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Instructions for Continued Airworthiness Talon LC Keeperless Cargo Hook Kit

For the

AS350 Series and EC130B4

System Part Numbers 200-353-00, 200-353-01

STC SR00886SE

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RECORD OF REVISIONS

Revision	*Date*	*Page(s)*	*Reason for Revision*
0	05/22/09	All	Initial release.
1	03/09/10	05-00-00 page 4	Changed overhaul frequency criteria, updated Figure 25.7 to show load beam closed and locked and added associated Caution statement. Changed application of section 25.18 to after re-installation of components.
2	01/27/16	Section 0, Section 4, Section 5, Section 25 pages 2-4, 6, 9, 10	Added kit P/N 200-353-01 which includes cargo hook P/N 528-029-02 with Surefire Release. Added instructions associated with this new cargo hook P/N. Updated section 4 wording.

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List of Effective Pages

Title	Pages	Revision	Date
Cover	*i, ii* Blank	2	01/27/16
Record of Revision	*iii, iv* Blank	2	01/27/16
List of Effective Pages	*v, vi* Blank	2	01/27/16
Table of Contents	*vii, viii* Blank	2	01/27/16
Section 0 Introduction	1, 2	2	01/27/16
Section 4 Airworthiness Limitations	1, 2 Blank	2	01/27/16
Section 5 Inspection and Overhaul Schedule	1 thru 5, 6 Blank	2	01/27/16
Section 25 Equipment and Furnishings	1	0	05/22/09
Section 25 Equipment and Furnishings	2 thru 4	2	01/27/16
Section 25 Equipment and Furnishings	5	0	05/22/09
Section 25 Equipment and Furnishings	6	2	01/27/16
Section 25 Equipment and Furnishings	7	0	05/22/09
Section 25 Equipment and Furnishings	8	1	03/09/10
Section 25 Equipment and Furnishings	9, 10	2	01/27/16

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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 the Cargo Hook Kit P/N 200-353-00 and P/N 200-353-01. This cargo hook kit is a replacement cargo hook kit for the factory installed cargo hook, it uses the Airbus Helicopters fixed provisions and the suspension components which attach the cargo hook to the aircraft. See Section 25.2 for 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 200-353-00 and P/N 200-353-01 Cargo Hook Kits in an airworthy condition.

0.6 Arrangement

This manual contains instructions for the service, maintenance, inspection and operation of Cargo Hook Kit P/N 200-353-00 (with cargo hook P/N 528-029-00) and P/N 200-353-01 (with cargo hook P/N 528-029-02) on Airbus Helicopters AS350 series and EC130B4 helicopters. The manual is arranged in the general order that maintenance personnel would use to maintain and operate the cargo hook in service.
The arrangement is:

Section 0 Introduction.
Section 4 Airworthiness Limitations (None apply)
Section 5 Inspection and Overhaul Schedule.
Section 25 Equipment and Furnishings

0.7 Applicability

These Instructions for Continued Airworthiness are applicable to Kit P/N 200-353-00 and P/N 200-353-01 on the Airbus Helicopters AS350B, AS350B1, AS350B2, AS350B3, AS350BA, AS350D, and EC130B4. Refer to the appropriate Airbus Helicopters' maintenance documentation for instructions regarding parts of the aircraft that interface with the cargo hook.

0.9 Abbreviations

FAA Federal Aviation Administration
FAR Federal Aviation Regulation
ICA Instructions for Continued Airworthiness

0.12 Precautions

The following definitions apply to precaution flags 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.

Onboard Systems offers a free notification service via fax or e-mail for product alerts and documentation updates. By registering Onboard Systems products on the web site, we will be able to contact you if a service bulletin is issued, or if the documentation is updated.

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Section 4
Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

No airworthiness limitations associated with this type design change.

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Section 5
Inspection and Overhaul Schedule
5.1 Cargo Hook Kit Inspection

The scheduled inspection intervals noted below are maximums and are not to be exceeded. If the cargo hook suspension system 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.

Annually or 100 hours of external load operations, whichever comes first, inspect the cargo hook kit components per the following. Refer to the cargo hook's CMM (manual no. 122-017-00) for additional procedures.

NOTICE

*Hours of external load operations should be interpreted to be **(1)** anything is attached to the primary cargo hook (whether or not a useful load is being transported) and **(2)** the aircraft is flying. If these conditions are **NOT** met, time does **NOT** need to be tracked.*

1. Activate the helicopter's electrical system and press the Cargo Release switch to ensure the cargo hook's electrical release system is operating correctly. With no load on it, the cargo hook must open. Reset the cargo hook by hand after release.

CAUTION

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

The following instructions are applicable to cargo hook P/N 528-029-02 which is equipped with Surefire electrical release. 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 hook lock indicator is aligned with the engraved line on the manual release cover.

