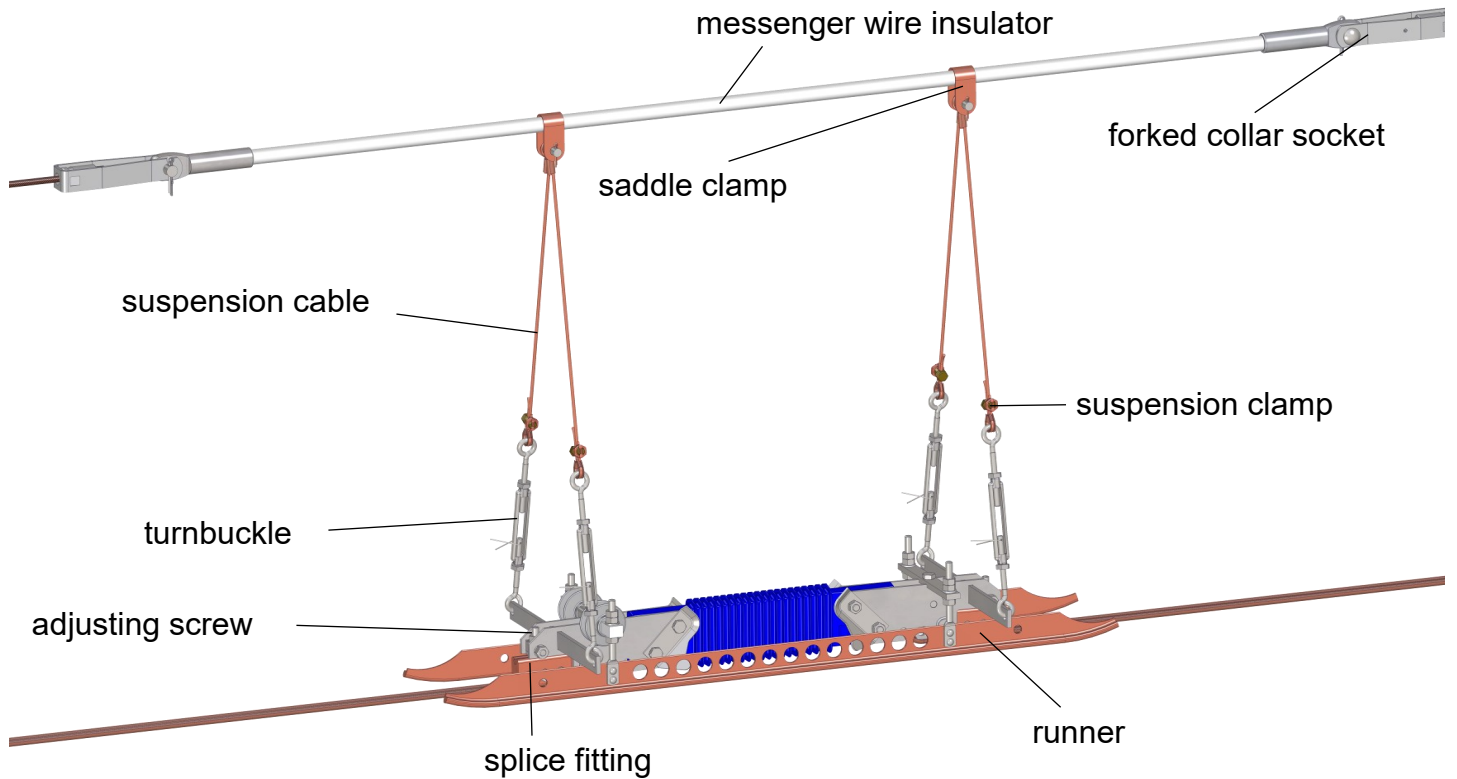


Section insulator FT1.5 / FTM1.5
Neutral section FTN1.5 / FTM1.5

V 2024/04



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RISK OF DEATH

Before working on the overhead line: Ensure that the overhead line is de-energized and properly grounded according to the regulations.

A) Tools

- 1 spring balance item no. 655.181.000
- 1 ring spanner 17 mm..... item no. 656.000.001
- 1 torque wrench 17 mm (50 Nm) item no. 655.114.000
- 1 adjustable spirit level item no. 655.141.000
- 1 alignment bar..... item no. 696.016.010
- 1 metal saw item no. 656.000.002
- 1 copper hammer item no. 656.000.009
- 1 flat nose pliers or gas pliers item no. 656.000.004
- 1 straightening wood item no. 656.000.005
- 1 hexagonal key 5 mm
- 1 bolt cutter
- 1 tensioning belt

Additionally for messenger wire insulator installation or replacement of a section insulator:

- 1 pulley block with 2 cable sockets

B) Preparation

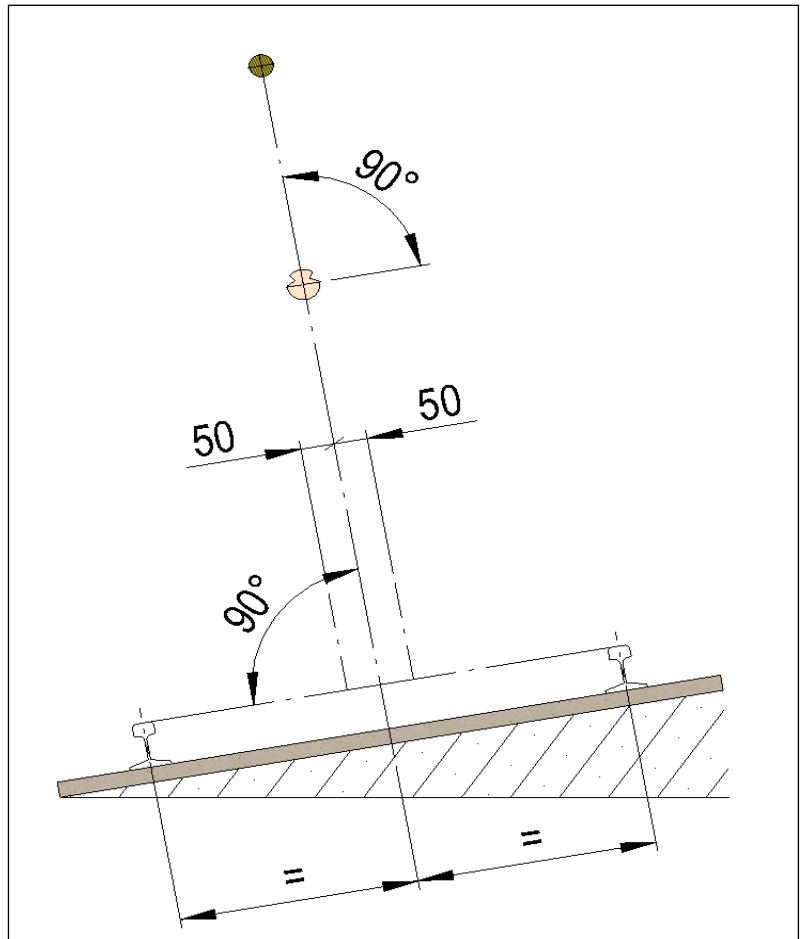
1. Preparation of the contact and messenger wire

The contact wire must not have any buckles or twists at the installation site.

