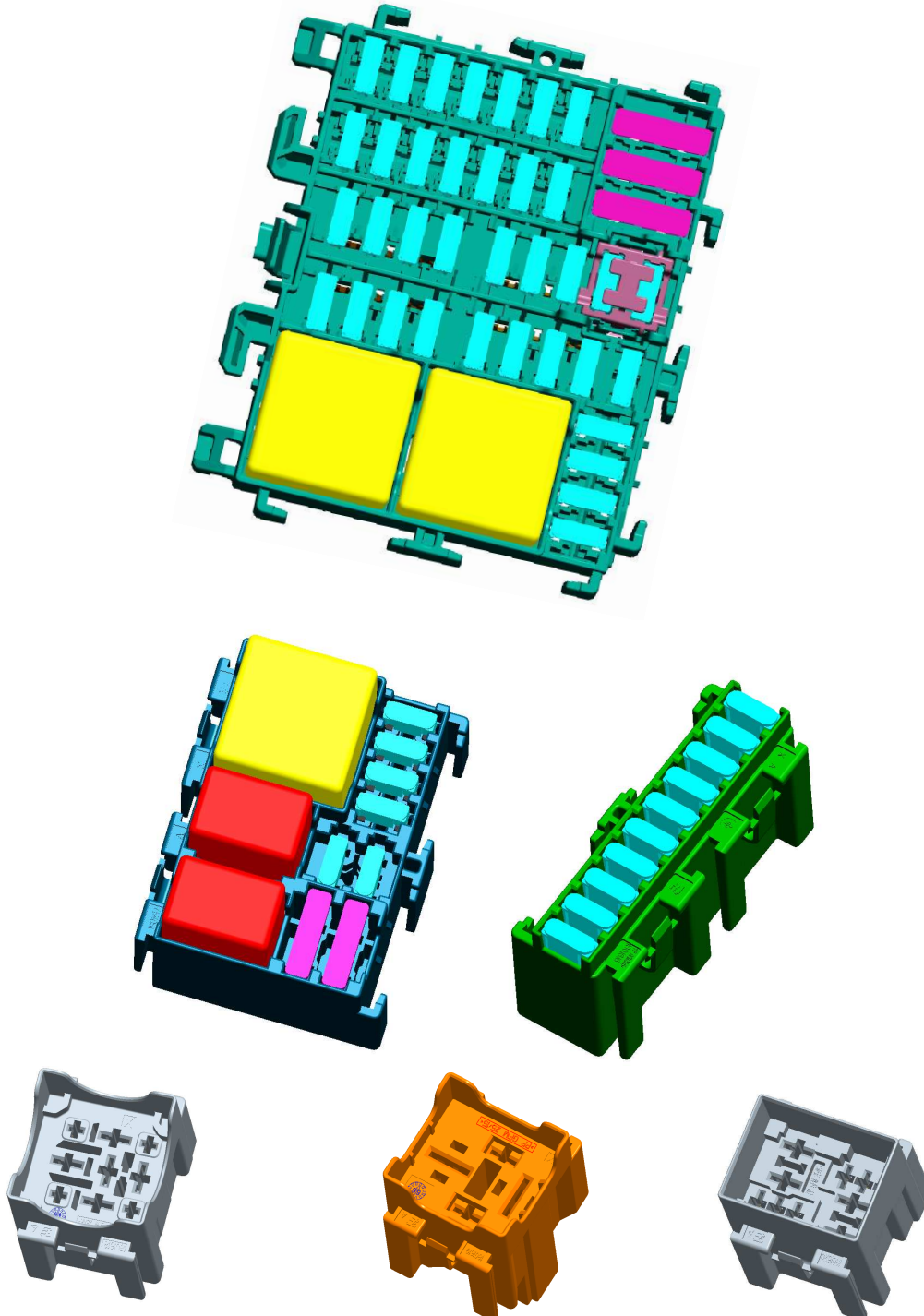


PASSENGER COMPARTMENT FUSE AND RELAY BOX BOX 1, BOX 2, BOX 3 AND RELAYS HOLDERS



Rédigé par/Drawing by : T.VERNIER le 08-Avr-2014 Approuvé par/Approved by : I.SMIRANI le 08-Avr-2014

Tyco Electronics France SAS
B.P. 30039, 95301 CERGY-PONTOISE Cedex

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TABLE DES REVISIONS – *REVISION TABLE*

Revision	Date	Responsible	Modification
A	04/07/2012	T.VERNIER	Change Tyco Electronics for TE Connectivity Modification of requirements for tests M5, M11, M12, M22, M25 & O1 Clarification of requirement for test E1
B	08/04/2014	T.VERNIER	Add PN 1801764 and 1801773, test M15 & M16, program approval test for new PN

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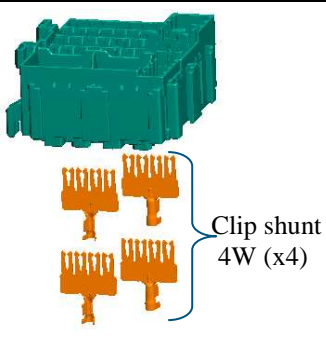
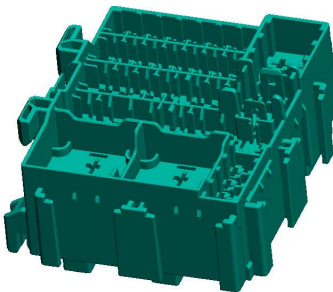
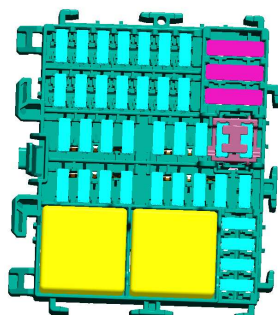
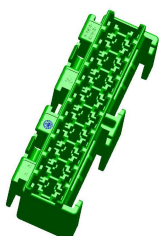
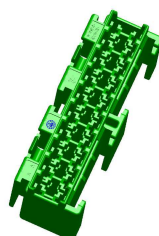
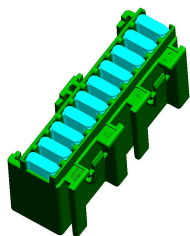
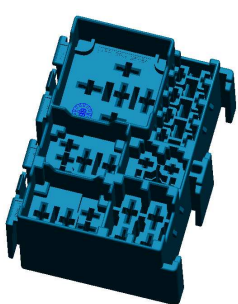
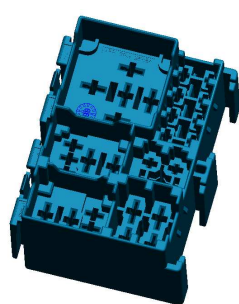
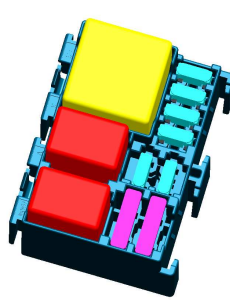
1. SCOPE

1.1. Content

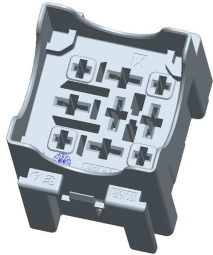
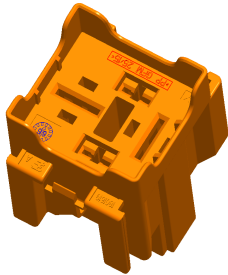
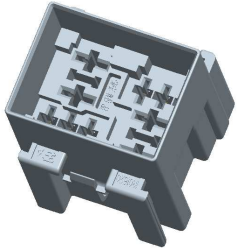
This document covers the performances, tests, and quality requirements for the all the boxes (BFRH – Fuse and relay box) used on the passenger compartment.
Due to the modular aspect of the boxes, different combination can exist on the vehicle.

2. DESCRIPTION

2.1. Composition of CRFB boxes

	Composition	As delivered from TE	Final Assembly (for indication only)
CRFB – BOX 1 or CRFB – BOX1 V2	 <p>Clip shunt 4W (x4)</p>		
CRFB – BOX 2			
CRFB – BOX 3 or CRFB – BOX3 V2			

2.2. Relays holders

	Relay ISO 40A Holder	Relay ISO 70A Holder	μ-Relays Holder
Relay Holder			

2.3. References

Renault Ref.	TE P/N	Description
243 517 012R	1801613-1	BFRH – BOX 1
243 803 076R	1801764-1	BFRH – BOX 1 V2
241 517 961R	1801616-1	BFRH – BOX 2
243 515 881R	1801617-1	BFRH – BOX 3
243 805 704R	1801773-1	BFRH – BOX 3 V2
243 809 443R	1801618-1	Relay ISO 40A Holder
243 808 725R	1801619-1	Relay ISO 70A Holder
243 801 496R	1801620-1	μ-Relays Holder

2.4. Fuse and wiring architecture: _____ **see appendix 3**

2.4. TE Contacts used in the BFRH

Clip, tab description	Wire	RSA P/N	TE P/N	Use
Clip JPT Type A	0,2 ² to 0,5 ²	8200 943 862	0-964280-2	Miniature fuses & Micro relay
Clip JPT Type A	0,5 ² to 1 ²	8200 943 856	0-964284-2	Miniature fuses & Micro relay
Clip JPT Type A	>1 ² - to 2,5 ²	8200 943 851	0-965999-2	Miniature fuses
Clip JPT Type A	>2.5 ² to 4 ²	8 200 790 713	0-1241978-2	Miniature fuses
Clip SPT	0.5 ² to 1 ²	7 703 497 431	0-0927831-2	Medium fuse & Micro, 40A 70A relays
Clip SPT	1 ² to 3 ²	7 703 497 424	0-0144617-1	Medium fuse & Micro, 40A, 70A relays
Clip SPT	3 ² to 5 ²	7 703 497 403	0-0144433-1	Medium fuse & Micro, 40A, 70A relays
Clip MPT	2.5 ² to 4 ²	8 200 057 143	0-0962928-1	70A relays
Clip MPT	4 ² to 6 ²	8 200 046 228	0-0962930-1	70A relays
Clip MPT	7 ² to 10 ²	8 200 046 229	0-0962932-1	70A relays
Clip Shunt	2.5 ² to 4 ²	290E80732R	0-1801614-3	Miniature fuses
Clip Shunt	5 ² to 6 ²	290E81611R	0-1801614-4	Miniature fuses

2.6. Other contacts used in the BFRH

Contact used on PN 1801764-1 & 1801773-1.

