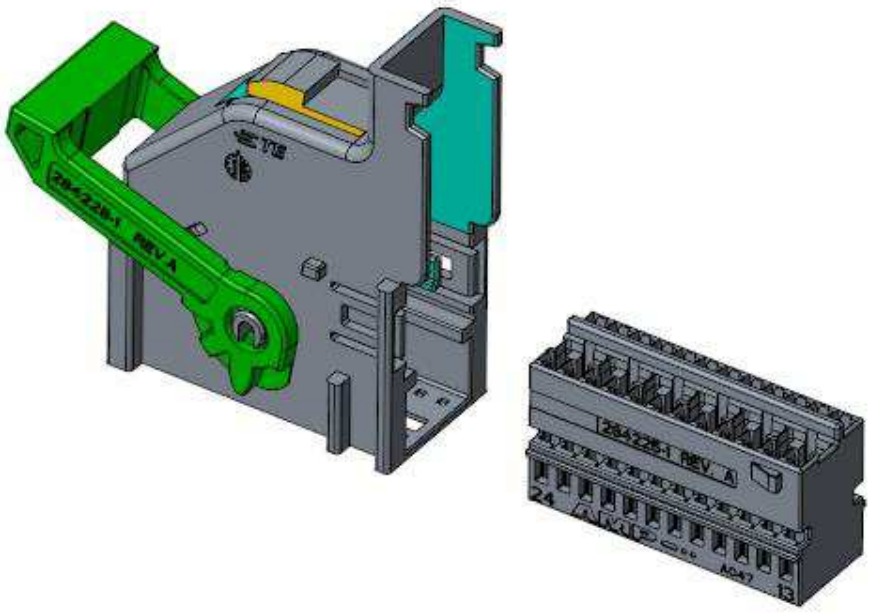
AIR BAG CONNECTOR SYSTEM 24 + 24 POSITIONS



A	New Spec. 02-04-18	R.O.	11/29/2018	S.H.	--/--/----
rev letter	rev. record	DR	Date	CHK	Date
DR.		DATE APVD			DATE

INDEX

For electrical requirement 3.1, 3.2, and 3.3 see MQS Qualification Test Report n. 501-18004.

4.0 ENVIRONMENTAL REQUIREMENTS

4.1 THERMAL CUMULATIVE AGEING
4.2 SALT SPRAY
4.3 KESTERNICH CORROSION

Appendix A - Random Vibration Chart and Parameters (Class 1-4)
Appendix B - Temperature cycling
Appendix C - Mechanical Shock Parameters

1.0 SCOPE

This specification intends to cover all the electro-mechanical and environmental performances of the 24+24 pos. air bag connector system.

1.1 COMPONENT LIST

PART NUMBER	DESCRIPTION
284225-1,-2	Housing for 24 pos. with short circuit bar
2330171-1,-2	24 pos. Kit assembly
144969-2	MQS contact gold plated version

1.2 APPLICABLE DOCUMENTS

Product drawings have to be considered part of this specification. In case of conflicts between specification and referenced documents, this specification shall take precedence.

1.3 TE CONNECTIVITY SPECIFICATION

A. 109-1 Test Specification, General Requirements for Test Methods

1.4 COMMERCIAL STANDARD SPECIFICATIONS

AIR BAG CONNECTOR SYSTEM 24 + 24 POSITIONS with 90° cable exit - TE Product Specification 108-20202 / Rev. C

Volvo GENERAL TR FOR CONNERCTORS - TR 20808076 – Date: 2012-06-19 (applied for 2.11; 2.12; 2.13; 3.6)

For electrical requirement 3.1, 3.2, and 3.3 see MQS Qualification Test Report n. 501-18004.

