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Owner's Manual 3,500 Pound Keeperless Cargo Hook Kit on the Eurocopter AS350B3

Part Number 200-281-00

Owner's Manual Number 120-106-00 Revision 9 October 26, 2009



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## RECORD OF REVISIONS

Revision	Date	Page(s)	Reason for Revision
1	1/06/03	All	Original issue.
2	10/02/03	Section 2	Redefined manual release cable routing for simplicity.
3	10/10/03	1-1, 1-2, 4-1 and 5-1	528-023-01 cargo hook configuration change Reference Service Bulletin 159-011-00
4	02/03/04	1-2, Section 2, 3-4	Changed part number of Manual Release Adapter Cable from 268-024-00 to 268-024-01 in Table 2-1. Replaced p/n's 410-131-00 (connector) and 410-166-00 (backshell) in Table 2-1 and on page 2-4 with P/N 230- 077-00 (connector and low profile backshell assembly).
			Clarified some of the installation instructions in Section 2.
			Added instructions for loading a cargo ring onto the cargo hook (see Cargo Hook Loading section).
5	10/26/04	1-2, 2-2, 5-1	Changed part number of Manual Release Cable from 268-024-01 to 268-024-02 in Table 1-2 and on page 2-2 and 5-1.
6	07/01/05	Section 4	Removed maintenance information from section 4 and replaced with reference to ICA and Cargo Hook Service Manual. Corrected weight in Table 2-2 to 4.7 lbs.
7	09/07/07	Section 1, 2-5, 3-1 and 3-2	Added Warnings, Cautions and Notes explanation to section 1.
			Updated warnings, cautions and notes format throughout document.
8	01/11/08	2-1, 2-4	Added "Remove rubber bumpers from swing assembly" instruction and updated Figure 2.1.
			Removed color labels from wiring diagram Figure 2.6, moved Table 2-1 adjacent to Figure 2.6.
9	10/26/09	2-2	Added caution note and revised Figure 2.2

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# *Section 1* General Information

## Introduction

The 200-281-00 Cargo Hook Kit is approved as a replacement for the following cargo hook on Eurocopter AS350 Series helicopters, equipped with a B-3 type swing system. The B-3 type swing systems are installed on AS350 B-3s and could be retrofitted to earlier models via Eurocopter Service Bulletin 2500.62.

P/N	Manufacturer	
AS 21-5-7	Siren	

## Warnings, Cautions and Notes

The following definitions apply to Warnings, Cautions and Notes used in this manual.



Means that if this information is not observed, serious injury, death or immediate loss of flight safety could occur.



Means that there is a risk of injury or degradation in performance of equipment if this information is not observed.



Draws the reader's attention to information which may not be directly related to safety, but which is important or unusual.

## **Specifications**

5
3,500 lb. (1,580 kg.)
15,750 lb. (7,140 kg.)
8,750 lb. (3,970 kg.)
8,750 lb. (3,970 kg.)
8 lb. Max.(.600" travel)
22-32 VDC 6.9 - 10 amps
0 pounds
3.0 pounds (1.35 kg.)
PC06A8-2S SR

#### Table 1-1 Specifications (528-023-01 Cargo Hook)

Load capacities given are for the equipment described only. Loading limits for your particular helicopter model still apply. Consult your flight manual.

#### Inspection

Inspect the cargo hook for evidence of damage, corrosion and security of lock wire and fasteners. If damage is evident, do not use the unit until it has been repaired.

## **Bill of Materials**

The following items are included with the Cargo Hook Kit, if shortages are found contact the company from whom the system was purchased.

#### Table 1-2 200-281-00 Bill of Materials

Part Number	Description	Quantity
120-106-00	Cargo Hook Kit Owners Manual	1
121-014-00	Flight Manual Supplement	1
122-005-00	Cargo Hook Service Manual	1
123-013-00	ICA Maintenance Manual	1
268-024-02	Manual Release Cable Assembly	1
232-149-00	Link Bumper Assembly	1
230-077-00	Connector Assembly	1
528-023-01 *	Cargo Hook	1
215-169-00	AS350 Light Indicator Placard	2

\* Minus attach hardware

## **Theory of Operation**

The primary elements of the Cargo Hook are the load beam, the internal mechanism, and a DC solenoid. The load beam supports the load and is latched through the internal mechanism. The DC solenoid and an external manual release cable provide the means for unlatching the load beam.