Clip, tab description	Wire	RSA P/N	Supplier	P/N	Use
Clip 2.8 AFK	0,35 ²	7703497833	LEAR	26700201185	Miniature fuses & Micro relay
Clip 2.8 AFK	0,5 ² to 1 ²	7703497835	LEAR	26701201185	Miniature fuses & Micro relay
Clip 2.8 AFK	1.25 ² to 2,5 ²	7703497837	LEAR	26705201185	Miniature fuses
Clip 2.8 DCS2	0.2 ² to 0.35 ²	7703497879	FCI	60012811	Miniature fuses & Micro relay
Clip 2.8 DCS2	0.5 ² to 1 ²	7703497880	FCI	60012831	Miniature fuses & Micro relay
Clip 2.8 DCS2	1 ² to 2.5 ²	7703497881	FCI	60012841	Miniature fuses
Clip 4.8 AFK	0.35 ²	7703497845	LEAR	26697330186	Medium fuses & Micro, 40A relays
Clip 4.8 AFK	0.5 ² to 1 ²	7703497846	LEAR	26649330186	Medium fuses & Micro, 40A relays
Clip 4.8 AFK	1.4 ² to 2.5 ²	7703497847	LEAR	26648330186	Medium fuses & Micro, 40A relays
Clip 4.8 AFK	3 ² to 4 ²	7703497848	LEAR	26650330186	Medium fuses & Micro, 40A relays

3. REFERENCE DOCUMENTS

3.1. Usable document

In the event of conflict between the requirements of this specification and the drawing, the drawing shall take precedent.

In the event of conflict between the requirement of this specification and the referenced documents, this specification shall take precedent.

3.2. TE Connectivity specifications

108-18013 rev E	JPT contact
108-18025 rev G	SPT contact
108-15122 rev A	SPT contact
108-18047 rev C	MPT contact

3.3. Customer specifications (Renault)

405/HA/MO/65660/09--B	BOITIER FUSIBLES RELAIS HABITACLE/I-M0/REF : 252368365R ---
36-05-219/--C	Wired part for relay and / or fuses.
36-05-019/--G	Electrical connections and connectors.
36-05-205/--E	Flat fuses with connector blades
36-05-210/--C	Plastic connector supports and protectors for electrical wiring assemblies and wiring components.
36-05-217/--A	Relay with diode
36-05-046/---	Relay with resistor

3.4. Interface specification

8201142369 of 26/04/2010 Interface support BFRH

4. OPERATING CONDITIONS

4.1. Temperatures

Class(*)	Operating temperature	Test temperature *	
3	-40°C to 125°C	+150°C	For electrical connection a rea
2	-40°C to +100°C	+125°C	For locking devices

(*): Without current load

4.2. Watertightness & Protection rating

- Watertightness: Class 0 - Unsealed

4.3. Vibration

- Class 1 according to 36-05-019/--E § 6.6

4.4. Load scenario current at 70°C:

- See appendix 3

5. TESTS

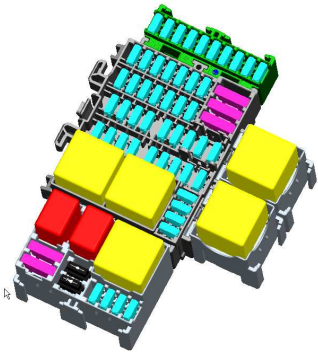
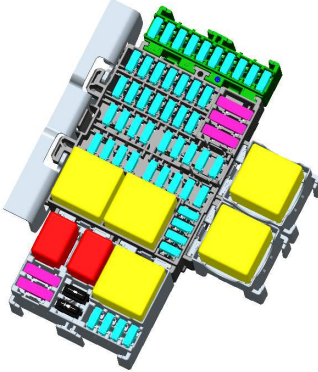
5.1. Test conditions:

- Supply voltage: 13.5V ± 0.5V
- Ambient temperature: 23°C ± 5°C
- Relative humidity: 60%± 15%
- Atmospheric pressure: 96kPa ± 10kPa
- If not otherwise specified mechanical test: v = 50 mm/min

- Different box configurations are defined: the table below gives the configuration for each individual box and for each relays holders

Configuration	Plastic boxes	Wired Contact & Clip-shunt	Fuses & Relays	Metal sheet fixation
A	X			
B	X	X		
C	X	X	X	
C assy	C with assy configuration defined below			
D	X	X	X	X
D assy	D with assy configuration defined below			
E	X			X

- The combinations below are used for some tests.

Configuration C Assembly (C Assy)	Configuration D Assembly (D assy)
	

GENERAL INSPECTION				
	Test description	Ref. RSA For indication	Procedure	Requirement
BOX BFRH				
V1	Visual inspection	36-05-019 § 6.1	Shall be performed with the naked eye.	No working damage No visible damage, cracking or defect.
MECHANICAL TESTS				
	Test description	Ref. RSA For indication	Procedure	Requirement
BOX BFRH				
M1	Mating force of the BOX 1 on the flange	405/HA/M0/ 65660/09	→ Box 1 in configuration E Mating Force	▪ $F \leq 60 \text{ N}$
M2	Unmating force of the BOX1 on the flange	405/HA/M0/ 65660/09	→ Box 1 in configuration E Unmating Force	▪ $F \leq 60 \text{ N}$
M3	Locked tensile strength BOX 1 on the flange	405/HA/M0/ 65660/09	→ Box 1 in configuration E. Forces are applied on 4 directions each axis of the BOX 1 (see appendix 6)	▪ $F \geq 240 \text{ N}$ on each direction ▪ $F < 800 \text{ N}$ in direction 1
M4	Flange locking system durability of the BOX1	405/HA/M0/ 65660/09	→ Box 1 in configuration E Mate and unmate 10 times the Box 1 on the flange	▪ The mating force value and the unmating force value must be within specified values at the 1st and the 10th operation.
M5	Insertion force inter boxes	36-05-219 § 7.2.4.1	→ Make test according table 1 (see appendix 10)	$F < 60 \text{ N}$
M6	Removal force inter boxes	36-05-219 § 7.2.4.1	→ Make test according table 1 (see appendix 10)	$F < 60 \text{ N}$
M7	Retention force inter boxes	36-05-219 § 7.2.4.1	→ Make test according table 1 (see appendix 10)	$F > 120 \text{ N}$
M8	Shock impact test	36-05-219 § 7.3.1 36-05-019 § 6.21.	→ Box 1, 2,3 and relays holders in configuration A Impact hammer weight: 300gr Falling height: 100 mm Striker described in NF R 13-415 Impact zone see appendix 10	▪ Visual examination: ▪ No break, cracking nor deformation
M9	Drop resistance	36-05-019 § 6.22.	→ Box 1, 2,3 and relays holders in configuration A and configuration C Assy 1m free fall test, on each face, on concrete floor. Test temperature : 0 °C	No incipient rupture but unconcealed damage permissible <i>Whereas 36-05-019/--G No damage or incipient rupture shall be observed.</i>

