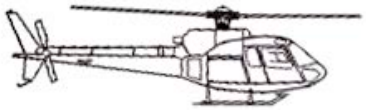
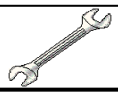


EMERGENCY
ALERT SERVICE BULLETIN

SUBJECT: ENGINE CONTROLS - Twist grip

Functional check and installation of a protection for microswitches 53Ka and 53Kb and 65K (IDLE / FLIGHT mode)

Corresponds to modification 074699
ATA 76

For the attention of	
	

AIRCRAFT CONCERNED	NUMBER	Version(s)	
		Civil	Military
AS350	05.00.61	B3	
AS550	05.00.41		C3
EC130	05A009	B4	

Revision No.	Date of issue
Revision 0 (AS350 - EC130)	2009-11-16
Revision 1 (AS350 - EC130) Revision 0 (AS550)	2012-11-22
Revision 2 (AS350 - EC130) Revision 1 (AS550)	2013-08-13
Revision 3 (AS350 - EC130) Revision 2 (AS550)	2015-06-15

Summary:
The purpose of the previous revisions of this ALERT SERVICE BULLETIN was to:
- ensure correct operation of the controls on the twist grip
- apply a protective varnish to the microswitch connectors to make them water-tight
- introduce a new periodic check.

Reason for last Revision:
The purpose of this Revision is to add details concerning the varnish application procedure in order to make the microswitch connectors water-tight.

Revision 3 (AS350 - EC130) and Revision 2 (AS550) affect compliance with the previous revisions of this ALERT SERVICE BULLETIN.

Application:

Airbus Helicopters renders compliance with this ALERT SERVICE BULLETIN mandatory.

1. PLANNING INFORMATION

1.A. EFFECTIVITY

1.A.1. Helicopters/installed equipment

AS350 and AS550 helicopters equipped with the ARRIEL 2B1 engine (MOD 073254) associated with the two-channel FADEC POST MOD 073261 (new twist grip).
EC130 helicopters equipped with the ARRIEL 2B1 engine associated with the two-channel FADEC POST MOD 073773 (new twist grip).

NOTA 1

Refer to the aircraft individual inspection record (MOD record), the equipment log cards (FMs) or the aircraft log book to identify the actual configuration of the helicopter.

1.A.2. Non-installed equipment

Not applicable.

1.B. ASSOCIATED REQUIREMENTS

Not applicable.

1.C. REASON

Revision 0 and Revision 1:
During trouble-shooting analysis at the EUROCOPTER works, it was found that there is the risk of a dormant failure of one of the two microswitches 53Ka or 53Kb following the introduction of modification 073254. Failure of the other microswitch, associated with this dormant failure, can prevent switching from "IDLE" mode to "FLIGHT" mode during training for autorotation, which can compel the pilot to continue autorotation until the final phase.

EUROCOPTER consequently made it mandatory to check for correct opening and closing of the microswitches 53Ka and 53Kb, in order to prevent this dormant failure.

Revision 2 (AS350 - EC130) or Revision 1 (AS550):
Following a recent incident (significant loss of power in flight) which occurred during an offshore flight, the subsequent investigations and tests revealed that the operation of the implicated microswitches could be altered due to environmental constraints (malfunction related to the possible presence of salt water on the microswitch terminals).

Technical analysis revealed that modification 074263, introduced by ALERT SERVICE BULLETINS 80.00.09 (AS350), 80.00.06 (AS550), 80A005 (EC130) Revision 0, is necessary but does not enable cancellation of the instructions given in this ALERT SERVICE BULLETIN. These instructions are therefore maintained for concerned helicopters given in paragraph 1.A.1.

Consequently, the revision of this ALERT SERVICE BULLETIN takes into account the results of these latest tests and renders the following mandatory:
- An extension of the effectivity for helicopters embodying modification 074263,
- A reduction of the time limit for first compliance and the periodic check to 330 flying hours,
- Removal/installation of the microswitch,
- A visual inspection to ensure there is no corrosion,
- Application of a varnish to make the microswitches water-tight,
- An electrical insulation check,
- A functional test for the correct opening and closing of the 53Ka, 53Kb and 65K microswitches.

