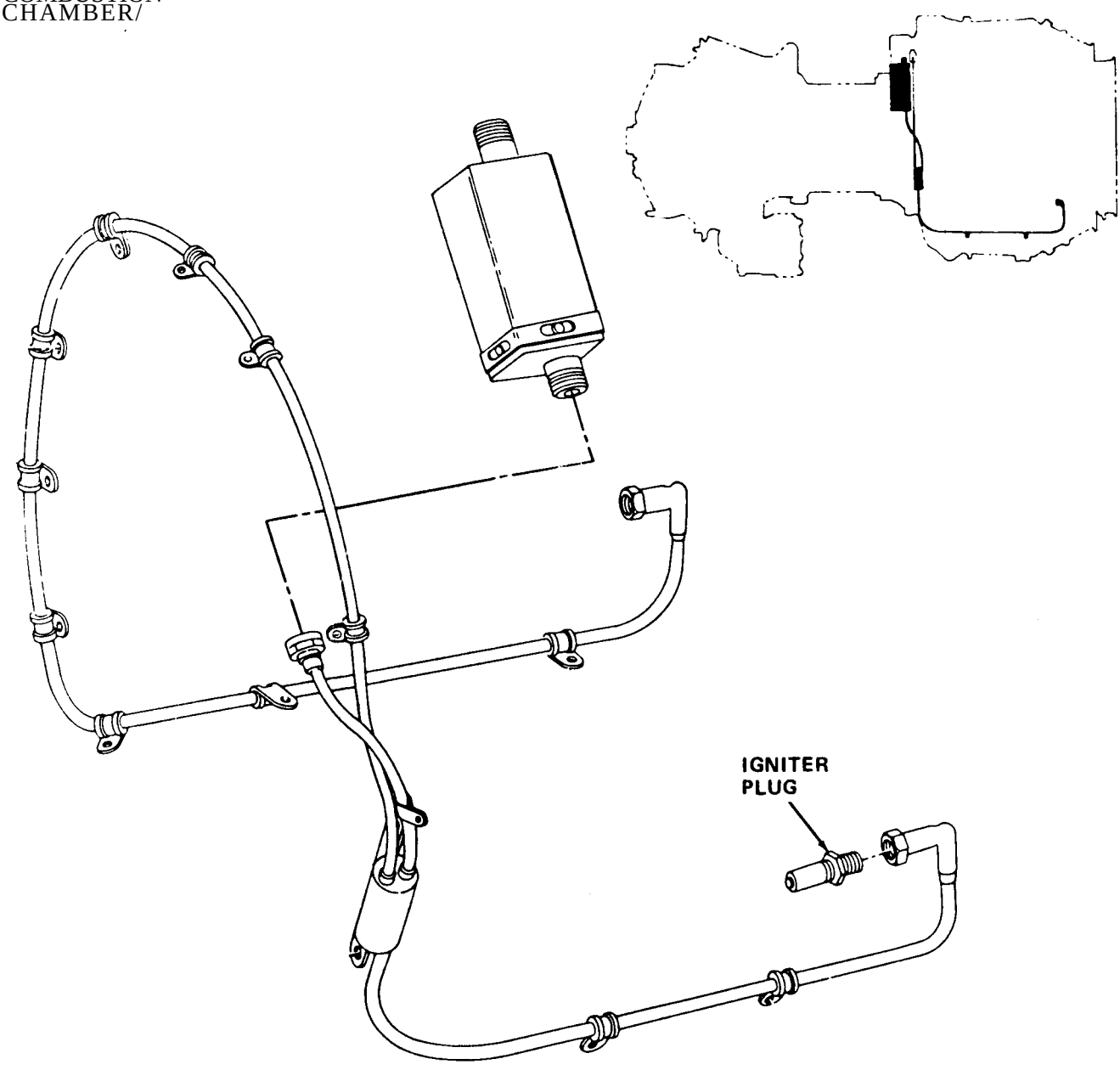
7-43. Igniter Plugs (T53-L-11 Series Engines) - Cleaning

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Magnus 61C (item 50, Appendix D)
Magnus 751 (item 51, Appendix D)
Oakite Rust Skipper (item 61, Appendix D)
Drycleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/		



7-43. Igniter Plugs (T53-L-11 Series Engines) - Cleaning - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/ - Continued		
1. Igniter Plugs		**Place** in a perforated or wire mesh corrosion-resistant steel container.
	WARNING **Provide adequate ventilation around bath. Wear rubber gloves to protect hands from chemicals as skin will be harmed by prolonged contact. If inhaled deeply, the solution may be injurious to the lungs.**	
	NOTE Do not permit copper, bronze, brass, or aluminum objects to contact solution. Do not apply heat to this solution as mixture will result in a solution temperature of approximately 180°F (82°C) when first mixed. Use solution only once.	
2. Igniter Plugs		**Immerse** parts in a solution containing, by volume, four parts Magnus 61C, (item 50, Appendix D), one part Magnus 751 (item 51, Appendix D), four parts Oakite Rust Stripper (item 61, Appendix D), and 14 parts water for 30 to 60 minutes.
3. Igniter Plugs		**Remove** parts from solution and **spray-rinse** with clean, cool water.
4. Igniter Plugs		**Rinse** all parts with dry-cleaning solvent (item 24, Appendix D), and **dry** with compressed air.

7-44. Igniter Plugs - inspection

INITIAL SETUP

Applicable Configuration
All

References
Para 7-41, 7-42, and 7-43

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/		
	NOTE See figures in paragraphs 7-41 and 7-42.	
1. Igniter Plug		Visually **inspect** ceramic surface.
2. Igniter Plug		**Replace if** surface is granular or chipped. **Replace** if other defects are evident.
3. Shank		**Inspect** for fretting conditions,
4. Igniter Plug		**Replace** if fretting is evident.
5. Igniter Plugs		If dirty and carbonized, **refer** to paragraph 7-43.

7-45. Igniter Plugs (T53-L-11 Series Engines) - Inspection

INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

References
Para 7-41

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/		
	NOTE See figure in paragraph 7-41.	
1. Igniter Plugs		**Inspect** for crossed or stripped threads.

7-45. Igniter Plugs (T53-L-11 Series Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/ Continued		
2. Igniter Plugs		**Replace** if defective,
3. Igniter Plugs		Visually **inspect** gap surface material.
4. Igniter Plugs		**Replace** if surface is granular or chipped. **Replace** if other damage is evident.
5. Shank		**Inspect** for fretting condition.
6. Igniter Plug		**Replace** if fretting is evident.

7-46. Igniter Plugs (T53-L-13B/703 Engines) - Inspection

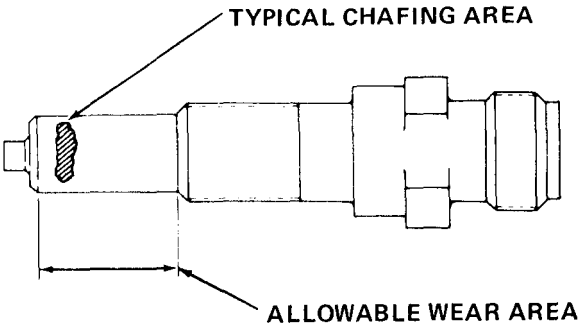
INITIAL SETUP

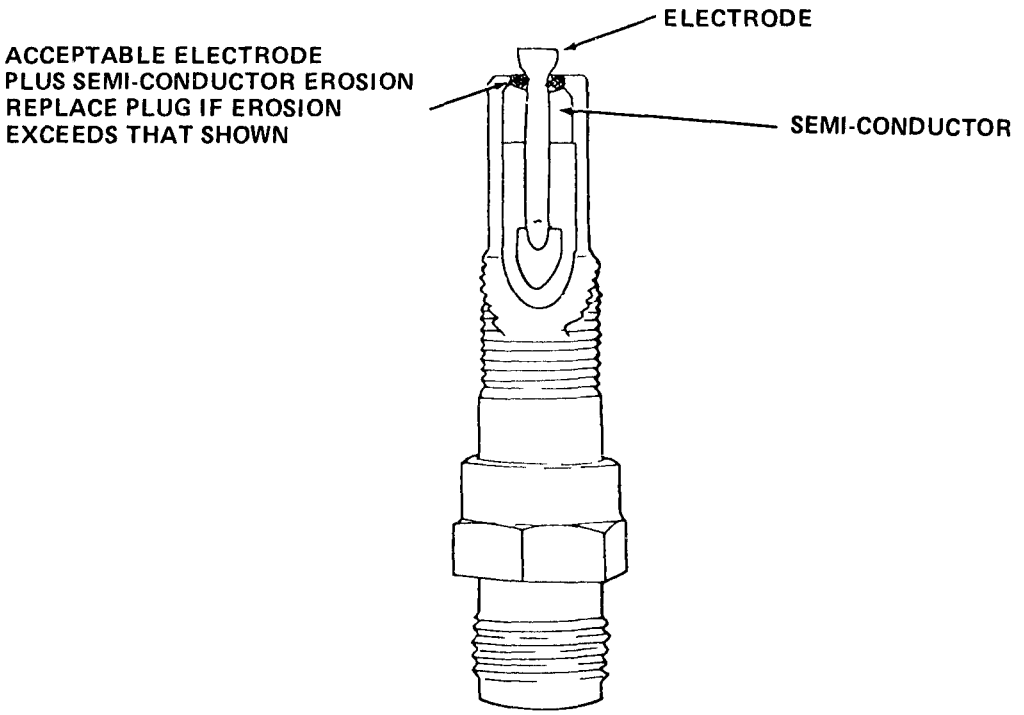
Applicable Configuration
T53-L-13B/703 Engines

References
Para 7-42 and 7-47

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/	**NOTE** See figure in paragraph 7-42.	
1. Igniter Plug		**Inspect** for crossed or stripped threads.
2. Connector End		**Inspect** for broken or chipped insulation.
3. Igniter Plug		**Replace** if defective.
4. Igniter Plug	Grooving and wear are allowable provided depth of grooves does not exceed 0.020 inch (0.51 mm).	**Inspect** for chafing or grooving in housing area.

7-46. Igniter Plugs (T53-L-13B/703 Engines) - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/ - Continued		
5. Igniter Plug		**Replace** if limit is exceeded.
6. Semiconductor	Errosion and chipping are acceptable provialed plug functions normally. Refer to paragraph 7-47.	**Inspect** at electrode end for errosion and chipping.
7. Electrode	Minor burning (discoloration) and slight eroding is acceptable.	**Inspect** for burning and erosion.
8. Igniter Plug		**Replace** if burned or heavily eroded electrode is noted.



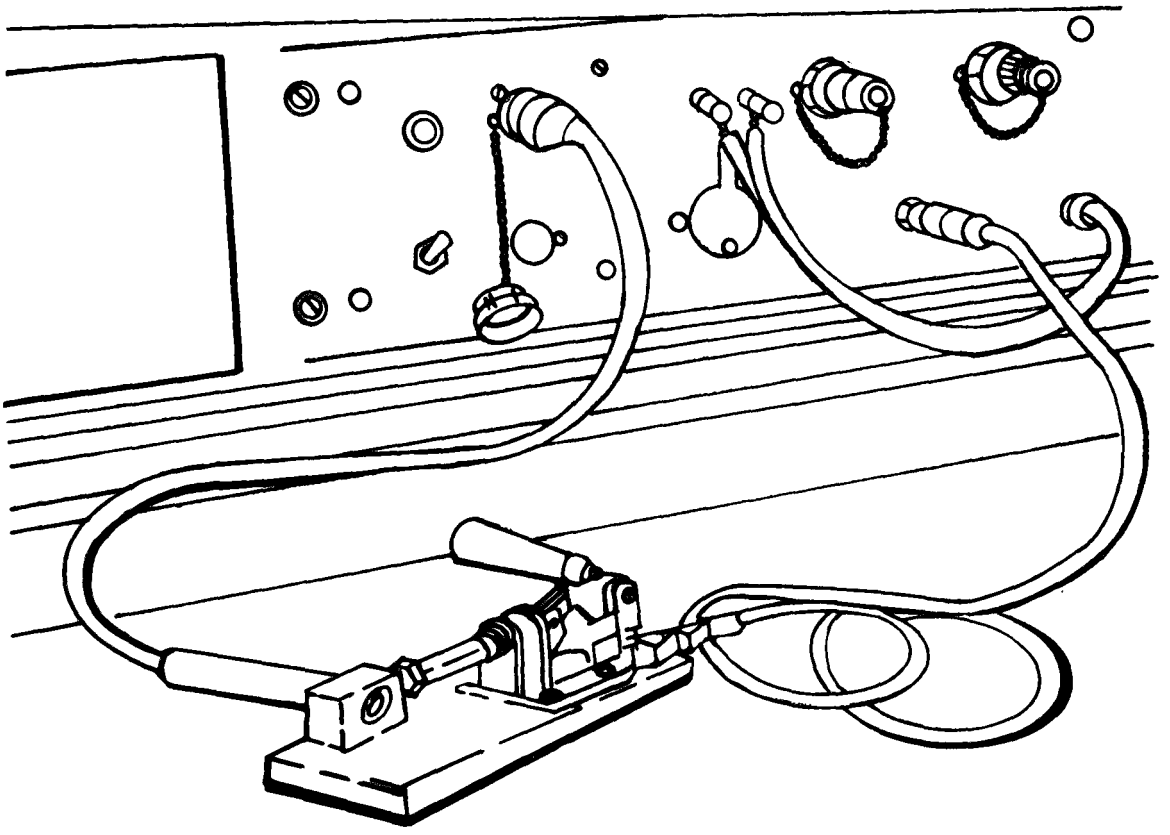
7-47. Igniter Plugs - Functional Test (AVIM)

INITIAL SETUP

Applicable Configuration
All

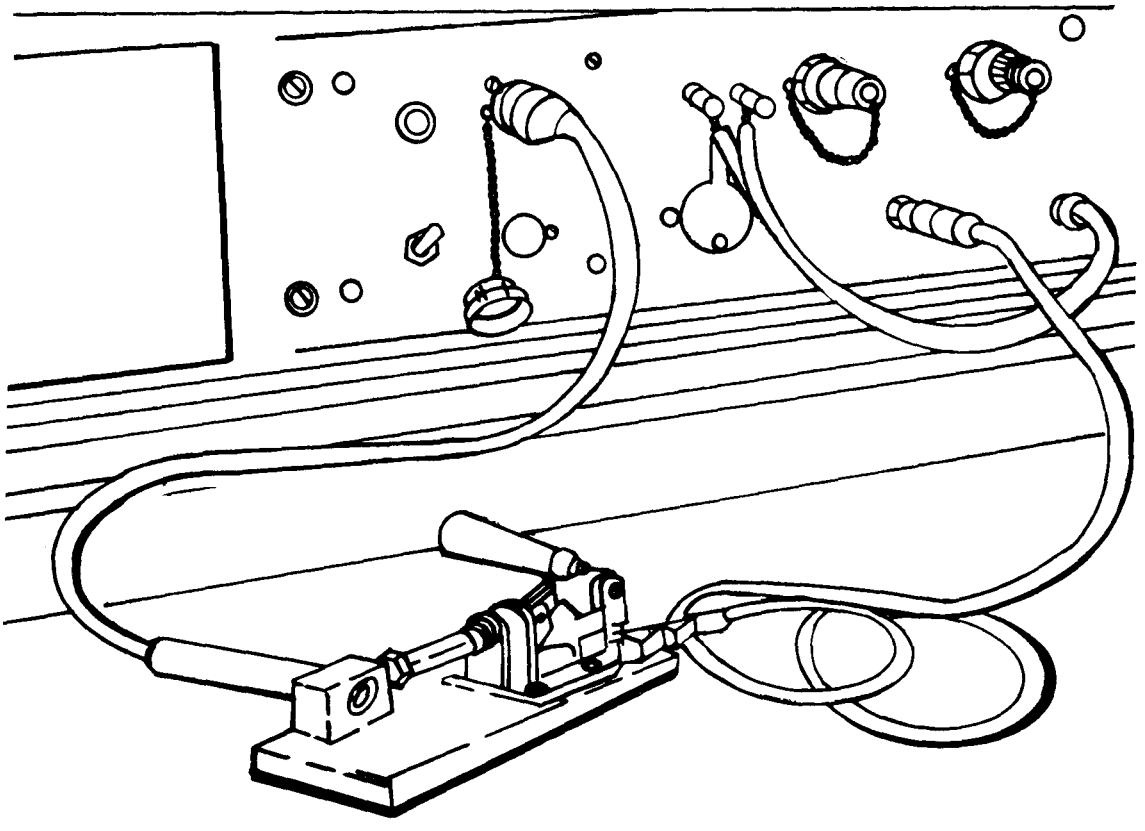
Special Tools
Igniter Cable Assembly (LTCT10462)
Holding Fixture (LTCT896)
Test Unit (LTCT315)

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/		
1. Igniter Plug		**Install** in holding fixture (LTCT896).



2. Ground Lead		**Attach** from ground jacks on test unit (LTCT315) or equivalent, to bolt on holding fixture.

7-47. Igniter Plugs - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/ - Continued		
		
3. Igniter Plugs	Use igniter cable assembly (LTCT10462).	**Connect** igniter cable assembly between connector (2) receptacle and igniter plugs.
4. Power Switch		**Set** switch to ON. **Observe** that red indicator lamp lights.
5. Voltage Selector Switch		**Turn** switch to H.V. Test
6. Meter Selector		**Turn** switch to 5 adc.
7. Test Unit		**Press** 60 cycle ac button.
8. Test Selector Switch		**Turn** to L.T. plug.

747. Igniter Plugs - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST UNIT/ - continued		
9. Filament Switch		**Press ON, wait 15** seconds, then **press** plate switch ON. Observe that red indicator lamps light.
10. Potentiometer		**Turn** until igniter plug fires five consecutive times without skipping.
11. **Push-To-Read** Switch	Five consecutive 1800-volt pulses **shall be applied** across the plug. Plug shall fire successfully under each of these pulses.	**Press and check** igniter plug firing voltage gage M-8.
12. Igniter Plug		Using a suitable adapter, **air-pressure test** the igniter plug at room temperature for leakage. **Pressurize** the firing end at 130 to 170 psig. Leakage shall not exceed 6 cc per minute.
13. **Igniter Plug**		If limits cannot be met, **replace.**
14. Test Unit		**Return to** pretest condition and **remove** igniter plug from holding fixture.

7-48. Igniter Plugs (T53-L-11 Series Engines) - Installation

INITIAL SETUP

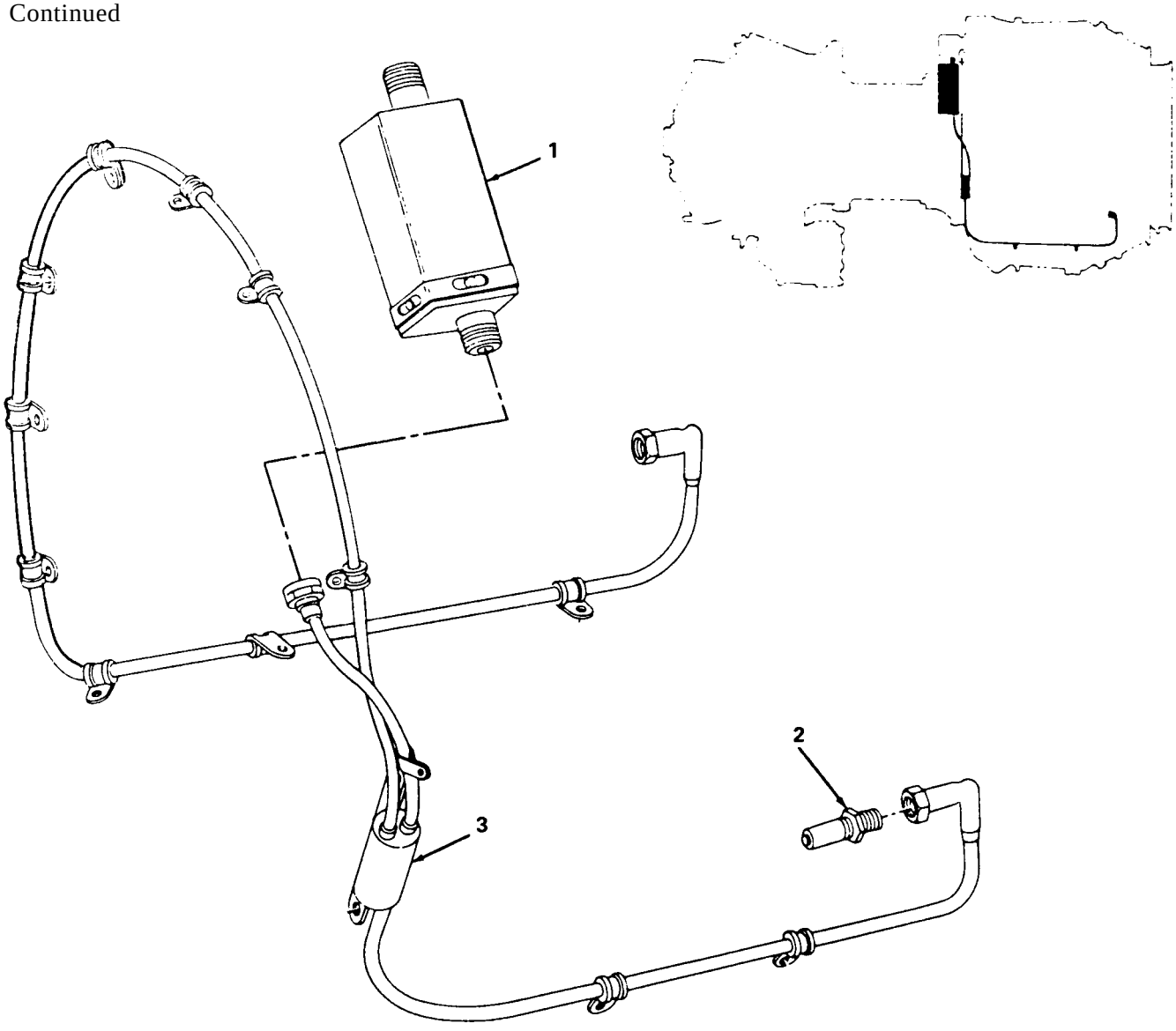
Applicable Configuration
T53-L-11 Series Engines

References
Appendix G, table G-3, reference number 62

Special Tools
Socket Adapter - LTCT4457

7-48. Igniter Plugs (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/ - Continued		



1. Igniter Plugs (2)

Install igniter plug (2) in fire shield mounting pads by hand. If plugs do not bottom, **repair** threads with a 7/16-28NEF tap or die. **Reinstall** plugs and **tighten** as required. (Refer to Appendix G, table G-3, reference number 62.)

7-48. Igniter Plugs (T53-L-11 Series Engines) - Instellation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/ - Continued		
2. Ignition Leads (3)	Use socket adapter (LTCT4457).	**Connect** ignition leads (3) to igniter plugs (2) and **tighten** connectors as required. (Refer to Appendix G, table G-2, reference number 62.)
3. Electrical Lead		**Connect** electrical lead to ignition unit (1). **Lockwire.**

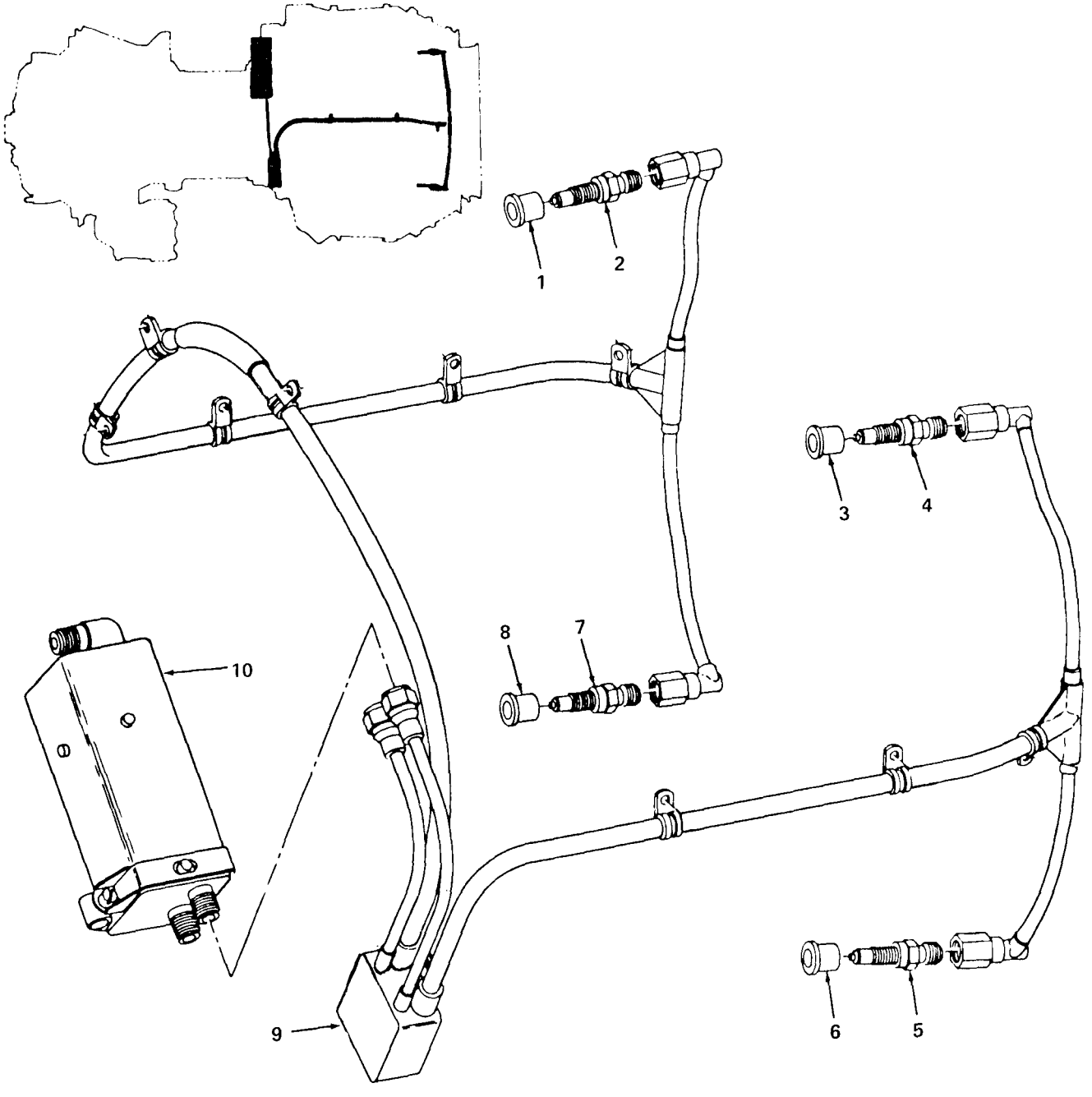
7-49. Igniter Plugs (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

References
Appendix G, table G-4, item 44

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/		



7-49. Igniter Plugs (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTION CHAMBER/ - Continued		
	NOTE **Position spacers with flange toward combustor housing.**	
1. Spacers		**Position** spacers (1, 3, 6, and 8) with shouldered end toward engine, on igniter plugs (2, 4, 5 and 7).
2. Igniter Plugs (2, 4, 5 and 7)	Lightly coat threads of igniter plugs with antiseizing compound (item 26 Appendix D) or equivalent.	**Install** into mounts on rear face of fireshield by hand. If plugs do not bottom, repair threads with a 7/16-28NEF tap or die. **Reinstall** plugs and **tighten** as required, **(Refer** to table G-4, Appendix G, reference number 43.)
3. Ignition Leads (9)		**Reconnect** ignition leads to igniter plugs. **Tighten** connectors as required. **(Refer to** table G-4, Appendix G, reference number 44.) **Lockwire connectors.**
4. Electrical Leads		**Reconnect** to ignition unit (10). **Lockwire.**

CHAPTER 8

OIL SYSTEM

OVERVIEW

This chapter contains procedures for the maintenance and preservation of the oil system. Paragraphs following outline disassembly, inspection, repair, and additional requirements needed to maintain the oil system and related parts. Procedures requiring maintenance on the Aviation Intermediate Maintenance (AVIM) level are specified and must be performed as such. Paragraphs in which the maintenance level is not specified shall be considered Aviation Unit maintenance (AVUM) and may be performed at this level or a higher level of maintenance.

8-1. GENERAL MAINTENANCE INFORMATION

Inspect all of the oil systems assemblies and subassemblies removed from the engine. Check for missing, loose or damaged parts. Disassembly procedures enable cleaning, inspection, servicing, repair or replacement.

During reassembly of assemblies and subassemblies, lightly coat all preformed packings with hydrogenated vegetable shortening (item 36, Appendix D) or castor oil (item 13, Appendix D). Discard-all the following parts and replace with new parts:

Seals	Tabwashers
Gaskets	Lockpins
Packing	Lockwashers
Cotter Pins	Lockwire

8-2. Lube Oil Filter Assembly - Minor Servicing

INITIAL SETUP

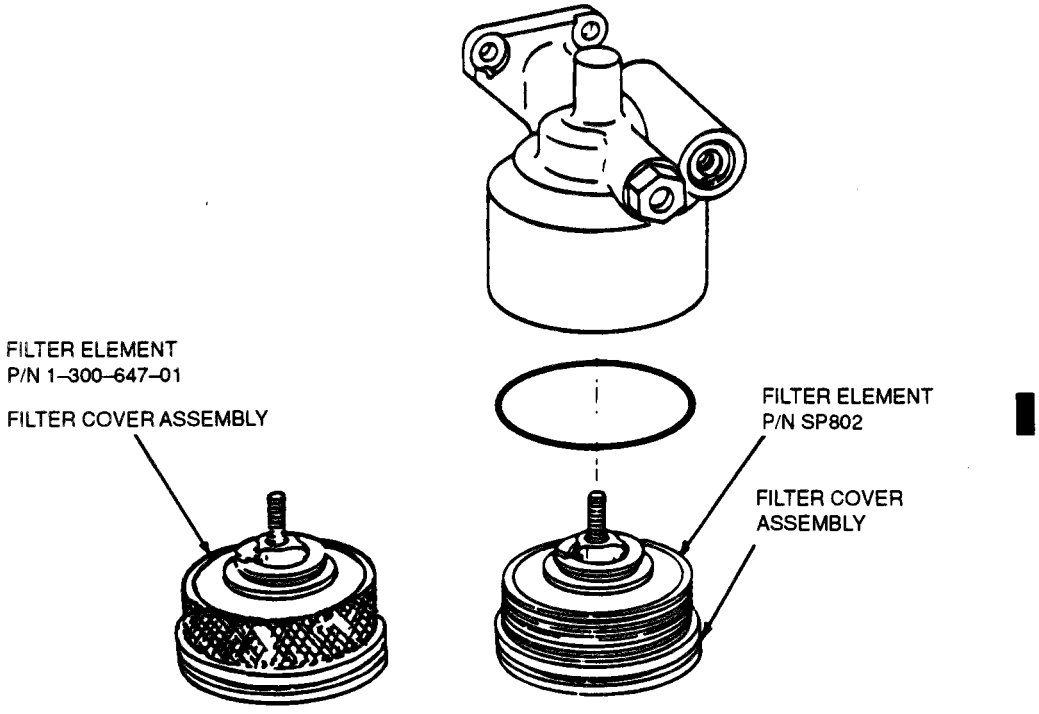
Applicable Configuration
All

Consumable Materials
Drycleanlng Solvent (item 24, Appendix D)

Special Tools
Cleaning Fixture SPT107

References
Para 8-4 and 8-5

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/		
1. Filter Cover Assembly		**Remove.**

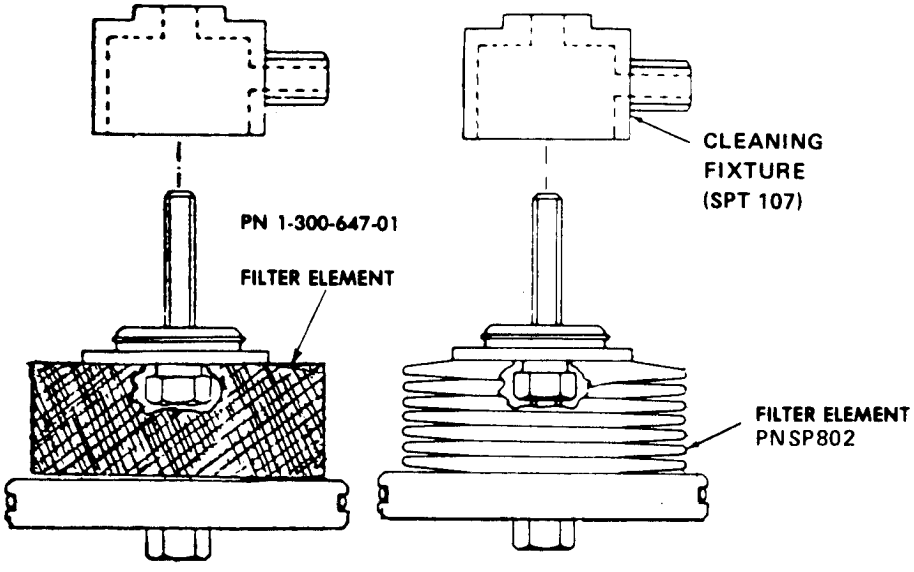


WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent Is 100°F to 138°F (38°C to 59°C).

8-2. Lube Oil Filter Assembly - Minor Servicing - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/ - Continued		
2. Filter Element P/N SP 802	The fixture used in this action prevents particles larger than 40 microns from entering inside section of filter elements. It shall be installed immediately upon removal of cover from housing.	**Clean** as follows: a. **Place** SPT 107 cleaning fixture on screw. **Turn** cleaning fixture down until it fits snugly against end plate. **Install** plug or cap on pipe nipple of fixture. b. **Immerse** and **soak** cover assembly, with cleaning fixture installed, in dry cleaning solvent (item 24, Appendix D) until contamination is removed from external surfaces of filter element. c. **Remove** cover assembly from solvent. **Remove** cap or plug.
	CAUTION **Only clean, pressurized air shall be used In step d. of this action.** **NOTE** Replace filter P/N 1-300-647-01 if contaminated. Do not try to clean.	d. **Place** cover assembly under running hot water or in a tank of boiling water. **Blow** clean air through air line at 30 psi (2.11 kg/sq cm). **Continue** rinsing until there is no discoloration. e. **Remove** cleaning fixture from screw. **Dry** cover assembly with compressed air.
3. Filter Cover Assembly	If cleaning (in preceding action for item 2) is not effective, perform this action. Refer to paragraph 8-4 for disassembly procedures. Refer to paragraph 8-5 for cleaning procedures.	**Disassemble. Clean.**

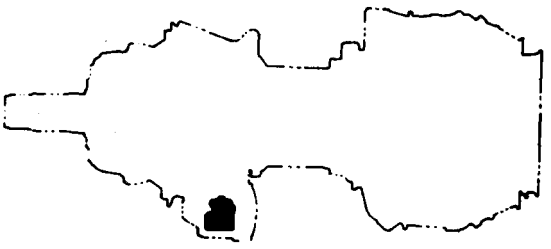


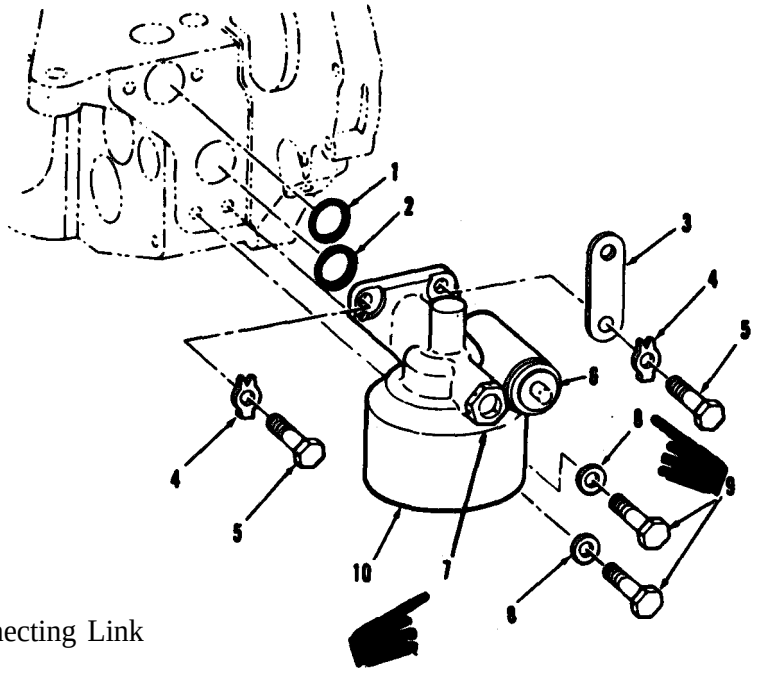
8-3. Lube Oil Filter Assembly - Removal

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX/	NOTE Impending bypass indicator (6) shall not be disturbed.	
1. Hose		**Disconnect** at oil pressure indicator port (7).
2. Lube Oil Filter Assembly (10)		**Support.**
3. Bolts (9) and Washers (8)		Loosen lower two bolts (9) and washers (8).
4. Tabs		**Straighten** on two tabwashers (4).
5. Bolts (5)		**Remove** upper two bolts (5).
6. Rigid Connecting Link (3)		**Remove.**
7. Tabwashers (4)		**Remove.**
8. Lube oil Filter Assembly (10)		**Lift** from position.
9. Packings (1 and 2) and Tabwashers (4)		**Remove.**



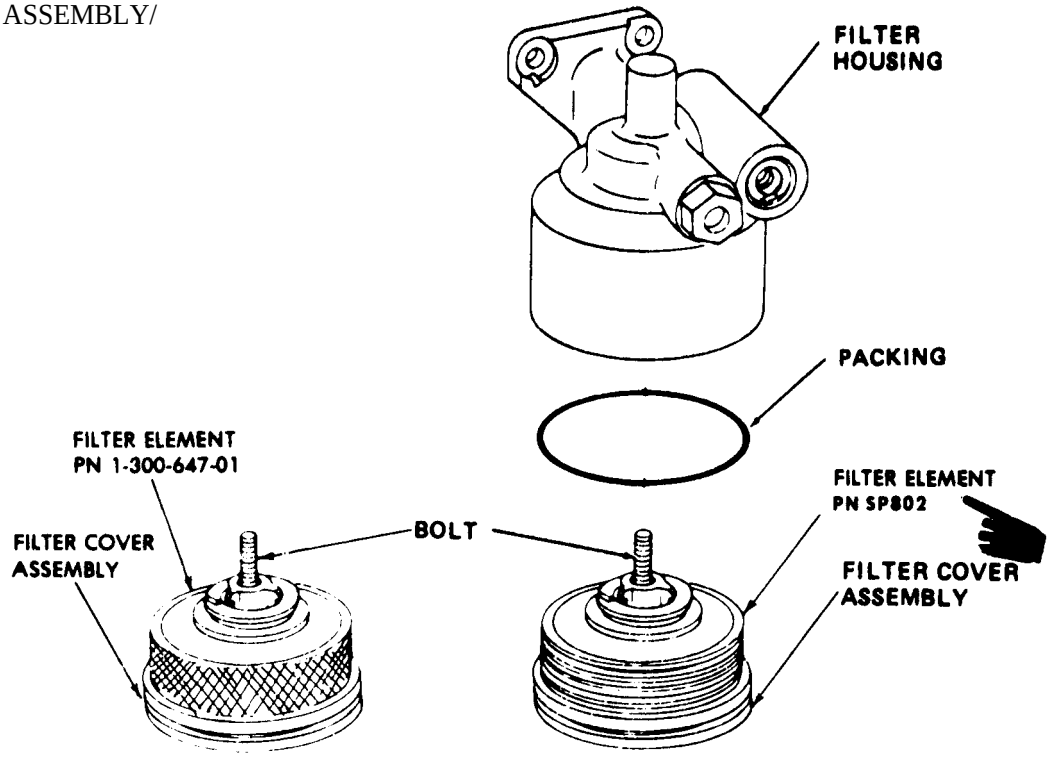


8-4. Lube Oil filter Assembly - Disassembly

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/		



1. Bolt	Bolt secures filter cover assembly into filter housing assembly.	**Loosen** and **withdraw** filter cover assembly.
2. Packing		**Remove.**

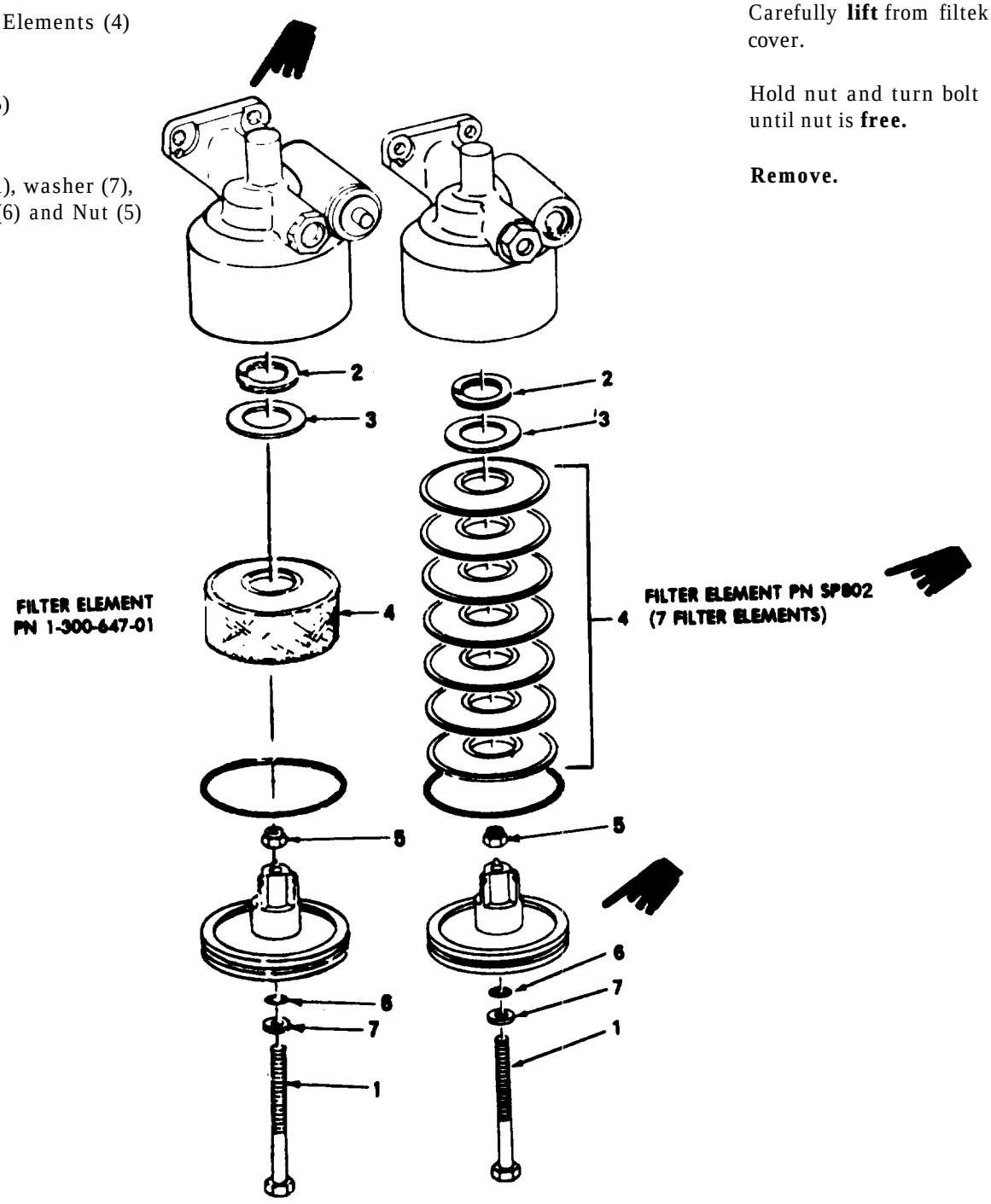
NOTE

Disassemble lube oil filter assembly only to replace parts or clean filter cover assembly.

3. Bolt (1)	Bolt secures filter cover assembly into filter housing assembly.	**Loosen** and **withdraw** cover assembly. **Remove** packing.

8-4. LUBE OIL FILTER ASSEMBLY - DISASSEMBLY - Cont.

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/ – Continued		
4. Retaining Ring (2) and End Plate (3)		**Remove**
5. Filter Elements (4)		Carefully **lift** from filtek cover.
6. Nut (5)		Hold nut and turn bolt until nut is **free.**
7. Bolt (1), washer (7), Packing (6) and Nut (5)		**Remove.**



8-5. Lube Oil Filter Assembly - Cleaning

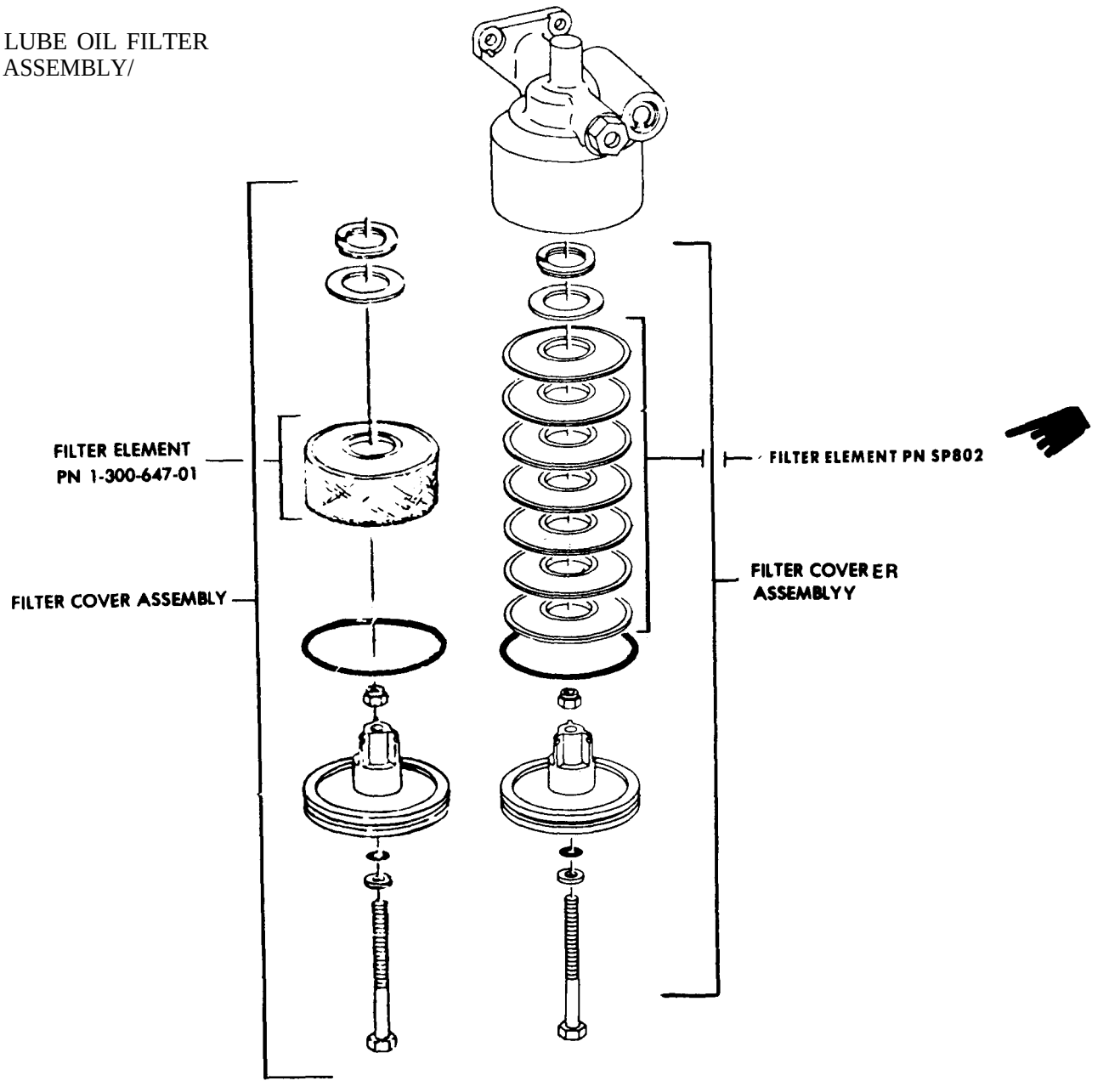
INITIAL SETUP

Applicable Configuration
All

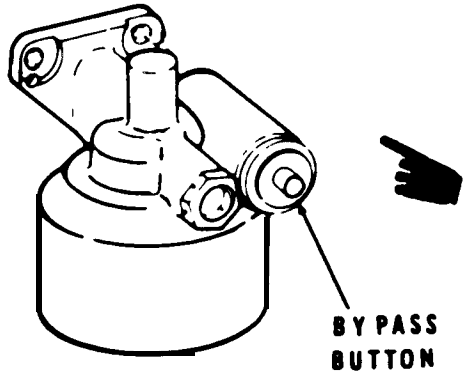
Consumable Materials
Turco Compound No. 713 (item 85, Appendix D)
Drycleaning Solvent (item 24, Appendix D)

References
Para 1-74

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/		



8-5. Lube Oil Filter Assembly - Cleaning - Continued

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/ - Continued	**NOTE** Some engines have filter assemblies with impending bypass indicators. If impending bypass indicator button is extended, clean filter element as outlined below, then depress button to reset.	
1. Filter Cover Assembly	**If upon removal of fitter cover assembly an excessive amount of chips are noted, refer to paragraph 1-74.**	
2. Filter Elements	**WARNING** **Perform this cleaning operation In a well-ventilated area.**	Clean as prescribed in the actions below.
3. Filter Elements		**Install** filter elements in a shaft having the same diameter as filter element orifice.
4. Shaft and Elements	If impending bypass indicator button located on differential pressure indicator was found extended during initial inspection and fitter was found to be clean, check indicator position following next engine runup. If button is extended, replace filter assembly.	**Immerse** in an agitating bath of Turco Compound No. 713 (item 85, Appendix D) at ambient temperature or **dry cleaning solvent (item** 24, Appendix D) until all combination is removed.
5. Shaft and Elements		**Rinse** under running hot water or in a tank of boiling water.
6. Elements		**Blow** clean dry air through filter elements at 100 psi (7 kg/sq cm) maximum.

8-5. Lube Oil Filter Assembly - Cleaning - Continued

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/ Continued	**WARNING** **Drycleaning solvent P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F to 138° F (38°C to 59°C).**	
7. All Parts		**Clean** all parts with drycleaning solvent (item 24, Appendix D) and a soft fiber brush.

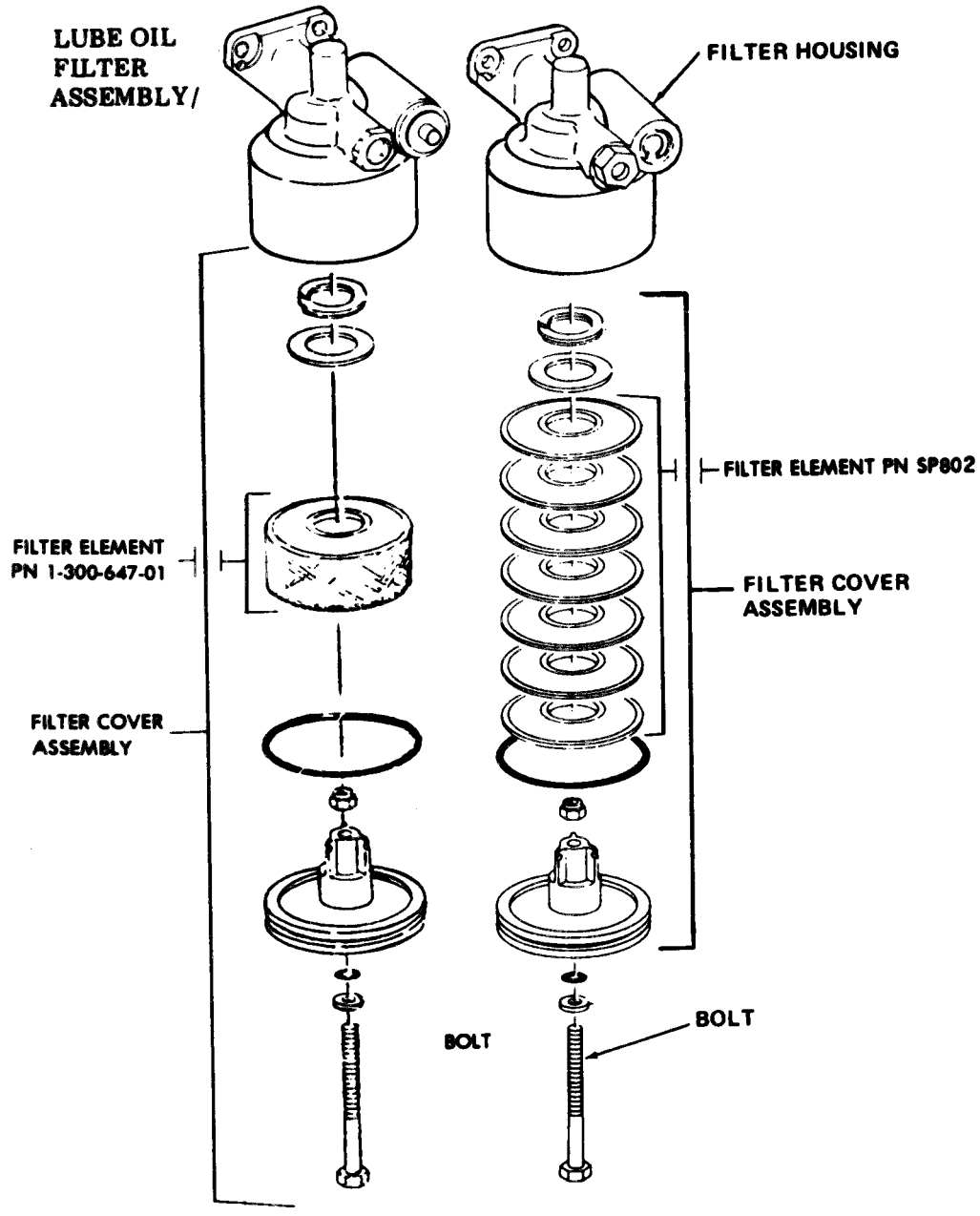
8-6. Lube Oil Filter Assembly - Inspection

INITIAL SETUP

Applicable Configuration
All

References
Para 1-74, 8-5 and H-27

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/		



8-6. Lube Oil Filter Assembly - Inspection - Continued

LUBE OIL FILTER ASSEMBLY/ - Continued		
1. Filter Cover Assembly	If an excessive amount of chips is noted, refer to paragraph 1-74. **Clean** filter elements, refer to paragraph 8-5.	**Inspect** for contamination.
	NOTE Replace filter P/N 1-300-647-01 if contaminated. Do not try to clean.	

8-6. Lube Oil Filter Assembly - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/ - Continued		
2. Filter Elements	Replace damaged elements.	**Inspect** for damage.
3. Bolt and Housing	Replace parts if defective.	**Inspect** for damage.
4. Filter Assembly	If thickness is not within limits (SP 802 only) replace elements.	**Measure** thickness of filter elements at inner ring, if filter is disassembled for any reason. Thickness shall be no less than 0.122 inch (0.310 cm).
5. Cover Assembly	Blend-repair as outlined in paragraph H-25.	**Inspect** for nicks, burrs and scratches.
6. Parts	Replace parts having threads damaged beyond repair.	**Inspect** for crossed or damaged threads.
7. Parts	Replace all cracked, distorted and excessively worn parts.	**Inspect** for cracks, distort on and excessive wear.

8-7. Lube Oil Fulter Assembly - Assembly

INITIAL SETUP

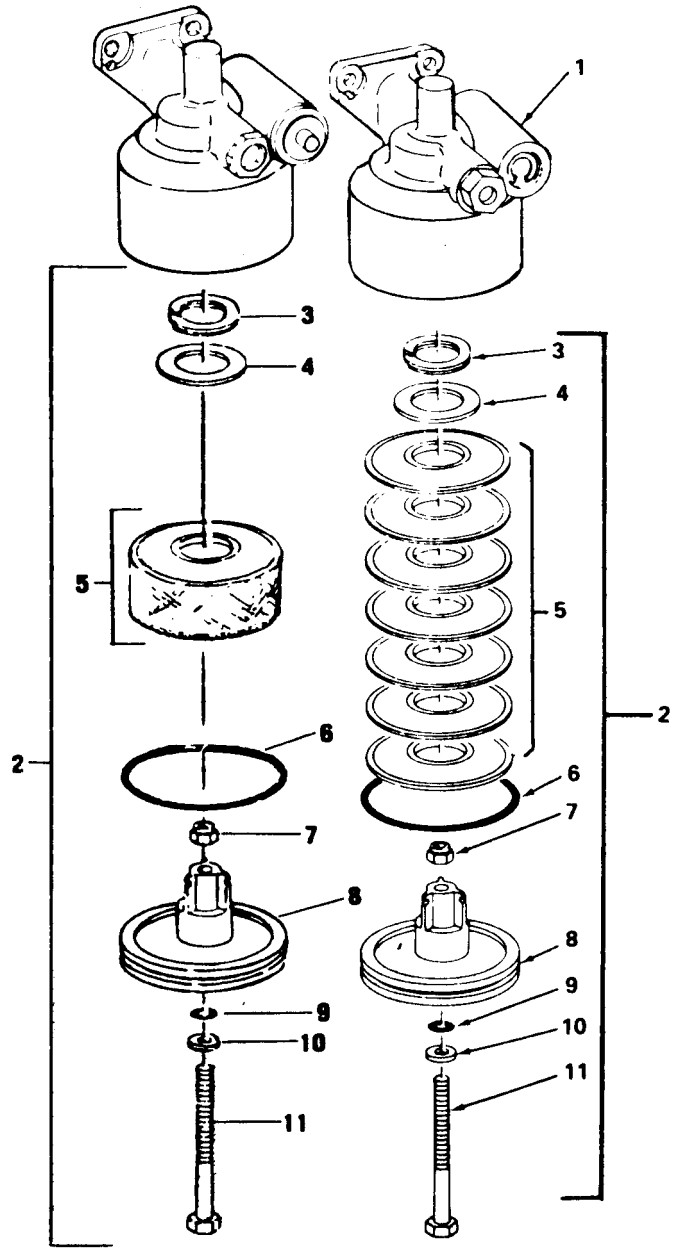
Applicable Configuration
All

Consumable Materials
Lockwire (item 41,42, or 43, Appendix D)

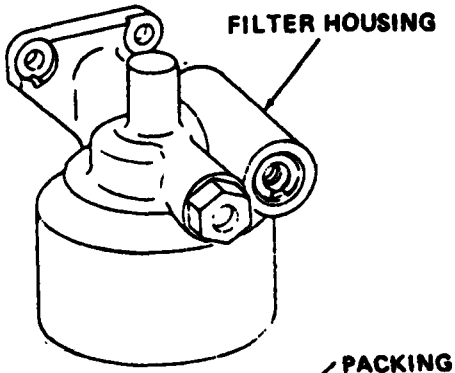
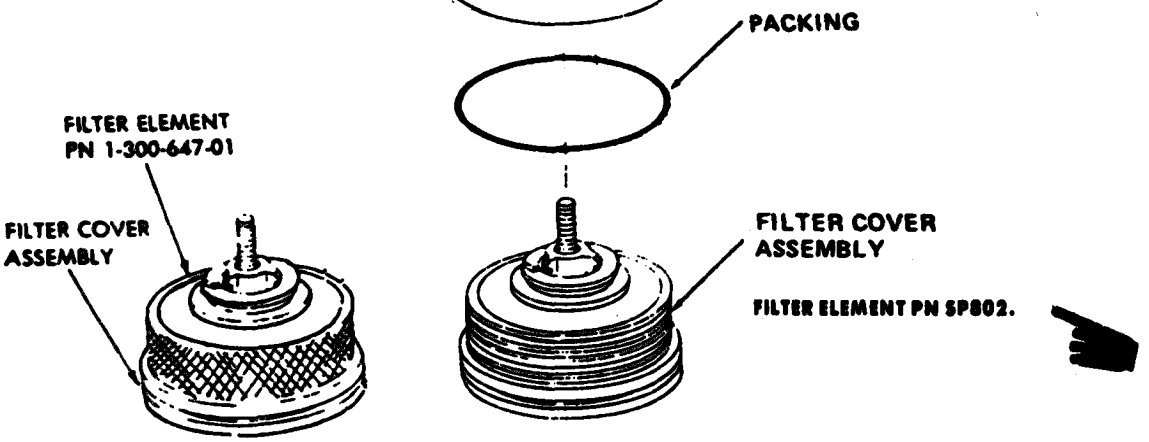
References
Appendix G, Table G-3, Reference Number 52, or Appendix G, Table G-4, Reference Number 52

8-7. Lube Oil Filter Assembly - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/		
1. Packing (9)		**Install** in groove on face of filter cover (8). Manually **depress** button after cleaning if extended.
2 Washer (10)		**Install** on bolt (11).
3. Bolt (11)	Using two suitable wrenches, tighten nut to just before it bottoms out; thus allowing the bolt to rotate without turning the housing assembly.	**Install** through filter cover (8). **Secure** with nut (7).



8-7. LUBE OIL FILTER ASSEMBLY - ASSEMBLY - Cont.

LOCATION/ITEM	REMARKS	ACTION
LUBE OIL FILTER ASSEMBLY/Continued		
4. Filter Elements (5)		**Install** carefully on filter cover (8). **Install** end plate (4) and **secure** with retaining ring (8).
5. Packing (6)		**Install** in groove on filter cover (8).
6. Filter Cover Assembly (2)		**Install** into filter housing (1).
	NOTE Either filter element or cover assembly may be used in filter housing (1-300-241-01 or 1-080-460-01).	
7. Bolt (11)	Use a suitable wrench. Refer to Appendix G, table G-3, reference number 52 or Appendix G, table G-4, reference number 52.	**Tighten** bolt as required **Lockwire**

8-8. DELETED.

All data on pages 8-14 through 8-17 deleted.

8-8. Lube Oil Filter Assembly - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
	NOTE **Connect** all hoses and lines according to items 3 thru 7.	
3. No. 10 Hose	Hose diameter is 5/8 inch	**Connect** between valve to FILTER INLET port on test stand and holding fixture.
4. No. 10 Hose	Hose diameter is 5/8 inch	**Connect** between valve to FILTER OUTLET port on test stand and holding fixture.
5. No. 4 Hose	Hose diameter is 1/4 inch	**Connect** from fitting in FILTER INLET line to CALIBRATION port located below INLET PRESSURE indicator.
6. No. 4 Hose	Hose diameter is 1/4 inch	**Connect** from tee fitting in FILTER OUTLET line to valve and adapter at OUTLET PRESSURE indicator.
7. No. 4 Hose	Hose diameter is 1/4 inch	**Connect** from HAND PUMP OUTLET port to tee fitting in FILTER INLET line.
8. STAND POWER Switch		**Press. Observe** red indicator lamp. **Be sure** it lights.
9. FILTER CIRCUIT PUMP Switch		**Press. Observe** red indicator lamp. Be **sure** it lights.
10. FILTER INLET Valve		**Open.**
11. FILTER OUTLET Valve	Differential pressure across the filter should be 5 psig maximum. **Reject** oil filter if requirements cannot be met.	**Open** until rotometer indicates 3500 phr flow.

8-8. Lube Oil Filter Assembly - Functional Test (AVIM) - Continued

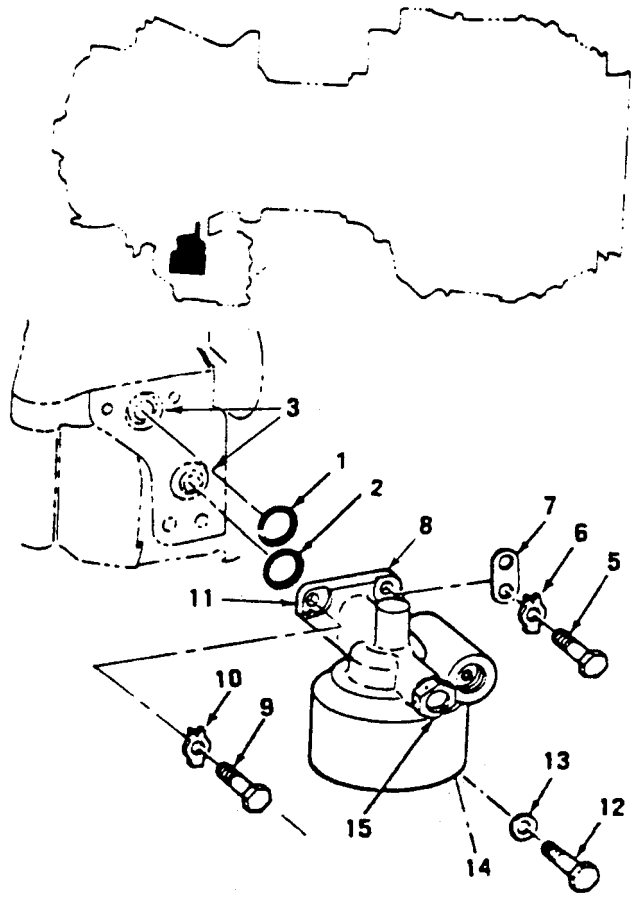
LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
12. FILTER OUTLET PUMP Switch		**Press** to OFF.
13. FILTER INLET Valve	Pressure indication on gages should drop to zero during this action.	**Open** valve. **Bleed** off all pressure.
41. Cover Assembly		**Remove** from filter housing.
15. Gasket and Test Plug		**Install** in housing.
16. FILTER OUTLET Valve		**Open.**
17. FILTER CIRCUIT PUMP Switch		**Press ON. Observe** red indicator lamp. **Be sure** it lights.
18. FILTER INLET Valve		**Open** slowly. **Observe** OUTLET PRESSURE indicator. Stop opening valve at first indication of pointer movement.
19. MAIN ELEMENT DISCHARGE PRESSURE Indicator		**Observe** pressure indication indicator.
20. OUTLET PRESSURE	Refer to item 18 for reading of OUTLET PRESSURE indicator. Refer to item 19 for reading of MAIN ELEMENT DISCHARGE PRESSURE. Difference between two readings shall be within 15 psi to 20 psi (1.05 kg/sq cm to 1.41 kg/sq cm).	**Subtract** pressure indication of OUTLET PRESSURE indicator from indication on MAIN ELEMENT DISCHARGE PRESSURE indicator. **Reject** lube oil filter assembly if requirement cannot be met. **Close** FILTER INLET valve.
21. FILTER CIRCUIT PUMP Switch		**Press** to OFF.
22. FILTER INLET Valve	Pressure indications should drop to zero.	**Open** valve. **Bleed** off all pressure.
23. Test Plug and Gasket	These were previously installed during action for item 15.	**Remove.**

8-8.1 LUBE OIL FILTER ASSEMBLY - INSTALLATION

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX		
1. Packing (1 and 2)		**Install** in grooves (3) of accessory drive gearbox lub oil filter mount pad.
2. Bolt (5), Tabwasher (6) and rigid connecting link (7).		**Install** in hole (8).
3. Bolt (9), Tabwasher (10).		**Install** in hole (11).
4. Bolt (12) and washer (13).		**Install** in hole (14).
5. Bolts (5), (9) and (12).		**Tighten** as required.
6. Tabwashers (6) and (10).		**Bend** tabs.
7. Bolt (12).		**Lockwire.**
8. Hose from oil pressure transmitter		**Connect** at oil pressure indicator port (15).



8-9. Power Turbine Bearing Oil Strainer- Minor servicing

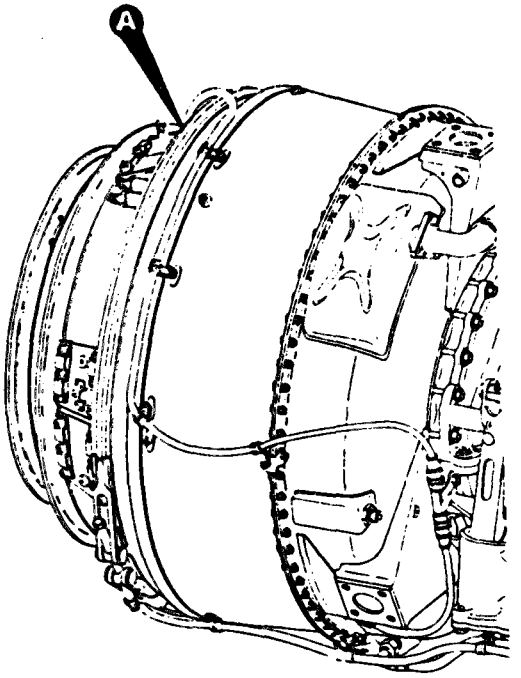
INITIAL SETUP

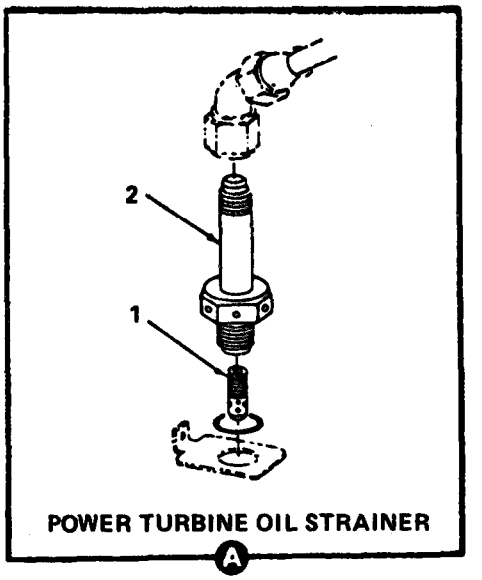
Applicable Configuration
All

References
Para 1-66

Consumable Materials
Drycleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		





1. Power Turbine Oil Strainer (1)	**Inspect** strainer bore on T53-L-13B/703 engines when performing this action. To determine source of contamination, refer to paragraph 1-66.	**Inspect** prior to cleaning for metallic chips.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

8-9. Power Turbine Bearing Oil Strainer - Minor Servicing - Continued

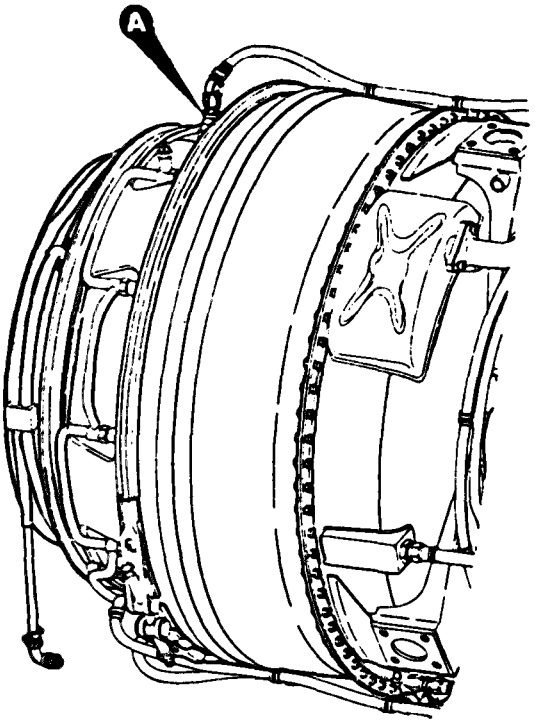
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Power Turbine Oil strainer (1)	**Use** drycleaning solvent (item 24, Appendix D).	**Clean** using soft fiber brush. **Rinse** with drycleaning solvent. **Air-dry.**
3. Power Turbine Oil Strainer (1)	**Replace** strainer if clogging cannot be removed or damage is noted.	Inspect for clogging and damage.
4. Power Turbine Oil Strainer Housing (2)	**Replace** adapter if threads cannot be repaired.	**Inspect** for stripped and/or damaged threads.

8-10. Power Turbine Bearing Oil Strainer (T53-L-11 Series Engines) - Removal

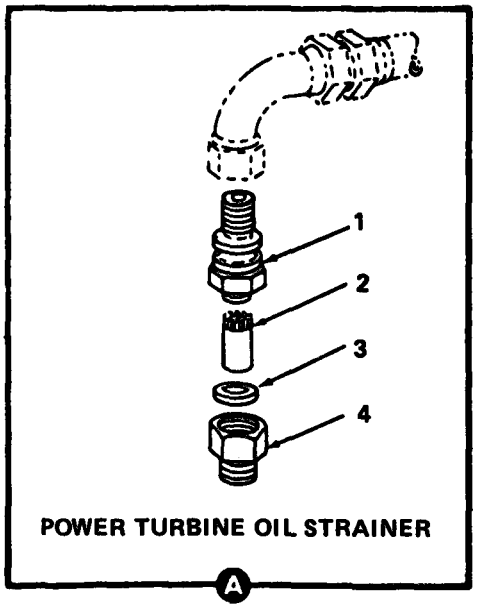
INITIAL SETUP

Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
1. Oil Pressure Hose Connector		**Disconnect** from oil strainer housing adapter (1).



T53-L-11 SERIES



8-10. Power Turbine Bearing Oil Strainer (T53-L-11 Series Engines) - Removal - Continued

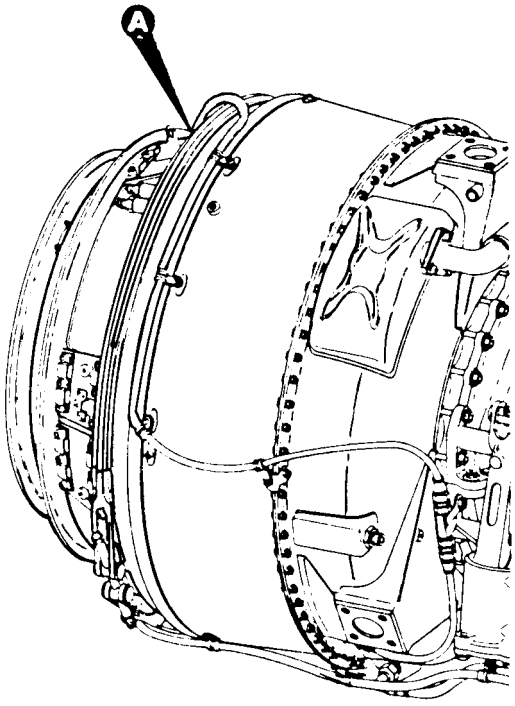
LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/-Continued		
2. Adapter (4)		Hold with wrench, unscrew.
3. Strainer Housing		**Remove**
4. Packing (3) and Strainer (2)		**Remove** from adapter (4).

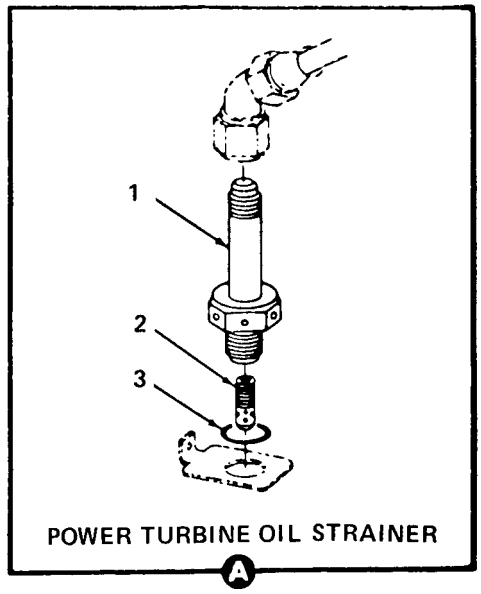
8-11. Power Turbine Bearing Oil Strainer (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

Applicable Configuration	References
T53-L-13B/703 Engines	Para 8-9

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
1. Hose Assembly Connector		**Disconnect** from power turbine oil strainer housing adapter (1).





8-11. Power Turbine Bearing Oil Strainer (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/-Continued		
2. Adapter		Unscrew. Remove.
3. Power Turbine CM Strainer (2)		Unscrew. Remove.
4. Packing (3)		Remove.
5. Strainer		**Unscrew** from within adapter.
6. Power Turbine Bearing Oil Strainer	For minor servicing, refer to paragraph 8-9.	**Service** if necessary.

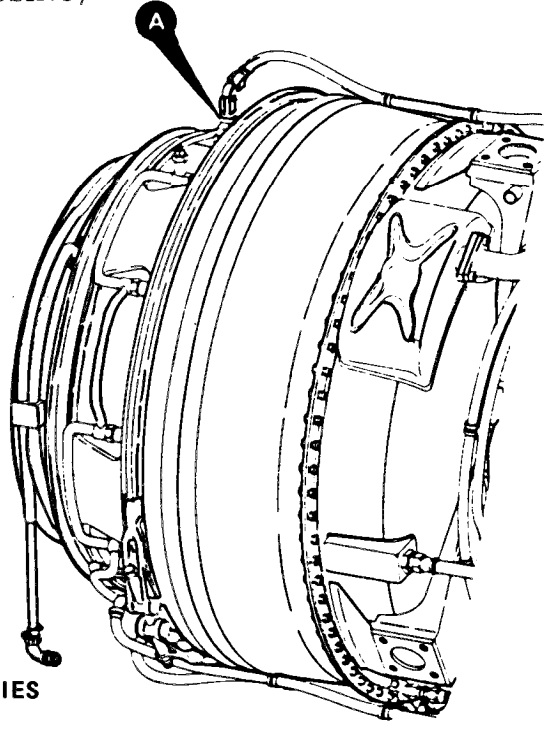
8-12. Power Turbine Bearing Oil Strainer (T53-L-11 Series Engines) - Installation

INITIAL SETUP

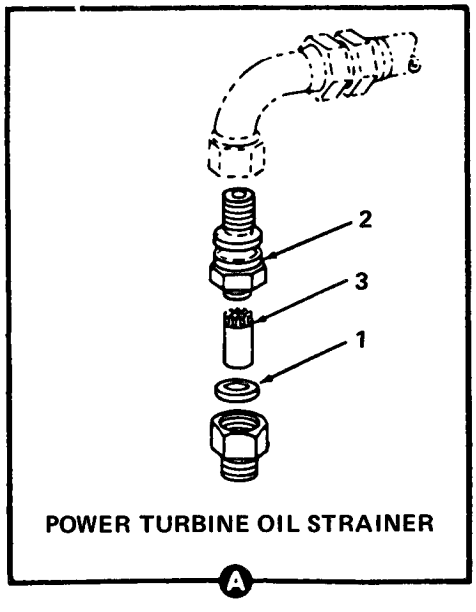
Applicable Configuration
T53-L-11 Series Engines

References
Appendix G, Table G-3, Reference Numbers 22 and 54

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
1. Packing (1)		**Place** on oil strainer housing adapter (2).



T53-L-11 SERIES



8-12. Power Turbine Bearing Oil Strainer (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
2. Strainer (3)		**Screw** onto power turbine oil nozzle.
3. Oil Strainer Housing	Refer to Appendix G, table G-3, reference number 22.	**Secure** to oil strainer housing adapter. **Tighten** as required.
4. Oil Pressure Hose Connector	Refer to Appendix G, table G-3, reference number 54.	**Connect** to oil strainer housing. **Tighten** as required.

8-13. Power Turbine Bearing Oil Strainer (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

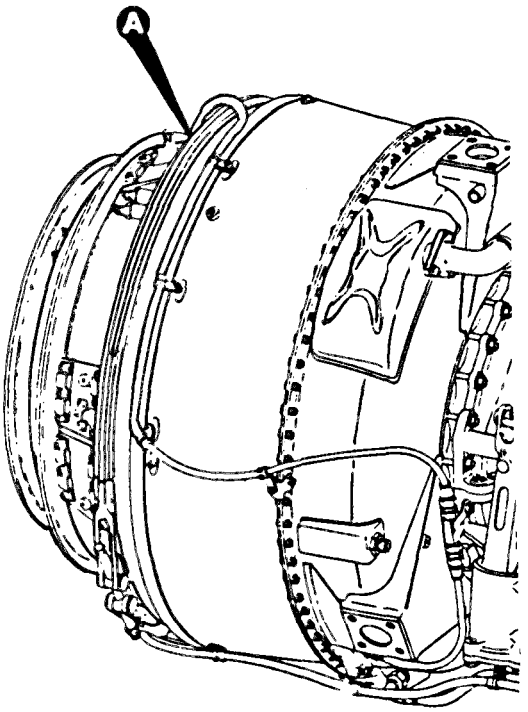
Consumable Materials
Lockwire (item 41, 42 or 43, Appendix D)

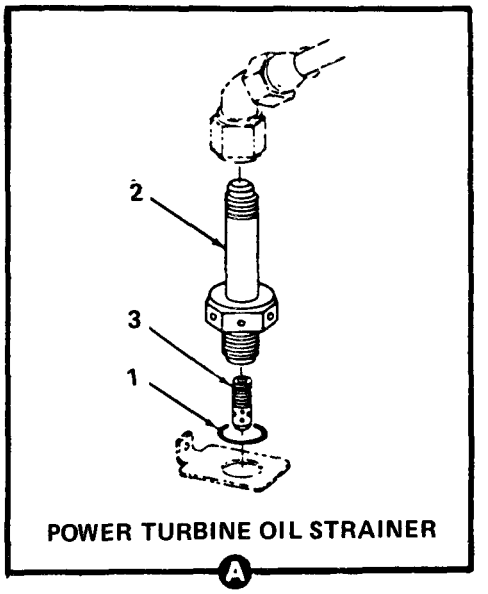
References
Appendix G, Table G-4, Reference Numbers 20 and 58

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
1. Packing (1)		**Place** on power turbine oil strainer housing adapter (2).
2. Power Turbine Oil Strainer (3)		Screw into power turbine oil strainer housing adapter (2) finger-tight.
3. Power Turbine Oil Strainer Housing Adapter (2)	**Refer** to Appendix G, table G-4, reference number 20.	**Thread** into tube. **Tighten** as required. **Lockwire.**
4. Power Turbine Oil Strainer Housing (2)	**Refer** to Appendix G, table G-4, reference number 58.	**Connect** hose assembly to power turbine oil strainer housing adapter. **Tighten** as required.

8-13. Power Turbine Bearing Oil Strainer (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/-Continued		





8-14. Rear Bearing Housing Oil Strainer - Minor Servicing

INITIAL SETUP

Applicable Configuration
All

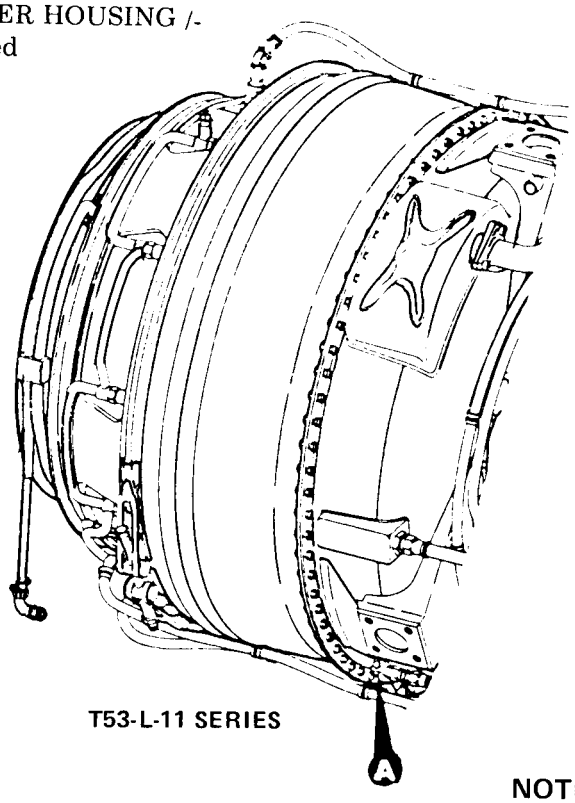
Consumable Materials
Drycleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
1. Rear Bearing Housing Oil Strainer	The following figure illustrates rear bearing housing oil strainers for T53-L-11 series engines only.	Inspect for metallic chips prior to cleaning.

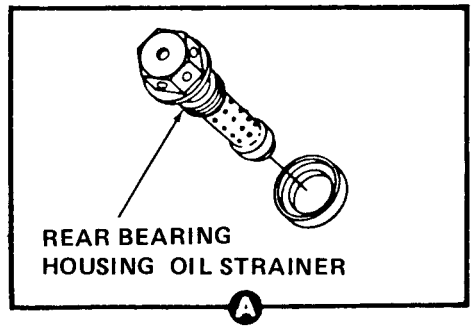
8-14. Rear Bearing Housing Oil Strainer - Minor Servicing - Continued

LOCATION/ITEM	REMARKS	ACTION

DIFFUSER HOUSING /- Continued

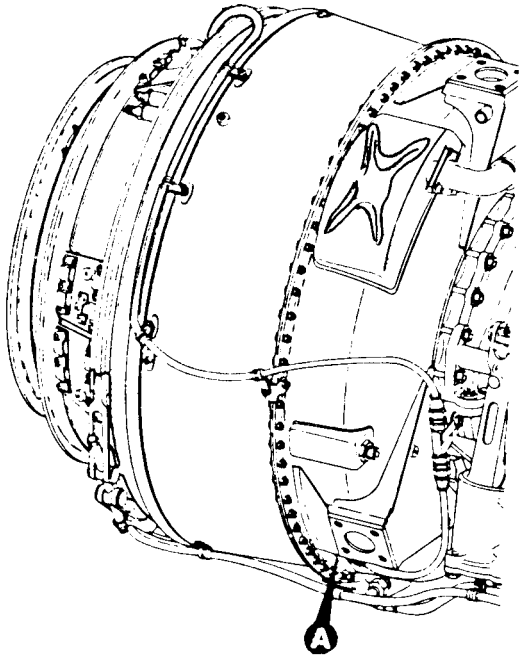


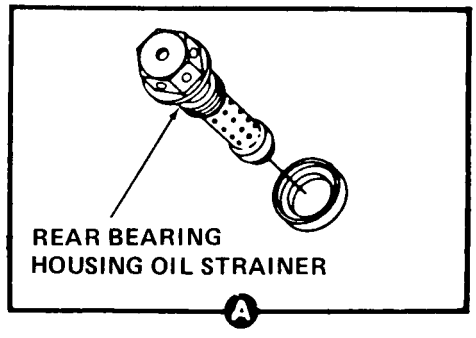
T53-L-11 SERIES



NOTE

The following figure illustrates rear bearing housing oil strainers for T53-L-13B/703 engines only.





8-14. Rear Bearing Housing Oil Strainer - Minor Servicing - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/-Continued		
	WARNING **Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F to 138°F (38°C to 59°C).**	
2. Strainer	Use drycleaning solvent (item 24, Appendix **D).**	**Clean** using soft fiber brush. **Rinse** with drycleaning solvent. **Air-dry.**
3. Strainer		**Inspect** for clogging and damage, **Replace** if clogging cannot be removed or damage is noted.

8-15. Rear Bearing Housing Oil Strainer (T53-L-11 series Engines) - Removal

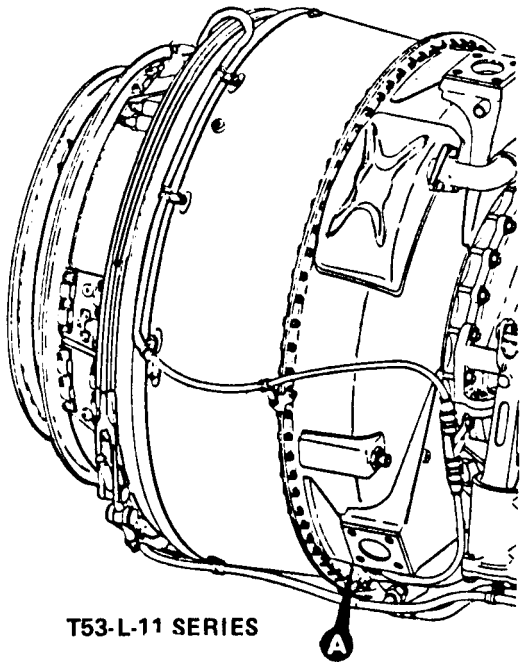
INITIAL SETUP

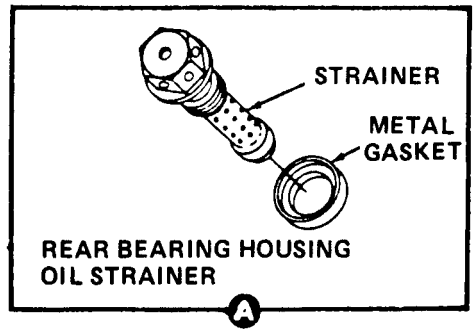
Applicable Configuration
T53-L-11 Series Engines

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/	The rear bearing (No. 2) housing oil strainer screws into a fitting on the bottom right side of the diffuser housing.	

8-15. Rear Bearing Housing Oil Strainer (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
1. Strainer		**Turn** hexagon portion counterclockwise. **Lift** out strainer.





2. Metal Gasket	**Discard.**

8-16. Rear Bearing Housing Oil Strainer (T53-L-13B/703 Engines) - Removal

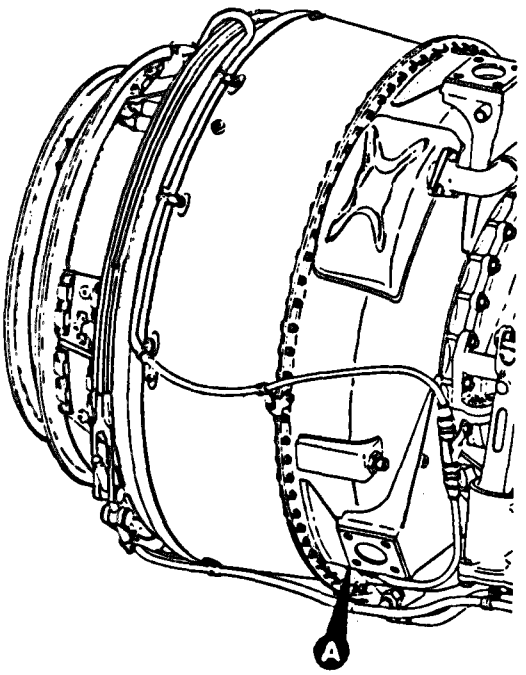
INITIAL SETUP

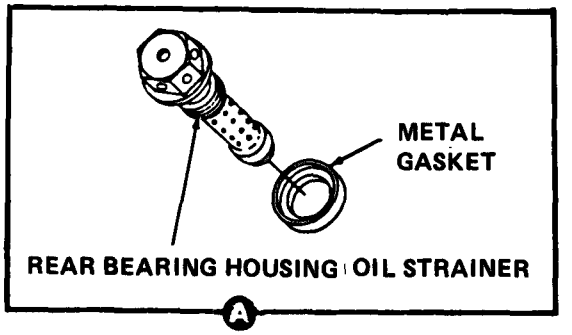
Applicable Configuration
T53-L-13B/703 Engine

References
Para 8-14

6-16. Rear Bearing Housing Oil Strainer (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/-Continued		
	NOTE The rear bearing No. 2 housing oil strainer screws into a fitting at the 4 o'clock position on the diffuser housing. Note part number of rear bearing housing oil strainer. If strainer is to be replaced it must be replaced with one having the same part number.	
1. Rear Bearing Housing Oil Strainer		**Turn** hexagon portion counterclockwise. Lift out strainer.
2. Metal Gasket		**Remove.**
3. Rear Bearing Housing Oil Strainer	For minor servicing, refer to paragraph 8-14.	**Service** if necessary.





