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Instructions for Continued Airworthiness Cargo Hook Kit

for the

EC135

System Part Number 200-375-00

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RECORD OF REVISIONS

Revision	*Date*	*Page(s)*	*Reason for Revision*
0	08/22/11	All	Initial release.

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List of Effective Pages

Title	Pages	Revision	Date
Cover	*i, ii* Blank	0	08/22/11
Record of Revision	*iii, iv* Blank	0	08/22/11
List of Effective Pages	*v, vi* Blank	0	08/22/11
Table of Contents	*vii, viii* Blank	0	08/22/11
Section 0 Introduction 00-00-00	1, 2	0	08/22/11
Section 4 Airworthiness Limitations 04-00-00	1, 2 Blank	0	08/22/11
Section 5 Inspection and Overhaul Schedule 05-00-00	1 thru 4	0	08/22/11
Section 11 Placards and Markings 11-00-00	1, 2 Blank	0	08/22/11
Section 25 Equipment and Furnishings 25-00-00	1 thru 10	0	08/22/11

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CONTENTS

Tables

Section 0
Introduction

0.4 Scope

The following information is necessary to carry out the service, maintenance, and inspection of Cargo Hook Kit P/N 200-375-00. Cargo Hook Kit P/N 200-375-00 is a replacement hook kit for upgrading the OEM installed cargo hook and uses a number of the OEM installed cargo hook provisions including the beam support structure. Refer to Section 25.2 for a detailed description of the cargo hook and a list of the kit components.

0.5 Purpose

The purpose of this Instructions for Continued Airworthiness (ICA) manual is to provide the information necessary to service, inspect and maintain the P/N 200-375-00 Cargo Hook Kit in an airworthy condition.

0.6 Arrangement

This manual contains instructions for the service, maintenance, inspection and operation of Cargo Hook Kit P/N 200-375-00 on Eurocopter EC135 helicopters. The manual is arranged in the general order that maintenance personnel would use to maintain and operate the cargo hook kit in service. The arrangement is:

Section 0 Introduction.
Section 4 Airworthiness Limitations (none apply)
Section 5 Inspection and Overhaul Schedule.
Section 11 Placards and Markings
Section 25 Equipment and Furnishings

0.7 Applicability

These Instructions for Continued Airworthiness are applicable to kit P/N 200-375-00 on the Eurocopter EC135. Refer to the appropriate Eurocopter maintenance documentation for instructions regarding parts of the aircraft that interface with the cargo hook.

0.9 Abbreviations

FAA Federal Aviation Administration
ICA Instructions for Continued Airworthiness
CFR Code of Federal Regulations

0.12 Precautions

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.

0.19 Distribution of Instructions for Continued Airworthiness

Before performing maintenance ensure that the Instructions for Continued Airworthiness (ICA) in your possession is the most recent revision. Current revision levels of all manuals are posted on Onboard Systems Int'l web site at www.onboardsystems.com. Also a Documentation Update Service is available on the web site. Registering for this service provides an e-mail or fax notification when a manual has been revised. Hard copies of all manuals are available from the factory, contact the factory at 800-275-0883 to request a copy.

Section 4
Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies maintenance required under 14 CFR §§ 43.16 and 91.403, unless an alternative program has been FAA approved.

No airworthiness limitations are associated with this type design change.

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Section 5
Inspection and Overhaul Schedule
5.1 Cargo Hook Kit Inspection Schedule

The scheduled inspection interval(s) presented below are maximums and are not to be exceeded. If the cargo hook is subjected to unusual circumstances, extreme environmental conditions, etc., it is the responsibility of the operator to perform the inspections more frequently to ensure proper operation. Refer to component maintenance manual 122-025-00 for damage and wear tolerances for the cargo hook.

Annually or 100 hours of external load operations*, whichever comes first, inspect the cargo hook kit per the following.

* "Hours of external load operations" is defined as the time in which a helicopter is engaged in external load operations. This includes time between loads on the hook.

1. Activate the helicopter's electrical system and press the Cargo Release button to ensure the cargo hook electrical release is operating correctly. The cargo hook must release. Reset the cargo hook by hand after release. If the cargo hook does not release or re-latch, do not use the unit until the problem is resolved.

