Owner's Manual
Cargo Hook Kit

on the

Robinson R66 Helicopter

STC SR02447SE

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Applicable Equipment Part Numbers

200-380-00, 200-380-10
200-381-00, 200-381-01, 200-381-10, 200-381-11
200-382-00
200-392-00
200-417-00

Please check our web site www.onboardsystems.com for the latest revision of this manual.

Record of Revisions

Revision	Date	Page(s)	Reason for Revision
3	04/15/15	All	Added CAUTION on page 12, updated placard list.
4	07/29/15	8, 10, 45	Changed pin load cell to P/N 210-301-01.
5	09/18/15	13	Added notice regarding Robinson Service Letter SL-11.
6	11/03/15	52	Added CGs to Table 4.12.1.
7	05/03/16	26-29	Updated load weigh system installation instructions.
8	08/22/16	4, 6, 38, 52, 54, 58-68	Removed load weigh system operation instructions (was section 6.0) and replaced with reference to manual no. 120-039-00. Updated instructions for attaching handle end of manual release cable and installation check-out.
9	12/06/16	37, 38	Clarified installation orientation of Manual Release Channel P/N 235-253-00.
10	02/24/17	All	Added kit P/N's 200-380-10 and 200-381-10 which include cargo hook P/N 528-029-02 with Surefire Release.
11	01/16/20	Pages 6, 11, and 12. Sections 4.2 and 4.11.	Added C-40 indicator model and associated instructions.
12	11/20/23	6, 12, 28	Replaced C-40 Indicator P/N 210-293-00 with P/N 210-293-01 in new production kits.

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Table of Contents

1.0 Introduction

1.1 Scope

This owner's manual contains instructions for installation, operation, and maintenance of the Cargo Hook Suspension System on the Robinson R66 Helicopter.

1.2 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

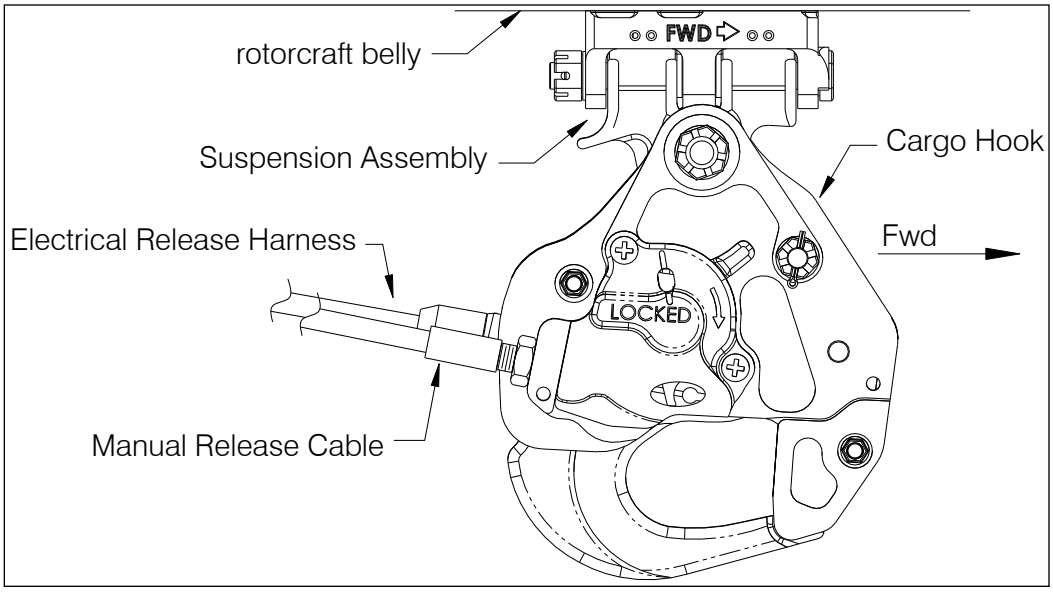
121-058-00	RFM Supplement
122-017-00	Component Maintenance Manual
123-038-00	ICA Manual
120-039-00	Owner's Manual, C-39 Indicator
120-152-00	Owner's Manual, C-40 Indicator

3.0 System Overview

3.1 Description

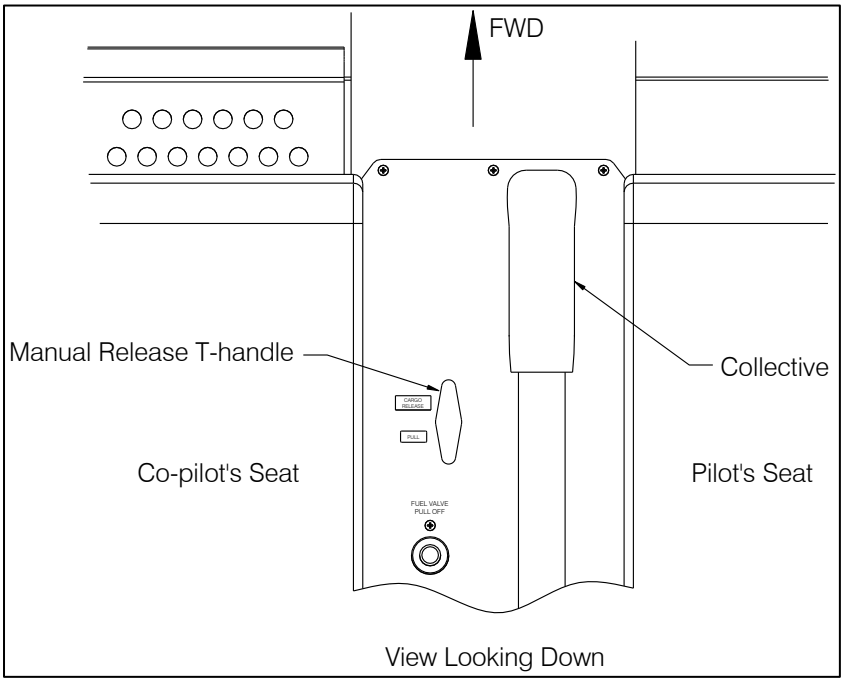
The P/N 200-380-00, 200-380-10, 200-381-00, and 200-381-10 Cargo Hook Suspension Kits are approved for use on the Robinson R66 helicopters. These kits provide a means for a rotorcraft to transport jettisonable external loads. They include the cargo hook, the suspension assembly which serves as the means to attach the cargo hook to the helicopter's hard point, the electrical release system including a cyclic mounted release switch, and the backup manual release system.

Figure 3.1 Overview of Cargo Hook Installation



A load release can be initiated by three different methods. Normal release is achieved by pilot actuation of the release switch on the cyclic. When the switch is pressed, it energizes a DC solenoid in the Cargo Hook, and the solenoid opens a latch in the internal mechanism. In an emergency, release can be achieved by pulling the manual release system's T-handle located between the pilot and co-pilot seats (see Figure 3.2). Pulling up on the T-handle pulls the inner cable of the manual release cable which is routed to the Cargo Hook and this action actuates the internal mechanism of the Cargo Hook to release the load. The load can also be released by ground crew using a lever located on the side of the Cargo Hook.

Figure 3.2 Manual Release T-handle

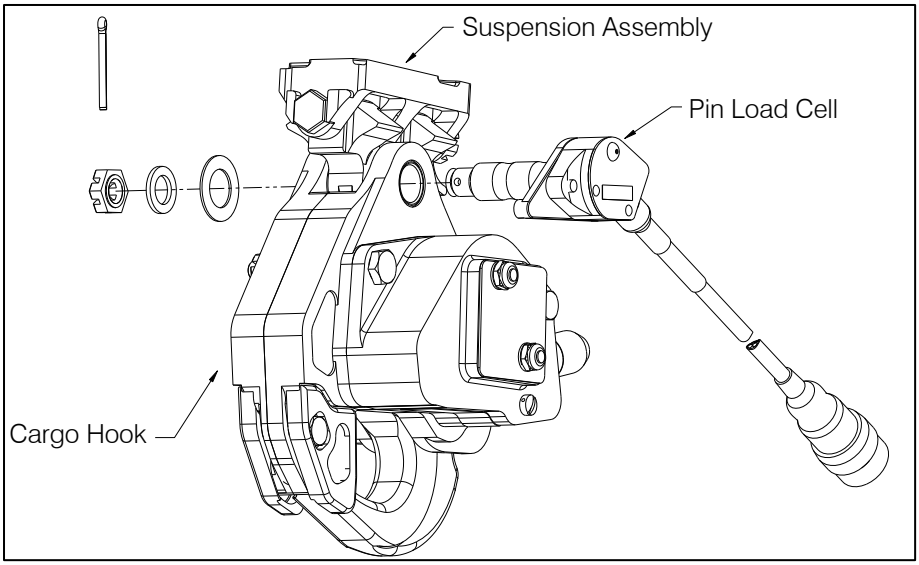


The P/N 200-381 series kits are the same as the P/N 200-380 series kits except they include a load weigh system. The load weigh system includes the pin load cell assembly at the cargo hook (see Figure 3.3), a load weigh indicator, and the interconnecting wire harness. The load weigh indicator included with the P/N 200-381-01 and P/N 200-381-11 Load Weigh System is Onboard Systems next generation indicator, the C-40 model (P/N 210-293-01). The C-40 Indicator makes several improvements over its predecessor (the C-39 model, P/N 210-095-00) while preserving classical features and is generally backwards compatible. Among others, the C-40 Indicator offers these improvements:

- Full color display
- Load measurement displayed in full, not X 10 (C-39 is X 10)
- Addition of Analog Bar and Maximum Load features
- Simplified user interface
- Addition of Cargo Hook hour meter
- Selectable backlight control voltage, 5 or 28 VDC
- Improved moisture resistance
- Expanded signal input range
- Field-upgradable firmware

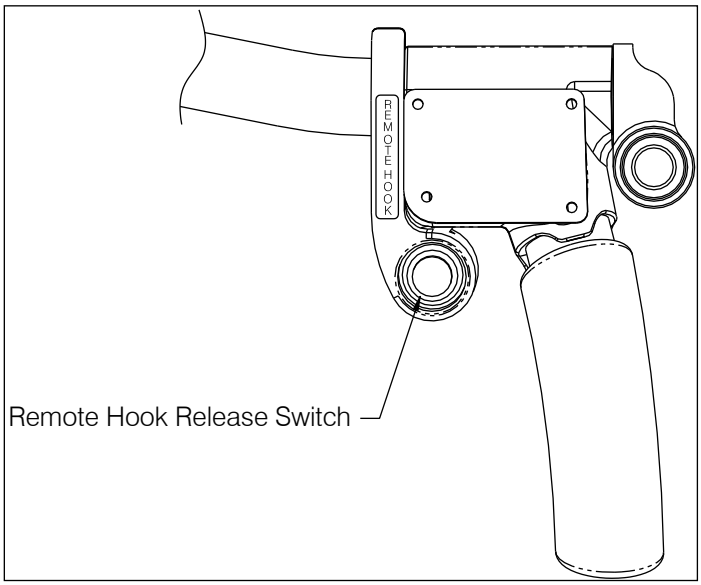
For a detailed description and operation instructions refer to Owner's Manual No. 120-039-00 for the C-39 model load weigh indicator and Owner's Manual 120-152-00 for the C-40 model load weigh indicator.

Figure 3.3 Cargo Hook Installation with Pin Load Cell



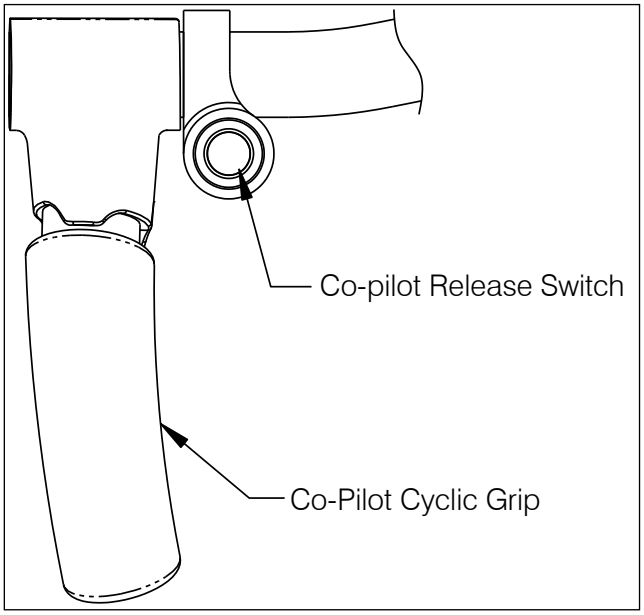
A Remote Hook Electrical Release Kit (P/N 200-392-00) is available as a complement to the kits listed above. This kit provides the fixed electrical provisions for the operation of a remote cargo hook such as the Onboard Systems P/N 210-303-00 cargo hook w/ cage or the 528-018 series of cargo hooks. The kit includes a cyclic mounted release switch, circuit breaker, relay, wiring, and a standard electrical connector for attaching a long line connector. The 200-392-00 remote electrical release kit is limited to use with intermittent electrical loads only (such as a remote cargo hook electrical release).

Figure 3.4 Remote Hook Release Switch



Another optional kit (P/N 200-417-00) provides a cargo hook electrical release switch to be mounted on the co-pilot's cyclic for use in external load training.

Figure 3.5 Co-pilot Release Switch



3.2 Surefire Release

Kit P/N's 200-380-10, 200-381-10, and 200-381-11 include a cargo hook (P/N 528-029-02) with Surefire which includes a short time delay circuit built into the cargo hook's electrical release system. This feature is a safety enhancement to protect against inadvertent load release due to accidental contact with the 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.

In addition to its P/N, a cargo hook with Surefire can be identified by a gold color solenoid housing (see Figure 3.6). Also a placard on the underside of the solenoid housing indicates that the electrical release is delayed by ½ second.

NOTICE

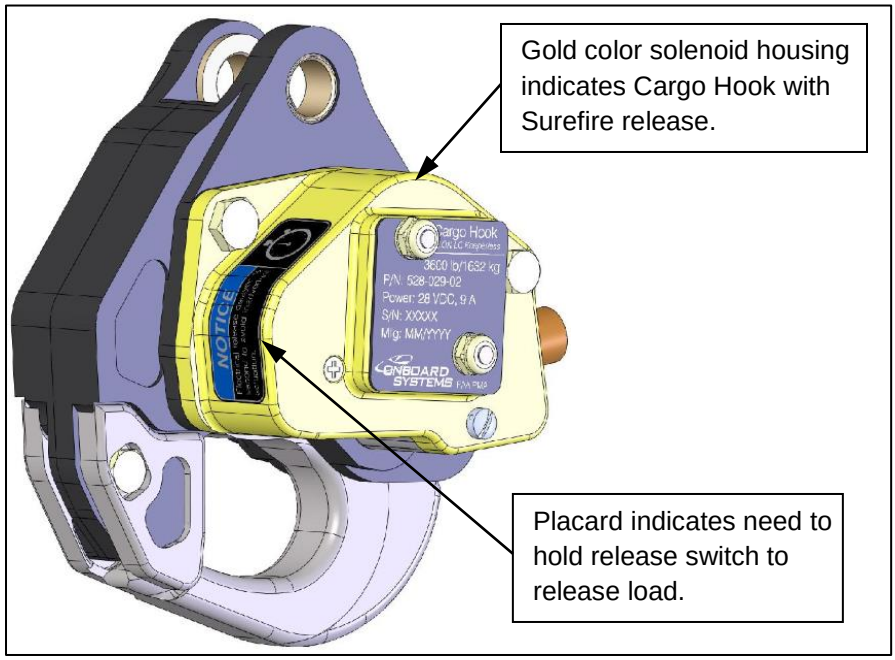
Cargo hook P/N 528-029-02 includes an electronic delay of approximately ½ second. It is necessary to press and hold the cargo hook release button to release the load.

⚠ 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 3.6 Surefire Configuration Identification



3.3 Bill of Materials

The following items are included with the Cargo Hook Suspension System Kits. If shortages are found contact the company from whom the system was purchased.

Table 3.3.1 Cargo Hook Suspension System Bill of Materials

Part No.	Description	200-380-00	200-380-10	200-381-00	200-381-01	200-381-10	200-381-11	200-382-01*
210-095-00	C-39 Indicator	-	-	1	-	1	-	-
210-293-01**	C-40 Indicator	-	-	-	1	-	1	1
210-301-01	Pin Load Cell Assembly	-	-	1	1	1	1	1
215-012-00	Elect. Weighing System Placard	-	-	1	-	1	-	-
215-277-00	External Load Limit Decal	1	1	1	1	1	1	-
215-281-00	R66 Multiple Label Sheet	1	1	1	1	1	1	-
215-343-00	Cockpit Decal (Surefire)	-	1	-	-	1	1	-
232-498-00	Suspension Assembly	1	1	1	1	1	1	-
232-512-00	Switch Housing Assembly	1	1	1	1	1	1	-
235-223-00	Connector Panel Assembly	1	1	1	1	1	1	-
235-234-00	Belly Panel	1	1	1	1	1	1	-
235-251-00	Relay Bracket	1	1	1	1	1	1	-
235-252-00	Manual Release Support Clip	1	1	1	1	1	1	-
235-253-00	Manual Release Channel	1	1	1	1	1	1	-
235-254-00	Indicator Trim Plate	-	-	1	1	1	1	1
235-255-00	Doubler	-	-	1	1	1	1	1
268-057-01	Manual Release Cable Assembly	1	1	1	1	1	1	-
270-192-00	Load Weigh Internal Harness	-	-	1	-	1	-	-
270-192-01	Load Weigh Internal Harness	-	-	-	1	-	1	1
270-193-00	Internal Electrical Harness	1	1	1	1	1	1	-
270-206-00	External Electrical Harness	1	1	1	1	1	1	-
270-211-00	Ground Strap	1	1	1	1	1	1	-
270-212-00	Ground Wire Assembly	1	1	1	1	1	1	-
290-332-00	Attach Bolt	1	1	-	-	-	-	-
291-669-00	Bolt	2	2	2	2	2	2	-
528-029-00	Cargo Hook	1	-	1	1	1	1	-
528-029-02	Cargo Hook (w/ Surefire)	-	1	-	-	1	1	-
410-079-00	Connector	-	-	1	1	1	1	1
410-162-00	Ring Terminal	1	1	2	2	2	2	1
410-199-00	Shield Termination	-	-	1	1	1	1	1
410-295-00	Ring Terminal	1	1	2	2	2	2	1
420-084-00	Wire, 22 Gauge	84"	84"	84"	84"	84"	84"	-
440-007-00	Circuit Breaker	1	1	1	1	1	1	-
445-005-00	Relay	1	1	1	1	1	1	-
450-001-00	Heat Shrink, ½" Lg.	2	2	2	2	2	2	-
450-010-00	Heat Shrink, 1 ½" Lg.	-	-	1	1	1	1	1
500-518-00	Spacer	2	2	2	2	2	2	-
505-021-00	Grommet	-	-	1	1	1	1	1
610-030-00	Grommet	1	1	1	1	1	1	-
510-029-00	Nut	4	4	8	8	8	8	4

Part No.	Description	200-380-00	200-380-10	200-381-00	200-381-01	200-381-10	200-381-11	200-382-01*
510-062-00	Washer	4	4	8	8	8	8	4
510-095-00	Washer	3	3	3	3	3	3	-
510-102-00	Nut	3	3	3	3	3	3	-
510-170-00	Nut	1	1	1	1	1	1	-
510-174-00	Washer	1	1	1	1	1	1	-
510-178-00	Cotter Pin	1	1	1	1	1	1	1
510-183-00	Washer	2	2	1	1	1	1	-
510-209-00	Washer	5	5	5	5	5	5	-
510-238-00	Washer	2	2	2	2	2	2	-
510-282-00	Rivet	-	-	6	6	6	6	6
510-391-00	Screw	1	1	1	1	1	1	-
510-453-00	Bolt	1	1	1	1	1	1	-
510-481-00	Screw	4	4	8	8	8	8	4
510-493-00	Screw	7	7	7	7	7	7	-
510-514-00	Nut	6	6	6	6	6	6	-
510-515-00	Screw	2	2	2	2	2	2	-
510-639-00	Instrument Mounting Nut	-	-	4	-	4	-	-
510-641-00	Nut Plate	-	-	1	1	1	1	1
510-677-00	Screw	-	-	4	-	4	-	-
510-712-00	Bolt	2	2	2	2	2	2	-
510-908-00	Screw	-	-	1	1	1	1	1
510-972-00	Rivet	-	-	2	2	2	2	2
511-101-00	Washer	2	2	2	2	2	2	-
511-102-00	Nut	1	1	1	1	1	1	-
511-103-00	Screw	1	1	1	1	1	1	-
511-223-00	Screw	-	-	-	4	-	4	4
512-003-00	Ty-wraps	-	-	8	8	8	8	8
512-027-00	Cushioned Loop Clamp	1	1	1	1	1	1	1
512-037-00	Cushioned Loop Clamp	4	4	4	4	4	4	-
512-061-00	Plain Loop Clamp	1	1	1	1	1	1	-
590-017-00	Spiral Wrap	18"	18"	18"	18"	18"	18"	-

*Kit P/N 200-382-01 is a load weigh upgrade kit which converts kit P/N 200-380-00 and P/N 200-380-10 to kit P/N 200-381-01 and P/N 200-381-11 respectively. It supersedes Kit P/N 200-382-00 which included C-39 Indicator P/N 210-095-00 and internal harness P/N 270-192-00.

**C-40 Indicator P/N 210-293-01 replaces P/N 210-293-00 in new productions kits as of November 2023, these P/Ns are interchangeable with the exception of software compatibility. Refer to C-40 Owner's Manual 120-152-00 for software compatibility.