Revision 3 (A350 - EC130) or Revision 2 (AS550):
Following feedback from some operators, complementary specifications have been added to the operational procedure.
This Revision introduces modification 074699. It consists in ensuring water-tightness of the considered microswitch connectors.
Moreover, the periodic check described in paragraph 1.E.2 is made applicable to helicopters POST MOD 074699.

This Revision affects compliance with the previous revisions of this ALERT SERVICE BULLETIN.

1.D. DESCRIPTION

- A visual inspection to ensure there is no corrosion on the microswitches.
- Electrical test and check.

1.E. COMPLIANCE

1.E.1. Compliance at the works

Not applicable.

1.E.2. Compliance in service

Helicopters/installed equipment:

1.E.2.a. For all helicopters identified in paragraph 1.A.1. which do not embody modification 07-4699:

NOTA 2

Modification 07-4699 introduces the application of a protective varnish in order to ensure water-tightness of the connectors of microswitches 53Ka, 53Kb and 65K.

- Comply with paragraph 3 of this ALERT SERVICE BULLETIN in its latest revision **within the next 10 flying hours or 7 days** (whichever limit comes first).

THEN

1) For the helicopters which operate or have operated since the previous compliance with paragraph 3 of this ALERT SERVICE BULLETIN in salt laden conditions [salt laden conditions persist when an aircraft is ship-based, based less than 1 km from the coast or performs an offshore flight at low altitude (below 1,000 feet)]:

- Comply with paragraph 3. of this ALERT SERVICE BULLETIN every **330 flying hours or 6 months** (whichever limit comes first).

OR

2) For the helicopters which do not operate and have never operated since the previous compliance with paragraph 3 of this ALERT SERVICE BULLETIN in salt laden conditions:

- Comply with paragraph 3. of this ALERT SERVICE BULLETIN every **660 flying hours or 12 months** (whichever limit comes first).

1.E.2.b. For all helicopters identified in paragraph 1.A.1. which embody modification 07-4699

1) For the helicopters which operate or have operated since embodiment of modification 07-4699 in salt laden conditions [salt laden conditions persist when an aircraft is ship-based, based less than 1 km from the coast or performs an offshore flight at low altitude (below 1,000 feet)]:

- Comply with paragraph 3 of this ALERT SERVICE BULLETIN every **330 flying hours or 6 months** since embodiment of modification 07-4699 (whichever limit comes first).

OR

2) For the helicopters which do not operate and have never operated since embodiment of modification 07-4699 in salt laden conditions:

- Comply with paragraph 3 of this ALERT SERVICE BULLETIN every **660 flying hours or 12 months** since embodiment of modification 07-4699 (whichever limit comes first).

Non-installed equipment:

Not applicable.

1.F. APPROVAL

Approval of modifications:

The information or instructions relate to modification 07-4699 which was approved on July 22, 2014 under the authority of EASA Design Organization Approval No. 21J.056 for helicopters of civil versions subject to an Airworthiness Certificate.

The information or instructions relate to modification 07-4699, which was approved on July 22, 2014 by the Airbus Helicopters Airworthiness Department for export military versions.

Approval of this document:

The technical information contained in this ALERT SERVICE BULLETIN Revision 0 (AS350 - EC130) was approved on November 12, 2009 under the authority of EASA Design Organization Approval No. 21J.056 for helicopters of civil version subject to an Airworthiness Certificate.

The technical information contained in this ALERT SERVICE BULLETIN Revision 1 (AS350 - EC130) was approved on November 20, 2012 under the authority of EASA Design Organization Approval No. 21J.056 for helicopters of civil versions subject to an Airworthiness Certificate.

The technical information contained in this ALERT SERVICE BULLETIN Revision 0 (AS550) was approved on November 20, 2012 by the EUROCOPTER Airworthiness Department for export military versions.

The technical information contained in this ALERT SERVICE BULLETIN (AS350 - EC130) Revision 2 was approved on August 13, 2013 under the authority of EASA Design Organization Approval No. 21J.056 for helicopters of civil versions subject to an Airworthiness Certificate.

The technical information contained in this ALERT SERVICE BULLETIN Revision 1 (AS550) was approved on August 13, 2013 by the EUROCOPTER Airworthiness Department for export military versions.

The technical information contained in this ALERT SERVICE BULLETIN Revision 3 (AS350 - EC130) was approved on June 15, 2015 under the authority of EASA Design Organization Approval No. 21J.056 for helicopters of civil versions subject to an Airworthiness Certificate.

