

**PLEASE CHECK WEB SITE AT WWW.ONBOARDSYSTEMS.COM FOR
THE LATEST REVISION OF THIS MANUAL**

**FAA APPROVED
ROTORCRAFT FLIGHT MANUAL
SUPPLEMENT**

STC SR01943SE

**Bell 407 Cargo Hook Kit
with Hydraulic Release**

R/N _____ S/N _____

FAA Approved:



122 Manager, Seattle Aircraft Certification Office
Federal Aviation Administration
Renton, Washington

Date: *2/13/2017*



Rotorcraft Flight
Manual Supplement
Cargo Hook Kit

Document Number
121-061-00

Page
1 of 22

Rev. 2

Record of Revisions

Rev.	Date	Page(s)	Reason for Revision
0	Dec. 5, 2008	All	Initial Release.
1	Sept. 10, 2015	All	Updated Types of Operation section.
2	Feb. 13, 2017	All	Added cargo hook (P/N 528-028-02) with Surefire release and associated instructions.



Rotorcraft Flight
Manual Supplement
Cargo Hook Kit

Document Number
121-061-00

Rev. 2

Page
2 of 22

FAA Approved
FEB 13 2017

INTRODUCTION

This supplement must be attached to the appropriate Bell FAA approved Rotorcraft Flight Manual when an Onboard Systems P/N 200-412-00, 200-412-10, 200-413-00, 200-413-01, 200-413-10, or 200-413-11 cargo hook suspension system is installed in accordance with Supplemental Type Certificate (STC) NO. SR01943SE. The information contained herein supplements or supersedes the basic manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the basic Rotorcraft Flight Manual.

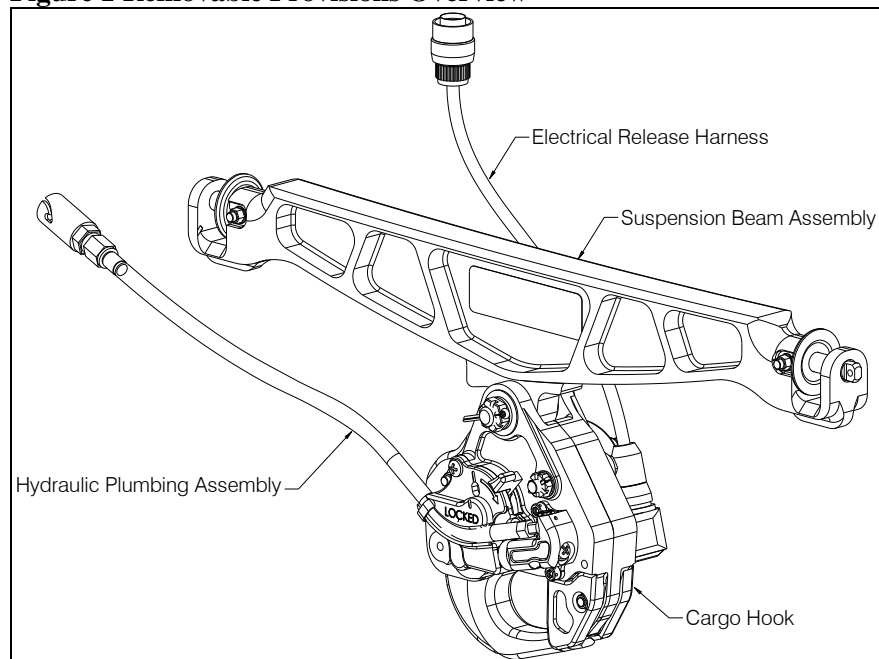
The cargo hook suspension kits include fixed provisions and removable provisions. The fixed provisions include the internal electrical release harnesses, the internal hydraulic backup release system including the release lever on the cyclic, miscellaneous supporting brackets, and pillow blocks. The pillow blocks support each end of the suspension beam assembly and attach to the rotorcraft's hard points.

The removable provisions include the cargo hook, suspension beam assembly, external hydraulic plumbing assembly, and external electrical release harness (see Figure 1). The suspension beam assembly supports the cargo hook and allows it to align itself with the external load. These items interface with the fixed provisions kit to form a complete external load carrying system.

	Rotorcraft Flight Manual Supplement Cargo Hook Kit	Document Number	Rev. 2
		121-061-00	
		Page	FAA Approved
		3 of 22	FEB 13 2017

INTRODUCTION continued

Figure 1 Removable Provisions Overview



The P/N 200-413 series kits include a load weigh system. The load weigh system consists of a cockpit-mounted indicator, a load cell above the cargo hook, and the interconnecting wiring harness.

