

GOODRICH
GROUND SUPPORT EQUIPMENT MANUAL
PART NUMBER 49900-889

TO: HOLDERS OF GROUND SUPPORT EQUIPMENT MANUAL GSE-2017-01, DATED JUN 29/18 COVERING THE FIELD LOAD CHECK TOOL KIT, PART NUMBERS 49900-889-103 AND 49900-889-104 FOR FIELD LOAD CHECK TOOL, PART NUMBER 49900-890.

REVISION NO. 3

DATED JUN 24/19

HIGHLIGHTS

THIS MANUAL HAS BEEN REVISED. HIGHLIGHTS OF THIS REVISION ARE INCLUDED BELOW, AND CHANGE BARS HAVE BEEN INCLUDED, INDICATING AREAS OF CHANGE. PLEASE REPLACE THE AFFECTED PAGES FROM THE PREVIOUS REVISION WITH THE REVISED PAGES FROM THIS REVISION 3 DATED JUN 24/19.

SECTION	DESCRIPTION OF CHANGE
All Pages	Updated to Reflect the New Revision Number and Date Removed the Name Sensors and Integrated Systems throughout the Document Updated all cross references to Blue Hyper-link throughout the Document
Title Page	Updated Copyright Year
Record of Revisions	Updated Record of Revisions
CHAPTER 2 - Maintenance	Updated Table 2-3 - Equipment and Materials Updated Figure 2-3 - Installation on Load Cell Holding Fixture Updated Paragraph 4.B.(1) Procedure Updated Paragraph 4.A. Assembly of the Load Check Tool to add step (3).(c) Updated Figure 2-2 - Calibration Test Datasheet

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GOODRICH CORPORATION
2727 E IMPERIAL HWY, BREA, CALIFORNIA 92821

FIELD LOAD CHECK TOOL KIT

PART NUMBER
49900-889-103
49900-889-104

FOR

FIELD LOAD CHECK TOOL
PART NUMBER
49900-890

GROUND SUPPORT EQUIPMENT MANUAL WITH ILLUSTRATED PARTS LIST

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SERVICE BULLETIN LIST

When a Service Bulletin is received for this assembly, perform the instructions given, log it into the Service Bulletin List given below, and insert the Service Bulletin into this section to maintain a historical record.

NOTE: Alert Service Bulletins are produced on blue colored paper with the heading ALERT. When an ALERT Service Bulletin is received, take immediate action.

SERVICE BULLETIN NUMBER	ORIGINAL ISSUE DATE	REVISION NUMBER AND DATE	INSERTION DATE	SUBJECT
49900-889-101-01	Jan 19/17	1 - Initial	No Effect	Remove 49900-889-101 FLCTs from service
49900-890-01	Jun 14/17	1 - Initial	Jun 24/19	Field Load Check Tool - Product Improvement

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CHAPTER 1 - GENERAL INFORMATION AND OPERATING PROCEDURES

1. Purpose

- A. This section provides an overview of the Field Load Check Tool (FLCT) kit.

2. Description

- A. The FLCT Kit consists of a load check tool, extra tooling, documentation, and additional adapters to attach the load check tool to the ball end of a Goodrich Rescue Hoist cable to check for proper hoist load retention.
- B. The load check tool utilizes a 2000 lbs (907 kg) tension TEDS load cell to measure the imparted load.
- C. The tension load cell is connected to a hand-held digital display (TEDS portable smart sensor indicator) compliant to IEEE 1451.4 which displays the measured load (see [Figure 1-1](#)).

3. General Warnings and Cautions

- A. This Technical Manual has been prepared by Goodrich Corporation. The manual contains the information, procedures and special tools for the maintenance of the equipment. Deviation from the operating, maintenance, repair and/ or test procedures contained in this manual is not approved by Goodrich Corporation and is therefore at the operators OWN RISK. Any deviation from the procedures and instructions, other than those which have been authorized in writing by Goodrich Corporation, could result in considerable financial liability to those who authorize the deviations.
- B. WARNINGS and CAUTIONS are provided as appropriate in this manual. The WARNINGS and CAUTIONS contained in this manual must be read in conjunction with the manufacturers WARNINGS and CAUTIONS contained on the packaging, the containers, and/or in manufacturers instructions. In the case of conflict, the manufacturers instructions take precedence over the instructions contained in this manual.
- C. Users are warned that failure to follow directions contained in any appropriate manual or instructional document could cause death or injury to persons and damage to equipment or property.
- D. Failure to comply with, or deviation from, the instructions and information contained in this Technical Manual is the operators responsibility and may invalidate the equipment Warranty or Certification.
- E. Do not use parts that have been repaired using procedures not contained or referred to in this manual or which are not otherwise authorized by Goodrich Corporation, Brea, California.

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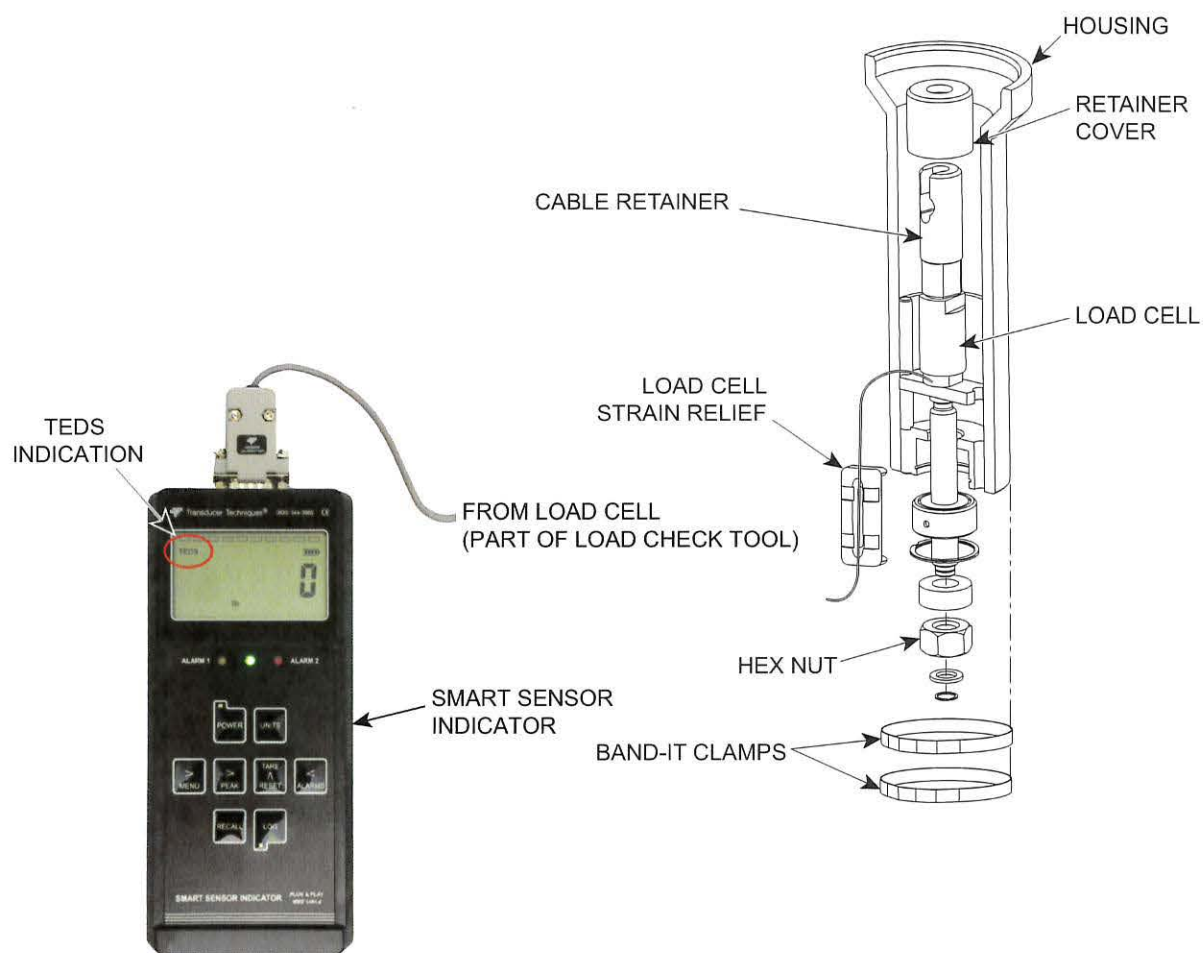


Figure 1-1. Field Load Check Tool

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4. Abbreviations and Unit Symbols

- A. Abbreviations and unit symbols used in this manual are shown below. All weights and dimensions are shown in English standard units, with the metric equivalent in parenthesis.

