

**PLEASE CHECK WEB SITE AT [WWW.ONBOARDSYSTEMS.COM](http://WWW.ONBOARDSYSTEMS.COM) FOR  
THE LATEST REVISION OF THIS MANUAL**

***Instructions for  
Continued Airworthiness***

***Cargo Swing Retrofit Kit  
for the  
Airbus Helicopters AS350 Series Helicopter***

***System Part Numbers***

***200-286-02***

***200-286-03***

***STC SR01393SE***



13915 NW 3<sup>rd</sup> Court Vancouver, Washington 98685 USA  
Phone: 360-546-3072 Fax: 360-546-3073 Toll Free: 800-275-0883  
[www.OnboardSystems.com](http://www.OnboardSystems.com)

THIS PAGE INTENTIONALLY LEFT BLANK

## Record of Revisions

<i>Revision</i>	<i>Date</i>	<i>Page(s)</i>	<i>Reason for Revision</i>
4	05/04/12	Section 5, Section 11, Section 12	Added detailed manual release cable inspection to annual/100 hour inspection. Changed 5 year/1000 hour inspection including addition of detailed part inspection criteria and moving bushing inspection to 5 year/1000 hour. Updated placards and lubrication requirements.
5	05/09/14	Section 0 Page 1, Section 5 Pages 1, 2, 5, 6, 10, 11 & 15; Section 25 Pages 2, 4-7, 9, 10, 14, 15, 17, 21-24	Updated Eurocopter to Airbus Helicopters. Added load cell P/N 210-249-03 and Link Assembly P/N 232-436-01. Replace fuel drain guard P/N 290-889-00 with 290-889-01. Updated electrical schematic to reflect new aircraft interface.
6	08/28/14	Section 5 Pages 13 thru 15, Section 25 Page 5	Expanded Table 5.1.6 to include inspection of warpage of Swing Frame Weldment, added reference to Cargo Hook CMM for storage instructions.
7	09/14/15	Section 5 Pages 11, 16 thru 18, Section 25 Page 21	Clarified parts requiring NDT, expanded re-assembly instructions including tightening instructions for nut for attaching load cell assembly.
8	02/21/18	Section 5 Pages 11, 15	Removed magnetic particle inspection requirement for load cell assembly, inserted instructions to return load cell to factory for inspection/calibration.  Listed overhaul kit P/N 212-040-00 for swing suspension.  Revised attach bolt diameter limit to .495" to standardize with cargo hook CMMs.
9	08/16/22	Section 0 page 1, Section 5 pages 1, 2, 5, 6, 18  Section 25 pages 2 – 4, 11-27	Incorporated kit P/N 200-286-03 w/ C-40 Indicator P/N 210-293-00 and associated instructions.  Added grace period for annual/100 hour and 5 year 100 hour inspections for maintenance scheduling convenience.
10	06/20/24	Section 5	Added disassembly and inspection of upper load cell joint to annual/100 hour inspection. Re-formatted inspection figures and inspection table.

THIS PAGE INTENTIONALLY LEFT BLANK

## List of Effective Pages

<b>Title</b>	<b>Pages</b>	<b>Revision</b>	<b>Date</b>
Cover	i, ii Blank	10	06/20/24
Record of Revisions	iii, iv Blank	10	06/20/24
List of Effective Pages	v, vi Blank	10	06/20/24
Table of Contents	vii, viii	10	06/20/24
Section 0 Introduction	1	9	08/16/22
Section 0 Introduction	2	0	05/18/10
Section 4 Airworthiness Limitations	1, 2 Blank	0	05/18/10
Section 5 Inspection and Overhaul Schedule	1 through 17, 18 Blank	10	06/20/24
Section 11 Placards and Markings	1, 2 Blank	4	05/04/12
Section 12 Servicing	1 through 3, 4 Blank	4	05/04/12
Section 25 Operation Instructions	1	0	05/18/10
Section 25 Operation Instructions	2 thru 4	9	08/16/22
Section 25 Operation Instructions	5	6	08/28/14
Section 25 Operation Instructions	6	5	05/09/14
Section 25 Operation Instructions	7, 8	1	09/01/10
Section 25 Operation Instructions	9, 10	5	05/09/14
Section 25 Operation Instructions	11 through 27	9	08/16/22

THIS PAGE INTENTIONALLY LEFT BLANK

# CONTENTS

<u>Identification</u>	Title, Page
<b>Section 0</b>	<b>Introduction 00-00-00</b>
	0.4 Scope, 1
	0.5 Purpose, 1
	0.6 Arrangement, 1
	0.7 Applicability, 1
	0.9 Abbreviations, 1
	0.12 Precautions, 2
	0.19 Distribution of Instructions for Continued Airworthiness, 2
<b>Section 4</b>	<b>Airworthiness Limitations 04-00-00</b>
<b>Section 5</b>	<b>Inspection and Overhaul Schedule 05-00-00</b>
	5.1 Cargo Swing Suspension System Inspection, 1
	5.2 Cargo Hook Overhaul Schedule, 18
<b>Section 11</b>	<b>Placards and Markings 11-00-00</b>
	11.1 Placards, 1
<b>Section 12</b>	<b>Servicing 12-00-00</b>
	12.2 Lubrication Information, 1
<b>Section 25</b>	<b>Equipment and Furnishings 25-00-00</b>
	25.1 Cargo Hook Connector, 1
	25.2 Description, 2
	25.5 Component Weights, 5
	25.12 Storage Instructions, 5
	25.15 Troubleshooting, 6
	25.16 Component Removal, 14
	25.17 Component Re-installation, 18
	25.18 General Procedures Instructions-Testing, 27
<b>Figures</b>	
	5.1.1 Manual Release Cable Inspection, Section 5 Page 2
	5.1.2 Manual Release Cable Conditions, Section 5 Page 2
	5.1.3 Manual Release Cable Rigging, Section 5 Page 3
	5.1.4 Load Cell Inspection, Section 5 Page 5
	5.1.5 Gimbal DU Bearing Inspection Criteria, Section 5 Page 5
	5.2.1 Suspension Cable to Swing Frame Attachment, Section 5 Page 8
	5.2.2 Swing Frame Assembly Part, Section 5 Page 8
	5.2.3 Suspension Cable Parts, Section 5 Page 9
	5.2.4 Shackle Assembly Parts, Section 5 Page 9
	5.2.5 Swing Frame Orientation, Section 5 Page 16

**Figures** continued

- 12.1 Shackle Assembly Lubrication, Section 12 Page 2
- 12.2 Upper Gimbal Grease Fitting Lubrication, Section 12 Page 3
- 25.1 Un-commanded cargo hook release, Section 25 Page 1
- 25.2.1 Swing Suspension System Overview, Section 25 Page 2
- 25.2.2 Cargo Hook Overview, Section 25 Page 3
- 25.2.3 Fuel Drain Guard Overview, Section 25 Page 4
- 25.2.4 Fuel Drain Guard Components, Section 25 Page 5
- 25.15.1 Cargo Hook Electrical Connector, Section 25 Page 7
- 25.15.2 Wire Harness Routing, Section 25 Page 8
- 25.15.3 Electrical Schematic, Section 25 Page 9
- 25.15.4 Load Weigh System Schematic w/ C-40, Section 25 Page 11
- 25.15.5 CAL Code on the C-39, Section 25 Page 12
- 25.15.6 C-40 Settings Screen, Section 25 Page 12
- 25.15.7 Changing Dampening Level, Section 25 Page 13
- 25.16.1 Suspension Attachment Hardware, Section 25 Page 14
- 25.16.2 Manual Release Cable Connection, Section 25 Page 15
- 25.16.3 Manual Release Cover Removal, Section 25 Page 15
- 25.16.4 Load Weigh Indicator, Section 25 Page 16
- 25.16.5 Load Cell Hardware, Section 25 Page 16
- 25.16.6 Fuel Drain Guard Removal, Section 25 Page 17
- 25.17.1 Cable Attachment, Section 25 Page 18
- 25.17.2 Cargo Hook Attachment Hardware, Section 25 Page 19
- 25.17.3 Manual Release Cable Adjustment, Section 25 Page 20
- 25.17.4 Manual Release Cable Connection, Section 25 Page 21
- 25.17.5 Manual Release Cable Rigging, Section 25 Page 22
- 25.17.6 C-40 Model Re-installation, Section 25 Page 22
- 25.17.7 Sealant Application Location, Section 25 Page 24
- 25.17.8 Guard/Retainer Assembly, Section 25 Page 24
- 25.17.9 Lever Installation, Section 25 Page 25
- 25.17.10 Cable Setting, Section 25 Page 26

**Tables**

- 5.2.1 Swing Suspension Parts List, Section 5 Page 10
- 5.2.2 Swing Suspension Inspection Criteria, Section 5 Page 12
- 11.1 Cargo Hook Suspension System Placards, Section 11 Page 1
- 25.1 Cargo Hook Connector, Section 25 Page 1
- 25.5.1 Component Weights and CGs, Section 25 Page 5
- 25.15.1 Troubleshooting, Section 25 Page 6



# *Section 0*

## **Introduction**

### **0.4 Scope**

The following information is necessary to carry out the service, maintenance, and inspection of the Cargo Swing Retrofit Kit P/N 200-286-02 and P/N 200-286-03. See section 25.2 for a detailed description of the kit.

### **0.5 Purpose**

The purpose of this Instructions for Continued Airworthiness (ICA) manual is to provide the information necessary to inspect, service, and maintain in an airworthy condition the P/N 200-286-02 and P/N 200-286-03 Cargo Swing Retrofit Kits.

### **0.6 Arrangement**

This manual contains instructions for the service, maintenance, inspection and operation of the Cargo Swing Retrofit Kit P/N's 200-286-02 and 200-286-03 on Airbus Helicopters model AS350 series helicopters. The manual is arranged in the general order that maintenance personnel would use to maintain and operate the Cargo Hook Swing Suspension System in service.

The arrangement is:

- Section 0 Introduction.
- Section 4 Airworthiness limitations (none apply to this system.)
- Section 5 Inspection and overhaul schedule
- Section 11 Placards and Markings
- Section 12 Servicing
- Section 25 Equipment and Furnishings

### **0.7 Applicability**

These Instructions for Continued Airworthiness are applicable to Cargo Swing Retrofit Kit P/N 200-286-02 and P/N 200-286-03 for the Airbus Helicopters AS350 series helicopters. Maintenance of this kit, which includes a common cargo hook (P/N 528-029-00), also requires cargo hook CMM 122-017-00 in addition to the instructions provided in this manual. Refer to the appropriate Airbus Helicopters maintenance documentation for instructions regarding parts of the aircraft that interface with these kits.

### **0.9 Abbreviations**

- FAA Federal Aviation Administration
- ICA Instructions for Continued Airworthiness
- CFR Code of Federal Regulations
- CMM Component Maintenance Manual

## 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](http://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**

This Airworthiness Limitations section is FAA approved and specifies inspections and other 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.

THIS PAGE INTENTIONALLY LEFT BLANK

## Section 5

# Inspection and Overhaul Schedule

The scheduled inspections (Annual/100 Hour and 5 Year/1000 Hour) are defined herein. If the 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. Refer to Section 5.1 for the Annual/100 Hour Inspection and Section 5.2 for the 5 Year/1000 Hour Inspection.

### 5.1 Annual/100 Hour Inspection

Annually or 100 hours of external load operations, whichever comes first, inspect the cargo hook and other kit components per the following. A grace period of 1 month or 10 hours of external load operations can be applied to this interval for maintenance scheduling convenience only. Refer also to Component Maintenance Manual (CMM) 122-017-00 for additional inspection.

## 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.*

## NOTICE

*The optional C-40 Indicator (P/N 210-293-00 or 210-293-01) also records and displays hours of external load operations accumulated. This resettable hour-meter automatically logs time when the external load goes above 50 lbs and stops counting when it goes under 25 lbs. For this method of tracking hours refer to the C-40 Owner's Manual for setup and additional instructions.*

### 5.1 Annual/100 Hour Inspection continued

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

## CAUTION

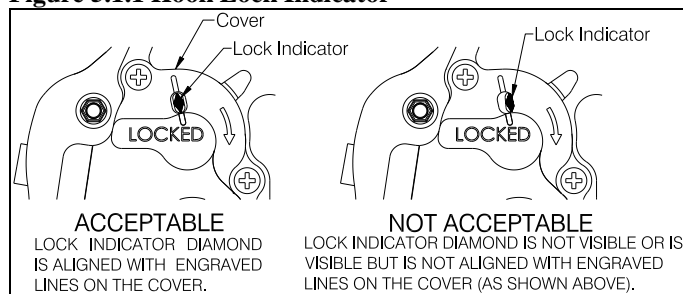
*Depressing the button continuously in excess of 20 seconds will cause the cargo hook solenoid to overheat, possibly causing permanent damage.*

2. Activate the manual release system by pulling the release lever in the cockpit. With no load on it, 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.

## CAUTION

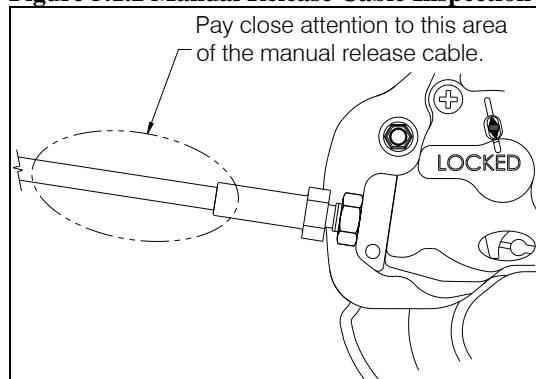
*In the fully locked position the hook lock indicator must align with the lines on the manual release cover (see Figure 5.1.1).*

**Figure 5.1.1 Hook Lock Indicator**



3. Visually inspect the external manual release cable for damage and security, with emphasis on the cargo hook end of the release cable (refer to Figure 5.1.2).

**Figure 5.1.2 Manual Release Cable Inspection**



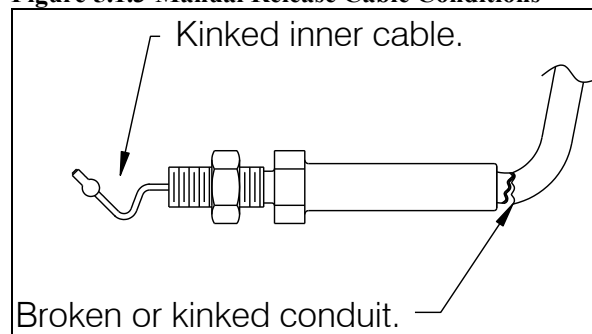
5.1 Annual/100 Hour Inspection continued

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



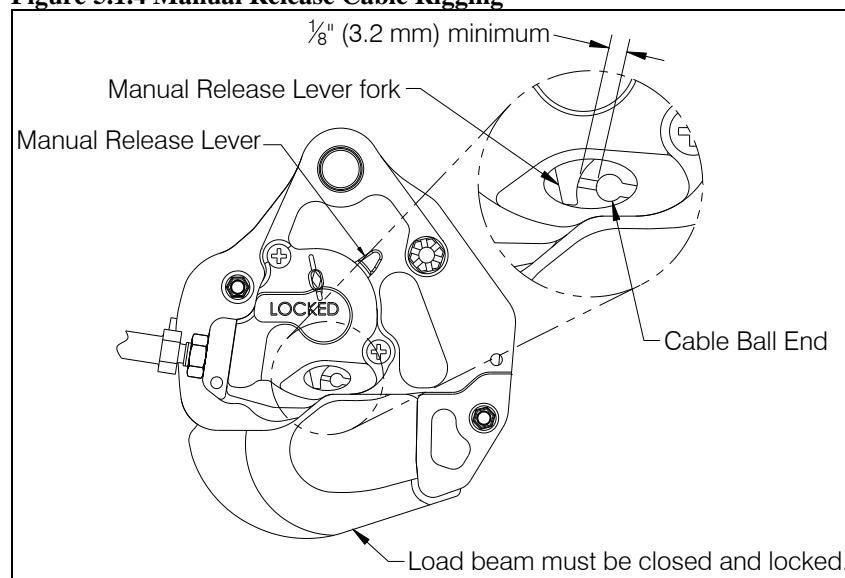
*Manual release cables are wearable items and must be replaced as condition requires. Broken or kinked conduit, inner cable kinks (ref Figure 5.1.3), frays, or sticky operation are each cause for immediate replacement.*

**Figure 5.1.3 Manual Release Cable Conditions**



5. Check the manual release cable rigging. 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 and the cable ball end as shown below. A minimum gap of 1/8" (3.2 mm) should be present as shown in Figure 5.1.4.

