Component Maintenance Manual, Cargo Hook

Onboard Systems International
13915 NW 3rd Court
Vancouver, WA 98685 United States of America
Cage Code: 1Y921

Toll Free Phone: (800) 275-0883
Phone: (360) 546-3072
Fax: (360) 546-3073

Applicable Equipment Part Numbers
528-041-00

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RECORD OF REVISIONS

Revision	Date	Page(s)	Reason for Revision
0	06/17/11	All	Initial Release
1	09/09/13	5, 6	Added requirement to maintain record of all cargo hook activity. Added Storage and Inactivity section. Added Section 6.3.
2	03/03/14	10 & 13-22	Added Cam Bearing deburr warning and Figure 9.2.
3	01/19/18	9	Removed NDT requirement for Manual Release Lever (4.1), Cam Assembly (2.1), Cam Roller Pin (8), Solenoid Cam (5.3).
4	01/14/20	5, 9	Replaced NDT inspection of Toggle (3.1) and Load Beam Assembly (1) with magnified visual inspection; moved inspection step to Table 9.1. Changed item 1 of section 4.5 to require a functional check rather than full ATP.
5	01/03/23	12, 13, 20	Add cleaning and inspection instructions for cam surfaces. Add cam assembly to overhaul kit.

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1.0 Introduction

1.1 **Scope.** This component maintenance manual contains instructions for inspection, maintenance and overhaul.

1.2 **Capability.** The instructions contained in this document are provided for the benefit of experienced aircraft maintenance personnel and facilities that are capable of carrying out the procedures.

1.3 **Safety Labels**. 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.

2.0 Referenced Documents

180-221-00 Acceptance Test Procedure

3.0 Service Bulletins/Amendments

3.1 This cargo hook is not subject to any service bulletins or amendments.

4.0 Maintenance

4.1 Maintain a record of ALL cargo hook activities including aircraft installation and removal, inspections, repair and overhaul as well as inactivity and storage events.

Failure to follow all equipment maintenance instructions and component inspection criteria may result in serious injury, death or immediate loss of flight safety.

4.2 Monthly Preventative Maintenance

1. Remove accumulated soils from the exterior with a soft bristle brush and mild solvent/cleaner

2. In salt water environments, apply a corrosion preventative compound such as ACF-50 to all exterior surfaces.

4.3 Annual Inspection

1. Annually or 100 hours of external load operations, whichever comes first, remove the Cargo Hook from the aircraft. Thoroughly clean the exterior with a soft bristle brush and mild solvent/cleaner and visually inspect for cracks, gouges, dents, nicks, corrosion, and missing or loose fasteners.

4.4 Overhaul

1. Overhaul the Cargo Hook in accordance with the overhaul schedule and instructions contained here-in.

4.5 Storage and Inactivity

1. The cargo hook may be stored in its original factory sealed bag and box for up to 2 years from its date of manufacture or last factory overhaul. If stored in its original factory sealed bag and box for less than 2 years, it may be used without any additional activity. If the period of storage in its original packaging is greater than 2 years the cargo hook must be subjected to a functional check, perform the functional check per the instructions in sections 11.7 through 11.9 of the acceptance test procedures (ATP) described herein before being used.

2. If the cargo hook has been installed on an aircraft and subsequently removed from service, store it in a reasonably protected indoor, dry, heated storage area for up to 6 months. If stored in this condition for less than 6 months, it may be used without any additional activity. If it is to be stored longer than 6 months perform the following activities. Prepare the cargo hook for storage by thoroughly cleaning and drying the exterior, liberally applying ACF-50 corrosion preventative compound inside and out, sealing it in a plastic bag with a desiccant, and labeling it with the date of storage. If stored in this condition for less than 2 years, it may be placed in service without any additional activity. If the period of storage exceeds 2 years the cargo hook must be subjected to the ATP described herein before being placed in service.

3. If the cargo hook has been installed on the aircraft and subsequently removed from service but not stored in accordance with the instructions above, the cargo hook must be subject to the ATP described herein before being placed in service.

