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Instructions for Continued Airworthiness

Cargo Hook Kit
For the
Eurocopter AS350B3
Helicopter

Part Number 200-281-00

STC SR01166SE

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Record of Revisions

Revision	*Date*	*Page(s)*	*Reason for Revision*
1	01/06/03	All	First Issue
2	10/10/03	25-00-00 Page 6	528-023-01 cargo hook configuration change Reference Service Bulletin 159-011-00
3	07/01/05	Section 5, 25-00-00 Page 2	Added daily check to section 5.1. Added cargo hook inspection schedule as section 5.2. Moved cargo hook overhaul to section 5.3 and updated to latest overhaul criteria. Added additional description to section 25.2.
4	03/11/10	Section 0, Section 5, Section 25 pages 1, 6, 8, 9	Changed overhaul frequency criteria. Added Section 0.12 and updated Warnings, Cautions and Notes format throughout document. Updated Figure 25-8 to show load beam closed, updated rigging instructions.
5	07/23/12	Section 4 Page 2, Section 5 Section 25 pages 1, 3, 8, 9	Updated maintenance section (section 5) to remove daily check, expand annual inspection, and add detail inspection at cargo hook overhaul. Updated troubleshooting table. Updated format of Precaution flags throughout manual.

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CONTENTS

Tables

Section 0
Introduction

0.4 Scope

The following information is necessary to carry out the service, maintenance, and inspection of the Cargo Hook Kit P/N 200-281-00.

0.5 Purpose

The purpose of this Instructions for Continued Airworthiness (ICA) manual is to provide the information necessary to inspect, service, and maintain in an airworthy condition the P/N 200-281-00 Cargo Hook Kit.

0.6 Arrangement

This manual contains instructions for the service, maintenance, inspection and operation of the Cargo Hook Kit P/N 200-281-00 on Eurocopter Model AS350B3 helicopters. The manual is arranged in the general order that maintenance personnel would use to install, maintain and operate the Cargo Hook in service.
The arrangement is:

ATA 0 Introduction.
ATA 4 Airworthiness limitations (None apply to this System.)
ATA 5 Inspection and overhaul schedule
ATA 25 Equipment and Furnishings

0.7 Applicability

These Instructions for Continued Airworthiness are applicable to Cargo Hook Kit P/N 200-281-00 (with Cargo Hook P/N 528-023-01) for the Eurocopter AS350B3 helicopter. Refer to the appropriate Eurocopter ICA for instructions regarding parts of the aircraft that interface with the P/N 200-281-00 system.

0.9 Abbreviations

FAA Federal Aviation Administration
FAR Federal Aviation Regulation
ICA Instructions for Continued Airworthiness

0.12 Precautions

The following definitions apply to precaution flags used in this manual.

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Draws the reader's attention to important or unusual information not directly related to safety.

Used to address practices not related to personal injury.

0.19 Distribution of Instructions for Continued Airworthiness

Before performing maintenance ensure that the Instructions for Continued Airworthiness (ICA) in your possession is the most recent revision. Current revision levels of all manuals are posted on Onboard Systems Int'l web site at www.onboardsystems.com. Current revision levels of all manuals are available from the factory.

Section 4
Airworthiness Limitations

4.2 No airworthiness limitations

No airworthiness limitations are associated with this type design change.

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Section 5
Inspection and Overhaul Schedule

5.1 Cargo Hook Kit Inspection Schedule

The scheduled inspection interval(s) presented below are maximums and are not to be exceeded. If the cargo hook is subjected to unusual circumstances, extreme environmental conditions, etc., it is the responsibility of the operator to perform the inspections more frequently to ensure proper operation.

Annually or 100 hours of external load operations*, whichever comes first, inspect the cargo hook kit per the following.

NOTICE

*Hours of external load operations should be interpreted to be **(1)** anything is attached to the primary cargo hook (whether or not a useful load is being transported) and **(2)** the aircraft is flying. If these conditions are **NOT** met, time does **NOT** need to be tracked.*

1. Activate the electrical system and press the Cargo Release button to ensure the cargo hook electrical release system is operating correctly. The cargo hook must release. Reset the cargo hook by hand after release. If the hook does not release or re-latch, do not use the unit until the problem is resolved.

CAUTION

Actuating the electrical release switch continuously in excess of 20 seconds will cause the cargo hook release solenoid to overheat, possibly causing permanent damage.