1.5 RATINGS

A. CURRENT RATINGS:

6.0 A max with 0.50 mm^2 wire

3.5 A max with 0.35 mm^2 wire

Current rating per wire section a.m. are according to Fiat spec. 91107/03

B. AMBIENT TEMPERATURE:

- 40°C TO +85 °C

C. MAXIMUM OPERATING VOLTAGE:

24 V D.C. (for application at higher voltage please contact TE Connectivity)

1.6 QUALITY ASSURANCE PROVISION

A. Sample preparation
The test samples to be used for the test shall be prepared by random selection from the current production and the contact shall be crimped in accordance with the application specification 114-15077.
No sample shall be re-used, unless otherwise specified.

B. Test condition:
All test shall be performed under any combination of the following test condition, unless otherwise specified:
Room temperature: 23±5°C
Relative humidity: 45÷75%
Atmospheric pressure: 860÷1060 mbar

1.7 PRODUCT DESCRIPTION

The system includes a header with two recess, each with 24 pins 2.54 mm pitch on two rows. Pins are gold plated on connector mating part, while on the other side are tin plated to be soldered on a P.C.B. (1.6 mm thickness). In each header recess there are special finger actuating the short circuit bar when the male connector is mate.
The male connectors have cavities suitable for MQS contacts gold plated version and in between the two contacts cavities rows are assembled six short circuit bar gold plated.
The short circuit bars work with a contact row only, putting the female contacts MQS in short circuit when the system is not closed (male connector not inserted into the header).

The connectors are provided with a secondary lock, which do not allow to assembly the housing 24 pos. into the frame, when a contact is not fully inserted into his cavity.

TEST PROCEDURE

Test Description	Requirements	Procedure
1.8 Confirmation of product	- Product shall confirm the requirements of applicable product drawing and Application specification.	Visually, dimensionally and functionally inspected per applicable quality inspection plan.
1.9 Visual examination	- Any visible damage, cracking or defect when the product is new and even after environmental, mechanical and electrical test.	Visual inspection.

2.0 MECHANICAL REQUIREMENTS

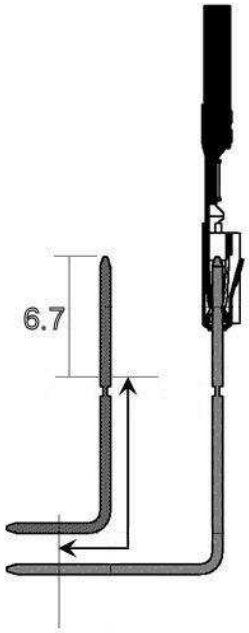
Test Description	Requirements	Procedure
2.1 Connector mating force	≤ 70 N At new and after 10 cycles of mating/un-mating.	All contacts (24) inserted into the frame housing. Test to be performed with correspondent header counterpart, all assembled moving the lever with an operation speed of 50 mm/min.
2.2 Connector un-mating force	≤ 70 N At new and after 10 cycles of insertion/un-mating.	All contacts (24) inserted into the frame housing Test to be performed with correspondent header counterpart, all assembled moving the lever with an operation speed of 50 mm/min.

2.3 Connector locking strength	100 N min.	Connector fully loaded assembled with the correspondent header counterpart Operating speed: 50 mm/min. Apply a pull-off load to the cables bundle in two directions: 1- axial direction 2- perpendicular direction
2.4 Retention force housing/frame	100 N min.	On assembled cavity block, fully loaded, with the corresponding housing. Pulling by wire bundle in an axial direction.
2.5 Lever retention when closed	100 N min.	Connector mated into the correspondent counterpart header. Without disengaging the lever hook, apply the load of 100 N per 30 sec. to the lever. No lever disengage shall occur.
2.6 Contact insertion force (into the cavity)	≤ 10 N	Crimped contacts onto 0.5 mm^2 Use a free-floating fixture with a operation speed of 25.4 mm/min.
2.7 Contact extraction force	≥ 30 N with Primary Lock only ≥ 60 N with Primary Lock and Secondary Lock	Pull out the contacts from the cavity with an operation speed of 25.4 mm/min.