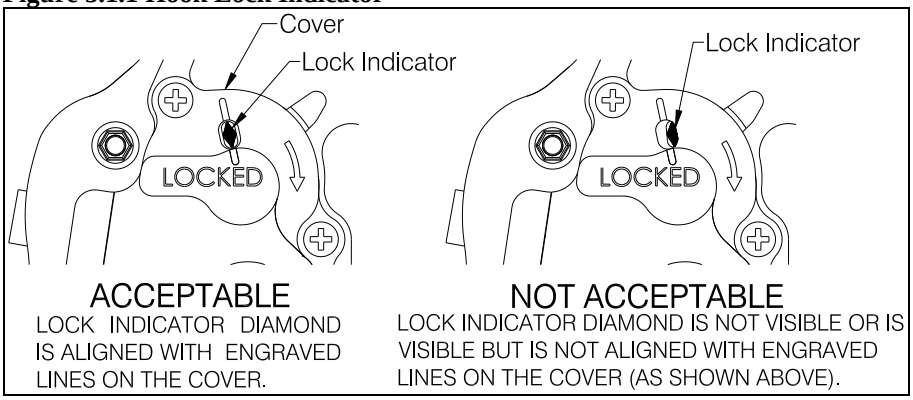
5.1 Cargo Hook Kit Inspection continued

2. Check the cargo hook's manual release system by pulling the release lever in the cockpit. With no load on it, the cargo hook must open. 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.

CAUTION

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

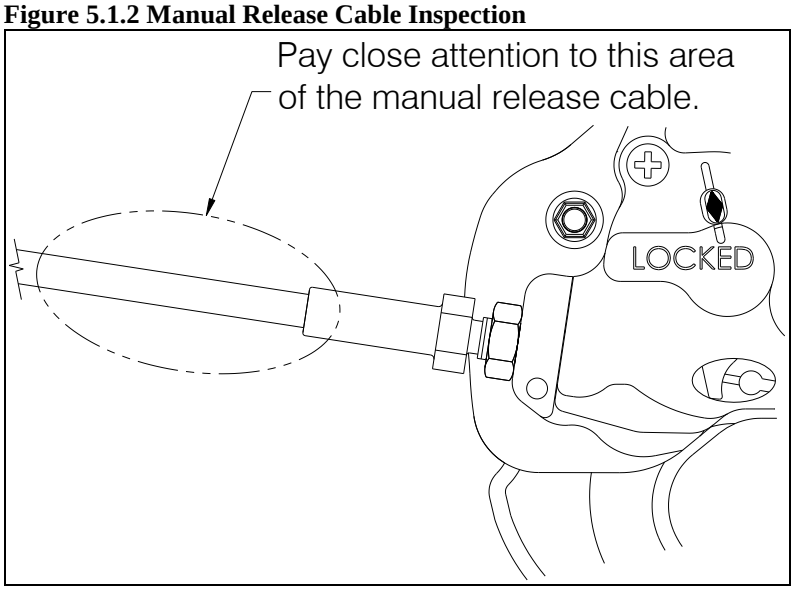


3. Move the cargo hook throughout its full range of motion and observe the manual release cable and electrical harness(es) to ensure that they have enough slack. The release cable and harness(es) must not be the stops that prevent the cargo hook from moving freely in all directions.
4. Visually inspect for presence and security of fasteners and electrical connections.
5. Visually inspect the cargo hook bumper for gouges, nicks, and scratches and other damage.

5.1 Cargo Hook Kit Inspection

6. Visually inspect the manual release cable for damage, paying close attention to the flexible conduit at the area of transition to the cargo hook end fitting (refer to Figure 5.1.2). Inspect for splitting of the outer black conduit in this area and separation of the conduit from the steel end fitting.

Figure 5.1.2 Manual Release Cable Inspection

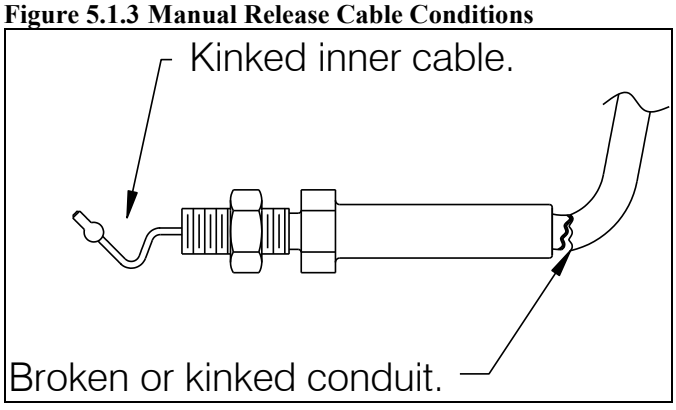


7. Remove the manual release cover from the cargo hook and inspect the visible section of the inner cable for kinks or frays.