**Figure 5.1.4 Manual Release Cable Rigging**



**5.1 Annual/100 Hour Inspection** continued

6. Visually inspect for presence and security of fasteners and electrical connections.
7. Visually inspect the external electrical wire harnesses for damage, chafing and security.
8. Visually inspect for corrosion on the exterior of cargo hook, load cell and swing suspension components.
9. Swing the cargo hook and the swing suspension and ensure all pivot points rotate freely without binding.
10. Move the cargo hook and the swing suspension throughout their full ranges of motion and observe the manual release cable, electrical harnesses, and ground strap to ensure that they have enough slack. The release cable, harnesses, and ground strap must not be the stops that prevent the cargo hook or suspension from moving freely in all directions.
11. Visually inspect the cargo hook and swing frame assembly bumpers for damage and security.
12. Visually inspect for dents, scratches and gouges in the swing frame assembly tubes. Refer to Table 5.2.2 for limits.
13. Visually inspect for cracks in suspension frame. Pay special attention to the areas around the welds. The frame tubes contain a corrosion preventative compound, which may leak out through a crack and provide an indication. At any sign of cracking, remove and replace discrepant part.
14. Inspect suspension cables for broken strands, paying close attention to the sections around the thimbles at each end. Pass a cloth over the cables. This will clean the load ropes for a visual inspection and detect broken wires if the cloth snags on the rope. Ten randomly distributed broken wires in one rope lay (one complete rotation around the wire) or five broken wires in one strand in one rope lay is considered unacceptable. One rope lay is the length along the rope which a single strand requires to make one complete spiral around the core.
15. Disassemble and inspect the upper joint of the load cell (16) per the following, referring to Figure 5.2.2 for item numbers in parentheses ( ).
  - a. Remove the cotter pin (22), washer (20), retaining washer (18), and nut (21) from the end of the bolt (19).
  - b. While supporting the load cell and cargo hook (28), remove the bolt and the other retaining washer (18) and slide the Gimbal Shaft (17) out of the joint, separating the load cell from the Gimbal (1.1).
  - c. Visually inspect the Gimbal Shaft for signs of wear, such as pitting, galling, or reduction in diameter. If reduction in diameter is observed, refer to the criteria in Table 5.2.2. There should be no visible wear, except for light burnishing of the outside diameter surface. If the burnishing can be removed using Scotch Brite (3M P/N 7447), it is considered light.

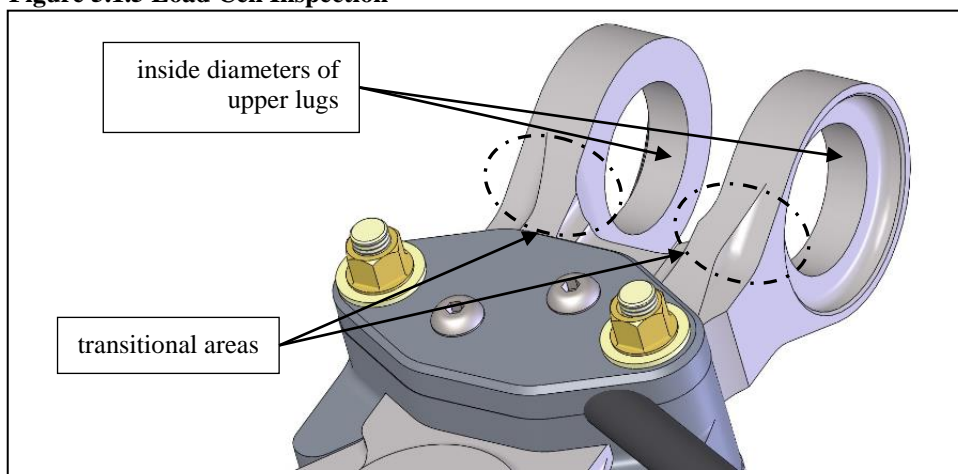


**5.1 Annual/100 Hour Inspection** continued

- d. Inspect the inside diameters of the upper lugs of the load cell (refer to Figure 5.1.5) for signs of wear such as pitting, galling, or elongation of the holes. If elongation is observed, refer to the size limits criteria in Table 5.2.2. There should be no visible wear, aside from light burnishing of the inside diameter surfaces. If the burnishing can be removed using the Scotch Brite, it is considered light.

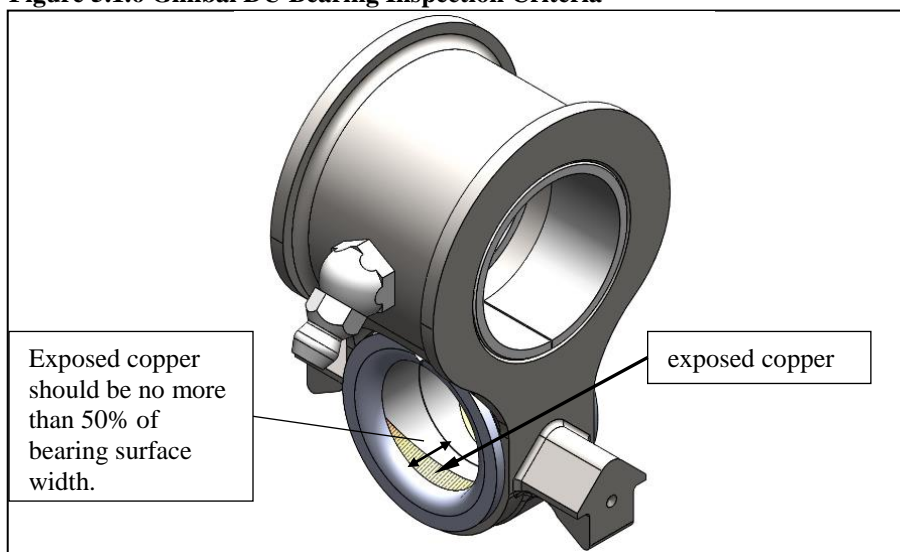
Visually inspect for cracks around both lugs, including the transitional areas (indicated in Figure 5.1.5) where the lugs transition into the flat portion of the load cell. Inspect these areas on both sides.

**Figure 5.1.5 Load Cell Inspection**



- e. Inspect the flanged DU bearings (1.2) of the Gimbal (1.1) that interface with the Gimbal Shaft. Any pits or signs of galling on these bearings are cause for replacement. Additionally, as these bearings wear, the low-friction PTFE layer is removed, exposing the copper layer below (ref. Figure 5.1.6). Across the width of the bearing surface, no more than 50% should be the exposed copper layer.

**Figure 5.1.6 Gimbal DU Bearing Inspection Criteria**



**5.1 Annual/100 Hour Inspection** continued

- f. Replace worn or damaged parts. If DU bearings require replacement (refer to this section for further disassembly instructions), press in with wet zinc chromate primer (TTP-1757 or equivalent) applied to the inside diameter of the mating hole.
- g. Re-assemble the load cell to the Gimbal per Section 25.17.

If the C-40 Indicator (P/N 210-293-00 or 210-293-01) is installed and connected to the VEMD for the function to increase the main rotor RPM perform the following.

3. Check the function of the C-40 Indicator to signal the VEMD to send N2 datum of 400 rpm to the FADEC when the measured external load is 331 lbs. (150 kg) or more. This function is applicable to AS350B3s with MOD 07-4716 incorporated. Perform check per the following.
  - From the Load screen rotate the rotary push button knob to enter the C-40 Settings screen.
  - Press the knob to enter the Setting menu.
  - Scroll down the menu to the Analog Test setting by rotating the knob and press the knob again.
  - A simulated load of 475 lbs. is output for 3 seconds, verify this load is displayed on the VEMD (if the engine is running in FLIGHT mode this also temporarily sends an N2 datum of 400 rpm to the FADEC resulting in a slight acceleration and deceleration of NR).

If the fuel drain guard is installed perform the following.

1. Inspect all fuel drain guard parts for corrosion, gouges, nicks, and dents. If depth of corrosion pits, gouges, nicks, or dents exceed .060", remove and replace damaged part(s).
2. Inspect Guard for damage that causes lever to bind or rub. Remove and replace Guard if it is obstructing free operation of lever.
3. Inspect for fuel leakage. If leakage is noted, re-apply sealant to Retainer as described in Section 25. Refer to Airbus Helicopters maintenance instructions for other possible causes.

## 5.2 5 Year/1000 Hour Inspection

---

**Every 5 years or 1000 hours of external load operations, whichever comes first, remove the external components from the aircraft and disassemble per the following. A six-month or 100-hour grace period can be applied if needed for maintenance scheduling convenience only. No extension to maintenance is allowed beyond this tolerance grace period.**

---

Remove the suspension by removing the quick release pins at the cable attachments to the shackle assemblies at the landing gear cross tubes and disconnecting the electrical harnesses, ground strap and manual release cable connections at the aircraft. Remove the four Shackle Assemblies from the aircraft hardpoints.

Disassemble per the following steps. For item numbers in parentheses ( ), refer to Figure 5.2.1 through Figure 5.2.3 for Swing Suspension parts and Figure 5.2.4 for Shackle Assembly parts. Part numbers are listed in Table 5.2.1.

1. Remove the four suspension cable assemblies from the swing frame feet by removing the cotter pin (33), nut (32), two washers (31) and bolt (29). Remove the Standoff Bushings (30).
2. Separate the Gimbal Assembly (34.1, 34.2, 34.3) from each suspension cable assembly by removing the cotter pin (33), nut (32), washer (31), and bolt (37).
3. Separate the Load Cell (16) and Cargo Hook (28) from the Swing Frame by removing the cotter pin (22), nut (21), washer (20), and Shaft Retaining Bushing (18) and sliding the Gimbal Shaft (17) and bolt out with the other Shaft Retaining Bushing (18).
4. At each foot of the swing frame remove the nut (7) and bolt (12) that secure the rod end fittings (13) to the swing frame feet.
5. At the upper pivoting joint of the swing frame remove the cotter pin (8) and nut (9) from the end of the bolt (10) and remove the Shaft Cap (5).
6. Slide the Swing Frame Half (3) off of the Pivot Shaft (4) and remove the bumper (6), thrust washers (15), and Gimbal Assembly (1.1, 1.2, 1.3).
7. Slide the Pivot Shaft out of the opposite Swing Frame Half (3) and remove the other Shaft Cap (5) and bolt (10).
8. Separate the Cargo Hook (28) and Hook Bumper (23) from the Load Cell by removing the cotter pin (8), nut (27), and washers (25, 26) from the end of the Attach Bolt (24) and slide the Attach Bolt out, removing the other washer (25).
9. Remove spiral wrap from around the frame tubes.
10. Remove bushings if it is necessary that they be replaced. All self-lubricating bushings use an interference fit to hold them in place. Use an arbor press or similar to press the bushings out of the bore they are mounted in. Do NOT use heat.

5.2 5 Year/1000 Hour Inspection continued

Figure 5.2.1 Suspension Cable to Swing Frame Attachment Hardware

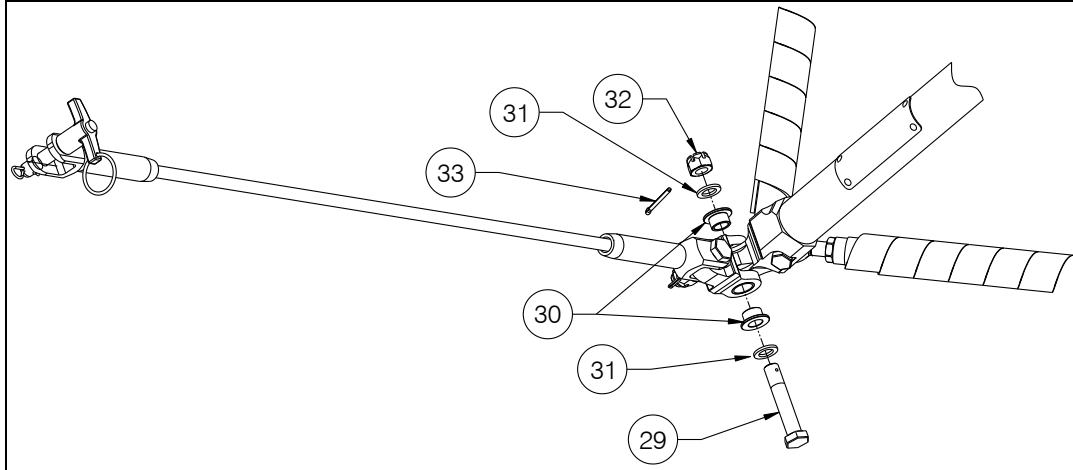
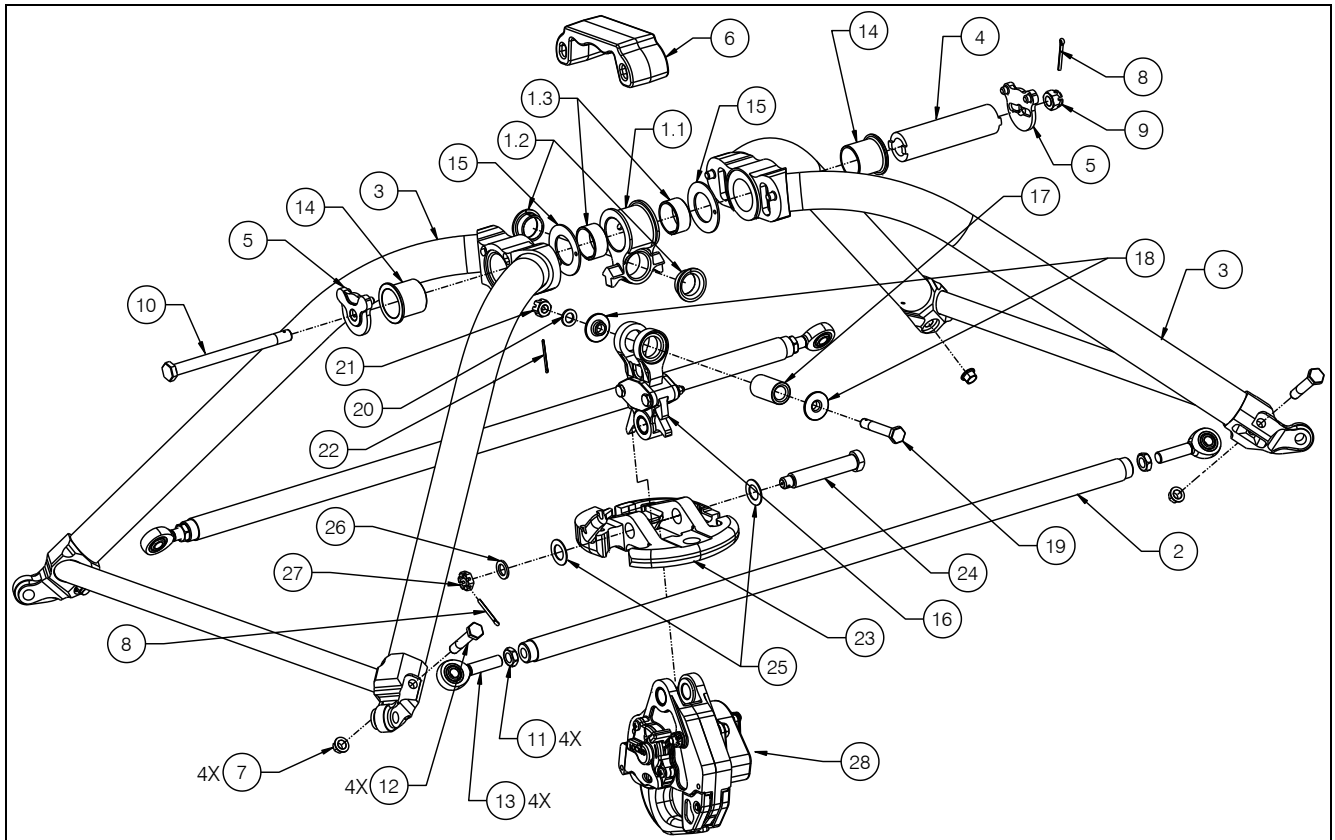


