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# TALON MC KEEPERLESS CARGO HOOK KIT

## Kit Part Number 200-246-00

## STC SR00699SE

## **Owner's Manual**

Owner's Manual Number 120-083-00 Revision 12 07/26/17



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## RECORD OF REVISIONS

Revision	Date	Page(s)	Reason for Revision
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	Added Cargo Hook Loading section.
		Section 4	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.
11	04/24/17	2-4, 2-7, 3-3, 3- 4	Added instructions for attaching ground strap, minor updates to installation check-out, and updated cargo hook rigging section.
12	07/26/17	3-2	Add instructions for loading the cargo hook with the aircraft in flight.

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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.

Bell Cargo Hook	Equivalent Breeze-Eastern
Part Number	Cargo Hook Part Number
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, <u>will</u> result in death or serious injury.

Indicates a hazardous situation which, if not avoided, <u>could</u> 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 No. 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	Component Maintenance 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 Cargo Hook 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 528-020-00, -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**

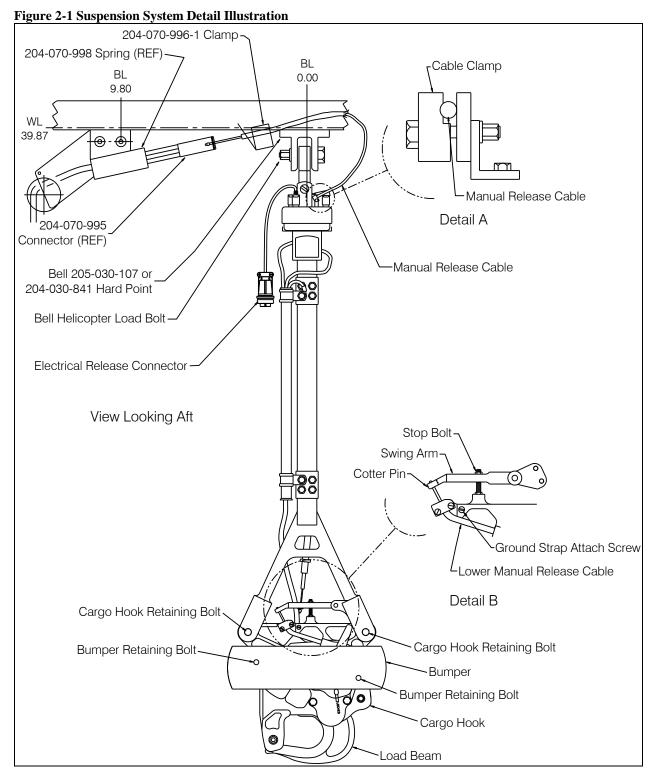
To remove the existing Cargo Hook from the suspension system disconnect the lower manual release cable from the swing arm by removing the cotter pin located in the out-board end of the swing arm.

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**



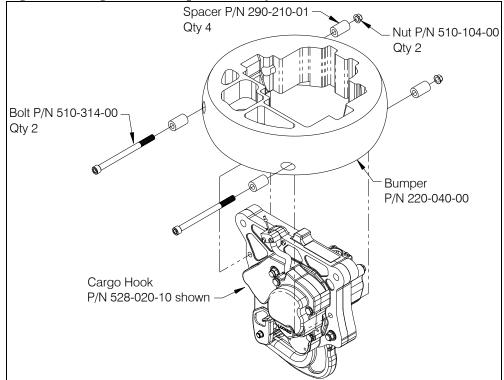
#### **Cargo Hook Installation**

Ensure the Cargo Hook removed is on the list in section 1 of this manual. Inspect the suspension system to ensure 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 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 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 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.





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

#### Cargo Hook Installation continued

Connect the lower manual release cable between the swing arm and the cargo hook manual release provisions (reference Figure 2-3), in the same manner as it was installed on the old hook. Inspect the cable to ensure 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. Secure the connector with lock wire.

