

REVISION NOTICE
Bell Helicopter **TEXTRON**
A Subsidiary of Textron Inc.

DATE Dec 01, 2004

TO: **All Owners/Operators of Bell 407 Helicopters**

SUBJECT: **REVISION "A" TO ALERT SERVICE BULLETIN 407-04-66:
(FREEWHEEL AFT BEARING CAP 406-040-509-101, INSPECTION
AND REWORK OF)**

Revision "A" to this bulletin mandates the replacement of the output shaft 406-040-517-101 and sprag and retainer 406-040-580-103 for freewheel with discrepant aft bearing cap installed.

AN APPROPRIATE ENTRY SHOULD BE MADE IN THE AIRCRAFT LOGBOOK UPON ACCOMPLISHMENT
IF OWNERSHIP OF AIRCRAFT HAS CHANGED PLEASE FORWARD TO NEW OWNER

ALERT SERVICE BULLETIN
Bell Helicopter **TEXTRON**

A Subsidiary of Textron Inc.

NO. 407-04-66

DATE July 19, 2004

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DATE 12-01-04

REV "A"

MODEL AFFECTED: 407

SUBJECT: Freewheel aft bearing cap 406-040-509-101, inspection and rework of

HELICOPTERS AFFECTED: Model 407.

Freewheel aft bearing cap P/N 406-040-509-101, serial number A-1833 thru A-1912.

COMPLIANCE: PART I

Upon receipt of this bulletin, determine if the aft bearing cap is affected. This applies to all spare aft bearing caps and freewheel assembly as well as those installed on the helicopter.

PART II

-NOTE-

Engine cycle start average can be calculated by subtracting the actual engine start cycle count from the engine start cycles at which time the freewheel was installed and dividing by the freewheel time since new or time between overhaul.

Example:

5000 cycles	Total of actual engine cycle start
- <u>3000</u> cycles	Total of engine cycle start at the freewheel installation
2000 cycles	Total of start cycle on freewheel assembly
2000 cycles	Total of start cycle on freewheel assembly
÷ <u>1000</u> hrs	Freewheel (TSN) or(TSO)
2 cycles/hrs	Engine cycle start average

For freewheel assemblies with less than 3 engine start cycles per hour on average and helicopters that are not exclusively used for training, accomplish PART II of this bulletin within the next 50 flight-hours.

PART III

For helicopters exclusively used for training, and for freewheel assemblies with 3 engine start cycles or more per hour on average, accomplish PART III of this bulletin within the next 50 flight-hours.

If the freewheel assembly is removed for any reason, accomplish PART III of this bulletin.

PART IV

For freewheel assembly equipped with aft cap as described in the HELICOPTER AFFECTED section, accomplish PART IV of this bulletin within the next 300 hours, but not later than 30 June 2005.

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DESCRIPTION:

Bell Helicopter has found that some freewheel aft bearing caps are missing the lubrication channel intended to allow oil flow into the aft bearing support assembly. These caps may have been delivered on production aircraft or as spares.

PART I of this bulletin gives instructions how to identify the affected aft cap.

PART II and III of this bulletin provides procedures required to return the freewheel assembly to service.

A PART IV of this bulletin mandates the replacement of the output shaft 406-040-517-101 and sprag and retainer 406-040-580-103 for freewheel with discrepant aft bearing cap installed.

APPROVAL:

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

MANPOWER:

Approximately 0.5 man-hour is required to complete PART I of this bulletin.
 Approximately 3.0 man-hours are required to complete PART II of this bulletin.
 Approximately 16.0 man-hours are required to complete PART III of this bulletin.
 Approximately 16.0 man-hours are required to complete PART IV of this bulletin.
 Man-hours are based on hands-on time, and may vary with personnel and facilities available.

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WARRANTY:

Owner/Operators of the affected helicopters who comply with the instructions outlined in this bulletin will receive a special 100% warranty credit for the replacement parts contained in the "Required Material" section of this bulletin.

