Class 1

VEHICLE CHARGE INLET Type GB compatible with GB/T 20234.2

VOLVO Configuration

| Indicates Change

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1. CONTENT

This specification describes the handling and assembly of the vehicle charge inlets Type GB compatible with GB/T 20234.2 for conductive charging of electric vehicles. This specification applies to manual assembly of the components from series production tooling.

2. PROCESSING NOTE

The processor is responsible for ensuring the quality of the manufacturing process and the proper function of the system. The warranty and liability is excluded if quality deficiency or damages occur by failing compliance to this specification or using not specified, not released tools, cables and components.

3. APPLICABLE DOCUMENTS

The following technical documents, if referred to, are part of this specification. In case of a contradiction between this specification and the product drawing or this specification and the specified documentation then the product specification has priority.

3.1. TE Connectivity Documents

a) Customer Drawings for GB Charge Inlets

2288553	CHARGE INLET, GB/T 20234.2
2177804	ACTUATOR, LOCKING UNIT, ASSY
2282241	INSULATION COVER, TE, CHARGE INLET
1241473	Screw 3x20mm
2120571	Sealing
2208383	7POS, MIXED, HSG, GB
2208382	2.LOCK, GB
2208376	CONTACT 6.0mm, POWER
2208378	CONTACT 3.0mm, SIGNAL
2288391	PT1000 TEMPERATURE SENSOR

b) Amendment to the Specification

114-94299-1	Charge Inlets GB/T 20234.2 Type GB

3.2. General Documentation

a) Cable Specifications of Prescribed Cables

Cross-section 1 x 6,0mm²

Supplier:	**COFICAB**
Outer Diameter:	**4.5-5.0 mm**
Cable description:	***2SBH* acc. VCC 31835203**
Supplier:	**NEXANS**
Outer Diameter:	**nom. 4,75mm, max. 4,85 mm**
Cable description:	***RK125 6mm²* acc. VCC 31835203 / ISO6722-1**
Part No.:	**Specification S11034 issue 1**

Cross-section 0,75 mm²

Supplier:	**LEONI Kabel GmbH**
Outer Diameter:	**1.90-0.20 mm**
Cable description:	***FLRY 0.75-B Single-core automotive cable with reduced wall-thickness***
Part No.:	**76783041K**

b) Assessment of the wires

To ensure the required electrical crimp contactability with stable crimp resistance a permissible maximum storage period of 8 months for unprocessed cable (referring to cable manufacturer production date) has to be respected.

c) Wire Selection

The contact system is released for the application with wires specified in chapter 3.2
The released contact-wire-combinations and crimp parameters are given in table 1.

Other wires require the validation and approval of the TE engineering department.
The wires are applied as single wire terminations. Double terminations are not intended.

4. APPLICATION TOOLS

Required application tools are:

Application Parts	Wire Size	Crimp Hight H	Die Set for Hand Tool:	Basis Hand Tool	Applicator tool Nr.:
Contact	~~4.0mm²~~	~~2.79mm +/-0.05~~	1-1105852-8	1-1105850-8	~~2276001-1~~
	0.75mm²	1.90mm +/-0.05			2276003-1
	6.0mm²	3.58mm +/-0.05	2-1105870-8		2276002-1

Table 1

Crimp Die Sets are subject to wear and their condition and quality have to be monitored. Suspect and/or worn Die Sets have not to be used for the production of these crimps. Die Sets are available as spare parts.

The crimp height has to be measured over both parallel faces. Both dimensions have to be in tolerance (Figure 1).