4.6 Repair

1. Repair the Cargo Hook in accordance with the repair instructions contained here-in.

5.0 Repair Instructions

5.1 It is recommended that only minor repairs be attempted by anyone other than the factory. The following procedures and information are provided for the benefit of experienced aircraft maintenance facilities capable of carrying out the procedures. They must not be attempted by those lacking the necessary expertise and suitable equipment to acceptance test the cargo hook after maintenance. See Section 14 for instructions for returning equipment to the factory.

5.2 Reference numbers throughout this manual shown in parentheses ( ) refer to Table and Figure 13.1.

5.3 Follow these steps to repair the Cargo Hook, referring to the applicable sections in this manual:

1. Disassemble as required.
2. Inspect disassembled parts.
3. Obtain required replacement parts.
4. Reassemble.
5. Acceptance test.
6. Inspect for return to service.

6.0 Overhaul Schedule

6.1 The Cargo Hook shall be overhauled every 1000 hours of external load operations or 5 years, whichever comes first.

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

6.3 The 5 year period is from the initial installation date when the cargo hook is new or newly overhauled, regardless of storage or inactivity periods. If initial installation date is unknown, then 5 year period is from date of manufacture as indicated on the cargo hook data plate or 5 years from date of last overhaul indicated on the overhaul sticker.

7.0 Overhaul Instructions

7.1 It is recommended that only minor repairs be attempted by anyone other than the factory. The following procedures and information are provided for the benefit of experienced aircraft maintenance facilities capable of carrying out the procedures. They must not be attempted by those lacking the necessary expertise and suitable equipment to acceptance test the cargo hook after maintenance. See Section 14 for instructions for returning equipment to the factory.

7.2 An Overhaul Kit is available that contains all parts required to complete an overhaul as well as additional parts typically replaced at overhaul. Overhaul kit P/N 212-032-00 detail parts are listed in Table 13.1.

7.3 Follow these steps to overhaul the Cargo Hook, referring to the applicable sections in this manual:

1. Completely disassemble.
2. Discard all items that are to be replaced by an item in Overhaul Kit P/N 212-013-00 listed in table 13.1 (springs, bearings, roll pins, cotter pins, fasteners, nuts and washers).
3. Inspect disassembled parts.
4. Obtain required replacement parts.
5. Reassemble.
6. Acceptance test.
7. Inspect for return to service.

8.0 Disassembly Instructions

8.1 Remove manual release cover (11) by removing 3 screws (23).

8.2 Remove cotter pins (17, 18)

8.3 Remove solenoid assembly (5) by removing nuts (16, 20), and washers (15, 19) from frame bolts (10, 21).

8.4 Remove nut (16), and armor plate (13) from frame bolt (22).

8.5 Remove armor plate (12).

8.6 The frame can now be split by lifting the side plate (7) from the assembly. The internal mechanism can now be viewed and cycled to check for smooth operation. All of the internal parts may be removed at this time.

8.7 The solenoid (5.2) may be removed from the cover (5.1) by removing two nuts (5.6) and two washers (5.5). Note the orientation of connector (5.8), diode (5.9) and solenoid wires. Do not typically unsolder the wires at the connector (5.8) and diode (5.9). Note the orientation of solenoid cam (5.3) and remove three screws (5.4).

8.8 Bushings and bearings may be removed from detail parts by conventional means.

8.9 Do not typically disassemble the bushings, roller, and pin (2.2, 2.3, 2.5) from the cam assembly (2)

8.10 Do not typically disassemble the bushings, roller, and pin (3.2, 3.3, 3.4, 3.5) from the toggle assembly (3).

8.11 Do not typically disassemble the load beam (1.1) from the load beam shaft (1.2).

9.0 Inspection Instructions

9.1 Thoroughly clean all parts to be inspected using standard methods. Parts should be completely free of surface contaminants, soils or grease before beginning inspections.

9.2 If the Cargo Hook is being overhauled, firstly perform nondestructive inspection on the following parts to confirm absence of surface cracks which may have developed in service. Confirmed cracks of any size are cause for part replacement.

For the **Side Plate, Solenoid (6.1)** and **Side Plate, Manual Release (7.1)**, inspect using:

- Liquid penetrant inspection per ASTM E1417

Mark all indications and then interpret each under 10X magnification. Differentiate surface cracks from other non-relevant indications such as machine tool marks, scratches, dents or superficial corrosion.

