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Talon LC Keeperless Cargo Hook Kit

For the

Eurocopter SA.315B (Lama)

Cargo Hook Kit, H-Frame, Part Number 200-270-01
Cargo Hook Kit, Frame Swing, Part Number 200-271-02

Owner's Manual

Owner's Manual Number 120-100-01
Revision 0
October 24, 2013

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Record of Revisions

Revision	*Date*	*Page(s)*	*Reason for Revision*
0	10/24/13	All	Initial Release

Current revision levels of all manuals are posted on Onboard Systems Int'l website at www.onboardsystems.com. Current revision levels of all manuals are available from the factory.

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Section 1
General Information
Introduction

The P/N 200-270-01 Cargo Hook Kit is approved as a replacement on the Lama SA.315B when modified by STC SH1735SW, which includes the ERC H-Frame 17112 and cargo hook 14027-4.

The P/N 200-271-02 Cargo Hook Kit is approved as a replacement on the Lama SA.315B when equipped with the Hook A90B-100, Frame 315A73-10-120 and Gimbal 3160S73-06-517.

Explanation of Signal Words and Symbols

The following definitions apply to the symbols used throughout this manual to draw the reader's attention to safety instructions as well as other important messages.

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.

Bill of Materials

The following items are included as listed in the H-Frame Kit P/N 200-270-01 and Swing Frame Kit P/N 200-271-02. If shortages are found contact the company from whom the system was purchased.

Table 1-1 Bill of Materials

Part Number	Description	H-Frame Kit Qty 200-270-01	Swing Frame Kit Qty 200-271-02
120-100-01	Owner's Manual	1	1
121-010-01	RFM supplement	1	1
122-017-00	Component Maintenance Manual, Cargo Hook	1	1
232-070-00	Hook to Gimbal Adapter, H-Frame	1	-
232-071-00	Hook to Gimbal Adapter, Swing	-	1
290-332-00	Attach Bolt	2	1
290-426-00	Hook to Manual Release Adapter	1	-
290-524-00	Hook Bumper	-	2
290-532-00	Hook to Manual Release Adapter	-	1
410-131-00	Electrical Connector	1	1
510-042-00	Washer	2	1
510-091-00	Nut	-	4
510-138-00	Screw	-	4
510-170-00	Nut	2	1
510-174-00	Washer	2	1
510-178-00	Cotter Pin	2	1
510-183-00	Washer	3	2
510-252-00	Jam Nut	1	-
510-257-00	Bolt	2	1
510-278-00	Washer	-	4
512-010-00	Adel Clamp	2	1
512-021-00	Adel Clamp #20	-	4
528-029-00	Cargo Hook	1	1

Specifications

Table 1-2 200-270-01, 200-271-02 Specifications

Design load*	3,000 lbs. (1,360 kg.)
Design ultimate strength	11,250 lbs. (5,103 kg.)

Table 1-3 P/N 528-029-00 Cargo Hook Specifications

Design load*	3,600 lbs. (1,633 kg.)
Design ultimate strength	13,500 lbs. (6,124 kg.)
Electrical release capacity	9,000 lbs. (4,082 kg.)
Mechanical release capacity	9,000 lbs. (4,082 kg.)
Force required for mechanical release at 3,600 lb.	8 lb. Max.(.600" travel)
Electrical requirements	22-32 VDC 6.9 – 10 amps
Minimum release load	0 pounds
Unit weight	3.0 pounds (1.35 kg.)
Mating electrical connector	PC06A8-2S SR

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

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, an external manual release cable, and a manual release lever provide the means for unlatching the load beam.

The 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.

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.

2.1 Removal of Existing Cargo Hook

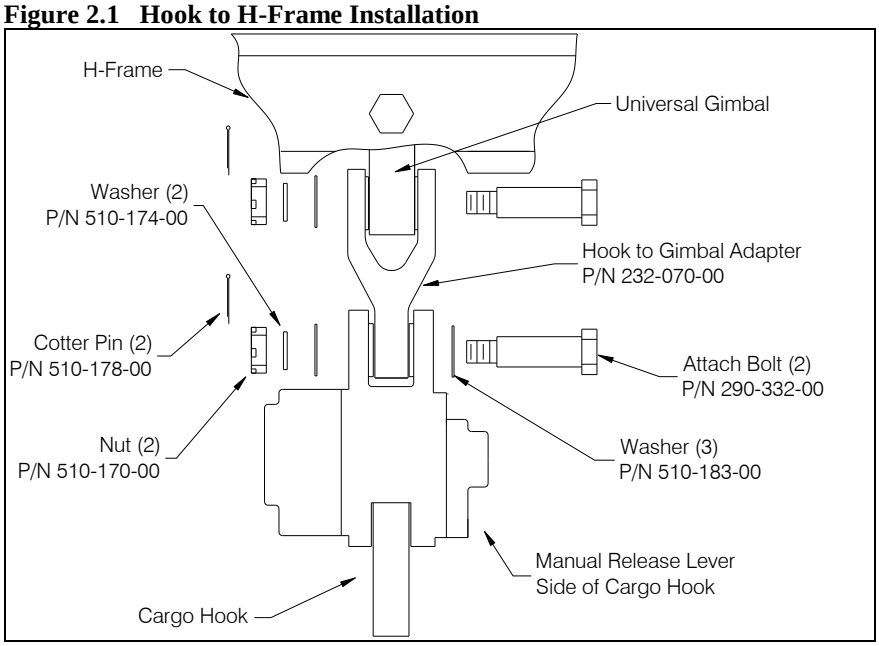
Remove the old Cargo Hook from the aircraft by disconnecting the hook from the universal (gimbal) adapter on the H-frame or Swing frame. Disconnect the manual and electrical release cables at the hook.

