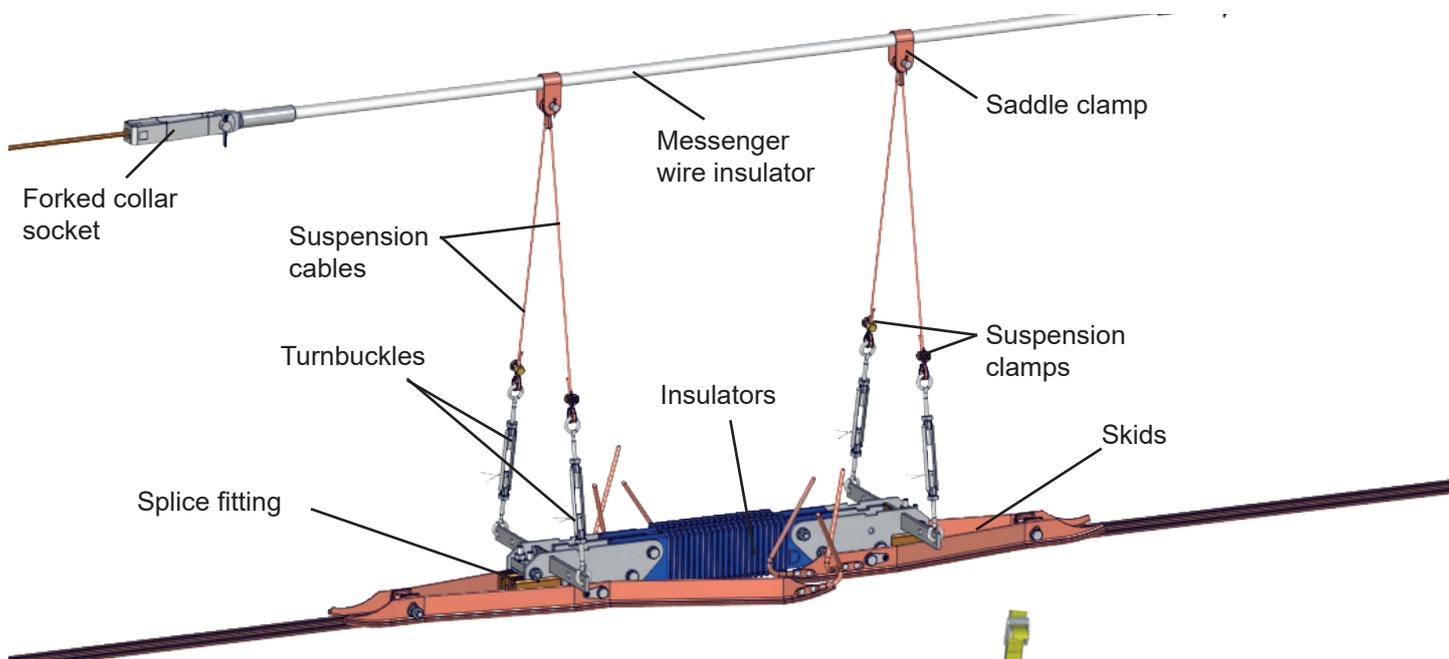


Section insulator FOD/FSD/FDD with 2 insulators

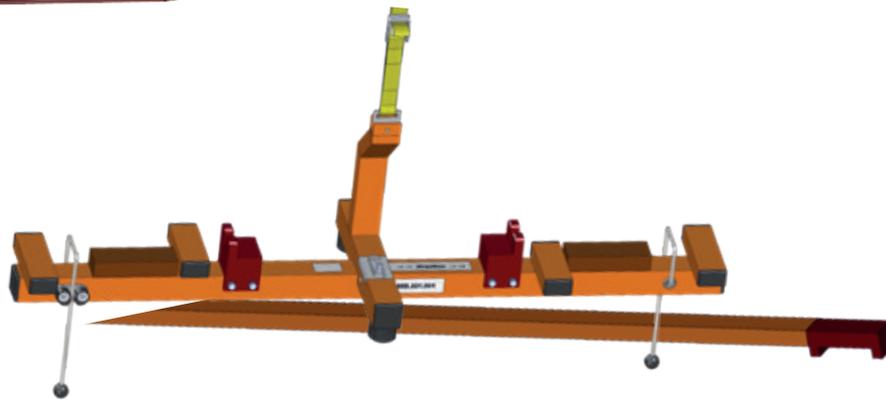
For 3 kV DC catenary systems to 100 km/h



Optional supplies:

Installation JIG:
Art. no. 655.301.001

Alignment bar:
Art. no. 696.016.010



Index

A) Tools.....	2
B) Preparation	2
C) Installation.....	4
D) Maintenance	9



RISK OF DEATH

Before start working in the overhead line: Make sure that the overhead line is switched off and correctly grounded on both sides and the lifting platform is insulated.