°C	Degrees Celsius (0 °C = 32 °F)
°F	Degrees Fahrenheit (0 °F = -17.78 °C)
ALT	Alternate
AR	As Required
ASSY	Assembly
CAGE	Commercial and Government Entity
CCW	Counter-clockwise
cm	Centimeter (1 cm = 0.394 inch)
Cont.	Continued
CW	Clockwise
EFF	Effectivity
Fig	Figure
FLCT	Field Load Check Tool
ft	Feet
ft-lb	Foot-pound (1 ft-lb = 1.36 N-m)
GSE	Ground Support Equipment
IEEE	Institute of Electrical and Electronics Engineers
in-lbs	Inch-pounds (1 in-lb = 0.11 N-m)
IPL	Illustrated Parts List
lbs	Pounds
kg	Kilogram
max	Maximum
min	Minimum
N-m	Newton-meter (1 N-m = 8.85 in-lbs)

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NA	Not Applicable
NHA	Next Higher Assembly
NIST	National Institute of Standards and Technology
P/N	Part Number
REF	Reference
RF	Reference
SB	Service Bulletin
SIL	Service Information Letter
SSI	Smart Sensor Indicator
TEDS	Transducer Electronic Data Sheets
TOC	Table of Contents
UUT	Unit Under Test

5. Operation

- A. Refer to Goodrich SIL-2014-01 for specific operating instructions.

NOTE: SIL-2014-01 is accessible at customers.utcaerospacesystems.com.

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CHAPTER 2 - MAINTENANCE

SECTION 1 - SERVICING

1. **Purpose**

- A. This section gives the necessary servicing instructions for the Field Load Check Tool (FLCT) kit, to make sure that the components are in good working order and the FLCT is properly calibrated.

2. **Maintenance Schedule**

Table 2-1. Periodicity Maintenance Chart

ITEM	MONTHS	SECTION
CALIBRATION	EVERY 12 MONTHS	SECTION 2 - CALIBRATION

NOTE: This manual only applies to Field Load Check Tool Kit P/N's 49900-889-103 and 49900-889-104. Field Load Check Tool Kit P/N 49900-889-101 is obsolete and must be removed from service. Refer to Service Bulletin 49900-889-101-01.

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SECTION 2 - CALIBRATION

1. Purpose

A. This section gives the necessary instructions to do the calibration of the Field Load Check Tool (FLCT), P/N 49900-890, to make sure that, it operates correctly at various load points. Calibration may be achieved by either of two methods given below:

- (1) Method 1: Calibrate the tension load cell (80, [IPL Figure 1](#)) and smart sensor indicator (15, [IPL Figure 1](#)) per [Paragraph 3](#).

NOTE: If the FLCT user chooses to calibrate the FLCT per Method 1 ([Paragraph 3](#)), the FLCT user assumes any and all risks of bodily injury, death or property damage, whether those risks are known or unknown. This also covers and includes all unknown, unforeseen, unanticipated and unsuspected injuries, damages, loss and liability and the consequences thereof. The provisions of any state, federal, local, or territorial law shall not extend to claims, demands, injuries, or damages which are known or unsuspected as of the publication date of this manual, to the FLCT user.

- (2) Method 2: Perform a calibration test of the FLCT per [Paragraph 4](#).

NOTE: The load check tool kit (-1, -1A, [IPL Figure 1](#)) may be returned to Goodrich Corporation (V3HRL4) for a calibration test per Method 2 at the following location:

Goodrich Corporation,
2727 E Imperial Highway
Brea, California 92821
Phone: 714-984-1461

2. Test Equipment and Materials

- A. Calibration of test and measuring instruments shall be in accordance with ANSI/NCSL Z540-3.
- B. The recommended test fixtures, equipment, and materials are given in [Table 2-2](#).

NOTE: Equivalent substitutes may be used for listed items.

Table 2-2. Test Equipment and Materials

DESCRIPTION	PART NUMBER	SPECIFICATION	SOURCE OR CAGE CODE
Calibration Label	QC-125-DS150	-----	Commercially Available
FLCT Test Fixture	T49900-875LTF1 (for Method 2 only)	-----	V3HRL4
Wrench	5163A82	7/8 inch	V3A054

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3. Method 1 - Tension Load Cell and SSI Calibration

NOTE: The load check tool (65, [IPL Figure 1](#)) may be tested per Method 2 in [Paragraph 4](#) as an alternative to this procedure.

- A. Remove the tension load cell (80, [IPL Figure 1](#)) per [Paragraph 3.B](#) of [SECTION 3 - REMOVAL/INSTALLATION](#).
- B. Send the tension load cell (80, [IPL Figure 1](#)) to a National Institute of Standards and Technology (NIST) (or equivalent) certified calibration lab for recalibration in accordance with ANSI/NCSL Z540-3 or equivalent. Calibration shall be up to 2000 lbs (907 kg) in tension only for TEDS type device.
- C. Recalibrate the smart sensor indicator (15, [IPL Figure 1](#)) using one of the following methods:
 - (1) Return the smart sensor indicator (15, [IPL Figure 1](#)) to Transducer Techniques (V0H187) for calibration.
 - (2) Send the smart sensor indicator (15, [IPL Figure 1](#)) with the tension load cell (80, [IPL Figure 1](#)) (refer to [Step 3.B](#)) to a NIST (or equivalent) certified calibration lab for validation against a lab standard TEDS load meter.

NOTE: Make sure that the smart sensor indicator (15, [IPL Figure 1](#)) calibration label on the lower portion of the rear panel is updated by the calibration lab after passing validation.

- D. Reassemble the load check tool (65, [IPL Figure 1](#)) per [Paragraph 4.A](#) of [SECTION 3 - REMOVAL/INSTALLATION](#).
- E. Mark a new Calibration Label, P/N QC-125-DS150 with the load check tool (65, [IPL Figure 1](#)) serial number, date of tension load cell (80, [IPL Figure 1](#)) calibration, calibration due date (12 months from tension load cell (80, [IPL Figure 1](#)) calibration date), and technician/operator acceptance identification. Install the calibration label below the CE label (120, [IPL Figure 1](#)) on the load check tool (65, [IPL Figure 1](#)).

NOTE: Remove and discard the outdated calibration label from the housing (90, [IPL Figure 1](#)).

- F. Reassemble the load check tool kit (-1, -1A, [IPL Figure 1](#)) per [Paragraph 4.B](#) of [SECTION 3 - REMOVAL/INSTALLATION](#).

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4. Method 2 - FLCT Calibration Test

NOTE: The tension load cell (80, [IPL Figure 1](#)) and smart sensor indicator (15, [IPL Figure 1](#)) may be calibrated separately per Method 1 in [Paragraph 3](#) as an alternative to this procedure.

A. Test Conditions

(1) Standard Conditions

PARAMETER	SPECIFICATION
Temperature	Room Ambient +65 °F (18 °C) to +95 °F (35 °C)
Barometric Pressure	Local Standard
Relative Humidity	90% or Less

(2) Tolerances

NOTE: These tolerances only apply if not specified elsewhere.

PARAMETER	SPECIFICATION
Force	±2% (Cable Load)
Temperature	±2.0 °F (1.1 °C)
Voltage	±0.5 Volts
Current	±2.0 Amperes

B. Procedure

(1) Prior to performing these calibration tests:

- (a) Visually check through the window in the housing (90, [IPL Figure 1](#)) and make sure the torque stripe on the load cell shafts is intact (see [Figure 2-3](#)).
- (b) If torque stripe is not intact, disassemble the load check tool (65, [IPL Figure 1](#)) per [Paragraph 3.B](#) of [SECTION 3 - REMOVAL/INSTALLATION](#) only as far as is required to re-torque the tension load cell (80, [IPL Figure 1](#)) per [Paragraph 4.A.\(3\)](#) of [SECTION 3 - REMOVAL/INSTALLATION](#).

WARNING: MAKE SURE THAT THE FLCT TEST FIXTURE IS ATTACHED TO A WORK BENCH OR SIMILAR WORKING SURFACE.

- (2) Turn ON the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) and allow to stabilize for 10 minutes minimum.

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- (3) Connect the load check tool (65, [IPL Figure 1](#)) to the UUT smart sensor indicator (15, [IPL Figure 1](#)). Turn power ON and allow to stabilize for 10 minutes minimum.
- (4) Make sure that the adapter cap is installed on the FLCT Test Fixture, P/N T49900-875LTF1.

NOTE: Do not use the FLCT Test Fixture, P/N T49900-875LTF1 without adapter cap.

- (5) Orient the load check tool (65, [IPL Figure 1](#)) so that the hex ACME nut (105, [IPL Figure 1](#)) is facing up. Install the load check tool (65, [IPL Figure 1](#)) onto the FLCT Test Fixture, P/N T49900-875LTF1, by attaching the cable retainer (75, [IPL Figure 1](#)) of the tool to the cable adapter on the FLCT Test Fixture. See [Figure 2-1](#).

