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Instructions for Continued Airworthiness

Cargo Hook Suspension Kits For the Bell 407 Helicopter

System Part Numbers
200-412-00, 200-412-10, 200-413-00, 200-413-01, 200-413-02, 200-413-10, 200-413-11, 200-413-12

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Record of Revisions

Revision	*Date*	*Page(s)*	*Reason for Revision*
0	10/26/12	All	First Issue
1	11/20/13	Section 0 page 2, Section 25 page 18	Updated section 0.19, updated tightening instructions for nut on pin load cell.
2	08/08/14	Section 5, page 4 Section 12, pages 1 and 3 Section 25 page 6	Clarified suspension assembly inspection interval, updated fluid level check instructions, deleted duplicate information for slave cylinder repair, added reference to CMM 122-015-00 for storage instructions.
3	06/04/15	Section 5 pages 5, 8, 9 Section 25 pages 5, 18, 19, and 22	Added load cell P/N 210-282-01, corrected tightening instructions for nut on pin load cell (section 25 page 22).
4	06/24/16	Section 0 Page 1 Section 5 pages 1 and 5 Section 11 Section 25 pages 1, 2, 5 thru 8, 18, and 27	Added kit P/Ns 200-412-10, 200-413-10, and 200-413-11 which include cargo hook P/N 528-028-02 with Surefire. Added instructions associated with these kits.
5	10/04/17	Section 12 pages 1, 2, 6, and 7	Added MIL-PRF-87257 as a compatible hydraulic fluid.
6	04/18/18	Section 5 page 8	Removed magnetic particle inspection requirement for pin load cell assembly, inserted instructions to return load cell to factory for inspection/calibration.
7	10/13/21	Section 0 page 1 Section 5 Section 11 page 2 Section 25 pages 2, 5, 8 – 11, 24, 25	Added C-40 Indicator and associated kit P/Ns and instructions. Re-formatted sub-sections of Section 5 for clarity. Added load weigh system schematics. Updated hose routing under seat instructions.

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Section 0
Introduction

0.4 Scope

The following information is necessary to carry out the service, maintenance, and inspection of the Cargo Hook Suspension Kit P/N's 200-412-00, 200-412-10, 200-413-00, 200-413-01, 200-413-02, 200-413-10, 200-413-11, and 200-413-12. Refer to Section 25.2 for a description of the kits.

0.5 Purpose

The purpose of these Instructions for Continued Airworthiness (ICA) is to provide the information necessary to inspect, service, and maintain in an airworthy condition the Cargo Hook Kits.

0.6 Arrangement

This manual contains instructions for the service, maintenance, inspection and operation of the Cargo Hook Suspension Kit P/Ns 200-412-00, 200-412-10, 200-413-00, 200-413-01, 200-413-02, 200-413-10, 200-413-11 and 200-413-12 on Bell model 407 helicopters. The manual is arranged in the general order that maintenance personnel would use to install, maintain and operate the Cargo Hook Kits in service.
The arrangement is:

Section 0 Introduction.
Section 4 Airworthiness limitations (None apply to this System.)
Section 5 Inspection and overhaul schedule
Section 11 Placards and Markings
Section 12 Servicing
Section 25 Equipment and Furnishings

0.7 Applicability

These Instructions for Continued Airworthiness are applicable to Cargo Hook Suspension Kits (P/N's as listed above) for the Bell 407.

0.9 Abbreviations

FAA Federal Aviation Administration
CFR Code of Federal Regulations
ICA Instructions for Continued Airworthiness

0.12 Precautions

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

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

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

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

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

Used to address practices not related to personal injury.

0.19 Distribution of Instructions for Continued Airworthiness

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

Onboard Systems offers a free notification service via fax or e-mail for product alerts and documentation updates. By registering Onboard Systems products on the web site, we will be able to contact you if a service bulletin is issued, or if the documentation is updated.

Notices can be chosen to be received on an immediate, weekly, or monthly schedule via fax, email or both methods. There is no charge for this service. Please visit the Onboard Systems web site at www.onboardsystems.com/notify.php to get started.

Section 4
Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under 14 CFR §§ 43.16 and 91.403, unless an alternative program has been FAA approved.

No airworthiness limitations are associated with this type design change.

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Section 5
Inspection and Overhaul Schedule

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

There is no maintenance to be performed on the Load Weigh Indicator. Do not open the enclosure, if repair is needed return it to the factory.

5.1 Annual/100 Hour Inspection

Annually or 100 hours of external load operations, whichever comes first, inspect the cargo hook and suspension per the following. Refer also to CMM 122-015-00 for the cargo hook for additional procedures.

*Hours of external load operations should be interpreted to be **(1)** anything is attached to the primary cargo hook (whether or not a useful load is being transported) and **(2)** the aircraft is flying. If these conditions are **NOT** met, time does **NOT** need to be tracked.*

The C-40 Indicator (P/N 210-293-00) records and displays hours of external load operations accumulated. This resettable hour-meter automatically logs time when the external load goes above 50 lbs and stops counting when it goes under 25 lbs. For this method of tracking hours refer to the C-40 Owner's Manual for additional instructions.

5.1 Annual/100 Hour Inspection continued

- Activate the electrical system and press the Cargo Release button to ensure the cargo hook electrical release system is operating correctly. The cargo hook must release. Reset the hook by hand after release.

CAUTION

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

The following instructions are applicable to cargo hook P/N 528-028-02 which is equipped with Surefire electrical release. With no load on the cargo hook perform the following.

- *Very* briefly press the Cargo Release switch, the cargo hook should not actuate and the load beam should remain closed.
- Press and hold the Cargo Release switch for a few seconds, the load beam should fall to the open position and the cargo hook solenoid should continue to cycle repeatedly.
- Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the manual release cover (see Figure 5.1.1).

5.1 Annual/100 Hour Inspection continued

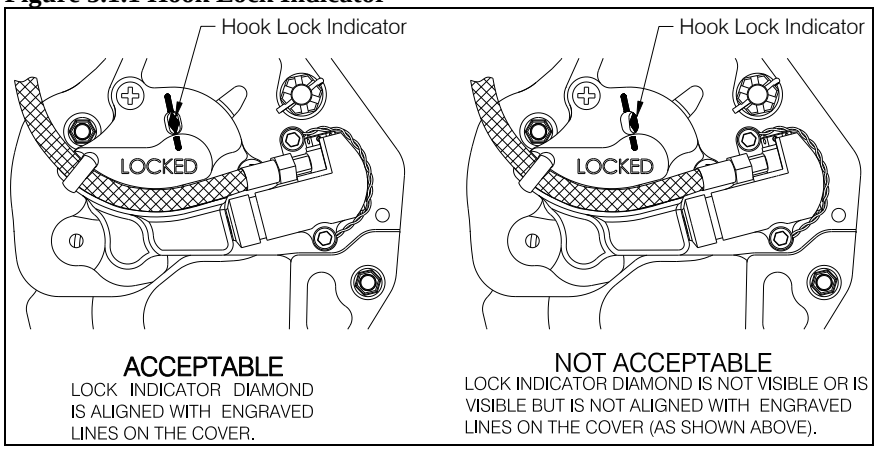
- Check the hydraulic release system for air by pulling the lever firmly until it bottoms out. Check the push rod position (reference Figure 12.2.5). If some of the green ring on the push rod is visible, the system is adequately bled. If some of the green on the push rod is NOT visible with the lever completely pulled, the system has too much air in it and must be bled, see Section 12.2 for bleeding instructions.

  Reset the cargo hook by hand after release. Verify that the hook lock indicator on the side of the hook returns to the fully locked position (see Figure 5.1.1).

⚠ CAUTION

In the fully locked position the hook lock indicator must align with the lines on the manual release cover (see Figure 5.1.1).

Figure 5.1.1 Hook Lock Indicator



- Move the cargo hook and suspension beam throughout their full ranges of motion and observe the hydraulic hose and electrical harnesses to ensure that they have enough slack. The hose and harnesses must not be the stops that prevent the cargo hook or suspension beam from moving freely in all directions.
- Inspect all pivoting joints to ensure that they rotate freely.
- Visually inspect for presence and security of fasteners.
- Visually inspect the electrical harnesses and connectors for damage and security.
- Visually inspect the hydraulic hose and its connections to the cargo hook and to the fixed connector bracket for damage and security.
- Visually inspect load cell strain relief (if load weigh kit is installed) for damage and security.

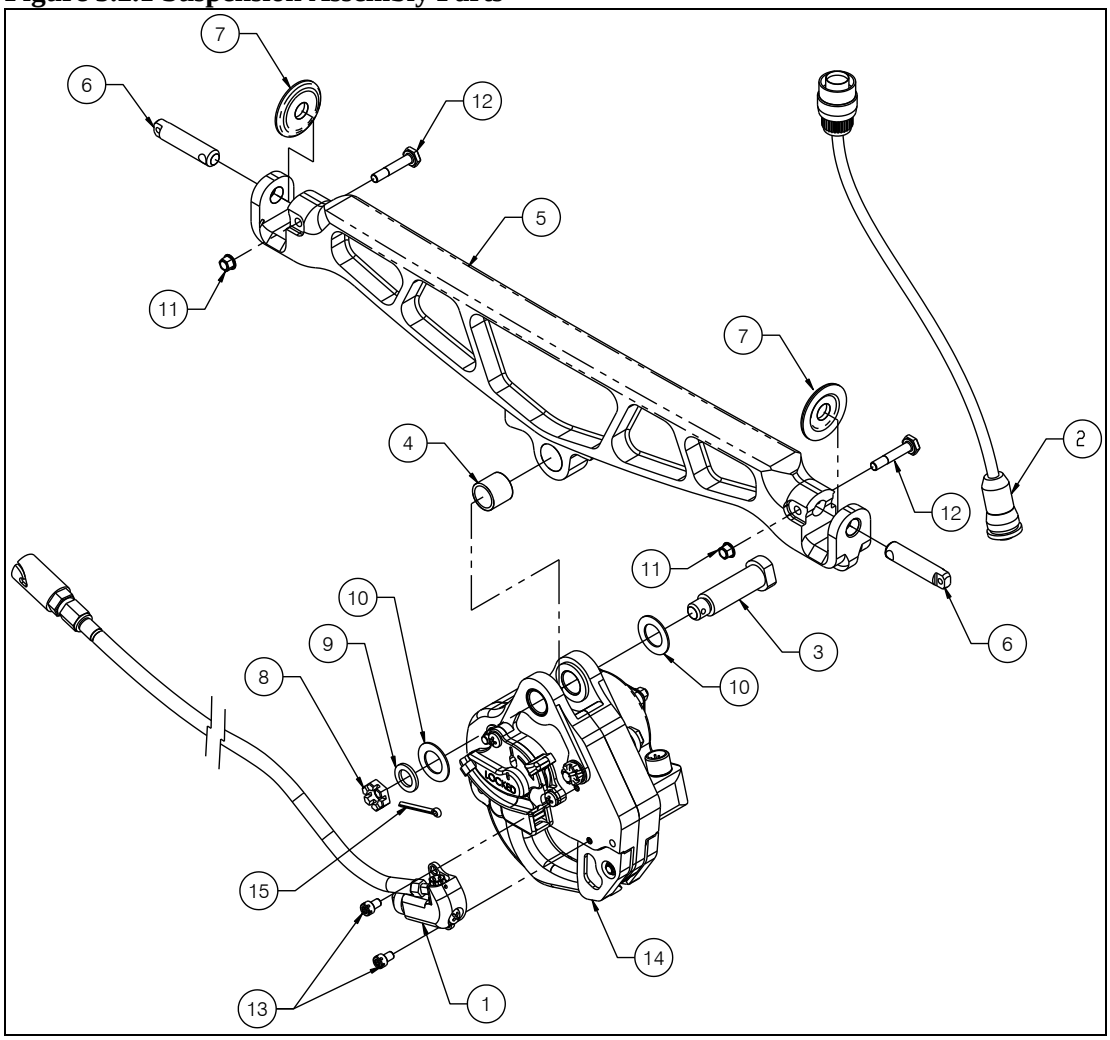
5.2 5 Year/1000 Hour Inspection

Every 1000 hours of external load operations or 5 years, whichever comes first, remove the suspension components from the helicopter, disassemble, and inspect the component parts per this section.

Remove the suspension assembly from the pillow blocks mounted to the belly of the helicopter by removing the nuts (11) and bolts (12) that retain the trunnion pins (6). Remove the trunnion pins and drop the suspension assembly from the pillow blocks. Removing the trunnion pins also separates the thrust washers (7) from the assembly.

Remove the cargo hook from the beam assembly by removing the cotter pin (15), nut (8), washer (9), and washer (10) from the end of the attach bolt (3, or load cell if load weigh kit is installed). Remove the attach bolt and washer (10) and separate the cargo hook from the beam.

Figure 5.2.1 Suspension Assembly Parts



5.2 5 Year/1000 Hour Inspection continued

Table 5.2.1 Suspension Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	232-523-00	Slave Cylinder w/ Plumbing	1
2	270-197-00	Electrical Release Harness	1
3**	290-332-00	Attach Bolt	1
4	290-364-00	Bushing	1
5	290-852-01	Main Beam	1
6	290-854-00	Trunnion Pin	2
7	290-881-00	Thrust Washer	2
8	510-170-00	Nut	1
9	510-174-00	Washer	1
10	510-183-00	Washer	2
11	510-500-00	Nut	2
12	510-523-00	Bolt	2
13	510-531-00	Screw	2
14	528-028-00 or 528-028-02	Cargo Hook	1
15	510-178-00	Cotter Pin	1

** If load weigh system is installed, the Attach Bolt and washer (P/N 510-183-00) under its head are replaced with the Pin Load Cell Assembly (P/N 210-282-01 or 210-226-04).

5.2 5 Year/1000 Hour Inspection continued

Figure 5.2.2 LH Pillow Block Assembly

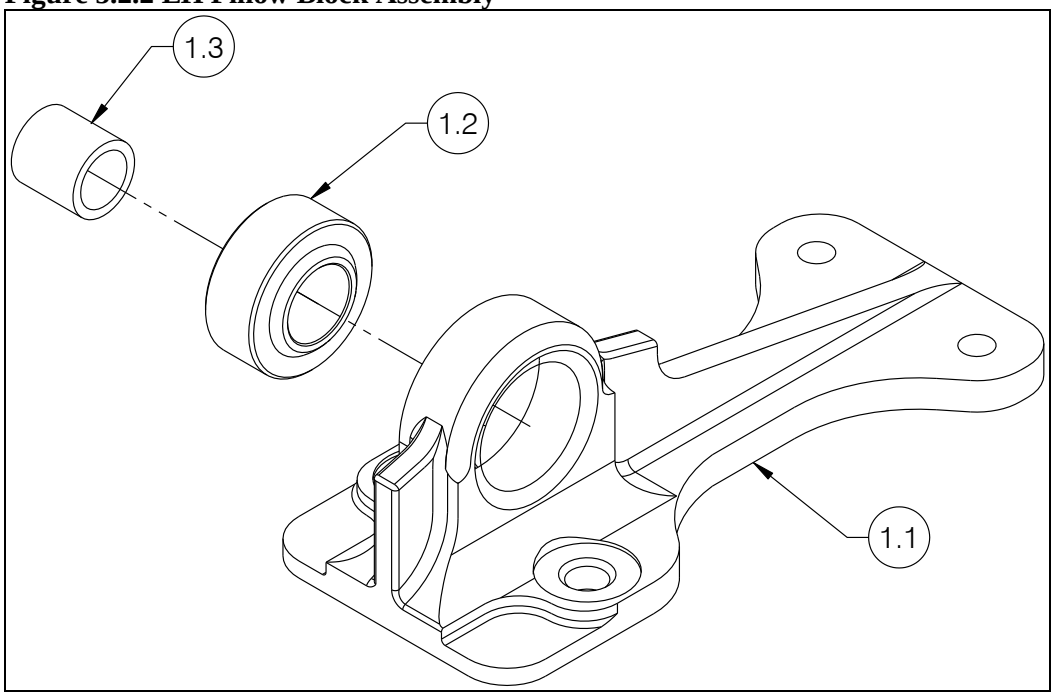


Table 5.2.2 LH Pillow Block Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1.1	290-853-01	Pillow Block, Left	1
1.2	517-012-00	Spherical Bearing	1
1.3	290-882-00	Bushing	1

