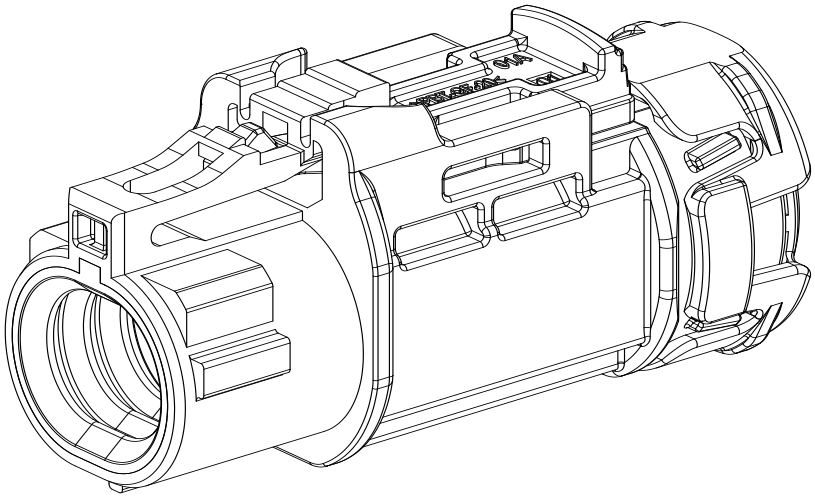
APTIV

Assembly Manuals

HF-Plug Housing

1-port H-MTD waterproof



D

EN; Rev.03, 08/2024

AS35444531

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Document Approval

Issued by:	Checked by:	Approved by:
Date: 05.05.2020	Date: 30.05.2022	Date: 17.11.2023
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Function: PE	Function: PEM	Function: PEM

Revision History

Revision	Modifications	Name	Date	ECN
01	initial release	Schmidt	17.11.2023	
02	page 6: wire diameter added page 15: note added	R. Schmidt	19.04.2024	
03	page 6: SWS version added page 7: PN's added	R. Schmidt	01.08.2024	

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1. Scope

This specification describes the general processing for:

Waterproof Female housing for H-MTD Rosenberger female terminal system

- Terminal application and testing at harness maker plant
- Connector assembly at OEM

1.1 Description of the connector design

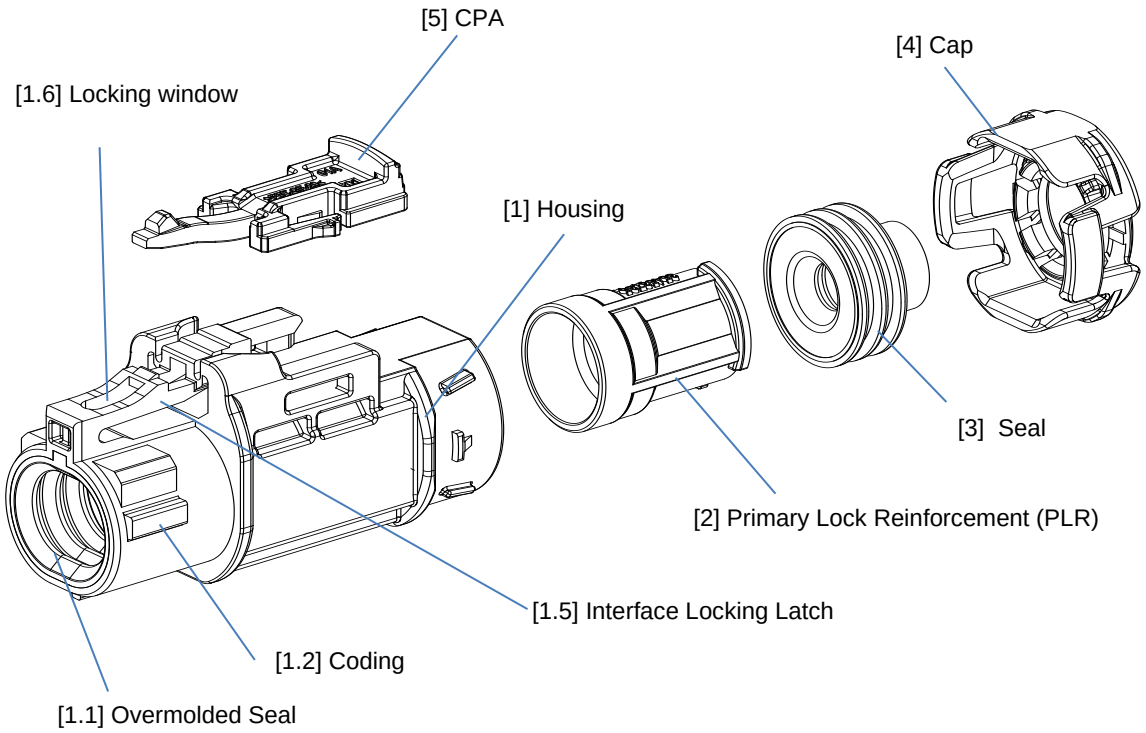


Fig.1 : Exploded view of the connector

The connector is a multiple-component part. It comprises a Housing [1] with overmolded seal [1.1] and locking latch [1.5] for counterpart, a Primary Lock Reinforcement (PLR) [2], a Single Wire Seal [3], a Cap [4], and an optional Female Connector Position Assurance (CPA) [5].

The terminal system is primarily locked in the housing [1] and additionally reinforced by using a PLR [2].

The Housing [1] along with the PLR [2], Seal [3] and the Cap [4] are delivered separately and assembled with the terminal by the harness maker.

The Female seals [1.1] and [3] of the connector are designed circular and made by self- lubricating Liquid-Silicone-Rubber.

Details like dimensions, operation spaces, also bill of material must be found in the PRODUCT DRAWING.

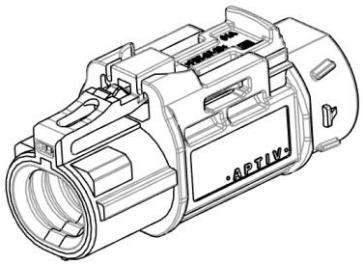
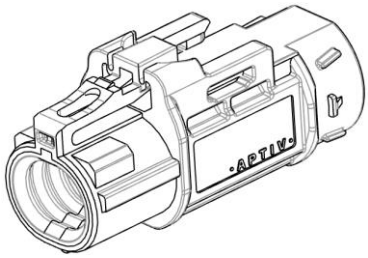
The connector plugging and removal can be done manually. The terminal insertion can be done manually or automated.

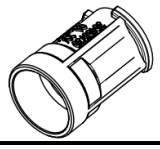
The technical data and performance can be found in the PRODUCT SPECIFICATION.

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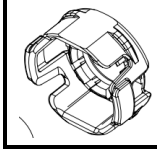
1.2 Product overview

1.2.1 Connector housing

	1-Port H-MTD HF-Plug Housing – waterproof		
	Coding:	**APTIV PN.:**	**CPA (Y/N)**
	A	35610597	Y
	B	35610598	Y
	C	35610599	Y
	D	35610600	Y
	E	35610601	Y
	F	35610602	Y
	Z	35610603	Y
	A	35512451	N
	B	35512457	N
	C	35512483	N
	D	35512484	N
	E	35512485	N
	F	35512486	N
	Z	35512487	N

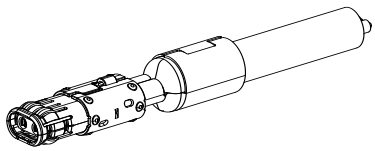
	PLR
	**APTIV PN.:**
	35453735

	SWS		
	For wire OD:	**APTIV PN.:**	
	~ Ø4mm	15324996	(02)
	~ Ø3.2mm	15324994	(03)

	Cap
	**APTIV PN.:**
	35453736

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1.2.2 Suitable counterparts



H-MTD female terminal				
Wire OD:	**APTIV DWG.:**	**Supplier PN.:**	**Supplier**	
~ Ø4mm	35648199	-	APTIV	(02)
~ Ø4mm	35847445	-	APTIV	
~ Ø3.2mm	35772221	-	APTIV	(03)
~ Ø4mm	35563136	E6K10A-1CAZ5	RT	

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2. Applicable Documents

The following documents are part of this specification. In case of conflict between the requirements of this specification and the product drawing or between the requirements of this specification and the referenced documents, the product drawing shall take precedence.

2.1 APTIV documents

Product Drawings		
APTIV Drawing no.	**Designation**	
35444531	1-Port H-MTD HF plug – waterproof Female Connector	
35648199	H-MTD Female Terminal	

Product Specifications		
APTIV Specification no.	**Designation**	
PS.35444531	Product Specification *1-Port H-MTD HF plug - waterproof*	
t.b.d.	Interface Specification *1-Port H-MTD HF plug - waterproof*	

Application Specifications		
APTIV Specification no.	**Designation**	
AS.35444531	Application Specification *1-Port H-MTD HF plug - waterproof*	-

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Test Reports		
APTIV Test Report no.	**Designation**	
TR321625	DV testing *VW 75174, PG0, PG1, PG4, PG6, PG7, PG8, PG21, PG23* *1-Port H-MTD HF plug – waterproof*	Customer limited version
TR321626	PV testing *VW 75174, PG0, PG1, PG3, PG4, PG6, PG7, PG8, PG9, PG13, PG17, PG20, PG21, PG22, PG23, PG28* *1-Port H-MTD HF plug - waterproof*	Customer limited version

2.2 Other documents

Internal Dokuments		
APTIV Document no. ***Dokument Nr.***	**Date** ***Datum***	**Designation** ***Bezeichnung***
TS.35444531	2020-08	TOLERANCE STUDY *1-Port H-MTD HF plug - waterproof*

External drawings and –specifications		
External spec. no.	**Revision**	**Designation**
TAB.026.004.CH	04/2022	Volkswagen 1-Port H-MTD HF plug – waterproof
VW 75174	2018-10	Motor Vehicle connectors - Tests
DIN EN 60664-1		Spannungsfestigkeit
RN_128-01	500	Rosenberger H-MTD interface, waterproof
777-S-002-1-Z01		USCAR-EWCAP single interface, waterproof 10GB Ethernet connector, 100ohm differential pari
t.b.d.		APTIV Interface specification

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3. Assembly notes

This assembly notes do not exempt the particular finisher from his duty to check his assembly equipment with regard to a correct assembly of the product.

3.1 Storage conditions

A chemical or mechanical damage of the product is not allowed. The product shall not be exposed to environmental pollution during storage and assembly.

Storage only allowed in closed compartments. Parts have to be acclimatized sufficiently prior to installation.

Storage conditions before assembly	
Storage temperature:	+18°C … +55°C
Relative humidity:	45% … +85%
Atmospheric pressure:	860hPa … 1060hPa
Storage time:	≥ 24h

3.2 Assembly conditions

The product and it‘s single components should not be damaged during the assembly. It is not allowed to soil the product with oil, grease, particles (as swarf, dust) or something equivalent. A correct function cannot be guaranteed otherwise. The Connector is designed for max. 3 mating cycles. After more mating-/ unmating steps, the locking latch will loose its mechanical performance.

Assembly condition	
Permissible assembly temperature:	0°C … +45°C

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4. Harness assembly

4.1 Delivery condition

At delivery condition, the housing [1], PLR [2], Seal [3] and the Cap [4] are delivered separately and assembled with the terminal by the harness maker (see Fig.4).

THIS PRODUCT IS NOT CATEGORIZED AS AN APPEARANCE ITEM

Minor molding process imperfections including, but not limited to, flow marks, color blemishes, gate marks and soft flashes that do not affect the fit, form or function of the part are permissible.

Minor mechanical defects in non-functional areas that do not have effect on the safety, ergonomic fit or function are permissible.

The link of the locking arm to the housing is only used for the production process and has no function. If one or both links are torn off in the delivery condition, this has no effect on the assembly process.