NOTE: Make sure the FLCT Test Fixture cable adapter is assembled so it is level with the FLCT Test Fixture Load Cell. Screw or unscrew the cable adapter as needed.

NOTE: A load can still exist if the hex ACME nut (105, [IPL Figure 1](#)) is loosely installed due to the ball socket attachment design. Loosen the hex ACME nut (105, [IPL Figure 1](#)) and then re-tighten by hand until snug and then back off 1/8 to a 1/4 turn to allow the cable adapter to float in the socket of the cable retainer (75, [IPL Figure 1](#)).

- (6) Zero the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) by pushing the TARE/RESET button. Push the PEAK button to enable the load cell display to read the peak load value.
- (7) Zero the UUT smart sensor indicator (15, [IPL Figure 1](#)) by pushing the TARE/RESET button. Push the PEAK button on the UUT smart sensor indicator (15, [IPL Figure 1](#)) to enable it to read the peak load value.
- (8) Tighten the hex ACME nut (105, [IPL Figure 1](#)) with the 7/8 inch Wrench until a load reading is displayed on the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI).
- (9) Continue to tighten the hex ACME nut (105, [IPL Figure 1](#)) with the 7/8 inch Wrench until a load reading of 750 ± 25 lbs is displayed on the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).

NOTE: If at any time the hex ACME nut (105, [IPL Figure 1](#)) is tightened beyond the required load reading, fully loosen the hex ACME nut (105, [IPL Figure 1](#)) to remove all load from the system and restart the test from [Step 4.B.\(6\)](#).

- (10) Make sure that the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) reading is within ± 7 lbs of the reading shown on the UUT smart sensor indicator (15, [IPL Figure 1](#)). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).

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- (11) Continue to tighten the hex ACME nut (105, [IPL Figure 1](#)) with the 7/8 inch Wrench until a load reading of 1000 ± 25 lbs is displayed on the FLCT Test Fixture, P/N T49900-875LTF1, load cell display. Record the results on the Calibration Test Datasheet in [Figure 2-2](#).

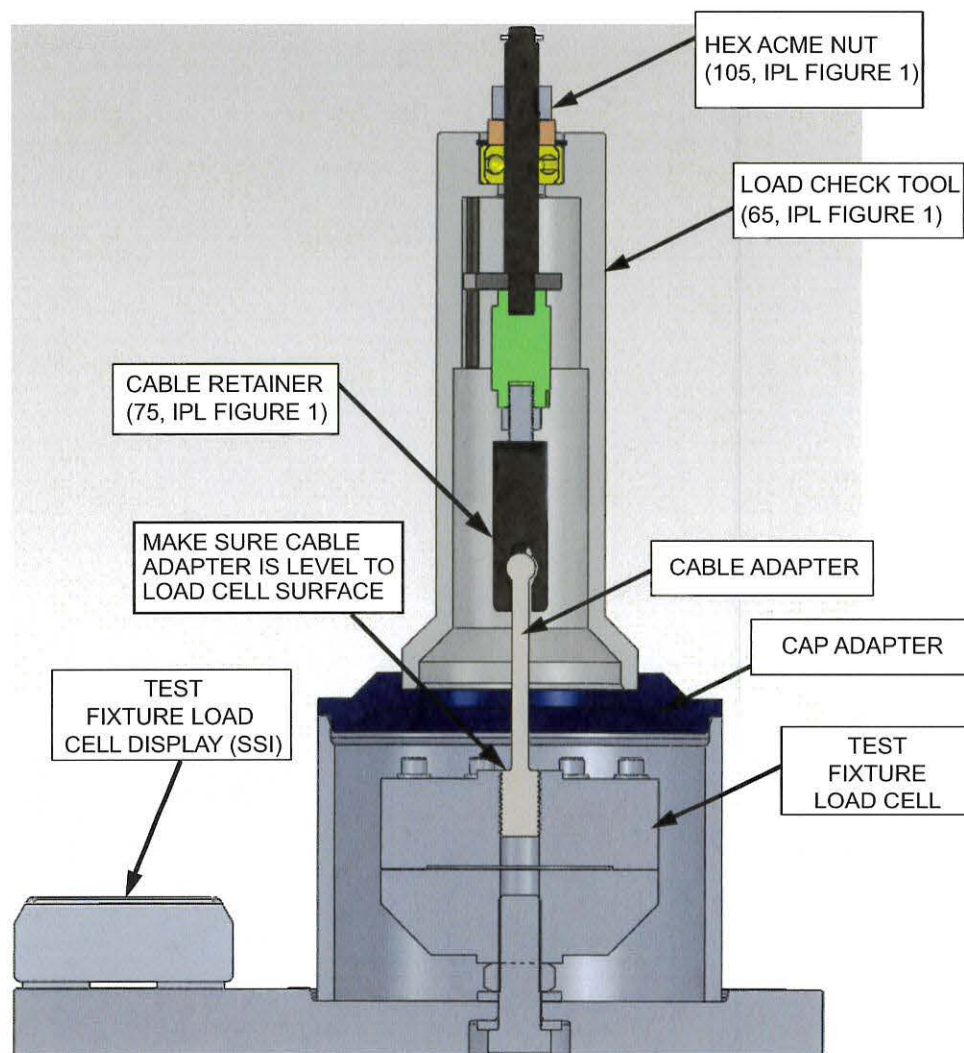


Figure 2-1. Load Check Tool Installation on Test Fixture

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- (12) Make sure that the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) reading is within ± 9 lbs of the reading shown on the UUT smart sensor indicator (15, [IPL Figure 1](#)). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).
- (13) Continue to tighten the hex ACME nut (105, [IPL Figure 1](#)) with the 7/8 inch Wrench until a load reading of 1250 ± 25 lbs is displayed on the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).
- (14) Make sure that the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) reading is within ± 12 lbs of the reading shown on the UUT smart sensor indicator (15, [IPL Figure 1](#)). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).
- (15) Continue to tighten the hex ACME nut (105, [IPL Figure 1](#)) with the 7/8 inch Wrench until a load reading of 1500 ± 25 lbs is displayed on the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).
- (16) Make sure that the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) reading is within ± 15 lbs of the reading shown on the UUT smart sensor indicator (15, [IPL Figure 1](#)). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).
- (17) Continue to tighten the hex ACME nut (105, [IPL Figure 1](#)) using the 7/8 inch Wrench until a load reading of 1750 ± 25 lbs is displayed on the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).
- (18) Make sure that the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) reading is within ± 18 lbs of the reading shown on the UUT smart sensor indicator (15, [IPL Figure 1](#)). Record the results on the Calibration Test Datasheet in [Figure 2-2](#).
- (19) Loosen the hex ACME nut (105, [IPL Figure 1](#)) to remove the load from the system.

NOTE: A load can still exist if the hex ACME nut (105, [IPL Figure 1](#)) is loosely installed due to the ball socket attachment design. After loosening the hex ACME nut (105, [IPL Figure 1](#)), re-tighten by hand until snug and then back off 1/8 to a 1/4 turn to allow the cable adapter to float in the socket of the cable retainer.

- (a) Reset the peak reading on FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) by holding the TARE/RESET button and pushing the PEAK button once.
 - (b) Reset the peak reading on the UUT smart sensor indicator (15, [IPL Figure 1](#)) by holding the TARE/RESET button and pushing the PEAK button once.
- (20) Zero the FLCT Test Fixture, P/N T49900-875LTF1, load cell display (SSI) by taking it out of peak mode by pushing the PEAK button once and then push the TARE/RESET button. Re-enable peak mode by pressing the PEAK button.

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- (21) Zero the UUT smart sensor indicator (15, [IPL Figure 1](#)) by taking it out of peak mode by pushing the PEAK button once and then push the TARE/RESET button. Re-enable peak mode by pushing the PEAK button.
- (22) Repeat [Step 4.B.\(8\)](#) thru [4.B.\(19\)](#) for a total of two iterations.
- (23) Turn off the UUT smart sensor indicator (15, [IPL Figure 1](#)). Disconnect the load check tool (65, [IPL Figure 1](#)) from the UUT smart sensor indicator (15, [IPL Figure 1](#)).
- (24) Remove the load check tool (65, [IPL Figure 1](#)) from the FLCT Test Fixture, P/N T49900-875LTF1.

C. Marking

- (1) If not already performed, install a label marked with the smart sensor indicator (15, [IPL Figure 1](#)) serial number over the original identification and calibration information on the lower portion of the rear panel of the smart sensor indicator (15, [IPL Figure 1](#)).
- (2) Mark a new calibration label with the smart sensor indicator (15, [IPL Figure 1](#)) serial number, current date, calibration due date (current date + 12 months), and technician/operator acceptance identification. Install the calibration label over the seam on the left side of the smart sensor indicator (15, [IPL Figure 1](#)).

