ALERT SERVICE BULLETIN

Bell Helicopter
A Textron Company

DATE	
REV	

NO.	412-09-135
DATE	Aug 25, 2009
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MODEL AFFECTED: **412 /412EP**

SUBJECT: **HIGH AFT CROSSTUBE ASSEMBLIES P/N 412-050-011-101, / -103, / -105, / -107, 412-050-045-105: MANDATORY INSPECTION**

HELICOPTERS AFFECTED: **Model 412 / 412EP helicopters serial numbers 33001 through 33213, 36001 and subsequent.**

The intent of this bulletin will be incorporated into the Model 412 Maintenance Manual at a future date.

COMPLIANCE: Within 6 months after receipt of this bulletin.

Part I
Schedule and accomplish a reoccurring 12 month / 2500 landing Fluorescent Penetrant Inspection of aft high crosstube.

Part II
Schedule and accomplish a reoccurring 12 month / 2500 landing Deflection Check of aft high crosstube

Part III
Establish a mandatory use of aft high crosstube towing retention kit per BHT-412-SI-58 at helicopter weight of 8900lbs and higher.

DESCRIPTION:

As a result of reported field failures, Bell Helicopter has completed a load survey, coupon testing and analysis of the high aft crosstubes. The results indicate repetitive cycle fatigue damage can occur during towing and landing operational events. These results warrant a 12 month / 2500 landing (which ever comes first) repetitive Fluorescent Penetrant Inspection, Deflection Check, and a mandatory use of the aft crosstube retention kit (BHT-412-SI-58) at helicopter weights at or above 8900 lb.

APPROVAL:

The engineering design aspects of this bulletin are FAA/DER approved.

MANPOWER:

Approximately 10 man-hours are required to complete this bulletin not including paint and primer cure times. Man-hours are based on hands-on time, and may vary with personnel and facilities available.

WARRANTY:

There is no warranty provided for 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 Number	Nomenclature	Quantity
412-050-045-117	Clamp Assembly	A/R
206-050-301-111	Abrasion Strip	A/R
LARSON L101	Larson Film	A/R
412-706-031-101*	Towing Provisions	A/R
412-250-100-101*	Puller Equipment	A/R
212-070-600-143**	Decal	2

*** See BHT-412-SI-58**
**** Acceptable to locally manufacture per Figure 3**

Consumable Material:

The following material is required to accomplish this bulletin and may be obtained through your Bell Helicopter Textron Supply Center.

Part Number	Nomenclature	Quantity	Reference
AMS-S-8802	Sealant	1	C-308
LARSON L100	Adhesive	A/R	C-571
MIL-R-81294	Paint Remover	A/R	C-436*****
EWDE072	Primer Kit (1GAL,1QT)	A/R	C-246
3950 Scotchcal	Edge Sealer	A/R	C-349
MS-242N	Quik-Freeze	A/R	C-137

* Customers may also use Turco 5351(T-5469)

SPECIAL TOOLS:

None required

WEIGHT AND BALANCE:

Not affected

ELECTRICAL LOAD DATA:

Not affected

REFERENCES:

BHT-412-IPB Illustrated Parts Breakdown
BHT-412-MM Maintenance Manual, Rev 12
BHT OSN 412-07-32
BHT-ALL-SPM Standard Practices Manual
BHT ASB 412-08-129 (AAI ASB AA-07109)
BHT-ASB 412-99-97
BHT-412-SI-58 Gross Weight Towing Kit Provisions & Puller Equipment

PUBLICATIONS AFFECTED:

BHT-412-IPB Illustrated Parts Breakdown
BHT-412-MM Maintenance Manual
BHT-412-MD-1, 2, & 3
BHT-412-SI-2 Emergency Float Kit
BHT-412-SI-40 High Skid Gear / High Crosstube

BHT-412-SI-58 Gross Weight Towing Kit Provisions & Puller Equipment
BHT-412-SI-60 Emergency Floats

ACCOMPLISHMENT INSTRUCTIONS

ESTABLISHING REQUIREMENTS:

1. Review the high landing gear aft crosstube component history card and determine bulletin applicability as indicated in Table 1 below.

