
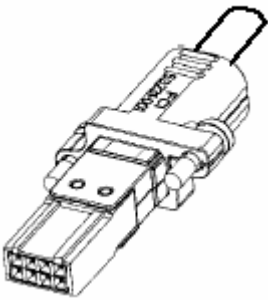


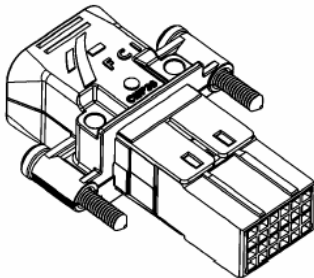
| | | | |
|---|--|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | | PAGE 1 of 27 | REVISION D |
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SHIELDED CABLE CONNECTOR (RECEPTACLE) IDC SIGNAL



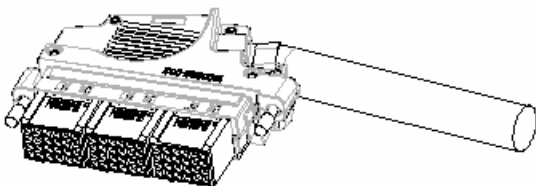
72861-201LF

2X4 SIGNAL



HM1C16D2J110EBLF


4X6 SIGNAL



10013881-201LF
3X24 SIGNAL



10074494-231LF
3X24 SIGNAL
GROUND CONTINUITY

| | | | |
|---|---|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
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2X4 SIGNAL(IDC SIGNAL)

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2.PART-B

4X6 SIGNAL(IDC SIGNAL)


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3.PART-C

3X24 SIGNAL(IDC SIGNAL)

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PART A 2X4 SIGNAL (IDC)

1.1 GENERAL

1.1.1 General information]

The specification is valid for the Lead Free/RoHS compatible products.
 This document is describing the assembly process of signal Connector 72861-201LF and the tools involved in the process.
 Also referring to GS-12-308.

1.2 INSTRUCTION

1.2.1 Cable preparation

1.2.1.1 Mount the outer ferrule over the cable.

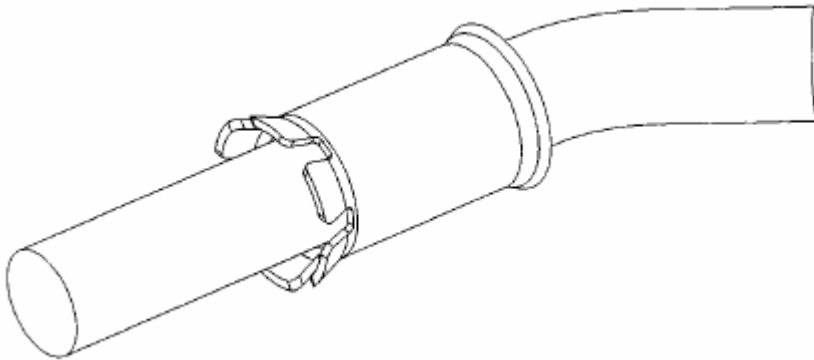


fig.1

1.2.1.2 Mount the shrink tube over the cable.

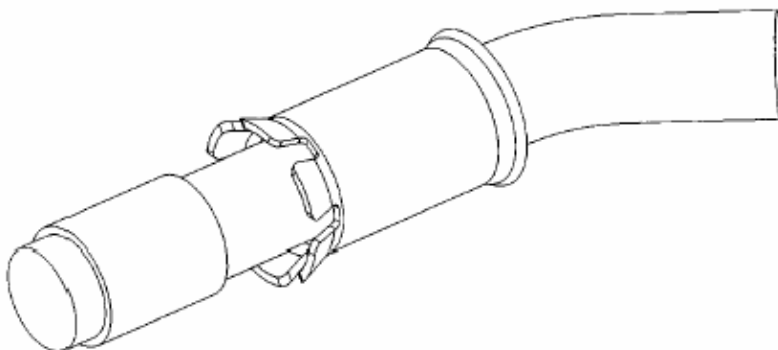



fig.2

| | | | |
|---|--|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | | PAGE 4 of 27 | REVISION D |
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- 1.2.1.3** It is important that the braid is cut in a special workplace or work-area, to keep out loose braid parts from the termination area.
 Remove 140 mm of the sheat then cut the braid leaving 10 mm.
 Avoid cutting the braid one more time, if really needed do it far away from the termination area
 Mount the shrink tube in line with the jacket.

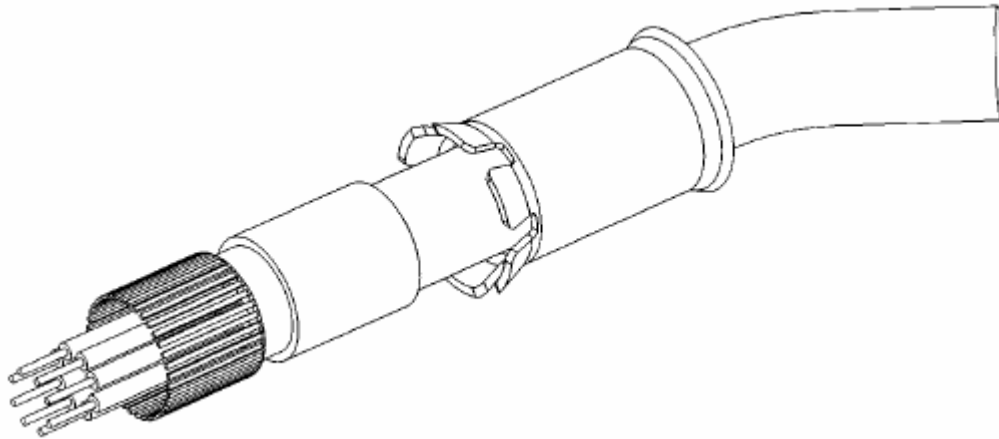


fig.3

- 1.2.1.4** Mount the inner ferrule under the braid.

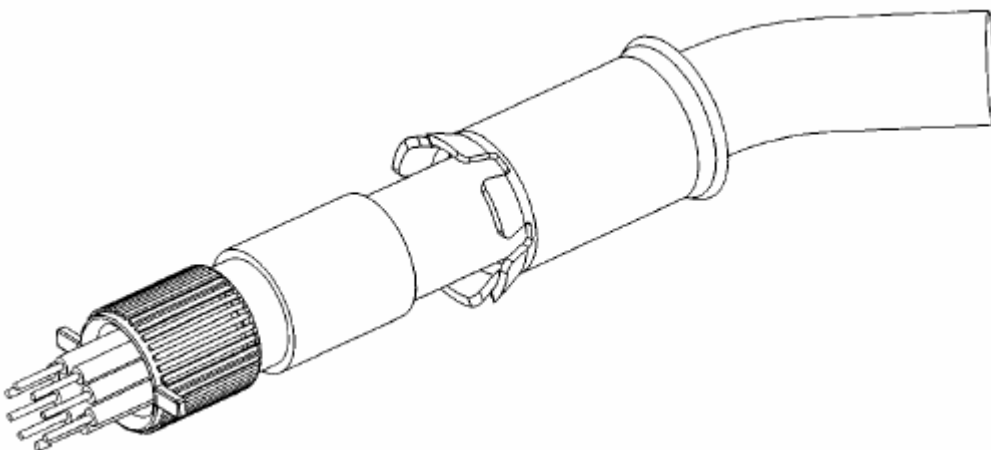



fig.4

| | | | |
|---|--|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
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1.2.1.5 Pull back the outer ferrule over the inner ferrule. At this point the inner ferrule and the braid should be completely covered by the outer ferrule. Crimp the ferrule and the jacket with the tool HM1Y459.

