



TQ SERIES TORQUE WRENCH CALIBRATION AND REPAIR MANUAL



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REVISIONS –

The TQ Series Repair Manual was originated and first issued on December 13, 2004. The manual will be reviewed and revised as necessary to assure that it contains the latest changes in product or repair changes. In between revisions, product bulletins may be issued to assure any changes in product or repairs are supplied to authorized repair facilities.

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SNAP-ON TQ SPLIT BEAM TORQUE WRENCH INSTRUCTIONS

SAFETY INSTRUCTIONS

Failure to follow **WARNING** instructions can cause personal injury to the operator.
Failure to follow **CAUTION** instructions can cause the equipment to fail or break in use.

! WARNING

Always wear Safety Glasses or goggles when using or repairing TQ Series Wrenches

Read this manual completely before repairing TQ Series Wrenches.

DO NOT use or test a TQ Series Wrench that shows signs of damage (damaged drives or sockets, cracked or broken parts) caused by misuse. Recommend replacement.

DO NOT exceed rated maximum torque.

Check all other test accessories for wear, damage or cracks prior to their use with TQ Series Torque Wrench. Do not exceed their rated maximum torque.

Always pull (DO NOT push) to apply torque. Adjust your stance to prevent a fall if something should give suddenly.

TQ wrenches operate in the clockwise direction only. DO NOT apply CCW torque.

CAUTION

Periodic recalibration is necessary to maintain accuracy.

Periodic examination and cleaning is necessary to maintain the TQ Series Wrenches.

INTRODUCTION

This manual covers the repair, maintenance and troubleshooting instructions to identify and remedy problems that could occur with the Snap-on TQ Series Torque Wrenches. Each wrench model has an Exploded Illustration that lists the component parts and shows assembly particulars. The exploded illustration must be used as a guide for assembling Snap-on TQ Series Torque Wrenches.

Snap-on has a Service Center that performs repairs and calibration on all of its products, plus a list of factory authorized repair/calibration centers throughout the world. Contact Snap-on Sales or Service Center for technical assistance on the repair or calibration of Snap-on products.

CLEANING

Wipe all exterior parts with a dry, clean and lint free cloth. **DO NOT USE** any abrasive or corrosive materials to clean any components of the Snap-on TQ Series Torque Wrenches. A non-abrasive polishing agent applied with a dry, clean and lint free cloth may be used to polish the chrome exterior parts.

LUBRICATION

- Loctite White lithium grease 30530 (for main calibration screw threads and main lock spring fork)
- Dow Corning 1122 chain and open gear grease (for beam knife-edge and trigger)
- Loctite 680 (for calibration button and calibration adjustment screw)
- Loctite D609 Epoxy Adhesive (for coverage of the lash cap and calibration button)

REPAIR TOOLS REQUIRED

- *Torque Tester (range determined by the torque wrench to be tested)
- 1 Calibration Button Spanner wrench TQN340
- 1 Lash Cap Spanner Wrench TQN293
- 16 oz. Ball Peen Hammer (Snap-on p/n BP24B)
- 1 5/64 Hex Key (Snap-on p/n AW2-1/2)
- 1 Dial Gear Insertter TQN344
- 1 Lock Spring Insertter/Remover TQN342
- 1 Phillips screwdriver (Snap-on p/n SDDP42 No 2)
- T30 TORX (Snap-on p/n FTX30E) (for Yoke screw torque to 60 in lb)
- 5/16 Center Punch (Snap-on p/n PPC3A) for staking lash cap and calibration button.
- QC1P100 Preset Torque wrench (for yoke screw, set at 60 in lb)
- Small bubble level

***We recommend that Snap-on torque testers be used to test the calibration accuracy of Snap-on manufactured torque products.**

Snap-on manufactures a complete line of torque testing equipment from moderately priced testers to complete state of the art test systems used in metrology calibration laboratories all over the world. Contact Snap-on Sales or Service Centers.