CONTACTS

M11	TE terminal insertion force	36-05-219 § 7.2.4.5 36-05-019 § 5.3.4	→ Box 1, 2, 3 and relays holders in configuration A Two insertion force measurement possible: . 1) Validation performed on a machine with a mobile jaw displacement speed of 50 mm/min ± 5 mm/min. . 2) The connector, installed on the measurement fixture, is manually loaded. The force is recorded at each insertion.	<ul style="list-style-type: none"> ▪ Clip JPT 2.8 ≤ 10 N <i>Whereas 36-05-019/--G: ≤ 8 N</i> ▪ Clip SPT 4.8 ≤ 15 N ▪ Clip SPT 4.8 ≤ 20 N for 5mm² wire <i>Whereas 36-05-019/--G: ≤ 12 N</i> ▪ Clip MPT ≤ 40 N <i>Whereas 36-05-019/--G: ≤ 20 N</i>
M12	TE terminal retention force	36-05-219 § 7.2.4.5 36-05-019 § 5.3.5	→ Box 1, 2, 3 and relays holders in configuration A The same measurement technique is used as the method described in M11 "terminal insertion". Under no circumstances must the mechanical strength of the wire be used as a reference.	<ul style="list-style-type: none"> ▪ Clip JPT 2.8 (fuses) > 120 N ▪ Clip JPT 2.8 (µrelays) > 100 N ▪ Clip SPT 4.8 > 120 N <i>Whereas 36-05-019/--G: >150 N</i> ▪ MPT > 150 N <i>Whereas 36-05-019/--G: >200 N</i> <p>After the ageing tests:</p> <ul style="list-style-type: none"> Clip JPT 2.8 > 72 N Clip SPT 4.8 > 72 N MPT > 90 N
M13	Clip shunt insertion	Specific test	→ Box 1 configuration A	F<50N
M14	Clip shunt retention	Specific test	→ Box 1 configuration A	F>100N After the ageing tests: F > 60 N
M15	Other terminal insertion force Test applicable on PN: - 1801764-1 - 1801773-1	36-05-219 § 7.2.4.5 36-05-019 § 5.3.4	→ Box 1, 2, 3 and relays holders in configuration A Two insertion force measurement possible: . 1) Validation performed on a machine with a mobile jaw displacement speed of 50 mm/min ± 5 mm/min. . 2) The connector, installed on the measurement fixture, is manually loaded. The force is recorded at each insertion.	<ul style="list-style-type: none"> ▪ Clip 2.8 ≤ 10 N <i>Whereas 36-05-019/--G: ≤ 8 N</i> ▪ Clip 4.8 ≤ 15 N <i>Whereas 36-05-019/--G: ≤ 12 N</i>
M16	Other terminal retention force Test applicable on PN: - 1801764-1 - 1801773-1	36-05-219 § 7.2.4.5 36-05-019 § 5.3.5	→ Box 1, 2, 3 and relays holders in configuration A The same measurement technique is used as the method described in M11 "terminal insertion". Under no circumstances must the mechanical strength of the wire be used as a reference.	<ul style="list-style-type: none"> ▪ Clip 2.8 > 100 N ▪ Clip 4.8 > 100 N <i>Whereas 36-05-019/--G: >150 N</i>

FUSES & RELAYS				
M21	Fuse insertion	36-00-219 § 7.2.4.2	➔ Box 1, 2 and 3 Configuration B	Fuse insertion force : <ul style="list-style-type: none"> ▪ Miniature: $F < 40N$ <i>Whereas 36-05-219/--C $< 30N$</i> ▪ Medium: $F < 55N$ <i>Whereas 36-05-219/ - -C $< 45N$</i>
M22	Fuse extraction force	36-00-219 § 7.2.4.2	➔ Box 1, 2 and 3 Configuration B	Fuse extraction force: <ul style="list-style-type: none"> ▪ Miniature: $7N \leq F \leq 40N$ <i>Whereas 36-05-219 / - -C $10N \leq F \leq 40N$</i> ▪ Medium: $10N \leq F \leq 50N$ <i>Whereas 36-05-219 / - -C $20N \leq F \leq 50N$</i>
M23	Relays insertion force	36-00-219 § 7.2.4.2	➔ Box 1, 3 and relays holders Configuration B	Relay insertion force : <ul style="list-style-type: none"> ▪ Micro: $F \leq 85N$ ▪ 40A: $F \leq 100N$ ▪ 70A: $F \leq 120N$
M24	Relays uncoupling force	36-00-219 § 7.2.4.2	➔ Box 1, 3 and relays holders Configuration B	Relay uncoupling force : <ul style="list-style-type: none"> ▪ Micro: $30 \leq F \leq 115N$ ▪ 40A: $40 \leq F \leq 100N$ ▪ 70A: $40 \leq F \leq 120N$
M25	Durability insertion and uncoupling components	36-00-219 § 7.2.4.4	➔ Box 1, 2, 3 and relays holders Configuration B Mount and remove each fuse and relay 10 times. <ul style="list-style-type: none"> - With 50% of the samples with the same component - With 50% of the samples with new component for each operations Record the first and the tenth: <ul style="list-style-type: none"> ▪ Mounting and removing forces ▪ Contact resistances 	<ul style="list-style-type: none"> ▪ Component insertion force (see M21 & M23) or/and the decrease must be lower than 10% of the 1st operation ▪ Component removing force (see M22 & M24) or/and the decrease must be lower than 10% of the 1st operation ▪ Contact resistance Maxi (see E1) <i>Whereas 36-05-219/--C Between the first to the tenth manipulation no variation of the strength and of the contact resistance of more than 10%</i>
M26	Protection of the contacts during the working and the handling	36-00-219 § 6.4.4	➔ Box 1, 2, 3 and relays holders Configuration B Mount and remove each fuse and relay 5 times in worst opposite combination clip/component. Record before the and after the test : <ul style="list-style-type: none"> ▪ Contact resistances ▪ Component removing forces ▪ Tab removing force for relay (For information) 	<ul style="list-style-type: none"> ▪ Contact resistance Maxi (see E1) ▪ Component removing force: the decrease must be lower than 20% of the 1st operation

ELECTRICAL TESTS				
Test description	Ref. RSA <small>For indication</small>	Procedure	Requirement	
E1	Contact resistance	36-05-219 § 7.2.2 36-05-019 § 6.2	<p>➔ Box 1, 2, 3 and relays holders Configuration C or C assy (see qualification plan)</p> <p>“MilliVolts” level method:</p> <ul style="list-style-type: none"> ▪ Test voltage : 20 mV ▪ Test current : 50 mA 	<p>Initial contact resistance:</p> <ul style="list-style-type: none"> ▪ Fuses $\leq 6 \text{ m}\Omega$ ▪ Relays μ & 40A $\leq 6 \text{ m}\Omega$ ▪ Relays 70A $\leq 2 \text{ m}\Omega$ <p>(see appendix 7)</p> <ul style="list-style-type: none"> ▪ JPT 2.8 $\leq 3 \text{ m}\Omega$ ▪ Clip SPT 4.8 $\leq 3 \text{ m}\Omega$ ▪ Clip MPT $\leq 1 \text{ m}\Omega$ <p>After the ageing tests:</p> <ul style="list-style-type: none"> ▪ Fuses $\Delta R_c \leq 8 \text{ m}\Omega$ ▪ Relays μ & 40A $\Delta R_c \leq 8 \text{ m}\Omega$ ▪ Relays 70A $\Delta R_c \leq 2 \text{ m}\Omega$ <p>(see appendix 7)</p> <ul style="list-style-type: none"> ▪ JPT 2.8 $\Delta R_c \leq 4 \text{ m}\Omega$ ▪ SPT 4.8 $\Delta R_c \leq 4 \text{ m}\Omega$ ▪ MPT $\Delta R_c \leq 1 \text{ m}\Omega$
E2	Insulation resistance	36-05-219 § 7.7 36-05-019 § 6.11	<p>➔ Box 1, 2, 3 and relays holders Configuration C or C assy (see qualification plan)</p> <p>Measures must be performed between each contacts and between each contacts connected together and a metal sheet covering the housing Voltage test : 500V dc / 1 min</p>	$R_i \geq 100 \text{ M}\Omega$
E3	Voltage resistance	36-05-219 § 7.6 36-05-019 § 6.12	<p>➔ Box 1, 2, 3 and relays holders Configuration C or C assy (see qualification plan)</p> <p>1 000 Vac eff. 50 Hz or 60 Hz (or 1400 Vcc) / 1 min between each contacts and between each contacts connected together and a metal sheet covering the housing</p>	<p>No dielectric breakdown or flash-over during the test. Contacts must be without damage, oxide trace, or all other defect Housing must be without damage</p>
E4	Fuse blowing test	36-05-219 § 7.11	<p>➔ Box 1, 2 and 3 Configuration C</p> <p>A test shall be conducted to ensure that the box is capable of resisting constraints associated with the utilization of fuses under limit conditions. The test is performed at ambient temperature.</p>	<p>First test : The box is equipped with a « Miniature » 30 A fuse. No deformation shall appear following passage of a 36 A current between 600s and 1800s and a 60A current between 0,15s and 5s. Second test : The box is equipped with a « Medium » 40 A fuse. No deformation shall appear following passage of a 48 A current between 600s and 1800s and 80A between 0,15s and 5s</p>

THERMALELECTRICAL TESTS				
Test description	Ref. RSA <small>For indication</small>	Procedure	Requirement	
T1 Current cycling at high temperature	36-05-219 § 7.4 36-05-019 § 6.15	<p>→ Boxes in configuration C Assy</p> <p>In an oven at 70°C, the box is powered:</p> <ul style="list-style-type: none"> ▪ 500 cycles of scenario at 70°C (see appendix 4) <p>1 cycle:</p> <ul style="list-style-type: none"> ▪ 45 min box powered ▪ 15 min box not powered 	<ul style="list-style-type: none"> ▪ Contact resistance (see E1) 	
T2 Heating measurement of the components of the contact : fuses, relays, busbars	36-05-219 § 7.2.3.1 § 7.2.3.2 § 7.2.3.3	<p>→ Boxes in configuration C Assy</p> <p>Boxes are placed in an oven protected from forced convection. The different loads described in appendix 3 and 4 are applied during 30min each (until the thermal stability).</p> <p>Reliability test (for indication purpose only): After the storage at T=70°C, the temperature is increased by step of 10°C with stabilisation during 30min until a first defect (fuse blowing, relay break...).</p>	<ul style="list-style-type: none"> ▪ Contact temperature ▪ JPT 2.8 ≤ 130°C ▪ Clip SPT 4.8 ≤ 130°C ▪ Clip Shunt ≤ 130°C ▪ Clip MPT ≤ 130°C <p style="color: green;">Whereas 36-05-219/--C < 125°C</p>	
T3 Current cycling at high temperature (For information)	36-05-219 § 7.4 36-05-019 § 6.15	<p>→ Boxes in configuration C Assy</p> <p>In an oven at 70°C, the box is powered:</p> <ul style="list-style-type: none"> ▪ 500 cycles of scenario at 70°C (see appendix 5) <p>1 cycle:</p> <ul style="list-style-type: none"> ▪ 45 min box powered ▪ 15 min box not powered 	For information	