5.2 5 Year/1000 Hour Inspection continued

Figure 5.2.3 RH Pillow Block Assembly

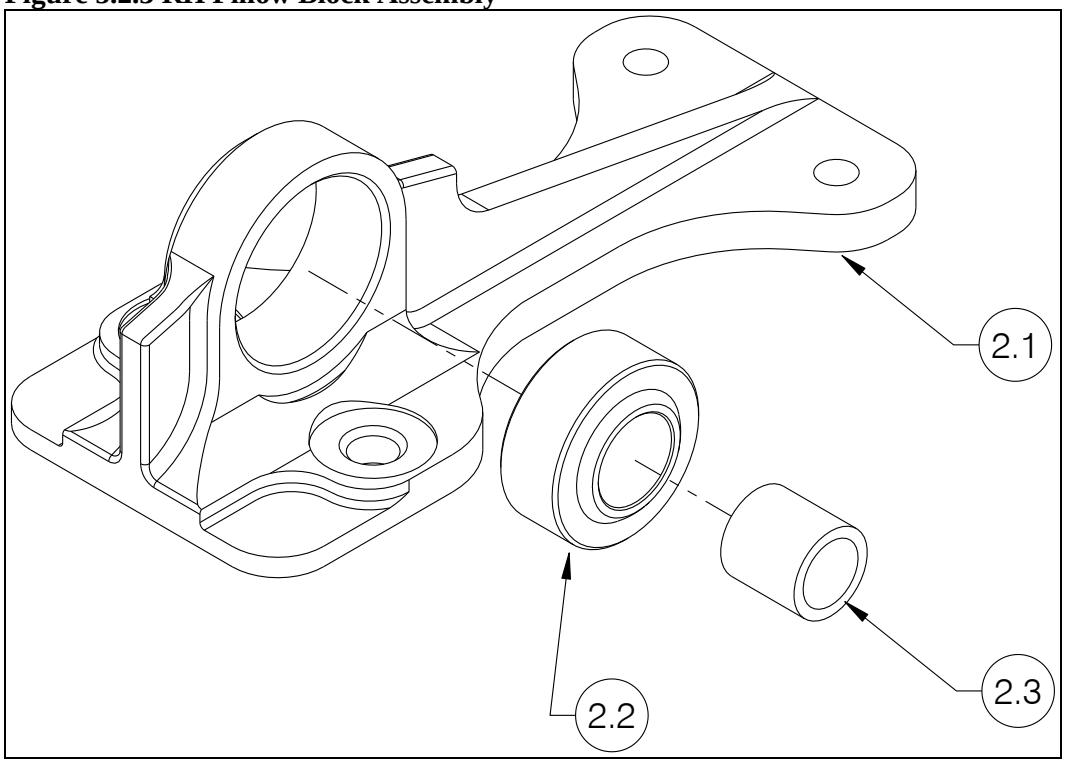


Table 5.2.3 RH Pillow Block Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
2.1	290-883-01	Pillow Block, Right	1
2.2	517-012-00	Spherical Bearing	1
2.3	290-882-00	Bushing	1

5.2 5 Year/1000 Hour Inspection continued

Return the Pin Load Cell Assembly (P/N 210-226-04 or 210-282-01) to the factory for inspection and calibration. The factory will inspect the condition of the load cell and perform acceptance test procedures including calibration and zero balance, repairing as necessary.

Carefully inspect, and if necessary repair, the detail parts in accordance with the instructions in Table 5.2.4. Inspect the parts in a clean, well-lit room.

Table 5.2.4 Suspension System Inspection Criteria

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Main Beam (5) P/N 290-852-01	Dents, gouges, and scratches less than .030" deep outside lug areas of Zones A and B (see Figure 5.2.4). Dents, gouges, and scratches less than .010" deep around lugs in Zones A and B (see Figure 5.2.4).	Blend at 20:1 ratio, length to depth, to provide smooth transitions. Protect affected surfaces with MIL-PRF-23377 Type 1 epoxy primer or equivalent and MIL-PRF-85285 Type 1 polyurethane coating or equivalent.	Dents, gouges and scratches greater than .060" deep outside lug areas of Zones A and B Dents, gouges, and scratches greater than .030" deep around lugs in Zones A and B Visible cracks.
Pillow Blocks (1.1, 2.1) P/N 290-853-01, P/N 290-883-01	Dents, gouges, and scratches less than .030" deep outside lug area of Zone A (see Figure 5.2.5).	Blend at 20:1 ratio, length to depth, to provide smooth transitions. Protect affected surfaces with MIL-PRF-23377 Type 1 epoxy primer or equivalent and MIL-PRF-85285 Type 1 polyurethane coating or equivalent.	Dents, gouges and scratches greater than .060" deep outside lug area of Zone A Dents, gouges, and scratches greater than .030" deep around lug in Zone A Visible cracks.

5.2 5 Year/1000 Hour Inspection continued

Table 5.2.4 Suspension System Inspection Criteria continued

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Trunnion Pin (6) P/N 290-854-00	Wear on outside diameter, diameter greater than .363”.	None.	Wear on outside diameter, diameter less than .363”. Visible cracks.
Bushing (4) P/N 290-364-00	Wear on inside diameter, diameter less than .510”.	None.	Wear on inside diameter, diameter greater than .510”.
Thrust Washer (7) P/N 290-881-00	Wear on ends of bearing, thickness greater than .125”.	None.	Wear on ends of washer, thickness less than .125”.
Shaft Bushing (1.3, 2.3) P/N 290-882-00	Wear on inside diameter, diameter less than .393”.	None.	Wear on inside diameter, diameter greater than .393”.
Attach Bolt (13) P/N 290-332-00	Wear on outside diameter, diameter greater than .495”.	None.	Wear on outside diameter, diameter less than .495”. Visible cracks.
Pin Load Cell P/N 210-226-04 or P/N 210-282-01 (replaces attach bolt if load weigh is installed)	Wear on outside diameter of pin, diameter greater than .495”	None	Wear on outside diameter, diameter less than .495”. Visible cracks.
Bearing (1.2, 2.2) P/N 517-012-00	None.	None.	Damage to Teflon liner. Binding or seizing.
Threaded fasteners	None.	None.	It is recommended to replace all threaded fasteners.
Electrical Release Harness (2) P/N 270-197-00	Superficial scratches, nicks, and scrapes on outside of electrical harness sleeving.	None.	Broken or missing pins on connectors.

5.2 5 Year/1000 Hour Inspection continued

Figure 5.2.4 Main Beam Inspection Zones

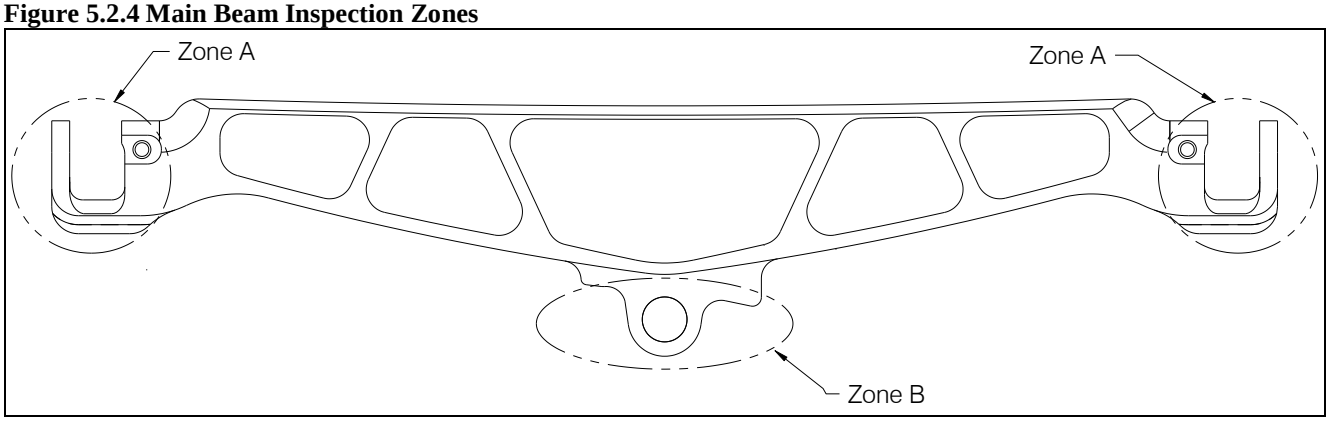
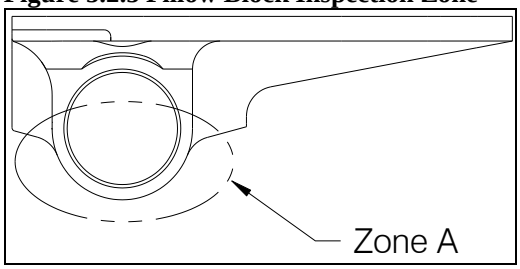


Figure 5.2.5 Pillow Block Inspection Zone



5.2 5 Year/1000 Hour Inspection continued

Suspension Re-assembly after Inspection

1. If removed, press Bushing (4) into Main Beam (5) with zinc chromate primer, TT-P-1757 or equivalent.
2. Install Cargo Hook (14) onto Main Beam (5) per section 25.17.
3. Install left and right Pillow Block Assemblies onto aircraft hard points per section 25.17.
4. Install suspension assembly onto Pillow Block Assemblies per section 25.17.

5.3 Cargo Hook Overhaul Schedule

Overhaul the cargo hook in accordance with the guidelines below.

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

Overhaul the cargo hook per Component Maintenance Manual (CMM) 122-015-00. Contact Onboard Systems for guidance in locating authorized overhaul facilities.

Section 11
Placards and Markings
11.1 Placards

The Cargo Hook Kits includes the following placards shown in Table 11.1.1.

Table 11.1.1 Cargo Hook Kit Placards

Placard part number and appearance	Location
P/N 215-212-00 EXTERNAL LOAD LIMIT 2650 LBS. 1202 KGS.	When kit P/N 200-394-00 is installed, one is located on the forward side and one located on the aft side of the cargo hook suspension beam.
 (text is engraved on manual release lever as shown)	When kit P/N 200-394-00 is installed, located on the release lever of the hydraulic release system. The release lever is located on the either the pilot or co-pilot cyclic.
P/N 215-336-00 	Mounted on the bottom of solenoid housing of cargo hook P/N 528-028-02 (included with kit P/Ns ending in -10 only).
P/N 215-343-00 CARGO RELEASE: HOLD FOR > 1 SECOND	Located adjacent to the cargo hook release switch on the cyclic (included with kit P/Ns ending in -10 only).

continued

11.1 Placards

Table 11.1.1 Cargo Hook Kit Placards continued

Placard part number and appearance	Location
P/N 215-010-00 ELECTRONIC WEIGHING SYSTEM	When Onboard Systems load weigh system is installed, mounted adjacent to both the power switch (if installed) and the circuit breaker in full view of the pilot and co-pilot.
P/N 215-012-00 TURN THE WEIGHING SYSTEM OFF WHEN NAVIGATION EQUIPMENT IN USE. NO AIRCRAFT OPERATION SHOULD BE PREDICATED ON THE READING OF THE ONBOARD WEIGHING SYSTEM.	When Onboard Systems load weigh system with the C-39 Indicator is installed, mounted adjacent to the Onboard Systems digital/analog indicator in full view of the pilot and co-pilot. Not applicable to the C-40 Indicator (P/N 210-293-00).

Section 12
Servicing

12.1 Maintenance of the Hydraulic Release System

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

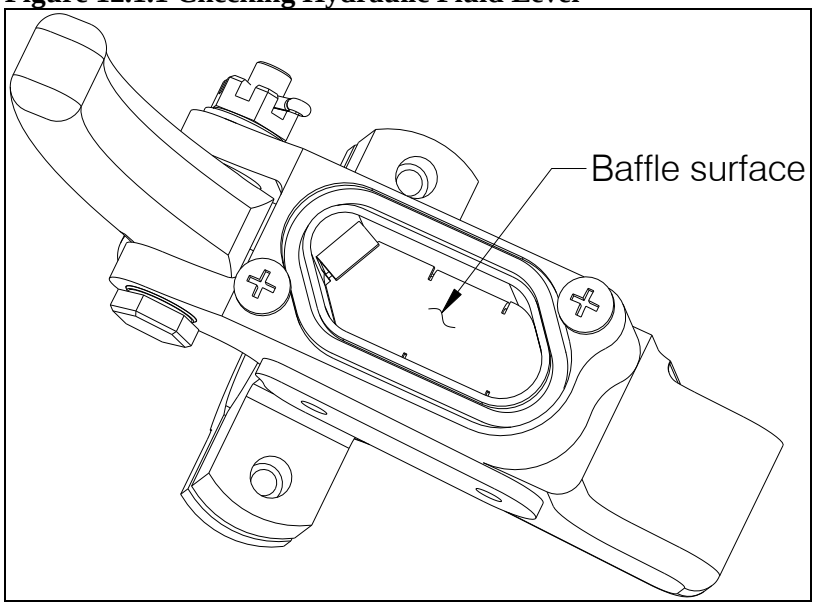
NOTICE

MIL-PRF-5606 and MIL-PRF-87257 fluids are both compatible with the hydraulic system. These fluids are interchangeable and miscible.

To check the fluid level:

1. Position the cyclic such that the top of the master cylinder is approximately level.
2. The Master Cylinder features a transparent lid through which the fluid level can be checked. Hydraulic fluid must be visible over the baffle surface (see Figure 12.1.1).
3. Remove lid and add hydraulic fluid as required until the baffle surface is partially or fully submerged. Do not over fill, fluid level should be farther than ¼" from the top of the reservoir.

Figure 12.1.1 Checking Hydraulic Fluid Level



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

12.1 Maintenance of the Hydraulic Release System continued

Master Cylinder Repair

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

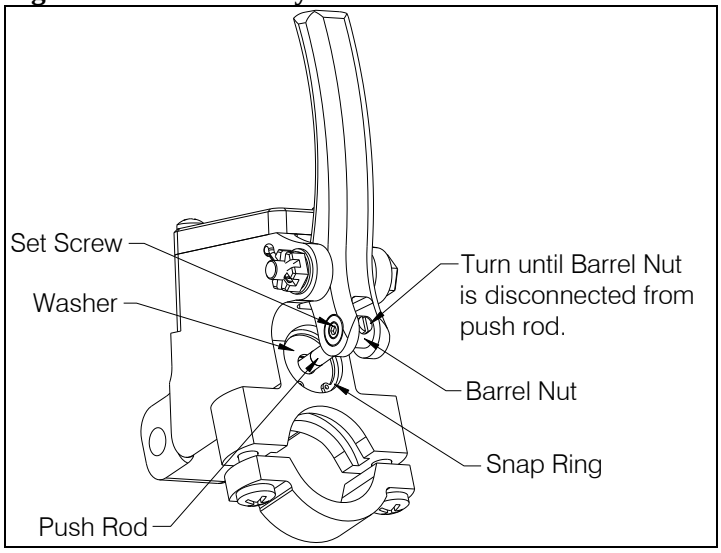
Disassembly:

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

Re-assembly:

1. If the bore condition is acceptable, replace the cup seal and O-ring on the piston assembly. Maintain orientation as shown in Figure 12.1.4. Stretch seals over piston into grooves using care to not nick or otherwise damage them.
2. To assemble the master cylinder, lubricate the piston seals and cylinder bore generously with hydraulic fluid.
3. Place the spring in the cylinder bore.
4. Pass the push rod through the washer.
5. Thread the push rod into the barrel nut until approximately 1/16" of thread is visible through the opposite side of the barrel nut.
6. Insert the small spring into the piston assembly and insert the piston assembly into the master cylinder bore using a firm rocking motion.
7. Use the lever to compress the spring and hold the piston in place.
8. Use snap ring pliers to install the snap ring.
9. Secure push rod threads by tightening set screw.