CAUTION

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 Manual Release Cable Conditions

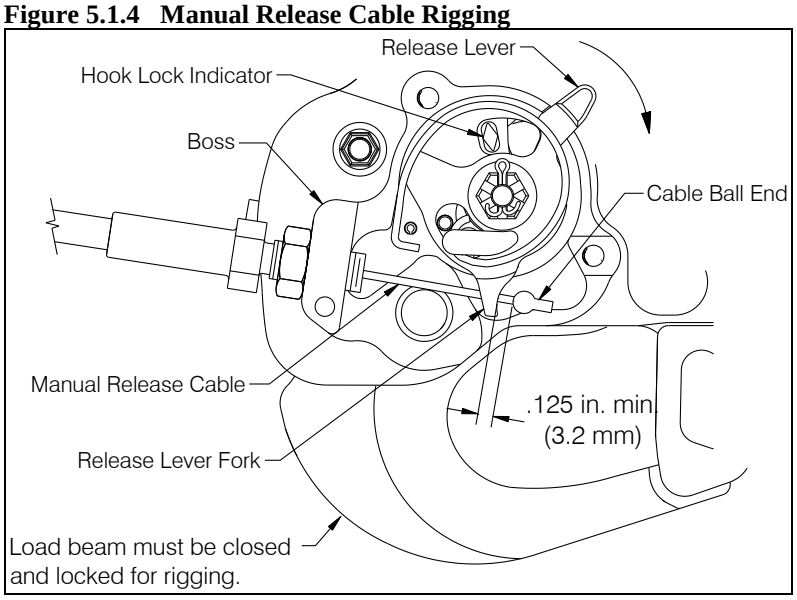


5.1 Cargo Hook Kit Inspection continued

8. Check the manual release cable rigging per the following.
   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 gap between the cable ball end and the release lever fork with the manual release handle in the cockpit in the non-release position. There must be a minimum of .125 inches (3.2 mm) between the cable ball end and fork fitting as shown in Figure 5.1.4. The maximum amount of free play is limited by the manual release cover, i.e. – the ball end must fit inside the manual release cover when it is installed.

   If necessary adjust the manual release cable system to obtain a minimum of .125 inches (3.2 mm). Some adjustment can be made at the cargo hook by loosening the jam nut and turning the manual release cable or cargo hook the required direction and re-tightening the jam nut. Ensure the manual release cable fitting threads maintain full thread engagement with the cargo hook side plate boss (i.e.- the end of the threads should not be recessed within the boss). Tighten jam nut. Re-install the manual release cover with two screws.

Figure 5.1.4 Manual Release Cable Rigging



Every 5 years or 1000 hours of external load operations, whichever comes first, or at cargo hook overhaul remove the cargo hook attach bolt (P/N 290-775-00) and inspect per the following.

- Inspect for wear on the outside diameter. Replace if outside diameter in any location is less than .495 in. (12.57 mm).

Re-install the attach bolt per Section 25.17 of this manual.

5.2 Cargo Hook Overhaul Schedule

Time Between Overhaul (TBO): 5 years or 1000 hours of external load operations (*), whichever comes first.

** Hours of external load operations should be interpreted to be **(1)** anything is attached to the primary cargo hook (whether or not a useful load is being transported) and **(2)** the aircraft is flying. If these conditions are **NOT** met, time does **NOT** need to be tracked.*

Overhaul the cargo hook per Component Maintenance Manual 122-017-00. Contact Onboard Systems for guidance to locate authorized overhaul facilities.

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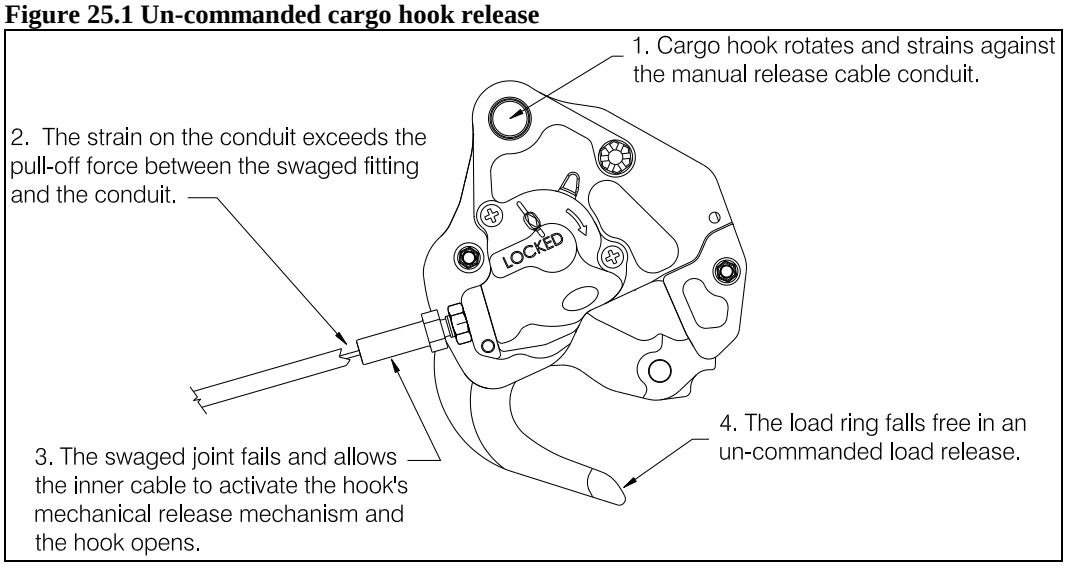
Section 25
Equipment and Furnishings

