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Instructions for Continued Airworthiness

Talon LC Hydraulic Cargo Hook Swing Suspension System
For the
Airbus Helicopters EC130 B4 Helicopter

System Part Number 200-321-00

STC SR01815SE

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Record of Revisions

Revision	*Date*	*Page(s)*	*Reason for Revision*
7	03/18/11	11-00-00 Page 1	Added new fuel drain warning placard to placards section. Updated format of external load limit placards.
8	12/16/11	12-00-00 Page 3, 4	Changed Cup Seal P/N 556-038-00 to Quad Ring P/N 556-097-00 on Slave Cylinder Assembly.
9	05/10/12	Section 5, Section 12 pages 9 thru 12, Section 25 page 25	Removed daily check section (addressed in RFMS) and moved these items to annual inspection. Updated "external load operations" definition. Updated part NDT requirements. Changed applicability of section 25.18 to after re-installation of parts.
10	05/27/14	00-00-00 Page 1, 05-00-00 Pages 3, 4, 8 & 14, 25-00-00 Pages 2 - 4, 15, 22-24	Updated Eurocopter to Airbus Helicopters. Replaced load cell P/N 210-249-01 with P/N 210-249-04. Replaced fuel drain guard P/N 290-889-00 with 290-889-01. Updated storage instructions. Clarified 5 year/1000 hour requirement for swing suspension.
11	09/18/15	Section 5 pages 9, 15 Section 25 pages 17, 21	Added tightening instructions for nut at upper load cell pivot point. Clarified parts requiring NDT. Update tightening instructions for nut on attach bolt P/N 290-775-00.
12	03/05/18	Section 4 Section 5 Page 9, 14 Section 12 pages 1 – 3, 5 – 7	Updated Airworthiness Limitation section to comply with 14 CFR section A27.4. Removed magnetic particle inspection requirement for load cell assembly, inserted instructions to return load cell to factory for inspection/calibration. Revised attach bolt diameter limit to .495" to standardize with cargo hook CMMs. Added MIL-PRF-87257 hydraulic fluid.

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Section 0
Introduction

0.4 Scope

The following information is necessary to carry out the service, maintenance, and inspection of the Cargo Hook Swing Suspension System P/N 200-321-00.

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 200-321-00 Cargo Hook Swing Suspension System.

0.6 Arrangement

This manual contains instructions for the service, maintenance, inspection and operation of the Cargo Hook Swing Suspension System P/N 200-321-00 on Airbus Helicopters Model EC130 B4 series helicopters. The manual is arranged in the general order that maintenance personnel would use to install, 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 Hook Swing Suspension System P/N 200-321-00 (with Cargo Hook P/N 528-028-00) for the Airbus Helicopters EC130 B4 Series Helicopters. Refer to the appropriate Airbus Helicopters maintenance documentation for instructions regarding parts of the aircraft that interface with the P/N 200-321-00 system.

0.9 Abbreviations

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

0.12 Precautions

The following definitions apply to safety labels used in this manual.

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Draws the reader's attention to important or unusual information not directly related to safety.

Used to address practices not related to personal injury.

0.19 Distribution of Instructions for Continued Airworthiness

Before performing maintenance ensure that the Instructions for Continued Airworthiness (ICA) in your possession is the most recent revision. Current revision levels of all manuals are posted on Onboard Systems Int'l web site at www.onboardsystems.com. Current revisions of all manuals are available from the factory.

Section 4
Airworthiness Limitations

4.2 No 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 are associated with this type design change.

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Section 5
Inspection and Overhaul Schedule

5.1 Cargo Hook Swing Suspension System Inspection

The scheduled inspection intervals noted below are maximums and are not to be exceeded. If the cargo hook is subjected to unusual circumstances, extreme environmental conditions, etc., it is the responsibility of the operator to perform the inspections more frequently to ensure proper operation.

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

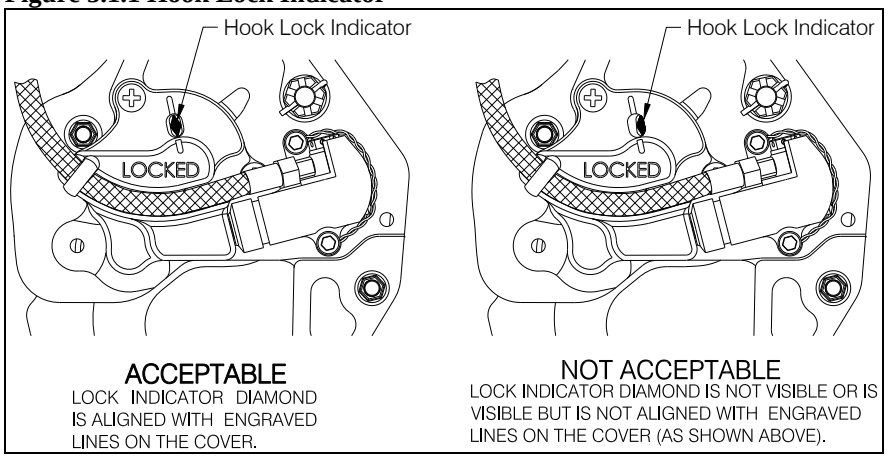
1. Activate the electrical system and press the Cargo Release button to ensure the cargo hook electrical release system is operating correctly. The cargo hook must release. Reset the hook by hand after release. If the hook does not release or re-latch, do not use the unit until the problem is fixed.

CAUTION

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

2. Activate the hydraulic release system by pulling the release lever on the collective in the cockpit. The mechanism should operate smoothly and the cargo hook must release. Return the load beam to its closed and locked position by hand after release. Verify that the hook lock indicator on the side of the hook returns to the fully locked position. In the fully locked position the hook lock indicator should align with the lines on the cover (see Figure 5.1.1). If the hook does not release or re-latch, do not use the unit until the problem is resolved.

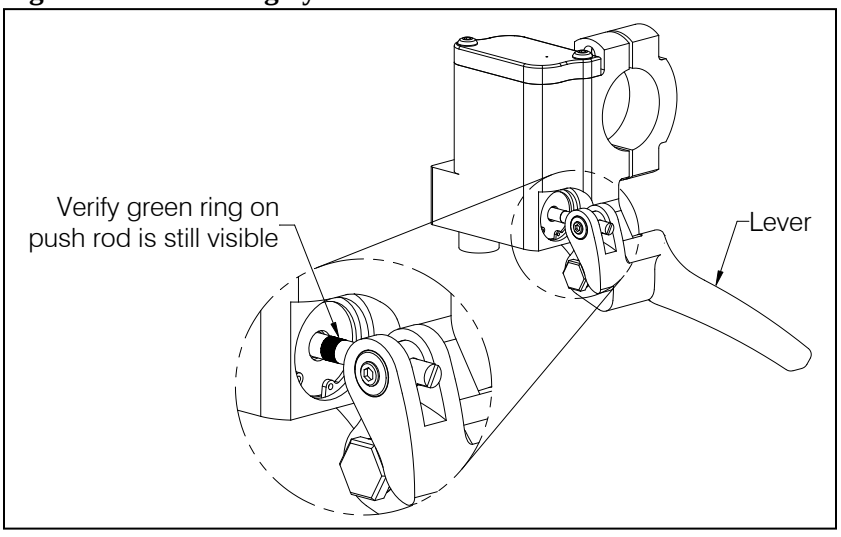
Figure 5.1.1 Hook Lock Indicator



5.1 Cargo Hook Swing Suspension System Inspection continued

3. Swing the cargo hook and the suspension system throughout their full ranges of motion to ensure the hydraulic hose and electrical harnesses have enough slack and are not kinked or pinched in any possible hook and swing frame locations. The hose and harnesses must not be the stops that prevent the cargo hook or suspension from swinging freely in all directions.
4. Inspect all pivoting joints to ensure that they rotate freely.
5. Visually check for presence and security of fasteners and electrical connections and condition of suspension cables.
6. Visually check for fluid leaks in the hydraulic release system. Some seeping or dampness is acceptable, but if drips or areas cleaned by fluid leaking are present the hook must not be used until the condition is repaired. See troubleshooting section to determine the course of action.
7. Check the fluid level in the master cylinder with the collective against the lower stop. The Master Cylinder features a transparent lid through which the fluid level can be checked. Hydraulic fluid must be visible over the baffle surface (reference Figure 12.1.1).
8. Check the hydraulic release system for air by pulling the lever firmly until it bottoms out. Check the push rod position (see Figure 5.1.2). If some of the green ring on the push rod is visible, the system is adequately bled. If some of the green on the push rod is NOT visible with the lever completely pulled, the system has too much air in it and must be bled, see Section 12.2 for bleeding instructions.

Figure 5.1.2 Checking System for Excess Air



9. Visually check for cracks in suspension frame. The frame tubes contain a corrosion preventative compound, which may leak out through a crack and also provide an indication.
10. Visually check shock cord assemblies for security of attachment and condition of cords.

5.1 Cargo Hook Swing Suspension System Inspection continued

11. Visually inspect for presence and security of fasteners.
12. Visually inspect the electrical harnesses and connectors for damage and security.
13. Visually inspect the hydraulic hose and its connection to the cargo hook for damage and security.
14. Visually inspect the cargo hook bumper for damage.
15. Visually inspect for cracks in suspension frame halves. 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 also provide an indication.
16. Inspect suspension cables for broken strands. Pass a cloth over the cables. This will clean the cables for a visual inspection and detect broken wires if the cloth snags on the cable. Ten randomly distributed broken strands in one cable lay (one complete rotation around the wire) or five broken strands in one strand in cable lay are considered unacceptable.
17. Visually inspect the suspension cables for crushing, unstranding, kinking, loss of rope diameter in short lengths, unevenness of outer strands or other damage. Visually inspect for corrosion.
18. Visually inspect for security of C-39 indicator mounting.
19. Inspect 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).
20. Inspect fuel drain guard for damage that causes lever to bind or rub. Remove and replace Guard if it is obstructing free operation of lever.
21. Inspect for fuel leakage. If leakage is noted, re-apply sealant to Retainer as described in Owner's Manual. Refer to Airbus Helicopters maintenance instructions for other possible causes.
22. Inspect and maintain the fuel valve, lever and control cable per Airbus Helicopters maintenance documentation.

5.1 Cargo Hook Swing Suspension System Inspection continued

Every 5 years or 1000 hours of external load operations, whichever comes first, inspect the cargo hook and suspension per the following.

Remove the suspension assembly from the helicopter (see section 25.17), disassemble, and inspect the component parts per the following instructions.

Remove the suspension cables from the suspension frame by removing the cotter pin (item 1), nut (item 4), washers (item 3) and bolt (item 5).

Disassemble the foot assemblies by removing the screws (item 11) and washers (item 10) that secure the Hat Bushing (item 9), Outer Thrust Washer (item 9), Paddle Assembly (item 7) and Inner Thrust Washer (item 6).

Figure 5.1.3 Swing Frame Foot Disassembly

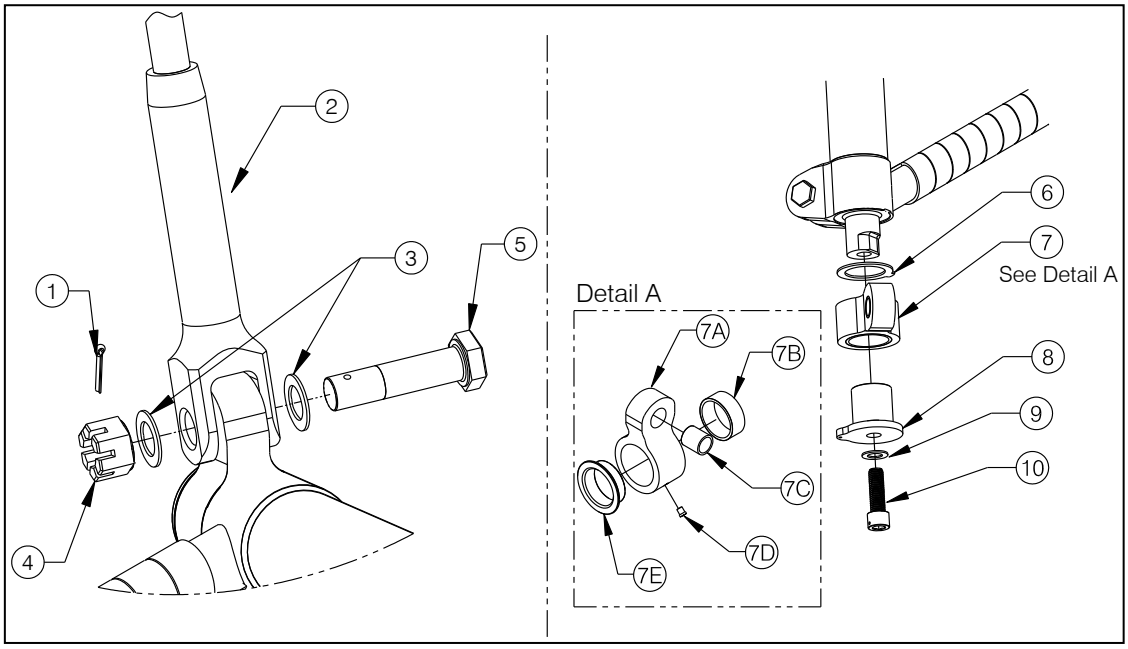


Table 5.1.1 Swing Frame Foot Parts

ITEM	PART NO.	DESCRIPTION	QTY
1	510-178-00	Cotter Pin	4
2	290-849-00	Fork Fitting	4
3	510-238-00	Washer	8
4	510-718-00	Nut	4
5	510-438-00	Bolt	4
6	235-155-00	Inner Thrust Washer	4
7	232-302-00	Paddle Assembly	4
7A	291-128-00	Paddle	4
7B	291-134-00	Bushing	4
7C	517-016-00	Bushing	4
7D	518-001-00	Grease Fitting	4
7E	291-250-00	Flanged Bushing	4
8	291-130-00	Hat Bushing	4
9	510-239-00	Washer	4
10	510-635-00	Bolt	4

5.1 Cargo Hook Swing Suspension System Inspection continued

Separate the suspension cable fork fittings (item 3) from the Shackle Assemblies (item 2) by removing the safety pins (not shown below) and then the quick release pins (item 1).

The parts that comprise the Shackle Assembly are shown in Detail A. If bushings need to be replaced, press out with an appropriately sized removal tool and arbor press.

Figure 5.1.4 Upper Shackle and Cable Disassembly

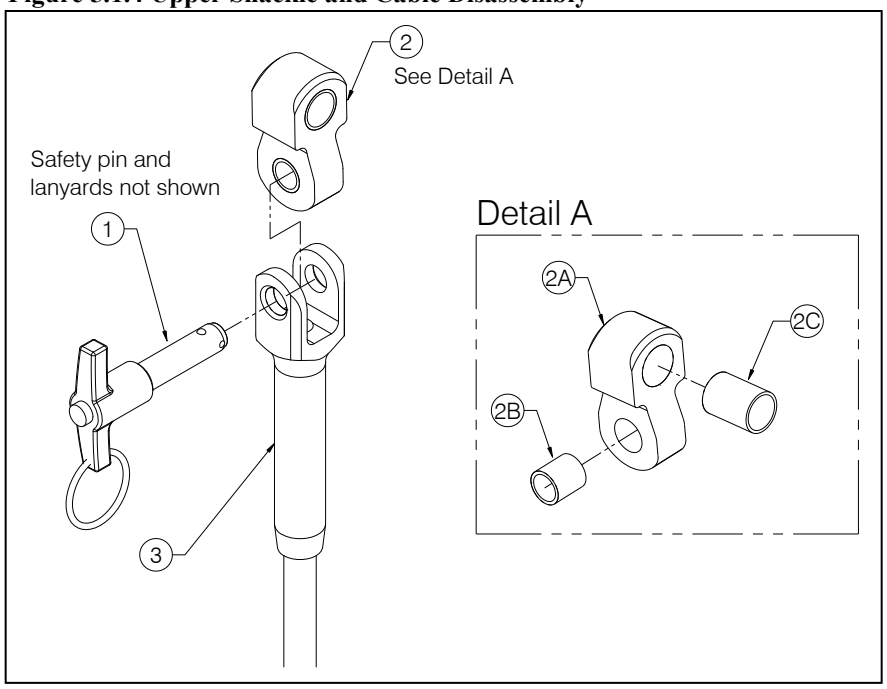


Table 5.1.2 Upper Shackle and Cable Parts

ITEM	PART NO.	DESCRIPTION	QTY
1	290-851-00	Quick Release Pin	4
2	232-293-00	Shackle Assembly	4
2A	291-135-00	Shackle	4
2B	517-016-00	Bushing	4
2C	291-117-00	Bushing	4
3	290-849-00	Fork Fitting	4

5.1 Cargo Hook Swing Suspension System Inspection continued

At each end of the two longitudinal struts (item 2), remove the nut (item 5), washer (item 6), Clamp Bushing (item 3), and bolt (item 4) as shown below.

