

Snap-on®

ETT

Electronic Torque Tester

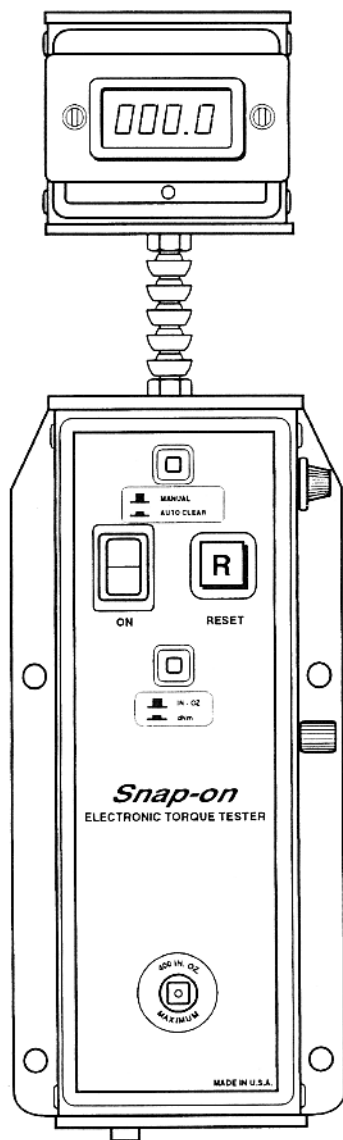


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ETT Electronic Torque Tester

IMPORTANT SAFETY INSTRUCTIONS

This manual contains important safety and operating instructions for the Electronic Torque Tester (ETT).

Read All Instructions

Read, understand and follow all safety messages and instructions in this manual and on the test equipment. Safety messages in this section of the manual contain a signal word, a three-part message, and, in some instances, an icon. An icon, when present, gives a graphical description of the potential hazard.

General Cautions

Snap-on Tools Company cannot anticipate or provide safety warnings and cautions to cover every situation that may be encountered when operating, servicing or repairing this tester. It is the responsibility of operators and servicing technicians to be knowledgeable about the procedures, tools and materials used, and to satisfy themselves that the procedures, tools and materials will not compromise their safety.

Do not attempt to operate this electronic torque tester until you have thoroughly read and completely understand all instructions and safety information in this manual. Failure to comply can result in accidents involving fire, electric shock or serious personal injury. Save this manual and review it frequently for continued safe operation, and use it to instruct others who may use this tester.



Snap-on Tools Company is not responsible for customer modification of test equipment for applications on which **Snap-on** Tools Company was not consulted.

General Safety

WARNING



Improper use can cause breakage.

- **Read instructions before operating.**
- **Follow manufacturer's instructions, safety precautions, and specifications when operating tools.**

Broken equipment can cause injury.



Flying particles can be discharged when applying torque.

Users and bystanders must wear safety goggles.

Flying particles can cause injury.



Risk of entanglement.

- **When starting power tools, check for obstacles near your hand and anticipate the reaction force by gripping the tool firmly.**
- **Do not wear loose clothing and jewelry while operating a power tool. Loose clothes and jewelry can be caught in moving parts.**
- **Keep body parts away from rotating parts.**
- **Wear a protective hair covering to contain long hair and prevent contact with moving parts.**
- **Do not overreach. Keep proper footing and balance at all times.**

Entanglement can cause injury.

Torque Tester Safety

WARNING

- **Be sure ratings for all components, including, adaptors, extensions, drivers and sockets, match or exceed the torque being applied.**
- **Do not use this instrument with power off. Always turn on power to meter so torque values display.**
- **Be sure the capacity of the ETT matches or exceeds each application before performing a procedure.**
- **Pull on a wrench handle—do not push—and adjust stance to prevent a possible fall.**
- **Do not use extensions, such as a pipe, on a wrench handle.**
- **Fully engage the direction lever in the correct position when using ratchets.**

- Never attempt to test an impact tool or pulse type tool on this instrument.
- Mount the ETT securely to a heavy bench, wall or other support structure before applying torque.
- Do not use the ETT if it makes unusual noises, has loose parts, or shows any other sign of damage. Have repairs performed at an Authorized Service Center before use.
- Do not use chipped, cracked, or damaged sockets and accessories.
- Do not remove any labels. Replace any damaged label.