WARNING

Un-commanded cargo hook release will happen 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 cyclic stick or Cargo Hook position is restrained by the manual release cable.

Figure 25.1 Un-commanded cargo hook release



25.1 Cargo Hook Connector

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

Table 25.1 Cargo Hook Connector

Pin	*Function*
A	Ground
B	Power

25.2 Description

The P/N 200-353-00 cargo hook kit includes the cargo hook, a cargo hook bumper, an electrical connector to splice into the helicopter's existing electrical release harness, and a manual release cable that connects to the helicopter's existing fixed manual release cable.

An optional cargo hook (P/N 528-029-02) with Surefire Release includes a time delay circuit built into the cargo hook's electrical release system. This feature is a safety enhancement to protect against inadvertent load release due to accidental contact with the cargo release switch or mistaken actuation of the release switch when another is intended. Surefire makes the electrical release a more deliberate pilot command by requiring that the release switch be depressed and held for more than a 1/2 second to open the cargo hook. In addition to its P/N, a cargo hook with Surefire can be identified by a gold anodized solenoid housing in and a placard on the underside of the solenoid housing that specifies that the electrical release is delayed ½ second.

Figure 25.2 shows the primary components that make up these cargo hook kits. Miscellaneous items, hardware, etc. are not shown.

Figure 25.2 Primary Kit Components

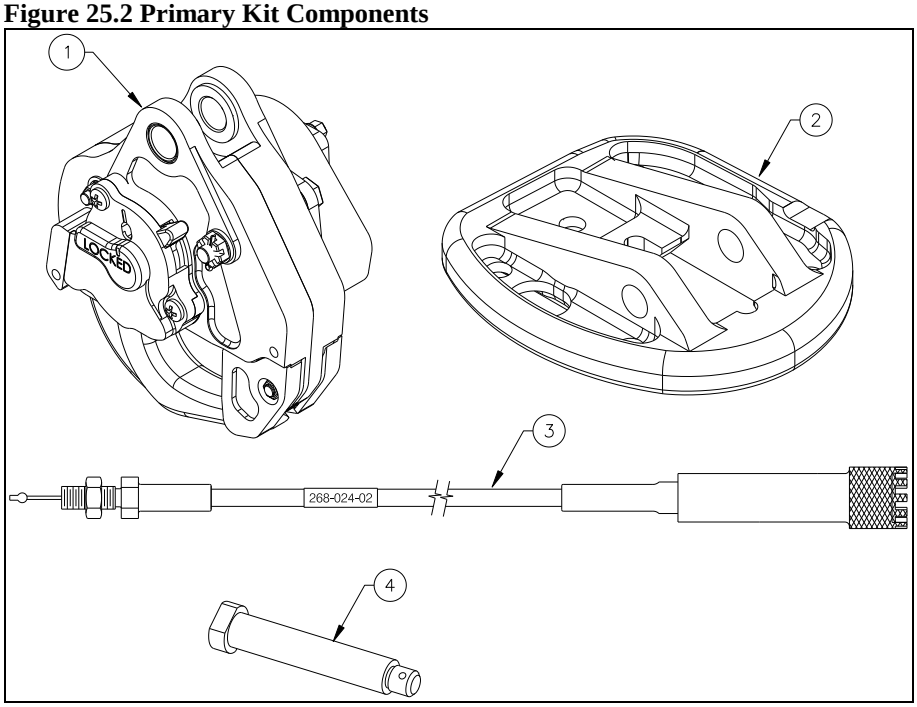


Table 25.2 Primary Kit Components

Item	Part No.	Description
1	528-029-00 or 528-029-02	Cargo Hook
2	290-773-00	Cargo Hook Bumper
3	268-024-02	Manual Release Cable
4	290-775-00	Attach Bolt

25.5 Component Weights

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

Table 25.3 Component Weights

Item	Weight
Complete Cargo Hook Kit	4.3 lbs (1.95 kgs)
Cargo Hook (w/o attach hardware)	3.0 lbs (1.36 kgs)
Cargo Hook Bumper (w/attach hardware)	0.7 lbs (0.32 kgs)

25.12 Storage Instructions

Refer to CMM 122-017-00 for storage instructions for the Cargo Hook.