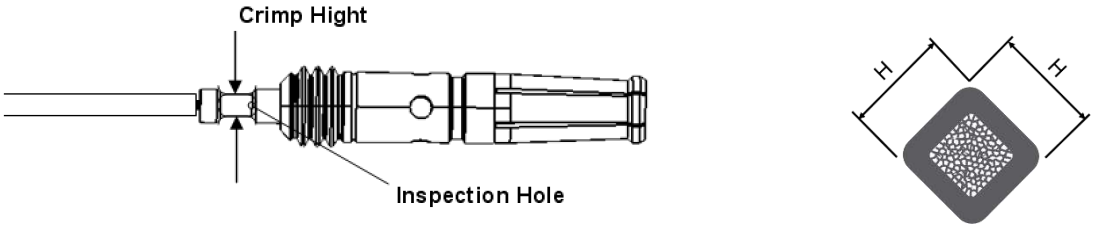


Figure 1

5. ASSEMBLY INSTRUCTIONS

5.1. Assembly overview

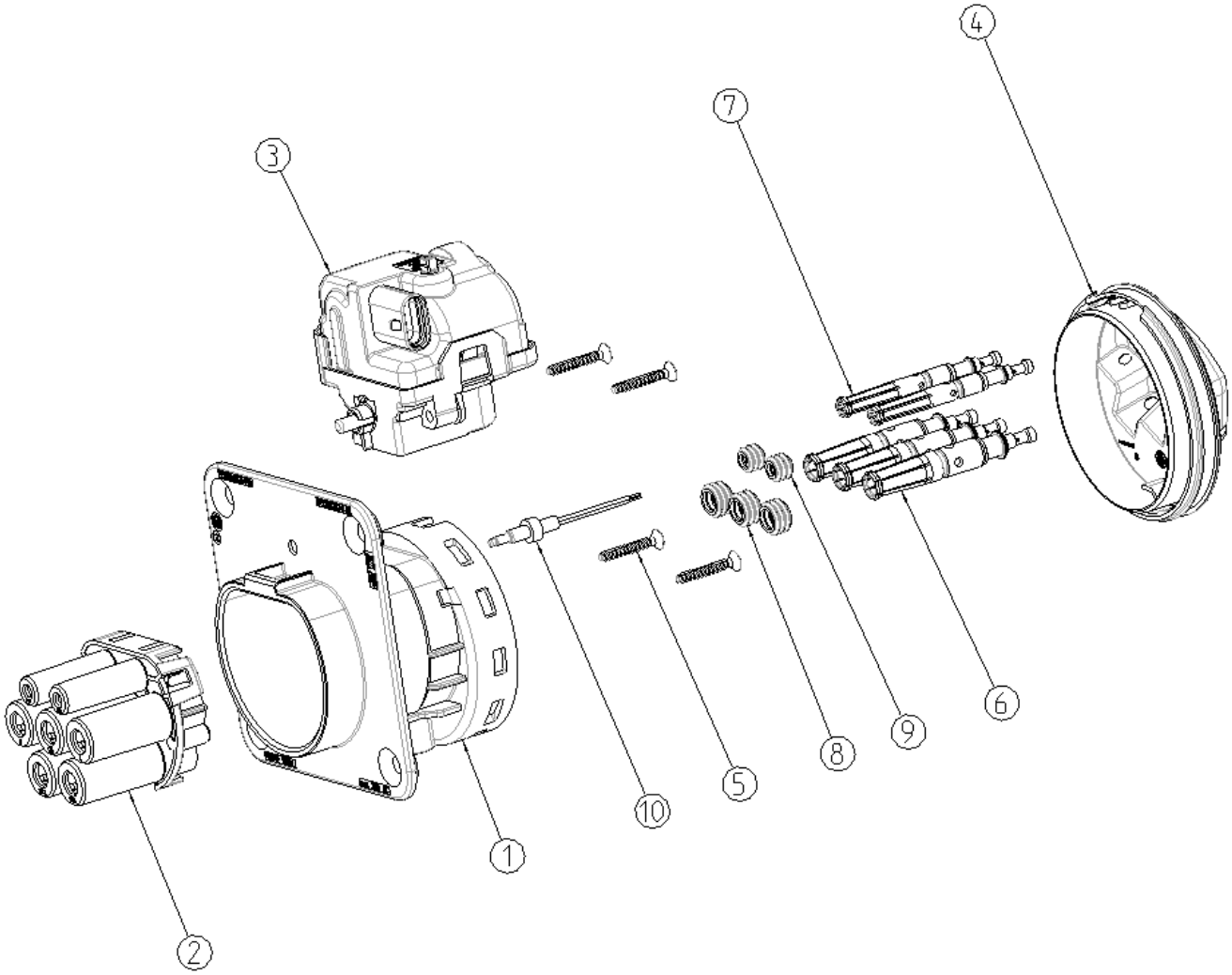


Figure 2
Charge Inlet GB

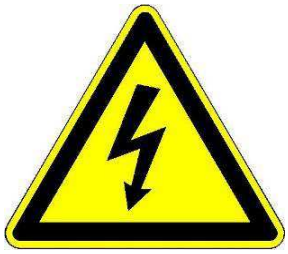
5.2. Parts to order

Charge Inlet Typ GB VOLVO Variant Part / Wire Size			~~L/N + Earth: 4.0 mm²~~ ~~Signal 0.75mm²~~	L/N + Earth: 6.0 mm² Signal 0.75mm²
Pos.	Qty.	Name / Bezeichnung	P/N	
1	1	7POS, MIXED, HSG, GB	0-2208383-1 (long pipe) alternative 0-2208383-3 (short pipe)	
2	1	2.LOCK, TE, GB	1-2208382-1	
3	1	Actuator, Locking unit, Assy	0-2177804-3	
4	1	Insulation Cover	0-2282241-1	
5	4	Screw 3x20mm	1-1241473-4	
6	3	CONTACT 6.0mm, POWER	~~2-2208376-2~~	2-2208376-3
7	2	CONTACT 3.0mm, SIGNAL	2-2208378-2	
8	3	SEAL, CONTACT, Power/Earth	0-2120720-1	
9	2	SEAL, CONTACT, Signal	0-2120721-1	
10	1	PT1000 Temperature Sensor	0-2288391-1	

Table 2

5.3. Security Advice

ATTENTION!
- HIGH VOLTAGE APPLICATION -
CABLE INSULATION MUST NOT BE DAMAGED!



