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**FAA APPROVED
ROTORCRAFT FLIGHT MANUAL
SUPPLEMENT**

STC SR01943SE

Bell 407 Cargo Hook Kit

R/N _____ S/N _____

FAA Approved:  For _____
Digitally signed by
ROBERT Y SCHLEIN
Date: 2022.01.13
16:08:42 -08'00'
Manager, Northwest Flight Test Section, AIR-715
Federal Aviation Administration
Seattle, WA

Date: 13 Jan 2022



Rotorcraft Flight
Manual Supplement


Cargo Hook Kit

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Record of Revisions

Rev.	Page(s)	Reason for Revision	FAA Approval
0	All	Initial Release.	Dec. 5, 2008
1	All	Updated Types of Operation and Normal Procedures section.	Sept. 10, 2015
2	All	Added cargo hook (P/N 528-029-02) with Surefire Release and associated instructions.	Feb. 13, 2017
3	All	Added C-40 Indicator (P/N 210-293-00) and associated instructions. Updated Limitations section per recent FAA guidance.	 Digitally signed by ROBERT Y SCHLEIN Date: 2022.01.13 16:08:23 -08'00'

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INTRODUCTION

Attach this supplement to the Bell 407 FAA approved Rotorcraft Flight Manual (RFM) when an Onboard Systems cargo hook/load weigh kit P/N 200-328-00, 200-329-00, 200-329-10, 200-330-00, 200-331-00, 200-331-01, and/or 200-331-02 is installed in accordance with Supplemental Type Certificate (STC) No. SR01943SE, see section 6 for a description of these kits. 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 RFM.



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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.

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 is the lesser of 2,650 lbs. (1202 kg) or as allowed by the basic RFM.



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1-7 Airspeed

V_{NE} with a load attached to the cargo hook is 100 KIAS or placarded V_{NE} , whichever is less.



Airspeed with an external load is limited by controllability. Caution should be exercised when carrying an external load, as handling characteristics may be affected by size, weight, and shape of the load.



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1-20 Placards

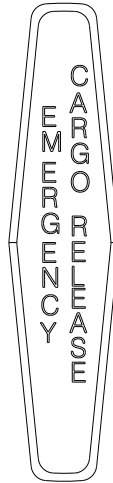
When an Onboard Systems kit P/N 200-329-00, 200-329-10 or 200-330-00 is installed the following placard applies.

Mounted on suspension beam assembly:

EXTERNAL LOAD LIMIT 2650 LBS. 1202 KGS.

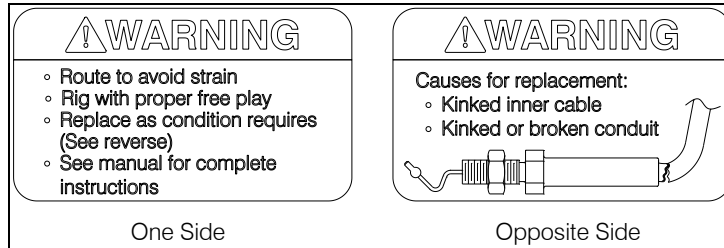
When an Onboard Systems kit P/N 200-328-00 is installed the following placard applies.

Engraved on the top of the manual release T-handle as shown:

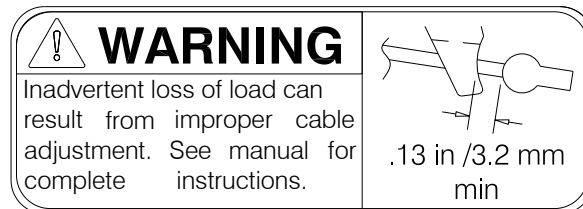


1-20 Placards continued

- Located on the manual release cable, near the cargo hook:



- Located on the bottom of the cargo hook:



- Adhered on the solenoid housing of optional cargo hook P/N 528-029-02 which is equipped with Surefire Release:



1-20 Placards continued

- Adhered adjacent to the cockpit cargo release switch if optional Cargo Hook with Surefire Release P/N 528-029-02 is installed:

**CARGO RELEASE:
HOLD FOR > 1
SECOND**

When kit P/N 200-331-00 or P/N 200-331-01 is installed the following placard applies. This placard is not applicable to the C-40 Indicator (P/N 210-293-00) that is included with kit P/N 200-331-02.

- Mounted adjacent to the Onboard Systems 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.

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2. NORMAL PROCEDURES

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.

