THE WORLD'S SAFEST WHEEL NUT

THE DISC-LOCK SAFETY WHEEL NUT

with NEW environmentally friendly, anti-corrosion coating

DISC-LOCK™
INTERNATIONAL

fleetsafetyforum
AWARDS FOR EXCELLENCE
2003
Vehicle Safety Invention Award

www.disc-lock.com

Disc-Lock Safety Wheel Nut

The vibration and shock-proof wheel nut for trucks, trailers and buses which *eliminates* the risk of *wheel loss.**

**As confirmed by MIRA Tests (see back page)*

The *Disc-Lock* Safety Wheel Nut:

- **maintains wheels on axles**
- **is approved by vehicle and axle manufacturers**
- **is fitted by major fleet operators worldwide**
- **is as simple to install as a standard two-piece wheel nut**

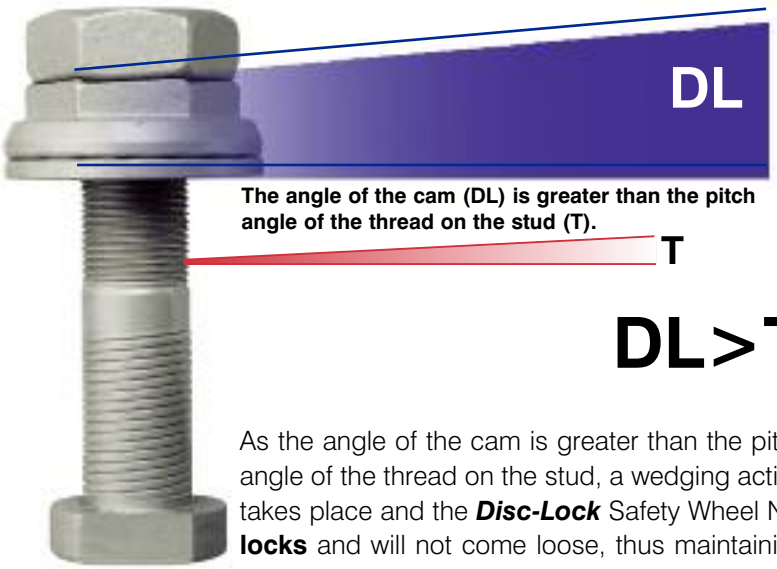
What is the *Disc-Lock* Safety Wheel Nut?

The ***Disc-Lock*** Safety Wheel Nut is specifically designed to prevent wheel loss from commercial vehicles such as trucks, trailers and buses. ***Disc-Lock*** Safety Wheel Nuts have proven to be far superior in terms of safety than standard two-piece wheel nuts. The combination of lateral, bending forces on the road-wheels due to cornering, and torsional forces due to braking and acceleration which result in settling and looseness of normal bolted assemblies cause ***Disc-Lock*** Safety Wheel Nuts to maintain the clamping force and to lock. thus keeping the wheels secure on the axle.

How does the *Disc-Lock* Safety Wheel Nut work?

Unlike a standard two-piece wheel nut, the ***Disc-Lock*** Safety Wheel Nut is split into three sections, comprising a nut (1), a hexagon-flanged washer (2) and a flat faced cup washer (3). These sections are joined together to form a one-piece assembly with a C-clip.

The top two sections (1 & 2) have interlocking cams. When subjected to road shock or vibration, the most common causes of wheel nut loosening, the interlocking cams of the ***Disc-Lock*** Safety Wheel Nut attempt to rise against each other.



The angle of the cam (DL) is greater than the pitch angle of the thread on the stud (T).

DL>T

As the angle of the cam is greater than the pitch angle of the thread on the stud, a wedging action takes place and the ***Disc-Lock*** Safety Wheel Nut **locks** and will not come loose, thus maintaining the clamp load and keeping the wheel on the axle.

New features for 2006

Disc-Lock is always working hard to find ways in which to improve its products. Main new features of this latest version of the ***Disc-Lock*** Safety Wheel Nut are:

- **Indestructible** - The nut has been strengthened considerably to overcome the problems caused by impact wrench abuse. Though, it should be noted, that while the ***Disc-Lock*** Safety Wheel Nut can now withstand such abuse, the same cannot be said of the stud. This could experience untold damage, in particular stretching of the stud, if the wheel nut is severely over torqued.
- **Better socket engagement** - The height of the middle hexagon-flanged washer (see section 2 in diagram on left) has been increased to give better socket engagement.
- **New, environmentally-friendly coating - GEOMET®**. The ***Disc-Lock*** Safety Wheel Nut is now coated with a new, environmentally-friendly, anti-corrosion protection, GEOMET®, which is chrome free, ensuring it is compliant with European Union Directive 2002/95/EC (Restriction of Hazardous Substances). This new coating has passed a 720 hours salt spray test.

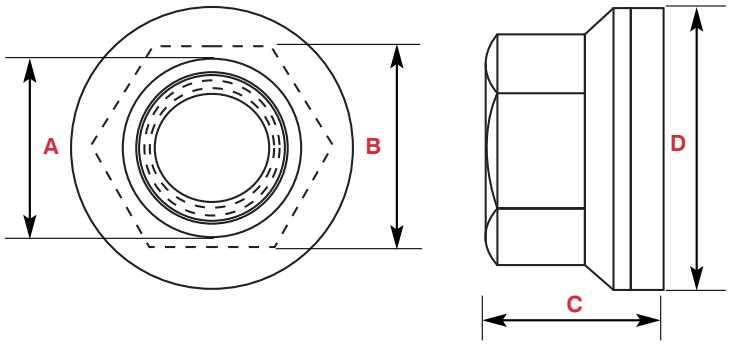
The patented ***Disc-Lock*** system is approved by vehicle and axle manufacturers throughout the world and the ***Disc-Lock*** Safety Wheel Nut is installed by many truck and bus fleets worldwide who recognize the Nut as an essential safety device.

