## CERTIFICATION

This torque wrench is certified to have been calibrated prior to shipment by the manufacturer to the following accuracy:

**Model 44478 (150 ft-lb capacity)**

± 3% on all readings above 30 Foot Pounds

± 1 ft-lb on readings below 30 Foot Pounds

**Model 44479 (75 ft-lb capacity)**

± 3% on all readings above 15 Foot Pounds

± 1/2 ft-lb on readings below 15 Foot Pounds

Meets Fed. Spec. GGG-W-686 for accuracy.

## FULL 90 DAY WARRANTY ON CRAFTSMAN DIGITORK™ MICRO ADJUSTING TORQUE WRENCH

If, within 90 days from the date of purchase, this **CRAFTSMAN DIGITORK™** Micro Adjusting Torque Wrench fails due to a defect in material or workmanship, Sears will repair and/or calibrate it free of charge.

## LIMITED WARRANTY

After 90 days and until one year from the date of purchase, Sears will repair any defect in material or workmanship in the torque wrench, free of charge. This warranty coverage does not include recalibration.

WARRANTY SERVICE IS AVAILABLE BY RETURNING THE WRENCH TO THE NEAREST SEARS STORE IN THE UNITED STATES.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Sears, Roebuck and Co. BSC 41-3, Sears Tower, Chicago, IL 60684