If a ground strap was attached to the cargo hook removed, re-attach it to the new Cargo Hook with the Cargo Hook Attach Screw (shown in Detail B of Figure 2-1). Before attaching the ground strap remove the anodize finish around the tapped hole (in an approximate 1/4" diameter area) and treat the bare aluminum with a conductive chemical conversion coating such as Alodine 1201. It is not necessary to secure the attach screw with lock wire (it is threaded into a locking insert).

#### **Suspension System Installation**

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**

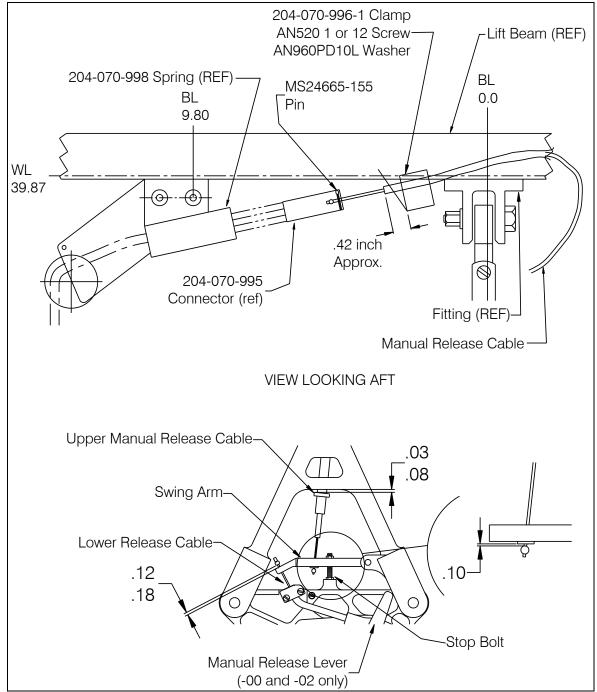


Figure 2-3 Suspension System Manual Release Arrangement

#### 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 2-3. 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 Car	go Hook Connector
PIN	FUNCTION
В	Power
С	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. Close the cargo hook release circuit breaker and position the battery switch to the ON position

- 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. Depress the cargo hook switch. The Cargo Hook should release with no load on it. 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 (see Figure 3-1). Do not use the hook unless the indicators are aligned. If marks are not aligned the hook may not be fully locked.
- 3. Rotate the suspension system 90 degrees, close the cargo hook and repeat step 2. Rotate the suspension system another 90 degrees, close the cargo hook and repeat step 2. 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 lbs (7.9 kgs). 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**

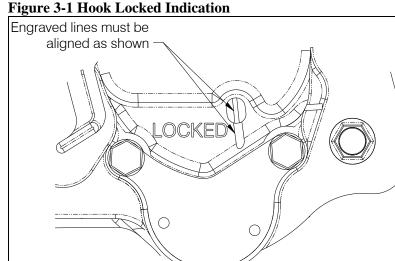
Prior to a flight involving external load operations perform the following.

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



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.

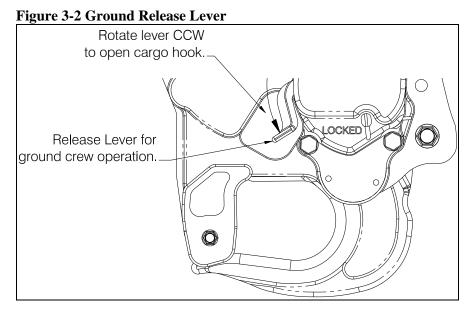
3. With no load on the cargo hook depress the manual release foot pedal in the cockpit to test the cargo hook manual release mechanism, the cargo hook load beam should drop open. Manually close the load beam. When the hook is closed, verify that the hook locked indicators are aligned. Do not use the 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 cargo hook may be flown in the open position to facilitate loading.



