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SHOP TOOLS

Testing Torque Wrenches

By Jeff Smith / Photos: Jeff Smith

→ The torque wrench is probably the car crafter's most often-used specialty tool. If you're like me, you may still have your first torque wrench; I got my Craftsman 1/2-inch drive clicker style as a Christmas present in 1972. It is the oldest tool in my toolbox. But veteran status might not necessarily mean it's accurate. We contacted Cornerstone Metrology in Van Nuys, California, a company that does calibration work for both industrial and individual mechanics. We needed a highly accurate test procedure to measure our torque wrenches, and Director of Quality Keith Chauvie showed us the digital scale that was accurate to within 0.10 of a pound, which suited our test just fine since we weren't going to be working on the Mars rover.

We originally gathered a small collection of standard 1/2-inch drive clicker torque wrenches including a Snap-on, a Craftsman, and a Harbor Freight.

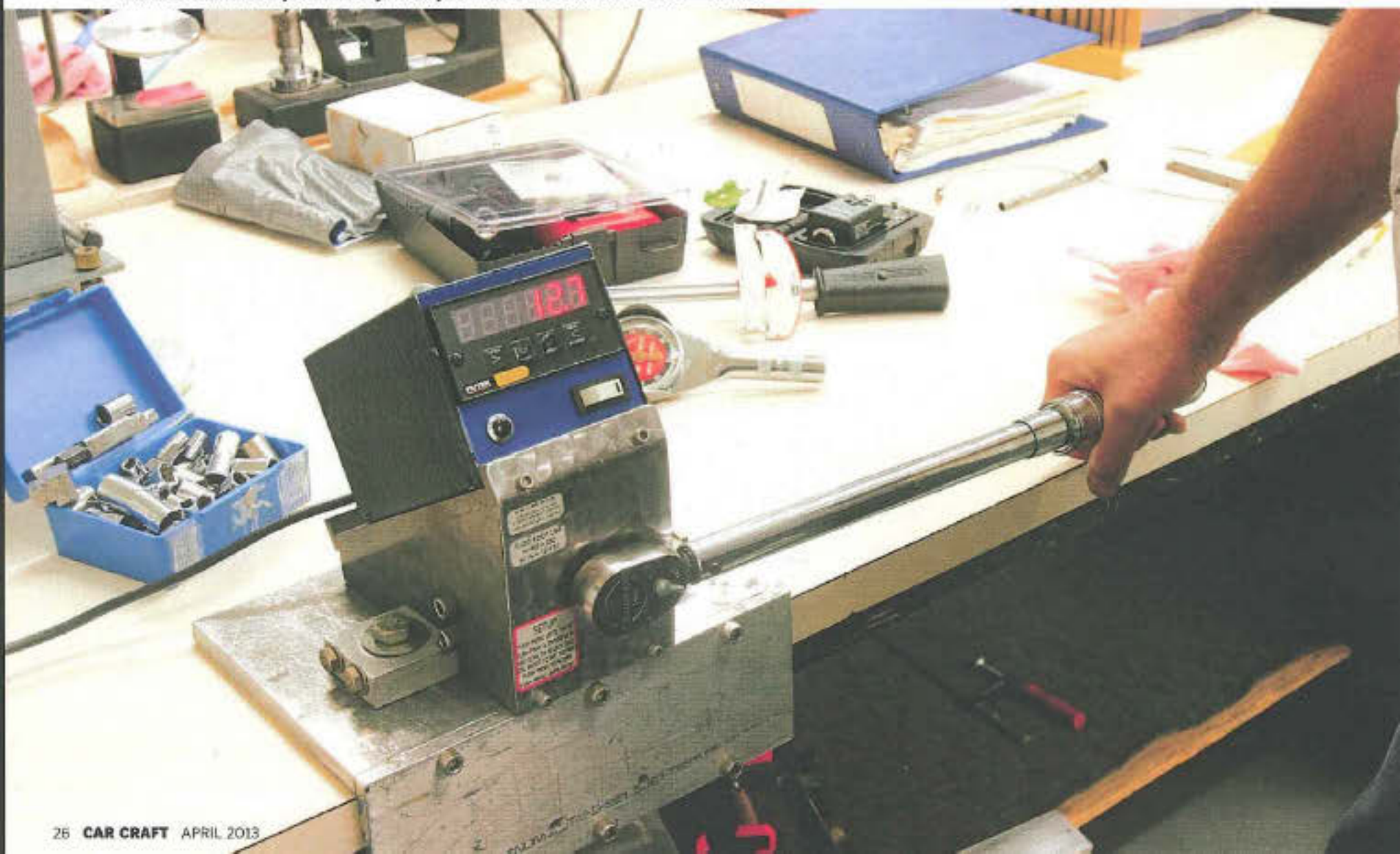
Then we discovered a digital torque adapter sold by Harbor Freight. This small unit fits in between a standard 1/2-inch drive breaker bar and the socket, and using a digital strain gauge, it converts the torque applied through the adapter into a digital readout. At a typical Harbor Freight price of \$39.99, we decided to include it in our test. We frankly didn't expect this little unit to be very accurate. But testing proved otherwise.

