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FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT

STC SR01808SE

Onboard Systems
Cargo Hook Suspension System
with Keeperless Cargo Hook
for the
Robinson R44, R44 II

R/N _____ S/N _____

FAA Approved: _____ For _____
Digitally signed by ROBERT Y SCHLEIN
Date: 2022.04.11 08:54:42 -07'00'

Manager, Northwest Flight Test Section, AIR-715
Federal Aviation Administration
Seattle, WA

Date: 11 Apr 2022

Record of Revisions

Rev.	Date	Page(s)	Reason for Revision
0	Jan. 07, 2008	All	Initial Release.
1	Feb. 25, 2009	All	Added Load Weigh System and accompanying instructions.
2	July 1, 2009	All	Added figure for manual release rigging check, revised figure for hook lock indicator for clarification.
3	March 29, 2016	All	Added remote hook electrical release system, re-formatted document, updated limitations section.
4	Oct. 24, 2016	All	Added "Warning" regarding long line recoil, updated pre-flight check for the C-39 load indicator, added "NOTICE" to note that the Remote Hook is not included with the kits.
5	May 19, 2017	All	Added cargo hook (P/N 528-029-02) with Surefire Release and associated instructions.
6	11 Apr 2022 	All	Added C-40 load weigh indicator and associated instructions. Moved System Description section to back of manual as a non-FAA approved section and added Weight and Balance to this section.

SECTION 1
GENERAL

INTRODUCTION

Attach this supplement to the appropriate FAA approved Rotorcraft Flight Manual (RFM) when an Onboard Systems International, LLC P/N 200-326-00, 200-327-00, 200-327-01, 200-327-02, 200-327-10, 200-327-11, or 200-327-12 Cargo Hook Suspension Kit and/or 200-396-00 Remote Hook Release Kit is installed in accordance with Supplemental Type Certificate (STC) NO. SR01808SE. 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.

SECTION 2
LIMITATIONS

AIRSPEED LIMITS

Vne = 80 KIAS, or less with external load. Do not exceed Vne of basic helicopter (Vne determined from maximum demonstrated airspeed with dense cargo).

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

WEIGHT LIMITS

The maximum Cargo Hook load is 800 lbs (363 kgs). Consult the basic Rotorcraft Flight Manual for weight limits for the rotorcraft.

CENTER OF GRAVITY LIMITS

Center of gravity limits must be checked with and without the external load to verify that the rotorcraft is within the approved center of gravity limits.

KINDS OF OPERATION LIMITATIONS

The basic Flight Manual remains applicable. With a load attached to the cargo hook, operation shall be conducted in accordance with the respective national operational requirements.

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

NOTICE

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

The optional remote hook electrical release kit (P/N 200-396-00) is limited to use with intermittent electrical loads only, such as electrical release of a remote cargo hook.

PLACARDS

The following placards are included with the kits.

Mounted on the belly of the aircraft adjacent to the cargo hook attachment point in clear view of the ground support personnel.

FOR FAR PART 133.35(A) OPERATIONS:
NO PERSON MAY BE CARRIED UNLESS HE IS:
(1) A FLIGHT CREW MEMBER OR TRAINEE;
(2) PERFORMS AN ESSENTIAL FUNCTION IN CONNECTION WITH THE EXTERNAL LOAD OPERATION; OR
(3) IS NECESSARY TO ACCOMPLISH THE WORK ACTIVITY DIRECTLY ASSOCIATED WITH THAT OPERATION.

Mounted in the cockpit in view of the pilot.

CARGO RELEASE	Mounted adjacent to the manual release in clear view of the pilot.
CARGO RELEASE	Mounted adjacent to the electrical release switch in clear view of the pilot.

PLACARDS continued

CARGO RELEASE	Mounted adjacent to the co-pilot's electrical release switch (if optional co-pilot's release switch is installed).
PULL	Mounted adjacent to the manual release in clear view of the pilot.
CARGO	Mounted adjacent to the Cargo Hook circuit breaker in clear view of the pilot.
REMOTE HOOK	When the P/N 200-396-00 kit is installed, mounted adjacent to the circuit breaker in full view of the pilot and co-pilot.
REMOTE HOOK	When the P/N 200-396-00 kit is installed, mounted on the face of the remote hook release switch housing in full view of the pilot and co-pilot.

