

### DESIGN OBJECTIVES

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## 15 AND 35 POS. SPLASH PROOF FEMALE CONNECTORS WITH SEC. LOCKING DEVICE (FOR JUNIOR POWER TIMER CONTACT)

### 1. SCOPE

This specification covers features and performances of Splash Proof female connectors with the following AMP P/N:

- C-282199 : 15 pos. Connector ( kit composition )
- C-282195 : 35 pos. Connector ( kit composition: standard exit cable version )
- C-282197 : 35 pos. Connector ( kit composition: opposite exit cable version )

with the relevant receptacle contacts - single wire seals - cavity plug with AMP P/N :

- C-929939-3 : contact "AMP Junior Power Timer" wire range 0,5-1 mm<sup>2</sup>
- C-929937-3 : contact "AMP Junior Power Timer" with wire range 1,5-2,5 mm<sup>2</sup>
- C-929937-1 : contact "AMP Junior Power Timer" wire range 1,5-2,5 mm<sup>2</sup>
- C-828904-1 : wire seal for single wire (and contact C-929939-3)
- C-828905-1 : wire seal for single wire (and contact C-929937-3, -1)
- C-282536-1 : wire seal for single wire 2.5 mm<sup>2</sup> only (and contact C-929937-3, -1)
- C-828906-2 : cavity plug to close connector cavity (or, in alternative, P/N C-282081-1)
- C-91-51054 : breather pipe ( retaining clip P/N 282279-1 plus wire seal plus plastic tube 1 m long )

These connectors are suitable for header counterparts, not manufactured by AMP, as shown on above mentioned customer drawing C-282199, C-282195, C-282197.

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		DR R. MARTINI <i>R.M.</i> 26 Sep 94		<b>AMP</b>		AMP ITALIA S.p.A. Corso F.lli Cervi, 15 Collegno (TORINO)	
		CHK C. TARTARI 14 Oct 94					
		APP.		LOC. I	NUMBER 108 - 20094	REV. A	
A	REVISED PER EC: ET00-0406-97	<i>RM</i> R.M.	C.T.	02-10 1997	SHEET  1 OF 7  NAME 15 AND 35 POS. SPLASH PROOF FEMALE CONNECTOR FOR JUNIOR POWER TIMER, PRODUCT SPECIFICATION		
1	REVISED PER EC: ET00-0150-97	R.M.	C.T.	20-03 1997			
0	FIRST ISSUE (ENGLISH VERSION)	-	-	-			
REV LTR	REVISION RECORD	DR	CHK	DATE			

TEC 034 Apr 93

## 2. CONNECTOR FEATURES :

2.1 Materials : - rec. contacts : Phosphor Bronze, Cu-Fe2 alloy for contact 929937-1, tin plated  
(with external reinforcement spring in stainless steel).

- housings : PA 6.6 glassfiber filled.

- frontal sealings : silicone rubber.

- single wire seals and cavity plugs: silicone rubber.

2.2 Wire Range : - stranded cable acc. to FIAT normation table n° 91107/03

0.5 mm<sup>2</sup> reduced insul. cable " phase 3 " dia. 1.5 - 1.7 mm

1.0 " " " " " 1.9 - 2.1 mm

1.5 " " " " " 2.2 - 2.4 mm

2.5 " " " " " 2.7 - 3.0 mm

2.3 Current Rating : 20 A (with 2.5 mm<sup>2</sup> wire and receptacle contact P/N 929937-1)

2.4 Working Temperature : -30 to +125°C (with included the temperature increasing due to working current flow).

2.5 Degree of Protection : IP x 4 according to IEC 529 ( when mated with the relevant interconnection box, E.C.U. made by Magneti Marelli )

2.6 Maximum operating voltage: 24 V dc. For application at higher voltage please contact AMP.

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### 3. FEATURES AND TEST CONDITIONS