#### **Cargo Hook Loading**

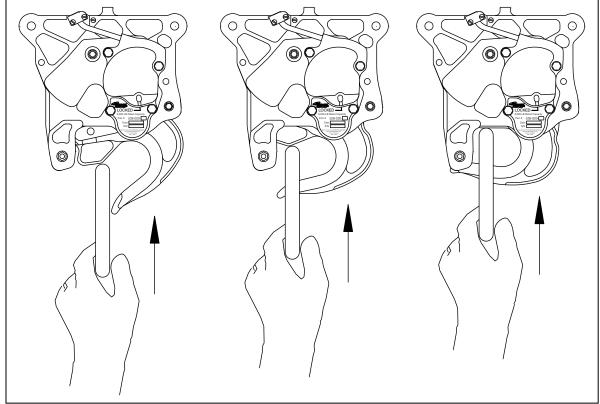
The cargo hook can easily be loaded with one hand. A load is attached to the hook by pushing the ring upward against the upper portion of the load beam throat, as illustrated in Figure 3-3, until an internal latch engages the load beam and latches it in the closed position.

If attaching a load to the cargo hook while the aircraft is in flight and the hook lock indicator is not visible perform the following.

- Push up on the load beam with the rigging (e.g. reach pendant) until it stops (as shown in Figure 3-3).
- Apply a sharp tug downward on the rigging several times to ensure the cargo hook is locked.

#### 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 and rigging to avoid.



The examples shown are not intended to represent all rigging possibilities. It is the responsibility of the operator to ensure the hook will function properly with the rigging.

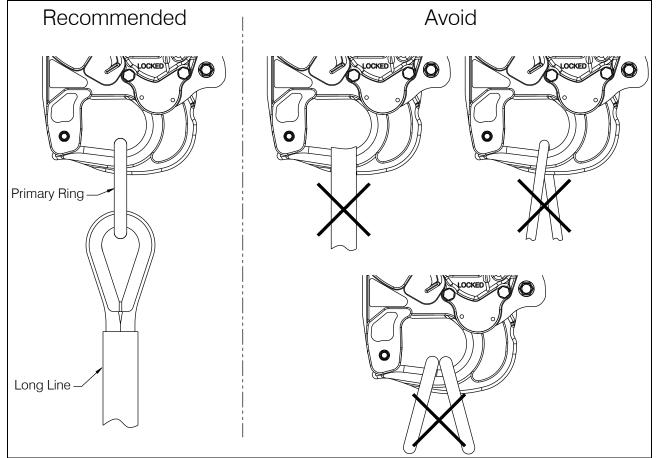
## Cargo Hook Rigging continued

#### 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 Examples of 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.



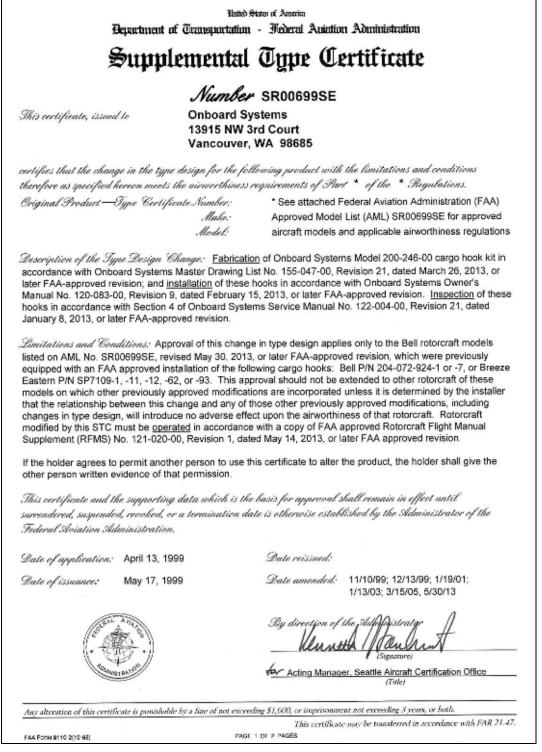
An RMA number is required for all equipment returns.

