

JUNIOR POWER TIMER SERIES CONNECTORS

2,4,6,10,16 POS. JPT / 2.8 x 0.8 mm TAB

1. SCOPE

1.1. CONTENT

This specification covers the performance, tests and quality requirements for the SAAB series Junior Power Timer connectors, for automotive applications.

1.2. QUALIFICATION

When tests are performed the following specified specifications and standards shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the events of conflict between the requirements of this specification and the product drawing or of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. AMP DOCUMENTS

A) Customer drawings and name

- | | |
|---|---|
| <ul style="list-style-type: none"> • 963210, 2 pos. rec. housing • 967239, 2 pos. rec. housing • 962344, 2 pos. tabhousing • 965421, 2 pos. tabhousing • 963209, facial sealing for 2 pos. connector • 963207, 4 pos. rec. housing • 962340, 4 pos. tabhousing • 962341, 4 pos. tabhousing • 963208, facial sealing for 4 pos. connector • 963212, 6 pos. rec. housing • 967241, 6 pos. rec. housing • 962349, 6 pos. tabhousing • 965426, 6 pos. tabhousing | <ul style="list-style-type: none"> • 963205, facial sealing for 6 pos. connector • 963211, 6 pos. tabheader • 963214, 10 pos. rec. housing • 967240, 10 pos. rec. housing • 962352, 10 pos. tabhousing • 965423, 10 pos. tabhousing • 963213, facial sealing for 10 pos. connector • 963287, 10 pos. tabheader • 963217, 16 pos. rec. housing • 967242, 16 pos. rec. housing • 963216, facial sealing for 16 pos. connector • 963215, 16 pos. tabheader |
|---|---|

B) Product Specifications / Design Objectives:

- 108-18013, Product Spec. for Junior Power Timer Contact, Revision B
- 108-18063, Product Spec. for 2.8mm Tab, Revision A

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Product Code : 1061 / 2004

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D	EG00-1113-98	D.K.		PAGE 1 OF 9	TITLE JPT SERIES CONNECTORS JPT SERIE KUPPLUNGEN				
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9-24-98

C) Application Specification:

- 114-18050-1, Application Spec. for Junior-Power Timer Contact, Revision A
- 114-18051, Application Spec. for 2.8mm Tab, Revision A

2.2 OTHER DOCUMENTS

A) IEC 512 (issue 04/94)

B) DIN 40050 (issue 05/93)

3. REQUIREMENTS

3.1. DESIGN AND CONSTRUCTION

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. MATERIAL

Description for material see in product drawings.

3.3. PERFORMANCE AND TEST DESCRIPTION

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Para. 3.4. All tests are performed at ambient environmental conditions per IEC 512 unless otherwise specified.

3.3.1 CONDITION OF DELIVERY

Tabs and receptacles shall be delivered with fixed cables (normally crimped).

The parts shall have a smooth surface without any cracks, folds and chamfers. There shall be no punching edges.

3.3.2 VISUAL EXAMINATION

The connectors shall not have any failures or damages. The connectors shall be manufactured according to the values and the tolerances which are shown by the drawings or the releases. All edges of the housing, which are in the handling area, shall not be sharp.

3.3.3 MOUNTING AND RETENTION FORCE OF CONNECTORS

The mounting and retention force of connectors shall not exceed the given value in 3.4.

Force will be brought on slide of the receptacle housing



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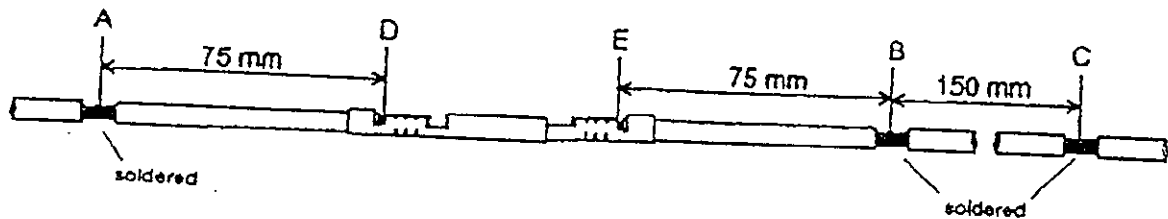
3.3.4 TERMINAL RETENTION IN HOUSING

The test for contact retention forces shall be carried out using a suitable test apparatus at a constant speed of 75 mm/min \pm 25 mm/min. The contacts shall have all locking devices effective. The contacts shall withstand the forces mentioned in Para. 3.4.