9.3 Carefully inspect detail parts in accordance with the instructions in Table 9.1. Inspect the parts in a clean, well lighted room using standard dimensional measuring tools and visual methods. Repair parts found within inspection limits. Replace any part found beyond limits.

Table 9.1, Cargo Hook Inspection Criteria

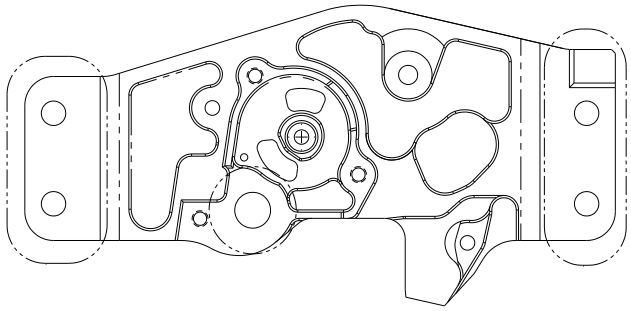
Seq	Component	Inspection Criteria & Limit	Repair Action	Finish
1.	Load Beam Assembly (1), Toggle Assembly (3.1)	Surface cracks – inspect under illuminated magnification (minimum 2X / 4 diopter).	None. Cracks of any size are cause for part replacement.	N/A
2.	Load Beam Assembly (1), Manual Release (4.1), Solenoid Cam (5.3), Armor Plate (12, 13)	Corrosion – 0.006 in. (0.127 mm) deep	Glass bead blast at less than 30 PSI (2.11 KGF/CM2) to remove corrosion.	Passivate per AMS-QQ-P-35 or ASTM A967
3.	Side Plate (6.1, 7.1)	See figure 9.1	Blend at 10:1 ratio as required to provide smooth transitions.	Apply Alodine (MIL-DTL-5541) and zinc chromate primer (MIL-PRF-23377 or similar) to affected surfaces – see Note 1
4.	Manual Rel. Cover (11) Solenoid Cover (5.1)	Dents, nicks, cracks, gouges, scratches and corrosion – 0.020 in. (0.50 mm) deep	Blend at 10:1 ratio as required to provide smooth transitions.	Apply Alodine (MIL-DTL-5541) and zinc chromate primer (MIL-PRF-23377 or similar) to affected surfaces – see Note 1.
5.	Bearing (6.2, 7.2)	Wear – more than 50% copper showing	None	N/A
6.	Bearing (2.4)	Roughness, binding, looseness, or corrosion	None	N/A

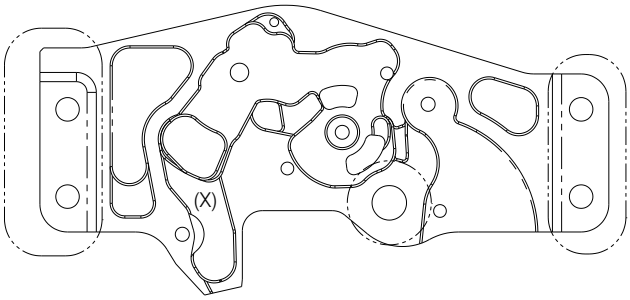
Seq	Component	Inspection Criteria & Limit	Repair Action	Finish
7.	Bumper (26)	Denting, cuts or abrasions – 0.060 in. (1.52 mm) deep	None	N/A
8.	Armor Plate (12, 13)	Gouges and nicks – 0.050 in. (1.27 mm) deep	Blend at 10:1 ratio as required to provide smooth transitions.	Passivate per AMS-QQ-P-35 or ASTM A967
9.	Cam Assembly (2)	See figure 9.2	None	N/A
10.	Cam Assembly (2)	Roughness, binding or looseness of the Interlock Roller (2.2)	Replace Interlock Pin (2.5), Roller (2.2), and Bearings (2.3)	N/A
11.	Toggle Assembly (3)	Roughness, binding or looseness of the Load Beam Roller (3.3)	Replace Pin (3.5), Roller (3.3), and Bearings (3.4)	N/A
12.	Cam Roller pin (8)	Visible denting	None	N/A
13.	Load Beam (1.1)	Wear, gouges and nicks – 0.050 in. (1.27 mm) deep	Blend at 10:1 ratio as required to provide smooth transitions and assure load rings will not hang up on load beam during release.	Passivate per AMS-QQ-P-35 or ASTM A967
14.	Serial Number Plate (5.7)	Damaged or illegible	None	N/A
15.	Solenoid (5.2)	Shorted or open electrical circuit. Resistance should be 3.0 to 4.0 ohms across pins.	None	N/A
16.	Electrical connector (5.8)	Loose, missing, or mutilated contact pins, cracked case, or worn insulator	None	N/A
17.	Rigging warning decal (28)	Damage or illegible	None	N/A
18.	Spring (27)	Cracks or deformation	None	N/A
19.	Electrical wiring	Deterioration	None	N/A

