Owner's Manual
Cargo Hook Suspension System

on the

Bell 204B, 205A, 205A-1, 205B, 210, 212, 412, 412CF
Agusta AB412, AB412EP
Rotorcraft Dev. Corp. UH-1H
Northwest Rotorcraft UH-1H
OAS Parts LLC UH-1H
Tamarack Helicopters UH-1F, UH-1H

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Applicable Equipment Part Numbers

200-391-XX, 200-401-XX, 200-428-00

Please check our web site www.onboardsystems.com for the latest revision of this manual.

Record of Revisions

Revision	Date	Page(s)	Reason for Revision
0	06/23/15	All	Initial Release
1	09/09/15	All	Minor edits resulting from installation fit check.
2	03/23/17	1, 10	Added 412CF, Tamarack UH-1F, UH-1H to title page, added 412CF and UH-1F models as not being an approved model for 200-428-00.
3	02/15/18	14, 15, 25	Added warnings to check for interference of suspension with equipment in the surrounding area.
4	03/12/19	4, 27	Added warnings to not use suspension systems for side pulling operations.

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1.0 Introduction

1.1 Scope

This owner's manual contains instructions for installation and operation of the Cargo Hook Non-rotating Suspension System Kits (P/Ns 200-391-XX and 200-401-XX) and Anti-Torque System (P/N 200-428-00) on medium Bell helicopters and some of their derivatives including UH-1H's. See the STC Approved Model List for complete listing of approved models.

NOTICE

These non-rotating Suspension Systems Kits are not compatible with the Bell 412EP model, for this model use the rotating Suspension Systems Kits which are also approved under this STC, see Owner's Manual 120-084-00.

⚠ WARNING

Do not use the suspension systems for side pulling operations such as wire-stringing. The load attached to the cargo hook must be lifted free of land or water during external load operations.

1.2 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.

2.0 Referenced Documents

121-060-00	RFM Supplement
122-004-00	Component Maintenance Manual, Cargo Hook
123-039-00	ICA Manual

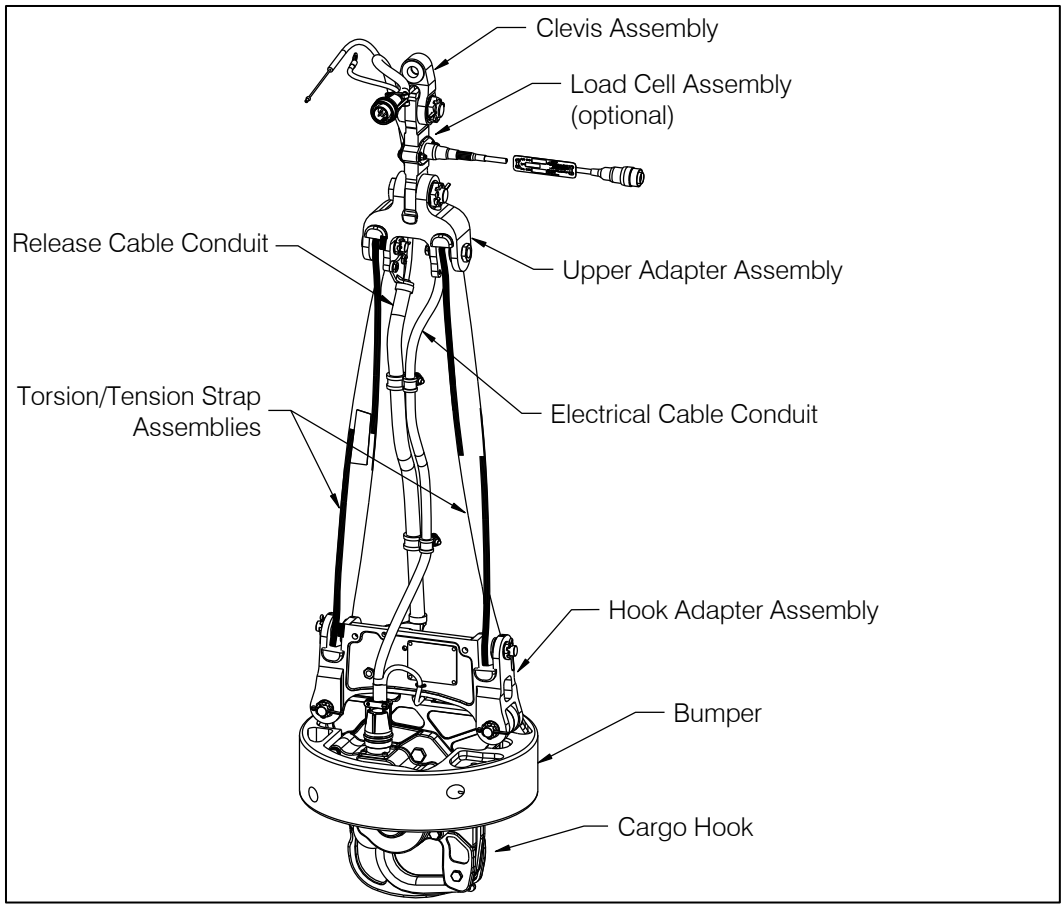
3.0 System Overview

3.1 Cargo Hook Suspension System

The Cargo Hook Suspension System provides a means for the medium Bell series helicopter to transport jettisonable external loads. The system includes a cargo hook, the structural means to suspend and attach the cargo hook to the helicopter's hard point, the electrical release cable, and a manual release cable. A load cell is an optional component.

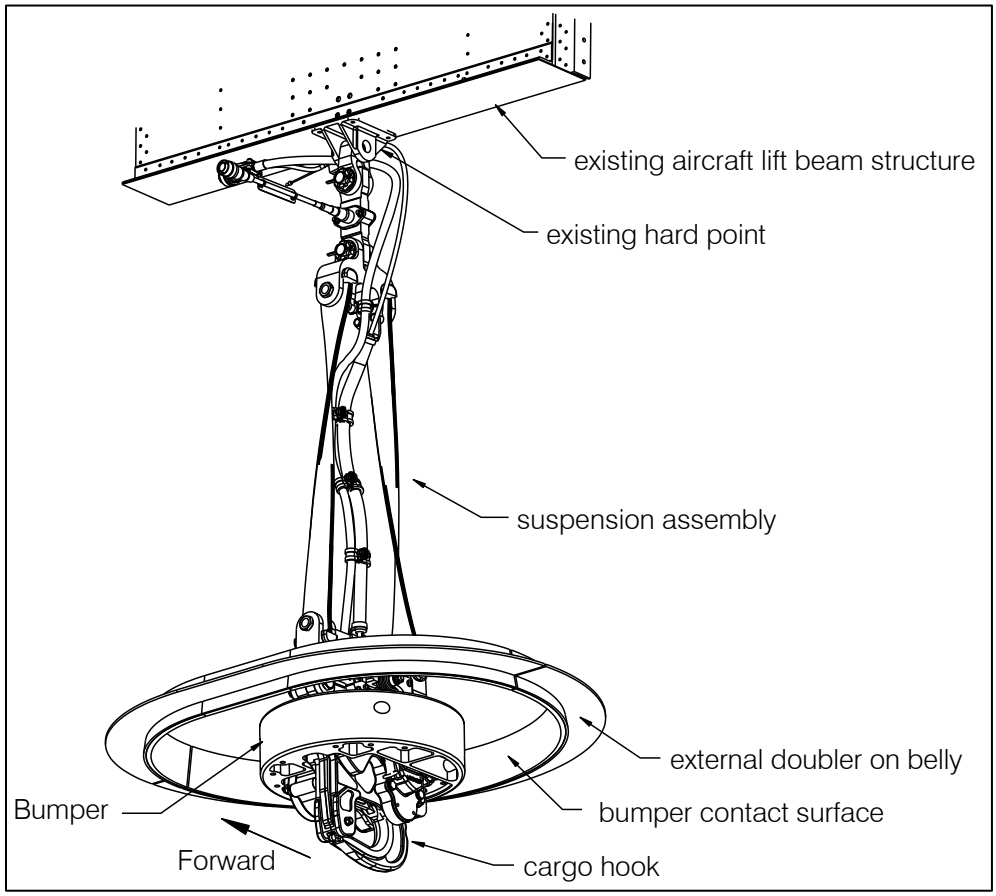
The suspension system features a simple non-rotating design which uses two flexible torsion-tension strap assemblies, aluminum adapters and a universal joint. A low-friction bumper protects the cargo hook and the aircraft coaming. The non-rotating design feature is ideal for certain types of external operations where the rotation of the external load is unnecessary or undesired. Some types of external loads necessitate use of the optional Anti-torque system in addition to the basic suspension system; see section 3.4.

Figure 3.1.1 Cargo Hook Suspension Overview



The Cargo Hook Suspension Systems are direct replacements for the Bell 204-072-915-025 and 204-072-915-103 suspension systems and interface with the helicopter's existing fixed provisions (see Figure 3.1.2).