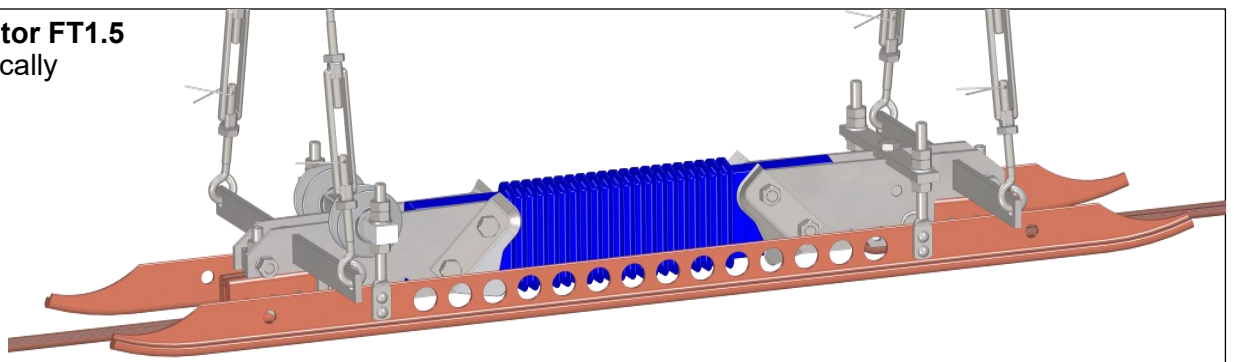
The section insulator should be well centred and aligned parallel to the track. The carbon strip of the pantograph must run centred over the section insulator.

Align the contact wire and the messenger wire in the middle of the track (**+/- 50 mm**).

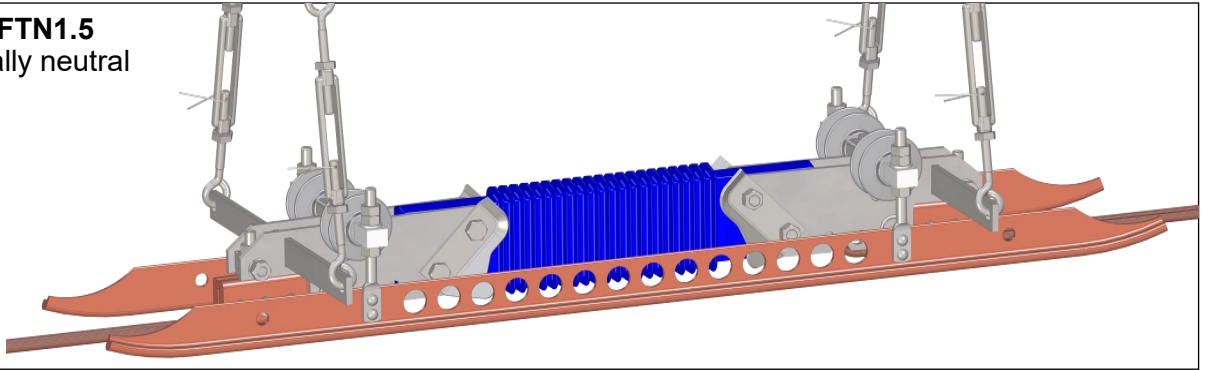
The contact wire and messenger wire must be positioned vertically within **50 mm** above each other.



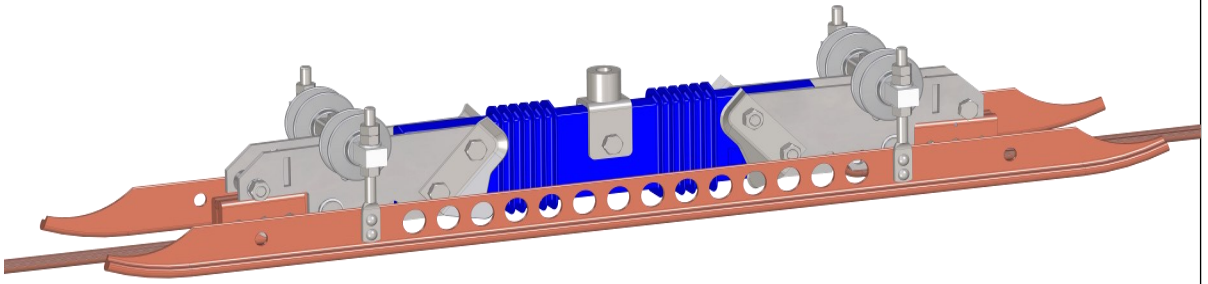
Section insulator FT1.5
Runners electrically powered



Neutral section FTN1.5
Runners electrically neutral



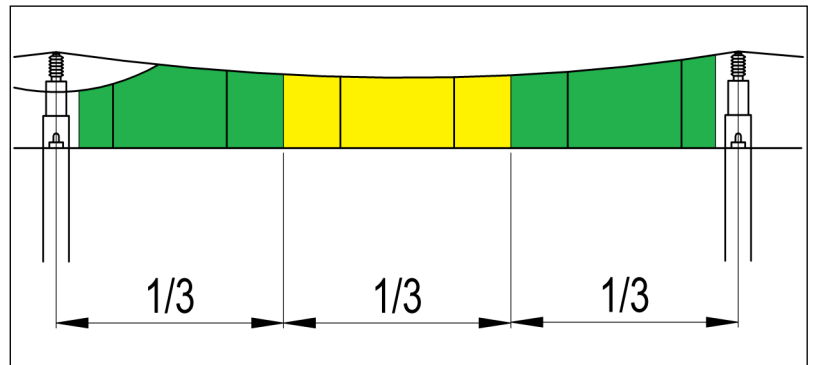
Section insulator with central suspension FTM1.5 - Runners electrically powered
Neutral section with central suspension FTM1.5 - Runners electrically neutral (illustrated)



2. Installation Location

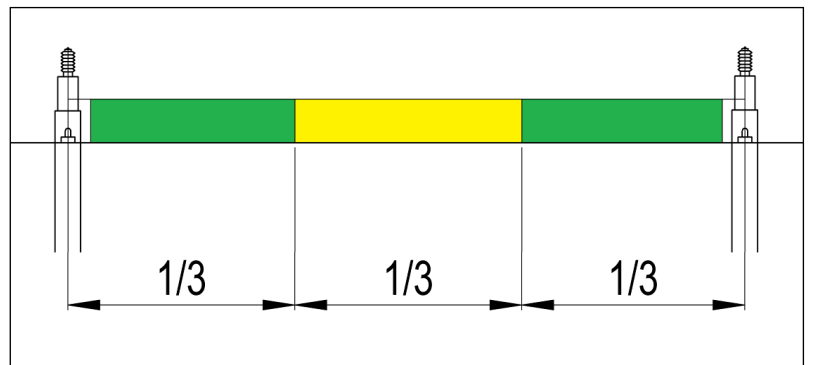
System with messenger wire

The section insulator or the neutral section must be installed in the green area.
The yellow area is not recommended for installation.
The setting is suitable for the section insulator and the neutral section.



System without messenger wire

Attach the section insulator to the guide arm or a cross-span cable.
The section insulator must be installed in the green area.
The yellow area is not recommended for installation.
The setting is suitable for the section insulator and the neutral section.