Figure 5.1.5 Strut/Frame Joint Disassembly

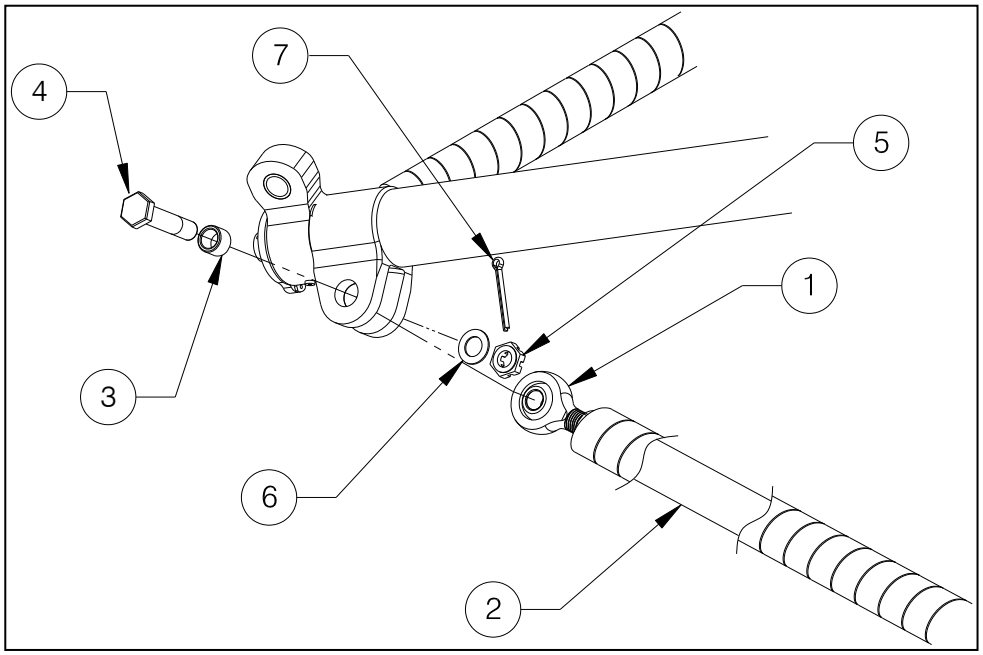


Table 5.1.3 Strut/Frame Joint Parts

ITEM	PART NO.	DESCRIPTION	QTY
1	517-055-00	Rod End Fitting	4
2	235-148-00	Longitudinal Strut Weldment	4
3	291-131-00	Clamp Bushing	4
4	510-636-00	Bolt	4
5	510-717-00	Nut	4
6	510-239-00	Washer	4
7	510-178-00	Cotter Pin	4

5.1 Cargo Hook Swing Suspension System Inspection continued

1. Remove the cotter pin (item 13), nut (item 12), and washer (item 11) from the center bolt (item 10).
2. Remove the bracket (item 9).
3. Remove the shaft cap (item 3) from the end of the pivot shaft.
4. Slide one of the two frame weldments (items 1 and 2) off of the pivot shaft (item 4).
5. Slide the Gimbal Assembly (item 7) off of the pivot shaft (item 4). Be sure to support the cargo hook and load cell assembly (not shown) during this step.
6. If bushings need to be replaced, press out with an appropriately sized removal tool and arbor press.

Figure 5.1.6 Frame Half Disassembly

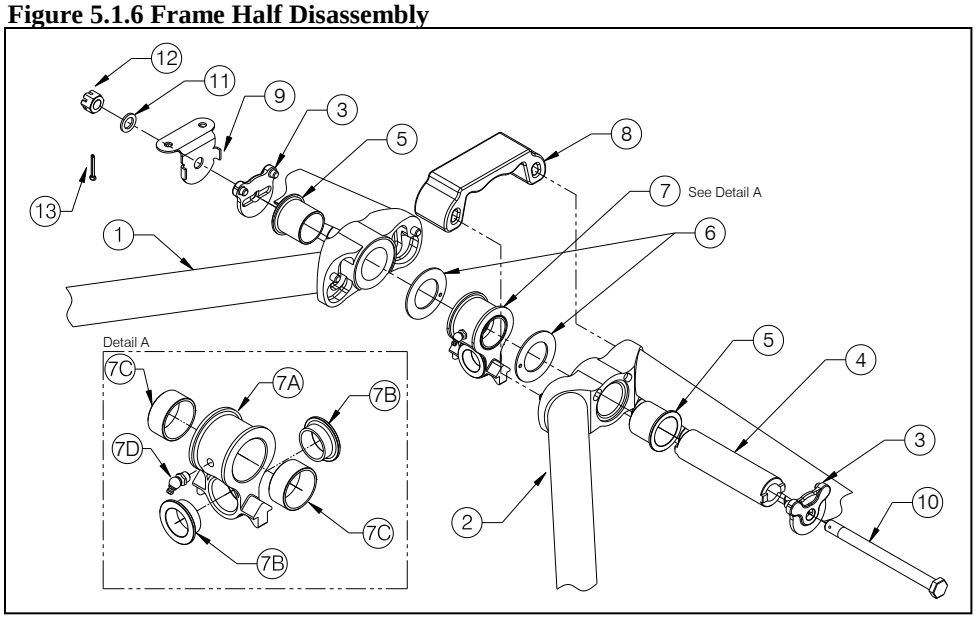


Table 5.1.4 Frame Half Assembly Parts

ITEM	PART NO.	DESCRIPTION	QTY
1	235-149-00	Aft Frame Weldment	1
2	235-150-00	Fwd Frame Weldment	1
3	290-843-00	Shaft Cap	2
4	290-842-00	Pivot Shaft	1
5	517-057-00	Flange Bushing	2
6	517-058-00	Thrust Washer	2
7	232-143-01	Gimbal Assembly	1
7A	290-841-00	Gimbal	1
7B	517-046-00	Flange Bushing	2
7C	517-056-00	Bushing	2
7D	518-003-00	Grease Fitting	1
8	290-862-00	Bumper	1
9	235-170-00	Bracket	1
10	510-676-00	Bolt	1
11	510-174-00	Washer	1
12	510-718-00	Nut	1
13	510-178-00	Cotter Pin	1

5.1 Cargo Hook Swing Suspension System Inspection continued

1. Remove the cotter pin (item 6), nut (item 5), washer (item 4), thrust washer (item 2) and remove the bolt (item 1) and other thrust washer.
2. Slide the Shaft (item 3) out to separate the Load Cell Assembly (item 9) from the Gimbal.
3. Separate the Cargo Hook (item 14) and Bumper (item 13) from the Load Cell Assembly by removing the Cotter Pin (item 13), nut (item 12), washers (item 8) and Attach Bolt (item 7).

Figure 5.1.7 Load Cell/Gimbal Disassembly Instructions

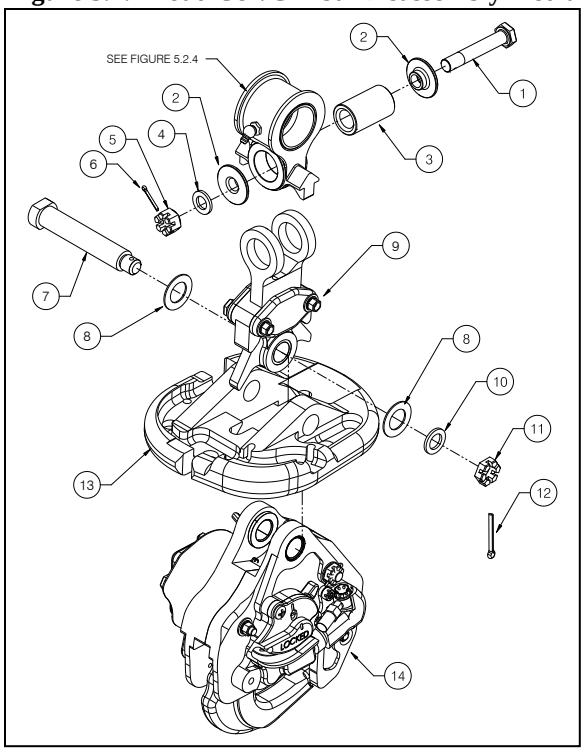


Table 5.1.5 Load Cell/Gimbal Assembly Parts

ITEM	PART NO.	DESCRIPTION	QTY
1	510-443-00	Bolt	1
2	290-740-00	Thrust Washer	2
3	290-739-00	Shaft	1
4	510-220-00	Washer	1
5	510-719-00	Nut	1
6	510-115-00	Cotter Pin	1
7	290-775-00	Attach Bolt	1
8	510-183-00	Washer	2
9*	210-249-04	Load Cell Assembly	1
10	510-174-00	Washer	1
11	510-170-00	Nut	1
12	510-178-00	Cotter Pin	1
13	290-839-01	Bumper	1
14	528-028-00	Cargo Hook	1

* P/N 210-249-04 supersedes P/N 210-249-01 & 210-199-02. These parts are interchangeable.

5.1 Cargo Hook Swing Suspension System Inspection continued

Return the Load Cell Assembly (P/N 210-199-02, 210-249-01 or 210-249-04) 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 5.1.6. Inspect the parts in a clean, well-lit room.

Table 5.1.6 Suspension System Inspection Criteria

Component	**Damage Permitted without Repair**	**Repair**	**Maximum Damage which Causes Replacement**
Fork End Fitting P/N 290-849-00 (item 2, Figure 5.1.3)	Wear on inside diameter of lug holes, diameter less than .392”. Dents, gouges, and scratches less than .020” deep outside lug areas. Dents, gouges, and scratches less than .010” deep around lugs.	None. Blend at 20:1 ratio, length to depth, to provide smooth transitions.	Wear on inside diameter of clevis holes, diameter greater than .392”. Dents, gouges, and scratches greater than .060” deep outside lug areas. Dents, gouges, and scratches greater than .030” deep around lugs. Cracks.
Hat Bushing P/N 291-130-00 (item 8, Figure 5.1.3)	Wear on shoulder diameter, diameter greater than .867”.	None.	Wear on shoulder diameter, diameter less than .867”.

Table 5.1.6 Suspension System Inspection Criteria continued

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Inner Thrust Washer P/N 232-155-00 (item 6, Figure 5.1.3)	These bushings have a Teflon type film overlaid on a layer of sintered copper on one side. Teflon film still covers more than 50% of the bushing wear area. Note: The bushing wear area is the side that faces the Paddle fitting (reference Figure 5.2.1).	None.	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.
Paddle P/N 291-128-00 (item 7A, Figure 5.1.3)	Dents, gouges, corrosion and scratches less than .010" deep.	Blend at 20:1 ratio, length to depth, to provide smooth transitions.	Dents, gouges, corrosion and scratches greater than .030" deep. Cracks.
Bushing P/N 291-134-00 (item 7B, Figure 5.1.3)	Wear on inside diameter, diameter less than .892".	None.	Wear on inside diameter, diameter greater than .892".
Bushing P/N 517-016-00 (Item 7C, Figure 5.1.3)	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.
Bushing P/N 291-250-00 (item 7E, Figure 5.1.3)	Wear on inside diameter, diameter less than .892".	None.	Wear on inside diameter, diameter greater than .892".
Quick Release Pin P/N 290-851-00 (item 1, Figure 5.1.4).	Wear on outside diameter, diameter greater than .362".	None.	Wear on outside diameter, diameter less than .362". Cracks.

Table 5.1.6 Suspension System Inspection Criteria continued

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Shackle P/N 291-135-00 (item 2A, Figure 5.1.4).	Dents, gouges, corrosion and scratches less than .010" deep.	Blend at 20:1 ratio, length to depth, to provide smooth transitions.	Dents, gouges, corrosion and scratches greater than .030" deep. Cracks.
Bushing P/N 517-016-00 (item 2B, Figure 5.1.4).	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None.	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.
Bushing P/N 291-117-00 (item 2C, Figure 5.1.4).	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None.	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.
Rod End Fitting P/N 517-055-00 (item 1, Figure 5.1.5)	Wear on or elongation of inside diameter of spherical bearing, diameter less than .330". Dents, gouges, corrosion and scratches less than .020" deep.	None. None.	Wear on or elongation of inside diameter of spherical bearing, diameter greater than .330". Dents, gouges, corrosion and scratches greater than .020" deep. Binding of spherical bearing in its housing.
Longitudinal Strut Weldment P/N 235-148-00 (item 2, Figure 5.1.5).	Dents, gouges, and scratches less than .030" deep.	Blend at 20:1 ratio, length to depth, to provide smooth transitions. Protect affected surfaces with MIL-PRF-23377 Type 1 epoxy primer or equivalent and MIL-PRF-85285 Type 1 polyurethane coating or equivalent.	Dents, gouges and scratches greater than .060" deep. Cracks.
Clamp Bushing P/N 291-131-00 (item 3, Figure 5.1.5).	Wear on inside diameter, diameter less than .324".	None.	Wear on inside diameter, diameter greater than .324".

Table 5.1.6 Suspension System Inspection Criteria continued

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Aft Weldment P/N 235-149-00 (item 1, Figure 5.1.6) Fwd Weldment P/N 235-150-00 (item 2, Figure 5.1.6)	Dents, gouges, scratches, nicks, and corrosion less than .010" deep in frame tubes or at welds. Dents, gouges, scratches, nicks, and corrosion less than .020" deep in machined junction fittings.	Blend at 20:1 ratio, length to depth, to provide smooth transitions. Protect affected surfaces with MIL-PRF-23377 Type 1 epoxy primer or equivalent and MIL-PRF-85285 Type 1 polyurethane coating or equivalent.	Dents, gouges, scratches, nicks and corrosion greater than .020" in frame tubes or at welds. Dents, gouges, nicks, scratches and corrosion greater than .030" in machined junction fittings. Visible cracks.
Shaft Cap P/N 290-843-00 (item 3, Figure 5.1.6)	Dents, gouges, and scratches less than .030" deep.	Blend at 20:1 ratio, length to depth, to provide smooth transitions. Part is 15-5 stainless steel, no touch up paint required.	Dents, gouges, and scratches greater than .060" deep. Cracks
Pivot Shaft P/N 290-842-00 (item 4, Figure 5.1.6).	Wear on outside diameter, diameter greater than .993".	None.	Wear on outside diameter, diameter less than .993". Cracks.
Flange Bushing P/N 517-057-00 (item 5, Figure 5.1.6).	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None.	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.
Thrust Washer P/N 517-058-00 (item 6, Figure 5.1.6).	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.

Table 5.1.6 Suspension System Inspection Criteria continued

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Bumper P/N 290-862-00 (item 8, Figure 5.1.6).	Dents, gouges, and scratches less than .060" deep.	None.	Dents, gouges, and scratches greater than .060". Splitting.
Bracket P/N 235-170-00 (item 9, Figure 5.1.6).	Dents, gouges, and scratches less than .030" deep.	Blend at 20:1 ratio, length to depth, to provide smooth transitions. Part is stainless steel, no touch up paint required.	Dents, gouges, and scratches greater than .060" deep. Cracks
Gimbal, P/N 290-841-00 (item 7A, Figure 5.1.6).	Dents, gouges, and scratches less than .010" deep.	Blend at 20:1 ratio, length to depth, to provide smooth transitions.	Dents, gouges, and scratches greater than .030" deep. Cracks.
Bushing P/N 517-046-00 (item 7B, Figure 5.1.6)	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None.	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.
Bushing P/N 517-056-00 (item 7C, Figure 5.1.6)	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None.	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.

Table 5.1.6 Suspension System Inspection Criteria continued

Component	**Damage Permitted without Repair**	**Repair**	**Maximum Damage which Causes Replacement**
Load Cell Assembly P/N 210-199-02 P/N 210-249-01 P/N 210-249-04 (item 9, Figure 5.1.7)	Dents, gouges, and scratches less than .020" deep outside lug areas. Dents, gouges, and scratches less than .010" deep around lugs.	Blend at 20:1 ratio, length to depth, to provide smooth transitions.	Dents, gouges and scratches greater than .060" deep outside lug areas. Dents, gouges, and scratches greater than .030" deep in lug areas. Cracks.
	Wear on inside diameter of upper lugs, diameter less than .759".	None	Wear on inside diameter of upper lugs, diameter greater than .759".
Gimbal Shaft, P/N 290-739-00 Item 3 (Figure 5.1.7).	Wear on outside diameter, diameter greater than .737".	None.	Wear on outside diameter, diameter less than .737". Cracks.
Attach Bolt, P/N 290-775-00 (Item 7, Figure 5.1.7).	Wear on outside diameter, diameter greater than .495".	None.	Wear on outside diameter, diameter less than .495".
Bumper, P/N 290-839-01 (item 13, Figure 5.1.7).	Dents, gouges, and scratches less than .060" deep.	None	Dents, gouges, and scratches greater than .060".
Bushing P/N 517-046-00 (item 15, Figure 5.1.7)	These bushings have a Teflon type film overlaid on a layer of sintered copper. Teflon film still covers more than 50% of the bushing wear area.	None.	If copper is visible over more than 50% of the bushing wear area, remove and replace the bushing.