Figure 12.1.2 Master Cylinder Lever Disconnect



12.1 Maintenance of the Hydraulic Release System continued

Master Cylinder Repair continued

Figure 12.1.3 Master Cylinder Piston Removal

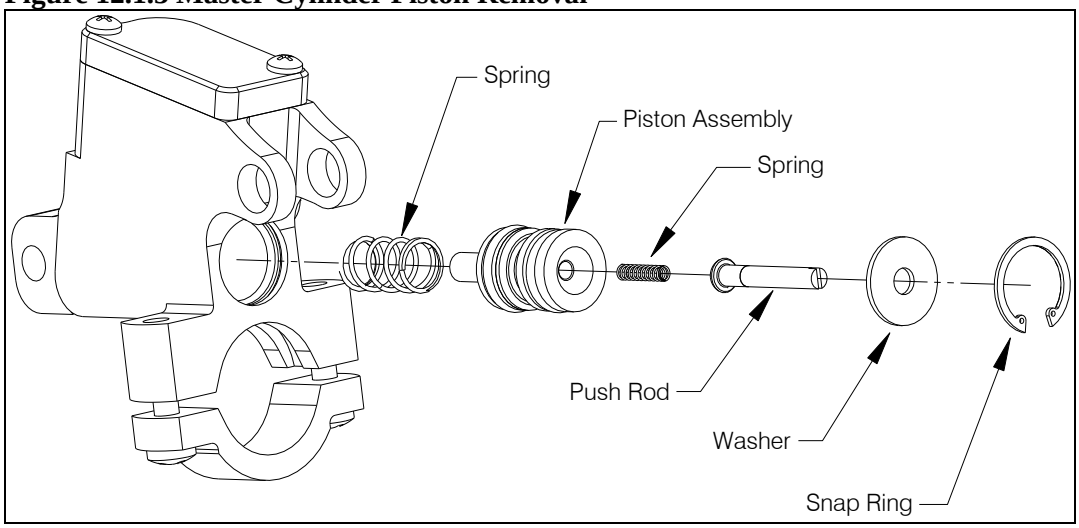
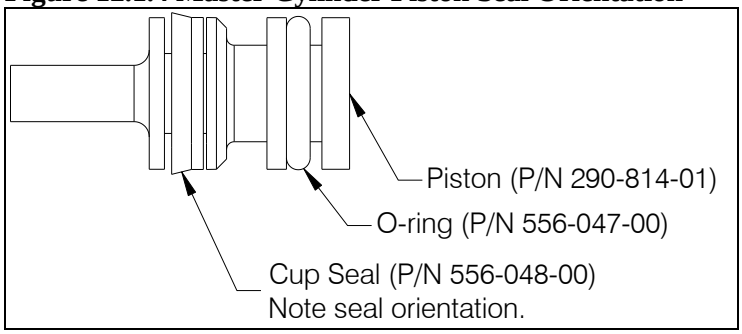


Figure 12.1.4 Master Cylinder Piston Seal Orientation



12.1 Maintenance of the Hydraulic Release System continued

Slave Cylinder Repair

If the slave cylinder is leaking oil around the piston rod, the only repair possible is to remove and replace the quad ring seal.

Disassembly:

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

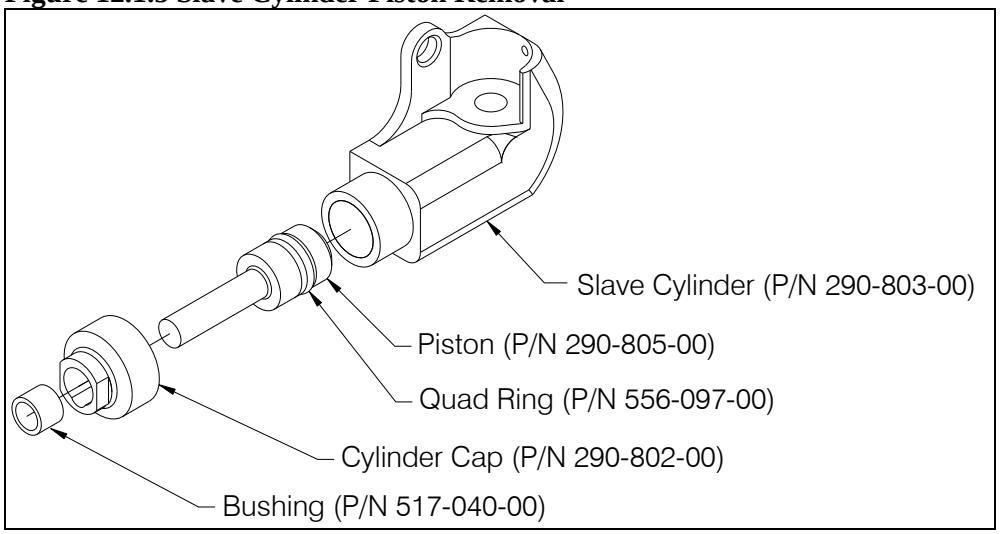
Re-assembly:

1. Press new bushing into cap.
2. Stretch quad ring seal over piston into groove. Use care when handling the quad ring seal to avoid nicks or cuts in it.
3. Clean and lubricate cylinder bore and quad ring seal with hydraulic fluid.
4. Insert piston into cylinder taking care not to damage edges of the seal.
5. Screw on cap and torque to 50-60 in-lbs.

12.1 Maintenance of the Hydraulic Release System continued

Slave Cylinder Repair continued

Figure 12.1.5 Slave Cylinder Piston Removal



12.2 Bleeding Hydraulic System

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

Following is the procedure:

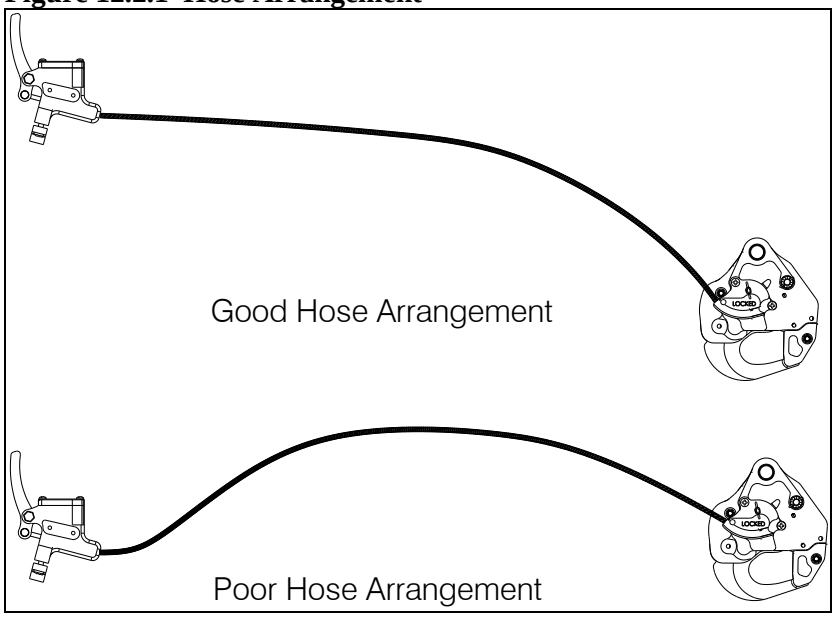
1. Obtain the hydraulic hook bleed kit, 212-014-02. This kit consists of 2 ounces of MIL-PRF-87257 fluid, a syringe, a female barb fitting, a length of PVC tubing, and a bleed adapter fitting. The bleed kit is included in new hydraulic hook kits. Assemble the bleed kit by pressing the fittings into the tubing and threading the one fitting into the syringe.
2. If the system is already installed on the aircraft, place an absorbent towel under the master cylinder. If the master cylinder is not installed on the aircraft, lightly clamp the master cylinder in a vise to hold it in a vertical position and position the slave cylinder so that its level is below the level of the master cylinder.

NOTICE

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

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

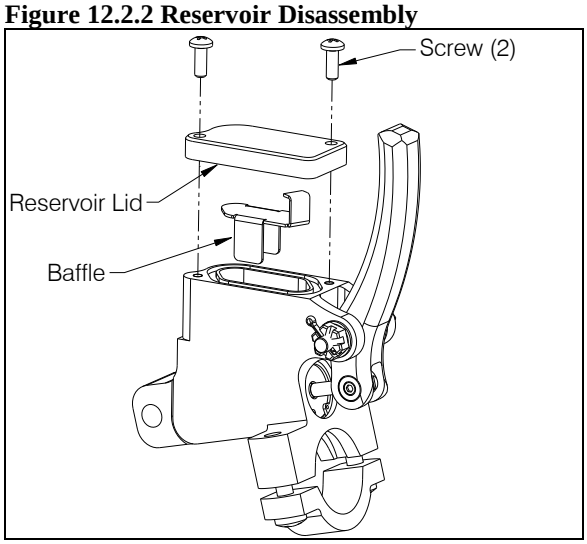
Figure 12.2.1 Hose Arrangement



12.2 Bleeding Hydraulic System continued

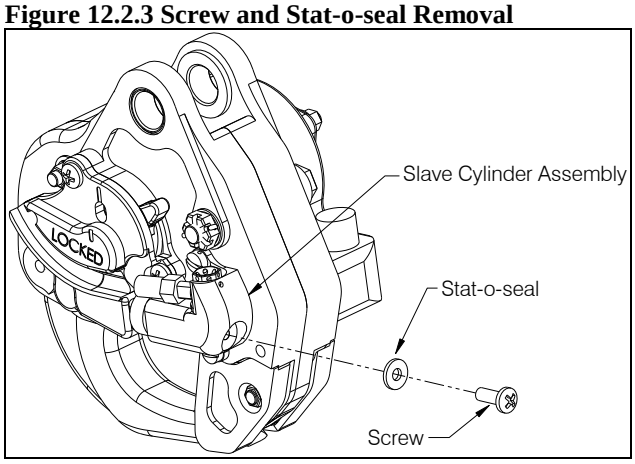
4. Remove screws, reservoir lid, and baffle from the master cylinder reservoir as shown in Figure 12.2.2.

Figure 12.2.2 Reservoir Disassembly



5. Remove the screw and stat-o-seal on the slave cylinder, see Figure 12.2.3.

Figure 12.2.3 Screw and Stat-o-seal Removal



6. Fill a syringe with approximately 35 cc of hydraulic fluid. Screw the end of the syringe into the screw hole on the slave cylinder to create a tight seal. See Figure 12.2.4.

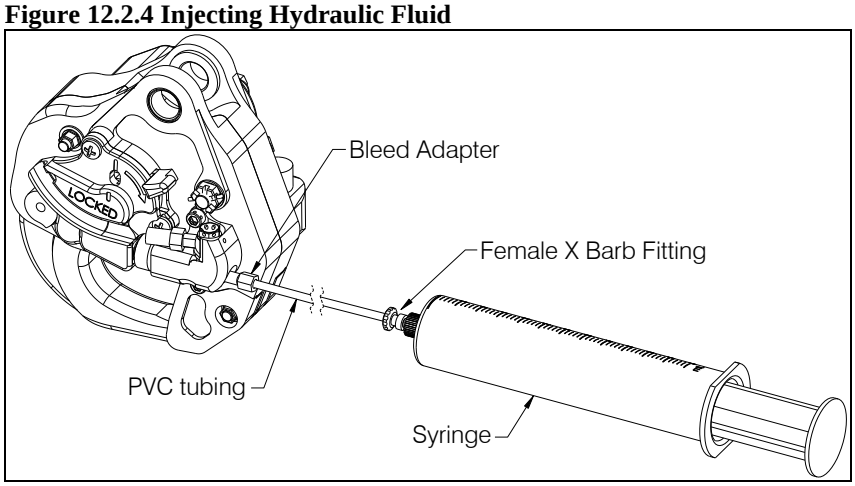
7. While observing the reservoir, **slowly** push on the syringe plunger to force fluid through the slave cylinder, hydraulic hose, and up to the master cylinder reservoir. There will be some resistance during filling—this is normal.

⚠ CAUTION

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

12.2 Bleeding Hydraulic System continued

Figure 12.2.4 Injecting Hydraulic Fluid



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

NOTICE

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

9. Remove the syringe from the screw hole. Re-install the Stat-o-Seal (P/N 510-496-00) and screw (P/N 510-525-00), see Figure 12.2.3.

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

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

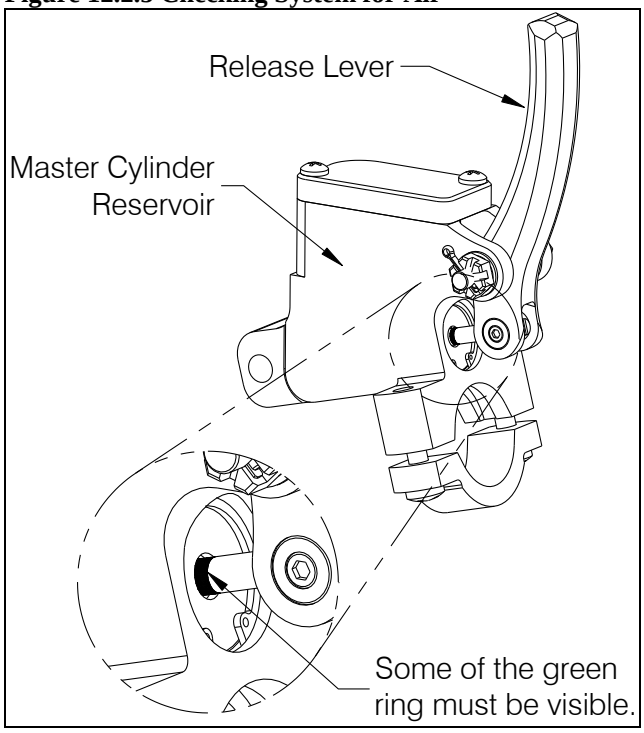
⚠ CAUTION

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

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

12.2 Bleeding Hydraulic System continued

Figure 12.2.5 Checking System for Air



13. After the system is properly bled, verify that the reservoir is approximately half full of hydraulic fluid. Fluid should be visible above the baffle.
14. Re-install the baffle, and the reservoir lid.
15. Check the system for proper operation. Fully actuate the release lever. The hook must open and the lever must have a firm feel.
16. Disassemble and thoroughly clean the syringe with isopropyl alcohol. Allow it to dry. Not cleaning the syringe will render it unusable. Reassemble and store for next use.

12.3 Lubrication Information

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

Lubricate the suspension assembly at points noted in Figure 12.3.1 and Figure 12.3.2. Refer to Sections 25.16 and 25.17 for removal and re-installation instructions for the cargo hook and suspension assembly. Recommended lubricants are AeroShell 17, MIL-G-21164 or Mobilgrease 28, MIL-G-81322.

Figure 12.3.1 Cargo Hook Pivot Point Lubrication

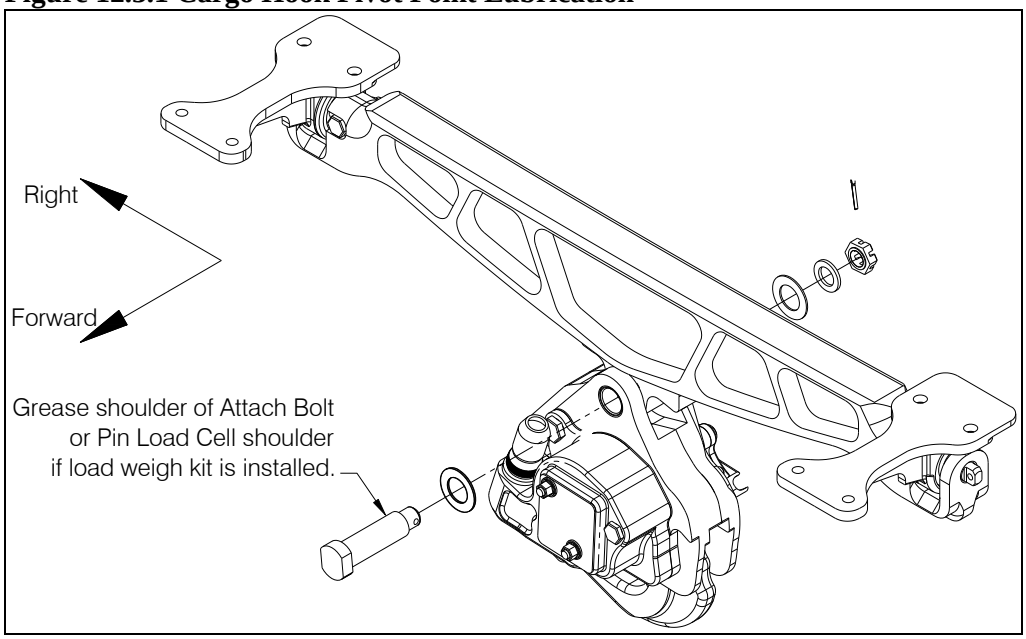
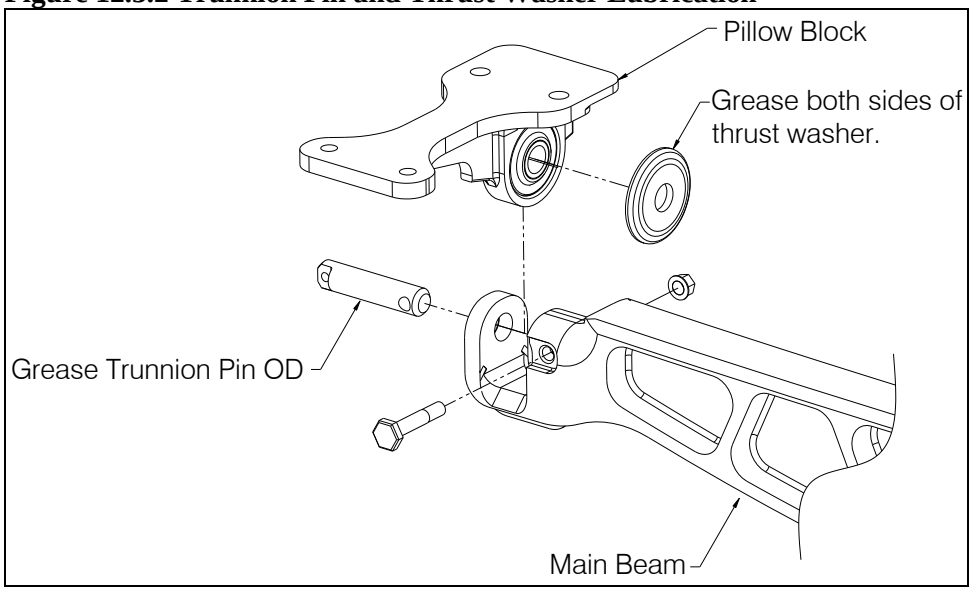


