

Description : **DASH-BOARD CONNECTOR SYSTEM FOR FIAT 188 CAR MODEL**

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- 1.1B WIRE RETENTION

A7	ADDED NEW PRODUCT ON TABLE PAGE 2	M. POLIZZI	O. CANUTO	27/09/06
A6	RE-WRITTEN AND REVISED	M. GHISOLFI	R. MARTINI	29/11/05
A5	UPDATED (ET00-0096-04)	F.AMERIO	O.CANUTO	10/05/04
A4	UPDATED (ET00-0166-02)	M. POLIZZI	O.CANUTO	16/09/02
A3	REVISED	A. GENTA	A. BRUNI	15/03/99
A2	REVISED	A. GENTA	A. BRUNI	03/08/98
A1	REVISED	A. GENTA	A. BRUNI	24/03/98

**0.1 CONTENTS**

This specification covers the requirements for product performance, test methods and quality assurance provision for dash-board connector system for FIAT 188 car model.

<b>PN's</b>	<b>Connector Frames</b>
284136-1/-2, 284360-1/-2 284647-2, 1745003-1/-2	18 ways 2,54 mm pitch with lever mating device*
284137-1, 284438-1, 284439-1	36 ways 2,54 mm pitch with lever mating device*
284138-1, 1745017-1	18 ways 3,50 mm pitch with lever mating device*
284142-1	6 ways in line with inertial lock mating device*
1745074-1/-2/-3	9 ways 3,50 mm pitch with lever mating device*
	<b>IDC Connectors</b>
284126-1/-2	9 ways 2,54 mm pitch IDC type
284127-1/-2/-3	9 ways 3,50 mm pitch IDC type
284128-1	6 ways 3,50 mm pitch IDC type
	<b>Housings Crimp</b>
284134-1/-2/-3/-4/-5/-6	9 ways 2,54 mm pitch for MQS contact
284135-1/-2/-3	9 ways 3,50 mm pitch for .070 contact
953599-1, 1745005-1/-2	18 ways 2,54 mm pitch for MQS contact

Note:\* connectors are composed by plastic shell ( with mating device ) in which terminated IDC and crimp connectors are inserted

**0.2 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.

**0.3 AMP SPECIFICATION**

A. 109-5000 Test Specification, General Requirements for Test Methods

**0.4 COMMERCIAL STANDARD SPECIFICATIONS**

Low Voltage Stranded Cables for Automobiles acc. to FIAT Normation Table N° 91107/03

## 0.5 DESIGN AND CONSTRUCTION

Product shall be comply with design, construction and physical dimensions specified in the applicable product drawing

## 0.6 RATINGS

A. CURRENT RATING:      9 A max. with 0.75 mm<sup>2</sup> wire for contacts 3.50 mm pitch  
                                    6 A max. with 0.50 mm<sup>2</sup> wire for contacts 2.54 mm pitch  
                                    3.5 A max. with 0.35 mm<sup>2</sup> wire for contacts 2.54 mm pitch

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

B. TEMPERATURE RATING: -30°C TO +125 °C ( including the temperature increasing due to working current flow )

C: MAXIMUM OPERATING VOLTAGE: 24 V d.c.; for application at higher voltage please contact AMP

## 0.7. 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 applic. spec. 114-20056.

No sample shall be reused, unless otherwise specified.