TABLE 1

Crosstube Assembly Part Number	Sub Assembly Crosstube Part Number (See Note)	Crosstube sub-assembly (Non-procurable) (See note)	Bare Crosstube (Non-procurable)
412-050-011-101	412-050-010-101	N/A this level	412-050-010-103
412-050-011-103	412-050-010-107	412-050-010-109	412-050-010-103
412-050-011-105	412-050-010-107	412-050-010-109	412-050-010-103
412-050-011-107	412-050-010-111	412-050-010-113	412-050-010-115
412-050-045-105	412-050-045-107	N/A this level	412-050-044-101
412-321-104	See AAI ASB AA-07109 / BHT ASB 412-08-129		

Note: Sub-assemblies are indicated above for tracking purposes. Tracking is accomplished at the sub assembly part number level on Bell 12-digit part numbers. The factory serial numbers or the company control serial numbers are visible in the cuff area above the skid tube saddle; refer to ASB 412-99-97.

2. Amend the component history card to reflect the bulletin requirements for a recurring 12 month / 2500 landing aft crosstube Fluorescent Penetrant Inspection and a Deflection Check. Refer to accomplishment instructions Part I & II respectively.

3. Establish maintenance practices to mandate towing with the aft crosstube retention kit. Refer to the Accomplishment Instructions Part III.

ACCOMPLISHMENT INSTRUCTIONS

PART I - **Accomplish a reoccurring 12 month / 2500 landing aft crosstube Fluorescent Penetrant Inspection as indicated below.**

-NOTE-

The high aft crosstube Fluorescent Penetrant Inspection can be accomplished by any person meeting the personnel Qualification / Certification Requirements of the BHT-ALL-SPM (ref. Chapter 6, Section 6-5).

1. Remove the landing gear assembly from the helicopter as per BHT-412-MM.

CAUTION

TEMPORARILY INSTALLING A SECONDARY LANDING GEAR OR MAINTAINING A CONNECTION TO AN OVERHEAD CRANE IS RECOMMENDED DURING THIS MAINTENANCE ACTION.

2. Remove the aft crosstube from the landing gear assembly.

3. Remove the support beam from the aft crosstube as per BHT-412-MM

4. Remove the hardware retaining BL 14 clamp assemblies P/N 412-050-045-115 or /-117 (left & right hand) on the high aft crosstube. Refer to Figure 1 below.

CAUTION

CROSSTUBE TEMPERATURE NOT TO EXCEED 200ºF (93.3ºC) WHEN USING HEAT GUN. EXCESSIVE HEAT WILL DAMAGE CROSSTUBE.

5. Use heat gun to soften sealant bonding the clamp assembly to the crosstube. Separate the clamp from crosstube and the abrasion strip (if installed).

-NOTE-

Crosstubes 412-050-011-ALL do not have the abrasion strips bonded to the under side at BL 14 or the Larson L101 material bonded to the underside at BL 00. Fluorescent Penetrant Inspection is required in these areas prior to reworking these crosstubes to meet the protective requirements of 412-050-045 crosstubes, containing the above mentioned items. Refer to “Rework” section below for the 412-050-011-ALL high aft crosstubes.

-NOTE-

Crosstube 412-050-045-107 with AAI replacement lower support 604-026-003 at BL 00 require Fluorescent Penetrant Inspection in this area. Refer to “Rework” section

6. Remove abrasion strip P/N 206-050-301-111 at BL 14 from the crosstube lower surface only if it has become partially de-bonded; or, if further maintenance related investigation is deemed necessary. Removal of the abrasion strips from crosstubes 412-050-045-107 or reworked 412-050-011-ALL series crosstubes is not necessary to accomplish the Fluorescent Penetrant Inspection. If abrasion strips must be removed, use a plastic scraper to separate the strip from the crosstube while cooling the strip with Quik-freeze C-137 to de-grade the bond line. Start at a corner and continue peeling carefully while maintaining the bond line in a cool / frozen state.

-NOTE-

The upper support 412-050-006-101 on the aft crosstube is bonded with structural adhesive and is <u>not</u> designed to be removed.

7. Removal of the lower crosstube support P/N 412-050-007-101 incorporating the abrasion strip at BL 0.0 is unnecessary unless there are signs of looseness or debonding. If the abrasion strip must be removed, use a plastic scraper to separate the strip from the crosstube while cooling the strip with Quik-freeze C-137 to de-grade the bond line. Start at a corner and continue peeling carefully while maintaining the bond line in a cool / frozen state. Crosstube assembly 412-050-045-107 and reworked crosstubes 412-050-011-ALL have the abrasion strip under BL 0.0 support. Crosstubes P/N 412-050-011-ALL in the original condition without the Larson L101 under the lower support P/N 412-050-007-101 at BL 0.0 require removal of the lower support for the first Fluorescent Penetrate Inspection (refer to Rework section for 412-050-011-ALL high aft crosstubes).