25.15 Trouble Shooting

Table 25.4 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 Airbus Helicopters' maintenance documentation for guidance on procedures relating to Airbus Helicopters parts that interface with this suspension system.

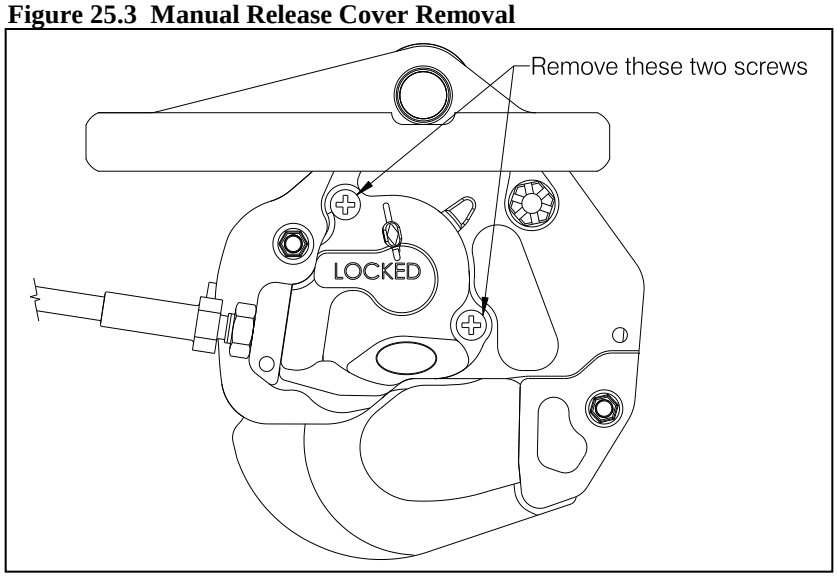
Table 25.4 Trouble Shooting

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 cable from electrical connector on Cargo Hook. Using multi-meter, 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.
Cargo hook does not operate electrically or manually.	Defective internal mechanism.	Remove and replace cargo hook or repair per CMM 122-017-00.
Cargo hook P/N 528-029-02 (includes Surefire time delay circuit) does not operate electrically, hydraulic release operates normally.	Release switch not held down long enough. Open electrical circuit, faulty wiring, circuit breaker, switch or solenoid.	Hold the release switch for a longer time. The time delay circuit incorporates an electronic delay of approximately ½ second after which time the hook solenoid will activate repeatedly. If the release switch is not held down long enough the cargo hook's solenoid will not activate. Check the aircraft circuit for opens and shorts by using a multi-meter on the hook connector. When the release switch is pressed 28V aircraft voltage should be present on the connector pins. Check the aircraft connector polarity. The time delay circuit is polarity sensitive and protected against reverse polarity. +28V should be on pin B and ground on pin A. Check the power pins on the hook itself. A multi-meter set to the kilo-ohms range should read between 2-8Kohms. Some auto-ranging meters will not read properly so be sure to try a manual kilo-ohms range. If the meter reads open or short there is a problem with the solenoid module itself and the hook should be replaced or repaired per CMM 122-017-00.
Cargo hook operates electrically, but not manually.	Defective manual release cable Defective manual release system	Check manual release cable and cable connection to Cargo Hook. Correct any defects. Remove and replace cargo hook or repair per CMM 122-017-00.
Load beam fails to re-latch after being reset.	Defective latch mechanism	Remove and replace cargo hook or repair per CMM 122-017-00.
Cargo hook manual release cable pull-off force exceeds 8 lbs. (at the hook).	Friction in internal mechanism.	Check operation of unit using manual release lever. Remove and replace cargo hook or repair per CMM 122-017-00.
Failure to open or re-lock properly	Failure to open or re-lock properly	Remove and replace cargo hook or repair per CMM 122-017-00.
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 Cargo Hook Removal

