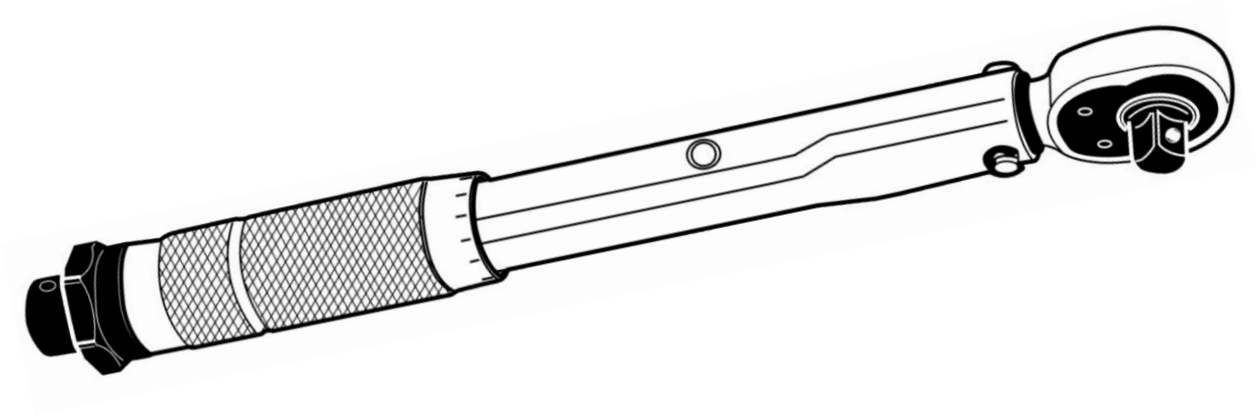
Lonnie's Notes …

TORQUE WRENCH (CLICK-TYPE)



- GENERAL INSTRUCTIONS
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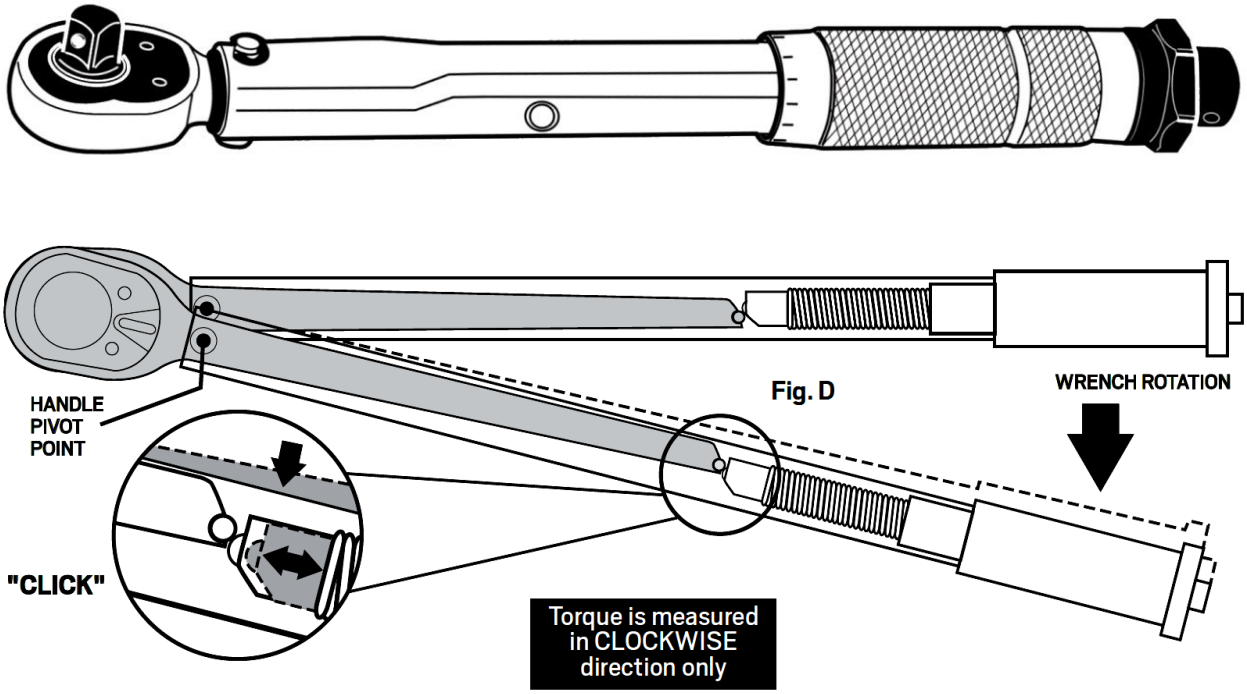
Lonnie Cook rev. 9-Jun-2024