Charger Safety

WARNING



Risk of electric shock and fire.

- Do not allow conductive objects to come in contact with terminals. 120 or 220 volts present at charger terminals.
- For indoor use only. Do not expose charger to rain or snow. Do not use in damp locations.
- Replace defective cord immediately. Return to qualified service center for replacement.
- Do not use any other type of charger. Using a charger not specifically designed for this unit may cause the battery to burst, releasing caustic chemicals.
- Do not use an extension cord with charger.
- Do not use a damaged charger.
- Do not disassemble charger.
- Do not attempt to connect two chargers together.
- Do not operate charger with damaged cord or plug. Replace immediately.
- Do not operate charger after it is dropped, receives a sharp blow or damaged. Take the charger to an Authorized Service Center.
- Unplug charger from outlet before maintenance or cleaning. Turning off controls is not adequate to avoid hazard.
- Read all instructions and safety messages on battery and battery charger before use.

Electric shock or fire can cause injury.

SAVE THESE INSTRUCTIONS

Introduction

Use the portable ETT to test all torque wrenches, including torque screwdrivers, preset "click" wrenches and drivers, and non-impact, non-pulse type pneumatic and electric nut-runners and drivers.

The tester features a swivel-neck LCD display with a selectable English or Metric readout. Eight models are available, ranging from 100 in oz to 600 ft lbs.

The ETT displays torque values using a built-in strain-gaged transducer with an accuracy of ± 0.5 percent of display from 10–100% of full range, in clockwise (CW) and counter-clockwise (CCW) directions.

Torque Values

Capture and display torque values in one of four switch-selectable modes:

- **TRACK**
 - Provides a real-time display of CW or CCW torque as applied. Also used during tester calibration procedures.
- **PEAK HOLD**
 - Captures and displays the highest torque applied, CW or CCW, until reset. Use to check dial, beam, and torque-limiting wrenches and drivers.
- **FIRST PEAK**
 - Responds to the dip in torque caused by the "click" of an adjustable or preset wrench. FIRST PEAK torque is measured, captured and displayed just prior to the dip, even if click torque is subsequently exceeded. An audible "beep" and a visible LED alert the operator to note the display reading.
- **POWER TOOL**
 - Used to test or setup non-impact, non-pulse type pneumatic or electric "nut runner" type tools. Generally used with hard/soft joint rate simulator accessories.



This manual contains general information. Operating features and specifications may change without notice. **Snap-on** Tools makes no claims regarding the suitability of the information in this manual for diverse user applications.

Power Source

The power source for the ETT is an internal, rechargeable nickel cadmium battery. The tester can also be operated directly from the AC adapter/charger that accompanies the tester.