AGEING TESTS				
Test description	Ref. RSA <small>For indication</small>	Procedure	Requirement	
A1 Atmospheric corrosion test	36-05-219 § 7.5.1 36-05-019 § 6.7	→ Boxes in configuration C Assy Method regarding CEI 68-2-60 with <ul style="list-style-type: none"> ▪ Preconditioning : 1 H ▪ Method : C ▪ Duration : 4 h 	<ul style="list-style-type: none"> ▪ Contact resistance (see E1) ▪ Visual inspection 	
A2 Vibrations	36-05-219 § 7.3.2 36-05-019 E § 6.6	→ Boxes in configuration D Assy Vibration: Class 1 see appendix 8	<ul style="list-style-type: none"> ▪ During sequence : No breakdown above 1µs ▪ Contact resistance (see E1) <li style="color: orange;">▪ For information: Perform the test 36-05-019/--G 	
A3 Temperature humidity cycle	36-05-219 § 7.5.2 36-05-019 § 6.16	→ Boxes in configuration C Assy <ul style="list-style-type: none"> ▪ Box not powered ▪ 10 cycles of 24 Hrs. Cycles described in appendix 9 Tmax=125°C Whereas 36-05-219/--C Tmax=150°C	<ul style="list-style-type: none"> ▪ Visual examination ▪ Contact resistance (see E1) ▪ Withstanding voltage ▪ Insulation resistance 	
A4 Thermal shocks	36-05-219 § 7.5.3 36-05-019 § 6.17	→ Boxes in configuration C Assy <ul style="list-style-type: none"> ▪ Box not powered ▪ 100 cycles (1 cycle : 1H/-40°C + 1H/+125°C) ▪ Transition time < 15s 	<ul style="list-style-type: none"> ▪ Visual examination ▪ Contact resistance (see E1) 	
A5 Climatic endurance	36-05-219 § 7.5.4 36-05-019 § 6.19	→ Boxes in configuration C Assy <ul style="list-style-type: none"> ▪ Box not powered ▪ 240 Hrs at 125°C Whereas 36-05-219/--C 240 Hrs at 150°C	<ul style="list-style-type: none"> ▪ No visible deformation nor crack ▪ Contact resistance (see E1) 	
A6 Climatic endurance (For information)	36-05-019 § 6.19	→ Relays Holders in configuration B <ul style="list-style-type: none"> ▪ Holder not powered ▪ 240 Hrs at 150°C 	<ul style="list-style-type: none"> ▪ No visible deformation nor crack 	

OTHER TESTS				
	Test description	Ref. RSA	Procedure	Requirement
O1	Speed of combustibility	36-05-219 § 7.9.1	Test on standard material sample According test method D45 1333	Class E Combustibility rate < 100mm/min <i>Whereas 36-05-219/--C < 50mm/min</i>
O2	Glow wire test	36-05-219 § 7.9.2	➔ Box 1, 2, 3 and relays holders In configuration A Test method D45 1730 with Wire temperature 750°C ± 10°C Duration of incandescent wire application is 30 s ± 1s	No presence of a flame shall be observed 30 seconds after the incandescent wire has been moved away.
O3	Resistance to fluids	36-05-219 § 7.8 36-05-019 § 6.18	➔ Boxes in configuration C Assy The tests are performed in accordance with Test Method D47 1924. Test with the following fluids: Engine oil Battery electrolyte "Severely cold" windscreen washing fluid,	At the end of the test, the parts tested must meet the following test requirements: ▪ No deformation or cracks shall be observed. ▪ Voltage resistance.

6. QUALITY INSURANCE MEASURE

6.1. Qualification test

Samples must be in accordance with drawings and be taken in a random way in the production in progress.

6.2. Program approval tests

In the groups defined below, the boxes undergo all the tests in the chronological order of the figure

N° Sequence	RSA Sequence (36-05-219)	Number of parts requested in 36-05-219	Individual Components number							Configuration			
			BFRH BOX 1	Clip-Shunt	BFRH BOX 2	BFRH BOX 3	Module Relais 40A	Module Relais 70A	Module 2 Micro Relays	Type	Number of sample		
1	C	NA	4	NA	NA	NA	NA	NA	NA	NA	NA	M1 → 405/HAM0/65660/09 Mating force on the flange of the BOX1	M2 → 405/HAM0/65660/09 Unmating force on the flange of the BOX1
2	C	NA	4	NA	NA	NA	NA	NA	NA	NA	NA	M3 → 405/HAM0/65660/09 Locked tensile strength of the BOX1	
3	C	NA	2	NA	NA	NA	NA	NA	NA	NA	NA	M4 → 405/HAM0/65660/09 Flange locking system durability of the BOX1	
4	C	10	0	NA	18	6	48	48	48	48	NA	M5 → 36-05-219 § 7.2.4.1 Insertion force inter boxes	M6 → 36-05-219 § 7.2.4.1 Removal force inter boxes
5	I	5	8	NA	8	8	8	8	8	8	NA	M8 → 36-05-019: 6.21 Shock impact	V1 → 36-05-019: 6.1 Visual inspection
6			12	48	12	24	24	24	24	24	Cassy	M9 → 36-05-019: 6.22 Drop test	M7 → 36-05-219 § 7.2.4.1 Retention force inter boxes
7	C	10	2	0	2	8	8	8	8	8	NA	M11 → 36-05-019 § 5.3.4 Terminal insertion	M12 → 36-05-019 § 5.3.5 Terminal retention force
8	C	10	8	32	NA	NA	NA	NA	NA	NA	NA	M13 → Specific test Clip shunt insertion force	M14 → Specific test Clip shunt retention force
9	C	10	2	8	2	4	NA	NA	NA	NA	NA	M21 → 36-05-219: 7.2.4.2 Fuses insertion force	M22 → 36-05-219: 7.2.4.3 Fuse extraction force
10	C	10	4	NA	NA	8	8	8	8	8	NA	M23 → 36-05-219: 7.2.4.2 Relays insertion force	M24 → 36-05-219: 7.2.4.2 Relays uncoupling force

N° Sequence	RSA Sequence (36-05-219)	Number of parts requested in 36-05-219	Individual Components number						Configuration	
			36-05-219 BOX 1	36-05-219 BOX 2	36-05-219 BOX 3	36-05-219 BOX 4	Module Relays	Module 2 Micro Relays		
11	H	3	1	4	1	1	1	1	NA	NA
12	E	1	1	4	1	1	2	NA	NA	Cassy
13	A	3	2	8	2	2	4	NA	NA	Dassy
14	F	3	2	8	2	2	4	NA	NA	Cassy
15	G	3	2	8	2	2	4	NA	NA	Cassy
16	A	3	2	8	2	2	4	NA	NA	Cassy
17	L	1	2	8	2	2	4	NA	NA	Cassy
18	K	1	1	4	1	1	NA	NA	NA	NA
19	B	3	2	8	2	2	4	NA	NA	Cassy
20			1	4	1	1	2	2	2	NA
21	D	1	Plastic material certificate							
22	D	1	4	16	4	8	8	8	8	B
23	A	3	2	8	2	2	4	NA	NA	Cassy
24	A	3	1	4	1	1	NA	NA	NA	Cassy

M25	36-05-219: 7.2.4.4 Durability Relay and fuse insertion and uncoupling	E1	36-05-219:7.2.2 Contact resistance
A1	36-05-019: 6.7 Atmospheric corrosion	E1	36-05-219:7.2.2 Contact resistance
A2	36-05-019 E: 6.6 Vibrations	E1	36-05-219:7.2.2 Contact resistance
A3	36-05-019: 6.16 Temperature/humidity	V1	36-05-019: 6.3.2 Visual inspection
A4	36-05-019: 6.17 Thermal shock	V1	36-05-019: 6.3.2 Visual inspection
A5	36-05-219: 7.5.4 Climate endurance	E1	36-05-219:7.2.2 Contact resistance
O3	36-05-019: 6.18 Resistance to fluids	V1	36-05-019: 6.3.2 Visual inspection
M31	36-05-219: 7.2.4.2 Fuse extraction force		
T2	36-05-219: 7.2.3.1; 7.2.3.2; 7.2.3.3 Heating measurement of components	E1	36-05-219:7.2.2 Contact resistance
M28	36-05-219: 6.4.4 Protection of the contacts during the working and the handling	E1	36-05-219:7.2.2 Contact resistance
O1	36-05-219: 7.9.1 Speed of combustibility		
O2	36-05-219: 7.9.2 Glow wire test (Essai de degre chauffant)		
A6	36-05-019: 6.5.1.9 Climate endurance (150°C for information)	M12	36-05-019 § 5.3.5 Terminal retention force
T1	36-05-219: 7.4 Current cycling at high temperature (For information)	E1	36-05-219:7.2.2 Contact resistance

E2	36-05-019: 6.1.1 Insulation resistance		
E3	36-05-019: 6.1.2 Voltage resistance		
M12	36-05-019 § 5.3.5 Terminal retention force		
E1	36-05-219:7.4 Current cycling at high temperature		
E3	36-05-019: 6.1.2 Voltage resistance		

