



## ARE YOU IN CONTROL?

Torque equipment should be chosen for its accuracy and suitability for the application. It is critical that the equipment is serviced and calibrated to ensure the torque applied is within expected limits. High-speed impact wrenches typically have far less load control than hydraulic wrenches. Hand torque wrenches can provide good accuracy but are subject to damage and must be calibrated frequently. The variation in a torque reading and the resultant bolt load is dependent on many factors, for example:



- Friction in the fastener mating interfaces is affected by lubricant, surface coatings, and surface finish
- Fastener quality including dimensional control
- Tolerances in bolt, nut, and flange dimensional properties
- Tolerances in bolt, nut and flange material properties
- Operator competence
- Procedure used
- Bolt diameter
- Accuracy of a torque application device

### TORQUE AND LOAD



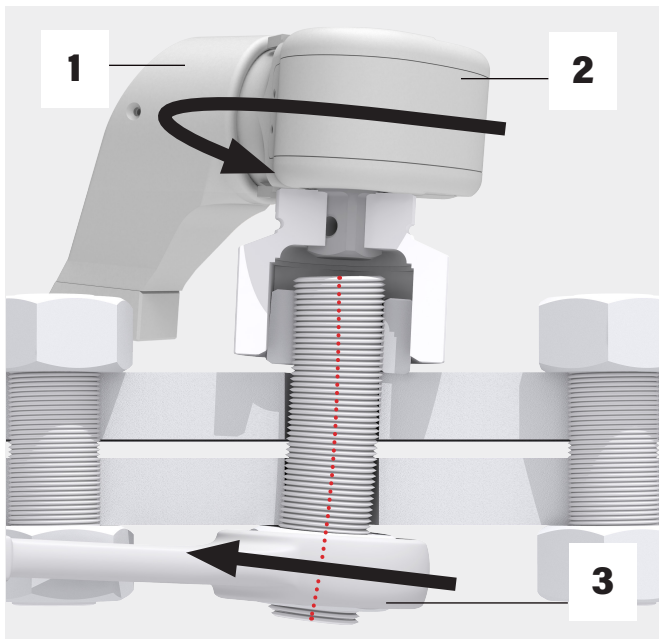
Great care has to be taken in evaluating the frictional conditions and resultant friction factor used in the torque to tension equation to improve the reliability in the correlation between torque and bolt load. The choice of lubricant, surface coating, and fastener quality can improve the torque/bolt load variation.

### HYTORC WASHER SYSTEM



One new hydraulic torque system uses a hardened washer introduced under the load-bearing nut. Its design provides system reaction and reduces torsional stresses associated with traditional torque reaction against the adjacent bolt or joint structure. The washer has a specially prepared bearing surface intended to improve friction consistency in the nut-bearing interface face and bolt load variation.

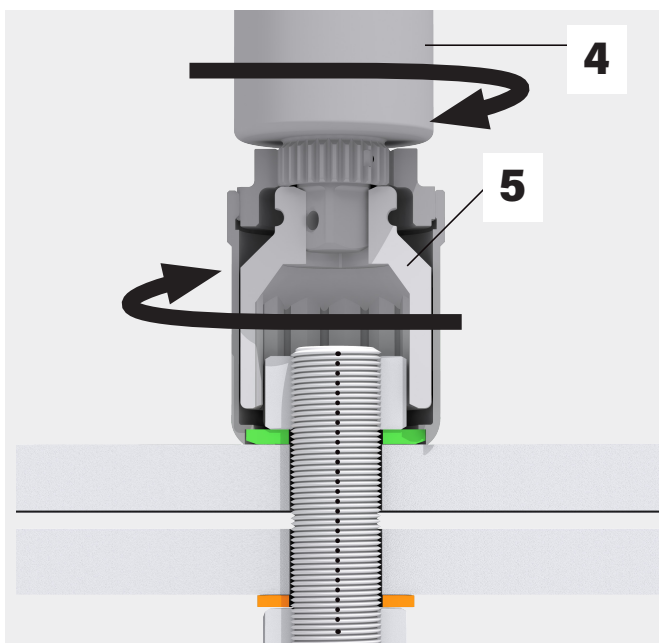
**TORQUE WRENCH USED WITH BACKUP WRENCH**



Torque wrench and backup wrench rotate in same direction.

- 1) Reaction fixture
- 2) Torque wrench
- 3) Backup wrench
- ↻ Incorrect angle and direction of rotation of torque wrench
- ← Incorrect angle and direction of rotation of backup wrench
- ⋯ Yielded bolt center axis

**DOUBLE SOCKET DRIVE USED WITH HYTORC WASHER**



The HYTORC Washer grips surface while the backup washer keeps the bolt in place and square with the surface.

- 4) Torque wrench
- 5) Double socket drive
- HYTORC Washer
- Backup washer
- ↻ Direction of rotation of torque wrench
- ↻ Direction of rotation of double socket drive
- ⋯ Uncompromised bolt center axis

The World's Most Trusted Industrial Bolting Systems

HYTORC owns all content, copyrights, trademarks and patents in this document. © 2020 HYTORC. Any unauthorized use or distribution of any material from this document is strictly prohibited.



**Headquarters:**  
333 Route 17 N., Mahwah, NJ 07430  
+1-201-512-9500

**Email:**  
info@hytorc.com

**Phone:**  
1-800-FOR-HYTORC

**Online:**  
hytorc.com