PLEASE CHECK WEB SITE AT WWW.ONBOARDSYSTEMS.COM FOR THE LATEST REVISION OF THIS MANUAL

Owner's Manual

For the

Cargo Hook
Suspension System Kits

On the

Bell Helicopter 407 Model

System Part Numbers
200-328-00, 200-329-00, 200-329-10
200-331-00, 200-331-01, 200-331-02

STC SR01943SE

Owner's Manual Number 120-136-00
Revision 12
12/11/23

ONBOARD™ SYSTEMS INTERNATIONAL

13915 NW 3rd Court Vancouver, Washington 98685 USA
Phone: 360-546-3072 Fax: 360-546-3073 Toll Free: 800-275-0883
www.OnboardSystems.com

This page intentionally left blank

Record of Revisions

Revision	*Date*	*Page(s)*	*Reason for Revision*
3	07/10/09	1-4, 2-2 & 2-8	Replaced ty-wrap P/N 512-035-00 with 512-003-00.
4	05/28/10	Sections 1 through 4	Corrected P/N's in Weight and CG table and updated weights. Clarified manual release cable rigging instructions. Updated format of safety symbols throughout manual.
5	03/24/11	2-33, 2-35, 2-37	Corrected figure number on page 2-33 to Figure 2.3.3. Updated note regarding EMI test at installation checkout. Added load cell connector wiring pin-out.
6	03/22/13	1-6	Changed indicator 210-095-00 qty to opt. Added indicator 215-095-02.
7	11/18/13	2-31 to 2-38	Updated pin load cell installation information.
8	08/24/15	1-6, 2-31, 4-3, 4-4	Added load cell P/N 210-282-00. Updated cargo hook rigging section.
9	06/24/16	All	Added cargo hook (P/N 528-029-02) with Surefire release and associated instructions. Added kit P/N 200-331-01, removed kit P/N 200-330-00.
10	10/13/20	1-1, 2-31	Added paragraph to address load weigh kit installation with alternate routing of Bell auxiliary equipment kit release cable and harness. Added Bell -143 auxiliary equipment kit.
11	10/15/21	All	Added kit P/N 200-331-02 with the C-40 Indicator and associated instructions.
12	12/11/23	1-1, 1-6, 2-35	Replaced C-40 Indicator P/N 210-293-00 with 210-293-01 in new production kits.

Current revision levels of all manuals are posted on Onboard Systems Int'l web site at www.onboardsystems.com.

Register Your Products for Automatic Notifications

Onboard Systems offers a free notification service via fax or email for product alerts and documentation updates. By registering your Onboard Systems products at our website, we will be able to contact you if a service bulletin is issued, or if the documentation is updated.

You can choose to receive notices on an immediate, weekly, or monthly schedule via fax, email or both methods. There is no charge for this service. Please visit our website at www.onboardsystems.com/notify.php to get started.

This page intentionally left blank.

CONTENTS

CONTENTS, continued

Section 1
General Information

Introduction

This Owner's Manual contains installation and operation instructions for cargo hook kit P/N's 200-328-00, 200-329-00, 200-329-10, 200-331-00, 200-331-01 on the Bell 407 model helicopter.

Kit P/N 200-328-00 is a fixed provisions kit which includes the internal electrical release wiring harness, fixed manual release cable including the T-handle for actuation, and miscellaneous brackets and hardware for supporting these items.

Kit P/N 200-329-00 is a cargo hook suspension kit and includes the cargo hook, a beam which supports the cargo hook and spans the helicopter hard points, and pillow blocks which attach to the hard points. It requires that a helicopter be equipped with Onboard Systems kit P/N 200-328-00 Fixed Provisions Kit (see above) or with Bell Helicopter P/N 206-706-341-111, -117, or -123 Auxiliary Equipment Kit - Cargo Hook Provisions.

Kit P/N 200-329-10 is identical to P/N 200-329-00 except it includes a cargo hook with Surefire release as part of its electrical release system. Surefire release is a safety enhancement to protect against inadvertent load release due to accidental contact with the release switch or mistaken actuation of the release switch when another is intended. See Theory of Operation section for complete description of Surefire release.

Kit P/N 200-331-00, 200-331-01 and 200-331-02 are load weigh kits which include a pin load cell, internal electrical harness, and load weigh indicator. It requires that a helicopter be equipped with an Onboard Systems kit P/N 200-329-00 200-329-10 suspension kits or with Bell P/N 206-706-341-141 or P/N 206-706-341-143 Auxiliary Equipment Kit. Kit P/N 200-331-02 includes the latest generation load weigh indicator, the C-40 model Indicator (P/N 210-293-00 or P/N 219-293-01).

The P/N 200-329-00 cargo hook suspension kit includes the P/N 528-029-00 keeperless cargo hook. This cargo hook is interchangeable with earlier model Onboard Systems cargo hooks: P/N 528-023-01 keeperless cargo hook and P/N 528-010-04 cargo hook with keeper. These earlier models may be used with these suspension kits.

Safety Labels

The following definitions apply to the symbols used throughout this manual to draw the reader's attention to safety instructions as well as other important messages.

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.

Specifications

Table 1.1 Suspension System Specifications

Design load	2,650 lbs. (1,202 kgs.)
Design ultimate strength	9,938 lbs. (4,507 kgs.)
Unit weight (w/o pillow blocks)	7.5 lbs (3.4 kgs)

Table 1.2 Specifications - P/N 528-029-00, -02 Cargo Hook

Design load	3,600 lb. (1,632 kg.)
Design ultimate strength	13,500 lb. (6,122 kg.)
Electrical release capacity	9,000 lb. (4,081 kg.)
Mechanical release capacity	9,000 lb. (4,081 kg.)
Force required for mechanical release at 3,600 lb.	8 lb. Max.(.600" travel)
Electrical requirements	22-32 VDC, 6.9 - 10 amps
Minimum release load	0 pounds
Unit weight	3.0 pounds (1.4 kg.)
Mating electrical connector	PC06A8-2S SR

Load capacities given are for the equipment described only. Loading limits for your particular helicopter model still apply. Consult your flight manual.

Bill of Materials

The following items are included with the 200-328-00 Fixed Provisions Kit.

Table 1.3 Bill of Materials – Fixed Provisions Kit P/N 200-328-00

Part No.	Description	Qty
268-041-00	T-Handle Release Cable	1
291-152-00	Shim	1
235-164-00	Bracket	1
291-144-00	Bulkhead Fitting	2
235-165-00	Doubler	1
220-042-00	Cover	1
291-145-00	Radius Block	2
291-146-00	Radius Block	2
235-169-00	T-Handle Support Assembly	1
270-151-00	Electrical Harness	1
270-152-00	Electrical Harness	1
215-205-00	Decal	1
440-007-00	Circuit Breaker	1
510-102-00	Nut	4
410-243-00	Splice	2
510-633-00	Screw	1
510-419-00	Washer	31
510-648-00	Washer	4
510-649-00	Rivet	8
510-227-00	Nut	4
510-698-00	Nutplate	1
512-034-00	Clamp	1
512-005-00	Clamp	6
510-493-00	Screw	1
510-580-00	Screw	4
510-644-00	Screw	18
510-652-00	Screw	1
510-645-00	Screw	5
510-653-00	Screw	4
512-003-00	Tie Wrap	15
510-654-00	Blind Rivet	3
510-655-00	Blind Rivet	2
510-656-00	Rivet	2
510-657-00	Washer	1
510-646-00	Spacer	1
510-647-00	Spacer	5
510-659-00	Bolt	2
510-613-00	Rivet	4
510-661-00	Reclosable Fastener (Hook)	8”
510-662-00	Reclosable Fastener (Loop)	8”
510-697-00	Rivet	3

Table 1.3 Bill of Materials – Fixed Provisions Kit P/N 200-328-00 continued

Part No.	Description	Qty
120-136-00	Owner's Manual	1
121-050-00	RFMS	1
123-032-00	ICA	1

The following items are included with the 200-329-00 and 200-329-10 Cargo Hook Suspension Kits.

Table 1.4 Bill of Materials – Cargo Hook Suspension Kit P/Ns 200-329-00, -10

Part No.	Description	Qty	
		-00	-10
232-324-00	Cargo Hook/Beam Assembly	1	-
232-324-10	Cargo Hook/Beam Assembly	-	1
232-188-01	Pillow Block, Left	1	1
232-189-01	Pillow Block, Right	1	1
215-343-00	Cockpit Decal	-	1
590-017-00	Spiral Wrap	18"	18"
600-006-00	Coupler	1	1
510-234-00	Nut	4	4
510-725-00	Bolt	4	4
510-648-00	Washer	4	4
510-624-00	Screw	4	4
510-419-00	Washer	4	4
512-024-00	Loop Clamp	1	1
510-453-00	Screw	1	1
510-042-00	Washer	1	1
510-102-00	Nut	1	1
120-136-00	Owner's Manual	1	1
121-050-00	RFMS	1	1
122-017-00	CMM, Cargo Hook	1	1
123-032-00	ICA	1	1

Bill of Materials continued

The following items are included with the P/N 200-331-00, 200-331-01, and 200-331-02 Load Weigh Kits.

Table 1.5 Bill of Materials – Load Weigh Kits

Part No.	Description	Qty		
		-00	-01	-02
210-282-00**	Pin Load Cell Assembly	1	1	-
210-095-02*	C-39 Indicator, 5V Lights	1	-	-
210-095-00*	C-39 Indicator, 28V Lights	-	1	-
210-293-01***	C-40 Indicator	-	-	1
215-010-00	Placard	1	1	-
215-012-00	Placard	1	1	-
215-417-00	Load Weigh Breaker Decal	1	1	1
235-035-01	QD Bracket	1	1	1
270-153-00	Load Weigh Internal Harness	1	1	-
270-241-00	Load Weigh Internal Harness, C-40	-	-	1
400-048-00	Switch	1	1	-
410-199-00	Shield Termination	-	-	1
410-255-00	Connector	-	-	1
410-446-00	Strain Relief Clamp	-	-	1
450-005-00	Heat Shrink, 1.5” Lg.	-	-	1
510-029-00	Nut	6	6	6
510-042-00	Washer	1	1	1
510-062-00	Washer	8	8	8
510-102-00	Nut	1	1	1
510-170-00	Nut	1	1	1
510-174-00	Washer	1	1	1
510-178-00	Cotter Pin	1	1	1
510-183-00	Washer	1	1	1
510-453-00	Screw	1	1	1
510-481-00	Screw	6	6	6
511-211-00	Screw	-	-	4
512-001-00	Ty-Wrap	10	10	10
512-024-00	Loop Clamp	1	1	1
512-026-00	Loop Clamp	6	6	6
120-039-00	Owner’s Manual, C-39 Indicator	1	1	-
120-152-00	Owner’s Manual, C-40 Indicator	-	-	1

* Verify Indicator voltage matches aircraft lighting system voltage.
** Supersedes P/N 210-226-00. These P/Ns are interchangeable.
*** C-40 Indicator P/N 210-293-01 replaces P/N 210-293-00 in new productions kits as of November 2023, these are interchangeable with the exception of software compatibility. Refer to C-40 Owner’s Manual 120-152-00 for specific software versions.

Theory of Operation

The 200-329-00 and 200-329-10 kits are comprised of:

- The cargo hook and beam assembly. The beam assembly spans the aircraft hard points and supports the cargo hook.
- The external (removable) provisions of the electrical release system. The electrical release system provides means for release by pilot actuation of the push-button switch in the cockpit. When the push-button switch is pressed, it energizes the DC solenoid in the cargo hook, and the solenoid opens the latch in the internal mechanism.
- The external (removable) provisions of the manual release system. The manual release system provides a means of releasing a cargo hook load in the event of an electrical release system failure. A T-handle (included with the fixed provisions kit) mounted on the center console between the pilot and co-pilot seat is used to actuate it.
- Ground personnel may also release a load by the actuation of a lever located on the side of the cargo hook.

A load is attached to the cargo hook by passing a cargo sling ring into the throat of the load beam and pushing the ring against the upper portion of the load beam throat, which will cause the hook to close. In the closed position, a latch engages the load beam and latches it in this position.

To release the load, the latch is disengaged from the load beam. With the latch disengaged, the weight of the load causes the load beam to sling to its open position, and the cargo sling ring slides off the load beam. The load beam then remains in the open position awaiting the next load.

The 200-331-00, 200-331-01 and 200-331-02 kits are load weigh kits, which are comprised of an indicator mounted within the instrument panel, a pin load cell at the cargo hook, and the interconnecting wire harness. The indicator displays the weight of the load carried on the cargo hook. It supplies the precision excitation voltage to the pin load cell, conditions the return signal, outputs a proportional analog signal and provides the means of system calibration.

The optional cargo hook with Surefire includes a short time delay circuit built into the cargo hook's electrical release system (cargo hook P/N 528-029-02). This feature is a safety enhancement to protect against inadvertent load release due to accidental contact with the release switch or mistaken actuation of the cargo hook switch when another is intended. The time delay feature requires that the release switch be depressed and held for more than a 1/2 second to open the cargo hook. Surefire makes the electrical release a more deliberate pilot command. If the cargo hook must be released immediately, use the mechanical backup release.

Theory of Operation continued

In addition to its P/N, a cargo hook with Surefire can be identified by a gold color solenoid housing (see Figure 1.1). Also, a placard on the underside of the solenoid housing indicates that the electrical release is delayed by ½ second.

NOTICE

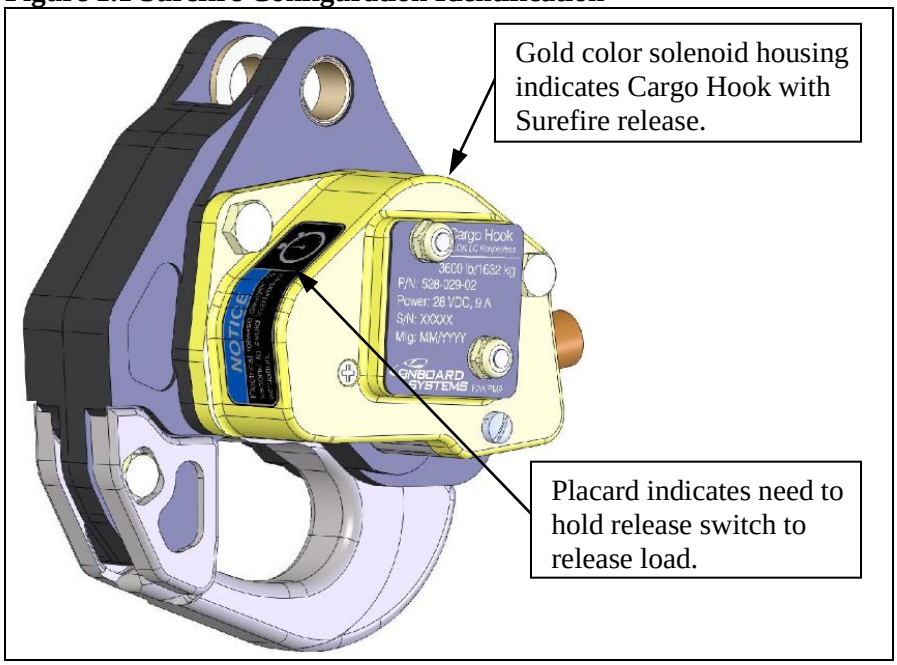
The 528-029-02 cargo hook includes an electronic delay of approximately ½ second. It is necessary to press and hold the cargo hook release button.

⚠ CAUTION

If a Surefire-equipped cargo hook must be released immediately without any delay (such as the case of engine failure or snagged load), use the mechanical backup release.

In addition to the delay feature the circuit includes on-off cycling to limit the duty-cycle on the cargo hook solenoid. If the release switch is held down, the solenoid will cycle on and off repeatedly in a "machine gun" fashion.

Figure 1.1 Surefire Configuration Identification



Section 2
Installation Instructions

These procedures are provided for the benefit of experienced aircraft maintenance facilities capable of carrying out the procedures. Those lacking the necessary expertise should not attempt them. In particular, the T-handle Support Bracket installation (refer to Section 2.1.4) requires expertise in working with and installing sheet metal.

This Owner's Manual provides instructions for the installation of the four kits outlined in Section 1. The installation instructions for each kit are provided in the following sections.

2.1 Fixed Provisions Kit P/N 200-328-00
2.2 Cargo Hook Suspension Kit P/Ns 200-329-00 and 200-329-10
2.3 Load Weigh Kit P/Ns 200-331-00, 200-331-01 and 200-331-02

2.1 Fixed Provisions Kit Installation (Kit P/N 200-328-00)

This part of the installation consists of installing the internal cargo hook electrical release wiring, manual release cable, bulkhead fittings, and support brackets for the manual release cable T-handle and connectors.

2.1.1 Electrical Release Wiring Installation

The electrical release wiring installation consists of installing two wire harnesses (P/N 270-151-00 and P/N 270-152-00) and circuit breaker (P/N 440-007-00). Refer to Figure 2.1.3 for wiring schematic.

NOTICE

If the optional load weigh kit is being installed, route its wiring harness through the structure as the release wiring harness is installed. Refer to section 2.3.3 for load weigh harness installation instructions.

2.1 Fixed Provisions Kit Installation continued

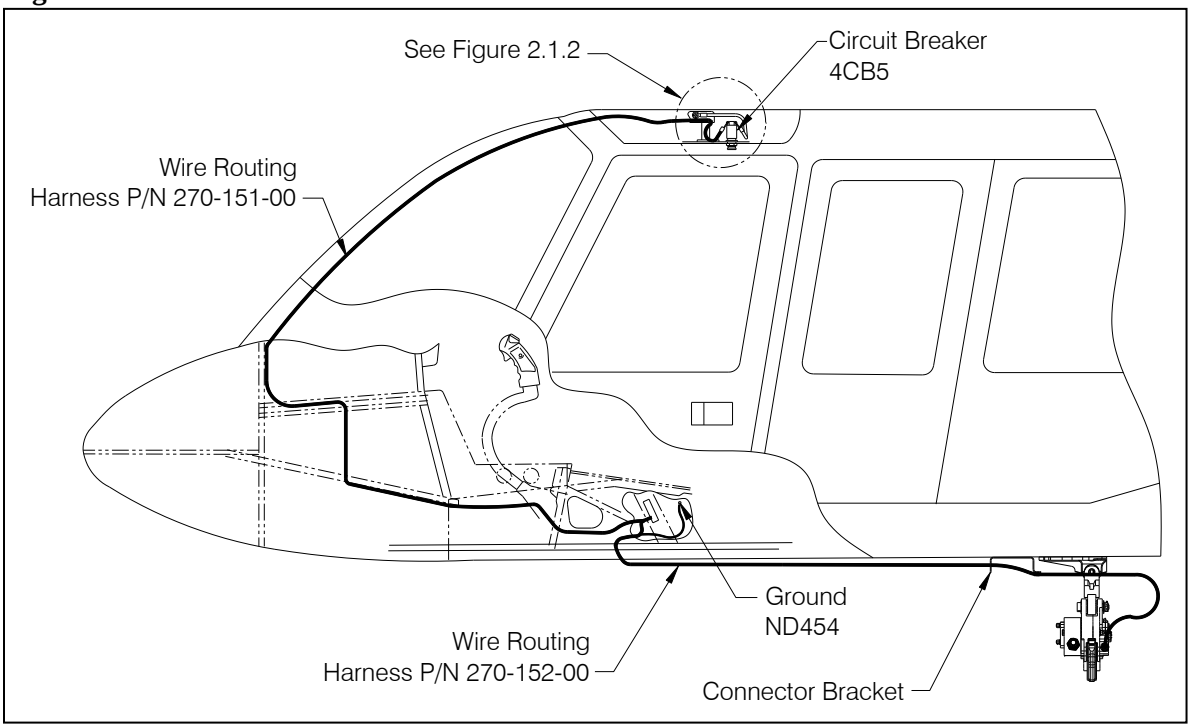
2.1.1 Electrical Release Wiring Installation continued

- Install the circuit breaker in the overhead console (reference Figure 2.1.2).
- Connect the ring terminal on the M1A18 wire of harness P/N 270-151-00 to the circuit breaker with hardware provided with the circuit breaker.
- Route the M1A18 wire with existing harnesses from the circuit breaker in the overhead console down to the underneath the pilot's seat and splice it with wire no. 10 from the cyclic. Splice the wires with the supplied splice (P/N 410-243-00) and secure with ty-wrap P/N 512-003-00.
- Route wire P14A12 from the circuit breaker to the 28VDC bus as shown in Figure 2.1.2.

Electrical harness P/N 270-152-00 is routed from the connector bracket (installed per section 2.1.3) on the belly of the helicopter. It is routed and secured with the manual release cable along the belly. Temporarily stow this end of the harness until the manual release cable is routed.

- Route the two individual wires (M3B18N and M2B18) forward and up through the hole in belly at STA 62.80.
- Route and connect wire no. M3B18N to ground point ND454 under the pilot seat.
- Route wire no. M2B18 to underneath the pilot seat and splice it with wire no. 9 from the cyclic. Splice the wires with the supplied splice (P/N 410-243-00) and secure with ty-wrap P/N 512-003-00.