### B. Test condition:

All the 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

0.8 TEST REQUIREMENTS AND PROCEDURES - A - CONNECTORS

Test Description	Requirements	Procedure
0.1 Confirmation of product	-Product shall confirm the requirements of applicable product drawing and Application specification	Visually, dimensionally and functionally inspection per applicable quality inspection plan
0.1 Visual examination	-Any visible damage, cracking or defect when the product is new and even after environmental, mechanical end electrical test.	Visual inspection
Test Description	Requirements	Procedure
1. MECHANICAL	REQUIREMENTS	
1.1A Single contact engaging force	-Contacts for 2.54 mm pitch: Ist insertion: ≤ 4.5 N -Contacts for 3.5 mm pitch: Ist insertion: ≤ 8 N	Operation speed: 50 mm /min. (with Tab as shown on FIG.4 or pin fig. 5 )
1.2A Single contact separating force	Contacts for 2.54 mm pitch: Ist extraction: ≤ 4.0 N Xth extraction: ≥ 1.0 N -Contacts for 3.5 mm pitch: Ist extraction: ≤ 7 N Xth extraction: ≥ 2.0 N	Operation speed: 50 mm /min. (with Tab as shown on FIG. 4 or pin fig. 5 )
1.3A Connector mating force	2.54 mm pitch:  36 ways: ≤75 N 18 ways: ≤40 N  3.5 mm pitch: 18 ways : ≤55 N 6 ways in line: ≤90 N 9 ways in line ≤120 N	With correspondent header counterpart, ( assembled) moving the lever with an operation speed of 50 mm/min. See fig. 3 F.C.  In working condition with header counterpart. Operation speed: 50 mm/min.
1.4A. Connector unmating force	<u>2.54 mm pitch:</u> 36 ways: ≤65 N 18 ways: ≤40 N <u>3.5 mm pitch:</u>  18 ways: ≤55 N 6 ways in line ≤70 N 9 ways in line ≤100 N	With correspondent header counterpart, all assembled moving the lever with an operation speed of 50 mm/min.. See fig. 3 -F.C.  In working condition with header counterpart. Operation speed: 50 mm/min. pressing on latching arm
1.5A Contact insertion force ( crimp contacts only )	<u>MQS contacts</u> 10 N max <u>.070 contacts</u> 15 N max	Insert contact into the cavity with operating speed 25 mm/min.. The housing has to be mounted on a self aligning platform.
1.6A Contact extraction force ( crimp contact only)	-with primary locking : <u>60 N min.(40 N min for .070 types)</u> <u>with secondary locking included</u> <u>-80 N min.</u> <u>with secondary locking only</u> <u>-70 N min.</u>	Pulling wires by with an operating speed of 50 mm/min. MAX

1.7A. Connector locking strength	100 N min. 9 ways in line 140 N min	Connector fully loaded assembled with the correspondent header counterpart ( wire bundle fixed to the shell. by a tail ) Operating speed: 50 mm/min. Apply an axial pull -off load to the cables bundle in two directions: 1- axial direction 2- perpendicular direction See fig. 3 -F
1.8A. Retention force housing/frame	-80 N min. for both pitch connectors	-On assembled housing, fully loaded, with the corresponded frame-slot. -Pulling by wire bundle in an axial direction ( wire bundle no fixed by tail )
1.9A Polarization effectiveness	For all connector types: 100N min. per 60 sec.	Assembled connectors must withstand without mating the counterpart with the incorret polarization
1.10A Vibration test (Random -passengers compartment )	-No electrical discontinuity greater than 1 micro sec.. shall occur  -Voltage drop within limits indicated for new contacts	as per diagram 1 enclosed Duration: 16 hrs on the direction of mating axis. Wires bundle fixet at 20 cm Test current: 1 mA On mated connector with the counterpart
1.11A Sine vibration test ( In alternative to vibrations at point 1.10A )-Voltage drop within limits indicated for new contacts	No electrical discontinuity greater than 1 micro sec.. shall occur  Voltage drop within limits indicated for new contacts	Vibrations as per following parameters: Freq. 10-500-10 Hz ( Variation one octave per minute ) Displacement 1 mm peak to peak up to 94 Hz, and costant acc. 200 m/sec <sup>2</sup> frequency $\geq 94$ Hz Duration:2 hours per axis On mated connector with the counterpart
<b>2. ELECTRICAL</b>	<b>REQUIREMENTS</b>	
2.1A Voltage drop ( IDC connectors )	- $\leq 6,0$ mVA wire size: 0.35 mmq - $\leq 4,5$ mVA wire size: 0.5 mmq - $\leq 3.5$ mVA wire size: 0.75 mmq - 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.( see FIG. 1 ) (Termination resistance is obtained after subtraction of wire used for termination ). For the wire current rating see §0.7-A See fig. 1& 2
2.2A Dielectric strength	Neither creeping discharge or flashover shall occur	$\geq 1000$ Vac for 1 minute. Test between adjacent circuits of mated connectors
2.3A Insulation resistance	10 M $\Omega$ min.	Applied voltage: 500 V dc between one contact and others short circuited.