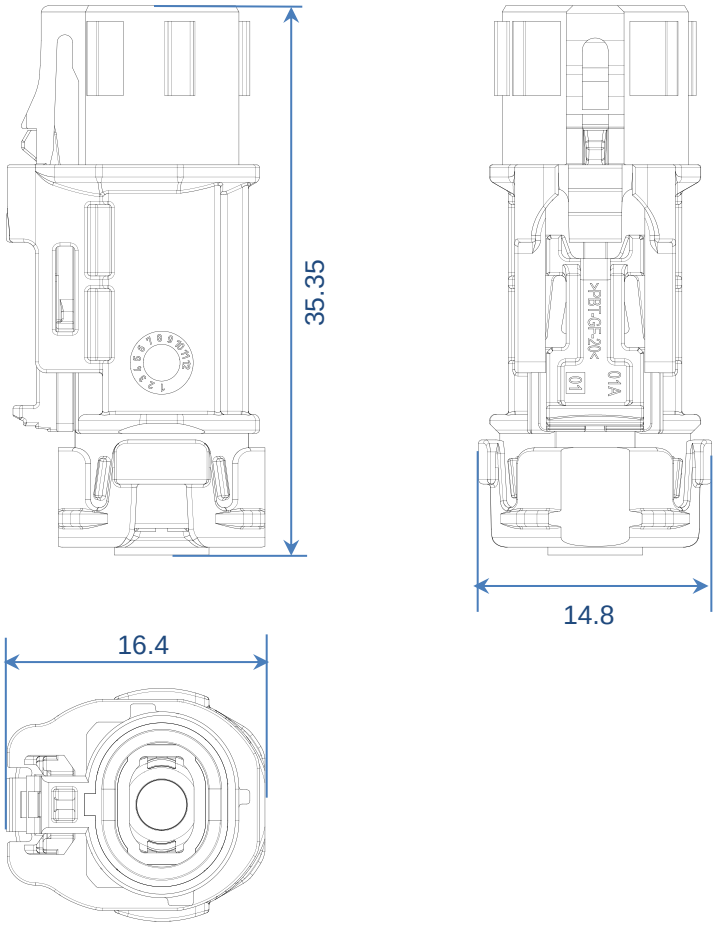


Fig.2: Main dimensions (the product drawing is binding)

4.2 Harness assembly steps

This runoff describes schematically the assembly steps of the product described in chapter 1. The used figures are schematic.

Check connector not being damaged. Don't process a damaged connector!

4.2.1 Terminal load procedure

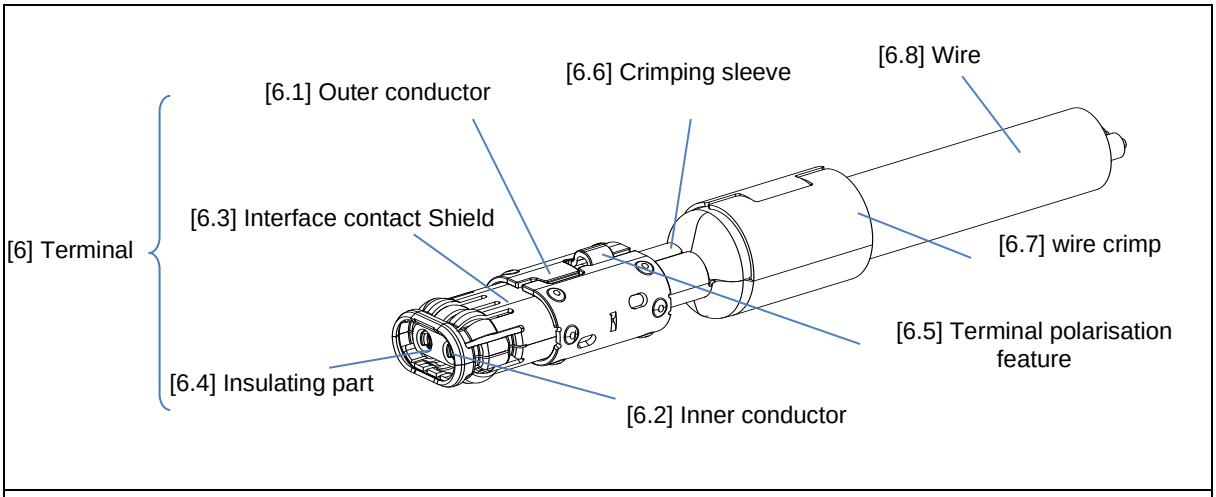
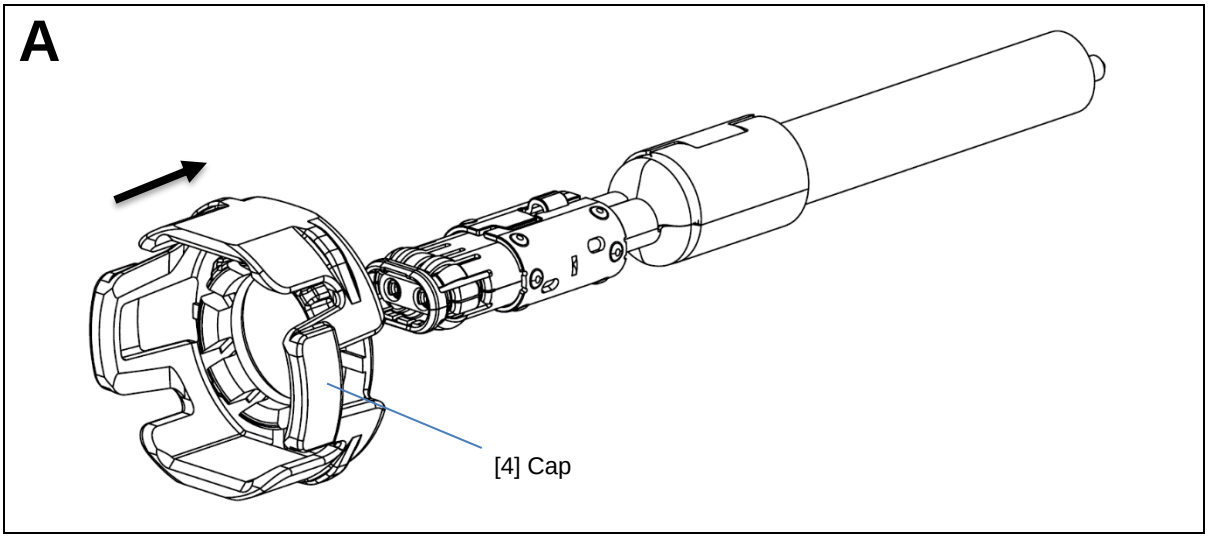


Fig. 3: Terminal build

4.2.1.1 Cap, Seal and PLR insertion



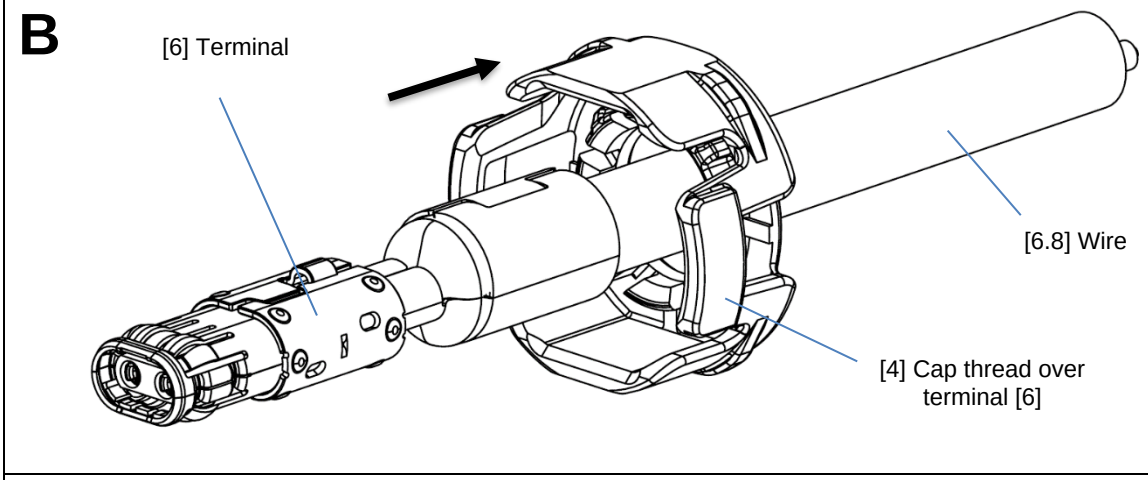
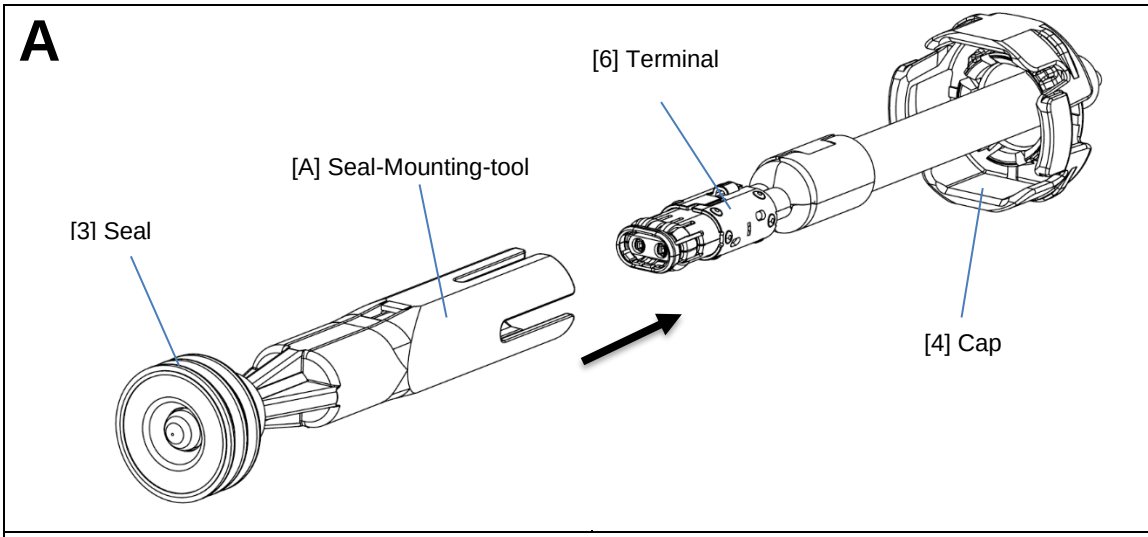


Fig.4: Cap insertion procedure



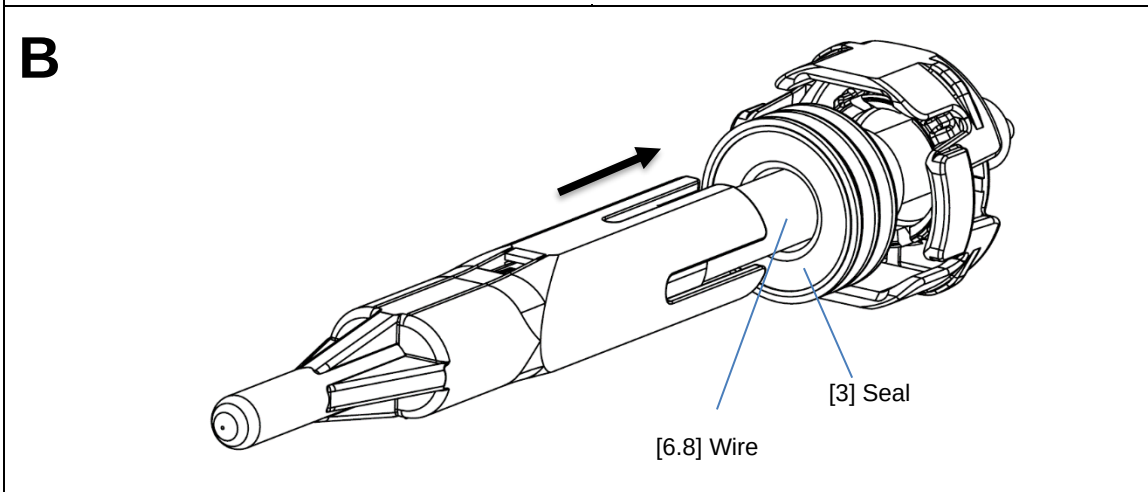


Fig.5: Seal insertion procedure

Thread the Cap [4] over cable, see fig.4. Put the Seal [3] on the tip the Seal-Mounting-Tool [A] and push it further over onto the wire terminal [6]. Push the Seal over the Seal mounting tool until it is completely placed on the cable behind the wire crimp [6.7]. See Fig.5.
Remove the Seal-Mounting-Tool [A] from the terminal [6].