A) Tools

- 1 Spring scale.....art. no. 655.181.000
- 1 Ring open-end wrench 17 mmart. no. 656.000.001
- 1 Torque wrench 17 mm (50 Nm).....art. no. 655.114.000
- 1 Adjustable spirit levelart. no. 655.141.000
- 1 Bolt cutter or metal sawart. no. 656.000.002
- 1 Torque wrench with hexagonal pin 5 mm
- 1 Hammerart. no. 656.000.009
- 1 Universal pliers.....art. no. 656.000.004
- 1 Straightening woodart. no. 656.000.005

Additionally for:

Messenger wire insulator installation or replacement of a section insulator

- 1 pulley block with 2 cable clamps

B) Preparation

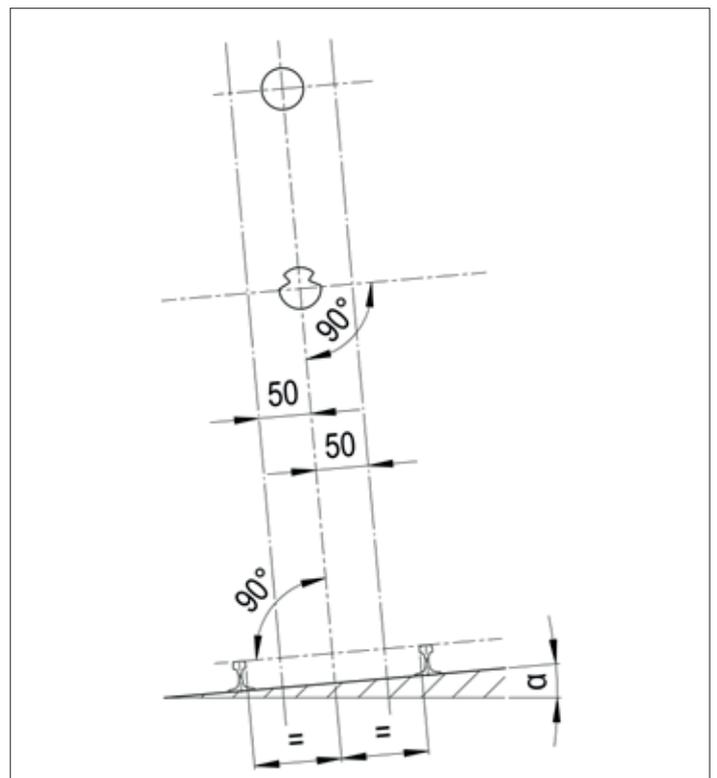
1. Preparation of contact and messenger wire

Straighten the contact wire at the installation location and make sure it is not twisted.

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

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

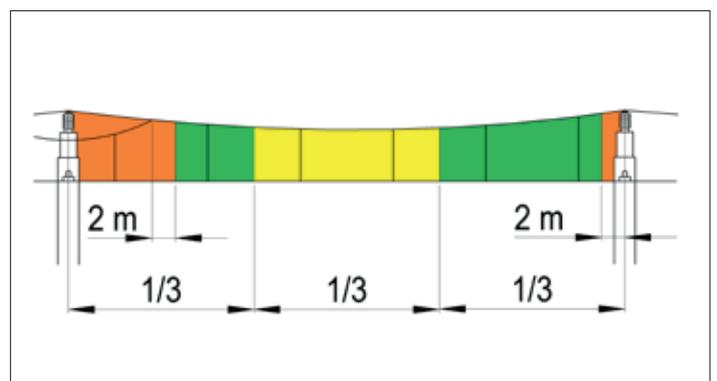
The contact wire and messenger wire must be positioned vertically within 50 mm above each other.



2. Installation location

The section insulator is preferably installed in the green zone, at least 2 m away from the guide arm or stitch wire. The yellow zone is less optimal and the orange zone is least recommendable.

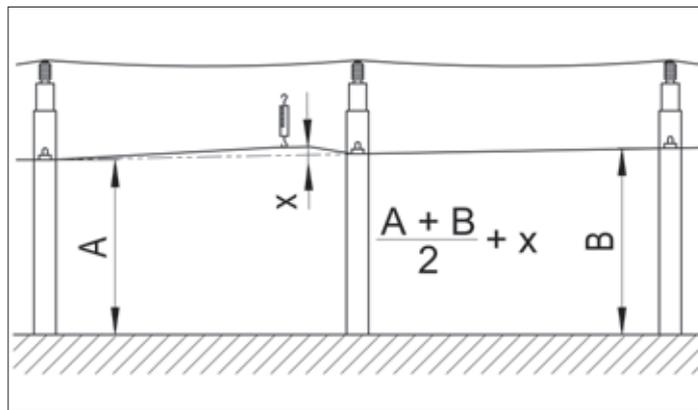
The sloping angle of the messenger wire insulator should not exceed 5° if saddle clamps are able to glide.