Figure 5.2.2 Swing Frame Assembly Parts



5.2 5 Year/1000 Hour Inspection continued

Figure 5.2.3 Suspension Cable Parts

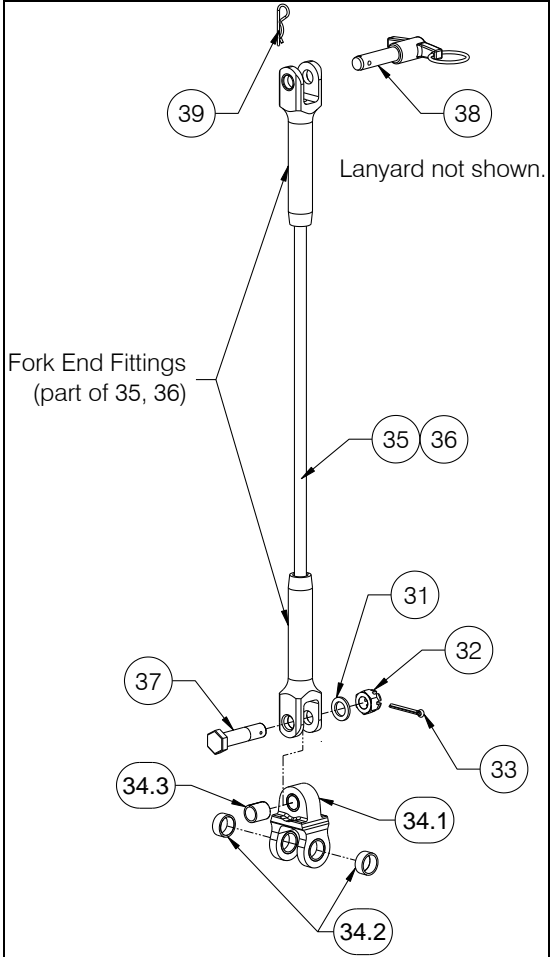
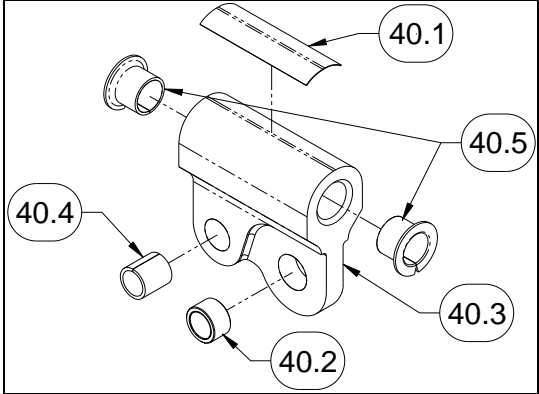


Figure 5.2.4 Shackle Assembly Parts



**5.2 5 Year/1000 Hour Inspection** continued

**Table 5.2.1 Swing Suspension Parts List**

<b>Item</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1*	232-143-01	Load Cell Gimbal Assembly	1
1.1	290-841-00	Gimbal	1
1.2	517-046-00	Flanged DU Bearing	2
1.3	517-056-00	DU Bearing	2
1.4***	518-003-00	Grease Fitting	1
2	235-116-00	Frame Strut Weldment	2
3	235-117-00	Swing Frame Half	2
4	290-842-00	Pivot Shaft	1
5	290-843-00	Cap-Shaft	2
6	290-862-00	Bumper	1
7	510-104-00	Nut	4
8	510-178-00	Cotter Pin	2
9	510-718-00	Nut	1
10	510-506-00	Bolt	1
11	510-510-00	Jam Nut	4
12	511-239-00	Bolt	4
13	517-055-00	Spherical Rod End	4
14	517-057-00	Flanged DU Bearing	2
15	517-058-00	Thrust Bearing	2
16	210-312-00	Load Cell Assembly w/ Y-Harness	1
17	290-739-00	Shaft - Gimbal	1
18	290-740-00	Retaining Bushing - Shaft	2
19	510-443-00	Bolt	1
20	510-220-00	Washer	1
21	510-320-00	Nut	1
22	510-115-00	Cotter Pin	5
23	290-839-02	Hook Bumper	1
24	290-775-00	Long Attach Bolt	1
25	510-183-00	Washer	2
26	510-174-00	Washer	1
27	510-170-00	Nut	1
28	528-029-00	Cargo Hook	1
29	510-439-00	Bolt	4
30	290-749-00	Standoff Bushing	8
31	510-221-00	Washer	12
32	510-718-00	Nut	8
33	510-178-00	Cotter Pin	8

**5.2 5 Year/1000 Hour Inspection** continued

**Table 5.2.1 Swing Suspension Parts List** continued

<b>Item</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
34*	232-142-00	Lower Attach Gimbal Assembly	4
34.1	290-746-00	Gimbal	1**
34.2	517-048-00	DU Bearing	2**
34.3	517-016-00	DU Bearing	1**
35	232-177-00	Forward Suspension Cable	2
36	232-178-00	Aft Suspension Cable	2
37	510-438-00	Bolt	4
38	290-851-00	Quick Release Pin	4
39	514-048-00	Safety Pin	4
40*	232-137-01	Shackle Assembly	4
40.1	215-396-00	Shackle Assembly Placard	1**
40.2	290-750-00	Attach Fitting Bushing	1**
40.3	290-850-00	Shackle	1**
40.4	517-016-00	DU Bearing	1**
40.5	517-047-00	Flanged DU Bearing	2**

\*Item not shown assembled.

\*\*Quantity is per assembly.

\*\*\* Not shown.

Notes:

- 1) Load Cell P/N 210-249-03 supersedes P/Ns 210-249-00, 210-199-01, and 210-199-00.
- 2) Swing Frame Assembly P/N 232-145-25 is comprised of items 1 through 15.

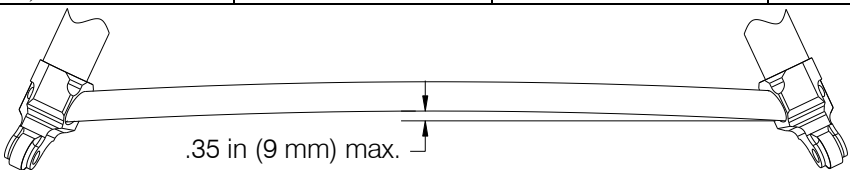
**5.2 5 Year/1000 Hour Inspection** continued

Return the Load Cell Assembly (P/N 210-249-03) to the factory for inspection and calibration. The factory will inspect the condition of the load cell and perform acceptance test procedures including calibration and zero balance, repairing as necessary.

In addition, carefully inspect, and if necessary repair or replace, the detail parts in accordance with the instructions in Table 5.2.2. Inspect the parts in a clean, well-lit room.

Overhaul Kit P/N 212-040-00 is recommended to use for re-assembly of the swing suspension. The overhaul kit contains fasteners, bushings and other recommended items to be replaced. The cargo hook has its own Overhaul Kit, refer to its CMM.

**Table 5.2.2 Swing Suspension Inspection Criteria**

Seq	Component	Inspection Criteria & Limit	Repair Action	Finish	Recommended replacement at overhaul
1.	Gimbal (1.1), Gimbal (34.1)	Surface cracks – inspect under illuminated magnification (minimum 2X / 4 diopter).	None. Cracks of any size are cause for part replacement.	N/A	No
2.	Frame Strut Weldment (2)	Dents, gouges, and scratches – 0.020 in. (0.51 mm) deep.	Blend at 10:1 ratio as required to provide smooth transitions.	Protect affected surfaces with MIL-PRF-23377 Type 1 primer or equivalent and MIL-PRF-85285 Type 1 coating or equivalent.	No
		Surface cracks – inspect under illuminated magnification (minimum 2X / 4 diopter).	None. Cracks of any size are cause for part replacement.	N/A	
3.	Swing Frame Weldment (3)	Dents, gouges, and scratches – 0.020 in. (0.51 mm) deep.	Blend at 10:1 ratio as required to provide smooth transitions.	Protect affected surfaces with MIL-PRF-23377 Type 1 primer or equivalent and MIL-PRF-85285 Type 1 coating or equivalent.	No
		Surface cracks – inspect under illuminated magnification (minimum 2X / 4 diopter).	None. Cracks of any size are cause for part replacement.	N/A	
		Bent lateral tube, gap measured along a straight edge is greater than .35” (see figure below).	None.	N/A	
					



**5.2 5 Year/1000 Hour Inspection** continued

**Table 5.2.2 Swing Suspension Inspection Criteria** continued

Seq	Component	Inspection Criteria & Limit	Repair Action	Finish	Recommended replacement at overhaul
4.	Pivot Shaft (4)	Wear on outside diameter, diameter less than 0.990" (25.1 mm).	None	N/A	No
5.	Shaft Cap (5)	Dents, nicks, cracks, gouges, scratches and corrosion – 0.060 in. (1.52 mm) deep	Blend at 10:1 ratio as required to provide smooth transitions.	Passivate per AMS-QQ-P-35 or ASTM A967.	No
6.	Bumper (6)	Gouges and scratches greater than .060" deep. Splitting.	None.	N/A	No
7.	DU Bearing (1.2, 1.3, 15, 34.2, 34.3, 40.4, 40.5)	Wear – more than 50% copper showing. Galling or pitting.	None	N/A	Yes
8.	Rod End (13)	Wear on or elongation of inside diameter of spherical bearing, diameter greater than .330 in. (8.4 mm). Binding of spherical bearing in its housing.	None	N/A	No
9.	DU Thrust Washer (15)	Wear on side facing Gimbal – more than 50% copper showing.	None.	N/A	Yes
10.	Load Cell Assembly (16)	Dents, gouges, and scratches greater than .020 in. deep in the load link.	Blend at 10:1 ratio as required to provide smooth transitions.	Passivate per AMS-QQ-P-35 or ASTM A967.	No
		Elongation of or wear on inside diameter of upper lugs, diameter greater than .759 in. (19.3 mm). Galling, pitting on inside diameter.	None.	N/A	
		Dents, gouges, and scratches greater than .060 in. (1.5 mm) deep in the Covers.	Blend at 10:1 ratio as required to provide smooth transitions.	Apply conversion coating (MIL-DTL-5541) to affected Cover surfaces.	
		Wear on ID of bushing - 0.520 in. (13.2 mm)	None.	N/A	
11.	Gimbal Shaft (17)	Wear on OD - .732 in. (18.6 mm) Galling, pitting.	None	N/A	No
12.	Retaining Bushing (18)	Wear on OD - .487 in. (12.4 mm)	None	N/A	No
13.	Hook Bumper (23)	Gouges and scratches greater than .060 in (1.5 mm) deep.	None	N/A	No

**Instructions for Continued Airworthiness**  
**123-014-02**

**5.2 5 Year/1000 Hour Inspection** continued

**Table 5.2.2 Swing Suspension Inspection Criteria** continued

<b>Seq</b>	<b>Component</b>	<b>Inspection Criteria &amp; Limit</b>	<b>Repair Action</b>	<b>Finish</b>	<b>Recommended replacement at overhaul</b>
14.	Attach Bolt (24)	Wear on OD - .495 in. (12.6 mm)	None	N/A	No
15.	Suspension Cable (35, 36) Fork End Fittings	Wear on ID of clevis holes - 0.397 in. (10.1 mm)	None	N/A	No
		Dents, gouges and scratches – 0.020 in. (0.51 mm) deep	Blend at 10:1 ratio to provide smooth transitions.	Parts are 303 stainless steel, no touch up finish required.	No
		Surface cracks – inspect under illuminated magnification (minimum 2X / 4 diopter).	None	N/A	No
16.	Suspension Cable (35, 36) Wire Rope	Inspect for damage as detailed in 100 Hour/Annual Inspection	None	N/A	No
17.	Quick Release Pin (38)	Wear on OD - 0.362 in. (9.2 mm)	None	N/A	No
18.	Shackle (40.3)	Dents, gouges and scratches – 0.020 in. (0.51 mm) deep	Blend at 10:1 ratio to provide smooth transitions.	Protect affected surfaces with MIL-PRF-23377 Type 1 epoxy primer or equivalent and MIL-PRF-85285 Type 1 coating or equivalent.	No
19.	All remaining nuts, bolts, cotter pins, washers	Wear, corrosion or deterioration.	None	N/A	Yes
20.	S/N Plate	Damaged or illegible	None	N/A	No

**5.2 5 Year/1000 Hour Inspection** continued  
**Swing Frame Re-assembly**

Re-assemble the suspension frame per the following.

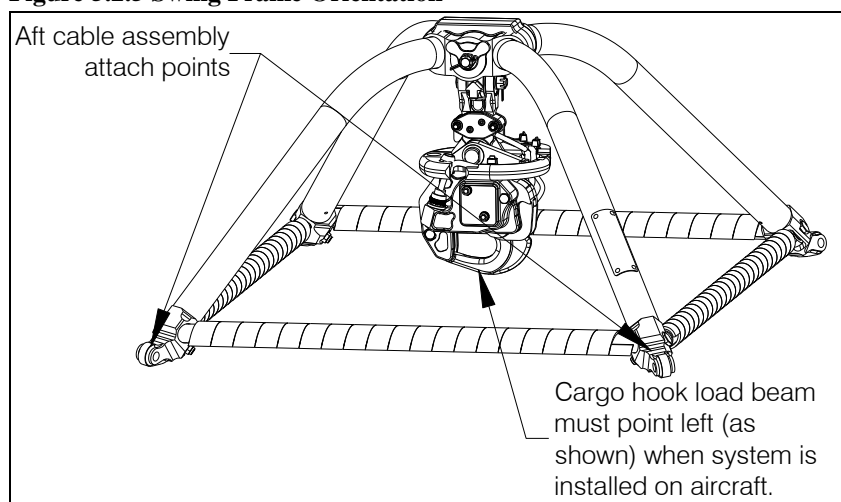
1. Install replacement self-lubricating bushings with wet zinc chromate primer (TTP-1757 or equivalent) applied to the inside diameter of the mating bore.
2. Apply a light film of grease (Mobilgrease 28 is recommended) to the outside diameter of the Pivot Shaft (5) and insert it through one frame half, thrust washer\* (16), Gimbal Assembly (1), thrust washer\* (16) and through second frame half. Do not fully seat frame halves yet.  
  
\*Ensure Teflon impregnated wear surfaces (darker sides) of thrust washers are facing gimbal.
3. Rotate the Pivot Shaft so that the raised “keys” at each end are horizontal.
4. Align the rod ends (14) to seat in the pockets of the swing frame feet.
5. Before fully seating and securing the frame halves together position the bumper (7) in between them.
6. Capture each end of the Pivot Shaft with Shaft Caps (5) and insert bolt (11) through, and thread the nut (10) on. Ensure that the rod ends are aligned with the holes in both feet.
7. Torque the nut (9) to 20 ft-lbs. Rotate the nut to the next castellation, not to exceed 30 ft-lbs.
8. Install and secure cotter pin (8).
9. Secure rod ends to frame feet with bolt (12) and nut (7). Torque to 8 – 12 ft-lbs.
10. Ensure the rod ends at each end of the frame struts are parallel, i.e.- the rod ends should be able to be rotated within the limits of the pockets in the frame feet. If necessary loosen a jam nut (12), rotate the strut so the tightened rod end is against the pocket, rotate other rod end in the same direction (to be parallel), and tighten its jam nut.
11. Attach the Load Cell Assembly (16) to the Gimbal Assembly (1) per section 25.17.
12. Attach the Cargo Hook (28) and Hook Bumper (23) to the Load Cell Assembly per section 25.17.
13. Apply grease (Mobilgrease 28 is recommended) to the holes of the Fork End Fittings of the Forward and Aft Suspension Cable Assemblies (35, 36).

5.2 5 Year/1000 Hour Inspection continued

14. Assemble the Gimbal Assemblies (34) onto the Fork End Fittings of the suspension cable assemblies with bolt (37), washer (31), and nut (32).
15. Tighten nut (32) to finger tighten then rotate to next castellation if necessary to insert cotter pin. Ensure the Gimbal Assembly pivots freely on the bolt (back off to previous castellation if it does not). Install cotter pin (33).
16. Apply grease (Mobilgrease 28 is recommended) to the shank of the bolts (29).
17. Fasten the Gimbal Assemblies of the two longer Aft Suspension Cable Assemblies onto the aft feet of the Swing Frame Assembly and the two shorter Aft Suspension Cable Assemblies onto the forward feet of the Swing Frame Assembly (reference Figure 5.2.5 for orientation).

At each joint, assemble with bolt (29), washers (31), Standoff Bushings (30), and nut (32). Tighten nut to 95-110 in-lb and rotate to next castellation to insert cotter pin (33).

Figure 5.2.5 Swing Frame Orientation



11. Re-install the suspension system on the aircraft per Section 25.17.

### 5.3 Cargo Hook Overhaul Schedule

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

**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.*

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

THIS PAGE INTENTIONALLY LEFT BLANK

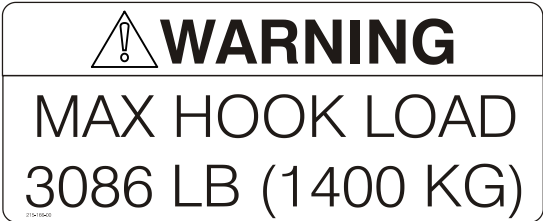
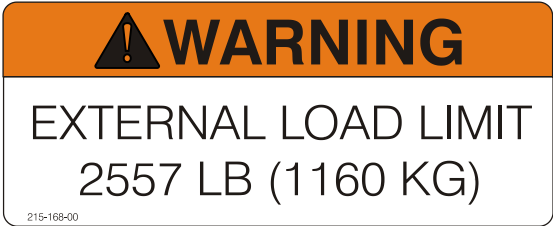


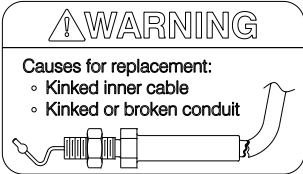
# Section 11

## Placards and Markings

### 11.1 Placards

The Cargo Swing Retrofit Kits include the following placards shown in Table 11.1.