System with Delta Wire

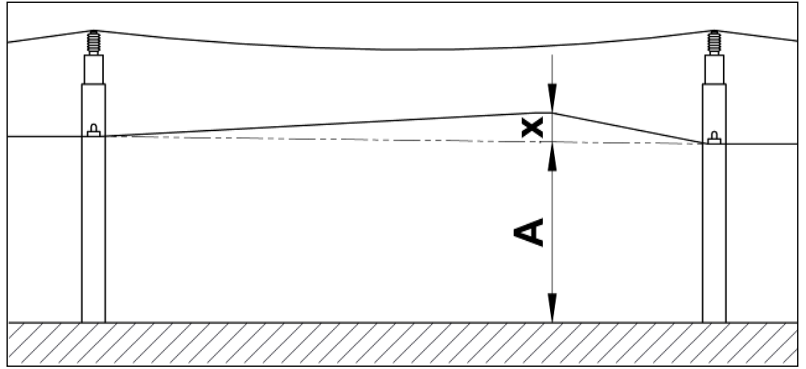
The section insulator must be installed within the Delta Wire in the green area.
The red area is excluded for installation.
The setting is suitable for the section insulator and the neutral section.



3. Hogging of the section insulator

Final height of the section insulator =
Standard height of contact wire + hogging of
at least 30 mm.

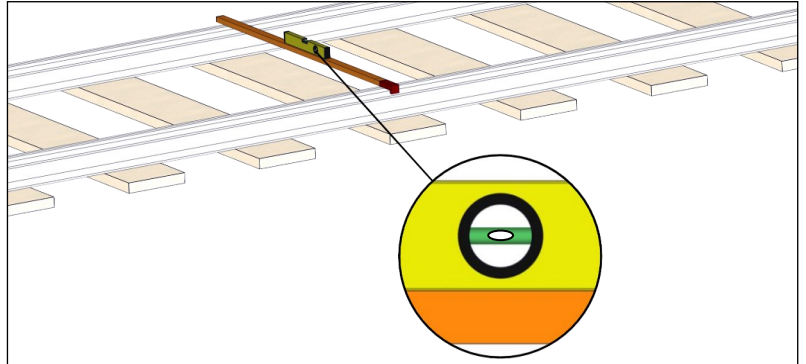
The standard height of the contact wire is the original contact wire height without the weight of the section insulator.



4. Measuring the inclination

Place the spirit level on the alignment bar at the installation location as shown and level it.

Make sure that the spirit level always points in the same direction during the installation as it was levelled.

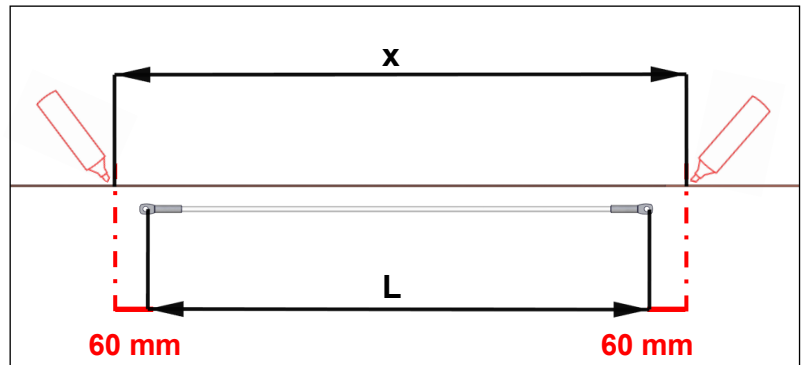


5. Installation of the messenger wire insulator

Cutting mark = x



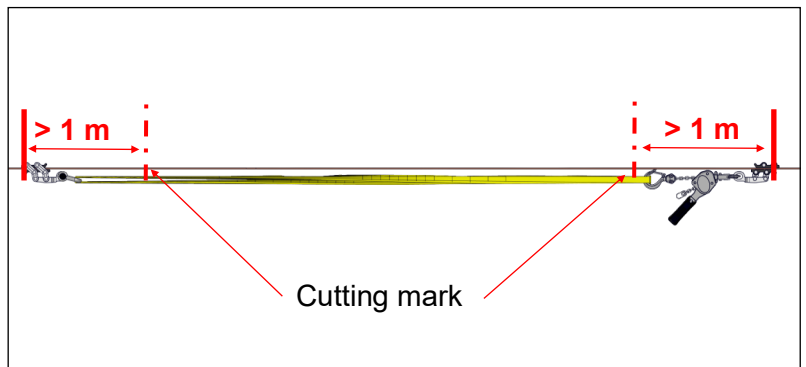
Cutting mark = Length of the insulator (L) +
2 x 60 mm.



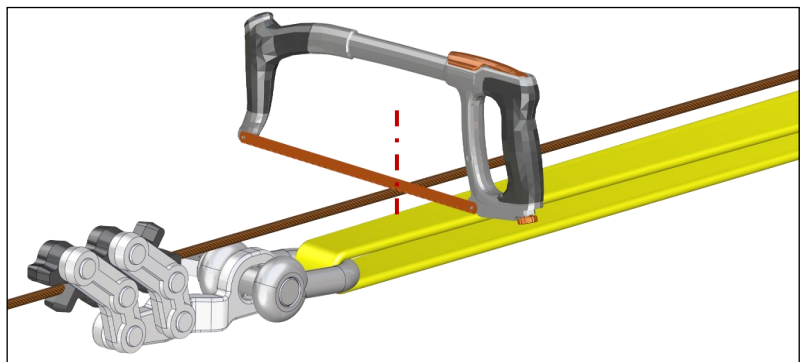
Attach the pulley block to the messenger wire using the two cable clamps.

Release the load on the messenger wire.

The distance between the cable clamp of the pulley and the cutting must be **at least 1 m** on each side.



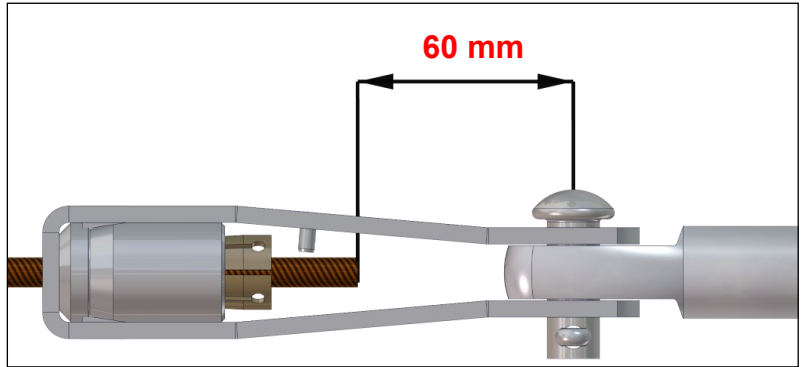
Cut the messenger wire at the marking with a metal saw.



Attach the messenger wire insulator to the forked collar sockets and insert the messenger wire ends into the cone of the forked collar sockets.

The distance between the centre of the bolt of the forked collar socket and the end of the messenger wire is **60 mm**.

Remove the pulley block after installing the messenger wire insulator.