-NOTE-

Lower support P/N 604-026-003 comes with black nylon abrasion material bonded to the support. The Larson L101 abrasion strip shall not be used with this support.

8. Remove lower crosstube support P/N 604-026-003 (if installed) from Crosstubes 412-050-011-ALL and 412-050-045-107 to accomplish the first Fluorescent Penetrant Inspection.

9. Remove Larson L101 abrasion strip bonded to the crosstube at BL 0.0 if using AAI replacement support P/N 604-026-003 to accomplish the first Fluorescent Penetrant Inspection.

CLEANING AND PREPARATION

1. Use a plastic scraper to remove residual sealant on the crosstube. It is not required to remove the sealant bead around the periphery of the 412-050-006-101 upper / 412-050-007-101 lower supports at BL 00 unless the sealing bead has been damaged on crosstube series 412-050-045. Residual sealant, Larson L101 film and Larson adhesive will need to be removed from crosstubes affected by the installation of spare replacement lower support 604-026-003. Original crosstubes P/N 412-050-011-ALL without Larson L101 (adhesive film) under the lower support at BL 0.0 require the residual sealant to be removed for the first Fluorescent Penetrant inspection only.

CAUTION

PROTECT ABRASION STRIPS AND UPPER / LOWER SUPPORTS (BL 14, BL 00) FROM PAINT REMOVER CONTAMINATION AS REQUIRED

2. Prepare crosstube for the inspection process by removing the paint on the crosstube in the area indicated in Figure 2.

    a. Crosstube P/N 412-050-045 will require the paint to be removed in area depicted in Figure 2 with the exceptions of the abrasion strip areas and the 412-050-006-101 upper and 412-050-007-101 lower supports (BL 0.0). The paint and Larson abrasion strip will need to be removed in the lower support area at BL 00 if support P/N 604-026-003 has been installed.

    b. Crosstube P/N 412-050-011-ALL which does not have the abrasion strip under the clamp assembly at BL 14 or Larson L101 material under the lower support at BL.0.0 will require the paint to be removed under the lower center support.

3. Apply chemical paint remover (C-436) to the crosstube with a brush following manufacturer’s directions and the BHT-ALL-SPM.

CAUTION

A PLASTIC SCRAPER OR ABRASIVE PAD C-407 MAY BE USED TO GENTLY ASSIST THE PAINT REMOVAL PROCESS. USE OF THE PLASTIC SCRAPER OR ABRASIVE PAD IS TO BE ACCOMPLISHED IN A LONGITUDINAL DIRECTION ENSURING NOT TO ABRADE THE CROSSTUBE METAL SURFACE.

4. Reapply the paint remover as required to completely remove the paint and primer. Rinse crosstube surface clean using potable water and dry thoroughly. Inspect crosstube to ensure the bare metal of the crosstube is clearly visible and free of paint and primer residue in the affected area.

5. Protect crosstube immediately after cleaning by applying corrosion preventive oil if the inspection process is delayed. Wrap in barrier material and secure with tape.

INSPECTION

CAUTION

USE CARE TO PREVENT CONTAMINATION FROM FLUORESCENT PENETRANT CHEMICALS ON THE ABRASION STRIPS AND UPPER / LOWER SUPPORT (BL14, BL 00) AS APPLICABLE.

-NOTE-

The aft crosstube Fluorescent Penetrant Inspection can be accomplished by any person meeting the personnel Qualification / Certification Requirements of the BHT-ALL-SPM (ref. Chapter 6, Section 6-5).

1. Inspect the crosstube, with the exception of the areas covered by the protective abrasion strips (if installed) and upper center support using Fluorescent Penetrant method per ASTM E1417, Type 1 Method B, C or D using a penetrant sensitivity level of 2 or 3 (Refer to BHT-ALL-SPM Chapter 6).

2. All penetrant inspection materials utilized shall be compatible, and shall meet requirements of SAE AMS 2644.

-NOTE-

The use of visible dye systems is prohibited.

3. Inspect crosstube damage per limits specified in the Maintenance Manual (BHT-412-MM-5, Chapter 32) to determine allowable damage and cleanup. No cracks are permitted. To determine the appropriate Inspection Criteria Table in the Maintenance Manual for a specific high aft crosstube, refer to cross reference Table 2 below.