3. Determine the hogging

If the section insulator is installed at a new location, use a spring balance to pull up the contact wire with 120 N - 150 N (dynamic pantograph pressure). The elevated height of the contact wire should correspond to the optimal hogging (value x).

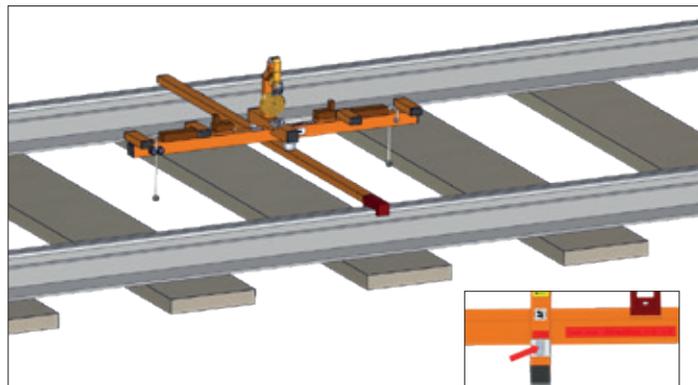
When replacing an existing section insulator measure the height of the contact wire at masts A and B and calculate the average value. The hogging value should be minimum $x = 70 \text{ mm}$.



4. Measure the level of the track by using the JIG

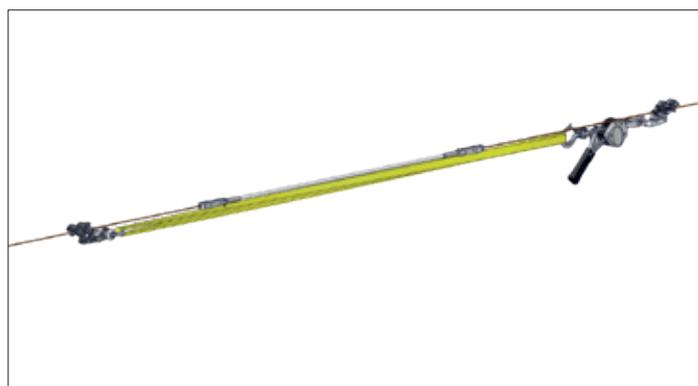
Place the installation JIG at the installation site on the alignment bar as shown and adjust the integrated spirit level.

The main driving direction can be selected as desired and is maintained during installation.

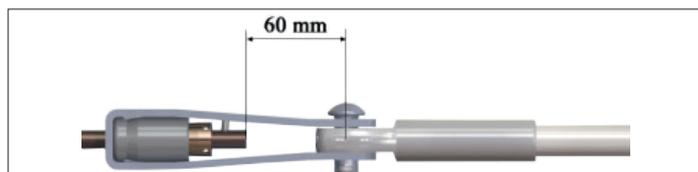


5. Installation of messenger wire insulator

Tighten the pulley block and mount the insulator on the messenger wire.



Correct forked collar socket installation.



Install the messenger wire insulator and attach the saddle clamps and suspension cables to it.

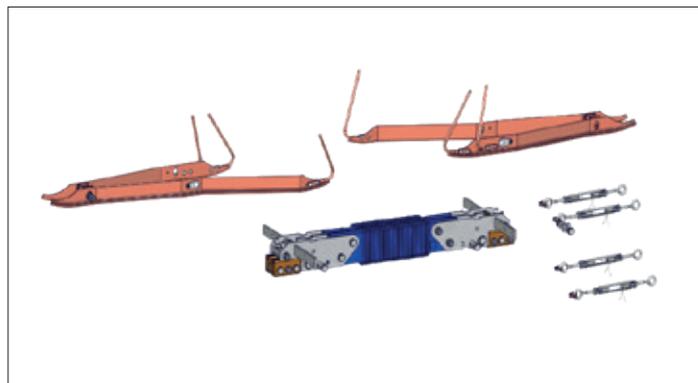


6. Removing the skids

Remove the skids from the insulator body and all nuts and safety wires from the turnbuckles. Keep the removed parts.

Loosen the screws of the splice fittings and open the turnbuckles completely.

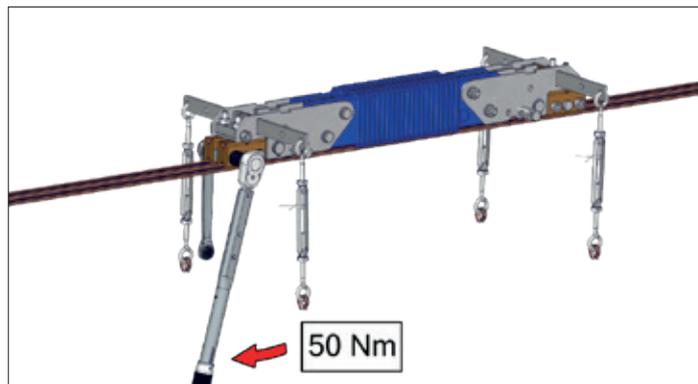
Re-installation: Loosen the pretension.