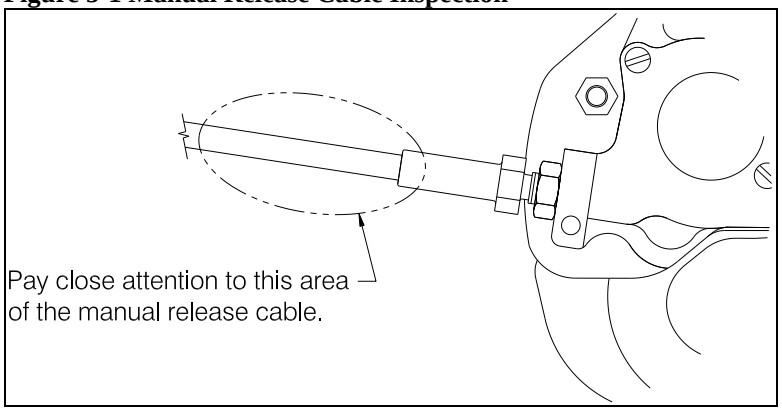
2. Activate the manual release system by pulling the release lever in the cockpit. The cargo hook must release. Reset the cargo hook by hand after release. If the hook does not release or re-latch, do not use the unit until the problem is resolved.

3. Move the cargo hook throughout its full range of motion to ensure the manual release cable and electrical harnesses have enough slack. The manual release cable or electrical harnesses must not be the stops that prevent the cargo hook from swinging freely in all directions.

5.1 Cargo Hook Kit Inspection Schedule continued

4. Visually inspect for presence and security of fasteners and electrical connections.
5. Visually inspect the cargo hook side plates and covers for damage including cracks, gouges, and nicks (refer to the cargo hook component maintenance manual (CMM) for damage limits).
6. Visually inspect the cargo hook load beam for damage including cracks, wear, gouges, and nicks (refer to cargo hook CMM for limits).
7. Visually inspect the manual release cable for damage, paying close attention to the flexible conduit at the area of transition to the cargo hook end fitting (refer to Figure 5-1). Inspect for splitting of the black conduit in this area and separation of the conduit from the steel end fitting.

Figure 5-1 Manual Release Cable Inspection

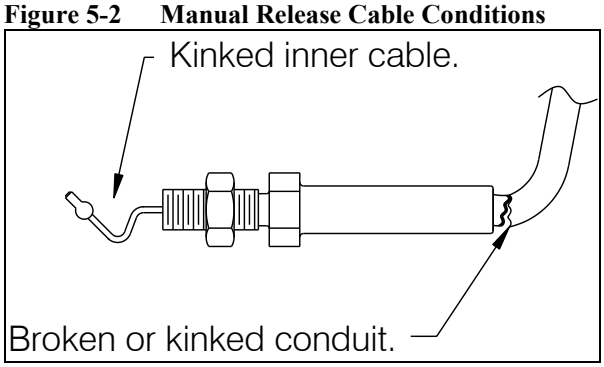


8. Remove the manual release cover from the cargo hook and inspect the visible section of the inner cable for kinks or frays.

⚠ CAUTION

Manual release cables are wearable items and must be replaced as condition requires. Broken or kinked conduit, inner cable kinks (ref Figure 5-2), frays, or sticky operation are each cause for immediate replacement.

