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THE LATEST REVISION OF THIS MANUAL**

**TALON MC  
KEEPERLESS  
CARGO HOOK KIT**  
for the  
**204, 205, 212 & 412 Series Helicopters**

**Part Number 200-246-00**

**Owner's Manual**

*Owner's Manual Number 120-083-00  
Revision 10  
March 27, 2015*



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## RECORD OF REVISIONS

<i>Revision</i>	<i>Date</i>	<i>Page(s)</i>	<i>Reason for Revision</i>
2	6-19-00	Section 4	Removed overhaul instructions from Section 4 and moved information to the new Service Manual 122-004-00
3	2-5-02	1-1, 2-3, and 4-1	Added 528-020-02 Cargo Hook configuration.
4	9/17/02	Title, 4-3	Factory address change.
5	8-7-03	1-1, 2-5, 3-1, 4-1, and 4-2	Added 528-020-04, and -06 Cargo Hook configuration. Moved RFMS to document 121-020-00
6	8-15-05	Section 3 Section 4	Added Cargo Hook Loading section. Removed maintenance information from section 4 and replaced with reference to service manual 122-004-00 (all the information was duplicated).
7	09/19/07	TOC, Section 1, 2-4, & Section 3	Added explanation of warnings, cautions and notes to general information section. Updated warnings, cautions and notes throughout.
8	05/15/12	1-3, 2-3, Section 3, 4-1	Added cargo hook P/N 528-020-10. Updated format of Section 3. Updated instructions for returning a system to the factory. Removed Functional Check Before Installation section.
9	02/15/13	1-1, 2-3, 2-4, 3-1	Removed reference to suspension system P/Ns for clarity. Added Figure 2-2. Updated Figure 3-1.
10	03/27/15	1-1, 2-6	Updated list of eligible cargo hook to replace to match STC, added caution stating cargo hook must be closed when adjusting manual release system.

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You can choose to receive notices on an immediate, weekly, or monthly schedule via fax, email or both methods. There is no charge for this service. Please visit our website at [www.onboardsystems.com/notify.php](http://www.onboardsystems.com/notify.php) to get started.

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# *Section 1*

## **General Information**

### **Introduction**

The 200-246-00 Cargo Hook Kit is approved as a replacement for the following cargo hooks on Cargo Hook Suspension Systems on Bell 204B, 205A, 205A-1, 212, 412, and 412EP models.

<b>Bell Cargo Hook Part Number</b>	<b>Equivalent Breeze-Eastern Cargo Hook Part Number</b>
204-072-924-1	SP7109-1, -11
204-072-924-7	SP7109-62
	SP7109-12
	SP7109-93

## Safety Labels

The following definitions apply to safety labels 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.



## Bill of Materials

The following items are included with the 200-246-00 Cargo Hook Kit, if shortages are found contact the company from whom the system was purchased.

Part Number	Description	Quantity
528-020-10*	Cargo Hook	1
220-040-00	Bumper Ring	1
510-314-00	Cap Screw	2
290-210-01	Spacer	4
510-104-00	Nut	2
120-083-00	Owner's Manual	1
121-020-00	RFM Supplement	1
122-004-00	Service Manual	1

\* Optional cargo hook part number is 528-020-06. These part numbers are interchangeable. Cargo hook part number 528-020-10 incorporates a ground crew release lever.

## 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.

## Specifications

**Table 1-1 Specifications**

Design load	6,000 lb. (2,721 kg.)
Design ultimate strength	27,000 lb. (12,247 kg.)
Electrical release capacity	15,000 lb. (6,804 kg.)
Mechanical release capacity	15,000 lb. (6,804 kg.)
Force required for mechanical release at 6,000 lb.	18 lb. Max. (.400" travel)
Electrical requirements	22-28 VDC 9 amps
Minimum release load	0 pounds
Unit weight	11.75 pounds (5.33 kg.)
Mating electrical connector	MS3106F16S-5S



*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 and an external manual release cable provide the means for unlatching the load beam.

The load beam is normally held in the open position by a spring loaded detent. The load is attached to the load beam by passing the load 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 load ring 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 pedal. A manual release cable attached to the pedal operates the internal mechanism of the Cargo Hook to unlatch the load beam. The load can also be released by the manual actuation of the cable mechanism located above the Cargo Hook on the suspension. On -00, -02, and -10 cargo hook configurations the load can also be released during ground operations by the actuation of a lever located on the side of the Cargo Hook.

## ***Section 2***

# **Installation Instructions**

### **Suspension System Removal**

The Suspension System interfaces with several helicopter components, such as the cargo hook manual and electrical release provisions. Before removing the Cargo Hook Suspension System have available and be familiar with the Bell Service Instructions 204-3, 212-5 or later bulletins.

See the Suspension System Detail Illustration located on the following page of this manual.

Remove the cargo hook manual release cable at the 204-070-995 Connector. Loosen the 204-070-996-1 Clamp to allow the cable to slide through it. The Connector and the Clamp are located at approximately WL 39.87 and between BL 9.80 and BL 0.00, near the upper end of the suspension system.

Disconnect the suspension system electrical connector located between the suspension system and airframe.