2.2 Cargo Hook Installation Instructions, H-Frame

2.2.1 Hook to H-Frame Installation

Attach the new Cargo Hook to the Hook to Gimbal Adapter as shown below. The 232-070-00 Hook to Gimbal adapter is installed with the longer lower arm pointing to the rear of the hook. The interface tab on the adapter will prevent installation of the adapter in the opposite orientation. Attach the Hook to Gimbal adapter to the H-Frame Gimbal using the hardware supplied, as illustrated below. The cargo hook load beam tip should point forward.

Figure 2.1 Hook to H-Frame Installation



In two places, tighten nut P/N 510-170-00 on bolt P/N 290-332-00 to finger tight, then rotate nut to next castellation to install and secure cotter pin P/N 510-178-00.

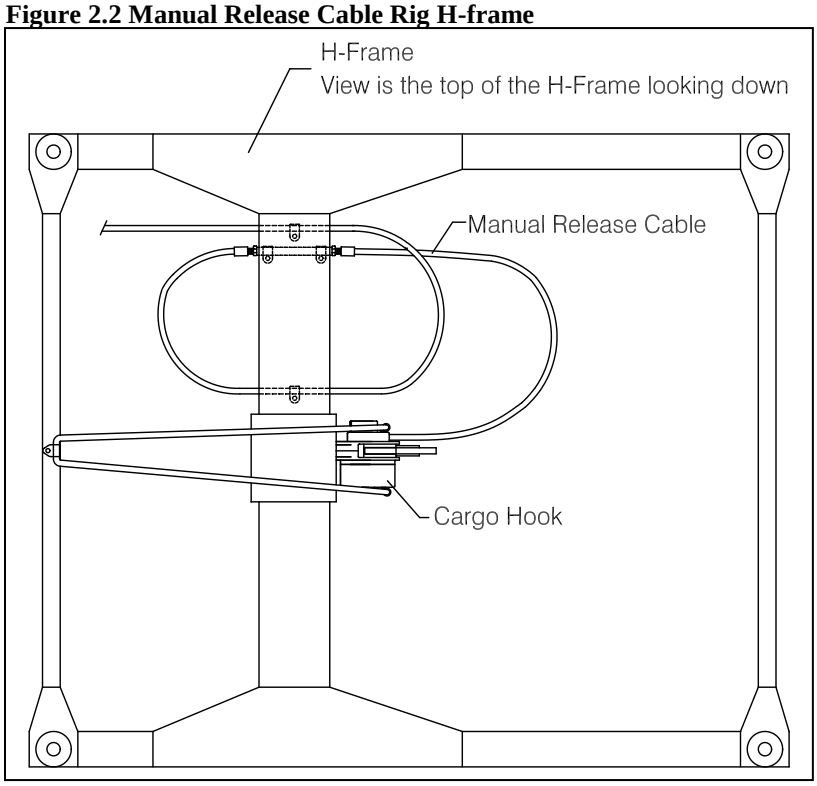
2.2 Cargo Hook Installation, H-Frame continued

2.2.2 Manual Release Cable Installation

Locate the Manual Release Cable and hold downs as illustrated below. As various Load Cell configurations may be utilized, the exact routing and position of the cable and hold downs should be determined upon installation. In determining the location make sure that the Cargo Hook is free to move in all possible directions without straining or kinking the Manual Release Cable, and that the bend radius of the mechanical release cable is as large as possible.

Because the new cargo hook provides additional ground clearance, use of the original bungee cord is optional. If needed, install the Bungee cord as illustrated below in Figure 2.2 and Figure 2.6.