NOTICE

The C-40 Indicator is a direct replacement for the C-39 Indicator. The internal harness (P/N 270-192-00) for the C-39 indicator is compatible with the C-40 model.

Table 3.3.2 Remote Release Kit (P/N 200-392-00) Bill of Materials

Part No.	Description	Qty
215-284-00	Placard Sheet	1
232-513-00	Switch Housing Assembly	1
270-191-00	Internal Electrical Harness	1
270-205-00	External Electrical Harness	1
410-295-00	Ring Terminal	1
410-309-00	Ring Terminal	1
420-084-00	22 Ga. Wire	60"
440-012-00	Circuit Breaker, 15 Amp	1
445-013-00	Relay	1
450-001-00	Heat Shrink, ½" Lengths	2
510-029-00	Nut	2
510-062-00	Washer	2
510-481-00	Screw	2

Table 3.3.3 Co-pilot Release Switch Kit (P/N 200-417-00) Bill of Materials

Part No.	Description	Qty
215-310-00	Placard	1
232-625-00	Co-pilot Switch Housing Assembly	1
512-011-00	Tie-Rap	2

3.4 Specifications

Table 3.4.1 Specifications - Kit P/N 200-380 series & P/N 200-381 series

System design load rating*	1,200 lb. (544 kg.)
Design ultimate strength	4,500 lb. (2,041 kg.)
Cargo hook electrical release capacity	9,000 lb. (4,081 kg.)
Cargo hook mechanical release capacity	9,000 lb. (4,081 kg.)
Force required for mechanical release at 3,600 lb.	8 lb. Max.(.600" travel)
Cargo hook electrical requirements	22-32 VDC, 6.9 - 10 amps
Cargo hook minimum release load	0 pounds
Cargo hook mating electrical connector	PC06P8-2S

⚠ CAUTION

**Load ratings given are specific to the equipment described only. Loading limits for the helicopter still apply. Consult the flight manual issued by the TC holder and the flight manual supplement provided with the cargo hook kit for limits.*

4.0 Installation

These procedures 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.

NOTICE

The helicopter must be equipped with the upgraded main gearbox (reference Robinson's R66 Service Letter SL-11) before conducting external load operations with the cargo hook.

The R66 maintenance and parts manuals should be available throughout the installation as various R66 components will be referred to by name and part number. The part numbers for Robinson components are provided for reference and are subject to change by Robinson.

All equipment removed and replaced shall be done in accordance with the R66 maintenance manual. All installed hardware shall be torqued in accordance with standard torques of AC43.13 unless noted otherwise. Apply torque stripe where applicable.

4.1 Electrical Wiring Installation

Depending on the kit configurations being installed, there are up to three internal wiring harnesses to install. The primary electrical release harness (P/N 270-193-00) is always installed. The load weigh internal harness (P/N 270-192-00 or P/N 270-192-01) is installed with kit P/N 200-381 series or as part of upgrade kit P/N 200-382-01 (see section 4.2 for load weigh harness installation instructions). The Remote Electrical Release Harness (P/N 270-191-00) is installed with kit P/N 200-392-00.

The primary cargo hook electrical release system is powered from the bus through a 10-amp circuit breaker to a relay mounted on the left keel panel between the pilot and co-pilot seats. A switch on the cyclic controls the relay and energizes the solenoid in the Cargo Hook, opening the hook and releasing the cargo. A schematic for the primary electrical release system is shown in Figure 4.1. Schematics for the load weigh system and remote electrical release system are shown in Figure 4.2 and Figure 4.4 respectively.

Route all wires using the following general guidance.

- Pick up existing wire runs by opening existing cable clamps nylon ties alone may not be used for primary support.
- New wire runs should be supported with MS21919WDG loop clamps.
- The distance between supports should not exceed 21 inches.
- The minimum radius of bends in wire groups or bundles must not be less than 10 times the outside diameter of the largest wire or cable.

- Inspect and verify that the wire harness may not be manually deflected into a structure with a bend radius less than .125".

Figure 4.1 Primary Cargo Hook Release Electrical Schematic

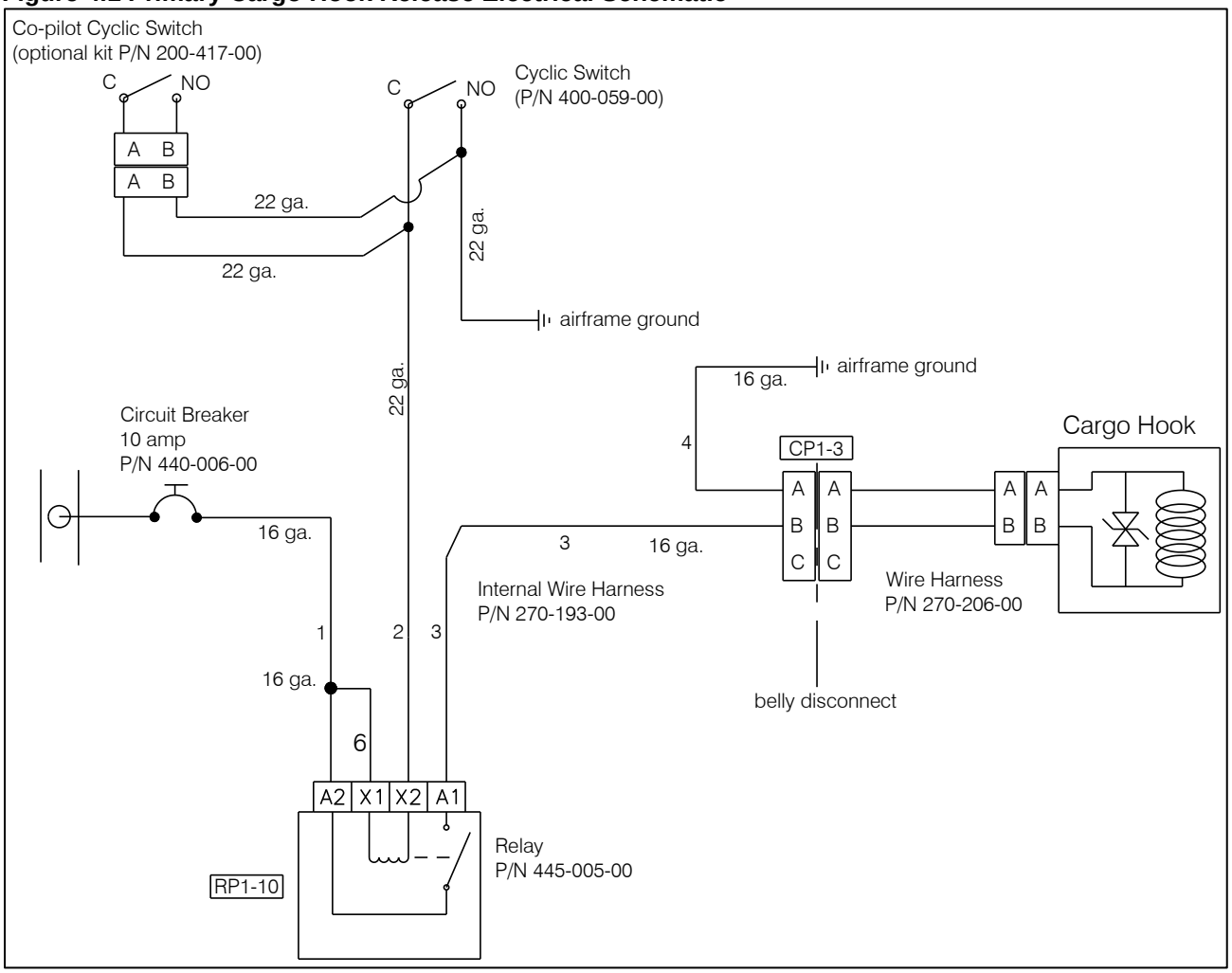


Figure 4.2 Load Weigh System Schematic w/ C-39 Indicator

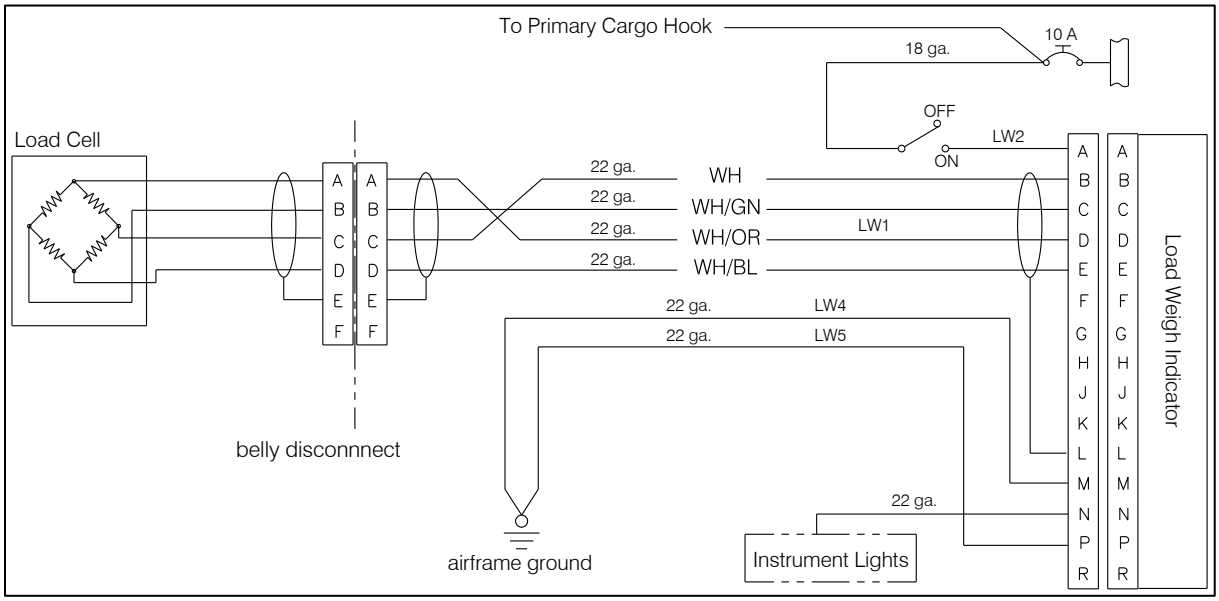


Figure 4.3 Load Weigh System Schematic w/ C-40 Indicator

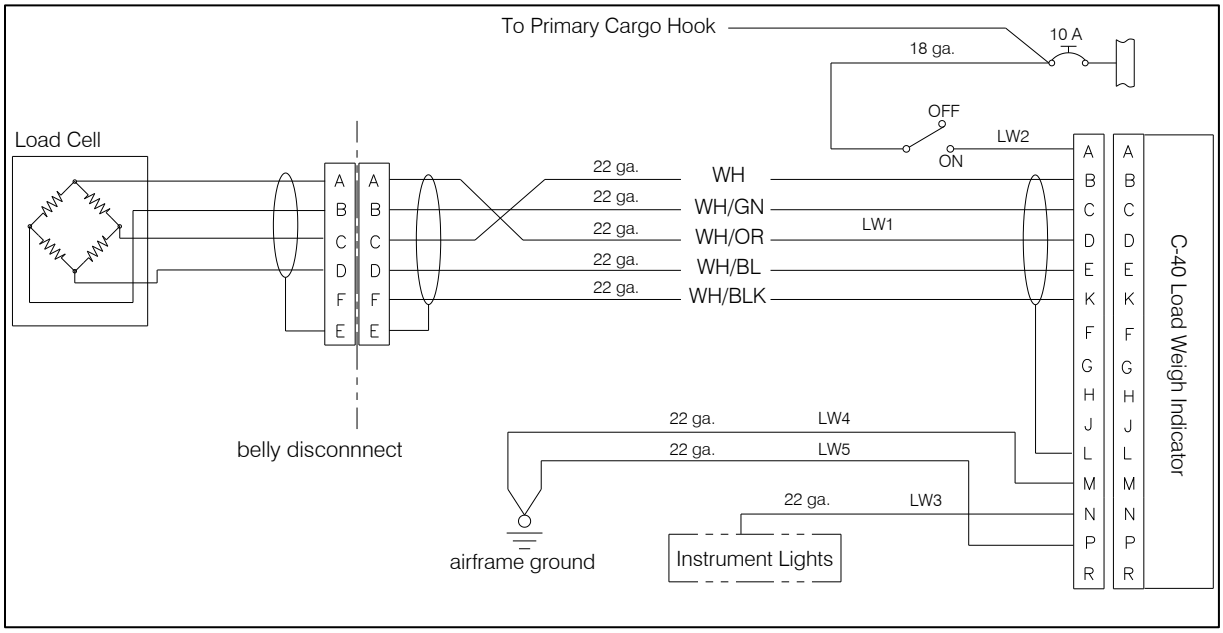
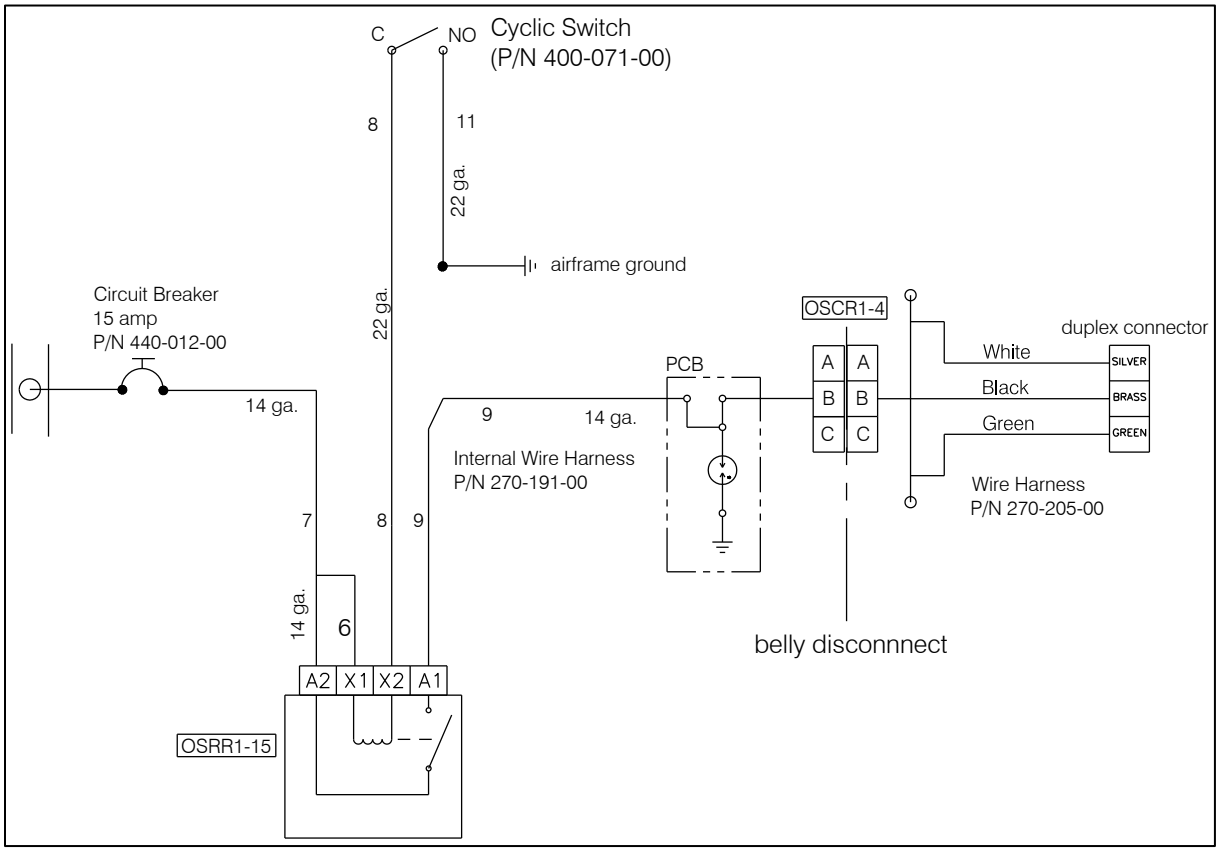


Figure 4.4 Remote Electrical Release Schematic

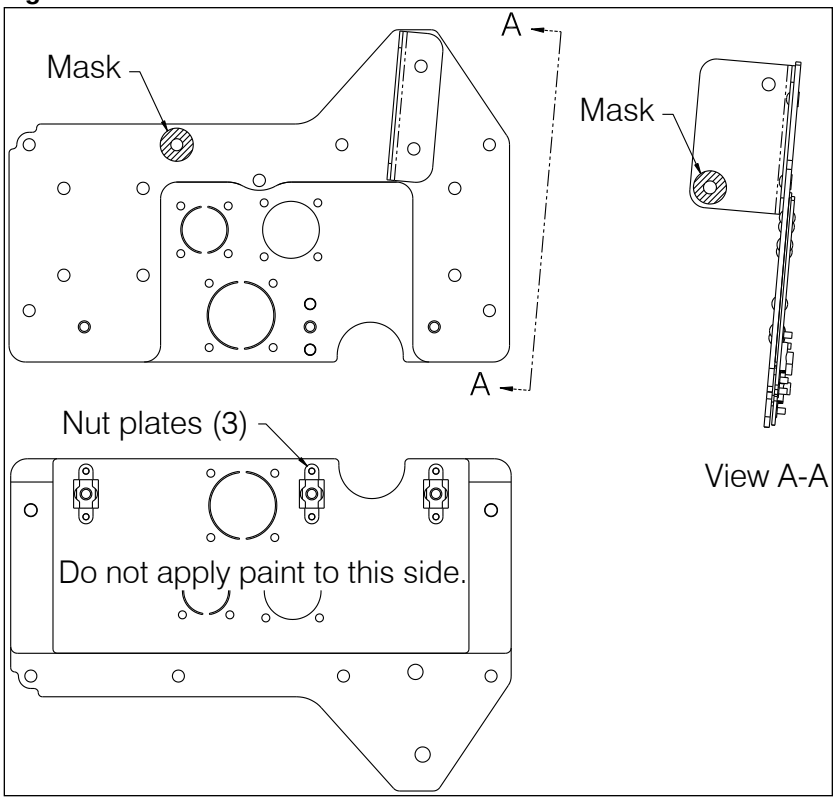


Install the electrical release wiring per the following instructions, if also installing the load weigh system refer to section 4.2 concurrently as all wiring is routed along the same existing wire harnesses.

1. Remove the forward and aft belly inspection panels and the Cover Assembly beneath the collective to provide access to the tunnel where the electrical harnesses are routed.

2. The Connector Panel Assembly (P/N 235-223-00) for mounting the electrical connectors and the Belly Panel (P/N 235-234-00) are provided pre-primed except for the surfaces for electrical grounding. It is recommended to paint the primed surfaces of these parts prior to installation. Mask all holes and areas of the Connector Panel Assembly as noted in Figure 4.5; do not paint the top side (the side with nut plates). Apply paint to match the helicopter color and specification or a MIL-PRF-85285 type 1 high solids polyurethane coating.

Figure 4.5 Paint Detail

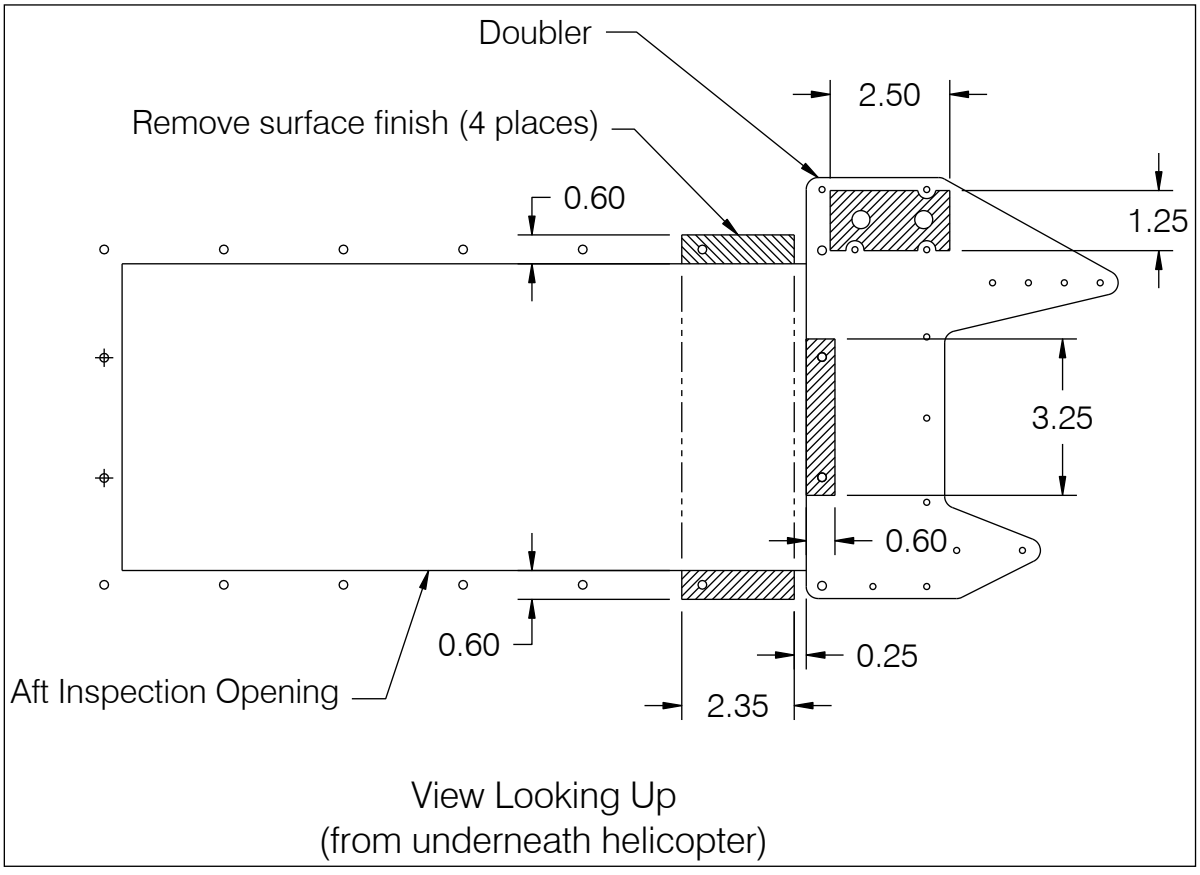


Working below the helicopter, prep the exterior of the helicopter for electrical grounding of the Connector Panel Assembly per the following.

