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E-84 ELECTRONIC LOAD WEIGH SYSTEM

For The
Sikorsky S-61N and S-61L Model Helicopters

Owner's Manual

System Part Numbers
200-243-00, 200-243-01

Owner's Manual Number 120-082-00
Revision 15
November 5, 2021

ONBOARD™ SYSTEMS INTERNATIONAL

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RECORD OF REVISIONS

Revision	*Date*	*Page(s)*	*Reason for Revision*
7	09/17/07	TOC, Section 1, 2-6, 3-8, 3-9, & 3-12	Added explanation of warnings, cautions and notes to general information section. Updated warnings, cautions and notes throughout.
8	3/2/10	TOC, 1-1, Section 2 & Section 4	Updated manual to reflect new load weigh harness configuration. Updated table on page 1-1 to list only the S-61N model (to match STC). Changed overhaul frequency criteria and updated inspection information. Updated EMI note in installation check-out section.
9	03/29/10	Section 1, 2, and 4.	Added 200-243-01, updated installation instructions and maintenance instructions.
10	12/14/10	2-1, 2-5	Changed optional analog meter p/n to 210-180 series (was 210-180-00).
11	06/06/11	1-1, 2-2	Added S-61L model and updated information regarding additional eligible configuration.
12	08/01/12	1-3,2-2,4-5	Replaced cotter pin: 510-098-00 was 510-113-00.
13	11/27/17	2-1, 2-2, 4-2, 4-3	Added clarification for orientation of load cell on cargo hook. Updated definition of external load operations.
14	04/12/18	4-1 through 4-5	Updated 5 year/1000 hour inspection actions. Removed requirement to perform magnetic particle inspection of load cell and replaced with instruction to return to factory for calibration/zero balance, etc., removed daily check.
15	11/05/21	1-3, 1-4 Section 3	Added note regarding C-39 Indicator P/N 210-095-04 w/ NVG backlight. Removed Load Weigh System operation instructions (was section 3) and replaced with reference to manual 120-039-00.

Register Your Products for Automatic Notifications

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

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

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CONTENTS

Section 1
General Information

Introduction

The purpose of the Onboard Systems E-84 Load Weigh system is to display the weight of the load carried on the cargo hook. The Load Weigh System consists of a cockpit mounted Indicator, the Internal Harness and the Load Cell. Optional equipment includes a Data Recorder, Data Card Reader, Data Card, cockpit printer and a 3" Analog Slave Meter. This system is designed specifically for the helicopters listed below that are equipped with the cargo hooks and suspension systems listed, and is intended to be a permanent installation.

The E-84 Load Weigh Systems are approved for installation on the following helicopter(s):

TC Holder	Model	TC
Sikorsky	S-61N, S-61L	1H15

Only those S-61N model helicopters that have been previously modified with one of the STC's listed below are eligible.

Heli-Pro Suspension System	SR00427SE
Croman	SH5125NM
Carson Suspension System	SH639NE

Only those S-61L model helicopters equipped with a Carson Helicopters external load suspension installed per Cargo Sling drawing number S61L-1000 are eligible.

The following cargo hooks are compatible with the E-84 Load Weigh Systems.

Breeze Eastern	SP-7102-1
Mechanical Specialties	6111

This manual describes the installation and operation of the E-84 Load Weigh System.

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.

Inspection

After unpacking the components of the E-84 System, check each component against the bill of materials below to ensure the correct configuration has been received. If an error is found, notify your distributor.

Inspect the components for evidence of mishandling and damage. All parts packaged at the factory were carefully tested, inspected and packaged. If damage is evident, do not proceed with installation. File a claim with the carrier and notify the distributor from whom the system was purchased.

Bill of Materials

The standard E-84 Load Weigh System, part number 200-243-00 or 200-243-01, includes the following items. If shortages are found contact the distributor from whom the system was purchased.

Table 1-1 Bill of Materials

Part No.	Description	200-243-00 Qty	200-243-01 Qty
210-187-00	E-84 Load Cell Assembly	1	-
210-187-01	E-84 Load Cell Assembly	-	1
210-095-00*	C-39 Indicator	1	1
270-092-01	Internal Harness Assembly	1	1
232-074-00	Hook Link Assembly	4	4
510-171-00	Washer	8	8
510-097-00	Washer	4	4
510-304-00	Bolt	4	4
510-096-00	Nut	4	4
510-098-00	Cotter Pin	4	4
400-048-00	Power Switch	1	1
215-010-00	Placard	2	2
215-012-00	Placard	1	1
512-001-00	Ty-Wrap	10	10
510-028-00	Screw	4	4
510-029-00	Nut	4	4
120-039-00	Owner’s Manual, C-39 Indicator	1	1
120-082-00	Owner's Manual	1	1
121-056-00	RFMS	1	1

*Note: The P/N 210-095-00 C-39 Indicator may be replaced by P/N 210-095-04 C-39 Indicator w/ NVG backlight (28 VDC). These indicators are identical with the exception of the backlight.

Cockpit Indicator

The C-39 model cockpit Indicator is a microprocessor-based instrument that receives data from the pilot and the load cell and displays computed load data. Entered data is retained in the system non-volatile memory when the system is powered down. Refer to the Owner's Manual 120-039-00 for instructions on setting up and operating the C-39 Indicator.