3.3.5 VOLTAGE DROP

The voltage drop shall be measured after the thermal equilibrium at a current density of 5 A/mm² nominal cross-sectional area of attached cable. The measurement shall be done at an ambient temperature of (23 \pm 5) °C. The maximum allowed voltage drop is fixed.

The voltage drops are measured as follows:



$$U_{\text{WHOLE}} = U_{DE} = U_{AB} - U_{BC}$$

3.3.6 INSULATION RESISTANCE

The insulation resistance will be measured by applying (100 \pm 10) V between all contacts connected together and a metal foil surrounding the housing. The metal foil shall be connected to earth for safety reasons. The measurements shall also be made between each adjacent contact. The resistance of the not connected connector must be higher than the mentioned value in 3.4.

3.3.7 CURRENT LOADABILITY

The temperature of the contact at its hottest spot may not exceed 80 °C \pm 2.5 K. The measurements shall be taken after thermal equilibrium at a current of 11 A on a 2.5 mm² wire sized cable noted in the following table. The attached cables shall have a length of 300 \pm 20 mm. The temperature of the handling area shall not exceed 63 °C \pm 2.5.

The tests shall be carried out at an ambient temperature of 23°C \pm 5 K.

3.3.8 TEMPERATURE TEST

The connectors with attached cables of 300 \pm 20 mm length are loaded at a current density of 5 A/mm² nominal cross-sectional area of attached cables. The parts shall be functional the whole test time (min. 144h) and the whole temperature range of -40°C up to 85 °C.

All requirements of contact retention in housing and voltage drop (crimp and contact) shall be fulfilled after this test.

No deformation, crack or breaking shall be visible at the housing.

3.3.9 TEMPERATURE CYCLING TEST

The test samples are to be subjected to 12 cycles of the following test sequence:

t min. for 6 hours;
t max. for 6 hours;
t min. = - 40 °C ± 3 K;
t max. = 105 °C ± 3 K

The test temperature shall be raised or lowered within 1 hour. The times in the table above don't include the periods of changing the temperature.

After this test all requirements of contact retention in housing and voltage drop (crimp and contact) shall be fulfilled.

3.3.10 VIBRATION TEST

The vibration shall be carried out with mated connectors suitable mounted on a vibration table as shown in following figure.

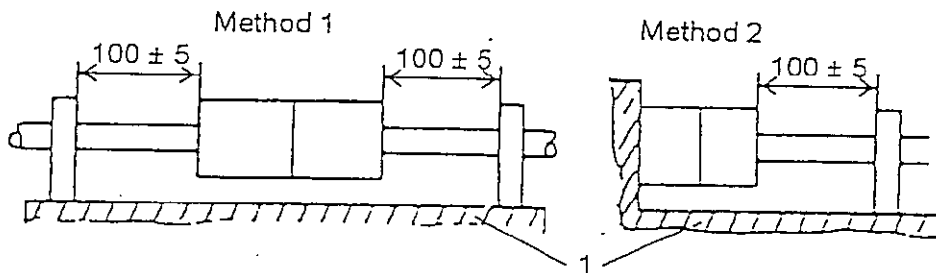


Figure: mounting on vibration table

All connectors are wired in series and connected to a d.c. source allowing a current flow of 100 mA to monitor connection resistance variation during the entire test.

During vibration test the connection resistance variation shall not exceed the values given in Para. 3.4.

The test temperatures are given in Para. 3.4.

3.3.11 HUMIDITY TEST

Connected parts shall be tested in following way:

Duration: 72 h ± 15 min.
Temperature: 40 °C ± 3 K
Humidity: ≈ 100 %
Current: 12, 5 A, 600 sec. On, 600 sec. Off

After this test all requirements of voltage drop (crimp and contact) shall be fulfilled. No deformation, crack or breaking shall be evident.

3.3.12 SALT FOG TEST

The salt spray test shall be carried out in following way:

Complete cycle time: 1 week separated in following steps:

- 24 h parts laying in salt fog
- 6 h drying in heatoven at $+40^{\circ}\text{C} \pm 2,5 \text{ K}$
- 18 h parts laying in salt fog
- 6 h drying in heatoven at $+40^{\circ}\text{C} \pm 2,5 \text{ K}$
- 18 h parts laying in salt fog
- 6 h drying in heatoven at $+40^{\circ}\text{C} \pm 2,5 \text{ K}$
- 24 h parts laying in salt fog
- 65 h drying in heatoven at $+40^{\circ}\text{C} \pm 2,5 \text{ K}$