A load is attached to the load beam by passing the 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.

To release the load, the latch is disengaged from the load beam. With the latch disengaged, the weight of the load causes the load beam to swing to its open position, and the cargo sling slides off the load beam. The load beam then remains in the open position awaiting the next load.

A load release can be initiated by three different methods. Normal release is achieved by pilot actuation of the 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 an emergency, release can be achieved by operating a mechanical release cable. The release cable operates the internal mechanism of the Cargo Hook to unlatch the load beam. The load can also be released by the actuation of a lever located on the side of the Cargo Hook. This page intentionally left blank.

# Section 2 Installation Instructions

These procedures are provided for the benefit of experienced aircraft maintenance facilities capable of carrying out the procedures. They must not be attempted by those lacking the necessary expertise.

## **Cargo Hook Removal**

Remove the existing cargo hook and manual release cable from the helicopter by disconnecting the hook from the load cell on the swing suspension and the manual release cable at the fitting on the belly of the aircraft. Disconnect the electrical release cable at the hook. Remove rubber bumpers from the swing assembly.

#### **Cargo Hook Installation**

Inspect the swing assembly components to ensure that they are in serviceable condition.

Attach the new Cargo Hook (P/N 528-023-01) with Link Bumper Assembly (P/N 232-149-00) to the load cell, re-using the Eurocopter hardware (see below). The cargo hook load beam should point to the left side of the aircraft.



Figure 2.1 Swing Mount Cargo Hook Installation Assembly

Install the Manual Release Cable Assembly (P/N 268-024-02).

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 2.2).

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



Manual release cable rigging must be done with the cargo hook in the closed and locked position.





Route the cable from the hook to the interface with the fixed manual release cable through two existing clamps. These clamps must be located at the two furthest forward positions on the lower cowling (points 1 and 2 in Figure 2.3 below). Do not use the clamp at the aft position.

Figure 2.3 Manual Release Cable Routing



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.





Verify proper setting at the hook:

Place the cable ball end fitting into the hook manual release fork fitting as illustrated in Figure 2.4. 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 should measure .19/.25" (see below).





If the gap does not measure .19/.25", make adjustments at the hook by disconnecting the cable at the interface with the fixed manual release cable (Figure 2.4), loosening the jam nut at the hook, and rotating the cable in the required direction.

Connect the electrical harness to the Cargo Hook per the following instructions.

Cut the hook end connector off of the existing Eurocopter release harness as close to the connector as possible. Install the supplied connector and backshell assembly P/N 230-077-00 (at 24M) onto the existing harness using the schematic below.



#### Figure 2.6 Wiring Diagram

Table 2.1	Cargo	Hook	Connector
-----------	-------	------	-----------

Pin	Function
А	Ground
В	Power

Cap and stow the remaining wires (for the load indicator lights) from 32M and install "INOP" placards (P/N 215-169-00) over the load indicator lights (74M and 75M) in the cockpit.

Route the electrical release cable connector through the slot in the Cargo Hook Bumper (see below) and connect the new cargo hook electrical release cable connector to the Cargo Hook and secure with safety wire. See table 2-1 for connector pin out information.

Figure 2.7 Cargo Hook Bumper Slot





The cargo hook is equipped with a suppression diode that will be damaged if the cargo hook electrical connection is reversed. Do not attach the electrical connector until the polarity of the aircraft connector is determined to be compatible with the cargo hook connector listed in table 2-1.



Un-commanded cargo hook release will happen if the manual and electrical release cables are 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 cyclic stick or cargo hook position is restrained by the manual or electrical release cables.



Figure 2.8 Un-Commanded Release From Incorrectly Secured Cable

## **Installation Check-Out**

After installation of the cargo hook, perform the following functional checks.

