



A Textron Company

ALERT SERVICE BULLETIN

407-22-127

PSL # 981

20 October 2022

Revision A, 9 November 2022

MODEL AFFECTED: 407

SUBJECT: FREEWHEEL ASSEMBLY AFT CAP 406-040-509-101, INSPECTION OF.

HELICOPTERS AFFECTED: Serial numbers 54641, 54737 through 54750, 54752, 54807, 54809 through 54812, 54814, 54825, and 54903.

[Serial numbers 53000 through 53900, 53911 through 53999, 54000 through 54166, and 54300 through 54640, 54642 through 54736, 54751, 54753 through 54800, 54805, 54806, 54808, 54813, 54815 through 54824, and 54826 through 54902 are not affected by this bulletin.]

[Serial number 54904 and subsequent will have the intent of this bulletin accomplished prior to delivery.]

COMPLIANCE: **PART I:** Within 50 flight hours or 30 days, whichever occurs first, after the release date of this bulletin.

PART II: At the next freewheel assembly overhaul, next freewheel assembly 60-month interim inspection, or at next available access, whichever occurs first, but no later than 12 months after the release date of this bulletin.

DESCRIPTION:

Bell has been made aware of a quality escape in the manufacturing process of the freewheel assembly aft cap 406-040-509-101. Some aft caps may have improperly machined scallops that are designed to allow oil to flow between the aft face of the support assembly bearing and the aft cap seal.

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Approved for public release.

This Alert Service Bulletin (ASB) provides instructions to perform a one-time inspection of suspect parts for this potential defect and replacement of parts if required.

Revision A of this bulletin provides clarification as to the helicopters not affected by this bulletin as they were delivered with known conforming parts, and it also corrects a part number of one of the packings in the **MATERIAL** list.

Applicability of this bulletin to any spare part shall be determined prior to its installation on an affected helicopter.

APPROVAL:

The engineering design aspects of this bulletin are Transport Canada Civil Aviation (TCCA) approved.

CONTACT INFO:

For any questions regarding this bulletin, please contact:

Bell Product Support Engineering
Tel: 1-450-437-2862 / 1-800-363-8023 / productsupport@bellflight.com

MANPOWER:

Approximately 0.10 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. No additional man-hours are required to accomplish **PART II** of this bulletin if done in conjunction with the freewheel assembly overhaul or interim inspection.

These estimates are based on hands-on time and may vary with personnel and facilities available.

WARRANTY:

Owner Operators, and or Fleet Operators of Bell Aircraft who comply with the instructions in this Bulletin will be eligible to receive non prorated replacement part as required, listed in the bulletin. The www.mybell.com portal allocates specific warranty entitlement for an aircraft by serial number. The Product Service Letter (PSL) number which will be listed below the bulletin number on the introduction page is going to be a required field when submitting a claim for replacement parts, labor, and/or freight. If you receive an ASB or TB that does not have a PSL number, then there is no warranty entitlement for that bulletin.

Labor entitlement: Yes \$ 285.0 USD

To receive parts, labor, under warranty:

- Comply with the instructions contained in this Bulletin no later than the applicable date in the **COMPLIANCE** section.
- If there is a PSL number identified in the bulletin you will be required to enter this PSL number which will validate warranty entitlement for the selected

aircraft. Please ensure that you use the **Bulletin tab** on the warranty section on www.mybell.com portal to file your claim.

NOTES:

- A user guide on how to submit a claim can be found here: [How to Submit PSL Bulletin Claims](#).

MATERIAL:

Required Material:

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

Part Number	Nomenclature	Qty (Note)
AS3208-03	PACKING	1 (1)
AS3209-018	PACKING	1 (1)
AS3209-021	PACKING	1 (1)
AS3209-140	PACKING	1 (1)
MS24665-285	COTTER PIN	1 (1)
209-340-265-103	SEAL	1 (2)
214-040-814-105	WEAR SLEEVE	1 (2)
406-040-509-101	FREEWHEEL AFT CAP	1 (2)
406-040-532-103	BEARING	1 (2)

NOTES:

1. Required for accomplishment of **PART II** of this bulletin.
2. Only required if failing inspection criteria of **PART II** of this bulletin.