PLACARDS continued

CARGO RELEASE:
HOLD FOR > 1
SECOND

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

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

ELECTRONIC WEIGHING SYSTEM
DECAL P/N 215-010-00

When 200-327-01 or 200-327-11 kit is installed, mounted adjacent to both the power switch and the circuit breaker in view of the pilot and co-pilot.

TURN THE WEIGHING SYSTEM OFF WHEN NAVIGATION EQUIPMENT IN USE. NO AIRCRAFT OPERATION SHOULD BE PREDICATED ON THE READING OF THE ONBOARD WEIGHING SYSTEM.
(DECAL P/N 215-012-00)

When 200-327-01 or 200-327-11 kit is installed, mounted adjacent to the load weigh indicator in view of the pilot and co-pilot (this placard not applicable if the C-40 Indicator (P/N 210-293-00) is installed).

SECTION 3
NORMAL PROCEDURES

STATIC DISCHARGE

Prior to attaching an external load, instruct the ground crew to ensure that the helicopter has been electrically grounded to discharge static electricity. If possible, maintain ground contact until hook up is completed.

PRE-FLIGHT CHECK

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

1. Check all mounting fasteners to ensure that they are tight.
2. Check the electrical connector and harness for damage and security.
3. Check the external portion of the manual release cable for damage with close attention to the transition at the cargo hook for tearing or splitting or exposed inner wires.

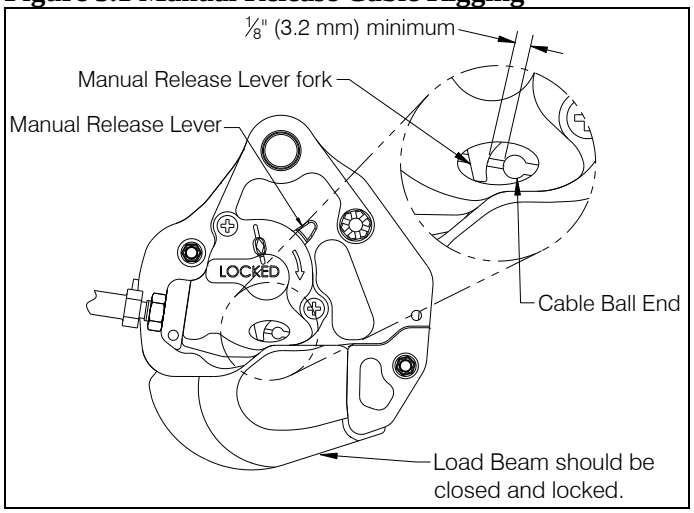
Manual release cables are wearable items and should be replaced as condition requires. Broken or kinked conduit or sticky operation are cause for immediate replacement.

4. Swing the cargo hook to its full extremes to verify that it does not reach the limit of the manual release cable and electrical release harness range of motion. The manual release cable and electrical release harness should not be the stops that prevent the cargo hook from moving freely in all directions.

PRE-FLIGHT CHECK continued

5. Check the manual release cable rigging through the window in the cargo hook manual release cover. 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 3.1.

Figure 3.1 Manual Release Cable Rigging



⚠ CAUTION

The load beam should be closed and locked when checking the free play in the release cable.

PRE-FLIGHT CHECK continued

6. 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 ½ second time delay. See specific procedures in this step for this cargo hook model.

- Press the CARGO RELEASE switch on the cyclic (ref. Figure 3.8) and the cargo hook should open with no load on it.
- Return the cargo hook to the closed and locked position by manually pushing up on the load beam. The load beam should snap shut.