Functional Description

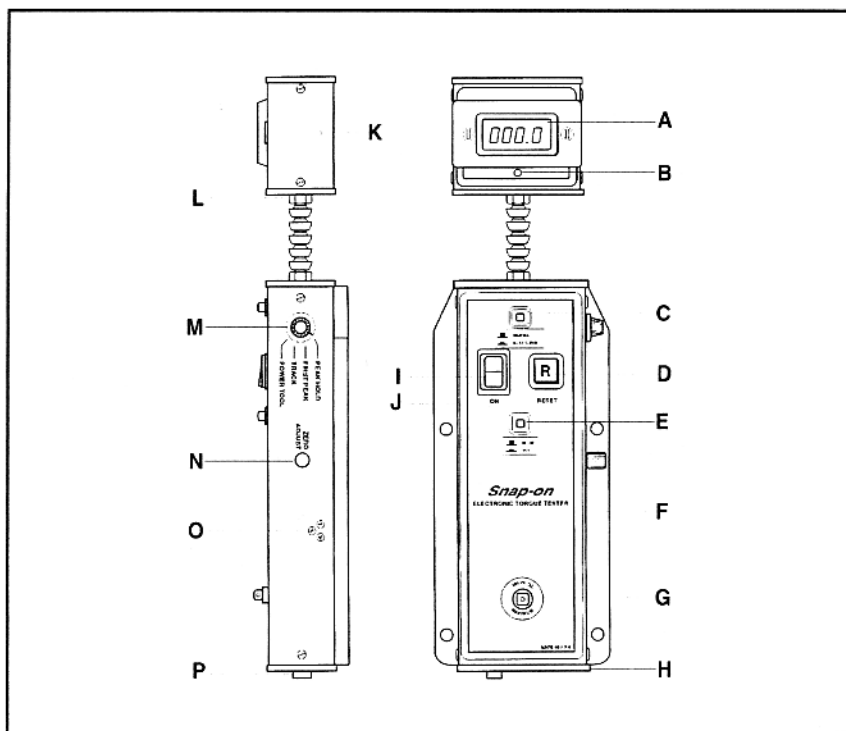


Figure 1: Electronic Torque Tester (ETT), Front and Side Views

A — Display

A four digit liquid crystal display for torque readings. A LOW BATTERY message displays in the upper left corner when recharging is required.

B — LED Alert

Light emitting diode flashes red momentarily when tester is powered and torque is captured in FIRST PEAK mode.

C — MANUAL/AUTO Selector

Pushbutton for MANUAL or AUTO mode selection.

- Out-MANUAL
- In-AUTO



AUTO clears captured display reading after two seconds.

D — Reset

Pushbutton clears captured display readings in MANUAL CLEAR mode.

E — Display Units

Pushbutton selector for English or Metric units of measure on the LCD. Select before applying torque.

- Out-English (in oz, in lb, ft lb)
- In-Metric (cNm, dNm, Nm)

F — Mounting Plate

Plate for securing tester to mounting surface. Use four 1/4" diameter bolts.

G — Transducer

External square drive for internal-internal drive adaptor, joint rate simulator or calibration test bar.

H — Battery Access

Nickel cadmium battery housing panel. Remove two screws to access battery.

I — Power Switch

Rocker switch turns power to tester on and off.

J — Zero Calibration Screw

Adjustment screw that calibrates the zero adjust knob.

K — Audible Alert

Signal sounds momentarily when:

- Power to tester is initiated, and
- Torque capture is in FIRST PEAK mode.

L — Swivel Display Head

Holds the display for view from any angle.

M — Mode Selector

Switch for selecting tester mode. When selected:

- PEAK HOLD captures maximum torque applied.
- FIRST PEAK displays maximum torque captured prior to preset wrench "click."
- TRACK displays torque being applied.
- POWER TOOL displays run-down and captured peak torque when used with joint simulator.

N — Zero Adjust

Knob adjusts the display to all zeros in the TRACK mode and during setup.

O — Calibration Adjust Screws

Adjustment screws used to display exact torque applied during calibration. For additional information refer to *Calibration*.

P — Charger Jack

Receptacle (9V @ 200 ma) for charging or continuous AC operation.

Specifications

Display

LCD on swivel neck
0.43" characters

Display Capacity

4 digits, 9,999 counts

Accuracy

$\pm 0.5\%$ of reading ± 1 count in the least significant digit
(10–100% of full range) at 25°C

Stability

+0.044% per °C

Units Of Measurement

Refer to model information

Front Panel Controls (Pushbuttons)

- Display Units
 - English
 - Metric
- MANUAL/AUTO Selector
 - MANUAL
 - AUTO
- Reset

Side Panel Controls

- Zero adjust
 - $\pm 5\%$ of full range tare
- Mode selector
 - TRACK
 - PEAK HOLD
 - FIRST PEAK
 - POWER TOOL

Operating Temperature

5–42°C (40–110°F)

Storage

-20–50°C (-2–122°F)

Humidity

Up to 90%, non-condensing

Dimensions

Width	4.5"
Height	14.6"
Depth	2.5"

Weight

4.5 lbs

5.0 lbs QC4ETT600

Battery

Two 9V Nickel cadmium, replaceable

Charge Life

8 hours continuous, full charge to LOW BATTERY flag

Battery Charger

Input 120VAC or 220VAC (50-60 Hz)

Output 9VDC, 200 ma

Integral Transducer

Full bridge strain gage,

350 ohms, 1500 μ E, 3mV/V F.S., 3.75V excitation

Transducer Range and Display Resolutions

ETT built-in transducers provide industry standard external square drives, and a full bridge strain gage sensing element. Each unit is supplied with an internal-to-internal drive adapter.

