

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

A Subsidiary of Textron Inc.

No. 407-04-59

Date 05-10-04

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**MODEL AFFECTED:** 407

**SUBJECT:** MAIN ROTOR FLIGHT CONTROLS ANTI-FRETTING WASHERS 140-005-19-16-4 AND 140-055-1, INSTALLATION OF.

**HELICOPTERS AFFECTED:** Part I Model 407 helicopters serial number 53000 through 53584.

[Model 407 helicopters serial number 53585 and subsequent will have the intent Part I of this bulletin accomplished prior to delivery]

**Part II Model 407 helicopters serial number 53000 through 53594.**

[Model 407 helicopters serial number 53595 and subsequent will have the intent Part I and Part II of this bulletin accomplished prior to delivery]

**COMPLIANCE:** At Customer's Option

**DESCRIPTION:**

It has been reported to Bell Helicopter that the forward servo actuator rod end can contact the actuator support 407-001-500-101/-105 forward attachment point. This condition could result in chafing damage to the actuator support assembly.

The same condition was also reported on the control tubes clevises inside surface. The chafing damage will occur when the control tube clevis come in contact with the stainless steel washers bonded on bellcranks 407-001-524-101/-105, 407-001-526-101/-105 and 407-001-527-101 or 407-001-528-101.

This Technical Bulletin is issued to allow the installation of anti-fretting washers on existing support assembly and bellcrank assemblies. Three new bellcrank assemblies were also created with these washers installed and can be used as direct replacements for existing bellcranks:

- Collective bellcrank 407-001-524-109 replaces 407-001-524-101 and /-105.
- Cyclic longitudinal (R/H) bellcrank 407-001-526-109 replaces 407-001-526-101 and /-105.
- Cyclic lateral (L/H) bellcrank 407-001-528-105 replaces 407-001-527-101 and 407-001-528-101.

PART I of this Technical Bulletin provides installation instructions of washer 140-005-19-16-4 at three locations to prevent chafing damage on the hydraulic servo support assembly.

PART II of this Technical Bulletin provides instructions to replace the existing stainless steel and rubber washers with a nylon washer 140-055-1 to prevent chafing damage on main rotor control tubes clevis.

**APPROVAL:**

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

**MANPOWER:**

Approximately 1.0 man-hour is required to complete PART I of this bulletin. Man-hours are based on hands-on time, and may vary with personnel and facilities available.

Approximately 3.0 man-hours are required to complete PART II this bulletin. Man-hours are based on hands-on time, and may vary with personnel and facilities available.

**MATERIALS:**

**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 I

| <u>Part Number</u> | <u>Nomenclature</u> | <u>Quantity</u> |
|--------------------|---------------------|-----------------|
| 140-005-19-16-4    | Washer              | 3               |

PART II

| <u>Part Number</u> | <u>Nomenclature</u> | <u>Quantity</u> |
|--------------------|---------------------|-----------------|
| 140-055-1          | Washer              | 6               |

**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.

PART II

| <u>Part Number</u>  | <u>Nomenclature</u>                     | <u>Reference</u> |
|---|---|------------------|
| 299-947-066, TY1 4oz  | Adhesive                                | C-301            |
| MIL-C-81706, CL3 PWDR<br>or<br>MIL-C-81706 1 GAL<br>or<br>MIL-C-81706 1QT | Chem Film                               | C-100            |
| ACETONE GALLON  | Acetone (per Q-A-51)                    | C-316 (Note 1)   |
| CCCC0046  | Cheese Cloth, Bleached<br>or equivalent | C-486            |
| P-C-451   | Abrasive Cloth (220 grit)               | C-406            |
| MIL-P-85582, TY1, CL2   | Epoxy polyamide primer                  | C-204 (Note 2)   |

MIL-PRF-81733 2.5 oz

Sealant

C-392 (Note 3)

or

MIL-PRF-81733 (4 oz)

**NOTES:**

1. As an alternate, use Methyl Ethyl Ketone (C-309).
2. As an alternate, use MIL-PRF-85582, type 1, class C2 or MIL-PRF-23377, type 1, class C.
3. Formerly MIL-S-81733.

