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AgustaWestland Products

SERVICE BULLETIN

N° 189-297

DATE: June 8, 2021

REV. : /

TITLE

ATA 25 - DOUBLE RESCUE HOIST SMART MODULE OVERCURRENT PROTECTION TEST, ALTERNATIVE PROCEDURE

REVISION LOG

First Issue

1. PLANNING INFORMATION

A. EFFECTIVITY

All AW189 helicopters equipped with Double Rescue Hoist fixed parts P/N 8G2591A08212 (part of Double Rescue Hoist Goodrich kit P/N 8G2591F00311).

B. COMPLIANCE

At Customer's Option in conjunction with Certification Maintenance Requirement CM25-12.

C. CONCURRENT REQUIREMENTS

N.A.

D. REASON

This Service Bulletin is issued in order to provide the necessary instruction on how to comply with Leach International Service Bulletin SBL-0002-000-000 containing an alternative procedure to comply with Certification Maintenance Requirement CM25-12.

E. DESCRIPTION

This Service Bulletin provides information on how to check the proper functioning of the overcurrent protection feature of the Double Rescue Hoist system. This will assure that, in case of rescue hoist short circuit, the smart modules P/N ECU-111-001 are able to isolate the rescue hoist from the 115 VAC distribution.

F. APPROVAL

The technical content of this Service Bulletin is approved under the authority of DOA nr. EASA.21.J.005. For helicopters registered under other Aviation Authorities, before applying the Service Bulletin, applicable Aviation Authority approval must be checked within Leonardo Helicopters customer portal.

EASA states mandatory compliance with inspections, modifications or technical directives and related time of compliance by means of relevant Airworthiness Directives. If an aircraft listed in the effectivity embodies a modification or repair not LH certified and affecting the content of this Service Bulletin, it is responsibility of the Owner/Operator to obtain a formal approval by Aviation Authority having jurisdiction on the aircraft, for any adaptation necessary before incorporation of the present Service Bulletin.

G. MANPOWER

To comply with this Service Bulletin five (5) MMH are deemed necessary.

MMH are based on hands-on time and can change with personnel and facilities available.

H. WEIGHT AND BALANCE

N.A.

I. REFERENCES

1) PUBLICATIONS

Following Data Modules refer to AMP:

DATA MODULE		DESCRIPTION	PART
DM01	89-A-00-20-00-00A-120A-A	Helicopter on ground for a safe maintenance	-
DM02	89-A-25-93-20-00A-920A-A	Smart modules - Replacement	-

Following Data Modules refer to AMPI:

CODE	DESCRIPTION	PART
89-A-04-30-00-00A-028E-P	Certification maintenance requirements - General	-

2) ACRONYMS & ABBREVIATIONS

AMDI	Aircraft Material Data Information
AMP	Aircraft Maintenance Publication
AMPI	Aircraft Maintenance Planning Information
EASA	European Aviation Safety Agency
IPD	Illustrated Parts Data
ITEP	Illustrated Tool and Equipment Publication
DM	Data Module
DOA	Design Organization Approval
LH	Leonardo Helicopters
MMH	Maintenance Man Hours
P/N	Part Number
SB	Service Bulletin

3) ANNEX

Annex A Leach International Service Bulletin SBL-0002-000-000 Rev.A.

J. PUBLICATIONS AFFECTED

N.A.

K. SOFTWARE ACCOMPLISHMENT SUMMARY

N.A.

2. MATERIAL INFORMATION

A. REQUIRED MATERIALS

1) PARTS

Refer to IPD for the spares materials required to comply with the AMP DM referenced in the accomplishment instructions.

2) CONSUMABLES

Refer to AMDI for the consumable materials required to comply with the AMP DM referenced in the accomplishment instructions.

3) LOGISTIC MATRIX

N.A.

NOTE

N.A.

B. SPECIAL TOOLS

Refer to Leach International Service Bulletin SBL-0002-000-000 for the tools required to comply with this SB.

Refer also to ITEP for the special tools required to comply with the AMP DM referenced in the accomplishment instructions.

SPECIAL TOOLS NOTES

N.A.

C. INDUSTRY SUPPORT INFORMATION

N.A.

