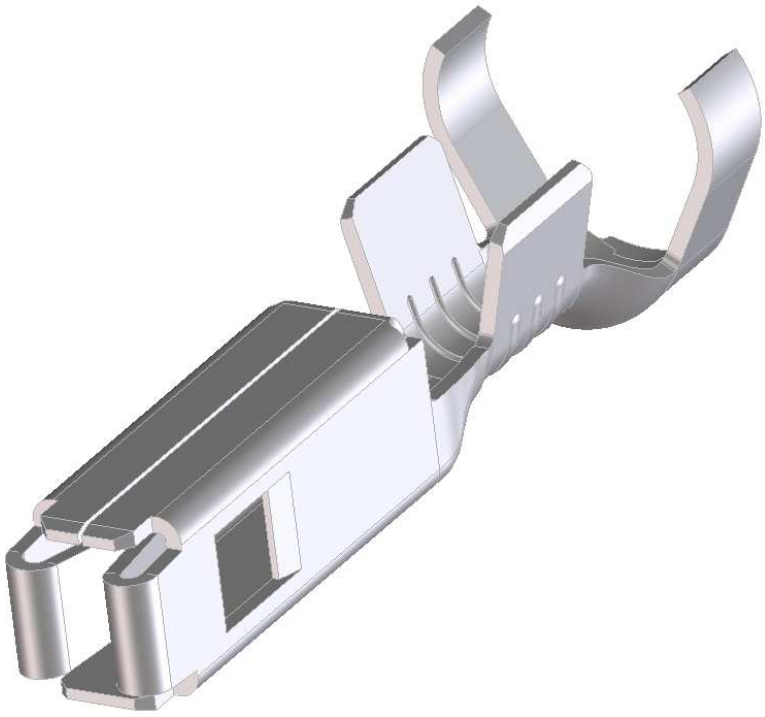
APPLICATION SPECIFICATION

UCC2 2.8 RECEPTACLE TERMINAL

98898 SERIES



REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A	EC No: G2012-0201 DATE: 2012 / 04 / 25	CRIMP SPECIFICATION UCC2 2.8 RECEPTACLE TERMINAL 98898 SERIES #	1 of 14

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Revision	MODIFICATION	SHEET	Date
A	First release	All	2012-04-25

APPLICATION SPECIFICATION

SUMMARY

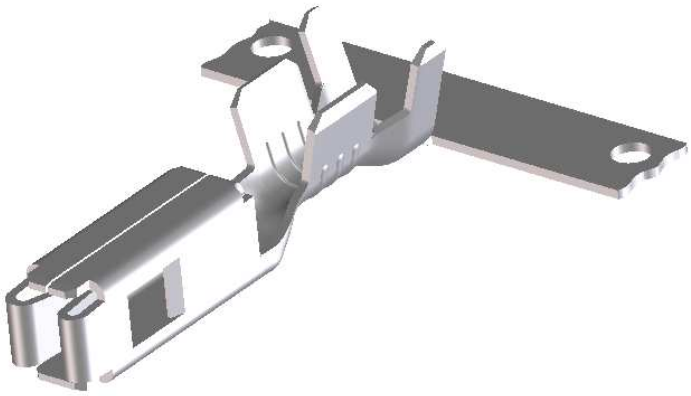
1.0 SCOPE

This specification details the crimping information and common practices for general crimps for the Molex UCC2.8 receptacle terminal per sales drawing SD-98898-100. Please refer to the sales drawing for additional part information.
The information in this document is for reference and benchmark purposes only.
The user is responsible for validating crimp performance based on tooling, equipment and wire that is being used.

All measurements are noted in Millimeter and Newton unless otherwise specified.