<p>2.4A High temperature resistance with current load</p>	<p>-Temperature increasing :<math>\leq 50^{\circ}\text{C}</math> ( Thermocouple placed on transition between contact body and wire ) -Voltage drop within limits indicated for new contacts -No damaging</p>	<p>On 6 adjacent ways contemporary -not airy ambient with a test temp. of <math>80 \pm 2^{\circ}\text{C}</math>. -Test current on each way: see par. 0.6 -Duration: 5 hours</p>
<p>2.5A Current overload</p>	<p>Temperature rise increase: <math>\leq 60^{\circ}\text{C}</math> ( thermocouple placed on transition between contact body and wire barrel ) -Voltage drop within limits indicated for new contacts -No damaging</p>	<p>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</p>
<p><b>3.0 ENVIRONMENTAL</b></p>	<p><b>REQUIREMENTS</b></p>	
<p>3.1 Thermal cumulative ageing</p>	<p>-No deformation or cracking of the plastic parts -Voltage drop: <math>\leq 10 \text{ mVA}</math> for 2.54 mm pitch connector <math>\leq 6 \text{ mVA}</math> for 3.5 mm pitch connector -Insulation resistance within indicated limits</p>	<p>On mated connectors: 5 cycles composed of: -4 hrs at <math>125^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> -4 hrs <math>-30^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> 5 cycles composed of: -4 hrs at <math>125^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> -4 hrs at <math>+40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> and 90-95% r.h. -4 hrs <math>-30^{\circ}\text{C} \pm 2^{\circ}\text{C}</math>  200 hrs at <math>125^{\circ}\text{C}</math></p>