Figure 3.1.2 Overview of Cargo Hook Installation



A load release from the cargo hook can be initiated by three different methods. Normal release is achieved by pilot actuation of the release switch on the cyclic. When the switch is pressed, it energizes a solenoid in the Cargo Hook (see Section 3.3 for Surefire feature), and the solenoid actuates the internal mechanism allowing the load to fall free. In the event of electrical system failure, load release can be achieved by actuating the manual release system's lever (medium Bell helicopters typically use a foot operated lever). Actuating the lever pulls the inner cable of the manual release cable which is routed to the Cargo Hook and this action actuates the internal mechanism of the Cargo Hook to release the load. The load can also be released by ground crew using a lever located on the side of the Cargo Hook.

3.2 Optional Load weigh system

The 200-391-XX system is the same as the P/N 200-401-XX system except it includes a load weigh system. The load weigh system consists of a load cell assembly, a load weigh indicator, and an interconnecting wire harness. This system provides the pilot with the weight of the load being carried on the cargo hook.

3.3 Optional Surefire Release

An optional feature for this system includes a short time delay circuit built into the cargo hook electrical release system (cargo hook P/N 528-020-12). This system is a safety enhancement to protect against inadvertent load release due to accidental contact with the release switch or mistaken actuation of the cargo hook switch when another is intended. Surefire makes the electrical release a more deliberate pilot command.

This cargo hook configuration can be identified by a gold color solenoid housing (see Figure 3.3.1) in addition to a placard on the underside of the housing. The time delay feature requires that the release switch be depressed and held for more than a 1/2 second to open the cargo hook. If the cargo hook must be released immediately, use the manual release.

NOTICE

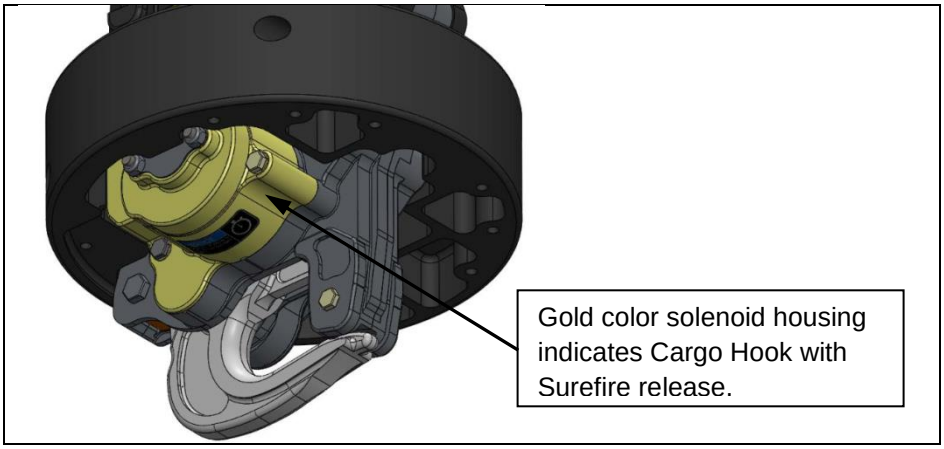
The 528-020-12 cargo hook includes an electronic delay of approximately ½ second. It is necessary to press and hold the cargo hook release button.

⚠ CAUTION

If a Surefire-equipped cargo hook must be released immediately without any delay, use the mechanical backup release.

In addition to the delay feature the circuit includes on-off cycling to limit the duty-cycle on the cargo hook solenoid. If the release switch is held down, the solenoid will cycle on and off repeatedly in a "machine gun" fashion.

Figure 3.3.1 Surefire Configuration Identification



3.4 Optional: Anti-torque System

The Anti-torque System (P/N 200-428-00) should be added to the cargo hook installation when external loads transfer significant torsional stresses into the suspension system. The following list provides criteria and examples for when use of this system is recommended.

- Carrying of external loads using a spreader bar (fertilizer bucket) or other rigidly coupled load.
- Twist of the suspension system in excess of 45º is observed in service.
- A need to keep the cargo hook pointed forward without *any* relative rotation.
- A crack is observed in any of the redundant torsion/tension straps at 100 hour inspection or at time of overhaul.

NOTICE

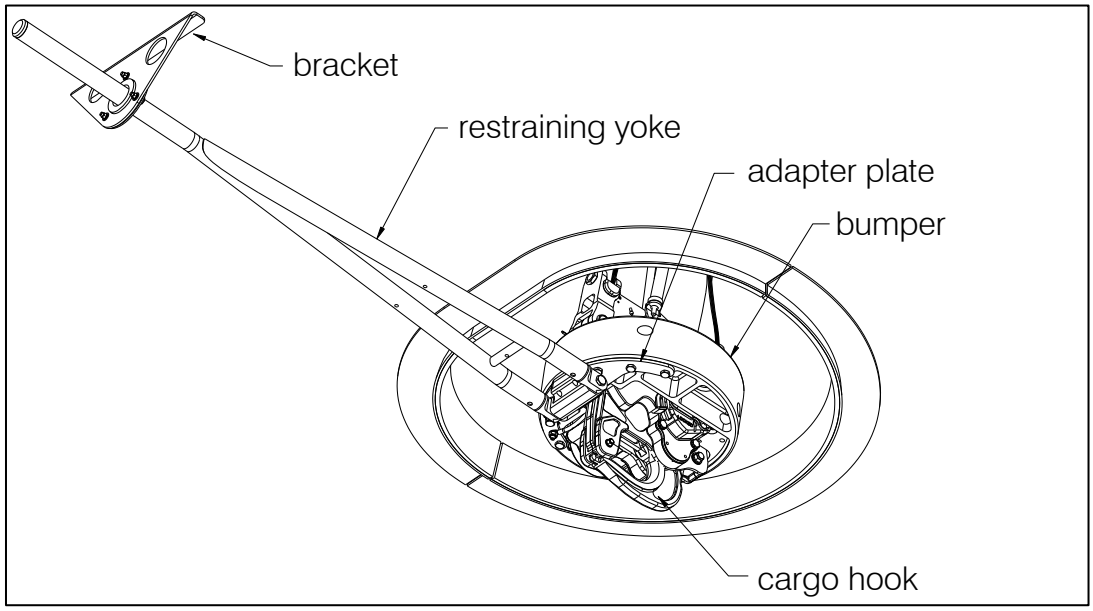
The Anti-torque system is recommended for external loads attached via a spreader bar, such as a fertilizer bucket.

The Anti-Torque System consists of an Anti-Rotation Adapter that is mounted to the cargo hook bumper, a bracket mounted to the belly of the helicopter forward of the cargo hook, and Restraining Yoke (see Figure 3.4.1) which serves as the beam to transfer the torsional loads applied to the cargo hook out to the bracket. The length of the Restraining Yoke serves as a long moment arm to reduce the loads on the aircraft to low magnitude. The cargo hook suspension system is still able to move freely within the confines of the coaming with it installed.

NOTICE

The Anti-torque system is not approved for the Bell 204B and 412CF models and Tamarack UH-1F model.

Figure 3.4.1 Anti-Torque System Overview



3.5 Bill of Materials

The following items are included with the Cargo Hook Suspension System Kits. If shortages are found contact the company from whom the system was purchased.

Table 3.5.1 Cargo Hook Suspension System Bill of Materials

Part No.	Description	200-391-XX Qty				200-401-XX Qty	
		-00	-01	-10	-11	-00	-10
210-095-02	C-39 Indicator, 5V Backlight	1	-	1	-	-	-
210-095-05	C-39 Indicator, 5V NVG Backlight	-	1	-	1	-	-
210-294-00	Non-Rotating Suspension System w/ Load Weigh	1	1	-	-	-	-
210-294-10	Non-Rotating Suspension System w/ Load Weigh w/ Surefire Release	-	-	1	1	-	-
210-295-00	Non-Rotating Suspension System	-	-	-	-	1	-
210-295-10	Non-Rotating Suspension System w/ Surefire Release	-	-	-	-	-	1
215-010-00	Electronic Load Weigh Placard	1	1	1	1	-	-
215-012-00	Electronic Load Weigh Placard	1	1	1	1	-	-
215-343-00	Cockpit Decal – Surefire	-	-	1	1	-	1
235-035-00	Quick Disconnect Bracket	1	1	1	1	-	-
270-044-01	Internal Harness	1	1	1	1	-	-
400-048-00	Power Switch	1	1	1	1	-	-
510-028-00	Screw	4	4	4	4	-	-
510-029-00	Nut	4	4	4	4	-	-
512-001-00	Ty-Wrap	10	10	10	10	-	-
512-002-00	Ty-Wrap	10	10	10	10	-	-
120-039-00	C-39 Indicator Owner's Manual	1	1	1	1	-	-
120-145-00	Owner's Manual	1	1	1	1	1	1
121-060-00	RFMS	1	1	1	1	1	1
122-004-00	CMM, Cargo Hook	1	1	1	1	1	1
123-039-00	ICA	1	1	1	1	1	1

Note: a circuit breaker for the load weigh system is not provided; a 1 or 2 amp MS26574 series circuit breaker is required.