Table 11.1 Cargo Hook Suspension System Placards

Placard part number and appearance	Location
<p>P/N 215-166-00</p>  <p>or P/N 215-168-00</p>  <p>dependent on the model of AS350 on which the system is installed.</p>	<p>Located on the belly of the aircraft near the cargo hook suspension in clear view of the ground support personnel.</p>
<p>P/N 215-271-00</p> 	<p>Located on the swing suspension frame near the serial number plate.</p>
<p>P/N 215-272-00</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="212 1577 513 1749">  <p>One Side</p> </div> <div data-bbox="548 1577 849 1749">  <p>Opposite Side</p> </div> </div>	<p>Located on the manual release cable, near the cargo hook.</p>

THIS PAGE INTENTIONALLY LEFT BLANK



# *Section 12*

## **Servicing**

### **12.2 Lubrication Information**

Lubrication of the Cargo Swing Suspension system is required every 500 hours of external load operations. To obtain maximum life under severe duty conditions such as logging or seismic work, it is recommended to lubricate the Swing Suspension every 250 hours. Recommended types of lubricant are AeroShell 17 (MIL-G-21164) or Mobilgrease 28 (MIL-G-81322).

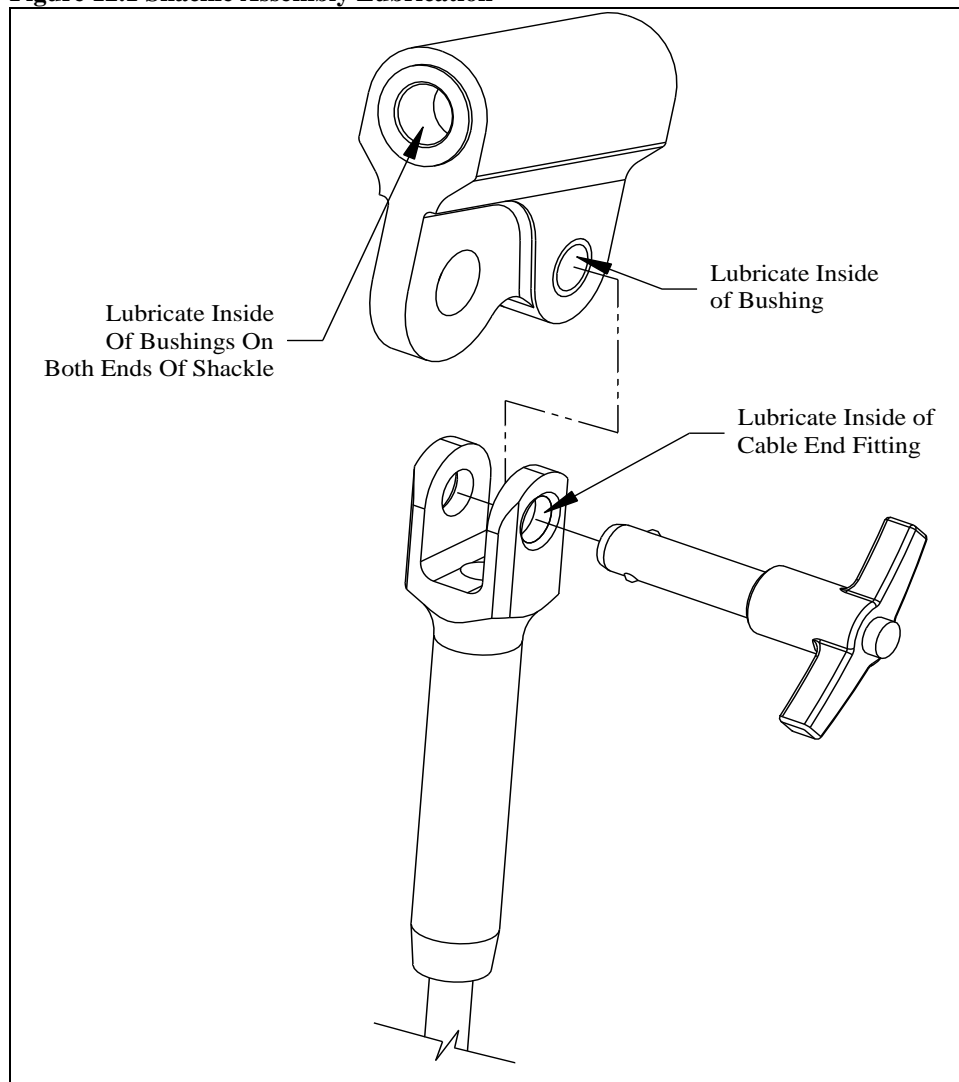
Lubricate the Cargo Swing Suspension at points noted in Figure 12.1 and 12.2.

## 12.2 Lubrication Information, continued

### Shackle Assembly Lubrication

Remove the Shackle Assemblies from the aircraft hard points and lubricate them and the mating fittings on the suspension cables as shown in Figure 12.1. This applies to all four Shackle Assemblies on the helicopter.

Figure 12.1 Shackle Assembly Lubrication

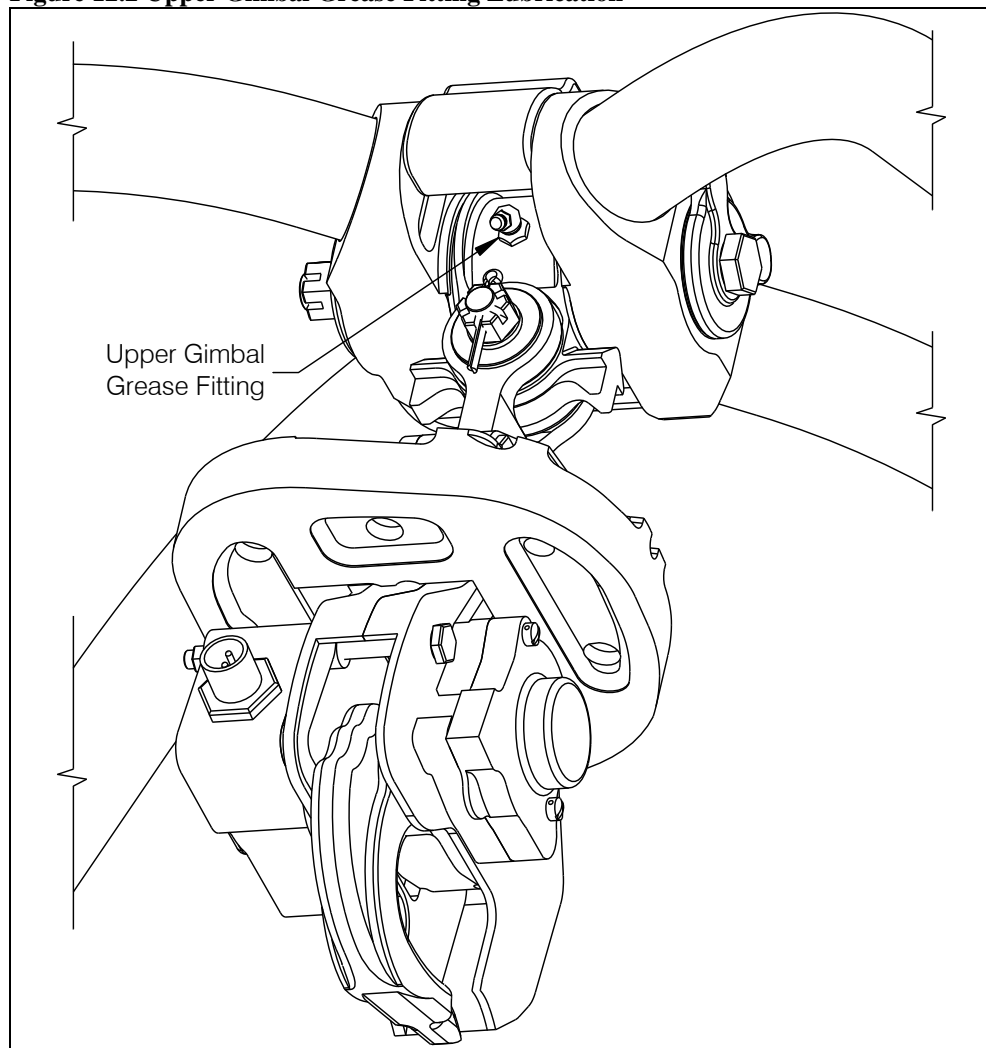


## 12.2 Lubrication Information, continued

### Upper Gimbal Grease Fitting

Lubricate Upper Gimbal Assembly at the grease fitting located as shown in Figure 12.2. You may have to rotate the hook slightly to access the grease fitting.

**Figure 12.2 Upper Gimbal Grease Fitting Lubrication**



THIS PAGE INTENTIONALLY LEFT BLANK

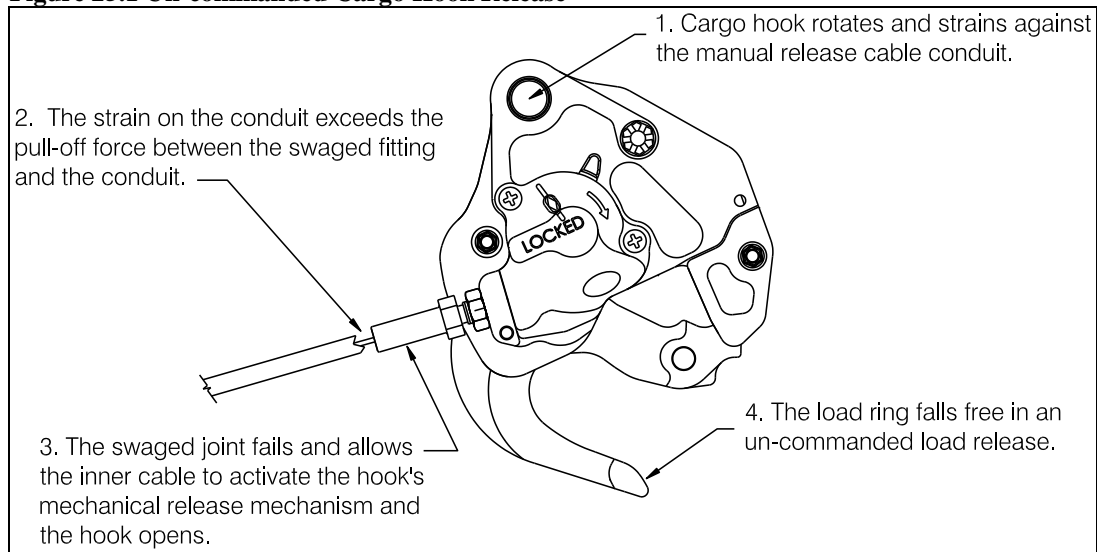
## Section 25

# Equipment and Furnishings



*Un-commanded cargo hook release will happen if the manual release cable is improperly restrained. The cable must not be the stop that prevents 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 Swing Frame 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**

<i>Pin</i>	<i>Function</i>
A	Ground
B	Positive

## 25.2 Description

The Cargo Swing Retrofit Kit is a conversion kit for AS350 operators with an existing Airbus Helicopters cargo hook swing system. This kit utilizes some of the existing Airbus Helicopters system's fixed components, i.e. – those which are compatible. These components include the fixed manual release cable, miscellaneous supporting brackets and miscellaneous hardware.

The Cargo Swing Retrofit Kit consists of five primary components/sub-system; these are the Swing Suspension Assembly, Electrical Release System, Manual Release Cable System, Load Weigh System and the Cargo Hook.

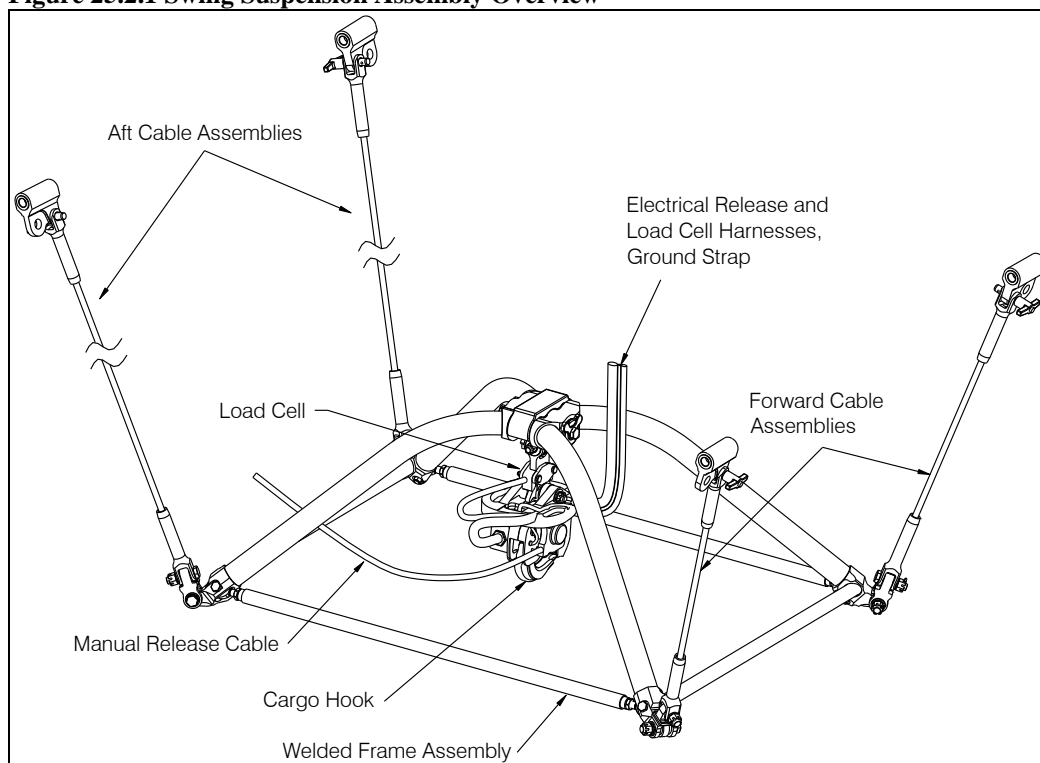
The Swing Suspension Assembly (see Figure 25.2.1) consists of a welded frame assembly which is attached to hard points and suspended below the belly of the helicopter by four cable assemblies. The frame assembly supports the cargo hook and a load cell through a gimbal.

The Electrical Release System provides a means to release a cargo hook load through the use of an existing switch in the cockpit. The kit includes the external electrical release harness and the internal electrical harness which interfaces with the existing electrical release switch and circuit breaker interface points on the aircraft.

The Manual Release Cable System consists of an external removable adapter cable that connects the cargo hook to the existing Airbus Helicopters fixed manual release cable. This system provides an additional means to release a cargo hook load.

The Load Weigh System consists of an indicator mounted within the cockpit, the load cell on the swing suspension assembly, and associated wiring.

Figure 25.2.1 Swing Suspension Assembly Overview

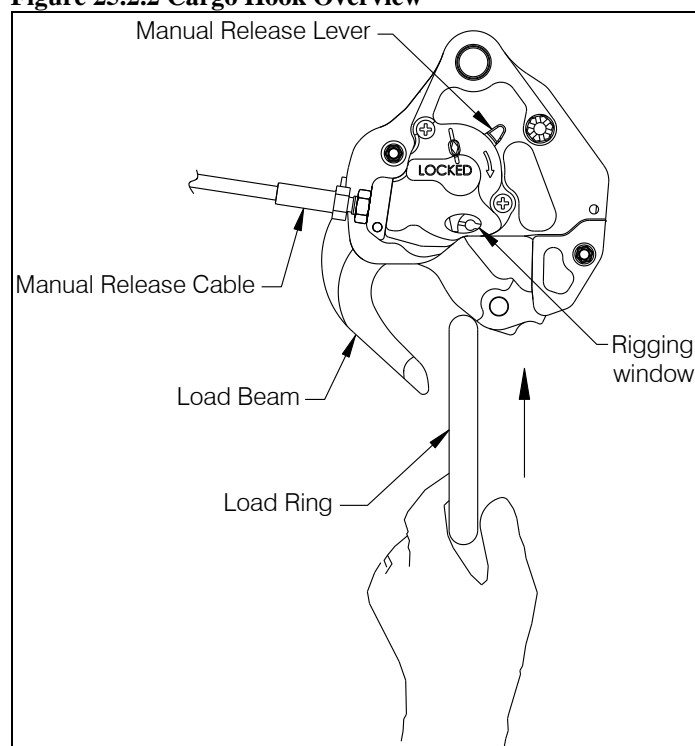


## 25.2 Description continued

The Load Weigh System provides the pilot with an indication of the weight of the external load on the cargo hook. There are two eligible indicator models, the C-39 Indicator (P/N 210-095-00) or the next generation C-40 Indicator (P/N 210-293-00 or 210-293-01) which is included with kit P/N 200-286-03. The C-40 Indicator's Analog Out signal can be connected to the VEMD (with the applicable Airbus mod) to serve as part of the system to increase the main rotor RPM when an external load of 150 kg or greater is measured by the load cell.