User calibration of ETT transducer is possible, with a known input torque of **Snap-on** precision length torque bars and certified weights. For additional information refer to *Calibration*.

IMPORTANT

Apply torque loads only. Never side-load a wrench, driver or power tool while installed on the tester transducer.

IMPORTANT

Transducers can withstand a torque of 10% over full range. Do not use the tester if the transducer:

- Does not zero,
- Does not calibrate, or
- Has been over-torqued.

Contact your **Snap-on** representative for service and/or calibration.

Display resolution is related to display capacity and the full range capability of the particular ETT model used. The table below describes minimum and maximum display ranges.

Part Number	Square Drive	Units	
		English	Metric
QC1ETT10	1/4"	10.0–100.0 in oz	7.0–70.6 cNm
QC1ETT400	1/4"	40.0–400.0 in oz	28.2–282.4 cNm
QC1ETT50	1/4"	5.00–50.00 in lb	5.65–56.50 dNm
QC1ETT100	1/4"	10.0–100.0 in lb	11.3–113.0 dNm
QC2ETT250	3/8"	25.0–250.0 in lb	28.2–282.5 dNm
QC2ETT1000	3/8"	100–1000.0 in lb	113–1130 dNm
QC3ETT250	1/2"	25.0–250.0 ft lb.	33.9–339.0 Nm
QC4ETT600	3/4"	60.0–600.0 ft lb	81.3–813.6 Nm

Setup

Mounting

Mount the ETT to a sturdy support before use. Torque testing and calibration procedures may involve hundreds of pounds of load. Be sure to consider counterweight of the mount to accommodate torque operations and calibration fixtures and weights. Allow enough room around and below the mount for the wrenches or calibration fixtures being used.

Vertical mounting on a wall or heavy pillar is preferred for most wrench and tool testing as shown in the illustration below. Use four 1/4" diameter bolts to insure a secure mount. The ETT can also be mounted vertically to a horizontal surface using the optional right angle bracket. For additional information refer to *Accessories*.

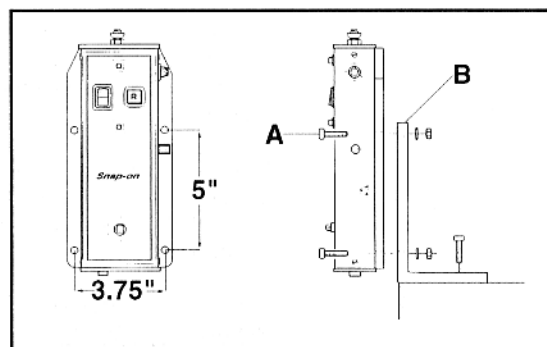


Figure 2: Mounting, Dimensions and Right Angle Bracket

A – Mounting Screw (4)

B – Right Angle Bracket

The ETT must be mounted horizontally for some applications. Horizontal mounting may be more appropriate for your torque testing methods and safer if mounting the tester on a roll-around cart.



Calibration cannot be performed when the ETT is mounted horizontally.

Tester Setup

The nickel cadmium batteries for the tester must be recharged for approximately 24 hours when first received and after extended storage. The tester can be used with the charger permanently installed after an initial charge of about one hour.

1. Turn the power switch on.
2. Select AUTO CLEAR by pushing in the MANUAL/AUTO CLEAR button.
 - A small red flag displays when the button is in.
3. Select English or Metric display units.
 - Out-English
 - In-Metric
4. Select TRACK mode using the mode selector switch located on the side of the unit.
5. Turn the zero adjust knob to the right or left until all four digits on the display are zeroes.



The tester displays an absolute value in the CW and CCW directions from zero. Therefore, the display value increases on both sides of the zero adjustment center.