Kit P/N 200-412-10 and 200-413-10 are the same as 200-412-00 and 200-413-00 respectively except they include a cargo hook (P/N 528-028-02) with a delay circuit to help protect against inadvertent load release as a result of accidental contact with the Cargo Release switch or inadvertently pressing this switch. This delay circuit requires that the release switch be held for approximately ½ second in order to release the cargo hook load. This feature is referred to as Surefire Release.



Rotorcraft Flight Manual Supplement Cargo Hook Kit

Document Number
121-061-00

Rev. 2

Page
4 of 22

FAA Approved
FEB 13 2017

1. LIMITATIONS

The limitations specified in the basic flight manual issued by Bell Helicopter remain applicable and are supplemented by the following.

1-3. Types of Operation

With a load attached to the cargo hook, operation shall be conducted in accordance with the respective national operational requirements.

The cargo hook kit configurations (as installed per this STC SR01943SE) do not meet the 14 CFR part 27 certification requirements for Human External Cargo (HEC).

NOTICE

The cargo hook kit certification approval does not constitute operational approval; operational approval for external load operations must be granted by the local Aviation Authority.

WARNING

The suspension assembly is designed to allow the cargo hook to pivot and align with the external load in all directions with limits to protect the cargo hook and its electrical release cable and hydraulic hose from damage. Take precautions to prevent external load angles which exceed the limits of rotation provided by the suspension assembly as the load may not be releasable in this position.



Rotorcraft Flight
Manual Supplement
Cargo Hook Kit

Document Number

121-061-00

Rev. 2

Page

5 of 22

FAA Approved

FEB 13 2017

1. LIMITATIONS continued

1-3. Types of Operation continued

For solo external load operations from the left crew seat: (1) the backup release system control must be installed on the left crew seat cyclic, (2) there must be provisions made to ensure that equipment originally intended to be operated by the pilot from the right crew seat is equally operable from the left crew seat with similar controls and (3) left crew seat pilot-in-command operation must be approved.

The helicopter may be operated with only the fixed provisions kit installed or may be operated without the load weigh kit installed.

The load weigh indicator (included with kit P/Ns 200-413-00, 200-413-01, 200-413-10, and 200-413-11) shall be operated in accordance with Owner's Manual 120-039-00.

	Rotorcraft Flight Manual Supplement Cargo Hook Kit	Document Number 121-061-00	Rev. 2
		Page 6 of 22	FAA Approved FEB 13 2017

1. LIMITATIONS continued

1-6. Weight and Center of Gravity

Consult the basic flight manual for Gross Weight and Center of Gravity limits of the helicopter.

The external load limit for the cargo hook suspension is the lesser of 2,650 lbs (1202 kg) or as allowed by the basic flight manual.

1-7. Airspeed

Consult the basic flight manual for airspeed limitations with an external load attached to the cargo hook.

Maximum operational airspeed with external loads is dependent upon the load configuration and sling length. It is the responsibility of the operator to establish the maximum operational airspeed for each specific configuration.



Rotorcraft Flight
Manual Supplement
Cargo Hook Kit

Document Number
121-061-00

Rev. 2

Page
7 of 22

FAA Approved
FEB 13 2017

1. LIMITATIONS continued

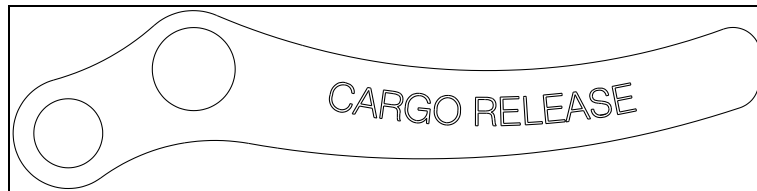
1-20 Placards

The following placards are included with kit P/Ns 200-412-00, 200-412-10, 200-413-00, 200-413-01, 200-413-10 and 200-413-11.

Mounted on suspension beam assembly:

EXTERNAL LOAD LIMIT
2650 LBS.
1202 KGS.

Engraved on the hydraulic release lever located on the cyclic:



When the Load Weigh System (included with kit P/N 200-413 series) is installed the following placards apply.