Figure 12.3.2 Trunnion Pin and Thrust Washer Lubrication



12.3 Lubrication Information continued

Hook Corrosion Prevention

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

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

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Section 25
Equipment and Furnishings

25.1 Cargo Hook Connector

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

Table 25.1.1 Cargo Hook Connector

Pin	*Function*
A	Ground
B	Power

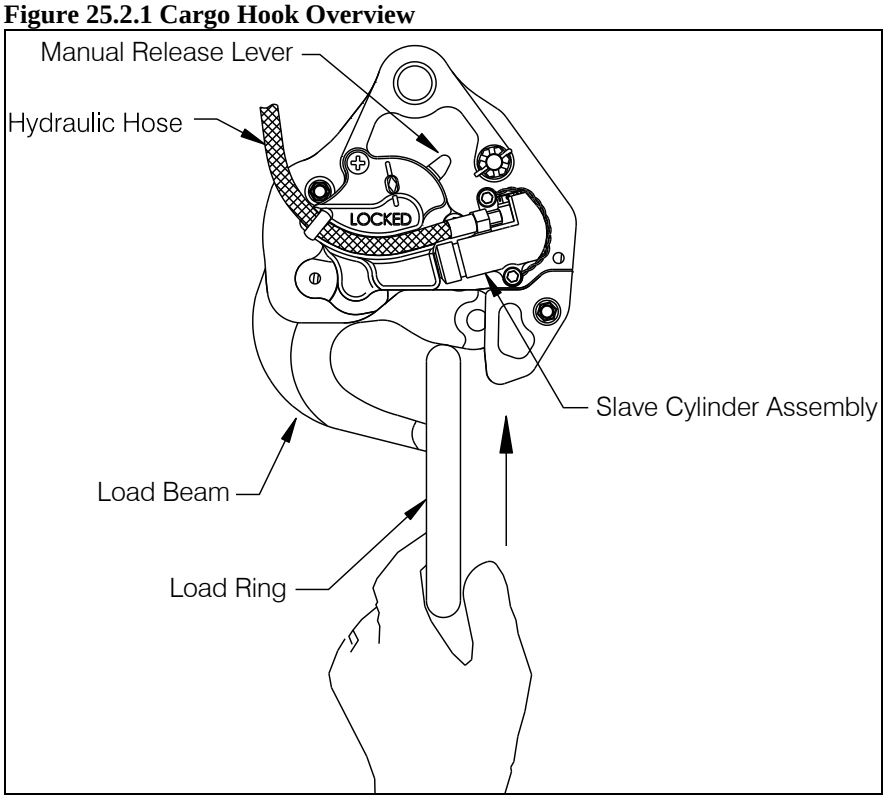
25.2 Description

The cargo hook kits enable a helicopter to transport and release external loads. The cargo hook is the device through which the load is attached and released. It is supported by a beam assembly which spans the hard points on the belly of the helicopter. The beam assembly has provisions which allow the cargo hook to pivot side to side and fore and aft in response to the direction of the load. An optional load weigh kit can be used to provide the pilot with the weight of the load on the cargo hook via a cockpit indicator.

A load is attached to the cargo hook by passing a load ring into the throat of the load beam and pushing the ring against the upper portion of the load beam throat (see Figure 25.2.1), which will initiate the hook to close. In the closed position, a latch engages the load beam and latches it in this position. A load release can be initiated by three different methods. Normal release is achieved by pilot actuation of a push-button switch in the cockpit. When the push-button switch is pressed, it energizes the solenoid in the cargo hook, and the solenoid opens the latch in the internal mechanism. In the event of an electrical failure, load release can be achieved by operating the manual release lever in the cockpit. The release lever forces hydraulic fluid through a hose which moves a piston within the slave cylinder assembly which extends and actuates the internal mechanism of the cargo hook to unlatch the load beam. Ground personnel can also release the load by actuating a manual release lever located on the side of the cargo hook (see Figure 25.2.1).

25.2 Description continued

Figure 25.2.1 Cargo Hook Overview



This ICA contains maintenance instructions for cargo hook suspension kit P/N's 200-412-00, 200-412-10, 200-413-00, 200-413-01, 200-413-02, 200-413-10, 200-413-11, and 200-413-12 on the Bell 407 model helicopter. Kit P/N 200-413 series are the same as 200-412 series except they include a load weigh system, see Figure 25.2.4 for load weigh system components.

Kit P/Ns ending in -10, -11, and -12 include Cargo Hook P/N 528-028-02 with Surefire release as part of its electrical release system. Surefire release is a safety enhancement to protect against inadvertent load release due to accidental contact with the release switch or mistaken actuation of the release switch when another is intended.

25.2 Description continued

The kits include a fixed provisions and a removable provisions kit. The fixed provisions kits include the internal electrical release wiring harnesses, fixed hydraulic release system including the release lever mounted on the cyclic for actuation, bulkhead fittings and pillow block assemblies which support the cargo hook suspension, and miscellaneous brackets and hardware for supporting these items. The primary kit components are shown below.

Figure 25.2.2 Fixed Provisions Kit Overview

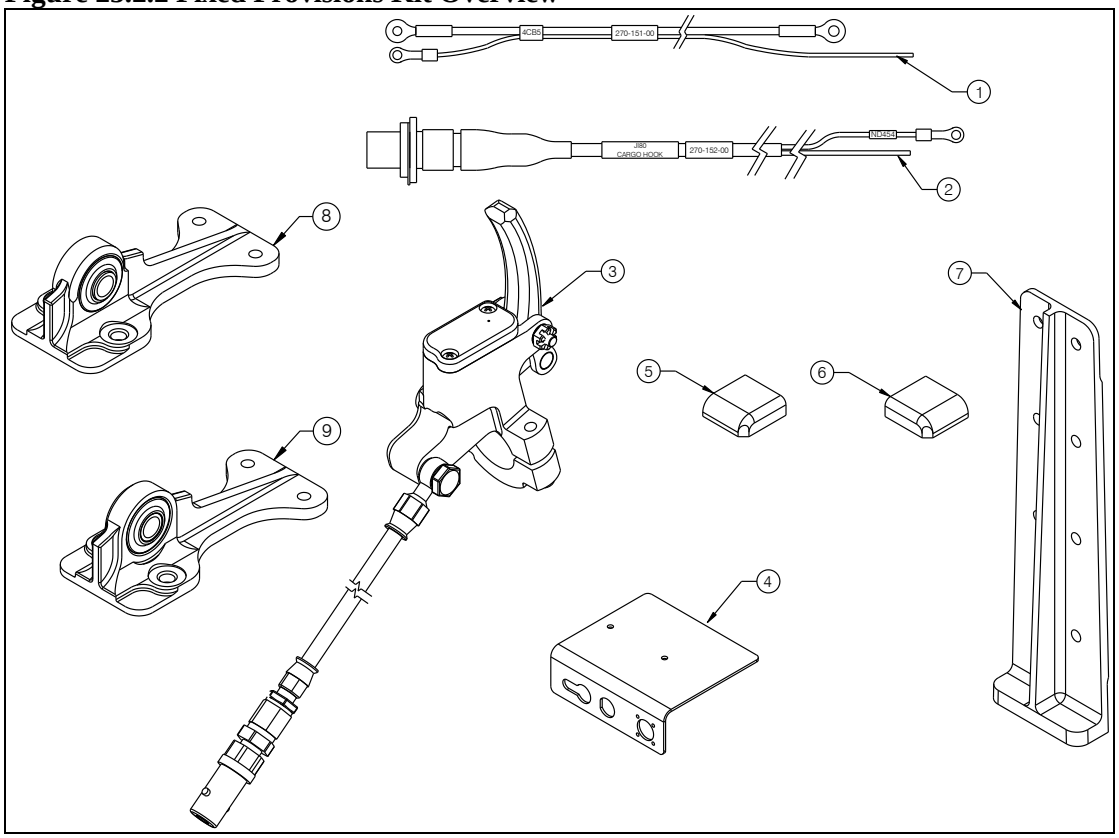


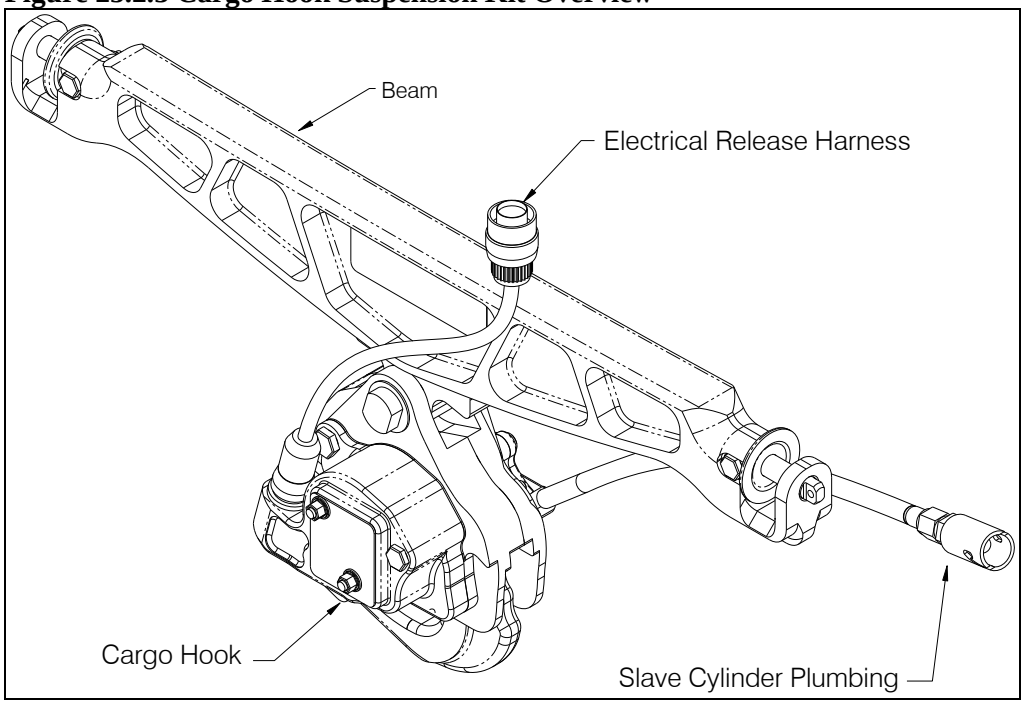
Table 25.2.1 Fixed Provisions Kit Components

ITEM	PART NO.	DESCRIPTION	QTY
1	270-151-00	Electrical Harness	1
2	270-152-00	Electrical Harness	1
3	232-590-00	Master Cylinder Assembly w/ Plumbing	1
4	235-216-00	Bracket	1
5	291-145-00	Radius Block	2
6	291-146-00	Radius Block	2
7	291-144-00	Bulkhead Fitting	2
8	232-188-01	Pillow Block Assembly, Left	1
9	232-189-01	Pillow Block Assembly, Right	1

25.2 Description continued

The removable provisions kit includes the cargo hook along with the electrical release harness and slave cylinder plumbing and a beam which supports the cargo hook and spans the pillow blocks (included with fixed provisions) which are mounted to the helicopter hard points.

Figure 25.2.3 Cargo Hook Suspension Kit Overview



25.2 Description continued

The load weigh system includes a pin load cell, internal electrical harness, and load weigh indicator. When this kit is installed the pin load cell assembly replaces the cargo hook attach bolt within the cargo hook suspension assembly. The primary kit components are shown below.

Figure 25.2.4 Pin Load Weigh Kit Overview

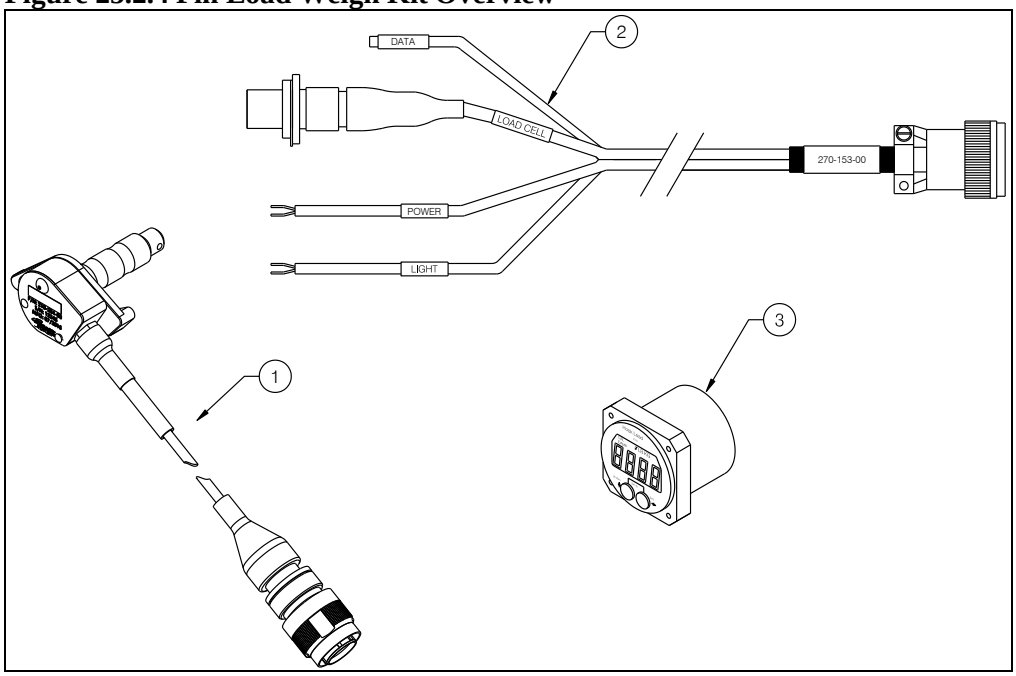


Table 25.2.2 Pin Load Weigh Kit Components

ITEM	PART NO.	DESCRIPTION	QTY
1	210-282-01*	Pin Load Cell Assembly	1
2	270-153-00	Load Weigh Internal Harness	1
3	210-095-00 or 210-095-02	C-39 Indicator**	1
	210-293-00	C-40 Indicator***	

*Supersedes P/N 210-226-04, these P/Ns are interchangeable.
** P/N 210-095-00 features a 28V backlight, 210-095-02 features a 5V backlight
*** The C-40 Indicator is included with Kit P/Ns 200-413-02 and 200-413-12.

25.5 Component Weights

The weights and cgs of the systems are listed in Table 25.5.1.

Table 25.5.1 Component Weights and CGs

Item	Weight Lbs (kg)	Station in (mm)
Fixed Provisions Kit* P/N 200-394-00	7.2 (3.27)	109.1 (2772)
Removable Provisions Kit** P/N 200-395-00	7.7 (3.49)	121.0 (3073)
Total Kit Weight (P/N 200-412 series)	**14.9 (6.76)**	**115.3 (2929)**
Fixed Provisions Kit w/ Load Weigh P/N 200-415-00	8.5 (3.18)	108.6 (2760)
Removable Provisions Kit w/ Load Weigh P/N 200-416-00	7.9 (4.26)	121.0 (3073)
Total Kit Weight (P/N 200-413 series)	**16.4 (7.44)**	**114.6 (2911)**

***** The fixed provisions are those items of the kit that remain on the aircraft. These include the fixed hydraulic hose, internal electrical wire harnesses, the load weigh indicator, pillow blocks, and the miscellaneous brackets that support these items. These components would typically be left on the aircraft when configuring the aircraft for non-external load work.

