Owner's Manual
Dual Cargo Hook System
for the
Bell 206L Series and 407

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Applicable Equipment Part Numbers

200-456-XX
200-458-XX
200-465-00

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RECORD OF REVISIONS

Revision	Date	Page(s)	Reason for Revision
3	09/10/20	9, 10, 20, 21	Updated bill of materials for 200-459-00 and 200-459-01 to replace P/Ns 232-782-03, 235-297-00, and 235-298-00 with P/N 232-782-01. Added P/N 232-782-03 to installation instructions.
4	07/15/24	12, 62	Replaced C-40 Indicator P/N 210-293-00 with P/N 210-293-01 in new production kits.
5	11/19/25	9, 10, 20, 22	Corrected Forward and Aft Bulkhead Fitting P/Ns in Bill of Materials (Table 2.5). Clarified the current configurations of these P/Ns in Figures 3.1.3 and 3.1.4.
6	04/06/26	8, 73	Added references to Onboard Systems Fixed Provisions Kit P/N 200-328-00 and Bell P/N 206-706-341-111, -117, -123 Auxiliary Equipment Kits under Table 2.4. Removed reference to decal P/N 215-382-00.
7	11/10/26	9, 12, 24, 25, 35, 48, 54, 78, 82-90	Added core removal step for installing bushings (P/N 291-994-00) through floor panel. Corrected MS27039 part number for screw P/N 511-221-00 and changed screw P/N 510-391-00 to 511-221-00 in Figure 3.1.7. Corrected screw P/N in step 27 below Figure 3.1.7 to 510-580-00. Added instructions to check cyclic balance and modify the existing cyclic balance parts if necessary. Added cyclic balance kit P/N 200-516-00 to Fixed Provisions Kits 200-459-00 and 200-459-01.

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CONTENTS

1.0 Introduction 4
1.1 Scope 4
1.2 Capability 4
1.3 Safety labels 4
2.0 System Overview 5
2.1 Introduction 5
2.2 Specifications 7
2.3 Bill of Materials – 407 Dual Cargo Hook System 8
2.4 Bill of Materials – 206L Dual Cargo Hook System 13
2.5 Bill of Materials – Long Line Kit 16
3.0 Installation 17
3.1 Secondary Hardpoint Installation - 407 18
3.2 Secondary Hardpoint Installation – 206L Models 27
3.3 Bulkhead Fitting Installation – 407 Model 32
3.4 Fixed Hydraulic Release System Installation 35
3.4.1 Routing – Right Side Cyclic Installation 37
3.4.2 Routing - Left Hand Cyclic (Bell 407 only) 49
3.5 Fixed Cargo Hook Electrical Provisions Installation 55
3.5.1 Primary Cargo Hook Electrical Release Wiring Installation 55
3.5.2 Secondary Cargo Hook Electrical Release Wiring Installation 59
3.5.3 Load Weigh System Fixed Electrical Installation 62
3.6 Primary Cargo Hook Installation 66
3.7 Secondary Cargo Hook Installation 70
3.8 Placard Installation 73
3.9 Hydraulic System Fill and Bleed Procedure 74
3.10 Long Line Kit 78
3.10.1 Rigging Plate 80
3.11 Cyclic Balance Check 82
3.12 Installation Check-out 87
3.13 Component Weights 89
3.14 Paperwork 90
4.0 Maintenance 91
5.0 Instructions for Returning Equipment to the Factory 91

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1.0 Introduction

1.1 Scope

This manual contains instructions for installation of the Dual Cargo Hook System on Bell 206L, 206L-1, 206L-3, 206L-4 and 407 aircraft.

1.2 Capability

The instructions contained in this document are provided for the benefit of experienced aircraft maintenance personnel and facilities that can carry out the procedures.

1.3 Safety labels

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



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



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



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



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



Used to address practices not related to personal injury.

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2.0 System Overview

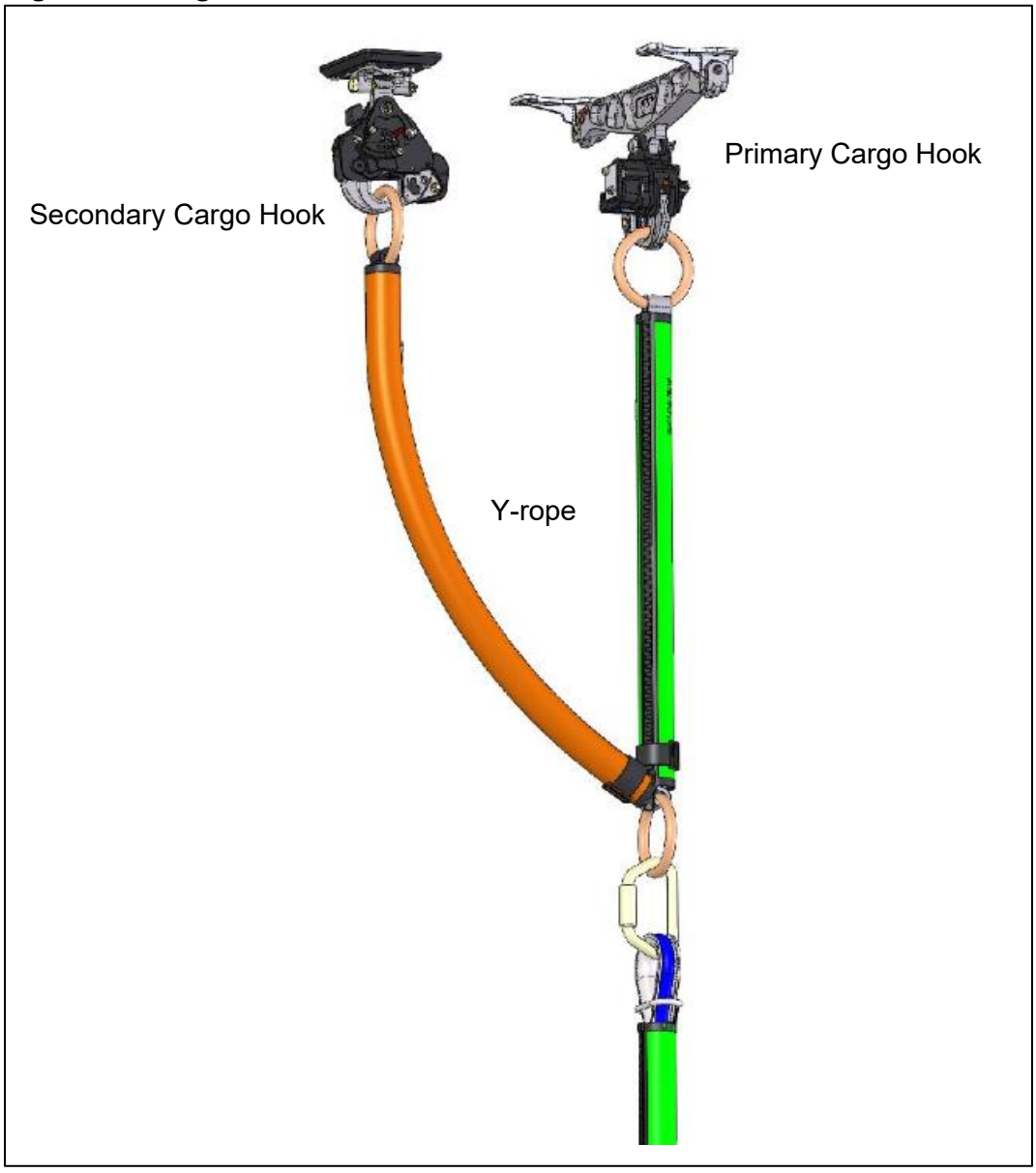
2.1 Introduction

The Dual Cargo Hook System is approved for carrying Human External Cargo (HEC) on the Bell 206L series and 407 model helicopters.

The Dual Cargo Hook System includes:

1. A primary cargo hook and a secondary cargo hook to which a supplied Y-rope is connected to for carrying of HEC. These cargo hooks are Onboard Systems 528-028 series of cargo hooks with hydraulic release.

Figure 2.1 Cargo Hook Overview

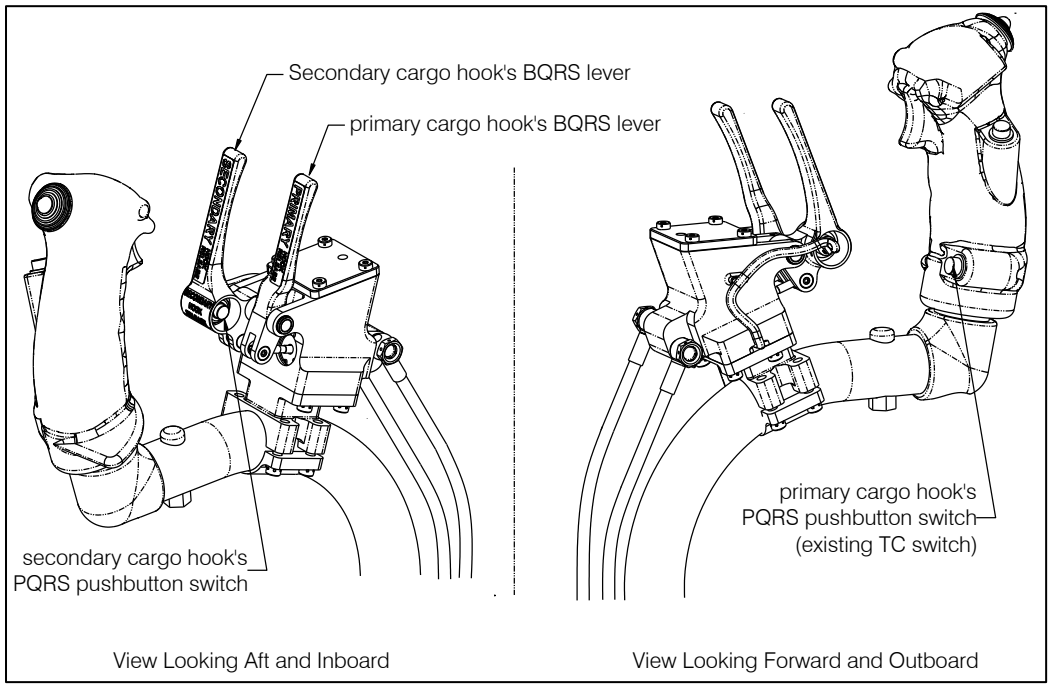


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2. Separate backup quick release sub-systems (BQRS) for the primary and secondary cargo hook. These systems are independently actuated by release levers installed on the cyclic (reference Figure 2.2)
3. A complete primary quick release sub-system (PQRS) for the secondary cargo hook including a release push button switch integrated into the secondary cargo hook release lever on the cyclic.
4. For the 407 model: a complete primary quick release sub-system (PQRS) for the primary cargo hook except for the release push button switch. The PQRS interfaces with the existing Bell cargo release switch integrated into the cyclic grip.

   For the 206L series models: the dual cargo hook system requires that the Bell fixed provisions including the primary cargo hook electrical release system is installed.

Figure 2.2 Cargo Hook Controls Overview



5. Secondary Hardpoint. The secondary hardpoint is the internal structure installed in the foot well of the passenger seats; it provides the means to attach the secondary cargo hook to the aircraft.
6. Y-rope. The Y-rope is required as it provides a controlled interface between the two cargo hooks and the long line.
7. An optional Long Line Assembly designed to interface with the Y-rope and includes Lanyard Assemblies to connect to a personnel harness.

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2.2 Specifications

Table 2.1 P/N 232-800-00 Attach Point (Secondary) Specifications

Rated Load*	800 lbs (363 kgs)
Design Ultimate Strength	3,000 lbs (1,361 kgs)

*Use of the secondary (forward) Attach Point is limited to dual cargo hook (HEC) operations with the slack line of the Y-rope attached to it. Do NOT exceed the rated load of 800 lbs with this configuration.

Table 2.2 P/N 232-606-00 Beam Assembly (Primary) Specifications

Rated Load**	2,650 lbs (1202 kgs)
Design Ultimate Strength	9,938 lbs (4,508 kgs)

**P/N 232-606-00 Beam Assembly is the previously approved configuration for NHEC operations under STC SR01943SE and this rated load remains applicable with the load attached ONLY to this attach point.

Table 2.3 Cargo Hook P/N 528-028-00, 528-028-03 Specifications

Rated load (P/N 528-028-00)	3,500 lbs. (1,580 kg.)
Rated load (P/N 528-028-03)	800 lbs. (363 kg)***
Design ultimate strength	13,125 lbs. (5,953 kg.)
Electrical release capacity	8,750 lbs. (3,970 kg.)
Mechanical release capacity	8,750 lbs. (3,970 kg.)
Force required for mechanical release at 3,500 lbs.	14 lbs max. @ Master Cylinder
Electrical requirements	22-32 VDC 6.9 – 10 amps
Minimum release load	0 lbs.
Unit weight	3.0 lbs. (1.35 kg.)
Mating electrical connector	PC05A8-2S

*** Cargo Hook P/N 528-028-03 is the secondary (forward) cargo hook and is a dedicated HEC cargo hook thus is limited to 800 lbs. (363 kg).

⚠ CAUTION

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

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2.3 Bill of Materials – 407 Dual Cargo Hook System

The following is a breakdown of the kits of the Dual Cargo Hook System for the 407 model. The Dual Cargo Hook System is broken down into several kit configurations to accommodate existing Onboard Systems cargo hook STC installations in the field, i.e. - if a cargo hook system is installed per Onboard Systems STC SR01943SE, most of this system can be used with an exception being the hydraulic release system must be replaced by the dual release system.

NOTICE

The Onboard Systems trolley beam (per STC SR00898SE) and Bell's TC trolley beam are not approved for use in the Dual Cargo Hook System. These installations must be upgraded to the fixed beam.

An operator with a fixed beam with hydraulic hook per STC SR01943SE requires 200-459-00 or 200-459-01 Fixed Provisions, Secondary Hook (depending on LH or RH PIC) and 200-460-00 Removable Provisions, Secondary Hook. A Bell 407 operator with no cargo hook provisions would purchase a 200-456-00 (407 w/ LH PIC) or 200-456-01 (407 w/ RH PIC).

Table 2.4 Bill of Materials – Dual Cargo Hook System P/N 200-456-XX

Part No.	Description	Qty	
		-00	-01
200-459-00	Fixed Provisions, Secondary Hook, LH PIC	1	-
200-459-01	Fixed Provisions, Secondary Hook, RH PIC	-	1
200-460-00	Removable Provisions, Secondary Hook	1	1
200-461-00*	Fixed Provisions, Primary Hook	1	1
200-395-00	Removable Provisions, Primary Hook	1	1
200-464-00	Pin Load Weigh Kit, C-40	Opt.	Opt.

*If the aircraft is equipped with an Onboard Systems trolley beam per STC SR00898SE or the Bell TC trolley beam kit, P/N 200-461-00 should be replaced by P/N 200-463-00 Pillow Block Kit which provides the structural mounts (Pillow Blocks) for connecting the fixed beam to the internal structural provisions. P/N 200-463-00 includes just the Pillow Blocks (P/N 232-188-01 for LH and P/N 232-189-01 for RH) and their mounting hardware from kit P/N 200-461-00.

If the aircraft is equipped with the Onboard Systems Fixed Provisions Kit P/N 200-328-00 or Bell P/N 206-706-341-111, -117, or -123 Auxiliary Equipment Kit – Cargo Hook Provisions, the P/N 200-461-00 kit should be replaced by P/N 200-463-00 Pillow Block Kit. To verify the Pillow Block configuration present, refer to Section 3.6 for figures showing Pillow Blocks.

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The parts included with the P/N 200-459-00 and 200-459-01 fixed provisions kits for the secondary cargo hook are listed below. These kits include the Dual Master Cylinder with Plumbing which includes the backup release provisions for both the primary cargo hook and secondary cargo hook. P/N 200-459-00 includes hydraulic release system components for installation for left hand PIC while P/N 200-459-01 is for installation for right hand PIC.

NOTICE

Installation of the backup release levers on the left side does not constitute approval for left crew seat pilot-in-command operations. There must be provisions 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 and left crew seat pilot-in-command operation must be approved.

Table 2.5 Bill of Materials – Fixed Provisions Kits 200-459-00 & 200-459-01

Part No.	Description	Qty	
		-00	-01
200-516-00[3]	Cyclic Balance Adjustment Kit	1	1
212-014-02	Hydraulic Bleed Kit	1	1
215-390-00	External Load Limit Decal	1	1
215-399-00	MS27039-1-06 Decal	2	2
232-782-01[1,2]	Forward Bulkhead Fitting Assy, 407	1	1
232-782-02[1,2]	Aft Bulkhead Fitting Assy, 407	1	1
232-800-00	Secondary Attach Point Assembly	1	1
232-820-00	Dual Master Cylinder with Plumbing, LH	1	-
232-821-00	Dual Master Cylinder with Plumbing, RH	-	1
232-826-00	Intermediate Plumbing	2	-
235-293-00	Disconnect Bracket	1	1
235-294-00	Doubler	1	1
235-295-00	Doubler	1	1
270-237-00	Internal Harness	1	1
270-238-00	External Fixed Release Harness	1	1
291-994-00	Bushing	4	4
291-996-00	Reinforced Tunnel, 407	1	1
291-997-01	Load Plate	1	1
410-218-00	Contact, 16/16	1	1
410-258-00	Ring Terminal, 16-14, #10 Stud	1	1
410-309-00	Ring Terminal, 16-14, #6 Stud	1	1
440-007-00	Circuit Breaker, 10A	1	1

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Part No.	Description	Qty	
		-00	-01
445-005-00	Relay	1	1
500-062-00	Spacer	-	2
510-095-00	Washer	53	56
510-100-00	Washer	8	8
510-102-00	Nut	3	4
510-390-00	Screw	-	2
510-391-00	Screw	41	40
510-392-00	Screw	-	2
510-419-00	Washer	1	1
510-580-00	Screw	2	2
510-644-00	Screw	2	4
510-645-00	Screw	5	5
510-646-00	Spacer	1	3
510-647-00	Spacer	5	7
510-652-00	Screw	2	4
510-688-00	Rivet	16	16
510-700-00	Screw	4	4
511-035-00	Insert	2	2
511-177-00	Bolt, 12-Point	4	4
511-178-00	Bolt, 12 Point	4	4
511-179-00	Nut, 12-Point	8	8
511-183-00	Insert, Molded-In	20	20
511-203-00	Perimeter Nut Plate	1	1
511-221-00	Screw	2	2
512-003-00	Cable Tie - Natural	24	24
512-005-00	Cushioned Loop Clamp	6	6
512-026-00	Cushioned Loop Clamp	6	6
512-028-00	Angle Bracket	1	2
512-034-00	Cushioned Loop Clamp	1	1
512-037-00	Cushioned Loop Clamp	2	6
512-067-00	Loop Clamp	1	1
512-068-00	Loop Clamp	2	2
512-069-00	Loop Clamp	1	1
540-032-00	2 oz. Bottle of Hydraulic Fluid	1	1
590-046-00	Spiral Hose Wrap 3/8 Inch, Black	36"	36"

Notes:

1. P/Ns 232-782-02 and 232-782-03 w/ Shims (P/Ns 235-297-00 and 235-298-00) replaced quantity 2 of P/N 232-782-00 for improved fit with aircraft (June 5, 2020). P/N 232-782-03 w/ shims was an interim configuration (see Note 2).
2. P/N 232-782-01 replaces Bulkhead Fitting Assembly P/N 232-782-03 and Shim P/Ns 235-297-00 and P/N 235-298-00 (September 8, 2020).
3. See Table 2.9 for Bill of Materials.

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The parts included with the P/N 200-460-00 Removable Provisions, Secondary Cargo Hook are listed below. This kit includes the Secondary Cargo Hook with the Slave Cylinder w/Plumbing pre-installed, an Electrical Release Harness, and attach hardware.

Table 2.6 Bill of Materials – P/N 200-460-00

Part No.	Description	Qty
232-822-00	Cargo Hook W/ Slave Cylinder	1
270-239-00	External Electrical Harness, Secondary	1
290-332-00	Attach Bolt	1
290-360-01	Bumper, 3.5k Hook	1
510-102-00	Nut	1
510-170-00	Nut	1
510-174-00	Washer	1
510-178-00	Cotter Pin	1
510-183-00	Washer	2
510-244-00	Bolt	1
510-712-00	Bolt	1
512-027-00	Cushioned Loop Clamp	1
512-058-00	Flat Bracket	1

The parts included with the P/N 200-461-00 Fixed Provisions Kits for the primary cargo hook are listed below.

Table 2.7 Bill of Materials – P/N 200-461-00

Part No.	Description	Qty
215-205-00	J180 Decal	1
232-188-01	Pillow Block, Left	1
232-189-01	Pillow Block, Right	1
270-151-00	Electrical Harness	1
270-152-00	Electrical Harness	1
291-144-00	Bulkhead Fitting	2
291-145-00	Radius Block, Left	2
291-146-00	Radius Block, Right	2
291-152-00	Shim	1
410-243-00	Splice	2
440-007-00	Circuit Breaker, 10a	1
510-095-00	Washer	20
510-102-00	Nut	1
510-234-00	Nut	4
510-419-00	Washer	1
510-624-00	Screw	4
510-633-00	Screw	1
510-644-00	Screw	16
510-648-00	Washer	4
510-725-00	Bolt	4
512-003-00	Cable Tie - Natural	2

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The parts included with the optional P/N 200-464-00 Pin Load Weigh Kit are listed below.

Table 2.8 Bill of Materials – P/N 200-464-00

Part No.	Description	Qty
210-282-01	Pin Load Cell Assembly	1
210-293-01*	C-40 Load Weigh Indicator	1
215-010-00	Electronic Load Weigh Placard	1
270-241-00	Load Weigh Internal Harness	1
410-199-00	Shield Termination	1
410-255-00	Connector	1
410-446-00	Strain Relief Clamp	1
450-005-00	Heat Shrink 1/4" Black 2:1	1.5"
510-029-00	Nut	4
510-062-00	Washer	4
510-170-00	Nut	1
510-174-00	Washer	1
510-178-00	Cotter Pin	1
510-183-00	Washer	1
510-481-00	Screw	4
511-211-00	Screw	4
512-001-00	Cable Tie 3.5 In	10
512-026-00	Cushioned Loop Clamp	6

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

Installation of the Dual Master Cylinder on the cyclic on an aircraft with dual controls may require modification and replacement of some of the existing cyclic balancing components. Cyclic Balance Adjustment Kit P/N 200-516-00 is included with Fixed Provisions Kits 200-459-00 and 200-459-01 for the 407 model and is to be used if necessary.

Table 2.9 – Bill of Materials - Cyclic Balance Adjustment Kit P/N 200-516-00

Part No.	Description	Qty
514-145-00	Spring	1
511-417-00	Insert	2
510-644-00	Screw	1
510-785-00	Washer	1

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2.4 Bill of Materials – 206L Dual Cargo Hook System

This section includes the kits of the Dual Cargo Hook System for the 206L series models. A 206L model must be equipped with the Bell fixed provisions including the electrical release wiring and the internal structural provisions for the primary cargo hook.

NOTICE

The Onboard Systems trolley beam (per STC SR00898SE) and Bell's TC trolley beam are not approved for use in the Dual Cargo Hook System. These components must be upgraded to the fixed beam.

Table 2.10 lists the kits for the Dual Cargo Hook System installation on the 206L, of which all are required except for the optional Pin Load Weigh Kit. P/N's 200-395-00, 200-460-00, and 200-464-00 are the same as for the 407 model and their parts lists are included in 2.3

Table 2.10 Bill of Materials – Dual Cargo Hook System P/N 200-465-00

Part No.	Description	Qty
200-395-00	Removable Provisions, Primary Hook	1
200-460-00	Removable Provisions, Secondary Hook	1
200-462-00	Fixed Provisions, Secondary Hook	1
200-463-00	Pillow Block Kit	1
200-464-00	Pin Load Weigh Kit, C-40	Opt.

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The parts included with the P/N 200-462-00 Fixed Provisions kit for the secondary cargo hook are listed in Table 2.11 below. This kit includes the Dual Master Cylinder with Plumbing which includes the backup release provisions for both the primary cargo hook and secondary cargo hook.

Table 2.11 Bill of Materials – Kit P/N 200-462-00

Part No.	Description	Qty
212-014-02	Hydraulic Bleed Kit	1
215-390-00	External Load Limit Decal	1
232-783-00	Fwd Bulkhead Fitting Assy, 206L	1
232-784-00	Aft Bulkhead Fitting Assy, 206L	1
232-800-00	Secondary Attach Point Assembly	1
232-821-00	Dual Master Cylinder With Plumbing, RH	1
235-293-00	Disconnect Bracket	2
235-294-00	Relay Mount Doubler	40
235-295-00	Doubler	8
270-237-00	Internal Harness	4
270-238-00	External Fixed Release Harness	2
291-993-00	Reinforced Tunnel	46
291-994-00	Bushing	2
291-997-01	Load Plate	4
410-218-00	Contact, 16/16	5
410-258-00	Ring Terminal, 16-14 AWG, #10 Stud	3
410-309-00	Lug, Ring, 16-14 AWG, #6 Stud	7
440-007-00	Circuit Breaker, 10a	4
445-005-00	Relay	16
500-062-00	Spacer	4
510-095-00	Washer	2
510-100-00	Washer	4
510-102-00	Nut	4
510-390-00	Screw	8
510-391-00	Screw	2
510-392-00	Screw	10
510-644-00	Screw	18
510-645-00	Screw	1
510-646-00	Spacer	4
510-647-00	Spacer	24
510-652-00	Screw	6
510-688-00	Rivet	6
510-700-00	Screw	2
511-035-00	Insert	1
511-177-00	Bolt, 12-Point	6
511-178-00	Bolt, 12 Point	1
511-179-00	Nut, 12-Point	2
511-180-00	Screw	1
511-183-00	Insert, Molded-In	36"

Continued on following page

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Part No.	Description	Qty
511-184-00	Washer	1
511-203-00	Perimeter Nut Plate	1
511-221-00	Screw	1
512-003-00	Cable Tie - Natural	1
512-005-00	Cushioned Loop Clamp	1
512-026-00	Cushioned Loop Clamp	2
512-028-00	Angle Bracket	40
512-034-00	Cushioned Loop Clamp	8
512-037-00	Cushioned Loop Clamp	4
512-067-00	Loop Clamp	2
512-068-00	Loop Clamp	46
512-069-00	Loop Clamp	2
540-032-00	2 oz. Bottle of Hydraulic Fluid	1
590-046-00	Spiral Hose Wrap 3/8 Inch, Black	4

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2.5 Bill of Materials – Long Line Kit

Table 2.12 lists the items included with the Long Line Kit P/N 200-458-XX. This kit provides the required Y-rope and all components, including a lanyard, to connect to a human harness.

NOTICE

The Y-rope is the only mandatory P/N of the Long Line Kit as it interfaces with the cargo hooks. Locally approved alternate components to connect to the Y-rope may be used.

The kit P/N is completed by replacing the XX by a two-digit number which is multiplied by 10 to define the length of the included long line, for example – kit P/N 200-458-10 includes a 100-foot-long line (P/N 490-015-10), Kit P/N 200-458-15 would include a 150-foot-long line (P/N 490-015-15), etc.

Table 2.12 Bill of Materials – Long Line Kit (P/N 200-458-10 listed)

Part No.	Description	Qty
292-017-00	Rigging Plate	1
490-019-00	Y-Rope	1
490-015-10	Long Line, 100 ft	1
490-017-00	25 LB Long Line Weight Bag	1
490-018-00	Lanyard	1
530-031-00	Carabiner	2

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3.0 Installation

These installation instructions 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.

The installation instructions are separated into the following sections and cover a complete installation. If the aircraft is equipped with an existing cargo hook installation, some of these sections can be skipped as noted.

