MECHRAIL

Original installation manual
2019-04-01

EN

movomech®

Even though we have strived to maintain the highest order of accuracy in the production of this document, we assume no responsibility for any errors. Specifications and design are subject to change without prior notice.

The images show representative products, but the product supplied may differ in some respects to those illustrated.

We reserve the right to make changes in design and dimensions compared to the information contained in the document, in order not to prevent the development in design, materials and manufacturing methods.

Considering all the possible combinations of Movomech's extensive range of products, the customer is reminded that when purchasing a Movomech product for professional use or elsewhere, there is additional, up-to-date information that could not be included in this document concerning advice regarding the suitability of each product.

All relevant information must be given to those responsible for using the product.

Table of contents

1. Safety

Movomech's products are manufactured according to latest technical development, as well as according to the latest applicable European standards and regulations. This documentation aims to provide the user with practical instructions for safe operation and easy maintenance of the product.

Everybody involved in the transport, installation, deployment, use, maintenance and repair of Movomech's equipment and accessories must have read and understood:

- the Operating Instructions,
- the safety directions, as well as
- the safety guidelines in the various chapters.

In order to avoid improper use and to ensure uninterrupted operation with our products, the Operating Instructions must always be available to the user / operator.

Intended use

The equipment is exclusively intended to operate according to the technical specification that the customer has provided for the procurement of the project. Other uses, such as towing a load with travel equipment or transporting passengers, is not permitted (there are further examples below). Movomech is not liable for damages caused by any such use. The user is fully responsible for all and any risk.

The equipment may only be used if in technically satisfactory condition by trained personnel and taking into account applicable occupational safety regulations. This also includes observing the operating and maintenance conditions in the Operating Instructions. Severe injury and property damage can occur if:

- unauthorized removal of covers,
- non-professional installation of the equipment,
- improper use, or
- insufficient maintenance.

Unauthorized use

Certain work and activity is not permitted for the equipment, as it may under certain conditions cause injury to personnel and damage to the equipment. For example:

- It is not permitted to transport people with the equipment.
- Personnel is not permitted to walk or be under suspended loads.
- Suspended loads are not to be dragged or pulled obliquely.
- It is not permitted to use the equipment to free items that are jammed or stuck.
- It is not permitted to overload the equipment.
- It is not permitted to leave suspended loads unsupervised.

About safety in general

Always keep the Operating Instructions close at hand at the site of the equipment! It contains essential aspects and relevant sections of the respective guidelines, standards and regulations. Any failure to comply with the safety instructions in these Operating Instructions may result in personal injury or death.

In addition to the operating instructions, generally applicable laws and other rules and regulations must be observed and complied with in order to avoid accidents and to protect the environment. This also applies to rules for handling environmentally hazardous goods and the provision / use of personal protective equipment.

For all work with and at the equipment, these, as well as the occupational safety and safety regulations in force at the user site, must be observed and complied with. In spite of this, lives may be at risk if the equipment is used and operated by non-trained or uninstructed personnel in a non-professional or non-intended manner.

The Operating Instructions must be supplemented by the instructions, inspection and reporting instructions which take into account the nature of the operation, e.g. company organization, work process, and staff.

Personnel using the equipment must have read the operating instructions before work begins, and especially the chapters with the safety instructions. It is too late to do that once work has started! This applies specially for staff that only occasionally work with the system, e.g. With maintenance work.

From time to other, the personnel's knowledge of safety and accident precautions at work must be checked.

The user is responsible for ensuring that the equipment is maintained in good condition and that all applicable relevant safety precautions and requirements are met.

The equipment must immediately be taken out of operation if any damage or defect is discovered.

Use personal protective equipment if necessary or when prescribed.

Do not remove or render illegible any protective and warning devices in the form of signs, stickers and markings.

All protective and warning devices at or on the equipment must be complete/readable and kept in good working condition.

No changes, additions or alterations that may affect safety are to be done without the written approval by Movomech! This also applies to the fitting and installation of protective equipment and to welding in supporting parts.

Spare parts must comply with the technical requirements established by Movomech. This is guaranteed by using Movomech original spare parts.

The prescribed or in the Operating Instructions indicated service intervals for periodic testing / checks must be observed!

Selection of operators and their qualifications

Work on the equipment may only be carried out by specially reliable personnel. Observe the rules concerning minors!

The user is responsible for the required training and instruction of employees and / or apprentices.

The user is encouraged to establish instructions and guidelines in case of malfunction, to inform the operators, and to put instructions in suitable places with good visibility.

The user is advised that prior to the commissioning of the equipment, ensure that the level of knowledge of the staff hired by him concerning the following is acceptable:

- knowledge of the contents of the Operating Instructions,
- knowledge of the instructions concerning safety and use contained therein, and
- knowledge of the applicable accident prevention legislation.

Only trained personnel is permitted to use the equipment. Clearly state permissions for use, maintenance and installation.

Operators' safety instructions

Persons under the influence of drugs, alcohol or drugs that may affect the ability to react quickly and correctly, are not permitted to use, maintain or repair the equipment.

All the described measures and instructions regarding occupational safety and the items on general safety and occupational safety issues that must be performed or taken into account before, during or after commissioning must be strictly followed. Failure to observe these may lead to fatal accidents.

Use of the equipment must be stopped or discontinued in all cases of known deficiencies regarding occupational safety and operational availability.
Protective devices must not be made inoperative, altered or used in violation of applicable regulations.

Measures must be taken to ensure safe operation and working conditions for the operator! It is only permitted to use the equipment when all protective and safety devices, such as removable guards and emergency stop devices, are in place and functioning properly.

Any manner of rebuilding and changes to the equipment is forbidden. This does not apply to minor changes, which do not affect strength, reliability and occupational safety or to measures for increased safety. The basic responsibility for these changes lies with the user. In case of doubt, Movomech must be contacted for a written approval prior to the implementation of any such measure.

In case of malfunction, the equipment must be switched of and safeguarded against further use! Any malfunction must be rectified at once!

After an "emergency stop", the user may only resume operation after the cause of the malfunction has been rectified and there is no other hazard.

The equipment must be switched off in the following cases:

- in case of damage to the pneumatic / electrical / mechanical equipment, and
- in case of malfunctioning personal protective equipment.

Certain localized circumstances or usage modes may lead to situations that cannot be anticipated at the time of writing. In these cases, the user must ensure that operations are harmless, or else switch off the equipment until such action has been taken after consultation with Movomech or other competent authority to maintain harmless operation.

Check before connection / commissioning that no one can be hurt by using the equipment! If the operator notices persons in the area that may be injured during operations, the operation must be stopped immediately and cannot be resumed until the person(s) have removed themselves from the risk zone.

Prior to each start of the equipment, the operator must ensure that the equipment is in a fully operational and reliable condition.

In case of disconnection of the equipment (e.g. in cases where operational and occupational safety is compromised, in emergency situations, during repair and maintenance work, is case of malfunction or at the end of the work day), the operator must perform all the prescribed protective measures and monitor that automatic operations are carried out.

Working with the equipment is only allowed if so ordered, and if training in the use of the equipment and its function has occurred.

2. Environment

Recycling

The various components of the lightweight overhead crane system are in the main manufactured from recyclable materials, and should be disposed of for recycling when the crane is decommissioned. Observe the applicable local and national rules and regulations for recycling the crane.

Hazardous waste

In normal use, the lightweight overhead crane system does not contain any hazardous materials. However, the lightweight overhead crane system may be used to handle hazardous materials. It is the responsibility of the operator to ensure that these materials in no way can harm neither people nor the environment.

If hazardous materials, e.g. batteries, lubricants or other chemicals are used for the erection, service or maintenance of the lightweight overhead crane system, these must be disposed of in the prescribed manner.

Lubricants and chemicals may never under any circumstance be poured into drains and such, but must be handed in for proper disposal by an authorized company. Always observe applicable local and national rules and regulations when disposing of hazardous waste.

3. About lightweight overhead crane systems

3.1 Terminology for aluminium overhead crane systems

Aluminium crane systems

A system with aluminium profiles in which trolleys, suspensions, lifting equipment and accessories are attached in order to provide ergonomic and flexible movement in the X and Y axles when lifting.

Runway track

Stationary aluminium profiles on which a hoist or other lifting equipment travels. A runway usually consists of two runway profiles, but may also be a single track runway or a triple track runway solution.

Suspension

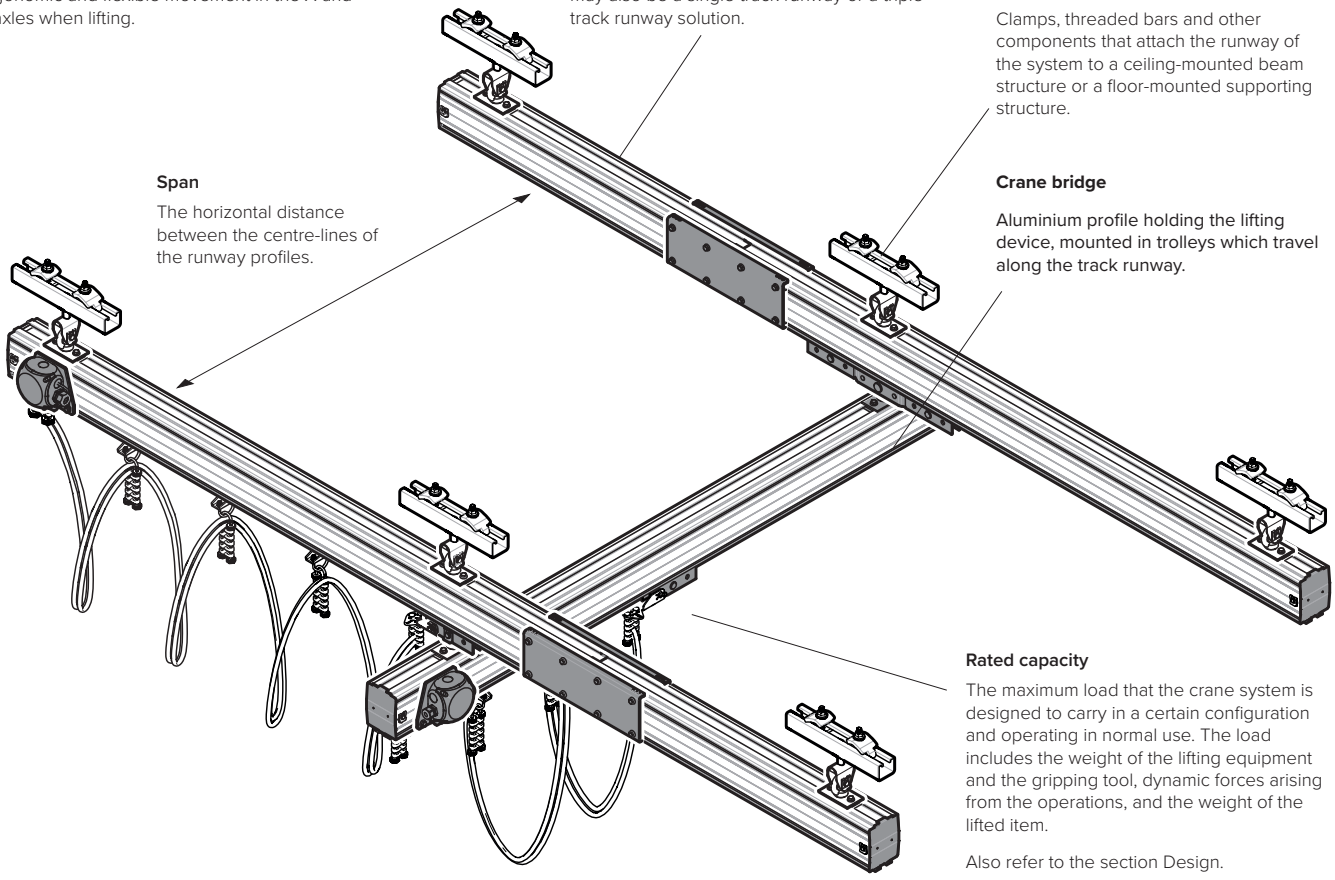
Clamps, threaded bars and other components that attach the runway of the system to a ceiling-mounted beam structure or a floor-mounted supporting structure.

Span

The horizontal distance between the centre-lines of the runway profiles.

Crane bridge

Aluminium profile holding the lifting device, mounted in trolleys which travel along the track runway.

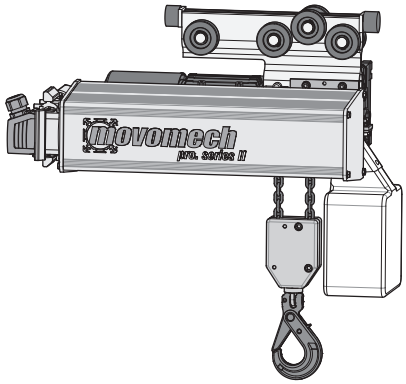


Rated capacity

The maximum load that the crane system is designed to carry in a certain configuration and operating in normal use. The load includes the weight of the lifting equipment and the gripping tool, dynamic forces arising from the operations, and the weight of the lifted item.

Also refer to the section Design.

An example of a simple ceiling-mounted overhead crane system for e.g. lifting with an electric chain hoist.



Lifting equipment

The equipment for lifting and lowering a load.

3.2 General characteristics

Mechrail™ aluminium crane system

Mechrail™ is a modular lightweight overhead crane system of light aluminium profiles for manual or powered handling of goods, designed to be used together with a number of different lifting devices.

The lightweight overhead crane system is designed to be attached to a ceiling-mounted beam structure or a floor-mounted supporting structure. The system must be dimensioned for the forces acting on it when in operation, and this must be verified before commissioning the overhead crane system.

Because of the hanging design, most configurations will only have downward-going forces on the supporting structure. An exception when upward-going forces are created, is if e.g. a torque absorbing load manipulator is mounted close to a runway.

Technical regulations

The Movomech range of products are designed according to the state of the art for technical equipment, and meets the requirements in the applicable European Norms and Regulations. The Standards and Directives that apply to the product are stated in the Declaration of Conformity or the Manufacturers declaration supplied with the product.

Safety precautions

The documentation provides appropriate instructions for the user to ensure safe operation and simple maintenance.

All personnel that transport, install, put into use, operate, maintain and repair the Movomech equipment and attached equipment must have read and understood:

- the Operating Instructions,
- the Safety Instructions, and
- the Safety Precautions in the various sections.

To avoid erroneous use and to ensure uninterrupted operation with our products, these Operating Instructions must always be available for the user/operator.

Installing the crane system

The overhead crane system must be installed using authentic components supplied or approved by Movomech. Components from other sources may carry a risk for the equipment or the personnel and voids any warranty claim.

When installing the equipment all safety and installing instructions in the manual must be observed and the installation work must be documented. During the installation work the work area must be closed for unauthorized persons.

The installation work requires skilled personnel and suitable tools in order to ensure safe and reliable operation. We recommend that the installation work is only performed by authorized personnel or an experienced service technician, authorized by the manufacturer.

Preventive maintenance

The overhead crane system is designed using modular components requiring minimal maintenance. As a general rule, the tightening torques of the screw joints must be check regularly, and also the state of the safety equipment and wear parts. The intervals for preventive maintenance depend on the actual usage of the system, but should be performed at least annually.

3.3 Material properties

Crane system profiles

The Mechrail crane system profiles are made of anodized aluminium and require no maintenance. They are manufactured in EN-AW 6063 T6 aluminium alloy according to SS-EN 755-2:2016, anodized colour C0 (natural).

Accessory range

A large part of the components in the Mechrail range are coated by galvanizing or anodizing, which makes them better resistant against wear and tear than painted components.

3.4 Temperature and environmental conditions

Temperature and environmental limitations

This product is designed to be used indoors in typical industrial environments such as in the automotive industry production and general manufacturing.

Temperature range +5 to +40 °C.

Atmospheric corrosion category C2.

Noise level < 70dB (A).

ATEX

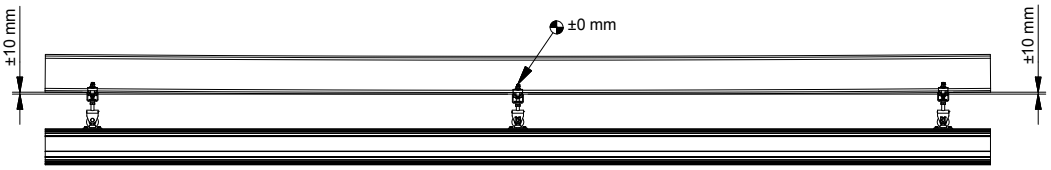
This product is not ATEX classified according to the EU directive for equipment in explosive environments.

4. Planning and preparations

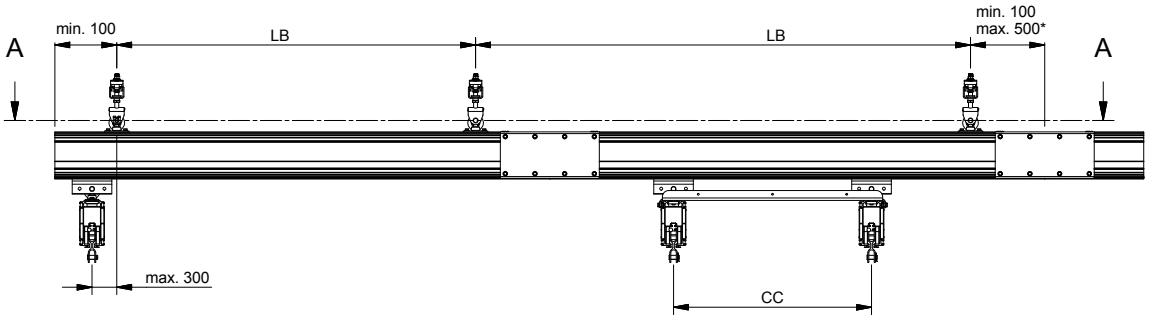
4.1 Tolerance requirements and installation dimensions

Horizontal level - overhead beams

The overhead beams mustn't exceed the tolerance ±10 mm in the horizontal level.



Installation dimensions



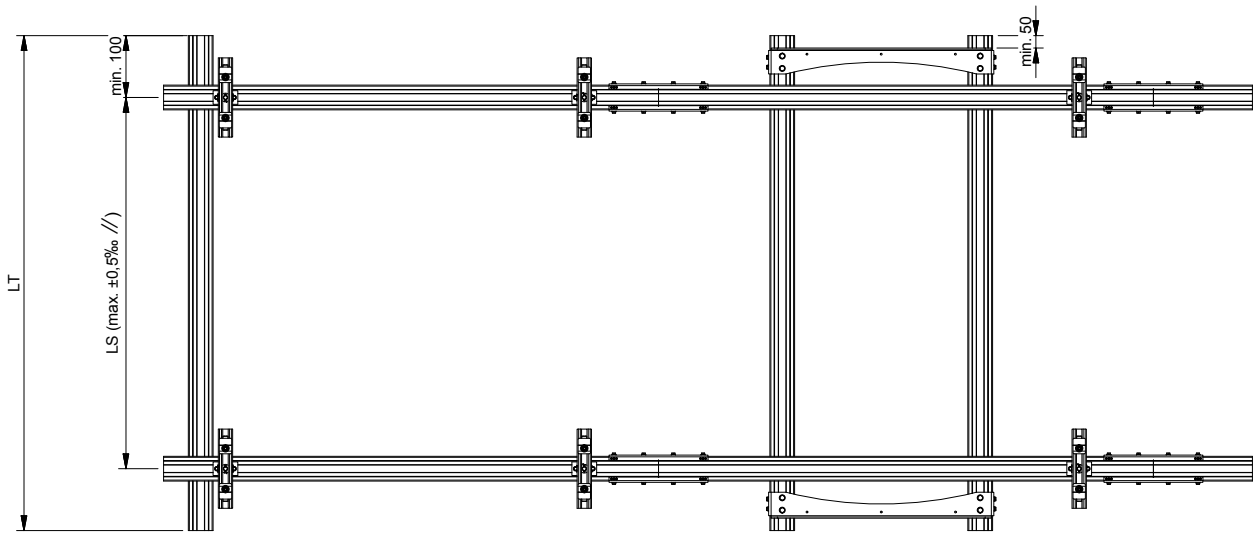
LB = runway hanging distance
LT = bridge length
LS = bridge span
CC = distance centre to centre, twin bridge
X = component-dependant distance

INFORMATION

Only one joint set may be fitted within the hanging distance LB and the distance from the suspension to the joint set may not exceed 500 mm. A joint set may only be used for bridges in three-string overhead crane systems. The above does not apply for AHB140/190 where the joint may be placed anywhere, but **the minimum distance from suspension to joint must always be 100 mm.**

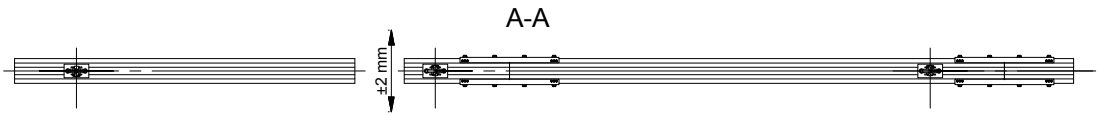
Parallelism - twin runway

The suspensions for a twin runway cannot exceed the tolerance ±0.5 ‰ for parallelism.

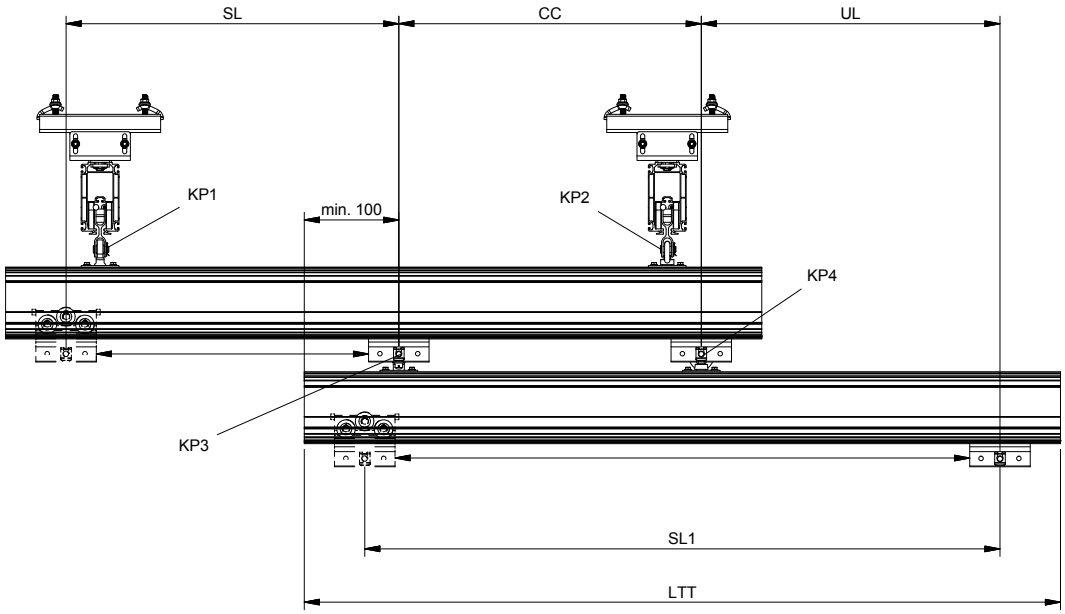


Straightness - runways

Suspensions for a runway must be placed with less deviation than ±2 mm from the intended path of the runway.



Telescoping bridges



INFORMATION

Contact Movomech if your application requires a telescoping bridge.

Suspensions D or F to be used in track.

Crane girder suspension C - ball joint to be used for KP1 single bridge.

Crane girder suspension C to be used for KP1 twin bridge.

Crane girder suspension A to be used for KP2.

Crane girder suspension C to be used for KP3

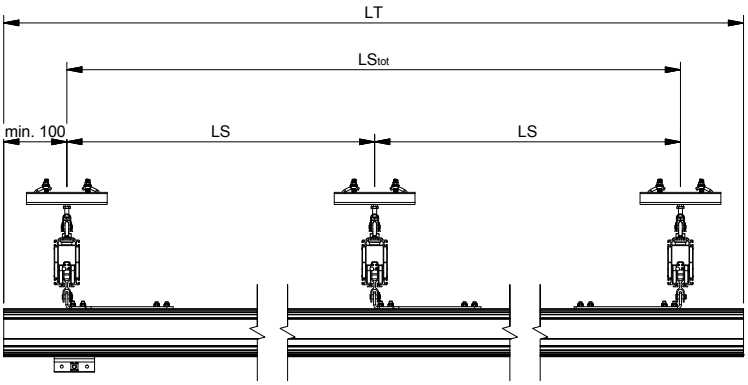
Crane girder suspension A to be used for KP4.

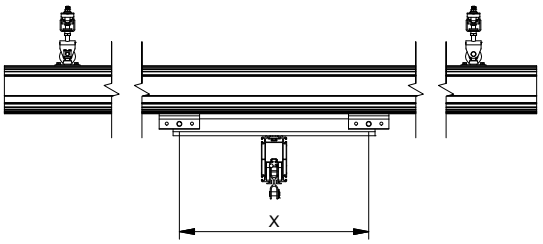
An inverted trolley may be required for KP1 and/or KP3.

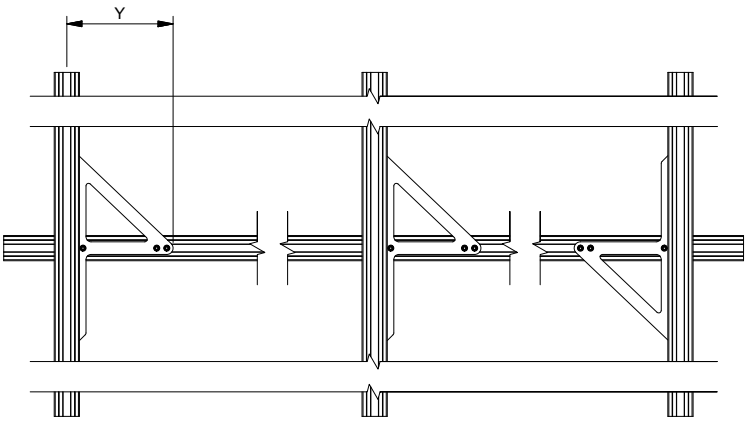
A double trolley may be required for KP4.

