

ALERT SERVICE BULLETIN



A Textron Company

NO. 427-10-32

DATE Mar 18, 2010

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DATE
REV

MODEL AFFECTED: 427

SUBJECT: TAIL ROTOR BLADES P/N 427-016-001-109 AND 427-016-001-109L, INSPECTION OF.

HELICOPTERS AFFECTED: Model 427 helicopters serial number 56001 and subsequent, 58001 and 58002

COMPLIANCE: PART I: Within the next 50 flight hours or 30 days after receipt of the bulletin whichever comes first and every 300 flight hours thereafter.

PART II : As required

PART III: As required

DESCRIPTION:

Bell Helicopter has received some reports of a significant increase in tail rotor vibration level recorded during normal operation. It was found that the vibration increase was due to water entering one of the tail rotor blades. Subsequent investigation revealed bond line separation in the blade root end block at the trailing edge as well as delamination between the blade root end closure and either upper or lower blade skin. This situation, if not remedied, can degrade and result in severe vibration that may affect the tail rotor gearbox attachment integrity.

This bulletin introduces tail rotor blade inspection particularly at the root end of the blade. In addition, specific maintenance procedures are provided should cracks or delaminations be detected or excessive tail rotor vibrations be reported.

APPROVAL:

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

MANPOWER:

PART I: Approximately 0.5 man-hour per aircraft is necessary to complete PART I of this bulletin.

PART II: Approximately 2.0 man-hours per affected tail rotor blade are necessary to complete PART II of this bulletin.

Man-hours are based on hands-on time, and may vary with personnel and facilities available.

WARRANTY:

There is no warranty applicable with this bulletin.

MATERIAL:

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 Helicopter Textron Supply Center.

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>	<u>Reference</u>
MILC87936TY1 5GAL	Detergent (Note1)	As required	C-318
TT-N-95, TYII	Aliphatic naphtha	As required	C-305
AMS-S-8802 6OZ	Sealant	As required	C-308
299-947-100TY2CL3PT	Adhesive	As required	C-363

Note:

1. Detergent MIL-C-87936 is an alternate to detergent MIL-C-87937.

SPECIAL TOOLS:

1. Waterproof insulated gloves.
2. Water tank with dimensions of 18 inches wide by 36 inches long by 18 inches deep or equivalent.

WEIGHT AND BALANCE:

Not affected.

ELECTRICAL LOAD DATA:

Not affected

REFERENCES:

BHT-427-MM

PUBLICATIONS AFFECTED:

BHT-427-MM

ACCOMPLISHMENT INSTRUCTIONS:

PART I: Tail rotor blade inspection

-NOTE-

This inspection is in addition to the pre-flight check. The visual check of the tail rotor blade can be done by the pilot during the pre-flight check. Pilot staff shall be instructed by the maintenance personnel of the area to check.

1. Use detergent (C-318) and thoroughly clean the tail rotor blade in the area to be inspected. Refer to Figure 1.
2. Using a 10 X magnifying glass, inspect tail rotor blade(s) for evidence of separation between skin plies and root end block at trailing edge.
 - If cracks are found, remove tail rotor blade from the aircraft and proceed with PART II and Part III of this bulletin.
 - If no crack is found but the tail rotor assembly has history of balance change or balance difficulties for unknown reason, remove tail rotor blade from the aircraft and proceed with PART II and Part III of this bulletin.
 - If no crack is found and the tail rotor assembly has no history of balance change or balance difficulties, blade may be returned to service.
3. Make an entry in the tail rotor blade historical record to reflect compliance with Part I of this bulletin.

PART II: Tail rotor blade leak check

-NOTE-

The following inspection should be performed whenever signs of delamination/separation are visible at the root end area of the blade or if excessive tail rotor vibrations are reported with no apparent causes

-NOTE-

Removal of the pitch horn from the tail rotor blade is not required to perform the blade leak check.