TABLE 2

Crosstube Assembly Part Number	Sub Assembly Crosstube Part Number	Crosstube With 10,000 Takeoff/ Landing Limit using Standard Inspection Criteria	Crosstube With 20,000 Takeoff/ Landing Limit using Improved Inspection Criteria
412-050-011-101	412-050-010-101	X	
412-050-011-103	412-050-010-107	X	
412-050-011-105	412-050-010-107	X	
412-050-011-107	412-050-010-111	X	
412-050-045-105	412-050-045-107		X
412-321-104			X See AAI ASB AA-07109 / BHT ASB 412-08-129

REPAIR

1. Repair all damaged crosstubes that are found to be within acceptable limits as indicated in BHT-412-MM-5 Standard or Improved inspection criteria Tables, record all repairs.

2. Replace crosstubes that are beyond the maximum allowable damage limits as indicated in the inspection Tables.

REWORK OF CROSSTUBES

-NOTE-

High aft crosstubes 412-050-011 -ALL shall incorporate the bonding procedures and abrasion strips at BL 00 and BL14 locations, to provide an equivalent level of protection as used on replacement crosstubes P/N 412-050-045-105/-107/-107A.

-NOTE-

It is required to omit the Larson L101 abrasion strip on the 412-050-011-ALL and 412-050-045-107 crosstubes at BL 00 when installing lower support 604-026-003.

1. Apply primer (C-246) to areas where paint has been removed for inspections as per BHT-ALL-SPM.

CAUTION

DO NOT SAND CROSSTUBE IN A CIRCUMFERENTIAL DIRECTION. SAND CROSSTUBE IN A LONGITUDINAL DIRECTION ONLY.

-NOTE-

It is required to complete the first Fluorescent Penetrant Inspection before installation of the abrasion strips at BL 0.0 and BL 14 on the crosstubes 412-050-011-ALL.

-NOTE-

Abrasion strip bonding is accomplished prior to the installation of the BL14 band clamp P/N 412-050-045-115 and BL 00 lower support P/N 412-050-007-101 installation.

2. Lightly abrade the primer on the crosstube common to the abrasion strip taking care not to expose bare material.

-NOTE-

Replacement of abrasion strip material on the under side of the crosstubes at station BL 0.0 and BL 14 locations on 412-050-045-ALL high aft crosstubes is not required if it has not been damaged during inspection.

3. Install the abrasion strip material on the under side of the crosstubes at both BL 0.0 and BL 14 locations on all high aft crosstubes series 412-050-011-ALL and 412-050-045-107 per the BHT-412-MM, as required. Abrasion strip removal for subsequent Fluorescent Penetrant Inspections is not required. When installing replacement lower support 604-026-003 at BL 00 the Larson L101 abrasion strip is not required. The replacement support has a black nylon abrasion material bonded to the support.

-NOTE-

All BL14 band clamps shall have an adhesive film on the inner surface prior installation.

4. Use band clamp assembly 412-050-045-115 (replaced by 412-050-045-117) or prepare band clamp P/N 330C400-338-S (alt. P/N 333C400-338-S) by adding the adhesive film as indicated in the BHT-412-MM, BL 14 clamp preparation. Clamp assembly 412-050-045-117 and clamp 333C400-338-S both have longer "T" bolts to ease installation.

CAUTION

CONFIRM BAND CLAMP POSITIONING PRIOR TO INSTALLATION AS PER BHT-412-MM. DO NOT POSITION BAND CLAMP OVERLAP AT CENTER OF RETENTION CAP RUBBER BUMPER. OVER ROTATION OF THE CLAMP ASSEMBLY COULD RESULT IN DAMAGE TO THE AIRFRAME TUNNEL FROM THE CLAMP "T" BOLTS.

CAUTION

DO NOT SAND CROSSTUBE IN A CIRCUMFERENTIAL DIRECTION.

5. Lightly abrade the primer on the crosstube and abrasion strip common to the band clamp (P/N 412-050-045-117) taking care not to expose bare material.

CAUTION

REMOVE PROTECTIVE BACKING FILM TO EXPOSE ADHESIVE FILM PRIOR TO BONDING CLAMP.

6. Install band clamp assembly P/N 412-050-045-117 using sealant (C-308) as per the BHT-412-MM. Ensure complete sealant coverage of the inner clamp surface, avoiding air pockets.