- 1. Swing the installed cargo hook to ensure that the manual release cable assembly and the electrical release cable have enough slack to allow full swing of the 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.
- 2. With no load on the cargo hook load beam, pull the manual release lever on the collective and verify the cargo hook releases. Reset the cargo hook load beam.
- 3. With no load on the cargo hook load beam, depress the cargo hook electrical release button, the cargo hook must release. Reset the cargo hook load beam.

#### **Component Weights**

The weight of the Cargo Hook Kit components are listed below.

#### Table 2-2 Component Weights

Item	Weight
Cargo Hook Kit (includes Cargo Hook Link Assembly and Manual Release Cable)	4.7 pounds (2.2 kgs)

#### **Cargo Hook Location**

See the Eurocopter provided Flight Manual Supplement for external load weight and balance data.

#### **Paper Work**

In the US, fill in FAA form 337 for the initial installation. This procedure may vary in different countries. Make the appropriate aircraft log book entry. Insert the Rotorcraft Flight Manual Supplement P/N 121-014-00 in the Rotorcraft Flight Manual.

# Section 3 Operation Instructions

# **Operating Procedures**

Daily prior to each hook use, perform the following:

- 1. Ensure that the Cargo Hook has been properly installed and that the manual and electrical release cables do not limit the movement of the hook.
- 2. Be completely familiar with this manual, particularly the Cargo Hook rigging section.
- 3. Be completely familiar with all Eurocopter Cargo Hook operating instructions and the ICA 123-013-00.
- 4. 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 should relatch after release. If the hook does not relatch do not use the unit until the difficulty is resolved.



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

5. Activate the manual release lever to test the cargo hook manual release mechanism. The mechanism should operate smoothly and the Cargo Hook must relatch after release. If the hook does not re-latch do not use the unit until the difficulty is resolved.

See the trouble shooting table in the ICA and the Eurocopter service instructions that cover the original Cargo Hook installation for additional instructions.

## **Cargo Hook Rigging**

Extreme care must be exercised when rigging a load to the Cargo Hook. Steel load rings are recommended to provide consistent release performance and resistance to fouling. Figure 3-1 shows the recommended rigging, but is not intended to represent all rigging possibilities.



Some combinations of small primary rings and large secondary rings could cause fouling during release.

It is the responsibility of the operator to assure the cargo hook will function properly with each rigging.

#### Nylon Type Straps and Rope



Nylon type straps (or similar material) or rope must not be used directly on the cargo hook load beam. If nylon straps or rope must be used they should be first attached to a steel primary ring. Verify that the ring will freely slide off the load beam when it is opened. Only the primary ring should be in contact with the cargo hook load beam

# Cargo Hook Rigging, continued

Figure 3-1 Example of Recommended Cargo Hook Rigging



# **Cargo Hook Loading**

The cargo hook can easily be loaded with one hand. A load is attached to the hook by pushing the ring upward against the upper portion of the load beam throat, as illustrated in Figure 3-2, until an internal latch engages the load beam and latches it in the closed position.





# Section 4 Maintenance

Refer to the Instructions for Continued Airworthiness (ICA) manual 123-013-00 for maintenance of the cargo hook kit. For maintenance specific to the cargo hook refer to Cargo Hook Service Manual 122-005-00.

## **Instructions for Returning Equipment to the Factory**

If an Onboard Systems product must be returned to the factory for any reason (including returns, service, repairs, overhaul, etc) obtain an RMA number before shipping your return.



An RMA number is required for all equipment returns.

- To obtain an RMA, please use one of the listed methods.
  - Contact Technical Support by phone or e-mail (<u>Techhelp@OnboardSystems.com</u>).
  - Generate an RMA number at our website: <u>http://www.onboardsystems.com/rma.php</u>
- After you have obtained the RMA number, please be sure to:
  - Package the component carefully to ensure safe transit.
  - Write the RMA number on the outside of the box or on the mailing label.
  - Include the RMA number and reason for the return on your purchase or work order.
  - Include your name, address, phone and fax number and email (as applicable).
  - Return the components freight, cartage, insurance and customs prepaid to:

Onboard Systems 13915 NW 3rd Court Vancouver, Washington 98685 USA Phone: 360-546-3072 This page intentionally left blank.

