

**TECHNICAL BULLETIN**  
**Bell Helicopter** **TEXTRON**  
A Subsidiary of Textron Inc.

**NO** 407-99-18

**DATE** 06-04-99

**PAGE NO.** 1 of 9

<b>DATE</b>
<b>REV.</b>

**MODELS AFFECTED:** 407

**SUBJECT:** **DISC PACK COUPLING 407-340-340-101, INTRODUCTION OF.**

**HELICOPTERS AFFECTED:** PART I: 407, Serial Number 53000 through 53319.

PART II: 407, Serial Number 53000 through 53292.

[Serial Number 53320 and subsequent will have the intent of PART I of this Technical Bulletin completed before delivery.]

[Serial Number 53293 and subsequent will have the intent of PART II of this Technical Bulletin completed before delivery.]

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

**DESCRIPTION:**

Bell Helicopter has received reports of cracks in the outboard laminates of the disc pack coupling 406-040-340-101.

PART I of this bulletin has you install a new disc pack coupling 407-340-340-101. You do not need to replace all the disc pack couplings at the same time.

PART II of this bulletin has you modify the tail-rotor-gearbox with a new input adapter 407-040-440-101. This modification is necessary when a new disc pack coupling 407-340-340-101 attached to the tail rotor gearbox input adapter (station 370.388) is installed.

These new disc pack couplings are subject to a 50 flight hours scheduled visual inspection. A torque check at 10 to 25 flight hours after installation and a torque check at every 300 flight hours thereafter is also applicable.

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**APPROVAL:**

The engineering design aspects of this Technical Bulletin are Transport Canada approved.

**MANPOWER:**

Approximately 6 man-hours are necessary to replace the eight disc pack couplings.

Approximately 1 man-hour is necessary to do PART II of this bulletin.

The man-hours are based on hands-on time and can change due to the personnel and facilities available.

**WARRANTY:**

Owners/operators of 407 helicopters who comply with the instructions outlined in this bulletin are eligible for a special 100% warranty credit toward the purchase of the parts contained in PARTs I and II of the "Required Material" section of this bulletin.

To receive this credit:

- Customers must order the replacement parts from an approved BHTI supply source.
- Comply with the instructions outlined in this bulletin no later than 30 November 1999.
- Send a completed Malfunction Report (MR) to BHT Warranty Administration. A copy of the invoice referencing parts used to accomplish this bulletin must be attached to the Malfunction Report.

- NOTE -

Customers who fail to comply with the instructions in this bulletin after 30 November 1999 are **not** eligible for the special warranty credit provisions listed above.

**MATERIAL:**

The material that follows is necessary to complete this Technical Bulletin and can be procured through Bell Helicopter Textron Supply Center.

**PART I**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
407-340-340-101	Disc Pack Coupling	8

**PART II**

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
407-040-440-101	Adapter	1
407-040-442-101	Plug	1
214-040-194-001	Lockspring	1
M83248/1-125	Packing	1

**SPECIAL TOOLS:**

No additional tools are required. Refer to the applicable Maintenance Manual and Component Repair and Overhaul Manual.

**WEIGHT AND BALANCE:**

Not affected.

**ELECTRICAL LOAD DATA:**

Not affected.

**REFERENCES:**

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.

ASB 407-97-7, T/R DRIVE, SHIMMING PROCEDURE BEARING SUPPORT TO BEARING HANGER, INTRODUCTION OF.

ASB 407-97-13A, DISC PACK COUPLINGS 406-040-340-101, TORQUE CHECK AND SPECIAL INSPECTION, INTRODUCTION OF.

ASB 407-98-22, OIL COOLER BLOWER FAN BEARING 407-340-339-101/-103 AND GREASE ROYC013 PER MIL-G-25013, 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 Disc Pack Couplings 407-340-340-101**

1. Make sure that ASB 407-97-7 and PART III of ASB 407-97-13A were accomplished.

- NOTE -

Record the amount of shims that keep the bearing hanger centered in the bracket and the position of each segmented shafts to make sure they are reinstalled in their initial location. If you do not follow this recommendation you must do ASB 407-97-7.

2. Remove the forward shaft assembly, the aft shaft assembly, and the four bearing and hanger segmented shaft assemblies. (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for the removal instructions.)
3. Make sure that the splines of the flywheel, the splines of the fan shaft assembly, and the splines of the adapter are within the specified wear limits. (Refer to the Maintenance Manual BHT-407-MM-7, Chapter 65, for the inspection instructions and to Figure 1 for added wear limits).