* ***** The removable provisions include the suspension w/ hook, external hydraulic hose, and external electrical release harness. These items are easily removed if they are not needed on the helicopter's mission. Refer to Suspension System Removal in Section 25.16 for removal instructions.

25.12 Storage Instructions

Clean the exterior Cargo Hook and suspension components thoroughly of excess dirt and grease with a rag before packaging. Pack the unit in a heat-sealable package. If the unit is to be stored for long periods in a tropical climate it should be packed in a reliable manner to suit local conditions. Refer to MIL-PRF-23199 and MIL-STD-2073-1 for additional guidance. Refer to the Cargo Hook Component Maintenance Manual 122-015-00 for the cargo hook storage instructions.

Package the unit in a suitable fiberboard box and cushion the unit to prevent shifting. Seal the fiberboard box with tape and mark the box with the contents and date of packaging.

25.15 Troubleshooting

Table 25.15.1 is provided with the intention of isolating the cause of malfunctions within the system. Sections 25.16 and 25.17 include instructions for removing and replacing defective components.

Table 25.15.1 Troubleshooting

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Cargo hook does not operate electrically or manually.	Defective internal mechanism.	Remove and replace cargo hook (see sections 25.16 and 25.17) or repair per CMM 122-015-00.
Cargo hook P/N 528-028-00 does not operate electrically, hydraulic release operates normally.	Open electrical circuit, faulty wiring, fuse/circuit breaker, switch or solenoid.	Using multi-meter, check for 3.0 to 4.0 ohms between pins A and B of electrical connector (see note 1 below). If open indication is obtained, remove and replace cargo hook (see sections 25.16 and 25.17) or repair per CMM 122-015-00. Check the aircraft circuit for opens and shorts by using a multi-meter on the hook connector. When the release switch is pressed 28V aircraft voltage should be seen on the connector pins.
Cargo hook P/N 528-028-02 (includes Surefire time delay circuit) does not operate electrically, hydraulic release operates normally.	Release switch not held down long enough. Open electrical circuit, faulty wiring, circuit breaker, switch or solenoid.	Hold the release switch for a longer time. The time delay circuit incorporates an electronic delay of approximately ½ second after which time the hook solenoid will activate repeatedly. If the release switch is not held down long enough the cargo hook's solenoid will not activate. Check the aircraft circuit for opens and shorts by using a multi-meter on the hook connector. When the release switch is pressed 28V aircraft voltage should be present on the connector pins. Check the aircraft connector polarity. The time delay circuit is polarity sensitive and protected against reverse polarity. +28V should be on pin B and ground on pin A. Check the power pins on the hook itself. A multi-meter set to the kilo-ohms range should read between 2-8Kohms. Some auto-ranging meters will not read properly so be sure to try a manual kilo-ohms range. If the meter reads open or short there is a problem with the solenoid module itself and the hook should be replaced or repaired per CMM 122-015-00.
Cargo hook operates electrically, but not manually.	Excess air in system. Fluid leakage.	Pull release lever and check for visibility of some of the green stripe. Repair hydraulic release system per Section 12.
Load beam fails to re-latch after being reset.	Defective latch mechanism.	Remove and replace cargo hook (see sections 25.16 and 25.17) or repair per CMM 122-015-00.
Force required to release cargo hook with lever in cockpit exceeds 15 lbs.	Friction in internal mechanism or defective hydraulic system.	Remove slave cylinder from hook and manually operate master cylinder. If operation feels free and force is less than 5 lbs remove and replace cargo hook (see Section 25.16 and 25.17).

Table 25.15.1 Troubleshooting continued

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Hydraulic fluid leaks at hose fittings.	Loose fittings	Tighten fittings. Check fluid level in reservoir. Bleed hydraulic system per Section 12.2.
Hydraulic fluid leaks around master or slave cylinder pistons.	Leaking seals	Replace master or slave cylinder assembly or repair per Section 12.1.
Circuit breaker opens when cargo hook is energized.	Short in the system, faulty wiring, circuit breaker or solenoid.	Check for shorts to ground along length of wire harness. Check solenoid resistance (see note 1), repair or replace defective parts.
Load Weigh Indicator does not light up.	Faulty wiring or circuit breaker.	Check the circuit breaker and wiring (see Note 2). If this doesn't help, remove and replace indicator per sections 25.16 and 25.17.
The displayed load on the Load Weigh Indicator is incorrect.	Incorrect calibration code.	Ensure the correct calibration code has been entered (refer to the applicable Owner's Manual for the Indicator)
C-39 Indicator displayed load is not stable.	Dampening level is too small.	Adjust the dampening level to a larger number (refer to the Owner's Manual for the C-39 Indicator).
C-39 Indicator displayed load takes too long to change the reading when the load is changed.	Dampening level is too large.	Adjust the dampening level to a smaller number (refer to the Owner's Manual for the C-39 Indicator).
Indicator displays large negative load	Indicator was zeroed under load.	Un-zero the indicator. Refer to applicable Owner's Manual for instructions.
C-40 Indicator analog bar not in sync with displayed load	Indicator is zeroed; analog bar always displays un-zeroed load.	Un-zero the indicator. Refer to the Owner's Manual for the C-40 Indicator.

Notes:

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

   Check for 3.0 to 4.0 ohms between pins A and B of electrical connector located on the cargo hook (see below).

Figure 25.15.1 Cargo Hook Electrical Connector

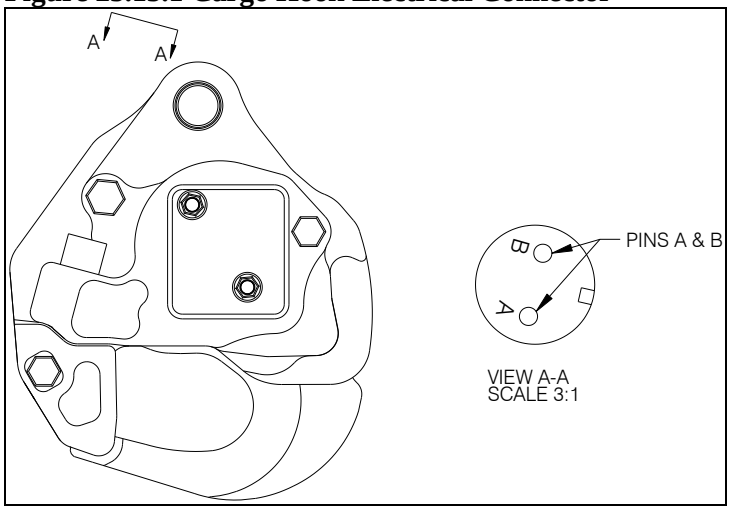


Table 25.3 Notes continued:

2. Checking Wire Harnesses.

As appropriate, before working on a circuit, e.g. - inspection, removal-installation of components, check that the aircraft system is not energized:

- External power connector is not supplied

- Further precaution: remove the circuit breaker(s) from the corresponding circuits.

The wire harnesses are routed with and secured to existing wire bundles and are located approximately as shown below. Inspect for general condition and chafing along length of wire runs. See Figures 25.15.3, 25.15.4, and 25.15.5 for electrical schematics.

Figure 25.15.2 Wire Harness Routing

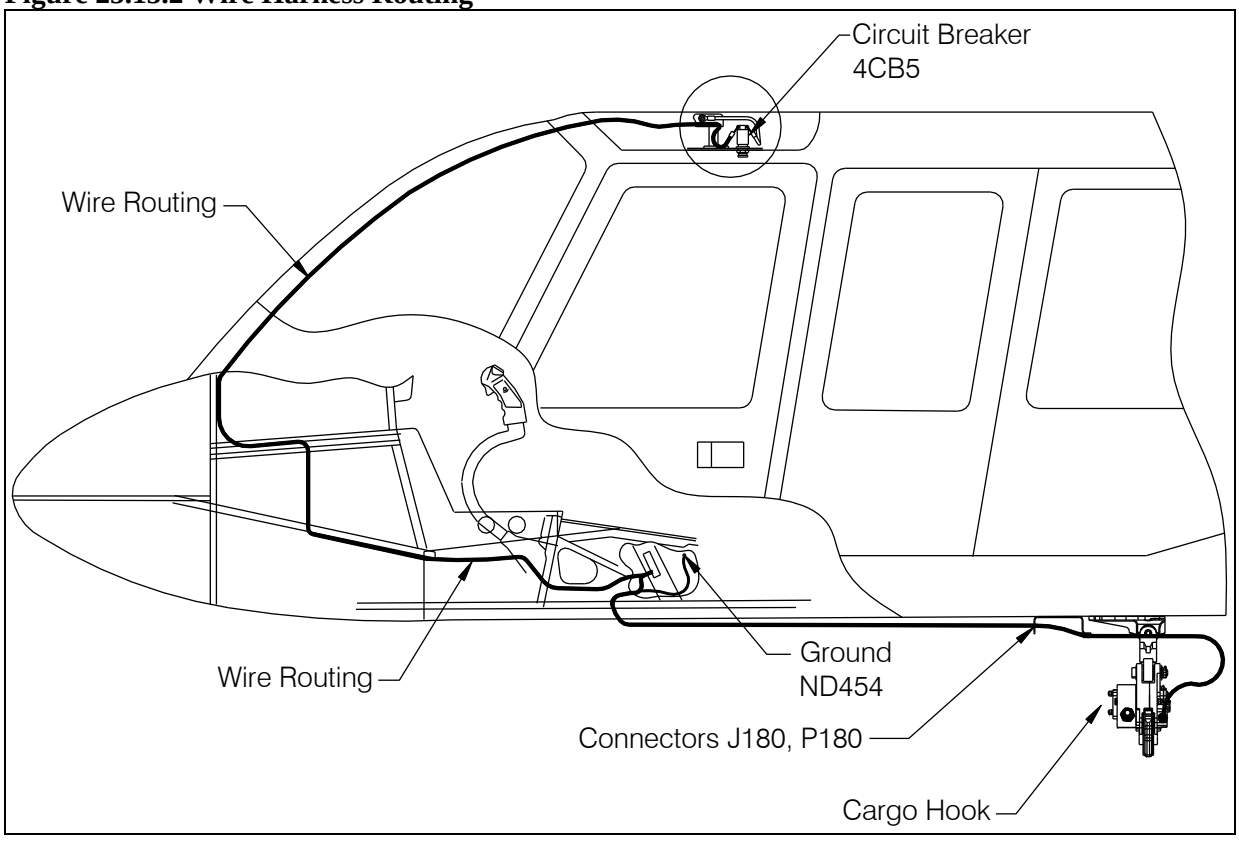


Table 25.3 Notes continued:

2. Checking Wire Harnesses continued

Figure 25.15.3 Electrical Schematic – Electrical Release Wiring

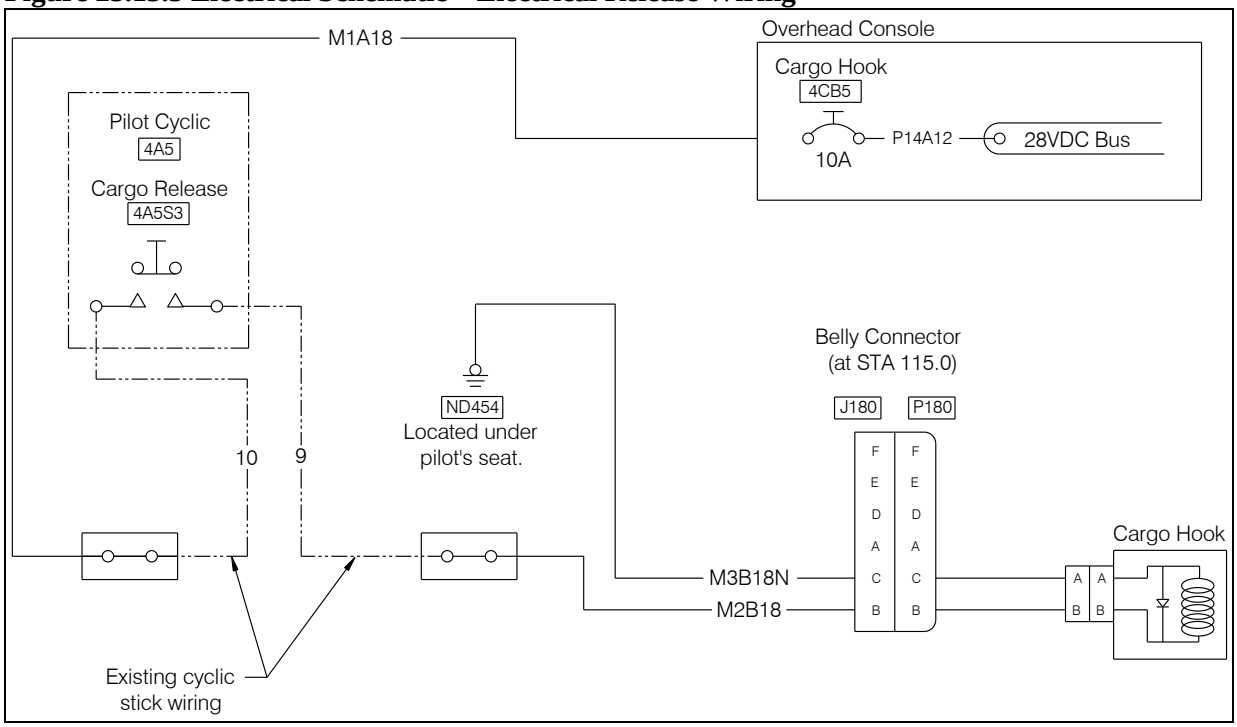


Table 25.3 Notes continued:

2. Checking Wire Harnesses continued

Figure 25.15.4 Load Weigh System Wiring Schematic (C-40)

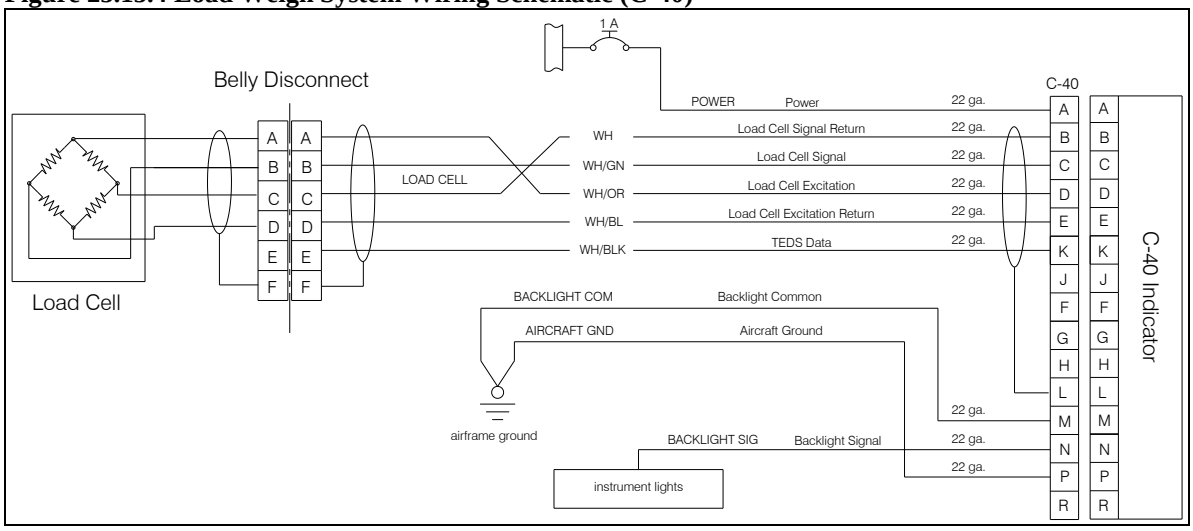
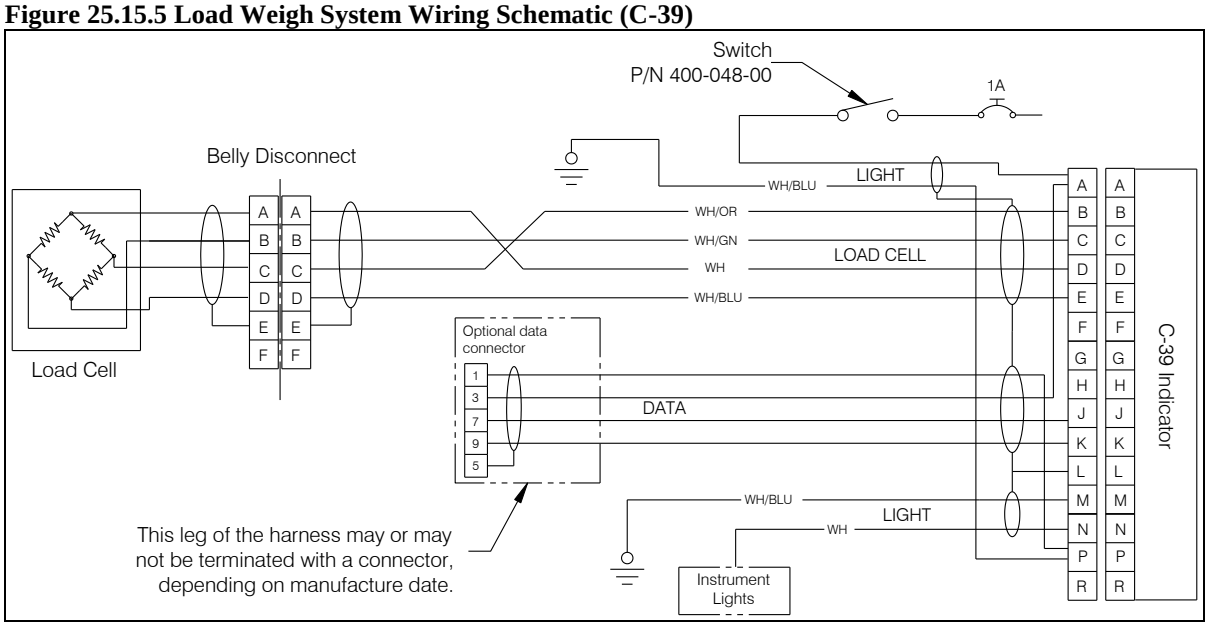