8-17. Rear Bearing Housing Oil Strainer (T53-L-11 Series Engines) - Installation

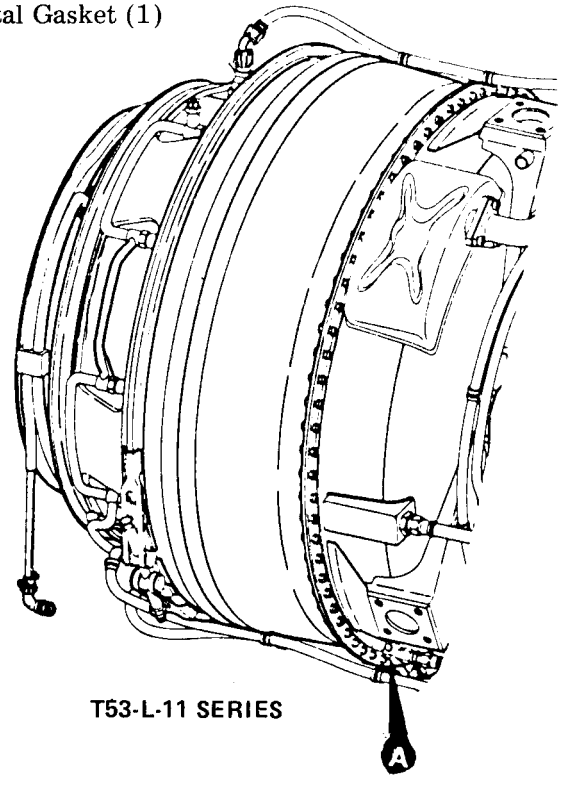
INITIAL SETUP

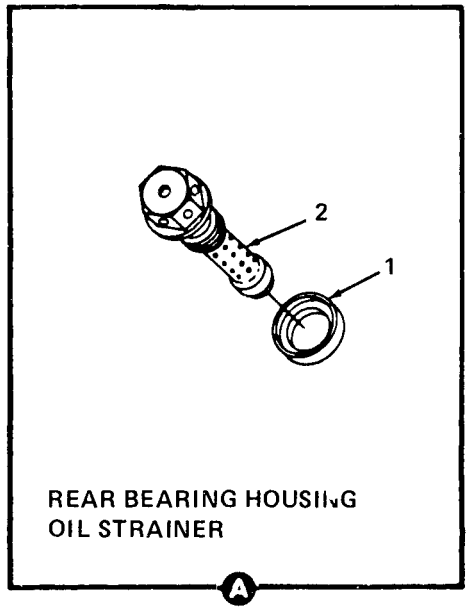
Applicable Configuration
T53-L-11 Series Engines

Consumable Materials
Lockwire (item 41, 42 or 43, Appendix D)

References
Appendix G, Table G-3, Reference Number 60

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
	CAUTION **In following items 1 and 2, insure that rear bearing housing oil strainer 1-110-114-01 is installed.**	
1. Metal Gasket (1)		**Install** onto rear bearing housing oil strainer (2).
2. Strainer (2)	**Refer** to Appendix G, table G-3, reference number 60.	**Install** into diffuser housing. **Tighten** to a torque of 80 lb-in to 100 lb-in (0.9 kg/m to 1.2 kg/m). **Lockwire.**





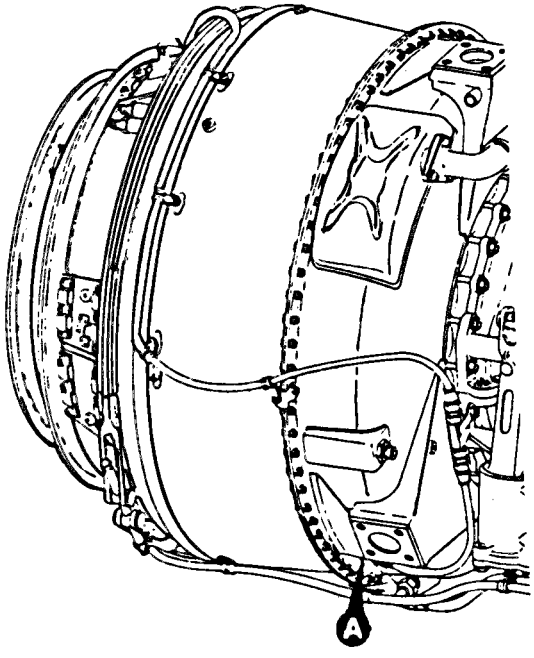
8-18. Rear Bearing Housing Oil Strainer (T53-L-13B/703 Engines) - Installation

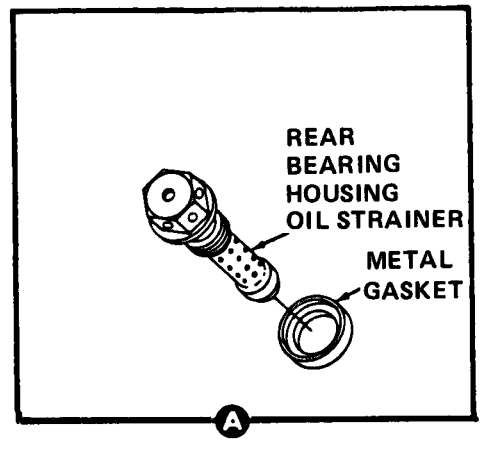
INITIAL SETUP

Applicable Configuration
T53-L-13B/703 Engines

Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
	CAUTION **Rear bearing housing oil strainer 1-110-114-08 shall be installed only in diffuser housing 1-110-230-08 and 1-110-230-15.**	
	NOTE The internal oil passage ID of the 1-110-114-08 oil strainer is 0.0755 inch to 0.0765 inch.	
1. Metal Gasket	Use new gasket when performing this action.	**Install** on rear bearing housing oil strainer.



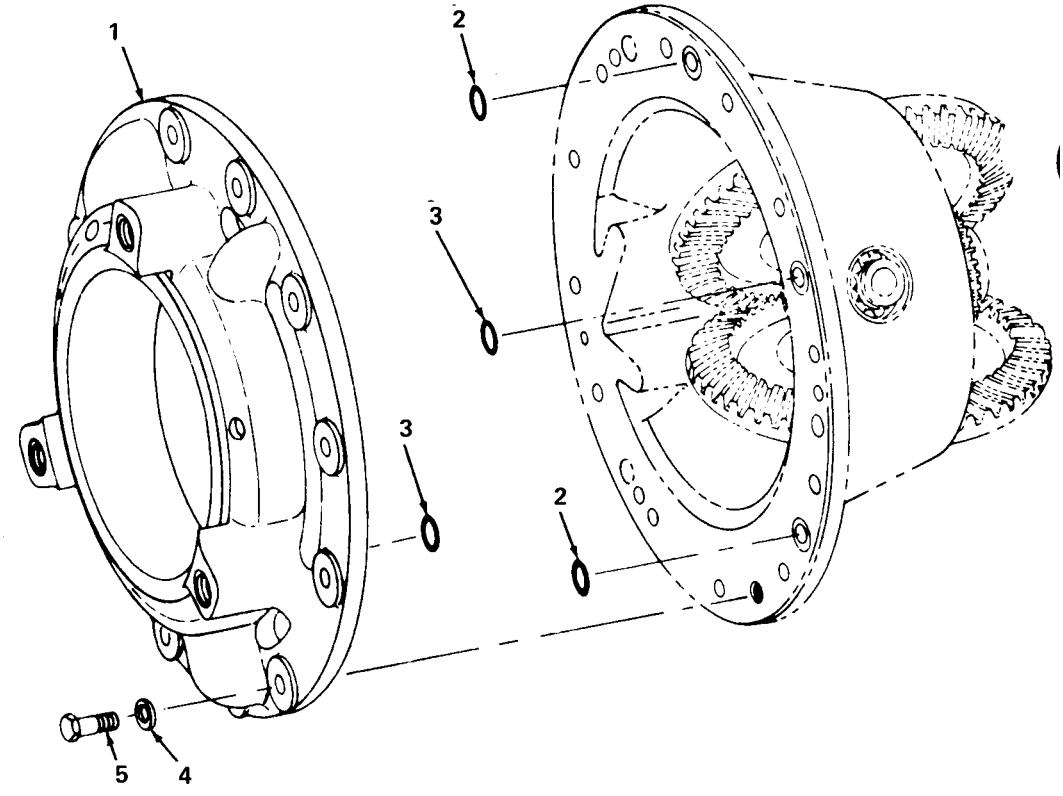


2. Strainer		Screw into diffuser housing. **Tighten** to a torque of 80 lb-in. to 100 lb-in. (0.9 kg/m to 1.2 kg/m). **Lockwire.**

8-19. Oil Transfer Support Assembly - Removal (AVIM)

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/		
1. 12 Bolts (5) and Washers (4)		**Remove.**
2. Oil Transfer Support Assembly (1)		**Install** three 1/4-20 threaded puller screws, three inches long, into oil transfer support assembly (1). **Tighten** screws evenly.

8-19. Oil Transfer Support Assembly - Removal (AVIM) - Continued

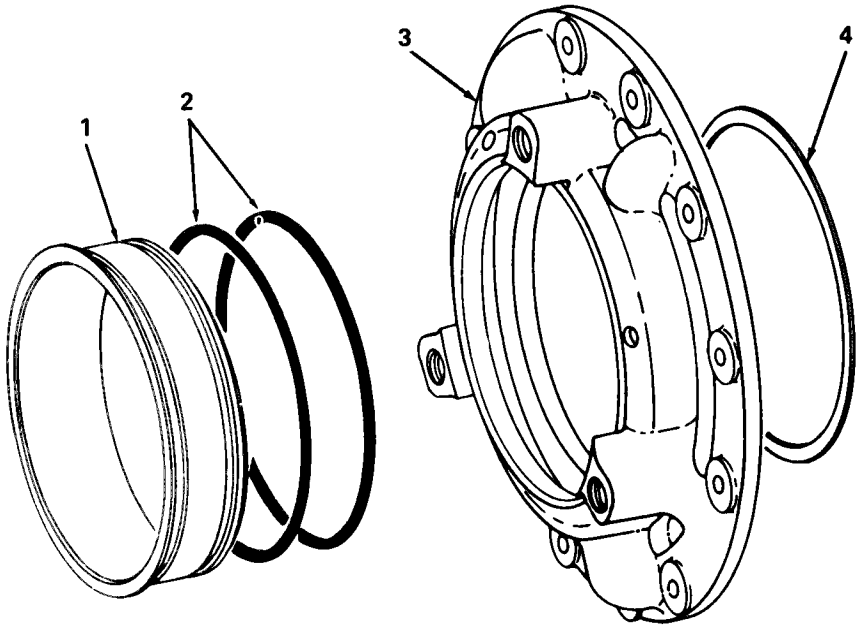
LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		
3. Oil Transfer Support Assembly (1) and Packings (2 and 3)		**Remove.**
4. Oil Transfer Support Assembly (1).		**Remove** puller screws.

8-20. Oil Transfer Support Assembly - Disassembly (AVIM)

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/		
1. Retaining Ring (4)		**Remove.**



2. Sleeve (1) and support (3)	Use fiber drift and arbor press.	**Press** sleeve (1) from support (3)
3. Packing (2)		**Remove.**

8-21. Oil Transfer Support Assembly - Inspection (AVIM)

INITIAL SETUP

Applicable Configuration
All

References
Para H-26, H-20, H-21

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/		
1. All Parts	Refer to paragraph H-26 for blend-repair procedures.	**Inspect** for nicks, burrs, and scratches. **Blend-repair.**
2. Threaded Parts		**Inspect** for damaged parts. **Replace** damaged parts.
3. All Parts		Visually **inspect** for cracks, distortion and excessive wear. **Replace** all damaged parts.
4. Support	Refer to paragraph H-20 for inspection by fluorescent penetrant. Refer to paragraph H-21 for inspection by dye-penetrant.	**Inspect** by fluorescent penetrant or dye-penetra

8-22. Oil Transfer Support Assembly - Assembly (AVIM)

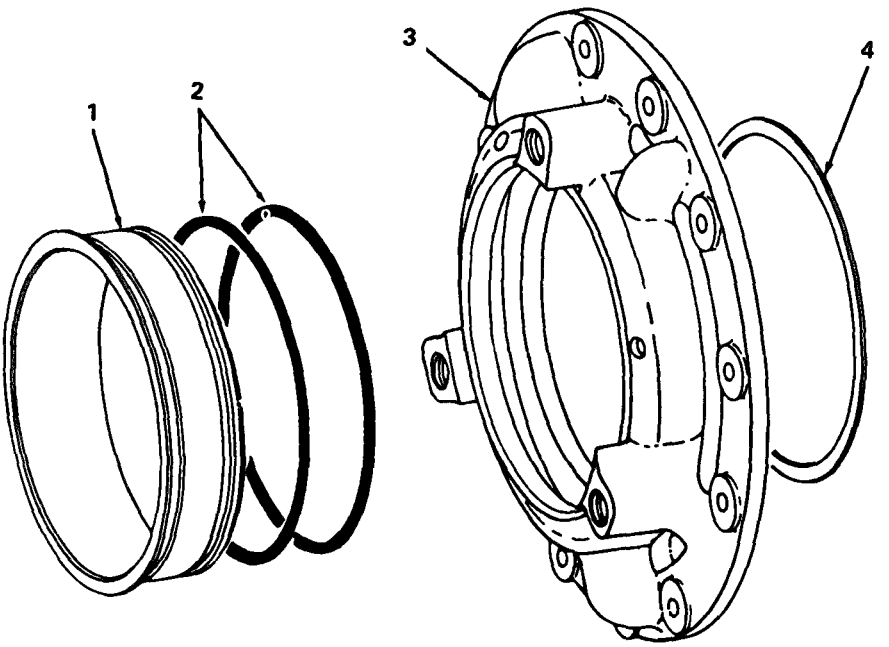
Applicable Configuration
All

Special Tools
Arbor Press
Fiber Drift

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/		

6-22. Oil Transfer Support Assembly - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		
1. Packing (2)		**Install** on sleeve (1).
2. Sleeve (1)	Use arbor press and fiber drift.	**Press** sleeve (1) into support (3). Secure with retaining ring (4).



6-23. Oil Transfer Support Assembly - Installation (AVIM)

INITIAL SETUP

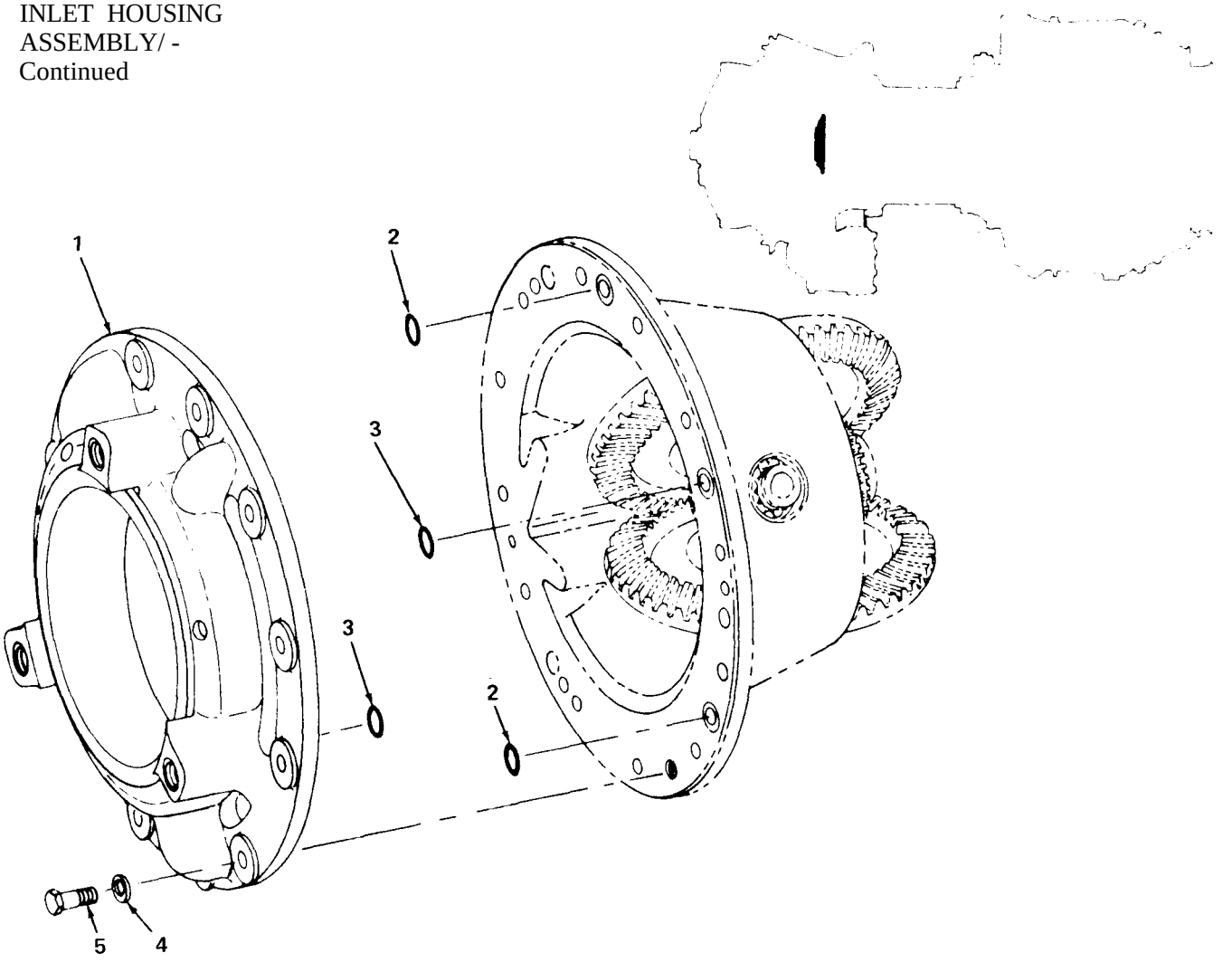
Applicable Configuration
All

Consumable Materials
Lubricating Oil (item 46 or 47, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/		

8-23. Oil Transfer Support Assembly - Installation (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		



1. Packings (3 and 2)		**Install** packings (3 and 2) on rim of accessory drive carrier assembly and on rim of oil transfer support assembly.
2. Oil Transfer Support Assembly (1)	Do not lubricate bolts.	**Position** oil transfer support assembly on flange of accessory drive carrier and **secure** with bolts (5) and washers (4). **Lockwire** bolts.
3. Oil Holes in Oil Transfer Support Housing Assembly	Use suitable oil flow test fixture.	**Plug.**

8-23. Oil Transfer Support Assembly - Installation (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		
4. Two Oil Ports in Mounting Pad of Overspeed Governor and Tachometer Drive Assembly on Inlet Housing Assembly		**Close** off.
	NOTE An automotive-type brake bleeder may be used as an oil supply. **Insure** that lubricating oil (item 46, or 47, Appendix D) is used.	
5. Oil		**Supply** oil at 25 psi to 30 psi (1.76 kg/sq cm to 2.11 kg/sq cm) to fitting on fixture from brake pressure bleeder. **Observe** impingement of oil stream on rollers of powershaft bearing.
6. Pressure Equipment		**Bleed** off pressure and **disconnect** equipment.

6-24. Lubrication Pressure Manifold, Oil Pressure Hoses and Scavenge Hoses (T53-L-11 Series Engines) - Removal

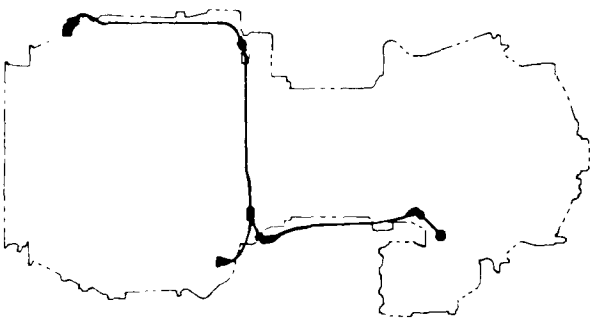
INITIAL SETUP

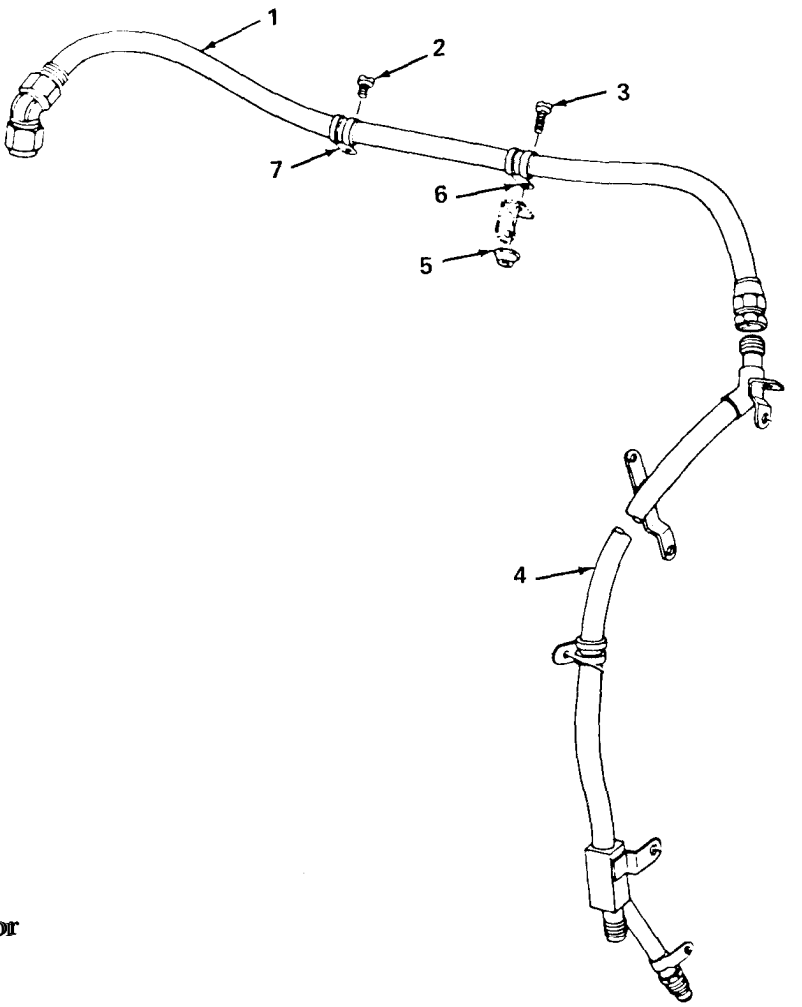
Applicable Configuration
T53-L-11 Series Engines

References
Para 1-79 and 2-52

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/		
1. Engine Oil	Refer to paragraph 1-79.	**Drain.**

8-24. Lubrication Pressure Manifold, Oil Pressure Hoses and Scavenge Hoses (T53-L-11 Series Engines) - Removal - Continued

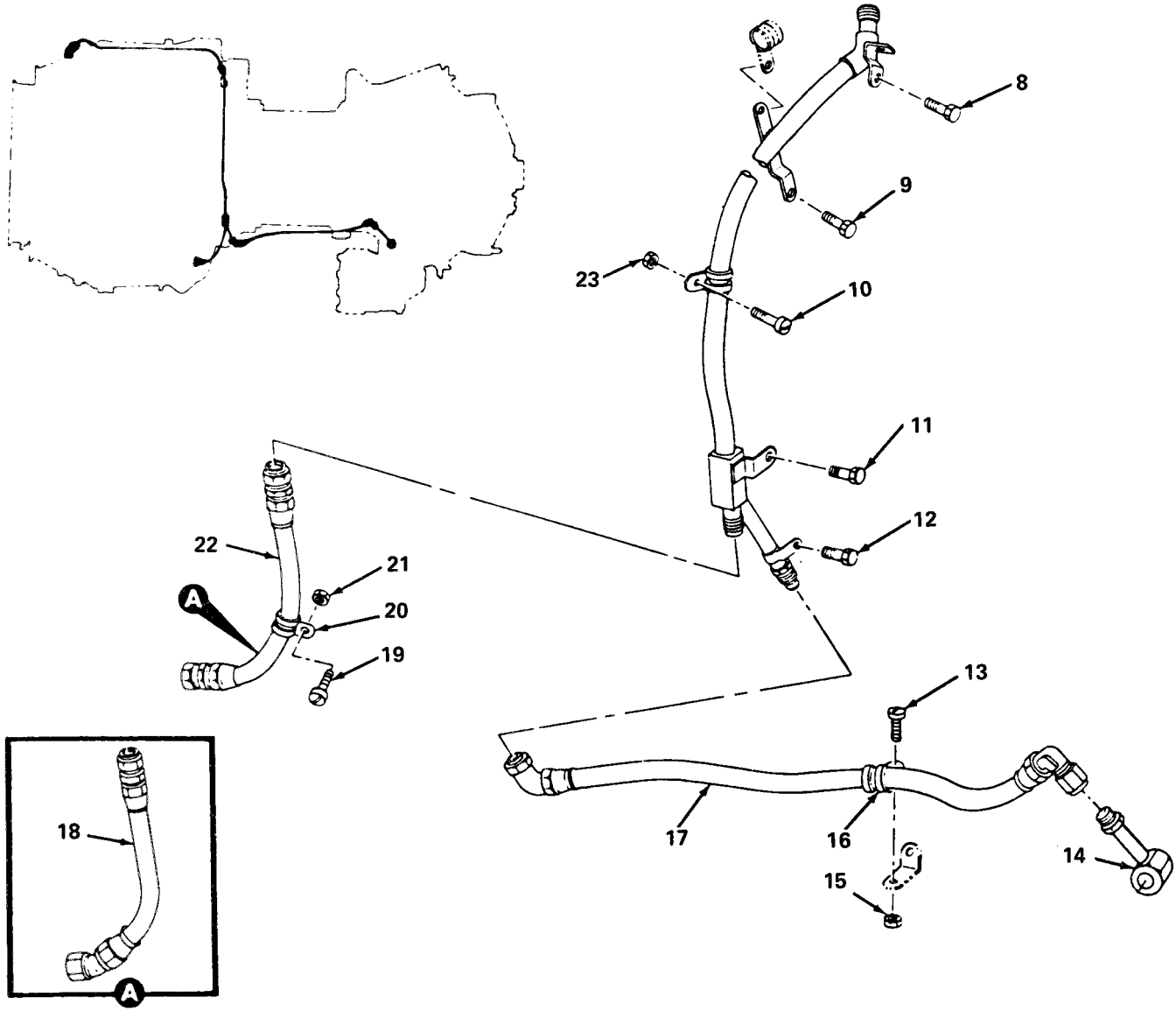
LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
2. No. 3 and 4 Bearings Oil Pressure Hose (1)		**Disconnect** from oil strainer housing and from oil pressure manifold assembly (4).
3. Screws (2 and 3) and nuts (5)		**Remove** all screws and nuts which secure clamps (6 and 7) to engine.
4. Hose (1)		**Remove.**



1. Oil Pressure Hose
2. Screw
3. Screw
4. Manifold Assy
5. Nut
6. Clamp
7. Clamp
8. Screw
9. Screw
10. Screw
11. Screw
12. Screw
13. Screw
14. Adapter
15. Nut
16. Clamp
17. Inlet Housing Oil Pressure Outlet Hose
18. No. 2 Bearing Oil Pressure Hose
19. Screw
20. Clamp
21. Nut
22. No. 2 Bearing Oil Pressure Hose
23. Clamp
24. No. 2 Bearing Oil Scavenge Hose
25. No. 3 and 4 Bearings Oil Scavenge Hose
26. Nut
27. Clamp
28. Screw
29. Clamp
30. Clamp
31. Screw
32. Nut
33. Clamp
34. Screw
35. Adapter
36. Packing
37. Connector

8-24. Lubrication Pressure Manifold, Oil Pressure Hoses and Scavenge Hoses (T53-L-11 Series Engines) - Removal - Continued

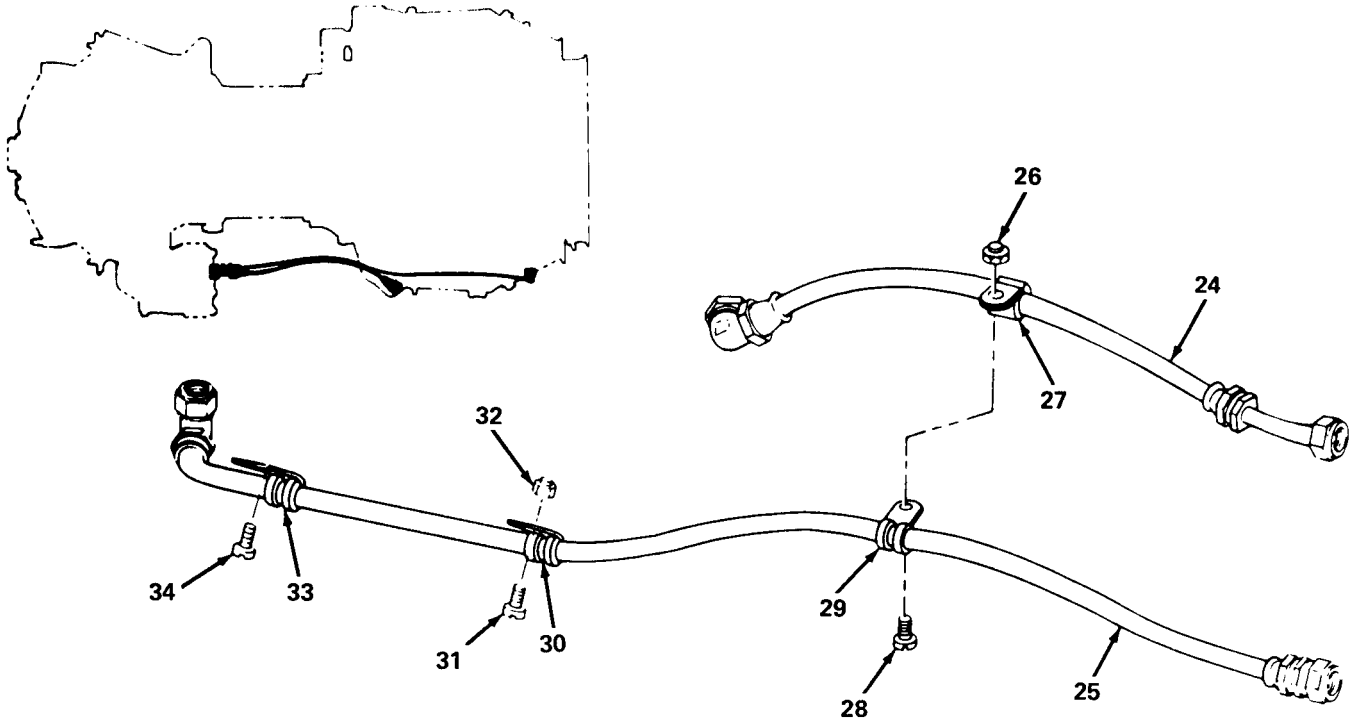
LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		



5. No. 2 Bearing Oil Pressure Hose (18 or 22)	Screw (19), nut (21), and clamp (20) are not required when hose (17) 1-300-054-01 is installed.	**Disconnect** from oil pressure manifold assembly (4) and from fitting on diffuser housing. **Remove** screw (19) that secures hose to engine. **Remove** hose.
6. Inlet Housing Oil Pressure Outlet Hose (17)		**Disconnect** from oil manifold assembly (4) and from adapter (14).

8-24. Lubrication Pressure Manifold, Oil Pressure Hoses and Scavenge Hoses (T53-L-11 Series Engines) - Removal - Continued

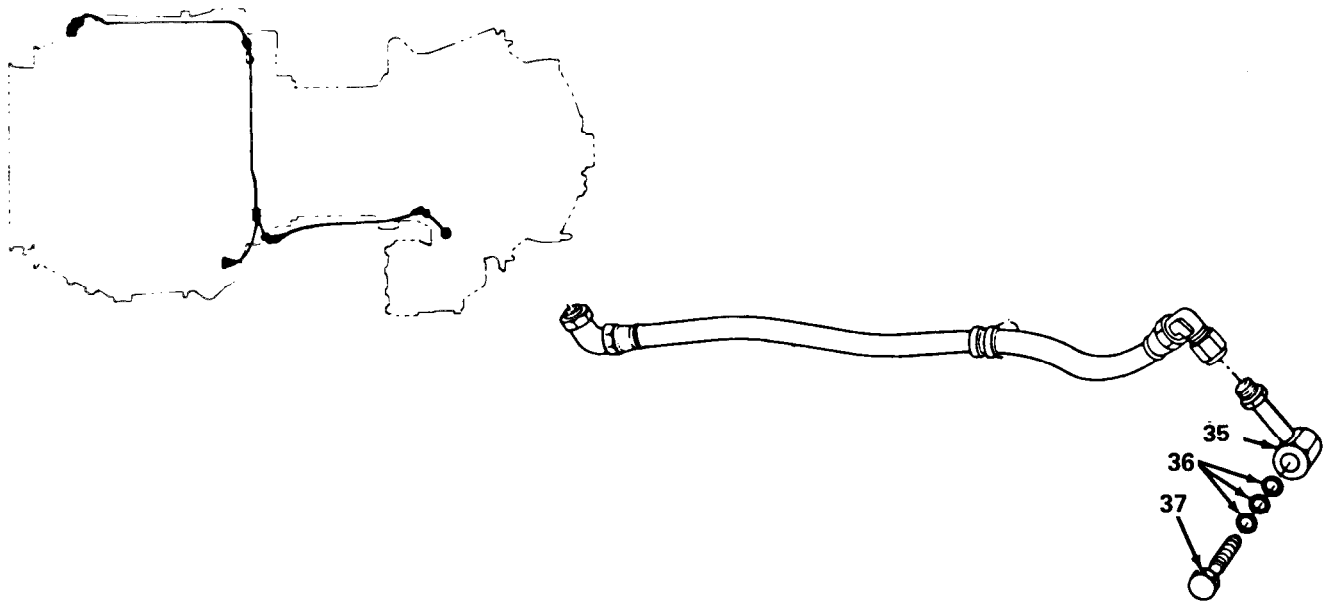
LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
7. Screw (13) and Nut (15)	Screw and nut secure clamp (16) to engine.	**Remove.**
8. Hose		**Remove.**
9. Screws (10), Nuts (23) and Bolts (8, 9, 11, and 12)	Because of inaccessibility of bolt (11) on T53-L-11 series engines, the interstage bleed actuator assembly shall be removed before the oil pressure manifold assembly (4) can be removed. Refer to paragraph 2-52.	**Remove** screws, nuts and bolts which secure oil pressure manifold assembly (4) to engine. **Remove** oil pressure manifold assembly (4).



10. No. 3 and 4 Bearings Oil Scavenge Hoses (25)		**Disconnect** from accessory drive gearbox fitting and from oil tube connector.
11. No. 2 Bearing Oil Scavenge Hose (24)		**Disconnect** from accessory drive gearbox fitting and from housing fitting.
12. Screws (28, 31, and 34) and Nuts (26 and 32)	Screws and nuts secure clamps (27, 29, 30, and 33) to engine.	**Remove.**

-24. Lubrication Pressure Manifold, Oil Pressure Hoses and Scavenge Hoses (T53-L-11 Series Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
DIFFUSER HOUSING/ - Continued		
13. Hoses		**Remove.**
14. Connector (37), Packing (36) and Adapter (35)		**Remove.**



6-25. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Removal

INITIAL SETUP

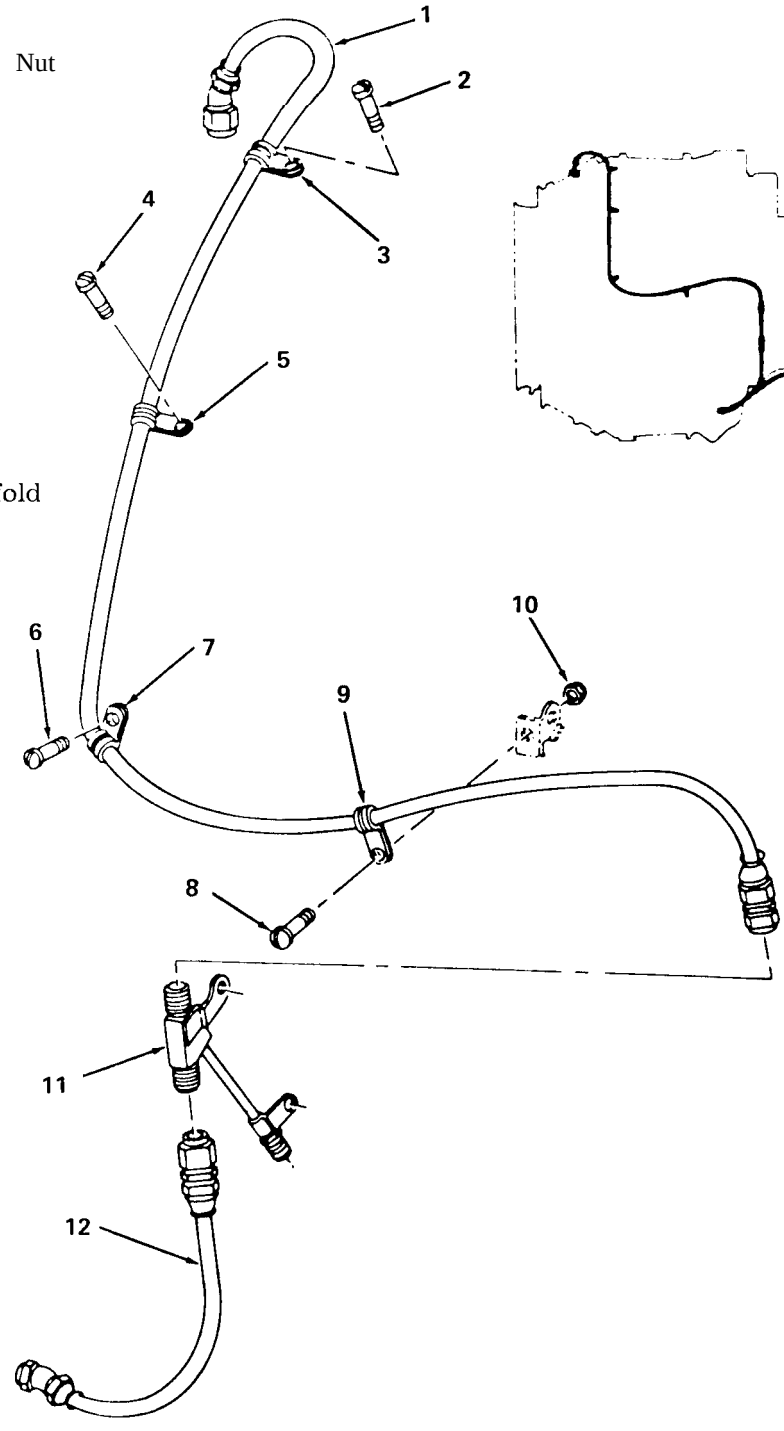
Applicable Configuration
T53-L-13B/703 Engines

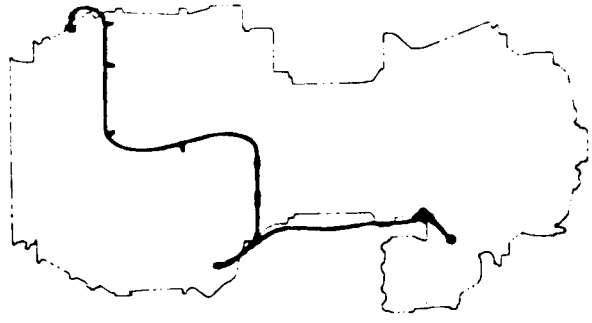
References
Para 1-79, 2-52

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Oil	Refer to paragraph 1-79.	**Drain.**

8-25. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Screws (2, 4, and 6)		**Remove** from clamps (3, 5 and 7).
3. Screws (8) and Nut (10)		**Remove** from clamp (9).

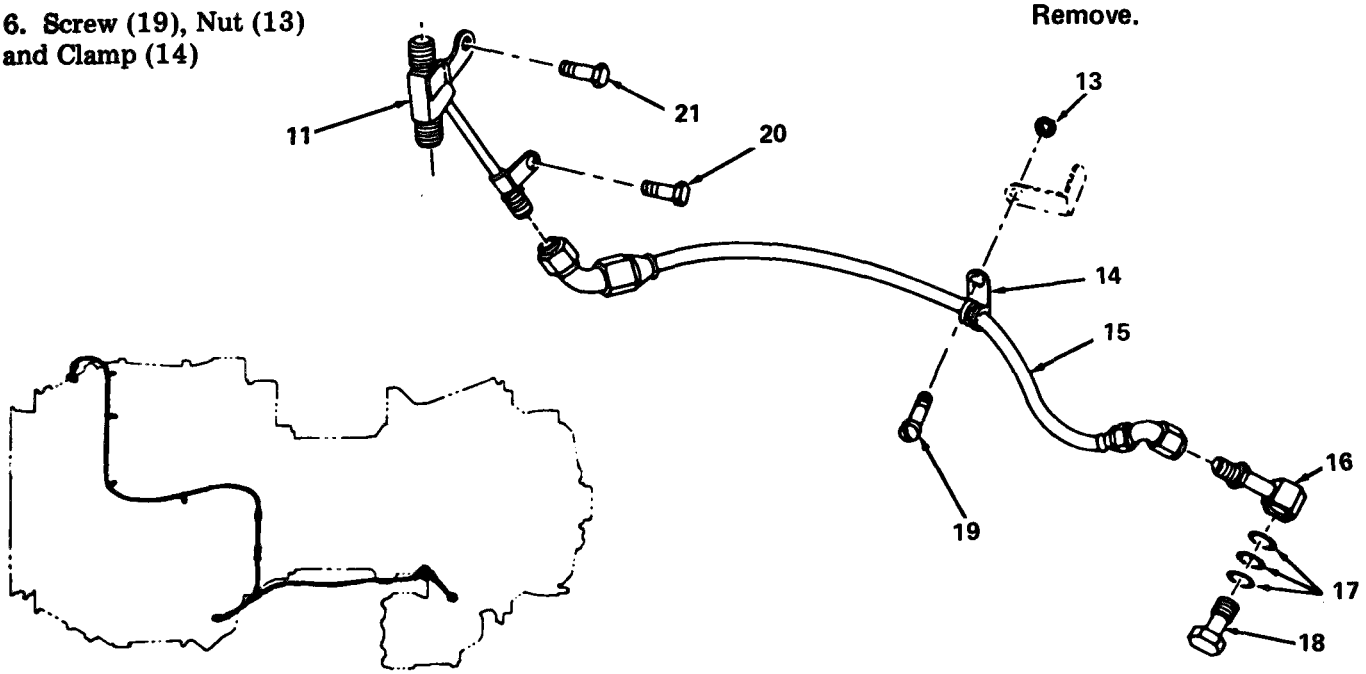




1. Hose Assy
2. Screw
3. Clamp
4. Screw
5. Clamp
6. Screw
7. Clamp
8. Screw
9. Clamp
10. Nut
11. Pressure Manifold
12. Hose Assy
13. Nut
14. Clamp
15. Hose Assy
16. Adapter
17. Packing
18. Connector
19. Screw
20. Bolt
21. Bolt
22. Packing
23. Connector
24. Nut
25. Clamp
26. Nut
27. Hose Assy
28. Union
29. Screw
30. Clamp
31. Screw
32. Clamp
33. Screw
34. Packing
35. Packing
36. Union
37. Hose Assy

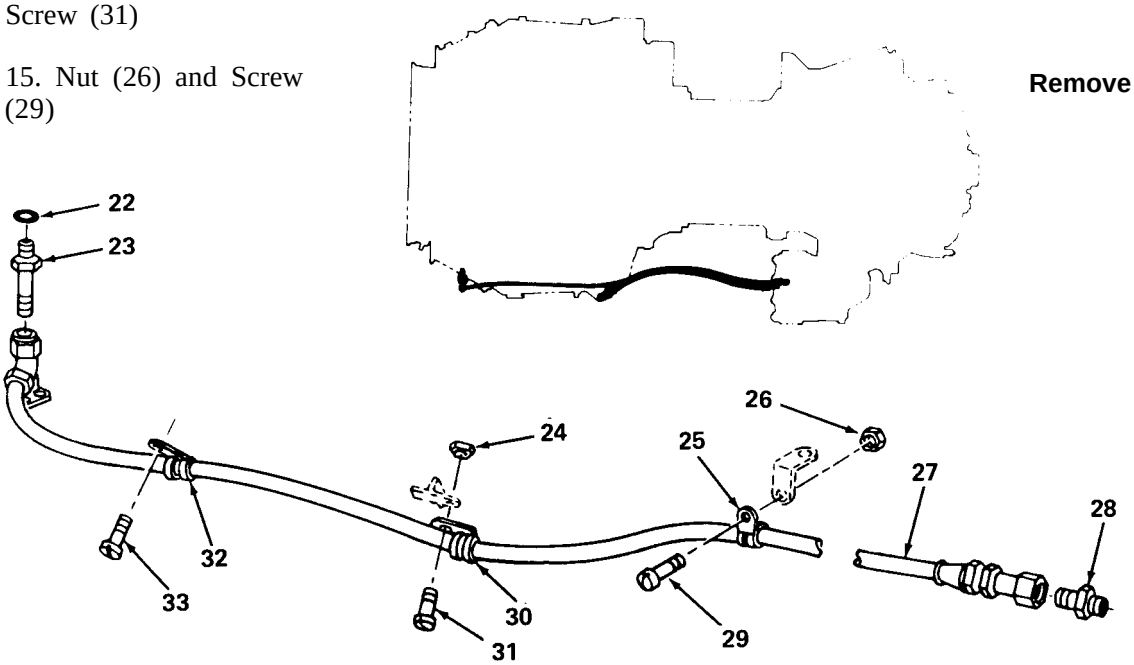
8-25. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
4. Hose Assembly (1)		**Disconnect** from oil strainer housing adapter on top of combustion chamber assembly and from lubrication pressure manifold (11). **Remove.**
5. Hose Assembly (12)		**Disconnect** from No. 2 bearing oil pressure fitting on diffuser housing assembly and from lubrication pressure manifold (11). **Remove.**
6. Screw (19), Nut (13) and Clamp (14)		**Remove.**
7. Hose Assembly (15)		**Disconnect** from adapter (16) and from lubrication pressure manifold (11). **Remove.**
8. Connector (18)		**Remove** from inlet housing.
9. Packings (17)		**Remove** from inlet housing.
10. Adapter (16)		**Remove** from inlet housing.

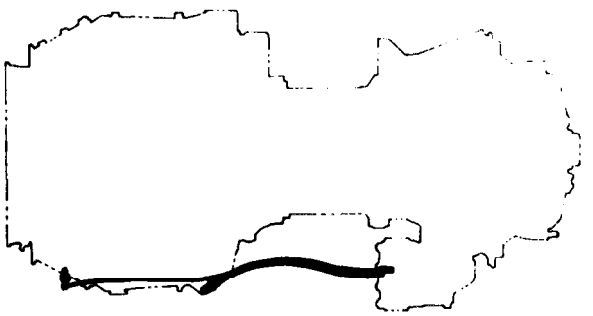
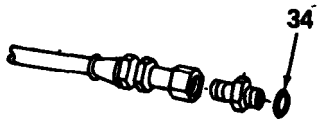
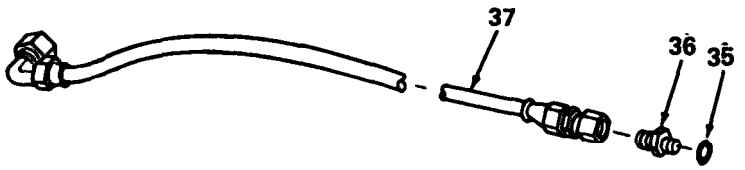


8-25. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
11. Bolts (20 and 21)	Because of the inaccessibility of bolt (20) and (21), the interstage bleed actuator assembly will have to be removed before the lubrication pressure manifold (11) can be removed. Refer to paragraph 2-52.	**Remove** bolts securing lubrication pressure manifold (11) to engine.
12. Lubrication Pressure Manifold (11)		**Remove.**
13. Screw (33)		**Remove** from clamp (32).
14. Nut (24) and Screw (31)		**Remove** from clamp (30).
15. Nut (26) and Screw (29)		**Remove** from clamp (25).
16. Hose Assembly (27)		**Disconnect** from connector (23) at bottom of combustor turbine assembly.
17. Hose Assembly (27)		**Disconnect** from union 28) on accessory drive gearbox assembly. **Remove** hose assembly,
18. Connector (23) and Packing (22)		**Remove** from combustor turbine assembly.



8-26. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) -

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
19. Packing (22)		**Remove** from connector.
20. Hose Assembly (37)		**Disconnect** from oil tube connector at diffuser housing assembly.
21. Hose Assembly (37)		**Disconnect** from union (36) on accessory drive gearbox assembly. **Remove** hose assembly.
		
22. Unions (28 and 36) and Packings (34 and 35)		**Remove** from accessory drive gearbox assembly.
23. Packings (34 and 35)		**Remove** from unions.
		

8-26. Lubrication pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses - Inspection

INITIAL SETUP

Applicable Configuration
All

References
Para 7-5 and H-30

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ -		
1. Hoses	**Repair or replace** damaged hoses as outlined in paragraph 7-5.	**Inspect** for damage as out lined in paragraph 7-5.
2. Pressure Manifold	**Replace** manifolds if cracks are noted.	**Inspect** for cracks.
3. Manifold Connectors	**Repair** damaged threads as outlined in paragraph H-30. **Replace** manifold if threads are damaged beyond repair.	**Inspect** for damaged threads

8-27. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-11 Series Engines) - Installation

INITIAL SETUP

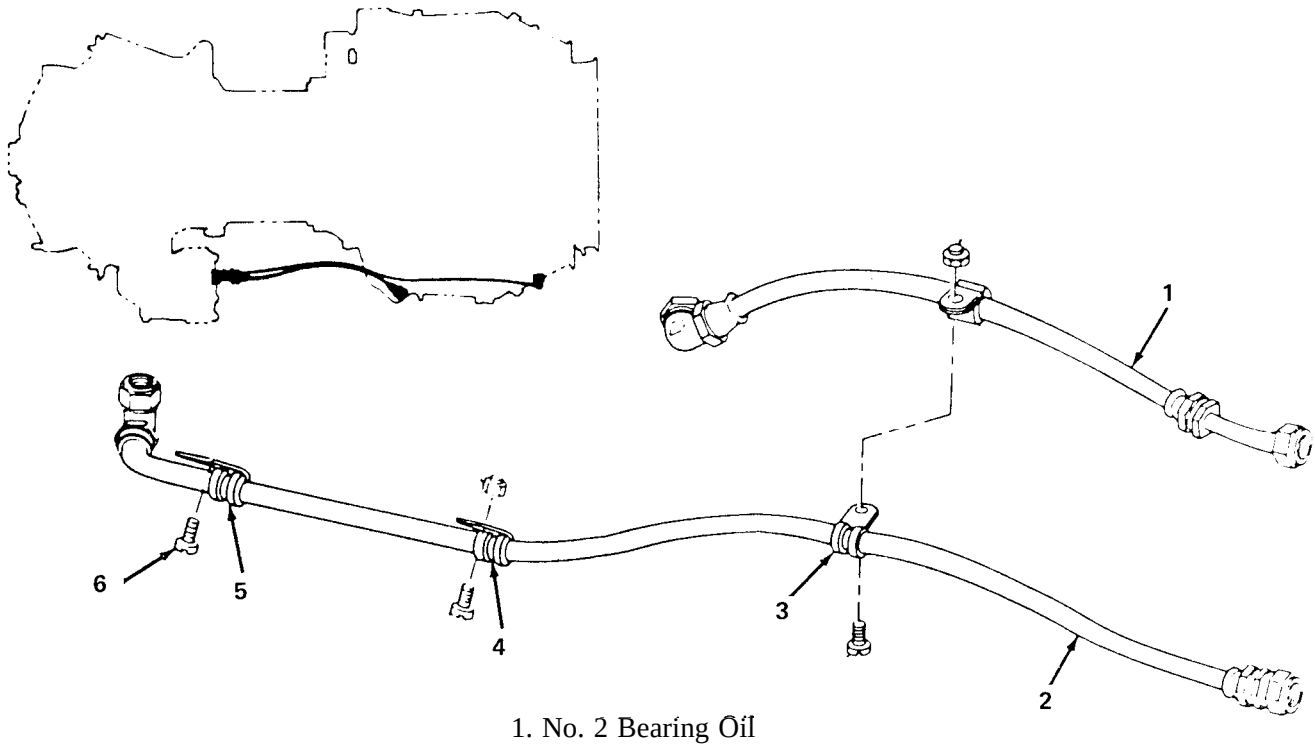
Applicable Configuration
T53-L-11 Series Engines

Special Tools
Hose (1-300-054-01)

Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

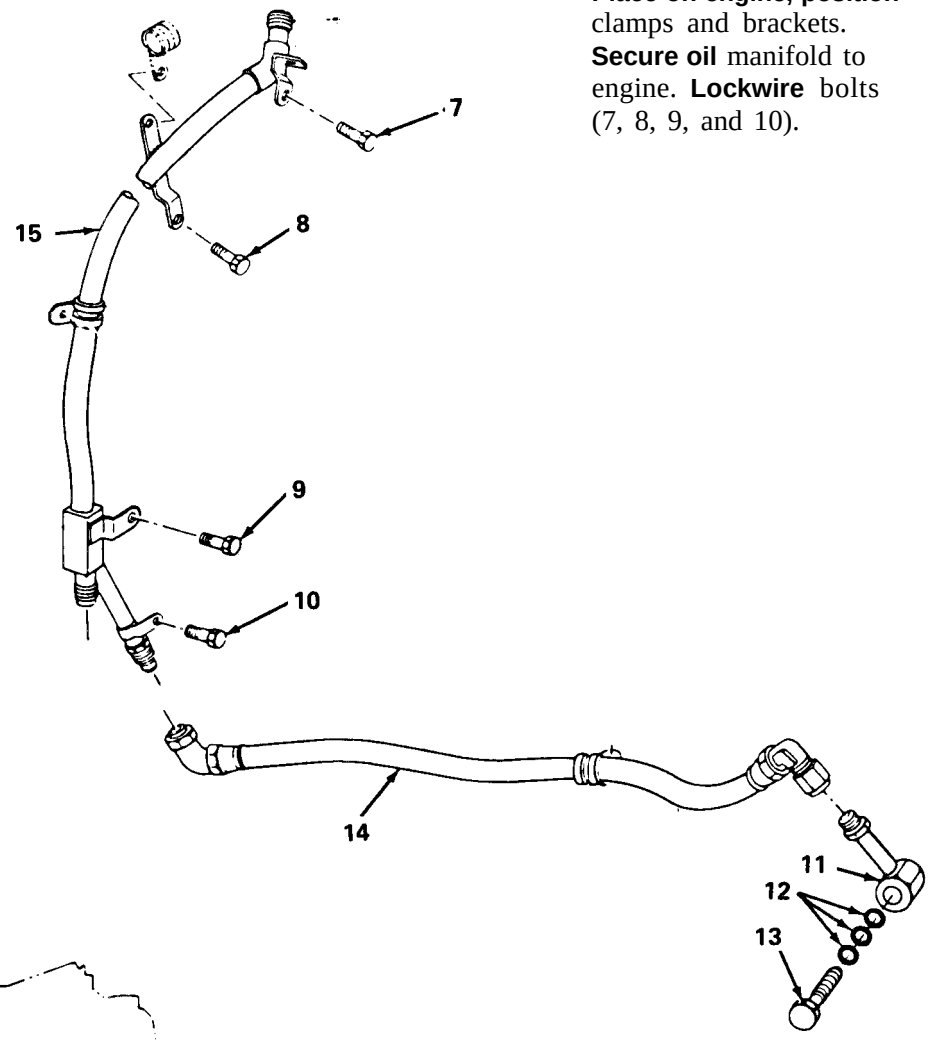
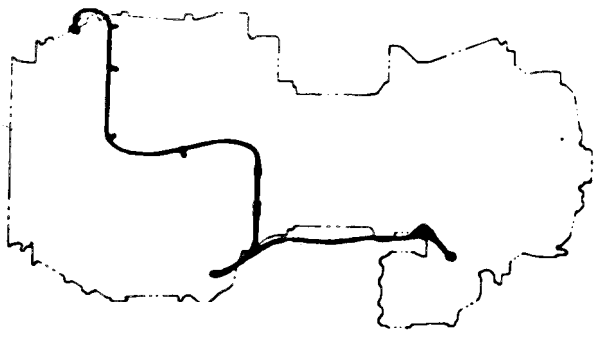
References
Para 2-60, 2-61
Appendix G, Table G-3, Reference Number 54

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. No. 2 Bearing Oil Scavenge Hose (1)		**Connect** to accessory drive gearbox fitting and diffuser housing fitting.
2. No. 3, No. 4 Bearings Oil Scavenge Hose (l), (2)		**Connect** to accessory drive gearbox fitting and oil tube connector.
3. Clamps (3, 4, and 5)		**Position, secure** hoses to engine. **Lockwire** screw (6).



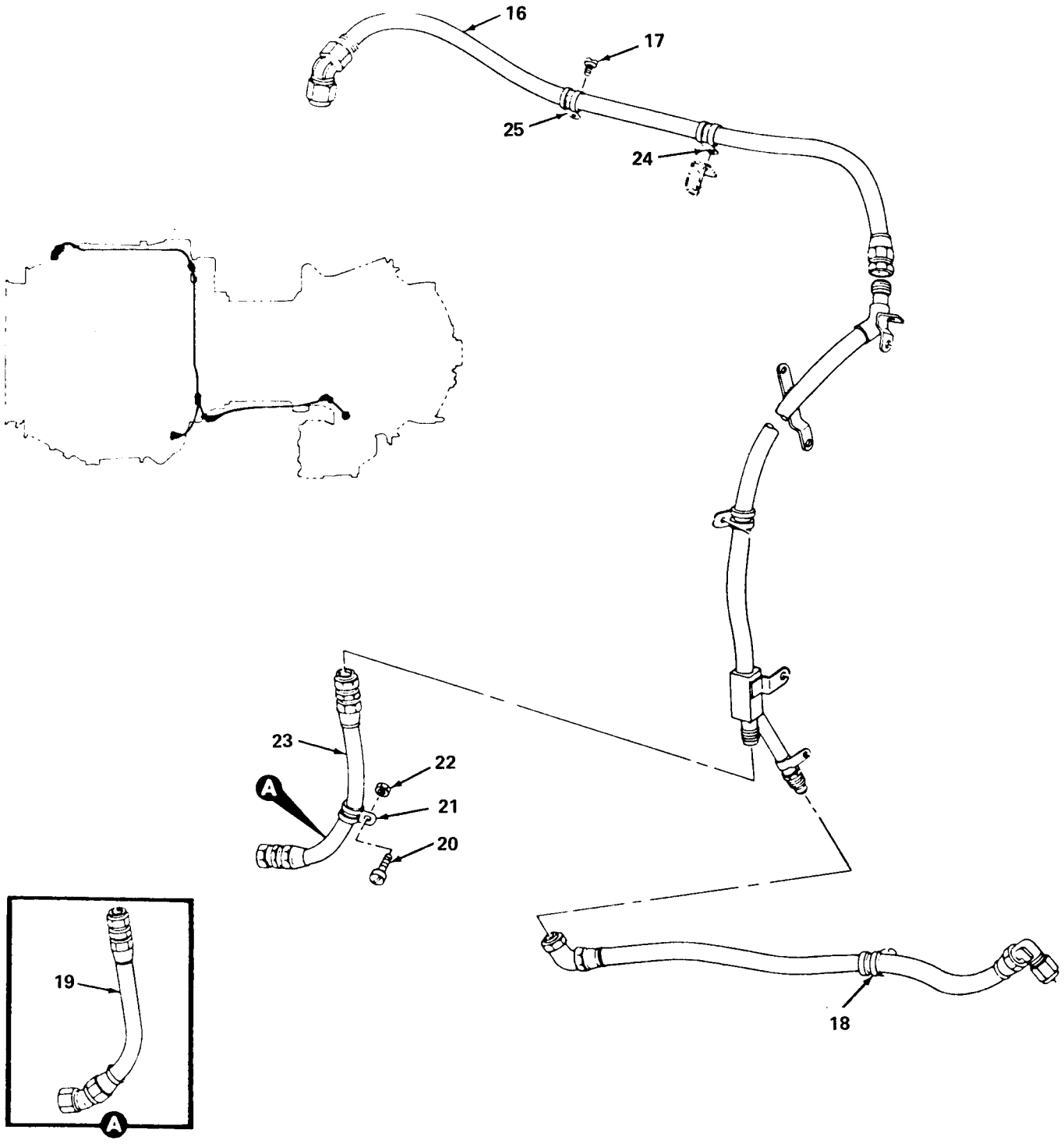
1. No. 2 Bearing Oil Scavenge Hose
2. No. 3 and No. 4 Bearings Oil Scavenge Hose
3. Clamp
4. Clamp
5. Clamp
6. Screw

6-27. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
4. Oil Manifold (15) 7. Bolt 8. Bolt 9. Bolt 10. Bolt 11. Adapter 12. Packing 13. Connector 14. Inlet Housing Oil Pressure Outlet Hose 15. Oil Manifold 16. No. 3 and No. 4 Bearings Oil Pressure Hose 17. Screw 18. Clamp 19. No. 2 Bearing Oil Pressure Hose 20. Screw 21. Clamp 22. Nut 23. No. 2 Bearing Oil Pressure Hose 24. Clamp 25. Clamp		**Place on engine, position** clamps and brackets. **Secure oil** manifold to engine. **Lockwire** bolts (7, 8, 9, and 10).
		
5. Interstage Bleed Actuator	Refer to para 2-61.	**Install. Refer** to para 2-61.

8-27. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-11 Series Engines) - Installation - Continued

ENGINE/ - Continued



8-27. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-11 Series Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
6. Packings (12)		**Install** on connector (13).
7. Adapter (11)		**Secure** to inlet housing with connector.
	CAUTION **To prevent damage to adapter tube, use wrench to hold adapter (11) when tightening connector of inlet housing oil pressure outlet hose (14).**	
8. Met Housing Oil Pressure Outlet Hose (14)		**Connect** to oil pressure manifold assembly (15) and adapter (11).
9. Clamp (18)		**Position.**
10. Inlet Housing Oil Pressure Outlet Hose (14)		**Secure** to engine.
11. No. 2 Bearing Oil Pressure Hose (23 or 19)		**Connect** to oil pressure manifold assembly (15) and diffuser housing fitting.
12. No. 2 Bearing Oil Pressure Hose (23 or 19)	A clamp, screw, and nut are not required when hose (1-300-054-01) is installed.	**Secure** with clamp (21), screw (20), and nut (22).
13. No. 3, NO. 4 Bearings Oil Pressure Hose (16)	Refer to Appendix G, table G-3, reference number 54.	**Connect** to oil strainer housing and oil pressure manifold assembly (15). **Hold oil** strainer housing nut, **tighten** hose connector nut as required.
14. Clamps (25 and 24)		**Position.**
15. No. 3, No. 4 Bearings Oil Pressure Hose (16)		**Secure** to engine. **Lockwire** screw (17).

8-28. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Installation

INITIAL SETUP

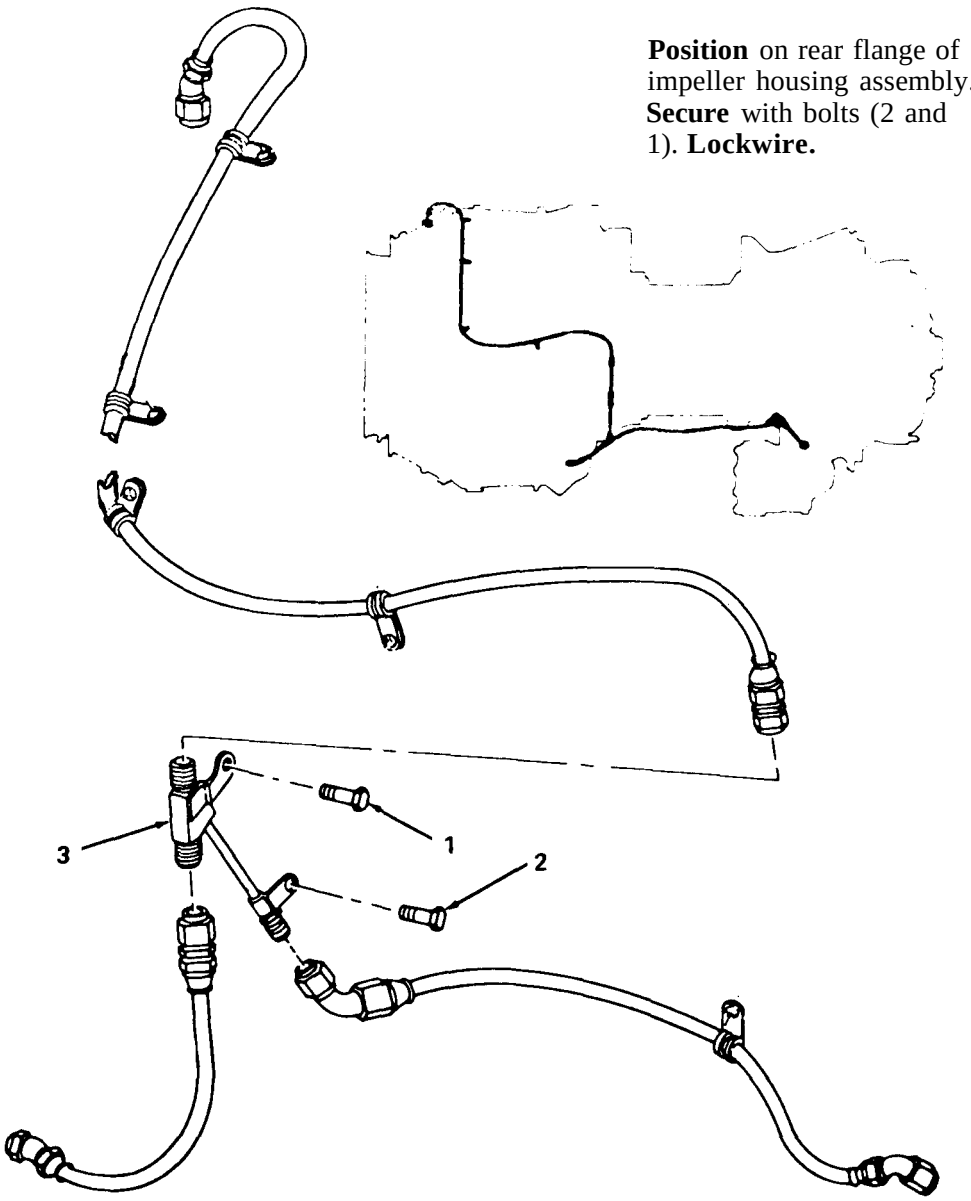
Applicable Configuration
T53-L-13B/703 Engines

References
Para 2-60
Appendix G, Table G-4, Reference Number 58

Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

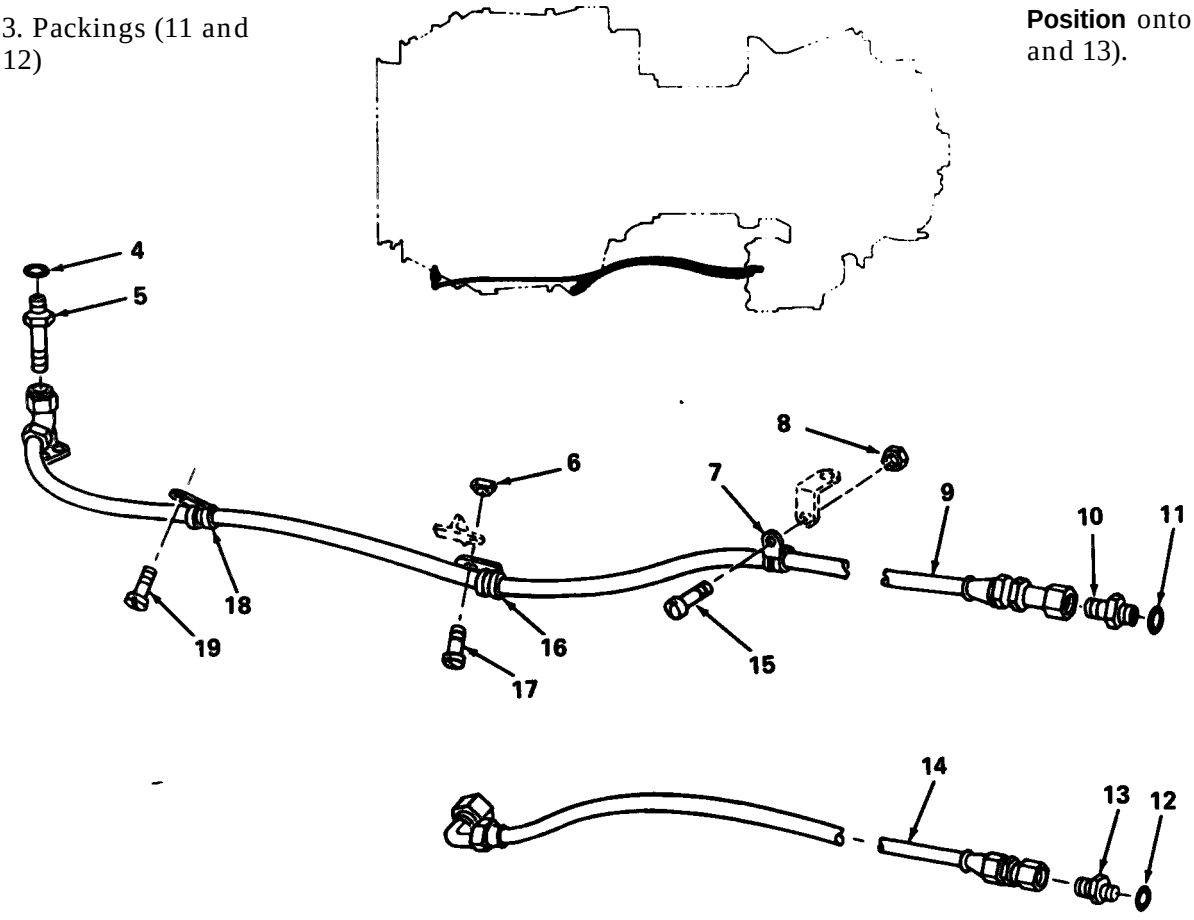
LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Lubrication Pressure Manifold (3)		**Position** on rear flange of impeller housing assembly. **Secure** with bolts (2 and 1). **Lockwire.**

1. Bolt
2. Bolt
3. Pressure Manifold
4. Packing
5. Connector
6. Nut
7. Clamp
8. Nut
9. Hose Assy
10. Union
11. Packing
12. Packing
13. Hose Assy
14. Hose Assy
15. Screw
16. Clamp
17. Screw
18. Clamp
19. Screw
20. Nut
21. Clamp
22. Hose Assy
23. Adapter
24. Packing
25. Connector
26. Screw
27. Hose Assy
28. Hose Assy
29. Screw
30. Clamp
31. Screw
32. Clamp
33. Screw
34. Clamp
35. Screw
36. Nut



8-28. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Installation - Continued

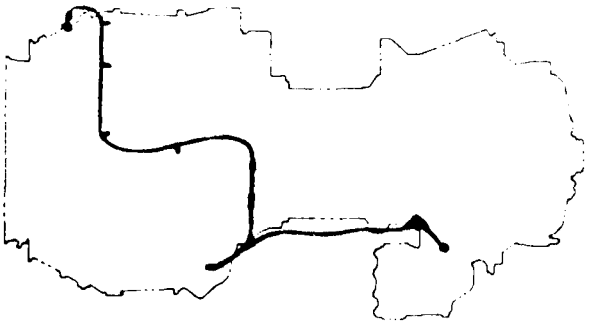
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Interstate Bleed Actuator Assembly	Refer to paragraph 2-60.	**Reinstall.**
3. Packings (11 and 12)		**Position** onto unions (10 and 13).

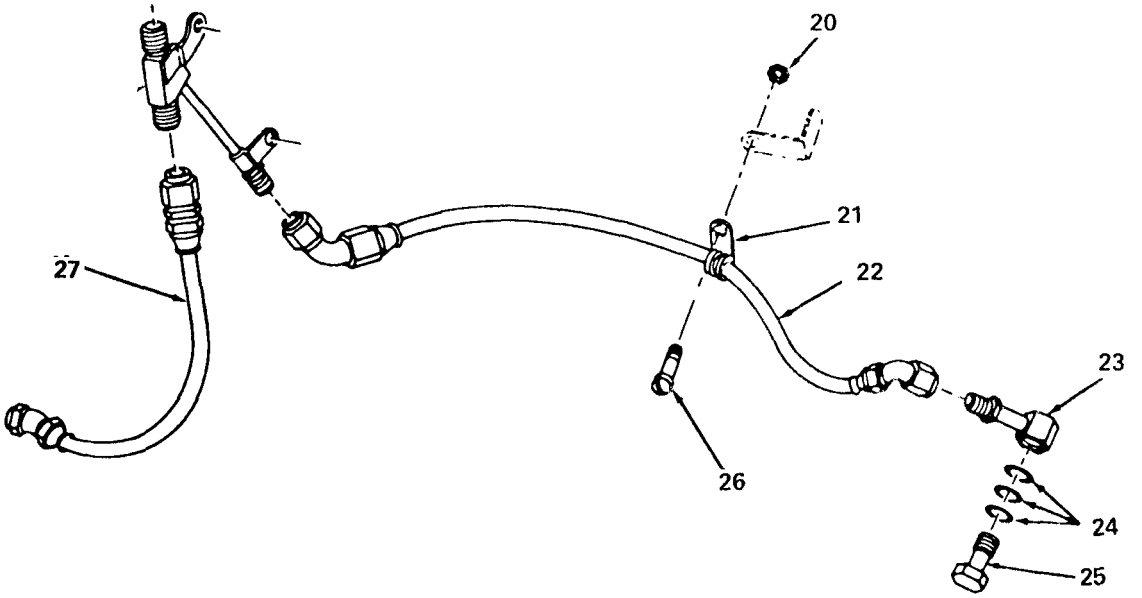


4. Unions (10 and 13)		**Install into** accessory drive gearbox assembly. **Tighten** as required.
5. Hose Assembly (14)		**Connect** to oil tube connector at bottom of diffuser housing assembly and union (13) on accessory drive gearbox. **Tighten** hose connectors.
6. Packing (4)		**Position** onto connector (5).

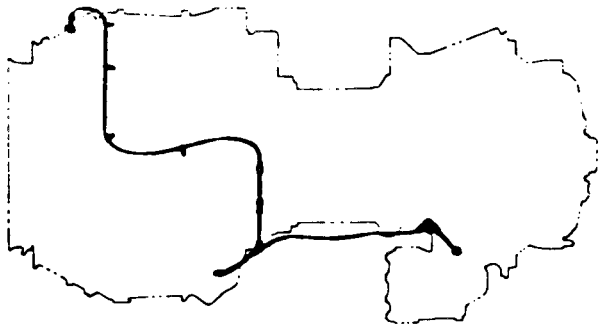
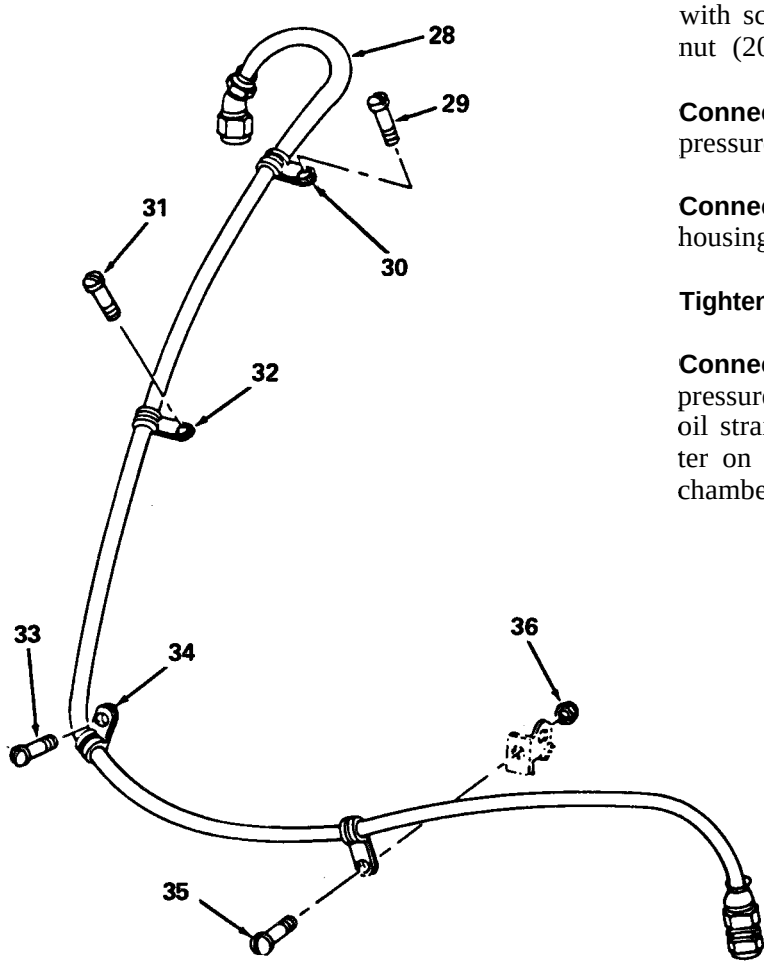
8-28. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
7. Connector (5)		**Install** into bottom of combustor turbine assembly. **Tighten** as required. **Lockwire.**
8. Hose Assembly (9)		**Connect** to connector (5) and union (10) on accessory drive gearbox. **Tighten** hose connectors.
9. Clamp (7)	Bracket is located at bottom of interstage bleed actuator assembly.	**Position** on outside of bracket, **secure** with screw (15) and nut (8).
10. Clamp (16)		**Secure** to bracket on forward flange on combustion chamber housing with screw (17), nut (6). **Secure** clamp (18) with screw (19).





8-28. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
11. Packings (24)	Do not tighten connector until hose assembly (13) has been installed; repositioning of adapter may be necessary.	**Install** onto connector (25).
12. Adapter (23)		**Secure** to inlet housing with connector.
13. Hose Assembly (22)		**Connect** to lubrication pressure manifold (3) and adapter (23).
14. Hose Connectors		**Tighten.**
15. Clamp (21)		**Secure** to bracket on compressor housing with screw (26), and nut (20).
16. Hose Assembly (27)		**Connect** to lubrication pressure manifold (3).
17. No. 2 Bearing Oil pressure Fitting		**Connect** to diffuser housing assembly.
18. Hose Connectors		**Tighten.**
19. Hose Assembly (28)		**Connect** to lubrication pressure manifold (3) and oil strainer housing adapter on top of combustion chamber assembly.

8-28. Lubrication Pressure Manifold, Oil Pressure Hoses, and Scavenge Hoses (T53-L-13B/703 Engines) - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
20. Connector	When tightening connector use one wrench on adapter and one on connector to prevent adapter from turning. Refer to Appendix G, table G-4, reference number 58.	**Tighten** on oil strainer housing adapter as required.
21. Hose Assembly		**Secure** to bracket on forward flange of combustion chamber housing with screw (35) and nut (36).
22. Clamps (30, 32, and 34)		**Secure** to combustion chamber housing with screws (29, 31, and 33). **Lockwire.**

8-29. Power-Driven Rotary (Oil Pump) - Removal

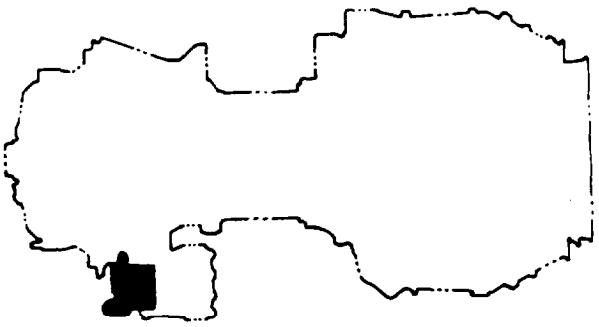
INITIAL SETUP

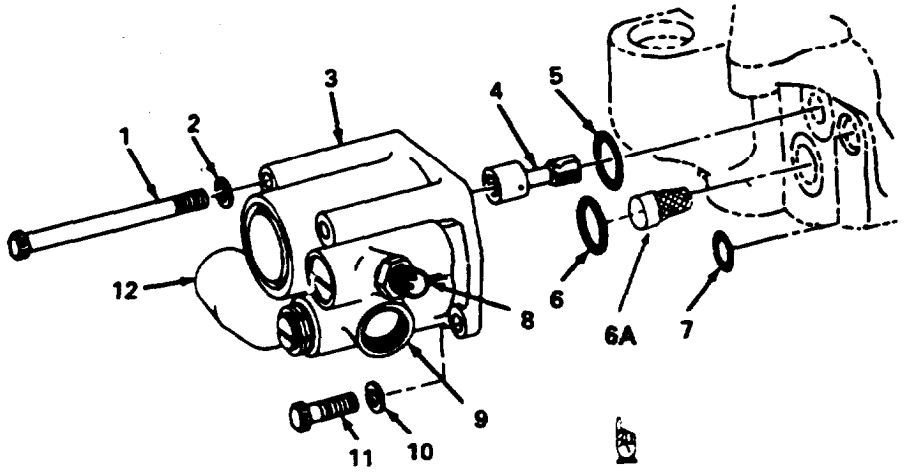
Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/	**NOTE** If installation of a new pump is necessary, remove oil temperature bulb (8) and packing from (oil) pump housing.	
1. Oil Temperature Bulb Electrical Connector		**Disconnect** from oil temperature bulb (8).
2. Aircraft Oil Inlet Hose		**Disconnect** from oil inlet connector (12) on pump.
3. Aircraft Hose		**Disconnect** from oil outlet (9).
4. Power-Driven Rotary (Oil) Pump (3)		**Support.**

8-29. Power-Driven Rotary (Oil) Pump - Removal - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		





5. Mounting Bolts (1 and 11)		Remove.
6. Washers (2 and 10)		Remove.
7. (Oil) Pump	Be careful not to damage powerdriven rotary (oil) pump drive shaft assembly (4).	Hold in position against mounting pad. Slowly pull directly from mounting pad.
8. Power-Driven Rotary (Oil) Pump Drive Shaft Assembly (4)		Remove from accessory drive gearbox assembly.
9. Packings (5, 6, and 7)		Remove.
10. Strainer Element (6A)		Remove.

8-30. POWER-DRIVEN ROTARY (OIL) PUMP-DISASSEMBLY (AVIM)

INITIAL SETUP

Applicable Configuration
All

References
TM 55-2840-213-40 or
TM 55-2840-216-49

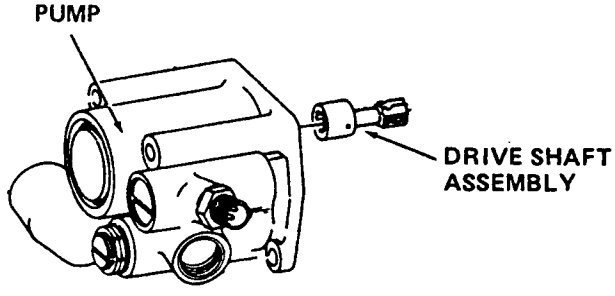
LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/	For all procedures except functional test, refer to TM 55-2840-213-40 or TM 55-2840-216-40 as applicable	

8-31. POWER-DRIVEN ROTARY (OIL) PUMP-INSPECTION

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
POWER DRIVEN ROTARY (OIL) PUMP/		



POWER-DRIVEN ROTARY (OIL) PUMP

NOTE

If pump is to be replaced, remove and retain temperature bulb for installation into new pump.

1. Pump	If damaged, **replace** pump.	**Inspect** for damaged threads and cracked flanges.
2. Drive Shaft Assembly	**Replace** drive shaft assembly if splines are damaged.	**Inspect** for damaged splines.

8-32. Power-Driven Rotary (Oil) Pump - Assembly (AVIM)

INITIAL SETUP

Applicable Configuration
A11

References
TM 55-2840-213-40 or
TM 55-2840-216-40

LOCATION/ITEM	REMARKS	ACTION
POWER DRIVEN ROTARY (OIL) PUMP/	For all procedures except functional teat, refer to TM 55-2840-213-40 or TM 55-2840-216-40 as applicable.	

8-33. Power-Driven Rotary (Oil) Pump - Functional Test (AVIM)

INITAL SETUP

Applicable Configuration
A11

Consumable Materials
Lubricating Oil (item 46 or 47, Appendix D)

Test Equipment
Test fixture adapter assembly (LTCT 423)
Test stand (LTCT 340)

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/	**NOTE** Use lubricating oil (item 46 or 47, Appendix D) to perform the functional test.	
1. Drive Shaft	Use applicable torque wrench. Refer to the following table.	**Check** that torque does not exceed values specified in the table following.

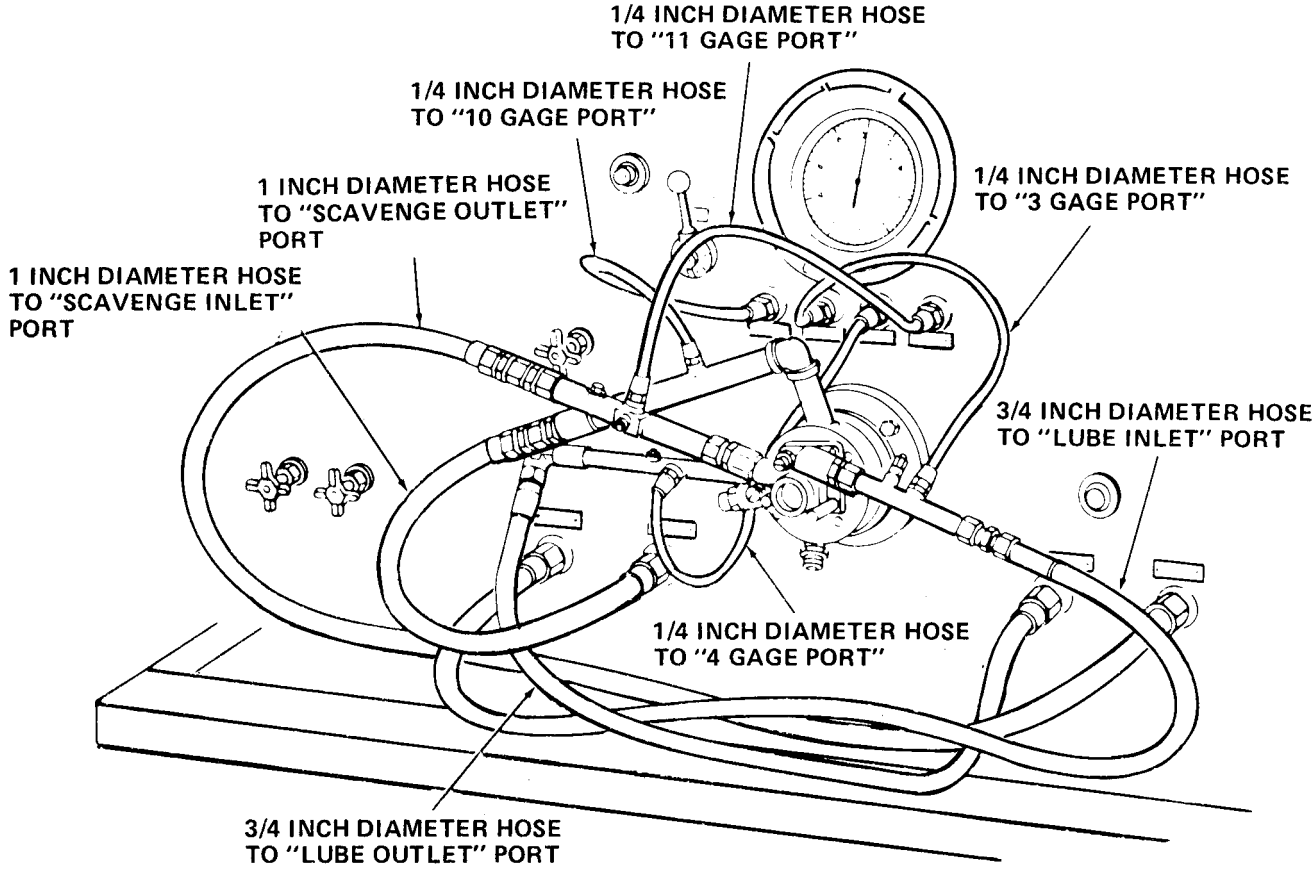
NOTE

The following table lists drive shaft torque requirements.

Part Number	Maximum Drive Shaft Torque	Torque Wrench Part Number
RG17350	3 pound-inches (.0 Kg/m)	TQ-1
2407-3	1 pound-inch (.0 Kg/m)	TQ-1
013973-020-04	65 pound-inches (0.7 Kg/m)	TQ-6

8-33. Power-Driven Rotary (Oil) Pump - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/ - Continued		
2. Oil Outlet Port	Oil outlet port is located on mounting face of pump.	**Fill** with oil.
3. Lube Inlet Port		**Supply** regulated air pressure.
4. Oil Outlet Port	Perform this action while observing oil outlet port. At pressure of 4 inches Hg, leakage shall not exceed 2.5 drops per 3 minutes.	Gradually **increase** air pressure until bubbles are noted in oil.
5. Power-Driven Rotary (Oil) Pump	Use test fixture adapter assembly (LTCT 423).	**Mount** on test fixture adapter assembly. **Secure** with four screws.



8-33. Power-Driven Rotary (Oil) Pump - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/ - Continued	**NOTE** Actions for items 6 thru 13 pertain to connecting all hoses.	
6. No. 12 Hose	Hose is 3/4 inch in diameter. Use test stand (LTCT340).	**Connect** from LUBE INLET PORT of test stand to 1/2-inch diameter adapter connected to oil-inlet port of pump.
7. Ho. 4 Hose	Hose is 1/4 inch in diameter.	**Connect** from GAGE PORT 3 on test stand to fitting in 1/2-inch diameter adapter.
8. No. 16 Hose	Hose is 1 inch in diameter.	**Connect** from SCAVENGE OUTLET port of test stand to 1 inch diameter adapter connected to oil outlet port of pump.
9. No. 4 Hose	Hose is 1/4 inch in diameter.	**Connect** from GAGE PORT 11 on test stand to tee fitting 1 inch diameter adapter.
10. No. 16 Hose	Hose is 1 inch in diameter.	**Connect** from SCAVENGE INLET port on test stand to scavenge adapter fixture.
11. No. 4 Hose	Hose is 1/4 inch in diameter.	**Connect** from GAGE PORT 10 on test stand to scavenge adapter of fixture.
12. No. 12 Hose	Hose is 3/4 inch in diameter.	**Connect** from LUBE OUTLET port on test stand to LUBE OUTLET adapter of fixture.
13. No. 4 Hose	Hose is 1/4 inch in diameter.	**Connect** from GAGE PORT 4 on test stand to LUBE OUTLET adapter of fixture.

8-33. Power-Driven Rotary (Oil) Pump - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/ - Continued		
14. Stand Power, Vacuum Pump, Circulating Pump, and Motor Generator	On buttons are green.	**Press** on buttons. **Observe** blue indicator lamps to **insure** they light.
15. Lube Inlet		**Loosen** hose connected to adapter of test fixture adapter assembly (LTCT 423).
16. RESERVOIR AIR/VACUUM SELECTOR Lever	Perform this action to bleed air from system.	**Turn** lever to AIR. **Observe oil flow. Place** RESERVOIR AIR/ VACUUM SELECTOR lever in OFF position. **Retighten** hose.
17. RESERVOIR AIR/VACUUM SELECTOR Lever		**Turn** lever to VACUUM. Hold lever until LUBE INLET PRESSURE gage indicates 5 inches Hg vacuum.
18. DC Drive Motor Button	On button is green.	**Press** on button. **Observe** blue indicator lamp. **Insure** blue indicator lamp lights.
19. SPEED CONTROL COURSE Knob		**Turn** knob until DRIVE SPEED gage indicates 400 rpm to 600 rpm.
20. LUBE FLOW Rotometer		**Check** to **insure** that there is oil flow within a maximum of 20 seconds.
21. Test Stand		**Operate** until lubricating oil heats to 180° F to 200°F (82°C to 93°C).
22. Pump Pressure Relief Valve	This action will indicate that valve is open.	**Open** until needle on LUBE OUTPUT PRESSURE gage begins to fluctuate.

8-33. Power-Driven Rotary (Oil) Pump - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/ - Continued		
23. Pump Pressure Relief Valve	LUBE INLET PRESSURE gage shall indicate -0.5 psi to +0.5 psi. LUBE OUTLET PRESSURE gage shall indicate 100 psi to 120 psi. LUBE FLOW rotometer shall indicate 3380 phr minimum.	**Turn** clockwise until gages indicate required readings given at left.
24. Oil Flow		**Adjust** by turning LUBE BACK PRESSURE valve knob.
25. SPEED CONTROL COURSE Knob		**Turn** until DRIVE SPEED gage indicates 4200 rpm to 4300 rpm.
26. RESERVOIR AIR/ VACUUM SELECTOR Knob		**Turn** until LUBE INLET PRESSURE gage indicates .0.5 inch to +0.5 inch Hg vacuum.
27. SCAVENGE BACK PRESSURE VALVE Knob		**Turn** until SCAVENGE OUTLET PRESSURE gage indicates 55 psi to 65 psi.
28. SCAVENGE FLOW Rotometer		**Check** for oil flow of 6720 phr minimum.
29. RESERVOIR AIR VACUUM SELECTOR Lever		**Turn** to VACUUM. **Hold** lever until LUBE INLET PRESSURE gage indicates 17.5 to 18.5 inches Hg.
30. LUBE OUTLET PRESSURE Gage		**Record** pressure indicated on gage.
31. LUBE FLOW Rotometer	Rotometer shall indicate oil flow of 2830 phr minimum.	**Record** oil flow.
32. RESERVOIR AIR VACUUM SELECTOR Lever		**Turn** lever to VACUUM. **Hold** lever until LUBE INLET PRESSURE gage indicates 22.5 to 23.5 inches Hg vacuum.

8-33. Power-Driven Rotary (Oil) Pump - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/ - Continued		
33. LUBE OUTLET PRESSURE Gage		**Record** pressure indicated on gage.
34. LUBE FLOW Rotometer	Rotometer shall indicate 2140 phr minimum.	**Record** oil flow.
35. RESERVOIR AIR VACUUM SELECTOR Lever		**Turn** lever to VACUUM. **Hold** lever until SCAVENGE INLET PRESSURE gage indicates 17.5 to 18.5 inches Hg vacuum.
36. SCAVENGE OUTLET PRESSURE Gage		**Record** pressure indicated on gage.
37. LUBE FLOW Rotometer	Rotometer shall indicate 5720 phr minimum.	**Record** oil flow.
38. RESERVOIR AIR VACUUM SELECTOR Lever		**Turn** lever to VACUUM. **Hold** lever until SCAVENGE INLET PRESSURE gage indicates 22.5 to 23.5 inches Hg vacuum.
39. SCAVENGE OUTLET PRESSURE Gage		**Record** pressure indicated on gage.
40. LUBE FLOW Rotometer	Rotometer shall indicate 4180 phr minimum.	**Record** oil flow.
41. Pump Relief Valve		**Bottom.**
42. LUBE BACK PRESSURE Valve	Rotometer P/N RG17350 and P/N 2407-3 shall indicate 3610 phr minimum. Rotometer P/N 013973-020-04 shall indicate 3500 phr minimum.	**Turn** until LUBE FLOW rotometer indicates recommended minimum.
43. Pump		**Reject** if limits cannot be met.