3. ACCOMPLISHMENT INSTRUCTIONS

GENERAL NOTES

a) Place an identification tag on all components that are re-usable, including the attaching hardware that has been removed to gain access to the modification area and adequately protect them until their later re-use.

b) Protect properly all those equipment not removed from area affected by the modification during installation procedure.

1. In accordance with AMP DM 89-A-00-20-00-00A-120A-A prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.
2. In accordance with the applicable steps of AMP DM 89-A-25-93-20-00A-920A-A remove the smart modules P/N ECU-111-001.
3. With reference to Leach International Service Bulletin SBL-0002-000-000 in Annex A, perform the ECU-111-001 overcurrent protection check.
4. In accordance with the applicable steps of AMP DM 89-A-25-93-20-00A-920A-A re-install the smart modules P/N ECU-111-001.
5. Return the helicopter to flight condition and record for compliance with this Service Bulletin on the helicopter logbook.
6. Send the “Test Data Sheet ECU-111-001 Trip Function” properly compiled to Product Support Engineering (engineering.support.lhd@leonardocompany.com).
7. Send the attached compliance form to the following mail box:

   engineering.support.lhd@leonardocompany.com

   As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the “Service Bulletin Application Communication”.

ANNEX A

LEACH INTERNATIONAL SERVICE BULLETIN

SBL-0002-000-000 REV.A

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	ECU-111-001	A	INITIAL RELEASE PER EO 112749	2021.05.21 10:04:20 -08'00'	David Sandoval

SERVICE BULLETIN
(ECU-111-001 TRIP FUNCTION)

Export Controlled		
Country	Control List	(Authorization #)
US	EAR: 1.CCN 9B991	

These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOL ANGLES ± -- DEC .XX ± -- .XXX ±	DRAWN	D. Hubert	04/08/21
	CHK.	N. BUDDEMEYER	5/12/21
	ENGR.	D. LAM	5/13/21
MATERIAL	PROJ. ENG.	----------	
	Q.A.	E. PRECIADO	5/14/21
FINISH	MFG.	L. SCHMENK	5/13/21
	ENG MGR	----------	

LEACH *INTERNATIONAL*
CORPORATION
6900 Orangethorpe Ave. Buena Park, CA 90622-5032

TITLE
SERVICE BULLETIN FOR
ECU-111-001 TRIP FUNCTION TEST

SIZE	DWG NO.	REV
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RECORDS OF REVISIONS

ISSUE	DATE	EFFECT ON		REASON FOR REVISION
		PAGE	PARA.	
1	04/14/21	All		Initial Engineering Release.
2	05/05/21	6	Table 1	Add secondary winding cable type.
		8	4.2	Add Hazard Warning.
		10	Figure 1	Change S2 and current meter position, add transformer ratio for secondary winding.
A	5/12/21	ALL	ALL	INITIAL RELEASE

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1.0 PURPOSE

This service bulletin defines the methods and requirements of the manual Trip Function performance testing on the AC Smart Module ECU-111-001 outlined in LEACH 550-0829-000-000 Acceptance Test Procedure.

2.0 ADMINISTRATIVE DATA

2.1 Manufacturer

Leach International Corporation (LIC)
P.O. Box 5032
6900 Orangethorpe Avenue
Buena Park, CA 90622-5032

2.2 Part Number

Leach Model	Leach P/N
ECU-111-001	221-0059-001-000

2.3 Applicable Documents

254-0059-001-000	Assembly, Smart Module, ECU-111-001
221-0059-001-000	Production Control Drawing (PCD), AC Smart Module
ENG-0806-122	AC Smart Module Interface Control Drawing
550-0829-000-000	AC Smart Module ATP, ECU-111
QAP 2.3	Data Retention/Data Control
QAP 3.12	Inspection Procedures
QAP 4.1	Equipment Control & Calibration

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3.0 TEST REQUIREMENTS

3.1 Acceptance Tests

Acceptance Tests shall consist of the inspections specified herein.

3.2 Test Conditions

All tests shall be performed in an ambient temperature of 20° to 35°C, a relative humidity of 40% to 75%, and at a barometric pressure of 650 to 800 millimeters of mercury, unless otherwise specified.