Table 3.5.2 Anti-Torque System (P/N 200-428-00) Bill of Materials

Part No.	Description	Qty
232-725-00	Bracket Assembly	1
232-726-00	Anti-Rotation Assembly	1
235-258-00	Restraining Yoke	1
510-042-00	Washer	4
510-095-00	Washer	2
510-115-00	Cotter Pin	1
510-227-00	Nut	6
510-239-00	Washer	1
510-343-00	Bolt	4
510-719-00	Nut	1
510-778-00	Washer	1
510-859-00	Nut Plate	2
510-860-00	Rivet	4
511-115-00	Bolt	1
511-116-00	Bolt	6

3.6 Specifications

Table 3.6.1 Specifications - Kit P/Ns 200-391-XX and 200-401-XX

System Design load	5,000 lb. (2,268 kg.)
System ultimate strength	18,750 lb. (8,505 kg.)
Cargo hook electrical release capacity	15,000 lb. (6,804 kg.)
Cargo hook mechanical release capacity	15,000 lb. (6,804 kg.)
Force required for mechanical release at 5,000 lb.	18 lb. Max. (.40" travel)
Cargo hook electrical requirements	22-32 VDC, 14.9 amps @ 28 VDC
Cargo hook minimum release load	0 pounds
Electrical release connector	MS3106F14S-7P

4.0 Installation

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.

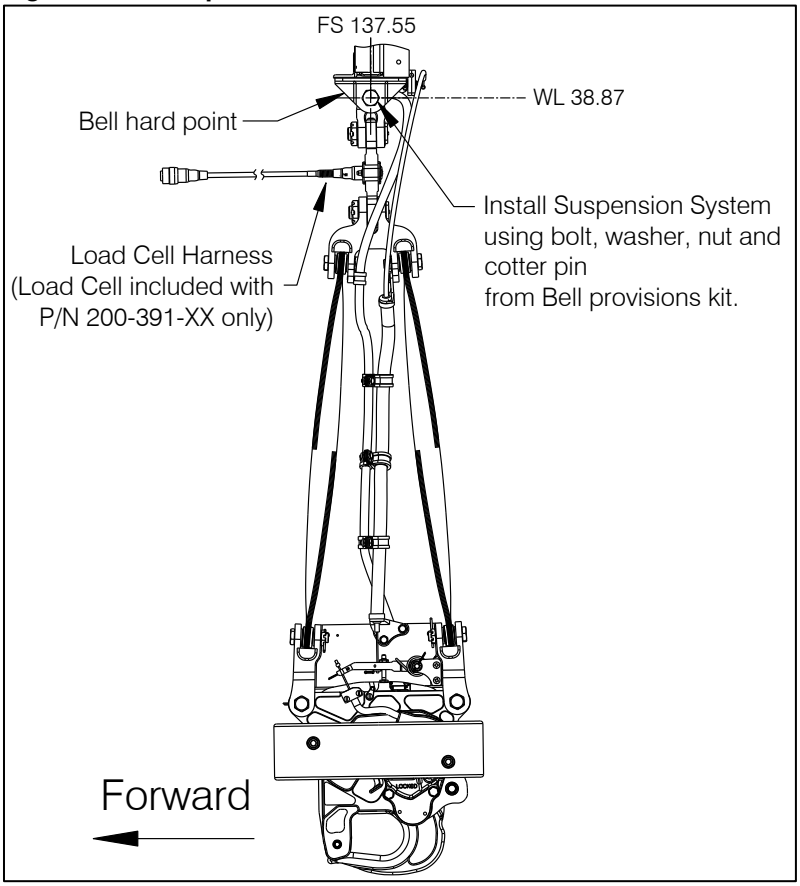
The aircraft maintenance and parts manuals should be available throughout the installation as various aircraft components will be referred to by name and part number. The part numbers for aircraft components are provided for reference and are subject to change by the TC holder.

4.1 Cargo Hook Suspension System Installation

If present, remove the existing suspension system.

Position the new non-rotating suspension system in the hook well and orient it so that the load beam is pointed forward (see Figure 4.1.1) and temporarily attach it to the existing hard point with the bolt, washer, and nut provided with the Bell provisions kit. Check clearance for suspension system per the following page; if satisfactory tighten nut and install cotter pin. Reference the appropriate Bell service instructions (e.g. – BHT-212-SI-5/BHT-412-SI-17) for tightening instructions.

Figure 4.1.1 Suspension Installation



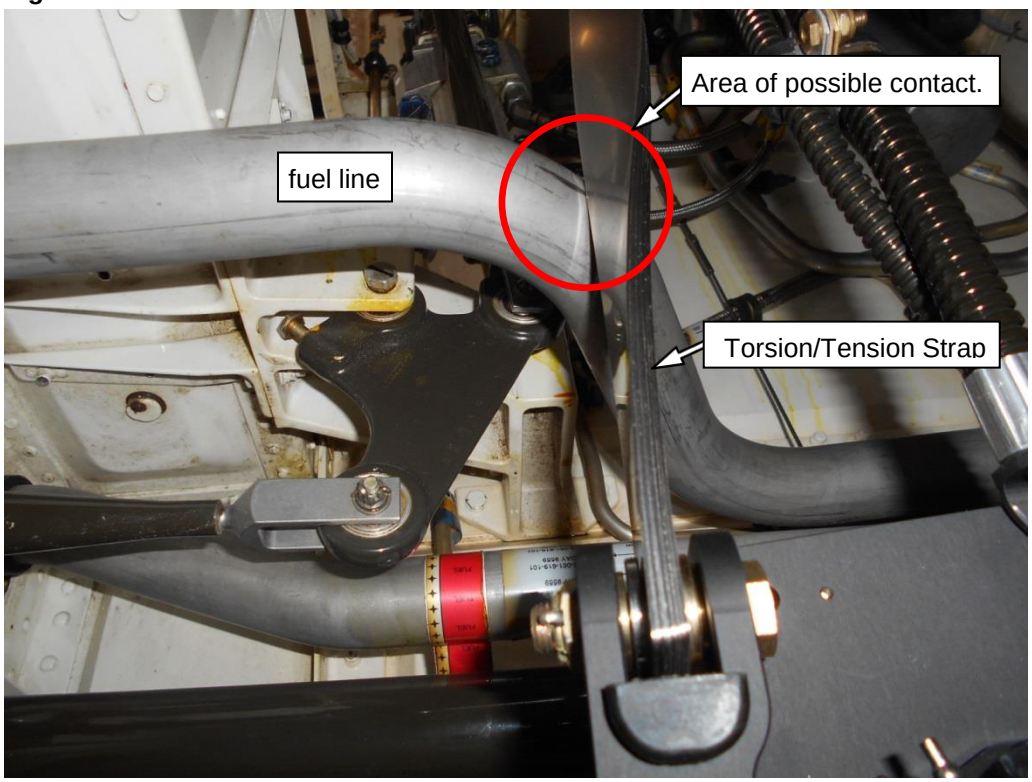
WARNING

Before proceeding, move the suspension system through its full range of motion and verify clearance with all equipment, fuel lines, etc. in the surrounding area under the transmission. Do not proceed if there is any interference.

WARNING

The Bell 412EP model has a configuration of a fuel line that can be contacted (see Figure 4.1.2) by the forward Torsion/Tension Strap when the cargo hook is in the right forward corner of the hook well. Do not use the cargo hook suspension if this fuel line is present and is contacted by the suspension.

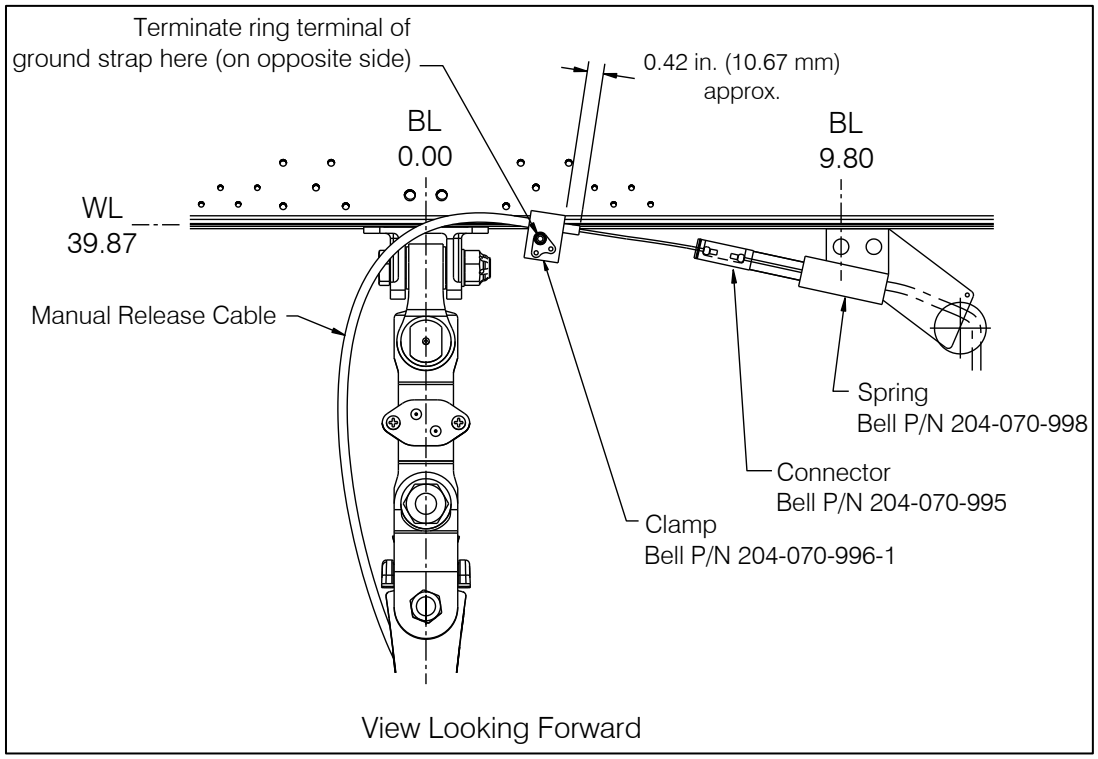
Figure 4.1.2 Possible Fuel Line Interference Location



Connect the manual release cable, electrical cable, and ground strap to the aircraft's existing fixed provisions per the following steps, refer to Figure 4.1.3 and Figure 4.1.4.