The features of the C-39 Indicator include:

- Front panel programmable
- Data Recorder communications link
- Internal back lighting system
- Analog Meter Output Signal

Table 1-2 Indicator Specifications

Size	Fits standard 2¼" clock hole
Weight	0.47 lbs (.21 kgs)
Operating Voltage	21 to 31 VDC
Current Consumption	< 150 mA
Accuracy Over Operating Temperature Range	0.1% ± 1 digit
Operating Temperature Range	+70°C to –45°C
Storage Temperature Range	+80°C to –50°C
Scalable Analog Output	0 to 5 VDC ± 0.5%

Table 1-3 Indicator Pin Out

Pin	Function
A	+ 24 VDC In
B	- Load Cell Signal
C	+ Load Cell Signal
D	+ Load Cell Excitation
E	Load Cell Common
F	Analog Out Common
G	+ Analog Out
H	Hook Open
J	Data Recorder Clock
K	Data Recorder Data
L	Shield
M	Back Light Common
N	Back Light Source 24 VDC
P	Aircraft Ground
R	Not Used

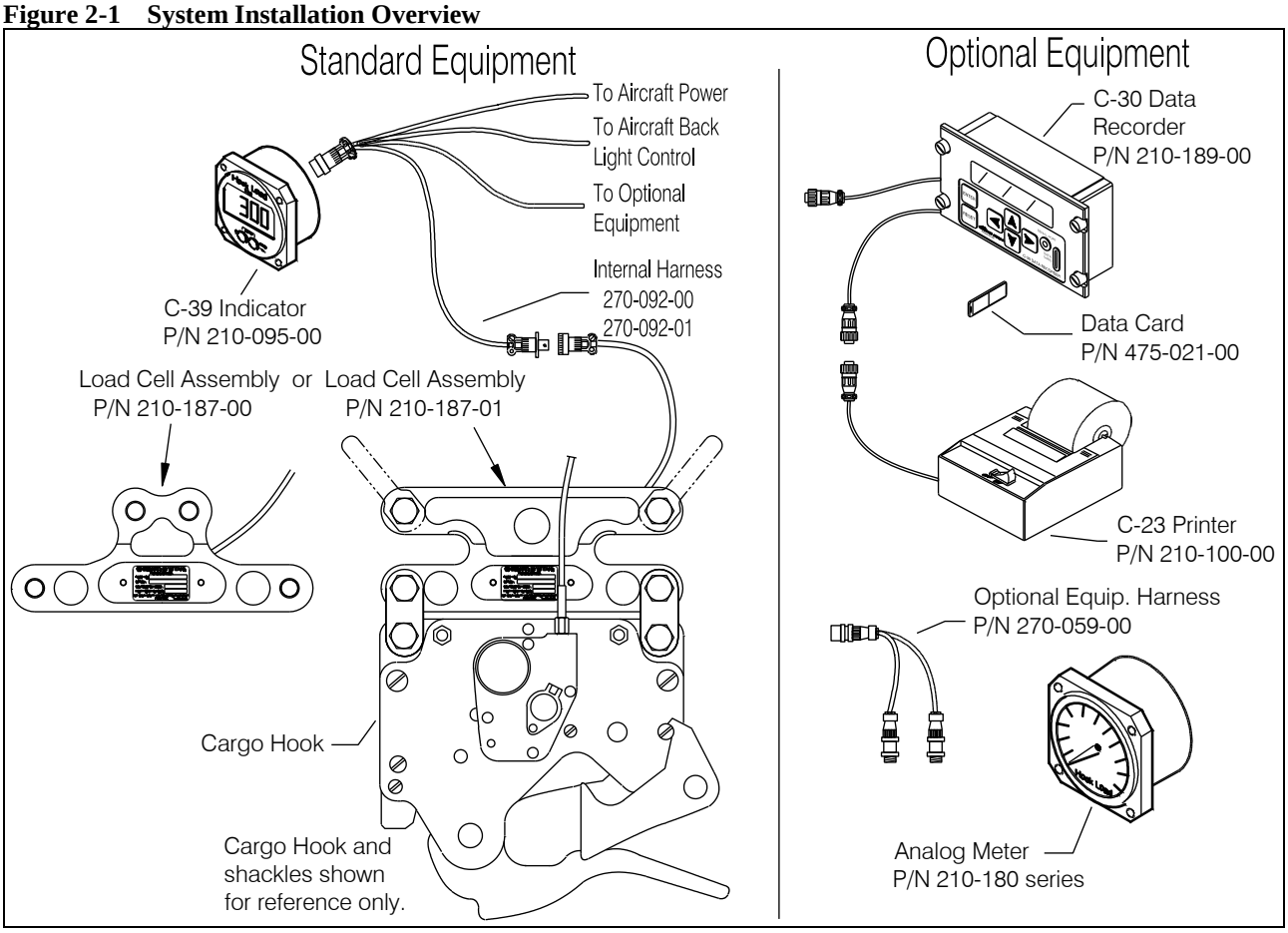
Section 2
Installation Instructions

Introduction

This section describes how to install the components of the Electronic Load Weigh System.