Note 1 – For service at Onboard Systems, optional finish: black anodize per MIL-A-8625 Type II, Class 2 after nondestructive inspection. Prepare for anodize by using standard methods.

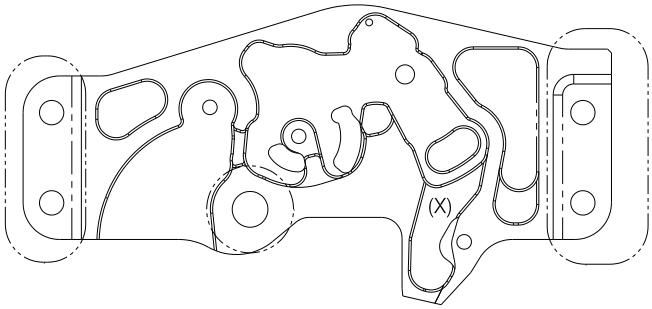
Figure 9.1, Side Plate, Additional Inspection Criteria

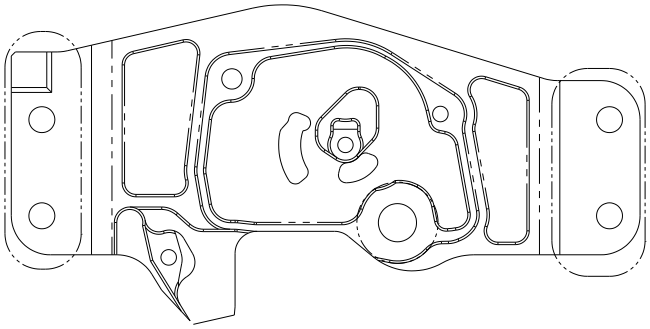
Side Plate, Manual (7.1)





Side Plate, Solenoid (6.1)





Inspection Criteria and Limits

Inside dashed circles – NO corrosion allowed.
Inside dashed circles – Dents, nicks, gouges, and scratches – 0.010 in (0.25 mm) deep.
Inside dashed rectangle – Dents, nicks, gouges, scratches, and corrosion – 0.010 in (0.25 mm) deep.
Outside dashed rectangle– Dents, nicks, gouges, scratches, and corrosion – 0.020 in (0.50 mm) deep.

(X) Approved metal stamp locations

Figure 9.2 Cam Assembly (2) Inspection Criteria

WARNING

Thoroughly inspect surfaces inside lines for signs of visible wear, dents, corrosion, gouges or nicks. Continued use of a damaged cam may cause inadvertent load release.

WARNING

Repair (including filing, deburring and buffing) is prohibited on all surfaces shown inside lines. Alterations of these surfaces may cause inadvertent load release.

Figure 9.2.1

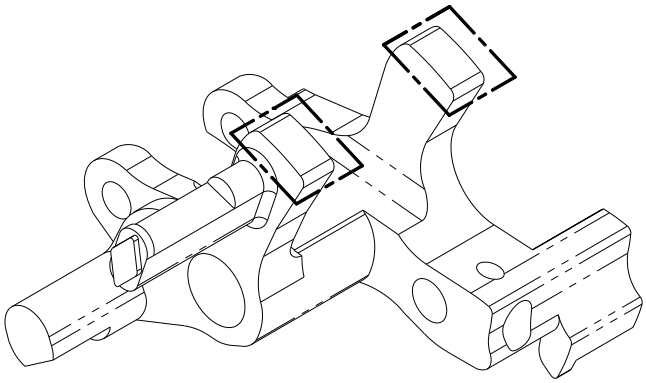
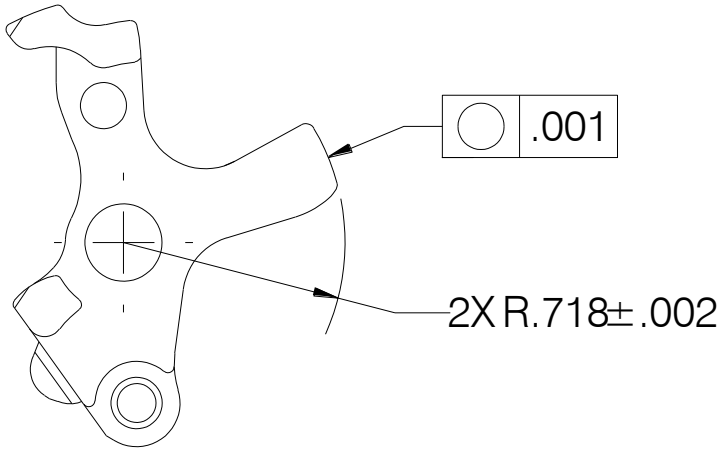


