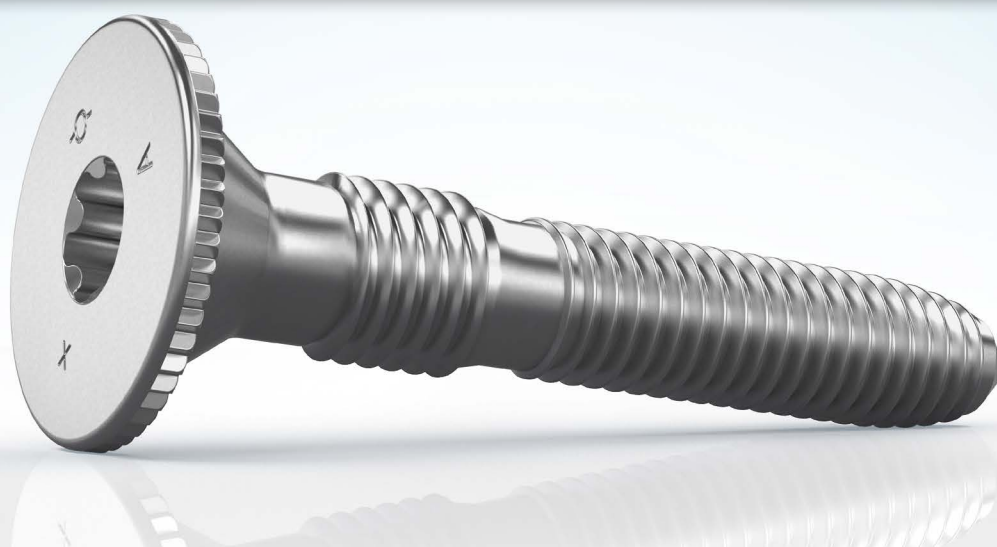


The new screw for trailer floors



Picture 1: The TrailSec screw has a larger countersunk head diameter, is manufactured in case-hardened steel, has a zinc flake coating, is lubricated and has the TORX PLUS[®] with AUTOSERT[®] drive, suitable for automation. (Picture: ARNOLD UMFORMTECHNIK)

In the trailer industry security and lightweight construction play an important role. Moreover, using the appropriate screws and processing technologies can make a contribution to the efficient construction and repair of semitrailers, while also honing costs.

The floor of a truck trailer is generally made of wood, serving to strengthen the semi-trailer. The wooden floor is exposed to strong dynamic forces. Given these circumstances, the task of screwing wood to metal is complex. Since wood yields to pressure when a screw is driven into it, it is not possible to build optimum pre-load force. The experts at ARNOLD UMFORMTECHNIK have developed a solution to this problem – it is called the TrailSec

screw. As a manufacturer of fasteners and supplier of systems, the company operates throughout the world in several different industrial sectors – including the cargo handling sector.

“The requirements imposed on trailer manufacturers today are very diverse. The great challenge is to ensure that goods are not damaged during haulage. Furthermore, the wooden flooring has an important function regarding the

vehicle’s static equilibrium. Accordingly, it is very important that the fastening points set fulfil their function,” said Stefan Höhn, Key Account Manager at ARNOLD UMFORMTECHNIK, describing the requirements of the fastening solution.

One thing is certain: The floor of a semitrailer is a dynamic system affected by strong forces. For example it has to drive on uneven roads, is subject to

Picture 2: The ASA automatically drills a hole into the floor, and then screws the TrailSec screw into it. Parameters such as screw-in depth and speed can be individually adjusted.

(Picture: ARNOLD UMFORMTECHNIK)

uneven loading, and to torsion when manoeuvring. Höhn pointed out that in practice, screws can rupture or come loose and that the surface of the floor is often damaged when the screw is set.

