

Hydraulic Torque wrench

MX-EC

MSX/T



Operating Instructions



Keep for future reference.



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1. Manufacturer

Maschinenfabrik Wagner GmbH & Co. KG
53804 Much, Germany
+49 (02245) 62-0

2. Notes

2.1. CE Mark

The products bear the CE Marking. The declaration of conformity certifies that the products meet the safety requirements set forth in the directives of the European Union.

2.2. Directives

The product meets the requirements of the EU Machinery Directive 2006/42/EC.

2.3. Notes concerning the operation instructions

These operating instructions contain important notes concerning operation, operating site and connection of the nutrunner. Be sure to read these notes carefully before operating the nutrunner. This will help protect you and will provide access to important information concerning proper connection, use and safety of the nutrunner. The operating instructions are part of the nutrunner. Keep them readily available near the nutrunner. Strict adherence to the operating instructions is a precondition for intended use and proper operation. When selling the nutrunner, be sure to pass the operating instructions on to the new owner.

Please note that the product supplied may differ in some details from the illustrations and the technical data presented in these operating instructions. The information presented in these operating instructions correspond to the status at the date of printing. We reserve the right to make amendments at any time without prior notice.

2.4. Notes concerning the workplace

Safety of the operator and trouble-free operation are guaranteed only if original PLARAD

components are employed. This especially applies to nutrunner parts and spare parts.

If other components are used, Maschinenfabrik Wagner cannot accept any liability for safe operation and reliable function.

2.5. Basic safety notes

When operating the torque wrench, be sure to observe locally applicable laws and regulations.

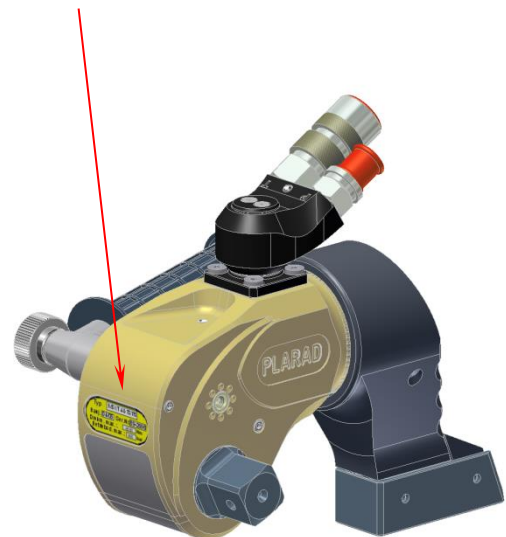
Before operating the torque wrench, check that it is functioning safely and is in proper condition. The operator must be familiar with the operation of the torque wrench. Before taking the torque wrench into service, check the torque wrench and the hoses for damages. Immediately replace damaged hoses, couplings and nipples.

Before commencing with any repair or maintenance work, be sure to separate the torque wrench from the hydraulic supply.

Only connect/disconnect the torque wrench when the hydraulic power pack is switched off. If this is not observed, the torque wrench may be damaged and fluid medium may escape. This in turn may lead to eye injury and burns. Concerning contact with operating fluids observe the material safety data sheets and the product information for the operating fluids.

2.6. Product identification

A nameplate identifies the hydraulic torque wrench.



2.7. Symbols and warnings



CE Mark



Observe assembly and operating instructions



Use ear protection



Wear eye protection



Use foot protection



Warning concerning a crushing hazard



Warning of hazards.
The type of hazard is indicated
by the text next to the symbol



Service tag with note
concerning next check-up

3. Product information

3.1. Intended use

The hydraulic torque wrench is a hand-guided tool and may be used exclusively for tightening and

loosening of screwed joints. It must be used for industrial purposes only.

Only use sockets/bits suitable for use with power tools to work on the joint.

If tools other than sockets for use with power tools are to be used, the manufacturer must inspect these and approve their use.

The hydraulic torque wrench is suitable for indoor and outdoor operation at ambient temperatures of -20° to +70 °C. If these values cannot be adhered to, contact the manufacturer before starting operation.

The hydraulic torque wrench is not suitable for use as a continuously operating drive system!

Have assembly, readjustment, changes, additions and repairs of the unit performed exclusively by Maschinenfabrik Wagner or service partners authorised by Maschinenfabrik Wagner.