3. Remove the surface finish down to bare metal in four (4) locations: two (2) locations between the overlap of the inspection panel and the belly skin, between the overlap of the inspection panel and the Doubler, and at the pillow block installation location on the Doubler as shown in Figure 4.6.

4. Protect the bare metal with a conductive chemical surface treatment per MIL-DTL-5541 Type II Class 3.

Figure 4.6 Surface Finish Removal Locations on Aircraft Belly

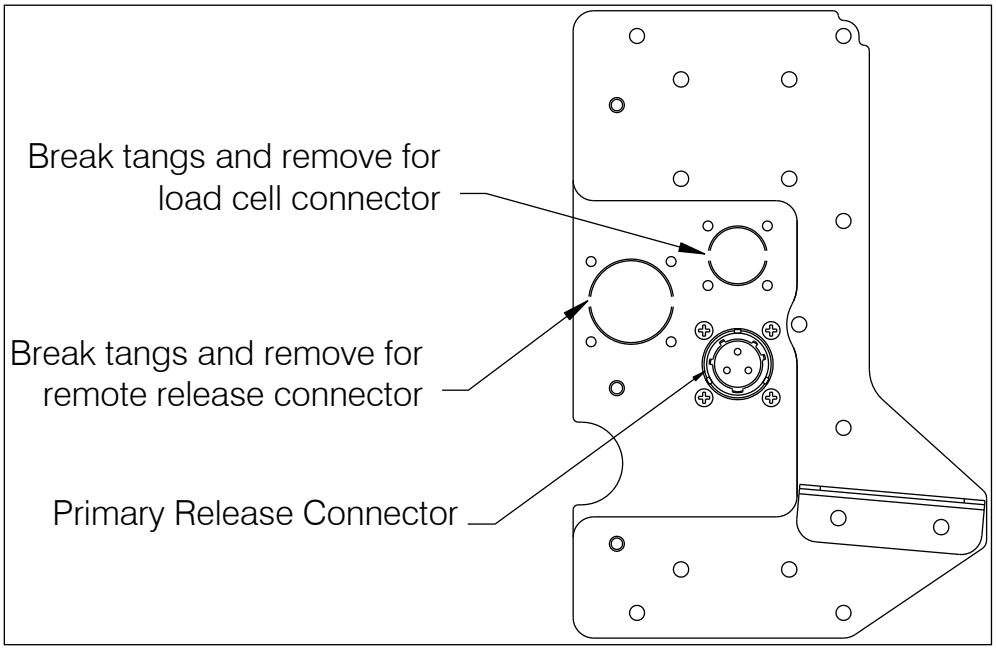


5. If installing the load weigh system and/or the remote hook release kit, prepare the Connector Panel Assembly (P/N 235-223-00) per Figure 4.7 by removing the plugs by twisting them off. File remaining burrs if necessary.

NOTICE

For ease of installation, install the harness connectors on the Connector Panel Assembly on the bench before mounting the Connector Panel Assembly in place on the belly.

Figure 4.7 Connector Panel Preparation



6. Attach the primary hook release harness (P/N 270-193-00) connector to the connector panel assembly with screws (P/N 510-481-00), washers (P/N 510-062-00) and nuts (P/N 510-029-00). Attach the local ground wire (wire no. 4) of the harness under one of the adjacent washers on the connector (see Figure 4.8).

7. The remote release connector (included with kit P/N 200-392-00 only) has a small circuit board assembled onto it. Remove the two screws which secure the circuit board to the connector flange and re-assemble through the connector panel assembly with it oriented as shown in Figure 4.8. Use screws (P/N 510-481-00), washers (P/N 510-062-00) and nuts (P/N 510-029-00) to secure the connector flange at its other two locations.

8. If the load weigh system is NOT being installed, install the Connector Panel Assembly with connectors attached, re-using the screws that secured the Robinson inspection panel except leave off the screw at the ground strap attachment location shown in Figure 4.9. This will be attached later.

   If the load weigh system is being installed, temporarily attach the Connector Panel Assembly with several screws until the load weigh harness is routed back to it (see Section 4.2).

   The wires to the connectors are provided with several inches of extra length to serve as a service loop for removal the connector panel assembly if needed. Route them aft to existing harness as shown and then forward with the existing wire harness on the left side of keel panel. Loosely support in position but do not secure wires until relay socket (s) are installed and load weigh system wiring is installed (if applicable).

Figure 4.8 Electrical Release Connector Installation

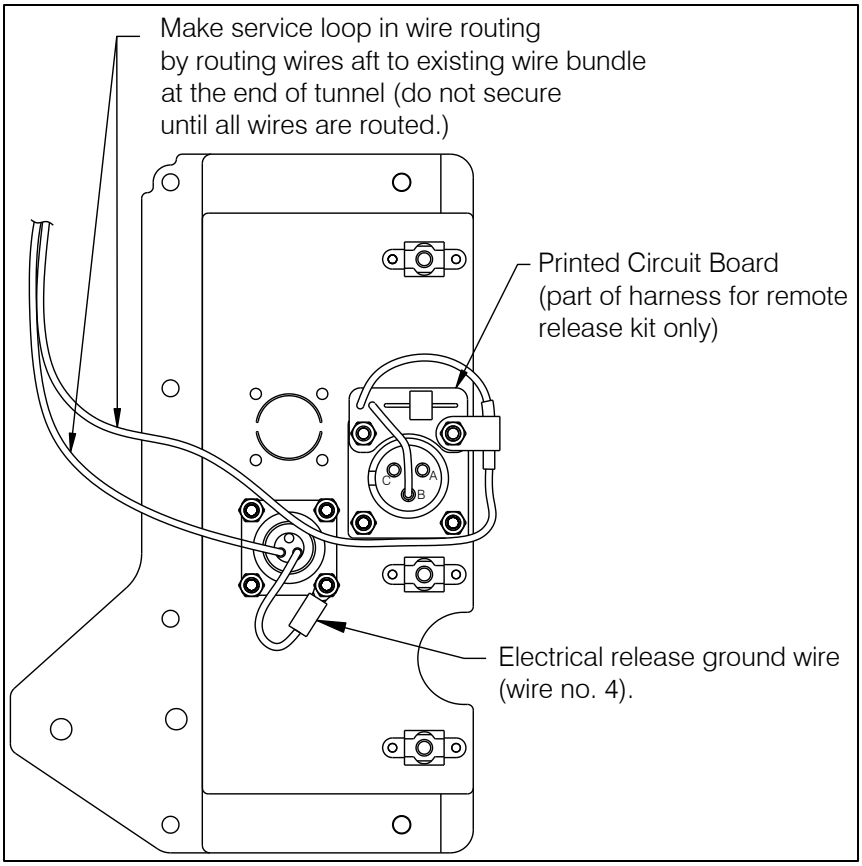
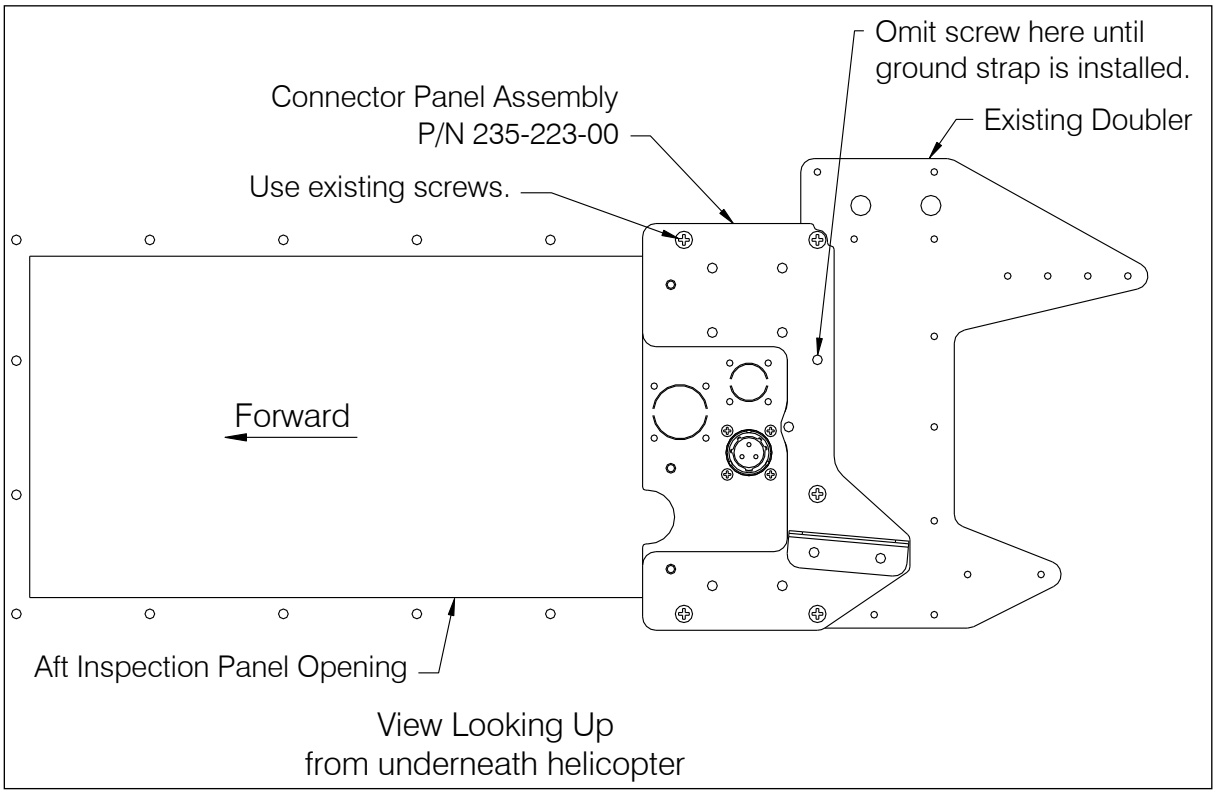


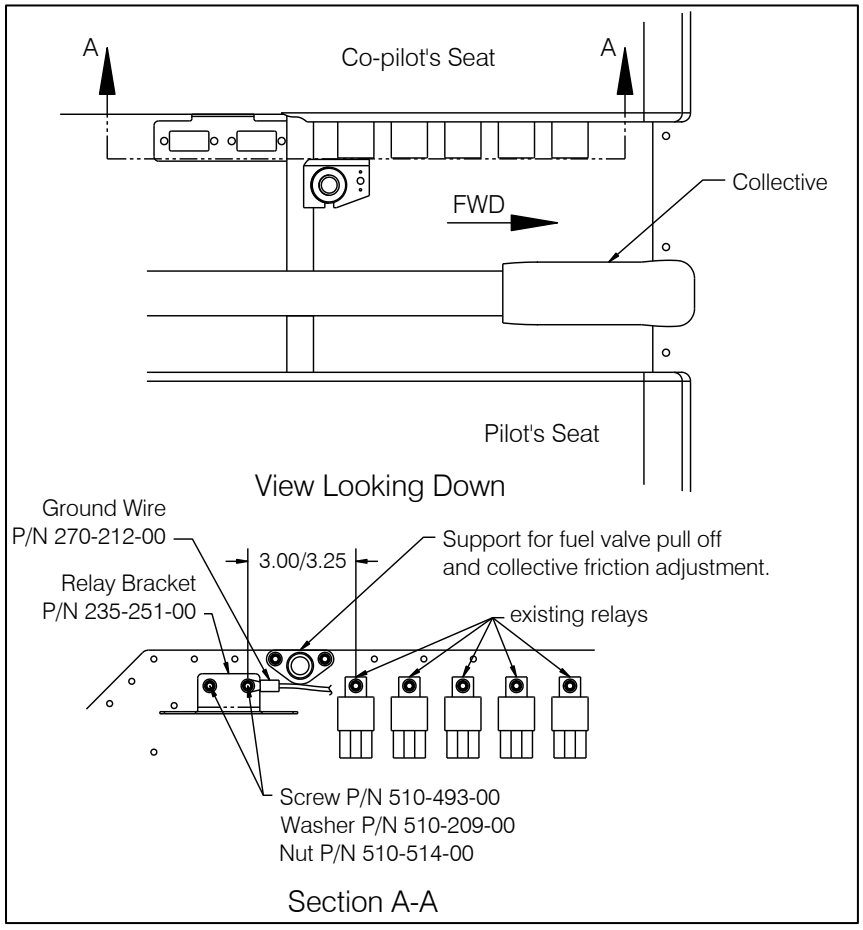
Figure 4.9 Connector Panel Installation



The relay bracket (P/N 235-251-00) is installed in the tunnel on the left keel panel, just aft of the support for the fuel valve pull off and collective friction adjustment (see Figure 4.10).

9. Locate the mounting holes on the relay bracket so they are at the same height as the mounting holes for the existing relays located forward of the support weldment and locate the forward mounting hole of the relay bracket fore/aft as shown. Drill two (2) Ø.170" holes in the keel panel to match the relay bracket.
10. For grounding of the ground wire (P/N 270-212-00) for the manual release cable, at the forward hole drilled in the keel panel remove the surface finish around the hole in an approximate .50" diameter and repeat this on both sides of the relay bracket at the mating hole. Apply a conductive chemical conversion coating such as Alodine 1201 to the bare areas.
11. Secure the Relay Bracket to the keel panel with hardware as shown with the small ring terminal of the ground wire P/N 270-212-00 installed under the forward nut and washer.

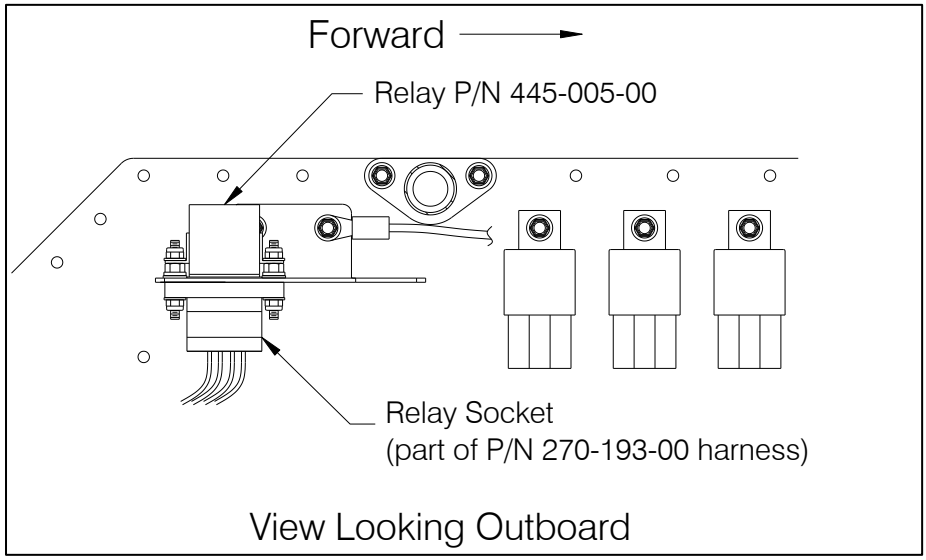
Figure 4.10 Relay Bracket Installation



12. Route the wires and relay socket (part of electrical release harness P/N 270-193-00) forward from the connector panel assembly and install the relay (P/N 445-005-00) and relay socket on the Relay Bracket as shown in Figure 4.11 using the hardware provided with the harness.

    Route the wires forward with the existing wire bundle on the left keel panel.

Figure 4.11 Primary Cargo Hook Relay Installation



13. Adhere the "RP1-10" label of the P/N 215-281-00 label set adjacent to the relay.
14. If the Remote Electrical Release Kit is also being installed, route its harness (P/N 270-191-00) wires and relay socket forward from the connector panel assembly and install its relay (P/N 445-013-00) and the relay socket in the mounting holes forward of the mounting holes for the primary hook relay.
15. Adhere the "OSRR1-15" label of the P/N 215-284-00 label set adjacent to or on the relay.
16. Remove the circuit breaker cover panel and install the 10 amp circuit breaker (P/N 440-007-00) for the primary electrical release system in an available location outside of the avionics bus.
17. If remote hook release kit is being installed, install its circuit breaker (P/N 440-012-00) in an available location outside of the avionics bus.

18. Route wire 1 from the primary hook relay with existing harnesses to the 10A circuit breaker installed previously, cut it to length if necessary, strip the end 3/16", crimp on the supplied ring terminal (P/N 410-162-00), and attach to circuit breaker.

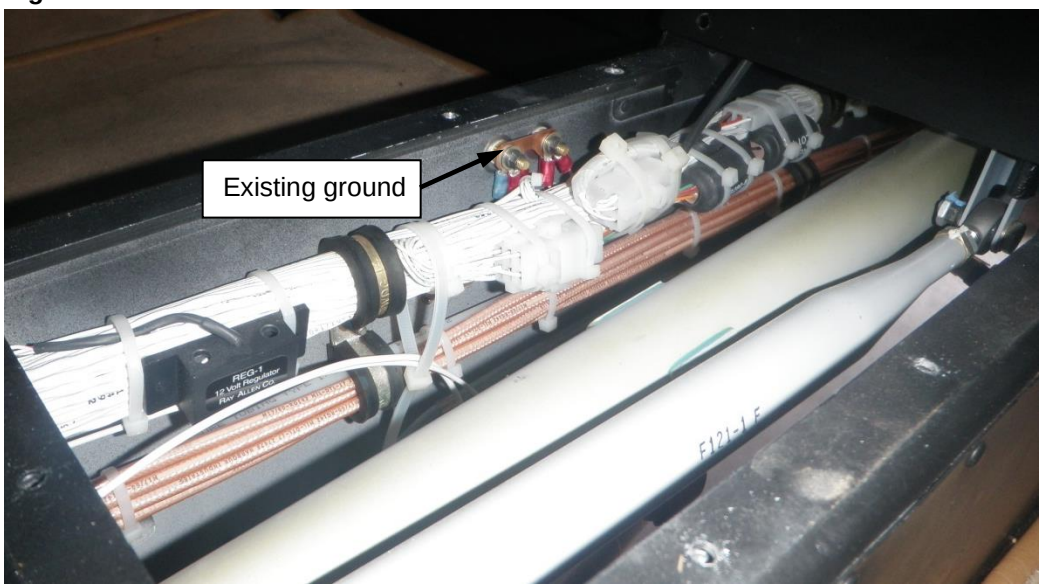
19. If the remote release kit is being installed route wire 7 from the relay to the circuit breaker installed previously, cut it to length if necessary, strip the end 3/16", crimp on the supplied ring terminal (P/N 410-309-00), and attach to 15A circuit breaker.

20. Route wire no. 2 of the primary hook release harness and wire no. 8 of the remote hook release harness (if remote kit is being installed) with the existing harnesses to the base of the cyclic. These wires are routed through the cyclic when the release switch(es) are installed (see Section 4.2).

Depending on the number of existing terminations at the existing ground studs (maximum of three ring terminals allowed per stud) typically an additional ground point will be needed. The P/N 200-380-00 and P/N 200-392-00 kits include a P/N 410-295-00 ring terminal for terminating the wire from their release switches to ground. The P/N 200-381-00 kit includes an additional P/N 410-295-00 ring terminal for terminating both the LW4 and LW5 wires.

Create an additional ground stud at the existing ground point in the tunnel at the foot of the aft center seat by replacing the two-hole copper bar with a three-hole copper bus bar per the following. The 3-hole bus bar may be obtained from Robinson (P/N A448-15).

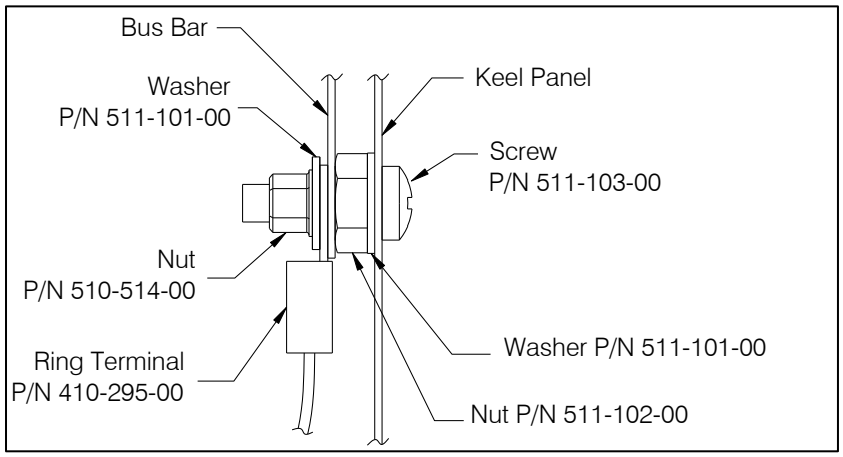
Figure 4.12 Ground Stud Location



21. Remove the two fasteners which secure the existing bus bar to the ground stud screws.

22. Drill a Ø.177" hole in the keel panel to match the location of the third hole in the copper bar.
23. Remove the surface finish on the keel panel down to bare metal in an approximate Ø.50" area centered around the Ø.177" hole.
24. Attach the supplied hardware through the third hole as shown below and assemble the copper bar over the three screws.
25. When all the grounds are attached, attach nut and washer to secure ring terminal(s).