8-33. Power-Driven Rotary (Oil) Pump - Functional lost (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/ - Continued		
	NOTE Outlet pressure indication on LUBE OUTLET PRESSURE gage must be 110 psig. Inlet pressure indication on LUBE INLET PRESSURE gage must be zero inch Hg vacuum. Perform actions for items 44 thru 47 if limits have been met.	
44. Inlet Pressure Port		Provide zero Hg.
45. Lube Discharge Port		Provide 110 psig.
46. Relief Valve		Adjust for flow of 3450 phr.
47. Relief Valve Adjustment		Secure.
48. SPEED CONTROL COURSE Knob		Turn until DRIVE SPEED gage indicates zero rpm.
49. RESERVOIR AIR/ VACUUM SELECTOR Lever		Turn lever to AIR. Turn lever to VACUUM side until LUBE AND SCAVENGE OUTLET PRESSURE gages indicate zero.
50. DRIVEMOTOR	Off buttons are red.	Push off button.
51. Off Buttons		Push remaining red off buttons.
52. Power-Driven Rotary (Oil) Pump		Remove.

8-34. Power-Driven Rotary (Oil) Pump - Installation

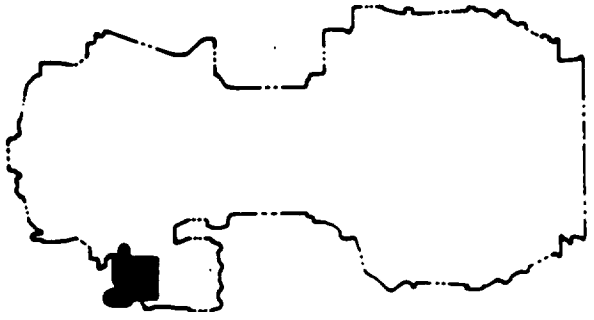
INITIAL SETUP

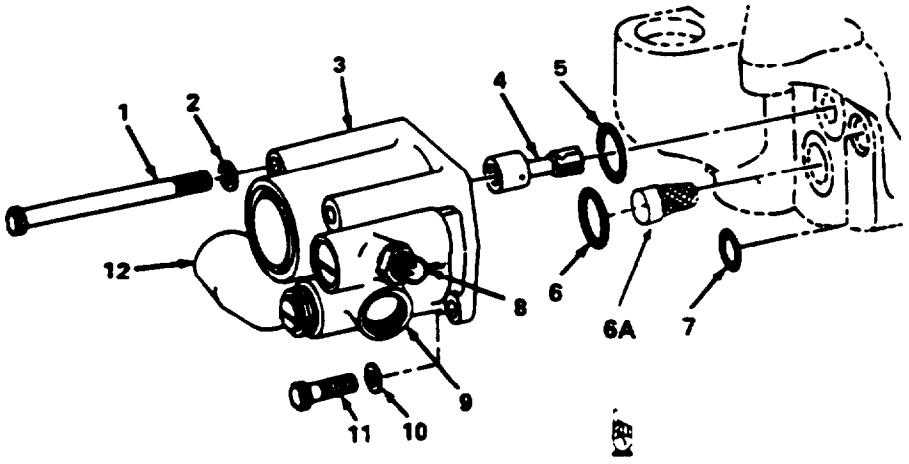
Applicable Configuration
All

Consumable Materials
Shortening Compound (Item 74, Appendix D)
Ultrachem Assembly Fluid #1 (hem 101, Appendix D)
Lockwire (Item 41, 42, or 43, Appendix D)

References
Para 5-14

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/		
1. Power-Driven Rotary (oil) Pump Drive shaft Assembly (4)		**Install** Into accessory drive gearbox. **Mate.** spline with oil pump drive shaft gear.





8-34. Power-Driven Rotary (011) Pump - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - **Continued**		
	NOTE Insure grooves in gearbox housing are clean. Coat grooves of housing with shortening compound (Item 74, Appendix D) or Ultra-chem Assembly Fluid #1 (Item 101, Appendix D) to facilitate holding packings in grooves during assembly.	
2. Packing (5)		Install on housing for power-driven rotary (oil) pump drive shaft assembly.
3. Strainer Element (6A)	**NOTE** Ensure the Strainer Element is free from debris and intact.	Install on housing in inlet scavenge port, with the screen facing in.
4. Packing (6 and 7)		Install on housing around inlet and outlet ports.

PIN: 048174-024

8-34. Power-Driven Rotary (Oil) Pump - Installation - Continued

LOCATION/ITEM	REMARKS	ACTION
ACCESSORY DRIVE GEARBOX ASSEMBLY/ - Continued		
4. Power-Driven Rotary (Oil) Pump (3)		**Mount** on accessory drive drive gearbox. **Aline** splines of oil pump drive splined coupling with coupling drive shaft.
5. Mounting Bolts (1 and 11) and Washers (2 and 10)		**Secure** pump with mounting bolts and washers.
6. Mounting Bolts (1 and11)		**Tighten** bolts to 70 to 95 pound-inches (0.8 to 1.1 K /m) torque. Using a 0.0015 inch feeler gage, **check** for clearance between pump flange and accessory gearbox. If a clearance exists, **remove** pump and visual **inspect** packings. **Replace** damaged packings and **reinstall** pump.
7. Electrical Connector	**NOTE** **If new (oil) pump was installed, Install oil temperature bulb (8). Refer to paragraph 5-4.)**	**Connect Lockwire.**
8. Aircraft Oil Inlet Hose		**Connect** to oil Inlet connector (12).
9. Aircraft Oil Outlet Hose		**Connect** to oil outlet (9).

8-35. Power-Driven Rotary (Oil) Pump - Adjustment

INITIAL SETUP

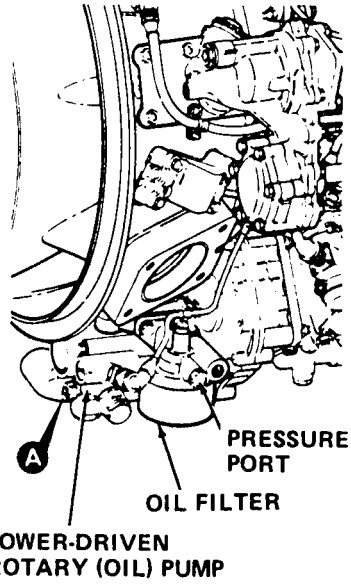
Applicable Configuration
All

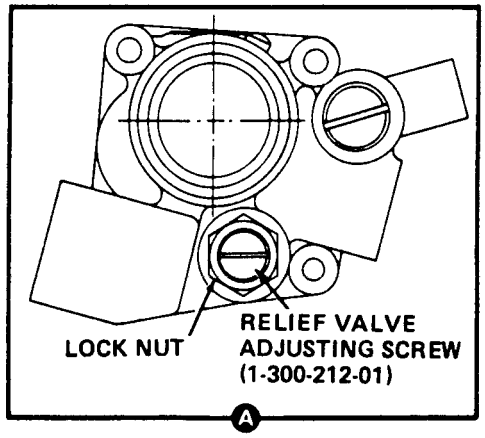
Consumable Materials
Lockwire (item 41, 42, or 43, Appendix D)

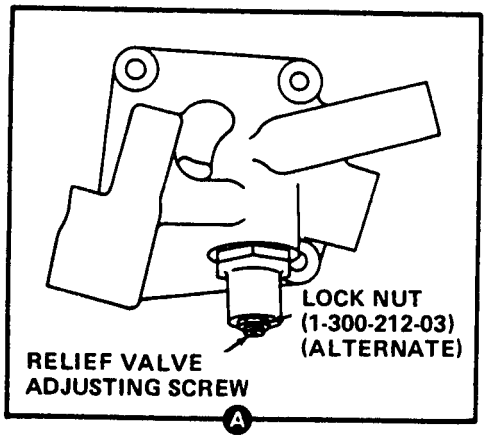
References
Para 8-2
Appendix G, Table G-3, Reference Number 42 andTable G-4, Reference **Number 53**

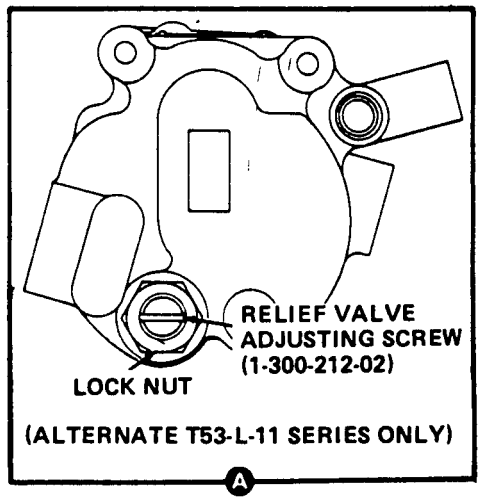
8-35. Power-Driven Rotary (Oil) Pump - Adjustment - Continued

LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/		
1. Aircraft Oil Pressure System, Cockpit Gage		**Check** for proper operation before making oil pump pressure adjustments.
2. Oil Filter	Refer to paragraph 8-2	**Check** for cleanliness.
3. Plug		**Remove** from pressure port of oil filter.
4. pressure Gage		**Install** with range of zero to 150 psig into oil filter pressure port.









8-35. Power-Driven Rotary (Oil) Pump - Adjustment - Continued

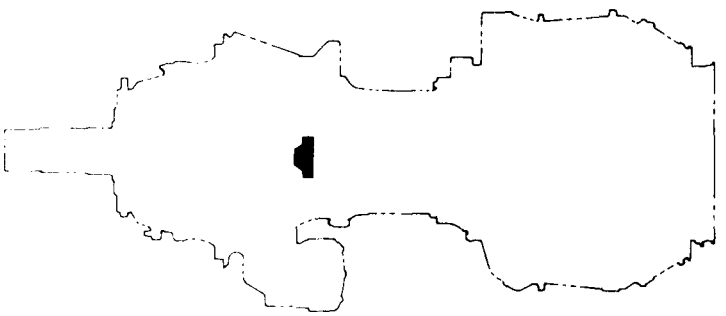
LOCATION/ITEM	REMARKS	ACTION
POWER-DRIVEN ROTARY (OIL) PUMP/ - Continued		
	WARNING **Do not make pressure adjustments during engine operation.**	
5. Engine	Normal pressures should be 60 to 80 psig at normal rated power and above, and 25 psig minimum at flight idle for T53-L-11 series engines and 80 to 100 psig at normal rated power and above, and 25 psig minimum at flight idle for T53-L-13B/703 engines. The readings should be taken after oil pressure and temperature have stabilized.	**Operate** and **check** oil pressure.
6. Engine		**Shut down.** If pressure is not within limits **adjust** as follows: a. **Loosen** adjustment screw locknut. b. **Turn** adjustment screw clockwise to increase pressure or counterclockwise to decrease pressure. One full turn will change oil filter discharge pressure 8 to 10 psig. **c. Tighten** locknut.
7. Engine	Repeat adjustment in preceding action for item 6 as necessary.	**Restart** engine. **Recheck** oil pressure.
8. Adjustment Screw	Refer to Appendix G, table G-3, reference number 42 and table G-4, reference numbe 53.	**Tighten** as required. **Lock**-wire locknut.

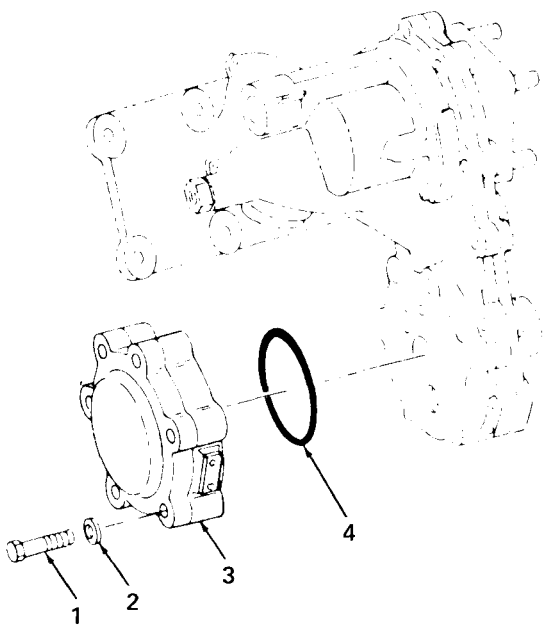
8-36. Power-Driven Rotary (Booster) Pump - Removal

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
OVERSPEED GOVERNOR AND TACHOMETER DRIVE ASSEMBLY/		
1. Mounting Bolts (1) and Washers (2)		**Remove** bolts and washers which secure power-driven rotary (booster) pump (3) to overspeed governor and tachometer drive assembly.
2. Power-Driven Rotary (Booster) Pump (3)		**Remove.**
3. Packing (4)		**Remove.**

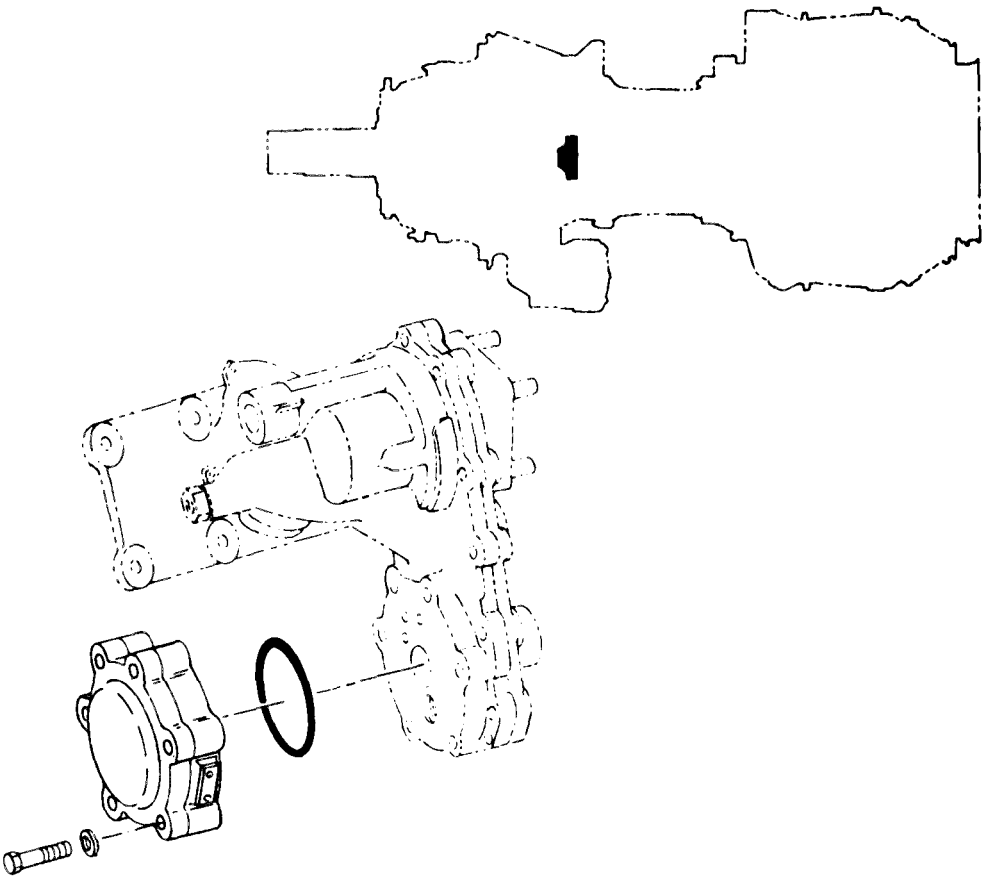




8-37. Power-Driven Rotary (Booster) Pump - Inspection

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
OVERSPEED GOVERNOR AND TACHOMETER DRIVE HOUSING/		
1. Housing	**Replace** rotary pump if damaged.	**Inspect** for damage and splined shaft for worn or chipped teeth.

8-38. Power-Driven Rotary (Booster) Pump - Functional Test (AVIM)

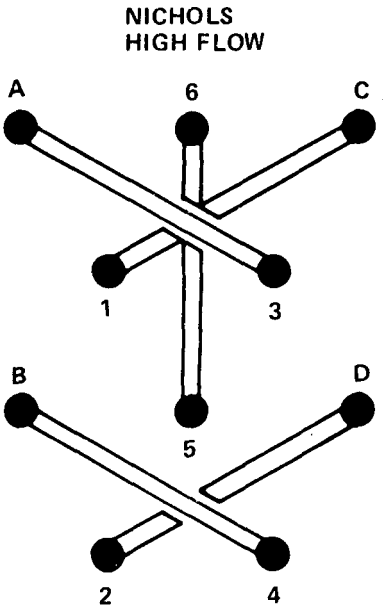
INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Lubricating Oil (Appendix D, item 46 or 47)

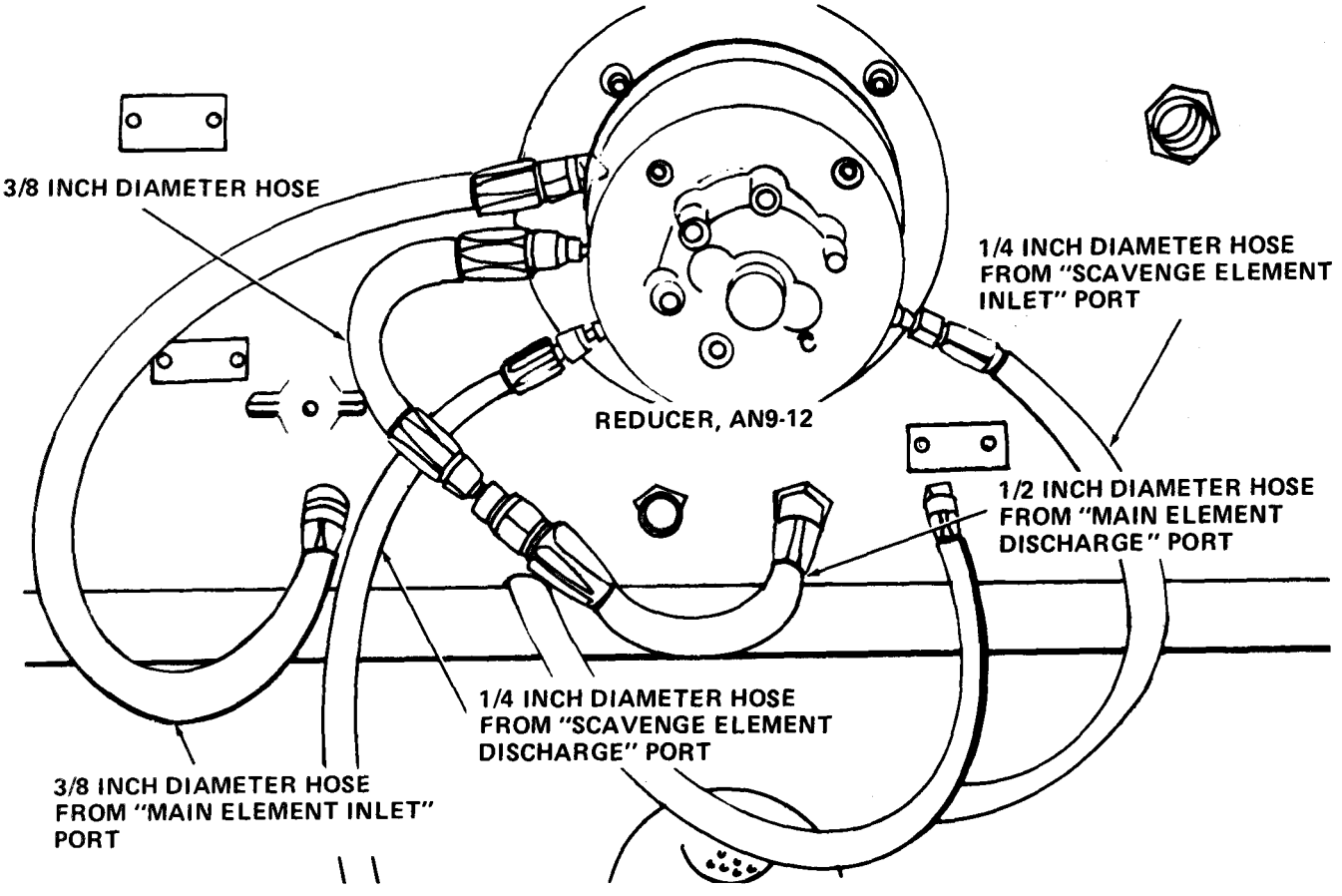
Test Equipment
Test Stand (LTCT422)

Special Tools
Reducer (AN919-12)

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/		
	NOTE **Check** rear of test stand (LTCT422) for proper internal connections before performing the following test.	
1. Test Stand (LTCT422)	Perform test using lubricating oil (item 46 or 47, Appendix D).	Using four bolts, **secure** pump to drive fixture of test stand. **Tighten** bolts as necessary.
		
2. No. 6 Hose (3/8 inch diameter)	**Connect** hoses according to items 2 thru 6.	**Connect** from SCAVENGE ELEMENT DISCHARGE port of test stand drive fixture.

8-38. Power-Driven Rotary (Booster) Pump - Functional Test - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		



3. No. 4 Hose (1/4 inch diameter)		**Connect** from SCAVENGE ELEMENT DISCHARGE port of test stand drive fixture.
4. No. 4 Hose (1/4 inch diameter)		**Connect** from SCAVENGE ELEMENT INLET port of test stand drive fixture.
5. NO. 8 Hose (1/2 inch diameter)	**Install** reducer AN919-12.	**Connect** to MAIN ELEMENT DISCHARGE port of test stand. **Install** reducer in open end of hose.
6. NO. 6 Hose (3/8) inch diameter)		**Connect** from reducer to drive fixture.

8-38. Power-Driven Rotary (Booster) Pump - Functional Test (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
7. Stand Power, Motor Generator, Boost Circuit Pump, and DC Drive Motor		**Press** switches on. **Observe** to be sure red indicater lamps light.
8. DRIVE ROTATION SELECTOR Knob		**Turn** knob to CCW.
9. SPEED CONTROL Indicator		**Advance** knob until DRIVE SPEED indicator indicates 1500 rpm.
10. Heater		**Switch** to ON.
11. Boost Pump Fuel Temperature Indicator	**Permit** test stand lubricating oil to attain an operating temperature of 185°F to 195°F (85°C to 91°C).	**Read** temperature.
	NOTE Float should rise partially up tube of rotometer to indicate that pump is primed and circulating fluid in following item 12.	
12. MAIN ELEMENT FLOW Rotometer		**Observe** rotometer for an indication of fluid flow.
13. MAIN ELEMENT INLET THROTTLE, PUMP BYPASS, MAIN ELEMENT DISCHARGE PRESSURE, MAIN ELEMENT INLET PRESSURE, SCAVENGE ELEMENT DISTANCE THROTTLE, and MAIN ELEMENT DISCHARGE THROTTLE Valves		**Open valves.**

8-38. Power-Driven Rotary (Booster) Pump - Functional Test - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
14. SCAVENGE INLET PRESSURE Valve		**Adjust** to maintain zero psig indication on SCAVENGE INLET PRESSURE indicator as SPEED CONTROL knob is obtained 4200 plus 50 rpm or minus 50 rpm indication on DRIVE SPEED indicator. **Observe** all remaining indicators. **Adjust** accordingly.
15. SCAVENGE ELEMENT DISCHARGE THROTTLE Valve (GC1032 and GC1608 Type Pump)	This reading on SCAVENGE ELEMENT DISCHARGE PRESSURE indicator applies to GC1032 and GC1608 pumps.	**Adjust** until SCAVENGE ELEMENT DISCHARGE PRESSURE indicator indicates 49 psig to 51 psig.
16. SCAVENGE ELEMENT DISCHARGE THROTTLE Valve (RG17670 Type Pump)	This reading on SCAVENGE ELEMENT DISCHARGE PRESSURE indicator applies to RG17670 pump.	**Adjust** until SCAVENGE ELEMENT DISCHARGE PRESSURE indicator indicates 60 psig +1 psig or -1 psig.
17. SCAVENGE ELEMENT FLOW Rotometer		**Insure** fluid flow indicated **exceeds** 260 phr (pound-force per hour). If specified flow cannot be met, reject pump.
18. MAIN ELEMENT DISCHARGE THROTTLE Valve (GC1032 Type Pump)	This reading on MAIN ELEMENT DISCHARGE PRESSURE indicator applies to GC1032 pump.	**Adjust** until MAIN ELEMENT DISCHARGE PRESSURE indicator indicates a discharge pressure of 150 psig +1 psig or -1 psig.
19. MAIN ELEMENT DISCHARGE THROTTLE Valve (GC1608 and RG17670 Type Pump)	This reading on MAIN ELEMENT DISCHARGE PRESSURE indicator applies to GC1608 and RG17670 pump.	**Adjust** until MAIN ELEMENT DISCHARGE PRESSURE indicator indicates a discharge pressure of 200 psig +1 psig or -1 psig.

8-38. Power-Driven Rotary (Booster) Pump - Functional Test - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
20. PUMP BYPASS Valve		**Adjust** until MAIN ELEMENT INLET PRESSURE indicator indicates 70 psig +1 psig or -1 psig.
21. MAIN ELEMENT FLOW Rotometer (GC1032 Type Pump)	GC1032 pump only.	**Observe** fluid flow as indicated. Be sure it **exceeds** 260 phr. If specified flow cannot be met, **reject** pump.
22. MAIN ELEMENT FLOW Rotometer (GC1608 and RG17670 Type Pump)	GC1608 and RG17670 pumps only.	**Observe** fluid flow as indicated. Be sure it **exceeds** 520 phr. If specified flow cannot be met, **reject** pump.
	NOTE Perform items 23 thru 25 carefully and simultaneously.	
23. PUMP BYPASS Valve		**Adjust** to **allow** MAIN ELEMENT INLET PRESSURE GAGE to **read** zero.
24. SPEED CONTROL Knob		**Turn** to zero.
25. SCAVENGE INLET PUMP Gage		**Maintain** zero reading by turning SCAVENGE ELEMENT INLET THROTTLE valve.
26. CIRCUIT PUMP OFF Button	Perform this action after items 23 thru 25 have been accomplished. DC DRIVE MOTOR system will also shut off during this action.	**Press.**
27. Bolts		**Remove** bolts that secure pump to fixture.
28. Pump		**Remove.** Manually **rotate** to insure freedom of movement. **Reject** pump if any binding is noted.

8-39. POWER-DRIVEN ROTARY (BOOSTER) PUMP - INSTALLATION

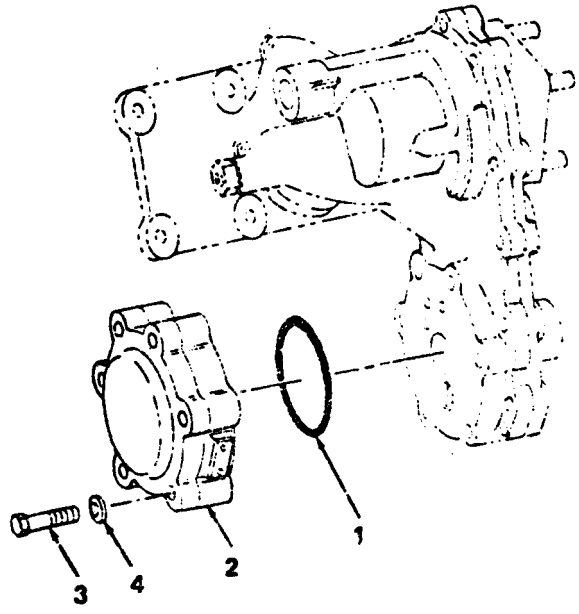
INITIAL SETUP

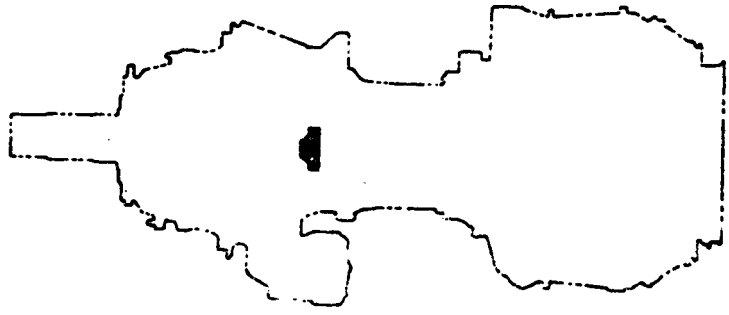
Applicable Configuration
All

Consumable Materials
LockWire (item 41, 42, or 43, Appendix D)

References
Para 6-89

LOCATION/ITEM	REMARKS	ACTION
OVERSPEED GOVERNOR AND TACHOMETER DRIVE ASSEMBLY/ 1. OverSpeed Governor Drive Shaft	Refer to paragraph 6-89.	**Establish** proper end float. Install nuts on either end of overspeed governor drive shaft, as required.
2. Packing (1)		**Install** in booster pump housing.
3. Power-Driven Rotary (Booster) Pump (2)		**Mount** on overspeed governor and tachometer drive housing. **Mate** splined shaft with internal spline of overspeed governor drive shaft.
4. Mounting Bolts (3) and Washers (4)		**Secure** power-driven rotary (booster) pump with mounting bolts and washers. **Tighten** bolts. **Lockwire.**





CHAPTER 9

DRIVE SYSTEM

OVERVIEW

This chapter contains procedures for the maintenance and preservation of the drive system. Paragraphs following outline disassembly, inspection. repair, and additional requirements needed to maintain the drive system and releated arts. Procedures requiring maintenance on the Aviation Intermediate Maintenenace (AVIM) level are specific and must be performed as such. Paragraphs in which the maintenance level is not specific shall be carsidered Aviation Unit Maintenance (AVUM) and may be performed at this level or at a higher level of maintenance.

9-1. GENERAL MAINTENANCE INFORMATION.

Visually inspect all subassemblies and accessores removed from the engines combustion section. Check for loose or missing parts. Note any damage or excessive wear. Repair damaged parts where possible. Replace damaged parts that cannot be repaired. Disassembly procedures provided enable required cleaning, inspection. repair or replacement of combustion section and its accessories.

During reassembly of the engines subassemblies and accessories discard all of the following parts and replace with new parts:

Seals	Tabwashers
Gaskets	Lockpins
Packing	Lockwashers
Cotter Pins	Lockwire

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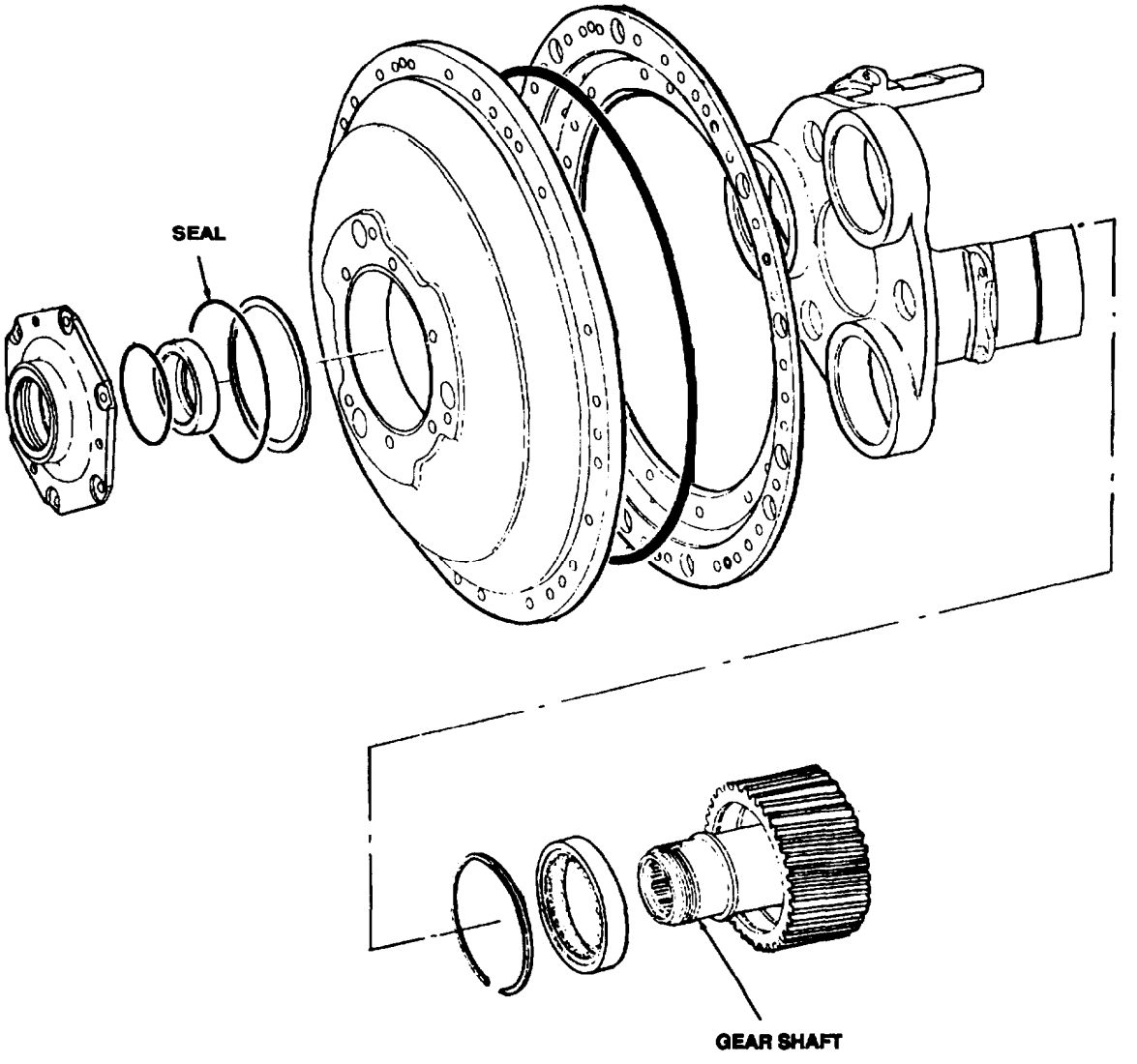
9-2. Output Reduction Carrier and Gear Assembly - Pressure Check (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
TEST FIXTURE/- Continued		



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9-4. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder, and Sun Gearshaft-Removal (AVIM)

INITIAL SETUP

Applicable Configuration

All

Special Tools

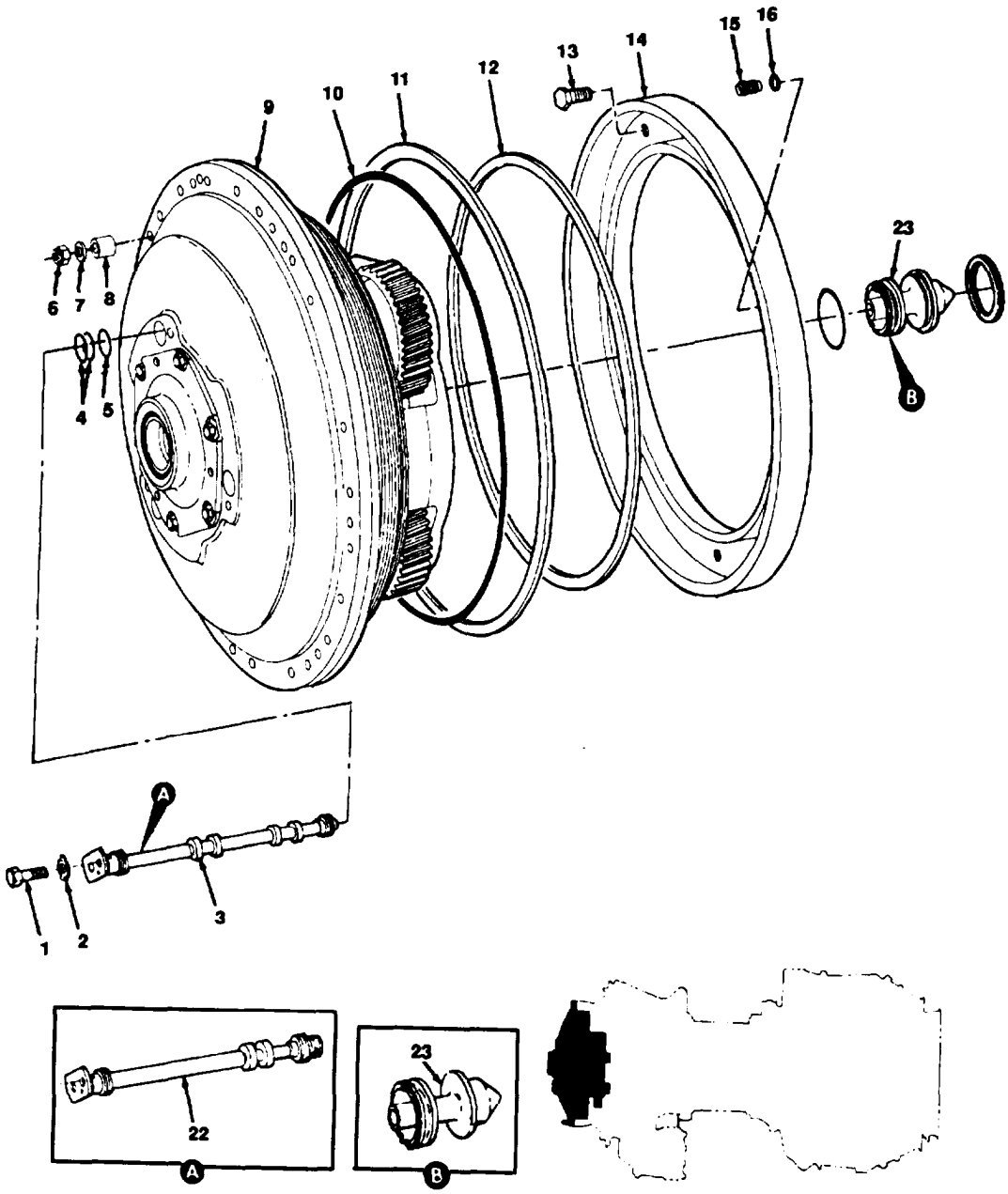
Lifting Fixture (LTCT4182)
puller Screws (detail of LTCT4182)
Installer and Remover (LTCT519)
Sun Gear Holding Fixture (LTCT2075)
Tool Set (LTCT509)
Driver Wrench (LTCT258)

INLET HOUSING
ASSEMBLY

LOCATION/ITEM	REMARKS	ACTION
1. Oil Transfer Tube (3 and 22)		**Straighten** tabwasher (2). **Remove** bolts (1) and tabwashers from each oil transfer tube (3 and 22).
2. Oil Transfer Tube (3 and 22)		**Insert** bolt with 1/4-28 thread into oil transfer tube. **Pull** oil transfer tube from reduction gear assembly. **Remove** two remaining oil transfer tubes. Remove packings (4 and 5) from each oil transfer tube.
3. Output Reduction Carrier and Gear Assembly (9)		**Remove** 24 nuts (6), washers (7). and spacers (8).

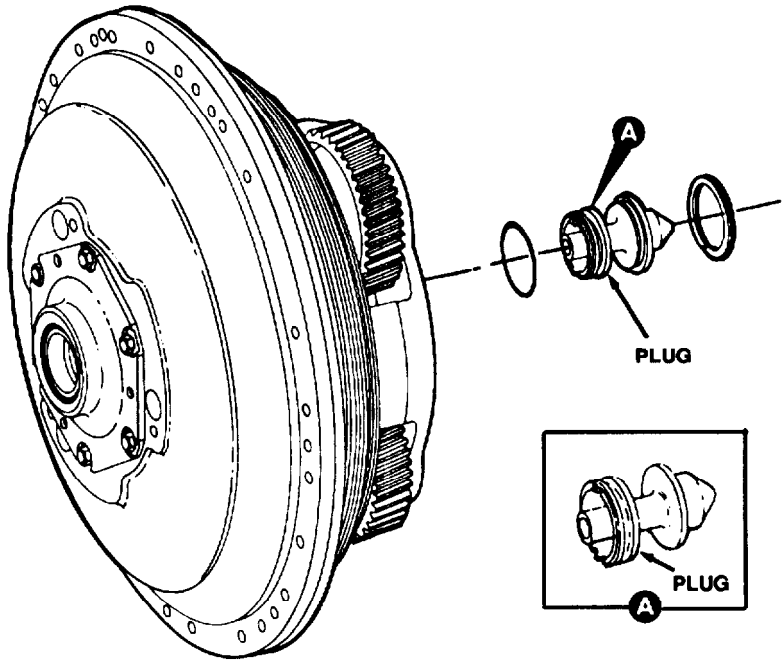
9-4. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder, and Sun Gearshaft-Removal (AVIM)

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/-Continued		



9-4. Output Reduction Carrier and Gear Assembly - Torquemeter Valve and Cylinder, and Sun Gearshaft-Removal (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		
4. Plug (23)	Use lifting fixture (LTCT4182). Use puller screws (detail of LTCT4182).	**Thread** lifting fixture into plug. **Thread** puller screws into housing. **Tighten** screws evenly.



5. Output Reduction Carrier and Gear Assembly (9)	Use overhead hoist attached to lifting fixture (LTCT4182).	**Remove** output reduction carrier and gear assembly (9). **Remove** packing (10) and seal rings (11 and 12).
6. Lifting Fixture		**Remove.**
7. Torquemeter Valve Assembly (15) and Shim (16)	Use installer and remover (LTCT519) or socket (preferably 6 point).	**Remove** from torquemeter cylinder (14).
8. Torquemeter Cylinder (14) and Bolts (13)		**Remove** 12 bolts (13) that secure torquemeter cylinder (14). **Remove** cylinder from inlet housing assembly.

Pages 9-8 through 9-11 have been deleted.

9-5. Output Reduction Carrier and Gear Assembly - Disassembly (AVIM)

INITIAL SETUP

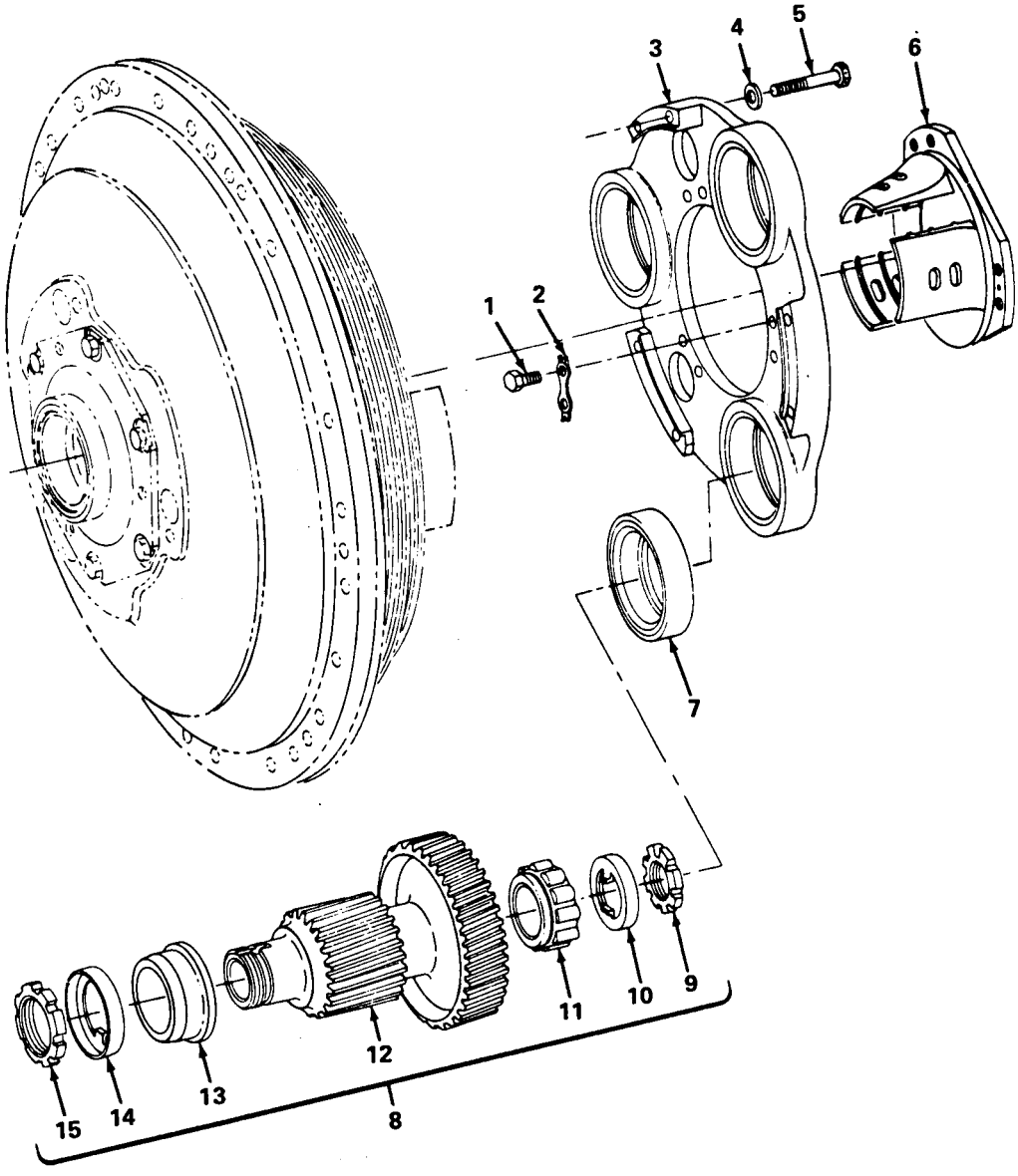
Applicable Configuration
All

Special Tools
Botts(LTCT718)
Removing tool (LTCT2086)
Sleeve bushing (LTCT3661)
Holding fixture (LTCT4018)
Ring assembly (LTCT4019)
Socket and pilot Tool (LTC2079)
Puller (LTCT52)
Socket and pilot tool (LTCT2080)
Puller (LTCT2073)
Installation and removal tool (LTCT 3638)
Holding fixture (LTCT283)
Wrench (LTCT729)
Holding fixture (LTCT496)
Wrench (LTCT4670)
Mechanical puller (LTCT4670)
Mechanical puller (LTCT2142)
Sleeve bushing (LTCT3659)

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/	**NOTE** **Note the bearing and gear positions by position numbers for ease of reassembly. Position carrier match-marks so that the gear adjacent to the marks is at the top looking forward. Positions will then be one through three counterclockwise with position one at the top.**	
1. Output Reduction Carrier and Gear Assembly	**N O T E** **If the inner races of roller bearings (11) hangup as the rear carrier (3) is separated, gently tap them with a fiber drift and a soft-faced mallet.**	**Remove** bolts (5) and washers (4).

9-5. Output Reduction Carrier and Gear Assembly - Disassembly (AVIM) - Continued

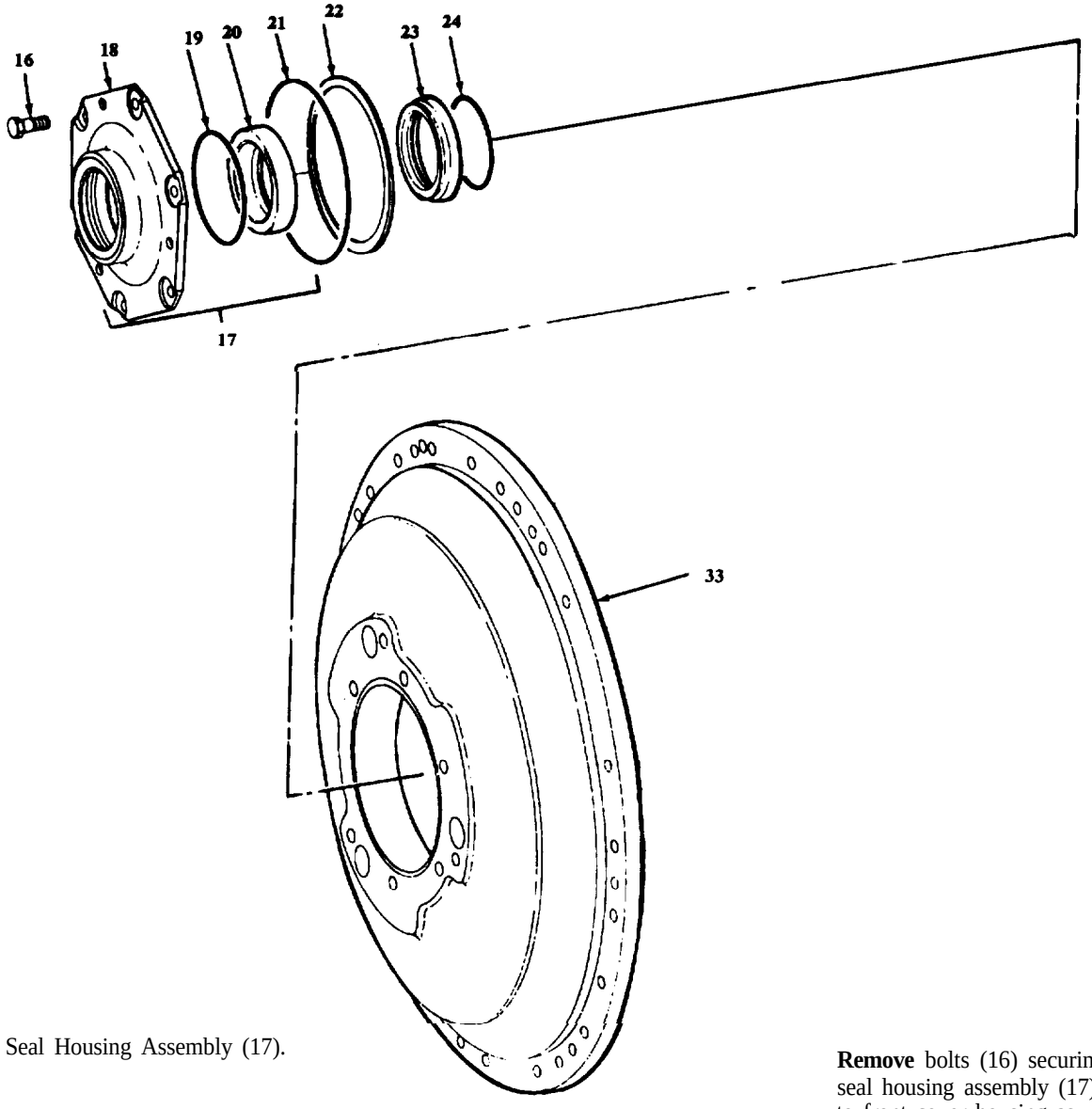
LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued		



2. Rear Carrier (3)	Use three bolts (LTCT718).	**Remove.**
3. Outer Races of Roller Bearings (7)	Use removing tool (LTCT2086) or sleeve bushing (LTCT3661).	**Remove** from rear carrier (3). **Tag** races with gear in position number.

9-5. Output Reduction Carrier and Gear Assembly - Disassembly (AVIM) - Continued

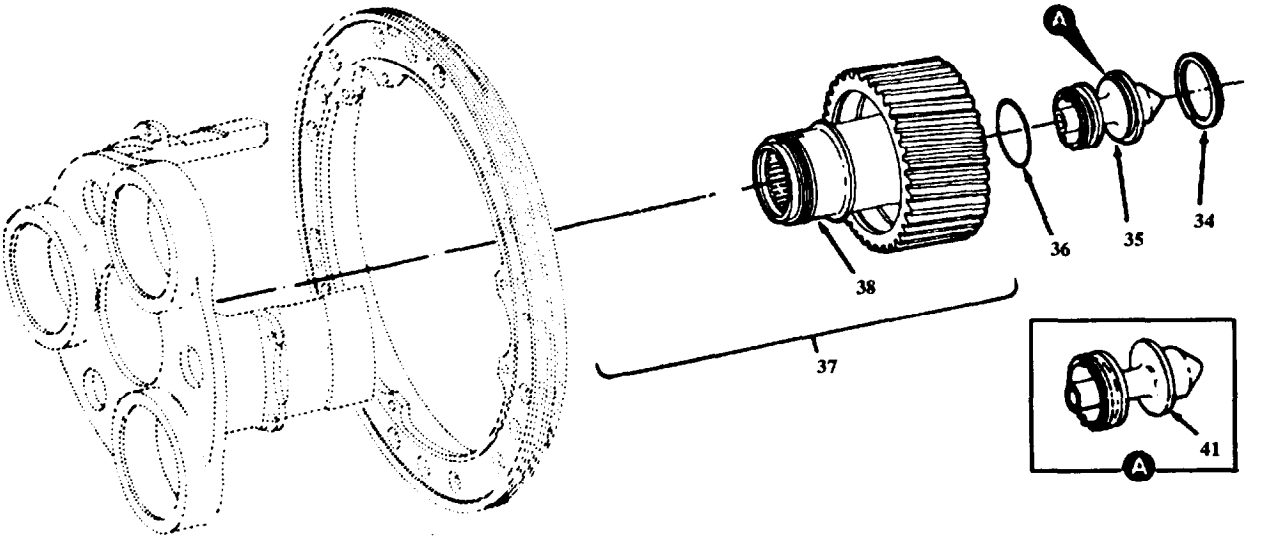
LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued		



14. Seal Housing Assembly (17).	**Remove** bolts (16) securing seal housing assembly (17) to front cover housing assembly (33).
15. SeaI Housing Assembly (17). Packing (21) and Spacer (22)	**Remove** from front cover housing assembly (33).

9-5. Output Reduction Carrier and Gear Assembly - Disassembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued		
16. Packing (19) and Seal (20)	Use installation and removal tool (LTCT3638).	**Remove** from seal retainer (18).
17. Faceplate (23) and Packing (24).		**Remove.**



18. Retaining Ring (34)		**Remove.**
19. Plug (35 or 41) and Packing (36)	Use fiber punch and soft-faced mallet.	**Drive** from gearshaft (38).
20. Deleted		
21. Deleted		
22. Deleted		

Pages 9-14 through 9-16 have been deleted.

9-6. Output Reduction Carrier and Gear Assembly, Toquemeter Valve and Cylinder and Sun Gearshaft - Inspection (AVIM)

INITIAL SETUP

Applicable Configuration

All

Test Equipment

Test stand (LTCT422)
Test fixture (LTCT2052)

Consumable Materials

Lubricating oil (item 46. Appendix D)

References

Paras H-13, H-25, and H-29

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/	**NOTE** Do not disassemble the output reduction carrier and gear assembly to perform the visual inspection of the gears. Do not clean gears prior to inspection. Rotate gears to insure complete inspection of all teeth. Use a 3-power magnifying glass, flashlight and a mechanics's mirror. If nicks. burrs and scratches are on bearing surfaces of gear teeth. replace gears or assembly.	
1. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder and Sun Gearshaft	Refer to paragraph H-25 for blend-repair procedures.	**Inspect** all parts for nicks, burrs and scratches. **Blend-repair.**
2. Output Reduction Carrier and Gear Assembly. Torquemeter Valve and Cylinder and Sun Gearshaft	Refer to paragraph H-29 for repair procedures.	**Inspect** threaded parts far stripped a crossed threads. **Repair** threads. **Replace** parts having threads damaged beyond repair.
3. output Reduction carrier and Gear Assembly. Torquemeter Valve and Cylinder and Sun Gearshaft		**Inspect** gearshaft plug for wear and damage to tangs. **Replace** if worn or damaged.
4. Front Cover Housing Assembly		**Inspect. Observe** repair limitations as follows:
	Corrosion, including light pitting to a depth of 0.020 inch (0.51 mm) without breakthrough or causing external leakage is acceptable after repair.	

9-6. Output Reduction Carrier and Gear Assembly, Toquemeter Valve and Cylinder and Sun Gearshaft - Inspection (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued	**WARNING** All repair of damaged threads and corrosion maintenance repair will be in accordance with Nuclear Regulatory Commission source material license number "STB-1433" issued to ATCOM. The following part number contains Magnesium Thorium (MG-TH) a radioactive material: 1-030-390-05 Front Cover Housing	

9-6. Output Reduction Carrier and Gear Assembly, Toquemeter Valve and Cylinder and Sun Gearshaft - Inspection (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued		
	CAUTION **Use care when brushing with fiber brush so as not to mar finish of non-affected surrounding parts.**	
		a. **Refinish** according to paragraph H-13. b. **Finish** repair according to paragraph H-13.
	Refer to paragraph H- 13 for repair instructions. Use Preferred Method Epoxy Sealant application. Corrosion, creating external leakage or a possibility of material fallout. is nonrepairable and is cause for replacement.	c. Corrosion with pitting greater than 0.020 inch (0.51 mm) in depth but not causing external leakage or possibility of material fallout **shall be** repaired.
5. Oil Transfer Tube Strainer		**Inspect** for foreign material, clogging, cuts and dents. **Replace** strainers that are clogged, cut, dented, and contain foreign material.
	CAUTION **If a planet or output gear is found unacceptable because of a surface condition, the gear shall be replaced. The defective gear (or planet gear set) shall be shipped to overhaul for disposition.**	
6. Deleted		
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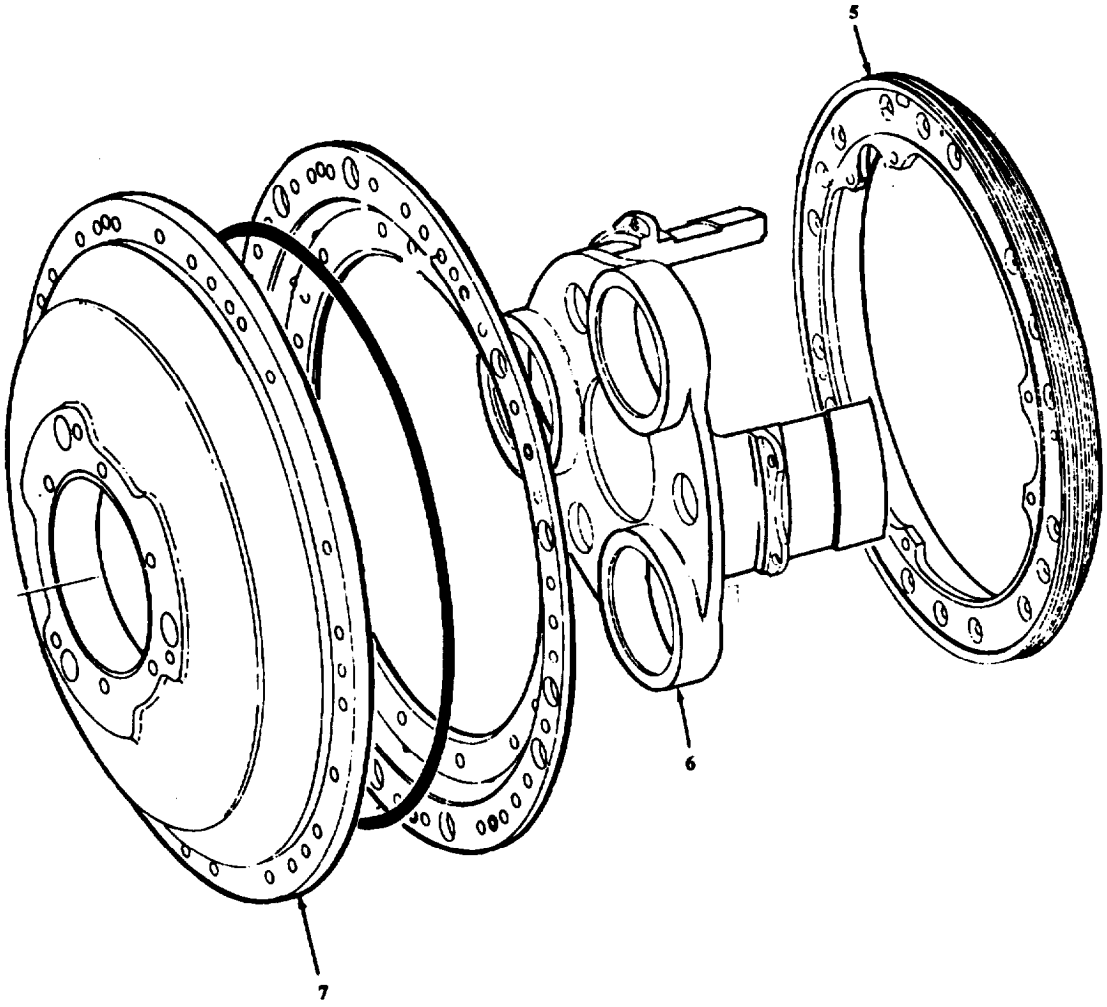
9-6. Output Reduction Carrier and Gear Assembly, Toquemeter Valve and Cylinder and Sun Gearshaft - Inspection (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued		



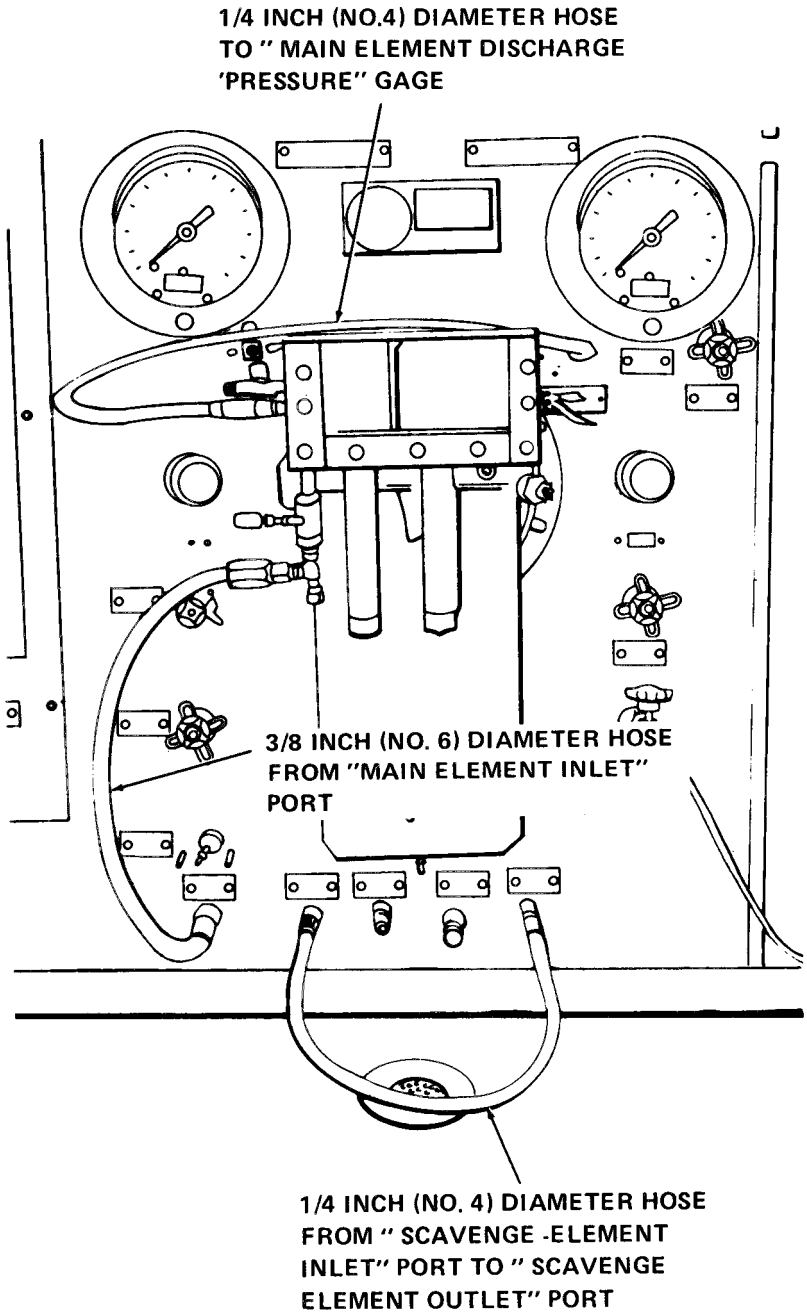
9-6. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder and Sun Gearshaft - Inspection (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRER AND GEAR ASSEMBLY/ - Continued		
12. All Parts		**Perform** visual inspection for cracks, distortion, and excessive wear. **Replace** parts that are cracked, distorted. and have excessive wear.
13. Front Cover Housing Assembly (7)		**Inspect** far damaged screw thread inserts. **Repair** screw thread inserts. **(Refer** to paragraph H-29.)
14. Output Reduction Carrier and Gear Assembly Torquemeter Valve and Cylinder and Sun Gem-shaft		Visually inspect all other parts for cracks. distortion and excessive wear, **Replace** parts that are cracked. distorted and have excessive wear.
15. Front Cover Housing Assembly (7)		**Inspect** for damaged screw thread inserts. **Repair** screw thread inserts as outlined in paragraph H-29.
16. Deleted		

Pages 9-31 and 9--32 have been deleted.

9-6. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder and Sun Gearshaft - Inspection (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued		



c. **Connect** a No. 4 (1/4-inch diameter) hose from top of pressure gage on holding fixture to MAIN ELEMENT DISCHARGE PRESSURE gage.

d. **Connect** a No. 4 (1/4-inch diameter) hose between SCAVENGE ELEMENT INLET and SCAVENGE ELEMENT OUTLET ports.

e. **Install** three packings on oil transfer tube. **Install** oil transfer tube into holding fixture. **Secure** transfer tube.

f. **Close** all valves on scavenge side of test stand.

g. Press STAND POWER and BOOST CIRCUIT PUMP switches on.

h. **Open** MAIN ELEMENT INLET THROTTLE VALVE. **Observe** that pressure indication appears on MAIN ELEMENT DISCHARGE PRESSURE gage.

i. **Adjust** PUMP BYPASS valve until MAIN ELEMENT DISCHARGE PRESSURE gage indicates 25 psi (1.76 kg/sq cm).

9-7. OUTPUT GEARSHAFT SEAL - REPLACEMENT

INITIAL SETUP

Applicable Configuration

All

Special Tools

Installation and Removal Tool (LTCT3638)

Consumable Materials

Shortening Compound (item 74. Appendix D)

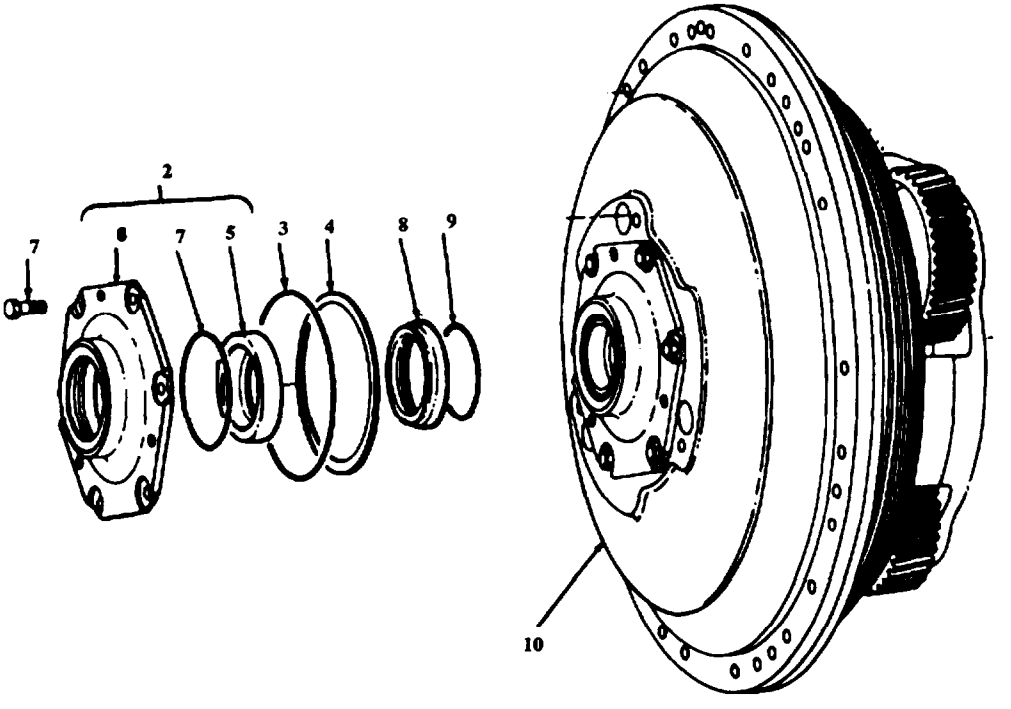
References

Appendix G. Table G-1

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION AND GEAR ASSEMBLY		
1. Lockwire		**Cut** and **remove** from bolts (1). **Remove** bolts.
2. Seal Housing Assembly (2)	Use three 1/4-28 bolts removed in step 1.	**Remove.**

9-7. OUTPUT GEARSHAFT SEAL - REPLACEMENT - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION AND GEAR ASSEMBLY/ - continued		



3. Spacer (4) and Packing (3)		**Remove. Discard** packing and retain spacer for reassembly.
4. Seal (5)	If installation and removal tool (LTCT3638) is not available. use a fiber drift and soft mallet or suitable sleeve and arbor press. Reference page 9-42, paragraph 9-8. step 30 for assembly, use lubricating oil (item 46 or 47, Appendix D) for lubrication.	Using installation and removal tool (LTCT3638) and arbor press. **remove** seal (5) from retainer (6).
5. Packing		**Remove** packing (7). **Discard** packing and seal (5).
6. Packing (7). Retainer (6)	Use shortening compound (item 74, Appendix D)	**Lubricate** new packing (7) and install in retainer (6).

9-7. OUTPUT GEARSHAFT SEAL - REPLACEMENT - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION AND GEAR ASSEMBLY/ - Continued		
	NOTE In following item 7, use care to prevent scratching or depressing seal (5). Insure seal is clean.	
7. Seal (5)		Using installation and removal tool (LTCT3638) and arbor press, **install** new seal (5) in retainer (6).
8. Faceplate (8) and Packing (9)		**Remove** faceplate (8) and packing (9) from output gearshaft. **Discard** packing and faceplate.
	NOTE In following item 9, use care to prevent scratching faceplate. Insure faceplate is clean.	
9. Packing (9)		**Install** new packing (9) in new faceplate (8). **Position** faceplate on output gearshaft.
10. Packing (3)		**Position** new packing (3) on seal housing assembly (2).
11. spacer (47)		**Position** original spacer (4). removed in item 3, in output reduction carrier and gear assembly (10).
12. Seal Housing Assembly (2)		**Position** seal housing assembly (2) on output reduction carrier and gear assembly (10) and **secure** with bolts (1). **Lockwire** bolts.

9-8. Output Reduction Carrier and Gear Assembly - Assembly (AVIM)

INITIAL SETUP

Applicable Configuration

All

Special Tools

Sleeve bushing (LTCT3659)
Sleeve bushing (LTCT3664)
Sleeve bushing (LTCT3663)
Sleeve bushing (LTCT3661)
Holding fixture (LTCT283)
Wrench (LTCT729)
Holding fixture (LTCT496)
Wrench (LTCT4190)
Installation and removal tool (LTCT3638 or installation tool LTCT722)
Holding fixture (LTCT4018)
Ring assembly (LTCT4019)
Wrench (LTCT-2080)
Socket and pilot tool (LTCT2079)
Alinement fixture (LTCT4560)
Sleeve bushing (LTCT3660)

Consumable Materials

Molybdenum Disulfide (item 57, Appendix D)
Opaque Ink No. 9 (item 94. Appendix D)
Oil (item 46 or 47. Appendix D)
Yellow Opaque Ink. No. 9 (item 94, Appendix D)
Lockwire (item 41, 42. or 43, Appendix D)

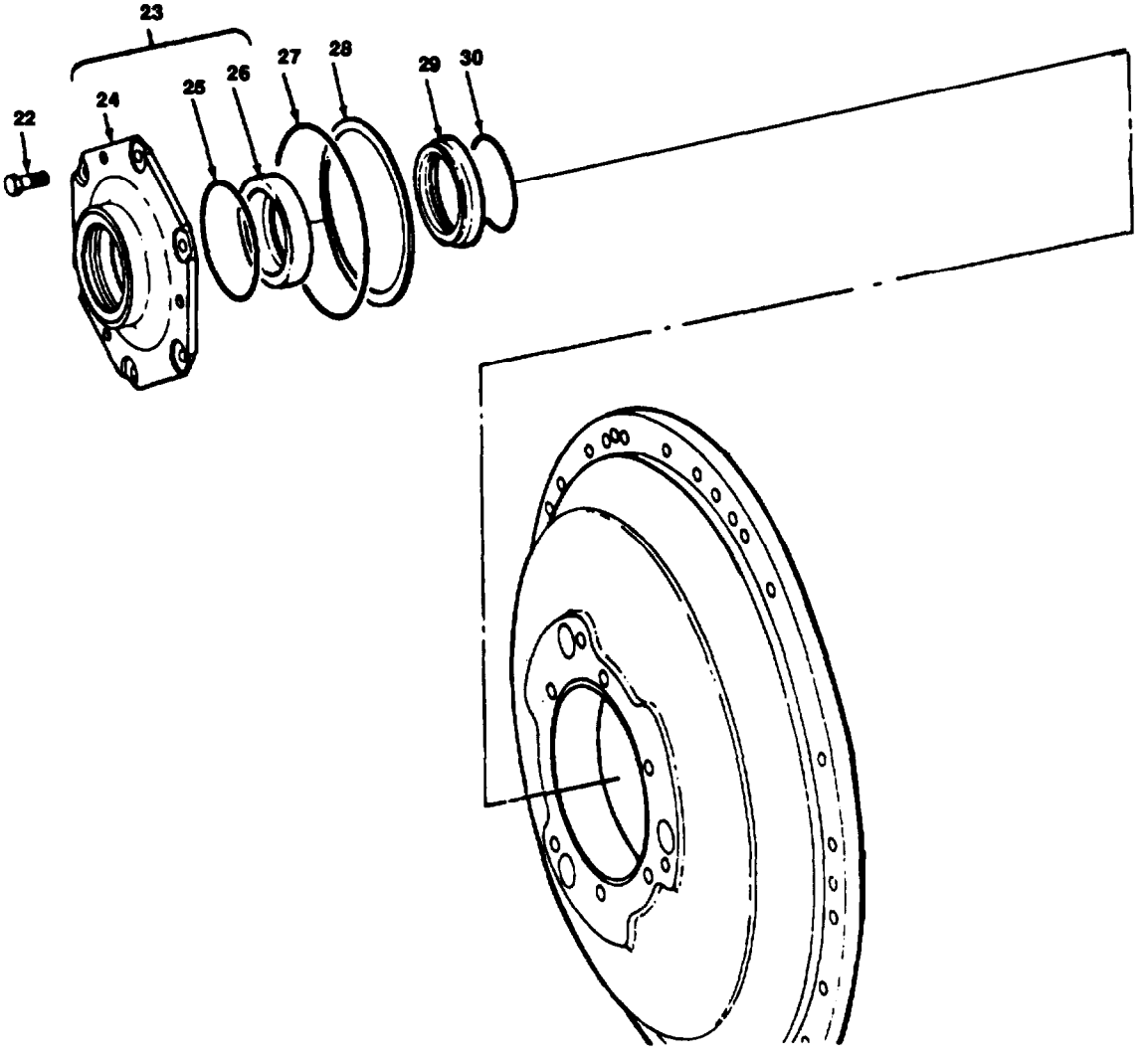
References

Tables G-3, G-4, G-5 and G-6, Appendix G

Pages 9-37 through 9-40 have been deleted.

9-8. Output Reduction Carrier and Gear Assembly - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued		

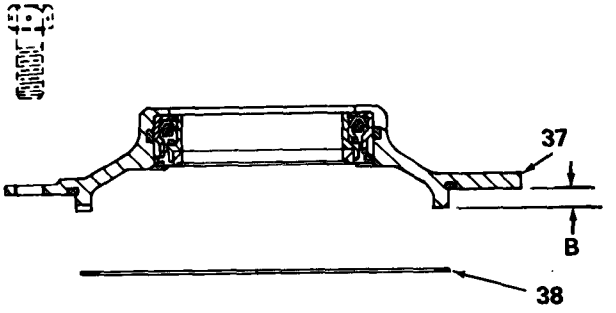


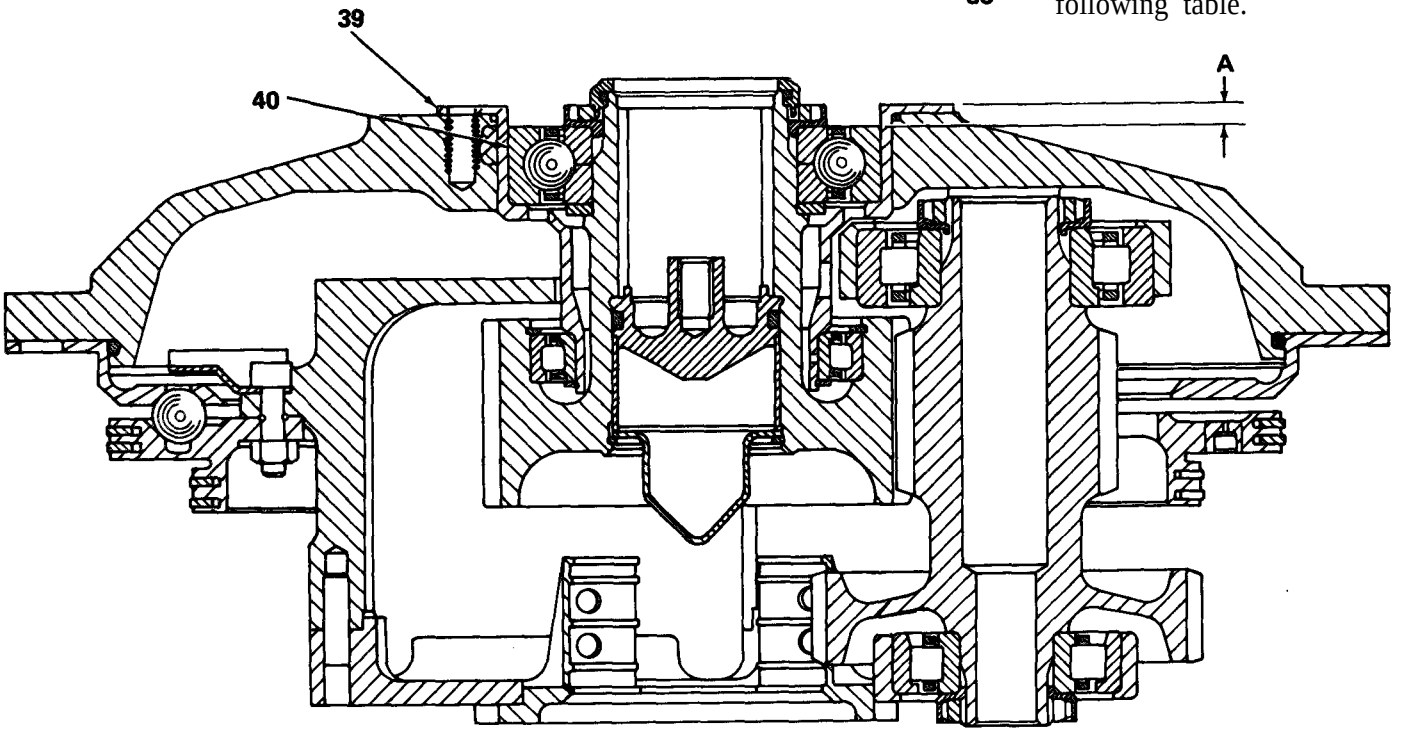
9-8. Output Reduction Carrier and Gear Assembly - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION AND GEAR ASSEMBLY/ - Continue		
24. Deleted		
25. Deleted		
26. Deleted		
27. Deleted		
28. Deleted		
29. Deleted		
30. Seal (26)	Use lubricating oil. item 46. Appendix D.	**Dip** in lubricating oil.
31. Packing (25)		**Place** in ID of retainer (24).
32. Seal (26)	Use arbor press and seal installation and removal tool (LTCT3638) or installation tool (LTCT722).	**Press** seal into retainer.

9-6. Output Reduction Carrier and Gear Assembly - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY/ - Continued		
33. Spacer (38)	Use depth micrometer. The following figure illustrates the determination of spacer thickness.	**Calculate** thickness of spacer as follows: a. **Measure from flange** of bearing liner (39) to outer race of bearing (40) to **determine** dimension A. b. **Measure** from lip to rear surface seal housing (37) flange to **determine** dimension B. c. **Subtract** dimension B from dimension A. **Add 0.003** inch to 0.006 inch (0.08 mm to 0.015 mm). Result will be thickness of spacer (38) required. **Select** proper spacer part number from following table.



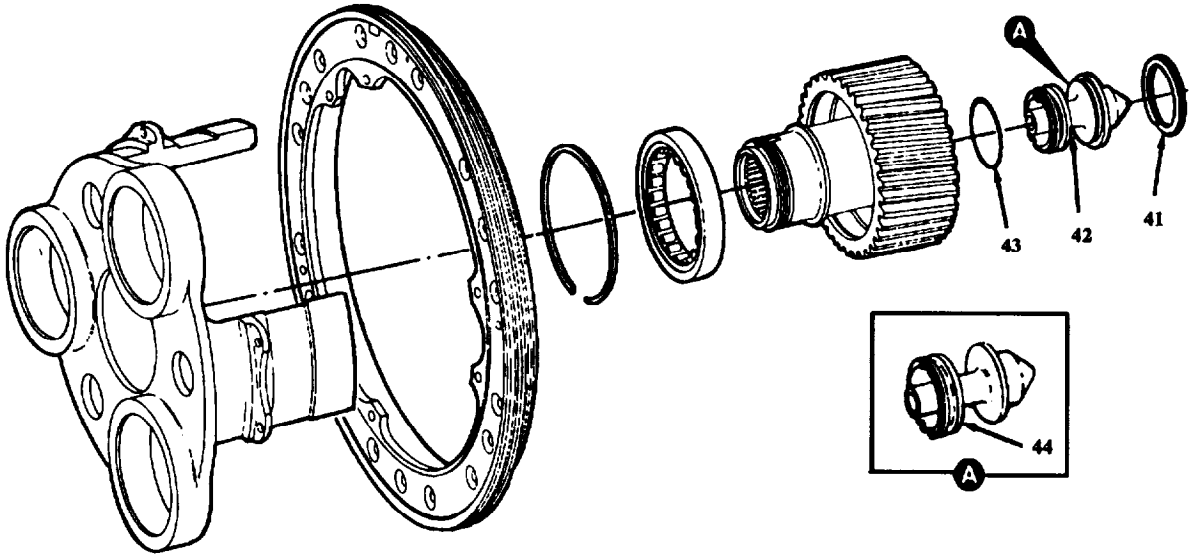


9-8. Output Reduction Carrier and Gear Assembly - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION AND GEAR ASSEMBLY/ - Continued		
	Use the following table for determining spacer thickness. Part Number / Shim Thickness 1-030-212-01 / 0.035 to 0.037 inch 1-030-212-02 / 0.038 to 0.040 inch 1-030-212-03 / 0.041 to 0.043 inch 1-030-212-04 / 0.044 to 0.046 inch	
34. Spacer (38)	**Determine** thickness of spacer (action for item 33).	**Place** against outer race of ball bearing (33).
35. Packing (27)		**Place** on OD of seal housing assembly (23).
36. Packing (30)		**Install** in ID of faceplate (29).
37. Faceplate (29)		**Reinstall** on gearshaft (19).
38. Seal Housing Assembly (23)		**Install** on front cover housing assembly (13). **Secure** with bolts (22). **Tighten** bolts as required. **Lockwire.**
39. Packing (43)		**Install** on plug (42 or 44).
40. Plug (42 or 44)		**Install** into rear of gearshaft (19). **Secure** with retailing ring (41).
41. Deleted		

9-8. Output Reduction Carrier and Gear Assembly - Assembly (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
OUTPUT REDUCTION AND GEAR ASSEMBLY/ - Continued		



42. Deleted

Pages 46 through 50 have been deleted.

9-9. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder, and Sun Gearshaft - Installation (AVIM)

INITIAL SETUP

Applicable Configuration

All

Special Tools

Installer and remover (LTCT519)
Guide (LTCT4602)
Holding fixture (LTCT2075)
Driver wrench (LTCT258)
Lifting fixture (LTCT4182)

Consumable Materials

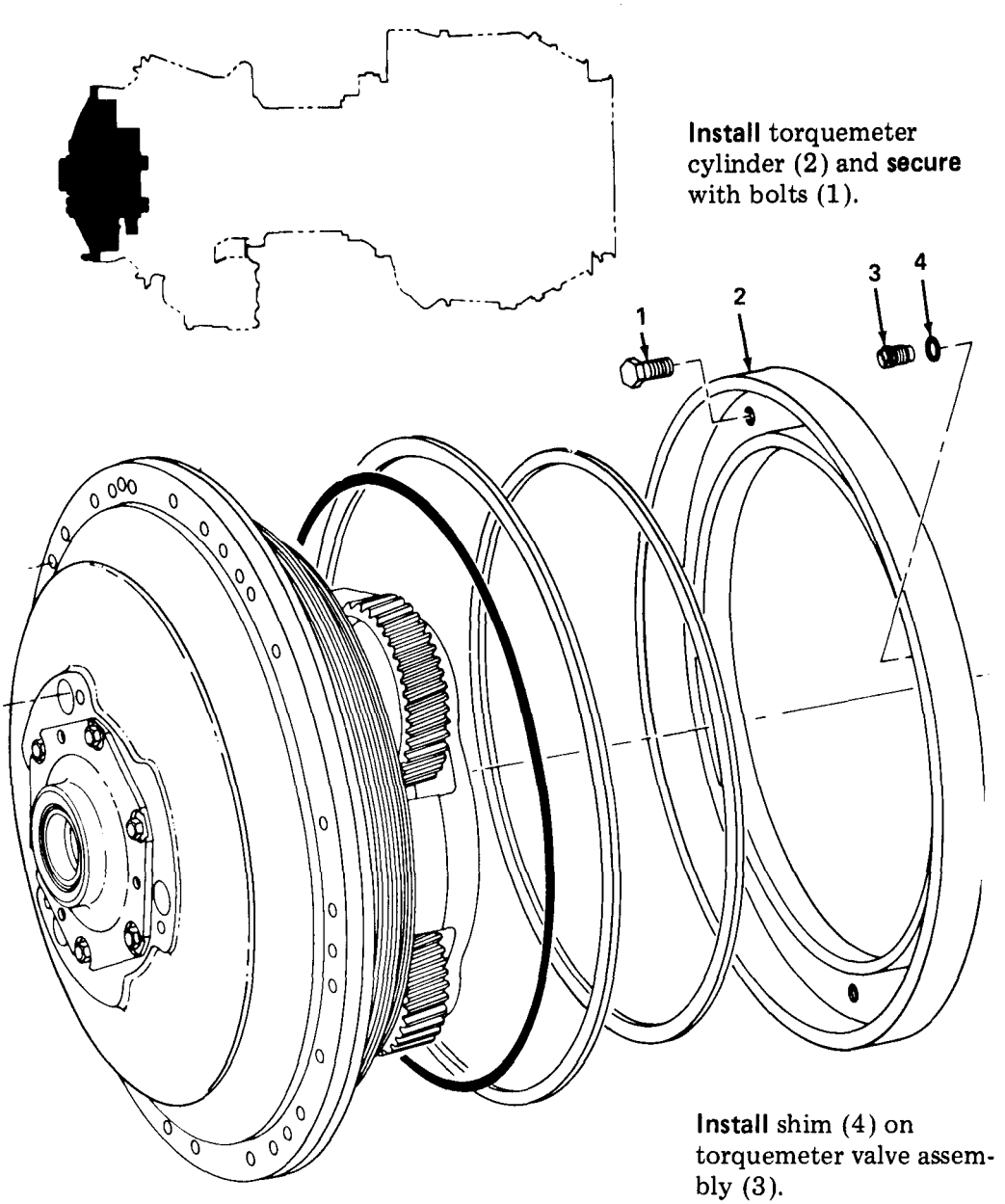
Lockwire (item 41, 42, or 43, Appendix D)

Refer Pages

Appendix G, table G-3. reference numbers 3, 14 and 16
Appendix G. table G-4, reference numbers 1, 3 and 9
Appendix G, table G-5, reference numbers 16 and 10
Appendix G. table G-6, reference numbers 1 and 3

9-9. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder, and Sun Gearshaft - Installation (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		
1. Torquemeter Cylinder (2)		**Install** torquemeter cylinder (2) and **secure** with bolts (1).
2. Shim (4)		**Install** shim (4) on torquemeter valve assembly (3).
3. Torquemeter Valve Assembly (3)	Use installer and remover (LTCT519) or socket (preferably 6-point).	**Install** torquemeter valve assembly (3) into torquemeter cylinder. **Tighten** valve as required **(Refer** to table G-3, Appendix G, reference number 3, or table G-4, reference number 1.)



9-9. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder, and Sun Gearshaft-Installation (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		
4. Tarquemeter Valve and Cylinder	Use depth micrometer or depth gage.	**Measure** distance (dimension A) from forward end of inlet housing to torquemetes valve plunger and distance (dimension B) from forward end of inlet housing to inner flange of torquemeter cylinder.
5. Torquemeter Valve and Cylinder	Dimension C shall be as given in table G-5, reference number 11, or table G-6, reference number 4. If this dimension is not within limits, remove torquemeter valve shim as required, and reinstall valve and shim.	**Subtract** dimension A from dimension B to obtain dimension C.
6. Taquemeter Valve Assembly (3)		**Lockwire.**
7. Deleted		
8. Deleted		
9. Deleted		

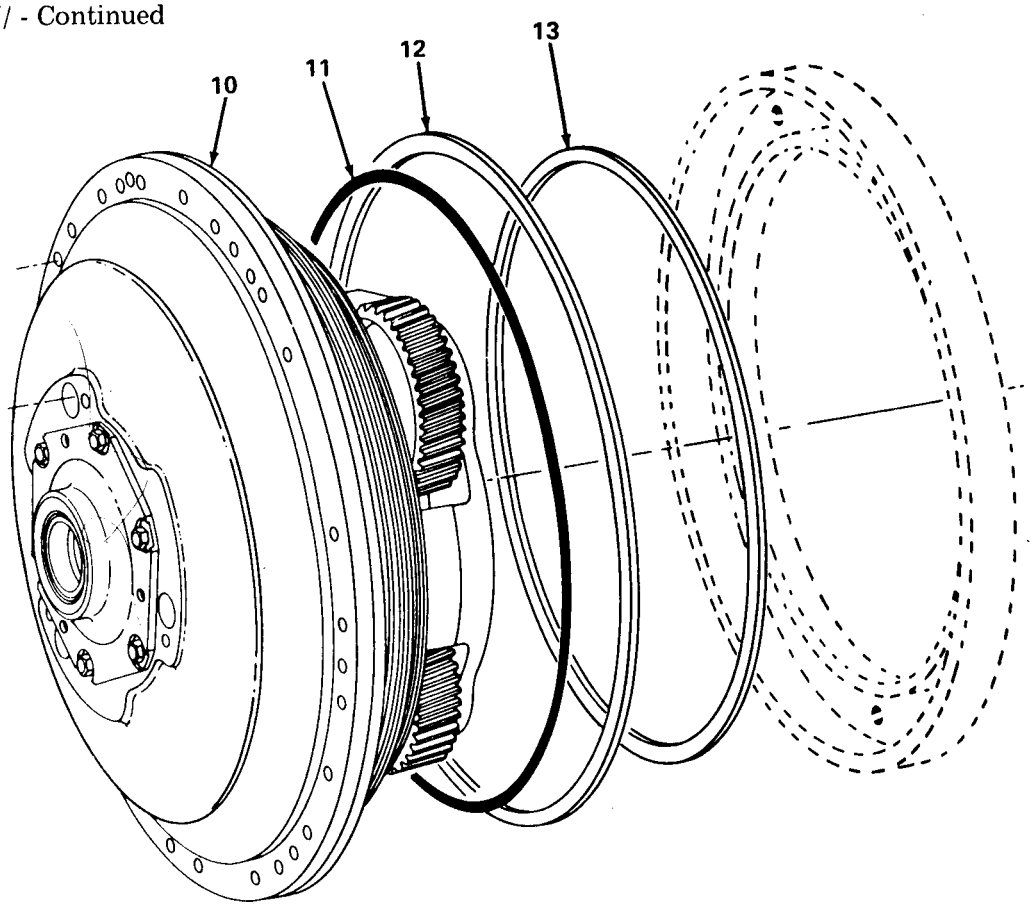
Page 9-54 has been deleted.

9-9. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder, and Sun Gearshaft - Installation (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		
14. Deleted		
15. Deleted		
16. Deleted		
17. Torquemeter Cylinder	End gap shall be as given in table G-5, Appendix G. reference number 10. or table G-6, reference number 3.	**Check** far end gap on seal rings (12 and 13) in the installed position in torquemeter cylinder (2). **Remove** rings.
18. Seal Rings (12 and 13)		**Install** in appropriate grooves of rear torquemeter plate.
19. New Packing (11)		**Place** new packing (11) on carrier and gear assembly (10).

9-9. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder, and Sun Gearshaft - Installation (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		



20. Reduction Gear Carrier Assembly	Use lifting fixture (LTCT4182).	**Thread** lifting device into plug.
21. Reduction Gear Carrier Assembly	Use suitable hoist.	**Install** reduction gear carrier assembly on engine inlet housing. **Insure** that the planetary gears and sun gear are properly meshed.