Figure 25.15.5 Load Weigh System Wiring Schematic (C-39)



25.16 Component Removal

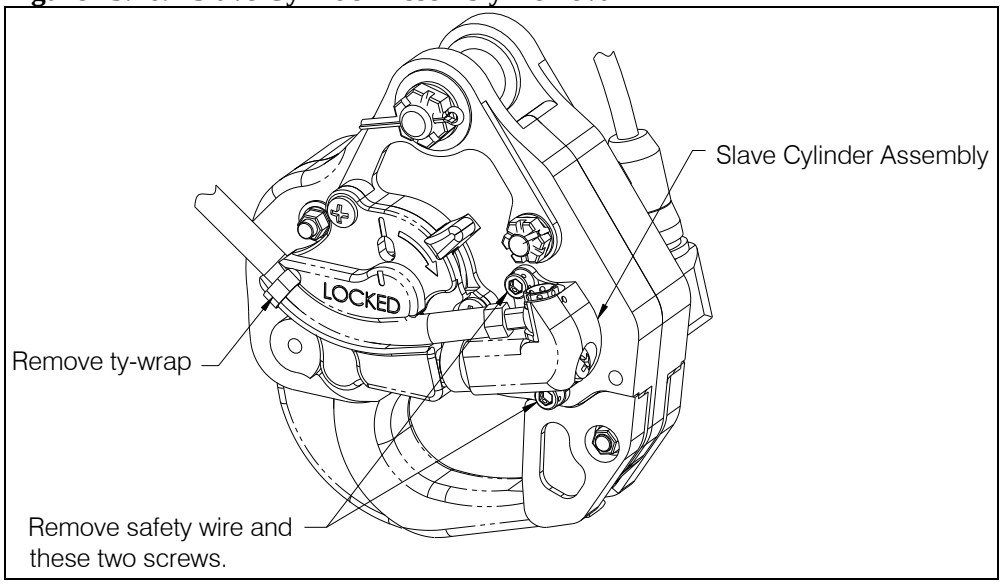
Cargo Hook Removal

1. Remove the slave cylinder assembly by removing safety wire and removing the two screws (refer to Figure 25.16.1) and associated ty-wraps or disconnect the slave cylinder plumbing at the quick disconnect fitting at the bracket on the belly of the helicopter.
2. Disconnect the electrical release harness connector from the Cargo Hook.
3. Remove the cotter pin (P/N 510-178-00) from the attach bolt (P/N 290-332-00) or the pin load cell if the load weigh system is installed.
4. Remove the castellated nut (P/N 510-170-00) and washers (P/N 510-174-00 and P/N 510-183-00) from the attach bolt (or pin load cell).
5. Remove attach bolt (or pin load cell) and remaining washers.
6. Remove the Cargo Hook from the beam.

Slave Cylinder Assembly Removal

1. Disconnect the hose at the quick disconnect coupling at the belly of the helicopter.
2. Remove the safety wire and two screws that secure the slave cylinder assembly to the cargo hook. Remove the ty-wrap that holds the hydraulic hose within the groove on the manual release cover of the cargo hook.

Figure 25.16.1 Slave Cylinder Assembly Removal

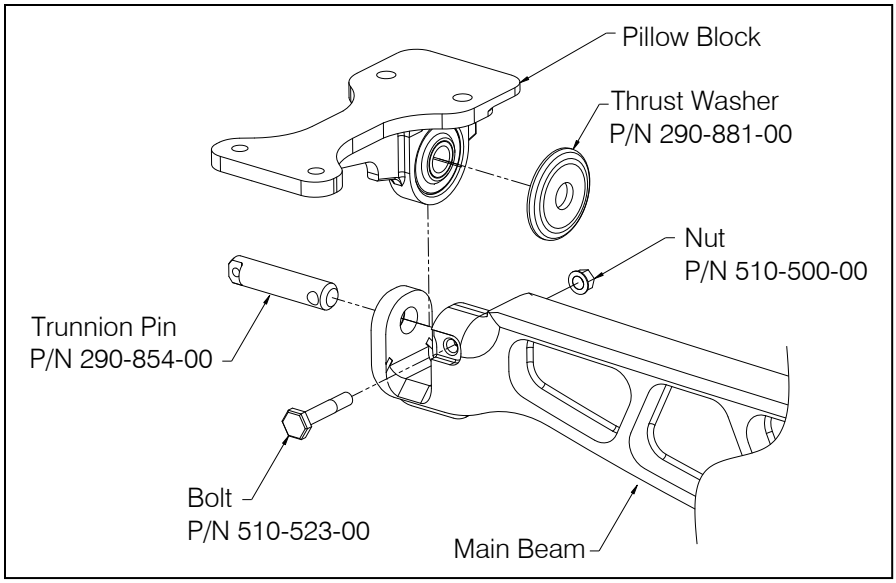


25.16 Component Removal continued

Suspension Beam Assembly Removal

1. Disconnect the load cell harness connector (if load cell is installed), electrical release harness connector, and slave cylinder plumbing at their respective connections at the bracket on the belly of the helicopter.
2. At each end of the Main Beam remove the nut and bolt that retain the Trunnion Pins (refer to Figure 25.16.2).
3. Remove the Trunnion Pins and separate the Main Beam and Thrust Washers from the Pillow Blocks.

Figure 25.16.2 Suspension Attachment Hardware



25.16 Component Removal continued

Pillow Block Assembly Removal

1. Remove the four screws that secure the Pillow Block Assemblies to the aircraft. The aft pairs of screws are secured with nuts that must be accessed from inside the helicopter. These nuts are located just forward of the bottom of the passenger seat bulkhead.

Pin Load Cell Removal

The pin load cell is present if the optional load weigh system is installed.

1. Disconnect the electrical connector at the bracket on the belly of the helicopter.
2. Separate pin load cell harness from the harness/hose bundle by removing the spiral wrap from around the bundle.
3. Remove the cotter pin (P/N 510-178-00), nut (P/N 510-170-00), washer (P/N 510-174-00), and washer (P/N 510-183-00) from the load cell and remove the load cell from the cargo hook.

Load Weigh Indicator Removal

The load weigh indicator location is optional within the cockpit. It is designed to fit within a standard instrument panel hole.

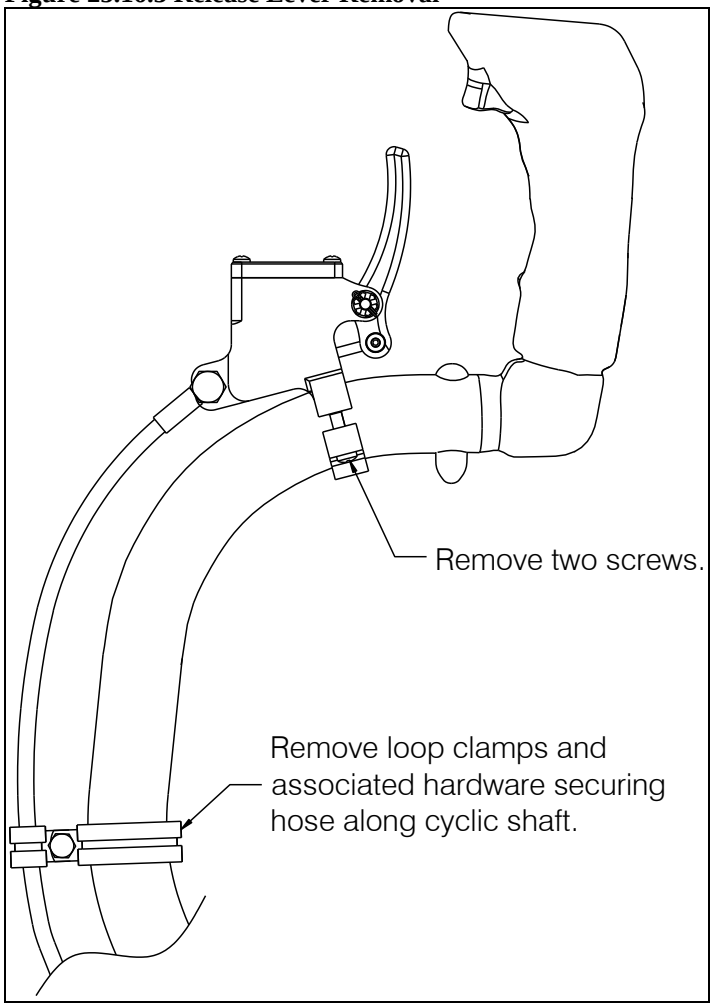
1. Remove the four screws that secure it to its mounting location.
2. Disconnect the electrical connector from the back of the indicator.

25.16 Component Removal continued

Hydraulic Release System Removal

1. Disconnect the end of the hose at the bracket on the belly of the helicopter and remove the hose from the six loop clamps along the belly.
2. Remove the pilot's seat, or co-pilot's seat if installed on the left side, and the panel underneath it in order to remove the hose from the loop clamps above the belly panel and to feed the hose up through the hole in the belly.
3. On the cyclic shaft remove the loop clamps securing the hose by removing associated hardware.
4. Remove the release lever assembly by removing two screws (see below). Use care to keep the reservoir upright to prevent fluid from leaking out through the vent hole in the lid.

Figure 25.16.3 Release Lever Removal



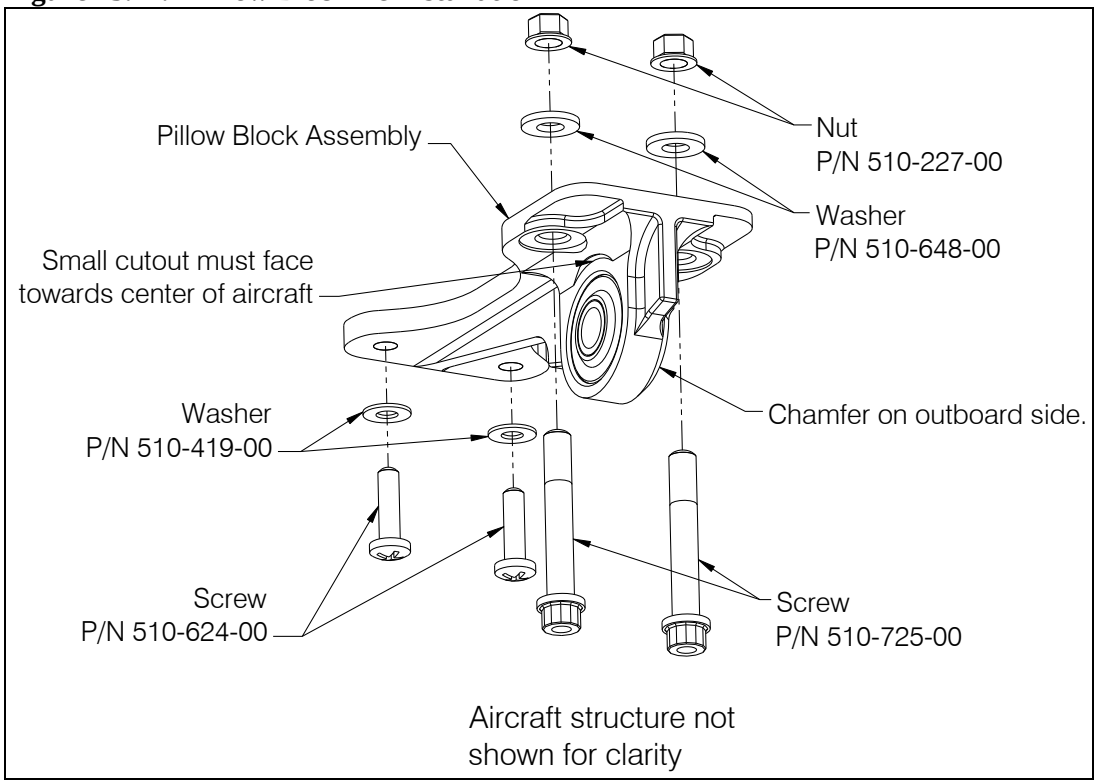
5. Remove the complete assembly by pulling the hose up through the boot at the base of the cyclic.

25.17 Component Re-installation

Pillow Block Assembly Re-installation

1. Position the Pillow Block Assemblies (P/N 232-188-01 and P/N 232-189-01) at their respective hard points on the belly of the helicopter. P/N 232-189-01 is installed on the right side (see figure below for identifying features).
2. Secure the Pillow Blocks to the aircraft with hardware as shown in Figure 25.17.1. Torque nuts (P/N 510-227-00) to 84 to 107 in-lbs. (9.5 to 12.1 Nm) plus drag torque.

Figure 25.17.1 Pillow Block Re-installation

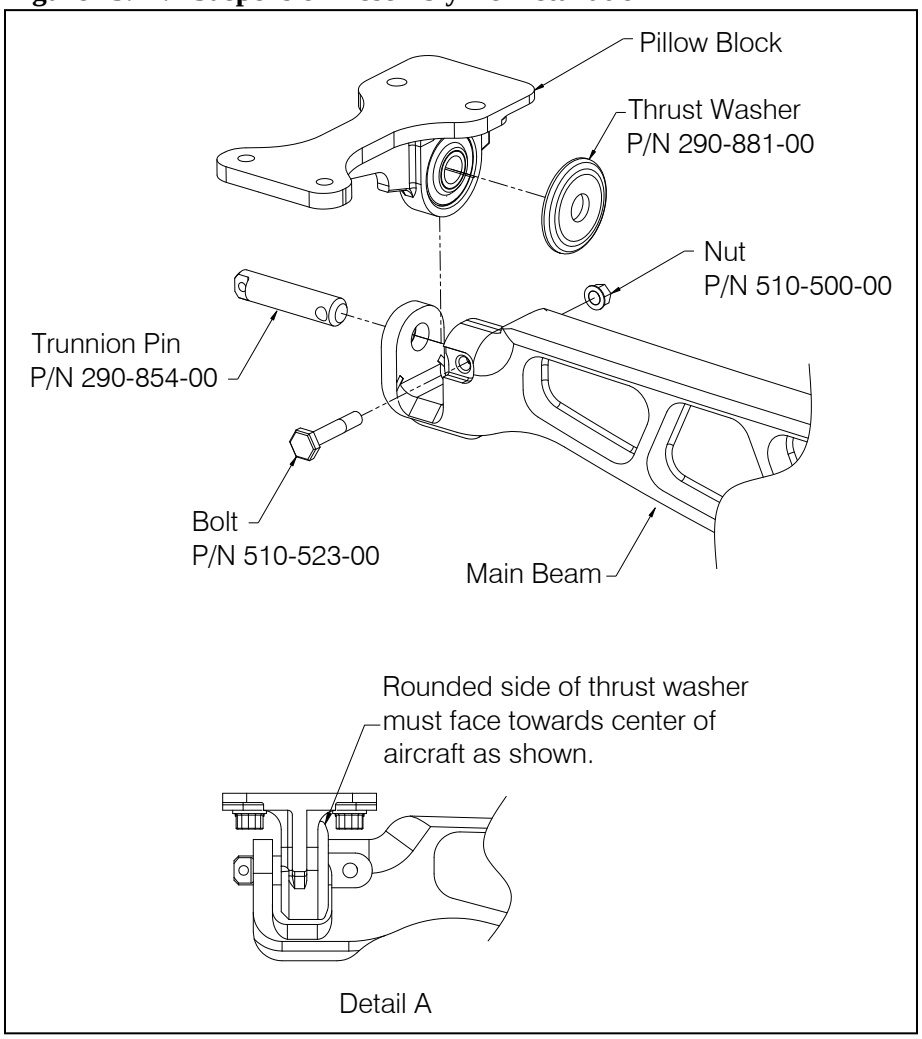


25.17 Component Re-installation continued

Suspension Assembly Re-installation

1. Orient the Thrust Washers (P/N 290-881-00) as shown in Detail A of Figure 25.17.2 and align them with the holes at each end of the Main Beam and hold in place by hand.
2. Position the Main Beam over the Pillow Blocks and align the holes at each end with the Pillow Block bearings and Thrust Washers and insert the Trunnion Pins through.
3. Rotate the Trunnion Pins as required to insert the bolt (P/N 510-523-00) through.
4. Install nut (P/N 510-500-00) over bolt and torque to 30-40 in-lbs.