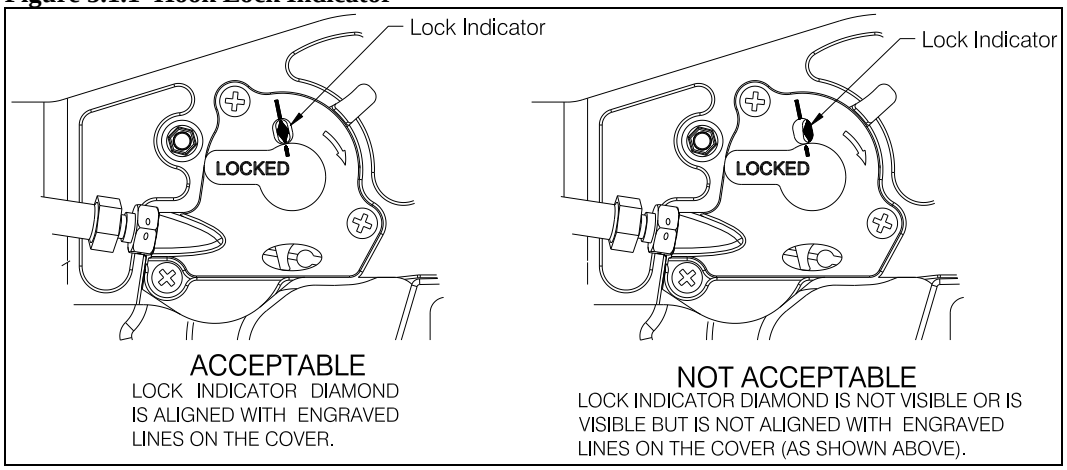
Actuating the electrical release switch continuously in excess of 20 seconds will cause the cargo hook release solenoid to overheat, possibly causing permanent damage.

2. Check the manual release system by pulling the release lever in the cockpit. The cargo hook must release. Reset the cargo hook by hand after release. Verify that the hook lock indicator on the side of the hook returns to the fully locked position. If the hook does not release or re-latch, do not use the unit until the problem is resolved.

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

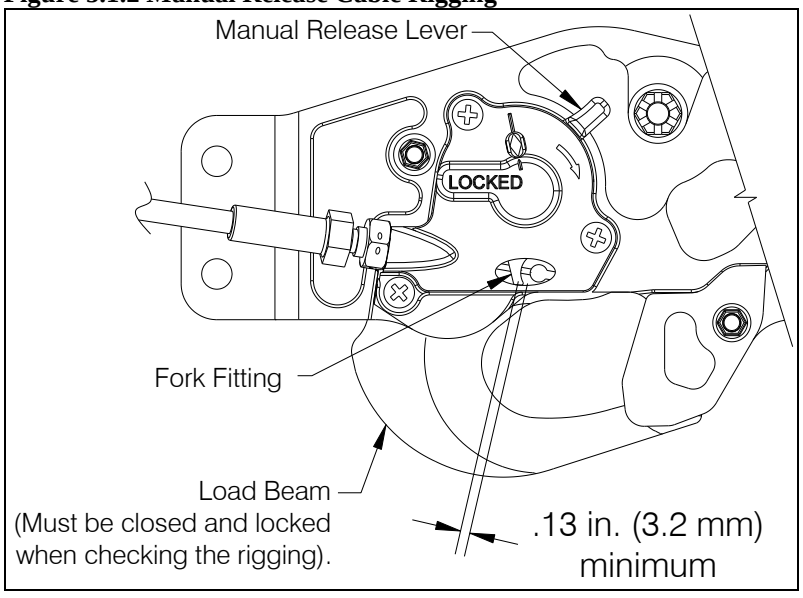
5.1 Cargo Hook Kit Inspection Schedule continued

Figure 5.1.1 Hook Lock Indicator



3. Verify that the manual release cable rigging is set properly per the following instructions.
   With the cargo hook load beam 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 fitting and the cable ball end as shown below. Verify that there is a minimum gap of .13 in. (3.2 mm) as shown in Figure 5.1.2. If necessary, adjust the release system at the collective to obtain this gap.

Figure 5.1.2 Manual Release Cable Rigging



4. Move the cargo hook throughout its full range of motion to ensure the manual release cable and electrical release harness have enough slack. The manual release cable or electrical harness must not be the stops that prevent the cargo hook from moving throughout its range of motion.