Exercise care when rigging a load to the Cargo Hook. Attaching the external load using a steel load ring on the Cargo Hook's load beam is the recommended rigging configuration to provide consistent release performance and resistance to fouling. Figure 2.1 shows the recommended rigging configuration and rigging to avoid, but is not intended to represent all possibilities. For each rigging configuration used, verify that the rigging will freely slide off the load beam when it is opened.



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



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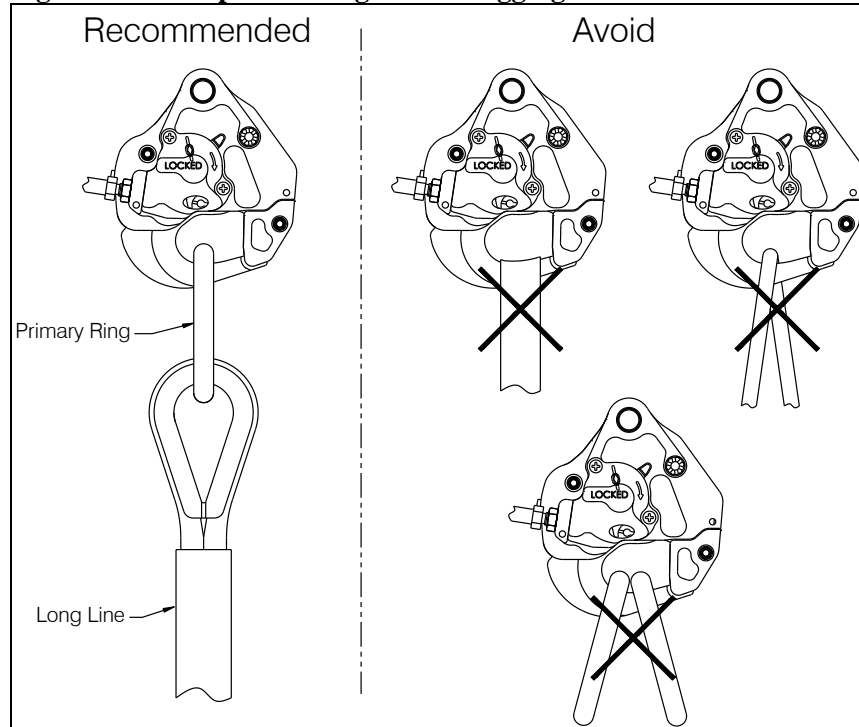
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2. **NORMAL PROCEDURES** continued
2-2 **Flight Planning** continued

Figure 2.1 Examples of Cargo Hook Rigging



2. **NORMAL PROCEDURES** continued

2-3 **Pre-flight Check**

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

1. Visually check all fasteners to ensure that they are tight.
2. Visually check the electrical connectors for damage and security.
3. Visually check the cargo hook case and covers for cracks and damage.
4. Visually check the cargo hook load beam for gouges and cracks.
5. Visually check the manual release cable for damage and security. Pay close attention to the flexible conduit at the area of transition to the cargo hook end fitting (see Figure 2.2). Check for kinked, broken, or splitting of the heat shrink and outer black conduit in this area and separation of the conduit from the steel end fitting.



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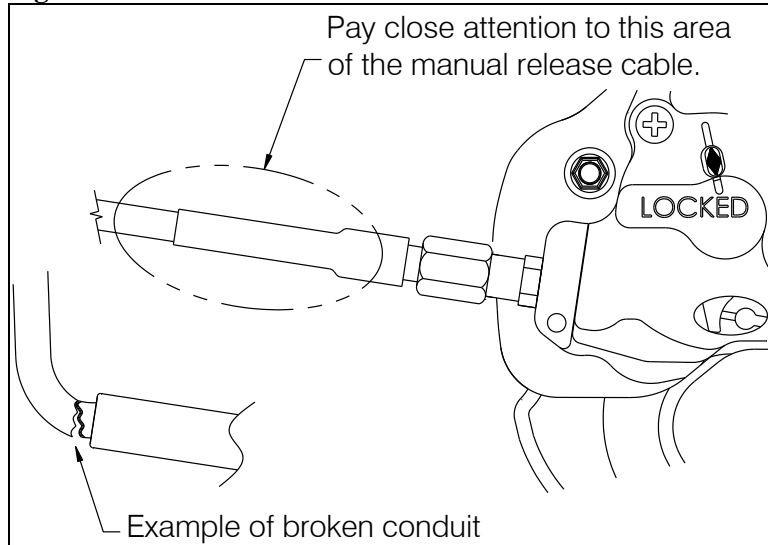
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2. **NORMAL PROCEDURES** continued

2-3 **Pre-flight Check**

Figure 2.2 Manual Release Cable Check



! WARNING

Manual release cables are wearable items and should be replaced as condition requires. Broken or kinked conduit, inner cable kinks, frays, or sticky operation are each cause for immediate replacement.

