



ALERT SERVICE BULLETIN

UH-1H-16-14
24 March 2016

MODEL AFFECTED: UH-1H

SUBJECT: GOODRICH EXTERNAL HOIST

HELICOPTERS AFFECTED: ALL UH-1H with Goodrich 44316 Series Hoist System installed

COMPLIANCE: See attached Vendor Bulletin ASB 44301-10-18, Rev 5. It is the responsibility of the owner to make sure that the most current version of the Goodrich ASB 44301-10-18 is consulted. Revision B of this bulletin attaches the most recent version of ASB 44301-10-18, Rev 5.

DESCRIPTION:

The purpose of this bulletin is to achieve complete distribution of the attached vendor bulletin to the current affected model distribution list on record by Bell Helicopter Textron.

APPROVAL:

See attached Vendor Bulletin ASB 44301-10-18, Rev 5.

CONTACT INFO:

For any questions regarding this bulletin, please contact:

Goodrich Corporation
Sensors & Integrated Systems
Brea, CA 92821
Phone: 714-984-1461



SENSORS & INTEGRATED SYSTEMS- CALIFORNIA
2727 E IMPERIAL HIGHWAY, BREA, CA 92821

TO: HOLDERS OF SERVICE BULLETIN 44301-10-18, DATED May 12/14.

REVISION NO. 5, DATED 23 Feb 2016

HIGHLIGHTS

Pages which have been revised are outlined below together with the highlights of the revision. Please destroy obsolete pages in your copy of this bulletin and replace them with Revision No. 5 pages dated 23 Feb 2016.

PAGE NO.	DESCRIPTION OF CHANGE	EFFECTIVITY
8	Modified table to allow only load check tool 49900-889-104. Added an obsolescence date for load check tool 49900-889-101	All
9	Added AD2015-0160 and 2015-0226 to the list of reference documents	All
12	Addressed slight cable bending after testing as an allowable condition	All
15	Removed check-boxes for FLCT tool used, as only the 49900-889-104 approved.	All



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Equipment/Furnishings - Load Check Inspection - Safety and Reliability

1. Planning Information

A. Effectivity

This Alert Service Bulletin and the information it contains is applicable to all part numbers of the hoists listed in Table 1. These hoists are manufactured by Goodrich Sensors & Integrated Systems, Brea, CA.

TABLE 1.

Hoist Family	Slip Load (Lb)
42315	Table 2/Figure 1
42325	Table 2/Figure 1
44301-10-4, -7, -9, -12, -13	Table 2/Figure 1
44301-10-1, -2, -5, -6, -8, -10, -11	Table 3/Figure 2
44311	Table 2/Figure 1
44312	Table 2/Figure 1
44314	Table 2/Figure 1
44315	Table 2/Figure 1
44316	Table 2/Figure 1
44318	Table 2/Figure 1

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TABLE 2. Lower Load Limit, 600 lb hoists

°F	°C	Lbs	°F	°C	Lbs	°F	°C	Lbs
32	0	1200	63	17	1255	93	34	1310
34	1	1203	64	18	1258	95	35	1313
36	2	1206	66	19	1262	97	36	1317
37	3	1210	68	20	1265	99	37	1320
39	4	1213	70	21	1268	100	38	1323
41	5	1216	72	22	1271	102	39	1326
43	6	1219	73	23	1275	104	40	1330
45	7	1223	75	24	1278	106	41	1333
46	8	1226	77	25	1281	108	42	1336
48	9	1229	79	26	1284	109	43	1339
50	10	1232	81	27	1287	111	44	1343
52	11	1236	82	28	1291	113	45	1346
54	12	1239	84	29	1294	115	46	1349
55	13	1242	86	30	1297	117	47	1352
57	14	1245	88	31	1300	118	48	1356
59	15	1249	90	32	1304	120	49	1359
61	16	1252	91	33	1307	122	50	1362

