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ROOF RACK SYSTEM WITH RAILS AND DEFLECTION ROLLERS

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Initial situation:
Currently, various loads are often transported on roof racks, e.g. bicycles, roof boxes, kayaks or long construction elements such as boards, beams, girders etc.

Disadvantage:
- Access to the roof is often very complicated, especially in off-road vehicles, due to the height, despite the presence of a running board between the doors.
- Lifting loads onto the roof rack is very bad for the back.
- The fastening of the objects/loads must sometimes be done without a view of the fastening points.
- Climbing onto the roof is dangerous and not recommended for the bodywork and chassis.

Solution:
With pulleys and a rail system, the objects are pulled up from the ground behind the vehicle to the roof (see figure 1).
I.e. the loading and fastening of the objects is done on the ground on a sledge-like pre-equipment.
The objects can be pulled by means of a cable pull or preferably by means of a cable winch attached to the vehicle.

Advantages:
- Risk of injury to users is significantly reduced.
- Faster and safer loading and fastening of objects on the roof rack.
- Damage (scratches, dents, ...) to the vehicle by the user is significantly reduced.

Technical implementation:
Deflection rollers and rail system are integrated in a roof rack system, whereby the rails with rollers can slide into each other to realise a ramp from the ground to the roof rack (see figure 2 and 4).
In this case, objects/loads can be loaded and fixed on a sledge-like pre-fitting, whereby the pre-fitting can slide on the extended rails (see figure 2 and 3).

Pulleys in combination with a pulley system enable the lifting/pulling up of the sled-like scaffolding sliding on the rails (see figure 5 and 6).

Preferably, the pulling force on the ropes can be generated by means of a winch.

Of course, the procedure backwards, i.e. to lower the load or object, is also provided for. In this case, the user has to pull the sledge-like pre-equipment backwards. The weight of the objects can be braked via the cable pull or the cable winch.

Preferably, before pulling the objects, the vehicle chassis can be moved to a low point or the chassis is moved to a lower point on "block", e.g. by means of pneumatic chassis adjustment, so that the damping is not damaged by the load.

Preferably, the vehicle has a roof rail, e.g. with "zero joint method", so that the roof rack system can be fixed conventionally between the roof rails.

Preferably the rail and pulleys are of a very robust and lightweight design (e.g. aluminium and composites).