FEATURES	TEST CONDITIONS	LIMITS	
3.1 Connector Mating Force ( with contacts inserted )	In working condition with header counterpart. Mating - Unmating speed 25 - 50 mm/minute Direction as shown in Fig. 3 ( tab contact as shown in Fig. 1)	Ist insertion: ≤ 260 N ( 35 pos ) ≤ 200 N ( 15 pos )	
3.2 Connector Unmating Force ( with contacts inserted )	like point 3.1 ( but pressing on the retaining spring)	Ist extraction ≤ 260 N (35 p) ≤ 200 N (15 p)	Xth extraction ≥ 80 N ( 35 p ) ≥ 65 N ( 15 p )
3.2.1 Connector Unmating Force ( with contacts inserted )	like point 3.1 ( but without pressing on the retaining spring )	≥ 200 N	
3.3 Single Contact Insertion Force	Single contact (tab as shown in Fig. 1)	≤ 18 N Ist insertion	
3.4 Single Contact Extraction Force	Single contact (tab as shown in Fig. 1)	Ist extr. ≤ 18 N	Xth extr. ≥ 4 N
3.5 Retention Force of the single contact from the housing	At temperature + 23 ± 5°C and at tensile speed of 25 - 50 mm/minute ( FIAT norm. 7.Z0690, as ref. )	Only with primary locking device ≥ 70 N Only with sec. locking device ≥ 30 N	
3.6 Crimping Tensile Strength	Tensile speed 25 - 50 mm/minute ( FIAT norm. 7.Z0700, as ref. )	0.5 mm <sup>2</sup> ≥ 70 N 1.0 mm <sup>2</sup> ≥ 115 N 1.5 mm <sup>2</sup> ≥ 155 N 2.5 mm <sup>2</sup> ≥ 235 N	
3.7 Voltage Drop	Between a point on the wire at 1 cm from the conn. edge and a point on the tab very closed to the conn.edge (FIAT n°7.Z0350 as ref.) see Fig. 2 as ref.	≤ 3 mV/A on new contacts and after 10 insertions/extractions	

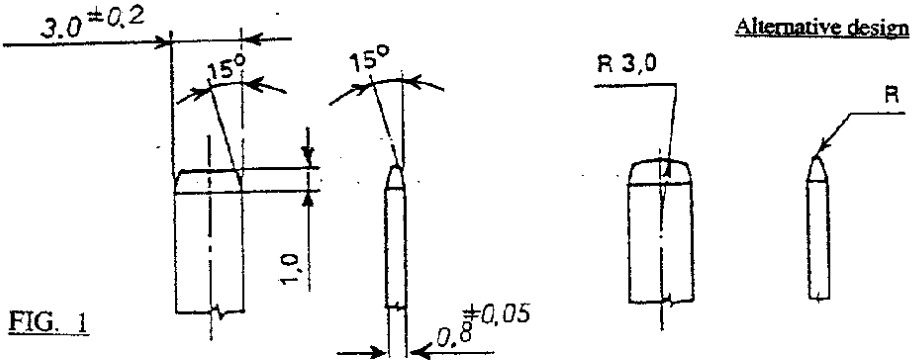
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FEATURES	TEST CONDITIONS	LIMITS
3.8 Insulation Resistance	Between two adjacent contacts apply 500 Vdc for 1 minute. ( FIAT norm. 7.Z0250, as ref. )	$\geq 10 \text{ M}\Omega$
3.9 Dielectric Breakdown Resistance	Between two adjacent contacts apply voltage for 1 minute ( FIAT norm. 7.Z0200, as ref. )	$\geq 1000 \text{ Vac}$
3.10 High Temperature Resistance with current load. ( note 1: 6 adjacent circuits with 20 A current, remaining circuits with 3 A current )	On all ways contemporarily ( see note 1 ): -Not airy ambient-with a test temp. of $80 \pm 2^\circ\text{C}$ : -Test current on each way : ( see note 1 ) -Wire section: 2,5 mm <sup>2</sup> -20 A and 0,5 mm <sup>2</sup> -3 A -Duration: 5 hours	Temperature increasing detected: $\leq 50^\circ\text{C}$ (thermocouple placed on transition between contact body and wire barrel)  Voltage drop within limits indicated for new contacts.  No damaging.
3.11 Current Overload	On one way only w/o housing : - Test current : 21 A ( with a 1.5 mm <sup>2</sup> wire ) or 30 A (with a 2.5 mm <sup>2</sup> wire ). - Duration: 500 cycles composed of : 45' current "ON" 15' current "OFF".	Temperature increasing $\leq 60^\circ\text{C}$ on transition between contact body and wire barrel  Voltage drop $\leq 4.5 \text{ mV/A}$  No damaging
3.12 Thermal Cycling Resistance	5 cycles composed of : 2 hrs. at $+125^\circ\text{C} \pm 2^\circ\text{C}$ 2 hrs. at $+ 40^\circ\text{C} \pm 2^\circ\text{C}$ and 90-95% R.H. 2 hrs. at $-30^\circ\text{C} \pm 2^\circ\text{C}$  ( connector mated with header counterpart).	No deformation or cracking of housing  Voltage drop $\leq 4.5 \text{ mV/A}$  Insulation resistance, dielectric breakdown resistance, and mechanical features, at points 3.2 and 3.5, within limits indicated for new contacts.