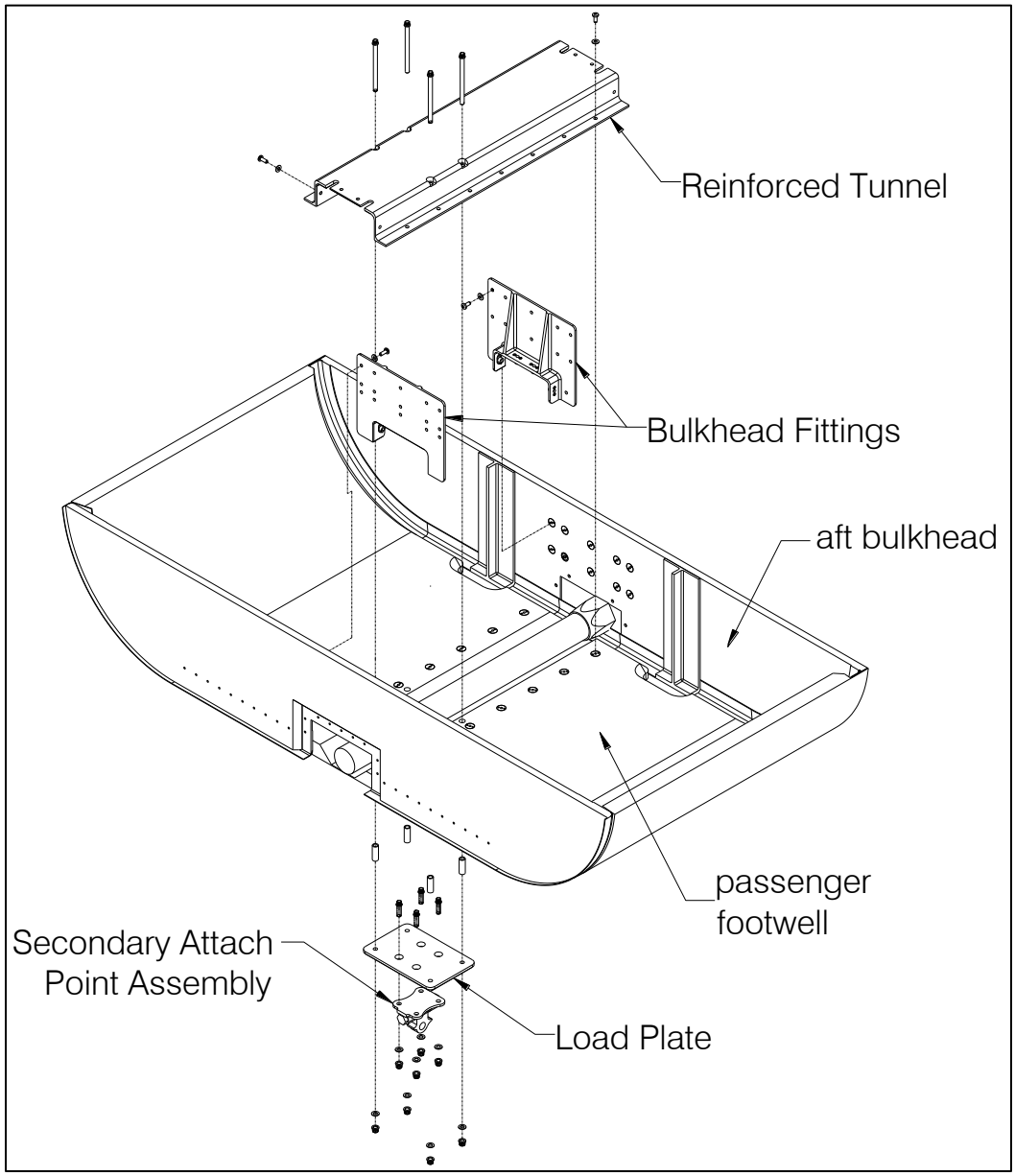
1. Installation of the support structure for the secondary cargo hook (i.e. – secondary hardpoint) is addressed in section 3.1 for the 407 model and section 3.2 for the 206L model.
2. Installation of the internal support structural fittings for the primary cargo hook is covered in section 3.3. These fittings are present on an aircraft with a cargo hook previously installed.
3. Section 3.4 includes instructions for the installation of the fixed side hydraulic release system including creating of a hole in the belly panel under the seat and installation of Doublers.
4. Section 3.5 addresses installation of the fixed electrical wiring for the primary cargo hook (this wiring will be present with an existing cargo hook installation), the secondary cargo hook, and the optional load weigh system.
5. Sections 3.6 and 3.7 provide instructions for installation of the primary cargo hook and the secondary cargo hook respectively.

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3.1 Secondary Hardpoint Installation - 407

The secondary hardpoint includes structure that is installed in the passenger foot well, replacing the existing cover over the fuel lines (see Figure 3.1). It provides the aircraft structural attachment means for the secondary cargo hook. For a 206L series model, refer to Section 3.2. If the aircraft is already equipped with the secondary hardpoint installed per STC SR02651LA then skip to section 3.3.

Figure 3.1 Secondary Hardpoint Installation Overview



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The following hardware is included with kit P/N 200-459-00 and P/N 200-459-01 for installing the secondary hardpoint fittings.

P/N	Description	Qty
510-095-00	Washer	44
510-100-00	Washer	8
510-391-00	Screw	40
510-580-00	Screw	2
511-177-00	Bolt, 12 Point	4
511-178-00	Bolt, 12 Point	4
511-179-00	Nut, 12 Point	8
511-183-00	Insert, Molded-in	20
511-221-00	Screw	2

⚠ CAUTION

At the bulkhead panels at each end of the foot well use caution to not break through and damage the fuel tanks behind each panel.

1. Remove existing rivets and the three angle brackets (that supported the removed Bell tunnel) from the forward bulkhead (FS 100). For the row of five rivets supporting the horizontal bracket, the three from the left (circled below) support a bracket which supports a fuel line fitting. The tails of the two outer of these three rivets cannot be removed and can be left in place.
2. Replace the center rivet of these three rivets with a blind countersunk head rivet (CR3212 series with grip length as needed) to secure the bracket.

Figure 3.2 Brackets and Rivets to Remove (Forward Bulkhead)



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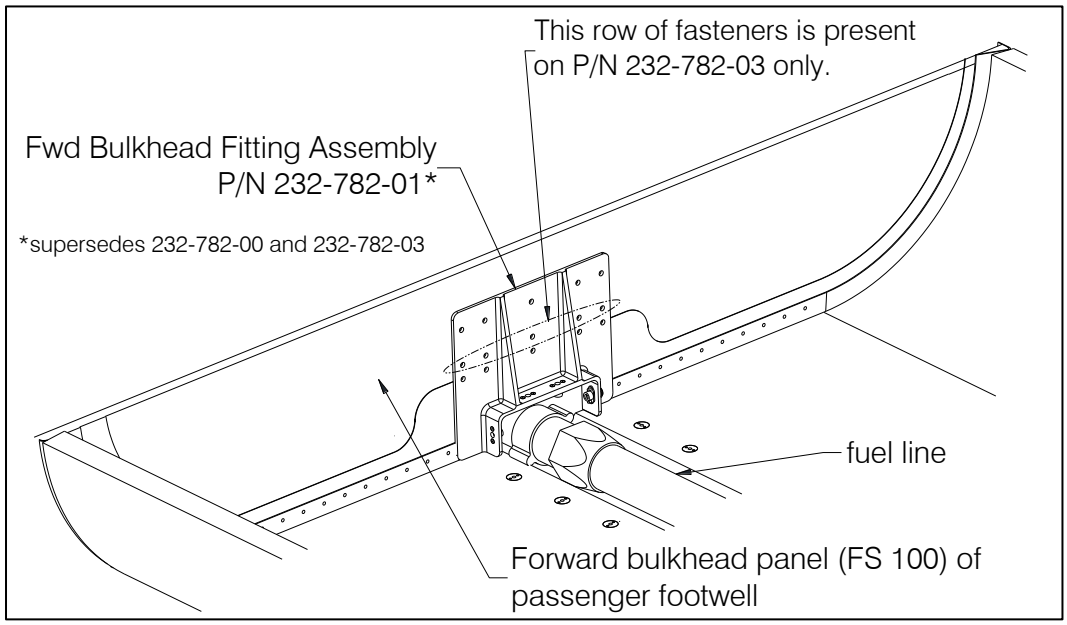
3. If in possession of Bulkhead Fitting Assembly P/N 232-782-00 or P/N 232-782-03 use shims (P/N 235-297-00 and 235-298-00) to accommodate the several different layers/surfaces on the forward bulkhead. Match drill (Ø0.201") the lower row of 5 holes in P/N 232-782-00 or middle row of 5 holes in P/N 232-782-03 through shims as applicable.

NOTICE

Fwd Bulkhead Fitting P/N 232-782-01 does not use shims; it is machined to fit the "stepped" surfaces of the forward bulkhead.

4. Position the Fwd Bulkhead Fitting on the forward bulkhead panel. Center it over the opening for the fuel lines.

Figure 3.3 Forward Bulkhead Fitting Location



5. Match drill fastener pattern from the bulkhead fitting into the outer skin of forward bulkhead panel using a #7 drill (10 places total).

NOTICE

For P/N 232-782-03, the lower row of 5 holes is not used. Use the two upper rows.

6. Remove the bulkhead fitting and enlarge the holes to Ø.561/.566" for the NAS1832-3 inserts (P/N 511-183-00). Deburr all holes.

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7. Install the inserts per Bell manual BHT-206-SRM-1, Chapters 3-2-11 and -12 (Figure 3-4) using a Bell C-317 adhesive. Follow manufacturer instructions for handling and curing. Allow adhesive to fully cure.
8. Secure the bulkhead fitting to the forward bulkhead panel using the 10 screws (P/N 510-391-00) and washers (P/N 510-095-00) provided.

At the aft bulkhead:

9. Position the Aft Bulkhead Fitting Assembly (P/N 232-782-02) or Bulkhead Fitting Assembly (P/N 232-782-00) on the aft bulkhead panel at FS 121. Center it over the opening for the fuel lines in the bulkhead panel. Verify there is clearance with the fuel lines. The bracket supporting the fuel line has slots which may provide some downward adjustment.

⚠ CAUTION

Ensure there is clearance with fuel line and fuel line fitting.

10. To check alignment with the forward bulkhead fitting set the Reinforced Tunnel in place.
11. Remove the Reinforced Tunnel.
12. Match drill fastener pattern from the bulkhead fitting into the outer skin of the aft bulkhead panel using a #7 drill (10 places total).

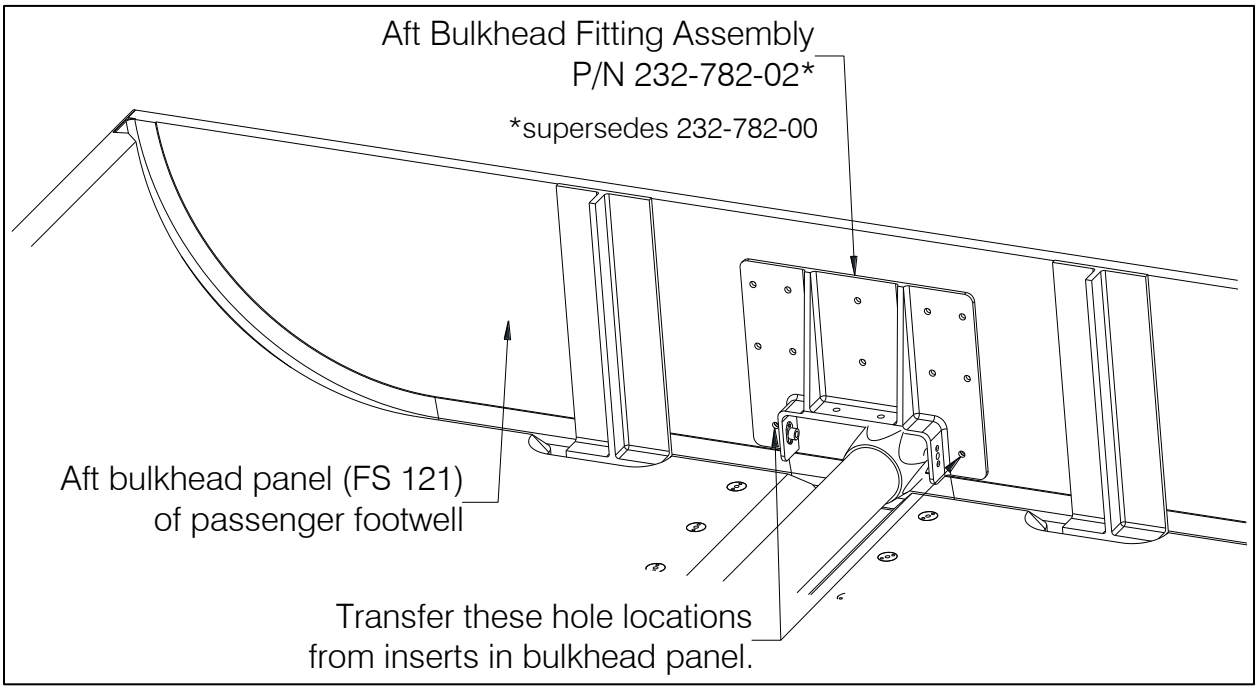
⚠ CAUTION

At the bulkhead panels at each end of foot well use caution to not break through and damage the fuel tanks behind each panel.

13. Remove the bulkhead fitting and enlarge the holes to Ø.561/.566" for the NAS1832 inserts (P/N 511-183-00). Deburr all holes.
14. Install the inserts per Bell manual BHT-206-SRM-1, Chapters 3-2-11 and -12 (Figure 3-4) using a Bell C-317 adhesive. Follow manufacturer instructions for handling and curing. Allow adhesive to fully cure.
15. Match drill Ø.201" the Bulkhead Fitting to the existing lower insert locations in the aft bulkhead on each side of the opening for the fuel lines (refer to Figure 3.4). Deburr the holes.

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Figure 3.4 New Holes in Aft Bulkhead Fitting



16. Secure the Bulkhead Fitting to the aft bulkhead panel using twelve (12) screws (P/N 510-391-00) and washers (P/N 510-095-00).

17. Position the Reinforced Tunnel (P/N 291-996-00) between the two bulkhead fittings, referring to Figure 3.5 for orientation.

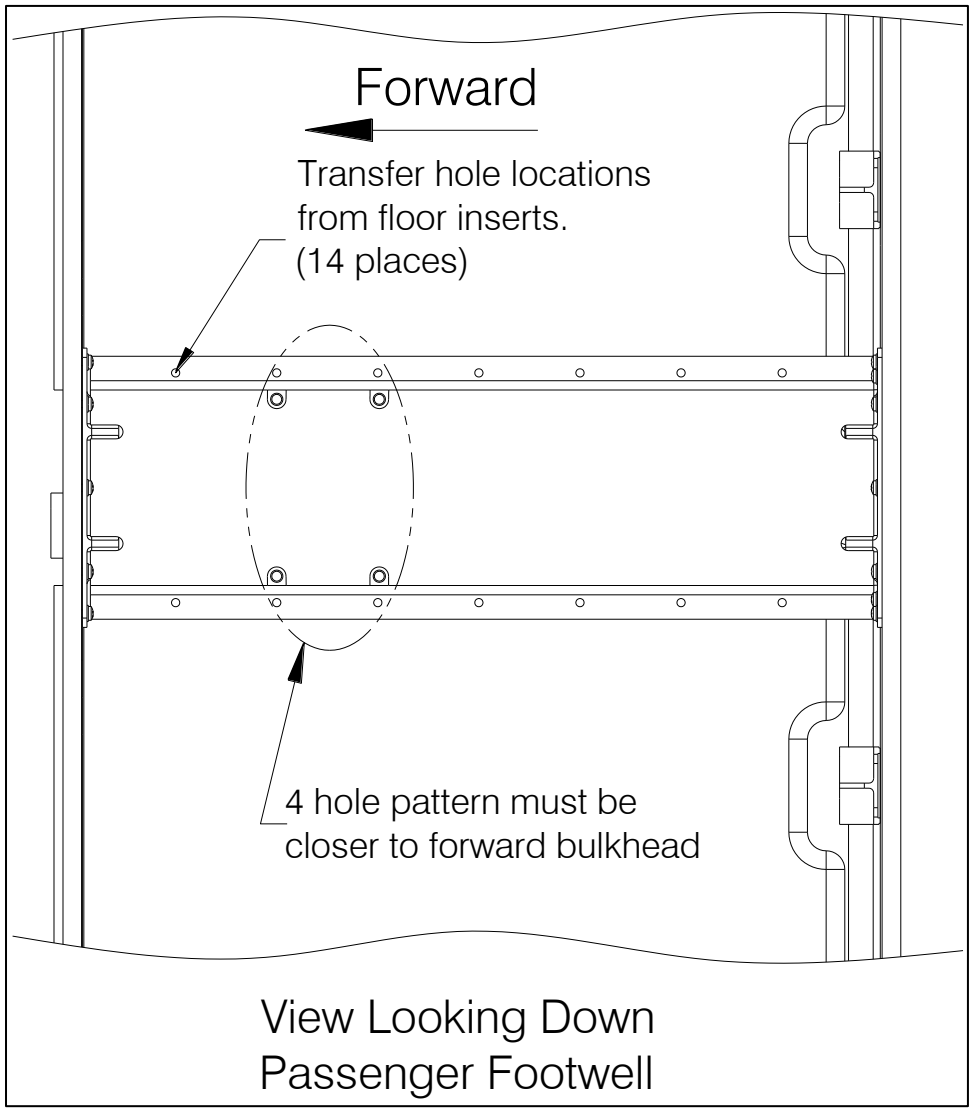
CAUTION

*The Reinforced Tunnel is **NOT** symmetrical; it must be oriented such that the 4-hole pattern (which supports the secondary cargo hook) is closer to the **forward** bulkhead of the footwell (refer to Figure 3.5).*

18. Transfer the threaded inserts pattern in the floor (used to attach the Bell cover) to each of the lower flanges (a "hole finder" tool is suggested). Drill Ø.201" diameter (14 places) through the lower flanges.

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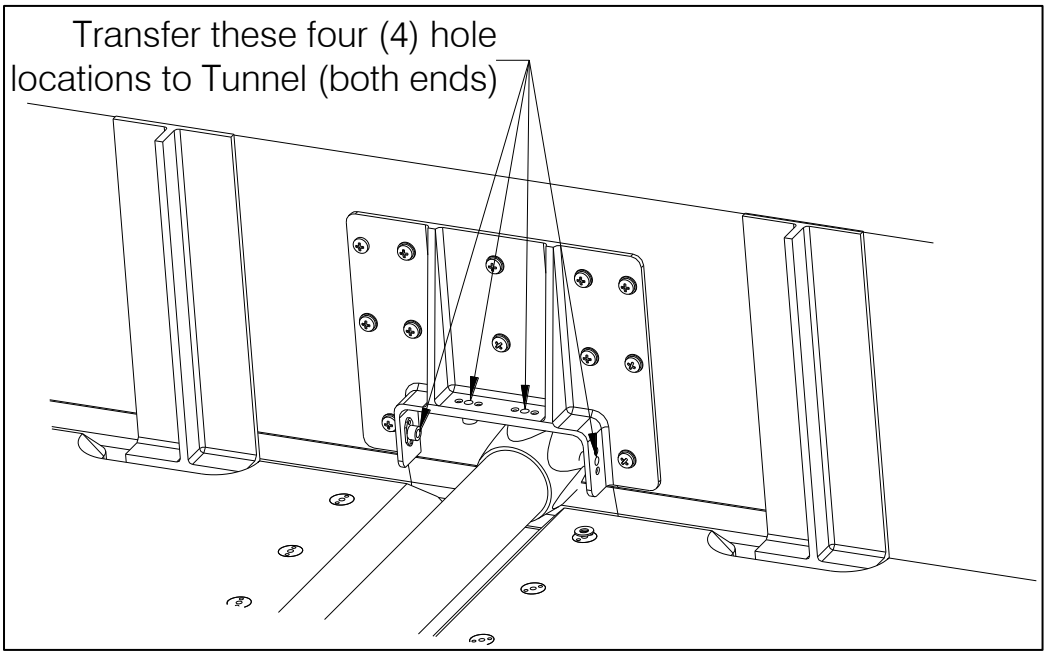
Figure 3.5 Orientation of Reinforced Tunnel



19. Mark and match drill Ø.201" each end (4 places each end, 8 places total) of the Reinforced Tunnel with the Bulkhead Fittings fastener pattern (see Figure 3.6).

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Figure 3.6 Bulkhead Fitting Locations to Transfer to Tunnel



20. Temporarily secure the Reinforced Tunnel in position to match drill through the floor.
21. With the Reinforced Tunnel secured drill Ø.25" through the floor using the 4-hole pattern (shown in Figure 3.5).
22. Remove the Reinforced Tunnel and ream the holes in the floor to Ø.375" for the bushings (P/N 291-994-00).
23. Dry fit the bushings; the bushings should be flush or protrude slightly (.010" max.) past top and bottom skins.
24. Prep the floor panel with core removal per Bell SRM Section 3-2-11.
25. Install bushings wet with a Bell C-317 adhesive.
26. Reinstall the Tunnel with fourteen (14) screws (P/N 510-391-00) and washers (P/N 510-095-00) through its lower flanges into the floor inserts and two (2) of these screws and washers into each vertical flange of each bulkhead fitting.

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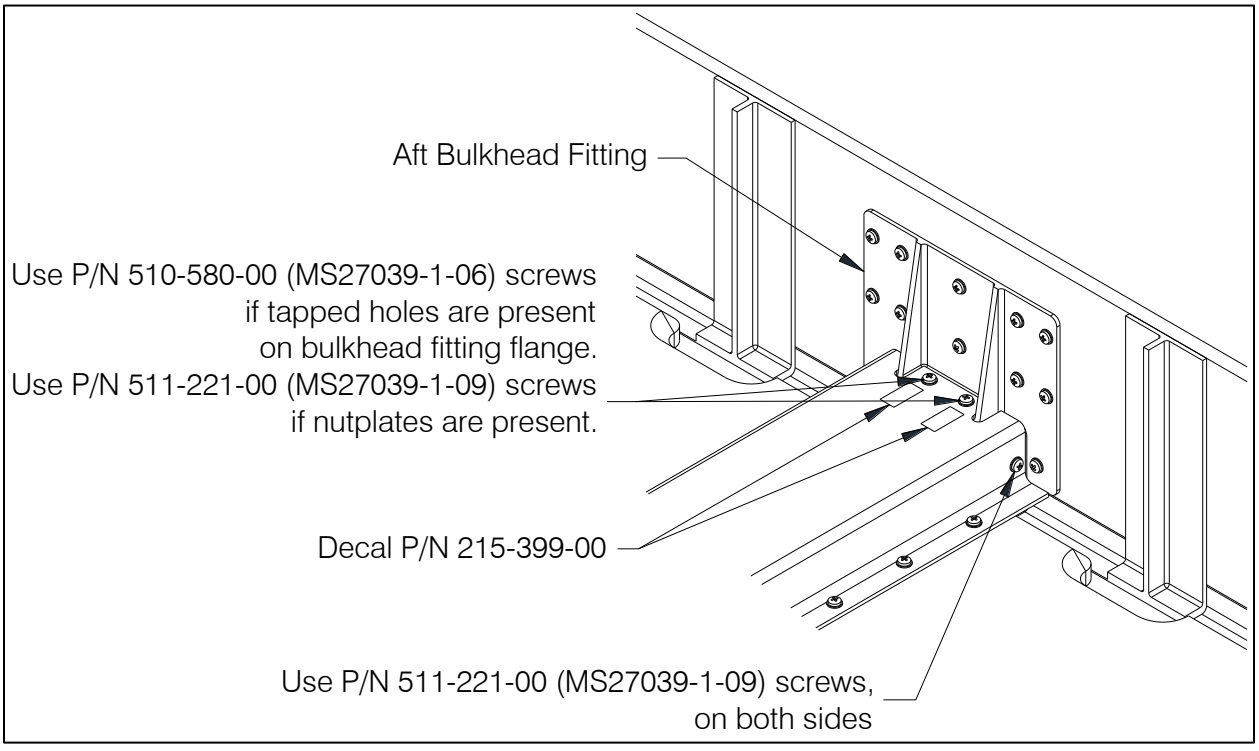
27. Use two (2) P/N 510-580-00 (MS27039-1-06) screws and washers (P/N 510-095-00) at the aft end of the top horizontal surface of the Reinforced Tunnel into the horizontal flange of the aft Bulkhead Fitting (P/N 232-782-02). Apply decal P/N 215-399-00 to the top surface adjacent to each of these screw heads.

    If Bulkhead Fitting P/N 232-782-00 (has nutplates under horizontal flange) is installed, use two (2) P/N 511-221-00 (MS27039-1-09) screws and washers (P/N 510-095-00). Modify the decal to indicate the -09 screw.

⚠ CAUTION

Do not substitute screws that secure the Reinforced Tunnel to the Bulkhead Fittings. Longer screws may contact the fuel line and/or fuel line fittings. If longer screws are used, verify that they do not contact the fuel lines.

Figure 3.7 Screws for Attaching Tunnel to Bulkhead Fitting

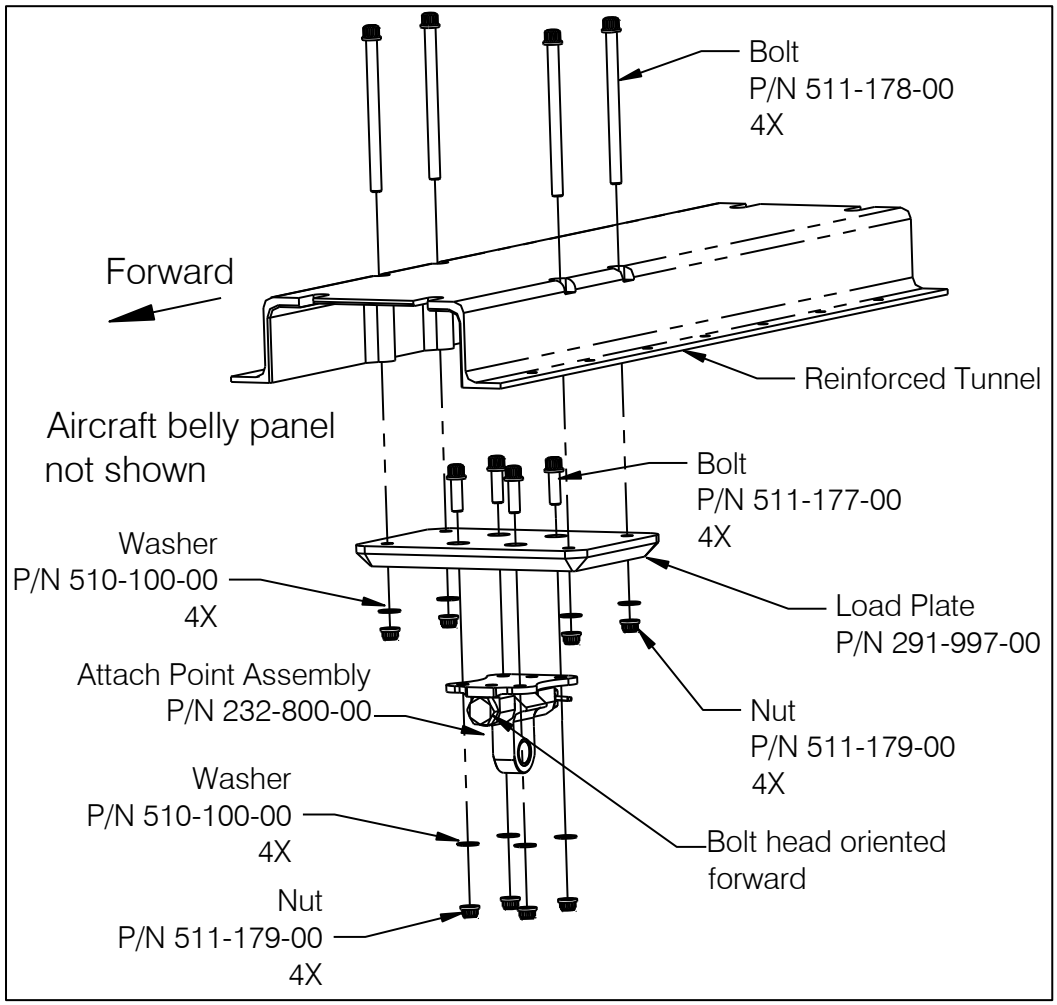


28. Use two (2) P/N 510-580-00 (MS27039-1-06) screws at the forward end of the top horizontal surface of the Reinforced Tunnel into the horizontal flange of the Forward Bulkhead Fittings.

