Robert Bosch GmbH

1 928 A00 07V-EN

Processing Specification

Matrix 1.2 clean body

BOSCH	Processing Specification	No. 1 928 A00 07V-EN	Page 2/16
GS-AM/ENC2	**Matrix 1.2 clean body**	Our Reference Schmatz	Telephone 8429

VALID	CHANGE	DWN.	CHK.
2009-03-06	first edition	Schmatz	Rehbein
2009-05-05	F1928498991	Schmatz	Rehbein
2014-07-30	F1928499357	Schmatz	Steinbrecher 11.08.2014

1 General 3
2 Description 3
2.1 Storage 4
2.2 Lubrication 4
3 Crimping 4
3.1 Crimping pliers 4
3.2 Crimping tool 4
3.3 Crimp specifications 5
3.3.1 Stripping 5
3.3.2 Wire positioning 5
3.3.3 Crimp dimensions 6
3.3.4 Micrographs conductor crimp 8
3.3.5 Pull off forces (extraction forces) 12
3.3.6 Visual inspections 12
4 Assembly 13
4.1 Manual 13
5 Final inspection 13
6 Disassembly 14
7 Ordering information 15
7.1 Terminal 15
7.2 Crimping tools and pliers 16
8 Information and addresses 16
8.1 Ordering 16
8.2 Technical information 16

BOSCH	Processing Specification	No. 1 928 A00 07V-EN	Page 3/16
GS-AM/ENC2	**Matrix 1.2 clean body**	Our Reference Schmatz	Telephone 8429

1 General

This processing specification describes the rules for the crimp processing of the Matrix 1.2 Terminal needed for wire harness manufacturing.

This processing specification is valid for the terminals mentioned in chapter 7.1.
For the crimping only Bosch released tools according to chapter 7.2 have to be used.

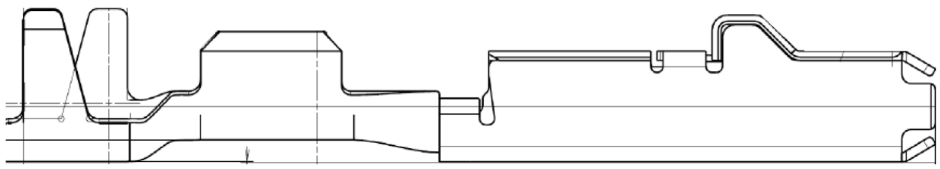
In the offer drawing and the TCI/TKU of the terminal, information about dimensions, materials and other terminal related aspects can be found.

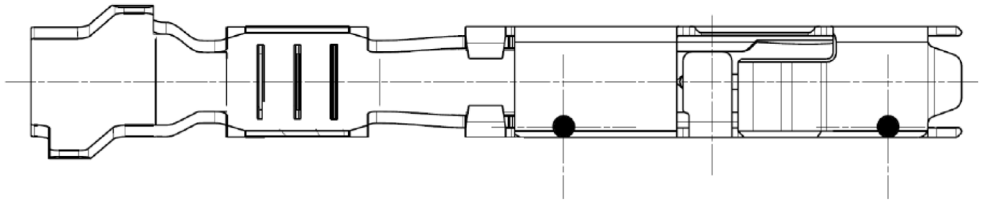
2 Description

The crimp connections are designed for wires of reduced cross section of type FLR-B according to DIN 72551-6.

The Matrix 1.2 clean body terminals are available for crimp areas of 0.35 to 1.5 mm² according to the different ordering / product numbers.
Other wires require the approval of the Bosch development department.
Double wire application with Matrix 1.2 clean body terminals are not permissible.

The terminal can be inserted into a connector housing only in one orientation (coding).
The terminals are supplied on disposable, one-way reels containing 8000 terminals. The terminals are suitable for transverse left–hand feed.





2.1 Storage

The disposable, one-way terminal reels should be stored well protected against external influences (crushing, impacts, kicks, thrusts, etc.).
Any user is responsible for the usability of the terminals stored at his plant.

To ensure that any problems can be easily traced, the manufacturer must be able to check the production date of the terminals which is mentioned on the packaging.

Detailed storage conditions see terminal TCD.

2.2 Lubrication

The Matrix 1.2 clean body terminal can be processed without additional lubrication. The use of lubricants is not permitted.
We cannot accept any responsibility for faulty crimping or changed terminal properties caused by the use of additional lubricants.