C) Installation

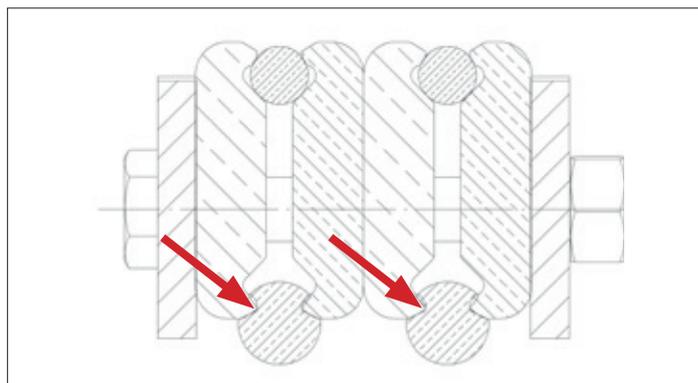
7. Installation of the insulator body

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



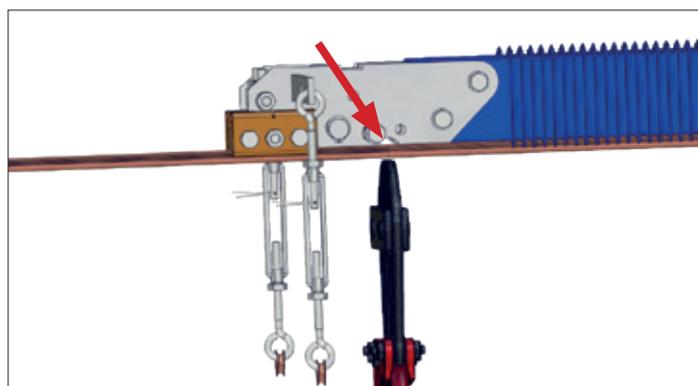
Warning: The teeth of the splice fittings must grip in the contact wire groove over the full length of the splice fittings.

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



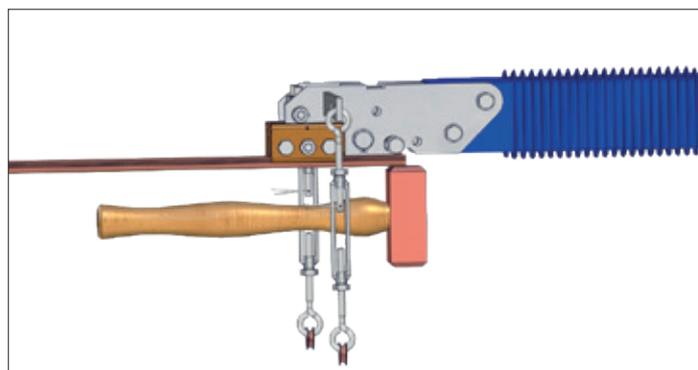
8. Cut the contact wire

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



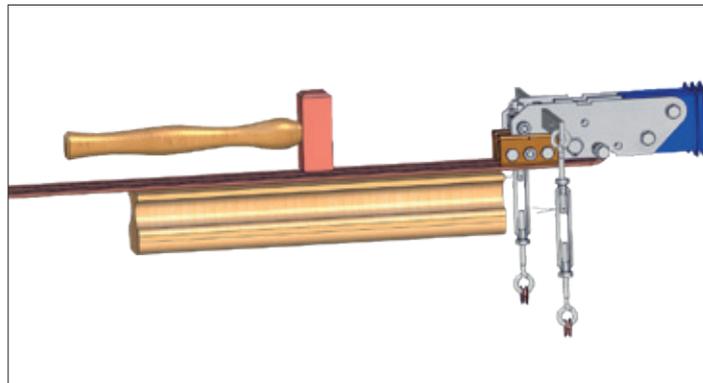
9. Bend up contact wire ends

Bend up the contact wire ends by hitting them with a hammer.



10. Straighten the contact wire

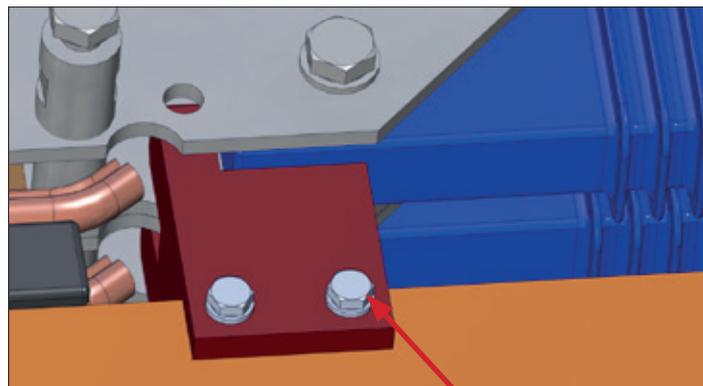
Straighten the contact wire on both sides of the section insulator by using a hammer and a straightening wood.



