

LAWSON MAINTENANCE FASTENERS
THE ENGINEERED FASTENING SYSTEMS
FOR THE 21ST CENTURY

TRU-TORQ®

The ultimate high strength matched component fastener system available. For use in critical applications. Designed for the most demanding requirements. Manufactured to exceed SAE Grade 8 specifications.



TUFF-TORQ®

This maintenance engineered fastening system is the best choice to replace standard production grade fasteners.





In the past, Lawson Products has always led the way in fastener innovation and solving the problems of industrial maintenance users.

Lawson continues to lead the way with several unique design characteristics to make our products better than that of the competition.

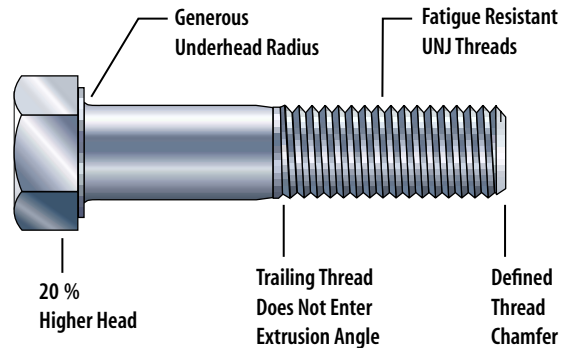
Offering 2 Maintenance Fastener Systems with unique design characteristics at no extra cost!

TRU-TORQ® 180,000 psi (min.).



TRU-TORQ® & TUFF-TORQ® CAPSCREWS FEATURE:

- Fatigue/vibration-resistant thread design
- Controlled thread run-out in the extrusion angle between the body and thread diameter addresses another key stress area
- American made
- Tapered point allows for quicker, easier assembly



Controlled thread run-out in the extrusion angle between the body and thread diameter



Generous point chamfer for efficient assembly

SYSTEM BENEFITS:

- **Maximum Component Load Distribution**
- **Rapid Engagement for Positive Assembly**
- **Consistent, Reliable Clamping Power**
- **Highly Efficient Friction Control System**
- **Superior Overall System Performance**

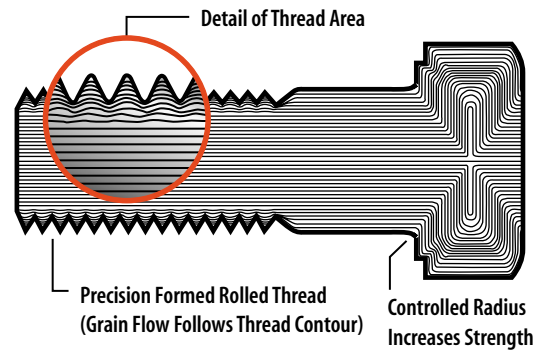


A typical Tru-Torq® application.



TUFF-TORQ® FASTENING SYSTEMS

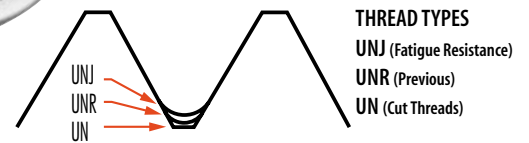
- 20% thicker head design for slip-resistant wrenching
- Cold formed for uninterrupted grain flow and added strength in head-to-shank and threaded area. Closely controlled dimensional characteristics in accordance with ANSI B18.2.1
- Clean, visible head markings for strength identification and product traceability
- Under head fully formed washer face for an improved bearing surface and even load distribution
- Heat treated, quenched and tempered for the proper balance of strength, toughness and ductility
- Matched strength components (nuts and washers)
- Perma Plating for superior corrosion protection



Tuff-Torq® – 150,000 psi minimum ultimate tensile strength



Under head fully formed washer face for maximum seating ability.



A typical Tuff-Torq® application.

TRU-TORQ® & TUFF-TORQ® MATCHED

All components (capscrews, nut, and washer) must be of matched strength to attain and maintain the ultimate high load carrying potential of each system.

To properly match all Lawson TRU-TORQ® fastener hardware for optimum holding power, we recommend the following guide to be utilized for choosing the correct corresponding hex nut, washer, and locknut within the system.