Figure 5-2 Manual Release Cable Conditions

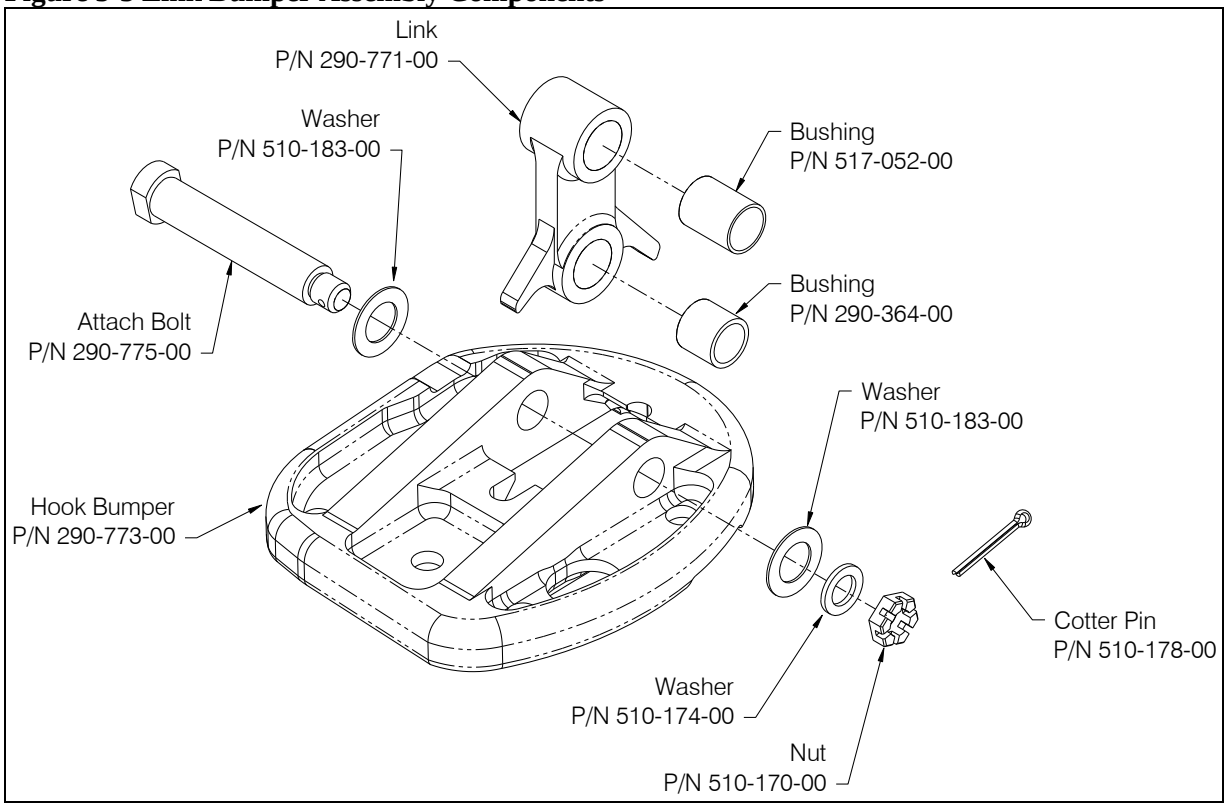


5.1 Cargo Hook Kit Inspection Schedule continued

At cargo hook overhaul (see section 5.2 for schedule), remove the kit components from the helicopter, disassemble, and inspect the component parts except cargo hook per this section. Refer to CMM 122-005-00 for cargo hook overhaul instructions.

Disassemble the Link Bumper Assembly referring to the figure below. The bushings do not need to be pressed out of the Link unless they need to be replaced per the criteria in Table 5-1.

Figure 5-3 Link Bumper Assembly Components



5.1 Cargo Hook Kit Inspection Schedule continued

Carefully inspect, and if necessary repair, the detail parts in accordance with the instructions in Table 5-1.

Table 5-1 Link Bumper Assembly Inspection Criteria

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Link P/N 290-771-00	Dents, gouges, and scratches less than .010" deep.	Blend at 20:1 ratio, length to depth, to provide smooth transitions.	Dents, gouges and scratches greater than .030". Visible cracks.
Bushing P/N 517-052-00	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None.	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.
Bumper, P/N 290-773-00	Gouges less than .060" deep.	None.	Gouges greater than .060" deep.
Attach Bolt, P/N 290-775-00	Wear on outside diameter, diameter greater than .495".	None.	Wear on outside diameter, diameter less than .495". Visible cracks.
Bushing P/N 290-364-00	Wear on inside diameter, diameter less than .510".	None.	Wear on inside diameter, diameter greater than .510".

5.2 Cargo Hook Kit Overhaul Schedule

Overhaul the cargo hook in accordance with the guidelines below.

Time Between Overhaul (TBO): 1000 hours of external load operations or 5 years, whichever comes first.

*Hours of external load operations should be interpreted to be **(1)** anything is attached to the primary cargo hook (whether or not a useful load is being transported) and **(2)** the aircraft is flying. If these conditions are **NOT** met, time does **NOT** need to be tracked.*

Overhaul the cargo hook per component maintenance manual 122-005-00. Contact Onboard Systems for guidance in locating authorized overhaul facilities.

