



About TORX PLUS® Drive Systems

The TORX PLUS® Drive was designed to enhance assembly line performance. Manufacturers all over the world have realized significant improvements and cost savings by switching to the TORX PLUS® Drive. Since its introduction, TORX PLUS® Drive has consistently outperformed every other drive system. Its longer tool life and optimal torque transfer have enhanced product reliability, increased productivity, and reduced total assembly costs on assembly lines in a multitude of industries.

The Solution to Your Assembly Problems

Since its introduction, TORX PLUS® Drive has consistently outperformed every other drive system. Its longer tool life and optimal torque transfer have enhanced product reliability, increased productivity, and reduced total assembly costs on assembly lines in a multitude of industries around the world.

Elliptically-Based Geometry

- Broadens contact surface to maximize engagement of driver and recess
- Eliminates damaging point-to-point contact

0° Drive Angle

- Optimizes torque transmission
- Virtually eliminates radial stresses to increase tool bit life
- Allows use of thinner-walled recesses

Six Lobes With Large Cross-Sectional Areas

- Allows faster tool engagement
- Maximizes torque transfer
- Increases torsional strength

Vertical Sidewalls & Reduced Recess Fallaway

- Increases tool engagement
- Virtually eliminates camout
- Ensures proper torque transfer
- Greatly reduces end load requirements
- Minimizes tool slippage and damage it can cause
- Can reduce fatigue and muscular stress during manual assembly of fasteners

Greatly Increased Strength and Reliability

- 100% average improvement in driver bit life; many users of the TORX PLUS® Drive System have driven 2 to 10 times more fasteners per drive tool
- 25% average improvement in driver bit torsional strength
- Increased bit strength allows for higher removal torque capability

Inch & Metric In One Drive Tool

- Same-sized drive tool seats both inch- and metric-sized fasteners
- Add or convert to metrics without a tooling change

- Reduce the number of tools required by field service personnel

Compatible with TORX® Drive for Field Service

- TORX® Drive tools can be used to remove and reinstall TORX PLUS® Drive recess fasteners

Perfect for High-Speed Assembly Lines

Difficulty in aligning the drive bit and the recess can force an assembly line to slow down to assure proper fastening.

AUTOSERT® FEATURE – The high productivity answer to high RPM engagement

The compound angle ramps of the AUTOSERT feature guide the driver bit into the recess, creating a self-centering and engaging action. It's the perfect solution for automated, robotic and other assembly situations where the driver bit is continuously rotating.

- Allows for higher rpm engagement
- Speeds engagement
- Reduces assembly time
- Increases productivity

Enlarged window of engagement improves drive bit alignment in offset and off-angle conditions

- Eases starting
- Eliminates need to slow down driver bit

Lobe Engagement

- Increases tool life - during beta site testing, a manufacturer achieved reduced drive bit usage at over 1500 rpm
- Eliminates camout debris

TORX PLUS® Drive Surpasses the Competition

What is your most annoying fastening problem? Damaged applications? Constantly changing tool bits? Perhaps your current system solves one problem, only to cause another.

Only the TORX PLUS® Drive gives you all the benefits you need to have a more efficient, more productive assembly line.

Using TORX PLUS® Drive benefits your entire organization:

Purchasing

- Reduced tooling costs
- Reduced overall costs

Manufacturing

- Reduced downtime from tooling changes
- More assemblies per shift
- Reduced worker fatigue

Quality Control

- Ensures proper seating of fasteners

- Reduced field service and warranty claims due to improperly seated fasteners
- Reduced number of scrapped or reworked components

TORX PLUS® Drive Outperforms the TORX® Drive

A finite element analysis (FEA) of the TORX PLUS® Drive System and the TORX® Drive System was conducted to analyze the amount of stress encountered by both the drive bits and recesses.

The TORX PLUS® Drive System demonstrated:

- An average 25% increase in ultimate torsional strength of the driver bit.
- An average 25% increase in ultimate torsional strength of the total drive system, allowing for higher torque transfer and higher torque removal capability.
- An increase in fatigue life averaging 100% because of reduced stresses in the driver bit.
- Because of the circumferential load transfer of the TORX PLUS® Drive System, the radial stresses are greatly reduced. This allows for thinner-walled recesses and demonstrates a more efficient drive system. The TORX PLUS® Drive directs the forces in a more circumferential direction than the TORX® Drive. Less force is passed into the fastener head and instead is utilized directly in rotating the fastener, resulting in a more efficient transfer of torque. This also allows thinner-walled recesses to be utilized. At 20Nm, the TORX PLUS® Drive has a very small percentage of the drive bit under stress, and no sign of internal yielding. The TORX® Drive bit has a much higher percentage of the drive bit affected by the combined stresses (torsional, tensile, etc.) and also shows a small region that has internal yielding. The TORX PLUS® and TORX® designs show a similar radial stress value at the point of contact. However, the radial stresses for the TORX® Drive System spread farther into the fastener recess over a larger area than the TORX PLUS® Drive System. In fact, the radial stresses in the head quickly dissipate to zero for the TORX PLUS® Drive System. NOTE: The materials used for the TORX® and TORX PLUS® models were a typical thru hardened quench and tempered carbon steel, with properties representative of a Property Class 10.9 fastener. The material properties for the drive bit are for a modified S-2 material corresponding approximately to a hardness of Rockwell C60.

TORX PLUS® Drive Variations

Tamper-Resistant TORX PLUS® Drive This unique TORX PLUS® variation incorporates a five lobe design and a solid post formed in the center of the recess.

- When combined with a countersunk or button head design, the fastener is extremely difficult to remove without a special tamper-resistant TORX PLUS® Drive tool
- Tamper-resistant TORX PLUS® tooling is only available to the OEM and their authorized service technicians to limit access and maintain the integrity of the system
- Installation is quick and easy with the proper tool
- Recognized as the only truly tamper-resistant drive system – the preferred internal drive system defined in SAE specification J2317 (Tamper Resistance for Adjustable Parameters on Diesel Fuel Injection Pumps)
- Available in fastener sizes M2.5 – M25 (#3 to 1")

Dual Drive Systems

The TORX PLUS® Drive System can be combined with either an external hex or a slot to provide a dual drive system.

- Provides the option of driving or removing the fastener with commonly available TORX PLUS® tools or with a hex socket or slotted screwdriver
- The slotted TORX PLUS® fastener has a slot that is enclosed at the ends, so the driver is less likely to slip out and damage surrounding surfaces

External TORX PLUS® Drive System Designed with the same elliptically-based geometry as the internal drive system, this version allows the highest torque transfer available.

- The external TORX PLUS® Drive provides 10% more torsional strength than the same-sized external TORX® Drive
- TORX PLUS® sockets are required for installation and removal, as TORX® sockets are not compatible
- Available in fastener sizes M0.6 – M24 (#0000 – 1”)

TORX PLUS® Stem Fasteners An external TORX PLUS® configuration, extruded onto one end of the double-end stud, simplifies driving.

- Eliminates need to grip threads during driving, preventing thread damage
- Offers improvement in stem strength due to increased cross-sectional area

External TORX PLUS® Low-Profile Head

This version provides high torque transfer in a low head height.

- Higher torque transfer capabilities than corresponding internal recesses
- Head height similar to pan or indented hex head
- Lower weight than pan or indented hex head fasteners
- Requires special sockets
- Available in fastener sizes M0.6 – M24 (#0000 – 1”)

Try the TORX PLUS® Drive

The superiority of the TORX PLUS® Drive System is well-documented. No matter what the industry, no matter what the application, the TORX PLUS® Drive System is proven to keep assembly lines running smoother and more efficiently.

Convert for Cost Savings

The real savings from the TORX PLUS® Drive System are on the bottom line. When factors such as the cost of drive tools, line downtime, design flexibility, productivity, scrap/rework per shift, worker fatigue and overall product integrity are considered, the choice to convert becomes clear.

Textron Fastening Systems can assist in your conversion to the TORX PLUS® Drive System by providing sample fasteners, drive tools, sales drawings and technical data; conducting engineering seminars; and performing comparative laboratory testing on your application in a simulated production line environment.

TORX PLUS® Drive Information Online

To put the information you need at your fingertips, Textron Fastening Systems maintains a web site focused on the TORX PLUS® Drive System. Technical and design data, including head specifications, test results, downloadable literature and CAD drawings are all available at www.camcar.textron.com/torxplus.

TORX PLUS® Drive Solutions: Increased Tool Bit Life Increases Productivity

Application: Disk drive for personal computers

Assembly Method: Automated

Assembly Problem: When using the TORX® Drive System, the manufacturer was only able to build 200 disk drives per drive bit.

TORX PLUS® Drive Solution: TORX PLUS® Drive fasteners

Customer Benefits:

- Manufacturer is building 2,000 disk drives per tool bit
- Lower drive tool costs
- Increased productivity due to fewer drive tool changes