Mounted adjacent to the load weigh indicator in full view of pilot or co-pilot:

TURN THE WEIGHING SYSTEM OFF WHEN
NAVIGATION EQUIPMENT IS IN USE. NO AIRCRAFT
OPERATION SHOULD BE PREDICATED ON THE
READING OF THE ONBOARD WEIGHING SYSTEM.

Mounted adjacent to the power switch and the circuit breaker in full view of the pilot and co-pilot:

ELECTRONIC WEIGHING SYSTEM



Rotorcraft Flight
Manual Supplement
Cargo Hook Kit

Document Number
121-061-00

Rev. 2

Page
8 of 22

FAA Approved
FEB 13 2017

1. LIMITATIONS continued

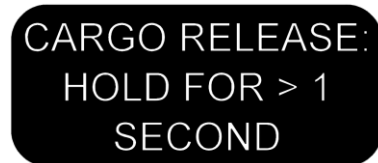
1-20 Placards

The following placards are included with kit P/Ns 200-412-10, 200-413-10 and 200-413-11. These kits include cargo hook P/N 528-028-02 with feature Surefire Release.

- Adhered on the solenoid housing of cargo hook P/N 528-028-02.



- Adhered adjacent to the cockpit cargo release switch if Cargo Hook P/N 528-028-02 is installed:



2. NORMAL PROCEDURES continued

2-2 Flight Planning

Instruct ground crew to discharge the helicopter's static electricity (before attaching the load to the cargo hook) by touching the airframe with a ground wire or if a metal sling is used, the load ring can be struck against the cargo hook. Re-ground if contact is lost and if possible maintain contact until load attachment is completed.

Extreme care must be exercised in rigging a load to the Cargo Hook. Figure 2.1 shows the recommended rigging configuration and rigging to avoid. The examples shown are not intended to represent all possibilities.



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



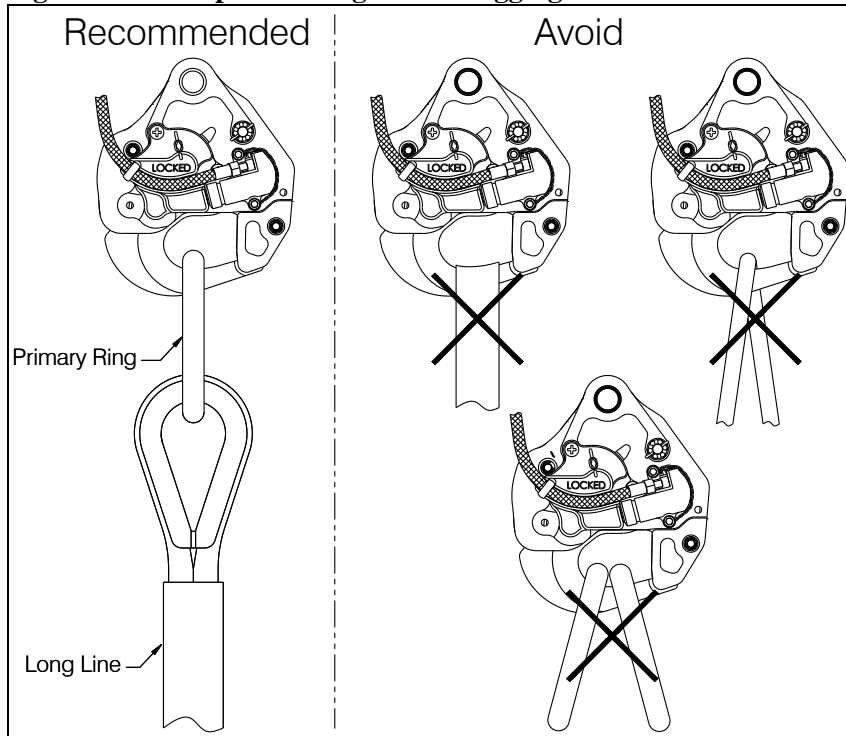
Nylon type straps or rope must not be used directly on the cargo hook load beam. If nylon straps or rope must be used they should be first attached to a steel primary ring. Verify that the ring will freely slide off the load beam when it is opened. Only the primary ring should be in contact with the load beam. See Figure 2.1.