Exclusively use the unit as described in these operating instructions. This only will allow safe, reliable operation. Unauthorised alterations may cause unexpected hazard.

Safety of the operator and trouble-free operation are guaranteed only if original PLARAD components are employed. This especially applies to unit parts and spare parts.

If other components are used, Maschinenfabrik Wagner cannot accept any liability for safe operation and reliable function.

3.2. Improper use

Any other use or use beyond these conditions is considered improper use. The risk lies solely with the owner/operator.

3.3. Applicable additional operating instructions

- Electric/pneumatic powered hydraulic power pack
- Castrol Tribol 3020/ 1000-0, PD / MSDS
- BGR 237, Rules for safe application of hydraulic hoses
- Shell Tellus S 2 V 15

4. Scope of delivery

- Hydraulic torque wrench, filled with oil and ready to operate
- Operating instructions with EC Declaration of Conformity, performance table

- BG-Regel 237 (German accident prevention rule): Hydraulik-Schlauchleitungen - Regeln für den sicheren Einsatz (Hydraulic Hoses - Rules for Safe Use)
- Oil bottle with RAFFOL C 68

5. Technical data

Maximum operating pressure:	800 bar
Maximum torque:	See performance table
Sound pressure level:	< 70 dB(A) 1 m ¹

The dimensions of the torque wrench are indicated in the technical datasheets available from our website www.plarad.de.

If oil or flow grease different from the above are used, they must meet the specifications in the product datasheets for Castrol Tribol 3020/1000-0, respectively.

6. Components required for operation



Attention!

Only components, which do not negatively influence the function and safety of the torque wrench, may be used.
If in doubt, contact the manufacturer.

6.1. Hydraulic Power Pack

The PLARAD hydraulic power pack for energy supply to the torque wrench must meet the following specifications:

Maximum operating pressure:	800 bar
Approved oil type:	Shell S 2 V 15
Maximum oil temperature:	90 °C

¹ The sound pressure levels indicated in the operating instructions of the hydraulic power pack apply



Attention!

If you plan to use a hydraulic power pack not manufactured by PLARAD, be sure that the specifications mentioned above are met.
If in doubt, contact the manufacturer.

6.2. Notes concerning use of HD (High-pressure) hydraulic hoses

- Exclusively use hoses approved for use at an operating pressure of 800 bar.
- Be sure the space available for connection of the hose is sufficient.
- Do not twist or kink high-pressure hoses, do not pull them across sharp edges and do not subject them to temperatures exceeding 70 °C.
- Before every use, check hoses and couplings for signs of damage.
- Be sure the hose couplings snap into place correctly.
- Secure the hose couplings with a threaded ring to prevent unintentional disconnecting. Improperly connected hoses may cause malfunction.
- Immediately shut the unit down if leakage occurs on the hoses. Promptly replace damaged hoses and couplings - even if they show exterior signs of damage only.



Attention!

Observe the BG-Regel 237 included, the German accident prevention rule for safe use of hydraulic hoses.

6.3. Tightening Accessories

Use quick-change bits, supports etc. only if they are suitable for the applicable torques and loads.

7. Functional description

This section contains a brief description of all control elements and connections. The operating procedures described must be followed to ensure safe use of the torque wrench.

7.1. Function of the Hydraulic Torque wrench

The hydraulic power pack generates hydraulic pressure, which is set at the pressure-limiting valve

and read off at the pressure gauge. High-pressure hoses (supply and return) supply the fluid medium to the torque wrench. The torque wrench converts the pressure into a torque by means of a lever and ratchet system.

7.2. Supporting the Reaction Torque

Torques can only be generated, if the reactive forces are compensated for. A support plate on the hydraulic torque wrench serves this purpose.

Standard support plates are included in the delivery of the torque wrench. The torque wrench may only be used with the support plate installed.



Warning!

During operation very high forces are occurring at the support plate of the hydraulic torque wrench. A crushing hazard occurs between the support plate and its contact surface.

Do not reach with your hands between support plate and contact surface.

Do not place hands near the contact surface.

Exclusively use support plates and extensions approved by PLARAD.

On request, suitable reaction arms - also customised versions - can be supplied. Reaction arms and support plates may not be altered beyond the approved dimensions indicated by us. If the reaction arm is altered, the performance table originally supplied may become invalid.