NOTE: Remove and discard the outdated calibration label from the outside edge of the smart sensor indicator (15, [IPL Figure 1](#)).

- (3) Mark a new calibration label with the load check tool (65, [IPL Figure 1](#)) serial number, current date, calibration due date (current date + 12 months), and technician/operator acceptance identification. Install the calibration label below the CE label (120, [IPL Figure 1](#)) on the load check tool (65, [IPL Figure 1](#)).

NOTE: Remove and discard the outdated calibration label from the housing (90, [IPL Figure 1](#)).

- (4) Reassemble the load check tool kit (-1, -1A, [IPL Figure 1](#)) per [Paragraph 4.B](#) of [SECTION 3 - REMOVAL/INSTALLATION](#).

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Figure 2-2. Calibration Test Datasheet (Sheet 1 of 2)

Goodrich P/N: 49900-890	FLCT S/N: _____	Date: _____			
Load Cell S/N: _____		Work Order/Job No.: _____			
SSI S/N: _____		Test Stand No.: _____			
<u>PARA</u>	<u>TEST</u>	<u>MEASUREMENT</u>	<u>LIMIT</u>	<u>ACCEPT</u>	<u>REJECT</u>
4.B	Load Check Tool Calibration Test				
	TEST GROUP #1				
(9)	Test Fixture SSI Display: _____	750 ± 25 lbs		_____	_____
(10)	UUT SSI load display: _____ Delta between Test Fixture & UUT: _____	± 7 lbs		_____	_____
(11)	Test Fixture SSI Display: _____	1000 ± 25 lbs		_____	_____
(12)	UUT SSI load display: _____ Delta between Test Fixture & UUT: _____	± 9 lbs		_____	_____
(13)	Test Fixture SSI Display: _____	1250 ± 25 lbs		_____	_____
(14)	UUT SSI load display: _____ Delta between Test Fixture & UUT: _____	± 12 lbs		_____	_____
(15)	Test Fixture SSI Display: _____	1500 ± 25 lbs		_____	_____
(16)	UUT SSI load display: _____ Delta between Test Fixture & UUT: _____	± 15 lbs		_____	_____
(17)	Test Fixture SSI Display: _____	1750 ± 25 lbs		_____	_____
(18)	UUT SSI load display: _____ Delta between Test Fixture & UUT: _____	± 18 lbs		_____	_____
	TEST GROUP #2				
(9)	Test Fixture SSI Display _____	750 ± 25 lbs		_____	_____
(10)	UUT SSI load display: _____ Delta between Test Fixture & UUT: _____	± 7 lbs		_____	_____
(11)	Test Fixture SSI Display: _____	1000 ± 25 lbs		_____	_____
(12)	UUT SSI load display: _____ Delta between Test Fixture & UUT: _____	± 9 lbs		_____	_____
(13)	Test Fixture SSI Display: _____	1250 ± 25 lbs		_____	_____
(14)	UUT SSI load display: _____ Delta between Test Fixture & UUT: _____	± 12 lbs		_____	_____
(15)	Test Fixture SSI Display: _____	1500 ± 25 lbs		_____	_____

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Figure 2-2. Calibration Test Datasheet (Sheet 2 of 2)

Goodrich P/N: 49900-890 FLCT S/N: _____ Date: _____
 Load Cell S/N: _____ Work Order/Job No.: _____
 SSI S/N: _____ Test Stand No.: _____

<u>PARA</u> <u>TEST</u>	<u>MEASUREMENT</u>	<u>LIMIT</u>	<u>ACCEPT</u>	<u>REJECT</u>
-------------------------	--------------------	--------------	---------------	---------------

4.B Load Check Tool Calibration Test (Contd.)

(16) UUT SSI load display:	_____			
Delta between Test Fixture & UUT:	_____	± 15 lbs	_____	_____
(17) Test Fixture SSI Display:	_____	1750 ± 25 lbs	_____	_____
(18) UUT SSI load display:	_____			
Delta between Test Fixture & UUT:	_____	± 18 lbs	_____	_____

FINAL RESULT: _____

Tested By: _____

Date: _____

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SECTION 3 - REMOVAL/INSTALLATION

1. Purpose

- A. This section gives the necessary instructions to disassemble and reassemble the Load Check Tool Kit, P/N 49900-889-103 & 49900-889-104, and Field Load Check Tool, P/N 49900-890.
- B. Complete disassembly is neither anticipated nor recommended. Remove only those parts necessary to accomplish a calibration test per [SECTION 2 - CALIBRATION](#) or to replace damaged parts.
- C. Continue with disassembly and reassembly as outlined below, referring to the exploded view illustrations in [CHAPTER 4 - ILLUSTRATED PARTS LIST](#) of this manual.

2. Equipment and Materials

- A. Calibration of measuring instruments shall be in accordance with ANSI/NCSL Z540-3.
- B. The recommended equipment and materials are given in [Table 2-3](#).

NOTE: Equivalent substitutes may be used for listed items.

Table 2-3. Equipment and Materials

DESCRIPTION	PART NUMBER	SPECIFICATION	SOURCE OR CAGE CODE
Band-it Tool	C00269	-----	V70847
Grease	Aeroshell 7	MIL-PRF-23827, Type II	V54527
Load Cell Holding Fixture	T49900-890HF1 or See APPENDIX A	-----	V3HRL4 or Local Manufacture
Spiral Wrap	T12N-C	7.0 ± 0.5 inch (177.8 ± 12.7 mm) Length	V06383
Torque Seal	83314 Orange (145951, V3HRL4)	-----	V98148
Torque Wrench	-----	5/8 inch, open end, capable of 160 to 180 in-lb (18.1 to 20.3 N-m)	Commercially Available
Wrench	-----	5/8 inch, open end	Commercially Available
Wrench	5163A82	7/8 inch	V3A054

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3. Disassembly Procedures

A. Disassembly of the Load Check Kit (-1, -1A, [IPL Figure 1](#))

- (1) Remove the load check tool (65) and smart sensor indicator (15) from the load check kit case (5, 5A).
- (2) Make sure that the load check tool (65) harness wires are not pinched, cut, or severed. If necessary, disassemble per [Paragraph 3.B](#) to remove the damaged tension load cell (80).
- (3) If necessary, remove the load check tool DVD (10), smart sensor indicator (15) charging cable (included with item 15), combination wrench (20), service information letters (-30 & -35), hex ACME nut (60), and retainer cover (70) from the load check kit case (5, 5A).

NOTE: The service information letters (-30 & -35) are packaged in a bag or envelope with the smart sensor indicator (15) abbreviated instruction manual (see [APPENDIX B](#)) and calibration certificates. Retain these documents for reassembly.

- (4) For Effectivity Code B (P/N 49900-889-104) only: If necessary, remove the center tube assembly (40), lower cap (45), and upper cap (50).

B. Disassembly of the Load Check Tool (65, [IPL Figure 1](#))

- (1) If not already performed, remove the retainer cover (70).
- (2) Remove two band-it clamps (76) that attach load cell strain relief (78) and the wire harness of the tension load cell (80) to the housing (90).
- (3) Remove the load cell strain relief (78) from the wire harness of the tension load cell (80) and housing (90).
- (4) If necessary, remove the Spiral Wrap, P/N T12N-C from the wire harness of the tension load cell (80).

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WARNING: THE RETAINING RING (-115, 115A) IS SPRING LOADED. REMOVAL MAY RESULT IN THE RETAINING RING (-115, 115A) BEING EJECTED FROM THE LOAD CHECK TOOL. MAKE SURE PERSONNEL ARE WEARING APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT AND SAFETY GOGGLES. MAKE SURE TO ORIENT THE RETAINING RING (-115, 115A) AWAY FROM BODY AND FACE DURING REMOVAL.

- (5) Remove the retaining ring (-115, 115A) and flat washer (110). If retaining ring (-115) was removed, discard the retaining ring (-115). If retaining ring (115A) was removed, retain for reassembly.

NOTE: The retaining ring (-115) may also be removed by slowly unscrewing the hex ACME nut (105).

NOTE: The retaining ring (115A) should be removed using standard shop snap ring pliers.

- (6) Remove the hex ACME nut (105) and flat washer (100).

CAUTION: THE TENSION LOAD CELL (80) IS HARDWIRED TO A WIRE HARNESS ASSEMBLY. DO NOT PULL WIRES DURING REMOVAL OR DAMAGE MAY OCCUR.

- (7) Carefully remove the cable retainer (75), tension load cell (80), and shaft assembly (95) as an assembly from the housing (90).