3 Crimping

3.1 Crimping pliers

We offer crimping pliers for a manual crimping (see chapter 7.2).
For industrial crimping e.g. in wire harness manufacturing, an automatic crimping tool has to be applied.
Crimping pliers can be employed for prototype production, repairing and similar cases; the crimp quality must be assured by means of measures outlined in this specification.

Functional characteristic of the crimping pliers:

- Positioning of the terminal into the inlet pocket (locator)
- Capability for unlocking in case of false operation

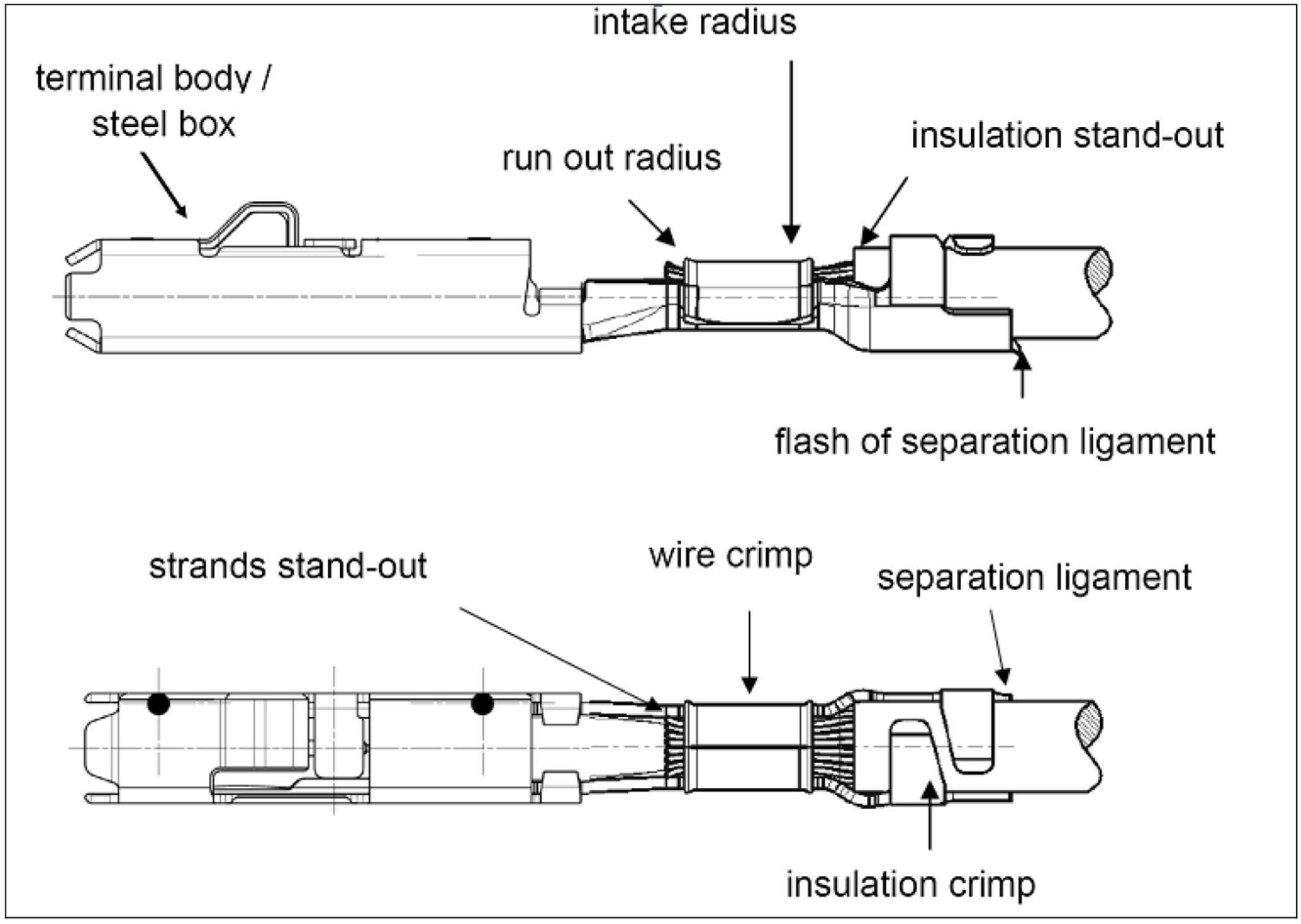
3.2 Crimping tool

For industrial crimping of the Matrix 1.2 terminals crimping tools are available. These crimping tools (for ordering no. see chapter 7.2) are for processing the released Matrix 1.2 terminals.
An automatic monitoring of the crimp force during industrial crimping is required.