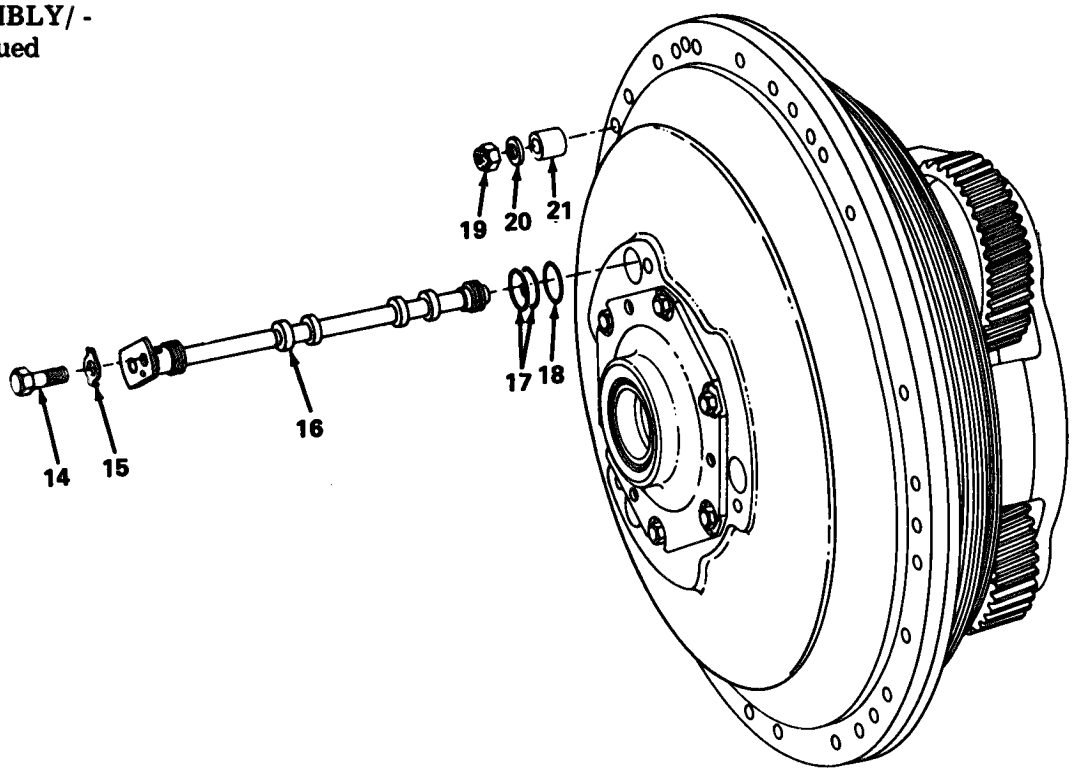
CAUTION

Use care when pushing the reduction gear carrier assembly over the inlet studs to prevent damage to screw threads.

22. Reduction Gear Carrier Assembly		**Remove** lifting fixture.

9-9. Output Reduction Carrier and Gear Assembly, Torquemeter Valve and Cylinder, and Sun Gearshaft - Installation (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
INLET HOUSING ASSEMBLY/ - Continued		



23. Output Reduction Carrier and Gear Assembly	Do not lubricate nuts or studs. Position end of spacer with chamfered ID against housing.	**Secure** with spacers (21), washers (20), and nuts (19). **Tighten** nuts as required. (Refer to table G-3, Appendix G, reference number 16 or table G-4, reference number 9.)
24. Oil Transfer Tubes (16)		**Install** packings (17 and 18) on oil transfer tube (16), and **install** tubes into output reduction carrier and gear assembly. **Secure** each oil transfer tube with tab-washer (15) and bolts (14). **Tighten** bolts as required and **secure by bending** one tab provided in oil transfer tuba.

APPENDIX A
REFERENCES

OVERVIEW

The following referenced publications are required for use by Aviation Unit Maintenance (AVUM), Aviation Intermediate Maintenance (AVIM). Aviation Intermediate Maintenance (AVIM), and Aviation Overhaul Maintenance (Depot) personnel in performance of their duties.

PUBLICATION NUMBER	TITLE
AR 385-11	Ionization Radiation Protection
DA PAM 738-751	The Army Maintenance Management System
DA Pamphlet 310-1 (microfiche)	Consolidated Index of Army Publications and Blank Forms
Technical Index No Number	Department of Defense Index of Specifications and Standards
MIL-C-5541	Chemical Films for Aluminum and Aluminum Alloys
MIL-F-22191	Heat Sealable Flexible Transparent Films for Packaging Application
MIL-I-6866	Fluorescent-Penetrant Method
MIL-I-6868	Magnetic-Particle Method
MIL-I-8846	Selection and Installation Procedure
MIL-W-8611	Tungsten Inert Gas Process
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U.S. Government Property
SB 708-501 (H4-1)	Federal Supply Code for Manufacturers
TB 1-2840-229-20-2	Sandy Environment and/or Combat Operations for T53-L-13B. and T53-L-703 Engines
TB 55-1500-200-40/2	Engine Quick Change Assembly Bulletin: Lycoming T53-L-9A. L-11,L-11B and L-13 engines for all Army Mode UH-1 Helicopters
TB 55-1500-200-40/3	Engine Quick Change Assembly Bulletin: Lycoming T53-L-13 engine for Army Model AH-1G/TH-1G Helicopters
TB 43-0106	Spectrometric Oil Analysis
TB 55-8100-200-24	Maintenance of Specialized Reusable Metal Containers for Aircraft Equipment
TB 55-9150-200-24	Engine and Transmission Oils, Fuels and Additives for Army Aircraft
TM 43-0103	Non Destructive Inspection Methods
TM 55-1500-204-25/1	General Aircraft Maintenance Manual
TM 55-1500-243-23	Corrosion Control for Army Aircraft
TM 55-1500-345-23	Painting and Marking of Army Aircraft
TM 55-2840-213-40 and	GS Maintenance Manual - Dual Element Hydraulic Gear Type Lube Scavenge Pump Assembly
TM 55-2840-214-40	GS Maintenance Manual - Inline Air Valve Part No. 25830029, 26130071,26230027,26330053
TM 55-2840-216-40	GS Maintenance Manual - Power Driven Rotary Lube and Scavenge Pump Model RG 17350

PUBLICATION NUMBER	TITLE
TM 55-2840-223-40	GS Maintenance Manual - Hot Air Shutoff Valve PM 28040
TM 55-2840-229-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (including Depot Maintenance Repair Parts and Special Tools)
TM 55-2840-247-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (including Depot Maintenance Repair Parts and Special Tools)
TM 55-4920-243-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual; Vibration Monitoring Kit (NSN 4920-00-879-0331)
TM 55-4920-401-13&P	Organizational, DS, GS, and Depot Maintenance Manual: Tester, Exhaust Gas Temperature. Model BH112JB53 (NSN 4920-00-372-4593)
TM 55-4920-317-15	Operation, Maintenance, and Repair Parts Data: Mobile Trailer Assembly (LTCT744 and TE12062)
TM 55-4920-328-14	Operation. Maintenance, and Repair Parts Data: Modular Engine Test System (LTCT10465-02)
TM 750-244-5	Destruction of Conventional Ammunition and Improved Conventional Munition to prevent Enemy Use

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. MAINTENANCE ALLOCATION CHART.

a. This Maintenance Allocation Chart (MAC) assigns maintenance functions in accordance with the Three Levels of Maintenance concept for Army aircraft, These maintenance levels, Aviation Unit Maintenance (AVUM); Aviation Intermediate Maintenance (AVIM) and Depot Maintenance are depicted on the MAC as:

AVUM which corresponds to the O Code in the RPSTL

AVIM which corresponds to an F Code in the RPSTL

DEPOT which corresponds to a D Code in the RPSTL

b. The maintenance to be performed below depot and in the field is described as follows:

(1) Aviation Unit Maintenance (AVUM) activities will be staffed and equipped to perform high frequency "On-Aircraft" maintenance tasks required to retain or return aircraft to a serviceable condition. The maintenance capability of the AVUM will be governed by the Maintenance Allocation Chart (MAC) and limited by the amount and complexity of ground support equipment (GSE), facilities required, and number of spaces and critical skills available. The range and quantity of authorized spare modules/components will be consistent with the mobility requirements dictated by the air mobility concept. (Assignments of maintenance tasks to divisional company size aviation units will consider the overall maintenance capability of the division, the requirement to conserve personnel and equipment resources and air mobility requirements.)

(a) Company size Aviation Units Perform those tasks which consist primarily of preventive maintenance and maintenance repair and replacement functions associated with sustaining a high level of aircraft operational readiness. Perform maintenance inspections and servicing to include preflight, daily, intermediate, periodic and special inspections as authorized by the MAC or higher headquarters. Identify the cause of equipment/system malfunctions using applicable technical manual troubleshooting instructions, built-in test equipment (BITE), installed aircraft instruments, or easy to use/interpret diagnostic/fault isolation devices (TMDE). Replace worn or damaged modules/components which do not require complex adjustments or system alinement and which can be removed/installed with available skills, tools and equipment. Perform operational and continuity checks and make minor repairs to the electrical system. Inspect, service and make operational capacity and pressure checks to hydraulic systems. Perform servicing, functional adjustments, and minor repair/replacement to the flight control, propulsion, power train and fuel systems. Accomplish airframe repair which does not require extensive disassembly, jigging, or alinement. The manufacture of airframe parts will be limited to those items which can be fabricated with tools and equipment found in current air mobile tool and shop sets. Evacuate unserviceable modules/components and end items beyond the repair capability of AVUM to the supporting AVIM.

(2) Less than Company Size Aviation Units: Aviation elements organic to brigade, group, battalion headquarters and detachment size units are normally small and have less than ten aircraft assigned. Maintenance tasks performed by these units will be those which can be accomplished by the aircraft crew chief or assigned aircraft repairman and will normally be limited to preventive maintenance, inspections, servicing, spot painting, stop drilling, application of nonstress patches, minor adjustments, module/component fault diagnosis and replacement of selected modules/components. Repair functions will normally be accomplished by the supporting AVIM unit.

(3) Aviation Intermediate Maintenance (AVIM) provides mobile, responsible "One Stop" maintenance support. (Maintenance functions which are not conducive to sustaining air mobility will be assigned to depot maintenance). Performs all maintenance functions authorized to be done at AVUM. Repair of equipment for return to user will emphasize support or operational readiness requirements. Authorized maintenance includes replacement and repair of modules/components and items which can be accomplished efficiently with available skills, tools, and equipment. Established the Direct Exchange (DX) program for AVUM units by repairing selected items for return to stock when such repairs cannot be accomplished at the AVUM level. Inspects, troubleshoots, tests, diagnoses, repairs, adjusts, calibrates, and alines aircraft system modules/components. AVIM units will have capability to determine the serviceability of specified modules/components removed prior to the expiration of the Time Between Overhaul (TBO) or finite life. Module/component disassembly and repair will support the DX program and will normally be limited to tasks requiring cleaning and the replacement of seals, fittings and items of common hardware, airframe repair and fabrication of parts will be limited to those maintenance tasks which can be performed with available tools and test equipment. Unserviceable reparable modules/components and end items which are beyond the capability of AVIM to repair will be evacuated to Depot Maintenance. This level will perform aircraft weight and balance inspections and other special inspections which exceed AVUM capability. Provides quick response maintenance support, including aircraft recovery and air evacuation, on-the-job training, and technical assistance through the use of mobile maintenance contact teams. Maintain authorized operational readiness float aircraft. Provides collection and classification services for serviceable/unserviceable material. Operates a cannibalization activity in accordance with AR 750-50. (The aircraft maintenance company within the maintenance battalion of a division will perform AVIM functions consistent with air mobility requirements and conservation of personnel and equipment resources. Additional intermediate maintenance support will be provided by the supporting nondivisional AVIM unit.)

B-2. USE OF THE MAINTENANCE ALLOCATION CHART.

a. The Maintenance Allocation Chart assigns maintenance functions based on past experience and the following consideration:

(1) Skills available.

(2) Time required.

(3) Tools and test equipment required and/or available.

b. The assigned levels of maintenance authorized to perform a maintenance function is indicated.

c. A maintenance function assigned to a lower maintenance level to be performed at any higher maintenance level.

d. A maintenance function that cannot be performed at the assigned level of maintenance for any reason may be evacuated to the hext higher maintenance organization. Higher maintenance levels will perform the maintenance functions of lower maintenance levels when required or directed by the appropriate commander.

e. The assignment of a maintenance function will not be construed as authorization to carry the associated repair parts in stock. Information to requisition or otherwise secure the necessary repair parts will be as specified in the Repair Parts, an Special Tools List.

f. Normally there will be no deviation from the assigned level of maintenance. In cases of operational necessity, maintenance functions assigned to a higher maintenance level may, on a one-time basis and at the request of the lower maintenance level, be specifically authorized by the maintenance officer of the higher level of maintenance to which the function is assigned. The special tools, equipment, etc. required by the lower level of maintenance to perform this function will be furnished b the maintenance level to which the function is assigned. This transfer of a maintenance fun on to a lower maintenance level does not relieve the higher maintenance level of the responsibility of the function. The higher level of maintenance has the authority to determine:

(1) If the lower level is capable of performing the work.

(2) If the lower level will require assistance or technical supervision and on-site inspection.

(3) If the authorization will be granted.

g. Maintenance of the US Army Communications and Electronics Material Readiness Command equipment will be performed by designated US Army CERCOM personnel.

h. Changes to the Maintenance Allocation Chart will be based on continuing evaluation and analysis by responsible technical personnel and on reports received from field activities.

B-3. DEFINITIONS.

Maintenance Functions. Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with the prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring and diagnostic equipment used in recision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating or fixing into position an item, part or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly or module (component or assembly), for an unserviceable counterpart.

i. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an em by correcting specific damage, fault, malfunctions or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by the maintenance standard (i.e. DMWR) in the appropriate technical publication. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero, those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-4. STANDARD GROUPS.

The standard groupings shown below are used, as applicable, throughout this MAC. Maintenance manuals and RPSTLS will reflect these standard groupings as individual chapters with sections in each chapter relative to the individual complete systems, subsystems, modules, components, assemblies, or specific parts noted.

Group Number	Description
0400	ENGINE SYSTEM
0401	ENGINE GENERAL Servicing, handling, inspection requirements, lubrication charts, overhaul and retirement schedules. External lines and hoses. (As applicable).
0402	COMPRESSOR SECTION Rotors, blades, vanes, impeller, stators, inlet guide vanes, main frame, particle separator, bleed valve, bearings, seals, external lines and hoses.
0403	COMBUSTION SECTION Liners, nozzles, stators, rotor seals, couplings, blades.
0404	POWER-TURBINE Nozzles, rotors, blades, exit guide vanes, exhaust frame, drive shaft, bearings, seals, external lines and hoses.
0405	ACCESSORY GEARBOX Input and output gears, seals, chips detector, housings, drive shaft, bearings, seals.
0406	FUEL SYSTEM Fuel Control, fuel boost pump, governor, fuel filter assembly sequence valve. Fuel manifold, fuel nozzle, external lines and hoses.

Group Number	Description
0407	ELECTRICAL SYSTEM Electrical control unite, exciters, thermocouple, ignition harness, electrical cables, history recorders, torque overspeed sensor, NP sensor, alternate stator, blowers.
0408	OIL SYSTEM Tanks, oil filter, oil cooler, lube and scavenge pumps oil filter bypass sensor, external lines and hoses.

B-5. SYMBOLS.

The letters "AVUM, AVIM and Depot" as placed on the Maintenance Allocation Chart, indicate the level of Maintenance responsible for performing the particular maintenance function based upon assigned skills tools and test equipment end time required to accomplish maintenance.

B-6. WORK TIMES.

The symbol _•_ identifies the lowest level of Maintenance authorized to perform a maintenance function and indicated that work time figures are being developed and will be entered at a later date. When develop ed, this time will appear: for example as, 0.1 and also indicates the lowest level of authorized maintenance.

B-7. TOOLS AND TEST EQUIPMENT (Section III).

Special tools, test, and support equipment required to do maintenance functions are listed with a reference number to permit cross-referencing to column 5 in the MAC. In addition, the maintenance category authorized to use the device is listed along with the item National Stock Number end, if applicable, the number to aid in identifying the tool/device.

B-8. REMARKS (Section IV).

Column 6 of the MAC contains alphabetic reference codes which are explained in Section, IV of this appendix.

Section II. MAINTENANCE ALLOCATION CHART

NOMENCLATURE OF END ITEMS

T53-L-11C/11D/13B/703

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category AVUM	AVIM	Depot	(5) Tools and Equipment	(6) Remarks
		NOTE					
		The AVUM Maintenance function identified herein as restricted to Company size units. These units are authorized SC 4920-99-CL-A92 (AVUM No. 2) Tool Set and have 10 or more Aircraft assigned. Refer to Paragraph B-1.b.(1)(a) and (2).					
	POWERPLANT AND RELATED SYSTEMS						
0400	ENGINE COMPLETE ASSEMBLY	Inspect	-			2	
		Test	-			1,2,64	A
				-		2,4,6,64	B
		Service	-			2	
		Replace	-			1,2,72,73	
		Repair	-			1,2	C
		Overhaul			-		
0401	ENGINE GENERAL						
0402	COMPRESSOR SECTION						
040201	IMPELLER HOUSING	Inspect	-			2	E,F
		Replace	-			1,2	
		Repair	-			1,2	D
		Overhaul			-		
040202	COMPRESSOR HOUSING	Inspect	-			2	E,F
		Replace	-			1,2,46	
		Repair	-			1,2,45	
		Overhaul			-		
040203	COMPRESSOR STATOR VANES	Inspect	-			2	F
		Replace	-			2,4	
		Repair	-			1,2	D
040204	COMPRESSOR ROTOR BLADES	Inspect	-			2	G
		Replace	-			1,2,7,10,11, 52,75	
		Repair	-			1,2	D

NOMENCLATURE OF END ITEMS

T53-L-11C/11D/13B/703

(1)	(2)	(3)	(4)			(5)	(6)
			Maintenance Category			Tools	
Group Number	Component/Assembly	Maintenance Function	AVUM	AVIM	Depot	and Equipment	Remarks
040205	POWER SHAFT (SPLINES)	Inspect	_·_			2	
		Replace			_·_		
040206	AIR INLET HOUSING	Inspect	_ _			2	D,E
		Replace			_ _		
		Repair		_ _		2,4	
040207	AIR INLET VANES	Inspect	_ _			2	F
		Replace			_·_		
		Repair	_ _			1,2	F
040208	VARIABLE INLET GUIDE VANE ASSY (T53-L-13B/703)	Inspect	_ _			1,2	F
		Replace			_ _		
		Repair	_·_			1,2	F
040209	OUTPUT SHAFT SEAL	Inspect	. . _			1	
		Replace	_ _			1,2,14	
040210	OIL TRANSFER TUBES	Inspect	_ _			2	
		Replace	_ _			1,2	
		Repair	_·_			1,2	
040211	REDUCTION CARRIER AND GEAR ASSY	Inspect		_·_		2,4	F
		Replace		_·_		2,4,43,39, 66	
		Repair		_ _		2,3,4,9,14, 39,40,41, 42,43,44, 53	
		Overhaul			_ _		
040212	OVERSPEED GOVERNOR AND TACHOMETER DRIVE SUPPORT AND GEAR ASSY	Inspect	_·_			2	
		Replace	_ _			1,2	
		Repair		_ _		2,4,49,50, 54,55,56, 57,58,59	
		Overhaul			_·_		
040213	INTERSTAGE BLEED BAND	Inspect	_ _			2	
		Replace	_·_			1,2	
		Repair	_·_			1,2	

NOMENCLATURE OF END ITEMS

T53-L-11C/11D/13B/703

(1)	(2)	(3)	(4)			(5)	(6)
			Maintenance Category			Tools and	
Group Number	Component/Assembly	Maintenance Function	AVUM	AVIM	Depot	Equipment	Remarks
040214	INTERSTAGE BLEED ACTUATOR HOSE ASSY	Inspect	— —			2	
		Replace	—·—			1,2	
040215	AIR DIFFUSER HOUSING	Inspect	— —			2	F
		Replace			— —		
		Repair		— —		1,2,4	
040216	REAR BEARING SEAL AND SEAL HOUSING	Inspect	— —			2	
		Replace	— —			1,2	
040217	REAR BEARING SEAL LINER AND REAR CONES	Inspect	— —			2	
		Replace	—·—			1,2	
040218	INLET GUIDE VANE ACTUATOR ASSY (T53-L-13B-703)	Inspect	— —			2	
		Replace	— —			1,2	
		Repair	— —			1,2	
		Overhaul			— —		
		Adjust	— —			1,2,61	H
040219	INLET GUIDE VANE ACTUATOR HOSE (T53-L-13B-703)	Inspect	— —			2	
		Replace	— —			1,2	
040220	INTERSTAGE BLEED ACTUATOR ASSEMBLY	Inspect	—·—			2	
		Replace	— —			1,2	
		Repair	— —			1,2	
		Overhaul			— —		
		Adjust	— —			1,2	H
0403	COMBUSTION SECTION						
040301	COMBUSTION CHAMBER HOUSING	Inspect	— —			2	F
		Replace	— —			1,2,22	
		Repair		—·—		2,3,4,20, 48,51,5	
040302	COMBUSTION CHAMBER LINER	Inspect	— —			2	F
		Replace	—·—			1,2	
		Repair		—·—		2,4,5,13	
040303	COMBUSTION CHAMBER DRAIN	Inspect	— —			2	
		Replace	— —			1,2	
		Repair	—·—			1,2	

NOMENCLATURE OF END ITEMS

T53-L-11C/11D/13B/703

(1)	(2)	(3)	(4)			(5)	(6)
			Maintenance Category			Tools	
Group Number	Component/Assembly	Maintenance Function	AVUM	AVIM	Depot	and Equipment	Remarks
040304	COMBUSTION CHAMBER DEFLECTOR	Inspect	_·_			2	F
		Replace	_·_			1,2	
		Repair		_ _		2,4,5	
040305	FIRE SHIELD	Inspect	_·_			2	F
		Replace	_·_			1,2	
		Repair		_ _		2,4,5	
040306	SUPPORT CONE, EXHAUST DIFFUSER	Inspect	_ _			2	F
		Replace	_·_			1,2	
		Repair		_ _		2,4	
040307	EXHAUST DIFFUSER	Inspect	_·_			2	F
		Replace	_·_			1,2	
		Repair		_ _		2,4,5	
0404	POWER TURBINE						
040401	1ST & 2ND STAGE POWER TURBINE NOZZLE ASSY (T53-L-13B/703)	Inspect	_ _			2	F
		Replace	_·_			1,2,19,20, 21,22,23	
		Repair		_ _		2,4,5,65	D
040402	2ND STAGE POWER TURBINE ROTOR ASSY (T53-L-13B/703)	Inspect	_·_			2	F
		Replace	_ _			1,2,19,20,21, 22,23,74	
		Repair				1,2	D
		Overhaul			_ _		
040403	1ST STAGE POWER TURBINE ROTOR ASSY (T53-L-13B/703)	Inspect	_ _			2	F
		Replace	_·_			1,2,15,19, 20,21,22,23, 27,29,30	
		Repair	_·_			1,2	D
		Overhaul			_ _		
040404	1ST AND 2ND STAGE GAS PRODUCER TURBINE ROTOR ASSY (T53-L-13B/703)	Inspect	_ _			2	F
		Replace				1,2,30,31, 32,33,34, 35,37,38, 71	
		Repair	_·_			1,2 2,4,5	D
		Overhaul			_ _		

NOMENCLATURE OF END ITEMS

T53-L-11C/11D/13B/703

(1)	(2)	(3)	(4)			(5)	(6)
			Maintenance Category			Tools	
Group Number	Component/Assembly	Maintenance Function	AVUM	AVIM	Depot	and Equipment	Remarks
040405	1ST & 2ND STAGE GAS PRODUCER NOZZLE AND FLANGE (T53-L-13B/703)	Inspect	--			2	F
		Replace	--			2,30,31,32, 33,34,35, 36,37,38, 62	
		Repair	--			1,2	D
				--		2,4,5	
		Overhaul			--		
040406	REAR BEARING AFT SEAL HOUSING (T53-L-13B/703)	Inspect	--			2	F
		Replace	--			1,2	
040407	REAR BEARING FWD SEAL & FWD REAR OIL RING & CONES (T53-L-13B/703)	Inspect	--			2	F
		Replace	--			1,2	
040408	REAR BEARING FWD SEAL & FWD REAR OIL RING & CONES (T53-L-11 SERIES ENGINES)	Inspect	--			2	F
		Replace		--		2,4,18	
040409	REAR BEARING AND REAR BEARING HOUSING (T53-L-11 SERIES ENGINES)	Inspect		--		2	
		Replace		--		2,4	
040410	POWER TURBINE NOZZLE AND CYLINDER (T53-L-11 SERIES ENGINES)	Inspect		--		2	F
		Replace		--		2,4	
		Repair		--		2,4,5	
040411	2ND STAGE POWER TURBINE ROTOR ASSY (T53-L-11 SERIES ENGINES)	Inspect	--			1	F
		Replace		--		1,4	
		Repair		--		1,4	
040412	FIRST STAGE TURBINE ROTOR ASSY (T53-L-11 SERIES ENGINES)	Inspect		--		1	F
		Replace		--		1,4,25,27, 28,29	
				--			
		Repair		--		1,4	
040413	FIRST STAGE TURBINE NOZZLE & FLANGE (T53-L-11 SERIES ENGINES)	Inspect		--		1	F
		Replace		--		1,4	
		Repair		--		1,4,5,65, 70	

NOMENCLATURE OF END ITEMS

T53-L-11C/11D/13B/703

(1)	(2)	(3)	(4)			(5)	(6)
Group Number	Component/Assembly	Maintenance Function	Maintenance Category AVUM	AVIM	Depot	Tools and Equipment	Remarks
0405	ACCESSORY GEARBOX						
040501	ACCESSORY DRIVE GEARBOX	Inspect	– · –			2	F
		Replace	– · –			1,2	
		Repair		– · –		1,2,17,67, 68,69	K
040502	ACCESSORY DRIVE CARRIER ASSY	Inspect		– · –		2,4	F
		Replace		– · –		2,4	
040503	CHIP DETECTOR	Inspect	– · –			2	
		Replace	– · –			1,2	
040504	OIL TEMPERATURE BULB	Inspect	– · –			2	
		Replace	– · –			1,2	
0406	FUEL SYSTEM						
040601	FUEL & OIL HOSE ASSY	Inspect	– · –			2	
		Replace	– · –			1,2	
040602	FUEL CONTROL ASSY	Inspect	– · –			2	N,O
		Replace	– · –			1,2	
		Repair	– · –			1,2	I
		Adjust	– · –			1,2	J
		Overhaul			– · –		
040603	FUEL CONTROL SOLENOID VALVE	Inspect	– · –			2	E,N
		Replace	– · –			1,2	
040604	FUEL CONTROL FILTERS & STRAINERS	Inspect	– · –			2	
		Replace	– · –			1,2	
040605	BYPASS FILTER (T5 3-L-11 SERIES ENGINES)	Inspect	– · –			2	
		Replace	– · –			1,2	
040606	STARTING FUEL SOLENOID VALVE	Inspect	– · –			2	E,N
		Replace	– · –			1,2	
		Repair	– · –			1,2	
040607	MAIN FUEL MANIFOLD (T53-L-11 SERIES ENGINES)	Inspect	– · –			2	F,L
		Replace	– · –			1,2	

NOMENCLATURE OF END ITEMS

T53-L-11C/11D/13B/703

(1)	(2)	(3)	(4)			(5)	(6)
			Maintenance Category				
Group Number	Component/Assembly	Maintenance Function	AVUM	AVIM	Depot	Tools and Equipment	Remarks
040608	MAIN FUEL MANIFOLD (T53-L-13B/703)	Inspect	— —			2	F,L
		Replace	—·—			1,2	
		Repair	—·—			1,2	
		Overhaul			— —		
040609	STARTING FUEL MANIFOLD	Inspect	—·—			2	M
		Replace	—·—			1,2	
040610	STARTING FUEL NOZZLES	Inspect	—·—			2	L
		Replace	—·—			1,2	
040611	FLOW DIVIDER AND DUMP VALVE (T53-L-13B/703)	Inspect	—·—			2	F
		Replace	—·—			1,2	
		Repair	—·—			1,2	
0407	ELECTRICAL SYSTEM						
040701	IGNITION UNIT	Inspect	— —			2	N
		Replace	— —			1,2	
040702	IGNITER PLUGS	Inspect	— —			2	N
		Replace	— —			1,2	
040703	EXHAUST THERMOCOUPLE ASSY	Inspect	— —			2	N
		Replace	— —			1,2	
		Test	— —			1,2	
040704	EXHAUST THERMOCOUPLE HARNESS ASSY (T53-L-703)	Inspect	— —			2	N
		Replace	— —			1,2	
		Repair		— —		1,4	
040705	ELECTRICAL CABLE ASSY & IGNITION LEADS & COIL ASSY	Inspect	—·—			2	
		Replace	— —			1,2	
		Repair	—·—			1,2	
040706	HOT AIR SOLENOID VALVE	Inspect	— —			2	E,N
		Replace	— —			1,2	
		Overhaul			— —		

NOMENCLATURE OF END ITEMS

T53-L-11C/11D/13B/703

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category AVUM	AVIM	Depot	(5) Tools and Equipment	(6) Remarks
0408	OIL SYSTEM						
040801	POWER-DRIVEN ROTARY (OIL) PUMP	Inspect	—•—			2	
		Replace	—•—			1,2	
		Repair		—•—		2,4	
		Adjust	—•—			1,2	
040802	REAR BEARING (NO.2) HOUSING OIL STRAINER, 3 & 4 BEARING HOUSING OIL STRAINER	Inspect	—•—			2	
		Replace	—•—			1,2	
040803	LUBE OIL FILTER ASSY	Inspect	—•—			2	
		Test		—•—		1,2	
		Replace	—•—			1,2	
		Repair	—•—			1,2	
040804	OIL TRANSFER SUPPORT ASSY	Inspect		—•—		2	
		Replace		—•—		2,4	
		Repair		—•—		1,2	
040805	POWER-DRIVEN ROTARY (BOOSTER) PUMP	Inspect	—•—			2	
		Replace	—•—			1,2	

Section III. TOOLS AND TEST EQUIPMENT

NOMENCLATURE OF END ITEMS

SPECIAL TOOLS FOR T53-L-11C/11D/l3BA/13B/703 ENGINES

Tool or Test Equipment Reference Code	Maintenance Category	Nomenclature	National/NATO Stock Number	Tool Number
1	AVUM	TOOL SET, AVUM No. 2	4920-00-567-0476	SC4920-99-CLA-92
2	AVUM	TOOL KIT, ENGINE REPAIRMAN	5180-00-323-4944	SC518099 CLA07
3	AVIM	SHOP SET AVIM, MACHINE SHOP	4920-00-405-9279	SC492099-CLA91MAAM
4	AVIM	SHOP SET AVIM, TURBINE ENGINE	4920-00-224-3684	SC492099 CLA91ENTAM
5	AVIM	SHOP SET AVIM, WELDING	4920-00-163-5093	SC492099 CLA91WEAM
6	AVIM	MOBILE ENGINE TEST STAND	4920-00-167-9178	LTCT10465-02
7	AVUM	PIN INSTALLER	4920-00-861-6871	LTCT256
8	AVIM	INSTALLATION TOOL	5120-00-893-2520	LTCT722
9	AVIM	GUIDE	4920-00-891-8372	LTCT4602
10	AVUM	INSTALLATION TOOL	4920-00-983-7360	LTCT4179
11	AVIM	FIRST STAGE TURBINE NOZZLE MAINTENANCE KIT	4920-00-921-7076	LTCT2020
12	AVIM	WELDING FIXTURE	4920-00-756-5489	LTCT780
13	AVUM	INSTALLATION AND REMOVAL TOOL	4920-00-071-4553	LTCT3638
14	AVUM	MECHANICAL PULLER	5120-00-977-2191	LTCT4680
15	AVIM	WRENCH	5120-00-618-4994	LTCT57
16	AVUM	SEAL INSTALLATION TOOL	5120-00-446-1585	LTCT501
17	AVIM	SEAL INSTALLATION TOOL	4920-00-898-7925	LTCT1644
18	AVUM	LOCKING PLATE ASSY	4920-00-778-2304	LTCT248
19	AVUM	SOCKET WRENCH	4920-00-475-7589	LTCT505

NOMENCLATURE OF END ITEMS

SPECIAL TOOLS FOR T53-L-11C/11D/13BA/13B/703 ENGINES

Tool or Test Equipment Reference Code	Maintenance Category	Nomenclature	National/NATO Stock Number	Tool Number
20	AVUM	SOCKET WRENCH	5120-00-473-7591	LTCT506
21	AVUM	WRENCH, SOCKET	5120-00-875-2588	LTCT393
22	AVUM	TORQUE ADJUSTMENT FIXTURE	5120-00-923-3414	LTCT962
23	AVIM	HOLDING FIXTURE	4920-00-841-0414	LTCT4533
24	AVIM	TORQUE FIXTURE	4920-00-419-9695	LTCT13430
25	AVIM	WRENCH, ASSEMBLY	5120-00-168-2166	LTCT4797
26	AVUM	POWER WRENCH	5120-00-482-2543	PD2501
27	AVUM	CONE REMOVAL TOOL ADAPTER	5120-00-409-9122	LTCT13676
28	AVUM	CONE REMOVAL TOOL	5120-00-409-9121	LTCT6465
29	AVUM	TORQUE FIXTURE	4920-00-495-6592	LTCT13175
30	AVUM	PULLER	5120-00-923-3423	LTCT691
31	AVUM	MECHANICAL SPACER PULLER	5120-00-834-6713	LTCT4842
32	AVUM	LOCKING PIN REMOVAL TOOL	4920-00-989-0020	LTCT4692
33	AVUM	ADAPTER AND GUIDE	4900-09-947-4712	LTCT3685
34	AVUM	PULLER	5120-00-989-0017	LTCT2121
35	AVUM	MECHANICAL PULLER	5120-00-834-6712	LTCT4809
36	AVUM	MECHANICAL PULLER	5120-00-834-6714	LTCT4846
37	AVUM	FORWARD SEAL PULLER	4920-00-989-0024	LTCT4568
38	AVIM	INSTALLER AND REMOVER	5120-00-034-1002	LTCT519
39	AVIM	HOLDING FIXTURE	4920-00-893-2485	LTCT704
40	AVIM	MECHANICAL PULLER	5120-00-446-1586	LTCT509

NOMENCLATURE OF END ITEMS

SPECIAL TOOLS FOR T53-L-11C/11D/13BA/13B/703 ENGINES

Tool or Test Equipment Reference Code	Maintenance Category	Nomenclature	National/NATO Stock Number	Tool Number
41	AVIM	DRIVER WRENCH	5120-00-778-0661	LTCT258
42	AVIM	LIFTING FIXTURE	4920-00-994-1129	LTCT4182
43	AVIM	SUN GEAR HOLDING FIXTURE	4920-00-923-2773	LTCT2075
44	AVUM	PIN REMOVAL TOOL	5120-00-842-6361	LTCT4895
45	AVUM	MECHANICAL PULLER	5120-00-509-2965	LTCT1218
46	AVUM	ADAPTER	4920-00-025-9074	LTCT6740
47	AVUM	ALINEMENT FIXTURE	45920-00-089-2295	LTCT4174
48	AVIM	SLEEVE BUSHING	3120-00-067-8320	LTCT3640
49	AVIM	FACE SPANNER WRENCH	5120-00-893-2519	LTCT215
50	AVUM	LOCATING BAR	5120-00-671-2129	LTCT153
51	AVUM	DRIFT	4920-00-891-4653	LTCT1643
52	AVIM	INSTALLING HOIST ASSEMBLY	4920-00-909-4204	LTCT692
53	AVIM	BEARING PULLER	5120-00-780-4423	LTCT675
54	AVIM	MECHANICAL PULLER	5120-00-919-2377	LTCT916
55	AVIM	GEAR HOLDING DEVICE	5120-00-906-8056	LTCT2044
56	AVIM	GEARSHAFT HOLDING ASSEMBLY	5120-00-909-4120	LTCT2037
57	AVIM	SPANNER NUT WRENCH	5120-00-891-3120	LTCT2161
58	AVIM	BEARING REMOVAL TOOL	45920-00-816-6848	LTCT231
59	AVUM	MECHANICAL PULLER	5120-00-780-5292	LTCT843
60	AVUM	SWITCH AND COUPLING KIT	4920-00-078-2410	LTCT13726
61	AVUM	WRENCH SOCKET	5120-00-986-5949	LTCT4181

NOMENCLATURE OF END ITEMS

SPECIAL TOOLS FOR T53-L-11C/11D/13BA/13B/703 ENGINES

Tool or Test Equipment Reference Code	Maintenance Category	Nomenclature	National/NATO Stock Number	Tool Number
62	AVIM	SHOP SET SHEET METAL	4920-00-166-5505	SC4920-99C LA91SMAM
63	AVUM	VIBRATION CHECK TOOL	4920-00-879-0331	LTCT171170 0104
64	AVIM	TOOL CRIB	4920-00-472-4183	SC492099C LA91TCAM
65	AVUM	SEAL INSTALLING TOOL	4920-00-776-7126	LTCT100
66	AVUM	REMOVAL TOOL	4920-00-071-4556	LTCT3648
67	AVUM	SEAL INSTALLATION TOOL	4920-00-491-0840	LTCT511
68	AVIM	FINISHING MACHINE	4920-00-725-5670	LTCT2125
69	AVUM	SLEEVE, BUSHING	5360-00-492-3218	LTCT9396
70	AVUM	SLING	1730-00-903-5019	LTCT773
71	AVUM	ENGINE INTAKE PROTECTOR	1730-00-780-4406	LTCT862
72	AVUM	FIXTURE HOLDING	4920-00-983-7514	LTCT4553
73	AVUM	ADAPTER ASSY	4920-00-842-6041	LTCT4475

Section IV. REMARKS

T53-L-llC/llD/13B/703 ENGINES

Reference Code	Remarks
A	Functional Test at AVUM - Engine in Airframe
B	Functional Test at AVIM - Engine in METS
C	Repairs at AVUM includes minor repair of the engine and minor repair/replacement of components and accessories.
D	Blend Repair
E	Corrosion Control, Pitting
F	Nicks, Dents, and Burrs; Cracks Distortion
G	Blockage, Foreign Material
H	Adjust
I	O-Rings, Drive Shaft Seal, Solenoid Valve
J	Trim Screw Bleed Band Adjustment, Idle Adjustment Maximum Trim
K	Seals and O-Rings
L	Coking, Clogging Damage
M	Breaks, Cracks Damaged
N	Corrosion, Threads Pins, Frayed, Crushed, Chafing
O	Sensing and Solenoid Assembly, Security of Mounting Splines and Fittings

APPENDIX C
SPECIAL TOOLS AND SUPPORT EQUIPMENT

OVERVIEW

This Appendix contains functional and numerical lists of all special tools and support equipment required to perform the work prescribed in this manual.

C-1. **USE OF TOOLS.** Use only plastic or rawhide (never metal) mallet heads when driving on any part of the engine. Lift heavy parts with the use of a chain or powered hoist and lifting yokes or slings. Do not attempt to lift heavy parts by hand as personnel injury or damage to machinery may occur. Apply an even pressure to all bearing pushers or pullers. Tighten jackscrews, attaching screws, bolts, and nuts in small increments, on opposite planes.

CAUTION

Do not use cadmium-plated tools for any of the disassembly or reassembly procedures given in this manual. Cadmium plating has a tendency to chip. If these chips enter the engine, they will contaminate the lubrication system and cause magnesium parts to deteriorate.

C-2. **TOOLS AND SUPPORT EQUIPMENT.** The tools and support equipment table numerically lists tools and equipment used to perform engine maintenance procedures. Figure numbers, nomenclature, and part numbers are given in the following table.

Special Tools and Support Equipment List

Figure	Nomenclature	NSN	Part Number
C-l	Multimeter	6625-00999-7465	AN/USM223
C-2	Jetcal Analyzer	4920-00-372-4593	BHl12JB53
C-2	Junction Box	4920-00-676-2309	BH361-5 detail of BH112JB53
C-3	Junction Box	4920-00-329-8294	BH861-8
C-4	Junction Box	4920-00-305-4604	BH361-10
C-5	Junction Box	4920-00-524-8644	BH361-12
C-6	Probe Assembly	6685-00-235-4594	BH7434L-40

Special Tools and Support Equipment List - Continued

Figure	Nomenclature	NSN	Part Number
C-7	Probe Assembly	6685-00-235-4593	BH743R-40
C-2	Probe Assembly	4920-00-670-9379	BH996-40 detail of BH112JA-36
C-34	Filter, 70CPS	5915-00-578-5255	1-003-0070 detail of 171170-0140
C-34	Filter, 200CPS	5915-00-808-8249	1-003-0200 detail of 171170-0140
C-34	Monitoring Kit Vibration	6625-00-590-6502	CEC1-117-0105 detail of 171170-0140
C-189	Vibration Test Set		CEC1-157-0103 detail of NR 171170-0104
C-34	Vibration Pickup		4-128-0101 detail of 171170-0104
C-8	Vibration Pickup	4920-00-082-0436	CEC4-128-0101
C-2	Cable Assembly		CEC49657-0300 detail of 171170-0104
C-185	Spanner Wrench		GGG-W-665B, Type II, detail of LTCT2020
C-9	Holding Fixture	4920-00-670-6990	LTCT40
C-11	Wrench	5120-00-618-4994	LTCT57
	Fixture	4920-00-863-3837	LTCT58
C-12	Lifting Device	1730-00-676-2274	LTCT87
C-13	Adapter Hoisting Lifting Fixture		LTCT91
C-14	Installation Tool	4920-00-776-7126	LTCT100
C-15	Socket	5120-00-839-0783	LTCT107
C-16	Fixture, Holding	4920-00-716-5486	LTCT115
C-17	Fixture	5120-00-716-5479	LTCT142
C-153	Bar, Locating	5120-00-671-2129	LTCT153

Special Tools and Support Equipment List - Continued

Figure	Nomenclature	NSN	Part Number
C-154	Fixture, Test	4920-00-816-6836	LTCT207
C-18	Socket	6120-00-893-2619	LTCT215
C-19	Test Fixture	4920-00-816-6866	LTCT216
C-155	Socket, Wrench	5120-00-618-6302	LTCT222
C-20	Puller	4920-00-816-6848	LTCT231
C-156	Locking Plate Assy	4920-00-778-2304	LTCT248
C-21	Pin Installer	4920-00-816-6871	LTCT256
C-22	Wrench	5120-00-778-0661	LTCT258
C-23	Tool Installing	4920-00-854-4619	LTCT270
C-24	Holding Fixture	4920-00-816-6908	LTCT283
C-25	Remover, Bearing	4920-00-816-6913	LTCT287
C-26	Holding Fixture	4920-00-886-1285	LTCT297
C-27	Oil Flow Test Stand	4920-00-871-0222	LTCT313
C-167	Test Stand	4920-00-874-0876	LTCT314
C-158	Test Unit	4920-00-687-6886	11-4700-1
-	Test Stand	4920-00-874-0878	LTCT316
-	Teat Set		LTCT23746-01
-	Tester, EGT		BH112-JB63
C-28	Fixture	4920-00-907-7647	LTCT324
	Test Stand	4920-00-874-0879	LTCT340
C-29	Wrench, Socket	5120-00-876-2688	LTCT393
C-159	Plug Assy, Test	4920-00-871-0226	LTCT406
C-160	Test Fixture	4920-00-871-0226	LTCT409

Special Tools and Support Equipment List

Figure	Nomenclature	NSN	Part Number
		4920-00-871-5132	LTCT413
C-30	Fixture, Test	4920008715132413	
C-161	Test Stand, Fuel Pump	4920-00-886-1287	LTCT422
	Test Stand, Compressor	4920-00-886-1286	LTCT421
	Test Fixture Adapter Assy	4920-00-886-1288	LTCT423
C-34, C-150, C-118	Adapter	4920-00-972-6118	LTCT433 detail of LTCT484 and LTCT20596 171170-0104
C-31	Tap, Thread	5136-00-847-6985	GGGT70
	Holding Fixture	4920-00-996-7421	LTCT458
C-32	Installing Tool		LTCT481
C-33	Installing and Removing Tool	4920-00-780-4398	LTCT482
C-34	Vibration Cheek Tool Kit		LTCT484, 14664-01 and 171170-0104
C-35	Fixture, Holding	4920-00-011-8940	LTCT496
C-36	Tool, Installation	5120-00-446-1585	LTCT501
C-162	Alinement Tool	5120-00-778-0664	LTCT503
C-37	Socket Wrench	4920-00-473-7589	LTCT505
C-38	Socket Wrench	5120-00-473-7591	LTCT506
C-39	Puller	5120-00-446-1586	LTCT509
C-40	Installation Tool	4920-00-491-0840	LTCT511
C-41	Bit, Screwdriver	5120-00-034-1002	LTCT519
C-42	Cup Installer	4920-00-084-3302	LTCT525
C-43	Holding Fixture	4920-00-228-1686	LTCT4850
C-34, C-151	Adapter	4920-00-858-0016	LTCT535 detail of LTCT484 and LTCT20596
	Washer		LTCT610 detail of LTCT2125

Special Tools and Support Equipment List

Figure	Nomenclature	NSN	Part Number
-	Adapter		LTCT613 detail of LTCT2125
C-44	Puller	5120-00-780-4423	LTCT675
C-45	Puller	5120-00-923-3423	LTCT691
C-168	Installing Hoist Assy	4920-00-909-4204	LTCT692
C-46	Puller, Mechanical	5120-00-994-3281	LTCT707
C-47	Test Fixture	5120-00-816-7091	LTCT713
C-48	Backlash Gage	5220-00-522-2268	LTCT716
C-49	Internal Wrenching Bolt	5120-00-062-0107	LTCT718
C-50	Puller	5120-00-816-7087	LTCT721
C-51	Tool, Installation	5120-00-893-2520	LTCT722
C-52	Socket Wrench	5120-00-061-2921	LTCT723
C-53	Spanner Wrench	5120-00-860-9586	LTCT725
C-82	Spanner Wrench	5120-00-813-3145	LTCT729
C-152	Mobile Trailer Assembly	4920-00-167-9178	LTCT10465-02
C-54	Puller	5120-00-923-3458	LTCT752
C-55	Sling, Aircraft Maintenance	1730-00-903-5019	LTCT773
C-56	Fixture, Welding	4920-00-756-5489	LTCT780
C-56	Welding Fixture Studs		LTCT783, detail of LTCT780
C-57	Installation Tool	5120-00-761-8988	LTCT791
C-58	Puller	5120-00-780-5292	LTCT843
C-163	Fixture, Test	4920-00-955-0030	LTCT859
C-59	Shield, Aircraft	1730-00-780-4406	LTCT862
	Pressure Test Mounting Stand	4920-00-757-4865	LTCT865

Special Tools and Support Equipment – List – Continued

Figure	Nomenclature	NSN	Part Number
C-60	Test Chamber		LTCT873
C-219	Test Adapter	4920-00-865-8023	LTCT887, LTCT3906
C-61	Socket Wrench	5120-00-923-3433	LTCT915
C-62	Pressure Mounting Stand	5120-00-919-2377	LTCT916
C-63	Socket Wrench	5120-00-757-2932	LTCT920
C-164	Plate, Locking	5120-00-923-3414	LTCT962
C-64	Socket and Spanner	5120-00-053-2603	LTCT1109
C-65	Puller	5120-00-509-2965	LTCT1218
C-66	Wrench		LTCT1409
C-165	Test Unit	4920-00-940-0346	LTCT1452
C-67	Drift	4920-00-891-4653	LTCT1643
C-68	Drift	4920-00-898-7925	LTCT1644
C-69	Puller	5120-00-757-4906	LTCT2017
C-166	Maintenance Kit, Flange	4920-00-921-7076	LTCT2020
C-70	Puller	5120-00-804-2629	LTCT2021
C-71	Puller	5120-00-906-9753	LTCT2026
C-72	Puller	5120-00-760-3343	LTCT2034
C-73	Holder Assembly	5120-00-909-4210	LTCT2037
C-74	Fixture	5120-00-906-8056	LTCT2044
C-227	Test Fixture	4920-00-919-0195	LTCT2052
C-75	Puller	4920-00-906-9755	LTCT2067
C-76	Seal Holder		LTCT2070
C-77	Puller	5120-00-923-3431	LtCT2073
C-78	Fixture, Holding	4920-00-923-2773	LTCT2075
C-79	Socket	5120-00-923-3443	LTCT2079

Special Tools and Support Equipment List - Continued

Figure	Nomenclature	NSN	Part Number
C-80	Socket	5120-00-923-3449	LTCT2080
C-81	Stud Retainer Installing Tool - Plate	5120-00-911-3703	LTCT2083
C-82	Driver, Plug	5120-00-923-3598	LTCT2086
C-83	Gage, Backlash	5220-00-906-3926	LTCT2099
C-84	Puller	5120-00-989-0017	LTCT2121
	Machine, Finishing	4920-00-725-5670	LTCT2125
C-85	Puller	5120-00-923-3454	LTCT2142
C-86	Spanner Nut Wrench	5120-00-891-3120	LTCT2161
C-19	Union		LTCT2169 detail of LTCT216
C-19	Handle		LTCT2170 detail of LTCT216
	Nut		LTCT2266 detail of LTCT2125
C-33	Base		LTCT2637 detail of LTCT482
C-33	Washer		LTCT2638 detail of LTCT482
C-33	Stud		LTCT2639 detail of LTCT482
C-33	Handle		LTCT2667 detail of LTCT482
C-87	Bushing	3120-00-071-8260	LTCT3492
C-88	Sleeve Bushing	3120-00-071-8261	LTCT3636
C-89	Bushing, Sleeve	3120-00-067-8321	LTCT3637
C-90	Installation and Removal Tool	4920-00-071-4553	LTCT3638
C-91	Bushing, Sleeve	3120-00-067-8320	LTCT3640

Special Tools and Support Equipment List - Continued

Figure	Nomenclature	NSN	Part Number
C-92	Removal Tool	4920-00-071-4556	LTCT3648
C-93	Bushing, Sleeve	5120-00-067-8331	LTCT3654
C-94	Bushing, Sleeve	3120-00-067-8324	LTCT3658
C-95	Bushing, Sleeve	3120-00-067-8326	LTCT3659
C-96	Bushing, Sleeve	3120-00-067-8328	LTCT3660
C-97	Bushing, Sleeve	3120-00-067-8330	LTCT3661
C-98	Bushing, Sleeve	3120-00-071-4571	LTCT3663
C-9 9	Bushing, Sleeve	3120-00-071-4569	LTCT3664
C-100	Adapter and Guide	4920-00-997-4712	LTCT3685
C-101	Pressure Test Fixture	4920430-034-5875	LTCT3694
C-102	installation Tool	5120-00-727-4481	LTCT3825
C-102	Base		LTCT3826 detail of LTCT3825
C-102	Anvil		LTCT3827 detail of LTCT3825
C-103	Holder	4920-00-889-7249	LTCT3833
C-102	Clamp		LTCT3875 detail of LTCT3825
C-104	Bracket	5340-00-880-7677	LTCT3955
C-105	Inserting Tool	4920-00-983-7555	LTCT4013
C-106	Ring Assembly	5120-00-839-6914	LTCT4017
C-107	Fixture, Holding	4920-00-946-2195	LTCT4018
C-108	Ring Assembly	4920-00-946-4860	LTCT4019
C- 169	Fixture	4920-00-908-1634	LTCT4100

Special Tools and Support Equipment List - Continued

Figure	Nomenclature	NSN	Part Number
-	Adapter		LTCT4127 detail of LTCT2125
C-109	Handling Tool	5120-00-840-9830	LTCT4155
-	Adapter		LTCT4162
-	Spacer		LTCT4165
C-242	Adapter Kit	4920-00-989-0018	LTCT4172
C110	Fixture Alinement	4920-00-089-2295	LTCT4174
C-111	Installing Tool	4920-00-983-7360	LTCT4179
C-112	Wrench Socket	5120-00-986-5949	LTCT4181
C-113	Hoisting Assy	4920-00-994-1129	LTCT4182
C-114	Spanner Wrench	5120-00-839-7011	LTCT4190
C-32	Adapter Bushing		LTCT4310 detail of LTCT481
C-32	Adapter		LTCT4311 detail of LTCT481
C-32	Adapter		LTCT4312 detail of LTCT481
C-33	Spacer		LTCT4333 detail of LTCT482
C-33	Disc		LTCT4334 detail of LTCT482
-	Bushing		LTCT4379 detail of LTCT2125
C-171	Balance Shaft and Weight		LTCT4388 detail of LTCT2125
C-171	Finishing Machine Shaft Spanner Wrench		LTCT4389 detail of LTCT2125
C-181	Spanner Wrench	5120-00-073-8321	LTCT4402-(02 detail of LTCT2020

Special Tools and Support Equipment List - Continued

Figure	Nomenclature	NSN	Part Number
C-167	Shouldered Shaft	4920-00-073-8508	LTCT4405 detail of LTCT2020
C-167	Sleeve Bushing	3120-00-082-0429	LTCT4406 detail of LTCT2020
C-172	Protective Cover	2840-00-448-9580	LTCT4408 detail of LTCT2020
C-174	Face Spanner Wrench	5120-00-082-0408	LTCT4450 detail of LTCT2020
C-115	Adapter, Socket	4920-00-917-9976	LTCT4457
C-116	Shaft Holding Fixture	4920-00-983-7514	LTCT4553
C-117	Alinement Tool	5120-00-988-8852	LTCT4560
C-118	Puller	4920-00-989-0024	LTCT4568
C-119	Arbor	5120-00-834-6711	LTCT4571
C-120	Installation Tool	5180-00-851-1461	LTCT4576
C-121	Guide	4920-00-891-8372	LTCT4602
C-122	Crank, Hand	4920-00-842-6040	LTCT4650
C-123	Mechanical Puller	5120-00-839-6913	LTCT4670
	Removal Kit	5180-00-841-0334	LTCT4675
C-124	Puller	5120-00-977-2191	LTCT4680
C-124	Arms		LTCT4682 detail of LTCT4680
C-125	Tool, Removal	4920-00-989-0020	LTCT4692
C-126	Loop Clamp	5120-00-250-6055	RC40C
C-127	Puller	5120-00-842-6360	LTCT4800
C-175	Mechanical Puller	5120-00-834-6712	LTCT4809
C-128	Fuel Harness Wrench	5120-00-034-6193	LTCT4810
C-129	Puller	5120-00-834-6713	LTCT4842

Special Tools and Support Equipment List - Continued

Figure	Nomenclature	NSN	Part Number
C-130	Puller	5120-00-834-6714	LTCT4846
	Puller	6120-00-842-6361	LTCT4895
C-131	Fixture, Holding	4920-00-878-6173	LTCT4904
	Shaft Adapter		LTCT4946
C-132	Installation Tool	4920-00-070-1162	LTCT4947
C-133	Installation Tool	4920-00-079-8816	LTCT6000
C-134	Installation Tool	5120-00-104-6764	LTCT6104
C-177	Measuring Tool	5210-00-228-8821	LTCT6124
C-135	Puller	5120-00-409-9121	LTCT6465
C-136	Removal Tool	4920-00-025-9074	LTCT6740
C-34	Adapter	4920-00-228-1685	LTCT6756 detail of LTCT484
C-137	Stop Assembly, Cold Weather	4920-00-113-9813	LTCT6763
C-138	Special Wrench		LTCT6940
C-32	Flat Washer		LTCT9023-10 detail of LTCT481
C-33	Flat Washer		LTCT9023-13 detail of LTCT482
C-166	cutter, Milling	3455-00-943-2345	LTCT9261 detail of LTCT2020
C-171	Wrench, Spanner	5120-00-886-1794	LTCT9263 detail of LTCT2020
C-139	Adapter		LTCT9268 detail of LTCT315
C-140	Lead		LTCT9271 detail of LTCT315
C-141	Cable Assembly		LTCT9272 detail of LTCT315

Special Tools and Support Equipment List – Continued

Figure	Nomenclature	NSN	Part Number
C-142	Test Lead	4920-00-011-8938	LTCT9277 detail of LTCT315
C-34, C-151	Monitoring Kit, Vibration	6625-00-590-6502	LTCT9281 detail of 171170-0104
C-34, C-151	Vibration Check Tool Kit	4920-00-937-0270	LTCT9282 detail of 171170-0104 and 4-128-010
C-34 C-151	Cable Assembly	4920-00-083-0409	LTCT9283-02 detail of 171170-0104 and 4-128-010
C-166	Bushing, Sleeve	536040492-3218	LTCT9396 detail of LTCT2020
C-143	Fixture, Test	4920-00484-3952	LTCT 10440-01
C-144	Lead, Elect	2925-00-438-1991	LTCT 10462-01
C-145	Puller	5120-00-136-4993	LTCT13070
C-146	Fixture	4920-00-923-2774	LTCT13175
C-147	Fixture, Torque	4920-00-419-9695	LTCT13430
C-147	Wrench, Socket	4920-00-252-2726	LTCT 13435 detail of LTCT13430
C-146	Wrench, Socket		LTCT13456 detail of LTCT13175
C-148	Adapter, Cone Remover	5120-00-409-9122	LTCT13676
C-149	Switch and Coupling Assy		LTCT13725 detail of LTCT13726
C-149	Switch and Coupling Kit	4920-00-078-2410	LTCT13726
C-150	Clamp, Gage	4920-01-020-1689	LTCT14503
C-168	Sling, Lifting	1730-01-139-1281	LTCT 14668-01
C-189	Sling, Webbed	1730-01-139-4717	LTCT14721
C-151	Monitoring Kit Vibration	4920-00-879-0331	171170-0104
C-151	Vibration Test Set		LTCT22031-01 detail of 171170-0104
–	Vibration Meter		LTCT23844-01

Special Tools and Support Equipment List - Continued

Figure	Nomenclature	NSN	Part Number
C-32	Screw		MS16187-103 detail of LTCT481
C-179	Power Wrench	5120-00-482-2543	PD2501
-	Cleaning Fixture	2945-00-893-5601	SPT107
C-180	Sleeve Puller	5120-00-701-1291	STD63557
C-181	Torque Wrench		TQ-1
C-182	Torque Wrench		TQ-6
C-183	Tang Breakoff Tool	5120-00-793-1086	3581-8
C-184	Adapter, Torque Throttle	4920-00-9574060	STD63556
C-178	Adapter Arm	4920-00-062-9531	SWE13852-1210
C-178	Adapter Base	4920-00-979-8932	SWE13852-1510
C-178	Geared Adapter Assembly	4920-00-084-3305	SWE13870
C-178	Stand, Maintenance	4920-00-269-0329	4920EG008
-	Shop Set, AVIM, Machine Shop	4920-00405-9279	SC492099 CLA91MAAM
-	Shop Set, AVIM, Welding	4920-00-163-5093	SC492099 CLA91WEAM
-	Shop Set, AVIM, Turbine Engine	4920-00-224-3684	SC492099 CLA9lENTAM
-	Tool Kit, Engine Repairer	5180-00-323-4944	SC518099 CLA07
-	Fixture Assembly	4920-00-7804404	LTCT2072
-	Probe Assembly	4920-01-106-9685	BH7454AH-40
-	Probe Assembly	49204)1-106-9686	BH7454BH-40
-	Test Connector	6685-01410-5942	1-300-564-01

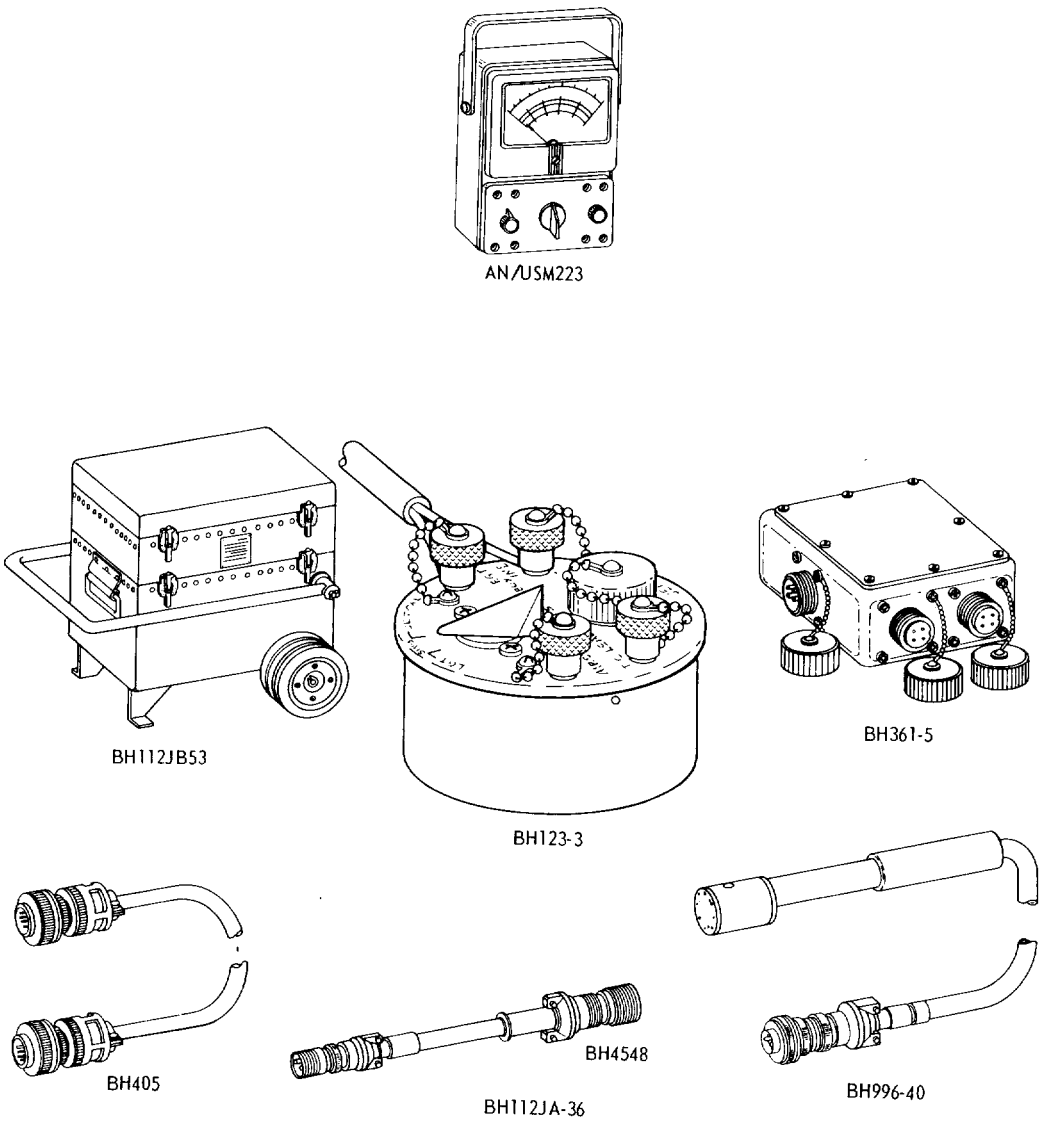
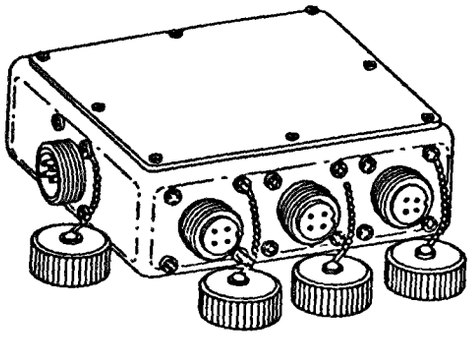
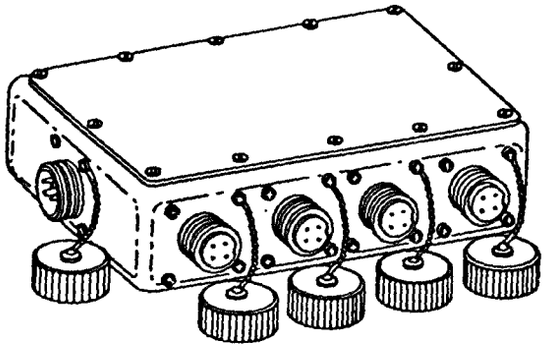


Figure C-2. Jetcal Analyzer



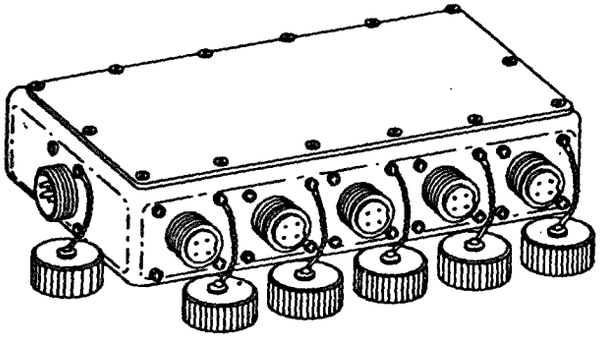
BH361-8

Figure C-3. Junction Box



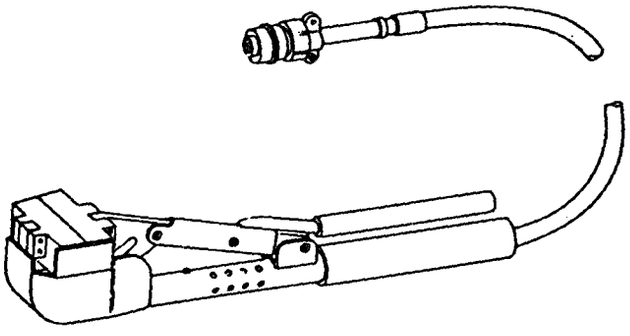
BH361-10

Figure C-4. Junction Box



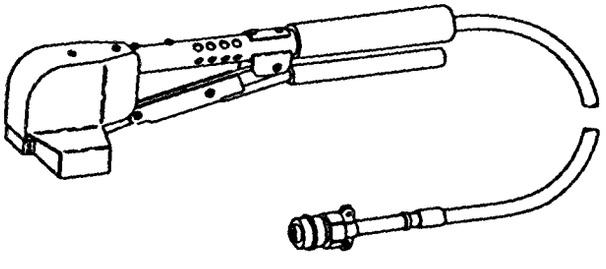
BH361-12

Figure C-5. Junction Box



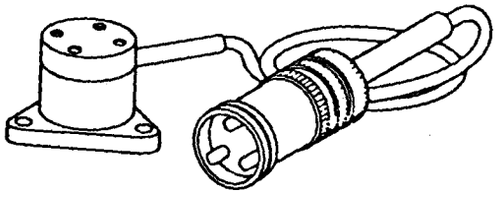
BH7434L-40

Figure C-6. Probe Assembly



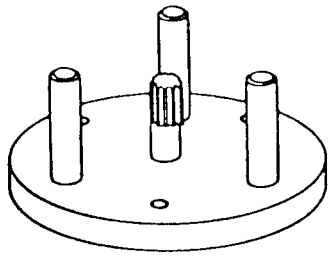
BH7434R-40

Figure C-7. Probe Assembly



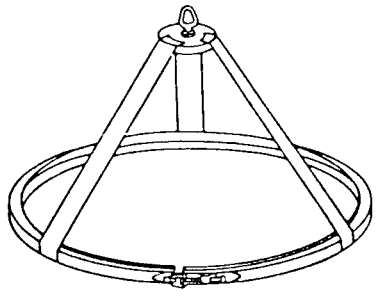
CEC4-128-0101

Figure C-8. Vibration Pickup



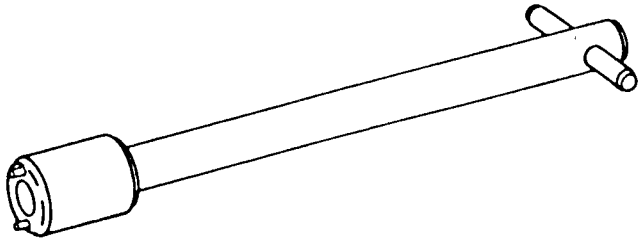
LTCT40

Figure C-9. Holding Fixture



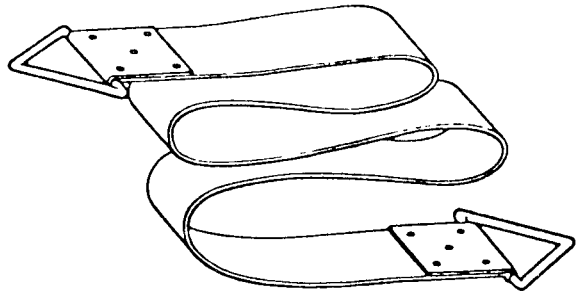
LTCT53

Figure C-10. Lifting Adapter



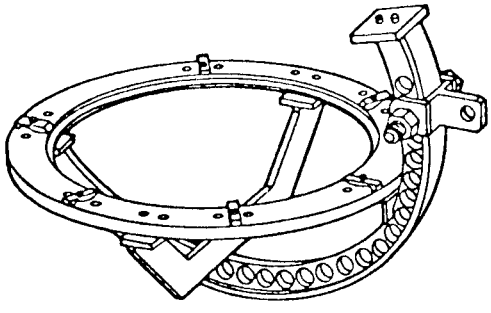
LTCT57

Figure C-11. Wrench



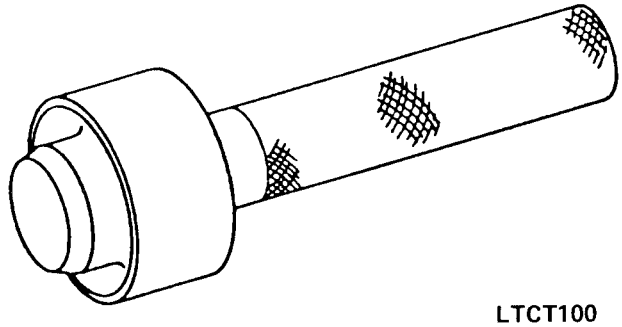
LTCT87

Figure C-12. Lifting Device



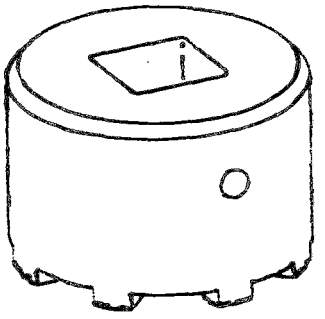
LTCT91

Figure C-13. Lifting Fixture



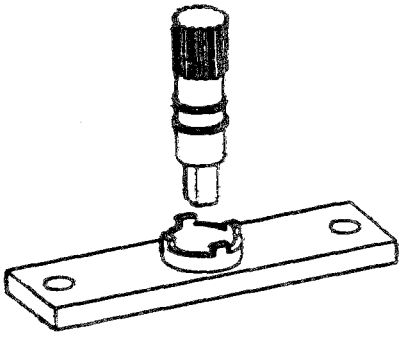
LTCT100

Figure C-14. Installing Tool



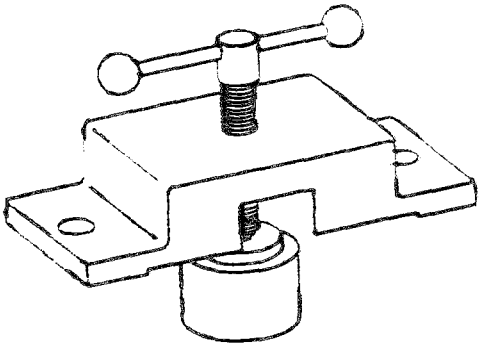
LTCT107

Figure C-15. Socket



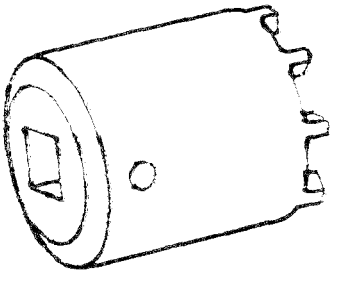
LTCT115

Figure C-16. Holding Fixture



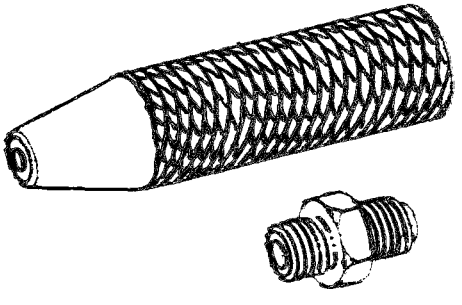
LTCT142

Figure C-17. Fixture



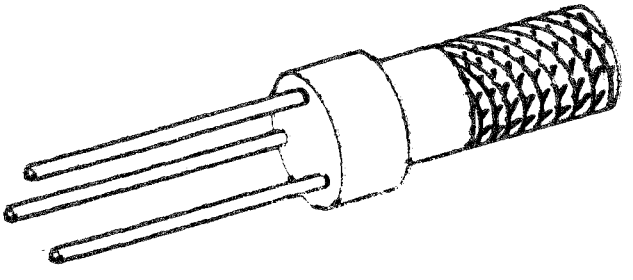
LTCT215

Figure C-18. Socket



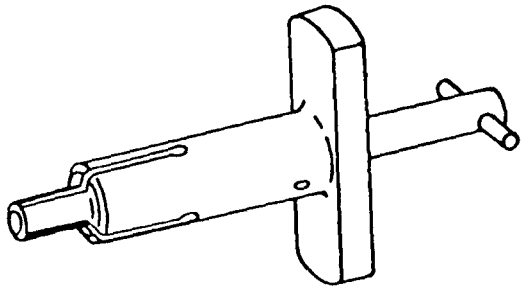
LTCT216

Figure C-19. Test Fixture Assembly



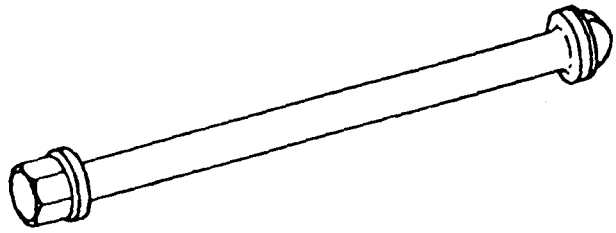
LTCT231

Figure C-20. Puller



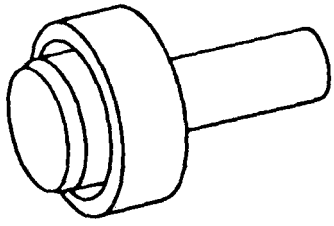
LTCT256

Figure C-21. Pin Installer



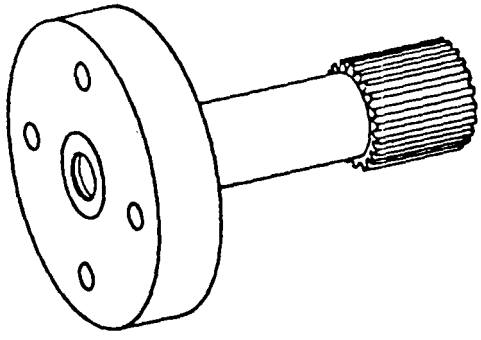
LTCT258

Figure C-22. Wrench



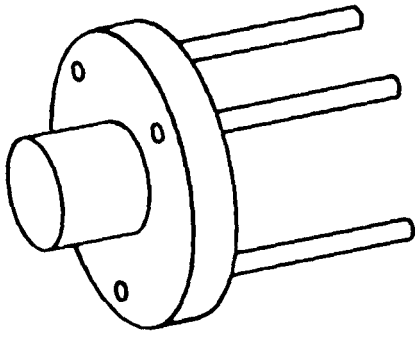
LTCT270

Figure C-23. Tool, Installing



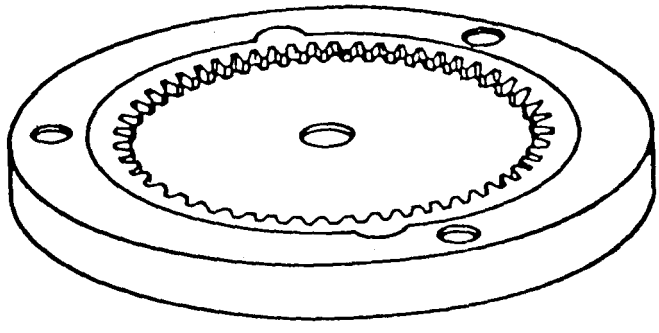
LTCT283

Figure C-24. Holding Fixture



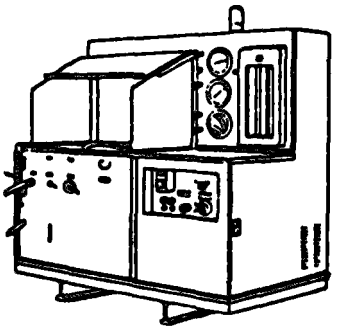
LTCT287

Figure C-25. Remover, Bearing



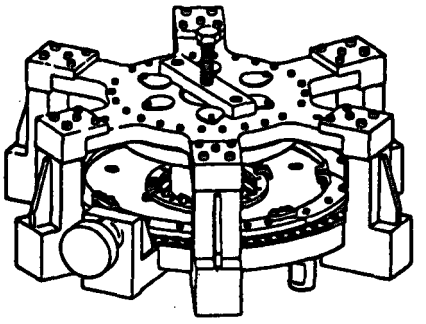
LTCT297

Figure C-26. Holding Fixture



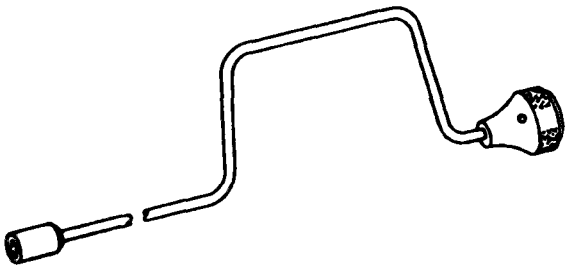
LTCT313

Figure C-27. Oil Flow Test Stand



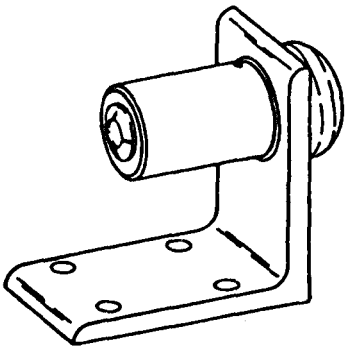
LTCT324

Figure C-28. Fixture



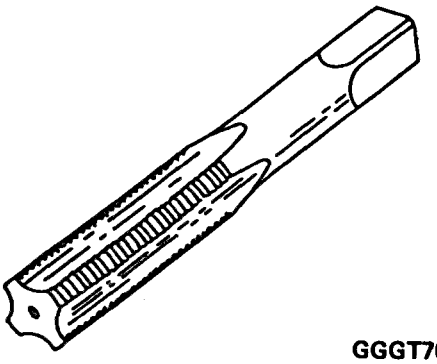
LTCT393

Figure C-29. Wrench, Socket



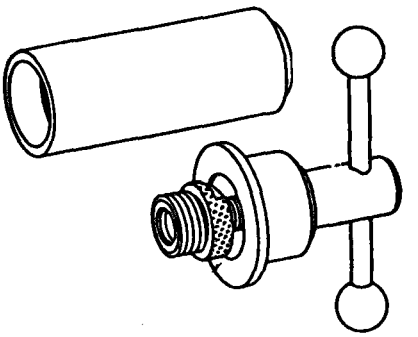
LTCT413

Figure C-30. Fixture, Test



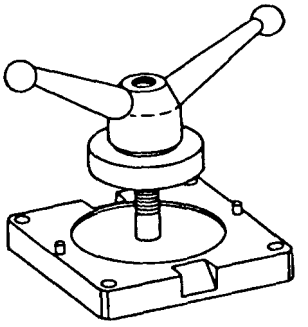
GGGT70

Figure C-31. Tap Thread



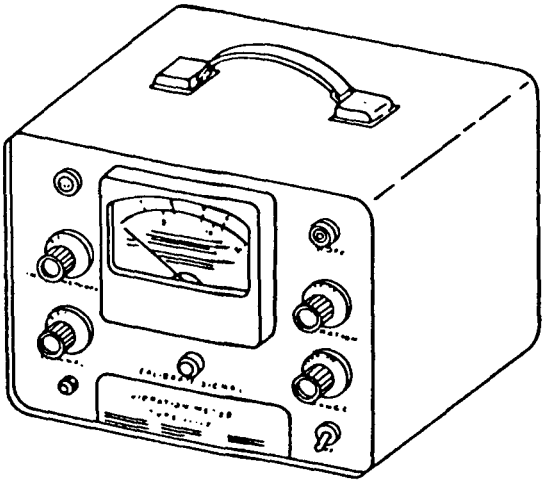
LTCT481

Figure C-32. Installing Tool

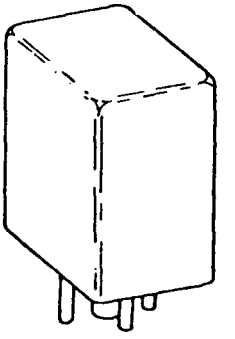


LTCT482

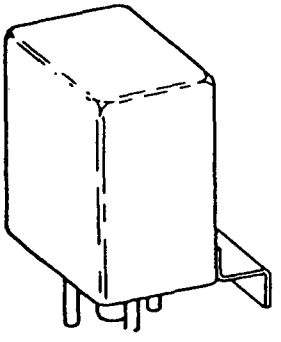
Figure C-33. Installing and Removing Tool



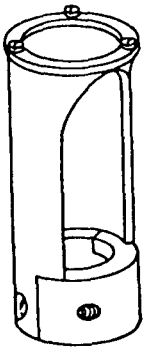
LTCT9231
(CEC1-117-0105)



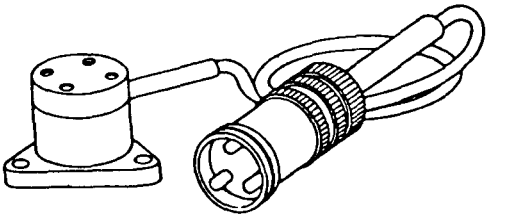
CEC1-003-0200



CEC1-003-0070

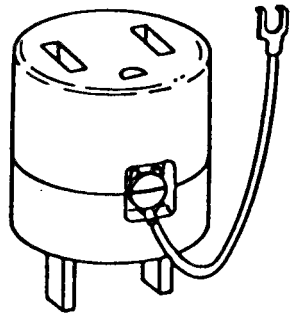


LTCT6756

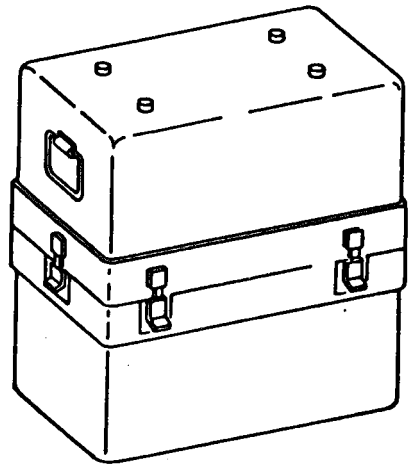


LTCT9282
(CEC4-118-0107)

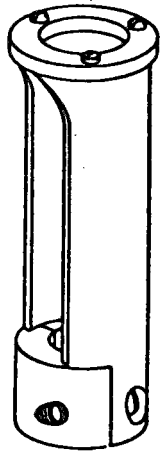
Figure C-34. Monitoring Kit, Vibration (Sheet 1 of 2)



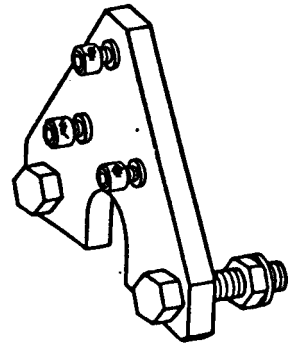
LTCT9280



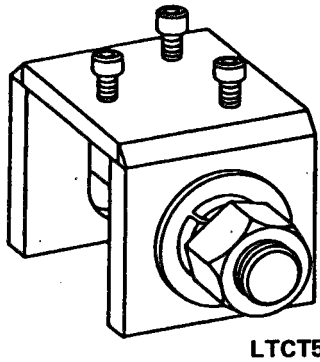
LTCT 171170-0140



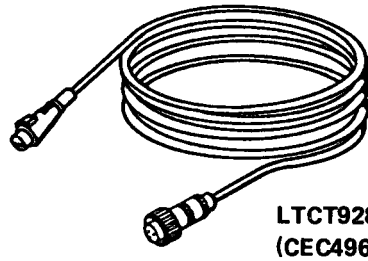
LTCT3187



LTCT433

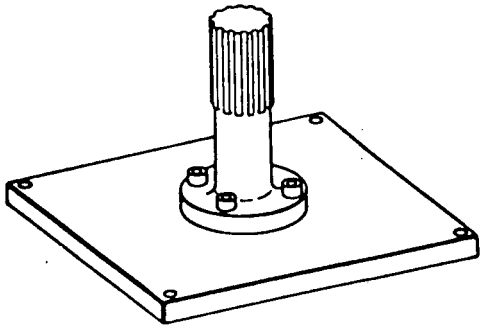


LTCT535



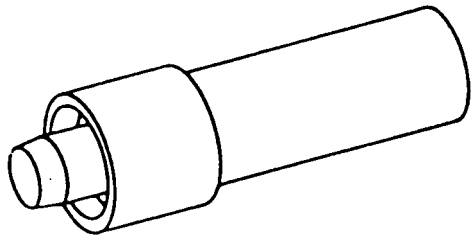
LTCT9283-02
(CEC49657-0300)

Figure C-34. Monitoring Kit, Vibration (Sheet 2 of 2)