CAUTION: DO NOT APPLY TORQUE TO THE BODY OF THE TENSION LOAD CELL (80). PRIOR TO APPLYING TORQUE, INSTALL THE TENSION LOAD CELL (80) INTO THE LOAD CELL HOLDING FIXTURE AS SHOWN IN FIGURE 2-3. NOTE THAT THE WIRE HARNESS FROM THE LOAD CELL SHOULD BE ORIENTATED TOWARDS THE TOP SURFACE OF THE FIXTURE.

- (8) Install the tension load cell (80) with attaching parts into the Load Cell Holding Fixture, P/N T49900-890HF1 (See [Figure 2-3](#)).

WARNING: MAKE SURE THAT THE LOAD CELL HOLDING FIXTURE IS ATTACHED TO A WORK BENCH OR SIMILAR WORKING SURFACE.

- (a) Using the 5/8 inch Wrench, unscrew and remove the cable retainer (75) from the tension load cell (80).
- (b) Using the 5/8 inch Wrench, unscrew and remove the shaft assembly (95) from the tension load cell (80). Retain shim(s) (85) for reassembly.
- (9) Make sure that the tension load cell (80) wire harness is not pinched, cut, or severed. Replace tension load cell (80) if damaged.

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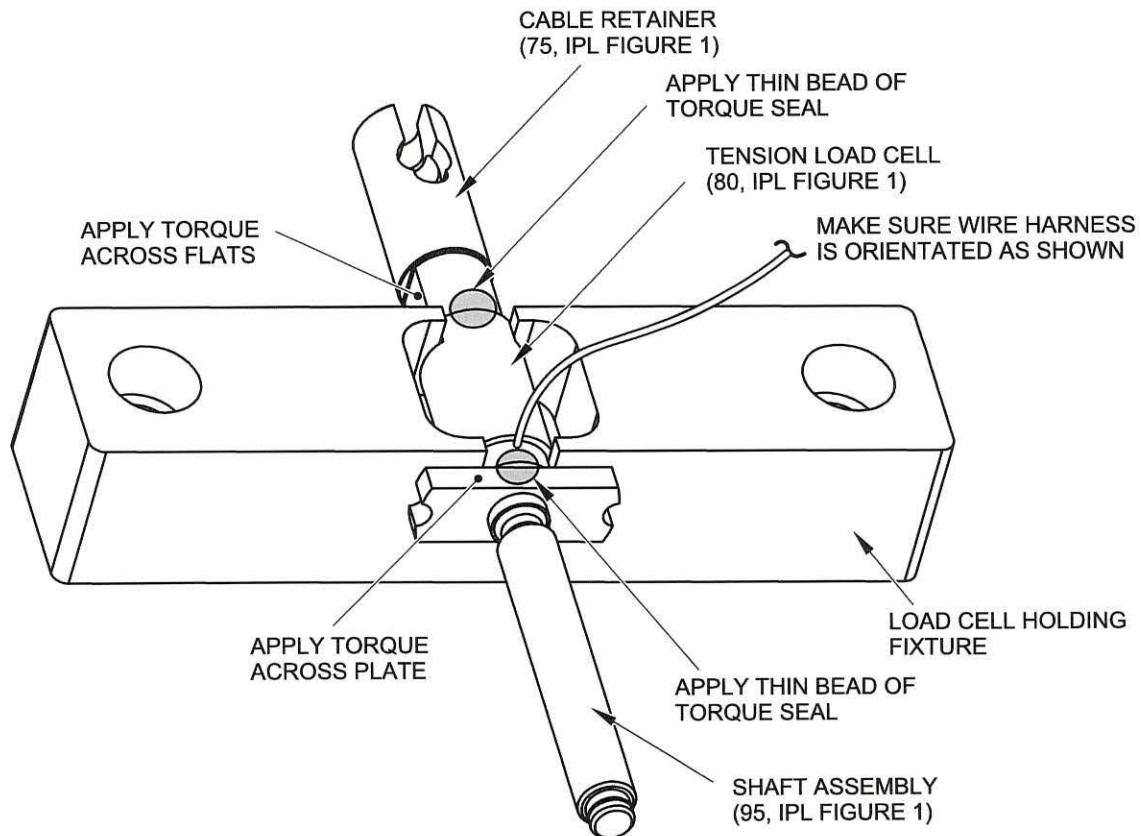


Figure 2-3. Installation on Load Cell Holding Fixture

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4. Assembly Procedures

A. Assembly of the Load Check Tool (65, [IPL Figure 1](#))

- (1) Install shim(s) (85) if retained from disassembly onto the shaft assembly (95). Assemble the shaft assembly (95) to the tension load cell (80) and hand tighten.
- (2) Assemble the cable retainer (75) to the tension load cell (80) and hand tighten.

WARNING: MAKE SURE THAT THE LOAD CELL HOLDING FIXTURE IS ATTACHED TO A WORK BENCH OR SIMILAR WORKING SURFACE.

CAUTION: DO NOT APPLY TORQUE TO THE BODY OF THE TENSION LOAD CELL (80). PRIOR TO APPLYING TORQUE, INSTALL THE TENSION LOAD CELL (80) INTO THE LOAD CELL HOLDING FIXTURE AS SHOWN IN FIGURE 2-3. MAKE SURE THAT THE WIRE HARNESS FROM THE LOAD CELL IS ORIENTATED TOWARDS THE TOP SURFACE OF THE FIXTURE.

- (3) Torque the shaft assembly (95) and cable retainer (75) to 160 to 180 in-lbs (18 to 20 N-m) with the 5/8 inch Torque Wrench and the Load Cell Holding Fixture, P/N T49900-890HF1 (see [Figure 2-3](#)).
 - (a) Make sure that the tension load cell (80) wire harness is aligned to the plate on the shaft assembly (95) as shown in [Figure 2-4](#). This orientation will make sure that the wire harness can be routed through the opening provided in the housing (90).
 - (b) If the tension load cell (80) wire harness is not aligned correctly, remove the shaft assembly (95) and remove/add shims (85) until alignment is achieved.
 - (c) Apply a thin bead of Torque Seal, 83314 Orange, across the wrench flats adjacent to each other on both sides of the tension load cell (80). Torque Seal shall be applied in line with the tension load cell (80) wire harness so it is visible through the window in the housing (90) (See [Figure 2-3](#)).

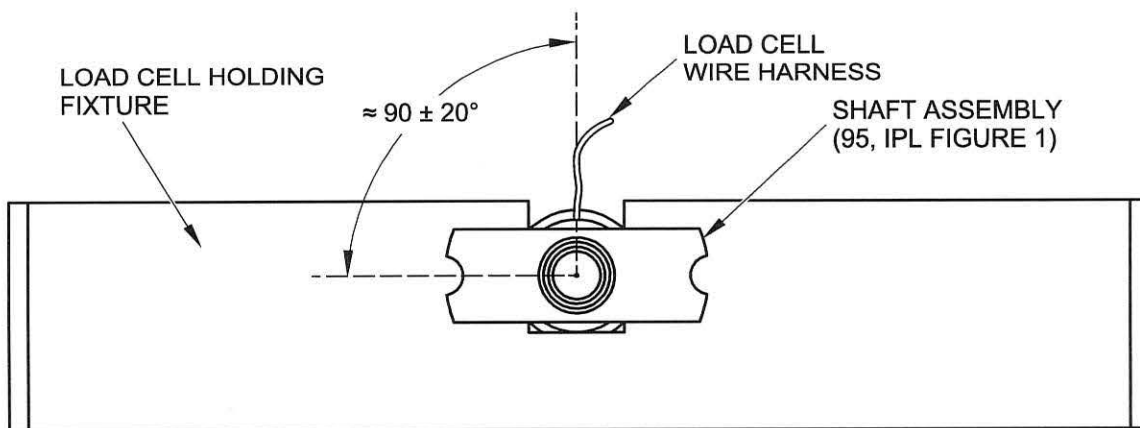


Figure 2-4. Load Cell Alignment

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- (4) Apply a thin coating of Grease, P/N Aeroshell 7, to the ACME threads of the shaft assembly (95).

CAUTION: MAKE SURE THAT THE TENSION LOAD CELL (80) WIRE HARNESS DOES NOT INTERFERE WITH THE SHAFT ASSEMBLY (95) DURING ASSEMBLY SO IT DOES NOT GET PINCHED AGAINST THE HOUSING (90).

- (5) Carefully, guide the wire harness from the tension load cell (80) into the housing (90) and out through the opening/window provided in the housing (90).

NOTE: It is recommended to temporarily bundle the wiring harness and attach with a cable tie or lacing.