Figure 2.1.1 Wire Harness Installation Overview



2.1 Fixed Provisions Kit Installation continued

2.1.1 Electrical Release Wiring Installation

Figure 2.1.2 Circuit Breaker Installation

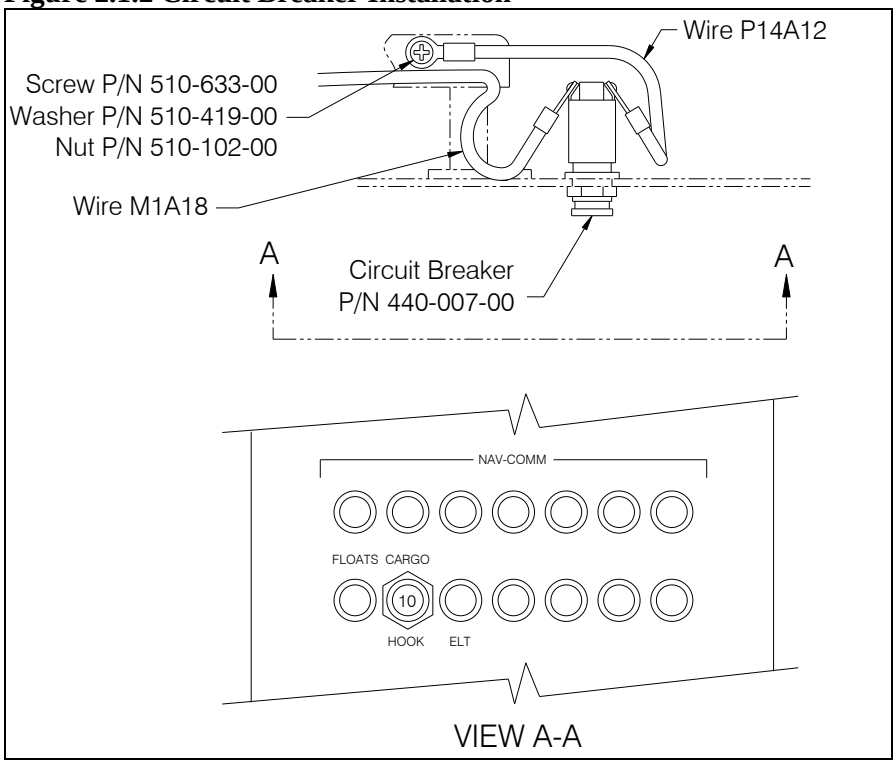
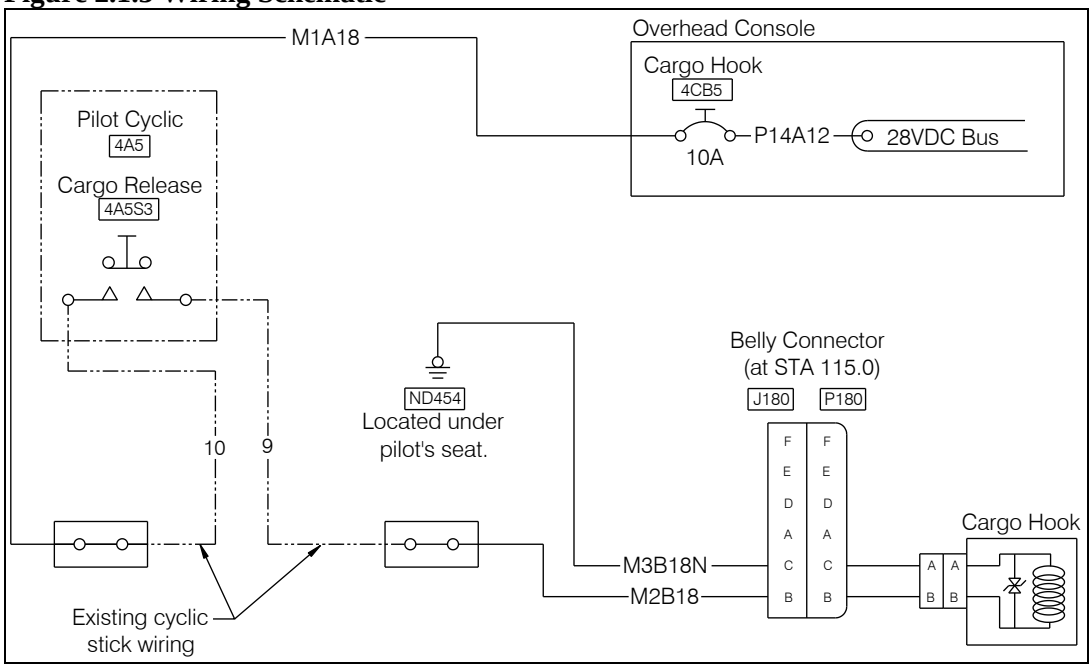


Figure 2.1.3 Wiring Schematic



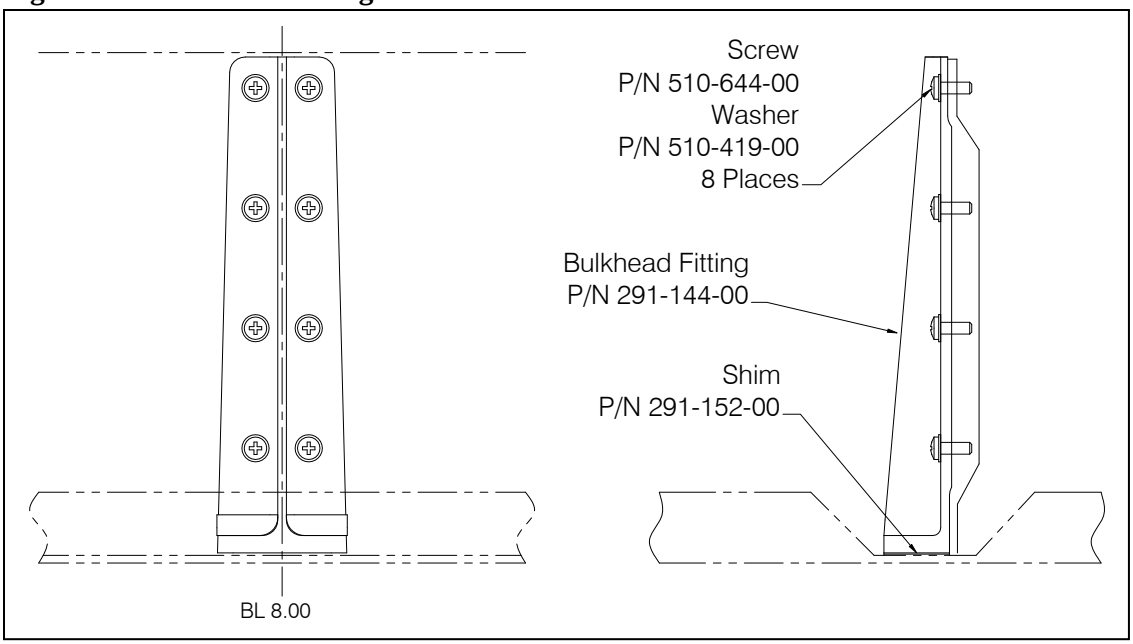
2.1 Fixed Provisions Kit Installation continued

2.1.2 Bulkhead Fitting Installation

The two bulkhead fittings (P/N 291-144-00) are installed on the passenger seat bulkhead (STA 121.44). Install them per the following instructions.

- ❑ Remove 16 screws at RBL 8.00 and LBL 8.00 from the passenger seat bulkhead.
- ❑ At these locations remove the four screws and nuts and eight washers from the floor panel.
- ❑ Place the bulkhead fittings at these locations and temporarily attach each to the bulkhead with eight screws (P/N 510-644-00) and washers (P/N 510-419-00).
- ❑ Peel shims (P/N 291-152-00) and insert between the bottom of the bulkhead fittings and inside of floor panel to establish a gap of 0.000/0.003 inches (0.00/0.07 mm).
- ❑ Temporarily remove the shims.

Figure 2.1.4 Bulkhead Fitting Fasteners



- ❑ Working from underneath the helicopter, transfer the four hole locations in the floor to the bulkhead fittings (two at each bulkhead fitting).
- ❑ Remove the bulkhead fittings and drill ∅0.250/0.255 inch through the flanges at the marked locations.

NOTICE

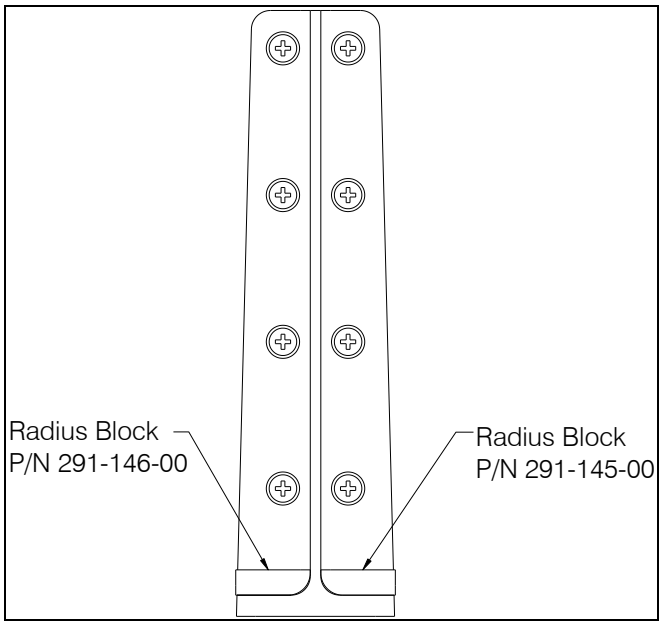
The bulkhead fittings are heat-treated steel thus it is recommended that they be clamped securely in a vise and that a drill press and new drill bits be used.

2.1 Fixed Provisions Kit Installation continued

2.1.2 Bulkhead Fitting Installation continued

- Place the four radius blocks in position on the lower flanges of the bulkhead fittings.

Figure 2.1.5 Radius Blocks



- Mark the four radius blocks with locations to match the holes in the flanges of the bulkhead fittings.
- Drill .250/.255 holes in the radius blocks at these locations.
- Check the radius blocks for fit by inserting bolts through them and the bulkhead fittings. Minor filing may be necessary to obtain proper fit and alignment.
- Align the shims with the bottom of the bulkhead fittings and transfer the hole locations to them and drill through the shims.
- In preparation for bonding, remove primer and clean the mating surfaces of the radius blocks, bulkhead fittings, shims, and the floor panel using MEK or similar cleaner.
- Align the holes and bond the shims to the floor panel with Magnobond 6398 adhesive (Bell P/N 299-947-100 Type II, Class 2).
- Install the bulkhead fittings onto the seat bulkhead with the sixteen screws and washers.
- Apply the Magnobond 6398 adhesive and position the four radius blocks onto the flanges of the bulkhead fittings. Temporarily install pillow blocks (or work aid) until adhesive cures.

Instructions for installing the pillow blocks are in section 2.2.

If the pillow blocks are not to be installed at this time, plug the holes in the belly with the supplied fasteners. At the forward pairs of holes (#10 size) install screw P/N 510-580-00 and washer P/N 510-419-00. At the two aft pairs of holes (1/4") install screw P/N 510-653-00, washer P/N 510-648-00 and nut P/N 510-227-00.

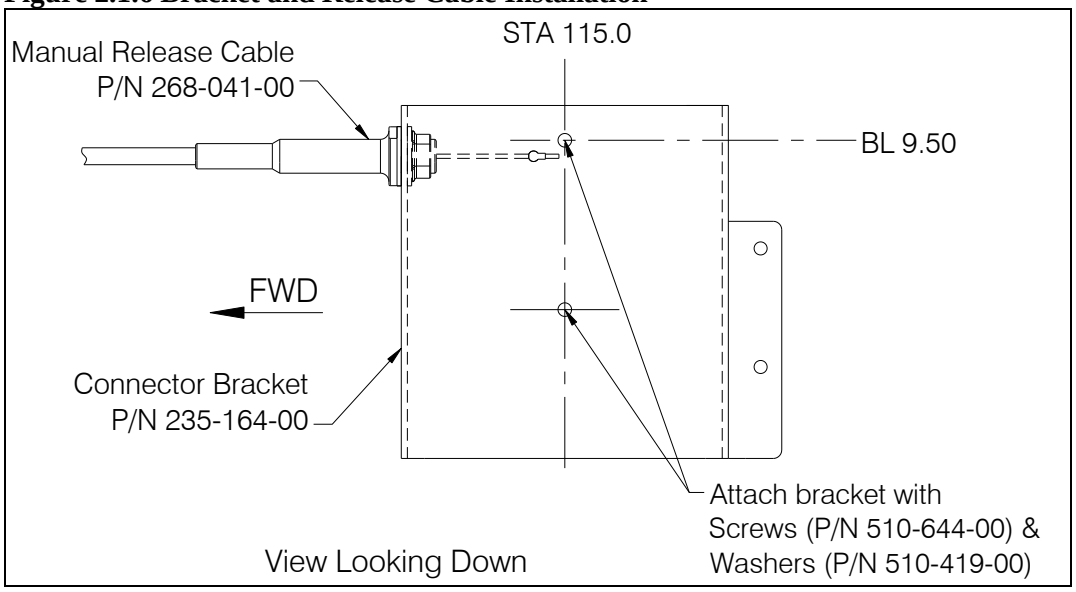
2.1 Fixed Provisions Kit Installation continued

2.1.3 Manual Release Cable Installation

The manual release cable (P/N 268-041-00) is routed from a connector bracket installed on the belly of the helicopter at STA 115.0 forward to a support bracket installed between the pilot and co-pilot's seats (refer to section 2.1.4 for the support bracket installation).

- Install the Connector Bracket (P/N 235-164-00) on the belly of the helicopter using two existing inserts located left of the centerline at STA 115.00. The inboard insert is located at BL 9.50. Attach the bracket with screws (P/N 510-644-00) and washers (P/N 510-419-00).
- Remove the nut and washer from the end of the manual release cable (P/N 268-041-00) and insert the end through the inboard hole on the forward flange.
- Re-install the washer and nut over the end and tighten to secure.
- Install the electrical release harness (P/N 270-152-00) connector at the center hole in the forward flange of the bracket.
- Apply decal P/N 215-205-00 (J180) next to the electrical connector. If the bracket is to be painted, apply this decal after painting.

Figure 2.1.6 Bracket and Release Cable Installation



2.1 Fixed Provisions Kit Installation continued

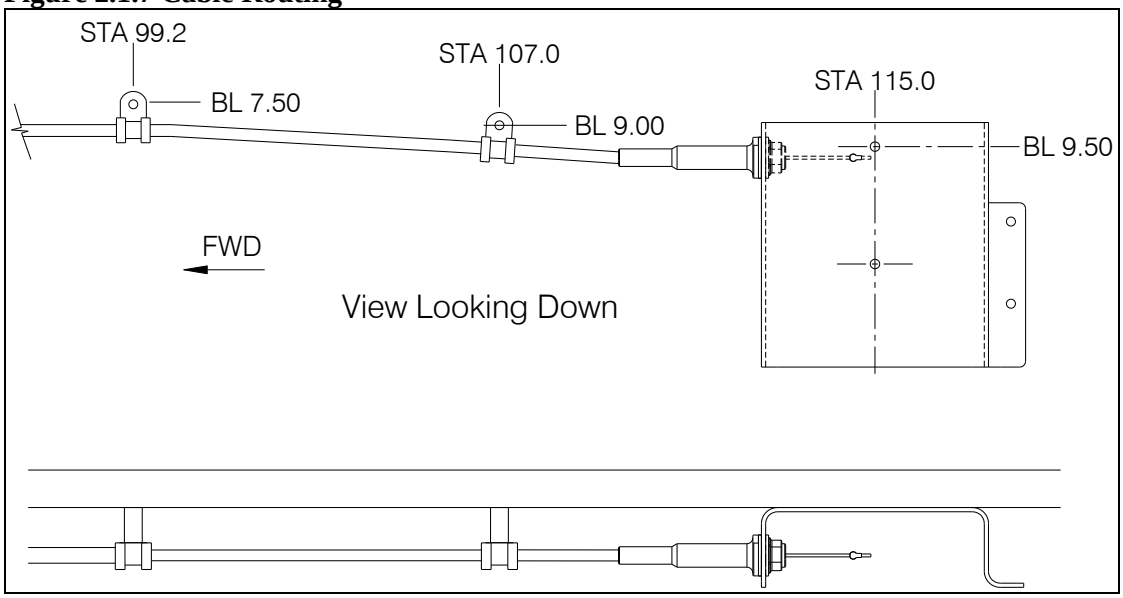
2.1.3 Manual Release Cable Installation continued

- At existing belly panel inserts at STA 107.0, 99.2, 91.0, and 83.0 (refer to Figure 2.1.2 and Figure 2.1.3) secure the manual release cable along with the electrical harness with spacer (P/N 510-647-00), loop clamp (P/N 512-005-00), screw (P/N 510-645-00), and washer (P/N 510-419-00).

NOTICE

If the optional load weigh kit (Kit P/N 200-331-00) is being installed, route its wiring harness through the loop clamps as the release wiring harness and manual release cable are routed through using the larger loop clamps (P/N 512-026-00) provided with the load weigh kit. Refer to section 2.3.3 for load weigh harness installation instructions.

Figure 2.1.7 Cable Routing

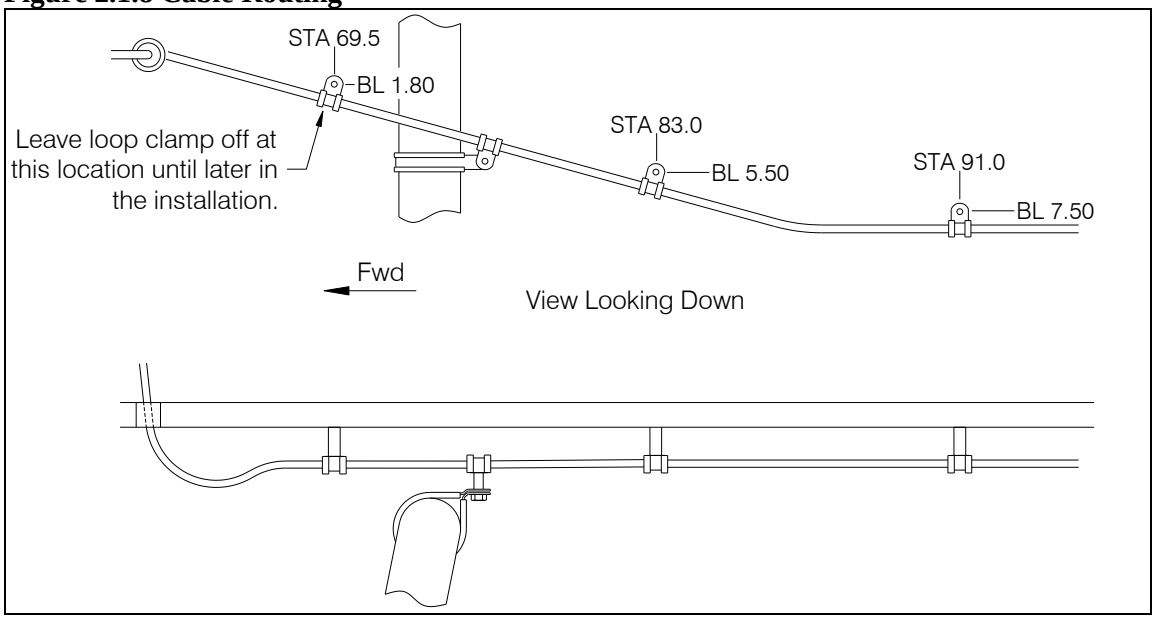


2.1 Fixed Provisions Kit Installation continued

2.1.3 Manual Release Cable Installation continued

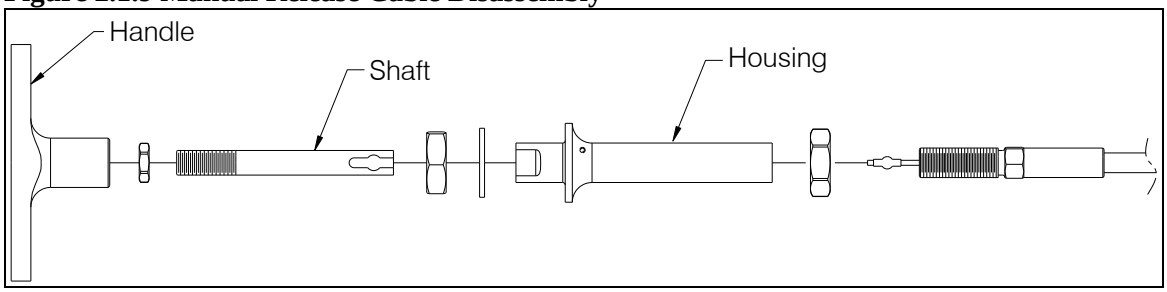
- Place loop clamp P/N 512-034-00 over the forward cross tube and attach loop clamp P/N 512-005-00 to it with screw P/N 510-652-00, washer P/N 510-419-00, nut P/N 510-102-00, and spacer P/N 510-646-00 to secure the manual release cable. At the insert at STA 69.5, do not install the loop clamp at this time.
- Install ty-wraps (P/N 512-003-00) over the manual release cable and wiring harness bundle at locations 3.0 inches from and on both sides of each loop clamp.

Figure 2.1.8 Cable Routing



- Remove the T-handle, Shaft Housing, Shaft, and associated hardware from the assembly in order to insert the forward end of the manual release cable fitting up through the hole in the belly at STA 62.80 in preparation for installing the T-handle Support Bracket.

