

CDI TORQUE PRODUCTS

A Division of Snap-on® Logistics Company

Torque Screwdriver Repair and Calibration Manual



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REVISIONS –

The Torque Screwdriver Repair Manual was originated and first issued on December 2001. The manual will be reviewed and revised as necessary to assure that it contains the latest changes in product or repair changes. In between revision, product bulletins may be issued to assure any changes in product or repairs are supplied to authorized repair facilities.

REV.	Date Issued	Affected Pages	Approved
	December, 2001		
A	May, 2009	i, 3, 4, 6, 8, 9, 10 & 15 (now 13) Deleted pages 11 & 12	E.S.

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CDI ADJUSTABLE AND PRE-SET TORQUE SCREWDRIVER WRENCH REPAIR, MAINTENANCE AND TROUBLESHOOTING 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 hand tools.

Read this manual completely before repairing torque wrenches.

DO NOT use or tests a wrench that shows signs of damage (cracked or broken parts) caused by misuse. Recommend replacement.

Check all sockets or other test accessories for wear, damage or crack prior to their use with torque wrenches. Do not exceed their rated maximum torque.

CAUTION

Periodic recalibration is necessary to maintain accuracy.

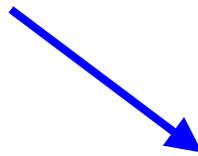
Periodic examination and cleaning is necessary to maintain the torque screwdriver.



MULTITEST
TORQUE
CALIBRATION
SYSTEM



SURETEST
TORQUE
CALIBRATION
SYSTEM



ETT
ELECTRONIC
TORQUE
TESTER



INTRODUCTION

This manual covers the calibration, repair, maintenance and a troubleshooting guide to identify and remedy problems that could occur with CDI Torque Screwdrivers. 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 the screwdrivers.

CDI has a Service Centers that performs repairs and calibration on all of our products at the factory, plus a list of factory authorized repair/calibration centers throughout the world. Contact CDI Sales or Service Center at (626) 965-0668 or sales@cditorque.com for technical assistance on the repair or calibration of CDI 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 CDI Torque Wrenches.

LUBRICATION

Super Lube MULTI-Purpose Synthetic Lubrication with Teflon, CDI Part #10-1000. NO SUBSTITUTES ALLOWED.

REPAIR TOOLS REQUIRED

CDI Torque Screwdrivers

- * **Torque Tester** (range determined by the torque wrench to be tested)
- 1 1/8" Hex "T" shape**
- 1 9/16" Open End Wrench**
- 1 3/4" Open End Wrench**
- 1 QC11200 Torque Wrench**
- 1 1/16" Hex**
- 1 3/8" Sq. Dr. ratchet head "J" shank**

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

CDI 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 CDI Sales or Service Center at (626) 965-0668 or sales@cditorque.com.

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.

ACCURACY VERIFICATION AND MINOR CALIBRATION PROCEDURE

This procedure is to be used to check the accuracy and, if necessary, perform a minor adjustment on calibration. It must also be used after a major calibration.

There are two major international standards that establish torque wrench accuracy requirements. They are ASME B107.14 Hand Torque Tools (American Society of Mechanical Engineers) and ISO 6789 Hand Torque Tools – Requirements and Test Methods (International Organization for Standardization). 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 revisions of the specifications listed above.

ASME B107.14

1. Preload the wrench by setting the wrench at 100% of full scale and operating three times on the tester.
2. Reset handle to 20% of full scale. Take 3 readings at 20%.
3. Set and test the wrench three (3) times at 60% and 100% of full scale noting the accuracy error for each reading. If the readings are within the accuracy requirements for the direction ($\pm 6\%$ or readings), no calibration adjustment is required.

ISO 6789

1. Preload the wrench by setting the wrench at 100% of full scale and operating five (5) times in the direction of the test.
2. Reset handle to 20% of full scale.
3. Test the wrench five (5) times at 20% noting the accuracy error for each reading. Set and test the wrench five (5) times at 60% and 100% of full scale noting the accuracy error for each reading. If the readings are within the accuracy requirements for the test direction ($\pm 6\%$ or readings), no calibration adjustment is required.

Minor Calibration Accuracy Adjustment

NOTE

A minor (knob/scale) adjustment is used to adjust 20% of the scale reading. If the reading at 20% and 100% of scale are both either high or low to the required accuracy, a minor adjustment may be used to bring the accuracy within torque specification. If the torque wrench requires minor adjustment follow steps 4 through 8.

4. Set the knob so that the scale is at 20% of full scale. Remove the plug from the end of the knob.



5. Test the screwdriver and Adjust the handle, clockwise to increase and counterclockwise to decrease the reading, until the screwdriver read within specification of the 20% reading (example: For a 100 IN.OZ. CDI screwdriver, the low reading is 20 IN.OZ. and 18.8 to 21.2 IN.OZ. is the tolerance).