Functional characteristic of the crimping tools:

- Adjustment of the crimp height by a locking device with fine grid steps of 0.02 mm.
- Terminal support plate is adjustable in height
- Wear parts exchangeable
- Adjustable for different spacing grids of the transport strip
- AMP-standard mount of the tool for conventional presses possible

3.3 Crimp specifications



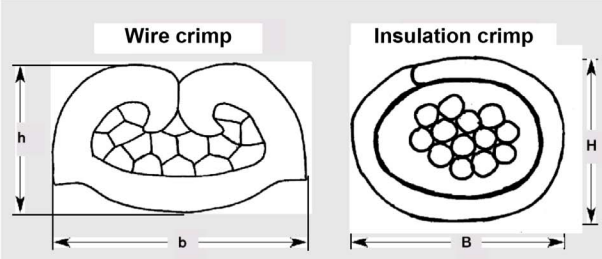
3.3.1 Stripping

The adjustment of the stripping length must be 3.5 ± 0.3 mm. The exact value has to be adjusted according the used wire type.

3.3.2 Wire positioning

Insulation stand-out:	min. 0.3 mm max. 1.0 mm
strands stand-out:	min. 0.1 mm max. 0.2 mm
separation ligament:	max. 0.3 mm
flash of separation ligament:	max. 0.03 mm
intake radius:	visible, max. height 0.15mm
run-out radius:	not necessary, max. height 0.05 mm

3.3.3 Crimp dimensions



Conformity with the specified crimp dimensions and tolerances is urgently recommended in order to guarantee uniformly high standards of quality. Suitable measuring instruments, such as specially shaped micrometers and caliper gauges, must be used for checking. All geometric measurements can be taken non-destructively.
All specified values refer to FLR wires (DIN 72551-6), FLR-B type. By applying other tools than the Bosch released these values can differ. In any cases the quality of the crimp must fulfill this specification.
For any open questions please contact us (addresses given in chapter 8).

Insulation crimp

Wire [mm²]	Ins.crimp height H ± 0,05	Ins.crimp width B ± 0,05	note
0,35	1.60	1.81	
0,50	1.73	1.83	
1,00	2.12	2.12	
1,50	2.52	2.52	

Wire [mm²]	Ins.crimp height H - 0,05	Ins.crimp width B - 0,05	note
0,75	1.90	1.90	Dimensions of the insulation crimp have to lie inside a circumscribed circle with diameter 3.30 mm.

Conductor crimp

wire [mm²]	conductor crimp height H ± 0,03	conductor crimp width B ± 0,03	Wire acc. DIN 72551-6 (type FLR-B) Single strand		note
			number of strands	diameter of single strand	
0,35	0.83	1.43	12	0,21	
0,50	0.88	1.43	16	0,21	
0,75	1.03	1.83	24	0,21	
1,00	1.13	1.84	32	0,21	
1,50	1.30	1.81	30	0,26	

Note:
Measurement of conductor crimp height with a test force of: F = 10 N +/- 0,4 N

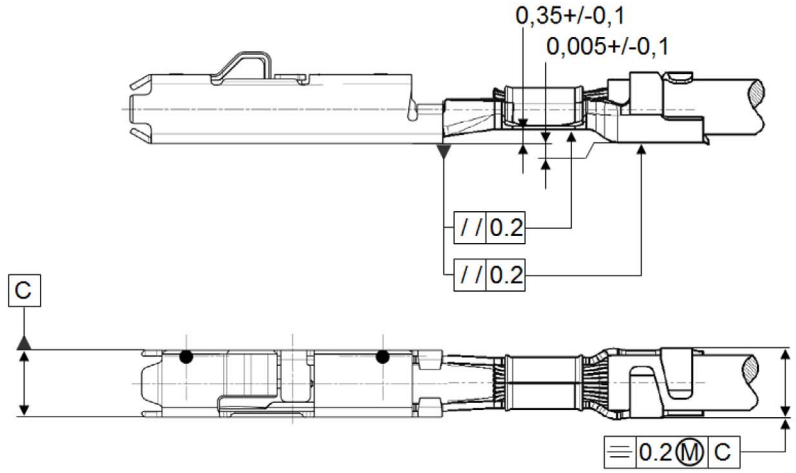
BOSCH	Processing Specification	No. 1 928 A00 07V-EN	Page 7/16
GS-AM/ENC2	**Matrix 1.2 clean body**	Our Reference Schmatz	Telephone 8429

Parallelism:

- Conductor crimp to terminal body: 0.2 mm
- Insulation crimp to terminal body: 0.2 mm