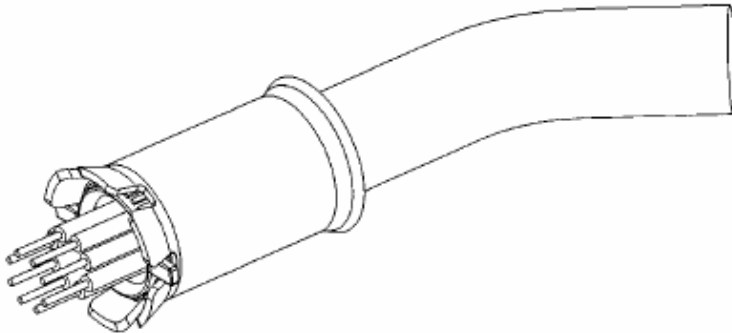


fig.5

1.2.2 Termination

1.2.2.1 Untwist the wires completely, and make sure that the individual wires are completely straight (not curled). Terminate the connector.

1.2.2.2 Place the cable in the cable holder of cable terminator BPY6736PC1UKLF according to the picture. Make sure that the required distance min. 12/max. 14mm is fulfilled by adjusting the tool.

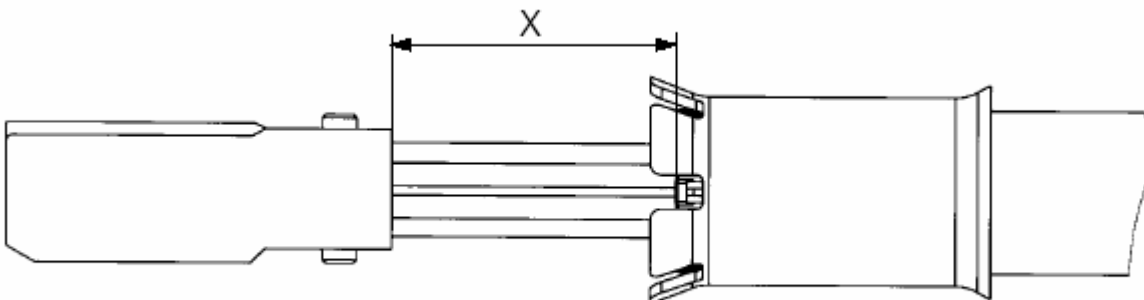



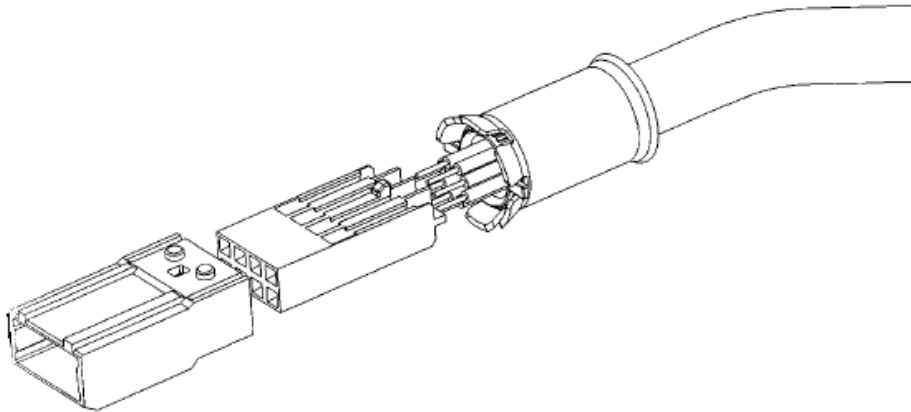
fig.6

| | | | |
|---|--|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
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1.2.2.3 Check the depth of the terminated wire.

The depth of the terminated wire can be checked as mentioned in the spec GS-20-002.

1.2.2.3.1 Mount the shroud on the terminal block.



*** It is not recommended to TWIST the connector for decreasing the distance x.**

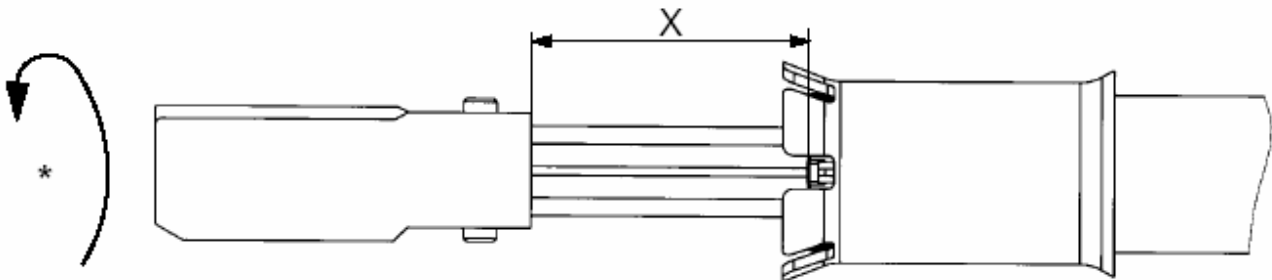



fig.7

| | | | |
|---|---|--------------------------------------|----------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| | TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | PAGE 7 of 27 | REVISION D |
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1.2.3 Final assembly

1.2.3.1 Place the cover, 53231-001LF in the tool HT-745P.

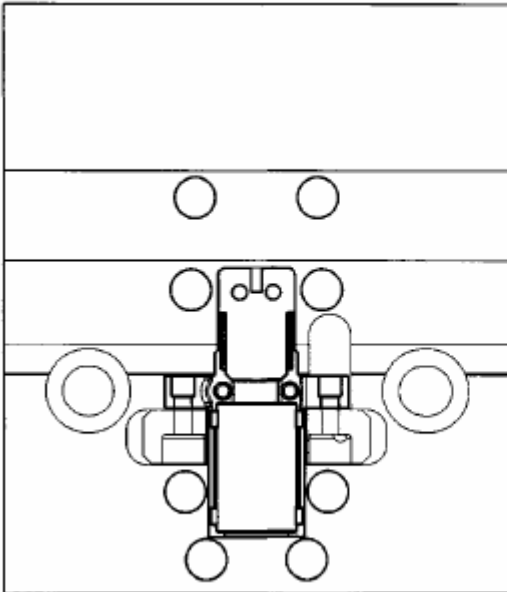
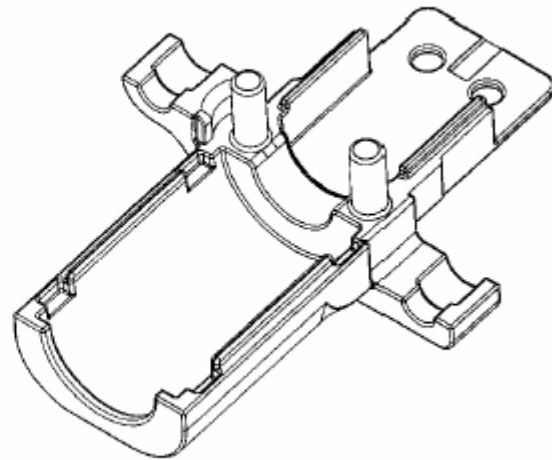


