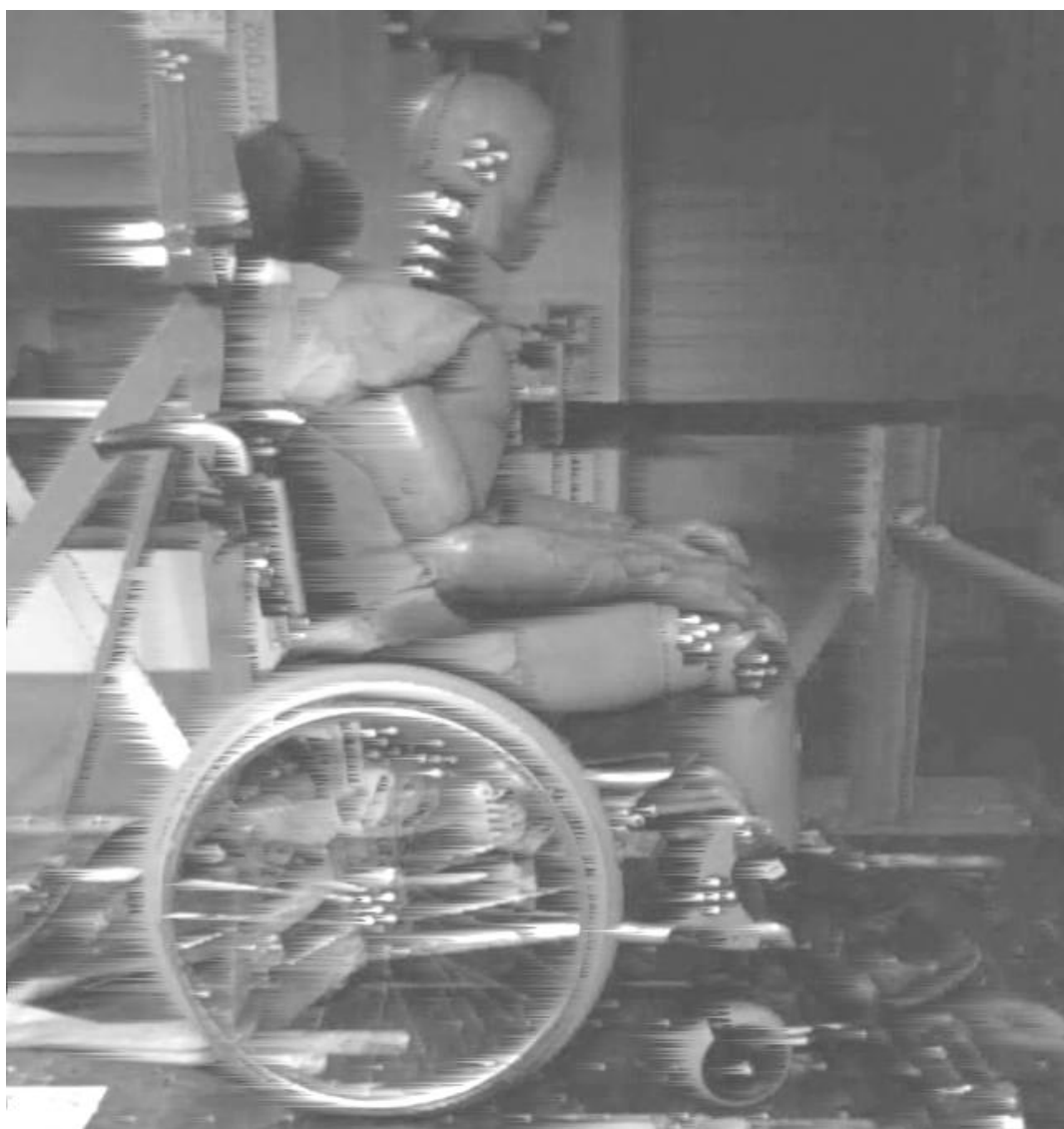




SORG Rollstuhltechnik GmbH + Co.KG Wheelchairs

tested according to ISO 7176-19



Information Brochure Crash Test and Mounting of Wheelchair Restraint Systems

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1. Introduction

In this document, you will find information on the crash tested manual wheelchairs by SORG Rollstuhltechnik GmbH + Co.KG, on the transportation in a motor vehicle, on restraint systems, possible limitations, safety indications, as well as on currently applying test standards.