5.1 Cargo Hook Kit Inspection Schedule continued

5. Visually inspect for corrosion on the exterior of the cargo hook.
6. Visually inspect for presence and security of fasteners and electrical connections.
7. Visually inspect the exterior of the cargo hook for damage including cracks, gouges, and nicks.
8. Visually inspect the cargo hook load beam for damage including cracks, wear, gouges, and nicks.
9. Visually inspect the manual release cable for damage (refer to Figure 5.1.3 for some examples). Pay close attention to the flexible conduit at the area of transition to the cargo hook end fitting (refer to Figure 5.1.4). Inspect for splitting of the outer black conduit in this area and separation of the conduit from the steel end fitting.

WARNING

Manual release cables are wearable items and must be replaced as condition requires. Broken or kinked conduit, inner cable kinks (ref. Figure 5.1.3), frays, or sticky operation are each cause for immediate replacement.

Figure 5.1.3 Examples of Manual Release Cable Damage

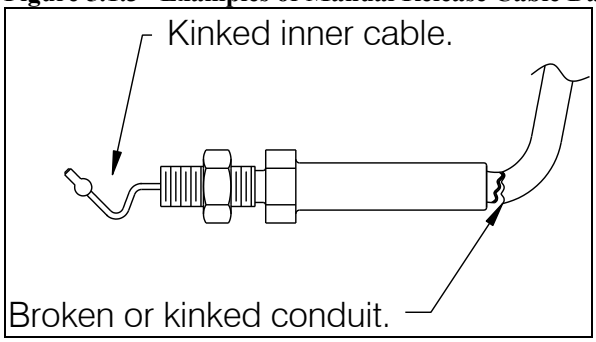
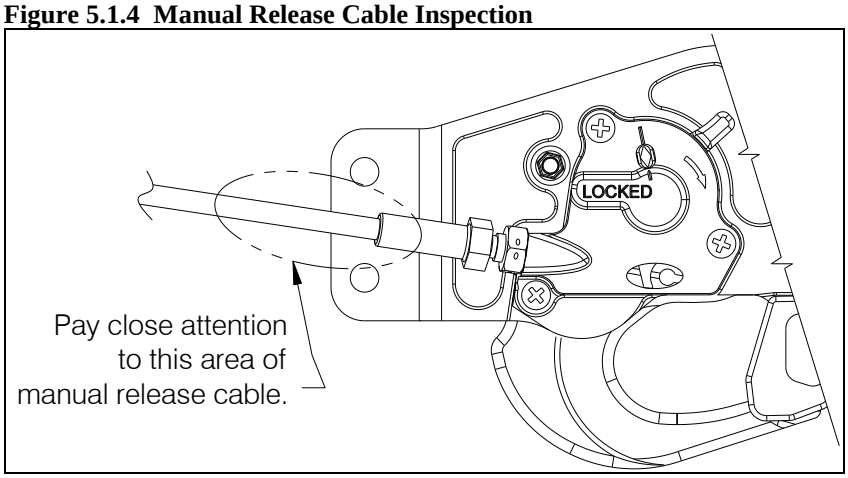


Figure 5.1.4 Manual Release Cable Inspection



5.2 Cargo Hook Overhaul Schedule

Time Between Overhaul (TBO): 1000 hours of external load operations (*) or 5 years, whichever comes first.
(*) hours of external load operations is defined as the time in which a helicopter is engaged in external load operations. This includes time between loads on the cargo hook.

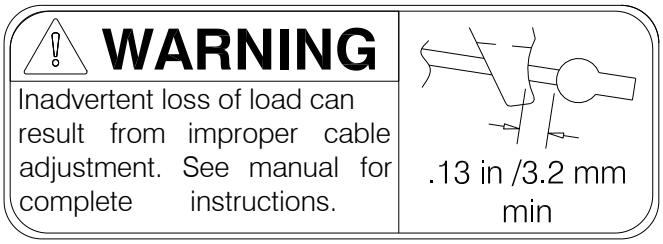
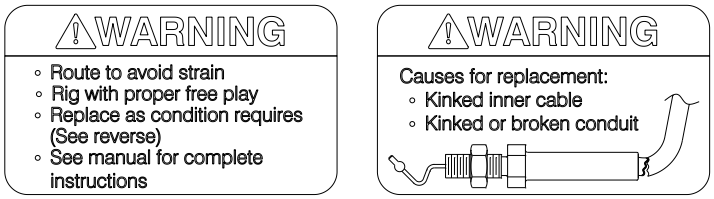
Overhaul the cargo hook per component maintenance manual 122-025-00. Contact Onboard Systems for guidance to locate authorized overhaul facilities.