Figure 25.17.2 Suspension Assembly Re-installation



25.17 Component Re-installation continued

Cargo Hook Re-installation

1. Attach the Cargo Hook (P/N 528-028-00 or P/N 528-028-02) to the suspension beam by aligning its holes with the hole in the beam and inserting the Attach Bolt (P/N 290-332-00) with washer (P/N 510-183-00). Refer to Figure 25.17.3.

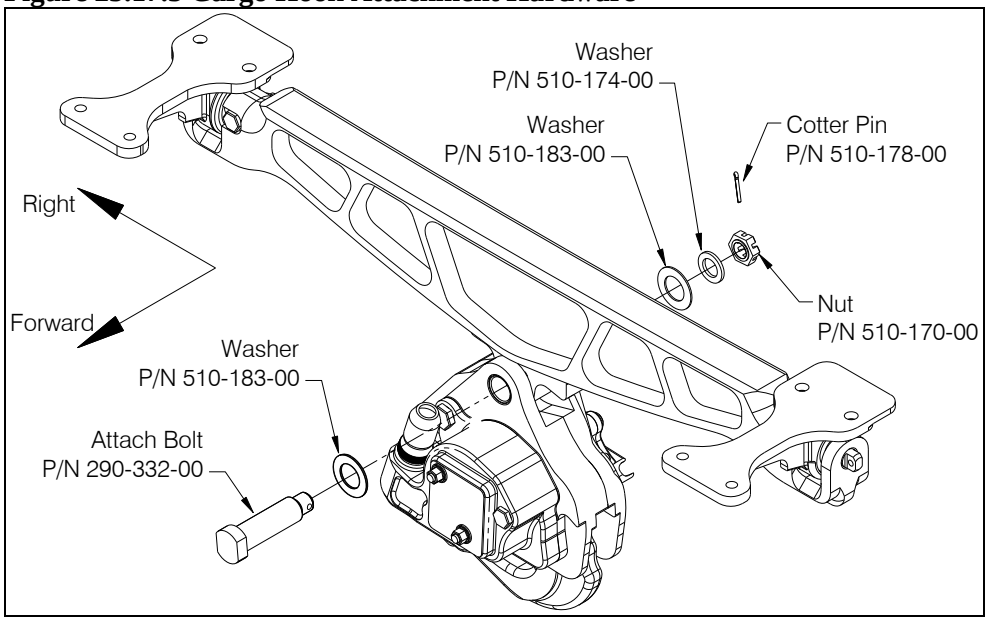
   If in possession of load weigh system, the Pin Load Cell (P/N 210-282-01 or P/N 210-226-04) is installed at this step rather than the Attach Bolt and washer (see Figure 25.17.4).
2. Install washer (P/N 510-183-00), washer (P/N 510-174-00) and nut (510-170-00) over bolt (or load cell) end.
3. Tighten nut on attach bolt or pin load cell 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 (P/N 510-178-00).

CAUTION

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

4. Connect the electrical release harness connector onto the cargo hook.
5. Re-install slave cylinder assembly onto cargo hook per this section.

Figure 25.17.3 Cargo Hook Attachment Hardware



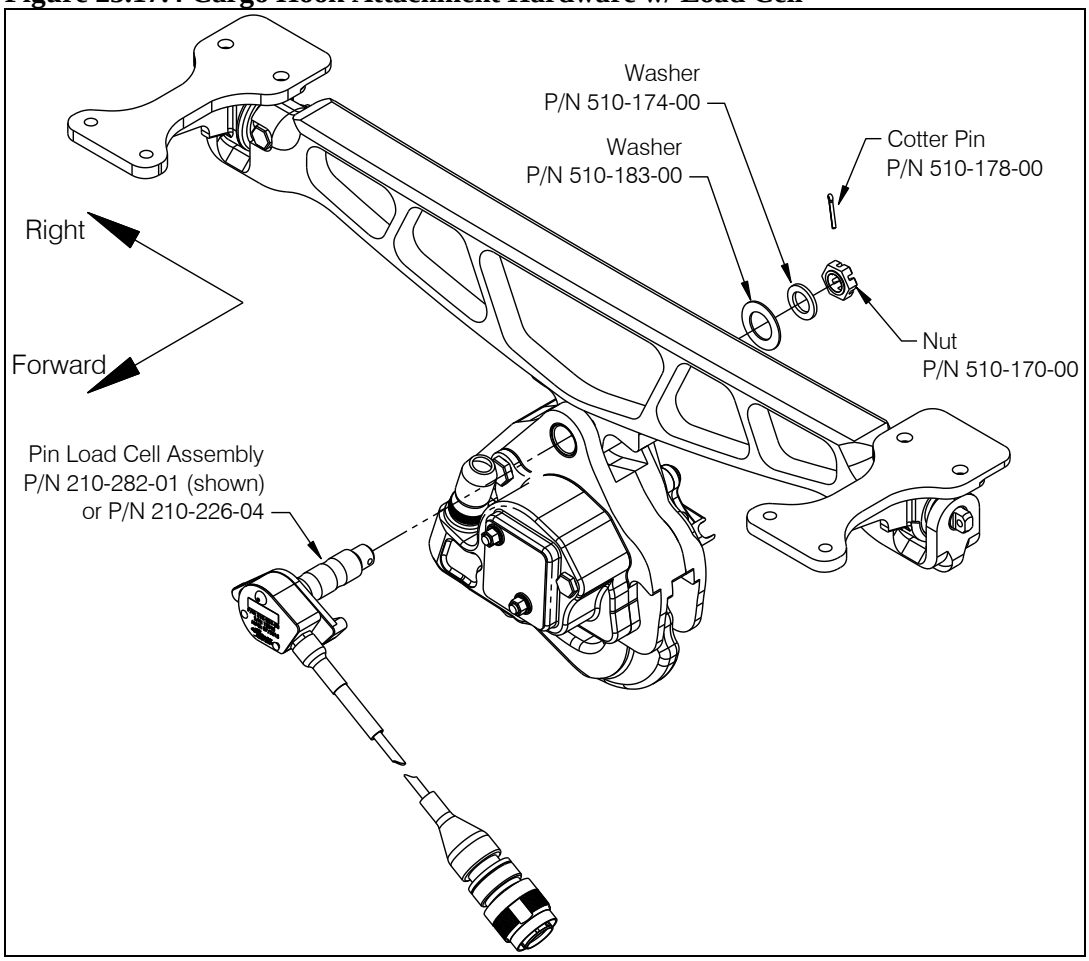
NOTICE

The Cargo Hook load beam must point to the right side of the helicopter when looking from the rear.

25.17 Component Re-installation continued

Cargo Hook Re-installation continued

Figure 25.17.4 Cargo Hook Attachment Hardware w/ Load Cell



25.17 Component Re-installation continued

Slave Cylinder Assembly Re-installation

Connect the slave cylinder assembly (P/N 232-523-00) to the cargo hook first, per the following instructions:

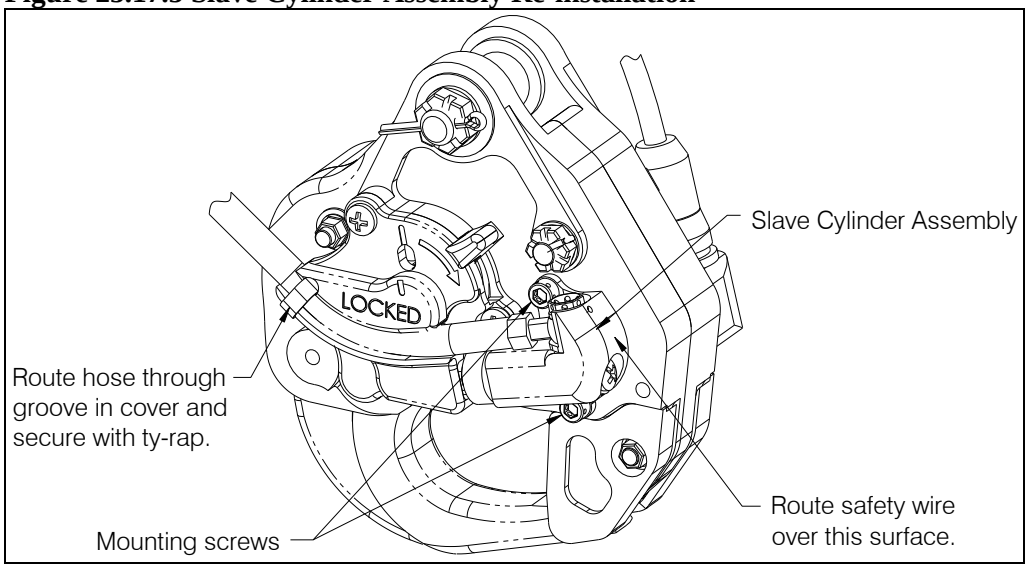
1. Ensure that the piston is in the retracted position. If the piston needs to be retracted, connect the quick disconnect coupling and push the piston in.

NOTICE

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

2. Insert the nose of the slave cylinder assembly into the side of the cargo hook as shown (ref Figure 25.17.5) and install the mounting screws (P/N 510-531-00). Torque screws to 12-15 in-lbs.
3. Install safety wire between these screws around the backside of the slave cylinder.
4. Route the hydraulic hose through the groove in the manual release cover and secure with a ty-wrap through the hole at the end of the groove in the manual release cover.

Figure 25.17.5 Slave Cylinder Assembly Re-installation

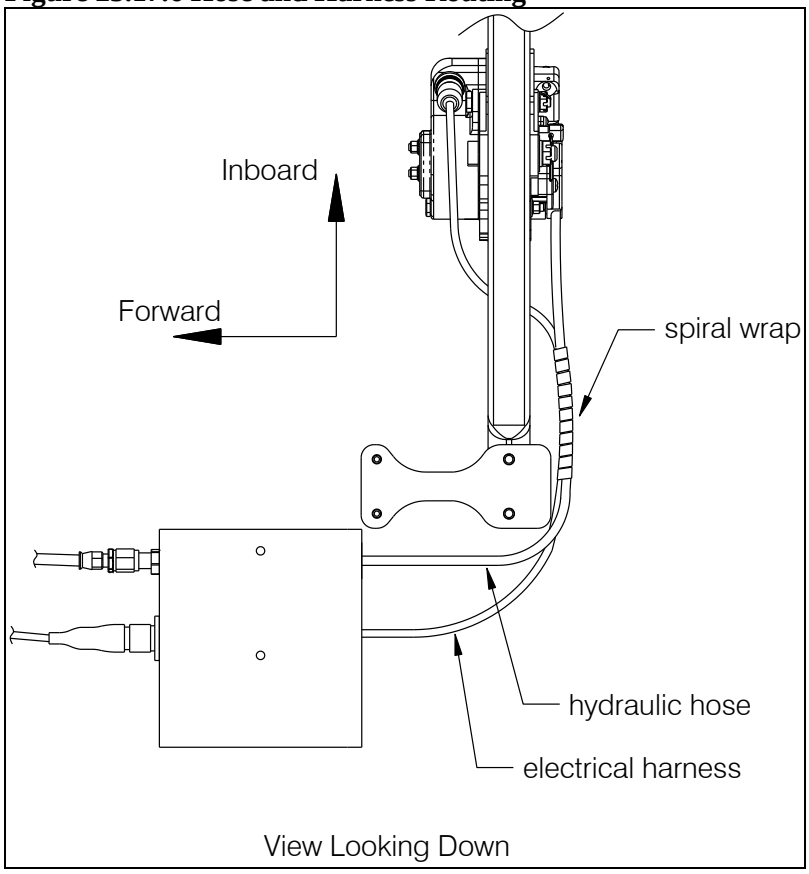


25.17 Component Re-installation continued

Slave Cylinder Assembly Re-installation continued

5. Route the slave cylinder assembly's hydraulic hose as shown below and connect it to the quick disconnect fitting at the bracket on the belly of the helicopter.
6. Wrap the hose and electrical harness together with spiral wrap as shown.

Figure 25.17.6 Hose and Harness Routing



25.17 Component Re-installation continued

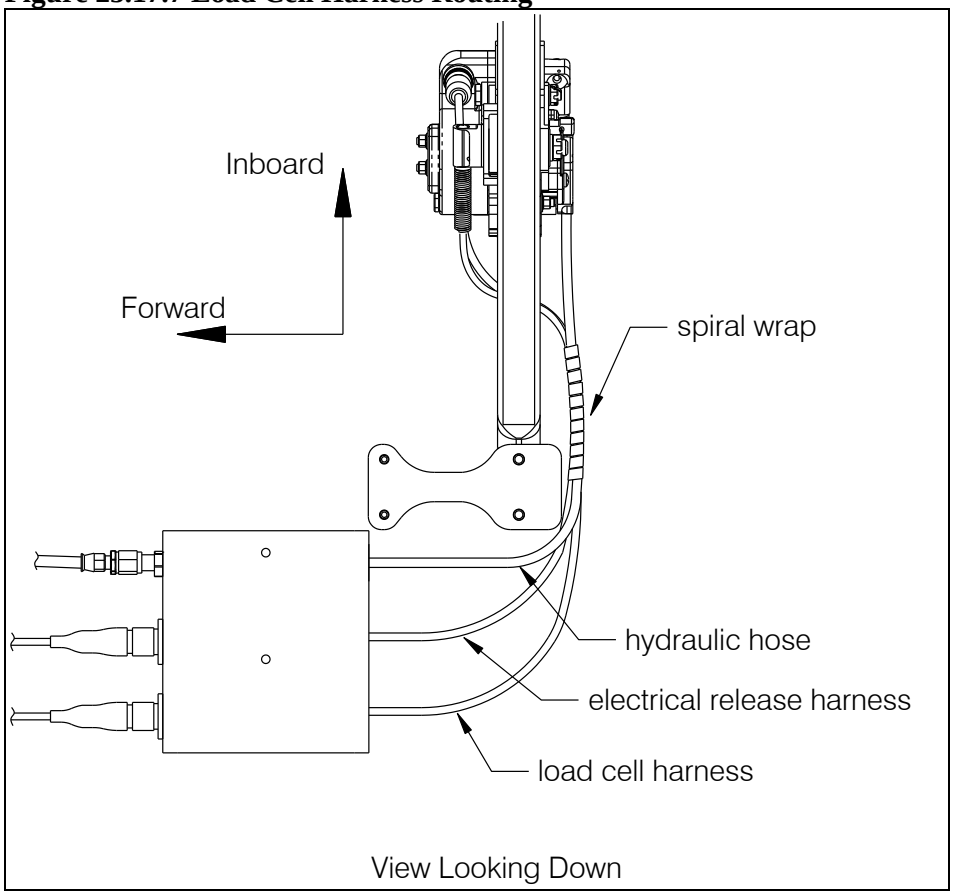
Load Weigh Indicator Re-installation

1. Place the Load Weigh Indicator into its mounting location and secure with four screws.
2. Connect the electrical connector on the wiring harness to the connector on the back of the indicator.