INSPECTION

Inspect all wrenches repaired to determine that they are in an operational condition by visually inspecting for worn, broken, cracked or damaged parts. Replace parts not found to be in satisfactory condition.

CAUTION

Some customers abuse torque wrenches and damage them beyond repair. The most common abuse is the placing of an extension or cheater bar on the handle end of the wrench. This type of misuse is evident if the plate, handle or the drive is bent or there are cheater bar marks on the handle near the plate. **DO NOT REPAIR** the wrench if it shows signs of this type of misuse. The component parts may be permanently damaged. The **SAFETY** and **INTEGRITY** of the wrench could be impaired. Recommend that the wrench be replaced.

ACCURACY VERIFICATION

This procedure is to be used to check the accuracy of TQ Series Torque Wrenches. TQ Series wrenches are to be used and tested in the Clockwise direction only.

There are two major international standards that establish torque wrench accuracy requirements. They are ASME B107.14M Hand Torque Tools (American Society of Mechanical Engineers) and ISO 6789 Hand Torque Tools – Requirements and Test Methods (International Organization for Standards). Both Standards are recognized as established accuracy test methods and referenced in this section. ASME and ISO standards are subject to review and changes. The repair manual will be reviewed and revised periodically but may not reflect the latest revision of the specifications listed above.

NOTE

Torque wrench readings **MUST** be obtained by applying force to the center of the handle (per ASME & ISO specifications).

ASME B107.14M

1. Preload the wrench by loading the wrench three times at 100% of full scale in the CW direction.
2. Set the wrench scale at 20% of full scale (example a 100 in. lb. wrench would be tested at 20 in. lb., which is 20% of full scale). Repeat the test 2 more times. Record all three readings.

3. Set the wrench scale at 60% of full scale (example a 100 in. lb. wrench would be tested at 60 in. lb., which is 60% of full scale). Repeat the test 2 more times. Record all three readings.
4. Set the wrench scale at 100% of full scale (example a 100 in. lb. wrench would be tested at 100 in. lb., which is 100% of full scale). Repeat the test 2 more times. Record all three readings.
5. If all of the readings are within the accuracy requirement no calibration adjustment is required. If they are not see the section on calibration adjustment.



ISO 6789

1. Preload the wrench by loading the wrench five times at max capacity of full scale in the CW direction.
2. Set the wrench scale at 20% of full scale (example a 100 in. lb. wrench would be tested at 20 in. lb., which is 20% of full scale). Repeat the test 4 more times. Record all five readings.
3. Set the wrench scale at 60% of full scale (example a 100 in. lb. wrench would be tested at 60 in. lb., which is 60% of full scale). Repeat the test 4 more times. Record all five readings.
4. Set the wrench scale at 100% of full scale (example a 100 in. lb. wrench would be tested at 100 in. lb., which is 100% of full scale). Repeat the test 4 more times. Record all five readings.
5. If all of the readings are within the accuracy requirement no calibration adjustment is required. If they are not see the section on calibration adjustment.

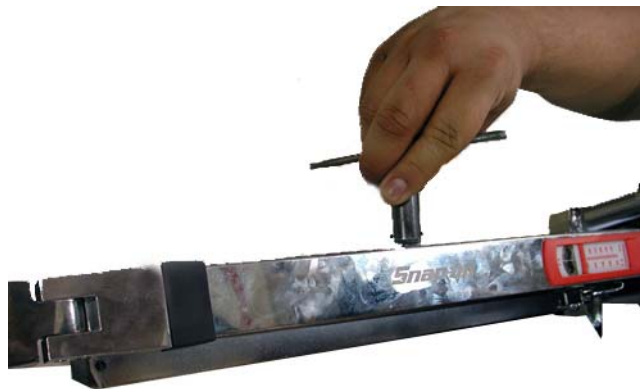


Calibration

1. Set torque wrench on the tester, and place the leveling bubble on the center of tube and adjust the reaction slide as necessary to achieve a level wrench on the tester.
2. Set scale to read at 60% of full scale and record the value. Set the scale to read at 20% of full scale and record the reading.