Section 11
Placards and Markings

11.1 Placards

The P/N 200-375-00 Cargo Hook Kit uses the OEM installed placards and includes the following placard(s) shown in Table 11.1.

Table 11.1 Cargo Hook Kit Placards

Placard part number and appearance	Location
P/N 215-240-00 	Located on the underside of the cargo hook.
P/N 215-272-00  One Side Opposite Side	Located on the manual release cable.

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Section 25
Equipment and Furnishings

Un-commanded cargo hook release can occur if the manual release cable is improperly restrained. The cable must not be the stops that prevent the Cargo Hook from swinging freely in all directions. If the Cargo Hook loads cause the hook to strain against the manual release cable the swaged end of the cable may separate allowing the inner cable to activate the cargo hook manual release mechanism. The result is an un-commanded release. Ensure that no combination of collective or Cargo Hook position is restrained by the manual release cable.

25.1 Cargo Hook Connector

Listed below is the pin out for the cargo hook connector.

Table 25.1.1 Cargo Hook Connector

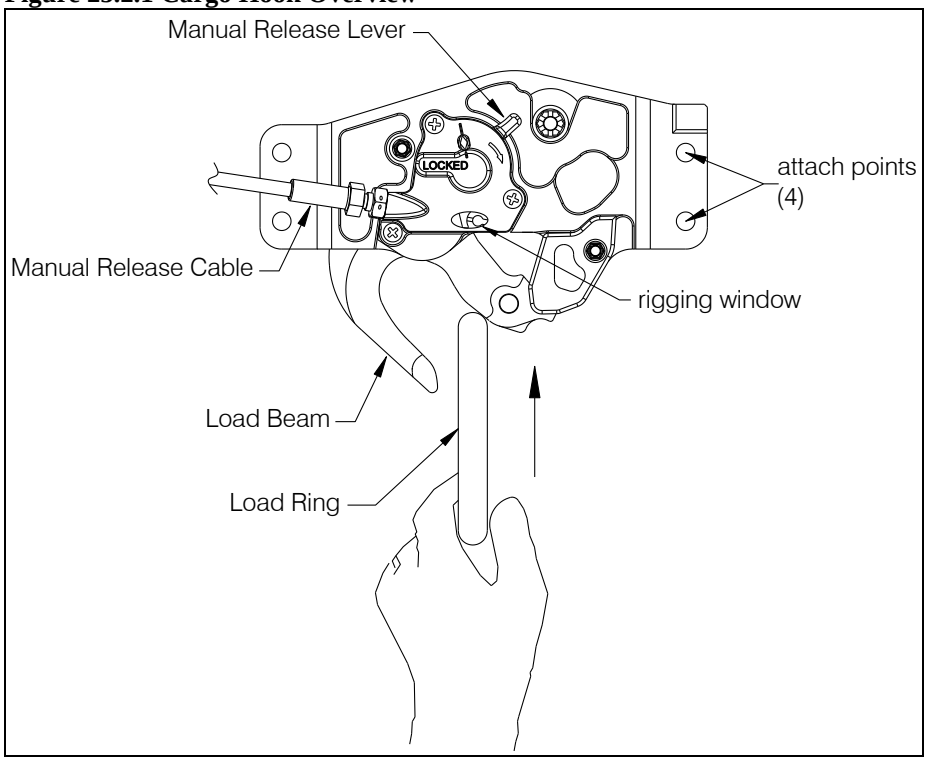
Pin	*Function*
A	Ground
B	Positive

25.2 Description

The P/N 200-375-00 cargo hook kit includes the cargo hook, an electrical harness to connect to the helicopter's internal electrical release harness, and a manual release cable that connects to the helicopter's internal manual release cable (see Figure 25.2.2). The cargo hook interfaces with and uses the attach hardware of the Eurocopter provided EC135 cargo hook beam structure.

