

Fact sheet: The Nord-Lock wheel nut

Conventional wheel nuts used on heavy vehicles loosen. This unfortunate and long-standing truth has resulted in wheels dislodging and causing traffic accidents involving property damage, personal injuries and, in the worst case, fatalities. Loose wheel nuts also result in increased operating costs as well as decreased overall delivery efficiency and productivity levels. The new Nord-Lock wheel nut effectively eliminates unintentional wheel nut loosening. Thereby the product will improve safety of the vehicle, secure productivity and contribute to more cost-effective operations.

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1 The problem: loose wheel nuts jeopardise safety, productivity and profits

Wheel detachment: a widespread and dangerous safety problem

Studies of both on- and off-road heavy vehicles in UK and US show that wheel detachment is a common problem, with comparable rates in other countries.

Governmental studies of on-road vehicle fatalities caused by loose wheel nuts

In the United Kingdom alone there are up to 400 wheel detachments from heavy on-road trucks every year. Of these, on average, there are 134 accidents involving vehicle/property damage, 27 injuries and up to seven fatalities. So states a 2006 report commissioned by the United Kingdom Department of Transport. In the United States of America, the National Transportation Safety Board reports that wheel detachments occur at an estimated rate of 1,000 per year - almost three a day - resulting in about 20 accidents per week. In other countries, wheel loss occurs at comparable rates.

Governmental studies of off-road vehicle fatalities caused by loose wheel nuts

Off-road accidents involving dislodged wheels result in damaging of industrial equipment, personal injuries and, even worse, fatalities. According to a 2008 report from the U.S. Bureau of Labor Statistics, entitled *Census of Fatal Occupational Injuries*, 2,053 workers died in vehicle-related crashes and transportation incidents. According to their earlier reports, wheels and tyre rims caused fatalities to 85 workers from 1992 to 2002, an average of 8.5 such fatalities per year over that period. Wheel detachment is one of the possible causes of such accidents. Loosening wheel nuts is the main reason for wheel detachment.

Negative effects on productivity and profitability for vehicle owners

Loose wheel nuts can:

- Jeopardise delivery efficiency and vehicle productivity
- Increase fuel consumption and tyre wear due to the effects of unbalanced wheels
- Increase spare parts costs due to increased wear of the wheel assembly
- Increase operational costs from damage, repair and possible fines or insurance claims
- Damage the image and safety record of the vehicle owner

2. The solution: The new Nord-Lock wheel nut

How the new Nord-Lock wheel nut works

The Nord-Lock wheel nut is a simple and cost effective way to make wheels safe. The Nord-Lock wheel nut safely secures wheels by maintaining a high clamp force even under severe operating conditions. Each nut incorporates a pair of washers that have cam faces on one side, with a cam angle “ α ” greater than the thread pitch “ β ”. On the opposite side there are radial teeth. When the wheel nut is tightened, the teeth of the Nord-Lock washers grip and lock the mating surfaces, allowing movement only across the cam faces. Any rotation of the wheel nut is blocked by the wedge effect of the cams. Once tightened, the Nord-Lock wheel nut cannot loosen by itself. The product is based on proven wedge-locking technology, suits flat-faced steel rims, M22x1.5 studs and is easy to install.



Proven in tests and in real-life

The Nord-Lock wedge-locking technology has been used in millions of bolted applications exposed to strong vibrations and high dynamic loads for over 25 years worldwide. The Nord-Lock wheel nut has been thoroughly tested, both in scientific laboratories and under operating conditions in various environments. Results prove that the Nord-Lock wheel nut does not rotate loose and will secure the wheel by maintaining high clamp load even when facing extreme vibrations and conditions.

Technical specifications

Thread: M22x1.5
Key width W: 32 mm
Diameter Ø: 46 mm
Height H: 27 mm
Tightening torque: 600-650 Nm (450-500 ftlb)
Approximate clamp load: 200 kN (45000 lb)
Surface coating: Basecoat Delta Protekt KL 100, Topcoat VH 302 GZ
Corrosion resistance: 600 hours according to ISO 9227
Thread tolerance after coating: 6H
Lubrication: Anti-corrosive wax
Property class: Grade 10

Premium quality, full traceability and environmental compliance

The Nord-Lock wheel nut is a Swedish product manufactured of high-quality steel. The Nord-Lock wheel nut is reusable, durable and pre-lubricated to ensure uniform friction and thereby accurate preload during tightening. Each Nord-Lock product is supplied with a control number, enabling full traceability. It complies fully with EU directives 2000/53/EC for the End of Life Vehicles (ELV) and 2002/95/EC for the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

Offered locally through Nord-Lock and its partners

The Nord-Lock wheel nut is offered through a global network of partners, including OEMs, distributors, providers of heavy vehicle tyres and parts as well as other companies. We are dedicated to making wheels safer and more productive for owners of heavy vehicles.

About Nord-Lock

Nord-Lock bolt securing systems are designed to secure fasteners in extreme conditions. We have over 25 years of experience of collaborating with our customers to achieve effective bolt security. We have an international team of sales engineers who visit our clients locally. We will help you optimize your bolted joints in order to minimize overall cost and maximize safety. Our premium bolt securing systems give effective security throughout an assembly's lifetime, resulting in:

- No bolt loosening caused by vibration and dynamic loads
- Minimized cost of maintenance, repair and overhaul
- Significantly reduced risk of lost production or operation due to bolt failure

For more information please go to www.safe-wheels.com or contact Stuart Robertson of Grampian Fasteners on +44 (0)1224 772777.