



Former issues of this standard: May 2011

1. Scope and field of application

This EUWA Guideline specifies safety and service instructions concerning the use of wheels. EUWA intends to inform consumers about the risks related to the product and its use.

Additional information for resellers and tyre workshop operators can be found in the “EUWA Safety and Service Recommendations”.

Additional information for use, general maintenance and safety requirements and out-of-service conditions are given in ISO 14400

The following guideline is valid for vehicle wheels which are produced or commercialized by EUWA members. It concerns the activities of handling, mounting and dismounting these wheels.

2. General Instructions

- 2.1 The wheel is a highly stressed component of the vehicle that in service may be subjected to extreme forces. Improper or unsafe wheel servicing practices can lead to risks during utilisation by the consumers. Therefore, it is highly recommended that all service operations should be performed only by qualified and appropriately trained personnel.
- 2.2 Follow the vehicle or wheel manufacturer’s current manuals for utilisation instructions, recommendations and any other additional information concerning the use and maintenance of wheels. It is essential to use only wheels and components which are approved by the vehicle manufacturer or in case of aftermarket wheels these parts are certified for the vehicle by an authorised institution.
- 2.3 Avoid damages or deformations of the wheel due to the application of high forces or due to impacts during all operations like handling and mounting to the vehicle.
 - ➔ Risk of reduced fatigue life performance of the wheel in service
 - ➔ Risk of uniformity problems and vibrations
- 2.4 In all those operations, avoid shocks or scratches which may damage the surface protection of the wheel.
 - ➔ Risk of resulting corrosion which may reduce fatigue performance of the wheel in service

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- 2.5 Prior to inflation of tyres on multipiece rims, the correct positioning of the lock rings or of the loose flange rings has to be carefully checked, always avoiding any correction by means of a hammer. In the case of incorrect positioning, all air has to be let out and the whole procedure has to be repeated. When inflating tyres, a safety cage or safety chains must be put round the wheel. The operator has not to stay in the near dangerous areas.

3. Mounting of the Tyre/ Wheel Assembly to the Vehicle

- 3.1. The tyre/wheel assembly must be correctly positioned relative to the hub when mounting on the vehicle. Make sure that all matching contact surfaces of hub and wheel are clean and that no foreign object is between wheel and hub.
- ➔ Risk of uniformity problems and vibrations
 - ➔ Risk of damages to the wheel in a highly stressed area which may cause fatigue problems
 - ➔ Risk of torque and subsequent wheel loss
- 3.2. To assure the right application, the following characteristics of the wheel have to be checked regarding correspondence with the axle hub and the vehicle:
- the diameter of centre hole
 - diameter of bolt holes
 - number and shape of bolt holes
 - wheel inset
 - type and kind of screws and nuts
 - rim size
 - wheel / vehicle combination
- 3.3. All mounting parts such as spherical or conical screws or nuts, special parts for steel and light alloy wheels, must fit exactly to the wheel being mounted. Any incorrect combination of parts (different type, different shape of radius/angle, different length) may cause screw or nut loosening or the wheel failure. The use of the wrong ring components on multipiece rims can result in catastrophic wheel failure.
- ➔ Risk of wheel loss or wheel failure
- 3.4. The user has to be extremely careful with any lubricant or rust protector. To prevent rusting small amounts of oil may be applied to the centring area of the centre hole. Nuts and stud threads shall be carefully cleaned and should not be lubricated, unless other specifications are given in the manual of vehicle manufacturer.
- ➔ Excessive lubrication may cause wheel loss

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- 3.5. The screws or nuts of all disc wheels have to be fastened with the recommended torque given in the vehicle manufacturer's instructions. The use of a torque wrench is highly recommended. Tighten progressively to the final torque, not in one go.
- ➔ Excessive screw tightening may cause deformation of wheel disc or screw-/ bolt failure
 - ➔ Insufficient tightening may cause wheel loss
- 3.6. The correct tightening sequence is crosswise over the wheel disc. This means to tighten one screw then the opposite one or the farthest away.
- ➔ Risk of deformation of the wheel centre and resulting vibrations if the tightening sequence is clockwise or counter-clockwise
- 3.7. On a new vehicle and always after a wheel or tyre replacement, it is imperative to verify the mounting torque after approximately 50-100 km of operation and, where necessary, to retighten the wheel screws to the correct value.
- ➔ Insufficient tightening may cause wheel loss