The cargo hook is the means used to attach an external load to the aircraft. A load is attached to the cargo hook by passing a load ring into the throat of the load beam and pushing the ring against the upper portion of the load beam throat (see Figure 25.2.1), which will initiate the hook to close. In the closed position, a latch engages the load beam and latches it in this position. A load release can be initiated by three different methods. Normal release is achieved by pilot actuation of a push-button switch in the cockpit. When the push-button switch is pressed, it energizes the solenoid in the cargo hook, and the solenoid opens the latch in the internal mechanism. In the event of an electrical failure, load release can be achieved by operating the manual release cable. The release cable actuates the internal mechanism of the cargo hook to unlatch the load beam. A rigging window provides a means to verify the manual release cable setting with respect to the internal mechanism. Ground personnel can also release the load by actuating a manual release lever located on the side of the cargo hook (see Figure 25.2.1).

Figure 25.2.1 Cargo Hook Overview



25.2 Description continued

Figure 25.2.2 shows the components that make up the cargo hook kit. The part numbers and descriptions are listed in Table 25.2.1.

Figure 25.2.2 Kit Components

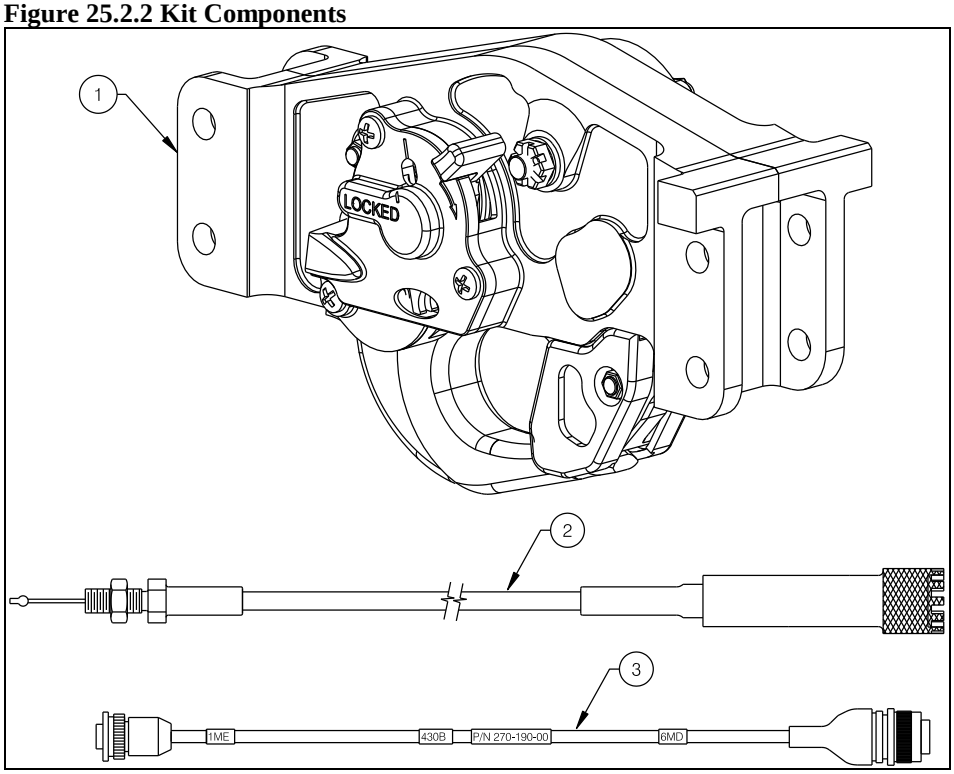


Table 25.2.1 Kit Components

Item	Part No.	Description
1	528-041-00	Cargo Hook
2	268-053-00	Manual Release Cable
3	270-190-00	Electrical Harness

25.5 Component Weights

The weight and locations of the Cargo Hook Kit and its components is listed below.

Table 25.5.1 Component Weights

Item	Weight lbs (kg)	CG Inches (mm)
Cargo Hook	3.67 (1.66)	165 (4200)
Manual Release Cable	0.45 (0.21)	142 (3600)
Electrical Release Harness	0.30 (0.13)	142 (3600)
Total Kit Weight	**4.42 (2.00)**	**161 (4103)**

25.12 Storage Instructions

Clean the exterior Cargo Hook components thoroughly of excess dirt and grease with a rag before packaging. Pack the unit in a heat-sealable package. If the unit is to be stored for long periods in a tropical climate it should be packed in a reliable manner to suit local conditions. Refer to MIL-PRF-23199 and MIL-STD-2073-1 for additional guidance.