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 25.2.2), 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 25.2.2).

**Figure 25.2.2 Cargo Hook Overview**

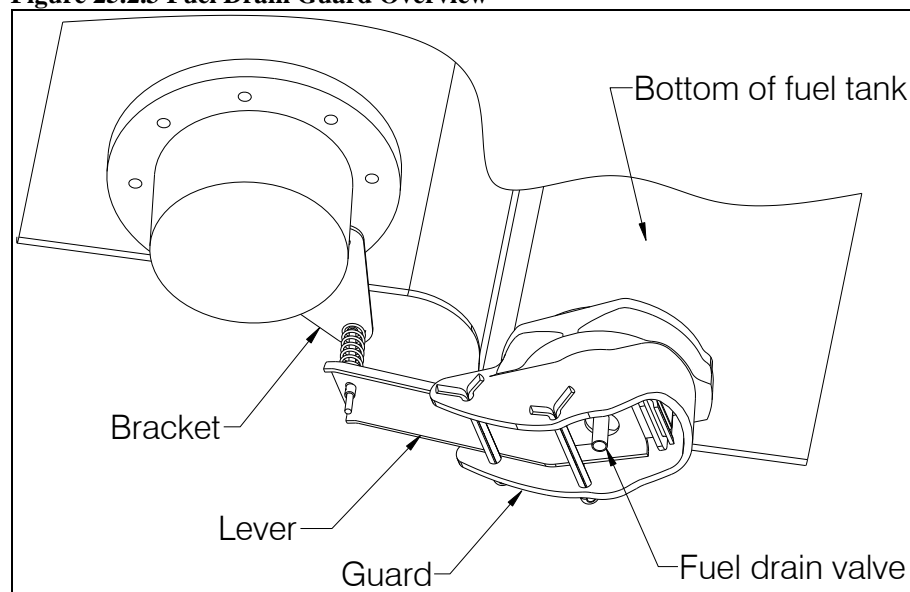


## 25.2 Description continued

The Fuel Drain Guard protects the fuel drain valve on AS350 helicopters from accidentally being opened. The fuel drain valve is located on the bottom of the fuel tank and extends below the belly of the helicopter. This location makes it vulnerable to damage or un-commanded fuel drainage on helicopters equipped with a cargo hook swing suspension. The most common occurrence of the cargo hook swing suspension striking the fuel drain valve happens when the helicopter lands on snow or on uneven terrain. The swing suspension has limited ground clearance and when the skid gear sinks into the snow, the swing suspension is pushed upward into the fuel drain valve, opening it and causing fuel to drain. The fuel drain valve can also be opened in flight by the swing suspension flying vertically due to aerodynamics when ferrying with no load or from recoil effects from releasing large cargo hook loads.

The Fuel Drain Guard provides mechanical protection for the fuel drain valve to prevent accidental contact while interfacing with Airbus Helicopters' existing valve, lever and control cable. The kit includes a Bracket, which replaces Airbus Helicopters' bracket and provides an optimized mounting point for the control cable.

**Figure 25.2.3 Fuel Drain Guard Overview**

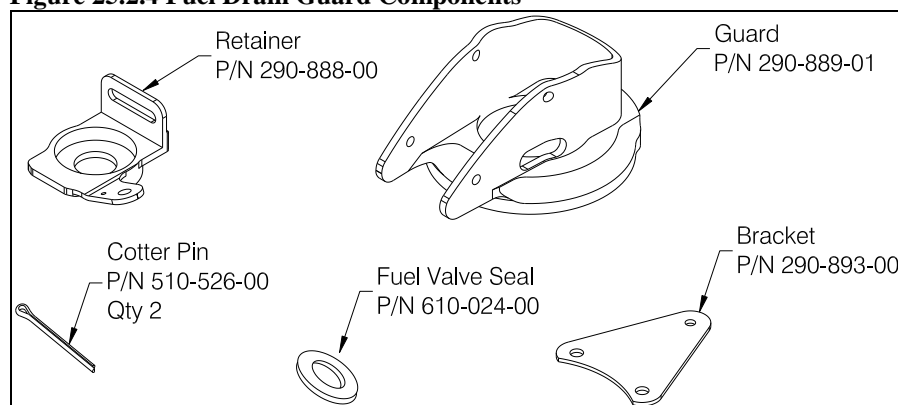




## 25.2 Description continued

Figure 25.2.4 shows the components of the Fuel Drain Guard installation.

**Figure 25.2.4 Fuel Drain Guard Components**



## 25.5 Component Weights

The weights and cgs of the systems are listed in Table 25.5.1.

**Table 25.5.1 Component Weights and CGs**

Item	Weight	Station
Removable Provisions*	30.0 lbs (13.6 kg)	133 in (3375 mm)
Fixed Provisions**	4.5 lbs (2.0 kg)	110 in (2794 mm)
Fuel Drain Guard***	0.4 lbs (.18 kg)	135 in. (3430 mm)
<b>Total</b>	<b>34.9 lbs (15.8 kg)</b>	<b>130 in (3302 mm)</b>

\* The removable provisions include the swing suspension w/ hook, external manual release cable, and external electrical release cable. These items are easily removed if they are not needed on the helicopter's mission. Refer to Suspension System Removal in Section 25.16 for removal instructions.

\*\* The fixed provisions are those items of the kit that remain on the aircraft. These include the internal electrical wire harnesses, the load weigh indicator, and the miscellaneous brackets that support these items.

\*\*\* Included with newer kits (kits shipped after August 2010).

## 25.12 Storage Instructions

Clean the exterior Cargo Hook components thoroughly of 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. Refer to Cargo Hook Component Maintenance Manual (CMM) 122-017-00 for storage instructions specific to the Cargo Hook.

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 Troubleshooting

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

**Table 25.15.1 Troubleshooting**

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Cargo hook does not operate electrically or manually.	Defective internal mechanism.	Remove and replace cargo hook (see sections 25.16 and 25.17) or repair per cargo hook CMM 122-017-00.
Cargo hook does not operate electrically, manual cable release operates normally.	Open electrical circuit, faulty wiring, fuse, 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 (see note 1 below). If open indication is obtained, remove and replace cargo hook (see sections 25.16 and 25.17). Check wiring per Note 2.
Cargo hook operates electrically, but not manually.	Defective manual release cable. Defective manual release system.	Inspect manual release cable and cable connection to Cargo Hook. Remove and replace manual release adapter cable or remove and replace cargo hook (see Sections 25.16 and 25.17). Refer to Airbus Helicopters maintenance documentation for fixed section of release cable.
Load beam fails to re-latch after being reset.	Defective latch mechanism.	Remove and replace cargo hook (see sections 25.16 and 25.17) or repair per cargo hook CMM 122-017-00.
Force required to release hook with lever on collective exceeds 14 lbs.	High cable friction or friction in internal mechanism of hook.	Remove cable from hook and check cable and hook independently (see below) to isolate problem. Refer to Airbus Helicopters maintenance documentation for fixed section of release cable.
With release cable disconnected at hook, the force required to move manual release lever on collective exceeds 6 lbs.	Kinks or wear in cable, frozen water in cable, debris or damage to cable quick disconnect fitting or lever mechanism on cyclic	Inspect individual components to isolate problem. Remove and replace defective parts (see Sections 25.16 and 25.17 for remove and replace instructions for manual release cable). Refer to Airbus Helicopters maintenance documentation for fixed section of release cable.
Cargo hook manual release cable pull-off force exceeds 8 Lbs. (at the hook).	Friction in internal mechanism.	Remove and replace cargo hook (see Section 25.16 and 25.17) or repair per cargo hook CMM 122-017-00.
Cargo hook fails to open or re-lock properly.	Defective internal mechanism.	Remove and replace cargo hook (see Sections 25.16 and 25.17) or repair per cargo hook CMM 122-017-00.

**Table 25.15.1 Troubleshooting** continued

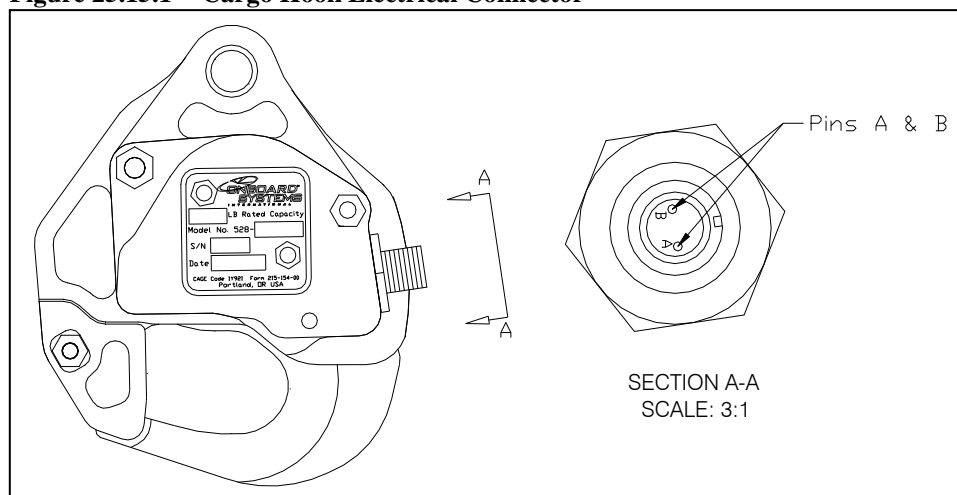
MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Fuse/circuit breaker opens when cargo hook is energized.	Short in the system, faulty wiring, fuse/circuit breaker or solenoid.	Check for shorts to ground along length of wire harness (see note 2). Check solenoid resistance (see note 1), repair or replace defective parts.
Load Weigh Indicator does not light up.	Faulty wiring or fuse or circuit breaker.	Check the fuse or circuit breaker (refer to Airbus Helicopters maintenance manual) and wiring (see Note 1). If this doesn't help, remove and replace indicator per sections 25.16 and 25.17.
The displayed load on the Indicator is incorrect.	Incorrect calibration code.	Ensure the correct calibration code has been entered (see Note 3).
C-39 Indicator displayed load is not stable.	Dampening level is too small.	Adjust the dampening level to a larger number (see Note 4).
C-39 Indicator displayed load takes too long to change the reading when the load is changed.	Dampening level is too large.	Adjust the dampening level to a smaller number (see Note 4).
C-39 Indicator does not change with changing hook loads.	Defective load cell, indicator failure or damaged wire harness.	Check for damaged wire harness (see note 2), remove and replace wire harness assembly or load cell (see sections 25.16 and 25.17).
Indicator displays large negative load	Indicator was zeroed under load.	Un-zero the indicator. Refer to applicable Owner's Manual for instructions.
C-40 Indicator analog bar not in sync with displayed load	Indicator is zeroed; analog bar always displays un-zeroed load.	Un-zero the indicator.

**Notes:**

**1. Checking resistance at pins A and B.**

Disconnect electrical release cable from cargo hook. Check for 3.0 to 4.0 ohms between pins A and B of electrical connector located on the cargo hook (see below).

**Figure 25.15.1 Cargo Hook Electrical Connector**



**Table 25.15.1 Troubleshooting notes continued:**

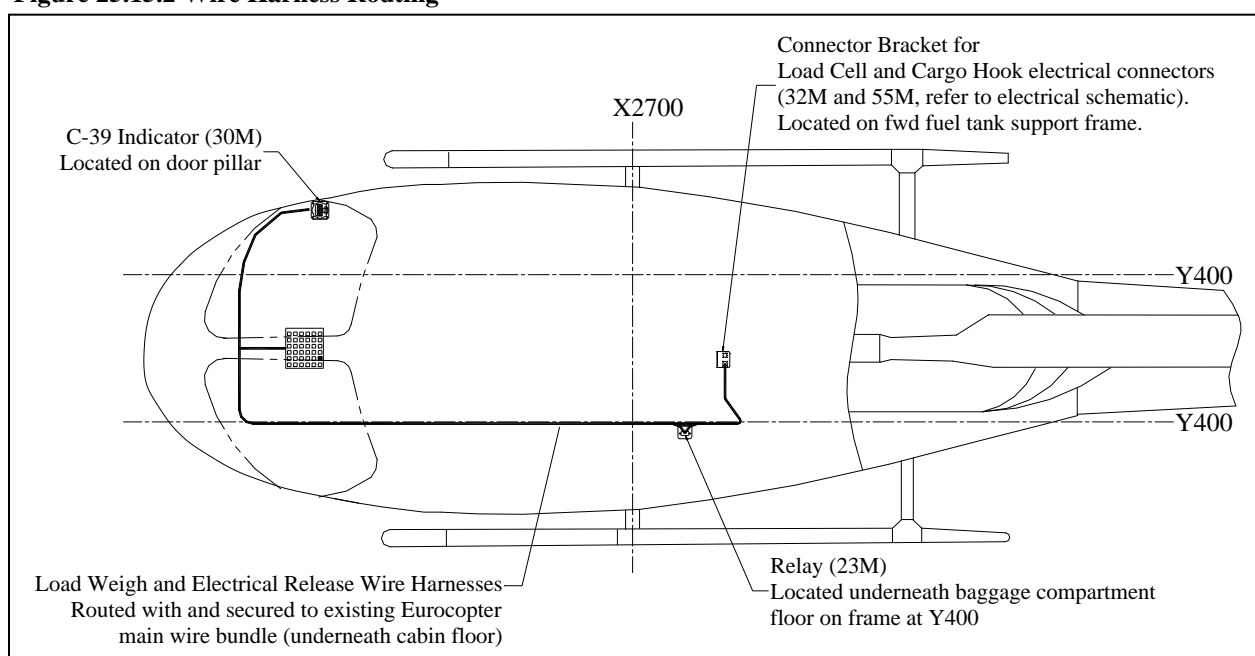
**2. Checking Wire Harnesses.**

As appropriate, before working on a circuit, e.g. - inspection, removal-installation of components, check that the aircraft system is not energized:

- "EXT. PWR. BAT." push-button is released.
- External power connector is not supplied
- Further precaution: remove the fuse(s) from the corresponding circuits (refer to Figure 25.15.3)

The wire harnesses are routed with and secured to existing wire bundles and are located approximately as shown below. Remove lower fairings to inspect wiring underneath the cabin floor. Inspect for general condition and chafing along length of wire runs. See Figure 25.15.3 for electrical wiring schematic.

**Figure 25.15.2 Wire Harness Routing**



**Table 25.15.1 Notes continued:**

**2. Checking Wire Harnesses continued**

The electrical schematic for the electrical release system and the load weigh system is shown below. Airbus Helicopters modification #'s 07-3450 and 07-4280 are reflected below. Earlier Airbus Helicopters configurations which affected how and where wire numbers ME1E, ME2E and ME10E of the electrical release harness and load weigh harness interface with the helicopter are shown on the following page. Refer to applicable Airbus Helicopters Wiring Diagrams Manual for additional information.