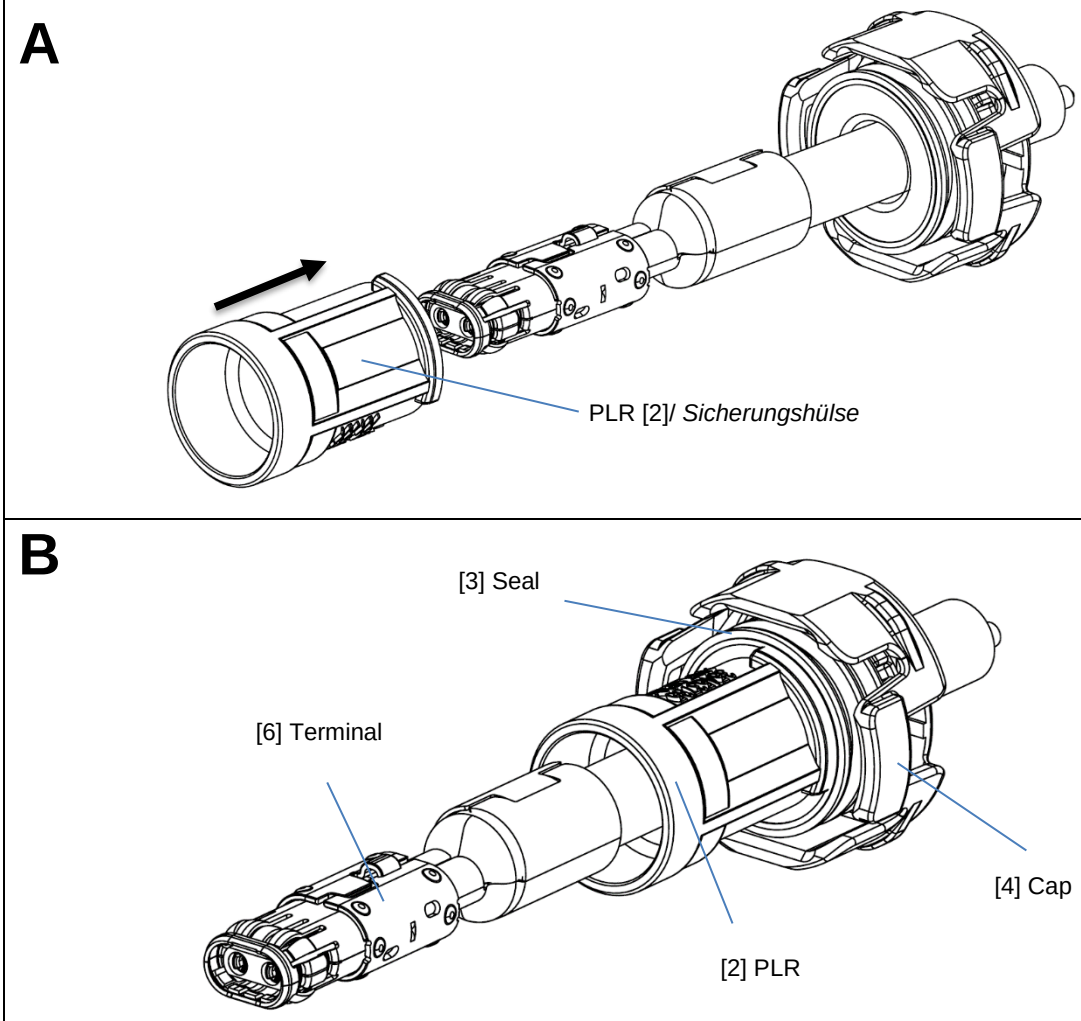
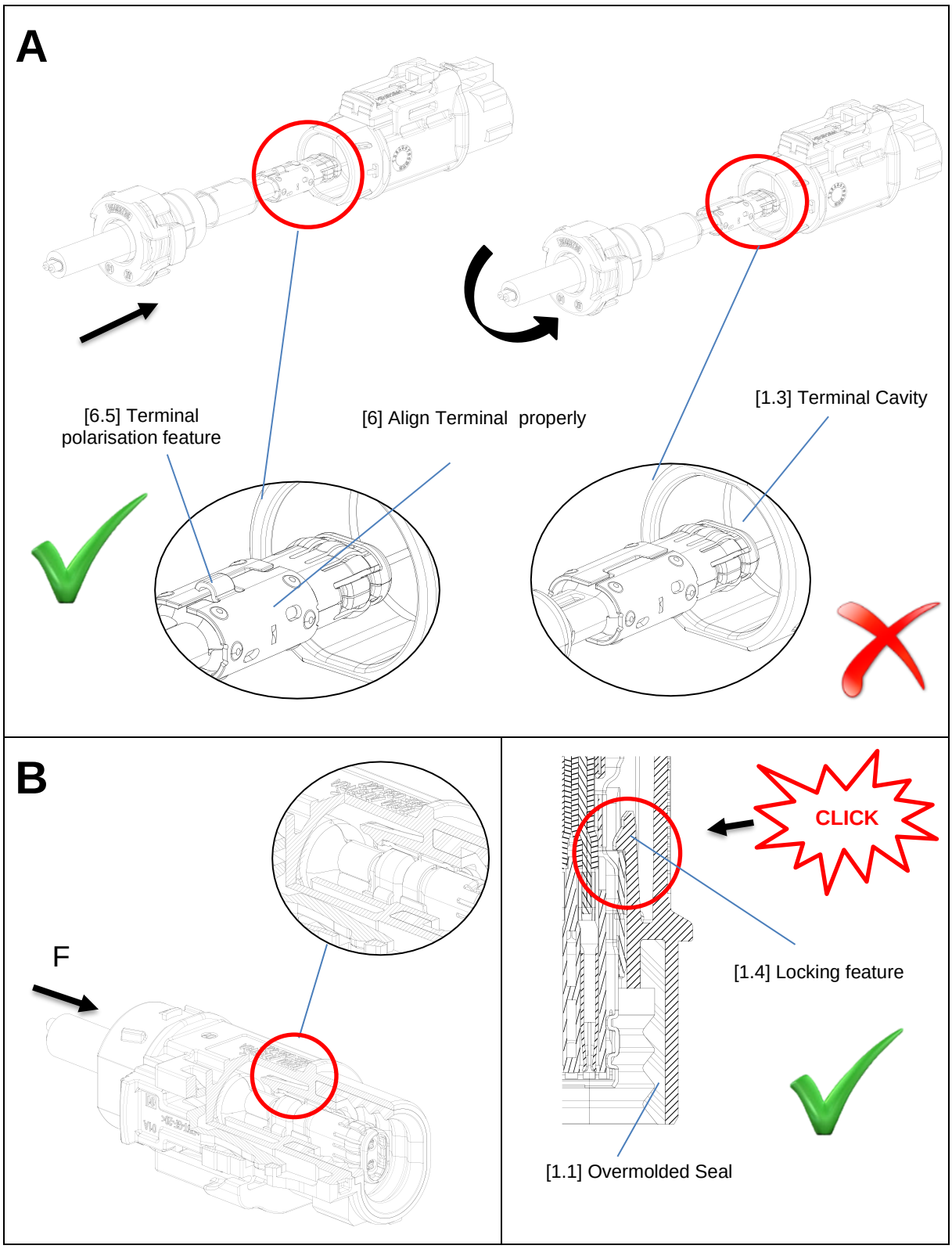


Fig.6: PLR insertion procedure

Thread the PLR [2] over the terminal [6] next to the seal [3]. See Fig.6. Take care for its correct orientation.

