### **Cable Installation Guidelines**

#### General

The following guidelines should be followed to ensure satisfactory long term operation of the TEBS:

- The power supply and wheel speed sensor cables should be installed separately avoiding parallel cable runs in all cases; the minimum separation should be 5 cm.
- Cables must be protected against damage, especially when passing through holes in the chassis or bodywork.
- Cables must be secured to solid elements of the trailer with a rigid connection to the device being connected, e.g. the trailer chassis, otherwise damage to the cable may result.
- From the connector cables must have a free straight run of approximately 80 mm (minimum of 1 x connector length). There must be no bending of the cable close to the connector.



• The cable length between the connector and the first securing point must not exceed 300 mm.

}

- There must be no tensile stress or static load on the cables or connectors and the cable must be secured without damage to the insulation or wires within the cable, i.e. cable ties must not be fastened too tight.
- All cables connected to the axles, i.e. wheel speed sensor and pad wear cables must be secured in such way as to allow freedom of movement.
- During assembly, the plugs must not be exposed environmental contamination such as humidity, dust or dirt. The arc through which a cable should follow must not exceed 90° with the following bend radii being maintained:
- Power supply cable: min. R 100 mm }
- In-Out cables: min. R 50 mm
- Wheel-speed sensor cable: min. R 50 mm }

or a minimum of 10 x the cable diameter

Should a cable be too long the excess may be 'lost' by wrapping the cable as shown below.



Note:

The use of contact lubricants/cleaners or electrical grease is **not permissible** on Knorr-Bremse TEBS connectors as these may damage the seals and insulation



**TEBS G2** 

### **Cable Installation Guidelines**

#### Disassembly / Assembly of Covers

Disassembly of the cover - TEBS G2.0/G2.1 Brake Modules and Trailer Electro-Pneumatic Modules

- Slide the locking mechanism to the left (1)
- Tilt the cover (2)
- Lift the bottom of the cover from the locating lugs on the brake module / electro-pneumatic module (3).



#### Assembly of the cover - TEBS G2.0/G2.1 Brake Modules and Trailer Electro-Pneumatic Modules

- Tilt the cover and locate the bottom onto the locating lugs on the brake module / electro-pneumatic module (1).
- Push the top of the cover towards the brake module / electro-pneumatic module (2).
- Slide the locking mechanism to the right (3).









**TEBS G2** 

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### **Cable Installation Guidelines**

#### Disassembly of the cover - TEBS G2.2 Brake Modules and Trailer Electro-Pneumatic Module Advanced (TEPM-A)

- Pull down on the tab to release the cover (1)
- Tilt the cover (2)
- Lift the bottom of the cover from the locating lugs on the brake module (3).



#### Assembly of the cover - TEBS G2.2 Brake Modules and Trailer Electro-Pneumatic Module Advanced (TEPM-A)

- Tilt the cover and locate the bottom onto the locating lugs on the brake module (1).
- Push the top of the cover towards the brake module (2).
- Push the top of the cover to lock it in position (3).



**TEBS G2** 

# PD-272-00

### **Cable Installation Guidelines**

#### **Disassembly / Assembly of Power Cables**

To avoid stress fractures, leakage and corroded contacts in the power cable the following issues have to be considered:

- The assembled connectors shall be protected against exposure to direct environmental influences such as water, snow, dust etc. this is achieved by ensuring the covers are fitted.
- The gasket must be present in the bayonet connector and needs to be checked for visible signs of damage.

## Assembly of the power cable to the TEBS G2 Brake Module and Trailer Roadtrain Module

- Familiarise yourself with the bayonet connector, there is an indication mark (coding) to aid orientation.
- Align the cable to the connector, and push it in as far as it will go (1), do not tilt it.
- Turn the locking nut (2) until a positive stop is felt, and an audible "click" is heard.
- TEBS G2 brake module press the cable firmly into the strain relief clamp (3). Secure with UV safe cable ties around the cast pillars.



"Strain relief"

#### Disassembly of the power cable

- Remove the cable fixation near the brake module.
- Remove the cable from the strain relief clamp.
- Rotate the locking nut on the bayonet connector until it is loose.
- Grasp the bayonet connector (not the cable) and pull vertically downwards.