5.1 Cargo Hook Swing Suspension System Inspection continued

Suspension Frame Re-assembly after Inspection

Re-assemble the suspension frame per the following (refer to Figures 5.1.6 and 5.1.7).

1. Insert Pivot Shaft (P/N 290-842-00) through one bushing, thrust washer***** (P/N 517-058-00), Gimbal Assembly, thrust washer***** (P/N 517-058-00) and through second frame half bushing.
   * Ensure Teflon impregnated wear surfaces (darker sides) of thrust washers are facing gimbal.
2. Rotate the pivot shaft so that the raised "keys" at each end are horizontal.
3. Before fully seating and securing the frame halves together, install the bumper (P/N 290-862-00).
4. Capture each end of pivot shaft with Shaft Caps (P/N 290-843-00) and install bolt (P/N 510-506-00), washer (P/N 510-174-00) and nut (P/N 510-718-00). Ensure that the rod ends are aligned with the holes in both feet.
5. Torque the nut to 20 ft-lbs. Rotate the nut to the next castellation, not to exceed 30 ft-lbs.
6. Install and secure cotter pin (P/N 510-178-00).
7. Secure rod ends to frame feet with bolt (P/N 510-505-00) and washer (P/N 510-173-00), nut (P/N 510-717-00) and cotter pin (P/N 510-178-00). Install nut and tighten to 50 in-lbs, then rotate to next castellation, not to exceed 85 in-lbs, and install cotter pin.
8. Slide Load Cell Assembly over Gimbal Assembly, align holes, and then insert Gimbal Shaft (P/N 290-739-00) through. Place Shaft Retaining Bushings (P/N 290-740-00) over each end of Gimbal Shaft, insert bolt (P/N 510-443-00) through, and secure with washer (P/N 510-220-00) and nut (510-320-00). Tighten nut to 60-70 in-lbs and rotate to next castellation if necessary to insert cotter pin.

   CAUTION

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

9. Install the Inner Thrust Washer* (P/N 235-155-00), Paddle Assembly** (232-302-00) and Hat Bushing (P/N 291-130-00) over each swing frame foot and secure with washer (P/N 510-239-00) and bolt (510-639-00). Reference Figure 5.1.3. Torque bolt to 8 – 12 ft-lbs and secure with safety wire.
   * Ensure the Teflon impregnated wear surface (darker side) of the thrust washer is facing the Paddle Assembly.
   ** Ensure proper orientation of Paddle Assembly with Flanged Bushing towards Hat Bushing as per Figure 5.1.3.
10. Install the suspension cables onto the swing frame assembly. The pair of shorter cables must be installed onto the forward end of the swing frame. Install with bolt, washer, nut and cotter pin. Install nut and tighten to 20 in-lbs, then rotate to next castellation, not to exceed 30 in-lbs, and install cotter pin.

5.2 Cargo Hook Overhaul Schedule

Overhaul the cargo hook in accordance with the guidelines below. Contact Onboard Systems for the latest revision of overhaul instructions for the cargo hook and guidance to locate authorized overhaul facilities.

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

Section 11
Placards and Markings

11.1 Placards

The 200-321-00 Cargo Hook Swing Suspension System Kit includes the following placards shown in Table 11.1.1.

Table 11.1.1 Cargo Hook Suspension System Placards

Placard part number and appearance	Location
P/N 215-168-00 	Located on the belly of the aircraft near the cargo hook suspension in clear view of the ground support personnel.
 (text is engraved on manual release lever shown)	Located on the release lever of the hydraulic release master cylinder assembly. Master cylinder assembly is located on the collective.
P/N 215-271-00 	Located on the swing suspension frame near the serial number plate.

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Section 12
Servicing

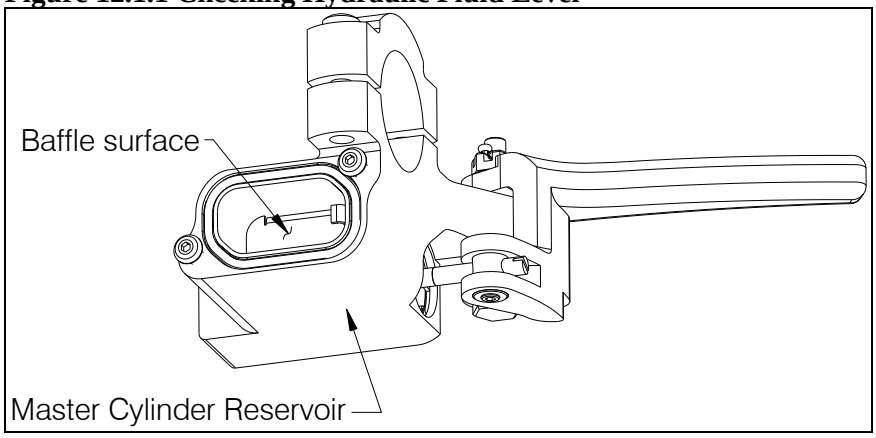
12.1 Maintenance of the Hydraulic Release System

The system is filled with fluid at installation and does not consume fluid unless it leaks out. If any leakage is detected, the fluid level should be immediately checked.

To check the fluid level:

1. Position the collective against the lower stop.
2. The Master Cylinder features a transparent lid through which the fluid level can be checked. Hydraulic fluid must be visible over the baffle surface (see Figure 12.1.1).
3. Remove lid and add MIL-PRF-87257 (optional: MIL-PRF-5606) hydraulic fluid as required until the baffle surface is partially or fully submerged.

Figure 12.1.1 Checking Hydraulic Fluid Level



If leakage is noted around any plumbing fittings, the fittings may be tightened until the leakage quits. If leakage is noted around the pistons in either the master or slave cylinders the leaking cylinder must be repaired. See the instructions for repair in this section.

12.1 Maintenance of the Hydraulic Release System continued

Master Cylinder Repair

If fluid is leaking around the piston, the only repair is to remove and replace the cup seal and O-ring. The master cylinder must be disassembled, inspected and then re-assembled with new seals.

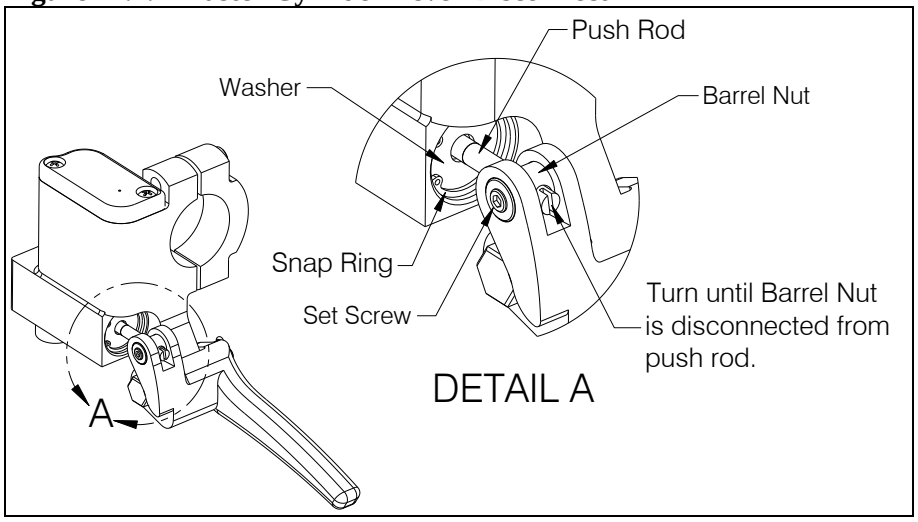
Disassembly:

1. Remove snap ring. Use caution when removing snap ring since the piston is spring loaded against the washer and snap ring. The piston will pop out of the housing when the snap ring is removed. Use the lever to put pressure on the piston while removing snap ring.
2. Loosen the set screw and disconnect barrel nut on lever from the push rod. See Figure 12.1.2.
3. Remove the piston and spring. See Figure 12.1.3 for parts breakdown.
4. Inspect the master cylinder bore for scratches. If any scratches or gouges are visible in the bore, the master cylinder must be replaced.

Re-assembly

1. If the bore condition is acceptable, replace the lip seal and O-ring on the piston assembly. Maintain orientation as shown in Figure 12.1.4. Stretch seals over piston into grooves.
2. To assemble the master cylinder, lubricate the piston seals and cylinder bore generously with hydraulic fluid.
3. Place the spring in the cylinder bore.
4. Pass the push rod through the washer.
5. Thread the push rod into the barrel nut until approximately 1/16" of thread is visible through the opposite side of the barrel nut.
6. Insert the small spring into the piston assembly and insert the piston assembly into the master cylinder bore using a firm rocking motion.
7. Use the lever to compress the spring and hold the piston in place.
8. Use snap ring pliers to install the snap ring.
9. Secure push rod threads by tightening set screw.

Figure 12.1.2 Master Cylinder Lever Disconnect



12.1 Maintenance of the Hydraulic Release System continued

Master Cylinder Repair continued

Figure 12.1.3 Master Cylinder Piston Removal

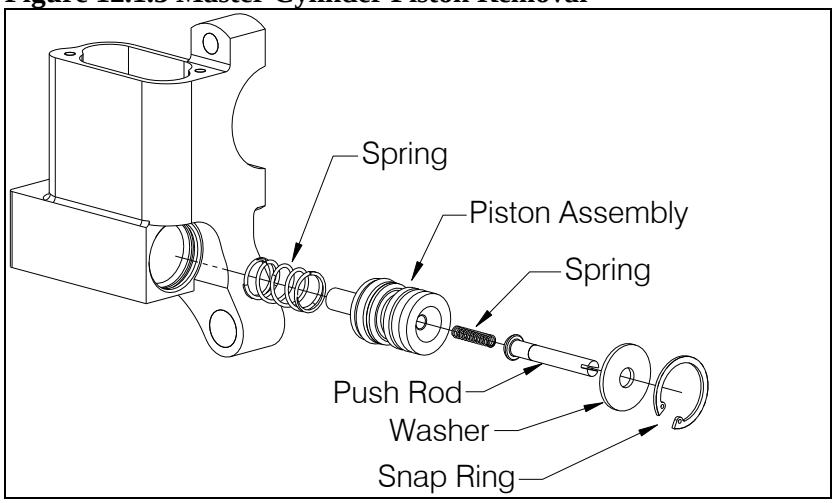
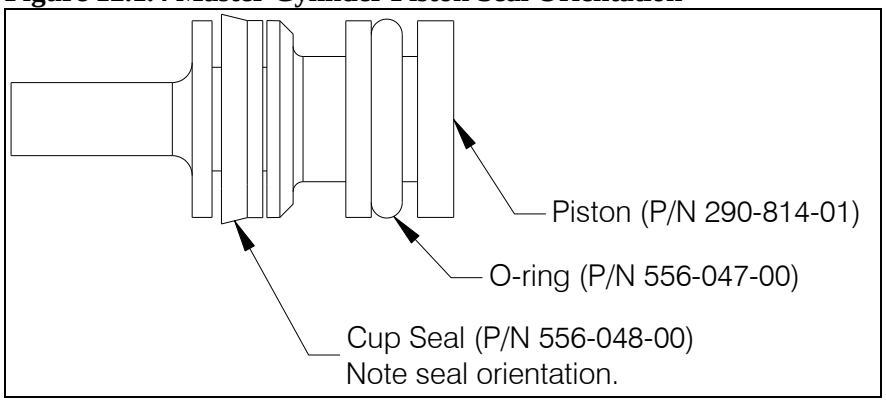


Figure 12.1.4 Master Cylinder Piston Seal Orientation



Slave Cylinder Repair

If the slave cylinder is leaking fluid around the piston rod, the only repair possible is to remove and replace the quad ring or cup seal (earlier production units of the slave cylinder assembly used a cup seal instead of the quad ring).

Disassembly:

1. Remove cap, piston, and seal (see Figure 12.1.5).
2. Inspect bore of slave cylinder for scratches or gouges. If any are present the assembly must be replaced.
3. Remove bushing in cap by pressing it out.
4. Remove quad ring (or cup seal) by stretching it over the piston.

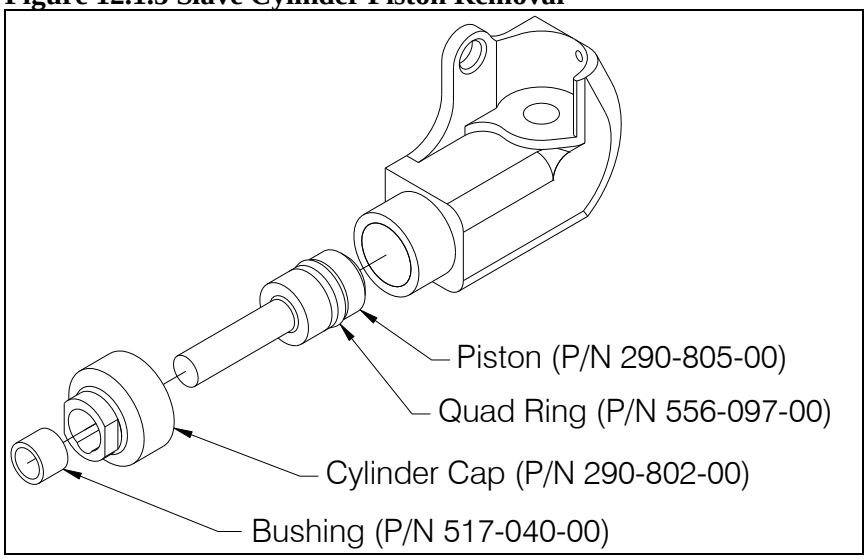
Re-assembly:

1. Press new bushing into cap.
2. Stretch new quad ring over piston into groove.
3. Clean and lubricate cylinder bore and piston seal with hydraulic fluid.
4. Insert piston into cylinder taking care not to damage edges of quad ring.
5. Screw on cap and torque to 50-60 inch pounds.

12.1 Maintenance of the Hydraulic Release System continued

Slave Cylinder Repair continued

Figure 12.1.5 Slave Cylinder Piston Removal



12.2 Bleeding Hydraulic System

Filling and bleeding the hydraulic release system is most easily accomplished on the bench, prior to installation on the aircraft. This process may also be accomplished after the system is installed. Filling and bleeding requires two persons, one to inject hydraulic fluid through the system and the other to observe the reservoir. Following is the procedure:

1. Obtain the hydraulic hook bleed kit, 212-014-02. This kit consists of 2 ounces of MIL-PRF-87257 fluid, a syringe, a female barb fitting, a length of PVC tubing, and a bleed adapter fitting. The bleed kit is included in new hydraulic hook kits.

NOTICE

MIL-PRF-5606 fluid is also compatible with the hydraulic system and was formerly included with new cargo hook kits. It is interchangeable and miscible with MIL-PRF-87257 fluid.

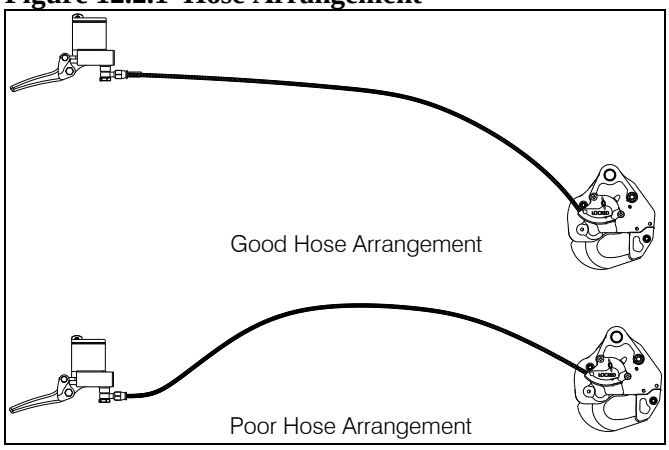
2. If the system is already installed on the aircraft, place an absorbent towel under the master cylinder. If the master cylinder is not installed on the aircraft, lightly clamp the master cylinder in a vise to hold it in a vertical position and position the slave cylinder so that its level is below the level of the master cylinder.

NOTICE

Use best shop practices to keep foreign material out of the hydraulic system. FOD will plug orifices, damage seals and/or scratch sealing surfaces necessitating system rebuild. Use only clean hydraulic fluid from sealed containers.

3. Connect the master cylinder assembly to the slave cylinder assembly if not already done. If filling or bleeding on the bench, as much as possible, arrange the hoses uncoiled, straight and running uphill. See Figure 12.2.1.