fig.8



1.2.3.2 Mount the terminated connector in tool HT-745P.

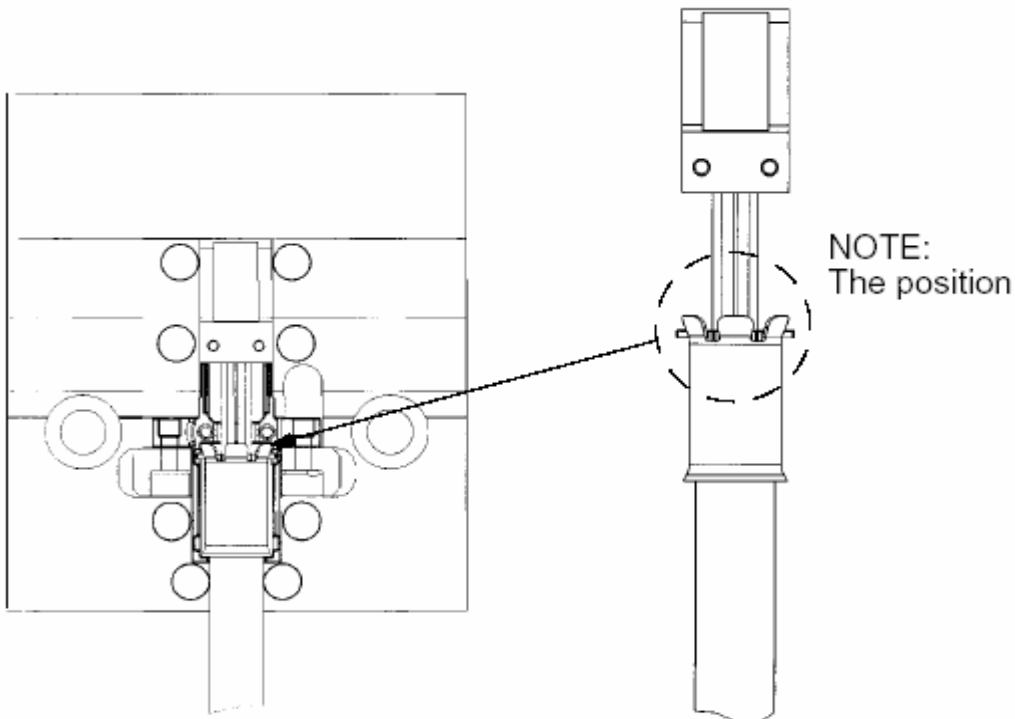



fig.9

| | | | |
|---|---|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
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1.2.3.3 Place the screws into the slots of the cover, 53231-001LF.

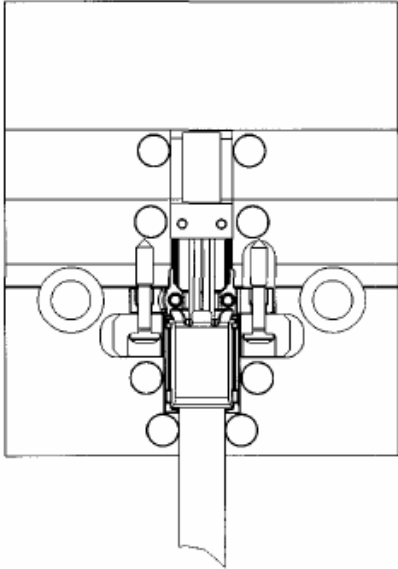


Fig.10

1.2.3.4 Place the cover, 53230-001LF over the cover, 53231-001LF and rivet. Check that no wires are fixed between the cover halves.

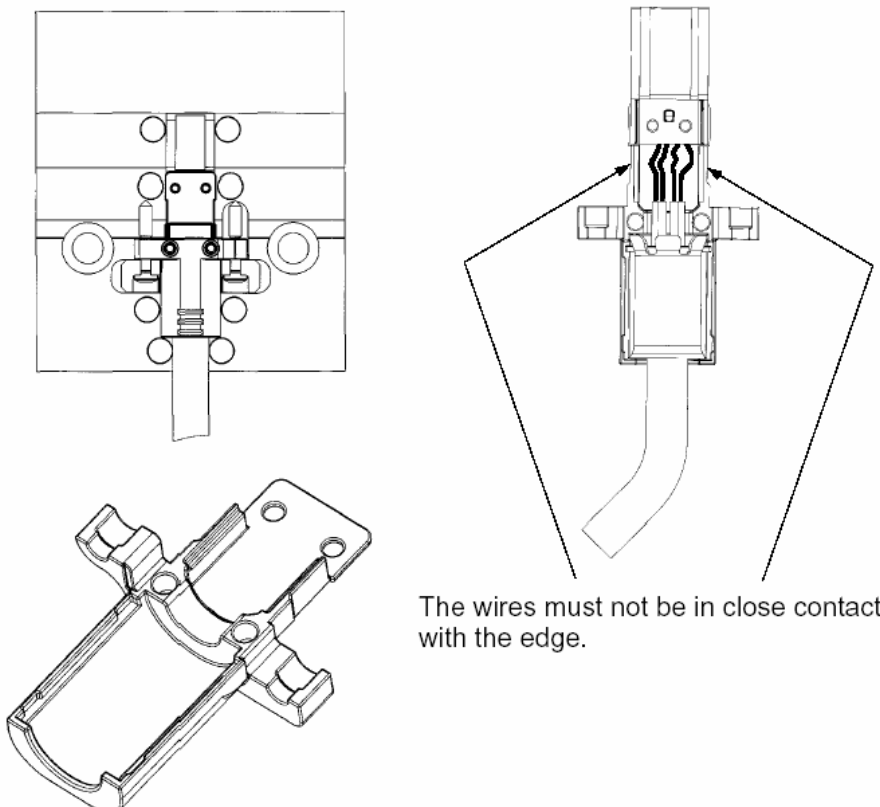



fig.11

| | | | |
|---|---|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| | TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | PAGE 9 of 27 | REVISION D |
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1.2.4 Final Check

1.2.4.1 Check max. dimension after mounting.

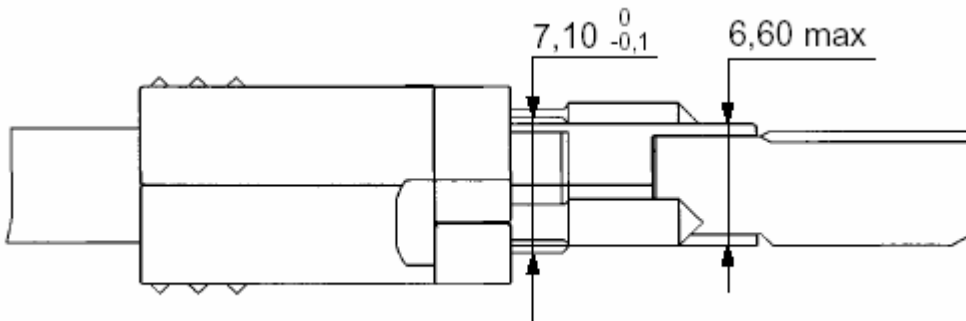



fig.12

1.3 Tool Overview

| Step Definition | Tool P/N |
|---|----------------------------------|
| 1.2.1 Cable Preparation Crimping Ferrule and Jacket | HM1Y459LF(Crimping Tool) |
| 1.2.2 Cable Termination Preparing for cable termination | BPY6736PC1UKLF(Cable Terminator) |
| 1.2.3.Final Assembly | HT 745-P |

| | | | |
|---|---|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| | TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | PAGE 10 of 27 | REVISION D |
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2.PART B

4X6 SIGNAL (IDC)

2.1 GENERAL

2.1.1 General information

The specification is valid for the Lead Free/RoHS compatible products. This document is describing the assembly process of signal connectors HM1C16D2J110EB LF and HM1C16D0J110EBLF and the tools involved in the process. Also referring to GS-12-308.

2.2. INSTRUCTION

2.2.1 Cable preparation

2.2.1.1 Cut the sheath.

Marks on the cable or loose braid parts must not appear.