- (6) Install the cable retainer (75), tension load cell (80), and shaft assembly (95) as an assembly into the housing (90). Align the shaft assembly (95) plate with the two dowel pins installed in the housing (90). Make sure the tension load cell (80) wire harness is aligned properly and exits through the opening/window provided in the housing (90).
- (7) Install the flat washer (100) onto the shaft assembly (95).
- (8) Assemble the hex ACME nut (105) onto the shaft assembly (95). Do not fully tighten the hex ACME nut (105) (only tighten for 4 to 6 threads).
- (9) Install the flat washer (110) and the retaining ring (115A). Make sure that the retaining ring (115A) is correctly installed in the first groove of the shaft assembly (95) (see [Figure 2-5](#)).

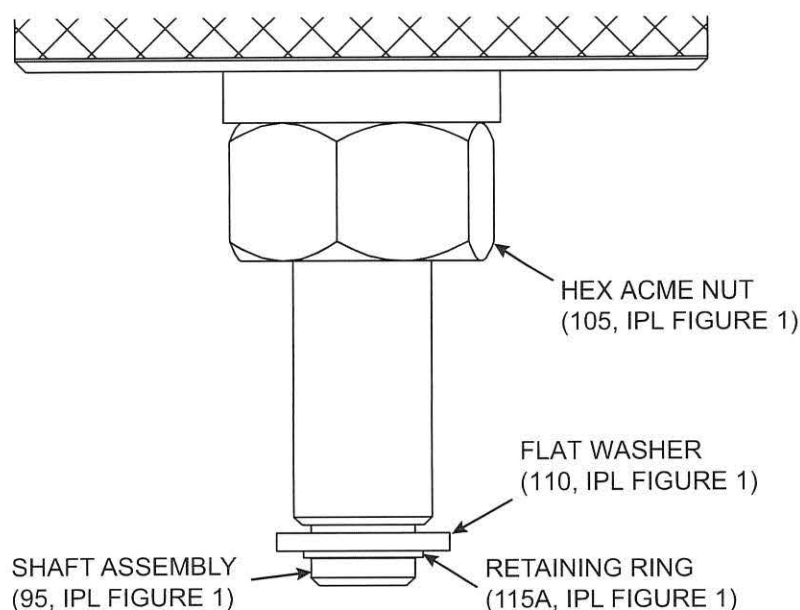


Figure 2-5. Installation of Retaining Ring

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- (10) If removed, put Spiral Wrap, P/N T12N-C on the wire harness of the tension load cell (80) to a length of 6.5 to 7.5 inch (165.1 to 190.5 mm) starting from the tension load cell (80) end.
- (11) Make a service loop and put the wire harness of the tension load cell (80) through the load cell strain relief (78).
- (12) Put the load cell strain relief (78) in correct position on the housing (90). See [Figure 2-6](#).
- (13) Use the Band-It Tool, P/N C00269 to attach the load cell strain relief (78) and the wire harness of the tension load cell (80) to the housing (90) with two band-it clamps (76).

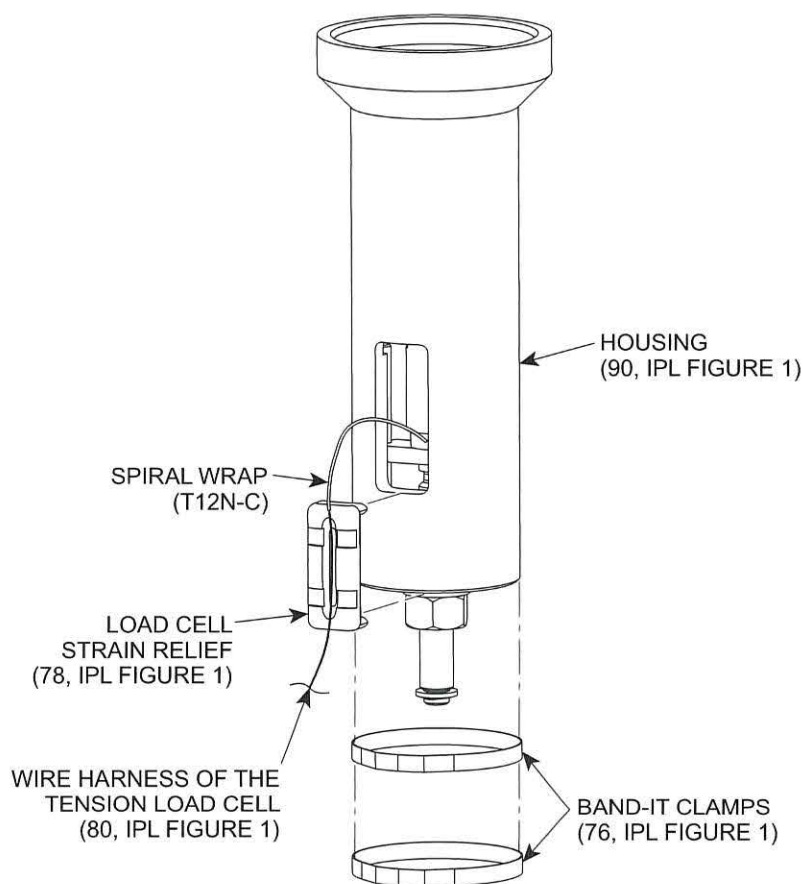


Figure 2-6. Installation of Load Cell Strain Relief

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- (14) Make sure that the shaft assembly (95) moves freely through the entire range of motion without straining wire harness of the tension load cell (80).
- (15) If removed, install a new CE label (120) adjacent to the opening provided on the housing (90).

B. Assembly of the Load Check Tool Kit (-1, -1A, [IPL Figure 1](#))

- (1) Install the retainer cover (70) into the load check tool case (5, 5A).
- (2) Install the load check tool (65) into the load check tool case (5, 5A).

NOTE: It is recommended to bundle the wire harness from the load cell to prevent damage during installation of the load check tool (65).

- (3) If not already performed, install the load check tool DVD (10), smart sensor indicator (15), smart sensor indicator (15) charging cable (included with item 15), combination wrench (20), and spare hex ACME nut (60) into the load check tool case (5, 5A).
- (4) For Effectivity Code B (P/N 49900-889-104) only: If not already performed, install the center tube assembly (40), lower cap (45), and upper cap (50) into the load check tool case (5A).
- (5) Package the following in a bag or envelope into the load check tool case (5, 5A):
 - (a) If not already included, latest revision of service information letters (-30 & -35).

NOTE: The latest revision of service information letters (-30 & -35) are accessible at customers.utcaerospacesystems.com.

- (b) Completed certificate of calibration (see [SECTION 2 - CALIBRATION](#) section) as required by local quality management system.
 - (c) Smart sensor indicator (15) abbreviated instruction manual (included with item 15 or see [APPENDIX B](#)).
- (6) If removed, install the case label (-25, -25A) on the front cover of the load check tool case (5, 5A) orientated upright so it is readable when the case is held by the handle.

NOTE: If the load check tool case (5, 5A) was replaced, remove any existing labels before installing the case label (-25, -25A).

- (7) If removed, install the CE label (-55) on the front cover of the load check tool case (5, 5A) adjacent to the case label (-25, -25A) orientated upright so it is readable when the case is held by the handle.



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CHAPTER 3 - OVERHAUL/MAJOR REPAIR

There are no overhaul or major repair procedures necessary for the FLCT. Replaceable parts are listed in [CHAPTER 4 - ILLUSTRATED PARTS LIST](#). Refer to [CHAPTER 2 - MAINTENANCE](#) for the necessary removal, installation, and repair procedures.

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CHAPTER 4 - ILLUSTRATED PARTS LIST

1. Purpose

The Illustrated Parts List (IPL) which follows has been provided for the identification and requisitioning of replaceable parts for the Field Load Check Tool Kit. The Field Load Check Tool Kit is manufactured by Goodrich Corporation, Brea, California.

A. Introduction

- (1) This section gives the illustration(s) and breakdown of parts for the assembly(ies) which can be disassembled, repaired or replaced, and reassembled.
- (2) This section contains a detailed list consisting of six columns: Figure and item, part number, airline part number, nomenclature, effectivity, and units per assembly.

B. Explanation and Usage

- (1) The Figure and ITEM column lists the Figure number and the item number for each detail part. The Figure number is listed once at the top of the column. Each part is called out by an item number. Any part which is not illustrated will have an item number preceded by a dash (-).
 - (a) Alpha variants, letters A through Z (except I and O), are assigned to an item number when necessary to show:
 - 1 Alternate parts
 - 2 Optional parts
 - 3 Service bulletin changes
 - 4 Configuration differences
 - (b) An alpha variant item number is not shown on the exploded view when the appearance and location of the alpha variant item is the same as the basic item number.
- (2) The PART NUMBER column lists the part number for each detail part. Always use the part number exactly as listed when procuring parts.
- (3) The AIRLINE PART NUMBER column is provided for individual airline use.
- (4) The NOMENCLATURE column describes the detail part.
 - (a) If a part is not manufactured by Goodrich Corporation, a vendor code is provided. The name and address of each vendor is listed at the end of this section.

