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TITLE Minitek Power CEM-5 12V-2x6 Wire to Board Connectors		PAGE 1 of 14	REVISION B
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1.0 OBJECTIVE






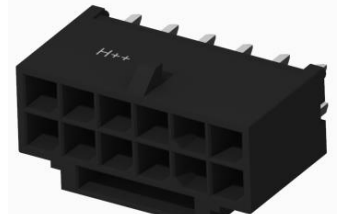
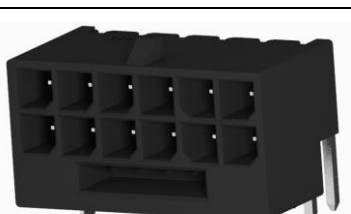
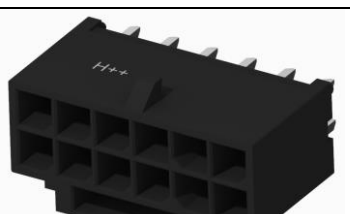
This specification provides information and requirements regarding customer application of Minitek Power CEM-5 12V-2x6 Wire to Board Connectors. This specification is intended to provide general guidance for application process development. It is recognized that no single application process will work under all customer scenarios and that customers will develop their own application processes to meet their needs. However, if these application processes differ greatly from the one recommended, AICC cannot guarantee results.

2.0 SCOPE

This specification provides information and requirements regarding customer application of Minitek Power CEM-5 12V-2x6 Wire to Board Connectors.

3.0 GENERAL

This document is meant to be an application guide. If there is a conflict between the product drawings and specifications, the drawings take precedence.

Series / Drawing Number	Product image	Series / Drawing Number	Product image
10160920 10174235		10164298	
10163894		10166200	
10164279		10161122 10175203	
10164297		10171623*	

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10176941		10161719	
10168565		10132447	
10171526		10166702	
10161952			

(*)Not yet tooled up

4.0 DRAWINGS AND APPLICABLE DOCUMENTS.

- AFCI PRODUCT SPECIFICATION GS-12-1706
- AFCI PRODUCT DRAWINGS
 - CEM 5 12V-2x6 Header with Power & Signal : 10160920, 10174235, 10163894, 10164279, 10164297, 10164298, 10166200, 10161122, 10175203 & 10171623.
 - CEM 5 12V-2x6 Receptacle Housing with Power & Signal : 10161719, 10168565 & 10171526
 - Receptacle HCC crimp terminal : 10132447 & 10166702
 - CEM 5 12V-2x6 Receptacle Signal Terminal : 10161952

Product drawings and **AICC's GS-XX-XXX** Product Specification are available at www.amphenol-icc.com In the event of a conflict between this application specification and the drawing, the drawing will take precedence. Customers are advised to refer to the latest revision level of Amphenol FCI product drawings for appropriate details.

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5.0 APPLICATION REQUIREMENTS

- 5.1 The wires in (Table 1) are the wiring information for use with crimp terminals 10132447 and 10161952.