**Figure 25.15.3 Electrical Schematic**

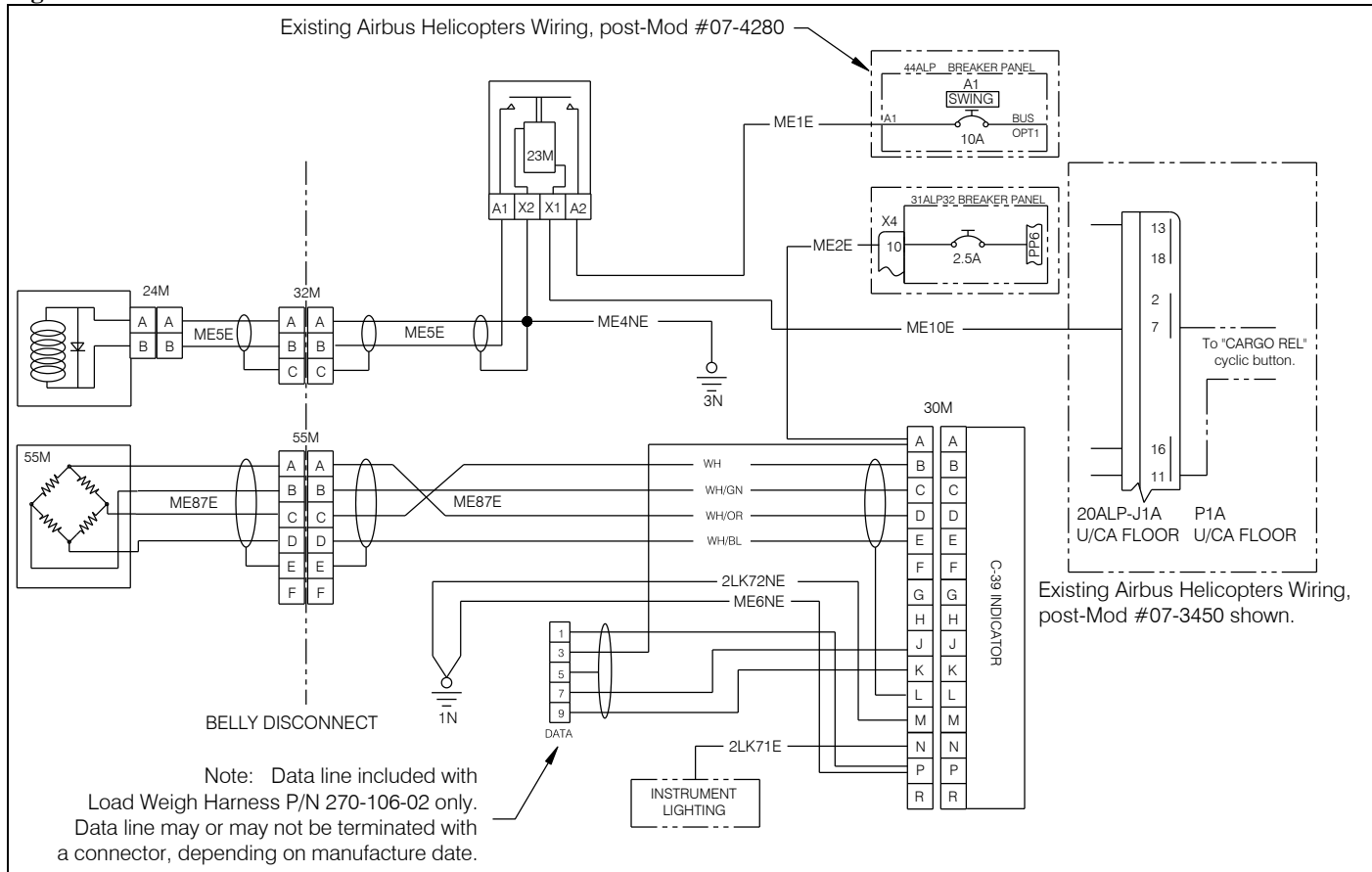
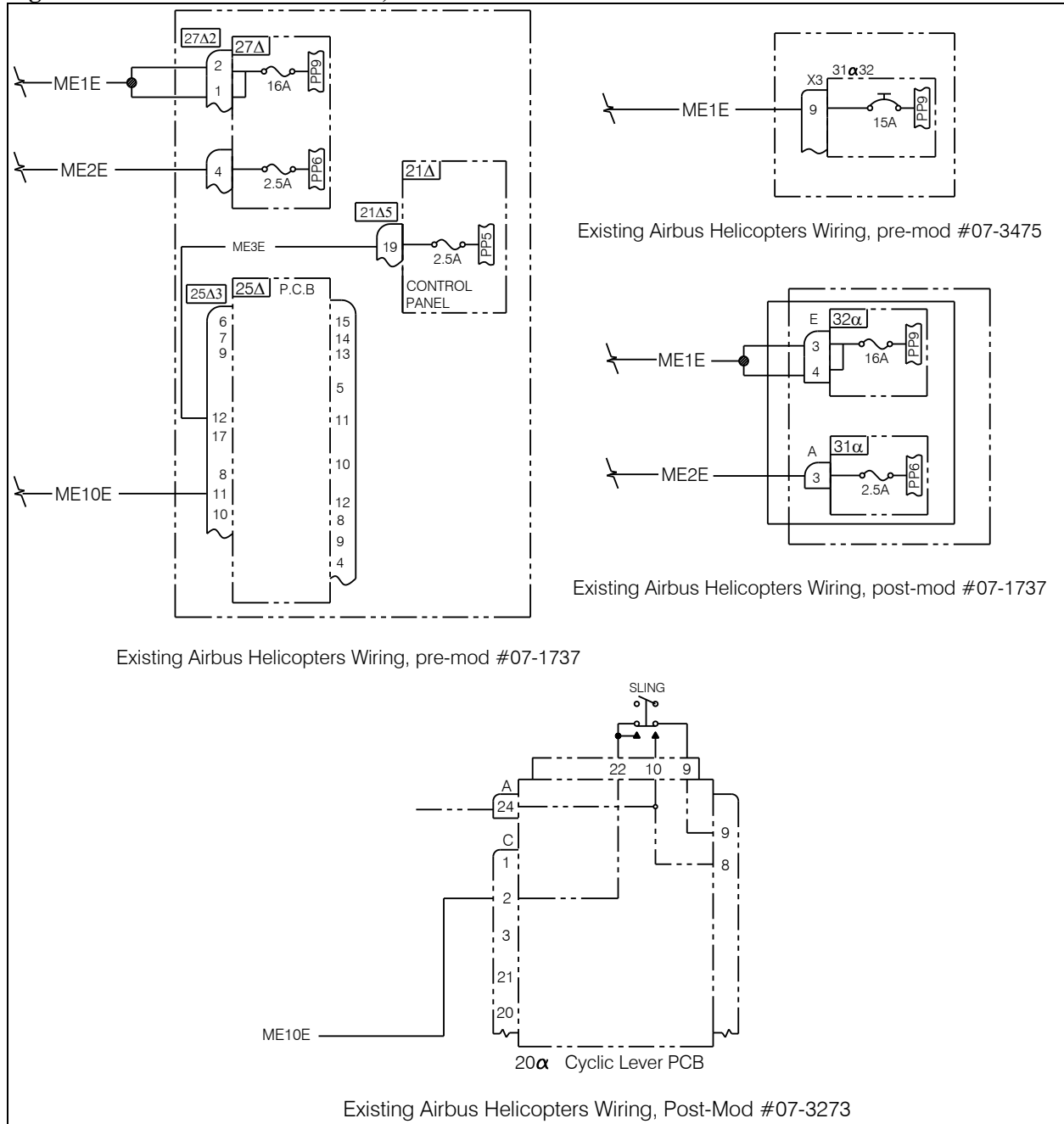


Table 25.15.1 Notes continued:

2. Checking Wire Harnesses continued

Figure 25.15.3 Electrical Schematic, continued



**Table 25.15.1 Notes continued**

**2. Checking Wire Harnesses continued**

The schematic below represents the C-40 Indicator with the optional VEMD connection. If this harness was modified per modification kit P/N 200-472-00, the DATA line may also be present (refer to Figure 25.6 for DATA line pin out to 30M connector).

**Figure 25.15.4 Load Weigh System Schematic w/ C-40**

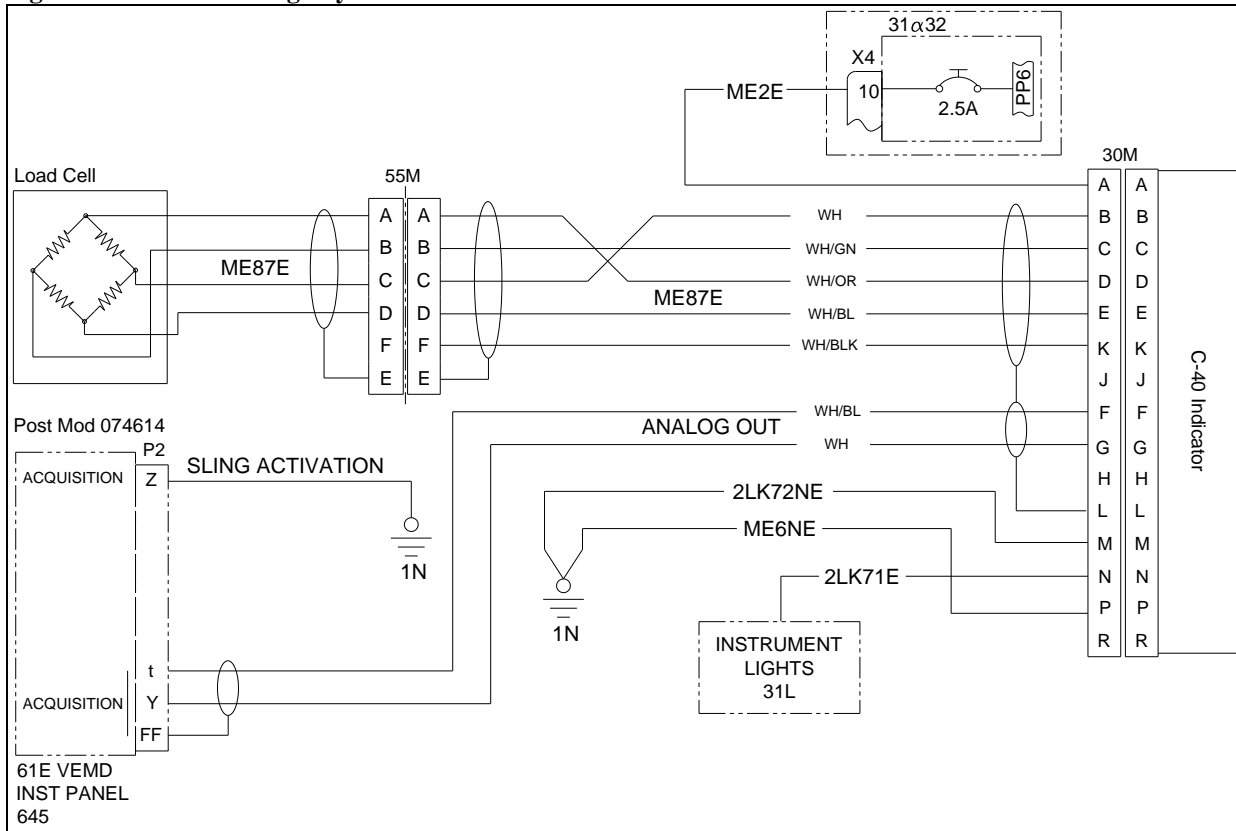
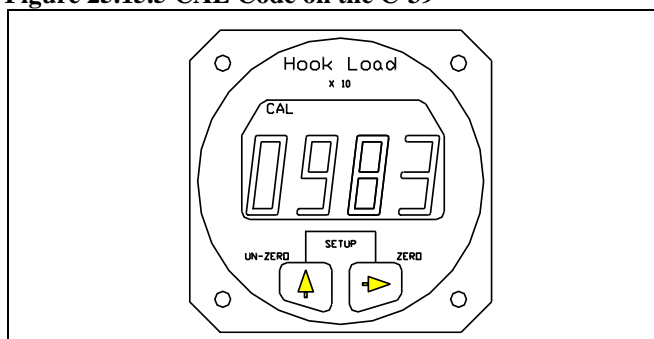


Table 25.15.1 Notes continued:

3. **Checking Load Weigh Indicator calibration code:**

**For the C-39 Indicator:** With the Indicator powered up and in the Run Mode, press both buttons at the same time to go to Setup. Scroll through the menu until the word CODE is displayed, then press the Right button. The display should look like this:

Figure 25.15.5 CAL Code on the C-39



This code should match the code printed on the tag attached to the load cell cable. If this code does not match, contact Onboard Systems for further guidance.

**On the C-40 Indicator:** To enter the C-40 Settings menu, from the Load screen rotate the knob and the Settings introduction screen will appear. Press the knob again to enter the Settings menu. To scroll through the Settings menu, rotate the knob right to advance to Cal Code to view it.

Figure 25.15.6 C-40 Settings Screen



This code should match the code printed on the tag attached to the load cell cable.

If this code does not match, contact Onboard Systems for further guidance.

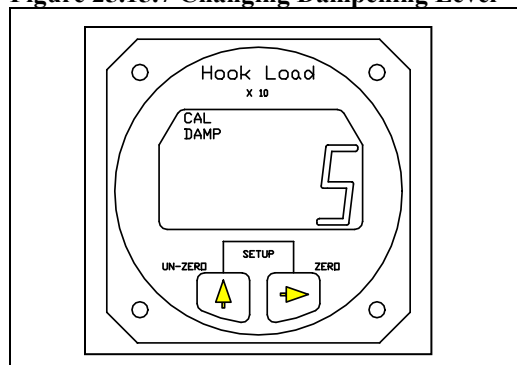


Table 25.15.1 Notes continued:

**4. Adjusting dampening level:**

With the Indicator powered up and in the Run Mode, press both buttons at the same time to go to Setup. Scroll through the menu, using the Left button, until the word DAMP is displayed. To look at or change the Dampening Level press the Right button. The display should look like this:

**Figure 25.15.7 Changing Dampening Level**



The CAL and the DAMP legend is turned on and the previously set dampening level is displayed. To return to Run without changing the current dampening level press both the Right and Left buttons at the same time. To change the dampening number, use the Left button to scroll the blinking digit to the desired number. Ten dampening levels are available, from 0 through 9. At level 0 the display responds to the slightest change in weight. However, if the load bounced even slightly, the display digits would respond instantly, making the display look unstable. With a dampening level of 9, the display would be stable under the most turbulent conditions, however, it would take several seconds for the display to respond to a change in weight. The ideal dampening level will depend on the flying conditions. A mid range setting of 5 or 6 is usually adequate. After the selection has been made press both the Right and Left buttons at the same time to return to Run.

## 25.16 Component Removal

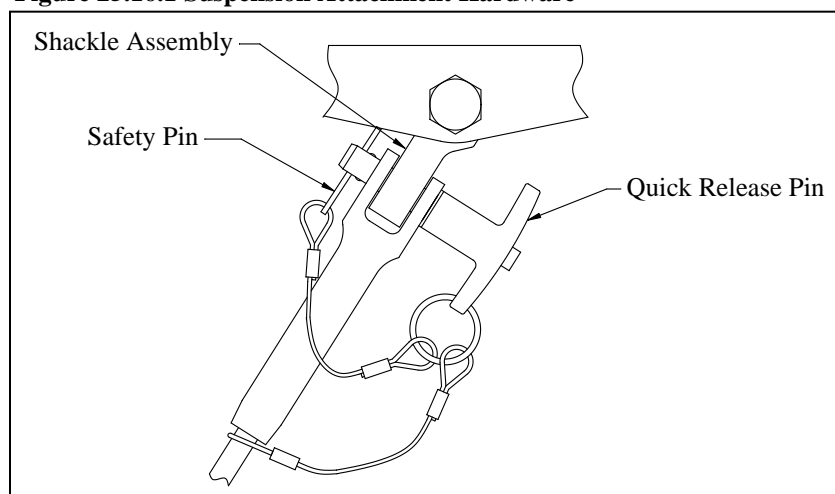
### Cargo Hook Removal

1. Remove manual release cover by removing two screws.
2. Loosen the jam nut and unthread the manual release cable from the Cargo hook and disconnect the electrical release harness connector at the Cargo Hook.
3. Remove the cotter pin (P/N 510-178-00) from the Attach Bolt (P/N 290-775-00). Refer to Figure 25.17.2.
4. Remove the castellated nut (P/N 510-170-00) from the Attach Bolt.
5. Remove Attach Bolt and all washers.
6. Remove the Cargo Hook from the suspension system.
7. Remove the Hook Bumper (P/N 290-774-00) from the cargo hook.

### Suspension System Removal

1. Disconnect the load cell cable at the bulkhead connector on the belly of the aircraft.
2. Disconnect the electrical release harness at the bulkhead connector on the belly of the aircraft.
3. Disconnect the ground strap at the quick disconnect near the bulkhead connectors on the belly of the aircraft.
4. Disconnect the manual release cable at the quick release fitting.
5. Remove the Safety Pins (P/N 510-464-00) and Quick Release Pins (P/N 290-851-00) at the 4 joints where the suspension cable ends mate with the Shackle Assemblies (P/N 232-137-01) as illustrated below.

