

# TECHNICAL BULLETIN



NO 407-01-31

DATE 06-13-01

PAGE NO. 1 of 14

DATE
REV.

**MODELS AFFECTED:** 407

**SUBJECT:** IMPROVED TAIL ROTOR GEARBOX INPUT SEAL P/N 427-342-412-101, INTRODUCTION OF.

**HELICOPTERS AFFECTED:** 407, Serial Number 53000 through 53391

[Helicopters 53392 and subsequent will have the intent of this bulletin completed before delivery.]

**COMPLIANCE:** At the option of the customer.

**DESCRIPTION:**

This bulletin is issued to introduce a new tail rotor gearbox input seal and wear sleeve. The new seal is a double lip design, which has performed well in test and during field evaluation. It is anticipated that this seal will improve reliability and life over the seal currently used.

- NOTE -

Gearbox 406-040-400-115 must be modified to a 406-040-400-117 FM as per T.B.407-99-18 (DISK PACK COUPLING 407-340-340-101 INTRODUCTION OF.) before you can carry out this Technical Bulletin.

Part I of this technical bulletin gives instructions for installation of the new tail rotor gearbox input seal 427-342-412-101 and wear sleeve 427-342-415-101 in the tail rotor gearbox P/N 406-040-400-117 or -117 FM with the adapter 407-040-440-101.

Part II of this technical bulletin gives instructions for the installation of the new tail rotor gearbox input seal 427-342-412-101 and wear sleeve 427-342-415-101 with a new adapter 427-042-440-103.

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**APPROVAL:**

The engineering design aspects of this bulletin are Transport Canada approved.

**MANPOWER:**

Approximately 1.0 man-hours are required to accomplish this bulletin. Man-hours are based on hands-on time and can vary with personnel and facilities available.

**MATERIAL:**

**Required Material:**

The material that follows is required to do this bulletin and can be obtained through your Bell Helicopter Textron Supply Center.

**PART I**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
427-342-412-101	Seal	1
427-342-415-101	Wear sleeve	1
M83248/1-125	Packing	1
M83248/1-234	Packing	1
100-071-5	Mod plate	1

**PART II**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
427-042-440-103	Adapter	1
427-342-412-101	Seal	1
427-342-415-101	Wear sleeve	1
M83248/1-125	Packing	1
M83248/1-123	Packing	1
M83248/1-234	Packing	1
100-071-5	Mod plate	1

**Consumable Material:**

The material that follows is required to do this bulletin; however, this material is considered consumable (bench stock) material and may not require ordering depending on the operator's consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center.

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>REFERENCE NO.</u>
TT-N-95, TYII 1GAL	Solvent	C-304
MILS8802CLB2 6OZ	Sealant	C-308
AS100028	Lockwire	C-405
299-947-100TY2CL2G50	Adhesive	C-317

**SPECIAL TOOLS:**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
T101449	Spanner wrench
T103216-101	Spanner assembly
T101308	Jackscrew
427-240-155-101	Seal driver
Work aid # 1 Figure 1	

**WEIGHT AND BALANCE:**

Not affected.

**ELECTRICAL LOAD DATA:**

Not affected.

**REFERENCES:**

BHT-407-MM-7, Rev. 6, 14 April 1998:

Chapter 53, Fuselage.

Chapter 65, Tail Rotor Drive.

BHT-407-CR&O, Rev. 1, 15 December 1997:

Chapter 65, Tail Rotor Drive.

T.B. 407-99-18, DISC PACK COUPLING 407-340-340-101, INTRODUCTION OF.

A.S.B. 407-97-7, TAIL ROTOR DRIVE, SHIMMING PROCEDURE BEARING SUPPORT TO BEARING HANGER, INTRODUCTION OF.

**PUBLICATIONS AFFECTED:**

BHT-407-MM-7, Rev. 6, 14 April 1998:

Chapter 65, Tail Rotor Drive.

BHT-407-CR&O, Rev. 1, 15 December 1997:

Chapter 65, Tail Rotor Drive.

BHT-407-IPB, Rev. 4, 1 May 1998:

Chapter 65, Tail Rotor Drive.