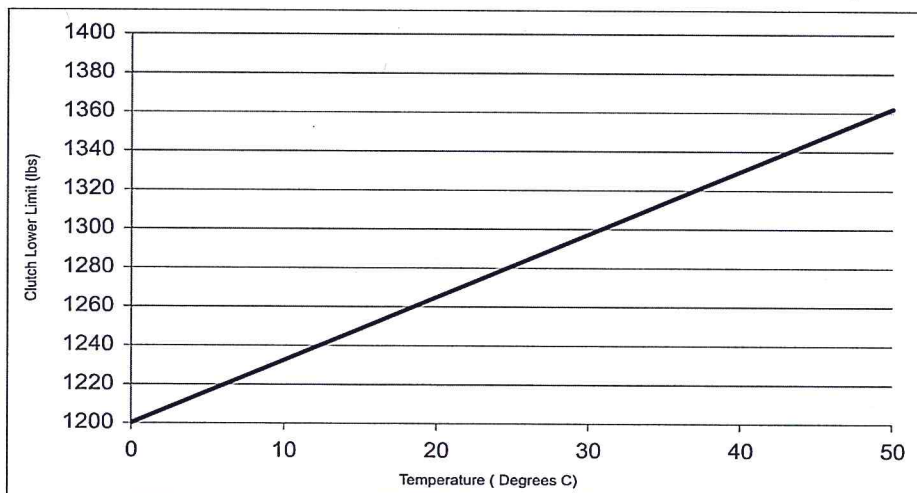


Figure 1. Lower limit for the 600 lb capacity hoists

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TABLE 3. Lower Load Limit, 500 lb hoists

°F	°C	Lbs	°F	°C	Lbs	°F	°C	Lbs
32	0	1000	63	17	1055	93	34	1110
34	1	1003	64	18	1058	95	35	1113
36	2	1006	66	19	1062	97	36	1117
37	3	1010	68	20	1065	99	37	1120
39	4	1013	70	21	1068	100	38	1123
41	5	1016	72	22	1071	102	39	1126
43	6	1019	73	23	1075	104	40	1130
45	7	1023	75	24	1078	106	41	1133
46	8	1026	77	25	1081	108	42	1136
48	9	1029	79	26	1084	109	43	1139
50	10	1032	81	27	1087	111	44	1143
52	11	1036	82	28	1091	113	45	1146
54	12	1039	84	29	1094	115	46	1149
55	13	1042	86	30	1097	117	47	1152
57	14	1045	88	31	1100	118	48	1156
59	15	1049	90	32	1104	120	49	1159
61	16	1052	91	33	1107	122	50	1162

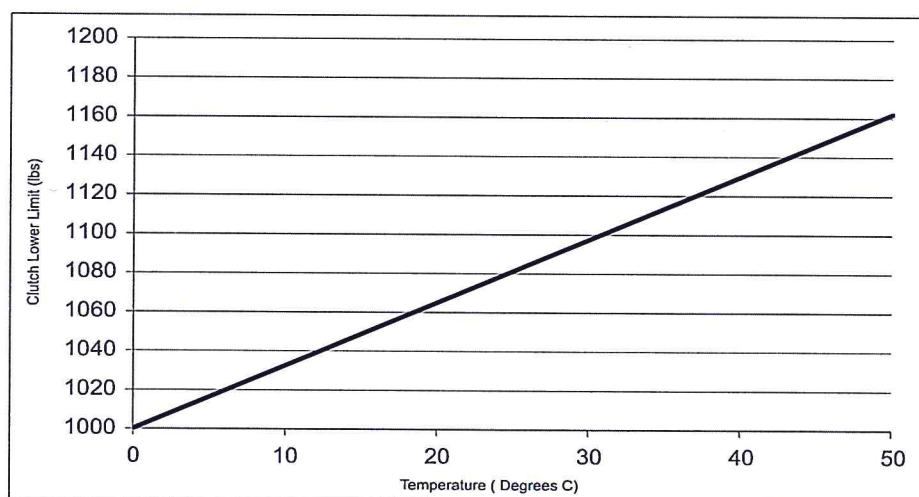


Figure 2. Lower limit for the 500 lb capacity hoists

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B. Reason

(1) Background

Goodrich received information from an Operator reporting an issue with a rescue hoist system. According to the information reported to Goodrich, the hoist lost the ability to hold a 252 kg (550 lb) load during a flight check, causing the test load to strike the ground. The incident did not result in any injuries. Goodrich has examined the subject hoist and has confirmed that the overload clutch was damaged to the point of failure. This overload clutch design is used in all external hoists and some of the findings from the failure investigation have highlighted the need for increased awareness within the hoist operator community of the clutch capability and how operators should best respond to events that may damage the clutch.

During performance of the overload clutch load checks, two operators have experienced issues that have led to broken cables and exposed Field Load Check Tool (FLCT) operators to potential injury. In response, we are reducing the maximum allowable load applied during testing.