System Installation Overview

Figure 2-1 System Installation Overview



Load Cell Installation

Before beginning installation, verify that the suspension system cable geometry is correct. The cable attach points on the airframe must be at the chine line on the lower surface of the skin at STA 243.5, BL 38.2 and STA 290, BL 38.2. For the S-61N model the suspension cable lengths must be between 58 and 62 in. long and for the unsymmetrical keel of the S-61L the LH cables are to be between 54 and 56 in. long.

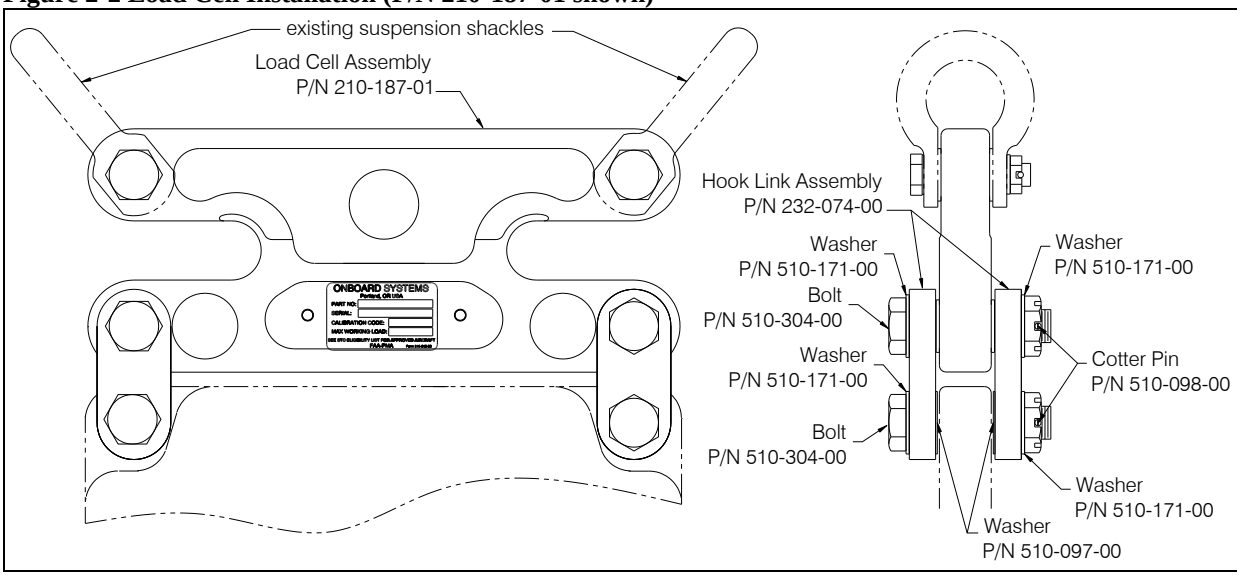
- Remove the suspension shackles from the cargo hook.
- Attach the load cell to the shackles re-using the hardware that attached the cargo hook to the shackles.

NOTICE

Orient the load cell such that its 90° electrical cable fitting is on the opposite side from the manual release cable of the cargo hook (ref. Figure 2-1).

- Attach the cargo hook to the load cell using the fasteners provided (refer to Figure 2-2).
- Tighten the cargo hook attaching fasteners to finger tight and rotate to next castellation to install cotter pins. Ensure that hook links are free to pivot.

Figure 2-2 Load Cell Installation (P/N 210-187-01 shown)



Secure the load cell electrical harness to the left front suspension cable, with ty-wraps, in a manner that will provide the maximum protection. Ensure that the harness is not strained during all possible hook movements.

Swing the hook assembly to verify that the electrical and mechanical release systems are not stretched and remain functional in all possible operating positions.

Indicator Installation

The Indicator should be mounted in a position that is convenient, accessible and visible to the pilot. It can be mounted in a standard 2¼" instrument hole. Connect the Indicator to its Internal Harness, refer to *Internal Harness Installation*.