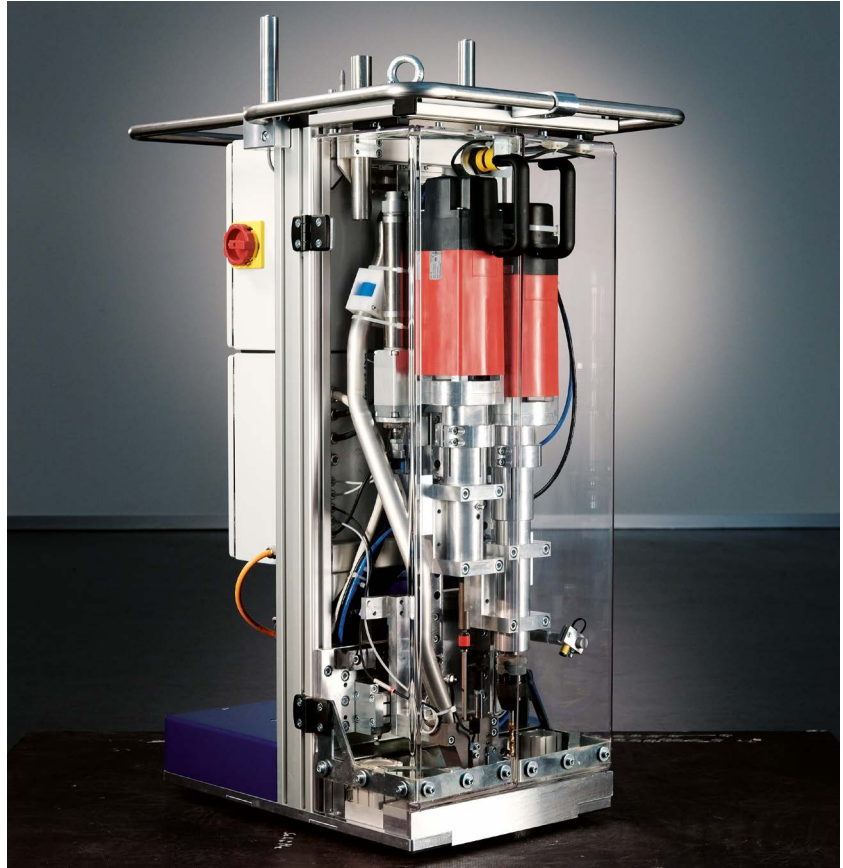
Perfect engineering design for trailer floors

The problem was discussed at many meetings with customers. The discussions triggered the ARNOLD developers' response: to create TrailSec. TrailSec stands for Trailer Security. The fundamental aim of the development work was to increase the fastening's strength, achieve improved loosening resistance, serve a wider range of applications, reduce the cost of the fastening, implement lightweight construction criteria, achieve reliable production process, and increase the degree of automation.

The TrailSec floor screw (patent applied for) has a large countersunk head diameter so that the forces are well distributed over the wood – for an M6 screw this is 15 millimetres and for M8 screws, up to 20 millimetres. The screw is manufactured in case-hardened steel, has a zinc flake coating, is lubricated and has the Torx Plus Autosert drive, suitable for automation. With the bugle head optimised for surface pressure, it achieves more surface pressure, and better preload force.

An important feature of the TrailSec screw is the new knurled head, for which a patent has been applied. When screws with a large head diameter are screwed into wood, the high pressure

forces create breakage traces in the wood. The knurled head, with its knurling on the side, is able to reduce this. It mills itself into the wood, thus forming the necessary pre-load force. The knurled head also means that less water can penetrate into the wood. "This design reduces the likelihood of the screw coming loose, and overall creates a more stable and better screw fastening at the fastening



Picture 3: The ASA's integral process monitoring makes it possible to control the drilling and screwdriving processes. In addition, faulty operations are detected quickly and can be corrected promptly.

(Picture: ARNOLD UMFORMTECHNIK)

„The advantages to the customer are plain to see: fewer screw holes, shorter assembly times, lower fastening costs, reliable processing, improved loosening resistance and better contact pressure due to the large head diameter.“

Stefan Höhn, Key Account Manager, ARNOLD UMFORMTECHNIK

point,” stressed Stefan Höhn. And an innovative thread-forming zone produces a perfect female thread. A ballistic projectile tip centres and forms a rim on the plate.

Automated processing for TrailSec floor screws

The ASA drill-screwdriving system has been in use at ARNOLD since 2012. ARNOLD has enhanced the technology of this system, adapted it to the latest machine safety requirements, and honed it for working with TrailSec. It is used on trucks, or to be more accurate, on semitrailers, where it fastens trailer floors.

Depending on the trailer type and the manufacturer, up to 300 screws are used on every semitrailer. With the ASA the screw-driving process is accurate, fast and easy to implement. For customers this represents a clear saving.

The automated ASA drills a hole into the floor, and then screws the TrailSec screw into it. Parameters such as screw-in depth and speed can be individually adjusted. This ensures fatigue-free working. The unit is also very flexible regarding the strength and quality of the substrate. It can drill into high-strength steel up to 15 mm thick and then fasten a screw into it.

The integral process monitoring system enables control of the drilling and screwdriving processes. In addition, faulty operations are detected quickly and can be corrected promptly.

Huge potential for truck manufacture and repair

ARNOLD presented the screw to customers and it is already used by some OEMs in their semitrailers. “Recently we have been promoting the product to retailers serving the

repairs sector. Since the floor of a truck is regularly overhauled, there is good potential for our TrailSec screws in this area. Of course TrailSec is likewise suitable for use in special vehicles. The advantages to the customer are plain to see: fewer screw holes, shorter assembly times, lower fastening costs, reliable processing, improved loosening resistance and better contact pressure due to the large head diameter,” summarised Stefan Höhn.

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