

## TSN (Cam-Over Wrench) Operating Instructions

Rev 2.2 (4/13/2017)

### TSN Cam-Over Torque Wrenches

The TSN is a preset torque wrench that's ideal for maintenance and production applications where over-torque conditions are not tolerated. The use of cam-over wrenches takes the operator influence out of the torque equation and offers more accurate and repeatable results than a standard 'click' type wrench.

### Adjusting Torque Setting

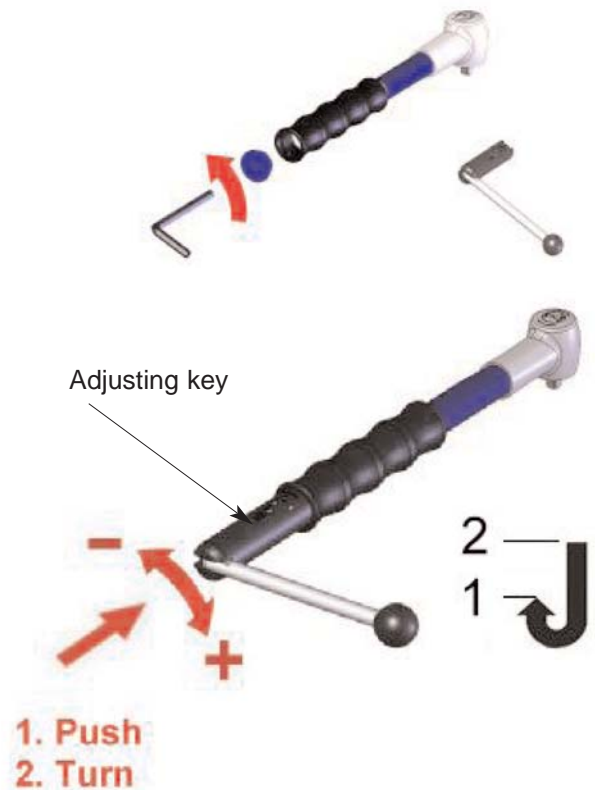
1. Remove end cap from the wrench using the 5mm hex key.
2. The special adjusting key is an articulated design. When in use the two halves are set at 90°, this allows downward force to be exerted on the sliding lock while rotating the adjusting screw.

#### Increase Torque

3. Insert adjusting key and turn clockwise to increase torque. Using a torque tester or torque sensor, test the torque readings of the wrench at a minimum of 10 times to ensure the correct torque setting is set. Do not adjust torque above the recommended torque ranges.

#### Decrease Torque

4. When adjusting, always approach the required torque from a lower setting. To reduce the torque setting, insert hex key into the adjusting key and rotate counterclockwise past your setting. Then clockwise to increase torque to the required value. Using a torque tester or torque sensor, test the torque readings of the wrench at a minimum of 10 times to ensure the correct torque setting is set. Do not adjust torque below the recommended torque ranges.
5. The adjustment mechanism locks automatically when the adjusting key is removed.



### Applying Torque

1. Tighten nut or bolt by applying a steady even pull using built in ratchet as necessary. Wrench should be kept at 90 degrees to axis of bolt during tightening. When pre-set torque is reached, the wrench will 'slip.'
2. The wrench will automatically reset itself for the next application.
3. With its unique design, it's impossible to over tighten beyond the pre set load.



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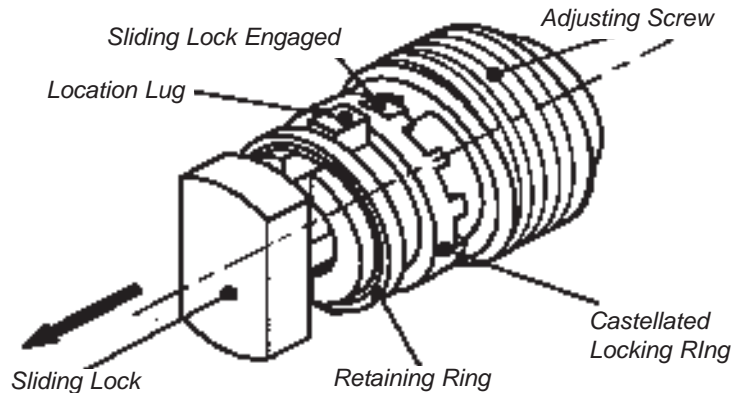
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### Construction & Operation of M-TALD System

The TSN wrenches features the M-TALD (Mechanical Torque Adjustment Locking Device) system. The M-TALD is an easy to use locking device for adjusting the torque of the TSN. It's a positive, mechanical locking system that does not rely on friction for movement, and does not require a secondary locking device. It's operated using a single key.