6. The ETT is ready for testing. For additional information refer to *Tests*.

Setup Tips

- ☐ Always use AUTO CLEAR when in the TRACK mode.
- ☐ Select manual or auto clear in PEAK HOLD, FIRST PEAK, or POWER TOOL MODES.
 - MANUAL CLEAR holds display readings until the reset (R) button is pushed.
- ☐ AUTO CLEAR resets the captured display after about two seconds. Use for repeated wrench cycling.
- ☐ ETT captures readings in the PEAK modes by detecting a 5% minimum dip in input torque.
- ☐ Captured readings may decrease a few counts in the PEAK modes while the display updates.

Tests

Testing Wrenches and Drivers

IMPORTANT

- To avoid damage, be sure the ETT model being used is capable of handling the torque being applied.
- Always position a torque wrench within 15° of perpendicular to the display housing.

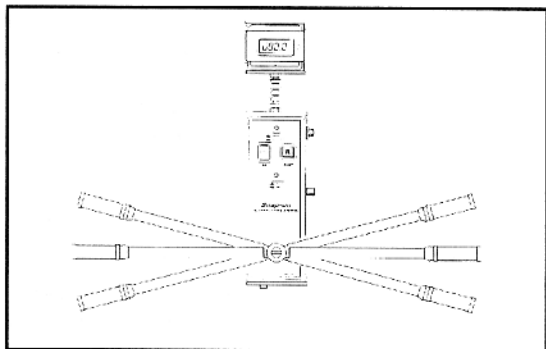


Figure 3: Wrench Position, Perpendicular to Tester

Dial and Beam Wrenches and Screwdrivers

1. Prepare tester for use. For additional information refer to *Tester Setup*.
2. Select the TRACK mode.
3. Install the tool on the torque transducer using the internal-internal drive adaptor. For additional information refer to *Figure 3*.
4. Slowly apply torque until the tester displays the full scale torque of the tool. Release torque and repeat twice to exercise tool and tester transducer.
5. Remove the tool. Zero the tester and tool, if necessary.
6. Select PEAK HOLD.
 - ✓ Select MANUAL CLEAR, if desired.
7. Reinstall the tool. Slowly apply torque until desired working torque of the tool or about 70% of the tool's full range displays.

8. Release torque and note the PEAK reading on the tester. The percentage of difference between tester and tool readings should not be greater than the sum of their respective accuracies.

Example

Wrench accuracy is 4%

Tester accuracy is 0.5%

Readings should be within $\pm 4.5\%$

Preset "Click" Wrenches and Screwdrivers

1. Prepare tester for use. For additional information refer to *Tester Setup*.
2. Select the TRACK mode.
3. Adjust the micrometer or preset knob on the tool to the desired working torque.
4. Install the tool on the torque transducer using the internal-internal drive adaptor. For additional information refer to *Figure 3*.
5. Slowly and smoothly, apply torque until the tool "clicks." Release the torque, and repeat twice to exercise the tool and the tester transducer.
6. Remove the tool and zero the tester, if necessary.
7. Select the FIRST PEAK mode.
8. Reinstall the tool. Slowly and smoothly apply torque until the tool "clicks."
 - The highest torque captured just prior to the click displays.
 - The audible alert sounds momentarily and the LED alert flashes.
 - The tester holds the display for about two seconds.
9. Release the torque and note the FIRST PEAK reading. The percentage of difference between tester and tool readings should not be greater than the sum of their respective accuracies.

Example

Wrench accuracy is 4%

Tester accuracy is 0.5%

Readings should be within $\pm 4.5\%$

Testing Power Tools

The dynamic torque characteristics of a power tool and the static torque applied when using a wrench usually result in different torque readings. Spinning electric and pneumatic motor armatures contain inertia that produce a higher torque reading than what is actually absorbed by a fastener. The difference is also due to individual fastener installation characteristics ranging from a gradually increasing run-down torque (soft joint), to a free speed, sudden dead-stop (hard joint).

Joint Rate Simulator

Use a joint rate simulator when testing a power tool to allow start-up rotation of the tool's armature. It is also experimentally adjusted to replicate the individual joint hardness of the intended work. For additional information refer to *Accessories*.

IMPORTANT

To avoid damage, be sure the ETT in use is capable of handling the maximum torque being applied.