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29. Referring to Figure 3.8 place four screws (P/N 511-177-00) in the inner four counterbored-hole pattern of the Load Plate (P/N 291-997-01) and secure the Secondary Hardpoint Assembly (P/N 232-800-00) with its bolt head oriented **forward** to the Load Plate (refer to engraved arrow on it) with washers (P/N 510-100-00) and nuts (P/N 511-179-00). Torque the nuts to 50-70 in-lbs.
30. Remove the paint from the aircraft skin that will mate with the Load Plate to create an electrical bond. Apply a MIL-DTL-5541 chemical conversion coating (Alodine 1001 or Alodine 1201 or similar) to the exposed bare metal.
31. Position the Load Plate on the belly with the FWD arrow pointing forward and secure it to the belly through the Tunnel with the four bolts (P/N 511-178-00), washers (P/N 510-100-00), and nuts (P/N 511-179-00). Torque the nuts to 50-70 in-lbs.
32. Torque stripe the eight nuts.

Figure 3.8 Load Plate and Secondary Hardpoint Assembly Installation



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3.2 Secondary Hardpoint Installation – 206L Models

The secondary hardpoint is installed in the passenger foot well, replacing the existing cover over the fuel lines. If the aircraft is already equipped with the secondary hardpoint installed per STC SR02651LA then skip to section 3.3.

Install the components per the following.

The following hardware is provided with kit P/N 200-462-00 for installing the secondary hardpoint.

P/N	Description	Qty
510-095-00	Washer	28
510-100-00	Washer	8
510-391-00	Screw	46
511-177-00	Bolt, 12 Point	4
511-178-00	Bolt, 12 Point	4
511-179-00	Nut, 12 Point	8
511-180-00	Screw, C'Sink	2
511-183-00	Insert, Molded-in	10
511-184-00	Washer, Reduced OD	18
511-221-00	Screw	4

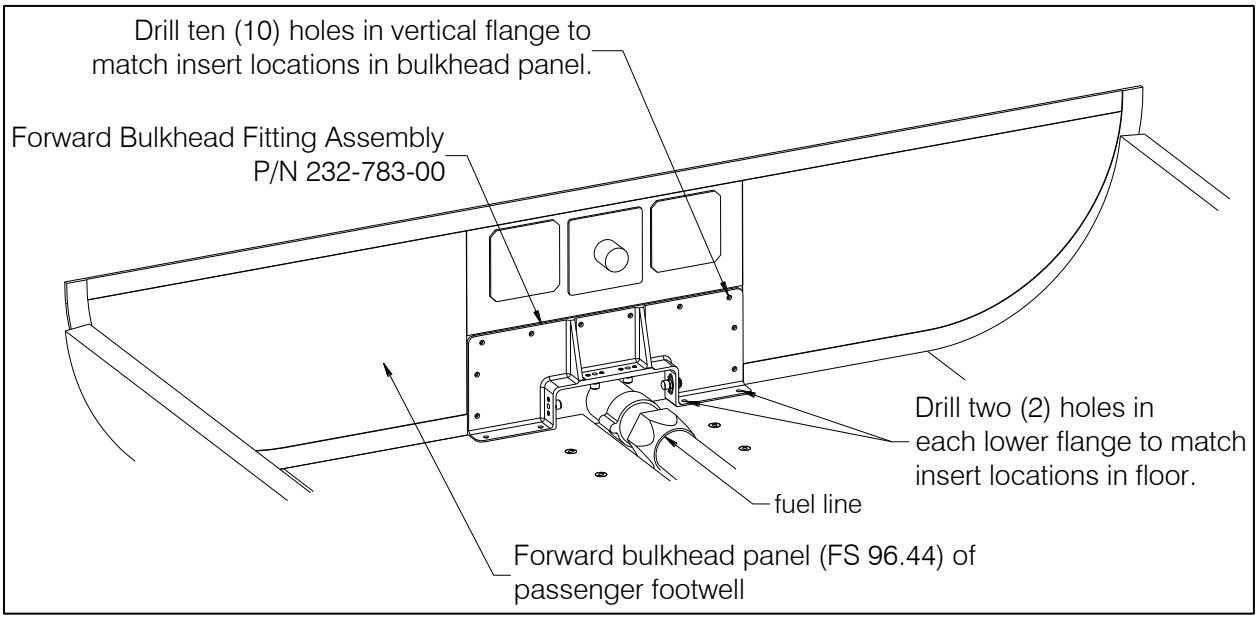
⚠ CAUTION

At the bulkhead panels at forward and aft ends of foot well use caution to not break through and damage the fuel tanks behind each panel.

1. Match drill Ø.201" in the Forward Bulkhead Fitting (P/N 232-783-00) using the existing fastener pattern in the forward bulkhead panel at FS 96.44 (ref. Figure 3.9) The Bulkhead Fitting should be centered over the opening for the fuel lines in the bulkhead panel. Deburr all holes.
2. Match drill the horizontal flanges of the Forward Bulkhead Fitting using the existing insert pattern in the floor (ref Figure 3.9). Deburr all holes.

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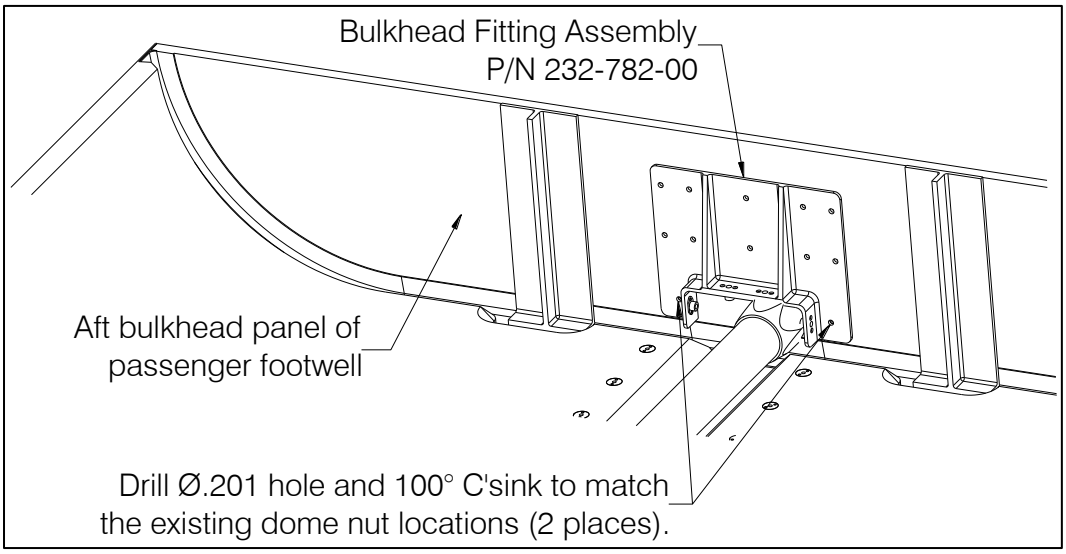
Figure 3.9 Forward Bulkhead Fitting Installation



3. Secure the Forward Bulkhead Fitting to the bulkhead panel using ten screws (P/N 510-391-00) and washers (510-095-00) and to the floor inserts using four of these same screws and washers.
4. Position the Aft Bulkhead Fitting at the aft bulkhead panel with it centered over the opening for the fuel lines. Ensure clearance with fuel lines. Alignment with the Fwd Bulkhead Fitting can be checked by setting the Reinforced Tunnel in place.
5. Match drill fastener pattern from the Aft Bulkhead Fitting (P/N 232-784-00) into the outer skin of aft bulkhead panel using a #7 drill (10 places total). Do not break through and damage fuel tank.
6. Remove the bulkhead fitting and enlarge the holes to Ø.561/.566" for the NAS1832 inserts (P/N 511-183-00). Deburr all holes.
7. Install the inserts per Bell manual BHT-206-SRM-1, Chapters 3-2-11 and -12 (Figure 3-4) using a Bell C-317 adhesive. Follow manufacturer instructions for handling and curing. Allow adhesive to fully cure.
8. Match drill Ø.201" and 100° countersink the Bulkhead Fitting to the existing dome nut locations on each side of the opening for the fuel lines (refer to Figure 3.10). Deburr the holes.

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Figure 3.10 Match Drill Locations on Bulkhead Fitting

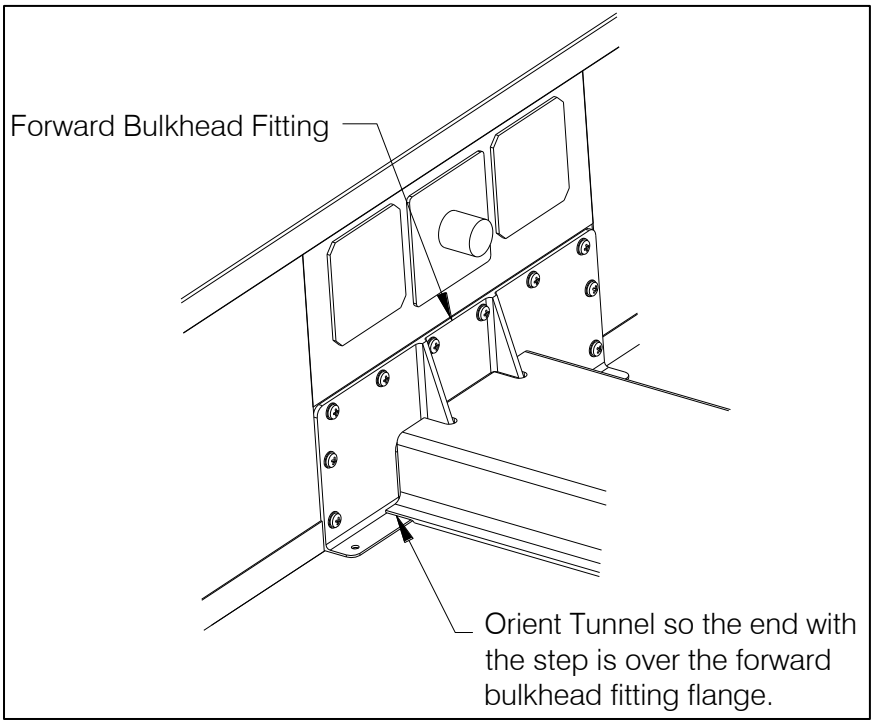


9. Secure the Aft Bulkhead Fitting to the bulkhead panel using ten screws (P/N 510-391-00) and washers (P/N 510-095-00) and two screws (P/N 511-180-00) at the countersunk locations.

10. Position the Reinforced Tunnel (P/N 291-993-00) between the two bulkhead fittings with it oriented as shown in Figure 3.11 and transfer the threaded inserts pattern in the floor to each of the lower flanges (a "hole finder" tool is suggested). Drill Ø.201" diameter (18 places) through the lower flanges and spot face .406" around holes to fit washers.

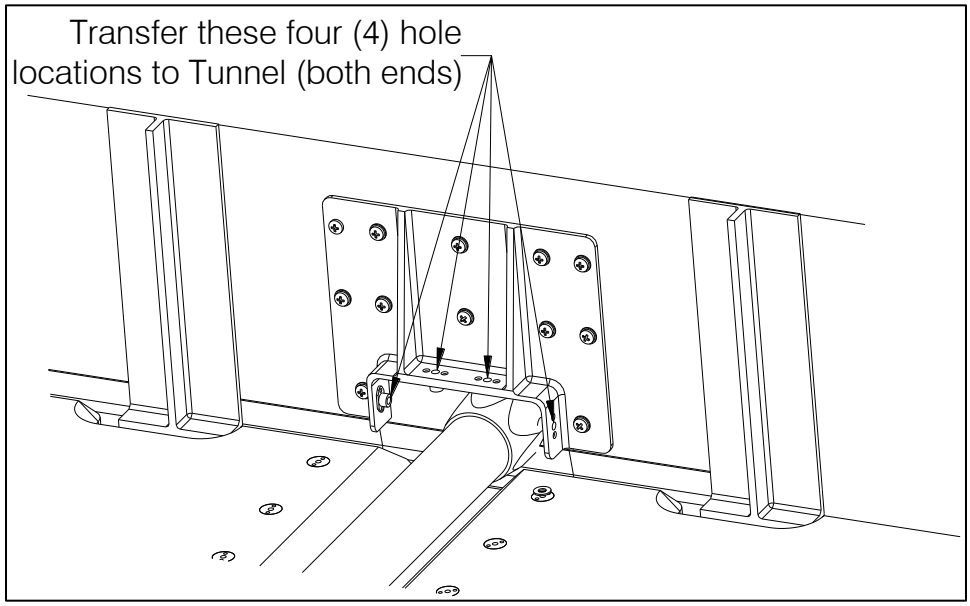
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Figure 3.11 Orientation of Reinforced Tunnel



11. Mark and match drill each end of the Reinforced Tunnel with the Bulkhead Fittings fastener pattern.

Figure 3.12 Bulkhead Fitting Hole Locations to Transfer to Tunnel



12. Temporarily secure the Reinforced Tunnel in position in order to match drill through the floor.

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13. With the Reinforced Tunnel secured drill Ø.25" through the floor using the 4-hole pattern (shown in Figure 3.5 for the Tunnel on the 407).
14. Remove the Reinforced Tunnel and ream the holes in the floor to .375" for the bushings (P/N 291-994-00).
15. Dry fit the bushings; the bushings should be flush or protrude slightly (.010" max.) past top and bottom skins.
16. Install bushings wet with a Bell C-317 adhesive.
17. Re-install the Reinforced Tunnel with eighteen (18) screws (P/N 510-391-00) and washers (P/N 511-184-00) through its lower flanges into the floor inserts and four (4) of these P/N 510-391-00 screws and P/N 510-095-00 washers into the vertical flanges of the bulkhead fittings (two (2) at each bulkhead fitting).
18. Use two (2) P/N 511-221-00 screws at each end of the top horizontal surface of the Reinforced Tunnel into the nutplates in the horizontal flange of the Bulkhead Fittings (two (2) at each Bulkhead Fitting).

For the following refer to Figure 3.8 (the 206L installation is the same as the 407).

19. Place four screws (P/N 511-177-00) in the inner four counterbored-hole pattern of the Load Plate (P/N 291-997-01) and secure the Secondary Hardpoint Assembly (P/N 232-800-00) with its bolt head oriented forward to the Load Plate (refer to engraved arrow on it) with washers (P/N 510-100-00) and nuts (P/N 511-179-00). Torque the nuts to 50-70 in-lbs.
20. Remove the paint from the aircraft skin that will mate with the Load Plate to create an electrical bond. Apply a MIL-DTL-5541 chemical conversion coating (Alodine 1001 or Alodine 1201 or similar) to the exposed bare metal.
21. Position the Load Plate on the belly with the FWD arrow pointing forward and secure it to the belly through the Tunnel with the four bolts (P/N 511-178-00), washers (P/N 510-100-00), and nuts (P/N 511-179-00). Torque the nuts to 50-70 in-lbs and apply torque stripe.

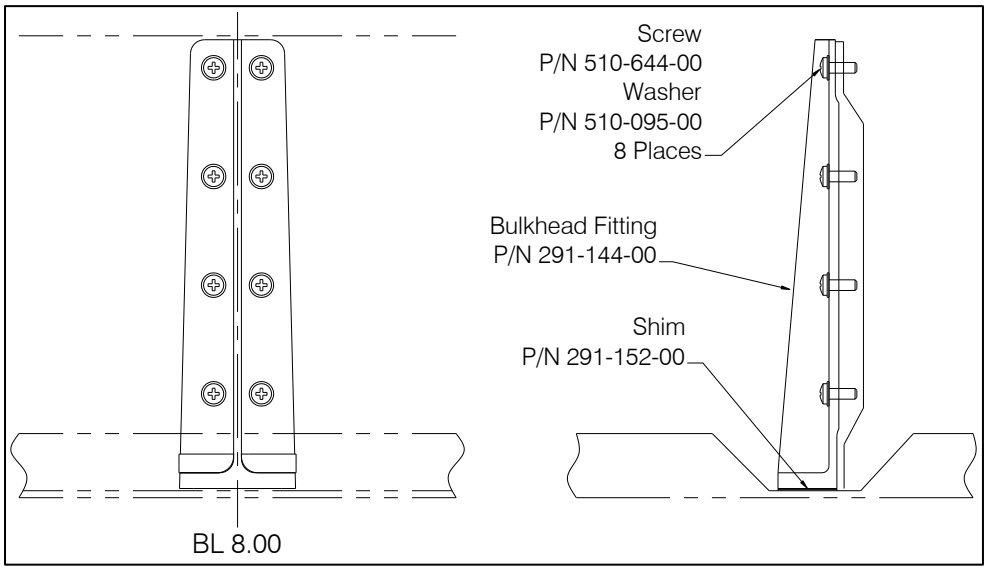
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3.3 Bulkhead Fitting Installation – 407 Model

The two bulkhead fittings (P/N 291-144-00) support the primary cargo hook beam and are installed on the passenger seat bulkhead (FS 121.44). These fittings are included with kit P/N 200-461-00. If these are already installed, skip to the next section; otherwise install them per the following instructions. For the 206L series models, the bulkhead fittings from Bell are required to be installed.

1. Remove 16 screws at RBL 8.00 and LBL 8.00 from the passenger seat bulkhead.
2. At these locations remove the four screws and nuts and eight washers from the floor panel.
3. 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 510-095-00).
4. 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).
5. Temporarily remove the shims.

Figure 3.13 Bulkhead Fitting Fasteners



6. Working from underneath the helicopter, transfer the four hole locations in the floor to the bulkhead fittings (two at each bulkhead fitting).

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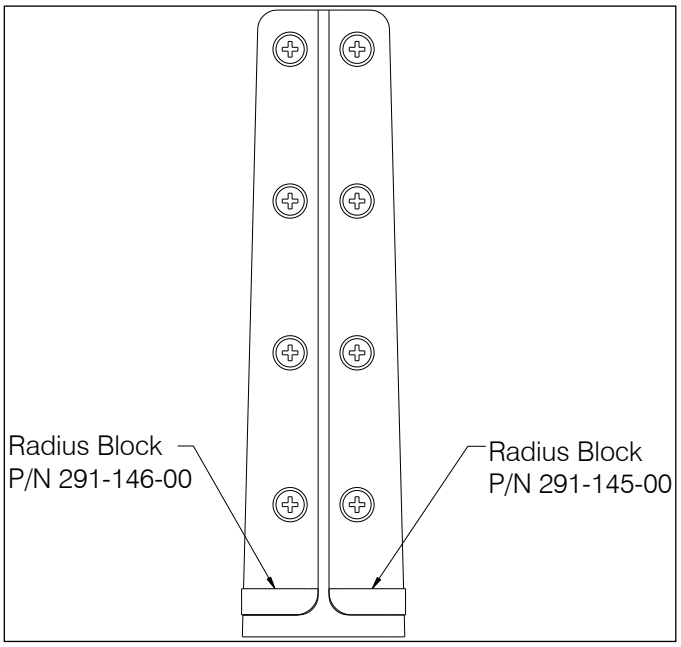
7. Remove the bulkhead fittings and drill a Ø0.250/0.255-inch hole through the flanges at the marked locations.

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.

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

Figure 3.14 Radius Blocks



9. Mark the four radius blocks with locations to match the holes in the flanges of the bulkhead fittings.
10. Drill Ø.250/.255 holes in the radius blocks at these locations.
11. 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.
12. Align the shims with the bottom of the bulkhead fittings and transfer the hole locations to them and drill through the shims.

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13. 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.
14. 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).
15. Install the bulkhead fittings onto the seat bulkhead with the sixteen screws and washers.
16. 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 3.6.

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3.4 Fixed Hydraulic Release System Installation

The fixed hydraulic release system installation consists of mounting the Dual Master Cylinder P/N 232-820-00 (for LH PIC on the 407) or P/N 232-821-00 (for RH PIC on the 206L and 407) to the cyclic, mounting the Connector Bracket on the belly of the aircraft (near the primary cargo hook location), and routing the hoses between these items.

A complete hardware set is provided for routing both hoses to the connector bracket thus if an existing cargo hook is installed there will be extra hardware.

NOTICE

Installation of the Dual Master Cylinder may result in a cyclic balance condition requiring adjustment with a modification using new parts when dual controls are utilized. The cyclic control balance should also be evaluated with the single control configuration. After completing the installation of the hydraulic release system and filling it with fluid, see Section 3.11.

Install the Dual Master Cylinder per the following, referring to Figure 3.15.

1. If installed, remove the Master Cylinder used for the single cargo hook installation and its hydraulic line to the connector bracket on the belly. Retain the hardware as some of this can be re-used including the spacers and loop clamps along the belly.

   If installing the kit on a 206L series with an existing cargo hook installation remove the manual release cable from the center console down to the connector bracket. This instruction is also applicable to 407 models with an existing cargo hook installation with the cable style backup release. Cover the hole in the center console through which the T-handle was installed.

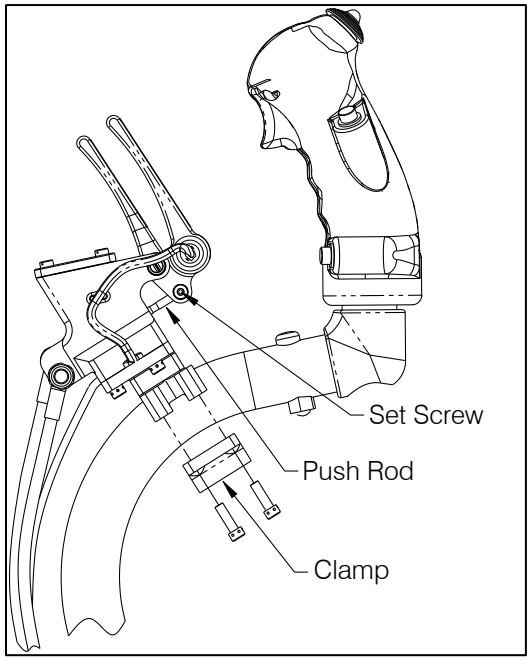
2. Remove the Clamp from the Dual Master Cylinder by removing the four screws that temporarily secured it.

3. Position the Dual Master Cylinder on the cyclic at approximate location shown below and re-install the four screws, tighten the screws just enough to hold the Dual Master Cylinder in position.

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4. Check this position by actuating the levers and verifying they do not contact the cyclic grip when fully actuated and that they are comfortably reached from the cyclic grip. Adjust the position of the Dual Master Cylinder on the cyclic tube as necessary and then tighten the four screws to 20-30 in-lbs. and safety wire them together in pairs.
5. Each individual lever can also be adjusted by loosening its set screw and using a small flat screwdriver at the end of the Push Rod to turn it. Maintain full thread engagement on the Push Rod.

Figure 3.15 Dual Master Cylinder Installation

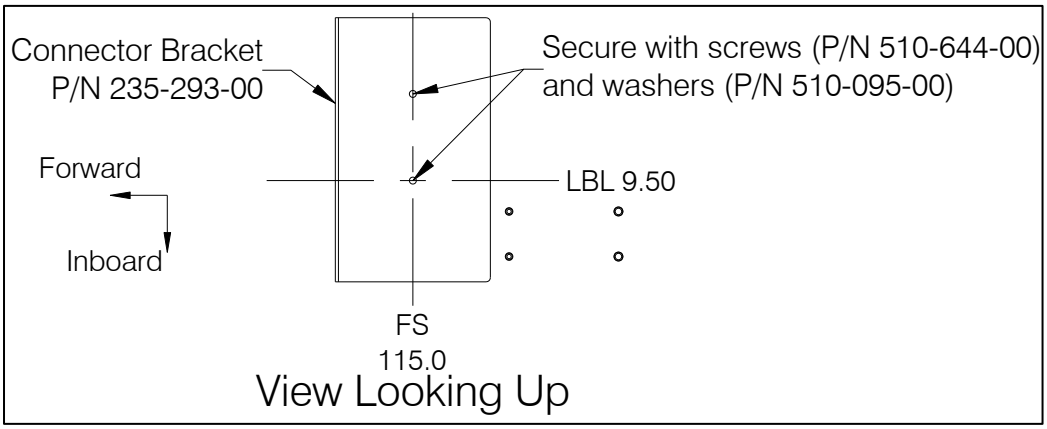


Install the Connector Bracket (P/N 235-293-00) on the belly per the following.

6. If installed, remove the connectors and existing connector bracket on the belly at FS115.00 that is used for the single cargo hook installation.
7. Install the supplied Connector Bracket on the belly of the helicopter using the two existing inserts located left of the centerline at FS 115.00 (ref. Figure 3.16). The inboard insert is located at LBL 9.50. Attach the bracket with screws (P/N 510-644-00) and washers (P/N 510-095-00).
8. As applicable, re-install the primary cargo hook release system and load weigh system electrical connectors (that were removed) into the new Connector Bracket.

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Figure 3.16 Connector Bracket Installation



3.4.1 Routing – Right Side Cyclic Installation

This section describes the routing of the hydraulic release system hoses from the Dual Master Cylinder to the Connector Bracket for right hand PIC on the 206L series and 407. Skip to Section 3.4.2 if installing for left hand PIC (left hand PIC is applicable to the 407 model only).

1. Route the hoses from the Dual Master Cylinder inside the boot and under the seat. On the cyclic tube, secure the hoses and electrical harness (from the switch) with loop clamps and hardware as shown below (the switch harness is terminated above the boot and is connected at a later step).

NOTICE

Actuation of the primary release lever (on the right) moves fluid through the hydraulic hose that exits the master cylinder on the left and the secondary hook release moves fluid through the hose on the right.

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Figure 3.17 Routing on Cyclic

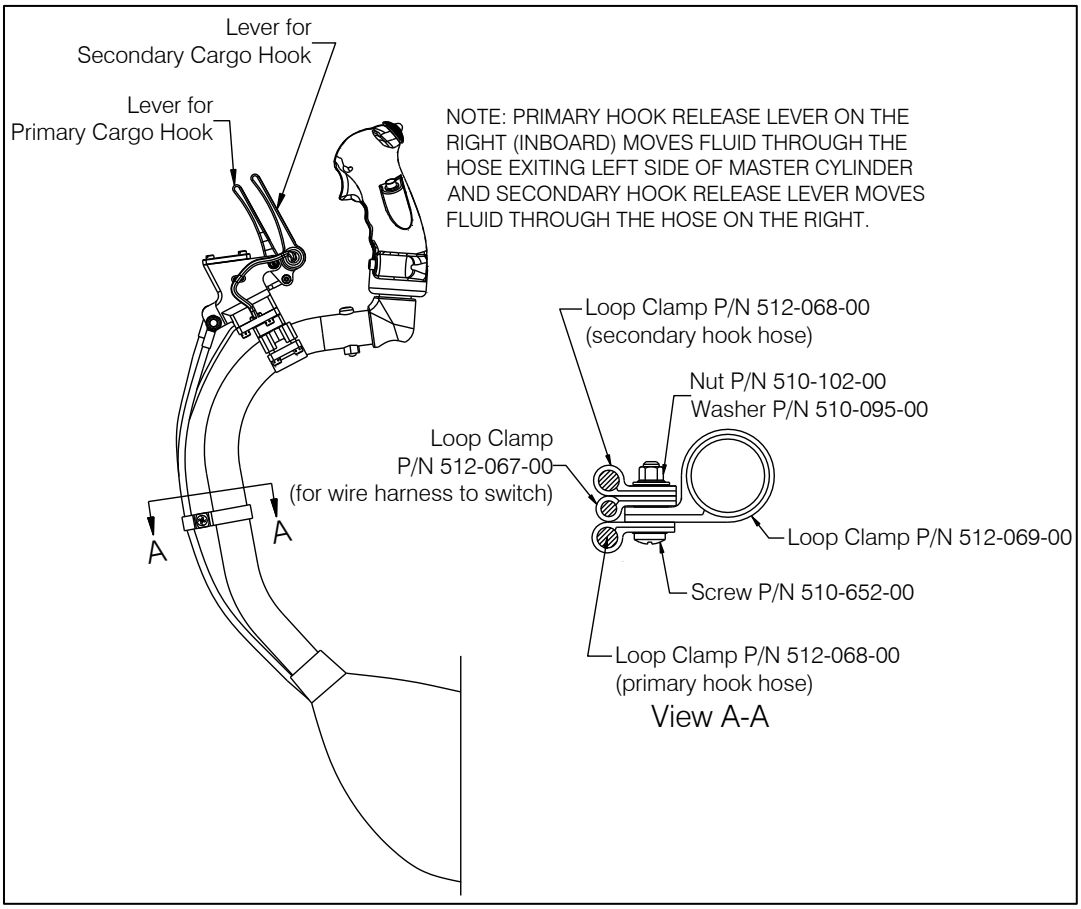


Figure 3.18 and Figure 3.19 below show an example of routing of the two hoses under the seat on a 206L model. Under the seat the routing may vary depending on equipment installed under the seat and on the exterior of the aircraft. Refer to the following general guidance and precautions when establishing the routing.