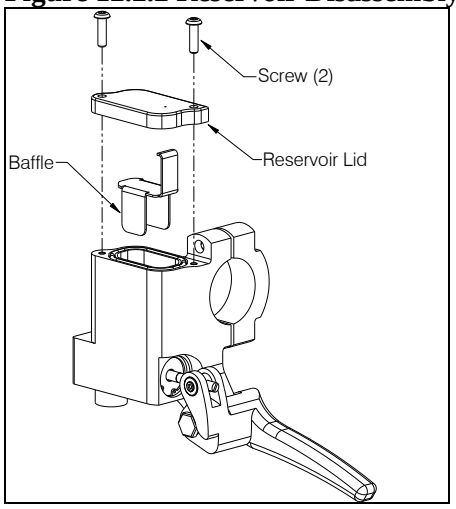
Figure 12.2.1 Hose Arrangement



12.2 Bleeding Hydraulic System continued

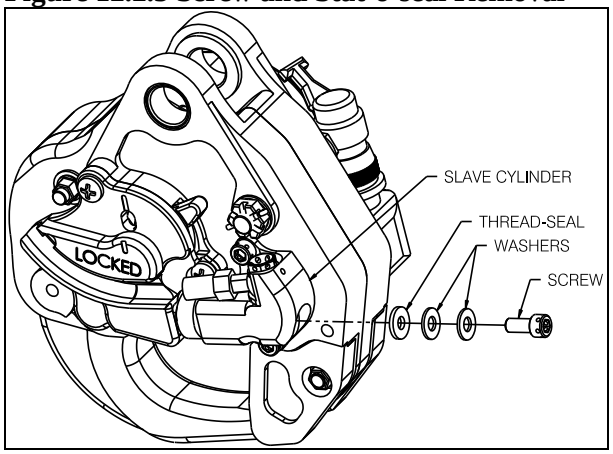
4. Remove screws, reservoir lid, and baffle from the master cylinder reservoir as shown in Figure 12.2.2.

Figure 12.2.2 Reservoir Disassembly



5. Remove the safety wire, screw, washers and thread-seal on the slave cylinder, see Figure 12.2.3.

Figure 12.2.3 Screw and Stat-o-seal Removal



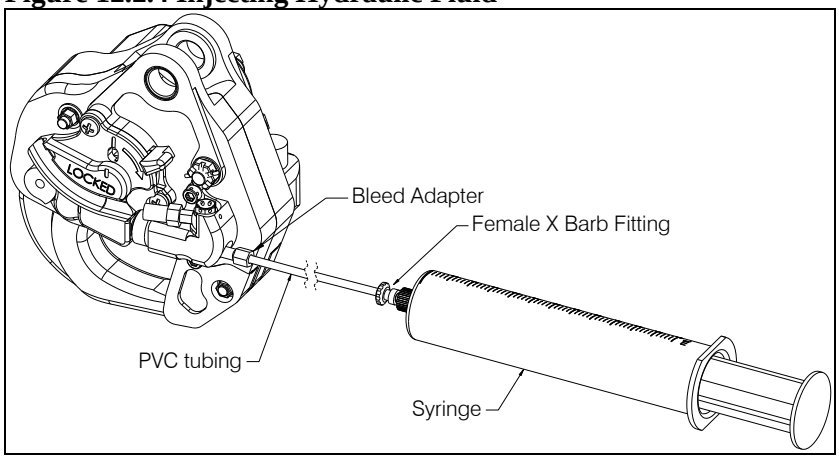
6. Fill a syringe with approximately 35 cc of hydraulic fluid. Screw the end of the syringe into the screw hole on the slave cylinder to create a tight seal. See Figure 12.2.4.
7. While observing the reservoir, **slowly** push on the syringe plunger to force fluid through the slave cylinder, hydraulic hose, and up to the master cylinder reservoir. There will be some resistance during filling—this is normal.

⚠ CAUTION

Injecting the fluid into the system too rapidly may cause the fluid to spray up and out of the master cylinder reservoir. Wear safety glasses when observing fluid reservoir while filling.

12.2 Bleeding Hydraulic System continued

Figure 12.2.4 Injecting Hydraulic Fluid



8. Continue to force fluid into the master cylinder reservoir until the reservoir is approximately half full.

NOTICE

If bleeding an already filled system, you may need to draw fluid from the master cylinder reservoir during this step to prevent overflow.

9. Remove the syringe from the screw hole. Re-install the Thread-Seal (P/N 510-740-00), washers (P/N 510-209-00) and screw (P/N 510-694-00), see Figure 12.2.3.

10. Allow the system to rest for several minutes. This will allow any air to rise through the system.

11. Very slowly pull the release lever on the master cylinder and watch for bubbles. If bubbles are observed rising within the reservoir, continue to cycle the lever until there are no more. Actuating the lever releases trapped air in the system.

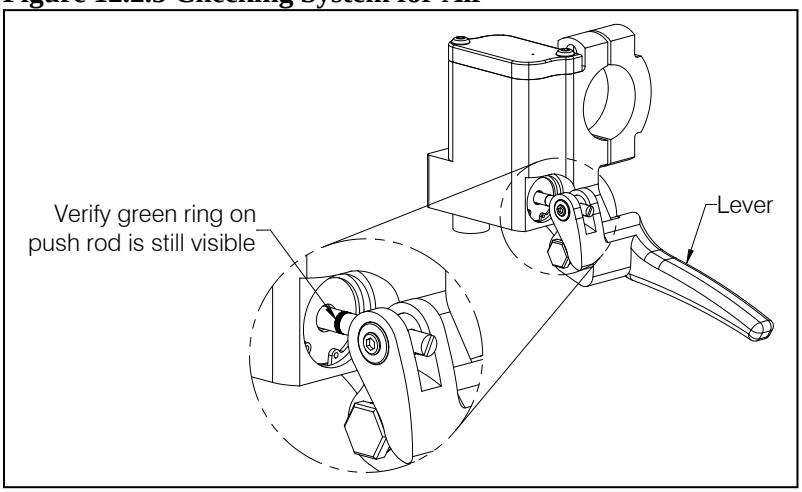
⚠ CAUTION

Pull the lever very slowly! When the reservoir is not baffled and capped, a hard pull will cause fluid to erupt over the edge of the reservoir.

12. Check the system for air by actuating the lever firmly until it bottoms out. Check the push rod position (see Figure 12.2.5). If the green area on the push rod is visible, proceed to step 13. If the green on the push rod is not visible with the lever completely pulled, the system has too much air in it and needs further bleeding. To do this, repeat steps 5 – 11.

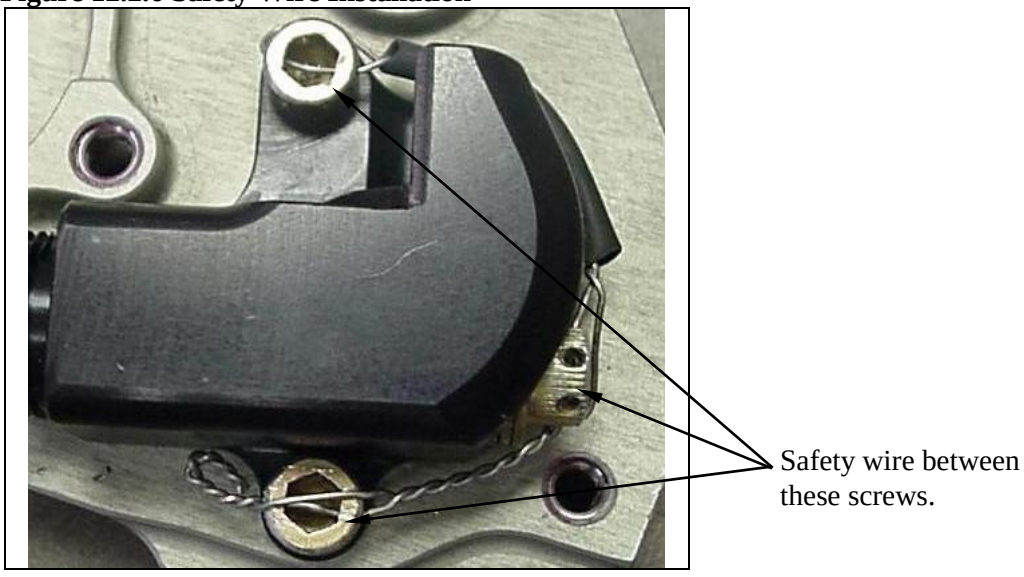
12.2 Bleeding Hydraulic System continued

Figure 12.2.5 Checking System for Air



13. After the system is properly bled, verify that the reservoir is approximately half full of hydraulic fluid. Fluid should be visible above the baffle.
14. Re-install the baffle and the reservoir lid.
15. Check the system for proper operation. Fully actuate the release lever. The hook must open and the lever must have a firm feel.
16. At the slave cylinder, safety wire the three drilled head screws together using .025 safety wire per MS20995C, see Figure 12.2.6.

Figure 12.2.6 Safety Wire Installation



17. Disassemble and thoroughly clean the syringe with isopropyl alcohol. Allow it to dry. Not cleaning the syringe will render it unusable. Reassemble and store for next use.

12.3 Lubrication Information

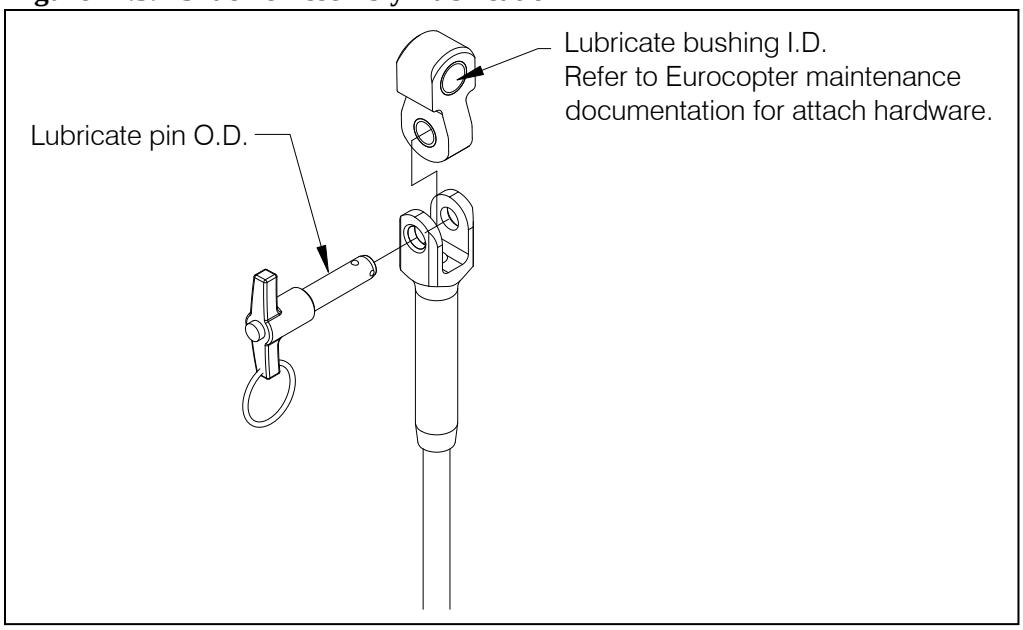
Lubrication of Cargo Hook Swing Suspension system is required every 500 hours of hook operation. To obtain maximum life under severe duty conditions such as logging or seismic work, it is recommended to lubricate the Swing Suspension system approximately every 250 hours.

Lubricate the Cargo Hook Swing Suspension at points noted in Figures 12.3.1 through 12.3.3. Recommended lubricants are AeroShell 17, MIL-G-21164 or Mobilgrease 28, MIL-G-81322.

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 12.3.1. This applies to all four Shackle Assemblies on the helicopter.

Figure 12.3.1 Shackle Assembly Lubrication



12.3 Lubrication Information continued

Lower Cable Gimbal Lubrication

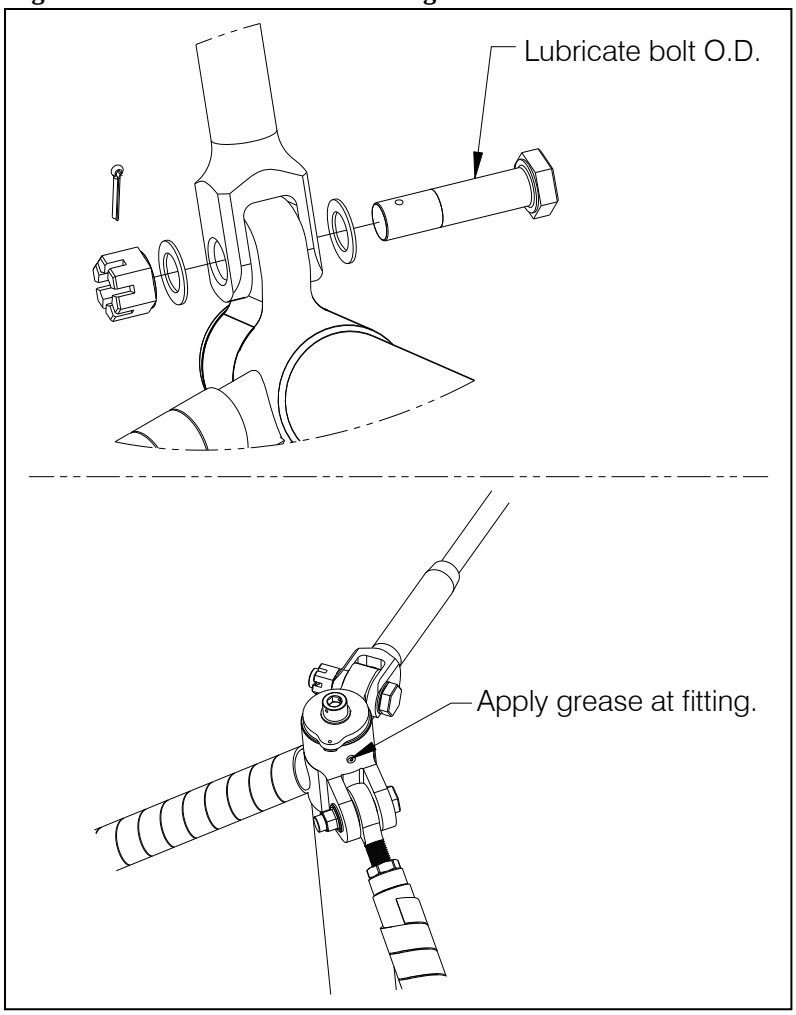
Lubricate the four lower cable and swing frame joints as shown in Figure 12.3.2. The swing frame joint has an NAS516-1A grease fitting for lubrication.

For re-assembly after lubrication, tighten castellated self-locking nut on suspension cable pivot bolt and tighten to 20 in-lbs, then rotate to next castellation, not to exceed 30 in-lbs, and install cotter pin.

⚠ CAUTION

Do not over-tighten these bolts, as this may cause undue stress in the cable clevis fittings. Ensure cable clevis fittings rotate freely after tightening.