Dated 6-1-81

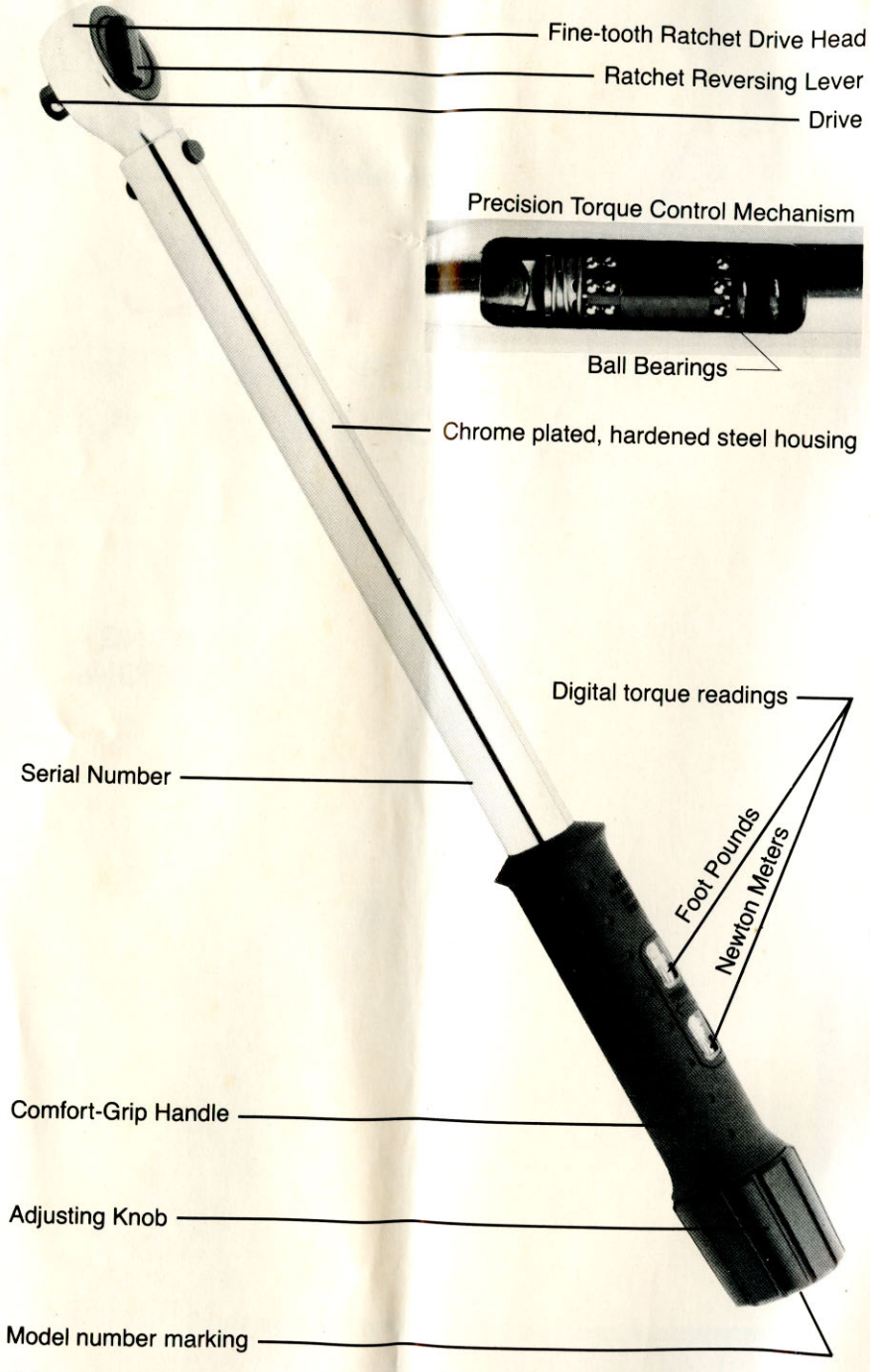
Sears Best CRAFTSMAN®

# DIGITORK™

# MICRO-ADJUSTING TORQUE WRENCH

## OPERATING INSTRUCTIONS

Sold by SEARS, ROEBUCK AND CO., Chicago, IL 60684, USA






## GENERAL DESCRIPTION

The **CRAFTSMAN DIGITORK™** Micro-Adjusting Torque Wrench indicates when the set torque setting has been reached by momentarily releasing the Drive Head for a few degrees of free travel, which is easily felt by the operator. In addition, an audible "click" signal is heard, except at very low torque settings. The torque setting is shown directly in one of the two Viewing Windows — one window for English settings, the other for Metric. The torque setting is adjusted by unlocking and turning the Adjusting Knob located at the Handle end of the wrench. Fine-Tooth Ratcheting Head accommodates sockets, fasteners and other attachments.

The **CRAFTSMAN DIGITORK™** Micro-Adjusting Torque Wrench offers many advantages over other types of torque wrenches. With no pointers to watch, it can be used with ease, speed and full confidence in places of limited accessibility or insufficient light. Unlike on other types of micrometer adjustable wrenches, the torque setting, whether English or Metric, is shown by a single number, thus practically eliminating errors in reading torque values.

The internal release mechanism is mounted on ball bearings, which, by greatly reducing friction, make the wrench more accurate and consistant. It is not at all necessary, or in any way advantageous, to "click" the wrench a few times prior to operating it — a cumbersome procedure often necessary with other makes of torque wrenches. The Comfort-Grip Handle fits comfortably and securely into hand for easy operation.

CAUTION: Read rules and instructions carefully for safe operation.

## SETTING THE TORQUE


Before adjusting the wrench to the desired torque setting, **make sure** that you are using the correct torque units. Torque values may be given in units of Inch Pounds, Foot Pounds, Meter Kilogram or Newton Meters. Your **DIGITORK™** wrench is calibrated in Foot Pounds (upper window) and Newton Meters (lower window).

All other torque values must be converted to these units first:

| To obtain | Multiply | By |
|---|---|---|
| Foot Pounds | Inch Pounds | .0833* |
| | Meter Kilograms | 7.233 |
| Newton Meters | Inch Pounds | .1130 |
| | Meter Kilograms | 9.807 |

*Foot Pounds can also be obtained by dividing Inch Pounds by 12.