⚠ WARNING

Be sure to operate pneumatic or electrical power tools according to manufacturer's instructions.

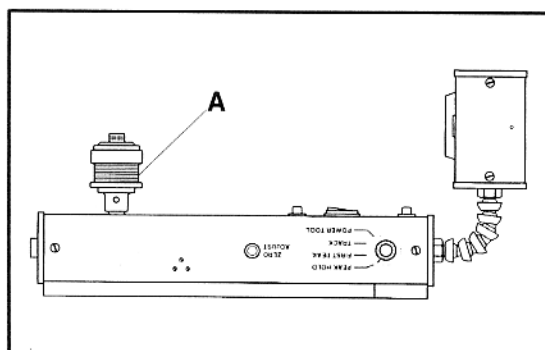


Figure 4: Joint Rate Simulator, Installed

A – Joint Rate Simulator

1. Prepare tester for use. For additional information refer to *Tester Setup*.
2. Select tester to TRACK mode.
3. Adjust the power tool to the desired torque limit, if possible.

4. Adjust the joint rate simulator assembly for the desired soft/hard configuration.
5. Install the joint rate simulator on the tester transducer and secure its set screw. Loosen the simulator load screw using the appropriate hex or box wrench.
6. Couple the power tool to the joint rate simulator using the appropriate accessory adapter and bit.
7. Apply torque until the power tool motor stalls or the clutch slips. Do not add torque by turning the tool manually.
8. Remove the power tool. Loosen the joint rate simulator load screw and repeat steps 6–8 twice to exercise the tool/simulator assembly and the tester transducer.
9. Remove the tool and zero the tester, if necessary.
10. Loosen the joint rate simulator load screw.
11. Select the POWER TOOL mode.
12. Reinstall the tool. Apply torque until the power tool motor stalls or the clutch slips. Do not add torque by turning the tool manually.
13. Release the torque and note the tester reading. The percentage difference between the tester and power tool readings should not be greater than the sum of their respective accuracies.

Example

Power tool accuracy is 10%

Tester accuracy is 0.5%

Readings should be within $\pm 10.5\%$.

Calibration

IMPORTANT

Owner calibration of the Electronic Torque Tester (ETT) voids factory certification. Calibration is recommended at least every 12 months. Contact your authorized **Snap-on** representative for calibration and service.

Required Equipment

- Precision test bar, hanger, and certified calibration weights.
- Small (0.1") flat blade screwdriver.

The tester must be mounted vertically to use precision test bars and hanging weights. For additional information refer to *Figure 5*.