Pin Load Cell Re-installation

1. Insert the pin load cell through the cargo hook and main beam pivot point (reference Figure 25.17.4). The load cell cover and harness must be on the forward side of the main beam when installed on the helicopter.
2. Secure with washer (P/N 510-183-00), washer (P/N 510-174-00), and nut (P/N 510-170-00). Tighten nut until fully seated, finger tight only. Back off nut to previous castellation, if needed, when aligning cotter pin for installation. Install and secure cotter pin (P/N 510-178-00).
3. Route the harness up to and connect its connector to the outboard connector on the connector bracket.
4. Secure the harnesses and hydraulic together using spiral wrap.

Figure 25.17.7 Load Cell Harness Routing

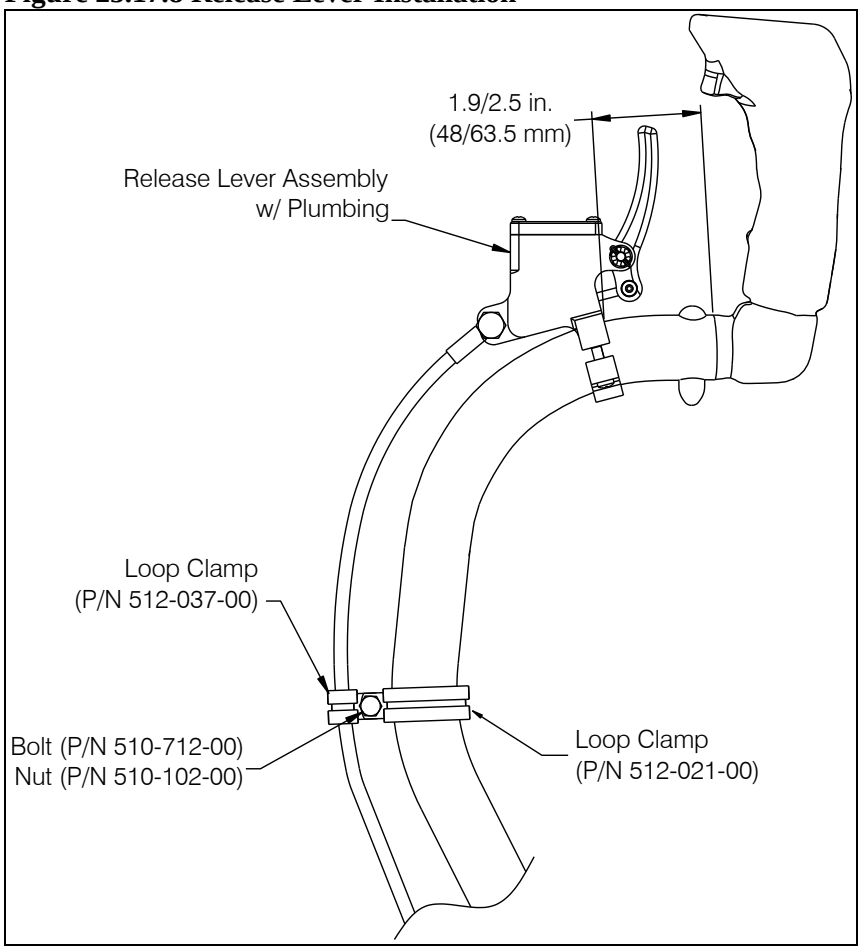


25.17 Component Re-installation continued

Hydraulic Release System Re-installation

1. Install the release lever assembly w/ plumbing onto the cyclic (at location shown below) with two screws (P/N 510-390-00).
2. Route the hose along the cyclic stick and secure at approximately half way down the cyclic shaft with cushioned loop clamps and hardware as shown below.

Figure 25.17.8 Release Lever Installation



3. Feed the end of the hydraulic hose through the boot at the base of the cyclic and route it through the hole in the frame underneath the boot.

25.17 Component Re-installation continued

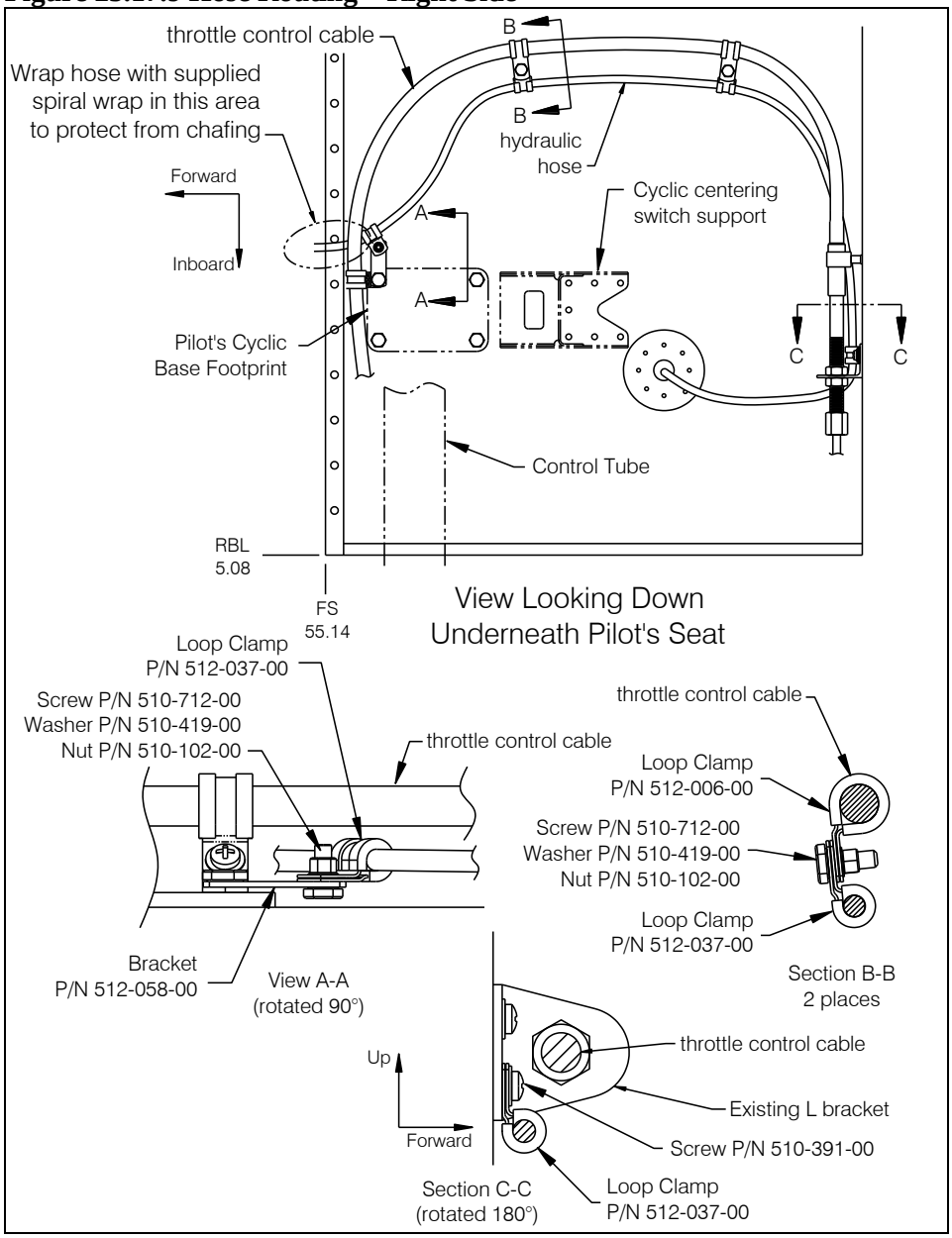
Hydraulic Release System Re-installation continued

For the pilot's side (right side) installation the hose is routed under the seat as shown in Figure 25.17.9 to underneath the belly.

⚠ CAUTION

Ensure 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 could impede or interfere with flight control movement.

Figure 25.17.9 Hose Routing – Right Side



25.17 Component Re-installation continued

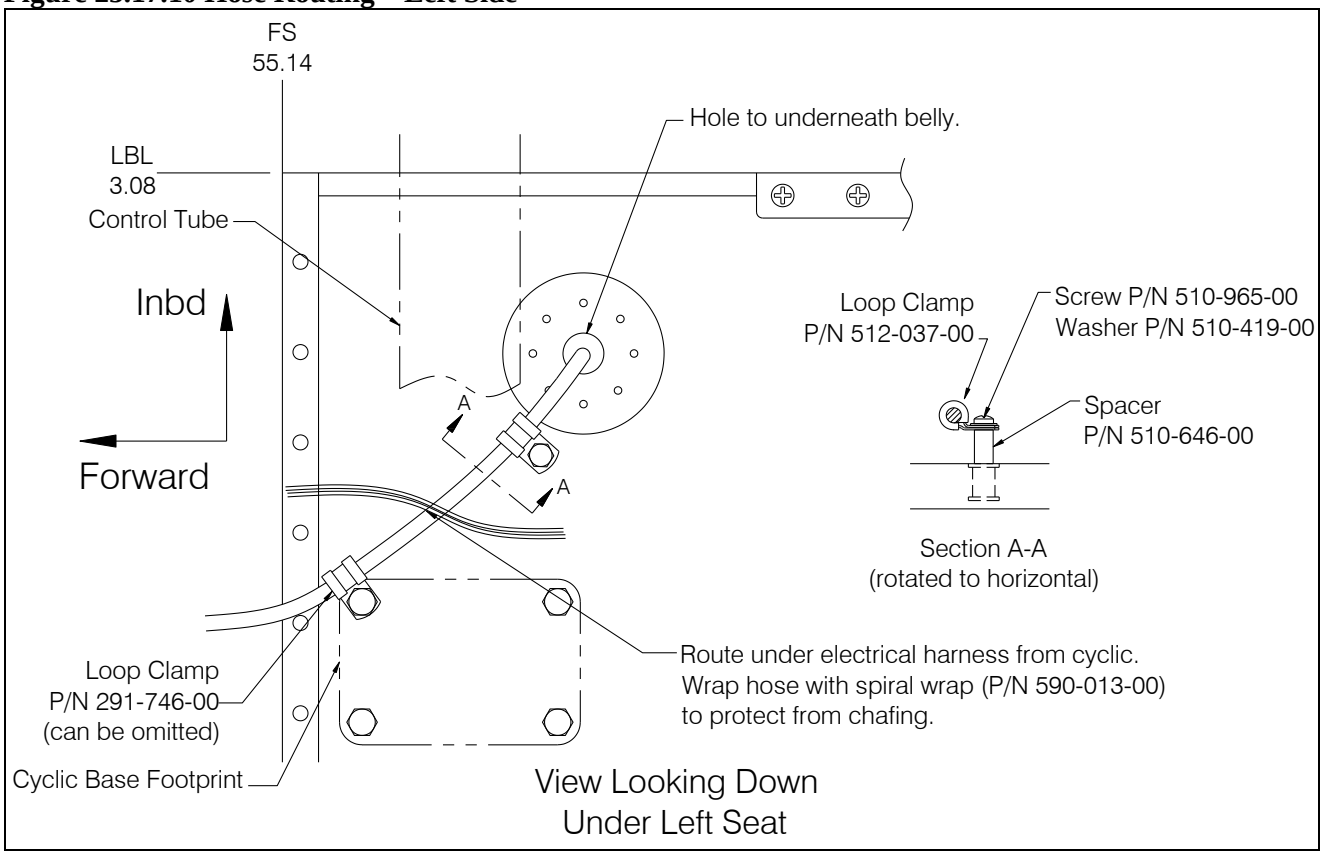
Hydraulic Release System Re-installation continued

For the co-pilot's side (left side) installation the hose is routed under the seat as shown in Figure 25.17.10 to underneath the belly.

⚠ CAUTION

Ensure 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.

Figure 25.17.10 Hose Routing – Left Side

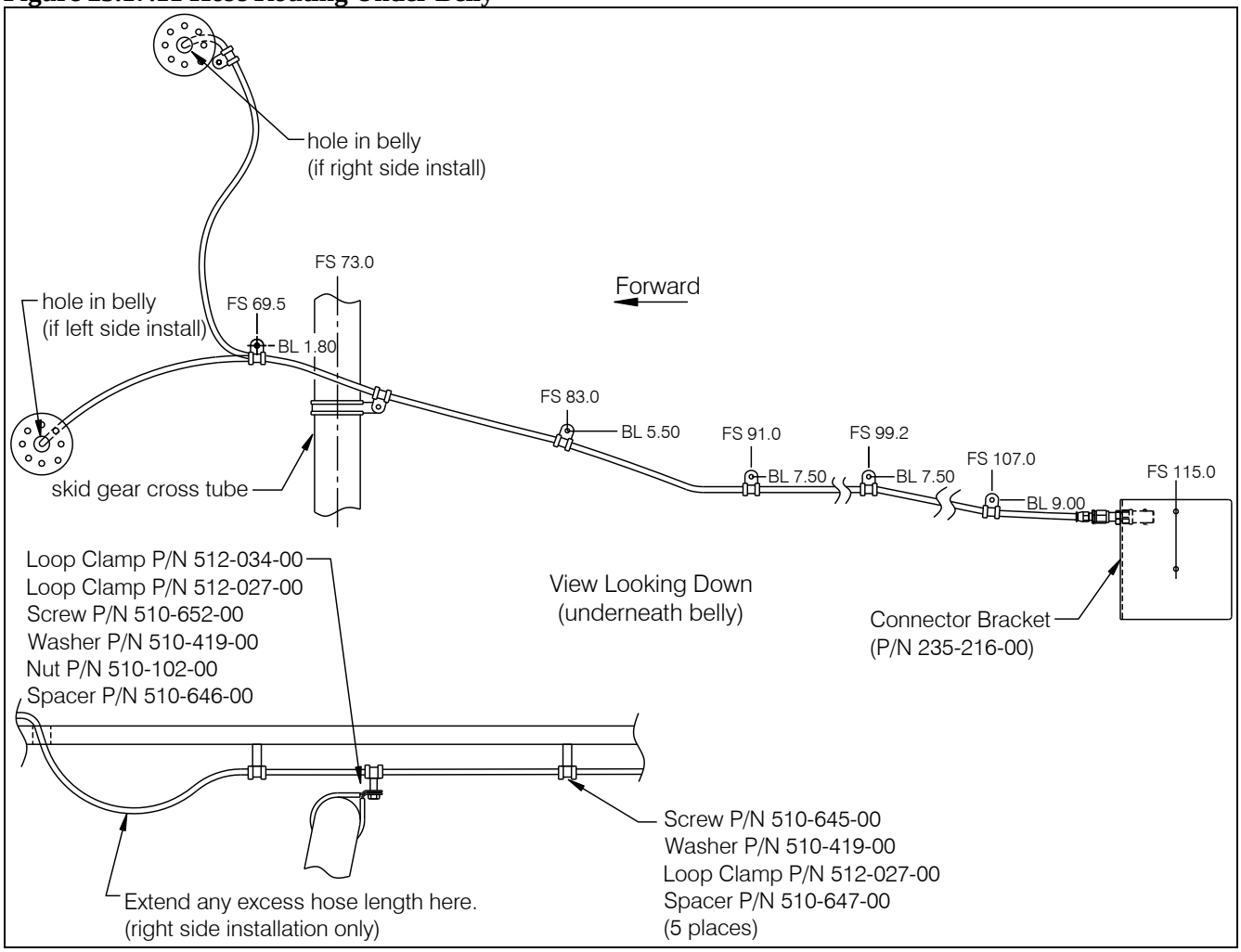


25.17 Component Re-installation continued

Hydraulic Release System Re-installation continued

Underneath the belly, re-install the loop clamps over the hose and the electrical release harness and secure the loop clamps to the belly inserts with spaces and bolts as shown below.

Figure 25.17.11 Hose Routing Under Belly



25.18 General Procedural Instructions-Testing

After re-installation of the cargo hook, hydraulic release, or electrical release system components, perform the following:

1. Activate the electrical system and press the Cargo Release button to ensure the cargo hook electrical release system is operating correctly. The cargo hook must release. Reset the hook by hand after release.

   CAUTION

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

   The following instructions are applicable to cargo hook P/N 528-028-02 which is equipped with Surefire electrical release. With no load on the cargo hook perform the following.

   - *Very* briefly press the Cargo Release switch, the cargo hook should not actuate and the load beam should remain closed.
   - Press and hold the Cargo Release switch for a few seconds, the load beam should fall to the open position and the cargo hook solenoid should continue to cycle repeatedly.
   - Push up on the load beam and verify that it latches and the hook lock indicator is aligned with the engraved line on the manual release cover (see Figure 5.1).

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

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