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3.13 Mechanical Duration ( 10 cycles )	In working condition with header counterpart. Mating - Unmating speed 25 - 50 mm/minute. ( pressing on the retaining spring )	No damaging. Mechanical feature at point 3.5 within limits indicate for new contacts Voltage drop within limits indicated for new contacts.
3.14 Accelerated Ageing Test	200 hours at +90°C ± 2°C (Connector mated with header counterpart).	No deformation or cracking of hsg. and plastic mat'l discoloration are admitted. Voltage drop ≤ 4.5 mV/A Dielectric breakdown resistance and mechanical feature, as indicated at point 3.5
3.15 Salt Spray Corrosion Test	150 hrs of salt mist at 35°C ± 2°C, 5% of NaCl, pH 6.5-7.2 class 2 Mated connector (FIAT norm.7.Z8460 as ref. )	Voltage drop ≤ 4.5 mV/A Insulation resistance within indicated limits
3.16 Vibration Test	2 hours for each axis : Freq: 10-500-10 Hz in 5 minutes Displacement : 1.5 mmpp Acceleration : 25 g (FIAT norm.7.Z8510, as ref.)	Voltage drop ≤ 3 mV/A No circuit break greater than 1µs
3.17 Water Resistance (to be carried out after tests 3.12 + 3.14)	Acc. to IEC norm. 529 para. 7.4 and para. 8.4 Test equipment according to Fig.4 Duration 2 hours Connector axially mated with header counterpart; wire bundle length 25-30cm, with wire ends protected by silicone paste and breather pipe end out of test equipment room	Insulation resistance within indicated limits. Dielectric breakdown resistance within indicated limits. Voltage drop ≤ 4.5 mV/A No water infiltration inside the connector.
<p>General Note: - Each test must be carried out, if not otherwise specified, at an ambient temperature of 23°C ± 5°C, relative humidity of 45-75% and atmospheric pressure of 860-1060 mbar.</p> <p>- See also page 7 for test groups and sequencies</p>		

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Stitched Tab ( Brass, Bright Tin-plated )