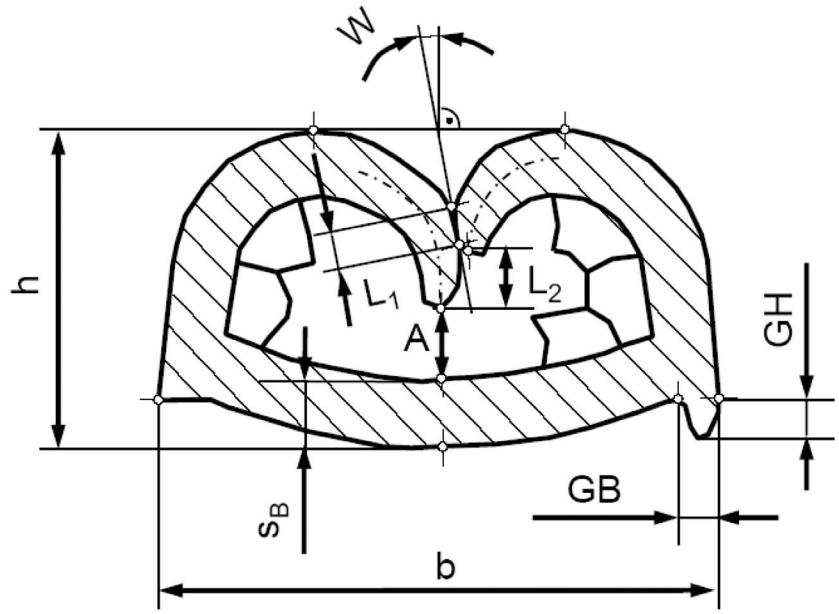
Symmetry:

- Insulation crimp to terminal body: 0.2 mm



3.3.4 Micrographs conductor crimp

Criteria for the evaluation of micrographs



h = Crimp Height (see 3.3.3)

b = Crimp Width (see 3.3.3)

W = Support Angle
W ≤ ± 30°

L_1 = Support Length
L_1 ≥ 0.5 x S

L_2 = Height Difference (between the crimp claws)
L_2 ≤ 1 x s

A = Claw End Distance
A ≥ 0.1 x s

GH = Burr Height
GH ≤ 1 x s

GB = Burr Width
GB ≤ 0.75 x s, if GH < 0.5 x s
GB ≤ 0.5 x s, if GH ≥ 0.5 x s

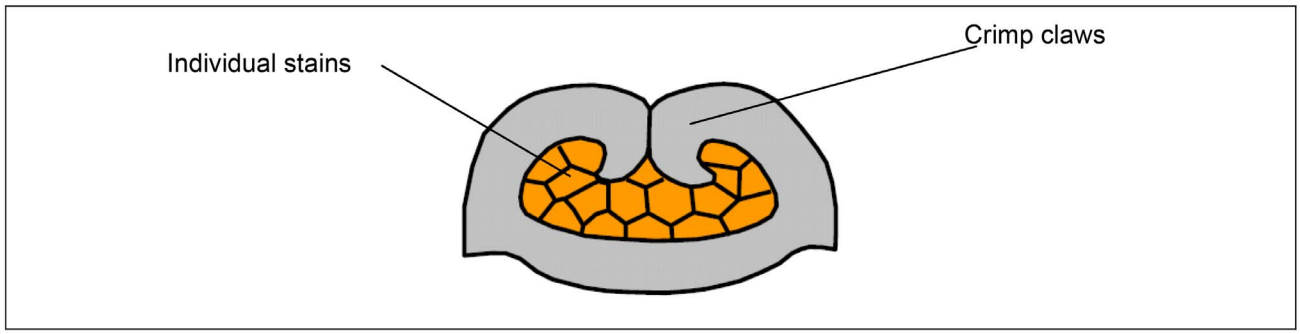
s_B = Bottom Thickness
s_B ≥ 0.75 x s

s = Terminal material thickness to be taken from terminal drawing
Matrix 1.2 clean body → s = 0.2 mm ± 0.01 mm