**TEBS G2** 

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## Cable Installation Guidelines

#### Assembly / disassembly of the power cable - Trailer Electro-Pneumatic Module Standard (TEPM-S)

#### Assembly of the power cable

- Familiarise yourself with the push-in connector, there is a locking device which can be used to aid orientation.
- Align the connector on the cable (with the locking device facing away from the module body) to the connector on the module and push it in (do not tilt) as far as it will go until an audible "click" is heard.
- Press the cable firmly into the guide.



#### Disassembly of the power cable

- Release the cable from the guide.
- Press the locking device on the end nearer the cable to release the lock.
- Grasp the connector (not the cable) and pull vertically downwards to remove it.

#### Assembly / disassembly of the power cable - Trailer Electro-Pneumatic Module Premium (TEPM-P)

#### Assembly of the power cable

- Familiarise yourself with the push-in connector, there is a locking device on each end of the connector and there is a locating key to ensure correct orientation.
- Align the connector on the cable (with the locating key facing away from the module body) to the connector on the modulator and push it in (do not tilt) as far as it will go until an audible "click" is heard.





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**TEBS G2** 

### **Cable Installation Guidelines**

#### Disassembly of the power cable

- Press the locking devices on the ends nearer the cable to release the lock.
- Grasp the connector (not the cable) and pull vertically downwards to remove it.

#### Cable fixation and routing - power cables

- The cable shall run vertically from the TEBS G2 Brake Module for at least 80 mm.
- The power cable has to be fixed to a suitable fixation point on the chassis not more than 300 mm from the cable exit from the bottom of the TEBS G2 Brake Module.
- Before and after the fixation point, a minimum bend radius 'R' of 100 mm must be observed.



#### Assembly / Disassembly of the power extension cable

To avoid stress fractures, leakage and corroded contacts in the power extension cable the following issues have to be considered:

- Any non-assembled connectors shall be protected against exposure to direct environmental influences such as water, snow, dust, etc.
- The gasket must be present in the bayonet connector and should be checked for visible signs of damage.



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**Cable Installation Guidelines** 

- Push the female connector onto the male connector as far as it will go (1), do not tilt it.
- Turn the locking nut (2) until a positive stop is felt, and an audible "click" is heard.



- The bayonet connection must be securely fixed, without tension, using cable straps ensuring that there are no bending forces created (see adjacent drawing).
  Use as large a radius as possible during the laying of

#### Cable fixation and routing - Trailer Roadtrain Module (TRM)

cables.

- The cables to the TRM must be fixed to a suitable fixation point on the chassis at a distance of between 250 mm and 300 mm from the TRM.
- After the fixation point, routing of the cables can be as required, however a minimum bend radius 'R' of 100 mm must be observed.



**TEBS G2** 

### **Cable Installation Guidelines**

#### Disassembly / Assembly of In-Out Cables

### Assembly / disassembly of the In-Out cables - TEBS G2 Brake Module and Trailer Electro-Pneumatic Module Advanced (TEPM-A)

Due to the various cabling options of the In-Out connector, the following shall be considered as an example only – you should adapt the instructions to suit your specific cabling situation.

To avoid stress fractures, leakage and corroded contacts in the In-Out connector/cable the following issues have to be considered:

 In all cases the In-Out sockets must be protected against water ingress and contamination. This is either achieved by the use of an In-Out plug and cable assembly or by the fitment of a closing plug:

	Part No.
12-way and 18-way sockets	K026197V01N00
6-way sockets (X2.3 & X2.4 on TEBS G2.2 Premium) (X2.3 on TEPM-A)	Z005861



- The assembled connectors shall be protected against exposure to direct environmental influences such as water, snow, dust etc. this is achieved by ensuring the covers are fitted.
- The gasket must be present on the connector, and needs to be checked for visible signs of damage.
- Any unused cable entries shall be closed using the supplied sealing "stops".

#### Assembly of the In-Out cable to the TEBS G2 Brake Module and Trailer Electro-Pneumatic Module Advanced (TEPM-A)

- Familiarise yourself with the In-Out connector, there is a coding key which needs to be orientated towards the front (long face without studs) of the module.
- Align the cable to the connector, and push it in as far is it will go (1), until an audible "click" is heard, do not tilt it.
- Press the cable(s) firmly into the strain relief slots (2). There are two slots, the first (A) provides space for four cables which have to be secured using a suitable cable tie. The second (B) is suitable for a single cable.





**TEBS G2** 

### **Cable Installation Guidelines**



#### Cable fixation and routing

• See "General" section on page 1 and the diagram for power cables on page 6.