1. Remove manual release cover by removing two screws.

Figure 25.3 Manual Release Cover Removal

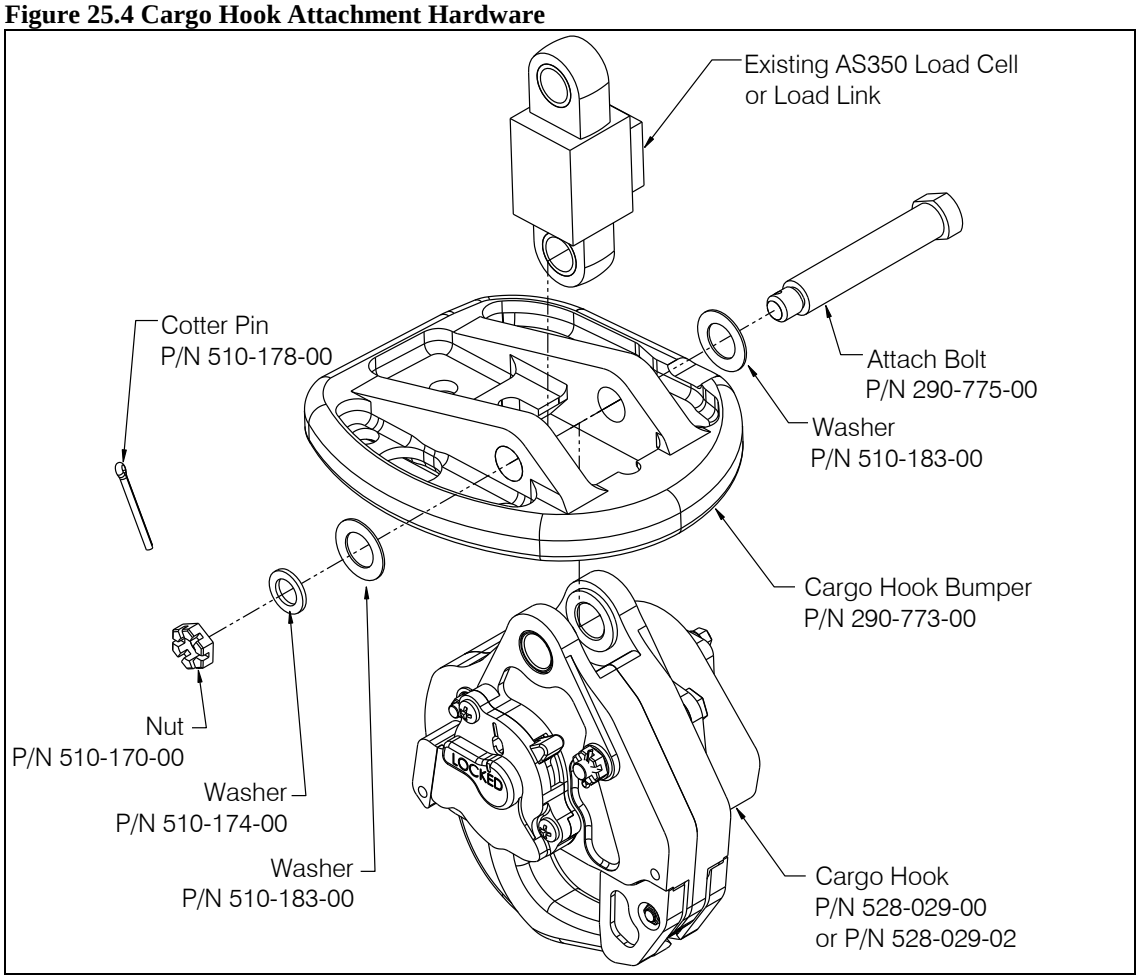


2. Remove the manual release cable from the cargo hook.
3. Disconnect the electrical release harness from the cargo hook.
4. Unhook the shock cords from the cushioned loop clamps on each side of the cargo hook.
5. Remove the cotter pin P/N, 510-178-00, from the Attach Bolt, P/N 290-775-00.
6. Remove the castellated nut, P/N 510-170-00, from the attach bolt.
7. Remove Attach Bolt and all washers.
8. Remove the cargo hook from the helicopter.
9. Remove the Bumper, P/N 290-773-00, from the cargo hook.

25.17 Cargo Hook Re-installation

1. Attach the Cargo Hook, P/N 528-029-00 or P/N 528-029-02, and Cargo Hook Bumper, P/N 290-773-00, to the suspension system by installing the attach bolt, P/N 290-775-00 and washer, P/N 510-183-00, as illustrated in Figure 25.4. The cargo hook load beam must point forward.
2. Install washer, P/N 510-183-00, and washer, P/N 510-174-00, over the attach bolt end.
3. Tighten nut, P/N 510-170-00, on bolt finger tight, then rotate nut to previous castellation if necessary to insert cotter pin. Install and secure cotter pin, P/N 510-178-00.