Conductor crimp - ideal case

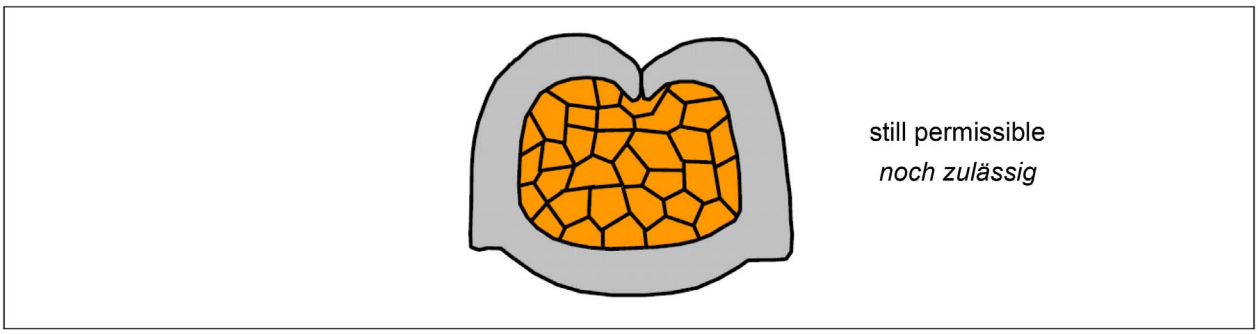
- All individual strains must be compressed into a honeycomb arrangement.
- No single wires may be missing (stripping error).
- The crimp claws must rest against each other between the entry bell and the exit bell.
- There must not be any visible cavities.
- The bottom must be shaped as illustrated.

If all the listed criteria can be seen in the micrograph, a „gas-tight“ crimp connection can be assumed.



Conductor crimp – borderline samples

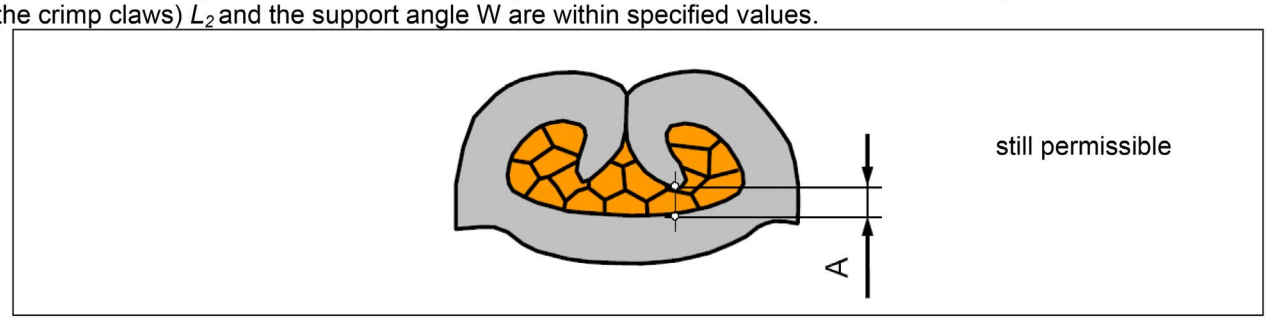
- Both crimp claws just rest against each other.
- The individual wires still show a honeycomb arrangement.
- In case of missing individual wires, no gaps are accepted and the remaining wires must be compressed in the honeycomb arrangement.
- Tiny gaps between individual wires or between wires and crimp claw are permitted if the gaps are definitely closed in another micrograph plane.



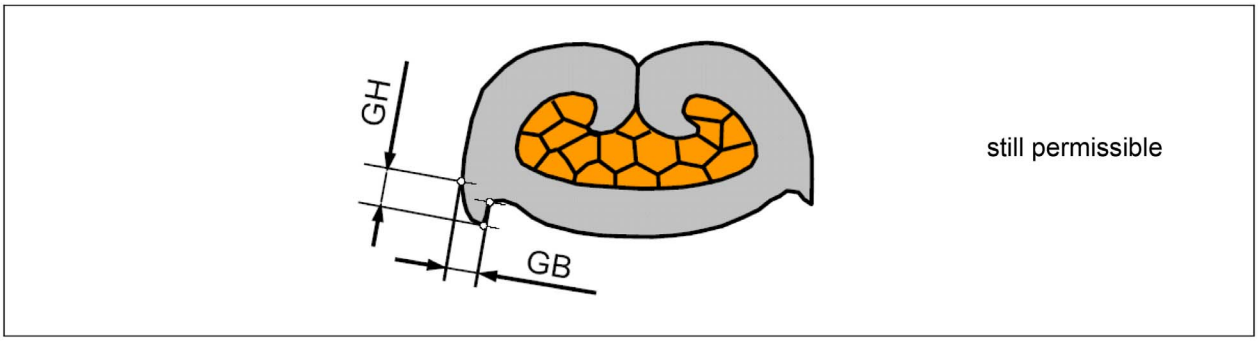
- The distance (A) between both crimp claws and the bottom of the crimp corresponds at the smallest point to $A \geq 0.1 \times s$

  (s = terminal material thickness)

An unequal curling of the crimp claws is acceptable, while support length L_1 and the height difference (between the crimp claws) L_2 and the support angle W are within specified values.