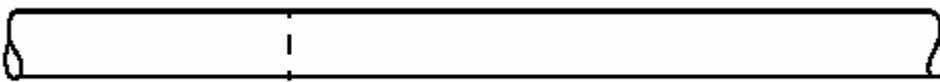


fig.1

2.2.1.2 It is important that the braid is cut in a special workplace or work-area, to keep out loose braid parts from the termination area. Remove 140 mm of the sheath then cut the braid leaving 10 mm. Avoid to cut the braid one more time, if really needed do it far away from the termination area.

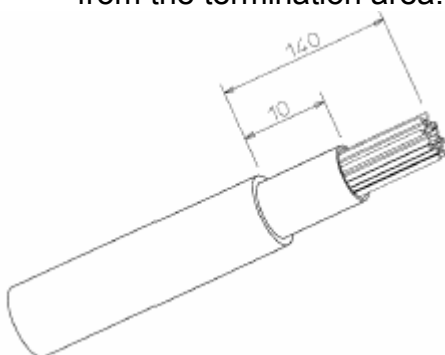



fig.2

| | | | |
|---|---|--------------------------------------|----------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| | TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | PAGE 11 of 27 | REVISION D |
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2.2.1.3 Mount the inner ferrule over the sheath and crimp with die set according to table . Make sure that the sheath doesn't go outside of the open part of the ferrule.

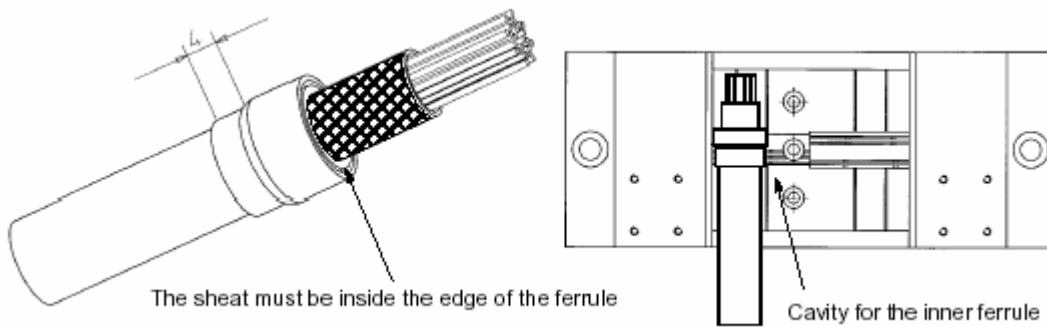



fig.3

2.2.1.4 Tooling list

| FCI Product number | Content Tool for crimping outer ferrule is include in all ferrule crimping tools | Ref |
|--|--|--------|
| HM1Y291LF HM1Y292LF | Mechanical press for riveting sequence, 12KN Mechanical press for riveting sequence, 15KN | Fig.3 |
| HM1Y293LF HM1Y314LF HM1Y313LF | Die set for riveting the two die-cast metal hoods together Die set crimping inner ferrule HM1CO1CR02BLF Die set crimping inner ferrule HM1CO1CR03BLF | Fig.10 |
| HM1Y315LF HM1Y315LF HM1Y314LF | Die set crimping inner ferrule HM1CO1CR04BLF Die set crimping inner ferrule HM1CO1CR05BLF Die set crimping inner ferrule HM1CO1CR06BLF | |
| HM1Y482LF | Die set crimping inner ferrule HM1CO1CR07BLF | |
| BPY6736PC1UKLF BPY6736A1LF BPY6736A1LF | Basic IDC Machine Kit for connector HM1C16D2J110EBLF Kit for connector HM1C16D0J110EBLF | |

| | | | |
|---|---|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| | TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | PAGE 12 of 27 | REVISION D |
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2.2.1.5 Bend back the braid over the inner ferrule, mount the outer ferrule and slide it over the inner ferrule until it stops. At this point the inner ferrule and the braid should be completely covered by the outer ferrule. Place the ferrule in the die set HM1Y31X and crimp it. The crimping-area must be placed 1mm from the outer edge of the ferrule (see figure), this is to gain the best retention force.

Cut away the rest of the Aluminum foil and the plastic foil

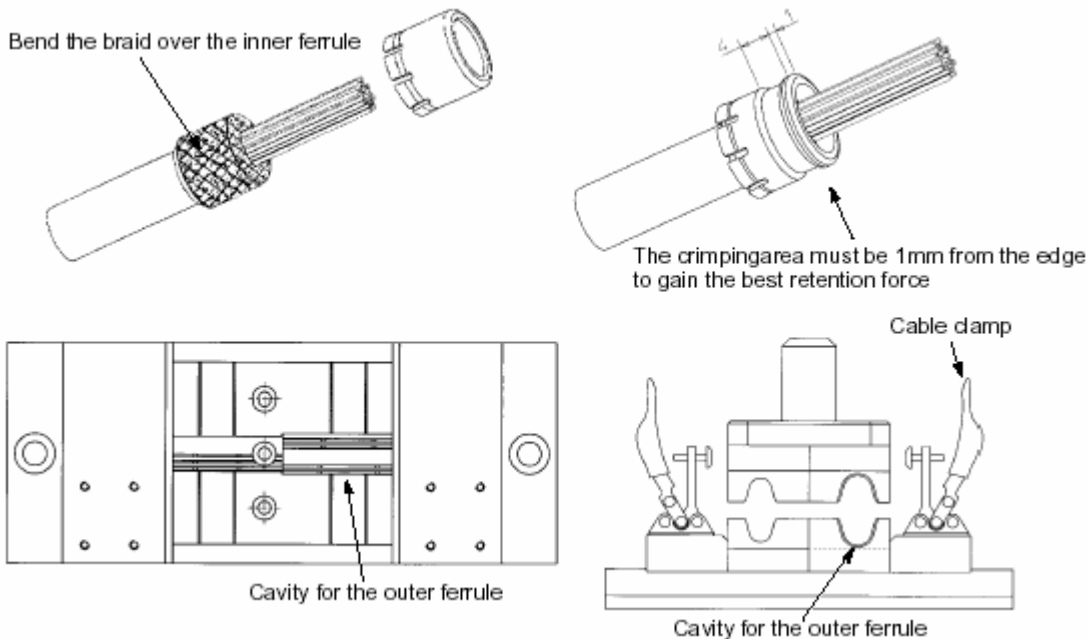


fig.4

2.2.1.6 Cable ferrules

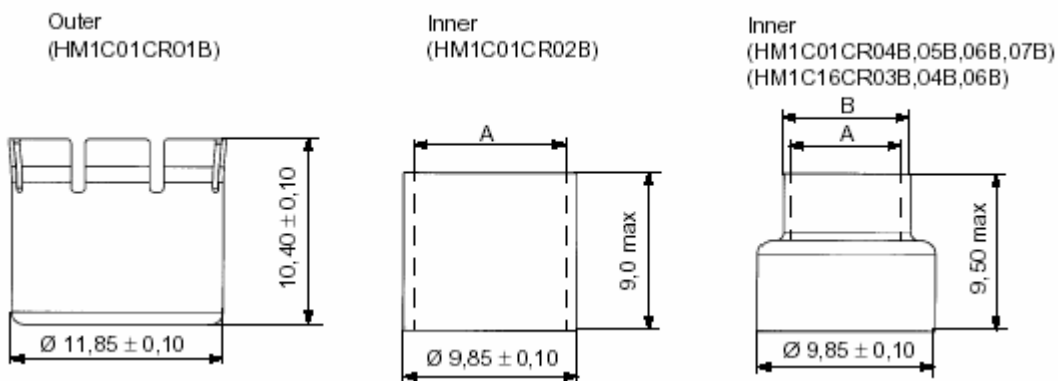



fig.5

| | | | |
|---|---|--------------------------------------|----------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| | TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | PAGE 13 of 27 | REVISION D |
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2.2.2 Termination

2.2.2.1 Untwist the wires completely, and make sure that the individual wires are completely straight (not curled). Terminate the connector.