2.0 PRODUCT DESCRIPTION

Material number	Plating	Crimping range (mm²)
0988981029	Pre tinned	0.35 to 0.75
0988981039	Pre tinned	1.0 to 2.50
0988981049	Pre tinned	3.0 to 5.0



3.0 DEFINITION OF TERMS

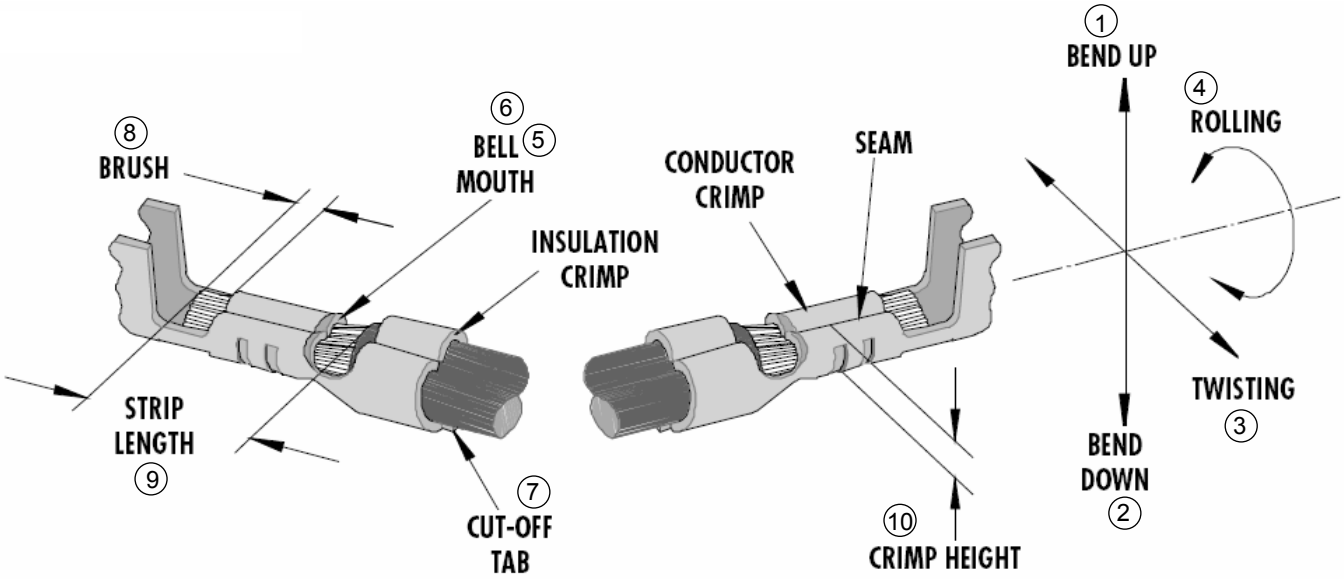
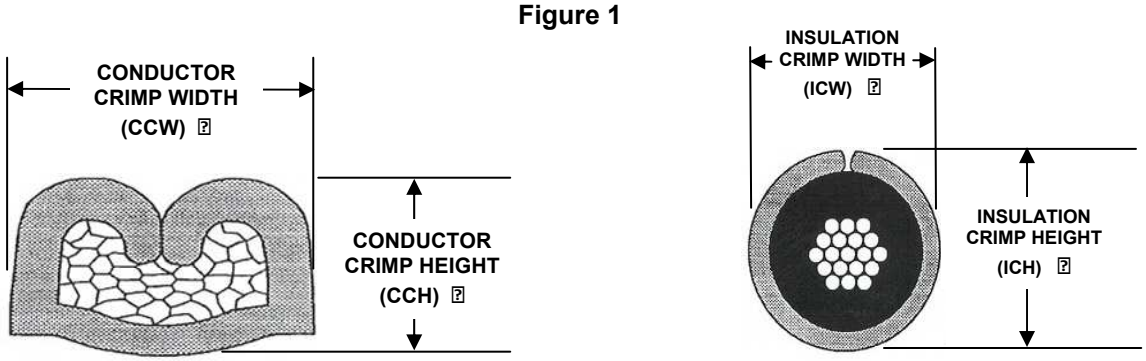


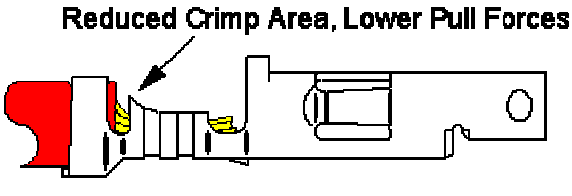
Figure 1



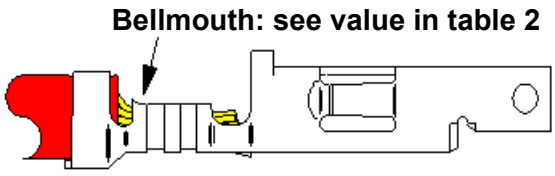
The above terminal drawing is a generic terminal representation. It is not an image of any terminal listed in the scope.