- Limit values for burr formation at bottom of crimp (see 2.4.1):
  maximum permissible burr height at bottom of crimp: GH = 1 x s
  max. perm. burr width:
  GB ≤ 0.75 x s, if GH < 0.5 x s
  GB ≤ 0.5 x s, if GH ≥ 0.5 x s
  (s = terminal material thickness)

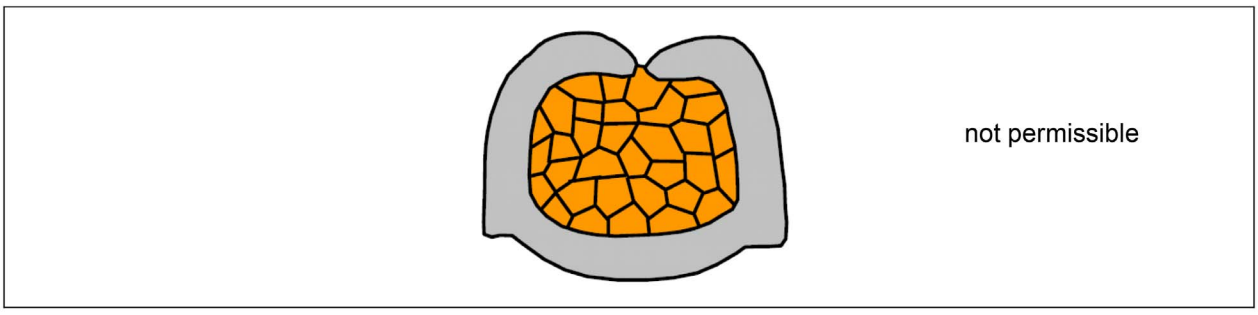


Conductor crimp defects

The crimp claws do not rest against one another.

Cause: The crimp is overfilled.

- Check attribution of the crimp connection area to the used conductor cross-section.



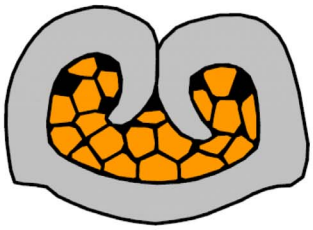
Insufficient compression.

Cause: The crimp is underfilled.

Check the following:

- Attribution of crimp connection area to conductor cross-section used.
- Stripping defects
- Crimp height
- Gaps

BOSCH	Processing Specification	No. 1 928 A00 07V-EN	Page 11/16
GS-AM/ENC2	**Matrix 1.2 clean body**	Our Reference Schmatz	Telephone 8429

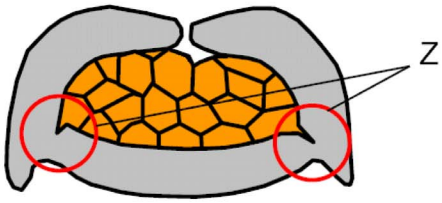


not permissible

Material cracked at position Z and crimp claws open.

Cause: Upper and lower dies worn.

Build up of burrs.



not permissible

3.3.5 Pull off forces (extraction forces)

The pull off forces have to meet the targets of TCD/TKU 1 928 A01 85T.
The measurements have to be executed according to DIN IEC 512-8 with an opened insulation crimp.