Figure 4.13 Ground Point Hardware



26. Verify the resistance between the outside of the Connector Panel Assembly and airframe ground. The resistance must be less than 10 milli-ohms.

CAUTION

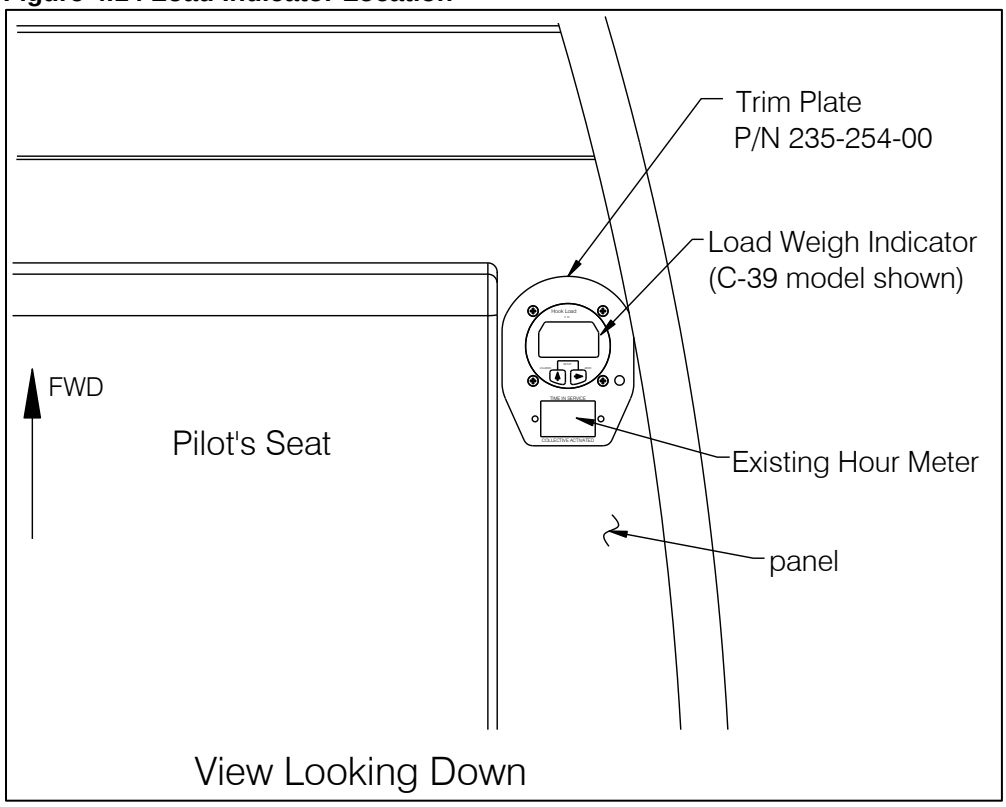
The Connector Panel Assembly must be sufficiently grounded to the airframe as it serves as the ground attachment for the primary hook release and the remote hook release.

4.2 Load Weigh System Installation

The load weigh system is included with kit P/Ns 200-381-00, 200-381-01, 200-381-10, and 200-381-11 and is available as an upgrade kit as P/N 200-382-00. If not installing one of these kits, skip to Section 4.3.

The load weigh indicator (P/N 210-095-00 for the C-39 model or P/Ns 210-293-00/210-293-01 for the next generation C-40 model) and its supporting Trim Plate (P/N 235-254-00) are mounted in the panel between the pilot's seat and the door, just forward of the hour meter. The Trim Plate for the indicator also serves as the trim plate for the hour meter, replacing the existing hour meter trim plate. Install the indicator, its trim plate, and the wire harness per the following steps.

Figure 4.14 Load Indicator Location

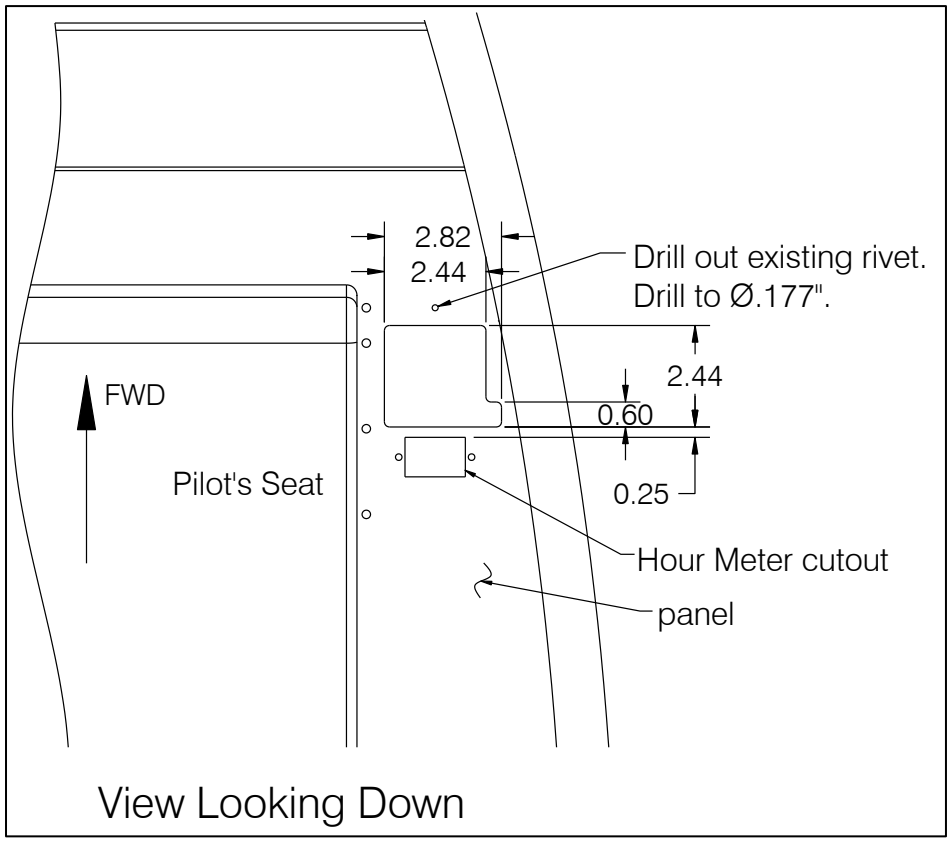


1. Remove the two screws securing the hour meter and its trim plate (Robinson P/N B417-2). This trim plate will not be re-used.

2. Peel the carpet up, starting from the back, and pulling it up to the front of the seat.

3. Mark and cut out the panel to accommodate the indicator and ON/OFF switch and drill out the existing rivet per the figure below. Use the trim plate and indicator as guides to ensure the cutout is located correctly laterally.

Figure 4.15 Panel Cutout



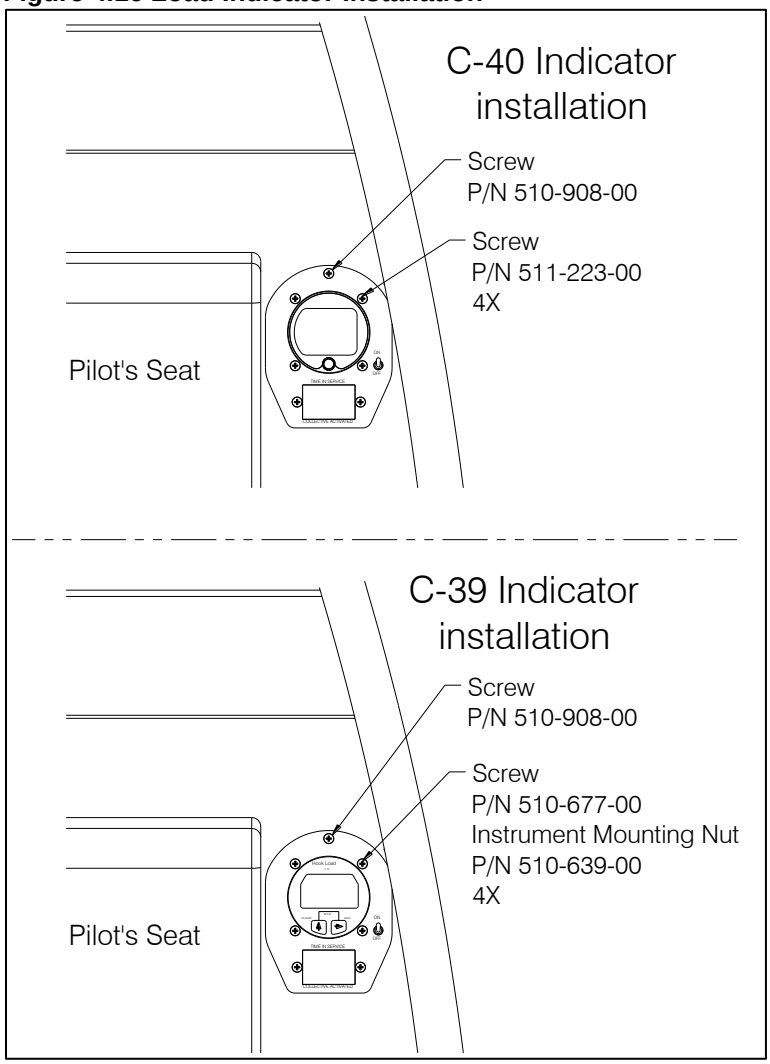
4. Transfer the location of the drilled out rivet hole to the trim plate and drill a Ø.177" hole at the marked location.

5. At the Ø.177" hole in the panel install a nut plate (P/N 510-641-00) underneath with rivets (P/N 510-972-00). Drill .098" holes in the panel to match the nut plate.

6. Lay the carpet back down and cut it out to match the panel cutout shown in Figure 4.15 and create a hole for the forward screw through the trim plate.

7. For the C-39 Indicator: insert an instrument mounting nut (P/N 510-639-00) into each of its four mounting holes and place the trim plate over it and secure it with the four instrument screws (P/N 510-677-00). For the C-40 Indicator: place the trim plate over it and secure it with four screws P/N 511-223-00.
8. Connect the mating connector on the load weigh harness (P/N 270-192-00 or P/N 270-192-01) to the indicator connector and secure the switch on the harness through the ¼" hole in the trim plate with the hardware provided on the switch.
9. Feed the wires of the harness down through the hole and place the supplied Trim Plate (w/ indicator attached) over the hour meter and secure the trim plate with the two screws (removed at step 1) at the hour meter and the supplied screw (P/N 510-908-00) at the forward hole.

Figure 4.16 Load Indicator Installation

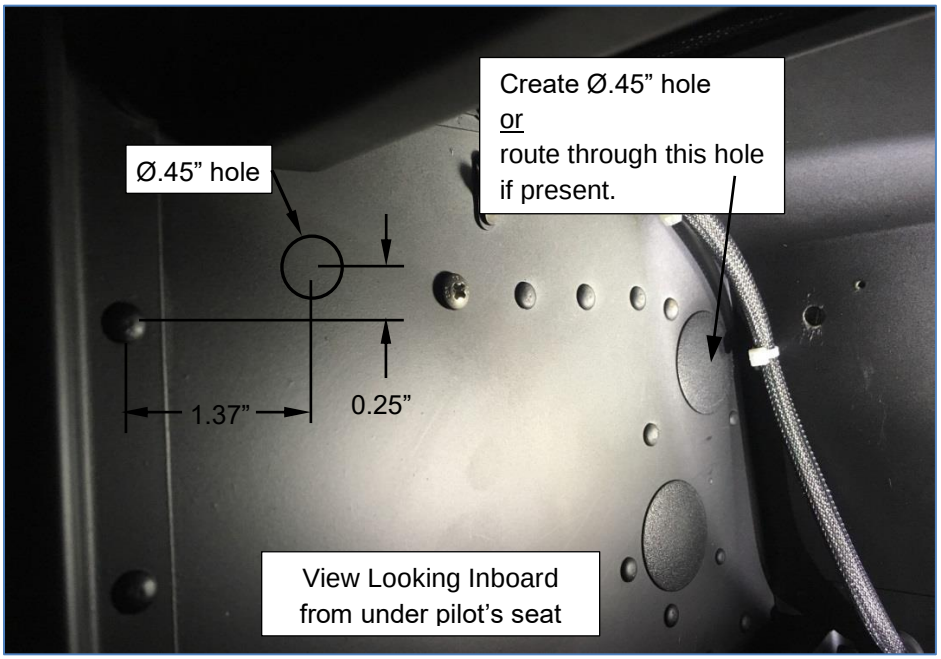


10. Use a spare length of wire to fish the wires up through the hole through which the wires of the hour meter are routed through and route the wires with the wires for the hour meter inboard and across the underside of the seat structure.

11. Before securing the wires with ty-raps (P/N 512-003-00) provide a short service loop below the C-39 indicator to allow it to be lifted up enough to disconnect its connector from above. Secure with ty-raps.

12. Depending on aircraft configuration, drill a .45" diameter hole in the RH keel panel 1.37" forward and .25" up from the rivet shown below. Later R66 models include two holes just forward of the .45" hole location shown below for a flight control computer installation. If these holes are present route the load weigh harness wires through the upper of the two holes rather than drilling the hole. Create a hole in plug and protect the wires with supplied grommet or route through with existing wires.

Figure 4.17 Hole for Load Weigh Harness



13. If using the new Ø.45" hole, position the supplied Doubler (P/N 235-255-00) over the hole and match drill (6 places) the keel panel using a #30 drill bit (.1285" dia.).

14. Secure the Doubler in place using AD4 rivets (P/N 510-282-00). Alternatively CR3213-4 blind rivets may be used to secure the Doubler in place if access is difficult.

15. Place grommet (P/N 505-021-00) over the wires and route the wires through the hole into the tunnel and insert the grommet into the hole. Slit the grommet if necessary to facilitate insertion.

16. Route wires around the flight control tubes to the wire bundle on the left side of the tunnel. Route LW2 through the existing wire bundle hole to the circuit breaker panel, route ground wires LW4 and LW5 and the 4 conductor signal wire LW1 aft with existing harnesses towards the aft inspection panel opening. Route wire LW3 to the instrument panel lighting circuit. Route wires with existing harnesses by feeding wires through loop clamps, opening them as necessary.

17. Route LW2 to primary cargo hook circuit breaker (P/N 440-007-00) installed previously, cut it to length if necessary, strip the end 3/16", crimp on the supplied ring terminal (P/N 410-162-00), and attach to primary cargo release 10A circuit breaker.

18. Position the load weigh connector (P/N 410-079-00) in the connector panel assembly hole. With the multi-conductor wire (LW1) routed as per its final configuration and with a short service loop provided aft and above the Connector Panel Assembly, cut it to length to terminate it at the connector.

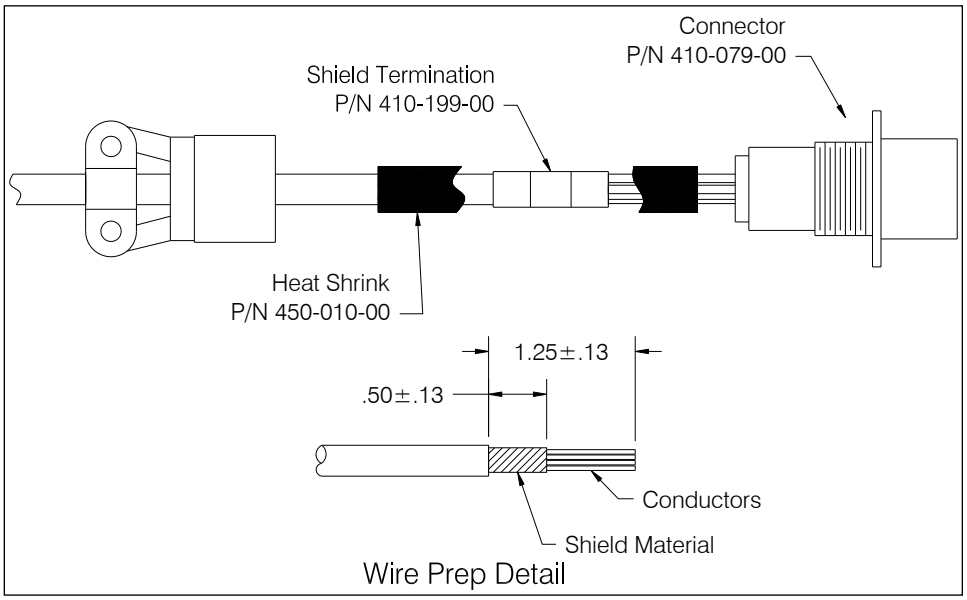
19. Prep the LW1 wire end per Figure 4.18 and terminate wires at connector pins per Table 4.2.1, use solder per J-STD-006. Slide the backshell up to and thread it over the connector threads and tighten securely. Clamp the wire harness using the connector clamps and screws.

Table 4.2.1 Pin-Out

Wire	Connector Pin
WH	C
WH/GN	B
WH/OR	A
WH/BL	D
WH/BLK*	F
Shield	E

*Present on harness P/N 270-192-01 only.

Figure 4.18 Wire Prep Detail



20. Secure the load weigh connector to the Connector Panel Assembly with four screws (P/N 510-481-00), washer (P/N 510-062-00), and nuts (P/N 510-029-00) and secure the LW1 wire to the existing wire bundle and ensure it cannot be deflected into or contact the flight controls.

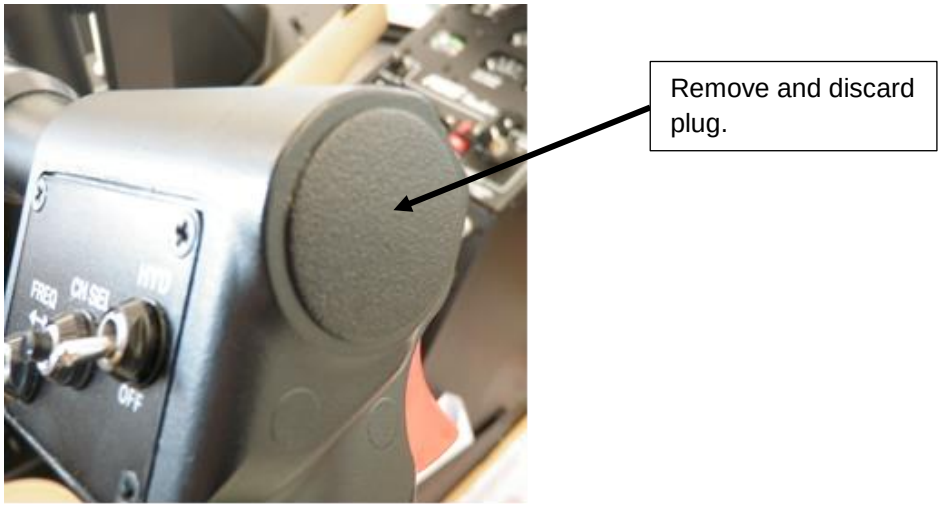
4.3 Electrical Release Switches Installation

There are up to three electrical release switches to install depending on the kits being installed. Section 4.3.1 provides instructions for installing the primary cargo hook release switch, which will always be installed. Section 4.3.2 and section 4.3.3 provide instructions for the optional remote hook release switch and the co-pilot release switch respectively.

4.3.1 Primary Switch Housing Assembly Installation

1. Remove existing Plug from end of cyclic (shown in Figure 4.19) and discard.

Figure 4.19 Grip Assembly Plug



2. Remove the existing threaded insert in the end of the cyclic grip by partially threading in a 6-32 screw and using a small pry bar under the screw head to pop it out or drill it out using a Ø.170 drill bit.

Figure 4.20 Grip Assembly, Insert Removal

3. Using a lead wire, pull the number 2 wire from wire harness P/N 270-193-00 up through the horizontal tube and out the end of the grip assembly and at the same time pull the supplied length of 22 gauge M22759/34 wire up through the cyclic base and through the cyclic to the grip assembly. This is the switch ground wire.

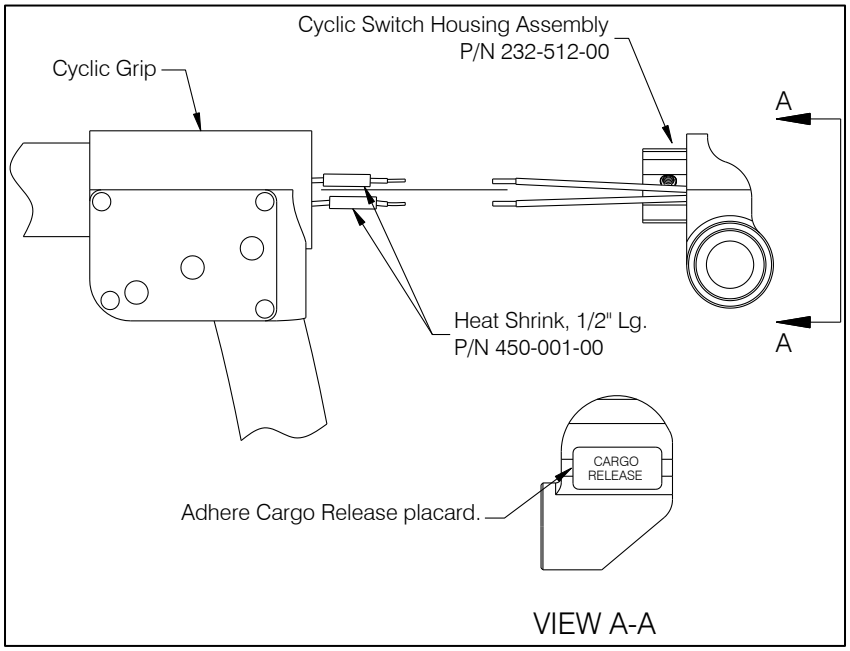
4. Trim wires to length as necessary and slide a piece of heat shrink (P/N 450-001-00) over the number 2 and ground wires (ref. Figure 4.21).