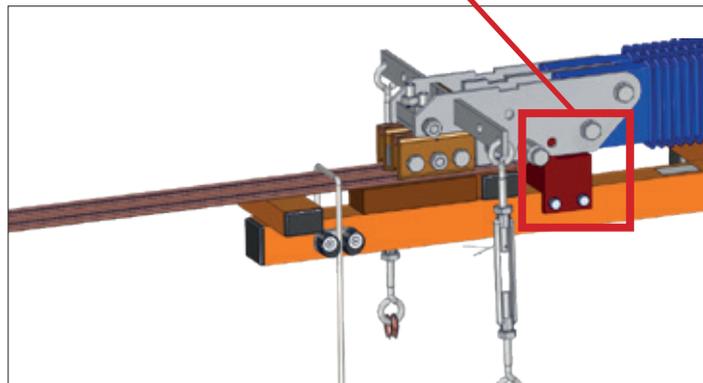
11. Mounting of the installation JIG

Fasten the installation JIG below the section insulator as indicated.

Observe the driving direction.



Fasten the ropes of the installation JIG to the contact wire.



12. Hogging

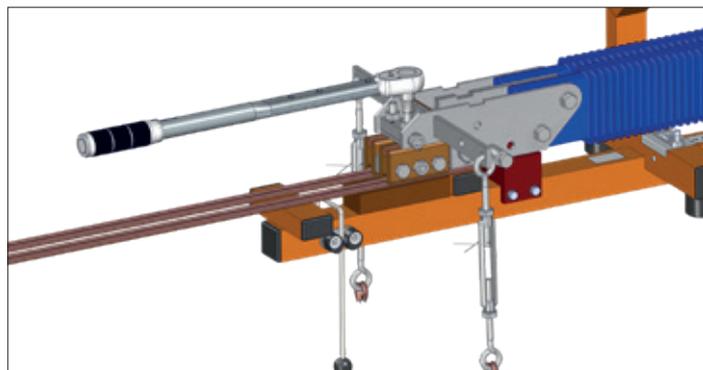
Attach the rope of the installation JIG to the messenger wire insulator. Adjust the hogging according to point 3 of these instructions.

If the hogging value is not known, superelevate the original contact wire height without section insulator by 70 mm.



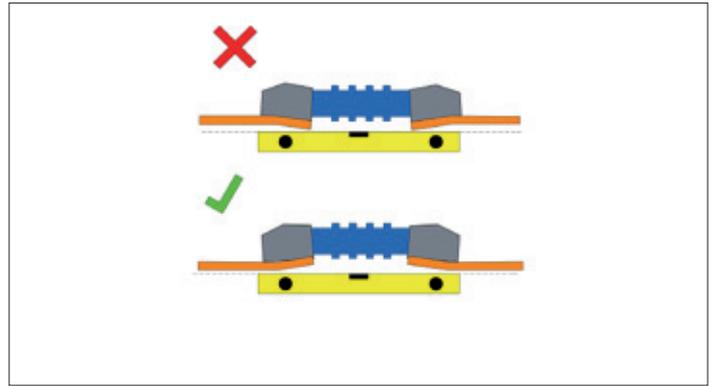
13. Adjust the pretension

Adjust the pretension (horizontal position) with the four adjustment screws above the splice fittings.



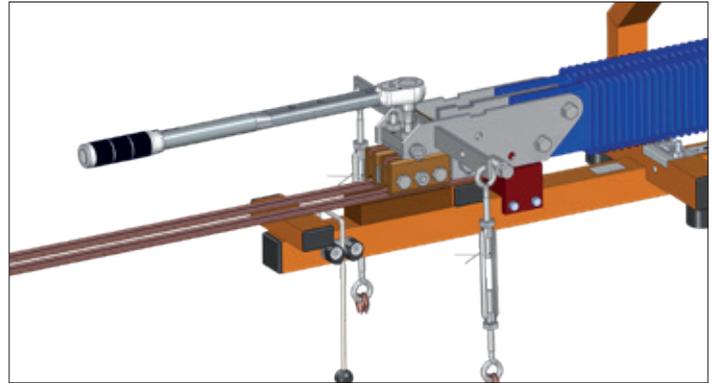
14. Check the pretension

Check the alignment with the installation JIG. Adjust the pretension so that the splice fittings hold the contact wire without deflection towards the bottom and parallel to the installation JIG or spirit level.