TORQUE WRENCH (CLICK-TYPE)

HOW TO NOTES

Lonnie Cook, rev 9-Jun-2024



GENERAL INSTRUCTIONS

- Check to see if the torque wrench was set to near zero the last time it was used. If not, then the torque applied may be lower than the indicator on the handle.

- "Exercise" the torque wrench before use. Perform the following exercise three times:
  - Turn knurled handle to the right until maximum torque setting is reached.
  - Turn handle to the left until minimum torque setting is reached.
  - Attach to the test fixture and operate several times at low, medium, and moderately high torque settings. This will allow internal lubricant to recoat moving parts.

- For critical applications, set the torque wrench at the desired setting and test the actual torque with a digital torque adapter attached to the test fixture. Reset the setting on the torque wrench handle to produce the correct torque. Test a few times for consistency.
  (Recalibrate the torque wrench now or later)

- If you overshoot the torque setting on the wrench, then back off two turns and set it again.

- When removing or retorquing a bolt or nut, loosen with a standard wrench or breaker bar. Don't loosen with the torque wrench. Loosen multiple fasteners in the same order as when tightening. Tom Lange recommends loosening the first head bolt/nut a half turn and retorque. Then move to the next.

- Lubricate the fastener or not? The shop manual will specify whether a fastener is to be dry or lubed.
    - Torque setting for most applications is for a clean, dry fastener.
    - Clean the threads of the bolt, nut, block to remove oil and debris.
    - Reduce the torque on oiled threads by 15 to 25 percent if the specs call for dry threads.
    - Lubricate fasteners that specify oiled threads with 30-wt motor oil or ARP Ultra-Torque™ Fastener Assembly Lubricant. e.g. ARP head studs and rod bolts

- If using washers under head bolts, then use hardened, parallel-ground washers.

- Tighten fastener with another tool until it is snug, then finish the operation with the Torque Wrench.

- Place socket on fastener. Grasp the knurled handle. Pull smoothly and slowly until the handle breaks away and a click is heard or felt. The proper torque has been achieved. Further pulling may damage fastener. One "click" is enough.

- Do the torque process in three steps:
    - Torque the entire piece, e.g. head bolt, to low torque in the order listed by the manufacturer.
    - Repeat at a setting half way between the first setting and the final objective. Increase the number of steps for high torque settings.
    - Repeat at the final torque setting.

- After using the wrench, set to the lowest torque setting. This setting relieves extra tension on the internal spring, eliminating fatigue that can adversely affect accuracy.

- Store wrench inside its case, indoors, in a clean, dry location.

- Calibrate the wrench every six months.

✓ VIDEO: "You're Using a Torque Wrench Wrong: MythBusting 10 Do's & Dont's"
https://www.youtube.com/watch?v=-hSmtLVESSM excellent

To Lubricate or Not - (Popular Mechanics)
https://www.popularmechanics.com/cars/how-to/a6613/torque-wrench-101-how-to-get-the-right-amount-of-force/