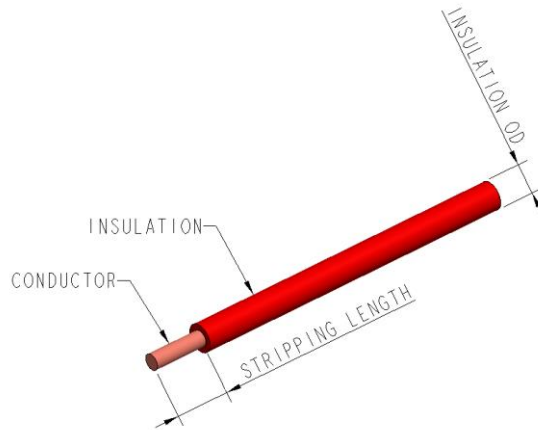


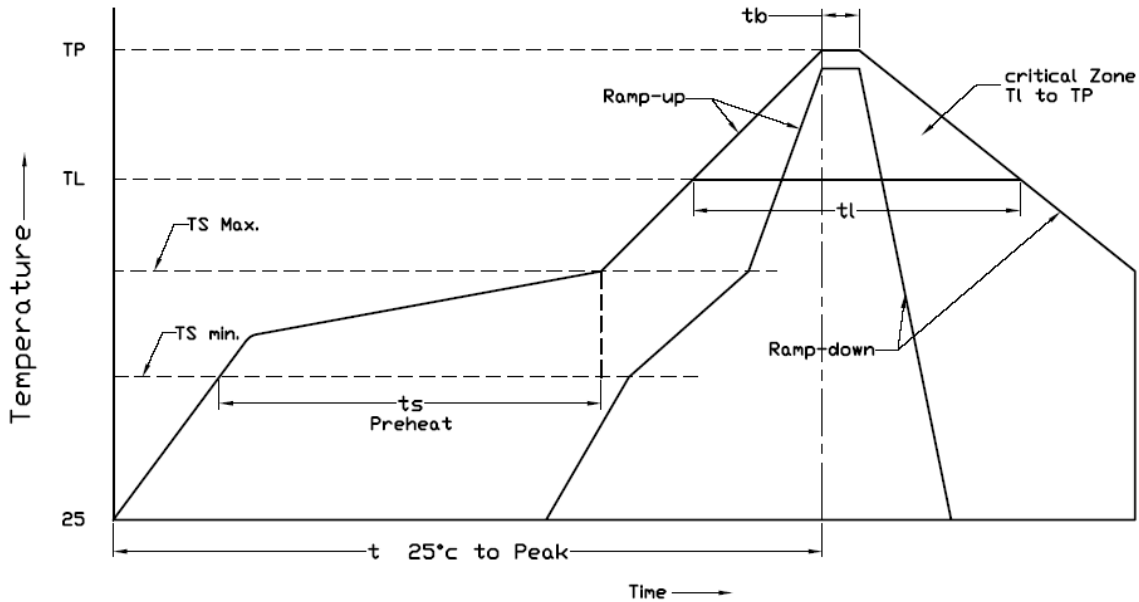
Figure-2

Table 1

Crimp Terminal Part Number	Applicable Wire Gauge	Insulation Outside Diameter (mm)	Strip Length (mm)
10132447-00XLF	16-20AWG	2.20 Max.	2.50 – 3.00
10161952-Y210LF	28 AWG	1.27 Max	1.00 – 1.05

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5.2 The header housing will withstand exposure to 260° peak temperature for 10 seconds in a convention reflow oven.



Profile Feature	Pb-Free Assembly
Average ramp-up rate (TL to TP)	3°C/ second Max.
Preheat - Temperature Min. (TS Min.) - Temperature Max. (TS Max.) - Time (Min. to Max.) (ts)	150°C 200°C 60-180 seconds
TS Max. to TL - Ramp-up rate	3°C/ second Max.
Preheat - Temperature Min. (TL) - Time (tl)	217°C 60-150 seconds
Peak Temperature (TP)	260 +0/-5°C
Time within 5°C of actual Peak Temperature	10 seconds
Ramp-down Rate	6°C/ second Max.
Time 25°C to Peak Temperature	8 minutes Max.

Note : All temperature refer to topside of the package, measured on the package body surface

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6.0 APPLICATION TOOLING

There are some commercial crimping tools available for crimping terminals. Select the models listed in Table 2:

Table 2: Crimping Tooling List

Crimping Applicator

Semi-Auto crimping machine	Fully-Auto Pneumatic Crimping Applicator	Fully-Auto Mechanical Crimping Applicator	Applicable Terminal P/N
Press P/N			
10157923-001			
Applicator P/N	Applicator P/N	Applicator P/N	
10159974-002	10159975-002	10159976-002	10132447-00XXLF
10165507-001	10165508-001	10165509-001	10161952-Y210LF

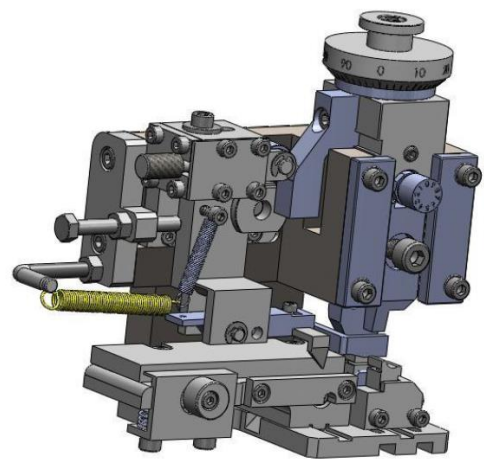
(* Fully-Auto Pneumatic and mechanical applicators are suitable in Semi-auto Crimping machines.