7. Trim the "T" bolts on the clamp assembly 412-050-045-117 to provide adequate clearance from fuselage tunnel, as required. Normally the "T" bolt should have approximately ½ inch of threads visible after installation. Deburr as required. Prime (C-246) and paint (as required) bare metal on "T" bolt for corrosion protection.

8. Lightly abrade the abrasion strip or the crosstube primer on the crosstube at BL 0.0 common to the lower support P/N 412-050-007-101 or 604-026-003 taking care not sand through abrasion strip or primer on crosstube exposing bare material. The Larson L101 abrasion strip is not required when installing replacement lower support 604-026-003.

9. Install lower support P/N 412-050-007-101 or 604-026-003 using sealant (C-308) per the BHT-412 Maintenance Manual. Prior to bonding the replacement lower support 604-026-003 with sealant (C-308) lightly abrade the black nylon abrasion material taking care not to expose bare metal.

10. Repaint crosstube as required per BHT-ALL-SPM.

11. Annotate component records to indicate incorporation of abrasion strips on 412-050-011 series crosstubes by the addition of “FM” to the end of the part number sequence (e.g. 412-050-011-107FM), for future reference.

12. Annotate helicopter / component records to indicate Part I of this bulletin has been accomplished.

ACCOMPLISHMENT INSTRUCTIONS

PART II - ACCOMPLISH AFT CROSSTUBE DEFLECTION CHECK AND ESTABLISH A RECURRING 12 MONTH / 2500 LANDING DEFLECTION CHECK (WHICH EVER COMES FIRST).

CAUTION

ENSURE HELICOPTER IS STABILIZED ON JACKS BEFORE PROCEEDING TO ACQUIRING MEASUREMENTS.

1. Hoist or jack the helicopter until the weight is removed from the landing gear.

2. Determine the BL 0.0 from the walking beam pivot point position and hang a plumb line to obtain the measurement from BL 0.0 to the outside edge of the skid tubes as indicated.

3. Confirm aft crosstube is within deflections limits indicated in the BHT-412-MM.

4. Replace aft crosstubes that exceed the dimensional tolerances indicated.

5. Annotate helicopter / component records to indicate Part II of this bulletin has been accomplished.

ACCOMPLISHMENT INSTRUCTIONS

PART III - TOWING:

Helicopter towing operations can result in fatigue damage to the aft crosstube. To prevent this damage, the recommendation to restrain the high aft crosstube as stated in the maintenance manual (BHT-412-MM-2), is **now mandatory** when towing at weights greater than or equal to 8900 lb.

The puller assembly used in the Service Instruction BHT-412-SI-58 is equipped with a load limiter called a “Load Sentry”. The mechanism is preset to provide a 4000 pound tension load on the crosstube. This high load counteracts the loads being applied to the crosstube by the towing actions and weight of the helicopter. The Load Sentry is contained in the handle of the retention devise and works similar to a torque wrench.

1. Install CAUTION decal P/N 212-070-600-143 per Figure 3 on pilot and co-pilot side and apply sealer (C-349) allowing 0.125 in (3.175) overlap on all sides of decal, as required.