Figure 2.2 Manual Release Cable Rig H-frame

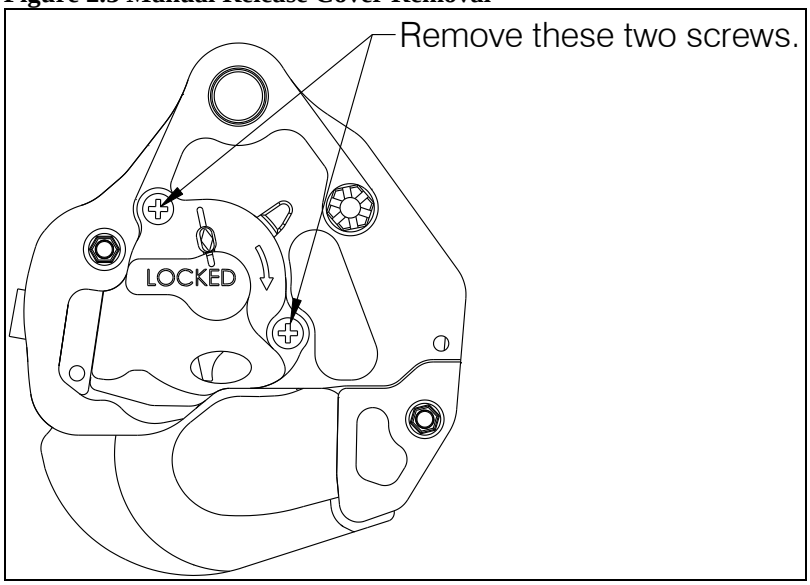


2.2 Cargo Hook Installation, H-Frame continued

2.2.2 Manual Release Cable Installation continued

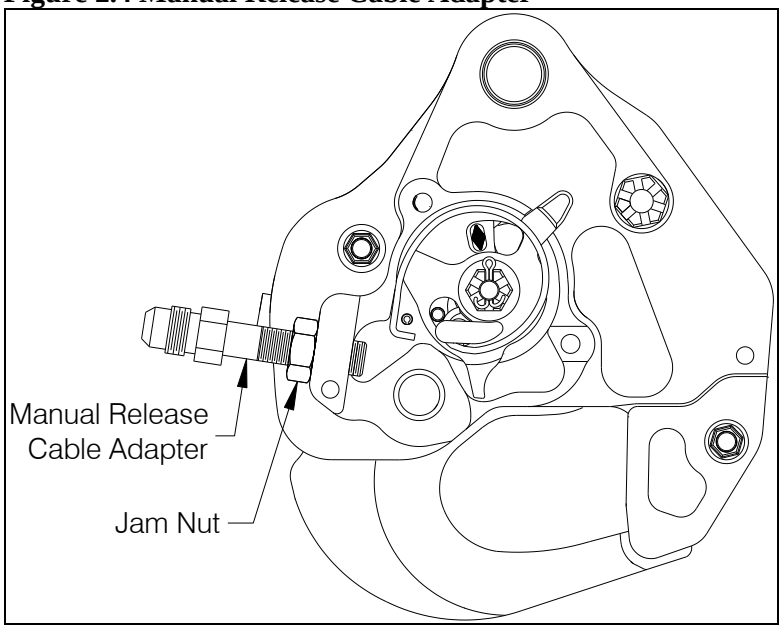
Remove the manual release cover from the cargo hook.

Figure 2.3 Manual Release Cover Removal



Thread the jam nut (P/N 510-252-00) onto the Manual Release Cable Adapter (P/N 290-426-00) and thread the Manual Release Cable Adapter into the cargo hook side plate. Thread it in until approximately .125" (3.2mm) of threads are visible on the inside of the cargo hook.

Figure 2.4 Manual Release Cable Adapter



2.2 Cargo Hook Installation, H-Frame continued

2.2.2 Manual Release Cable Installation continued

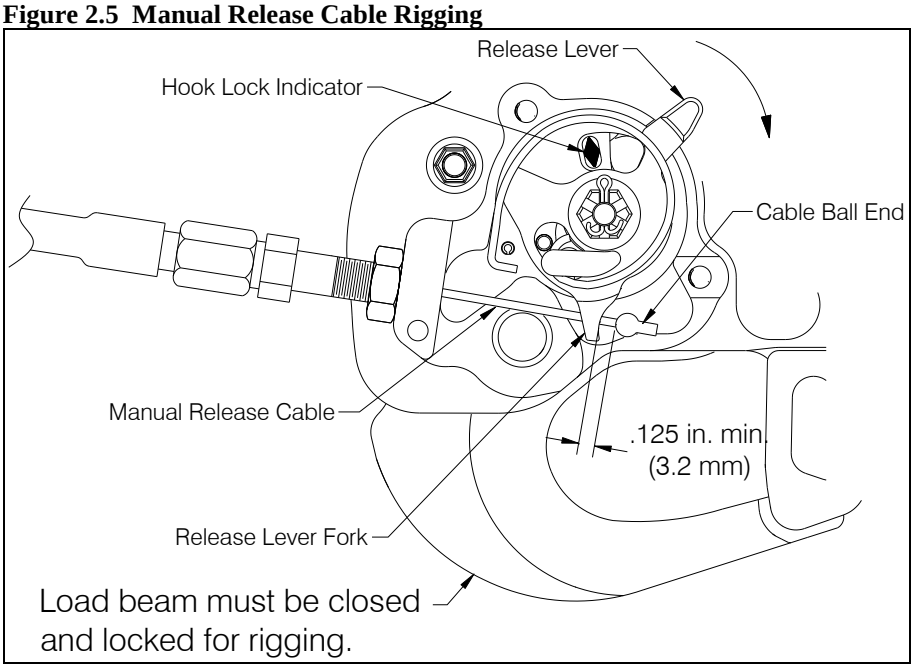
Thread the manual release cable onto the Manual Release Cable Adapter and place the cable ball end fitting into the hook manual release lever fork as illustrated in Figure 2.5.

Rotate the manual release lever in the clockwise direction to remove free play (this is readily felt as the lever moves easily for several degrees before encountering greater resistance) and while holding it in this position measure the cable ball end free play with the manual release handle in the cockpit in the non-release position and the cargo hook in the closed and locked position.

⚠ CAUTION

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

Figure 2.5 Manual Release Cable Rigging



Adjust the manual release cable system for a minimum of .125” of free play at the fork fitting as shown in Figure 2.5. Tighten the jam nut against the hook and secure with safety wire. Replace the manual release cover and secure the screws with safety wire.

2.2 Cargo Hook Installation, H-Frame continued

2.2.3 Electrical Release Cable Installation

It will be necessary to replace the connector on the electrical release cable with the one supplied with the Cargo Hook Kit.

Connect the cargo hook electrical release cable connector to the Cargo Hook and belly mounted bulk-head receptacle and safety wire the connector. Listed below is the pin out for the cargo hook connector.

Table 2-1 Cargo Hook Connector

Pin	*Function*
A	Ground
B	Positive

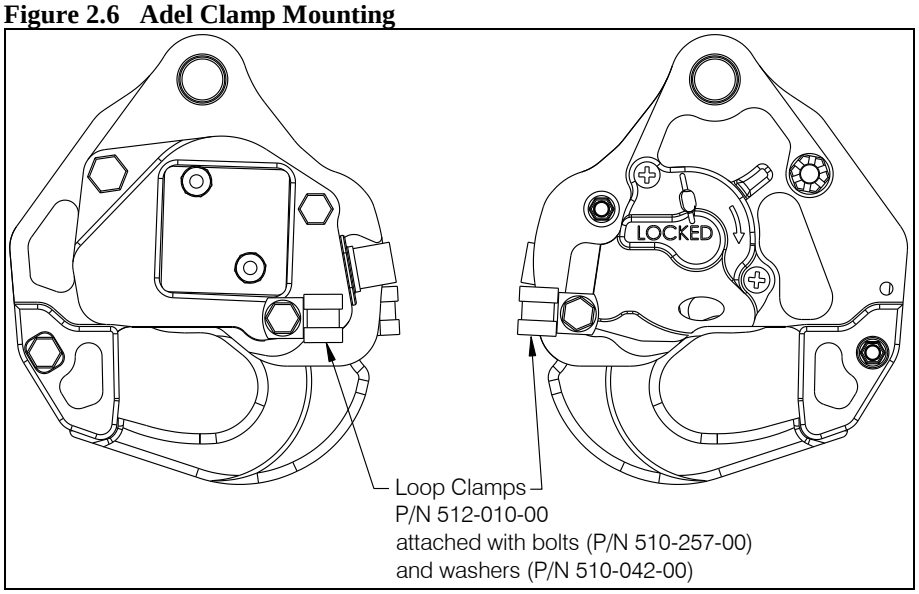
The Cargo Hook is equipped with a suppression diode that will be damaged if the Cargo Hook electrical connections are reversed. Do not attach the electrical connector until the polarity of the aircraft connector is determined to be compatible with the Cargo Hook connector listed in Table 2-1.