The technical information contained in this ALERT SERVICE BULLETIN Revision 2 (AS550) was approved on June 15, 2015 by the Airbus Helicopters Airworthiness Department for export military versions.

1.G. MANPOWER

Qualification:
1 Avionics technician.

Time for the operations:
4 hours

Estimated helicopter grounding time:
1/2 day

1.H. WEIGHT AND BALANCE

Not applicable.

1.I. EFFECT ON ELECTRICAL LOADS

Not applicable.

1.J. SOFTWARE MODIFICATION EMBODIMENT RECORD

Not applicable.

1.K. REFERENCES

Aircraft Maintenance Manual (AMM):
- Task 24-00-00, 3-1.
- Task 53-51-00, 4-2.
- Task 76-12-03, 4-1
- Task 76-12-03, 4-1b
- Task 76-12-03, 5-1.

Standard Practices Manual (MTC):
- Work Card: 20.04.03.401
- Work Card: 20.04.03.103

1.L. DOCUMENTS AFFECTED

The following document will be the subject of a future update: AMM.

1.M. INTERCHANGEABILITY OR MIXABILITY OF PARTS

Not applicable.

2. MATERIAL INFORMATION

2.A. MATERIAL: PRICE - AVAILABILITY - PROCUREMENT

For any information on the price of components, contact the Airbus Helicopters Network Sales & Customer Relations Department.

NOTE 1

On the purchase order, please specify the mode of transport, the destination, and the serial numbers of the helicopters to be modified.

NOTE 2

For ALERT SERVICE BULLETINS, order by:
Telex: HELICOP 410 969F
Fax: +33 (0)4.42.85.99.96.

2.B. INFORMATION CONCERNING INDUSTRIAL SUPPORT

For any information on technical assistance, contact the Airbus Helicopters Network Sales & Customer Relations Department.

For any technical details, contact Airbus Helicopters Technical Support:
Fax: +33 (0)4 42 85 99 66
Email: Avionics.Technical-Support@eurocopter.com

2.C. MATERIAL REQUIRED FOR EACH HELICOPTER/COMPONENT

Products to be ordered separately:

As per Work Cards and Tasks mentioned in this ALERT SERVICE BULLETIN and the list below:

Material P/N	Qty	Item	Key Word	Former P/N	Instruction
E0718-00-30	A/R	10	Heat-shrink sheath		
E0718-02-30	A/R	11	Heat-shrink sheath		
ECS2228.10	A/R	12	Vernelec 43022 varnish or equivalent		

The products can be ordered separately, from the INTERTURBINE AVIATION LOGISTICS company:
Website: http://www.interturbine.com
Telephone: +49.41.91.809.300
AOG: +49.41.91.809.444

Tools:

Key Word	Qty	Part Number	Item
Megohmmeter	1	Off the shelf	zz
Ohmmeter	1	Off the shelf	yy

2.D. MATERIAL TO BE RETURNED

Not applicable.

3. ACCOMPLISHMENT INSTRUCTIONS

3.A. GENERAL

CAUTION

APPLY THE ROTOR BRAKE TO PREVENT ANY RISK OF STARTING.

Read and comply with the general instructions as per AMM Task 24-00-00, 3-1.
Carry out the check described below on the pilot's and/or copilot's side, according to the helicopter version.

3.B. OPERATIONAL PROCEDURE

3.B.1. Visual inspection of microswitches (Figure 1)

3.B.1.a. Removal of cowlings

- Remove the lower front cowling as per AMM Task 53-51-00, 4-2.
- Remove the protective cover (b).

3.B.1.b. Visual inspection

- Inspect the wiring side of microswitches (c), (d) and (e) in order to ensure that there are no marks, residues, corrosion or flaky varnish (DETAIL A - Figure 1).
- If there are marks, residues, corrosion or flaky varnish, comply with paragraph 3.B.2.
- If there are no marks, residues, corrosion or flaky varnish, comply with paragraph 3.B.3.

3.B.2. Procedure in the event of marks, residues, corrosion or flaky varnish (Figures 1, 2, 3 and 4)

- Disconnect electrical connector 87DELTAP1 (a).
- Loosen and remove microswitches (c, d) and (e) as per AMM Task 76-12-03, 4-1 (AS350 and AS550) or 76-12-03, 4-1b (EC130).
- For each microswitch, note the position of the wires on the terminals.
- Remove and discard the sheath.
- Remove any varnish present.
- Unsolder the wires.
- Clean the wire side as per MTC Work Card 20.04.03.401 or 20.04.03.103.