Internal Harness Installation

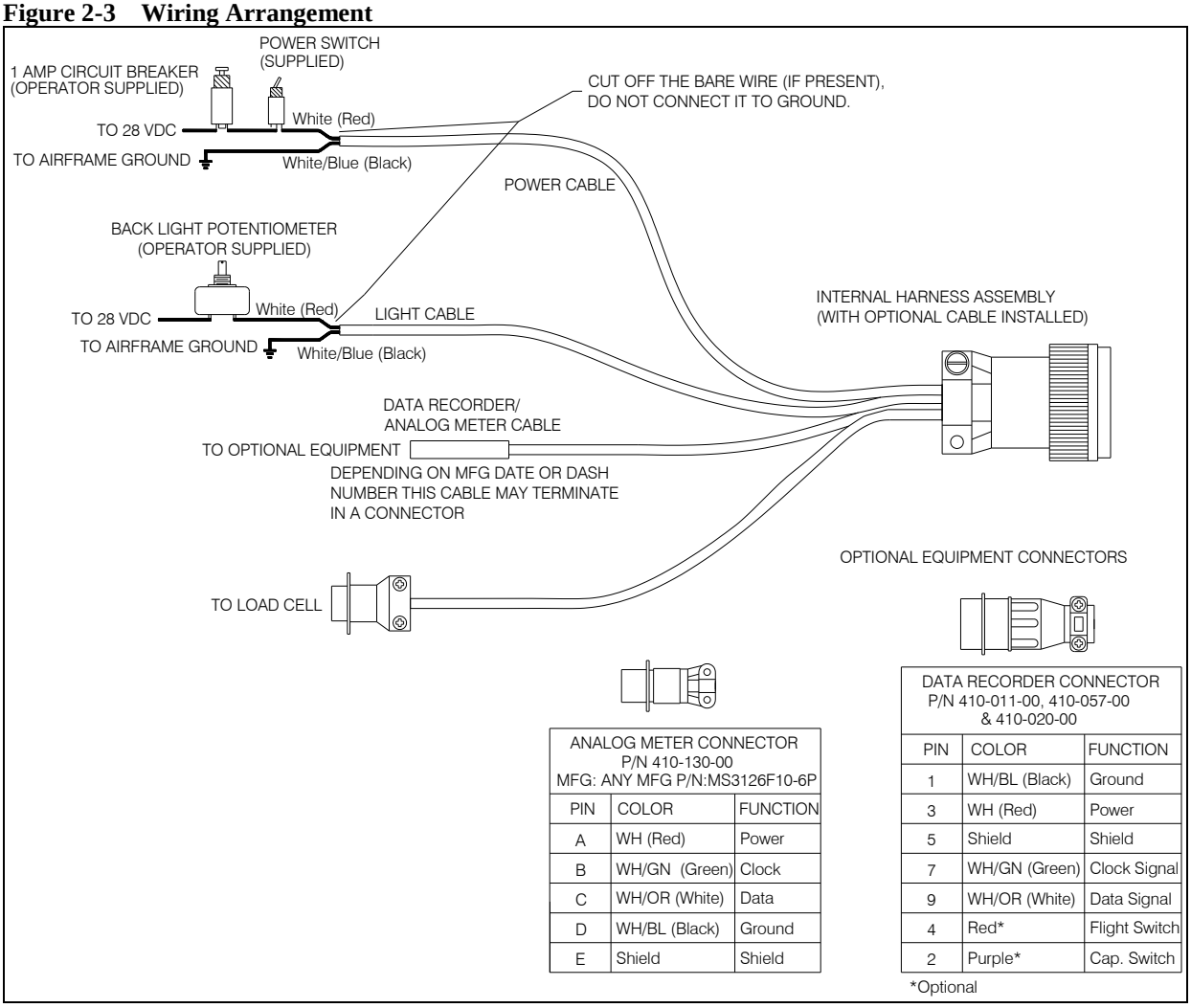
The Internal Harness is made up of four cables terminated to one connector (see Figure 2-3). The connector is mated with the cockpit Indicator connector located on the back of the Indicator. One of the Internal Harness cables is marked "LOAD CELL" and is connected to the load cell. Another cable is marked "POWER" and is connected to aircraft electrical power. Another cable is marked "LIGHT" and enables the system display backlight to be connected to the aircraft's instrument panel backlight control. The last cable is marked "DATA" and can be connected to an optional Data Recorder or Analog Slave Meter. These optional items are not included under this STC.

Position the Internal Harness connector next to the cockpit Indicator connector located on the back of the Indicator, but do not connect it. Route the load cell cable from the Indicator to the load cell belly connector location with the existing aircraft wire bundles. Route the cables so that they are protected from tension, shearing, bending and vibration. Attach the load cell connector to a convenient location in the cargo hook area. Secure the cables to the existing wiring bundles with the Ty-wraps.

Install the supplied power switch, P/N 400-048-00. The "POWER" cable on the Internal Harness is supplied extra long, cut off the excess cable and use as needed to connect the switch and circuit breaker. Connect the "POWER" white (red, if wire harness P/N 270-092-00 is installed) wire to one side of the power switch, connect another piece of suitable wire to the other side of the switch and then to an available 1 or 2-amp circuit breaker as illustrated in Figure 2-3. Connect the circuit breaker to the 28 VDC bus. Connect the white/blue (black if wire harness P/N 270-092-00 is installed) wire to the ground bus. The bare wire (present on wire harness P/N 270-092-00 only) should be cut off as it is not needed at this end of the cable. Use a minimum of 22 AWG wire to make all connections. Secure the connections and protect from corrosion.

Internal Harness Installation continued

Figure 2-3 Wiring Arrangement



ANALOG METER CONNECTOR
P/N 410-130-00
MFG: ANY MFG P/N:MS3126F10-6P

PIN	COLOR	FUNCTION
A	WH (Red)	Power
B	WH/GN (Green)	Clock
C	WH/OR (White)	Data
D	WH/BL (Black)	Ground
E	Shield	Shield

DATA RECORDER CONNECTOR
P/N 410-011-00, 410-057-00
& 410-020-00

PIN	COLOR	FUNCTION
1	WH/BL (Black)	Ground
3	WH (Red)	Power
5	Shield	Shield
7	WH/GN (Green)	Clock Signal
9	WH/OR (White)	Data Signal
4	Red*	Flight Switch
2	Purple*	Cap. Switch

*Optional

Connect the Internal Harness to the Indicator connector. Install the placard 215-010-00 “ELECTRONIC WEIGHING SYSTEM” next to the power switch and circuit breaker. Install the placard 215-012-00 “TURN THE WEIGHING SYSTEM OFF WHEN NAVIGATION EQUIPMENT IN USE. NO AIRCRAFT OPERATION SHOULD BE PREDICATED ON THE READING OF THE ONBOARD WEIGHING SYSTEM” next to the Indicator.