- Verify the location where the hoses penetrate through to the outside to ensure there is clearance for the Doublers (P/Ns 235-294-00 and 235-295-00) with any belly mounted equipment, inserts, doublers, etc.
- Ensure the hoses do not restrict the movement of the cyclic, provide enough slack between the first support point aft of the cyclic and the clamps securing the hoses to the cyclic.
- Ensure the hoses are secured clear of flight controls and are protected from chafing on wires, structure, adjacent equipment, etc.
- Support the hoses with cushioned loop clamps every 12 to 16 inches.
- Use existing inserts in the belly panel under the seat if possible or install new inserts provided.

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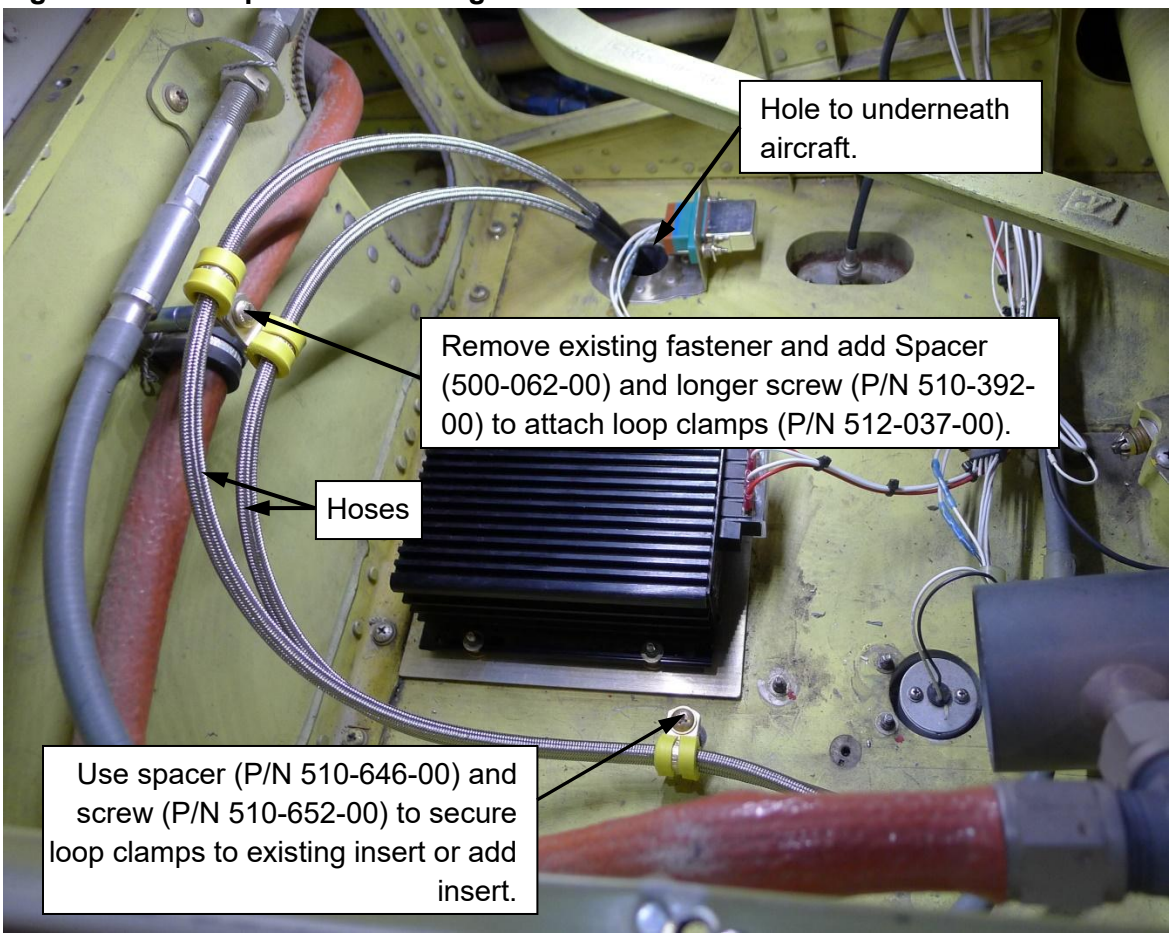
- If available an existing hole in the belly can be used for routing the hoses to underneath the aircraft provided the above guidance is followed. The installation of the Doublers can be omitted but a bracket will need to be fabricated to mount the relay.

The following hardware is provided with kit P/N 200-459-01 and kit P/N 200-462-00 for routing under the seat. Depending on routing, not all this hardware may be used and different lengths of screws or spacers of the same series may be substituted.

P/N	Description	Qty
500-062-00	NAS43DD3 spacer, 1" long for #10 screw	2
510-646-00	NAS43DD3 spacer 9/16" long spacer for #10 screw.	2
510-647-00	NAS43DD3 spacer 3/4" long spacer for #10 screw.	2
510-095-00	#10 Washer	3
510-102-00	Nut	2
510-390-00	MS27039-1-14 screw	2
510-392-00	MS27039-1-22 screw	2
510-644-00	MS27039-1-08 screw	2
510-652-00	MS27039-1-17 screw	2
511-035-00	Insert	2
512-037-00	MS21919-WDG4 cushioned loop clamp	6
512-028-00	Angle Bracket	2

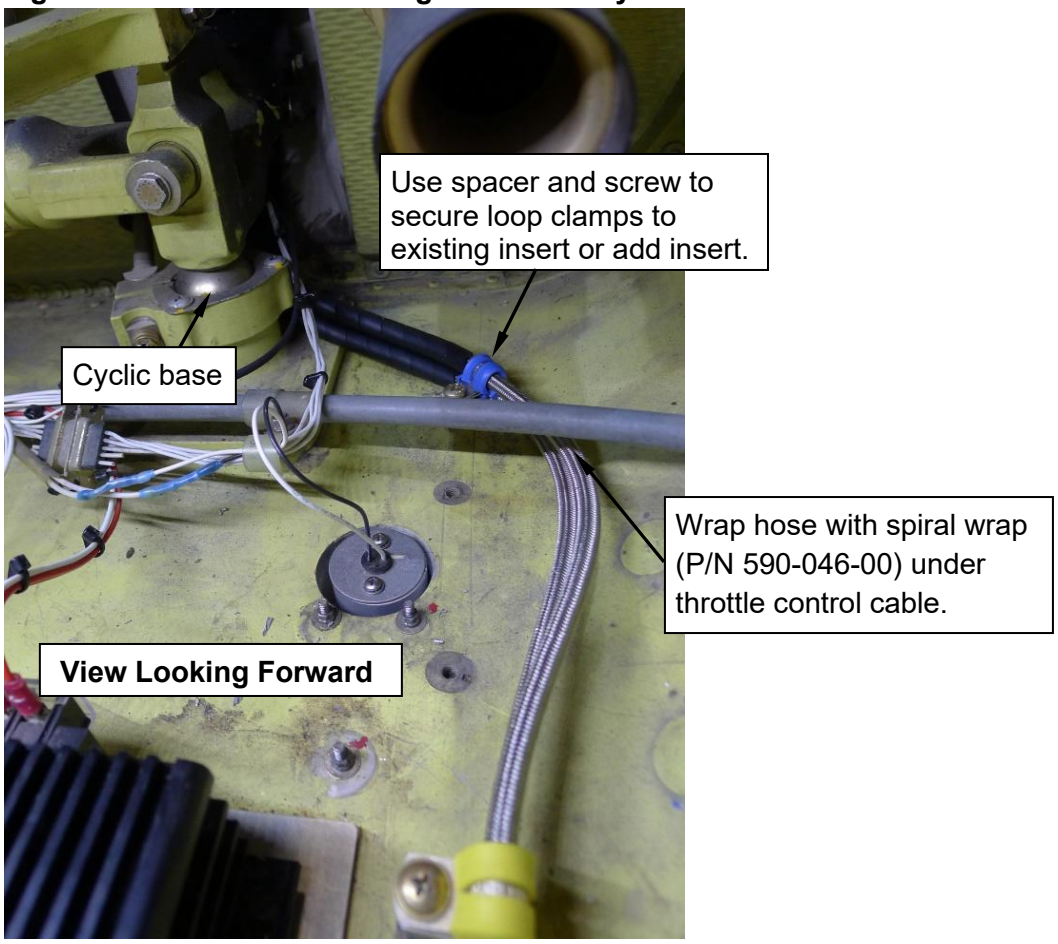
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Figure 3.18 Example Hose Routing Under Seat on the 206L



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Figure 3.19 206L Hose Routing Just Aft of Cyclic



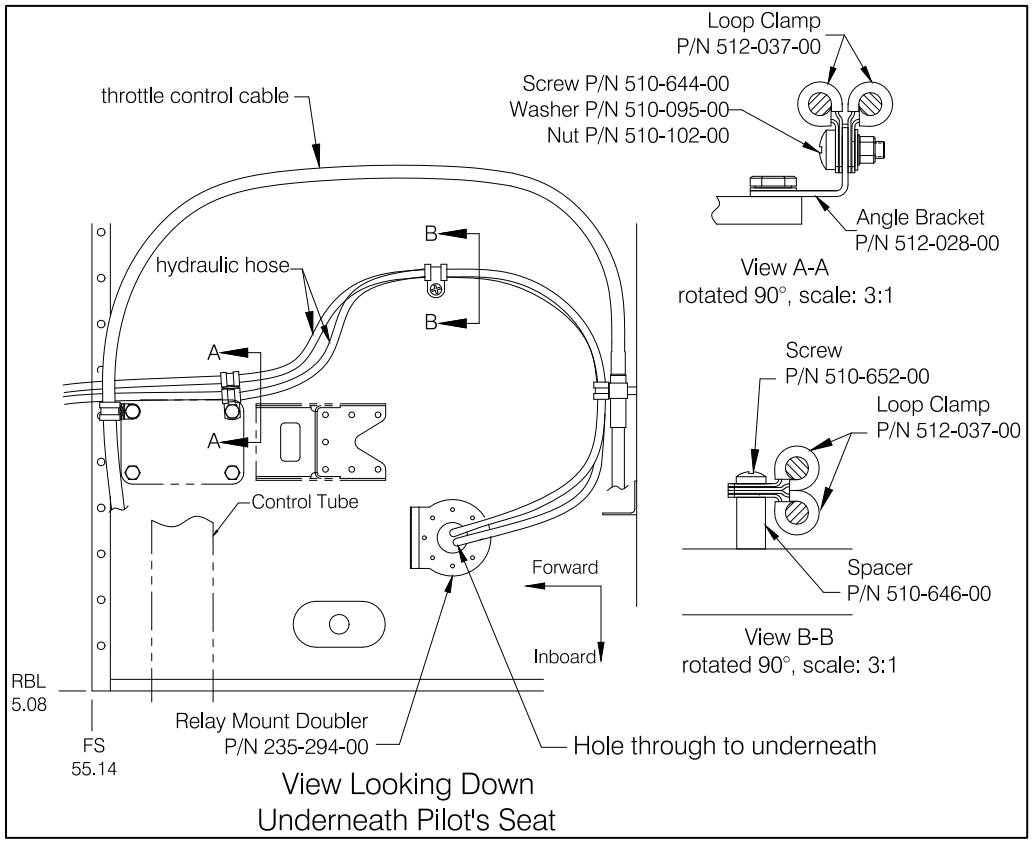
An example hose routing sketch and hole location for the Bell 407 under the right seat is shown below. This routing is similar to the 206L except the aft right bolt at the cyclic base can be used to attach an Angle Bracket (P/N 512-028-00). Drill out the #10 hole in the longer flange of the Angle Bracket to .25" for mounting it.

⚠ CAUTION

Provide enough slack up to the loop clamps on the cyclic to allow full movement of the cyclic and ensure the slack is not in excess to where it has potential to impede or interfere with flight control movement.

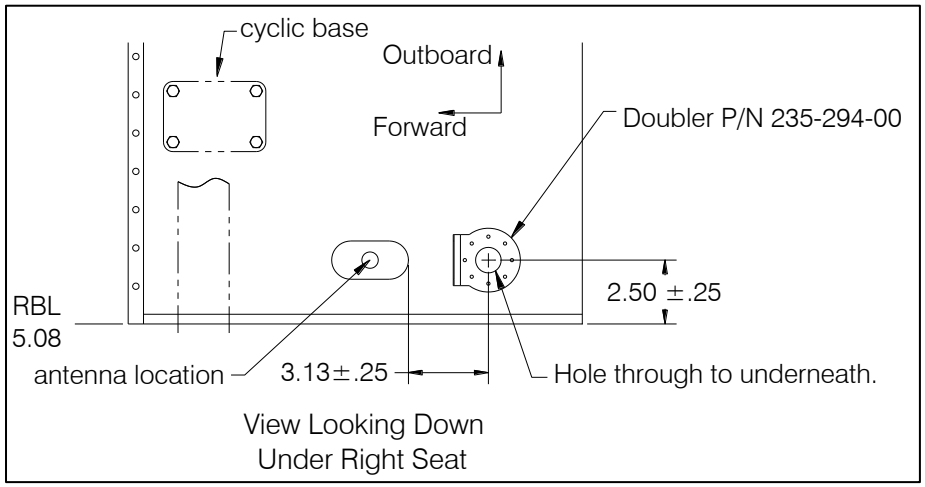
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Figure 3.20 Hose Routing Under the RH Seat on the 407



2. The next step for routing the hoses under the seat is to establish the location of the 1.00" diameter hole to underneath the aircraft. On the 206L the location shown in Figure 3.18 works well, this location is dimensioned in Figure 3.21. For the 407 model, the approximate location is shown in Figure 3.20.

Figure 3.21 Hole Location on 206L



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3. To verify clearance, position the Relay Mount Doubler P/N 235-294-00 at the hole location. Rotate the Doubler so that the vertical flange for mounting the relay is away from the direction which the hoses will be routed from (reference Figure 3.18 and Figure 3.20). If area is confined verify the relay and relay socket will fit by test fitting these items.

⚠ CAUTION

Before creating the hole in the belly panel verify that the Doublers will fit on the inside and the outside of the belly panel in the location shown. Check for inserts, antennae, optional equipment, etc. on the outside.

NOTICE

Refer to Bell manual BHT-ALL-SRM Chapter 3 for standard practices and details not fully defined below. Reference Figure 3.22 for overview of the modification.

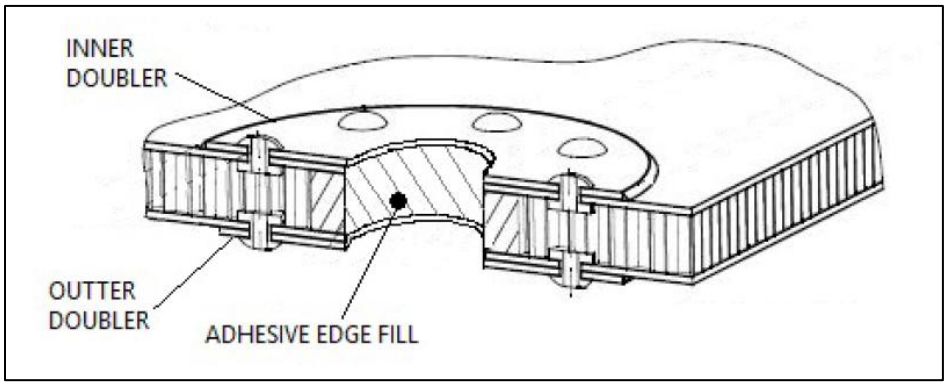
NOTICE

Clean cutting tools to prevent contamination of insert holes during drill and routing operations.

4. After verifying clearance for the Doublers inside and outside of the belly panel, create a Ø1.00" (25.4 mm) hole in an approximate location as shown in Figure 3.18 or Figure 3.20 (depending on aircraft).
5. Enlarge the hole in honeycomb core to 0.30" to 0.50" (7.6 to 12.7 mm) larger than diameter of 1.0" hole (i.e. – 0.15" to 0.25" undercut from edge of cutout). Hole shall extend all the way from upper to lower skin.

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Figure 3.22 Belly Panel Modification Overview



6. After drilling hole through panel, it is recommended to route hoses through and back to Connector Bracket, mocking up the routing under the seat and on the belly to ensure the hoses will have enough length (the hoses are provided with sufficient length to accommodate varied routings).

7. Locate the upper (internal) Relay Mount Doubler in position around the hole on the inside and match drill (using #40 drill (.098) as a pilot drill) the interior skin. Use clecos to clamp the Doubler to the skin and match drill Doubler and skin using #30 drill (.129") in preparation for riveting.

   Repeat this step for lower (external) Doubler (P/N 235-295-00).

8. Remove the Doublers and deburr all holes. Deburr not to exceed .005". Remove debris and loose material. Clean drilled holes in honeycomb of debris resulting from cutting operation using clean, dry, filtered compressed air. No further surface preparation of hole is required.

⚠ CAUTION

Wear protection for eyes and hands. Air pressure not to exceed 30 psi (207 kPA).

9. Using metallic tape (or equivalent), mask the bore of the 1.0" diameter hole in preparation for edge sealing. Mask all fastener holes except for the inner skin holes at the 12 o'clock and 6 o'clock positions.

10. Use a syringe to inject adhesive (Bell C-317) through one of the open fastener holes. Continue to inject adhesive until the edge cavity is filled and adhesive squeezes out of the open vent hole on the opposite side of the fastener hole patten. Remove excess adhesive. Once adhesive is set, remove the metallic tape.

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11. In preparation for bonding, prep the faying surfaces of the Relay Mount Doubler and the belly panel per the instructions in BHT-ALL-SRM paragraph 3-2-5.
12. Apply a general-purpose bonding adhesive (Bell C-317) to bond the Relay Mount Doubler to the belly panel referring to the instructions in BHT-ALL-SRM paragraph 3-2-7 and re-position the Doubler around the hole.
13. Install the supplied rivets (P/N 510-688-00) wet with adhesive while the doubler adhesive is still wet.
14. Repeat steps 11-13 with the exterior Doubler.
15. Allow adhesive to cure at room temperature for 24 hours.
16. Route the hoses through to underneath the helicopter and aft to the Connector Bracket.
17. Insert the Secondary hose quick disconnect fitting through the keyhole slot in the Connector Bracket and slide it to the inboard end of the slot and tighten.
18. Insert the Primary hose quick disconnect fitting through the keyhole slot and slide it to the outboard end of the slot and tighten the nut securely.

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The hoses and electrical harnesses are secured along the belly with cushioned loop clamps and spacers installed at existing inserts that are used for routing of the type certificated manual release cable. The following hardware is included in the kit for external routing of the hoses along the belly. Refer to the instructions following. The electrical harnesses share this same routing path, refer to section 3.5 concurrently.

P/N	Description	Qty
510-646-00	Spacer	1
510-647-00	Spacer	5
510-095-00	#10 Washer	6
510-102-00	Nut	1
510-645-00	Screw	5
510-652-00	Screw	1
512-003-00	Cable Tie	24
512-005-00	Cushioned Loop Clamp	6
512-026-00	Cushioned Loop Clamp	6
512-034-00	Cushioned Loop Clamp	1

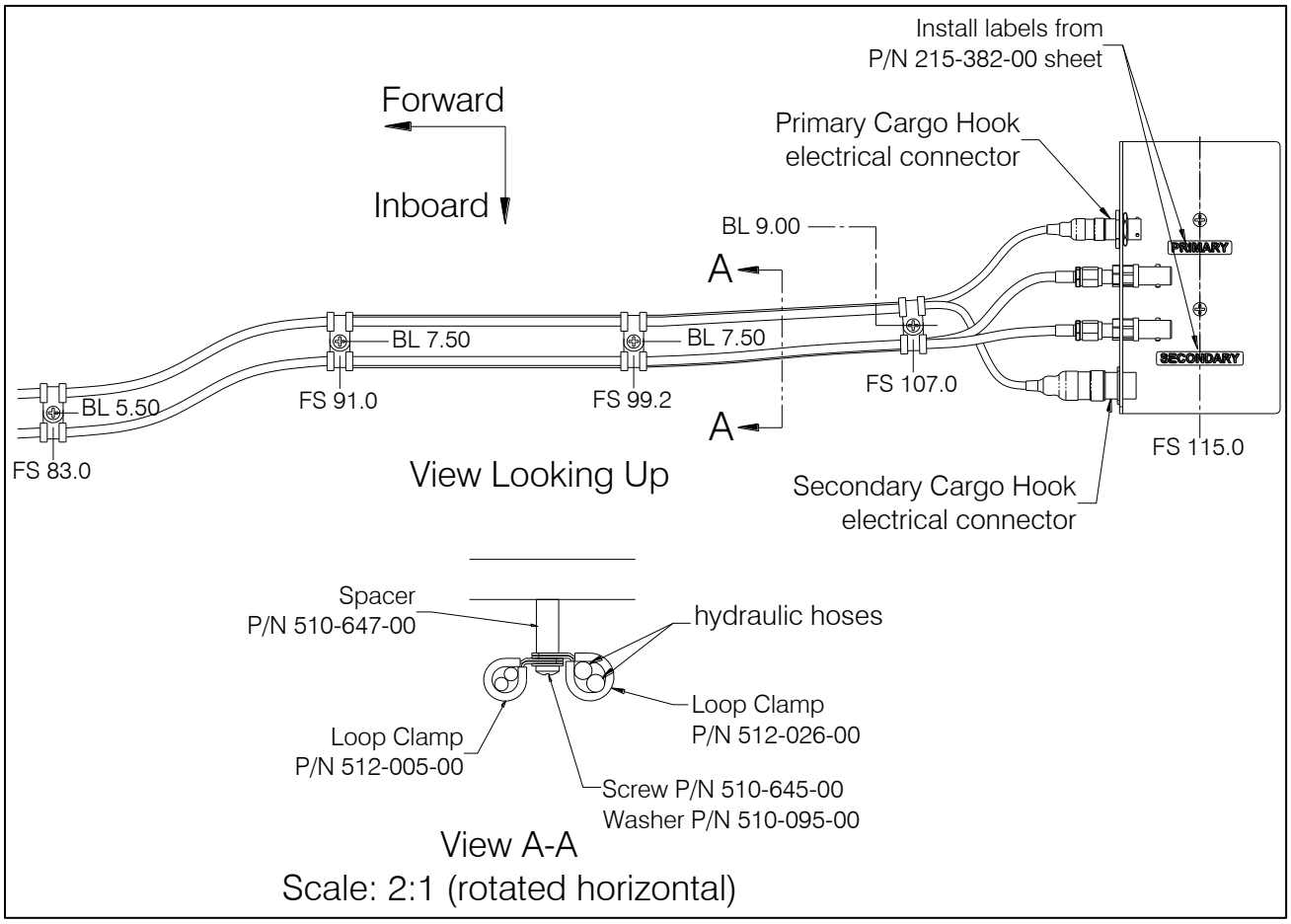
19. At existing belly panel inserts at FS 107.0, 99.2, 91.0, and 83.0 (refer to Figure 3.23) insert the hydraulic hoses together into loop clamp P/N 512-026-00 and the cargo hook electrical release harnesses into loop clamp P/N 512-005-00 and secure these with spacer (P/N 510-647-00), screw (P/N 510-645-00), and washer (P/N 510-095-00) as shown. If other wires (e.g. - for a remote cargo hook release system) are routed along this route, use larger MS21919 loop clamps or equivalent as appropriate to accommodate the larger bundle.

NOTICE

If the load weigh system is being installed, route its wiring harness through the loop clamps as the release wiring harness and hydraulic hose are routed through using the larger loop clamps (P/N 512-026-00) provided with the load weigh kit.

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Figure 3.23 Hose Routing to Connector Bracket

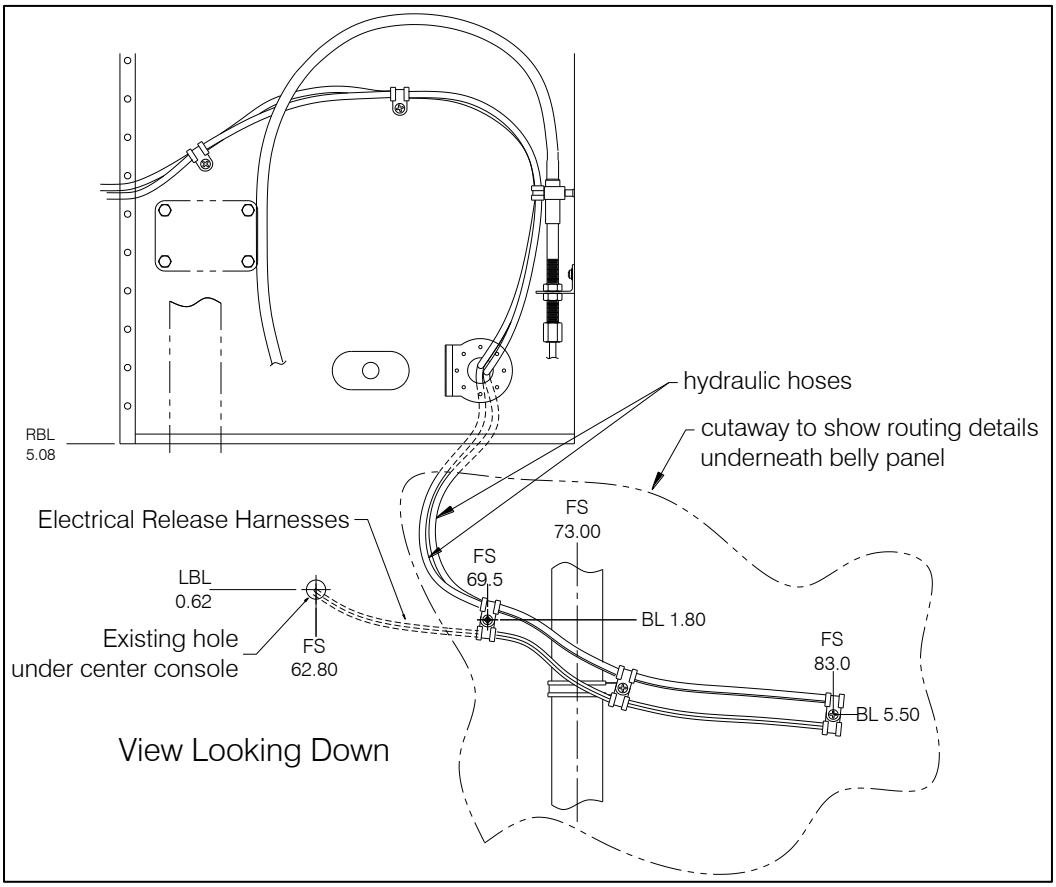


20. Place loop clamp P/N 512-034-00 over the forward landing gear cross tube and attach two loop clamps (P/N 512-005-00 and 512-026-00) to it with screw (P/N 510-652-00), washer (P/N 510-095-00), nut (P/N 510-102-00), and spacer P/N 510-646-00 to secure the hydraulic hoses and electrical harnesses.