BELLMOUTH (FLARE)

The flare that is formed on the edge of the conductor crimp acts as a funnel for the wire strands. This funnel reduces the possibility that a sharp edge on the conductor crimp will cut or nick the wire strands.



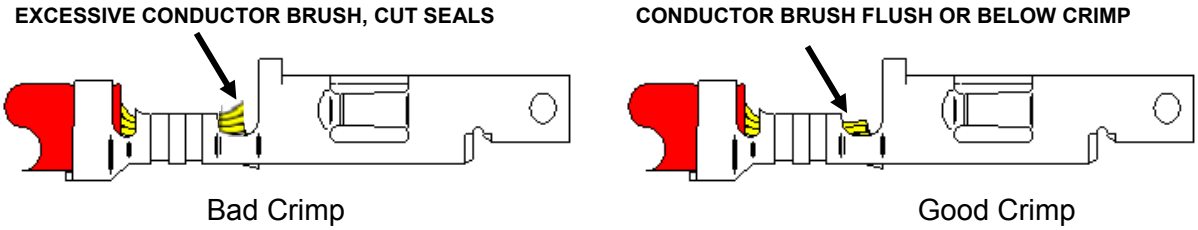
Bad Crimp



Good Crimp

CONDUCTOR BRUSH

The conductor brush is made up of the wire strands that extend past the conductor crimp on the contact side of the terminal. This helps ensure that mechanical compression occurs over the full length of the conductor crimp. The conductor brush should not extend into the contact area or above the conductor crimp height. CAUTION: Excessive conductor brush extended above the transition/crimp can cause connector water leak by compromising the glands of the matte seal.



Bad Crimp

Good Crimp

CONDUCTOR CRIMP

This is the metallurgical compression of a terminal around the wire's conductor. This connection creates a common electrical path with low resistance and high current carrying capabilities.

CONDUCTOR CRIMP HEIGHT

The conductor crimp height is measured from the top surface of the formed crimp to the bottom most radial surface. Do not include the extrusion points in this measurement. Measuring crimp height is a quick, non-destructive way to help ensure the correct metallurgical compression of a terminal around the wire's conductor and is an excellent attribute for process control. The crimp height specification is typically set as a balance between electrical and mechanical performance over the complete range of wire stranding and coatings, and terminal materials and plating. Although it is possible to optimize a crimp height to individual wire stranding and terminal plating, one crimp height specification is normally created.

CUT-OFF TAB LENGTH

This is the material that protrudes outside the insulation crimp after the terminal is separated from the carrier strip. A cut-off tab that is too long may expose a terminal outside the housing, it may fail electrical spacing requirements or could lead to excessive seal tears in matte sealed connectors. In most situations, a tool is setup to provide a cut-off tab that shall not exceed value indicated in **table 2**, no burrs. CAUTION: Excessive length or burrs can cause connector water leak by compromising the glands of the matte seal.

EXTRUSIONS (ANVIL FLASH)

These are the small flares that form on the bottom of the conductor crimp resulting from the clearance between the punch and anvil tooling. If the anvil is worn or the terminal is over-crimped, excessive extrusion can result. An uneven extrusion may also result if the punch and anvil alignment is not correct, if the feed adjustment is off, or if there is insufficient/excessive terminal drag. CAUTION: Excessive length or burrs can cause connector water leak by compromising the glands of the matte seal.