Hand crimping tool

Hand Crimping Tool P/N	Applicable Terminal P/N
10159387-002	10132447-00XXLF
10163639-001	10161952-Y210LF

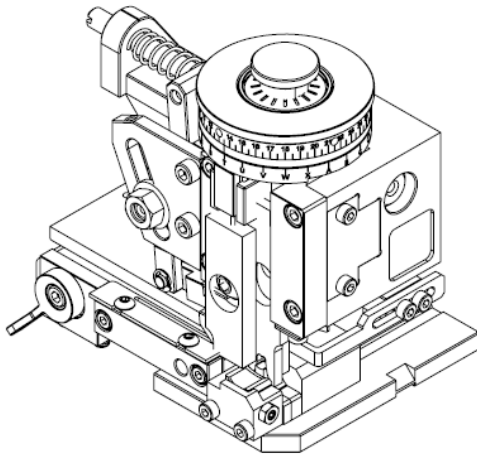


10157923-001

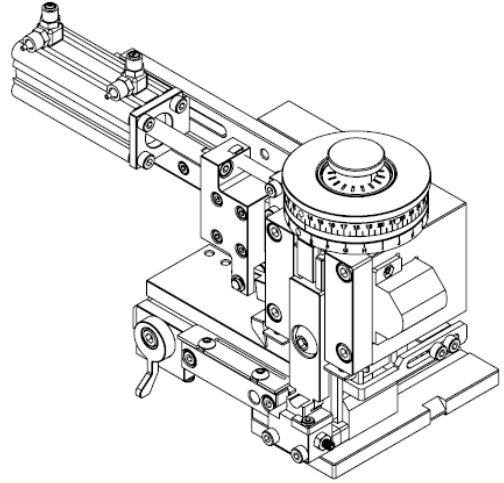


10159974 & 10165507

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10159975 &



10159976 &