Figure 25.16.1 Suspension Attachment Hardware

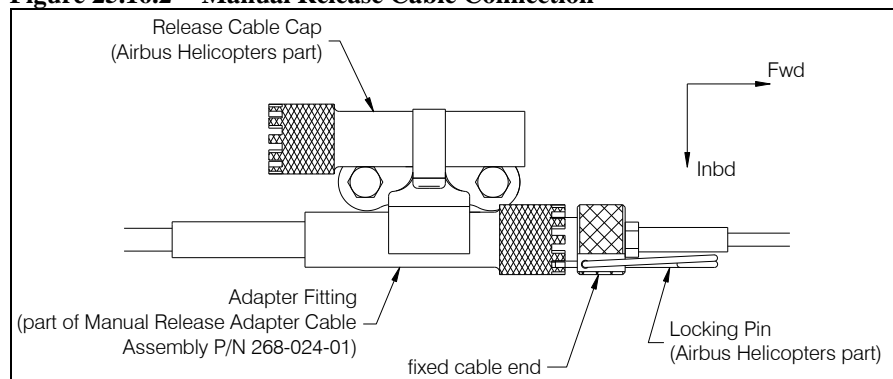


## 25.16 Component Removal continued

### Manual Release Cable Removal

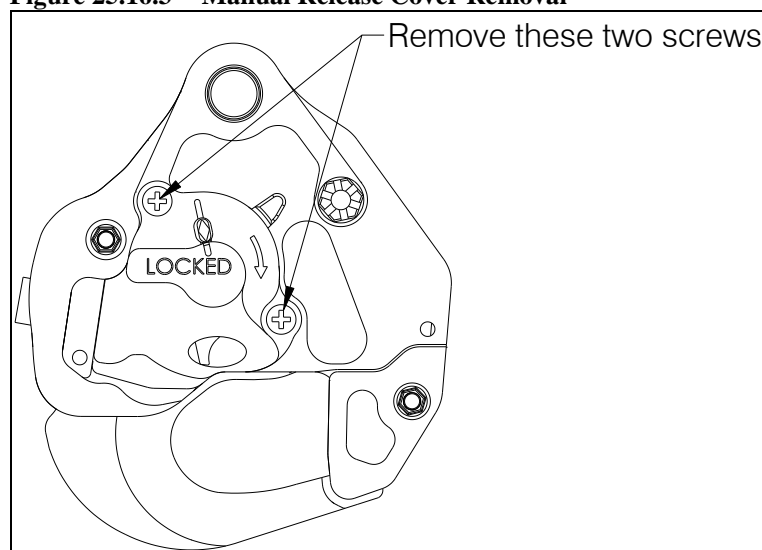
1. Unclip the forward end of the release cable from the bracket on the belly of the helicopter.
2. Disengage the locking pin and unthread the Adapter Fitting.
3. Unclip the Release Cable Cap (see below) from the bracket and thread it over the open end of the fixed cable and clip it into the inboard spring clip on the bracket.

**Figure 25.16.2 Manual Release Cable Connection**



4. At the other end of the cable (at the cargo hook) remove the two screws that secure the manual release cover to the hook (see below) and unhook the cable ball end from the fork fitting.

**Figure 25.16.3 Manual Release Cover Removal**



5. Loosen the jam nut and unthread the release cable from the hook.

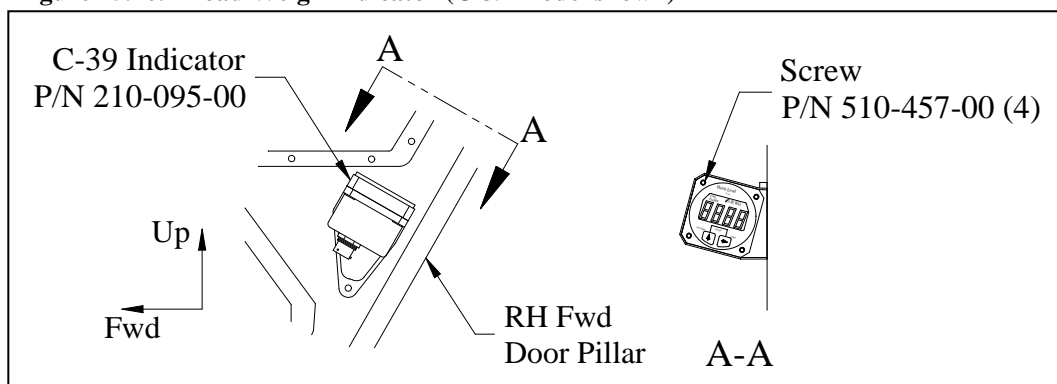
## 25.16 Component Removal continued

### Load Weigh Indicator Removal

The Load Weigh Indicator (C-39 or C-40 model) is located on the RH forward door pillar.

1. Disconnect electrical connector from the back of indicator.
2. Remove the four screws that secure the indicator to the mounting bracket and remove the indicator.

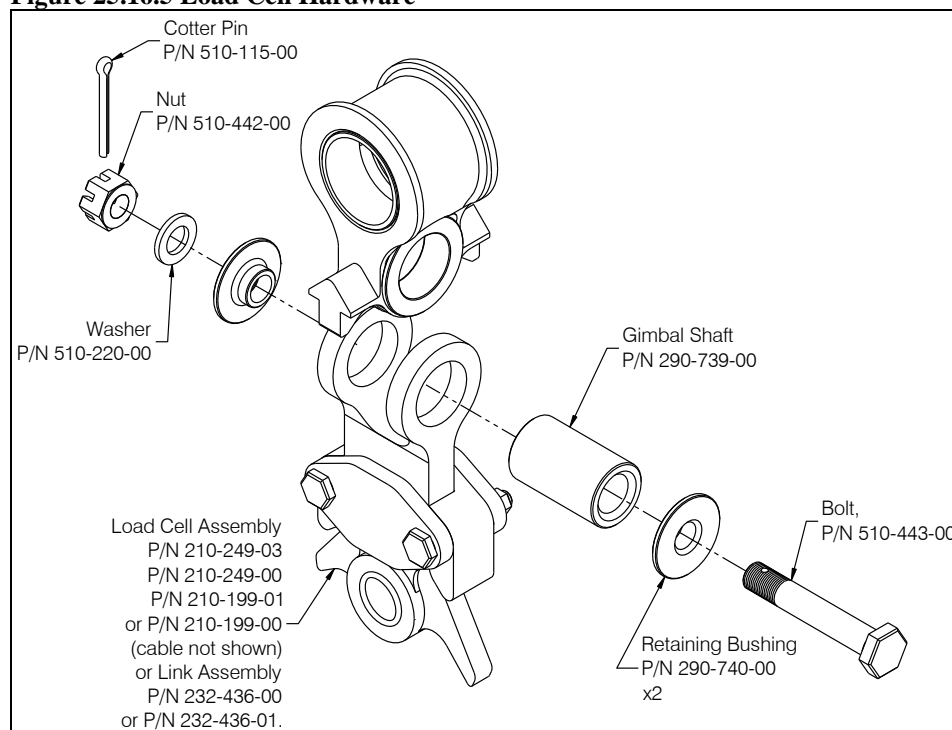
Figure 25.16.4 Load Weigh Indicator (C-39 Model shown)



### Load Cell Removal

1. Disconnect the electrical connector on the belly of the helicopter.
2. Remove the Cargo Hook per the above instructions.
3. Remove the Load Cell Assembly from the gimbal on the suspension frame (not shown) by removing the hardware as illustrated below.

Figure 25.16.5 Load Cell Hardware



## 25.16 Component Removal continued

### Self-lubricated Bushing Removal

All self-lubricated bushings use an interference fit to hold them in place. Use an arbor press or similar to press the bushings out of bore they are mounted in.

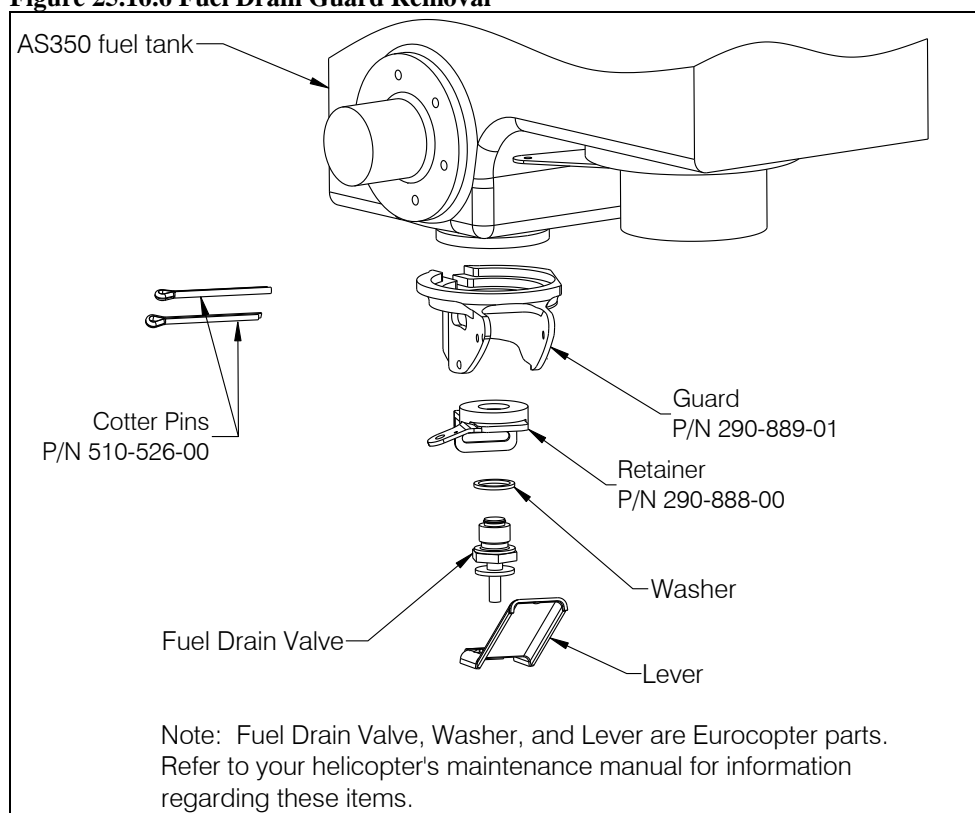
**CAUTION**

*Do not use heat on any of the parts when removing the self-lubricated bushings. These parts are all heat-treated and using heat may affect their mechanical properties.*

### Fuel Drain Guard Removal

1. Drain fuel tank.
2. Remove the two cotter pins from Guard.
3. Remove lever.
4. Remove safety wire between fuel tank valve and retainer tab.
5. Remove ground strap from Retainer.
6. Unthread fuel drain valve from tank and remove it and washer.
7. Remove Guard and Retainer.
8. Remove Bracket.

**Figure 25.16.6 Fuel Drain Guard Removal**



## 25.17 Component Re-installation

### Suspension Re-installation

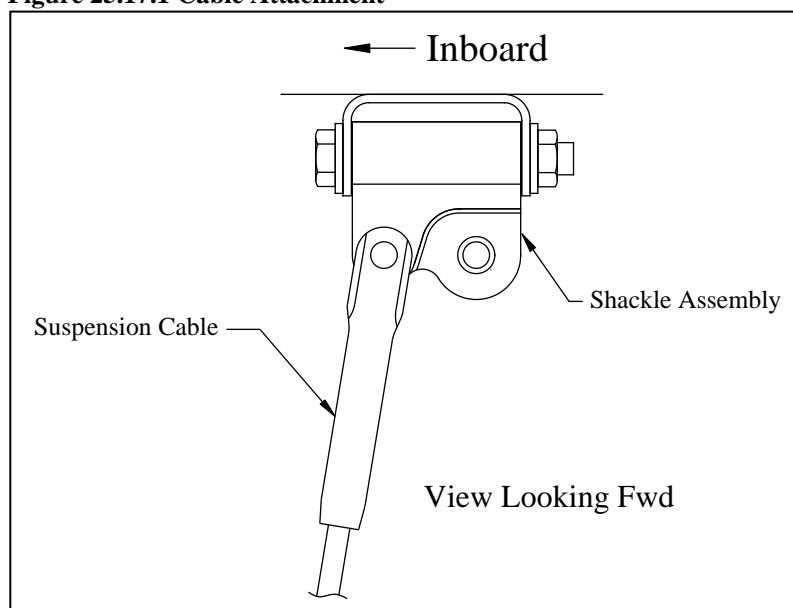
1. Install the Suspension by securing the four suspension cable ends to the shackles with the quick release pins.



*Install the Suspension such that the longer cables attach to the rear attach points and are pinned to the inboard holes of the Shackle Assemblies (as illustrated below).*

2. Connect the load cell cable connector at the bulkhead connector at the belly of the aircraft.
3. Connect the ground strap attached to the cargo hook to the ground strap connection at the belly of the aircraft.
4. Connect the electrical release cable to the bulkhead connector at the belly of the aircraft.
5. Connect the manual release cable at the quick release fitting per the instructions in this section.

**Figure 25.17.1 Cable Attachment**

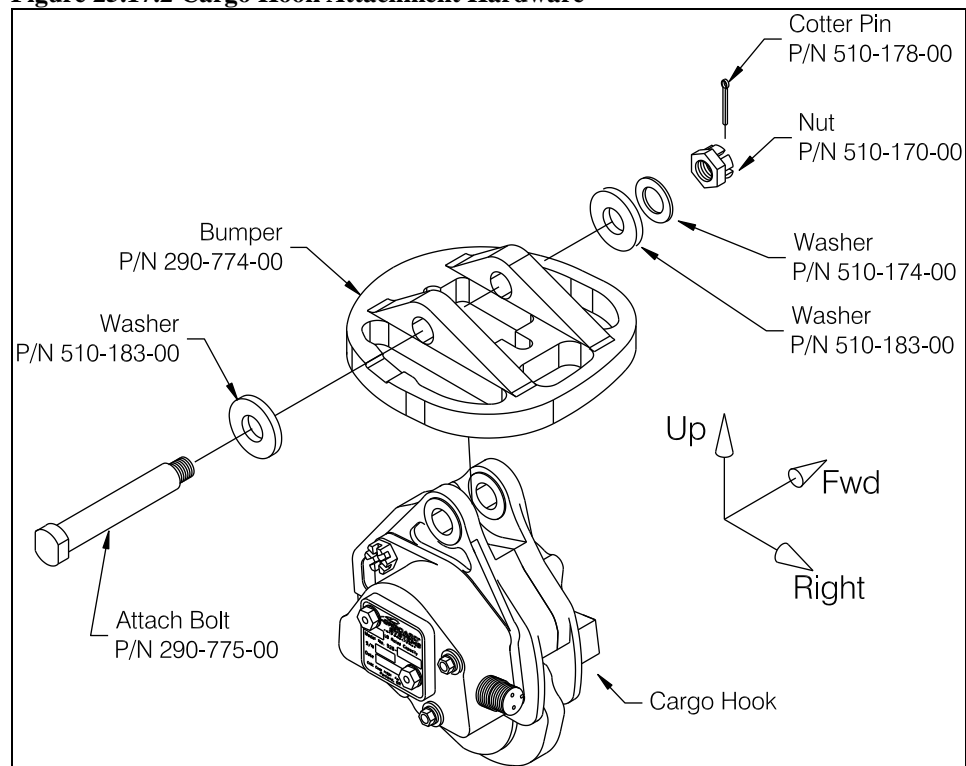


## 25.17 Component Re-installation continued

### Cargo Hook Re-installation

1. Fit the Cargo Hook Bumper P/N 290-774-00 over the Cargo Hook (P/N 528-029-00) and align the attach point holes with the lower load cell pivot point on the swing frame assembly (not shown below).
2. Install the attach bolt P/N 290-775-00 and washer P/N 510-183-00 as illustrated in Figure 25.17.2.
3. Install washer P/N 510-183-00 and washer P/N 510-174-00 over bolt end.
4. Torque nut P/N 510-170-00 on bolt to finger tight, then rotate nut to previous castellation if necessary to insert and secure cotter pin P/N 510-178-00.