Consumable Material:

The following material is required to accomplish this bulletin, but may not require ordering, depending on the operator's consumable material stock levels. This material may be obtained through your Bell Supply Center.

Part Number	Nomenclature	Qty (Note)	Reference *
2400-00017-00	GREASE	5 LB (1)	C-001
2400-00220-00	ASSEMBLY FLUID	2 OZ (1)	C-024
2400-00020-00	LUBRICATING OIL	1 QT (1)	C-030
2010-07915-01	SEALANT	6 OZ (1)	C-308

* C-XXX numbers refer to the consumables list in the BHT-ALL-SPM, Standard Practices Manual

NOTE 1: The quantity indicated is the format the product is delivered in. Actual quantity required to accomplish the instructions in this bulletin may be more or less.

SPECIAL TOOLS:

T103216-101 Spanner Assembly.

T103311-101 Wear Sleeve Press (only required if wear sleeve requires replacement in procedures of **PART II** of this bulletin)

Bearing puller (commercial)

WEIGHT AND BALANCE:

Not affected.

ELECTRICAL LOAD DATA:

Not affected.

REFERENCES:

BHT-407-IPB Illustrated Parts Breakdown, Chapter 63 and 65.

407-MM Maintenance Manual, Chapter 63 and 65.

PUBLICATIONS AFFECTED:

None affected.

ACCOMPLISHMENT INSTRUCTIONS:

PART I – Identification of freewheel assembly aft cap serial number

1. Prepare the helicopter for maintenance.
2. Gain access to engine bay area.
3. Verify serial number of the aft cap. It will be located under the part number (Figure 1).
 - a. If the aft cap serial number **is not** included in the **Table 1**, no further action is required, and go to step 4.
 - b. If the aft cap serial number **is** in the list in **Table 1**, perform **PART II** of this bulletin within the **COMPLIANCE** period.
4. Make an entry in the helicopter logbook and historical service records indicating compliance with **PART I** of this Alert Service Bulletin.

PART II – Inspection of freewheel assembly aft cap 406-040-509-101

1. Prepare the helicopter for maintenance.
2. Remove the forward tail rotor short shaft assembly ([DMC-407-A-65-10-00-00A-520A-A](#)).

-NOTE-

The followings steps are specific to the freewheel assembly aft support assembly, and are included as detailed in the complete freewheel assembly removal instructions and associated figures ([DMC-407-A-63-13-00-00A-520A-A](#)).

3. Remove the freewheel support assembly (8, Figure 2) and freewheel aft adapter (6) as follows:
 - a. Remove and discard the cotter pin (1) from the nut (2).
 - b. Install the spanner assembly (T103216-101) on the freewheel aft adapter (6) and attach in place with the hardware supplied.
 - c. Hold the freewheel aft adapter (6) with the spanner assembly (T103216-101) and remove the nut (2) and washers (3) from the freewheel output shaft assembly (7).
 - d. Remove the spanner assembly (T103216-101).
 - e. Use a plastic scraper to remove the sealant from the washers (3,4) and the freewheel aft adapter (6).

-NOTE-

When removing the freewheel aft adapter (6), the oil will drain from the freewheel aft support assembly to the engine pan.

- f. Remove the pilot washer (4), packing (5), and adapter (6) from the freewheel support assembly (8) and the freewheel output shaft assembly (7). Discard packing (5).
- g. Disconnect the oil inlet line (12) from the elbow (11) on the freewheel support assembly (8).
- h. Close the oil inlet line (12) with a cap.
- i. Remove the nuts (13) and the washers (14) from the studs (19) that hold the freewheel support assembly (8).

- j. Remove the freewheel support assembly (8) and packing (15) from the engine gearbox. Discard packing (15).

CAUTION

YOU MUST KEEP THE CONE HALVES OF THE CONE SET TOGETHER. THE CONE SET IS A MATCHED SERIALIZED SET. INSTALLATION OF A CONE HALF FROM ANOTHER SET WILL CAUSE AN INCORRECT OPERATION OF THE FREEWHEEL ASSEMBLY.