6.3. Program approval tests for new raw material

Qualification applicable for the box PN1801764:

N° Sequence	Renault Sequence (36-05-219 revC)	Number of parts requested in 36-05-219	Individual Components number						Configuration				
			BFRH BOX1 V2 PN 1801764-1	Clip- Shunt BOX 2 PN 1801764-1	BFRH BFRH BOX 3 V1 holder	Relay 70A holder	2 Micro-Relays holders	Type	Number of sample				
1	C	NA	4	NA	NA	NA	NA	NA	NA	NA	M1 405-HAM0/65660/09 Mating force on the flange of the BOX1	M2 405-HAM0/65660/09 Unmating force on the flange of the BOX1	
2	C	NA	4	NA	NA	NA	NA	NA	NA	NA	M3 405-HAM0/65660/09 Locked tensile strength of the BOX1		
3	C	NA	4	NA	NA	NA	NA	NA	NA	NA	M4 405-HAM0/65660/09 Flange locking system durability of the BOX1		
4	C	10	32	NA	12	48	48	48	NA	NA	M5 36-05-219 § 7.2.4.1 Insertion force inter boxes	M6 36-05-219 § 7.2.4.1 Removal force inter boxes	
5	I	5	8	NA	NA	NA	NA	NA	NA	NA	M8 36-05-019 § 6.21 Shock impact	V1 36-05-019 § 6.1 Visual inspection	
6			12	16	4	6	8	NA	NA	Cassy A 6	M9 36-05-019 § 6.22 Drop test		
7	C	10	8	NA	NA	NA	NA	NA	NA	NA	M11 36-05-019 § 5.3.4 Terminal insertion	M12 36-05-019 § 5.3.5 Terminal retention force	
8	C	10	8	32	NA	NA	NA	NA	NA	NA	M13 Specific test Clip shunt insertion force	M14 Specific test Clip shunt retention force	
13	A	3	2	8	2	4	NA	NA	NA	Dassy 2	E1 36-05-219 § 7.2.2 36-05-019 § 6.2 Contact resistance	A2 36-05-019 E § 6.6 Vibrations	
17	L	1	2	8	NA	NA	NA	NA	NA	Cassy 2	E3 36-05-019 § 6.12 Voltage resistance		
21	D	1		Plastic material certificat									
22	D	1	3	NA	NA	NA	NA	NA	NA	A NA	O2 36-05-219 § 7.9.2 Glow wire test (Essai de jet de flamme)		
23	A	3	2	8	NA	NA	NA	NA	NA	Cassy 2	A6 36-05-019-G § 6.19 Climatic endurance (150°C for information)	M12 36-05-019 § 5.3.5 Terminal retention force	
25	C	10	8	NA	NA	NA	NA	NA	NA	NA	M15 36-05-019 § 5.3.4 Terminal insertion with competitors (LEAR and FC) contacts	M16 36-05-019 § 5.3.5 Terminal retention force with competitors (LEAR and FC) contacts	

Qualification applicable for the box PN1801773:

N° Sequence	Renault Sequence (36-05-219 revC)	Number of parts requested in 36-05-219	Individual Components number								Configuration					
			BERH BOX1 V2 PN 1801764-1	BERH BOX1 V1 PN 1801613-1	Clip-Shunt PN 1801764-1	BERH BOX 2 PN 1801773-1	Relay 40A holder	Relay 70A holder	2 Micro-Relays holders	Type	Number of sample					
4	C	10	NA	NA	NA	NA	16	8	8	8	8	NA	NA	M5 36-05-219 § 7.2.4.1 Insertion force inter boxes	M6 36-05-219 § 7.2.4.1 Removal force inter boxes	M7 36-05-219 § 7.2.4.1 Retention force inter boxes
5	I	5	NA	NA	NA	NA	8	NA	NA	NA	NA	NA	NA	M8 36-05-019 § 6.1 Visual inspection	V1 36-05-019 § 6.1 Visual inspection	
6			4	2	24	6	10	12	NA	NA	NA	Cassy A	6 4	M9 36-05-019 § 6.2.2 Drop test		
7	C	10	NA	NA	NA	NA	8	NA	NA	NA	NA	NA	NA	M11 36-05-019 § 5.3.4 Terminal insertion	M12 36-05-019 § 5.3.5 Terminal retention force	
13	A	3	2	NA	8	2	2	4	NA	NA	NA	Dassy	2	E1 36-05-219 § 7.2.2 36-05-019 § 6.2 Contact resistance	A2 36-05-019 E § 6.6 Vibrations	E1 36-05-219 § 7.2.2 36-05-019 § 6.2 Contact resistance
13bis	A	3	NA	2	8	2	2	4	NA	NA	NA	Dassy	2	E1 36-05-219 § 7.2.2 36-05-019 § 6.2 Contact resistance	A2 36-05-019 E § 6.6 Vibrations	E1 36-05-219 § 7.2.2 36-05-019 § 6.2 Contact resistance
17	L	1	NA	NA	NA	NA	2	NA	NA	NA	NA	Cassy	2	E3 36-05-019 § 6.12 Voltage resistance		
21	D	1	Plastic material certificate										O1 36-05-219 § 7.9.1 Speed of combustibility			
22	D	1	NA	NA	NA	NA	3	NA	NA	NA	NA	A	NA	O2 Glow wire test (Essai du fil chauffant)		
23	A	3	NA	NA	NA	NA	2	NA	NA	NA	NA	Cassy	2	A6 36-05-019-G § 6.19 Climate endurance (150°C for information)	M12 36-05-019 § 5.3.5 Terminal retention force	
25	C	10	NA	NA	NA	NA	8	NA	NA	NA	NA	NA	NA	M15 Terminal insertion with competitors (LEBK and PCJ) contacts	M16 36-05-019 § 5.3.5 Terminal retention force with competitors (LEBK and PCJ) contacts	

6.4. General conditions of test

Unless otherwise specified, the tests are conducted in the following conditions.
Minimum test samples quantity: 2 parts

6.5. Test and conformity

Conformity test is made regarding specific TE Connectivity quality inspection plan which define acceptable quality limit based on number of samples.
Dimensional and functional requirement must meet production drawing and that specification.

APPENDIX 1 : Fuse rating

CRFB BOX 2	FH40	FH41	FH42	FH43	FH44	FH45	FH46	FH47	FH48	FH49		
	Mini 15A	Mini 30A	Mini 20A	Mini 20A	Mini 25A	Mini 20A	Mini 30A	Mini 30A	Mini 20A	Mini 5A		
CRFB BOX 1	FH1	FH2	FH3	FH4	FH5	FH6	FH7	FH37				
	Mini 30A	Mini 10A	Mini 10A	Mini 10A	Mini 10A	Mini 10A	Mini 10A	Ato 25A				
	FH8	FH9	FH10	FH11	FH12	FH13	FH14	FH38				
	Mini 30A	Mini 7,5A	Mini 10A	Mini 20A	Mini 5A	Mini 10A	Mini 5A	Ato 30A				
	FH15	FH16	FH17	FH18	FH19	FH20	FH21	FH22	FH23			
	Mini 15A	Mini 10A	Mini 10A	Mini 10A	Mini 5A	Mini 5A	Mini 10A	Mini 5A	MINI 20A			
	E16				E20							RH7 Relay ISO 40A
	FH24	FH25	FH26	FH27	FH28	FH29	FH30	FH31	FH32			
	Mini 15A	Mini 10A	Mini 15A	MINI 20A	Mini 30A	MINI 25A	Mini 15A	Mini 10A	Mini 15A			
	E26				E30							RH6 Relay ISO 40A
	RH4				RH5							
	Relay ISO 40A				Relay ISO 40A							
Mini 15A				FH33								
Mini 15A				FH34								
Mini 15A				FH35								
Mini 15A				FH36								
CRFB BOX 3	RH8b		RH7b		RH6b							
	μ-Relays		μ-Relays		Relay ISO 40A							
	FH42b		FH40b		FH44b	FH45b	FH46b	FH47b				
	Ato 25A		Mini 30A		Mini 30A	Mini 15A	Mini 15A	Mini 30A				
	FH43b		FH41b									
Ato 15A		Mini 25A										