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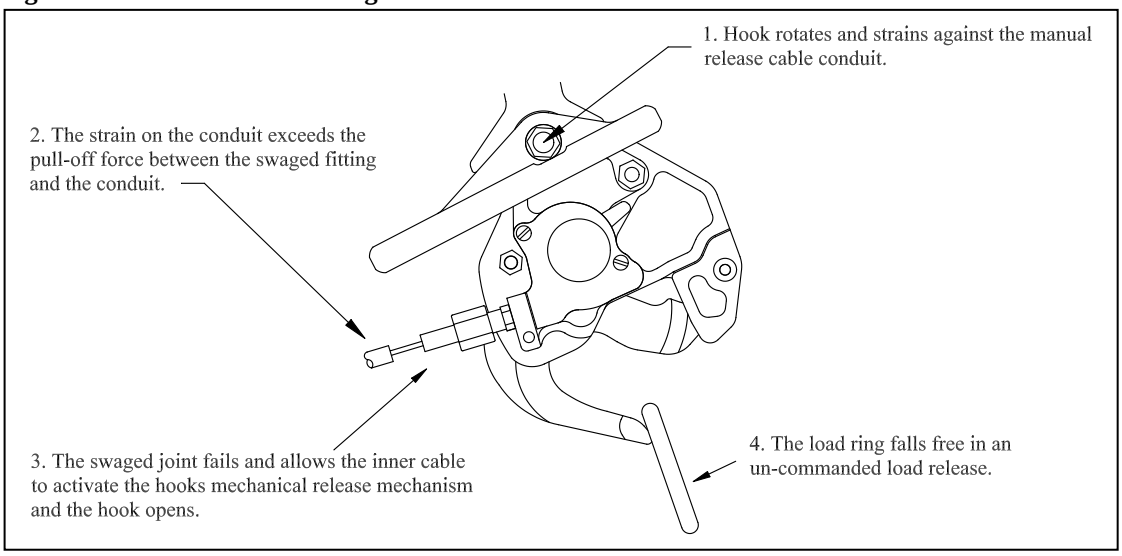
Section 25
Equipment and Furnishings

WARNING

Un-commanded cargo hook release will happen if the manual release cable is improperly restrained. The cables must not be the stops that prevent the Cargo Hook from swinging freely in all directions. If the Cargo Hook loads cause the hook to strain against the manual release cable the swaged end of the cable may separate allowing the inner cable to activate the cargo hook manual release mechanism. The result is an un-commanded release. Ensure that no combination of collective stick or Cargo Hook position is restrained by the manual release cable.

Figure 25-1 Un-commanded cargo hook release



25.1 Cargo hook connector

Listed below is the pin out for the cargo hook connector.

Table 25-1 Cargo Hook Connector

Pin	*Function*
A	Ground
B	Positive

25.2 Description

The primary components of the 200-281-00 Cargo Hook Kit are:

1. The Cargo Hook, which attaches to the AS350B3 swing suspension through a supplied adapter link.
2. A manual release cable, which interfaces with the helicopter's existing fixed manual release cable.
3. A hook bumper, which provides protection for the manual and electrical release cables.
4. An electrical connector is supplied to splice into and interface with the helicopter's electrical release system.

A load is attached to the cargo hook by passing a cargo sling ring into the throat of the load beam and pushing the ring against the upper portion of the load beam throat, which will initiate the hook to close. In the closed position, a latch engages the load beam and latches it in this position. A load release can be initiated by three different methods. Normal release is achieved by pilot actuation of a push-button switch in the cockpit. When the push-button switch is pressed, it energizes the DC solenoid in the cargo hook, and the solenoid opens the latch in the internal mechanism. In the event of an electrical failure, load release can be achieved by operating the manual release cable. The release cable actuates the internal mechanism of the cargo hook to unlatch the load beam. Ground personnel can also release the load by actuating a lever located on the side of the cargo hook.

25.5 Component Weights

The weight of the system is listed in Table 25-2. Refer to Eurocopter manual for location of cargo hook.

Table 25-2 Component Weights

Item	Weight
P/N 200-281-00	4.7 lbs (2.2 kgs)

25.12 Storage Instructions

Clean the exterior Cargo Hook components thoroughly of excess dirt and grease with a rag before packaging. Pack the unit in a heat-sealable package. If the unit is to be stored for long periods in a tropical climate it should be packed in a reliable manner to suit local conditions.

Package the unit in a suitable fiberboard box and cushion the unit to prevent shifting. Seal the fiberboard box with tape and mark the box with the contents and date of packaging.

25.15 Troubleshooting

Table 25-3 is provided with the intention of isolating the cause of malfunctions within the system. Sections 25.16 and 25.17 include instructions for removing and replacing defective components. Refer to the appropriate Eurocopter maintenance documentation for guidance on procedures relating to Eurocopter parts that interface with the cargo hook and adapter cable. Repair to the cargo hook and adapter cable beyond what is described in this manual is not authorized by these instructions. Contact Onboard Systems for further guidance if necessary.