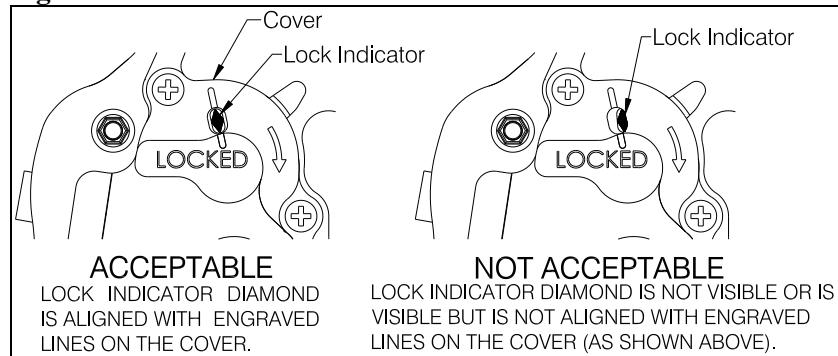
2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

- Cycle the manual release system to ensure proper operation. Pull up on the manual release T-handle located on the center console between the pilot and co-pilot seats. With no load on it, the cargo hook 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 2.3).

Figure 2.3 Hook Lock Indicator



2. **NORMAL PROCEDURES** continued

2-3 **Pre-flight Check** continued

7. Cycle the electrical release system to ensure proper operation. The following instructions are applicable to cargo hook P/N 528-029-00.

NOTICE

If Cargo Hook with Surefire Release (P/N 528-029-02) is installed, the electrical release includes a 1/2 second time delay. See specific procedures in this step for this cargo hook model.

- 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 (see Figure 2.3).

NOTICE

The cargo hook system interfaces with the rotorcraft's internal electrical release switch as supplied by Bell. Consult the Flight Manual Supplement – Cargo Hook for operation of the electrical release system.

2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

The following instructions are applicable to the cargo hook P/N 528-029-02. In addition to the P/N, this cargo hook can also be identified by its gold color solenoid cover (see Figure 2.4).

- *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 2.3)

NOTICE

By design (to help protect against inadvertent load release) cargo hook P/N 528-029-02 requires that the switch on the cyclic be held for at least ½ second to release the load.



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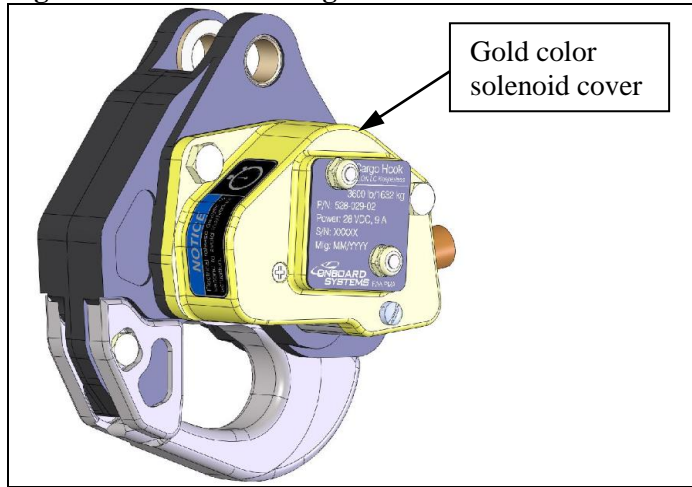
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2. **NORMAL PROCEDURES** continued
2-3 **Pre-flight Check** continued

