

**TECHNICAL BULLETIN**  
**Bell Helicopter** **TEXTRON**

A Subsidiary of Textron Inc.

No. 230-01-31

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**MODEL AFFECTED:** Model 230

**SUBJECT:** MAIN DRIVESHAFT ASSEMBLY P/N 222-044-006-111 AND SHIM PLATE P/N 430-044-002-101, INTRODUCTION OF

**HELICOPTERS AFFECTED:** Model 230 S/N 23001 through 23038

**COMPLIANCE:**

**PART I:** At Customer's Option.

**PART II:** As soon as practical following receipt as this bulletin

**DESCRIPTION:**

Bell Helicopter Textron has received reports of internal corrosion of P/N 222-044-006-109 engine to transmission driveshaft assemblies. We have also received reports of corrosion at the aft coupling to engine adapter interface.

A new drive shaft assembly, P/N 222-044-006-111, has been created to address the reported problems. This new assembly will have inner and outer couplings that use an Ion Vapor Deposited Aluminum (IVDA) coating on all areas currently cadmium plated and/or primed. In addition, to eliminate galling of shaft assembly and inner coupling during assembly and disassembly, the 222-044-685-105 shaft pilot diameter has been carburized and the 222-044-607-103 inner coupling pilot diameter has been nitrided to increase resistance to damage. The inner coupling retention nut has also been silver plated to assist in preventing corrosion.

The new P/N 222-044-607-103 and P/N 222-044-672-105 inner and outer couplings are Ion Vapor Deposited Aluminum (IVDA) coated and do not require primer application per Technical bulletin 230-95-14.

The new 222-044-006-111 driveshaft still requires the installation of the overtemperature indicators (TEMP-PLATES) on the outer couplings per Alert Service Bulletin 230-93-3 and BHT-230- CR&O-2, Chapter 63.

- NOTE -

The IVDA coating is chromate treated, giving the coupling a tan to iridescent gold appearance. Unlike cadmium plated couplings, this coating may lighten in color while in service. DO NOT use the color of the coupling to determine an overheat condition, check the Templates in accordance with the maintenance manual.

Driveshaft assembly P/N 222-044-006-111 will be supplied as a spare replacement for all earlier driveshaft assemblies. In addition, the detail parts of driveshaft assembly P/N 222-044-006-111 will be supplied as spare replacement for all earlier detail parts.

Part I of this bulletin provides information to operators that have a requirement to upgrade main driveshaft assemblies to the latest configuration.

Part II of this bulletin introduces shim plate P/N 430-044-002-101 that is to be installed between the Rolls Royce engine adapter and main driveshaft outer coupling flange P/N 222-044-672-105 to prevent corrosion.

**APPROVAL:**

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

**MANPOWER:**

No additional man-hours will be required to accomplish PART I and PART II of this bulletin when done in conjunction with driveshaft disassembly.

**MATERIALS:**

**PART I:**

Reference ACCOMPLISHMENT INSTRUCTION. Material will be available through your Bell Helicopter Supply Center.

**PART II:**

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

<u>Part Number</u>	<u>Nomenclature</u>	<u>QUANTITY</u>
430-044-002-101	Shim plate	A/R

**Consumable Material:**

The following material is required to accomplish this bulletin, however this material is considered consumable (bench stock) material and may not require ordering depending on the operators 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>
MILS8784CLB2,3.5OZ	Sealant	A/R	C-328

**SPECIAL TOOLS:**

Not required.

**WEIGHT AND BALANCE:**

Not affected.

**ELECTRICAL LOAD DATA:**

Not affected.

**REFERENCES:**

BHT-230-MM-6, Chapter 63  
BHT-230-CR&O-2, Chapter 63  
Alert Service Bulletin 230-93-3, Over-temperature indicators, installation of  
Alert Service Bulletin 230-94-3, 222-044-685-101 Drive shaft inspection  
Alert Service Bulletin 230-95-7, 222-044-685-101 Drive shaft recall/replacement  
Technical Bulletin 230-95-14, Driveshaft couplings, corrosion protection of

**PUBLICATIONS AFFECTED:**

BHT-230-MM-6, Chapter 63  
BHT-230-CR&O-2, Chapter 63

**ACCOMPLISHMENT INSTRUCTIONS:**

**Part I**

Table 1 lists the major components of dash numbered configurations, but does not contain parts and hardware common to all configurations. These items are contained in the Illustrated Parts Catalog.

The helicopter certified design configurations at time of delivery were as follows:

Helicopter Serial No.	Driveshaft Assembly Part Number
23001-23038	222-044-006-109

The use of a later dash numbered main driveshaft assembly on an earlier helicopter serial number is approved. The use of an earlier dash number main driveshaft assembly on a later helicopter serial number is not authorized. To do so places the helicopter out of the certified design configuration.

Overhaul main driveshaft assembly in accordance with Chapter 63, Volume II, of Model 230 Component Repair and Overhaul Manual.

The upgraded main driveshaft assembly must have its data plate and Historical Record reidentified to the new part number that the driveshaft assembly was upgraded to. The suffix "FM" will be added after the part dash number to indicate "field modified". The serial number of field modified part will not be altered or changed.