SL = bridge stroke
SL1 = telescoping crane stroke
CC = distance between suspensions
UL = overhang
LTT = length telescoping bridge
KP = connection point

Triple track system



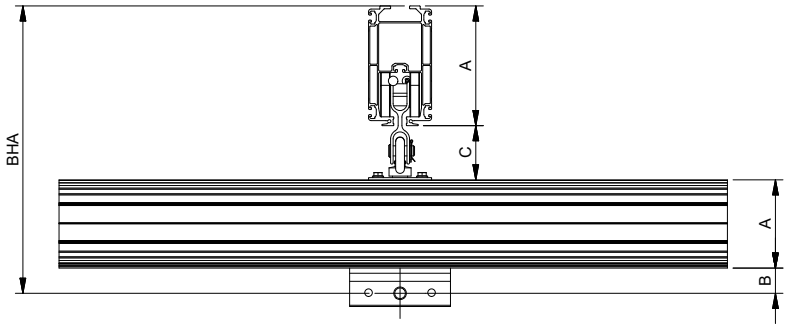




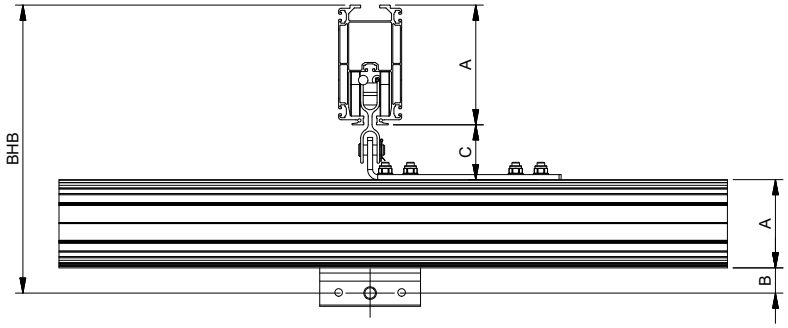
LS = bridge span
LS_{tot} = bridge total span
LT = bridge length
X = see "Triangular bracing" in Mechrail catalouge
Y = see "Triangular bracing" in Mechrail catalouge

4.2 Build heights

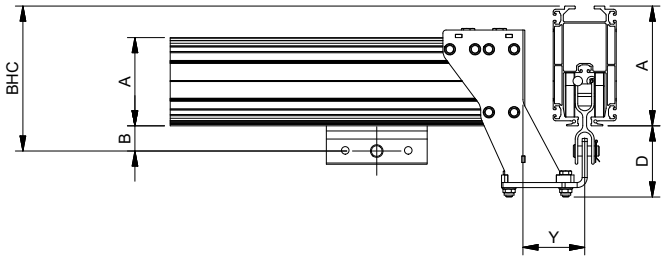
Crane girder suspension



Triangular bracing



Space saving module



	A [mm]	B [mm]	C [mm]	D [mm]	Y [mm] (A)*	Y [mm] (B)*
30s						
PHB	90	41,5	90	N/A	N/A	N/A
LHB	90	39	87,5	139	105	95
50s						
PHB1	150	42,5	89	115,5	100	100
AHB140	140	40	86	113	100	100
AHB190	190	40	86	113	100	100
75s						
AHB3	210	43	95,5	109,5	147	137

* (A) Single crane
(B) Double crane

R: spare part S: wear part

Chart: Build heights

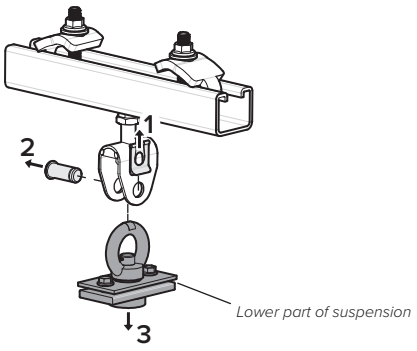
Profile, runway	Profile, bridge	BHA	BHB	BHC
30s				
PHB	PHB	312	N/A	N/A
	LHB	309	N/A	N/A
	PHB1	N/A	N/A	N/A
	AHB140	N/A	N/A	N/A
	AHB190	N/A	N/A	N/A
	AHB3	N/A	N/A	N/A
LHB	PHB	309	N/A	N/A
	LHB	307	307	129
	PHB1	370	N/A	N/A
	AHB140	358	N/A	N/A
	AHB190	N/A	N/A	N/A
	AHB3	N/A	N/A	N/A
50s				
PHB1	PHB	371	N/A	N/A
	LHB	368	N/A	N/A
	PHB1	432	432	205
	AHB140	419	419	193
	AHB190	469	469	193
	AHB3	500	N/A	N/A
AHB140	PHB	358	N/A	N/A
	LHB	355	N/A	N/A
	PHB1	419	419	193
	AHB140	406	406	180
	AHB190	456	456	180
	AHB3	487	N/A	N/A
AHB190	PHB	408	N/A	N/A
	LHB	405	N/A	N/A
	PHB1	469	469	243
	AHB140	456	456	230
	AHB190	506	506	230
	AHB3	537	N/A	N/A
75s				
AHB3	PHB	426	N/A	N/A
	LHB	423	N/A	N/A
	PHB1	490	N/A	N/A
	AHB140	478	N/A	N/A
	AHB190	528	N/A	N/A
	AHB3	559	559	253

5. Installation instructions for runway & bridge

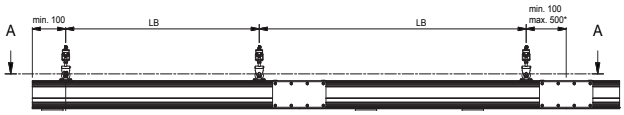
5.1 Mounting runway profile with suspension (A), (B), (C)

Mounting the upper part of the suspension to the beams above

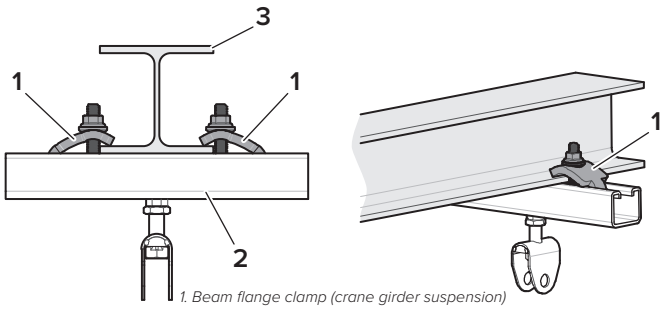
1. Dismantle the lower half of the suspension.



2. Measure the distance between the suspensions (LB) and mark each point on the beams where the suspensions for the runway profiles are to be mounted.
(The distance LB is decided at the projecting stage)

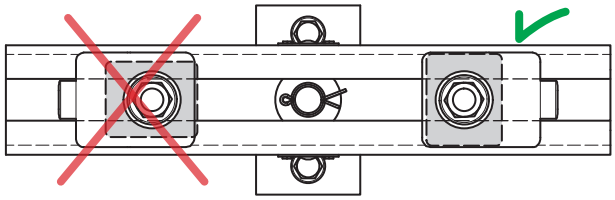


3. Hold a suspension up against a suspension point and push in the beam flange clamp towards the beam so that it clamps the beam flange.



1. Beam flange clamp (crane girder suspension)
2. Anchoring profiles (crane girder suspension)
3. Beam

4. Make sure that the lower plate of the beam flange clamp is turned in the right direction inside the anchor profile.



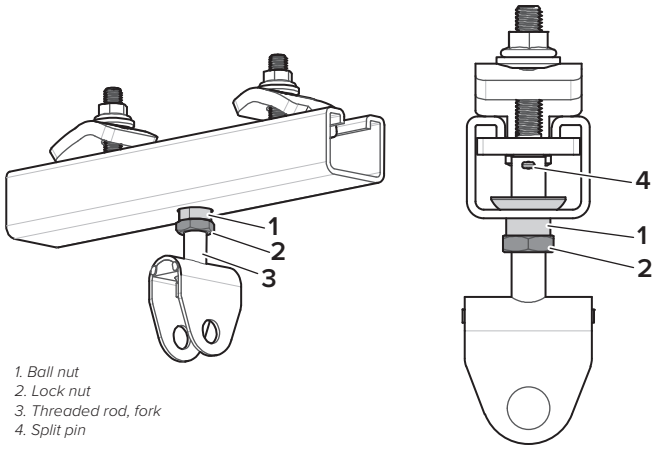
5. Tighten the nut of the beam flange clamp, but not so hard that you cannot make final adjustments at the point of suspension.

6. The nut of the beam flange clamp is finally tightened when everything has been adjusted.
Tightening torque: **(M12) 81 Nm**
(M16) 197 Nm

7. Repeat items 3 to 6 until all suspensions are mounted

Horizontal adjusting and levelling of the suspension points

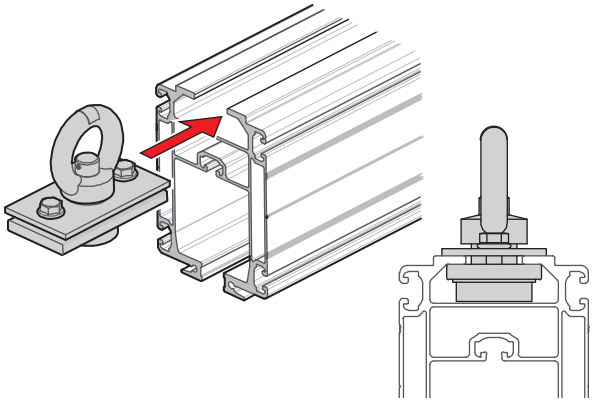
1. Use a levelling laser or similar equipment.
2. Turn the ball nut as far up as possible against the split pin in the threaded rod.
3. Measure and make a note of the suspension which is in the highest position horizontally.
4. Adjust the other suspensions, using the ball nut, so that they end up level with the first one.
   Horizontal tolerance: **±2 mm**
5. Tighten the lock nut against the ball nut.
   Tightening torque: **(M12) 81 Nm**
   (M16) 197 Nm



1. Ball nut
2. Lock nut
3. Threaded rod, fork
4. Split pin

Mounting the lower part of the suspension in the runway profile

1. Push the lower part of the suspension into the profile so that the upper flange of the profile is in between the two plates.
2. Adjust the space between the lower parts of the suspension so that it is the same as for the upper parts of the suspension.
3. Tighten the screws on the lower part of the suspension.
   Tightening torque: **(M8) 20 Nm**
   (M12) 10 Nm



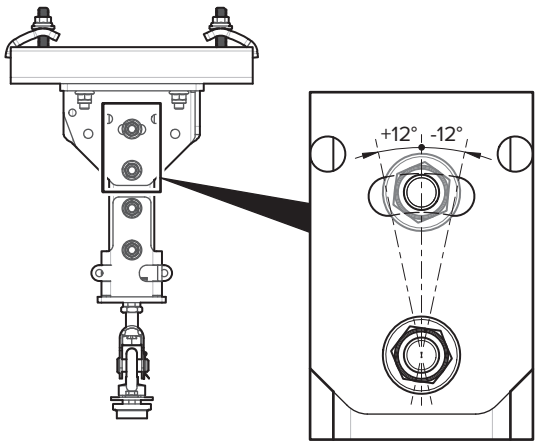
Mounting components that are to be used in and on the runway

1. See the installation instructions for each component respectively.

   NB! End stops must always be fitted before the runway is operational! The track is considered operational when it has been suspended in place.
   (Mounting the end stops, see “6.3 End stops” on page 26)

Suspending the runway

1. Lift the runway profile with the lower parts of the suspension facing the upper parts.
2. Fit the eye in the fork, insert the pin and secure it with the lock clip.
3. Make sure the fork and the lower part of the suspension are aligned. Adjust if necessary.
4. On the suspension (C) the angle of the upper part may be adjusted (see image).
   - Undo the upper nut, see image
   - Adjust the angle of the suspension so that the lower part is perpendicular
   - The maximum possible setting is ±45 ° to the vertical plane. If a larger angle than ±12 ° is required, drill a new hole (Ø13 mm) for screw and nut.
   - Tighten the screws.
     Tightening torque: **81 Nm**
5. For jointed runway profiles - see section “1. Pick-up arm” on page 63.



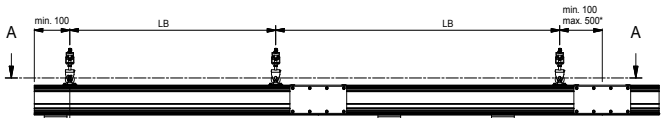
Suspension (C)

Fitting safety wires

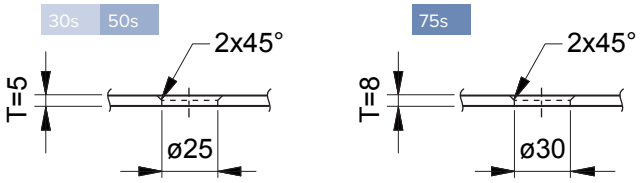
NB! In cases of only two suspension point per runway, suspension safety wires are to be fitted, see section “6.1 Suspension safety wire” on page 24.

5.2 Mounting runway profile with suspension (E)

Design, suspension points



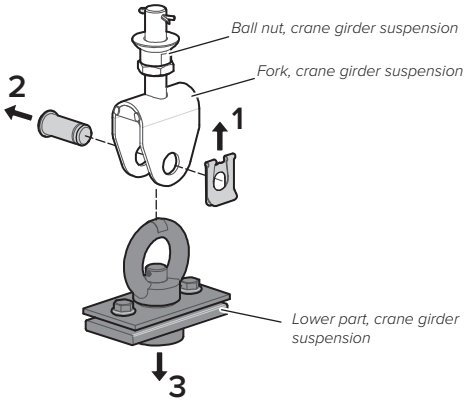
1. Measure and mark the spots for the suspension points (LB), see image.
   (The distance LB is decided at the projecting stage).



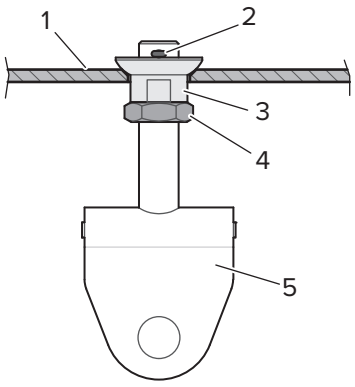
2. Drill and countersink a hole according to image.

Mounting the upper part of the suspension

1. Dismantle the lower half of the suspension.



2. Remove the split pin and the ball nut from the threaded rod of the fork.



1. Plate
2. Split pin
3. Ball nut
4. Lock nut
5. Fork

3. Push up the threaded rod of the fork through one of the countersunk holes.

4. Fit the ball nut to the threaded rod.
   NB! The lock nut must be on the other side of the plate to the ball nut

5. Fit the split pin at the end of the threaded rod. Turn the ball nut all the way up against the split pin.

Horizontal adjusting and levelling of the suspension points

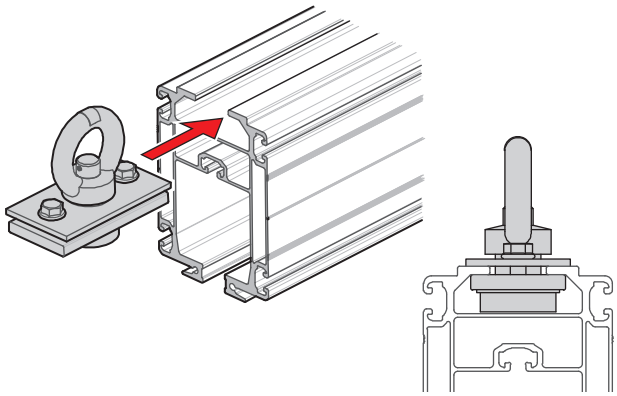
1. Use a levelling laser or similar equipment.
2. Turn the ball nut as far up as possible against the split pin in the threaded rod.
3. Measure and make a note of the suspension which is in the highest position horizontally.
4. Adjust the other suspensions, using the ball nut, so that they end up level with the first one.
   Horizontal tolerance: ±2 mm.
5. Tighten the lock nut against the ball nut.
   Tightening torque: (M12) 81 Nm
   (M16) 197 Nm

Mounting the lower part of the suspension in the runway profile

1. Push the lower part of the suspension into the profile so that the upper flange of the profile is in between the two plates.

2. Adjust the space between the lower parts of the suspension so that it is the same as for the upper parts of the suspension.

3. Tighten the screws on the lower part of the suspension.
   Tightening torque: **(M8) 20 Nm**
   (M12) 10 Nm



Mounting components that are to be used in and on the runway

1. See the installation instructions for each component respectively.

   NB! End stops must always be fitted before the runway is operational! The track is considered operational when it has been suspended in place.
   (Mounting the end stops, see “6.3 End stops” on page 26)

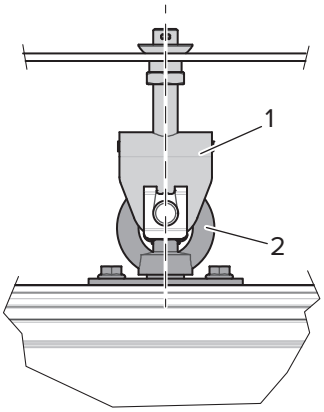
Suspending the runway

1. Lift the runway profile with the lower parts of the suspension facing the upper parts.

2. Fit the eye in the fork, insert the pin and secure it with the lock clip.

3. Make sure the fork and the lower part of the suspension are aligned. Adjust if necessary.

4. For jointed runway profiles - see section "6.5 Joint set" on page 31.



Suspension
1. Upper part
2. Lower part

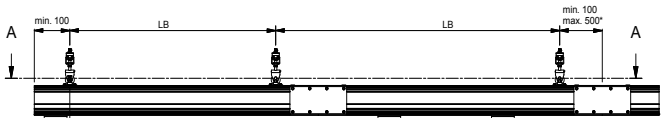
Fitting safety wires

NB! In cases of only two suspension point per runway, suspension safety wires are to be fitted, see section “6.1 Suspension safety wire” on page 24.

5.3 Mounting runway profile with suspension (D), longitudinally

Mounting the suspension on a runway profile

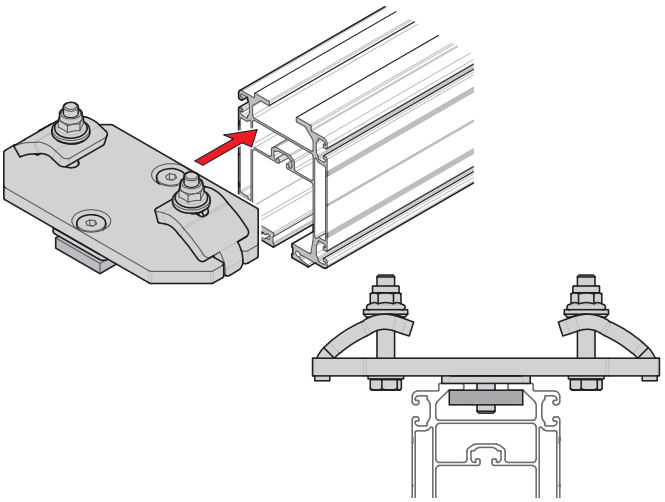
1. Measure the distance (LB) and mark the runway profile where the suspensions are to be mounted.
   (The distance LB is decided at the projecting stage)



2. Push the suspension into the profile so that the upper flange of the profile is in between the two plates underneath the suspension.

3. Place the suspension at the marked places on the runway profile.

4. Tighten the suspensions by tightening the two hex socket screws in the large plate of the suspension.
   Tightening torque: **(M12) 81 Nm**
   (M16) 197 Nm



Mounting components that are to be used in and on the runway

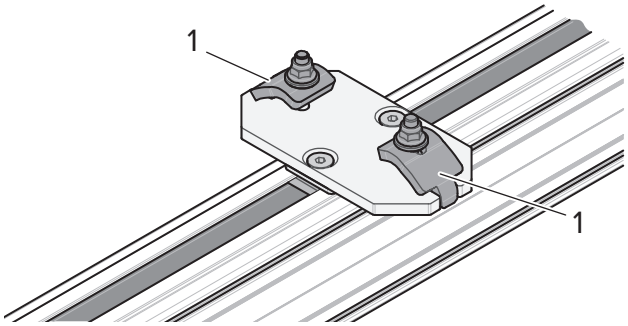
1. See the installation instructions for each component respectively.

   NB! End stops must always be fitted before the runway is operational! The track is considered operational when it has been suspended in place.
   (Mounting the end stops, see “6.3 End stops” on page 26)

Suspending the runway

1. Remove the beam flange clamps and fasteners from the suspensions on the runway profile.

2. Lift the runway profile with suspensions towards the overhead beams where it is to be attached.

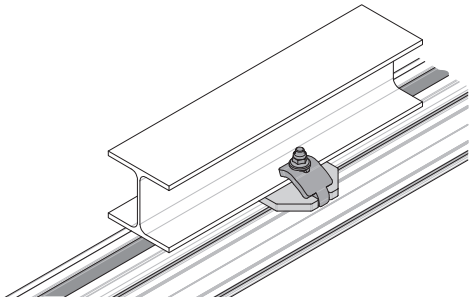


Suspension mounted on a profile
1. Beam flange clamp

3. Refit the beam flange clamps to the suspensions.

4. Tighten the fasteners of the beam flange clamps.
   Tightening torque: (M12) 81 Nm
   (M16) 197 Nm

5. For jointed runway profiles - see section “6.5 Joint set” on page 31.



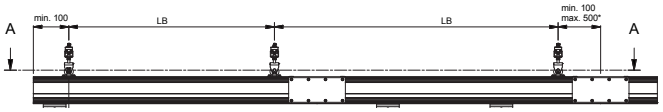
Fitting safety wires

NB! In cases of only two suspension point per runway, suspension safety wires are to be fitted, see section “6.1 Suspension safety wire” on page 24”.

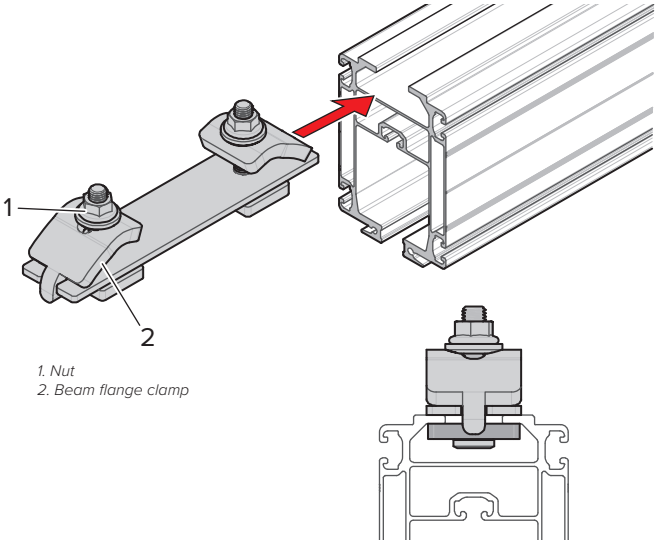
5.4 Mounting runway profiles with suspensions (D), transverse

Mounting the suspension on a runway profile

The beams where the runway profile is mounted must be level.
Horizontal tolerance: **±2 mm**

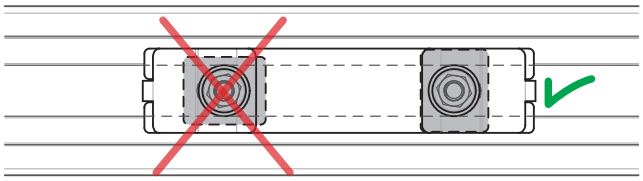


1. Measure the distance (LB) and mark the runway profile where the suspensions are to be mounted.
   (The distance LB is decided at the projecting stage)



1. Nut
2. Beam flange clamp

2. Push the suspensions into the runway profile so that the upper flange of the profile is in between the plate and the washers of the suspension.



3. Make sure that the plate of the beam flange clamp in the runway profile is turned in the right direction.

4. Place the suspension at the marked places on the runway profile.

5. Remove the beam flange clamps, washers and nuts.

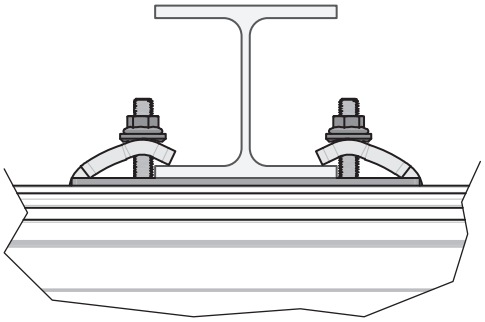
Mounting components that are to be used in and on the runway

1. See each section respectively for the mounting of the components.

   NB! End stops must always be fitted before the runway is operational! The track is considered operational when it has been suspended in place.
   (Mounting the end stops, see “6.3 End stops” on page 26)

Suspending the runway

1. Lift the runway profile with suspensions towards the overhead beams where it is to be attached.



2. Refit the beam flange clamps, washers and nuts. Make sure that the beam flange clamps properly grip the beam flange.

3. Check that the spacings between the suspension points haven't changed. Adjust if necessary.

4. Tighten the nuts of the beam flange clamps.
   Tightening torque: **(M12) 81 Nm**
   (M16) 197 Nm

5. For jointed runway profiles - see section "6.5 Joint set" on page 31.

Fitting safety wires

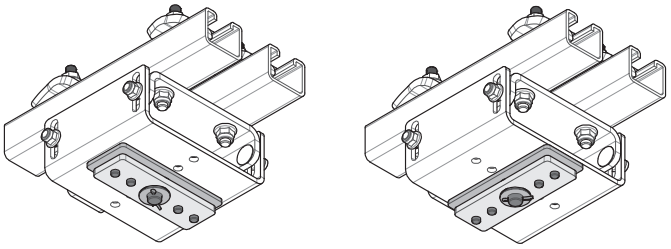
NB! In cases of only two suspension point per runway, suspension safety wires are to be fitted, see section "6.1 Suspension safety wire" on page 24.

5.5 Mounting runway profile with suspension (F)

Mounting the suspension on a runway profile

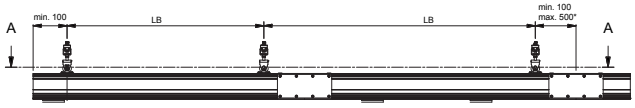
1. Make sure that the suspension is properly configured for longitudinal or transverse attachment to the overhead beams.

   - If not, remove the screws holding the two plates underneath the crane girder suspension.
   - Turn the plates 90°.
   - Fit the screws.

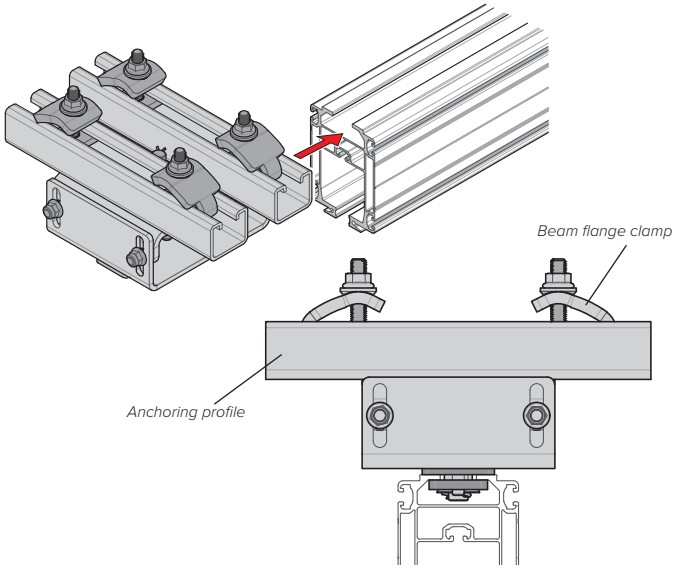


Longitudinal configuration *Transverse configuration*

2. Measure the distance (LB) and mark the runway profile where the suspensions are to be mounted.
   (The distance LB is decided at the projecting stage).



3. Push the suspensions into the profile. The upper flange of the profile must end up in between the plates underneath the suspension, see image. Place the suspension parts where you have marked the profile.



4. Tighten the screws holding the lower plate of the suspension.
   Tightening torque: **(M10) 47 Nm**
   (M12) 81 Nm

Mounting components that are to be used in and on the runway

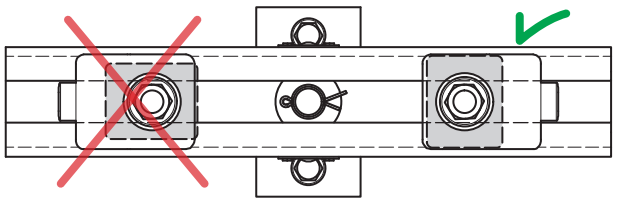
1. See the installation instructions for each component respectively.

   NB! End stops must always be fitted before the runway is operational! The track is considered operational when it has been suspended in place.
   (Mounting the end stops, see “6.3 End stops” on page 26)

Suspending the runway

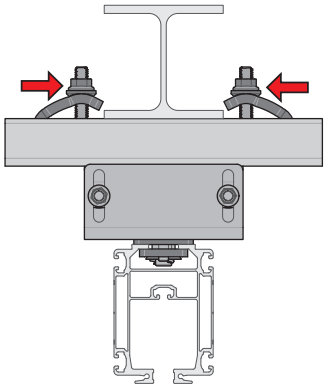
1. Lift the runway profile with suspensions towards the overhead beams where it is to be attached.

2. Make sure that the lower plate of the beam flange clamp is turned in the right direction inside the anchor profile.



3. Push in the beam flange clamps towards the beam so that they clamp the beam flange.

4. Tighten the nuts of the beam flange clamps, but not so much that you cannot fine-tune the suspension.



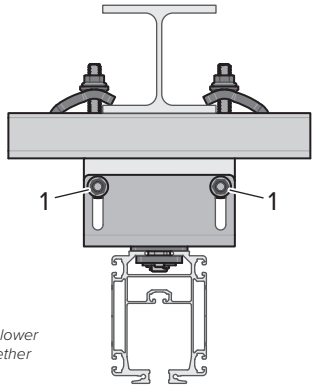
5. Tighten the nuts of the beam flange clamps.
   Tightening torque: **(M12) 81 Nm**
   (M16) 197 Nm

6. For jointed runway profiles - see profile "6.5 Joint set" on page 31.

Horizontal adjusting and levelling of the suspension points

1. Use a levelling laser or similar equipment.

2. Undo the nuts holding the upper and lower parts of the suspension.

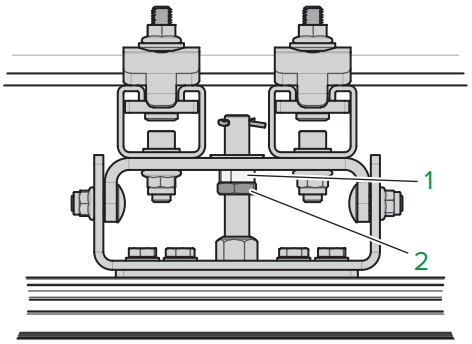


1. Nuts holding the upper and lower parts of the suspension together

3. Make sure all suspensions are in their bottom position by turning the ball nut on the threaded bar between the anchor profiles as far up as possible.