5. Prep and solder, using a lap splice, the number 2 wire from up through the cyclic to one of the wires from the switch and the ground wire from the cyclic to the other wire from the switch.

6. Slide the heat shrink over the respective solder joints and shrink in place using a heat gun.

7. Install the Switch Housing Assembly (P/N 232-512-00) into the end of the grip assembly and secure with the provided screw (P/N 510-493-00).

Figure 4.21 Switch Housing Assembly



8. In the tunnel cut the 7 ft. length of 22 gauge wire to length as necessary, crimp on the supplied ring terminal (P/N 410-295-00) and attach it to the ground installed previously. If installing the remote release kit, combine its ground wire into the same ring terminal before crimping.

9. Check the cyclic for freedom of motion throughout its complete travel range and ensure the wires are not chafing on any components.

4.3.2 Co-Pilot Switch Housing Assembly Installation

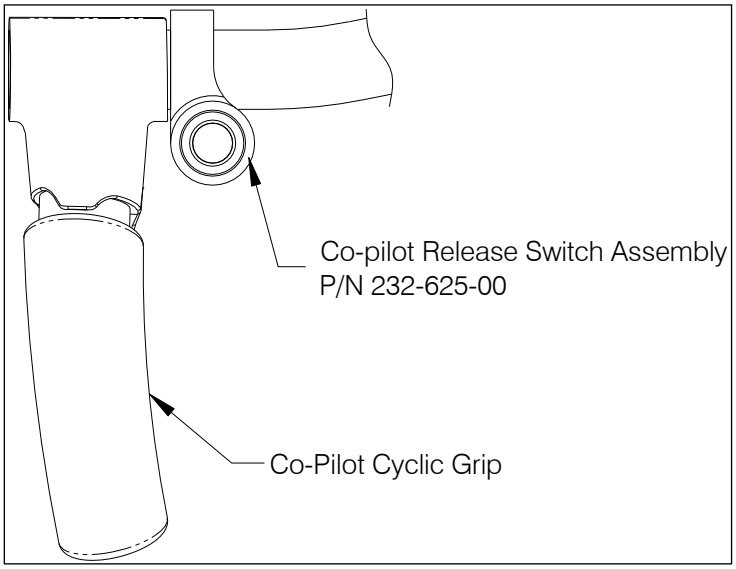
The co-pilot cargo hook release switch is included with kit P/N 200-417-00 only. If not installing kit P/N 200-417-00, skip this section.

The co-pilot release switch is provided pre-wired and assembled within housing (P/N 232-625-00).

1. If installed, remove the pilot's switch housing assembly from the end of the pilot's cyclic grip assembly, remove the heat shrink over the solder joints and unsolder these joints.

2. Remove the co-pilot cyclic grip tube from the cyclic assembly and slide the co-pilot release switch housing over the tube and up to the grip. If necessary insert a flat screwdriver between the clamping gap to pry the housing open slightly to slide it over the tube. Tighten the screw on the housing to secure it in position.

Figure 4.22 Co-Pilot Switch Assembly



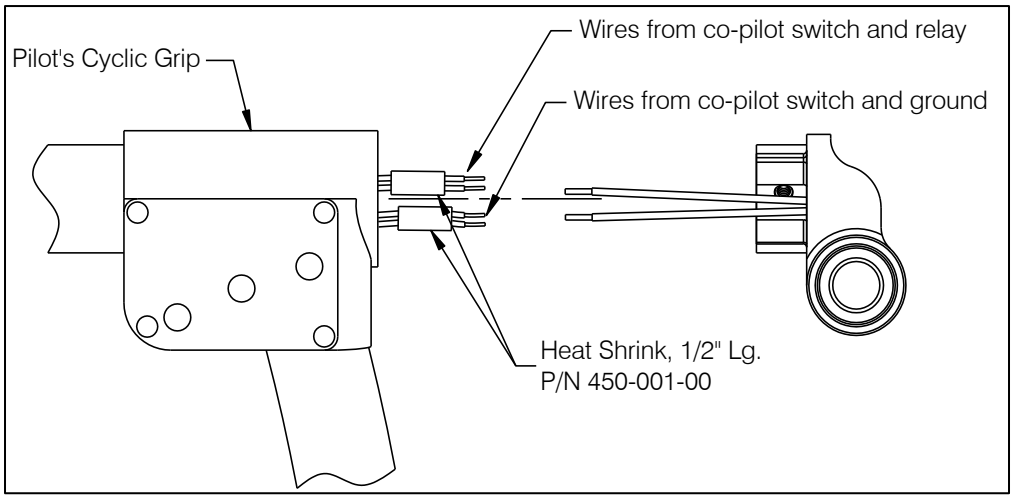
3. Route the switch harness alongside the forward side of the tube and secure with provided tie wraps (P/N 512-011-00).

4. Feed the switch harness through the existing wire harness mesh overbraid and into the hole immediately to the right of the vertical tube of the cyclic and route it through the pilot's cyclic grip.

5. Slide the two ½" lengths of heat shrink over the wires as shown and solder the two sets of three wires together as shown below. Also reference the schematic in Figure 4.1.

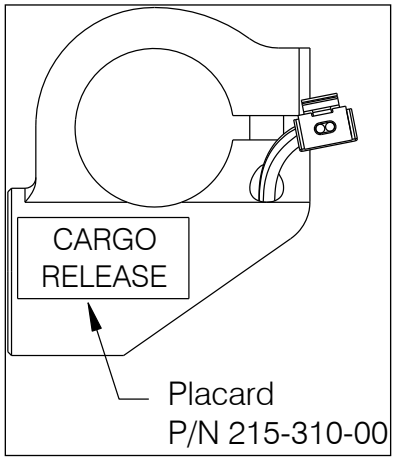
6. Slide the heat shrink over the solder joints and shrink in place using a heat gun.

Figure 4.23 Co-Pilot Release Switch Wiring



7. Install the pilot's release switch housing in the end of the cyclic and secure with screw (P/N 510-493-00).
8. Apply the "CARGO RELEASE" placard (P/N 215-310-00) to the co-pilot release switch housing.

Figure 4.24 Cargo Release Placard



4.3.3 Remote Switch Housing Assembly

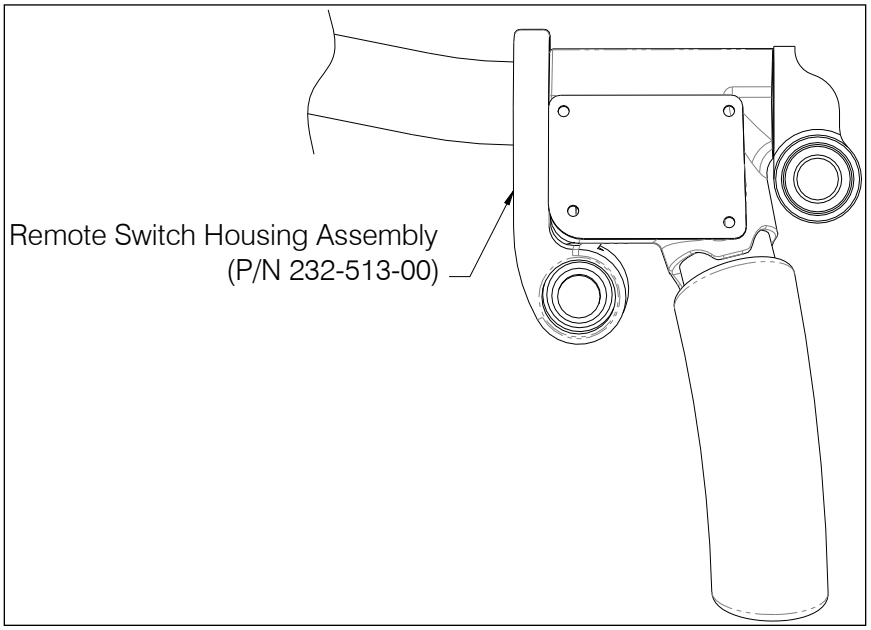
The remote cargo hook release switch is included with kit P/N 200-392-00 only. If not installing kit P/N 200-392-00, skip this section.

The remote release switch is provided pre-assembled into the housing (P/N 232-513-00) which is designed to clamp onto the cyclic tube (as shown below). Install it per the following instructions.

1. Remove the two screws and clamp provided pre-assembled onto the switch housing.

2. Position the switch housing assembly to the left of the controls housing on the end of the cyclic. The exact position of the switch housing assembly can be altered according to pilot preference by rotating it about and/or sliding it inboard on the cyclic shaft. In preparation for wire routing, temporarily secure it in the desired position with the clamp and two screws.

Figure 4.25 Remote Switch Housing Assembly

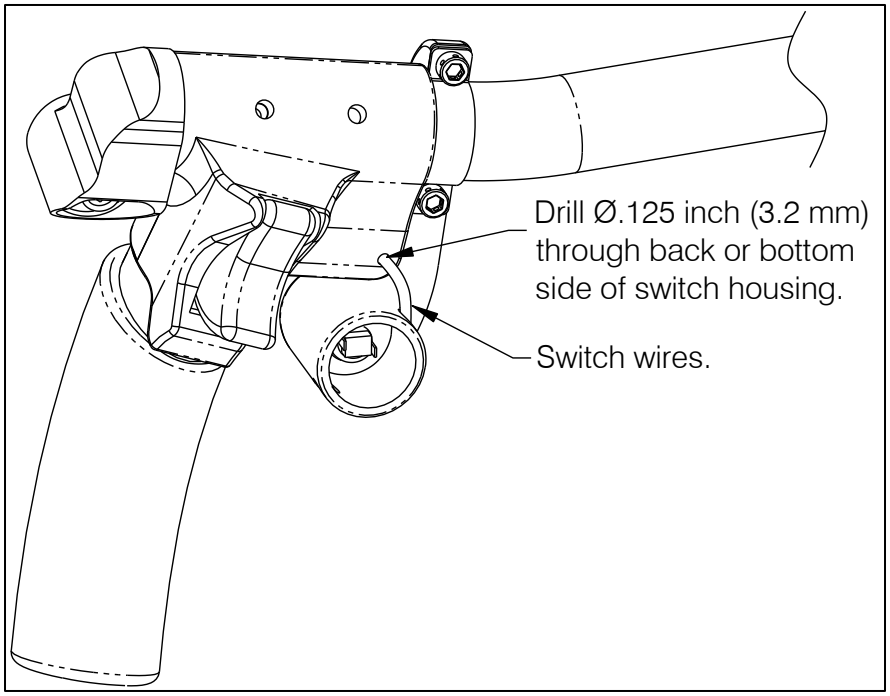


The switch wires require that a hole be drilled into the cyclic control housing. The location of this hole can be through the back of the housing or through the bottom depending on the preferred position of the switch housing and/or possible interference with components internal to the housing. Complete the installation per the following.

3. Remove the cover of the cyclic control housing and any internal components as necessary to provide clearance for drilling.

4. Loosen the clamp screws and slide the switch housing assembly out of the way and drill a .125 inch (3.2 mm) hole in the cyclic controls housing in order to feed the wire leads from the switch through.

Figure 4.26 Remote Switch Wire Routing

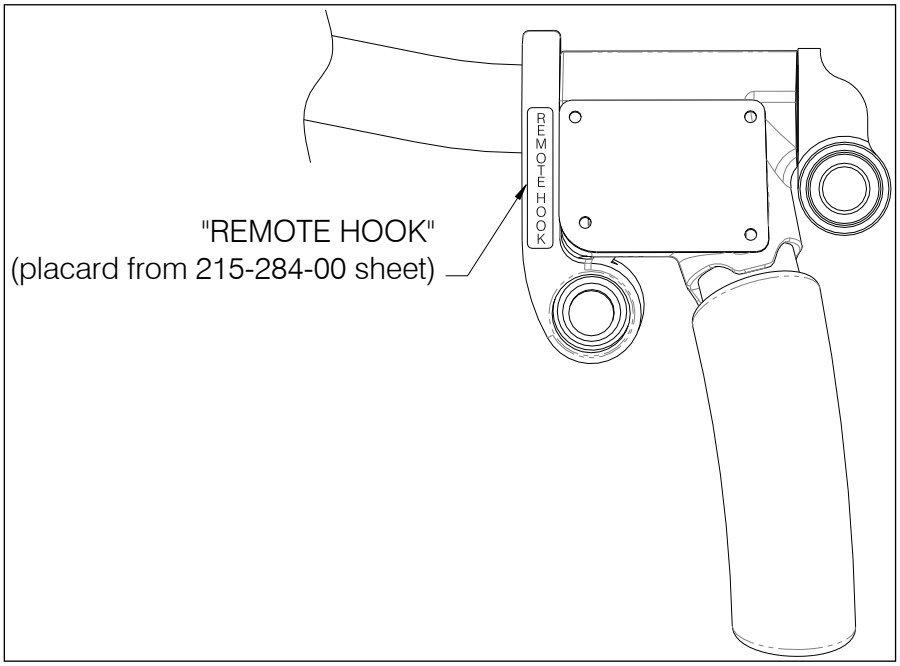


5. Using a lead wire, pull the number 8 wire from the wire harness P/N 270-191-00 and the supplied length of 22 gauge M22759/34 wire (switch ground wire) up through the horizontal tube and into the cyclic controls housing.
6. Slide a piece of the supplied heat shrink (P/N 450-001-00) over the number 8 wire and the switch ground wire.
7. Re-position the switch housing assembly and secure in place by tightening the two screws. Feed the wires through the drilled hole into the housing and cut them to length if necessary. If possible it may be desirable to leave a small service loop in the housing to accommodate some switch position adjustment later.
8. Prep and solder, using a lap splice, the 8 wire from up through the cyclic to one of the wires from the switch and the ground wire from the cyclic to the other wire from the switch.
9. Slide the heat shrink over the respective solder joints and shrink in place using a heat gun.
10. Re-install the cyclic grip control cover.

11. In the tunnel, route the ground wire to the ground stud added earlier, cut it to length and crimp it into the supplied ring terminal (P/N 410-295-00) with the 22 gauge wire from the primary release harness and attach to the ground stud.

12. Install the "REMOTE HOOK" placard on the front of the switch housing assembly (as shown below).

Figure 4.27 Switch Housing Placard Installation



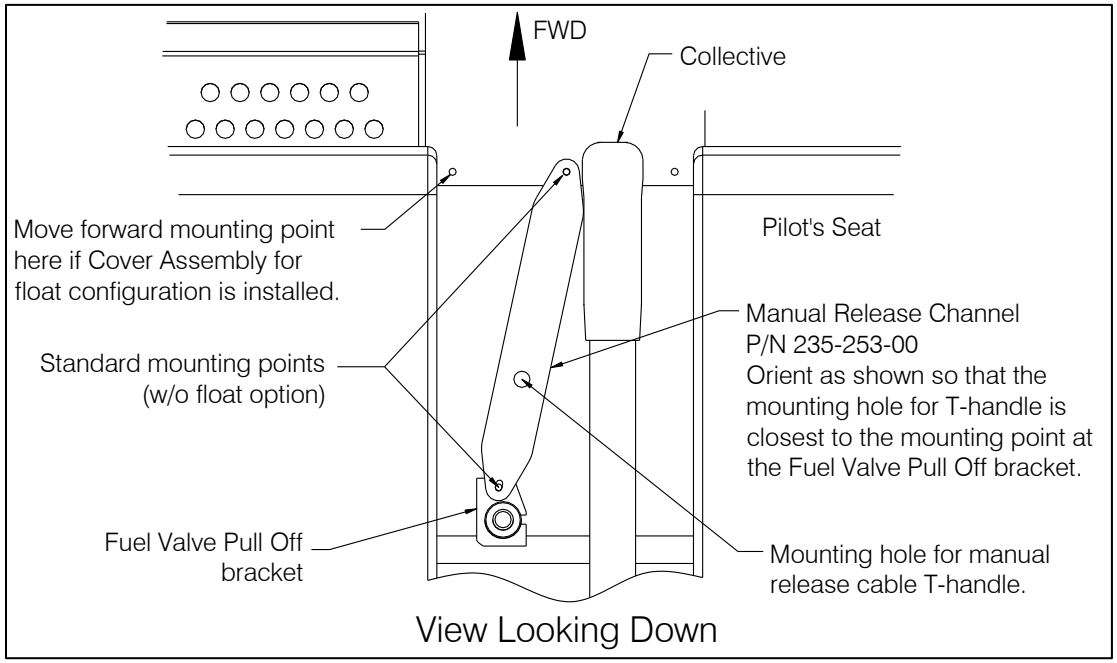
4.4 Manual Release Cable Installation

A mounting bracket (referred herein as Manual Release Channel) is provided with the kit to support the cargo hook manual release system's T-handle. The Manual Release Channel (P/N 235-253-00) is mounted between the pilot and co-pilot seats and spans the mounting bracket for the Fuel Valve Pull Off and the forward support for the Cover Assembly (Robinson P/N F445-1).

Install the Manual Release Channel and Manual Release Cable per the following steps.

1. Remove the fasteners securing the perimeter of the Cover Assembly (Robinson P/N F445-1) underneath the collective and lift it up enough to access the mounting points.

Figure 4.28 Manual Release Channel Installation Location



2. Using the Manual Release Channel as a template, align its mounting holes with the holes in the Cover Assembly (if floats configuration is present use the left hole as shown in Figure 4.28) and transfer the T-handle mounting hole location to the Cover Assembly and drill a ½" hole to match.

NOTICE

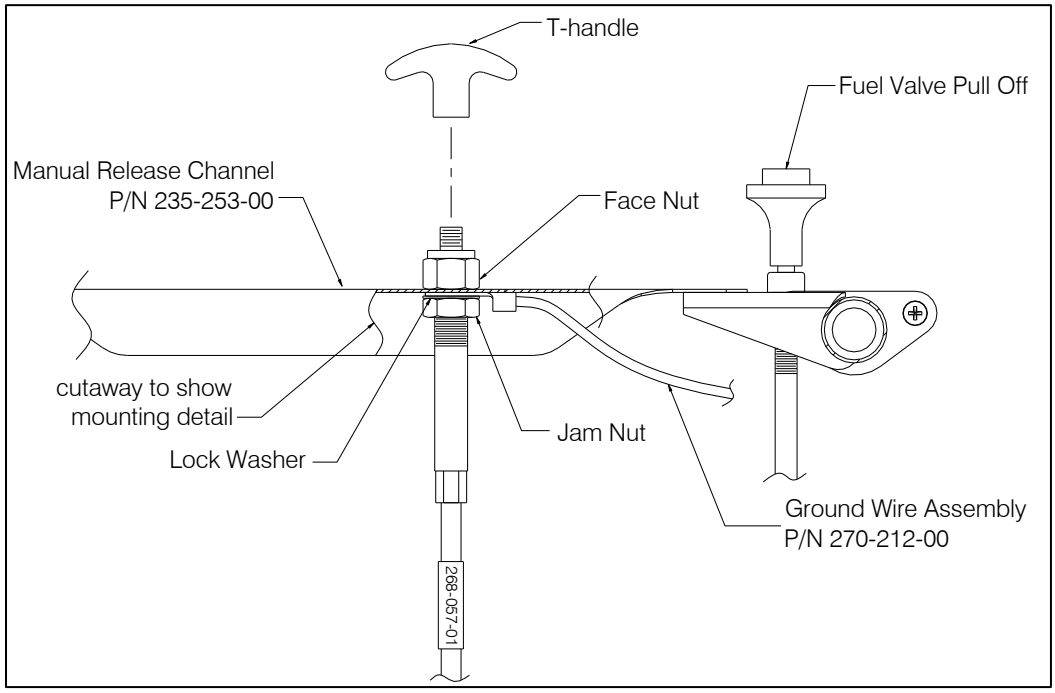
The Manual Release Channel is orientation sensitive; install it so that the T-handle mounting position is closer to the Fuel Valve Pull Off mounting point than it is to its mounting point at the forward support (as shown in Figure 4.28).

3. Place the Manual Release Channel in position with the forward end slid under the cyclic control cover and secure the Cover Assembly over it with the screws removed previously.

4. Remove the T-handle and the face nut from the manual release cable (P/N 268-057-01) end fitting and place the Ground Wire Assembly's (P/N 270-212-00) larger ring terminal over it (see Figure 4.29).

5. Insert the manual release cable end fitting up through the hole in the Manual Release Channel and thread the face nut on (reference Figure 4.29). Tighten the face nut finger tight until it is seated, do not overtighten, and tighten the jam nut underneath to secure the assembly to the channel.