Figure 2.1.9 Manual Release Cable Disassembly



2.1 Fixed Provisions Kit Installation continued

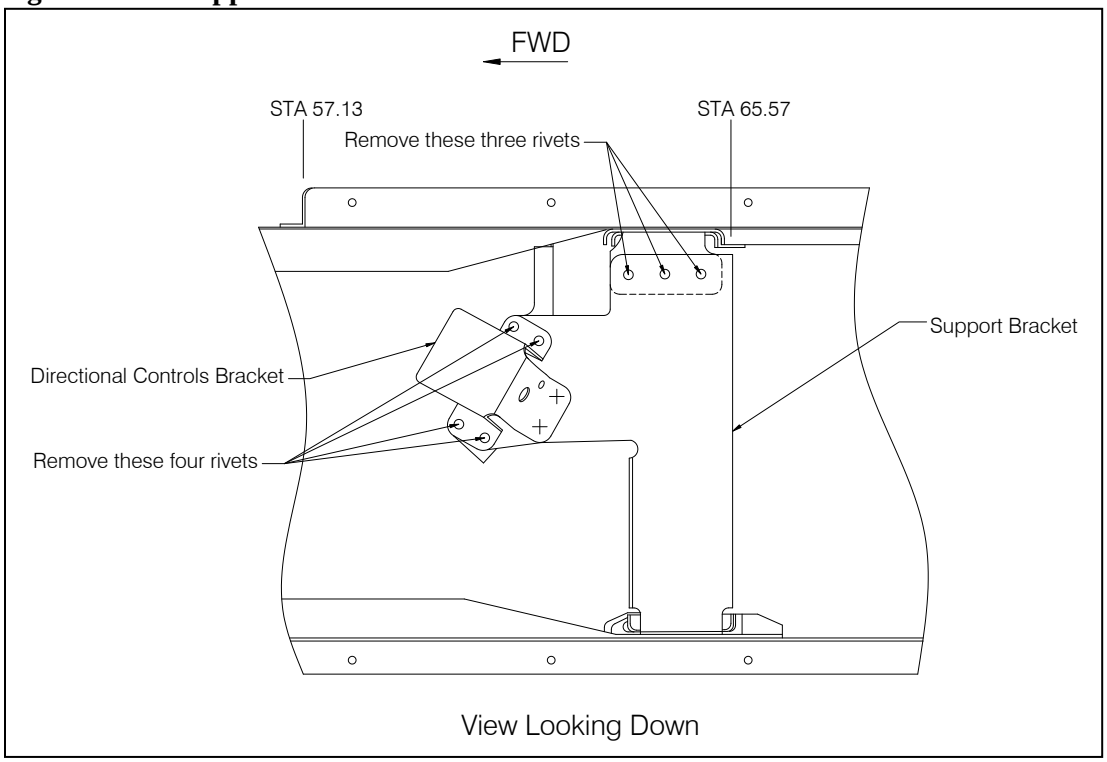
2.1.4 T-handle Support Bracket Installation

The manual release cable installation requires that a T-handle Support Bracket (P/N 235-169-00) be installed in the center console next to and to the left of the directional controls stop handle.

In preparation for installing the T-handle Support Bracket, remove the directional controls stop handle and cover, remove the center cover from between the forward seats and disconnect the directional controls stop cable assembly from its support assembly. Remove the bleed air heater knob of the Air Comm Heater (if it is installed).

- Remove the pair of rivets at each of the two flanges on opposite sides of the directional controls bracket (see Figure 2.1.10).
- Remove the three rivets on the right side of the center console (reference Figure 2.1.10) that secure the Bell Support Bracket to supporting structure.

Figure 2.1.10 Support Bracket Rivet Removal

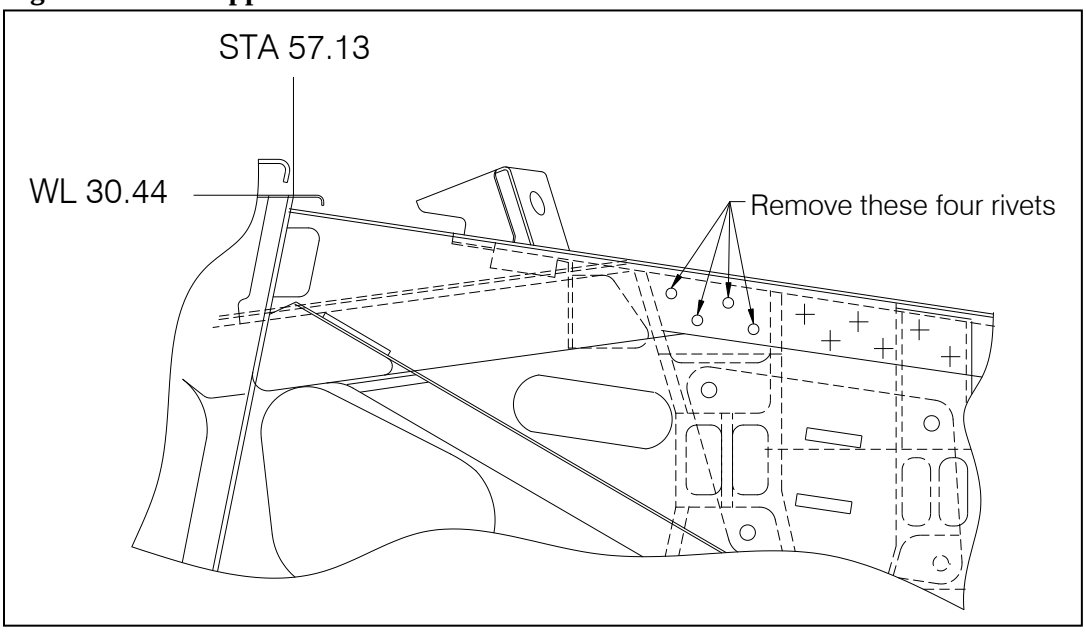


2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

- Remove the four rivets in the vertical flange located at the opposite side of the Support Bracket from the three removed above and remove the Support Bracket to obtain access to the area.

Figure 2.1.11 Support Bracket Rivet Removal

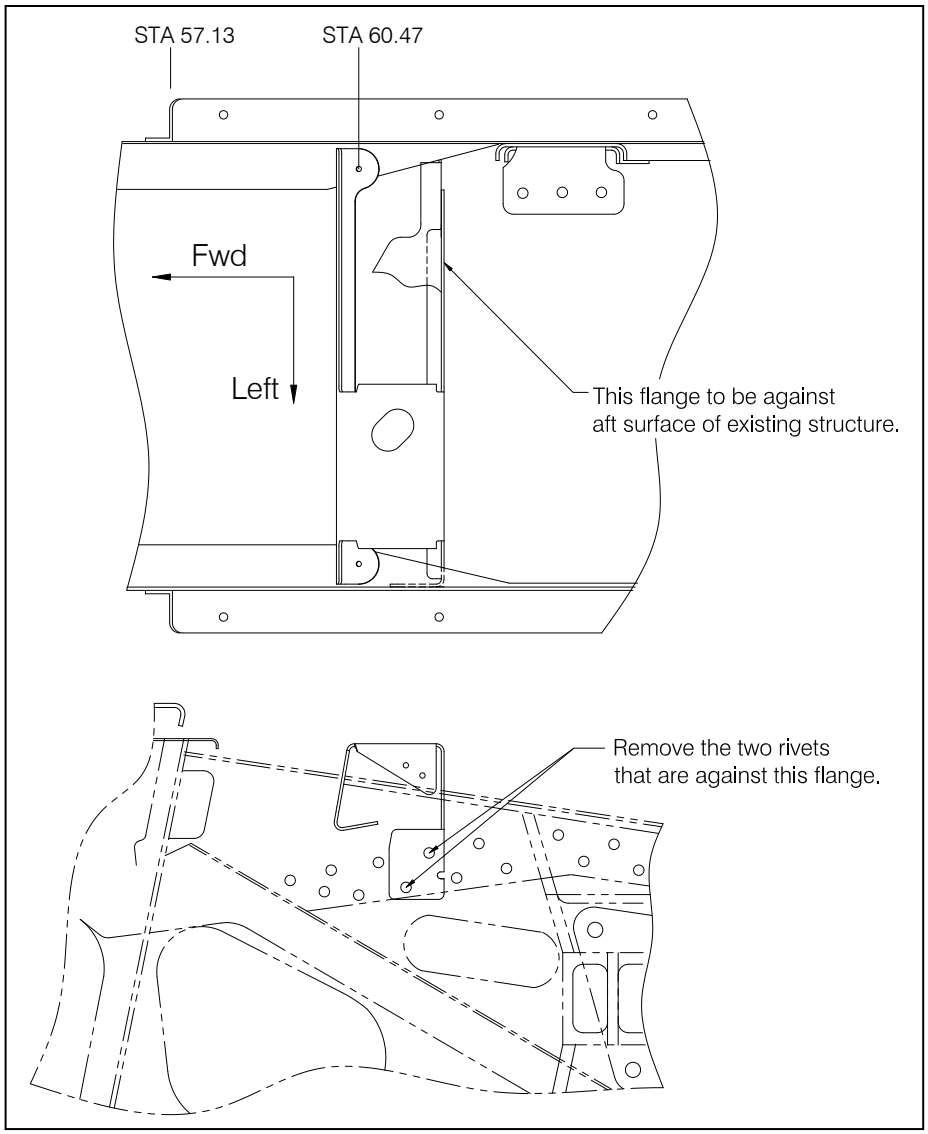


2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

- Place the T-handle Support Bracket in place, orienting and locating it as shown below. At the vertical flange on the left side of the bracket note the two rivets that will need to be removed. Mark the flange for trimming if necessary.
- Remove the bracket and drill out the two rivets.

Figure 2.1.12 T-handle Support Bracket Orientation



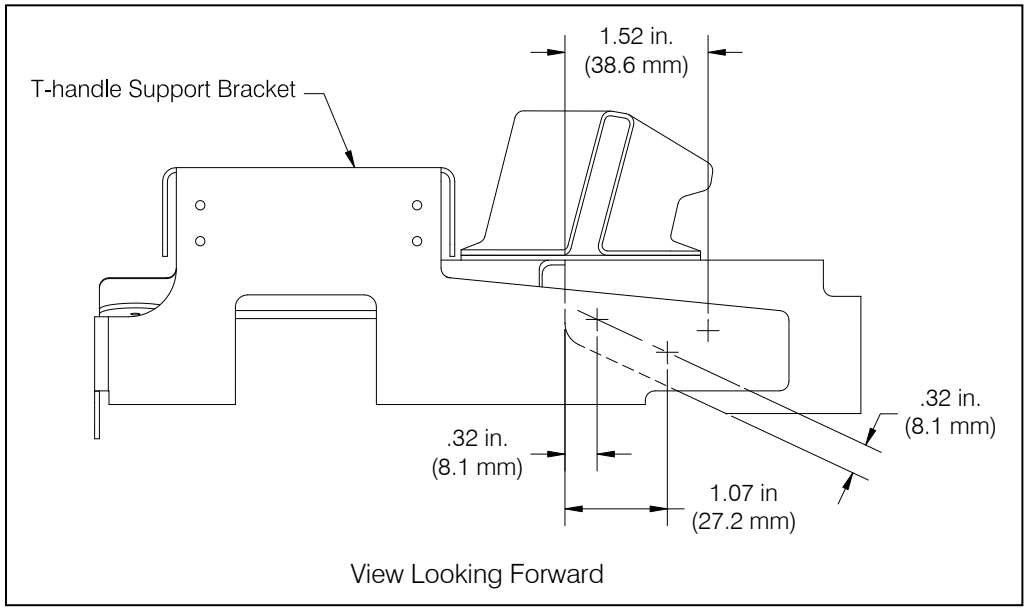
- Set the T-Handle Support Bracket back into position and with the left flange tight against the structure and its aft flange behind (see Figure 2.1.13) and flat against the mating structure, temporarily secure it into place.
- Using a non-permanent marker transfer the two rivet hole locations (where rivets were removed from the existing structure) to the left side flange of the T-handle Support Bracket.

2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

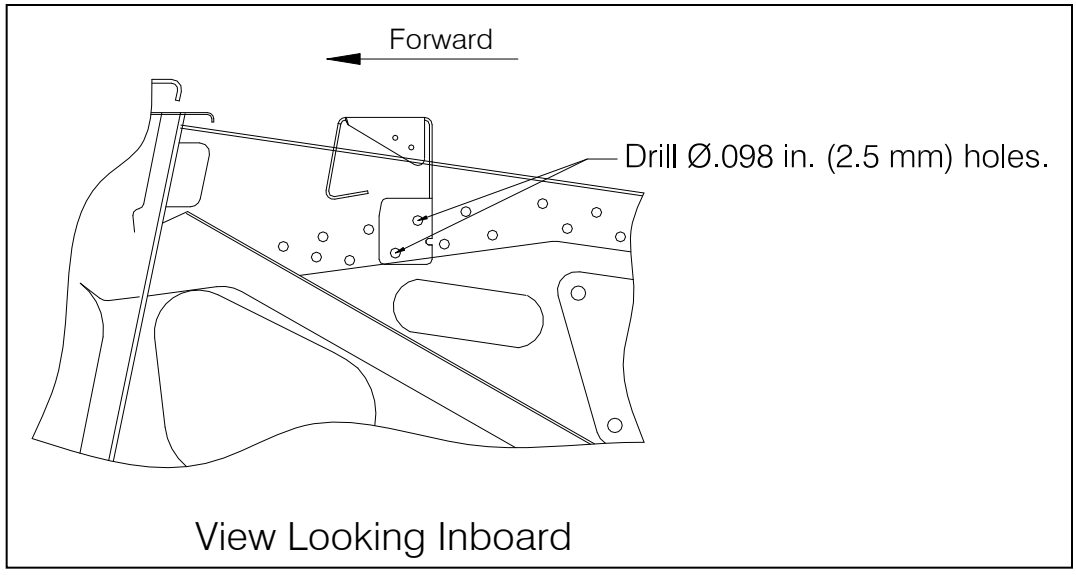
- Layout pattern for three holes in the aft flange of the T-handle Support Bracket as shown in Figure 2.1.13.
- Remove the T-handle Support Bracket and drill ∅.098 inch holes (no. 40 drill) at these locations.

Figure 2.1.13 Aft Flange Hole Pattern



- On the T-handle Support Bracket drill a ∅.098 in (2.5mm) hole in the lower position marked in the left side flange (see below, bracket shown in installed position) and place the bracket in its installed position and secure with a temporary fastener (e.g. - Cleco type).
- Using the existing structure as the template drill the upper hole in the left side flange of the T-handle Support Bracket (see Figure below).

Figure 2.1.14 T-handle Support Bracket LH Flange Holes

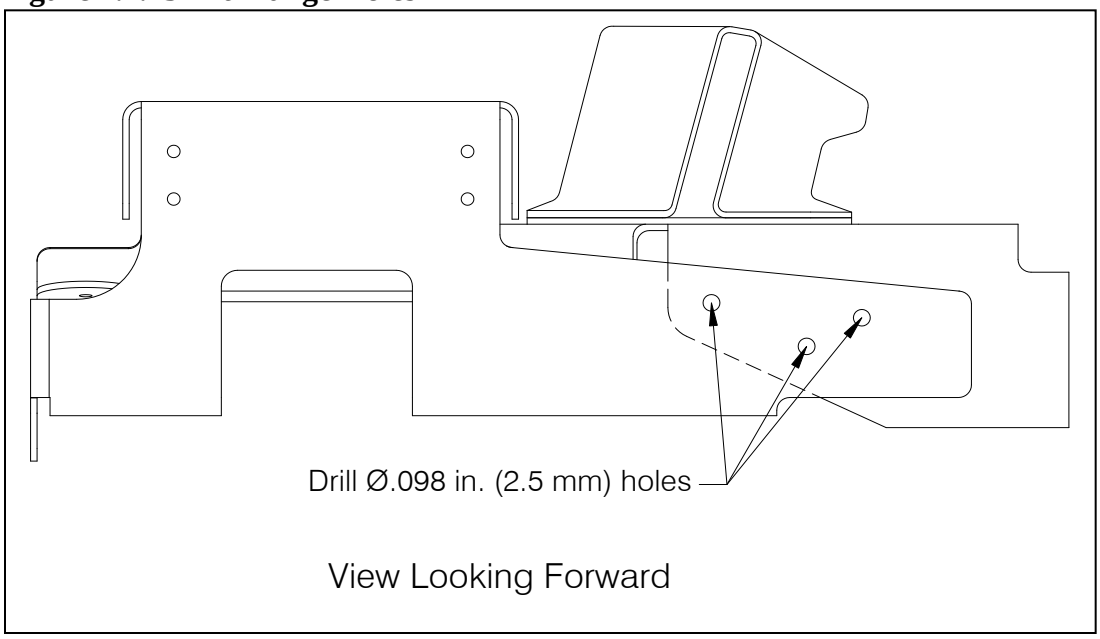


2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

- Using the T-handle Support Bracket as the template, drill the existing structure with the three ∅.098 inch holes drilled in its aft flange.

Figure 2.1.15 Aft Flange Holes



- Place the Bell Support Bracket back into position and secure it to the surrounding structure with temporary fasteners.

2.1 Fixed Provisions Kit Installation continued

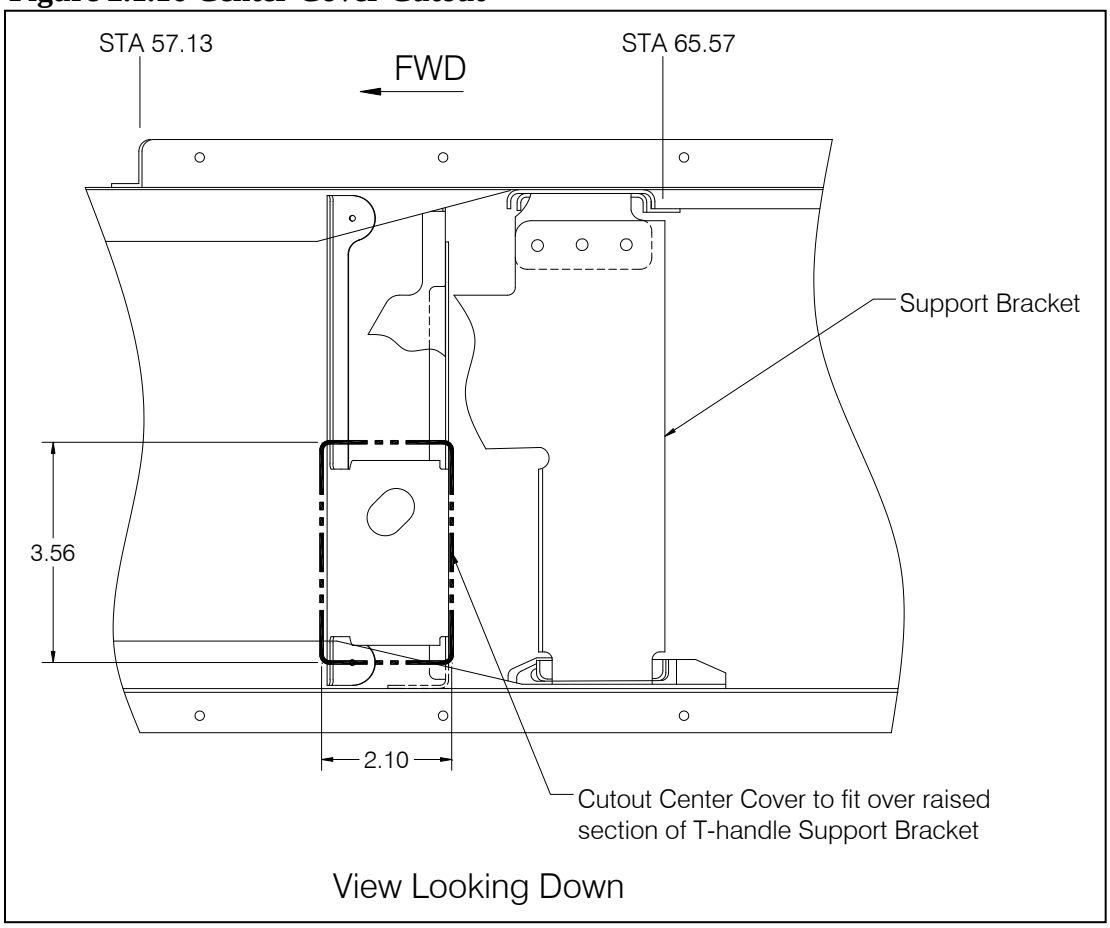
2.1.4 T-handle Support Bracket Installation continued

NOTICE

The center console cover cutout (see following two steps) may be done anytime after the T-handle Support Channel location is established.

- ❑ Locate the area in the center console cover in which the T-handle Support Channel will protrude through and layout and cut a 2.10 inch x 3.56 inch (53 mm x 90 mm) hole in the console center cover as shown in Figure 2.1.16.

Figure 2.1.16 Center Cover Cutout



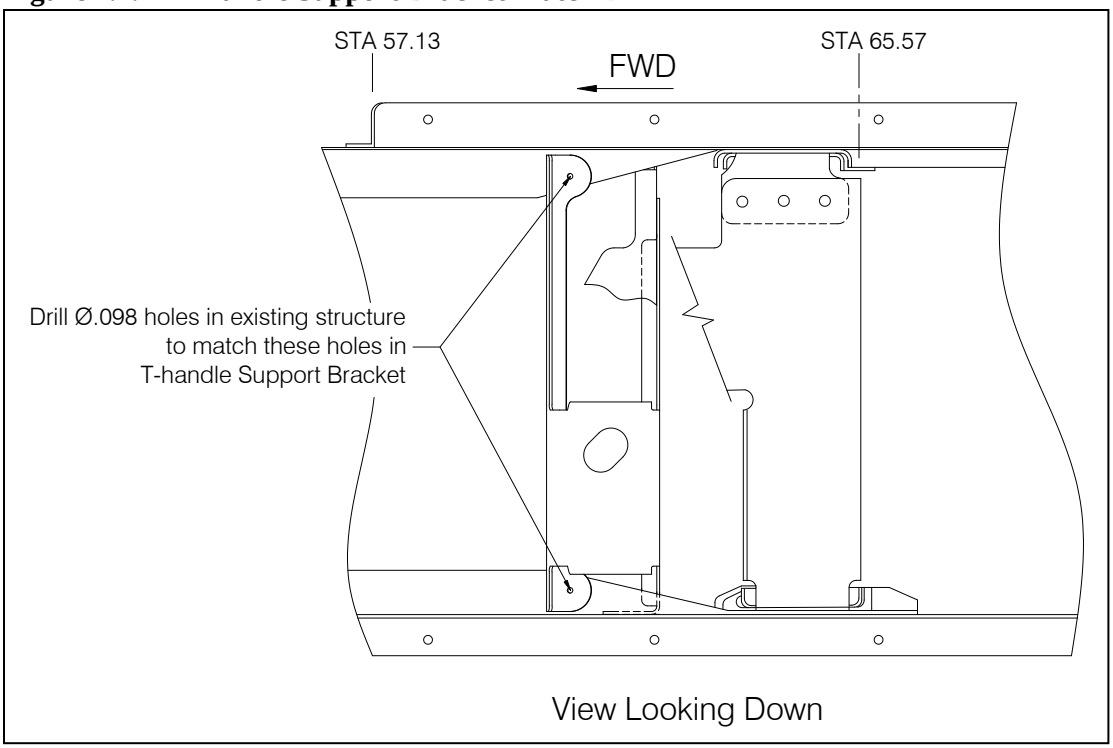
- ❑ Position the console center cover (Bell P/N 206-031-168) in place over the bracket and inspect the rectangular hole for clearance with the bracket. The cutout should have .10 inch (2.5 mm) clearance on three sides of the bracket, trim if necessary to obtain this.