Example wrench is 250 ft. lb. If the torque reading shows a value 150 ft. lb. (60% of full scale) is testing at 145 ft lb and the 50 ft lb reading is showing a value of 55 ft lb, rotate the calibration button, using the calibration button spanner wrench (TQN340), to approximately 5° in the CCW direction.

If the torque reading at 150 ft. lb (60% of full scale) is testing at 155 ft lb and the 50 ft lb reading is showing value of 45 ft lb, using the calibration button spanner wrench (TQN340), to approximately 5° in the CW direction.



3. After adjusting the wrench at 60% of scale, the wrench will need to be adjusted at 20% of scale.

Example wrench is 250 ft. lb. Following the examples shown above adjust the 20% value of the 250 ft. lb. TQ wrench to read 50 ft lb by rotating the calibration set screw with a 5/64 hex key. Rotating the calibration set in the CCW direction will increase the torque readings. Rotating the calibration set screw in the CW direction will decrease torque readings.



4. Retest the wrench and repeat steps 2 and 3 until the wrench is within the calibration Accuracy requirements.
5. When the wrench meets the accuracy requirements, apply (Loctite D609 Epoxy) to the main calibration button and lash, be sure to cover them completely with the (Loctite D609 Epoxy). Let the epoxy stand for one minute.
6. If the TQ Series Wrench can not be adjusted into calibration the yoke beam sub assembly **MUST** be replaced (see Yoke Beam Sub Assembly Section).

Yoke Beam Sub Assembly

If the beam and yoke needs to be replaced, the complete beam, yoke, trigger, trigger spring, pin yoke needs to be purchased as a complete assembly and will be pre-set at the manufacturer and ready for installation.

1. The TQ wrench has to be disassembled to replace the beam and yoke. Disassemble as follows:
 - a) Remove the two #2 Philips Head screws from the handle.



- b) Remove the back plate, rubber boot, and front plate.



- c) Open up the lock lever.



- d) Place the handle end of the wrench on the Lock Spring Insert/remover TQN342.
e) Slide it until the main lock spring is on top of the end of the Lock Spring Insert/remover TQN342



- f) Apply pressure to the main lock spring until the lock lever can be disengaged and removed.



- g) Unscrew the main adjusting screw.



- h) Remove the beam and yoke assembly from the handle.



- i) Tap the tube on the table to loosen and remove the gear and scale.
- j) Remove the lash cap with the lash cap spanner wrench TQN 340.



- k) Remove the Calibration Button with the Calibration Button Spanner Wrench, part number TQN340
- l) Remove the head from the yoke assembly with a T30 Torx® and set it aside.

2. Assemble ratchet and spring to the yoke of the new beam and yoke assembly with a T30 Torx® and torque the yoke screw to 60 in lb.



NOTE. Make sure there is the Dow Corning 1122 grease applied to the beam knife-edge and trigger area.



3. Reassemble the TQ wrench as follows:

- a.) Apply Loctite 680 to calibration button threads, then assemble calibration button into the tube using the calibration spanner wrench, TQN340. Make sure the calibration button is flush with the tube surface.



- a) Install the main dial gear by using the main dial gear inserter TQN344. The dial must be clean. After insertion turn the tube over to hold the dial gear in place.



- b) Slide the ratchet, beam and yoke assembly into the tube.



- c) Apply white lithium grease (Loctite 30530) to the main adjusting screw threads and screw it into the tube.



- d) Place main lock spring on the Lock Spring Inserter/Remover (TQN 342). Add white lithium grease to the main lock spring and it on the main adjusting screw.



- e) Slide the assembly on the Lock Spring Inserter/Remover (TQN 342) until the main lock spring show through the main lock spring hole on the tube and retain it with a 5/64 hex key.