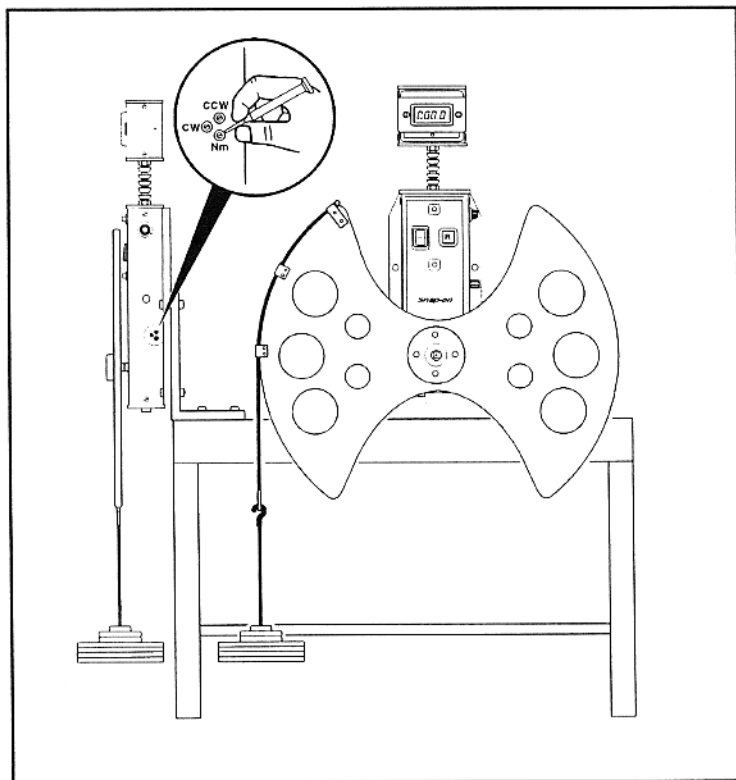


Figure 5: Calibration Mounting, Test Bars and Hangers

1. Connect the AC charger to the tester and turn the power switch on. Allow at least 10 minutes for warm-up.
2. Select AUTO CLEAR—pushbutton in, red flag visible.
3. Select TRACK mode.
4. Select English units—pushbutton out.
5. Install the appropriate test bar. For additional information refer to *Calibration Chart*.
6. Zero the display using zero adjust knob on right side of tester.
 - ✓ The tester displays an absolute value in the CW and CCW directions from zero. Therefore, the display value increases on both sides of the adjustment center. Adjust for zero slowly. The display updates every two seconds in AUTO CLEAR mode.
7. Exercise the built-in transducer CCW three times by loading and unloading the left side of the test bar, with appropriate weight, to full range.
8. Remove weights without removing the test bar and readjust zero, if necessary.
9. Apply 100% of tester full range capacity in CCW torque.
10. Adjust upper calibration screw on right side of tester, if necessary, to display exact torque applied.
11. Select Metric units—pushbutton in.
12. Adjust lower calibration screw on right side of tester, if necessary, to display the exact torque applied.
13. Select English units—pushbutton out.
14. Exercise built-in transducer CW three times by loading and unloading the right side of the test bar, with appropriate weights, to full range.
15. Remove weights without removing the test bar and readjust zero, if necessary.
16. Apply 100% of tester full range capacity in CW torque.

17. Adjust the center calibration screw on right side of tester, if necessary, to display exact torque being applied.
18. Apply 10%, 50%, and 100% torque in both directions to check calibration. If accuracy is worse than $\pm 0.5\%$ ± 1 count, repeat calibration procedure.

Calibration Chart

Model Bar and Hanger	Check Point 10, 50, 100%	Metric Conversion	Weights To Add (more than 1)
<i>QC1ETT10</i>	10.0 in oz	7.0 cNm	none
Bar 2.5"	50.0 in oz	35.3 cNm	1 lb
Hanger 1/4 lb	100.0 in oz	70.6 cNm	1/4 lb, (2) 1 lb
<i>QC1ETT400</i>	40.0 in oz	28.2 cNm	1/2 lb
Bar 2.5"	200.0 in oz	141.2 cNm	1/2 lb, (2) 2 lb
Hanger 1/2 lb	400.0 in oz	282.4 cNm	1/2 lb, (2) 2 lb, 5 lb
<i>QC1ETT50</i>	5.00 in lb	5.65 dNm	1/2 lb
Bar 5"	25.00 in lb	28.25 dNm	1/2 lb, (2) 2 lb
Hanger 1/2 lb	50.00 in lb	56.50 dNm	1/2 lb, (2) 2 lb, 5 lb
<i>QC1ETT100</i>	10.0 in lb	11.3 dNm	1/2 lb, 1 lb
Bar 5"	50.0 in lb	56.5 dNm	1/2 lb, (2) 2 lb, 5 lb
Hanger 1/2 lb	100.0 in lb	113.0 dNm	1/2 lb, (2) 2 lb, (4) 5 lb
<i>QC2ETT250</i>	25.0 in lb	28.2 dNm	2 lb
Bar 10"	125.0 in lb	141.2 dNm	2 lb, (2) 5 lb
Hanger 1/2 lb	400.0 in oz	282.5 dNm	1/2 lb, (2) 2 lb, (4) 5 lb
<i>QC2ETT1000</i>	150.0 in lb (15%)	113 dNm	none
Bar 10"	500.0 in lb	565 dNm	5 lb, 10 lb, 20 lb
Hanger 15 lb	1000.0 in lb	1130 dNm	5 lb, (2) 10 lb, (3) 20 lb
<i>QC3ETT250</i>	25.0 ft lb	33.9 Nm	5 lb, 10 lb
Bar 10"	125.0 ft lb	169.5 Nm	5 lb, 10 lb, 20 lb, (2) 50 lb
Hanger 15 lb	250.0 ft lb	339.0 Nm	5 lb, (4) 20 lb, (4) 50 lb
<i>QC4ETT600</i>	60.0 ft lb	81.3 Nm	1 lb, 2 lb
Bar 40"	300.0 ft lb	406.8 Nm	5 lb, 10 lb, (3) 20 lb
Hanger 15 lb	600.0 ft lb	813.6 Nm	5 lb, (3) 20 lb, (2) 50 lb