## TO SET THE TORQUE:

1. Pull the adjusting knob out to unlock the mechanism.
2. While holding the adjusting knob unlocked, turn it clockwise to increase the torque, and counterclockwise to decrease torque. Keep turning until the desired torque reading shows in the readout window. Although the wrench is calibrated to torque correctly with the reading in any position within the window, best accuracy is obtained by centering the number.
3. Lock the setting by releasing and, if necessary, pushing the adjusting knob in. The knob might be turned slightly back and forth without changing the torque setting to assure proper engagement of teeth in the locking mechanism.

WARNING: DO NOT turn the adjusting knob more than one revolution either below the lowest scale reading or above the highest scale reading.



## APPLYING THE TORQUE

1. Attach the proper socket or other attachment to the drive. Set the reversing lever for the proper direction of operation.

NOTE: If drive extensions or attachments are used, torque setting must be corrected in accordance with the directions given on page 6.

2. Insert the socket or attachment onto the fastener to be torqued.
3. Utilizing the ratcheting head, you may "spindown" the fastener until resistance is felt.
4. Holding the wrench BY THE GRIP ONLY,* apply SLOW AND STEADY pull until a momentary release impulse is felt. Release tightening pressure right at this moment.

WARNING: At low torque settings the release is gentle and there usually is no audible 'click' signal. Learn how the release feels BEFORE you torque to avoid accidental overtightening or damage.

*When using long sockets or concentric extensions, the wrench may be supported at the head (only at the head!) with only negligible effects on accuracy.

5. The wrench resets automatically and is ready for the next operation.

## IMPORTANT SUGGESTIONS

1. Threads on bolts, nuts and other mating components should be clean and smooth. A lubricant applied to the threads and under the head of bolts will produce more accurate and consistent results.
2. Never torque a fastener that is already tightened. Loosen it first, then re-torque to the desired value.
3. When tightening many fasteners holding one component (engine head, pipe flanges, etc.) follow manufacturer's recommended procedures. If such procedures are not available, torque in a criss-cross manner first to 60-70% of the desired torque, then to the final torque.

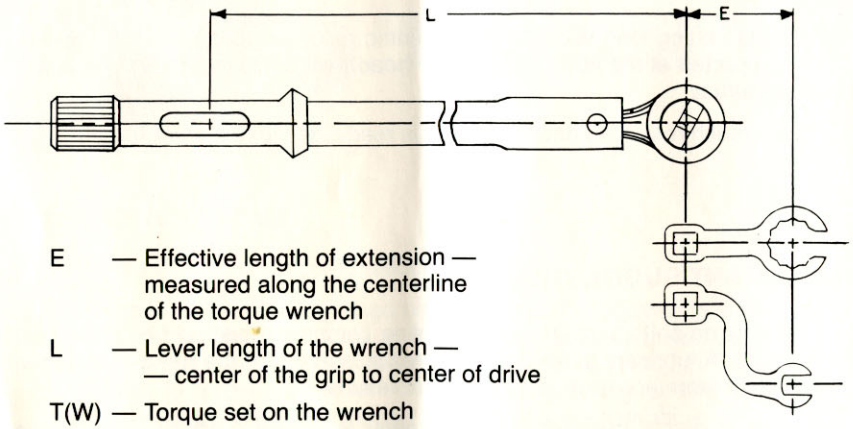
## EXTENSIONS

1. HANDLE EXTENSIONS

   Handle extensions (a piece of pipe put onto the wrench in order to make torqueing easier) SHOULD NOT BE USED under any circumstances. Their use will result in erroneous torque readings, and may damage the grip or the adjusting mechanism. While applying torque, the wrench should be held ONLY BY THE GRIP. At high torque readings, if both hands are necessary to apply enough pressure to operate the wrench, hold the grip in one hand, and put the other hand on the top of the first hand, never on the wrench body.