As per Figure 3:
- Strip and tin the wires over a length of 4mm: Detail B.
- Position two pieces of sheath: one 10 mm piece of sheath (10) and one 8mm piece of sheath (11): Detail B.
- Preform the wire strands into a hook shape: Detail C.
- Position the preformed wire strands in the contact hole of the microswitch: Detail D.
- Solder using a soldering iron set to 340°C (tolerance -15°C to +30°C): Detail E.
- In order to protect them from corrosion, apply varnish (12) with a brush to (See Diagram - Figure 4):
  . the soldered points of the electrical terminals,
  . the unused terminals,
  . the microswitch "heels" (area where the terminals are located).
  Comply with MTC Work Card 20.04.03.103 without oven-drying the component: Detail E.
- Leave to dry until the varnish hardens.
- Position the sheath (10) against the soldered area and shrink fit it: Detail E.
- Position the sheath (11) against the microswitch over sheath (10) and shrink fit it: Detail F.

CAUTION

WHEN INSTALLING THE MICROSWITCHES (C, D) AND (E), TORQUE TIGHTEN TO A VALUE BETWEEN 0.25 AND 0.3 N.M (2.21 - 2.65 IN.LB).

- Install microswitches (c, d) and (e) as per AMM Task 76-12-03, 4-1 (AS350 and AS550) or 76-12-03, 4-1b (EC130).
- Carry out an insulation test as per paragraph 3.B.3.

3.B.3. Insulation test (Figures 1 and 2)

- If not previously disconnected, disconnect electrical connector 87DELTAP1 (a).
- Carry out an electrical insulation test at 50 volts using a megohmmeter (zz) connected between:
  . the housing of microswitch 53Ka and terminals A and B of connector 87DELTAP1.
  . the housing of microswitch 53Kb and terminals D and F of connector 87DELTAP1.
  . the housing of microswitch 65K and terminals D and E of connector 87DELTAP1.

Interpretation of the results:
a) If the values displayed are more than or equal to 10 MΩ, comply with paragraph 3.B.4.

b) If the values displayed are less than 10 MΩ:

- Loosen, remove and then discard the concerned microswitch(es) as per AMM Task 76-12-04, 4-1.
- Install a new microswitch.
- Note the position of the wires on the terminals.
- Remove and discard the sheath.
- Remove any varnish present.
- Unsolder the wires.

As per Figure 3 :

- Strip and tin the wires over a length of 4mm: Detail B.
- Position two pieces of sheath: one 10mm piece of sheath (10) and one 8mm piece of sheath (11): Detail B.
- Preform the wire strands into a hook shape: Detail C.
- Position the preformed wire strands in the contact hole of the microswitch: Detail D.
- Solder using a soldering iron set to 340°C (tolerance -15°C to +30°C): Detail E.
- In order to protect them from corrosion, apply varnish (12) with a brush to (See Diagram - Figure 4):
  - the soldered points of the electrical terminals,
  - unused terminals,
  - the microswitch “heels” (area where the terminals are located).

Comply with MTC Work Card 20.04.03.103 without oven-drying the component: Detail E.

- Allow to dry until the varnish hardens.
- Position the sheath (10) against the soldered area and shrink fit it: Detail E.
- Position the sheath (11) against the microswitch over sheath (10) and shrink fit it: Detail F.

CAUTION

WHEN INSTALLING THE MICROSWITCH, TORQUE TIGHTEN TO A VALUE BETWEEN 0.25 AND 0.3 N.M (2.21 - 2.65 IN.LB).

- Install the microswitch(es) concerned as per AMM Task 76-12-04, 4-1.
- Carry out a new insulation test.
- Then comply with paragraph 3.B.4.