4. Turn the fan shaft assembly to find the condition of its bearings. Replace unserviceable bearings. (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for the instructions to replace the fan shaft hanger bearings.)
5. Remove the disc pack couplings 406-040-340-101.
6. Examine the nuts, the washers, and the bolts for condition.
7. Do PART II of this bulletin if the disc pack coupling attached to the tail rotor gearbox input adapter (station 370.388) is replaced.

- NOTE -

Use recorded values at removal and make sure the segmented shaft assemblies are installed in their initial locations with their correct shims. If dimension and location were not recorded accomplish ASB 407-97-7.

- NOTE -

Make sure that the drag torque of each nut, as measured with a dial indicator torque wrench, is added to the required torque.

8. Install the new disc pack couplings 407-340-340-101. (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for the removal and installation instructions.)
9. Align the segmented-drive shaft hanger bearings. (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for the bearing alignment instructions.)

**Inspection and Torque Check for the New Disc Pack Coupling 407-340-340-101**

1. At each 50 flight hours, do the inspection that follows:

- NOTE -

The disassembly of the disc pack couplings is not necessary to do this inspection.

- a. Examine the disc pack coupling 407-340-340-101 for any scratches, cracks, fretting, and corrosion. (Refer to Figure 3.)

- b. Make sure the laminate gapping is in the limits. (Refer to Maintenance Manual BHT-407-MM-7, Chapter 65, for gapping limits.)
2. Do a torque check 10 to 25 hours after the initial installation of the disc pack coupling. Repeat torque check every 10 to 25 hours until torque is stabilized. (Refer to MM BHT-407-MM-7, Chapter 65 for the torque check procedure.)
3. Do a torque check at every 300 flight hours. (Refer to MM BHT-407-MM-7, Chapter 65 for the torque check procedure.)