4. Measure and make a note of the suspension which is in the highest position horizontally.

5. Adjust the other suspensions so that they end up level with the first one.
   Vertical adjustment is made with the ball nut, and lateral adjustment is made by setting the angle of the lower suspension cantilever. It is possible to make lateral adjustments up to ± 7°.
   Horizontal tolerance: **± 2 mm**

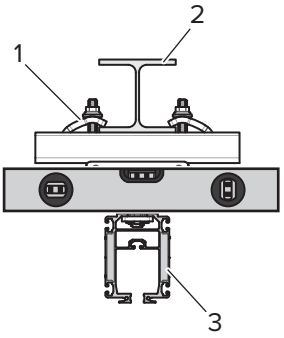


1. Ball nut
2. Lock nut

6. When the suspension is in level, the suspension is secured using the lock nut under the ball nut.
   Tightening torque: **(M12) 81 Nm**
   (M16) 197 Nm

7. Tighten the nuts holding the upper and lower parts of the suspension.
   Tightening torque: **(M10) 47 Nm**

8. Use a spirit level to check the runway profile. If not, adjust the lower profiles of the suspension.



Checking the straightness in the vertical plane

1. Suspension
2. Beam
3. Runway profile

Fitting safety wires

NB! In cases of only two suspension point per runway, suspension safety wires are to be fitted, see section “6.1 Suspension safety wire” on page 24.

5.6 Mounting bridge profiles

Mounting of suspension for bridge profile

1. Install the trolley in the lower cut-out of the runway profile according to the instructions on page 25
2. Install the crane girder suspension in the upper flange of the bridge profile according to the instructions on page 34

Mounting components that are to be used in and on the bridge

1. See the installation instructions for each component respectively.

   NB! End stops must always be fitted before the bridge is operational! The bridge is considered operational when it has been suspended in place.

Mount the bridge

1. See the installation instructions for each suspension component respectively.

Fitting safety wires

NB! For a single bridge, safety wires must be fitted (does not apply for single bridge with space saving module), see section “6.1 Suspension safety wire” on page 24

6. Mounting instructions for components

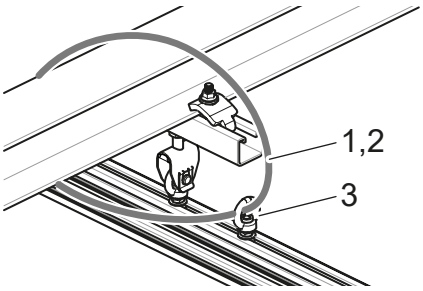
6.1 Suspension safety wire

30s

1. Push the supplied crane girder suspension into the profile so that the upper flange of the profile is in between the two plates of the crane girder suspension.

2. Pull the safety wire through the loop on the crane girder suspension and over and around the beam above.

3. Fit the two wire clamps according to the description below.

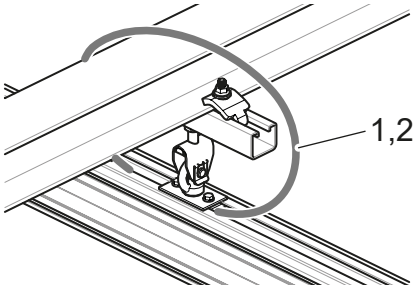


1. Wire
2. Wire clamp
3. Crane girder suspension

50s

1. Pull the safety wire under the suspension into the runway profile and over and around the beam above.

2. Fit the two wire clamps according to the description below.



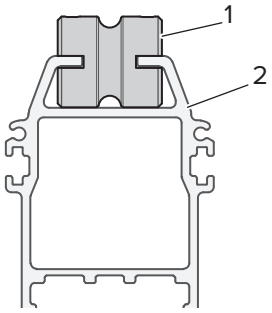
1. Wire
2. Wire clamp

75s

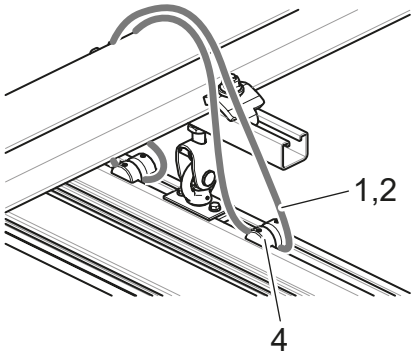
1. Fit a wire roll on each side of the suspension (for mounting the suspension, see “5. Installation instructions for runway & bridge” on page 14). The wire roll is fitted in the cavity in the upper flange of the profile, see image.

2. The wire is pulled:
   - down through the upper cavity of the runway profile, under one of the wire rolls,
   - over the overhead beam,
   - down into the upper cavity, under the wire roll on the other side and
   - back over the overhead beam.

3. Fit the two wire clamps according to the description below.



1. Wire roll
2. Runway profile



1. Wire
2. Wire clamp
4. Wire roll

Fitting the wire clamp

The wire is tightened and the wire clamp is closed in such a way as to fit easily around the overhead beam. The safety wire must not in any way interfere with the movement of the runway.

1. Check that the wire and the wire clamps are not damaged, and that the threads of the screws of the wire clamps are clean and lubricated.

2. Unscrew the nuts of the wire clamps as far as possible.

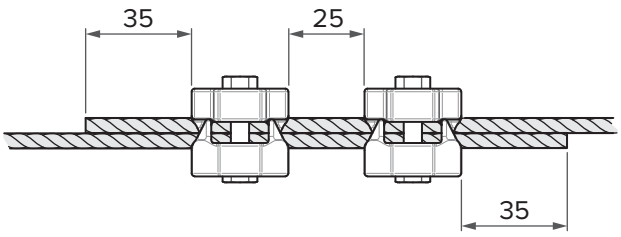
3. Pull one end of the wire through both locks.

4. Lay the wire as described above.

5. Pull this end also through both wire clamps.

6. Fit the wire clamps 25 mm from each other and with 35 mm of the wire sticking out at both ends, see image.
   Make sure the wire clamps are sitting as straight and symmetrical as possible.

7. Tighten the nuts of the wire rope clamps alternately.
   Tightening torque: **9.5 Nm**
   NB! Make sure the teeth of the wire clamps grip the cut-outs on each side.

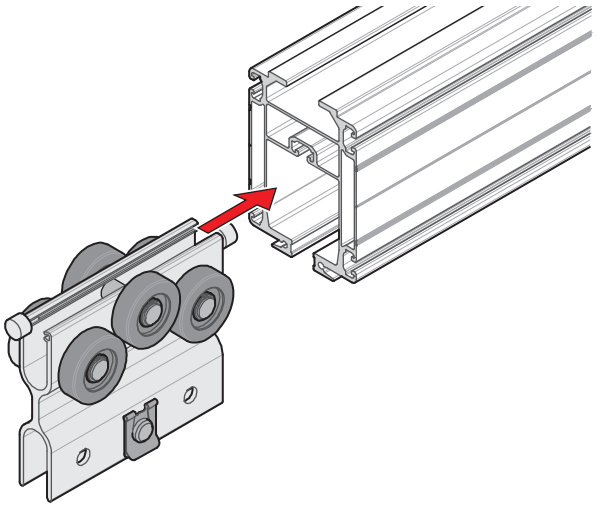


6.2 Trolleys

1. Remove the end covers, end stops and travel limiters if they are fitted to the runway profile.

2. Push in the trolley(s) into the lower cavity of the runway profile.

3. Refit the end covers, end stops and travel limiters.



6.3 End stops

End stops (A)

30s

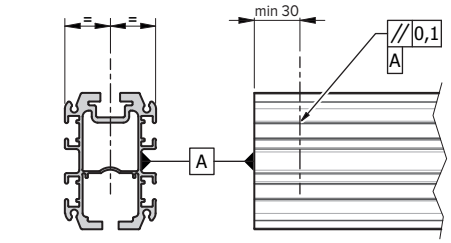
1. If it is required, drill holes for the end stops at the end of the profile:
   - Measure and mark where the end stops are to be fitted, see image.
     NB! It is important that the holes are in the middle of the profile and vertical.
   - Drill the holes for the end stops.
     Diameter: **ø10 mm**
   - Deburr the holes.
   - Clean the inside of profile. It is most important that all drill shavings are removed or else they may stick in the wheels of the trolley.

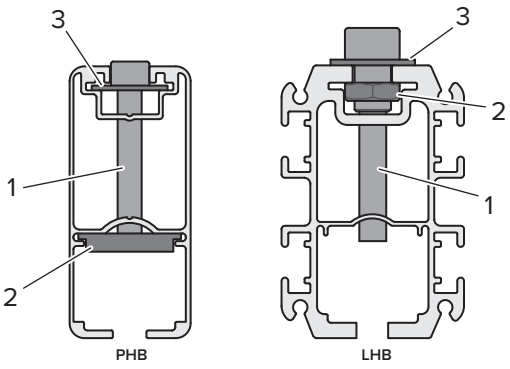
2. PHB: Push in the threaded plate into the upper t-slot in the lower cavity of the profile. Position the plate directly under the hole.

   LHB: Insert the nut under the upper flange and position it directly over the hole.

3. Put the washer on the screw and insert the bolt into the drilled holes. Screw it into the threaded plate/nut.

4. Tighten the screw.
   Tightening torque: **10 Nm**





1. Screw
2. PHB: Threaded plate
LHB: Nut
3. Washer

50s - PHB1

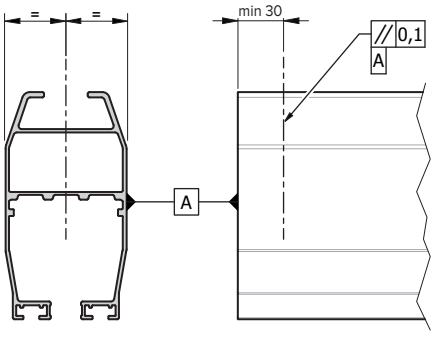
1. If it is required, drill holes for the end stops at the end of the profile:
   - Measure and mark where the end stops are to be fitted, see image.
     NB! It is important that the holes are in the middle of the profile and vertical.
   - Drill the holes for the end stops.
     Diameter: **ø13 mm**
   - Deburr the holes.
   - Clean the inside of profile. It is most important that all drill shavings are removed or else they may stick in the wheels of the trolley.

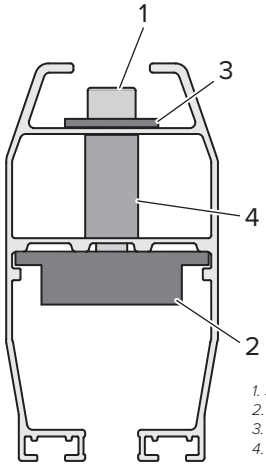
2. Push in the threaded plate into the upper t-slot in the lower cavity of the profile. Position the plate directly under the hole.

3. Position the sleeve against the holes in the middle cavity of the profile.

4. Put the washer on the screw and insert the bolt into the drilled holes. Screw it into the threaded plate/nut.

5. Tighten the screw.
   Tightening torque: **20 Nm**





1. Screw
2. Threaded plate
3. Washer
4. Sleeve

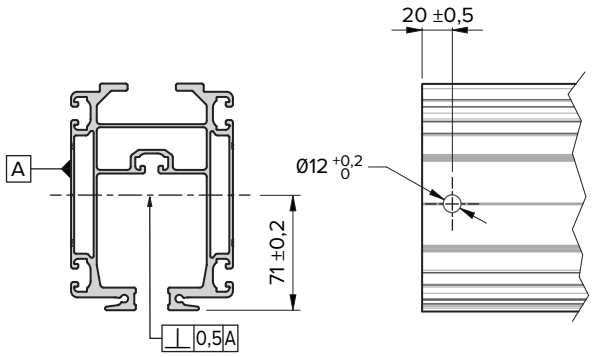
50s - AHB140/190

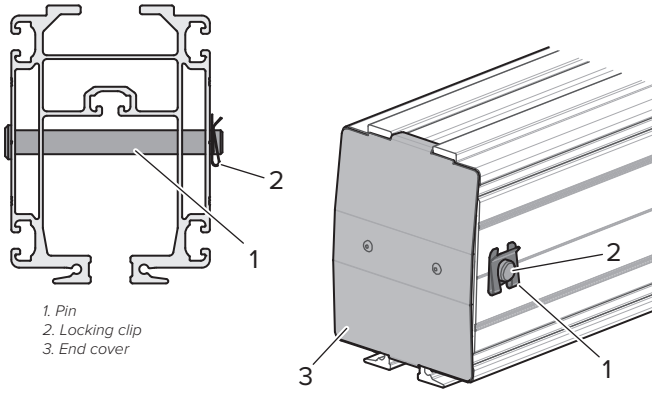
1. If it is required, drill holes for the end stops at the end of the profile:
   - Measure and mark where the end stops are to be fitted, see image.
   - Drill holes for the end stops (use drill template **744025**).
     Diameter: **ø12.2 mm**
   - Deburr the holes.
   - Clean the inside of profile. It is most important that all drill shavings are removed or else they may stick in the wheels of the trolley.

2. *The end covers for AHB140/190 is fitted at the same time as the end stop:*
   Place the end cover at the end of the runway profile.

3. Insert the pin into the drilled holes and through the end cover.

4. Lock the pin with the lock clip.





1. Pin
2. Locking clip
3. End cover

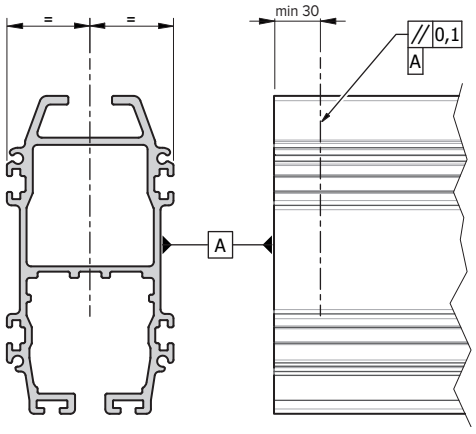
75s

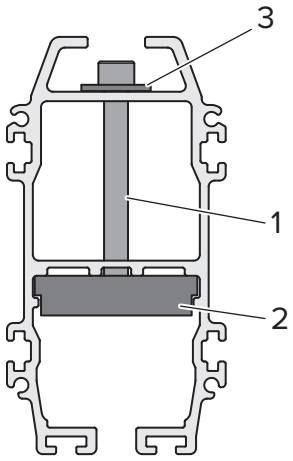
1. If it is required, drill holes for the end stops at the end of the profile:
   - Measure and mark where the end stops are to be fitted, see image.
     NB! It is important that the holes are in the middle of the profile and vertical.
   - Drill the holes for the end stops.
     Diameter: **ø13 mm**
   - Deburr the holes.
   - Clean the inside of profile. It is most important that all drill shavings are removed or else they may stick in the wheels of the trolley.

2. Push in the threaded plate into the upper t-slot in the lower cavity of the profile. Position the plate directly under the hole.

3. Put the washer on the screw and insert the bolt into the drilled holes. Screw it into the threaded plate/nut.

4. Tighten the screw.
   Tightening torque: **20 Nm**



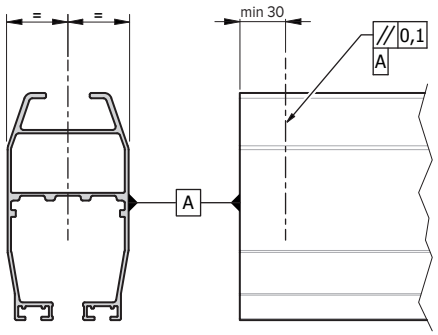


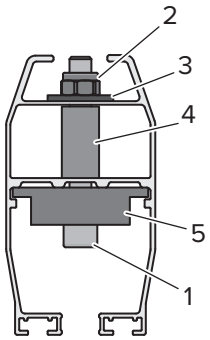
1. Screw
2. Threaded plate
3. Washer

End stop (B)

50s - PHB1

1. If it is required, drill holes for the end stops at the end of the profile:
   - Measure and mark where the end stops are to be fitted, see image.
     NB! It is important that the holes are in the middle of the profile and vertical.
   - Drill the holes for the end stops.
     Diameter: **ø13 mm**
   - Deburr the holes.
   - Clean the inside of profile. It is most important that all drill shavings are removed or else they may stick in the wheels of the trolley.
2. Push in the plate into the upper t-slot in the lower cavity of the profile. Position the plate directly under the hole.
3. Position the sleeve against the holes in the middle cavity of the profile.
4. Insert the screw into the plate, through the lower drilled hole, through the sleeve and through the upper drilled hole.
5. Fit the washer and the nut on the screw.
6. Tighten the screw and nut.
   Tightening torque: **20 Nm**

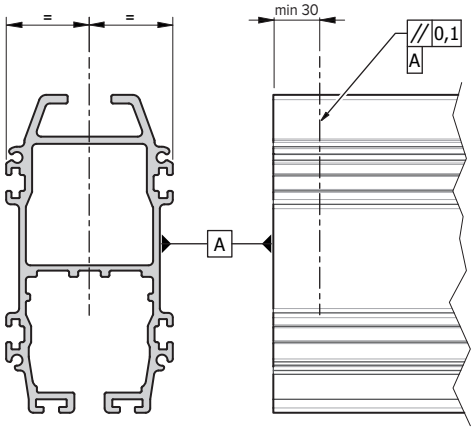


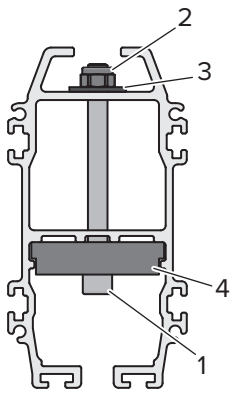


1. Screw
2. Nut
3. Washer
4. Sleeve
5. Plate

75s

1. If it is required, drill holes for the end stops at the end of the profile:
   - Measure and mark where the end stops are to be fitted, see image.
     NB! It is important that the holes are in the middle of the profile and vertical.
   - Drill the holes for the end stops.
     Diameter: **ø13 mm**
   - Deburr the holes.
   - Clean the inside of profile. It is most important that all drill shavings are removed or else they may stick in the wheels of the trolley.
2. Push in the plate into the upper t-slot in the lower cavity of the profile. Position the plate directly under the hole.
3. Insert the screw through the plate and through both drilled holes of the profile.
4. Fit the washer and the nut on the screw.
5. Tighten the screw and nut.
   Tightening torque: **20 Nm**





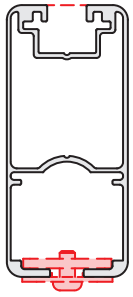
1. Screw
2. Nut
3. Washer
4. Plate

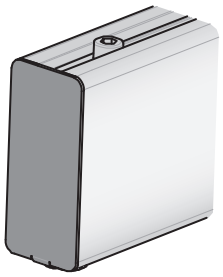
6.4 End cover

30s - PHB

1. Place the end cover on the profile so that the threaded plate and the tab clamp the lower flange of the profile.

2. Tighten the screw.
   Tightening torque: **8.1 Nm**

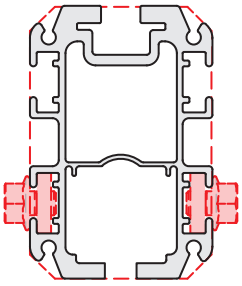


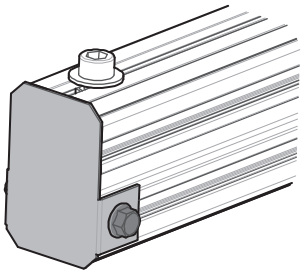


30s - LHB

1. Insert the slot nuts in the lower external t-slot of the runway profile.

2. Tighten the screws.
   Tightening torque: **24 Nm**

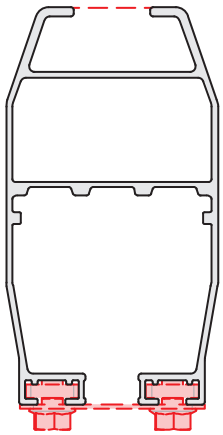


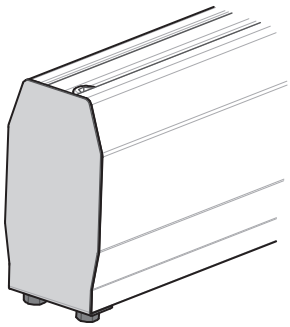


50s - PHB1

1. Insert the slot nuts of the end cover in the lower t-slot of the profile.

2. Tighten the screws.
   Tightening torque: **24 Nm**





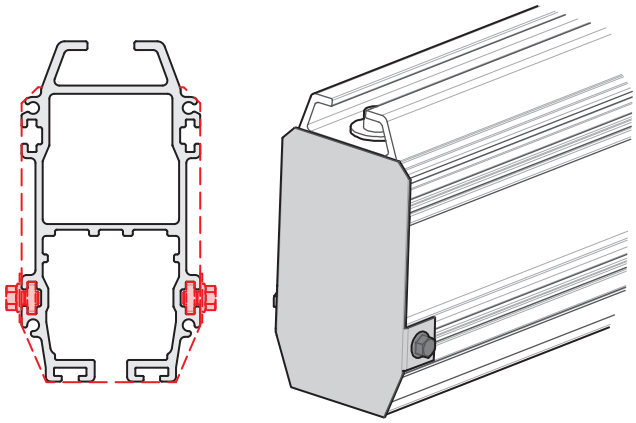
50s - AHB140/190

The end covers for AHB140/190 are fitted the same time as the end stop, see ”50s - AHB140/190” under “End stops (A)” on page 26.

75s

1. Insert the slot nuts in the lower external t-slot of the profile.

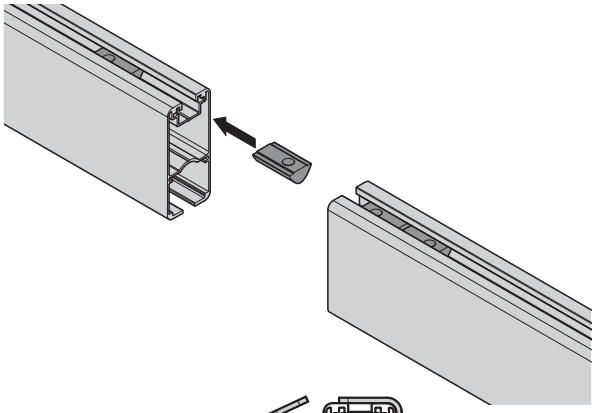
2. Tighten the screws.
   Tightening torque: **24 Nm**



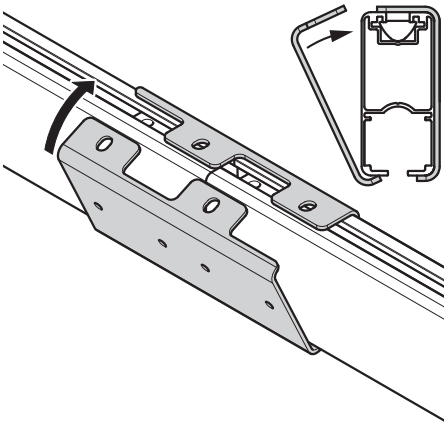
6.5 Joint set

30s - PHB

1. Insert the nuts into the upper t-slot of the profile.
   Push together the ends of the profiles so that they are tight agains each other.



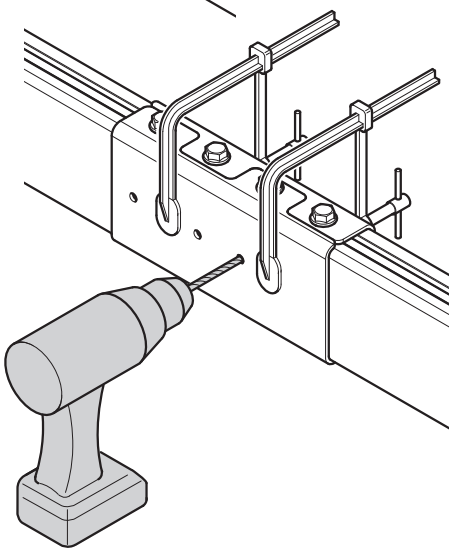
2. Position the joint plates so that the joint lies directly under these.
   NB! It is important that the lower flange of the plates are touching the lower edge of the profile before pressing the upper flange in place.



3. Use a screw clamp or similar tool to carefully press the joint kit against the profile. Tighten the upper screw somewhat.

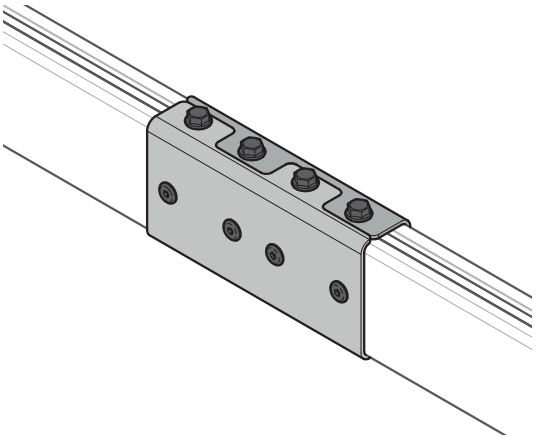
4. Check that the profiles lie tight against to each other.

5. Drill the holes for the screws to be used on the sides of the joint plates.
   The holes must be ø6 mm on one side of the profile (the screw side), and ø9 mm on the other side (the nut side).



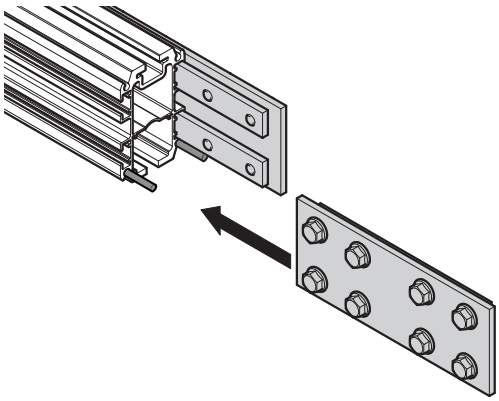
6. Insert the screws and the nuts into the joint plates, and tighten moderately.

7. Tighten the upper screws.
   Tightening torque: **24 Nm**



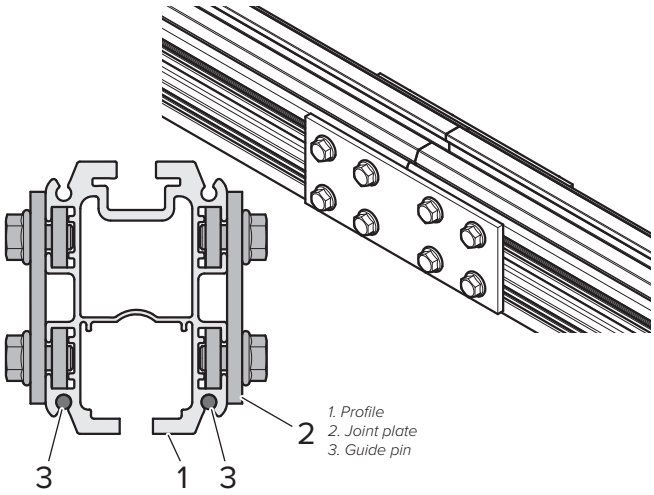
30s - LHB

1. Push in the joint plates in the outside t-slots in one of the profiles that is to be joined.



2. Insert the guide pins in the lower cut-outs of the same profile. The guide pin must protrude about 10 mm

3. Push the other profile onto the joint plates and guide pins. Make sure that the profiles are abutting each other and that the joint plates are centred over the joint.