PROOF LOAD.....150,000 PSI
ULTIMATE TENSILE STRENGTH (Min.).....180,000 PSI

TRU-TORQ® SYSTEM			
CAPSCREW A600 series	+HEX NUT 82881 series	+WASHER 88435 series	LOCKNUT 53695 series



TRU-TORQ® HARDENED & TEMPERED FLAT WASHERS

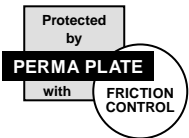
- Exceeds SAE and ASTM Specifications
- Permits the Maximum Clamping Load of the TRU-TORQ® Capscrew and Hex Nut Assembly Without Dishing or Belling Out Which Results in a Loosened and Potentially Dangerous Bolted Connection

- Consistent Higher Hardness for Greater Load Support
- Tighter Inside Diameter for Correct Size Mating and Equal Load Distribution for Both USS and SAE
- Clearly Marked with Lawson 'L' and Size for Proper Identification and Fully Traceable



THICK ALL METAL LOCKNUT

- Triobular Locking for Even Distribution
- Locks in Place Even Under Severe Vibration
- Extra Thickness for Greater Wrenching
- Heat Treated for Matched Strength
- Designed for High Strength Applications



TRU-TORQ® HIGH STRENGTH HEX THICK NUTS

Because a complete fastener assembly is only as strong as its weakest component each member part must have equal physical and mechanical properties.



- Heat Treated
- Extra Nut Thickness Offers a Larger Wrenching Surface
- TRU-TORQ® has Precision Threads Meeting ANSI Class 2-B Thread Fit
- The TRU-TORQ® Hex Nut is Manufactured from Prime, High Strength, Fine Grain Steel

COMPONENT CAPSCREW SYSTEMS

For proper replacement of standard production fasteners, it is recommended that the following selection of TUFF-TORQ® component hardware be utilized to obtain maximum holding power.

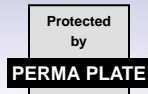
PROOF LOAD.....120,000 PSI
ULTIMATE TENSILE STRENGTH (Min.).....150,000 PSI

TUFF-TORQ® SYSTEM			
CAPSCREW 600 series	+HEX NUT A100 series	+WASHER 88435 series	LOCKNUT 80929 series



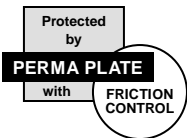
TRU-TORQ® FLAT WASHER

- Greater Thickness
- Tighter Inside Diameter
- Specially Marked for Positive ID
- Uniform Load Distribution for Attaining High Clamping Loads
- Meets and Exceeds ASTM F436



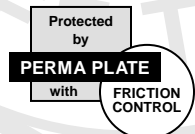
ALL METAL GRADE "C" LOCKNUT

- Heat Treated for Matched Strength
- Locks in Place Even Under Severe Vibration
- Designated for High Strength Applications



TUFF-TORQ® HEXAGON HEAT TREATED NUT

- High Strength Fine Grade Steel
- Three Stage Heat Treating
- Full Finished Nut Dimensions
- Meets SAE Grade 8 Specifications
- Special Radial Line/Dash Notation Designating High Strength
- ANSI Class 2B Thread Fit
- Forged
- Improved Torque Reliability
- Greater Clamp Load Consistency



APPLICATION ENGINEERING ASSISTANCE & FAILURE ANALYSIS



Manufacturing lot number appears on the box label of all Tru-Torq® & Tuff-Torq® fasteners for traceability and product certification.



Lawson's high tech image capturing system enables Lawson to provide visual test results to aid with problem solving.



On-Site Torque Test



LAWSON'S A2LA ACCREDITED LAB

Lawson's in-house (A2LA) American Association for Laboratory Accreditation lab is equipped to perform a number of various test and inspection functions during failure analysis.



Rockwell hardness tester



*Micro-Vu
Optical Comparator*



Sample Preparation



Microscopes

LET LAWSON SOLVE YOUR COMMON FASTENER PROBLEMS

HAVE YOU EXPERIENCED ANY OF THE FOLLOWING?

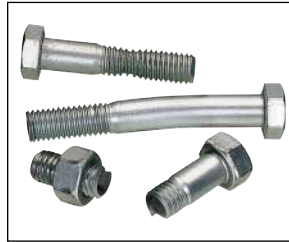
- Fastener failure due to vibration and fatigue
- Permanently stretched or elongated capscrews
- Bent, twisted, or broken bolts
- Cracked, dished, or embedded washers
- Stripped threads
- Mushrooming of nuts