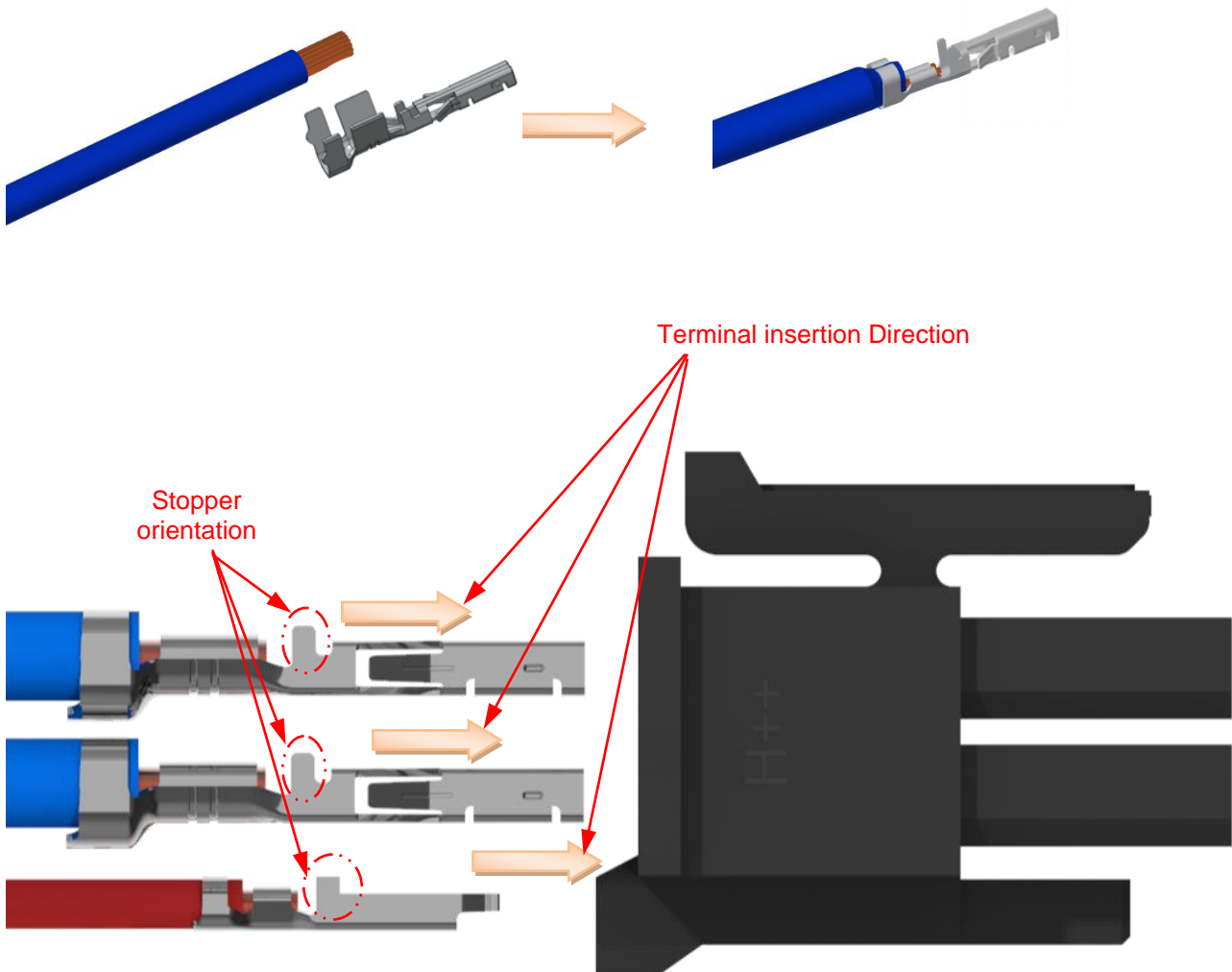


10159387 & 10163639

7.0 APPLICATION PROCEDURE

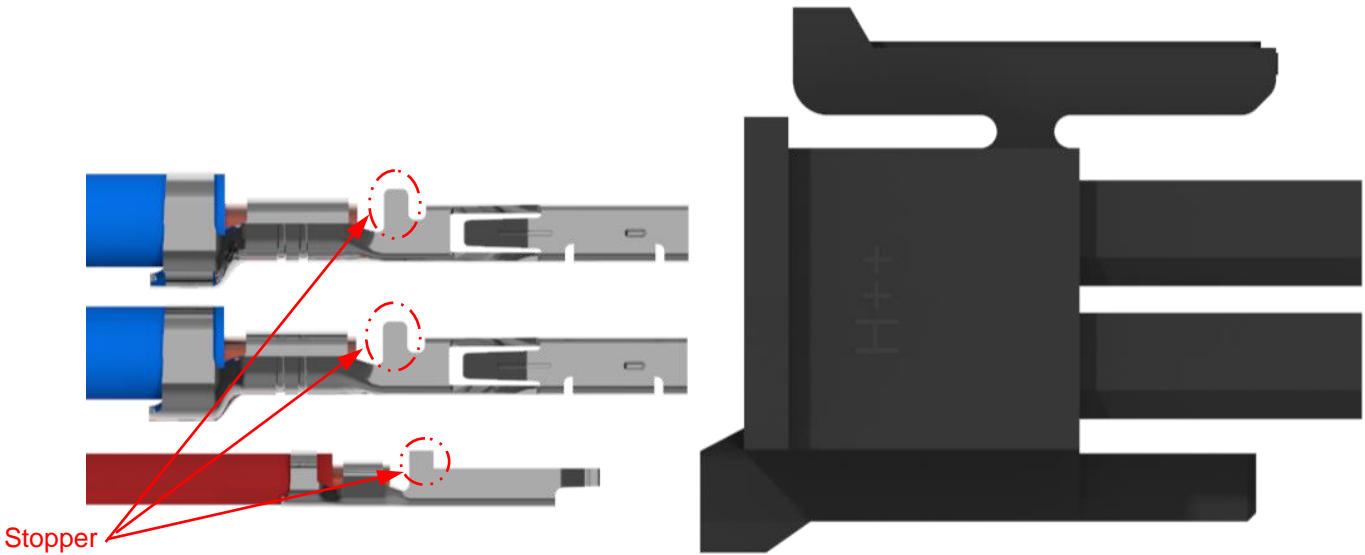
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7.1 Strip the wire (Table 1) Crimp wire and inserting to housing. No insertion tool is required.
(Same for 10132447-1X1XLF, 10161952-YX10LF)