Further testing has shown a correlation between the clutch slip point and the ambient temperature. As a result, it is necessary to apply the following hoist operation limitations and inform all flight crew members and hoist operators accordingly:

For 600 lb. hoists:

OAT at or above 0°C; maximum hoist load 600 lb [272 kg]

OAT between -20°C and 0°C; maximum hoist load 550 lb [249 kg]

OAT at or below -20°C; maximum hoist load 500 lb [227 kg].

For 500 lb hoists:

OAT at or above 0°C; maximum hoist load 500 lb [227 kg]

OAT between -20°C and 0°C; maximum hoist load 450 lb [204 kg]

OAT at or below -20°C; maximum hoist load 400 lb [181 kg].



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(2) Details

There are actions or conditions which could wear or degrade the capacity of the overload clutch.

- (a) **Peel out of the Cable.** Partial peel out of the cable which indicates clutch slippage can be recognized by the distinct stick/slip noise which might be audible on an external hoist when the cabin door is open, and can also be felt by a gloved hand on the cable. Failure to maintain vigilance by keeping a gloved hand on the cable and awareness of the load during operation can result in a partial peel out event without the operator's awareness of the event.

A "Partial Peel Out" is defined as an obvious detectable slip of the hoist overload clutch that results in approximately 20 inches (0.5 meters) or more of the hoist cable to reel off of the hoist cable drum in one overload clutch slip incident.

In the event of a partial peel out event, Goodrich recommends that the load be smoothly lowered to the ground while in a hover. Do not attempt to raise the load to the aircraft. Upon returning to base, remove the hoist from service and contact Goodrich Product Support at the address listed below to arrange for return of your hoist.

- (b) **High-energy overload event.** A single hoist high-energy overload event (approximately 200 feet per minute cable peel out for 6 seconds) can damage the overload clutch and result in the loss of the load attached to the hoist cable hook. In the event of a loss of load, the hoist shall be taken out of service and returned to Goodrich for servicing and repair. In the event of a high-energy overload event, Goodrich recommends that the load be smoothly lowered to the ground while in a hover. Do not attempt to raise the load to the aircraft. Upon returning to base, remove the hoist from service and contact Goodrich Product Support at the address listed below to arrange for return of your hoist.
- (c) **Entanglement of the cable on the ground or objects.** If a partial peel of more than 20 inches (0.5 meters) occurs due to entanglement of the cable, remove the hoist from service and contact Goodrich Product Support at the address listed below to arrange for return of your hoist.
- (d) **Flight Maneuvers on the Rescue Hoist System.** Excessive aircraft maneuvering has the capability to amplify hook loads that can exceed the overload clutch's capacity. Potential sources that could cause an overload condition are shock loads induced from slack on the cable, or a sharp turning radius with an extended cable, even at slow airspeeds, causing the peel out condition described above.



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Care must be taken to operate the hoist and aircraft within the allowable limits and perform maintenance in accordance with published maintenance documentation.

If you have any questions regarding the operational limits of your aircraft with the hoist installed, contact your aircraft OEM for hoists installed under the aircraft Type Certificate or Goodrich for hoists installed under a Goodrich Supplemental Type Certificate.

After experiencing a partial peel event, remove the hoist from service and contact Goodrich Product Support at the address listed below to arrange for return of your hoist.

- (e) **Improper adjustment of Stop/Homing Load Limit Switches.** In the event of improperly adjusted or failed up stop/homing load limit switches, the overload clutch may be cycled if the motor operates with the hook in the homed position. Repetitive cycling of the overload clutch when driven by the motor can rapidly accumulate overload clutch cycles and degrade the overload clutch's capacity.

After adjusting the stop/homing load limit switches, perform the load check as described in paragraph 3 of this ASB prior to the next hoisting mission. If the hoist fails the load check, remove the hoist from service and contact Goodrich Product Support at the address listed below to arrange for return of your hoist.

- (f) **Storage related activities.** Any hoist kept in storage must be tested in accordance D.(1) and (2) before being returned to service. Additionally, amend the storage instructions found in the CMM to keep the gearbox filled with oil during long-term storage. Prepare a tag that reads "Gearbox filled. Drain and service to proper level before use" and attach it to the hoist.

C. Description

The overload clutch design is common to all externally-mounted rescue hoists. Due to the nature of the reported incident, Goodrich is requiring the following inspection and one of the operational check procedures be performed to allow operators to check the rescue hoists in their fleets and to ensure that they remain in a serviceable condition.