**ACCOMPLISHMENT INSTRUCTIONS:**

**PART I: Installation of new tail rotor gearbox input seal 427-342-412-101 and wear sleeve 427-342-415-101 in tail rotor gearbox P/N 406-040-400-117 or -117 FM with adapter 407-040-440-101.**

- NOTE -

You can replace the input seal with the tail rotor gearbox installed on the helicopter.

1. Prepare the helicopter for maintenance.
2. Remove the applicable cowlings to get access to the tail rotor driveshaft and the tail rotor gearbox (Refer to Maintenance Manual, Chapter 53).

- NOTE -

Record the quantity of shims that keep the bearing hanger centered in the bracket to make sure it is reinstalled in the same position. If the shim stack is not recorded, or you feel that shim stack needs to be verified, then perform ASB 407-97-7.

3. Remove the aft bearing and hangar segmented shaft assembly attached to the tail rotor gearbox (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for the removal instructions).

- NOTE -

Do not remove seal mating ring (6, figure 2) from gearbox when you remove the adapter.

4. Remove the tail rotor gearbox adapter (1, Figure 2); the nut (12), and the carbon seal (13) (Refer to BHT-407-CR&O Manual, Figures 65-5 and 65-6 for accomplishment instructions).
5. Discard the packing (9), and (14), and the carbon seal (13). Keep the seal mating ring (6) inside the gearbox.
6. Clean adapter (1) and wear sleeve (11) with solvent (C-304).
7. Apply a small bead of sealant (C-308) on the wear sleeve journal surface and on the adapter (1).
8. Apply heat to the sleeve (11).
9. Use an arbor press and a pressing plate, to install the wear sleeve (11, Figure 2) flush to 0.010 inch (0.254 mm) from the end of adapter (1).
10. Remove any excess adhesive from adapter (1).

- NOTE -

Keep the shipping mandrel installed on the seal (13) until you are prepared for the immediate installation of the nut (12).

11. Clean the nut (12) with solvent (C-304).
12. Remove the shipping mandrel from the seal (13) before pressing it in the nut (12) and reinstall after.

- NOTE -

Do not use a hydraulic press to install the seal. Use an arbor press. Excessive pressure can deform the seal case, distort the sealing lip, and cause leakage to occur.

13. Use tool 427-240-155-101 to press seal (13) into nut (12).
14. Apply a small bead of sealant (C-308) to the mating line of seal (13) and the nut (12).
15. Make sure that the seal mating ring (6) is in position inside the gearbox.
16. Install the nut (12) with the new packing (14) (Refer to BHT-407-CR&O Manual, Figure 65-12 for accomplishment instructions).
17. Remove the seal shipping mandrel.
18. Lubricate the seal lips and adapter with transmission oil.

-NOTE-

New adapter with wear sleeve may fit tight over the pinion input splines. If such case, apply heat to adaptor before installation.

19. Installed the adapter (1), packing (9), nut (4), plug (3), and spring lock (2) (Refer to BHT-407-CR&O Manual, Figure 65-6 for accomplishment instructions).
20. Install the bearing and hanger segmented shaft assembly you removed in Step 3 (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for the installation instructions).
21. Use a vibrating stylus to mark the Mod plate 100-071-5 as follows:

407-540-400-101

22. Form Mod plate to fit a 3.75 to 4.00 inches diameter for installation.
23. Apply adhesive (C-317) to the Mod plate 100-071-5 and install on the tail rotor gearbox as shown on Figure 3.

24. Install the cowlings removed in Step 2 (Refer to Maintenance Manual, Chapter 53).
25. Make an entry in the Helicopter Historical Records (HR) to show that the tail rotor gearbox 406-040-400-117 or -117 FM has been modified to 407-540-400-101.

**PART II: Installation of new tail rotor gearbox input seal 427-342-412-101 and wear sleeve 427-342-415-101 with new adapter 427-042-440-103.**

- NOTE -

You can replace the input seal with the tail rotor gearbox installed on the helicopter.

1. Prepare work aid (#1, Figure 1).
2. Prepare the helicopter for maintenance.
3. Remove applicable cowlings to get access to the tail rotor driveshaft and the tail rotor gearbox (Refer to Maintenance Manual, Chapter 53).