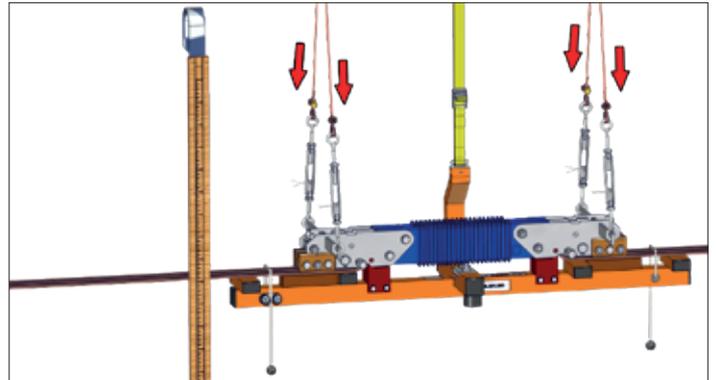
15. Secure the adjusting screws

Secure the adjusting screws with the counter nuts (**25 Nm**).



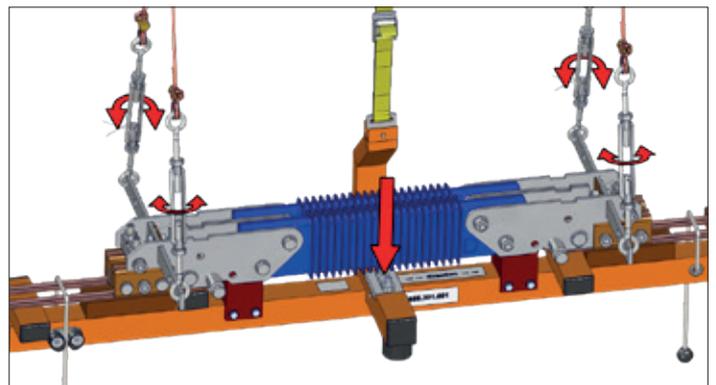
16. Fix the suspension

Tension the suspension until the tension is taken over by the suspension cables.



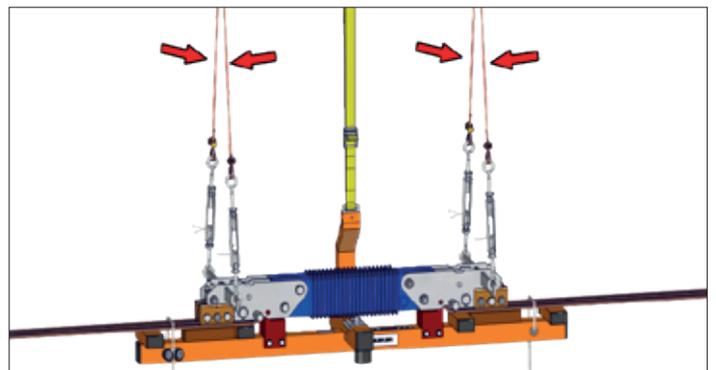
17. Adjust the inclination of the section insulator

Adjust the inclination of the section insulator with the turnbuckles and check it with the spirit level of the installation JIG according to point 4 of these instructions.



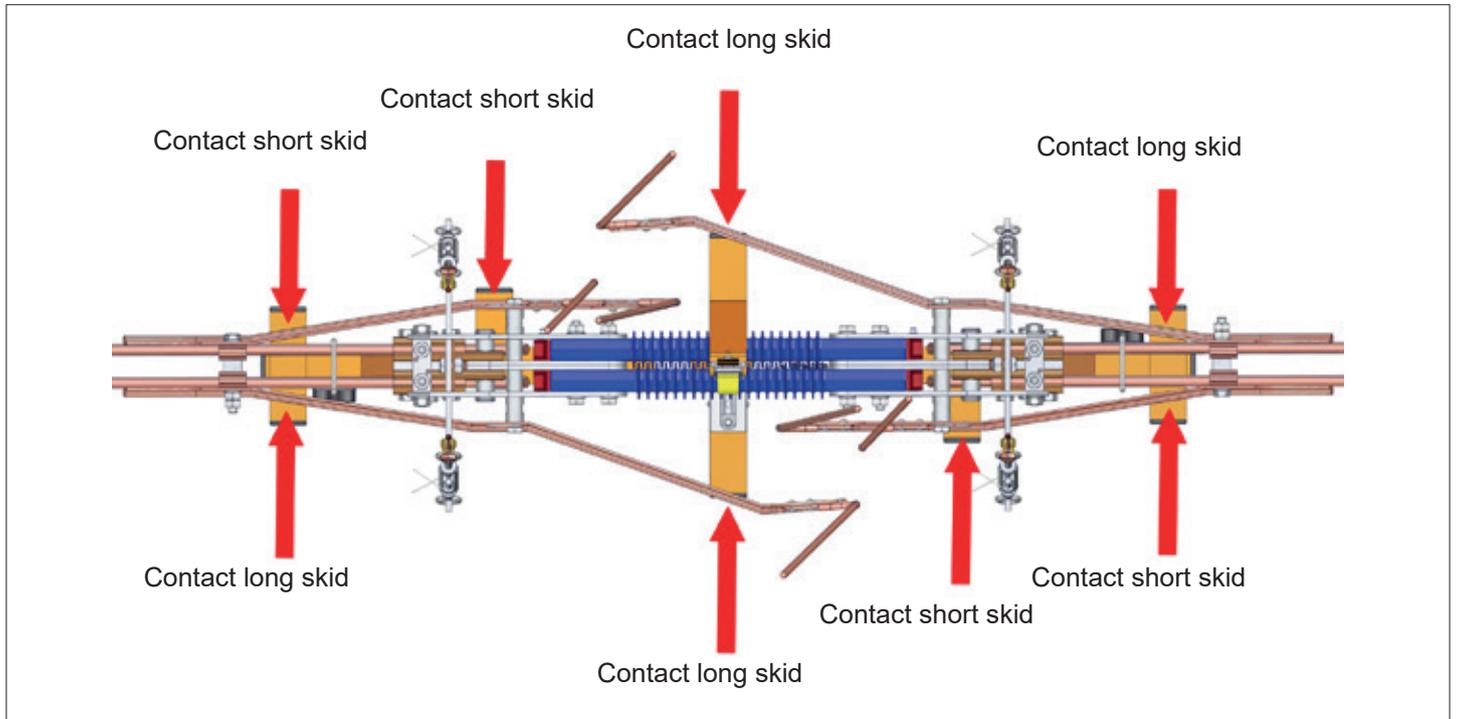
18. Check the tension of the suspension cables