We ran the torque adapter through five consecutive applications of 70 lb-ft of torque to watch it hit within 0.10 of a lb-ft twice and actually hit exactly 70 lb-ft on one occasion. The average of the five tests was an amazing 70.1 lb-ft. The unit offers a digital readout and warning lights, and it even emits a progressive electronic beep when nearing the pre-selected torque.

Next, Chauvie suggested an even more interesting test. He offered to keep our Harbor Freight 1/2-inch clicker

wrench and test it every 30 days for two months while keeping the wrench loaded at 70 lb-ft. He said the problem with clicker torque wrenches is, when the mechanic fails to return the preload to its lowest setting after each use, the tool begins to lose accuracy. Chauvie says the longer the wrench is loaded, the less accurate it will become. He has since reported on the torque wrench's performance at 30 days and 60 days, and we've included a graph to show the results (page 30). This inaccuracy occurs because the internal spring loses its tension, allowing the wrench to break away (click) at a lower torque value. Chauvie says this is a common problem for all types of clicker torque wrenches. The point here is that you should always return your clicker torque wrench to the base setting before storing the wrench. This simple step will maintain the wrench's accuracy for years instead of mere months.

We tested a variety of torque wrenches on Cornerstone's digital bench unit and were impressed with the accuracy of the Harbor Freight tools. We tested torque accuracy mainly at 70 lb-ft but also at 20 and 120 lb-ft.





This is the **Harbor Freight** digital torque adapter. It fits between a breaker bar and the socket and converts torque to a digital readout. The tool delivers a digital readout (which can be hard to see during use), but also offers two yellow and one red warning light along with "progressive audio notification" beeps as the selected torque is achieved. The unit has a usable range of 30 to 147.5 lb-ft. The tool also includes adapters so you could use it with $\frac{3}{4}$ - or even $\frac{1}{4}$ -inch drive sockets. Best yet—it has a lifetime warranty.



We tested the **Harbor Freight** digital unit against Cornerstone's calibrated scale and recorded accuracy within 0.20 lb-ft on five separate tests. In this case, both the **Harbor Freight** and Cornerstone tools read the same at 115.2 lb-ft. We were impressed.



We also tested the **Harbor Freight** unit against a Snap-on digital torque wrench costing far more, and readings from the two tools were generally within 0.20 lb-ft.



If you are more the mechanical-clicker-torque-wrench kind of guy, we also tested **Harbor Freight's** $\frac{1}{2}$ -inch clicker torque wrench, and it was also very close. It also has a range of 20 to 150 lb-ft and a lifetime warranty. Accuracy after five consecutive tests at 70 lb-ft ranged from 68.8 lb-ft (-1.2) to 70.3 (+0.3), with an average error of 0.30 ft-lb over five tests. It doesn't get much better than that for a mechanical torque wrench. This is represented as Test 1 in the following graph (page 30).