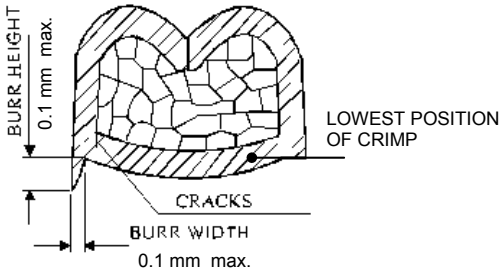


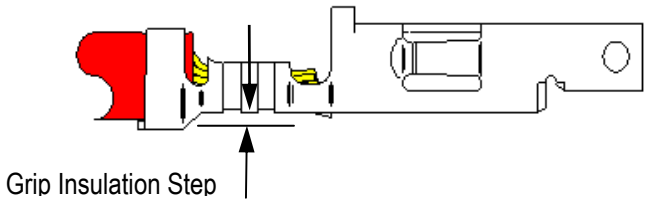
Figure 2

INSULATION CRIMP HEIGHT
Insulation crimp heights are specified in **table 1**. UCC2 2.8 receptacle terminals are designed to accommodate multiple wire ranges and within the terminal range, an insulation grip may not completely surround the wire or fully surround the diameter of the wire, this condition will still provide an acceptable insulation crimp. To evaluate the insulation section cut the wire flush with the back of the terminal. Once the optimum setting for the application is determined it is important to document the insulation crimp height. Then, as part of the setup procedure the operator can check the crimp height.

INSULATION POSITION
This is the location of the insulation in relation to the transition area between the conductor and insulation crimps. Equal amounts of the conductor strands and insulation needs to be visible in the transition area. The insulation position ensures that the insulation is crimped along the full length of the insulation crimp, and that no insulation gets crimped under the conductor crimp. The insulation position is set by the wire stop and strip length for bench applications. For automatic wire processing applications the insulation position is set by the in/out press adjustment.

STRIP LENGTH ?
The strip length is determined by measuring the exposed conductor strands after the insulation is removed. The strip length determines the conductor brush length when the insulation position is centered between conductor and insulation crimps. CAUTION: Care must be taken not to leave indentations on the wire surface during the strip and cut operation as this can affect the integrity of grommet to wire seal performance and can cause wire leaks.

GRIP INSULATION STEP ?
The designed offset between the conductor grip and the insulation grip. Not to be altered by crimp process.



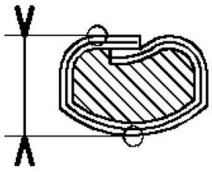
4.0 PRODUCT SPECIFICATIONS

Terminal crimps were validated per the following standards and specifications:
- International wire standard ISO 6722.
- PSA wire specification B251110

Table 1

TERMINAL	WIRE (IR)			CONDUCTOR BARREL		INSULATION BARREL		CRIMPING TYPE	INSULATION GRIP STEP	WIRE / TERMINAL
Material number	Nominal cross section (mm²)	Effective cross section (mm²)	Insulation diameter	CCH	CCW (0/+0.05)	ICH (± 0.10)	ICW (0/+0.05)	See picture on the next page	(± 0.10)	Minimum axial pull-out force (N)
0988981029	0.35	0.314 min 0.341 max	1.25 min 1.40 max	1.05±0.04	(2.1)	2.25	(2.5)	Single wire	0.15	60
	0.50	0.461 min 0.501 max	1.40 min 1.70 max	1.10±0.04		2.45		Single wire		70
	0.75	0.692 min 0.752 max	1.70 min 1.90 max	1.15±0.04		2.65		Single wire		90
	0.35 + 0.35	0.628 min 0.682 max	2.50 min 2.80 max	1.10±0.04		2.50		Double wire		60
0988981039	1.00	0.924 min 1.004 max	1.99 min 2.15 max	1.45±0.05	(2.85)	2.90	(3.85)	Single wire	0.75	115
	1.50	1.346 min 1.459 max	2.10 min 2.40 max	1.50 ±0.05		3.10		Single wire		155
	2.00	1.812 min 1.971 max	2.50 min 2.80 max	1.65 ±0.05		3.20		Single wire		195
	2.50	2.249 min 2.442 max	2.65 min 3.00 max	1.70 ±0.05		3.35		Single wire		235
	0.35 + 1.00	1.238 min 1.345 max	3.24 min 3.55 max	1.50±0.05		3.15		Double wire		60
	0.35 + 2.00	2.126 min 2.312 max	3.75 min 4.20 max	1.70 ±0.05		3.50		Double wire		60
	1.00 + 1.00	1.848 min 2.008 max	3.98 min 4.30 max	1.65±0.05		3.45		Double wire		115
0988981049	3.00	2.776 min 3.016 max	3.25 min 3.45 max	1.95±0.05	(3.2)	4.00	(4.1)	Single wire	0.3	260
	4.00	3.624 min 3.942 max	3.70 min 3.90 max	2.10±0.05		4.15		Single wire		320
	5.00	4.332 min 4.715 max	3.80 min 4.00 max	2.40±0.05		4.30		Single wire		300
	1.00 + 2.00	2.736 min 2.975 max	4.49 min 4.95 max	1.70±0.05		4.10		Double wire		115
	2.00 + 2.00	3.624 min 3.942 max	5.00 min 5.60 max	2.00±0.05		4.30		Double wire		195