1. Connect the electrical connector from the suspension system to the existing fixed provisions connector near the hard point.
2. At the top of the suspension system route the free end of the manual release cable to the right of the hard point.
3. Engage the cable ball end of the manual release cable into the existing Connector (Bell P/N 204-070-995) and secure with cotter pin (P/N MS24665-155).
4. Remove the existing screw and washer from the clamp (Bell P/N 204-070-996-1).
5. Place outer conduit of manual release cable into the clamp and locate the end approximately .42" (10.7 mm) past the edge of the clamp as shown.
6. Clean the mating surface as necessary and place the ring terminal of the ground strap from the electrical release cable under the screw head and washer and tighten screw to secure the clamp around the conduit.

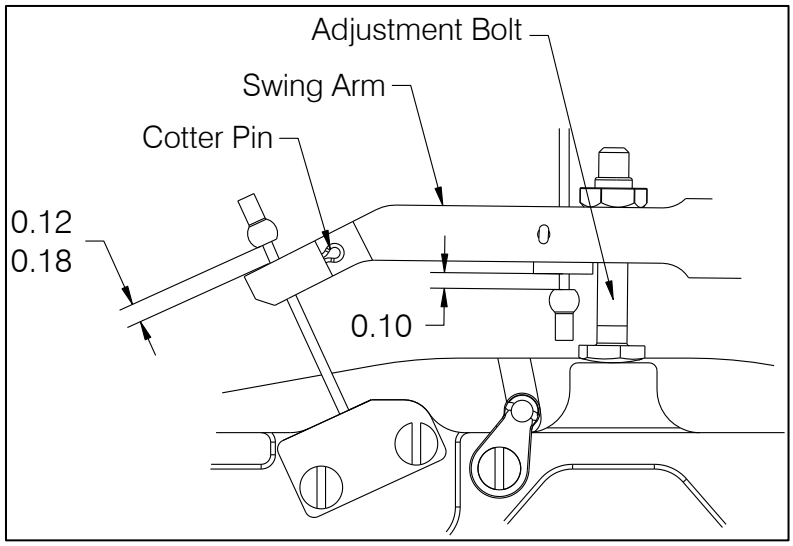
Figure 4.1.3 Release Cable Connection to Aircraft System



7. Adjust the Connector to obtain .10" (2.5 mm) of clearance between the underside of the swing arm and the cable ball end of the manual release cable (see Figure 4.1.4). The adjustment bolt of the swing arm should be in contact with the top of the cargo hook case and the swing arm should be approximately parallel to the top of the cargo hook case when the .10" measurement is taken.

8. Pull the lower manual release cable outwards from the hook to remove all of its slack and measure the clearance between its cable ball end and the swing arm. This measurement shall be .12/.18" when the load beam is closed and locked.

Figure 4.1.4 Release Cable Settings



CAUTION

When rigging the manual release cable, the cargo hook load beam must be in the closed and locked position.

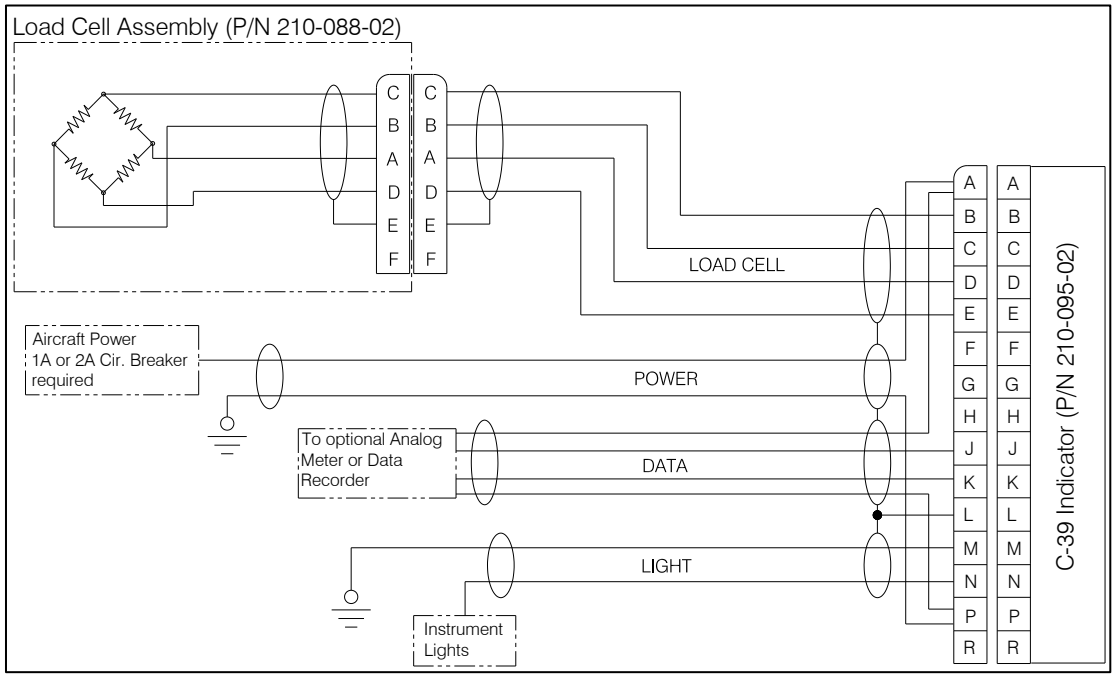
9. If adjustment is made to the adjustment bolt in order to obtain proper clearance, re-check adjustment of both the upper and lower manual release cables.

10. If the configuration installed includes the Cargo Hook w/ Surefire Release, install the Cockpit Decal (215-343-00) adjacent to the cargo hook release switch on the cyclic.

4.2 Load Weigh System Installation

The load weigh system is an optional system which is included with Kit P/N 200-391-XX. It includes the C-39 load weigh indicator, the load cell at the top of the suspension system, and the interconnecting wire harness. The load weigh system schematic is shown in Figure 4.2.1

Figure 4.2.1 Load Weigh System Schematic



1. Mount the C-39 in the cockpit, the C-39 is designed to fit a standard 2 ¼" instrument panel hole. Mount it in a location for optimum viewing during external load operations. Secure the indicator with four #8 screws (not included).

2. Route the load weigh harness from the C-39 indicator with existing harnesses. Route the LOAD CELL connector leg aft and into the top of the hook well to mate up with the harness from the Load Cell. Route harness while following the following guidelines.

   - Pick up existing wire runs by opening existing cable clamps. Nylon ties alone may not be used for primary support.
   - The distance between supports should not exceed 21 inches.
   - Bend radius of wire or harness must not be less than 10 times the wire or harness diameter.
   - Inspect and verify that the wire harness may not be manually deflected into a structure with a bend radius of less than .13 inches.

3. A generic bracket (P/N 235-035-00) is provided as an option for mounting the LOAD CELL leg connector, alternatively a bracket may be fabricated to accommodate the desired mounting location. Pre-route the harness from the load cell to the intended bracket mounting position to ensure reach and a secure routing path. The provided bracket is mounted by drilling two .110 inch holes in the aircraft to match its spacing.

4. Route the POWER cable of the harness to a convenient location for the power switch (P/N 400-007-00). This cable is supplied with excess length; cut off the excess and retain for connecting the switch to the circuit breaker. Connect the white wire in the POWER cable to one side of the power switch and connect the other side to a dedicated 1 or 2 amp MS26574 circuit breaker on the aircraft's utility or non-essential bus. Connect the white/blue wire to aircraft ground.

5. Route the LIGHT cable of the harness to the instrument panel lighting circuit. The indicator (P/N 210-095-02) included with kit P/N 200-391-00 requires 5 VDC for its backlight. Connect the white wire from the LIGHT cable to 5 VDC and the white/blue wire to aircraft ground.

6. The C-39 indicator is equipped with an analog drive circuit that can be connected to an Onboard Systems Analog Slave Meter through the DATA cable of the harness. The analog slave meter is not included under this STC. Contact Onboard Systems for additional information on this option. Cap and stow the DATA cable if it is not used.

7. Install the placards provided with the load weigh system. Install one of the P/N 215-010-00 placards ("ELECTRONIC WEIGHING SYSTEM") adjacent to the power switch and the other adjacent to the circuit breaker. Install placard P/N 215-012-00 ("TURN THE WEIGHING SYSTEM OFF WHEN NAVIGATION EQUIPMENT IN USE…..") adjacent to the indicator.