Remove the Bell load bolt located at BL 0.00, WL 38.87 and Station 137.55, this will allow the suspension system to be removed through the bottom of the aircraft.

### **Cargo Hook Removal**

To remove the Cargo Hook from the suspension system disconnect the lower manual release cable from the swing arm by removing the cotter pin located in the out-board end of the swing arm.

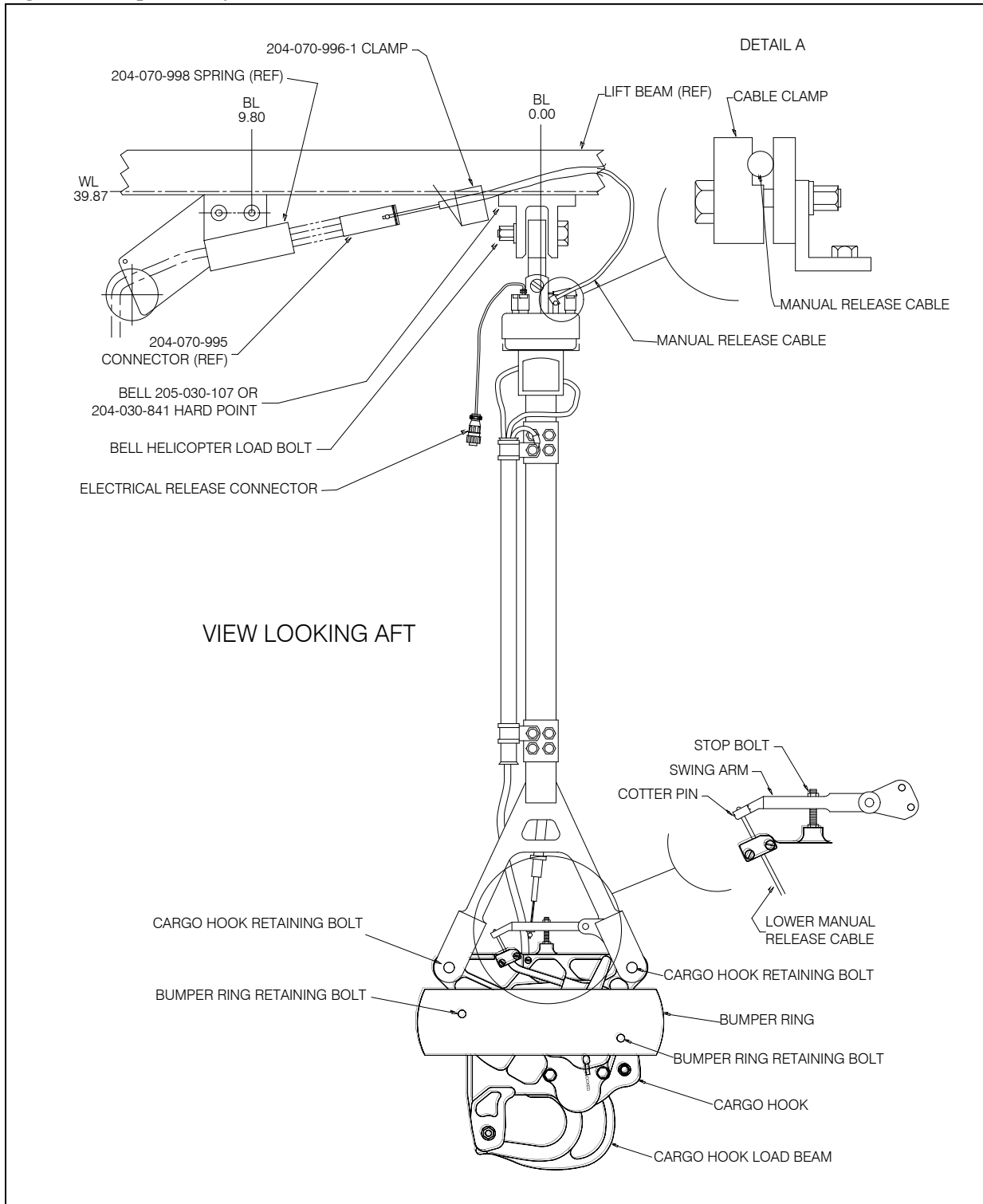
Remove the cargo hook electrical connector located on the Cargo Hook between the two cargo hook retaining bolts.

Remove the two cargo hook retaining bolts and separate the Cargo Hook from the suspension system.

Remove the two bumper ring retaining bolts and separate the bumper ring from the Cargo Hook.