Package the unit in a suitable fiberboard box and cushion the unit to prevent shifting. Seal the fiberboard box with tape and mark the box with the contents and date of packaging.

25.15 Trouble Shooting

Table 25.15.1 is provided with the intention of isolating the cause of malfunctions within the system. Sections 25.16 and 25.17 include instructions for removing and replacing defective components. Refer to the appropriate Eurocopter maintenance documentation for guidance on procedures relating to Eurocopter parts that interface with this cargo hook kit.

Table 25.15.1 Trouble Shooting

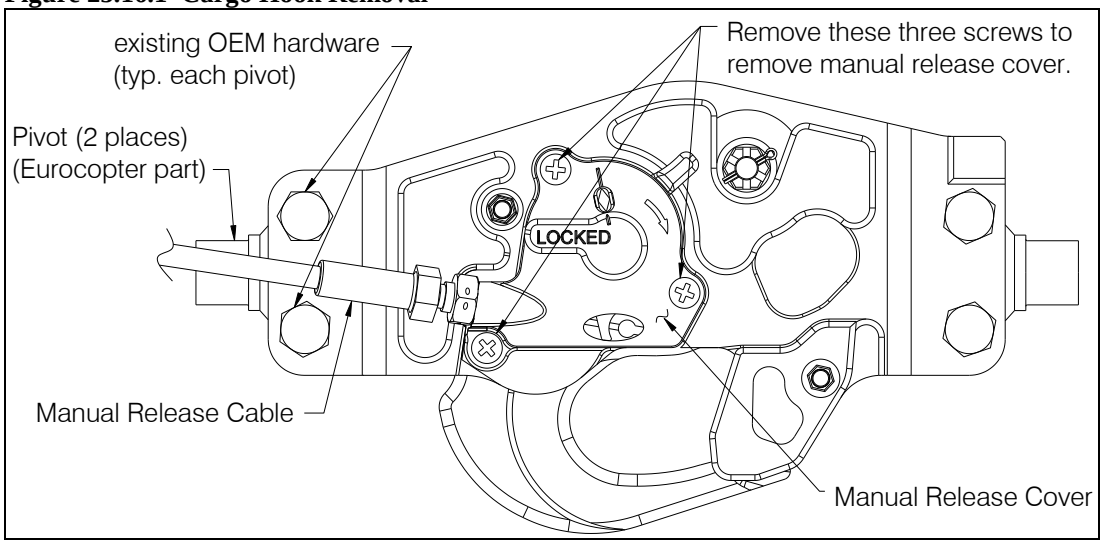
MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Cargo hook does not operate electrically, manual cable release operates normally.	Open electrical circuit, faulty wiring, circuit breaker, switch or solenoid.	Disconnect electrical connector at the Cargo Hook. Using multimeter, check for 3.0 to 4.0 ohms between pins A and B of electrical connector. If open indication is obtained, remove and replace cargo hook or replace solenoid per cargo hook component maintenance manual (document no. 122-025-00).
Cargo hook does not operate electrically or manually.	Defective internal mechanism	Remove and replace cargo hook or repair per the cargo hook component maintenance manual.
Cargo hook operates electrically, but not manually.	Defective manual release cable. Defective manual release mechanism components in cargo hook. Kinks or wear in external manual release cable, frozen water in cable, debris or damage to cable quick disconnect fitting.	Check manual release cable and cable connection to Cargo Hook. Correct any defects. Remove and replace cargo hook or repair per the component maintenance manual.
Load beam fails to re-latch after being reset.	Defective latch mechanism	Remove and replace cargo hook or repair per the component maintenance manual.
Manual release cable force (at the hook) required to open the cargo hook exceeds 8 lbs.	Friction in internal mechanism.	Check operation of unit using manual release lever on the cargo hook. Remove and replace cargo hook or repair per the component maintenance manual.
Failure to open or re-lock properly	Defective internal mechanism.	Remove and replace cargo hook or repair per the component maintenance manual.
Circuit breaker opens when Cargo Hook is energized.	Short in the system, faulty wiring, circuit breaker or solenoid.	Check for shorts to ground. Check solenoid resistance, repair or replace defective parts.