1. Thoroughly clean the blade including the surfaces of the root end cuff with cleaning detergent (C-318). Rinse with clear water.
2. Cool the blades in a refrigerator for a minimum of 1 hour at a temperature of -1°C to 7°C (30°F to 45°F).
3. Fill the water tank with clean clear water. For best results the water should be maintained at 60°C to 80°C (140°F to 175°F).
4. Wearing protective gloves, place the cool blade into the heated water. The blade will float, so it will be necessary to manually submerge the blade. Refer to Figure 3

-NOTE-

Be careful not to misinterpret random trapped surface air bubbles as a leak point.

5. Slightly rotate the blade back and forth about the blade pitch change axis to allow any air trapped on the blade surfaces to be expelled.

-NOTE-

It may take several seconds before the air is forced out through any existing leak path.

6. With the blade under water, check for air leaks that will be indicated by a steady stream of fine bubbles originating from a single point.
7. Gently rotate blade back and forth to allow a thorough inspection of all the blade surfaces. Pay particular attention to the root end cuff and around the leading edge drain hole. Refer to the Figure 2.

CAUTION

Do not submerge the blade in water for more than 2 minutes. Maintaining the blade in water for more than 2 minutes could allow water to enter the blade if a leak path is present.

8. The blade should be left in hot water for a minimum of 1 minute and a maximum of 2 minutes.
9. If an air leak is found on a tail rotor blade, send the blade to a Bell Helicopter Approved Blade Repair Facility for evaluation and possible repair as water may have entered the blade.
10. If no air leak is found on a tail rotor blade, repair the defects on the blade per Part III of this bulletin.

PART III: Blade repair

1. Repair any defect located in the blade root end cuff as follows:
 - a. Thoroughly clean the area around the defect using aliphatic naphtha (C-305). Do not allow solvent to enter the blade. Wipe dry with a clean lint-free cloth.
 - b. Apply sufficient AMS-S-8802 sealant (C-308) to the affected area to completely seal the defect. Sealant should extend a minimum of 0.250 inch around the defect in all directions.
 - c. Cure the sealant per manufacturer's instructions.
 - d. Perform a leak check again per PART II of this bulletin to ensure the blade does not leak.
 - e. Prime and paint touch-up the repaired area. Refer to BHT-427-MM.
2. Repair any defect located on the exterior surface of the blade or in the leading edge drain hole as follows:
 - a. Sand the area to be repaired by hand with 220 grit sand paper. Do not sand into the fiberglass.
 - b. Thoroughly clean the sanded area using aliphatic naphtha (C-305). Do not allow solvent to enter the blade. Wipe dry with clean cloth.

- c. Apply sufficient 299-947-100T2CL3 adhesive (C-363) to the affected area to completely seal the defect.
 - d. Cure the adhesive per manufacturer's instructions.
 - e. Using 220 grit sandpaper, fair the cured adhesive to obtain a smooth finish.
 - f. Perform a leak check again as per PART II of this bulletin to ensure the blade does not leak.
 - g. Prime and paint touch-up the repaired area. Refer to BHT 427-MM.
3. Make an entry in the tail rotor blade historical record to reflect compliance with Part II and Part III of this bulletin.