NOTICE

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

Indicator Internal Back Light

The Indicator is equipped with an Internal Back Lighting System that can be connected to the aircraft 28 VDC light dimming circuit. Use a 22 AWG, twisted pair, shielded cable to connect the aircraft dimming circuit to the Internal Harness. Connect the cable shield wire to airframe ground at the light dimmer end of the cable **ONLY**.

Indicator Hook-Open Warning

The Indicator is equipped with a Hook-Open Warning feature that can be connected to a cargo hook equipped with a hook open switch. Depending on the capabilities of the cargo hook switch, the Indicator will flash "HOOK OPEN" when the cargo hook load beam is open. The cargo hook switch must be normally open when the cargo hook load beam is in the closed position. When the load beam is open, one side of the switch must be grounded and the other side of the switch is to be connected to the Indicator. Use a 22 gauge, shielded wire to connect the cargo hook switch to the Indicator. Disassemble the Indicator mating connector and carefully solder the wire, from the cargo hook switch, to pin H. Connect the cable shield wire to airframe ground as close to the cargo hook as possible, at the cargo hook end of the cable **ONLY**.

Analog Slave Meter

The C-39 Indicator can be connected to an Onboard Systems' Analog Slave Meter (P/N 210-180 series) through the "DATA" cable. The Analog Slave Meter may be mounted in any convenient location in a standard 3" instrument hole. Attach connector, P/N 410-130-00, to data line per pin out in Figure 2-3 to connect the Analog Slave Meter to the Internal Harness "DATA" cable. If a data connector is present on the data line use cable, P/N 270-059-00, to connect to Analog Slave Meter.

The C-39 Indicator is equipped with an Analog drive circuit that can be connected to a remote analog meter. Use a 22 AWG, twisted pair, shielded cable to connect the remote analog meter to the Indicator. Disassemble the Indicator mating connector and carefully solder the positive wire, from the analog meter, to pin G and the common wire to pin F. Connect the cable shield wire to airframe ground as close to the analog meter as possible, at the analog meter end of the cable **ONLY**.

Installation Check-Out

After the system has been properly installed, activate the circuit breaker to turn the system on. Refer to *Operation Instructions*.

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

NOTICE

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

Ensure that the cargo hook is free to move to its full extremes.

Ensure that all electrical cables are secured clear of flight controls and hydraulic lines.

Weight and Balance

Table 2-1 Weight and Balance

ITEM	200-243-00 WEIGHTS	200-243-01 WEIGHTS
Indicator	.47 lbs (.21 kgs)	0.47 lbs (0.21 kgs)
Load Cell	6.0 lbs (2.72 kgs)	9.0 lbs (4.08 kgs)
Hook Links and hardware	3.0 lbs (1.36 kgs)	3.0 lbs (1.36 kgs)
Internal Wiring Harness	1.36 lbs (0.62 kgs)	1.36 lbs (0.62 kgs)
Total	**10.83 lbs (4.91 kgs)**	**13.83 lbs (6.27 kgs)**

Paper Work

Insert the Flight Manual Supplement 121-056-00 into the aircraft flight manual. In the US fill in FAA form 337 for the initial installation. This procedure may vary in different countries. Make the appropriate aircraft log book entry.

Section 3
Maintenance

The following procedures are provided for the benefit of experienced aircraft maintenance facilities capable of carrying out the procedures. They must not be attempted by those lacking the necessary expertise. It is recommended that only minor repairs be attempted by anyone other than the factory.

Lubrication

Lubrication of the Load Weigh System is recommended every 500 hours of operation. To obtain maximum life under severe duty conditions such as logging or seismic work, it is recommended to lubricate the lower Load Cell Assembly pivot bushings every 200 hours. Recommended lubricants are AeroShell 17, MIL-PRF-21164 or Mobilgrease 28, MIL-PRF-81322.

Inspection

The scheduled inspection/overhaul intervals noted below are maximums and are not to be exceeded. If the load weigh system 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.

Annually or 100 hours of external load operations, whichever comes first, inspect the load weigh system per the following instructions (see Figures 3.1 through 3.3 for part identification and Table 3.1 for inspection criteria).

NOTICE

*Hours of external load operations should be interpreted to be **(1)** anything is attached to the 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.*

1. Visually inspect the electrical harness strain relief at the load cell for damage.
2. Visually inspect the external load cell electrical harness for damage and chafing.
3. Visually inspect the load weigh harness connector at the belly of the helicopter for damage and security.
4. Visually inspect the load cell covers for corrosion, damage and security.
5. Visually inspect the load cell body for corrosion, damage and cracks.

Inspection continued

Every 5 years or 1000 hours of external load operations, whichever comes first, inspect the load weigh system per the following instructions (see Figure 3.1 through 3.3 for part identification and Table 3.1 for inspection criteria).