# Suspension System Detail Illustration

Figure 2-1 Suspension System Detail Illustration



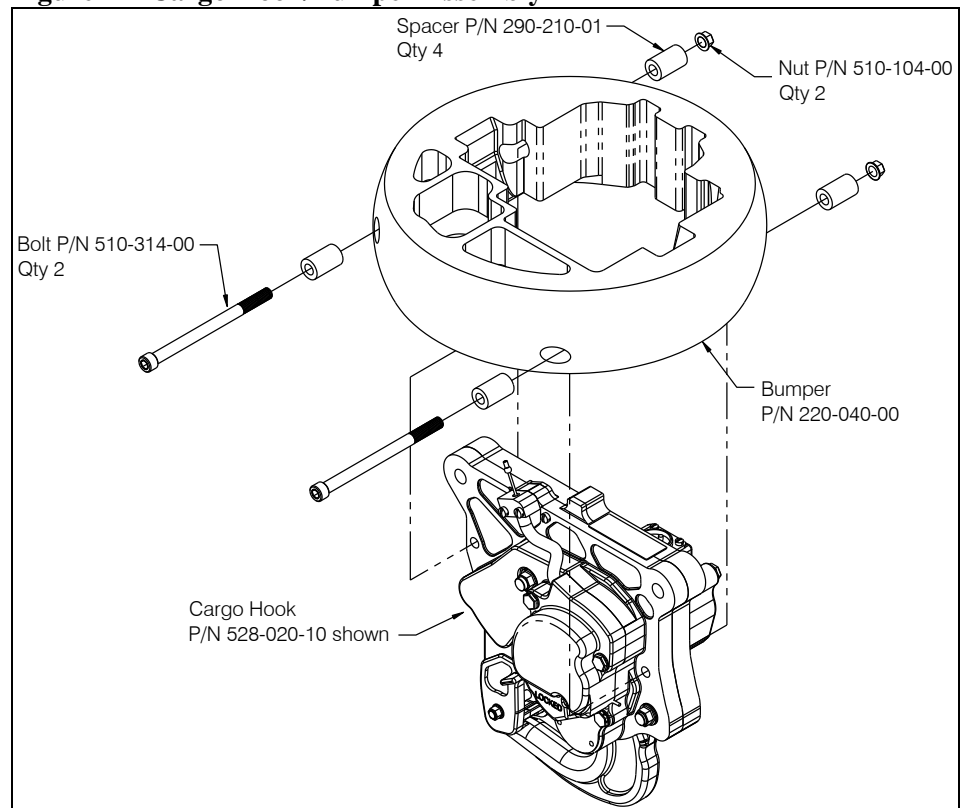
## Cargo Hook Installation

Ensure the Cargo Hook removed is on the list in section 1 of this manual. Inspect the suspension system to insure that all components are in serviceable condition before installing the new Cargo Hook to the suspension system and returning the system to service.

The kit is normally shipped with the Bumper Ring installed onto the cargo hook. If installing a kit that is not assembled, refer to the instructions in the following paragraph for assembly.

Install the P/N 220-040-00 Bumper Ring to the Cargo Hook using the two P/N 510-314-00 Cap Screws, four P/N 290-210-01 Spacers and P/N 510-104-00 Nuts. Insert a Cap Screw with a Spacer into one of the Bumper Ring mount holes. See Figure 2-1 for mount hole locations. Place the second Spacer into the other side of the Bumper and secure with the Nut. Repeat this for the second Cap Screw installation. Torque Cap Screw and Nuts to 120-160 in-lbs.

**Figure 2-2 Cargo Hook/Bumper Assembly**



Install the new Cargo Hook and Bumper Ring assembly to the suspension system, in the same manner as the old hook was installed, using the hardware that was removed. See the appropriate Bell service instructions for the correct installation torque values. Inspect the hardware to insure that it is serviceable. Orient the hook to the suspension system such that the cargo hook load beam points in the same direction as the swing arm. See Figure 2-1.

## Suspension System Installation

Connect the lower manual release cable between the swing arm and the cargo hook manual release provisions, in the same manner as it was installed on the old hook. Inspect the cable to insure that it is serviceable. Install the cotter pins.

Connect the cargo hook electrical connector located on the Cargo Hook between the two cargo hook retaining bolts. Safety wire the connector.