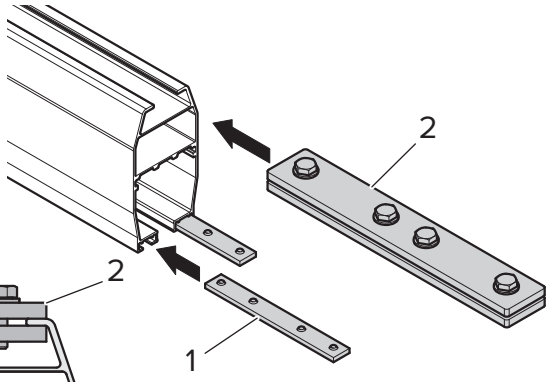


1. Profile
2. Joint plate
3. Guide pin

4. Tighten the screws on the joint plates crosswise.
Tightening torque: 24 Nm

50s - PHB1

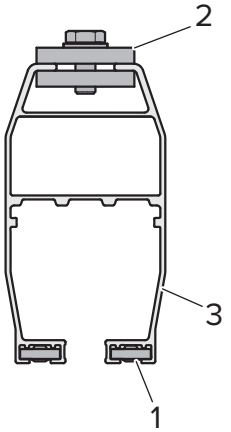
1. Push in the elongated nuts with hex socket screws into one of the lower t-slots, and the twin elongated nuts in such a way that they clamp the upper flange of the profile.



2. Insert the free end of the elongated nuts into the other profile in the same way.

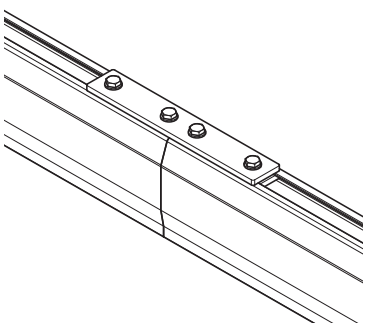
3. Push together the profiles so that they are touching each other.

1. Elongated nut with hex socket screw
2. Double elongated nut
3. Profile



4. Make sure that the joint between the profiles is under each of the elongated nuts.

5. Tighten the screws and the elongated nuts.
Tightening torque: (M6) 8 Nm
(M10) 47 Nm



50s - AHB140/190

1. Fit the joint plate onto one of the profiles to be joined. The elongated nuts for the joint plates are to be in the outside t-slot of the profiles.

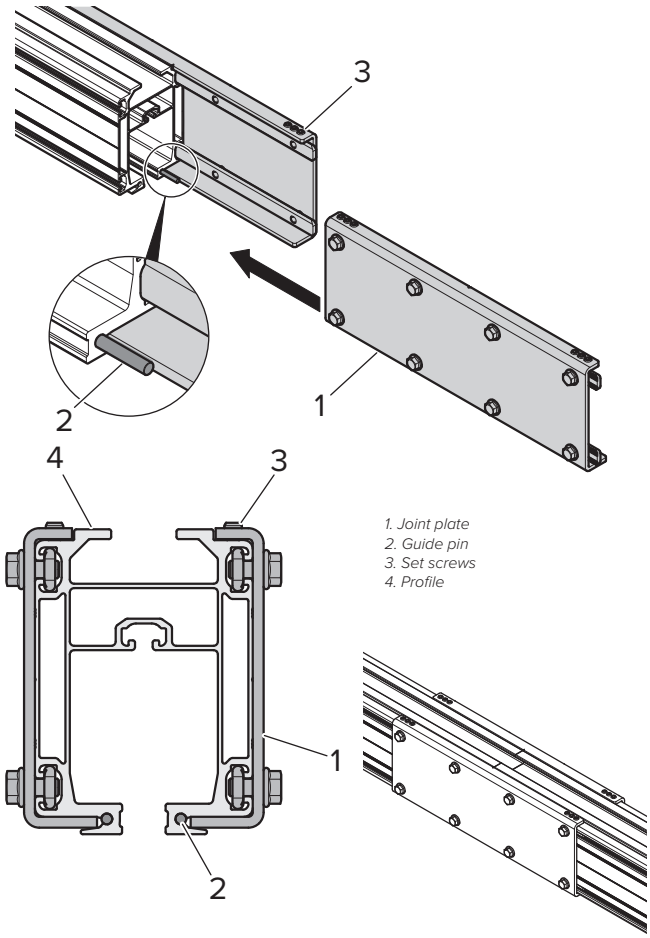
2. Insert the guide pins in the lower cut-outs of the same profile. The guide pin must protrude about 10 mm.

3. Push the other profile onto the joint plates and guide pins. Make sure that the profiles are abutting each other and that the joint plates are centred over the joint.

4. Tighten the set screws for the joint plates somewhat.
If necessary, the set screws on one side of the joint plate may be tightened so much that the joint is straightened.

5. Tighten the screws on the joint plates crosswise.
Tightening torque: 34 Nm

6. Tighten the set screws.
Tightening torque: 8 Nm



1. Joint plate
2. Guide pin
3. Set screws
4. Profile

75s - AHB3

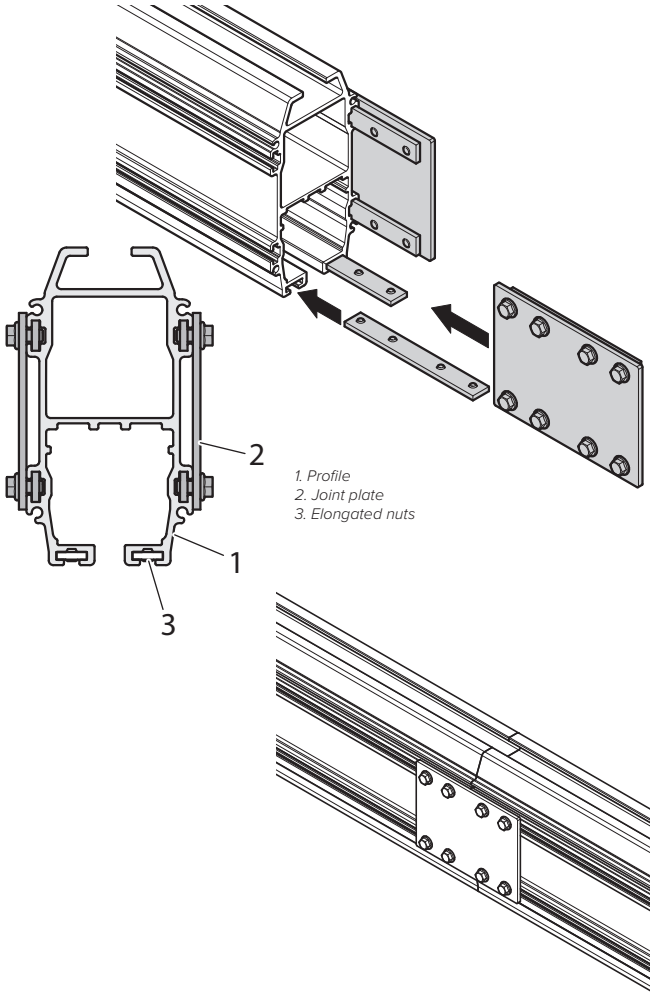
1. Fit the joint plate onto one of the profiles to be joined. The elongated nuts for the joint plates are to be in the outside t-slot of the profiles.

2. Insert the elongated nuts with hex socket screws into the lower t-slot of the profile.

3. Push the other profile onto the joint plates and elongated nuts. Make sure that the profiles are abutting each other and that the joint plates and elongated nuts are centred over the joint.

4. Tighten the flange screws on the joint plates crosswise.
Tightening torque: 24 Nm

5. Tighten the hex socket screws in the elongated nuts.
Tightening torque: 8 Nm



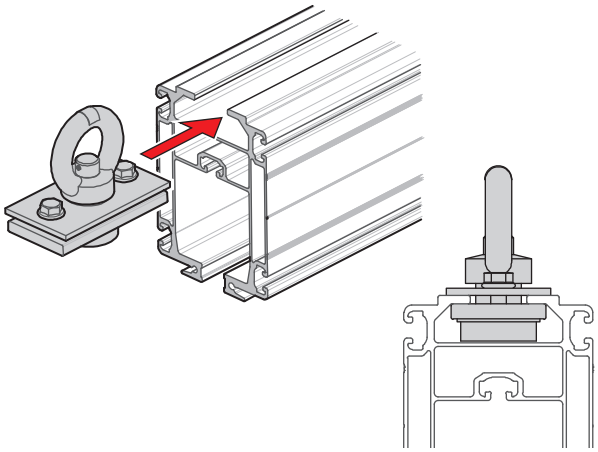
1. Profile
2. Joint plate
3. Elongated nuts

6.6 Crane girder suspension

1. For 50s: If safety wires for the bridge are to be fitted, this must be done at the same time as the crane girder suspension are fitted, see “6.9 Safety Wire for Bridge” on page 37.

2. Measure and mark the spots on the profile where the crane girder suspensions are to be mounted.

3. Insert the crane girder suspension in the profile. The washers/ plates of the crane girder suspension must clamp the upper flange of the profile, see image.



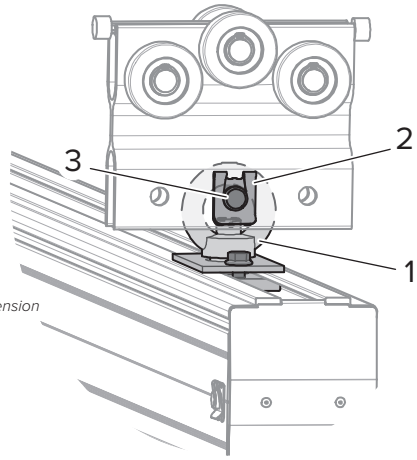
4. Tighten the screws/nuts of the crane girder suspension so that the plate/washers are clamping the upper flange of the profile.
   Tightening torque: **(M8) 20 Nm**
   (M12) 10 Nm

5. Remove the pin and the locking clip from the trolley(s).

6. Lift the bridge to the runway profile.

7. Insert the eye of the crane girder suspension in the trolley in the runway profile.

8. Insert the pin and secure it with the locking clip.

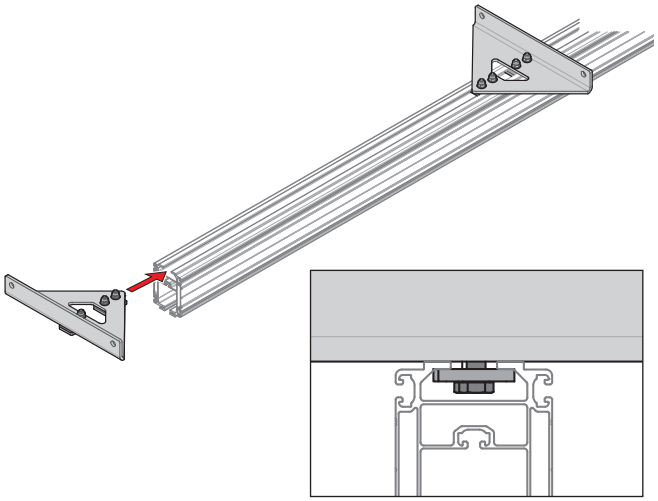


1. Crane girder suspension
2. Locking clip
3. Pin

6.7 Triangular bracing

1. Measure and mark the position of the triangular support on the profile (bridge).

2. Insert the triangular support into the upper part of the profile (bridge) so that the triangular support is above the upper flange of the profile and the washers end up below the upper flange, see image.
NB! The triangular supports are to be positioned so they point at each other.



3. Position the triangular bracings where you have marked the profiles.

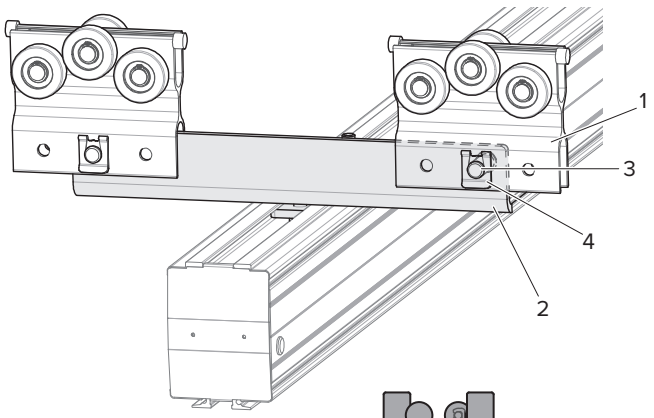
4. Tighten the nuts of the triangular bracing.
Tightening torque: **(M12) 81 Nm**
(M16) 197 Nm

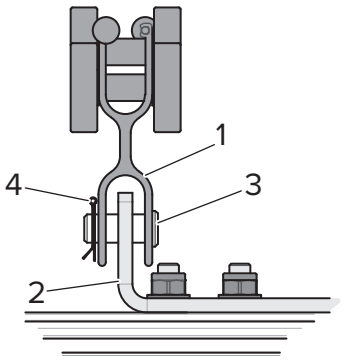
5. Remove the pins and the locking clips from the trolleys.

6. Lift the bridge to the runway profile.

7. Insert the triangular bracing in the trolleys.

8. Insert the pin through the trolley and the triangular bracing, secure with the locking clip.





1. Trolley
2. Triangular bracing
3. Pin
4. Locking clip

6.8 Space saving module

1. Insert the profile as far as possible into the space saving module. The attaching plate must be inserted into the upper t-slot of the profile, and the four t-slot nuts in the outer t-slots of the profile, see image.

2. Tighten the screws of the attaching plate.
   Tightening torque: **81 Nm**

3. Tighten the screws of the T-shaped slot nuts.
   Tightening torque: **24 Nm**

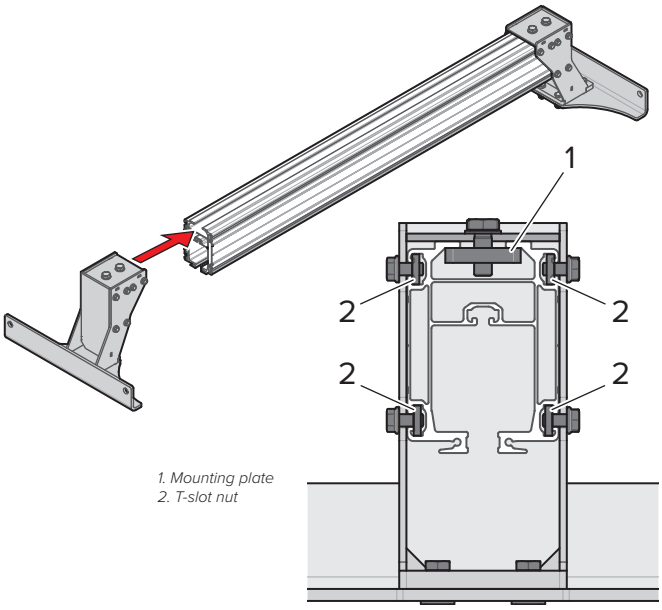
4. For a twin bridge:
   Install the spacer strut between the space saving modules, see “6.10 Spacers for twin bridges” on page 42.

5. Remove the pins and the locking clips from the trolleys.

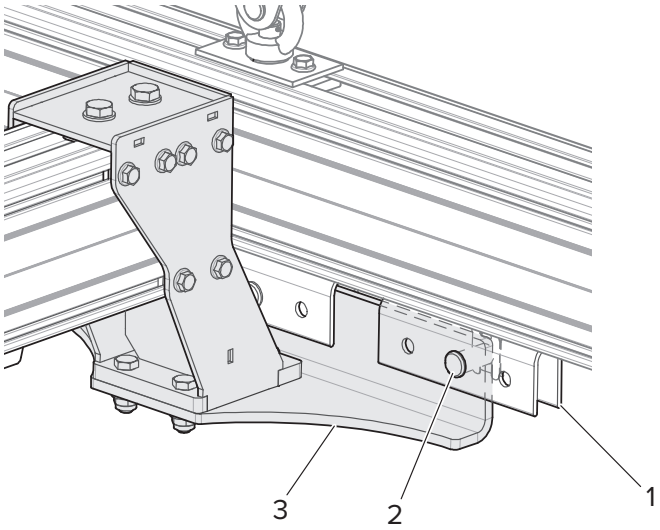
6. Lift the bridge profile to the runway.

7. Insert the space saving module into the trolleys.

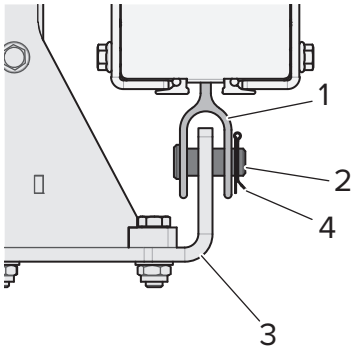
8. Insert the pin through the trolley and the space saving module, secure with the locking clip.



1. Mounting plate
2. T-slot nut



1. Trolley
2. Pin
3. Space saving module
4. Locking clip



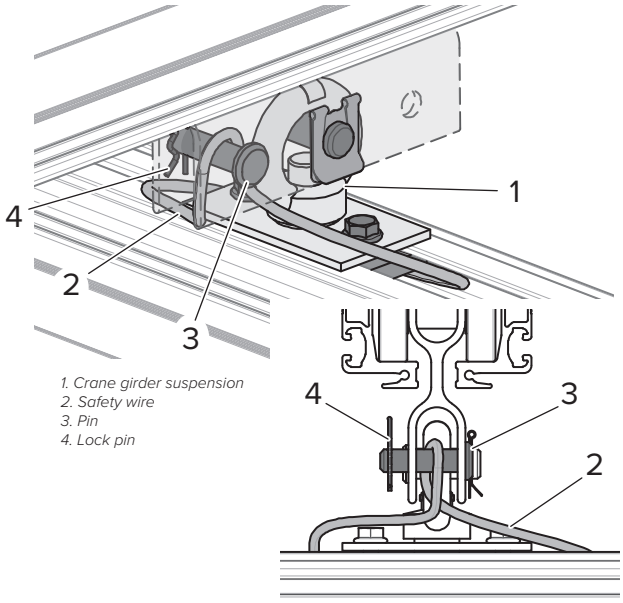
6.9 Safety Wire for Bridge

Safety wire for bridge (A)

50s

Safety wires are fitted at the same time as the crane girder suspension, see “6.6 Crane girder suspension” on page 34.

1. Position the safety wire around the crane girder suspension.
2. Install the crane girder suspension according to directions in “6.6 Crane girder suspension” on page 34.
3. Twist the safety wire half a turn to form a loop and insert it into the holes in the trolley, see image.
4. Insert the supplied pin into the hole and through the safety wire, secure the pin.



1. Crane girder suspension
2. Safety wire
3. Pin
4. Lock pin

Safety wire for bridge (B)

30s

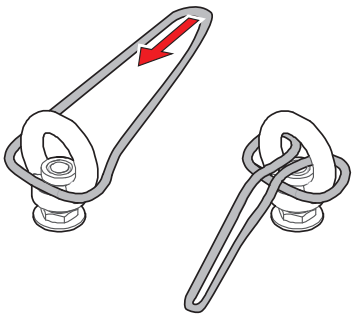
1. Install the supplied crane girder suspension according to directions in “6.6 Crane girder suspension” on page 34.

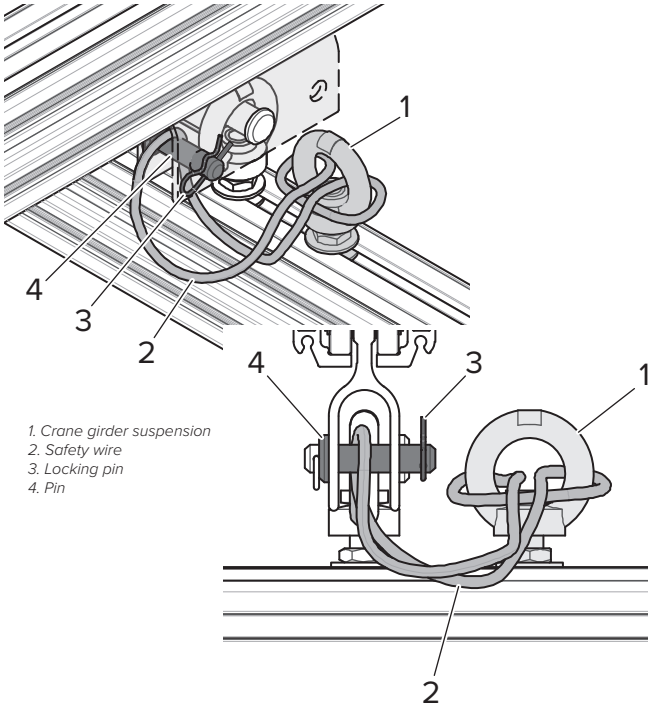
2. Position the safety wire around the supplied crane girder suspension.

3. Pull the end of the safety wire from one side of the crane girder suspension, and through the eye of the crane girder suspension over the safety wire to secure it.

4. Twist the free end of the safety wire half a turn, insert it into the trolley through one of the available holes.

5. Insert the supplied pin into the hole, through the safety wire and secure the pin.





1. Crane girder suspension
2. Safety wire
3. Locking pin
4. Pin

50s

1. Position the safety wire around the attaching plate and insert the plate into profile.
   The plates of the attaching plate must clamp the upper flange of the profile, and at an angle of 90° to the profile.

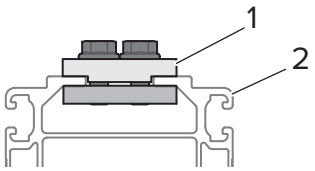
2. Push the attaching plate against the crane girder suspension so that the attaching plate ends up next to the crane girder suspension.

3. Tighten the screws of the locking plate to secure it.
   Tightening torque: **25 Nm**

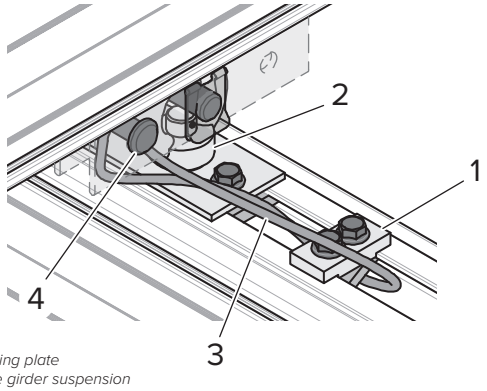
4. Twist the safety wire half a turn to form a loop.

5. Insert the loop between the shanks at an available hole of the trolley.

6. Insert the supplied pin into the hole through the safety wire and secure the pin.



1. Mounting plate
2. Profile



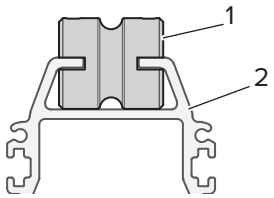
1. Mounting plate
2. Crane girder suspension
3. Safety wire
4. Pin

75s

1. Position the safety wire around the wire roll.

2. Insert the wire roll into the upper flange of the profile.

3. Tighten the screws of the wire roll.
   Tightening torque: **24 Nm**

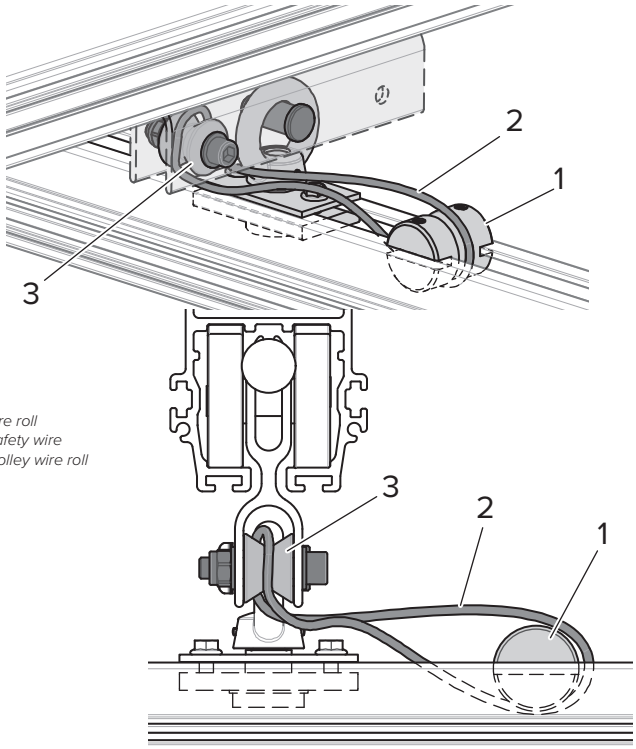


1. Wire roll
2. Profile

4. Twist the end of the safety wire half a turn to form a loop.

5. Place the loop around the wire roll for the trolley, insert it into an available hole between the shanks of the trolley.

6. Install the wire roll for the trolley using screw, washer and nut. Tighten.
   Tightening torque: **81 Nm**



1. Wire roll
2. Safety wire
3. Trolley wire roll

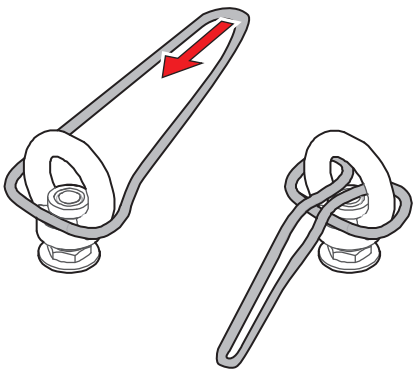
Safety wire for bridge (C)

30s

1. Install the supplied crane girder suspension according to directions in “6.6 Crane girder suspension” on page 34.

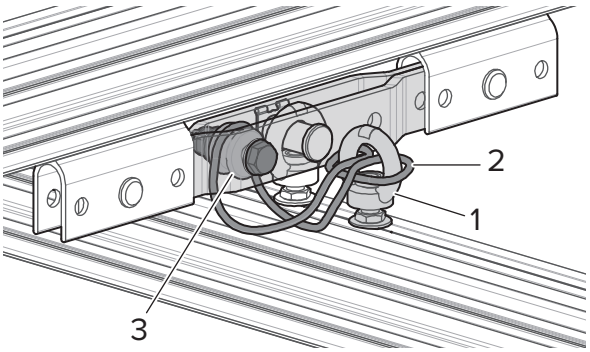
2. Position the safety wire around the supplied crane girder suspension.

3. Pull the end of the safety wire from one side of the crane girder suspension, and through the eye of the crane girder suspension over the safety wire to secure it.



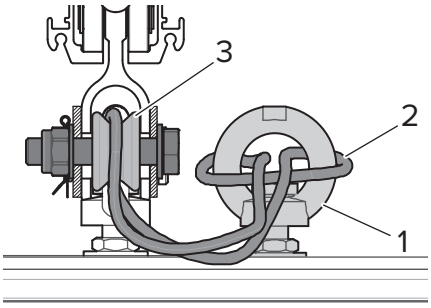
4. Twist the free end of the safety wire half a turn to form a loop.

5. Place the loop around the wire roll for the trolley, insert it into an available hole in the strut between the trolleys.



1. Crane girder suspension
2. Safety wire
3. Trolley wire roll

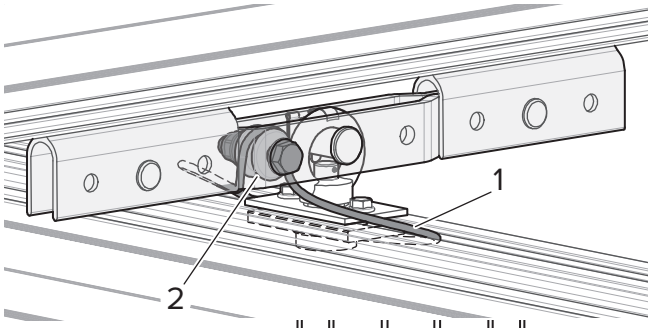
6. Install the wire roll using screw, washer and nut. Tighten.
Tightening torque: **81 Nm**



50s

Safety wires are fitted at the same time as the crane girder suspension, see “6.6 Crane girder suspension” on page 34.

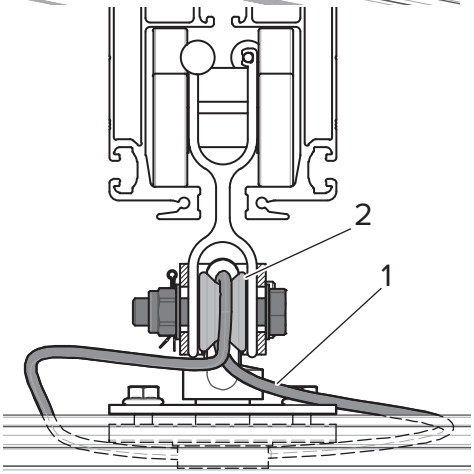
1. Position the safety wire around the crane girder suspension.