	Rotorcraft Flight Manual Supplement Cargo Hook Kit	Document Number 121-061-00	Rev. 2
		Page 10 of 22	FAA Approved FEB 13 2017

2. **NORMAL PROCEDURES** continued

2-2 **Flight Planning** continued

Figure 2.1 Examples of Cargo Hook Rigging



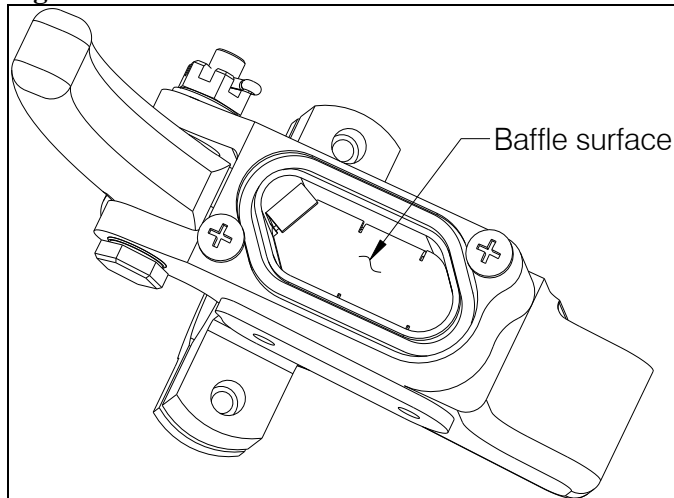
2. NORMAL PROCEDURES continued

2-3 Pre-flight Check

Before a flight involving external load operations perform the following procedures.

1. Visually check all cargo hook fasteners to ensure that they are tight.
2. Visually check the electrical connectors for damage and security.
3. Visually check the hydraulic hose and its connections for damage and security.
4. Check the fluid level in the master cylinder reservoir on the cyclic. The master cylinder reservoir features a transparent lid through which the fluid level can be checked. Hydraulic fluid must be visible over the baffle surface.

Figure 2.2 Fluid Level

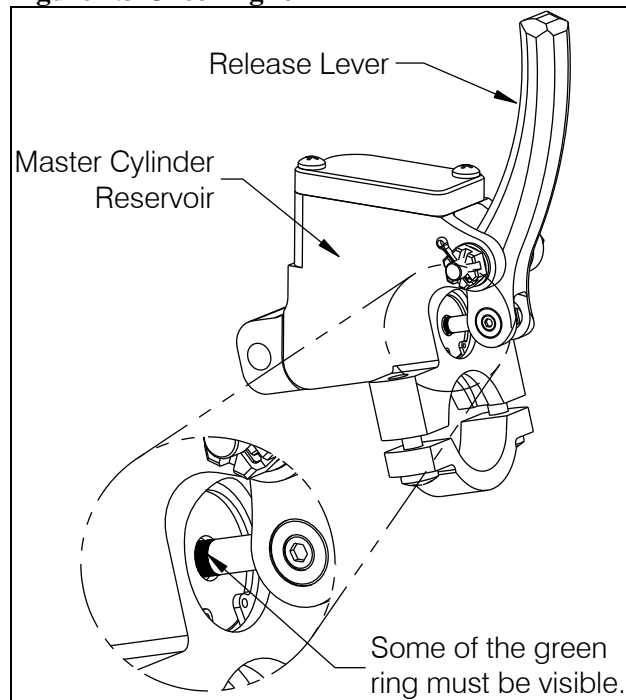


2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

5. Check the hydraulic release system for excess air in the lines by firmly pulling the release lever located on the cyclic until it comes to a stop. Check the piston position (see Figure 2.3). If some of the green ring on the push rod is visible, the system is ready for use. If none of the green ring is visible, the system needs to be bled. Refer to applicable Owner's Manual or ICA for bleed instructions.

Figure 2.3 Checking for Air



2. NORMAL PROCEDURES continued

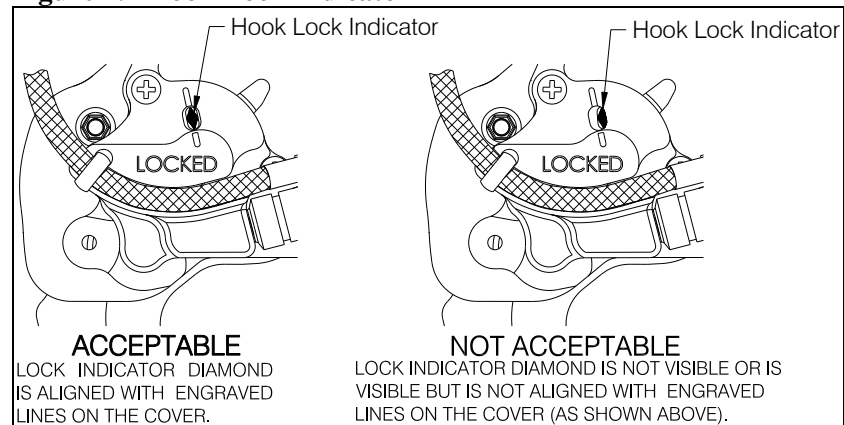
2-3 Pre-flight Check continued

6. Cycle the manual release system to ensure proper operation. Pull the release lever located on the cyclic (see Figure 2.6). With no load on it, the cargo hook's load beam should open. The cargo hook may be returned to the locked position by manually pushing up on the load beam. The load beam should snap shut.