Figure 12.3.2 Lower Cable and Swing Frame Joint Lubrication

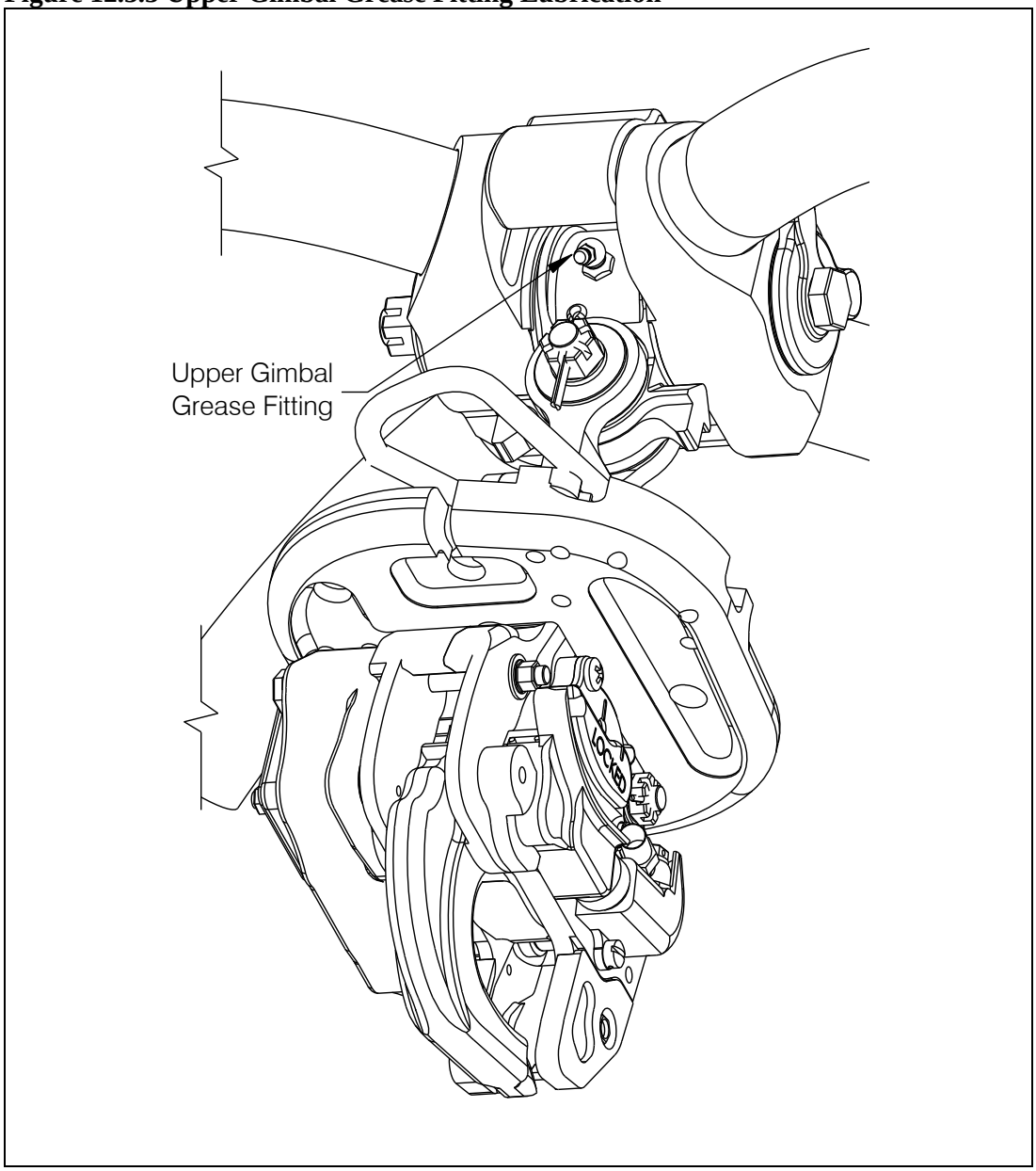


12.3 Lubrication Information, continued

Upper Gimbal Grease Fitting

Lubricate Upper Gimbal Assembly at the grease fitting located as shown in Figure 12.3.3. You may have to rotate the hook slightly to access the grease fitting. Pump until grease comes out around ends of upper gimbal. Wipe off excess. This fitting lubricates the gimbal and the thrust washers. It does not lubricate the bearings in the steel frame. The grease fitting is provided for additional lubrication outside of the normal lubrication schedule. If this area is disassembled for inspection, hand grease all bearing surfaces when reassembling.

Figure 12.3.3 Upper Gimbal Grease Fitting Lubrication



12.3 Lubrication Information, continued

Hook Corrosion Prevention

In marine or other corrosive environments the life of the hook can be increased by periodically treating with a corrosion preventative compound such as ACF-50. Spray exterior of hook with corrosion preventative compound and wipe off excess with a rag.

The amount and frequency of application will vary depending on climate. In dry dusty environments it is not recommended to treat for corrosion since the oily residue on the inside of the hook that cannot be wiped off could attract and retain dust and sand. In addition corrosion is not likely to be a problem in these conditions. For offshore or coastal operations, treatment should be done every two weeks.

Section 25
Equipment and Furnishings

25.1 Cargo Hook Connector

Listed below is the pin out for the cargo hook connector. The hook is polarity sensitive due to an arc suppressing diode internally mounted.

Table 25.1.1 Cargo Hook Connector

Pin	*Function*
A	Ground
B	Power

25.2 Description

The Cargo Hook Swing Suspension System consists of four primary subsystems, these are the swing suspension assembly, hydraulic release system, electrical release system, Load Weigh System, and fuel drain guard.

The Swing Suspension Assembly consists of a welded "swing" frame assembly that is suspended from four hard points on the belly of the helicopter via cables. The swing frame assembly supports the cargo hook and load cell. The swing frame assembly has two shock cords attached which when attached to brackets on the belly of the helicopter retract the frame assembly and provide increased ground clearance.

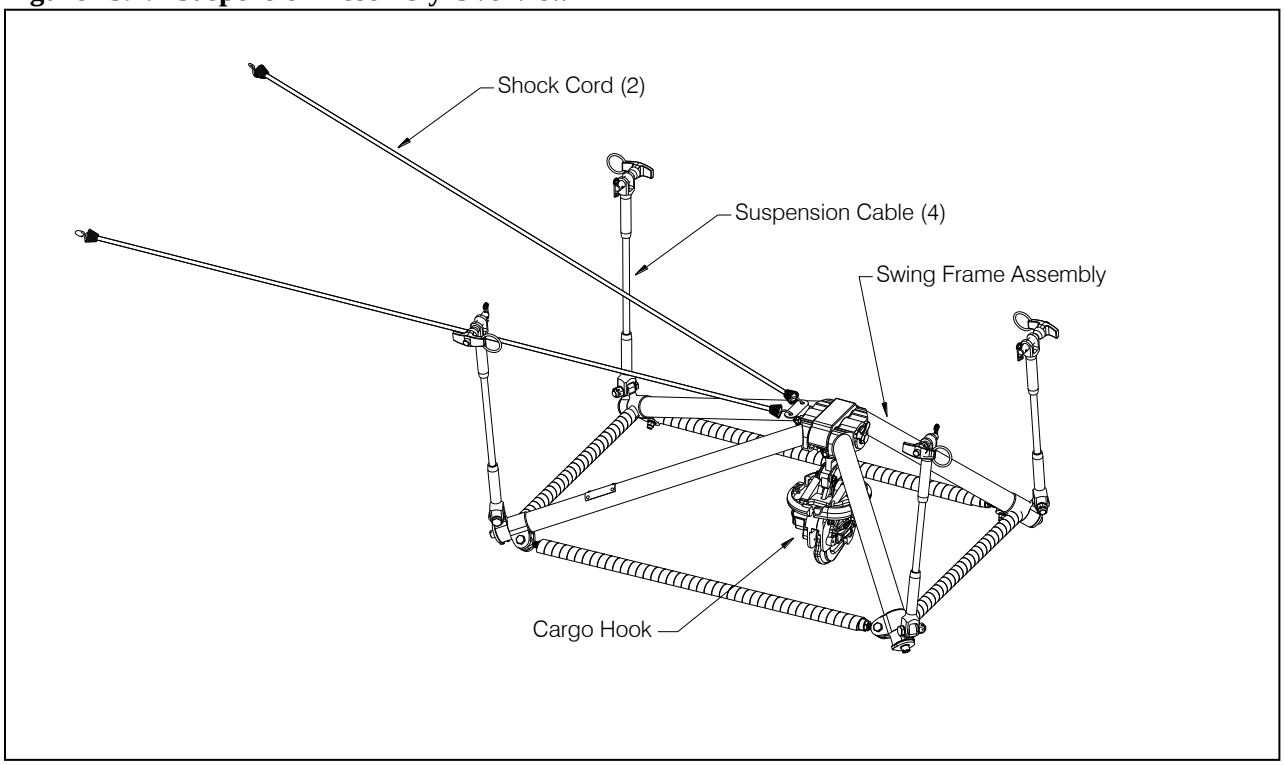
The Electrical Release System provides a means to release a cargo hook load through the use of a switch in the cockpit.

The Hydraulic Release System provides an additional means to release a cargo hook load and consists of a release lever mounted on the collective, a hose routed from the release lever to the hook, and a piston at the hook that actuates the internal release mechanism when the lever is pulled.

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

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

Figure 25.2.1 Suspension Assembly Overview



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*	28.5 lbs (12.9 kg)	134 in (3410 mm)
Fixed Provisions**	6.5 lbs (2.9 kg)	67 in (1700 mm)
Total	35.0 lbs (16.1 kg)	121.6 in (3068 mm)

***** The removable provisions include the swing suspension w/ hook, external hydraulic hose, and external electrical release harness. 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 fixed hydraulic hose, internal electrical wire harnesses, the load weigh indicator, and the miscellaneous brackets that support these items. These components would typically be left on the aircraft when configuring the aircraft for non-external load work.

25.12 Storage Instructions

For temporary storage the master cylinder must be stored with the reservoir lid up. The lid contains an air vent that will allow hydraulic fluid to drain out if left inverted. If long term storage or shipping must be done where the orientation of the master cylinder cannot be controlled, the reservoir must be drained. Remove the hose attached to the master cylinder and drain it as well. Seal the hydraulic parts in a plastic bag for shipping or storage to prevent dirt contamination. The slave cylinder end needs no special handling.

Clean the exterior Cargo Hook and Swing Frame components thoroughly of excess dirt and grease with a rag before packaging. Pack the unit in a heat-sealable package. If the unit is to be stored for long periods in a tropical climate it should be packed in a reliable manner to suit local conditions. Refer to MIL-PRF-23199 and MIL-STD-2073-1 for additional guidance. Refer to the Cargo Hook Component Maintenance Manual for additional storage instructions for 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 manual 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).
Cargo hook does not operate electrically, manual hydraulic 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 (see note 1 below). If open indication is obtained, remove and replace cargo hook (see sections 25.16 and 25.17).
Cargo hook operates electrically, but not manually.	Leaks in hydraulic hose system. Air in hydraulic hose system. Jammed slave cylinder.	Check for leaks in hydraulic hose system and correct defects if found. Bleed hydraulic system per this manual. Remove slave cylinder from hook and check for proper operation while actuating manual release lever. Repair as required.
Load beam fails to re-latch after being reset.	Defective latch mechanism.	Remove and replace cargo hook (see sections 25.16 and 25.17).
Force required to release hook with lever on collective exceeds 14 lbs.	Friction in internal mechanism or defective hydraulic system.	Remove slave cylinder from hook and manually operate master cylinder. If operation feels free and force is less than 5 lbs remove and replace cargo hook (see Section 25.16 and 25.17).
Hydraulic fluid leaks at hose fittings.	Loose fittings	Tighten fittings. Check fluid level in reservoir. Bleed hydraulic system per Section 12.2.
Hydraulic fluid leaks around master or slave cylinder pistons.	Leaking seals	Replace master or slave cylinder assembly.
Visibly loose fasteners or missing locking pins on suspension.	Visibly loose fasteners or missing locking pins.	Re-torque and reinstall locking pins per installation instructions.
Visibly loose electrical connector.	Visibly loose electrical connector.	Re-tighten connector
Visible cracks or corrosion on hook.	Visible cracks or corrosion.	Remove and replace cargo hook (see Sections 25.16 and 25.17).
Gouges or wear deeper than .090 on the cargo hook load beam.	Gouges or wear deeper than .090.	Remove and replace cargo hook (see Sections 25.16 and 25.17).
Cargo hook fails to open or re-lock properly.	Failure to open or re-lock properly.	Remove and replace cargo hook (see Sections 25.16 and 25.17).

Table 25.15.1 Troubleshooting continued

Circuit breaker opens when cargo hook is energized.	Short in the system, faulty wiring, 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 circuit breaker.	Check the circuit breaker and wiring (see Note 2). If this doesn't help, remove and replace indicator per sections 25.16 and 25.17.
The displayed load on the Load Weigh Indicator is incorrect.	Incorrect calibration code.	Ensure the correct calibration code has been entered (see Note 3).
Indicator displayed load is not stable.	Dampening level is too low.	Adjust the dampening level to a higher number (see Note 4).
Indicator displayed load takes too long to change the reading when the load is changed.	Dampening level is too high.	Adjust the dampening level to a lower number (see Note 4).
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).

Notes:

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

   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

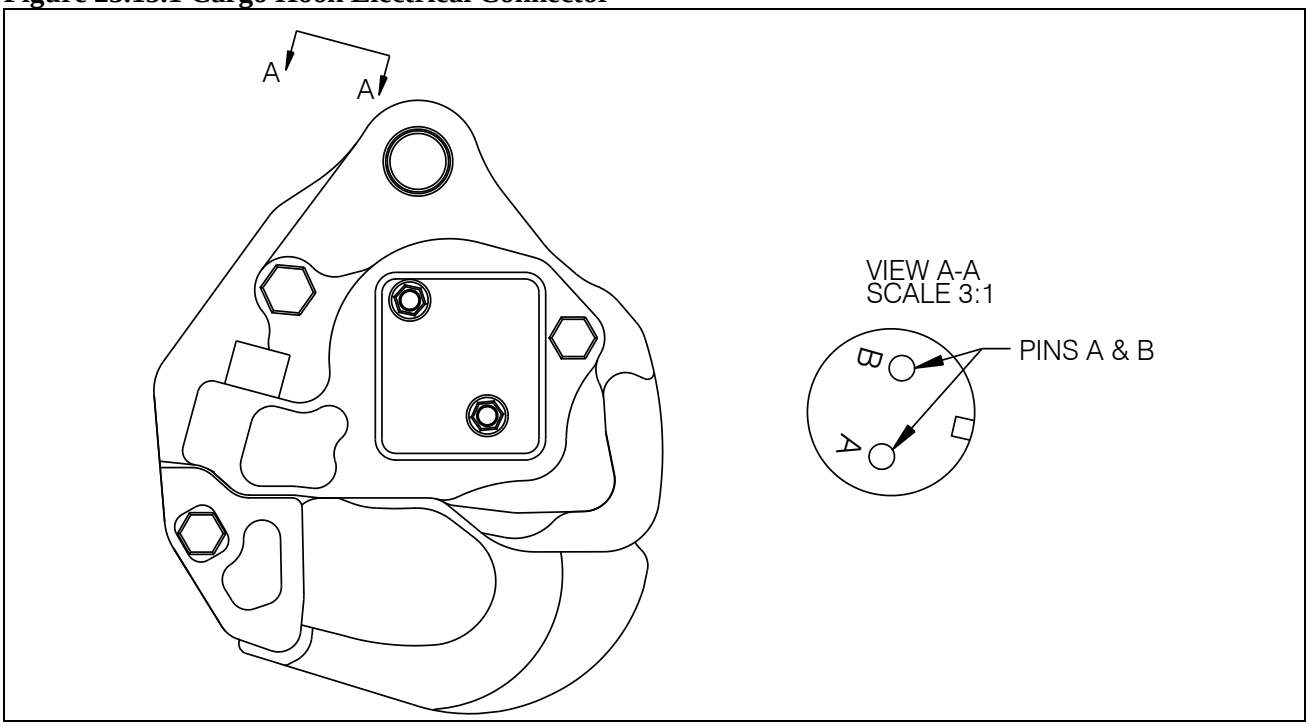


Table 25.3 Notes continued:

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 circuit breaker(s) from the corresponding circuits.

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 schematic.