1. Return the Load Cell Assembly (P/Ns 210-187-00, 210-187-01) 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.
2. Inspect bushings (items 1.2, 1.3, 1.4 of Figure 3.2 and item 2.2 of Figure 3.3) for corrosion and wear (see Table 3.1 for wear limits).
3. Inspect Links (item 2.1 in Figure 3.3), refer to Table 3.1.
4. Inspect internal electrical harness from the load weigh indicator to the load cell for general condition, security of attachment, and chafing along the length of wire runs.
5. Inspect for security of load weigh indicator attachment.
6. Inspect attachment hardware, refer to Table 3.1.

Inspection continued

Figure 3.1 Load Weigh System Components

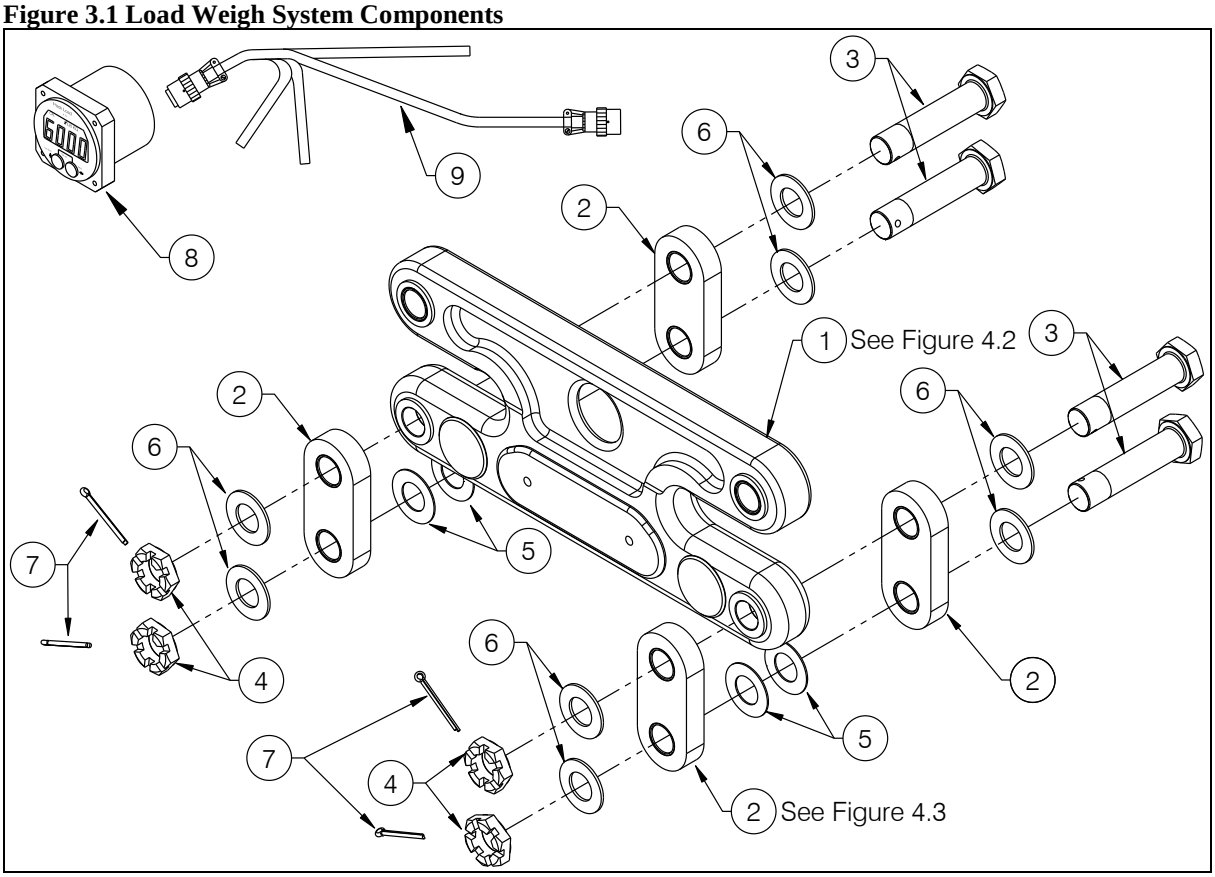
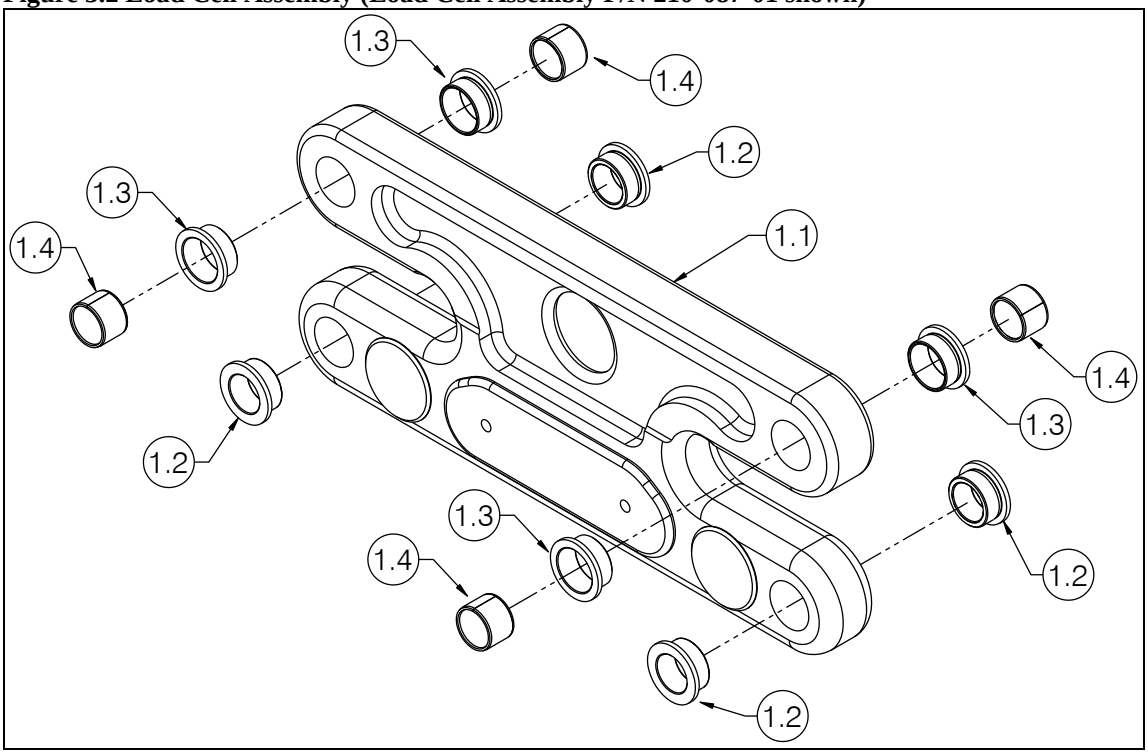