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 should align with the lines on the cover (see Figure 2.4).

Figure 2.4 Hook Lock Indicator



2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

7. Check the operation of the cargo hook's electrical release system to ensure proper operation. The following instructions are applicable to cargo hook P/N 528-028-00.

NOTICE

If Cargo Hook with Surefire Release (P/N 528-028-02) is installed, the electrical release includes a 1/2 second time delay. See specific procedures in this step for this model.

- Press the electrical release switch on the cyclic; the cargo hook 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 (see Figure 2.4).

NOTICE

The cargo hook system interfaces with the rotorcraft's CARGO RELEASE switch on the cyclic as supplied by Bell.



Rotorcraft Flight
Manual Supplement
Cargo Hook Kit

Document Number
121-061-00

Rev. 2

Page
15 of 22

FAA Approved
FEB 13 2017

2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

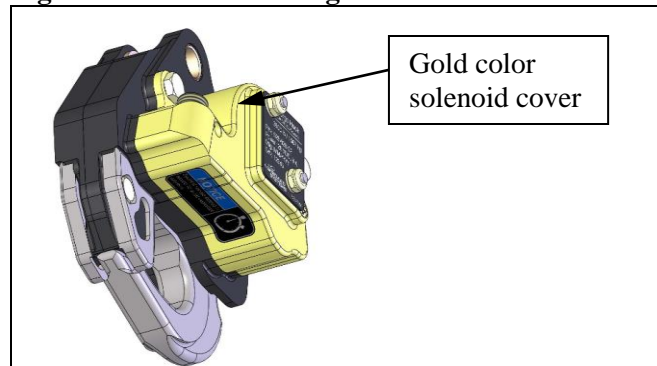
The following instructions are applicable to the cargo hook P/N 528-028-02. In addition to the P/N, this cargo hook can also be identified by its gold color solenoid cover (see Figure 2.5).

- 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 several 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 hook lock indicator is aligned with the engraved line on the manual release cover (see Figure 2.4)

NOTICE

By design (to help protect against inadvertent load release) cargo hook P/N 528-028-02 requires that the Cargo Release switch on the cyclic be held for at least ½ second to release the load.

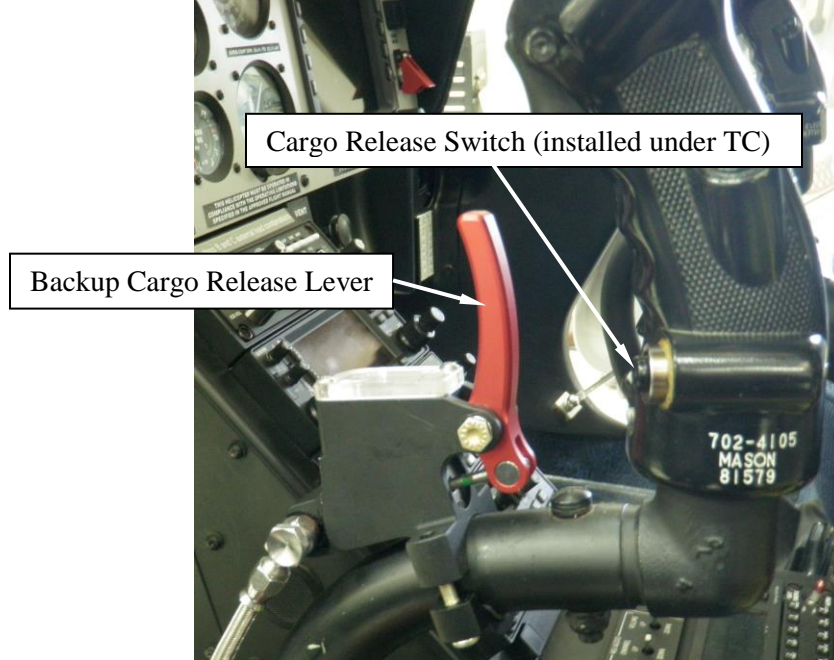
Figure 2.5 Surefire Configuration Identification



2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

Figure 2.6 Cargo Release Switch and Lever Locations



8. Move the cargo hook and the suspension beam assembly throughout their full ranges of motion to ensure the hydraulic hose and electrical harnesses have enough slack. The hydraulic hose or electrical harnesses must not be the stops that prevent the cargo hook or suspension beam assembly from moving freely in all directions.