<p>3.2 Salt spray corrosion test</p>	<p>-Voltage drop: <math>\leq 10 \text{ mVA}</math> for 2.54 mm pitch connector <math>\leq 6 \text{ mVA}</math> for 3.5 mm pitch connector -Insulation resistance within indicated limits</p>	<p>-150 hours of salt mist at <math>35^{\circ}\text{C} \pm 2^{\circ}\text{C}</math>, 5% of NaCl , pH 6.5-7.2 class 2  ( mated connector )</p>
<p>3.3 Kesternich corrosion</p>	<p>-Voltage drop: <math>\leq 10 \text{ mVA}</math> for 2.54 mm pitch connector <math>\leq 6 \text{ mVA}</math> for 3.5 mm pitch connector -Insulation resistance within indicated limits</p>	<p>4 cycles composed of: -8 hrs of exposure to an atmosphere with 0.66% of <math>\text{SO}_2</math> at <math>+40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> ( method acc. to DIN 50118 )  -16 hours in free air  ( mated connector )</p>

The following part, covers the mechanical performances of the IDC connectors after wires termination.

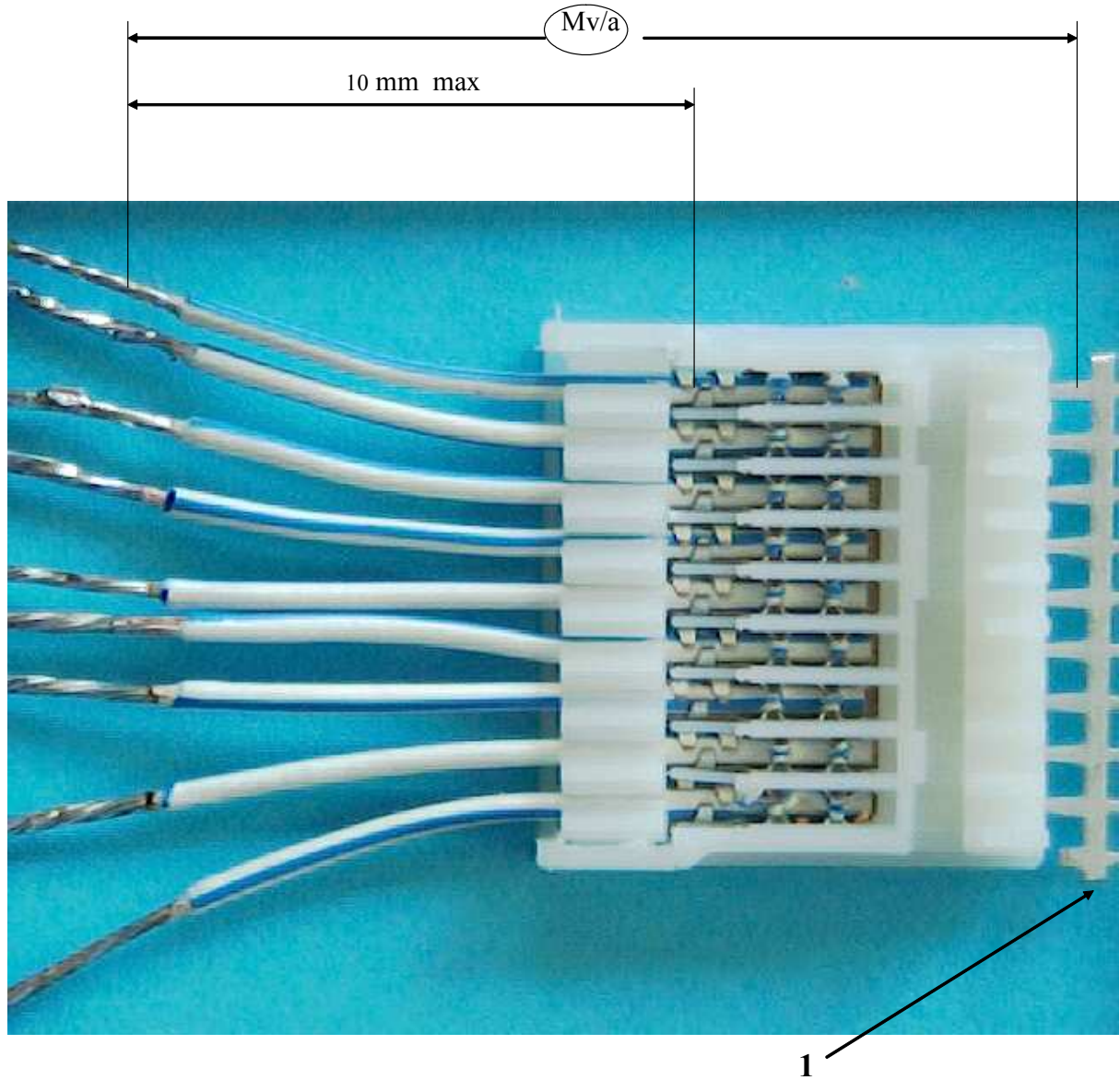
Test Description	Requirements	Procedure
<b>1. MECHANICAL</b>	<b>REQUIREMENTS</b>	
1.1B Wire retention in housing (IDC version)	0.35 mm <sup>2</sup> -Axial retention wire axis: 30 N min. -Retention in the perpendicular plane: 18N min.  0.75 mm <sup>2</sup> -Axial retention wire axis: 60 N min. -Retention in the perpendicular plane: 18N min.	Operation speed: 50 mm / min.