4.2.1.2 Terminal insertion



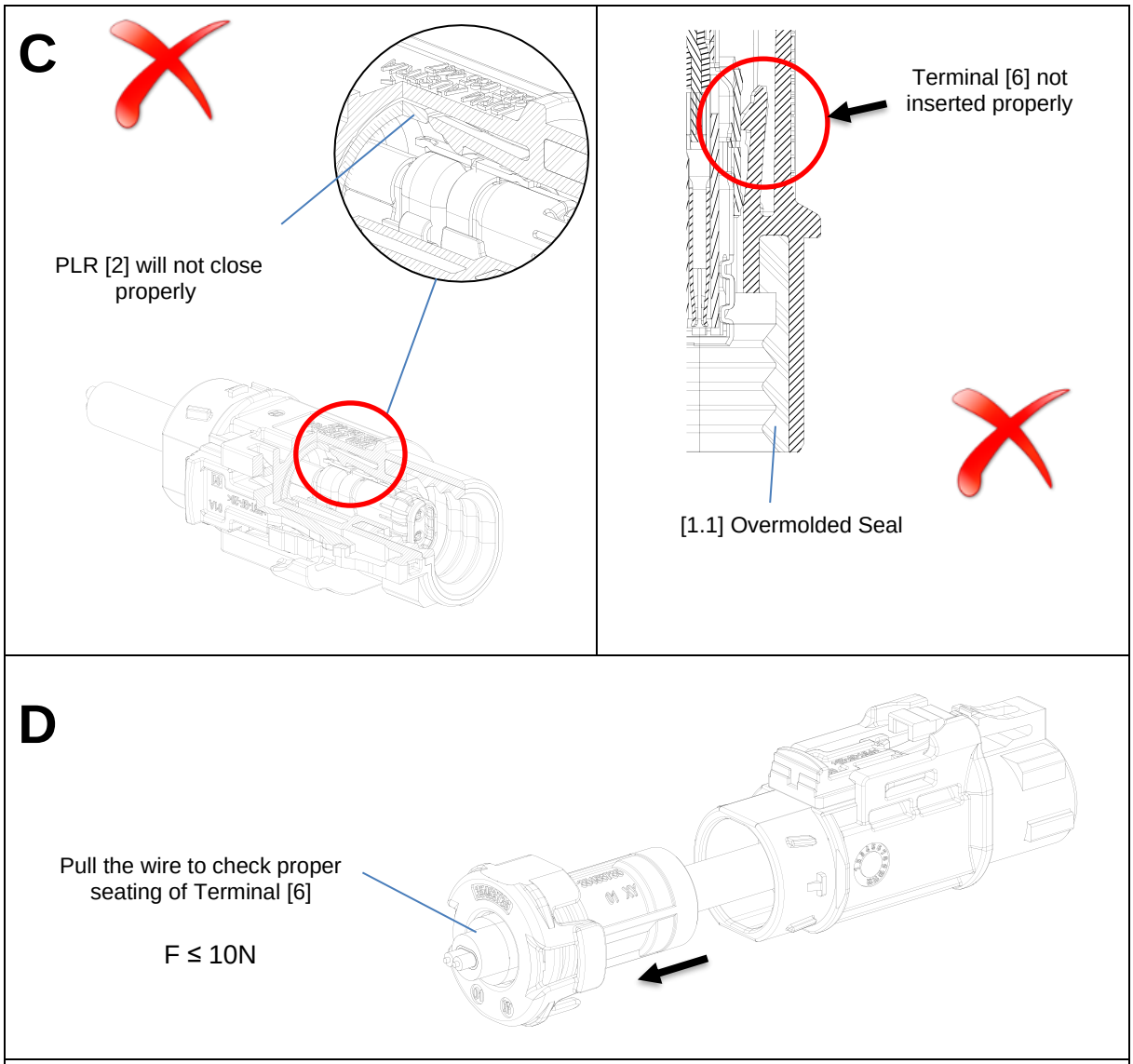


Fig.7: Terminal insertion procedure

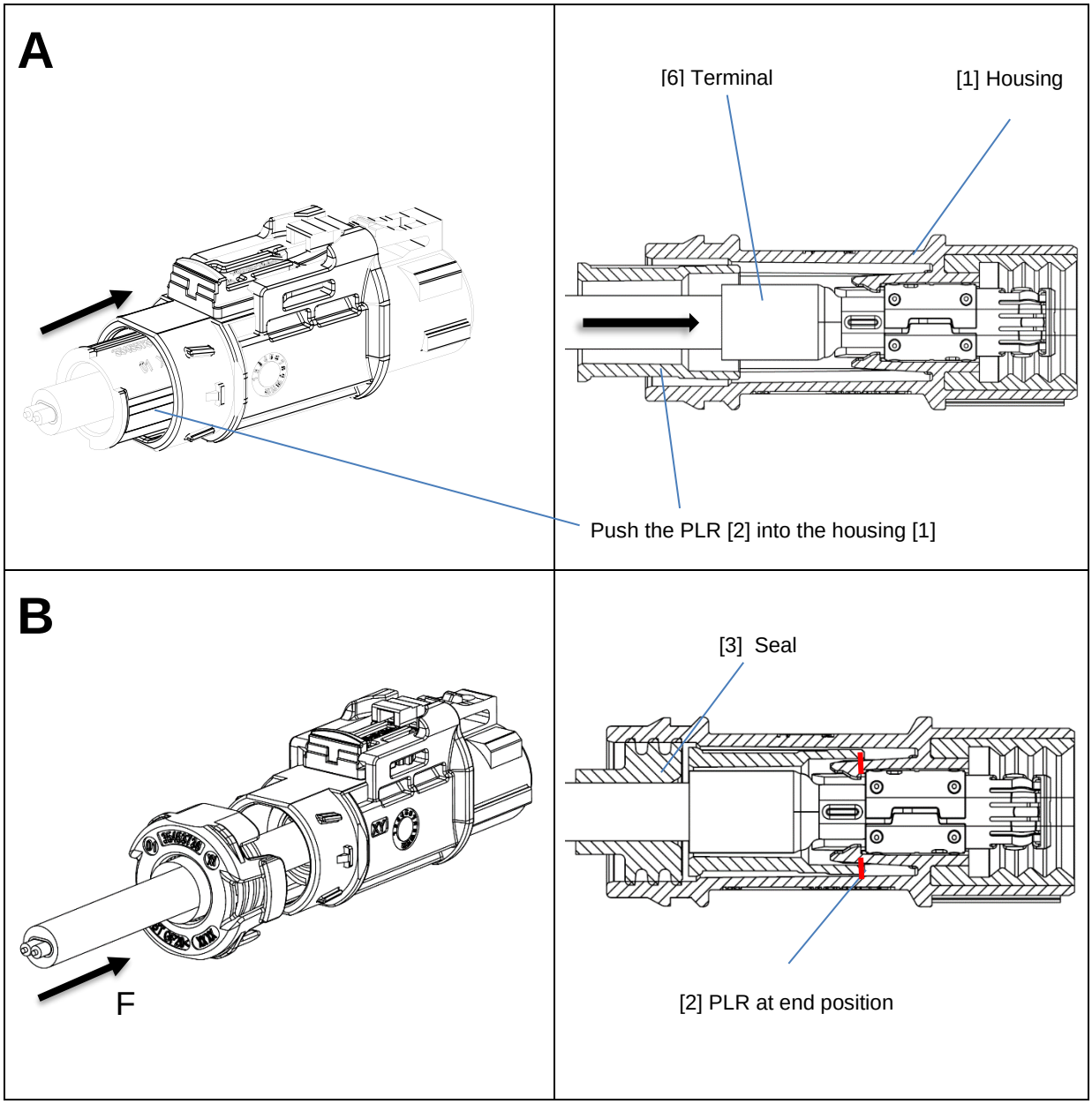
Align terminal [6] in correct orientation to the terminal cavity [1.3] (see Fig.7A). The terminal polarisation feature [6.5] (see Fig.7A) must be in proper orientation. Put the terminal into the cavity [1.3] until the locking feature [1.4] locks the terminal [6] (see Fig.7B). Audible feedback is a must (see Fig.7B). Check, if the locking feature is properly latched and pull the wire slightly to check proper seating of terminals (see Fig.7D).

Only use the suitable terminal system!
Only use the suiteable single wire seal to the wire diameter!

02

Do not use sharp insertion tools, do not apply excessive forces!

4.2.1.3 PLR (Primary Locking Reinforcement)



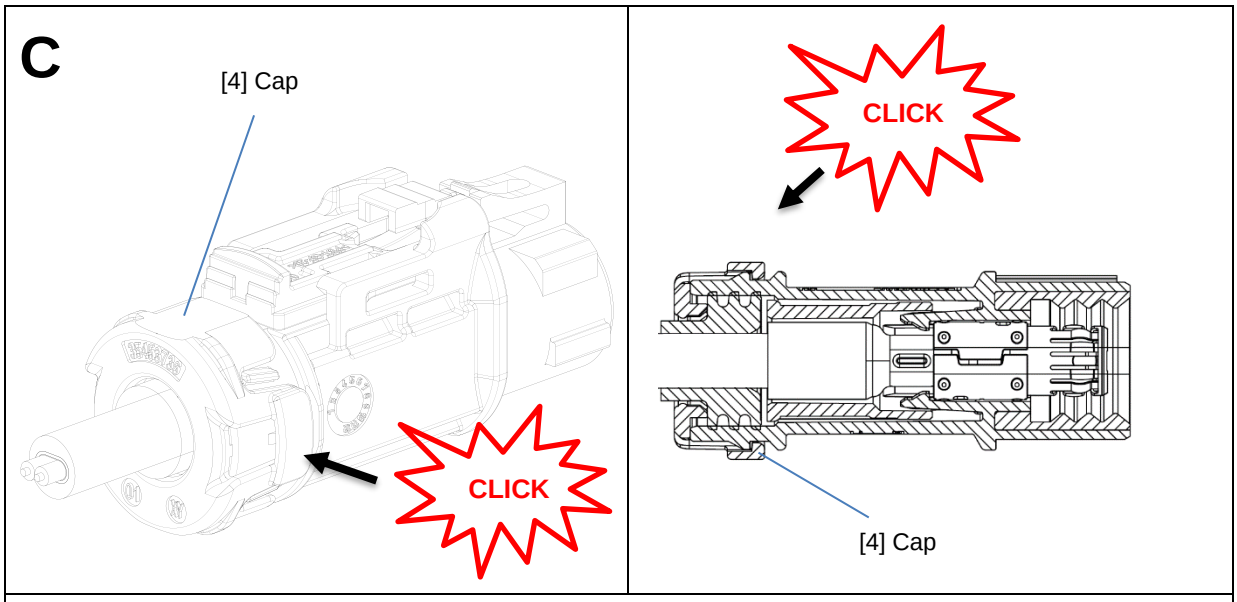


Fig.8: Assembly of PLR, Seal and Cap

Push the PLR [2] into the housing [1] (see Fig. 8A). Check if PLR [2] is in proper position. If it is not insert PLR [2] completely, stop pressing immediately. In this case, check if the Terminal is in locked position (See Fig. 7B & 7C).

Then insert the Seal [3] together with Cap [4] to lock the PLR [2] (see Fig. 8B & 8C).

Do not use sharp tools! Do not apply excessive forces!

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4.2.2 Plug Board

Perform electrical test:

Following checks have to be done after the harness assembly and testing for deviations:

- Check the Female Connector for damage
- Dimension accuracy according to harness drawing
- Completeness of the Female Connector according to the description, specifications and harness drawing

Do not ingress into the terminal contact zone with test pins or similar objects during the complete assembly process or during the checks.