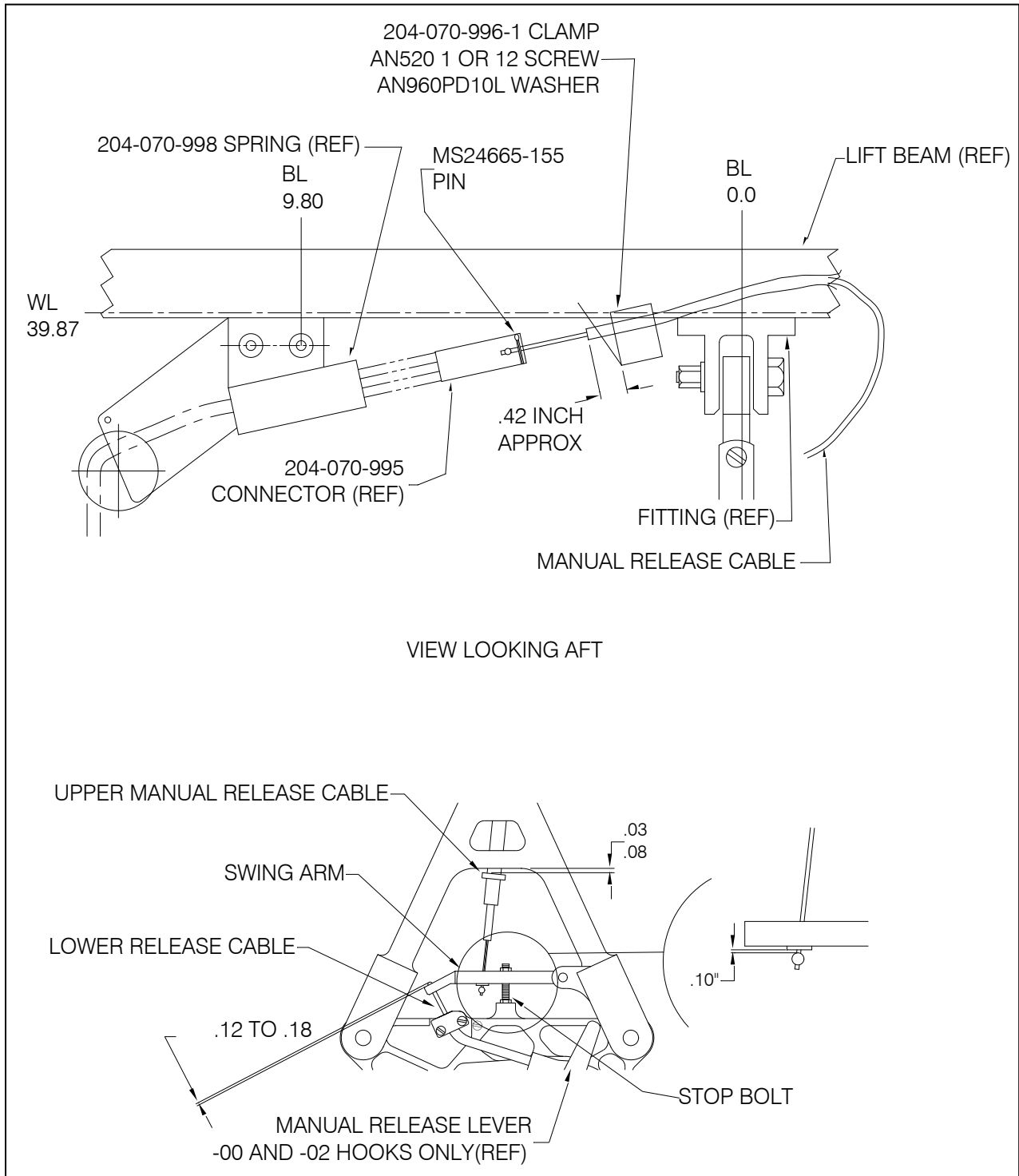
Position the Suspension System with the manual release control cable on the left and the clevis aligned in the Bell hard point, 205-030-107 or 204-030-841, at waterline 38.87.

Install the bolt, washer and nut removed previously. See the appropriate Bell service instructions for the correct installation, torque values and maintenance.

Route the free end of the manual release cable aft and to the right (looking aft) of the hard point fitting. See the *Suspension System Manual Release Arrangement* section of this manual. Engage ball terminal into the cable connector 204-070-995 and secure with the cotter pin MS24665-155. Place the outer housing (conduit) of control cable assembly into clamp 204-070-996-1 and secure with screw AN520-1 or 12 and washer AN960PD10L into nut plate in existing structure. The conduit end should measure approximately 0.42 inches from clamp 204-070-996-1.

# Suspension System Manual Release Arrangement

Figure 2-3 Suspension System Manual Release Arrangement



## Suspension System Manual Release Cable Adjustment



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

Adjust the conduit of the manual release cable to obtain 0.03 to 0.08 inch dimension shown in the previous section and secure clamp shown in detail A of the *Suspension System Detail* section. Adjust connector 204-070-995, shown in the previous section to obtain 0.10 inch over-travel in the control cable as shown in the previous section.

The stop bolt of the swing arm should be in contact with the top of the cargo hook case and the swing arm should be parallel to the plane of the main hook attachment bolts when the 0.10 inch measurement is taken.

By grasping the top of the lower control cable, apply tension until all the backlash is taken out. Measure the clearance of the lower control cable ball terminal to the swing arm as shown in Figure 2-2. This measurement shall be 0.12 to 0.18 inches when system is rigged and load beam is latched. If adjustment is made to the stop bolt in order to obtain proper clearance, recheck adjustment of control cable and conduit.

With the cargo hook release pedal against the FORWARD stop, check for the following conditions:

- Ensure that the spring assembly 204-070-998, does not bottom. If the spring assembly should bottom, return the cargo hook pedal to the aft stop and check control cable tension. Cable tension should be 20 to 24 pounds.
- Check the operation of the mechanical release with at least 20 pounds load on the cargo hook load beam.
- Ensure the swing arm is full up. Ensure lever is not stopped by the bottom end of the control cable outer housing.
- Ensure cargo hook load beam unlocks.
- Release the cargo hook pedal and ensure that both the upper and lower manual release cables return to the locking position.
- See the Bell Helicopter service instructions that cover the original cargo hook suspension system for additional instructions.



## Suspension System Electrical Release Installation

Connect the electrical release cable to the connector located on the right underside of the lift beam and safety wire.