Before switching on the torque wrench, attach the reaction arm/support plate to the contact point in opposite direction to the sense of rotation of the torque wrench.



Warning!

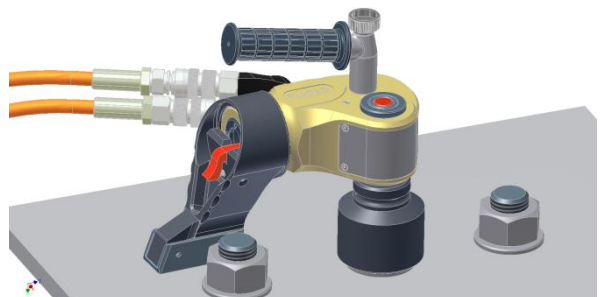
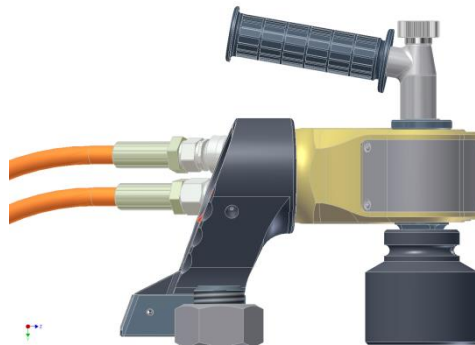
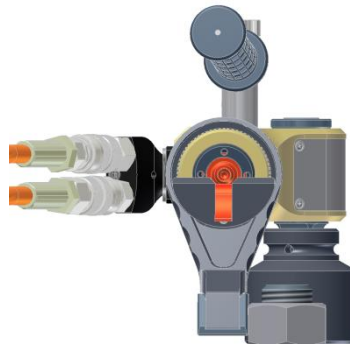
If the torque wrench is not sufficiently supported, it may slip off and be ejected from the joint.

The contact point at the joint must be such that the reaction arm cannot slip off the contact surface!

7.2.1. Optimum Reaction Support

Correct:

Ensure full surface contact of the reaction arm!



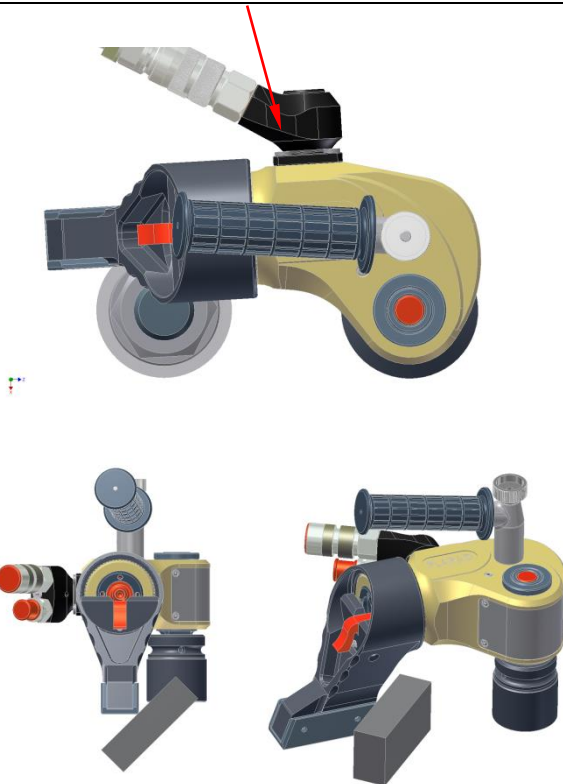
Admissible reaction support

7.2.2. Inadmissible reaction support



Warning!

Never drive against or support the torque wrench at the rotary connector.



Inadmissible reaction support



Warning!

Any single-spot contact of the reaction arm leads to excessive force acting on the arm. This may cause the reaction arm or accessories to break.

Do not burden the reaction arm at a single point only!



Warning!

A crushing hazard occurs between the reaction arm and its contact surface.
Do not reach with your hands between reaction arm and contact surface.
While working, do not place your hands on the reaction arm.
Observe the hazard alert message on the reaction arm.

8. Operating

8.1. Preparations and completion of work

Before operating the torque wrench, check that it is functioning safely and is in proper condition. Before taking the torque wrench into service, check the torque wrench and the hoses for damages. Immediately replace damaged hoses, couplings and nipples.