Owner/Operators that comply with PART II of this ASB will receive \$150.00 labor credit, Owner/Operators that comply with PART III of this ASB will receive \$800.00 labor credit. An additional \$100.0 will be issued for customers that elect local rework of the aft bearing cap.

Purchase the required parts from an approved BHTI supply source. Submit a completed Maintenance Malfunction Information Report (MMIR) to BHTI Warranty Department no later than 30 days after completion of this bulletin.

MATERIAL:**Required Material:**

The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Helicopter Textron Supply Center.

PART II

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
214-040-814-105	SLEEVE	A/R (NOTE 1)
214-040-841-101	SEAL	1
406-040-509-101	AFT BEARING CAP	A/R (NOTE 2)
406-040-532-103	BEARING	A/R (NOTE 1)
M83248/1-018	PACKING	1
M83248/1-021	PACKING	1
M83248/1-140	PACKING	1
MS24665-285	COTTER PIN	1

NOTE:

1. Bearing and sleeve replacement may not be necessary depending on the parts condition.
2. Aft bearing cap replacement may not be required depending on the option chosen by the operator.

PART III

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
206-040-279-101	PACKING	1
214-040-841-101	SEAL	1
214-040-814-105	SLEEVE	A/R (NOTE 1)
406-040-509-101	AFT BEARING CAP	A/R (NOTE 2)
406-040-516-101	INPUT SHAFT	A/R (NOTE 1)
406-040-517-101	OUTPUT SHAFT	1
406-040-530-103	BEARING	A/R (NOTE 1 and 3)
406-040-532-103	BEARING	A/R (NOTE 1 and 4)
407-340-533-101	BEARING	A/R (NOTE 1 and 5)
406-040-580-103	SPRAG AND RETAINER	1
M83248/1-011	PACKING	5
M83248/1-016	PACKING	1
M83248/1-018	PACKING	1
M83248/1-021	PACKING	1
M83248/1-033	PACKING	1
M83248/1-034	PACKING	1
M83248/1-036	PACKING	1
M83248/1-140	PACKING	1
M83248/1-240	PACKING	1
M83248/1-238	PACKING	1
M83248/1-903	PACKING	1
M83248/1-906	PACKING	1
M83248/1-907	PACKING	1
MS24665-285	COTTER PIN	1

NOTE:

1. Replacement of bearing, input shaft, and sleeve, may not be necessary depending on the parts condition.
2. Aft bearing cap may not be required depending on the option chosen by the operator.
3. As an alternate, it is acceptable to use 406-040-530-105 or 206-040-206-001 in lieu of 406-040-530-103 bearing.
4. As an alternate, it is acceptable to use 406-040-532-101 in lieu of 406-040-532-103 bearing.

5. As an alternate, it is acceptable to use 206-040-206-001 or 206-040-206-101 in lieu of 407-340-533-101 bearing.

PART IV

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
206-040-279-101	PACKING	1
406-040-517-101	OUTPUT SHAFT	1
406-040-580-103	SPRAG AND RETAINER	1
M83248/1-011	PACKING	5
M83248/1-016	PACKING	1
M83248/1-018	PACKING	1
M83248/1-021	PACKING	1
M83248/1-033	PACKING	1
M83248/1-034	PACKING	1
M83248/1-036	PACKING	1
M83248/1-140	PACKING	1
M83248/1-240	PACKING	1
M83248/1-238	PACKING	1
M83248/1-903	PACKING	1
M83248/1-906	PACKING	1
M83248/1-907	PACKING	1
MS24665-285	COTTER PIN	1

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SPECIAL TOOLS:

None required

WEIGHT AND BALANCE:

Not required

ELECTRICAL LOAD DATA:

Not affected

REFERENCES:

BHT-407-MM, Rev. 18 – 29 August 2003

Chapter 63, Main Rotor Drive System

BHT-407-CR&O, Rev. 2 – 09 March 2004

Chapter 63-30, Drive System Freewheel

PUBLICATIONS AFFECTED:

None affected

ACCOMPLISHMENT INSTRUCTIONS:

PART I: Identification of the affected aft bearing cap, 406-040-509-101

1. Open the engine access doors.
2. Locate the serial number (1, Figure 1) of the freewheel aft bearing cap (2).
 - a. If the cap serial number is not listed in the HELICOPTER AFFECTED section, no further action is required. Close the access doors and continue with Step 3.
 - b. If the cap serial number is listed in HELICOPTER AFFECTED section, refer to the COMPLIANCE section and accomplish either PART II or III of this bulletin as directed. Contact Product Support Engineering Light Helicopters with the P/N, S/N, TSN, and TSO of the aft bearing cap and freewheel assembly.

Product Support Engineering Light Helicopters

Office: 450-971-6407

Fax: 450-433-0272

E-mail: pselight@bellhelicopter.textron.com

3. Make an entry in the helicopter Technical Records to show that PART I of the Alert Service Bulletin is completed.

PART II. For freewheel assemblies with an average of less than 3 engine start cycle per hour and for helicopter that are not exclusively used for training

1. Remove the engine cowling and transmission fairing assembly (BHT-407-MM, Chapter 53).
2. Remove the forward short shaft (BHT-407-MM, Chapter 65).

3. Remove the aft adapter (5, Figure 2) and aft bearing cap (2) (BHT-407-MM, Chapter 63).
4. Remove bearing (1) from the aft bearing cap (2) (BHT-407-MM, Chapter 63).
5. Remove and discard the support assembly seal (3).
6. Inspect support assembly bearing (1) for condition (BHT-407-CR&O). Replace bearing if defective .
7. Inspect sleeve (4) for condition (BHT-407-CR&O).
8. Select from the following list, the rework option deemed most suitable for convenience:
 - a. Order a replacement cap assembly through your Bell Helicopter Spares supplier. Please note that limited assets are available to support this bulletin, and spares will be issued on a first come, first served basis.
 - b. Locally rework the aft bearing cap as shown in Figure 3. Use a vibrating stylus to identify locally-reworked cap assembly by adding letter "R" to the serial number on the cap.
 - c. Provide the cap for rework to Bell Tennessee. This option permits the original cap to be reworked by Bell Tennessee, identified with the rework letter "R" suffix to the serial number, and returned for installation.
 - d. Obtain a reworked cap from the rotatable pool available through Bell Tennessee. This option will accept the rework candidate in exchange for a reworked item from the rotatable pool. Please note that for this option due to limited assets, a rework candidate must be supplied in advance of shipment from the rotatable pool.
 - e. For option c or d above, contact Bell Tennessee for advance scheduling at:

Bell Helicopter Tennessee Textron
157 Industrial Park Road
Piney Flats, TN. 37686
Office: 423-538-5114
Fax: 423-538-6198.
9. Install the support assembly bearing (1) and seal (3) into the aft bearing cap (BHT-407-MM, Chapter 63).

10. Install the aft bearing cap (2) and adapter (5) (BHT-407-MM, Chapter 63).
11. Install the forward short shaft (BHT-407-MM, Chapter 65).
12. Check the freewheel and transmission chip detectors for presence of metal contamination (BHT-407-MM, Chapter 63).
13. Install the engine cowling and transmission fairing assembly (BHT-407-MM, Chapter 53).
14. Perform a 30 minute ground run as follows:
 - a. Perform normal start as per Flight Manual.
 - b. Operate the helicopter until it reaches 100% Nr then roll the throttle back to idle speed as you would do during normal operation.
 - c. Repeat the above step one time every 2 minutes until the 30 minute ground run is completed.
15. Perform a serviceability check to the transmission and freewheel assembly (BHT-407-MM, Chapter 63).
16. Make an entry in the helicopter Technical Records to show that PART II of this Alert Service Bulletin is completed.

PART III: For helicopters exclusively used for training, for freewheel assemblies with an average of 3 engine start cycles or more per hour, or if the freewheel has to be removed for any reason.