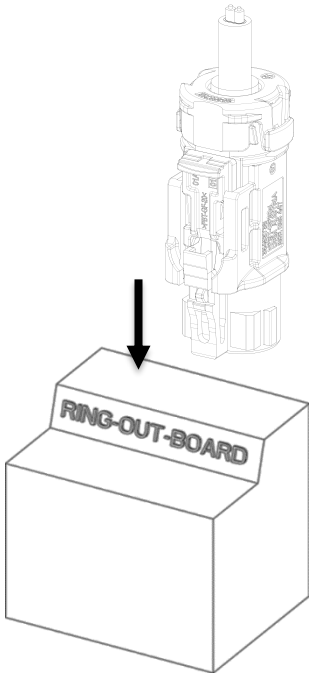


Fig.9: Electrical test

4.2.3 Terminal assembly

4.2.3.1 Unlocking of the Cap

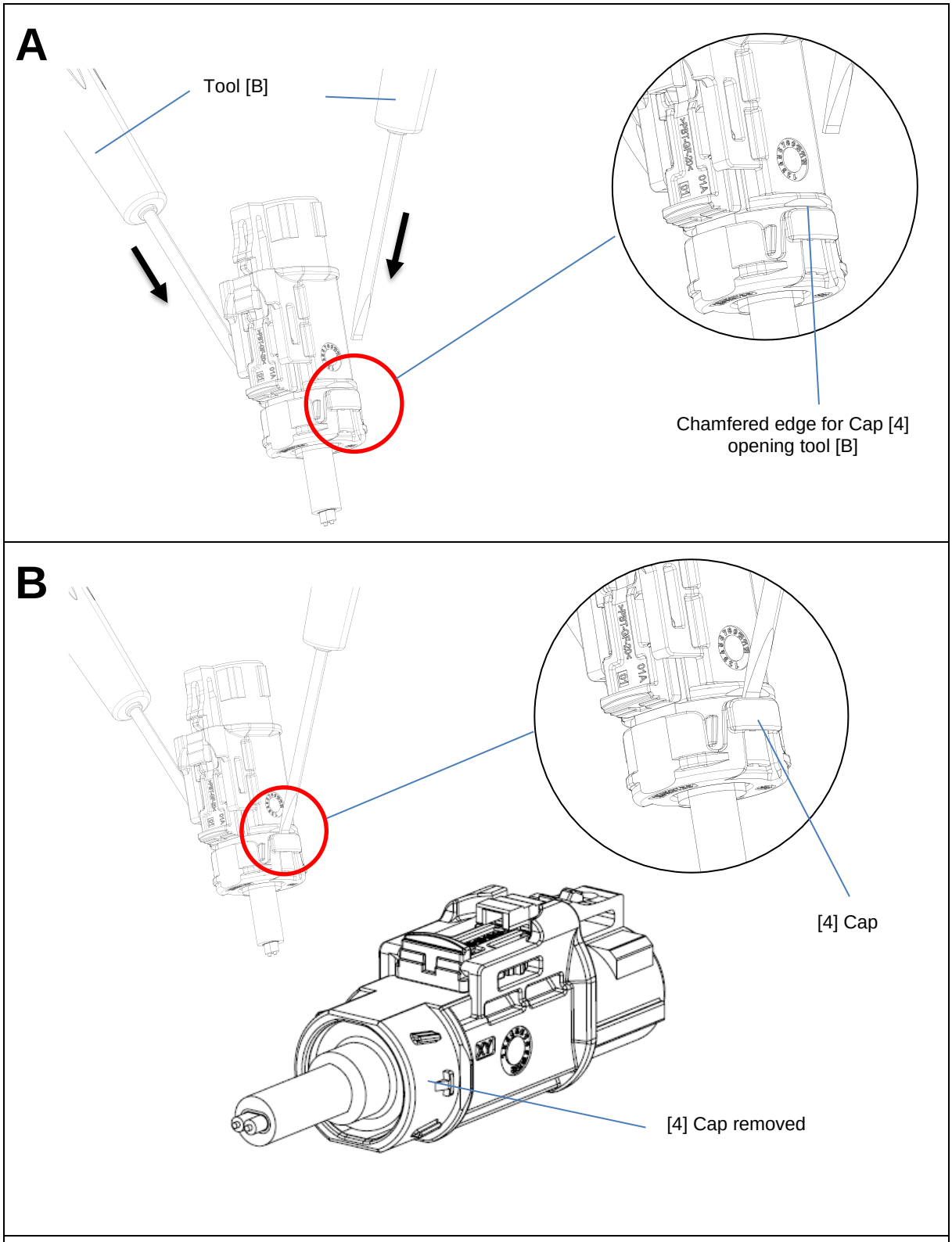


Fig.10: Opening of the cap

4.2.3.2 Removal of the seal

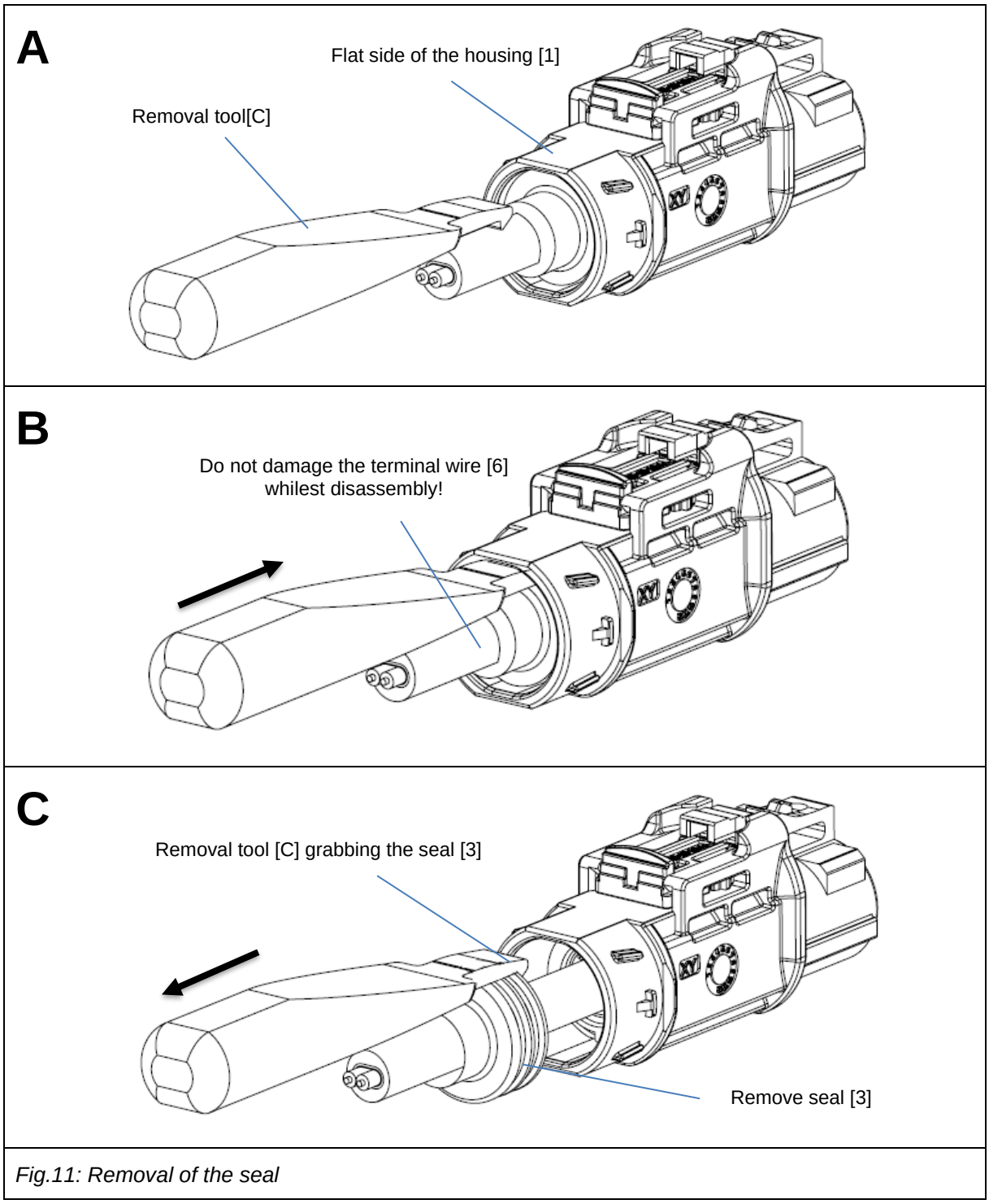


Fig.11: Removal of the seal

4.2.3.3 Removal of the PLR

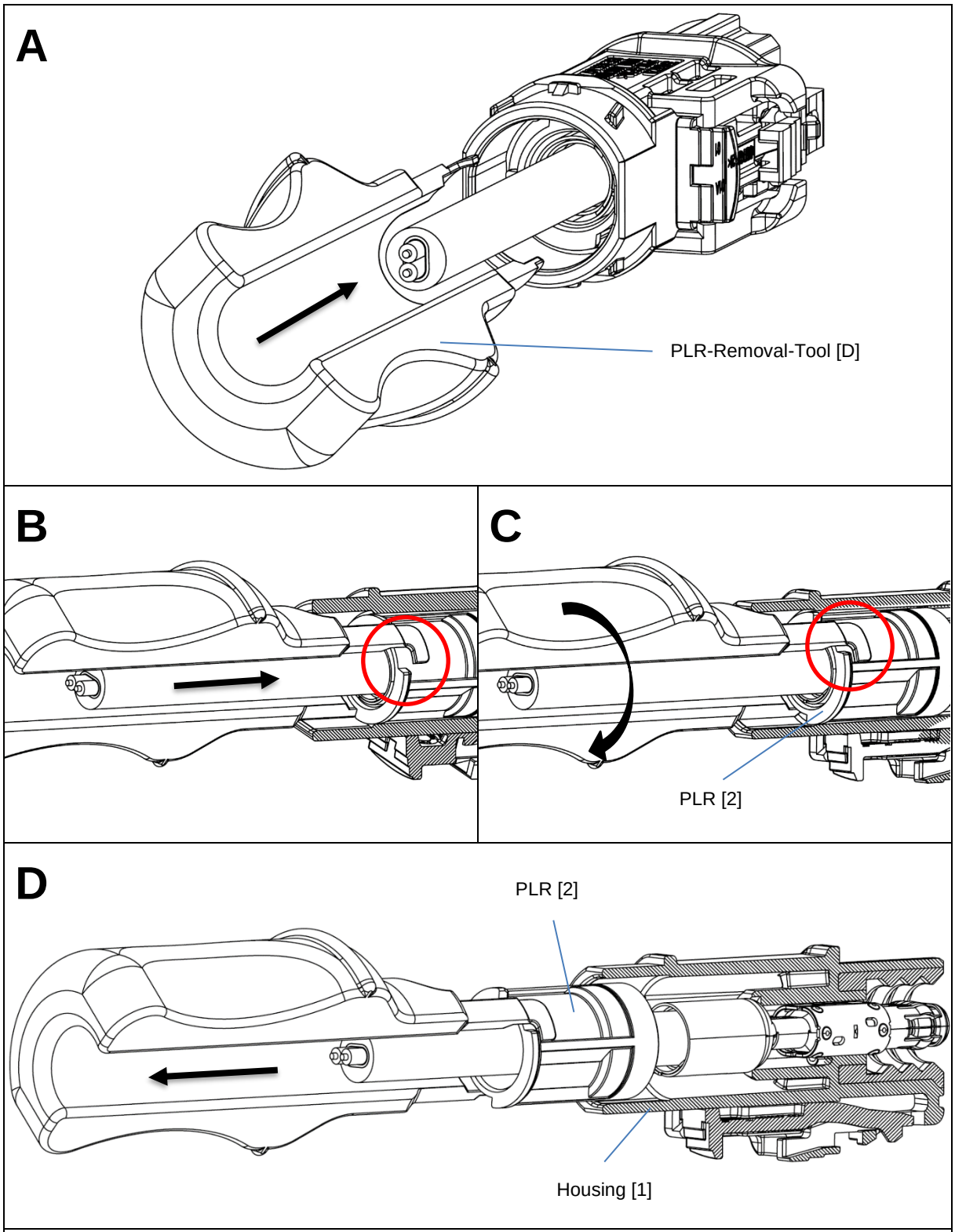


Fig.12: Removal of the PLR

Select tools according to table in chapter 4.3.

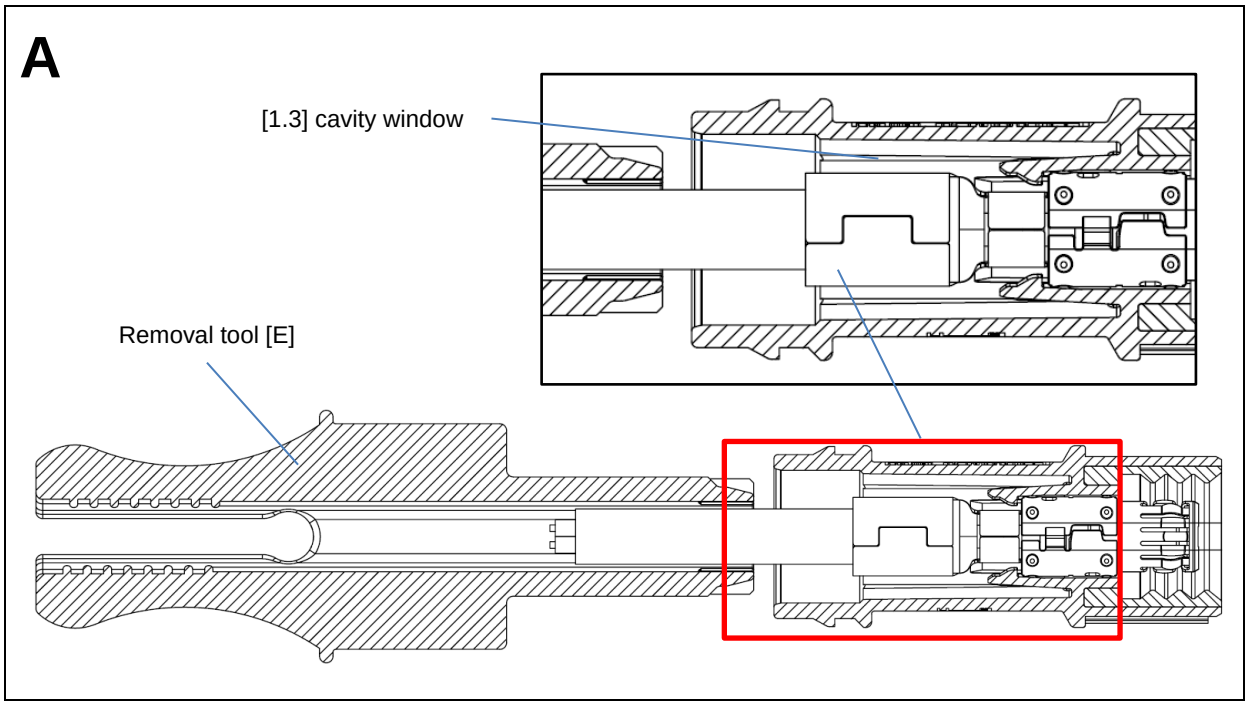
Insert tool [B] between housing [1] and Cap [4] and remove Cap [4] (see fig. 10B).

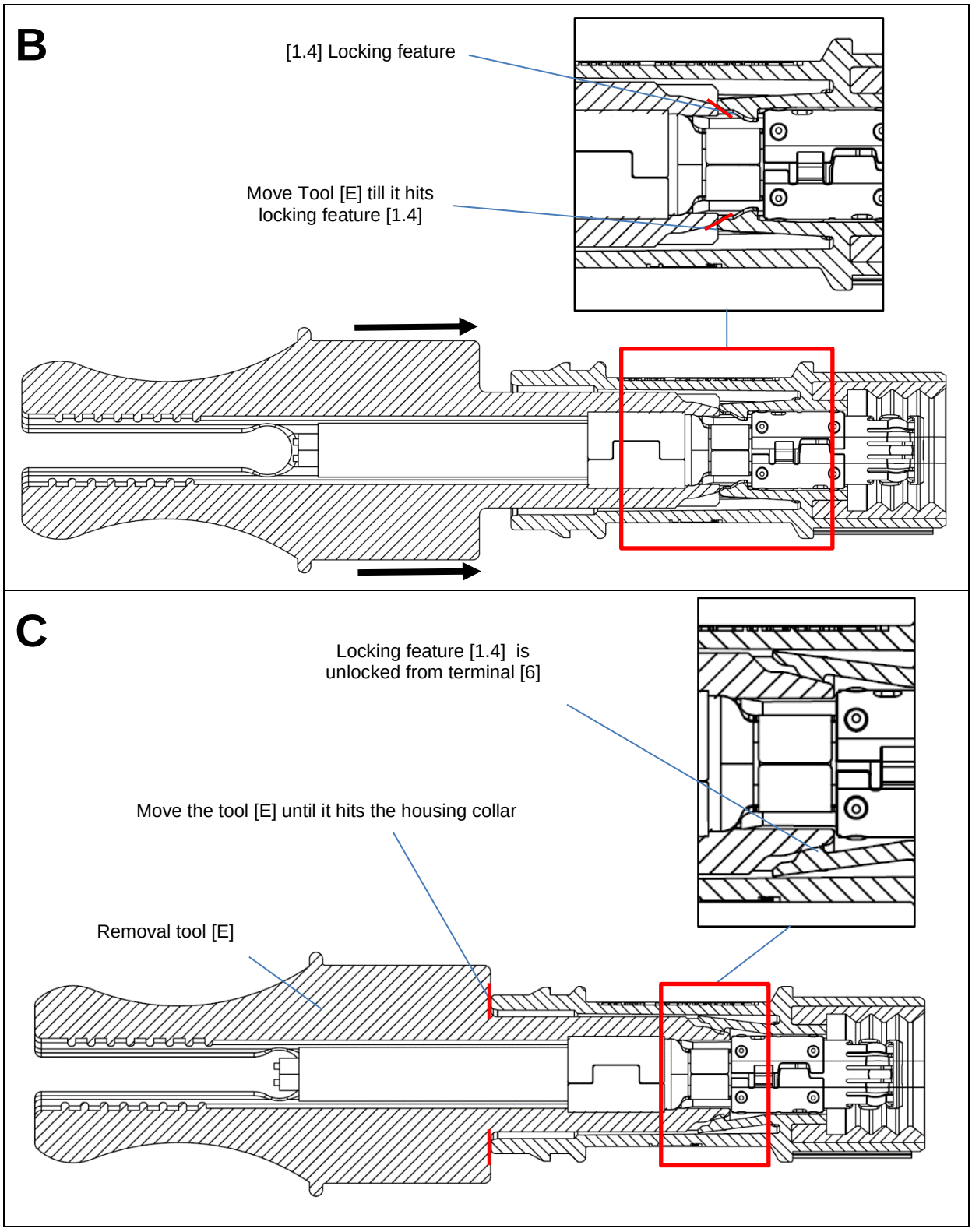
Position the Removal tool [C] to the flat side of the housing [1] (see fig.11A). Push the tool [C] inside the housing [1] until it grabs the seal [3], then pull the tool [C] and the seal [3] out of the housing [1] (see fig.11B and 11C). Grabbing the seal [3] and pulling it out may take several attempts because seal [3] and housing [1] are very tight.