2. Review Bell Helicopter Service Instruction BHT-412-SI-58 to determine the items required to use of this kit.

CAUTION

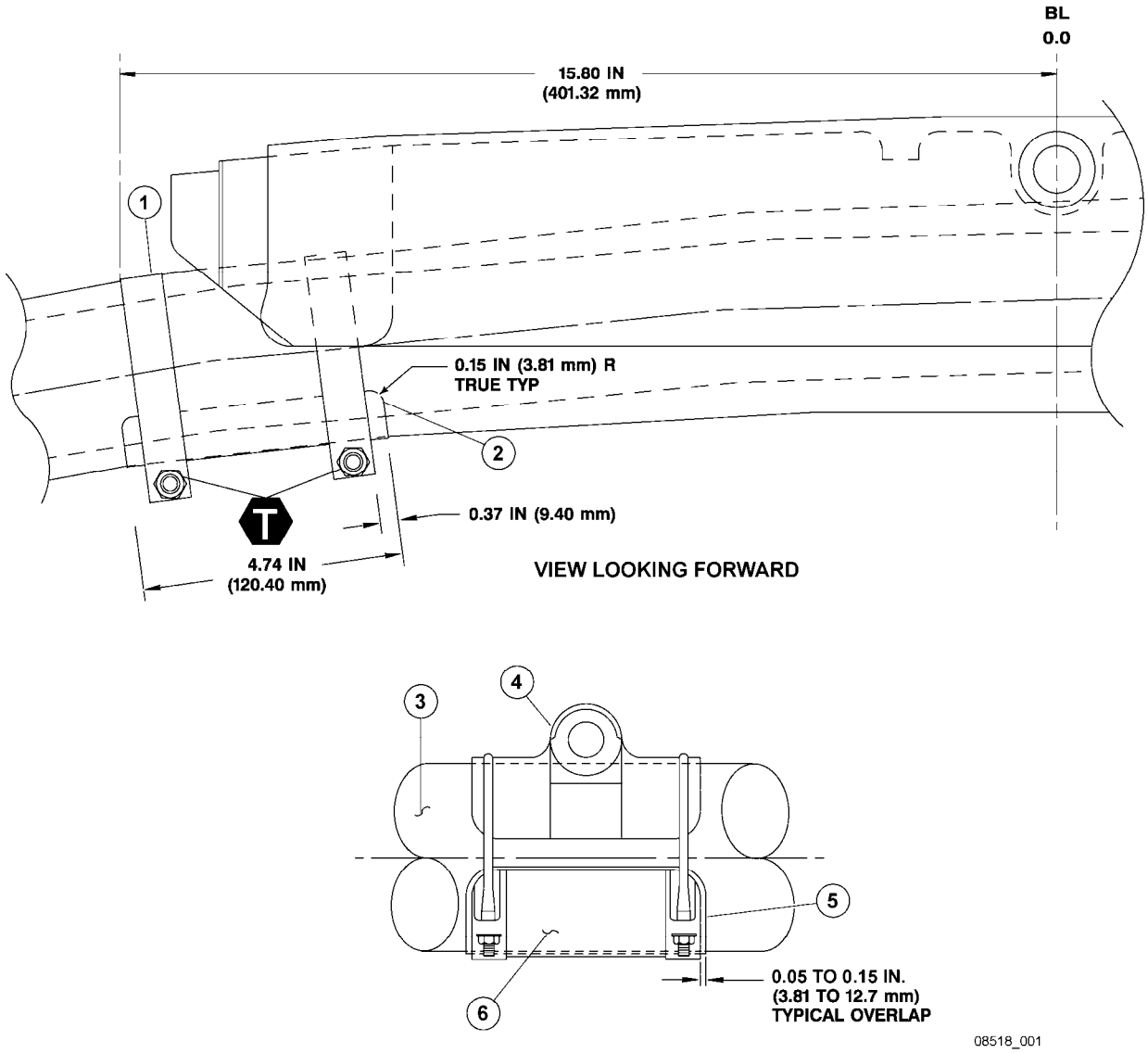
ENSURE LANDING GEAR MEETS THE MINIMUM REQUIREMENTS FOR TOWING PER THE SERVICE INSTRUCTION. TOWING SHOULD ONLY BE ACCOMPLISHED USING THE FORGED TOW FITTINGS P/N 204-050-104-101 AND SUPPORT BEAM ASSEMBLY P/N 412-050-003-109, INCLUDING SUBSEQUENT REPLACEMENTS OF EACH ITEM.

3. Establish helicopter towing practices for high landing gear at weights greater than or equal to 8900 lb and incorporate the use of Service Instruction BHT-412-SI-58.

4. Customers that use helicopter landing dollies (movable platforms) are also required to use the restraining devise per BHT-412-SI-58 at helicopter weights greater than or equal to 8900 lb for high landing gear.

5. When towing a helicopter (at weights less than 8900 lbs) over unprepared surfaces or rough terrain with or without the use of a dolly, the use of Service Instruction BHT-412-SI-58 is <u>strongly</u> recommended.