- To obtain an RMA, please use one of the listed methods.
  - Contact Technical Support by phone or e-mail (<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* Certification

## FAA STC



0699SE O HOOK KIT ISSUE DATE: May 17, 1999	May 17, 1999	AML REV DATE		May 30, 2013	May 30, 2013		
	O HOOK KIT ISSUE DATE:	FAA APPROVED SEALED DRAWING LIST	Revision*	Revision 21, dated March 26, 2013	Revision 21, dated March 26, 2013	Acting Manager, Seattle Aircraft Certification Office 1999, May 30, 2013	
T (AML) SR0	46-00 CARG	FAA APPR( DRAW	Drawing	155-047-00	155-047-00	Acting Manage Acting Manage Restificat 1999; May 30, 2	
FEDERAL AVIATION ADMINISTRATION (FAA) APPROVED MODEL LIST (AML) SR00699SE FOR FABRICATION AND INSTALLATION OF ONBOARD SYSTEMS MODEL 200-246-00 CARGO HOOK KIT ISSUE DATI	MODEL 200-2	FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT	Dated*	May 14, 2013	May 14, 2013	November 10, 1999; May 30, 2013	
	D SYSTEMS I	FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT	Number	121-020-00, Revision 1	121-020-00, Revision 1	FAA Approved: AMENDED: REISSUED:	Page 1 of 1
	ON OF ONBOARI	CERTIFICATION BASIS FOR ALTERATION		CAR 7, dated. 8/1/58 and Amendments 7-1 through 7-4, Cateoory B	FAR Part 29, dated 2/1/65 and Amendments 29- 1 and 29-2. See TCDS H4SW for additional information		Page
TION ADMIN	NSTALLATIC	ORIGINAL TC NUMBER		H1SW	H4SW		
EDERAL AVIA	ICATION AND I	ROTORCRAFT MODEL		204B, 205A, 205A-1	212, 412, 412EP, 412CF	ved Revision	
	FABR	ROTORCRAFT MAKE		BELL	BELL	Or later FAA Approved Revision	
		ITEM		÷	N		

#### Canadian STC



Transports Canada Transport Canada

# Department of Transport Supplemental Type Certificate

#### This approval is issued to:

**Onboard** Systems 13915 North West 3rd Court Vancouver, Washington United States of America 98685

**Responsible Office:** Aircraft/Engine Type or Model: Canadian Type Certificate or Equivalent: Pacific

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

Description of Type Design Change:

H-86 (Bell 212, 412, 412CF, 412EP) FAA Type Certificate H1SW (Bell 204B, 205A, 205A-1) Installation of Onboard Systems Model 200-246-00 Cargo Hook per FAA STC SR00699SE

Issue No.:

Issue Date:

Approval Date:

Number: SH99-217

2

September 20, 1999

June 07, 2019

Installation/Operating Data, Required Equipment and Limitations:

Installation of Onboard Systems Model 200-246-00 cargo hook is to be carried out in accordance with FAA approved Onboard Systems Owner's Manual No. 120-083-00, Rev 9, dated February 15, 2013 \*. This cargo hook is to be fabricated in accordance with FAA approved Onboard Systems Master Drawing List No. 155-047-00, Rev 21, dated March 26, 2013 \*. Inspect this cargo hook in accordance with Section 4 of Onboard Systems Service Manual No. 122-004-00, Rev 21, dated January 8, 2013 \*.

Approval of this change in type design applies to Bell 204B, 205A, 205A-1, 212, 412, 412CF 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, -12, -62 or -93. Modified rotorcraft must be operated in accordance with an FAA approved copy of Onboard Rotorcraft Flight Manual Supplement No. 121-020-00, Rev 1, dated May 14, 2013 \*.

(\* 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