

**Torque  
Tools**

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## HANDLE TORQUE MULTIPLIERS

### Feature

- Provides the operator with the power to tighten the screws with a fraction of the force required when using conventional tools.
- The rotation of input and output is in the same direction.
- The torque arm is opposite to the direction of entry and must be placed against a stationary object to support the reaction force generated.
- Removing four screws, the head can be easily disassembled for inspection, cleaning and lubrication.



## HANDLE TORQUE MULTIPLIERS

Product Code	Max. Output Ft. Lds.	Multiplication Ratio*	Approx. Ft. Lbs. Rq'd for Max Output	Input Female Sq.	Output male Sq.	Head Thickness Inc. Tang	Head Diam.	Oal Lgth. Inc. Reaction Bar
TM-750LW	1000	3.6 to 1	275	1/2	3/4	3 9/32	3 1/2	22 1/2
TM-1000	2000	3.6 to 1	550	3/4	1	4 3/8	3 17/32	24
TM-1500	4000	3.9 to 1	1150	1	1 1/2	6 1/8	5 3/16	28 7/8
TM-2000	8000	4.6 to 1	1915	1	1 1/2	6 1/4	6 1/2	31
TM-2500	12000	5.4 to 1	2200	1	2 1/2	7 1/4	7 1/4	30

\* The multipliers are mechanical devices that have frictional losses. A factor of 10% was included in the rate of multiplication. For greater precision in the ratio of multiplication, the output should be tested in a torque tester.

## TORQUE MULTIPLIERS WITH PLANETARY GEAR MECHANISM

### Features

- Designed where high torque are necessary for fastening or breaking out stubborn fasteners.
- Allows operator safe and easy means of producing torque for job requirements.
- Precision planetary gear multiply the operator's input from standard torque wrenches.
- Can also multiply the torque from air-driven (non impact) wrenches.



## MULTIPLICADORES DE TORQUE CON MECANISMO DE ENGRANAJE PLANETARIO

Product Code	Max. Output Ft. Lds.	Input Cap	Gear Ratio	Torque Ratio	Input Female Sq.	Output Sq. Size	Overall Length	Head Height Sq. to Top	Head Dia.
TM-290	750	227	4:1	3:3:1	1/2	3/4	8 1/2	3 1/4	2 13/16
TM-391	1200	200	6:3:1	6:0:1	1/2	3/4	19 39/64	4	3 15/16
TM-392	2200	162	15:0:1	13:6:1	1/2	1	19 39/64	5 3/4	4 1/16
TM-393	3200	173	20:25:1	18:5:1	1/2	1	19 39/64	6 1/2	4 1/16
TM-394	5000	189	29:25:1	26:5:1	1/2	1 1/2	14 29/32	8 3/4	5 5/8
TM-395	8000	154	60:1	52:0:1	1/2	1 1/2	15 13/64	10 3/4	5 13/16
TM-396	12000	171	81:1	70:0:1	1/2	2 1/2	19 13/16	12 3/8	7 11/16



## TORQUE MULTIPLIERS WITH REACTION PLATE

### Features

- Input torque holding ratchet - holds multiplier in place during torquing
- Needle bearing construction for high efficiency.
- Standard reaction plate meets most job applications.
- Shearable output squares-to protect tool during overload.
- 1 / 2 "square drive female input.



## LLAVES DE TORQUE

## MULTIPLICADORES DE TORQUE

## TORQUE MULTIPLIERS WITH REACTION PLATE

Product Code	Max. Output Ft. Lds.	Input Cap	Gear Ratio	Torque Ratio	Input Male Sq.	Overall Length	Head Height	Head Dia.
TM-492	2200	162	15:1	13:6:1	1	14	5 1/2	4 7/8
TM-493	3200	173	20:25:1	18:5:1	1	14	6 7/16	4 7/8



## REPLACEMENT SQUARE DRIVES FOR TORQUE MULTIPLIERS

Replacement square drive for planetary- gear and plate reaction torque multipliers reaction plates.

## REPLACEMENT SQUARE DRIVES FOR TORQUE MULTIPLIERS

Product Code	Description
TM-391RSD	Repl. Sq. Drive for TM-391 1/2"
TM-392RSD	Repl. Sq. Drive for TM-392 y TM-492 3/4"
TM-393RSD	Repl. Sq. Drive for TM-393 y TM-493
TM-394RSD	Repl. Sq. Drive for TM-394
TM-395RSD	Repl. Sq. Drive for TM-395



## TORQUE COMPARATOR

Large dual scale. Perfect when a quick review of your wrench is required before usage. Compact design allows installation on any flat surface horizontally or vertically. It is calibrated and certified with "F" NIST. + / - 2% accuracy from 20% of full scale maximum. With Calibration Certificate.