2.2 Cargo Hook Installation, H-Frame continued

2.2.4 Adel Clamp Installation

Re-use of the bungee cord, used to secure the cargo hook, is optional. The new cargo hook provides additional ground clearance making its use unnecessary in most conditions. If the bungee cord is to be used secure the 2 supplied adel clamps, P/N 512-010-00, to the cargo hook bolts using P/N 510-257-00 bolts and P/N 510-042-00 washers as illustrated below. Torque the bolts to 20-25 in-lbs. Secure the bolts with safety wire.

Figure 2.6 Adel Clamp Mounting



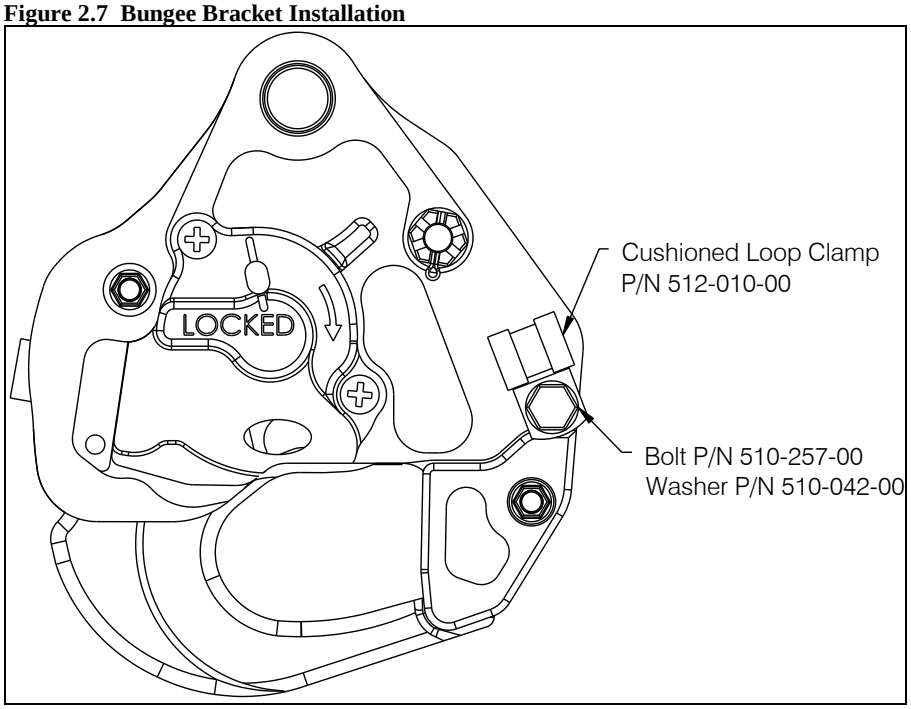
The H-frame installation is complete at this point, proceed to the installation checkout.

2.3 Installation Instructions Swing-Frame

2.3.1 Bungee Bracket Installation

Re-use of the Bungee cord, used to secure the cargo hook is optional. The new cargo hook provides additional ground clearance, making the bungee cords use unnecessary in most conditions. If the bungee cord is to be used, attach the Cushioned Loop Clamp P/N 512-010-00 to the manual release side of the cargo hook with a P/N 510-257-00 bolt and P/N 510-042-00 washer as illustrated. Torque the bolt to 20-25 in-lbs.