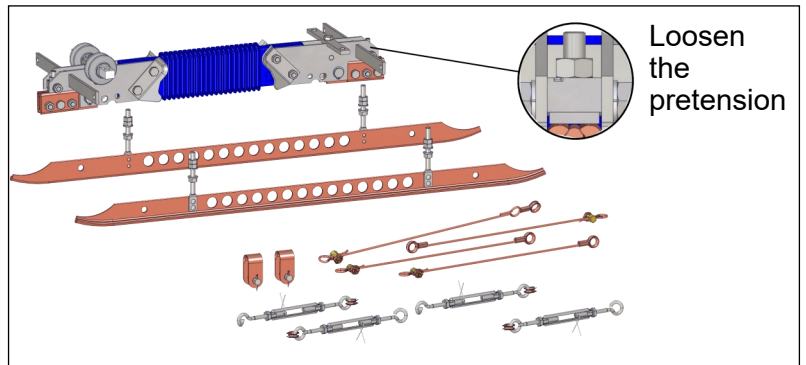
Attach the saddle clamps and the suspension cables to the messenger wire insulator.



6. Preparation of the section insulator

Remove the runners from the insulator body and all nuts and safety wires from the turnbuckles. Keep the removed parts. Loosen the bolts of the splice fittings and open the turnbuckles completely.

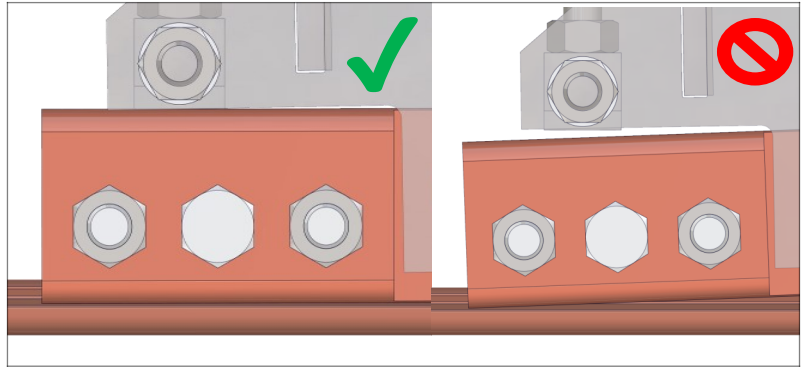
When reinstalling: Loosen the pretension on the adjusting screws.



C) Installation

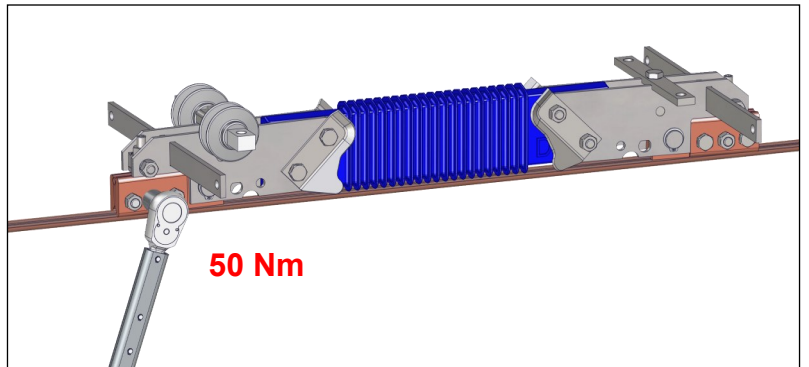
7. Mount the section insulator onto the contact wire

Place the section insulator with slightly spread splice fittings on the contact wire and check that the splice fittings are correctly placed on the contact wire groove.



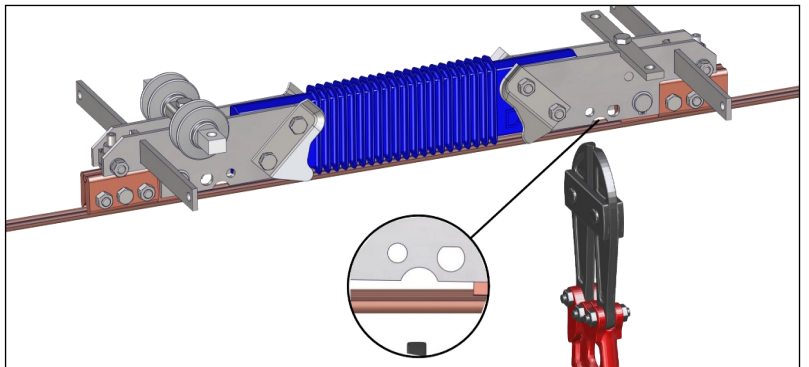
Attention: The teeth of the splice fittings must grip in the contact wire groove over the full length of the splice fittings.

Tighten the bolts of the splice fittings one after the other with a torque wrench to **50 Nm**. Repeat this process twice until each bolt has been tightened a total of three times.



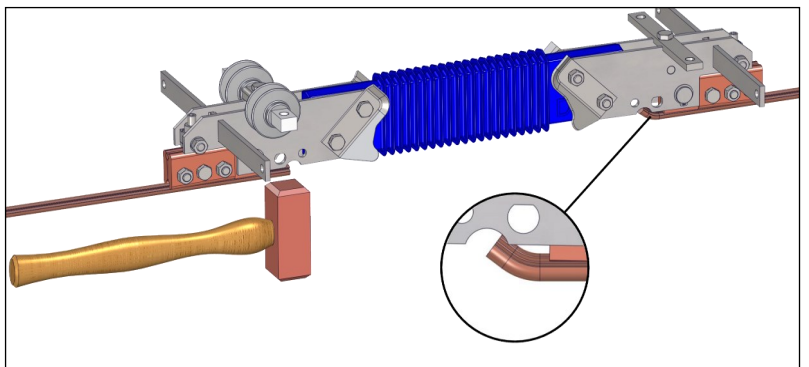
8. Cut the contact wire

Cut the contact wire on both sides of the section insulator with a bolt cutter.



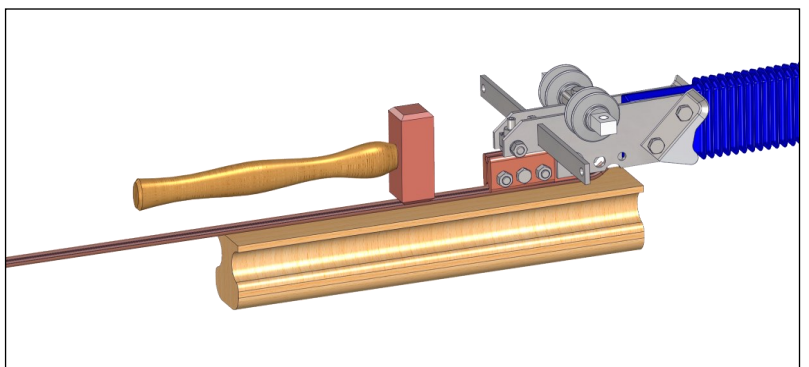
9. Bend up the contact wire ends

Bend up the contact wire ends on both sides of the section insulator body by hitting them with a copper hammer.



10. Straighten the contact wire

Straighten the contact wire on both sides of the section insulator by using a copper hammer and a straightening wood.



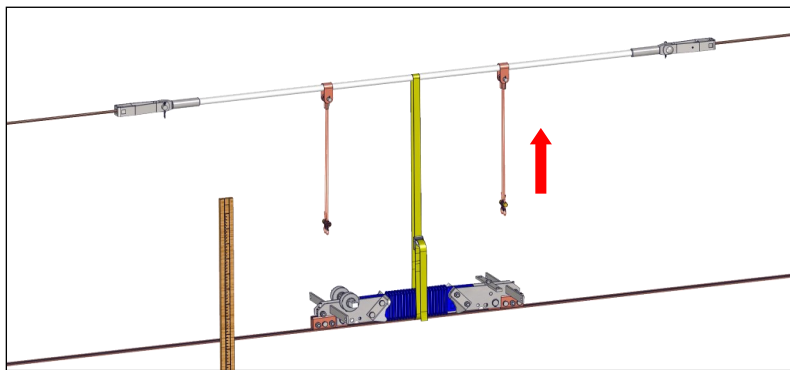
Installation FT1.5 / FTN1.5

11. Determine the hogging

Final height of the section insulator =
Standard height of contact wire + hogging of
at least 30 mm.