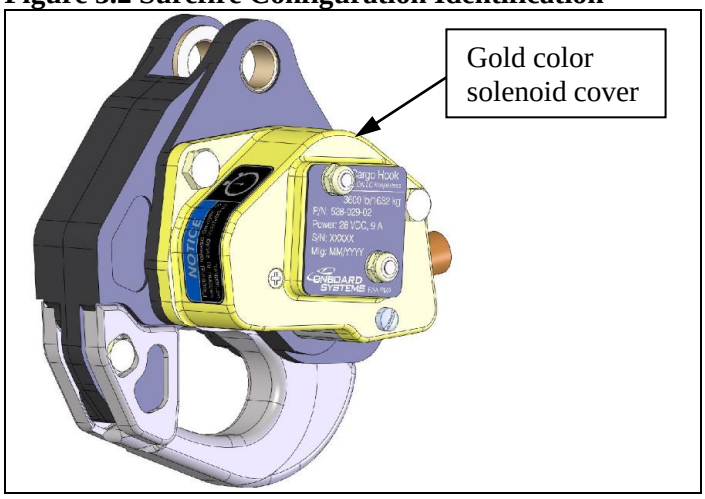
The following instructions are applicable to the cargo hook P/N 528-029-02. This cargo hook can also be identified by its gold color solenoid cover (see Figure 3.2).

- *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.
- Return the cargo hook to the closed and locked position by manually pushing up on the load beam. The load beam should snap shut.

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.

Figure 3.2 Surefire Configuration Identification



7. If the optional co-pilot switch is installed on the outboard side of the co-pilot's seat (ref. Figure 3.9) repeat the previous step except use this switch.

NOTICE

The co-pilot switch is an optional installation which is intended primarily for external load training. If this switch is installed but rarely used, take precautions to protect the switch from being inadvertently contacted.

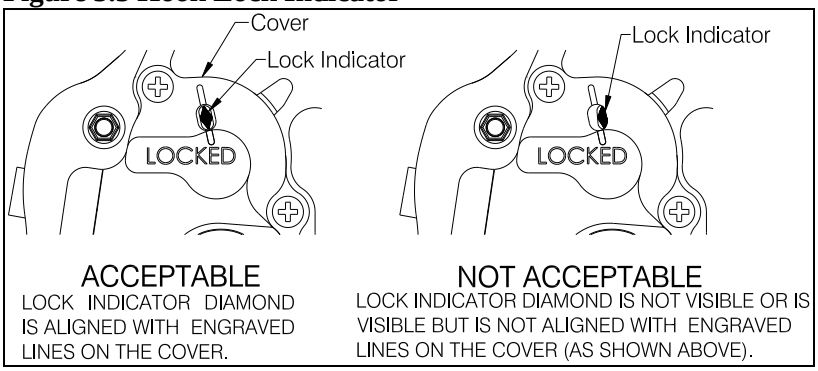
PRE-FLIGHT CHECK continued

8. Cycle the manual release mechanism to ensure proper operation. Pull up on the manual release T-handle located between the pilot and co-pilot seat. The cargo hook load beam should open. Return the load beam to the locked position by manually pushing up on it. The load beam should snap shut. Verify that the lock indicator on the side of the cargo hook returns to the fully locked position.

⚠ CAUTION

In the fully locked position the hook lock indicator should align with the lines on the manual release cover (see Figure 3.3).

Figure 3.3 Hook Lock Indicator

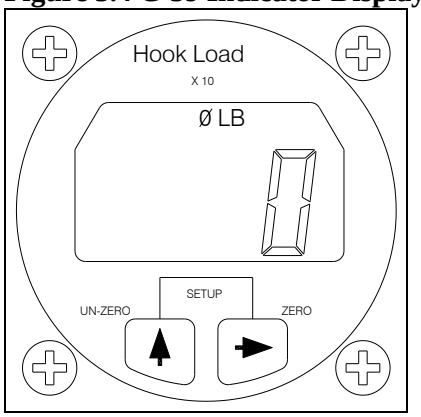


PRE-FLIGHT CHECK continued

If the Load Weigh System is installed, perform the following additional procedure(s) depending on the model of Load Indicator that is installed.