2. DRIVE EXTENSIONS

   There are two types of drive extensions. Concentric extensions extend directly along the centerline of the drive and as such do not affect the torque readings. Other extensions and attachments extend to points away from the centerline of the drive and the torque applied with them is different from the torque set on the wrench. Use the following formulas to calculate the correct torque.




E — Effective length of extension — measured along the centerline of the torque wrench

L — Lever length of the wrench — — center of the grip to center of drive

T(W) — Torque set on the wrench

T(E) — Torque applied by the extension

$$T(W) = T(E)\frac{L}{L+E} \qquad T(E) = T(W)\frac{L+E}{L}$$



## PROPER CARE AND MAINTENANCE

1. The **CRAFTSMAN** DIGITORK™ Micro-Adjusting Torque Wrench is a precision instrument and should be handled and stored with care. IT SHOULD NEVER BE USED AS A HAMMER OR PRYBAR.
2. DO NOT apply more torque than the rated capacity of the torque wrench. Do not use as a nut-breaker!!
3. When the wrench is not in use, keep it set below 25% of capacity. If, accidentally, you leave the wrench set at a reading over 50% of the wrench capacity for more that a few hours, set the wrench at the lowest setting and leave it there for a minimum of four (4) hours before using it again.
4. The wrench is lubricated for life with a special lubricant. Do not oil it in any manner except that the ratchet head may be lubricated as needed for smooth operation.
5. The plastic grip is not affected by petroleum products, but it will be damaged by acetone and certain industrial solvents. It may be cleaned with a clean cloth wetted in mineral spirits or denatured alcohol. *NEVER IMMERSE THE WRENCH OR ANY PORTION OF IT IN ANY LIQUID!*
6. Periodically, the wrench should be checked for accuracy. This should be done regularly if the wrench is used frequently or is subjected to abnormal handling or storage. In assembly line type of usage, the wrench should be checked every 10,000 cycles (torque applications). Calibration service is available by returning your wrench to the nearest Sears store.
7. Do not attempt to repair the wrench yourself. Repair service is available by returning your wrench to your nearest Sears store.

## WHAT IS TORQUE?

Torque, by definition, is the result of a force applied to an object through a lever arm, thus tending to rotate the object.

$$T = F \times L$$

T — Torque
F — Applied Force
L — Lever length measured from the center of rotation to, and at 90° to, the direction of force.

Since both force and length can be expressed in many different units of measurements, so can torque. However, the most common units are: Inch pound (in-lb or lb-in), foot pound (ft-lb or lb-ft), meter kilogram (m-kg) and newton meter (n·m).

When torque is applied to a threaded fastener, it produces a clamping force that holds the components together. Too much force, and the fastener will break. Not enough, and the assembly will not stay together. By controlling the amount of torque, the clamping or holding force is controlled.

## WHY IS TORQUE IMPORTANT?

SAFETY: Bolts or nuts which are not tightened enough may vibrate loose, while overtightened ones may break.

ECONOMY: Improperly tightened components may cause damage or accelerated wear. "Blown out" gaskets and broken head bolts are typical examples of such costly errors.

PERFORMANCE: Today's equipment is made of many precision parts which needs to be assembled just right to achieve maximum efficiency and performance. Improperly tightened head bolts may result in poor compression, overtightened bearings may bind, etc.



## GENERAL CONVERSION TABLE FOR TORQUE UNITS

| TO OBTAIN / MULTIPLY NUMBER OF (BY) | Inch Ounces | Inch Pounds | Foot Pounds | Centimeter Kilograms | Meter Kilograms | Newton Meters |
|---|---|---|---|---|---|---|
| Inch Ounces | 1 | 16 | 192 | 13.89 | 1389 | 141.6 |
| Inch Pounds | .0625[1] | 1 | 12 | .8680 | 86.80 | 8.851 |
| Foot Pounds | .00521 | .0833[2] | 1 | .07233 | 7.233 | .7376 |
| Kilogram-Centimeters | .0720 | 1.152 | 13.82 | 1 | 100 | 10.20 |
| Kilogram-Meters | .000720 | .01152 | .1382 | .01 | 1 | .1020 |
| Newton-Meters | .00706 | .1130 | 1.356 | .0981 | 9.807 | 1 |