1. M-TALD comprises of three main parts: The adjusting screw, the spring-loaded sliding lock and the castellated lock ring. These are assembled into a single, self-contained unit and held together by a retaining ring.
2. The assembly is screwed into the wrench handle tube, with the location lugs of the lock ring engaging with specially formed grooves.
3. An inward force has to be exerted onto the sliding lock, through the special adjusting key, while the adjusting screw is being rotated.
4. As soon as the inward force is released, the spring-loaded sliding lock engages with the teeth of the lock ring, further rotation of the adjusting screw is not possible.
5. The castellated lock ring has ten teeth, allowing the adjusting screw to be set at increments of 36°. The resolution of each increment varies with each model of the tool and are, generally, as follows:

TSN 25	0.15 Nm
TSN 55	0.6 Nm
TSN 125	1.0 Nm



### Calibrating Torque Wrenches

To calibrate torque wrenches either use a torque tester or torque sensor within the range of the torque wrench. For cam-over torque wrenches calibrate torque in "Peak" mode with a torque tester or torque sensor. Make sure to apply the torque slowly and smoothly.

1. Select a torque tester or torque sensor that covers the torque range of the TSN wrench.  
Connect wrench to the torque tester or torque sensor.
2. Apply torque clockwise slowly until wrench 'slips' and note reading.
3. Adjust wrench to required torque setting as described on page 1
4. Test and repeat adjustment as necessary to obtain desired value.
5. Recalibrate torque wrench at prescribed intervals.

*Note: Refer to ISO6789 International Standard for more information on hand tool testing requirements.*



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### TSN Maintenance Schedule

#### Expected Tool Life

With normal use – 100,000 operations

#### Period between Resetting of Torque

5000 operations (as recommended in BS EN 26789:1994). It is acknowledged that some TSN tools achieve 5000 operations in a relatively short period of time. Under these circumstances the User may decide, with the benefit of their experience, to increase the period between calibration checks.

#### Routine Maintenance

After 100,000 operations, strip, clean & re-grease the Spindle, Cam & Roller. Any worn components should be replaced.

Note: Any tool that is dismantled during its life must be re-lubricated in accordance with the Mountz recommendations. Do not clean tools by immersing them in solvent, as this will destroy the internal lubrication and cause failure of the tool.

#### Tool Lubrication Chart for TSN

Silicon Grease RS 555-083	Shell Tonna 32 Lubricating Oil	Fuchs Renolit EP X1 PBF
"O" Rings	Ratchet & Pawl	Spring, Roller & Cam

#### TSN Cam/Spindle Replacement Procedure - Overview:

This procedure has been prepared in response to requests from authorized Mountz Distributors who wish to Service and Replace components in the head assembly of TSN wrenches.

#### Tools and Materials:

- Rear bearing removal tool - to suit model of TSN being serviced
- Rear bearing insertion mandrel - to suit model of TSN being serviced
- Normal Workshop tools
- Replacement parts as necessary
- Anti-scuffing paste - ROCOL ASP recommended
- Light machine oil

#### Procedure

1. The external parts of the TSN should be cleaned. The dust cap at grip end of handle removed and the torque adjustment mechanism slackened off just to the point where the square drive of the TSN can freely rotate in both directions. This indicates that the roller is no longer in engagement with the cam. Do not slacken the adjustment screw further than this point as the roller will become disengaged from the roller guide and may be difficult to relocate.
2. Remove the Spirolox retaining ring from the underside of the head assembly.