Figure 9.2.2

Continued on next page.

Figure 9.2.3



Inspection Criteria and Limits

Inside lines, see figure 9.2.1, gently clean surface by hand using Scotch-Brite (MFG: 3M, MFG P/N: 7447).

Visually inspect surface. No dents, corrosion, gouges, or nicks may remain after cleaning, see figure 9.2.2.

If the cam passes visual inspection, dimensionally inspect per figure 9.2.3.

10.0 Re-assembly Instructions

10.1 Replace all parts found to be unserviceable or beyond limits.

10.2 Install bearings (6.2, 7.2) and roll pin (6.3) with an arbor press into side plates (6.1) and (7.1).

10.3 Install toggle bearings (3.2, 3.4). Use AeroShell 7 (Mil-G-23827) grease on the toggle cam roller bearing (3.4). If load beam roller (3.3) was disassembled, install bearings (3.4) into roller (3.3) and pin (3.5) through toggle and roller. Stake pin into toggle holes.

10.4 Install cam bearings (2.4). If cam was disassembled, install bearings (2.3) into interlock roller (2.2) and pin (2.5) through cam and roller. Stake pin into cam body.

10.5 Install solenoid cam (5.3) onto solenoid (5.2) with three screws (5.4) and safety wire.

10.6 Install solenoid (5.2) and connector (5.8) into solenoid cover (5.1) with S/N plate (5.7). Apply silicone sealant to studs and install washers (5.5) and nuts (5.6). Torque nuts to 20-25 inch pounds plus drag torque.

10.7 Orient connector key opposite S/N plate and snug connector nut (5.8).

10.8 Install bolt (9) through side plate (6.1).

10.9 Install cam assembly (2) over bolt (9) in side plate (6.1). Install spring (2.7) over roll pin (6.3).

10.10 Install toggle assembly (3) in Side Plate (6.1), grease pin (8) and assemble into toggle assembly (3).

10.11 Install load beam assembly (1) in Side Plate (6.1).

10.12 Install bumper (26).

10.13 Check for and remove FOD.

10.14 Install side plate (7.1).

10.15 Install solenoid assembly (5.1) with bolts (10, 21), pushing bolts into place through side plate to hold internal components for assembly.

10.16 Install armor plates (12, 13) with bolt (22) and nut (16). Use corrosion preventative compound between armor plates and side plates. Torque nut (16) to 20-25 in-lbs plus drag torque.

10.17 Check for and remove FOD.

10.18 Install spring (27) into side plate (7.1).

10.19 Install bearing (4.2) into manual release lever (4.1).

10.20 Install manual release lever (4) over the bolt (9) and side plate hub.

10.21 Attach washer (24) and nut (14) finger tight.

10.22 Install washers (15) and (19) and nuts (16) and (20)

10.23 Torque nut (20) to 15 inch-pounds then align hole with castle and install cotter pin (17).

10.24 Torque nut (16) to 20-25 inch-pounds.

10.25 Snug nut (14), align hole with castle and install cotter pin (18).

10.26 Install screw (25) and safety wire to connector nut (5.8).

10.27 Install manual cover (11) with two screws (23).

10.28 Install rigging warning decal (28) onto bottom of solenoid cover (5.1).

10.29 If applicable, complete and install Overhaul Label 215-260-00.

10.30 Perform the acceptance test procedure per this manual.

11.0 Acceptance Test Procedure

11.1 When overhaul or major repair is performed (major repair is defined as separation of the Cargo Hook side plates (6.1 and 7.1)) the Cargo Hook must be subjected to the following acceptance test procedure (ATP) before being returned to service. Optionally use the Onboard Systems factory acceptance test procedure 180-221-00:

11.2 Examine the cargo hook externally for security of the lock wire, cotter pins and fasteners.

11.3 Use an appropriate insulation resistance tester to test the resistance between each pin and the base of the connector (5.8). The readings should not be less than 2 mega-ohms.