- k. Remove the spacer (16), packing (23), and cone set (22) from the shaft assembly (5). Discard the packing (23).
4. Remove the bearing from the freewheel aft support assembly ([DMC-407-A-63-13-02-00A-520A-A](#)).
5. Inspect the freewheel assembly aft cap for a correctly machined scallop (Figure 3).
 - a. If the aft cap is correctly machined, go to step 10.
 - b. If the aft cap is **not** correctly machined, go to step 6.
6. Remove the elbow (11, Figure 2), nut (10), and preformed packing (9) from the freewheel support assembly (8).
7. Replace aft cap (8) with a serviceable cap that meets the intent of this bulletin.
 - a. If there is no seal installed on the replacement aft cap, install seal (21) ([DMC-407-A-63-13-01-00A-720A-A](#)).
8. Inspect support assembly bearing ([DMC-407-A-63-13-02-00A-280A-A](#)). Replace if unserviceable.
9. Visually inspect freewheel adapter and wear sleeve of adapter (6) for nicks, dents, scratches, or wear. Replace adapter or wear sleeve if any defects or wear beyond allowable limits are exceeded ([DMC-407-A-63-13-03-00A-520A-A](#) and [DMC-407-A-63-13-03-00A-720A-A](#)).
 - a. Wear is permitted if as follows:
 - (1) It is smooth with no sharp edges.
 - (2) It has a maximum depth of 0.002 inch (0.05 mm).
10. Install aft support (8) bearing ([DMC-407-A-63-13-02-00A-720A-A](#)).

-NOTE-

The following steps are specific to the freewheel assembly aft support assembly, and are included as detailed in the complete freewheel assembly installation instructions and associated figures ([DMC-407-A-63-13-00-00A-720A-A](#)).

11. Install aft support (8, Figure 2) and freewheel aft adapter (6) as follows:

- a. Lubricate the two halves of the cone set (22), packing (AS3209-018) (23), and spacer (16) with lubricating oil (C-030).

CAUTION

MAKE SURE THAT THE TWO HALVES OF THE CONE SET ARE CORRECTLY SEATED IN THE GROOVE OF THE TAIL ROTOR DRIVE OUTPUT SHAFT AND THAT THE SPACER IS FULLY SEATED ON TOP OF THE CONE SET. IF THE CONE SET BECOMES UNSEATED, THEN THE ACCESSORY DRIVE GEARS AND OUTPUT SHAFT CAN BE DAMAGED.

- b. Install the cone set (22) and the packing (AS3209-018) (23) in the groove of the shaft assembly (7), and then install the spacer (16) on the cone set.
- c. Lubricate the new packing (AS3209-140) (15) with lubricating oil (C-030) and install it on the support assembly (8).
- d. Apply a light coat of grease (C-001) to the area between the lips of the aft cap seal (21).
- e. Install the freewheel support assembly (8) on the studs (19). Use hand pressure to set the freewheel support assembly (8) on the engine gearbox.
- f. Install the washers (14) and the nuts (13) on the studs (19). Torque nuts (13) 50 to 70 inch-pounds (5.65 to 7.91 Nm).
- g. Lubricate a new packing (AS3208-03) (9) with lubricating oil (C-030).
- h. Install the elbow (11), nut (10), and preformed packing (9) on the freewheel support assembly (8). Torque nut (10) 30 to 45 inch-pounds (3.39 to 5.08 Nm).

CAUTION

USE CAUTION WHEN INSTALLING THE ADAPTER ONTO THE SHAFT ASSEMBLY TO PREVENT DAMAGE TO THE SEAL IN THE SUPPORT ASSEMBLY.

- i. Install the adapter (6) on the shaft assembly (7).
- j. Lubricate a new packing (AS3209-021) (5) with lubricating oil (C-030).
- k. Install the packing (AS3209-021) (5) and the pilot washer (4) on the shaft assembly (7).
- l. Apply a small bead of sealant (C-308) to the exposed face of the pilot washer (4) and to the threads of the shaft assembly (7).
- m. Connect the inlet oil line (12) to the elbow (11).