## **PART II: Installation of the New Tail-Rotor Gearbox Adapter 407-040-440-101**

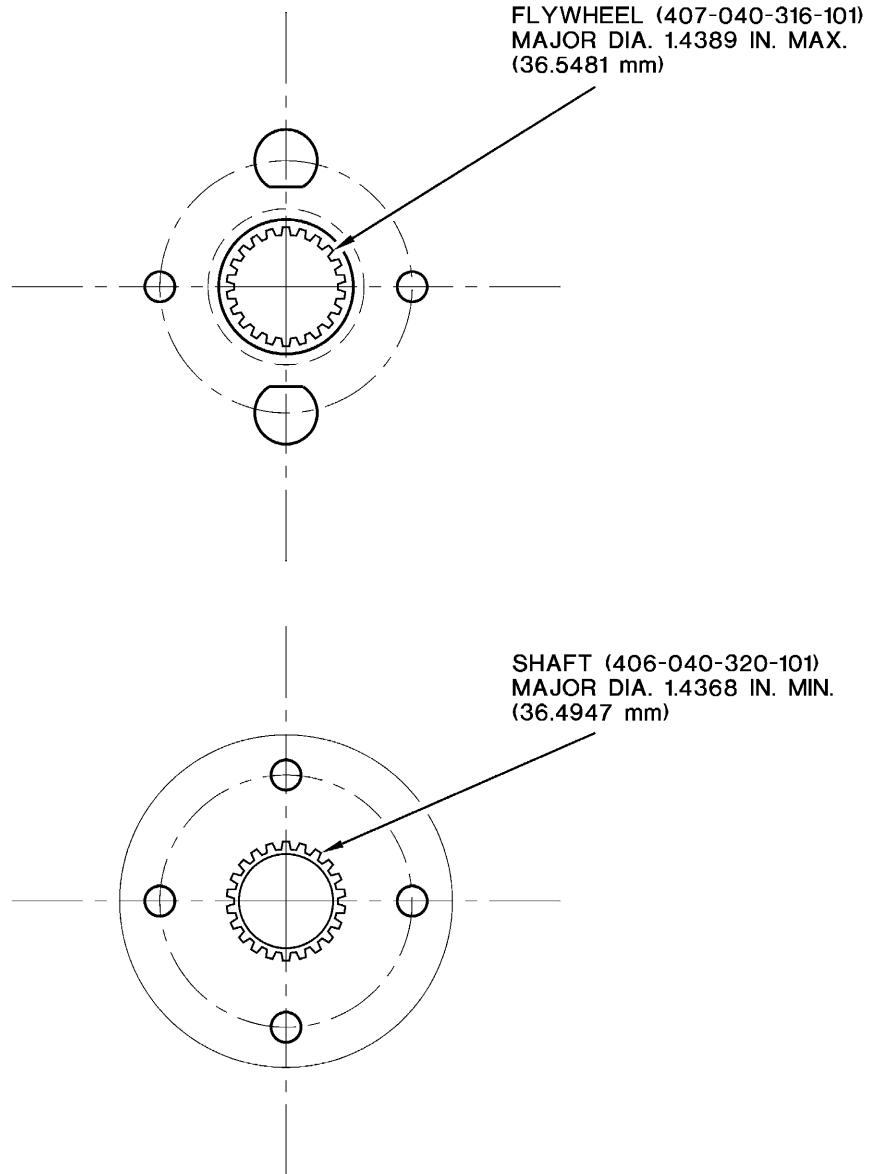
- NOTE -

You can replace the adapter 406-040-440-101 with the tail-rotor-gearbox installed on the helicopter.

- NOTE -

Do not move the seal mating ring when you remove the adapter.

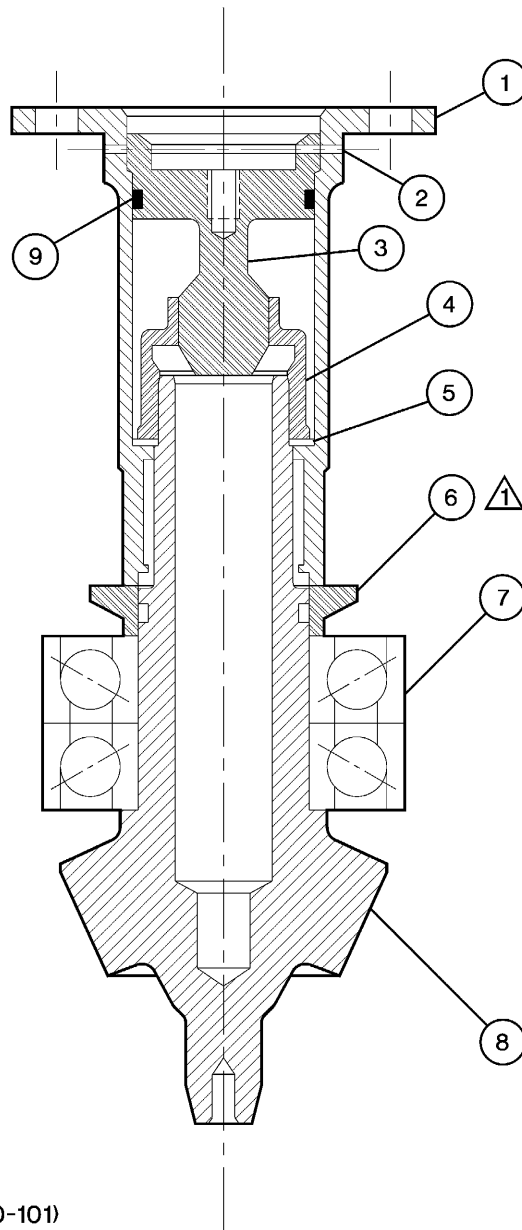
1. Remove the tail-rotor gearbox-adapter 406-040-440-101. Discard the adapter 406-040-440-101, the retainer MS16625-3150, the plug 406-040-442-101, the lockspring 406-040-441-101, the retainer M27426-3139B, and the packing M83248/1-125. (Refer to BHT-407-CR&O manual, Figures 65-5 and 65-6 for accomplishment instruction.)
2. Install the adapter (1, Figure 2), the washer (5), and nut (4). Apply torque 80 to 100 FT-LBS to nut (4). Install the plug (3), the packing (9), and the lockspring (2) as shown in Figure 2. (Refer to BHT-407-CR&O manual, Figure 65-6, for the required torque.)
3. After you do the modification, use a vibrating stylus and mark the tail-rotor-gearbox assembly data plate as follows:  
  
406-040-400-~~445~~,117 FM
4. Make an entry in the Helicopter Historical records to show that PART I and PART II of this bulletin are accomplished.



**FLYWHEEL AND FAN SHAFT WEAR LIMITS**

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**Figure 1. Flywheel and Fan Shaft Wear Limits**