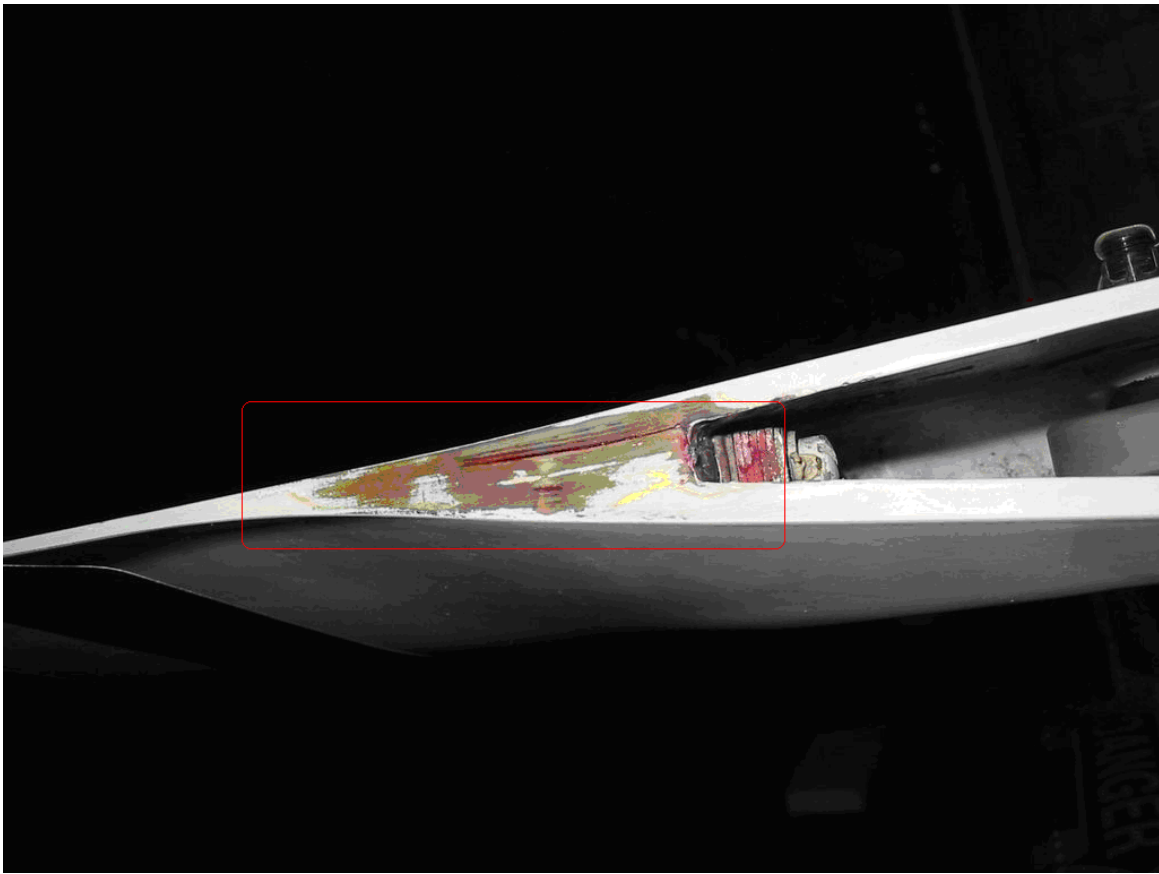


Figure 1. Blade area to be inspected

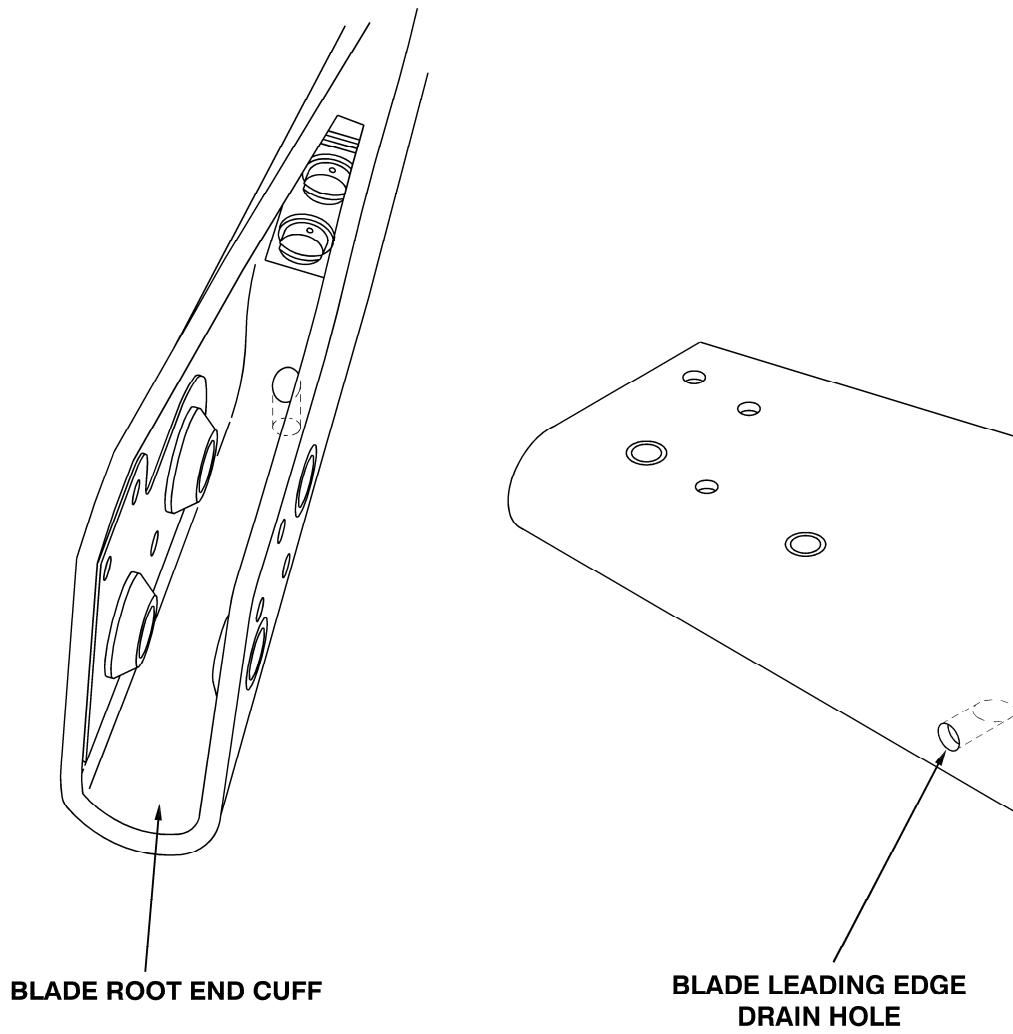
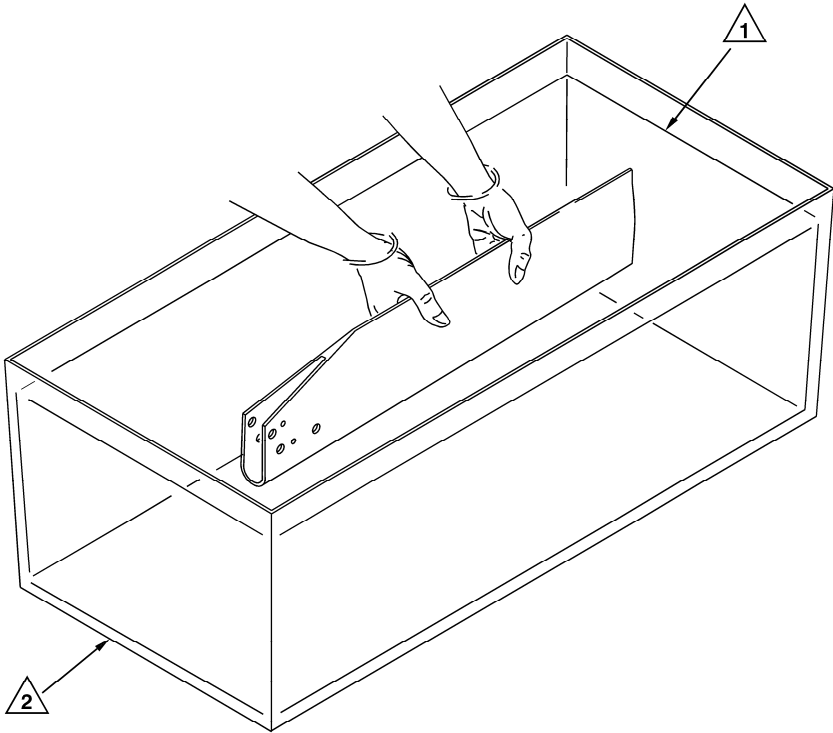


Figure 2. Areas to verify during leak check



NOTES

- 1** Water temperature to be maintained between 60°C to 80°C (140°F to 175°F).
- 2** Water tank should be 18 inches wide x 36 inches long by 18 inches deep or equivalent.

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Figure 3. Water tightness check