**SPECIAL TOOLS:**

None required

**WEIGHT AND BALANCE:**

Not affected.

**ELECTRICAL LOAD DATA:**

Not affected

**REFERENCES:**

BHT-407-MM Maintenance Manual

**PUBLICATIONS AFFECTED:**

BHT-407-IPC Illustrated Parts Breakdown

BHT-407-MM Maintenance Manual

**ACCOMPLISHMENT INSTRUCTIONS:**

**PART I: Installation of rubber washer 140-005-19-16-4 on hydraulic servo support assembly.**

**-CAUTION-**

DO NOT APPLY HYDRAULIC PRESSURE TO THE AIRCRAFT WHILE PERFORMING PART I.

1. Disconnect the hydraulic servo actuators from the support assembly at the forward attachment point. Make sure the servo actuators are properly supported and protected to prevent damage. Refer to Figure 1.
2. Clean and inspect support assembly for damage in the actuators forward attachment point area.
3. Install one rubber washer (9, Figure 1) with no adhesive at each lug of the support assembly on the fixed bushing side.
4. Install hydraulic servo actuators to support assembly at the forward attachment point. Refer to BHT-407-MM-4, chapter 29.
5. Make an entry in the helicopter records to show that PART I of this Technical Bulletin has been completed.

**PART II: Installation of nylon washer 140-055-1 on bellcrank assembly.****-NOTE-**

This task can be performed with the bellcrank installed or removed from the helicopter. If the bellcrank remains installed, proceed with step 3.

**-NOTE-**

The following procedure applies to the cyclic longitudinal bellcrank, the cyclic lateral bellcrank and the collective bellcrank assembly.

1. Disconnect main rotor control tubes from bellcrank. Protect disconnected control tubes from damage. Refer to BHT-407-MM-4, chapter 67.
2. Remove bellcrank from the helicopter.
3. Remove the stainless steel washers 140-009D60S96 and the rubber washers 140-005-30-24-8 from bellcrank using a sharp plastic scraper. Refer to figure 2.
4. Inspect bellcrank for damage.

5. Prepare the bellcrank surface for bonding of washer 140-055-1 as follows:

**-NOTE-**

Do not remove primer from bellcrank. If primer is damaged or removed, apply polyamide epoxy primer (C-204).

- a. Use 220 grit abrasive cloth or aluminum oxide paper (C-406). Lightly abrade the primer.
  - b. Use clean cloth (C-486) dampened with Acetone (C-316). Thoroughly clean the bellcrank. Allow to air dry for 5 minutes.
6. Prepare washer 140-055-1 surface for bonding to bellcrank as follows:
- a. Use 220 grit abrasive cloth or aluminum oxide paper (C-406). Lightly abrade the surface to be bonded to the bellcrank.
  - b. Use clean cloth (C-486) dampened with Acetone (C-316). Thoroughly clean washer.
  - c. Allow washer to dry at 200°F (93°C) for 5 minutes.

**-CAUTION-**

DO NOT ALLOW ADHESIVE TO CONTACT THE BEARING SURFACE.

7. Apply adhesive (C-301) to the prepared surface of washer 140-055-1. Bond washer to bellcrank. Apply between 5 and 20 psi pressure (34.5 and 138 KPa). Cure for two days at room temperature or 2 hours at 160°F (71°C). Refer to figure 2.

**-CAUTION-**

DO NOT ALLOW SEALANT TO CONTACT THE BEARING SURFACE.

8. Apply a bead of sealant (C-251) around the inside and outside diameter of the washer 140-055-1 to seal the bond lines.

**-CAUTION-**

THE DEPTH OF THE VIBROETCH MUST NOT EXCEED  
0.005 inch (0.127 mm).

9. Use a vibrating stylus. Change the bellcrank assembly dash number as follows:

**-NOTE-**

Bellcrank 407-001-524-101, bellcrank 407-001-526-101 and 407-001-527-101 are machined from solid aluminum stock and they cannot be upgraded to the latest configuration, therefore these bellcranks will remain as /-101 with the FM suffix added. ( FM = Field Modified )

Bellcrank 407-001-524-105, bellcrank 407-001-526-105 and 407-001-528-101 are made from a forging and they can be upgraded to the latest configuration.