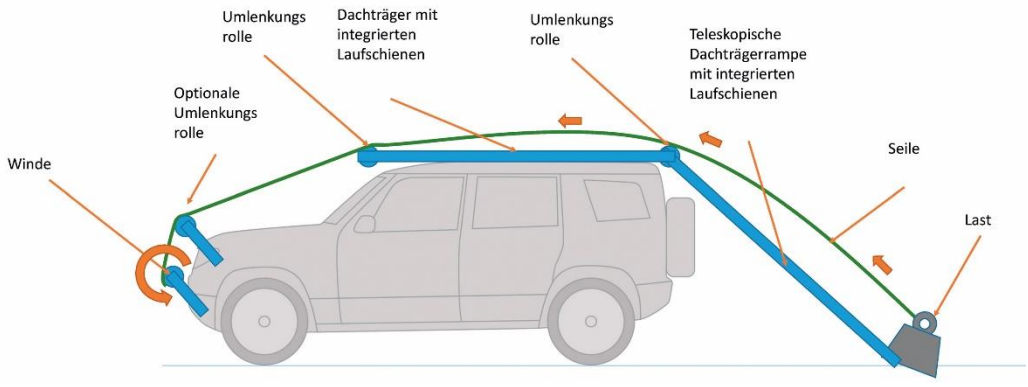

Figure 1

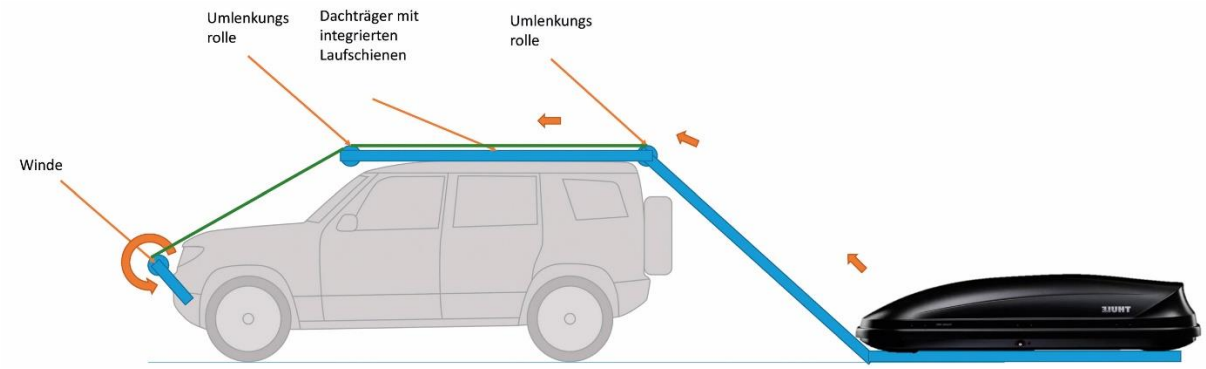

Figure 2

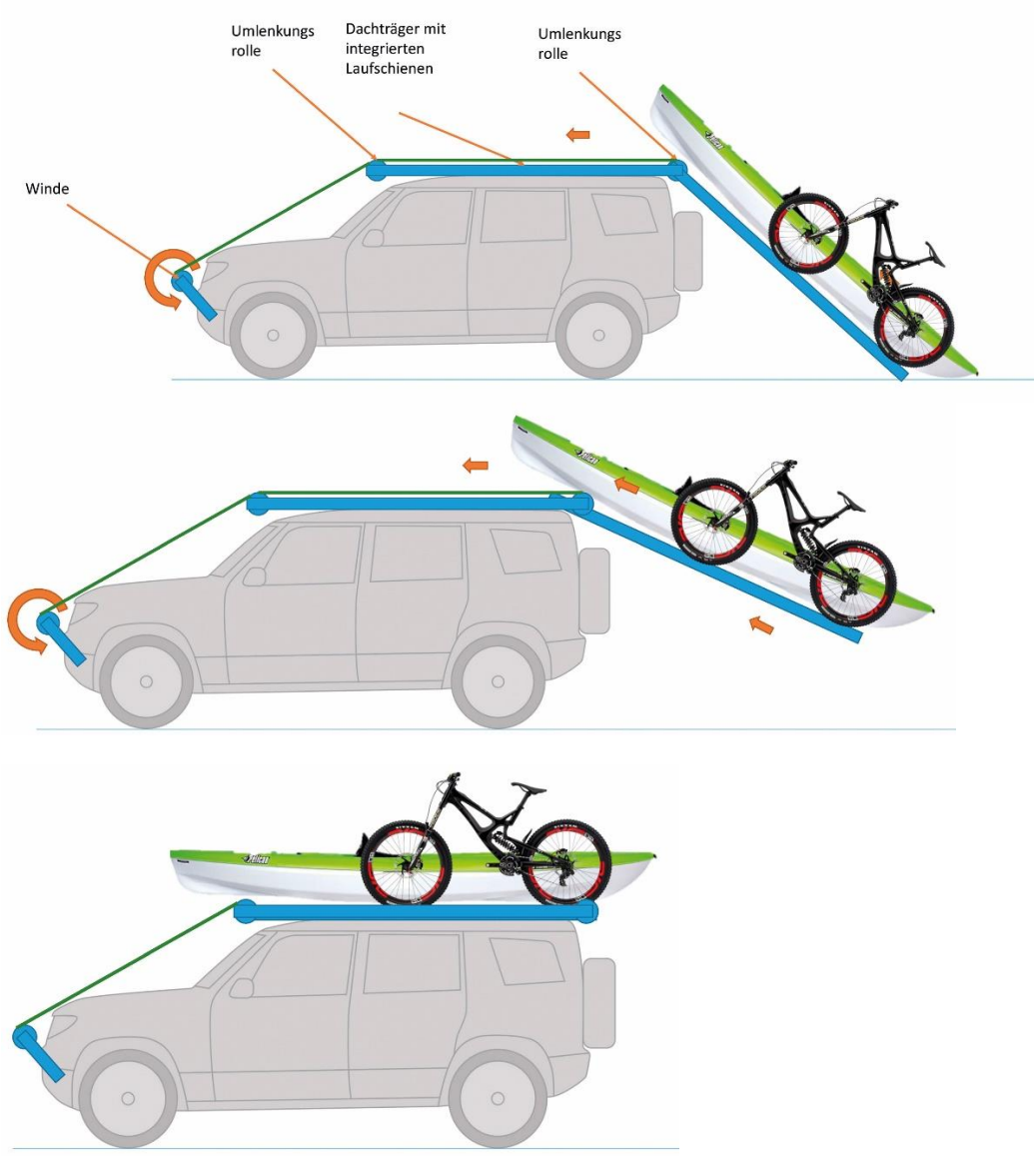

Figure 3: Exemplary kinematics

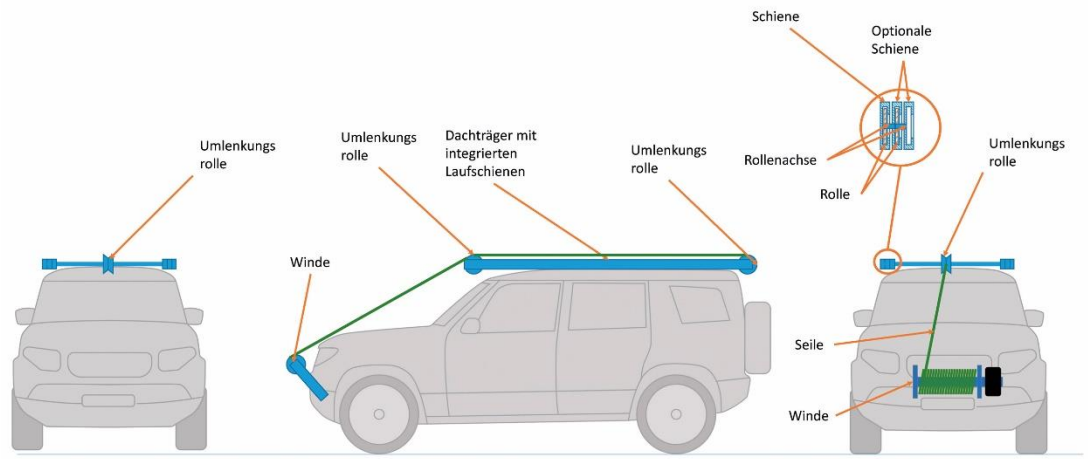