After extensive tests and the results gained from them, we know that our wheelchairs tested according to ISO 7176-19 resist the forces they are exposed to in a crash test and are hence suitable as a seat in passenger vehicles.

Considering the high number of individual equipment options of each SORG wheelchair and the numerous available restraint systems, it is impossible for us to test all wheelchair restraint systems currently on the market. All SORG wheelchairs were tested in combination with AMF passenger transportation and restraint systems. Consequently, AMF systems and all other safety systems conforming to DIN 75078-part 2 may be used for transportation. To find out whether a system not mentioned is qualified, please contact the manufacturer of the respective restraint system.

2. Applied and Relevant Test Standards

In accordance to our release list under point 6, it is possible to use the respective SORG wheelchairs as passenger seats in any vehicle designed to transport handicapped people. The following standards had to be fulfilled in the course of the crash tests.

SORG wheelchair products are tested according to the standard ISO 7176-19 in travel direction, standing, exposed to a frontal crash at 50 km/h (31 mph) with a 4-point restraint system for the wheelchair and a 3-point restraint system for passengers with a lap and shoulder belt. If not indicated otherwise, a 76 kg (167 lb) hybrid-2 dummy is used.

The demands for any 4-point wheelchair restraint system are defined by the standard ISO 10452. The applied system by AMF GmbH meets the requirements of ISO 10452.

3. Safety Indications

SORG Rollstuhltechnik GmbH + Co.KG does not recommend using a wheelchair or seat shell frame as a seat for transportation in a vehicle. We build versatile, lightweight and functional mobility aids. These features oppose the requirements of an ideally secured seat for transportation in motor vehicles. Any firmly installed seats and restraint systems in a vehicle are to be preferred whenever possible.

Additionally, the mounting of passenger transport systems or wheelchair restraint systems inherits a considerable source of errors concerning explanation and usage and thus imply an increased safety risk. SORG Rollstuhltechnik cannot take any responsibility for physical restraints of the users resulting from traffic accidents. People transport systems and wheelchair restraint systems used correctly can reduce the risk of injury, but they can never eliminate it.

Considering the following safety indications is of utmost importance:

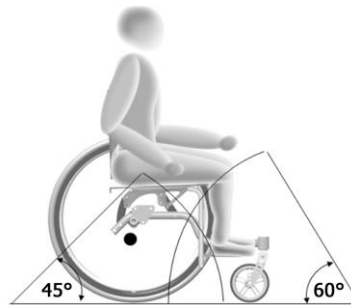
- The wheelchair/seat shell frame may only be used directed in travel direction (do not transport if directed sideways!). The restraint systems must be used according to the instructions of the manufacturer.
- To restrain the wheelchair/frame, 4-point restraint belts fixed to the vehicle have to be applied. They must conform to the standards specified above. The belt buckles used on the wheelchair/frame have to be compatible with the system of the ends of the restraint belts.
- The wheelchair/seat shell frame may only be used in accordance with the user manual.
- If the wheelchair is equipped with an adjustable back angle or seat inclination, make sure that the passenger is in upright position during transport.
- Remove all attachment parts, e.g. therapy tables, abduction wedges, loose cushions, etc. from the wheelchair. These have to be secured individually. The reaction of accessory drives cannot be estimated since SORG Rollstuhltechnik does not test these configurations. Generally, we recommend to secure these devices separately.
- Make sure that both lap belt and shoulder belt are applied correctly.
- Only restraint belts conforming to the standards described in chapter 2 are to be used. If the wheelchair driver does not wish to use the belt system fixed to the wheelchair, he/she should use a belt system fixed to the vehicle instead.
- Safety belts must not be placed on car or frame parts, keeping them away from the body. Safety belts must rest against the body as tightly as possible.
- Safety belts must not be twisted when used.
- Further positioning/fixation systems which serve the positioning of the user may be used additionally. However, they must not replace the people transport systems and wheelchair restraint systems.
- No changes of the fastening points of the wheelchair or the components of the frame may be conducted without consulting the manufacturer. If this is not respected, the wheelchair can no longer be used as a seat for transportation in a motor vehicle and the warranty of the manufacturer expires.
- If involved in a crash accident, the product may no longer be used as a seat for transportation in a motor vehicle. We recommend replacing the product.
- The safety of the users transported in the wheelchair/frame is also highly dependent on the person jointly responsible for the transport. Make sure that this person is trained appropriately and familiar with the regulations/safety indications and that he/she follows them.