Figure 25.4 Cargo Hook Attachment Hardware

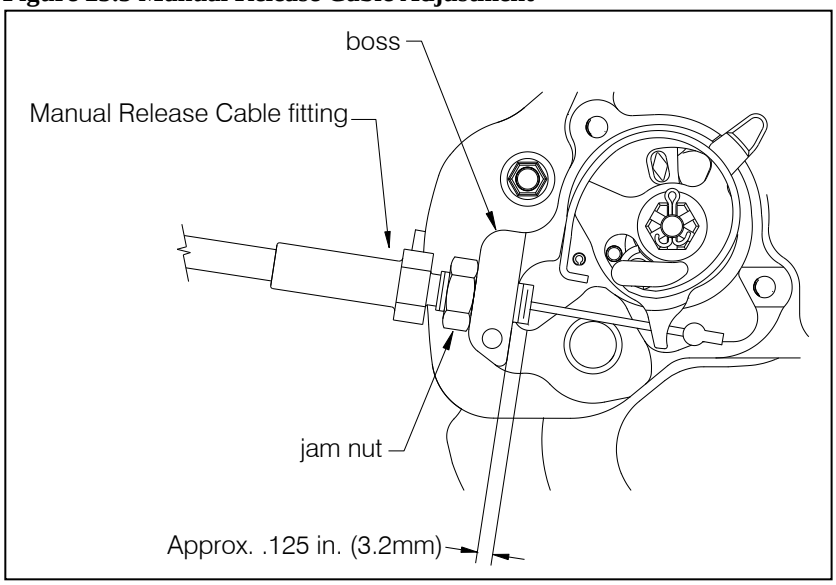


25.17 Cargo Hook Re-installation continued

Connect the manual release cable (P/N 268-024-02) to the cargo hook per the following instructions:

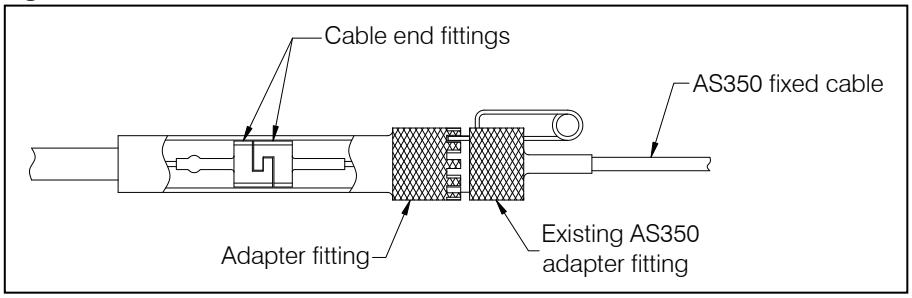
1. Remove the manual release cover from the cargo hook.
2. Thread the fitting at the end of the manual release cable into the manual release boss on the hook side plate until the threads protrude approximately .125 inches beyond the boss and secure with jam nut (as shown in Figure 25.5). Leave the cover off of the cargo hook until the other end of the release cable is connected, in order to verify proper setting.

Figure 25.5 Manual Release Cable Adjustment



3. Connect the other end of the release cable to the fixed section of the existing AS350 manual release cable by mating the cable end fittings together as shown below. Slide the Adapter Fitting forward and thread it onto the existing AS350 fitting, and engage a castellation on the Adapter Fitting with the retaining pin to lock it in place.

Figure 25.6 Manual Release Cable Connection



25.17 Cargo Hook Re-installation continued

CAUTION

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

4. At the cargo hook, place the cable ball end fitting into the manual release lever fork as illustrated in Figure 25.7.

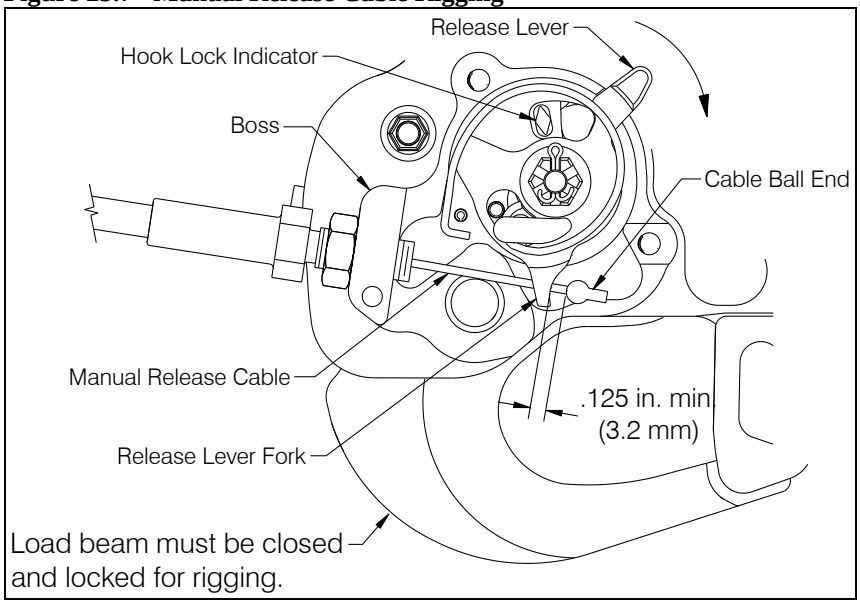
5. Rotate the release lever in the clockwise direction to remove free play (the free play is taken up when the hook lock indicator begins to move, this is also felt, as the release lever rotates relatively easily for several degrees before the resistance increases) and measure the cable ball end free play with the manual release handle in the cockpit in the non-release position. There must be a minimum of .125 inches (3.2 mm) between the cable ball end and fork fitting as shown in Figure 25.7. The maximum amount of free play is limited by the manual release cover, i.e. – the ball end must fit inside the manual release cover when it is installed.