2.8 Secondary lock effectiveness	60 N min.	Force applied to the connector housing when a contact is not fully insert into its own cavity, shall not produce the insertion of the housing into the cover. Insertion speed: 25.4 mm/min
2.9 Connector polarization effectiveness	200 N	Force applied on the connector, it should not be possible to insert the housings to the corresponding headers under a rotation of 180 degree in mating direction. Speed 50 mm/min;
2.10 Connector coding effectiveness	200 N	Force applied on the connector, it should not be possible to insert the housings to headers with a different coding. Constant Speed 50 mm/min
2.11 Heat Storage	No cracks or damages 3.6 connection resistance test must be passed	TR20808076 - 4.3.2: 85°C for 500h Place the fully equipped mated connectors in a test chamber and leave them there at the test Temperature (Class 2).
2.12 Mechanical Shock	No cracks or damages 3.6 connection resistance test must be passed TR 20808076 - 5.3.3: No electrical discontinuity greater than 1 micro sec. shall occur	TR20808076 - 5.4.8.2: Test parameters must be in accordance with Table C.1

2.13 Vibration test	Voltage drop within limits indicated for new contacts No electrical discontinuity greater than 1 micro sec. shall occur Electrical continuity between two contacts and the relative short circuit bar.	Vibration Test according to Volvo TR 20808076 - Test sequence F Vibration Class 2 Temperature cycling acc. TR 20808076 / 5.5.4 (Diagram B.1) On mated connector with the counterpart random vibration test as per diagram A.1 and table A.1 enclosed Duration: 3 x 32 hrs (X,Y,Z-Axis). Wires bundle fixed at 10 cm Test current: 1 mA Note about Appendix A from Volvo TR 20808076: - 4 samples and no less than 20 terminals tested - Only the largest wire size with 0.5 mm^2 applied for testing

3.0 ELECTRICAL REQUIREMENTS

Test Description	Requirements	Procedure
3.1 Voltage drop	-≤ 5,0 mV/A wire size: 0.5 mm² for a single contact At new and after ten insertion/extraction	Between a point of the wire at 1 cm from the conn. Edge and a point very close to the header edge (single contact). Termination resistance is obtain after subtraction of resistance due to wire used for termination and due to male pin (length 10 mm min as shown in the following picture). 
3.2 Dielectric strength	Neither creeping discharge or flashover shall occur	≥ 1000Vac for 1 minute. Test between adjacent circuits of mated connectors
3.3 Insulation resistance	10 MΩ min.	Applied voltage: 500 V dc

3.4 Temperature rise over Oven Temperature	-Temperature increasing: ≤ 50°C (Thermocouple placed on transition between contact body and wire) -Voltage drop within limits indicated for new contacts -No damaging	On 6 adjacent contacts: - Test temp. of 80 ±2°C. - Test current on each contact: 6A - Duration: 5 hours
3.5 Current overload	Temperature rise increase: ≤ 60°C (thermocouple placed on transition between contact body and wire barrel) -Voltage drop within limits indicated for new contacts -No damaging	On one way without housing: Test current 1.5 nominal current (see par. 0.6) -Duration 500 cycles composed of: • 45' current ON • 15' current OFF
3.6 Connection Resistance	TR20808076 - Chapter 4.3.2: The maximum permitted resistance is 2.5 x initial resistances (initial permitted resistance is ≤5mΩ).	TR20808076 - Chapter 5.3.2: To prevent the breakdown of possible insulating films on the terminals, the test voltage shall not exceed 20mV and the test current shall not exceed 100mA.