11.4 Using a multi-meter, check the resistance between pins A and B of the electrical connector. Resistance should be 3 to 4 ohms.

11.5 Remove the Manual Release Cover (11) and screws (23) and install a manual release test cable. Replace the Manual Release Cover and screws.

11.6 Suspend the hook from a test rig capable of loading the cargo hook to 7,500 pounds (3,402 kg). Use a steel ring to apply the load to the load beam.

11.7 Connect an adjustable 22 – 28 VDC supply with a momentary release switch wired into the positive wire, to the connector (5.8), and an in-line current meter. Connect the negative lead to pin A and the positive lead to pin B. Set the voltage to 22.0 $\pm$ 0.1 VDC.

11.8 With no load on the load beam, operate the manual release lever. The load beam should fall open and stay in the open position. Push the load beam up and closed. The load beam should automatically latch. Repeat step.

11.9 With no load on the load beam, release the cargo hook with the electrical release. The load beam should fall open and stay in the open position. Push the load beam up and closed. The load beam should automatically latch. Repeat step.

CAUTION

Damage to the cargo hook release solenoid can occur if the release switch is operated for more than 20 seconds continuously.

11.10 Load a suitable load ring onto the load beam (1.1) and push up load beam until it latches. Gradually proof load the cargo hook with the test rig to 7,500 pounds (3,402 kg). Hold the load for 1 minute. The load beam should hold the load without unlatching. Reduce the load to zero.

CAUTION

Do not release the proof test load electrically or manually. Decrease the load gradually, using the test machine, after completion of the proof load test.

11.11 Load the cargo hook using a steel ring that is free to drop clear of the load beam. Gradually load the cargo hook to 3,000 pounds (1,360 kg). Using a spring scale or equivalent, pull the manual release cable. The load beam should unlatch and the nylon sling or the steel ring should slide off the load beam. Verify the required release force is between 3.5 pounds (1.58 KG) and 8 pounds (3.62 KG). Repeat the test at 2000 pounds (907 KG), and 600 pounds (272 KG).

CAUTION

Use of a nylon sling is not recommended for load release tests as recoil may cause damage to the cargo hook.

11.12 Set the voltage to 20 VDC. Load the cargo hook a steel ring that is free to drop clear of the load beam. Gradually load the cargo hook to 3,000 pounds (1,360 kg). Press the electrical release button. The load beam should unlatch and the steel ring should slide off the load beam. Verify that the current draw is between 5 and 9 amps. Repeat the test at 2000 pounds (907 KG), and 600 pounds (272 KG).

11.13 Remove the Cargo Hook from the test stand. Remove the manual release cable and replace the Manual Release Cover (11) and screws (23).

12.0 Troubleshooting

12.1 The following section lists symptoms and probable causes to aid in equipment troubleshooting.

Symptom	Probable Cause	Remedy
Failure to operate electrically.	Damaged or defective diode (5.9) or solenoid (5.2).	Check for proper resistance across connector pins A and B per section 11.4. If out of tolerance, remove the Solenoid Assembly (5) and disconnect the diode (5.9). Re-check for proper resistance. Replace diode (5.9) or solenoid (5.2) as necessary.
	Damaged or loose wiring.	Check for proper continuity across connector pins A & B per table 9.1 seq. 16. Remove the Solenoid Assembly (5) and repair wiring.
During the Acceptance Test Procedure, the manual release cable force exceeds requirements.	Friction in internal mechanism.	Check operation of unit using the manual release lever. Disassemble and inspect internal mechanism. Check all bearing joints for free movement. Check cam assembly (2) for denting/ damage. Check toggle roller and pin for denting/ damage. Replace as necessary.