6. If necessary adjust the manual release cable system to obtain a minimum of .125 inches (3.2mm). Some adjustment can be made at the cargo hook by loosening the jam nut and turning the manual release cable in the required direction and re-tightening the jam nut. Maintain a minimum of .31 inches of thread engagement between the manual release cable fitting and the cargo hook side plate boss.

7. Re-install the manual release cover with the two screws.

8. Snap the Adapter Fitting into the existing clip mounted to the belly of the helicopter.

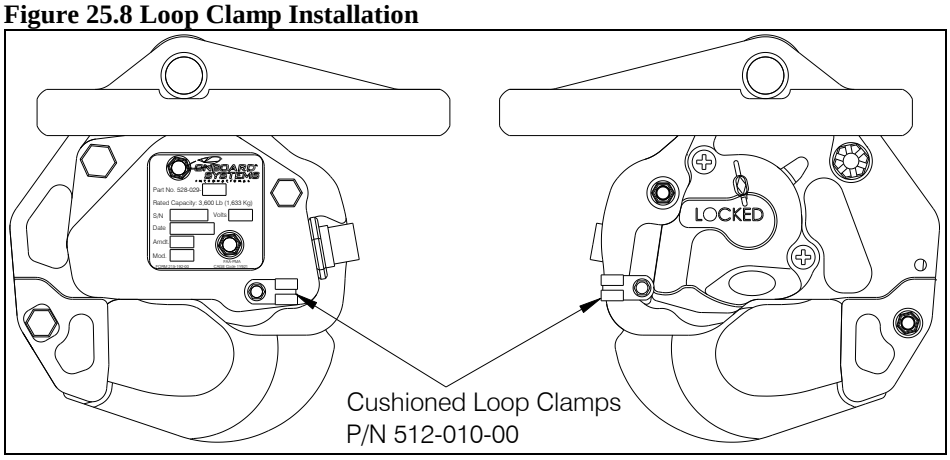
Figure 25.7 Manual Release Cable Rigging



25.17 Cargo Hook Re-installation continued

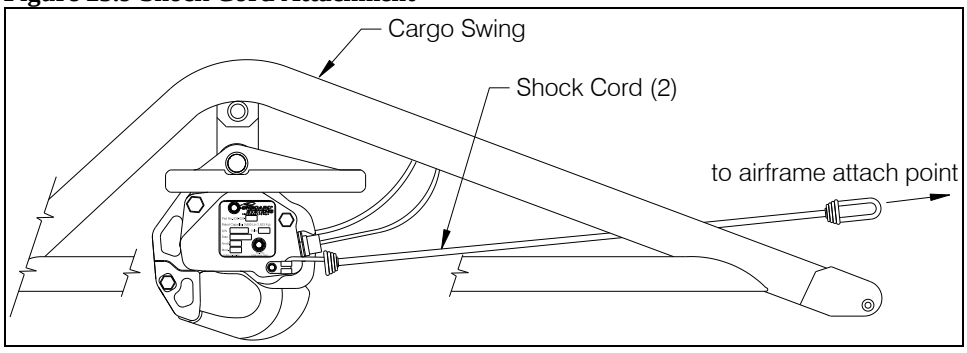
If the cargo hook is installed on the Airbus Helicopters' "Cargo Swing" (see Figure 25.9) re-install the cushioned loop clamps (P/N 512-010-00) on each side of the cargo hook, with bolt (P/N 510-257-00) and washer (P/N 510-042-00).

Figure 25.8 Loop Clamp Installation



Connect the existing shock cords (Airbus Helicopters supplied parts) from the airframe attach points to the cushioned loop clamps. Refer to Airbus Helicopters documentation for additional information on shock cord installation.

Figure 25.9 Shock Cord Attachment



25.18 General Procedural Instructions -Testing

After re-installation of the cargo hook or manual release cable perform the following

1. Activate the electrical system and press the Cargo Hook release button to ensure the cargo hook electrical release is operating correctly. The Cargo Hook must release. Push up on the load beam and verify that it latches and the hook lock indicator aligns with the engraved line on the manual release cover.

The release solenoid is intended to be energized only intermittently. Depressing the electrical release button continuously in excess of 20 seconds will cause the release solenoid to overheat, possibly causing permanent damage.

The following instructions are applicable to cargo hook P/N 528-029-02 which is equipped with Surefire electrical release. 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 hook lock indicator is aligned with the engraved line on the manual release cover.

2. Activate the release handle located between the seats to test the cargo hook manual release mechanism. The mechanism should operate smoothly and the Cargo Hook must release. Reset the hook by hand after release. If the hook does not release or re-latch do not use the unit until the difficulty is resolved.
3. Swing the installed Cargo Hook to ensure that the manual release cable and the electrical harnesses have enough slack to allow full swing of the cargo hook without straining or damaging the cables. The cable and electrical harnesses must NOT be the stops that prevent the Cargo Hook from swinging freely in all directions.