## PRODUCT QUALIFICATION TEST SEQUENCE

### TEST GROUP

ITEM	DESCRIPTION	A	B	C	D	E	F	G	H	K	M	
0.8	Visual examination	1.3	1.6	1.5.8	1,5,8	1.5	1.5	1.8	1.5	1.5	1.5	1.5
1.1 A	Single contact insert force											
1.2A	Single contact sep. force											
1.3A	Connector mating force		2	2	2							
1.4A	Connector unmating force			4	4							
1.5A	Connector locking strength			3	3							
1.6A	Retention housing/frame						7					
1.7A	Durability ( 10 cycles )		4								3	
1.8A	Random vibration test			6								
1.9 A	Vibration test				6							
2.1A	Voltage drop		3.5	7	7	2.4	2.4	2.6	2.4	2.4	2.4	2.4
2.2A	Dielectric strength							5				
2.3A	Insulation resistance							4				
2.4A	High temp. resist.(in oven)					3						
2.5A	Current over-load						3					
3.1A	Thermal cycling							3				
3.2A	Salt spray								3			
3.3A	Kesternick corrosion									3		
3.4A	Accelerating aging test										3	
1.1B	Wire retention	2										

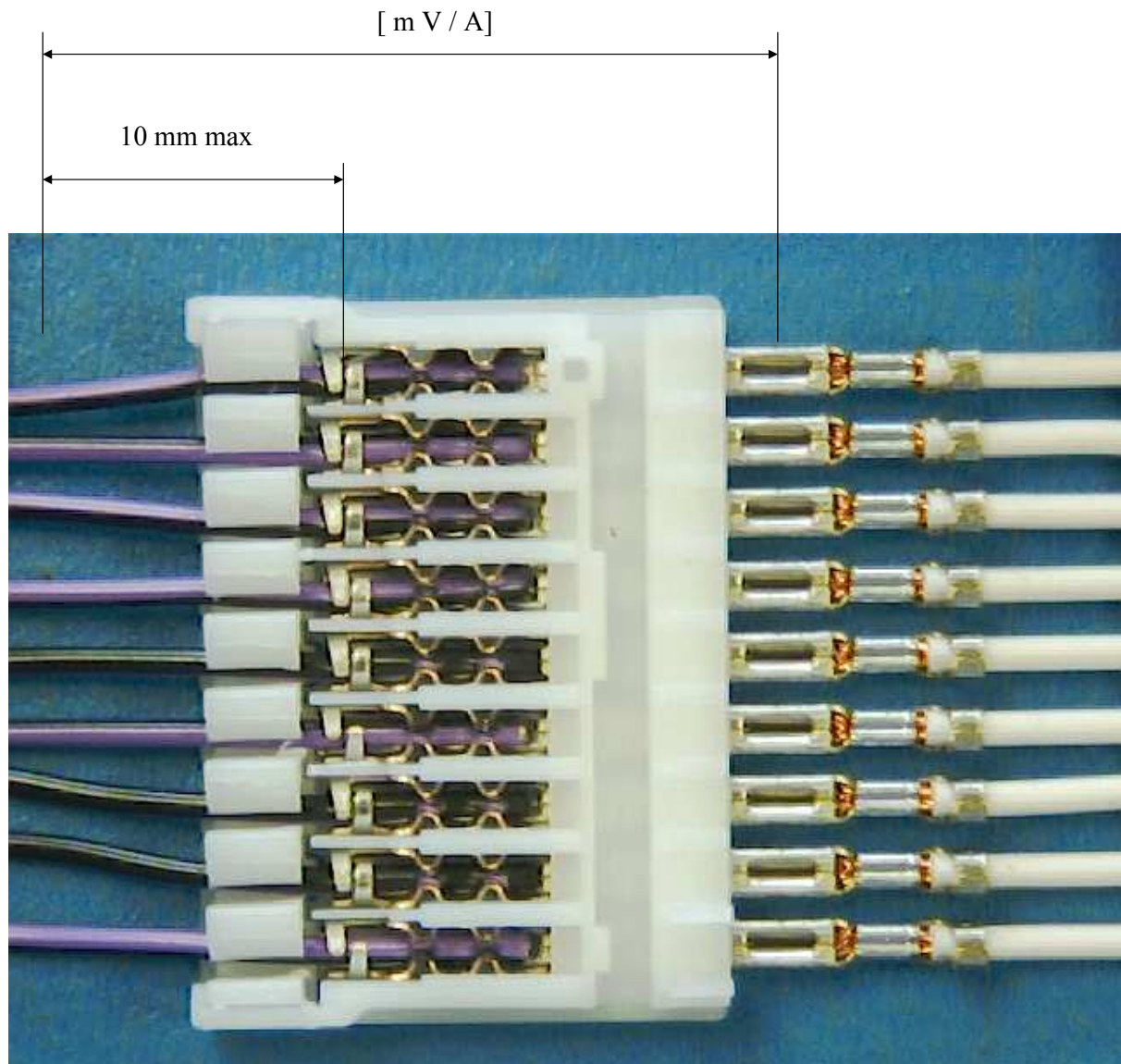
FIGURE 1  
IDC connector 9 pos. 2.54 mm pitch



1) pin contact 0.63 x 0.63 mm



FIGURE 2  
IDC connector 9 pos. 3.5 mm pitch



1) TAB contact 0.64 x 1.7 Amp Multilock Series, crimped on wire 1.0 mm<sup>2</sup> min.