Figure 3.2 Load Cell Assembly (Load Cell Assembly P/N 210-087-01 shown)



Inspection continued

Figure 3.3 Link Assembly

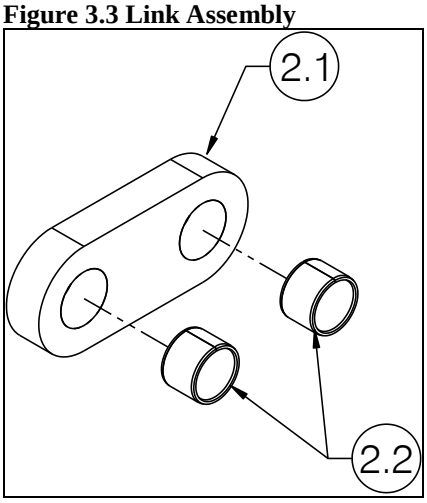


Table 3.1 Inspection Criteria

Item	Part	Inspect for:	Repair
1	Load Cell Assembly P/N 210-187-00 P/N 210-187-01	Dents, nicks, cracks, gouges, corrosion or scratches in the load cell body.	Repair dents, gouges, nicks, scratches and corrosion if less than .030" deep, blend out at a ratio of 20:1, length to depth, replace assembly if otherwise damaged. Load cell body is 15-5 stainless steel, no finish touch-up required.
		Dents, nicks, cracks, gouges, corrosion or scratches in the covers.	Repair dents, gouges, nicks, scratches and corrosion if less than .050" deep, blend out at a ratio of 20:1, length to depth. Touch up with alodine and zinc chromate primer.
1.2	Bushing (Qty 4) P/N 290-529-00	Wear on inside diameter.	Replace bushing if inside diameter exceeds 0.640 in. See Note 1 at the end of this table for optional repair to improve bushing service life.
1.3	Bushing (Qty 4) P/N 290-647-00	Wear on inside diameter.	Replace if inner bushing has worn through.
1.4	Bushing (Qty 8) P/N 517-025-00	Wear on inside diameter.	Replace bushing if inside diameter has greater than 50% copper showing.
2.1	Link (Qty 4) P/N 290-526-00	Dents, nicks, cracks, gouges, corrosion or scratches in the load cell body.	Repair dents, gouges, nicks, scratches and corrosion if less than .030" deep, blend out at a ratio of 20:1, length to depth, replace assembly if otherwise damaged. Load cell body is 15-5 stainless steel, no finish touch-up required.
2.2	Bushing (Qty 4) P/N 517-025-00	Wear on inside diameter.	Replace bushing if inside diameter has greater than 50% copper showing.
3	Bolt (Qty 4) P/N 510-304-00	Wear on outside diameter, security of attachment.	It is recommended to replace threaded fasteners at 5 year/1000 hour interval.
4	Nut (Qty 4) P/N 510-096-00	Security of attachment.	It is recommended to replace threaded fasteners at 5 year/1000 hour interval.
7	Cotter Pin (Qty 4) P/N 510-098-00	Security of attachment.	Replace.

Note 1: Open 290-529-00 bushing ID to .7192/.7184. Install P/N 517-025-00 bushings with wet zinc chromate primer. Remove excess primer from bushing inner diameter. Do not lubricate bushings.