- NOTE -

Record the quantity of shims that keep the bearing hanger centered in the bracket to make sure it is reinstalled in the same position. If the shim stacks up are not recorded, or you feel that shim stack up needs to be verified, you must do ASB 407-97-7.

4. Remove the bearing and hanger segmented shaft assembly attached to the tail rotor gearbox (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for the removal instructions).
5. Remove the tail rotor gearbox-adapter (1, Figure 4), the nut (12), the carbon seal (13), and seal mating ring (6) (Refer to BHT-407-CR&O Manual, Figures 65-5 and 65-6 for accomplishment instructions).
6. Discard the packings (9), (10) and (14) the carbon seal (13), the seal mating ring (6), and the adapter (1).
7. Clean the new adapter, 427-042-440-103, and the wear sleeve (11) with solvent (C-304).
8. Apply a small bead of sealant (C-308) on the wear sleeve journal surface and on the end of the adapter (1).
9. Apply heat to the sleeve (11).

10. Use an arbor press and work aid (#1, Figure 1) to install the wear sleeve (11, Figure 4) on adapter (1). Press the wear sleeve (11) until it touches the step in adapter (1).
11. Remove any excess adhesive from adapter (1).
12. Clean the nut (12) with solvent (C-304).

- NOTE -

Do not use a hydraulic press to install the seal. Use an arbor press. Excessive pressure can deform the seal case, distort the sealing lip, and cause leakage to occur.

13. Remove shipping mandrel from the seal (13). Use tool 427-240-155-101 to press seal (13) into nut (12). Reinstall shipping mandrel into seal.

- NOTE -

Keep the shipping mandrel installed on the seal (13) until you are prepared for the immediate installation of the nut (12).

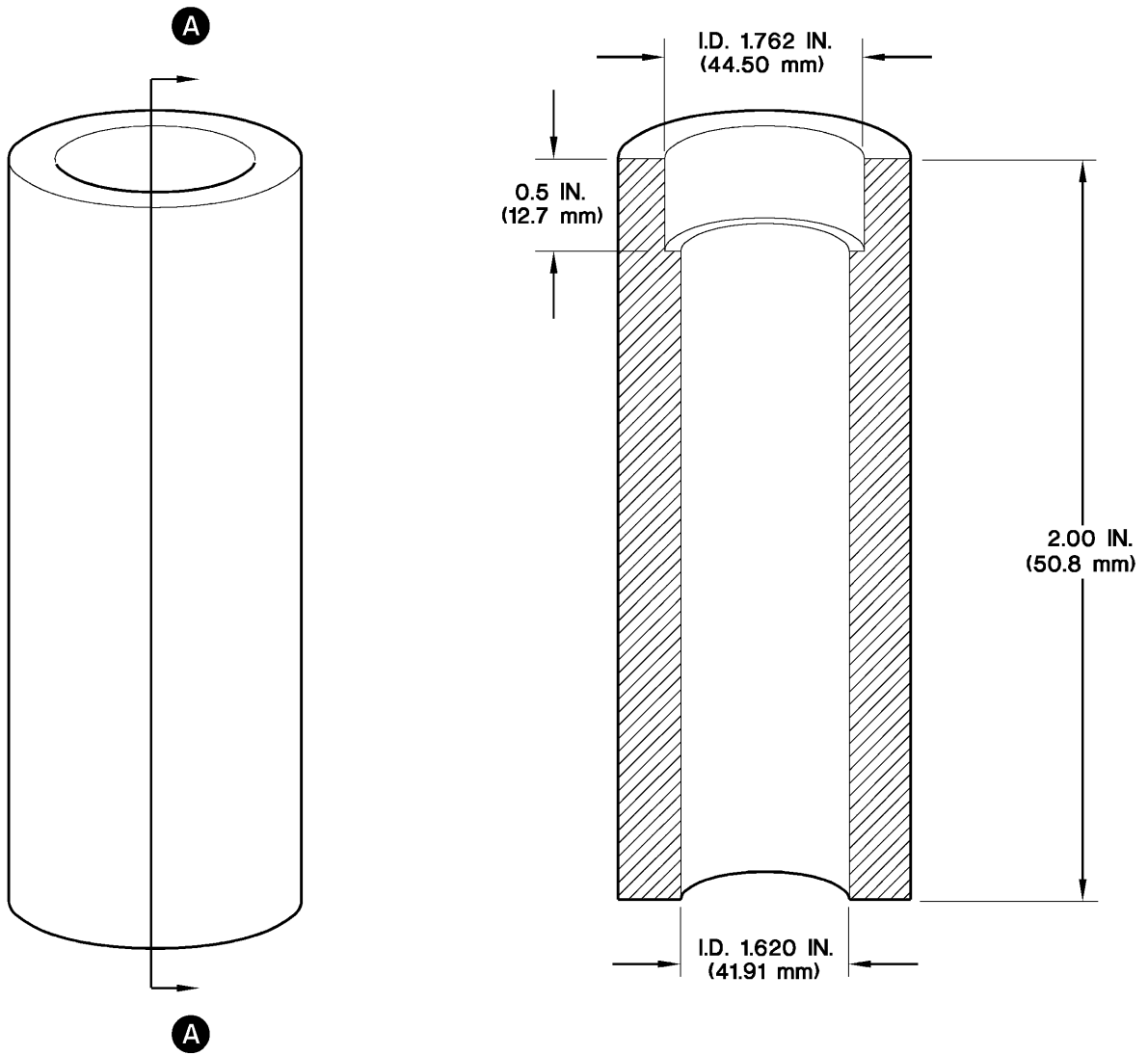
14. Apply a small bead of sealant (C-308) to the mating line of the seal (13) and the nut (12).
15. Make sure the seal mating ring (6) and the packing (10) are removed from the gearbox.
16. Install nut (12) with the new packing (14) (Refer to BHT-407-CR&O Manual, Figure 65-12 for accomplishment instruction).
17. Remove the seal shipping mandrel.
18. Lubricate the seal lips and adapter with transmission oil.