Crimping type : Single Wire



Crimping type : Double Wire

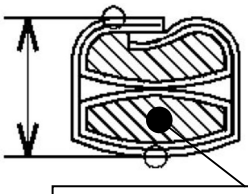


Table 2

TERM.	Material number →		0988981029	0988981039	0988981049
WIRE	Nominal cross section (mm²) →		0.35 to 0.75	1.0 to 2.50	3.0 to 5.0
BALLON #	1	Bend Up	2° MAX		
	2	Bend Down	2° MAX		
	3	Twisting	2° MAX		
	4	Rolling	6° MAX		
	5	Rear Bell Mouth	Visible		
	6	Front Bell Mouth	Visible		
	7	Cut-off tab length	0.2 MAX		
	8	Conductor length / Wire brush	0.2 to 1.0 mm Not to exceed above conductor crimp height		
	9	Wire strip length	4.50		
	10	Conductor Crimp Height	See Table 1		
	11	Conductor Crimp Width	See Table 1		
	12	Insulation Crimp Height	See Table 1		
	13	Insulation Crimp Width	See Table 1		

Customers are required to complete validation testing if tooling and/or wire specifications are different than above.

REDUCTION RATIO

The reduction ratio is obtained by formula:

$$\text{REDUCTION RATIO} = \left(1 - \left(\frac{\text{CONDUCTOR CROSS SECTION AREA AFTER CRIMPING}}{\text{REAL CONDUCTOR CROSS SECTION AREA BEFORE CRIMPING}}\right)\right) \times 100$$

Requirement: 15 % MINI and 25 % MAXI

5.0 REFERENCE DOCUMENTS

Reference documentation for general practices is located on the website per the below links:

i. Molex Quality Crimping Handbook
http://www.molex.com/images/products/apptool/qual_crimp.pdf

ii. Molex-Recognizing Good Crimps
http://www.molex.com, search for Application Tooling

6.0 PROCEDURE

6.1 GENERAL MEASUREMENT AND EVALUATION REQUIREMENTS

Crimp Height Measurement (Extrusion Evaluation)

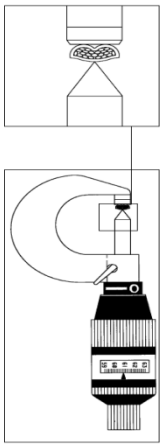


Figure 3

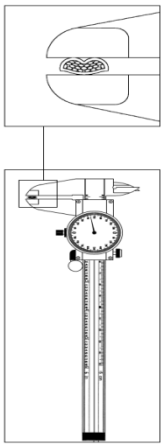


Figure 4

1. Complete tool set-up procedure.
2. Crimp a minimum of 5 samples.
3. Place the flat blade of the crimp micrometer (Figure 3) across the center of the dual radii of the conductor crimp. Do not take the measurement near the conductor bell mouth.
4. Rotate the micrometer dial until the point contacts the bottom most radial surface. If using a caliper, be certain not to measure the extrusion points (anvil flash) of the crimp.
5. To check for extrusion (anvil flash) use the caliper (Figure 4) to measure the crimp height. If the caliper measurement is greater than the crimp micrometer measurement the extrusion is not acceptable. CAUTION: Excessive extrusion can cause connector water leak.