4. Indications on Transportation of a Wheelchair as Seat in a Vehicle

The following points need to be regarded when fixating a wheelchair and buckling on a wheelchair user:

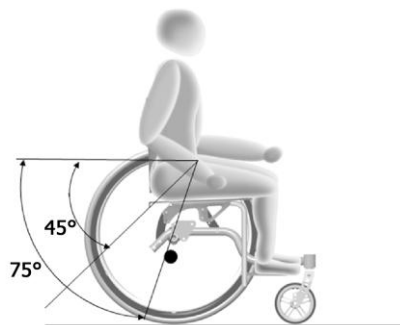
- Place the wheelchair in travel direction in centre between the tracks fixed on the vehicle and secure it with the locking brake.
- The restraint belts/retractors fixed to the vehicle floor need to be connected to the wheelchair with the compatible counter piece (e.g. car belt system).
- If possible, turn the casters forward to improve stability.
- It is important that the belts of the wheelchair restraint system have a maximum angle of 60° on the front and a maximum angle of 45° on the back, corresponding to the horizontal (cf. image 1).

Bild 1



- Please tighten the restraint belts according to the indications of the manufacturer. After locking, the lap belt of the passenger restraint system must have an angle of 45° - 75° (corresponding to the horizontal). An angle closer to 75° is desirable, but it must not be larger than 75° in any case (cf. image 2).
- Link the shoulder belt with the lap belt. The shoulder belt must rest plane on the shoulder and across the chest. If this is not possible, the user must not be transported in the vehicle.

Bild 2



According to DIN 75078 part 2 it is recommended to use a head rest during transportation in any passenger car. Generally, a head rest which is attached to the vehicle and which can be activated from the top or the sides should be used. If a head rest attached to the wheelchair is used, the following aspects need to be regarded:

- If there are indications on attachment, they need to be followed.
- The head rest should be adjusted at the height of the head's centre of gravity.
- The distance to the head, when sitting upright, should be as minimal as possible.

5. Release List

Wheelchair models released according to ISO 7176-19 by SORG Rollstuhltechnik GmbH + Co. KG

(The list of products tested is continuously extended)

Model	Report-no.	Date	Recommended restraint system	Limitations
Trend/Trend abdu	A227I01	28.03.11	AMF-BRUNS-Kraftknoten + AMF-BRUNS-Protektor wheelchair restraint system	If using head rest Co. SORG, Set 2 stabilizing bars necessary
Trend S/Trend S abdu	MBK S11406	29.11.10	AMF-BRUNS-Kraftknoten + AMF-BRUNS-Protektor-wheelchair restraint system	If using head rest Co. SORG, Set 2 stabilizing bars necessary
Skater/ Skater abdu	A153I03	02.11.10	AMF-BRUNS-Kraftknoten + AMF-BRUNS-Protektor-wheelchair restraint system	If using head rest Co. SORG, Set 2 stabilizing bars necessary 59 kg/130 lb Dummy used
Vector	U0854SF002	14.03.11	AMF-BRUNS-Kraftknoten + AMF-BRUNS-Protektor-wheelchair restraint system	If using head rest Co. SORG, Set 2 stabilizing bars necessary
Tilty	2511.2010	23.11.10	AMF-BRUNS-Kraftknoten + AMF-BRUNS-Protektor-wheelchair restraint system	If using head rest Co. SORG, Set 2 stabilizing bars necessary Caster adapter metal necessary
Tilty II	MBK S11407	29.11.10	AMF-BRUNS-Kraftknoten + AMF-BRUNS-Protektor-wheelchair restraint system	If using head rest Co. SORG, Set 2 stabilizing bars necessary Caster adapter metal necessary
Tilty Vario	A227I02	28.03.11	AMF-BRUNS-Kraftknoten + AMF-BRUNS-Protektor-wheelchair restraint system	If using head rest Co. SORG, Set 2 stabilizing bars necessary
Siro II	U0854SF003	27.4.11	AMF-BRUNS-Kraftknoten + AMF-BRUNS-Protektor-wheelchair restraint system	No SORG head rest for transportation in a passenger car available

Please feel free to ask for information about the wheelchair restraint systems used:

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