**Table 2-1 Cargo Hook Connector**

PIN	FUNCTION
B	Power
C	Ground

## Suspension System Installation Check-Out

After installation of the Suspension System, perform the following functional checks. Follow the Bell Helicopter instructions for the specific helicopter. Direct an assistant to observe the Cargo Hook and reset the cargo hook load beam to the closed position as required.

1. 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.
2. Close the cargo hook release circuit breaker and position the battery switch to the ON position. Depress the cargo hook switch. The Cargo Hook should release.
3. Rotate the suspension system 90 degrees, close the cargo hook and repeat step 3. Rotate the suspension system another 90 degrees, close the cargo hook and repeat step 3. Repeat this procedure until the suspension system is back at its original position. To prevent burning out the solenoid do not hold the switch for more than 5 seconds in any 30 second period.
4. With the cargo hook closed, depress the foot operated cargo hook mechanical release in the cockpit, the Cargo Hook should release.
5. See the Bell Helicopter service instructions that cover the original cargo hook suspension system for additional instructions.

## **Component Weights**

The weight of the 200-246-00 Cargo Hook kit is 17.5 pounds. This is approximately the same weight as the Cargo Hook and Bumper it replaced.

## **Paper Work**

Place the Rotorcraft Flight Manual Supplement, 121-020-00, into the Rotorcraft Flight Manual. 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.

# Section 3

## Operation Instructions

### Cargo Hook Operating Procedures

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

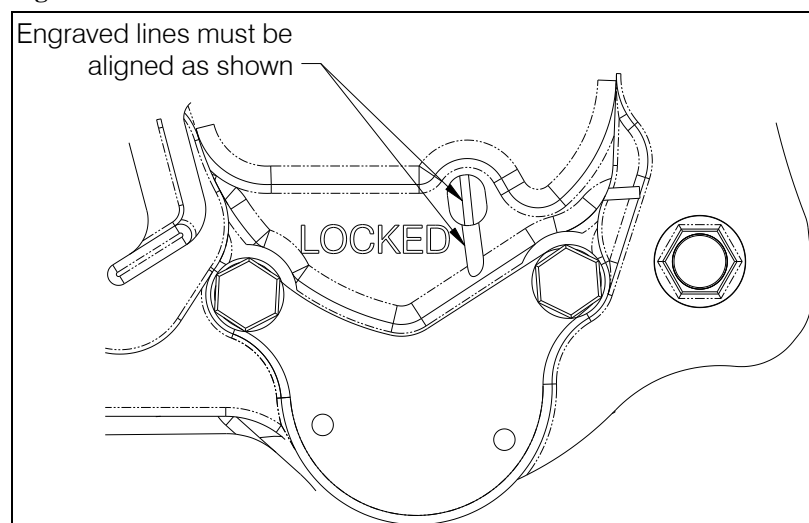
1. Before operating the Suspension System be completely familiar with the Rotorcraft Flight Manual Supplement for External Cargo Operation for your helicopter.
2. Cargo is released electrically by use of the cyclic CARGO RELEASE button. Refer to the applicable RFM Supplement for each helicopter for switch settings and sequence. Activate the electrical system and press the release button to ensure the cargo hook electrical release is operating correctly. The cargo hook must release.

## CAUTION

*The solenoid in the hook is not rated for continuous duty. Continuous power to the solenoid for longer than 30 seconds will damage the solenoid.*

3. Depress the manual release foot pedal in the cockpit to test the cargo hook manual release mechanism. Manually close the hook. After each release the cargo hook must be manually closed. When the hook is closed, verify that the hook locked indicators are aligned. Do not use the hook unless the indicators are aligned. If marks are not aligned the hook may not be fully locked.

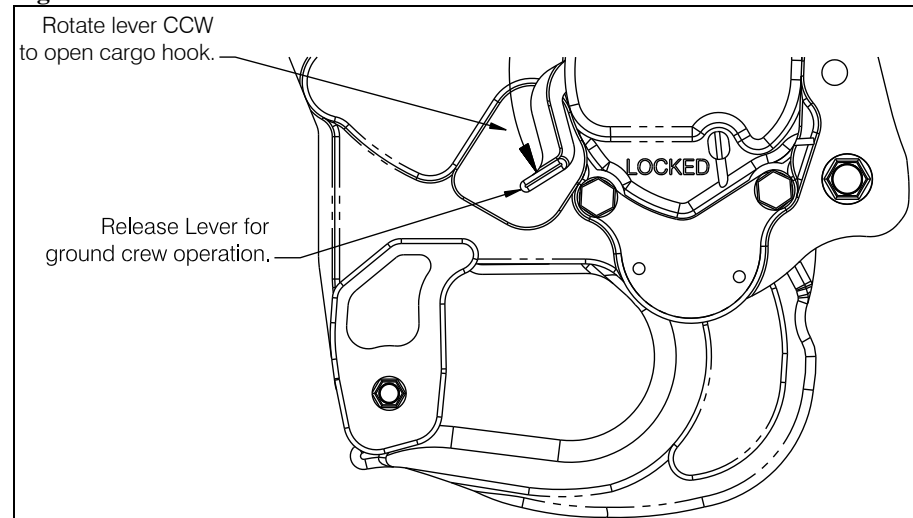
**Figure 3-1 Hook Locked Indication**



## Suspension System Operating Procedures continued

4. Cargo hook P/N 528-020-10 has a lever for opening the cargo hook from the ground. With no load on the hook, rotate the lever counterclockwise (CCW) until the load beam opens. The hook may be flown in the open position to facilitate loading.