Figure 25.15.2 Wire Harness Routing

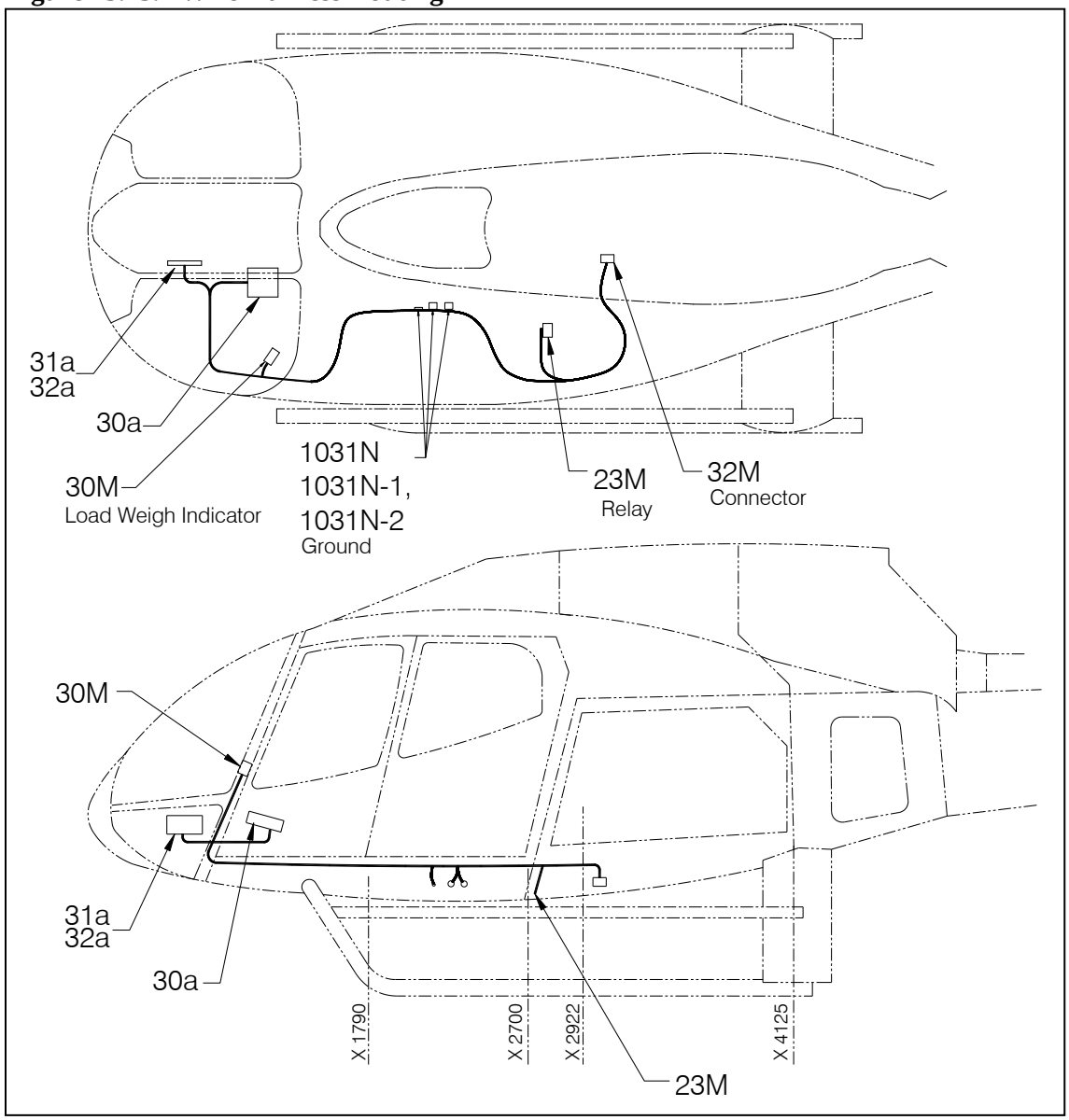


Table 25.3 Notes continued:

2. Checking Wire Harnesses continued

Figure 25.15.3 Electrical Schematic

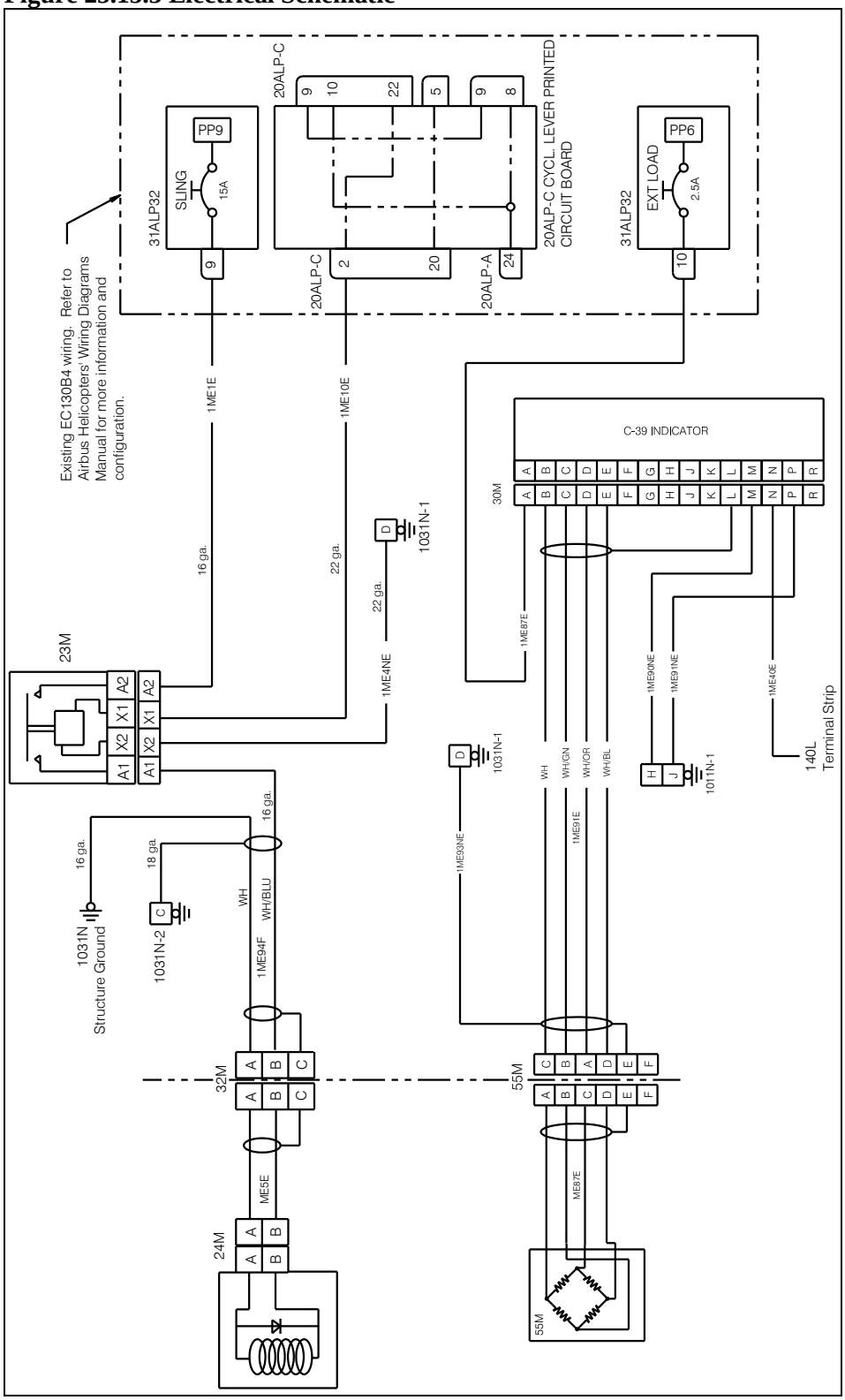
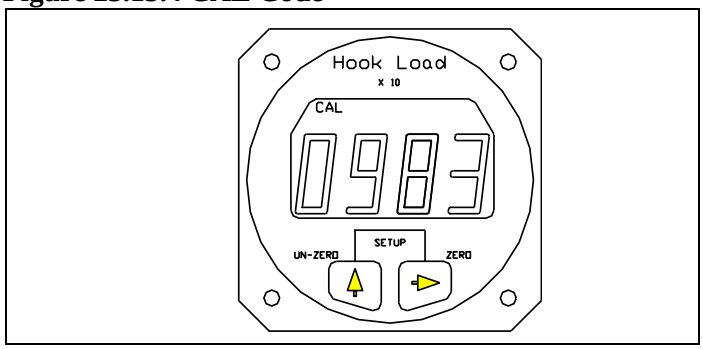


Table 25.3 Notes continued:

3. Checking Load Weigh Indicator calibration code:

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 25.15.4 CAL Code

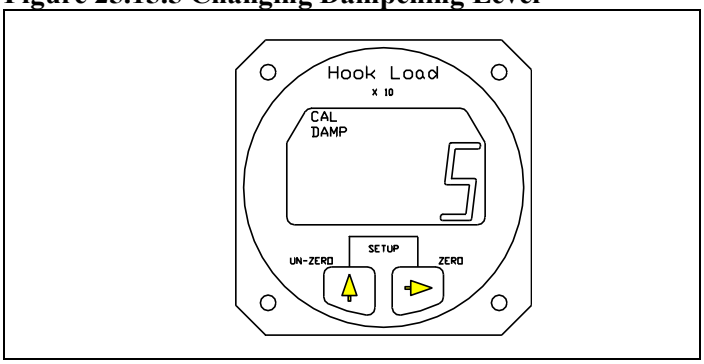


This code should match the code printed on the tag attached to the load cell cable. If this code does not match, contact Onboard Systems for further guidance.

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 25.15.5 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

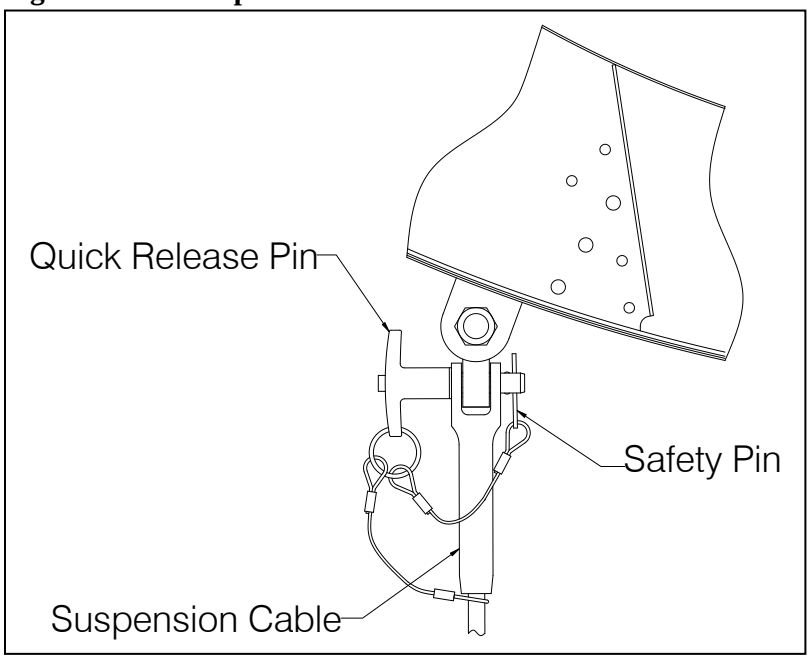
Cargo Hook Removal

1. Remove the slave cylinder assembly by removing two screws (refer to Figure 25.16.2) and associated ty-wraps.
2. Remove the electrical release harness, and ground strap from the Cargo Hook and associated ty-wraps at the bumper.
3. Remove the cotter pin (P/N 510-178-00) from the shoulder bolt (P/N 290-775-00) (refer to Figure 25.17.2).
4. Remove the castellated nut (P/N 510-170-00) from the shoulder bolt.
5. Remove shoulder bolt and all washers.
6. Remove the Cargo Hook from suspension system.
7. Remove the Hook Bumper (P/N 290-839-01) from the cargo hook.

Suspension System Removal

1. Disconnect the load cell harness connector, electrical release harness connector, ground strap, and hydraulic hose at their respective connections at the belly of the aircraft.
2. 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 as illustrated below.

Figure 25.16.1 Suspension Attachment Hardware

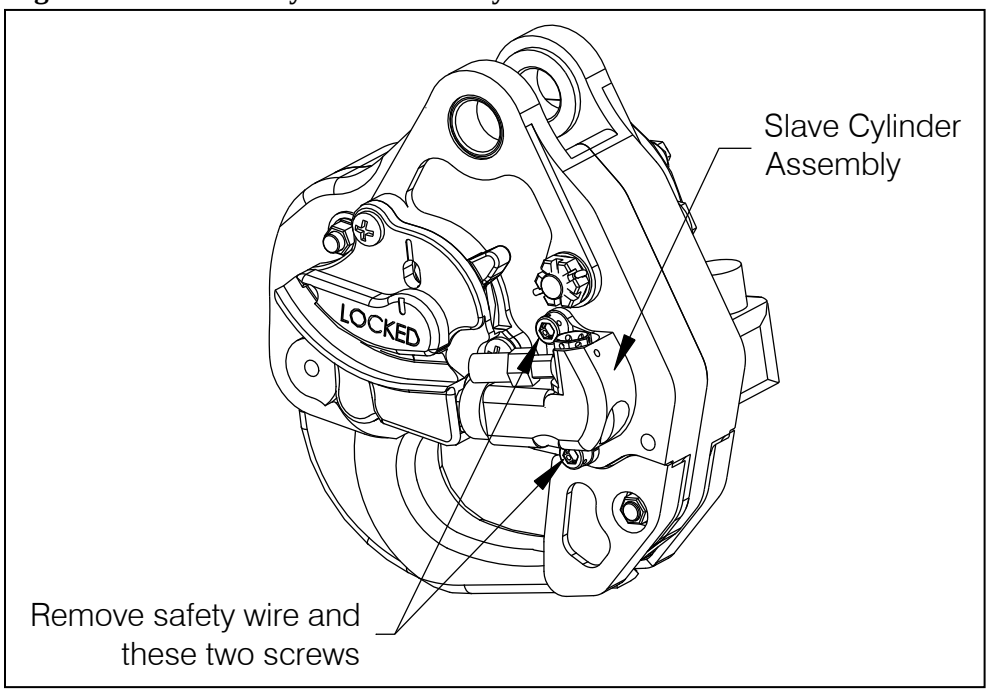


25.16 Component Removal continued

Slave Cylinder Assembly Removal

1. Disconnect the hose at the quick disconnect coupling at the belly of the helicopter.
2. Remove the two screws that hold the slave cylinder assembly to the cargo hook. Remove all ty-wraps that hold the hydraulic hose to the cargo hook and the bumper.

Figure 25.16.2 Slave Cylinder Assembly Removal

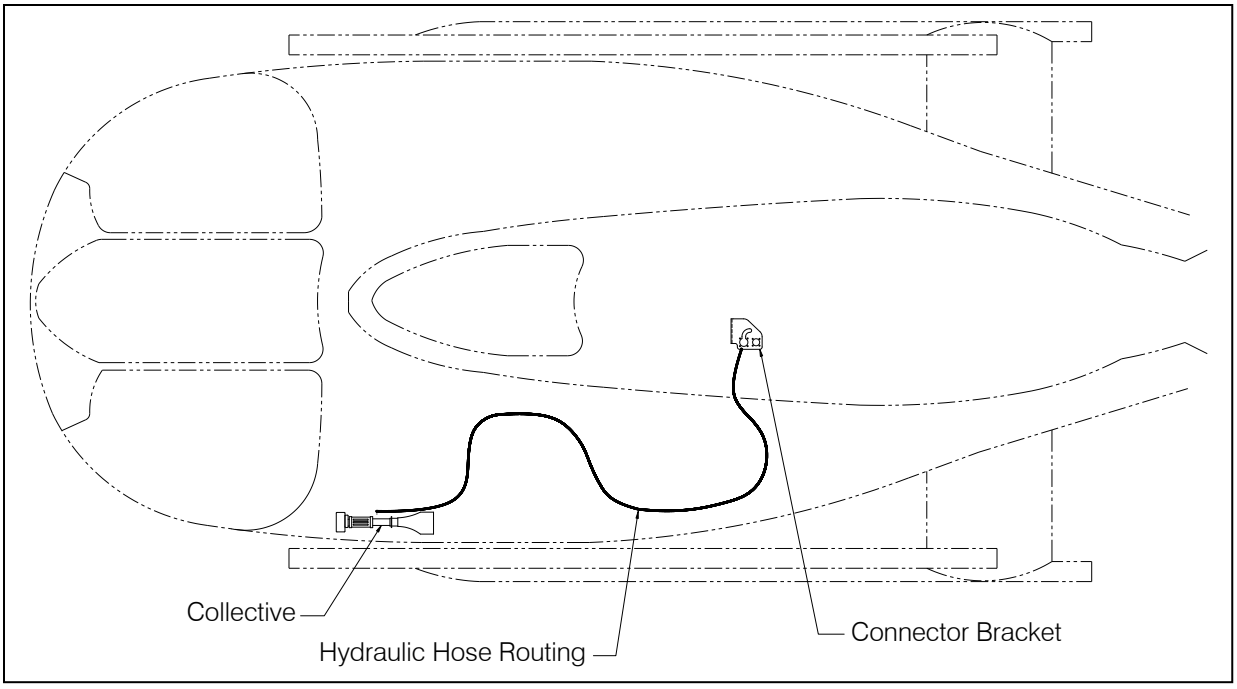


25.16 Component Removal continued

Fixed Hydraulic Release Hose Assembly Removal

The fixed hydraulic release hose is routed from the release lever mounted to the collective shaft, to underneath the cabin floor where it is routed with existing wire harnesses back to the connector bracket on the forward fuel tank support of the helicopter where it is mated with the removable section of the hydraulic release system.

Figure 25.16.3 Fixed Hydraulic Release Hose Routing

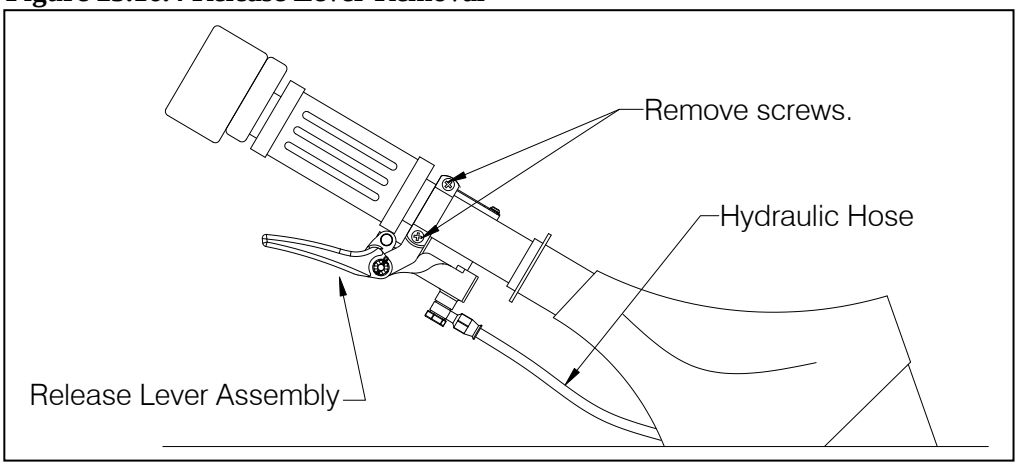


25.16 Component Removal continued

Fixed Hydraulic Release Hose Assembly Removal continued

1. Remove the quick disconnect coupling from the connector bracket that is attached to the fuel tank support frame.
2. Moving forward, remove all ty-wraps along the length of the hose.
3. Feed the hose forward and then up through the slot in the floor.
4. Above the floor and on the collective stick remove the release lever by removing two screws (see below).