4.3 Anti-Torque System Installation

The Anti-Torque System (P/N 200-428-00) is an optional system, if not installing this system skip to installation check-out.

The Anti-Torque System includes an adapter to attach to the cargo hook bumper, a Bracket Assembly to install on the belly of the aircraft, and a tube structure (Restraining Yoke) to transfer torsional loads between them. Before installing this system, ensure that the area forward of the cargo hook is free from any antennae or other belly mounted equipment.

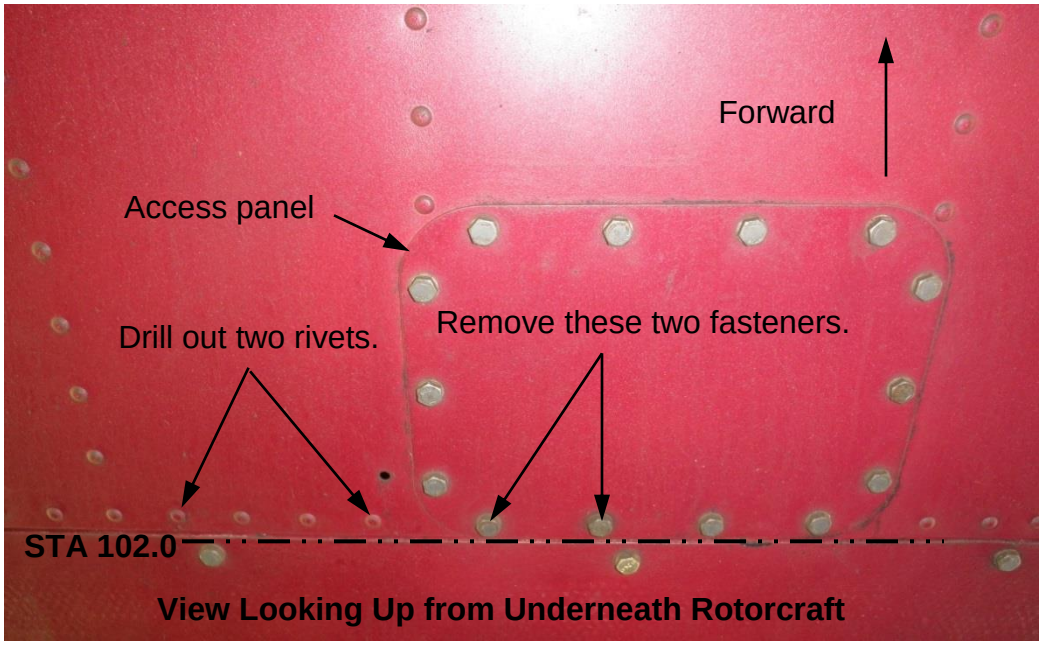
4.3.1 Bracket Assembly Installation

The installation of the Bracket Assembly (P/N 232-725-00) varies depending on the model and serial number of aircraft on which the system is being installed on.

For the UH-1H, Bell 212 S/N 30850 and subsequent, Bell 412 S/N 33001 thru 33107, 36087 and subsequent; use the following instructions for installation of the Bracket Assembly.

1. Underneath the rotorcraft and just forward of STA 102.0 remove the two existing inboard fasteners in the row parallel to STA 102.0 on the access panel (see below) and drill out two rivets shown below.

Figure 4.3.1 Aircraft Modification



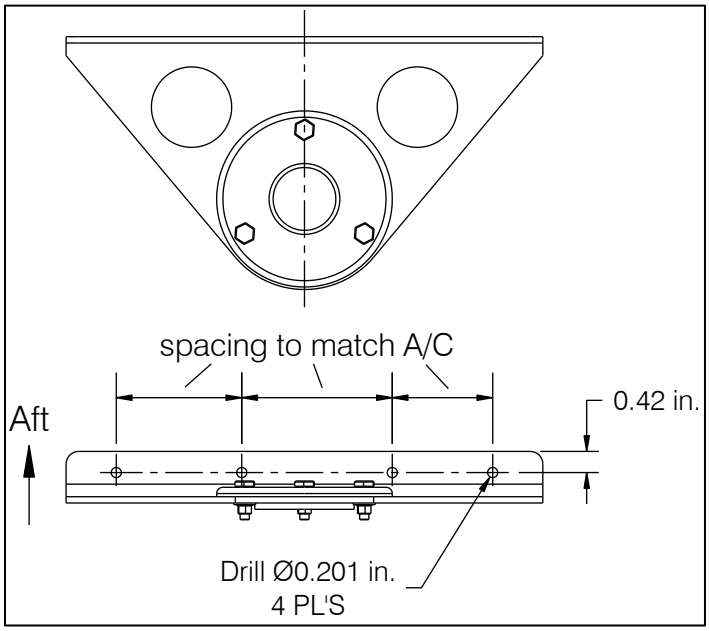
2. Drill the rivet holes out to Ø0.201 diameter.

3. Using the supplied nut plates (P/N 510-859-00) as a template, drill .098 holes on either side of each drilled out rivet hole and countersink 100º to a depth of .036".

4. Install the two nut plates above the skin using the supplied rivets (P/N 510-860-00).

5. Transfer the 4-hole pattern from above to the bracket assembly such that the center of the bracket assembly is at BL0.0 when installed and the horizontal flange is pointed aft.

Figure 4.3.2 Bracket Assembly Hole Pattern



6. Position the Bracket Assembly over the 4-hole pattern with a washer (P/N 510-095-00) between the horizontal flange and the skin of the aircraft at the two locations where the rivets were drilled out. The washers serve as a spacer to match the access panel thickness at the other two attach points.

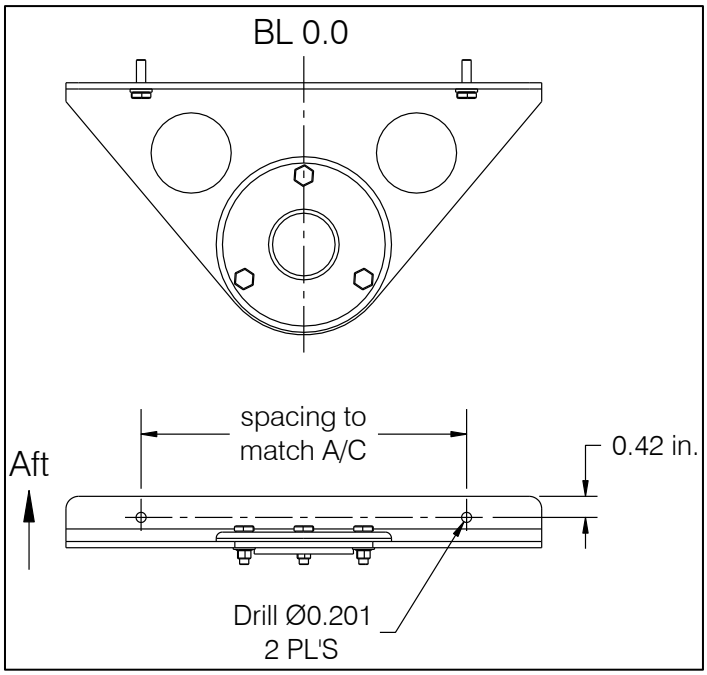
7. Secure the Bracket Assembly with the 4 provided bolts (P/N 510-343-00) and washers (P/N 510-042-00). Tighten bolts to 20-25 in-lbs.

For the Bell 205, 212 S/N 30849 and previous use the following instructions.

8. Underneath the rotorcraft and just aft of STA 102.0 remove the two existing fasteners (closest one on each side of BL0.0).

9. Transfer the center to center distance of the fastener holes to the horizontal flange of the Bracket Assembly and position them such that the Bracket Assembly will be centered on BL0.0 and with horizontal flange pointed aft.

Figure 4.3.3 Bracket Assembly Modification

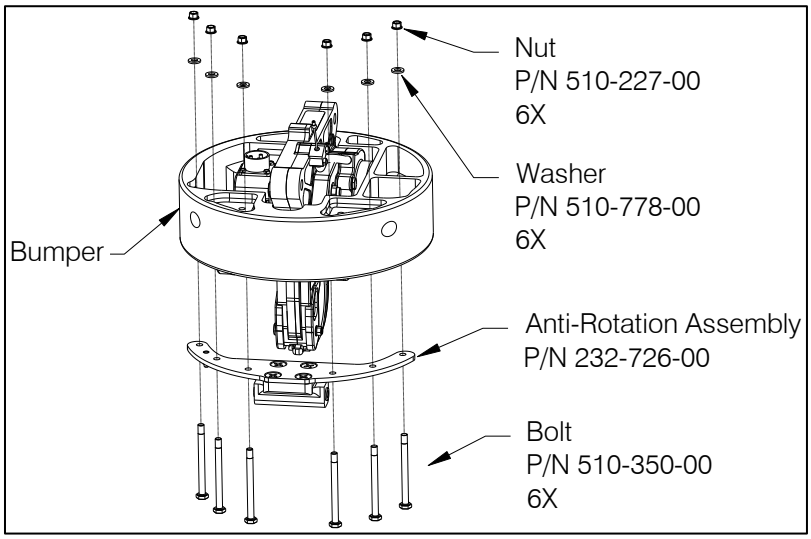


10. Position the Bracket Assembly over the two holes and secure with the provided bolts (P/N 510-343-00) and washers (P/N 510-042-00). Tighten bolts to 20-25 in-lbs.