6. Place the 1/8" T-Shaped Hex in the back of the knob and Loosen the set screw. Pull the knob back and turn it until it is on the "0" increment of the knob is aligned with the 20% increment of the scale. Push the knob back to engage it and tighten the set screw. Recheck the reading.



7. Use a 1/16" hex in a screwdriver to loosen and remove the 2 (two) screws on the scale bezel. Remove the bezel. Move the scale until the increment line is aligned to the lowest increment.



8. Place the Bezel over the scale and tighten the screws. Recheck the readings at 20, 60 and 100% of scale. If the screwdriver is calibrated torque the Bezel screws at $3\pm.2$ IN.LB. Then the set screw to 60 ± 2 IN.LB. Place a new end plug on the end of the screwdriver.



9. If a minor calibration cannot be used to calibrate the screwdriver, perform a major calibration.

Major Calibration Accuracy Adjustment

NOTE

A major (nose cone) adjustment is used to adjust all of the scale reading. If the reading at 20%, 60 and 100% of scale are either too high or low to the required accuracy to adjust with a minor adjustment, a major adjustment must be used to bring the accuracy within torque specification. If the torque wrench requires major adjustment follow steps 1 through 4.

1. Use a 3/4" open-end wrench, turning it clockwise, to loosen and remove the cone nut.



2. Turn the cone to set the calibration as follows:
 - a.) If the reading on the tester was **below** the **accuracy limit** for the value tested turn the cone **clockwise** to **increase** the value. Test and repeat this procedure until the readings are within the accuracy limits or a minor adjustment could be used to bring the wrench within the accuracy limits.
 - b.) If the reading on the tester was **above** the **accuracy limit** for the value tested turn the cone **counterclockwise** to **decrease** the value. Test and repeat this procedure until the readings are within the accuracy limits or a minor adjustment could be used to bring the wrench within the accuracy limits.



3. Replace the cone nut and tighten counterclockwise. Then tighten the cone nut to 80 ± 3 IN.LB.



4. Perform an accuracy check and, if required, a minor calibration adjustment.



OR



How to check the Spherical Ball Placement

NOTE

If the torque screwdriver jams or does not turn the spherical balls can be the problem. Follow steps 1 through 7 to check and/or replace the spherical balls.

1. Use a $\frac{3}{4}$ " open end wrench, turning it clockwise, to loosen and remove the cone nut.



2. Turn the cone counterclockwise to remove from the cone from the screwdriver.



3. Remove the cam from the screwdriver.



4. Inspect the secondary cam to assure that the spherical balls (2) are in place in the secondary cam. If they are not, grease lightly to hold them in the secondary cam.



5. Grease the cam.



6. Place the cam into the cone and screw into place.



7. Perform a major calibration adjustment to bring the screwdriver within the accuracy limits or a minor adjustment could be used to bring the wrench within the accuracy limits.

How to re-engage the knob.

1. If the knob becomes disengaged, Line up the decagon on the knob with the decagon on the inside of the screwdriver. Apply a force until the knob re-engages.



2. Perform a minor calibration adjustment to set the low reading.

Calibration Instructions for a Pre-Set CDI Screwdriver.

1. Remove the plug from the end of the knob.



3. Place the 1/8" T-Shaped Hex in the back of the screwdriver and Turn the set screw to set the calibration as follows:
 - c.) If the reading on the tester was **below** the **accuracy limit** for the value tested turn the set screw **clockwise** to **increase** the value. Test and repeat this procedure until the readings are within the accuracy limits.
2. If the reading on the tester was **above** the **accuracy limit** for the value tested turn the set screw **counterclockwise** to **decrease** the value. Test and repeat this procedure until the readings are within the accuracy limits.



3. Place the end plug on the end of the screwdriver.



CDI SCREWDRIVER TROUBLESHOOTING MATRIX

PROBLEM	REMEDY
<p>Calibration accuracy at 20% of scale is out of tolerance.</p> <p style="text-align: center;">OR</p> <p>Calibration accuracy at 20%, 60% and 100% of scale is out of tolerance.</p> <p style="text-align: center;">OR</p> <p>Calibration accuracy at 60% and 100% of scale is out of tolerance</p>	<p>Perform a minor calibration adjustment.</p> <p style="text-align: center;"><u>NOTE</u></p> <p>If a minor calibration fails to bring the 20% of scale reading into tolerance or if adjustment causes the 60% or 100% of scale to fall out of the tolerance a major calibration is required.</p> <p>Perform a major calibration.</p> <p>Perform a major calibration.</p>
The screwdriver is jammed.	See repair instructions for spherical ball.
Knob disassembled from screwdriver	See knob engagement instructions.