1. **For the C-39 model**: power on the 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 3.4 C-39 Indicator Display



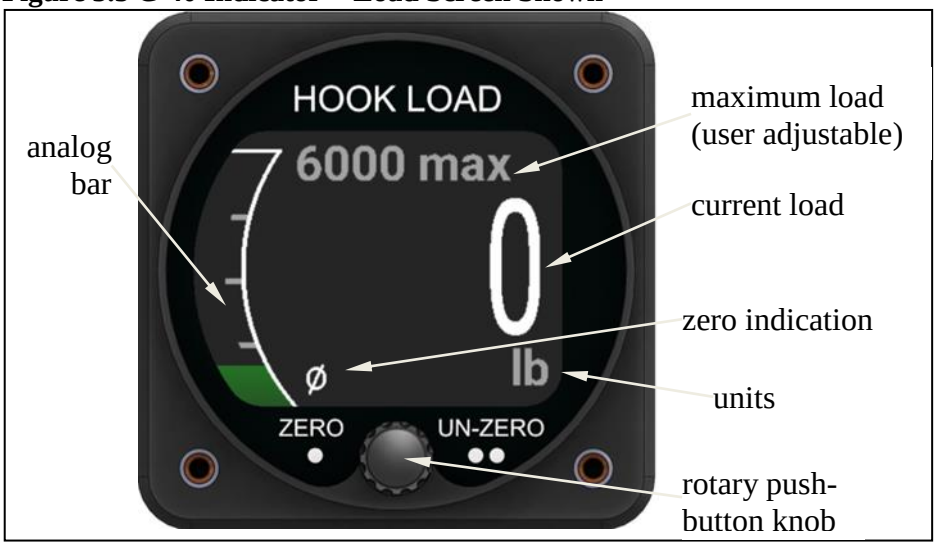
NOTICE

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.

PRE-FLIGHT CHECK continued

For the C-40 model: 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 3.5 C-40 Indicator - Load Screen Shown



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.

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.

Figure 3.6 Maximum Load Screen

- 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.

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.

If the Remote Hook Electrical Release Kit is installed and the external load operation involves a remote hook, perform the following additional procedure.

1. Connect the electrical cable from the remote hook to the connector on the electrical cable suspended from the belly mounted connector. Press the "REMOTE HOOK" release switch on the cyclic and verify that the remote hook releases.

NOTICE

The remote hook is NOT included with the remote hook electrical release kit. Consult the remote hook manual for its operation instructions.

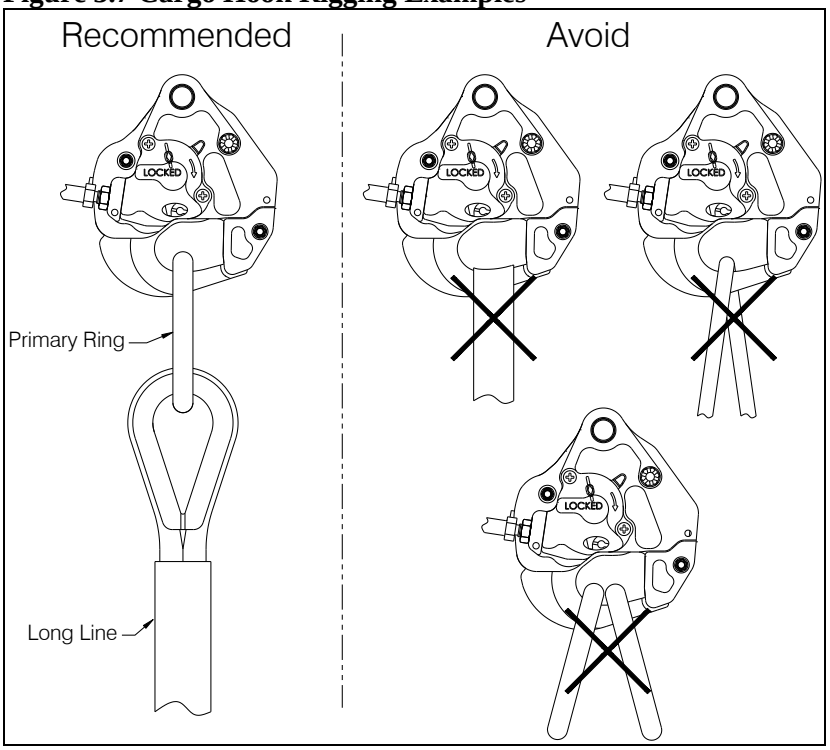
CARGO HOOK RIGGING

Exercise care when rigging a load to the Cargo Hook. 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 3.7 shows this recommended rigging and rigging to avoid, but is not intended to represent all rigging 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 assure the cargo hook will function properly with the rigging.