Zero Adjust Knob Calibration

Use this procedure with the zero calibration screw to calibrate the zero adjust knob to a center range. For additional information refer to *Functional Description*.



Remove the "CE" sticker from the left side of the tester to access the zero calibration screw.

1. Turn the power switch on.
2. Select AUTO CLEAR and TRACK modes.
3. Turn the zero adjust knob to the center of its rotation.
4. Adjust the zero calibration screw until all four digits on the display are zeroes.

Accessories

Description	Part Number
Mounting Bracket	
Right angle kit	QCETTBACKET

Internal to Internal Drive Adapters

1/4" square to 1/4" hex	QCETT26027
1/4" square to 1/4" square	QCETT34240
1/4" square to 3/8" square	QCETT342411
1/4" square to 1/2" square	QCETT65261
3/8" square to 1/4" hex	QCETT26028
3/8" square to 3/8" square	QCETT342412
3/8" square to 1/2" square	QCETT65262
1/2" square to 1/2" square	QCETT65263
1/2" square to 1" square	QCETT75252
1/2" square to 3/4" square	QCETT65781
3/4" square to 3/4" square	QCETT65782
3/4" square to 1" square	QCETT75251

Joint Rate Simulators

Capacity and Drive Size

50 in lb max (1/4" internal square)	QC1JRS50
use on QC1ETT400 and QC1ETT50 only	
400 in lb max (3/8" internal square)	QC2JRS400
use on QC2ETT250 only	
1000 in lb max (3/8" internal square)	QC2JRS1000
use on QC2ETT1000 only	

Power Packs (Charger)

120 VAC to 9VDC @200 ma	VERSACHARGE1
220 VAC to 9VDC @200 ma EURO ..	VERSACHARGE2
220 VAC to 9VDC @200 ma G.B./AUSI	VERSACHARGE3

**Snap-on Compression Gauges
Limited One (1) Year Warranty**

SNAP-ON TOOLS COMPANY WARRANTS THIS ELECTRONIC TORQUE TESTER TO BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS FOR ONE (1) YEAR FROM THE DATE OF PURCHASE BY THE ORIGINAL CONSUMER. **Snap-on** will repair or replace this tester if it fails to give satisfactory service due to defective workmanship or materials. Repair or replacement shall be at the election and expense of **Snap-on** Tools Company. Products must be returned to **Snap-on** or a **Snap-on** dealer for warranty service, unless such return is unreasonable. Proof of purchase date is required to make a warranty claim.

Snap-on does NOT provide any warranty for 1) products labeled other than **Snap-on** 2) consumable products (except as noted below) or 3) products subjected to abnormal use. The warranty for non **Snap-on** products is provided by the manufacturer, which is not **Snap-on**. **Snap-on** will pass on warranties granted by other manufacturers. Consumable products are not covered by any warranty, except for a defect in workmanship or materials in a new product that prevents its use. Consumable products are goods reasonably expected to be used up or damaged during use, including but not limited to drill bits, saw blades, grinding discs, sanding discs, knife blades, files, O₂ sensors and batteries. Abnormal use includes misuse, accident, modification, unreasonable use, neglect, lack of maintenance, use in production-related service, or use after the tool is significantly worn.

SNAP-ON SHALL NOT BE LIABLE FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL COSTS OR DAMAGES INCURRED BY THE PURCHASER OR OTHERS (including without limitation, lost profits, revenues, anticipated sales, business opportunities, goodwill, or interruption of business and any other injury or damage). Some states do not allow the exclusion or limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty is your exclusive remedy and is in place of all other rights and remedies. You may have other rights which vary from state to state or country.

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