- NOTE -

New adapter with wear sleeve may fit tight over the pinion input splines. If such case, apply heat to adaptor before installation.

19. Install new packing (10), adapter (1), nut (4), new packing (9), plug (3), and spring lock (2) (Refer to BHT-407-CR&O Manual, Figure 65-6 for accomplishment instruction).
20. Install the bearing and hanger segmented shaft assembly you removed in Step 4 (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for the installation instructions).
21. Use a vibrating stylus, to mark the Mod plate 100-071-5 as follows:  

**407-540-400-105 FM**
22. Form Mod plate to fit a 3.75 to 4.00 inches diameter for installation.
23. Apply adhesive (C-317) to the Mod plate 100-071-5 and install on the tail rotor gearbox as shown on Figure 3.
24. Install the cowlings removed in Step 3 (Refer to Maintenance Manual, Chapter 53).
25. Make an entry in the Helicopter Historical Records (HR) to show that the tail rotor gearbox 406-040-400-117 or -117FM has been modified to 407-540-400-101 FM

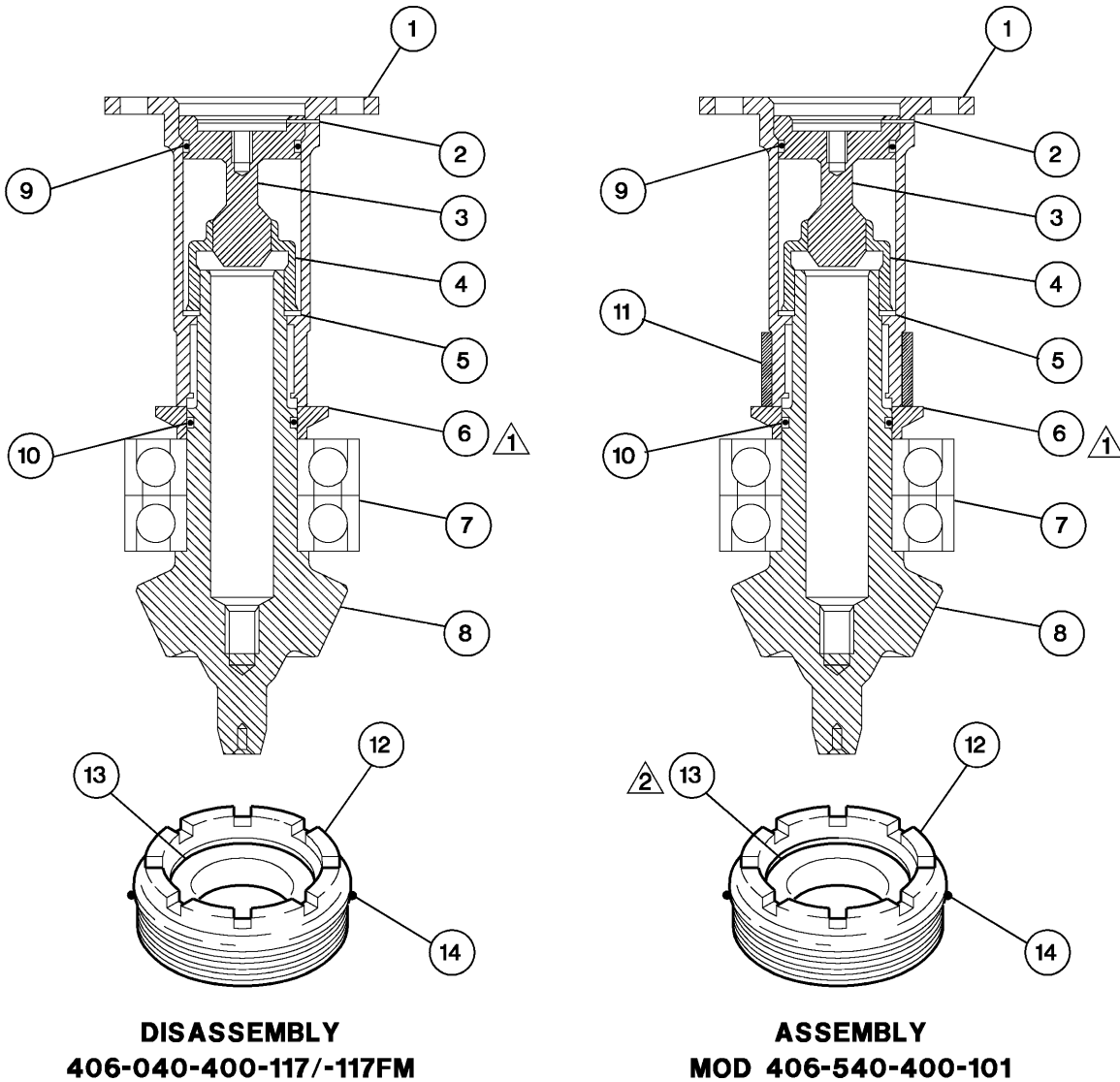


**SECTION A-A**

**WORKAID  
(ITEM # 1)**  
MATERIAL : ALUMINIUM  
O.D. : 2.000 INCH (50.8 mm)  
I.D. : 1.620 INCH (41.91 mm)

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Figure 1. Work aid No. 1



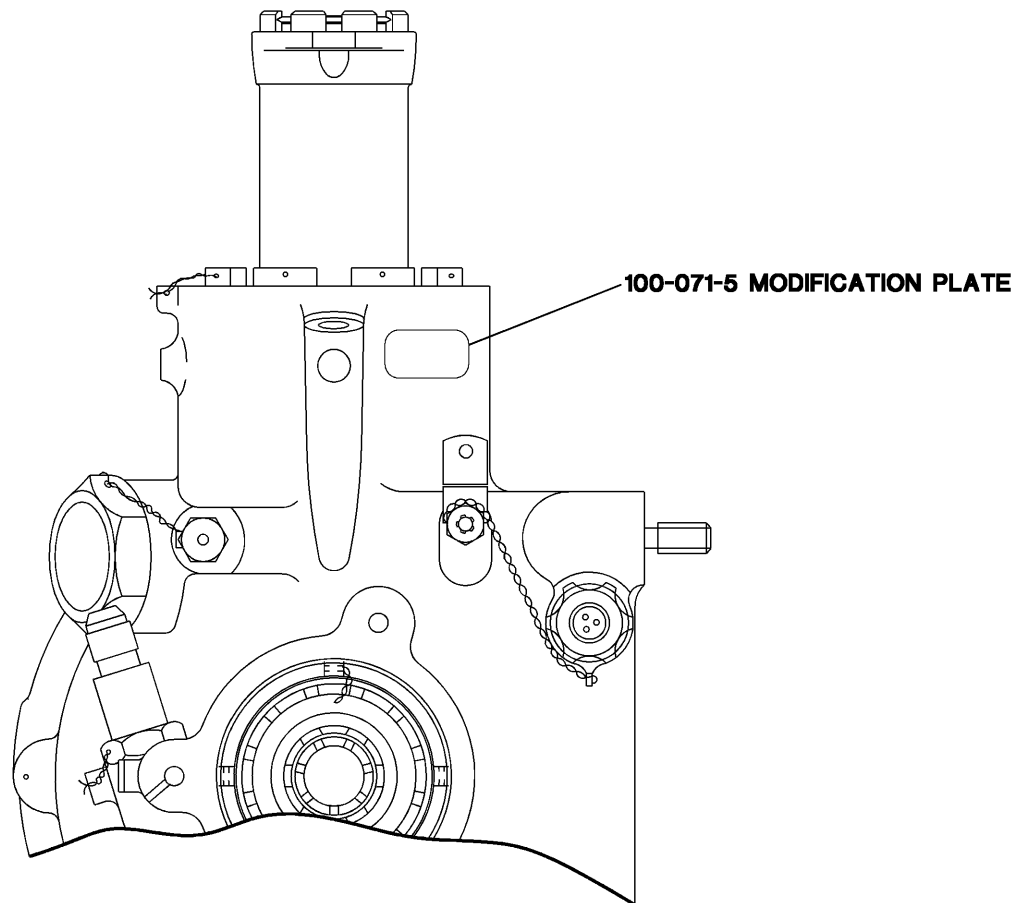
**LEGEND**

ITEM	DESCRIPTION	DISASSEMBLY P/N	ASSEMBLY P/N
1.	Adapter	407-040-440-101	407-040-440-101
2.	Lockspring	214-040-194-001	214-040-194-001
3.	Plug	407-040-442-101	407-040-442-101
4.	Nut	406-040-443-101	406-040-443-101
5.	Washer	406-040-444-101	406-040-444-101
6.	Mating ring	Note 1	Note 1
7.	Bearing	406-040-430-101	406-040-430-101
8.	Pinion	406-040-420-101	406-040-420-101
9.	Packing	M83248/1-125	M83248/1-125
10.	Packing	M83248/1-123	M83248/1-123
11.	Wear sleeve	N/A	427-342-415-101
12.	Nut	406-040-405-101	406-040-405-101
13.	Seal	406-040-453-101	427-342-412-101
14.	Packing	M83248/1-234	M83248/1-234