CARGO HOOK RIGGING continued

Figure 3.7 Cargo Hook Rigging Examples



IN-FLIGHT OPERATION

Take-off

1. Following attachment of the external load, slowly increase the collective pitch and ascend vertically, maintaining the rotorcraft directly above the load. When the slack in the long line is removed dwell briefly before lifting the load from the surface.
2. Check torque required to hover with the external load.
3. Check for adequate directional control.
4. Take off into the wind, if possible, and ensure clearance of the external load over obstacles.

It is the responsibility of the operator to establish safe operational limits for each specific configuration.

Control movements should be made gently and kept to a minimum to prevent oscillation of the load.

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 electrical and manual release cables from damage. Take precautions to prevent external load angles which exceed the limits of rotation provided by the suspension as the load may not be releasable in this position.

IN-FLIGHT OPERATION continued

Approach with and release of external load

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 (see Figure 3.8) on the cyclic or the optional switch on the outboard co-pilot's seat support (see Figure 3.9) to release the external load.

   The T-handle (see Figure 3.10) is intended as a backup release in the event of an electrical failure but may be used to release the external load in normal circumstances.

   If the remote hook release switch kit (kit P/N 200-396-00) is installed, a second switch is installed on the right-hand cyclic grip (see Figure 3.11). The external load may be released from the remote hook with this switch.

   WARNING

   A release of the external load from the remote hook with the load suspended above the ground can result in potentially dangerous re-coil of the long line. Consult the user's manual provided by the long line manufacturer for its characteristics, proper use, care and inspection.

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

   WARNING

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

Figure 3.8 Cyclic Grip Release Switch

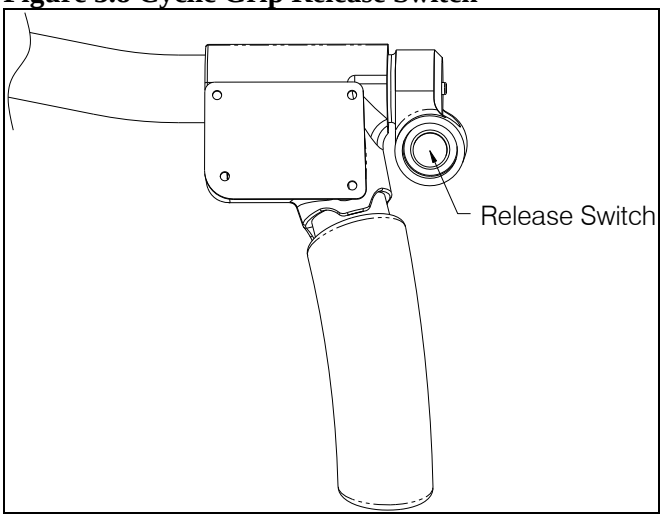
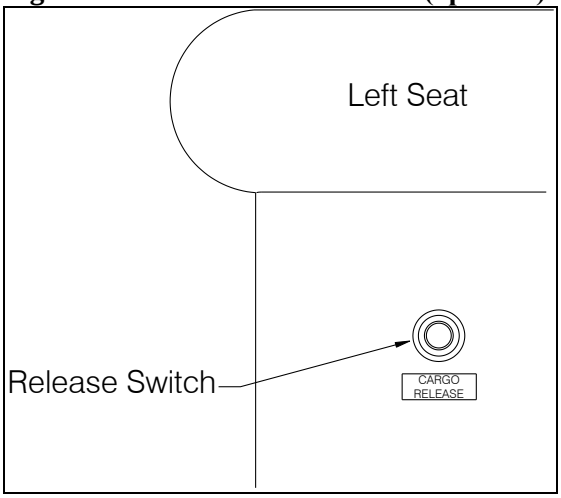


Figure 3.9 Co-Pilot's Seat Switch (optional)