**Figure 3-2 Ground Release Lever**

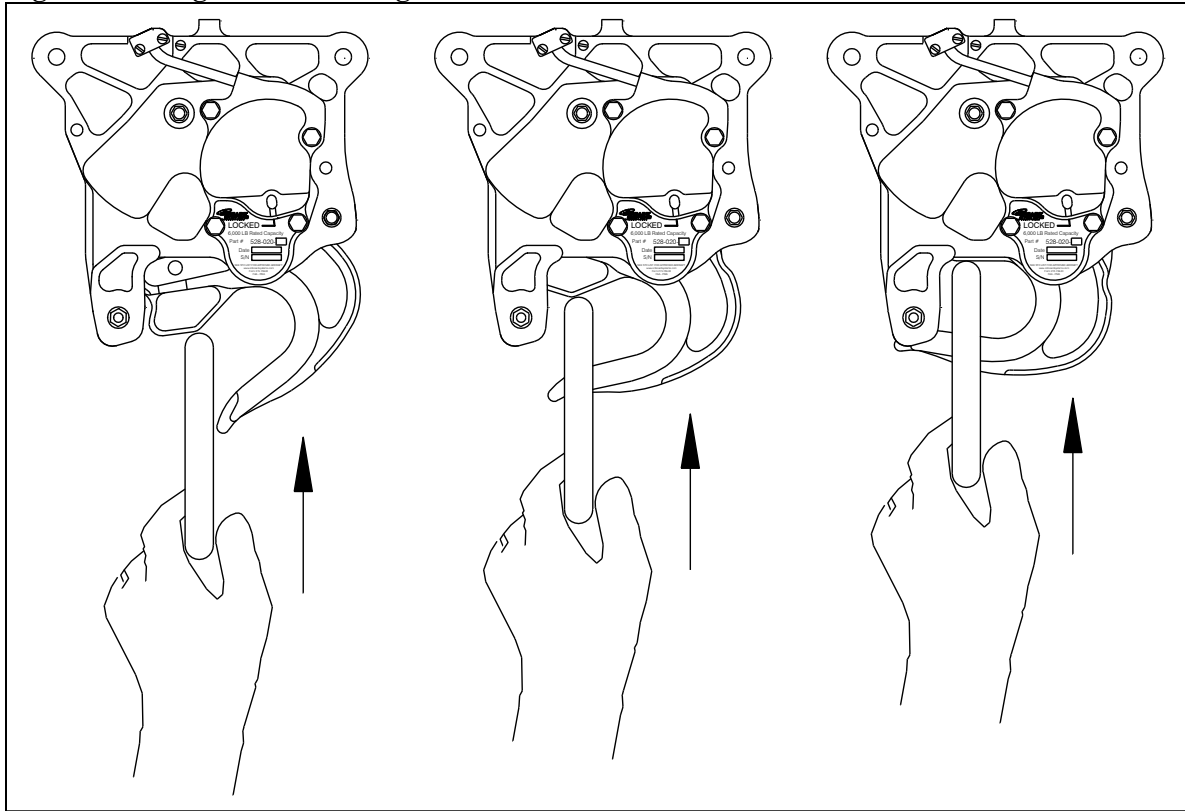


## Cargo Hook Loading

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.

## Cargo Hook Loading continued

Figure 3-3 Cargo Hook Loading



## Cargo Hook Rigging

Extreme care must be exercised in rigging a load to the Cargo Hook. Steel load rings are recommended to provide consistent release performance and resistance to fouling. Refer to Figure 3-4 for the recommended rigging.



*The example shown is not intended to represent all rigging possibilities. It is the responsibility of the operator to assure the hook will function properly with the rigging.*