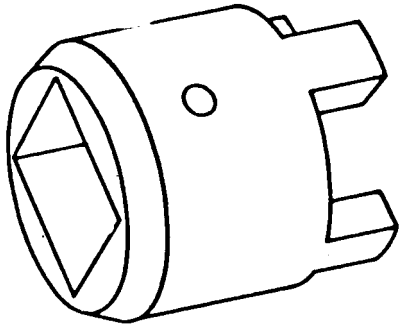
LTCT496

Figure C-35. Fixture, Holding



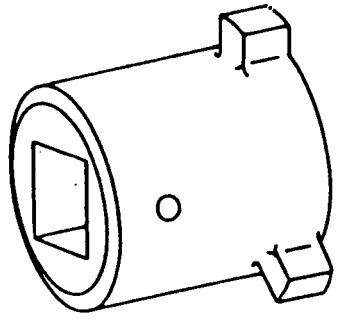
LTCT501

Figure C-36. Tool, Installation



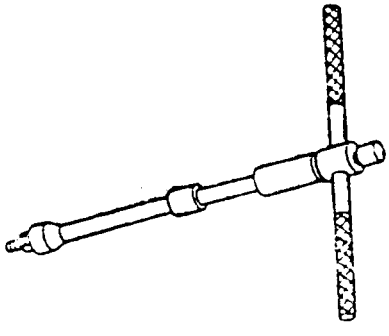
LTCT505

Figure C-37. Socket Wrench



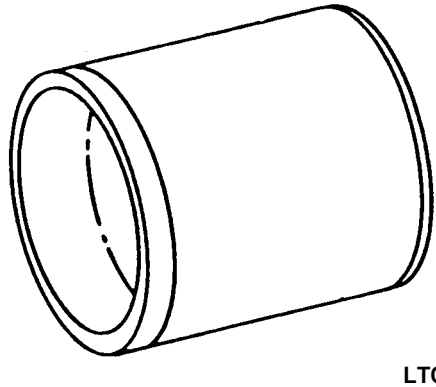
LTCT506

Figure C-38. Socket Wrench



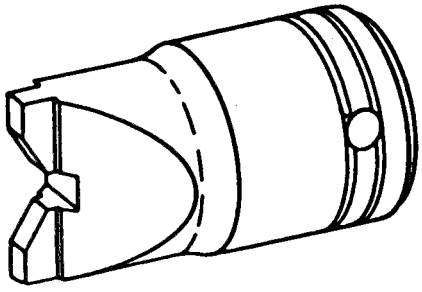
LTCT509

Figure C-39. Puller



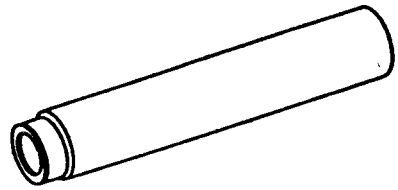
LTCT511

Figure C-40. Installation Tool



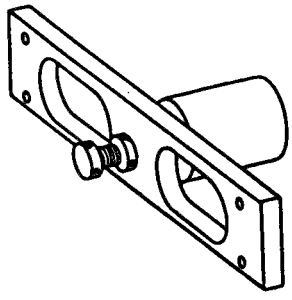
LTCT519

Figure C-41. Bit, Screwdriver



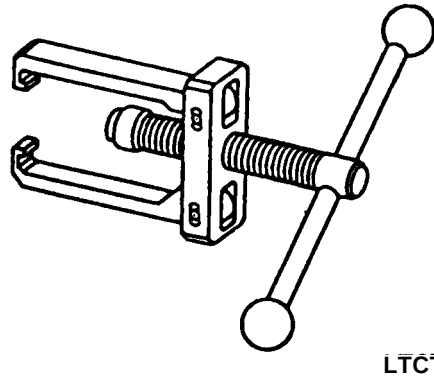
LTCT525

Figure C-42. Cup Installer



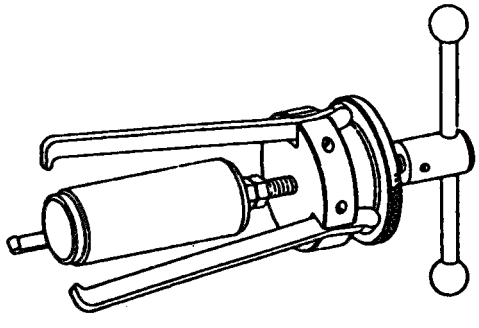
LTCT528

Figure C-43. Holding Fixture



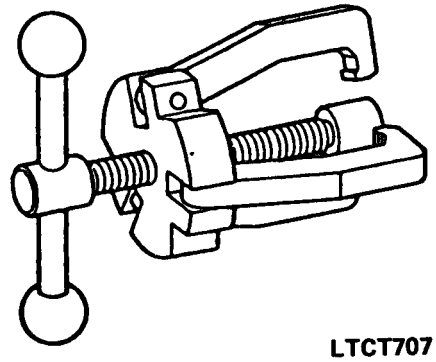
LTCT675

Figure C-44. Bearing Puller



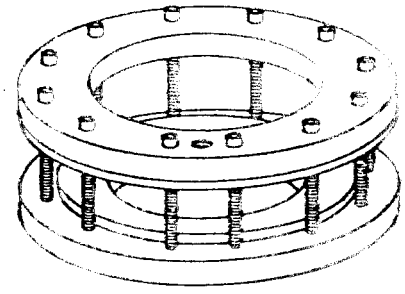
LTCT691

Figure C-45. Puller



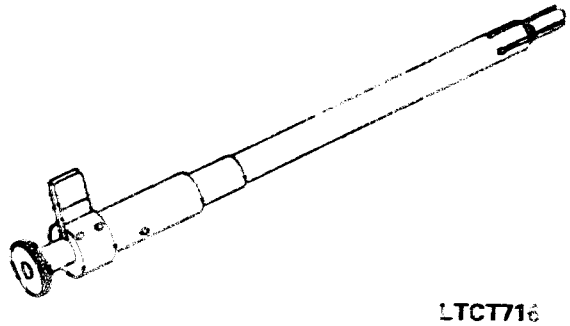
LTCT707

Figure C-46. Puller, Mechanical



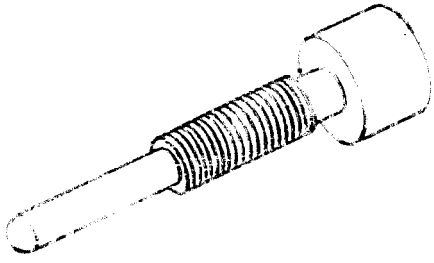
LTCT713

Figure C-47. Test Fixture



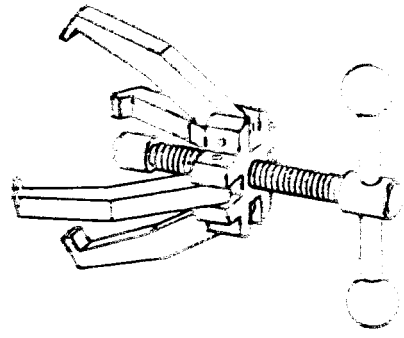
LTCT716

Figure C-48. Backlash Gage



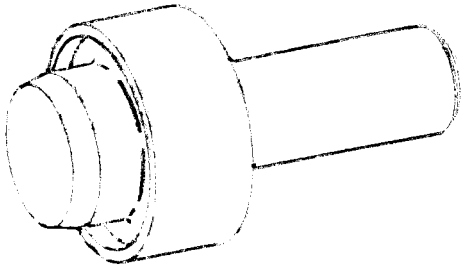
LTCT718

Figure C-49. Internal Wrenching Bolt



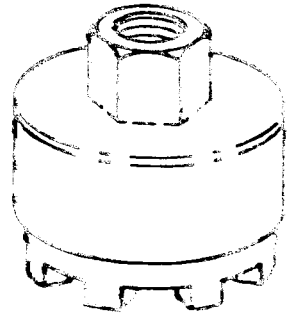
LTCT721

Figure C-50. Mechanical Puller



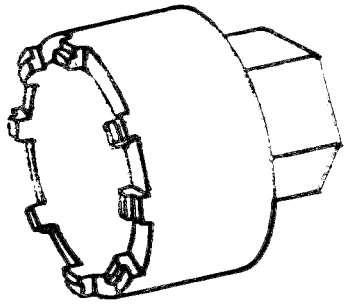
LTCT722

Figure C-51. Tool, Installation



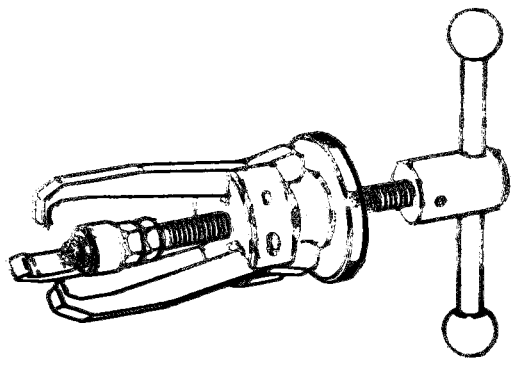
LTCT723

Figure C-52. Face Spanner Socket Wrench



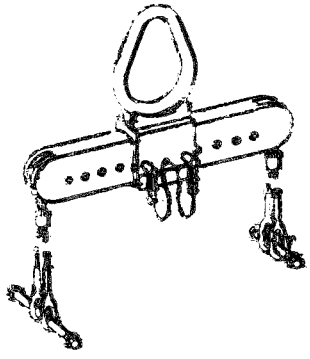
LTCT725

Figure C-53. Spanner Wrench



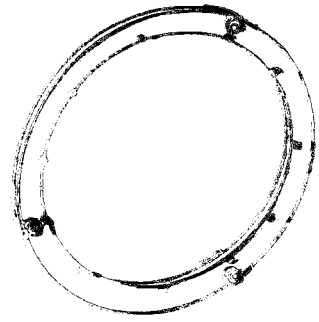
LTCT752

Figure C-54. Planet Gear Rear Bearing Mechanical Puller



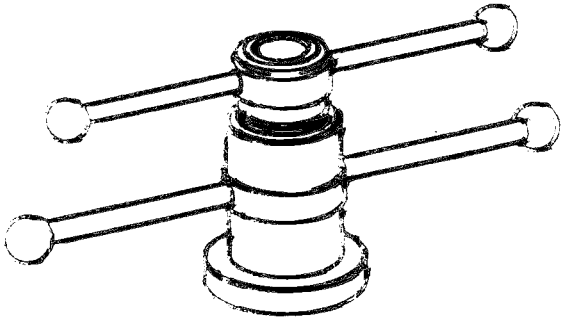
LTCT773

Figure C-55. Sling, Aircraft Maintenance



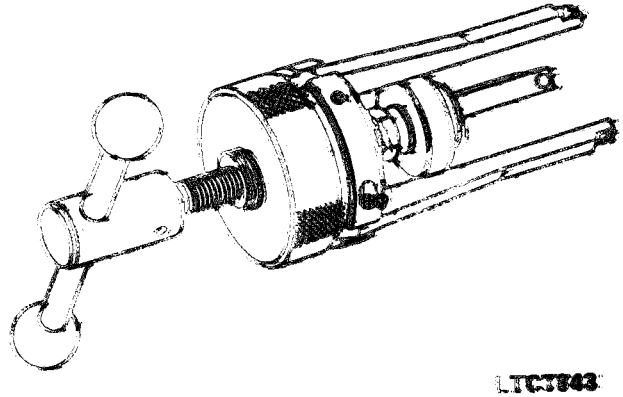
LTCT738

Figure C-56. Fixture, Welding



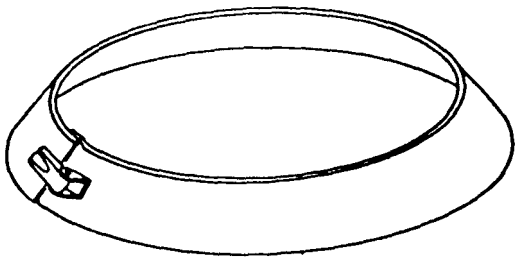
LTCT791

Figure C-57. Installation Tool



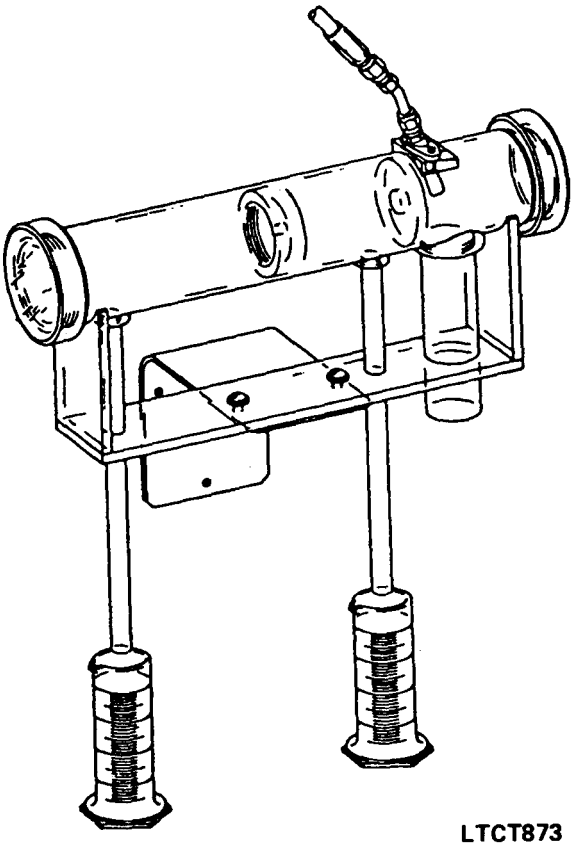
LTCT843

Figure C-58. Puller



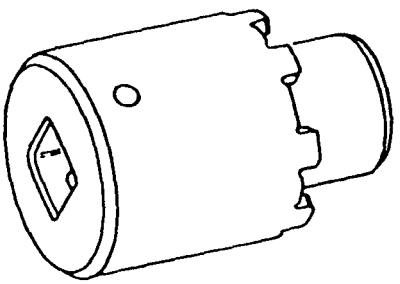
LTCT662

Figure C-59. Shield, Aircraft



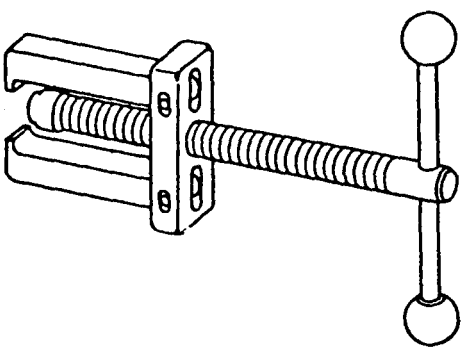
LTCT873

Figure C-60. Test Chamber



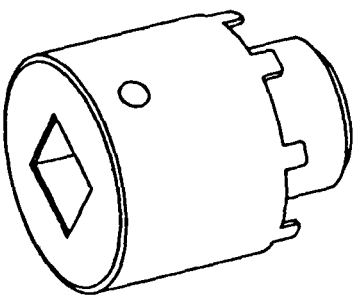
LTCT915

Figure C-61. Socket Wrench



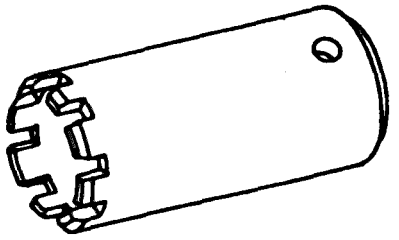
LTCT916

Figure C-62. Puller



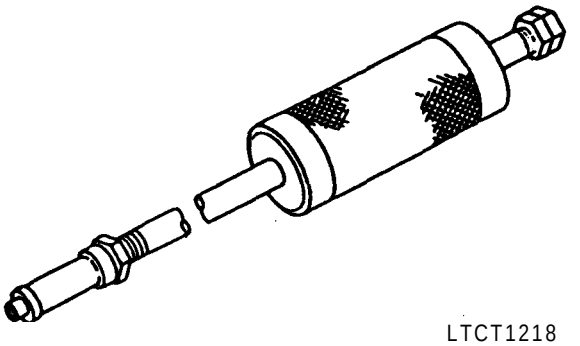
LTCT920

Figure C-63. Socket Wrench



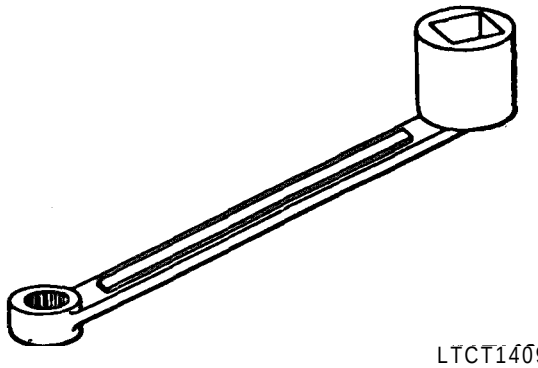
LTCT1109

Figure C-64. Socket and Spanner



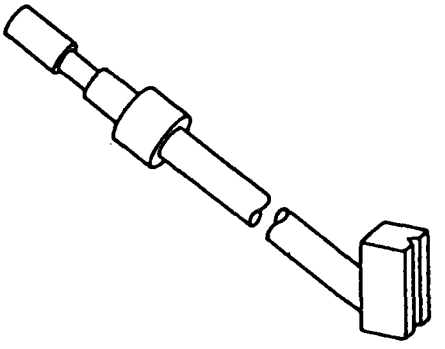
LTCT1218

Figure C-65. Puller



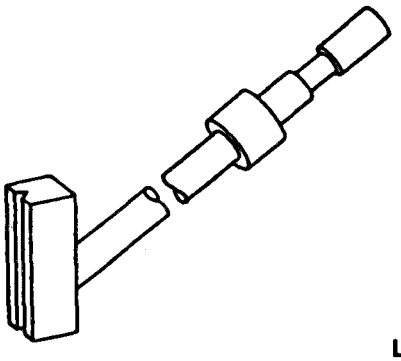
LTCT1409

Figure C-66. Wrench



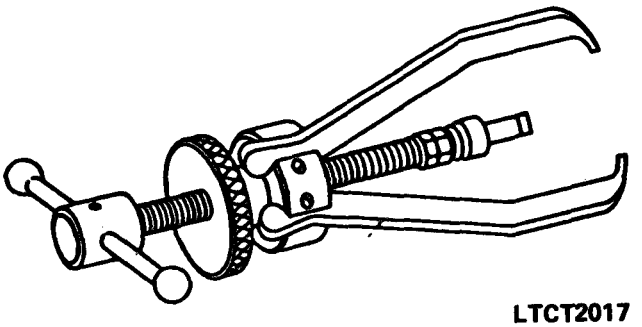
LTCT1643

Figure C-67. Drift



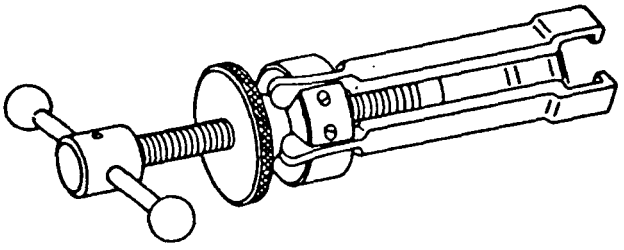
LTCT1644

Figure C-68. Drift



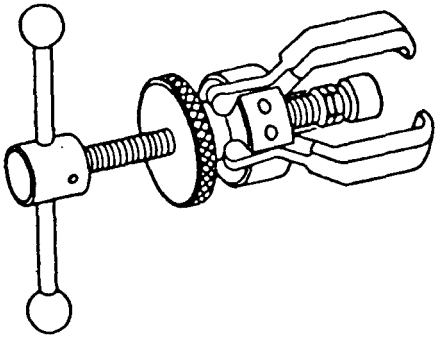
LTCT2017

Figure C-69. Puller



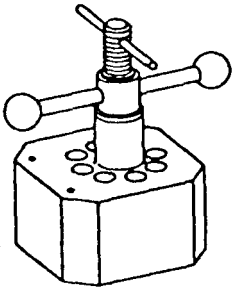
LTCT2021

Figure C-70. Puller



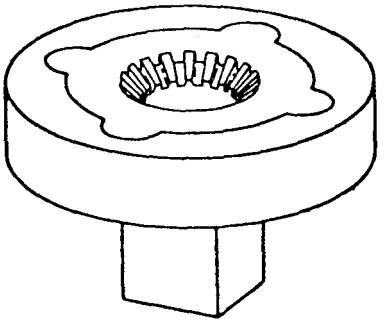
LTCT2026

Figure C-71. Puller



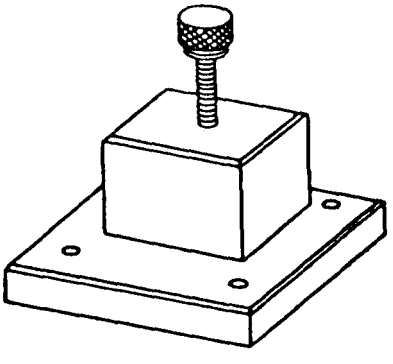
LTCT2034

Figure C-72. Puller



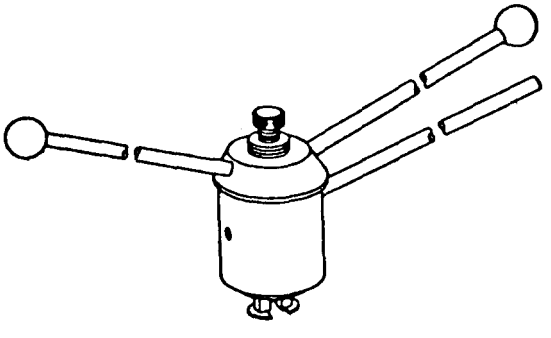
LTCT2037

Figure C-73. Holder Assembly



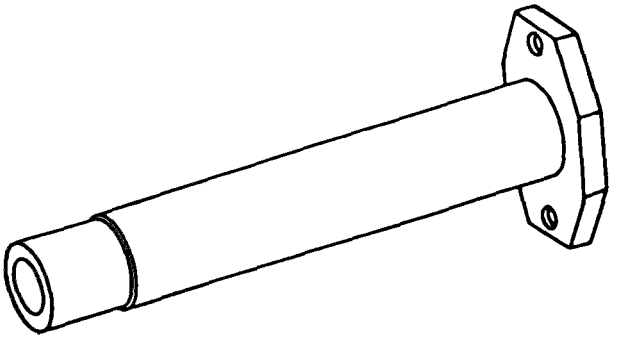
LTCT2044

Figure C-74. Fixture



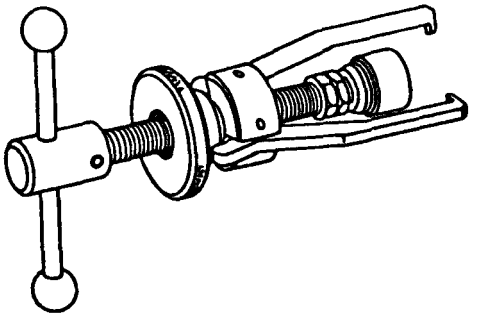
LTCT2067

Figure C-75. Puller



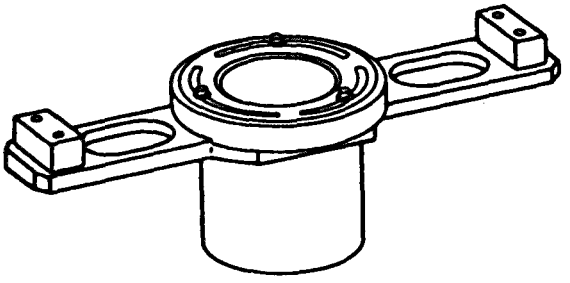
LTCT2070

Figure C-76. Seal Holder



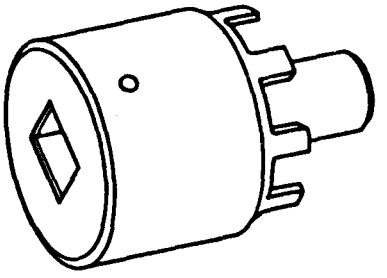
LTCT2073

Figure C-77. Puller



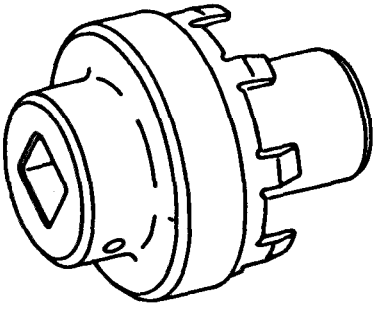
LTCT2075

Figure C-78. Fixture, Holding



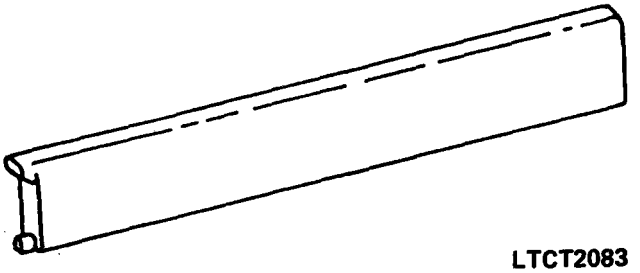
LTCT2079

Figure C-79. Socket



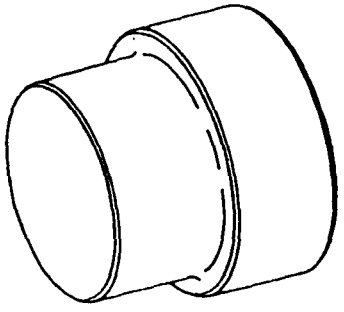
LTCT2080

Figure C-80. Socket



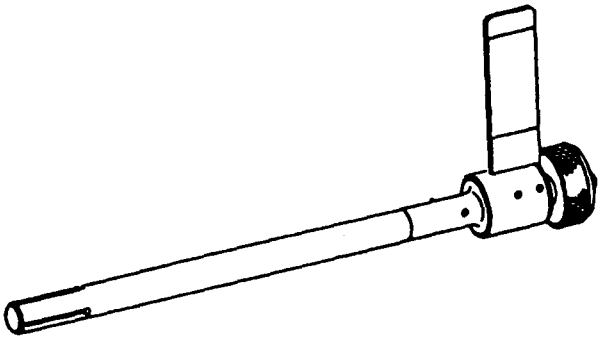
LTCT2083

Figure C-81. Stud Retainer Installing Tool - Plate



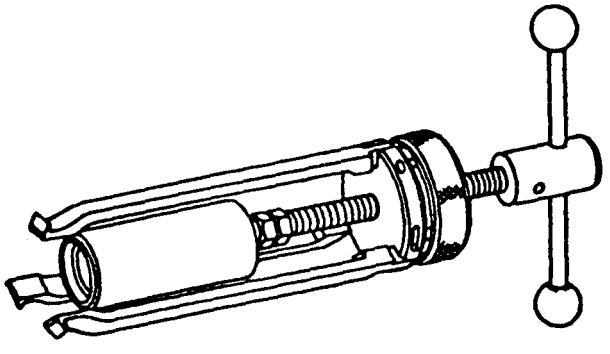
LTCT2086

Figure C-82. Driver, Plug



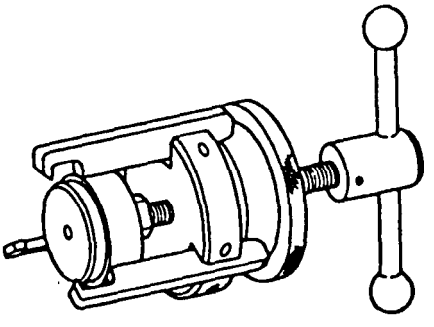
LTCT2099

Figure C-83. Gage, Backlash



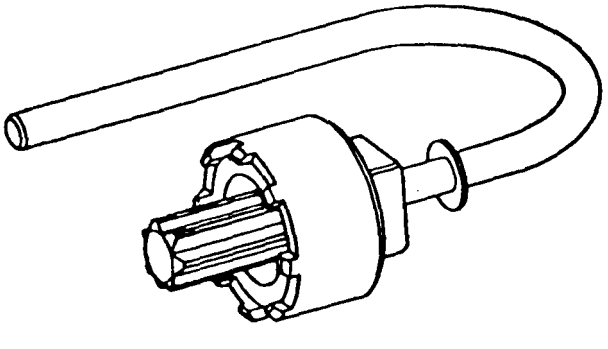
LTCT2121

Figure C-84. Puller



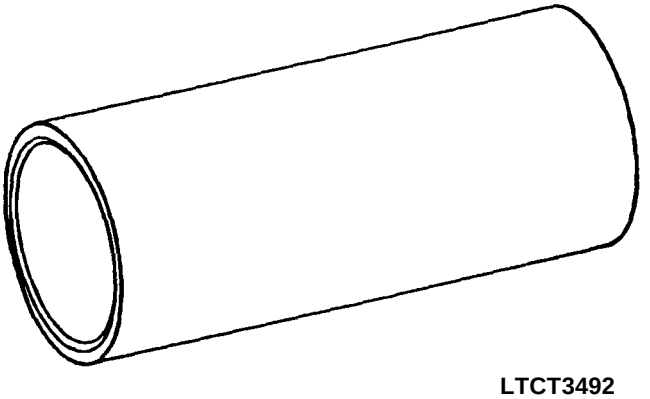
LTCT2142

Figure C-85. Puller



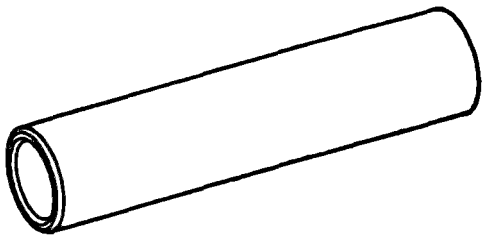
LTCT2161

Figure C-86. Spanner Nut Wrench



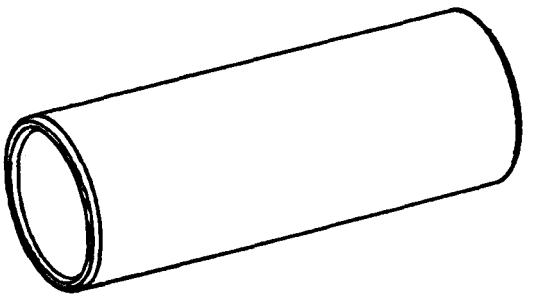
LTCT3492

Figure C-87. Bushing



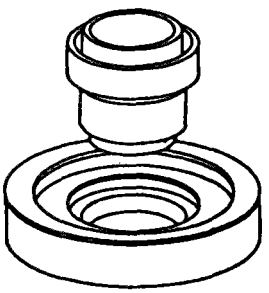
LTCT3636

Figure C-88. Bushing, Sleeve



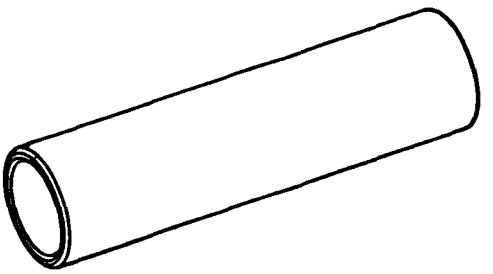
LTCT3637

Figure C-89. Bushing, Sleeve



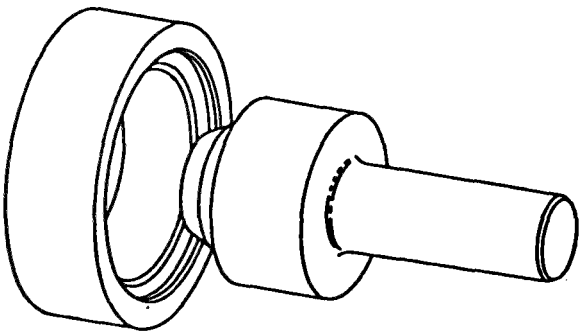
LTCT3638

Figure C-90. Installation and Removal Tool



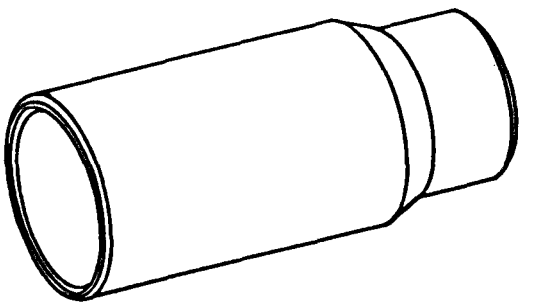
LTCT3640

Figure C-91. Bushing, Sleeve



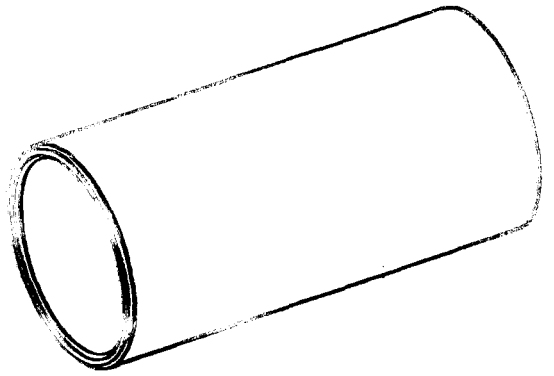
LTCT3648

Figure C-92. Removal Tool



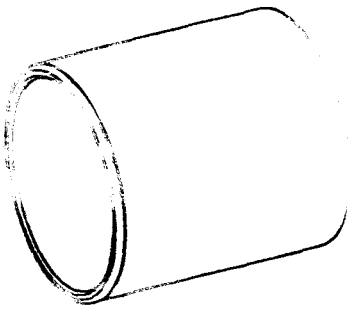
LTCT3654

Figure C-93. Bushing, Sleeve



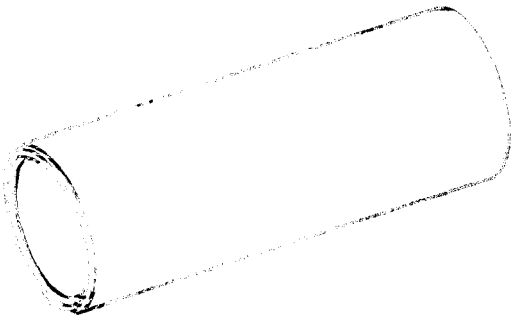
LTCT3658

Figure C-94. Bushing, Sleeve



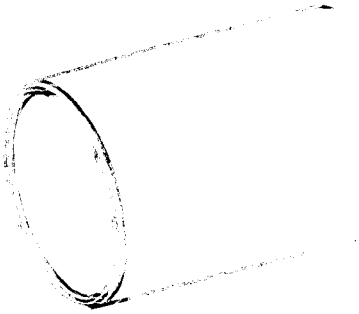
LTCT3659

Figure C-95. Bushing, Sleeve



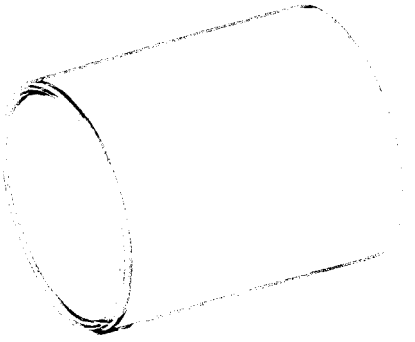
LTCT3660

Figure C-96. Bushing, Sleeve



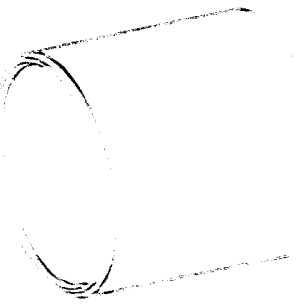
LTCT3661

Figure C-97. Bushing, Sleeve



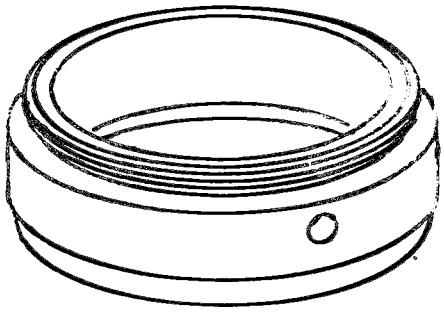
LTCT3663

Figure C-98. Bushing, Sleeve



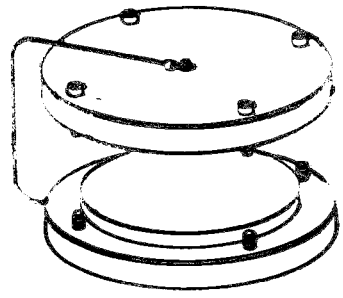
LTCT3664

Figure C-99. Bushing, Sleeve



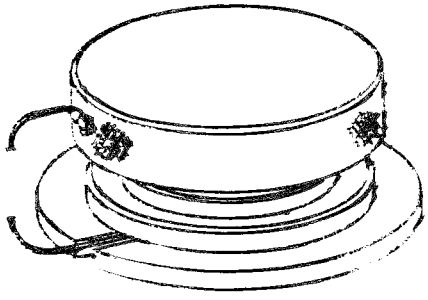
LTCT3885

Figure C-100. Adapter and Guide



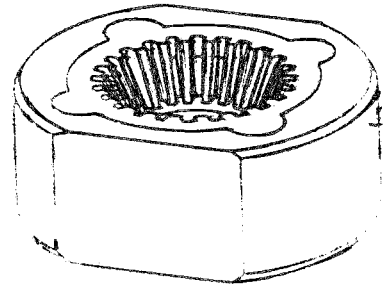
LTCT3884

Figure C-101. Pressure Test Fixture



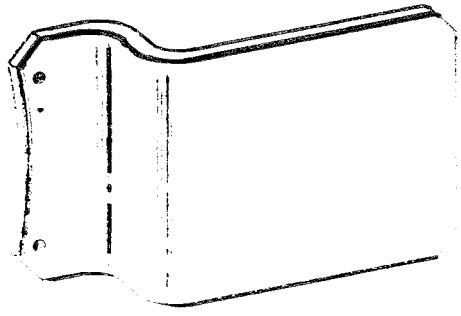
LTCT3825

Figure C-102. Installation Tool



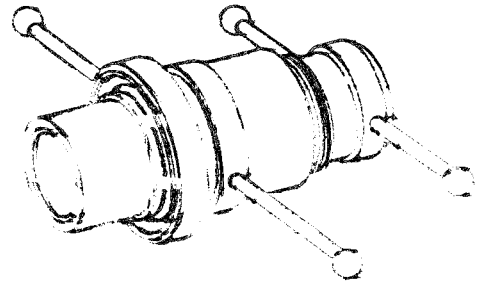
LTCT3833

Figure C-103. Holder



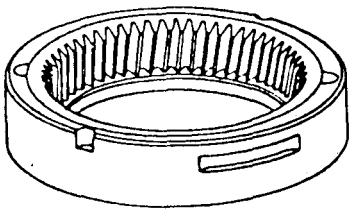
LTCT3955

Figure C-104. Bracket



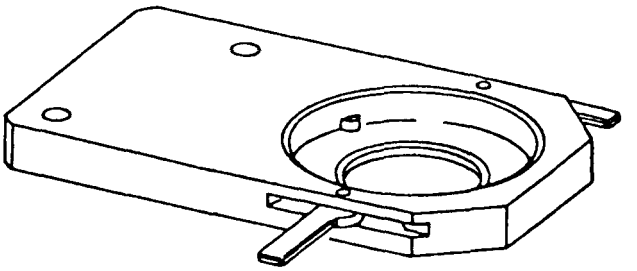
LTCT4003

Figure C-105. Inserting Tool



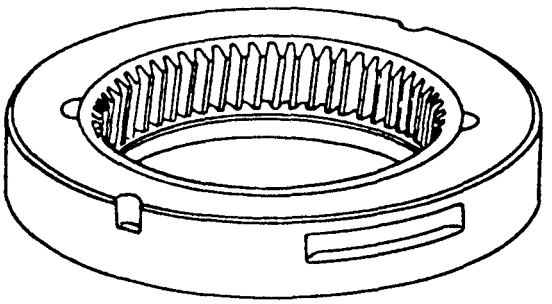
LTCT4017

Figure C-106. Ring Assembly



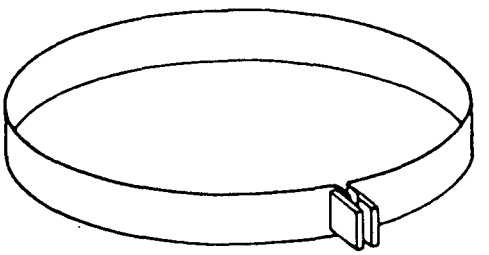
LTCT4018

Figure C-107. Fixture, Holding



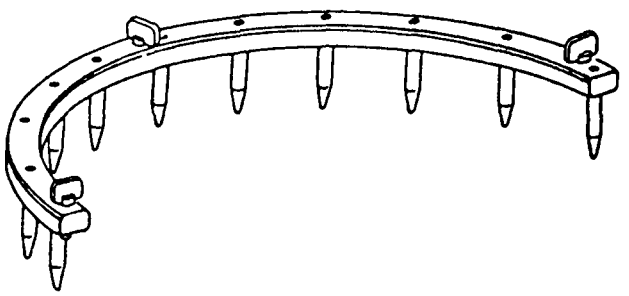
LTCT4019

Figure C-108. Ring Assembly



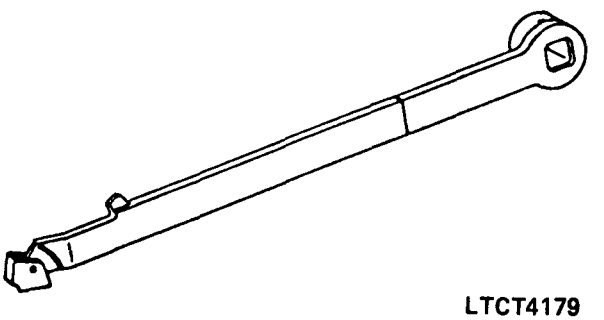
LTCT4155

Figure C-109. Handling Tool



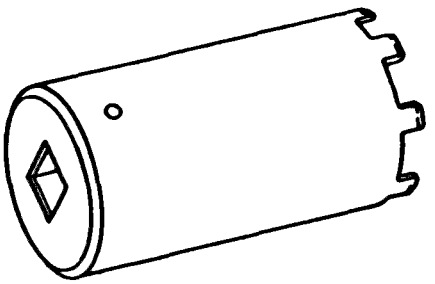
LTCT4174

Figure C-110. Fixture Alinement



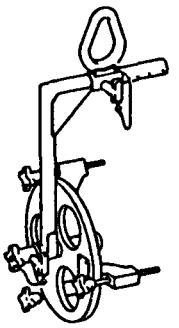
LTCT4179

Figure C-111. Installing Tool



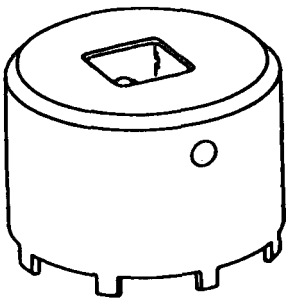
LTCT4181

Figure C-112. Wrench Socket



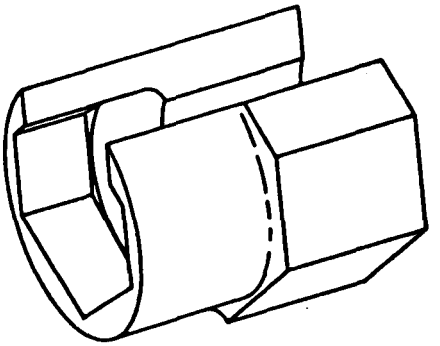
LTCT4182

Figure C-113. Hoisting Assy



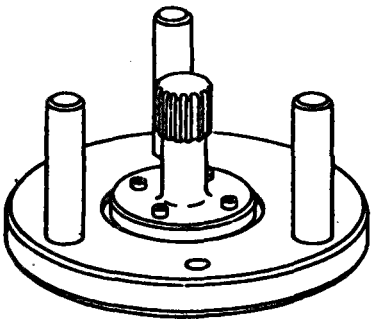
LTCT4190

Figure C-114. Spanner Wrench



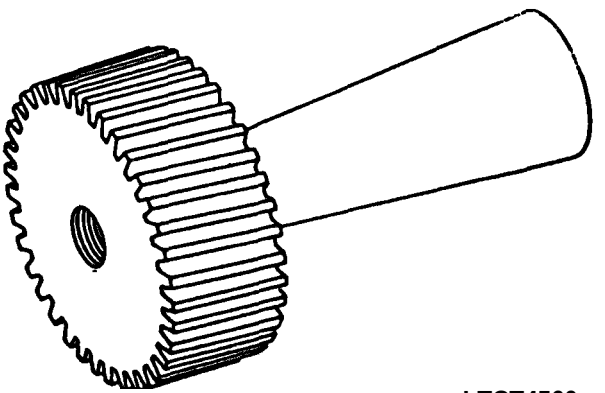
LTCT4457

Figure C-115. Adapter, Socket



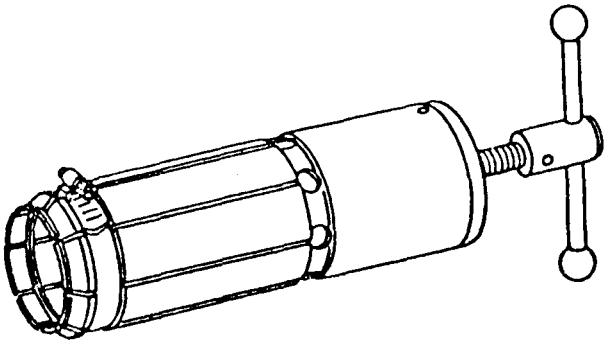
LTCT4553

Figure C-116. Shaft Holding Fixture



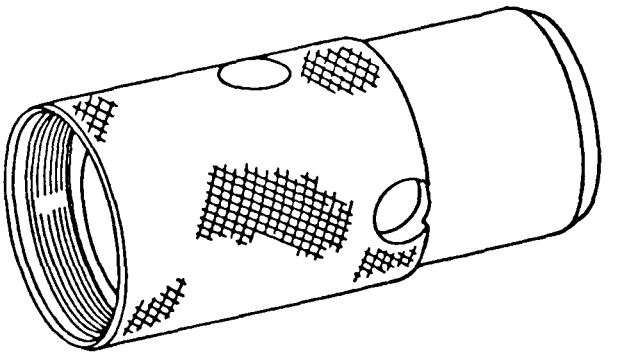
LTCT4560

Figure C-117. Alinement Tool



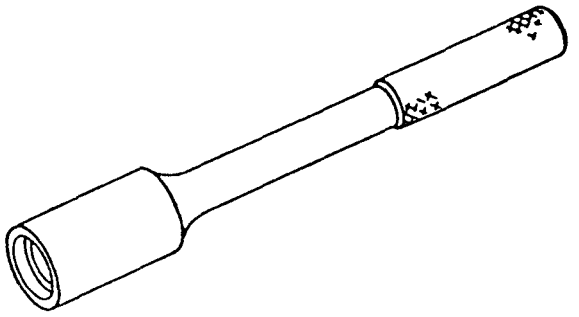
LTCT4568

Figure C-118. Puller



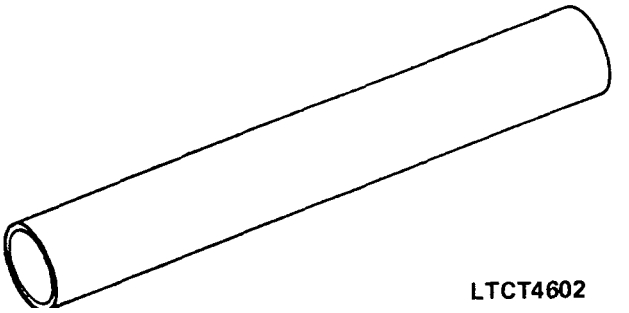
LTCT4571

Figure C-119. Arbor



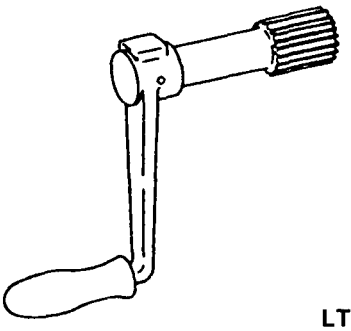
LTCT4576

Figure C-120. Installation Tool



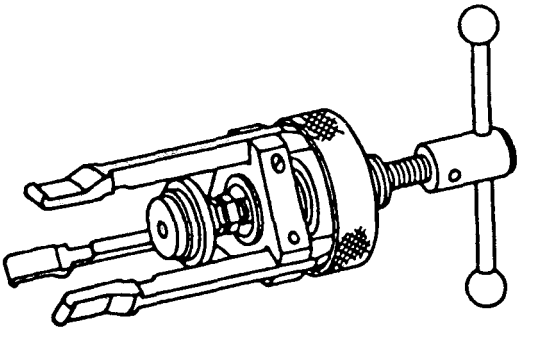
LTCT4602

Figure C-121. Guide



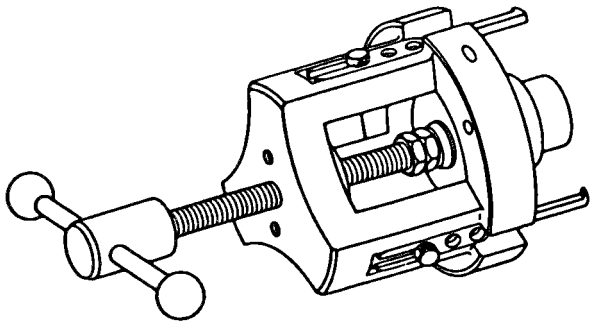
LTCT4650

Figure C-122. Crank, Hand



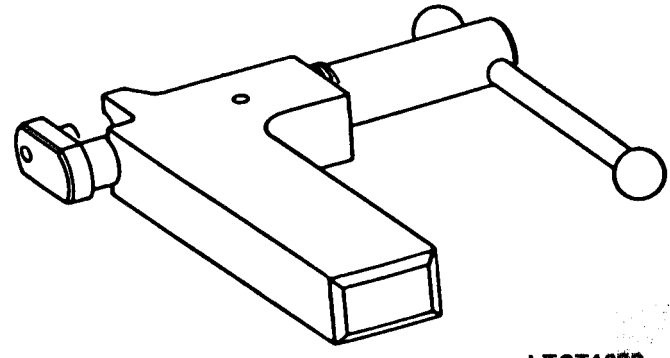
LTCT4670

Figure C-123. Mechanical Puller



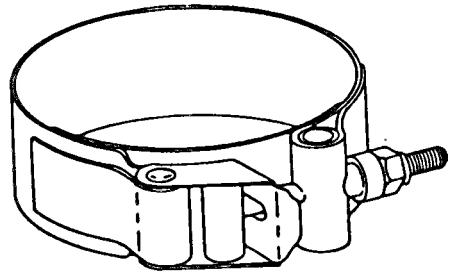
LTCT4680

Figure C-124. Puller



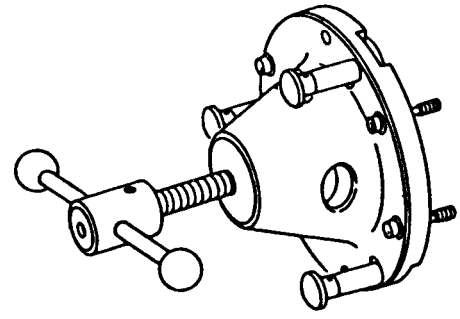
LTCT4692

Figure C-125. Tool Removal



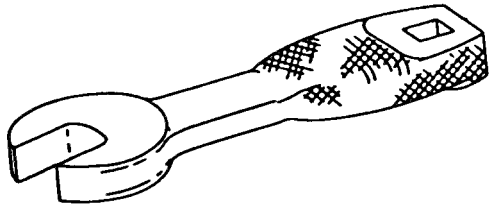
RC40C

Figure C-126. Loop Clamp



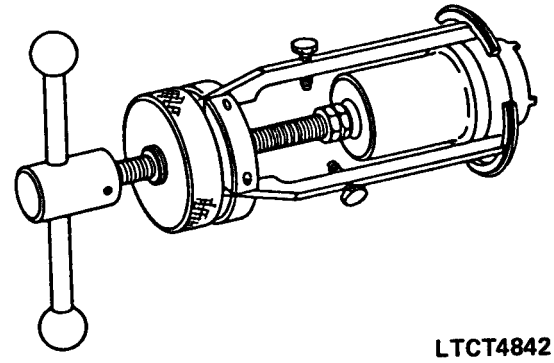
LTCT4800

Figure C-127. Puller



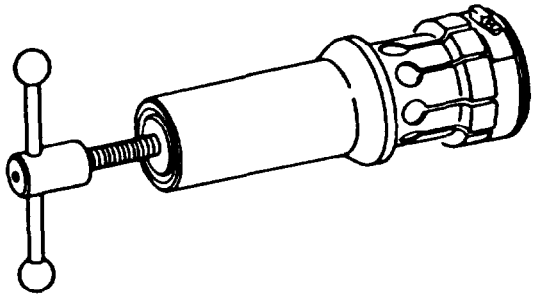
LTCT4810

Figure C-128. Fuel Harness Wrench



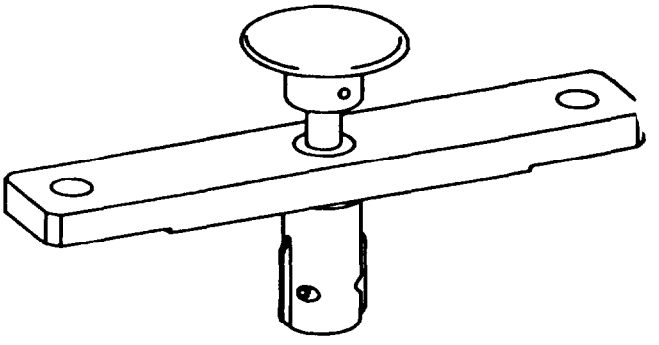
LTCT4842

Figure C-129. Puller



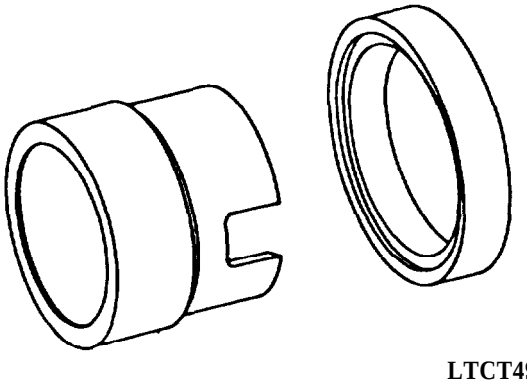
LTCT4846

Figure C-130. Puller



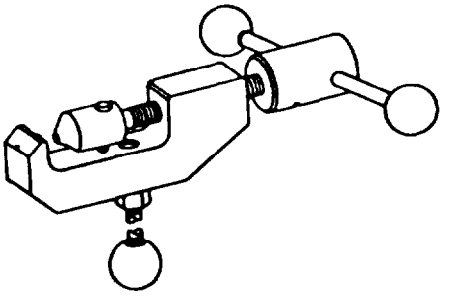
LTCT4904

Figure C-131. Fixture, Holding



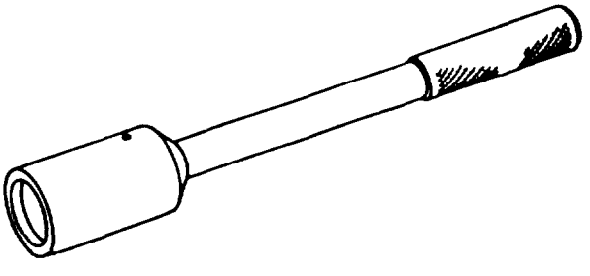
LTCT4947

Figure C-132. Installation Tool



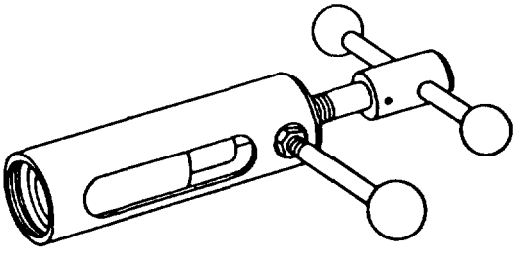
LTCT6000

Figure C-133. Installation Tool



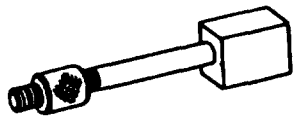
LTCT6104

Figure C-134. Installation Tool



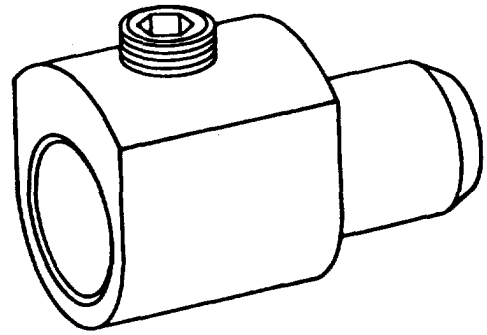
LTCT6465

Figure C-135. Puller



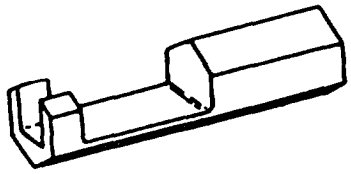
LTCT6740

Figure C-136. Removal Tool



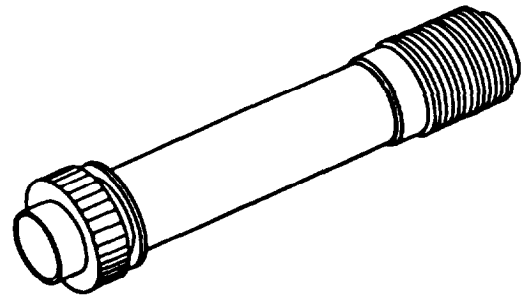
LTCT6763

Figure C-137. Stop Assembly, Cold Weather



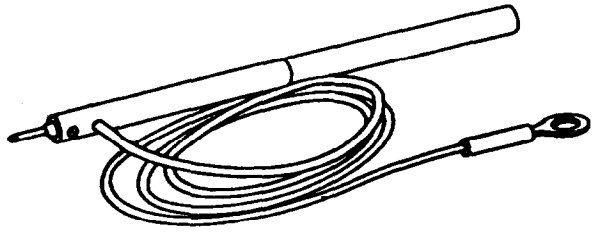
LTCT6940

Figure C-138. Special Wrench



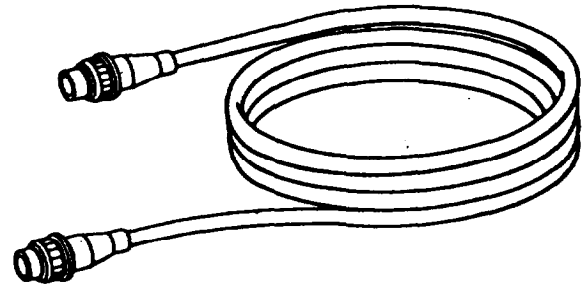
LTCT9268

Figure C-139. Adapter



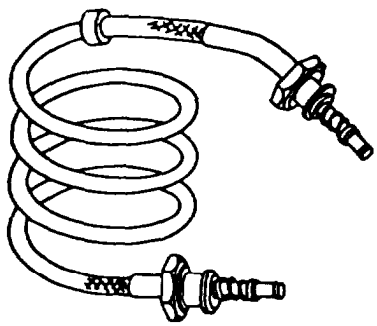
LTCT9271

Figure C-140. Lead



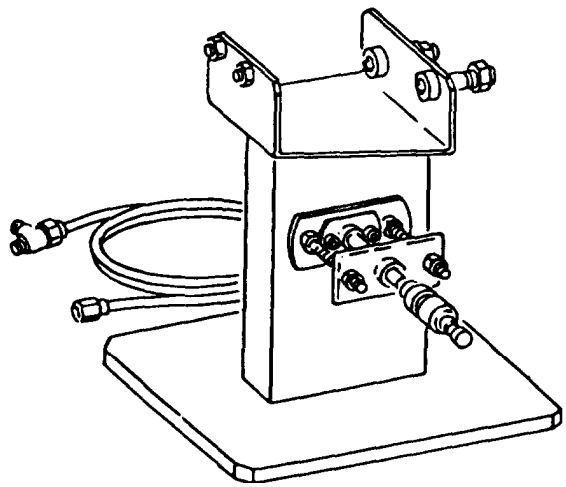
LTCT9272

Figure C-141. Cable Assembly



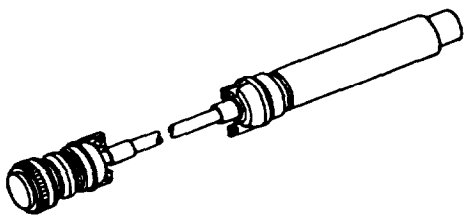
LTCT9277

Figure C-142. Test Lead



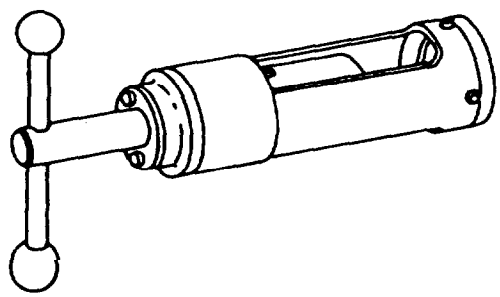
LTCT10440

Figure C-143. Fixture, Test



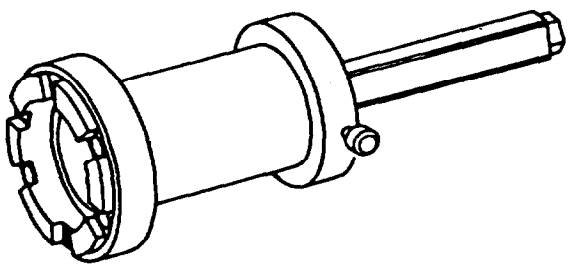
LTCT10462

Figure C-144. Lead, Elect



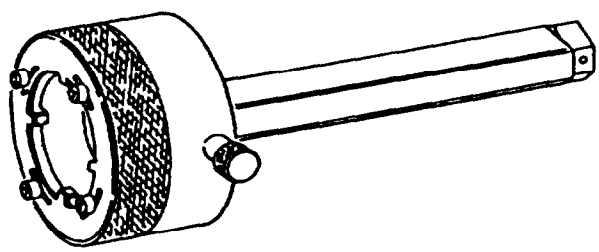
LTCT13070

Figure C-145. Puller



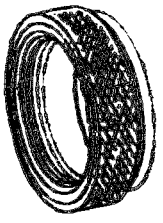
LTCT13175

Figure C-146. Fixture



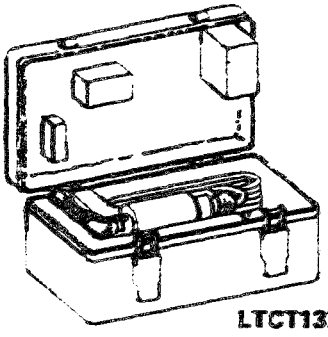
LTCT13430

Figure C-147. Fixture, Torque



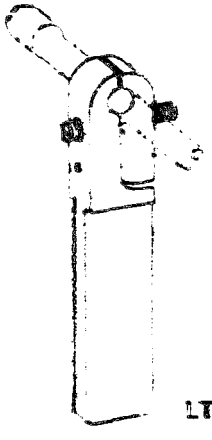
LTCT13676

Figure C-148. Adapter, Cone Remover



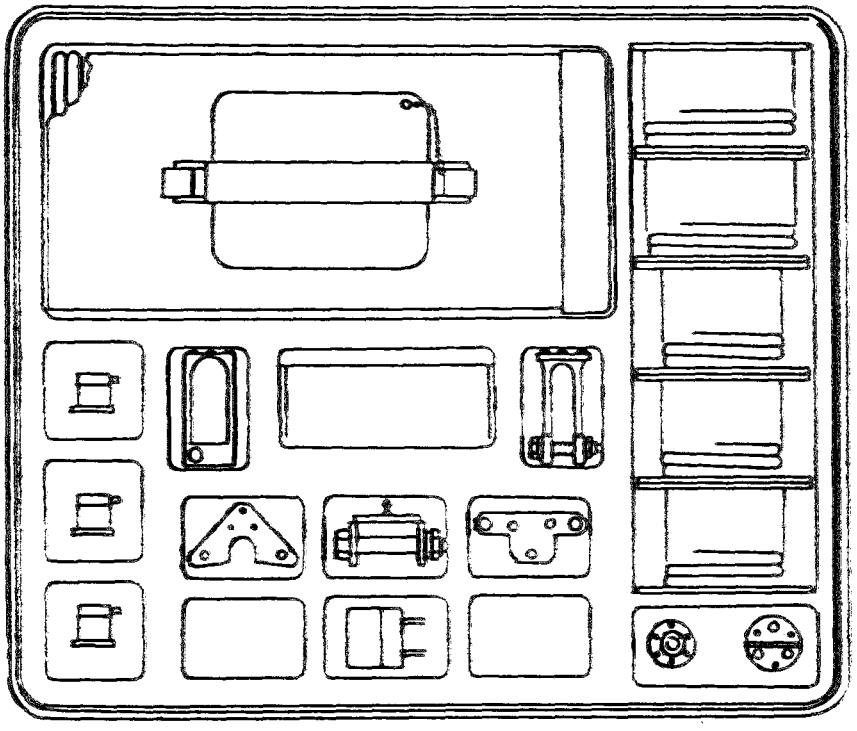
LTCT13726

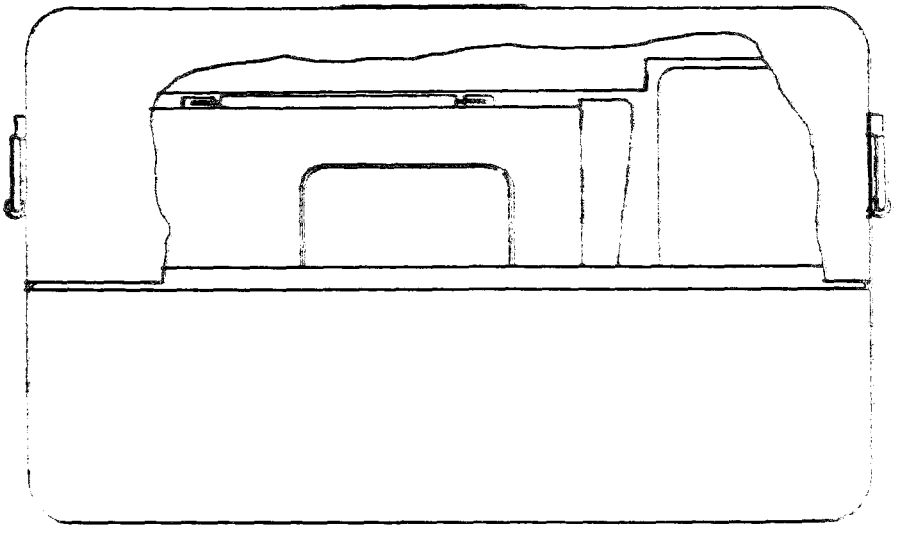
Figure C-149. Switch and Coupling Kit



LTCT14503

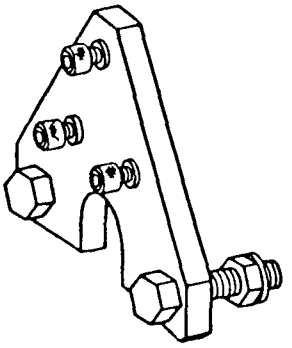
Figure C-150. Clamp, Gage



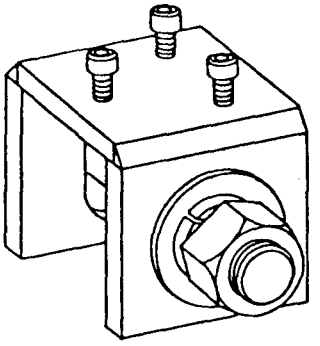


171170-014

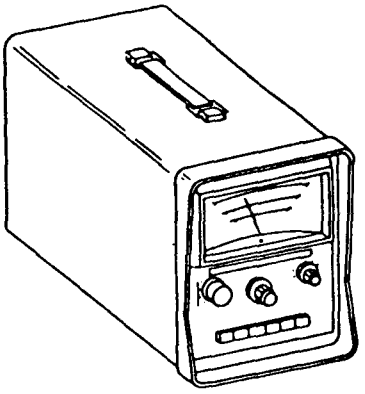
Figure C-151. Mounting [illegible] Vibration Test Set (Sheet [illegible] of 2)



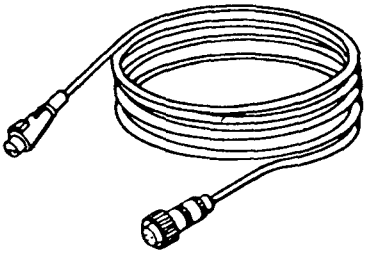
LTCT433



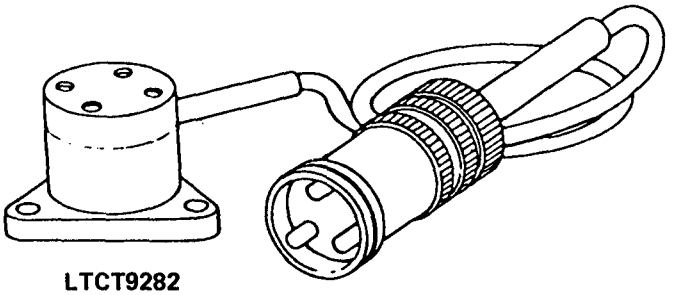
LTCT535



LTCT22031-01
(CEC1-157-0103)



LTCT9283-02
(CEC49657-0300)



LTCT9282
(CEC4-118-0107)

LTCT20596

Figure C-151. Monitoring Kit, Vibration Test Set
(Sheet 2 of 2)

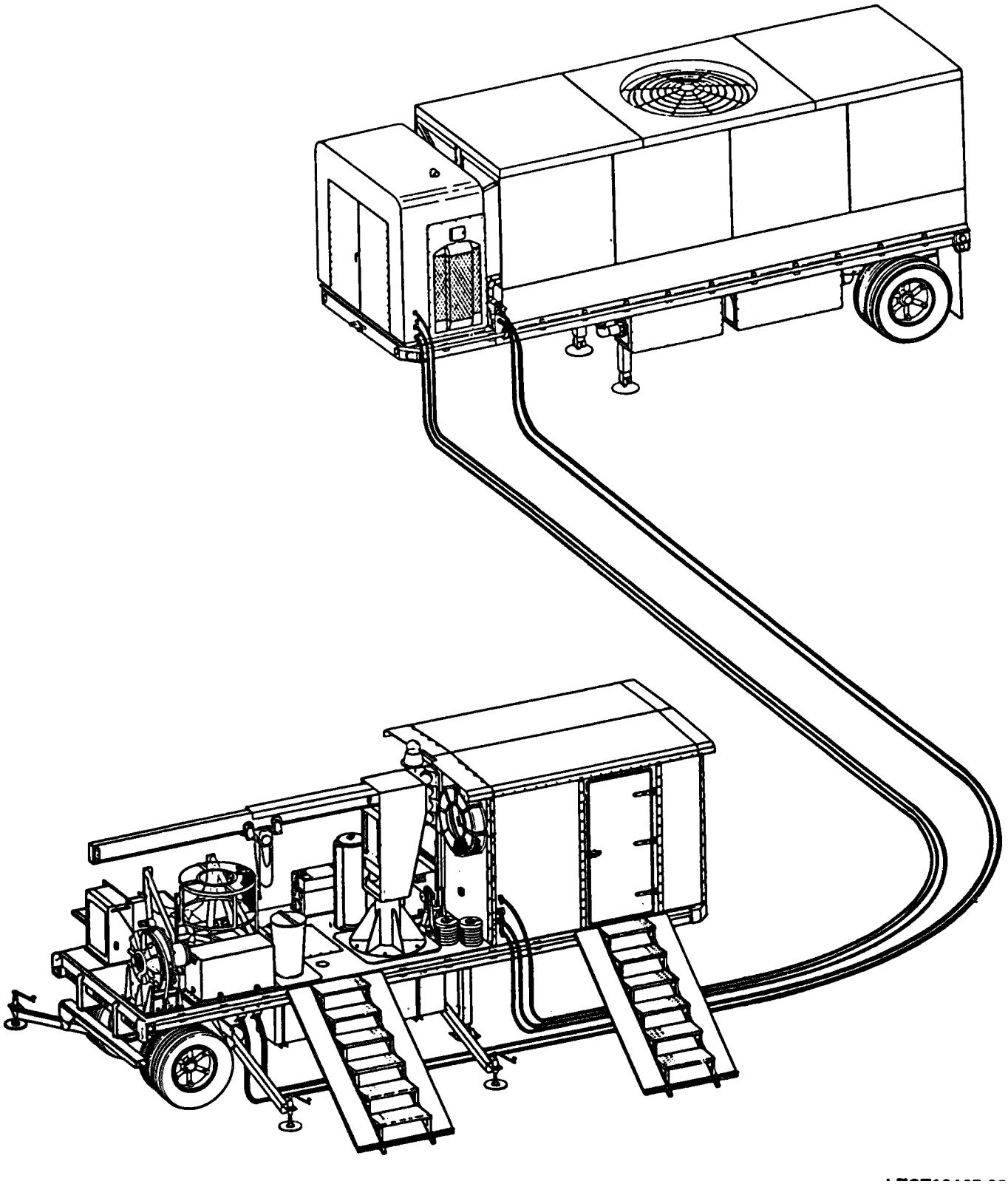
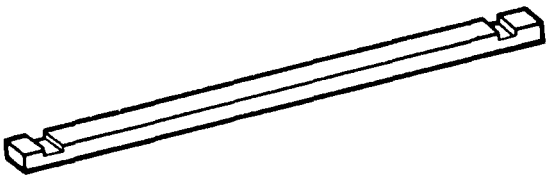
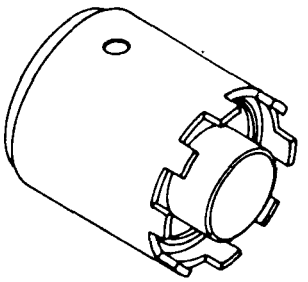


Figure C-152. Mobile Trailer Assembly



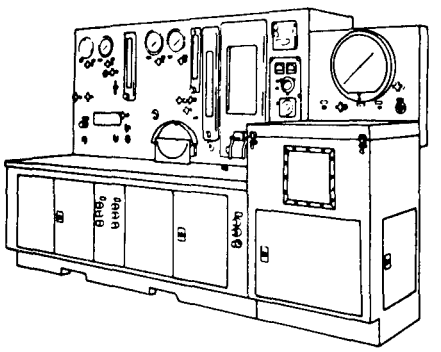
LTCT153

Figure C-153. Bar, Locating



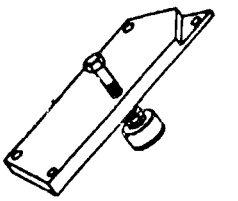
LTCT222

Figure C-155. Socket Wrench



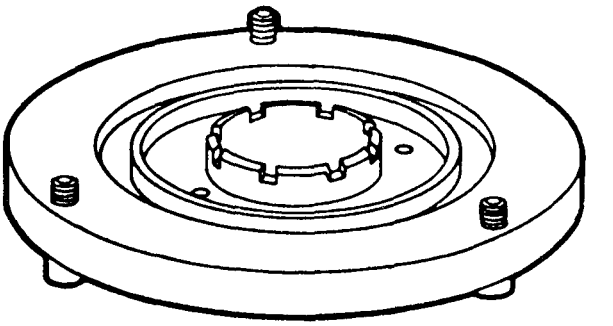
LTCT314

Figure C-157. Test Stand



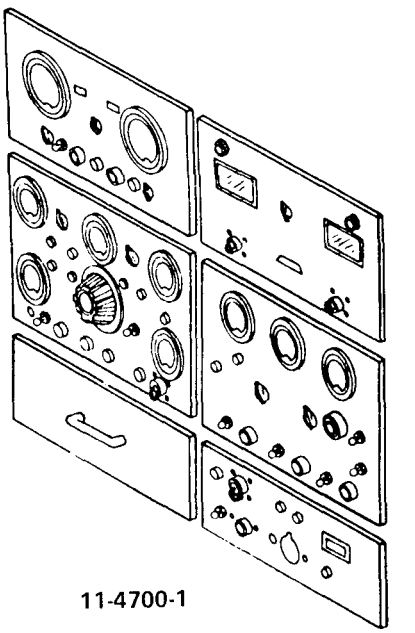
LTCT207

Figure C-154. Fixture, Test



LTCT248

Figure C-156. Locking Plate Assy

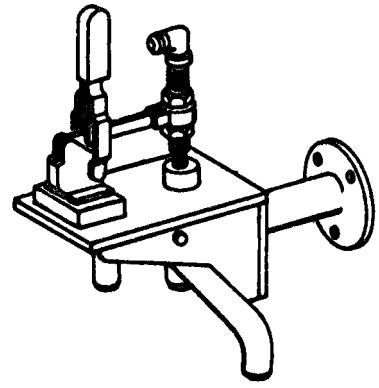


11-4700-1

Figure C-158. Test Unit

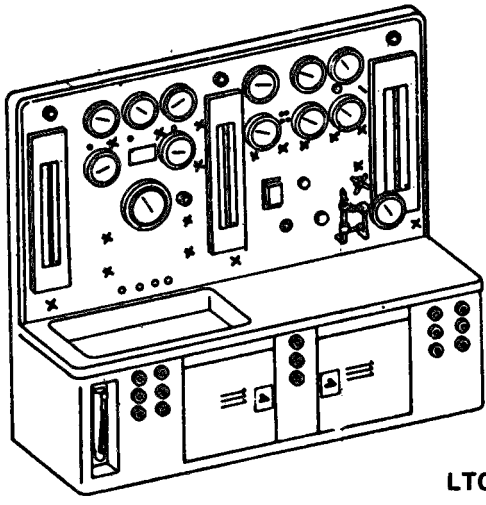
LTCT406

Figure C-159. Plug Assy, Test



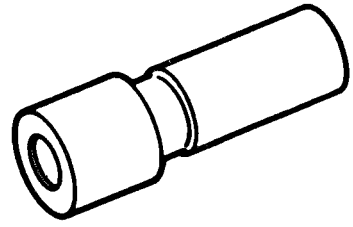
LTCT409

Figure C-160. Test Fixture



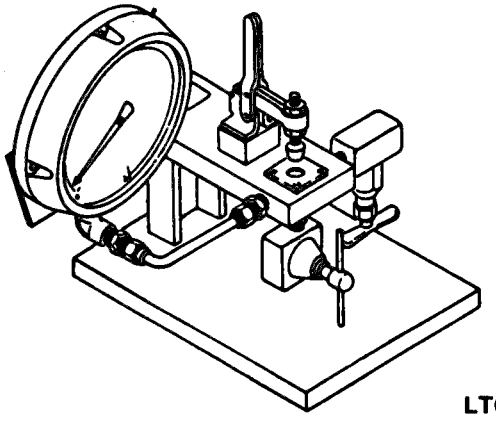
LTCT422

Figure C-161. Test Stand, Fuel Pump



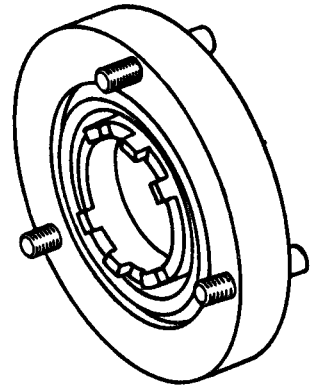
LTCT503

Figure C-162. Alinement Tool



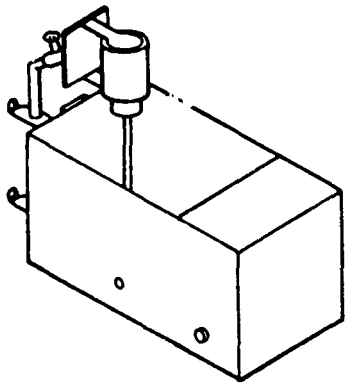
LTCT859

Figure C-163. Fixture, Test



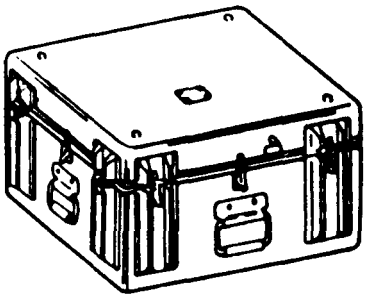
LTCT962

Figure C-164. Plate, Locking



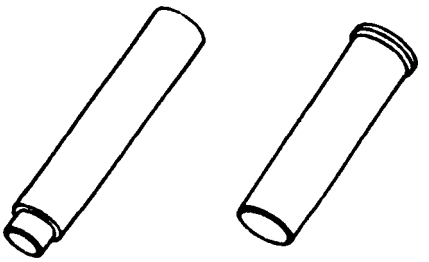
LTCT1452

Figure C-165. Test Unit



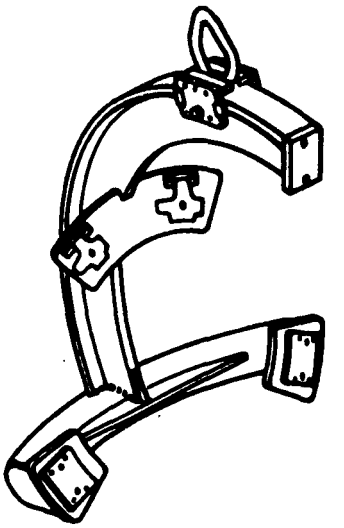
LTCT2020

Figure C-166. Maintenance Kit, Flange



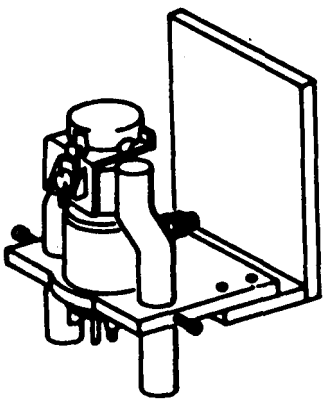
LTCT4405 LTCT4406

Figure C-167. Shouldered Shaft and Sleeve Bushing



LTCT3665

Figure C-168. Hoisting Adapter



LTCT4100

Figure C-169. Fuel Vaporizer Fixture

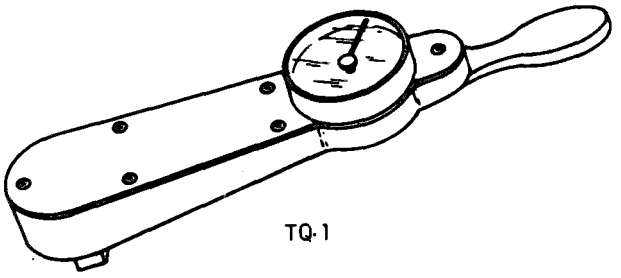


Figure C-181. Torque Wrench

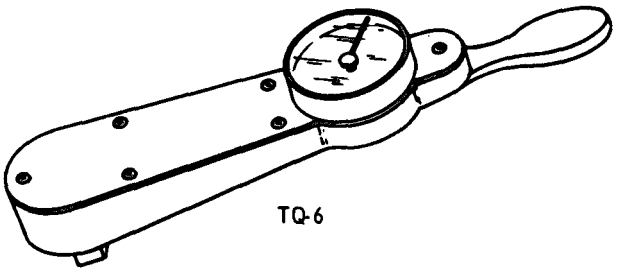


Figure C-182. Torque Wrench

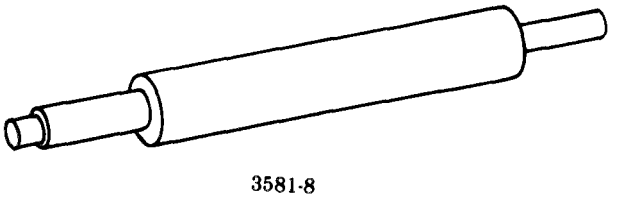


Figure C-183. Tang Breakoff Tool

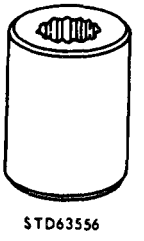


Figure C-184. Torque Throttle Adapter

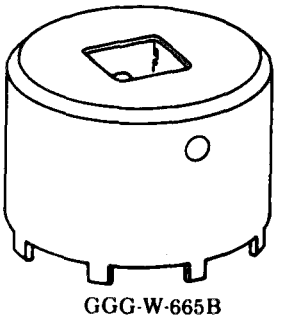


Figure C-185. Spanner Wrench

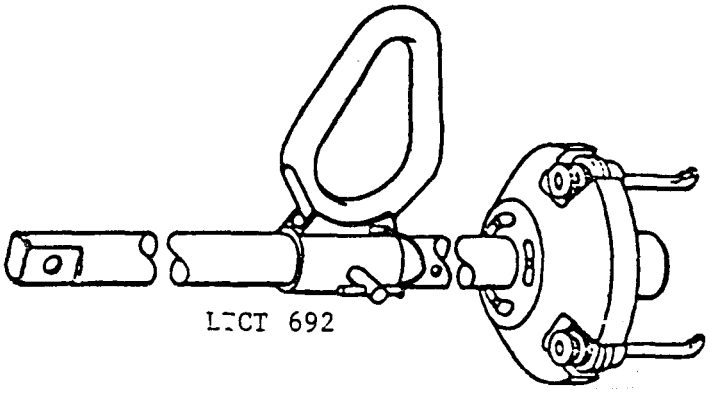


Figure C-186. Hoist Assy

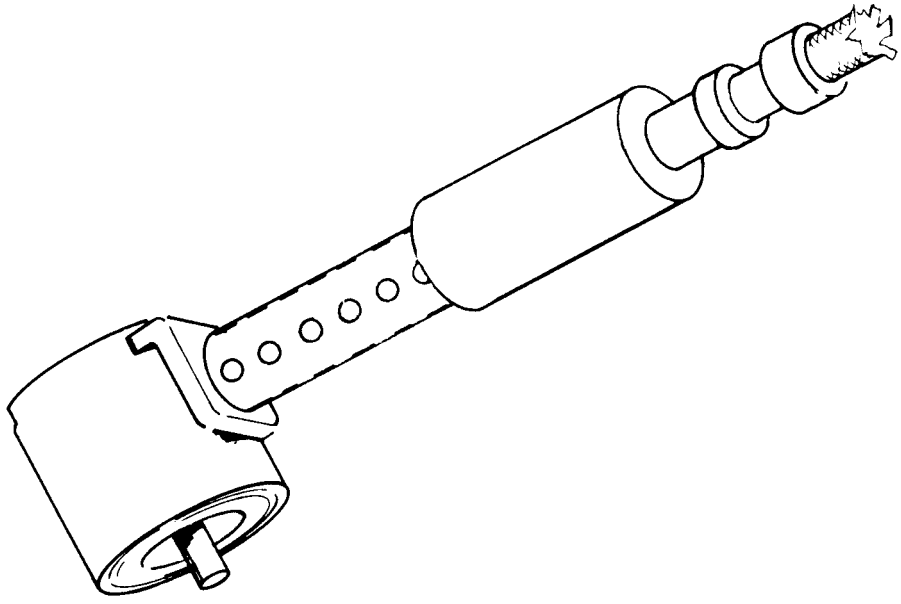


Figure C-187. Probe Assembly

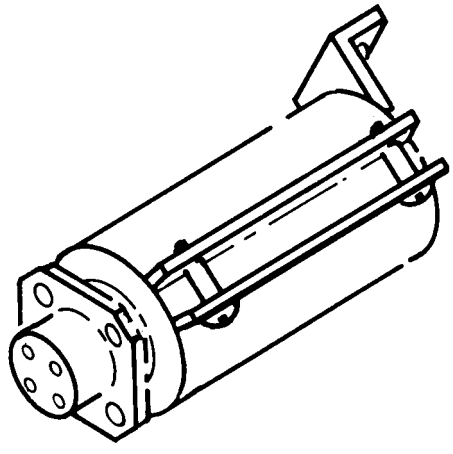
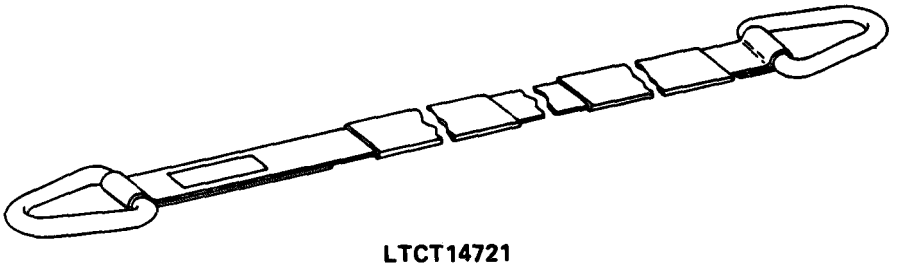


Figure C-188. Housing Test Connector



LTCT14721

Figure C-189. Sling, Webbed

LTCT3981

Figure C-190. Crimping Tool

APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

OVERVIEW

This appendix lists expendable supplies and materials you will need to operate and maintain the engine. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

D-1. EXPLANATION OF COLUMNS.

a Column 1- Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

AVUM
AWIM

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4- Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5- Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue. requisition the lowest unit of issue that will satisfy your requirements.

(1) Item Number	(2) Level	National Stock Number	(4) Description	(5) U/M
1	AVUM	6810-00-003-0262	Acetone O-A-51	GL
2	AVUM	6850-00-935-0995	Alkaline Cleaner MIL-C-25769	GL
3	AVUM	3490-00-891-5162	Alloy AMS4769	TO
4	AVUM	3490-00-528-3882	Alloy AMS4771	LB
5	AVUM	9530-00-232-0494	Aluminum Alloy 040 2024-0	EA
6	AVUM	5350-00-161-9715	Aluminum Oxide (Grade 400) (10646) (or equivalent)	EA
7	AVUM	5350-00-161-9066	Aluminum Oxide Cloth (No. 100) (10646) (or equivalent)	EA
8	AVUM	8010-00-815-2692	Aluminum Paint (Heat Resisting 1200°F) TT-P-28	GL
9	AVUM	8335-00-224-8885	Barrier Material (Grade A) MIL-B-121	YD
10			Deleted	
11	AVUM	6850-00-264-5771	Calibrating Fluid (Type II) MIL-F-7024	GL
12	AVUM	6850-00-803-6420	Carbon Removing Compound MIL-C-19853 or MIL-C-25107	GL
13	AVUM	9150-00-261-7455	Castor Oil JJJ-C-86	GL
14			Deleted	
15			Deleted	
16			Deleted	
17	AVUM	6850-00-209-7235	Corrosion-Preventive Compound (Type 3) MIL-C-6529	GL
18	AVUM	8030-00-244-1299	Corrosion-Preventive Compound MIL-C-16173 (Grade 2)	EA
19	AVUM	8030-00-114-4017	Corrosion-Preventive Fingerprint Remover MIL-C-15074	PT

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
20	AVUM	8030-00-166-8830	Corrosion-Preventives Synthetic-Resin Varnish AMS3132 or ML-R-3043	QT
21	AVUM	5350-00-221-0872	Crocus Cloth P-C-458	EA
22	AVUM	9150-00-261-8144	Cutting Oil VV-C-846	GL
23	AVUM	6850-00-264-6562	Desiccant MIL-D-3464	EA
24	AVUM	6850-00-264-9038	Dry Cleaning Solvent (Type I) P-D-680	GL
25	AVUM	6850-00-285-8011	Dry Cleaning Solvent (Type II) P-D-680	GL
25a	AVUM	6850-01-252-6407	Dry Cleaning Solvent, Penair M-5704	GL
26			Deleted	
27	AVUM	8010-00-598-5932	Enamel TT-E-489 (81348)	QT
28	AVUM	7520-00-973-1059	Felt Ink Marker (Black) (01195) (or equivalent)	EA
29	AVUM	3439-00-471-9899	Filler Wire AMS5784	LB
30	AVUM	3439-00-943-8889	Flux O-F-499 (Brazing, Silver Alloy)	LB
31	AVUM	9130-00-256-8613	Fuel (JP-4, JP-5) MIL-T-5624	GL
32	AVUM	6810-00-264-6548	Glycerol O-G-491	GL
33	AVUM	9150-01-101-1061	DAG 154 (70079)	PT
34	AVUM	9150-00-269-8255	Grease MIL-G-4343	LB
35	AVUM	6850-00-664-9067	Layout Dye MIL-L-83795 Dyke M Steel Blue (98148)	PT
36	AVUM	8945-00-949-5169	Hydrogenated Vegetable Shortening EE-S-321	QT
37	AVUM	8010-00-007-8164	TT-P-385 (81346)	LB
38	AVUM	5350-00-018-2085	Lapping Compound (No. 400) MIL-L-17862	LB

(1) Item Number	(2) Level	National Stock Number	(4) Description	(5) U/M
39	AVUM	6850-00-186-2963	Leak Test Solution MIL-L-25567 (81349)	OZ
40	AVUM	8520-00-228-0598	Liquid Soap P-S-624 (81348)	GL
41	AVUM	9505-00-221-2650	Lockwire MS20995C20 0.020 in. dia (81349)	FT
42	AVUM	9505-00-878-2958	Lockwire MS9226-02 0.025 in. dia (81349)	FT
43	AVUM	9505-00-293-4208	Lockwire MS9226-04 0.032 in. dia (81349)	FT
44	AVUM	9150-00-273-2388	Lubricating Oil (Grade 1010) MIL-L-6081 (81349)	QT
45	AVUM	9150-01-007-9134	Lubricating Oil MIL-L-6082 (81349)	QT
46	AVUM	9150-00-782-2627	Lubricating Oil MIL-L-7808 (81349)	QT
47	AVUM	9150-00-180-6266	Lubricating Oil MIL-L-23699 (81349)	CN
48	AVUM	9150-00-993-6618	Lubriplate (73219) (or equivalent) (130A)	QT
49	AVUM		Magnesium Alloy AMS4350	
50	AVUM		Magnus 61C (37733) (or equivalent)	
51	AVUM		Magnus 751 (37733) (or equivalent)	
52	AVUM	7510-00-106-8029	Marking Ink (Black) Stamp Pad (No. KX425) (87049) (or equivalent)	CN
53	AVUM	7520-00-973-1062	Marking Ink Pencil (Red) (Marks-A-Lot) (03042) (or equivalent)	EA
54	AVUM	7510-00-465-0994	Marking Pencil (Yellow) Colorbrite No. 2107 (73685) (or equivalent)	EA
55	AVUM	6810-00-275-6010	Methanol (Grade A or B) O-M-232	GL
56	AVUM	6810-00-281-2785	Methyl-Ethyl-Ketone TT-M-261	GL
57	AVUM	6810-00-264-6715	Molybdenum Disulfide MIL-M-7866	LB
58	AVUM	9150-00-543-7220	Molykote Antiseize Thread Compound (94499) (or equivalent) MIL-T-83483 (81349)	LB

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
59	AVUM	6810-00-237-2918	Nitric Acid O-N-350 (81348)	PT
59a	AVUM	6810-00-264-6717	Chromium Trioxide O-C-303	LB
60	AVUM	5550-00-184-6258	Novahone 325 (62755) (or equivalent)	LB
61	AVUM	6850-00-935-5853	Oakite Rust Stripper (44389) (or equivalent)	LB
62	AVUM	8010-00-985-2963	Mite Stripper S-A (44389) (or equivalent)	LB
63	AVUM		Oakite VisStrip Paste (44389) (or equivalent)	
64	AVUM	9150-00-261-7899	Penetrating Oil A-A-50493 (81348)	PT
65	AVUM	6810-00-819-1128	Perchloroethylene O-T-236 (81348)	GL
66	AVUM	9150-00-250-0926	Petrolatum W-P-236 (81348)	LB
67	AVUM		Deleted	
68	AVUM	9150-00-269-8255	Pneumatic System Grease MIL-G-4343 (81349)	LB
69	AVUM	8010-00-243-9265	Red Lead D-83 (32018)	LB
70	AVUM	8030-00-938-1949	Corrosion Preventive Compound MIL-C-81309	OZ
71	AVUM	5350-00-224-7203	Sandpaper (No. 320) P-P-101 (81349)	EA
72	AVUM	8030-00-081-2338	Sealing and Retaining Compound (Loctite, Grade A, Red) MIL-S-22473 (81349)	CC
73	AVUM	5990-00-439-8940	Sealing and Retainer Compound (Loctite, Grade A, Red) MIL-S-22473 (81349)	EA
74	AVUM	8945-00-949-5169	Shortening Compound EE-S-321(81348)	QT
75	AVUM	5330-00-971-7779	Silastic 589 RTV (71984) (or equivalent)	CN
76	AVUM	6810-00-143-2000	Sodium Dichromate O-S-595 (81348)	LB
77	AVUM	6810-00-270-8177	Sodium Hydroxide O-S-598 (81348)	OZ
78	AVUM	7590-00-439-9960	Pneumatic system identification MS87033K1 (96906)	YD

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
79	AVUM	7510-00-079-7907	Tape (Type 1) PPP-T-60 (81348)	YD
80	AVUM	6810-00-281-2002	Toluene (Toluol) TT-T-548 (or equivalent) (81348)	GL
81	AMUM	8105-00-027-8485	Transparent Bag MIL-B-22020 (81349)	EA
82	AVUM	6810-00-184-4800	Trichloroethylene O-T-634 (81348)	GL
83	AVUM	6510-00-930-6311	Trichloroethylene ASTM D4126 (81346)	GL
84	AVUM	6810-00-184-4800	Trichloroethylene (Type II) O-T-634 (81348)	GL
85			Deleted	
86			Deleted	
87			Deleted	
88			Deleted	
89	AVUM	6850-01-252-6407	Water Soluble Cleaner (Penair M5704) (56883)	GL
90	AVUM	3439-00-004-4547	Welding Wire AWS A5.9-77ER347.0.035 (31505)	LB
91	AVUM		Welding Wire AMS5694	
92	AVUM		Welding Wire AMS5774	
93	AVUM	3439-00-166-9584	Alloy Wire AMS5786 (81343)	LB
94	AVUM	7510-00-224-6732	Clear Print No. 9 (White Opaque) AA4208A Type I (58536)	OZ
95	AVUM		Zinc-Chromate Primer AMS3110	
96	AVUM	8040-01-290-4508	Zinc-Chromate Primer MIL-P-8585 (81349)	GL
97	AVUM	6850-00-142-9582	Corrosion Preventive Concentrate (Brayco 599) (98308) (or equivalent)	GL
98	AVUM	5350-00-246-0330	Aluminum Oxide (180-320 Grit) (10646) (or equivalent)	EA

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
99	AVUM	8030-00-105-0270	{ever-Seize Anti-Seize Compound (15145)	P T
100	AVUM	9150-00-269-8246	Damping Fluid (Silicone) VV-D-1078 (81348)	QT
101	AVUM	9150-00-159-5012	Ultrachem Assembly Fluid #1 (56385)	OZ
102	AVUM	8030-00-251-3980	Anti-Seize, 76764 (05972)	LB
103	AVUM	8030-00-243-3285	Nickel-Ease MIL-T-83483	OZ
104	AVUM	8125-00-075-5310	Bottle Dropper 4-090-53-001(00742)	EA
105	AVUM	6850-01-372-8308	Type II (MIL-C-85704)	5 GL
106	AVUM	6850-01-372-8304	Type II (MIL-C-85704)	55 GL
107	AVUM	6850-01-370-5245	Type IIA (MIL-C-85704)	5GL
108	AVUM	6850-01-370-5244	Type IIA (MIL-C-85704)	55 GL

APPENDIX E

SCHEMATIC DIAGRAMS

(NOT APPLICABLE)

APPENDIX F

ILLUSTRATED LIST OF MANUFACTURED ITEMS

OVERVIEW

This appendix includes complete instructions, including bills of material, for field manufacture of all items listed in the TM 55-2840-229-23P, Aviation Unit and Intermediate Maintenance (AVUM), Repair Parts and Special Tools Lists, bearing MF and MH Source Code.

The part number index lists all items in part number order with a cross-reference to the figure in which the item appears. All material necessary for manufacture of an item are listed, by National stock number, in the bill of material for the item.