21. Extend excess hose length into a loop between the Doubler (see Figure 3.24) and the first insert (FS 69.5) after it exits the skin and secure it to the insert at FS69.5 with loop clamps (P/N 512-005-00 and P/N 512-026-00), spacer (P/N 510-647-00), screw (P/N 510-645-00) and washer (P/N 510-095-00).

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Figure 3.24 Hose Routing from Landing Gear to Doubler



22. Install cable tie (P/N 512-003-00) over the hydraulic hose and wiring harness bundle at locations 3.0 inches from and on both sides of each loop clamp.

23. Route the electrical harnesses wires through the existing hole under the center console at FS62.80.

24. When hose and electrical harness routing is set, seal holes in belly panel with MIL-S-81733 sealant. When adding sealant to the hole for the hydraulic hose, center the hose within the hole and seal around it to prevent it from chafing on the edges of the hole.

25. After bleeding the hydraulic release system per 3.9, check the cyclic balance and modify the balance system if necessary per Section 3.11.

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3.4.2 Routing - Left Hand Cyclic (Bell 407 only)

For the left-hand cyclic installation, the hoses from the Dual Master Cylinder terminate above the boot at the base of the cyclic to accommodate removal of the cyclic. Intermediate hoses are included that extend just above the boot for connection to the hose from the Dual Master Cylinder and route to the bracket on the belly. When the cyclic is removed stow the ends of the intermediate hoses to the right of the cyclic base, on the forward side of the bulkhead.

Under the seat the routing may vary depending on equipment installed under the seat and on the exterior of the aircraft. Refer to the following general guidance and precautions when determining the routing under the seat.

- Verify the location where the hoses penetrate through to the outside to ensure there is clearance for the Doublers (P/Ns 235-294-00 and 235-295-00) with any belly mounted equipment, inserts, doublers, etc.

  If available an existing hole in the belly can be used for routing the hoses to underneath the aircraft provided this guidance is followed. The installation of the Doublers can be omitted but a bracket will need to be fabricated to mount the relay.

- Ensure the hoses do not restrict the movement of the cyclic, provide enough slack between the first support point aft of the cyclic and the clamps securing the hoses to the cyclic.

- Ensure the hoses are secured clear of flight controls and are protected from chafing on wires, structure, adjacent equipment, etc.

- Support the hoses with cushioned loop clamps every 12 to 16 inches.

- Use existing inserts in the belly if possible or install new inserts provided.

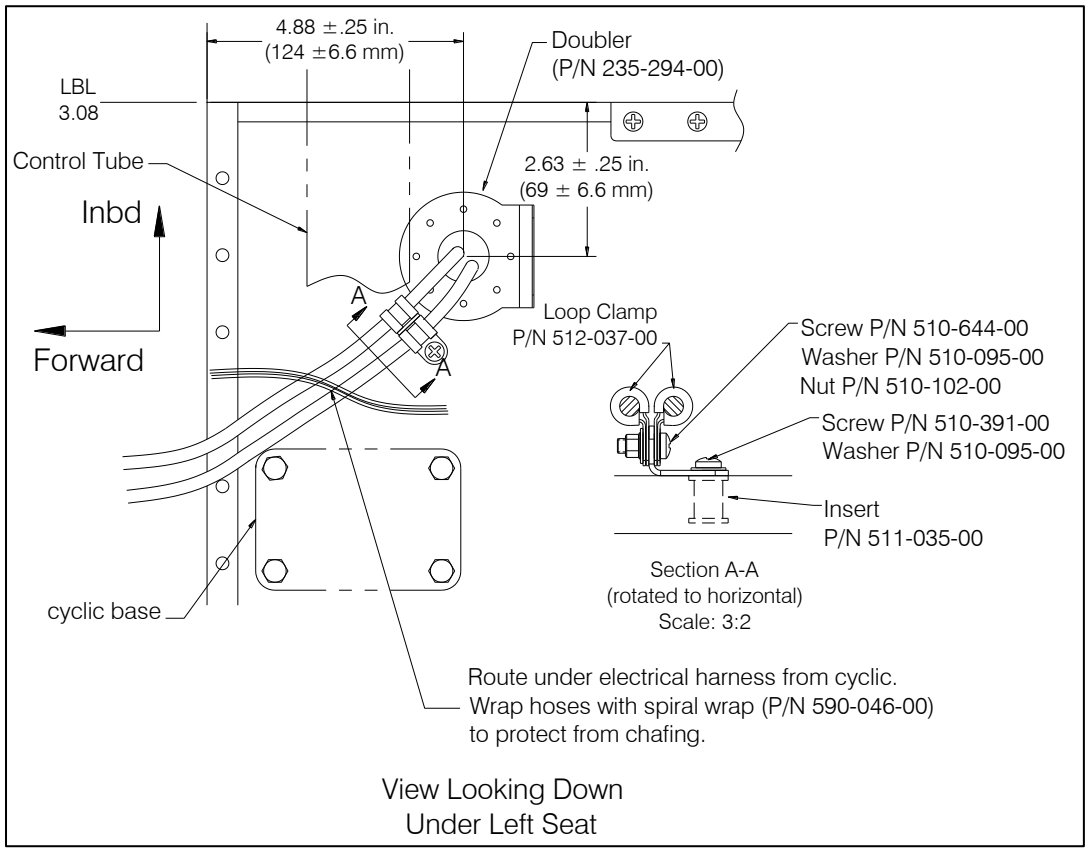
1. Remove the seat and the panel underneath it for access.
2. To verify clearance for the Doublers and the hoses routed to them, position the Relay Mount Doubler P/N 235-294-00 at the hole location shown in Figure 3.25. Rotate the Doubler so that the vertical flange for mounting the relay is away from the direction which the hoses will be routed from. Verify the relay and relay socket will fit here by test fitting these items.
3. After verifying clearance for the Relay Mount Doubler (P/N 235-294-00) inside and Doubler P/N 235-295-00 on the outside of the belly panel (see Caution note below), create a Ø1.00" (25.4 mm) hole in the honeycomb panel in a location shown in Figure 3.25.

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CAUTION

Before creating the hole in the belly panel verify that the Doubler will fit on the inside and the outside of the belly panel in the location shown. Check for inserts, antennae, optional equipment, etc. on the outside.

Figure 3.25 Hose Routing Under LH Seat



4. Install Relay Mount Doubler (P/N 235-294-00) around the hole on the inside and Doubler P/N 235-295-00 around the hole on the outside. Use the supplied rivets (P/N 510-688-00) for securing the doublers and refer to the steps detailed in Section 3.4.1 for installing these doublers.
5. Route the two Intermediate Hose Assemblies (232-826-00) up from underneath the helicopter through the Doubler and route them through the lower right corner of the opening in the panel just forward of the cyclic base.

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6. Place a cushioned loop clamp (P/N 512-037-00) over each hose and secure them to the short leg of an angle bracket (P/N 512-028-00) with screw (P/N 510-391-00), washer (P/N 510-095-00), and nut (P/N 510-102-00). Do not fully tighten the nut yet.
7. To determine its optimum mounting location, position the angle bracket (with hoses) adjacent to the Doubler (see Figure 3.25) and verify clearance and satisfactory routing of the hoses from the Doubler up to the cyclic. Mark this location and install an insert (supplied P/N 511-035-00 or Bell P/N as allowed in the BHT-ALL-SRM) or use an insert nearby (if present) that provides satisfactory routing of the hoses. Follow the instructions in the BHT-ALL-SRM for modifying the panel.
8. Secure the angle bracket to the panel insert with Screw (P/N 510-391-00) and washer (P/N 510-095-00).
9. Connect the intermediate hose fittings to the fittings of the hoses from the dual master cylinder (see Figure 3.26).
10. To ensure satisfactory slack in the hoses move the cyclic throughout its range of motion and ensure there is slack in the hoses in all positions and that the hoses cannot be deflected into a position where they may interfere with cyclic movement.

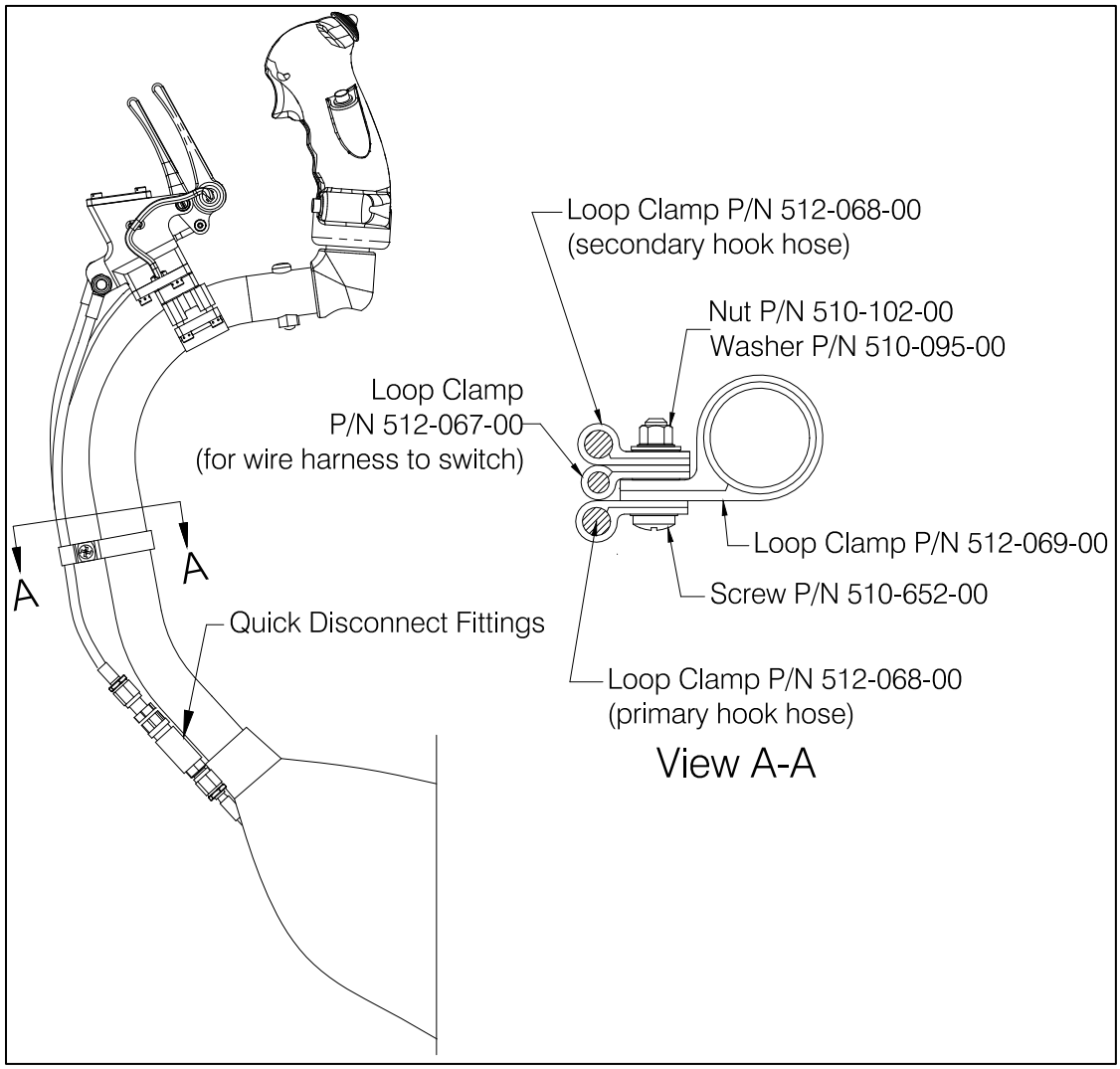
⚠ CAUTION

Provide enough slack up to the loop clamp on the cyclic to allow full movement of the cyclic and ensure the slack is not in excess to where it has potential to impede or interfere with flight control movement.

11. When routing is set tighten the nut at the loop clamp on the angle bracket and seal the hole in the belly around the hoses with sealant.
12. Wrap the hoses along the cyclic with a short section of spiral wrap to prevent abrading on the wire harness from the cyclic.
13. As needed, for when the cyclic is removed, provide provisions to cap and stow of the ends of the intermediate hoses on the forward-facing side of the bulkhead at the pilot's feet and to the right of the cyclic base. Provide a means for securing the hoses and the small switch wire harness to prevent them from coming into contact with the cyclic controls.

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Figure 3.26 Routing on Cyclic (LH)



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14. Set some slack in the hoses to ensure they do not get pulled tight in any cyclic position and tighten the nut securely at the angle bracket.
15. Underneath the aircraft, route the hoses aft to the Connector Bracket (installed per Section 3.4).
16. Insert the Secondary hose quick disconnect fitting through the keyhole slot in the Connector Bracket and slide it to the inboard end of the slot.
17. Insert the Primary hose quick disconnect fitting through the keyhole slot and slide it to the outboard end of the slot.

The Intermediate Hose Assemblies and the electrical harnesses are secured along the belly with cushioned loop clamps and spacers installed at existing inserts that are used for routing of the type certificated manual release cable. Refer to the following instructions.

18. At existing belly panel inserts at FS 107.0, 99.2, 91.0, and 83.0 (refer to Figure 3.23) insert the hydraulic hoses together into loop clamp P/N 512-026-00 and the two cargo hook electrical release harnesses into loop clamp P/N 512-005-00 and secure these with spacer (P/N 510-647-00), screw (P/N 510-645-00), and washer (P/N 510-095-00) as shown. If other wires (e.g. - for a remote cargo hook release system) are routed along this route, use larger MS21919 loop clamps or equivalent as appropriate to accommodate the larger bundle.

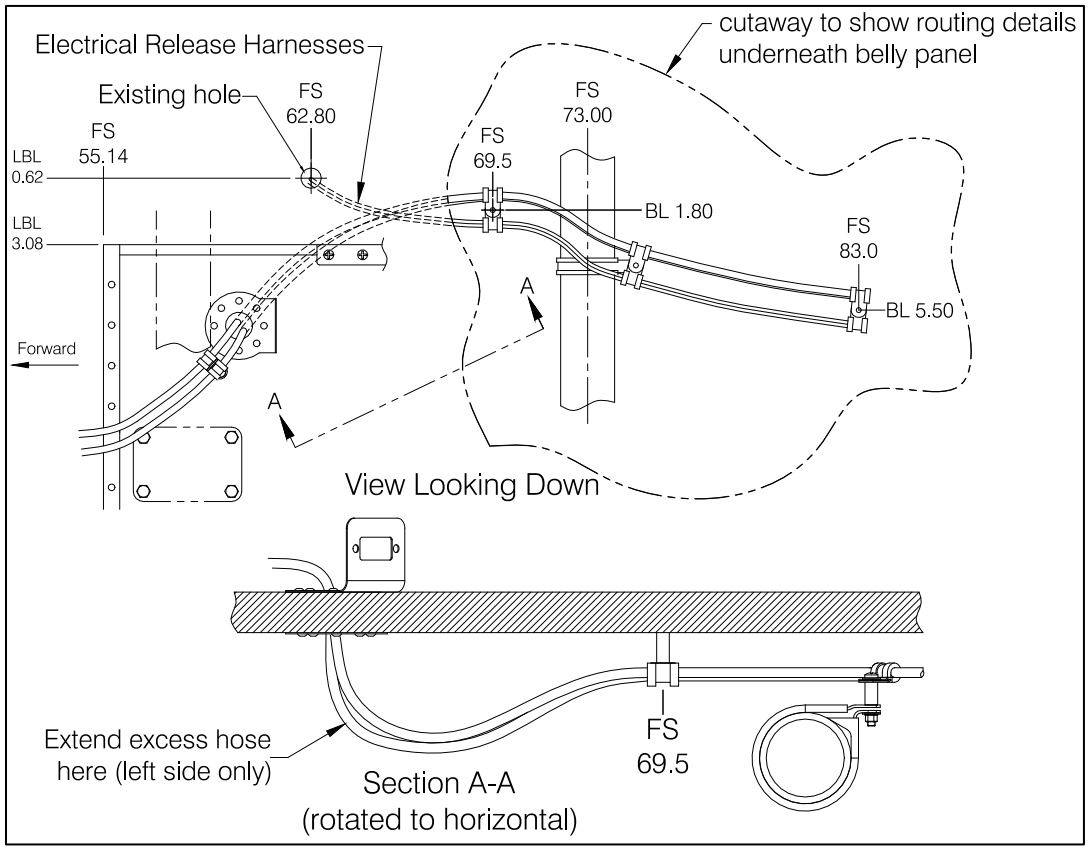
NOTICE

If the load weigh system is being installed, route its wiring harness through the loop clamps as the release wiring harness and hydraulic hose are routed through using the larger loop clamps (P/N 512-027-00) provided with the load weigh kit.

19. Place loop clamp P/N 512-034-00 over the forward landing gear cross tube and attach loop clamp P/N 512-005-00 and P/N 512-026-00 to it with screw P/N 510-652-00, washer P/N 510-095-00, nut P/N 510-102-00, and spacer P/N 510-646-00 to secure the hydraulic hoses and electrical harnesses.
20. Extend excess hose length into a loop just outside the Doubler (see Figure 3.27) and at the first insert (FS 69.5) aft of the point where it exits the skin, secure the hydraulic hose (and electrical harness) with a loop clamp (P/N 512-027-00), spacer (P/N 510-647-00), screw (P/N 510-645-00) and washer (P/N 510-095-00).

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Figure 3.27 Routing Aft from Doubler



21. After bleeding the hydraulic release system per 3.9, check the cyclic balance and modify the balance system if necessary per Section 3.11.

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3.5 Fixed Cargo Hook Electrical Provisions Installation

This section provides the instructions for installing the primary cargo hook and secondary cargo hook internal electrical release harnesses and supporting items for these harnesses (Relay Bracket and Connector Bracket) and the optional load weigh system indicator and its internal harness. The installation of the electrical wiring requires crimpers for crimping on ring terminals and M39029 socket contacts

Route the wires along the existing harnesses per the following guidance.

- Pick up existing wire runs by opening existing cable clamps. Nylon ties alone may not be used for primary support.
- The distance between supports should not exceed 21 inches (53 cm).
- Bend radius of wire or harness must not be less than 10 times the wire or harness diameter.
- Inspect and verify that the wire harness may not be manually deflected into a structure with a bend radius of less than 0.13 inches (3.3 mm).

3.5.1 Primary Cargo Hook Electrical Release Wiring Installation

If the primary cargo hook is installed, skip to section 3.5.2. The primary 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 3.28 for a wire harness installation overview. Refer to Figure 3.30 for wiring schematic.

NOTICE

If the load weigh system is being installed, route the load weigh wiring harness through the structure as the release wiring harness is installed. Refer to section 3.4.3 for load weigh system wiring installation instructions.

1. Install the circuit breaker in the overhead console (reference Figure 3.29).
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.

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3. Route the M1A18 wire with existing harnesses from the circuit breaker down to 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.
4. Route wire P14A12 from the circuit breaker to the 28VDC bus and secure as shown in Figure 3.29.

Electrical harness P/N 270-152-00 is routed to the Connector Bracket installed on the belly of the helicopter. It is routed with the hydraulic hose along the belly and is secured along the belly with loop clamps when the hydraulic hose is routed.

5. Secure the connector of harness P/N 270-152-00 to the Connector Bracket.
6. Route the two individual wires (M3B18N and M2B18) forward and up through the existing hole in the belly at STA 62.80 between the pilot and co-pilot seats.
7. Route and connect wire no. M3B18N to ground point ND454 under the pilot seat.
8. Route wire no. M2B18 to underneath the pilot seat and splice it with existing 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.

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Figure 3.28 Primary Cargo Hook Wire Harness Installation Overview

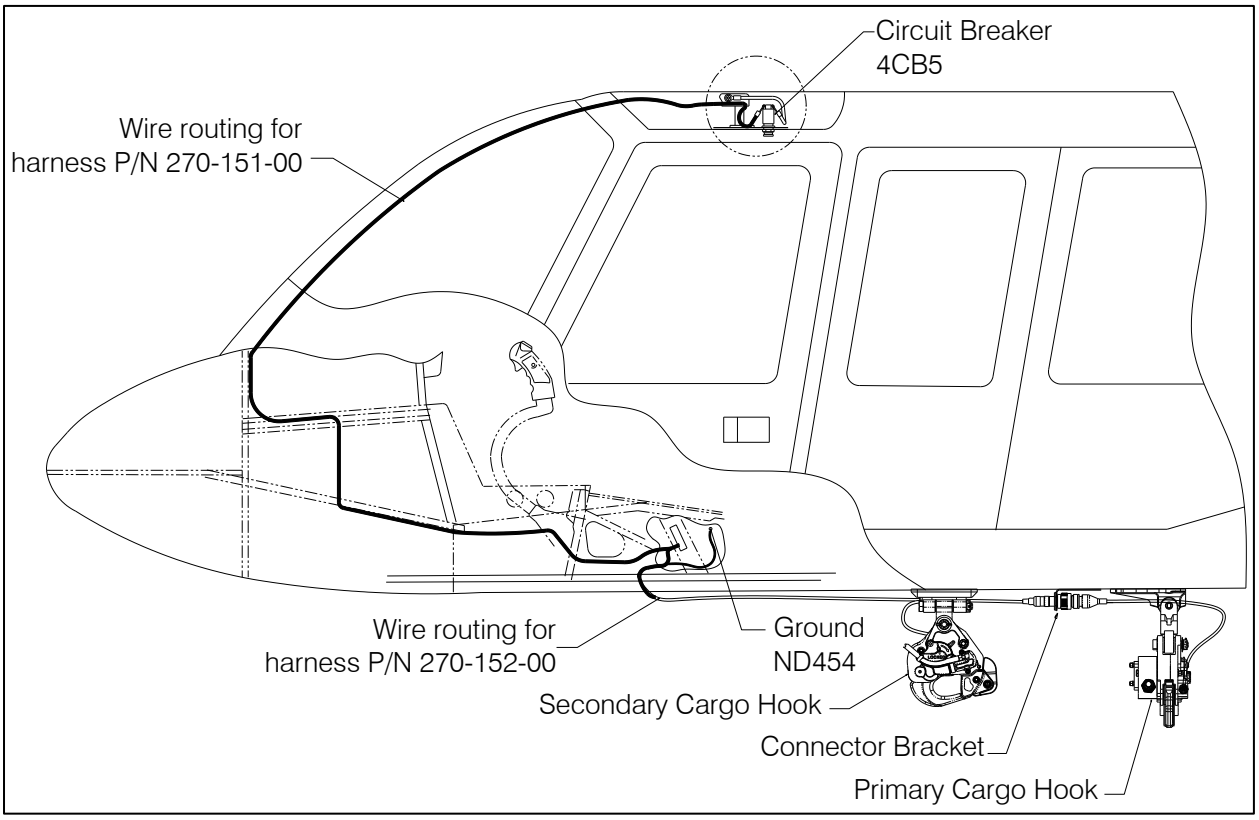
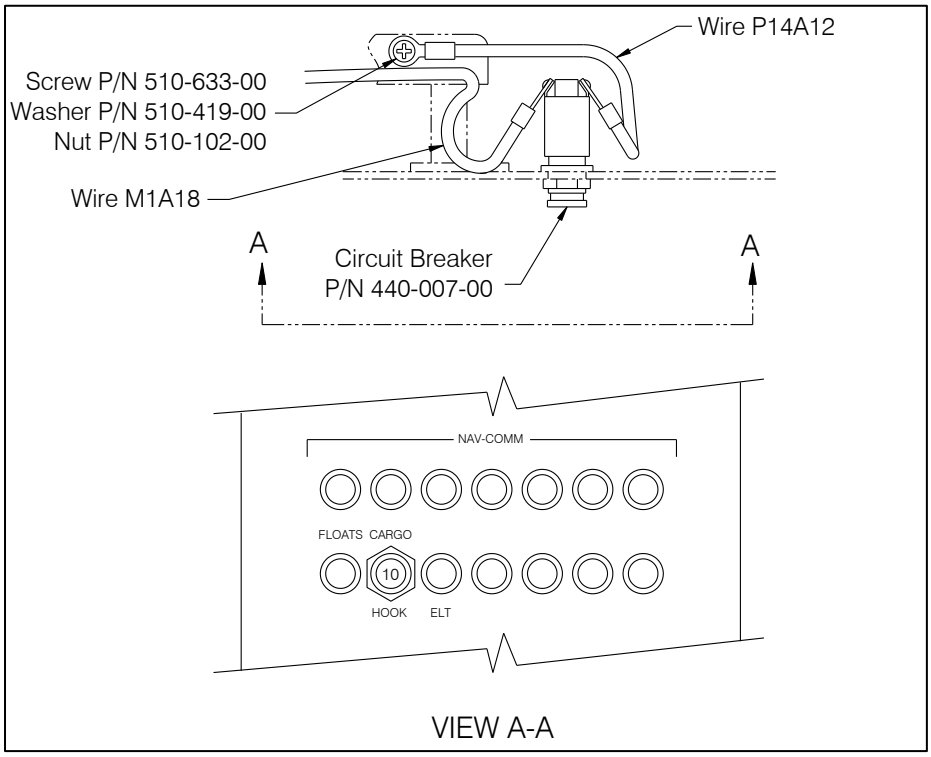
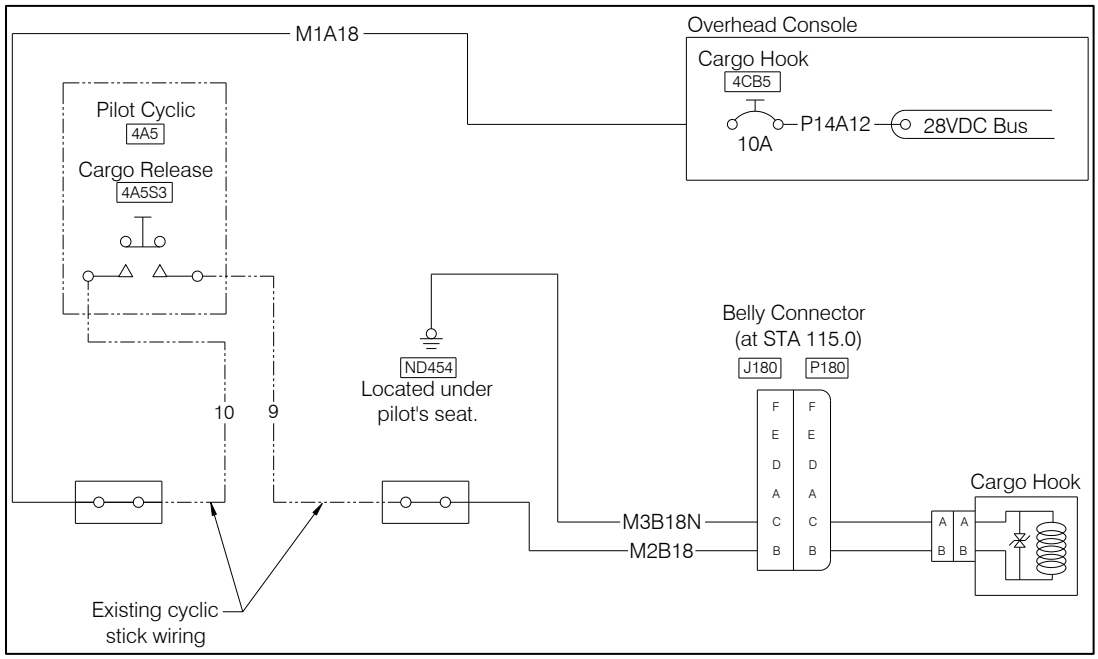


Figure 3.29 Circuit Breaker Installation



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Figure 3.30 Wiring Schematic



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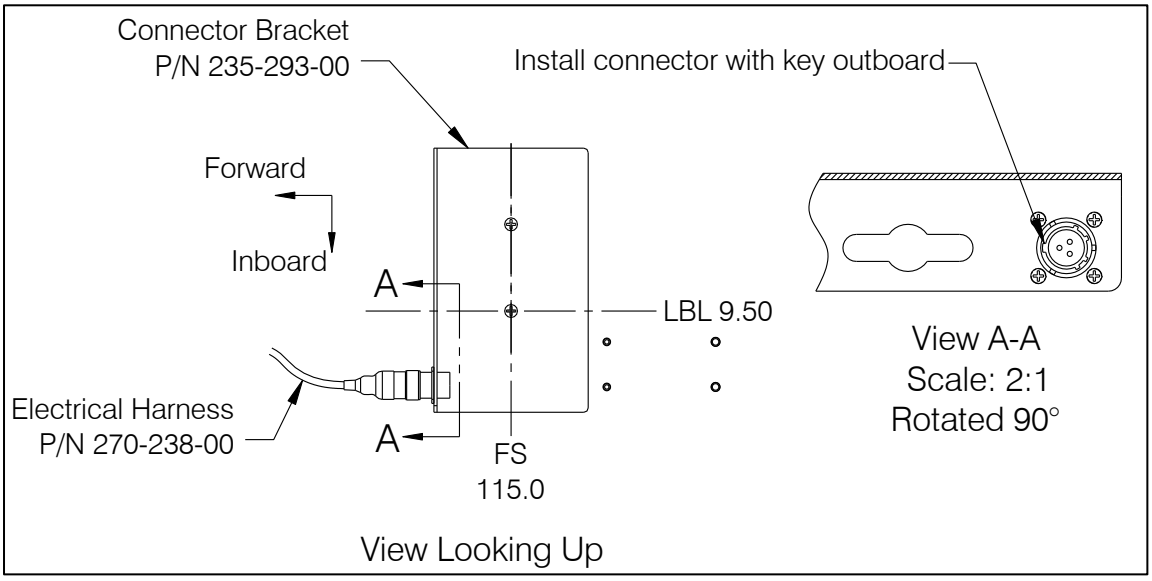
3.5.2 Secondary Cargo Hook Electrical Release Wiring Installation

The secondary cargo hook electrical release wiring consists of installing two electrical harnesses (P/N 270-237-00 and P/N 270-238-00) and circuit breaker.