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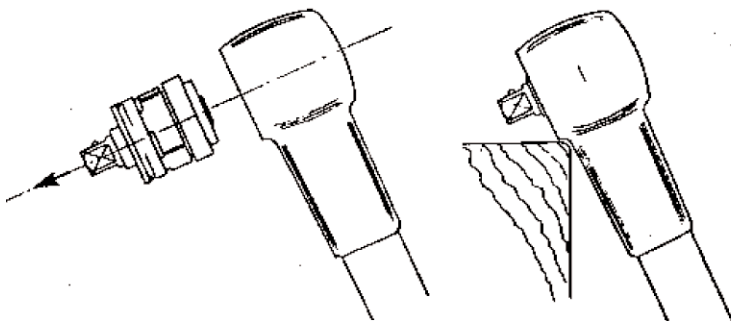
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3. Gentle tapping of the head assembly against a wooden block (as per sketch) will eject the cam/spindle assembly complete with cover plate and front bearing from the TSN head. This may also cause the spindle and pawls to be ejected from the cam. If this occurs take care not to lose the pawls or pawl springs.
4. Ensure the roller is below the surface of the main bearing housing and remove the rear main bearing using special removal tool.  
**Note:** It may not be necessary to replace the main bearings in every TSN unless there are signs of extreme wear, or the cam will not rotate smoothly within the bearings.
5. With the cam/spindle assembly removed, check the condition of the roller guide and roller. It may be necessary to remove the rear main bearing to carry out this check.
6. Degrease, clean and inspect all parts, replacing those which are worn or broken.
7. Replace rear main bearing in the head using special insertion mandrel ensuring that the roller is fully retracted so as not to interfere with the bearing as it is inserted. Ensure that the rear main bearing sits squarely on the rear face of the housing.
8. Re-lubricate the rear main bearing with anti-scuffing paste.
9. Re-assemble spindle and pawls into the cam ensuring that the pawl springs are correctly positioned. Also ensure that the pawls are located with their half rounded long edge resting in the spindle journals and that the pawls and spindle "ratchet" when turned within the cam. The pawls and spindle should be lubricated with light machine oil (see page 2)
10. Lubricate the cam faces and main bearing journals with anti-scuffing paste and insert the cam spindle assembly into the head ensuring that the nylon thrust bearing is located on the spindle end and within the rear main bearing.
11. Insert the front main bearing into the head with the large chamfer outwards.
12. For TSN 55 and 125 Wrenches. Locate one or two 'O' rings on the front bearing chamfer and replace the cover plate and Spirolox Ring.

For TSN 25 Wrenches Only. Replace the lip seal with the lip uppermost ensuring the seal is located squarely in the bore. Tap fully home onto abutment washer using suitable tubular drift and replace the Spirolox Ring.

13. Progressively tighten the torque setting adjustment screw, operating the tool several times as torque increases.

The wrench is now ready for use. It is advisable to operate the wrench approximately 100 times at the upper end of its designed capacity to ensure that new parts "settle in" properly before final calibration is carried out.



### Testing & Servicing

In order to maintain accuracy, it is crucial that torque control measuring equipment be calibrated regularly.

We recommend a general once a year calibration interval. However, it is the user's organization that must determine suitable intervals based upon equipment performance, application, degree of usage and management objectives.

For calibration, re-adjustment or repairs, please send the tool to one of our 3 service locations (see page 5).



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### Mountz Calibration & Repair Services

Mountz Inc. features an experienced calibration and repair staff. Our trained technicians can calibrate and repair most any tool. Mountz provides rapid service with quality that you can trust as we offer two state-of-the-art calibration lab and repair facilities that can calibrate up to 20,000 lbf.ft.

Since 1965, Mountz Inc. has proven its in-depth knowledge of torque and torque solutions by consistently developing, producing, marketing and servicing highly sophisticated, cutting-edge tools. Mountz Inc. is known to the industry as the premier torque tool supplier.

### Tool Service & Repair Capability

- Torque Wrench Calibration: Click Wrench, Dial Torque Wrench, Beam Wrench, Cam-Over & Break-Over Wrench
- Torque Screwdrivers: Dial, Micrometer, Preset & Adjustable
- Torque Analyzers/Sensors: All brands
- Electric Screwdrivers: All brands
- Air Tools: All brands
- Impact Wrenches, Drills, Pulse Tools, Grinders, Percussive Tools, Air Screwdrivers, Nutrunners, DC Controlled Nutrunners
- Torque Multipliers: All brands

### Mountz Torque Testers and Calibration Equipment

Torque tools go out of calibration with use. Calibrating a torque tool is a fine-tuning process of bringing the tool back within its tolerance. Torque testers can also be used for quick tools tests on the line or in the lab to determine whether torque tools are holding a given setting.

A regular torque tool calibration and re-calibration guarantees the operator repeatable accuracy and adherence to international standards. Torque testing also ensures torque equipment is operating to peak performance and can highlight potential tooling problems before they arise perhaps due to tool wear or broken components.

Controlling torque is essential for companies to ensure their product's quality, safety and reliability isn't compromised. The failure of a three-cent fastener that isn't properly tightened can lead to catastrophic or latent failures. Fasteners that are insufficiently torqued can vibrate loose and excessive torque can strip threaded fasteners. Using a quality torque tool has become increasingly important for many companies to ensure that proper torque is being applied and maintains gauge requirements associated with the ISO 9001 Quality Standard. Look for the Mountz hexagon logo - it's a stamp for quality tools, service and knowledge in the field of torque control.

### Mountz Service Locations

#### Eastern Service Center

19051 Underwood Rd.  
Foley, AL 36535  
Phone: (251) 943-4125  
Fax: (251) 943-4979

#### Western Service Center

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San Jose, CA 95112  
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[sales@mountztorque.com](mailto:sales@mountztorque.com)



Twitter: @mountztorque

Download a "Service Form" and include a copy when you send the tools in to be serviced.

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