APPENDIX 2 : WIRING ARCHITECTURE

CRFB BOX 2	FH40 E JPT 2,5 mm ² S JPT 0,35 mm ²	FH41 E JPT 2,5 mm ² S JPT 2,5 mm ²	FH42 E JPT 2,5 mm ² S JPT 2 mm ²	FH43 E JPT 2,5 mm ² S JPT 2 mm ²	FH44 E JPT 2,5 mm ² S JPT 0,75 mm ²	FH45 E JPT 2,5 mm ² S JPT 0,75 mm ²	FH46 E JPT 2,5 mm ² S JPT 2,5 mm ²	FH47 E JPT 2,5 mm ² S JPT 2,5 mm ²	FH48 E JPT 2,5 mm ² S JPT 1,5 mm ²	FH49 E JPT 2,5 mm ² S JPT 0,75 mm ²		
CRFB BOX 1	FH1 E JPT 2,5 mm ² S JPT 2 mm ²	FH2 E JPT 0,75 mm ² E JPT 0,75 mm ²	FH3 E JPT 0,75 mm ² S JPT 0,35 mm ²	FH4 E JPT 1 mm ² E JPT 0,75 mm ²	FH5 E JPT 1 mm ² S JPT 0,35 mm ²	FH6 E JPT 0,75 mm ² S JPT 0,5 mm ²	FH7 E JPT 0,75 mm ² S JPT 0,5 mm ²	FH37 E SPT 3 mm ² S SPT 2,5 mm ²				
									FH38 E SPT 3 mm ²			
									S SPT 1 mm ²			
									FH39 E SPT 2,5 mm ²			
									S SPT 2,5 mm ²			
	FH8 E JPT 2,5 mm ² S JPT 2 mm ²	FH9 E JPT 0,75 mm ² S JPT 0,75 mm ²	FH10 E JPT 1 mm ² S JPT 0,5 mm ²	FH11 E JPT 2,5 mm ² S JPT 1 mm ²	FH12 E JPT 1,5 mm ² S JPT 1,5 mm ²	FH13 E JPT 0,5 mm ² S JPT 0,5 mm ²	FH14 E JPT 0,5 mm ² S JPT 0,5 mm ²					
	FH15 JPT 1,5 mm ²	FH16 JPT 0,5 mm ²	FH17 JPT 0,35 mm ²	FH18 JPT 0,35 mm ²	FH19 JPT 0,35 mm ²		FH20 JPT 0,35 mm ²	FH21 JPT 0,35 mm ²	FH22 JPT 0,5 mm ²	FH23 E JPT 2,5 mm ² E JPT 2,5 mm ²		
	E16 Clip-Shunt 4 mm²				E20 Clip-Shunt 4 mm²							
	FH24 JPT 0,35 mm ²	FH25 JPT 0,5 mm ²	FH26 JPT 1 mm ²	FH27 JPT 1 mm ²	FH28 JPT 1 mm ²	FH29 JPT 1 mm ²	FH30 JPT 0,35 mm ²	FH31 JPT 0,5 mm ²	FH32 E JPT 2,5 mm ² E JPT 0,5 mm ²			
	E26 Clip-Shunt 4 mm²				E30 Clip-Shunt 4 mm²							
	RH4 Commande SPT 2*1 mm ² Puissance SPT 2x2,5 mm ²		RH5 Commande SPT 2*1 mm ² Puissance SPT 2x3 mm ²				FH33 E JPT 2,5 mm ² S JPT 1,5 mm ²	FH34 E JPT 2,5 mm ² S JPT 0,75 mm ²	RH6 Commande SPT 2*1 mm ² Puissance SPT 2x2 mm ²			
							FH35 E JPT 1 mm ² S JPT 0,35 mm ²	FH36 E JPT 0,5 mm ² S JPT 0,35 mm ²				
CRFB BOX 3	RH8 Commande JPT 2*0,5 mm ² Puissance SPT 2*4 mm ²		RH7 Commande JPT 2*0,5 mm ² Puissance SPT 2*4 mm ²		RH6 Commande SPT 2*1 mm ² Puissance SPT 2x2 mm ²							
	FH42 E SPT 4 mm ² S SPT 1 mm ²		FH40 E JPT 1 mm ² S JPT 1,5 mm ²		FH44 E JPT 4 mm ² S JPT 1,5 mm ²	FH45 E JPT 2 mm ² S JPT 0,5 mm ²	FH46 E JPT 2 mm ² S JPT 1,5 mm ²	FH47 E JPT 4 mm ² S JPT 2,5 mm ²				
	FH43 E SPT 1,5 mm ² S SPT 1 mm ²		FH41 E JPT 2 mm ² S JPT 1 mm ²									

APPENDIX 3 : CURRENT LOAD SCENARIOS AT 20°C

CRFB BOX 2	FH40	FH41	FH42	FH43	FH44	FH45	FH46	FH47	FH48	FH49			
	10 A	0 A	10 A	0 A	10 A	0 A	18 A	0 A	10 A	0 A			
CRFB BOX 1	FH1	FH2	FH3	FH4	FH5	FH6	FH7	FH37					
	15 A	5 A	5 A	5 A	5 A	5 A	5 A	15 A					
	FH8	FH9	FH10	FH11	FH12	FH13	FH14	FH38					
	0 A	5 A	0 A	14 A	0 A	7 A	0 A	5 A					
	FH15				FH16	FH17	FH18	FH19	FH20	FH21	FH22	FH23	
	10 A				2 A	7 A	2 A	2 A	2 A	5 A	2 A	5 A	
	E16				E20				RH7				
	FH24				FH25	FH26	FH27	FH28	FH29	FH30	FH31	FH32	
	10 A				0 A	10 A	0 A	10 A	0 A	10 A	2 A	10 A	
	E26				E30				Relay ISO 40A 20A				
	RH4				RH5				RH6				
	Relay ISO 40A 15A				Relay ISO 40A ON				Relay ISO 40A 20A				
								10 A FH33					
								0 A FH34					
								10 A FH35					
								0 A FH36					
CRFB BOX 3	RH8				RH7				RH6				
	μ-Relays 10A				μ-Relays ON				Relay ISO 40A 20A				
	FH42		FH40		FH44		FH45		FH46		FH47		
	15 A		10 A		15 A		0 A		15 A		0 A		
FH43		FH41											
0 A		10 A											

APPENDIX 4 : CURRENT LOAD SCENARIOS AT 70°C

CRFB BOX 2	FH40	FH41	FH42	FH43	FH44	FH45	FH46	FH47	FH48	FH49						
	8 A	0 A	10 A	0 A	10 A	0 A	15 A	0 A	10 A	0 A						
CRFB BOX 1	FH1	FH2	FH3	FH4	FH5	FH6	FH7	FH37								
	10 A	0 A	0 A	5 A	5 A	1 A	7 A	10 A								
	FH8	FH9	FH10	FH11	FH12	FH13	FH14	FH38								
	0 A	5 A	0 A	10 A	0 A	7 A	0 A	5 A								
	FH39			FH15			FH16	FH17	FH18	FH19		FH20	FH21	FH22	FH23	
	15 A			10 A			0 A	7 A	2 A	2 A		2 A	5 A	2 A	10 A	
				E16			E20			RH7						
				FH24			FH25	FH26	FH27	FH28		FH29	FH30	FH31	FH32	
				8 A			0 A	8 A	0 A	10 A		0 A	8 A	2 A	5 A	
				E26			E30			Relay ISO 40A 20A						
				RH4			RH5					RH6				
				Relay ISO 40A 15A			Relay ISO 40A ON			10 A		Relay ISO 40A ON				
										0 A		FH33				
										8 A		FH34				
									0 A		FH35					
											FH36					
CRFB BOX 3	RH8			RH7			RH6									
	μ-Relays 10A			μ-Relays ON			Relay ISO 40A 20A									
	FH42			FH40			FH44		FH45	FH46	FH47					
	15 A			0 A			10 A		0 A	10 A	0 A					
FH43			FH41													
0 A			10 A													