-NOTE-

It is permitted to add one thick washer (3) to the thin washer (3) for the cotter pin (1) to be engaged correctly. Refer to the Illustrated Parts Breakdown (BHT-407-IPB, Chapter 63) for the correct part number of the washer(s).

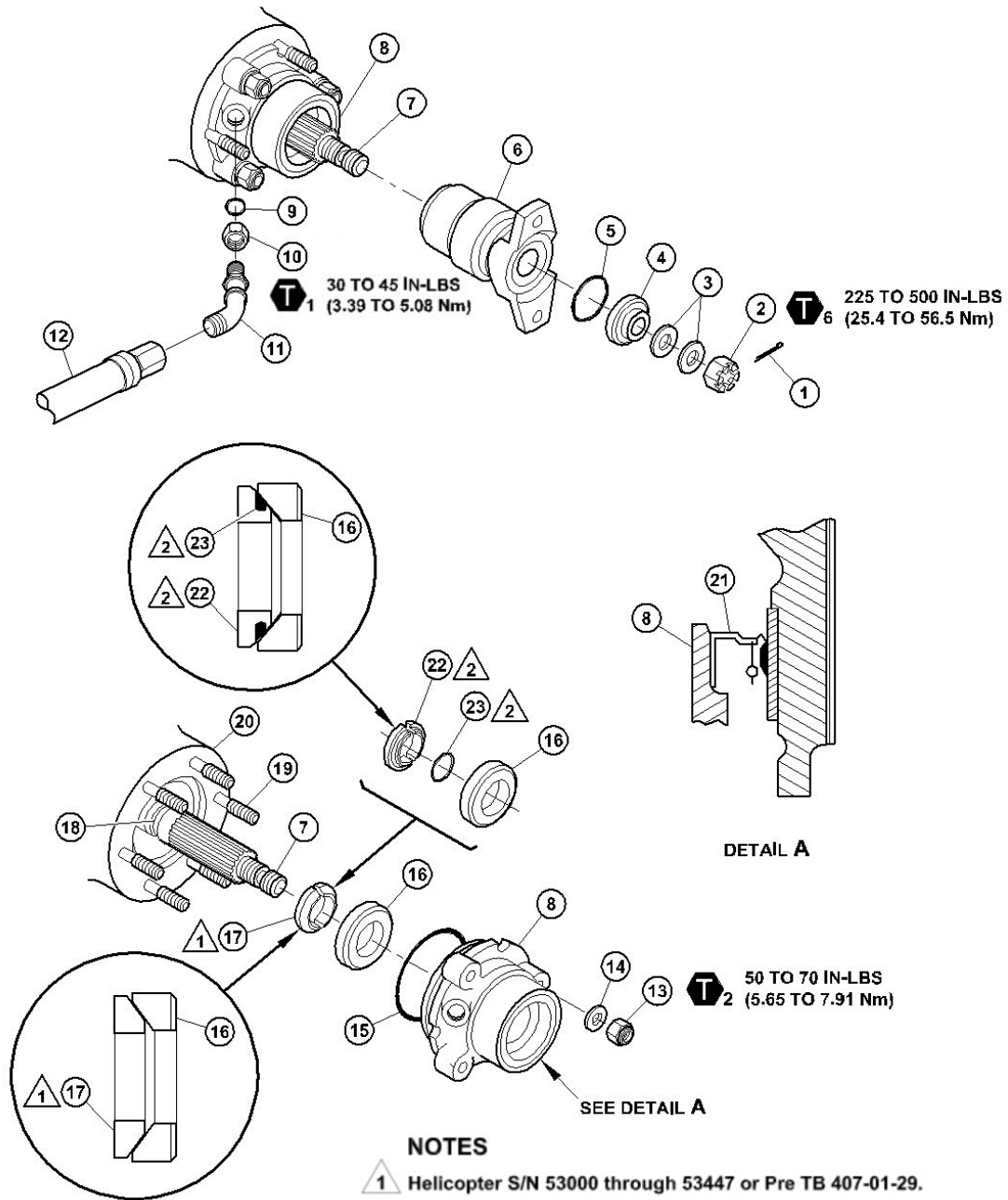
- n. Install the washers (3) and the nut (2).
 - o. Install the spanner assembly (T103216-101) on the freewheel aft adapter (6) and tighten the nut (2). Torque nut (2) 225 to 500 inch-pounds (25.4 to 56.5 Nm).
 - p. Safety the nut (2) with a new cotter pin (1).
 - q. Remove spanner assembly (T103216-101) from the aft adapter (6).
12. Install the forward tail rotor short shaft assembly ([DMC-407-A-65-10-00-00A-720A-A](#)).
13. Service the transmission and freewheel oil system ([DMC-407-A-12-00-00-03A-200A-A](#)).
14. Do the operational check ([DMC-407-A-63-00-00-00A-320A-A](#)).
15. Make an entry in the helicopter logbook and historical service records indicating compliance with **PART II** of this Alert Service Bulletin.