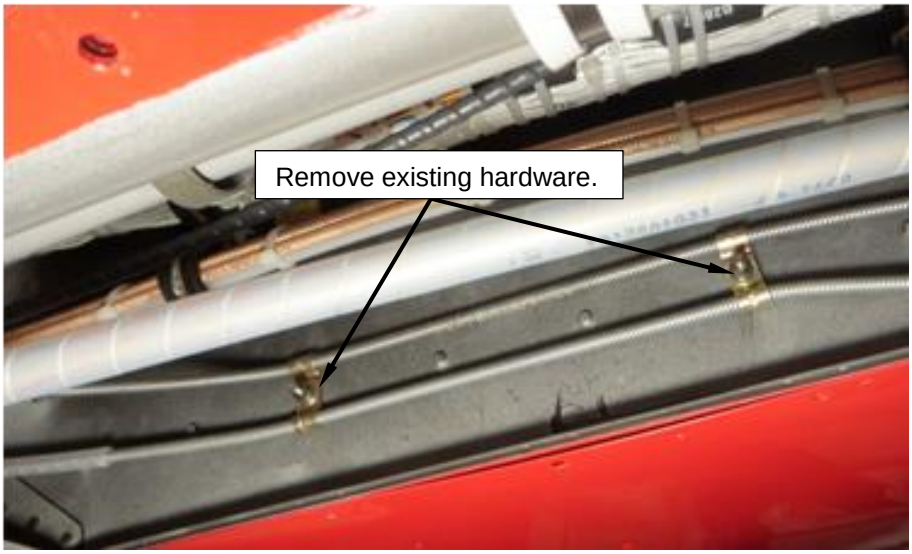
Figure 4.29 Manual Release Cable Installation



6. Route the manual release cable aft through the tunnel, alongside the left keel panel.

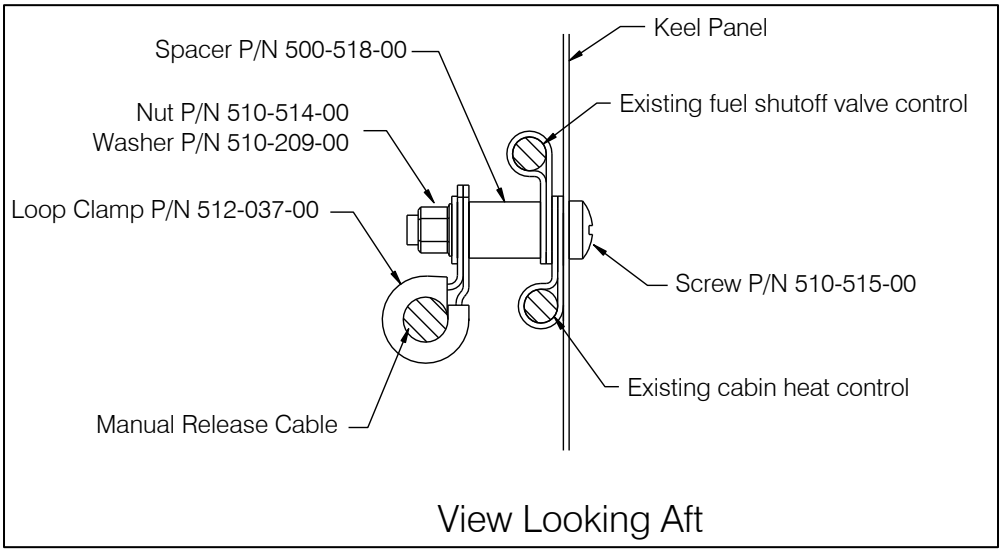
7. Remove the screw, washer and nut from the loop clamps securing the fuel shutoff valve control and the cabin heat control cables at points shown in Figure 4.30 (above the forward inspection panel).

Figure 4.30 Manual Release Cable Attachment Points



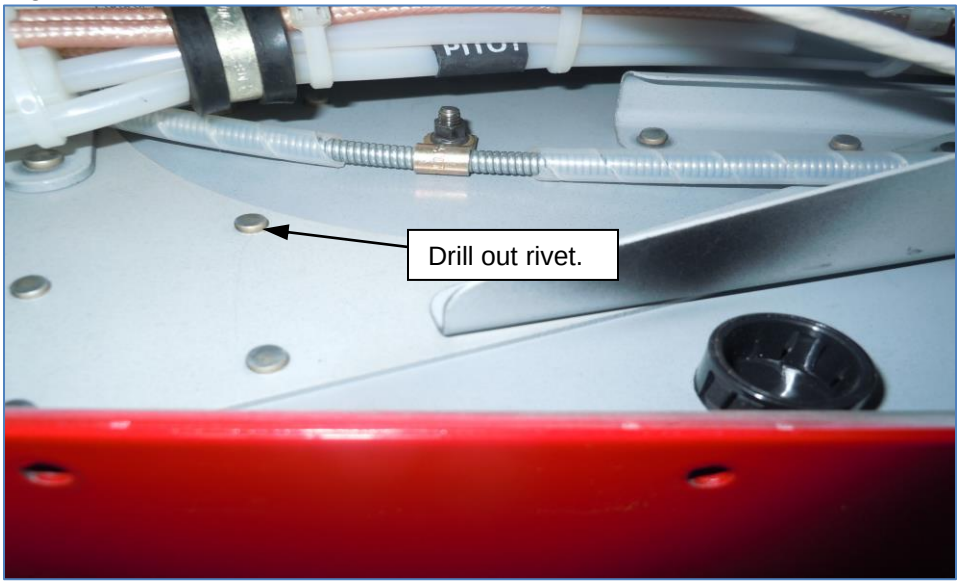
8. Place a cushioned loop clamp (P/N 512-037-00) over the manual release cable and using a longer screw (P/N 510-515-00) and spacer (P/N 500-518-00) attach this over the loop clamps securing the fuel shutoff valve control and the cabin heat control as shown in Figure 4.31.

Figure 4.31 Manual Release Cable Attachment (2 Places)



9. On the left side keel panel, above the aft inspection panel, drill out the rivet shown below and drill hole to Ø.170".

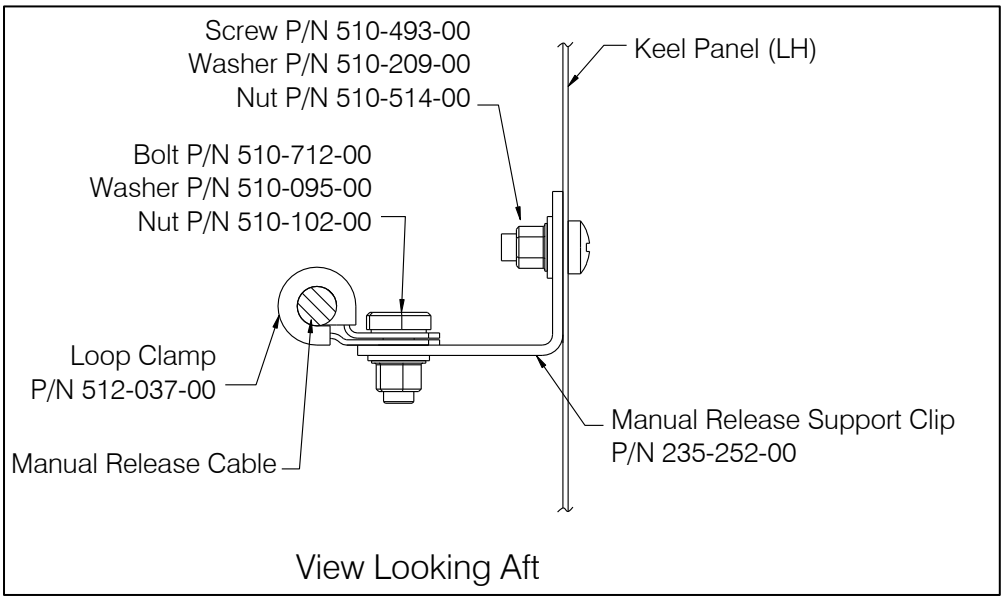
Figure 4.32 Aft Manual Release Cable Attachment Point



10. Attach the Manual Release Support Clip (P/N 235-252-00) to the keel panel at the drilled hole using screw, washer, and nut as shown below.

11. Attach the manual release cable to the support clip with a loop clamp secured with a bolt, washer, and nut as shown below.

Figure 4.33 Aft Attachment Point Hardware



⚠ CAUTION

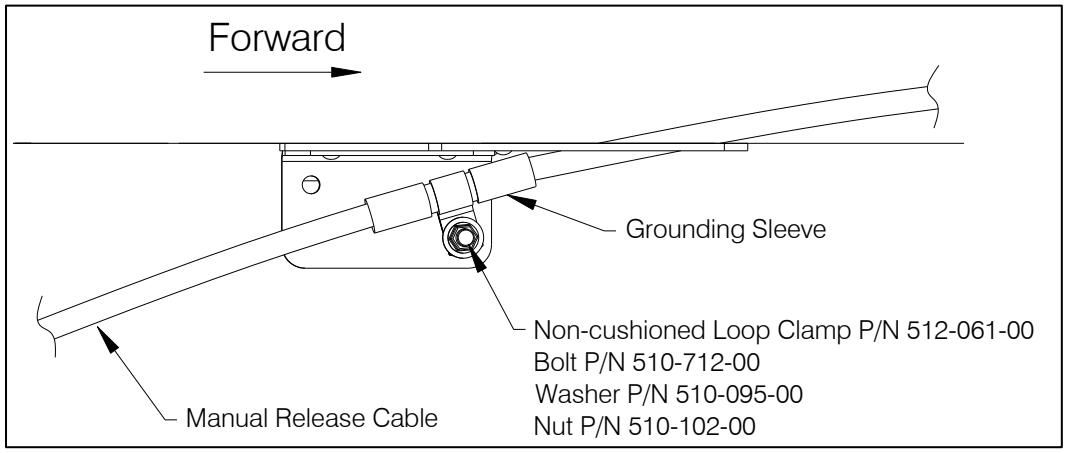
Verify that the release cable does not interfere with push/pull control rods and electrical components in the tunnel and that there is sufficient clearance between these items to allow for motion and account for any slack.

12. Route the manual release cable to outside the aircraft; it will be routed through the slot formed by the Connector Panel Assembly and the Inspection Panel Cover.

13. At this point slit the grommet (P/N 610-030-00) to be inserted in the slot and slide it over the manual release cable to a point forward of the grounding sleeve.

14. Secure the grounding sleeve on the manual release cable to the OUTBOARD side of the bracket on the Connector Panel Assembly using a non-cushioned loop clamp, bolt, washer, and nut as shown in Figure 4.34.

Figure 4.34 Manual Release Grounding Sleeve



4.5 Cargo Hook Suspension Assembly Installation

1. Thread bolts (P/N 291-669-00) into the two holes in the Robinson hard point block and screw in to ensure thread integrity. Some re-work of access holes in skin may be required to allow bolt installation.
2. Remove the bolts.
3. Disassemble the Suspension Assembly P/N 232-498-00 (refer to Figure 4.36).
4. Orient the Pillow Block, referring to the engraved "FWD" on it, and secure it to the helicopter with the two P/N 291-669-00 bolts and two P/N 510-238-00 washers (refer to Figure 4.35).
5. Torque the P/N 291-669-00 bolts to 26 ft.-lbs.
6. Safety-wire the bolts through the adjacent pairs of holes in the pillow block.
7. Grease the Suspension Assembly pivot bolt (P/N 510-982-00) with Mobilgrease 28 or equivalent before assembly.
8. Position the Gimbal Assembly in the orientation shown in Figure 4.36, align it within the Pillow Block and slide the bolt through.
9. Apply sealant to the perimeter of the Pillow Block and doubler joint.

NOTICE

The Gimbal Assembly is "keyed" to fit within the Pillow Block in only one orientation.

Figure 4.35 Pillow Block Installation

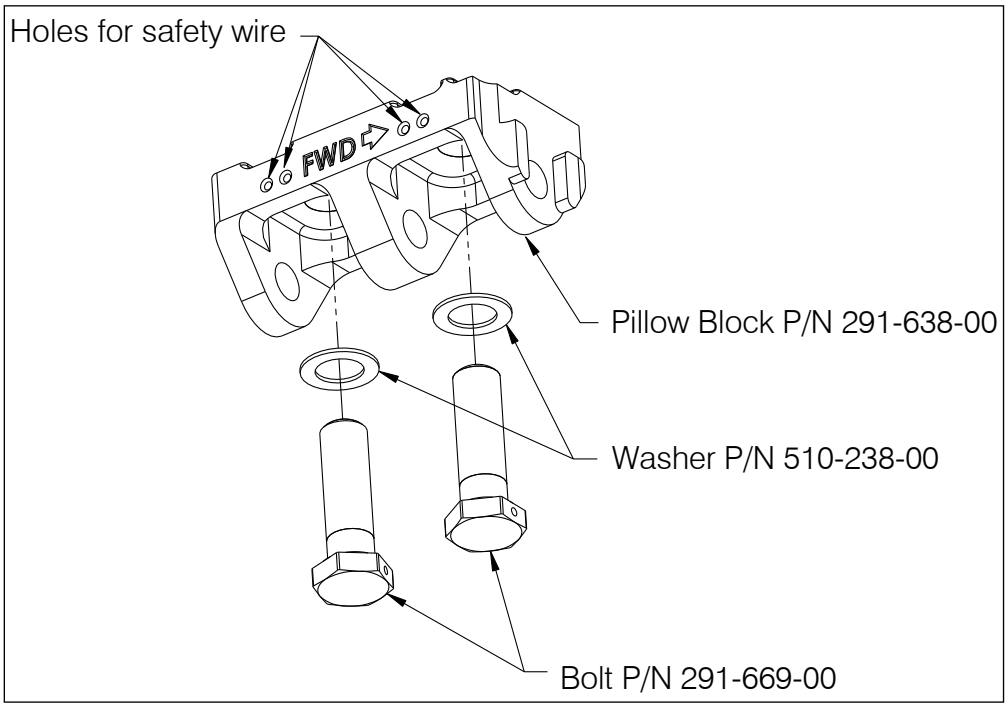
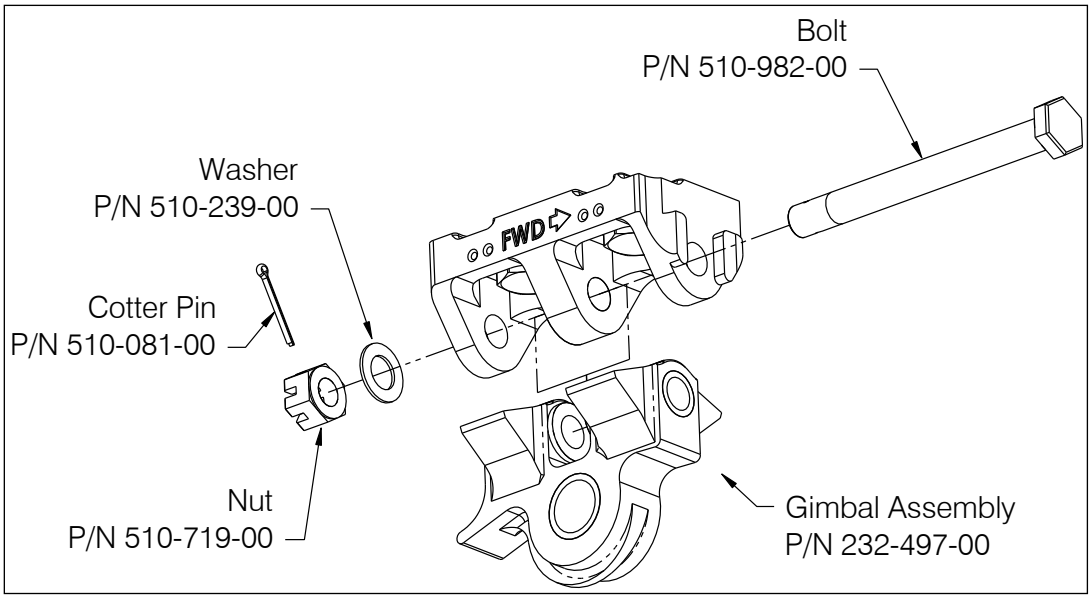


Figure 4.36 Gimbal Assembly Installation



4.6 Cargo Hook Installation

1. Remove the manual release cover from the cargo hook (P/N 528-029-00 or P/N 528-029-02).

2. Thread the end of the manual release cable into the cargo hook by holding the cable and turning the cargo hook. Thread the cable until it protrudes approximately 1/8" past the flange and into the cargo hook (refer to Figure 4.39).

3. Install the cargo hook to the suspension assembly in order to set the release cable rigging. Temporarily install the cargo hook to the suspension assembly using the hardware as shown in Figure 4.37.

If installing a kit with load weigh system, install the cargo hook with the Pin Load Cell Assembly and hardware as shown in Figure 4.38. The cargo hook load beam must point forward.

If kit P/N 200-382-00 is being installed as an upgrade, remove the attach bolt (P/N 290-332-00) and replace with the Pin Load Cell Assembly as shown in Figure 4.38.

NOTICE

Do not tighten nut and install cotter pin until after the manual release cable rigging is completed.

Figure 4.37 Cargo Hook Installation

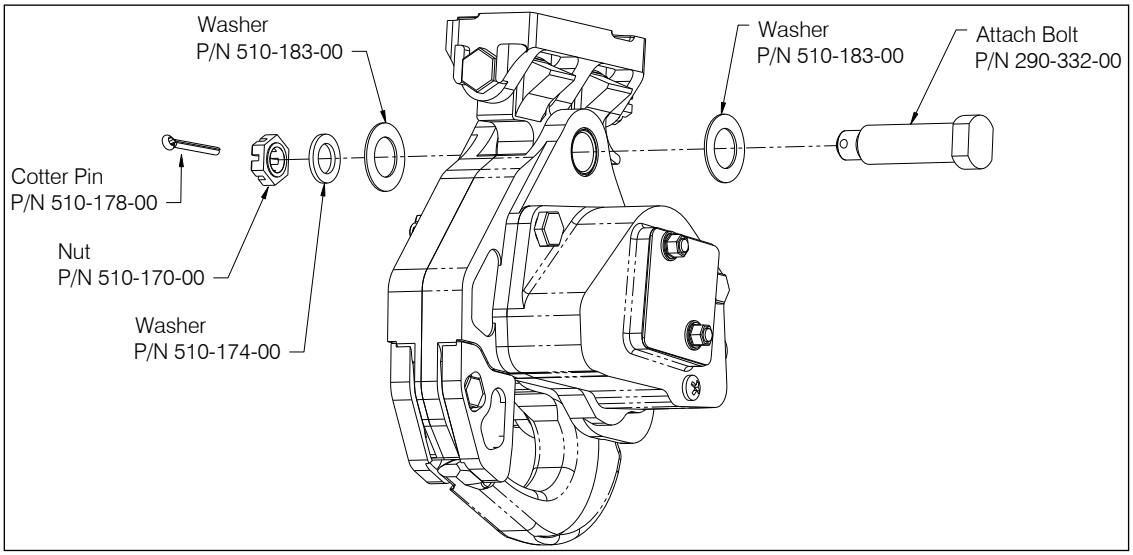
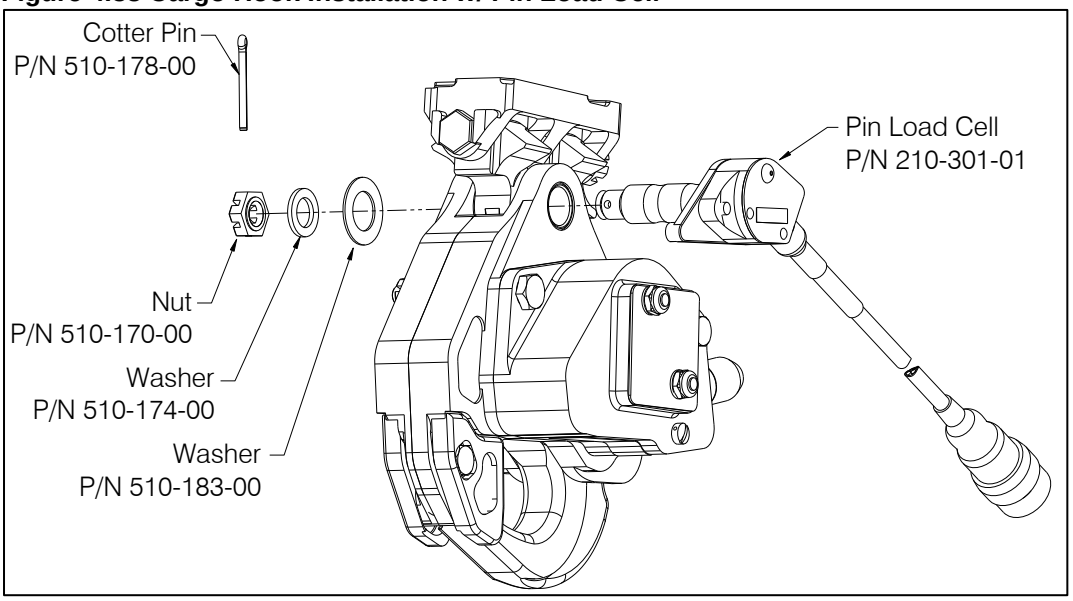


Figure 4.38 Cargo Hook Installation w/ Pin Load Cell



4. Place the inner cable of the manual release cable through the slot of the release lever fork as shown in Figure 4.39.

5. Rotate the release lever in the clockwise direction to remove free play and hold (the free play is removed when the hook lock indicator begins to move). This is also readily felt as the lever rotates relatively easily for several degrees as the free play is removed.