Figure 25.17.2 Cargo Hook Attachment Hardware



# NOTICE

*The cargo hook load beam must point to the left side of the helicopter when looking from the rear (as shown above).*

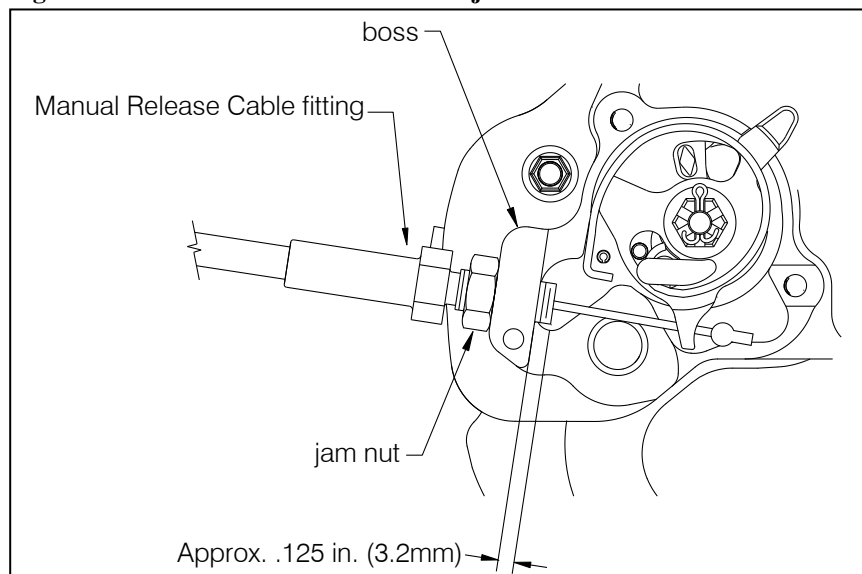
## 25.17 Component Re-installation continued

### Manual Release Cable Re-installation

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 25.17.3). 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 25.17.3 Manual Release Cable Adjustment**



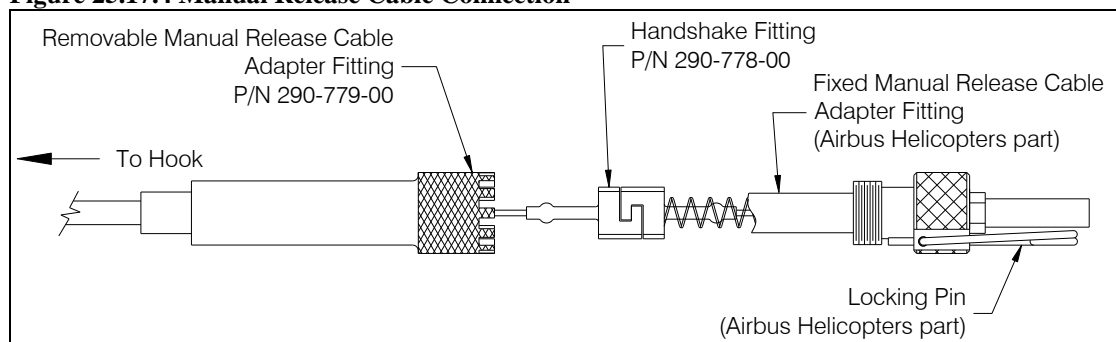


## 25.17 Component Re-installation continued

### Manual Release Cable Re-installation continued

3. Connect the other end of the removable cable assembly to the end of the fixed cable by sliding the Adapter Fitting back to expose the Handshake Fitting and connecting this fitting to the Handshake Fitting on the fixed cable as shown below.
4. Thread the Adapter Fitting on the removable cable onto the fixed cable adapter fitting and lock in position by engaging a castellation with the Locking Pin.
5. Snap the removable cable Adapter Fitting into the inboard spring clip on the bracket on the lower rear RH fairing.

Figure 25.17.4 Manual Release Cable Connection



6. At the cargo hook, place the cable ball end fitting into the manual release lever fork as illustrated in Figure 25.17.5.



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

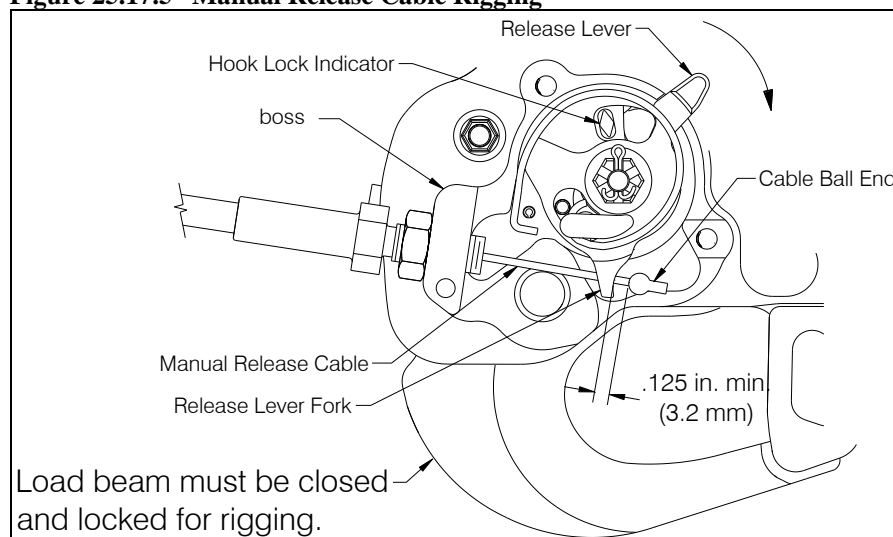
7. With the cargo hook in the closed and locked position, rotate the release lever in the clockwise direction to remove free play (the free play is taken up when the hook lock indicator begins to move) and measure the cable ball end free play with the release lever in the cockpit in the non-release position. There must be a minimum of .125 inches (3.2 mm) between the cable ball end and fork fitting as shown in Figure 25.17.5. 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

### Manual Release Cable Re-installation continued

8. 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 in 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 must not be recessed within the boss). Tighten jam nut.
9. Re-install the manual release cover with the two screws.

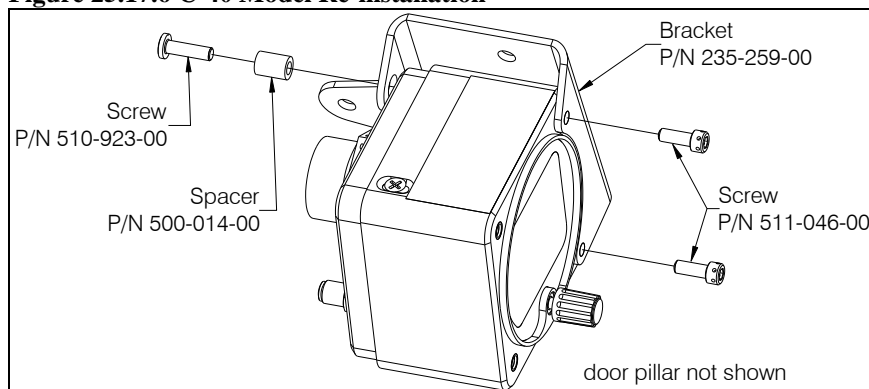
**Figure 25.17.5 Manual Release Cable Rigging**



### C-40 Model Load Weigh Indicator Re-installation

1. Place the Load Weigh Indicator into the mounting bracket on the RH door pillar and secure with two screws (P/N 511-046-00) on the display side and a spacer (P/N 500-014-00) and screw (P/N 510-923-00) on the connector side. Safety-wire the screws on the display side per MS33540.
2. Connect the electrical harness to the connector on the back of the indicator.

**Figure 25.17.6 C-40 Model Re-installation**



## 25.17 Component Re-installation continued

### C-39 Model Load Weigh Indicator Re-installation

1. Place the Load Weigh Indicator into the mounting bracket (P/N 290-772-00) on the RH door pillar and secure with four screws (P/N 510-457-00).
2. Connect the electrical harness to the connector on the back of the indicator.

### Load Cell Re-installation

1. Attach the load cell assembly to the gimbal fitting on the suspension frame with hardware as illustrated in Figure 25.16.5.
2. Tighten nut to 60-70 in-lb and rotate to next castellation if necessary to insert cotter pin.

## CAUTION

*The Load Cell Assembly must pivot freely about its upper attach point independently of the bolt (P/N 510-443-00) and nut, back the nut off to previous castellation if necessary to achieve this.*

3. Connect the load cell electrical cable connector on the load cell cable to the connector on the belly of the helicopter.
4. Attach load cell cable to cargo hook bumper with ty-wraps. After installation is complete, ensure cable does not get pulled or pinched at any point in the full range of motion of cargo hook and swing.

## NOTICE

*A Link Assembly (P/N 232-436-00 or P/N 232-436-01) can be installed in place of the Load Cell Assembly. It is installed using the same hardware as the Load Cell Assembly. The Link Assembly does not provide load weighing.*

### Self-lubricated Bushing Re-installation

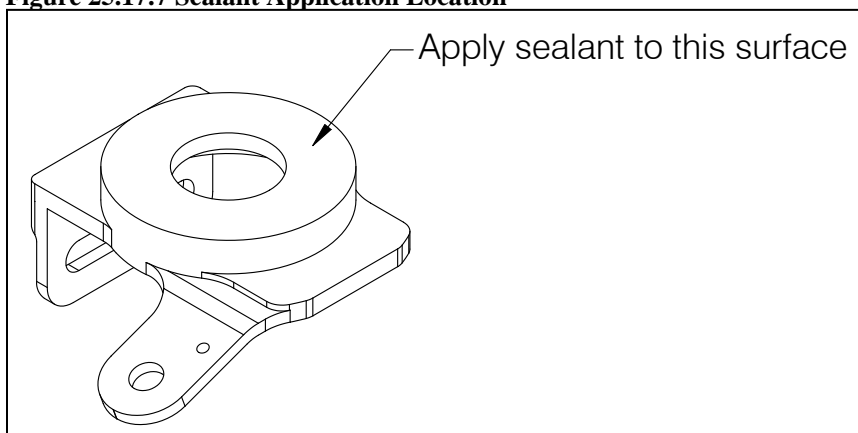
1. Install bushings with wet zinc chromate primer (TTP1757-1CY or equivalent) to the inside diameter of the mating hole.
2. Use an arbor press and an appropriately sized press tool to push the bushing into the hole until it is fully seated.

## 25.17 Component Re-installation continued

### Fuel Drain Guard Re-installation

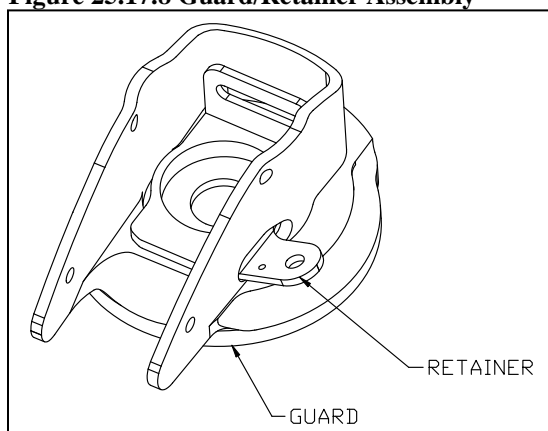
1. Remove residual sealant from the tank and Retainer, P/N 290-888-00, taking care not to mar the sealing surfaces. Prepare the areas for sealing per Airbus Helicopters Standard Practices Manual.
2. Prepare PR1422-B or equivalent sealant per Airbus Helicopters Standard Practices Manual. Apply sealant to Retainer as shown in Figure 25.17.7.

**Figure 25.17.7 Sealant Application Location**



3. Place the Retainer (P/N 290-888-00) inside the Guard (P/N 290-889-01) by inserting the tab through the slot in the Guard. See Figure 25.17.8.

**Figure 25.17.8 Guard/Retainer Assembly**



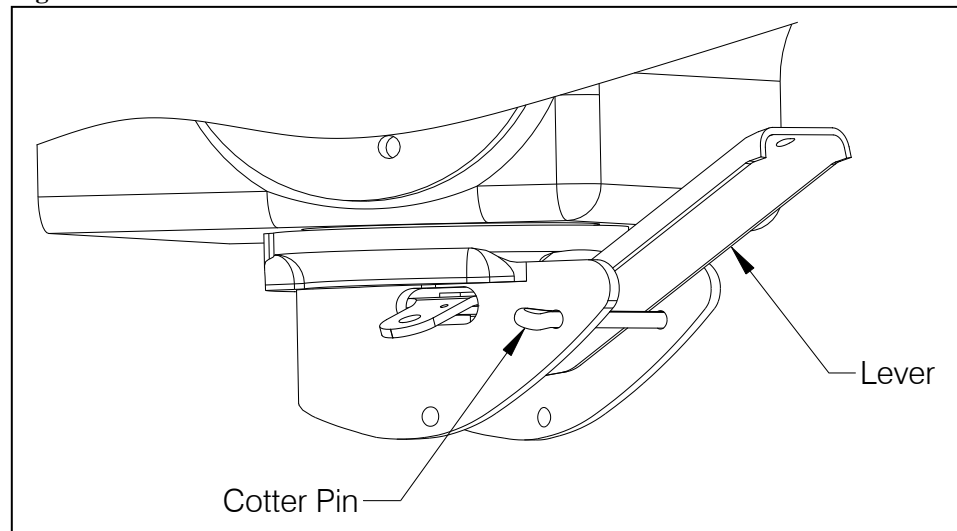
4. Place these two items onto the boss on the bottom of fuel tank, aligning the notch in the Guard with the key on the bottom of the fuel tank.

## 25.17 Component Re-installation continued

### Fuel Drain Guard Re-installation continued

5. Secure the Guard and Retainer by re-installing the Fuel Drain Valve with new Fuel Valve Seal, 610-024-00. Use a flat-blade screwdriver to prevent the Retainer from twisting when tightening the Fuel Drain Valve. Torque per Airbus Helicopters specifications.
6. Secure the Fuel Drain Valve with safety wire using the small hole in the retainer tab.
7. Re-install the electrical connections to the Retainer tab per Airbus Helicopters Electrical Bonding Procedure. Refer to Airbus Helicopters Standard Practices Manual, 20.02.07.
8. Install the Lever by placing it in Retainer slot and rotating upwards. Secure with cotter pin (P/N 510-526-00). See Figure 25.17.9.

Figure 25.17.9 Lever Installation



9. Install a second cotter pin through the other holes in the Guard (this cotter pin is for valve protection only and is not used for rigging purposes).

## 25.17 Component Re-installation continued

### Fuel Drain Guard Re-installation continued

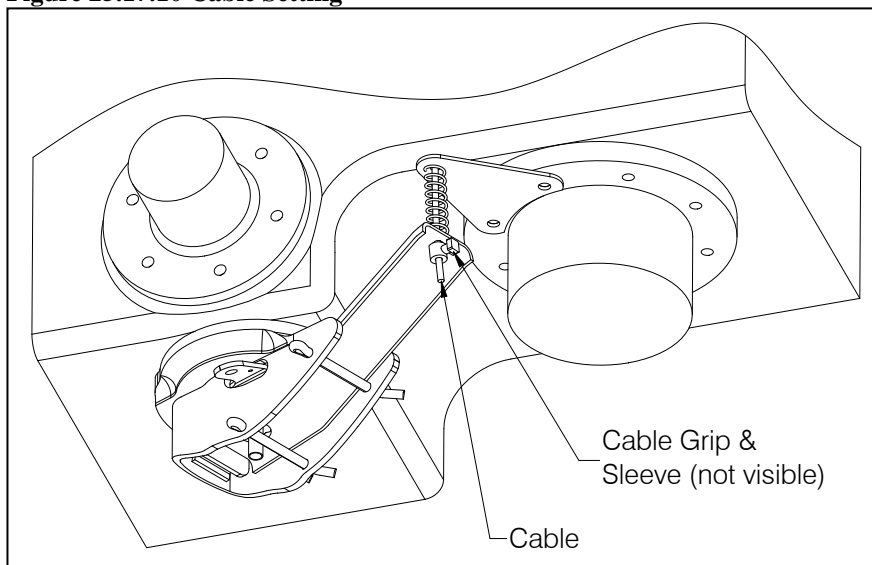
10. Prepare to install Bracket (P/N 290-893-00) by threading the control cable through the Bracket hole. Install Bracket using the two screws removed previously.
11. Pass the cable through the Spring (Airbus Helicopters P/N 350A55-1044-21) and Lever (Airbus Helicopters P/N 350A55-1043-21). Slide the Sleeve (Airbus Helicopters P/N N1-5ALU) over the cable and secure with Cable Grip (Airbus Helicopters P/N 58-2-009).



*To avoid inadvertent fuel loss, Airbus Helicopters P/N 58-2-009 Cable Grip must be used with this installation.*

12. Adjust the cable travel by doing the following: allow the lever to rest against the cotter pin stop. Slide the Cable Grip up to the bottom of the lever and secure (see Figure 25.17.10).

**Figure 25.17.10 Cable Setting**



13. Allow the sealant to cure per Airbus Helicopters Standard Practices Manual before adding fuel. Verify proper cure of unused sealant.
14. Re-fill fuel tank and check for leaks.

## 25.18 General Procedural Instructions-Testing

After re-installation of the cargo hook, 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 mechanism should operate smoothly and the Cargo Hook must release. Reset the hook by hand after the release. If the hook does not release or re-latch, do not use the unit until the difficulty is resolved.

### CAUTION

*The cargo hook 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.*

2. Activate the manual release system by pulling the release lever on the collective. 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.

### 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).*

3. Swing the installed Cargo Hook and the suspension to ensure that the manual release cable assembly and the electrical release cable have enough slack to allow full swing of each component without straining or damaging the cables. The cables must not be the stops that prevent the Cargo Hook or the suspension from swinging freely in all directions.