The assembly has to be performed by trained personnel only.

Avoid prolonged or repeated skin contact with silver plating (wear protective gloves)!

5.4. Assembly Steps

Step 1:

Insert the respective cables into the Insulation Cover (0-2282241-1) as shown in Figure 3.

If the Charge Inlet is assembled with no contacts or connectors on the other cable end, the insertion of the cable into the Insulation Cover could alternatively be done after Assembly Step 8 (to harness makers decision, also depending on cable length).

For a better mechanical protection of the cabling of the temperature sensor and to achieve the defined water protection, the four signal cables (CP, PP, Temp Sensor) may be proposed to be link together to a bundle with an outer diameter of about 4,5mm (heat shrink tube preferred versus tape, to harness makers decision).

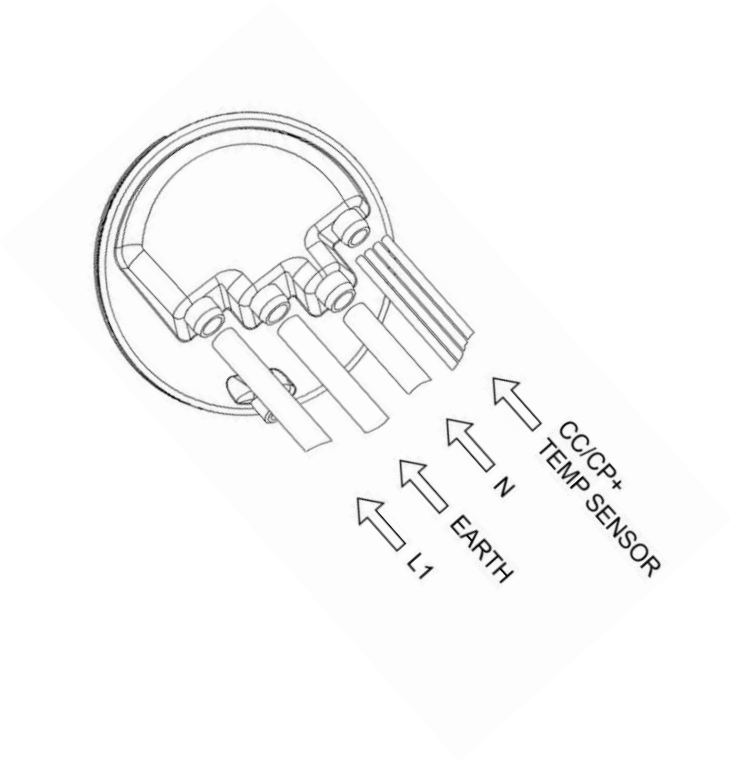


Figure 3

Step 2:

Remove isolation of the single wires according to the lengths shown in Figure 4
The insulation must be cut accurately and pulled off from the conductor. Offcut of insulation must not remain on the conductor. Single strands may not be damaged, fanned out, cut or pulled out. Further more the operator should avoid touching the bare single strands and the strands shall not be twisted.

Wire Size	Removal of isolation dim. "A"
0.75 mm²	8 +/-1 mm
~~4.0 mm²~~	~~8 +/-1 mm~~
6.0 mm²	8 +/-1 mm

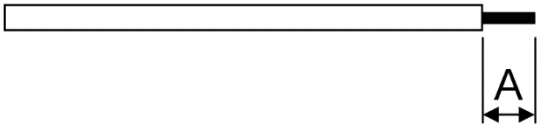


Figure 4

Step 3:

Assemble the Sealing on the Contact (Figure 5). Care shall be taken of:
- **max. allowable elongation 100%**
- **Distortion, twist not allowable**
- **Damage (e.g. cuts) not allowable**
- **Any kind of pollution has to be avoided.**

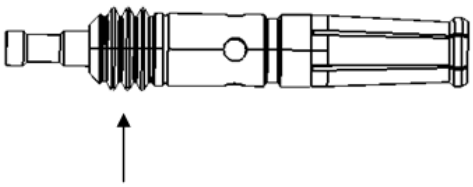


Figure 5

Step 4:

Crimp the conductors to the socket contacts with the specified tools. Care shall be taken that all braids are caught in the crimp. Not inserted braids may jeopardize HV requirements! Wires shall be completely inserted to be visible through the inspection hole (Figure 6). Crimp height H shall be conform to dimension acc. table 1.