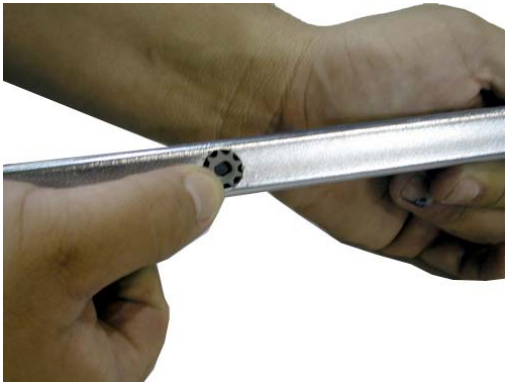
- f) Push down on the tube and remove the retaining pin and assemble the lock lever to the main lock spring hoop. This will hold the assembly together.



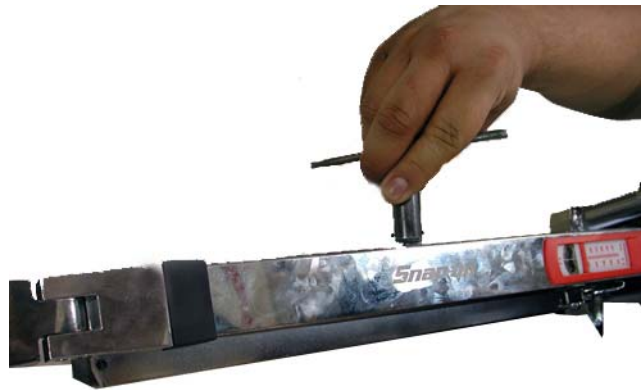
- g) Rotate main calibration screw in the CW direction until snug. Then mark the main calibration screw with an index mark at the 12 o'clock area of the main calibration screw knob (as illustrated). Turn screw 1-1/2 turns counter-clockwise for 250 ft.lb. and larger wrenches, 1 turn for smaller wrenches.



- h) Line up dial to highest increment with the holding pin. Install the small gear with the dome positioned inward, then apply the white lithium grease on the small gear face and tip of the main calibration screw.



- i) Screw the lash cap into the tube by using the lash cap spanner tool, TQN293



- j) Adjust the lash cap until you have slight drag to the main calibration screw.
k) Once the lash cap is adjusted to the desired position stake the lash cap with 5/16 Center Punch, PPC3A, using a small ball peen hammer to the tube assembly 2x, 180 degrees apart from each other.



- l) Remove the protective film from the lens / printed scale, (if new) and position it in the cover plate.
- m) Assemble the cover plate and the lens printed scale to the tube.



- n) Next, assemble the rubber grip to the cover plate, by sliding it on the cover plate.



- p) Install the bottom plate and use the two screws to fasten the bottom plate to the top cover plate.



- q) Assemble the rubber grip to the cover plate, by sliding it on the cover plate.



- r) Install the bottom plate and use the two screws to fasten the bottom plate to the top cover plate.
- s) Set main dial scale at 50 ft lb then apply Loctite 680 to calibration set screw threads and install into the calibration button using 5/64 hex key, rotate calibration set screw in the CW direction until you get a 50 ft lb torque reading on the torque indicator.
- 4.) Cycle the wrench by setting main dial scale to read 250 ft lb and cycle 300x in the CW direction.
- 5.) Next calibrate the wrench as shown in the calibration section.
- 6.) Apply Loctite Hysol D609 on both calibration and lash cap. It must go around and seal the whole cap.

Tech Notes

All Yoke and beam assemblies will come pre-set from the factory, with the complete trigger assembly installed.

TROUBLESHOOTING

Snap-on TE style wrenches will need periodic calibration adjustments. All adjustments are to be made as shown in the section on calibration.

The Troubleshooting Matrix is for Snap-on TE Split Beam torque Wrench models only. Refer to the Troubleshooting Matrix for problems that could occur to Snap-on TE Split Beam torque Wrenches and their remedy

PROBLEM	REMEDY
Wrench will not reset after releasing torque load.	Faulty trigger spring or faulty trigger or burrs on knife-edge of beam.