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- (b) The part descriptions in the nomenclature column are indented to depict the relationship of the part to the next higher assembly. For example:

1 2 3 4 5 6 7

Top Assembly

- Detail Parts for Top Assembly
- Sub- Assembly
- Attaching Parts for Sub-Assembly
- • Detail Parts for Sub- Assembly
- • Sub-Sub- Assembly
- • Attaching Parts for Sub-sub-assembly
- • • Detail Parts for Sub-sub-Assembly

- (c) When the part number is more than 15 characters or contains invalid characters (only alphanumerics or "-" allowed), it will be shown in the IPL nomenclature column preceded by "True P/N" according to the following examples:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
M55302-60-20C10	.WASHER (TRUE P/N M55302-60-20C100)
M8504910-19W	.CABLE CLAMP (TRUE P/N M85049/10-19W)

- (5) The EFFECTIVITY CODE column is used to show additional configurations to the top assembly. Each configuration is assigned a code letter (letters A through Z, except I and O). All detail parts associated with a configuration are coded with the same letter. A blank space in the effectivity column indicates that the detail part is used on all configurations of the top assembly.
- (6) The UNITS PER ASSEMBLY column lists the total quantity of each part required. The abbreviation AR indicates that the quantity required will be determined during assembly procedures. The abbreviation RF indicates that the item is listed for reference purposes only.

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C. Parts Replacement Data

- (1) The interchangeability relationship between parts is identified in the NOMENCLATURE column. A list of the terms used and their definitions are as follows:

TERM	ABBREVIATION	DEFINITION
Alternate	ALT	The part fully meets required functional and structural specifications, but differs either in overall external dimensions, connection installation, and/or mounting provisions, and may require additional rework or modifications to install in a specific application.
Optional	OPT	The part is completely interchangeable in form, fit and function with the subject part number, thus providing a choice of parts for procurement and support purposes.
Preferred	PRFD	The part is first choice over other alternate or optional parts listed.
Replaced by	REPLD BY	The part is replaced by and is interchangeable with the item number listed in the notation.
Replaces	REPLS	The part replaces and is interchangeable with the number listed in the notation.
Superseded by	SUPSD BY	The part is replaced by and is not interchangeable with the item number listed in the notation.
Supersedes	SUPSDS	The part replaces and is not interchangeable with the item number listed in the notation.

D. Proprietary

- (1) A proprietary item is listed with “(-P)” in the nomenclature column for the part listing. This item is also identified by the component manufacturer’s source controlled part number which is used for any parts procurement.

E. Vendor Information

- (1) The following list contains the name and address of each vendor whose code number is used in the nomenclature column of the illustrated parts list, in alphanumeric order.

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2. Vendor Supplied Parts

- A. Vendor supplied parts which are altered by Goodrich Corporation, are listed and identified by a Goodrich Corporation allocated part number and description. Vendor supplied parts which are not altered are listed by the vendor part number and description.
- B. Vendor supply codes used in this manual are listed in Commercial And Government Entity (CAGE) Cataloging Handbooks H4/H8 as applicable. The CAGE code consists of a five-digit number preceded by the letter "V". Vendor CAGE codes used in this manual are as follows:

CODE	NAME AND ADDRESS
V0H187	Transducer Techniques, LLC 42480 Rio Nedo Temecula, CA 92590-3734
V06383	Panduit Corp. 18900 Panduit Dr. Tinley Park, IL 60487-3600
V1R2W7	Clarion Safety Systems, LLC 190 Old Milford Rd. Milford, PA 18337-7601
V3A054	McMaster-Carr Supply Company 9630 Norwalk Blvd. Santa Fe Springs, CA 90670-2932
V3HRL4	Goodrich Corporation 2727 E Imperial Hwy. Brea, CA 92821-6213
V51506	Accurate Screwmachine Corporation 10 Audrey Pl Fairfield, NJ 07004-3402
V51814	Smalley Steel Ring Co. 555 Oakwood Road Lake Zurich, IL 60047
V54527	Shell Oil Co. 1 Shell Plz. Houston, TX 77001
V70847	Band-it-idex Inc. Unit of Idex Corp. 4799 Dahlia St., Po Box 16307 Denver, CO 80216-0307
V98148	ITW Dykem/Dymon 805 E Highway 56 Olathe, KS 66051-0340

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3. Detailed Parts List

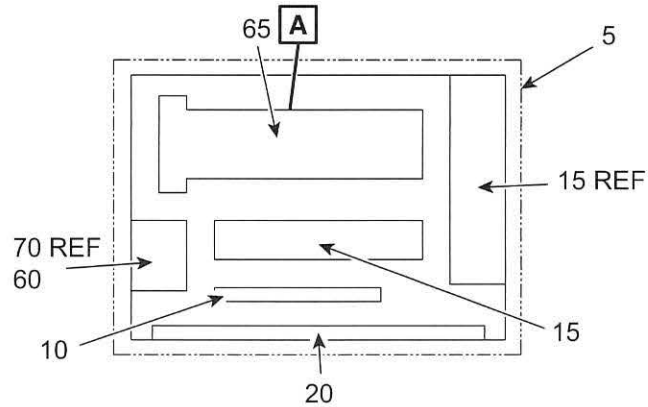
- A. The component parts of the Field Load Check Tool Kit are illustrated in [IPL Figure 1](#) and are identified in the associated detailed parts list.

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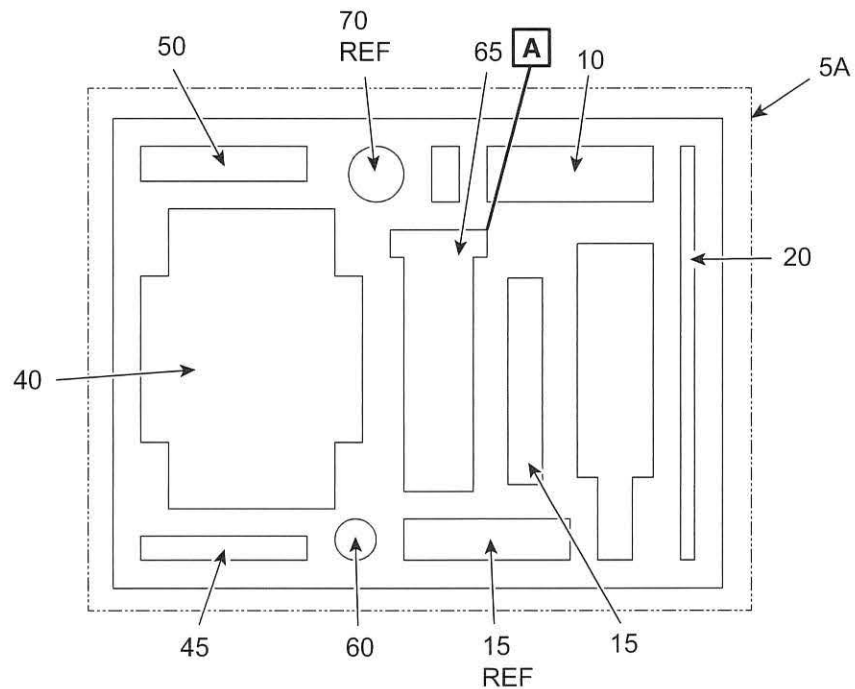
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**FOR EFFECTIVITY CODE A ONLY
(KIT P/N 49900-889-103)**



**FOR EFFECTIVITY CODE B ONLY
(KIT P/N 49900-889-104)**

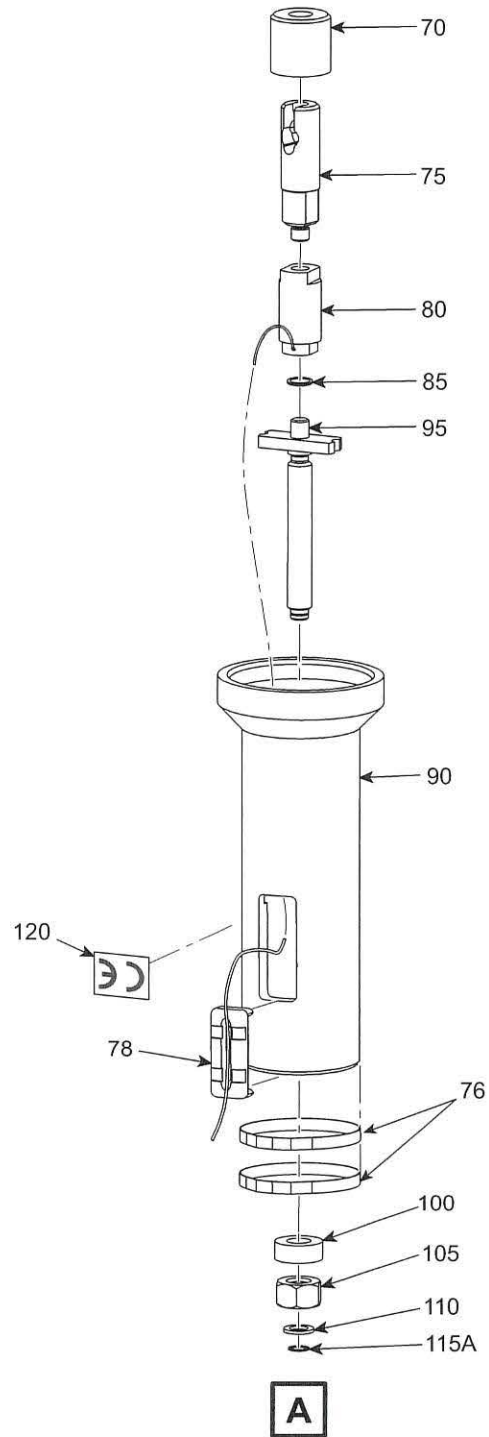


IPL Figure 1. Load Check Tool Kit (Sheet 1 of 2)