4.3.2 Anti-Rotation Assembly and Restraining Yoke Installation

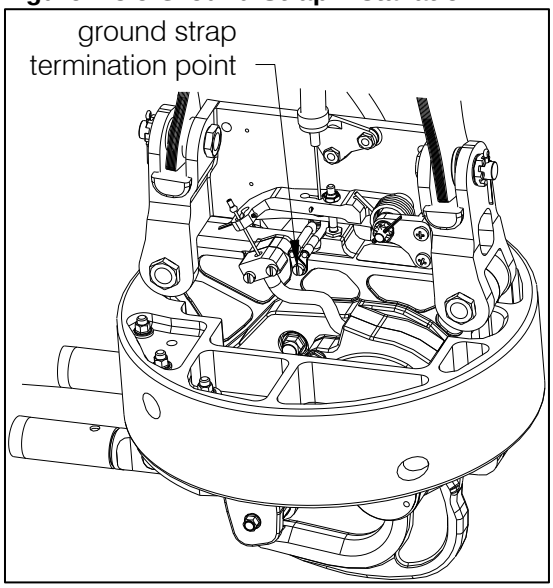
1. Attach the Anti-Rotation Adapter (P/N 232-726-00) to the cargo hook's Bumper with six bolts (P/N 511-116-00), washers (P/N 510-778-00) and nuts (P/N 510-227-00). Tighten nuts to 50-70 in-lbs.

Figure 4.3.4 Anti-Rotation Adapter Attachment



2. Route the ground strap on the Anti-Rotation Assembly up between the bumper and the cargo hook solenoid housing and route it to the termination point of the ground strap from the suspension assembly, adjacent to the cargo hook's manual release cable.

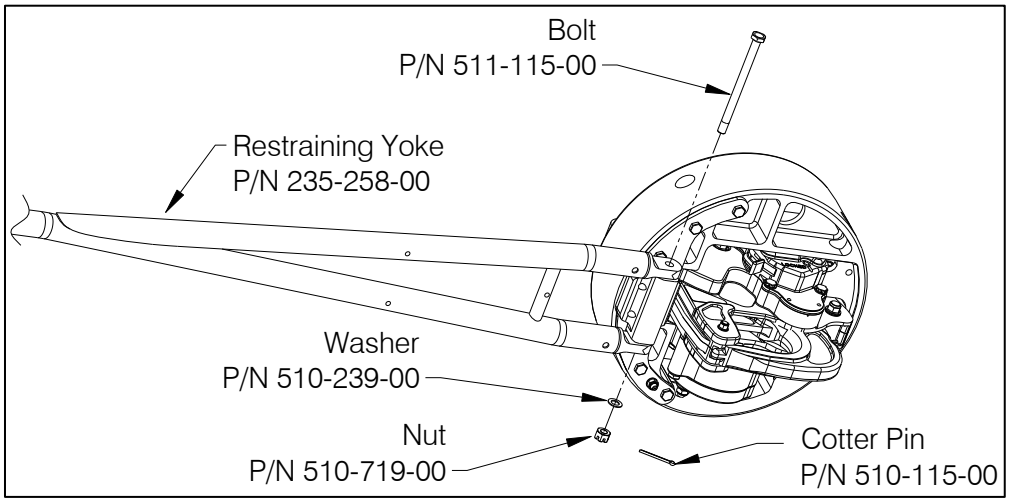
Figure 4.3.5 Ground Strap Installation



3. Remove the conductive silicone from around the termination point, remove the screw, and re-install the screw through both ground strap ring terminals.

4. Attach the Restraining Yoke (P/N 235-258-00) to the Anti-Rotation Adapter with bolt P/N 511-115-00, washer P/N 510-239-00, and nut P/N 510-719-00. Tighten nut until cotter pin (P/N 510-115-00) can be inserted. Do not over-tighten; Restraining Yoke should pivot freely about its pivot point on the Anti-Rotation Adapter.

Figure 4.3.6 Restraining Yoke Attachment



5. Slide the end of the Restraining Yoke through the Bracket Assembly before installing the suspension system on the aircraft.

4.4 Installation Check-out

After installation of the Cargo Hook Suspension System, perform the following functional checks.

1. Move the installed Cargo Hook Suspension System throughout its range of motion to ensure that the manual release cable assembly and the electrical harnesses have enough slack to allow full swing of the suspension assembly without straining or damaging them.

2. Move the cargo hook suspension throughout its range of motion and ensure the suspension does not contact any adjacent equipment mounted in the surrounding area under the transmission.

Ensure clearance with all equipment, fuel lines, etc. If there is any interference, do not operate the system until it is resolved.

3. With the Cargo Release pedal against the forward stop ensure that the Spring (Bell P/N 204-070-998-00) does not bottom out, refer to Figure 4.1.3. If the spring assembly bottoms out, return the cargo release pedal to the aft stop and check cable tension. Cable tension should be 20 to 24 lbs.

4. Depress and release the Cargo Release pedal and ensure the cargo hook load beam falls open and that the upper and lower manual release cables return to their initial positions. Reset the load beam and visually check that the cargo hook is locked by ensuring that the hook lock indicator is aligned.

5. Electrical release system operation depends on the cargo hook P/N installed. The following instructions are applicable to cargo hook P/N 528-020-12 which is equipped with Surefire electrical release (reference Section 3.3). With no load on the cargo hook perform the following.

    - *Very* briefly press the Cargo Release switch, the cargo hook should not actuate and the load beam should remain closed.

    - Press and hold the Cargo Release switch for a few seconds, the load beam should fall to the open position and the cargo hook solenoid should continue to cycle repeatedly.

    - Push up on the load beam and verify that it latches and the lock indicator is aligned with the engraved line on the manual release cover.

The following instructions are applicable to cargo hook P/N 528-020-10.

- Press and release the Cargo Release switch on the cyclic, the load beam should fall to the open position.
- Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the manual release cover.

6. If the load weigh system is installed, turn on the load weigh system using the power switch and attach a weight to the cargo hook or pull downward on the load beam. The C-39 display should show a load on the hook.

7. If the Anti-Torque System was installed, move the cargo hook suspension system throughout its full range of motion and verify adequate clearance with any belly mounted equipment and that the Anti-Torque System does not restrict cargo hook suspension system movement.

8. If Anti-Torque System was installed, move the cargo hook suspension system throughout its full range of motion and verify that the Restraining Yoke maintains engagement with the Bracket throughout its full range of motion.

9. Perform an EMI ground test per AC 43.13-1b section 11-107.

NOTICE

The cargo hook and load cell are of a class of equipment not known to have a high potential for interference. This class of equipment does not require special EMI installation testing as required in paragraphs 7 and 8 of FAA policy memorandum ASW-2001-01.

4.5 Component Weights

The weight of the system is listed in Table 4.5.1.

Table 4.5.1 Component Weights

Item	Weight lbs (kgs)
P/N 200-391-00	29.0 (13.2)
P/N 200-401-00	27.0 (12.2)
P/N 200-428-00	5.4 (2.45)

4.6 Cargo Hook Location

Table 4.6.1 Cargo Hook Location

Fuselage Station	137.55

4.7 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 121-060-00 in the Rotorcraft Flight Manual.

5.0 Operation Instructions

WARNING

Do not use the suspension system for side pulling operations such as wire-stringing. The load attached to the cargo hook must be lifted free of land or water during external load operations.

5.1 Operating Procedures

Refer to Owner's Manual 120-039-00 for operation instructions for the C-39 Load Indicator.

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

1. Provide power to the cargo hook's electrical release system. Electrical release system operation depends on the cargo hook P/N installed. The following instructions are applicable to cargo hook P/N 528-020-12 which is equipped with Surefire release (reference Section 3.3). With no load on the cargo hook perform the following.

NOTICE

Electrical release operation will differ depending on the P/N of the cargo hook installed. Cargo hook P/N 528-020-12 is equipped with Surefire release which provides an approximate ½ second delay between switch actuation and release.

- Briefly press and release the Cargo Release switch without holding it down, the load beam should remain closed.
- Press and hold the Cargo Release switch for several seconds, the load beam should fall to the open position and the cargo hook solenoid should continue to cycle repeatedly. Return the load beam to the closed position.
- Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the manual release cover.

The following instructions are applicable to cargo hook P/N 528-020-10.

- Press the Cargo Release switch on the cyclic, the load beam should fall to the open position.
- Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the manual release cover.