Figure 2.7 Bungee Bracket Installation

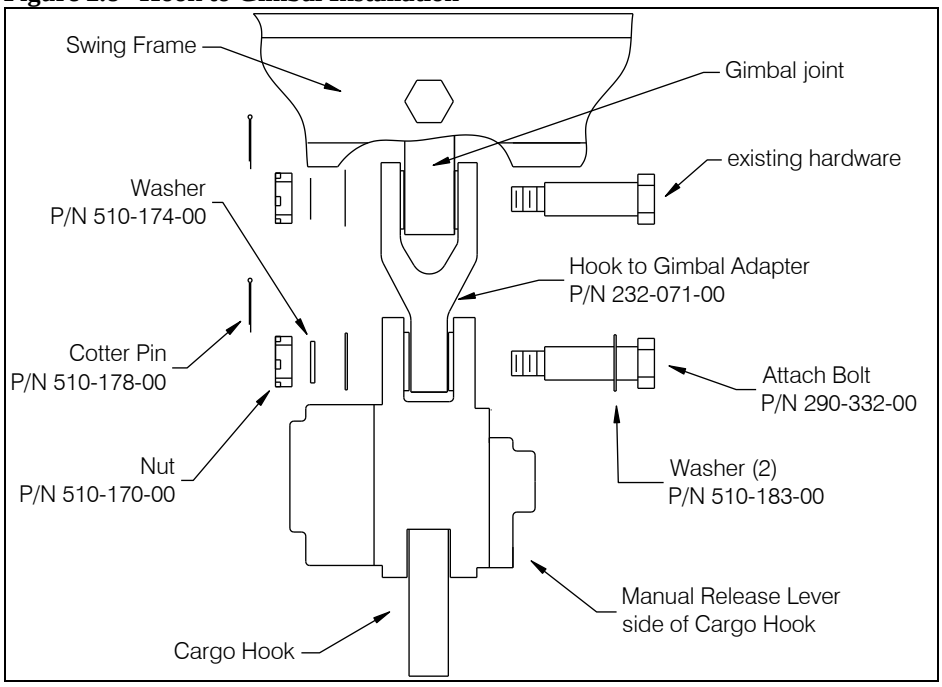


2.3 Cargo Hook Installation, Swing Frame continued

2.3.2 Hook to Gimbal Joint Installation

Attach the Cargo Hook to the Gimbal Adapter. The 232-071-00 Gimbal adapter is installed on the cargo hook with the longer lower arm pointing to the rear of the hook. The hook interface tab on the adapter will prevent installation of the adapter in the opposite orientation. Attach the cargo hook and Gimbal adapter to the Swing Frame Gimbal, using existing hardware and the hardware supplied as illustrated below. The cargo hook load beam should point aft.

Figure 2.8 Hook to Gimbal Installation



Tighten nut P/N 510-170-00 on bolt P/N 290-332-00 to finger tight, then rotate nut to next castellation to install and secure cotter pin P/N 510-178-00.

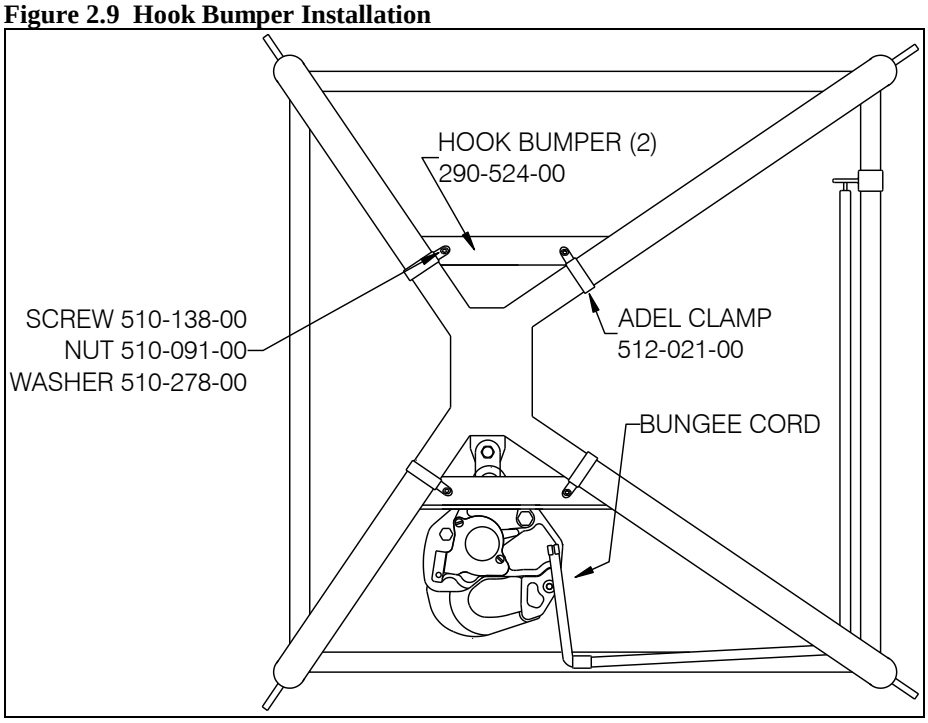
2.3.3 Hook Bumper Installation

Attach the two Hook Bumpers to the Swing Frame, as illustrated in Figure 2.9 using the hardware provided. Do not use the new hook without the Hook Bumpers as they protect the manual release fitting and the electrical release connector from damage when the hook swings about.

2.3 Cargo Hook Installation, Swing Frame continued

2.3.3 Hook Bumper Installation continued

Figure 2.9 Hook Bumper Installation



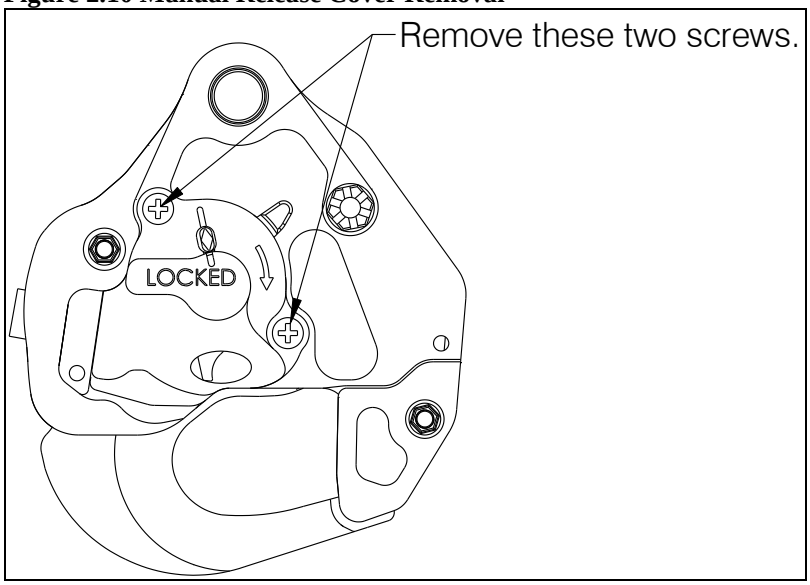
2.3.4 Bungee Installation

Attach the bungee hook to the adel clamp on the cargo hook.

2.3.5 Manual Release Cable Installation

Remove the manual release cover from the cargo hook per Figure 2.10.