If you are not using the tool [C], please be advised not to use any sharp objects. Terminal wire [6] must not be damaged.

Select PLR-Removal-Tool [D], insert it into the housing [1] and hook the collar of the PLR [2] by rotating the tool [D] (see fig. 12B & 12C). Pull the PLR [2] out of the housing [1] (see fig. 12D).

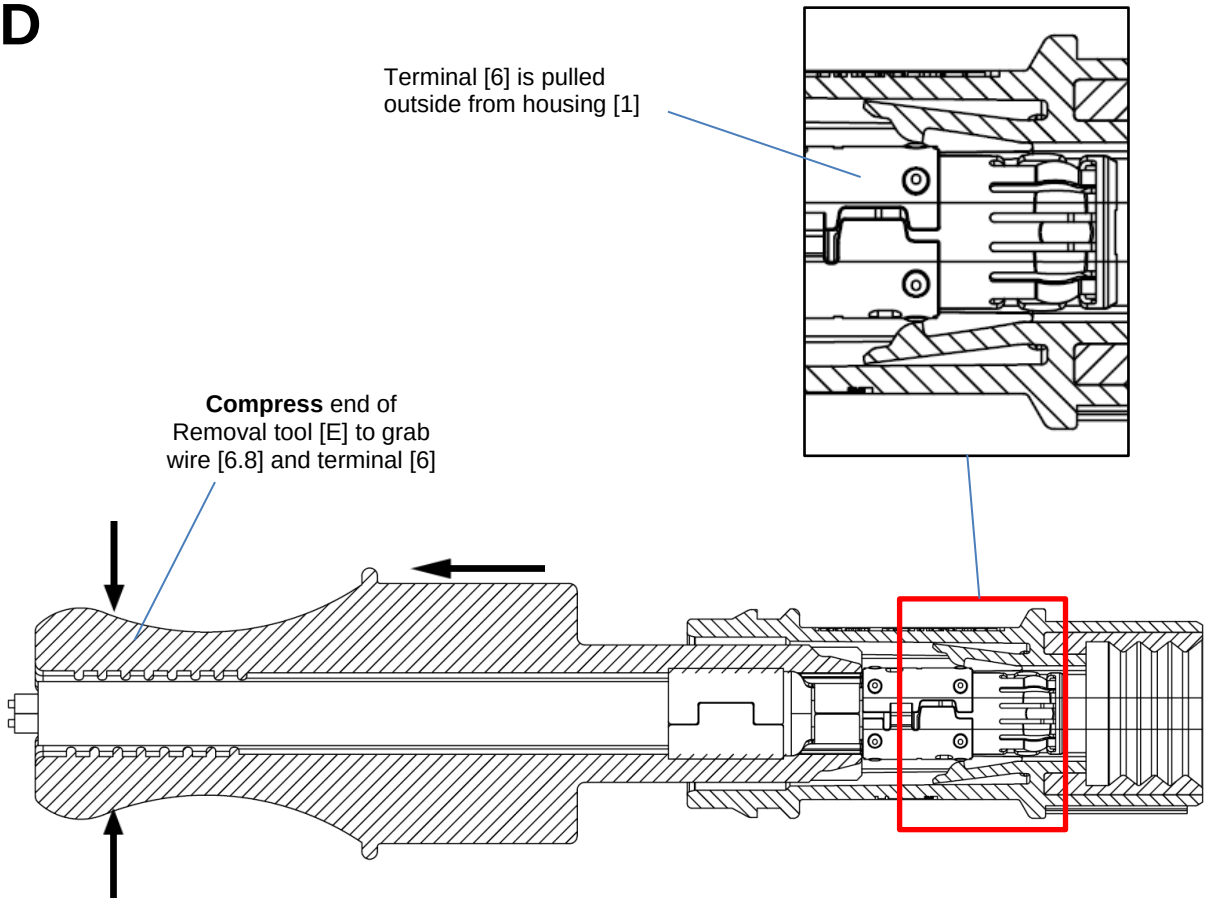
4.2.3.4 Terminal unlocking



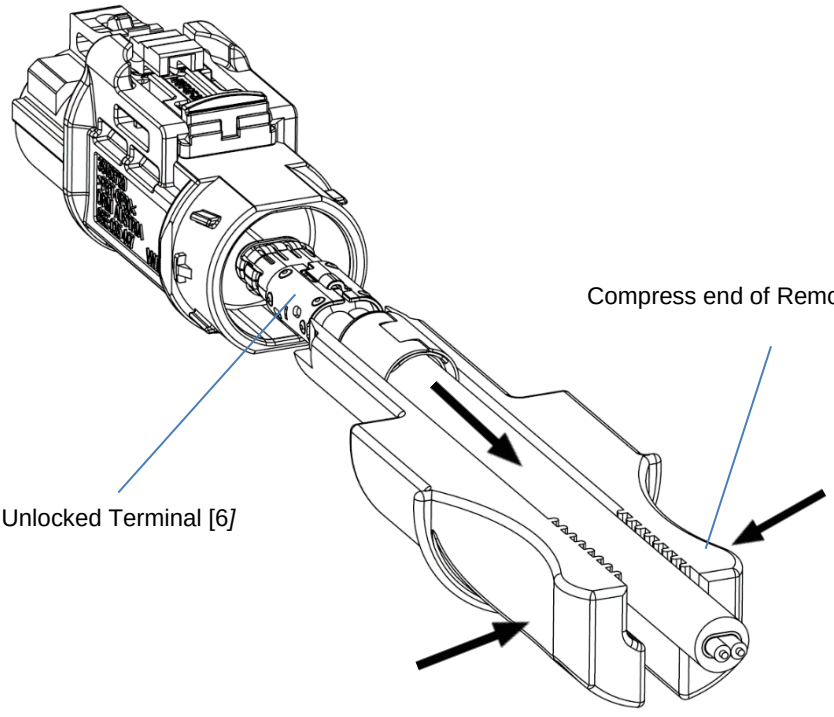


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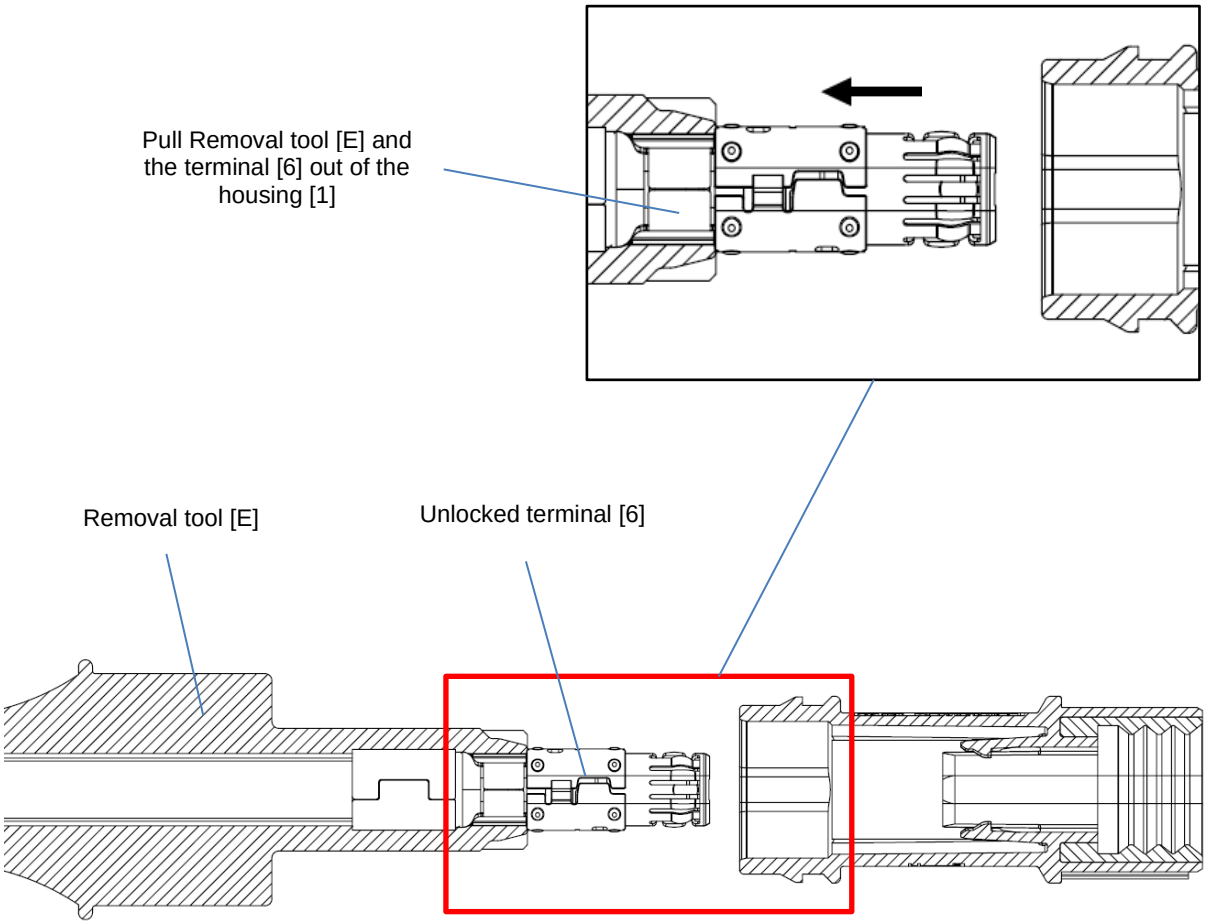
D


Terminal [6] is pulled outside from housing [1]
Compress end of Removal tool [E] to grab wire [6.8] and terminal [6]

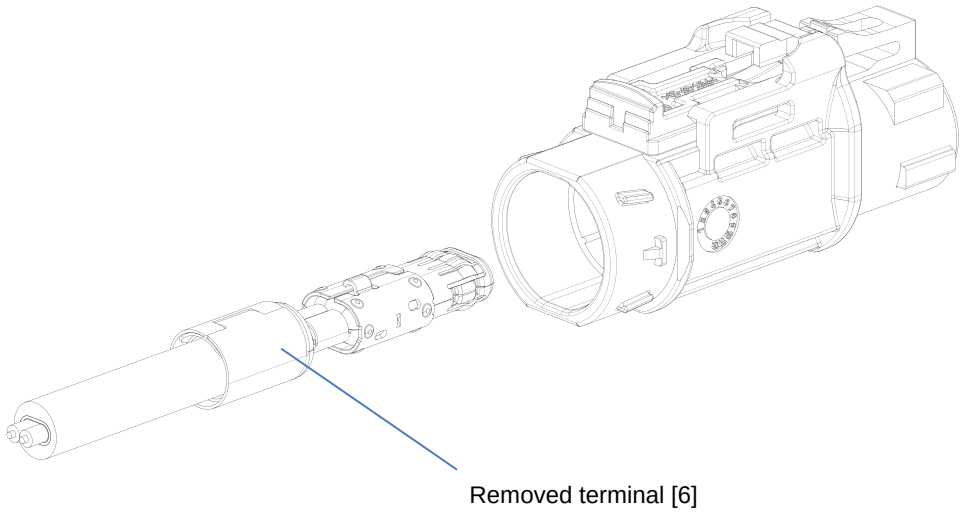
E


Compress end of Removal tool [E]
Unlocked Terminal [6]