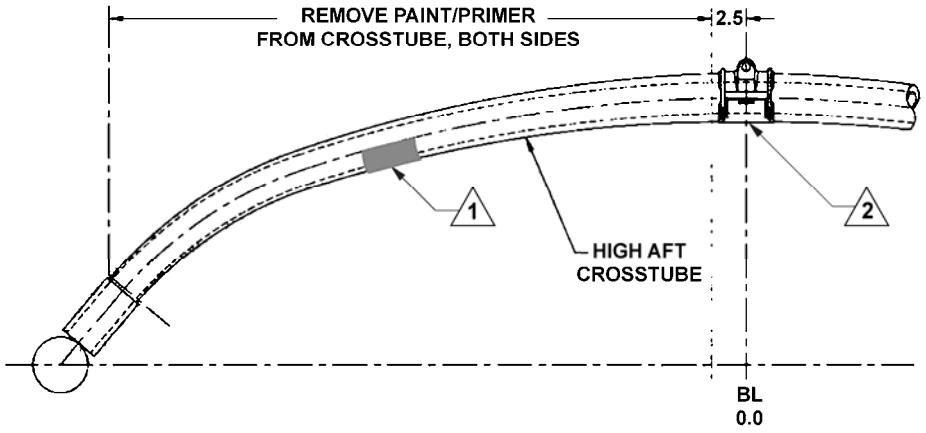
6. Annotate helicopter / component records to indicate Part III of this bulletin has been accomplished.



1. Clamp assembly (412-050-045-115/-117)
2. Abrasion strip (206-050-301-111)
3. Aft crosstube (Ref)
4. Upper center support (412-050-006-101)
5. Larson L101 abrasion strip (raw material size 0.020 x 5.0 x 6.0 inch (0.051 x 127 x 152.4 mm))
6. Lower center support (412-050-007-101) replaced by (604-026-003)

T 50 TO 70 IN-LBS
(67.8 TO 94.9 Nm)

FIGURE 1

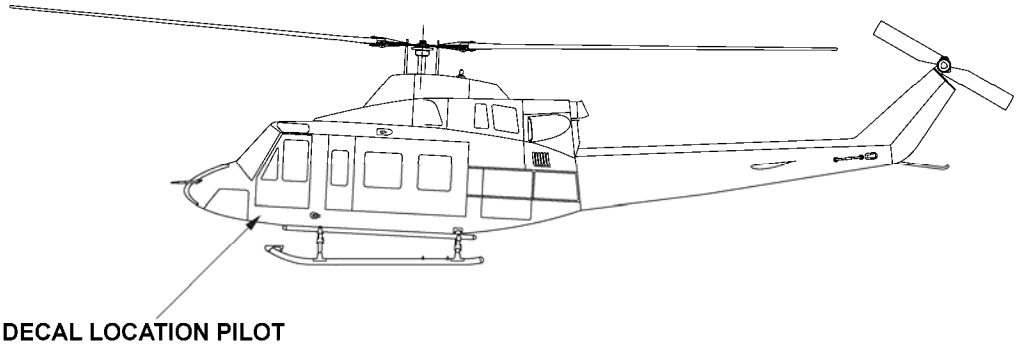


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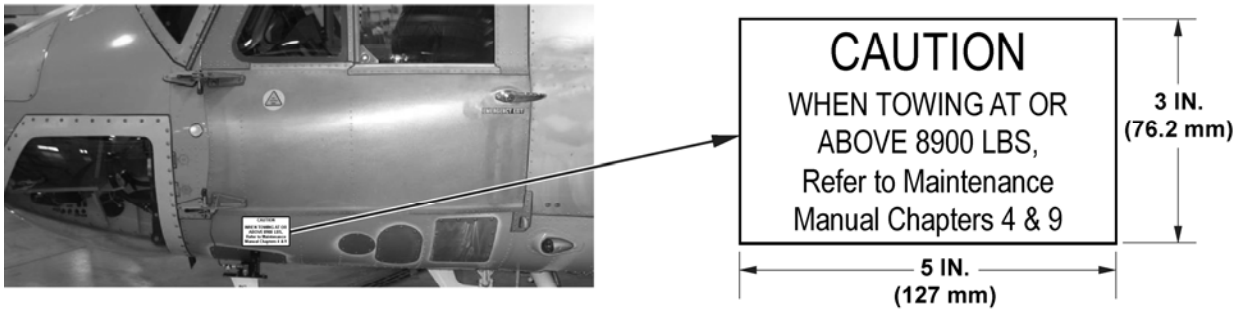
1. Protect abrasion strip P/N 206-050-301-111 (if installed) during paint removal process.

2. Protect upper and lower support during paint removal process. Crosstubes 412-050-011 in original condition without larson L101 under the lower support will require the lower support to be removed for paint stripping and fluorescent penetrant inspection.

FIGURE 2



DECAL LOCATION PILOT
AND COPILOT SIDES



NOTE

Decal characters are in red (Medium Compact Helvetica Font) 60 point for the first line and 36 point for the remaining lines, on a white background.

FIGURE 3