Table 25-3 Troubleshooting

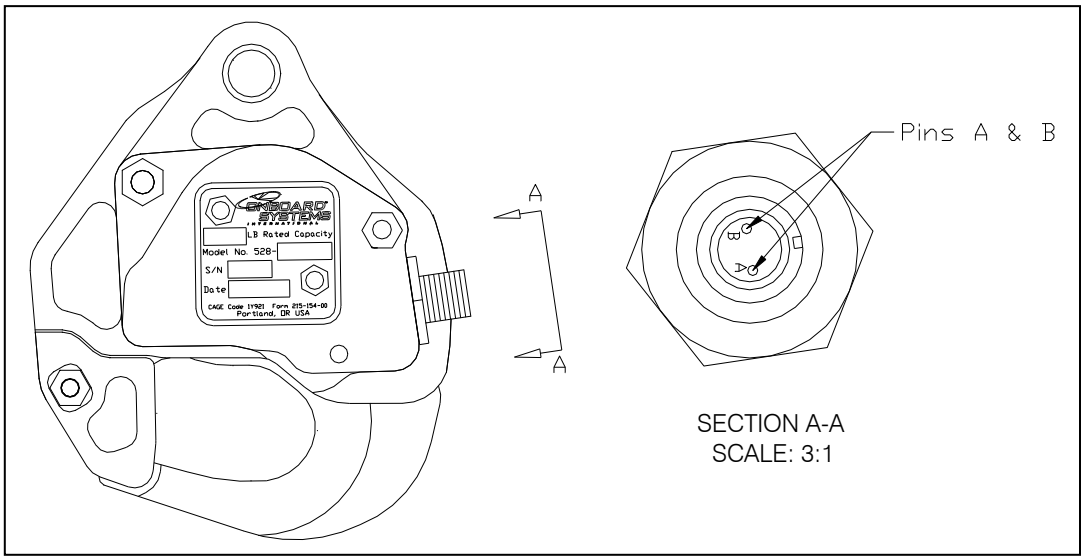
MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Cargo hook does not operate electrically, manual cable release operates normally.	Open electrical circuit, faulty wiring, fuse, switch or solenoid.	Disconnect cable from electrical connector on cargo hook. Using multi-meter, check for 3.0 to 4.0 ohms between pins A and B of electrical connector (see note 1). If open indication is obtained, remove and replace cargo hook (see sections 25.16 and 25.17).
Cargo hook does not operate electrically or manually.	Defective internal mechanism	Remove and replace cargo hook (see sections 25.16 and 25.17).
Cargo hook operates electrically, but not manually.	Defective manual release cable. Defective manual release system.	Check manual release cable and cable connection to cargo hook (remove and replace manual release cable per sections 25.16 and 25.17). Remove and replace cargo hook (see sections 25.16 and 25.17).
Load beam fails to re-latch after being reset.	Defective latch mechanism.	Remove and replace cargo hook (see sections 25.16 and 25.17).
Cargo hook manual release cable pull-off force exceeds 8 Lbs. (at the hook).	Friction in internal mechanism.	Check operation of unit using manual release lever. Remove and replace cargo hook (see sections 25.16 and 25.17).
Visibly loose fasteners or missing locking pins	Visibly loose fasteners or missing locking pins.	Re-torque and re-install locking pins per installation instructions.
Visibly loose electrical connector	Visibly loose electrical connector.	Retighten connector
Failure to open or re-lock properly	Failure to open or re-lock properly.	Remove and replace cargo hook (see sections 25.16 and 25.17).
Fuse opens when cargo hook is energized.	Short in the system, faulty wiring, fuse or solenoid.	Check for shorts to ground. Check solenoid resistance (see note 1).

Notes:

1. Checking resistance at pins A and B.

Check for 3.0 to 4.0 ohms between pins A and B of electrical connector located on the cargo hook (see below).