F



G



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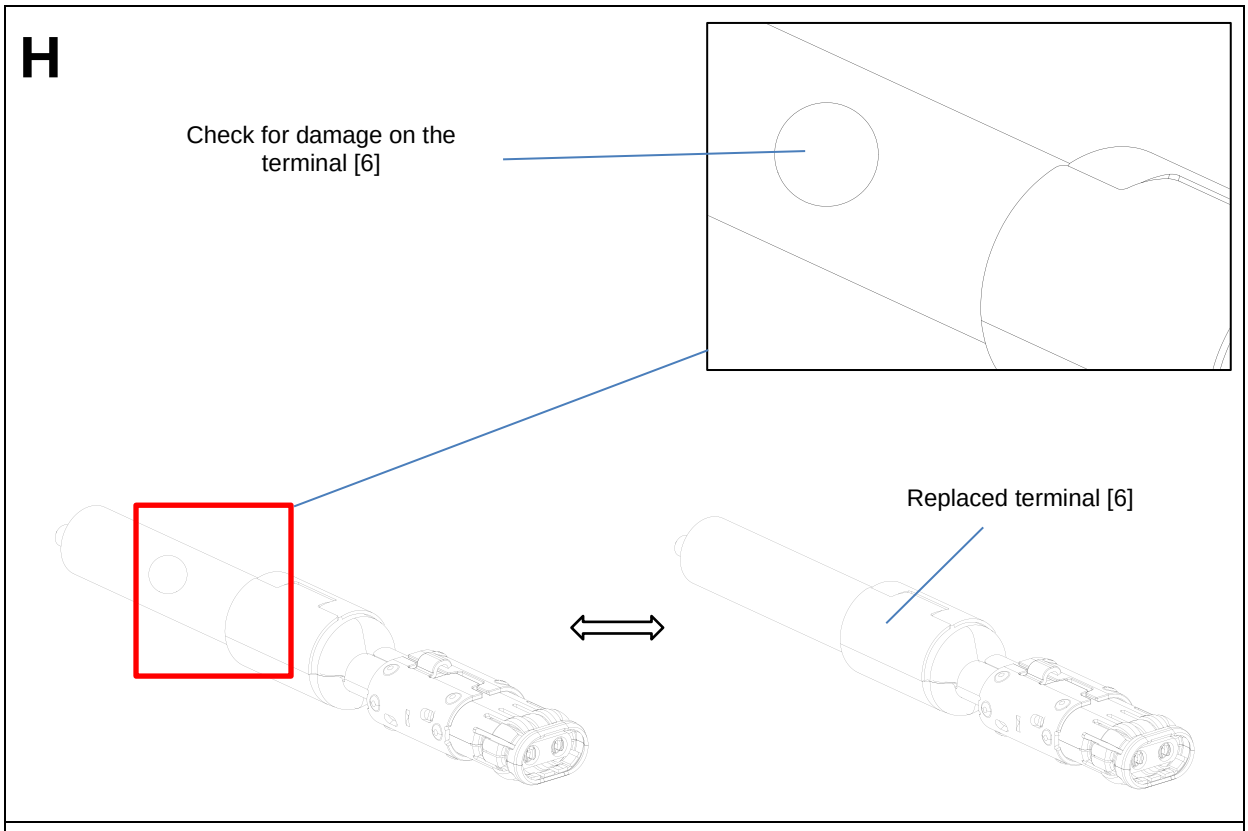


Fig.13: Terminal unlocking & replacement in case of service

Select tool [E], see chapter 4.3 (see fig.13A).

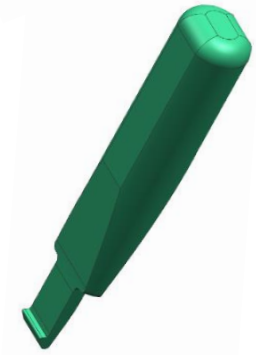
Insert tool [E] carefully in the cavity window [1.3] and lift the cavity locking feature [1.4] (see fig.13A - 13C). Cavity locking feature [1.4] is released as shown (see fig. 13C). Keep tool [E] in place and carefully remove the terminal [6] by pulling (see fig.13D - 13G). Replacement of a damaged terminal (see fig.11H).

Only use matching extraction tool for the terminals! Do not stick anything into terminals!

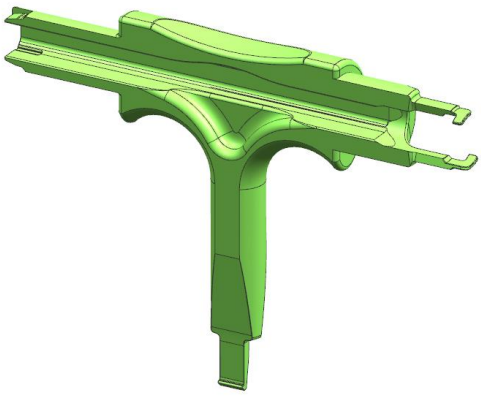
Whenever the terminal [6] has been removed from the housing, a new Housing [1] and Seal [3] have to be used for reassembly.

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4.3 Mounting- & Removal tools

Designation	Part no / purpose	Picture
Seal Mounting Tool [A]	Seal mounting	
APN	35594376	
Supplier pn.	-	
Tool [B]	Cap opening	
APN	-	
Screwdriver - standard tool		
Removal Tool [C]	Seal removal	
APN	-	
Supplier pn.	-	
Removal tool [D]	PLR detachment	
APN	35594378	
Supplier pn.	-	

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Removal tool [E]	Terminal unlocking	
APN	35594377	
	-	
Optional: Removal tool [F]	Multi-Tool (C + D + E)	
APN	*	
	-	

All tools can be bought from Aptiv.

*Consult us

5. Car Assembly

5.1 Delivery conditions

Small visible irregularities like damages at nonfunctional surfaces and locations are permissible. Damages at functional locations like locking noses or codings are defects. Broken locking arms are defects. Burns or not filled corners or walls are also defects. A missing component at the connector (e. g.: seal, PLR) is a defect.

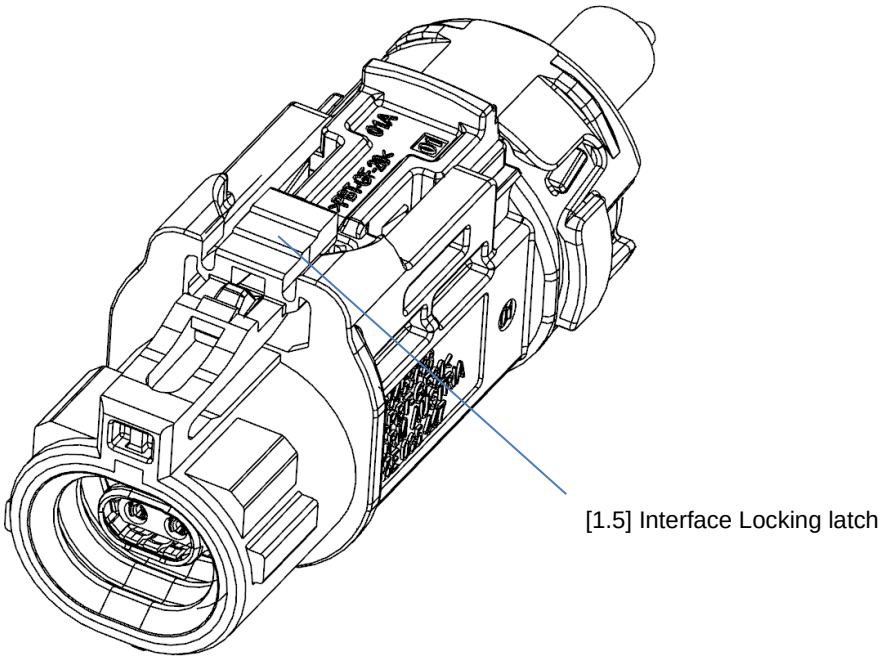


Fig.14: Delivery condition at OEM (the product drawing is binding)

5.2 Connector mating at Harness laying

This procedure describes schematically the assembly steps of the product described in chapter 1. The used figures are schematic.