The standard height of the contact wire is the original contact wire height without the weight of the section insulator.

Attach the tensioning belt to the messenger wire as shown.

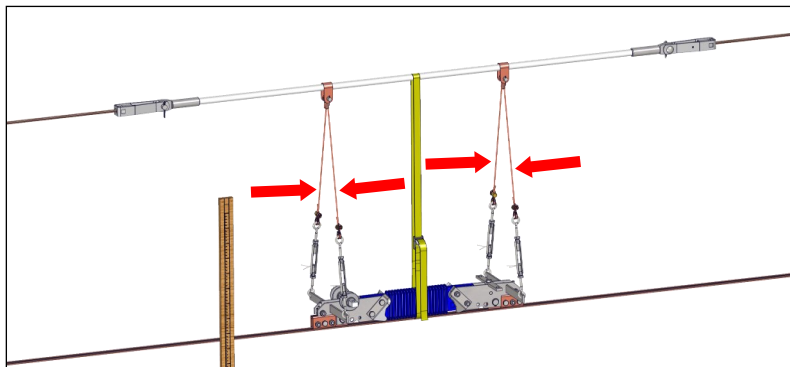


12. Attach the suspension

Attach the suspension to the messenger wire insulator and adjust by turning the turnbuckles until the tension is taken up by the suspension cables.

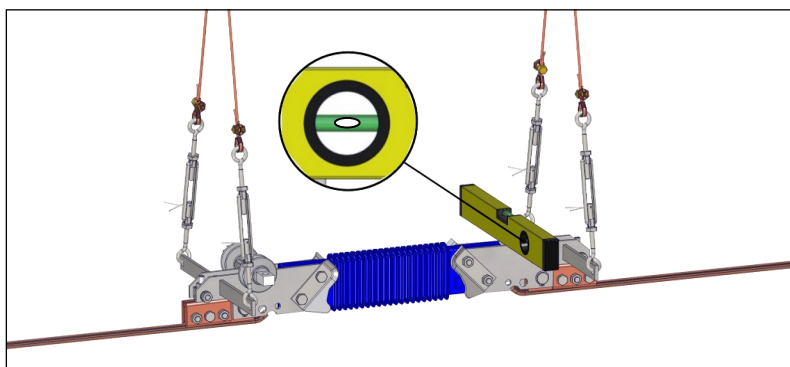
The tension in the suspension cables must be identical.

Remove the tensioning belt.



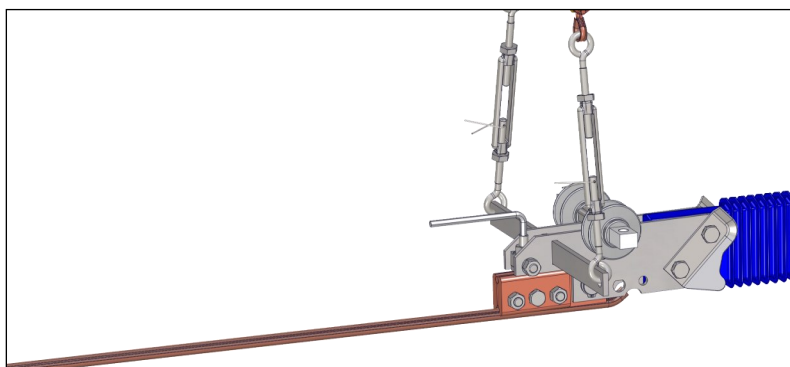
13. Adjust the cant of the section insulator

Use the levelled spirit level (from point 4) to adjust the section insulator parallel to the track.



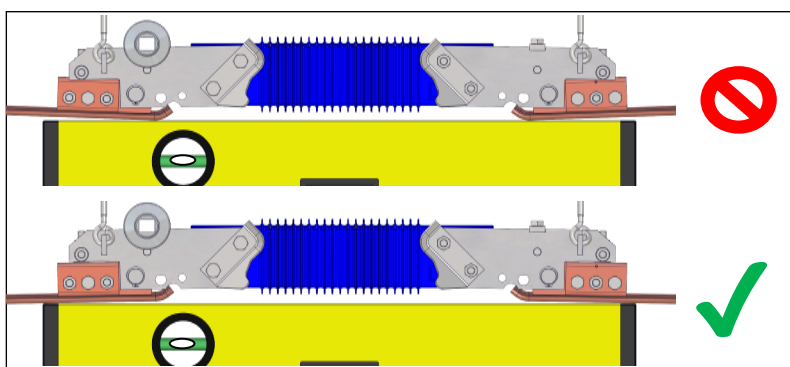
14. Adjust the pretension

Adjust the pretension on the adjusting screws with a hexagonal key.



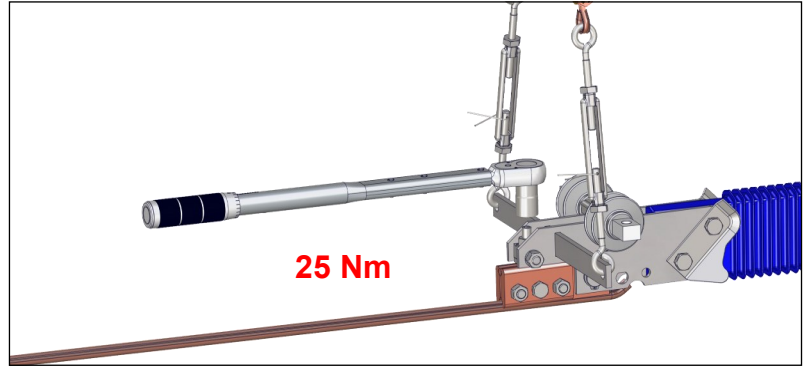
15. Check the pretension

Check the alignment with the spirit level. Adjust the pretension to ensure that the splice fittings hold the contact wire without deflection.



16. Secure the adjusting screws

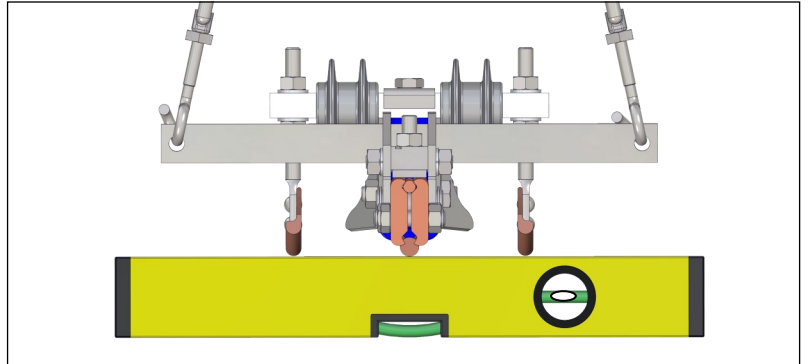
Secure the adjusting screws with the counter nuts to **25 Nm**.



