

Loading Guidelines for the Robel Model Transport Unit (TU) for Long-Welded Rails

On Skks wagons (old) and Skks wagons (new)

Supplementary information to the applicable Robel operating instructions

The following loading guidelines apply to the loading and unloading of all long-welded rail transport units operated by Vossloh Deutschland GmbH.

A transport unit (TU) comprising Skks wagons (old) can transport up to 28 long-welded rails of 120m or 180m in length.

A transport unit comprising Skks wagons (new) (TU 531-TU 536) can transport up to 30 long-welded rails 120m in length.

General Remarks:

These TUs can only be loaded with the following rail profiles: 49E1/5, **54E1/2** 54E3/4, 60E1/2 and **R65**.

The corresponding clamps are available on the TUs:

green clamps for 49E1/5, 54E1-E4 and **white clamps** for 60E1/2

Note: red clamps for 54E1/2 are not available on all the TUs!

Note: blue clamps for R65 are only put on the TUs if arranged in advance

Note: The TUs are currently equipped with two different clamp designs.

We distinguish between the old type of clamps (short brace plate without a safeguard) and the new design (longer brace plate with a safeguard). See Figures 1 and 2.

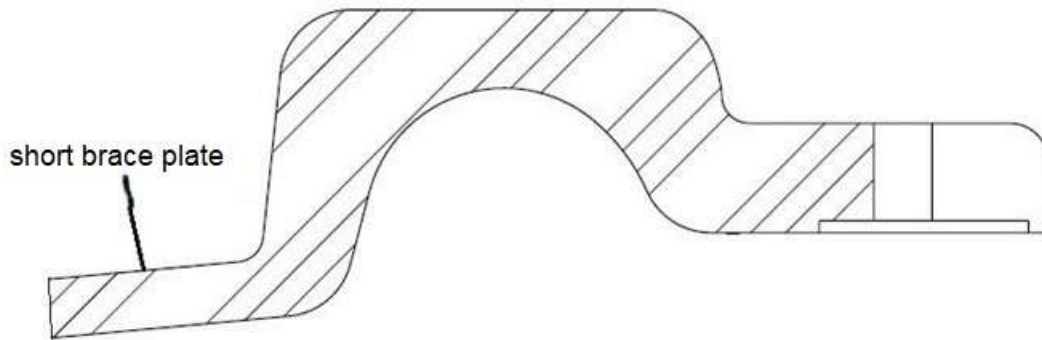


Figure 1: An example of the old type of clamp

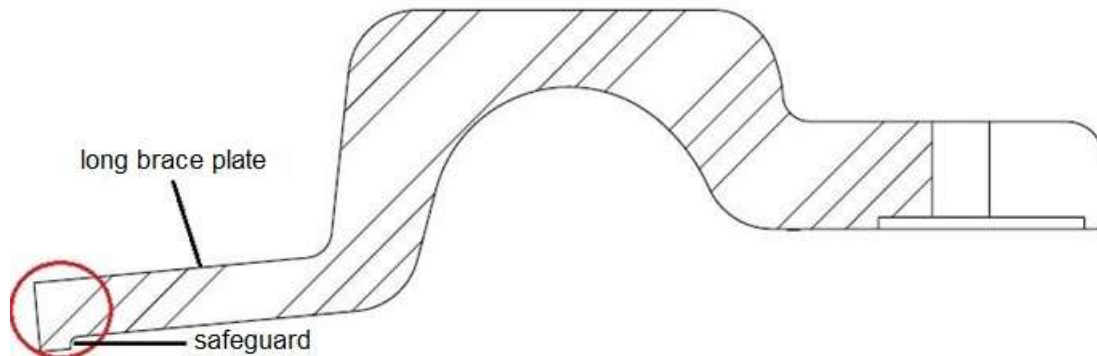


Figure 2: An example of the new clamp design

The top tier of rails must always be secured using the new type of clamps!

Under certain conditions (coupling more than one TU together), only new rails ≥ 180 meters in length can be transported (rails up to 300 meters long are transported on two TUs coupled together).

The specifications under 'Special information for loading new rails across two or more transport units' on Page 6 of these Loading Guidelines must be observed.

Transporting used rails longer than 120 meters is only permitted with safety bars in place! Only 180-meter TUs are equipped with safety bars.

If it is not possible to put safety bars in place, it is imperative for reasons of safety during transport that all rails over 120 meters long be cut accordingly. These cut lengths of rail can be transported on opposite sides of one compartment with each length clamped in position on the end wagons.

With any rail delivery where the total volume or the arrangement of the load makes loading onto more than one transport unit necessary, a check shall be made to determine if it is possible to distribute the load on the individual transport units in such a way that the middle channels of the third (upper) layer on each TU remain free. This further minimizes the risk of falling for the workers who undo the rails at the clamping block because work is primarily performed from the centre of the vehicle.