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D. Compliance

(1) Initial Test

The actions in this Alert Service Bulletin shall be performed according to Table 4, below.

TABLE 4. Compliance Times

Condition (since last load check)	Compliance time
Hoist currently in service	Within six (6) months of receipt of this ASB
Return to service after depot maintenance	Six (6) months after return to service
In storage	Perform ASB prior to return to service

Hoists which are in storage do not need to meet these requirements, but will need to be tested IAW Table 4 before their next operation. Reference paragraph 1.B(f)

NOTE: If flight operations have been just completed with hoist operation, wait for a period of 5 hours to allow the hoist gearbox oil temperature to return to ambient conditions prior to initiating the test sequence

Record the performance of this ASB in the hoist log and complete the reporting form found on the last page of this ASB. Send an email containing a copy of the reporting sheet to the type certificate (TC) holder and to ASB.SIS-CA@utas.utc.com indicating the hoist part number, serial number, slip load, ambient temperature, and the results of the test.

(2) Ongoing testing

This test shall be repeated every 6 months or 300 cycles for those operators using cycles as a method of recording usage, or every 6 months or 400 lifts for those operators using lifts as a method of recording usage, whichever occurs first.

NOTE: Refer to the applicable Hoist CMM or OEM documentation for more information on defining "cycles" and "lifts."

- E. Record the performance of this ASB in the hoist log and complete the reporting form found on the last page of this ASB. Send an email containing a copy of the reporting sheet to the type certificate (TC) holder and to ASB.SIS-CA@utas.utc.com indicating the hoist part number, serial number, slip load, ambient temperature, gearbox lubricant and the results of the test. If the hoist fails the test, the hoist shall be removed from service. The TC holder will authorize the return of the hoist and log card to the TC holder or to Goodrich. Either the TC holder or Goodrich will contact the operator with an RMA to return the failed hoist for maintenance.

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F. Approval

This service bulletin contains no modification information that revises the approved configuration.

G. Manpower

- (1) The estimated amount of labor to accomplish the instructions of this Alert Service Bulletin for Rescue Hoist Assembly is up to 120 minutes, as follows:

Perform cable conditioning lift*	30 minutes
Perform load test**	15 minutes

* After performing the cable conditioning lift, wait 2 hours to allow the hoist to return to ambient temperatures before performing the load check.

** After performing hoist operations, wait 5 hours to allow the hoist to return to ambient temperatures before performing the load check.

- (2) The inspection described in this Alert Service Bulletin may be performed by the operator or other authorized repair facility.

H. Material — Cost and Availability

None.

I. Tooling - Price and Availability

The Load Check Tool (p/n 49900-889-104) is available for short-term loan (no cost for tool or shipping) as part of the listed kits. Contact the Goodrich or the UTAS 24-Hour Customer Response Center (CRC) at the address below to arrange for loan of the needed tool.

Hoist	Adapter
All external hoists <i>Except 44301-10-7</i>	No adapter used. Remove the hook from cable and use only the load check tool (49900-890) on the ball end of the cable.
44301-10-7	49900-891

Load Check Tool 49900-889-101 will not be supported for use after 31 March 2016. After that date, only tool 49900-889-104 will be supported for use. If you are holding tool 49900-889-101, please return it to Goodrich for a FOC upgrade to 49900-889-104 no later than this date.



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Following outlines the tool loan process.

- (a) Contact the Goodrich Hoist & Winch (7 AM to 5 PM PT) at 714-984-1584, or the UTC CRC (outside normal working hours) at 1-877-808-7575 (US) or +1-860-654-2500 (outside US) to request a tool loan.
- (b) Goodrich/CRC will request information from the end user.
- (c) The tool kit will be shipped to the end user.
- (d) End user will perform load checks. If the end user encounters any technical issues, Goodrich/CRC is available to provide support by answering technical questions, including discussion of test results.
- (e) If you report an overload clutch failure, obtain a return authorization for the failed hoist using the standard RMA process through Goodrich at the address listed below in the Point of Contact section.
- (f) Tool kit will be returned from the end user. The return shipping label is included with the tool kit and shipping is pre-paid.

2. Background

A. Weight and Balance

Not affected.

B. Electrical Load Data

Not affected.

C. Software Accomplishment Summary

None.