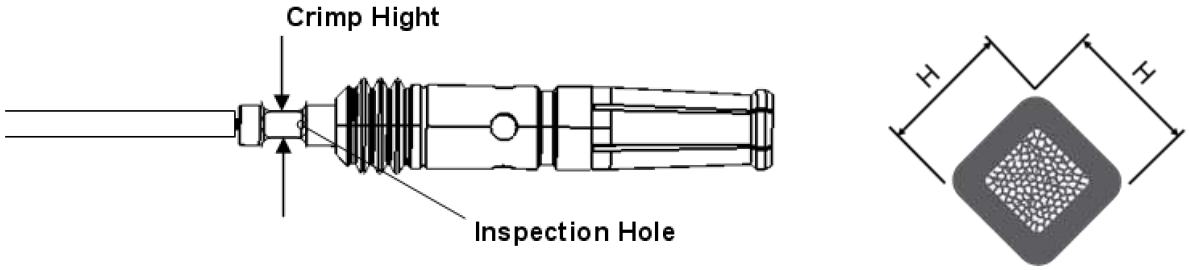


Figure 6

The crimp geometry, crimp heights including their corresponding tolerances as well as wire sizes are given in table 1.

The crimp height is the key quality feature of a crimp connection. The measurement allows a non-destroying examination and a continuous process inspection. It is provided for every wire size and contact.

Step 5:

Insert the Contacts from the backside into the Charge Inlet Housing (Figure 7) into their locking position. Cavitiy marking is molded into the housing and shown in Figure 8a. To ensure that the contacts are correctly inserted, push-pull test with a low force on the cables (max. 10N) and check visually on the front side that the locking lances are properly engaged in the related pin groove (Figure 8b). Locking lances must not stay outside of the grooves. Ensure the seals are properly positioned in their seats and are not damaged!

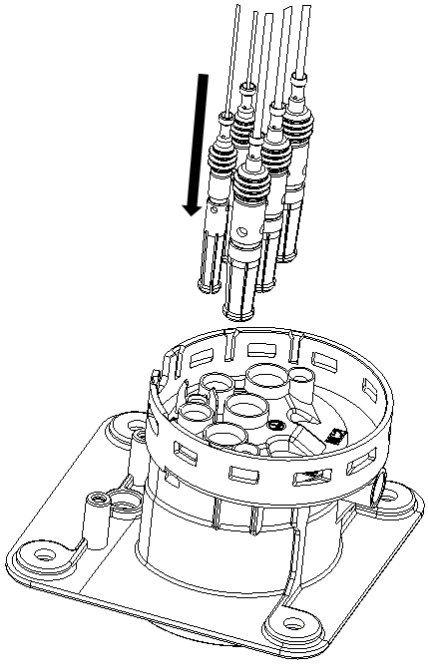


Figure 7

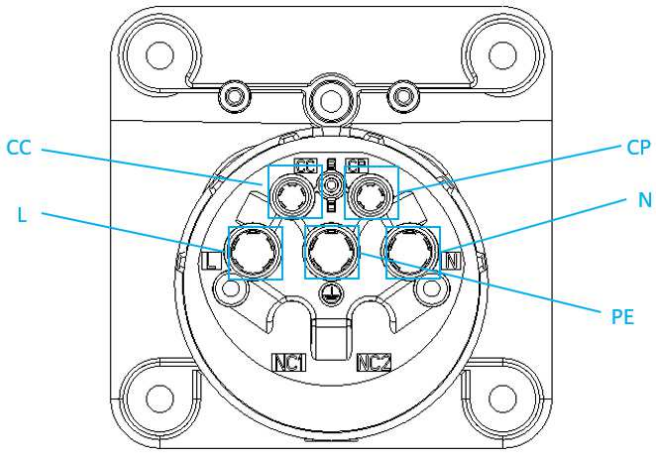


Figure 8a (back side)

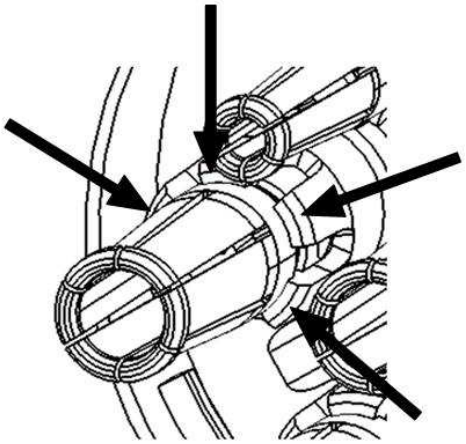


Figure 8b (front side)

Step 6:

After the contacts have been controlled for correct positioning and locking, the Secondary Lock has to be pressed in from the front side (Figure 9a). The adequate locking must be ensured and checked (dimensional check of correct position, Figure 9b). The secondary lock has to be secured with the screw from the backside (screwing torque 0.9 +/- 0.15 Nm) (Figure 10).
ATTENTION: The correct pinning has to be ensured BEFORE locking the Secondary Lock! Rewiring is not possible after locking the Secondary Lock without destroying the plastic parts.