25.16 Component Removal

Cargo Hook Removal

1. Disconnect the electrical release harness connector from the cargo hook.
2. Remove the manual release cover from the cargo hook by removing three screws (see below).
3. Unhook the cable ball end of the manual release cable from the fork fitting of the cargo hook's manual release lever.
4. Loosen the jam nut on the manual release cable end fitting and unthread the manual release cover from it.
5. The cargo hook interfaces with Eurocopter pivots which are existing parts of the Eurocopter cargo hook system. The 200-375-00 kit does not include the fasteners which attach the cargo hook to the pivots. Refer to Eurocopter documentation for instructions for removing the pivots.

Figure 25.16.1 Cargo Hook Removal



Manual Release Cable Removal

1. Disconnect the manual release cable from the cargo hook per the instructions above.
2. At the belly of the helicopter, disengage the lock pin from the adapter fitting and unthread the adapter fitting to disconnect it from the helicopter's fixed manual release cable (refer to Figure 25.17.2).
3. Feed the release cable through the beam structure to remove it.

Electrical Harness Removal

1. Disconnect the electrical harness connector at the belly of the helicopter and the connector at the cargo hook.
2. Feed the harness through the beam structure to remove it.

25.17 Component Re-installation

Cargo Hook Re-installation

1. Attach the Cargo Hook, P/N 528-041-00, to the forward pivot assembly (Eurocopter P/N AS22-38-20-04, AS22-38-20-02, et. al. Refer to Eurocopter maintenance documentation for complete parts breakdown) and aft pivot assembly (Eurocopter P/N's AS22-38-20-03, AS22-38-20-05, AS22-38-20-06, et.al.) with the Eurocopter supplied hardware (screw P/N 22201BC080044L, washer P/N 23118AG080LE, and nut P/N 8PH135M).
2. Remove the manual release cover from the cargo hook and thread it onto the end fitting of the manual release cable. Thread it on until the threads protrude into the inside of the cover (i.e. – full thread engagement).
3. Since the manual release cover fasteners are difficult to access when the cargo hook is installed within the beam, hold the cargo hook just below the beam and position the manual release cover close to the cargo hook to insert the inner cable of the manual release cable through the fork fitting and then fasten the cover to the cargo hook with the three screws. Tighten the screws to 10-15 in-lbs.
4. Slide the cargo hook with the pivot assemblies up into the beam and secure with the Eurocopter supplied fasteners.
5. Check the rigging of the manual release cable per the following.

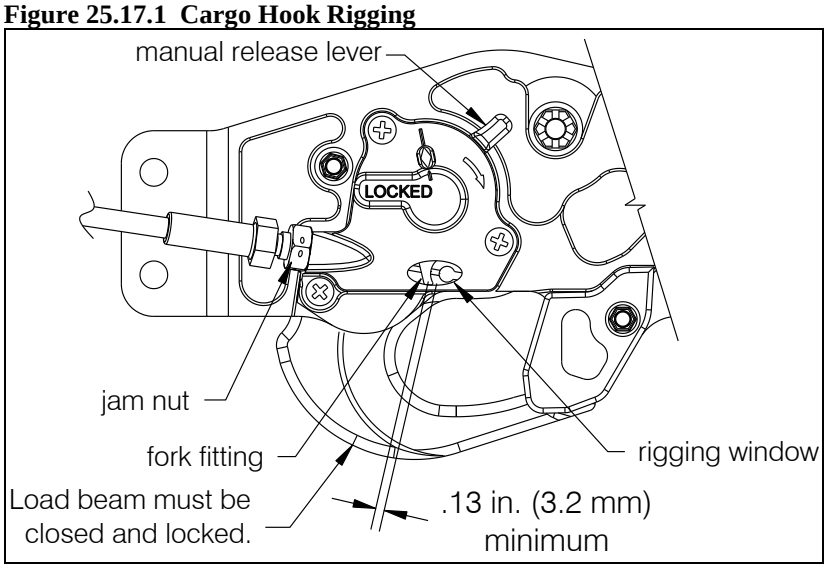
Manual release cable rigging must be done with the cargo hook in the closed and locked position.

With the cargo hook in the closed and locked position, rotate the release lever in the clockwise direction to remove free play (the free play is taken up when the hook lock indicator begins to move) and measure the cable ball end free play with the release lever in the cockpit in the non-release position. There must be a minimum of .13 inches (3.2 mm) between the cable ball end and fork fitting as shown in Figure 25.17.1. The maximum amount of free play is limited by the manual release cover, i.e. – the ball end must fit inside the cover when it is installed.