13.0 Illustrated Parts List

Figure 13.1, Cargo Hook Parts

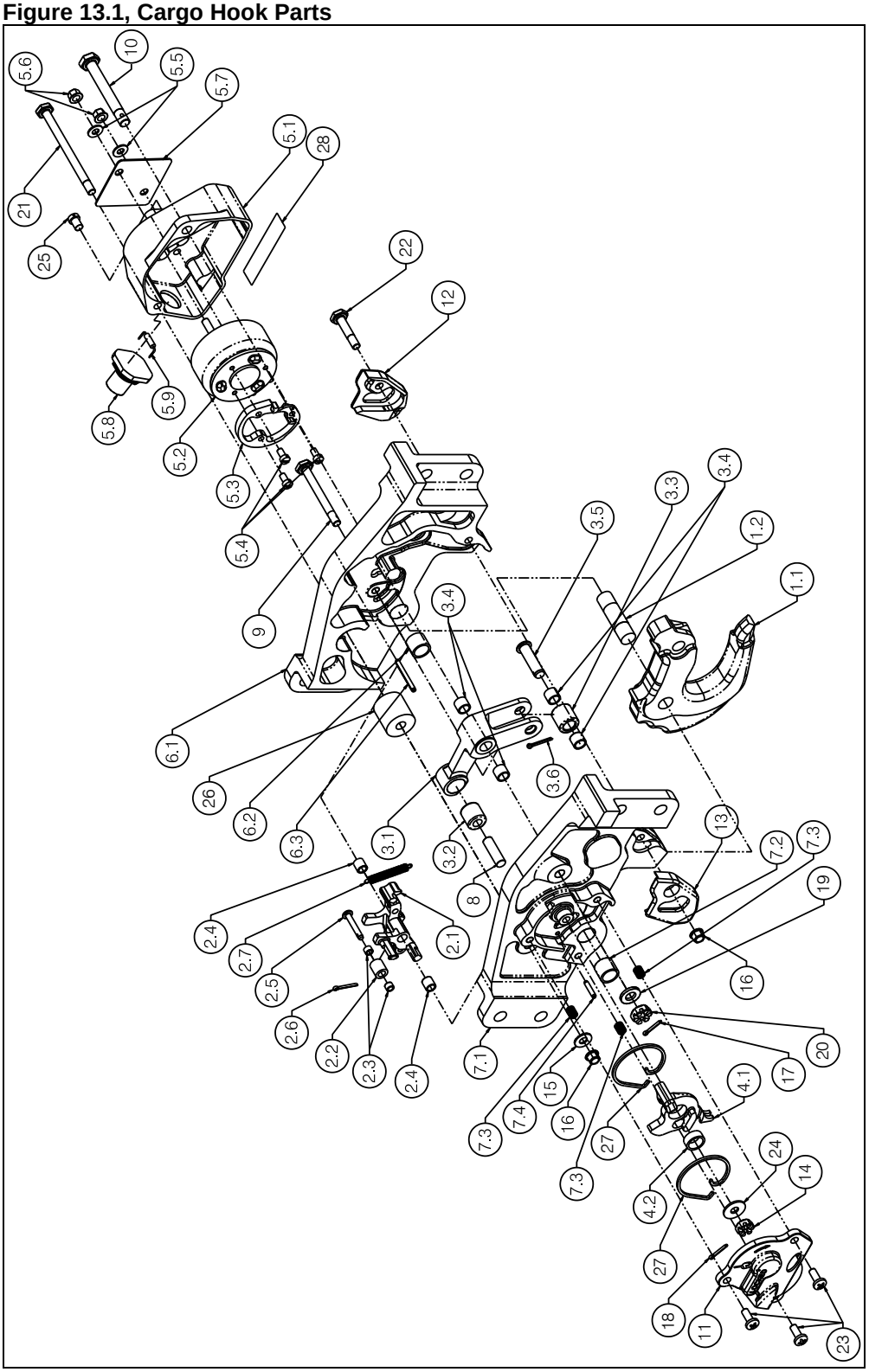


Table 13.1, Cargo Hook Parts

Item	Part No.	Description	Quantity	Included in Overhaul Kit P/N 212-032-00
1♦	232-161-00	Load Beam Assembly	1	-
1.1	290-831-00	Load Beam	1	-
1.2	290-640-00	Load Beam Shaft	1	-
2♦	232-162-00	Cam Assembly	1	1
2.1	290-832-00	Cam	1	-
2.2	290-603-00	Roller	1	-
2.3	517-031-00	Bushing	2	-
2.4	517-009-00	Bushing	2	-
2.5	510-495-00	Pin	1	-
2.6	510-417-00	Cotter Pin	1	-
2.7	514-032-00	Spring	1	-
3♦	232-185-00	Toggle Assembly	1	-
3.1	290-838-00	Toggle	1	-
3.2	517-060-00	Bearing	1	1
3.3	290-438-00	Roller	1	-
3.4	517-021-00	Bushing	4	4
3.5	510-494-00	Pin	1	1
3.6	510-417-00	Cotter Pin	1	1
4♦	232-195-01	Manual Release Lever Assembly	1	-
4.1	290-899-01	Manual Release Lever	1	-
4.2	517-054-00	Bearing	1	1
5♦	232-212-04	Solenoid Assembly	1	-
5.1	290-941-00	Solenoid Cover	1	-
5.2	455-003-00	Solenoid	1	-
5.3	290-835-00	Solenoid Cam	1	-
5.4	510-379-00	Screw	3	3
5.5	510-209-00	Washer	2	2
5.6	510-206-00	Nut	2	2
5.7	215-265-00	S/N Plate	1	-
5.8	410-139-00	Connector	1	-
5.8.1	556-045-00	O-Ring	-	1
5.9	340-035-00	Diode	1	-
6♦	232-461-00	Side Plate Assembly, Solenoid	1	-
6.1	291-576-00	Side Plate, Solenoid	1	-
6.2	517-010-00	Bearing	1	1
6.3	510-202-00	Roll Pin	1	1

Item	Part No.	Description	Quantity	Included in Overhaul Kit P/N 212-032-00
7♦	232-462-00	Side Plate Assembly, Manual	1	-
7.1	291-577-00	Side Plate, Manual	1	-
7.2	517-010-00	Bearing	1	1
7.3	510-210-00	Helicoil	3	3
7.4	510-203-00	Roll Pin	1	1
8	290-896-00	Cam Roller	1	-
9	290-901-00	Bolt	1	1
10	290-913-00	Bolt	1	1
11	291-578-00	Manual Release Cover	1	-