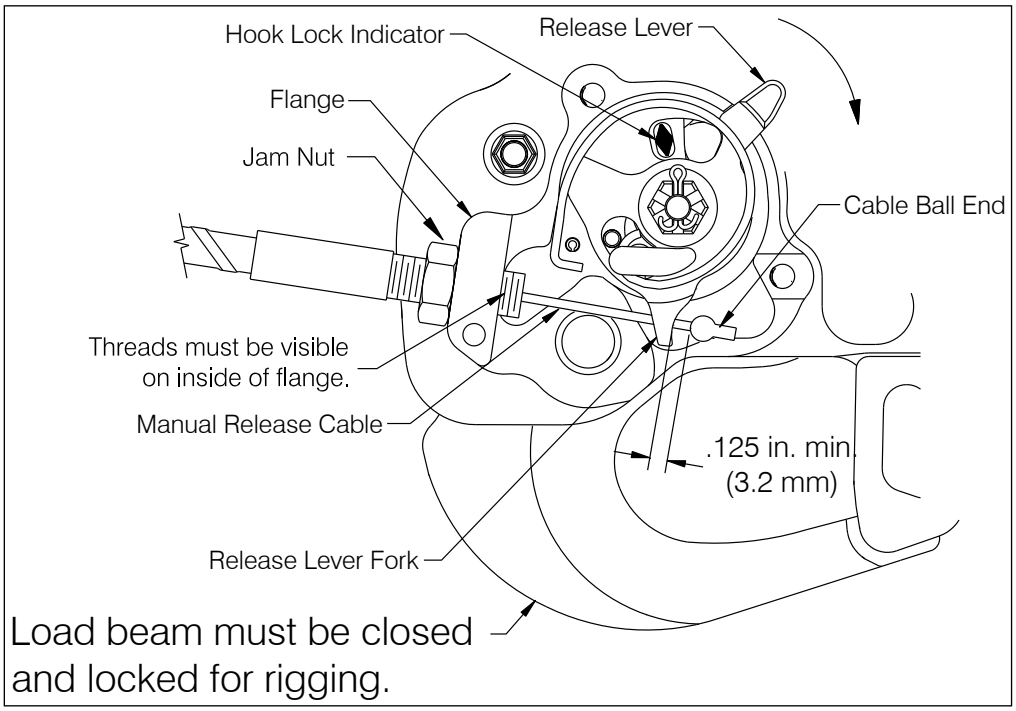
6. Measure the gap between the release lever fork and the cable ball end with the manual release handle in the cockpit in the non-release position. The gap should measure a minimum of .125" (3.2 mm). The maximum amount of free play is limited by the manual release cover, i.e. – the ball end must fit inside the manual release cover when it is installed.

7. If the gap does not measure at least .125" (3.2 mm), make adjustments at the cargo hook. This is done by removing the cargo hook from the suspension and rotating the cargo hook in the required direction.

8. When correct setting is achieved, tighten the jam nut securely against the cargo hook.

9. Re-install the manual release cover on the cargo hook with the two screws removed.

Figure 4.39 Manual Release Cable Rigging



10. Re-install the washers and nut onto the cargo hook attach bolt (or pin load cell).

11. Tighten nut on cargo hook attach bolt (or pin load cell) until fully seated, finger tight only. Back off nut to previous castellation if needed to insert cotter pin. Install and secure cotter pin.

CAUTION

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

12. Attach the electrical release harness (P/N 270-206-00) to the belly connector and route with manual release cable and pin load cell harness (if installed) to the cargo hook and attach other end to cargo hook connector.

13. Secure the electrical release harness, load cell harness (if installed), and manual release cable at the bracket on the connector panel assembly as shown in the Figure 4.40.

14. Wrap the manual release cable and harness(es) where they are routed in a tight bundle with the supplied spiral wrap (P/N 590-017-00) and trim off excess as necessary.

Figure 4.40 Electrical Harness/Manual Release Cable Routing

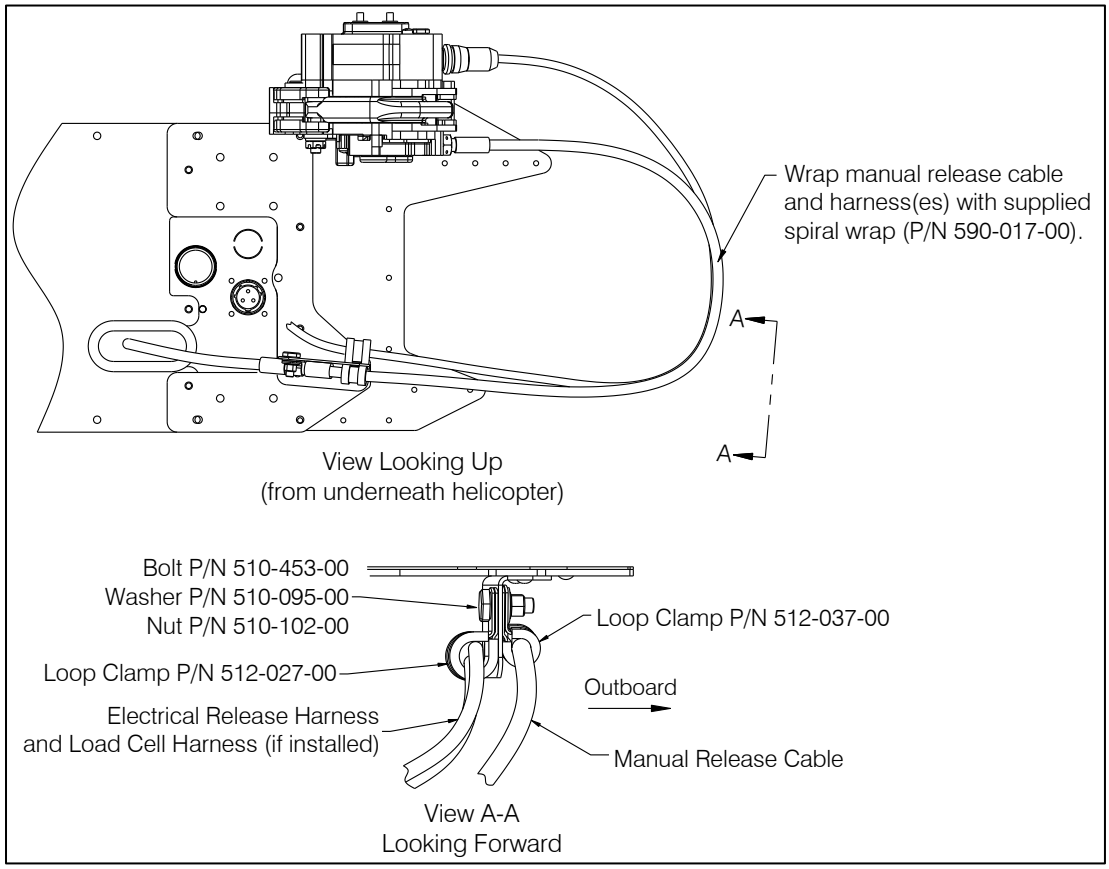


Table 4.6.1 Cargo Hook Connector

Pin	*Function*
A	Ground
B	Power

CAUTION

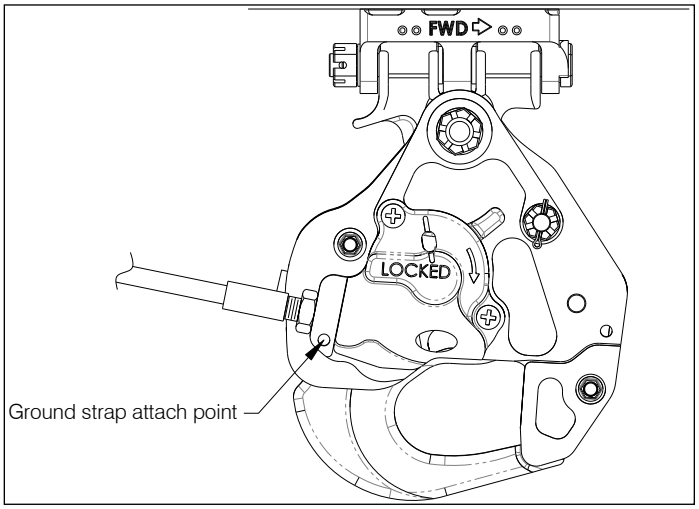
Early versions of Cargo Hook P/N 528-029-00 were equipped with a suppression diode that will be damaged if the Cargo Hook electrical connections are reversed.

4.7 Ground Strap Installation

Install the Ground Strap (P/N 270-211-00) between the cargo hook and connector panel assembly per the following.

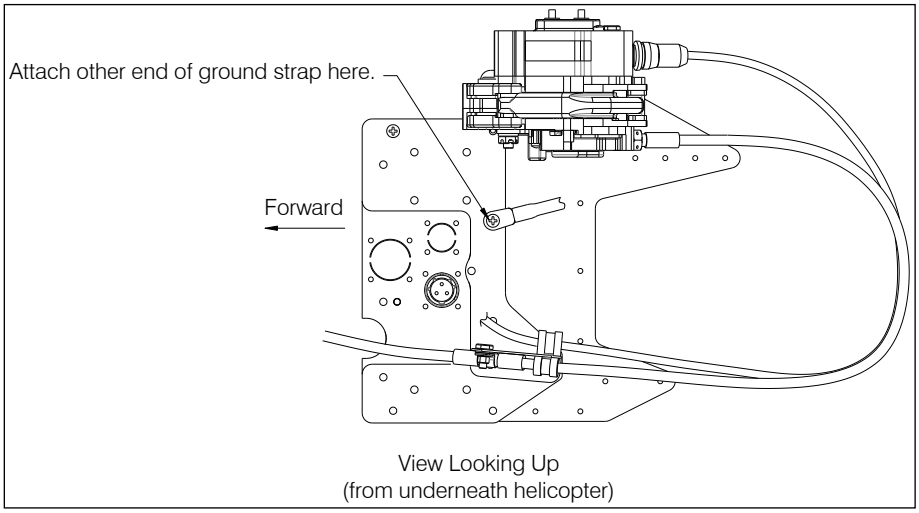
1. At the cargo hook, remove the anodize finish at the side plate by lightly sanding around the tapped hole next to the manual release cable attachment (Figure 4.41). Apply a suitable conductive chemical surface treatment (such as Alodine 1201) to the bare metal. Attach one of end of ground strap at this point with screw P/N 510-391-00.

Figure 4.41 Ground Strap Attach Point



2. Attach the other end of the ground strap at the connector panel assembly at the location shown below, re-using the screw removed with the Robinson inspection panel.

Figure 4.42 Ground Strap Attach Point (Connector Panel)



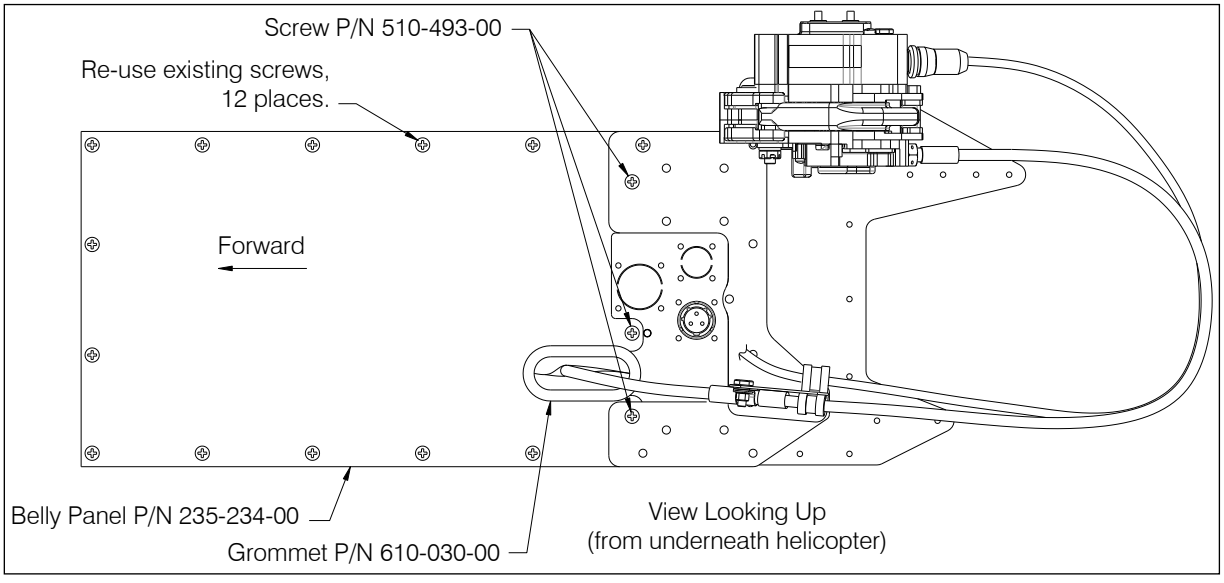
4.8 Belly Panel Installation

⚠ CAUTION

Before installing the Belly Panel (P/N 235-234-00), verify that the wire harnesses and manual release cable are secured clear of flight controls. Move the flight controls through their range of motion to verify that there is clearance in all positions.

1. Attach the supplied Belly Panel (P/N 235-234-00) by sliding the notched end into the gap between the upper and lower sheets of the Connector Panel Assembly.
2. Fasten the inspection panel cover to the aircraft, re-using the screws removed earlier.
3. Fasten the inspection panel cover to the Connector Panel Assembly with the three supplied screws (P/N 510-493-00).
4. Fit the grommet within the slot formed by the Belly Panel and Connector Panel Assembly.

Figure 4.43 Belly Panel Installation

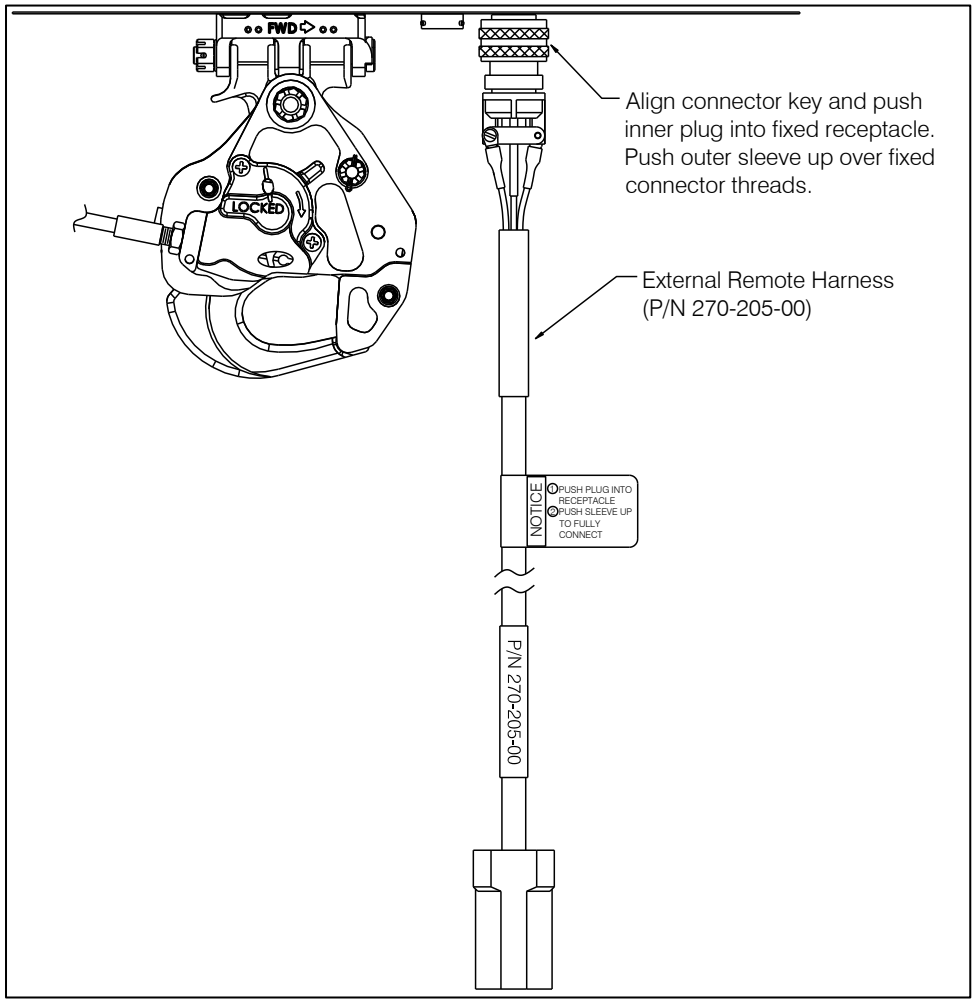


4.9 External Remote Electrical Harness Connection

The external remote electrical harness (P/N 270-205-00) features a breakaway connector that is designed to separate from the fixed connector in the event of a release of the rigging from the primary hook. Another feature of the external harness is that the ground and neutral wires are grounded through the backshell and the connector panel assembly for lightning protection.

1. To connect the external harness connector to the fixed connector, align the connector key and push the inner plug upwards into the fixed receptacle until seated. Then push the outer sleeve over the threads of the fixed receptacle until it is seated.

Figure 4.44 External Harness Connector



4.10 Placards

Following table summarizes all of the placards that should be installed (depending on kit configuration).

Table 4.10.1 Placards

Decal Description (Decal Number)	Location
CARGO RELEASE (P/N 215-281-00)	Install on the primary release switch housing in clear view of the pilot.
CARGO RELEASE (P/N 215-281-00)	Install on the co-pilot release switch housing (if installed) in clear view of the pilot.
CARGO RELEASE (P/N 215-281-00)	Install adjacent to the manual release T-handle in clear view of the pilot.
PULL (P/N 215-281-00)	Install adjacent to the manual release T-handle in clear view of the pilot.
CARGO HOOK (P/N 215-281-00)	Mount adjacent to the cargo hook circuit breaker in clear view of the pilot.
FAR PART 133.35(A) OPERATIONS: ... (P/N 215-281-00)	Install in the cockpit in clear view of the pilot.
WARNING EXTERNAL LOAD LIMIT…. (P/N 215-277-00)	Mount on the belly of the aircraft adjacent to the cargo hook attachment point in clear view of ground support personnel.
LOAD WEIGH (P/N 215-281-00)	Install adjacent to the load weigh circuit breaker in clear view of the pilot (if load weigh system is installed).
REMOTE HOOK (P/N 215-284-00)	Install on the remote release switch housing (ref to Figure 4.4.9).
REMOTE HOOK (P/N 215-284-00)	Install adjacent to the remote hook circuit breaker in clear view of the pilot (if remote release system is installed).
CARGO RELEASE HOLD FOR >1 SECOND (P/N 215-343-00)	Install adjacent to the primary CARGO RELEASE switch on the cyclic in clear view of the pilot (if cargo hook P/N 528-029-02 is installed).

4.11 Installation Check-out

After installation of the Cargo Hook Suspension System, perform the following functional checks.

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

2. With no load on the cargo hook load beam, pull the T-handle adjacent to the collective, the T-handle should freely move and the cargo hook load beam should open. If the T-handle doesn't readily return to its bottom position, loosen the face nut just enough so it moves freely. Reset the cargo hook load beam.

3. Close the cargo hook release circuit breaker and provide power to the system. 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's 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.

    - Repeat using the co-pilot release switch if kit P/N 200-417-00 was installed.

    The following instructions are applicable to cargo hook P/N 528-029-00.

    - With no load on the cargo hook load beam, depress the Cargo Release switch on the cyclic; the cargo hook load beam should open. Reset the cargo hook load beam.

    - Repeat using the co-pilot release switch if kit P/N 200-417-00 was installed.

If the C-39 Indicator was installed, refer to step 4 below.

4. Turn on the load weigh system using the On/Off switch next to the C-39 indicator and attach a weight to the cargo hook or pull downward on the load beam. The C-39 indicator display should show a load on the hook. Set the Installation Zero for the installation per the instructions contained in the C-39 Indicator's Owner's Manual 120-039-00.

If the C-40 Indicator was installed, refer to steps 5 and 6 below.

5. 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.

6. 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). 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).

If the remote hook release kit (P/N 200-392-00) was installed:

7. Connect a remote hook to the connector on the belly and depress the remote hook switch on the cyclic. The cargo hook should release.

4.12 Component Weights

The weights of the kits are listed in Table 4.12.1. Kit P/N 200-382-00 is not listed as it is an upgrade kit to convert a kit P/N 200-380 series to kit P/N 200-381 series.

Table 4.12.1 Component Weights & CGs

Kit	Weight lbs (kgs)	Longitudinal CG (STA) Inches (mm)	Lateral CG (BL) Inches (mm)
P/N 200-380 series	6.7 (3.0)	95.0 (2413)	-4.0 (-102)
P/N 200-381 series	7.9 (3.6)	87.0 (2210)	-4.0 (-102)
P/N 200-392-00	1.2 (0.54)	77.3 (1964)	-1.0 (-25)
P/N 200-417-00	0.15 (0.07)	32.0 (813)	-8.0 (-203)

4.13 Cargo Hook Location

Table 4.13.1 Cargo Hook Location

Fuselage Station	100.0
Lateral Station	-4.1

4.14 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. Insert the Rotorcraft Flight Manual Supplement 121-058-00 in the Rotorcraft Flight Manual.

5.0 Operation Instructions

Refer to Owner's Manual 120-039-00 for operation instructions for the C-39 indicator. Refer to Owner's Manual 120-152-00 for operation instructions for the C-40 indicator.

5.1 Operating Procedures

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

1. Activate the electrical 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's 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.
    - Repeat using the co-pilot release switch if kit P/N 200-417-00 is installed.

    The following instructions are applicable to cargo hook P/N 528-029-00.

    - With no load on the cargo hook load beam, depress the Cargo Release switch on the cyclic; the cargo hook load beam should open. Reset the cargo hook load beam.
    - Repeat using the co-pilot release switch if kit P/N 200-417-00 is installed.

    CAUTION

    The cargo hook release solenoid is not intended to be energized continuously. Depressing the electrical release button continuously in excess of 20 seconds will cause the release solenoid to overheat, possibly causing permanent damage.