FIGURE 3

Pull lever as shown

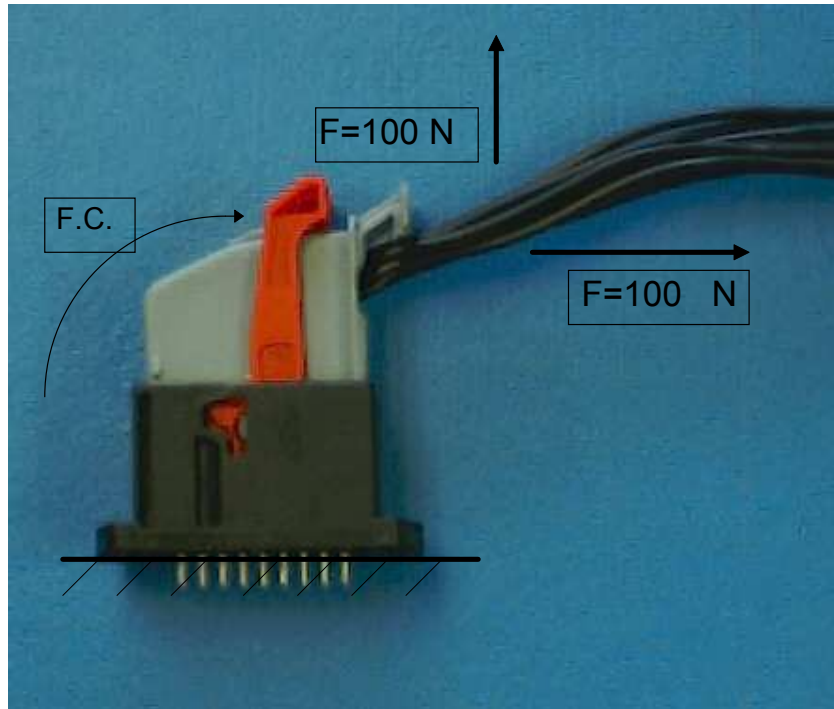
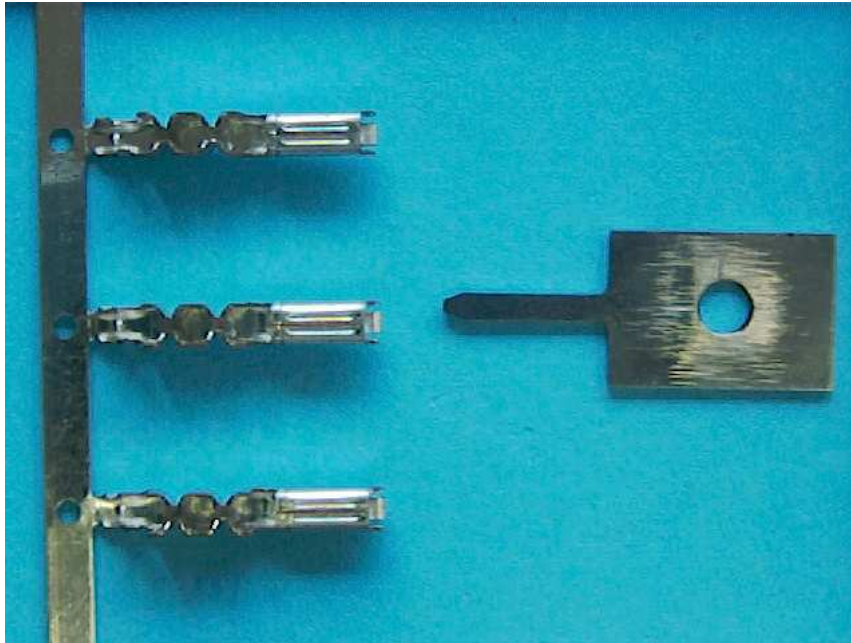


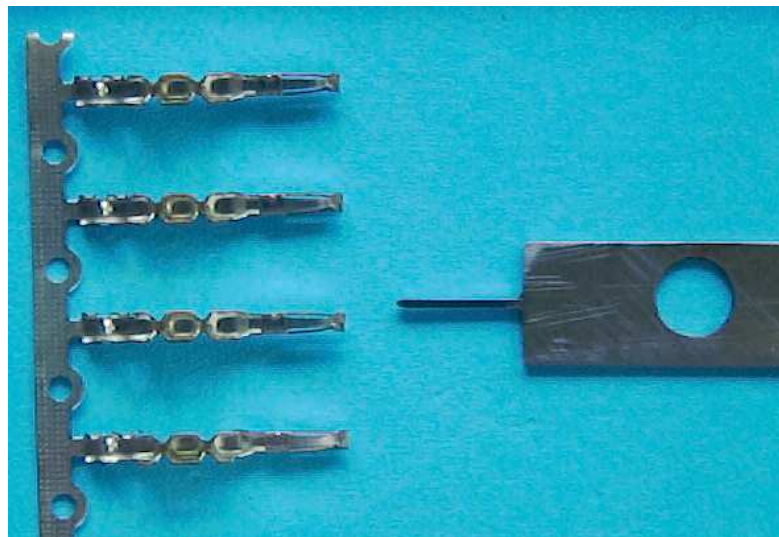
Figure shows 9+9 pos. MQS 2.54 mm pitch

**FIGURE 4**  
IDC CONTACTS FOR 3.5 mm PITCH SYSTEM



Gage made in Stainless steel.  
Dimensions:  $0.64 \pm 0.02$  mm x  $1.7 \pm 0.03$  mm x 10 .  
Chamfers :  $10^\circ$  x 0.6 mm on the thk and  $20^\circ$  x 0.6 mm on the wdth

**FIGURE 5**  
IDC CONTACT FOR 2.54 mm PITCH



Gage made in Stainless steel.  
Dimensions: ( 0.63 x 0.63 ) mm - 0.03 mm  
Chamfers: 0.6 x  $40^\circ$  on 4 sides

FIGURE 6  
Random vibration test for car body