Figure 25.16.4 Release Lever Removal



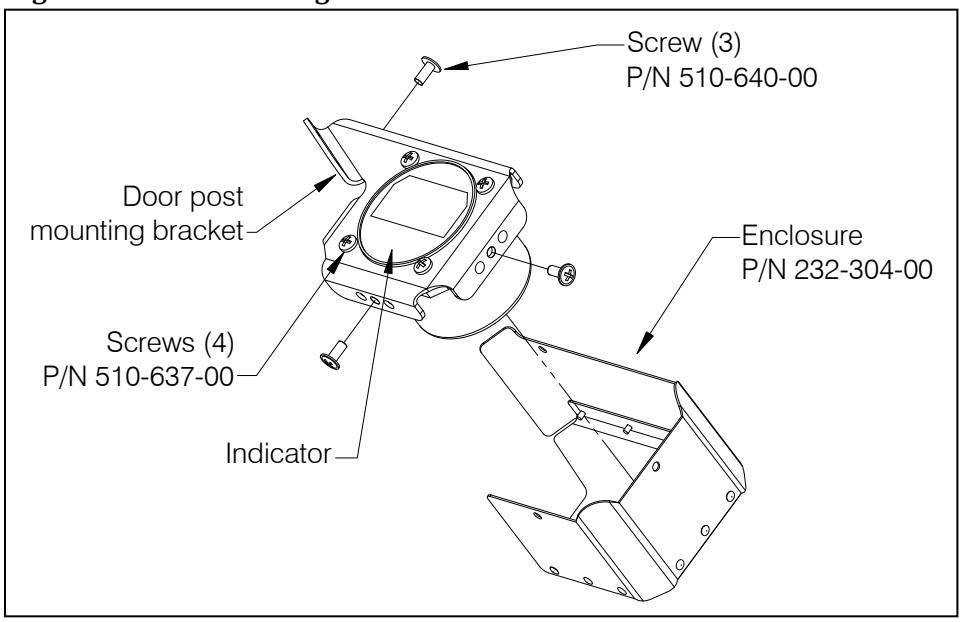
25.16 Component Removal **continued**

Load Weigh Indicator Removal

The load weigh indicator is located on the LH forward door pillar.

1. Disconnect electrical connector from the back of indicator.
2. Remove the enclosure cover by removing three screws (P/N 510-640-00) as shown below.
3. Remove the four screws (P/N 510-637-00) that secure the indicator to the mounting bracket and remove the indicator.

Figure 25.16.5 Load Weigh Indicator Removal

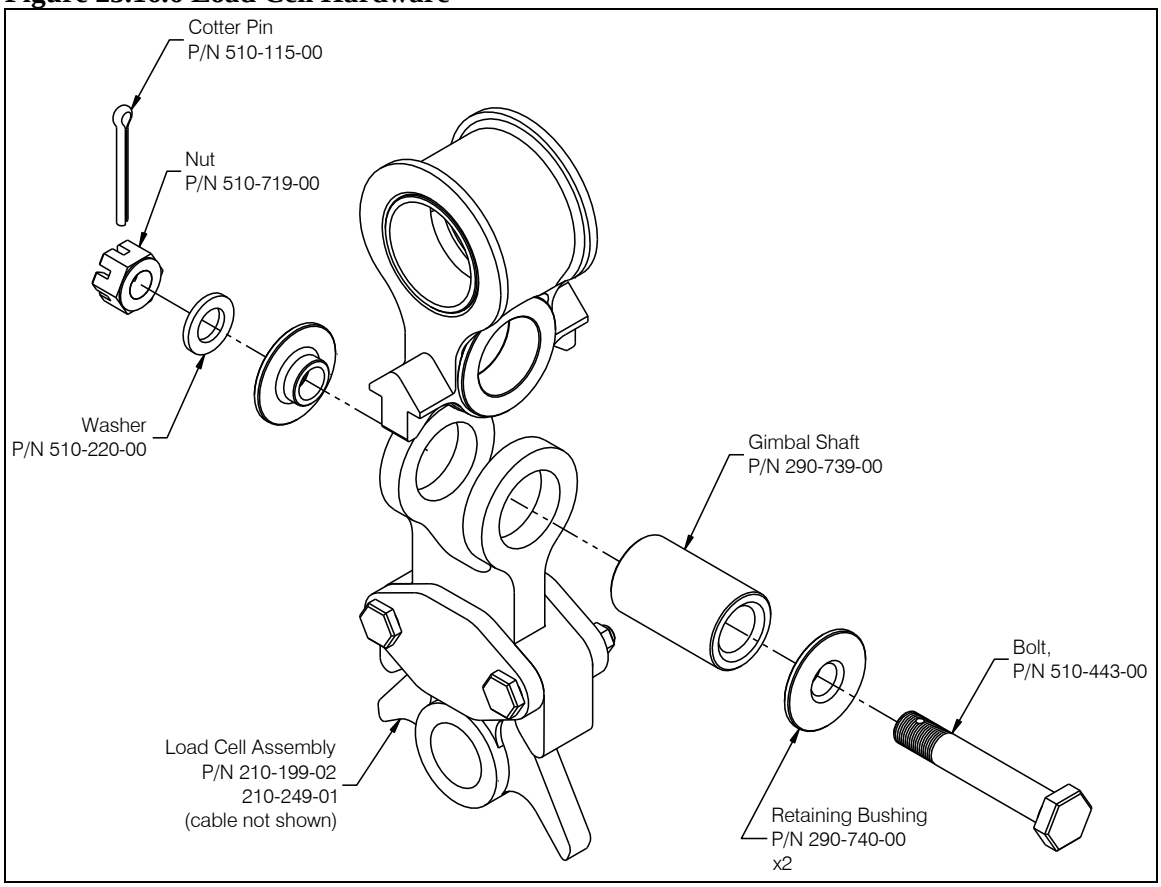


25.16 Component Removal continued

Load Cell Removal

1. Remove the Cargo Hook per the above instructions.
2. Disconnect the electrical connector at the belly of the helicopter.
3. Remove the Load Cell Assembly from the gimbal on the suspension frame (not shown) by removing the hardware as illustrated in Figure 25.16.6.

Figure 25.16.6 Load Cell Hardware



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

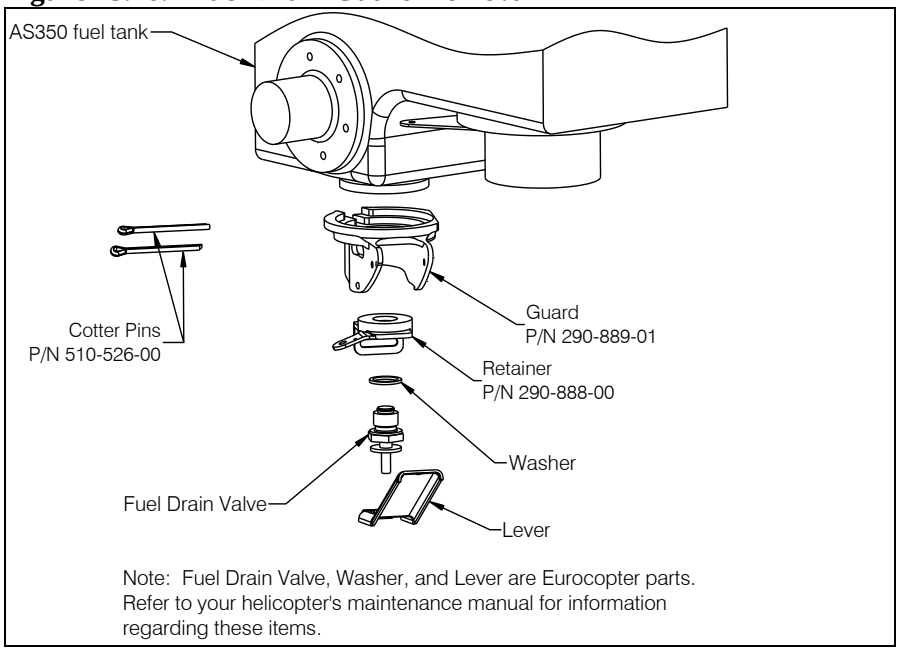
Do not use heat on any of the parts when removing the self-lubricated bushings. These parts are all heat-treated and using heat may affect their mechanical properties.

25.16 Component Removal continued

Fuel Drain Guard Removal

1. Drain fuel tank.
2. Remove 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 25.16.7 Fuel Drain Guard Removal

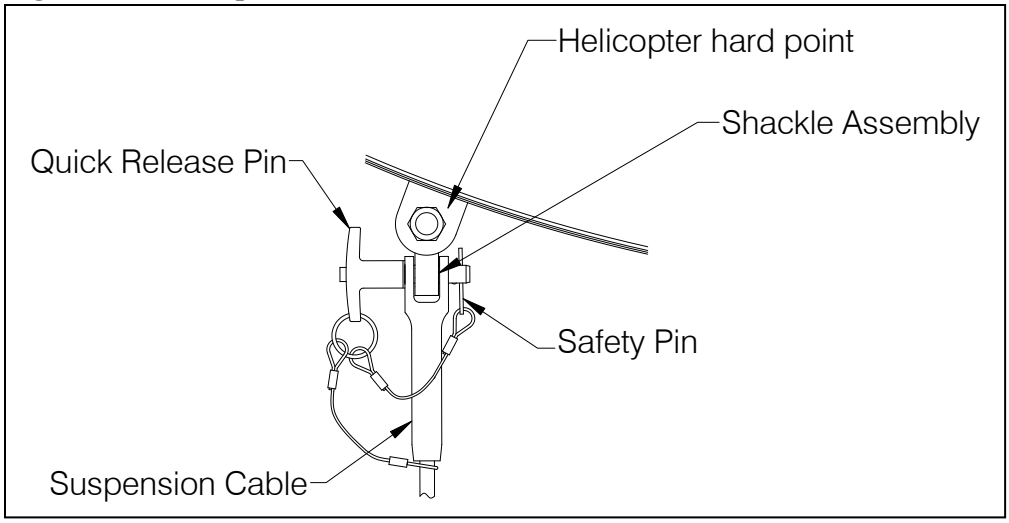


25.17 Component Re-installation

Suspension Re-installation

1. Inspect the Suspension for evidence of damage, corrosion, cable fraying, freedom of rotation at all pivot points, and security of fasteners. If damage is evident, do not use the items until they are repaired.
2. Install the Suspension by securing the shorter suspension cables to the forward Shackle Assemblies and the longer suspension cables to the aft Shackle Assemblies with the quick release pins. Secure quick release pins with attached safety pins.
3. Connect the load cell harness connector to the bulkhead connector at the belly of the aircraft.
4. Connect the electrical release harness connector to the bulkhead connector at the belly of the aircraft.
5. Connect the ground strap attached to the cargo hook to the ground strap attached to the aircraft.
6. Connect the hydraulic release hose to the quick disconnect coupling at the belly of the aircraft.

Figure 25.17.1 Suspension Cable Attachment

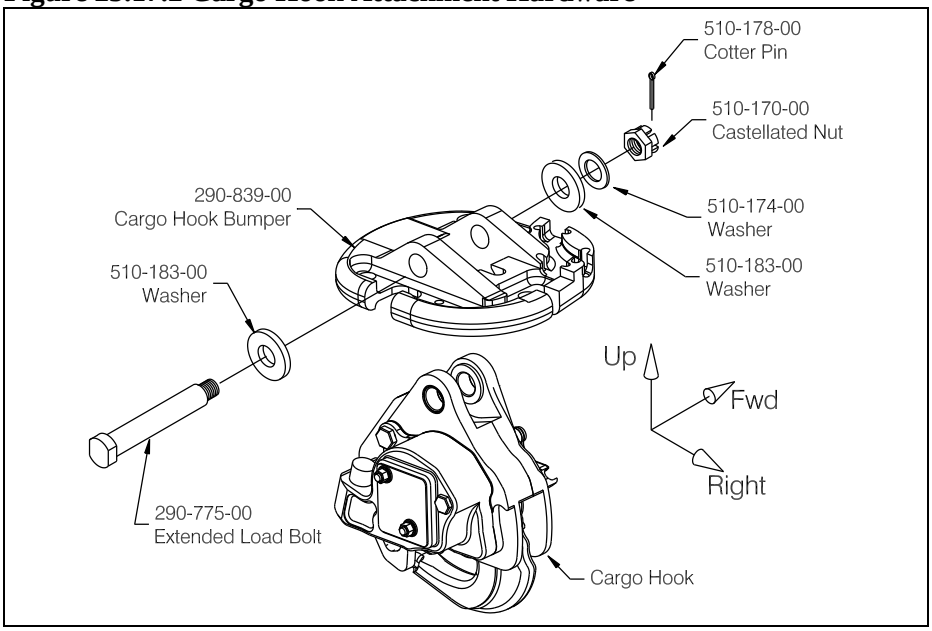


25.17 Component Re-installation continued

Cargo Hook Re-installation

1. Inspect the Cargo Hook for evidence of damage, corrosion and security of lock wire and fasteners.
2. Re-install slave cylinder assembly (P/N 232-168-00) onto cargo hook per this section.
3. Re-install the ground strap (P/N 270-125-01) onto cargo hook with screw (P/N 510-391-00).
4. Re-install electrical release harness (P/N 270-129-01) onto cargo hook.
5. Attach the Cargo Hook (P/N 528-028-00) to the load cell on the suspension system by placing the Hook Bumper (P/N 290-839-01) over the Cargo Hook and installing the shoulder bolt (P/N 290-775-00) through the load cell (not shown below) with washer (P/N 510-183-00). Refer to Figure 25.17.2.
6. Install washer (P/N 510-183-00), washer (P/N 510-174-00) and nut (510-170-00) over bolt end.
7. Tighten nut finger tight, then rotate to previous castellation if necessary to install and secure cotter pin (P/N 510-178-00).
8. Route electrical harnesses, ground strap, and hydraulic hose through channel in bumper and secure with ty-wraps. See Figure 25.17.4.

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

Slave Cylinder Assembly Re-installation

Connect the slave cylinder assembly to the cargo hook first, per the following instructions:

NOTICE

Slave cylinder assembly should be bled at this point. If assembly has not been bled follow instructions in Section 12.2.

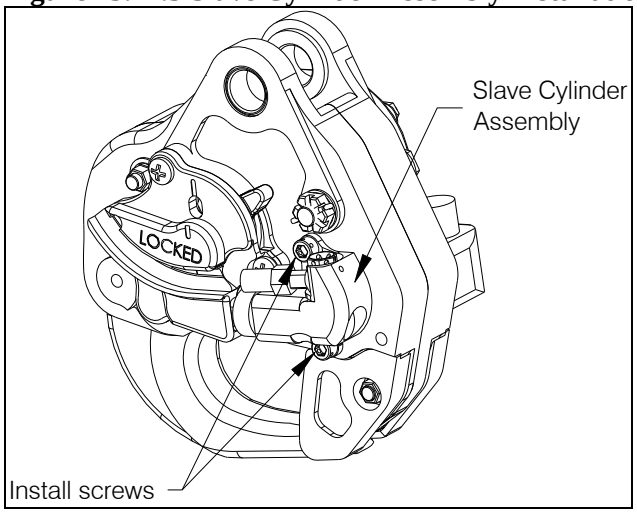
1. Ensure that the piston is in the retracted position. If the piston needs to be retracted connect the quick disconnect coupling and push the piston in.

NOTICE

The piston will not be able to be retracted if the hydraulic hose is not connected at the quick disconnect.

2. Insert the nose of the slave cylinder assembly into the side of the cargo hook as shown below and install the mounting screws (P/N 510-531-00). See Figure 25.17.3.
3. Install safety wire per Section 12.2 instructions.
4. Route the hydraulic hose along the manual release cover and up through the hook bumper, along with the electrical cables and ground strap, as shown in Figure 25.17.4. Secure components to bumper with ty-wraps as shown.
5. Connect the quick disconnect coupling at the belly of the helicopter.