2. Install the crane girder suspension according to directions in “6.6 Crane girder suspension” on page 34.

3. Twist the end of the safety wire half a turn to form a loop. Place the loop around the wire roll, insert it into an available hole in the strut between the trolleys.

1. Safety wire
2. Wire roll



4. Install the wire roll using screw, washer and nut. Tighten.
Tightening torque: **81 Nm**

75s

I may be necessary to dismantle the crane girder suspension in order to install the safety wire. See “6.6 Crane girder suspension” on page 34 for reinstalling the crane girder suspension.

1. Position the safety wire around the wire roll.

2. Insert the wire roll into the upper flange of the profile.

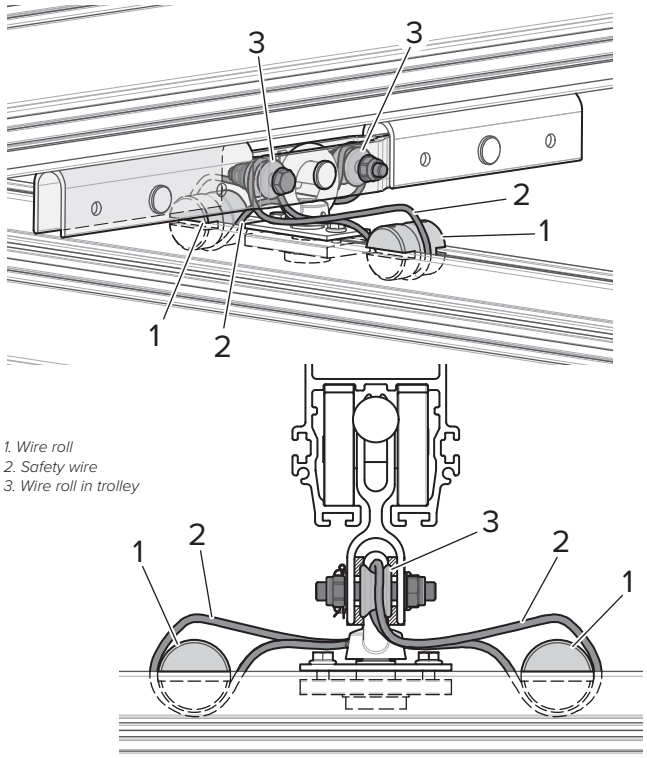
3. Tighten the screws of the wire roll.
   Tightening torque: **24 Nm**

4. Twist the end of the safety wire half a turn to form a loop.

5. Place the loop around the wire roll in the trolley, insert it into an available hole in the strut between the trolleys.

6. Install the wire roll in the trolley using screw, washer and nut. Tighten.
   Tightening torque: **81 Nm**

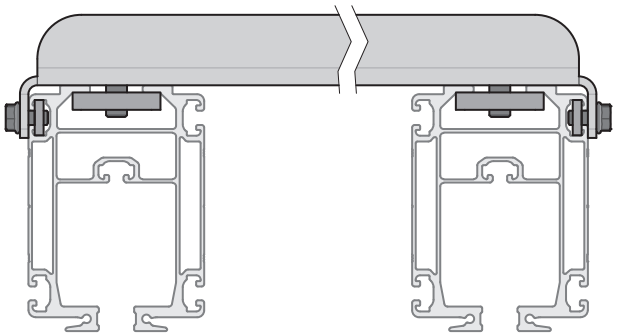
7. Repeat points 1 - 6 on the opposite side of the crane girder suspension.



1. Wire roll
2. Safety wire
3. Wire roll in trolley

6.10 Spacers for twin bridges

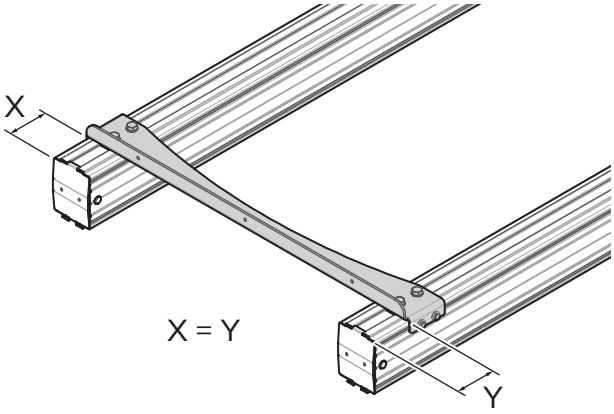
1. If required, the end covers and end stops are removed before the spacers for a twin bridge are installed.



2. Insert the spacer in the profile. The upper washers must be inserted under the upper flange of the profile and in some cases the washers have to be inserted into the upper t-slots of the profile.

   NB! - The spacer must be positioned at least 50 mm from the end of the profile.

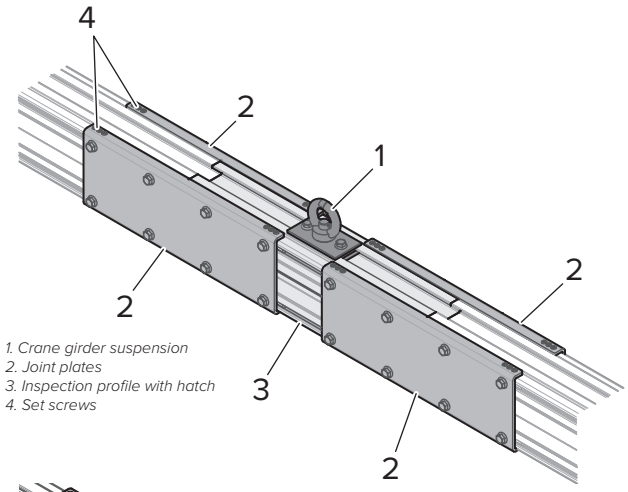
   - The distance from the end of the profile must be the same on both sides.



3. Tighten the screws of the spacers to secure them.
   Tightening torque: **(M8) 24 Nm**
   (M12) 81 Nm

6.11 Inspection hatches

NB! The inspection hatch must be installed directly below a crane girder suspension.



1. Crane girder suspension
2. Joint plates
3. Inspection profile with hatch
4. Set screws

1. Insert the joint plates into the profile where the inspection hatch is to be installed (two joint plates per profile).

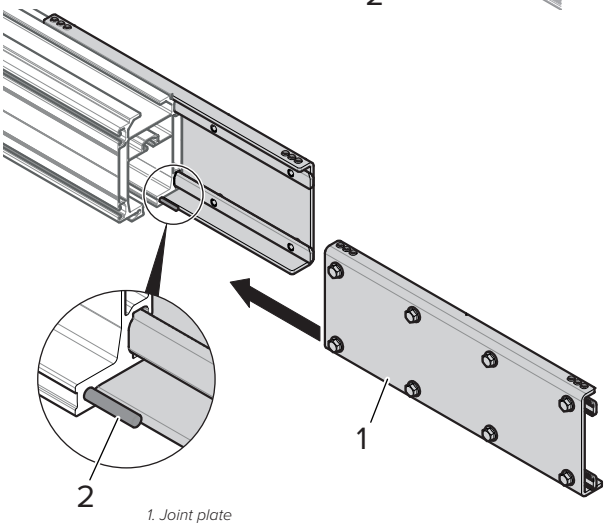
2. Fit a guide pin to each profile where the inspection hatch is to be installed. The guide pin is to be fitted to the opposite side of the inspection hatch.

3. Push together the inspection hatch profile with the profiles.
   Make sure the joint between the profile and the hatch profile ends up directly below each joint respectively.
   Also make sure that profile is fully pressed together with each other.

4. Tighten the upper set screws for the joint plates somewhat.

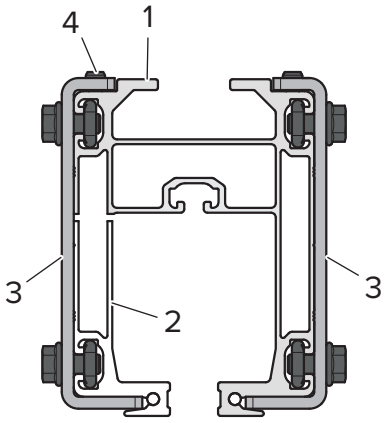
5. Tighten the screws for each joint plate crosswise.
   Tightening torque: **34 Nm**

6. Tighten the set screws.
   Tightening torque: **16 Nm**

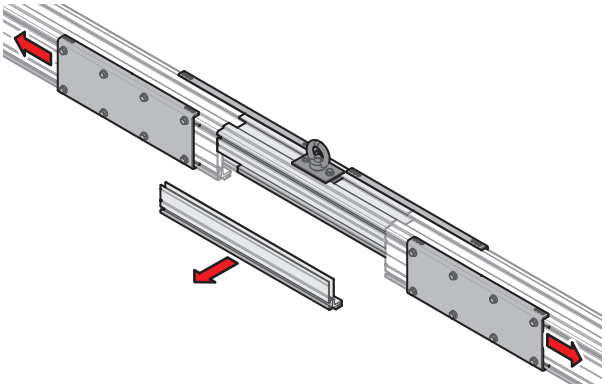


1. Joint plate
2. Guide pin

Before opening the inspection hatch, the joint plates on the same side as the hatch must be moved to a side.



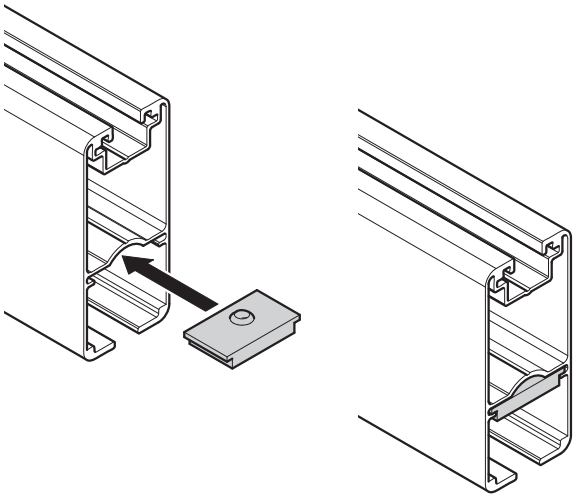
1. Profile
2. Hatch, profile
3. Joint plate
4. Set screw



6.12 Travel limiter

Travel limiter (A)

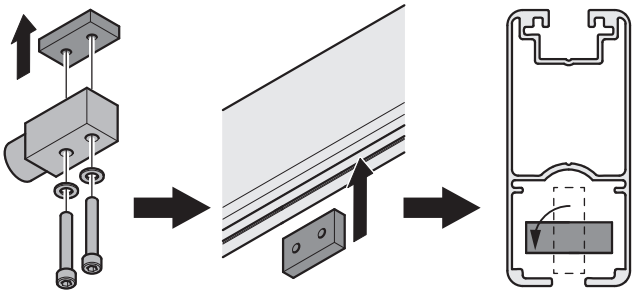
1. Remove the end stop and the end cover.
2. Push the travel limiter into the upper t-slot in the lower cavity of the profile.
3. Push the travel limiter to the desired place and tighten the screw(s) of the travel limiter.
   Tightening torque: 10 Nm
4. Refit the end stop and the end cover.

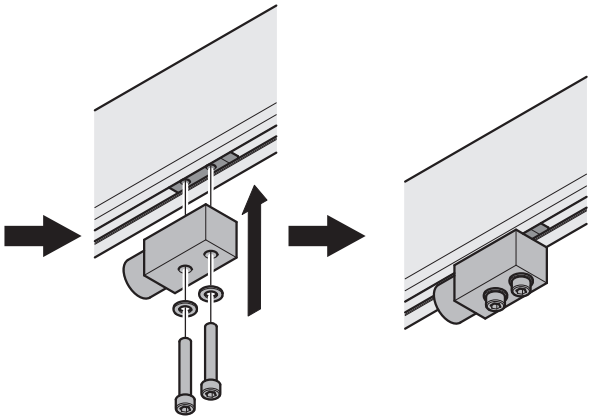


Travel limiter (B), (B double)

This type of travel limiter can be divided, making it possible to insert the attaching plate of the travel limiter through the opening in the lower cavity of the profile without removing end stops and end covers.

1. Undo the screws from the plate of the travel limiter.
2. Fold the plate into the opening in the lower cavity of the profile.
3. Attach the travel limiter to the plate.
4. Push the travel limiter to the desired position.
5. Tighten the screws of the travel limiter to secure it.
   Tightening torque: (M8) 24 Nm
   (M10) 47 Nm

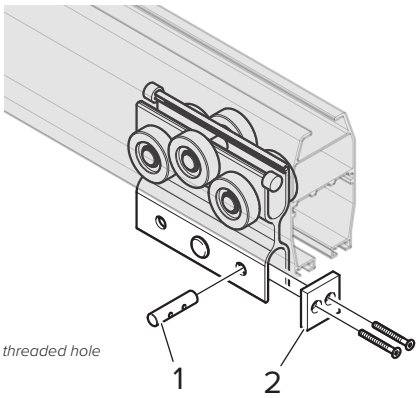




Travel limiter (C)

1. Fit the plate in the trolley:

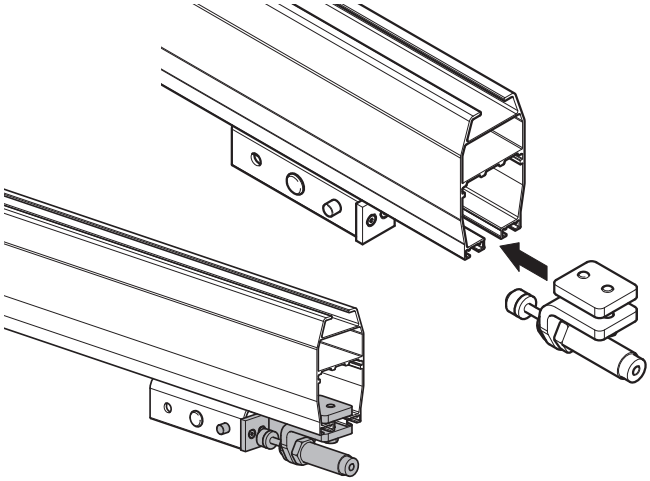
   - Insert the pin with threaded hole into the hole in the trolley that is closest to the travel limiter.
   - Position the plate against the end of the trolley and insert the screws into the plate.
   - Screw in the screws in the plate.
   - Tighten the screws.
     Tightening torque: 8.1 Nm



1. Pin with threaded hole
2, Plate

2. Insert the mounting plate of the hydraulic damper into the lower cavity of the profile and move the damper to the desired position.

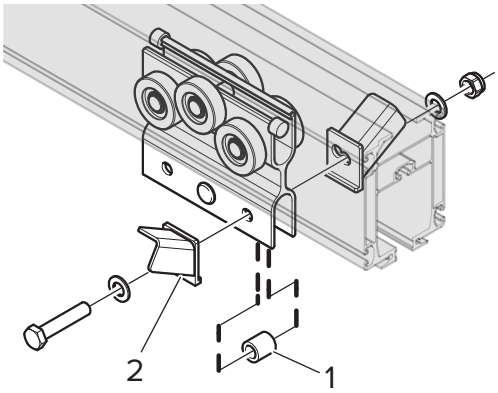
3. Tighten the screws of the mounting plate to secure the hydraulic damper.
   Tightening torque: 47 Nm



Travel limiter (D)

1. Fit the bumper plates to the trolley:

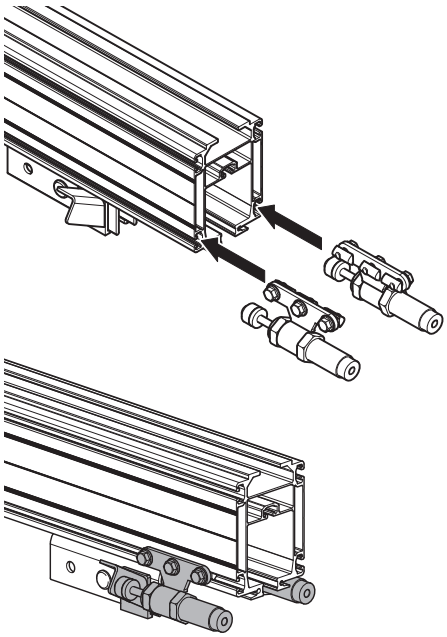
   - Insert the spacer between the shanks of the trolley. Position it next to an available hole on the same side where the travel limiter will be mounted.
   - Position the bumper plates on the sides of the trolley.
   - Put a washer on the screw and insert the screw through the bumper plates, trolley and spacer.
   - Fit the nut and tighten.
     Tightening torque: 81 Nm



1. Spacer
2. Bumper plate

2. Insert the travel limiter in the outside t-slot of the profile and move the travel limiter to the desired position.

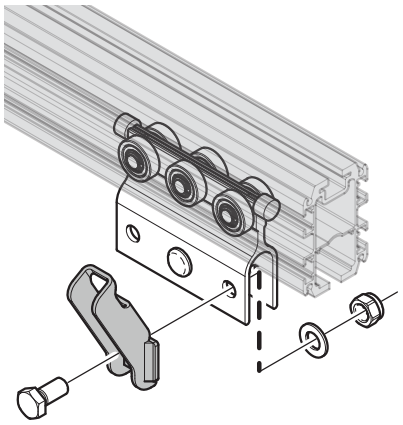
3. Secure the travel limiter by tightening the screws.
   Tightening torque: 24 Nm



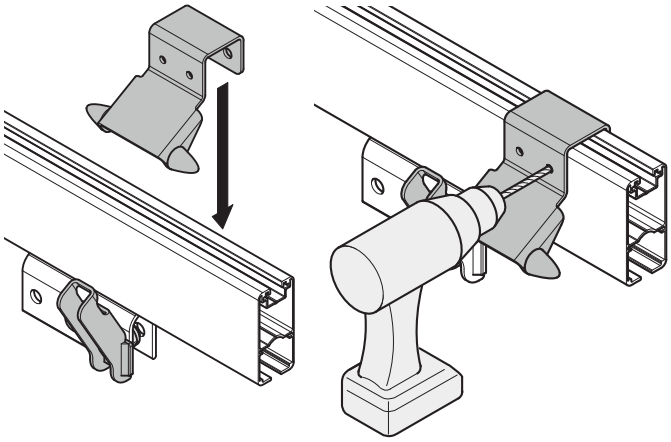
Travel limiter (E)

30s PHB

1. Position the bumper plate on the side of the trolley next to the hole which will be closest to the travel limiter.



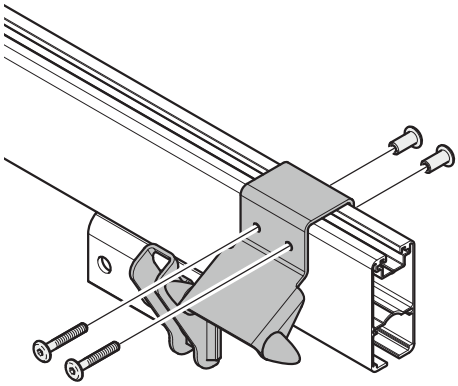
2. Secure the bumper plate with screw, washer and nut.
   Tightening torque: 81 Nm

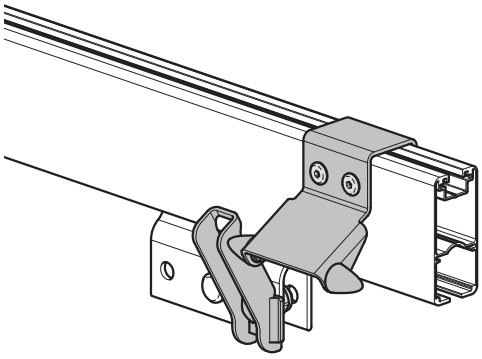


3. Drill two holes through the profile where the travel limiter will be mounted, see image. The front end holes (where the screw will be) should have a diameter of ø6 mm, and the other side (where the nut will be), should be ø9 mm.

4. Position the travel limiter at the holes. Insert the screws and fit the nuts on the screws.

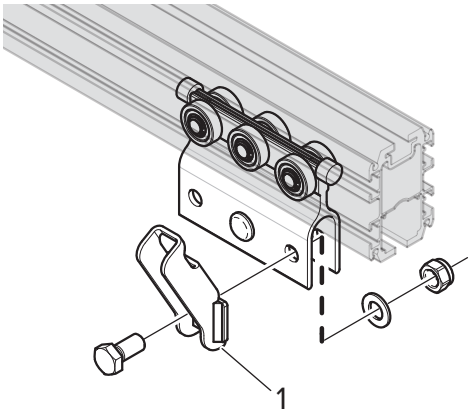
5. Tighten the nuts somewhat.





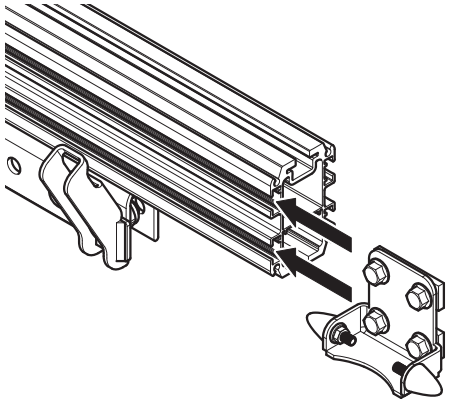
30s LHB

1. Position the bumper plate on the side of the trolley next to the hole which will be closest to the travel limiter.



2. Secure the bumper plate with screw, washer and nut.
   Tightening torque: 81 Nm

3. Insert the slot nuts of the travel limiter in the external t-slot of the profile.

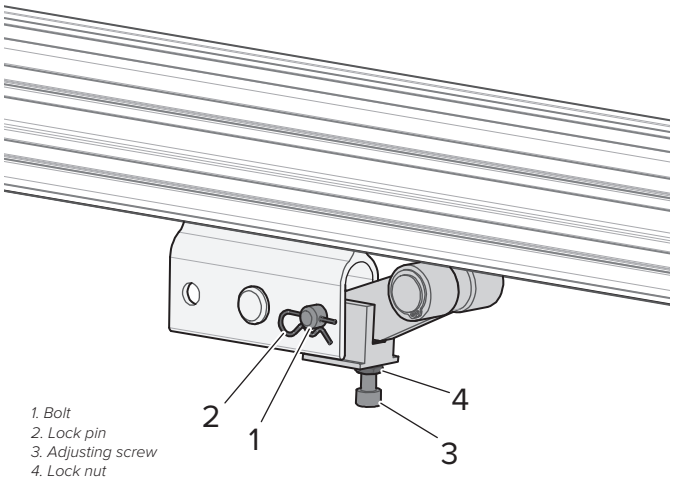


4. Push the travel limiter to the desired position.

5. Tighten the screws to secure the travel limiter.
   Tightening torque: 24 Nm

6.13 Friction Rollers

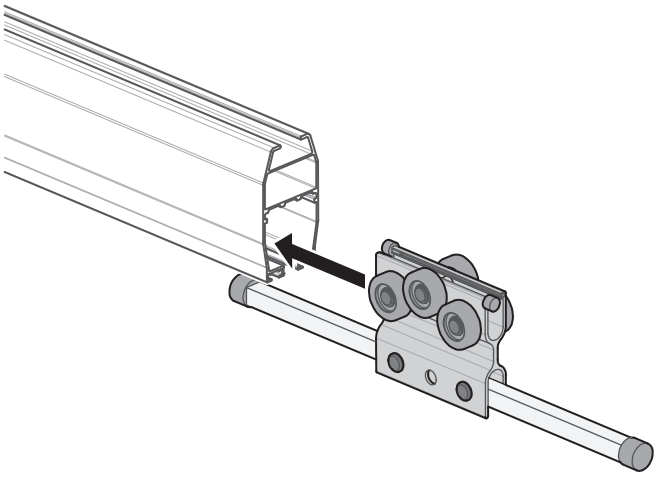
1. Insert the friction roller between the shanks of the trolley.
2. Adjust the position of the friction roller so that the bolt can be inserted through the hole of the trolley and through the friction roller.
3. Secure the bolt with the split pin.
4. Adjust the friction against the profile with the adjustment screw. Only tighten the adjustment screw so much that the trolley doesn't move by itself.
5. Lock the adjustment screw with the lock nut.



1. Bolt
2. Lock pin
3. Adjusting screw
4. Lock nut

6.14 Spacer brace

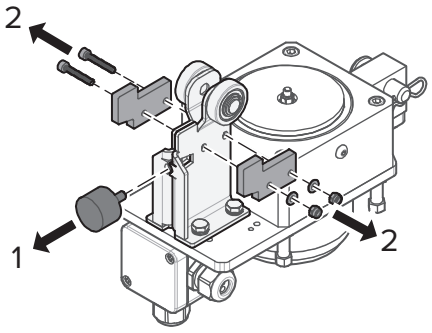
1. Remove the end stop, end cover and travel limiter, if fitted.
2. Insert the trolley with spacing brace into the profile.
3. Refit the end stop, end cover and travel limiter, if fitted.



6.15 Parking brake

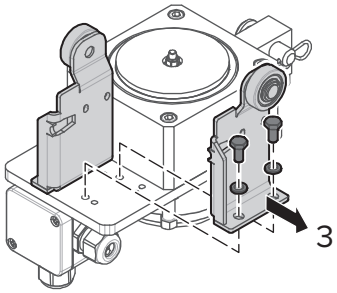
Fitting the parking brake

The two support wheel brackets of the parking brake can be split, which makes it possible to install the parking brake without removing end stops, end covers and trolleys.

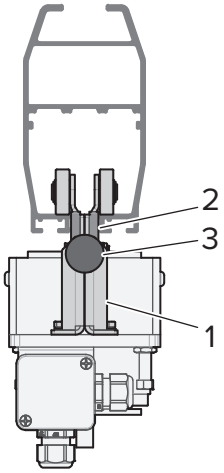


1. Remove the rubber buffer on the support wheel brackets (M8).

2. Remove the plastic guide strips on the support wheel brackets (M4).



3. Remove the support wheel brackets from the parking brake (M6).

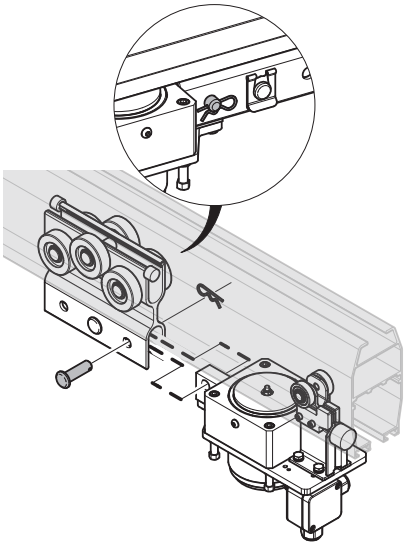


1. Support wheel bracket
2. Plastic guide strip
3. Rubber buffer

4. Insert the support wheels into the lower opening of the profile.

5. Refit the support wheel brackets on the parking brake.
   Tightening torque: 10 Nm

6. Refit the guide strips and the rubber buffer on the support wheel brackets.

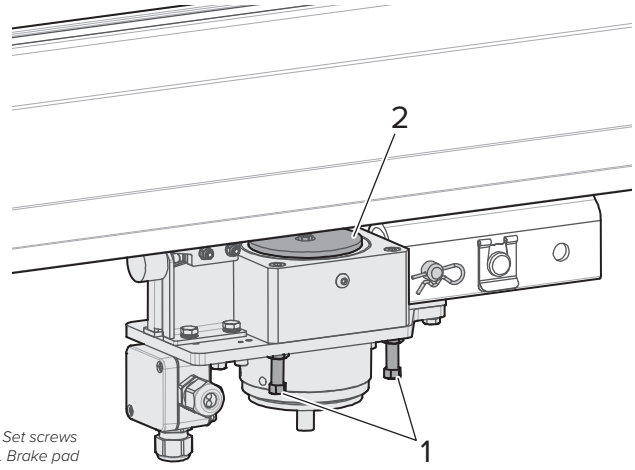


7. Secure the parking brake to the trolley with the locking bolt.

8. Connect the parking brake.

Adjusting the parking brake (A)

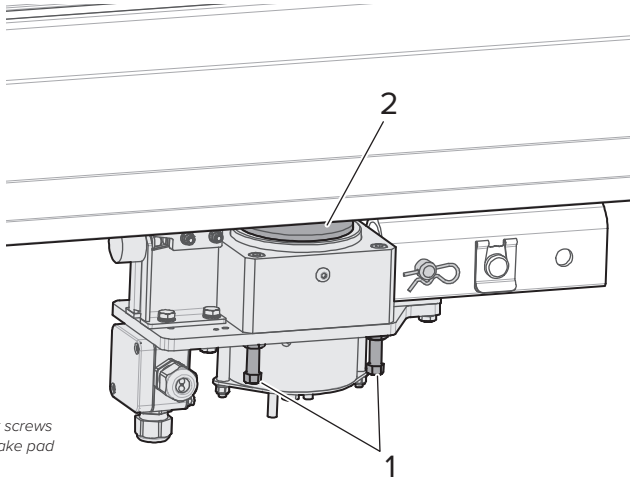
1. Activate the parking brake electrically.
2. Adjust the set screws on the brake housing so that the brake pad just touches and is parallel to the lower edge of the profile.
3. Turn the set screws another 1.5 turns.