## TORQUE COMPARATOR

Product Code	Square Drive	Capacity (Lbs.)	Inc.	Capacity (Nm)	Inc.
1753-TC	1/2"	175 ft. lbs.	5 ft. lbs.	230 Nm	10 Nm
6004-TC	3/4"	600 ft. lbs.	5 ft. lbs.	800 Nm	20 Nm



### WARNING

- Do not exceed torque capacity.
- The need for periodic recalibration to maintain accuracy.
- Do not use wrenches to loosen fasteners.
- Inspect, clean and lubricate frequently ratchet mechanism with light oil.





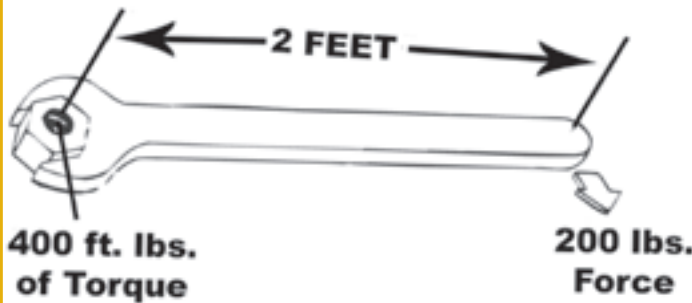
## TORQUE FACTS

### WHAT IS TORQUE?

According Webster:

- A twisting or wrenching effect, or moment, exerted by a force acting at a distance on a body, equals to the force multiplied by the perpendicular distance between the line of action of the force and the center of rotation which is exerted.
- A force, which tends to produce rotation. The measurement of torque is based on the fundamental law of the lever.

Basic Formula of Torque  
 $L \text{ (length)} \times F \text{ (force)} = T \text{ (torque)}$



Example: A two foot lever at a right angle to the fastener with 200 pounds at the end will produce 400 ft / lbs of torque

Formula of Torque  $L \times F = T$

What are we trying to achieve with a torque wrench?

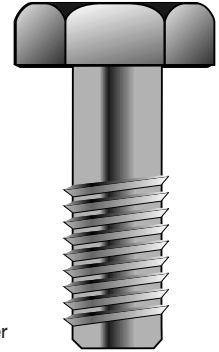
Answer: **Proper Clamping Force**

### TORQUE AND CLAMPING FORCE

Controlling the torque applied in tightening threaded fasteners is the most commonly used method for the application of clamping force. There are many factors which may affect the relationship between torque and clamping force of threaded fasteners. Some of these are: The type of lubricant used on the thread, the material of which the bolt and nut are made, the type of washer used, the class and finish of thread and various other factors. It is not possible to establish a definitive relationship between torque and clamping force which will be applicable for all conditions.

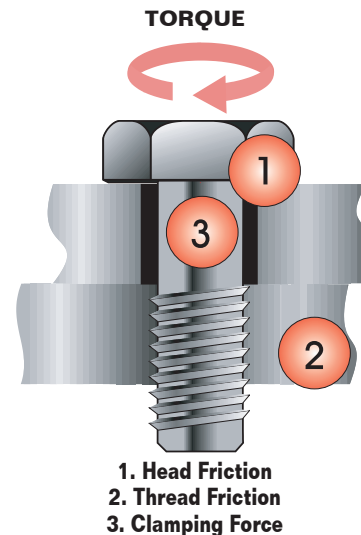
- Torque is expressed in commonly used units of measures, such as:

- in. lbs. = inch pounds
- in. ozs. = inch ounces
- ft. lbs. = foot pounds
- Nm = Newton meter
- cNm = centi Newton meter



### TORQUE VERSUS CLAMPING FORCE

Only a small part of the torque applied to a fastener contributes to clamping force. The remaining, as much as 90% of the total applied torque, is used to overcome friction under the fastener head (or between nut and washer) and friction in the thread engagement.



### TORQUE

Head Friction:  
45% - 55%

Thread Friction:  
35% - 45%

Fuerza de Cierre:  
10%

