SAFETY MEETS EFFICIENCY: HEICO-LOCK® REACTION WASHERS SIGNIFICANTLY REDUCE THE RISK OF WORKSPACE ACCIDENTS WITH POWERED HIGH-TORQUE TOOLS

Large bolted assemblies challenge even experienced installers: powered high-torque tools require reaction arms or support devices, making the process complex and time-consuming. Additionally, the risk of workspace accidents increases, **HEICO** explains…

In Germany alone, over 2,000 reportable workspace accidents occur each year due to the use of power-driven bolt, tensioning and bolt-turning tools (Statistik Arbeitsunfallgeschehen 2024, Deutsche Gesetzliche Unfallversicherung e.V. (DGUV)). In more than 83% of cases, these incidents are caused by a loss of control over the tool or workpiece.

Electric, pneumatic and hydraulic tools operating at high torque require reaction arms or additional devices to redirect the force generated. Standard reaction arms, typically supplied by the tool manufacturers, allow proper operation when used correctly by trained personnel. However, many bolted connections and installation situations are so unique – or the support was not considered during the design process – that standardised support arms cannot be used, making it necessary to find expensive customised solutions.

Many operators underestimate the risk

"High costs for custom-made support arms or tight deadlines often force operators to rely on improvised, self-built solutions," explains Tobias Hübing, Certified Fastener Engineer (DSV) and Head of Laboratory at HEICO Group. "In doing so, many users underestimate the risks associated with high-torque bolting tools and the immense forces involved. For example, achieving the preload specified by VDI 2230-1 for an M24 bolt of strength class 10.9 requires a tightening torque of approx. 1,000 Nm – roughly equivalent to the maximum torque produced by two to three high-performance mid-size cars with around 200 hp each."

Even with a nominal bolt size of M24, a reaction force of more than 8,000 N must be transferred into surrounding structure. This corresponds roughly to the weight force of a small compact car with a mass of around 800 kg. The reaction force acts both on the support point and on the bolt itself. Failure or slippage of the support can have devastating consequences. The weight force of a mass of only around 100 kg is already sufficient to cause severe finger crushing injuries, while forces between 100 to 150 KGS can lead to bone fracture.



HEICO-LOCK® Reaction Washers are compatible with a wide range of torque tool models from leading high-torque tool manufacturers

"A makeshift support made from structural steel (e.g. S235) with a diameter of approx. 6 mm would shear off or fracture under the previously calculated reaction force of 8,000 N – and would already begin to bend at significantly lower forces or tightening torques," explains Tobias Hübing. →







HEICO Fastening Systems

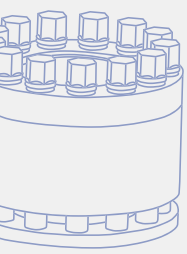
The best value to secure
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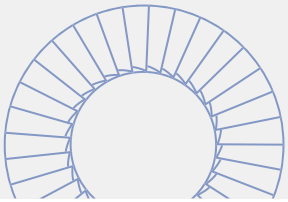


HEICO-LOCK® Reaction Washers

The ultimate bolt locking system that allows reaction arm-free tightening with most branded high-torque tools.







Proven. Precise. Made in Germany.

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Maximum safety by eliminating reaction arms and support devices

HEICO-LOCK® Reaction Washers enable reaction arm free tightening of large bolted joints when using motorised torque tools.

HEICO's dual socket engages with the gear-shaped outer profile of the HEICO-LOCK® Reaction Washer, allowing the tool's reaction torque to be absorbed directly through the washer. As a result, external reaction arms and additional support devices are no longer required.

By applying the tightening torque purely axially through the torque tool, the bolt remains properly aligned during tightening and no additional bending stresses are introduced. By reducing side load and bending moments during tightening, the system improves torque accuracy, may increase joint load-bearing capacity, and helps extend the service life of the high-torque tool.

Safe bolted joints with maximum efficiency

Large-diameter bolts (> M24) are frequently used in critical industries such as oil and gas, power generation, chemical processing and mining, where they are often tightened in high-volume or series bolting applications.

This is where the advantages of HEICO-LOCK® Reaction Washers become particularly clear. Instead of laboriously repositioning and correctly aligning reaction arms and support devices of the high-torque tool after each bolt is tightened, the use of these innovative reaction washers in combination with the matching HEICO dual socket allows bolted joints to be tightened one after another more quickly, easily and safely.

This not only increases efficiency and occupational safety but also optimizes the entire bolting process while simultaneously reducing costs.

Reliable protection against self-loosening

Like all locking solutions in the HEICO-LOCK® series, the reaction washers are based on the proven wedge locking principle. This two-washer system provides highly effective protection against self-loosening of bolted joints under dynamic load such as vibration, which commonly occur in machinery and industrial applications.





Many users underestimate the risks associated with high-torque bolting tools. Both pinching or crushing the fingers as well as injuries from the tool slipping off are often the result

The radial ribs on the outer surfaces of the washer pair embed themselves into both the clamped component and the bearing surface of the bolt head or nut during tightening, creating a positive mechanical interlock. At the same time, the opposing internal wedge surfaces prevent any rotational loosening caused by vibration or shock load.

Compatible use with HEICO Dual Sockets

HEICO-LOCK® Reaction Washers are compatible with a wide range of torque tool models from leading high-torque tool manufacturers. In cooperation with these tool manufacturers, HEICO designs and supplies the corresponding dual sockets customised to each specific system.

This allows operators to integrate the Reaction Washers quickly and easily, as existing torque tools can continue to be used without costly replacement or major modification.

HEICO-LOCK® Reaction Washers enable the safe, efficient, and precise assembly of large bolted joints using high-torque tools – without the need for reaction arms and with reliable protection against self-loosening.

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