1. Remove freewheel assembly (BHT-407-MM-6, Chapter 63).

-NOTE-

It is not necessary to remove wear sleeves from the forward and aft adapters unless they are damaged.

2. Disassemble the freewheel assembly (BHT-407-CR&O, Chapter 63-30).
3. Discard the sprag and retainer (7, Figure 2), the output shaft (10), and the aft seal (2).
4. Visually inspect the remaining freewheel part details for condition (BHT-407-CR&O, Chapter 63-30).

5. Select from the following list, the rework option deemed most suitable for convenience:
- a. Order a replacement cap assembly through your Bell Helicopter Spares supplier. Please note that limited assets are available to support this bulletin, and spares will be issued on a first come, first served basis.
 - b. Locally rework the aft bearing cap as shown in Figure 3. Use a vibrating stylus to identify locally-reworked cap assembly by adding letter "R" to the serial number on the cap.
 - c. Provide the cap for rework to Bell Tennessee. This option permits the original cap to be reworked by Bell Tennessee, identified with the rework letter "R" suffix to the serial number, and returned for installation.
 - d. Obtain a reworked cap from the rotatable pool available through Bell Tennessee. This option will accept the rework candidate in exchange for a reworked item from the rotatable pool. Please note that for this option due to limited assets, a rework candidate must be supplied in advance of shipment from the rotatable pool.
 - e. For option c or d above, contact Bell Tennessee for advance scheduling at:

Bell Helicopter Tennessee Textron
157 Industrial Park Road
Piney Flats, TN. 37686
Office: 423-538-5114
Fax: 423-538-6198

6. Assemble the freewheel assembly (BHT-407-CR&O, Chapter 63-30).
7. Install the freewheel assembly (BHT-407-MM-6, Chapter 63).
8. Make an entry in the helicopter Technical Records to show that PART III of the Alert Service Bulletin has been completed.

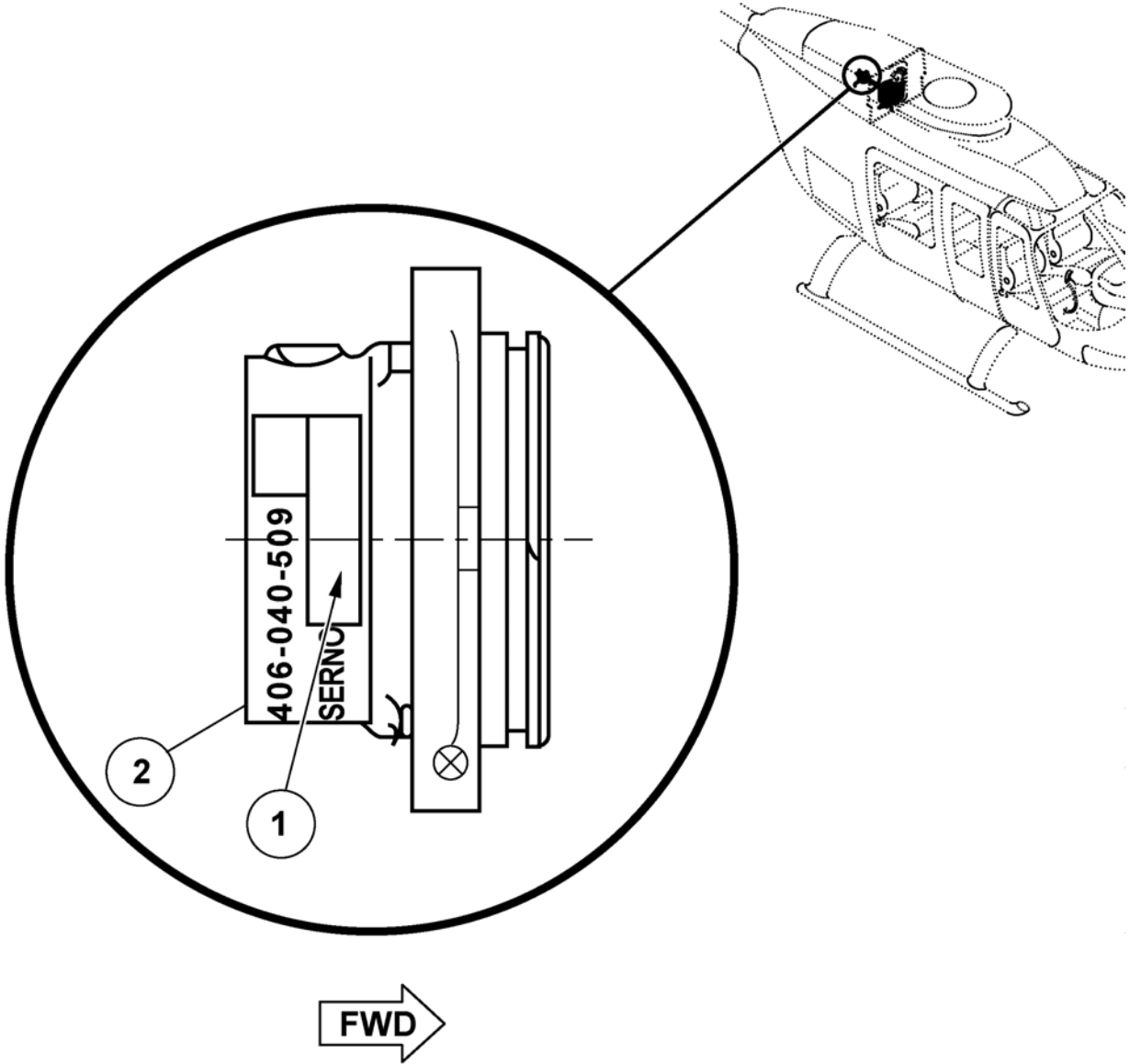
PART IV: For freewheel assembly equipped with affected aft cap.