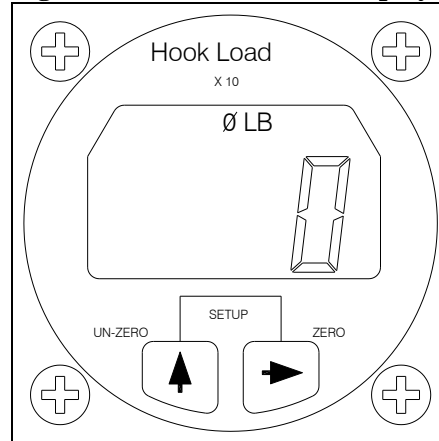
2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

If the Load Weigh System is installed, perform the following additional procedure:

1. Power on the C-39 Load Indicator. After a brief self-diagnostic routine is complete the indicator display should indicate “0” as shown below (with no load on the cargo hook):

Figure 2.7 C-39 Indicator Display



NOTICE

Refer to Owner's Manual 120-039-00 for setup instructions including changing the units, changing the calibration code, zeroing the display, changing the dampening level, etc.

2. NORMAL PROCEDURES continued

2-8 Takeoff

1. Hover at sufficient height to allow a ground crew member to discharge static electricity and attach the load to the cargo hook.
2. Ascend vertically, directly over the load, and then slowly lift the load from the ground.
3. Check for adequate directional control.
4. Check torque required to hover with the load.
5. Take-off into wind, if possible, and ensure the load has clearance over obstacles.

2-9 In-Flight Operations

Make all control movements gently with gradual acceleration and deceleration and only slightly banked turns.



Control movements should be made smoothly and kept to a minimum to minimize oscillation of the external load.

2. NORMAL PROCEDURES continued

2-10 Descent and Landing

1. Perform the approach at minimum rate of descent.
2. Execute the approach to hover with sufficient height to prevent the load from hitting obstacles on or being dragged along the ground and then slowly descend vertically to set the load on the ground.
3. Press the CARGO RELEASE switch on the cyclic to release the load from the cargo hook.

The manual release lever is intended as a backup release in the event of an inability to release the load electrically but may be used to release the load in normal circumstances.

4. Visually check to ensure that the load has been released.



Verify that the external load and long line has dropped free from the rotorcraft before departing the drop-site.

	Rotorcraft Flight Manual Supplement Cargo Hook Kit	Document Number 121-061-00	Rev. 2
		Page 20 of 22	FAA Approved FEB 13 2017

3. EMERGENCY PROCEDURES



In an emergency such as snagged load or engine failure, the manual release system should be the first option for release of the external load as this system provides greater load release authority in an overload condition. If the manual release option fails, NEXT try the electrical release.

In the event that the cargo hook will not release the load electrically, proceed as follows.

1. Maintain tension on the sling.
2. Pull the release lever on the cyclic to release the load.

4. PERFORMANCE

Consult the basic flight manual issued by Bell for out of ground effect hover performance.

There is no change from flight performance as specified in the basic flight manual when no load is attached to the cargo hook. Performance will be reduced depending on the size, weight and shape of the external load.

If the Load Weigh System is installed the following applies. The Load Weigh System is designed and installed as a means of MONITORING the load (weight) suspended from the cargo hook. Functional and performance characteristics have not been determined on the basis of the load cell indication or display. Therefore, this instrument shall NOT be used as an indication of performance and flight operation must NOT be predicated on its use.



Rotorcraft Flight
Manual Supplement
Cargo Hook Kit

Document Number

121-061-00

Rev. 2

Page

21 of 22

FAA Approved

FEB 13 2017

5. WEIGHT AND BALANCE

5-2 Empty Weight Center of Gravity

The cargo hook is located at FS 121.0 (3073 mm).

	Rotorcraft Flight Manual Supplement Cargo Hook Kit	Document Number 121-061-00	Rev. 2
		Page 22 of 22	FAA Approved FEB 13 2017