3.B.4. Checking the IDLE and FLIGHT controls on the pilot's and copilot's twist grips (Figure 2)

- Connect an ohmmeter (yy) to terminals A and B of connector 87DELTAP1.
- Turn the twist grip from "IDLE" to "FLIGHT" and from "FLIGHT" to "IDLE":
  . Check on the ohmmeter (yy) that the microswitch closes in the "IDLE" position and opens as soon as the twist grip is turned from the "IDLE" position to the "FLIGHT" position.
  . If the check result is not correct, replace the microswitch concerned by carrying out the procedure described in paragraph 3.B.3.b).
- Disconnect the ohmmeter (yy) and connect it to terminals D and F of connector 87DELTAP1.
- Turn the twist grip from "IDLE" to "FLIGHT" and from "FLIGHT" to "IDLE":
  . Check on the ohmmeter (yy) that the microswitch closes in the "IDLE" position and opens as soon as the twist grip is turned from the "IDLE" position to the "FLIGHT" position.
  . If the check result is not correct, replace the microswitch concerned by carrying out the procedure described in paragraph 3.B.3.b).
- Disconnect the ohmmeter (yy) and connect it to terminals D and E of connector 87DELTAP1.
- Turn the twist grip from "IDLE" to "FLIGHT" and from "FLIGHT" to "IDLE":
  . Check on the ohmmeter (yy) that the microswitch closes in the "IDLE" position and opens as soon as the twist grip is turned from the "IDLE" position to the "FLIGHT" position.
  . If the check result is not correct, replace the microswitch concerned by carrying out the procedure described in paragraph 3.B.3.b).
- Disconnect the ohmmeter (yy).
- Connect the electrical connector 87DELTAP1 (a).
- Carry out the appropriate procedure as defined in the table below:

Compliance with paragraph 3.B.2	Replacement of microswitch	Required procedure
YES	NO	Comply with paragraph 3.B.6
YES	YES	Comply with paragraph 3.B.5
NO	NO	PRE MOD 074699, comply with paragraph 3.B.5 POST MOD 074699, comply with paragraph 3.B.6
NO	YES	Comply with paragraph 3.B.5

3.B.5. Application of varnish (Figures 3 and 4)

NOTE 1

Revision 2 required the application of varnish to the soldered points and unused terminals only. The procedure described below ensures water-tightness of the microswitch by application of varnish to the heel.

- Apply varnish (12) with a brush to (See Diagram - Figure 4):
  - the soldered points of the electrical terminals,
  - the unused terminals,
  - the microswitch “heels” (area where the terminals are located).
- Comply with MTC Work Card 20.04.03.103 without oven-drying the component: Detail E.
- Allow to dry until the varnish hardens.
- Comply with paragraph 3.B.6.

3.B.6. Tests

- Install the protective cover (b) Figure 2.
- Install the front lower cowling as per AMM Task 53-51-00, 4-2.
- Conduct the operational tests and indicating tests of the twist grip as per AMM Task 76-12-03, 5-1.

3.C. IDENTIFICATION

Identification of the modification:

Record the embodiment of modification 07-4699 in the helicopter documents upon first compliance with this document.

Identification of this document:

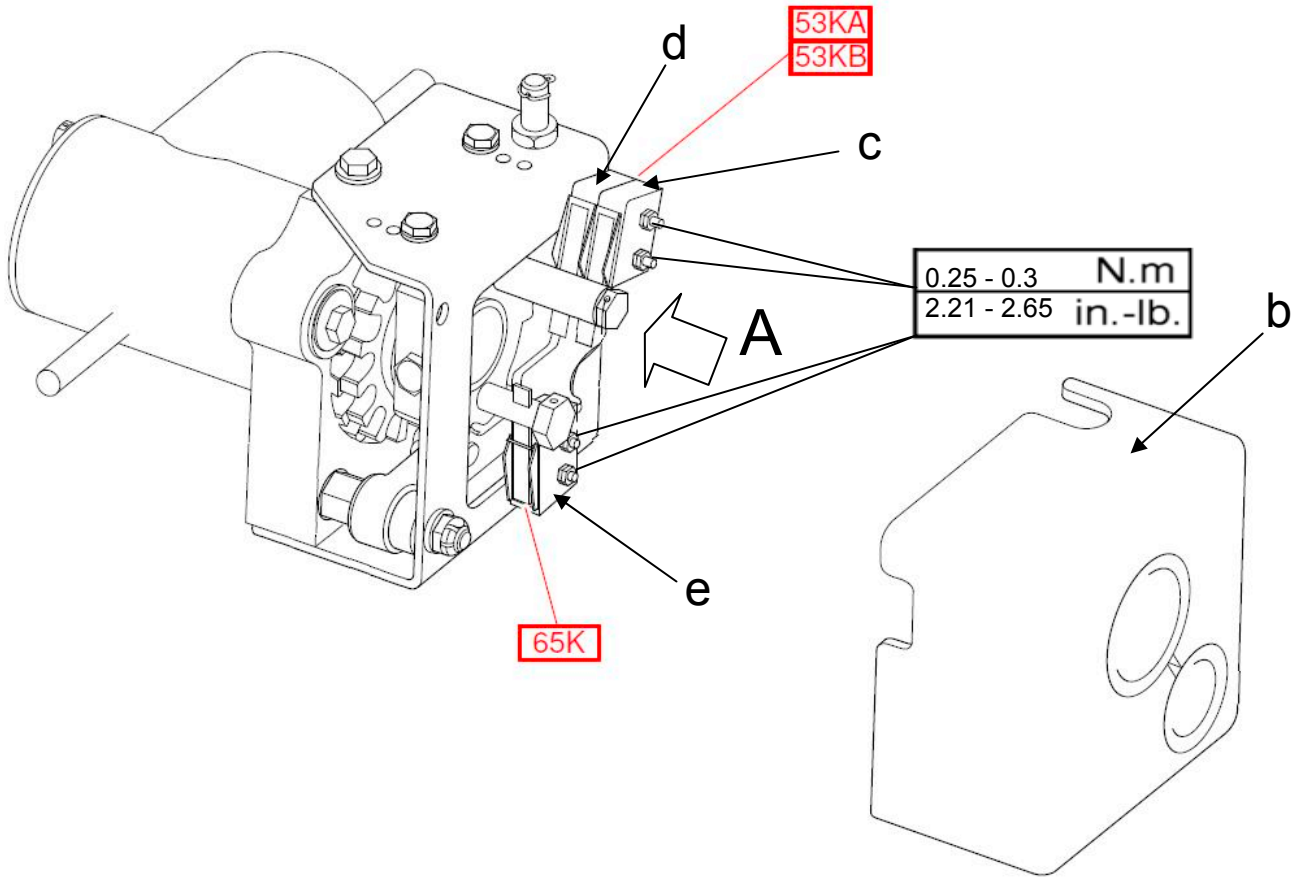
Record first compliance with this document in the helicopter documents.

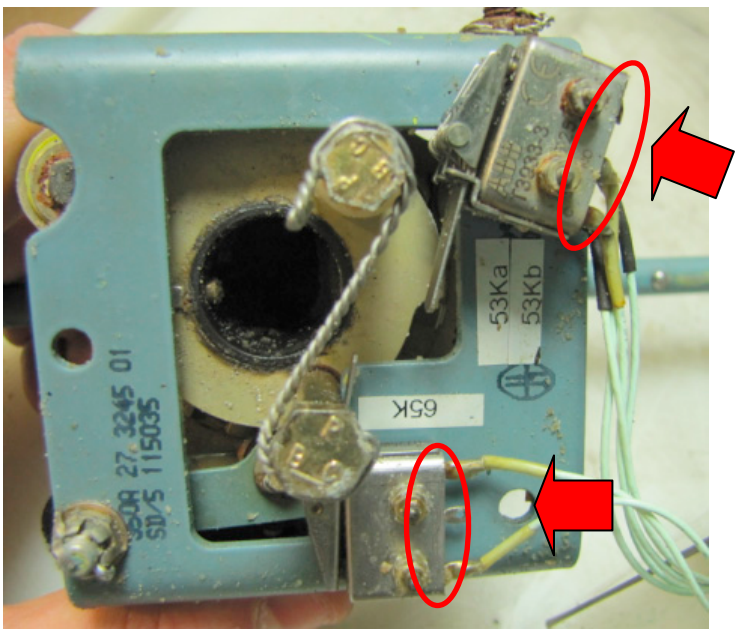
3.D. OPERATING AND MAINTENANCE INSTRUCTIONS

Not applicable.

4. ANNEXE

Not applicable.