12	291-643-00	Armor Plate, Solenoid Side	1	-
13	291-644-00	Armor Plate, Manual Side	1	-
14	510-082-00	Nut	1	-
15	510-095-00	Washer	1	-
16	510-102-00	Nut	2	2
17	510-115-00	Cotter Pin	1	1
18	510-125-00	Cotter Pin	1	1
19	510-219-00	Washer	1	1
20	510-259-00	Nut	1	1
21	510-375-00	Bolt	1	1
22	510-376-00	Bolt	1	1
23	510-493-00	Screw	3	3
24	510-516-00	Washer	1	1
25	510-755-00	Screw	1	1
26	514-031-00	Bumper	1	1
27	514-058-00	Torsion Spring	2	2
28	215-240-00	Rigging Warning Label	1	1
29	215-260-00	Overhaul Label	-	1

♦ *Item not illustrated as an assembly.*

* *Item not shown.*

14.0 Instructions for Returning Equipment to the Factory

14.1 If an Onboard Systems product must be returned to the factory for any reason (including returns, service, repairs, overhaul, etc.) obtain an RMA number before shipping your return.

An RMA number is required for all equipment returns.

- To obtain an RMA, please use one of the listed methods.
    - Contact Technical Support by phone or e-mail (Techhelp@OnboardSystems.com).
    - Generate an RMA number at our website: http://www.onboardsystems.com/rma.php
- After you have obtained the RMA number, please be sure to:
    - Package the component carefully to ensure safe transit.
    - Write the RMA number on the outside of the box or on the mailing label.
    - Include the RMA number and reason for the return on your purchase or work order.
    - Include your name, address, phone and fax number and email (as applicable).
    - Return the components freight, cartage, insurance and customs prepaid to:

      Onboard Systems International
      13915 NW 3rd Court
      Vancouver, Washington 98685
      USA
      Phone: 360-546-3072