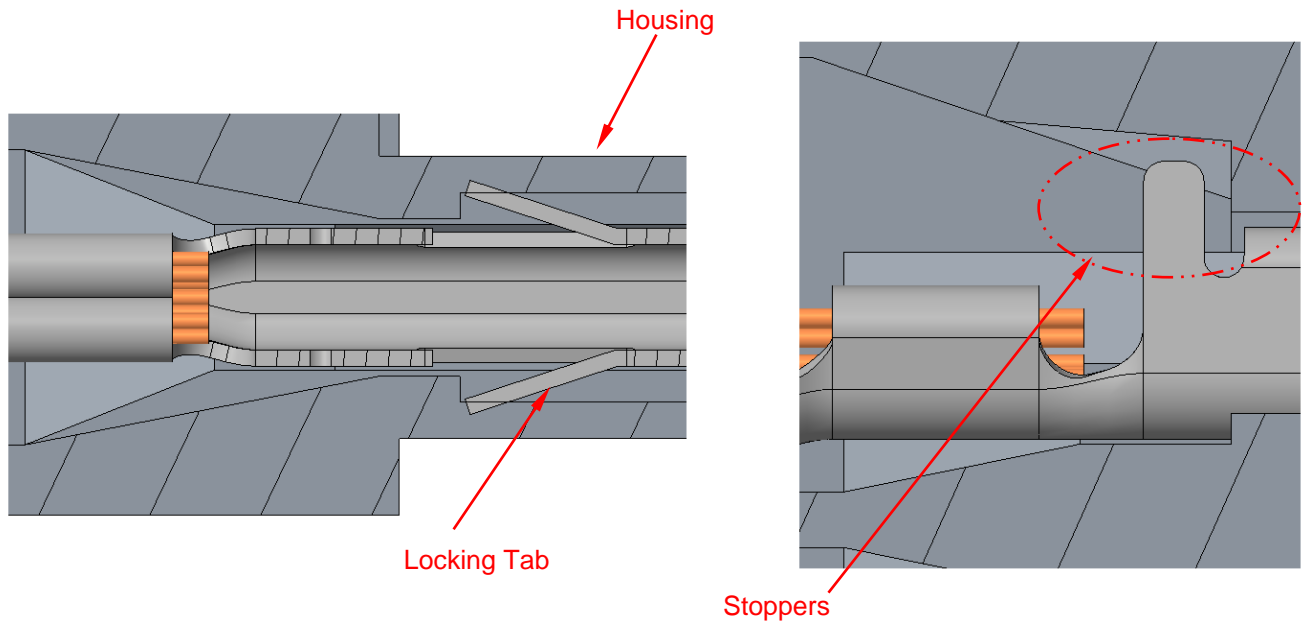


7.2 Make sure the stoppers on the terminals are always upwards for both rows: towards the lock (latch) of Housing. (Same for 10132447-1X1XLF, 10161952-YX10LF)

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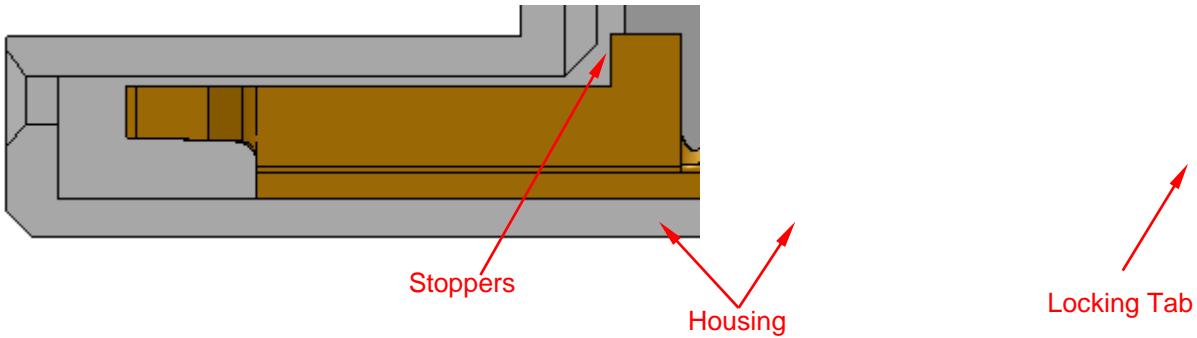


7.3 Insert the terminal into Housing until stopped by Housing. Then locking tabs will be engaged the retention shoulder and prevent back out during mating. Pull back the wire slightly and ensure the terminal is fully seated on the Housing.



For Power Terminals

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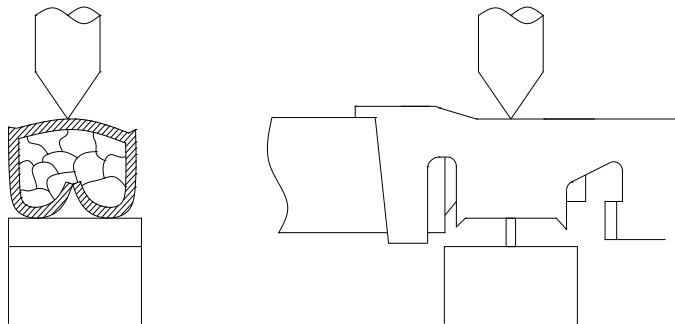


For Signal Terminals

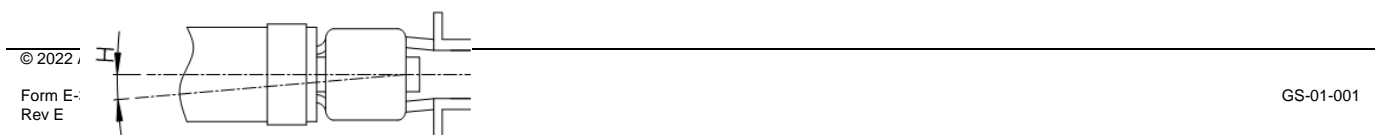
8.0 POST- APPLICATION INSPECTION PROCEDURES

8.1 Crimp height and width measurement:

8.1.1 Use Crimp Height Type Micrometers to measure crimping height.



8.2 Required crimping dimensions, crimp height and width for different wire AWG are defined in Table 3, Table 4 and Table 5.