The mounting for the relay socket of harness P/N 270-237-00 is integrated into the Doubler installed in section 3.4 that is installed around the hole in the belly panel for the hydraulic hoses to pass through to underneath. It is installed under the left seat or right seat depending on which side the cargo hook controls are to be installed (i.e. - install on the same side as the dual master cylinder assembly).

1. Working with wire harness P/N 270-238-00 under the aircraft, install the connector on this wire harness at the furthest inboard hole of the Connector Bracket P/N 235-293-00 installed on the belly. Secure the connector with four screws (P/N 510-700-00) and Perimeter Nut Plate (P/N 511-203-00).
2. Route the harness forward (if not already routed with the hoses, refer to Section 3.4) with the hydraulic hoses along the belly and then up through the existing hole in the belly at FS 62.80 under the center console.
3. Inside the aircraft, route wire no. 4 to an available ground point under the seats, cut it to length as necessary, crimp on the supplied ring terminal (P/N 410-258-00) and attach it to ground (refer to AC43.13).

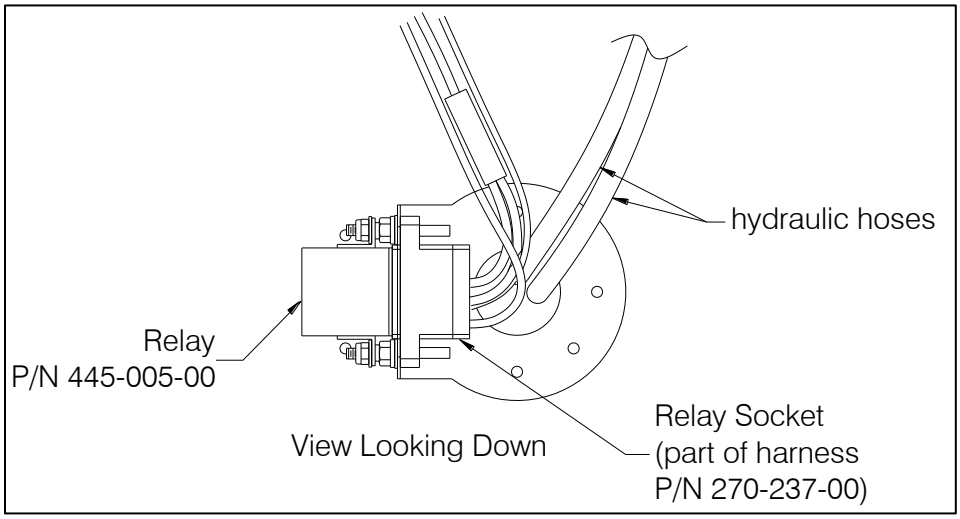
Figure 3.31 Connector Installation



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4. Route wire no. 5 to the relay socket of harness P/N 270-237-00, cut it to length as necessary, crimp on the supplied contact (P/N 410-218-00) and insert into position A1 of the relay socket.
5. Position the relay socket in the flange of the Doubler and secure with the relay socket hardware provided with the harness.
6. Plug the relay (P/N 445-005-00) into the relay socket and secure with the nuts provided.

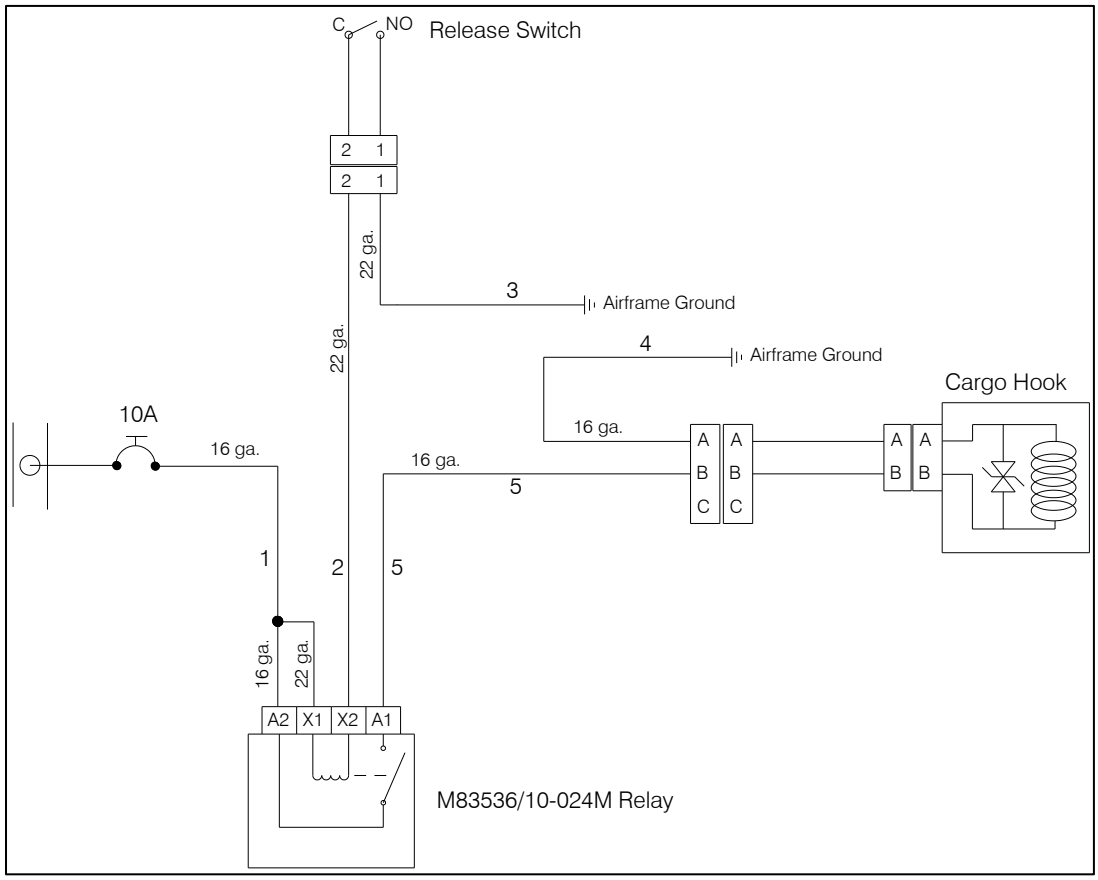
Figure 3.32 Relay Installation



7. Route the wire harness leg (wires 2 and 3) with the small black connector to the cyclic to connect to the secondary release switch harness from the switch on the Dual Master Cylinder lever installed in Section 3.4.
8. Route wire number 3 from the black connector to an available ground point under the seat, cut to length as necessary, prep the end and crimp on a ring terminal and connect to ground per AC43.13.
9. Route wire number 1 forward with existing wire runs to the circuit breaker panel in the overhead console.
10. At an available location install the supplied 10-amp circuit breaker (P/N 440-007-00) and as necessary use a 16 AWG M22759 wire to connect this new circuit breaker to the 28 VDC bus.
11. Terminate wire number 1 at the circuit breaker using the supplied ring terminal (P/N 410-309-00).
12. Protect the leg of the wire harness routed with the hydraulic hoses up the cyclic from chafing by wrapping the hoses with supplied spiral wrap (P/N 590-046-00).

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Figure 3.33 Secondary Hook Electrical Release System Schematic



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3.5.3 Load Weigh System Fixed Electrical Installation

The Load Weigh System (P/N 200-464-00) is optional, if not installing this system, skip to the next section.

The fixed electrical components of the load weigh system are the C-40 Indicator and the internal wire harness. The predecessor to the C-40 indicator, the C-39 indicator (P/N 210-095-00 or P/N 210-095-02), and its load weigh harness (P/N 270-153-00) are also eligible to be used if they are present and installed per STC SR01943SE on the 407 model.

On the 206L model and 407 models with the E-85 load weigh system, the C-39 model and its load weigh harness (P/N 270-048-04) are also eligible to be used if they are present and installed per STC SR00898SE but the fixed connector on the belly bracket must be swapped to a D38999 connector (P/N 410-255-00). See pin-out table in this section for this harness.

The C-40 Indicator is directly interchangeable with the C-39 Indicator (without changing the internal harness) except it does not support the optional components (Analog Meter, C-30 Data Recorder). The functions performed by the C-30 data recorder will be integrated into the C-40 Indicator with a future software update.

The internal harness (P/N 270-241-00) provided with the C-40 indicator has an additional wire (TEDS DATA, refer to Figure 3.35) which will be used on future updates to the C-40 indicator.

The C-40 Indicator is designed to be mounted in a standard 2¼" instrument hole and should be located in a position that is convenient, accessible and visible to the pilot. Another consideration for its mounting location is access to the USB port on the back; this USB port is intended for firmware updates.

If replacing the existing C-39 indicator within the existing load weigh system:

1. Remove the C-39 Indicator from its mounting position and disconnect the electrical harness connector from the back.
2. Connect the electrical harness connector to the C-40 indicator and position the C-40 indicator within the mounting location.
3. Secure the C-40 Indicator in the mounting location with the four screws (P/N 511-211-00) provided.

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If installing new load weigh system, install the C-40 indicator as noted above and continue per the following.

4. Connect the wire harness (P/N 270-241-00) connector (labeled C-40) to the Indicator.
5. 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 215-010-00 adjacent to the circuit breaker.
6. 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.

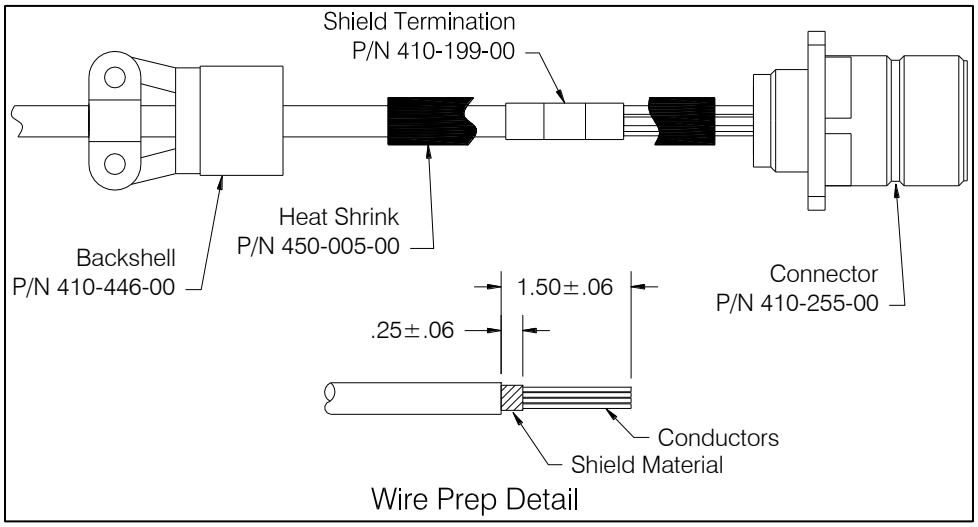
NOTICE

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).

13. Wire AIRCRAFT GND is to be connected to a suitable aircraft ground per AC43.13.
14. 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.
15. 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" 6 conductor wire end per Figure 3.34.

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Figure 3.34 Wire Prep Detail



16. Strip the individual wire ends, crimp on contacts supplied with connector, and terminate wires at connector P/N 410-255-00 per Table 3.1, refer also to the schematic in Figure 3.35. Slide the backshell up to and thread it over the connector threads and tighten securely.

Table 3.1 Connector Pin-Out

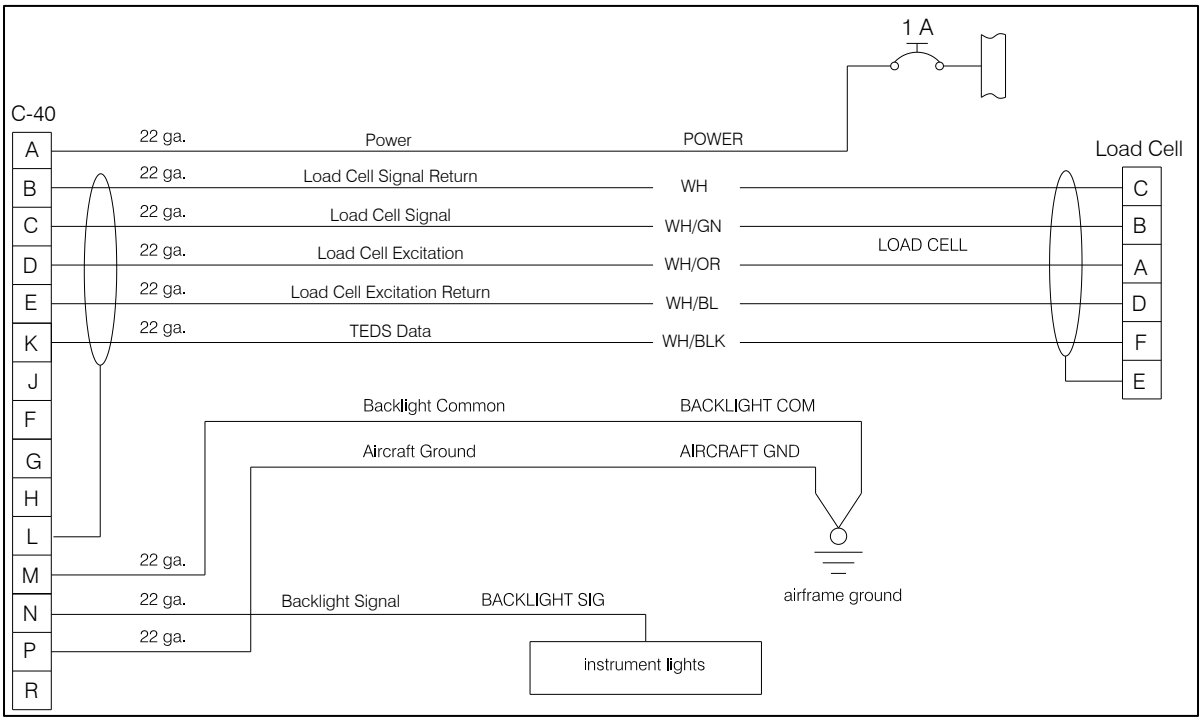
Harness P/N 270-241-00		**Harness P/N 270-048-04***	
Wire	**Connector Pin**	**Wire**	**Connector Pin**
WH	C	WH/OR	C
WH/GN	B	WH/GN	B
WH/OR	A	WH	A
WH/BLU	D	WH/BLU	D
WH/BLK	F	-	F
Shield	E	Shield	E

*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 as shown in Figure 3.34.

17. Secure the load weigh 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).

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Figure 3.35 Load Weigh System Wiring Schematic



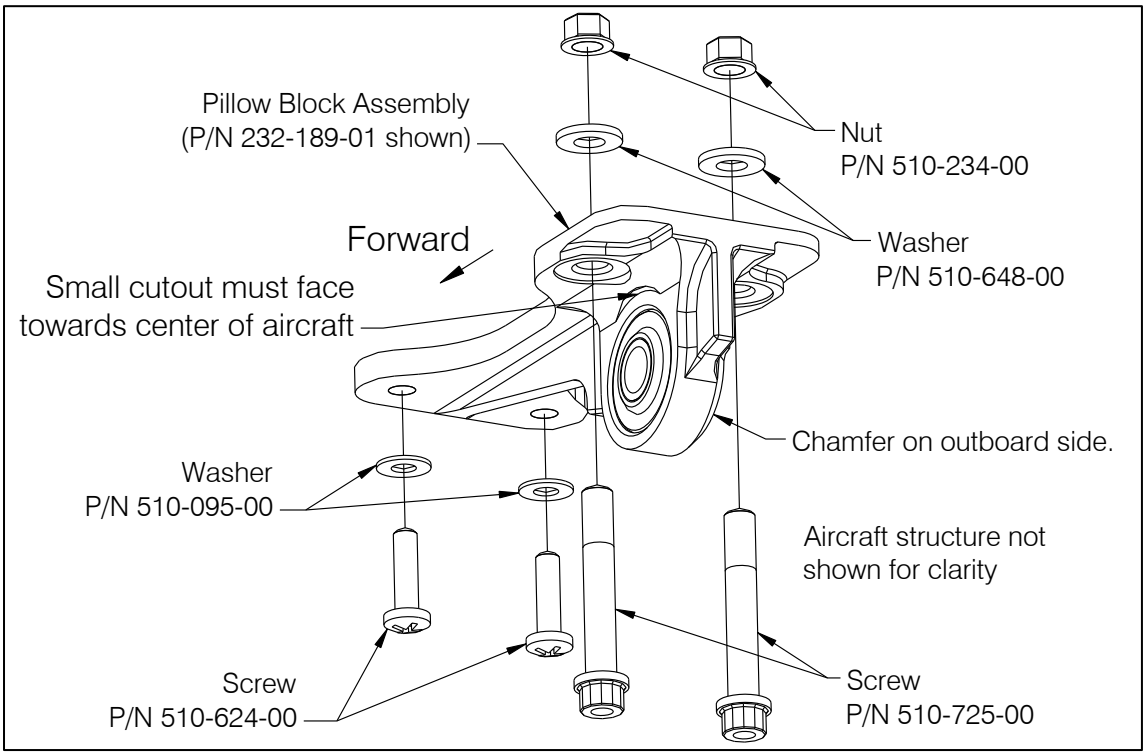
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3.6 Primary Cargo Hook Installation

The pillow blocks provide the mounting points for the beam and attach to the aircraft belly with the aft pair of holes aligning with the pair of holes in the bulkhead fittings installed earlier.

1. Apply sealant (MIL-S-81733) to the faying surfaces of the pillow block assemblies (P/N 232-188-01 and P/N 232-189-01) and the belly of the helicopter.
2. Position pillow blocks on the belly of the helicopter and align the four holes and secure with fasteners as shown. See Figure 3.36 for orientation of pillow block. Note orientation of small cutout, which must face towards the center of the aircraft.
3. Torque nuts (P/N 510-234-00) to 84 to 107 in-lbs (9.1 to 12.1 N-m) plus drag torque.

Figure 3.36 Pillow Block Orientation (right side pillow block shown)



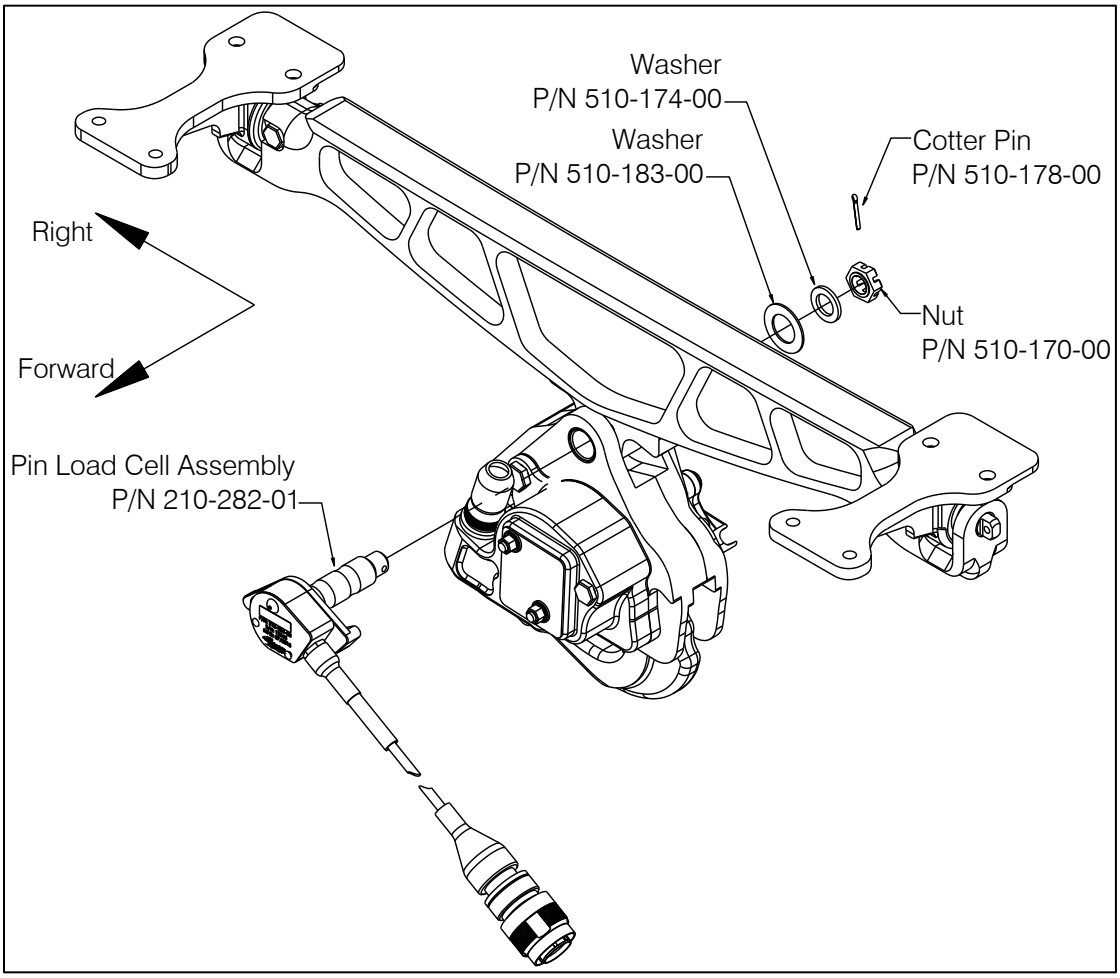
NOTICE

Note that the Pillow Block Assemblies are sensitive to right and left. See Figure 3.36.

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4. If the Load Weigh System is being installed, replace the Attach Bolt (P/N 290-332-00) for the cargo hook with the supplied Pin Load Cell. The Pin Load Cell is attached with the same hardware (reference Figure 3.37) as the Attach Bolt minus the washer P/N 510-183-00 under the head of the bolt (reference Figure 3.37). Retain the Attach Bolt in the event the Pin Load Cell requires servicing (and load weighing is not needed).

Figure 3.37 Pin Load Cell Installation



5. Position the suspension assembly on pillow block assemblies with the thrust washers held in place by hand (see Figure 3.39 for orientation) and insert the Trunnion Pins. The cargo hook load beam must point to the right (when looking from the rear), see Figure 3.38.

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Figure 3.38 Suspension Assembly Installation

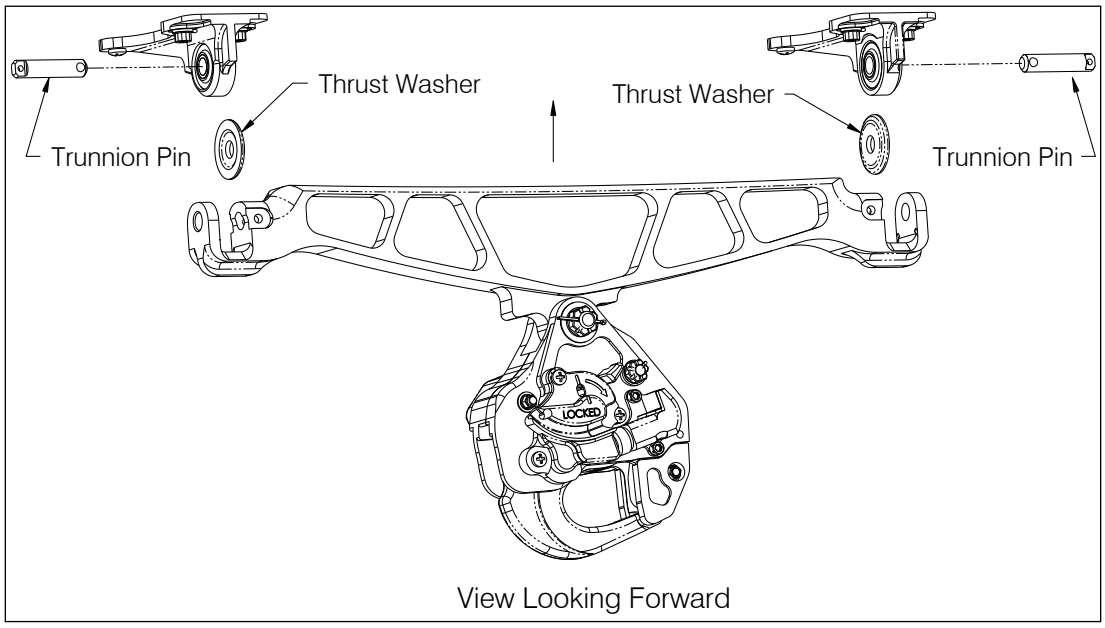
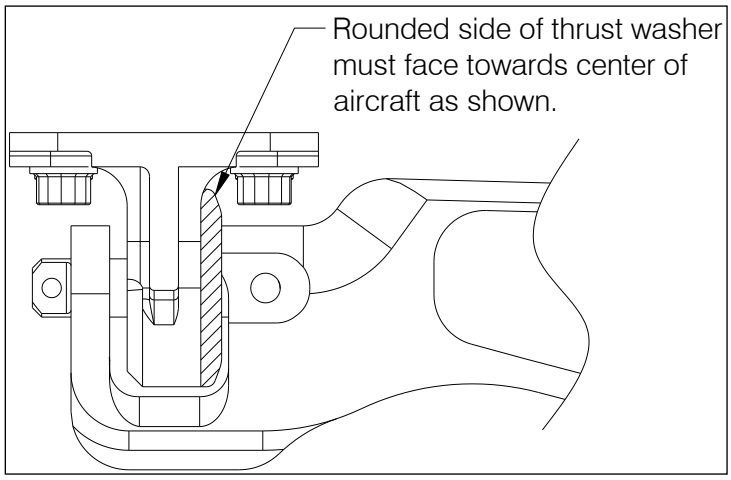


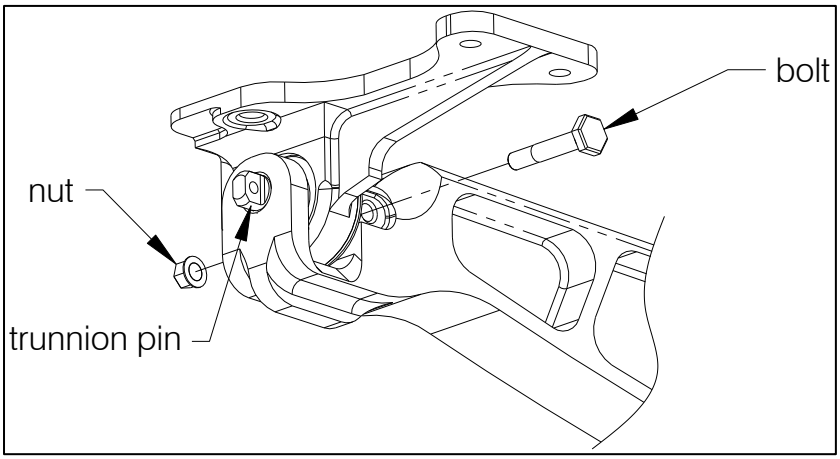
Figure 3.39 Thrust Washer Orientation



6. Insert bolt into the hole as shown in Figure 3.40. 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.
7. Install nut and torque to 20-25 in-lbs.