2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

- Using the pilot holes at each end of the T-handle Support Bracket drill ∅.098 holes (no. 40 drill) in the existing structure below it (see Figure 2.1.17).
- Secure the T-Handle Support Bracket with temporary fasteners and drill these two holes out to ∅.193/.197 inches (4.9/5.0 mm).

Figure 2.1.17 T-handle Support Bracket Match Drill



- Insert the manual release cable fitting up through the slotted hole in the T-Handle Support Bracket.

2.1 Fixed Provisions Kit Installation continued

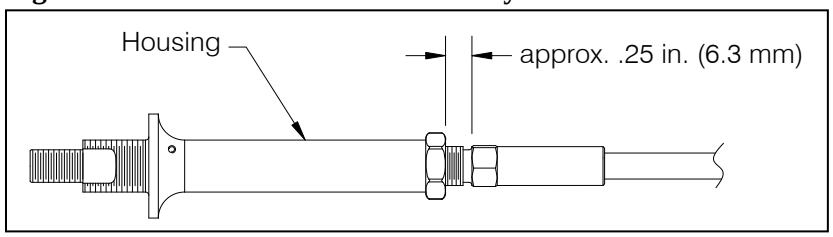
2.1.4 T-handle Support Bracket Installation continued

Partially re-assemble manual release cable per the following:

- Thread the jam nut onto the cable end fitting and thread it down to achieve a dimension as shown in figure below.
- Insert the cable ball end into the slot of the Shaft and slide the Housing over it aligning the flat on the shaft with the roll pin in the Housing.
- Thread the Housing over the Cable Ending Fitting down to the jam nut and tighten jam nut against it.

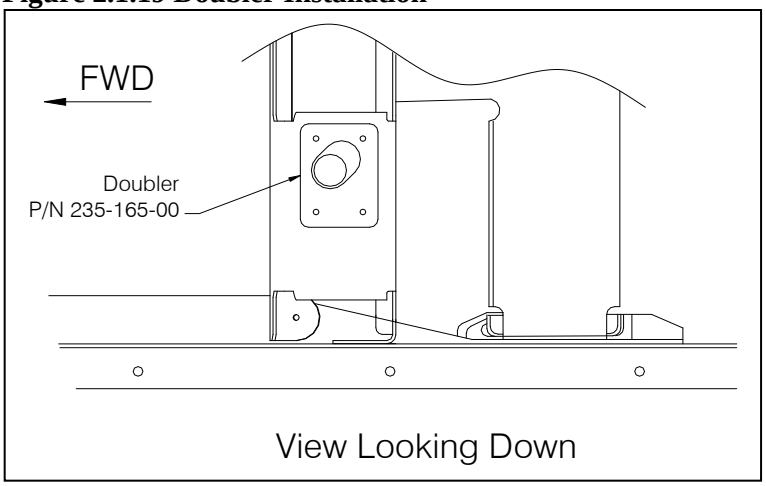
The T-handle will be re-assembled later in the installation procedure.

Figure 2.1.18 Release Cable Re-assembly



- Place the Doubler (P/N 235-165-00) over the release cable fitting and onto the T-Handle Support Bracket and install washer and nut over the stud and tighten finger tight allowing the doubler to be slid around if necessary.

Figure 2.1.19 Doubler Installation



- To position the manual release cable fitting within the slotted hole perform the following steps.

  Disconnect the main rotor pitch change links at the swash plate assembly (refer to BHT-407-MM, Chapter 62).

  Move the cyclic, collective and anti-torque controls throughout their full range of travel while observing clearance with the manual release cable. Position the manual release cable within the slot in order to obtain a minimum clearance of .125 inches between the release cable and all flight controls.

  At the location set above tighten the jam nut and trace the outline of the Doubler onto the top of the T-Handle Support Bracket.

2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

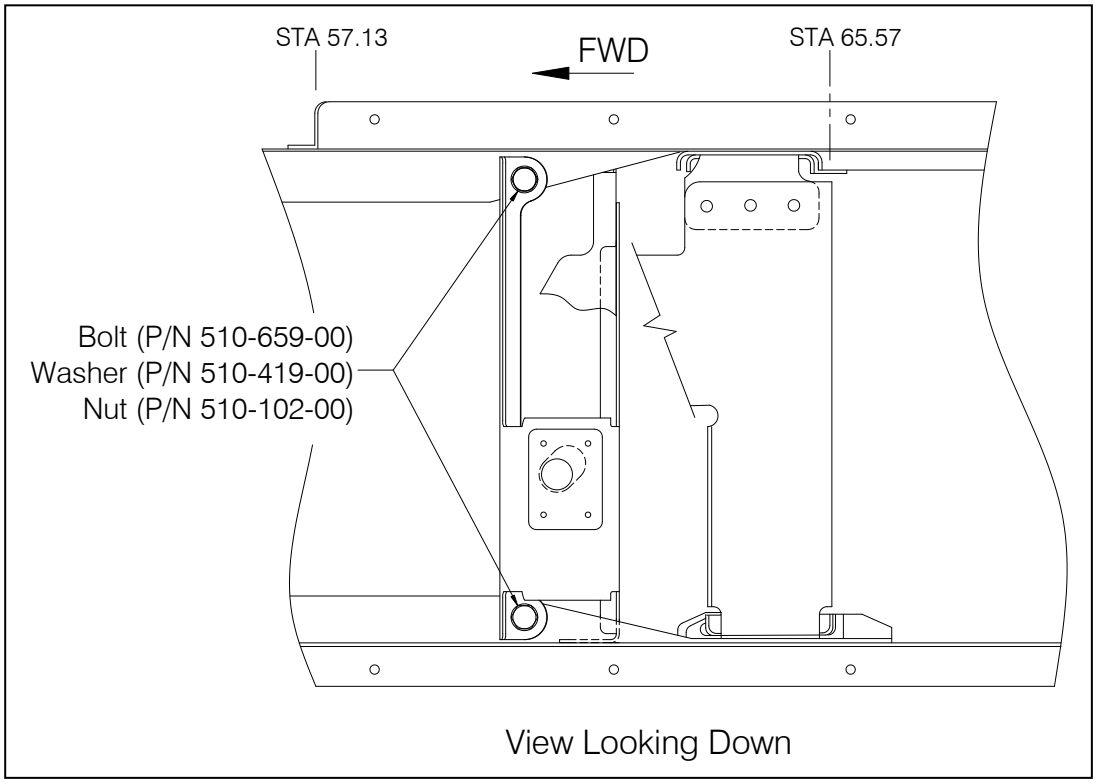
- Remove washer and nut from the manual release cable and remove the Doubler and the T-Handle Support Bracket.
- Position the Doubler on the T-Handle Support Bracket using the traced outline and after verifying sufficient edge distances drill ∅.098 inch holes (no. 40 drill) through the Doubler and the T-handle Support Bracket at the pilot hole locations in the Doubler.
- Remove primer from the mating surfaces of the Doubler and T-handle Support Bracket and apply Magnobond 6398 adhesive (Bell specification 299-947-100 Type II Class 2) to these surfaces.
- Position the Doubler (P/N 235-165-00) onto the T-handle Support Bracket and secure with rivets (P/N 510-613-00).

2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

- Place the T-handle Support Bracket back into position on the aircraft and secure with temporary fasteners.
- Secure the T-handle Support Bracket at each end of the forward flange with hardware as shown below.

Figure 2.1.20 Securing Fwd Flange

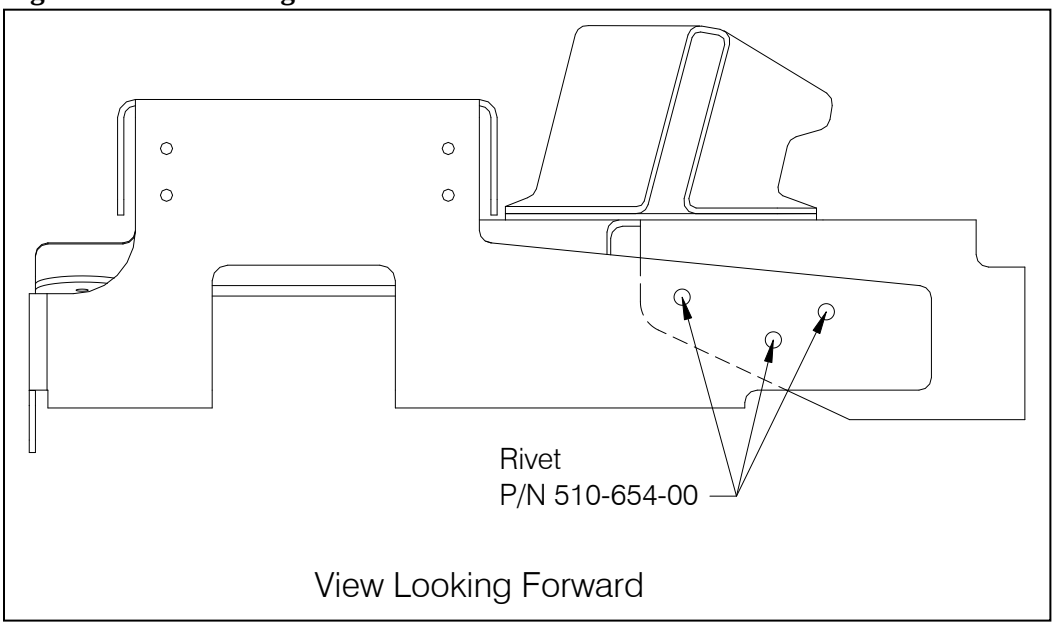


2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

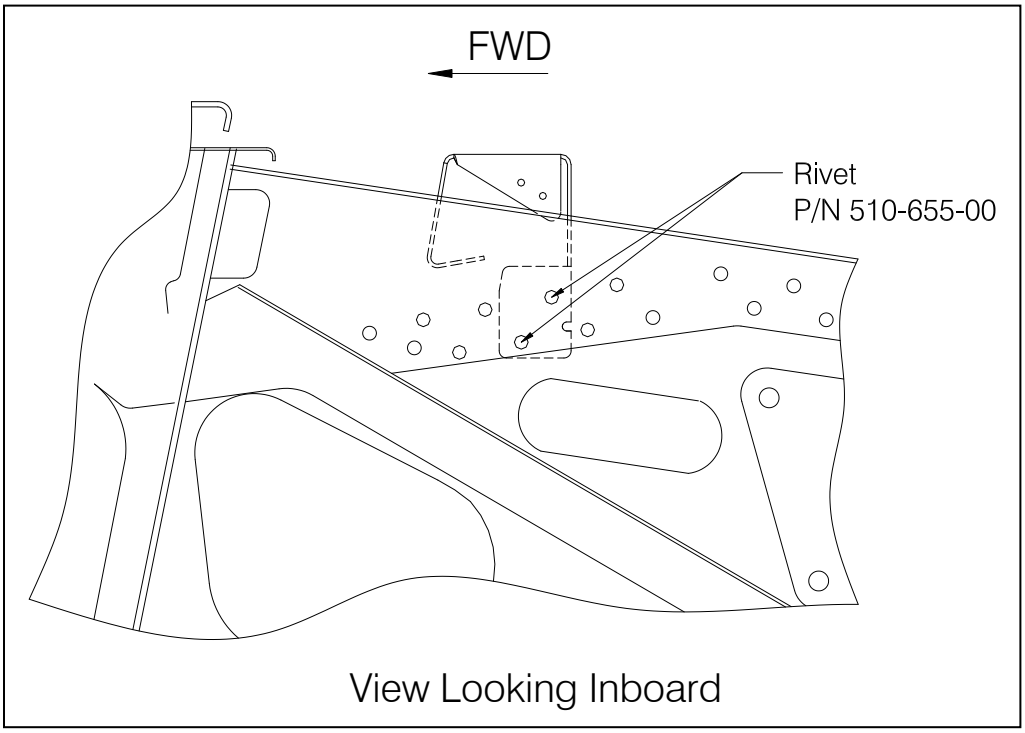
- Secure the aft flange of the T-handle Support Bracket to the mating structure with three rivets (P/N 510-654-00).

Figure 2.1.21 Aft Flange Rivets



- Secure the flange on the left side of the T-Handle Support Bracket to the mating structure with two rivets (P/N 510-655-00), see below.

Figure 2.1.22 LH Flange Rivets

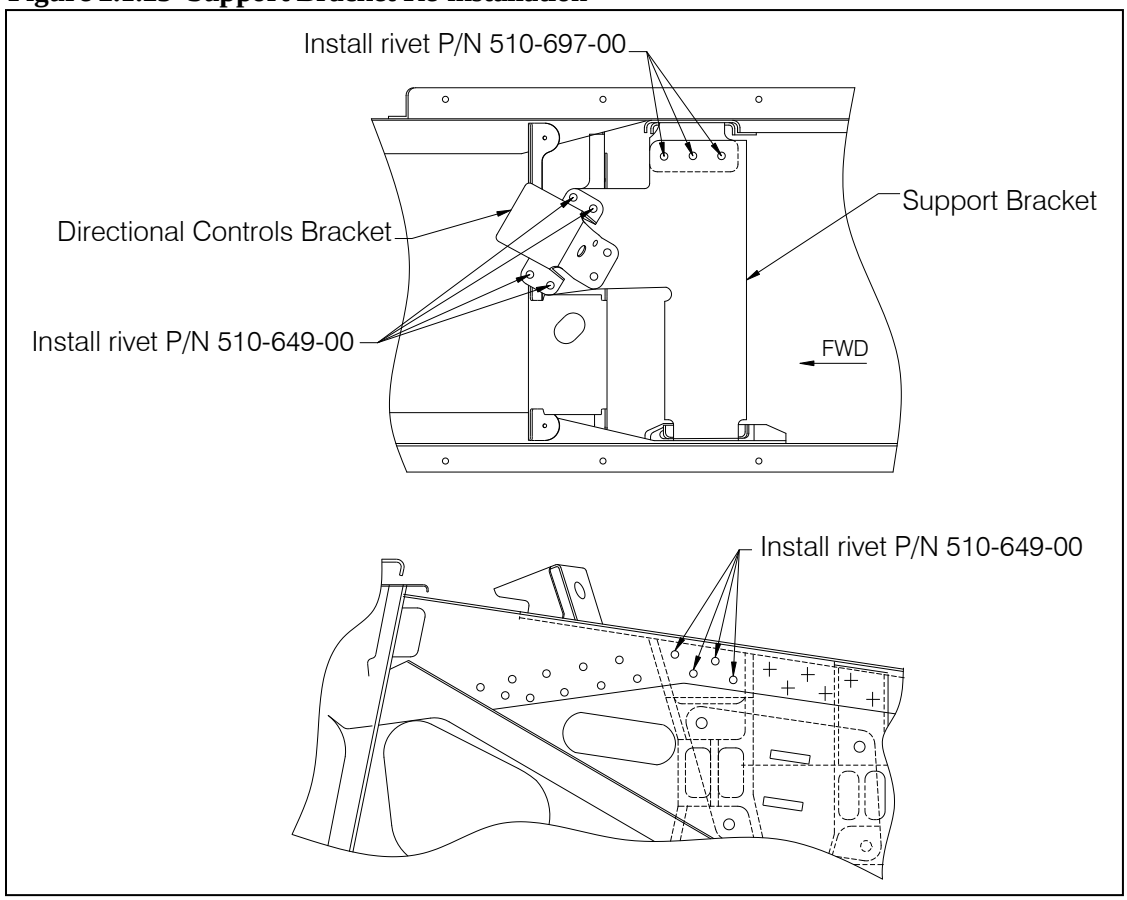


2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

- Re-install the Support Bracket that was removed to obtain access. Place the Support Bracket into position and secure with a total of 12 rivets as indicated below.

Figure 2.1.23 Support Bracket Re-installation



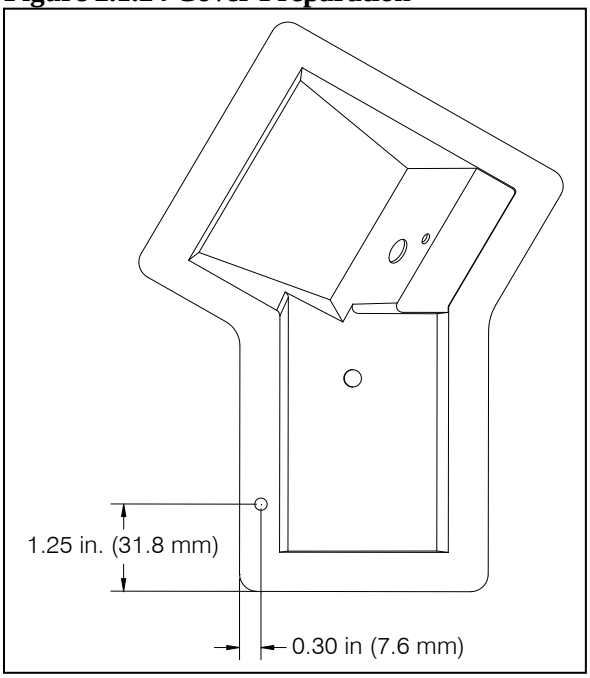
2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

Install the Cover (P/N 220-042-00) per the following.

- Position the Cover (P/N 220-042-00) over the T-Handle Support Bracket and the directional controls stop bracket and align the pilot holes for the respective handles (T-handle and directional controls handle). If the holes are not aligned, mark the direction in which the holes are to be enlarged (the holes are to be enlarged at a later step).
- Remove the Cover and drill a pilot hole at a location as shown below.

Figure 2.1.24 Cover Preparation



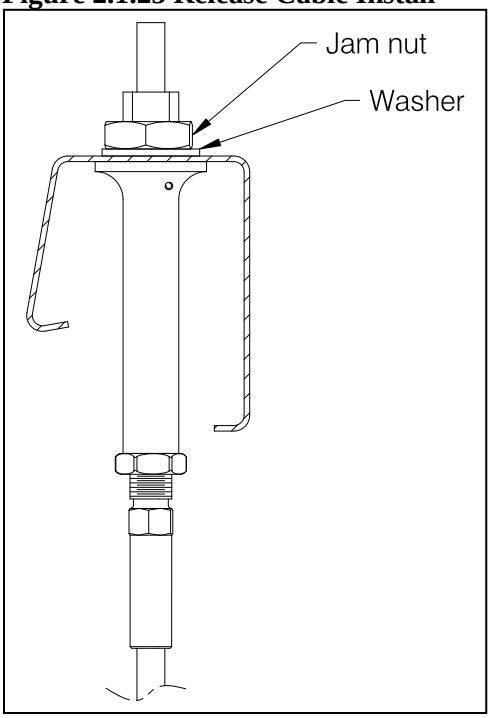
- Temporarily place the center cover (Bell P/N 206-031-168) over the T-Handle Support Bracket and directional controls bracket.
- Place the Cover in position and center it over the T-handle Support Bracket and directional controls bracket and locate it in such a manner that the existing nut plate holes from the center cover can be transferred to it.
- Transfer the nut plate hole locations in the center cover to the Cover.
- Pilot drill out the center cover with the pilot hole in the left side of the Cover (shown in Figure 2.1.24).
- Pilot drill the three holes in the Cover that were transferred from the center cover.
- Drill out all four holes to ∅.175 inches (4.5 mm).
- Install the nut plate (P/N 510-698-00) into the left side of the center cover with rivets (P/N 510-656-00).

2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

- Install the release cable fitting up through the hole in the T-handle Support Bracket and secure with the jam nut and washer (see Figure 2.1.25).