Table 1 – Suspect Freewheel Assembly Aft Cap 406-040-509-101

AFT CAP SERIAL NUMBER DELIVERED/INSTALLED
RD0001
RD0004
RD0007
RD0012
RD0014
RD0018
RD0025
RD0031
RD0032
RD0035
RD0041
RD0043
RD0044
RD0048
RD0058
RD0061
RD0066
RD0067
RD0069
RD0070
RD0071
RD0080
RD0081
RD0083
RD0089



Figure 1 – Location of Freewheel Assembly Aft Cap Serial Number



- | | |
|--|-----------------------|
| 1. Cotter pin | 13. Nut |
| 2. Nut | 14. Washer |
| 3. Washer | 15. Preformed packing |
| 4. Washer | 16. Cone set spacer |
| 5. Preformed packing | 17. Cone set |
| 6. Freewheel aft adapter | 18. Groove |
| 7. Freewheel output (inner) shaft assembly | 19. Stud |
| 8. Freewheel aft support assembly | 20. Output support |
| 9. Preformed packing | 21. Lip seal |
| 10. Nut | 22. Cone set |
| 11. Elbow | 23. Packing |
| 12. Oil Inlet line | |

Figure 2 – Freewheel Aft Support Assembly

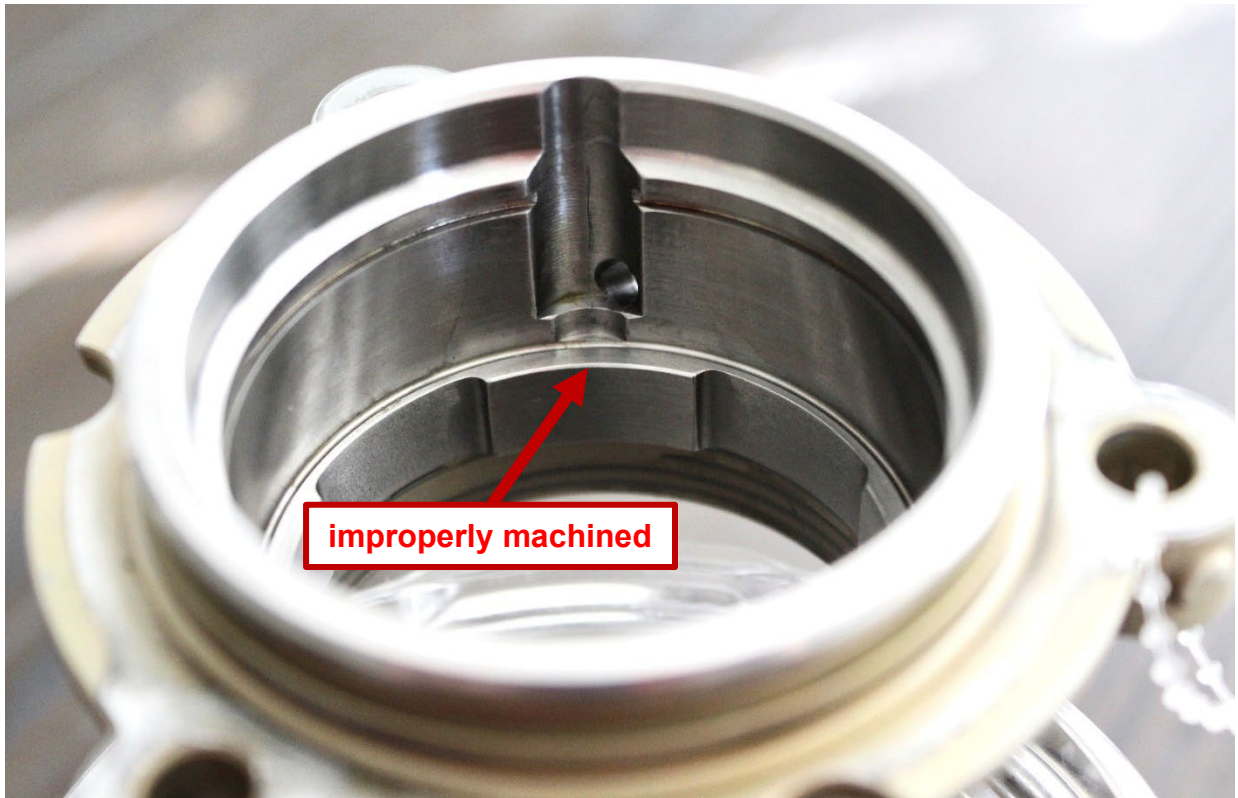


Figure 3 – Improper Machining of Aft Cap Scallop (sheet 1 of 2)