1. Set screws
2. Brake pad

Adjusting the parking brake (B)

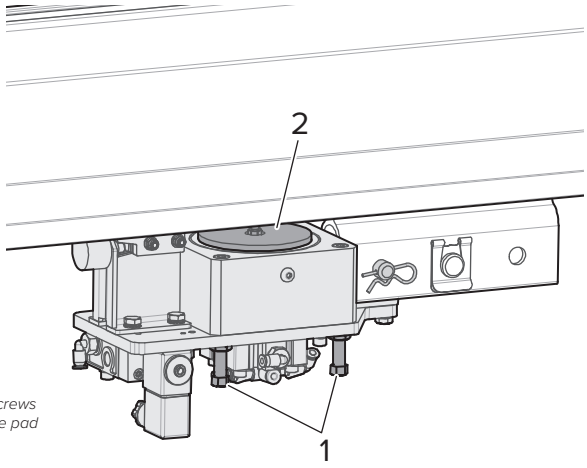
1. Activate the parking brake electrically.
2. Adjust the set screws on the brake housing so that the brake pad just touches and is parallel to the lower edge of the profile.
3. Undo the set screws 1.5 turns.



1. Set screws
2. Brake pad

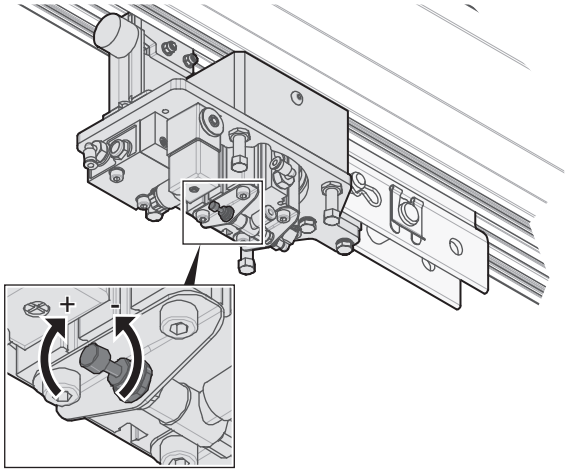
Adjusting the parking brake (C), (E), (G)

1. Use your hand to press the brake pad to its lowermost position in the brake housing.
2. Adjust the set screws on the brake housing so that the brake pad just touches and is parallel to the lower edge of the profile.
3. Undo the set screws 1.5 turns.
4. Activate the parking brake with air pressure.



1. Set screws
2. Brake pad

5. Adjust the braking power using the pressure regulator:
   - turn the screw clockwise to increase the pressure
   - turn the screw anti-clockwise to reduce the pressure

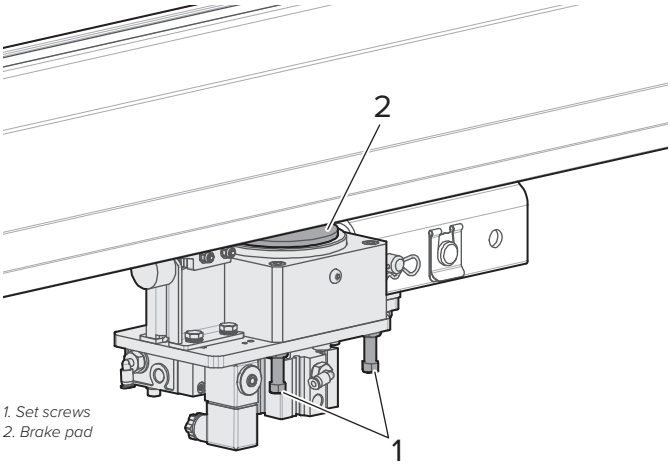


Adjusting the parking brake (D), (F), (H)

1. Activate the parking brake with air pressure.

2. Adjust the set screws on the brake housing so that the brake pad just touches and is parallel to the lower edge of the profile.

3. Undo the set screws 1.5 turns.

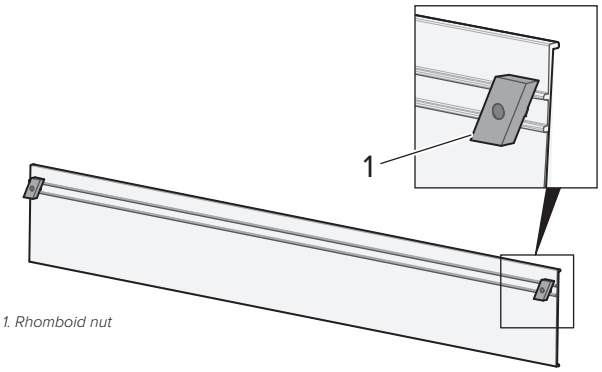


1. Set screws
2. Brake pad

6.16 Signs

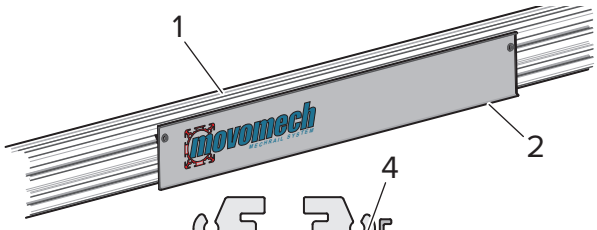
30s LHB 75s

1. Undo and remove the rhomboid nuts (M4) at the back of the sign.

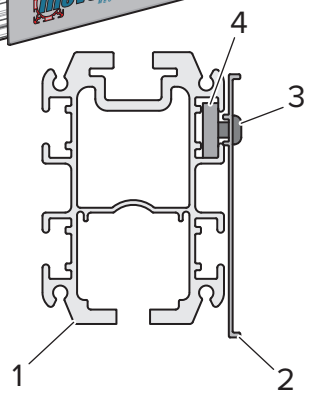


1. Rhomboid nut

2. Insert the nuts into the upper outside t-slot of the profile.

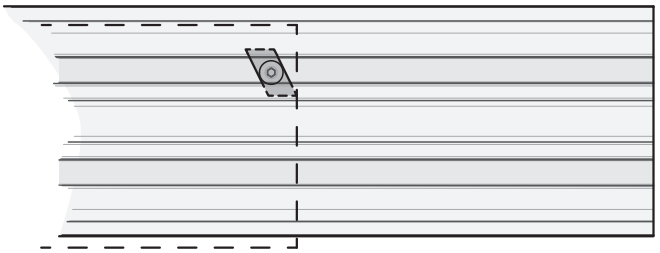


3. Screw in the screws to the rhomboid nuts to secure the sign.



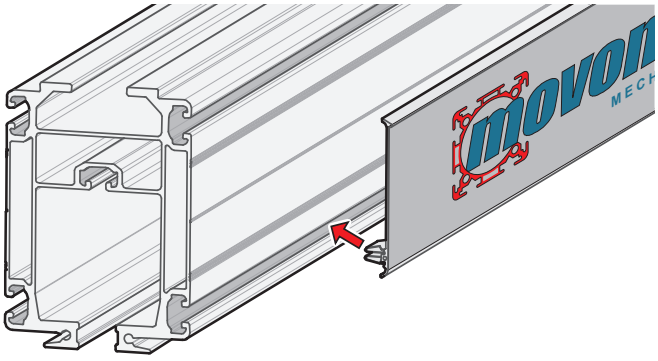
1. Profile
2. Sign
3. Screw
4. Rhomboid nut

4. Make sure the rhomboid nuts are correctly positioned, see image.



50s AHB140/190

1. The sign profile is press fitted to the lower outer t-slot of the profile.

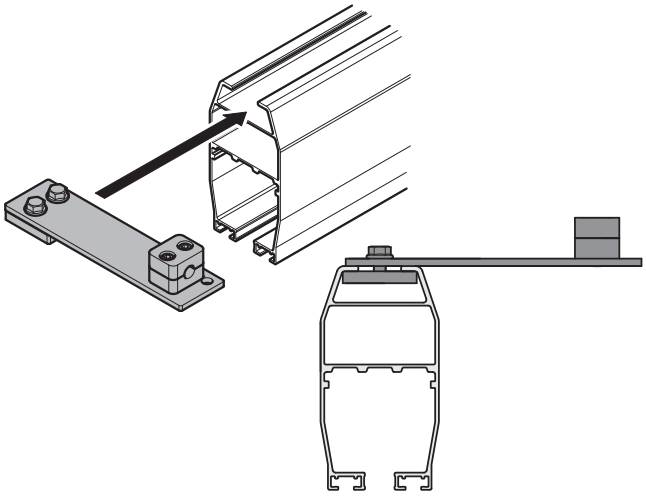


7. Mounting Instructions for the media supply

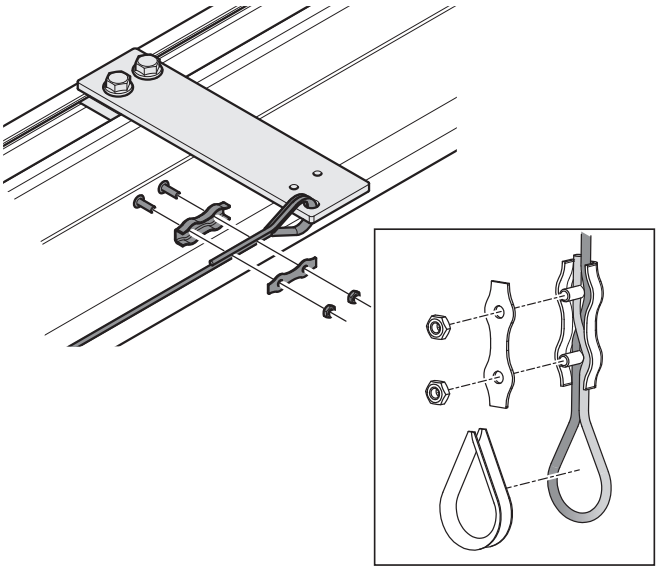
7.1 Spiral hose

30s PHB	50s PHB1

1. Insert the wire console in the profile. The slot nut of the wire console is inserted in the upper t-slot of the profile.



2. Secure one of the wire consoles in the desired place using the screw in the slot nut.
   Tightening torque: 24 Nm



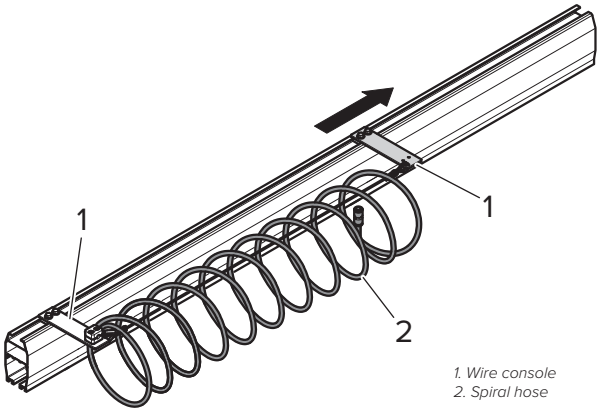
3. Fix the wire on the secured wire console using a thimble and a wire clamp.
   NB! The wire must cross over in the wire clamp!
   Tighten the screws of the wire lock.
   Tightening torque: 5 Nm

4. Pull the wire through the spiral hose.

5. Fix the wire on the other wire console using a thimble and a wire clamp.
   NB! The wire must cross over in the wire clamp!
   Tighten the screws of the wire lock.
   Tightening torque: 5 Nm

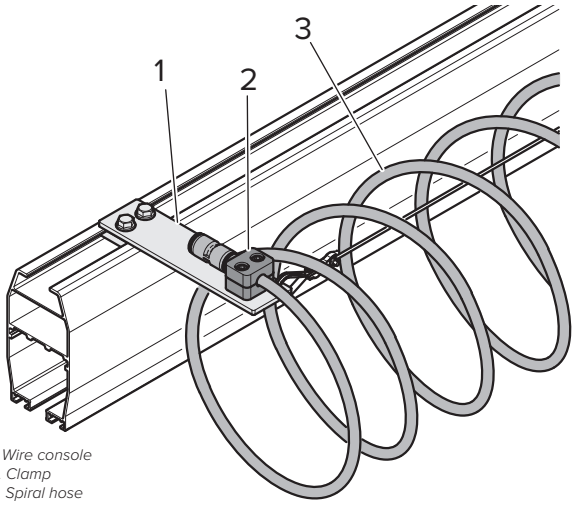
6. Tighten the wire by moving the wire console that isn't secured away from the secured wire console.

7. Secure the wire console using the screw in the slot nut.
   Tightening torque: 24 Nm



1. Wire console
2. Spiral hose

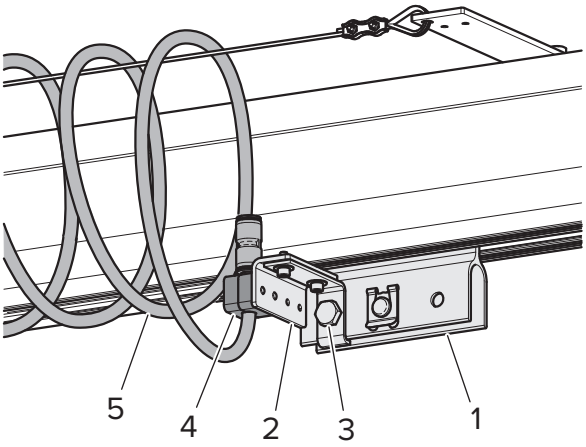
8. Fit the spiral hose in the clamp of the wire console.



1. Wire console
2. Clamp
3. Spiral hose

9. Fit the strain relief to the trolley. Tighten the screw holding the strain relief to the trolley.
Tightening torque: 81 Nm

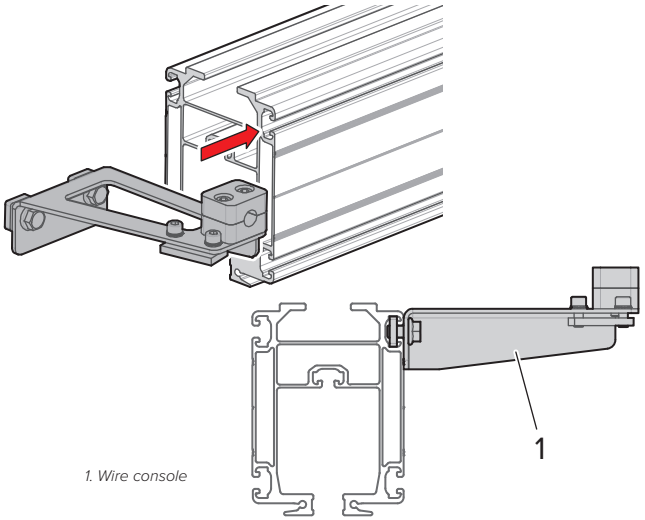
10. Fit the other end of the spiral hose in the clamp of the strain relief.



1. Trolley
2. Strain relief
3. Screw and nut for fitting a strain relief to the trolley
4. Clamp
5. Spiral hose

11. Check that the travel limiter - if fitted - is installed in such a way that the spiral hose is not obstructed in operation.

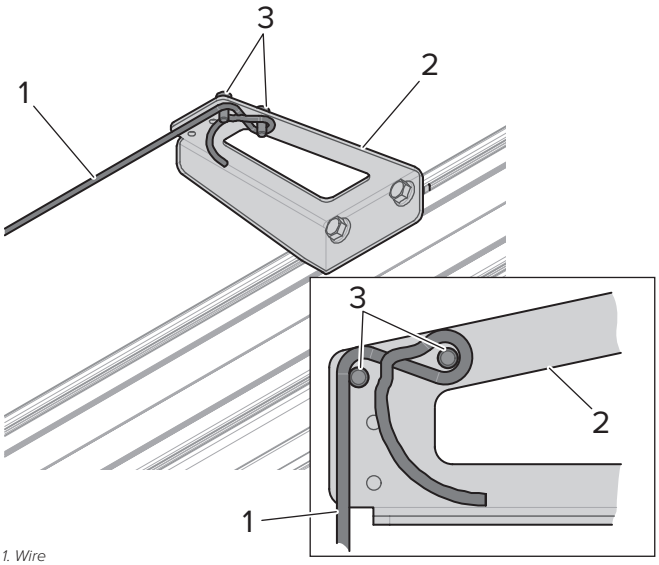
1. Insert the nuts of the wire console into the upper outside t-slot of the profile.



1. Wire console

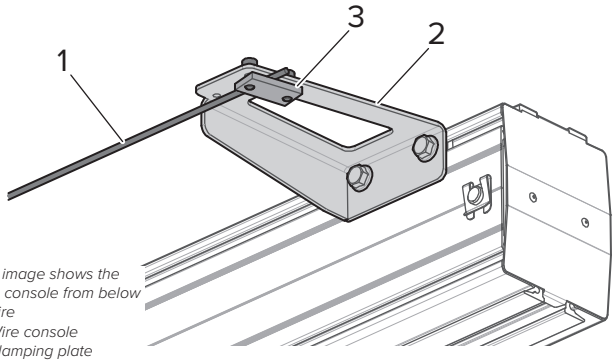
2. Secure one of the wire consoles in its correct position by tightening the screws with the slot nuts.
   Tightening torque: 24 Nm

3. Wrap the wire around the screws to the secured wire console.



1. Wire
2. Wire console
3. Screws securing the clamping plate

4. Trap the wire in the clamping plate on the wire console. Tighten the screws which hold the clamping plate.
   Tightening torque: 10 Nm



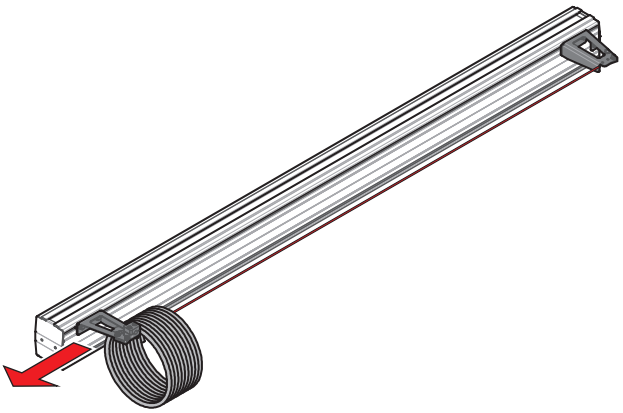
The image shows the wire console from below
1. Wire
2. Wire console
3. Clamping plate

5. Fit the spiral hose on to the wire.

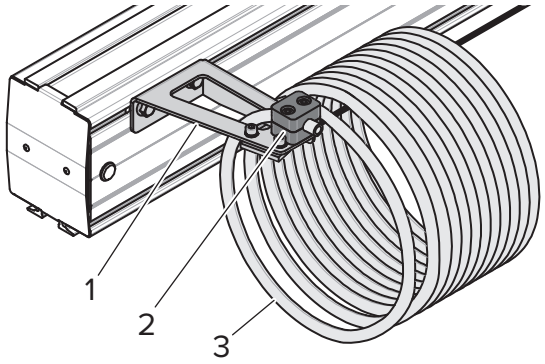
6. Fit the wire onto the other wire console in the same way as for the first.

7. Tighten the wire by moving the second wire console away from the first.

8. Secure the second wire console in its correct position by tightening the screws with the slot nuts.
   Tightening torque: 24 Nm



9. Fit the spiral hose in the clamp of the wire console.

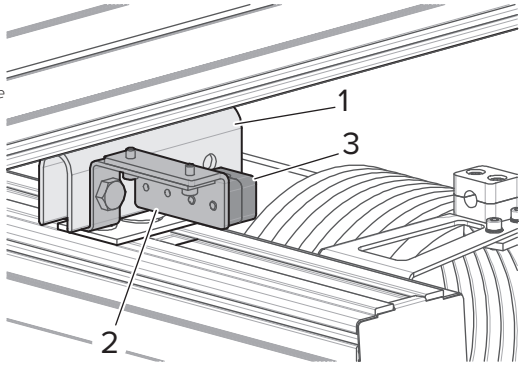


10. Fit the strain relief to the trolley. Tighten the screw.
    Tightening torque: 81 Nm

11. Fit the spiral hose in the clamp of the strain relief.

12. Check that the travel limiter - if fitted - is installed in such a way that the spiral hose is not obstructed in operation.

1. Wire console
2. Clamp
3. Spiral hose



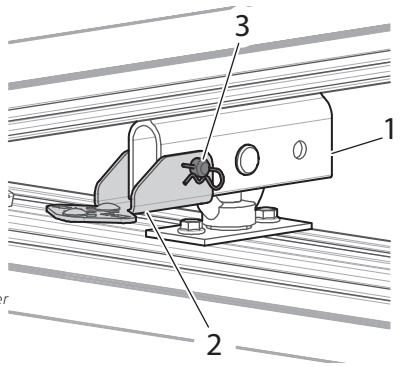
1. Trolley
2. Strain relief
3. Clamp on the strain relief

7.2 Cable trolley for profile

The installing instructions below are applicable to the types (A) saddle, (B) ball joint, (C) strap and (D) shackle. The images show the end fix, cable trolley and strain relief for shackle type (D).

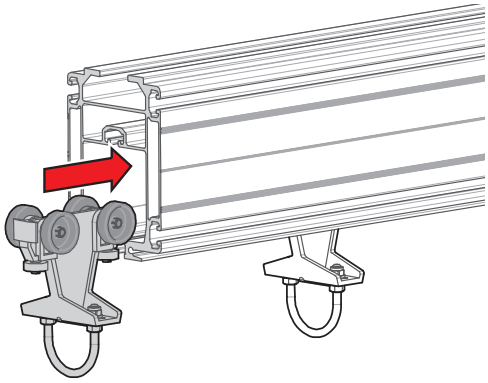
1. Remove the end stop, end cover and travel limiter, if fitted.

2. Fit the strain relief to the trolley with the locking bolt.

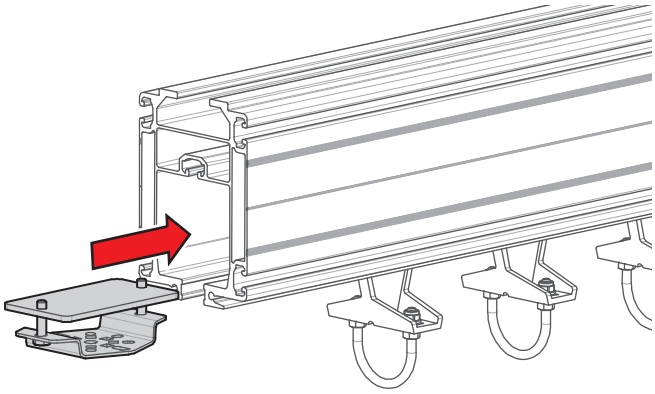


The image shows a travel limiter type (D) shackle
1. Trolley
2. Travel limiter
3. Locking bolt with split pin

3. Insert the required number of cable trolleys into the lower cavity of the profile.



4. Insert the end fix into the lower cavity of the profile. Secure the end fix by tightening its screws.
   Tightening torque: 8 Nm
   NB! It is not possible to insert the carriage bolts for the cable trolleys afterwards.
   For fitting, see page 60.



5. Refit the end stop, end cover and travel limiter, if fitted (see “6.3 End stops” on page 26, “1. Pick-up arm” on page 63 and “6.12 Travel limiter” on page 44).

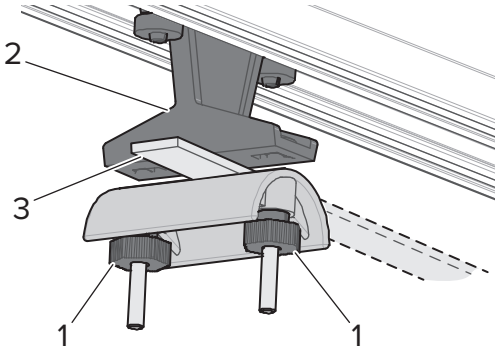
6. Make sure that the cable trolleys are fully operational if travel limiters are fitted.

Fitting a cable to the strain relief, cable trolley or end fix type (A) saddle

1. Undo the plastic nuts of the strain relief/cable trolley/end fix.

2. Insert the ribbon cable through the saddles.

3. Tighten the plastic nuts by hand.

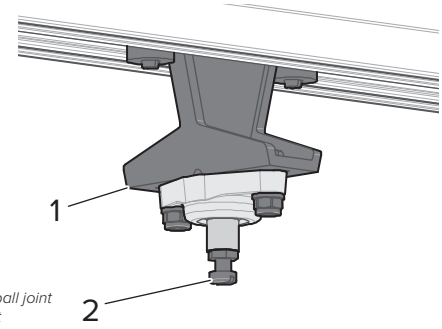


The image shows cable trolley (A) saddle
1. Plastic nut
2. Cable trolley
3. Ribbon cable

Fitting clamps and hose or cable to the strain relief, cable trolley or end fix type (B) ball joint

The first clamp is fitted as follows:

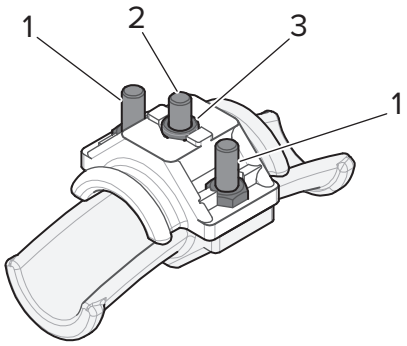
1. Remove the screw from the ball joint.



1. Cable trolley with ball joint
2. Screw on ball joint

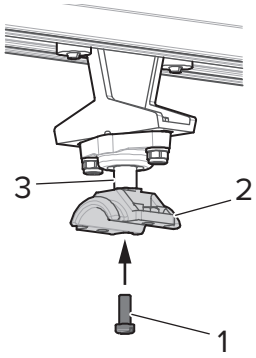
2. Open the cable clamp by undoing and removing the screws keeping it together.

3. Remove the screw and the lock nut in the middle of the upper part of the cable clamp.



1. Screws holding together the cable clamp
2. Cable clamp retaining screws
3. Cable clamp retaining lock nut

4. Fit the upper part of the cable clamp to the ball joint and secure with the screw from the ball joint.



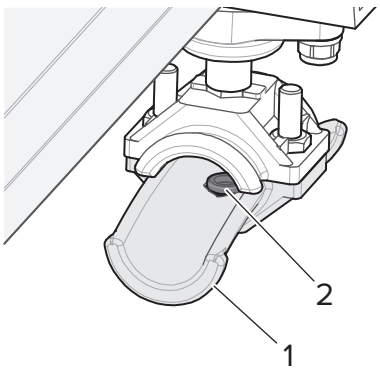
1. Screw from ball joint
2. Cable clamp upper part
3. Ball joint on cable trolley

5. Reattach the lower part of the clamp to the upper part.

6. Place the lock nut that was removed from the cable clamp with the locking side up in the cut-out in the lower part of the cable clamp.

7. Insert hose/cable through the cable clamp.

8. Tighten the screws holding the cable clamp together.
   Tightening torque: 4 Nm

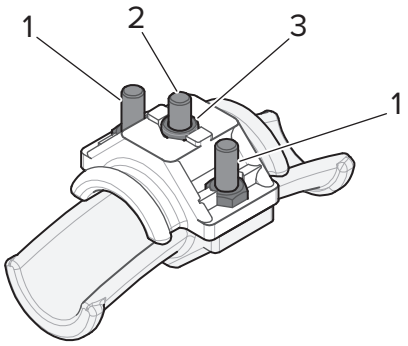


1. Cable clamp lower part
2. Lock nut

Fitting clamp number two and following:

9. Open the cable clamp by undoing the screws holding it together.

10. Remove the screw and the lock nut in the middle of the upper part of the cable clamp.



1. Screws holding together the cable clamp
2. Cable clamp retaining screws
3. Cable clamp retaining lock nut

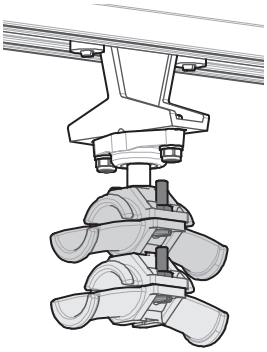
11. Hold the cable clamp up against the cable clamp that is already fitted. Make sure the raised part of the cable clamp ends up in the groove of the already fitted cable clamp.