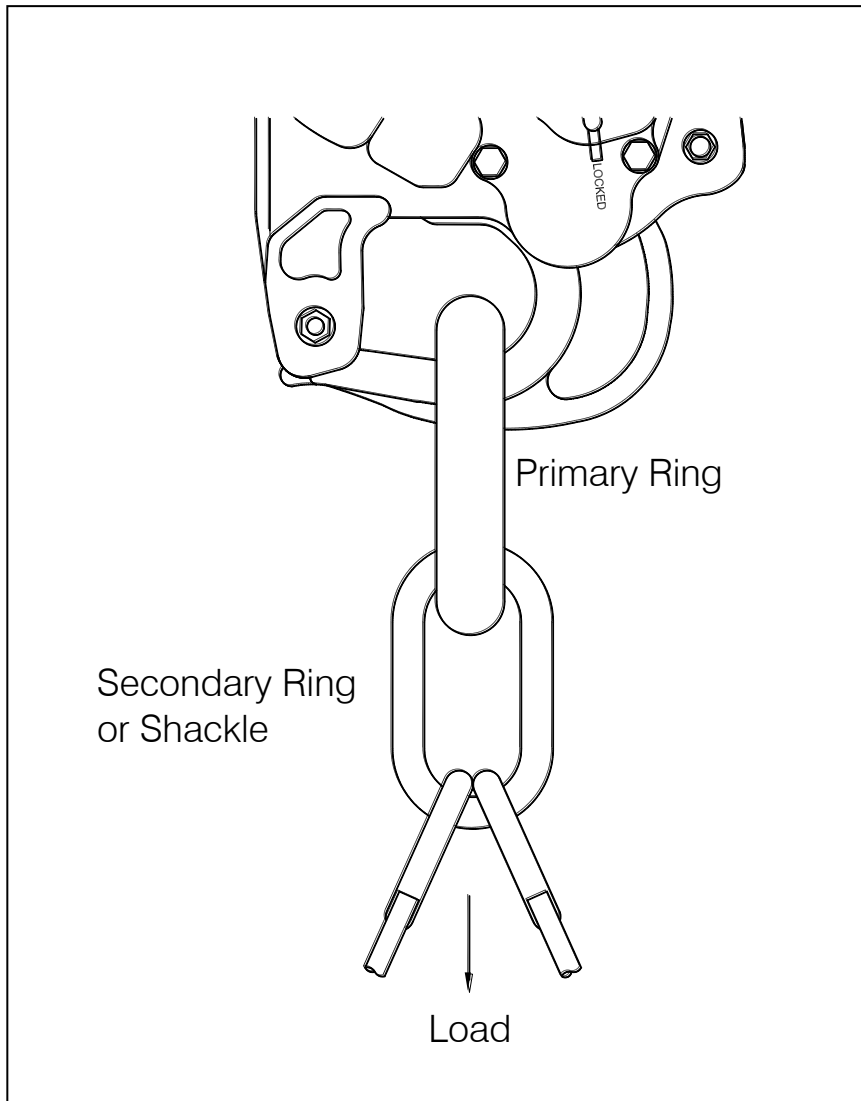
## Cargo Hook Rigging continued

### Nylon Type Straps or 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. See following illustration.*

**Figure 3-4 Example of Recommended Cargo Hook Rigging**



# Section 4

## Maintenance

Refer to the Cargo Hook Component Maintenance Manual (CMM) 122-004-00 for maintenance of the cargo hook.

### 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](mailto: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

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# Section 5 Certification

## FAA STC

<small>United States of America</small>	
<b>Department of Transportation - Federal Aviation Administration</b>	
<b>Supplemental Type Certificate</b>	
<b>Number SR00699SE</b>	
<i>This certificate, issued to</i>	<b>Onboard Systems 13915 NW 3rd Court Vancouver, WA 98685</b>
<i>certifies that the change in the type design for the following product with the limitations and conditions therefore as specified herein meets the airworthiness requirements of Part * of the * Regulations.</i>	
<i>Original Product—Type Certificate Number:</i>	* See attached Federal Aviation Administration (FAA)
<i>Make:</i>	Approved Model List (AML) SR00699SE for approved
<i>Model:</i>	aircraft models and applicable airworthiness regulations
<i>Description of the Type Design Change:</i> Fabrication of Onboard Systems Model 200-246-00 cargo hook kit in accordance with Onboard Systems Master Drawing List No. 155-047-00, Revision 21, dated March 26, 2013, or later FAA-approved revision; and installation of these hooks in accordance with Onboard Systems Owner's Manual No. 120-083-00, Revision 9, dated February 15, 2013, or later FAA-approved revision. Inspection of these hooks in accordance with Section 4 of Onboard Systems Service Manual No. 122-004-00, Revision 21, dated January 8, 2013, or later FAA-approved revision.	
<i>Limitations and Conditions:</i> Approval of this change in type design applies only to the Bell rotorcraft models listed on AML No. SR00699SE, revised May 30, 2013, or later FAA-approved revision, which were previously equipped with an FAA approved installation of the following cargo hooks: Bell P/N 204-072-924-1 or -7, or Breeze Eastern P/N SP7109-1, -11, -12, -62, or -93. This approval should not be extended to other rotorcraft of these models 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. Rotorcraft modified by this STC must be <u>operated</u> in accordance with a copy of FAA approved Rotorcraft Flight Manual Supplement (RFMS) No. 121-020-00, Revision 1, dated May 14, 2013, or later FAA approved revision.	
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.	
<i>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.</i>	
<i>Date of application:</i> April 13, 1999	<i>Date reissued:</i>
<i>Date of issuance:</i> May 17, 1999	<i>Date amended:</i> 11/10/99; 12/13/99; 1/19/01; 1/13/03; 3/15/05, 5/30/13
	<i>By direction of the Administrator</i>  <small>(Signature)</small>
	<i>for Acting Manager, Seattle Aircraft Certification Office</i> <small>(Title)</small>
<hr/> <small>Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.</small>	
<small>This certificate may be transferred in accordance with FAR 21.47.</small>	
<small>FAA Form 8110-2(10-98)</small>	<small>PAGE 1 OF 2 PAGES</small>