**NOTE**

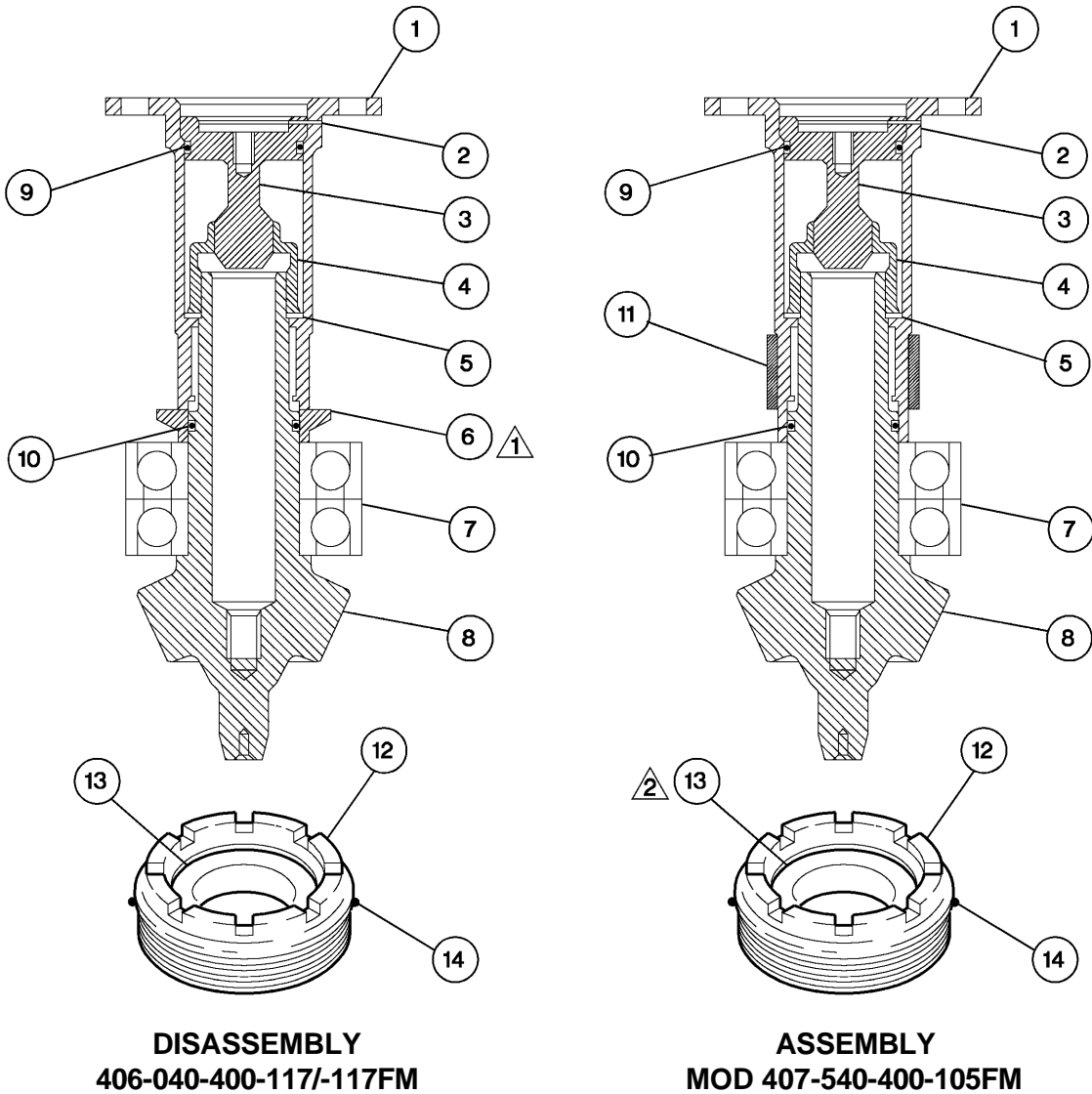
- 1 Seal mating ring is part of seal 406-040-453-101.
- 2 Apply small bead of sealant (C-308).

**Figure 2. Tail Rotor Gearbox, Disassembly/Assembly**



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Figure 3. Tail Rotor Gearbox – Mod Plate Installation



**LEGEND**

ITEM	DESCRIPTION	DISASSEMBLY P/N	ASSEMBLY P/N
1.	Adapter	407-040-440-101	427-042-440-103
2.	Lockspring	214-040-194-001	214-040-194-001
3.	Plug	407-040-442-101	407-040-442-101
4.	Nut	406-040-443-101	406-040-443-101
5.	Washer	406-040-444-101	406-040-444-101
6.	Mating ring	Note 1	N/A
7.	Bearing	406-040-430-101	406-040-430-101
8.	Pinion	406-040-420-101	406-040-420-101
9.	Packing	M83248/1-125	M83248/1-125
10.	Packing	M83248/1-123	M83248/1-123
11.	Wear sleeve	N/A	427-342-415-101
12.	Nut	406-040-405-101	406-040-405-101
13.	Seal	406-040-453-101	427-342-412-101
14.	Packing	M83248/1-234	M83248/1-234

**NOTE**

- 1 Seal mating ring is part of seal 406-040-453-101.
- 2 Apply small bead of sealant (C-308).

Figure 4. Tail Rotor Gear Box, Assembly/Disassembly