APPENDIX 5 : CURRENT LOAD SCENARIOS N°2 AT 70°C

Specific wiring architecture only for this test

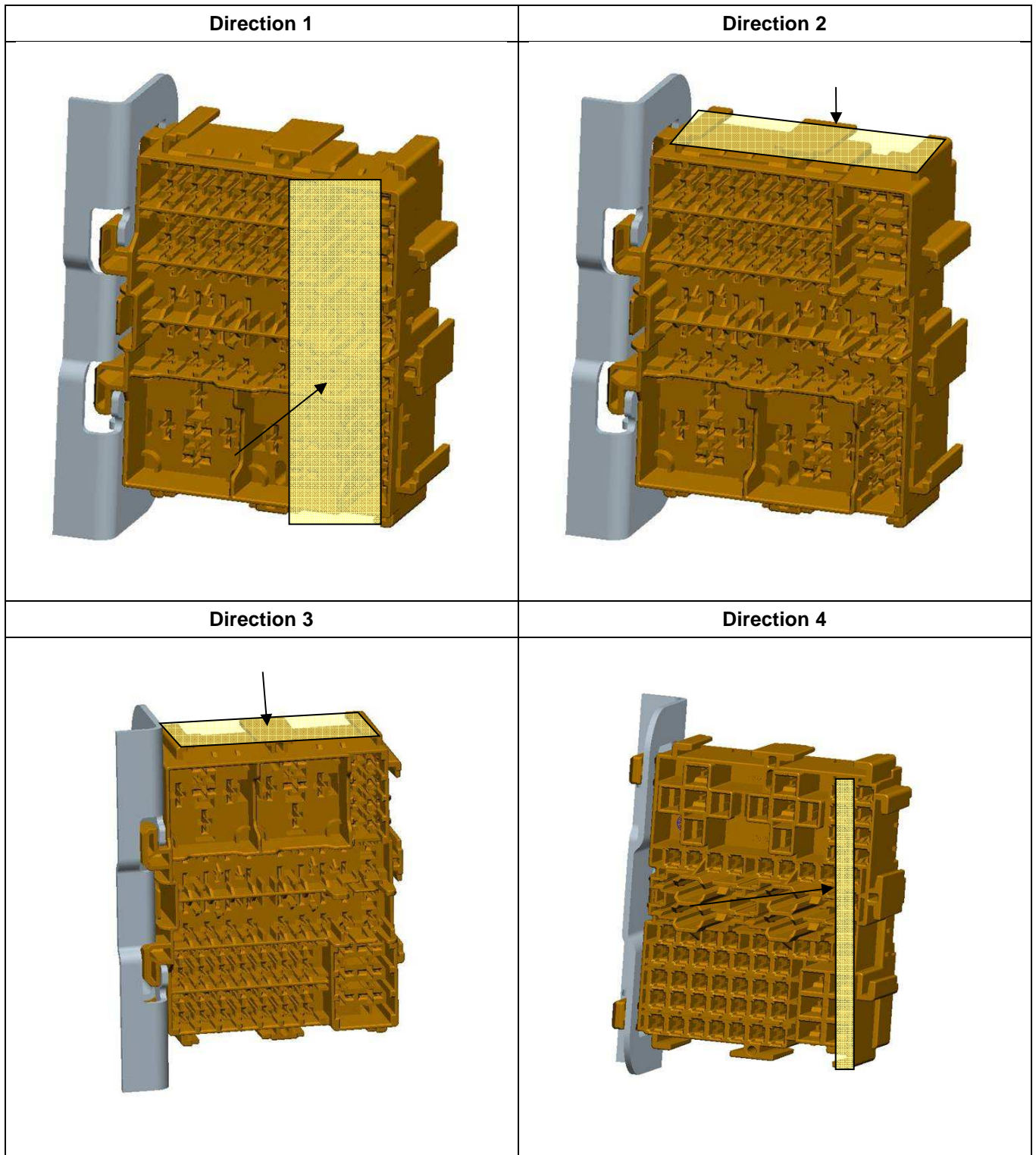
CRFB BOX 2	FH40	E JPT 4 mm ² S JPT 4 mm ²	FH41	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH42	E JPT 4 mm ² S JPT 4 mm ²	FH43	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH44	E JPT 4 mm ² S JPT 4 mm ²	FH45	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH46	E JPT 4 mm ² S JPT 4 mm ²	FH47	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH48	E JPT 4 mm ² S JPT 4 mm ²	FH49	E JPT 2,5 mm ² S JPT 2,5 mm ²	
CRFB BOX 1	FH1	E JPT 4 mm ² S JPT 4 mm ²	FH2	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH3	E JPT 4 mm ² S JPT 4 mm ²	FH4	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH5	E JPT 4 mm ² S JPT 4 mm ²	FH6	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH7	E JPT 4 mm ² S JPT 4 mm ²	FH37 E SPT 3 mm ² S SPT 3 mm ²		FH38 E SPT 3 mm ² S SPT 3 mm ²				
	FH8	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH9	E JPT 4 mm ² S JPT 4 mm ²	FH10	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH11	E JPT 4 mm ² S JPT 4 mm ²	FH12	E JPT 2,5 mm ² S JPT 2,5 mm ²	FH13	E JPT 4 mm ² S JPT 4 mm ²	FH14	E JPT 2,5 mm ² S JPT 2,5 mm ²	S SPT 3 mm ²		FH39 E SPT 3 mm ² S SPT 3 mm ²				
	FH15	JPT 4 mm ²	FH16	JPT 2,5 mm ²	FH17	JPT 4 mm ²	FH18	JPT 2,5 mm ²			FH19	JPT 2,5 mm ²	FH20	JPT 4 mm ²	FH21	JPT 2,5 mm ²	FH22	JPT 4 mm ²	FH23	E JPT 2,5 mm ² S JPT 2,5 mm ²	
	E16 Clip-Shunt 6 mm²				E20 Clip-Shunt 6 mm²																
	FH24	JPT 2,5 mm ²	FH25	JPT 4 mm ²	FH26	JPT 2,5 mm ²	FH27	JPT 4 mm ²	FH28	JPT 4 mm ²	FH29	JPT 2,5 mm ²	FH30	JPT 4 mm ²	FH31	JPT 2,5 mm ²	FH32	E JPT 2,5 mm ² S JPT 2,5 mm ²			
	E26 Clip-Shunt 6 mm²				E30 Clip-Shunt 6 mm²																
	RH4 Commande SPT 2*1 mm ² Puissance SPT 2x2,5 mm ²				RH5 Commande SPT 2*1 mm ² Puissance SPT 2x3 mm ²																
													E JPT 4 mm ² S JPT 4 mm ²		FH33						
													E JPT 2,5 mm ² S JPT 2,5 mm ²		FH34						
													E JPT 4 mm ² S JPT 4 mm ²		FH35						
													E JPT 2,5 mm ² S JPT 2,5 mm ²		FH36						

Specific fuse rating only for this test

CRFB BOX 2	FH40	FH41	FH42	FH43	FH44	FH45	FH46	FH47	FH48	FH49		
	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A		
	FH1	FH2	FH3	FH4	FH5	FH6	FH7	FH37				
	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Ato 40A				
	FH8	FH9	FH10	FH11	FH12	FH13	FH14	FH38				
	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	Ato 40A				
	FH15	FH16	FH17	FH18				FH19	FH20	FH21	FH22	FH23
	Mini 30A	Mini 30A	Mini 30A	Mini 30A				Mini 30A	Mini 30A	Mini 30A	Mini 30A	MINI 30A
	E16				E20							
FH24	FH25	FH26	FH27				FH28	FH29	FH30	FH31	FH32	
Mini 30A	Mini 30A	Mini 30A	Mini 30A				Mini 30A	Mini 30A	Mini 30A	Mini 30A	Mini 30A	
E26				E30								
RH4 Relay ISO 40A				RH5 Relay ISO 40A						Mini 30A	FH33	
										Mini 30A	FH34	
										Mini 30A	FH35	
										Mini 30A	FH36	

CRFB BOX 2	FH40	FH41	FH42	FH43	FH44	FH45	FH46	FH47	FH48	FH49		
	13 A	0 A	13 A	0 A	13 A	0 A	13 A	0 A	13 A	0 A		
CRFB BOX 1	FH1	FH2	FH3	FH4	FH5	FH6	FH7	FH37				
	12 A	0 A	12 A	0 A	12 A	0 A	12 A	20 A				
	FH8	FH9	FH10	FH11	FH12	FH13	FH14	FH38				
	0 A	12 A	0 A	12 A	0 A	12 A	0 A	0 A				
	FH15	FH16	FH17	FH18				FH19	FH20	FH21	FH22	FH23
	10 A	0 A	10 A	0 A				0 A	10 A	0 A	10 A	0 A
	E16				E20							
	FH24	FH25	FH26	FH27				FH28	FH29	FH30	FH31	FH32
	0 A	10 A	0 A	10 A				15 A	0 A	15 A	0 A	0 A
	E26				E30							
	RH4				RH5							
	Relay ISO 40A ON				Relay ISO 40A ON				15 A	FH33		
									0 A	FH34		
									15 A	FH35		
								0 A	FH36			

APPENDIX 6 : LOCKED BOX TENSILE STRENGTH



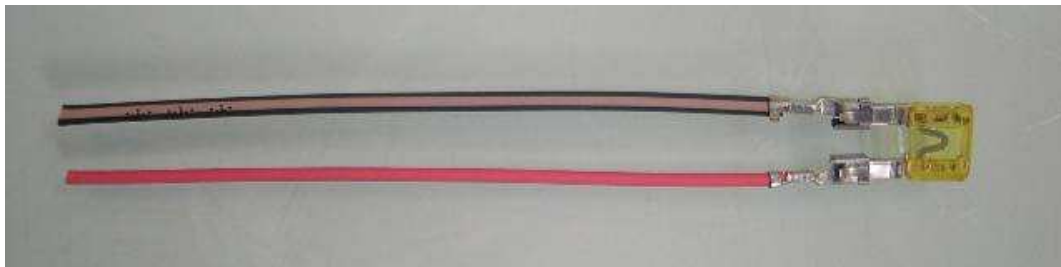
APPENDIX 7 : CONTACT RESISTANCE

Contact resistance measurement point for busbar:



Contact resistance measurement for fuses and relays:

The method is similar for fuses wired on both tabs and fuses wired on one side and connected to the busbar on the other side.



The wire length is 100mm. depending on the configuration (wire or busbar).

The resistance of :

 The fuse or the relay,

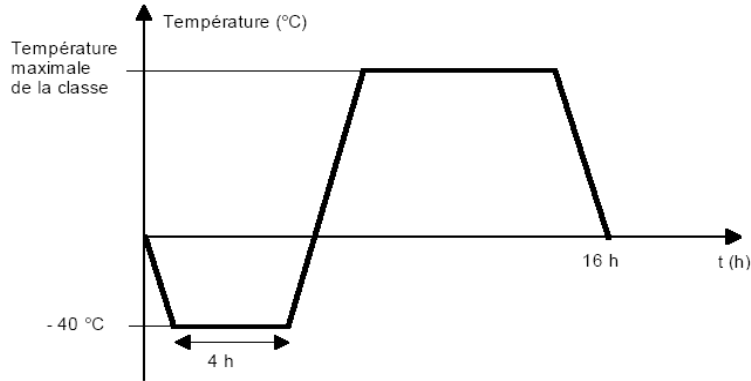
 The one or two wires,

are removed from the resistance measurement.

The criterion of acceptance is the sum of both connexions on the both fuse tabs.