Most times, the specified torque value assumes clean and dry parts. Clean means no dirt, rust, dried-up gasket sealer or anything except shiny metal. Wire-brushing the threads will help remove rust or sealant. Engine fasteners, like head bolts or main cap bolts, are often specified to be torqued with 30-weight engine oil wetting the threads and washer. If you're installing a fastener that has a dry torque spec, and the threads and bolt face are oiled, you'll need to reduce the torque by 15 to 25 percent, because the slipperier surfaces will decrease friction. Teflon-bearing lubes or moly-sulfide engine assembly lubes can reduce friction enough to require a 50 percent reduction in tightening torque. Even casually substituting a zinc- or cad-plated bolt or washer for an unplated one calls for, respectively, a 15 or 25 percent reduction in applied torque, because the plating acts as a lubricant. Fail to heed this advice and the fastener will be seriously overtightened. You'll either snap it or crush a gasket to the point where it leaks.

On the other hand, rust or burrs on the threads can increase friction enough that a fastener tightened to the specified value won't provide sufficient clamping force. The shop manual will specify whether the fastener is supposed to be dry or lubed. In either case, prep your bolts. Don't forget that residue from the parts washer or that pie tin full of kerosene you're using to clean parts has oil in it. Even a quick blast of compressed air to dry off a fastener will leave an oily film behind, affecting ultimate torque. If you're really fastidious, clean up with some aerosol carb or brake cleaner, followed by more air. If you've used grease or anti-seize compound to keep the brake discs from seizing to the hubs, take care not to contaminate the studs or lug nuts.

TEST & CALIBRATE CLICK-TYPE TORQUE WRENCHES

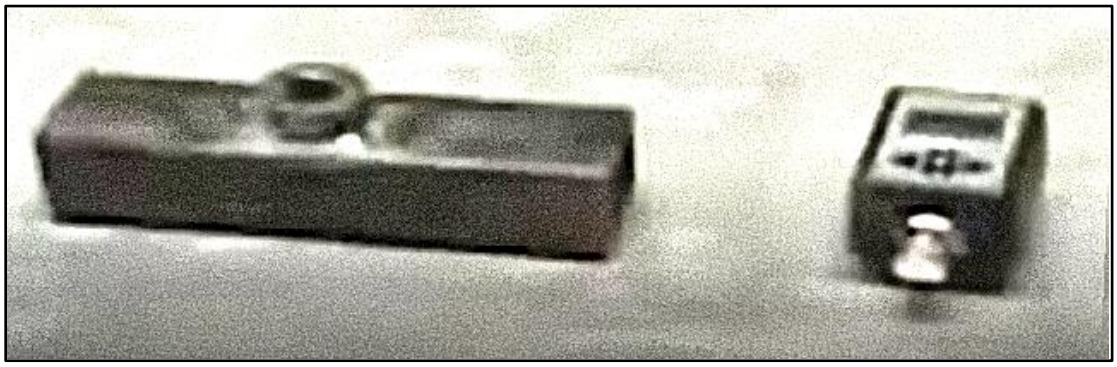
Here are three methods to test the accuracy of your torque wrench: Test with a digital torque adapter. Test with weights and a ruler. Send it to a professional service.

TEST WITH A DIGITAL TORQUE ADAPTER

Test and calibrate most click-type torque wrenches with a
Quinn (HF) 25-250 ft. lb. 1/2 in. Drive Digital Torque Adapter
(SKU: 58706). Accuracy = ± 2%
Needs 3/8" drive adapters to calibrate 3/8" drive torque wrenches
A 3/8" drive 5.9-59 ft. lb. unit with is also available.
https://www.harborfreight.com/12-in-drive-25-250-ft-lb-digital-torque-adapter-58706.html

TEST FIXTURE - DIGITAL TORQUE ADAPTER

Construct a "test fixture" by welding a socket with ½" drive facing up onto a steel bar that can be locked into the vice. Alternatively, secure a bolt or ½" drive socket in a bench vice to attach torque wrench.