-NOTE-

Sprag and retainer and the output shaft presently installed on freewheel affected by this bulletin, which have not run with a defective cap, may remain in service.

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1. For freewheel assembly equipped with the aft cap described in the HELICOPTER AFFECTED section of this bulletin, proceed as follow:
 - a. If the freewheel assembly is currently located in spare stock, continue with step 3.
 - b. If the freewheel assembly has had PART II of this bulletin complied with, continue with step 2.
 - c. If the freewheel assembly has had PART III of this bulletin complied with, continue with step 8.
 2. Remove freewheel assembly (BHT-407-MM-6, Chapter 63).
 3. Disassemble the freewheel assembly (BHT-407-CR&O, Chapter 63-30).
 4. Discard the sprag and retainer (7, Figure 2) and the output shaft (10).
 5. Visually inspect the remaining freewheel part details for condition (BHT-407-CR&O, Chapter 63-30).
 6. Assemble the freewheel assembly (BHT-407-CR&O, Chapter 63-30).
 7. Install the freewheel assembly (BHT-407-MM-6, Chapter 63).
 8. Make and entry in the helicopter Technical Records to show that PART IV of the Alert Service Bulletin has been completed.



LEGEND

- 1. Cap serial number is located on the R/H side
- 2. Aft bearing cap (406-040-509-101)

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Figure 1. Location of the lubrication channel and the serial number