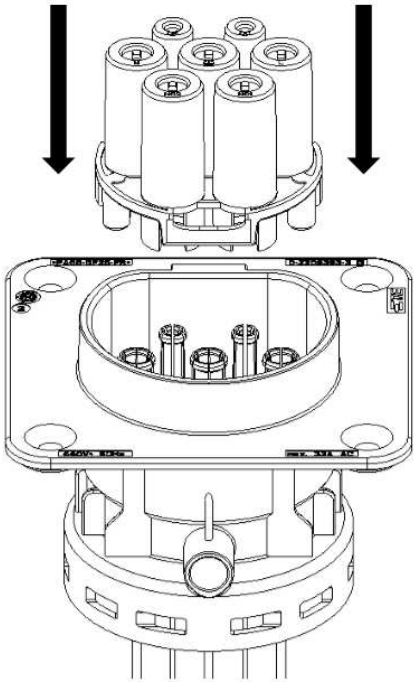


Figure 9a

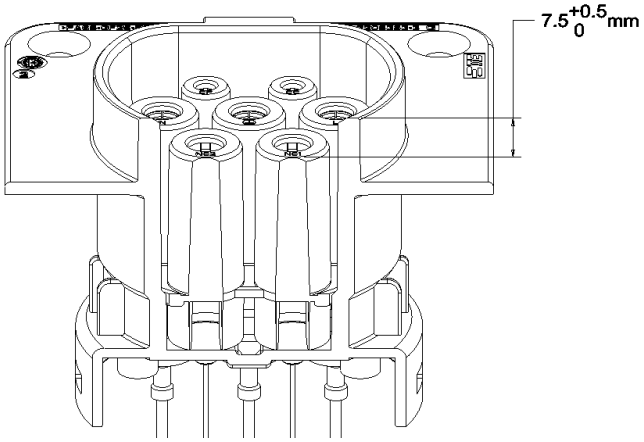


Figure 9b

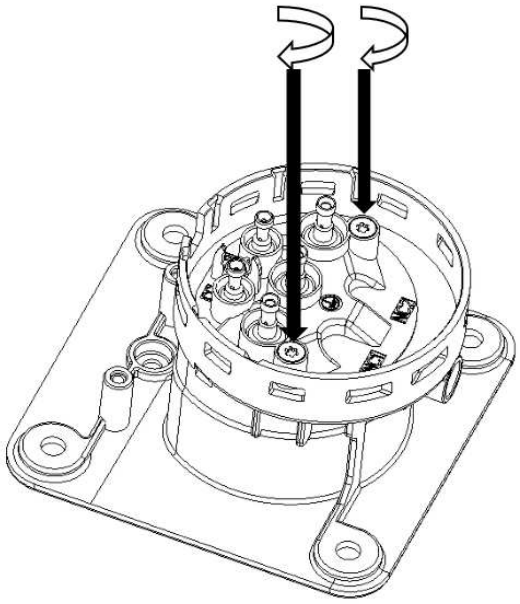


Figure 10 (cables not shown)

Step 7:

Insert the Temperature Sensor from the backside into its cavity in the center between the CC / CP signal contact positions of the Charge Inlet Housing (Figure 11a). Ensure that the locking hooks are properly engaged.

CAUTION: The Temperature Sensor has to be pressed correctly into its cavity with the brass collar of the Temperature Sensor on the Inlet Housing bottom (Figure 11b).

It is NOT allowable to pull the Temperature Sensor cables for an eventual pull test for correct sensor seating ! Any pull force on the Temperature Sensor cables is forbidden.

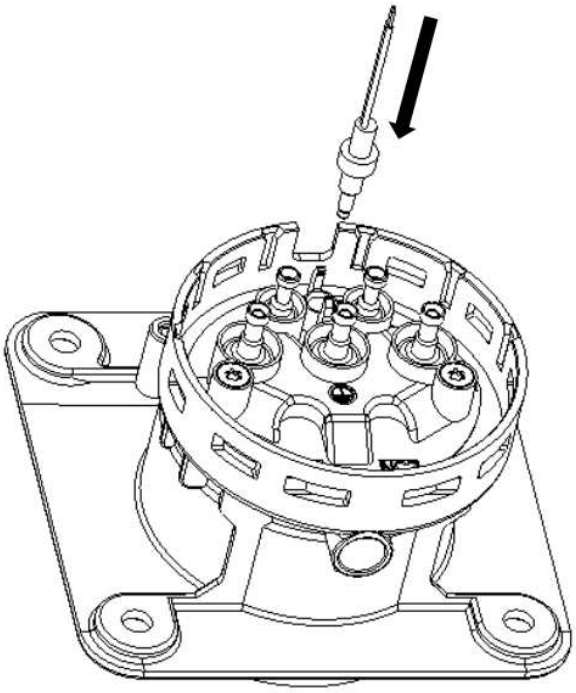


Figure 11a (cables not shown)