D. Reference

EASA ADs
2013-0275
2014-0201
2014-0254
2015-0069
2015-0160
2015-0226
and subsequent revisions or supersedures

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E. Other Publications Affected

None.

3. Accomplishment Instructions

Within 30 days of release of this ASB

- A. Carefully inspect the first 18" (45 cm) of cable to ensure there are no broken wires or necked down sections of the cable within this region. The minimum allowable cable diameter is 0.185" (4.7 mm). Additionally, no broken wires or necked down sections are allowed in the cable. If conditions such as this are observed, replace the cable immediately and notify Goodrich by sending an email to ASB.SIS-CA@utas.utc.com.

The requirements of this ASB can be satisfied by either of the two methods outlined below (ATP or Load Check Tool) and only one method needs to be followed to comply with this ASB.

- B. Successful accomplishment of the factory acceptance test (approved ATP) will satisfy the testing requirements of this ASB.

C. Using the Load Check Tool

NOTE: After performing any hoist operations, wait at least 5 hours before performing the load check to allow the hoist to cool to ambient temperature.

- (1) To prevent the cable from being pulled between wraps on the outer layer of the cable drum, perform a cable conditioning before performing the load check. Cable conditioning can be accomplished by utilizing either of the following procedures:

(a) In-flight conditioning lift

- 1 From a hovering aircraft, fully extend the hoist cable to the down limit stop.
- 2 Reel in a load of 500 lbs (227 kg) up to the maximum of the hoist rated capacity for the full length of cable.

- (b) The cable can also be reeled onto the drum using ground-support equipment capable of loading the cable to 500 lbs (227 kg) during reeling in.

- (c) Wait 2 hours to allow the hoist to return to ambient temperature before installing the load check tool.

CAUTION: FAILURE TO PRE-TENSION THE CABLE CAN RESULT IN DAMAGE TO THE CABLE DURING LOAD TESTING.

- (2) Install the load check tool in accordance with the instructions included with the tool (SIL 2014-01).

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(3) Slip Load Test

NOTE: Performing the test at temperatures outside of the limits noted in Table 1 (<32°F/0°C or >120°F/50°C) is not authorized. Make a record of the air temperature on the test record form found on the last page of this document.

If possible, perform the testing in a controlled environment to minimize the difference between the ambient temperature and the temperature of the hoist gearbox.

- (a) Press the Peak button on the load meter.
- (b) Using the box wrench provided in the kit, tighten the hex nut on the load check tool at a rate not exceeding 90° per second to increase the load on the cable until the clutch slips or until reaching 1500 lbs. If the clutch does not slip at less than 1500 lbs, then record the load as 1500 lbs and stop increasing the load. Decrease load to 600-700 lbs and continue at step 3d.

NOTE: Clutch slippage will be indicated by a sudden slippage, or a failure of the clutch to reach the required load. You will also notice that the load displayed on the meter is not increasing with continued turns of the nut. Clutch slippage is generally accompanied by a single loud pop from within the hoist.

CAUTION: DO NOT EXCEED 1500 LBS. ON THE FIELD LOAD CHECK TOOL AS IT MAY CAUSE DAMAGE TO THE HOIST CABLE OR INJURE THE OPERATOR.

- (c) Record the peak load as captured on the load meter.
- (d) Reset the peak value by pressing the Peak and Reset buttons together.
- (e) Repeat the test step 3(b) four (4) additional times, resetting the peak value after each slip.

NOTE: As the testing progresses, it may be necessary to stop between tests to unscrew the hex nut down the threaded shaft and re-seat the load tool against the hoist using the pendant.

- (f) Average the five (5) slip values to obtain the final value. Record the test results on the hoist log card and evaluate the test results in accordance with the values in Table 1 based on the ambient temperature at the time of testing
- (g) Loosen the hex nut or reel out the cable to remove the load on the cable and remove the tool from the hoist.



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- (h) Inspect the first 30 feet (10 meters) of the cable for damage and size in accordance with the Cable Inspection section of the CMM or helicopter documentation.

Carefully inspect the first 18" (45 cm) of cable after the FLCT load check has been completed to ensure there are no broken wires or necked down sections of the cable within this region. The minimum allowable cable diameter is 0.185" (4.7 mm). The cable may exhibit a slight curve after testing, but this is an allowable condition, it causes no safety risk, and is not cause for removal of the cable. Additionally, no broken wires or necked down sections are allowed in the cable. If conditions such as this are observed, replace the cable immediately and notify Goodrich by sending an email to ASB.SIS-CA@utas.utc.com.