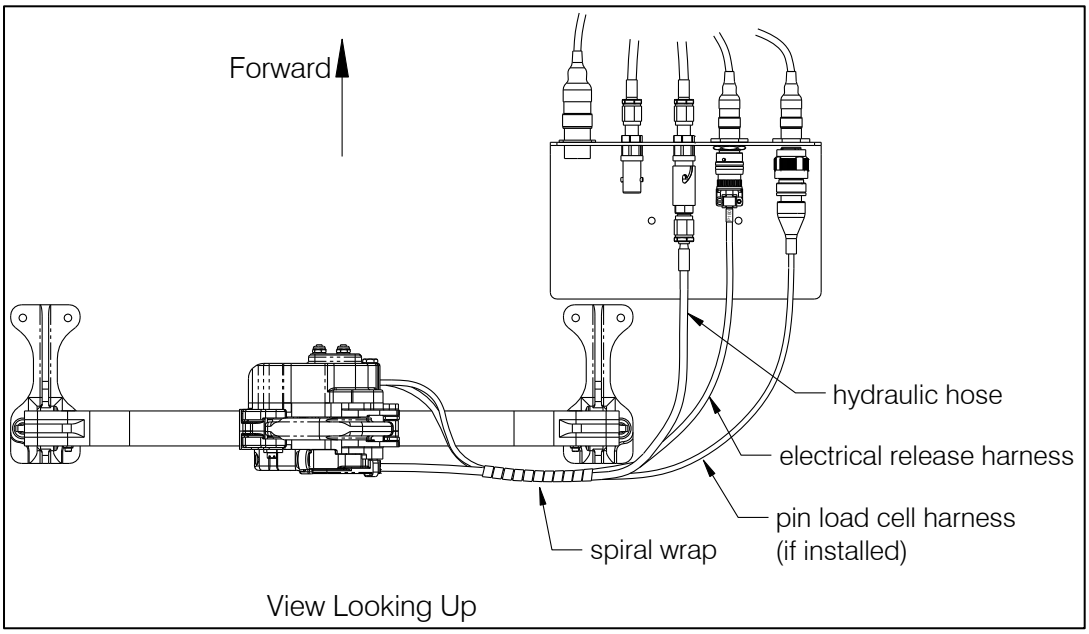
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Figure 3.40 Trunnion Pin Retention



8. Route the slave cylinder plumbing hose, the electrical release harness, and load cell harness (if installed) as shown in Figure 3.41 and connect them to the respective fixed connectors at the bracket.
9. Swing the cargo hook and beam in all possible directions and observe the hose and harness(es) to ensure they do not get pulled tight. If necessary, adjust position and/or trim length of the spiral wrap (P/N 590-017-00) over the harness(es) and hydraulic hose.

Figure 3.41 Hose and Harness Routing for Primary Cargo Hook



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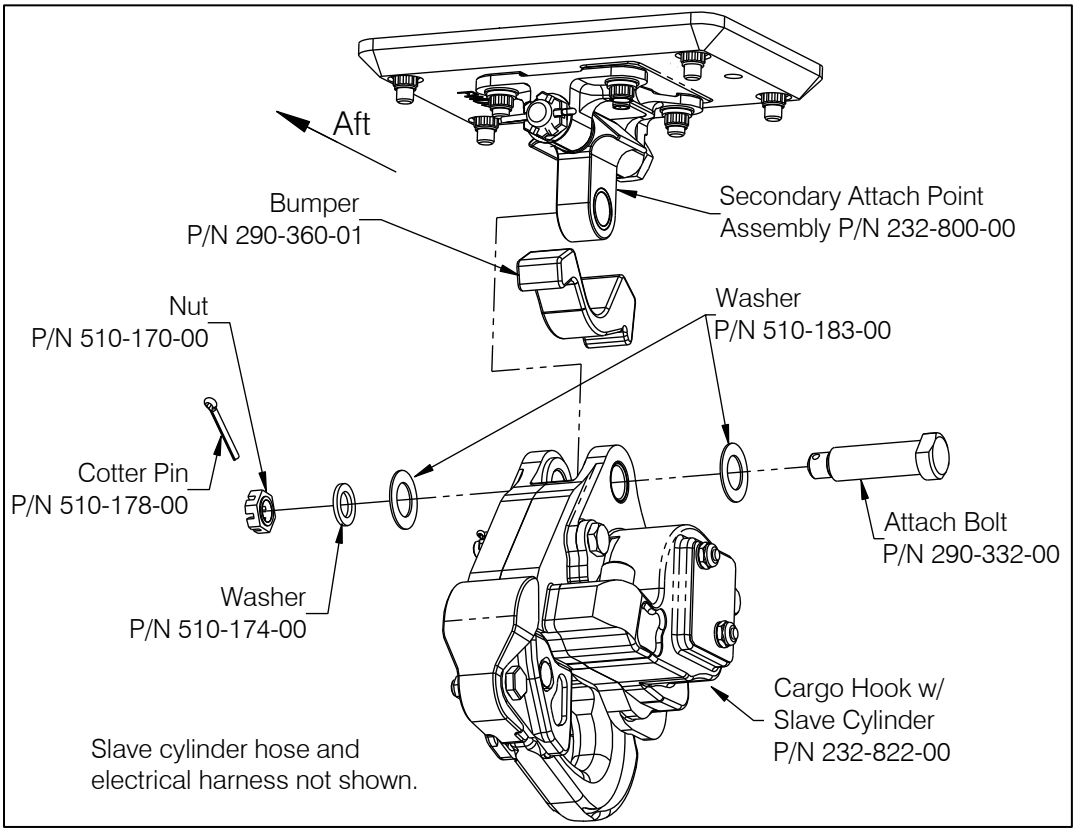
3.7 Secondary Cargo Hook Installation

The secondary Cargo Hook (P/N 528-028-03) is provided with the Slave Cylinder and Plumbing assembled onto it (this assembly P/N is 232-822-00). It is installed at the secondary hard point.

Install the secondary Cargo Hook per the following.

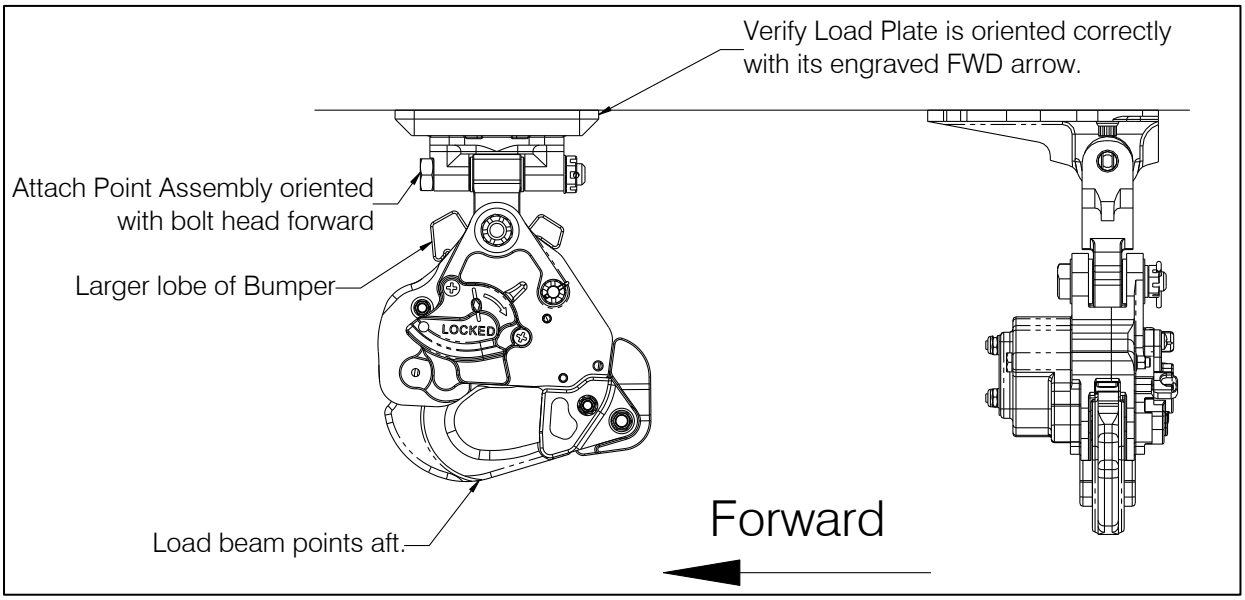
1. Insert the Bumper (P/N 290-360-01), oriented with the larger lobe forward, between the attach lugs of the cargo hook (refer to Figure 3.42 and Figure 3.43). The Bumper is a tight fit and will need to be forced into position with a blunt screwdriver or similar tool
2. Apply grease (Mobilgrease 28 is recommended) to the Attach Bolt.
3. Align the cargo hook attach hole with the hole in the link of the Secondary Attach Point Assembly and secure with the hardware as shown. Since the Bumper is a tight fit, push up on the cargo hook to compress it slightly to get the holes to align.
4. Tighten the nut finger 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.

Figure 3.42 Secondary Cargo Hook Installation



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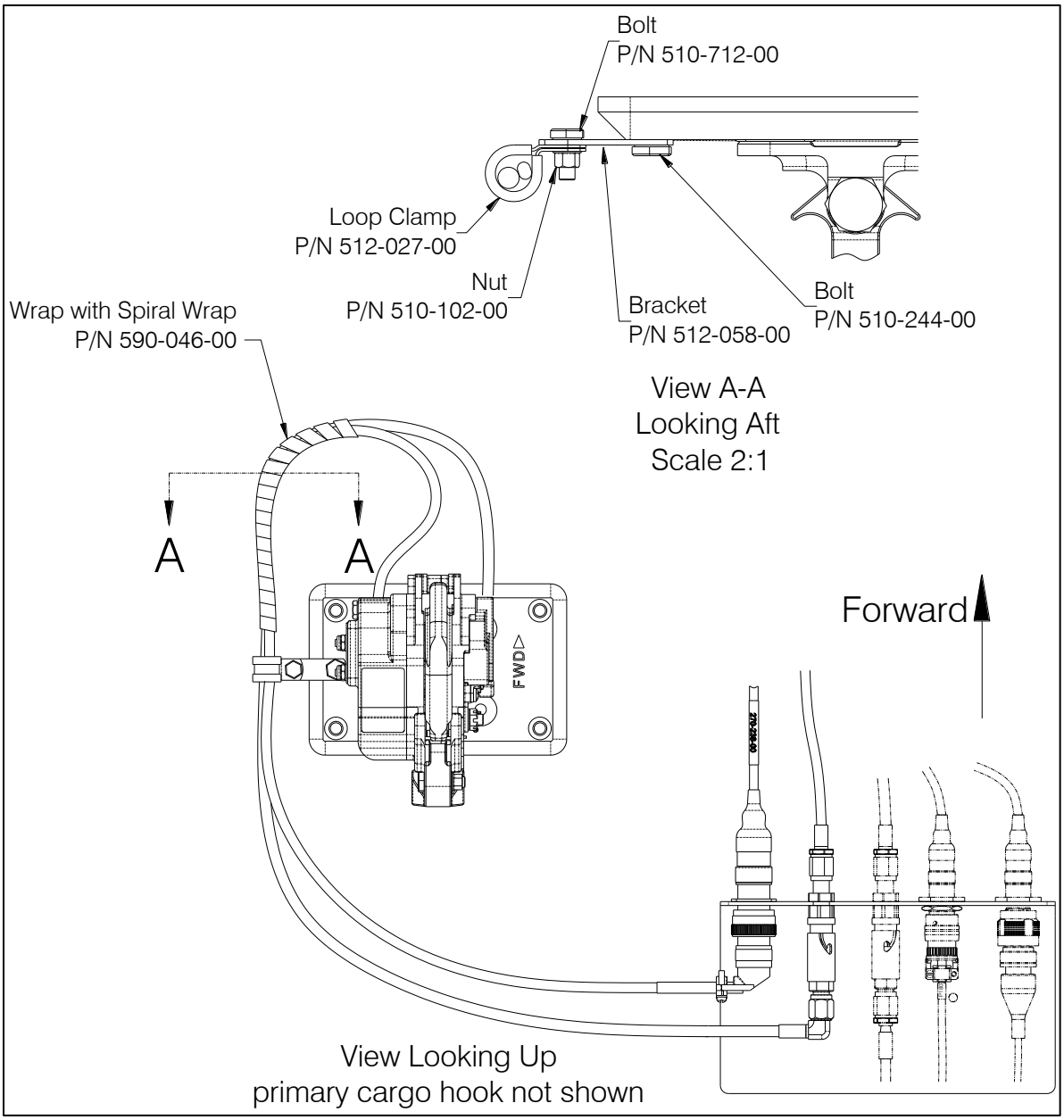
Figure 3.43 Secondary Cargo Hook Installation Orientation



5. Connect the electrical release harness (P/N 270-239-00) to the cargo hook connector.
6. Route the hydraulic hose and electrical release harness as shown below to the connector bracket on the belly and connect them to the respective inboard connectors.
7. Attach Bracket P/N 512-058-00 to the tapped hole in the Load Plate with Bolt P/N 510-244-00 (as shown in Figure 3.44)
8. Place the loop clamp over the hose and harness and secure the loop clamp to the bracket with bolt and nut shown. Before tightening the nut, ensure there is sufficient loop in the hose and harness forward of the bracket to allow full movement of the cargo hook without them being pulled tight.

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Figure 3.44 Secondary Cargo Hook Hose and Harness Routing

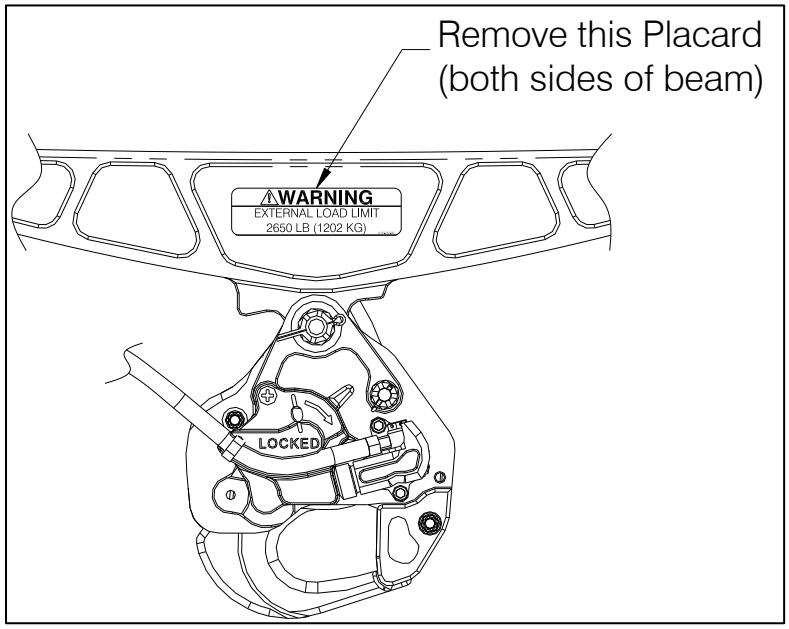


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3.8 Placard Installation

1. Install the External Load Limit Placard (P/N 215-390-00) on the belly of the helicopter, adjacent to the primary cargo hook. This placard supersedes the original load limit placard located on the beam and includes the relevant information so remove this placard. Optionally make placards that include the relevant load limits on P/N 215-390-00 and cover these placards on the beam (in addition to having P/N 215-390-00 on the belly).

Figure 3.45 Placard Removal



2. Install the "SECONDARY HOOK" decal adjacent to the circuit breaker installed for the secondary cargo hook.

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3.9 Hydraulic System Fill and Bleed Procedure

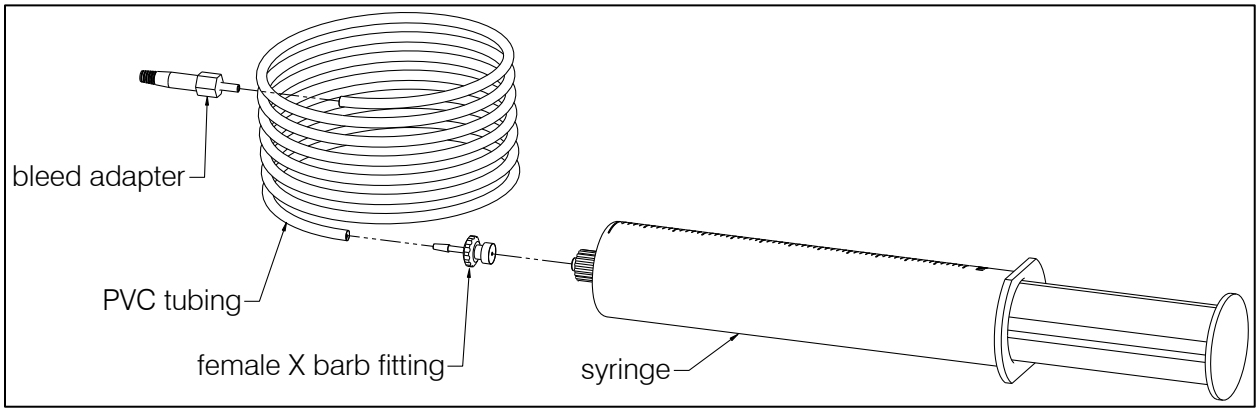
If there is a need to fill and/or bleed the system, follow the procedures listed below. Proper bleeding is critical to the operation of the hydraulic release system. An improperly bled system will not release the cargo hook mechanism.

Filling and bleeding require two people, one to inject hydraulic fluid through the system and the other to observe the master cylinder reservoir.

A bleed kit (P/N 212-014-02) is provided with each cargo hook kit. This kit consists of 2 oz of MIL-PRF-87257 hydraulic fluid, a syringe, a female barb fitting, a length of PVC tubing, and a bleed adapter fitting. The bleed procedure is as follows.

1. Assemble the bleed kit components by press fitting each component together as shown.

Figure 3.46 Hydraulic Hook Bleed Kit



2. Place an absorbent towel under the master cylinder.

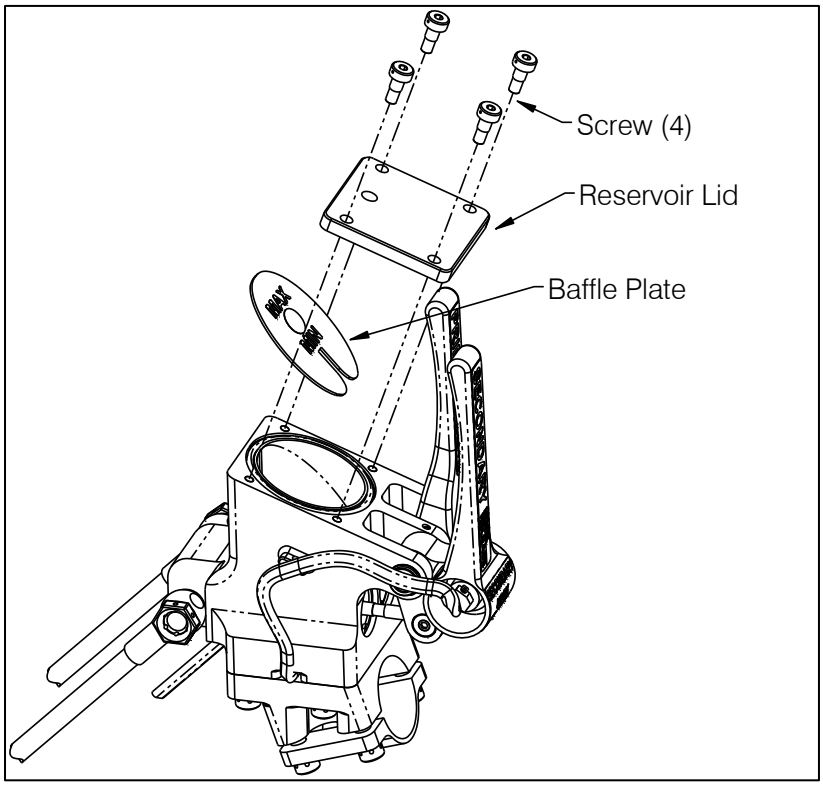
NOTICE

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

3. Remove screws, reservoir lid, and baffle plate from the master cylinder reservoir as shown in Figure 3.47.

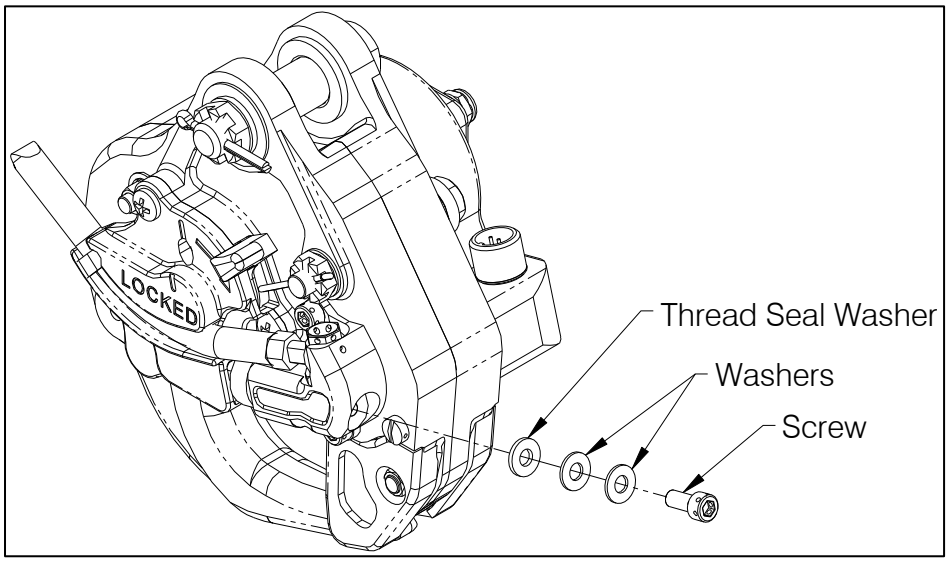
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Figure 3.47 Reservoir Lid Removal



4. Remove the bleed screw, thread seal washer, and washers from the slave cylinder, see Figure 3.48.

Figure 3.48 Bleed Screw Removal



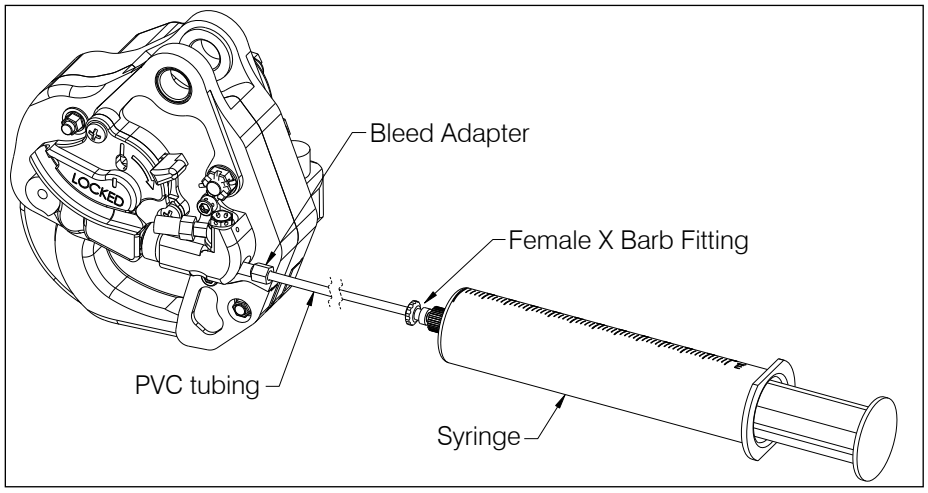
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5. Fill the syringe with approximately 35 cc of hydraulic fluid and purge any remaining air in the syringe and tubing. Screw the end of the bleed adapter into the screw hole on the slave cylinder to create a tight seal. See Figure 3.49.
6. While observing the reservoir, **slowly** push on the syringe plunger to force fluid through the slave cylinder, hydraulic hose, and up to the master cylinder reservoir. There will be some resistance during filling—this is normal.

CAUTION

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

Figure 3.49 Injecting Hydraulic Fluid



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

NOTICE

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

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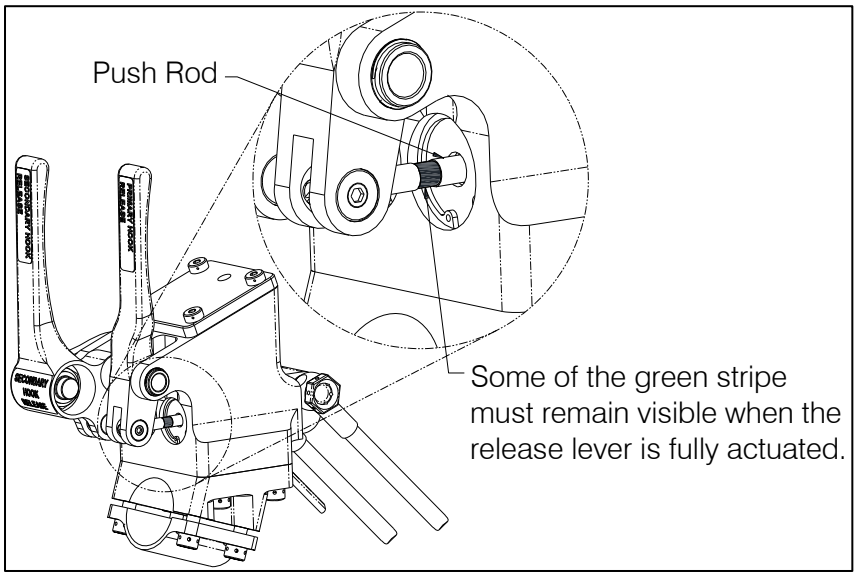
8. Prepare the thread seal washer, washer and screw for quick assembly into the bleed screw hole when the adapter is removed as fluid will began to drain from the system.
9. Remove the bleed adapter from the screw hole. Re-install the Thread Seal Washer, washers, and screw.
10. Repeat steps 4 through 9 with the other cargo hook.
11. Allow the system to rest for several minutes. This will allow any air to rise through the system
12. Very **slowly** pull each release lever on the master cylinder and watch for bubbles. If bubbles are observed rising within the reservoir, continue to slowly cycle the lever until there are no more. Actuating the lever releases air trapped within the master cylinder.

⚠ CAUTION

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

13. Check the system for air by actuating the lever firmly until it bottoms out. Check the push rod position (see Figure 3.50). If some of the green stripe on the push rod is visible, proceed to step 13. If some of the green on the push rod is not visible with the lever completely pulled, the system has too much air in it and needs further bleeding. To do this, repeat steps 5 – 11.