- a. Collective bellcrank assembly 407-001-524-101FM, or  
407-001-524-~~105~~-109FM
  - b. Cyclic Longitudinal bellcrank assembly 407-001-526-101FM, or  
407-001-526-~~105~~ 109FM
  - c. Cyclic Lateral Bellcrank assembly 407-001-527-101FM, or  
407-001-528-~~101~~ 105FM
10. Apply brush alodine chemical film treatment (C-100) to the modified dash number area of the bellcrank per step 9. Rinse the bellcrank with water and dry with compressed air. Apply polyamide epoxy primer (C-204) to the bare metal surfaces that are not protected.
11. Install bellcranks on the helicopter and install control tubes. Refer to BHT-407-MM-4, chapter 67.
12. Make an entry in the helicopter and component records to show that PART II of this Technical Bulletin has been accomplished.

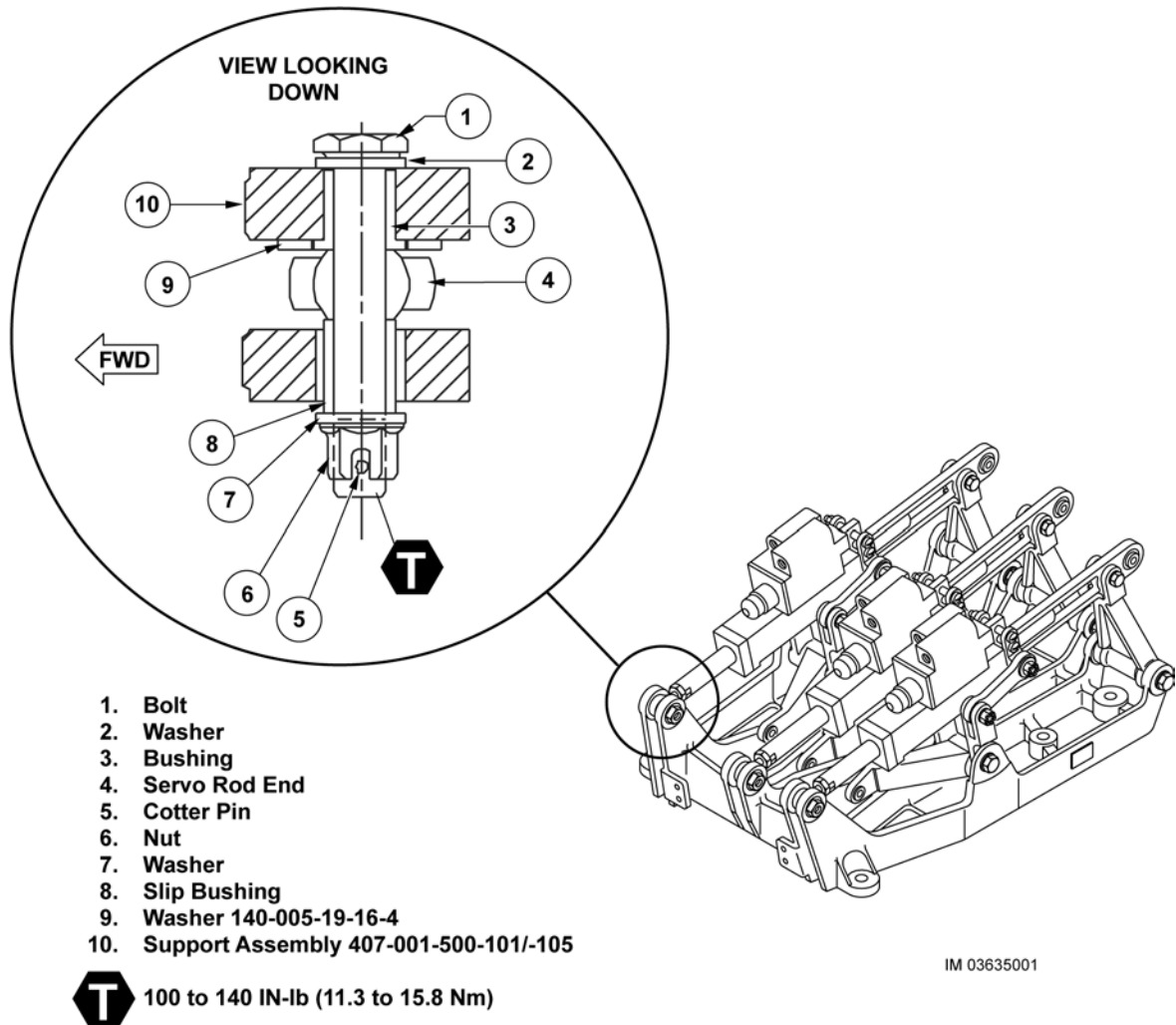
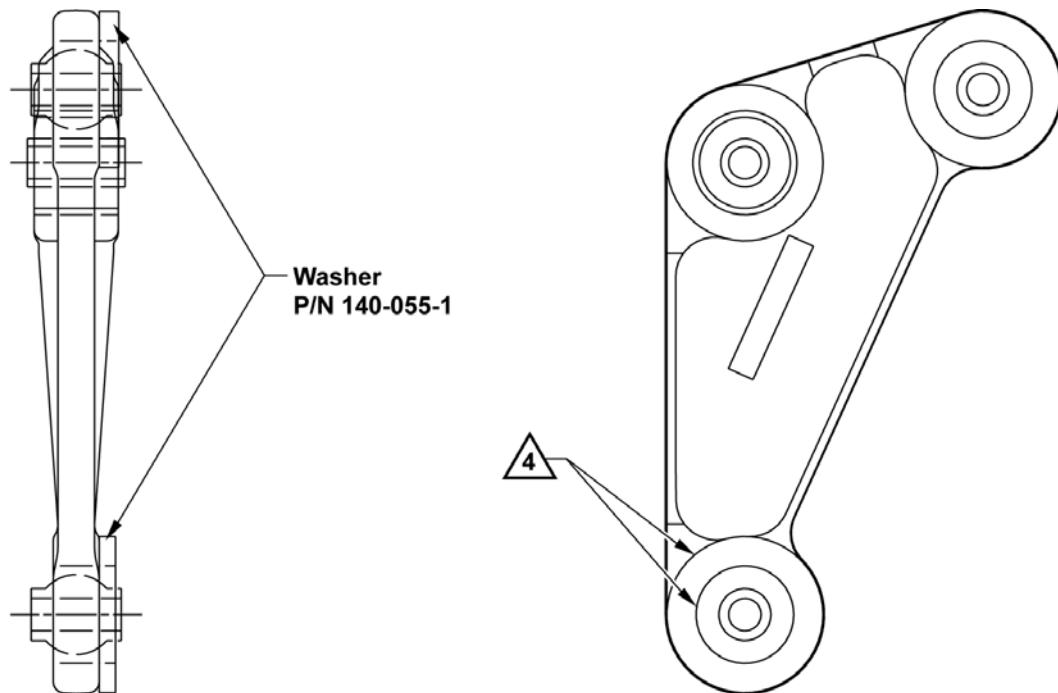


Figure 1. Washer installation on Support Assembly



**BELLCRANK 407-001-524-101/-105  
407-001-526-101/-105  
407-001-527-101  
407-001-528-101**

#### NOTES

1. Washers P/N 140-009D60S96 and P/N 140-005-30-24-8 replaced with one washer P/N 140-055-1 at two locations.
2. Bond washer P/N 140-055-1 to bellcrank assembly with adhesive (C-301).
3. Do not allow adhesive and sealant to contact bearing.

- 4.** Apply a bead of sealant (C-251) around the inside and outside diameters of the washer 140-055-1 at mating surface with bellcrank.

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**Figure 2. Washer replacement on Bellcrank Assembly**