17. Mount the runners

First provisionally attach the runners to the section insulator.

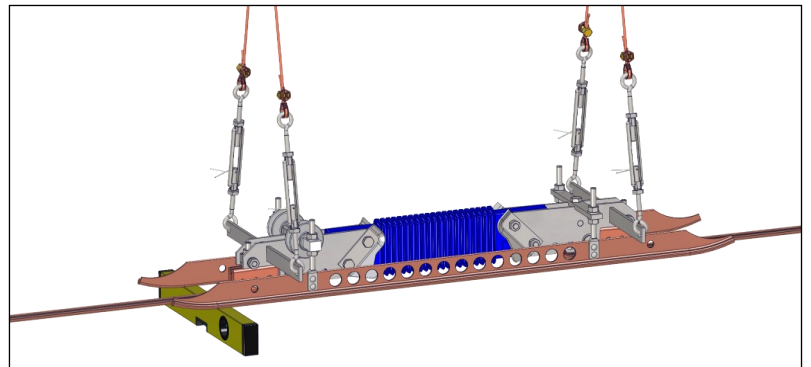
Set the runners to the height of the underside of the contact wire and parallel to the track.



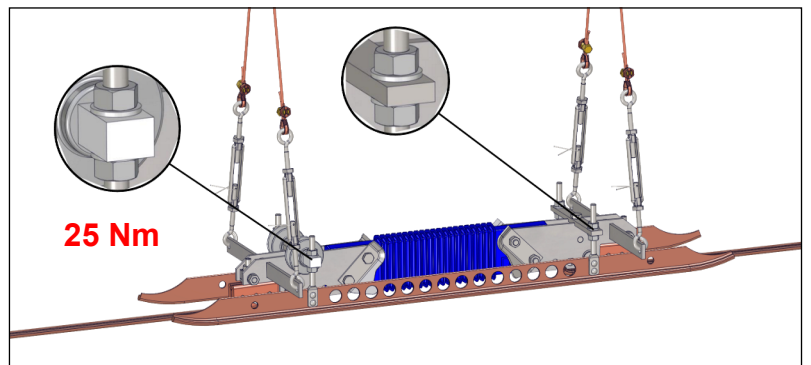
18. Check gliding and inclination

Check gliding with a pantograph or a spirit level.

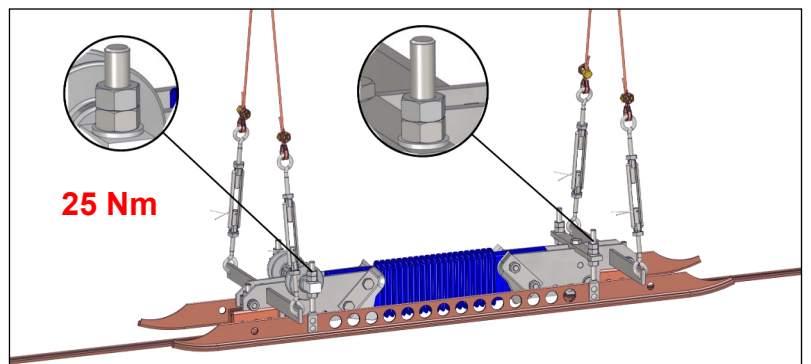
The transitions between contact wire - runners - contact wire must be smooth. The runners must be set parallel to the track.



Tighten the screws of the runners to **25 Nm**.

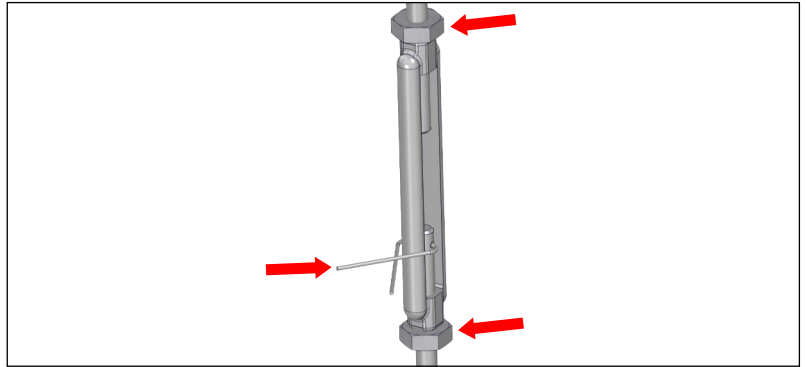


Tighten the counter nuts to **25 Nm**.



19. Secure the turnbuckles

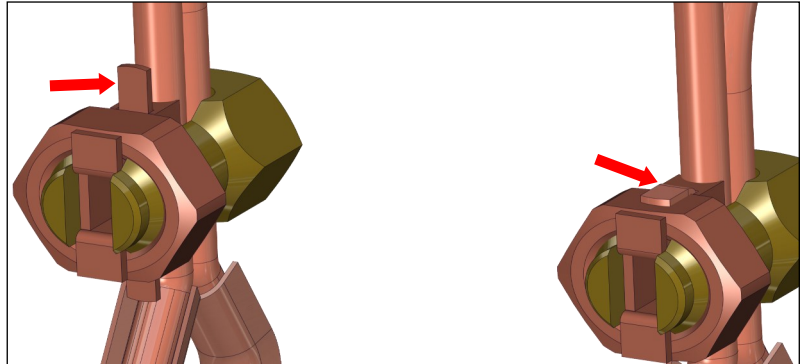
Tighten all locking nuts and lock the turnbuckles with a safety wire.



20. Secure the suspension clamps

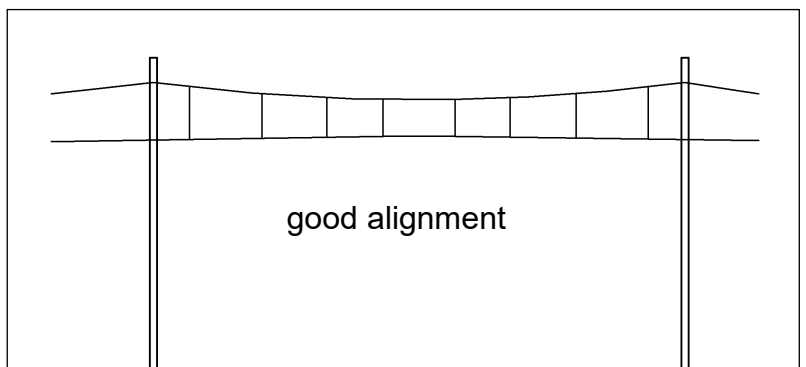
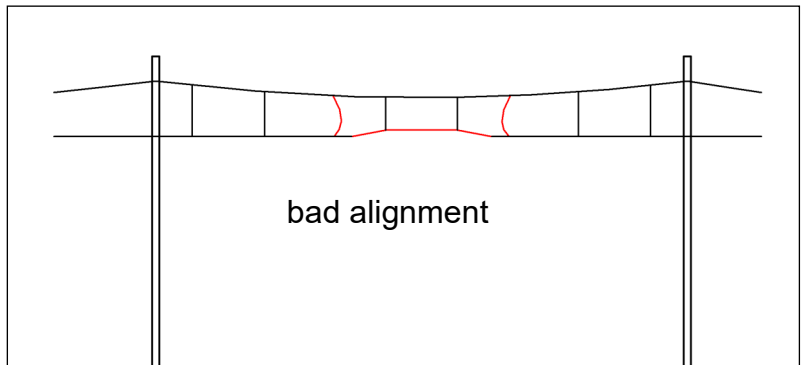
Secure the suspension clamps by bending over the anti-loosening wire.