PART NUMBER INDEX

Part Number	Figure Number
2-300-123-01	F-1
5220EG000-3	F-2
1560-EG-151-1	F-3
GE0X100	F-4
TMRX-10	F-5
4-200B	F-6

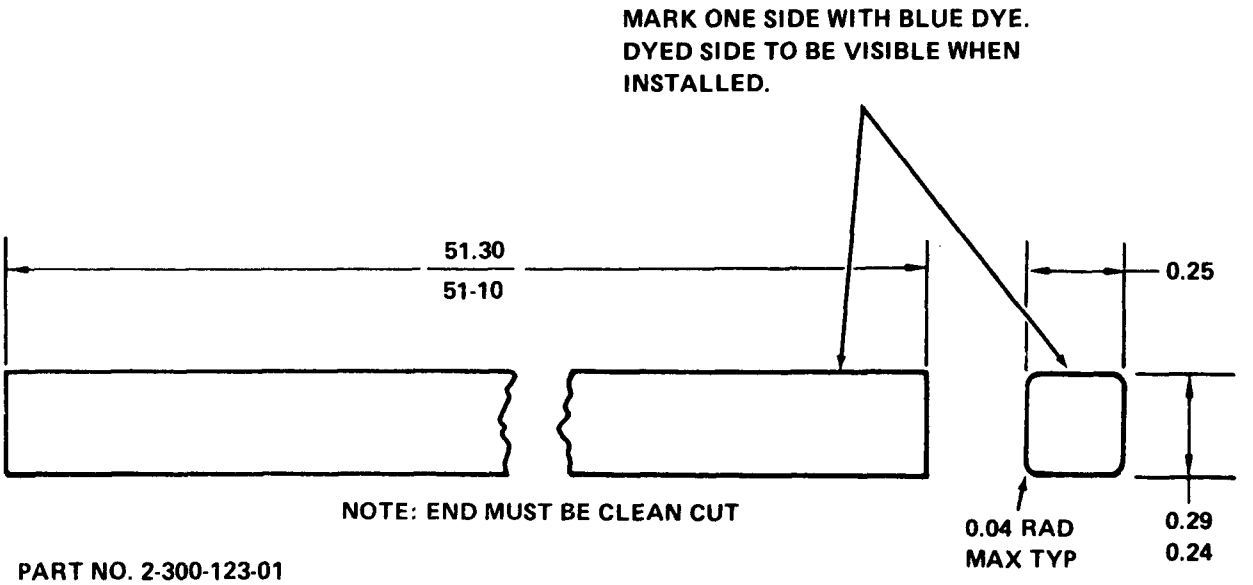
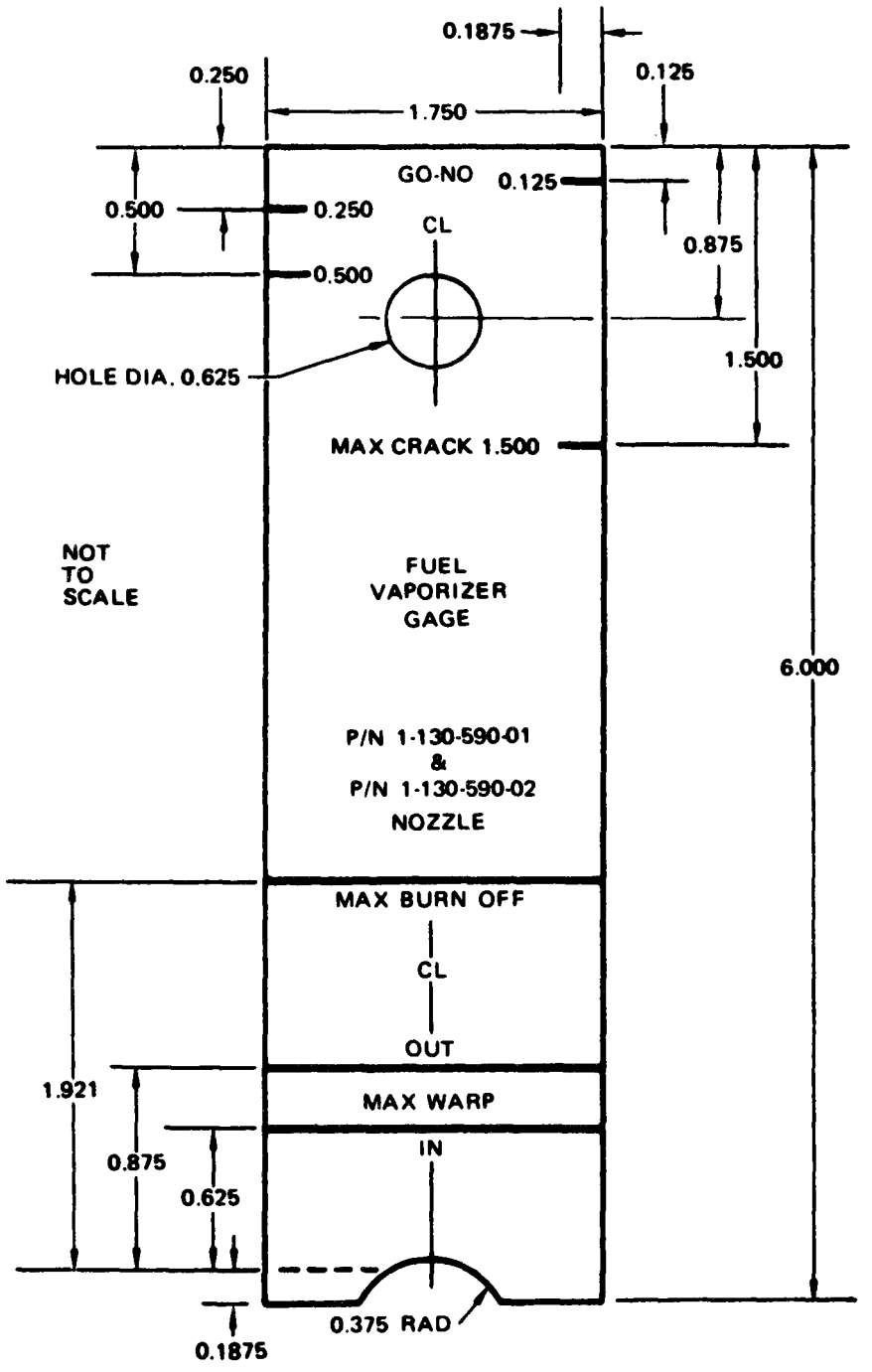


Figure F-1. Packing, Material



PART NO. 5220EG000-3
GAGE FUEL, VAPORIZER
FABRICATE FROM NSN 9535-00-249-5809

Figure F-2. Gage, Fuel Vaporizer

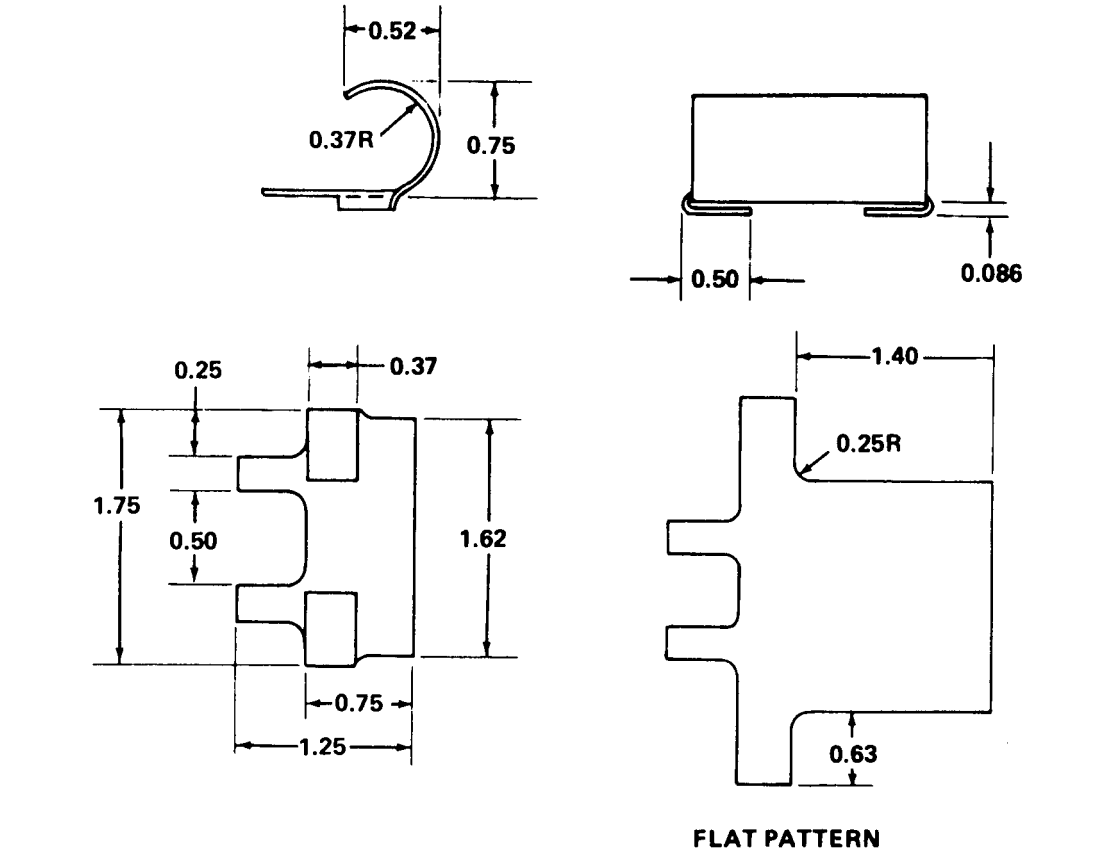


Figure F-3. Support Clip

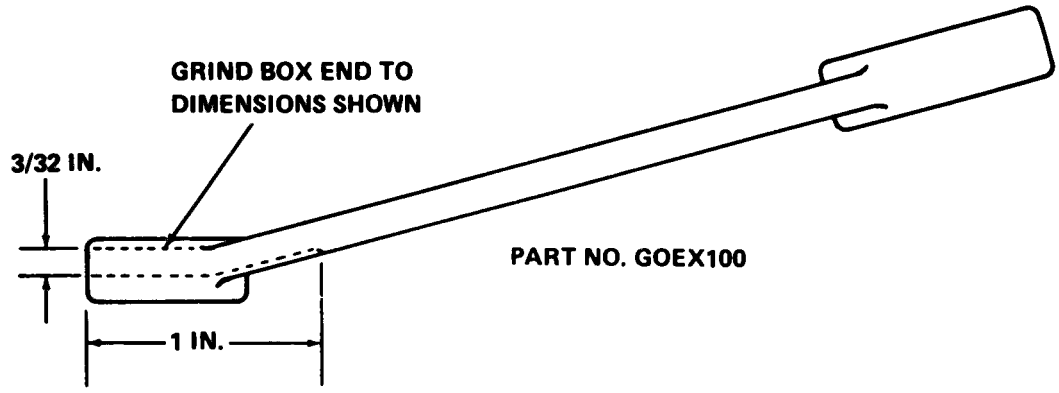


Figure F-4. Modification of Short-Handle Flank-Drive 5/16-inch Combination Wrench

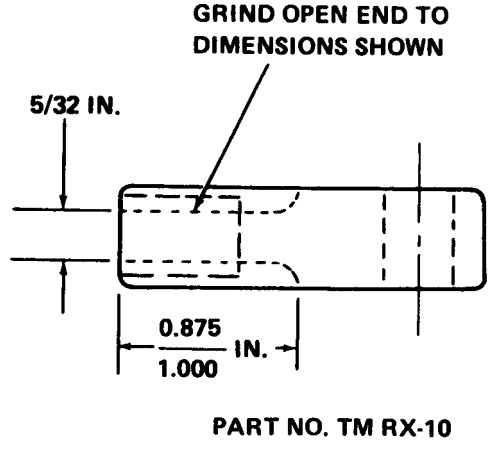
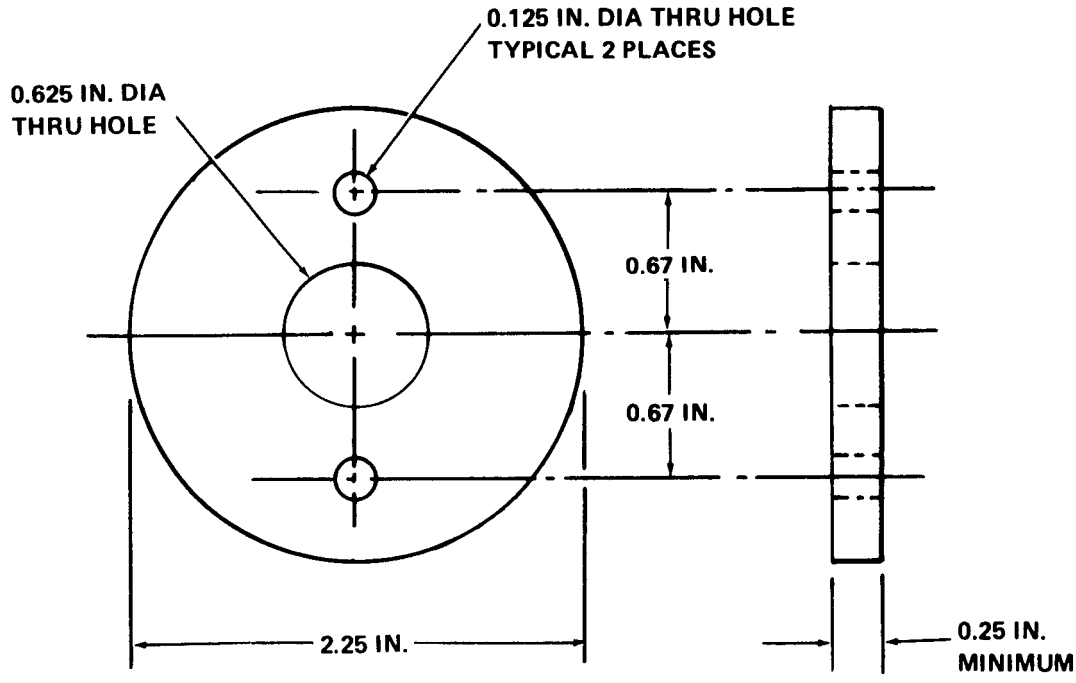


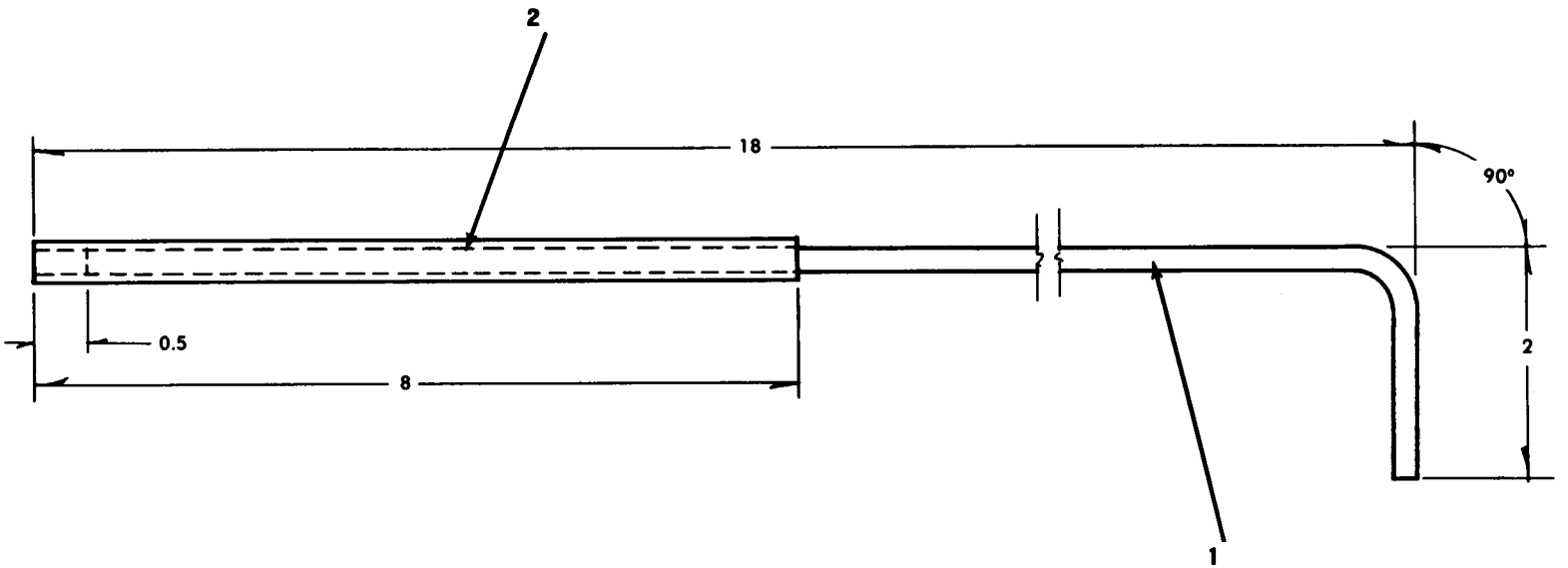
Figure F-5. Modification of 5/16-inch Crowfoot - Flare Nut Wrench



NOTE:

1. FABRICATE FIXTURE FROM ANY COMMON FLAT STEEL STOCK.
2. MOUNT LINER SUPPORT TO HOLDING FIXTURE, USING # 4x1/2 IN. STEEL SCREWS (PART NO. MS35266-17), # 4 STEEL WASHERS (PART NO. AN960-4L), AND #4 NUTS (PART NO. MS1042-04) OR SUITABLE EQUIVALENTS.

Figure F-6. Liner Support Holding Fixture



NOTES:

1. DRAIN TUBE EXTENSION BEYOND END OF TUBING NECESSARY FOR COMPRESSOR BLADE PROTECTION

Figure F-7. Engine Compressor Tubing Tool

APPENDIX G

TORQUE AND DIMENSIONAL LIMITS, OVERHAUL AND RETIREMENT SCHEDULE

OVERVIEW

This appendix contains torque limits, dimensional limits, and overhaul and retirement schedule needed to maintain the engine. Paragraphs G-1 thru G-6 are instructions for the use of torque wrenches. Standard torque values, special torque values and equivalent reference figures are found in tables G-2 thru G-4.

Dimensional limits (tables G-5 and G-6) are applicable when determining the relation between two engine components and/or assemblies as referred to in chapters of this manual. Paragraphs G-7 thru G-9 contain instructions on how to use dimensional limits.

Overhaul and inspection intervals are given in table G-7.

G-1 . TORQUE WRENCH CALIBRATION. Torque wrenches must be calibrated frequently by using weights and a measured lever arm. Inaccurate readings may occur because of abuse or constant use. Do not check one wrench against another.

G-2. RECOMMENDED TORQUE WRENCH SIZES. Table G-1 lists the recommended torque wrench sizes.

Table G-1. Recommended Torque Wrench Sizes

Required Torque	Torque Wrench
0 to 25 pound-inches (0.0 to 0.3 kg/m)	30 pound-inches (0.3 kg/m)
25 to 140 pound-inches (0.3 to 1.6 kg/m)	150 pound-inches (1.7 kg/m)
140 to 550 pound-inches (1.6 to 6.3 kg/m)	600 pound-inches (6.9 kg/m)
30 to 140 pound-feet (4.1 to 19.4 kg/m)	150 pound-feet (20.7 kg/m)
140 to 240 pound-feet (19.4 to 33.2 kg/m)	250 pound-feet (34.6 kg/m)
240 to 1000 pound-feet (33.2 to 138.2 kg/m)	1000 pound-feet (138.2 kg/m)

G-3. TORQUE WRENCH EXTENSIONS AND ADAPTERS. Extensions or adapters maybe used with any torque wrench. Because extensions or adapters change the length of the torque arm for which the scale is calibrated, torque applied at the end of the extension or adapter is not correctly indicated on the

scale and must be calculated. When using extensions or adapters, apply the manual torque at the calculated arm length at the center of the handle. When substituting values in formulas, use inch units to obtain an answer in pound-inches, and foot units to obtain an answer in pound-feet. The centerline of the wrench and the wrench extension or adapter shall aline as shown in figure G-1. To determine the indicated torque, using extensions or adapters, use the formula shown in figure G-1.

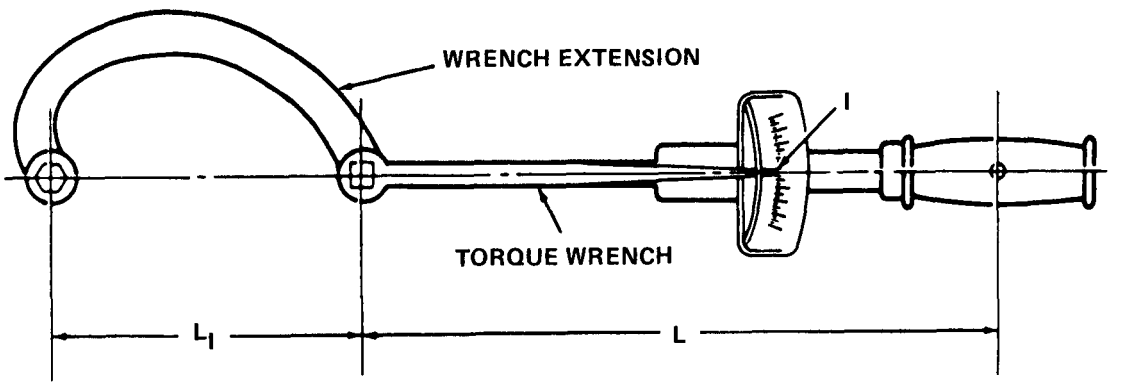
G-4. PROCEDURE FOR APPLYING TORQUE. Clean parts to be tightened in drycleaning solvent (item 24, Appendix D). Unless instructed otherwise, do not lubricate parts. Torque should be applied slowly and evenly until the specified torque value is reached and then held at this value until the nut, bolt, or screw has stopped turning.

G-5. STANDARD TORQUE VALUES. Standard torque values for general application are listed in table G-2. Standard torque values for stepped and straight studs are shown in figure G-2.

NOTE

When no special torque values are given in an assembly and/or installation procedure, standard torque values shall apply. All torque values are in pound-inches. Threads shall be clean and undamaged. Unless instructed otherwise, do not lubricate parts.

G-6. SPECIAL TORQUE VALUES. Special torque values, under or over standard torque values are listed in tables G-3 and G-4. Special torque value locations are shown in figures G-3 and G-4.



$$I = \frac{RL}{L + L_I}$$

I = INDICATED TORQUE ON WRENCH

R = REQUIRED TORQUE OF BOLT OR NUT

L = LENGTH OF TORQUE WRENCH (WRENCH HEAD TO MIDPOINT OF HANDLE) IN INCHES

L_I = LENGTH OF EXTENSION OR ADAPTER (CENTER TO CENTER DISTANCE) IN INCHES.

Figure G-1. Application of Torque Wrench Extension Formula

Table G-2. Standard Torque Values

STANDARD STEEL SCREWS, BOLTS, AND NUTS (POUND-INCHES)*		
Thread Size	Slotted-Head Screws	Hexagon-Head Bolts and Nuts
2-56	2 to 3 (0.02 to 0.03 kg/m)	
3-48	3 to 4 (0.03 to 0.05 kg/m)	-
4-40	5 to 6 (0.05 to 0.07 kg/m)	-
5-40	6 to 7 (0.07 to 0.08 kg/m)	-
6-32	7 to 9 (0.08 to 0.1 kg/m)	-
8-32	10 to 12 (0.12 to 0.14 kg/m)	-
10-32	18 to 20 (0.21 to 0.23 kg/m)	40 to 45 (0.46 to 0.52 kg/m)
** 10-32		20 to 25 (0.23 to 0.29 kg/m)
7/32-24	22 to 25 (0.25 to 0.29 kg/m)	65 to 70 (0.7 to 0.8 kg/m)
1/4-28	30 to 35 (0.3 to 0.4 kg/m)	70 to 95 (0.8 to 1.1 kg/m)
* * 1/4-28		35 to 50 (0.4 to 0.58 kg/m)
5/16-24	40 to 45 (0.46 to 0.52 kg/m)	120 to 165 (1.4 to 1.9 kg/m)
3/8-24	55 to 60 (0.63 to 0.69 kg/m)	250 to 325 (2.9 to 3.7 kg/m)
7/16-20	80 to 90 (0.9 to 1.0 kg/m)	400 to 475 (4.6 to 5.5 kg/m)
1/2-20 or -13	loo to 110 (1.2 to 1.3 kg/m)	500 to 700 (5.8 to 8.1 kg/m)
9/16-18		750 to 1000 (8.6 to 11.5 kg/m)
5/8-18		1000 to 1400 (1 1.5 to 16.1 kg/m)

*Metric equivalent appears in parentheses ( ).
*Toque for installation of bolts into magnesium base metal only.

Table G-2. Standard Torque Values - Continued

STEEL TAPER PIPE-THREAD FITTINGS AND PLUGS (POUND-INCHES)*

Thread Size	In Steel Case	In Magnesium or Aluminum Case
1/16-27	35 to 40 (0.4 to 0.5 kg/m)	10 to 15 (0.1 to 0.2 kg/m)
1/8-27	75 to 125 (0.9 to 1.4 kg/m)	30 to 40 (0.3 to 0.5 kg/m)
1/4-18	200 to 250 (2.3 to 2.9 kg/m)	70 to 85 (0.8 to 1.0 kg/m)
3/8-18	300 to 375 (3.5 to 4.3 kg/m)	95 to 110 (1.1 to 1.3 kg/m)
1/2-14	400 to 500 (4.6 to 5.8 kg/m)	140 to 160 (1.6 to 1.8 kg/m)
3/4-14	500 to 600 (5.8 to 6.9 kg/m)	175 to 200 (2.0 to 2.3 kg/m)
1-11-1/2	600 to 700 (6.9 to 8.1 kg/m)	230 to 260 (2.6 to 3.0 kg/m)

TUBE AND HOSE END FITTINGS ('B' NUTS)

Dash No. Ref	Tubing OD Inches	Flared Tubing Nuts				Hose End Fittings	
		Aluminum-Alloy Tubing		Steel Tubing		Steel	
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
-3	3/16	-	-	(1.0 kg/m)	100 1.2 kg/m)	70 (0.8 kg/m)	100 (1.2 kg/m)
-4	1/4	40 (0.5kg/m)	(0.7 kg/m)	135 (1.6 kg/m)	150 (1.7 kg/m)	70 (0.8 kg/m)	120 (1.4 kg/m)
-5	5/16	60 (0.7 kg/m)	80 (0.9 kg/m)	180 (2.1 kg/m)	200 (2.3 kg/m)	85 (1.0 kg/m)	180 (2.1 kg/m)
-6	3/8	75 (0.9 kg/m)	125 (1.4 kg/m)	270 (3.1 kg/m)	300 (3.5 kg/m)	100 (1.2 kg/m)	250 (2.9 kg/m)
-8	1/2	150 (1.7 kg/m)	250 (2.9 kg/m)	450 (5.2 kg/m)	500 (5.8 kg/m)	210 (2.4 kg/m)	420 (4.8 kg/m)
-10	5/8	200 (2.3 kg/m)	350 (4.0 kg/m)	650 (7.5 kg/m)	700 (8.1 kg/m)	300 (3.5 kg/m)	480 (5.5 kg/m)

* Metric equivalent appears in parentheses ( ).

Table G-2. Standard Torque Values - Continued

TUBE AND HOSE END FITTINGS ('B' NUTS) - Continued

Dash No. Ref	Tubing OD Inches	Flared Tubing Nuts				Hose End Fittings	
		Aluminum-Alloy Tubing		Steel Tubing		Steel	
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
-12	3/4	300 (3.5 kg/m)	500 (5.8 kg/m)	900 (10.4 kg/m	1000 (11.5 kg/m)	500 (5.8 kg/m)	850 (9.8 kg/m)
-16	1	500 (5.8 kg/m)	700 (8.1 kg/m)	1200 (13.8 kg/m	1400 (16.1 kg/m)	700 (8.1 kg/m)	1150 (13.2 kg/m)
-20	1-1/4	600 (6.9 kg/m)	900 (10.4 kg/m)	-	-	-	-
-24	1-1/2	600 (6.9 kg/m)	900 (10.4 kg/m)				

JAMNUTS FOR BULKHEAD FITTINGS (POUND-INCHES)*

Tubing Outside Diameter	Thread Size	Torque
1/8	5/16-24	35 to 50 (0.4 to 0.6 kg/m)
3/16	3/8-24	65 to 80 (0.7 to 0.9 kg/m)
1/4	7/16-20	85 to 105 (1.0 to 1.2 kg/m)
5/16	1/2-20	105 to 125 (1.2 to 1.4 kg/m)
3/8	9/16-18	120 to 150 (1.4 to 1.7 kg/m)
1/2	3/4-16	240 to 280 (2.8 to 3.2 kg/m)
5/8	7/8-14	320 to 380 (3.7 to 4.4 kg/m)
3/4	1-1/16-12	500 to 600 (5.8 to 6.9 kg/m)
1	1-5/16-12	780 to 880 (9.0 to 10.1 kg/m)
1-1/8	1-5/8-12	960 to 1200 (11.1 to 13.8 kg/m)
1-1/2	1-7/8-12	1200 to 1440 (13.8 to 16.1 kg/m)

*Metric equivalent appears in parentheses ( ).

Table G-2. Standard Torque Values - Continued

JAMNUTS, BOLTS, AND FITTINGS USED WITH GASKETS (POUND-INCHES)*

Tubing Outside Diameter	Thread Size	Nuts (MS9099, MS9100, MS9200, MS9201) Plug (MS9015) Union (AN815) Bolt - Universal (BANJO) Fitting (AN774 and AN775)
1/8	5/16-24	45 to 50 (0.5 to 0.6 kg/m)
3/16	3/8-24	60 to 70 (0.7 to 0.8 kg/m)
1/4	7/16-20	90 to 100 (1.0 to 1.2 kg/m)
5/16	1/2-20	120 to 130 (1.4 to 1.5 kg/m)
3/8	9/16-18	150 to 160 (1.7 to 1.8 kg/m)
1/2	3/4-16	275 to 300 (3.2 to 3.5 kg/m)
5/8	7/8-14	375 to 400 (4.3 to 4.6 kg/m)
3/4	1-1/16-12	550 to 600 (6.3 to 6.9 kg/m)
1	1-5/16-12	800 to 900 (9.2 to 10.4 kg/m)
1-1/8	1-5/8-12	900 to 1000 (10.4 to 11.5 kg/m)
1-1/2	1-7/8-12	900 to 1000 (10.4 to 11.5 kg/m)

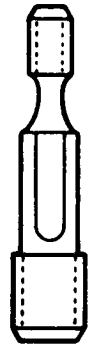
*Metric equivalent appears in parentheses ( ).

TYPES X AND Y ARE DRIVEN FROM NUT END. TYPE Z IS DRIVEN FROM FLAT ON STUD.

STUDS

TYPE X

TYPE Y



TYPE Z

STEPPED STUD TORQUE VALUES (POUND-INCHES)*				
Thread Size				
Nut End	Stud End	Type X	Type Y	Type Z
10-32	1/4-20	20 to 50 (0.2 to 0.6 kg/m)	-	-
1/4-28	5/16-18	50 to 110 (0.6 to 1.3 kg/m)	50 to 75 (0.6 to 0.9 kg/m)	50 to 165 (0.6 to 1.9 kg/m)
5/16-24	3/8-16	100 to 240 (1.2 to 2.8 kg/m)	100 to 160 (1.2 to 1.8 kg/m)	100 to 350 (1.2 to 4.0 kg/m)
3/8-24	7/16-14	175 to 475 (2.0 to 5.5 kg/m)	175 to 325 (2.0 to 3.7 kg/m)	175 to 600 (2.0 to 6.9 kg/m)
7/16-20	1/2-13	250 to 725 (2.9 to 8.4 kg/m)	250 to 525 (2.9 to 6.0 kg/m)	250 to 1000 (2.9 to 11.5 kg/m)
1/2-20	9/16-12	400 to 1150 (4.6 to 13.2 kg/m)	400 to 850 (4.6 to 9.8 kg/m)	400 to 1500 (4.6 to 19.6 kg/m)
9/16-18	5/8-11	600 to 1650 (6.9 to 19.0 kg/m)	600 to 1150 (6.9 to 13.2 kg/m)	600 to 2100 (6.9 to 24.2 kg/m)
5/8-18	11/16-11	900 to 2400 (10.4 to 27.6 kg/m)	900 to 1700 (10.4 to 19.6 kg/m)	900 to 3100 (10.4 to 35.7 kg/m)

Figure G-2. Stepped and Straight Stud Torque Values (Sheet 1 of 2)

STRAIGHT STUD TORQUE VALUES (POUND-INCHES)*

Thread Size				
Nut End	Stud End	Type X	Type Y	Type Z
4-48	4-40	3 to 7	-	-
6-40	6-32	8 to 14 (0,09 to 0.16 kg/m)	-	-
8-36	8-32	18 to 25 (0.2 to 0.3 kg/m)	-	-
10-32	10-24	25 to 35 (0.3 to 0.4 kg/m)	-	-
1/4-32	1/4-20	50 to 95 (0.6 to 1.1 kg/m)	50 to 95 (0.6 to 1.1 kg/m)	50 to 105 (0.6 to 1.21 kg/m)
5/16-24	5/16-18	100 to 225 (1.2 to 2.6 kg/m)	100 to 225 (1.2 to 2.6 kg/m)	100 to 250 (1.2 to 2.9 kg/m)
3/8-24	5/8-16	175 to 375 (2.0 to 4.3 kg/m)	175 to 375 (2.0 to 4.3 kg/m)	175 to 400 (2.0 to 4.6 kg/m)
7/16-20	7/16-14	250 to 650 (2.9 to 7.5 kg/m)	250 to 400 (2.9 to 4.6 kg/m)	250 to 700 (2.9 to 8.1 kg/m)
1/2-20	1/2-13	400 to 1000 (4.6 to 11.5 kg/m)	400 to 700 (4.6 to 8.1 kg/m)	400 to 1100 (4.6 to 12.7 kg/m)
9/16-18	9/16-12	600 to 1450 (6.9 to 16.7 kg/m)	500 to 1050 (5.8 to 12.1 kg/m	600 to 1600 (6.9 to 18.4 kg/m)
5/8-18	5/8-11	900 to 2000 (10.4 to 23.0 kg/m)	700 to 1400 (8.1 to 16.1 kg/m	900 to 2200 (10.4 to 25.3 kg/m)

*Metric equivalent appears in parentheses ( ).

Figure G-2. Stepped and Straight Stud Torque Values (Sheet 2 of 2)

Table G-3. Special Torque Values (T53-L-11 Series Engines)

NOTE

Measurements are given in pound-inches unless otherwise specified. Metric equivalent appears in parentheses.

Ref. No.	Fig. No.	Description	Minimum (Pound-Inches)	Maximum (Pound-Inches)
1	G-3	Planetary Gear Assembly Forward Roller Bearing Retaining Nut	975 (1 1.2 kg/m)	1000 (11.5 kg/m)
2	G-3	Planetary Gear Assembly Spur Gear Retaining Nut	775 (8.9 kg/m)	800 (9.2 kg/m)
3	G-3	Torquemeter Valve Assembly Into Torquemeter Cylinder	150 (1.7 kg/m)	200 (2.3 kg/m)
4	G-3	Overspeed, Governor and Tachometer Drive Support and Gear Assembly Gearshaft, Bearing Support Assembly and Gear Retaining Nut	1175 (13.5 kg/m)	1250 (14.4 kg/m)
5	G-3	Rear Carrier Retaining Bolts	120 (1.38 kg/m)	125 (1.44 kg/m)
6	G-3	Output Reduction Carrier and Gear Assembly to Inlet Housing Assembly Retaining Nuts	70 (0.8 kg/m)	(0.9 kg/m)
7	G-3	Front Torquemeter Plate, Front Carrier and Rear Torquemeter Plate Attaching Nuts	70 (0.8 kg/m)	75 (0.86 kg/m)
8	G-3	Power Shaft Plug	600 (6.9 kg/m)	720 (8.3 kg/m)
9	G-3	Spanner Nut - Housing to Carrier Gear Assembly	200 (pound-feet)	225 (pound-feet)
10	G-3	Planetary Gear Assembly Bearing Retainer Nut	975 (1 1.2 kg/m)	1000 (1 1.5 kg/m)
11	G-3	Accessory Drive Gearbox Assembly to Inlet Housing Assembly Attaching Bolts	100 (1.2 kg/m)	120 (1.4 kg/m)
12	G-3	Accessory Gearbox Cover Assembly Retaining Nut	420 (4.8 kg/m)	520 (6.0 kg/m)
13	G-3	Pinion Gearshaft and Bearing Assembly Bearing, Bushing, and Liner Retaining Nut	300 (3.5 kg/m)	360 (4.1 kg/m)

Table G-3. Special Torque Values (T53-L-11 Series Engines) - Continued

Ref No.	Fig. No.	Description	Minimum (Pound-Inches)	Maximum (Pound-Inches)
14	G-3	Sun Gearshaft Retaining Bolt	600 (6.9 kg/m)	720 (8.3 kg/m)
15	G-3	Rear Carrier Retaining Bolts	155 (1.8 kg/m)	165 (1.9 kg/m)
16	G-3	Output Reduction Carrier and Gear Assembly Retaining Nut,	70 (0.8 kg/m)	80 (0.9 kg/m)
17	G-3	Compressor Vane Assembly to Compressor Housing Assembly Half	Tighten center bolts to 44 to 46 pound-inches (0.51 to 0.53 kg/m) torque. Tighten outer bolts to 14 to 16 pound-inches (0.16 to 0.18 kg/m) torque.	
18	G-3	Exit Guide Vane to Compressor Housing Half Attaching Bolts	Tighten center bolts to 44 to 46 pound-inches (0.51 to 0.53 kg/m) torque. Tighten outer bolts to 14 to 16 pound-inches (0.16 to 0.18 kg/m) torque, Tighten screws to 30 to 40 pound-inches (0.3 to 0.5 kg/m). Lockwire bolts.	
19	G-3	Air Deflector, First Stage Turbine Nozzle and Flange Assembly, Shim, and Combustion Chamber Deflector to Compressor Rear Bearing Housing Assembly Attaching Bolts	70 (0.8 kg/m)	75 (0.9 kg/m)
20	G-3	First Stage Turbine Rotor Retaining Spanner Nut	320 (pound-feet)	350 (pound-feet)
21	G-3	V-Band Coupling Retaining Nut	Tighten nuts to 200 to 225 pound-inches (2.3 to 2.6 kg/m) torque. Seat V-Band by tapping, starting from the middle and working toward the bolt heads. Release torque, retighten to 145 to 155 pound inches (1.7 to 1.8 kg/m) torque.	
22	G-3	Power Turbine Oil Strainer Housing to Adapter	Tighten oil strainer housing fingertight. Place one wrench on oil strainer housing and one wrench on adapter. Tighten oil strainer housing to 80 to 90 pound-inches (0.9 to 1.0 kg/m) torque and lockwire.	

Table G-3. Special Torque Values (T53-L-11 Series Engines) - Continued

Ref. No.	Fig. No.	Description	Minimum (Pound-Inches)	Maximum (Pound-Inches)
23	G-3	Adapter into Power Turbine Tube	(0.6 kg/m)	(0.7 kg/m)
24	G-3	Exhaust Diffuser Assembly 'to Second Stage Turbine Rotor Assembly Attaching Screws	(0.2 kg/m)	(0.3 kg/m)
25	G-3	Bearing Retainer Spanner Nut	225 (pound-feet)	250 (pound-feet)
26	G-3	Power Shaft Bolt Internal Wrenching Nut	Apply Ease-Off 990 (item 26), Appendix D or Molykote anti-seize thread compound (item 58, Appendix D) to threads of nut. Tighten nut to 100 pound-feet (13.8 kg/m) torque. Loosen and remove nut. Retighten power shaft bolt to 195 to 200 pound-inches (2.2 to 2.3 kg/m) torque. Install nut and tighten to 50 pound-feet (6.9 kg/m) torque.	
27	G-3	Power Turbine Rear Bearing Cover Bolts	70 (0.8 kg/m)	75 (0.9 kg/m)
28	G-3	Power Turbine Tube into Second Stage Turbine Support Assembly	100 (1.2 kg/m)	110 (1.3 kg/m)
29	G-3	Power Turbine Oil Tube Connector into Power Turbine Tube	80 (0.9 kg/m)	90 (1.0 kg/m)
30	G-3	Cooling Air Deflector and Seal and Housing Assembly to Bearing Housing Attaching Bolts	70 (0.86 kg/m	75 (0.86 kg/m)
31	G-3	Fuel Vaporizer Adapter Nuts	Tighten nuts to 170 to 180 pound-inches (2.0 to 2.1 kg/m) torque. Lockwire nuts in pairs at four locations. Lockwire remaining three nuts as a group.	
32	G-3	Combustion Chamber Liner Assembly to Combustion Chamber Housing Attaching Nuts	Tighten nuts to 35 to 40 pound-inches (0.4 to 0.46 kg/m) torque in sequence on eight nuts that do not have washers first. Then tighten the nuts on the three remaining studs to 35 to 40 pound-inches (0.4 to 0.46 kg/m) torque.	

Table G-3. Special Torque Values (T53-L-11 Series Engines) - Continued

Ref No.	Fig. No.	Description	Minimum (Pound-Inches)	Maximum (Pound-Inches)
33	G-3	Second Stage Turbine Support Assembly to Combustion Chamber Assembly Attaching Bolts	Apply Ease-Off 990 (item 26, Appendix D) or Molykote antiseize thread compound (item 58, Appendix D) to threads of bolt. Tighten bolts to 70 to 75 pound-inches (0.8 to 0.9 kg/m) torque.	
34	G-3	Power Shaft Bolt into Power Shaft	Apply Ease-Off (item 26, Appendix D) or Molykote antiseize thread compound (item 58, Appendix D) to threads of bolt. Tighten bolt to 195 to 200 pound-inches (2.2 to 2.3 kg/m) torque.	
35	G-3	Filter Assembly Overspeed Governor	77 (0.89 kg/m)	96 (1.1 kg/m)
36	G-3	Filter Assembly Retaining Plug (Overspeed Governor and Tachometer Drive Assembly)	70 (0.8 kg/m)	85 (1.0 kg/m)
37	G-3	Exhaust Thermocouple Assembly to Exhaust Diffuser Attaching Nuts	35 (0.4 kg/m)	45 (0.5 kg/m
38	G-3	Main Fuel Manifold Plug	140 (1.6 kg/m)	160 (1.8 kg/m)
39	G-3	Manifold Fuel Filter	140 (1.6 kg/m)	160 (1.8 kg/m)
40	G-3	Bypass Fuel Filter Plug	100 (1.2 kg/m)	125 (1.4 kg/m)
41	G-3	Fuel Control Trimmer Lock Bolt	26 (0.3 kg/m)	30 (0.35 kg/m)
42	G-3	Power-Driven Rotary (Oil) Pump Oil Pressure Adjustment Screw Locknut	96 (1.1 kg/m)	120 (1.4 kg/m)
43	G-3	Fuel Control Temperature-Sensing Element Housing to Inlet Housing Assembly Attaching Bolts	18 (0.21 k/gm)	22 (0.25 kg/m)
44	G-3	Torquemeter Relief Valve Assembly into Housing and Liner Assembly	80 (0.9 kg/m)	100 (1.2 kg/m)

Table G-3. Special Torque Values (T53-L-11 Series Engines) - Cont.

Ref. No.	Fig. No.	Description	Minimum (Pound-Inches)	Maximum (Pound-Inches)
45	G-3	Overspeed Governor and Tachometer Drive Assembly Torquemeter Oil Pressure Adjustment Screw Locknut	70 (0.8 kg/m)	80 (0.9 kg/m)
46	G-3	Inlet Strainer, Retainer, Spring, and Inlet Fitting into Fuel Control Attaching Screws	30 (0.3 kg/m)	35 (0.4 kg/m)
47	G-3	Fuel Control Manual Control Cover Retaining Screw	12 (0.14 kg/m)	20 (0.23 kg/m)
48	G-3	Fuel Control Acceleration Bleed Band Adjustment Screw Locknut	30 (0.3 kg/m)	40 (0.5 kg/m)
49	G-3	Fuel Control Acceleration Bleed Band Adjustment Screw Lockscrew	20 (0.2 kg/m)	30 (0.3 kg/m)
50	G-3	Filter Housing, Servo Supply Filter Element, an Cover and pump Discharge Strainer into Fuel Control Attaching Screws	50 (0.6 kg/m)	70 (0.8 kg/m)
51	G-3	Fuel Control N1 Drive Seal Retaining Screws	20 (0.2 kg/m)	30 (0.3 kg/m)
52	G-3	Lube Oil Filter Assembly Cover Assembly to Filter Housing Attaching	20 (0.2 kg/m)	35 (0.4 kg/m)
53	G-3	Sediment Strainer Plug	115 (1.3 kg/m)	125 (1.4 kg/m)
54	G-3	Oil Pressure Hose Assembly to Oil Strainer Housing and Oil Pressure Manifold Assembly	50 (0.6 kg/m)	75 (0.9 kg/m)
55	G-3	Nuts Securing Bolts Through Hollow Dowels in Compressor and impeller Housing Halves	70 (0.8 kg/m)	95 (1.1 kg/m)
56	G-3	Power Takeoff Oil Supply Nozzle Assembly Setscrew	30 (0.3 kg/m)	50 (0.6 kg/m)
57	G-3	Power Takeoff Oil Supply Nozzle Assembly Setscrew	30 (0.3 kg/m)	50 (0.6 kg/m)
58	G-3	Chip Detector into Accessory Drive Gearbox	90 (1.0 kg/m)	100 (1.2 kg/m)
59	G-3	Combustion Chamber Drain Valve to Combustion Chamber Housing Attaching Bolts	35 (0.4 kg/m)	40 (0.5 kg/m)

Table G-3. Special Torque Values (T53-L-11 Series Engines) - Continued

Ref No.	Fig. No.	Description	Minimum (Pound-Inches)	Maximum (Pound-Inches)
60	G-3	Guide and Strainer Retainer	80 (0.9 kg/m)	100 (1.2 kg/m)
61	G-3	Igniter Plugs into Mounts	85 (1.0 kg/m)	95 (1.1 kg/m)
62	G-3	Ignition Leads to Igniter Plugs	75 (0.9 kg/m)	85 (1.0 kg/m)
63	G-3	Main Fuel Manifolds to Fuel Vaporizers Connector Nuts	350 (4.0 kg/m)	400 (4.6 kg/m)
64	G-3	Stinting Fuel Manifold to Starting Fuel Nozzle Connector Nuts	35 (0.4 kg/m)	50 (0.6 kg/m)
65	G-3	Accessory Drive Gearbox to Inlet Housing Attaching Bolts	250 (2.9 kg/m)	325 (3.7 kg/m)
66	G-3	Accessory Drive Gearbox to Inlet Housing Attaching Bolts	400 (4.6 kg/m)	475 (5.5 kg/m)
67	G-3	Airbleed Servo Valve Cover Retaining Screws	5 (0.06 kg/m)	6 (0.07 kg/m)
68	G-3	Bellows Assembly Retaining Screws	20 (0.23 kg/m)	25 (0.3 kg/m)
69	G-3	Large Diaphragm Assembly Cover Retaining Screws	5 (0.06 kg/m)	6 (0.07 kg/m)
70	G-3	Airbleed Valve Strainer Assembly Retaining Screws	20 (0.23 kg/m)	25 (0.3 kg/m)
71	G-3	Large Diaphragm Assembly Retaining Nut	10 (0.12 kg/m)	12 (0.14 kg/m)
72	G-3	Airbleed Valve Spacer Retaining Screw	20 (0.23 kg/m)	25 (0.3 kg/m)
73	G-3	Valve Seat	40 (0.5 kg/m)	60 (0.7 kg/m)
74	G-3	Tachometer Shaft Gear Retainer Spanner Nut	80 (0.9 kg/m)	100 (1.2 kg/m)
75	G-3	Tachometer Drive Shaft Gear and Liner Assembly Retaining Bolts	30 (0.3 kg/m)	38 (0.4 kg/m)

Table G-3. Special Torque Values (T53-L-11 Series Engines) - Cont.

Ref. No.	Fig. No.	Description	Minimum [Pound-inches)	Maximum (Pound-inches)
76	G-3	Upper Drive Shaft Gear and Liner Assembly Retainer Spanner Nut	80 (0.9 kg/m)	100 (1.2 kg/m)
77	G-3	Upper Drive Shaft Gear and Liner Assembly Bearing Retainer Plate Retaining Bolt	30 (0.3 kg/m)	38 (0.4 kg/m)
78	G-3	Rear Bearing Housing Oil Strainer	80 (0.9 kg/m)	100 (1.2 kg/m)
79	G-3	Nuts Securing Taper Pins in Compresser and Impeller Housing Halves	30 (0.3 kg/m)	35 (0.4 kg/m)

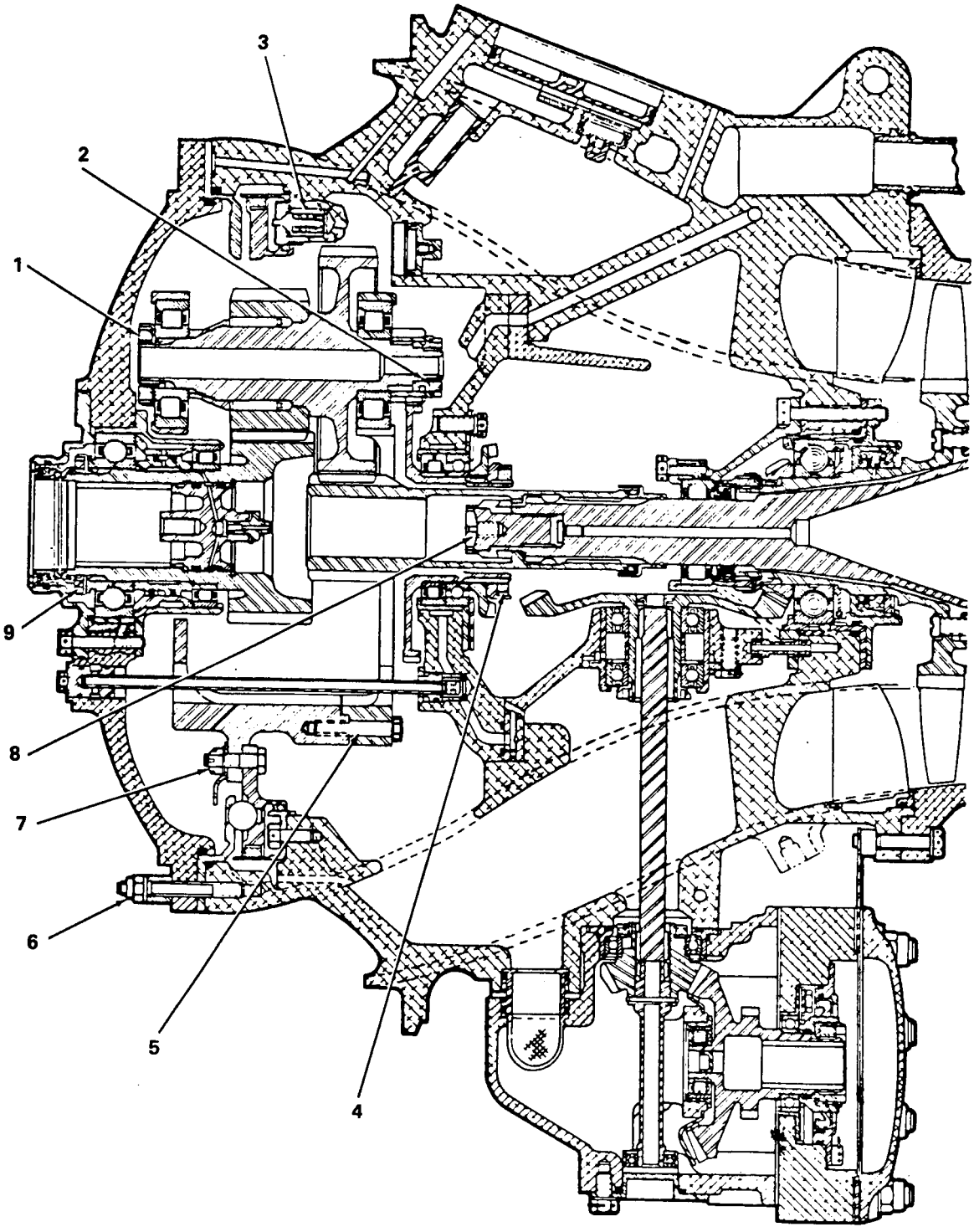


Figure G-3. Special Torque Value Locations (T53-L-11 Series Engines) (Sheet 1 of 6)

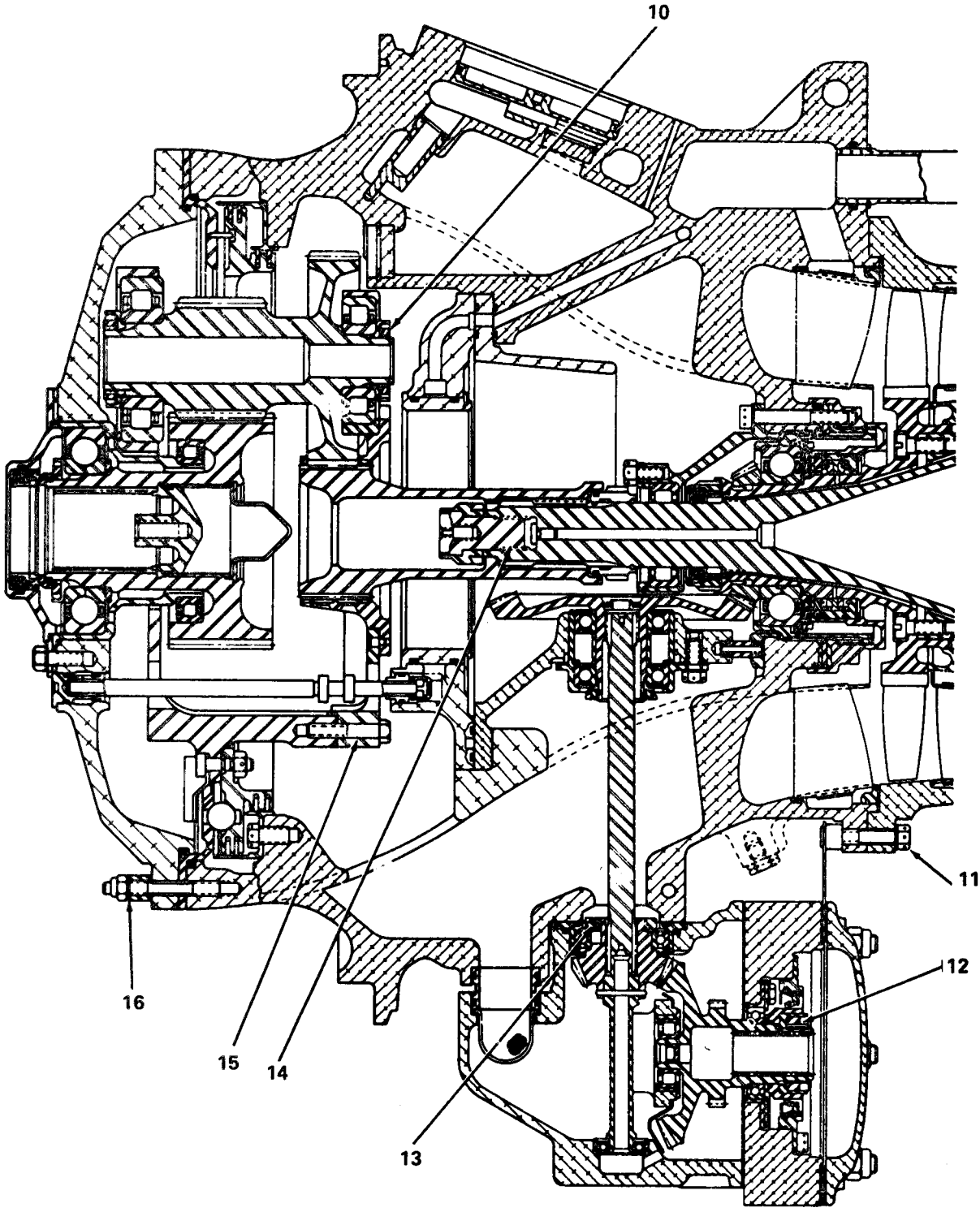


Figure G-3. Special Torque Value Locations (T53-L-11 Series Engines) (Sheet 2 of 6)

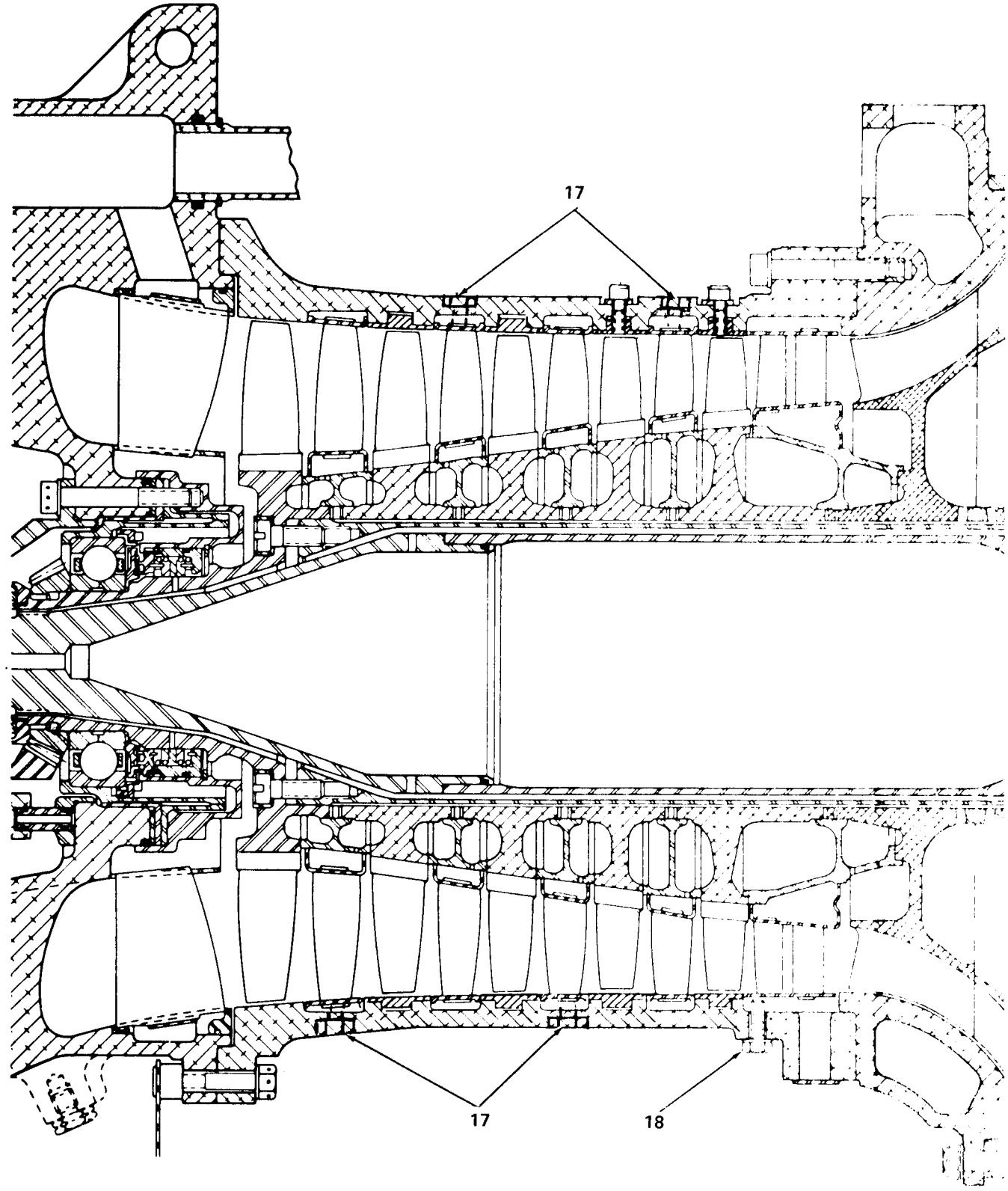


Figure G-3. Special Torque Value Locations (T53-L-11 Series Engines) (Sheet 3 of 6)

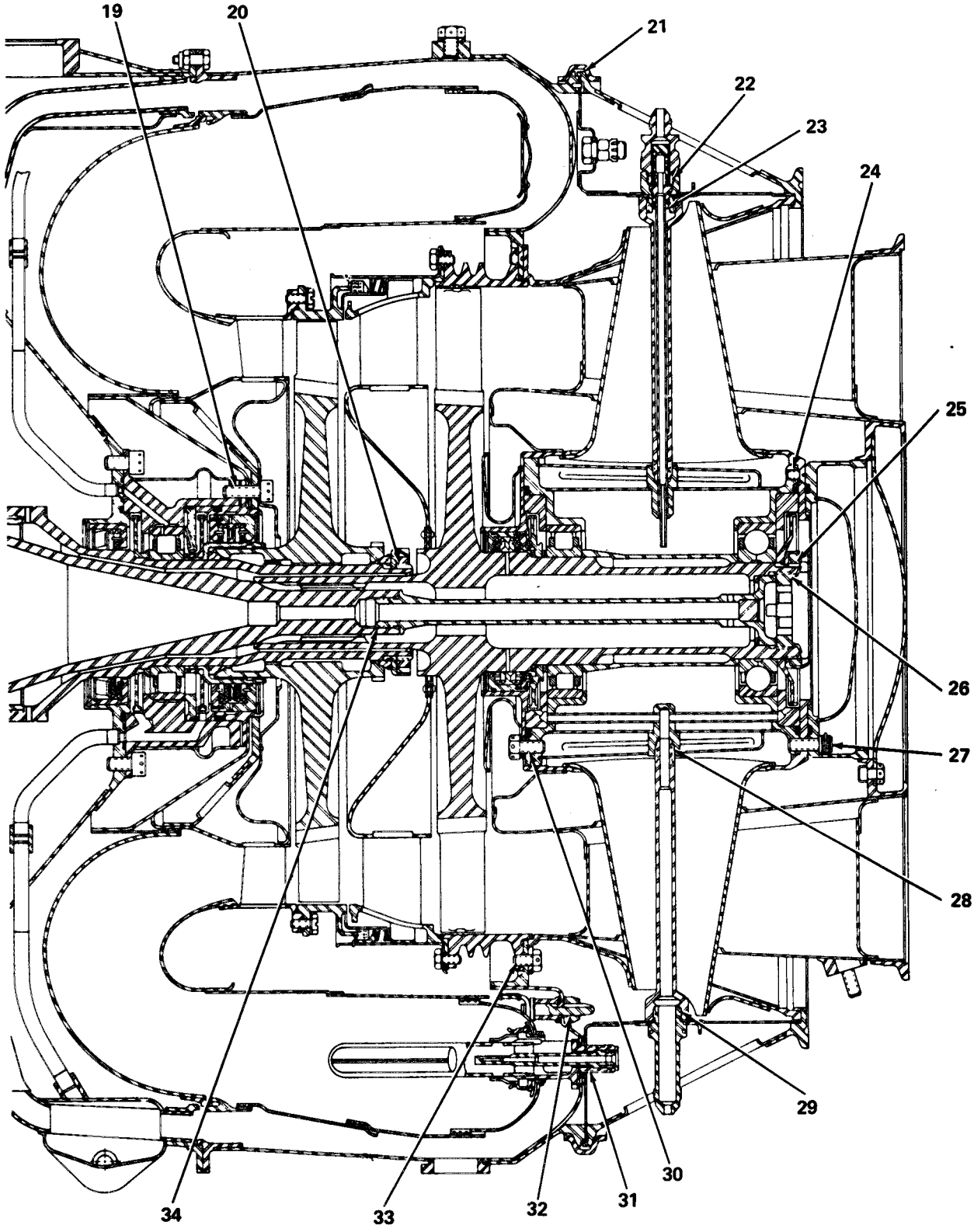


Figure G-3. Special Torque Value Locations (T53-L-11 Series Engines) (Sheet 4 of 6)

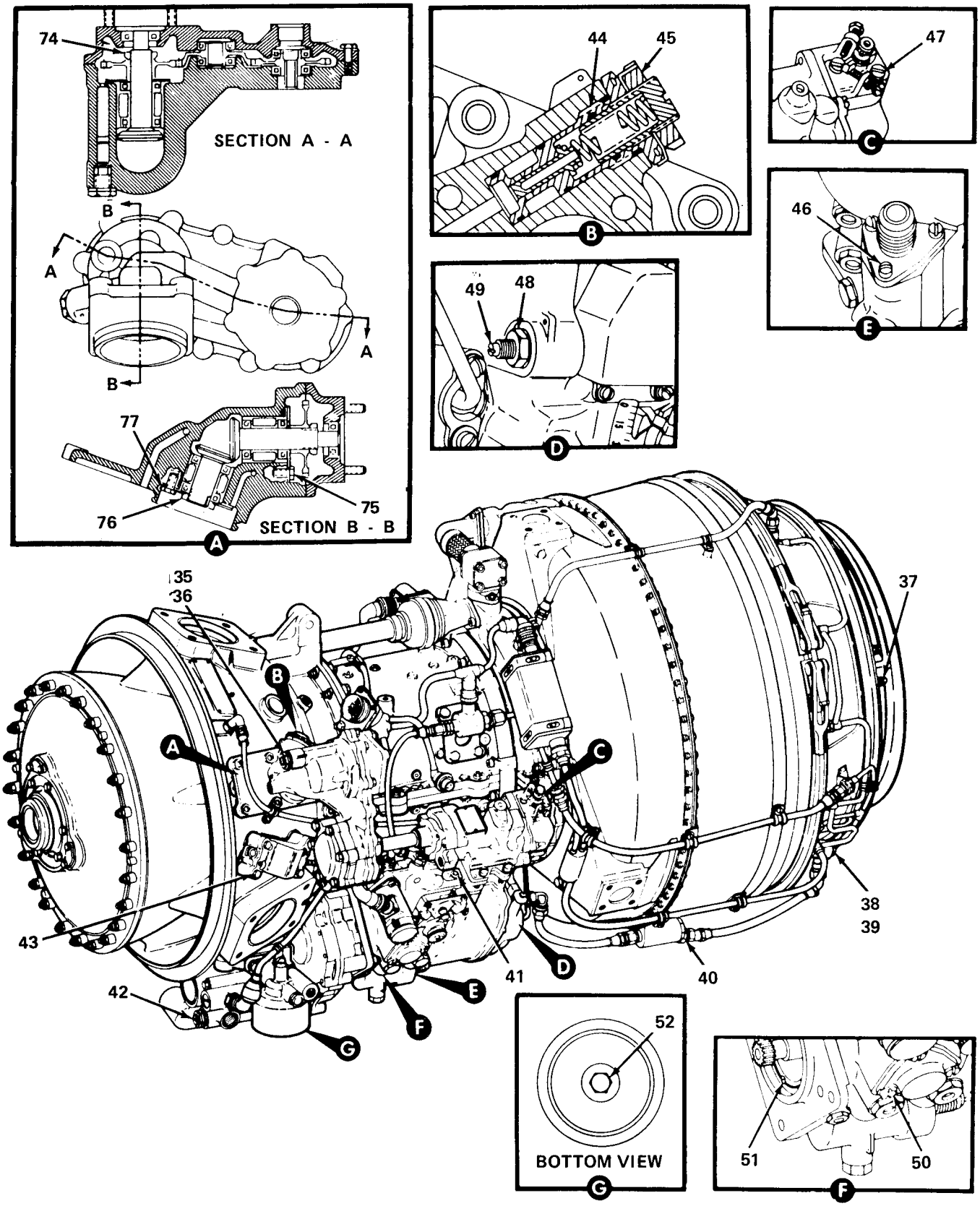


Figure G-3. Special Torque Value Locations (T53-L-11 Series Engines) (Sheet 5 of 6)

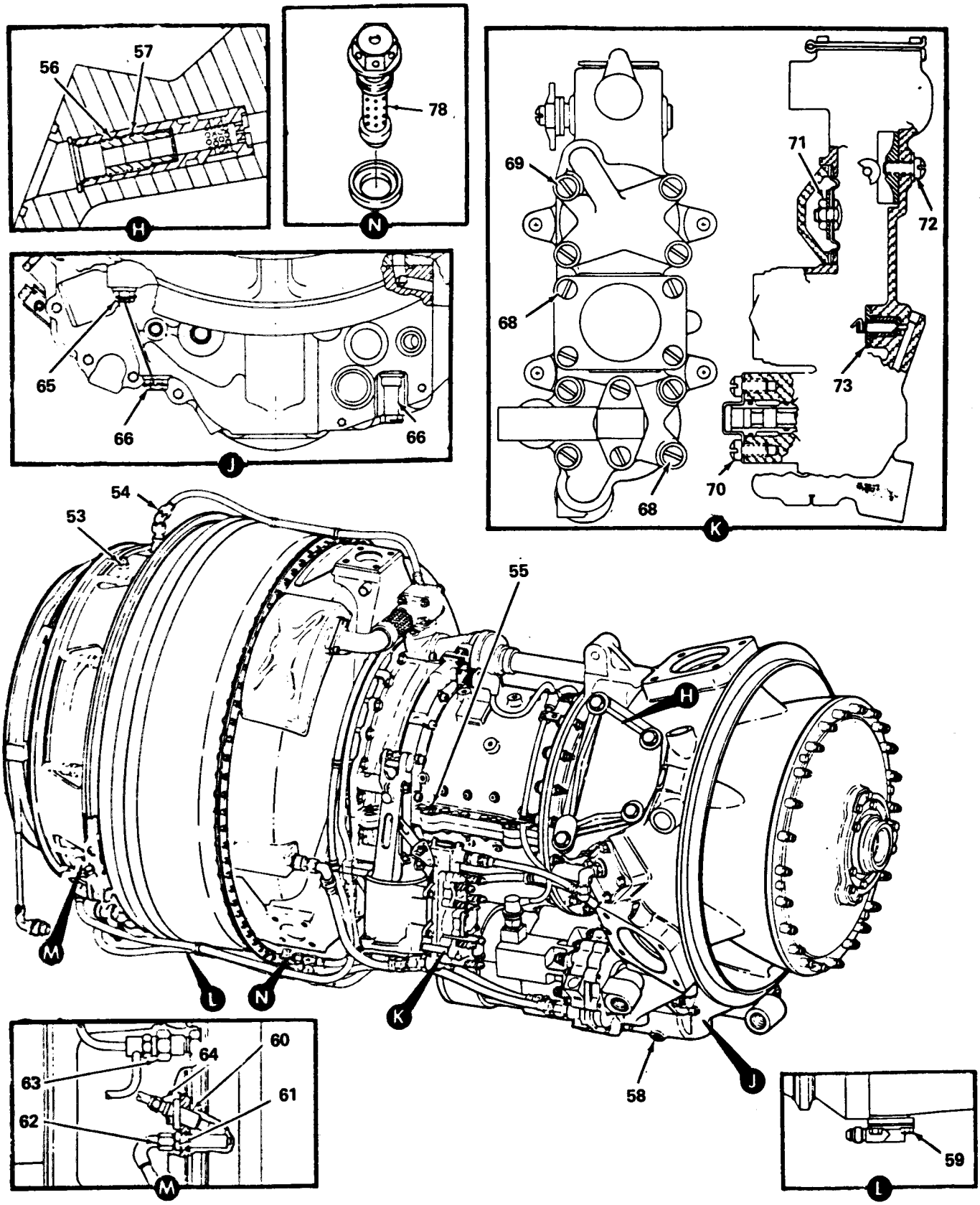


Figure G-3. Special Torque Value Locations (T53-L-11 Series Engines) (Sheet 6 of 6)

Table G-4. Special Torque Values (T53-L-3B/703 Engines)

NOTE

Measurements are given in pound-inches unless otherwise specified. Metric equivalent appears in parentheses.

Ref. No.	Fig. No.	Description	Minimum (pound-inches)	Maximum (Pound-inches)
1	G-4	Torquerneter Valve Assembly Into Torquemeter Cylinder	150 (1.7 kg/m)	200 (2.3 kg/m)
2	G-4	Planetary Gear Assembly Spur Gear Retaining Nut	975 (1 1.2 kg/m)	1000 (11.5 kg/m)
3	G-4	Sun Gearshaft Retaining Bolt	600 (6.9 kg/m)	720 (8.3 kg/m)
4	G-4	Accessory Drive Gearbox Assembly to Inlet Housing Assembly Attaching Bolts	100 (1.2 kg/m)	120 (1.4 kg/m)
5	G-4	Accessory Gearbox Cover Assembly Retaining Nut	420 (4.8 kg/m)	520 (6.0 kg/m)
6	G-4	Pinion Gearshaft and Bearing Assembly Bearing, Bushing, and Liner Retaining Nut	300 (3.5 kg/m)	360 (4. 1 kg/m)
7	G-4	Accessory Drive Driven Gear Spanner Nuts	300 (3.5 kg/m)	300 (3.5 kg/m)
8	G-4	Rear Carrier Retaining Bolts	155 (1.8 kg/m)	165 (1.9 kg/m)
9	G-4	Output Reduction Carrier and Gear Assembly Retaining Nuts	70 (0.8 kg/m)	80 (0.9 kg/m)
10	G-4	Spanner Nut - Housing to Carrier Gear Assembly	700 (pound-feet)	225 (pound-feet)
11	G-4	Planetary Gear Assembly Forward Roller Bearing Retainer Nut	975 (11.2 kg/m)	1000 (11.5 kg/m)
12	G-4	First through Fourth Stage Compressor Vane Assemblies to Compressor Housing Assembly Half Attaching Screws	Tighten center srews to 44 to 46 pound-inches (0.51 to 0.53 kg/m) torque. Tighten outer screws to 14 to 16 pound-inches (0. 16 to 0.18 kg/m) torque.	

Table G-4. SPECIAL TORQUE VALUES (T53-L-13-B/703 ENGINES) – Cont.

Ref. No.	Fig. No.	Description	Minimum (Pound-Inches)	Maximum (Pound-Inches)
13	G-4	Exit Guide Vane Assembly to Compressor Housing Assembly Half Attaching Bolts and screws	Tighten center bolts to 44 to 46 pound-inches (0.51 to 0.53 kg/m torque. Tighten outer bolts to 14 to 16 pound-inches (0.16 to 0.18 kg/m) torque. Tighten screws to 30 to 40 pound-inches (0.3 to 0.5 kg/m) torque.	
13A	G-4	Compressor Housing to Impeller Housing Attaching Bobs	45 to 50 pound-inches (0.5 kg/m to 0.6 kg/m)	
14	G-4	First Stage Turbine Nozzle Assembly Combustion Chamber Deflector and Bearing Housing Assembly to Diffuser Housing Assembly Attaching Studs, Bolts and Nuts.	Tighten bolts to 120 to 165 pound-inches (1.4 to 1.9 kg/m) torque. Tighten studs to 70 to 90 pound-inches (0.8 to 1.0 kg/m) torque. Tighten nuts to 60 to 90 pound-inches (0.7 to 1.0 kg/m) torque.	
15	G-4	Seal and Retainer, and Bearing Retaining Plate to Bearing Housing Assembly Attaching Bolts	**40** (0.46 kg/m)	**45** (0.52 kg/m)
16	G-4	Second Gas Producer Cylinder and First Stage Gas Producer Nozzle Bolts	Tighten bolts to 35 to 40 pound-inches (0.4 to 0.46 kg/m) torque. Release torque to zero pound-inches and retighten to 15 to 20 pound-inches (0.17 to 0.23 kg/m) torque.	
17	G-4	First Stage Power Turbine Rotor to Second Stage Power Turbine Rotor Attaching Bolts	**140** (1.6 kg/m)	**160** (1.8 kg/m)
18	G-4	V-Band Coupling Assemblies Retaining Nut	Tighten nut to 200 pound-inches (2.8 kg/m) torque. Seat couplings by tapping with soft-faced mallet towards the bolts at the ends. Release torque to zero pound-inches. Retighten to 145 to 155 pound-inches (1.7 to 1.8 kg/m) torque.	
19	G-4	Combustion Chamber Housing Assembly to Combustion Chamber Liner Assembly Attaching Nuts	**20** (0.2 kg/m)	**30** (0.3 kg/m)

Table G-4. Special Torque Values (T53-L-13B/703 Engines) - Cont.

Ref. No.	Fig. No.	Description	Minimum (Pound-inches)	Maximum (Pound-inches)
20	G-4	Oil Strainer Housing Adapter into Power Turbine Tube	80 (0.9 kg/m)	90 (1.0 kg/m)
21	G-4	Power Turbine Tube into Beating Housing Assembly	100 (1.2 kg/m)	110 (1.3 kg/m)
22	G-4	Exhaust Diffuser Assembly to Second Stage Turbine Rotor Assembly Attaching Screws	20 (0.2 kg/m)	30 (0.3 kg/m)
23	G-4	Power Shaft Bolt Retaining Nut	Tighten nut to 100 pound-feet (13.8 kg/m) torque. Loosen and remove nut. Retighten power shaft bolt to 195 to 200 pound-inches (2.2 to 2.3 kg/m) torque. Install nut and tighten to 50 pound-feet (6.9 kg/m) torque.	
24	G-4	Second Stage Power Turbine Rotor Retaining Nut	225 (pound-feet)	250 (pound-feet)
25	G-4	Exhaust Diffuser Cover Retaining Bolt	70 (0.8 kg/m)	75 (0.9 kg/m)
26	G-4	Power Turbine Rear Bearing Cover Bolts	70 (0.8 kg/m)	75 (0.9 kg/m)
27	G-4	Power Shaft Bolt into Power Shaft	195 (2.2 kg/m)	200 (2.3 kg/m)
28	G-4	Second Stage Turbine Spacer, and Second Stage Gas Producer Turbine Rotor Retaining Nuts	170 (2.0 kg/m)	180 (2.1 kg/m)
29	G-4	Cooling Air Deflector and Seal and Housing Assembly to Bearing Housing Attaching Bolts	70 (0.8 kg/m)	75 (0.9 kg/m)
30	G-4	Connector into Power Turbine Tube	80 (0.9 kg/m)	90 (1.1 kg/m)
31	G-4	Plate to Second Stage Power Turbine Rotor Attaching Bolts	25 (0.29 kg/m)	30 (0.35 kg/m)
32	G-4	First Stage Gas Producer Turbine Rotor Assembly Retaining Nut	320 (pound-feet)	350 (pound-feet)

Table G-4. Special Torque Values (T53-L-13B/703 Engines) - Continued

Ref No.	Fig. No.	Description	(Pound-Inches)	(Pound-Inches)
33	G-4	Sealing Ring, Seal and Retainer, and Retaining Plate to Bearing Housing Assembly Attaching Bolts	Tighten bolts to 85 to 95 pound-inches (1.0 to 1.1 kg/m) torque. Retighten bolts to 40 to 45 pound-inches (0.46 to 0.5 kg/m) torque. After 5 minutes, release torque on bolts and tighten to 95 to 105 pound-inches (1.1 to 1.2 kg/m) torque.	
34	G-4	Chip Detector into Accessory Drive Gearbox	90 (1.0 kg/m)	100 (1.2 kg/m)
35	G-4	Power Takeoff Oil Supply Nozzle Assembly Setscrew	30 (0.3 kg/m)	50 (0.6 kg/m)
36	G-4	Power Takeoff Oil Supply Nozzle Assembly Setscrew	30 (0.3 kg/m)	50 (0.6 kg/m)
37	G-4	Torquemeter Relief Valve Assembly into Housing and Liner Assembly	80 (0.9 kg/m)	100 (1.2 kg/m)
38	G-4	Overspeed Governor and Tachometer Drive Assembly Torquemeter Oil Pressure Adjustment Screw Locknut.	70 (0.8 kg/m)	80 (0.9 kg/m)
39	G-4	Filter Assembly-Overspeed Governor	77 (0.89 kg/m)	96 (1.1 kg/m)
40	G-4	Filter Assembly Retaining Plug (Overspeed Governor and Tachometer Drive Assembly)	70 (0.8 kg/m)	85 (1.0 kg/m)
41	G-4	Variable Air Inlet Guide Vane Assembly Outer Fairing to Inlet Housing Assembly Attaching Bolt	60 (0.7 kg/m)	80 (0.9 kg/m)
42	G-4	Starting Fuel Manifold Connector to Nozzle	35 (0.4 kg/m)	50 (0.6 kg/m)
43	G-4	Igniter Plugs into Mounts	85 (0.98 kg/m)	95 (1.1 kg/m)
44	G-4	Ignition Leads to Igniter Plugs	40 (0.5 kg/m)	50 (0.6 kg/m)
45	G-4	Fuel Control Bleed Band Adjustment Screw Locknut	30 (0.3 kg/m)	40 (0.5 kg/m)

Table G-4. Special Torque Values (T53-L-13B/703 Engines) - Continued

Ref No.	Fig. No.	Description	Minimum Pound-Inches)	Maximum (Pound-Inches)
46	G-4	Fuel Control Bleed Band Adjustment Screw Lock-screw	20 (0.23 kg/m)	30 (0.3 kg/m)
47	G-4	Inlet Strainer, Retainer, Spring and Inlet Fitting into Fuel Control Attaching Screws	30 (0.3 kg/m)	35 (0.4 kg/m)
48	G-4	Fuel Control Trimmer Lock Bolt	26 (0.3 kg/m)	30 (0.35 kg/m)
49	G-4	Fuel Control to Accessory Drive Gearbox Assembly Attaching Nuts	125 (1.4 kg/m)	140 (1.6 kg/m)
50	G-4	Filter Housing, Servo Supply Filter Element, and Cover and Pump Discharge Strainer into Fuel Control Attaching Screws	50 (0.6 kg/m)	70 (0.8 kg/m)
51	G-4	Fuel Control N1 Drive Seal Retaining Screws	20 (0.23 kg/m)	30 (0.3 kg/m)
52	G-4	Lube Oil Filter Assembly Cover Assembly to Filter Housing Attaching Bolt	20 (0.23 kg/m)	35 (0.4 kg/m)
53	G-4	Power-Driven Rotary (Oil) Pressure Adjustment Screw Locknut	95 (1.1 kg/m)	110 (1.3 kg/m)
54	G-4	Fuel Control Temperature-Sensing Element Housing to Inlet Housing Assembly Attaching Bolts	18 (0.21 kg/m)	22 (0.25 kg/m)
55	G-4	Fuel Control Manual Control Cover Retaining Screw	12 (0.14 kg/m)	20 (0.23 kg/m)
56	G-4	Exhaust Thermocouple Assembly to Exhaust Diffuser Attaching Nuts	35 (0.4 kg/m)	45 (0.5 kg/m)
57	G-4	Tube Assembly Retaining Bolt	90 (1.0 kg/m)	120 (1.4 kg/m)
58	G-4	Oil-Pressure Hose Assembly to Oil Strainer Housing	50 (0.6 kg/m)	100 (1.2 kg/m)
59	G-4	Compressor and Impeller Housing to Diffuser Housing Attaching Bolts	90 (1.0 kg/m)	100 (1.2 kg/m)
60	G-4	Inlet Guide Vane Actuator Assembly Retainer Screw	50 (0.58 kg/m)	55 (0.63 kg/m)

Table G-4. Special Torque Values (T53-L-13B/703 Engines) - Cont.

Ref. No.	Fig. No.	Description	Minimum (Pound-inches)	Maximum (Pound-inches)
61	G-4	Combustion Chamber Drain Valve Retainer Bolts	35 (0.4 kg/m)	40 (0.5 kg/m)
62	G-4	Flow Divider and Dump Valve Assembly Retaining Screws	26 (0.3 kg/m)	36 (0.41 kg/m)
63	G-4	Accessory Drive Gearbox to Inlet Housing Attaching Bolts	400 (4.6 kg/m)	475 (5.5 kg/m)
64	G-4	Accessory Drive Gearbox to Inlet Housing Attaching Bolts	250 (2.9 kg/m)	325 (3.7 kg/m)
65	G-4	Rear Bearing Housing Oil Strainer	80 (0.9 kg/m)	100 (1.2 kg/m)
66	G-4	Nuts Securing Bolts Through Hollow Dowels in Compressor and Impeller Housing Halves	70 (0.8 kg/m)	95 (1.1 kg/m)

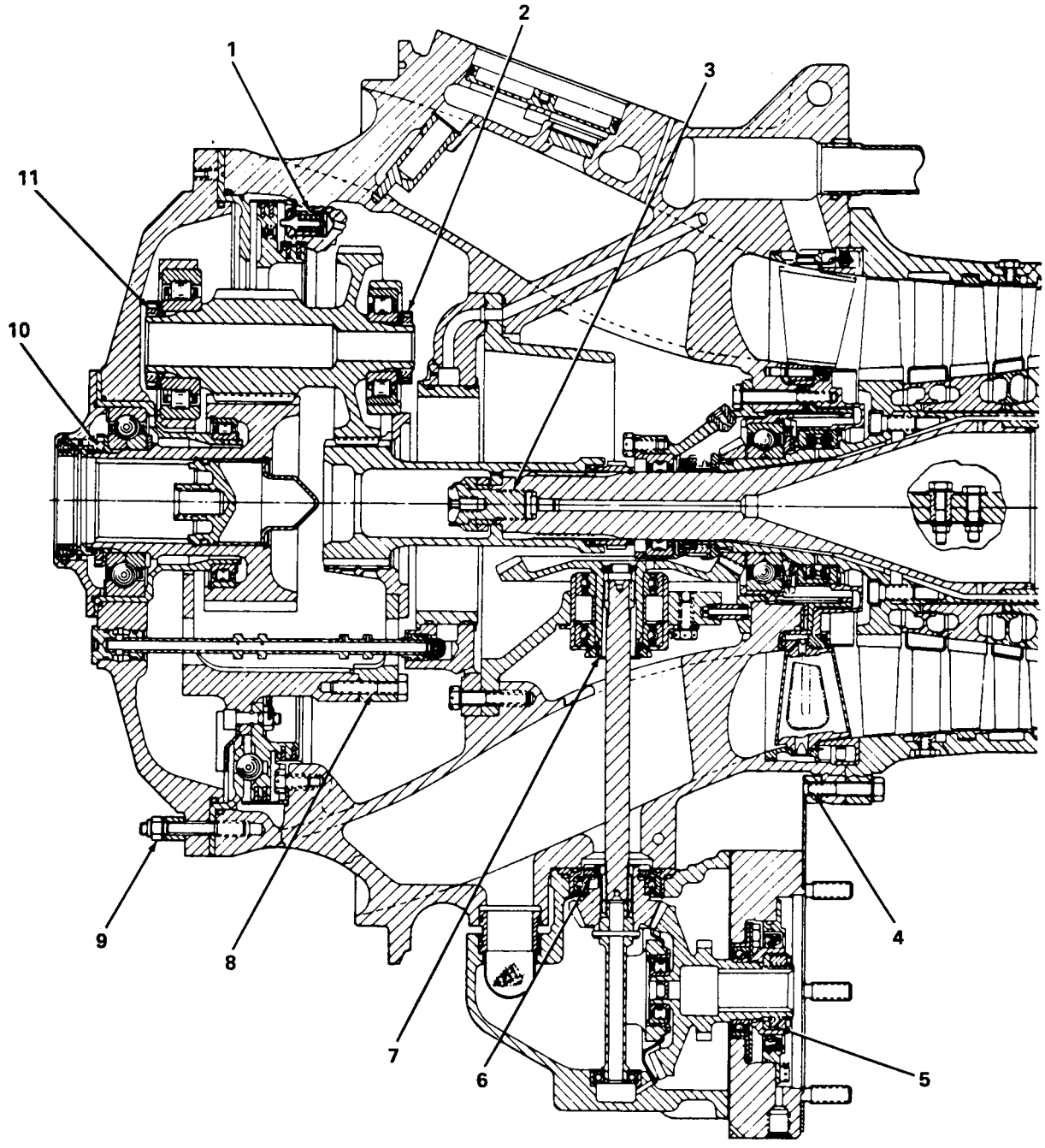


Figure G-4. Special Torque Value Locations (T53-L-13B/703 Engines) (Sheet 1 of 5)

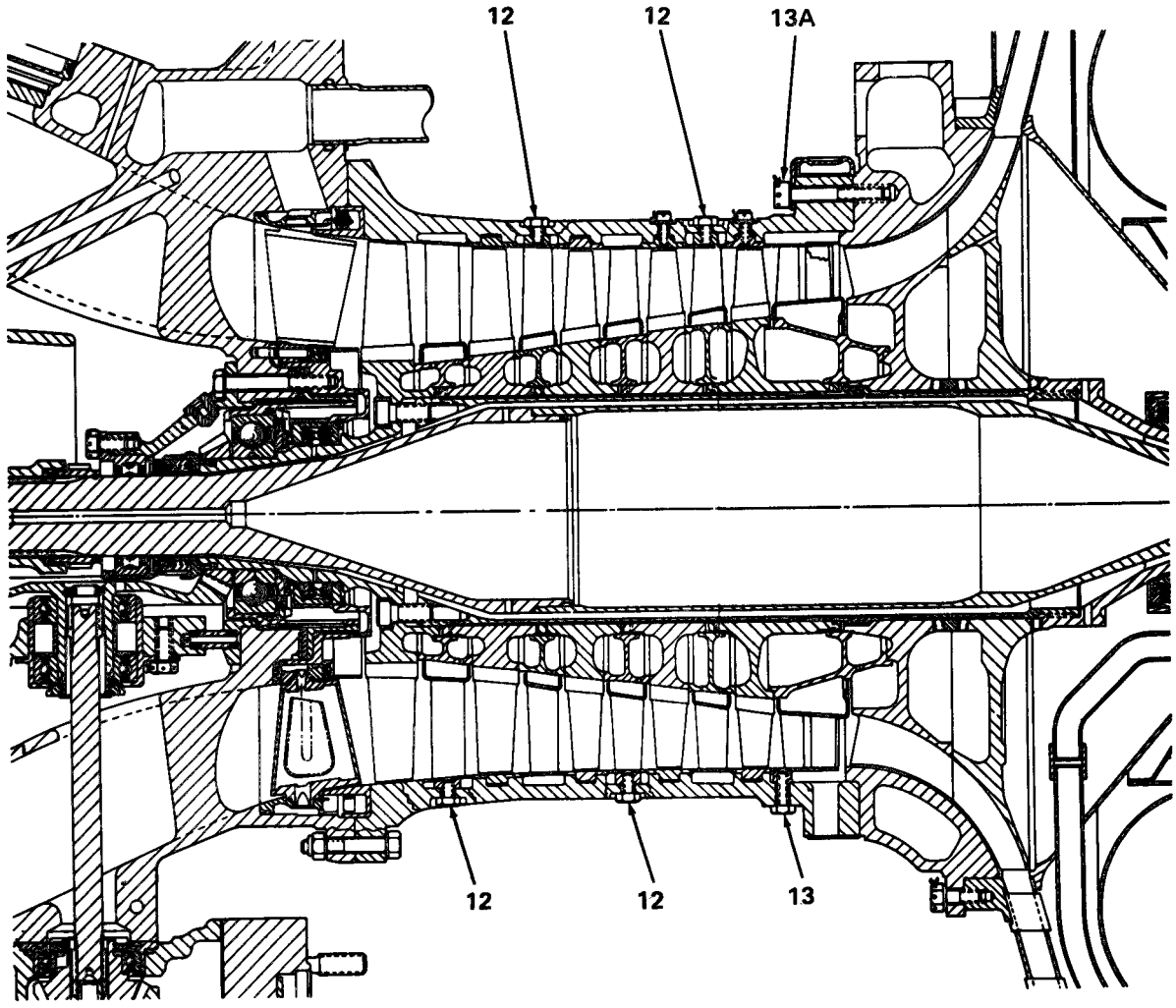


Figure G-4. Special Torque Value Locations (T53-L-13B/703 Engines) (Sheet 2 of 5)

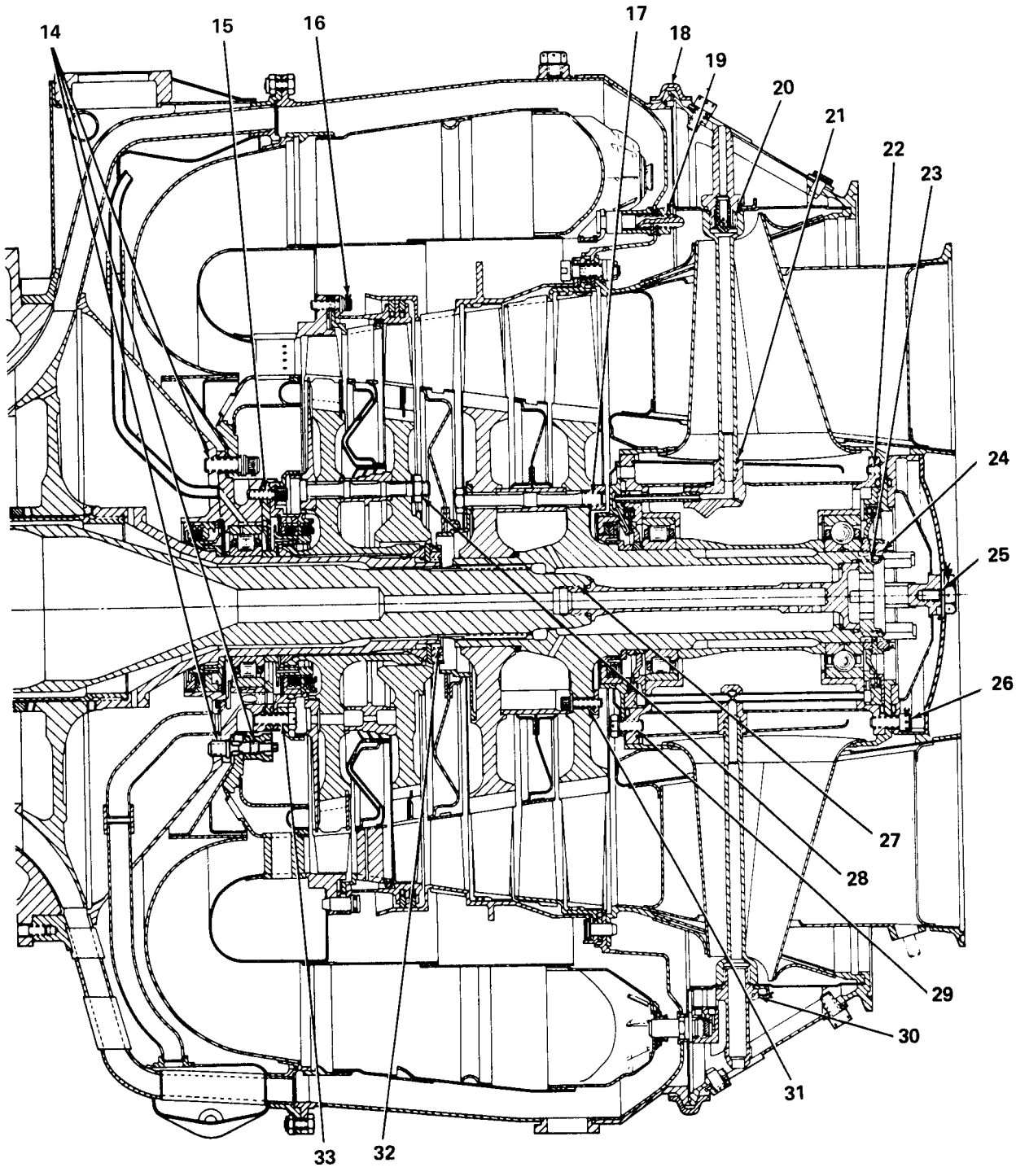


Figure G-4. Special Torque Value Locations (T53-L-13B/703 Engines) (Sheet 3 of 5)

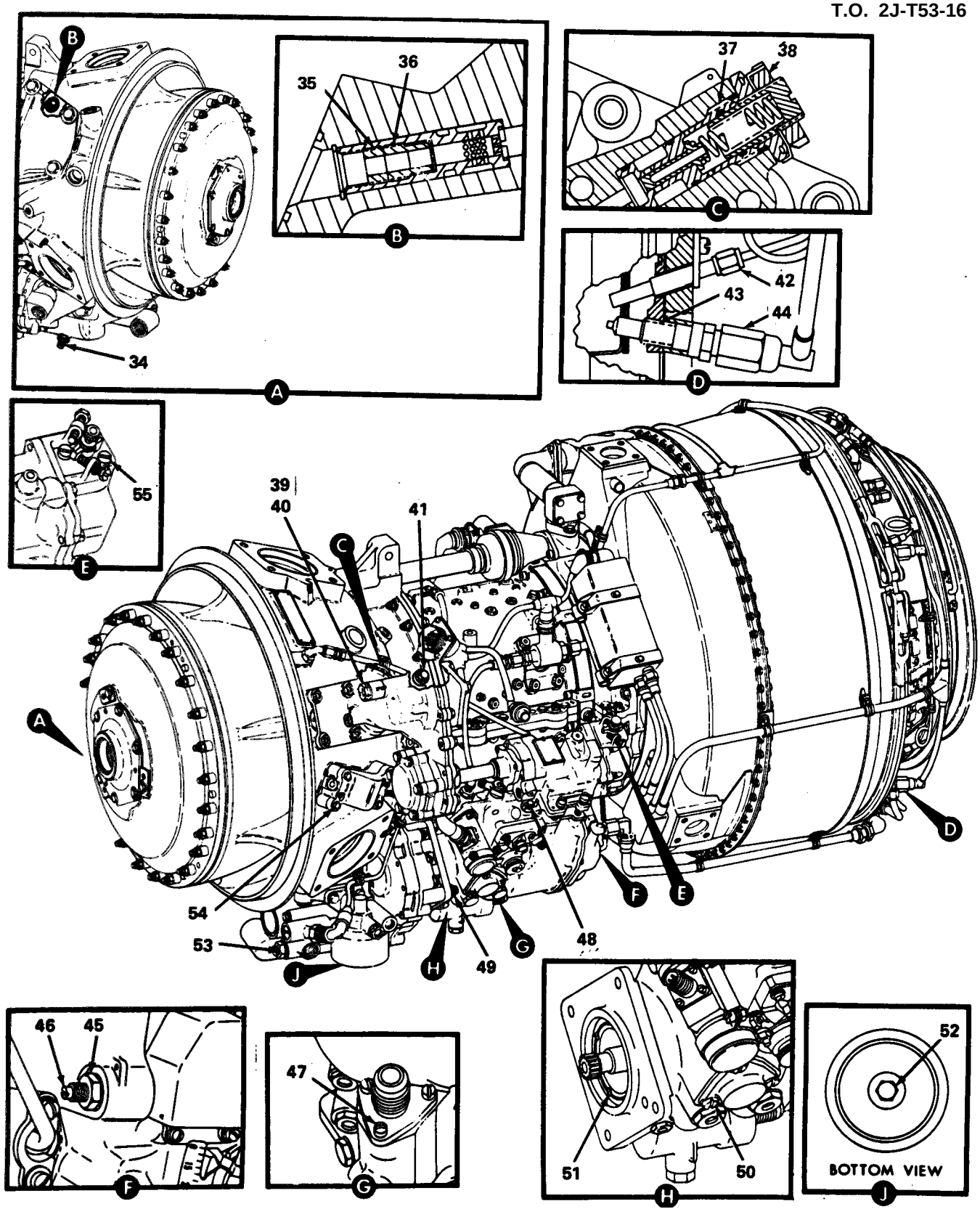


Figure G-4. Special Torque Value Locations (T53-L-13B/703 Engines) (Sheet 4 of 6)

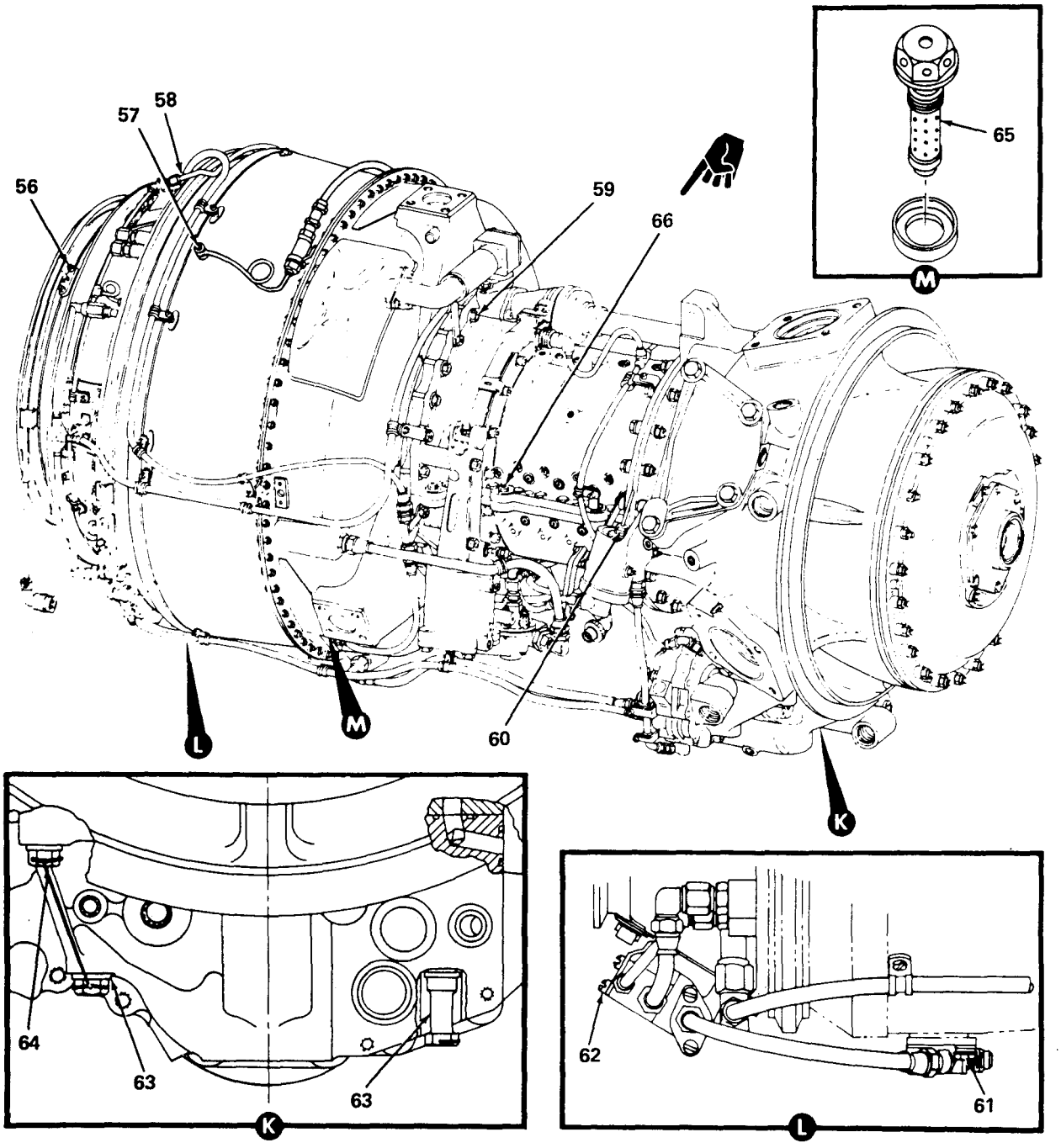


Figure G-4. Special Torque Value Locations (T53-L-13B/703 Engines) (Sheet 5 of 5)

G-7. TABLES OF DIMENSIONAL LIMITS. The tables of dimensional limits (tables G-5 and G-6) list the minimum and maximum clearances which are the specified engine design limits using new engine components. Replacement of part(s) shall be governed by inspection and repair criteria in conjunction with the limits specified in tables G-5 and G-6.