12. Fit the cable clamp to the already installed clamp with the screw from the clamp.

13. Place the lock nut that was removed from the cable clamp with the locking side up in the cut-out in the lower part of the cable clamp.

14. Insert hose/cable through the cable clamp.

15. Tighten the screws holding the cable clamp together.
Tightening torque: 4 Nm

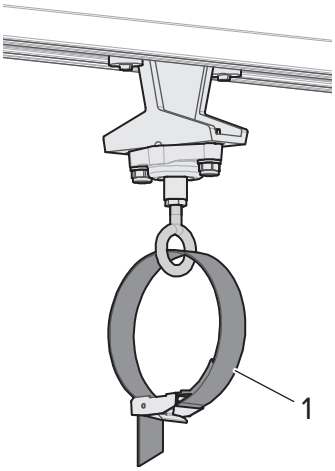


Fitting a vacuum hose to the strain relief, cable trolley or end fix type (C) stop

1. Undo the strap of the strain relief, cable trolley or end fix.

2. Insert the vacuum hose through the strap.

3. Tighten the strap.



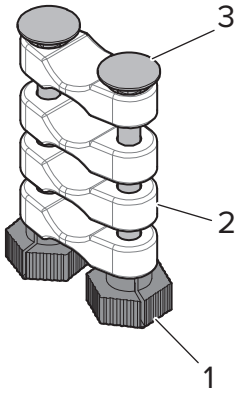
1. Cable trolley strap

Fitting clamps and hose/cable to the strain relief, cable trolley or end fix type (D) shackle

Fitting a fixed cable clamp and cable onto the strain relief and end fix:

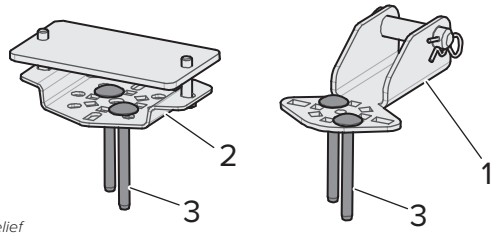
1. Loosen and remove the plastic nuts.

2. Remove the double-deck clamp.



1. Plastic nut
2. Double-deck clamp
3. Carriage bolt

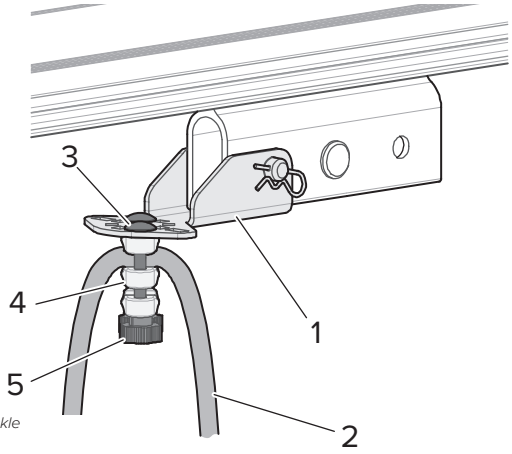
3. Insert the carriage bolts in the holes of the strain relief/end fix.



1. Strain relief
2. End bracket
3. Carriage bolt

4. Fit the hose or cable with a double-deck clamp in between.
NB! Always begin with a double-deck clamp at the top of the carriage bolt.

5. Fit the plastic nuts and tighten them by hand.

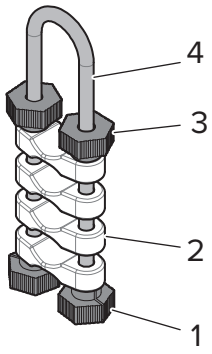


1. Strain relief, (D) shackle
2. Cable
3. Carriage bolt, cable clamp
4. Double-deck clamp, cable clamp
5. Plastic nut, cable clamp

Fitting a cable clamp (shackle) and cable to the cable trolley:

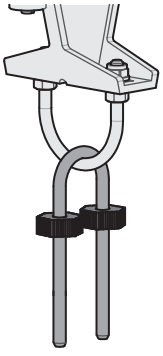
6. Undo and remove the lower plastic nuts.

7. Remove the double-deck clamps from the cable clamp.



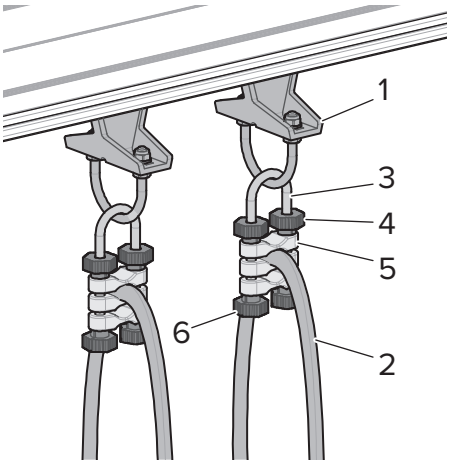
1. Lower plastic nut
2. Double-deck clamp
3. Upper plastic nut
4. Schackle

8. Insert the bracket of the cable clamp in that of the cable trolley. The bracket of the cable trolley is designed so that it is only possible to rotate it 90° between the brackets.



9. Fit the hose or cable with a double-deck clamp in between.
NB! Always begin with a double-deck clamp at the top of the carriage bolt.

10. Fit the lower plastic nuts and tighten them by hand.



1. Cable trolley
2. Cable
3. Schackle, cable clamp
4. Upper plastic nut, cable clamp
5. Double-deck clamp, cable clamp
6. Lower plastic nut, cable clamp

7.3 Cable trolley for C-rail

When installing a console without counterweight in a flexible suspended profile, the supporting plates and chains shall be fitted to the suspension, see “Fitting brackets for cable tray and chain” on page 64

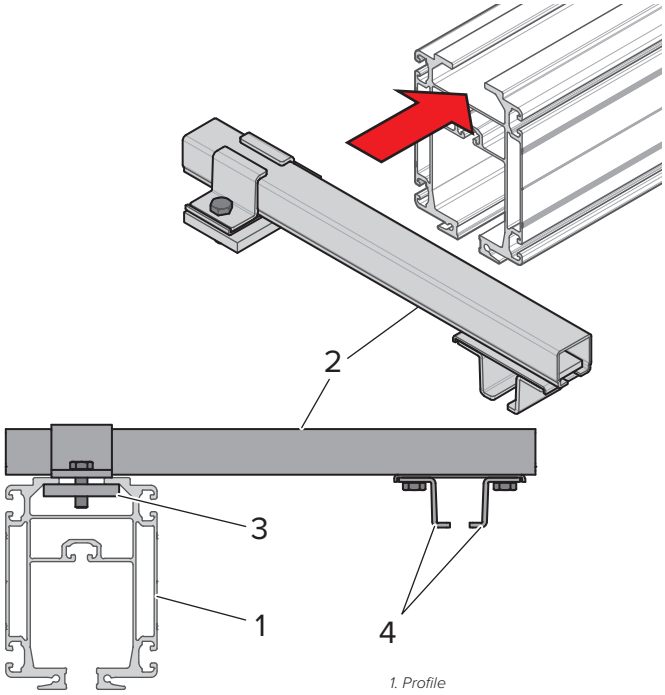
1. Measure and mark the spots on the profile where the consoles for the C-rail are to be mounted.

2. Insert the slot-nuts of the consoles into the upper cavity of the profile and move the consoles to the marked spots.

3. Secure the consoles to the profile by tightening the screw with the t-slot nut.
   Tightening torque: 24 Nm

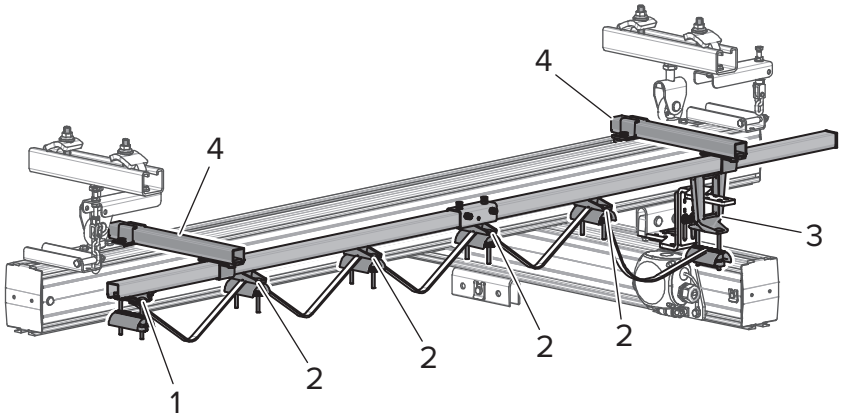
4. Insert the C-rail between the clamps of the consoles.

5. Secure the C-rail by tightening the screws holding the clamps on the consoles.
   Tightening torque: 24 Nm



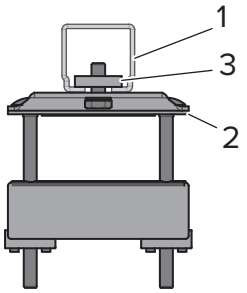
1. Profile
2. Console for C-rail
3. Slot nut
4. Clamps for attaching the C-rail

6. Insert a pick-up trolley and the required number of cable trolleys into the C-rail.
   NB! The pick-up trolley must be next to the crane trolley.



1. End bracket
2. Cable trolley
3. Pick-up trolley
4. Console for C-rail

7. Insert the end fix into the C-rail and secure it by tightening the screws with the slot nuts.
   Tightening torque: 10 Nm

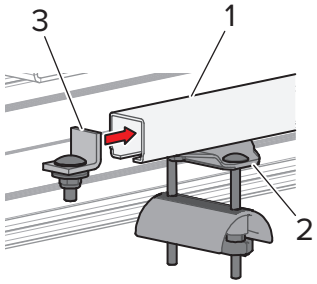


1. C-profile
2. End bracket (type (A) saddle)
3. Slot nut for end fix

8. Insert the end stops into the C-rail.

9. Make sure that the end stops are installed in such a way that the cable trolleys are fully operational.

10. Secure the end stops.
    Tightening torque: 24 Nm

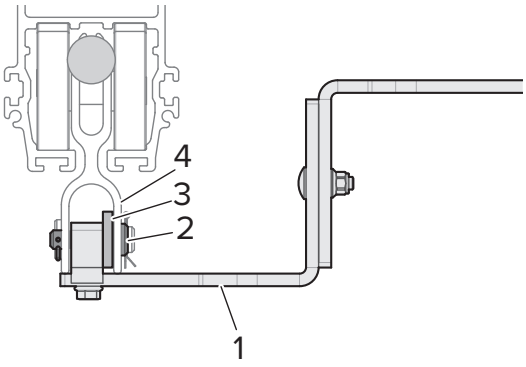


1. C-profile
2. End bracket (type (A) saddle)
3. End stop

11. Fit the end covers to the C-rail.

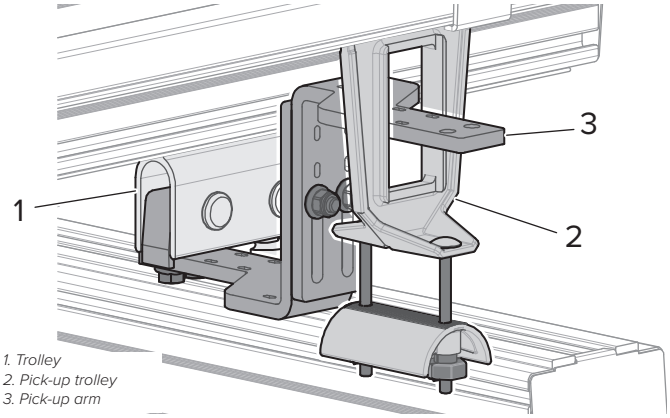
12. Insert the pick-up arm between the shanks in the upper part of the pick-up trolley.

13. Insert the guide of the pick-up arm into the crane trolley and secure the pick-up arm with a locking bolt and split pin. Use a spacer washer for the 75s, otherwise not.



1. Pick-up arm
2. Locking bolt
3. Spacing washer
4. Trolley

14. The pick-up arm may be adjusted vertically by undoing the carriage bolts on the middle of the pick-up arm and moving the upper part of the arm up or down. Tighten the carriage bolts.



1. Trolley
2. Pick-up trolley
3. Pick-up arm

Fitting a cable - (A) saddle

See section “Fitting a cable to the strain relief, cable trolley or end fix type (A) saddle” on page 58.

Fitting clamps and cable or hose - (B) ball joint

See section “Fitting clamps and hose or cable to the strain relief, cable trolley or end fix type (B) ball joint” on page 58.

Fitting a vacuum hose - (C) strap

See section “Fitting a vacuum hose to the strain relief, cable trolley or end fix type (C) stop” on page 59.

Fitting cable clamps and cable/hose - (D) shackle

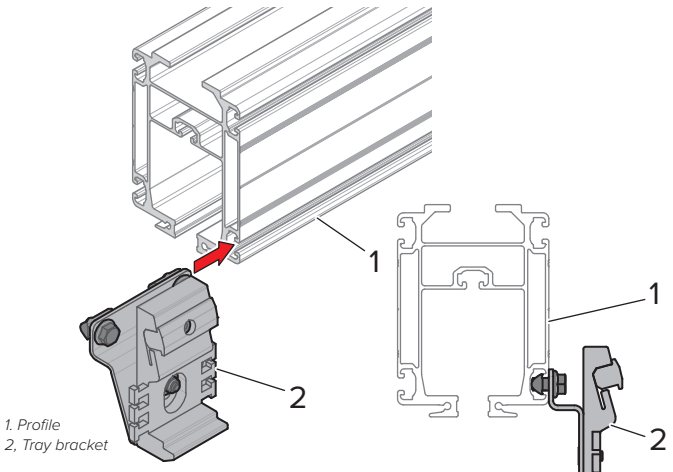
See section “Fitting clamps and hose/cable to the strain relief, cable trolley or end fix type (D) shackle” on page 60.

7.4 Cable chain

1. Measure and mark the spots on the profile where the brackets for the tray are to be fitted.
   NB! The maximum spacing between the tray brackets is 1000 mm.

2. Insert the slot nuts of the tray brackets into the lower external t-slot of the profile.

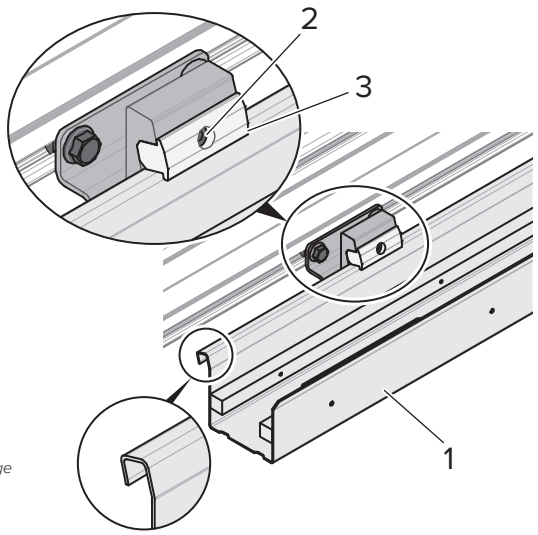
3. Secure the tray brackets by tightening the slot nut screws.
   Tightening torque: 24 Nm



1. Profile
2, Tray bracket

4. Install the tray in the tray brackets with the rounded edge facing the tray brackets.

5. Secure the tray with the supplied plastic wedges and screws.



1. Tray
2. Screw
3. Plastic wedge

Fitting brackets for cable tray and chain

When installing trays in a flexibly suspended profile, the supports for the cable tray and chains must be fitted to the suspension.

6. Mark the suspensions that will have supports added to them.

7. Drill two holes in the suspension, diameter ø9 mm, for the screws in the upper support.
   NB! The upper supports can be installed on both longitudinal and transverse suspensions.

8. Fit the upper supports to the suspensions. Tighten the screws.
   Tightening torque: 24 Nm

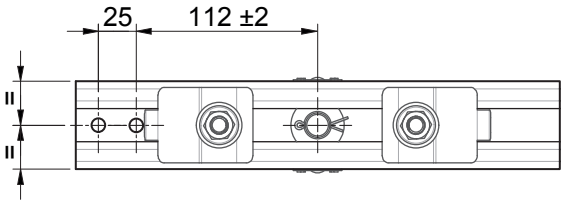
9. Fit the lower supports to the profile:
   The part with the nut is folded into the upper t-slot of the profile.
   Tighten the screws.
   Tightening torque: 24 Nm

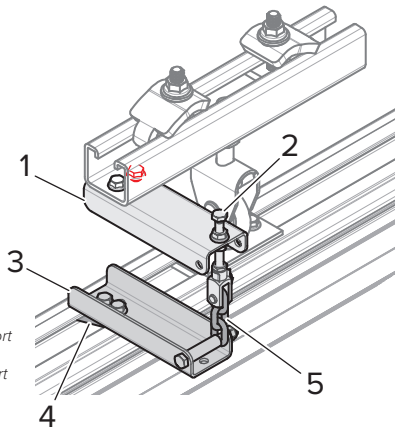
10. Turn down the setting screw of the upper support as far as possible.

11. Fit the chains in the fork link of the upper support.

12. Fit the other end of the chain in the lower support. Tighten the screw a bit only.

13. Adjust the set screw of the upper support so that the profile is vertical.





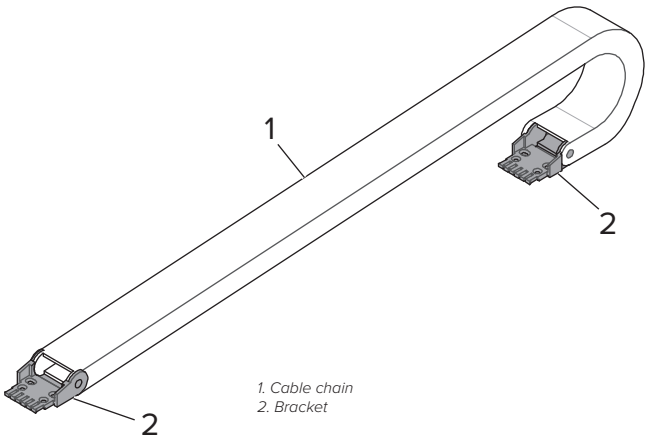
1. Upper cable tray support
2. Set screw on upper cable tray support
3. Lower cable tray support
4. Nut piece on lower cable tray support
5. Chain

Continued:

14. Fit the brackets to the cable chain.

15. Insert the wire and/or hose in the cable chain.

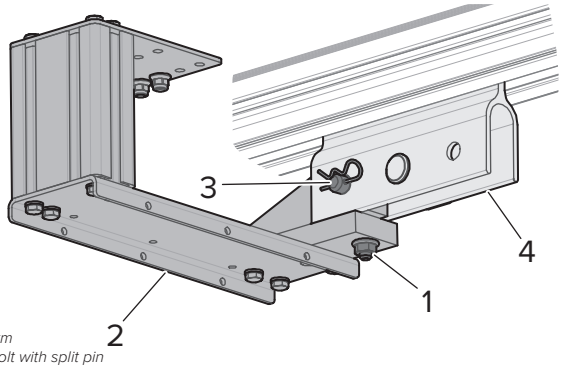
16. Place the cable chain in the tray and secure one of the brackets in the tray.
    Tightening torque: 10 Nm



1. Cable chain
2. Bracket

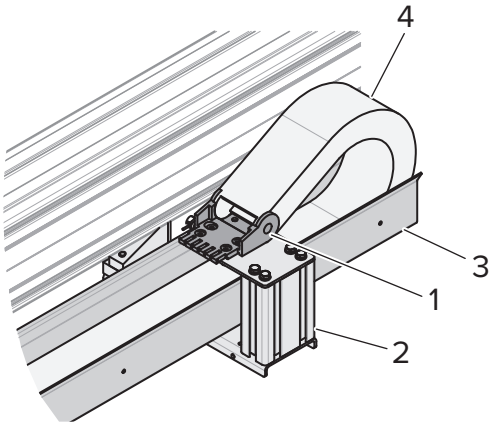
17. Fit the pick-up arm to the trolley:

    - Undo the nut underneath the pick-up arm.
    - Fit the pick-up arm to the trolley with the locking bolt.
    - Tighten the nut.
      Tightening torque: 24 Nm



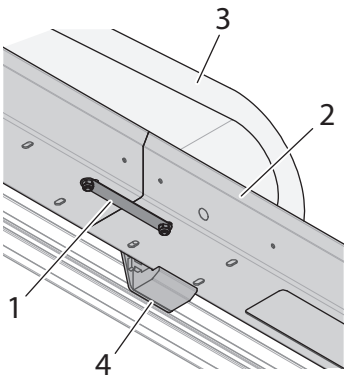
1. Nut
2. Pick-up arm
3. Locking bolt with split pin
4. Trolley

18. Fit the other bracket in the pick-up arm.
    Tightening torque: 10 Nm



1. Bracket
2. Pick-up arm
3. Tray
4. Cable chain

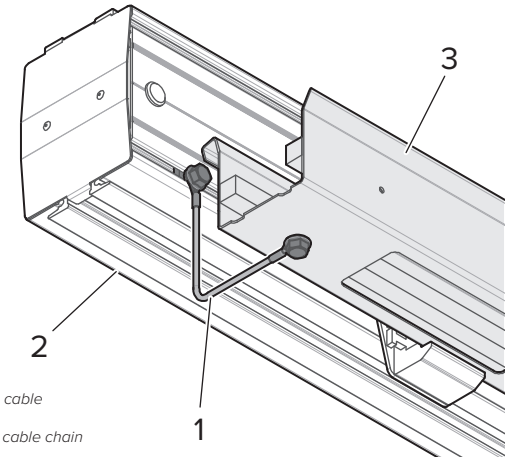
19. Install an grounding plate underneath the joints of each trayTightening torque: 10 Nm



1. Grounding plate
2. Tray
3. Cable chain
4. Tray bracket

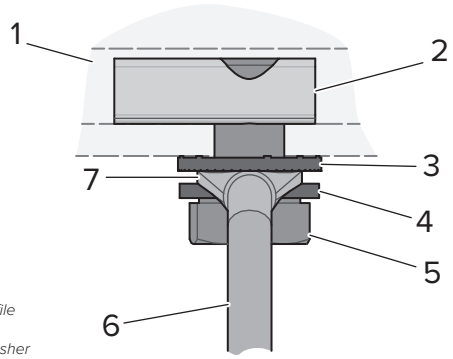
20. Fit an grounding cable between the profile and the tray:

- Insert the slot nut in one end of the grounding cable in the lower outside t-slot of the profile.
- Drill a hole ø8.5 mm in the bottom of the tray for the cable chain.
- Fit the other end of the grounding cable into the hole just drilled in the tray using a screw and nut.
- Tighten the flange screws of the grounding cable to secure it.
  Tightening torque: (M8) 24 Nm
  (M6) 10 Nm



1. Earthing cable
2. Profile
3. Tray for cable chain

NB! The toothed washer for the grounding cable must have the teeth against the profile, see image.



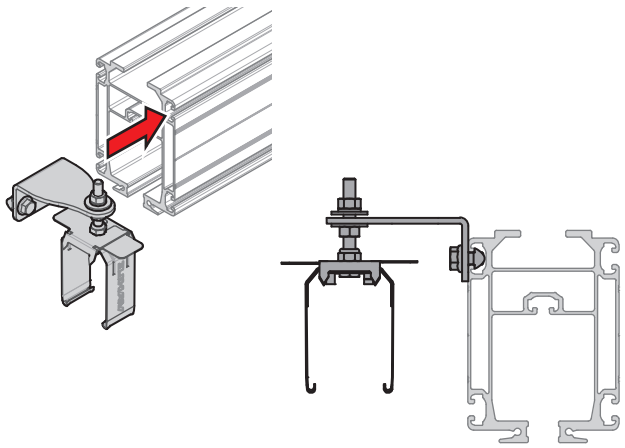
1. T-slot in profile
2. Slot nut
3. Toothed washer
4. Washer
5. Screw
6. Earthing cable
7. Cable terminal, grounding cable

7.5 Power rail

1. Measure and mark the spots on the profile where the brackets for the power rail are to be fitted.
   NB! The maximum spacing between the suspensions is 2000 mm.

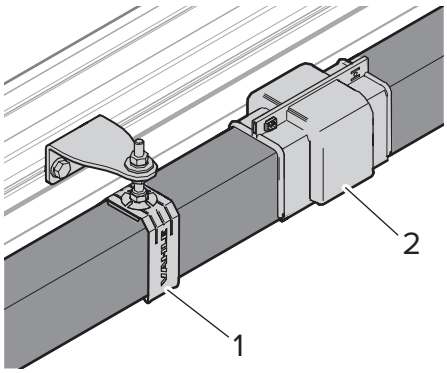
2. Insert the slot nuts from the suspension into the external t-slot of the profile.
   The brackets for AHB140/190 may be turned 180° to fit both sides of the profile.
   At the infeed end a fixed bracket is fitted, the rest of the brackets must be movable.

3. Secure the suspension by tightening the screw on the bracket joint next to the track of the profile.
   Tightening torque: 24 Nm



4. Install the power rail in the brackets.

5. If you need to extend the power rail a joint kit must be fitted at the joint.



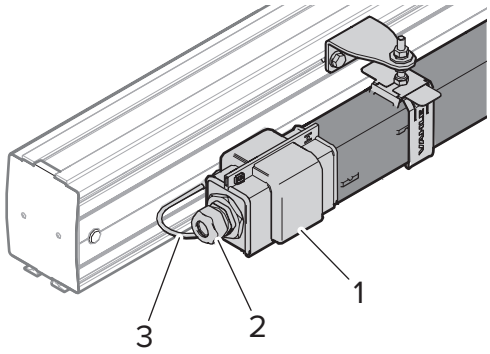
1. Suspension
2. Joint set

6. Fit the infeed connector at one end of the power rail.

7. Connect the infeed cable to the infeed connector.

Connect the wire for the grounding to the profile. Tighten the ground wire screw.
Tightening torque: 24 Nm

NB! The toothed washer for the grounding cable must have the teeth against the profile, see image on previous page..

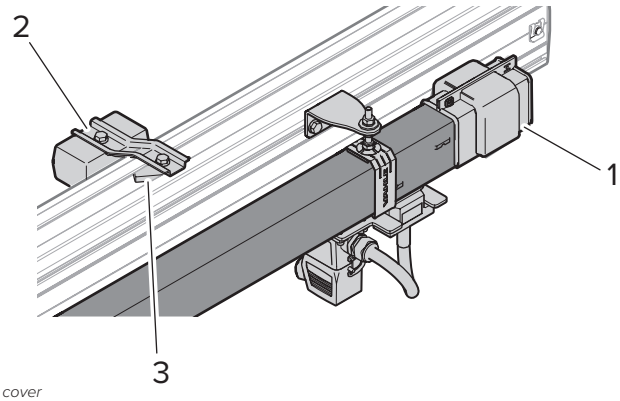


1. Infeed
2. Infeed connector
3. Earthing cable

8. Fit an end cover at the other end of the power rail.

9. If the power rail is installed on flexible runway profile or bridge profile, counterweights must be added to the profile. One counterweight per meter power rail.

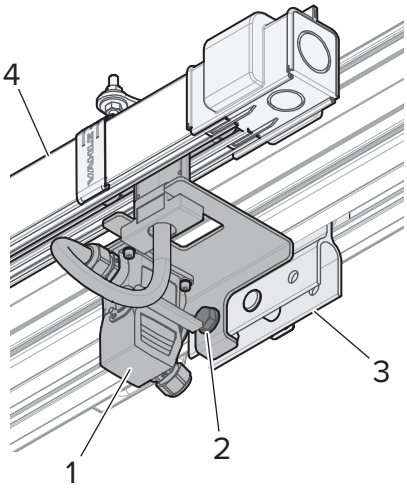
10. Fit the counterweight to the upper track of the profile. The nutpiece may be folded into the cut-out. Secure the counterweights.
    Tightening torque: 24 Nm



1. End cover
2. Counterweight
3. Nut piece on counter weight

11. Insert the power takeoff into the power rail.
NB! The ground brushes with yellow/green wire must touch the conductor with the yellow/green marking.