The test solution shall be prepared by dissolving 5 parts by weight reagent grade salt (sodium chloride NaCl) in 95 parts by weight deionized water with a conductivity of $\leq 2\text{mS/m}$ at $+ 23^{\circ}\text{C} \pm 2,5 \text{ K}$. The pH of the solution shall then be adjusted by the addition of diluted chemically pure hydrochloric acid or chemically pure sodium hydroxide, so that collected condensate and the spray solution have a pH of 6,5 to 7,2 at $+23^{\circ}\text{C} \pm 2,5 \text{ K}$. The pH value shall be measured electrometrically at $+23^{\circ}\text{C} \pm 2,5 \text{ K}$ using a glasses electrode, or colourimetrically using bromine thymol blue as an indicator.

After this test all requirements of voltage drop (crimp and contact) shall be fulfilled.

3.3.13 WATER TIGHTNESS

The connector shall be assembled with the full complement of contacts fitted. The cables attached shall be of the min. and max. overall diameter that the connector sealing allows.

The cable ends shall be sealed. The test sample shall be aged after the first water tightness test in a temperature chamber at $+ 90^{\circ}\text{C}$ for a period of 250 hours.

The parts are tested according to DIN 40050, IPX4K.

No water shall be in the connection after the test (water finding paste). The test is repeated after ageing.

3.3.14 DIELECTRIC WITHSTAND VOLTAGE

An a.c. voltage of 500 V r.m.s. (50 Hz) shall be applied for 60 seconds across all contacts connected together and a metal foil surrounding the housing. The metal foil shall be connected to earth for safety reasons. The voltage shall also be applied between each adjacent contact. During the tests no dielectric breakdown nor flash over shall occur.

3.4. TEST REQUIREMENTS AND PROCEDURES SUMMARY

TEST DESCRIPTION	REQUIREMENT
DELIVERY-CONDITIONS ACC. TO SECTION 3.3.1	CHECK WITHOUT OPTICAL EQUIPMENT. SMOOTH SURFACE WITHOUT CRACKS AND CHAMFERS.
VISUAL EXAMINATION ACC. SECTION 3.3.2	CHECK WITHOUT OPTICAL EQUIPMENT. NO DAMAGES OR FAILURES AT THE CONNECTORS, NO SHARP EDGES IN HANDLING AREA.
MOUNTING FORCE OF CONNECTOR ACC. TO SECTION 3.3.3; FIRST CONNECTION CONNECTOR FULLY MATED WITH CONTACTS WITH TIN PLATED SURFACE, SPEED 100mm/min	F < 150N FOR 2 - 10 POS. COUPLING F < 170N FOR 12 - 16 POS. COUPLING
RETENTION FORCE OF CONNECTOR ACC. TO SECTION 3.3.3; FIRST DISCONNECTION CONNECTOR FULLY MATED WITH CONTACTS WITH TIN PLATED SURFACE, SPEED 100mm/min	F < 150N FOR 2 - 10 POS. COUPLING F < 170N FOR 12 - 16 POS. COUPLING
TERMINAL RETENTION IN HOUSING ACC. TO SECTION 3.3.4 CONSTANT SPEED OF v = 100mm/min ALL LOCKING DEVICES EFFECTIVE	F > 60N
VOLTAGE DROP ACC. TO SECTION 3.3.5	$R_{\text{INITIAL}} \leq 10m\Omega$, $\Delta R / R_{\text{AFTER}} \leq 5$
INSULATION RESISTANCE ACC. TO SECTION 3.3.6	R > 1M Ω
CURRENT LOADABILITY ACC. TO SECTION 3.3.7 JPT: 2.5mm ² , 11A CONNECTOR FULLY LOADED, CURRENT ON ALL CONTACTS	TEMPERATURE OF CONTACT AT ITS HOTTEST SPOT: T ≤ 82,5 °C TEMPERATURE OF CONNECTOR IN HANDLING AREA: T ≤ 65°C
TEMPERATURE TEST ACC. TO SECTION 3.3.8 TEMPERATURE CLASS: E	SEE REQUIREMENTS FOR VOLTAGE DROP AND RETENTION FORCE
TEMPERATURE CYCLING TEST ACC. TO SECTION 3.3.9 TEMPERATURE CLASS: E	SEE REQUIREMENTS FOR VOLTAGE DROP AND RETENTION FORCE