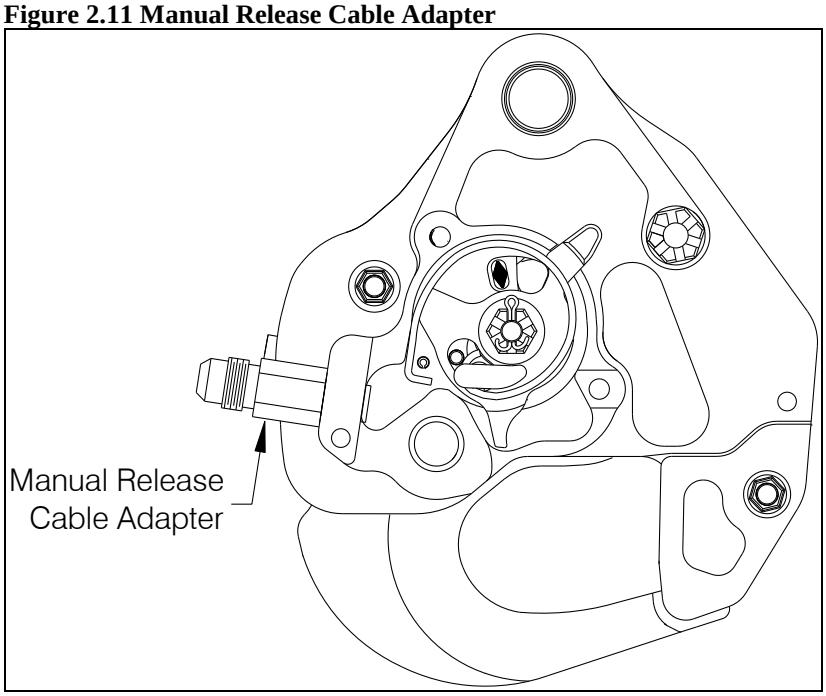
Figure 2.10 Manual Release Cover Removal



2.3.5 Manual Release Cable Installation continued

Thread the Manual Release Cable Adapter (P/N 290-532-00) into the cargo hook side plate per Figure 2.11.

Figure 2.11 Manual Release Cable Adapter



Connect and rig the manual release cable to the cargo hook per the instructions in Section 2.2.2.

2.3.6 Electrical Release Cable Installation

It will be necessary to replace the connector on the electrical release cable with the one supplied with the Cargo Hook Kit. See table 2-1 for the pin out for the cargo hook connector and corresponding wire numbers.

Wire NM10T4 is for a hook open indicator light. The P/N 528-029-00 Cargo Hook does not have a hook open switch. Insulate and secure the end of this wire.

Connect the cargo hook electrical release cable connector to the Cargo Hook and secure with safety wire.

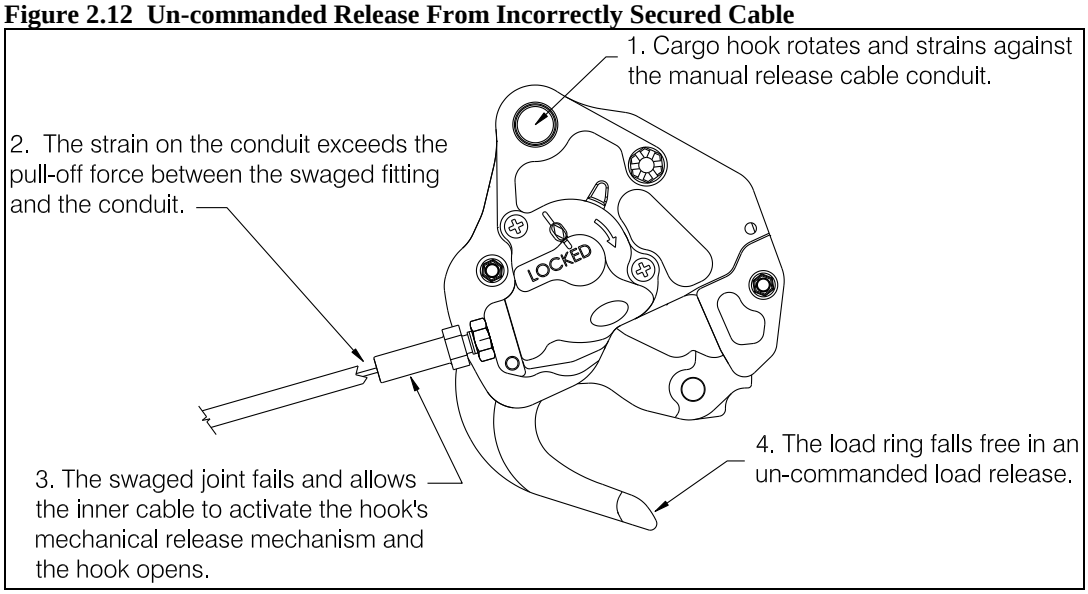
The Cargo Hook is equipped with a suppression diode that will be damaged if the Cargo Hook electrical connections are reversed. Do not attach the electrical connector until the polarity of the aircraft connector is determined to be compatible with the Cargo Hook connector listed in Table 2-1.

2.4 Precautions

WARNING

Un-commanded cargo hook release will happen if the manual release cable is improperly restrained. The cable 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 release cable.

Figure 2.12 Un-commanded Release From Incorrectly Secured Cable



2.5 Installation Check-Out

After installation of the Cargo Hook Kit, 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 handle operated cargo hook mechanical release, the Cargo Hook should release. Reset the cargo hook load beam.

3. Close the cargo hook release circuit breaker and position the battery switch to the ON position. With no load on the cargo hook load beam, depress the cargo hook electrical release button, the Cargo Hook should release. Reset the cargo hook load beam

4. See the service instructions for your specific helicopter model for additional installation instructions.

2.6 Component Weights

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

Table 2-2 Component Weights

Item	Weight lbs (kgs)
Cargo Hook	3.0 (1.36)
Hook to Gimbal Adapter	.68 (.31)
Attach Bolt	.12 (.05)
Misc. Hardware	.20 (.09)
Total	**4.0 (1.81)**

2.7 Cargo Hook Location

See the Eurocopter provided Flight Manual Supplement for External Load weight and balance data.