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IPL Figure 1. Load Check Tool Kit (Sheet 2 of 2)

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FIG. & ITEM NO.	PART NUMBER	AIRLINE STOCK NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	EFF. CODE	UNITS PER ASSY.
IPL 1					
-1	49900-889-103		KIT, LOAD CHECK TOOL	A	RF
-1A	49900-889-104		KIT, LOAD CHECK TOOL	B	RF
5	49900-884		. CASE, LOAD CHECK TOOL	A	1
5A	49900-885		. CASE, LOAD CHECK KIT	B	1
10	49900-888		. DVD, LOAD CHECK TOOL		1
15	SSI		. SMART SENSOR INDICATOR (V0H187)		1
20	5163A82		. WRENCH, COMBINATION, 0.875 INCH (V3A054)		1
-25	49900-887-3		. LABEL, CASE	A	1
-25A	49900-887-4		. LABEL, CASE	B	1
-30	SIL-2014-01		. SERVICE INFORMATION LETTER		1
-35	SIL-2015-01		. SERVICE INFORMATION LETTER		1
40	49900-891-101		. CENTER TUBE ASSEMBLY	B	1
45	49900-891-3		. CAP, LOWER	B	1
50	49900-891-4		. CAP, UPPER	B	1
-55	CE-PE		. LABEL, CE (V1R2W7)		1
60	49900-890-7		. ACME NUT, HEX 0.500-10 ACME-2G, BRASS		1
65	49900-890		. LOAD CHECK TOOL (PARTIAL BREAKDOWN FOLLOWS)		1
70	49900-890-3		. . COVER, RETAINER		1
75	49900-890-9		. . RETAINER, CABLE		1
76	JS2569		. . BAND-IT CLAMP (V70847) (POST SB 49900-890-01)		2
78	49900-890-10		. . STRAIN RELIEF, LOAD CELL (POST SB 49900-890-01)		1
80	TLL-2K-CAL-TEDS		. . LOAD CELL, TENSION (V0H187)		1
85	886-134		. . SHIM, 0.010 INCH THICK		AR
90	49900-890-1		. . HOUSING (NOT PROCURABLE - ORDER NHA)		1
95	49900-890-4		. . SHAFT ASSEMBLY		1

- ITEM NOT ILLUSTRATED

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FIG. & ITEM NO.	PART NUMBER	AIRLINE STOCK NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	EFF. CODE	UNITS PER ASSY.
IPL 1					
100	414-0-375-B-1		. . WASHER, FLAT (V51506) (TRUE P/N 414 0.375 B 1)		1
105	49900-890-7		. . ACME NUT, HEX 0.500-10 ACME-2G, BRASS		1
110	NAS1149F0663P		. . WASHER, FLAT 0.390 ID, 0.625 OD, 0.063 THK		1
-115	XAS-37		. . RING, RETAINING (V51814) (PRE SB 49900-890-01)		1
115A	MS16624-4037		. . RING, RETAINING (POST SB 49900-890-01)		1
120	CE-PE		. . LABEL, CE (V1R2W7)		1

- ITEM NOT ILLUSTRATED



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CHAPTER 5 - MANUFACTURER'S DATA

The following appendices provide manufacturer's data for specific items.

[APPENDIX A](#)

LOAD CELL HOLDING FIXTURE

[APPENDIX B](#)

SMART SENSOR INDICATOR (SSI)



GROUND SUPPORT EQUIPMENT MANUAL
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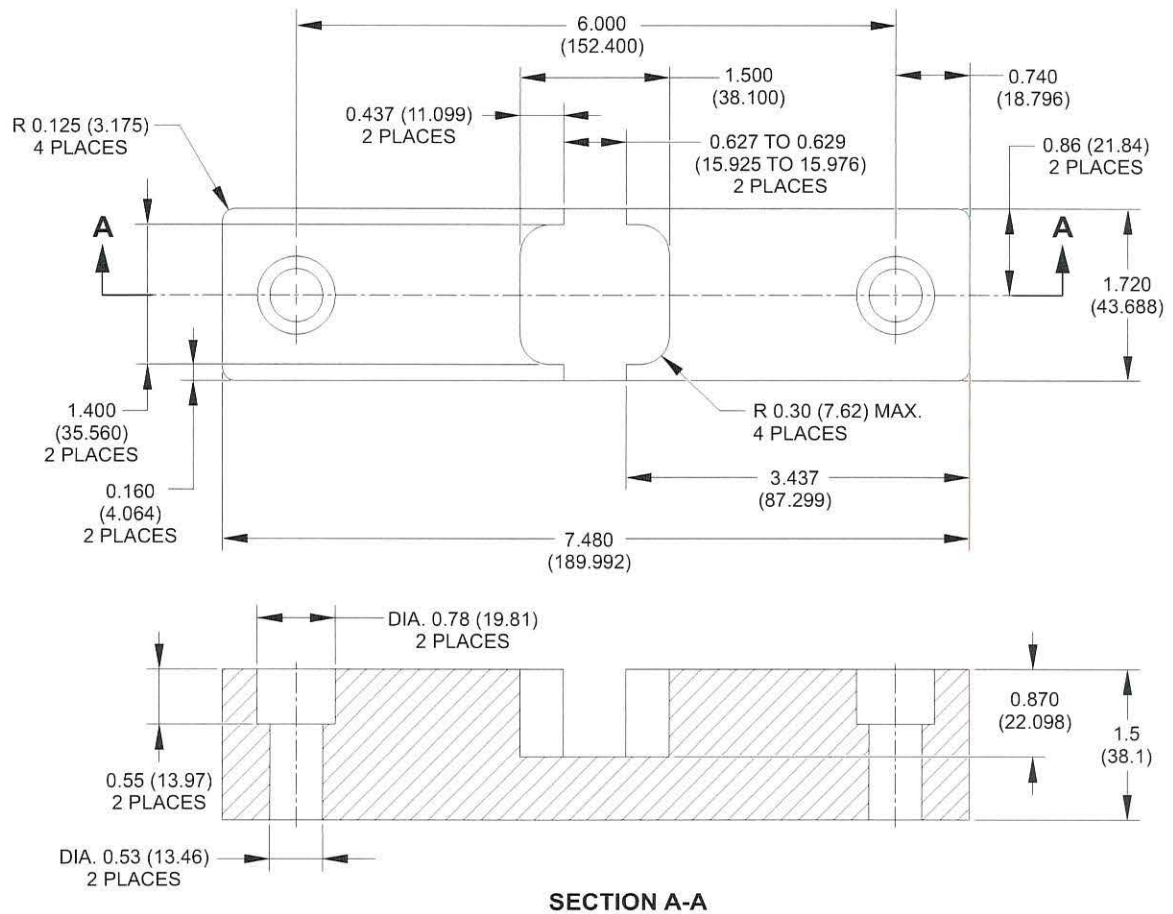
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APPENDIX A

Load Cell Holding Fixture
(For local manufacture)



TOLERANCES:

.XX = ± 0.03 (0.76)

.XXX = ± 0.010 (0.254)

MATERIAL: ALUMINUM 6061-T6

RECOMMENDED FINISH: BLACK ANODIZE PER MIL-A-8625, TYPE III, CLASS 2

SECURE TO WORK SURFACE USING APPROPRIATELY SIZED HARDWARE

NOTE: ALL DIMENSIONS ARE IN INCHES (MILLIMETERS).

Figure A-1. Load Cell Holding Fixture

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APPENDIX B

Transducer Techniques
Smart Sensor Indicator (SSI)

1. User Manual (abbreviated)

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