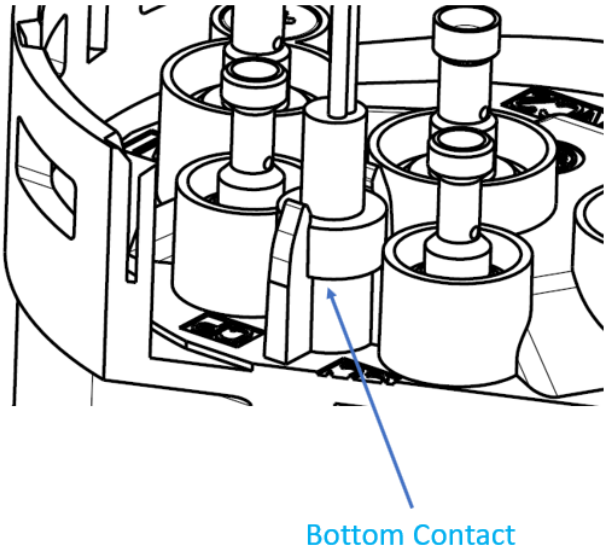


Figure 11b

Step 8:

Assemble the Insulation Cover to the Charge Inlet as shown in Figure 12a.
Ensure correct (symmetrical) position of Insulation Cover on Charge Inlet Housing (Figure 12b).

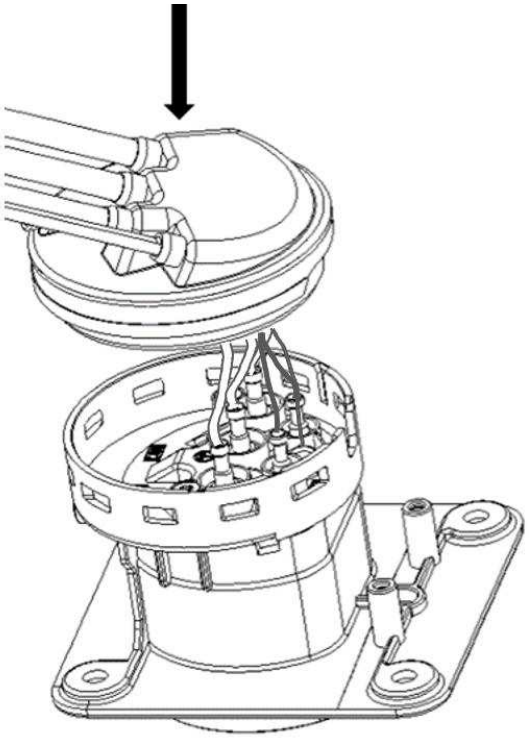


Figure 12a

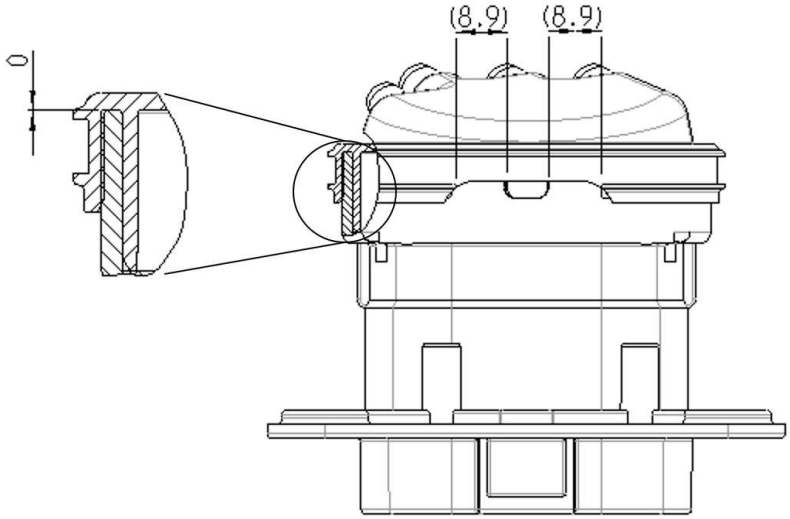


Figure 12b (cables not shown)

During the assembly of the Insulation Cover make sure to not apply pull forces on the temperature sensor cables. A dislocated sensor (pulled out of its seat in the charge inlet) may cause high voltage insulation risks !

Step 9:

Secure Insulation Cover on Charge Inlet Housing with a cable tie (Figure 13a).
Cable Tie should be properly placed in the groove (Figure 13b)

Minimum requirements of Cable Tie:

Width	**3.5mm**
Temperature resistance	**+85°C**

Table 4

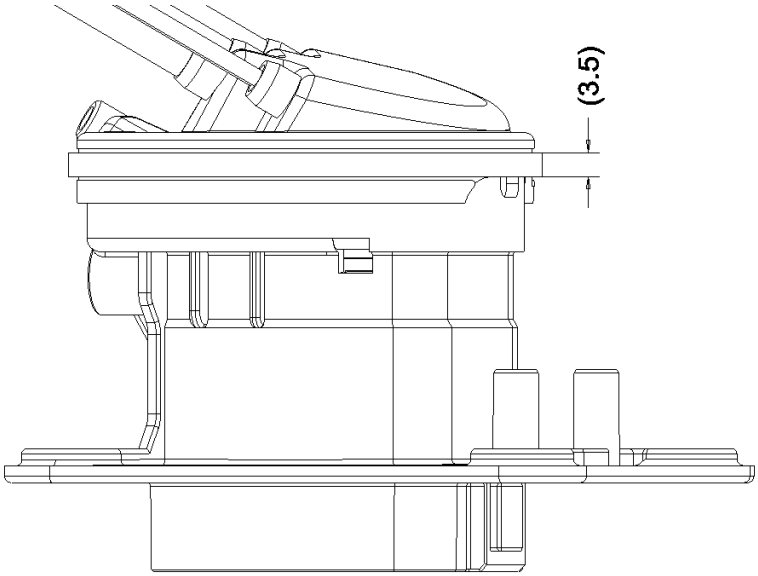


Figure 13a

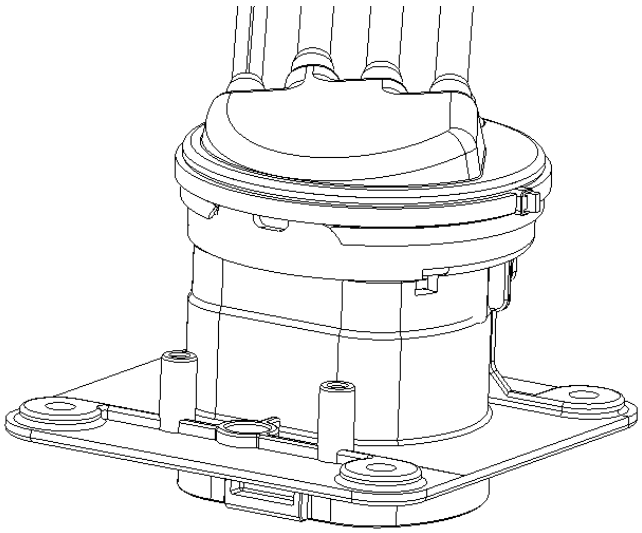


Figure 13b

Step 10:

Assemble the Connector Locking Unit to the assembled charge inlet. Ensure the prepositioning collar engages properly into the charge inlet housing and fix the locking unit with two screws, torque 0.9 +/- 0.15 Nm (Figure 14).

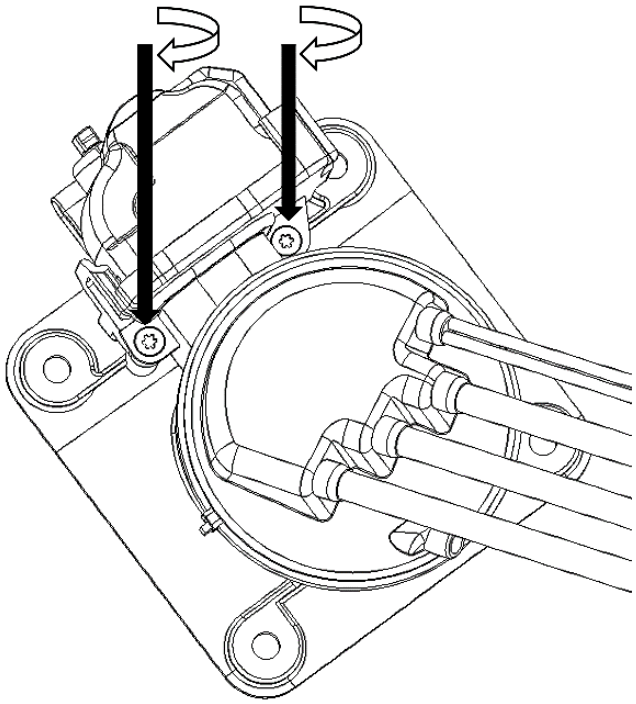


Figure 14

Attention: Alternatively Step 11 can be done before step 10

Step 11:

Assemble the Charge Inlet to the Mounting Bracket by fixing the Charge Inlet with four screws (Figure 15a), Torque 1.5+/-0.15 Nm (Figure 15b).
Fastening geometry of the Bracket is designed for screwing of Ejot Delta PT WN 5451 4x10.
TE will not be responsible for any damage caused by using any screws other than mentioned above.