2.2.2.2 Place the cable in the cable holder of cable terminator BPY6736PC1UKLF according to the picture. Make sure that the required distance min. 12/max. 14mm is fulfilled by adjusting the tool.

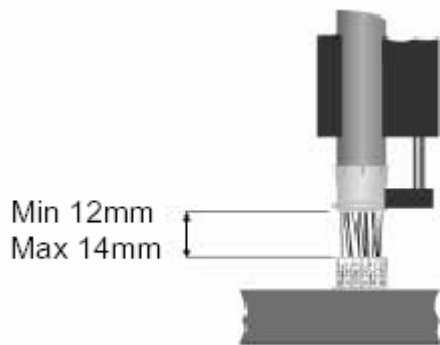


fig.6

2.2.2.3 Check the depth of the terminated wire.

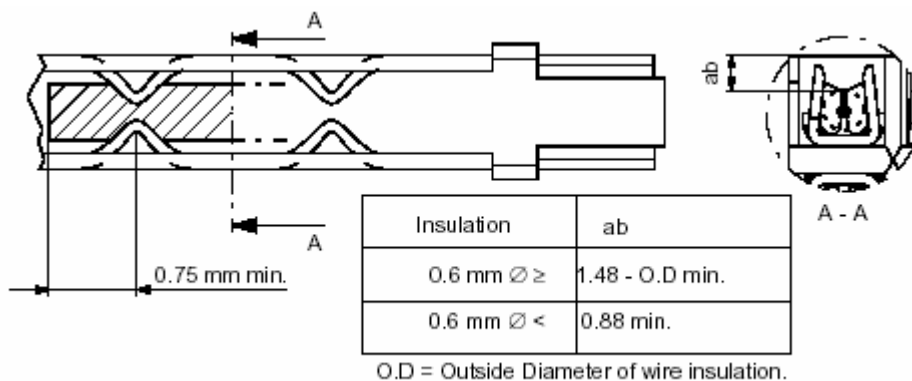



fig.7

| | | | |
|---|--|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | | PAGE 14 of 27 | REVISION D |
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2.2.2.4 Mount the terminal blocks

Make sure that the guiding pegs are in the right position.

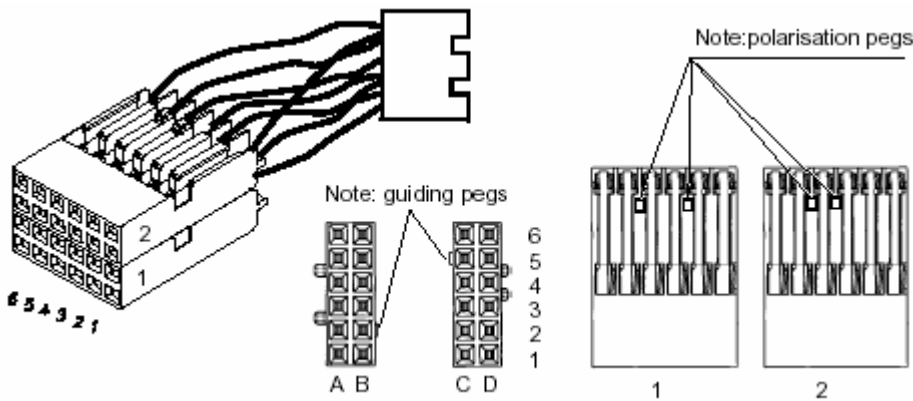


fig.8

2.2.2.5.

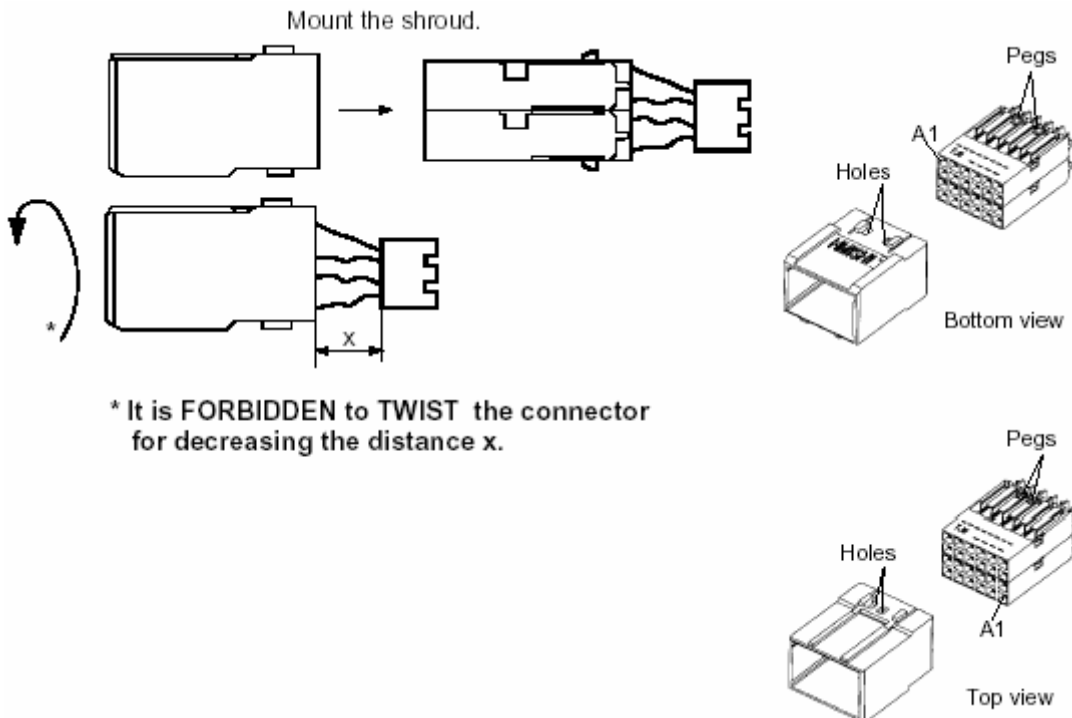



fig.9

| | | | |
|---|---|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| | TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | PAGE 15 of 27 | REVISION D |
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2.2.3 Final assembly

- 2.2.3.1** Place the right part of the metal cover in mechanical press, put the terminated connector with the ferrule in the cavity of the metal cover. Make sure that there is no risk of damaging the wires during the assembly. Do not twist the connector. Put the screws in their places, mount the left part of the metal cover, put the rivets in their holes and press the cover halves together.