What the experts say: *"The **Disc-Lock** nut should be encouraged and publicized because practical experience shows that it does make a major contribution to road safety and it is the most significant improvement to wheel security for years".*

—Eur Ing Don H Wright, Bsc (Eng), CEng, FI MechE.

All of the vehicles pictured here have ***Disc-Lock*** Safety Wheel Nuts installed on their wheels.

Disc-Lock Safety Wheel Nut Dimensional Chart



SIZE & THREAD	WIDTH ACROSS THE FLATS	HEIGHT	FLANGE DIAMETER
A	B	C	D
M18 x 1.5	34.0mm	29.0mm	47.5mm
M20 x 1.5	34.0mm	29.0mm	47.5mm
M20 x 2.5	34.0mm	29.0mm	47.5mm
M22 x 1.5	38.0mm	34.0mm	52.0mm
3/4" - 16UNF	1.340"	1.140"	1.880"
7/8" - 14UNF	1.500"	1.320"	2.000"

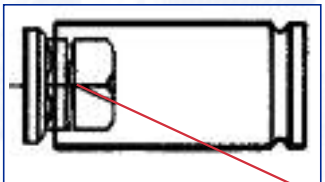
*How to install & remove the **Disc-Lock** Safety Wheel Nut*

The ***Disc-Lock*** Safety Wheel Nut is easy to install and remove. Indeed, it is installed in exactly the same way as a standard two-piece wheel nut.

To install or remove, simply place the socket over the hexagon nut and hexagon flanged washer and tighten or loosen.

Refer to axle manufacturer's instructions for torque settings.

A detailed installation instruction leaflet and workshop poster is available on request to *Disc-Lock International*, tel 310/944-9352 or email info@disc-lock.com.



To install or remove push socket on to fully cover both hexes of nut

Disc-Lock **Safety Wheel Nuts keep wheels secure if maintained and installed *correctly.***

Disc-Lock Safety Wheel Nut On Test

MIRA Test

In December 2004 the *Disc-Lock* Safety Wheel Nut underwent a severe performance test at the Motor Industrial Research Association (MIRA) Proving Ground in Nuneaton, Warwickshire, UK.

A fully-laden semi-trailer/tractor-unit combination (weight 35 ton) was fitted with ***Disc-Lock*** Safety Wheel Nuts on the nearside and standard two-piece wheel nuts on the offside.

Over a two-day period the vehicle was driven around a figure-of-eight track to apply lateral bending movements to the wheels. In addition, repeated forward and rearward emergency braking was undertaken to induce torsional slipping forces to the wheels. At the completion of each cycle of thirty minutes a torque check was undertaken.

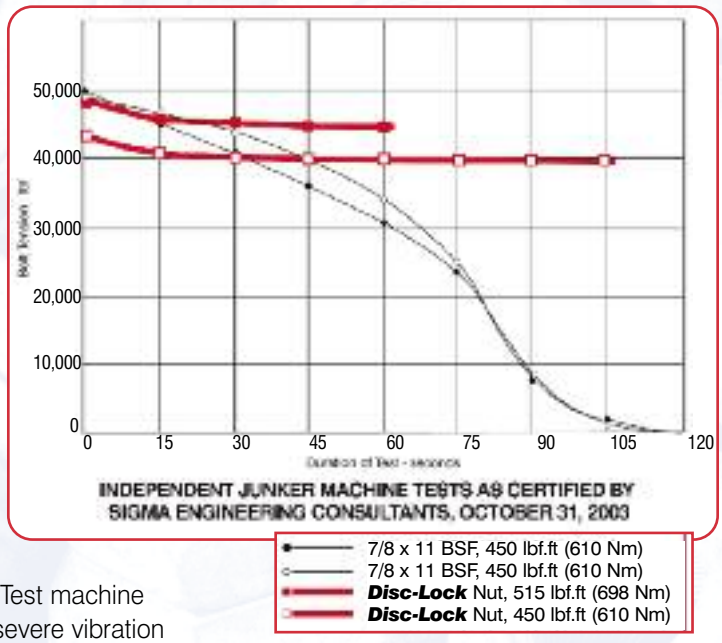
Actual truck and trailer used for the MIRA Test.

These checks revealed no loss of torque on any of the Disc-Lock Safety Wheel Nuts at any stage. The same could not be said of the standard two-piece wheel nuts, a staggering 50% of which had come loose by the end of the test.

To obtain a detailed copy of this MIRA Test report call *Disc-Lock International at 310/944-9352* or e-mail info@disc-lock.com

Junker Vibration Test

Disc-Lock Safety Wheel Nuts are tested on a Junker Vibration Test machine which is named after its German designer Gerhard Junker. Junker's theories are based in part on the so-called "long-form torque equation" relating the torque applied to a fastener to the frictional and elastic reactions to that torque. The Junker Test machine works as follows: an eccentric cam generates a controllable amount of transverse displacement on the joint under test. A load cell measures the actual transverse forces exerted on the joint. One can determine the relationship between residual preload in the fastener under test and external vibratory forces created by the test machine as a function of time.



When tested against a standard two-piece wheel nut on a Junker Test machine the ***Disc-Lock*** Safety Wheel Nut remains secure under the most severe vibration conditions while the standard two-piece wheel nut comes completely loose.

DISC-LOCK™ INTERNATIONAL
LEADING INNOVATORS IN FASTENER TECHNOLOGY

For further information and prices contact ***Disc-Lock International***
6101 W. Centinela Avenue, Suite 280, Culver City, CA 90230, USA
Tel: 310/944-9352 Fax: 310/944 9522 Email: info@disc-lock.com