Figure 25-2 Cargo Hook Electrical Connector



25.16 Component Removal

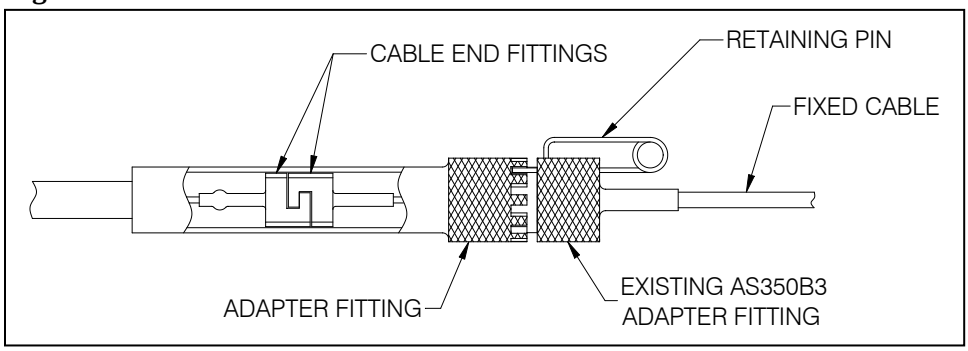
Cargo Hook Removal

1. Cut and remove all lockwire.
2. Remove manual release cover by removing 2 screws.
3. Remove the manual and electrical release cables from the Cargo Hook.
4. Remove the cotter pin P/N 510-178-00 from the Attach Bolt P/N 290-775-00 (reference Figure 25-5).
5. Remove the castellated nut P/N 510-170-00 from the Attach Bolt.
6. Remove Attach Bolt and all washers.
7. Remove cargo hook.

Manual Release Cable Removal

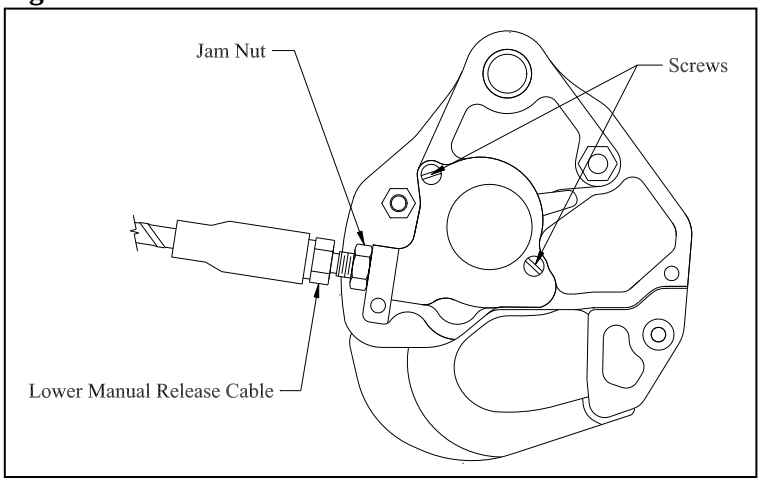
1. Disconnect the cable at the joint with the fixed manual release cable on the belly of the helicopter by disengaging the retaining pin and unthreading the adapter fitting to expose and disengage the cable end fittings.

Figure 25-3 Manual Release Cable Connection



2. At the other end of the cable (at the cargo hook) remove the two screws that secure the manual release cover to the hook (see below) and unhook the cable ball end from the fork fitting.