5.2.1 Connector mating

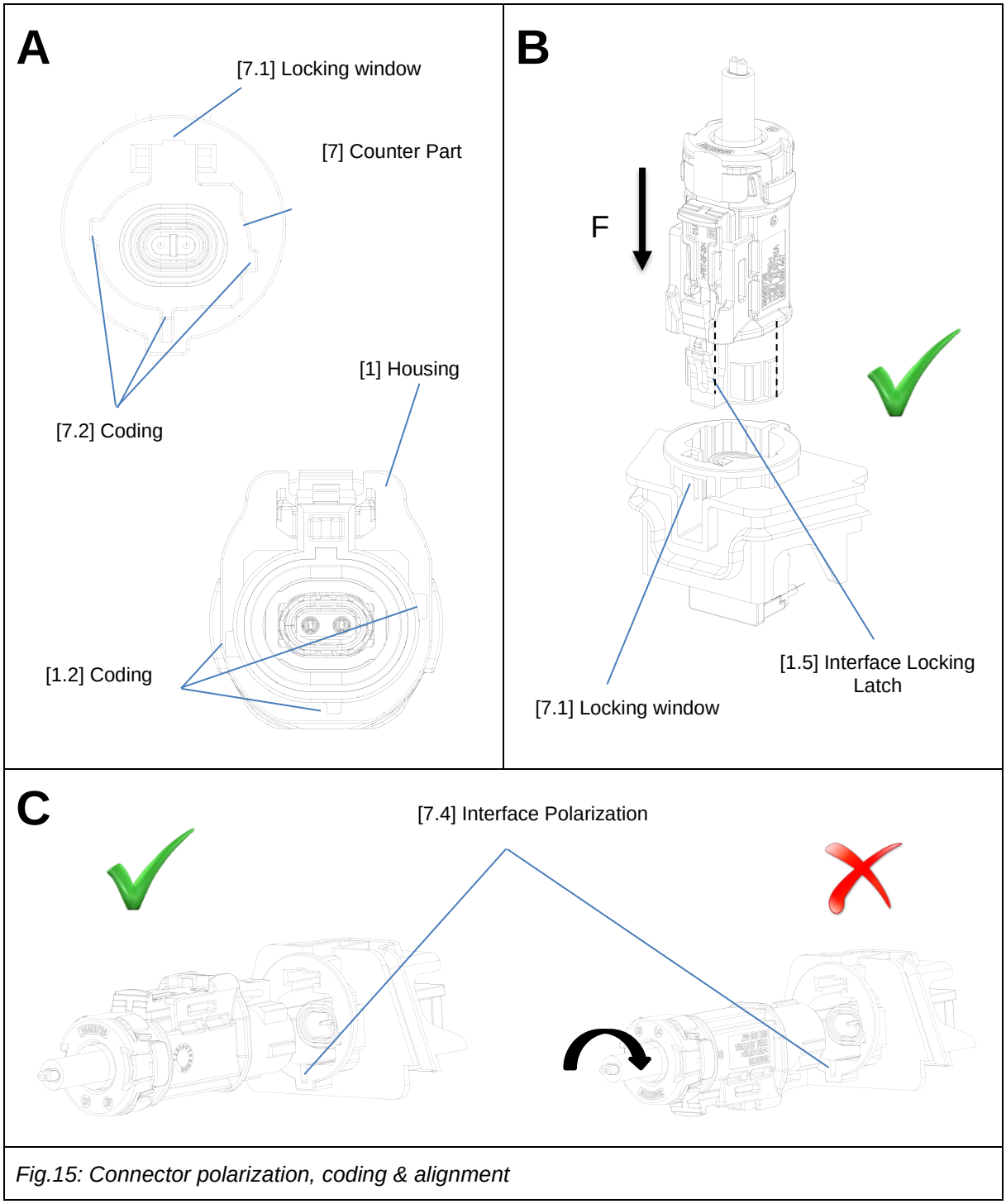


Fig.15: Connector polarization, coding & alignment

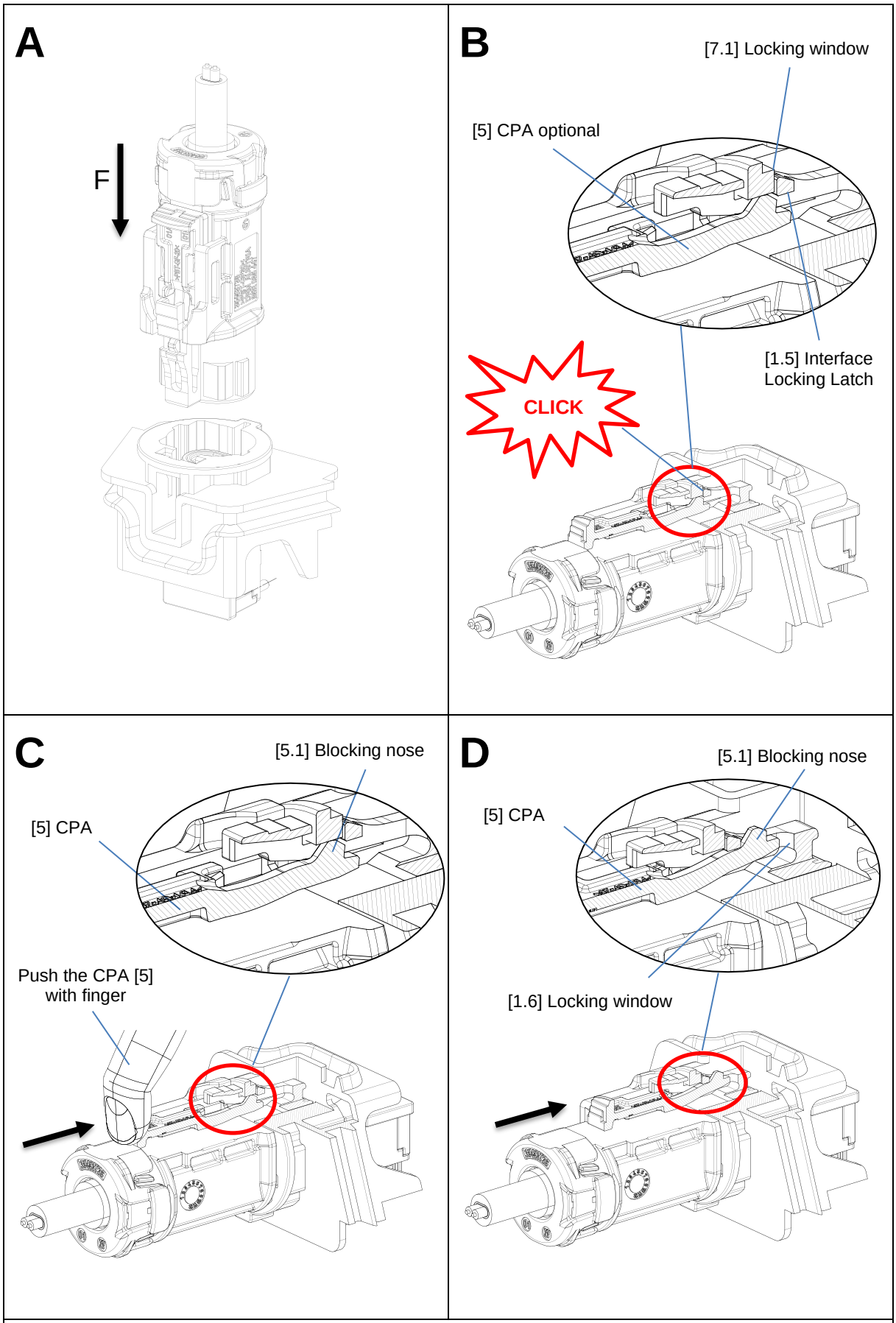


Fig.16: Connector mating procedure

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Check connector for damage. Don't process a damaged connector!
Check connector counterpart is according to Interface specification. Don't process with a damaged or dirty counterpart.

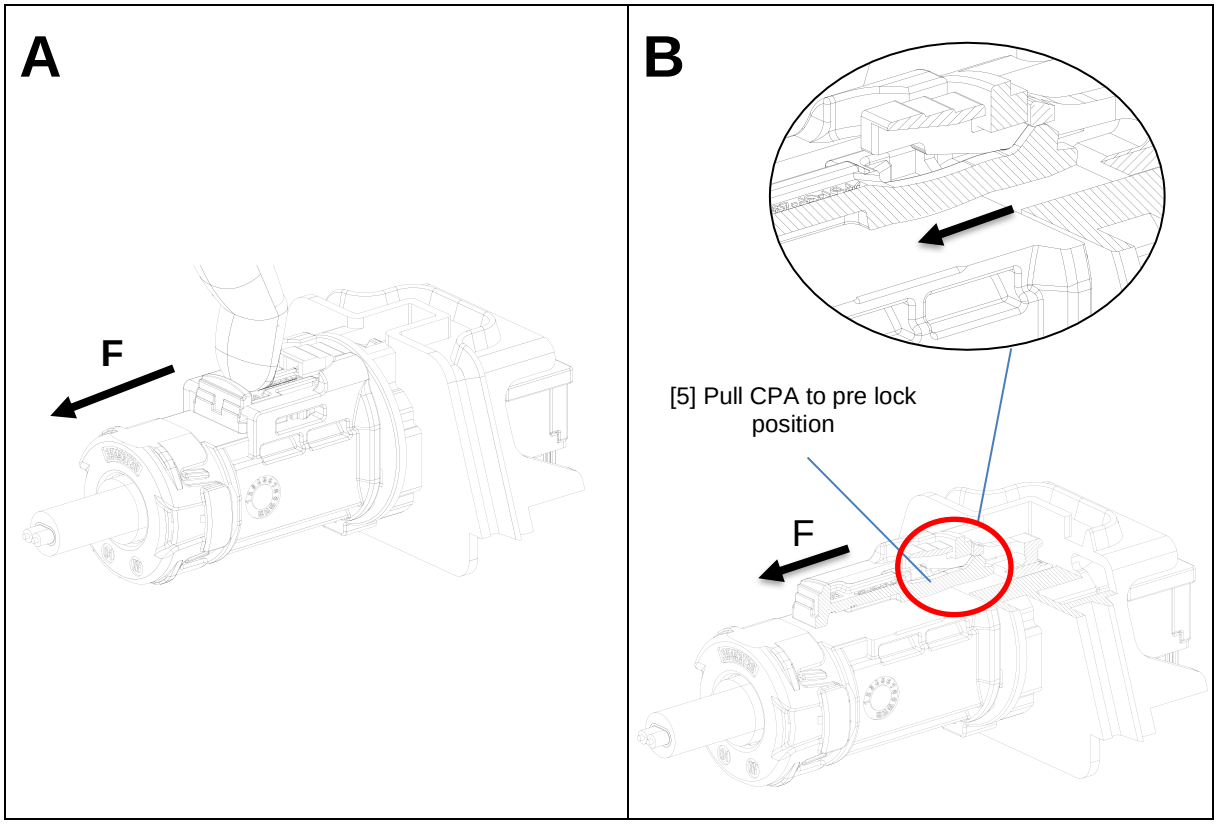
Align connector [1] properly to the counter part [7] (see fig. 15B & 15C). Make sure you have the correct polarization [7.4]. Push the connector into the counter part [7] until locking latch [1.5] at the housing [1] gets locked with locking window [7.1] at the counter part [7] (see fig. 14B). Audible feedback is a must (see Fig.16B).

5.2.1.1 Actuation of CPA (optional)

If the housing [1] is correctly locked with the counterpart [7], the blocking nose [5.1] is released and the CPA [5] can be actuated (see fig. 16C). Push the CPA [5] with a finger until the blocking nose [5.1] of the CPA [5] is locked with the locking window [1.6] of the housing [1] (see fig. 16D).

Do not tilt connector! If mating process is not possible, check right coding and polarization!
Don't try to connect non-fitting housings. Do not apply excessive forces!

5.2.2 Connector unmating



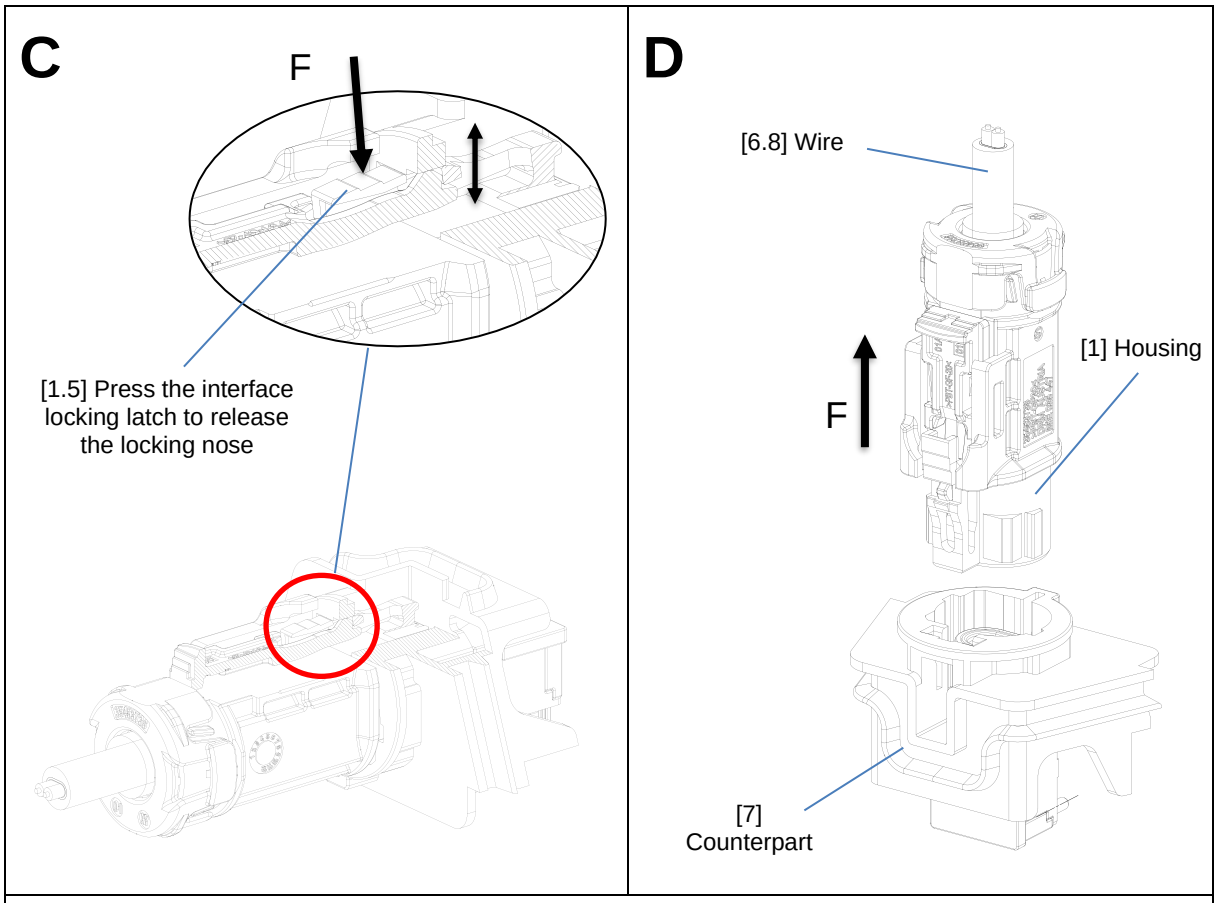


Fig.17: Connector unmating

Pull the CPA [5] to pre lock position (see fig.17A + 17B), and then press on the interface locking latch [1.5] to release the locking nose (see fig. 17C) and pull the Housing [1] out of counterpart [7] (see fig. 17D).

Pulling the connector at the housing [1] is preferable than pulling at the wire [6.8]. The maximum allowed unmating force shall not exceed.

If unmating process is not possible, check connection for soiling, corrosion or damage!
Do not apply excessive forces!

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