CAUTION

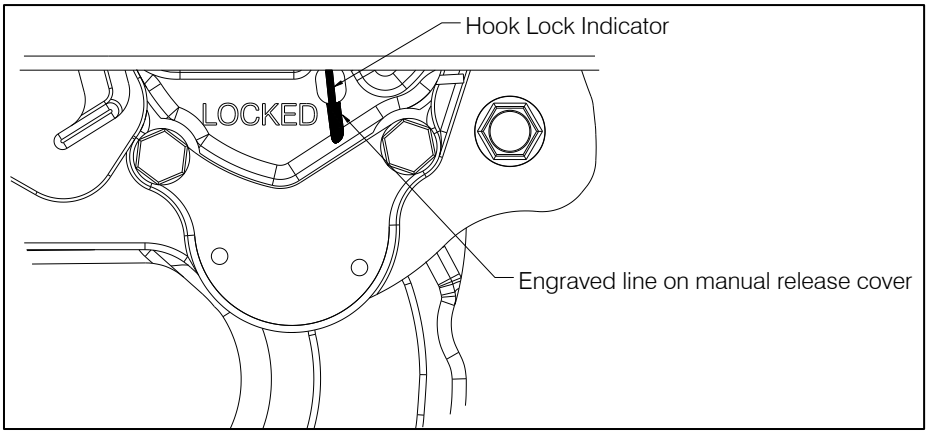
Depressing the electrical release button continuously in excess of 20 seconds will cause the release solenoid to overheat, possibly causing permanent damage.

2. Activate the foot-operated lever in the cockpit to test the manual release system. The mechanism should operate smoothly and the Cargo Hook must release. Reset the load beam by hand after release. Verify that the hook lock indicator on the side of the hook returns to the fully locked position. In the fully locked position the hook lock indicator must align with the lines on the manual release cover (see Figure 5.1.1).

⚠ WARNING

In the fully locked position the hook lock indicator must align with the lines on the manual release cover (see Figure 5.1.1).

Figure 5.1.1 Hook Lock Indicator

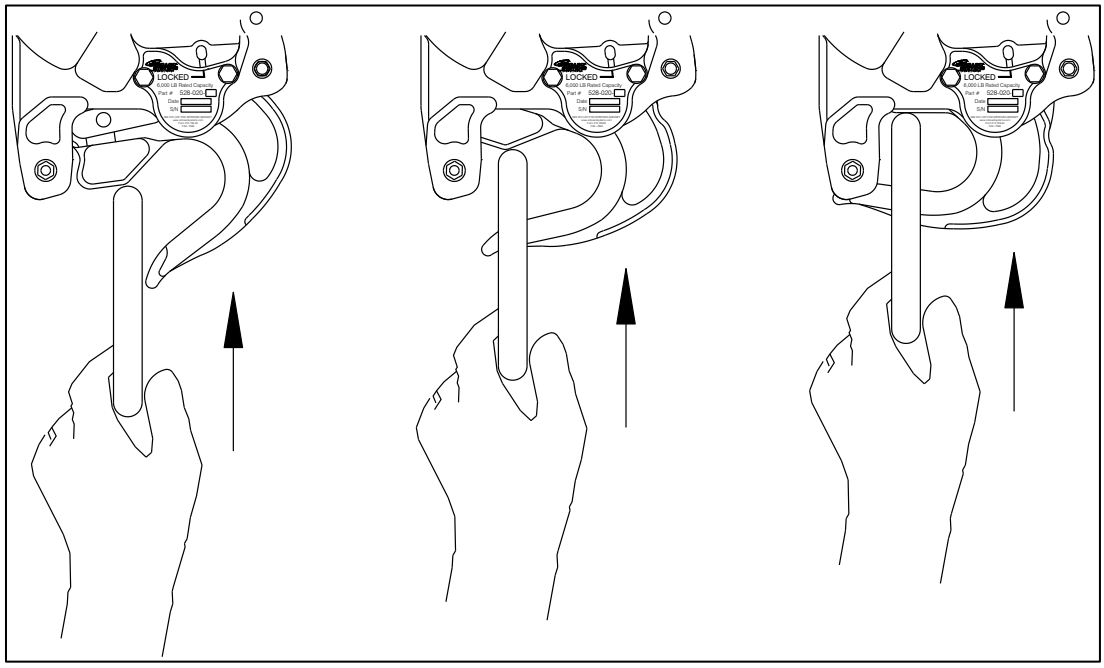


3. Swing the cargo hook and suspension assembly in all directions and ensure the manual release cable and electrical harnesses are NOT pulled tight in any possible location.

5.2 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 5.2.1, until an internal latch engages the load beam and latches it in the closed position.

Figure 5.2.1 Cargo Hook Loading



5.3 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 and rigging to avoid, but is not intended to represent all rigging possibilities.

WARNING

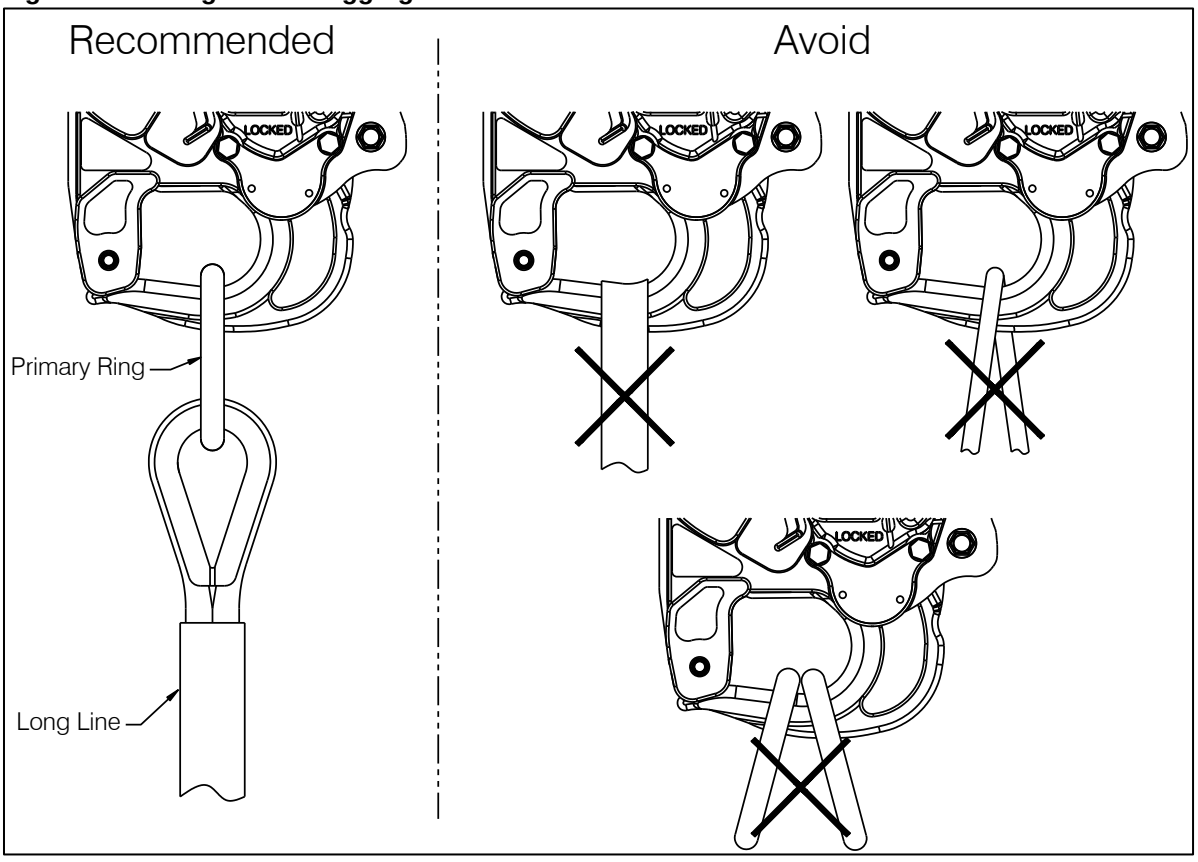
It is the responsibility of the operator to ensure the cargo hook will function properly with each rigging.

5.3.1 Nylon Type Straps and Rope

WARNING

Multiple load rings, 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 5.3.1 Cargo Hook Rigging



6.0 Maintenance

Refer to the Instructions for Continued Airworthiness (ICA) manual 123-039-00 for maintenance of the cargo hook suspension system. For maintenance of cargo hook P/N 528-020 series refer to Component Maintenance Manual 122-004-00.

6.1 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.

NOTICE

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:

1. Package the component carefully to ensure safe transit.
2. Write the RMA number on the outside of the box or on the mailing label.
3. Include the RMA number and reason for the return on your purchase or work order.
4. Include your name, address, phone and fax number and e-mail (as applicable).
5. Return the components freight, cartage, insurance and customs prepaid to:

Onboard Systems
13915 NW 3rd Court
Vancouver, Washington 98685
USA
Phone: 360-546-3072

7.0 Certification

7.1 FAA STC

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number **SR00713SE**

This certificate, issued to **Onboard Systems International**
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 * of the * Regulations.*

Original Product—Type Certificate Number: * See attached Federal Aviation Administration (FAA)
Make: Approved Model List (AML) SR00713SE for approved
Model: rotorcraft models and applicable airworthiness regulations

Description of the Type Design Change: Installation of Onboard Systems International Cargo Hook Kit in accordance with the master drawing list as listed on AML SR00713SE. Maintained in accordance with FAA-approved Component Maintenance Manual (CMM) Document No. 122-028-00, Revision 4, dated July 30, 2015, or later FAA-approved revision or Instructions for Continued Airworthiness (ICA) Document No. 123-039-00, Revision 2, dated March 30, 2017, or later FAA-accepted revision, as applicable. Operated in accordance with the applicable FAA-approved Rotorcraft Flight Manual Supplement as listed on AML SR00713SE.