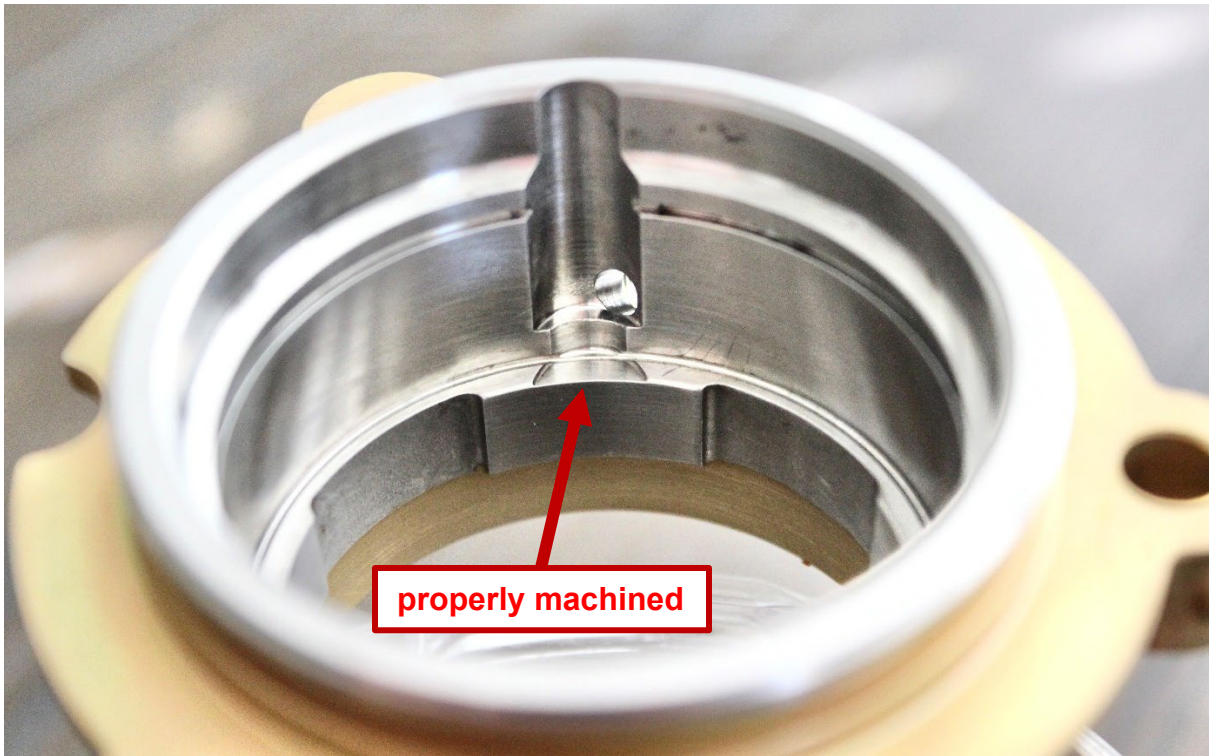
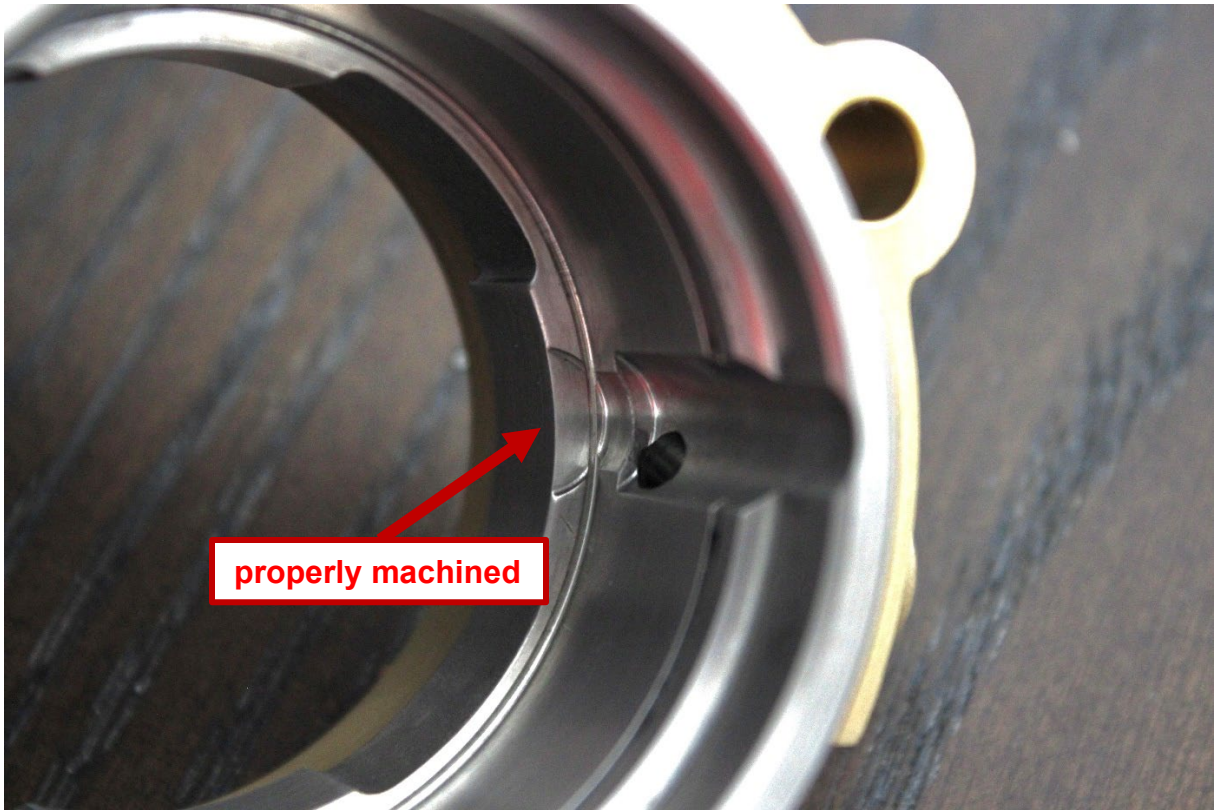


Figure 3 – Proper Machining of Aft Cap Scallop (sheet 2 of 2)