3.3 Equipment & Instrumentation

Test equipment and inspection facilities shall be of sufficient accuracy, quality and quantity to permit performance of the required inspection. All test equipment shall be calibrated at periodic intervals, using standards traceable to the National Institute of Standards and Technology. Evidence of calibration shall appear on each instrument, and additional documentation shall be available to demonstrate the validity of the calibration per QAP 4.1. When equipment listed for a test is not available, equipment of equal to or greater accuracy may be substituted. Reference Table 1 for test equipment list.

3.4 Test Tolerances

Unless otherwise specified.

Voltage	± 5 %
Current	± 5 %
Frequency	± 5 %
Time	± 10 %
Temperature	± 5 %

3.5 Test Data

The Acceptance Tests Data Sheet (TDS) shall be completed and supplied for each module tested. A sample of the data sheet is contained herein. A module failing to meet any requirements of this test procedure shall be rejected at that point and shall be retested after corrective action has been taken.

Table 1, Test Equipment List
TDK Lambda GEN 30-25 DC Power Supply
Keithley 2110-120 5 1/2-digit Multimeter
AEMC SR661 Current Clamp
Agilent DSOX 3014A Oscilloscope
California Instruments CSW11100-208
Toroid Corporation (TCM) Step Down Transformers #1212
FlexWhip 1/0 Welding Cable (secondary windings, ratio N:7)

Table 2, Overload Currents (Reference Figure 2; Thermal I^2t Curve Plot)	
TRIP TEST AMPERAGE	**TRIP TIME**
200 (-0.0 +20) Arms	≤ 0.036 sec
300 (-0.0 +30) Arms	≤ 0.012 sec
400 (-0.0 + 40) Arms	≤ 0.006 sec
Non-Trip Test Amperage	**No Trip Time**
150 (+0.0 -7.5) Arms	> 300 sec

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4.0 ACCEPTANCE TEST PROCEDURE

4.1 Power On Condition Test

4.1.1 Test Requirements

Condition indicators shall be verified for the proper state at power on and the maximum power current shall be ≤ **48mA** at +28.0VDC.

4.1.2 Test Methods

(a) Connect the module and test equipment per Figure 1, Trip Test Setup as follows:

1.) Set Switch 1 and Switch 2 to the open position.
2.) Ensure that the AC Current Source is in the Off state.
3.) Set the three phases of the Current Source for a single phase output.
4.) Set the Current Source for a Frequency to 400 Hz.
5.) Ensure that the Oscilloscope is ground isolated.
6.) Set the Oscilloscope trip function to Channel 2 Falling Edge.
7.) Set the Oscilloscope Channel 1 for a current reading.
8.) Set the Oscilloscope Channel 2 for a voltage reading.
9.) Set the DMM for a current reading.
10.) Set the power supply for a +28.0 VDC level output.
11.) Observing proper polarity, ensure the remaining connections to J1 are complete and that the coil load resistor is in place.

(b) Set Switch 1 to the closed position to apply +28.0VDC to the module .
(c) Verify the assembly is drawing ≤ 48 mA.
(d) Verify the state of the condition indicators as follows:

1.) TRIP indicator is not illuminated.
2.) BIT / TEST is not illuminated.
3.) PWR indicator is illuminated

(e) Record the Pass/Fail condition on the TDS.

4.2 Overload Trip Current Function

4.2.1 Test Requirements

AC line overload current monitoring and thermal I^2t curve trip time shall be confirmed on each phase independent of the other phases and shall be at the prescribed current values.

WARNING ELECTRICAL HAZARD

This equipment should be installed, adjusted, and serviced only by qualified personal familiar with operation of the equipment and the High Current hazards involved.
Failure to observe this precaution could result in bodily injury.

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4.2.2 Test Method

(a) Continue with the test setup from Section 4.1.2 and perform the following:
(b) Set Switch 2 to the closed position.
(c) Verify that the condition indicators did not change state.
(d) Verify that Oscilloscope reads +28.0 VDC on Channel 2.
(e) Set the trip level of the Oscilloscope to ≈ 10% of the current value.
(f) Record the Pass/Fail condition on the TDS.
(g) Set Switch 2 to the open position followed by Switch 1 to the open position.
(h) Ensure that the transformers secondary line is routed through one phase of the module, reference ECU-111-001 PCD.
(i) Turn on the out put of the Current Source.
(j) While monitoring Channel 1 of the Oscilloscope, increase the voltage until the desired current value is reached, reference Table 2.
(k) Turn off the out put of the Current Source.
(l) Set Switch 1 to the closed position followed by Switch 2 to the closed position.
(m) Turn on the out put of the Current Source for ≤ 2 seconds or until the Trip indicator illuminates, whichever comes first.
(n) Verify the time duration between the input current reaching the prescribed level to when the coil voltage turns off.
(o) Verify that the TRIP indicator is illuminated.
(p) Record the Pass/Fail condition on the TDS.
(q) Repeat steps (g) through (p) for the remaining current trip levels per Table 2.
(r) Route the transformers secondary line through the next phase of the module.
(s) Repeat steps (g) through (r) until all three module phases have been tested.
(t) Set Switch 2 to the open position followed by Switch 1 to the open position.