- (i) If the test results indicate a value above the allowable limits per Table 1, record the results, inform Goodrich and the TC holder, and continue operations.
- (j) If the test results indicate a value below the acceptable lower limit per Table 1, obtain a return authorization for the failed hoist using the standard RMA process through Goodrich at the address listed below. Send results of testing to Goodrich.

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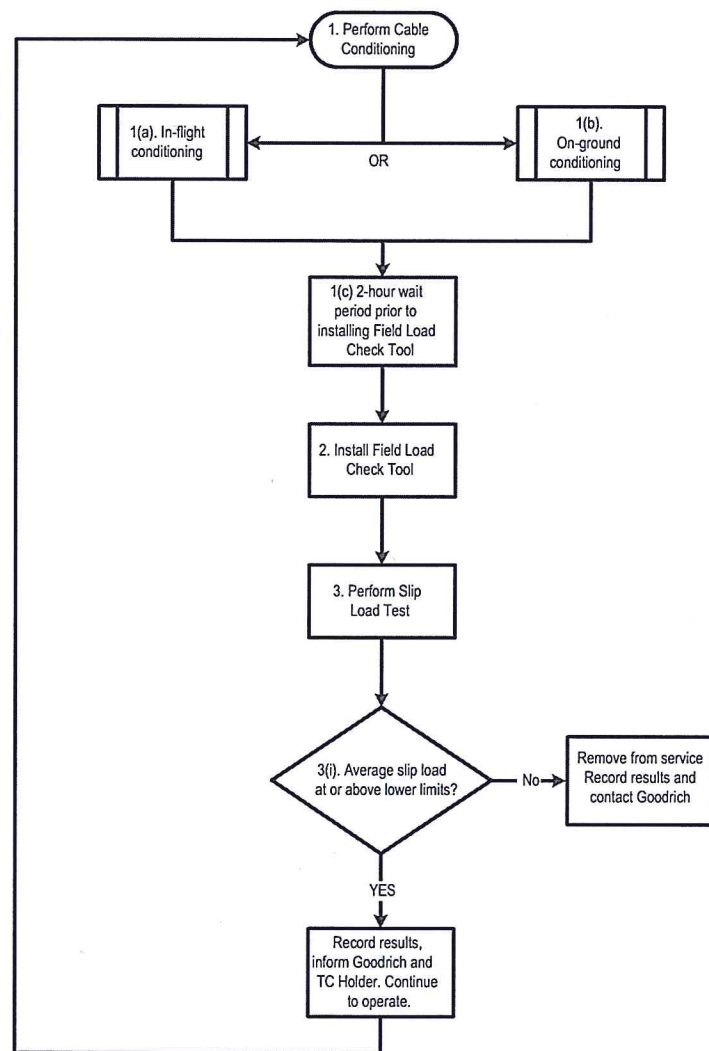


Figure 3. Load check flowchart



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D. Marking

- (1) Document the incorporation of this ASB on the Hoist Log Card or maintenance record.

E. Points of Contact

To obtain a loan of the Load Check Tool or obtain an RMA for the return of a hoist that has failed the load check in this ASB:

Goodrich Corporation

A UTC Aerospace Systems Company, Hoist and Winch Division
2727 E Imperial Hwy
Brea, CA 92821
Phone: 714-984-1584
Email: ASB.SIS-CA@utas.utc.com

To obtain a loan of the Load Check Tool outside of normal CA working hours, please contact:

UTC Aerospace Systems Customer Response Center (CRC)

1-877-808-7575 (US)
+1-860-654-2500 (Outside US)

4. Material Information

None

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Hoist Load Check Reply Form

Please complete this form upon completion of the load check IAW this ASB. Return a copy of this form to ASB.SIS-CA@utas.utc.com.

Operator name _____

Email address _____

Phone number _____

Helicopter model and serial number _____

Hoist Part number _____

Serial number _____

Operating hours _____

Cycles/Lifts _____

Slip loads (5) _____

Average slip load _____

Air temperature _____

Gearbox lubricant _____

☐ Load check PASS

☐ Load check FAIL

Note: If the hoist fails the load check, the hoist shall be removed from service. Regardless of pass or fail, the test result shall be forwarded by email to Goodrich and the type certificate (TC) holder.

Comments _____

_____

Date _____ Signature _____

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