2.8 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 121-010-01 into the Rotorcraft Flight Manual.

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Section 3
Operation Instructions

Operating Procedures

Prior to a flight involving external load operations perform the following:

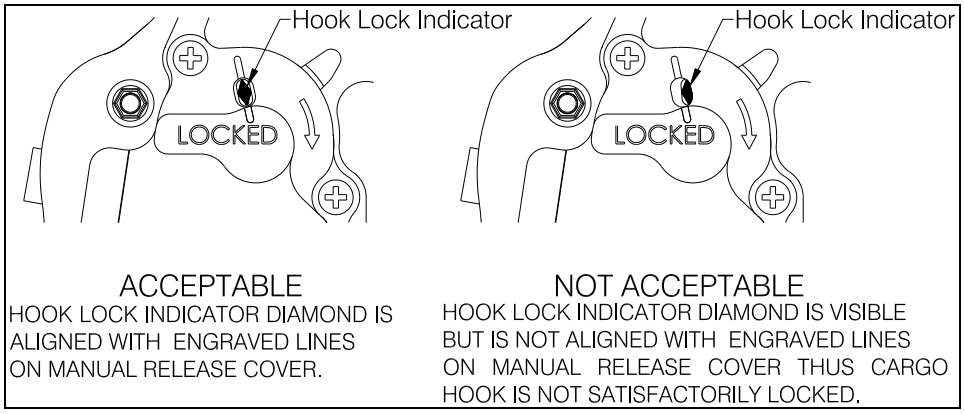
1. Be completely familiar with this Owner's Manual.
2. Be completely familiar with all the aircraft's Cargo Hook operating instructions.
3. Activate the electrical system and press the Cargo Hook release button to ensure the cargo hook electrical release is operating correctly. The mechanism should operate smoothly and the Cargo Hook must release. Reset the hook by hand after the release. If the hook does not release or re-latch, 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 seconds will cause the release solenoid to overheat, possibly causing permanent damage.

4. Activate the manual release lever 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. Ensure the hook lock indicator on the side of the cargo hook aligns with the engraved line on the manual release cover (see Figure 3.1). If the hook does not release or re-latch do not use the unit until the difficulty is resolved.

Figure 3.1 Hook Lock Indicator



See the aircraft's 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. The following illustration shows the recommended rigging, but is not intended to represent all rigging possibilities.

⚠ CAUTION

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

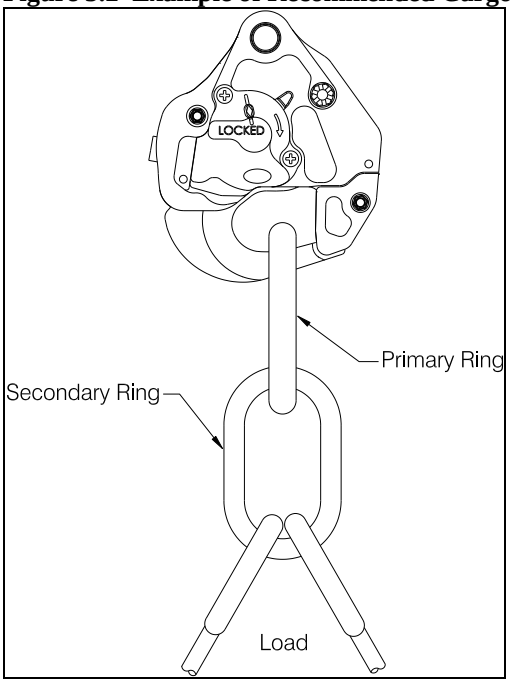
It is the responsibility of the operator to assure the cargo hook will function properly with each rigging.

Nylon Type Straps and Rope

⚠ CAUTION

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.

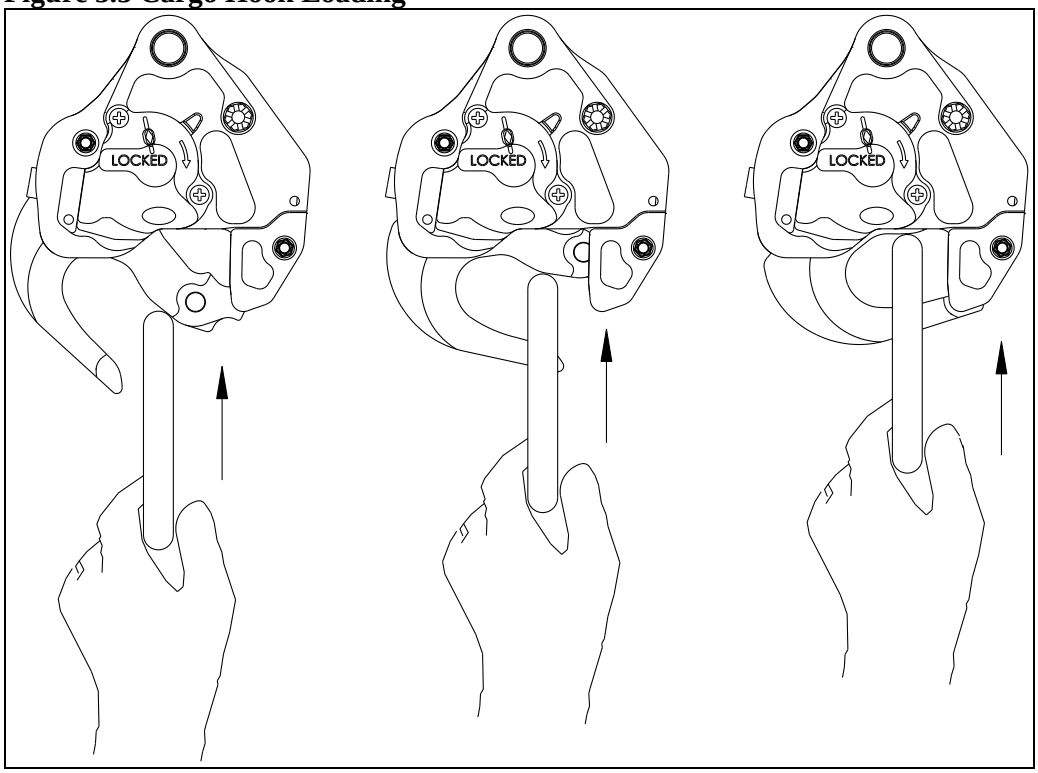
Figure 3.2 Example of Recommended Cargo Hook Rigging