Figure 2.1.25 Release Cable Install



2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

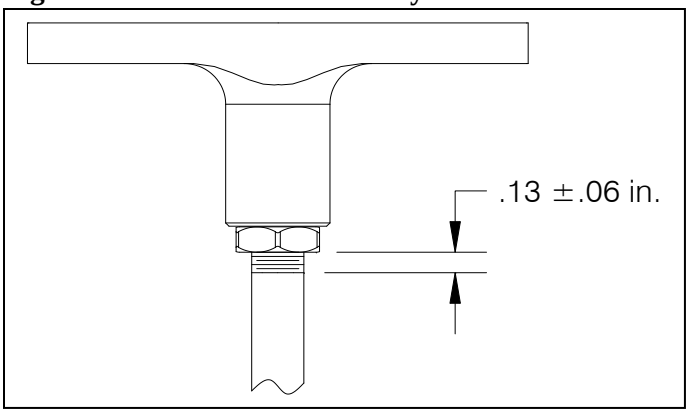
- Below the skin, at the first insert (STA 69.5) aft of the point where the release cable exits the skin, secure the release cable with a loop clamp (P/N 512-005-00), spacer (P/N 510-647-00), screw (P/N 510-645-00) and washer (P/N 510-419-00).
- Secure the electrical release harness and the manual release cable together with ty-wraps at locations 3 inches above the inside of the skin and 4 inches below.
- Apply MIL-S-81733 sealant into the hole in the belly skin around the manual release cable and electrical harnesses.
- Re-install the directional controls stop cable assembly through its support.
- Re-install the console center cover.
- Verify the layout and then enlarge the pilot holes in the Cover for the directional controls cable assembly and the T-handle. Enlarge each hole to a size to clear the jam nuts for each of these.
- Re-install the handle onto the directional control stop cable.

2.1 Fixed Provisions Kit Installation continued

2.1.4 T-handle Support Bracket Installation continued

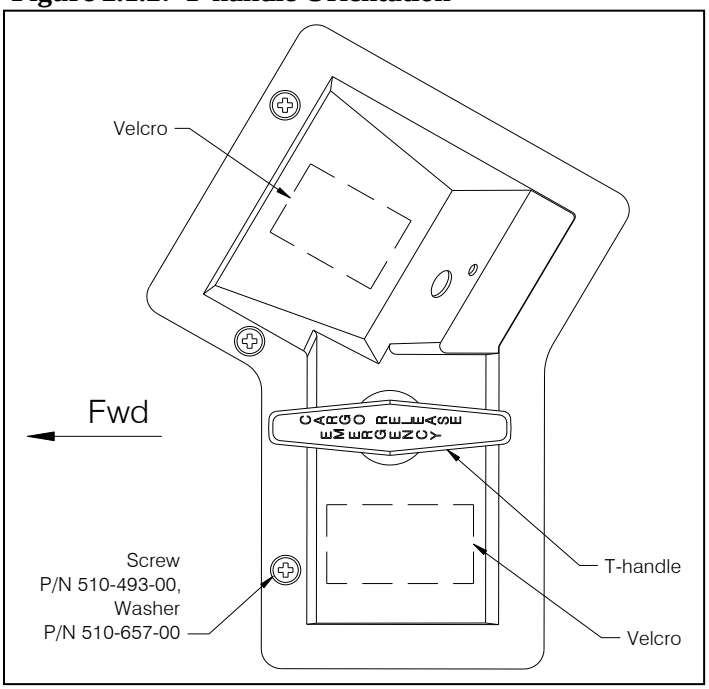
- Thread the jam nut and T-handle onto the manual release cable fitting leaving .13 ±.06 inches (3.3 ±1.5 mm) of thread exposed as shown in Figure 2.1.26. Orient the T-handle as shown in Figure 2.1.27 and tighten jam nut to secure.

Figure 2.1.26 T-handle Assembly



- Cut to length and apply the supplied Velcro strips (P/N 510-661-00 and P/N 510-662-00) to the inside of the Cover and to the mating directional controls bracket and T-handle Support Bracket surfaces.
- Secure the Cover to the console with hardware as shown below.

Figure 2.1.27 T-handle Orientation

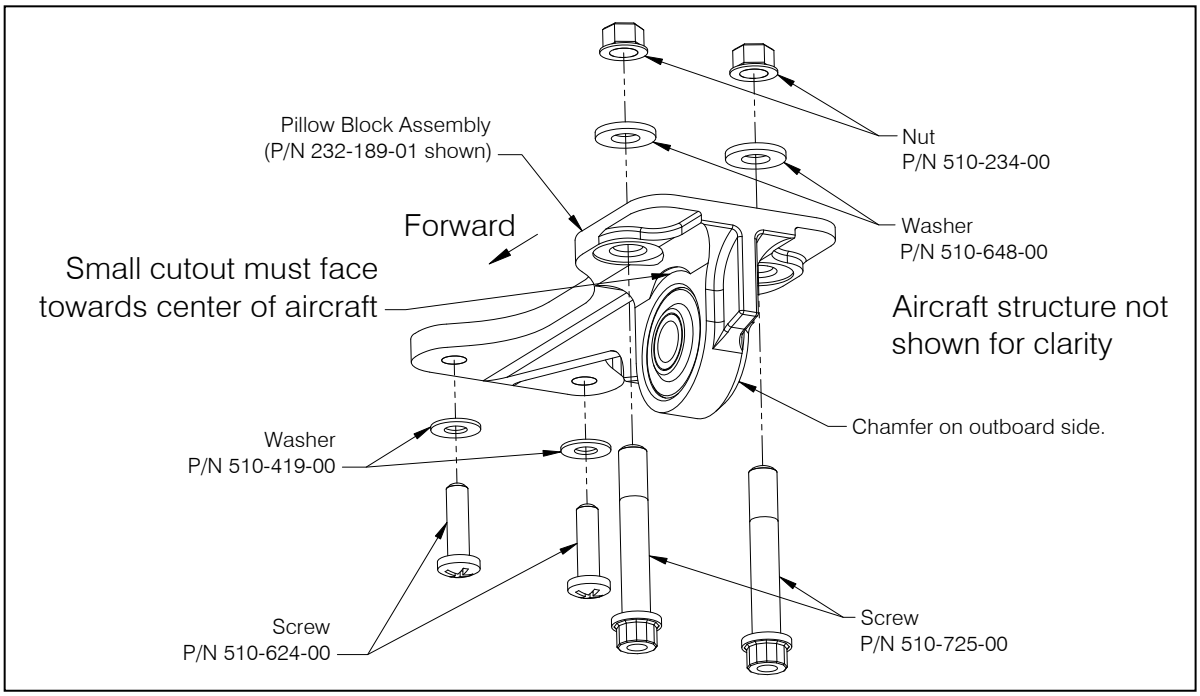


2.2 Cargo Hook Suspension Kit Installation

This section covers the installation of kits P/Ns 200-329-00 and 200-329-10. If installing kit P/N 200-329-00 or 200-329-10 with Bell Helicopter P/N 206-706-341-111, -117, or -123 Cargo Hook Provisions Kit remove the Pillow Blocks (Bell P/N 206-072-935-001) from the helicopter.

- ❑ Seal the faying surfaces of pillow block assemblies (P/N 232-188-01 and P/N 232-189-01) and helicopter with MIL-S-81733 sealant.
- ❑ Position pillow blocks on aircraft hard points. See Figure 2.2.1 for orientation of pillow block. Note orientation of small cutout, which must face towards the center of the aircraft.
- ❑ Install fasteners in pillow block assembly. Torque nuts (P/N 510-234-00) to 84 to 107 in-lbs (9.1 to 12.1 N-m) plus drag torque.

Figure 2.2.1 Pillow Block Orientation (right side pillow block shown)



NOTICE

Note that the Pillow Block Assemblies are sensitive to right and left. See Figure 2.2.1.

2.2 Cargo Hook Suspension Kit Installation continued

- Position the suspension assembly on pillow block assemblies with the thrust washers held in place by hand (see Figure 2.2.3 for orientation) and insert the Trunnion Pins. The cargo hook load beam must point to the right (when looking from the rear), see Figure 2.2.2.

Figure 2.2.2 Suspension Assembly Installation

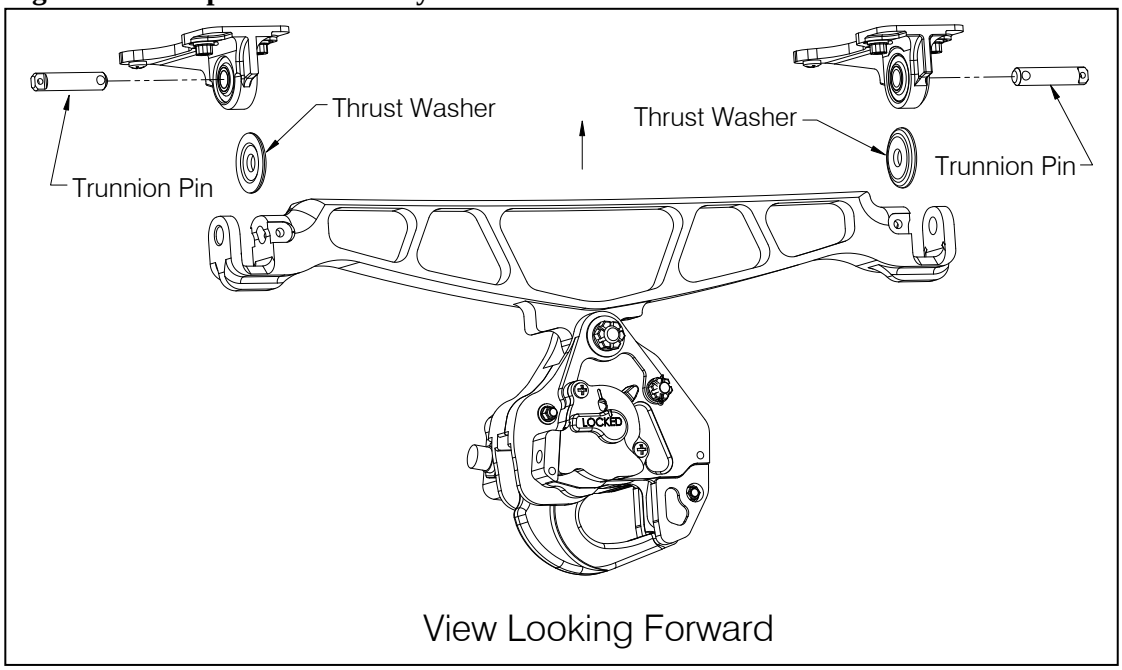
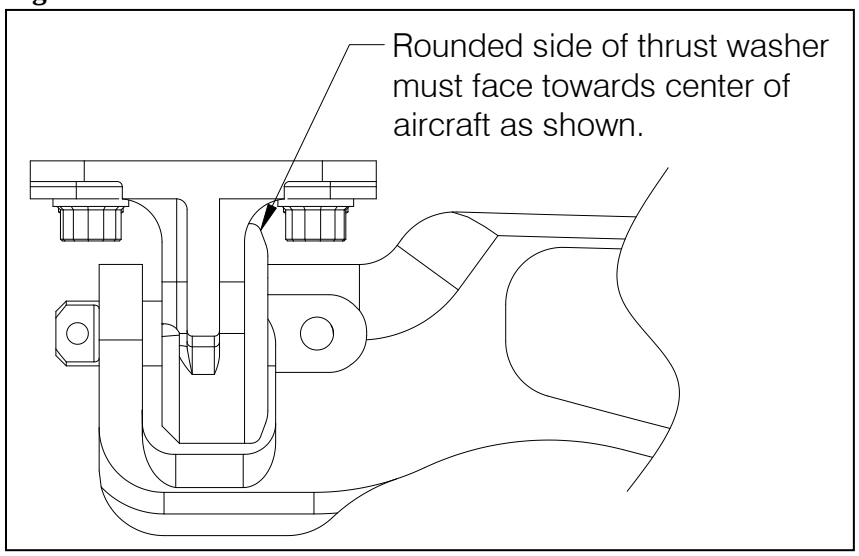


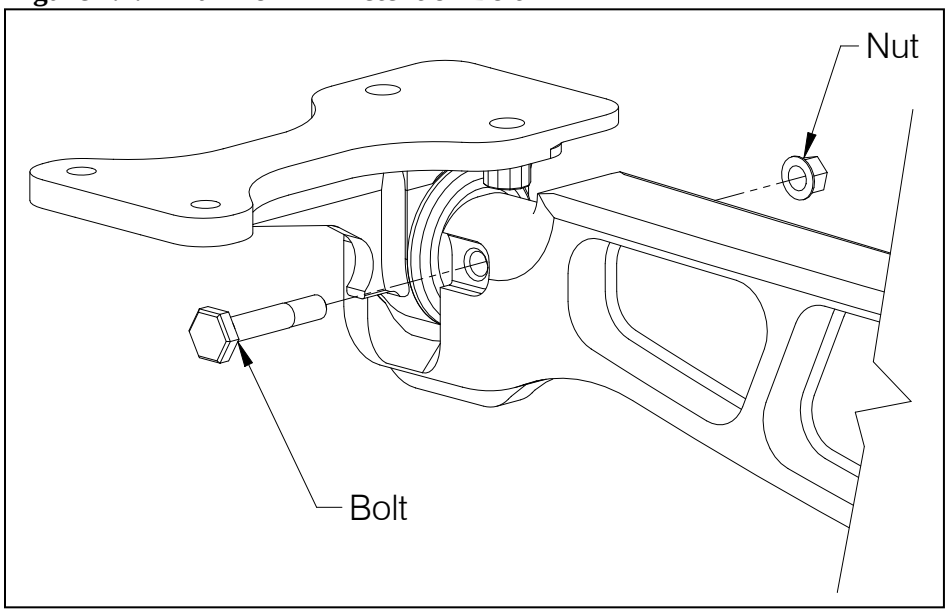
Figure 2.2.3 Thrust Washer Orientation



2.2 Cargo Hook Suspension Kit Installation continued

- Insert bolt into the hole as shown in Figure 2.2.4. Rotate the trunnion pin as necessary to align the hole in the pin with the hole in the beam. The bolt must pass through the hole in the pin when installed. Insert the bolt so its head seats into the slot in the beam.
- Install nut and torque to 20-25 in-lbs.

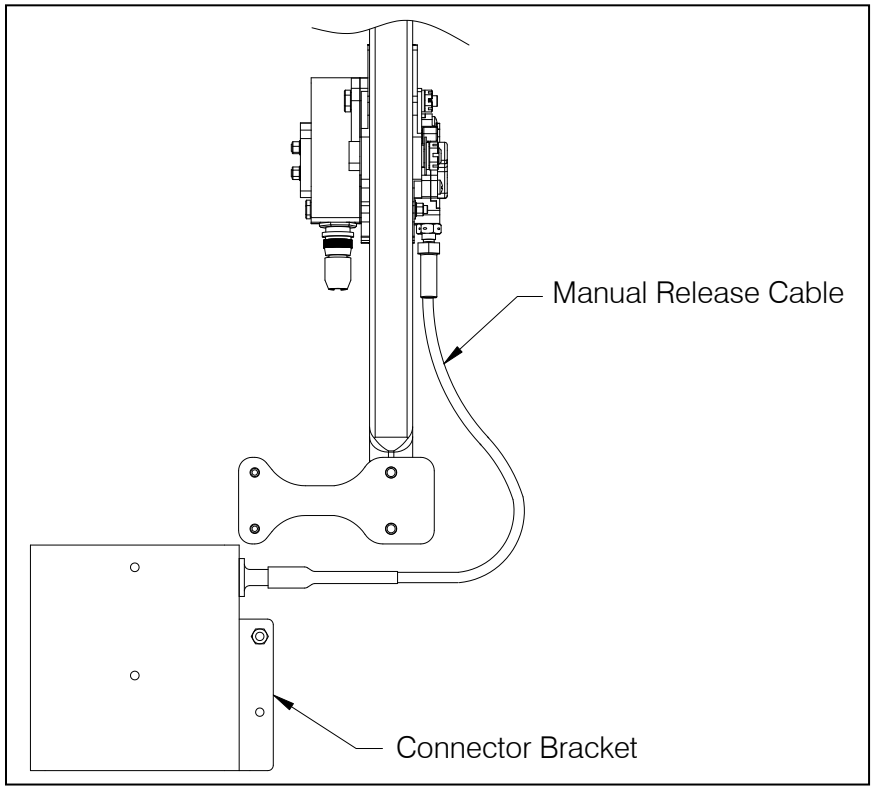
Figure 2.2.4 Trunnion Pin Retention Bolt



2.2 Cargo Hook Suspension Kit Installation continued

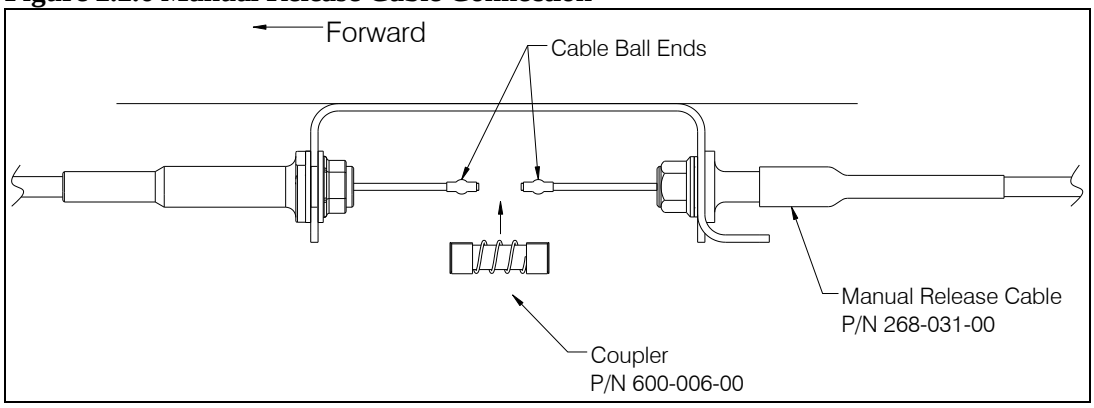
- Route the manual release cable as shown below.

Figure 2.2.5 Release Cable Routing



- Remove the nut and washer from the end fitting of the manual release cable at the connector bracket.
- Insert the end fitting through the inboard hole of the aft flange of the bracket and secure with the nut and washer removed on previous step.
- Connect the inner cable to the inner cable from the fixed manual release cable using the Coupler (P/N 600-006-00) by retracting the spring-loaded sleeve at each end (of the Coupler) and inserting the Cable Ball Ends.

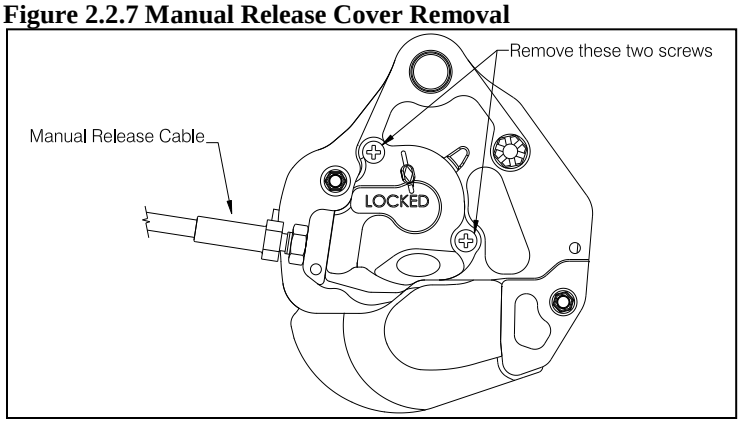
Figure 2.2.6 Manual Release Cable Connection



2.2 Cargo Hook Suspension Kit Installation continued

- Remove the manual release cover from the cargo hook and check the rigging per the following.

Figure 2.2.7 Manual Release Cover Removal

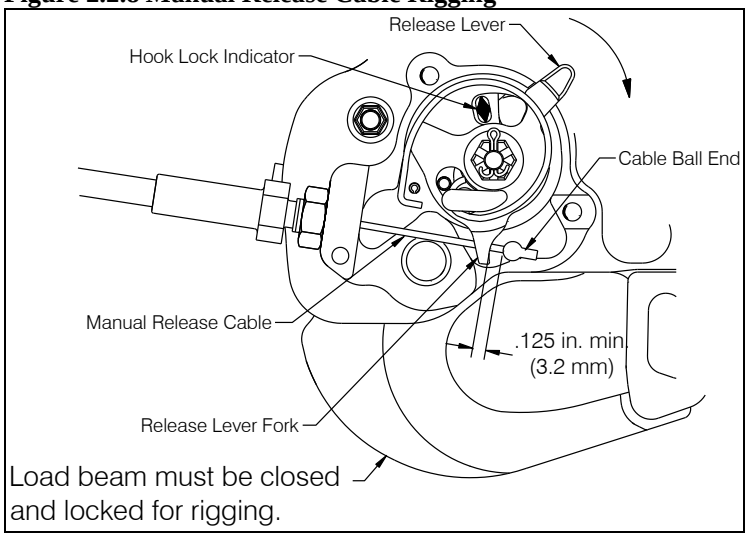


- Ensure the cable is installed through the cargo hook release fork fitting as illustrated in Figure 2.2.8.
- Rotate the release lever in the clockwise direction to remove free play and hold (the free play is taken up when the hook lock indicator begins to move).
- Measure the cable ball end free play with the manual release handle in the cockpit in the non-release position. The gap must measure a minimum of .125".

CAUTION

The cargo hook load beam must be closed and locked when the manual release cable is rigged.

Figure 2.2.8 Manual Release Cable Rigging



If the gap does not measure at least .125", make adjustments at the cargo hook. This is done by disconnecting the cable at the interface with the fixed manual release cable, loosening the jam nut at the cargo hook, and rotating the cable in the required direction. Maintain minimum of .31" of thread engagement between the manual release cable fitting and cargo hook.

2.2 Cargo Hook Suspension Kit Installation continued

Minor adjustment (per the following) may also be made at the T-handle between the seats.

- Loosen the jam nut, turn the T-handle up to increase the gap at the hook or lower the T-handle and jam nut by rotating them CW to decrease the gap.
- When proper setting is achieved tighten the jam nuts at the cargo hook and T-handle.
- Re-install the manual release cover on the cargo hook.
- Route the electrical release harness as shown and connect it to the fixed electrical release connector. See Table 2.1 for pin out information.