25.17 Component Re-installation continued

Cargo Hook Re-installation continued

Figure 25.17.1 Cargo Hook Rigging



6. If necessary adjust the manual release cable system to obtain the minimum of .13 inches (3.2 mm). Minor adjustment can be made at the cargo hook by removing the cover and rotating it in the required direction. Ensure the manual release cable fitting threads maintain full thread engagement with the manual release cover (i.e.- the end of the threads should not be recessed within the cover flange).

7. Tighten the jam nut on the manual release cable.

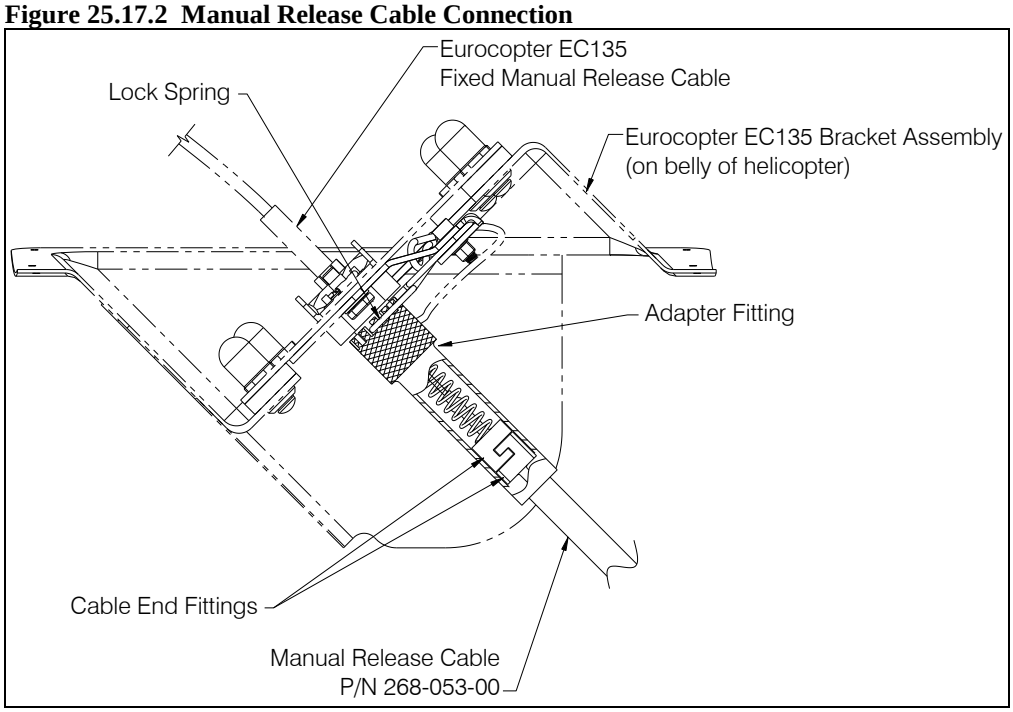
8. Check the operation of manual release system by pulling the release lever in the cockpit. The cargo hook must release. Reset the cargo hook by hand after release. Verify that the hook lock indicator on the side of the hook returns to the fully locked position (Ref. Figure 5.1.1).

25.17 Component Re-installation continued

Manual Release Cable Re-installation

1. Connect the end of the release cable to the fixed section of the existing EC135 manual release cable by mating the cable end fittings together as shown below. Slide the Adapter Fitting forward and thread it onto the existing EC135 fitting, and engage a castellation on the Adapter Fitting with the lock spring (part of Eurocopter bracket assembly) to lock it in place.
2. Connect the other end of the manual release cable to the cargo hook and check the rigging per this section.

Figure 25.17.2 Manual Release Cable Connection



25.17 Component Re-installation continued

Electrical Harness Re-installation

1. Connect the 3 pin connector to the fixed connector mounted on the bracket on the belly of the helicopter.
2. Route the electrical harness with the manual release cable to the cargo hook and connect it to the cargo hook connector.

NOTICE

The cargo hook included with this kit does not include a "load on hook" switch so pin C of the belly connector is not used. Refer to Eurocopter Wiring Diagrams Manual for information on shipside wiring.