4.3 No Trip Current Overload Trip Function

4.3.1 Test Requirements

AC line overload current monitoring and thermal I^2t curve trip time shall be confirmed not to trip for the duration and current level prescribe on each phase independent of the other phases.

4.3.2 Test Method

(a) Continue with the test setup from Section 4.2.2 and perform the following:
(b) Ensure that the transformers secondary line is routed through one phase of the module, reference ECU-111-001 PCD.
(c) Turn on the out put of the Current Source.
(d) While monitoring Channel 1 of the Oscilloscope, increase the voltage until the desired current value is reached, reference Table 2.
(e) Turn off the out put of the Current Source.
(f) Set Switch 1 to the closed position.
(g) Turn on the out put of the Current Source for 300 to 330 seconds.
(h) Turn off the out put of the Current Source.
(i) Verify that the TRIP indicator did not illuminate.
(j) Record the Pass/Fail condition on the TDS.
(k) Route the transformers secondary line through the next phase of the module.
(l) Repeat steps (b) through (k) until all three module phases have been tested.
(m) Set Switch 2 to the open position followed by Switch 1 to the open position.

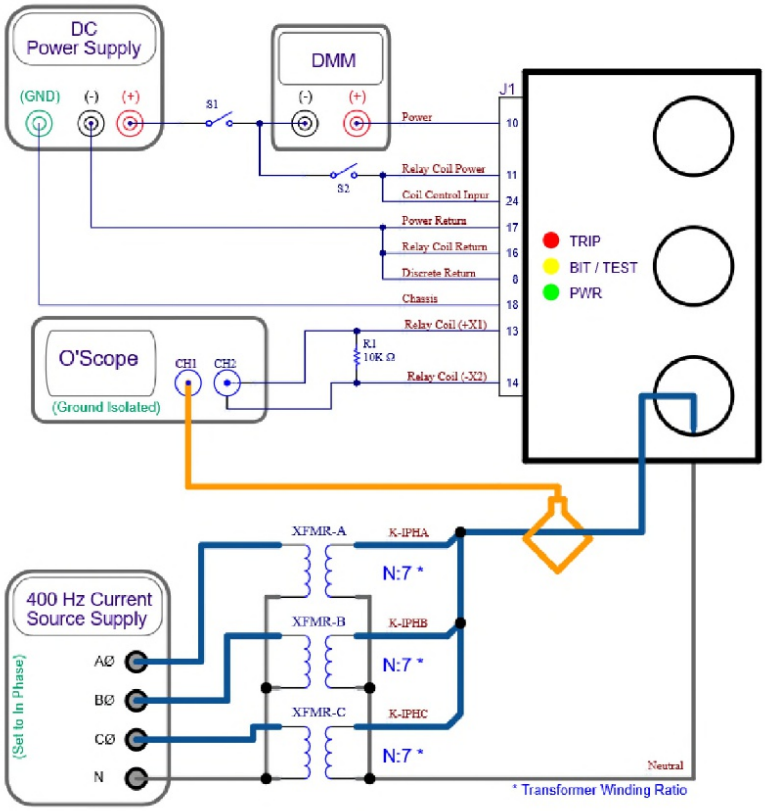

Figure 1
Trip Test Setup

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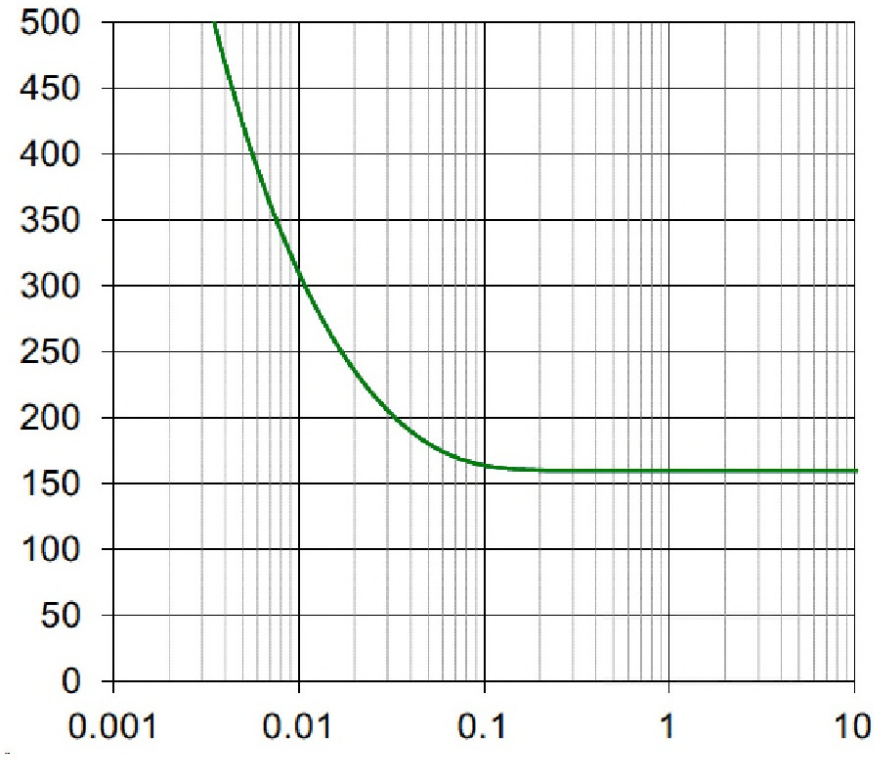

Figure 2
Thermal I^2t Curve Plot

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Test Data Sheet
ECU-111-001 Trip Function

MODEL NO.:	SERIAL NO.:
WORK ORDER NO.:	DATE CODE:

PROCEDURE PARAGRAPH	TEST	RESULTS	
		PASS	Fail
4.1.2	≤ 100mA		
	TRIP indicator not illuminated		
	BIT / TEST indicator not illuminated		