Table 2.1 Cargo Hook Connector

Pin	Function
A	Ground
B	Power

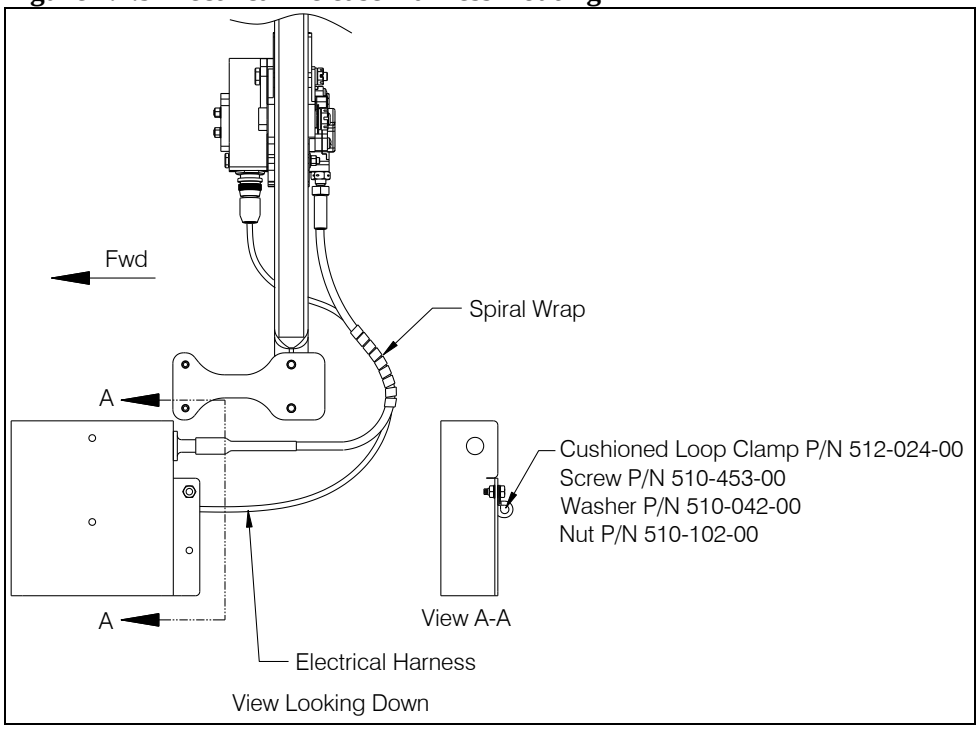
CAUTION

Earlier versions of cargo hook P/N 528-029-00 were equipped with a suppression diode that will be damaged if the cargo hook electrical connection is reversed.

If installing the cargo hook kit with Onboard Systems fixed provisions kit 200-328-00, secure the electrical release harness to the aft flange of the connector bracket with hardware as shown.

Add the supplied spiral wrap (P/N 590-017-00) over the harness and manual release cable approximately as shown. Cut to length as necessary.

Figure 2.2.9 Electrical Release Harness Routing



If installing kit P/N 200-329-10 which includes cargo hook P/N 528-029-02 with Surefire Release, adhere the Cockpit Decal (P/N 215-343-00) near the Cargo Release switch on the cyclic in view of the pilot.

2.3 Load Weigh Kit Installation

The load weigh kit (P/N 200-331-00 includes a C-39 indicator with 5V backlight, P/N 200-331-01 includes a C-39 with 28V backlight, and P/N 200-331-02 includes the C-40 Indicator) is an optional kit that may be installed with kit P/N 200-329-00 or P/N 200-329-10.

NOTICE

If not installing the load weigh kit, skip this section and proceed to section 2.4, Installation Checkout.

There are three primary components to install – the pin load cell assembly, the internal electrical harness and the load weigh indicator. Refer to the following sections for installation instructions for each.

The load weigh kit is compatible with Bell Helicopter P/N 206-706-341-141 and P/N 206-706-341-143 Auxiliary Equipment Kits. An alternative installation of the auxiliary equipment kit routes the manual release cable and electrical release harness and installs the connector bracket to the right of aircraft center. If this configuration is present, insert the pin load cell from aft to forward (with the cargo hook and beam rotated 180° from that as shown in Figure 2.3.1) to maintain proper operation of the stops and route its harness as shown in Figure 2.3.2 with the exception of to the right side, along the cargo hook's manual release cable and electrical harness.

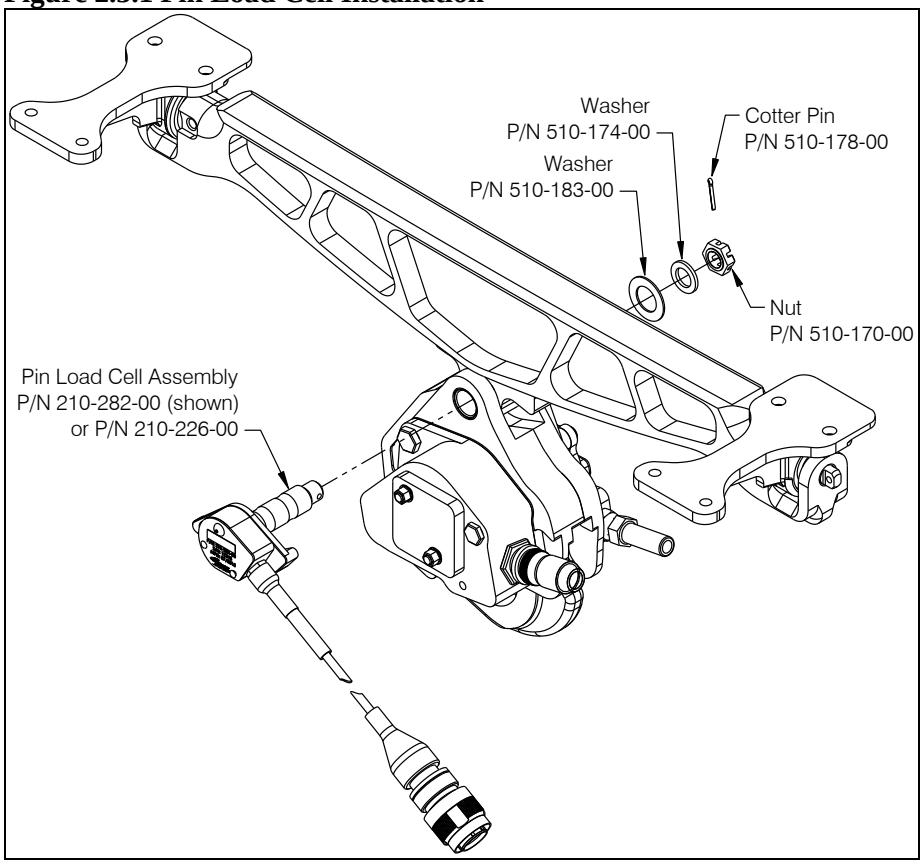
2.3 Load Weigh Kit Installation continued

2.3.1 Pin Load Cell Installation

The pin load cell replaces the cargo hook attach bolt (P/N 290-332-00) in the suspension beam assembly. It is installed per the following instructions.

- Remove the nut (P/N 510-170-00), washer (P/N 510-174-00) and washer (P/N 510-183-00) from the end of the attach bolt.
- Remove the attach bolt (P/N 290-332-00) and washer (P/N 510-183-00) from the cargo hook, separating the cargo hook from the beam. The attach bolt and the washer under its head are not used with the load weigh installation.
- Install the pin load cell through the cargo hook and suspension beam. Insert the pin load cell through from the side of the cargo hook with the electrical connector (as shown below).

Figure 2.3.1 Pin Load Cell Installation



- Install nut (P/N 510-170-00), washer (P/N 510-174-00) and washer (P/N 510-183-00) onto the end of the pin load cell. Tighten nut until fully seated, finger tight only. Back off nut to previous castellation, if needed, when aligning cotter pin for installation. Install and secure cotter pin.

⚠ CAUTION

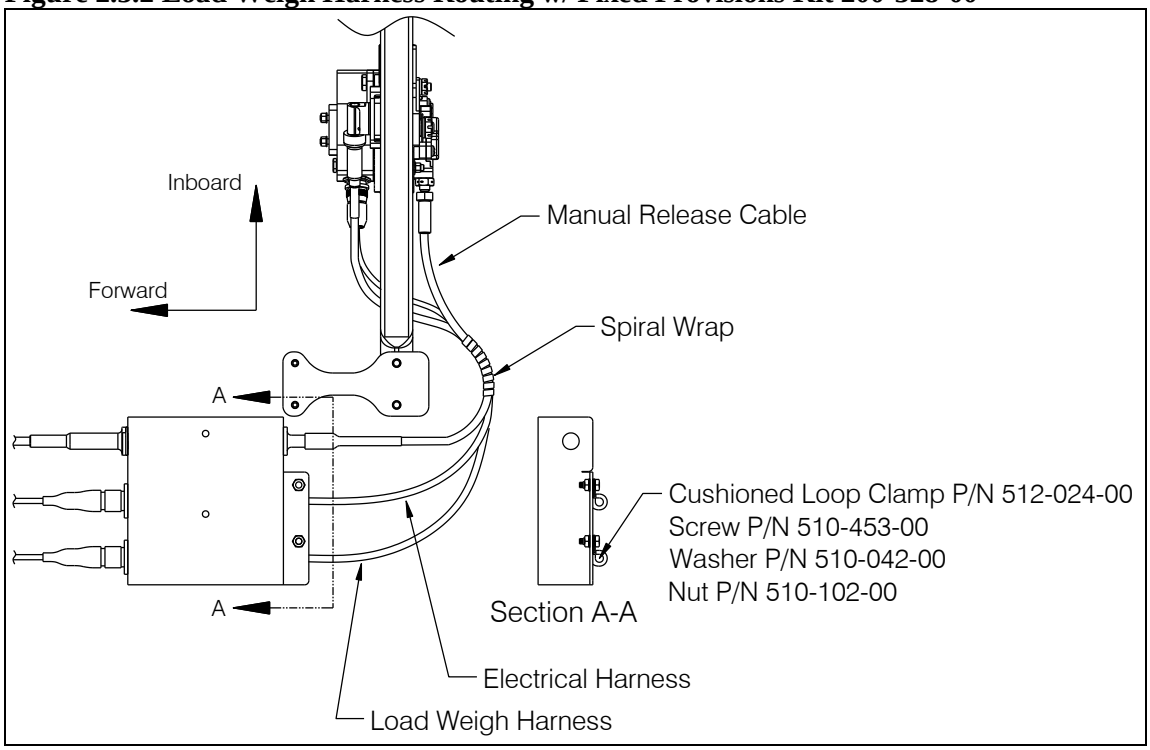
Do not tighten nut on pin load cell more than finger tight. Over-tightening will damage load cell.

- Route the load weigh harness as shown below and secure to aft flange of the Connector Bracket P/N 235-164-00 (if installing with Onboard Systems fixed provisions kit P/N 200-328-00) with cushioned loop clamp at the outboard hole (as shown below).

NOTICE

If the Bell fixed provisions kit is installed (see Figure 2.3.3 for identification aid), use the supplied Bracket P/N 235-035-01 by attaching it to the Bell connector bracket as shown in Figure 2.3.3.

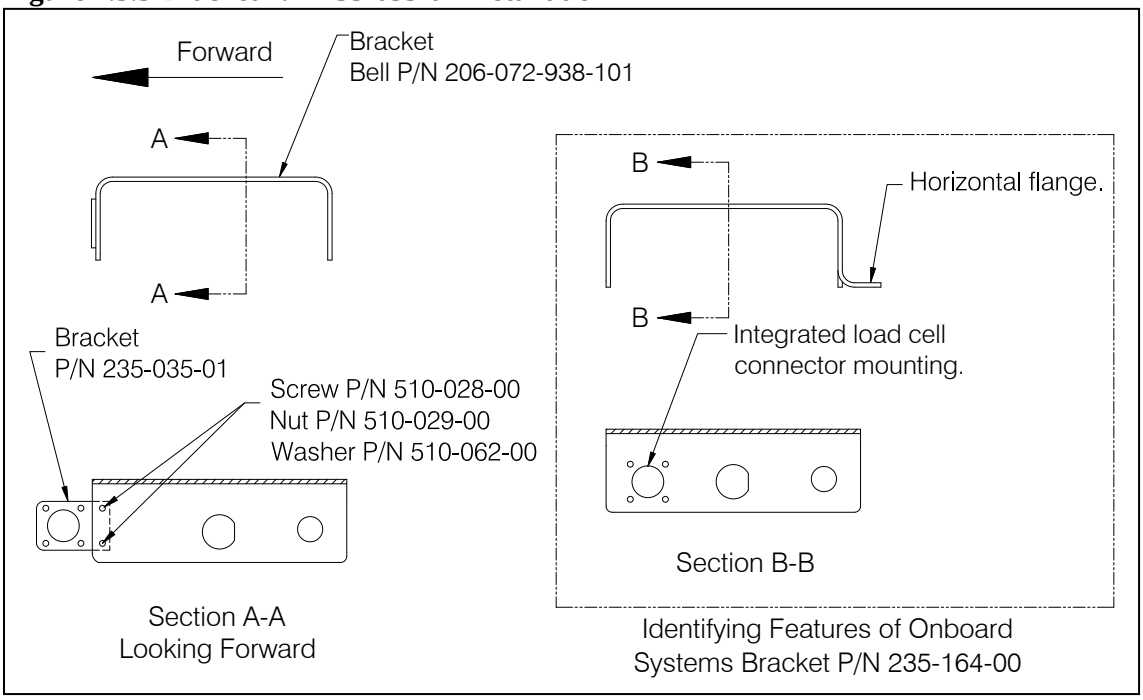
Figure 2.3.2 Load Weigh Harness Routing w/ Fixed Provisions Kit 200-328-00



2.3 Load Weigh Kit Installation continued

2.3.1 Pin Load Cell Installation continued

Figure 2.3.3 Bracket P/N 235-035-01 Installation



2.3 Load Weigh Kit Installation continued

2.3.2 Load Indicator Installation

The C-39 indicator (P/N 210-095-00 (28V backlight) or P/N 210-095-02 (5V backlight)) or C-40 Indicator* (P/N 210-293 series) can be mounted in a standard 2 ¼" instrument panel hole. It should be mounted in a position that is convenient, accessible and visible to the pilot. A consideration for the C-40 model mounting location is access to the USB port on the back, this USB port is intended for the firmware updates.

The C-40 Indicator kit includes four screws (P/N 511-211-00, MS35214-26) for mounting it, depending on the thickness of the mounting panel use another length MS35214 screw as needed.

*The C-40 Indicator is directly interchangeable with the C-39 Indicator (without changing the internal harness) except it does not support optional components (Analog Meter, C-30 Data Recorder).

2.3.3 Load Weigh Internal Harness Installation for the C-39

For the C-40 Indicator, skip to section 2.3.4.

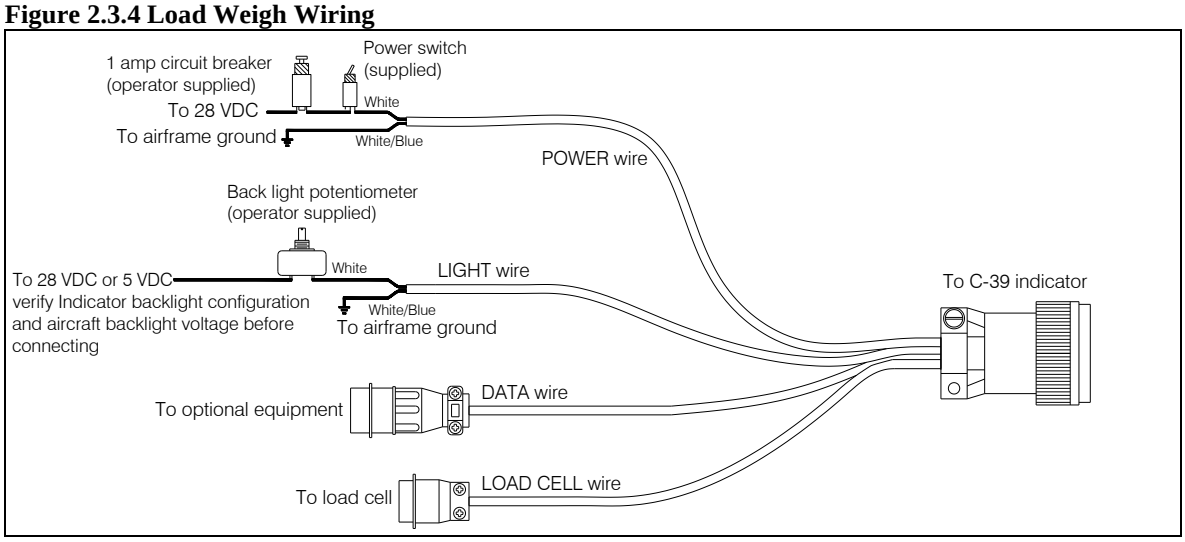
The primary leg of the load weigh harness (P/N 270-153-00) is routed from the C-39 indicator to the bracket at the belly of the helicopter. Install the connector at the bracket with screws (P/N 510-481-00), washers (P/N 510-062-00), and nuts (P/N 510-029-00). Two other legs are routed from the indicator to pick up power and lights and the fourth leg features a DATA connector, which may be used for optional equipment such as an analog meter or data recorder (reference Figure 2.3.4). Route the wires with existing wire harnesses, securing them with ty-wraps (P/N 512-001-00).

Route the POWER wire to a convenient location for the installation of the switch (P/N 400-048-00). The wire is supplied extra long, cut off the excess wire and use as needed to connect the switch and circuit breaker. Connect the white wire in the POWER wire to one side of the power switch, connect another piece of suitable wire to the other side of the switch and then to a dedicated 1 or 2-amp MS26574 series circuit breaker on the utility or non-essential bus. Connect the white/blue wire to ground. Install a placard 215-010-00 "ELECTRONIC WEIGHING SYSTEM" next to the power switch and circuit breaker. Install the placard 215-012-00 "TURN THE WEIGHING SYSTEM OFF WHEN NAVIGATION EQUIPMENT IN USE. NO AIRCRAFT OPERATION SHOULD BE PREDICATED ON THE READING OF THE ONBOARD WEIGHING SYSTEM" next to the Indicator.

NOTICE

If the C-23 Printer is being utilized with the C-20 or C-30 Data Recorder, a 5-amp circuit breaker should be used.

Figure 2.3.4 Load Weigh Wiring



If it is necessary to remove the load cell bulkhead connector to ease cable routing, reconnect using the color code below.

Wire Color	Connector Pin
White	A
WH/GN	B
WH/OR	C
WH/BLU	D
Shield	E

2.3 Load Weigh Kit Installation continued

2.3.4 Load Weigh Internal Harness Installation for the C-40

The internal harness (P/N 270-241-00) provided with the C-40 indicator has an additional wire (TEDS DATA, refer to Figure 2.3.6) within the 6 conductor wire which will be used on future updates to the C-40 indicator.

1. Connect the wire harness (P/N 270-241-00) connector (labeled C-40) to the Indicator.
2. Route the wire labeled POWER to the circuit breaker panel and install a 1 or 2-amp circuit breaker (not supplied) and connect this wire to it. Apply the supplied placard P/N 215-417-00 adjacent to the circuit breaker.
3. Wire numbers BACKLIGHT SIG and BACKLIGHT COM are for the C-40 Indicator's backlight control voltage. Connect wire BACKLIGHT SIG to the instrument panel lighting circuit and wire BACKLIGHT COM to aircraft ground.

   NOTICE

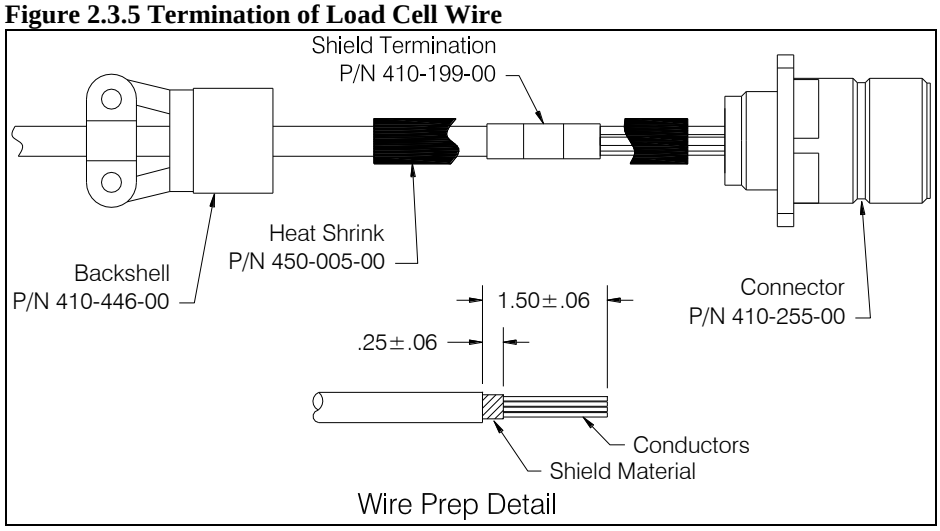
   The Indicator does function normally without the Backlight Control Voltage wired, but will just not dim with other instruments. Full brightness of the Indicator is overridden by the aircraft dimming control voltage (if connected).

4. Wire AIRCRAFT GND is to be connected to a suitable aircraft ground per AC43.13.
5. Route the "LOAD CELL" leg of the harness to the hole in the belly under the center console (which the original manual release cable was routed through) and route underneath back to the connector bracket.
6. Slide backshell (P/N 410-446-00), heat shrink (P/N 450-005-00), and shield termination (P/N 410-199-00) over it and prep the "LOAD CELL" end per the Wire Prep Detail in Figure 2.3.5. Center the shield termination over the exposed shield and heat with heat gun until the solder ring melts, flows and wets the shield and ground lead. Cut its wire lead to the length of the surrounding wires.