The tension of the suspension cables must be identical.

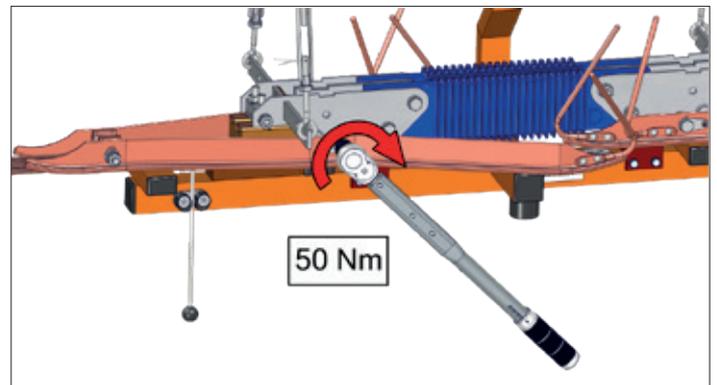


19. Attachment of the skids

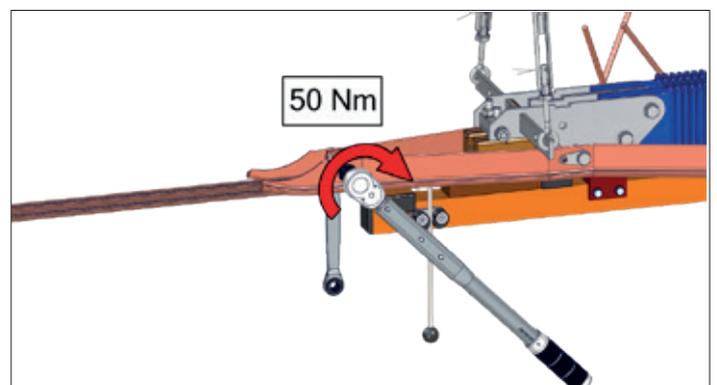
Mount the skids and washers and tighten the nuts by hand.
The skids must rest on the installation JIG.



Tighten the nuts of the skids with **50 Nm**.



Tighten the nuts to **50 Nm** and lock them with the second nut.



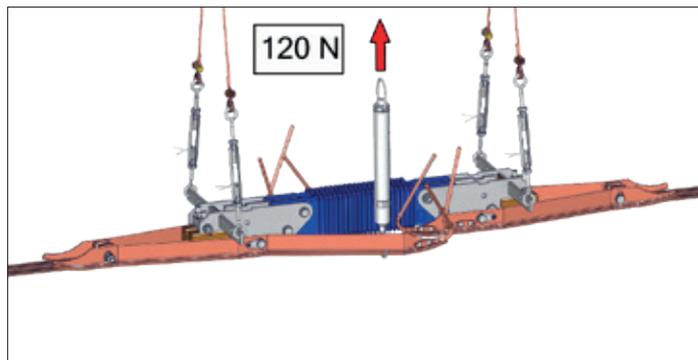
Remove the installation JIG from the insulator body.

20. Check gliding and inclination

Check with spirit level or pantograph for optimal gliding.

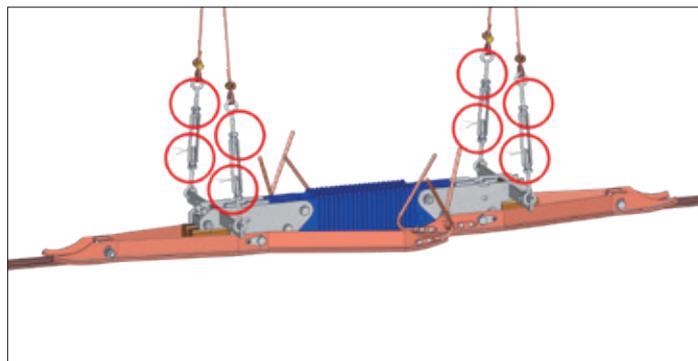
The transition between contact wire - skids - contact wire must be smooth. The skids must be aligned parallel to the track.