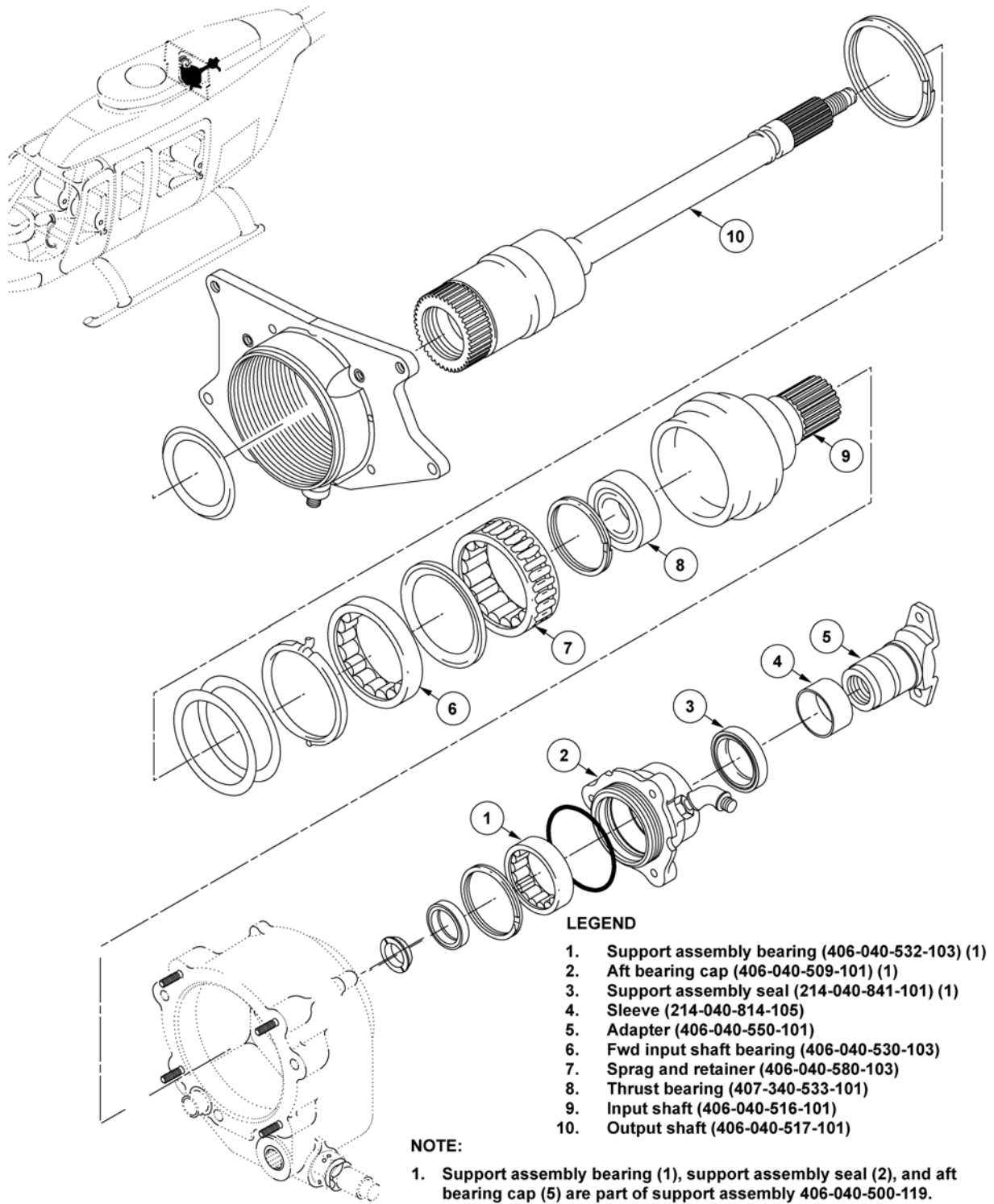
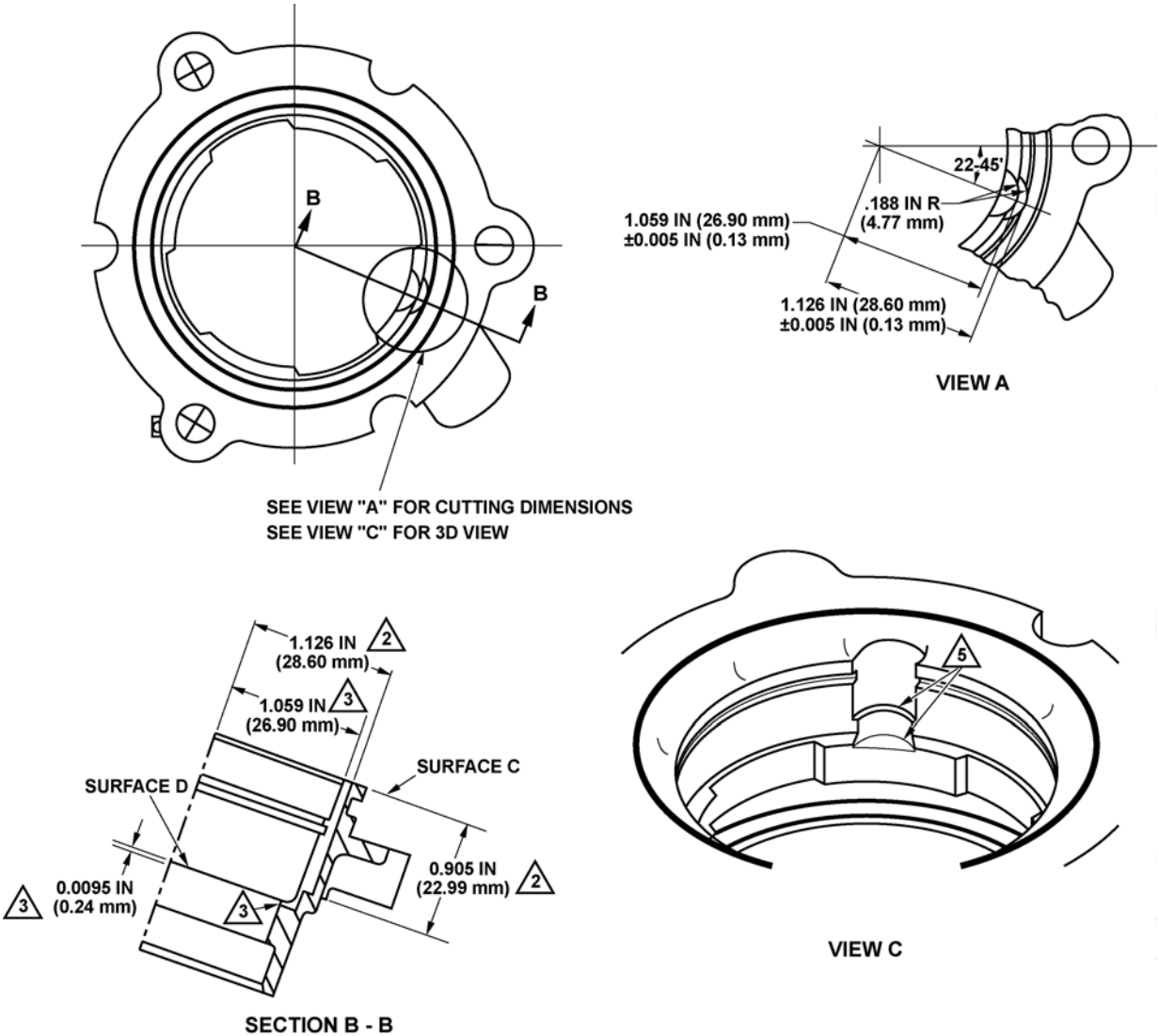


Figure 2. Parts affected by the missing lubrication channel



NOTES

1. Surface finish to be 125 u inch RMS
2. Machine scallop 1.126 inch (28.60 mm) ±0.005 inch (0.13 mm) into bore. Length of scallop to be 0.905 inch (22.99 mm) ±0.010 inch (0.254 mm) from the surface C.
3. Machine scallop 1.059 inch (26.90 mm) ±0.005 inch (0.13 mm) into bore. Scallop to be 0.0095 inch (0.24 mm) ±0.0025 inch (0.06 mm) below surface D.
4. Break all sharp edges.
5. Machine scallop radius .020 inch maximum 2 places

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Figure 3. Instructions required to modify the aft bearing cap 406-040-509-101