2.3 Load Weigh Kit Installation continued

2.3.4 Load Weigh Internal Harness Installation for the C-40 continued

Figure 2.3.5 Termination of Load Cell Wire



7. Strip the individual wire ends, crimp on contacts supplied with connector, and terminate wires at connector P/N 410-255-00 per Table 2.3.1, refer also to the schematic in Figure 2.3.6.
8. Position the heat shrink over the shield termination and shrink in place with heat gun.
9. Slide the backshell up to and thread it over the connector threads and tighten securely.

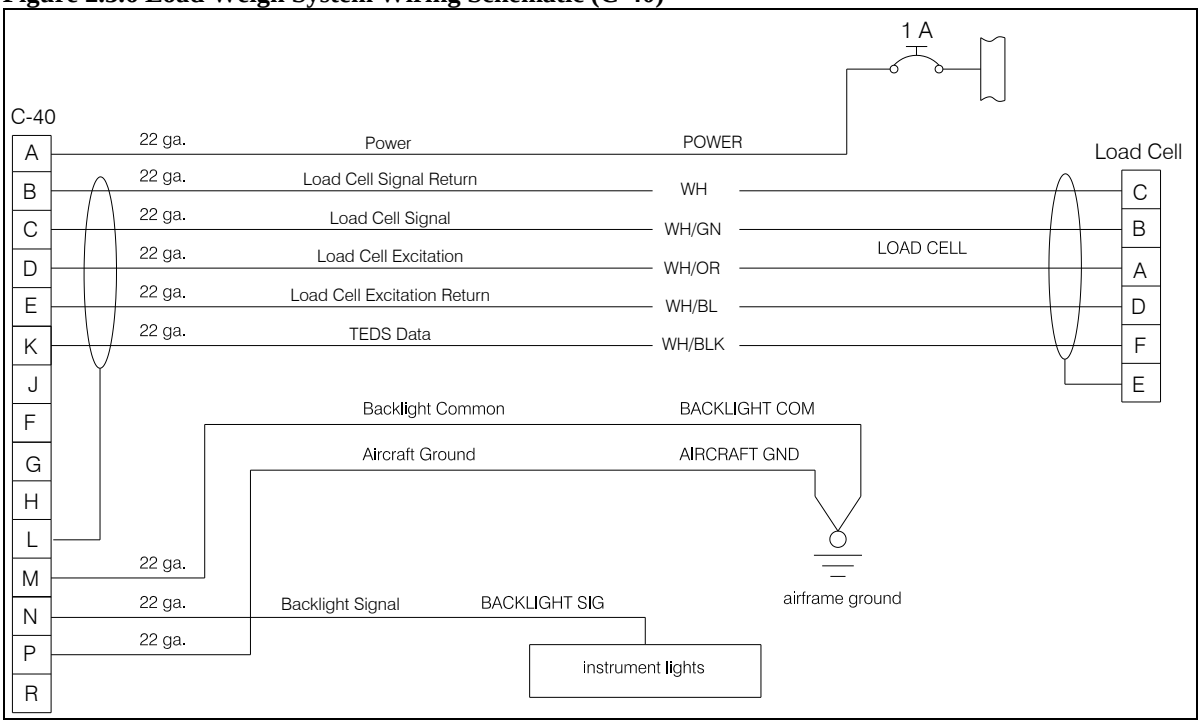
Table 2.3.1 Connector Pin-Out

Harness P/N 270-241-00		Harness P/N 270-048-04*	
Wire	**Connector Pin**	**Wire**	**Connector Pin**
WH	C	WH/OR	C
WH/GN	B	WH/GN	B
WH/OR	A	WH	A
WH/BLU	D	WH/BLU	D
WH/BLK	F	-	F
Shield	E	Shield	E

*Included with the E-85 load weigh system, the link-style load cell included with this system must be replaced with the pin load cell P/N 210-282-01 and the load cell connector of P/N 270-048-04 replaced with P/N 410-255-00.

10. Secure the connector to the Connector Bracket with four screws (P/N 510-481-00), washer (P/N 510-062-00), and nuts (P/N 510-029-00).

Figure 2.3.6 Load Weigh System Wiring Schematic (C-40)



2.4 Installation Check-Out

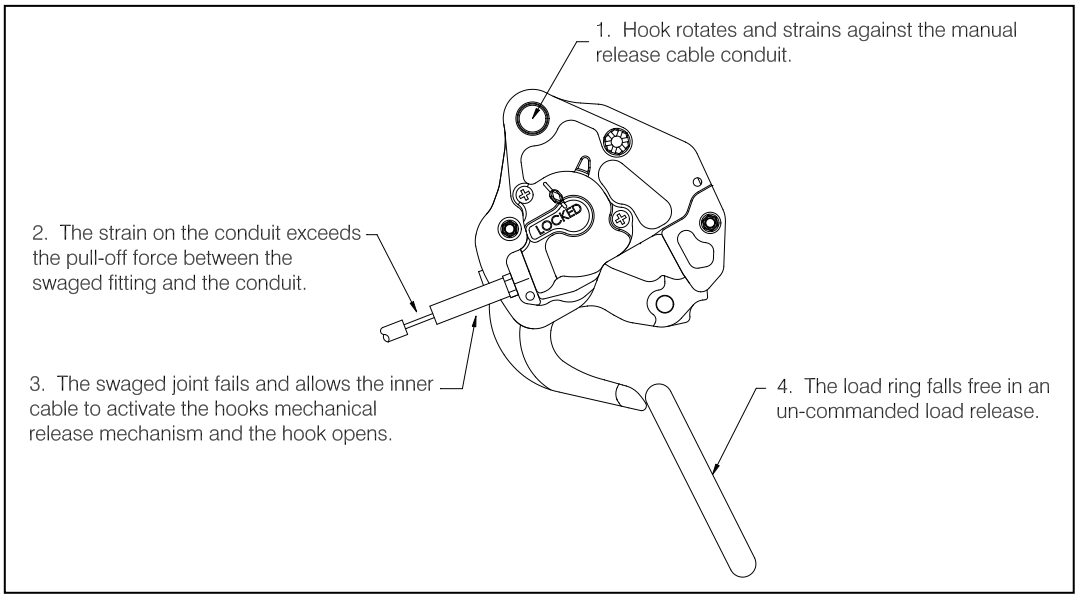
After installation of the system, perform the following functional checks.

- Swing the installed cargo hook and suspension to their full extremes to ensure that the manual release cable and the electrical harnesses have enough slack to allow full range of motion without straining or damaging the cable or harnesses. The cable or harnesses must not be the stops that prevent the cargo hook and suspension beam from pivoting freely in all directions.

WARNING

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

Figure 2.4.1 Un-Commanded Release From Incorrectly Secured Cable



- With no load on the cargo hook load beam, pull up on the T-handle next to the collective, the cargo hook should release. Reset the cargo hook load beam and verify that the hook lock indicator on the cargo hook is aligned with the lines on the manual release cover.

2.4 Installation Check-Out continued

- Provide power to the electrical release system. Electrical release system operation depends on the cargo hook P/N installed. The following instructions are applicable to cargo hook P/N 528-029-02 which is equipped with Surefire electrical release. With no load on the cargo hook perform the following.
  - Very briefly press the Cargo Release switch, the cargo hook should not actuate and the load beam should remain closed.
  - Press and hold the Cargo Release switch for a few seconds, the load beam should fall to the open position and the cargo hook solenoid should continue to cycle repeatedly.
  - Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the manual release cover.

  The following instructions are applicable to cargo hook P/N 528-029-00.
  - Press and release the Cargo Release switch on the cyclic, the load beam should immediately fall to the open position.
  - Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the cover.

- If the Load Weigh Kit is installed perform the following:
  For the C-39 Indicator:
  - Power on the Indicator and allow it to warm up for 5 minutes (with no load on the hook). Press both Indicator buttons at the same time to go to the Setup Mode. Scroll through the menu until the symbol "0 in" is displayed, then press the right button. Remove any weight that is not to be zeroed out and press either button to complete the procedure.

NOTICE

Refer to Owner's Manual 120-039-00 for setup instructions including changing the units, zeroing the display, changing the dampening level, etc. and operation instructions.

2.4 Installation Check-Out continued

For the C-40 Indicator:

- Power on the Load Weigh System. On startup the C-40 Indicator will display an information screen while performing a brief self-diagnostic routine and then display the load screen. Set the Installation Zero for the installation per the instructions contained in C-40 Indicator's Owner's Manual 120-152-00.
- In the Settings menu adjust units (lb or kg), brightness of the display, maximum load, and other settings as preferred (refer to the C-40 Indicator Owner's Manual 120-152-00 for detailed instructions). With the C-40 Indicator one setting that must be set properly to function is the backlight voltage. If the wire for the backlight was connected the backlight voltage must be set to the aircraft circuit voltage (5 VDC or 28 VDC).

Perform an EMI ground test per AC 43.13-1b section 11-107. For equipment that can only be checked in flight an EMI flight test may be required.

NOTICE

The cargo hook and load weigh system are of a class of equipment not known to have a high potential for interference. This class of equipment does not require special EMI installation testing (i.e. FADEC) as required in paragraphs 7 and 8 of FAA policy memorandum ASW-2001-01.

2.5 Component Weights

The weights and cgs of the Cargo Hook Suspension System components are listed below.

Table 2.5.2 Weight & CGs – Cargo Hook Kits

Item	Weight	Station
Fixed Provisions Kit P/N 200-328-00	5.7 lbs (2.59 kgs)	106.0 (2692)
Cargo Hook Suspension Kit w/ Pillow Blocks P/N 200-329-00, -10	9.2 lbs (4.17 kgs)	121.0 (3073)
Load Weigh Kit* P/N 200-331-00, -01, -02	1.8 lbs (0.82 kgs)	83.0 (2108)

* The load weigh kit replaces the attach bolt and washer in kit P/Ns 200-329-00, -10. The attach bolt and washer weigh 0.12 lbs.

2.6 Paper Work

In the US, fill in FAA form 337 for the initial installation. This procedure may vary in different countries. Make the appropriate aircraft log book entry. Place the Rotorcraft Flight Manual Supplement in the aircraft Flight Manual.

Section 3
Operation Instructions

Operating Procedures

Refer to Owner's Manual 120-039-00 for operation instructions for the C-39 load weigh indicator or Owner's Manual 120-152-00 if the C-40 Load Indicator is installed.

Prior to a flight involving external load operations perform the following.

1. Provide power to the electrical release system. Electrical release system operation depends on the cargo hook P/N installed. The following instructions are applicable to cargo hook P/N 528-029-02 which is equipped with Surefire electrical release. With no load on the cargo hook perform the following.
   - *Very* briefly press the Cargo Release switch, the cargo hook should not actuate and the load beam should remain closed.
   - Press and hold the Cargo Release switch for a few seconds, the load beam should fall to the open position and the cargo hook solenoid should continue to cycle repeatedly.
   - Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the manual release cover.

   The following instructions are applicable to cargo hook P/N 528-029-00.
   - Press and release the Cargo Release switch on the cyclic, the load beam should fall to the open position.
   - Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the manual release cover.

CAUTION

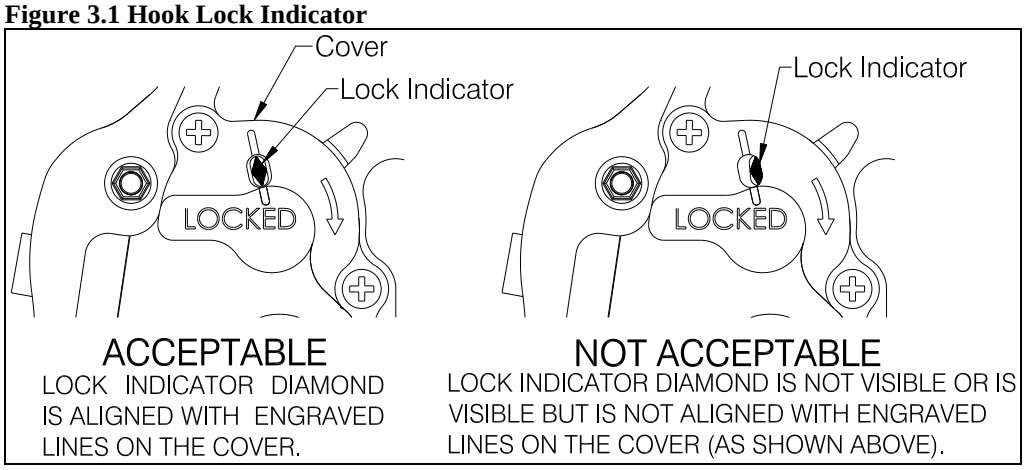
The release solenoid is intended to be energized only intermittently. Depressing the electrical release button continuously in excess of 20 seconds will cause the release solenoid to overheat, possibly causing permanent damage.

2. Pull up on the T-handle located between the pilot's and co-pilot's seat to test the cargo hook manual release system. The system should operate smoothly and the Cargo Hook must release. Reset the cargo hook by hand after release. Verify that the hook lock indicator on the side of the hook returns to the fully locked position.

⚠ CAUTION

In the fully locked position the hook lock indicator must align with the lines on the manual release cover (see Figure 3.1).

Figure 3.1 Hook Lock Indicator

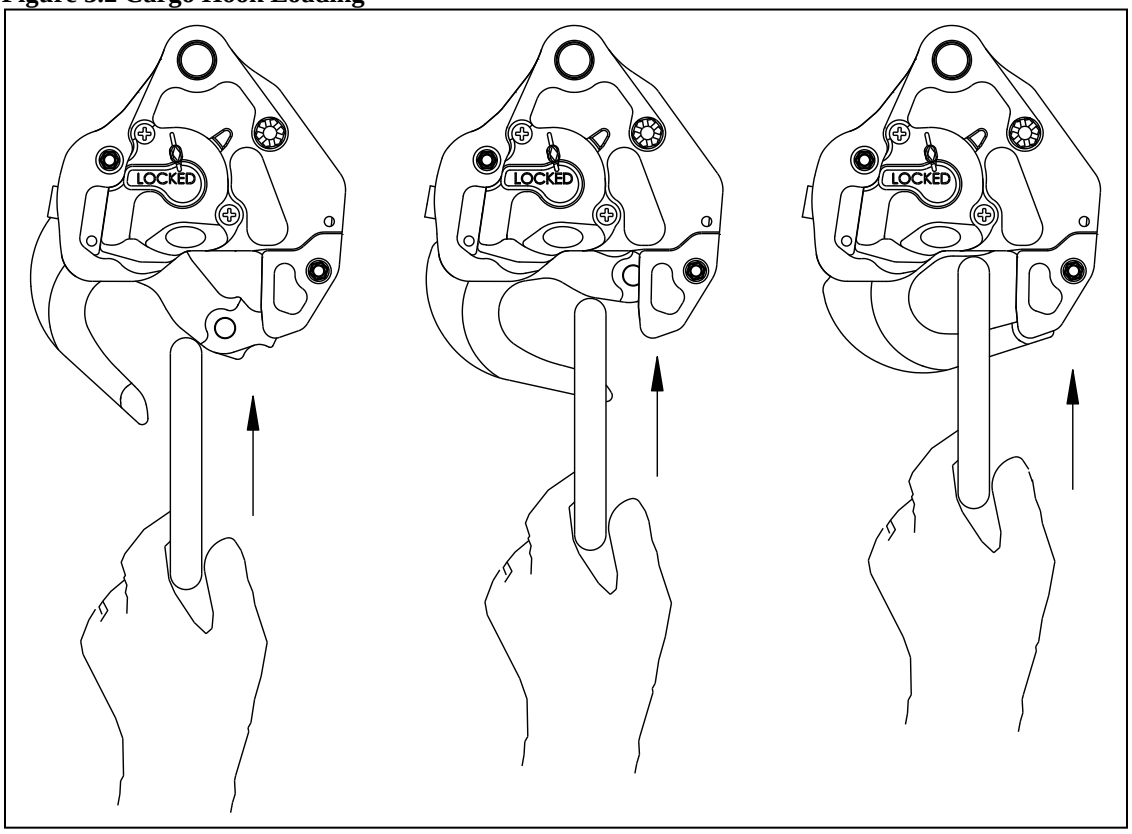


3. Swing the installed Cargo Hook and the suspension to ensure that the manual release cable and electrical harnesses have enough slack to allow full swing of each component without straining or damaging the harnesses and/or manual release cable. The manual release cable and/or harnesses must not be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

Cargo Hook Loading

The cargo hook can easily be loaded with one hand. A load is attached to the hook by pushing the ring upward against the upper portion of the load beam throat, as illustrated in Figure 3.2, until an internal latch engages the load beam and latches it in the closed position.

Figure 3.2 Cargo Hook Loading



Cargo Hook Rigging

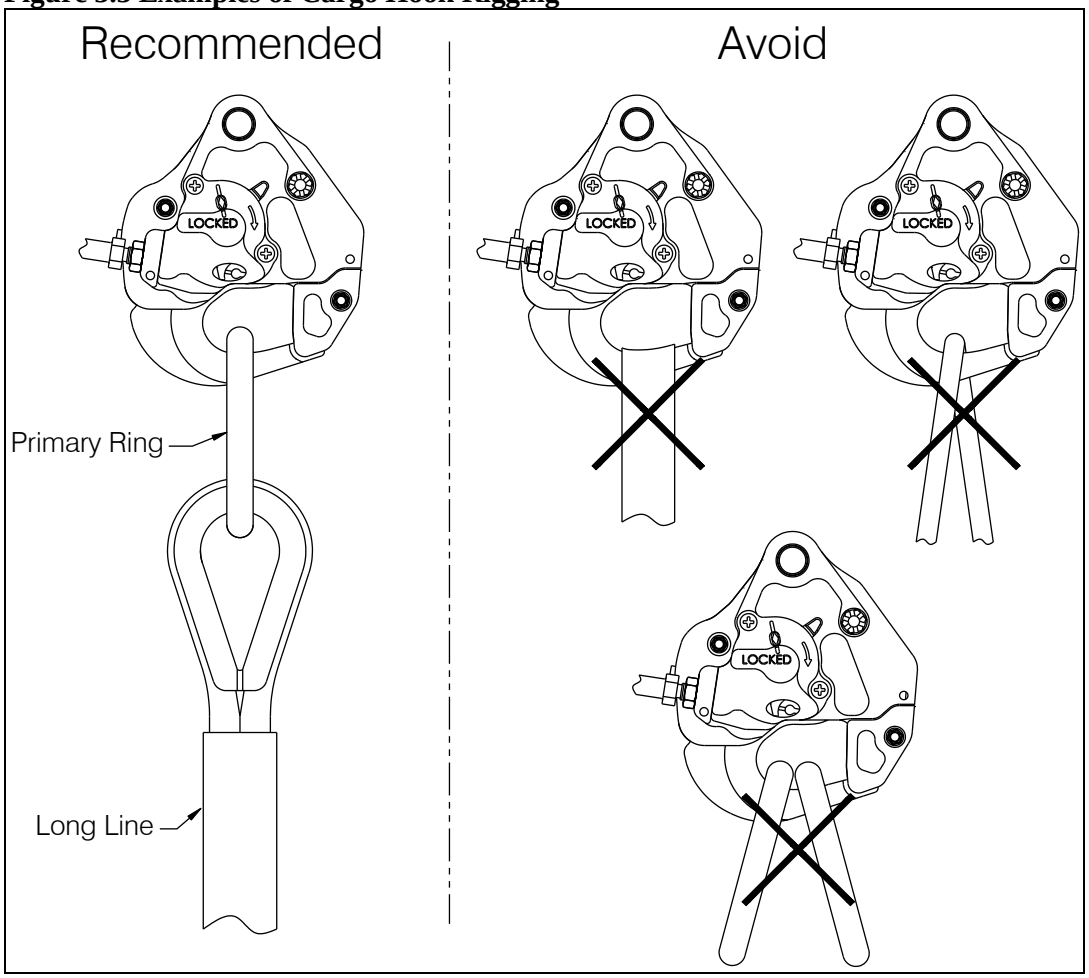
Extreme care must be exercised when rigging a load to the Cargo Hook. Steel load rings are recommended to provide consistent release performance and resistance to fouling. The following illustration shows the recommended rigging and rigging to avoid, but is not intended to represent all rigging possibilities.

It is the responsibility of the operator to ensure the cargo hook will function properly with each rigging.

Nylon type straps (or similar material) or rope should not be used directly on the cargo hook load beam. If nylon straps or rope must be used they should be first attached to a steel primary ring. Verify that the ring will freely slide off the load beam when it is opened. Only the primary ring should be in contact with the cargo hook load beam.

Cargo Hook Rigging, continued

Figure 3.3 Examples of Cargo Hook Rigging



This page intentionally left blank

Section 4
Maintenance

Refer to the Instructions for Continued Airworthiness (ICA) manual 123-032-00 for maintenance of the fixed provisions kit, load weigh kit and cargo hook suspension kits. For maintenance specific to the cargo hook refer to Cargo Hook Component Maintenance Manual 122-017-00.