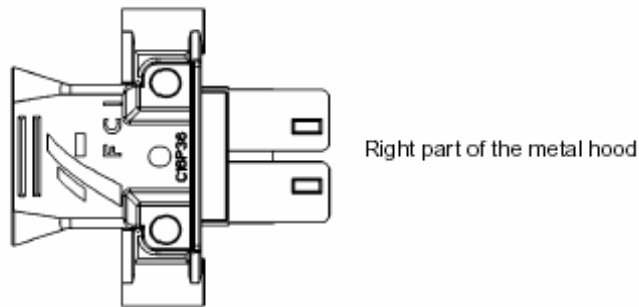


fig.10

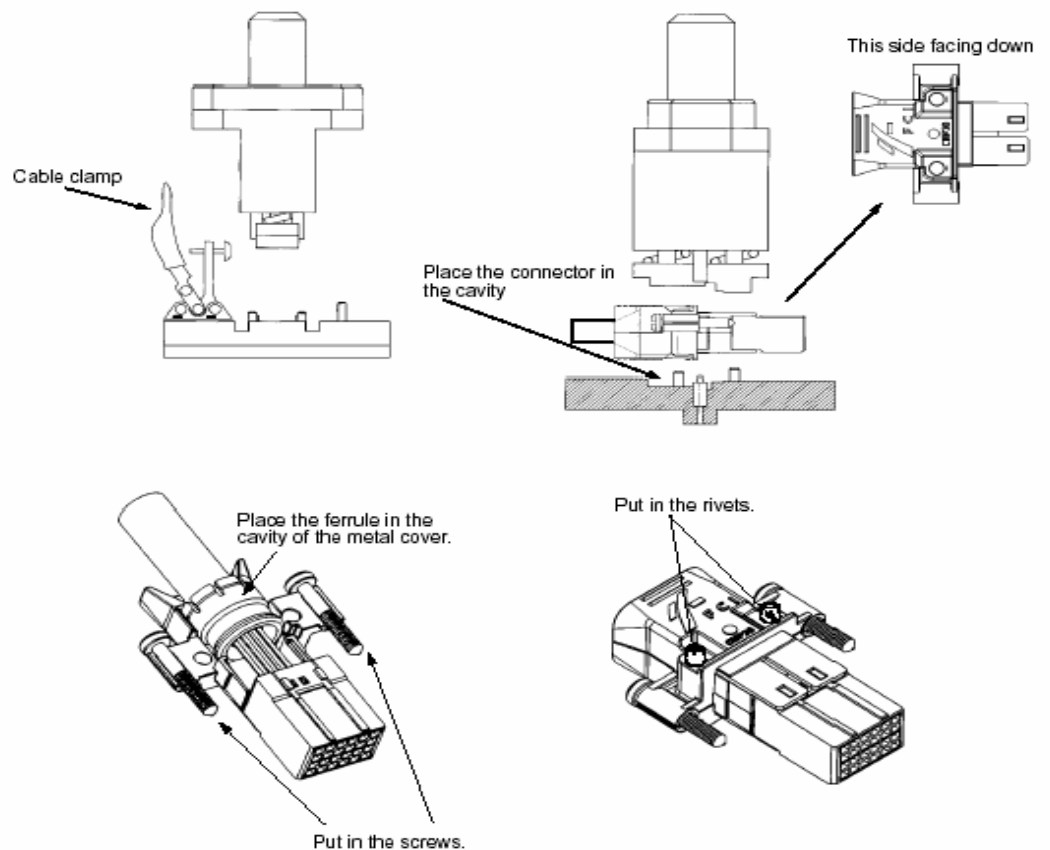



fig.11

| | | | |
|---|---|--------------------------------------|----------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
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2.2.4 Final Check

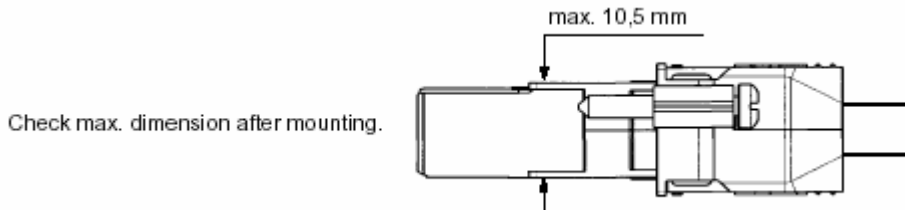



fig.12

2.3 Tool Overview

| Step Definition | Tool P/N |
|---|--|
| 2.2.1.3. Cable Preparation Crimping tool for ferrules 2.2.1.5. Crimping | HM1Y291, HM1Y292, HM1Y293, HM1Y313, HM1Y314, HM1Y315, HM1Y482, BPY6736A1, BPY 6736 PC1UK HM1Y31X(Die Set) |
| 2.2.2 Cable Termination Preparing for cable termination | BPY6736PC1UK (Cable Terminator) |

| | | | |
|---|--|----------------------------------|--------------------------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
| TITLE Metral Sofix® P/N: 72861LF-201LF, HM1C16D2J110EBLF, 10013881-201LF 10074494-231LF | | PAGE 17 of 27 | REVISION D |
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3.PART C

3X24 SIGNAL (IDC)

3.1 GENERAL

3.1.1 General information

The specification is valid for the Lead Free/RoHS compatible products.
 This document is describing how to assembly a 72 position Sofix low profile cable connector for signal transmission.
 Basic grid is 2,00 mm. The minimum PCB spacing is 25 mm.
 The connector consists of 6 terminal blocks (2x6 position), a shroud and a two piece plastic cover.

Also referring to GS-20-308.

3.1.2 Approved cables

See GS-12-308.

3.2 INSTRUCTION

3.2.1 Cable preparation

3.2.1.1 For PRODUCT 10013881-201LF (Without ground devices)

- Cut the cable.




fig.1

- Remove outer jacket
- Ensure conductors are not damaged during cable preparation



fig.2

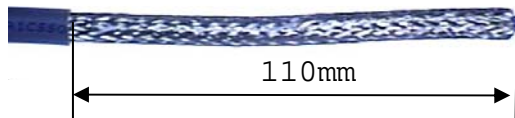
Go to chapter 3.2.2

| | | | |
|---|---|--------------------------------------|----------------------|
|  | TYPE APPLICATION SPECIFICATION | NUMBER GS-20-050 | |
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| | STATUS RELEASED | | |

3.2.1.2 For PRODUCT 10074494-231LF (with GROUND CONTINUITY devices)

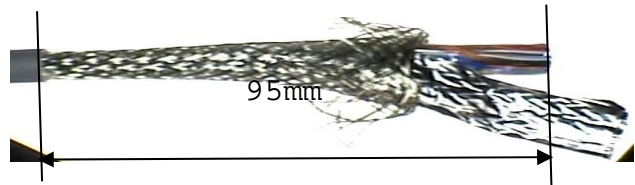
•1- Cut the cable outer insulator

Fig: 1



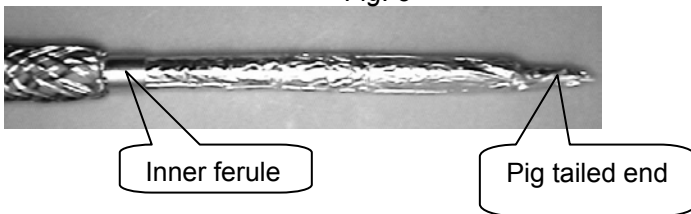
•2- Cut the cable wires ONLY

Fig: 2



•3- Insert Inner ferule over the foil (under the braid)

Fig: 3



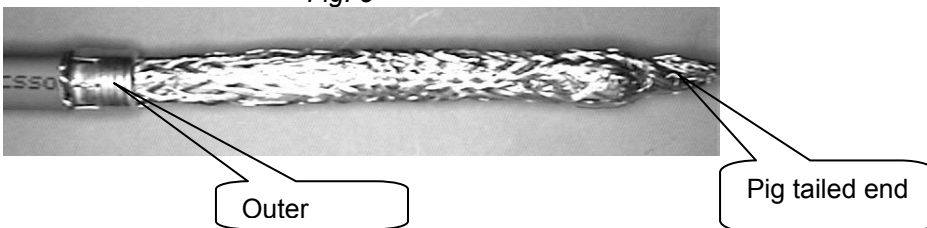
•4- Move back the braid over inner ferule

Fig: 4



•5- Insert Outer ferule over the braid

Fig: 5



**•6- Install crimping tool: HM1Y521A1, and install cable with ferules correctly under the tool –
Operate the crimping with the press**