DETAIL A

Figure 1

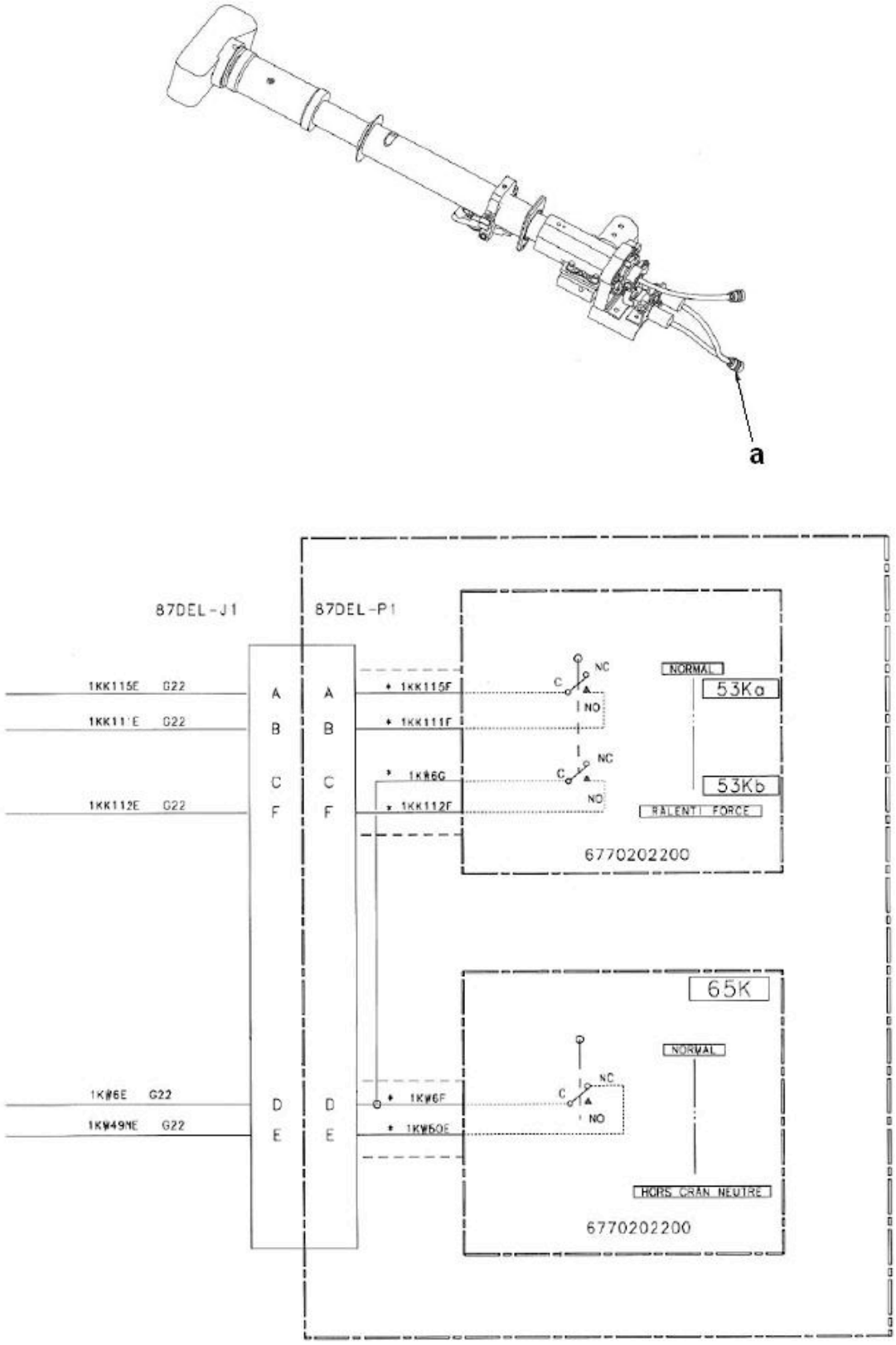
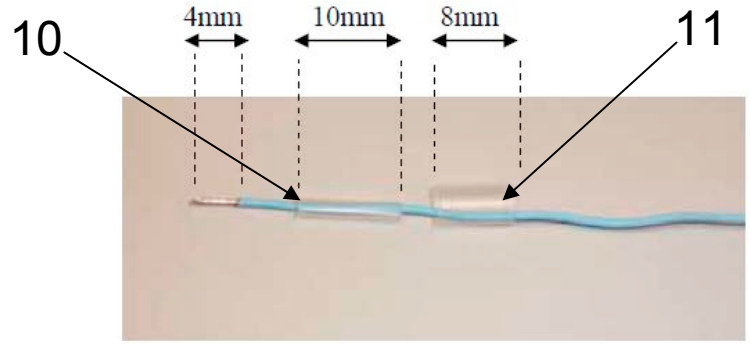
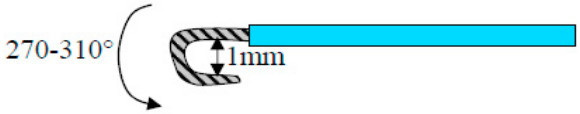