Limitations and Conditions: Approval of this change in type design applies to only those model rotorcraft listed on AML SR00713SE which were previously equipped with an FAA-approved installation of Bell cargo hook suspension assembly Part Number 204-072-915-25 or Part Number 204-072-915-103 or U.S. Army cargo suspension Part Number 204-072-024-1. 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. A copy of this certificate, the Owner's Manual identified in the MDL, the applicable FAA-approved RFMS, and the applicable CMM or ICA, must be maintained as a part of the permanent records of 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.

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: May 11, 1999
Date of issuance: July 6, 1999
Date reissued:
Date amended: 1/13/03; 3/15/05; 6/2/06, 9/27/07; 10/31/07; 5/21/10; 8/15/14; 11/4/15; 5/4/17

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 2 PAGES

7.2 FAA STC AML

FEDERAL AVIATION ADMINISTRATION (FAA) APPROVED MODEL LIST (AML) SR00713SE
FOR
CARGO HOOK SUSPENSION SYSTEM

ISSUE DATE: July, 6, 1999

ITEM	ROTORCRAFT MAKE	ROTORCRAFT MODEL	ORIGINAL TC NUMBER	CERTIFICATION BASIS FOR ALTERATION	FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT		FAA APPROVED MASTER DRAWING LIST		AML REV DATE
					Number **	Revision*	Drawing	Revision*	
1.	Bell	204B, 205A, 205A-1, 205B (S/N 30297 only), 210	H1SW	FAR Part 29	121-021-00 121-060-00	Revision 5, 3/30/2017 Revision 1, 3/30/2017	155-048-00	Revision 25, 3/31/17	5/4/2017
2.	Bell	212, 412, 412EP, 412CF	H4SW	FAR Part 29	121-021-00 121-060-00	Revision 5, 3/30/2017 Revision 1, 3/30/2017	155-048-00	Revision 25, 3/31/17	5/4/2017
3.	Rotorcraft Development Corporation	UH-1H	H13WE	FAR Part 29	121-021-00 121-060-00	Revision 5, 3/30/2017 Revision 1, 3/30/2017	155-048-00	Revision 25, 3/31/17	5/4/2017
4.	Northwest Rotorcraft, LLC	UH-1H	R00005SE	FAR Part 29	121-021-00 121-060-00	Revision 5, 3/30/2017 Revision 1, 3/30/2017	155-048-00	Revision 25, 3/31/17	5/4/2017
5.	Agusta	AB412, AB412EP (S/N 25801 AND SUBS)	H79EU	FAR Part 29	121-021-00 121-060-00	Revision 5, 3/30/2017 Revision 1, 3/30/2017	155-048-00	Revision 25, 3/31/17	5/4/2017
6.	OAS Parts LLC	UH-1H	H7SO	FAR Part 29	121-021-00 121-060-00	Revision 5, 3/30/2017 Revision 1, 3/30/2017	155-048-00	Revision 25, 3/31/17	5/4/2017

Page 2 of FAA STC AML:

FEDERAL AVIATION ADMINISTRATION (FAA) APPROVED MODEL LIST (AML) SR00713SE
FOR
CARGO HOOK SUSPENSION SYSTEM

ISSUE DATE: July, 6, 1999

ITEM	ROTORCRAFT MAKE	ROTORCRAFT MODEL	ORIGINAL TC NUMBER	CERTIFICATION BASIS FOR ALTERATION	FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT		FAA APPROVED MASTER DRAWING LIST		AML REV DATE
					Number **	Revision*	Drawing	Revision*	
7.	Tamarack Helicopters, Inc.	UH-1F	H7NE	FAR Part 29	121-021-00 121-060-00	Revision 5, 3/30/2017 Revision 1, 3/30/2017	155-048-00	Revision 25, 3/31/17	5/4/2017
8.	Tamarack Helicopters, Inc.	UH-1H	R00010SE	FAR Part 29	121-021-00 121-060-00	Revision 5, 3/30/2017 Revision 1, 3/30/2017	155-048-00	Revision 25, 3/31/17	5/4/2017

* Or later FAA Approved Revision
** As applicable

FAA Approved: for Manager, Seattle Aircraft Certification Office

AMENDED: 6/2/2006; 5/21/2010; 8/24/2012; 11/4/2015; 5/4/17
REISSUED:

7.3 Transport Canada STC

Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

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

Number: SH99-215
Issue No.: 3
Approval Date: September 14, 1999
Issue Date: February 10, 2016

Responsible Office: Pacific

Aircraft/Engine Type or Model: Bell 204B, 205A, 205A-1, 205B, 210, 212, 412, 412 EP

Canadian Type Certificate or Equivalent: H-104 (Bell 205B, 210); H-86 (Bell 212, 412, 412 EP)
H1SW (Bell 204B, 205A, 205A-1)

Description of Type Design Change: Installation of Onboard Systems Cargo Hook Suspension System per FAA STC SR00713SE

Installation/Operating Data, Required Equipment and Limitations:

Installation of Onboard Systems International Cargo Hook Suspension System in accordance with the Master Drawing List as listed on the FAA Approved Model List (AML) SR00713SE. Maintain this Cargo Hook Suspension System in accordance with FAA approved Component Maintenance Manual, Document No. 122-028-00, Rev. 4, dated July 30, 2015* or Instructions for Continued Airworthiness (ICA), Document No. 123-039-00, Rev. 0, dated June 26, 2015, or later FAA accepted revision.

Approval of this change in type design applies to Bell 204B, 205A, 205A-1, 205B (S/N 30297 only), 210, 212, 412, and 412EP rotorcraft which were previously equipped with an FAA approved installation of Bell cargo hook suspension assembly, P/N 204-072-915-25 or 204-072-915-103. Modified rotorcraft must be operated in accordance with an FAA approved copy of Onboard Systems Rotorcraft Flight Manual Supplement No. 121-021-00, Rev. 4, dated August 01, 2012 * or 121-060-00, Revision 0, dated October 13, 2015 *.

(* 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

7.4 EASA STC

EASA
European Aviation Safety Agency

SUPPLEMENTAL TYPE CERTIFICATE

10057199 REV. 4

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to:

ONBOARD SYSTEMS INTERNATIONAL

13915 NW 3RD COURT
VANCOUVER WA 98685
USA

and 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 Type Certificate Number: 1. US H1SW
2. EASA.IM.R.106
3. EASA.R.114

Type Certificate Holder: 1&2. Bell Helicopter Textron
3. LEONARDO S.p.A.

Type: 1. Bell 204/205/210
2. Bell 212/412
3. AB 212/AB 412

Model: 1. 204B, 205A-1
2. 212, 412, 412EP
3. AB 412, AB 412EP

Original STC Number: FAA SR00713SE

See Continuation Sheet(s)

For the European Aviation Safety Agency

Date of Issue: 13 January 2017

Pier Giorgio COLOMBO
Medium Rotorcraft Section Manager

EASA.IM.R.S.00552
SUPPLEMENTAL TYPE CERTIFICATE - 10057199 - REV. 4 - ONBOARD SYSTEMS INTERNATIONAL - 302945

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An Agency of the European Union

EASA STC continued

EASA
European Aviation Safety Agency

Description of Design Change:
Installation of Onboard Systems International Cargo Hook Suspension Kit in accordance with master drawing list 155-048-00
Reasons for the revision of the approval:
Revision 1 issued to correct the RFM document number.
Revision 2 issued to extend the approval to the Bell 412
Revision 3 issued to extend the approval to the Bell 412EP.
Revision 4 issued to include the kit with delayed electrical release.

EASA Certification Basis:
The Certification Basis (CB) for the original product remains applicable to this certificate/ approval.
The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Associated Technical Documentation:
- Rotorcraft Flight Manual Supplement Cargo Hook Suspension Kit Document Number 121-021-00 Revision 4, dated August 1, 2012.
- Rotorcraft Flight Manual supplement Cargo Hook Suspension Kit Document Number 121-060-00 Revision 0, dated October 13 2015

or later revisions of the above listed documents approved by EASA in accordance with EASA ED Decision 2004/04/CF (or subsequent revisions of this decision) and/ or the Technical Implementation Procedures of EU/ USA Bilateral Agreement.

- Master Drawing List Number 155-048-00 Revision 23, dated September 09 2015.
- Component Maintenance Manual Number 122-028-00 Revision 4, dated July 30 2015
- Instructions for Continued Airworthiness Document Number 123-039-00 Revision 0, dated June 26 2015.

Limitations/Conditions:
Approval of this change in type design is only applicable to the models listed in this certificate which were previously equipped with Bell Cargo hook suspension assembly Part Number 204-072-915-25 or Part Number 204-072-915-103.
The Cargo Hook suspension systems, as installed in accordance with this approval, do not meet the certification requirements for Human External Cargo (HEC).

Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- End -

EASA.IM.R.S.00552
SUPPLEMENTAL TYPE CERTIFICATE - 10057199 - REV. 4 - ONBOARD SYSTEMS INTERNATIONAL - 302945

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