4.0 ENVIRONMENTAL REQUIREMENTS

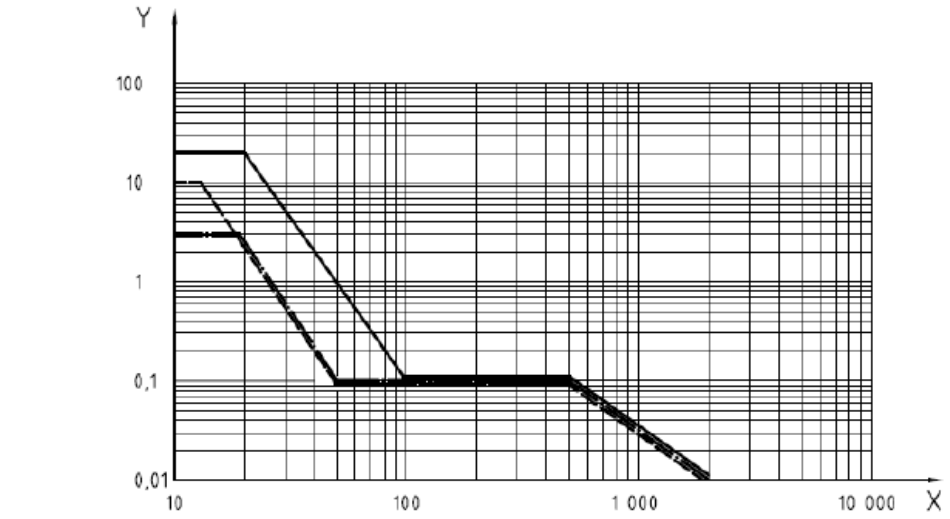
Test Description	Requirements	Procedure
4.1 Thermal cumulative ageing	-No deformation or cracking of the plastic parts -Voltage drop: ≤ 10 mVA -Insulation resistance within indicated limits -Electrical continuity between two contacts and the relative short circuit bar.	On mated connectors: 5 cycles composed of: -4 hrs at 105°C ± 2°C -4 hrs -30°C± 2°C 5 cycles composed of: -4 hrs at 105°C ± 2°C -4 hrs at + 40°C ± 2°C and 90-95% r.h. -4 hrs -30°C± 2°C 200 hrs at 105 °C
4.2 Salt spray corrosion test	-Voltage drop: ≤ 10 mVA -Insulation resistance within indicated limits -Electrical continuity between two contacts and the relative short circuit bar.	-98 hours of salt mist at 35°C± 2°C, 5% of NaCl, pH 6.5-7.2 class 2 (mated connector)
4.3 Kesternich corrosion	-Voltage drop: ≤ 10 mVA -Electrical continuity between two contacts and the relative short circuit bar.	4 cycles composed of: -8 hrs of exposure to an atmosphere with 0.66% of SO_2 at +40°C ± 2°C (method acc. to DIN 50118) -16 hours in free air (mated connectors)

PRODUCT QUALIFICATION TEST SEQUENCE

TEST GROUP

ITEM	DESCRIPTION	A	B	C	D	E	F	G	H	I	L	M	N	O
1.10	Visual examination	1,7, 9	1,3	1,3	1,3	1, 13	1,4	1,5	1,6	1,5	1,6	1,5	1,5	1,3,5
2.1	Connector mating force	2,5												
2.2	Connector un-mating force	3,6												
2.3	Connector locking strength	8												
	Durability (10 cycles)	4												
2.4	Retention force housing/frame						2							
2.5	Lever retention (when it's closed)						3							
2.6	Contact insertion force (into the cavity)		2											
2.7	Contact extraction force			2										
2.8	Secondary lock effectiveness				2									
2.9	Connector pol. effectiveness													2
2.10	Connector coding effectiveness													4
2.11	Heat storage					3								
2.12	Mechanical Shock					11								
2.13	Vibration					5, 7, 9								
3.1	Voltage drop							2,4	2,5	2,4	2,4	2,4	2,4	
3.2	Dielectric strength								4					
3.3	Insulation resistance								3		5			
3.4	Temp. rise (in oven)									3				
3.5	Current over-load							3						
3.6	Connection Resistance					2, 4, 6, 8, 10, 12								
4.1	Thermal cum. Ageing										3			
4.2	Salt spray											3		
4.3	Kesternick corrosion												3	

Appendix A: Random Vibration Chart and Parameters (Class 1-4)



Key

X	frequency, Hz
Y	power spectral density (PSD) of acceleration, $(m/s^2)^2/Hz$
———	vertical
——·——	longitudinal
— — —	lateral