4. Mounting of the Wheel or Hub Cover

- 4.1. The mounting of wheel or hub cover must not require excessive forces which may damage the surface protection.
- ➔ Risk of resulting corrosion
- 4.2. The wheel cover must be mounted in the correct angular position versus the valve in order to avoid damages or bending of the valve.
- 4.3. Verify the proper seating of the wheel cover in order to prevent its loss or overheating of brakes.

5. Dismounting of the Wheel and Inspection

- 5.1. Follow attentively the instructions of the vehicle manufacturer concerning the dismounting of the tyre/wheel assembly. For safety reasons it is imperative that, where multipiece rims and divided (bolted) type wheels are involved, the tyres must be fully deflated before any removal procedures are started and that only correct tools are used. Check closely all components after removal, to ensure that they are in good condition and look for any possible non conformity.

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- 5.2. The wheel as a safety part must not show fractures, deformations, distortions, severe corrosion or other similar defects. Such pieces have to be replaced and scrapped. Also, in the event of a suspected damage, due to severe pot-hole shocks for example, the involved part must be replaced.
- 5.3. The replacement has to be carried out with new pieces having completely identical characteristics. Typical defects that require the part's replacement are:
- ➔ cracks in the wheel disc face, in particular the bolt holes area, the upper area of the disc and the ventilation holes can be concerned
 - ➔ deformations or abnormal imprints in the seats of the bolts
 - ➔ bent rim flanges (generally due to impacts against obstacles or pot-holes)
 - ➔ cracks in the rim area which have been caused by a tyre puncture
 - ➔ excessive wear on attachment face to the hub and at the rim flanges
 - ➔ excessive corrosion on rim faces and at hole edges in disc area

6. Repair and visual reconditioning of passenger car wheels

- 6.1. The repair of a damaged rim or disc by heating, by welding, by plastic deformation, by addition or removal of material is strictly forbidden. Any repair alters the requirements for conformity to the wheel original specification (aftermarket Type approval, car manufacturer type approval or other project specifications) See table 1.
- 6.2. In case of visual reconditioning by an external company, the full liability is transferred from the wheel manufacturer to this external company or to the person or company that ordered the visual reconditioning.
- 6.3. The external company shall mark the wheel with a hard stamp as a sign of visual reconditioning. This hard stamp should be unique to the external company, with a traceability number that leads to the information on the visual reconditioning activities and controls done.
- 6.4. The visual reconditioning of the wheel is possible only one time.

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➔ Examples of repairs are shown in table 1. This data is not an allowance for the repair of other defects or defects which are smaller as described

Table 1:

Not limitative examples of repairs that are not allowed.				Safety effects			Comfort and cosmetic effects	
position	type of defect	Example	Type of Repair	fatigue cracks	risk for collapse	leak - air loss	vibrations	corrosion/adhesion
inner rim horn	crack	1	welding or polymer	x	x	x	x	x
inner rim horn	runout/deformation	2	straightening	x	x	x	x	x
rim profile	crack	3	welding or polymer	x	x	x	x	x
outer rim horn	scratches	4	removing material more than 1.0 mm or reworked thickness below than 10 mm	x	x	x		x
outer rim horn	runout/deformation	5	straightening	x	x	x	x	x
spoke front side	scratches	6-A 6-B	remachining *) front side	x	x			x
spoke front side	corrosion	7	remachining *) front side	x	x			x
spoke front side	corrosion		paint stripping at temp. above 160°C	x	x			x
spoke front side	corrosion		basecoat + clearcoat with curing > 100°C	x	x			x

*) Remachining means the use of machining tools, not local grinding.

Sample Images:



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Example No. 3



Example No. 4



Example No. 5



Example No. 6-A



Example No. 6-B



Example No. 7

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