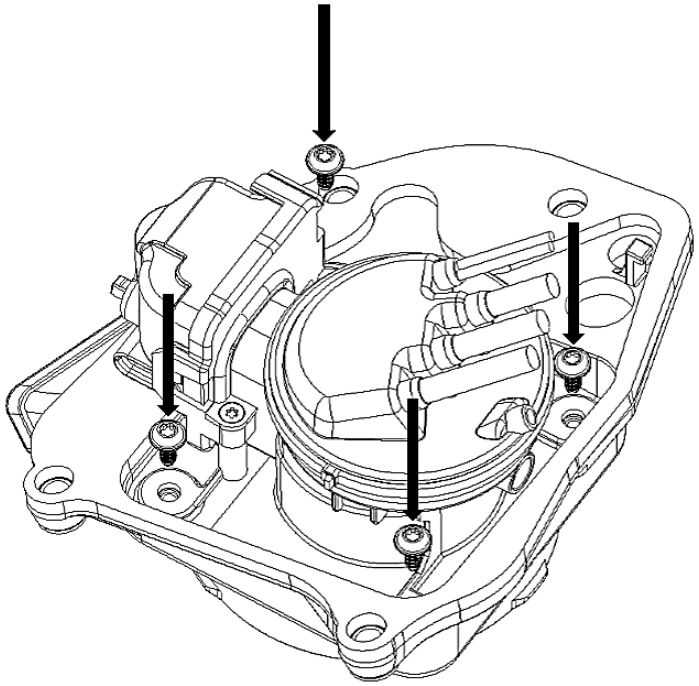


Figure 15a

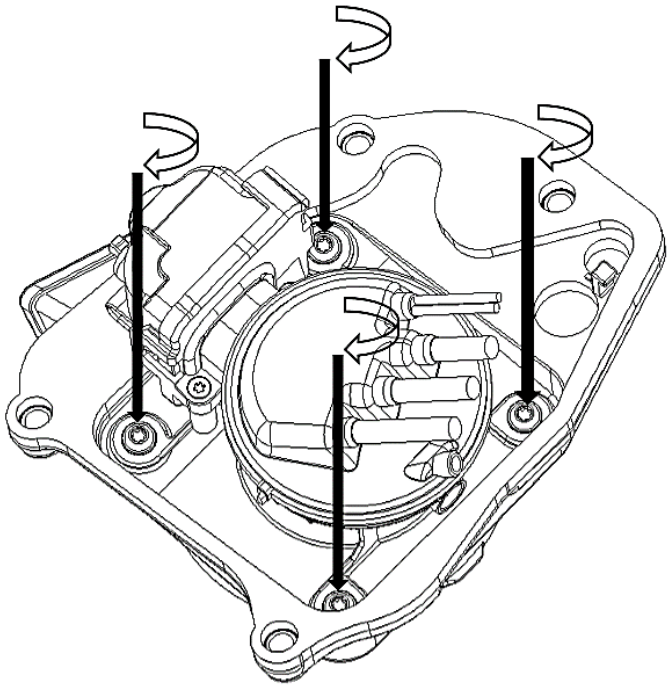


Figure 15b

5.5. End of Line Test:

Assembled Charge Interfaces have to be tested electrically and mechanically to applicable requirements, including High Voltage test.

<u>As a minimum following tests have to be performed:</u>

- **Isolation Resistance:**
  Test Voltage: 500VDC contact-to-contact (all contacts, excluding CP to CC)
  Inspection Duration: 1s
  min. Riso: 200MOhm
- **Dielectric withstand voltage:**
  Test Voltage: 2000VAC pin-to-pin (all pins, excluding CP–to-CC)
  Inspection Duration: 1s
  max. Leakage current: 10mA
- **Correct Pinning**
- **Check seals for correct seating / Check of leakage**
- **Gauge check of mating face**
- **Functionality of connector locking device (mechanical check of pin movement in locking and unlocking position)**
- **Application of marking according requirements**

LTR	REVISION RECORD	DWN	APP	DATE
A	FIRST REVISION FOR SINGLE WIRE CABLING OF TYPE GB	F. WITTROCK	D. WEYRAUCH	15DEC2014
B	POWER AND SIGNAL CONTACTS 0-2208376-2/-3 AND 0-2208378-2 ARE REPLACED BY 2-2208376-2/-3 AND 2-2208378-2 REMARK TO ASSEMBLY STEPS ADDED	T.SALMAN	D. WEYRAUCH	19JULY2016
C	CABLE EXIT UPDATED IN FIG 3	ARAVIND H.M	T. SALMAN	24NOV2016
D	ADDED APPLICATOR TOOL NR.	G. KUTI	D. WEYRAUCH	08FEB2019
E	MORE DETAILLED REQUIREMENT ON CABLES AND CRIMP, 4MM² P/N CROSSED OUT, PROPOSAL FOR TAPE AROUND SIGNAL CABLING, BETTER IDENTIFICATION OF CONTACT CAVITIES, MORE DETAILLED DESCRIPTION OF TEMPERATURE SENSOR ASSEMBLY, WARNING ADDED TO NOT PULL TEMPERATURE SENSOR CABLES	D. WEYRAUCH	F. WITTROCK	22JAN2021

DR D. WEYRAUCH 22JAN2021	TYCO ELECTRONICS AMP GMBH A TE CONNECTIVITY LTD. COMPANY AMPÈRESTRAßE 12-14 D-64625 BENSHEIM GERMANY		
CHK D. WEYRAUCH 22JAN2021			
APP F. WITTROCK 22JAN2021	NO 114-94299	REV E	LOC AI
TITLE	VEHICLE CHARGE INLET acc. GB/T 20234.2 TYP GB		