TEST USING DIGITAL TORQUE ADAPTER *(Mountz Torque Tools)*

- Lock test fixture into a bench vice. Or secure bolt or socket in vice.
- Insert torque wrench drive into test fixture with or without the digital torque adapter.
- Preload/operate the wrench five times to maximum setting.
- Insert ½" male drive of digital torque adapter into socket of test fixture.
- Adjust the digital torque adapter to show peak torque.
- Set wrench at 20% of torque range. Do not set below the range of the digital torque adapter.
- Set digital torque adapter to same torque setting as wrench.
- Insert ½" male drive or 3/8" socket adapter of torque wrench into digital torque adapter.
- Slowly pull torque wrench until it clicks. The torque adapter will beep as the torque level is near.
- Repeat five times and record readings.
- Adjust to 60%. Record five times.
- Adjust to 100%. Record five times. Do not exceed the limit of the digital torque adapter.
- Modify the test settings if they are near or beyond the limit of the digital torque adapter.
  Harbor Freight digital torque adapter torque range = 25-250 ft-lb. Accuracy = ± 2%

VIDEOS ABOUT TESTING WITH DIGITAL TORQUE ADAPTER

- "How to Calibrate a Click Wrench" - Mountz Torque Tools
  https://www.youtube.com/watch?v=mLSLInzTMuM

- "Digital Torque Adapter - How To Check & Calibrate Torque Wrench"
  https://www.youtube.com/watch?v=ZiBbDWPNHiI

- "Calibrating your torque wrenches at home" With Digital Torque Adapter
  https://www.youtube.com/watch?v=wIkg94hDswY

TEST WITH WEIGHTS AND RULER

https://www.tekton.com/torque-wrench-accuracy-and-calibration

TEKTON®

What If I Think My Torque Wrench Is Out Of Calibration?

If you need to know for sure whether your torque wrench is calibrated correctly, you should take it to a professional or use well-maintained calibration equipment. However, here's a quick check you can do yourself:

- Get a large fixed weight (such as a 45 lb. steel plate) and a way of hanging it on the end of your torque wrench (such as a rope). Add up the weight of the objects you'll be hanging on the torque wrench (for example, total weight = 46 lb. if the steel plate weighs 45 lb. and the rope weighs 1 lb.)
- Measure the distance in inches from the center of the torque wrench handle to the drive tang. Divide by 12 to get the number of feet—for example, 21 in. = 1.75 ft.
- Set the torque wrench to the total weight of the objects you will hang on it multiplied by the number of feet. In this example, 46 lb. * 1.75 ft. = 80.5 ft-lb. of torque.
- Fix the drive end on a fastener or other object that won't move so that the torque wrench is parallel to level ground. You can use a level to make sure the wrench is really parallel.
- Hang the weight from the center of the handle. Don't let the weight touch the ground.
- Your torque wrench is accurate if it clicks when set to the same torque as you are generating, as long as it **doesn't click** when less torque is applied. You can check this last part by moving the weight in slightly toward the drive, which will reduce the torque. The torque wrench shouldn't click when the weight is moved closer. If it does, it is under-measuring the torque, meaning that your fastener won't be tight enough.

VIDEO ABOUT TESTING WITH WEIGHTS AND A RULER

- "CALIBRATE YOUR TORQUE WRENCH IN UNDER 5 MINUTES (NO SPECIAL TOOLS REQUIRED!)"
  https://www.youtube.com/watch?v=VrOvF9b5Qis

CALIBRATE A TORQUE WRENCH

Method #1:

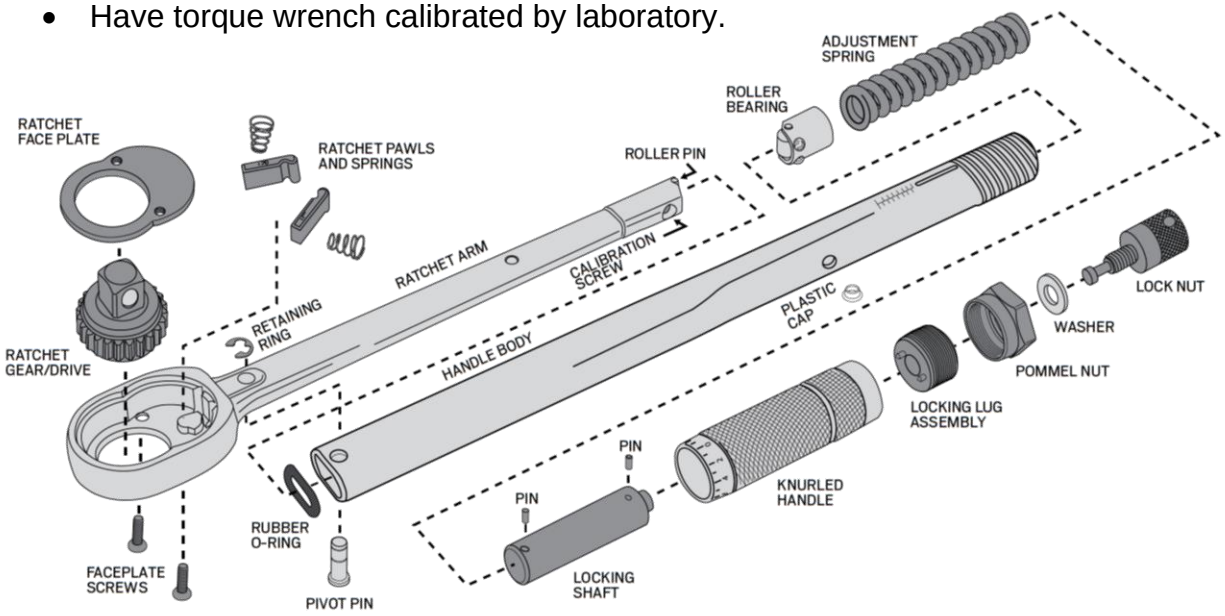
- Write the torque error on the torque wrench and adjust the wrench accordingly when using. Confirm the setting with the digital torque adapter before use.

Method #2:

- Calibrate torque wrench yourself.

Method #3:

- Have torque wrench calibrated by laboratory.



TO CALIBRATE SOME TORQUE WRENCHES

- Follow calibration instructions in manual. Some wrenches have an opening for adjustment. (see diagram)

TO CALIBRATE HARBOR FREIGHT PITTSBURGH TORQUE WRENCHES

- If the test results were outside the accuracy limits of the wrench, then adjust. HF wrench = ± 4%
- Remove the pommel nut.
- Rotate the locking lug assembly a half-turn clockwise to increase torque or counterclockwise to decrease torque.
- Tighten the lock nut to hold the locking lug assembly in place. Replace the pommel nut to strong-finger-tight.
- Repeat test and calibration procedure until all settings are acceptable.
- Firmly tighten the pommel nut.
- After using the wrench, set to the lowest torque setting.

VIDEO ABOUT CALIBRATING HF PITTSBURGH TORQUE WRENCHES

- harbor freight pittsburgh torque wrench how to calibrate! super easy!! https://www.youtube.com/watch?v=QpLm33L0ghI#t=4m25s *(Starts at 4:35)*

- **CLEAN AND LUBRICATE TORQUE WRENCHES**

- Proceed at your own risk.
- May need to remove the pivot pin and retaining ring.
- Probably better to buy a new Harbor Freight wrench.

VIDEO ABOUT DISASSEMBLY AND CLEANING – or just watch to see how it works

- Torque Wrench Calibration DIY EASY! + Stripdown + Fix
  https://www.youtube.com/watch?v=FEZ-ajSksHs

MYTHS AND TRUTHS ABOUT USING A TORQUE WRENCH

VIDEO

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- "Digital Torque Adapter - How To Check & Calibrate Torque Wrench"
  https://www.youtube.com/watch?v=ZiBbDWPNHiI

- "Calibrating your torque wrenches at home" With Digital Torque Adapter
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- harbor freight pittsburgh torque wrench how to calibrate! super easy!!
  https://www.youtube.com/watch?v=QpLm33L0ghI *(advance to 4-min, 25-sec)*

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