G-8. DEFINITIONS. T or L following a value in the limit columns indicates a tight or loose fit; TIR refers to total indicator reading; ID refers to inside diameter; and OD refers to outside diameter. Radial clearance between parts is measured at a right angle to a common axis. Axial clearance between parts is measured laterally on a common axis. Axial-radial clearance between parts is given where the location requires a combination of clearances. Backlash is the clearance between parts to determine looseness or wear of parts. Runout is the measurement of maximum diametrical eccentricity of a part.

G-9. REFERENCE ILLUSTRATIONS. The various fits, clearances, and backlashes are shown in figures G-5 and G-6.

Table G-5. Dimensional Limits (T53-L-11 Series)

NOTE

Metric equivalent appears in parentheses.

Ref No.	Fig. No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
1	G-5	End Gap Clearance of Inner Spacer Seal Rings	Circumferential	0.020 (0.051 cm)	0.031 (0.079 cm)
2	G-5	Sun Gearshaft End Play	Axial	0.020 (0.051 cm)	0.046 (0.117 cm)
3	G-5	End Play of Planetary Gear Assembly	Axial	0.010 (0.025 cm)	0.020 (0.051 cm)
4	G-5	End Gap Clearance of Front and Rear Torquemeter Seal Rings in Installed Position	Circumferential	0.004 (0.010 cm)	
5	G-5	Dimensional Limits Between Forward End of Inlet Housing and Inner Flange of Torquemeter Cylinder	Axial	0.030 (0.076 cm)	0.034 (0.086 cm)
6	G-5	Dimensional Limit Between Forward Face of Power Shaft and Inside of Sun Gear Sealing Cup	Axial	2.460 (6.248 cm)	
7	G-5	Backlash Between Gearshaft and Liner Assembly and Gear	Circumferential	0.004 (0.010 cm)	0.008 (0.020 cm)
8	G-5	Pinch Fit Between Bearing Support Plate Liner and Bearing	Axial	0.003 (0.008 cm)	0.006 (0.015 cm)
9	G-5	End Play of Planetary Gear Assembly	Axial	0.013 (0.033 cm)	0.048 (0.122 cm)

Table G-5. Dimensional Limits (T53-L-11 Series) - Continued

Ref No.	Fig. No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
10	G-5	End Gap Clearance of Front and Rear Torquemeter Seal Rings in Installed Position	Circumferential	0.004 (0.010 cm)	
11	G-5	Dimensional Limits Between Inner Flange of Torquemeter Cylinder and Forward End of Torquemeter Valve Plunger	Axial	0.030 (0.076 cm)	0.034 (0.086 cm)
12	G-5	Dimensional Limit Between Forward Face of Power Shaft and Forward Face of Spur Gear	Axial	2.020 (5.131 cm)	2.040 (5.182 cm)
13	G-5	Backlash Between Accessory Drive and Power Takeoff Driven Gears	Circumferential	0.006 (0.015 cm)	0.012 (0.030 cm)
14	G-5	Pinch Fit Between Bearing and Liner	Axial	0.002 (0.005 cm)	0.004 (0.010 cm)
15	G-5	Sun Gearshaft End Play	Axial	0.020 (0.051 cm)	0.046 (0.117 cm)
16	G-5	Clearance Between Inlet Guide Vane and First Stage Compressor Rotor	Axial	0.084 (0.213 cm)	0.156 (0.396 cm)
17	G-5	First Stage Compressor Rotor Blade to Compressor Housing-Tip Clearance	Radial	0.021 (0.053 cm)	
18	G-5	Clearance Between First through Fifth Stage Compressor Vane ID Compressor Rotor Spacer OD	Radial	0.026 (0.066 cm)	
19	G-5	Second Stage Compressor Rotor Blade to Compressor Housing-Tip Clearance	Radial	0.024 (0.061 cm)	
20	G-5	Third Stage Compressor Rotor Blade to Compressor Housing-Tip Clearance	Radial	0.024 (0.061 cm)	
21	G-5	Fourth and Fifth Stage Compressor Rotor Blade to Compressor Housing-Tip Clearance	Radial	0.023 (0.058 cm)	
22	G-5	Clearance Between Exit Guide Vane and Impeller Housing	Axial	0.000 (0.000 cm)	0.062 0.157 cm)
23	G-5	Clearance Between Centrifugal Compressor Impeller (Forward End of Impeller Blade) and Impeller Housing	Radial	0.015 (0.038 cm)	
24	G-5	Clearance Between Centrifugal Compressor Impeller (Midpoint of Impeller Blade) and Impeller Housing	Radial-Axial	0.017 (0.043 cm)	

Table G-5. Dimensional Limits (T53-L-11 Series) - Continued

Ref No.	Fig. No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
25	G-5	Clearance Between Centrifugal Compressor (Rear End of Impeller Blade) and Impeller Housing	Axial	0.026 (0.066 cm)	
26	G-5	Clearance Between Centrifugal Compressor Impeller Blade and Diffuser Housing-Tip Clearance	Radial	0.036 (0.091 cm)	0.055 (0.140 cm)
27	G-5	Clearance Between Shroud Ends of Mating Compressor Vane Assemblies	Circumferential	0.003 (0.008 cm)	
28	G-5	Clearance Between Exit Guide Vane and Impeller	Axial	0.012 (0.030 cm)	
29	G-5	Clearance Between Fifth Stage Compressor Rotor Blade and Exit Guide Vane	Axial	0.043 (0.109 cm)	
30	G-5	Clearance Between Fourth Stage Compressor Vane and Fifth Stage Compressor Rotor Blade	Axial	0.044 (0.112 cm)	
31	G-5	Clearance Between Fourth Stage Compressor Rotor Blade and Fourth Stage Compressor Vane	Axial	0.042 (0.107 cm)	
32	G-5	Clearance Between Third Stage Compressor Vane and Fourth Stage Compressor Rotor Blade	Axial	0.043 (0.109 cm)	
33	G-5	Clearance Between Third Stage Compressor Rotor Blade and Third Stage Compressor Vane	Axial	0.040 (0.102 cm)	
34	G-5	Clearance Between Second Stage Compressor Vane and Third Stage Compressor Rotor Blade	Axial	0.040 (0.102 cm)	
35	G-5	Clearance Between Second Stage Compressor Rotor Blade and Second Stage Compressor Vane	Axial	0.037 (0.094 cm)	
36	G-5	Clearance Between First Stage Compressor Vane and Second Stage Compressor Rotor Blade	Axial	0.038 (0.097 cm)	
37	G-5	Clearance Between First Stage Compressor Rotor Blade and First Stage Compressor Vane	Axial	0.038 (0.097 cm)	
38	G-5	Pinch Fit Between Bearing Retainer and Roller Bearing Outer Race	Axial	0.010T (0.025 cm)	0.014T (0.036 cm)
39	G-5	Clearance Between Aft End of First Stage Rotor Nozzle Inner Shroud and Forward Face of First Stage Turbine Wheel	Axial	0.080 (0.203 cm)	
40	G-5	First Stage Turbine Rotor Blade to First Stage Turbine Nozzle Flange ID-Tip Clearance	Radial	0.025 (0.064 cm)	

Table G-5. Dimensional Limits (T53-L-11 Series) - Continued

Ref No.	Fig. No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
41	G-5	Runout Just Inboard of Blade Roots and Runout on Hub of Disc Immediately Forward of Hub Lip of First Stage Turbine Rotor Assembly	Axial and Radial		0.003TIR (0.008 cm)
42	G-5	Clearance Between First Stage Turbine Nozzle Flange Rear Face and Forward End of Second Stage Nozzle Outer Shroud	Axial	0.030 (0.076 cm)	0.070 (0.178 cm)
43	G-5	Clearance Between Second Stage Turbine Nozzle Inner Shroud and Second Stage Turbine Rotor Blade Roots	Axial	0.070 (0.178 cm)	
44	G-5	Power Turbine Rotor Blade to Power Turbine Cylinder ID-Tip Clearance	Radial	0.025 (0.064 cm)	
45	G-5	End Gap Between V-Band Couplings	Circum-ferential	Must be equal on both sides within plus or minus 3/32 inch (2.4 mm)	
46	G-5	Pinch Fit Between Bearing Housing Shoulder and No. 4 Bearing Outer Race	Axial	0.003T (0.008 cm)	0.006T (0.015 cm)
47	G-5	Clearance Between OD of Power Turbine Forward Seal Flange and ID of Power Turbine Nozzle Air Seal	Radial	0.015 (0.038 cm)	
48	G-5	Runout on Rear Compressor Shaft ID	Radial		0.002TIR (0.005 cm)
49	G-5	Pinch Fit Between Bearing and Liner Flange	Axial	0.002 (0.005 cm)	0.004 0.010 cm)
50	G-5	Backlash Between Tachometer Drive Shaftgear and Upper Drive Shaftgear	Circum-ferential	0.004 (0.010 cm)	0.008 0.020 cm)
51	G-5	Pinch Fit Between Bearing and Liner Flange	Axial	0.002 (0.005 cm)	0.004 0.010 cm)
52	G-5	Backlash Between Intermediate Gear and Shaftgear	Circum-ferential	0.006 (0.015 cm)	0.012 0.030 cm)

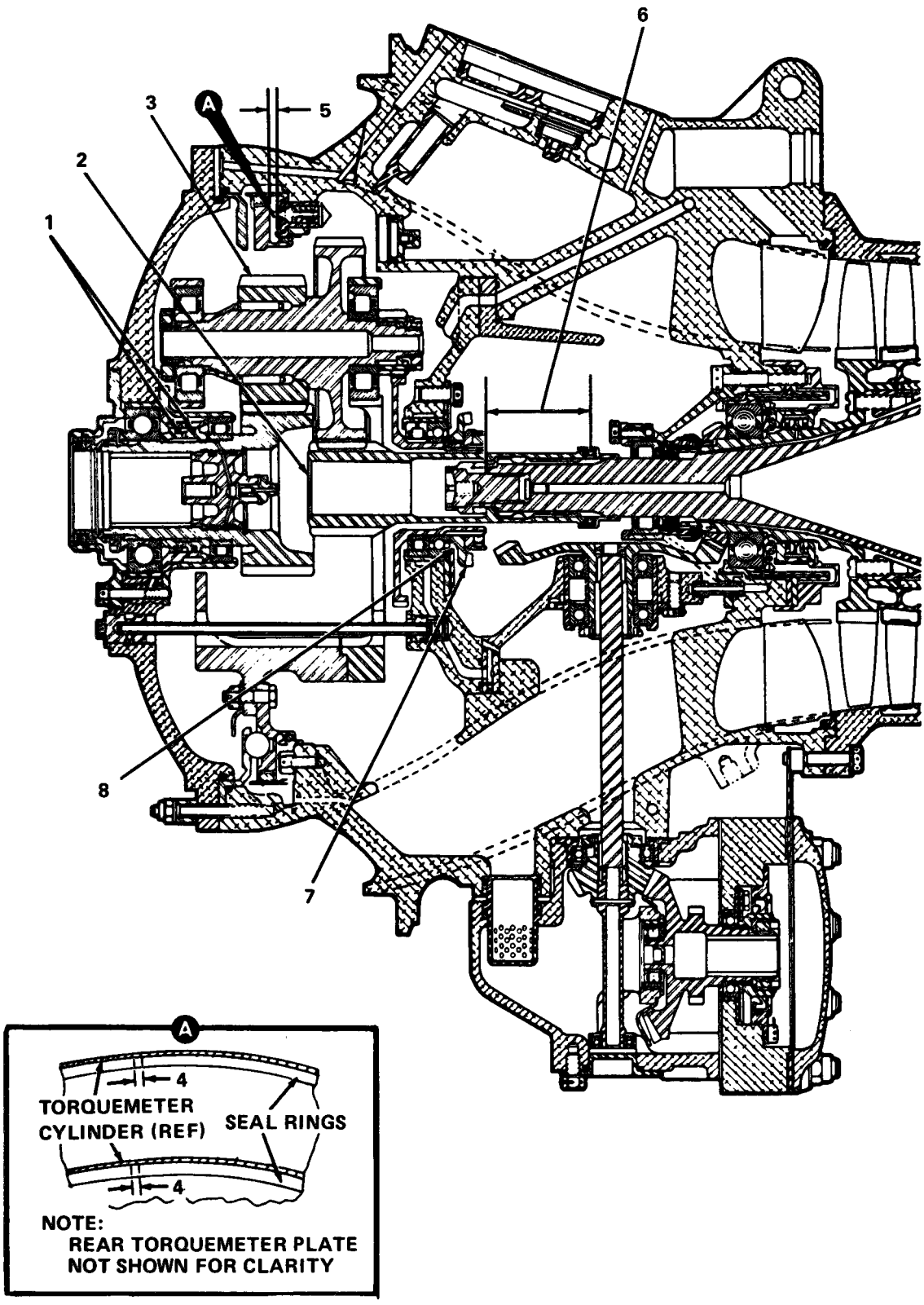


Figure G-5. Fits, Clearances and Backlashes (T53-L-11 Series Engines) (Sheet of 5)

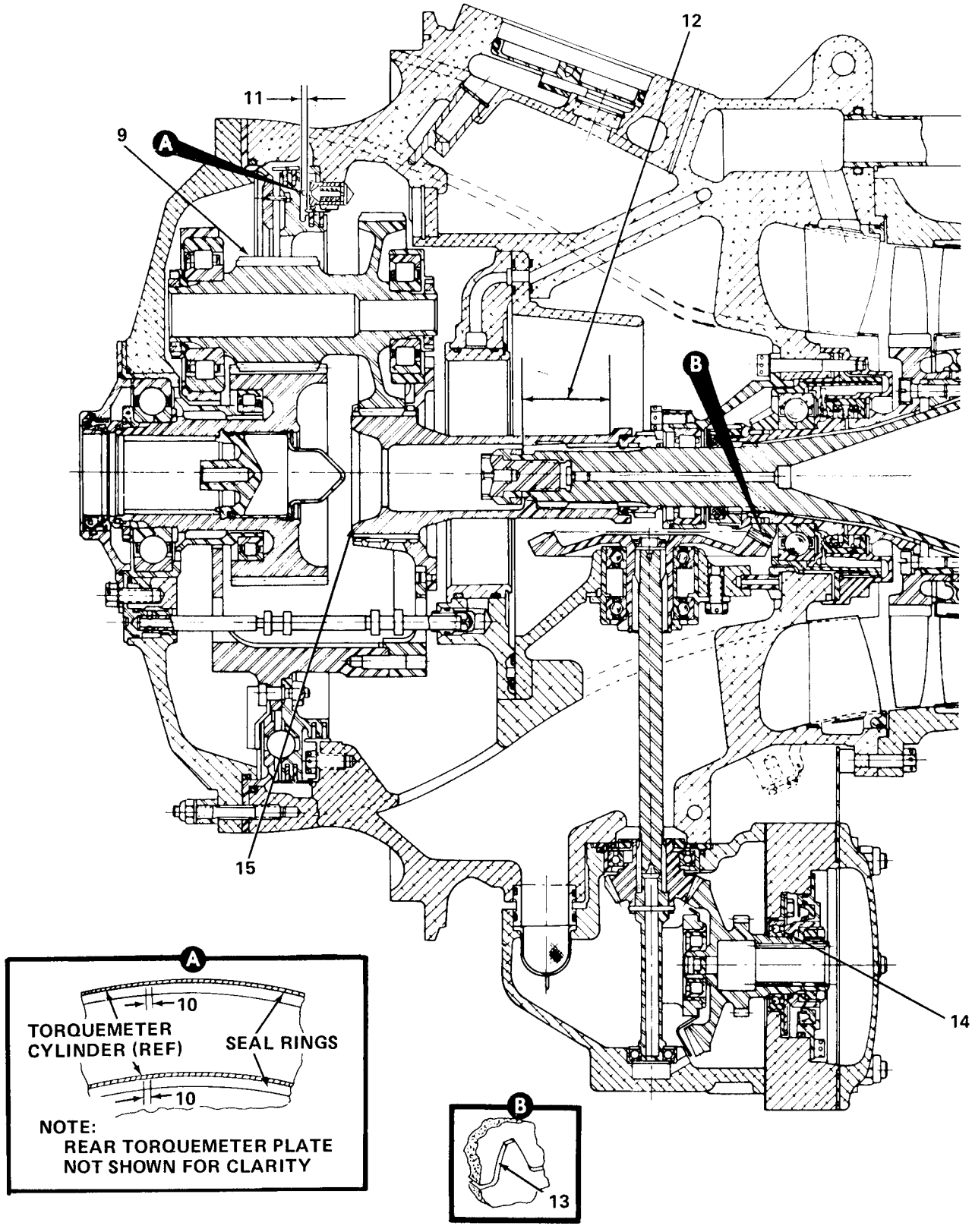


Figure G-5. Fits, Clearances and Backlashes (T53-L-11 Series Engines) (Sheet 2 of 5)

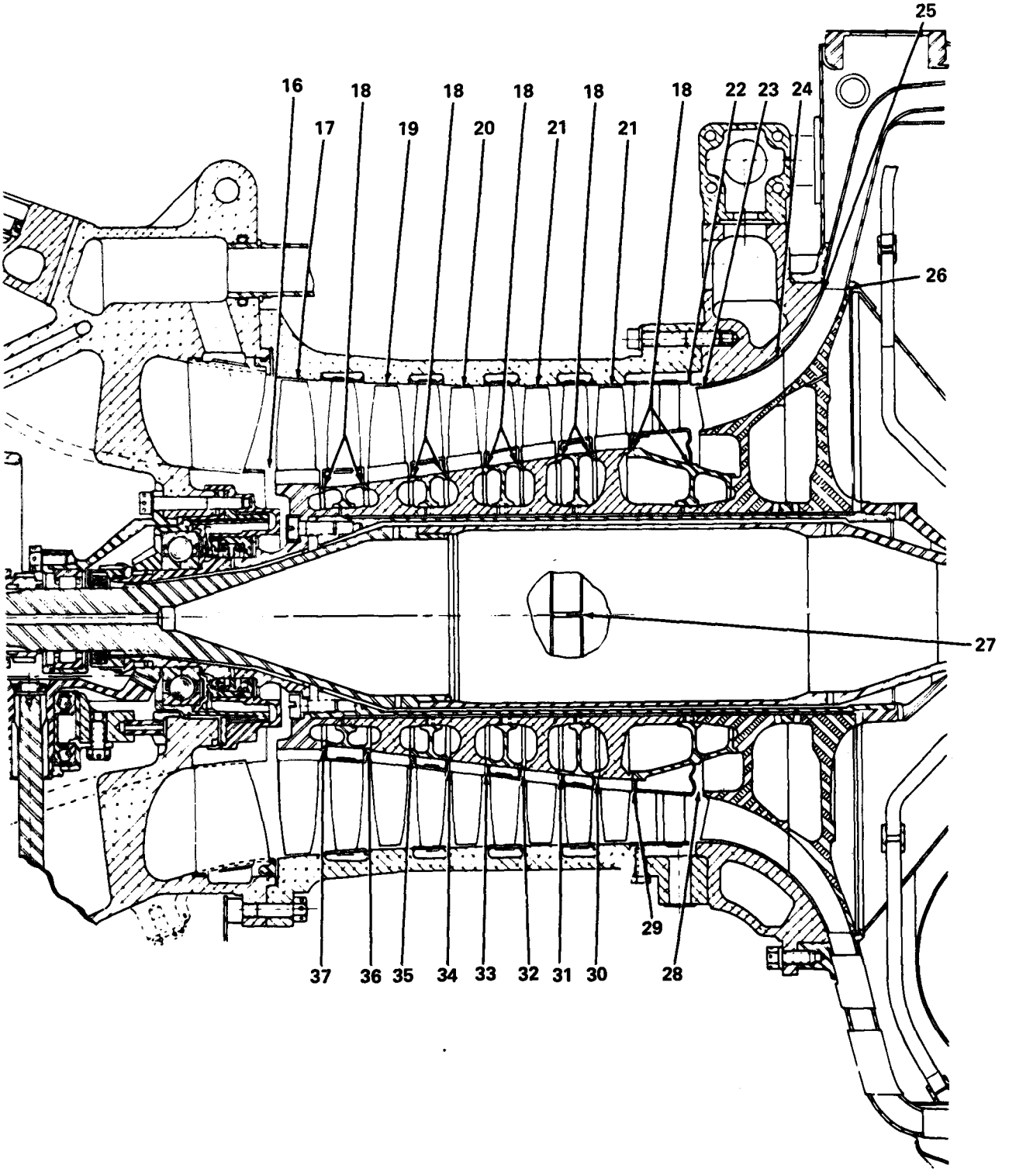


Figure G-5. Fits, Clearances and Backlashes (T53-L-11- Series Engines) (Sheet 3 of 5)

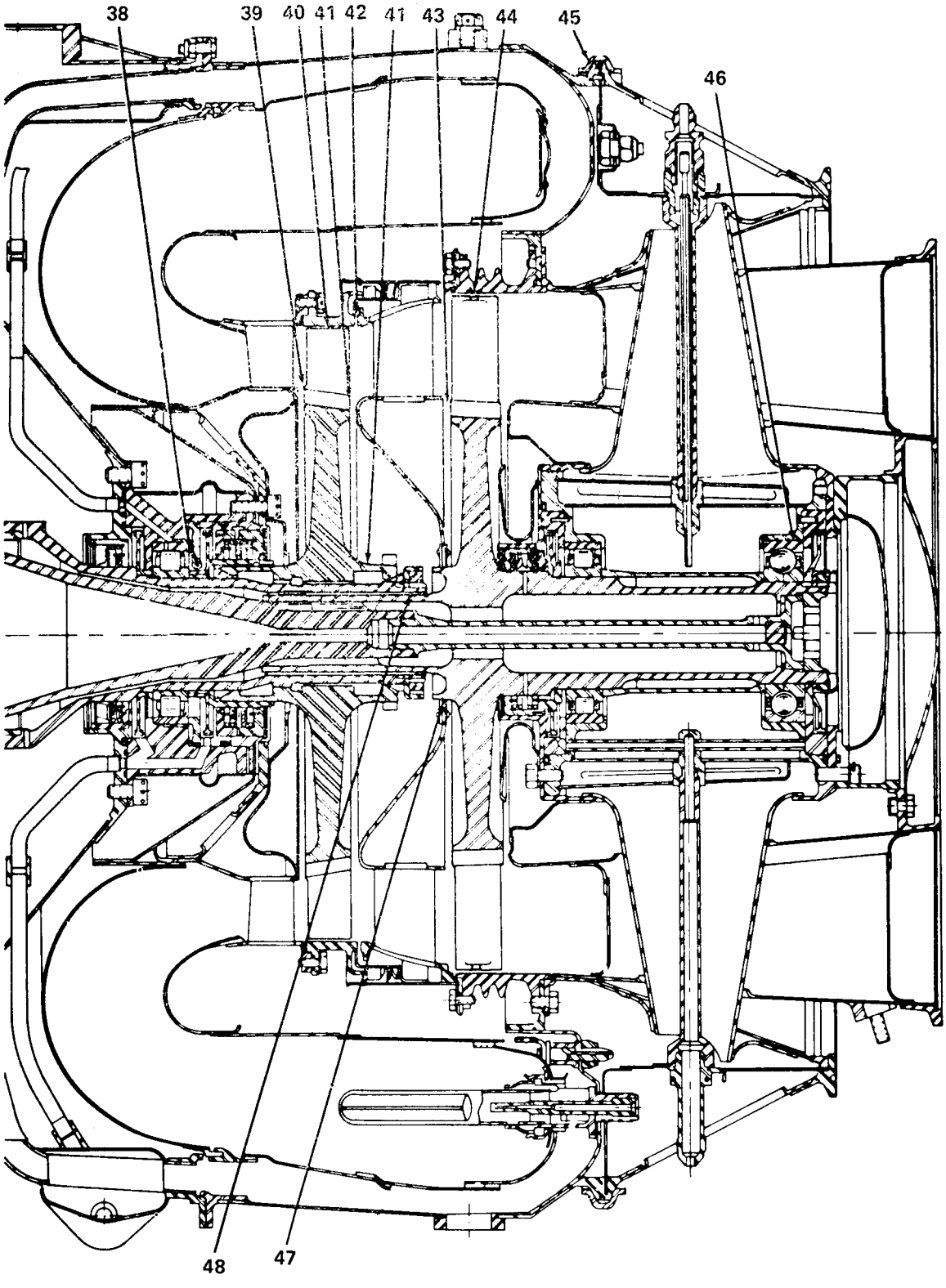


Figure G-5. Fits, Clearances and Backlashes (T53-L-11 Series Engines) (Sheet 4 of 5)

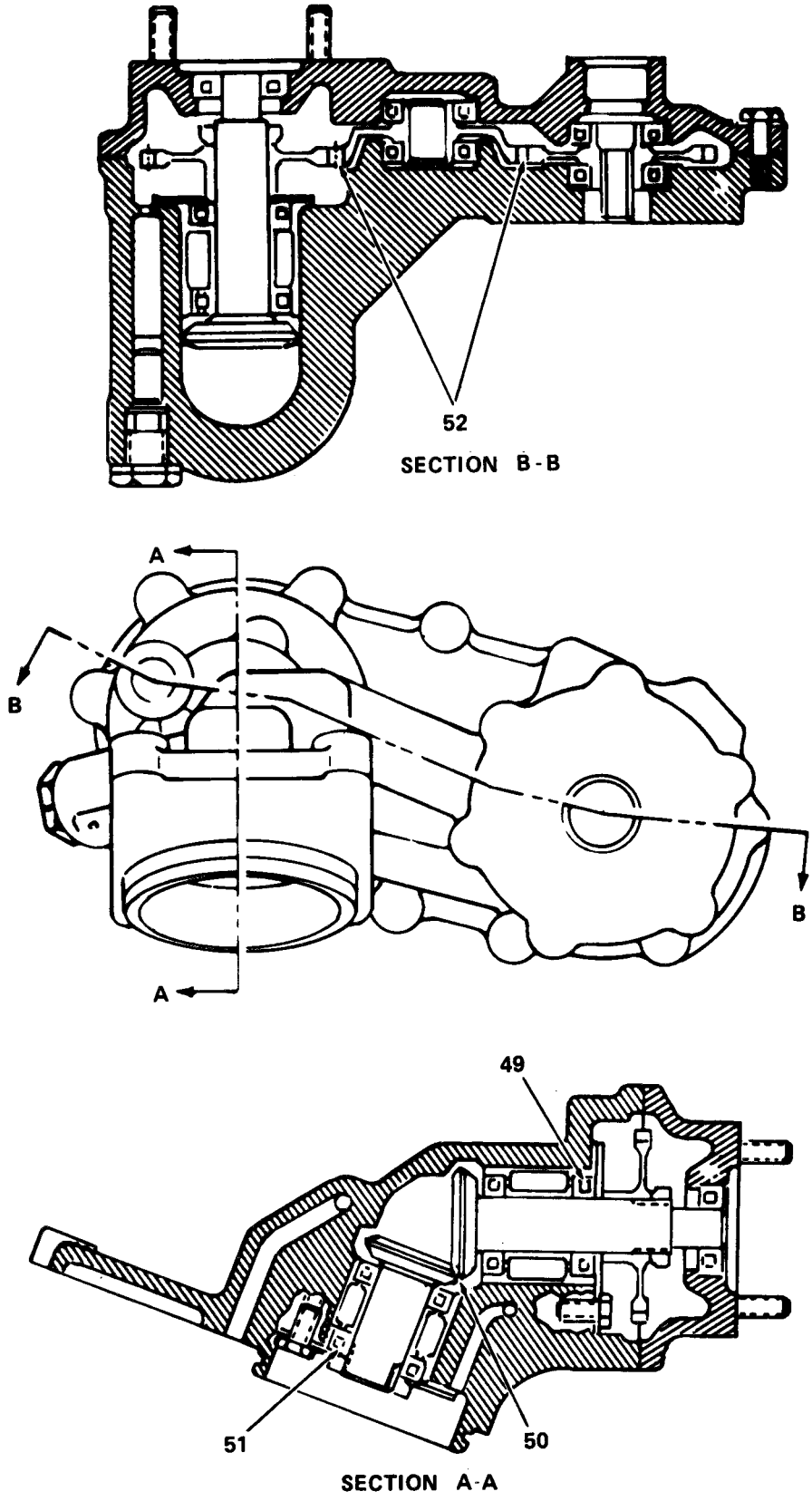


Figure G-5. Fits, Clearances and Backlashes (T53-L-11 Series Engines) (Sheet 5 of 5)

Table G-6. Dimensional Limits (T53-L-13B/703 Engines)

NOTE

Metric equivalent appears in parentheses.

Ref. No.	Fig No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
1	G-6	Sun Gearshaft End Play	Axial	0.020 (0.05 1 cm)	0.046 (0.1 17 cm)
2	G-6	End Play of Planetary Gear Assembly	Axial	0.013 (0.033 cm)	0.048 (0.122 cm)
3	G-6	End Gap Clearance of Front and Rear Torquemeter Seal Rings in Installed Position	Circumferential	0.004 (0.010 cm)	
4	G-6	Dimensional Limits Between Inner Flange of Torquemeter Cylinder and Forward End of Torquemeter Valve Plunger	Axial	0.030 (0.076 cm)	0.034 (0.086 cm)
5	G-6	Dimensional Limits Between Forward Face of Power Shaft and Forward Face of Spur Gear	Axial	2.020 (5.131 cm)	2.040 (5.182 cm)
6	G-6	Backlash Between Accessory Drive and Power Takeoff Driven Gears	Circumferential	0.006 (0.015 cm)	0.012 (0.030 cm)
7	G-6	Pinch Fit Between Bearing and Liner	Axial	0.002 (0.005 cm)	0.004 (0.010 cm)
8	G-6	First Stage Compressor Rotor Blade to Compressor Housing Assembly - Tip Clearance	Radial	0.018 (0.046 cm)	
9	G-6	Clearance Between First through Fifth Stage Vane Assembly ID to Compressor Rotor Spacer OD	Radial	0.026 (0.066 cm)	
10	G-6	Second Stage Compressor Rotor Blade to Compressor Housing Assembly - Tip Clearance	Radial	0.018 (0.046 cm)	
11	G-6	Third through Fifth Stage Compressor Rotor Blade to Compressor Housing Assembly - Tip Clearance	Radial	0.024 (0.061 cm)	
11	G-6	Fourth Compressor Rotor Blade to Compressor Housing - Tip Clearance (1-1 00-070-04/05 Housings Only)	Radial	0.020 (0.051 cm)	
12	G-6	Exit Guide Vane Assembly to Fifth Stage Insert Gap	Axial	0.000 (0.000 cm)	0.010 (0.025 cm)

Table (G-6. Dimensional Limits (T53-L-13B/703 Engines) - Continued

Ref No.	Fig. No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
13	G-6	Clearanace Between Centrifugal Compressor Impeller Assembly (Forward End of Impeller Blade) and Impeller Housing Assembly	Radial	0.017 (L-13B) 0.023 (L-703)	
14	G-6	Clearance Between Centrifugal Compressor Impeller Assembly (Midpoint of Impeller Blade) and Impeller Housing Assembly	Radial-Axial	0.037 (0.094 cm) (L-13B) 0.041 (0.084 cm) (L-703)	0.051 0.130 cm)
15	G-6	Clearance Between Centrifugal Compressor Impeller Assembly (Rear End of Impeller Blade)	Axial	0.062 (0.142 cm)	
16	G-6	Clearance Between Shroud Ends of Mating Compressor Vane Assemblies	Circum-ferential	0.003 (0.008 cm)	
17	G-6	Clearance Between Exit Guide Vane Assembly and Impeller Housing Assembly	Axial	0.000 (0.000 cm)	
18	G-6	Clearace Between Fifth Stage Compressor Rotor Disk Assembly and Exit Guide Vane Assembly	Axial	0.040 (0.102 cm)	
19	G-6	Cearance Between Fourth Stage Compressor Vane Assembly and Fifth Stage Compressor Rotor Disc Assembly	Axial	0.040 (0.102 cm)	
20	G-6	Clearance Between Fourth Stage Compressor Rotor Diet Assembly and Fourth Stage Compressor Vane Assembly	Axial	0.040 0.102 cm)	
21	G-6	Clearance Between Third Stage Compressor Vane Assembly and Fourth Stage Compressor Rotor Diet Assembly	Axial	0.040 0.102 cm)	
22	G-6	Clearance Between Third Stage Compressor Rotor Disc Assembly and Third Stage Compressor Vane Assembly	Axial	0.040 0.102 cm)	
23	G-6	Clearance Between Second Stage Compressor Vane Assembly and Third Stage Compressor Rotor Disc Assembly	Axial	0.040 0.102 cm)	

Table G-6. Dimensional Limits (T53-L-13B/703 Engines) - Continued

Ref No.	Fig. No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
24	G-6	clearance Between Second Stage Compressor Rotor Disc Assembly and Second Stage Compressor Vane Assembly	Axial	0.040 (0.102 cm)	
25	G-6	Clearance Between First Stage Compressor Vane Assembly and Second Stage Compressor Rotor Disc Assembly	Axial	0.040 (0.102 cm)	
26	G-6	Clearance Between First Stage Compressor Rotor Disc Assembly and First Stage Compressor Rotor Disc Assembly	Axial	0.040 (0.102 cm)	
27	G-6	Clearance Between First Stage Turbine Nozzle Assembly and First Stage Gas Producer Turbine Rotor Assembly	Axial	0.095 (0.241 cm) L13B/703	0.120 (0.305 cm) L13B/703
28	G-6	Runout Just Inboard of First Stage Gas Producer Turbine Rotor Blade Roots	Axial		0.004 TIR (0.010 cm)
29	G-6	First Stage Gas Producer Turbine Rotor Blade to First Stage Turbine Nozzle Assembly Cylinder Flange - Tip Clearance	Radial	0.020 (0.051 cm)	
30	G-6	Clearance Between Fit Stage Gas Producer Turbine Rotor Assembly and Second Stage Turbine Nozzle	Axial	0.080 (0.203 cm)	0.105 (0.267 cm)
31	G-6	Clearance Between Second Stage Gas Producer Nozzle Assembly and Second Stage Gas Producer Turbine Rotor Sealing Disk	Axial	0.120 (0.305 cm) L13B 0.051 (0.130 cm) (L-703)	0.190 (0.483 cm) 0.128 L13B (0.325 cm) (L-703)
32	G-6	Runout Just Inboard of Second Stage Gas Producer Turbine Rotor Blade Roots	Axial		0.004 TIR (0.010 an)
33	G-6	Second Stage Gas Producer Turbine Rotor Blade to Second Stage Gas Producer Cylinder - Tip Clearance	Radial	0.020 (0.051 cm)	
34	G-6	Clearance Between First Stage Power Turbine Nozzle and Second Stage Gas Producer Cylinder	Axial	0.015 (0.038 cm)	0.238 (0.605 an)
35	G-6	Runout at Second Stage Gas Producer Turbine Rotor Disc Hub Flange	Radial		0.003 TIR (0.609 an)

Table G-6. Dimensional Limits (T53-L-13B/703 Engines) - Continued

Ref No.	Fig. No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
36	G-6	Runout Just Inboard of First Stage Power Turbine Blade Roots	Axial		0.004TIR (0.010 cm)
37	G-6	Clearance Between First Stage Power Turbine Nozzle Shrouded Tip of First Stage Power Turbine Rotor Blades	Axial	0.063 0.160 cm)	0.078 (0.198 cm)
38	G-6	First Stage Power Turbine Rotor Blade to First Stage Power Turbine Nozzle Cylinder - Tip Clearance	Radial	0.025 (0.064 cm)	
39	G-6	Clearance Between First Stage Power Turbine Rotor and Second Stage Power Turbine Nozzle	Axial	0.062 (0.157 cm)	0.077 (0.196 cm)
40	G-6	Second Stage Power Turbine Rotor Blade to Second Stage Power Turbine Nozzle Cylinder - Tip Clearance	Radial	0.025 (0.064 cm)	
41	G-6	End Gap Between V-Band Coupling Assemblies	Circum-ferential	Must be equal on both sides with plus or minus 3/32 inch (2.4 **mm)**	
42	G-6	Clearance Between Second Stage Power Turbine Rotor and Forward Face of Exhaust Diffuser Assembly Inner Cone	Axial	0.070 (0.178 cm)	
43	G-6	Bearing Housing Shoulder to Aft Face of Bearing Outer Race	Axial	0.003T (0.008 cm)	0.006T (0.015 cm)
44	G-6	Power Turbine Spacer OD to Second Stage Power Turbine Nozzle ID	Radial	0.005 (0.013 cm)	
45	G-6	Clearance Between Pin OD and Holes in Combustion Chamber Flange Ring and Spacers	Dia-metrical	0.001L (0.003 cm)	0.005L (0.0013 cm)
46	G-6	Clearance Between First Stage Power Turbine Nozzle ID and Sealing Flange OD	Radial	0.015 (0.038 cm)	
47	G-6	Clearance Between Aft Face of Retaining Nut and Aft Face of Compressor Rotor Rear Stub Shaft	Axial		0.060 (0.152 cm)
48	G-6	Runout at First Stage Gas Producer Turbine Rotor Rear Flange OD	Radial		0.003TIR (0.008 cm)
49	G-6	Pinch Fit Between Bearing and Liner Flange	Axial	0.002 (0.005 cm)	0.004 (0.010 cm)

Table G-6. Dimensional Limits (T53-L-13B/703 Engines) - Continued

Ref No.	Fig. No.	Description	Direction Measured	Minimum (Inches)	Maximum (Inches)
50	G-6	Backlash Between Tachometer Drive Shaftgear and Upper Drive Shaftgear	Circum-ferential	0.004 (0.010 cm)	0.008 0.020 cm)
51	G-6	Pinch Fit Between Bearing and Liner Flange	Axial	0.002 (0.005 cm)	0.004 0.008 cm)
52	G-6	Backlash Between Intermediate Gear and Shaft-gear	Circum-ferential	0.006 (0.015 cm)	0.012 0.030 cm)

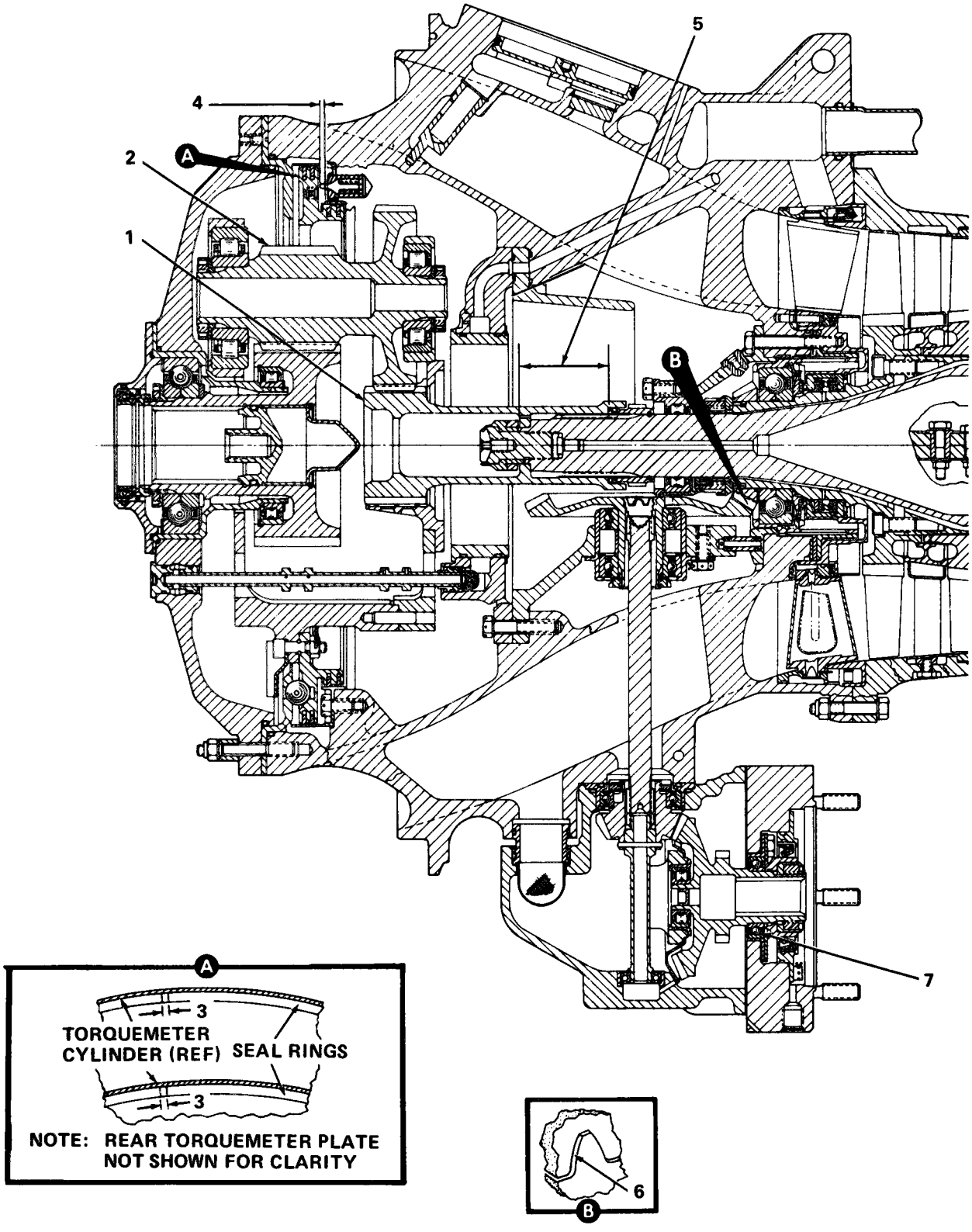


Figure G-6. Fits, Clearances and Backlashes (T53-L-13B/703 Engines) (Sheet 1 of 4)

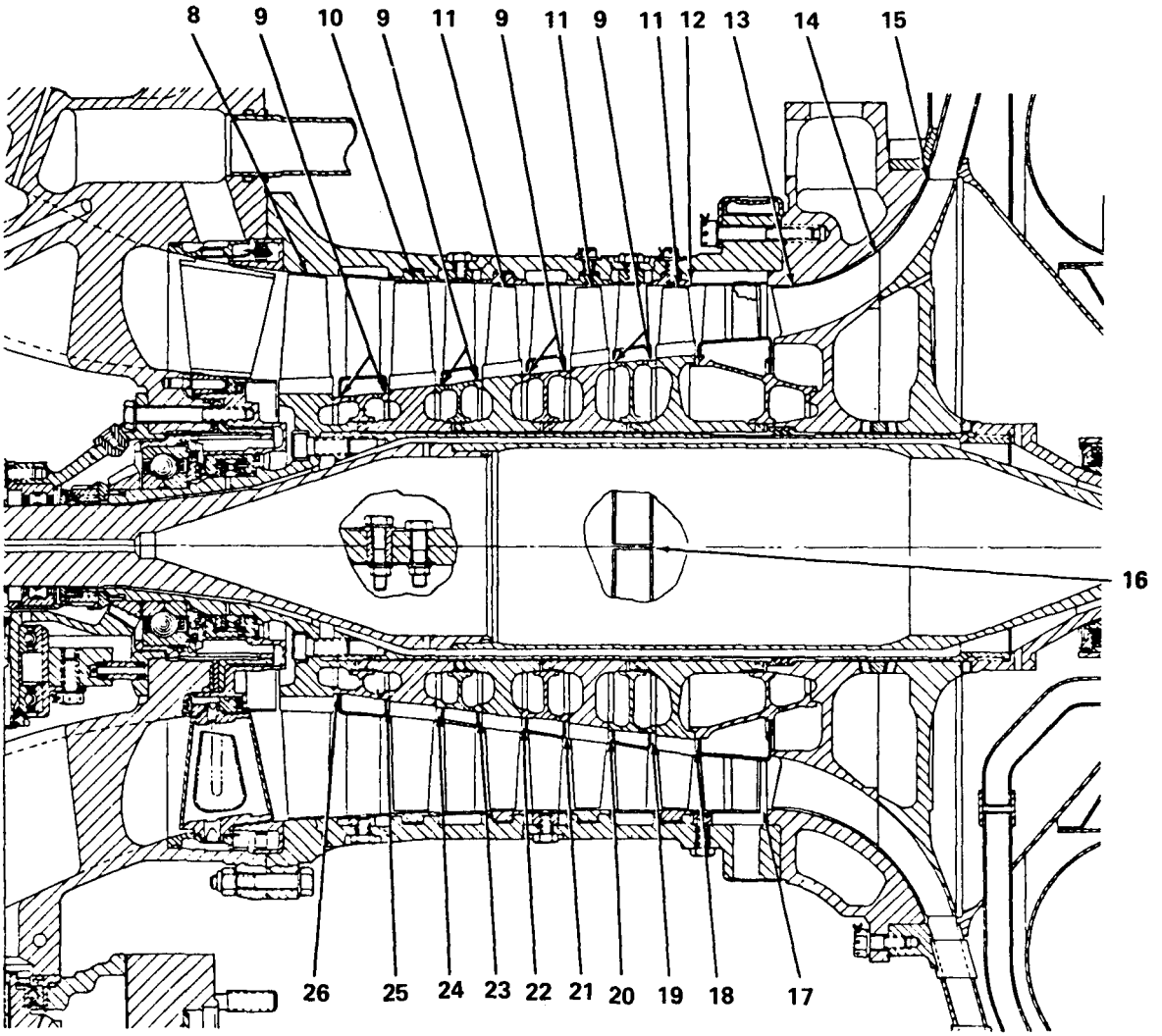


Figure G-6. Fits, Clearance and Backlashes (T53-L-13B/703 Engines) (Sheet 2 of 4)

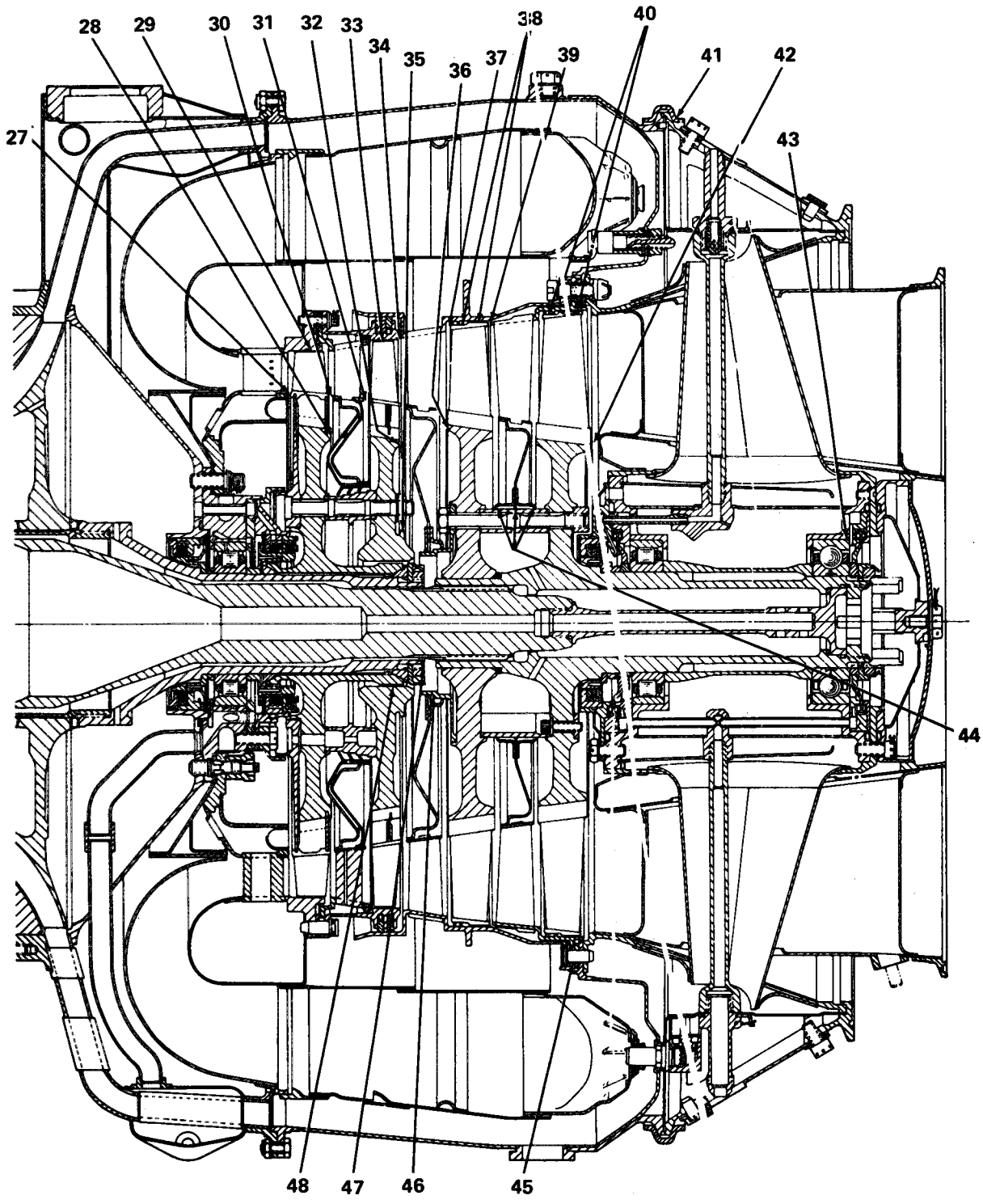


Figure G-6. Fits, Clearance and Backlashes (T53-L-13B/703 Engines) (Sheet 3 of 4)

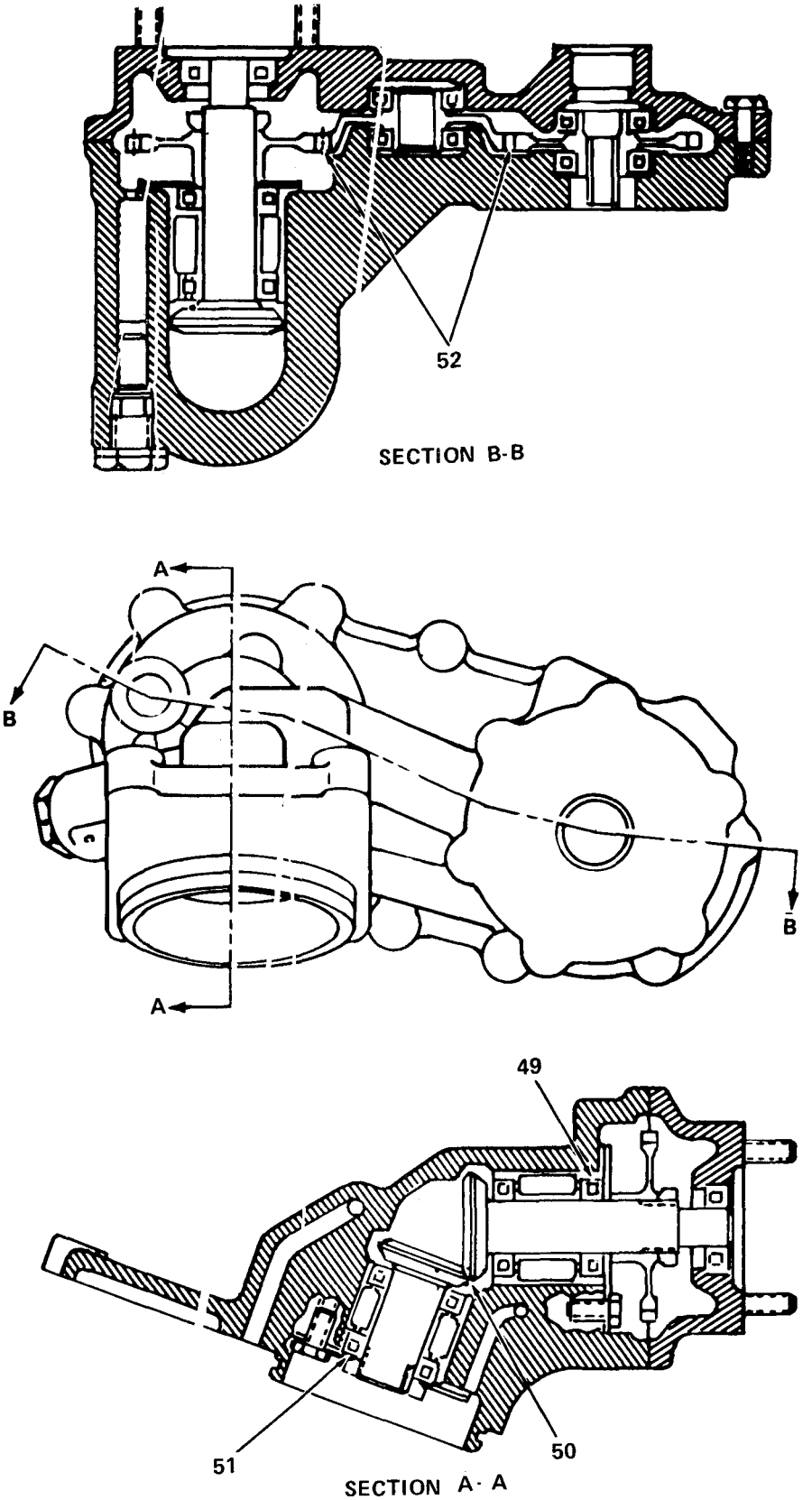


Figure G-6. Fits, Clearances and Backlashes (T53-L-13B/703 Engines) (Sheet 4 of 4)

Table G-7. OVERHAUL, INSPECTION, AND RETIREMENT INTERVALS

NOTE

It is imperative that TEAC and HIT check procedures be followed and accurate baselines be established. The OAT gage shall be in proper calibration to preclude erroneous readings that might affect the accuracy of the TEAC and HIT checks.

Compliance with all engine condition monitoring checks is essential to allow proper quantitative analysis of internal engine conditions.

Area	Overhaul Interval	Inspection* Interval	Retirement Interval	Item and Part Number
		1200		Engine, T53-L-703, 1-000-060-23
5		1200		Engine, T53-L-13B, 1-000-060-22**
		600		Engine, T53-L-13BA, 1-000-060-10A***
			5000	Rotor, Compressor, GA, 1-100-070-07
			1875	Second PT Disc, 1-140-272-04
			4000	First PT Disc, 1-190-009-05
			4575	First GP Seal Disc, 1-100-135-03
			4760	First Stage GP Disc, 1-100-133-01
			9425	Disc and Hub, 1-101-250-04
			12400	Second Stage GP Disc, 1-100-063-05
			14275	GP Spacer, 1-100-294-03
			14275	Front Compressor Shaft, 1-100-495-07
			14275	Rear Compressor Shaft, 1-100-501-01
			14275	Second GP Seal Disc, 1-100-544-03
			14275	First GP Seal Disc, 1-100-545-03
			14275	GP Spacer, 1-100-546-02
			14275	First GP Spacer, 1-100-559-01
			16650	Power Shaft, 1-100-800-04
			16650	PT Spacer, 1-100-169-04
			9425	Disc and Hub, 1-101-250-03

* Time interval at which Hot-End Inspection must be performed.

** (Rebuild Engine).

NOTE

*** The Maximum Allowable Operating Time (MAOT) for engines, T53-L-13A is 2400 hours.

The Time Between Overhaul (TBO) for Engines, T53-L-13B/703 is 2400 hours.

Inspect engine records to determine engine operating hours since last repair at Depot. If no Depot repair exists, use Time Since Overhaul (TSO). If no TSO exists, use total Time Since New (TSN) to establish initial MAOT.

NOTE

Mandatory hot end inspection is at 1200 hours. If the engine has over 1200 hours, implementation of the mandatory hot end inspection will be performed at the next phase inspection of the aircraft T53-L-703 engine.

APPENDIX H

GENERAL MAINTENANCE PRACTICES

H-1. GENERAL INFORMATION

This appendix contains general maintenance instructions and practices for cleaning, inspecting and repairing the engine. Maintenance personnel will become familiar with them before starting any work on the engine or any of the engine subassemblies or components.

H - 2 . Torque Values, Special torque values are referenced in text to Appendix G, table G-3 or G-4. Torque values considered standard for general applications are also listed in Appendix G, table G-2.

H - 3 . Cleaning, Inspection, and Repair. Thoroughly clean and inspect all parts that are removed from engine. Check for loose and missing parts. Note any damage or excessive wear. Repair parts when necessary, but avoid excessive repair not warranted from a safety-of-flight standpoint. Replace parts that cannot be returned to service.

H-4. General Maintenance Procedures - Precautions

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Drycleaning Solvent (item 24, Appendix D)
Penetrating Oil (item 64, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
	NOTE When removing engine components, observe the following precautions.	
1. Engine		**Use** extreme caution to **prevent** dirt and foreign objects from entering engine.
2. Covers	Use temporary covers when performing this action.	**Place** on all exposed openings.
3. Open Hoses and Tubing	This action pertains to all open hoses and tubing. If suitable caps are not available, use commercial grade aluminum foil crimped to fit the particular opening.	**Protect** with plastic or metal caps.
4. Engine	If practical, perform engine maintenance in closed areas.	**Protect** from dust and inclement weather.
5. Engine	Use penetrating oil (item 64, Appendix D).	**Apply** penetrating oil as required to **assist** in removal of parts during disassembly.

WARNING

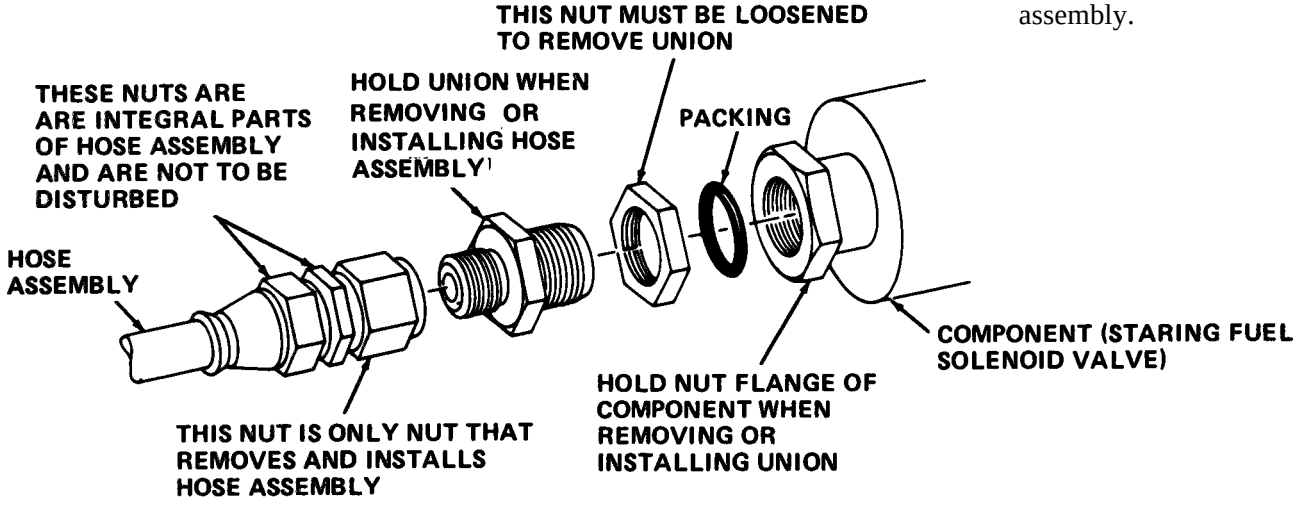
Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Avoid prolonged or repeated breathing of vapors. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

H-4. General Maintenance Procedures - Precautions - Continued

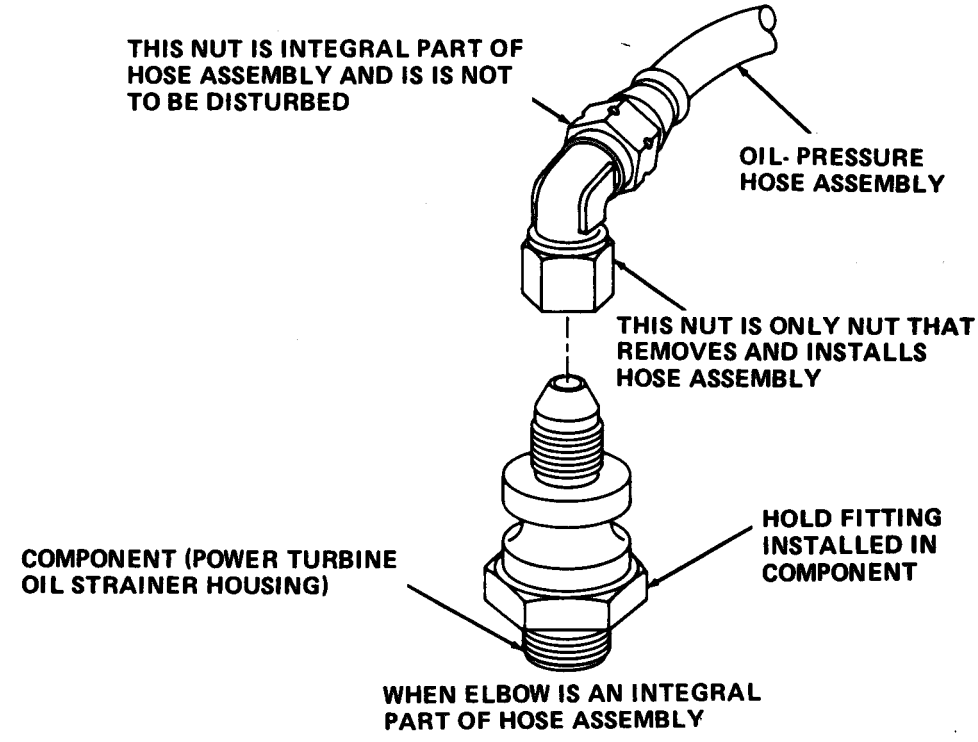
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
6. Parts	Perform this action on parts to be reinstalled. Use drycleaning solvent (item 24, Appendix D).	**Remove** all penetrating oil with drycleaning solvent.
7. Electrical Components		**Insure** electrical power is off before removing.
8. Lockwire		When removing lockwire, **use** care to **prevent** damage to lockwire holes.
9. Lockwire, Packings, Cotter Pins, Gaskets, Tabwashers, Lockpins, Keywashers, and Lockwashers		**Discard** used items.
10. Hoses and Electrical Lines	Perform this action when removing these items. Generally, brackets are left on engine unless otherwise stated.	**Remove** clamps from brackets.
11. Clamps or Brackets	When disconnecting electrical connectors, or hose and tube fittings perform this action.	**Remove** as required to **gain** slack and **avoid** damage to connectors and fittings.
12. Hose Assemblies	Perform this action to hose assemblies that may be damaged during removal of engine components.	**Remove.**
13. Hose Assemblies	Care shall be taken to route and clamp hose assemblies securely. Chafing shall ***be*** avoided at all times. Proper clamping and chafing pads shall be used at all times.	**Avoid** hanging objects (tools, etc.) on hose assemblies.
14. All parts	Perform this action during removal.	**Examine** for serviceability.
15. Leads, Hoses, and Linkages		**Tag** all those that have been removed for proper reinstallation.

H-4 General Maintenance Procedures - Precautions - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
16. (Oil, Fuel, and Air Hose Assemblies	Perform this action when removing or installing these items. Do not apply torque to narrow hex nut of sleeve and nipple. Fitting being tightened to prescribed torques should have dry, clean threads.	**Apply** torque to wide hex nut only. When loosening or tightening the wide hex nut, **secure** nipple or sleeve to prevent twisting of hose assembly.

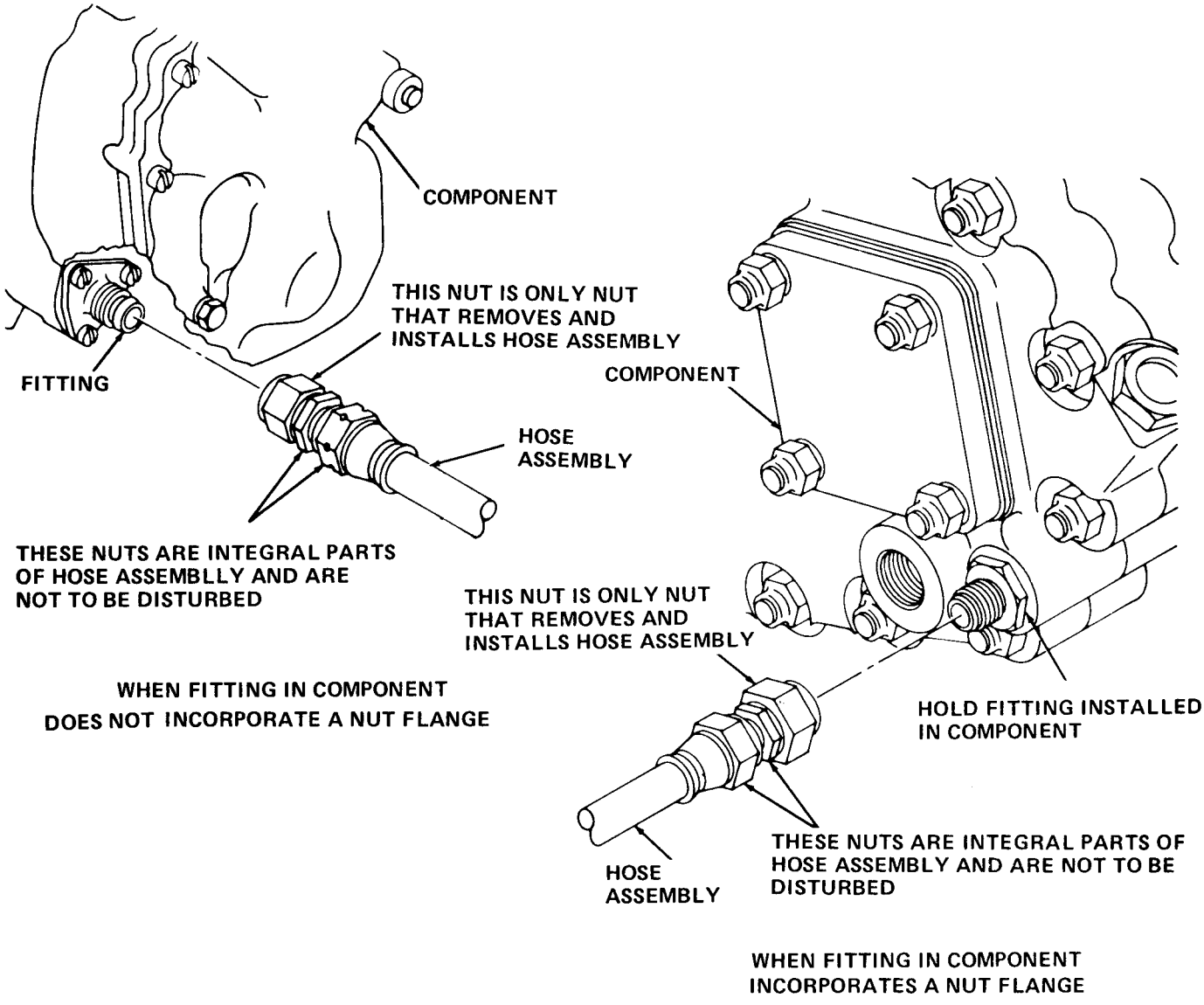


WHEN FITTING IS NOT AN INTEGRAL PART OF HOSE ASSEMBLY



H-4. General Maintenance Procedures - Precautions - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		



17. Protective Tape, Caps, Plugs, and Covers		**Remove** as necessary for installation.
18. Engine	All repairable components without specific shipping instructions shall be adequately preserved and returned for repair using sufficient packing material to avoid additional damage during transit.	

H-5. ENGINE CLEANING. The primary purpose of cleaning is to remove contaminants that might conceal minor cracks and defects, which, if not detected, could eventually lead to failure. Under normal circumstances, engine components will be cleaned only as necessary to perform required inspection and repair. After the use of alternate and/or emergency fuels, cleaning of the internal hot end parts is required to remove the lead oxide deposits. These deposits, if not removed, would be detrimental to engine life and performance. The cleaning methods given in this section are adequate for AVUM or AVIM maintenance.

NOTE

For exterior cleaning of engine refer to TM55-1500-333-24.

Choice of cleaning agent or process will depend upon the engine part to be cleaned and the type of contaminants to be removed. Observe the following precautions for all cleaning operations.

CAUTION

Take particular care in selecting cleaning method to insure that anodizing or dichromating is not removed from surfaces. Do not use caustics on aluminum, magnesium, ceramic-coated, SAC-coated, aluminized, painted, nitrided, or carburized parts.

Wear rubber gloves, boots, apron or coveralls, and face shield or goggles, when working with or near solvents.

Use the least toxic available cleaning materials that will satisfactorily accomplish the work.

Perform all cleaning operations in a well-ventilated area.

Treat accidentally spilled acid immediately, using a sufficient quantity of water or by following manufacturer's prescribed instructions.

Insure that adequate firefighting and safety equipment is conveniently located and readily available to all personnel.

Do not smoke or expose a flame within 50 feet (15.2 meters) of cleaning area.

Insure that vapor-degreasing, solvent immersion, and vapor-blasting soluions are thoroughly removed from parts after cleaning, provided that the solvent is free of contamination.

Do not use a steel brush for any scrubbing operation. Use a stiff bristle fiber brush.

H-5. Engine Cleaning - Continued

LOCATION/ITEM	REMARKS	ACTION

Table H-1 lists the correct cleaning methods to be used on specific detail parts and assemblies not specified in paragraphs 5-18 thru 9-31. The table divides the engine into subassemblies and detail parts. Any special cleaning instructions needed are provided in this table.

WARNING

When handling combustion chamber internal parts that have been exposed to fuels containing tetraethyl lead, insure that the byproduct (poisonous lead oxide) is not inhaled or taken into the body through cuts or other external openings, If accidental exposure occurs, drench affected area with large amounts of clean water and obtain immediate medical attention.

Table H-1. Cleaning of Major Assemblies and Detail Parts

Name	Cleaning Paragraph	Special Instructions
Miscellaneous Hardware (Bolts, Nuts, Brackets)	H-12 or H-6	Clean external threads with fiber brush and flush. Dry with moisture. free compressed air.
Gears	H-12 or H-6	Dry with moisture-free compressed air.
Ball and Roller Bearings	H-12 or H-6	Dry with moisture-free compressed air. Coat with lubricating oil (item 46 or 47, Appendix D). Seal in plastic bag.
INLET HOUSING ASSEMBLY		
Inlet Housing	H-6	
All Other Parts	H-6	

H-5. Engine Cleaning - Continued

Table H-1. Cleaning of Major Assemblies and Detail Parts - Continued

Name	Cleaning Paragraph	Special Instructions
ACCESSORY DRIVE GEARBOX ASSEMBLY		
Accessory Gearbox Housing	H-6	
Accessory Gearbox Cover	H-6	
Gearbox Seals	H-6	
Fuel Control Gearshaft Splines	H-6	
All Other Parts	H-12 or H-6	
OUTPUT REDUCTION CARRIER AND GEAR ASSEMBLY		
All Parts	H-12 or H-6	
OVERSPEED GOVERNOR AND TACHOMETER DRIVE SUPPORT AND GEAR ASSEMBLY		
All Parts	H-12 or H-6	
OIL TRANSFER SUPPORT ASSEMBLY (T53-L-11 Series Engine and T53-L-13B/703 Engines)		
All Parts	H-12 or H-6	
COMPRESSOR ROTOR ASSEMBLY		
All Parts	H-12 or H-6	Brush heavy deposits. Do not clean positive contact seals.
COMPRESSOR AND IMPELLER HOUSING ASSEMBLY		
Compressor Vanes	H-12 or H-6	
All Other Parts	H-6	
COMBUSTOR TURBINE ASSEMBLY		
Combustion Chamber Housing	H-12 or H-6	If necessary, use solvent-immersion method. (Refer to paragraph H-10.)
Combustion Chamber Liner	H-12	If necessary, use solvent-immersion method. (Refer to paragraph H-10.) If further cleaning is required use vapor-blasting (liquid honing) method. (Refer to paragraph H-11.)

H-5. Engine Cleaning - Continued

Table H-1. Cleaning of Major Assemblies and Detail Parts - Continued

Name	Cleaning Paragraph	Special Instructions
COMBUSTOR TURBINE ASSEMBLY (Cent)		
Turbine Nozzle Assembly	H-12	If necessary, use vapor-blasting (liquid honing) method. (Refer to paragraph H-11.)
Power Turbine Cylinder	H-12	If necessary, use vapor-blasting (liquid honing) method. (Refer to paragraph H-11.)
Power Turbine Rotor	H-12	
Fuel Vaporizers (T53-L-11 Series Engines only)	H-10	Fully immerse fuel vaporizers for as long as necessary to soften carbon deposits. Thoroughly clean with a stiff fiber brush, giving particular attention to insides of vaporizer exit legs. Do not use stainless steel brush. Dry with clean, dry compressed air.
Exhaust Diffuser	H-6	If necessary use solvent-immersion method (paragraph H-10.)
Flow Divider (T53-L-13B Series and L-703 Engines only)		Loosen carbon and other foreign material on divider, using a stiff fiber brush. Remove carbon by soaking in trichloroethane (item 83, Appendix D), for 5 minutes. Dry with clean, dry compressed air.
All Other Parts	H-12 or H-6	If necessary use solvent-immersion method outlined in paragraph H-10.
INTERSTAGE BLEED ACTUATOR ASSEMBLY		
All Parts	H-12 or H-6	

H-5. Engine Cleaning - Continued

Table H-1. Cleaning of Major Assemblies and Detail Parts - Continued

Name	Cleaning Paragraph	Special Instructions
GAS PRODUCER NOZZLES, ROTORS, AND ASSOCIATED PARTS		
Turbine Nozzle	H-12	A light vapor-blast, using vapor-blasting (liquid honing) method (paragraph H-11), may be used provided care is taken not to damage coating.
Turbine Rotor	H-12	A light vapor-blast, using vapor-blasting (liquid honing) method (paragraph H-11), may be used.
All Other Parts	H-12 or H-6	On seal, use drycleaning solvent method only. (Refer to paragraph H-6.)
SECOND STAGE TURBINE SUPPORT ASSEMBLY		
All Parts	H-12 or H-6	If necessary, use solvent-immersion method (paragraph H-10) for any aluminum-painted parts.
OVERSPEED GOVERNOR AND TACHOMETER DRIVE ASSEMBLY		
Housing	H-6	
Cover	H-6	
Seal	H-6	
All Other Parts	H-12 or H-6	

H-6. Drycleaning Solvent

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Drycleaning Solvent (item 25, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
	WARNING **Drycleaning solvent P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Avoid prolonged or repeated breathing of vapors. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C). Wear rubber gloves and use handcream to prevent contact with skin.**	
1. All Metal Parts	All metal parts maybe cleaned with drycleaning solvent (item 25, Appendix D). This method is suitable for removing heavy oil and grease deposits from most parts, including flexible hoses and carbon oil seals.	**Clean** with drycleaning solvent.
	CAUTION **Drycleaning solvent shall be changed periodically to prevent contamination.** **Do not use a wire brush. Do not brush carbon seals.**	
2. All Metal Parts		**Immerse** in a tank containing solvent. **Scrub** with a stiff-bristled fiber brush.

H-6. Drycleaning Solvent - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued	**NOTE** In a spraying booth, parts may be cleaned with atomized drycleaning solvent under an air pressure of 60 to 90 psi (4.22 to 6.32 Kg/sq cm). Spray a second time to remove residue loosened by scrubbing,	
3. All Metal Parts		**Dry** using moisture-free compressed air.
4. Tank		**Cover** tank when not in use.
	NOTE Drycleaning solvent will leave an oily film that will protect steel parts from corrosion for a short period of time.	

H-7. Corrosion Protection After Cleaning. Unprotected metal surfaces of components, which have been cleaned and are to be stored, will be preserved and protected against corrosion in accordance with paragraph H-8.

H-8. Removing Fingerprints After Cleaning Machined Surfaces

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Corrosion-Preventive Fingerprint Remover (item 19, Appendix D)
Drycleaning Solvent (item 25, Appendix D)
Lubricating Oil (item 46 or 47, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
	NOTE Fingerprints shall be removed from all machined surfaces to prevent corrosion.	
1. Previously Cleaned Parts		**Immerse** in corrosion-preventive fingerprint remover (item 19, Appendix D). **Agitate** solution for a minimum of 2 minutes.
	WARNING **Drycleaning solvent P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Avoid prolonged or repeated breathing of vapors. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C). Wear rubber gloves and use handcream to prevent contact with skin.**	
	CAUTION **When removing parts from fingerprint remover in following action for item 2, do not touch the machined surfaces.**	
2. Parts		**Remove** parts from fingerprint remover. **Rinse** using drycleaning solvent (item 25, Appendix D).

H-8. REMOVING FINGERPRINTS AFTER CLEANING MACHINED SURFACES - Cont.

LOCATION/ITEM	REMARKS	ACTION
ENGINE/-Continued	**WARNING** Prolonged contact with lubricating oil (item 46 or 47), Appendix D) may cause a skin rash. Those areas of skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be adequately ventilated to keep mist and fumes to a minimum.	
3. Parts	If parts are not to be reassembled within a short period of time, perform this action.	**Coat** parts with lubricating oil (item 46, or 47, Appendix D). **Cover** all unprotected openings with caps, plugs, or suitable covers. **Package** components individually in a plastic bag.

H-9. NONRIGID HOSES - CLEANING

INITIAL SETUP

Applicable Configuration
A l l

Consumable Materials
Trichloroethylene (item 84, Appendix D)

LOCIATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Hoses and Fittings	Use trichloroethylene (item 84, Appendix D).	**Clean** with trichloroethylene and **dry** thoroughly.
2. Hoses		**Blow** out hoses with low pressure (25 psi to 40 psi) (1.76 Kg/sq cm to 2.8 Kg/sq cm) compressed air, when available, to insure that hoses are free from obstructions and completely dry.

H-10. Solvent - Immersion

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Carbon Removing Compound (item 12, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. All Steel and Stainless Steel Parts	In solvent-immersion cleaning method, carbon removing compound (item 12, Appendix D) is used to remove carbon, gum, grease, and other surface contaminants, (except rust and corrosion), from all steel and stainless steel parts. **WARNING** **Insure that cleaning area is well-ventilated. Operators should wear protective clothing and goggles. If carbon removing compound comes in contact with skin, eyes, or clothing, flush area with running water.** **CAUTION** **Do not clean enamel finishes with carbon removing compound. Such finishes are attacked by this compound.**	**Clean** using solvent-immersion method.
2. All parts		**Remove** all grease, dirt, and oil by **vapor-degreasing.**
3. Cleaning Tank		**Fill** with carbon removing compound (item 12, Appendix D.) **Add 2-**inch water seal to prevent evaporation ‘of carbon removing compound.

H-10. Solvent - Immersion - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
4. All Steel and Stainless Steel Parts		**Immerse** in carbon removing compound below water seal. Allow part to **soak** for as long as necessary to **remove contaminants.**
5. All Steel and Stainless Steel Parts		**Raise** from tank and **allow** to **drain.**
6. All Steel and Stainless Steel Parts		**Rinse** in cold water to **remove** foreign deposits, then **rinse** in hot water.
7. All Steel and Stainless Steel Parts		**Allow** to **air-dry.**

H-11. Vapor-Blasting (Liquid Honing)

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Novahone 325 (item 60, Appendix D)
Tape (Type I) (item 79, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
COMBUSTOR TURBINE/	**NOTE** Vapor-blasting is an abrasive method used to clean combustor parts. Insure that metal is not removed during cleaning and that cooling slots, holes, ridges, and overlap areas do not become clogged with grit. Use Novahone 325 (item 60, Appendix D). **CAUTION** **Vapor-blasting shall not be used on magnesium or aluminum parts or on parts having a ceramic coat or other form of mating. Compressor rotor blades shall not be vapor blasted.**	

H-11. Vapor-Blasting (Liquid Honing) - Continued

COMBUSTOR TURBINE/ - Continued

CAUTION

Protect critical diameters and other finished surfaces with tape, Type I (item 79, Appendix D). A separate cleaning unit shall be used to clean parts that have lead contamination. Do not use this cleaning unit for any parts that do not have lead contamination.

1. Combustor Parts		**Vapor-grease.**
2. Combustor Parts		**Place** into cleaning unit. **Arrange** into positions suitable for blasting.
	NOTE When vapor-blast slurry is new, cleaning will be faster and cleaned surfaces slightly rougher. As the abrasives in the slurry are reused, natural wear creates finer sizes that clean more slowly and leave smoother surfaces. Optimum nozzle distance is 1 1/2 inches to 2 1/2 inches (3.81 cm to 6.35 cm) from parts to be cleaned.	
3. Vaporized Stream	Use vapor-blast slurry at pressure of 40-psi (2.81 kg/sq cm) and nozzle with 1/4 inch opening.	**Direct** vaporized stream back and forth across surfaces of parts being cleaned.
4. Combustor Parts		**Remove** from cleaning unit. **Rinse** thoroughly in cold water.

WARNING

Because of the toxicity of some deposited material, keep both part and brush wet with soap and water to prevent dust from becoming airborne.

H-11. Vapor-Blasting (Liquid Honing) - Continued

LOCATION/ITEM	REMARKS	ACTION
COMBUSTER TURBINE/ - Continued	**CAUTION** **Do not scrub parts with a steel brush in following action for item 5.**	
5. All Remaining Contaminants		**Remove** all remaining contaminants by **hand-scrubbing** with a stiff-bristled fiber brush.
6. Parts	To remove loose particles that may remain from vapor-blasting, perform this action.	**Rinse** parts in a running water bath heated to 190°F to 212°F (88°C to 100°C).

H-12. Vapor-Degreasing

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Trichloroethylene (type II) (item 84, Appendix D)
Perchloroethylene (item 65, Appendix D)
Corrosion-Preventive Compound (item 17, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Unpainted Metal Parts or Aluminum Painted Steel Parts	Vapor decreasing, using heated trichloroethylene, Type II (item 84, Appendix D) or perchloroethylene, (item 65, Appendix D) will remove oil, grease, and sludge. The hot vapor condenses on metal surfaces, liquefies, and carries away the oil, grease, and sludge. Parts may be flushed while held in the vapor. **CAUTION** **This process is used only on unpainted metal parts or aluminum-painted steel parts.**	Clean with vapor degreasing method.

H-12. Vapor-Degreasing - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Degreaser		**Fill** with trichloroethylene or perchloroethylene to approximately 4 inches (10.2 cm) above the heating coils.
3. Degreaser		**Heat** to an operating temperature of 188°F (87°C) for trichloroetylene or 250°F (121°C) for perchloroethylene.
4. Parts	Do not use insulated basket when performing this action unless insulation material is resistant to degreaser solvent.	**Place** parts in a basket, and **lower** basket into degreaser tank, **allowing** vapors to condense.
5. Parts	Allow parts to remain in vapor until they have reached the temperature of the vapor. When vapors cease to condense on parts perform this action.	**Direct** the spray away from the nozzle at the parts; **hold** tip of nozzle below vapor level.
	CAUTION **To prevent corrosion, do not remove parts from solvent vapors until they have reached the temperature of the vapor. Parts removed from vapor zone will dry immediately because of the heat of the metal and volatility of the solvent.**	
6. Basket		**Raise** basket at the rate of approximately 10 feet (3 meters) per minute maximum, and **allow** parts to **drain** and **dry** completely while **holding** basket in area above vapor level.

H-12. Vapor-Degreasing - Continued

LOCATIOWITEM	REMARKS	ACTION
ENGINE/ - Continued	**CAUTION** **Vapor-degreased, noncorrosion resistant parts that have breaks in their surface finishes are highly susceptible to corrosion even in a moderate dry atmosphere. When parts are not to be processed further, immediately treat them with corrosion-preventive compound (item 17, Appendix D), after vapor-degreasing.** If further decreasing is required, allow parts to cool and repeat the decreasing procedure.	

H-13. Magnesium and Magnesium Alloys - Touchup Procedure

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Smooth Stone
Crocus Cloth (item 21, Appendix D)
Methyl-Ethyl-Ketone (item 56, Appendix D)
Acetone (item 1, Appendix D)
Sodium Bichromate (item 76, Appendix D)
Nitric Acid (item 59, Appendix D)
Zinc-Chromate Primer (item 96, Appendix D)
Enamel (item 27, Appendix D)
Aluminum Oxide 180-320 Grit (item 98, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**WARNING** **All repair of Magnesium Thorium alloy (MG-TH) will be done in accordance with Nuclear Regulatory Commission source material license number "STB-1433" issued to AVSCOM.**	

H-13. Magnesium and Magnesium Alloys - Touchup Procedure - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued	**CAUTION** **When performing following action for item 1, the blend must be smooth and continuous to minimize possible stress-concentration areas.**	
1. Surrounding Metal	Use a smooth stone or crocus cloth (item 21, Appendix D) or abrasive paper, Aluminum Oxide 180-320 grit (item 98, Appendix D).	**Blend** nicks, scratches, or reworked areas to surrounding metal.
2. Powdery Corrosion Scale	Use a stiff fiber brush.	**Remove** by brushing.
3. Area To Be Touched Up	Use methyl-ethyl-ketone (item 56, Appendix D) and acetone (item 1, Appendix D).	**Clean** with methyl-ethyl-ketone followed by acetone. **Allow** 15 minutes for area to **dry** thoroughly.
	NOTE Surrounding areas not requiring touch-up shall be masked or shielded.	
	WARNING **Liquid nitric acid (used in action for item 4) and its vapors are a hazard to personnel. Avoid contact with skin, eyes, or clothing. Avoid inhalation of vapors. In case of contact with skin or eyes, immediately flush with warm water for 15 minutes and get medical attention.**	
4. Chrome Pickle Solution	Use cotton swab for application of solution. Chrome pickle solution consists of 1.5 pounds (0.67 kg) sodium bichromate (item 76, Appendix D) and 1.5 pints (0.7095 liter) nitric acid (item 59, Appendix D) with a specific gravity of 1.42 to one gallon (3.785 liters) of water at ambient temperature.	**Apply** locally to exposed area. **Allow** solution to **remain** on surface for 2 to 5 minutes; then **rinse** thoroughly with cold water. **Dry** with clean dry cloth.
5. Parts	Use 500-watt heat lamp or equivalent.	**Dry** for 10 to 15 minutes.