2. Pull the T-handle in the cockpit to test the manual release system. The system should operate smoothly and the Cargo Hook must release and the T-handle should return to its initial position. Reset the load beam by hand after release. Verify that the hook lock indicator on the side of the hook returns to the fully locked position. In the fully locked position the hook lock indicator must align with the lines on the manual

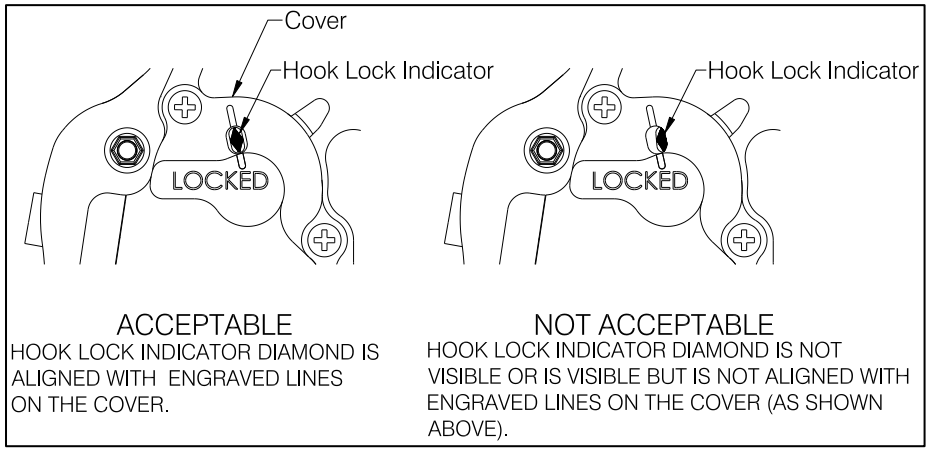
release cover (Figure 5.1). If the hook does not release or re-latch, do not use the unit until the problem is resolved.

WARNING

In the fully locked position the hook lock indicator must align with the lines on the manual release cover (see Figure 5.1)

3. Swing the cargo hook and suspension assembly in all directions and ensure the manual release cable and electrical harnesses are NOT pulled tight in any possible location.

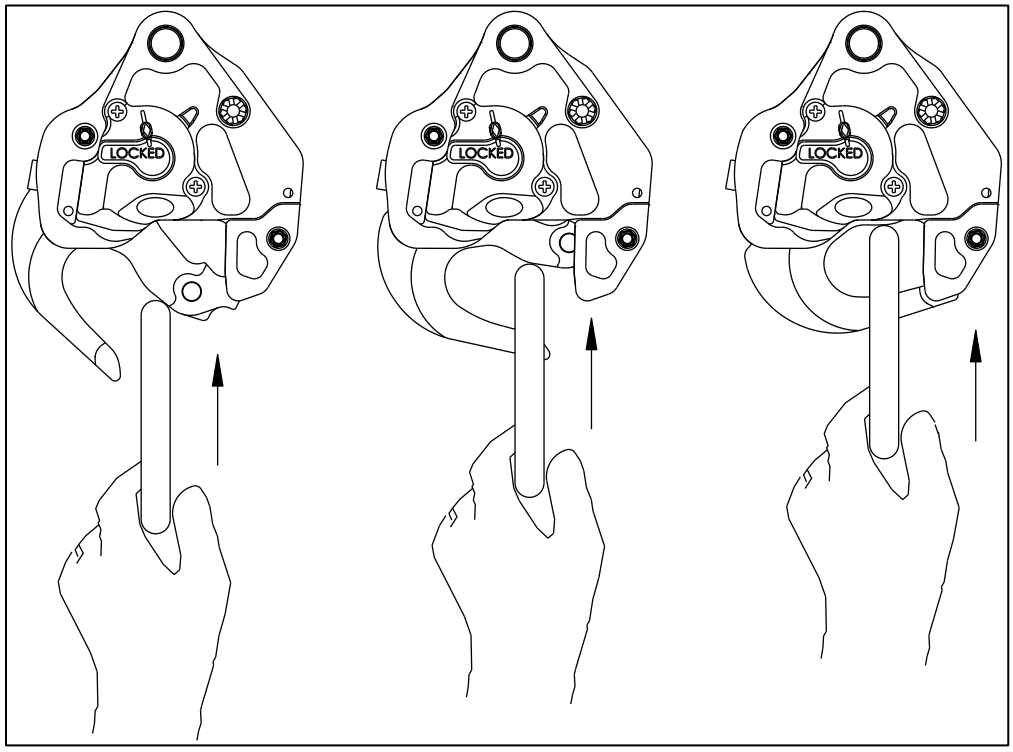
Figure 5.1 Hook Lock Indicator



5.2 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 5.2, until an internal latch engages the load beam and latches it in the closed position.

Figure 5.2 Cargo Hook Loading



5.3 Cargo Hook Rigging

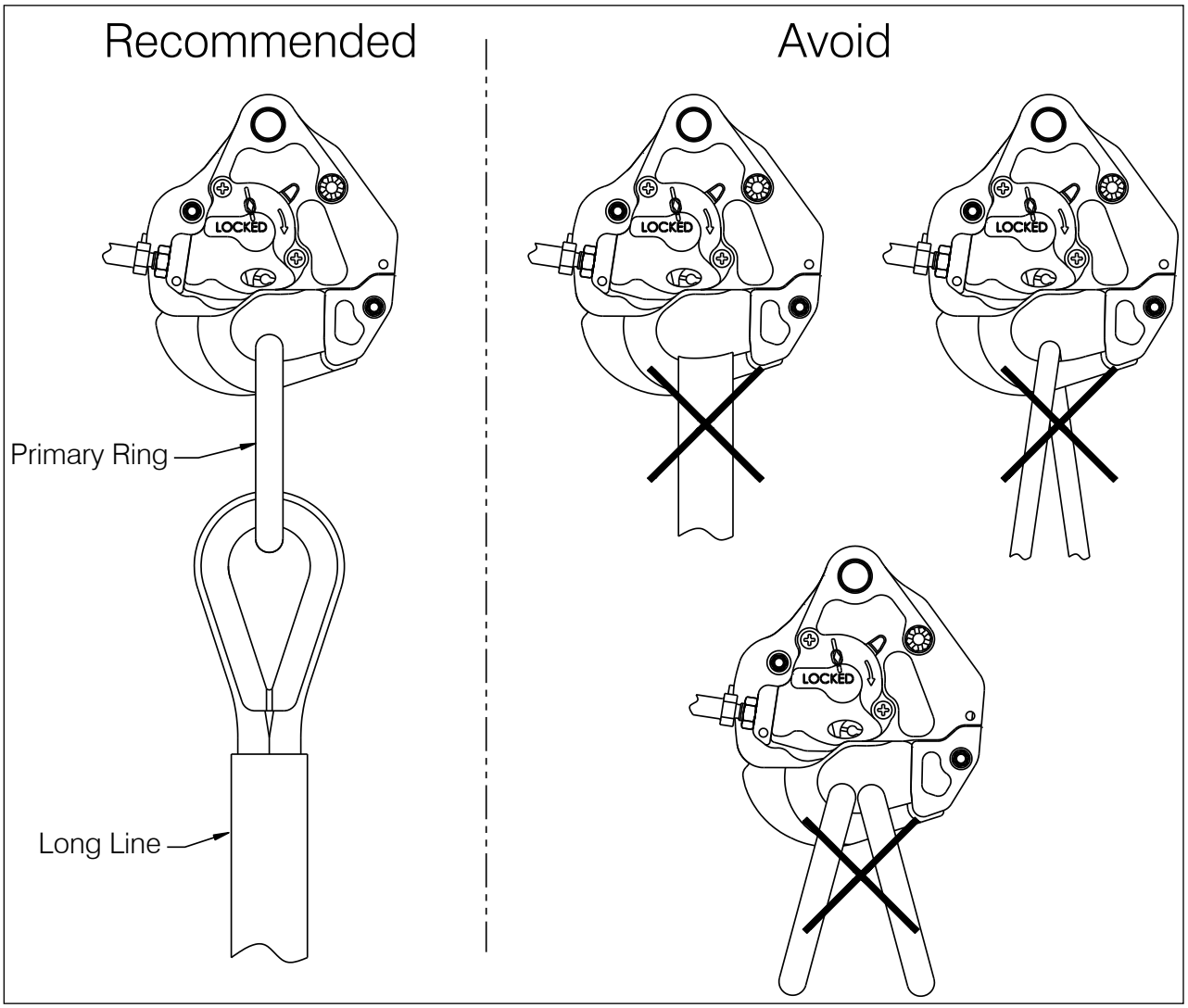
Extreme care must be exercised when rigging a load to the Cargo Hook. Steel load rings are recommended to provide consistent release performance and resistance to fouling. The following illustration shows the recommended rigging and rigging to avoid, but is not intended to represent all rigging possibilities.

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

5.3.1 Nylon Type Straps and Rope

Multiple load rings, nylon type straps (or similar material) or rope must 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.

Figure 5.3 Cargo Hook Rigging



6.0 Maintenance

Refer to the Instructions for Continued Airworthiness (ICA) manual 123-038-00 for maintenance of the cargo hook suspension system. For maintenance of cargo hook P/N 528-029-00 and P/N 528-029-02 refer to Cargo Hook Component Maintenance Manual 122-017-00.

6.1 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.

NOTICE

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:

1. Package the component carefully to ensure safe transit.
2. Write the RMA number on the outside of the box or on the mailing label.
3. Include the RMA number and reason for the return on your purchase or work order.
4. Include your name, address, phone and fax number and e-mail (as applicable).
5. 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

7.0 Certification

7.1 FAA STC

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number **SR02447SE**

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: R00015LA
Make: Robinson Helicopter Company
Model: R66

Description of the Type Design Change: Fabrication of Onboard Systems International R66 Cargo Hook Suspension System in accordance with Master Drawing List No. 155-173-00, Revision 5, dated April 15, 2015, or later Federal Aviation Administration (FAA) approved revision. Installation in accordance with Owner's Manual No. 120-206-00, Revision 3, dated April 15, 2015, or later FAA-approved revision. Maintained in accordance with the Instructions for Continued Airworthiness (ICA) No. 123-038-00, Revision 2, dated April 6, 2015, or later FAA-accepted revision. Operated in accordance with FAA-approved Rotorcraft Flight Manual Supplement (RFMS) No. 121-058-00, dated July 20, 2015, or later 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 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. A copy of this certificate, the ICA, and the RFMS must be maintained as part of the permanent records for the modified rotorcraft.

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.

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: April 22, 2011
Date of issuance: July 24, 2015
Date reissued:
Date amended:

FEDERAL AVIATION ADMINISTRATION

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(10-98) PAGE 1 OF 2 PAGES

7.2 Transport Canada Approval

Transport Canada / Transports Canada
Civil Aviation / Aviation Civile

Suite 820
800 Burrard Street
Vancouver, B.C.
V6Z 2J8

Your file Votre référence

Our file Notre référence
RDIMS# 11234954
5010-1

October 30, 2015

To,
Mr. Ross Landes
Manager, Seattle Aircraft Certification Office
Transport Airplane Directorate
1601 Lind Avenue SW
Renton, Washington 98057-3356
USA

Subject: Transport Canada Acceptance of FAA STC SR02447SE

References:
1. FAA letter 102S-15-242, dated September 04, 2015
2. TCCA Staff Instruction 513-003 "Acceptance and Approval of Foreign Design Changes"

Dear Mr. Landes,

This is in response to reference 1, requesting a Transport Canada approval of the subject STC.

In accordance with current policy associated with the review of foreign STCs (reference 2), FAA STCs applicable to Normal Category rotorcraft which were type certified on the basis of FAR 27 or equivalent standards, for which the U.S. is the State of Design are exempt from a type design examination.

The subject STC falls within the criteria and can be used in Canada without review by Transport Canada. As such, no acceptance letter will be issued for this application.

Should you require further information or wish to discuss the enclosed, please do not hesitate to contact me by telephone at 604-666-5269 or by email at robert.metz@tc.gc.ca.

Yours truly,

Robert Metz
Regional Engineer
Aircraft Certification (TAHI-VAN)
Pacific Region

Cc: Mark Hanson, Onboard Systems (markh@onboardsystems.com)

Canada

1/1

7.3 EASA STC

EASA
European Aviation Safety Agency

SUPPLEMENTAL TYPE CERTIFICATE

10055382

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 (EU) No. 748/2012 to:

ONBOARD SYSTEMS INTERNATIONAL

13915 NW 3RD COURT
VANCOUVER WA 98685
USA

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 Type Certificate Number: EASA.IM.R.507
Type Certificate Holder: ROBINSON HELICOPTER COMPANY
Type: R66
Model: R 66
Original STC Number: FAA SR0244SE

Description of Design Change:
Cargo Hook Kit

EASA Certification Basis:
The Certification Basis (CB) for the original product remains applicable to this certificate/ approval.
The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

See Continuation Sheet(s)

For the European Aviation Safety Agency

Date of Issue: 05 November 2015

Massimo MAZZOLETTI
Head of Rotorcraft Department

10039622
SUPPLEMENTAL TYPE CERTIFICATE - 10055382 - ONBOARD SYSTEMS INTERNATIONAL - 302945

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EASA STC continued

EASA

Associated Technical Documentation:
Rotorcraft Flight Manual Supplement Onboard Systems Cargo Hook Suspension System for the Robinson R66 121-058-00, Rev. 0, dated 20 July 2015 or later revisions of the above listed documents approved by EASA in accordance with EASA ED Decision 2004/04/CF (or subsequent revisions of this decision) and/ or the Technical Implementation Procedures of EU/ USA Bilateral Agreement.

Master Drawing List 155-173-00, Revision 5, dated 15 April 2015.

Limitations/Conditions:
Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- End -

10039622
SUPPLEMENTAL TYPE CERTIFICATE - 10055382 - ONBOARD SYSTEMS INTERNATIONAL - 302945

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7.4 Mexico Approval

SCT
SECRETARÍA DE COMUNICACIONES Y TRANSPORTES

Subsecretaría de Transporte
Dirección General de Aeronáutica Civil
Unidad de Aviación Aeronáutica de Aviación

Convalidación IA-343/2015 del Certificado de Tipo Suplementario No. SR02447SE

La Secretaría de Comunicaciones y Transportes, con base en la Carta de Política AV-01/02 R4 de fecha 24 de Enero de 2012, y al Artículo 21, Fracción XIV del Reglamento Interior de la Secretaría de Comunicaciones y Transportes, a través de la Dirección General de Aeronáutica Civil, otorga este documento a favor de:

The Secretaría de Comunicaciones y Transportes, based in the Carta de Política AV-01/02 R4 dated January 24, 2012, and the Article 21, Section XIV of the Reglamento Interior de la Secretaría de Comunicaciones y Transportes, by means of the Dirección General de Aeronáutica Civil, issues this document to:

ONBOARD SYSTEMS INTERNATIONAL
13915 NW 3rd Court
Vancouver, Washington 98685
USA

Convalidando el Certificado de Tipo Suplementario No. SR02447SE, expedido el 24 de julio de 2015, por la Administración Federal de Aviación (FAA).

Validating the Supplemental Type Certificate No. SR02447SE, issued on July 24, 2015 by the Federal Aviation Administration (FAA).

Lo enunciado a continuación, reúne las especificaciones aplicables para su operación segura de acuerdo con las Normas, Procedimientos y Reglamentaciones requeridas por esta Dirección General de Aeronáutica Civil (DGAC).

The described below meets the applicable specifications for safe operation in accordance with the Standards, Procedures and Regulations required by the Dirección General de Aeronáutica Civil (DGAC).

Mexico Approval continued

SCT
SECRETARÍA DE COMUNICACIONES Y TRANSPORTES

No. control DGAC *DGAC control No.*	IA-343/2015
Titular *Holder*	Onboard Systems International
Modificación *Modification*	Fabricación de un sistema de suspensión de gancho de carga R66 de Onboard Systems International, de acuerdo con la Lista Maestra de Dibujos de Onboard Systems No. 155-173-00, Revisión 5, de fecha 15 de abril de 2015, o revisión posterior aprobada por la Administración Federal de Aviación (FAA). La instalación debe ser de acuerdo con el Manual del propietario No. 120-206-00, Revisión 3, de fecha 15 de abril de 2015, o revisión posterior aprobada por la FAA. El mantenimiento debe efectuarse de acuerdo con las Instrucciones de Aeronavegabilidad Continua (ICA) No. 123-038-00, Revisión 2, de fecha 6 de abril de 2015, o revisión posterior aceptada por la FAA. La operación debe ser de acuerdo con el Suplemento al Manual de Vuelo del helicóptero (RFMS) No. 121-058-00, de fecha 20 de julio de 2015, o revisión posterior aprobada por la FAA. *Fabrication of Onboard Systems International R66 Cargo Hook Suspension System in accordance with Master Drawing List No. 155-173-00, Revision 5, dated April 15, 2015, or later Federal Aviation Administration (FAA) approved revision. Installation in accordance with Owner's Manual No. 120-206-00, Revision 3, dated April 15, 2015, or later FAA-approved revision. Maintained in accordance with the Instructions for Continued Airworthiness (ICA) No. 123-038-00, Revision 2, dated April 6, 2105, or later FAA-accepted revision. Operated in accordance with FAA-approved Rotorcraft Flight Manual Supplement (RFMS) No. 121-058-00, dated July 20, 2015, or later FAA-approved revision.*

Mexico Approval continued

SCT

SECRETARÍA DE COMUNICACIONES Y TRANSPORTES

No. control DGAC *DGAC control No.*	IA-343/2015
Limitaciones y Condiciones *Limitations and Conditions*	La aprobación de este cambio al diseño de tipo aplica solamente al modelo listado abajo. Esta aprobación no se deberá extender a helicópteros de este modelo, en el que estén incorporadas otras modificaciones previamente aprobadas, a menos que el instalador determine que la interrelación entre este cambio y cualquiera de esas modificaciones previamente aprobadas, incluyendo cambios en el diseño de tipo, no introducirá ningún efecto adverso sobre la aeronavegabilidad del helicóptero. Una copia de esta convalidación, del STC SR02447SE, de las ICA y del RFMS, deberán mantenerse como parte de los registros permanentes del helicóptero modificado. Si el Titular acuerda en permitir que otra persona use el STC SR02447SE para alterar un producto, el Titular deberá dar a la otra persona la evidencia por escrito de ese permiso. *Approval of this change in type design applies only to the below model rotorcraft. This approval should not be extended to 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. A copy of this validation, STC SR02447SE, the ICA, and the RFMS must be maintained as part of the permanent records for the modified rotorcraft.* *If the holder agrees to permit another person to use STC SR02447SE to alter the product, the holder shall give the other person written evidence of that permission.*
Aplicable a las aeronaves *Applicability*	*Robinson Helicopter Company* *R66*

Mexico Approval continued

SCT

SECRETARÍA DE COMUNICACIONES Y TRANSPORTES

No. control DGAC *DGAC control No.*	IA-343/2015

VIGENCIA: Esta convalidación se mantendrá vigente hasta que sea cancelada, suspendida o revocada o si se establece una fecha de terminación por la Dirección General de Aeronáutica Civil (DGAC).

Validity: *This validation shall remain in effect until surrendered, suspended or revoked or a termination date is otherwise established by the Dirección General de Aeronáutica Civil (DGAC).*

FECHA DE EMISIÓN

Date of Issue

04 de Diciembre de 2015

December 04, 2015

ING. PABLO CARRANZA PLATA

DIRECTOR GENERAL ADJUNTO DE AVIACIÓN

7.5 ANAC (Brazil) STC

ANAC
AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL

CERTIFICADO SUPLEMENTAR DE TIPO
(Supplemental Type Certificate)

NÚMERO (Number) **2016S03-01**

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 Systems 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 especificadas, satisfeito aos requisitos de aeronavegabilidade aplicáveis.
(for having the change to the type design of the product mentioned below, with the limitations and conditions therefor as specified hereon, met the applicable airworthiness requirements.)

Produto Original - Número do Certificado de Tipo: (Original Product – Type Certificate No:) 2011T06

Fabricante: (Manufacturer:) Robinson Helicopter Company

Modelo(s): (Model(s):) R66

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

Installation of Onboard System International R66 Cargo Hook Suspension System in accordance with Master Drawing List No. 155-173-00, revision 5, dated 15 Apr. 2015 or later approved revision.

This CST validates in Brazil the STC No. SR02447SE, issued by FAA (USA).

LIMITAÇÕES E CONDIÇÕES:
(Limitations and Conditions:)

See continuation sheet for applicable data.

DATAS:
(Dates of:)

Do Requerimento: (Application:) 04 Nov. 2015 **Da emissão:** (Issuance:) 01 Mar. 2016 **Da reemissão:** (Reissuance:) **Da emenda:** (Amendment:)

MÁRIO IGAWA
Gerente-Geral, Certificação de Produto Aeronáutico
(General Manager, Aeronautical Product Certification)

DINO ISHIKURA
Superintendente de Aeronavegabilidade
(Airworthiness Superintendent)

F-400-01G (04.12) Fl. 01 de 02 (Sheet) (of) H.02-4661-0

ANAC (Brazil) STC continued

ANAC
AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL

Folha de Continuação ao
(Continuation Sheet to)

CERTIFICADO SUPLEMENTAR DE TIPO
(Supplemental Type Certificate)

NÚMERO **2016S03-01**
(Number)

LIMITAÇÕES E CONDIÇÕES:
(Limitations and Conditions:)

I. The approval of this type design change 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.

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 Onboard Systems Rotorcraft Flight Manual Supplement (RFMS) No. 121-058-00, Rev. I.R., dated 20 July 2015, or later approved revisions.

IV. Instructions for Continued Airworthiness (ICA) No. 123-038-00, Rev. 3, dated 30 July 2015, or later FAA accepted revisions is required for this installation.

V. A copy of this Certificate, the Supplement referred on item III above, ICA and Cargo Hook Service Manual shall be maintained as part of the permanent records of the modified rotorcraft.

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

F-400-01G (04.12) Fl. 02 de 02 (Sheet) (of) H.02-4661-0