Figure 2.4 Surefire Configuration Identification



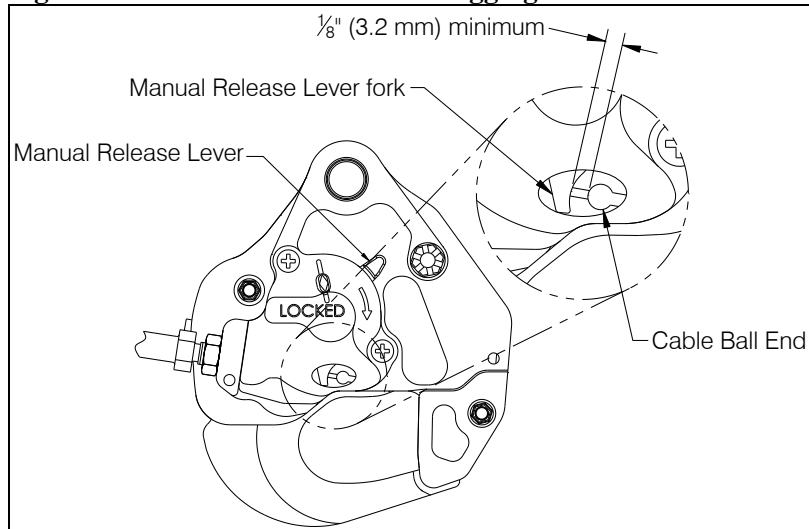
8. Move the cargo hook and the suspension beam throughout their full ranges of motion to ensure the manual release cable and electrical harnesses have enough slack. The manual release cable or electrical harnesses should not be the stops that prevent the cargo hook or suspension from moving freely in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

2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

9. Check the manual release cable rigging through the window in the cargo hook manual release cover. With the cargo hook closed and locked, rotate the manual release lever clockwise to remove the free play (the free play is taken up when the hook lock indicator begins to move, this is also readily felt as the lever rotates relatively easily for several degrees as the free play is taken up) and hold it in this position while checking the gap between the release lever fork and the cable ball end as shown below. Visually check that there is approximately a minimum gap of 1/8" (3.2 mm) as shown in Figure 2.5.

Figure 2.5 Manual Release Cable Rigging



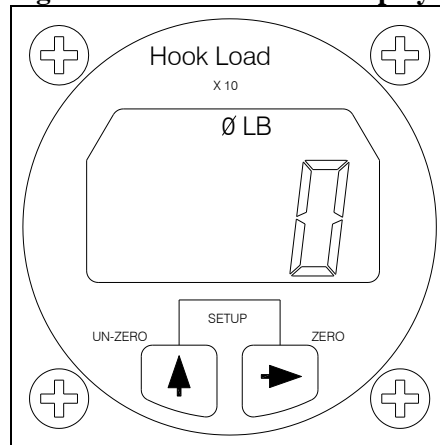
2. NORMAL PROCEDURES continued

2-3 Pre-flight Check continued

If the Load Weigh System is installed, perform the following additional procedures (depending on the Indicator model):

For the C-39 Indicator (P/N 210-095-00 or 210-095-02): On power up, after a brief self-diagnostic routine is complete verify the indicator display indicates “0” as shown below (with no load on the cargo hook):

Figure 2.6 C-39 Indicator Display



NOTICE

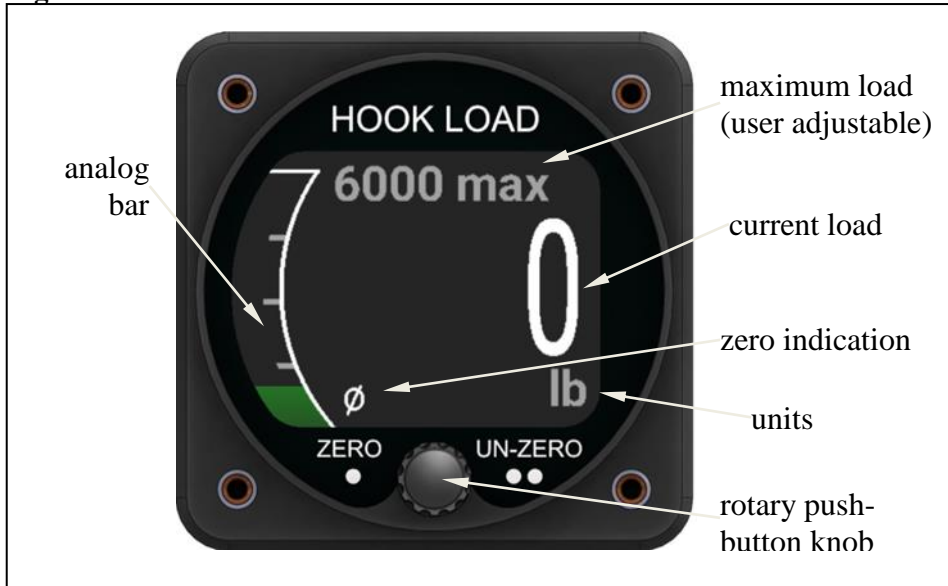
Refer to Owner's Manual 120-039-00 for setup instructions including changing the units, changing the calibration code, zeroing the display, changing the dampening level, etc.