# Section 5 System Part Numbers

200-281-00 Cargo Hook Replacement Kit



ITEM	Part Number	DESCRIPTION	QTY
1	232-149-00	Link Bumper Assembly	1
2*	528-023-01	3.5K Keeperless Cargo Hook	1
3	230-077-00	Connector Assembly	1
4	268-024-02	Manual Release Cable Assembly	1
5	215-169-00	AS350 Light Indicator Placard	2

\* Minus attach hardware

# System Part Numbers continued

232-146-00 Link Assembly



Item	Part Number	Description	Qty
1	290-771-00	Adapter Link	1
2	517-052-00	Bushing	1
3	290-364-00	Bushing	1

# System Part Numbers continued

232-149-00 Link Bumper Assembly



ITEM	P/N	DESCRIPTION	QTY
1	510-178-00	Cotter Pin	1
2	510-170-00	Nut	1
3	510-174-00	Washer	1
4	510-183-00	Washer	2
5	290-775-00	Attach Bolt	1
6	232-146-00	Link Assembly	1
7	290-773-00	Replacement Bumper	1

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# *Section 6* Certification

#### STC



#### $STC \ {\rm continued}$



## **Canadian** Approval

Transport



Canaḋa Aviation Transports Canada Aviation

Aircraft Certification Branch 620 - 800 Burrard Street Vancouver, BC V6Z 2J8

Your file Votre référence 190S-03-169 Our file Notre référence

March 24, 2003

Onboard Systems 13915 NW 3<sup>rd</sup> Court Vancouver, WA 98685 USA

Attention: Mr. Ron Pirtle

#### Subject: Acceptance of Foreign STCs SR01164SE, SR01165SE, and SR01166SE

Dear Sir:

This is in response to your letters dated February 25, 2003 making application for Canadian approvals of the subject STCs.

In accordance with our current policy associated with the review of foreign STCs, some STCs applicable to certain categories of rotorcraft may be accepted solely on the basis of their foreign certification, and do not require the issue of a corresponding certificate by Transport Canada. The subject STCs fall within these criteria.

These STCs will be entered in the national index of STCs that have been reviewed and accepted by Transport Canada for installation on Canadian-registered aeronautical products.

This letter confirms formal acceptance of the referenced STCs by Transport Canada. Should you require additional information with regards to this matter or clarification please do not hesitate to contact the undersigned at (604) 666-5597.

Yours truly,

H. W. Wong Senior Engineer, Aircraft Certification

for Minister of Transport

c.c. Mr. Jeffrey E. Duven Acting Manager, Seattle ACO

Canada

1/1

## **EASA Approval**



# SUPPLEMENTAL TYPE CERTIFICATE

#### EASA.IM.R.S.00623

This certificate, established in accordance with Regulations (EC) No 1592/2002 and (EC) No 1702/2003 and issued to:

#### Onboard Systems 13915 NW 3rd Court Vancouver, WA 98685 USA

certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable type certification basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Product Type Certificate number: DGAC TC No. 84 Manufacturer: Eurocopter France Model: Eurocopter AS 350 B3 Helicopter

**Description of Design Change:** 

Cargo Hook Kit installation, in accordance with FAA STC No. SR1166SE issued January 22, 2003.

# EASA Approval continued

Laropsung	viation Safety Agency
6	
Associated Technical Documentation	
- AS 350 B3 Flight Manual and RFM S 2003, and revised on July 23, 2004 or la	upplement Onboard No. 121-014-00 dated January 15, ater approved revisions.
Limitations and Conditions:	
	oduct configuration as defined in the approved design iption". Compatibility with other aircraft/engine he installer.
This certificate shall remain valid unles	
For the European Aviation Safety Agen Date of Issue: 15 <sup>th</sup> March 2005	cy,
	Consport Condell
	<b>M. Mazzoletti</b> Certification Manager Rotorcraft, Ballons and Airships
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