Trouble Shooting

Table 3.2 Trouble Shooting

PROBABLE CAUSE	DIFFICULTY	CORRECTIVE ACTION
Short in the system, faulty circuit breaker or switch.	Circuit breaker opens when the circuit to Load Weigh System is energized.	Repair or replace defective wiring, circuit breaker and switch.
Faulty wiring, circuit breaker or switch.	Load Weigh Indicator does not light up.	Check the power switch, circuit breaker and wiring. If this doesn't help, return the unit to the factory.
	Where Am I?	Turn the Indicator power off for a few moments. When it comes to life it will be in the Run mode.
Incorrect Calibration Code.	Displayed load is incorrect.	Insure the correct Calibration Code has been entered.
Dampening level is too small.	Displayed load is not stable.	Adjust the Dampening level to a larger number.
Dampening level is too large.	Displayed load takes too long to change the reading when the load is changed.	Adjust the Dampening level to a smaller number.
NV Ram failure, A/D or D/A circuit failure.	Do not recognize the displayed numbers on the Indicator.	Refer to *Error Codes* in section 3.
Defective load cell or damaged internal harness.	Load Weigh Indicator does not change with changing hook loads.	Check for damaged internal harness, replace load cell.

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

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

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Section 4
Certification
FAA STC

United States of America

Department of Transportation—Federal Aviation Administration

Supplemental Type Certificate

Number **SR00681SE**

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

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 7 *of the* Civil Air *Regulations.*

Original Product—Type Certificate Number: 1H15
Make: Sikorsky Aircraft
Model: S-61L, S-61N

Description of the Type Design Change: Fabrication of Onboard Systems Model 200-243-00 or 200-243-01 Cargo Hook Load Weigh System in accordance with FAA Approved Onboard Systems Master Drawing List No. 155-046-00, revision 14, dated April 5, 2010, or later FAA approved revision; and installation of this cargo hook load weigh system in accordance with FAA approved Onboard Systems Owner's Manual No. 120-082-00, revision 9, dated March 29, 2010, or later FAA approved revision. Inspect this cargo hook load weigh system in accordance with Section 4 of Onboard Systems Owner's Manual No. 120-082-00, revision 9, dated March 29, 2010, or later FAA approved revision.

Limitations and Conditions: Approval of this change in type design applies only to those Sikorsky Model S-61N rotorcraft equipped with an FAA approved installation of cargo hook Model No. SP-7102-1 (Breeze Eastern) or 6111 (Mechanical Specialties, Inc.) installed in accordance with external load suspension Supplemental Type Certificates No. SR00427SE (Helipro), SH5125NM (Croman), or SH639NE (Carson) or Sikorsky model S-61L rotorcraft equipped with a Carson Helicopters external load suspension installed per Carson Cargo Sling Install drawing no. S61L-1000. This approval should not be extended to other rotorcraft of these models on which other previously approved modifications are incorporated unless it is determined by the installer that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that rotorcraft. Modified rotorcraft must be operated in accordance with a copy of an FAA approved Onboard Rotorcraft Flight Manual Supplement (RFMS) No. 121-056-00, revision 1, dated July 15, 2011, or later FAA approved revision. A copy of this Certificate and FAA approved RFMS must be maintained as part of the permanent records of the modified rotorcraft.

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

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

Date of application: January 12, 1999
Date of issuance: March 9, 1999
Date reissued:
Date amended: 1/13/2003; 7/01/2010; July 21, 2011

By direction of the Administrator

(Signature)
Acting Manager, Seattle Aircraft Certification Office
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2(10-68)

Canadian STC

Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

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

Number: SH99-213
Issue No.: 2
Approval Date: August 16, 1999
Issue Date: September 14, 2011

Responsible Office: Pacific

Aircraft/Engine Type or Model: Sikorsky S-61L, S-61N

Canadian Type Certificate or Equivalent: FAA TCDS 1H15

Description of Type Design Change: Installation of Onboard Systems Model 200-243-00 or 200-243-01 per FAA STC SR00681SE

Installation/Operating Data, Required Equipment and Limitations:

Installation of Onboard Systems Model 200-243-00 or 200-243-01 Cargo Hook Load Weigh System is to be carried out in accordance with FAA approved Onboard Systems Owner's Manual No. 120-082-00, Revision 9, dated March 29, 2010 *.

The Onboard Systems Model 200-243-00 or 200-243-01 Cargo Hook Load Weigh System is to be fabricated in accordance with FAA approved Onboard Systems Master Drawing List No. 155-046-00, Revision 14, dated April 5, 2010 *. Inspect this cargo hook load weigh system in accordance with Section 4 of Onboard Systems Owner's Manual No. 120-082-00, Revision 9, dated March 29, 2010 *.

Modified rotorcraft must be operated in accordance with an FAA approved copy of Onboard Rotorcraft Flight Manual Supplement No. 121-056-00, Revision 1, dated July 15, 2011 *.

Limitations :

Approval of this change in type design applies to only those Sikorsky Model S-61N rotorcraft equipped with an FAA approved installation of Cargo Hook Model No. SP-7102-1 (Breeze Eastern) or 6111 (Mechanical Specialties, Inc.) installed in accordance with external load suspension Supplemental Type Certificate No. SH98-2 (Helipro), SH96-96 (Croman), or SH96-124 (Carson); or Sikorsky S-61L rotorcraft equipped with an FAA approved Carson Helicopters external load suspension installed per Carson Cargo Sling Install Drawing No. S61L-1000.

(* or later FAA approved revisions)

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

Henry Wong
For Minister of Transport

Canada