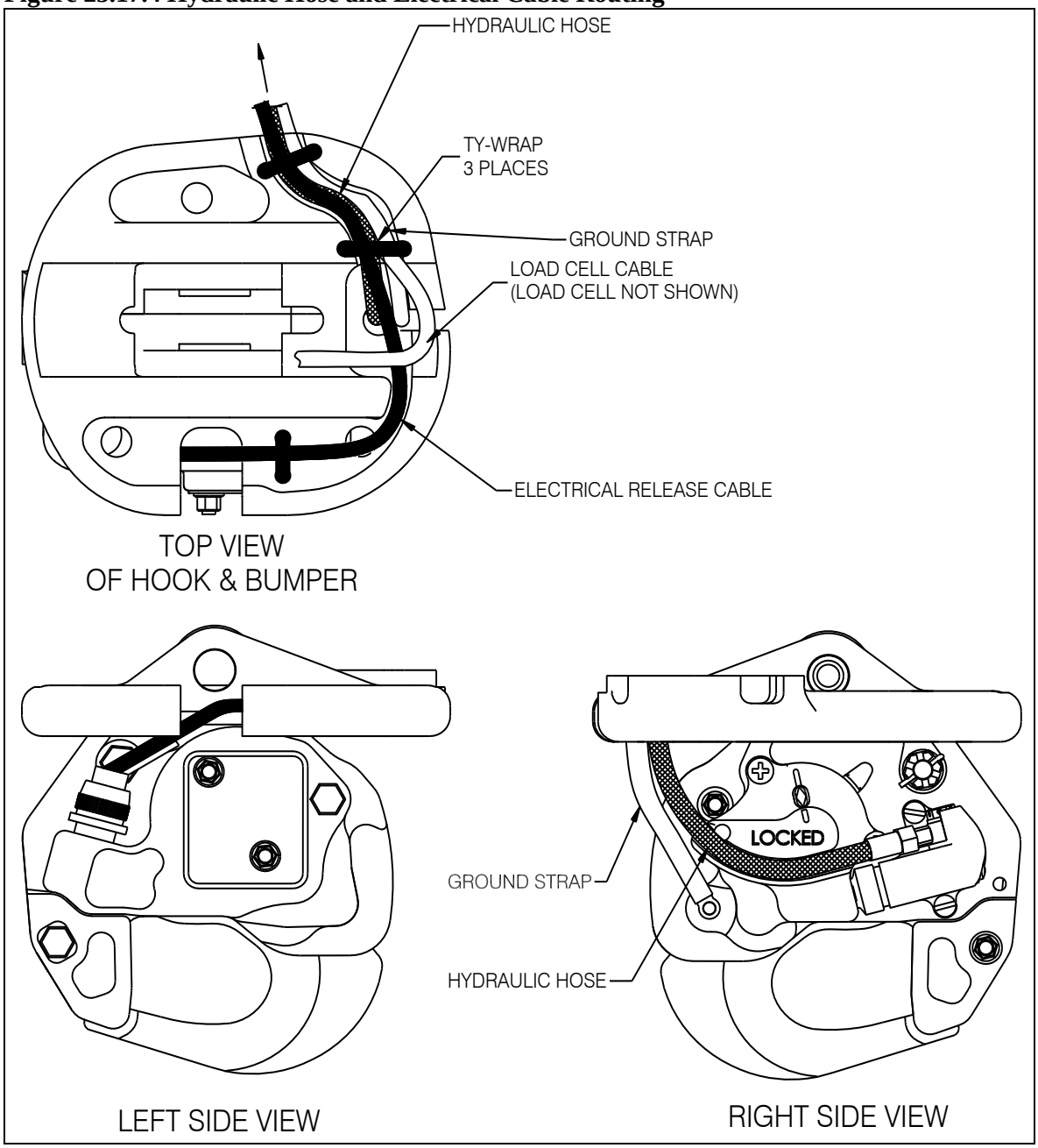
Figure 25.17.3 Slave Cylinder Assembly Installation



25.17 Component Re-installation continued

Slave Cylinder Assembly Re-installation continued

Figure 25.17.4 Hydraulic Hose and Electrical Cable Routing

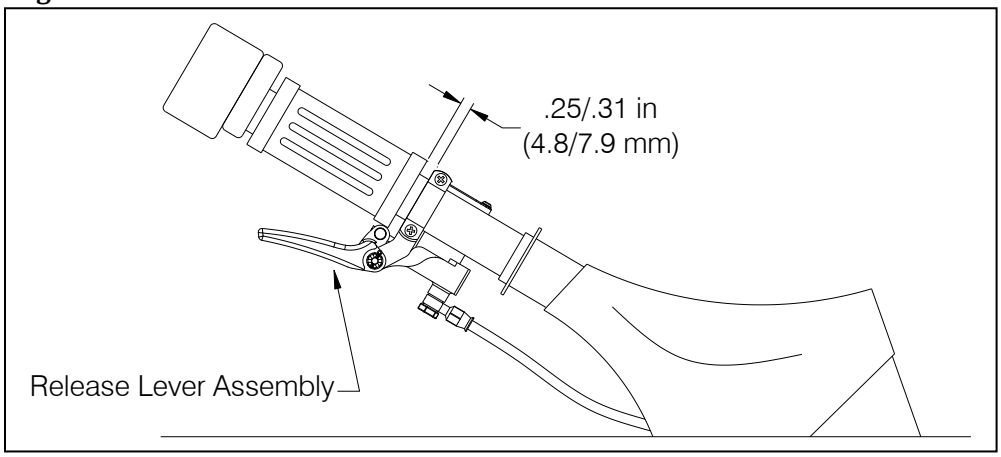


25.17 Component Re-installation continued

Fixed Hydraulic Release Hose Re-installation

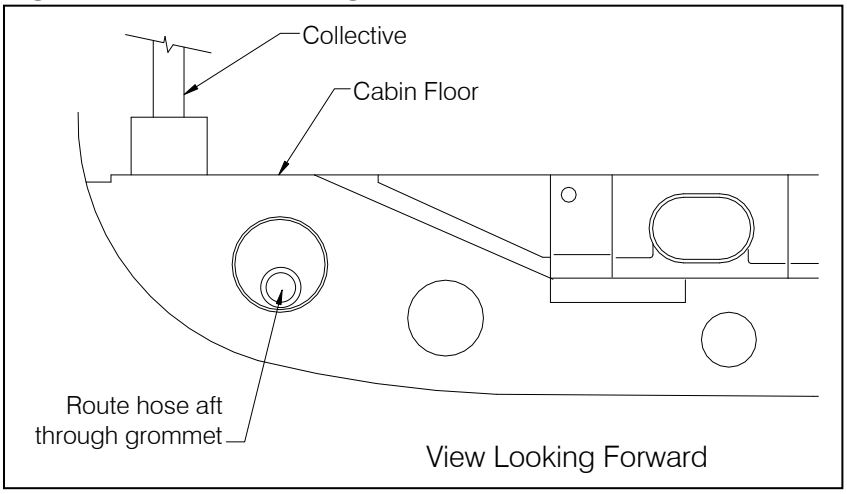
1. Install the master cylinder and release lever onto the collective shaft (at location shown below) with the two screws (P/N 510-390-00).

Figure 25.17.5 Release Lever Installation



2. Feed the end of the hydraulic hose through the slot in the floor. The grommet may have to be temporarily removed to allow the fitting to pass through.
3. Underneath the floor and immediately aft of the collective base, route the hose through the grommet installed in the frame at the location shown below.

Figure 25.17.6 Hose Routing – Aft of Collective



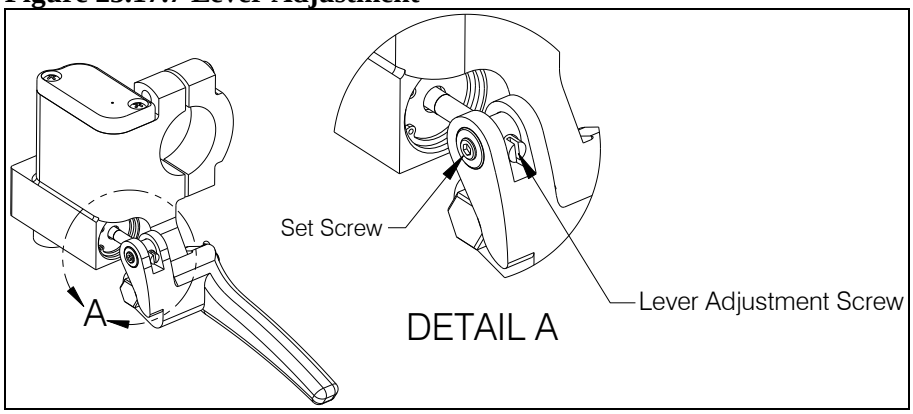
4. Route the hose to the wire harness and route with the harness back to the connector bracket and install the quick disconnect coupling to the connector bracket attached to the fuel tank support. Secure the hose to the harness with ty-wraps.

25.17 Component Re-installation continued

Fixed Hydraulic Release Hose Re-installation continued

5. After completing installation of the hydraulic system (both fixed and removable) bleed the system per section 12.2. If the hoses have not been disassembled, the system may not need to be bled, check function.
6. If necessary adjust position of lever (see below) on master cylinder to give full stroke of lever. Secure lever adjustment screw with set screw. Ensure there is no interference in any combination of control movements.

Figure 25.17.7 Lever Adjustment



Load Weigh Indicator Re-installation

1. Place the Load Weigh Indicator into the mounting bracket on the LH forward door pillar and secure with four screws (P/N 510-637-00).
2. Install the Enclosure (P/N 232-304-00) over the indicator with three screws (P/N 510-640-00).
3. Connect the electrical connector on the wiring 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 25.16.6.
2. Tighten nut to 60-70 in-lbs 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 harness connector to the connector on the belly of the helicopter.
4. Fix electrical harness to bumper with ty-wraps. Ensure harness does not pull or get pinched at full range of motion of hook and swing frame assembly.

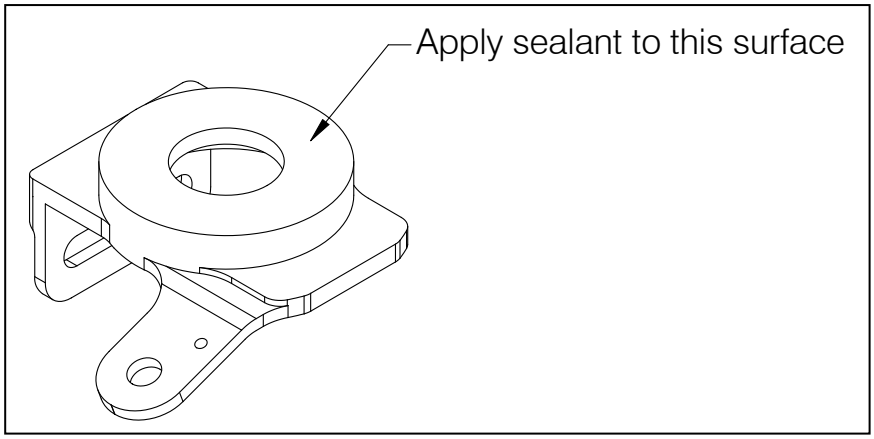
25.17 Component Re-installation continued

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.

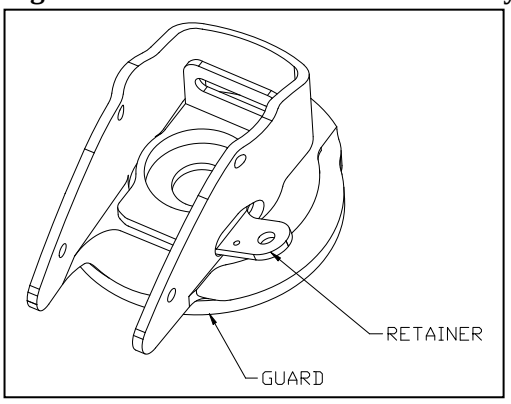
2. Prepare PR1422-B or equivalent sealant per Airbus Helicopters Standard Practices Manual. Apply sealant to Retainer as shown in Figure 25.17.8.

Figure 25.17.8 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 25.17.9.

Figure 25.17.9 Guard/Retainer Assembly



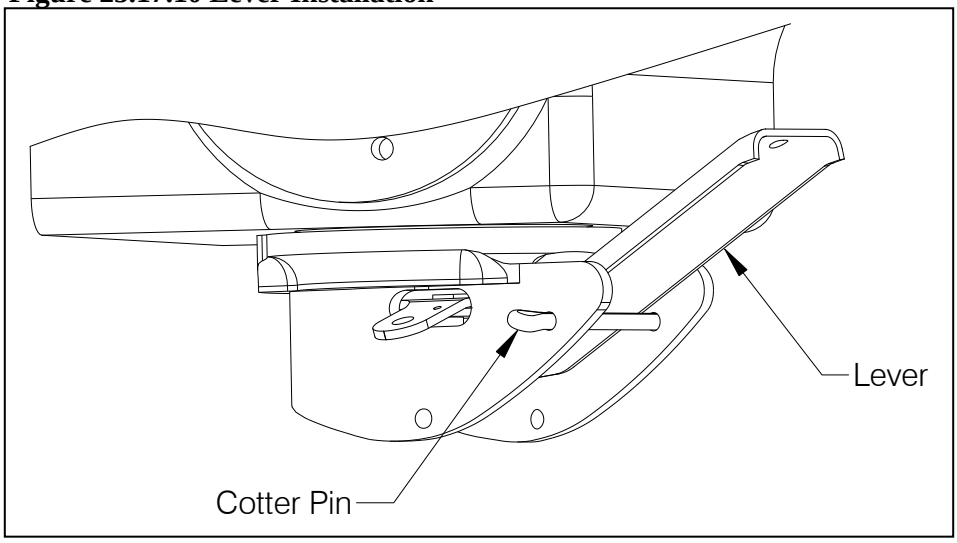
4. Place these two items onto the boss on the bottom of fuel tank, aligning the notch in the Guard with the key on the bottom of the fuel tank.

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 25.17.10.

Figure 25.17.10 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

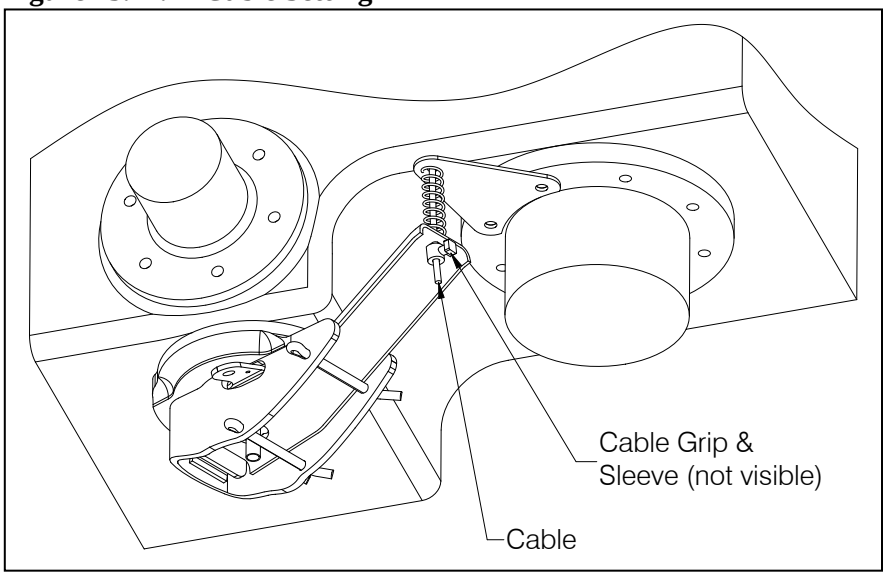
10. Prepare to install Bracket (P/N 290-893-00) by threading the control cable through the Bracket hole. Install the Bracket using the two screws removed previously.
11. Pass the cable through the Spring (Airbus Helicopters P/N 350A55-1044-21) and Lever (Airbus Helicopters P/N 350A55-1043-20). Slide the Sleeve (Airbus Helicopters P/N N1-5ALU) over the cable and secure with Cable Grip (Airbus Helicopters P/N 58-2-009).

WARNING

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. Trim excess cable to within .25" of cable grip. See Figure 25.17.11.

Figure 25.17.11 Cable Setting



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

25.18 General Procedural Instructions-Testing

After re-installation of any parts, 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. 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 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 hydraulic release system by pulling the release lever on the collective in the cockpit. The mechanism should operate smoothly and the cargo hook must release. Return the load beam to its closed and locked position by hand after release. Verify that the hook lock indicator on the side of the hook returns to the fully locked position. In the fully locked position the hook lock indicator should align with the lines on the manual release cover (see Figure 5.1). If the hook does not release or re-latch, do not use the unit until the problem is resolved.

3. Swing the installed Cargo Hook and the suspension to ensure that the hydraulic release hose, the electrical cable, and ground strap 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.