After raising and fine-tuning, shorten the suspension cables.

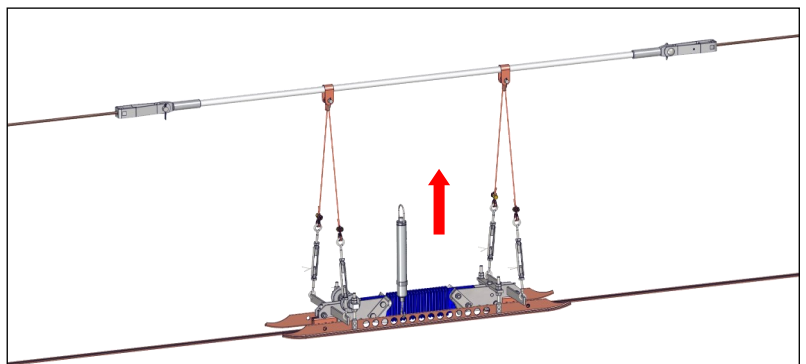


21. Alignment of the droppers

Check the next three droppers in both directions and adjust as needed.



A well adjusted section insulator can be lifted with 120 N - 150 N using a spring balance attached to the runners without slanting or the suspension becoming loose. If the suspension is no longer under tension when lifted, tighten the suspension with the turnbuckles until the tension is taken over by the suspension cables. The tension in the suspension cables must be identical.

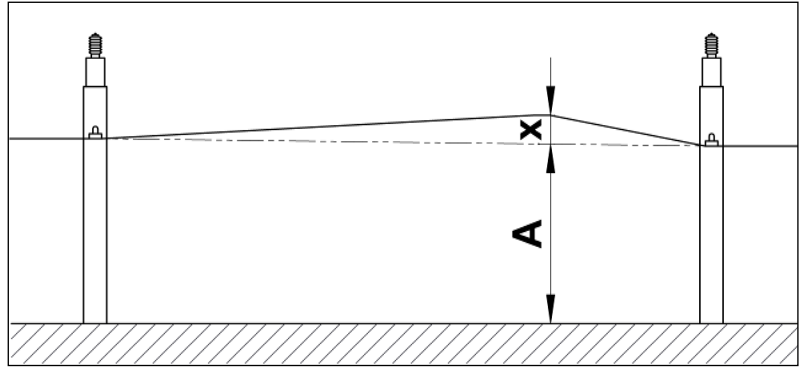


Installation FTM1.5

11. Determine the hogging

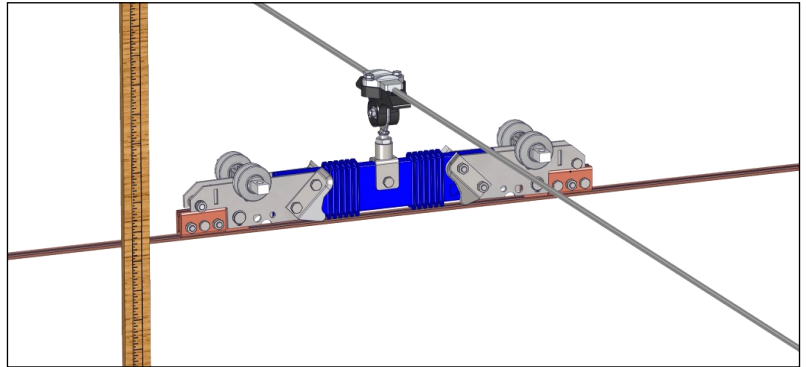
Final height of the section insulator =
Standard height of contact wire + hogging of
at least 30 mm.

The standard height of the contact wire is the original contact wire height without the weight of the section insulator.



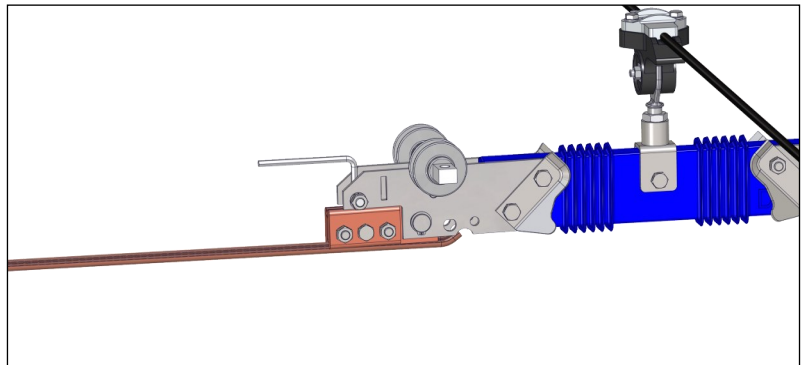
12. Attach the central suspension

Attach the central suspension to the guide arm or cross-span cable.



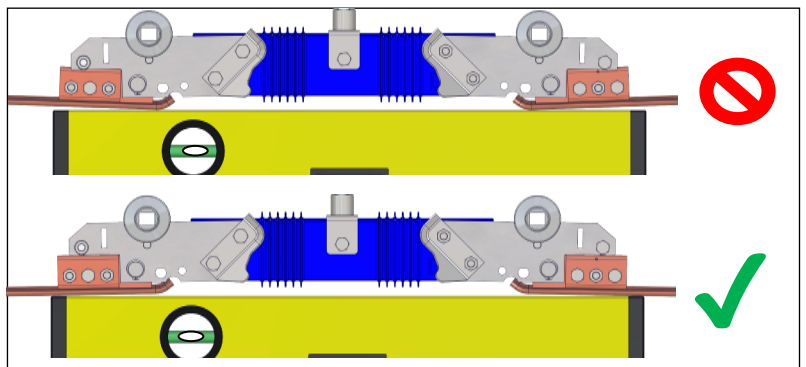
13. Adjust the pretension

Adjust the pretension on the adjusting screws with a hexagonal key.



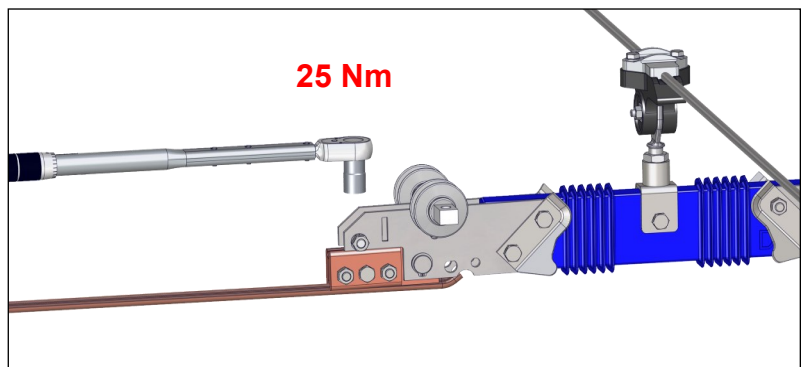
14. Check the pretension

Check the alignment with the spirit level. Adjust the pretension to ensure that the splice fittings hold the contact wire without deflection.