[1] or divide by 16
[2] or divide by 12

## GENERAL TORQUE SPECIFICATION CHART FOR ENGLISH FASTENERS (in Foot Pounds)*

| MATERIAL OR GRADE / BOLT SIZE | SAE 2 (Mild Steel) | SAE 5 | SAE 8 | SOCKET HEAD CAP SCREWS | BRASS | Stainless AISI TYPE 303 |
|---|---|---|---|---|---|---|
| 1/4-20 | 6 | 11 | 12 | 13 | 5 | 5 |
| 1/4-28 | 7 | 13 | 15 | 16 | 6 | 7 |
| 5/16-18 | 13 | 21 | 25 | 27 | 8 | 9 |
| 5/16-24 | 14 | 23 | 30 | 33 | 9 | 10 |
| 3/8-16 | 23 | 38 | 50 | 52 | 15 | 17 |
| 3/8-24 | 26 | 40 | 60 | 60 | 16 | 18 |
| 7/16-14 | 37 | 55 | 85 | 86 | 23 | 25 |
| 7/16-20 | 41 | 60 | 95 | 95 | 25 | 28 |
| 1/2-13 | 57 | 85 | 125 | 130 | 32 | 37 |
| 1/2-20 | 64 | 95 | 140 | 145 | 34 | 40 |
| 9/16-12 | 80 | 125 | 175 | 180 | 44 | 50 |
| 9/16-18 | 91 | 140 | 195 | 210 | 48 | 54 |
| 5/8-11 | 111 | 175 | 245 | 255 | 68 | 75 |
| 5/8-18 | 128 | 210 | 270 | 290 | 73 | 80 |

*These torque values are approximate and should not be accepted as accurate limits. Indeterminant factors (surface finish, type of plating and lubrication) in specific applications preclude the publication of accurate values for universal use. Manufacturers of various types of equipment usually provide specific tightening instructions which should be followed. **DO NOT USE** the above values for gasketed joints or joints of soft materials.



## GENERAL TORQUE SPECIFICATION CHART FOR METRIC FASTENERS (in Newton Meters)*

| MATERIAL CLASS / BOLT DIAM. MM | BOLT DIAM. INCH | 4.6 | 4.8 | 5.8 | 8.8 | 9.8 | 10.9 | 12.9 |
|---|---|---|---|---|---|---|---|---|
| 5 | .197 | 3 | 4 | 5 | 7 | 8 | 11 | 12 |
| 6 | .236 | 5 | 6 | 8 | 12.5 | 14 | 17 | 20 |
| 6.3 | .248 | 5.5 | 8 | 9.5 | 14 | 16 | 21 | 24 |
| 8 | .315 | 12 | 16 | 20 | 30 | 34 | 44 | 50 |
| 10 | .394 | 23 | 32 | 40 | 60 | 70 | 85 | 100 |
| 12 | .472 | 40 | 56 | 70 | 103 | 120 | 150 | 180 |
| 14 | .551 | 65 | 90 | 110 | 167 | 190 | 240 | 280 |
| 16 | .630 | 100 | 140 | 170 | 270 | 290 | 380 | 440 |
| 18 | .709 | 137 | 177 | 225 | 350 | — | 480 | 580 |
| 20 | .787 | 200 | — | 330 | 520 | — | 740 | 860 |

*These torque values are approximate and should not be accepted as accurate limits. Indeterminant factors (surface finish, type of plating and lubrication) in specific applications preclude the publication of accurate values for universal use. Manufacturers of various types of equipment usually provide specific tightening instructions which should be followed. **DO NOT USE** the above values for gasketed joints or joints of soft materials.