Where possible and subject to prior arrangement with the customer, the rail diagrams should also be drafted so that the rails can be unloaded starting from the centre of each layer and working outwards.

When loading old rails on the construction site, the procedure is to be performed in reverse, i.e. starting with the outer channels. These measures/procedures also help improve safety for the operator working at the clamping block.

Each rail must always be fastened onto one clamping block only and must **never be fastened to two clamping blocks at the same time.**

Only rail lengths $\geq 7\text{m}$ may be transported on the lower layer and only rail lengths $\geq 15\text{m}$ may be transported on the middle and upper layers.

Each rail must be fastened to a clamping block with a pair of rail clamps immediately upon loading. Be careful to ensure that the rail clamps appropriate for the height of the respective fishplate seatings (rail type) are used.

The top tier of rails must always be secured using the new type of clamps!

Only DIN 960-10.9 M20x1.5x190-200 hex cap screws (metric fine thread) and **DIN 6319, 50mm-diameter, spherical / dished washers** are to be used.

It is imperative that the clamping screws be tightened to **200 Nm** of torque.

The clamping bolts should be inserted with the threaded end facing the loaded compartment.

Note: The rail clamps on any one rail must not be loosened off until just before that rail is unloaded. Under no circumstances are the rail clamps to be loosened before the work train leaves for the unloading site!

All rails should be loaded such that they lie on the clamping block and on the standard support blocks on the other side and in between.

Care must be taken that rails have adequate clearance to /overhang on all of the cross-members on the lower layer (**approx. 1 meter**).

In order to be able to undo the rail clamps behind the clamping block while in a standing position, rail overhang on the clamping block should be kept to a minimum while still in compliance with technical requirements (length compensation, overhang over last standard support block).

For rails of non-standard lengths, an extra support block can be swung in on the clamping block side towards the end of the train and used to facilitate equal overhang over both end support blocks.

The standard support block located towards the centre of the train next to the clamping block being used must not be swung in.

On the TUs which have been converted for the transportation of rails ≥ 180 meters in length, the additional standard support block mounted at the end of the end car can be pivoted in and used, but only when the rails are being transported using 2 or more transport units coupled together.

Once swung into position, all the clamping blocks and standard support blocks require their respective H-pieces to be inserted up to the stop. An incorrectly seated H-piece could result in the support block opening while the Robel rail manipulator is still loading or during transport, which may damage the support block as well as the rails.

Once the H-pieces have been inserted, the clamping blocks on the 2nd and 3rd layers must also be secured with fastening rods (diagonal braces).

Care must be taken to ensure that the lower and middle support plates are not bent. They may have to be straightened, if necessary, before the blocks are closed.

Where possible, avoid loading rails fitted with insulated joints in the two middle rail compartments of the lower and middle layer because the fishplate bolts can damage the support blocks.

The minimum distance in machine direction between the unclamped ends of the rails loaded in the outer compartments should be approx. **1 meter** from any lateral superstructure components (stanchions, deflectors, guard brackets etc.)

When loading used rails that have aluminothermic-welds (thermite welding) for disposal or recycling, care must be taken that the welding beads under the base of the rail are not higher than **20mm** and do not exceed the width of the rail. Rails with welding beads under the base of the rail $\geq 10\text{mm}$ may only be loaded or unloaded at a maximum handling speed of **2 km/h**.

All the rebound gates must be closed and secured for transport! When using the **one-sided TU 313 transport unit**, the rebound gate planks must be placed in the double-T beam pillars mounted on the side with the wooden sides facing the load.

Before loading and unloading a two-sided TU at the construction site, the rebound gates of each end wagon must be locked in the open position.

Before each loading or unloading procedure, a check must be carried out to ensure that the bridging running rails (bridging supporting rails for the rail manipulator) are functioning correctly. The pin retainers in particular must be inspected. Any differences in the height of the running rails must be evened out with flat washers.

Any standard support blocks not being used must be pivoted in and secured in place with bolts. Rebound gates must be secured in place with bolts in both the transport and open positions.

Any fastenings not required for the load must be stowed in the appropriate storage devices and secured. This also applies after unloading.

The transport unit must be swept clean before hand-over.

After every loading or unloading procedure, all the crane buffers on the end wagons are to be raised and secured in place using the pegs provided! A check must be carried out to ensure that the crane buffers have been properly secured!

Transport Units (TUs) using Skks wagons (old):

There is one transport unit (TE 313) with one open end wagon (TU can be loaded/unloaded from one side → `one-sided TU'). All the other transport units have two open end wagons (TU can be loaded/unloaded from both sides → `two-sided TU'). Two-sided transport units are each equipped with a full clamping block on each end wagon.

The lower level of the open end wagon on all one-sided transport units is equipped with an additional clamping block with 8 anchoring points. This clamping block is used exclusively for anchoring rails of shorter lengths. A maximum of **36 rails** can be transported with this TU.

For rails of non-standard length, the one-sided transport unit is also equipped with an additional support block behind the clamping block of the closed end wagon.