A well adjusted section insulator can be lifted with 120 N using a spring balance attached to the skid ends without inclining or the suspension cables becoming loose. If the suspension cables are no longer tight when raised, the section insulator must be raised gradually (by 10 mm) until the suspension cables are tight again.



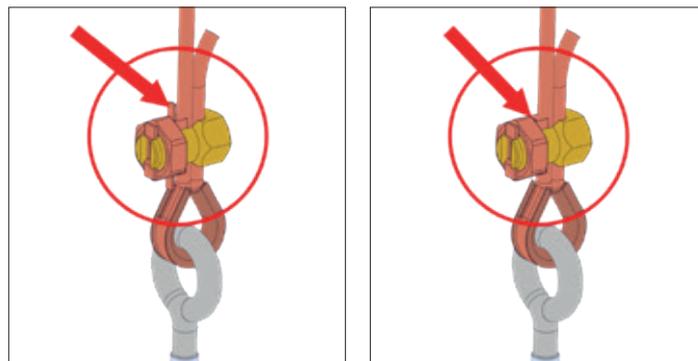
21. Secure the turnbuckles

Check the counter nuts of the turnbuckles and lock all turnbuckles.



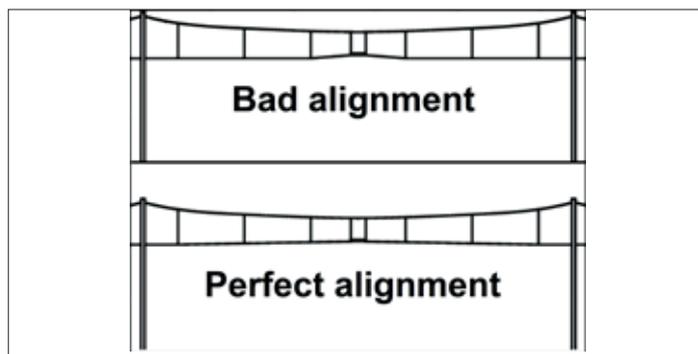
22. Secure the suspension clamps

Secure the suspension clamps with the locking device. After raising and fine-tuning, shorten the suspension cables.



23. Check the alignment

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



D) Maintenance

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

Insulator

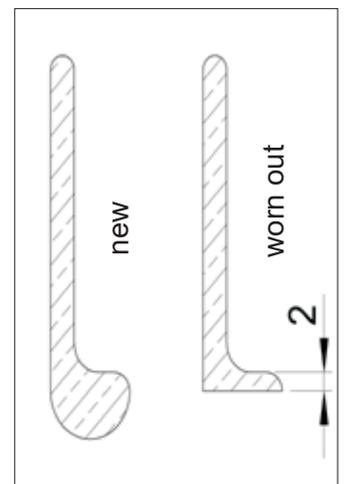
The insulators with blue silicone coating are usually sufficiently cleaned by rain and do not require maintenance. In the case of extreme soiling (e.g. due to regular use of diesel engines or when installed in a tunnel, etc.), we recommend cleaning the section insulator annually with water and commercially available soap (without the addition of cleaning agents or solvents). After rinsing, no soap residue should remain on the surface of the insulator.

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

Skids

If the skids show increased wear at the entry, it indicates that they have not been adjusted accurately enough. The skids must be readjusted according to the installation instruction. Well adjusted skids show even wear over the entire length.

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



Performance

Observe the section insulator and the suspension during pantograph passage. The section insulator must remain stable during the passage. If the installation 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) so that the suspension remains stable when being passed.



Caution! Danger of accident if these points are not followed:

- The section insulator may only be installed by instructed specialists.
- Note the tightening torques.
- The bolts of the contact wire clamps must be tightened with 50 Nm and retightened two times. Otherwise the teeth do not grip the contact wire material sufficiently. Failure to do so could cause the contact wire to slip out of the contact wire clamp and cause accidents. When tightening the counter nuts the bolts must be restrained with a spanner. Otherwise the bolts could be loosened by vibrations and cause accidents.
- The skids must be mounted and aligned correctly as instructed. Otherwise shocks by the pantograph might damage the section insulator or the pantograph.
- Turnbuckles must be secured with counter nuts and locking wires. These could otherwise open and the resulting incorrect position of the section insulator could cause disturbance in rail traffic.
- All bolts and nuts must be tightened correctly as instructed.
- If individual components (contact wire underneath splice fitting and lever/glider/insulator/spring dropper/skids) have excessive wear or are damaged, they must be readjusted or replaced according to the installation instructions.

Arthur Flury AG rejects responsibility for any damage caused by not following this installation instruction.