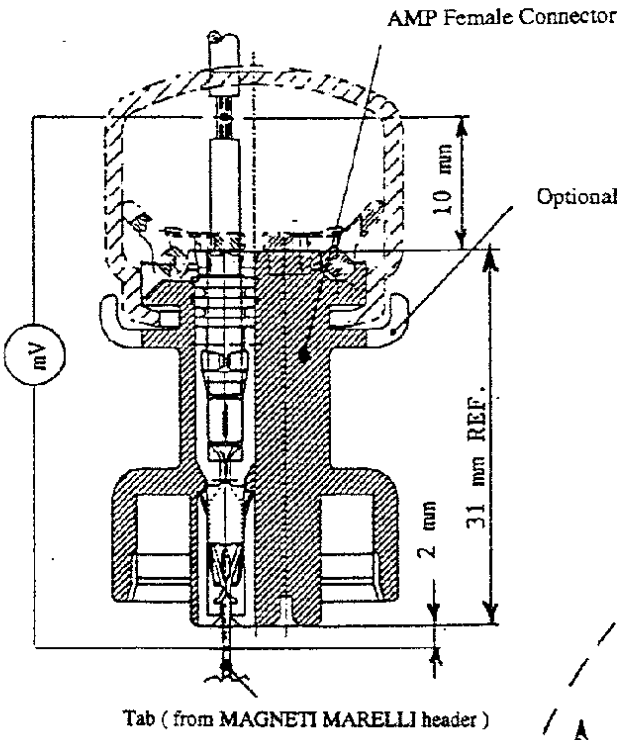


FIG. 2

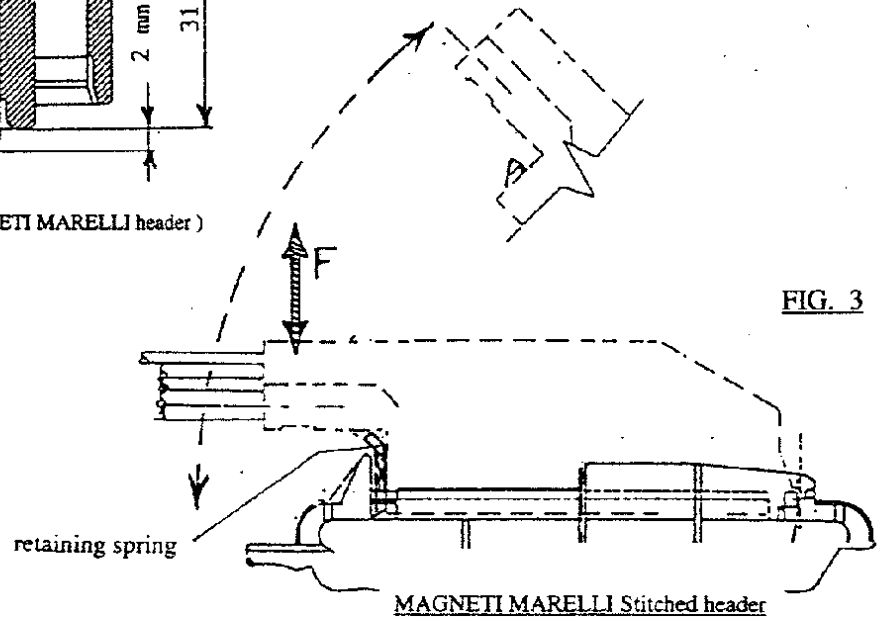


FIG. 3

<b>AMP</b>	AMP ITALIA S.p.A. Corso F.lli Cervi, 15 Collegno (TORINO)	SHEET	LOC.	NUMBER	REV.
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TEST TO BE CARRIED OUT	TEST GROUP AND SEQUENY										
	A	B	C	D	E	F	G	H	I	L	
Visual examination	1,7	1,8	1,3	1,4	1,4	1,9	1,8	1,6	1,5	1,9	
Single contact mating force	2										
Single contact unmating force	4										
Connector mating force with contacts inserted		2									
Connector unmating force with contacts inserted		4				5	5				
Mechanical duration ( 10 cycles )	5	5									
Voltage drop	3,6	3,6		3	3	2,4	2,4	2,4	2,4	2,6	
Retention force of the single contact in the housing		7				8	7				
Crimping tensile strength			2								
Insulation resistance						6		5		7	
Dielectric breakdown resistance						7	6			8	
High temperat. resistance with current load				2							
Current overload					2						
Thermal cycling						3				3	
Accelerated ageing test							3			4	
Salt spray test								3			
Vibration test									3		
Water resistance										5	

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