Example: Upgrade main driveshaft assembly P/N 222-044-006-109 to the -111 configuration. Reidentify driveshaft assembly data plate and Historical Service Record to new part.  
Number: 222-044-006-~~109~~-111FM.  
Retain existing serial number.

**TABLE 1. MAIN DRIVESHAFT P/N 222-044-006**

**CONFIGURATION**

<b>PART NUMBER</b>	<b>NOMENCLATURE</b>	<b>DASH NUMBERS</b>		<b>NOTES</b>
222-044-006	Driveshaft Assembly	-109	-111	
222-044-607-003	COUPLING	X		(1) (5)
222-044-607-103	COUPLING		X	(6)
222-044-654-103	NUT	X		(2)
222-044-654-105	NUT		X	
222-044-672-101	COUPLING	X		(3) (5)
222-044-672-105	COUPLING		X	(6)
222-044-685-101	SHAFT	X		(4) (7)
222-044-685-103	SHAFT	X		(4) (8)
222-044-685-105	SHAFT		X	(8)

- NOTES -

1. Superseded in Spares by P/N 222-044-607-103.
2. Superseded in Spares by P/N 222-044-654-105.
3. Superseded in Spares by P/N 222-044-672-105.
4. Superseded in Spares by P/N 222-044-685-103 or -105
5. Couplings already modified/primed per Technical Bulletin 230-95-14 may be kept in service and primer may be reapplied as required. However, Technical Bulletin 230-95-14 should no longer be applied on original couplings.
6. Application of primer per Technical Bulletin 230-95-14 is not permitted on couplings coated with Ion Vapor Deposited Aluminum (IVDA).
7. Shaft Inside diameter is protected with Epoxy Zinc coating.
8. Shaft Inside diameter is protected with Cadmium plating.

**PART II:**

-NOTE-

Installation of shim plate P/N 430-044-002-101 is not required with cadmium plated outer coupling P/N 222-044-672-101

Mating of outer coupling P/N 222-044-672-105 and black oxide treated Rolls Royce engine adapter P/N 23056601, 23059591, 23061917 or 23064617 may result in corrosion due to the difference in surface treatment. Therefore, the installation of shim plate P/N 430-044-002-101 is required for this configuration.

1. Review driveshaft assembly records to determine if outer coupling(s) P/N 222-044-672-105 is installed in driveshaft assembly.
2. If outer coupling(s) P/N 222-044-672-105 is found installed, verify the driveshaft installation to determine if the -105 coupling is in contact with the engine adapter.
3. If outer coupling P/N 222-044-672-105 is found installed in contact with the engine adapter, Proceed as follows:
  - a) Remove the driveshaft assembly. Refer to BHT-230-MM-6, Chapter 63.
  - b) Inspect the outer coupling(s) 222-044-672-105 for damage and corrosion. Refer to BHT-230-CR&O-2, Chapter 63 for damage limits and repair procedure.  
Damage limits for the coupling flange are as follows:

Grey stains and transferred material/corrosion from the engine adapter is not cause for rejection. Transferred material should be removed with scotchbrite (C407). Carefully examine the affected areas with 10X magnifying glass to determine if the base material is corroded and pitted. Maximum depth of repaired area is 0.003 inch. Surface corrosion not in excess of 0.50 square inches may be repaired by locally abrading with scotchbrite (C-407) and brush cadmium plating (C-108) all bare areas. . Remove only raised material around nicks and/or scratches with fine India stone (C-464).

- c) Inspect engine adapter for damage and corrosion. Damage limits listed below are acceptable. For additional details, contact Rolls Royce Customer Support at 317-230-6400.

Remove all loose corrosion from the flange face and pilot diameter with an abrasive pad or wire brush. Clean the flange face and pilot diameter with alcohol or naphtha.

- 1) Inspect the flange surface for corrosion. Affected areas greater than 50% of any square inch or more than 25% of the total area of the adapter is cause for rejection of the adapter. After loose corrosion is removed, any area that displays distinct pitting that can be hung with a sharp pointed instrument (tip radius <0.002 inch) is cause for rejection. Distinct pitting will display visual depth, with small pockets in the base material.
- 2) Inspect the pilot diameter and adjacent chamfer and radius for corrosion. No more than 25% of the total diameter or radius or 50% of the chamfer may be affected. Distinct pitting in these areas that can be hung with a sharp edge instrument (tip radius <0.002 inch) is cause for rejection of the adapter.

Affected areas do not require any subsequent treatment but bare areas may be touched up with Perma Blue (liquid gun blue) per manufacturer instructions. Do not contaminate adjacent areas.

Perma Blue is available from the following vendor:

Birchwood Laboratories, Inc.  
7900 Fuller Road  
Eden Prairie, MN. 55344  
Tel: 612-937-7931  
Fax: 612-937-7979

- NOTE -

A small amount of sealant may be applied to the outside diameter of the driveshaft coupling to keep the shim in place during installation.

**Do not apply sealant to the face of the coupling**

Apply sealant (C-328) to four (4) small areas, equally spaced, no longer than one inch in length. Remove any excess sealant.

4. Install the shim plate P/N 430-044-002-101 over the outer coupling (cup portion of the shim pointing towards the transmission) that will be in contact with the engine adapter.
5. Install the driveshaft assembly. Refer to BHT-230-MM-6, Chapter 63.
6. Annotate aircraft records to reflect compliance with this bulletin.