6.2 CRIMP TOOLING GEOMETRY

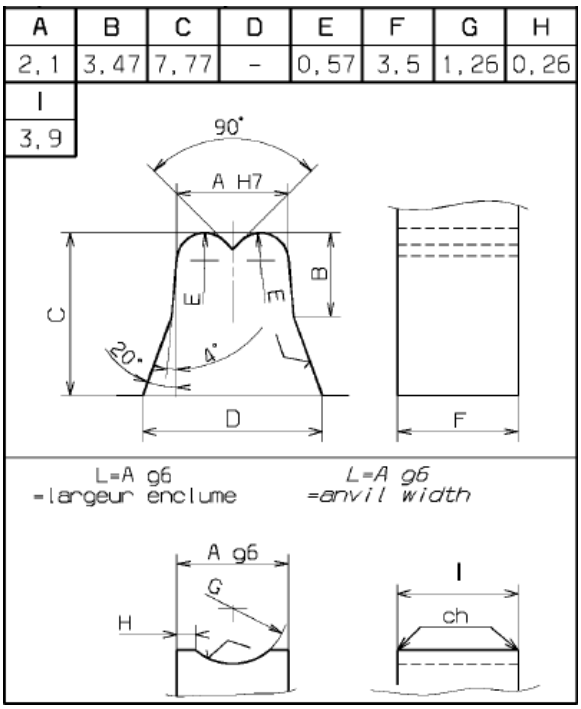
The crimp tooling information shown below is based on the tooling that Molex used to perform (Crimp performance) and to establish recommended crimp height and widths. The user is responsible for validating crimp performance based on tooling, equipment and wire that is being used.