Target values see terminal TCD

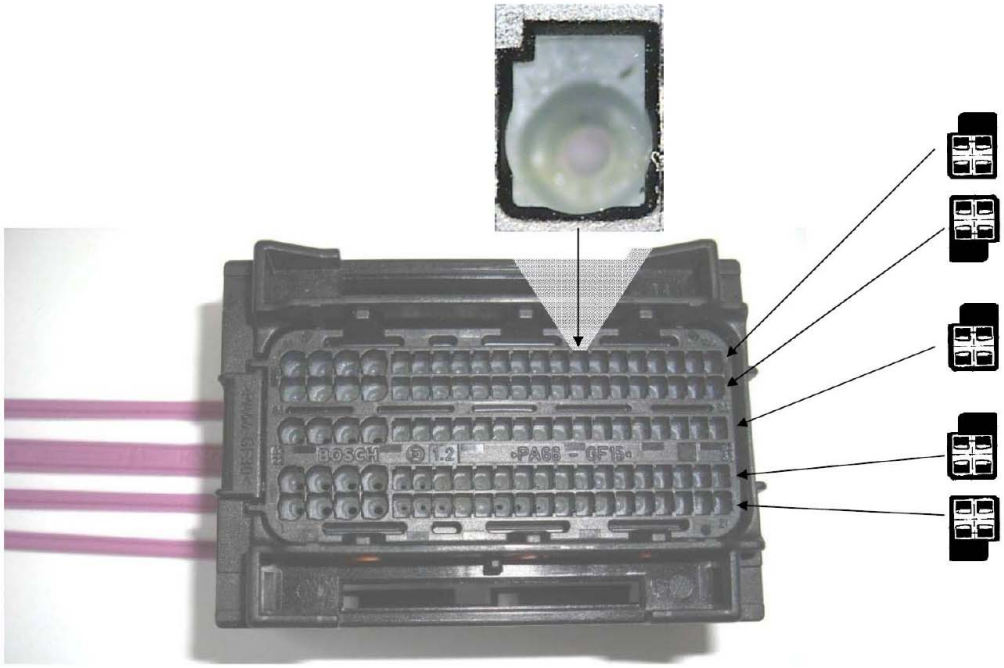
3.3.6 Visual inspections

- All strands must be surrounded by the crimp claw for a good compression.
- Damage of the strands is not permissible.
- Crimp claws have to be closed for a good compression.
- Avoid large flashs at the bottom of the crimp barrel.
- The terminals have to show no damages: check of bended or squeezed terminals (bodies, crimp, locking hump).
- Observe and keep limits for the position of the wires and stripping dimensions.
- Keep symmetry conditions of the terminal.

4 Assembly

4.1 Manual

The terminal can be inserted into a connector housing only in one orientation (Coding).
The alignment and the orientation is according to the hump of the terminal. During assembling the terminal, the orientation should no more be changed. The mounting force for correctly oriented terminals is below 15 N.



105-way module of 196-way connector

After assembling test the full locking of the terminals by a light pulling (between 4 N and 8 N) off the wire (pull - test) *before* the secondary locking (in the figure purple-coloured) will be closed.
A so called push-test / push-back-test by using a pin or tool with a certain force is ***forbidden***.

5 Final inspection

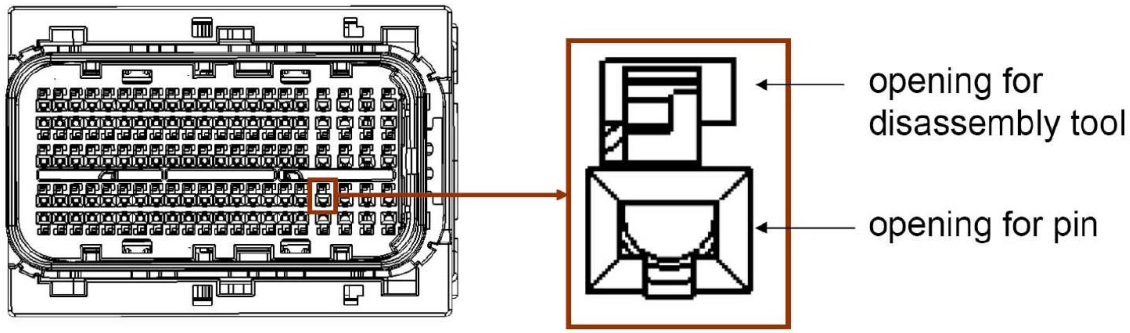
The electrical function test has to be executed with spring mounted test pins according to AZ 1 928 A00 180. These test pins must enable to meet the opening for all tolerances without damaging the terminal or connector and without penetrating into the contact area of the terminal. For any open questions, please contact us (chapter 8.2).

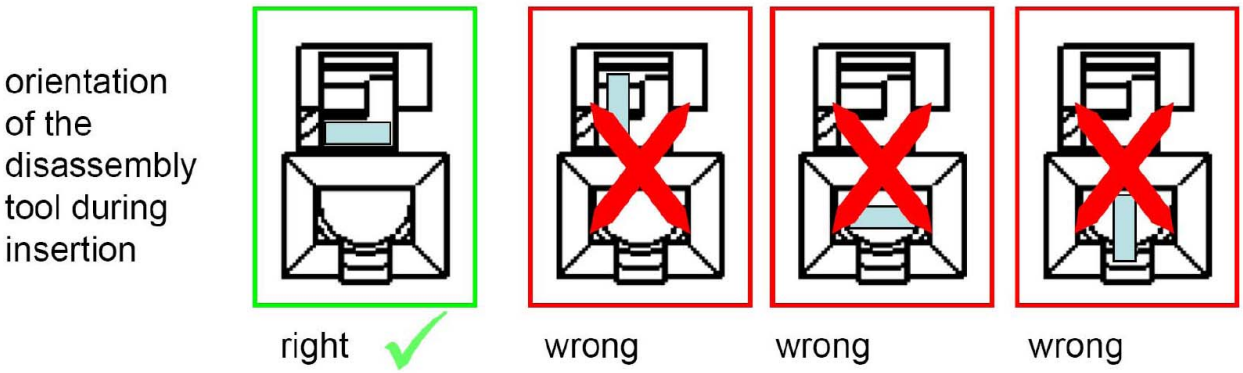
The electrical test has to be done **after** closing of the secondary locking.