When rails are transported with a one-sided TU, the rebound gate plank must be placed in the double-T beam pillars mounted on the side with the wooden sides facing the load.

When loading or unloading the one-sided transport unit, **3 rebound gate planks** from the unloading side of each unit are to be removed and placed in the mountings on the longitudinal chassis members.

A maximum of **56 short lengths** can be fastened and transported on two-sided transport units (Skks old) and a maximum of **36 single lengths** (20 regular + 16 short lengths) can be fastened and transported on one-sided TU's insofar as the total length of the rails loaded in each compartment does not exceed the maximum loading length of the transport unit.

In order to ensure length compensation when travelling through curves and to prevent the rails from coming into contact with each other, the distance between two short rail lengths lying one behind the other must be at least 2 meters.

The unclamped rail ends must extend at least **1.5 meters** but no more than **5 meters** beyond the last standard support block. The rail ends that are clamped must extend between **10 cm** and no more than **5 meters** beyond the clamping block.

Transport Units (TUs) using Skks wagons (new):

Transport units made up of the new **TU 531 – TU 536** Skks wagons can fasten and transport up to a maximum of **60 short lengths** insofar as the total length of the rails loaded in each compartment does not exceed the maximum loading length of the transport unit.

The distance between two short lengths lying one behind the other must be at least **2 meters** in order to ensure length compensation when travelling through curves and to prevent the rails from coming into contact with each other.

The rail ends at the end that is not clamped must protrude a minimum of **1.5 meters** and a maximum of **5 meters** over the last standard support block and must also have at least **1.5 meters** of clearance to the rebound gates (length compensation).

The **TU 531 – TU 536** transport units are equipped with an improved rebound gate retention mechanism. There is, however, an increased risk of injury when the rebound gates are being opened and closed. For this reason, entering the rail storage area marked in black and yellow is not permitted under any circumstances.

Special information for loading new rails across two or more transport units:

Note: When loading rails across two or more transport units, the transition from the first to the second transport unit will be called the middle of the train in the following notes.

The clamping blocks on the two end wagons of the assembled module unit are referred to either as No. 1 and No.4 or No. 1 and No. 6.

The clamping blocks on the two end wagons in the middle (No. 2 and 3) are only used for rails longer than 180 meters!

If two 120-meter transport units are used to transport rails ≤ 180 meters in length, the rails can be clamped to one block (one-sided).

If two 120-meter transport units are used to transport rails > 120 meters in length, the rails on the middle clamping blocks 2 and 3 must be anchored: the upper and lower tier of rails to the one clamping block and the middle tier of rails to the other. The same applies when transporting 300 meter-long rails on a wagon group comprising **one 120-meter TU and one 180-meter TU**.

When loading rails longer than the regular rail lengths (120/180m), never use the first standard support block behind clamping block 2 (towards the middle of the train) or the last support block before clamping block 3. The newly fitted standard support blocks (respectively the last one before and after the rebound gates) must instead be pivoted in and used.

The rails are to be loaded such that the rail ends extend at least **1.5 meters** beyond a standard support block or end at least **1.5 meters** in front of it.

When transporting shorter lengths (that differ from the standard rail length) each compartment can hold one additional rail of corresponding length as long as the maximum loading length is not exceeded. **Each individual rail must be fastened to one outer clamping block.**

When loading rails in this manner the rail ends must be at least 3 meters apart in order to prevent the rails from coming into contact when the train negotiates curves.

The bridging running rails must be inserted between the transport units and secured with pin retainers prior to every loading procedure across two or more transport units. Any differences in the height of the running rails must be evened out with washers. Once unloading of the rails has been completed, the bridging running rails **must be removed** and placed in their transport holders.

Once the loading of long lengths of rail across two transport units has been completed, the bridging running rails between the transport units are, of course, **not** to be removed if they have been secured with pin retainers in the manner prescribed!

Once unloading has been completed, two bridging running rails are to be put back in the transport holders of each of the transport unit's end wagons.

A list of "Module" transport units for transporting new rails:

120 meter - 6 wagons - max. 28 clamping points: TU 332, TU 421, TU 422, TU 424, TU 426

120-meter - 6 wagons - max. 30 clamping points: TU 531, TU 532, TU 533, TU 534, TU 535, TU 536

180-meter - 9 wagons - max. 28 clamping points: TU 441, TU 442, TU 444

Final Remarks:

The applicable statutory accident insurance provision are to be observed during any and all work carried out on long-rail transport units.

Before beginning the loading process, the rail manipulator (loading system) should be run at walking speed along the entire length of each Robel transportation unit in order to ensure there are no technical malfunctions.

Wagon Management is to be informed immediately by phone of any defects discovered on or sustained by the transport units during loading/unloading. Corresponding entries are to be documented in the un/loading protocol. Photos are to be taken of any damage sustained.

Please call one of our employees to report any damage or if you have any questions:
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