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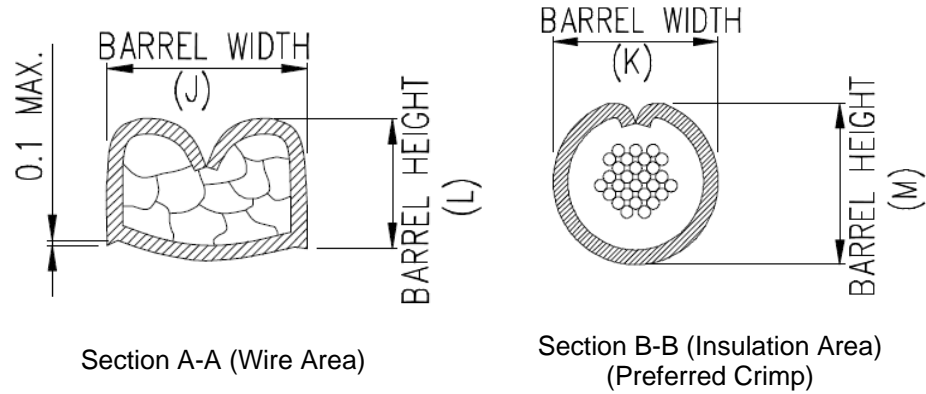


Table 3 (unit: mm)

Item		Requirement	Note
Insulation position	C	20% to 75% of Inspection window	Insulation and wire should be visual in this area
Front bell mouth	D	0.40 mm max.	
Rear bell mouth	E	0.40 mm max.	
Extruded wire length	F	0.90 Max.	
Bend up / down	G	±3° max.	
Bend right / left	H	±3° max.	

Table 4 (Unit: mm) For Hand crimping tool

Series	Part Number	Tool Part Number	AWG Range	Conductor		Insulation	
				Crimp Height (mm)	Crimp Width (mm)	Crimp Height (mm)	Crimp Width (mm)
10132447	10132447-00XXLF	10159387-002	16	1.20 – 1.30	1.80 – 1.90	2.35 Ref	2.40 Ref
			18	1.05 – 1.15	1.80 – 1.90	2.35 Ref	2.10 Ref
			20	1.00 – 1.10	1.60 – 1.70	2.15 Ref	1.75 Ref
			18	1.03 – 1.09	1.74 – 1.84	2.44 Ref	2.15 Ref
			20	0.91 – 0.97	1.76 – 1.86	2.01 Ref	1.77 Ref
10161952	10161952-Y210LF	10163639-001	28	0.55-0.65	0.96-1.06	1.53 Ref	1.46 Ref

* When using hand crimping tool, insulation crimping height and width in this table are references only, because the range of wires, strands and insulation OD will affect the actual crimping height.

** Pullout force should be performed to check the hand crimping tool.

Table 5 (Unit: mm) For Semi-automatic Crimping machine

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Series	Part Number	Tool Part Number	AWG Range	Conductor		Insulation	
				Crimp Height (mm)	Crimp Width (mm)	Crimp Height (mm)	Crimp Width (mm)
10132447	10132447-00XXLF	10159974-002 10159975-002 10159976-002	16	1.13 – 1.19	1.95 – 2.05	2.60 Ref	2.40 Ref
			18	1.04 – 1.10	1.95 – 2.05	2.50 Ref	2.40 Ref
			20	0.93 – 0.99	1.95 – 2.05	2.45 Ref	2.40 Ref
			18	1.03 – 1.09	1.76 – 1.86	2.44 Ref	2.30 Ref
			20	0.91 – 0.97	1.76 – 1.86	2.01 Ref	2.30 Ref
10161952	10161952-Y210LF	10165507-001 10165508-001 10165509-001	28	TBD*	TBD*	TBD*	TBD*

* Will be updated.

8.3 Pullout force measurement:

- 8.3.1 After crimping, pullout force measurement should be applied to ensure the performance. Follow test procedure of GS-12-1706.
- 8.3.2 Apply an axial pullout force on the wire at a rate of 25 ± 6 mm.
- 8.3.3 Pullout force should not be less than those listed in Table 5.