**Cable Installation Guidelines** 

#### Disassembly / Assembly of In-Out Connector - TEBS G2.0/2.1/2.2 & TEPM-A - 12 way Disassembly

1.In order to disassemble a cable or a contact you will need a screwdriver with a wide blade. Apply it to the side of the housing		and push it carefully between the locking wedge and the housing (without damaging the lip seal). Prise out the locking wedge.	
2. Remove the locking wedge.	Contraction of the second seco	3. To remove each contact, gently pull its wire backwards while at the same time releasing the locking finger by moving it away from the contact with a small screwdriver.	ALLEN ST
4. Hold the rear seal in place, as removing the contact will tend to displace the seal		Schematic representation of contact removal.	
5. An alternative to using a screwdriver is to use another locking wedge (if available)		and push it carefully between the locking wedge and housing (without damaging the lip seal). Prise out the locking wedge.	

#### Assembly

1.	Take a single cable with crimped contact and hold it close behind the barrel of the contact.		2. Insert the contact carefully through the seal of the connector, push the contact until it is felt to snap in place.	50000
3. Afte thei con	After installing all cables (contacts) into their correct location), visually check that all contacts are correctly locked.	trans	Contact insertion	
			Contact locked in place with locking wedge fitted	

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### **Cable Installation Guidelines**



#### Disassembly / Assembly of TEPM-P 18 way plus TEBS G2.2 Premium and TEPM-A 6-way Connector Disassembly







**TEBS G2** 

### **Cable Installation Guidelines**

#### **Assembly of Wheel Speed Sensor Cables**

#### Assembly of the wheel speed sensor cables to the TEBS G2.0/G2.1 Brake Module and Trailer Electro-Pneumatic Module Premium (TEPM-P)

- · Familiarise yourself with the wheel speed connector, there is a coding key which needs to be orientated away from the module body.
- Align the cable to the connector, and push it in as far as it will go. The top of the connector shall be above the "O" ring seals (1).
- Press the cable firmly into the strain relief slot. Secure with UV safe cable ties around the cast pillars.

#### Closure cap, already attached





#### 2S/2M Systems:

• The unused wheel speed sensor connections "S-E" and "S-F" must be protected against water ingress and contamination by the fitment of closing caps, Part Number K022848.





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### **Cable Installation Guidelines**

#### Assembly of the wheel speed sensor cables to the TEBS G2.2 Brake Module and Trailer Electro-Pneumatic Modules -Standard (TEPM-S) and Advanced (TEPM-A)

- Familiarise yourself with the push-in connector, there is a locking device which can be used to aid orientation.
- Align the connector on the cable to the connector on the module and push it in (do not tilt) as far as it will go until an audible "click" is heard.
- Press the cables firmly into:
- TEBS G2.2 & TEPM-A the right hand strain relief slot (cable locator).
- TEPM-S the centre strain relief slots (cable locators).
- Secure with UV safe cable ties around the cast pillars.



#### 2S/2M Systems:

• When TEBS G2.2 Premium is used in a 2S/2M system, the unused wheel speed sensor connections "S-E" and "S-F" must be protected against water ingress and contamination by the fitment of closing caps, Part Number Z005860.

#### **TEPM-A:**

• When connections "S-E" and "S-F" are not used on the TEPM-A they must be protected against water ingress and contamination by the fitment of closing caps, Part Number Z005860.



### TEBS G2 Cable Installation Guidelines

#### Assembly of DIN Bayonet Connector (2, 3 and 4 -pin)

The DIN Bayonet connector is mainly used on electro-mechanical components, e.g. modulators, lift axle valves, sensors, etc.

- Familiarise yourself with the bayonet connector and make sure that the seal in the plug is not damaged.
- Aligntheplugtothesocket, and pushitinas farasit will go. You can feel and hear when the nut has locked onto the socket.
- The cable from the plug must be fixed securely, without tension, using cable ties ensuring that no bending stresses are created.
- Use as large a radius R as possible during the installation of cables.
- It is not necessary to create a loop for the avoidance of water ingress because the connector is a completely sealed.



300 mm max.



**TEBS G2** 

### **Cable Installation Guidelines**

#### Installation of ISO 7638 Socket

The installation position of the ISO 7638 socket is 0° to 30° inclined below the horizontal. If this is not observed water can penetrate the contact area while coupling the mating plug. ISO 7638 sockets which are not used must be coupled with a dummy (parking) connector.



#### **Revision Details**

Rev. 004	January 2019	New Layout		



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