Figure 25-4 Manual Release Cover Removal

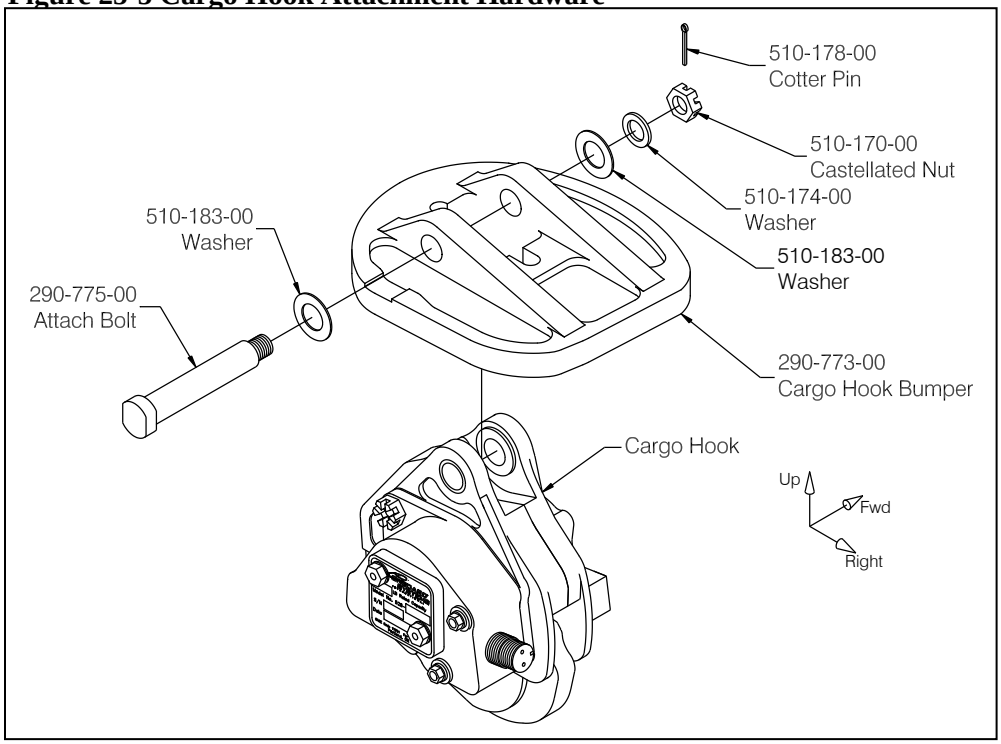


25.17 Component Re-installation

Cargo Hook Re-installation

1. Inspect the Cargo Hook for evidence of damage, corrosion and security of lock wire and fasteners. If damage is evident, do not use the items until they are repaired.
2. Verify that the part number of the cargo hook removed matches one of the numbers on the list in the Applicability section of this manual. If it does not, do not attempt to use the cargo hook, contact the factory for clarification.
3. Attach the Cargo Hook (P/N 528-023-01) and Cargo Hook Bumper (P/N 290-773-00) to the Adapter Link on the suspension system with the Attach Bolt (P/N 290-775-00) and washer (P/N 510-183-00) as illustrated in Figure 25-5.
4. Install washer (P/N 510-183-00) and washer (P/N 510-174-00) over bolt end.
5. Tighten nut P/N 510-170-00 on the Attach Bolt to finger tight, then rotate nut to next castellation to install and secure cotter pin (P/N 510-178-00).

Figure 25-5 Cargo Hook Attachment Hardware



Note: The Cargo Hook Load Beam must point to the left side of the helicopter when looking from the rear**.**

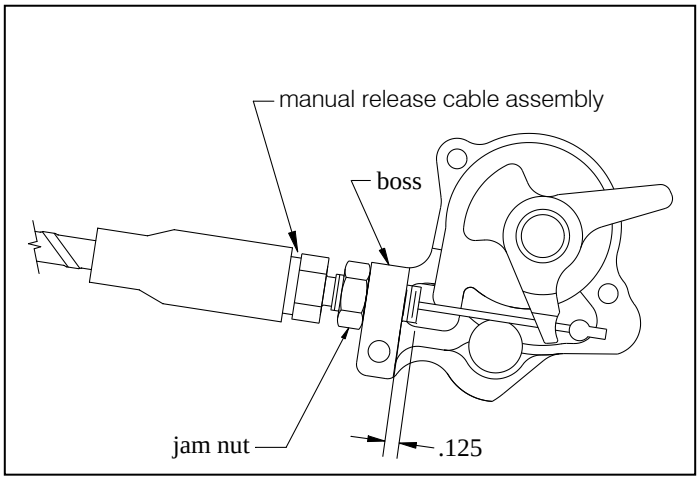
25.17 Component Re-installation, continued

Manual Release Cable Re-installation

1. Remove the manual release cover from the cargo hook. Thread the fitting at the end of the manual release cable into the manual release boss on the hook side plate until the threads protrude approximately .125" inch beyond the boss and secure with jam nut (as shown in Figure 25-6).

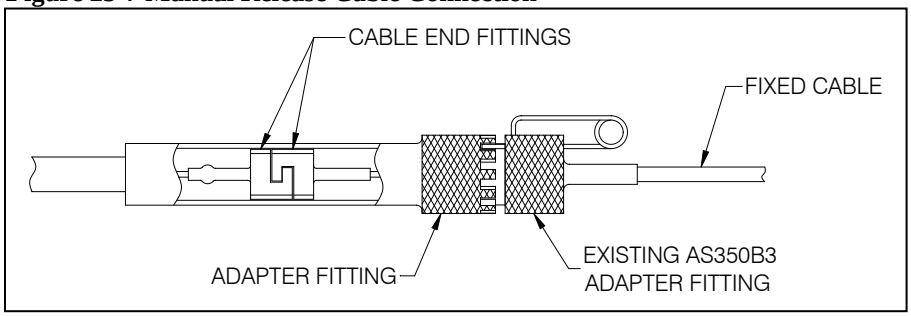
   Leave the cover off of the cargo hook until the other end of the release cable is connected, in order to verify proper setting.