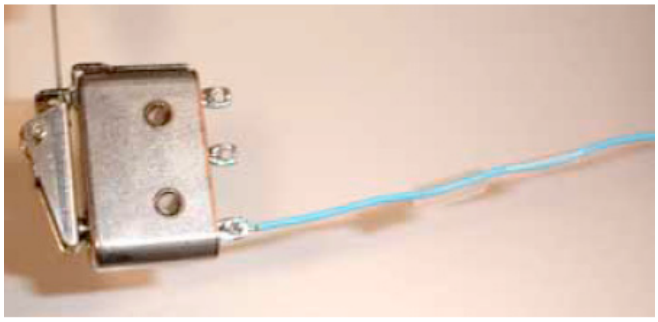
Figure 2: Electrical continuity test of microswitches 53Ka, 53Kb and 65K



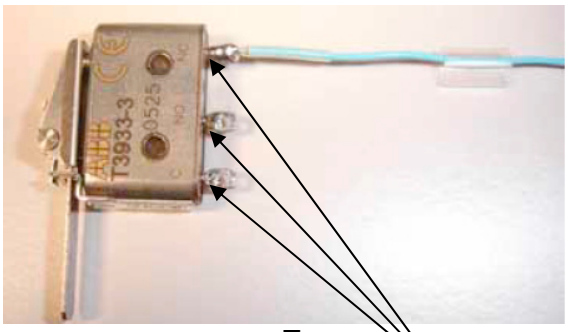
B



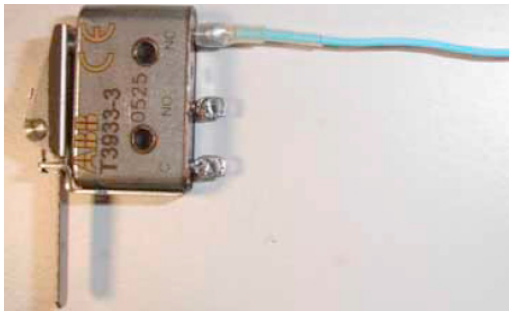
C



D

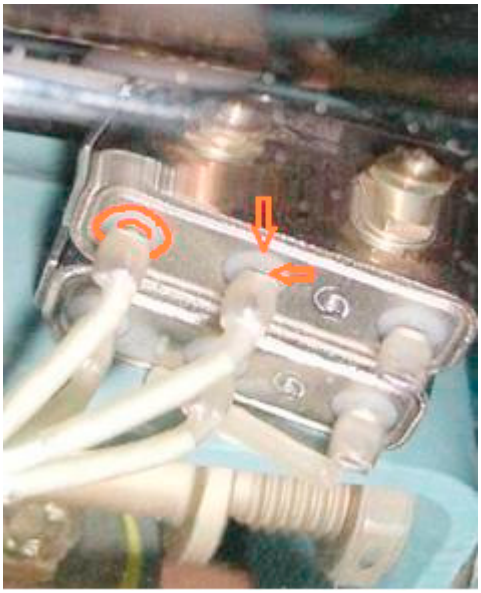


E



F

Figure 3



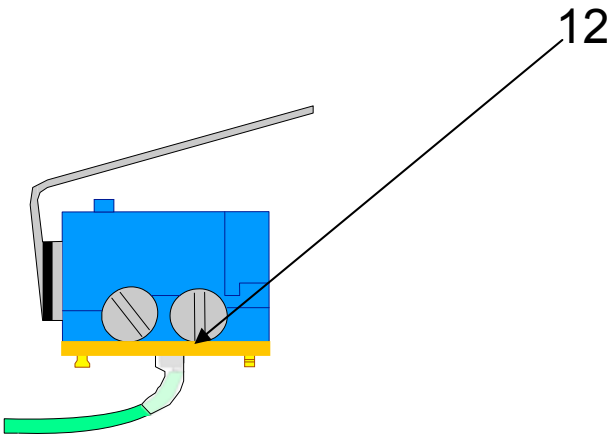


Figure 4