PREFERRED METHOD

6. Epoxy Sealant	**NOTE** **Do not intermix epoxy sealant materials.**	**a. Mix one of the epoxy sealants as outlined in table.**

PIGMENTED EPOXY SEALANTS

Nomenclature	Part Number	Manufacturer	Special Instructions
Beige Epoxy	E4634, Component A	Armitage 460 Bostwick Ave. Bridgeport, CT 06605	Mix equal parts by volume and and allow to stand for 1/2 hour. Restir before use.
Beige Epoxy	E4634, Component B		
Gray Epoxy	IP9158 A and B	Indestructible Paint 66 Erna Ave. Milford, CT 06460	
Beige Epoxy	S-3612 (Synthetesine 200 Base) 806	Valspar Inc. 2000 Westhall St. Pittsburgh, PA 15233	Mix equal parts by volume.
Thinner	T336		
Gray Epoxy	S-3612 (Synthetesine 200 Base) 810	Valspar Inc. 2000 Westhall St. Pittsburgh, PA 15233	Mix equal parts by volume.
Thinner	T336		

CLEAR EPOXY SEALANTS

Nomenclature	Part Number	Manufacturer	Special Instructions
Epoxy	Epon 828 Resin	Miller-Stephenson Chemical Co. Danbury, CT	Mix 100 parts epon resin to 12 parts diethylenetramine hardener.
Hardener	Triethylometetramine or diethylenetramine		Mix 100 parts epon resin to to 13 parts triethylometramine hardener.
Clear Synthetic Thinner	4-56 4-111	Reliance Varnish Co. Chicago, IL	Mix equal parts.
Clear Baking Epoxy	IP9039	Indestructible Paint 66 Erna Avenue Milford, CT 06460	

H-13. Magnesium and Magnesium Alloys - Toucup Procedure - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/- Continued		
	Thickness shell blend smoothly with original coating	b. Using a paint brush, **apply** epoxy sealant to exposed areas..
		c. **Remove** masking or shielding.
	CAUTION **In following action d., a relative humidity greater than 65 percent may impair the curing process**	
	NOTE **A 250-watt reflector heat lamp placed 2 to 4 inches from the epoxy surface will cure the epoxy in approximately 3 hours, provided the surface temperature reaches 120°F (49°C) by the end of the cure cycle.**	
	Refer to above NOTE if heat lamp is available.	d. **Cure** epoxy at 70°F (21°c) for a minimum of 24 hours
	ALTERNATE METHOD	
7. Engine		**Apply** enamel coating as follows:
		a. **Apply** a coat of zinc-chromate primer (item 96, Appendix D). Allow primer to dry.
		b. **Apply** engine gray, aircraft gray, olive drab, gloss black, aircraft cream or light green enamel (item 27, Appendix D).

H-14. Black Oxide Finished Parts - Touchup

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Gun Blueing (item 35, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Black Oxide Finished Parts	Use gun blueing (item 35, Appendix D) to perform this action.	**Touch up** repaired areas.

H-15. Painted Surfaces - Refinishing

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Chemical Film (item 15, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**NOTE** Refinishing of anodized aluminum parts is not required, provided that all paint has been removed and anodizing is neither damaged and/or destroyed.	
1. Aluminum	Use chemical film (item 15, Appendix D) for refinishing.	**Spot refinishing** is permissible.
2. Scratched or Exposed Painted Areas	Areas shall be protected with chemical film.	**Spot-paint** to prevent surface corrosion.

H-16. Aluminum and Aluminum Alloys - Chemical Film Procedure

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Trichloroethylene (item 84, Appendix D)
Zinc-Chromate (item 95 or 96, Appendix D)

References
MIL-C-5541
Para H-14

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	The following procedure applies to parts that are to be touched up. Apply chemical film coat in accordance with Military Specification MIL-C-5541 and the following procedures.	
	CAUTION **If chemical film is left on exposed areas for more than 6 minutes, a loose powdery coating will form, resulting in poor metal protection.**	
1. All Areas to be Touched Up		**Clean** using trichloroethylene (item 84, Appendix D).
	NOTE Temperature of rinse water in following action for item 2, must be below 160°F (71°C).	
2. Scratched Areas	Use a cotton swab to apply chemical ‘film.	**Apply** chemical film to scratched areas. **Allow** trichloroethylene to remain on area for 3 to 6 minutes, then **rinse** quickly with hot water.
3. All Parts		**Dry** with dry, oil-free compressed air.
4. Touched Up Area	Perform this action if part was previously painted. Use zinc-chromate (item 95 or 96, Appendix D).	**Apply** zinc-chromate primer to the touched up area.
5. Touched Up Areas	Apply engine gray epoxy to the touched up areas as outlined in paragraph H-14.	**Air-dry** or use infrared lamp to **force-dry** quickly on humid days.

H-17. Aluminum - Painted Steel Parts - Touchup Procedures

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Toluene (item 80, Appendix D)
Grit Sandpaper No. 320 (item 71, Appendix D)
Paint (item 8, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**NOTE** To insure successful touchups, area to be painted must be thoroughly cleaned.	
1. Areas to be Painted	Use toluene (toluol) (item 80, Appendix D) to clean areas.	**Clean** to remove contaminants.
2. Areas to be Painted	Use grit sandpaper No. 320 (item 71, Appendix D).	Lightly **abrade** areas. **Use** wet or dry sandpaper with a grit depending on surface conditions.
3. Areas to be Painted	Use paint (item 8, Appendix D).	**Apply** light even coat. **Air-dry or use infrared** lamp to **force-dry** quickly on humid days.

H-18. Engine Inspection. A close and complete inspection is important to insure engine life and maximum performance. Check for foreign object damage. Remove upper compressor half when F.O.D. is evident, no matter how minor. Check for loose or missing parts, and inspect any engine component that has been worn or damaged. Inspection and repair shall be made only where safety-of-flight is affected, or where such repair will add to total life of part. Sound judgement must be exercised by inspection personnel to avoid excessive repair not warranted from safety-of-flight standpoint.

All inspection procedures should be carried out in a lighted, clean, dust- and dirt-free room. Benches should be covered with clean, dry paper to keep previously cleaned parts free of dirt and dust. All parts should be suitably tagged to indicate necessary repair or replacement. Although parts will require only visual inspection, a certain number require use of micrometers or special gages. Deepseated damage may be inspected by magnetic-particle or fluorescent-penetrant inspection methods. Methods of inspection for specific components are stated in text.

H-19. Magnetic-Particle Inspection

INITIAL SETUP

Applicable Configuration
All

References
TM43-0103

The magnetic-particle inspection method detects cracks, voids, pits, subsurface holes, and other discontinuities. The method is applicable only to ferrous magnetic steel and has no effect on non-ferrous materials. The equipment shall be capable of detecting harmful defects using specific amperage for the particular parts. Procedures are covered in TM 43-0103, Nondestructive Inspection Methods.

NOTE

Inspection by magnetic-particle method is not required unless specified in detailed inspection paragraphs.

Table H-2 lists magnetic-particle inspection requirements.

Table H-2. Magnetic-Particle Inspection Requirements

Part Name	Item	AMPERAGE AND MAGNETIZATION: Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR	Method WC
Overspeed Governor and Tachometer Drive Assembly						
Tachometer Drive Shaft-gear	1	700/900		5000	x	
Tachometer Shaftgear	2	700/900		5000	x	
Overspeed Governor and Tachometer Drive Intermediate Gear	3	700/900		5000	x	x

Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR WC
Overspeed Governor Drive Shaft gear	4	700/900		5000	X
Upper Drive Shaft gear	5		700/900	5000	X
Spline Shaft	**6**	**700/900**		**5000**	**X**

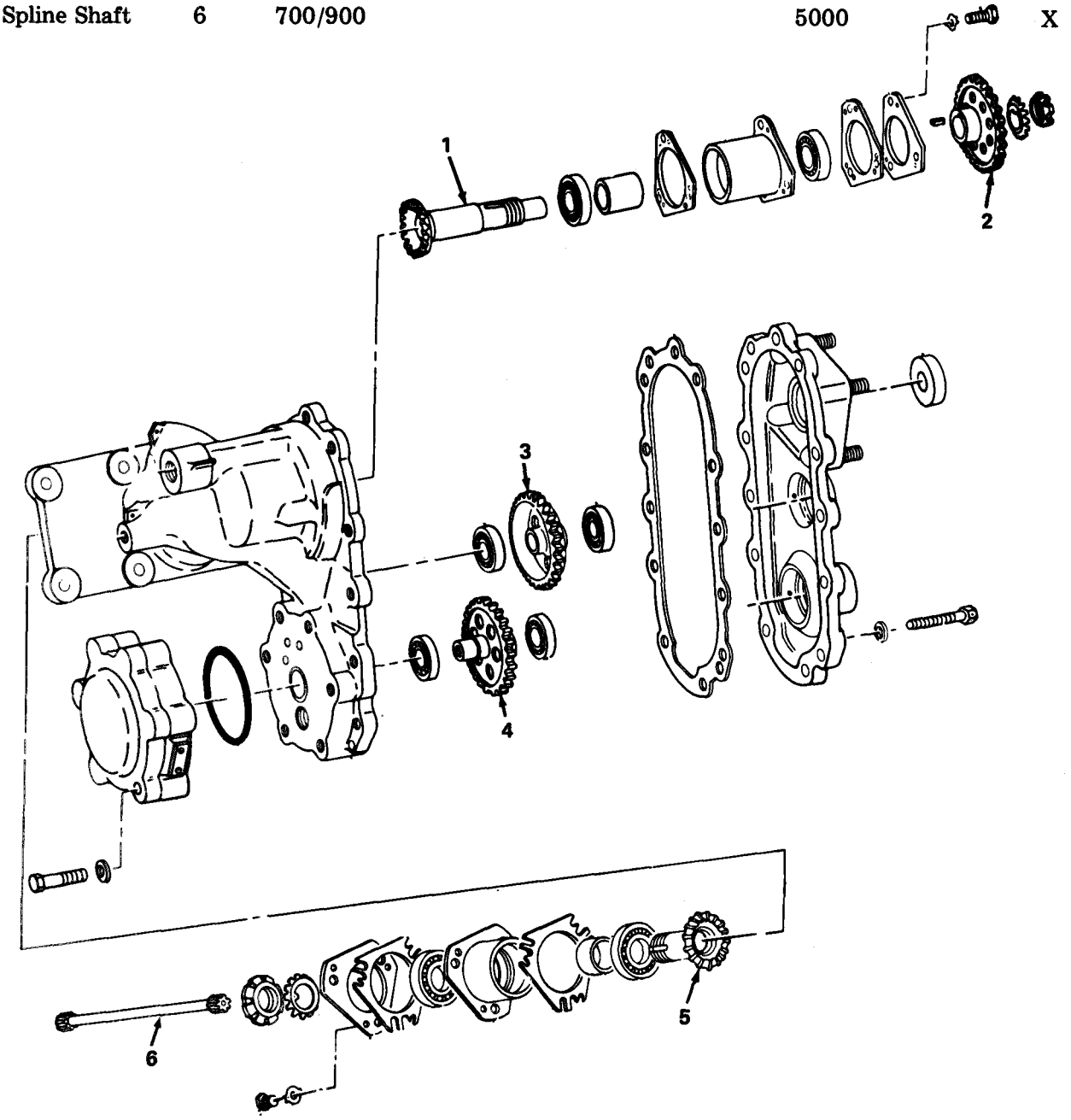


Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR	Method WC
		Accessory Drive Gearbox Assembly				
Spacer		500				X

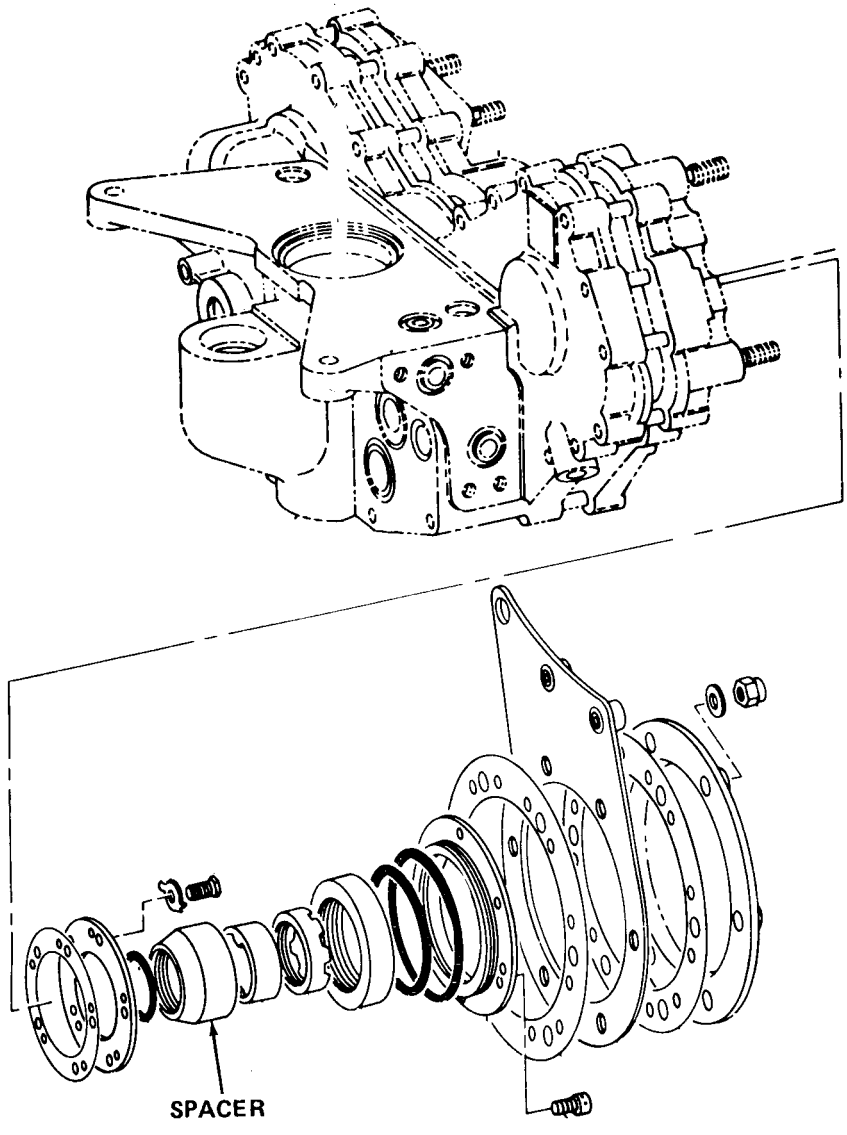


Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR	Method WC
Output Reduction Carrier and Gear Assembly						
Plug	1		500/700	4000	X	
Output GearShaft	2	700/900		5000	X	X

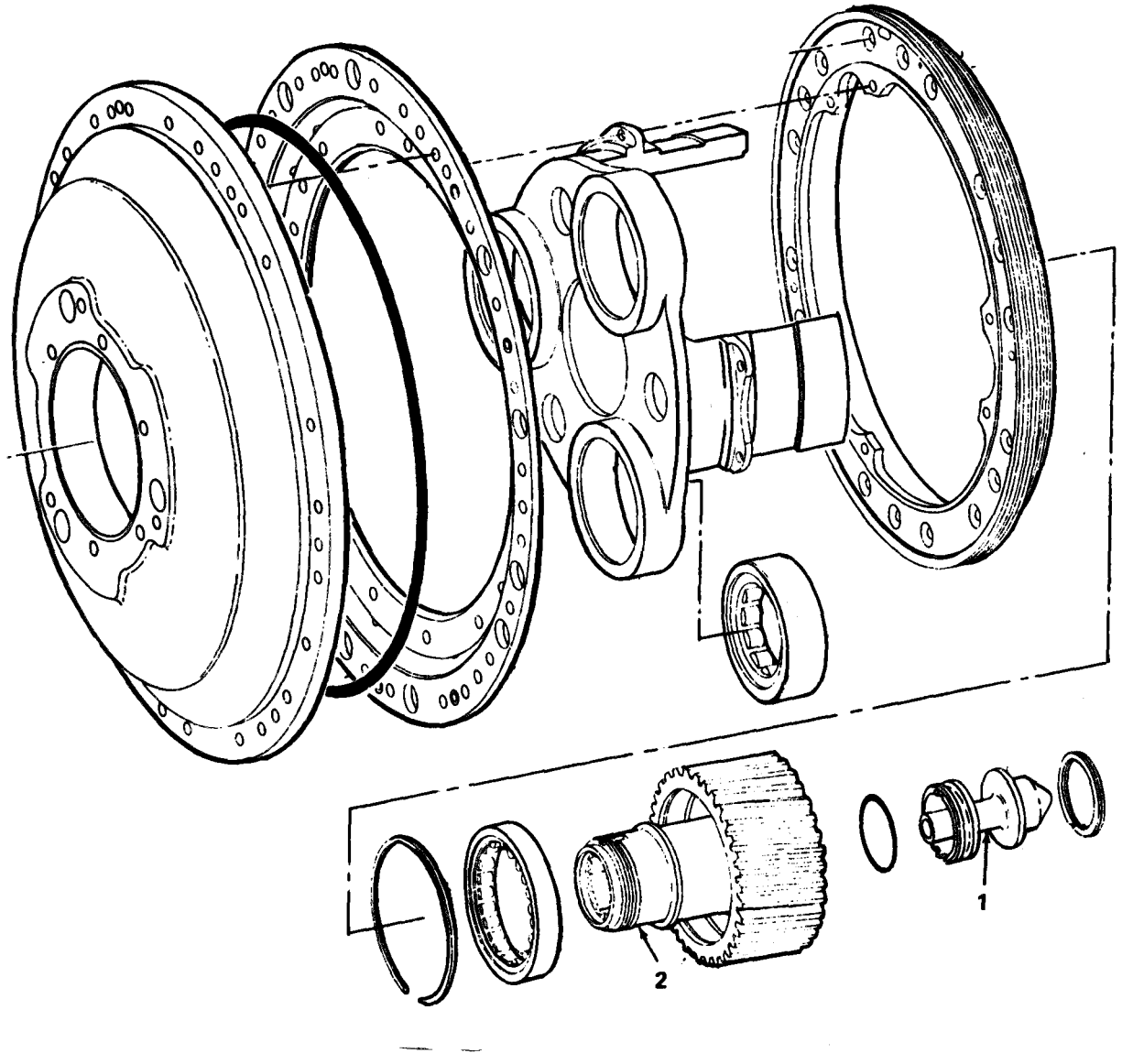


Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR WC
			Combustor Turbine Assembly		
Power Shaft Bolt (T53-L-llC-D)		700/900		5000	X
Power Shaft Bolt (T53-L-13 B/703)			700/900	5000	X

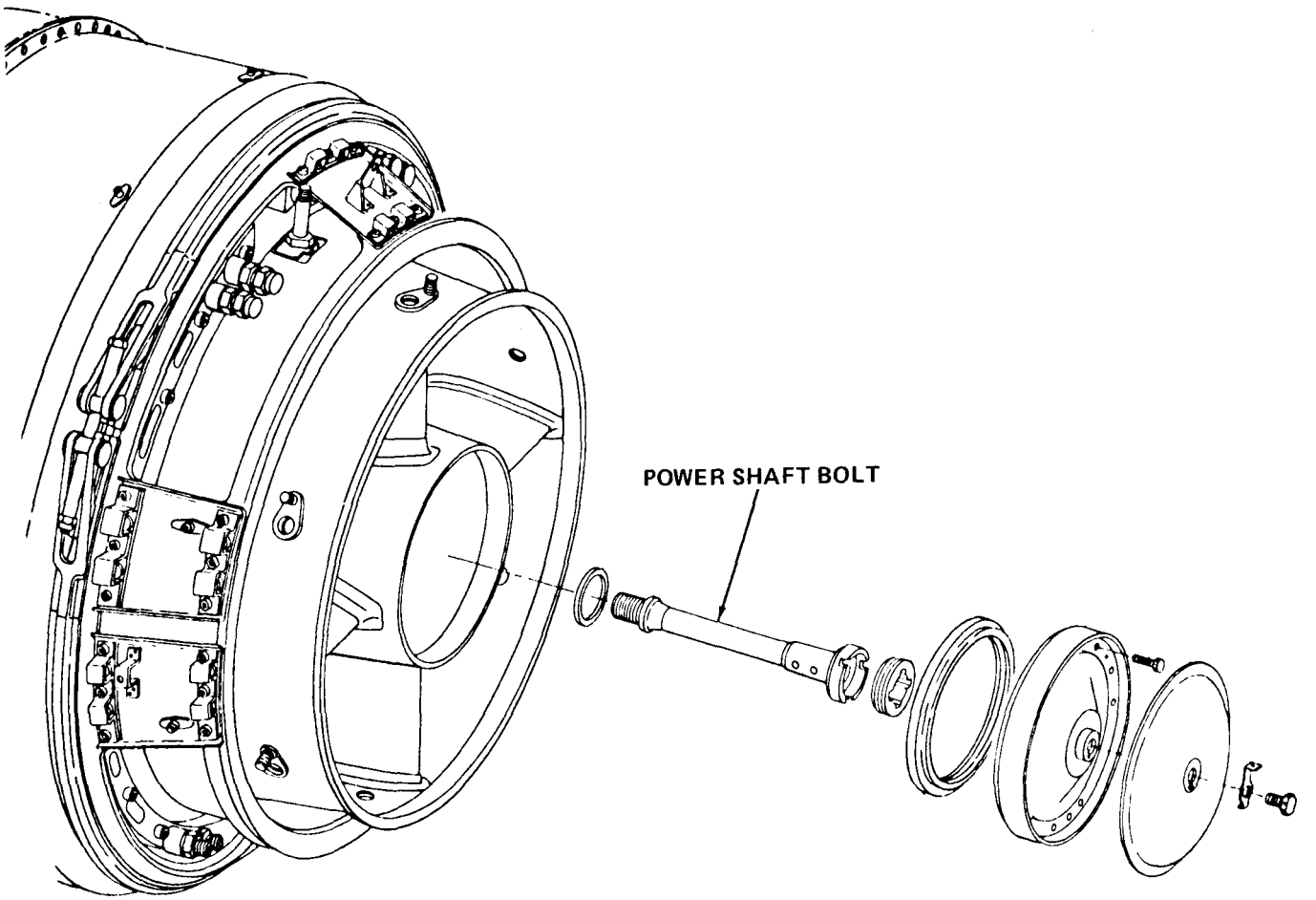


Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR WC
Bolt	1		500/700		X
Power Turbine Spacer	2	500/700		4000	X

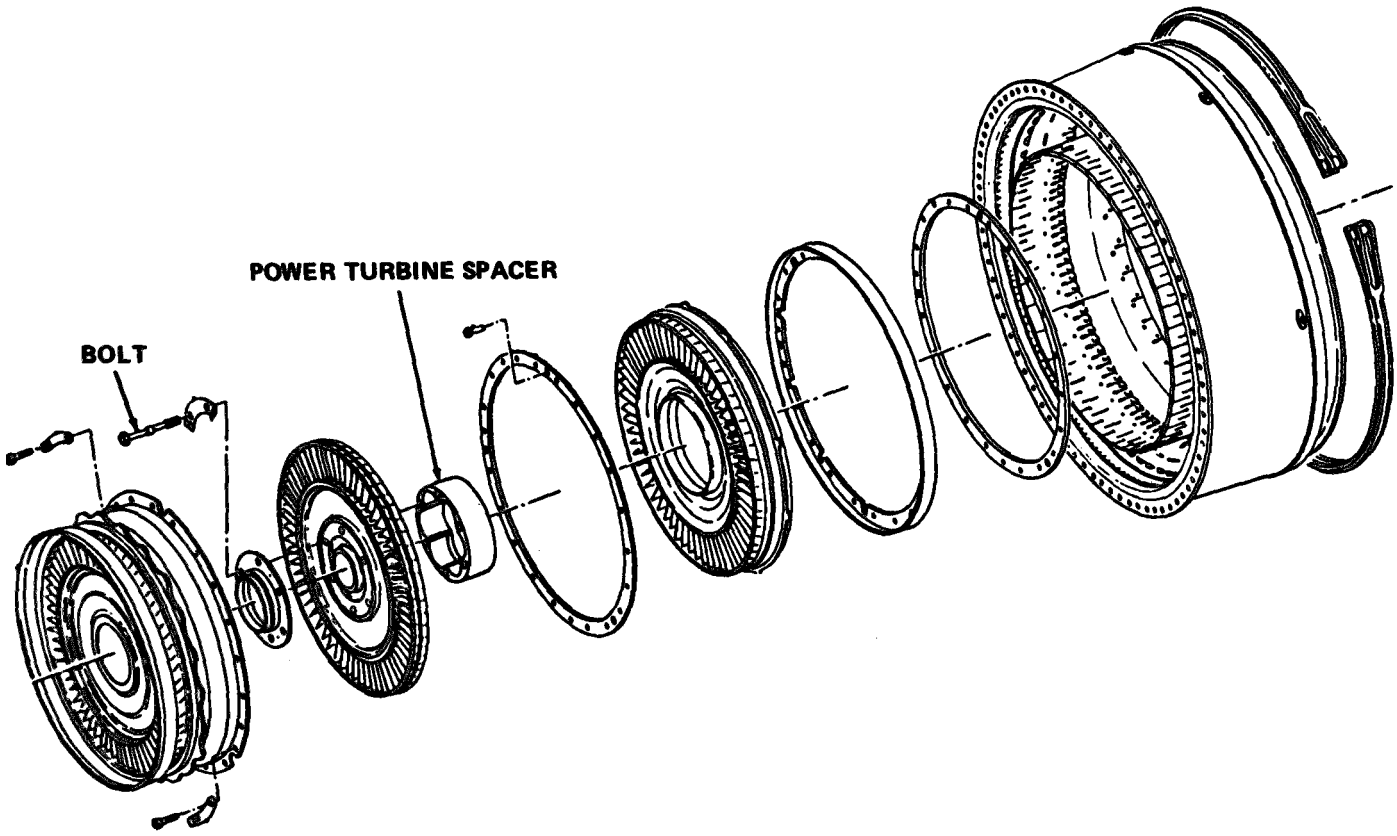


Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR	Method WC
Second Stage Turbine Rotor Assembly (T53-L-11 Series Engines)						
Housing	1	700/900		5000		X
Shim	2	500/700			X	
Forward Impeller	3	500/700		4000	X	
Forward Retaining Ring	4	500/700		4000		
Spanner Nut	5				X	
Lock cup	6				X	
Rear Impeller	7			4000	X	
Rear Retaining Ring	8			4000	X	
Spacer	9			5000	X	
Shim	10				X	
Disc	11			9000		X

Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR WC

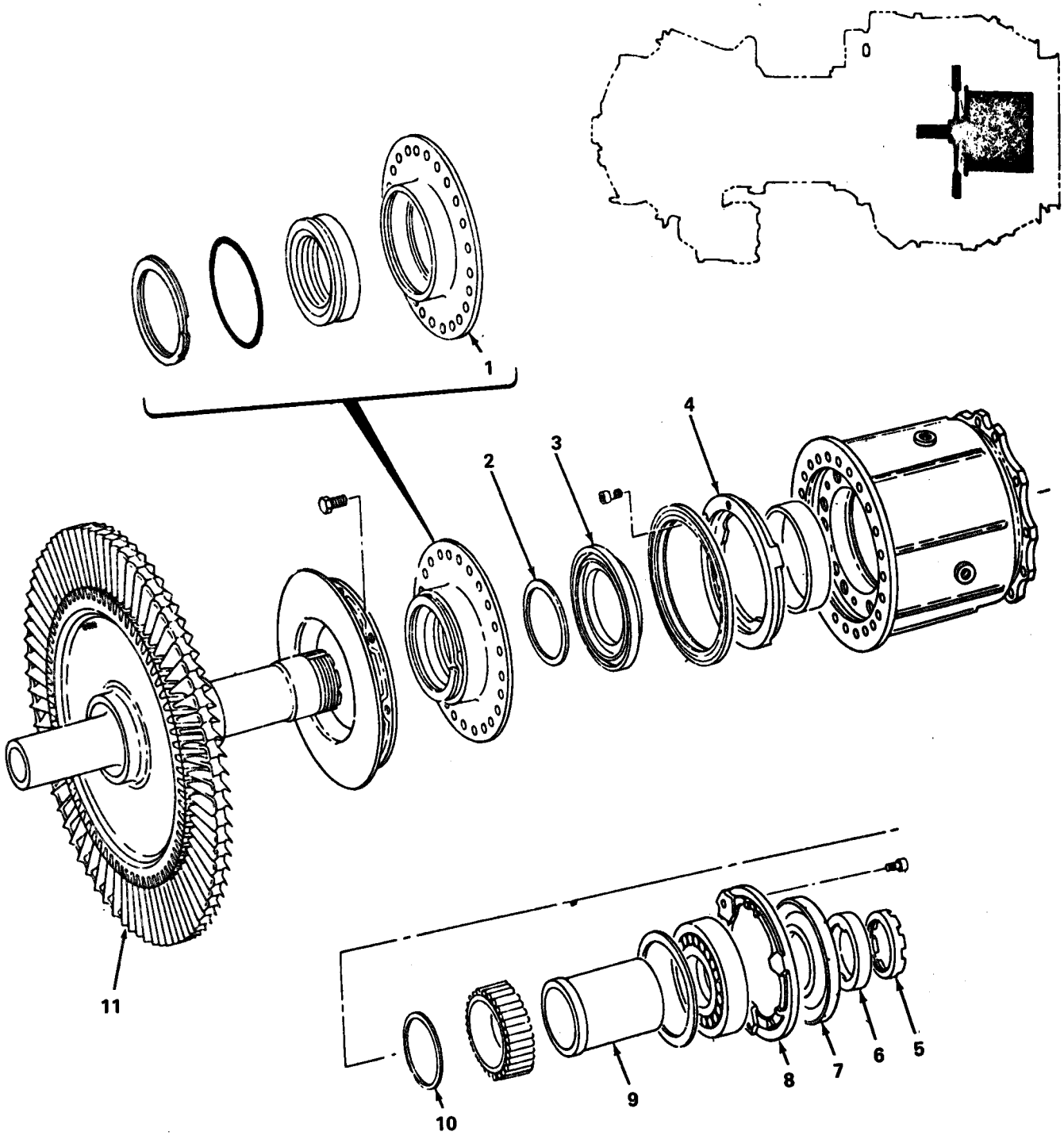


Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR WC
Power Turbine Rotor and Bearing Housing Assembly (T53-L-13B and L-703 Engines)					
Seal	Housing	1	500/700	4000	X

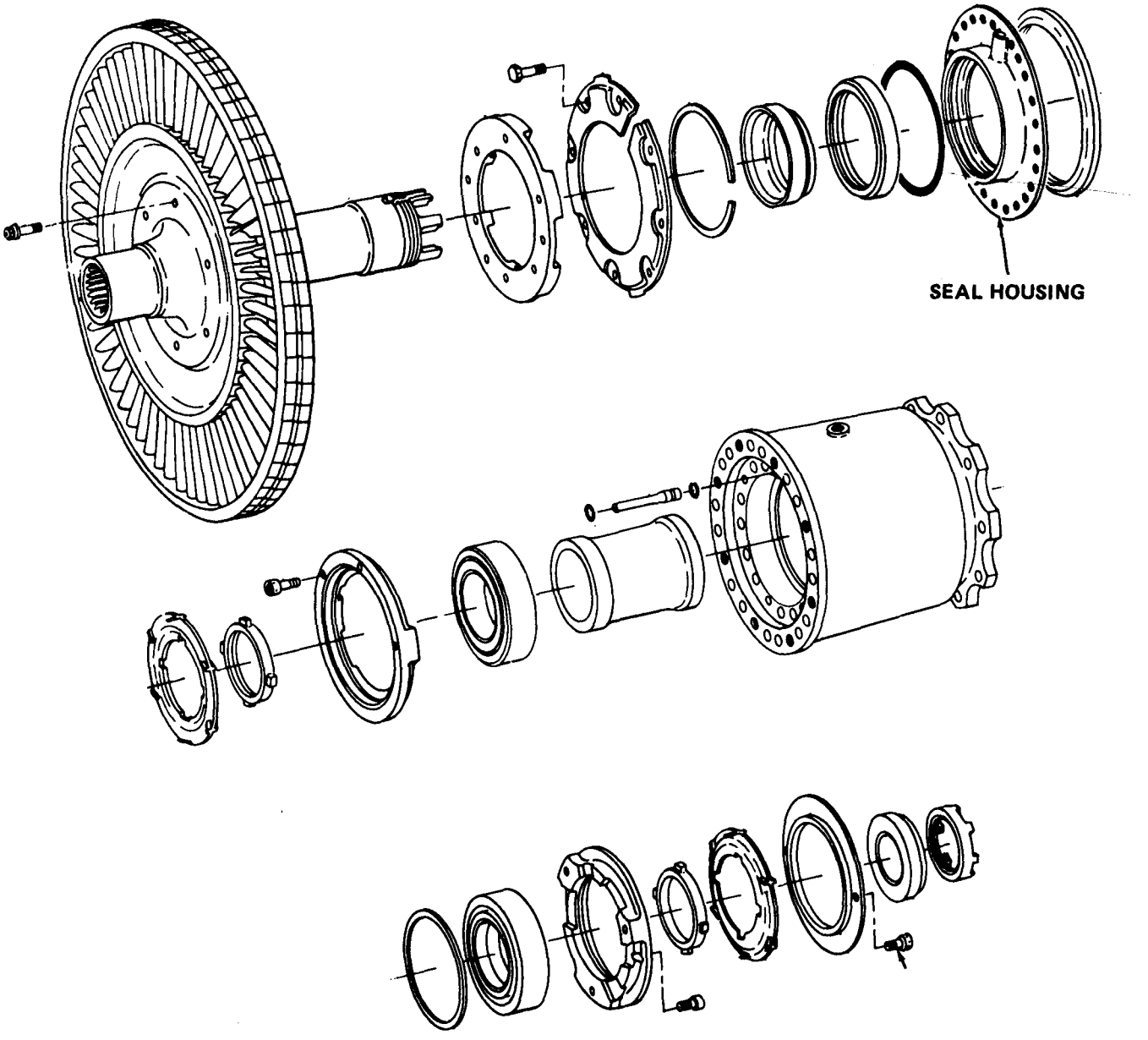


Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR	Method WC
First Stage Turbine Rotor (T53-L-11 Series Engines)						
Lockring		500/700		4000	X	
Spanner Nut		500/700			X	
Air Deflector, First Stage Turbine Nozzle and Flange Assembly, Combustion Chamber Deflector, Bearing Seal, Seal Housing, and Attaching Parts (T53-L-11 Series Engines)						
Liner		500/700		4000	X	
Seal Housing		500/700		4000		X
Air Deflector		500/700		4000		X
Bolt				4000	X	
Gas producer System components (T53-L-13J3/703 Engines)						
Forward Oil Ring	2	700/900		5000	X	
stepped Stud	1			4000	X	
Bearing Re-killing Plate	3	500/700		4000	X	
Retainer	5	700/900		5000	X	
Aft Oil Ring	4	700/900		5000	X	

Table H-2. Magnetic-Particle Inspection Requirements - Continued

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR WC

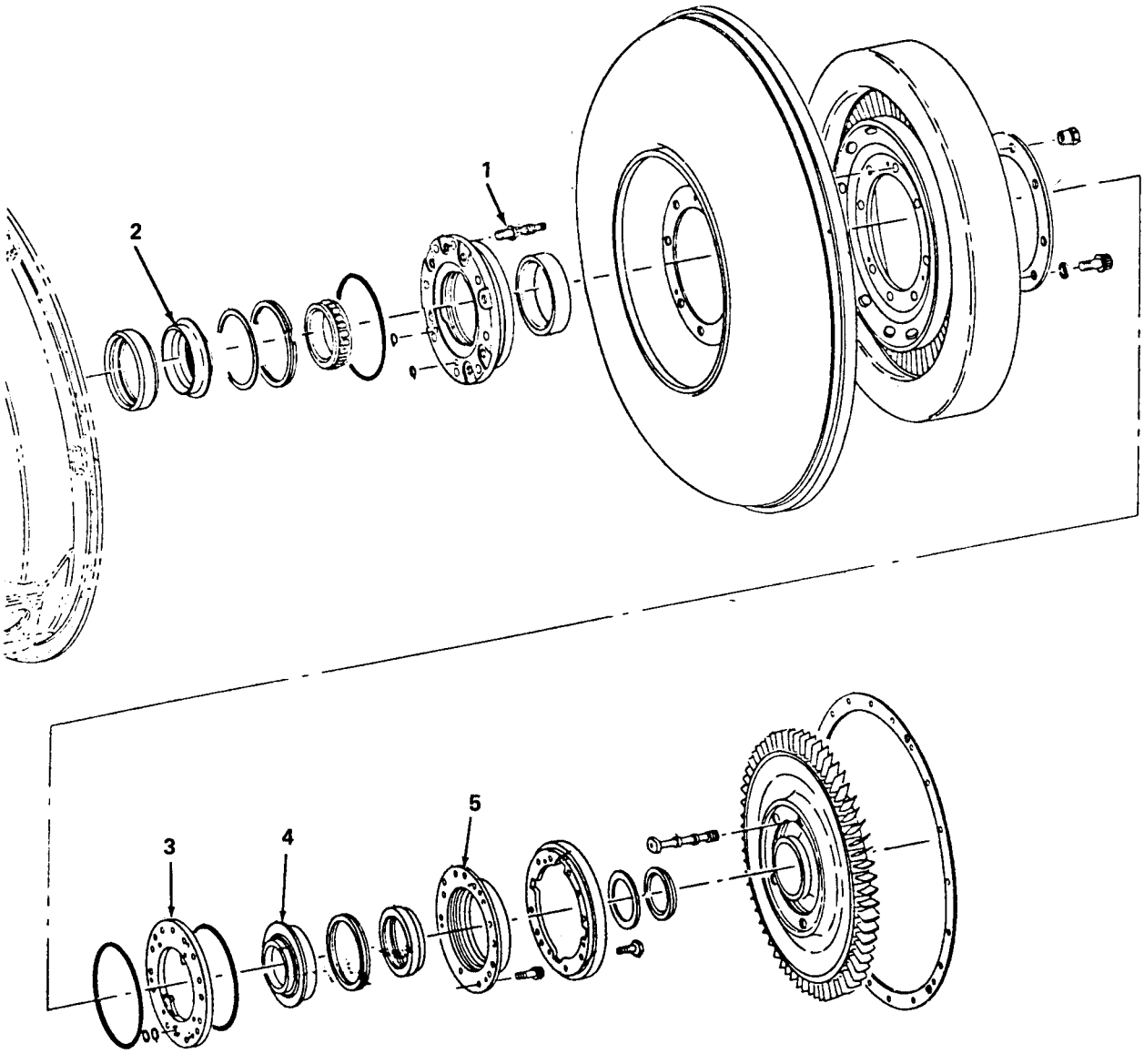


Table H-2. **MAGNETIC-PARTICLE INSPECTION REQUIREMENTS - Cont.**

Part Name	Item	Central Conductor Amps	End-to-End Amps	Longitudinal Amp Turns	Method WR WC
		Compressor Rotor Assembly (T53-L-13B/703 Engines)			
First Stage Compressor Rotor Blades				2000	X

H-20. **FLUORESCENT - PENETRANT INSPECTION.** This method is a means of inspecting nonferrous material for cracks, laps, cold shuts, porosity, and other defects having surface openings. This method may be used on ferro-magnetic parts that are complex in structure and give false indications when inspected by the magnetic-particle inspection method. Penetrant inspections must be accomplished by qualified personnel trained in NDT. Procedures are covered in TM 43-0103, Nondestructive Inspection Method.

NOTE

Inspection by fluorescent-penetrant inspection is not required unless specified in the detail inspection paragraph.

H-21. NONRIGID HOSES - INSPECTION

INITIAL SETUP

Applicable Configuration
All

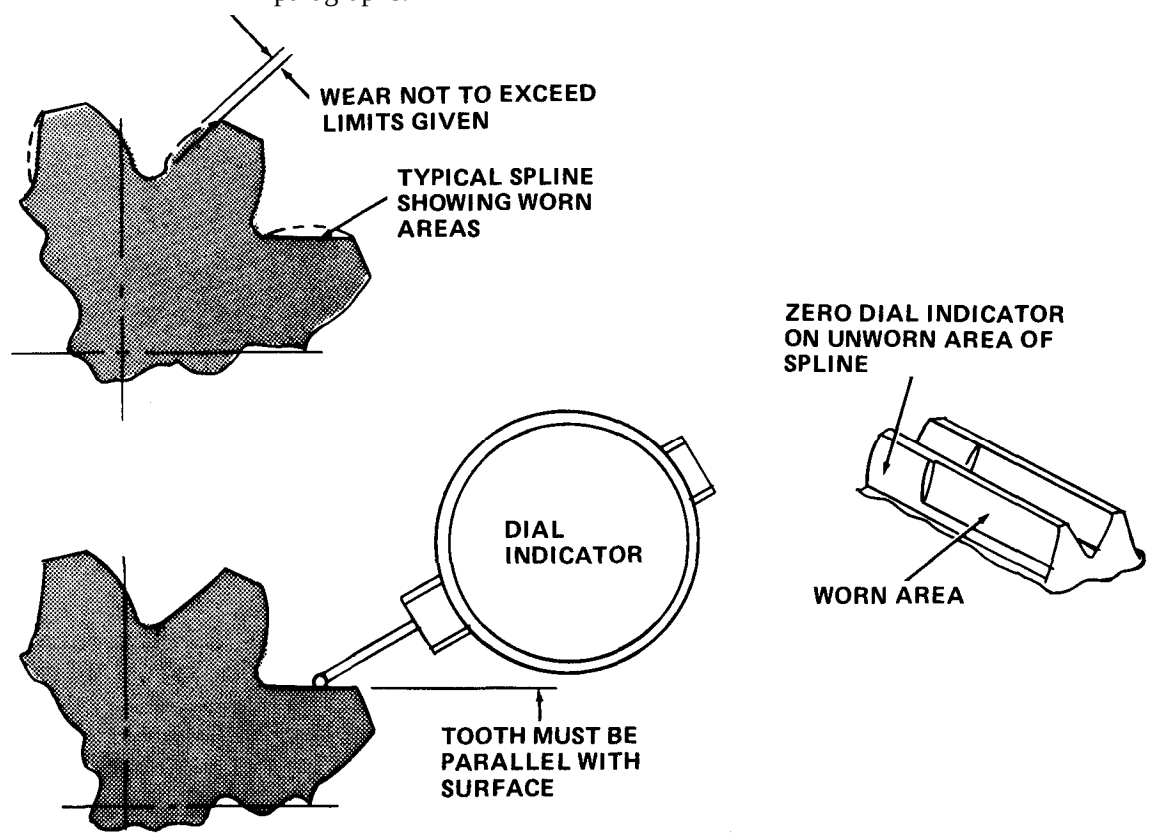
LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Hoses	Minor cuts, fraying, and chaflng are repairable; more severe damage is unacceptable and requires hose replacement.	Visually **inspect** hoses for cuts, fraying, and chafing.
2. Fittings	Minor damage is repairable; severe damage requires hose replacement.	Visually **inspect** fittings for cracks, nicks, burrs, and damaged threads.

H-22. Gears and Splined Parts - Inspection

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
1. Internal and External Splines	Use a four-power magnifying glass.	**Inspect** each internal and external spline visually for wear and/or fretting corrosion. Light wear or fretting is acceptable, provided it does not exceed inspection limits given in following item 2.
2. Spline Wear Steps or Fretting Corrosion	Wear and/or fretting corrosion maximum depth shall not exceed 0.007 inch (0.18 mm) on external spline teeth, and 0.005 inch (0.13 mm) on internal spline teeth, except as specified in detail inspection paragraphs.	**Inspect** maximum depth. If limits are exceeded, **replace** splined parts.



H-23. Anti-Friction Bearing. Inspection

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
	NOTE Observe the following general precautions before and during bearing inspection.	
1. Bearing Components	Never mix bearing components.	**Record** bearing serial number. **Tag** bearings.
2. Bearings	Do not clean bearings.	
3. Exposed Bearings		**Keep** exposed bearings covered with clean paper or lint-free cloth.
4. Bearing	If replacement of bearing is indicated, do not remove new bearing from wrapper until ready for installation.	
5. Bearing	Perform this action without the aid of a magnifying glass.	Visually **inspect** bearing for conditions listed in actions for items 6 thru 9.
6. Bearing	For general condition perform this action.	**Inspect** for any obvious damage such as rust or broken parts. This is cause for **rejection.**
7. Bearing		**Inspect** for surface defects; noticeable defects, such as heavy pitting or spalling on the active surfaces is cause for rejection.
8. Bearing	Abrasive, obstructive, or clogging substances are cause for rejection.	**Inspect** for foreign matter.

H-23. Anti-Friction Bearing - Inspection - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
9. Bearings	Bearings that are straw colored, tan, or light brown are not overheated and may continue in service. Be airings that are red-purple, purple, or blue should be replaced. The exceptions to this condition are the No. 2 and 3 positions bearings, 1-300-584 and 1-300-176, which are made of M-50 alloy. If these bearings are red-purple, purple, or blue and have a slight luster, they are acceptable for further use. If they are gray-blue and are scaled or show a dull matte, they should be rejected.	**Inspect** for discoloration.

H-24. General Repair. After inspection, repair or replacement may be required to restore the engine to a serviceable condition. Extreme care must be used to insure correct replacement of parts. Follow repair instructions carefully. Fit precision parts and mating parts during repair procedures to insure matching after repair. All uncovered openings shall be sealed with caps, plugs, or suitable cover.

H-25. Blend-Repair - General Repair Instructions

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Crocus Cloth (item 21, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**WARNING** **All repair of Magnesium Thorium alloy (MG-TH) will be done in accordance with Nuclear Regulatory Commission source material license number "STB-1433" issued to AVSCOM.**	
1. Blend-Repair	Use Swiss-type files and India or Carborundum stones. Use crocus cloth (item 21, Appendix D) for final polishing. Do not use power tools.	**Blend** all repairs. **Finish** smoothly. Lines, scratches, or sharp edges, which might cause a concentration of stress, **are not permitted.**

H-26. Fusion Weld-Repair (AVIM)

INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
ENGINE/		
	NOTE If the part requires various weld-repairs, remove surface treatment from entire part.	
1. Part		**Vapor-degrease.**
2. Each Imperfection	Use a carbide burr.	**Rout** each imperfection to expose clean, sound, base metal. **Minimize** routing to **lessen** the possibility of breaking through the parent metal.
3. Part		**Reinspect** part to insure that complete **removal** of imperfection has been accomplished.
4. Part	Normally, removal with stainless steel brush is adequate.	**Remove** all surface treatment from local area to be welded.
5. All Areas to be Welded		Thoroughly **clean** chips, scale, dirt, oil and any other foreign material detrimental to proper welding from all areas to be welded.
6. Parts	**Do** not sand blast or steel grit blast parts that are to be welded.	**Vapor-degrease** parts.

H-26. Fusion Weld-Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
7. Area to be Repaired		**Back up** the area to be repaired with copper or inert gas, and **reweld,** using tungsten inert gas process, Military Specification MIL-W-8611, with the filler material specified in the applicable table within the detail repair procedures.
	NOTE If specified in the detailed repair procedure, a variance of Plus or minus 50°F (plus or minus 28°C) shall be maintained during welding operation. If postheat is specified in detail repair procedure, maintain the preheat temperature and post heat each area immediately after weld repair, maintaining a temperature variance of plus or minus 25°F (plus or minus 14°C).	
8. Weld-Repair and any Burn-Through		**Blend** the weld-repair and any burn-through with the surrounding parent metal to **minimize** stress concentrations.
	NOTE Weld beads shall be smooth and free from irregularities in accordance with aircraft quality, welding practices and shall blend into base metal in gradual smooth curves. Overlapping and lack of fusion of the weld beads are not acceptable.	

H-26. Fusion Weld-Repair (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
9. Butt Welds	Penetration shall be 100 percent unless otherwise specified. Penetration (under bead) of a butt weld should not exceed one third the thickness of the thinner base material and penetration excess shall be removed if it causes interference when parts are assembled and mated. Cracks are not acceptable.	**Observe** allowable limits.
10. Surface Porosity	Surface porosity is acceptable provided its size is less than one third the material thickness but not greater than 0.080 inch (2.0 mm) and the minimum spacing between the porosities is three times the dimension of the largest defect. There shall be no more than three indications of maximum size, or equivalent, per linear inch (25.4 mm).	**Observe** allowable limits.
11. Internal Defects	Internal defects shall not exceed requirements of preceding item 9, except that maximum defect size shall not exceed twice the material thickness or 0.100 inch (2.54 mm) maximum.	**Observe** allowable limits.

H-27. Silver-Braze (AVIM)

INITIAL SETUP

Applicable Configuration
All

References
Military Specification MIL-B-7883
Para H-20

ENGINE/		
1. Parts	Use drycleaning solvent method.	**Clean** parts.

NOTE

Areas to be brazed shall be free of chips, dirt, oil, and all other foreign material detrimental to the brazing operation.

H-27. Silver-Braze (AVIM) - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Repair Area		**Apply** brazing flux to the area to be braze-repaired.
3. Parts		**Braze** parts in accordance with Military Specification MIL-B-7883 by **applying** brazing alloy, **using** a neutral or reducing flame.
4. Flux		**Remove** flux by **rinsing** with hot water at a temperature of 180°F (82°C).
5. Excess Braze Deposits		**Remove.**
6. Repaired Area	Observe the following limits: Ninety percent fillet is required on side of braze applications. b. No cracks or voids are allowed in braze of adjacent base metal. c. Surface porosity is acceptable. d. Surfaces of parts shall be free of excessive brazing material.	**Inspect** by fluorescent-penetrant method. (Refer to para H-20.)

H-28. **Connector Thread - Repair**

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Crocus Cloth (item 21, Appendix D)
Drycleaning Solvent (item 24, Appendix D)

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**NOTE** Threaded male connectors shall be repaired as follows:	
1. Surface Corrosion		**Remove** with crocus cloth (item 21, Appendix D).

H-28. Connector Thread - Repair - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
2. Burrs and Nicks		**Remove** from threads with small triangular file.
3. Connector		Thoroughly **clean** with drycleaning solvent (item 24, Appendix D).

H-29. Inserts - Thread Repair and Replacement

INITIAL SETUP

Applicable Configuration

All

Consumable Materials

Zinc-Chromate Primer (item 96 Appendix D)
Petrolatum (item 66, Appendix D)
Shortening Compound (item 74, Appendix D)
Castor Oil (item 13, Appendix D)

Special Tools

Hammer
step Drill
Porting Tool

References

TM 55-1500-204-25/1

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	**WARNING** All repair of Magnesium Thorium alloy (MG-TH) will be done in accordance with Nuclear Regulatory Commission source material license number "STB - 1433" issued to ATCOM.	
1. Studs, Threaded Inserts, and All Internal and External Threads	If damage is noted repair as outlined in TM 1-1500-204-23. General Aircraft Maintenance Manual, or as follows: **NOTE** The preferred method of repairing damaged helical wire inserts or damaged internal threads in hydraulic ports of particular magnesium metal areas on the engine is by use of Rosan inserts. Table H-3 lists Rosan materials and tools applicable to such repairs and Table H-4 lists related tool sizes and repair dimensions for each repair listed. The procedural instructions are examples of repair/replacement procedures that may be made, using Rosan inserts.	**Inspect** far damaged or crossed threads.

H-29. Inserts - Thread Repair and Replacement - Continued

ENGINE/ - Continued

Table H-3. Rosan Materials and Tools

Location	Insert	NSN	Lockring
Power Takeoff Pad	RJ2280SX-10	5340-00-151-5941	RLRR38SU-9
Engine Mount Pad on Inlet Housing	RJ210SX-16	5340-00-151-5943	RLRR56SU-11
Customer Bleed Port	SRW258	5340-00-407-9261	
Inlet Housing N2 Gearbox Mounting Pad and Forward Face of Centrifugal Compressor Housing	RJ206SX-8	5340-00-151-5971	RLRR28SU-8
Accessory Gearbox chip Detector Port	R1711SX-9	5340-00-151-5981	RLRR56SU-8
Inlet Housing Torquemeter Pressure Port	R1709SX-9	5340-00-151-5980	RLRR47SU-8
Accessory Gearbox Starter Drain	R1707SX-8	5340-00-151-5979	RLRR38SU-7
Hydraulic Port on N2 Gearbox	RZA12112	5340-00-151-7309	

*U.S. GOVERNMENT PRINTING OFFICE: 1996-755-119/40015

H-29. Inserts - Thread Repair and Replacement - Continued

ENGINE/ - Continued

Table H-3. Rosan Materials and Tools - Continued

NSN	Tool	Tool Number	NSN
5365-00-151-7154	Step Drill	RCADC38-484	5133-00-177-7269
	Drive Wrench	R1108-W	5120-00-473-7702
	Drive Tool	R208-D	5120-00-473-7015
5365-00-151-7156	Step Drill	RCADC56-641S	5133-00-116-2774
	Drive Wrench	R1111-W	5120-00-776-1837
	Drive Tool	R210-D	5120-00-473-7017
	Step Drill	SRW-25D	5133-00-782-4231
	Drive Wrench	SR25W4-A	5120-00-169-0124
	Swage Tool	SRW25S-A	5120-00-177-9529
5365-00-151-7152	Step Drill	RCADC28-312	5133-00-177-7268
	Drive Wrench	R1106-W	5120-00-381-9126
	Drive Tool	R206-D	5120-00-473-7013
5365-00-151-7210	Step Drill	RCAD56-687	5133-00-116-2800
	Drive Wrench	R1111-W	5120-00-776-1837
	Drive Tool	R1711-D	5120-00-169-0123
5365-00-151-7155	Step Drill	RCAD47-562	5133-00-116-2820
	Drive Wrench	R1110-W	5120-00-473-7703
	Drive Tool	R209-D	5120-00-473-7016
5365-00-151-7153	Step Drill	RCAD38-453	5133-00-116-2793
	Drive Wrench	R1108-W	5120-00-473-7702
	Drive Tool	R1707-D	5120-00-169-0122
	Porting Tool	RZA12112PT	5133-00-419-9680

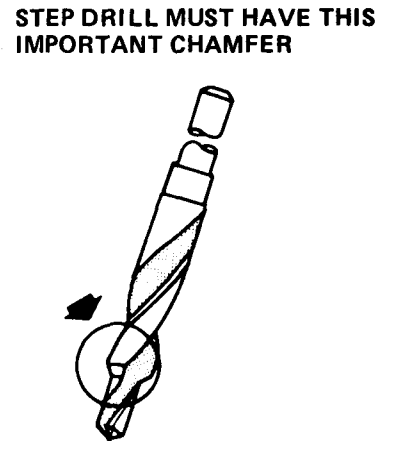
H-29. Inserts - Thread Repair and Replacement - Continued

ENGINE/ - Continued

Table H-4. Tools Sizes and Repair Dimensions

No.	Step Drill Depth in Inches*	Tap Size in Inches	Tap Depth in Inches	Packing No.
1	11/64 to 13/64 (4.4 to 5.2 mm)	N.C. 9/16-12	21/32 (16.7 mm)	N/A
2	13/64 to 16/64 (5.2 to 6.0 mm)	N.C. 3/4-10	1-1/8 (28.6 mm)	N/A
3	3/32 (2.4 mm)	National 11/32-24 Standard	27/64 (10.7 mm)	N/A
4	5/32 to 3/16 (4.0 to 4.8 mm)	N.C. 3/8-16	17/32 (13.5 mm)	N/A
5	9/32 (7.1 mm)	N.C. 3/4-16	Full Depth	NAS1594-115
6	17/64 to 9/32 (6.7 to 7.1 mm)	N.C. 5/8-18	11/16 (17.5 mm)	NAS1594-112
7	17/64 to 9/32 (6.7 to 7.1 mm)	N.F. 1/2-20	5/8 (15.9 mm)	NAS1594-110
8	9/64 (3.6 mm)	United 7/16-28 National Extra Fine	21/64 (8.3 mm)	NAS1594-012

*See figure for step drill special chamfer.



CHAMFERED STEP DRILL

NOTE : Repairs No. 1 thru 4 are to be used when converting from a wire to a Rosen insert at nonhydraulic locations. Repairs No. 5 thru 8 are to be used at hydraulic port locations.

H-29. Inserts - Thread Repair and Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued	**NOTE** Repair power takeoff pad according to actions for items 2 thru 10.	
2. Rosan Insert Material, Special, and Common Tools	See tables H-3 and H-4.	**Select.**
3. Old or Damaged Wire Insert		**Remove.**
4. Hole	Step-drill to a depth of between 11 /64 and 13/64 inch (4.4 and 5.2 mm).	**Step-drill** the hole with the special Rosan step drill, RCADC38-484.
5. Minor Diameter Hole	Depth shall be 21/32 inch (16.7 mm).	**Tap** with the common size tap listed in Repair No. 1 listed in table H-4.
6. Tapped Magnesium Threads	Use zinc-chromate primer (item 96, Appendix D).	**Coat** with zinc-chromate primer.
7. Rosan Insert		Initially engage Rosan insert by hand. Install drive wrench, R1108-W onto the insert. Screw insert into magnesium to a depth of 0.010 to 0.020 inch (0.25 to 0.51 mm) below the surface of the material.
8. Power Takeoff Pad		**Aline** the OD flat of the lockring nearest the pad surface edge with the least hole edge distance and where serrations of both lockring and insert aline.
9. Drive Tool R208-D		**Install** over the lockring.

H-29. Inserts - Thread Repair and Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
10. Drive Tool	Use a hammer to perform this action.	**Strike** the end of the drive tool to drive locking into magnesium parent metal until lockring is either flush with or to a depth of 0.010 inch (0.25 mm) below the surface of material.
	NOTE Repair engine mount pad on inlet housing according to actions for items 11 thru 19.	
11. Rosan Insert Material, Special, and Common Tools		**Select.**
12. Old or Damaged Wire ,Insert		**Remove.**
13. Existing Hole		**Step-drill** the existing hole so as to attain step in hole to depth specified in table H-4.
14. Hole		**Tap** the hole with common size tap noted in Repair No. 2, table H-4 depth of 1 1/8 inches (28.6 mm) in the minor diameter hole.
15. Tapped Magnesium Threads		**Coat** with zinc-chromate primer (item 96, Appendix D).
16. Rosan Insert		Initially **engage** the Rosan Insert by hand, and then **install** the drive wrench, R1111-W, onto the insert. Screw the insert into the magnesium housing to

H-29. Inserts - Thread Repair and Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
		a depth of 0.010 to 0.020 inch (0,25 to 0.51 mm) below the surface of the material.
17. Engine Mount Pad		**Aline** the OD flat of the lockring nearest the pad surface edge with the least hole edge distance and where serrations of both lockring and insert aline.
18. Drive Tool R210-D		**Install over** the lockring.
19. Drive Tool	Use a hammer to perform this action.	**Strike the** end of the drive tool to **drive the** lockring into the magnesium parent metal until the lockring is flush or to a depth of 0,010 inch (0.25 mm) below the surface of the material.
	NOTE Repair accessory gearbox chip detector port according to actions for items 20 thru 31.	
	CAUTION **When repairing hydraulic ports, pack the end of the port with petrolatum (item 66, Appendix D) or suitable substitute to pravent machining chips from entering oil system.**	
20. Rosan Insert Material and Special Tools	Listed in table H-3.	**Select.**
21. Step Drill RCAD56-687		**Coat** tips with petrolatum (item 66, Appendix D) or suitable substitute to **pick up** chips.

H-29. Inserts - Thread Repair and Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
22. Step Drill	use step drill.	**Cut** to a depth (counterbore) of 9/32 inch (7.1 mm) maximum below boss face.
23. Minor Diameter Hole		**Tap** minor diameter hole to its full depth, **using** the common size tap listed in Repair No. 5, table H-4.
24. Petrolatum and chips		**Remove** from tip of counterbore tool and hydraulic port.
25. Packing NAS1594-115		**Lubricate** packing, NAS1594-115, with shortening compound (item 74, Appendix D) or castor oil (item 13, Appendix D), and install packing over the smooth shank of the insert.
26. Tapped Magnesium Threads		Coat with zinc-chromate primer (item 96, Appendix D).
27. Rosan Insert		Initially **engage** by hand.

CAUTION

Once the packing has engaged the parent metal, do not back out the insert (counterclockwise). If the insert must be turned out after partial engagement of the packing, replace the packing and repeat preceding items 20 thru 27.

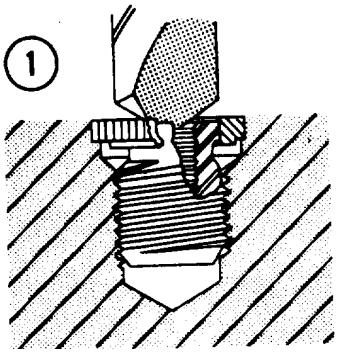
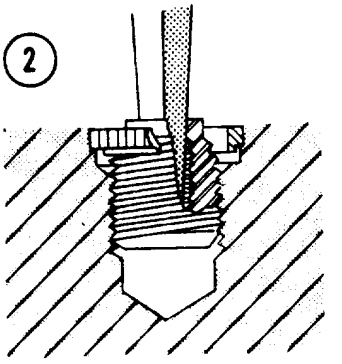
H-29. Inserts - Thread Repair and Replacement - Continued

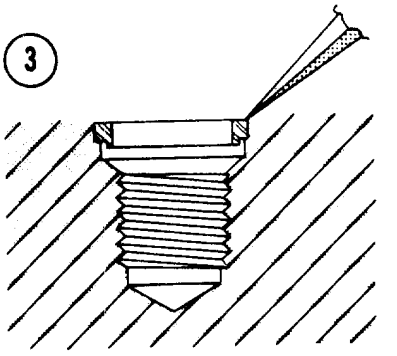
LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
28. Drive Wrench, R1111-W		Install the drive wrench, R1111-W over the insert and **turn** the insert until the top of the serrated flange is 0.010 to 0.020 inch (0.25 to 0.51 mm) below the surface of the material.
29. Accessory Gear-box Chip Detector Port		**Aline** the OD flat of the lockring nearest the pad surface edge with the least hole edge distance and where serrations of both locking and insert aline.
30. Drive Tool R1711-D		**install R1711-D, over** the lockring.
31. Drive Tool	Use a hammer to perform this action.	**Strike** end of drive tool to **drive** the lockring into the magnesium parent metal until the lockring is flush with or to a depth of 0.010 inch (0.25 mm) below the surface of the material.
	NOTE Repair hydraulic port on N2 gearbox according to actions for items 32 thru 40.	
	When repairing hydraulic ports, pack the end of the port with petrolatum (item 66, Appendix D) or suitable substitute to prevent machining chips from entering the engine oil system.	

H-29. Inserts - Thread Repair and Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
32. Rosan Insert Material and Special Porting Tool		Select (listed in table H-3).
33. Porting Tool RZA12112PT	Porting tool has a special stop to prevent overcutting. Use petrolatum (item 66, Appendix D).	**Coat** tip with petrolatum or suitable substitute to **pick up** chips.
34. Porting Tool	use porting tool	**Cut** until special stop **contacts** face of boss.
35. Minor Diameter Hole		**Tap** with the common size tap **listed in** table H-4 to a depth of 21/64 inch (8.3 mm).
36. Petrolatum and chips		**Clean** from tip of porting tool and hydraulic port.
37. Packing NAS1594-012	Use shortening compound (item 74, Appendix D) or castor oil (item 13, Appendix D).	**Lubricate** with shortening compound or castor oil and **install** packing over the smooth shank of the insert.
38. Tapped Magnesium Threads		**Coat** with zinc-chromate primer (item 96, Appendix D).
39. Rosan Insert	**CAUTION** **Once the packing has engaged the parent metal, do not back out the insert (counterclockwise). If the insert must be turned out after partial engagement of the packing, replace the packing and repeat preceding items 32 thru 39.**	Initially **engage** by hand.
40. Insert	Use a standard wrench on the hex head of the insert.	**Tighten** the insert to 45 **pound-inches (0.5 Kgm) torque.**

H-29. Inserts - Thread Repair and Replacement - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ - Continued		
	CAUTION **When engaging or removing the union from the insert, double wrench both the insert and the union.**	
	NOTE Remove Rosan insert, and replace with Rosan insert of the same size as follows in actions for items 40 thru 43.	
41. Damaged Rosan Insert		**Remove as** shown in figure.
	 **DRILL OUT-SERRATED COLLAR OF INSERT. USE DRILL SAME DIAMETER AS SERRATIONS, DRILL TO DEPTH OF COUNTER-BORE. USE DRILL AT HIGH SPEED.**	 **DRIVE IN SQUARE-TYPE "EASE OUT" TOOL OR SIMILAR SQUARE TOOL. SCREW OUT INSERT.**
		PERFORM IN SEQUENCE SHOWN
42. Rosan Insert Material and Special Tools		**Select** proper size (listed in table A) for the specific repair location.
43. Original Tapped Magnesium Threads		**Coat** with zinc-chromate primer (item 96, Appendix D).
44. Rosan Insert		**Install** Rosan insert with applicable drive wrench and **stake** with applicable drive tool.
	NOTE No special or common cutting tools are required when replacing one Rosan insert with a comparable Rosan insert.	



IF LOCK RING FAILS TO COME OUT AS INSERT IS UNSCREWED. COLLAPSE REMAINING PORTION OF RING WITH PUNCH.

H-30. Lubricants and Sealing Compounds.

Unless instructions recommend the use of special compounds for a particular installation, only the . following shall be used during assembly.

a. Petrolatum (item 66, Appendix D) for lubricating fuel systerr packing rings.

b. Hydrogenated vegetable shortening (item 36, Appendix D) or castor oil (item 13, Appendix D) for lubricating oil system packing rings.

c. Pneumatic system grease (item 68, Appendix D) for lubricating pneumatic system packing rings.

d. Lubriplate (item 48, Appendix D) or equivalent for low temperature applications other than packing rings.

e. Anti-Seize (item 102 or 103, Appendix D) or Molykote Anti-Seize Thread Compound (item 58, Appendix D) for high temperature application.

f. Molybdenum disulfide (item 57, Appendix D) as an alternate for anti-seize compound.

CAUTION

Do not use Plastliube Moly No. 3 or Multifax EP2 on hot end splines of fuel control drive shaft and accessory rive gearbox fuel control drive shaft gear.

H-31. Air, Fuel, and Lubrication Hose Assemblies - Pressure Test (AVIM)

INITIAL SETUP

Applicable Configuration
All

Consumable Materials
Calibrating Fluid (item 11, Appendix D)

Test Equipment
Test Stand (LTCT314)

LOCATION/ITEM	REMARKS	ACTION
TEST STAND/	Perform the following test, using Calibrating Fluid (item 11, Appendix D).	
1. Plug		**Install** suitable plug in one end of hose being tested. **Do not tighten** plug at this time.
2. Hose	Use test stand LTCT314.	**Connect** opposite end to OUTLET NO. 3 STATIC BYPASS port of test stand.
3. Static Bypass Valve		**close.**
4. Hose		**Using** handpump on test stand, **bleed** air from hose by simultaneously **applying** hydraulic pressure and **loosening** plug installed in preceding item 1. After all air has been bled, securely **tighten** plug.
5. Gage No. 1 Static pressure Gage		**Using** handpump **increase** pressure until gage indicates 2900 psi to 3100 psi.

H-31. Air, Fuel, and Lubrication Hose Assemblies - Pressure Test (AVIM) - Continued

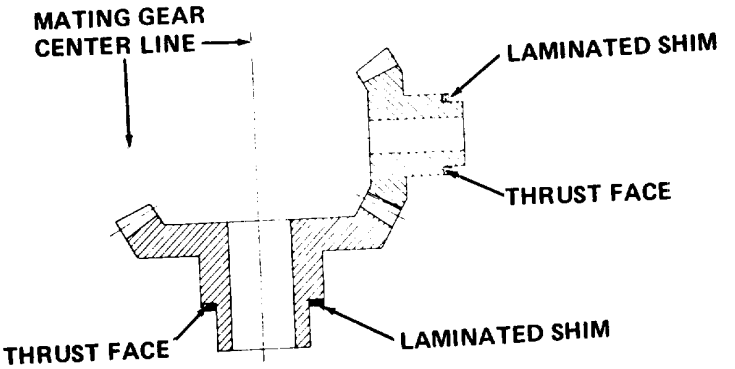
LOCATION/ITEM	REMARKS	ACTION
TEST STAND/ - Continued		
6. Air, Fuel and Lubrication Hose Assemblies		**While maintaining** this hydraulic pressure for a minimum period of 30 seconds and a maximum period of 5 minutes, **observe** for leakage through braze joints and through braid casing.
7. Hose		If leakage is noted, reject hose.
8. Hose		**Decrease** hydraulic pressure to **zero,** then **remove** hose from test stand.
9. Plug		**Remove** plug installed in preceding action for item 1 and **drain hose.**

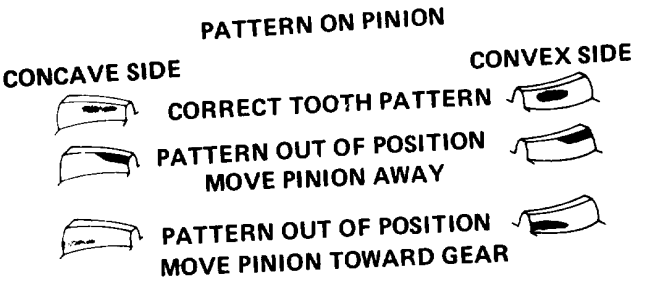
H-32. Bevel Gears-Assembly

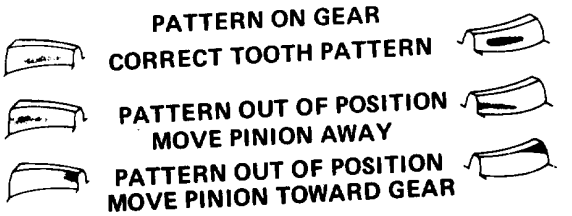
INITIAL SETUP

Applicable Configuration
All

LOCATION/ITEM	REMARKS	ACTION
ENGINE/	Bevel gears are properly mounted in relation to each other when the gear pattern and backlash are within specified limits. (See figures.)	







H-32. Bevel Gears - Assembly - Continued

LOCATION/ITEM	REMARKS	ACTION
ENGINE/ Continued		
	Each bevel gear haa a reference mounting distance. This distance is a line dimension from the thrust face of one gear to the centerline of the mating gear. During initial buildup, laminated shims are used to position the gears to the correct mounting distance. The standard procedure is to measure and record shim thickness needed. The upper figure shows a typical bevel gear mounting. The lower figure shows typical gear patterns. When a solid shim is required, establish the thickness of the shim as follows:	
1. Laminated Shims	Laminated shims shall be of the proper ID and OD and laminations shall be 0.002 inch (0.05 mm) thick.	**Install** laminated shims behind the pinion and behind the gear to **obtain** the desired tooth bearing and backlash.
	NOTE Once the desired tooth bearing and backlash has been obtained, a solid shim of proper thickness shall be used.	
2. Bevel Gears		**Reassemble** the bevel gears using the solid shims installed in their respective positions.

APPENDIX I

The engine components listed contain Thorium, a radioactive material. Maintenance of these parts is limited to their replacement unless other maintenance is specifically authorized and is covered by a valid U.S. Nuclear Regulatory Commission License. Dispose of nonreparable Magnesium-Thorium parts as radioactive waste in accordance with AR 385-11.

The following parts contain Thorium.

1-060-100-07	Inlet Housing Assembly
1-030-390-05	Front Cover Housing Assembly
1-060-220-03	Inlet Housing Assembly
1-170-220-01	Adapter Assembly

GLOSSARY

This glossary **lists the first** word of each term alphabetically, the way the term is used in the manual. Every effort has been made to include all the terms that might cause disagreement among those using this manual.

A

ABRASION - Wearing away of small amounts of metal as a result of friction between parts.

ABRASIVE CLOTH - A **cloth coated with grit, used for hand cleaning, polishing, removing corrosion and paint, etc. Sometimes referred to as emery cloth.**

ACCESSORY - A self-contained unit, mounted on a higher assembly, designed to do a specific job. Fuel pumps, fuel controls and like parts are typical accessories.

ADAPTER - Any device that makes it possible to use parts or pieces of equipment that were not designed to be used together.

AEROSPACE GROUND EQUIPMENT (AGE) - All non-airborne equipment required to inspect, repair, assemble and test parts to make them operational.

AIRFOIL - In turboshaft engines, that part of a vane or blade that affects or is affected by the flow of air.

ASSEMBLY - A unit normally removed and reassembled as a single item, consisting of accessories and components that operate together for a specific purpose. Typical assemblies are: engine, torque sensor shaft and sleeve assembly, power takeoff assembly.

AVERAGE DIAMETER - A number found by adding several measurements, usually 3 or more, of the same diameter and dividing the sum by the number of measurements taken.

AXIAL - Relating to the axis of a part.

AXIAL CLEARANCE - Clearance measured in a direction parallel to the engine centerline.

AXIAL LOOSENESS - The amount of looseness between parts that have a common center or whose axes are parallel.

AXIAL MOVEMENT - The distance that a part travels in an axial direction, relative to the axis of the part, when a load is applied first in one direction and then in the other.

AXIAL PLAY - A term **used mostly in bearing inspection to describe the total movement of the inner race relative to the outer race when a load is applied first in one direction and then in the other.**

AXIS - An imaginary straight line through the center of a part, as in the case of a rotor, or through some feature of a part as in the case of a gearbox.

B

BACKLASH - A term used to describe the distance that a working part has to move before it moves its mating part. The motion lost between two connected parts when the direction of motion is changed is also considered backlash. This loss of motion or looseness, is caused by design tolerances or by the wearing of working parts (such as clevis pin in rod-end bearing).

BENCH - To do the work described in the term BENCHING.

BENCH CHECK - The action taken by maintenance for determining whether an accessory or component is working properly.

BENCHING - A general shop term that refers to a particular kind of work (stoning, grinding, filing, buffing, etc.) done by hand at a bench.

BEND - Distortion in a part.

BLENDING - An operation in which surfaces are worked by hand to produce a smooth surface without abruptly changing its contour.

BLISTER - A raised portion of a surface caused by separation either of the outer layers of the parent metal or of a coating applied to it.

BLUEING - A term that describes the bluish color on the surfaces of some metals exposed to high temperatures.

BOWING - A bend or curve in a normally straight or nearly straight line.

BREAK - Separation of part.

BUCKLING - A large-scale deformation of the original contour of a part, usually due to pressure or impact from a foreign object, structural stresses, excessive localized heating, high-pressure differentials, or to any combination of these.

BULGE - An area on a sheet metal part that has swelled outward.

BURN - A rapid destructive oxidizing action usually caused by higher temperatures than the material can withstand structurally. Change in color and appearance often indicates this condition.

BURNISHING - Smoothing of a metal surface by mechanical action, but without a loss of material, generally found on plain bearing surfaces. Surface discoloration is sometimes present around the outer edges. Normal burnishing from operational service is not detrimental if the coverage approximates the carrying load and there is no evidence of burns.

BURN-THROUGH - A portion of parent metal, usually sheet ***metal,*** that has burned through,leaving a hole.

BURR - A rough or sharp edge on a hole or corner usually caused by machining; sometimes by wearing.

C

CALIBRATE - The work done in testing and/or adjusting an instrument or accessory to known standards.

CAPTIVE NUT - A nut permanently attached to a piece of equipment,

CHAFING - A worn or rubbed area causal by friction: refers to the wear produced by parts such as fuel and air lines rubbing against other parts.

CHAMFER - A beveled edge, usually made by machining, sometimes by forming.

CHASE THREADS - To remove high spots, dirt, etc. from threads, using a hand tap or hand die.

CHATTER MARK - Surface irregularity.

CHIPPING - Breaking away of metallic particles.

CHORD - A straight line drawn between the leading and trailing edges of an airfoil.

CHORDAL LENGTH - The distance between the leading and trailing edges of an airfoil.

COCKED - A term generally used to describe a condition in which close-fitting parts are not square with one another either before or after being assembled,

COKING - Carbon-like deposits (caused by improperly burned fuel) left on parts in hot section of engine.

COMPONENT - A unit somewhat similar to an accessory in that it is self-contained but differing in that it is designed to control operations. Valves, switches, solenoids, etc., are typical components.

CONCAVE - A hollow surface curved like the inside of a bowl.

CONCENTRIC - Outside or inside diameters of different size but which have the same center or axis are called **concentric.**

CONFIGURATION - A term referring to the form, shape or contour of a part or parts.

CONTAMINATION (FOREIGN MATERIAL) - Any foreign substance such as metal chips, lint, rust and water that would be harmful to the functioning of a part or system.

CONVERGING - Two or more lines (cracks) which approach one another and which, if allowed to continue, will meet at a single point.

CONVEX - A surface shaped like the outside of a sphere or a ball.

COPPER BACKUP - A copper block, shaped to suit part being repaired, used during welding to take away some of the heat.

CORROSION - A mass of small pits which cumulatively create a large cavity (usually shallow) in the surface of the parent metal.

CRACK - Parting of parent metal.

CRAZING - A mesh of very small hairlike cracks found in glazed or baked-on coated surfaces, generally caused by temperature changes or by deformation of parent metal, cracks do not penetrate into parent metal.

D

DEFECT - A general term covering any flaw affecting the usefulness or serviceability of a part.

DEFORMATION - An undesirable change in shape of the part, usually of a permanent nature.

DEMINERALIZED WATER - Water from which minerals such as salt, lime sulfur etc. have been removed, usually by distilling or boiling.

DENT - A completely smooth surface depression caused by pressure or impact from a smooth ball-like foreign object. The parent material is displaced, but usually none is separated.

DESICCANT - A drying agent; usually placed in containers, along with parta being stored, to absorb moisture and prevent rusting.

DIAGNOSTIC EQUIPMENT - Test equipment used to determine what the defective part is.

DIAMETER - The length of a chord passing through the center of a circle.

DIAMETRAL - Referring to the diameter.

DIAMETRAL RUNOUT - The total indicator reading of an indicator in contact with a cylindrical or conical surface when the piece or indicator is rotated 360 degrees about an established axis. This includes both eccentricity and out-of-roundness.

DISCOLORATION - The change in color of a surface, which usually becomes daker. Usually caused by he heat or buildup of varnish film.

DISHING - The CONCAVE shape taken by a normally flat surface, usually after being subjected to excessive pressures.

DISTORTION - Twisting or bending out of a normal, natural or original shape, usually caused from being exposed to excessive pressure or temperature either when restrained or unrestrained.

DOWEL PIN - A pin pressed or tapped into a reamed hole through two parts, so that about 1/2 of its length is in each part. Principally used to make it possible to accurately realine parts.

DRIFT - A flat, tapered piece of steel used to remove tapered shank drills and other tools from their holder.

DYNAMIC-BALANCE - To determine the area of unbalance of a rotating part so that material can be removed or added to make part run without vibration.

E

ELECTROCHEMICAL ETCH - Method of marking parts in which the characters are produced by removing material by an electrolytic process.

ENTRANCE THREAD - The first or lead thread in a tapped hole or in a nut.

EROSION - The gradual wearing away of material caused by the hot flow of gases, or foreign particles. An eroded surface may appear similar to a corroded surface.

ETCHING - The process of treating the surface of a part with acid to expose and exaggerate the surface conditions of the metal.

EXTERNAL COMPONENT - A component attached to the outside of the engine.

F

FACE RUNOUT - The total reading on an indicator measuring the runout on the face of a part rotating about an established axis.

FATIGUE - The progressive weakening of a material under repeated cycles of stress.

FILLER MATERIAL - The metal used, usually in rod form, in making a weld.

FILLET WELD - A weld having a triangular cross section, usually joining two surfaces at right-angles to one another.

FIT - The amount of tightness or looseness between mating parts when assembled together.

FLAKING - Breaking away of paint or plate.

FLATNESS - See OUT-OF-FLATNESS.

FLUSH - A shop term used in describing two surfaces that are even with each other. The term is also used to describe the washing or cleaning of chips or dirt by pressure flushing. See PRESSURE-FLUSH.

FOREIGN MATERIAL - See CONTAMINATION.

FOREIGN OBJECT - Any object such as a tool, piece of equipment, engine part (nut, bolt, lockwire) that could in any way damage the engine.

FRAYING - Wearing or rubbing of areas, generally used in reference to damage on wire-braid covering (of Teflon hose) or on thermocouple harnesses.

FRET CORROSION - Oxidation (rusting) of metal, usually bearings, that takes place at loaded surfaces subjected to relatively slight motion.

FRETTING - Wearing away of metal by rubbing against another metal (generally associated with press fit or close fitting parts).

FROSTING - An initial stage of scoring caused by irregularities or high points of metal welding together with minute particles of metal transferring to the mating surface, giving a frosted appearance.

G

GALLING - A defect caused by the movement of two surfaces in contact with each other. In most cases an accumulation of foreign material is deposited on the parent metal.

GAP - An opening or space; a break in continuity.

GLAZING - A hard, glossy surface.

GOUGE - A wide rough scratch or group of scratches, usually with one or more sharply impressed corners, and frequently accompanied by deformation or removal of parent material.

GROOVE - A long narrow, continuous cavity or impression caused by pressure of a moving surface in contact with the parent material.

H

HANG UP - Failure of an engine to accelerate to the speed at which the throttle has been set,

HARDWARE - Miscellaneous nuts, bolts, studs, washers etc. used as fasteners.

HEX KEY - An L-shaped hand tool used for turning socket head screws, studs, etc; frequently called an "Allen wrench. "

HOT SPOT - A condition caused by a defective fuel nozzle (poor spray patterns) causing fuel to burn unevenly in the combustion chamber, which caused metal on outside of combustion casing to turn blue.

I

IMBALANCE - The state of being out of balance. An unequal distribution of weight about the axis of rotation.

INCLUSION - Foreign matter enclosed in metal.

INDICATIONS - Surface defect, not necessarily a crack.

INTERFERENCE - Anything that prevents a part, component, etc. from being assembled or disassembled.

K

KINKS - Short, tight twists or curls caused by a doubling or winding of a hose or line upon itself. Likely to cause difficulties in the operation of something.

KIT - A group or set of parts or tools usually used for repair or replacement of worn or damaged assemblies.

L

LAMINATED - Anything laminated, such as certain kinds of shims, that consists of layers of material, each of identical thickness.

LAPPING - Smoothing or polishing two surfaces, with or without abrasives, to a high degree of accuracy.

LEAK - The entering, escaping or by-passing (contrary to intension) of liquids or gases from their normal passage or containment, usually caused by a hole or improper sealing. The act of leaking is called leakage and the measurement of leakage is called leakage rate.

LOOSE - Abnormal movement of a part.

M

MATCHED - Fitted together or made suitable to be fitted together.

MATCHMARK - A mark made on the surfaces of two or more mating parts so that they can be realined to these marks at reassembly.

MATCH-MARK - Doing the work described in matchmark.

MATING SURFACES - Two surfaces that join or fit together.

METALIZATION - Coating by molten metal particles sprayed through the engine.

MICROINCH - One millionth of an inch; largely used in measuring imperfections of surface finishes.

MICRON - A unit of length in the metric system equal to 0.001 millimeter.

MISALINED - A mismatching or malformation of any parts which either prevents assembly or results in faulty operation and/or ultimate part failure.

MISSING PIECE - Removal or loss of a portion of parent material due to a combination of defects or damage.

N

NICK - A surface impression with sharp corners or bottom, usually caused by pressure or impact from a sharp-edged foreign body. The parent material is displaced but usually none is separated.

NOISY - An abnormal sound condition of moving parts, usually an increase in volume or a change of pitch.

O

ORIFICE - A small-diameter hole, machined to close tolerances, used to accurately control the flow of fluid or air through accessories and components, especially in fuel and oil systems.

OUT-OF-FLATNESS - The total amount that a surface deviates from a true, flat surface.

OUT OF ROUNDNESS - Total variation, in a radial direction, from a true circle. When measured with an indicator, it is the total indicator reading when the part is rotated 360°; when measured with a micrometer, it is one half the total difference between the maximum and minimum diameters.

P

PARENT METAL - The basic metal of a part, sometimes referred to as base metal; the term is used particularly in connection with welding, where the parent metal is that being welded rather than that used in the welding rod.

PEENING - Surface deformation.

PICKUP - Transfer of one material onto another,

PITTING - Very shallow depressions in a surface, usually caused by chemical reaction (rusting chemical corrosion).

POTTING - The sealant in an electrical junction box or fitting, usually applied as a liquid or paste, which sets to a firm moisture seal.

PRESSURE-FLUSH - To force a liquid (water, solvent) under pressure through all inside passages or over the outside of a part to wash it clean.

R

RADIAL CLEARANCE - Clearance measured in a direction perpendicular to the engine centerline.

RADIAL CRACK - A crack that runs perpendicular to the axial centerline of the engine.

RADIAL MOVEMENT - Movement of a part in a direction perpendicular to the engine centerline.

RIGGING - The procedure for preadjusting the linkages that control engine operation.

ROUTE - Doing what is described in routing.

ROUTING - The path usually taken by lines, hoses, etc. on the outside of engine connecting the various fittings.

RUB - A surface cavity or impression caused by two surfaces moving against each other.

RUN-ON TORQUE - The torque required to screw a self-locking nut onto a thread until threads are fully engaged.

RUNOUT - See DIAMETRAL RUNOUT and FACE RUNOUT.

S

SCORING - Multiple scratches, usually parallel and resulting from the same cause.

SCRATCH - A long, narrow sharp-cornered impression caused by the movement of a sharp object across the surface of the parent material..

SCUFFING - A dulling or moderate wear of a surface resulting from a slight amount of rubbing.

SEIZURE - A wedging or binding of two surfaces, which prevents further movement.

SETUP - A general term used to describe the work done in setting up tools, fixtures, etc. to do a specific job.

SHEET METAL - Rolled metal up to one-quarter inch thick; the type used in making fabricated parts such as nozzles, turbine casings, etc.

SPALLING - Cracking off, or flaking off of small particles of metal from the surface, usually in thin layers.

STAKING - An operation in which the metal around a pin or shaft or the end of a pin (or shaft) itself is displaced to hold part firmly in place.

STATIC BALANCE - An operation, usually done before dynamic balancing, in which blades are shifted or weight is added, depending on the assembly being balanced, to eliminate unbalance.

STOP-DRILL - Drilling a small-diameter hole in the end of a crack, usually in sheet metal parts, to keep it from getting longer.

STRESS - A cause of part failures.

SUBASSEMBLY - A self-contained unit of an ASSEMBLY that can be removed, replaced and repaired separately. Turbine nozzles and combustion liners are typical subassemblies.

SURFACE FINISH - A shop term that refers to surface roughness. Surface roughness, a standard term used in industry to accurately express the degree of roughness of a surface, is expressed in microinches. In the text, the allowable surface finish is given in microinches. But on an illustration, the symbol is used, as in the following example: 63. The apex of the symbol is always shown touching the surface in question.

SYMMETRY - Correspondence in size, shape, and relative position of parts on opposite sides of a dividing line.

T

TEAR - A forcible, somewhat crude pulling or wrenching away of material so that ragged or irregular edgea result.

THROUGH-CRACK - A crack, usually V-shaped and relatively narrow, deep enough to penetrate the total thickness of the parent metal.

TOLERANCE - The range of variation allowed in maintaining a specified dimension in making a part.

TORQUE - To tighten a nut, bolt, or fitting, using a torque wrench, to a specified torque value expressed as inch-pounds or as foot-pounds.

TOTAL INDICATOR READING (TIR) - Is the total movement of the pointer of an indicator when measuring the amount of out-of-roundness, out-of-flatness or other deviations of a part.

U

UNBALANCE - Unequal distribution of weight about the axis of rotation; usually results in vibration.

W

WARPED - Not true to an established plane or line; out of true shape.

WEAR - Relatively slow removal of parent material from any cause, frequently not visible to the naked eye.

WELD - Metal fused by heating, with or without pressure applied, with or without using filler material. See WELD BEAD.

WELD BEAD - A deposit of weld made when the bare electrode melts during arc welding.

WELDMENT -An assembly made up of parts joined by welding. Also called a fabrication.

LIST OF ABBREVIATIONS

AVIM	Aviation Intermediate Maintenance
AVUM	Aviation Unit Maintenance
C	Celsius
CPS	Cycles Per Second
EGT	Engine Gas Temperature
F	Fahrenheit
HIT	Health Indicator Test
Hz	Hertz
ID	Inside Diameter
IN/LB	Inch-Pound
IN/SEC	Inch-Second
LB/HR.	Pound-Hour
LB/IN.	Pound-Inch
LH	Left-Hand
LRU	Line Replaceable Unit
MAC	Maintenance Allocation Chart
MAX	Maximum
MIN	Minimum
N1	Turbine Speed
N2	Output Shaft Speed
OAT	Outside Air Temperature

LIST OF ABBREVIATIONS - Continued

PA	Atmospheric Pressure
PB	Boost Pressure
P_1	Compressor Inlet Pressure
PM	Modulated Pressure
Ps	Servo Pressure
PSI	Pounds Per Square Inch
PSIG	Pounds Per Square Inch Gage
P3	Compressor Discharge Pressure
RH	Right Hand
RPM	Revolutions Per Minute
RPSTL	Repair Parts Special Tools List
TAT	True Air Temperature
TEAC	Turbine Engine Analysis Check
TGT	Turbine Gas Temperature
TIR	Total Indicator Reading
TM	Technical Manual
TOT	Turbine Outlet Temperature

ALPHABETICAL INDEX

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ALPHABETICAL INDEX - Continued

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ALPHABETICAL INDEX - Continued

ALPHABETICAL INDEX - Continued

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ALPHABETICAL INDEX - Continued

ALPHABETICAL INDEX - Continued

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Chief of Staff

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To be distributed in accordance with DA Form 12-31, Organizational Maintenance Requirements for AH-1G, UH-1B, UH-1C/M, UH-1D/H and EH-1H, AH-1S(MOD), and AH-1S(PROD) aircraft.

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The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and ail fields must be included; however, only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@avma27.army.mil>
To: Is-lp@redstone.army.mil
Subject: DA Form 2028
1. ***From:*** Joe Smith
2. *Unit:* home
3. ***Address:*** 4300 Park
4. ***City:*** Hometown
5. ***St:*** AL
6. ***Zip:*** 77777
7. ***Date Sent:*** 19-OCT-93
8. ***Pub No:*** 55-2840-229-23
9. ***Pub Title:*** TM
10. ***Publication Date:*** 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. ***Submitter Fname:*** Joe
14. Submitter Mname: T
15. ***Submitter Lname:*** Smith
16. ***Submitter Phone:*** 123-123-1234
17. ***Problem:*** 1
18. Page: 2
19. Paragraph: 3
20. tine: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. ***Text:***

This is the text for the problem below line 27.

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THEN . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC John DOE
CO A 3rd Engineer Bn
Ft. Leonardwood, MO 63108

DATE SENT 22 August 1992

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 1-1520-250-10	15 June 1992	Operator's manual MH60K Helicopter

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	

IN THIS SPACE, TELL WHAT IS WONG 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 calle a shim. Please correct one or the other

EXAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

JOHN DOE, PFC (268) 317-7111

SIGN HERE

JOHN DOE John Doe

DA FORM 1 JUL 79 2028-2

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DRSTS-M verprint2, 1 Nov 80

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COMMANDER
US ARMY AVIATION AND MISSILE COMMAND
ATTN AMSAM-MMC-LS-LP
REDSTONE ARSENAL AL 35898-5230

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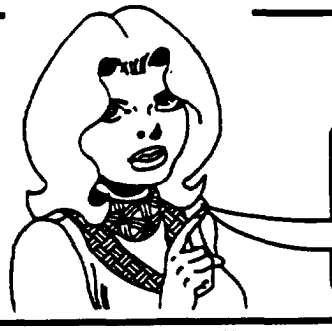

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FROM: (PRINTYOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 55-2840-229-23-2	09 March 1981	ENGINE ASSEMBLY, AVUM/AVIM

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO

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THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

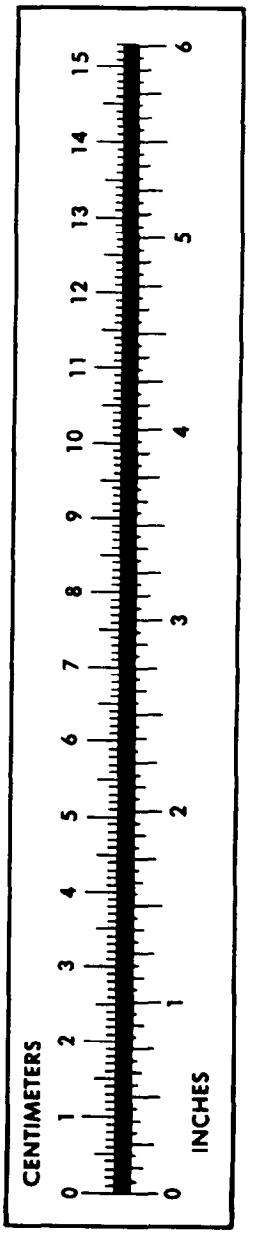
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
ıts	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



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