Instructions for Returning Equipment to the Factory

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:

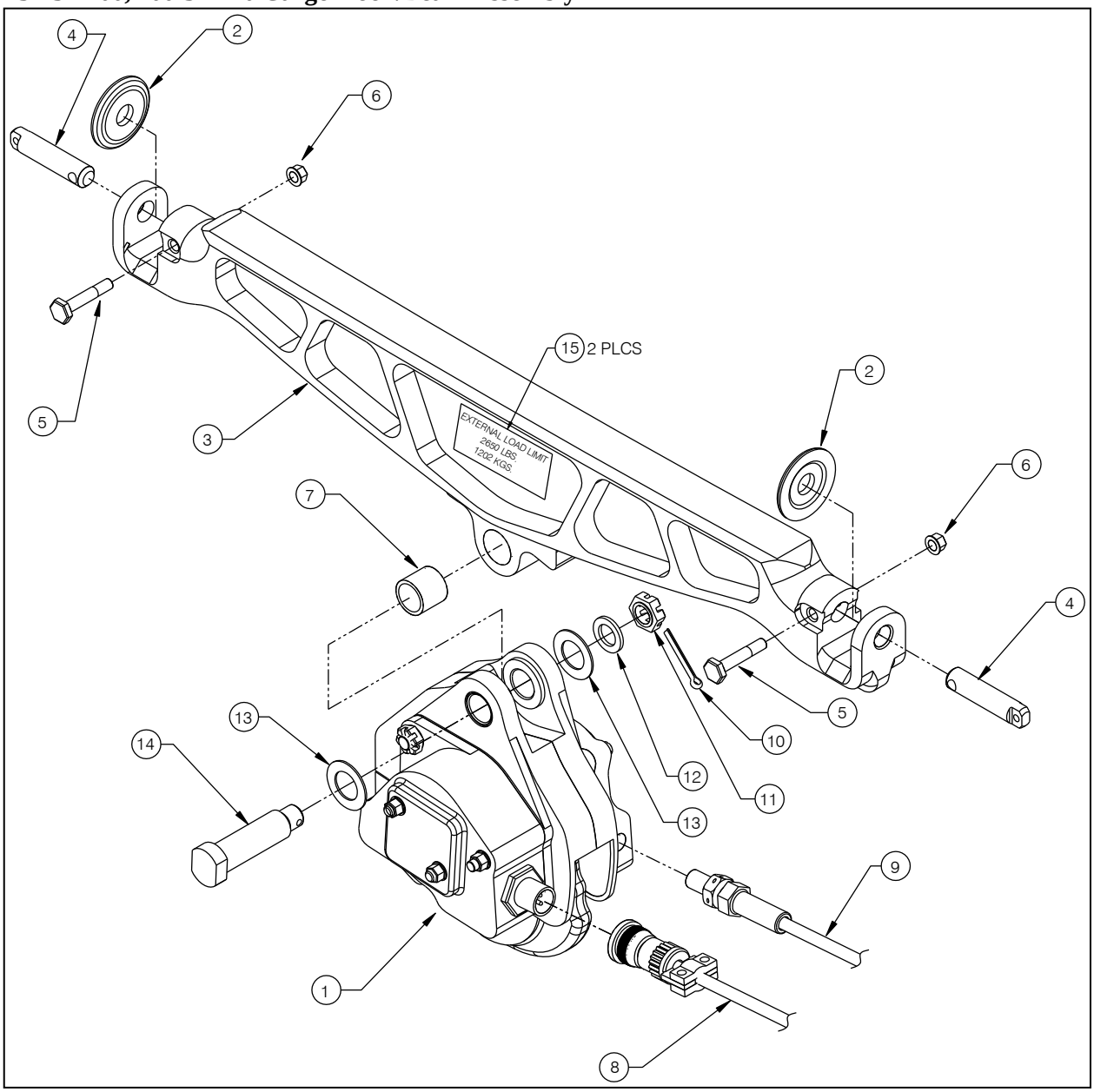
- Package the component carefully to ensure safe transit.
- Write the RMA number on the outside of the box or on the mailing label.
- Include the RMA number and reason for the return on your purchase or work order.
- Include your name, address, phone and fax number and email (as applicable).
- Return the components freight, cartage, insurance and customs prepaid to:

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

This page intentionally left blank

Section 5
System Part Numbers

232-324-00, 200-324-10 Cargo Hook/Beam Assembly

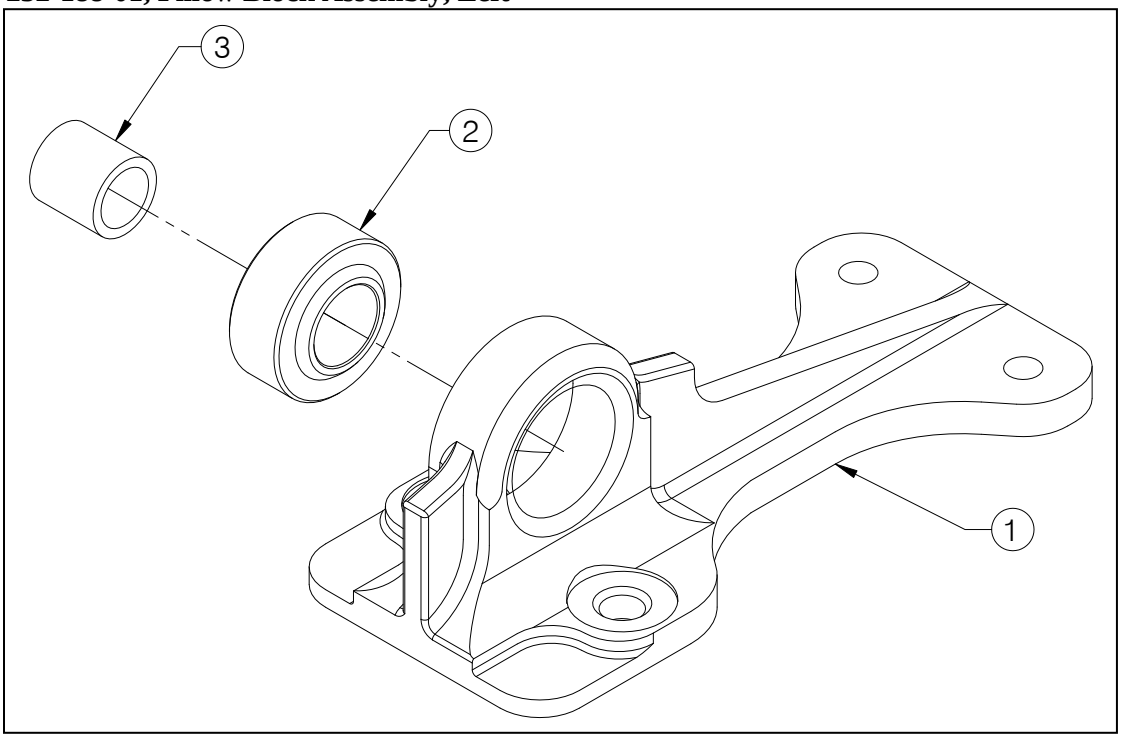


System Part Numbers continued

232-324-00, 200-324-10 Cargo Hook/Beam Assembly

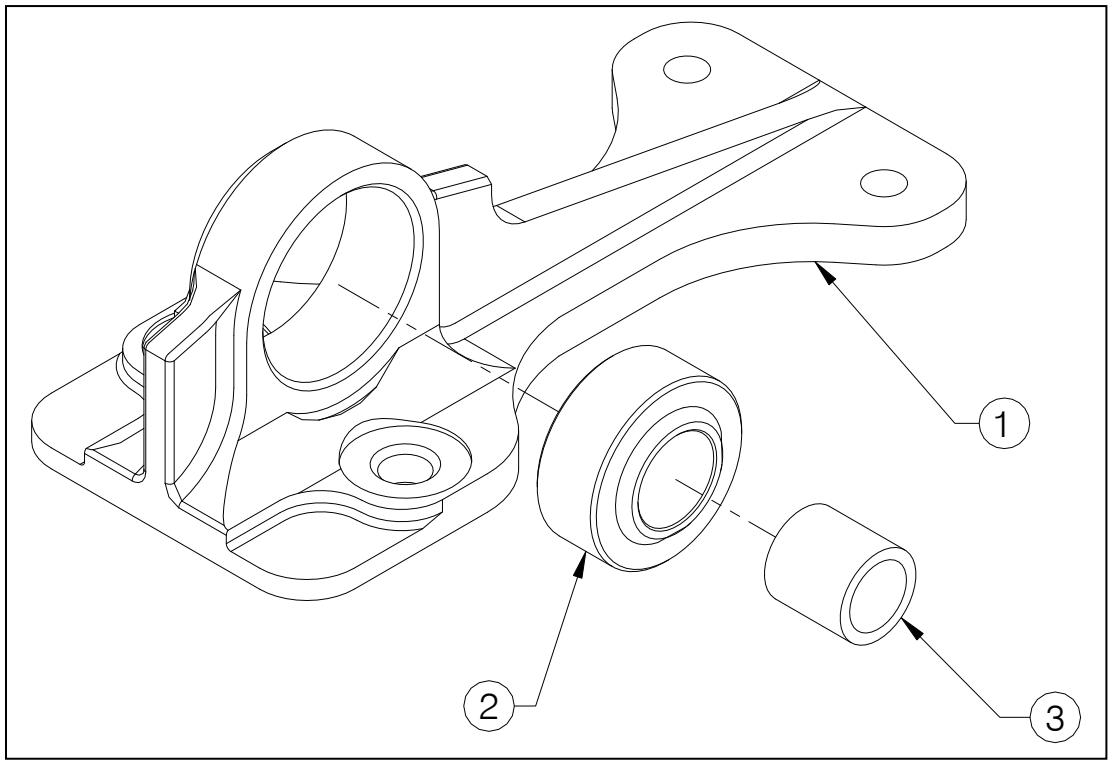
ITEM	PART NO.	DESCRIPTION	QTY	
			-00	-10
1	528-029-00	Cargo Hook	1	-
	528-029-02	Cargo Hook (with Surefire)	-	1
2	290-881-00	Thrust Washer	2	2
3	290-852-01	Main Beam	1	1
4	290-854-00	Trunnion Pin	2	2
5	510-523-00	Bolt	2	2
6	510-500-00	Nut	2	2
7	290-364-00	Bushing	1	1
8	270-155-00	Electrical Release Cable	1	1
9	268-031-00	Manual Release Cable	1	1
10	510-178-00	Cotter Pin	1	1
11	510-170-00	Nut	1	1
12	510-174-00	Washer	1	1
13	510-183-00	Washer	2	2
14	290-332-00	Attach Bolt	1	1
15	215-212-00	External Load Decal	2	2

232-188-01, Pillow Block Assembly, Left



ITEM	P/N	DESCRIPTION	QTY
1	290-853-01	Pillow Block, Left	1
2	517-012-00	Spherical Bearing	1
3	290-882-00	Shaft Bushing	1

232-189-01, Pillow Block Assembly, Right



ITEM	P/N	DESCRIPTION	QTY
1	290-883-01	Pillow Block, Right	1
2	517-012-00	Spherical Bearing	1
3	290-882-00	Shaft Bushing	1

Section 7
Certification
FAA STC

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number **SR01943SE**

This certificate, issued to **Onboard Systems International**
13915 NW 3rd Court
Vancouver, WA 98685

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part **27** *of the* **Federal Aviation Regulations.**

Original Product—Type Certificate Number: H2SW
Make: Bell
Model: 407

Description of the Type Design Change: Installation of Onboard Systems International Cargo Hook Kits and Load Weigh Kits in accordance with the Master Drawing List (MDL) No. 155-125-00, Revision 15, dated July 14, 2016, or later Federal Aviation Administration (FAA) approved revision.

Limitations and Conditions: Approval of this change in type design applies only to the above model rotorcraft. This approval should not be extended to other rotorcraft of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that rotorcraft. This modification must be maintained in accordance with Instructions for Continued Airworthiness (ICA) Document No. 123-032-00, Revision 5, dated June 24, 2016, or Document No. 123-040-00, Revision 4, dated June 24, 2016, as applicable, or later FAA-accepted revisions. This modification must be operated in accordance with RFMS 121-050-00, Revision 2, dated February 13, 2017, or RFMS No. 121-061-00, Revision 2, dated February 13, 2017, as applicable, or later FAA-approved revisions. A copy of this certificate, the applicable RFMS, the applicable Owner's Manual identified in the MDL, and the applicable ICA, must be maintained as part of the permanent records of the modified rotorcraft.

(See Continuation Sheet Page 3 of 3 Pages)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: November 26, 2007 *Date reissued:*

Date of issuance January 9, 2009 *Date amended:* February 26, 2013; March 2, 2017

By direction of the Administrator

(Signature)

Manager, Seattle Aircraft Certification Office
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred in accordance with FAR 21.47.

FAA FORM 8110-2(10-68) PAGE 1 OF 3 PAGES

FAA STC continued

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number **SR01943SE**

Onboard Systems International

Issued: January 9, 2009

Reissued:

Amended: February 26, 2013; March 2, 2017

Limitations and Conditions Continued:

Operational approval for external load operations must be granted by the local Aviation Authority. For solo external load operations from the left crew seat, provisions must be made to ensure that equipment originally intended to be operated by the pilot from the right crew seat is equally operable from the left crew seat with similar controls.

- END -

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2(10-68) PAGE 3 OF 3 PAGES

EASA STC

European Aviation Safety Agency

SUPPLEMENTAL TYPE CERTIFICATE

EASA.IM.R.S.01531 Revision 1

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EC) No. 1702/2003 to

Onboard Systems International

13915 NW 3rd Court
Vancouver
WA 98685
United States

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Product Type Certificate Number:	TCCA TC H92
Type Certificate Holder:	Bell Helicopter Textron Canada Limited
Model:	Bell 407
Original STC Number:	FAA STC SR01943SE

Description of Design Change:
200-328-00 Cargo Hook Fixed Provisions Kit;
200-329-00 Cargo Hook Suspension Kit with Pillow Blocks;
200-330-00 Cargo Hook Suspension Kit without Pillow Blocks;
200-331-00 Pin Load Weigh Kit.

Associated Technical Documentation:
- 155-125-00 revision 1 dated 16 December 2008, or later EASA approved revision – Master Drawing List;
- 120-136-00 revision 1 dated 15 December 2008, or later EASA approved revision – Owners Manual;
- 123-032-00 revision 1 dated 15 December 2008 or later EASA approved revision – Instructions for Continued Airworthiness;
- 122-017-00 revision 1 dated 14 December 2007 or later EASA approved revision – Service manual;
- 121-050-00 revision 0 dated 5 December 2008 or later EASA approved revision – Rotorcraft Flight manual Supplement.

Limitations and Conditions:
1. For P/N 200-329-00 (Cargo Hook Suspension Kit with Pillow Blocks) – P/N 200-328-00 (Fixed Provisions Kit) or Bell Helicopter P/N 206-706-341-111, -117 or -123 (Auxiliary Equipment Kit – Cargo Hook Provisions) must be installed;

   For P/N 200-330-00 (Cargo Hook Suspension Kit without Pillow Blocks) – Bell Helicopter P/N 206-706-341-125, or -127 (Auxiliary Equipment Kit) must be installed;

   For P/N 200-331-00 (Pin Load Weigh Kit) – P/N 200-329-00 or P/N 200-330-00 (Suspension Kit) or Bell Helicopter P/N 206-706-341-141 (Auxiliary Equipment Kit) must be installed.

EASA Form 91, Issue 1

European Aviation Safety Agency

2. Prior to installation of this modification the installer must determine that the interrelationship between this modification and any other previously installed modification will introduce no adverse effect upon the airworthiness of the product.
3. The installation of this modification by third persons is subject to written permission of the approval holder and holding and disposal of the approved appropriate documentation.

This Certificate shall remain valid unless otherwise surrendered or revoked.

For the European Aviation Safety Agency,

Date of issue: 10 March 2009

p/o
Massimo MAZZOLETTI
Certification Manager

STC – EASA.IM.R.S.01531 Revision 1 – Onboard Systems International

EASA Form 91, Issue 1

Transport Canada STC

Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Onboard Systems
13915 North West 3rd Court
Vancouver, Washington
United States of America 98685

Number: SH09-18
Issue No.: 1
Approval Date: April 23, 2009
Issue Date: April 23, 2009

Responsible Office: Pacific

Aircraft/Engine Type or Model: Bell 407

Canadian Type Certificate or Equivalent: H-92

Description of Type Design Change: Onboard Systems Cargo Hook Fixed Provisions, Suspension and Pin Load Weigh Kit Installation per FAA STC SR01943SE

Installation/Operating Data, Required Equipment and Limitations:

Fabrication of Onboard Systems Model 200-328-00, Cargo Hook Fixed Provisions Kit, 200-329-00 or 200-330-00 Suspension Kit and 200-331-00 Pin Load Weigh Kit in accordance with FAA approved Onboard Systems Master Drawing List No. 155-125-00, Rev. 1, dated December 16, 2008 *;

Installation of Onboard Systems Model 200-328-00, Cargo Hook Fixed Provisions Kit, 200-329-00 or 200-330-00 Suspension Kit and 200-331-00 Pin Load Weigh Kit in accordance with FAA approved Onboard Systems Owner's Manual Document 120-136-00, Rev. 1, dated December 15, 2008 *.

Inspect and Maintain Onboard Systems Model 200-328-00, Cargo Hook Fixed Provisions Kit, 200-329-00 or 200-330-00 Suspension Kit and 200-331-00 Pin Load Weigh Kit in accordance with Section ATA 5 of Onboard Systems Instructions for Continued Airworthiness Document 123-032-00, Rev. 1, dated December 15, 2008 * and Onboard Systems Cargo Hook Service Manual Document 122-017-00, Rev. 1, dated December 14, 2007 *.

Rotorcraft modified with Onboard Systems Model 200-328-00, Cargo Hook Fixed Provisions Kit, 200-329-00 or 200-330-00 Suspension Kit and 200-331-00 Pin Load Weigh Kit approved under this STC must be operated in accordance with FAA approved Onboard Systems Rotorcraft Flight Manual Supplement No. 121-050-00, Rev. 0, dated December 5, 2008 *.

(* or later FAA approved revisions)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

Henry Wong
For Minister of Transport

Canada

ANAC STC

ANAC

CERTIFICADO SUPLEMENTAR DE TIPO

(Supplemental Type Certificate)

NÚMERO (Number) **2012S04-07**

Este certificado, emitido com base na Lei nº 7565 "Código Brasileiro de Aeronáutica", de 19 de dezembro de 1986,
(This certificate, issued in the basis of the Law No. 7565 "Código Brasileiro de Aeronáutica", dated 19 December 1986,

é conferido ao (à): (is granted to:) Onboard System International
13915 NW 3rd Court
Vancouver, WA 98685
USA

por ter a modificação ao projeto de tipo do produto abaixo citado, observadas as limitações e condições
(for having the change to the type design of the product mentioned below, with the limitations and conditions therefor as)

especificadas, satisfeito aos requisitos de aeronavegabilidade aplicáveis.
(specified hereon, met the applicable airworthiness requirements.)

Produto Original - Número do Certificado de Tipo: (Original Product – Type Certificate No:) 9603 (ANAC)

Fabricante: (Manufacturer:) Bell Helicopter Textron

Modelo(s): (Model(s):) Bell 407

DESCRIÇÃO DA MODIFICAÇÃO AO PROJETO DE TIPO:
(Description of Type Design Change:)

Installation of Onboard System kits 200-328-00, 200-329-00, 200-330-00 or 200-331-00 in accordance with Onboard System Master Drawing List, document No. 155-125-00, Rev. 5, dated 04 May 2011, or later approved revision.

This CST validates in Brazil the STC No. SR01943SE, issued by FAA (USA).

LIMITAÇÕES E CONDIÇÕES:
(Limitations and Conditions:)

See continuation sheet for applicable data.

DATAS:
(Dates of:)

Do Requerimento: (Application:) 05 Dec. 2011 **Da emissão:** (Issue:) 16 Apr. 2012 **Da reemissão:** (Reissue:)

HÉLIO TARQUINIO JÚNIOR
Gerente-Geral, Certificação de Produto Aeronáutico
(General Manager, Aeronautical Product Certification)

DINO ISHIKURA
Superintendente de Aeronavegabilidade
(Airworthiness Superintendent)

F-400-01F (03.11) Fl. 01 de 02 (Sheet) (of) H.02-3809-0

ANAC

Folha de Continuação ao
(Continuation Sheet to)

CERTIFICADO SUPLEMENTAR DE TIPO
(Supplemental Type Certificate)

NÚMERO **2012S04-07**
(Number)

LIMITAÇÕES E CONDIÇÕES:
(Limitations and Conditions:)

I. The approval of this type design change should not be extended to other rotorcraft of these models on which other previously approved modifications are incorporated unless it is determined by the installer that the relationship between this change and any of those other previously approved modifications, including changes in Type Design, will introduce no adverse effect upon the airworthiness of that rotorcraft.

II. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

III. Operation must be performed in accordance with the FAA approved Airplane Flight Manual Supplement (AFMS) Document No. 121-050-00, Rev. 0, dated 05 Dec. 2008, or later approved revision.

IV. Instructions for Continued Airworthiness (ICA), Document No. 123-032-00, Rev. 2, dated 18 Mar. 2010, or later FAA approved revision and Onboard Systems Cargo Hook Service Manual, document No. 122-017-00, Rev. 13, dated 29 Mar. 2011 or later FAA approved revision are required for this installation.

V. Approval of this change in type design applies only to that model rotorcraft listed above, which, for P/N 200-329-00, are equipped with Onboard Systems P/N 200-328-00 Fixed Provisions Kit or with Bell Helicopter P/N 206-706-341-111, -117 or -123 Auxiliary Equipment Kit - Cargo Hook Provisions; for P/N 200-330-00, those which are equipped with Bell Helicopter P/N 206-706-341-125 or -127 Auxiliary Equipment Kit, or for P/N 200-331-00, those which are equipped with Onboard Systems P/N 200-329-00 or P/N 200-330-00 Suspension Kit or with Bell Helicopter P/N 206-706-341-141 Auxiliary Equipment Kit.

VI. A copy of this Certificate and the Supplement referred on item III above shall be maintained as part of the permanent records of the modified aircraft.

----------END----------

F-400-01F (03.11)

Fl. 02 de 02
(Sheet) (of)

H.02-3809-0