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 3.3, until an internal latch engages the load beam and latches it in the closed position.

Figure 3.3 Cargo Hook Loading



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Section 4
Maintenance

Refer to Component Maintenance Manual 122-017-00 for detailed maintenance information for the Cargo Hook.

Inspection

The inspection of the Cargo Hook Kit shall be in accordance with the table 4-1 shown below.

Table 4-1 Inspection

Part Number	Daily Inspection	At Overhaul Interval*
528-029-00 Cargo Hook	Refer to Component Maintenance Manual 122-017-00.	Refer to Component Maintenance Manual 122-017-00.
232-070-00 232-071-00 Gimbal Adapter	Inspect for security of attachment, fasteners, excessive wear or cracks. Replace if damage or cracks found.	Inspect to the requirements of this manual. Overhaul at the same interval as the Cargo Hook.

* Refer to Component Maintenance Manual 122-017-00 for overhaul interval for the Cargo Hook.

Adapter Overhaul

Carefully inspect the adapter in accordance with Table 4-1 in a clean, well lit room.

Inspect the bushing and bearing surfaces for wear and corrosion. Pitting, corrosion or excessive wear is cause for rejection. Maximum permissible bushing clearance is .010" on diameter.

Perform Magnetic Particle Inspection on adapter P/N 232-070-00 (or 232-071-00) in accordance with ASTM E-1444 and MIL-STD-1907, Grade A. No cracks are permitted.

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: (Techhelp@OnboardSystems.com).
  - Generate an RMA number at our website: http://www.onboardsystems.com/rma.php
- 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

Section 5
Certification Documentation
FAA STC

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number **SR00897SE**

This certificate, issued to **Onboard Systems**
13915 NW 3rd Court
Vancouver, WA 98685

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part **6** *of the* **Civil Air** *Regulations.*

Original Product—Type Certificate Number: H1IN
Make: Aerospatiale
Model: SA.315B Alouette III

Description of the Type Design Change: Fabrication of Onboard Systems Model 200-270-00, 200-270-01, 200-271-00, and 200-271-02 Cargo Hook Kits in accordance with Onboard Systems Master Drawing List No. 155-065-00, Revision 7, dated October 30, 2013, or later FAA-approved revision. Installation and inspection of the 200-270-00 and 200-271-00 cargo hook kits in accordance with FAA-approved Onboard Systems Cargo Hook Kit Owner's Manual, Document 120-100-00, Revision 5, dated October 26, 2009, and Cargo Hook Component Maintenance Manual, Document 122-005-00, Revision 26, dated March 26, 2013, or later FAA-approved revisions.

(See Continutation Sheet Page 3 of 3 Pages)

Limitations and Conditions: Approval of this change in type design applies to only those rotorcraft listed above, which were previously equipped with an FAA-approved installation of a Siren Model A90B hook, or those modified by the installation of a Breeze-Eastern Part Number 14027-4 hook per Supplemental Type Certificate (STC) SH1735SW. This approval should not be extended to other rotorcraft of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that rotorcraft.

(See Continutation Sheet Page 3 of 3 Pages)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: September 22, 2000 *Date reissued:*

Date of issuance: March 26, 2001 *Date amended:* 5/17/01; 1/13/03; 12/10/13

FEDERAL AVIATION ADMINISTRATION

By direction of the Administrator

(Signature)

for Manager, Seattle Aircraft Certification Office
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2(10-68) PAGE 1 OF 3 PAGES

FAA STC continued

United States of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number **SR00897SE**

Onboard Systems

Issued: March 26, 2001

Reissued:

Amended: 5/17/01; 1/13/03; 12/10/13

Description of the Type Design Change continued: Installation and inspection of the 200-270-01 and 200-271-02 cargo hook kits in accordance with FAA-approved Onboard Systems Cargo Hook Kit Owner's Manual, Document 120-100-01, Revision 0, dated October 24, 2013, and Cargo Hook Component Maintenance Manual, Document 122-017-00, Revision 17, dated July 31, 2012, or later FAA-approved revisions.

Limitations and Conditions continued: Rotorcraft modified in accordance with this STC with Onboard Systems Model 200-270-00 or 200-271-00 cargo hook kits must be operated in accordance with FAA-approved Onboard Rotorcraft Flight Manual Supplement (RFMS) No. 121-010-00, Revision 1, dated September 9, 2004, or later FAA-approved revision. Rotorcraft modified in accordance with this STC with Onboard Systems Model 200-270-01 or 200-271-02 cargo hook kits must be operated in accordance with FAA-approved Onboard Rotorcraft Flight Manual Supplement (RFMS) No. 121-010-01, Revision 0, dated November 21, 2013, or later FAA-approved revision. A copy of this certificate, the applicable owner's manual, component maintenance manual, and the applicable FAA-approved RFMS must be maintained as part of the permanent records for the modified rotorcraft.

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

- END -

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

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