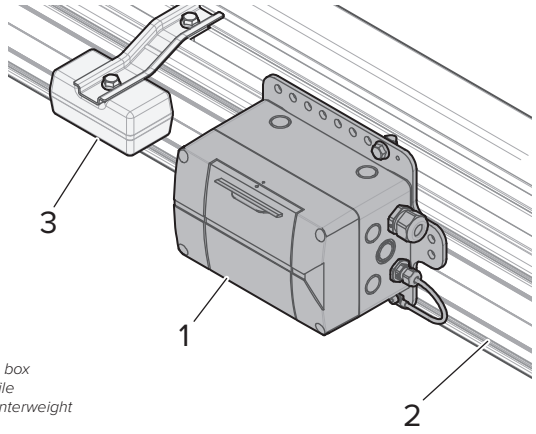
12. Fit the power takeoff in the trolley using the screw and nut supplied with the power takeoff.
Tightening torque: 81 Nm



Profile with power rail and power takeoff seen from below

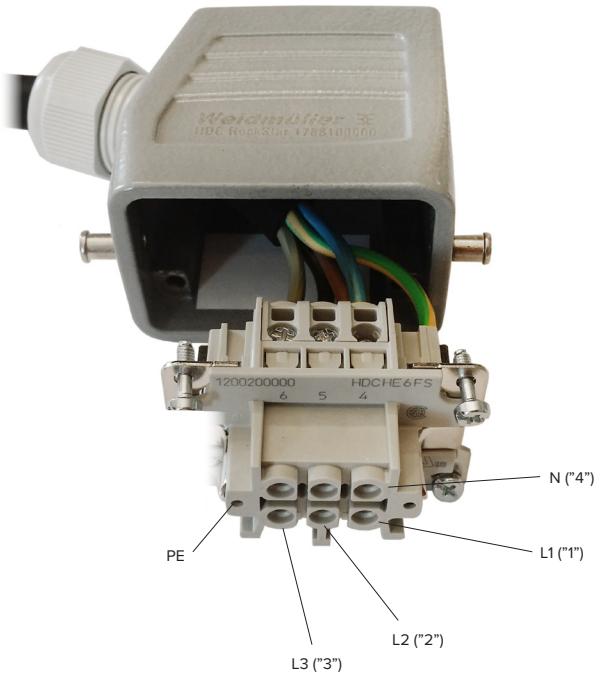
1. Power takeoff
2. Screw and nut for fitting the power takeoff to the trolley
3. Trolley
4. Power rail

13. A fuse box must be installed on each bridge profile if the bridge is powered by a power rail on the runway profile.



1. Fuse box
2. Profile
3. Counterweight

Connection on takeoff trolley is connected according to picture.

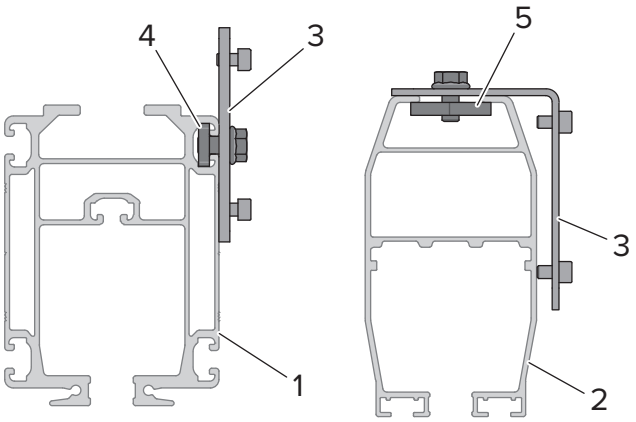


7.6 Filter/regulator unit

1. LHB, AHB140/190 and AHB3: Insert the slot nut in the bracket for the air preparation unit in the external t-slot of the profile.

   For PHB1: Insert the rhomboid nut in the bracket for the air preparation unit in the upper t-slot of the profile.

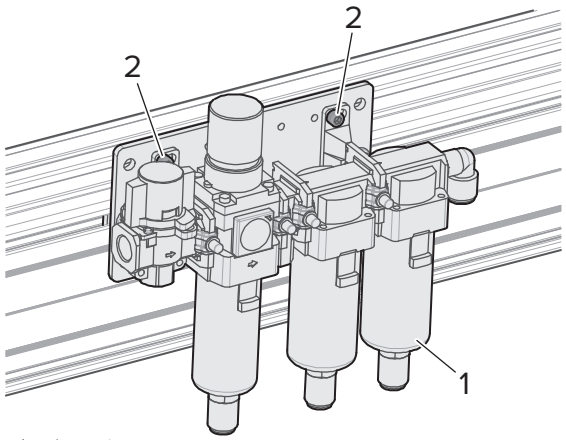
2. Move the bracket to the desired position. Secure the bracket.
   Tightening torque: 24 Nm



1. Profile AHB140 (the same procedure also applies for LHB, AHB190 and AHB3)
2. Profile PHB1
3. Bracket for air preparation unit
4. Slot nut
5. Rhomboid nut

3. Remove the hex socket screws on the bracket.

4. Install the air preparation unit using the hex socket screws. Tighten the screws.
   Tightening torque: 10 Nm



1. Filter/regulator unit
2. Hex socket screw

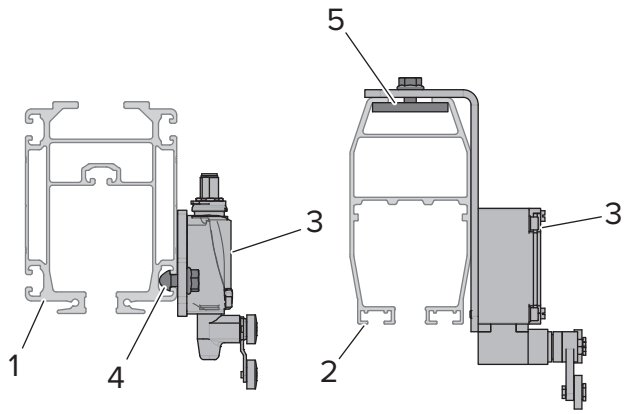
7.7 Limit switch

1. LHB, AHB140/190 and AHB3: Insert the slot nut for the limit switch bracket in the lower external T-shaped slot.

   PHB1: Insert the rhomboid nut for the upper part of the limit switch bracket in the upper t-slot of the profile.

2. Move the limit switch to the desired position.

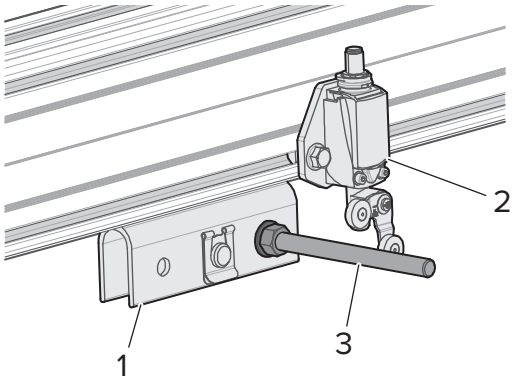
3. Tighten the screws of the slot nuts / rhomboid nuts.
   Tightening torque: 24 Nm



1. Profile AHB140
2. Profile PHB1
3. Limit switch and bracket
4. T-slot nut
5. Rhomboid nut

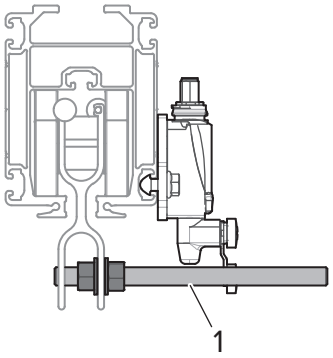
4. Undo one nut and washer of the limit switch flag.

5. Insert the limit switch flag into one of the available holes of the trolley.



1. Trolley
2. Limit switch
3. Limit switch flag

6. Refit the washer and the nut for the limit switch flag. The flag should sit on one of the trolley shanks. Secure in place.
   Tightening torque: 81 Nm



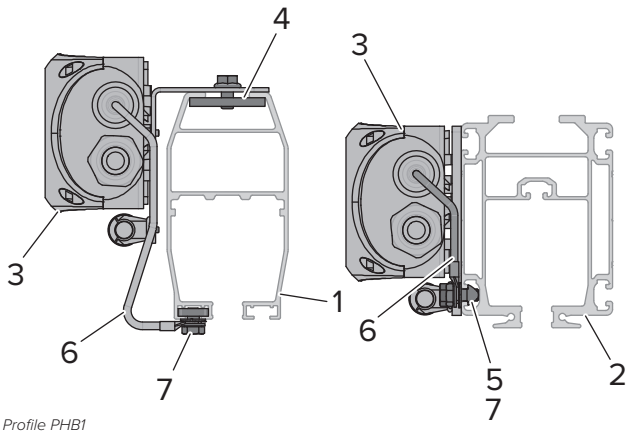
1. Limit switch flag

7.8 Connection units

1. LHB, AHB140/190 and AHB3: Insert the slot nut for the connector bracket in the lower external t-slot of the profile.

   PHB1: Insert the rhomboid nut for the connector unit bracket in the upper slot of the profile.

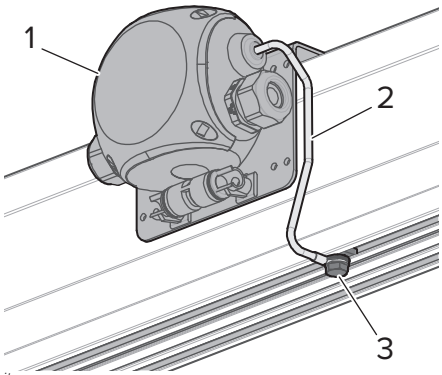
2. Move the connection unit to the desired place and tighten the screws.
   Tightening torque: 24 Nm



1. Profile PHB1
2. Profile AHB140 (the same procedure also applies for LHB, AHB190 and AHB3)
3. Connection unit
4. Rhomboid nut and screw for attaching the connection unit
5. Slot nut and screw for attaching the connection unit
6. Earthing cable
7. Slot nut and screw for attaching the grounding cable

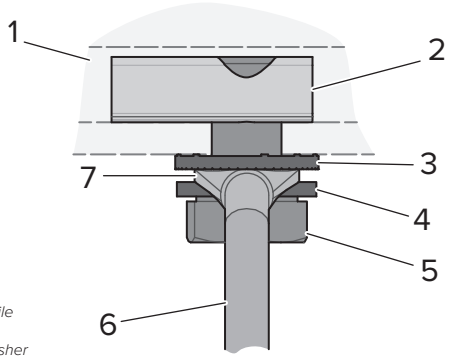
3. LHB, AHB140/190 and AHB3: Insert the slot nut of the grounding cable in the lower external t-slot of the profile. Tighten the screw.
   Tightening torque: 24 Nm

   PHB1: Insert the slot nut of the grounding cable in the t-slot underneath the profile. Tighten the screw.
   Tightening torque: 24 Nm



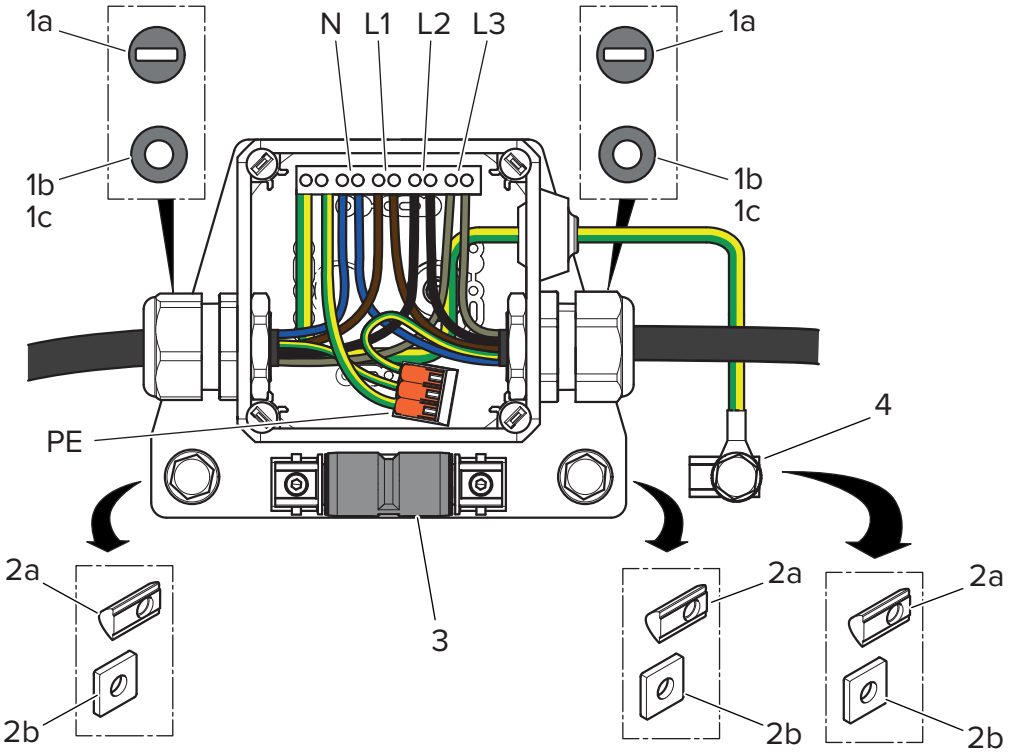
1. Connection unit
2. Earthing cable
3. Slot nut and screw for attaching the grounding cable

NB! The toothed washer for the grounding cable must have the teeth against the profile, see image.



1. T-slot in profile
2. Slot nut
3. Toothed washer
4. Washer
5. Screw
6. Earthing cable
7. Cable terminal, grounding cable

Connecting the wires of the connection unit



1a-c, 2a-b and 3 are included in the scope of delivery.

Cable connector gaskets:
1a - ribbon cable gasket
1b - cable gasket ø6 - 10 mm
1c - cable gasket ø11 - 17 mm

Slot nuts for profile (back end of bracket):
2a - t-slot nuts suitable for profile AHB140 and AHB190
2b - t-slot nuts suitable for profiles LHB and AHB3

3 - quick coupler for compressed air

4 - connector for potential equalisation (ground) on profile

Connecting points for wiring:
N - neutral (blue)
L1 - phase 1 (brown)
L2 - phase 2 (black) (optional)
L3 - phase 3 (grey) (optional)
PE - ground (yellow/green)

8. Installation protocol

The protocol is to be used by the technician performing the installation. The document as completed and signed by the technician confirms that the equipment has been installed according to Movomech's instructions and must be kept by the customer.

Place:

Date:

Equipment number:

Technician:

Component	Installed	Not Installed	Note
Runway and bridge:			
Runway profile with suspension (A), (B), or (C)			
Runway profile with suspension (E)			
Runway profile with suspension (D), longitudinally			
Runway profile with suspension (D), transverse			
Runway profile with suspension (F)			
Bridge profiles			
Components:			
Suspension safety wire			
Wire clamp			
Trolleys			
End stop			
End cover			
Joint set			
Crane girder suspension			
Triangular bracing			
Space saving module			
Safety wire for bridge			
Spacer for twin bridge			
Inspection hatch			
Travel limiter			
Friction rollers			
Spacer brace			
Parking brake			

Component	Installed	Not Installed	Note
Signs			
Media supply:			
Spiral hose			
Cable trolley for profile			
Cable trolley for C-rail			
Cable chain			
Power rail			
Filter/regulator unit			
Limit switch			
Connection unit			

The equipment has been installed according to the instructions in this publication:

.....

Signature of service technician

9. Service

A general review and functional control tests are performed on a regular basis during commissioning. All service and maintenance shall be recorded. The user should make sure that material for the purpose is easily available.

NOTE: Make sure that damaged components are replaced immediately in order to avoid possible personal and material damage.

Do not connect the equipment until the workplace is cleaned. This is important for the comfort and well-being of personnel and facilitates service and maintenance.

Dirt gives a clear indication of the equipment not being properly maintained, which may possibly affect the remaining guarantees on the equipment.

Maintenance safety instructions

The prescribed procedures and service intervals, including those concerning the replacement of parts/accessories, are described in the instruction manual and must be followed. Professionals are the only persons who are allowed to carry out such procedures.

Staff members with appropriate competence and authority are the only persons who are allowed to carry out mechanical and electrical repair and maintenance work. Unauthorised persons should be prohibited to work with machines and devices inside the equipment.

The equipment should be disconnected and secured against unintentional or unauthorised use, including reconnection, during all repair and maintenance work.

It should be cofirmed that the equipment is free from voltage before any work on electric equipment is commenced.

Make sure that:

- the main power supply is disconnected,
- moving parts are stationary and locked,
- moving parts cannot move accidentally during maintenance work, and that
- it is not possible to accidentally reconnect the power supply during maintenance and repair work.

Use safe and environmentally friendly maintenance products and spare parts!

Directions for work during operation

The user or the ”authorised person” must, in each individual case, ensure that the work in question can be carried out without any risk of personal injury because of specific local conditions.

To prevent accidents, only approved and suitable tools and aids may be used during maintenance, adjustment and repair work.

Do not touch rotating parts. Maintain an adequate safe distance between yourself and the machinery to prevent clothes, limbs and hair from becoming caught.

Avoid the occurrence of naked flame, extreme heat (e.g. welding) and sparks in the presence of volatile cleaning materials and nearby inflammable or heat-sensitive materials (e.g. wood, plastics, oils, fats and electric equipment). This can result in fire hazard, harmful gases and damaged insulation.

Directions for work with electric equipment

Use only original fuses with the appropriate rating. The equipment should be stopped immediately on discovery of faults related to the electric power supply.

Defect fuses must not be repaired or bypassed and should only be replaced with fuses of the same kind.

Work on electric equipment and electric components or parts must be carried out by an electrician or authorised staff in accordance with current electric safety regulations.

The parts of the equipment on which inspection, maintenance, and repair work is to be carried out should be disconnected from the power supply.

The electrical equipment should be inspected regularly. Deficiencies, such as loose connections, should rectified without delay.

When it is necessary to work with live parts, a second member of staff, whose responsibility it is to activate the emergency stop and deactivate the main switch in case of an emergency, should be called in. Isolate the work area with a red/white chain or tape and warning signs. Use only voltage-insulated tools.

Electric connectors must be free of voltage (exemptions include socket-outlets, unless safety precautions state that these are dangerous to be in contact with) before they are disconnected
or connected.

Directions for work with pneumatic equimpent

The equipment should be stopped immediately on discovery of faults related to the air supply.

Work on pneumatic equipment or parts must only be carried out by authorised staff.

The parts on which inspection, maintenance, and repair work is to be carried out should be disconnected from the air supply.

Maintenance of the equipment

Each product has specific directions for service, maintenance and care. In the service protocol, there is information and the references needed for managing the product.

All preventive maintenance, service and repair should be recorded. The service procedures should always be used. If more than one rail system exists, each one shall be provided with an Identity number or other designation. Separate maintenance records should be kept for each sysem.

The service protocol shall be kept by the client/user and must be shown to Movomech on request.

9.1 Service protocol

The protocol is an acknowledgement that the equipment has been serviced according to Movomech's instructions and must be filed by the customer.

Place:

Date:

Equipment number:

Service technican:

Explanation of signs:

Visual inspection - Examine whether the product exhibits damages.

Auditory inspection - Examine whether the product exhibits discordant sound.

Physical inspection - Examine whether the product exhibits damages.

Mechanical inspection - Examine whether the product exhibits decomposition, instrument is needed.

Additional information available

Component / part	Interval in months at 1 shift/day	Interval in months at more than 1 shift/day	Action	Remark
Runway and bridge:				
Runway profile with suspension (A), (B), or (C)	3	2		
Runway profile with suspension (E)	3	2		
Runway profile with suspension (D), longitudinally	3	2		
Runway profile with suspension (D), transverse	3	2		
Runway profile with suspension (F)	3	2		
Bridge profiles	3	2		
Components:				
Suspension safety wire	3	2		
Trolleys	3	2		
End stop	3	2		
End cover	3	2		
Joint set	3	2		
Crane girder suspension	3	2		
Triangular bracing	3	2		
Space saving module	3	2		
Safety wire for bridge	3	2		
Spacer for twin bridge	3	2		
Inspection hatch	3	2		
Travel limiter	3	2		
Friction rollers	3	2		

Component / part	Interval in months at 1 shift/day	Interval in months at more than 1 shift/day	Action	Remark
Spacer brace	3	2		
Parking brake	3	2		
Signs	3	2		
Media supply:				
Spiral hose				
Cable trolley for profile	3	2		
Cable trolley for C-rail	3	2		
Cable chain	3	2		
Power rail	3	2		
Filter/regulator unit	1	1		
Limit switch	1	1		
Connection unit	1	1		

The eqipment has been serviced according to the instructions:

.....

Place, date and signature of the service technican.

Additional information

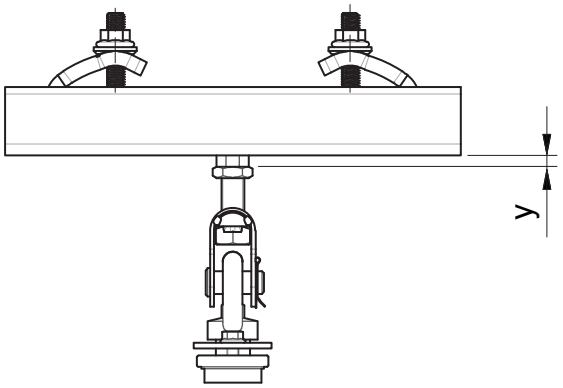
Rail profiles	Clean running surface in the profile where the trolley moves. The surface shall be clean and dry. Dirty and greasy running surfaces will inevitably affect performance. Use a clean and dry wiping cloth.
Suspension	Check for wear on the suspension type A & B according to the description below.
Trolleys	Check that the trolley runs quietly and without difficulty along the entire section.
Crane girder suspensions	For PHB1 & AHB, check for wear on the crane girder suspension according to the description below.
Joint sets	Make sure that the runway is flat over the splice, test with trolley.
Travel limits	Limit switches with hydraulic dampers are also checked with regard to leakage.
Safety wires	Check that the safety wires are relaxed and without load.
Air preparation units	Filter: Open the blowdown valve from time to time to blow out collected condensate. Do not allow the liquid level to reach the vortex disk. In case of malfunction, check that the direction of flow is correct. If the flow decreases substantially or the pressure drop increases sharply, the filter element should be cleaned or replaced. Filter element is replaced when the pressure drop across the filter reaches 0.1 MPa, and at least once a year. Pressure regulator: In case of malfunction, check that: a) the primary pressure is higher than the regulated secondary pressure. NOTE: Also in throughflow. b) the seat of the main valve is not clogged. c) membrane or spring has not been damaged. If unregulated air flows through the regulator, this is a sign of membrane damage.
Cable trolleys	Check that the trolleys runs quietly and without difficulty along the entire section.
Cable towing arms	Check whether cables or hoses are damaged.
End fix	Check whether cables or hoses are damaged.
Cable & hose clamps	Check whether cables or hoses are damaged.
Cable & hose inlet	Check whether cables or hoses are damaged.
Cable chains	Check whether cables or hoses are damaged.
Coupling units	Check whether cables are damaged.
Limit switches	Check that the intended function is obtained.

9.2 Specific wear check

Suspension type A & B

	Delivered y [mm]	Cassation y [mm]
30s, 50s	7,5	≥9,0
75s	11,0	≥12,5

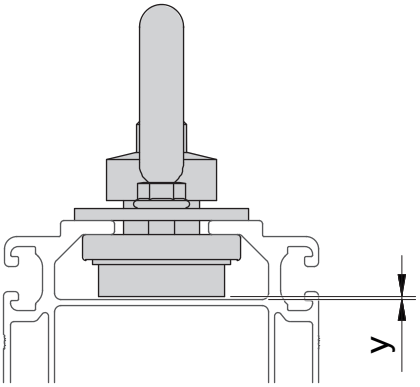
Besides this wear check, a general check of the suspension an its fastening elements according to the service protocol is required.



Crane girder suspension type A

	Delivered y [mm]	Cassation y [mm]
50s	1,0	≥2,0
75s	2,5	≥3,5

Besides this wear check, a general check of the suspension an its fastening elements according to the service protocol is required.



9.3 Troubleshooting

The performance of the track system is influenced by many factors. If the system isn't working as expected, the following flow chart may help you to find the cause.
Start by using a tensile load meter to determine how much force is required to start and continue moving the load.

Generally for the Movomech over head crane system the power required for starting moving a load should be around 1 - 1.5 % of the total weight of the moved load (incl. Crane components, lifting equipment and lifting tools), the power to maintain the movement of the lifted load should be less than 1 %.
If supplied with media, the power required should increase by about 10 - 20 N.

Customer solutions may influence the force required to start and continue moving the load.

#	Problem	State (see table below)
1	Fixture, hoist, arm or bridge does not move evenly along the track.	A B C D F G
2	Fixture, hoist, arm or bridge moves evenly along some parts of the track but unevenly along other parts of the track.	A B C D E F
3	Fixture, hoist, arm or bridge does not continue to move after having been started.	A B C D F G
4	Fixture, hoist, arm or bridge gets stuck at joints or suspensions.	B E
5	Fixture, hoist, arm or bridge is not straight or is turning around a horizontal axis (a twin bridge looks like a parallelogram), gets stuck or is difficult to move.	B C D E F G
6	Fixture, hoist, arm or bridge moves erratically.	A D F G
7	Fixture, hoist or arm is stuck in the middle of the bridge or the bridge is stuck in the middle of the track and will not be parked at any other place on the track.	B D
8	Fixture, hoist or arm or bridge is stuck at a profile where there are no suspension, travel limiter or joints.	B C D
9	Fixture, hoist, arm or bridge trolleys are worn or broken quite often.	E F

	State		
A	Is the track free from lubricants or dirt? No - Clean the inside of the profile where the trolley moves. Dirty or greasy rolling surface will be detriment to the system's performance. Lubricant may temporarily help to clear a problem with a sticky profile, but disguises the problem, and may in the future cause a larger problem because dirt and grime sticks to the lubricant. Also, lubricants applied to the track may drip onto people underneath the track.	B	Is the runway parallel within ± 0.5‰ and level within ± 2 mm? No - Adjust the system so that it is level and aligned.
C	Only for articulated suspensions: Are these permitted to articulate about the longitudinal axle at the suspension points? No - Make sure that nothing prevents the free movement of the runway profile. The runway profiles must be free to move in their suspensions.	D	Are pneumatic hoses, spiral hoses, cables, drive units or locking mechanisms catching the bridge? No - Make sure any auxiliary equipment does not prevent the movement of the bridge. If hoses and cables do not move freely, this may influence the performance of the system.
E	Are the joint correctly mounted, i.e. Are they parallel and level without any tension in the joint? No - Adjust the system so that it is level and aligned.	F	Do the trolley move easily and without noise? No - Check the wheels of the trolleys for damage, dirt and bearing wear. The wheels shouldn't wobble more than 0.1 mm and they should turn freely and without problem. Replace the trolley if the wheels are damaged or worn. Clean the trolley and wheels if the problem is caused by dirt.
G	Is the c/c for the runway the same as the c/c for the bridge suspension? No - The c/c for the runway profiles must be the same as the c/c for the bridge suspension (e.g. Crane girder suspension, triangular supports or space saving module) with a tolerance of ± 0.5‰. For a twin bridge, the suspension must be measured crosswise and adjusted if needed.		

If the system is in good shape and does not show any visible damage, please get in touch with Movomech for consultation.

10. EC declaration of conformity

EG-försäkran om maskinens överensstämmelse

ORIGINAL
(enligt 2006/42/EG, bilaga 2B)

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Behörig person
Joakim Stannow
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försäkrar härmed att maskinen

Benämning	**Maskintyp**	**Version**
Mechrail	Standardkomponenter för skensystem	PHB, LHB, AHB

överensstämmer med alla tillämpliga bestämmelser i

☒ **Maskindirektivet 2006/42/EG**

☒ **EMC-direktivet 2014/30/EU**

☒ **Lågspänningsdirektivet 2014/35/EU**

samt att standarder och/eller tekniska specifikationer enligt nedan är tillämpade.

☒ **Maskindirektivet**
SS-EN-ISO 12100:2010

☒ **EMC-direktivet**

☒ **Lågspänningsdirektivet**
IEC 60204-32
IEC 60204-1

Ort: Kristianstad **Datum:** 2019-02-01

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