Permanently stretched capscrew



Stripped



Cracked, bent, broken



Mushrooming nuts



Washer dishing

SOLUTIONS: HERE'S HOW BY CHOOSING LAWSON MATCHED STRENGTH FASTENER SYSTEMS THESE PROBLEMS CAN BE OVERCOME AND ELIMINATED

- Fatigue/vibration failure is reduced by our special thread form which provides more material at the root radius (stress points) in the threaded section of the capscrew. Also, the trailing thread does not enter the extrusion angle where the capscrew body and threads meet.
- Lawson capscrews utilize rolled threads. Rolling or forming the threads displaces the raw material and results in an uninterrupted grain flow for greater resistance to thread stripping.
- Tru-Torq® flat washers resist cracking, dishing, and deforming under load because they're manufactured from selected prime steel and through hardened in a controlled atmosphere heat treatment furnace.
- Permanently stretched bolts occur when bolts of insufficient strength are used. Remember Lawson Tru-Torq® and Tuff-Torq® capscrews exceed SAE Grade 8 strength properties.
- Lawson capscrews are heat treated, quenched, and tempered for the proper balance of strength, toughness and ductility. In addition, we make available technical assistance and torque charts to ensure correct and proper tightening.
- Tru-Torq® hex nuts have special thick dimensions (height) to provide additional strength needed for 180,000 psi minimum tensile strength. Tuff-Torq® nuts meet SAE Grade 8 nut specifications.

FASTENING SYSTEMS DO NOT HAVE TO BREAK TO CAUSE EQUIPMENT FAILURE

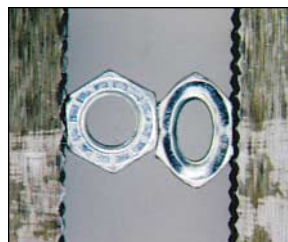
- Lawson's maintenance fastening systems have been designed with greater holding power capability to eliminate loosening – *Lawson can prove it!*
- Ask your Lawson agent to show you any of the Tru-Torq® fastening systems demonstrations.
- All systems look alike, but they don't perform alike. Let's demonstrate the difference...



Washer Bend Demonstration



Washer Dishing/Belling Demonstration



Hex Nut Vise Demonstration



Fastener System Performance Demonstration

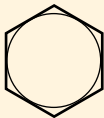




TRU-TORQ®

TECHNICAL DATA

TUFF-TORQ® VS. PRODUCTION GRADE FASTENING SYSTEMS

FEATURE	TUFF-TORQ®	PRODUCTION GRADE
Thicker head for slip-resistant wrenching	Yes	No
Lubricated hex nut for consistent tightening wet or dry	Yes	No
Fatigue/vibration-resistant thread design	Yes	No
Easily identified matched strength components	Yes	No
Tapered end for easier assembly	Yes	No
Consistent clamp loads	Yes	No

HEX HEAD CAP SCREW STRENGTH GRADES AND IDENTIFICATION MARKINGS

	GRADE 2	GRADE 5	GRADE 8	TUFF-TORQ®	TRU-TORQ®
STRENGTH GRADE MARKINGS					
DEFINITION	SAE Grade 2 ASTM A 307 Common Commercial Quality	3 Radial Lines SAE Grade 5* ASTM A-449	6 Radial Lines SAE Grade 8* ASTM A-354BD	Lawson Tuff-Torq®	Lawson Tru-Torq®
MATERIAL	Low Carbon Steel	Medium Carbon Steel Quenched & Tempered	Medium Carbon Alloy Steel Quenched & Tempered	Selected Medium Carbon Steel Quenched & Tempered	Special Analysis Alloy Steel Quenched & Tempered
ULTIMATE TENSILE STRENGTH, PSI	Grade 2 thru 3/4" Dia. 74,000 PSI. Over 3/4" Thru 1-1/2" 60,000 PSI	120,000 PSI Min.	150,000 PSI Min.	150,000 PSI Min.	180,000 PSI Min. 190,000 PSI Avg.
PROOF LOAD STRENGTH, PSI	Grade 2 thru 3/4" Dia. 55,000 PSI. Over 3/4" Thru 1-1/2" 33,000 PSI	85,000 PSI Min.	120,000 PSI Min.	120,000 PSI Min.	150,000 PSI Min.
SINGLE SHEAR STRENGTH, PSI	Grade 2 thru 3/4" Dia. 48,000 PSI. Over 3/4" Thru 1-1/2" Dia. 39,000 PSI	78,000 PSI	97,000 PSI	97,000 PSI	117,000 PSI

*To conform to American Standards (SAE J429) the manufacturer's mark, symbol, logo or I.D. **must** appear on top of the head.



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