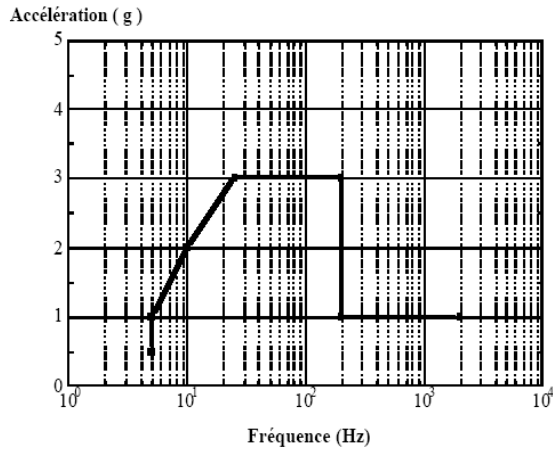
APPENDIX 8 : VIBRATION PROFIL

- Temperature cycling during vibration endurance test:



Tmin = -40°C
Tmax = +100°C
Temperature variation:
40°C/hour
Maintaining at extreme
temperature: 4h

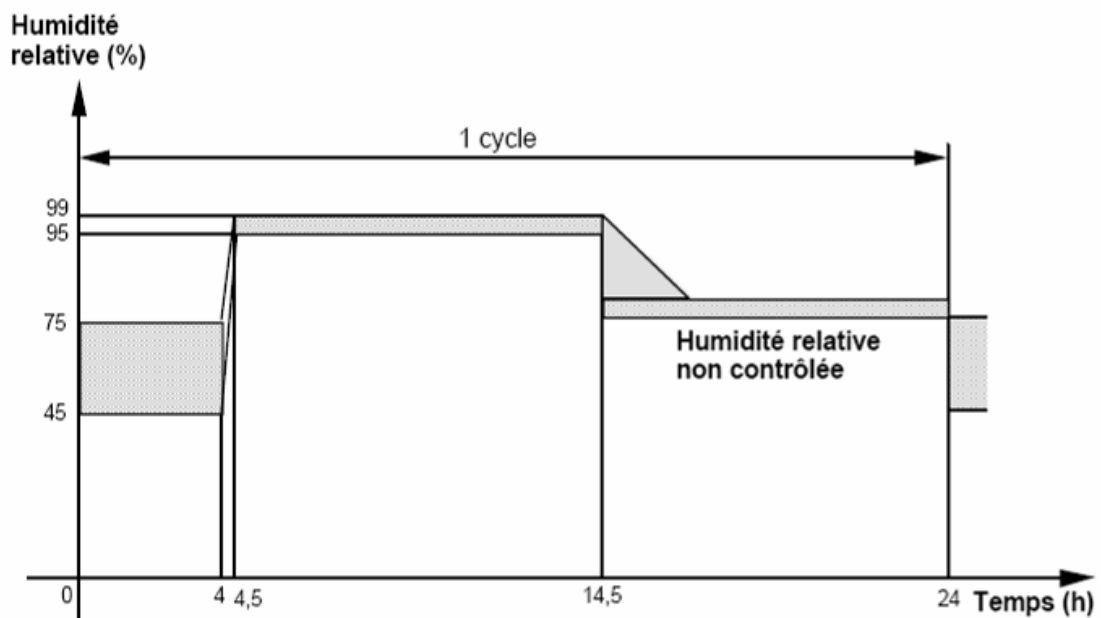
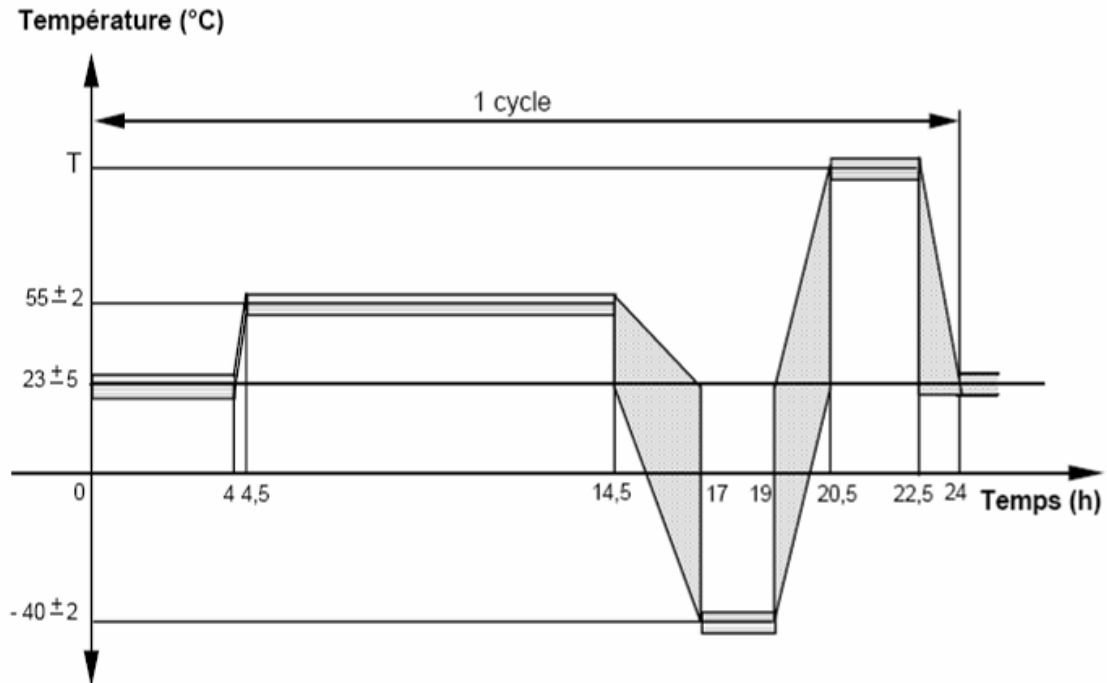
- Vibration profile:



Fréquences	Accélération
5 Hz	0,5 g à 1 g
10 Hz	2 g
25 Hz à 200 Hz	3 g
200 Hz	3 g à 1g
200 Hz à 2000 Hz	1 g

APPENDIX 9 : TEMPERATURE HUMIDITY CYCLE

Tmax = 125°C

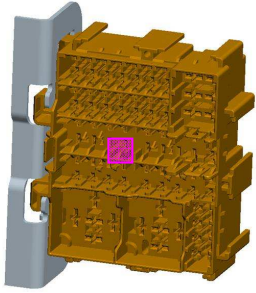
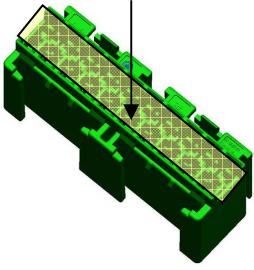
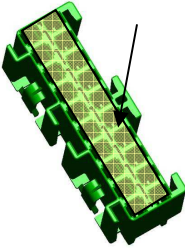
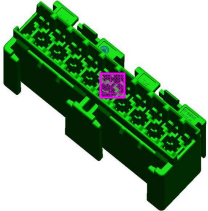
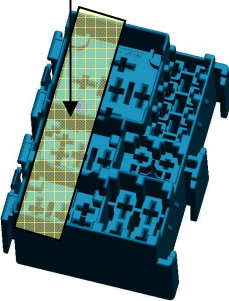
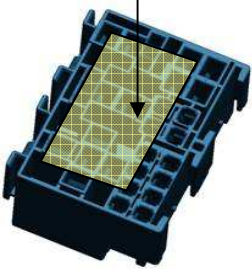
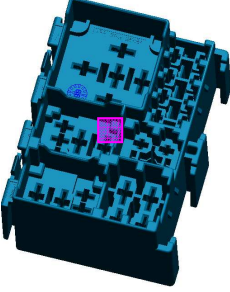


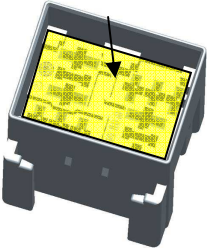
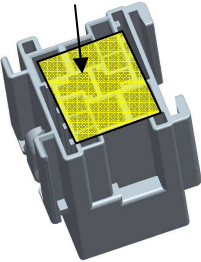
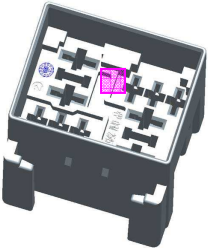
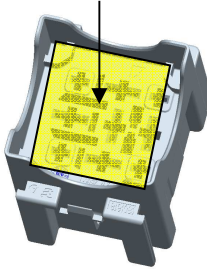
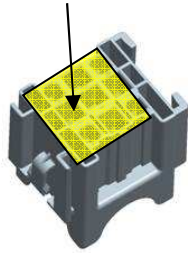
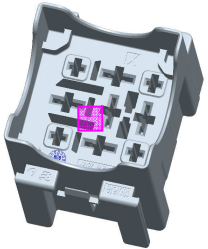
APPENDIX 10 : TABLE OF TEST CONFIGURATION FOR INTER BOXES MECHANICAL TESTS

		Number of tested parts					
		Box1 or Box1 V2	Box2	Box3 or Box3 V2	Relay holder 20A micro-relais	Relay holder 40A	Relay holder 70A
Pièces ref	Box1 or Box1 V2	X	6	6	12	12	12
	Box2	X	4	X	4	4	4
	Box3 or Box3 V2	X	8	X	8	8	8
	Relay holder 20A micro-relais	X	X	X	8	8	8
	Relay holder 40A	X	X	X	8	8	8
	Relay holder 70A	X	X	X	8	8	8

X: not performed

Table 1

	Insertion test	Removal test Locking system inactive	Retention forces test	Area for shock impact test
Box 1 PN 1801613 Box1 V2 PN 1801764				
Box2 PN 1801616				
Box3 PN 1801617 Box3 V2 PN 1801773				

<p>Relay holder 20A micro-relais PN 1801620</p>			
<p>Relay holder 40A PN 1801618</p>			
<p>Relay holder 70A PN 1801619</p>	