	PWR Indicator is illuminated		
4.2.2	Relay Coil Voltage reads +28.0 VDC		
	⌀A 200 Arms trip time; TRIP indicator illuminated		
	⌀A 300 Arms trip time; TRIP indicator illuminated		
	⌀A 400 Arms trip time; TRIP indicator illuminated		
	⌀B 200 Arms trip time; TRIP indicator illuminated		
	⌀B 300 Arms trip time; TRIP indicator illuminated		
	⌀B 400 Arms trip time; TRIP indicator illuminated		
	⌀C 200 Arms trip time; TRIP indicator illuminated		
	⌀C 300 Arms trip time; TRIP indicator illuminated		
	⌀C 400 Arms trip time; TRIP indicator illuminated		
4.3.2	⌀A 150 Arms no-trip time; TRIP indicator not illuminated		
	⌀B 150 Arms no-trip time; TRIP indicator not illuminated		
	⌀C 150 Arms no-trip time; TRIP indicator not illuminated		

Tested by:	Date Tested:	Stamp:

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Please send to the following address: **LEONARDO S.p.A.** **CUSTOMER SUPPORT & SERVICES - ITALY** **PRODUCT SUPPORT ENGINEERING & LICENSES DEPT.** Via Giovanni Agusta, 520 21017 Cascina Costa di Samarate (VA) - ITALY Tel.: +39 0331 225036 Fax: +39 0331 225988	**SERVICE BULLETIN COMPLIANCE FORM**	Date:
	Number:	
	Revision:	

Customer Name and Address:	Telephone:
	Fax:
	B.T. Compliance Date:

Helicopter Model	S/N	Total Number	Total Hours	T.S.O.

Remarks:

Information:

We request your cooperation in filling this form, in order to keep out statistical data relevant to aircraft configuration up-to-date. The form should be filled in all its parts and sent to the above address or you can communicate the application also via Technical Bulletin Application Communication Section placed in Leonardo AW Customer Portal - MyCommunications Area. We thank you beforehand for the information given.