Diagram A.1: From Volvo TR 20808076 / 5.4.11.2.2 - Power spectral density (Y - [m/s2] 2/Hz) vs. Frequency (X - Hz)

Frequency Hz	PSD $(m/s^2)^2/Hz$		
	Vertical[a]	Longitudinal[b]	Lateral[c]
10	20	3	10
13			10
19		3	
20	20		
50		0,1	0,1
100	0,1		
500	0,1	0,1	0,1
2 000	0,01	0,01	0,01

[a] r.m.s. acceleration value: 21,3 m/s^2.
[b] r.m.s. acceleration value: 11,8 m/s^2.
[c] r.m.s. acceleration value: 13,1 m/s^2.

Table A.1: From Volvo TR 20808076 / 5.4.11.2.2 - Values for frequency and power spectral density

Appendix B: Temperature cycling

T_{min} = -40°C
T_{max} = 85°C

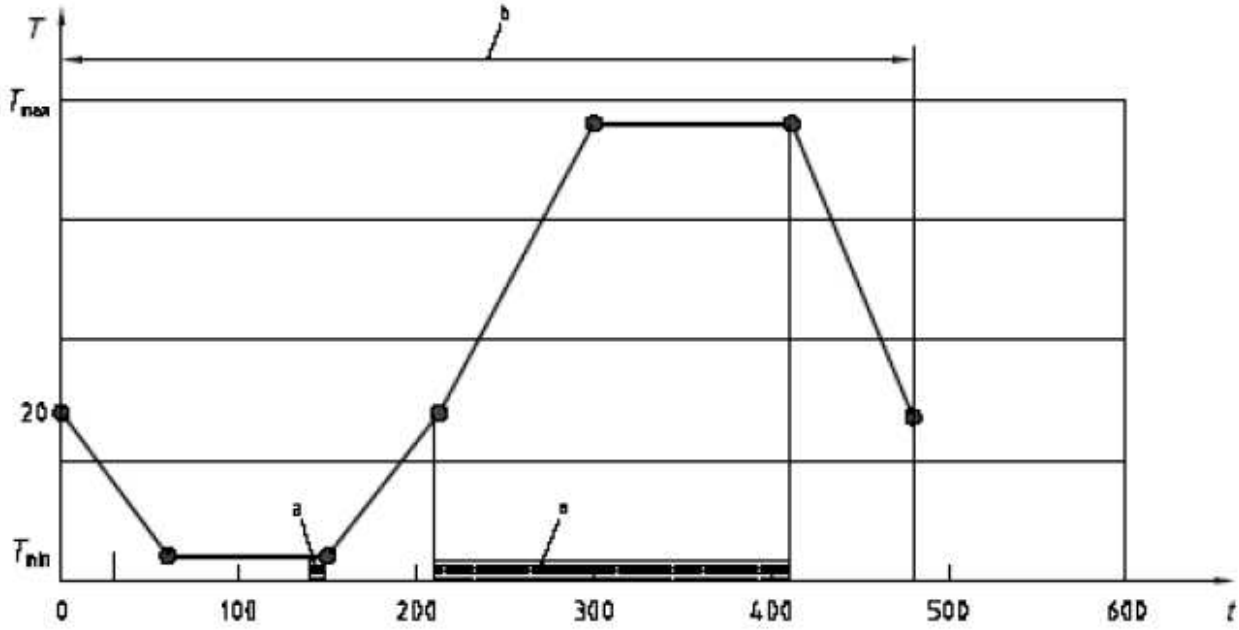


Diagram B.1: From Volvo TR 20808076 / 5.5.4 - Temperature cycling

Appendix C: Mechanical Shock Parameters

Operating mode of DUT (see ISO 16750-1:2003)	3.2
Pulse shape	half-sinusoidal
Acceleration	500 m/s²
Duration	6 ms
Temperature	Room temperature
Number of shocks	10 per test direction

Table C.1: From Volvo TR 20808076 / 5.4.8.2 - Mechanical shock test for connectors on rigid point on the body and on the frame – Parameters.