Table 6 (unit: N)

Wire AWG	AWG 16	AWG 28
Wire Pullout Force	68.8 N	8.9 N

8.4 Visual

8.5 Inspection:

- 8.5.1 No damage, deformation on locking tabs, contact area or other portion of the terminals.
- 8.5.2 Insulation should not be crimped into wire barrel.
- 8.5.3 Wire should not be cut-off and insulation should not be broken after crimping process.

9.0 REPAIR TOOLING

The tool needed for extracting terminals from Housing is defined in Table 7:

Table 7

Tool P/N	Tool Description	Applicable Terminal P/N
FCI 10129274-030LF	Terminal extract tool	10132447 & 10166702
Under Development		10161952

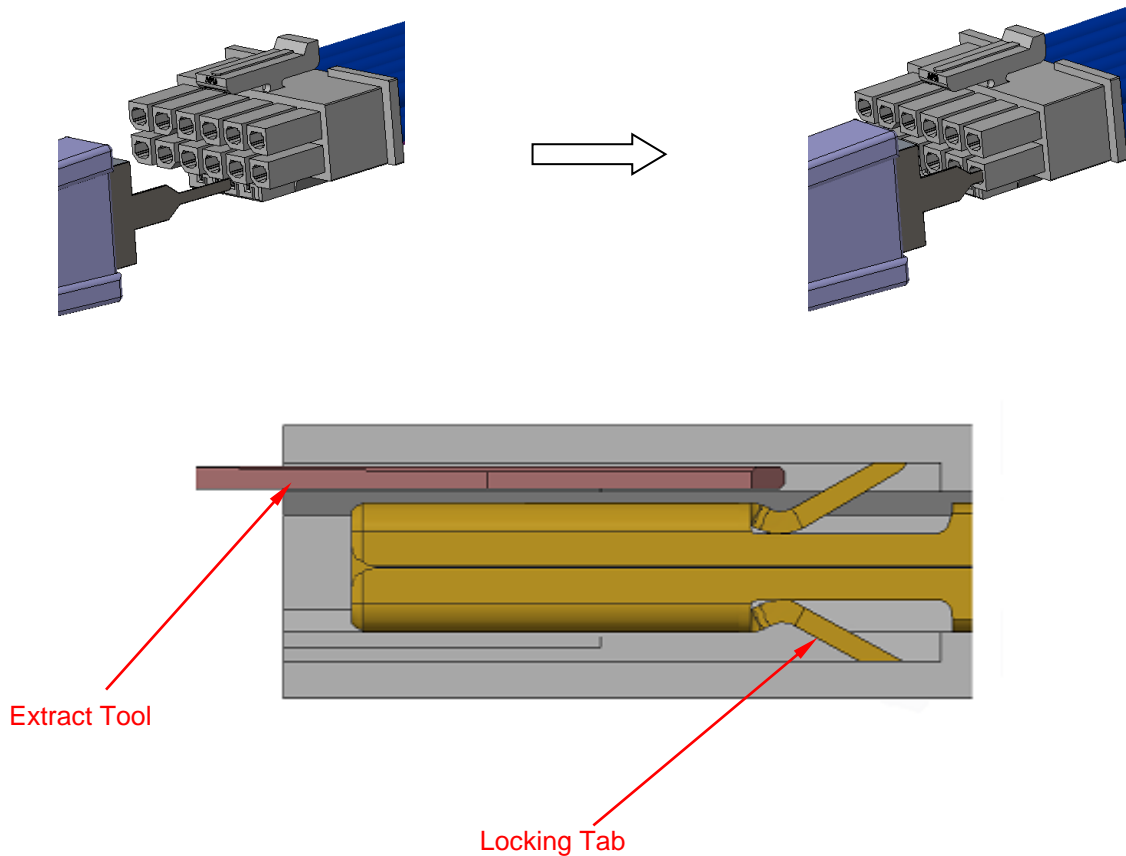


10.0 REPAIR / REMOVAL PROCEDURE

- 10.1 Use the extract tool 10129274-030LF to replace or repair individual terminal which is in the Housing.