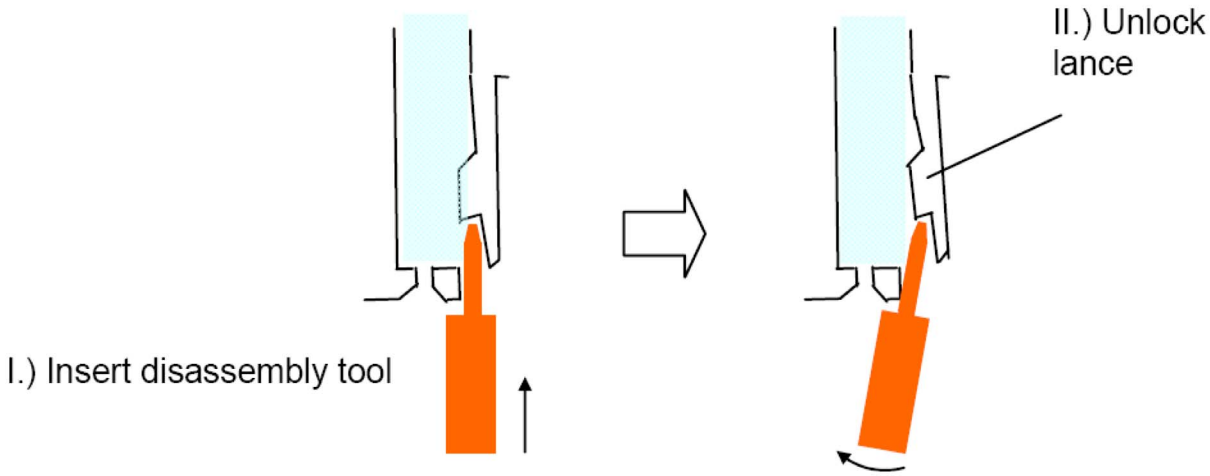
6 Disassembly

In case of false assembly or in order to repair failures first open the secondary locking. Then extract the terminal with a special disassembly tool (chapter 7.2).

Disassembly tool







Disassembly process

The disassembly process has to be done with the Bosch disassembly tool.

Disassembled terminals have to be replaced by new parts.

7 Ordering information

7.1 Terminal

crimp range [mm²]	Plating	Part-No.
		feed of carrier strip 8 mm
0,35 / 0,50	Sn	1 928 498 991
0,75 / 1,00	Sn	1 928 498 992
1,50	Sn	1 928 498 993
0,35 / 0,50	Ag	1 928 499 357
0,75 / 1,00	Ag	1 928 499 358
1,50	Ag	1 928 499 359

7.2 Crimping tools and pliers

Article	Part-No.
Crimping pliers for 0.35 / 0.50 mm²	1 928 498 212
Crimping pliers for 0.75 / 1.00 mm²	1 928 498 213
Crimping pliers for 1.50 mm²	1 928 498 214

Article	crimp range [mm²]	Part-No.
		feed of carrier strip 8 mm
Crimping tool Wear Part Set	0,35 / 0,50	1 928 498 720 1 928 498 724
Crimping tool Wear Part Set	0,75	1 928 498 721 1 928 498 725
Crimping tool Wear Part Set	1,00	1 928 498 722 1 928 498 726
Crimping tool Wear Part Set	1,50	1 928 498 723 1 928 498 727

Article	Part-No.
Disassembly tool	1 928 498 997

8 Information and addresses

8.1 Ordering

Robert Bosch GmbH
Gasoline Systems
Technical sales department
Department GS-AM/SCO
PO box 300240

70442 Stuttgart

Telephone: 0711 811-43069

8.2 Technical information

Robert Bosch GmbH
Gasoline Systems
Connectors and Plastic Parts
Department GS-AM/ENC2
PO box 300240

70442 Stuttgart

Telephone: 0711 811-20788
0711 811-8429