15. Secure the adjusting screws

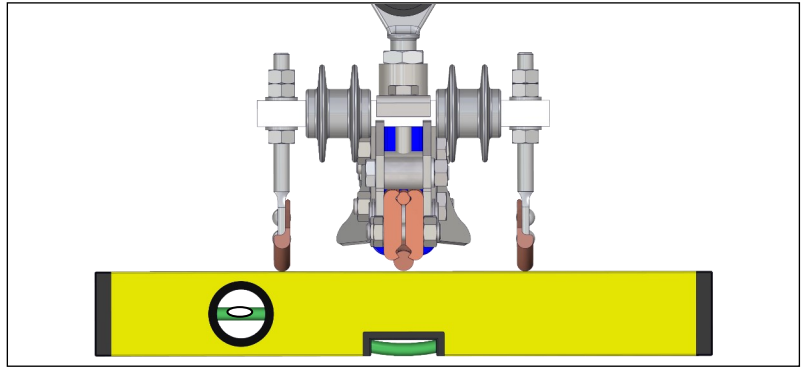
Secure the adjusting screws with the counter nuts to **25 Nm.**



16. Mount the runners

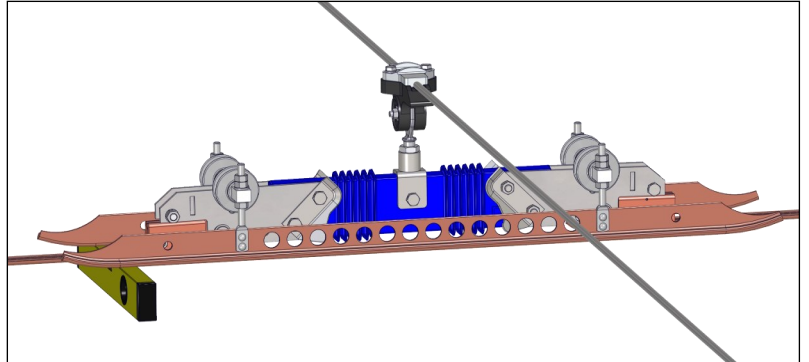
First provisionally attach the runners to the section insulator.

Set the runners to the height of the underside of the contact wire and parallel to the track.

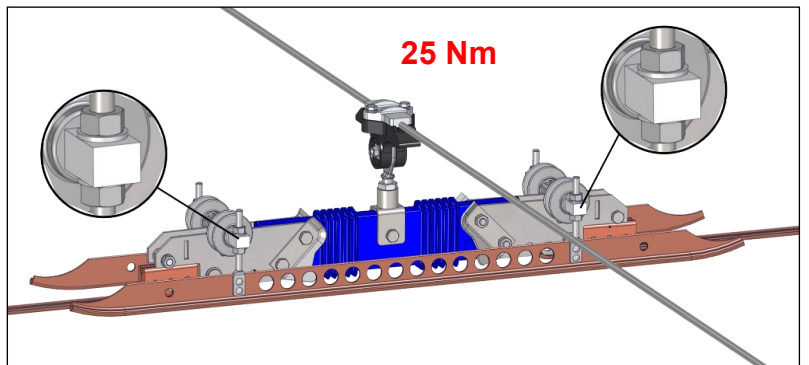


17. Check gliding and inclination

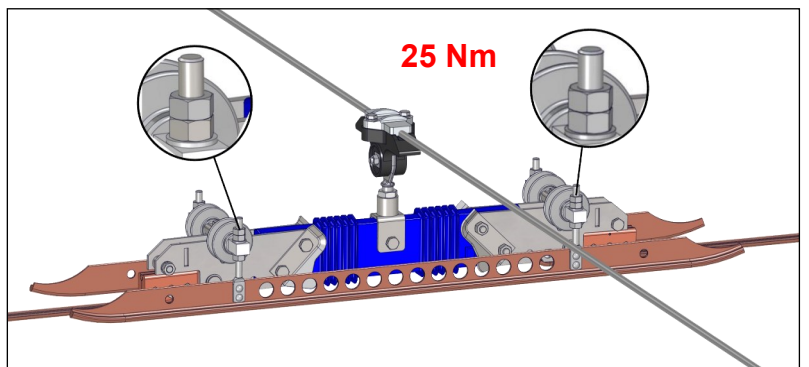
Check gliding with a pantograph or a spirit level. The transitions between contact wire - runners - contact wire must be smooth. The runners must be set parallel to the track.



Tighten the screws of the runners to **25 Nm**.



Tighten the counter nuts to **25 Nm**.



D) Maintenance

A correctly adjusted Arthur Flury AG section insulator requires no maintenance over a long period of time.

Insulator

The insulators with blue silicone coating are usually sufficiently cleaned by rain. In the case of extreme soiling (e.g. due to regular use of diesel engines or when installed in a tunnel, etc.), we recommend cleaning the section insulator with water and commercially available soap (without added cleaning agents or solvents). No soap residue should remain on the surface of the insulator after rinsing.

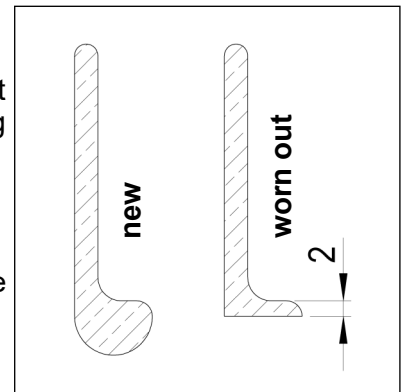
If there is visible damage to the insulator cover, the insulator must be replaced immediately.

Runners

If the runners show increased wear at the entry, it indicates that they have not been adjusted accurately enough. The runners must be readjusted according to the installation instructions.

Well adjusted runners show even wear over the entire length.

Should the wear have reached the maximum value (bulb only 2 mm) the runners must be replaced.



Running properties

The section insulator and any installed suspension must be observed while passing with the pantograph. The installation must remain stable during the passage. If it vibrates strongly or even becomes loose, this is a sign that the pantograph is creating too much pressure on the section insulator. In this case the section insulator must be positioned higher (increase hogging).

E) Legal information

The product must only be operated by trained specialists.

The product can be permanently damaged by loads that exceed the maximum values. If the product is exposed to absolute maximum loading for an extended period, it may impair the product's reliability and life. Arthur Flury AG will not accept any liability in this case.

Arthur Flury AG will not accept any liability for incorrect use and use for applications other than those specified in these instructions.

If damage to the product is suspected, any use or operation must be stopped immediately. Arthur Flury AG will not accept any liability in the event of continued use despite suspected damage.

Due to the diverse ways in which this product can be used, the instructions for use represent a general guide only and do not constitute a guarantee of the product's suitability for use in a specific application. The user is responsible for checking the full product data and clarifying the product's suitability for the intended use. The user is responsible for the choice of product and compliance with all the safety regulations and warnings. Please contact Arthur Flury AG if you require additional product information.

Our products comply with the current legal requirements and regulations (including RoHS, REACH, WEEE) in the markets where we operate. Please refer to Arthur Flury AG's Code of Conduct, available on our website, for further information.

These instructions are intended to provide the customer with information and should not be supplied unless accompanied by the product. The products and information in this publication require appropriately trained specialist personnel. Despite the greatest care being taken, the instructions may contain inaccuracies or typographical errors for Arthur Flury AG will not accept any liability. Arthur Flury AG may amend the instructions at any time, without notice, in the interests of technical progress. The customer is responsible for downloading an up-to-date version of the instructions from Arthur Flury AG's website before using the product.

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