IN-FLIGHT OPERATION continued

Approach with and release of external load continued

Figure 3.10 Manual Release Handle

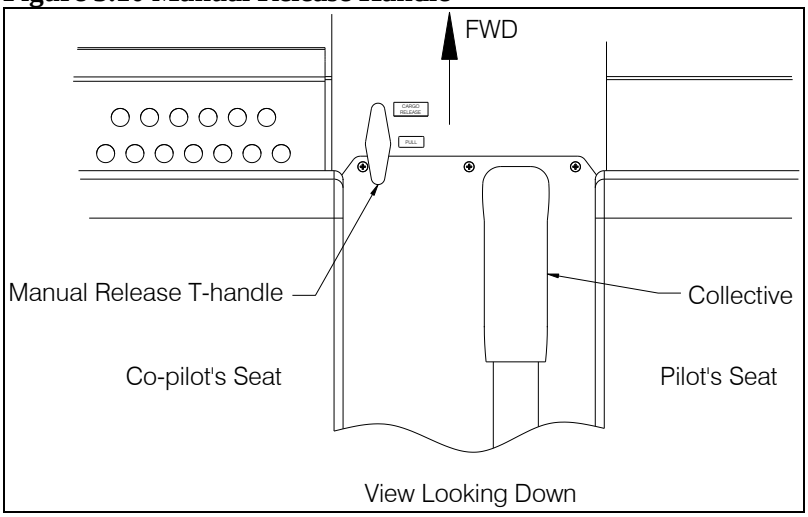
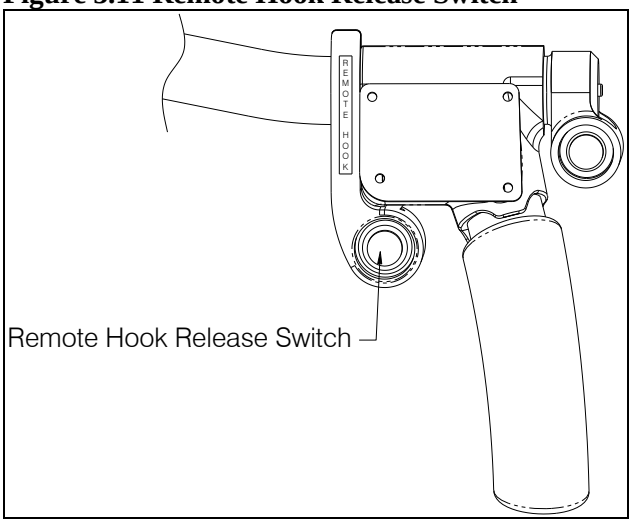


Figure 3.11 Remote Hook Release Switch



SECTION 4
EMERGENCY PROCEDURES

Cargo Fails to Release Electrically

In the event that the Cargo Hook will not release the external load electrically, proceed as follows:

1. Maintain tension on the sling.
2. Pull the manual release T-handle upwards to release the external load.

SECTION 5
PERFORMANCE

The basic Flight Manual issued by Robinson remains applicable.

There is no change from basic flight performance with no load attached to the Cargo Hook.

With an external load attached, performance will be reduced depending on the size, weight and shape of the external load.

NOTICE

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.

WEIGHT AND BALANCE

The cargo hook is located at STA 93.9 and at BL -4.1.

SYSTEM DESCRIPTION

The cargo hook suspension kit provides a means to transport jettisonable external loads. The kit includes the cargo hook, a structural linkage assembly (referred to as suspension assembly) which connects the cargo hook to the existing hard point on the belly of the helicopter and the cargo hook's primary and backup quick release systems for jettisoning of the external load.

In addition to the basic cargo hook suspension kits (P/N 200-326-00 (for 14-volt aircraft) and P/N 200-327-00 (for 28-volt aircraft)) other kit configurations (P/Ns 200-327-01, 200-327-02, 200-327-11, and 200-327-12) for 28-volt aircraft include a load weigh system. The load weigh system includes a load cell above the cargo hook which serves as part of the structural linkage, a load weigh indicator (-02 and -12 kits include the next generation C-40 model) and an internal electrical wiring harness. This system provides the pilot with an indication of the weight of the external load being carried.

Kit P/Ns 200-327-10, 200-327-11, and 200-327-12 include 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.

Either of the basic kit configurations may be complemented by a remote hook release kit (P/N 200-396-00). The remote hook release kit provides the fixed electrical provisions including a release switch on the cyclic grip for the release of a load from a remote cargo hook at the end of a long line.