Fig: 6

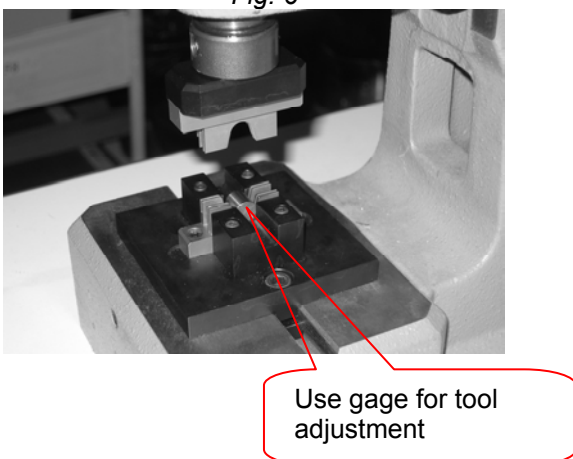
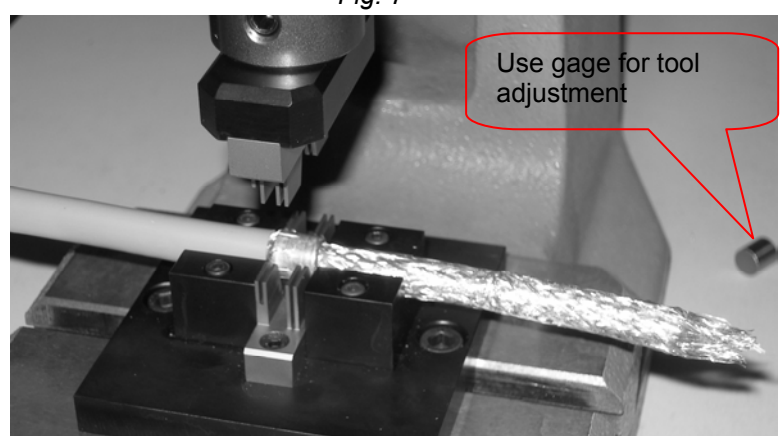



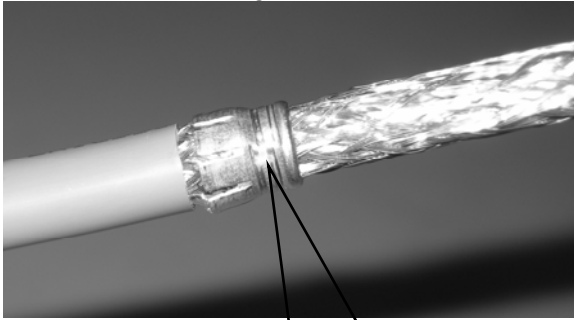
Fig: 7



| | | | |
|---|---|--------------------------------------|----------------------|
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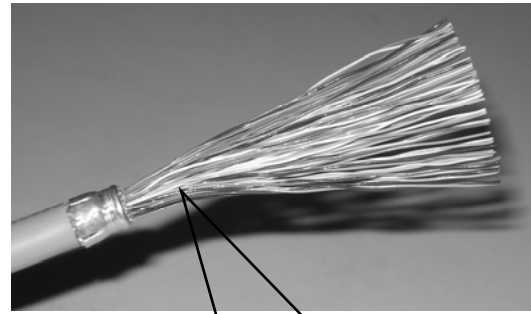
•7- Finish cable preparation

Fig: 8



Cable with crimped ferule

Fig: 9



Cable with Braid and foil correctly cut before cabling terminal blocks

3.2.2 Cable termination

- Terminate the cable with cable termination machine BPY6736PC1UKLF and use KIT BPY6736A1.
This KIT contains:
2 insertion punches BPY6736A41LF.
1 connector nest BPY6736A21LF
(for holding 3 terminal blocks HM1C16D20R10EBLF or HM1C16D20L10EBLF).
- Metral cable clamp BPY6716B18LF, included in machine BPY6736PC1UKLF, needs to be replaced by cable holder BPY6704D3LF and cable support BPY6736B106LF.
- Place the cable in the cable holder BPY6704D3LF and cable support BPY6736B106LF, see fig.3.

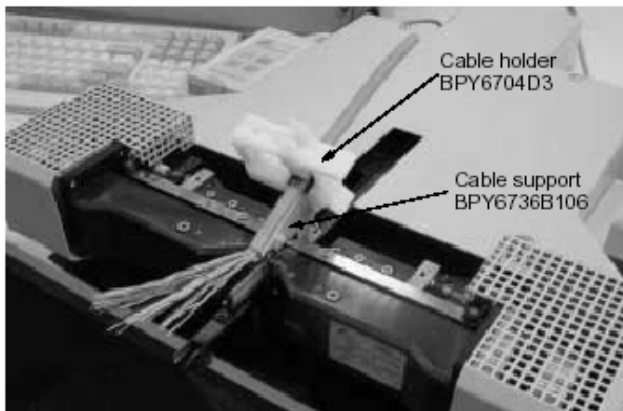



fig.3

Note :
For all cable termination pictures only the version without ground devices is shown

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- Make sure that the end of the outer insulation of the stripped cable, be positioned just to the end of the cable clamp, before clamping the cable.

See arrow on fig.4

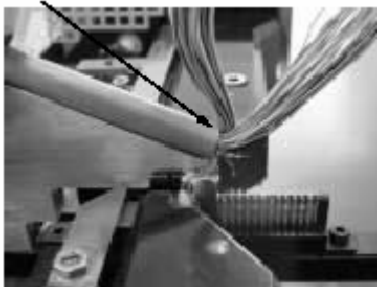


fig.4

Wire termination and use of machine: see instruction manual of cable terminator BPY6736PC1UKLF.

- 3 left or 3 terminal blocks are placed in nest BPY6736A21 and will be terminated. After the first 3 terminal blocks, the other 3 terminal blocks follow the same procedure. See fig.5.



fig.5

Make sure that the wires are correctly terminated/ positioned and not damaged by visual examination.

The copper conductor shall extend at least 0,75 mm beyond the IDC dimples see fig.6.

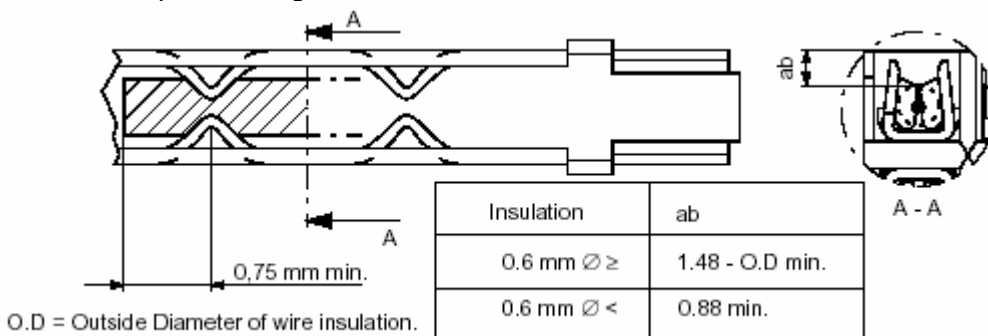



fig.6

| | | | |
|---|--|----------------------------------|--------------------------------------|
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Termination of 3 left and 3 right terminal blocks see fig.7.



fig.7

3.2.3 Shroud assembly

Assembly the 6 terminal blocks in shroud as shown in fig.8
 Make sure the connectors are clicking into the shroud see fig.8
 Make sure there will be no wires damages between the covers.