TEST DESCRIPTION	REQUIREMENT
<p>VIBRATION TEST ACC. TO SECTION 3.3.10 3 x 24h RANDOM VIBRATION TEST WITH TEMPERATURE CYCLING 10Hz - 0.217g 1000Hz - 0.0022g; $g_{eff} = 3.26$ CONTINUOUS MONITORING AND MEASURING OF CONTACT INTERRUPTION MORE THAN 1μs DURING VIBRATION TEMPERATURE CYCLING TEST 3 CYCLES : PERIODICAL FROM -40°C UP TO +85°C; THE DURATION OF THE HIGH, RESP. LOW TEMPERATURE IS 3 HOURS, TEMP. GRADIENT 2°C / min. CONTACT RESISTANCE MEASUREMENT (20mV METHOD ACC. TO IEC 512, PART 2); INITIAL, AFTER VIBRATION AND BETWEEN EACH DIRECTION CONTINUOUS MONITORING AND MEASURING OF CONTACT INTERRUPTION MORE THAN 1μs; ELECTRICAL CONDITION: SUPPLY VOLTAGE: 10V ELECTRICAL LOADING OF CONTACTS: 100mA THRESHOLD VALUE: 2.5V, RESP. 25Ω CONTACT RESISTANCE</p>	<p>SEE REQUIREMENTS FOR VISUAL EXAMINATION</p> <p>NO CONTACT INTERRUPTION DURING VIBRATION</p> <p>CONTACT RESISTANCE: $\Delta R / R \leq 5$, $R_{\mu} \leq 10m\Omega$</p>
<p>HUMIDITY TEST ACC. TO SECTION 3.3.11 CURRENT: 5 A / mm²</p>	<p>SEE REQUIREMENTS FOR VOLTAGE DROP</p>
<p>SALT FOG TEST ACC. TO SECTION 3.3.12 CURRENT: 5 A / mm² 1 WEEK CYCLE</p>	<p>SEE REQUIREMENTS FOR VOLTAGE DROP</p>
<p>WATER TIGHTNESS ACC TO SECTION 3.3.13 TESTING TO BE REPEATED AFTER AGEING</p>	<p>NO COLOURING OF H₂O INDICATION PASTE</p>
<p>DIELECTRIC WITHSTAND VOLTAGE ACC. TO SECTION 3.3.14 A.C. VOLTAGE OF 500V</p>	<p>NO DIELECTRIC BREAKDOWN NOR FLASH OVER SHALL OCCUR</p>

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3.5. TEST SEQUENCE

TEST		TESTSAMPLE-GROUP						
TITLE	SECT. /	A	B	C	D	E	F	G
DELIVERY CONDITIONS	3.3.1	1	1	1	1	1	1	1
VISUAL EXAMINATION	3.3.2	2	2	2	2,	2	2	2,4
MOUNTING FORCE	3.3.3	3						
RETENTION FORCE	3.3.3	4						
TERMINAL RETENTION	3.3.4	5		7				
VOLTAGE DROP	3.3.5		3	6	4	4		5
INSULATION RESISTANCE	3.3.6		4					
CURRENT LOADABILITY	3.3.7			3				
DIELECTRIC WITHSTAND VOLTAGE	3.3.14		5					
TEMPERATURE TEST	3.3.8			4				
TEMPERATURE CYCLING TEST	3.3.9			5				
HUMIDITY TEST	3.3.11				3			
SALT FOG TEST	3.3.12					3		
VIBRATION TEST	3.3.10							3
WATERTIGHTNESS	3.3.13						3	

TABLE 2



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4. QUALITY ASSURANCE PROVISIONS

4.1. QUALIFICATION TESTING

A. SAMPLE SELECTION

The samples shall be prepared in accordance with product drawings. They shall be selected at random from current production. All tests group shall contain of two samples at least.

As the connectorseries is worked as a family with identical designfeatures the different tests are partly worked out on specific connectors only.

Testgroup A. Connectors of each positions

Testgroup B: Connector 2 position

Testgroup C. Connector 2 position

Testgroup D: Connector 10 position

Testgroup E. Connector 24 position, see specification 108-18102-5

Testgroup F. Connectors of each position

Testgroup G: Connector 6 position

B. TEST SEQUENCE

Qualification inspection shall be verified by testing samples, as specified in 3.6.

4.2. REQUALIFICATION TESTING

If changes significantly affecting form, fit or function are made to the product or to the manufacturing process, AMP shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by product development.

4.3. ACCEPTANCE

Acceptance is based on verification that that the product meets the requirements of Para. 3.4.

Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective actions shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. QUALITY CONFORMANCE INSPECTION

The applicable AMP inspection plan will specify the sampling acceptable quality level to be used.

Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.



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