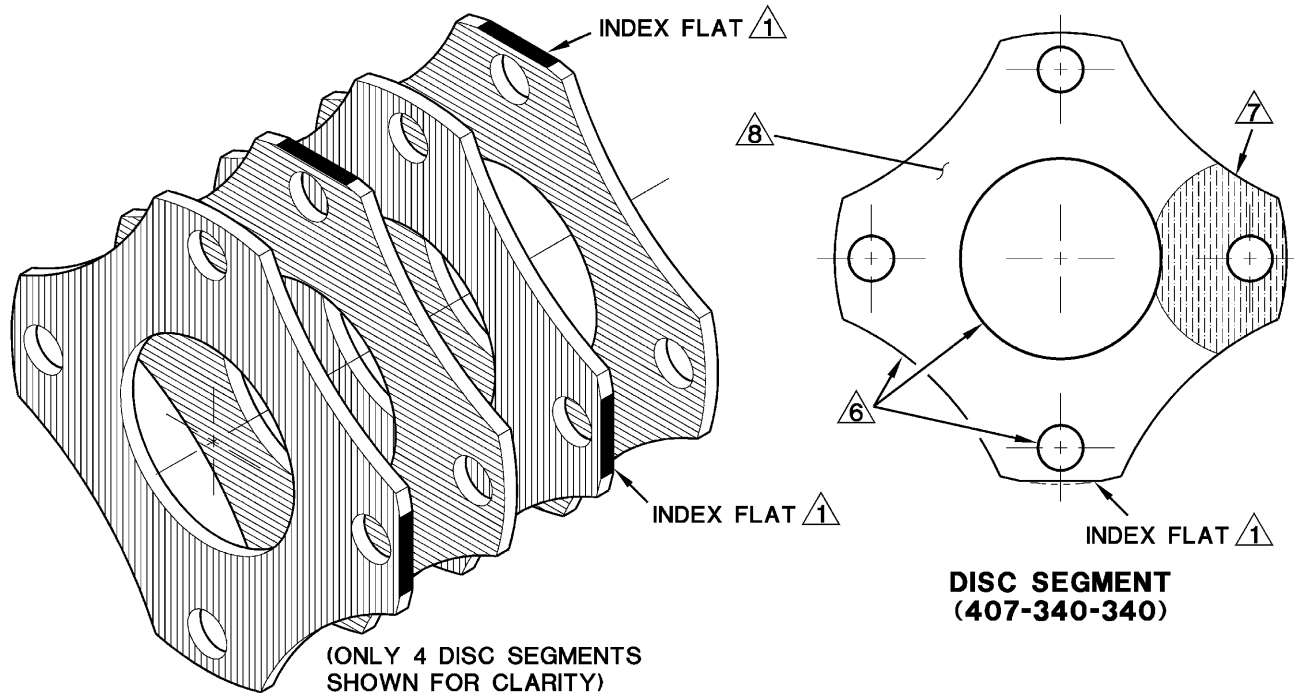
**LEGEND**

- 1. Adapter (407-040-440-101)
- 2. Lockspring (214-040-194-001)
- 3. Plug (407-040-442-101)
- 4. Nut (406-040-443-101)
- 5. Washer (406-040-444-101)
- 6. Seal, mating and drive ring (406-040-453-101)
- 7. Bearing (406-040-430-101)
- 8. Pinion (406-040-420-101)
- 9. Packing (MS83248/1-125)

**NOTE**

 Do not move the seal (6) when you remove the adapter (1).

**Figure 2. New Adapter – Installation**



### CAUTION

MAKE SURE THAT THE ORDER IN WHICH THE DISC SEGMENTS ARE STACKED DOES NOT CHANGE AFTER THE COUPLING DISC PACK HAS OPERATED.

### NOTES

- 1 The grain of the disc segment is parallel to the index flats. Make sure that the index flats on each disc segment are turned 90 degrees from the disc segment before and the disc segment after in the disc pack.
2. A coupling disc pack is 0.115 to 0.127 inch (2.92 to 3.22 mm) thick. A coupling disc pack has 9 to 12 disc segments. Each disc segment is 0.010 to 0.014 inch (0.254 to 0.355 mm) thick.
3. Use solvent (C-304) to clean grease and oil from each disc segment.
4. Soak the coupling disc pack in alcohol phosphoric cleaner (C-344), or use a soft rubber eraser to clean fretting corrosion.
5. Cracks, nicks and scratches are not permitted.
- 6 No fretting damage is permitted in less than 0.050 inch (1.270 mm) from an edge.
- 7 Discard disc segments that have fretting corrosion of more than 0.001 inch (0.025 mm) deep and on more than 40 percent of the area (4 places each side) . Damage of 0.001 inch (0.025 mm) can be felt with a 0.010 inch ( 0.254 mm) spherical radius probe.
- 8 Random light fretting corrosion is permitted if corrosion is not on more than 5 percent of each quadrant, and each pitted area is not more than 0.005 inch (0.127 mm) in diameter and 0.001 inch (0.025 mm) in depth. Damage of 0.001 inch (0.025 mm) can be felt with a 0.010 inch (0.254 mm) spherical radius probe.

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Figure 3. Coupling Disc Packs – Inspection and Repair