Figure 25-6 Manual Release Cable Rig



2. Connect the other end of the release cable to the fixed section of the existing AS350 manual release cable by mating the cable end fittings together as shown below (slide back the Adapter Fitting to access fitting on removable cable). Slide the Adapter Fitting forward and thread it onto the AS350B3 fitting, and engage a castellation on the Adapter Fitting with the retaining pin and lock it in place. Snap the Adapter Fitting into the existing clip mounted to the belly of the helicopter.

Figure 25-7 Manual Release Cable Connection



25.17 Component Re-installation, continued

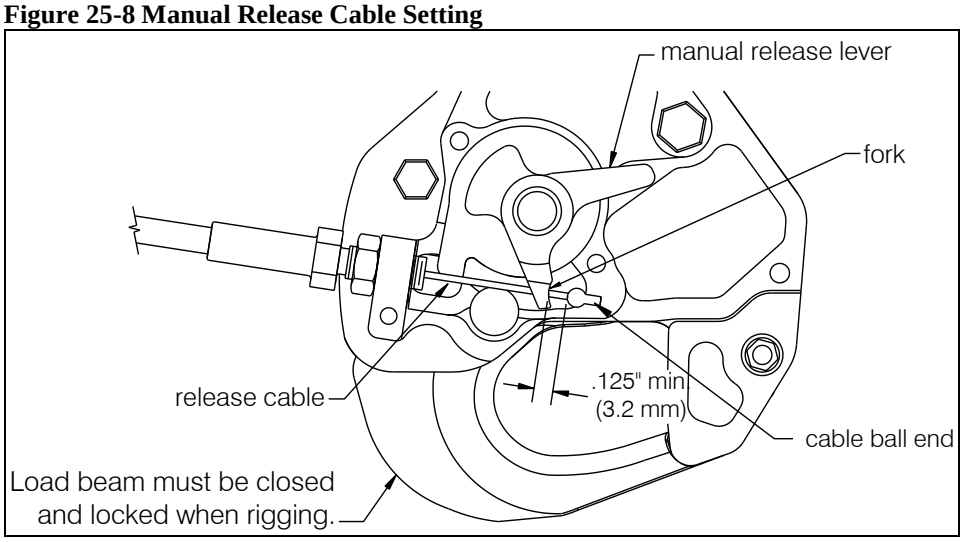
Verify proper setting at the hook:

CAUTION

Cargo hook must be closed and locked when verifying rigging and adjusting the manual release cable.

Place the cable ball end fitting into the hook manual release fork fitting as illustrated in Figure 25-8. Move the manual release lever in the clockwise direction until it is against the cam stop. Measure the cable ball end free play with the manual release handle in the cockpit in the non-release position. The gap must measure at least .125 inches (see below).

Figure 25-8 Manual Release Cable Setting



If the gap does not measure at least .125” (3.2 mm), make adjustments at the manual release lever in the cockpit or at the cargo hook by disconnecting the cable at the interface with the fixed manual release cable (Figure 25-7), loosening the jam nut, and rotating the cable in the required direction.

25.18 General Procedural Instructions-Testing

After re-installation of the cargo hook and/or manual release cable perform the following.

1. Activate the electrical system and press the Cargo Hook release button to ensure the cargo hook electrical release is operating correctly. The mechanism should operate smoothly and the Cargo Hook must release. Reset the hook by hand after the release. If the hook does not release or relatch, do not use the unit until the difficulty is resolved.

   CAUTION

   The release solenoid is intended to be energized only intermittently. Depressing the electrical release button continuously in excess of 20 sec. will cause the release solenoid to overheat, possibly causing permanent damage.

2. Activate the release handle located on the collective to test the cargo hook manual release mechanism. The mechanism should operate smoothly and the Cargo Hook must release. Reset the hook by hand after release. If the hook does not release or relatch do not use the unit until the difficulty is resolved.

3. Swing the installed Cargo Hook and the suspension to ensure that the manual release cable assembly and the electrical release cable have enough slack to allow full swing of the Cargo Hook suspension assembly without straining or damaging the cables. The cables must not be the stops that prevent the Cargo Hook from swinging freely in all directions.

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