NORMAL PROCEDURES continued

Pre-Flight Check continued

For the C-40 model (P/N 210-293-00): on power up an Information screen will display the Hook Hours, software version, and serial number (S/N) and then the indicator should display the Load screen. The Load screen of the C-40 model is shown below.

Figure 2.7 C-40 Indicator Load Screen



NOTICE

For the C-40 model refer to Owner's Manual 120-152-00 for detailed setup instructions including changing the units, changing the brightness of the display, etc. and additional operation instructions.

NORMAL PROCEDURES continued

Pre-Flight Check continued

The C-40 model includes a Maximum Load setting, this setting provides the option to select a maximum load for each flight involving external load operations based on flight conditions (temperature, altitude, fuel, etc.) or it can be set to the maximum external load rating for the helicopter. To set the maximum load:

- From the Load screen press and hold the rotary push button knob until the Maximum Load screen appears. Release the knob.

Figure 2.8 Maximum Load Screen



User adjustable value
(this value is shown for
reference only)

- Rotate the knob to the left or right to decrease or increase the value to the desired setting.
- Press the knob to set this value.

NORMAL PROCEDURES continued

Pre-Flight Check continued

To zero (or tare) the weight of the long line, net, remote hook, etc. from the displayed load, apply that weight to the cargo hook and press the knob once and the display should zero out. Press the knob twice to un-zero (un-tare) the display and add this weight back in.

NOTICE

The analog bar always displays the un-zeroed load. If there is a discrepancy between the analog bar and the displayed load, a large amount of load has likely been zeroed.



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2. NORMAL PROCEDURES continued

2-8 Takeoff

1. Hover at sufficient height to allow 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.

NOTICE

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

! WARNING

The suspension 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 electrical and manual release cables 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.



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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 system 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.



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3. EMERGENCY PROCEDURES

In the event that the cargo hook will not release the load when the Cargo Release switch on the cyclic is pressed, proceed as follows.

1. Maintain tension on the sling.
2. Pull upward on the Cargo Release T-handle located adjacent to the collective to release the load.

4. PERFORMANCE

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



The Load Weigh System is intended as a means of MONITORING the weight of the load suspended from the Cargo Hook.

Before lifting a load, it is recommended that the load weight be estimated, the shape/size is considered and, upon lifting the load, monitor the load indicator and compare the actual engine torque value vs. the expected value for a given weight to verify sufficient performance.

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5. WEIGHT AND BALANCE

5-2 Empty Weight Center of Gravity

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

6. SYSTEM DESCRIPTION

The P/N 200-328-00 is a cargo hook fixed provisions kit. It includes the internal electrical release harnesses, the internal manual release cable including the T-handle between the pilot and co-pilot seats, and miscellaneous supporting brackets.

The P/N 200-329-00 and 200-329-10 cargo hook kits include the cargo hook, suspension beam assembly, and pillow blocks. The suspension beam assembly supports the cargo hook and allows it to align itself with a load. The pillow blocks support each end of the suspension beam assembly and attach to the rotorcraft's hard points. In addition, the kit includes the external manual release cable and electrical harness. These items interface with the fixed provisions kit on the rotorcraft.

Kit P/N 200-329-10 is the same as 200-329-00 except it includes a cargo hook (P/N 528-029-02) 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.



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6. SYSTEM DESCRIPTION continued

P/N 200-330-00 kit is the same as the P/N 200-329-00 cargo hook suspension kit except it does not include pillow blocks. It is intended for use with the pillow blocks supplied by Bell.

P/N 200-331-00, 200-331-01, and 200-331-02 kits are load weigh systems. They consist of a cockpit-mounted indicator, a load cell above the cargo hook, and the interconnecting wiring harness. These kits can be used with the P/N 200-329-00, 200-329-10 or 200-330-00 cargo hook suspension kit. The kits are the same except the 200-331-00 kit includes a C-39 model indicator with 5V backlight, the 200-331-01 kit includes a C-39 model indicator with a 28V backlight, and the 200-331-02 includes the next generation C-40 model indicator.

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