TERMINAL MATERIAL NUMBER →	**0988981029**
WIRE NOMINAL CROSS SECTION (mm²) →	**0.35 to 0.75**

CONDUCTOR PUNCH

A	B	C	D	E	F	G	H
2,1	3,47	7,77	–	0,57	3,5	1,26	0,26

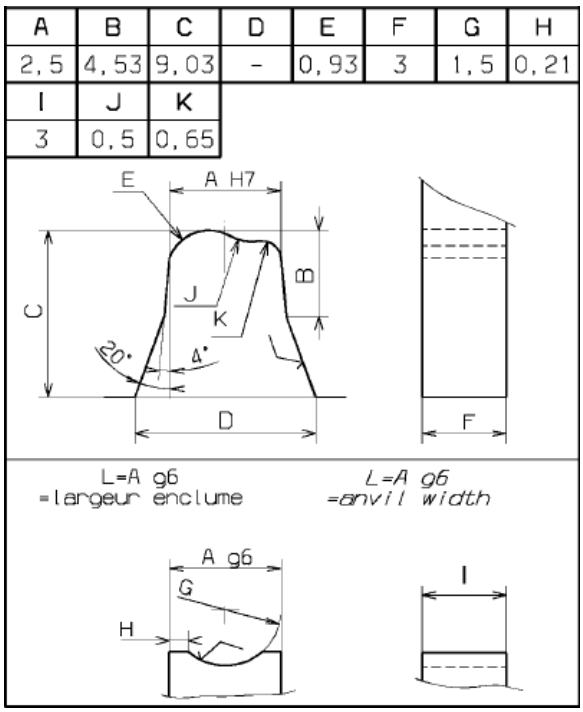
I
3,9



INSULATOR PUNCH

A	B	C	D	E	F	G	H
2,5	4,53	9,03	–	0,93	3	1,5	0,21

I	J	K
3	0,5	0,65



CONDUCTOR ANVIL

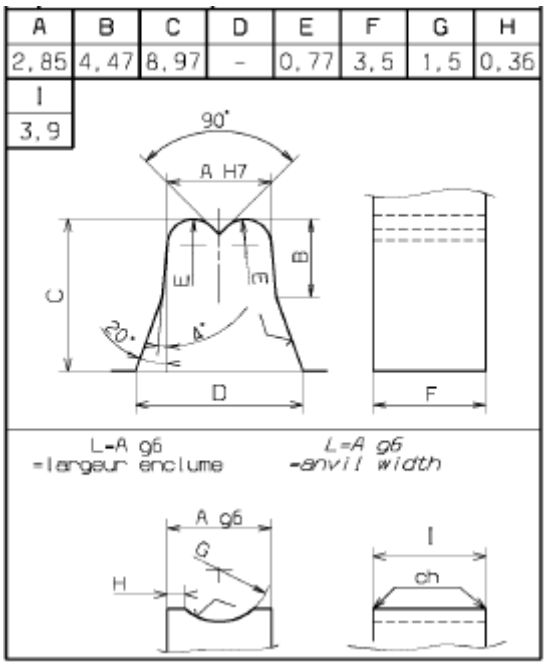
INSULATOR ANVIL

RECOMMENDED ANGLE CLEARANCE: 3° ±0.15'
TOOLING TOLERANCE: SYMMETRY 0.03

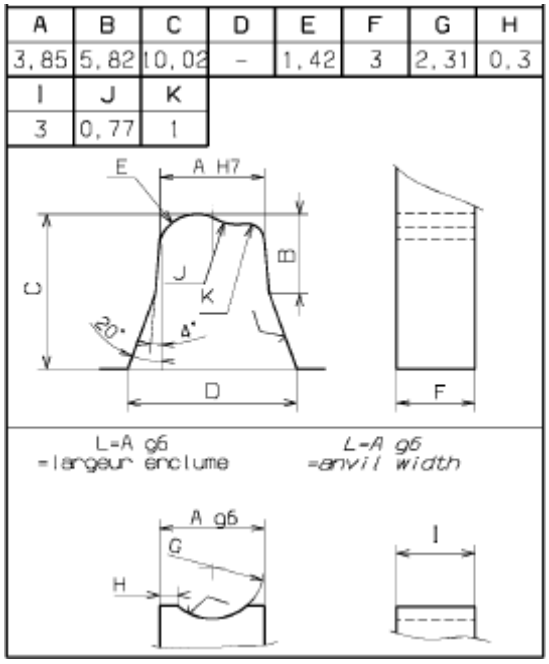
Figure 5a

TERMINAL MATERIAL NUMBER →	0988981039
WIRE NOMINAL CROSS SECTION (mm²) →	1.00 to 2.50

CONDUCTOR PUNCH