Figure 4: General view

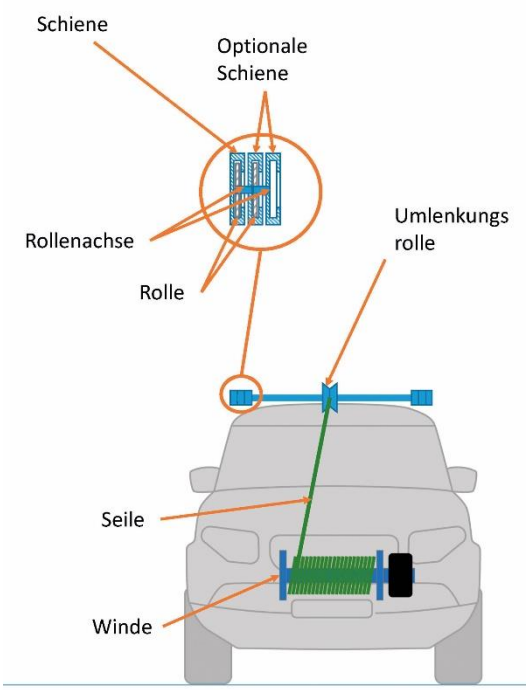

Figure 5: Detailed view of rails

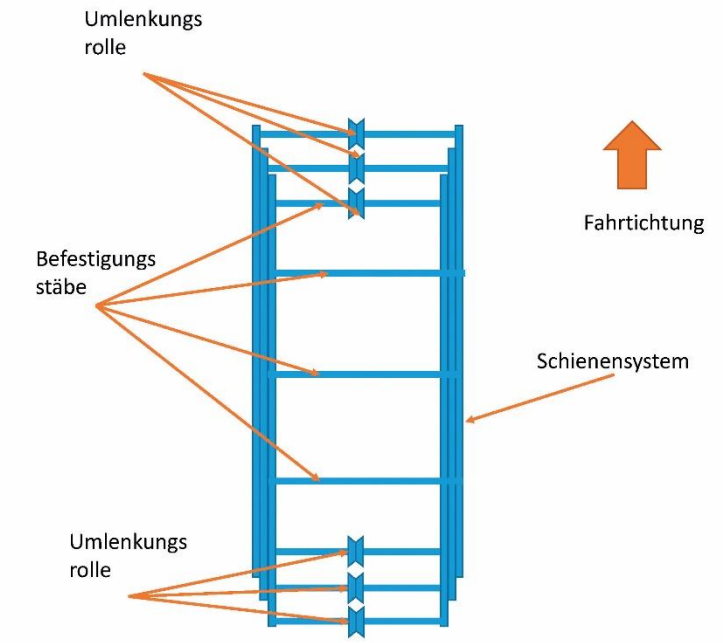

Figure 6: Simplified roof position of the roof rack system from above