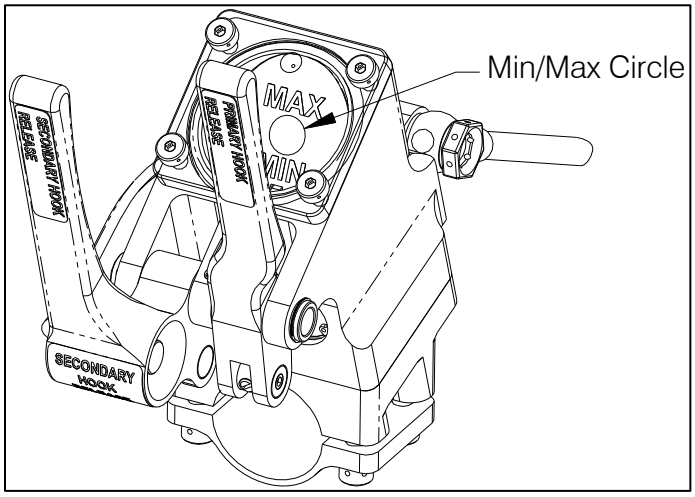
Figure 3.50 Checking System for Air



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14. After the system is properly bled, re-install the baffle plate and verify that the reservoir is adequately filled with hydraulic fluid. Fluid level should be within the Min/Max circle on the baffle. Add or draw off fluid as necessary.

Figure 3.51 Fluid Level



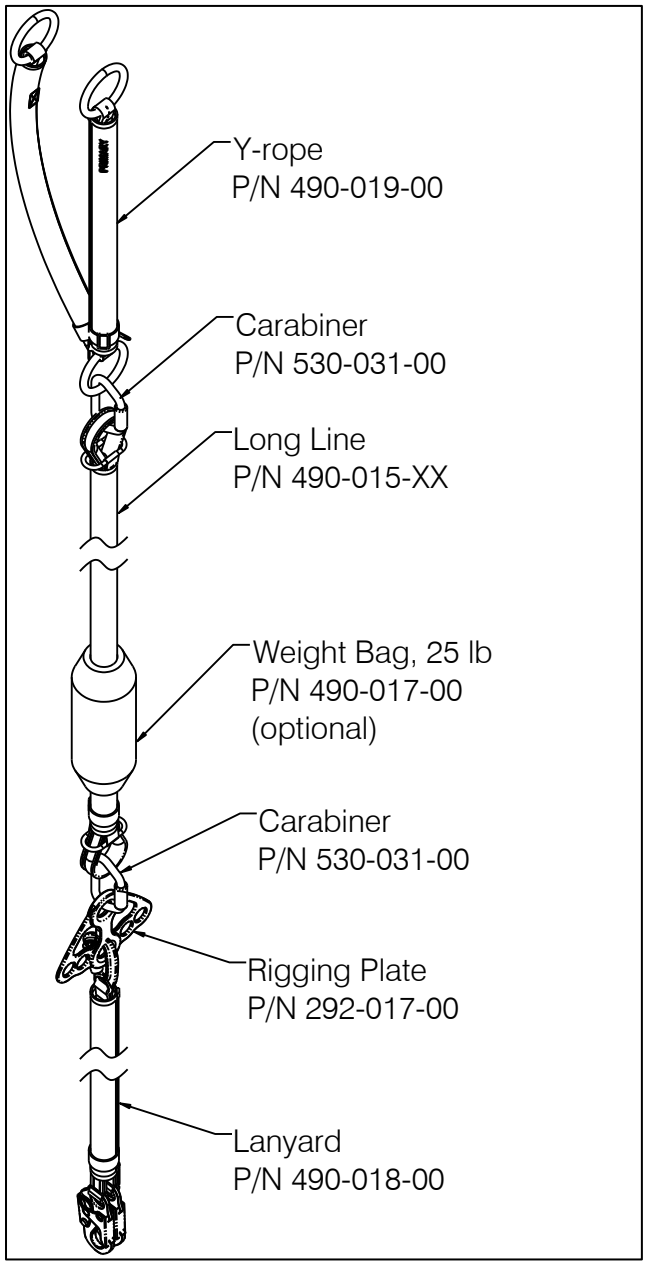
15. Check the system for proper operation. Fully actuate the release lever. The hook must open and the lever must have a firm feel.
16. Re-install the reservoir lid with the four screws and safety-wire them together.
17. Disassemble and thoroughly clean the bleed kit with isopropyl alcohol. Allow it to dry. Not cleaning the syringe will render it unusable. Re-assemble and store for next use.
18. Proceed to Section 3.11 to check the cyclic balance and modify the cyclic balance spring installation (if necessary).

3.10 Long Line Kit

The Long Line Kit (P/N 200-458-XX) includes the components shown in the figure below. The Y-rope is the only component of the long line kit that is required to be used with the dual cargo hook system as it is designed to provide a controlled interface with the cargo hooks. For the components below the Y-rope (carabiner to lanyard), an alternative configuration or components approved by the local Aviation Authority may be used.

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Figure 3.52 Long Line Kit



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Connect one end of the long line to the load ring that joins the two legs of the Y-rope with carabiner P/N 530-031-00 (shown in Figure 3.52).

WARNING

With this configuration use only the supplied carabiners, P/N 530-031-00. Do not substitute.

Connect the single lug end of the Rigging Plate (P/N 292-017-00) to the long line through the other carabiner P/N 530-031-00 provided with the kit.

The lanyard provides a single carabiner at one end to connect to one of the lower Rigging Plate holes and two snap hooks at the other end to connect to a human harness. The lanyard is rated at 310 lbs. Multiple lanyards may be connected to the Rigging Plate (see section 3.10.1 below for Rigging Plate loading limitations).

Attach the 25 lb weight bag to the lower end of the long line, this specific weight bag is optional with the 200-458-XX kit configuration but a minimum of 10 lbs is required at the lower end of the long line to minimize risk of an unloaded long line trailing into tail rotor (refer to RFMS for limitation and operational procedures).

NOTICE

Refer to the Long Line User's Manual provided for additional information regarding the ropes and instructions for use.

3.10.1 Rigging Plate

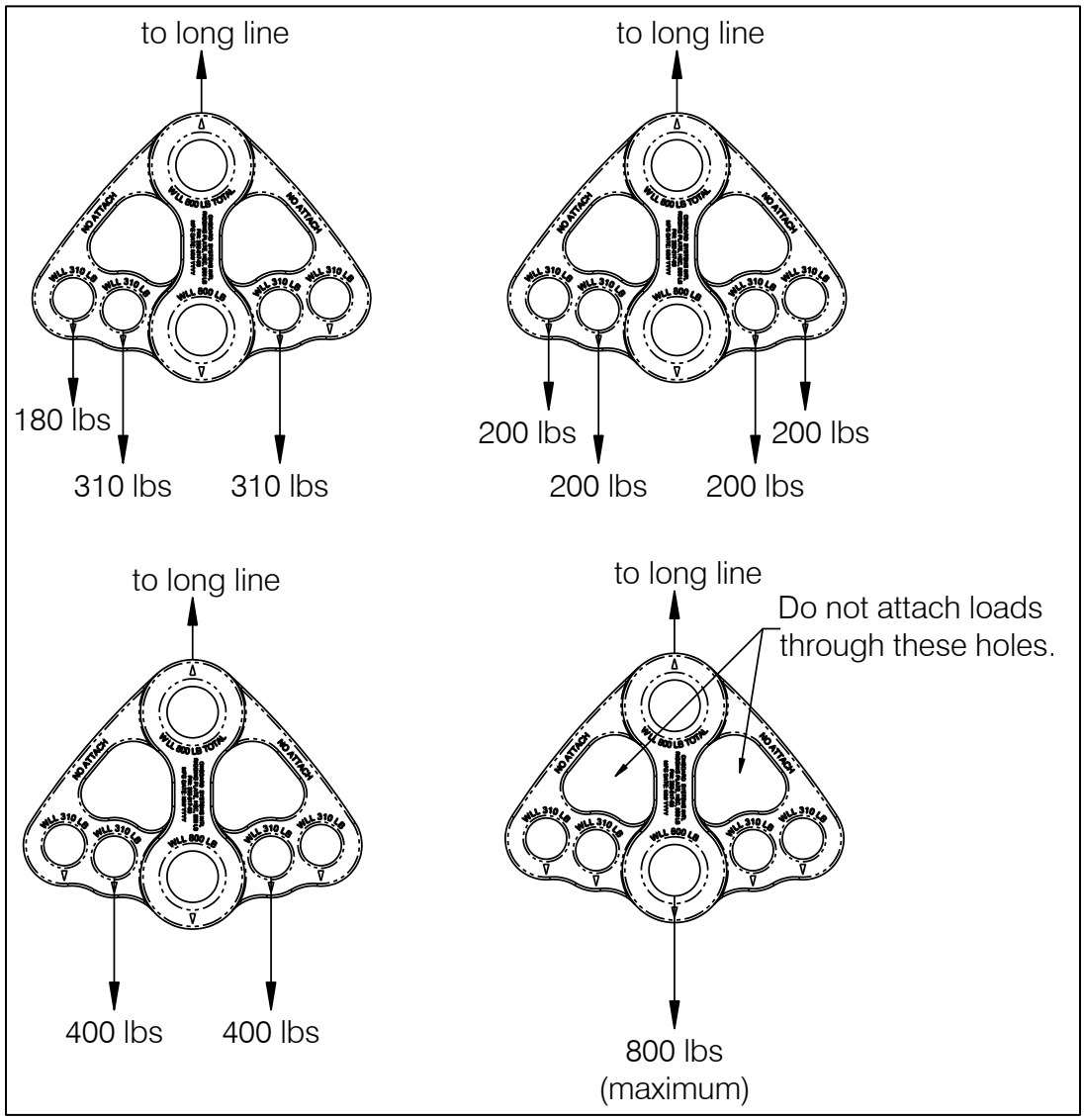
The Rigging Plate (P/N 292-017-00) provides an upper 1.25-inch diameter hole to connect to the long line through the carabiner, a lower 1.25-inch hole with a working load limit (WLL) of 800 lbs and four lower 1.00 inch diameter holes each rated for a WLL of 400 lbs (800 lbs remains the overall limit) for connecting a lanyard or multiple lanyards for carrying more than one person. Figure 3.53 provides some examples of Rigging Plate loading with each example representing the 800 lbs maximum that can be carried. Distribute the loads about the center of the Rigging Plate as much as possible. If a single load is attached to the Rigging Plate use the center lug (as shown).

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NOTICE

Any combination of loads may be applied through the lower five holes as long as the 400 lb load is not exceeded at the 1.00 inch holes and the 800 lb overall limit is not exceeded.

Figure 3.53 Rigging Plate Loading Examples (800 lb maximum shown)



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3.11 Cyclic Balance Check

Installation of the Dual Master Cylinder on the cyclic may result in a cyclic balance condition requiring adjustment when dual controls are utilized. The cyclic control balance should also be evaluated with the aircraft configured for single control operation in accordance with FAA AC 27.161.

During trim control verification per AC 27.161, forward movement in the cyclic control position may be observed upon release of the controls, with the magnitude of movement dependent on the level of cyclic friction applied. AC 27.161 states that the control shall not move when released.

1. With the Dual Master Cylinder installed, perform the *Cyclic Control Stick Longitudinal Balance Spring* adjustment using the applicable specification, as follows.

Table 3.2 Cyclic Control Stick Longitudinal Balance Spring Specifications

MM Operation Description	Section No.
BHT-407-MM, Chapter 67	DMC-407-A-67-12-00-00A-271A-A* DMC-407-A-67-14-00-00A-271A-A†
BHT-206L-MM-1, Chapter 27	27-27
BHT-206L1-MM-1, Chapter 27	27-27
BHT-206L3-MM-8, Chapter 67	67-39
BHT-206L4-MM-8, Chapter 67	67-39

* Model 407 and Model 407GX without the AFCS Provisions Kit installed.

† Model 407GX with the AFCS Provisions Kit installed and all Model 407GXi rotorcraft.

2. Perform the *Cyclic Friction Adjustment* using the applicable specification, as follows. Per section 1.6, the cyclic friction shall be maintained at 0.5 lbs to 1.5 lbs.

Table 3.3 Cyclic Friction Adjustment Specifications

MM Operation Description	Section No.
BHT-407-MM, Chapter 67	DMC-407-A-67-12-02-00A-280A-A
BHT-206L-MM-1, Chapter 27	27-27A
BHT-206L1-MM-1, Chapter 27	27-28
BHT-206L3-MM-8, Chapter 67	67-40
BHT-206L4-MM-8, Chapter 67	67-40

3. Perform steps 1 and 2 iteratively, as required, to satisfy the control balance requirements in accordance with AC 27.161.

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4. If, after completion of Step 1 through Step 3, the flight trim control does not meet the requirements of AC 27.161, as evidenced by forward cyclic drift when the cyclic control is released from a forward position, then accomplish the following steps 5 through 15.

The following instructions for balancing the cyclic are applicable to the 407 model, necessary parts are included in kit P/N 200-516-00. On a 206L model, if the flight trim control does not meet the requirements after steps 1 through 3 are performed, contact Onboard Systems for further information.

5. Remove the existing trim control spring (P/N E0750-063-3000-M for 407GXi and 407GX with AFCS Provisions Kit or P/N 206-001-402-001 for 407 and 407GX without the AFCS Provisions Kit) from the Eyebolt (P/N 206-001-745-003). See Figure 3.54.
6. Remove and retain the Bracket Assembly (P/N 206-001-379-001) and the Eyebolt (P/N 206-001-745-003). See Figure 3.55.
7. Temporarily relocate the electrical bracket and Loop clamp attached on the aft screw. Retain screws and washers (Qty 2).
8. **For Model 407GX with the AFCS Provisions Kit installed and Model 407GXi:**

   Install QTY 2 new inserts (P/N 511-417-00) at STA 65.08 and 67.58. The new inserts shall be 1.00" aft of the current inserts at STA 64.08 and 66.58. Drill .562/.565" holes through the inner skin and core. Add adhesive (P/N 299-947-100 Type II CL 2) to retain the inserts. See Figure 3.55.
9. **For Model 407 and Model 407GX without the AFCS Provisions Kit installed:**

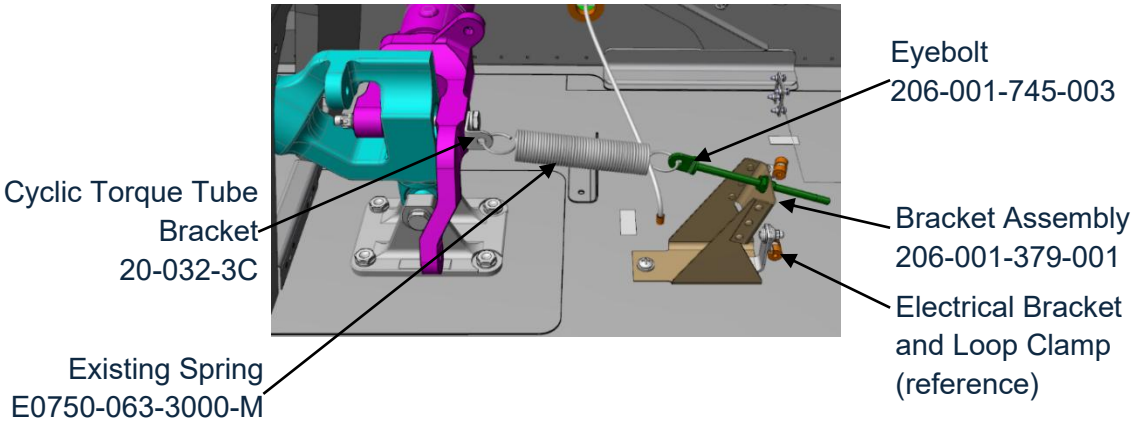
   Install QTY 2 new inserts (P/N 511-417-00) at STA 65.08 and 67.58. The new inserts shall be 1.50" forward of current inserts at STA 66.58 and STA 69.08. Drill .562/.565" holes through the inner skin and core. Apply adhesive (P/N 299-947-100, Type II, Class 2) to retain the inserts.
10. Plug the visible insert located at STA 64.08 (407GX with AFCS Provisions Kit or 407GXi) or STA 69.08 (407 or 407GX without AFCS Provisions Kit) with a screw (P/N 510-644-00) and washer (P/N 510-785-00) as seen in Figure 3.55.
11. Re-install Bracket Assy (P/N 206-001-379-001) with Eyebolt (P/N 206-001-745-003) using the new inserts. See Figure 3.56.
12. Relocate the electrical bracket and loop clamp and ensure that electrical harnesses are free from chafing and sagging and that minimum bend radii are respected. See Figure 3.56.

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13. Connect the new Balance Spring (P/N 514-145-00) to the Eyebolt (P/N 206-001-745-003) and the Cyclic Torque Tube Bracket (P/N 20-032-3C) as shown in Figure 3.
14. Perform the cyclic friction adjustment per Table 3.3 except adjust the tension on the balance spring (P/N 514-145-00) by adjusting the eyebolt position to achieve a spring length of 4.30" for single pilot control or 5.91" for dual controls as shown in Figure 3.56. The cyclic stick shall be in full aft position during adjustment.
15. Apply hydraulic power and ensure the cyclic stick remains stationary when either cyclic stick is moved from the central position in any direction.

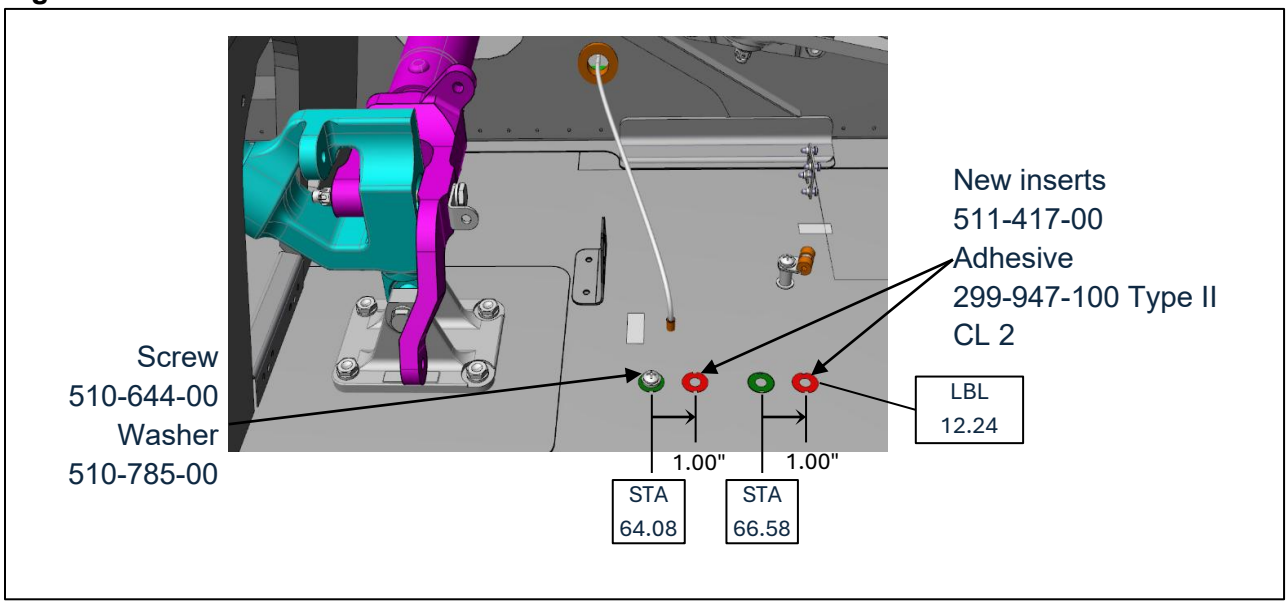
The pilot cyclic stick balance check should be performed each time the co-pilot control cyclic stick is installed or removed. Cyclic balance shall be achieved in single or dual control configuration by adjusting the eyebolt (P/N 206-001-745-003).

Figure 3.54 Existing Installation for 407GXi & 407GX with AFCS Provisions Kit



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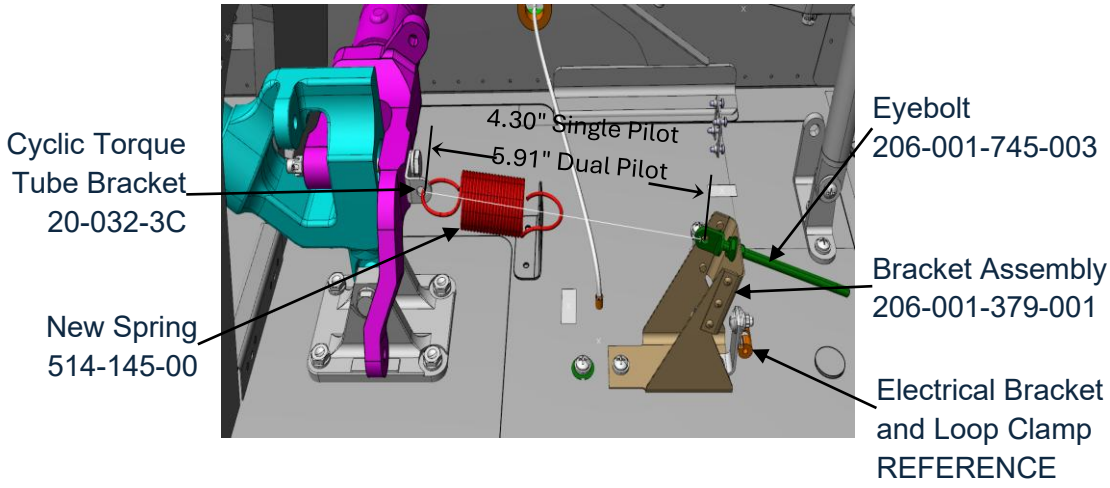
Figure 3.55 – Modifications for 407GXi and 407GX with AFCS Provisions Kit



Please note: Model 407 and 407GX without AFCS Provisions Kit baseline inserts are not located at STA 64.08 and 66.58 as shown. The baseline inserts for Model 407 and 407GX without AFCS Provisions Kit are located at STA 66.58 and 69.08.

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Figure 3.56 – Modified Installation for 407GXi and 407GX with AFCS Provisions Kit

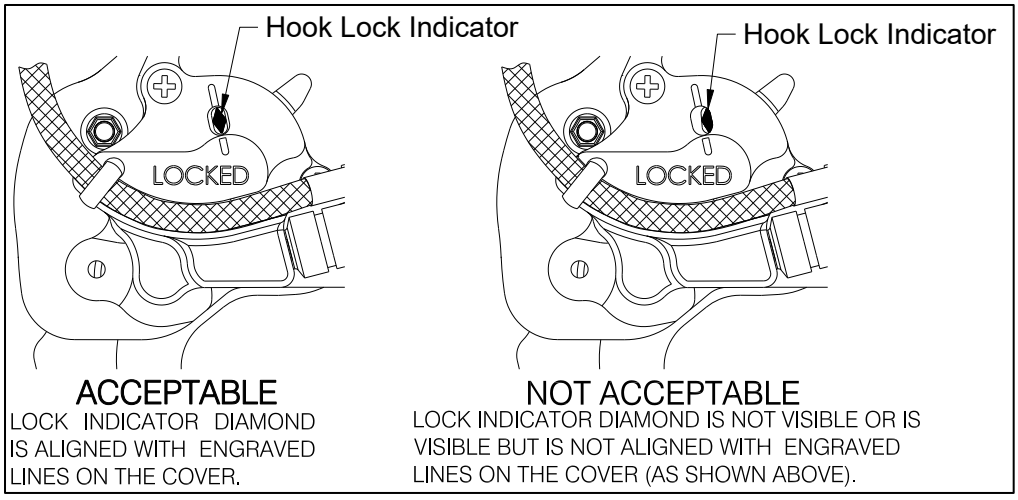


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3.12 Installation Check-out

1. Swing the cargo hooks throughout their ranges of motion to ensure that the hose and harnesses have enough slack to allow full swing of the cargo hooks without being pulled tight or otherwise damaged. The hoses and harnesses must not be the stops that prevent the cargo hooks from swinging freely in all directions throughout the range of motions as provided by the physical stops of their attachment means.
2. Power up the aircraft electrical system, press the release switch for the primary cargo hook, and verify that the primary (AFT) cargo hook opens with no load on it.
3. Press the release switch for the secondary (FORWARD) cargo hook and verify the secondary cargo hook opens with no load on it.
4. Return each cargo hook to the closed position and verify that each cargo hook's lock indicator aligns with the lines on the manual release cover.

Figure 3.57 Hook Lock Indicator



5. Pull the primary release lever and verify the primary cargo hook opens with no load on it.
6. Pull the secondary release lever and verify the secondary cargo hook opens with no load on it.

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7. Refer to the documentation provided for the long line kit components for initial inspection and familiarization with the care, handling, and recurring inspection of the rope materials.
8. If the long line kit's Y-rope, long line, and/or lanyard are being placed into service at this time, record the Service Entry Date on the ID tag of each component and record in logbook.

   If these components are not to be placed into service at this time, store the components in a protected environment free from mechanical, environmental, ultraviolet, and temperature damage (refer to rope manufacturer's instructions provided).

NOTICE

The Y-rope (P/N 490-019-00), Long Line (P/N 490-015-XX), and Lanyard (P/N 490-018-00) must be retired at four (4) years after entry into service. Refer to ICA 123-049-00. Enter the service entry date on the applicable ID tag on the component.

If the load weigh system was installed:

9. 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.
10. 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).
11. Enter the calibration code from the load cell into the C-40 Indicator (in the settings menu).

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3.13 Component Weights

The weights and CGs of the major components of Dual Cargo Hook System are listed below. When performing weight and balance calculations remember to deduct the weight of any components removed or not installed.

Table 3.4 Dual Cargo Hook System P/N 200-456-XX Weight and CGs (407)

Item	Weight (Lbs.)	Long. Arm (in.)	Lat. Arm (in.)
Primary Cargo Hook Installation*	11.6	120.0	0.0
Secondary Cargo Hook Installation (kit P/N 200-460-00)	3.8	107.0	0.0
Secondary Hardpoint Fittings	9.0	107.4	0.0
Dual Master Cylinder w/ Plumbing	1.9	54.0	14.0**
Miscellaneous kit components (slave cylinder plumbing, electrical harnesses, hardware, connector bracket, etc.)	1.5	87.0***	-5.0***
Total	**27.8 lbs (12.6 kg)**	**107.8**	**0.7**

*Includes cargo hook, beam, pillow blocks, internal fittings and hardware.

**Depends on RH or LH controls installation, RH installation is shown.

***Estimated.

Table 3.5 Dual Cargo Hook System P/N 200-465-00 Weight and CGs (206L)

Item	Weight (Lbs.)	Long. Arm (in.)	Lat. Arm (in.)
Primary Cargo Hook Installation*	9.3	120.0	0.0
Secondary Cargo Hook Installation (kit P/N 200-460-00)	3.8	108.0	0.0
Secondary Hardpoint Fittings	9.0	109.5	0.0
Dual Master Cylinder w/ Plumbing	1.9	54.0	14.0
Miscellaneous kit components (slave cylinder plumbing, electrical harnesses, clips, connector bracket, etc.)	1.5	87.0**	-5.0**
Total	**25.5 lbs (11.6 kg)**	**107.6**	**0.8**

*Includes cargo hook, beam, pillow blocks and hardware (does not include internal fittings, these are provided by Bell).

**Estimated.

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Table 3.6 Long Line Kit P/N 200-449-10 Weights

Item	Weight Lbs. (kg)
Y-rope (P/N 490-019-00)	3.6 (1.63)
Carabiner (P/N 530-031-00) Qty 2	0.7 (0.32)
Rigging Plate (P/N 292-017-00)	1.75 (0.79)
Long Line, 100 ft (P/N 490-015-10)	16.05 (7.28)
Weight Bag (P/N 490-017-00)	27.10 (12.30)
Lanyard (P/N 490-018-00)	3.25 (1.47)
Total Kit Weight	**52.5 (23.8)**

3.14 Paperwork

In the US, fill in FAA form 337 for the initial installation. This procedure may vary in different countries. Make the appropriate aircraft logbook entry. Insert the Rotorcraft Flight Manual Supplement P/N 121-069-00 into the Rotorcraft Flight Manual.

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4.0 Maintenance

Refer to the Instructions for Continued Airworthiness (ICA) manual 123-049-00 for maintenance of the dual cargo hook system and Component Maintenance Manual 122-015-00 for maintenance specific to the cargo hook.

5.0 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:

- 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 number and email (as applicable).
- Return the components freight, cartage, insurance and customs prepaid to:

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

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