INSULATOR PUNCH



CONDUCTOR ANVIL

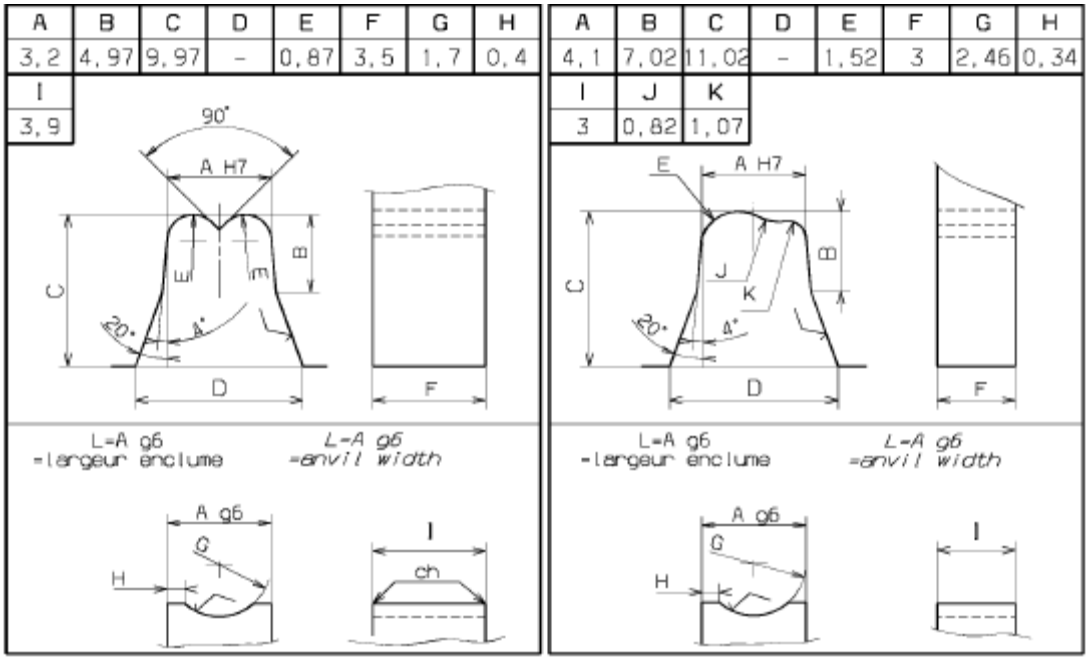
INSULATOR ANVIL

RECOMMENDED ANGLE CLEARANCE: 3° ±0.15'
TOOLING TOLERANCE: SYMMETRY 0.03

Figure 5b

TERMINAL MATERIAL NUMBER →	**0988981049**
WIRE NOMINAL CROSS SECTION (mm²) →	**3.00 to 5.00**

CONDUCTOR PUNCH **INSULATOR PUNCH**



CONDUCTOR ANVIL **INSULATOR ANVIL**

RECOMMENDED ANGLE CLEARANCE: 3° ±0.15'
TOOLING TOLERANCE: SYMMETRY 0.03

Figure 5c

CRIMP STRAIGHTNESS

A method to maintain crimp straightness is shown in figure 6a below.

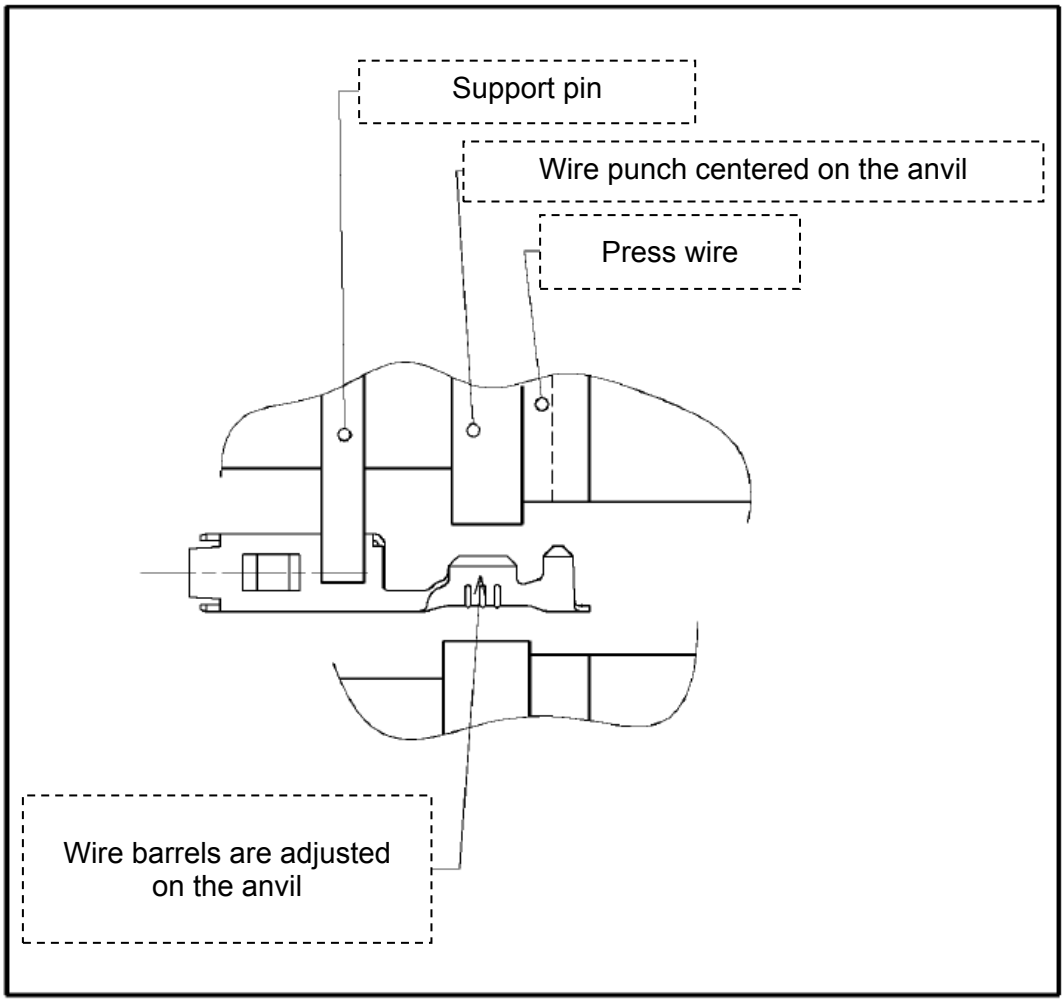


Figure 6a – TERMINAL POSITION IN TOOL