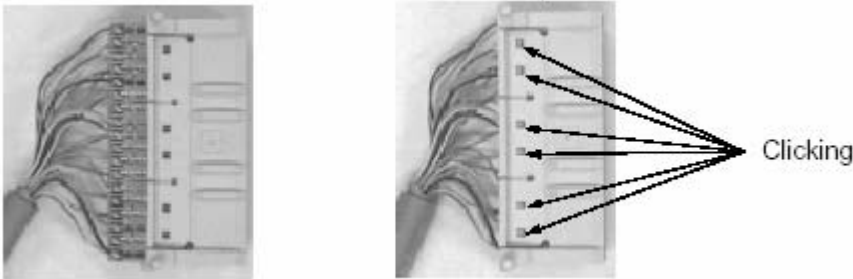


fig.8

3.2.4 Cover assembly

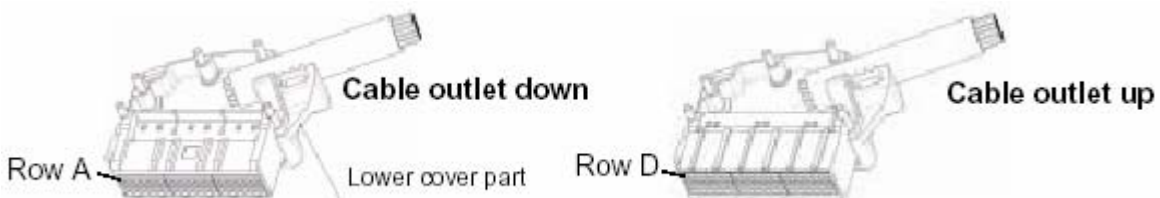



fig.9

Place shroud with terminal blocks correct in lower cover part
 10009610-002LF.

NOTE: Possibility to have the cable outlet in two directions without coding.

| | | | |
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3.2.5 Cold stack operation with tool HM1Y512LF

Step:1

Place the cable assembly(terminated cable connector with pre-assembled shroud and covers)in the lower die of the tool, over the two positioning pins. Make sure the cable assembly is properly closed.

Pre-assembled connector:

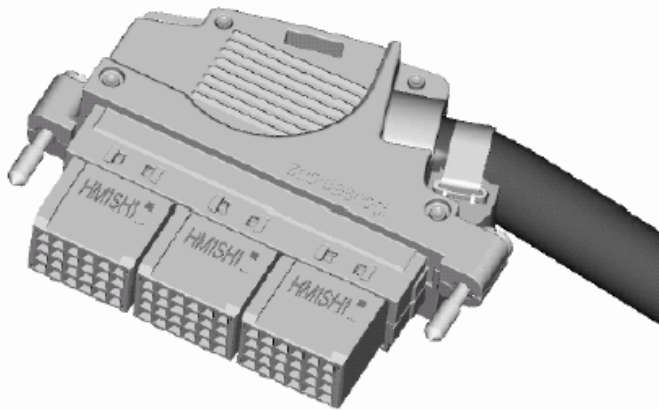



fig.10

Pre-assembled connector placed in cold stacker:



fig.11

| | | | |
|---|--|----------------------------------|--------------------------------------|
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Step 2:

Move the handle from the press down for:

Closing the covers

Cold stacking the 4 pegs on the upper side of the shroud

ig.12

Closed cold stacking tool:




Step 3:

Reverse the presses handle and take away the formed assembly.

Make sure that there are no air gaps between the covers and that the colds stacking are O.K. by visual inspection.

Riveted connector *fig.13*



| | | | |
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3.2.6 Tie wrapping with tool HM1Y489

Insert tie wrap HPTE1637B into the shelf for clamping the cable, see fig.14.



fig.14

Close the stainless steel wrap, see fig.15.



fig.15

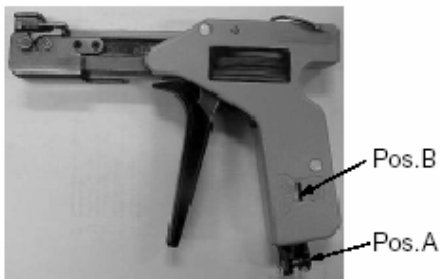


fig.16

Turn lower knob (pos.A) until tool force reaches value 5 (pos B).

| Cable | Force Indication Number on Tool |
|---------------------------------------|---------------------------------|
| 0.4mm,26 AWG, maximum dia 0.65mm . | 5 |


| | | | |
|---|--|----------------------------------|--------------------------------------|
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fig.17

Important

Pull the tie wrap until you feel tension coming up in the tie wrap, then continue gently pulling on the tie wrap with the tool until the tie wrap breaks loose. The tie wrap must be fit nicely around the cable, it may not become a little bit loose at the end of tie wrapping, otherwise the required maximum pull force on the cable can not be guaranteed. No sharp edge is allowed.

Finished connector.

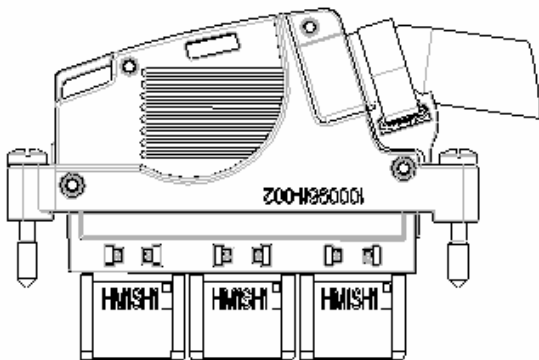



Fig.18

| | | | |
|---|---|----------------------------------|--------------------------------------|
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3.2.7 Reparability

The covers and shroud are not repairable.

Tie wrap HPTE1637BLF, can be repaired. First you need to cut the existing tie wrap, then put the new tie wrap between cover and old tie wrap, see fig.18, and pull out the old tie wrap. Insert the new tie wrap and fasten it with hand tool HM1Y489LF as explained in clause 3.2.6

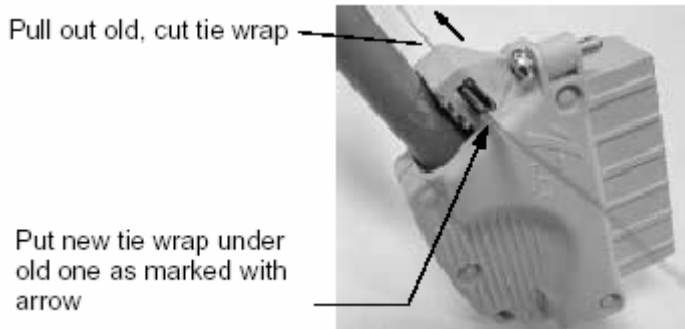



fig.19

3.3 Tool Overview

| Step Definition | Tool P/N |
|---|--|
| 3.2.2 Cable Termination Preparing for cable termination | HM1Y521A1 (ferule crimping tool specific for grounded version 10074494-231LF)) BPY6736PC1UKLF(Machine) , BPY6736A1LF(Kit), BPY6704D3LF(Cable Holder), BPY6736B106LF(Cable Support) |
| 3.2.5 Cold Stack Operation Cold stacking | HM1Y512LF |
| 3.2.6 Tie Wrapping Tool Tie Wrapping | HM1Y489LF |

| | | | |
|---|---|--------------------------------------|----------------------|
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4 DOCUMENT REVISION INFORMATION

| REV | PAGE | DESCRIPTION | EC # | DATE |
|-----|----------|--|-----------|------------|
| A | ALL | NEW DOCUMENT | LS05-0014 | 01-14-2005 |
| B | ALL | NEW LOGO | LS06-0109 | 07-04-2006 |
| C | ALL | UPDATE DOCUMENT FOR LF PN ADDED | LS07-0045 | 02-15-2007 |
| D | 17 TO 26 | UPDATE SPECIFICATION ADD CABLING FOR KIT 10074494-213LF | LS07-0221 | 08-28-2007 |