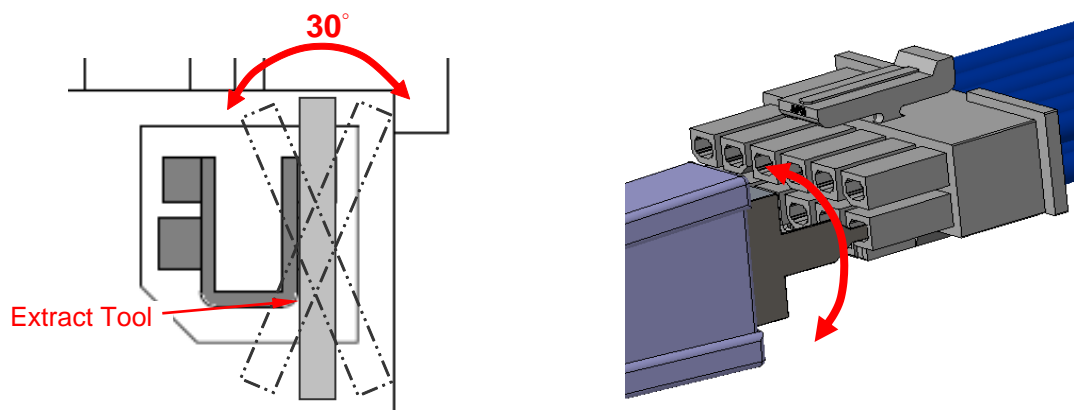
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10.1.1 Insert the extract tool on one side of the terminal until it stops.



10.1.2 Rotate the tool clockwise and then counter clockwise about 30 degrees in each direction.

10.1.3 Repeat above steps on the opposite side of terminal. Depress locking tab on the terminal and pull out terminal from housing.

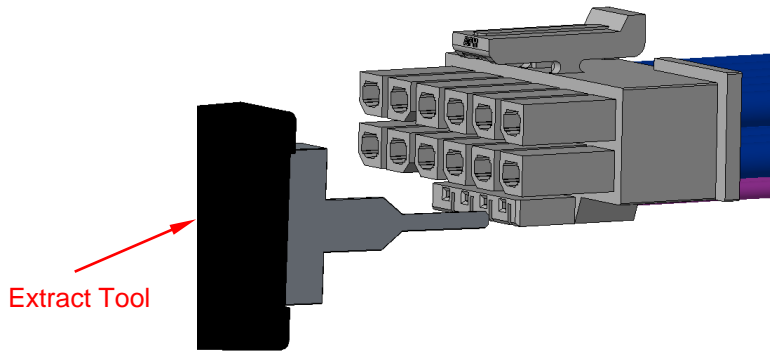


10.2 The locking tabs, after extracted from housing, will be damaged and the terminal is not reusable. *(Extraction tool shown in below section are under development)*

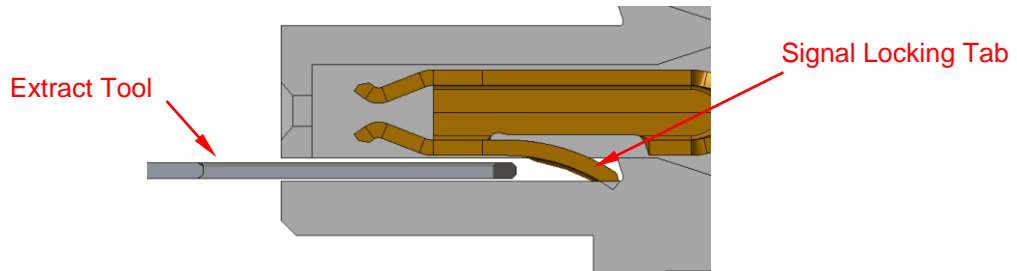
10.3 Use the extract tool to replace or repair individual of signal terminal (10161952) which is in the Housing (10161719).

10.3.1 Insert the extract tool on slot in the signal side of the receptacle terminal until it stops.

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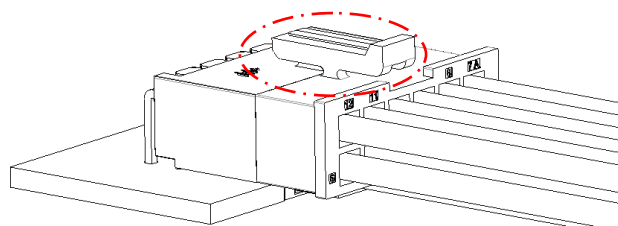


10.3.2 Depress locking tab on the terminal and pull out terminal from housing.



11.0 OTHERS

11.1 During connectors mating, make sure latch on the receptacle wire connectors is fully secured to the lock on plug wire connectors or board connectors.



RECORD RETENTION

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A	All	New Release		23-June-2021
B	All	Updated connector & crimping tool part number, also updated crimp dimension Added reflow profile details (5.2) Removed 10134160 and changed related images Added New series	ELX-I-51843	15-June-2024