# Approved Model List

FEDERAL AVIATION ADMINISTRATION (FAA) APPROVED MODEL LIST (AML) SR00699SE

FOR

FABRICATION AND INSTALLATION OF ONBOARD SYSTEMS MODEL 200-246-00 CARGO HOOK KIT

ISSUE DATE: May 17, 1999

ITEM	ROTORCRAFT MAKE	ROTORCRAFT MODEL	ORIGINAL TC NUMBER	CERTIFICATION BASIS FOR ALTERATION	FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT		FAA APPROVED SEALED DRAWING LIST		AML REV DATE
					Number	Dated*	Drawing	Revision*	
1.	BELL	204B, 205A, 205A-1	H1SW	CAR 7, dated 8/1/58 and Amendments 7-1 through 7-4, Category B	121-020-00, Revision 1	May 14, 2013	155-047-00	Revision 21, dated March 26, 2013	May 30, 2013
2.	BELL	212, 412, 412EP, 412CF	H4SW	FAR Part 29, dated 2/1/65 and Amendments 29-1 and 29-2. See TCDS H4SW for additional information	121-020-00, Revision 1	May 14, 2013	155-047-00	Revision 21, dated March 26, 2013	May 30, 2013

\* Or later FAA Approved Revision

FAA Approved:

Acting Manager, Seattle Aircraft Certification Office

AMENDED: November 10, 1999; May 30, 2013

REISSUED:



## Supplemental Type Certificate

**This approval is issued to:**

Onboard Systems  
11212 NW St. Helens Road  
Portland, OREGON  
97231 UNITED STATES OF AMERICA

**Number:** SH99-217

**Issue No.:** 1

**Approval Date:** September 20, 1999

**Issue Date:** September 20, 1999

**Responsible Office:**

Pacific

**Aircraft/Engine Type or Model:**

Bell 204B, 205A, 205A-1, 212, 412, and 412EP

**Canadian Type Certificate or Equivalent:**

FAA Type Certificate H1SW (Bell 204B, 205A, 205A -1)  
Canadian Type Certificate H-86 (Bell 212, 412, 412EP)

**Description of Type Design Change:**

Installation of Onboard Systems Model 528-020-00 Cargo  
Hook per FAA STC SR00699SE

**Installation/Operating Data,  
Required Equipment and Limitations:**

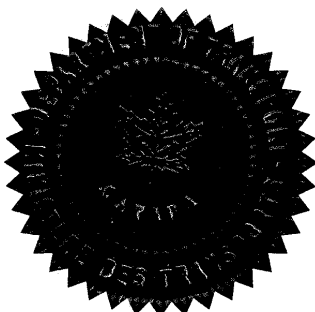
Installation of Onboard Systems Model 528-020-00 cargo hook is to be carried out in accordance with FAA approved Onboard Systems Owner's Manual No. 120-083-00, dated March 10, 1999 \*. This cargo hook is to be fabricated in accordance with FAA approved Onboard Systems Master Drawing List No. 155-047-00, dated April 6, 1999 \*. Inspect this cargo hook in accordance with Section 4 of Onboard Systems Owner's Manual No. 120-083-00, dated March 10, 1999 \*.

Approval of this change in type design applies to Bell 204B, 205A, 205A-1, 212, 412, and 412EP rotorcraft which were previously equipped with an FAA approved installation of the following cargo hook : Bell P/N 204-072-924-1 or -7, or Breeze Eastern P/N SP7109-1, -11 or -62. Modified rotorcraft must be operated in accordance with an FAA approved copy of Onboard Rotorcraft Flight Manual Supplement No. 120-083-00, dated May 17, 1999 \*.


Basis of Certification as defined in the applicable Type Certificate Data Sheets.

(\* or later FAA approved revisions)

-- End --



**Conditions:** This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

  
H. W. Wong  
Regional Engineer, Aircraft Certification  
For Minister of Transport

Canada



Transport  
Canada  
Aviation

Transports  
Canada  
Aviation

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

Your file    Votre référence

Our file    Notre référence  
5009-02

May 1, 2001

Onboard Systems  
11212 NW St. Helens Road  
Portland, OR 97231

Attention: Mr. Ron Pritle

Subject: **Amendment of Canadian STC SH99-217, Issue 1 dated September 20, 1999**

Dear Sir/Madam :

This is in response to your letters to FAA Seattle ACO dated February 23, 2001 requesting a revision of the subject STC.

Having reviewed the subject STC and FAA STC SR00699SE, Date Amended : January 19, 2001, we would like to inform you that the later FAA approved revision of supporting documentation referenced in the subject STC are accepted and a revision of the subject STC is not required.

If you have any questions please do not hesitate to contact the undersigned at (604) 666-5597.

Yours truly,

Henry Wong  
Regional Engineer, Aircraft Certification

c.c. Dorenda D. Baker  
Acting Manager, Seattle ACO  
1601 Lind Avenue S. W.3960 Paramount Boulevard  
Renton, Washington 98055-4056

(your reference : 190S-01-152)

Canada

1/1