Before connecting the hose, clean the couplings and nipples on the torque wrench and the hoses. Check the function of all moving parts.

Before beginning the bolting work, check the lubrication of the ball joint between piston and lever. To be able to do so, separate the drive unit from the ratchet head (see description in section 0).

After completion of the work, disconnect the hoses and cover all connections with caps to prevent dirt from entering the oil circuit.

Clean the hydraulic torque wrench.



Warning!

Hazard due to dropping of the torque wrench!



Lift larger torque wrenches with suitable lifting equipment only (as of 4000 Nm with handle, as of 20000 Nm attach hoist to crane eyes).



When working overhead, secure the torque wrench; operators must wear head protection and safety shoes.



Caution!

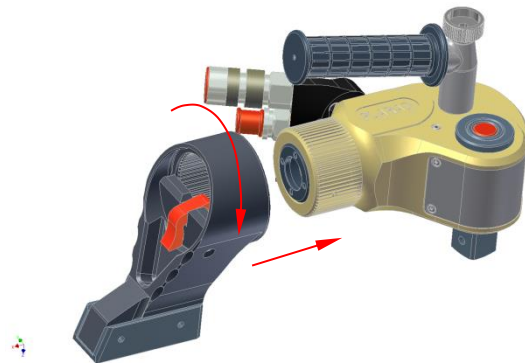
Burning hazard!

At high ambient temperatures the torque wrench may reach surface temperatures of up to 80 °C.

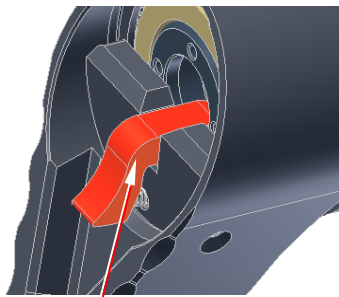
Wear safety gloves.

Installing the reaction arm

The position of the reaction arm can be adapted to the support position by means of the tothing on the arm. Insert the reaction arm in a suitable position.



Ensure the safety lever snaps into place.



Warning!

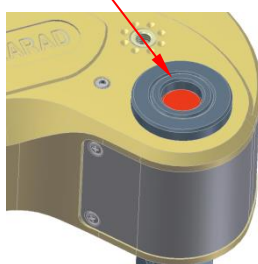
If the torque wrench is operated although the reaction arm is not locked properly, the torque wrench may be ejected from the work.

Be sure to lock the reaction arm before switching the torque wrench on!

Locking the adapter

Check that the adapter is locked safely.

Not locked



locked

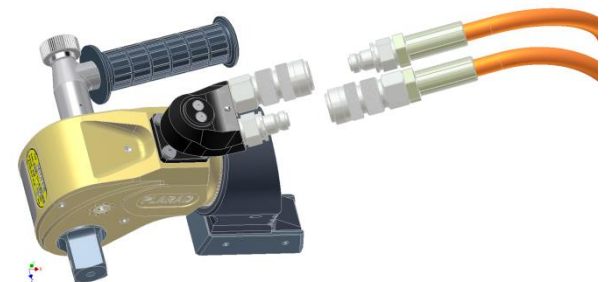


Attaching and securing the socket



Connecting the torque wrench to the hydraulic supply

Connect the hydraulic hoses.



Secure the hydraulic hoses.



Replacing the drive adapter

For tightening or loosening a screwed joint, the square drive adapter must be fitted to the hydraulic torque wrench from the right or left side.

Press the push-button of the square drive adapter.



Pull out the drive adapter.



Pull out the intermediate bushing.



Re-install the square drive adapter on the opposite side in reversed sequence.

8.2. Setting the torque

The following describes the torque settings for a combination of a PLARAD hydraulic power pack and an MX-EC torque wrench.

- Switch on the hydraulic power pack.
- Press the "ON" button on the remote control and keep it pressed until the pressure adjustment is completed. Turn the pressure-adjusting-valve at the hydraulic power pack to set the pressure for the desired torque; read the pressure at the pressure gauge.
- For automatic operation, observe the corresponding sections in the operating instructions of the hydraulic power pack.



Attention!

Check that the torque table for the torque wrench is available. The serial number of the correct torque table is indicated on the nameplate of the torque wrench and in the "Technical Datasheet for Torque Wrench".

When setting the torque, be sure not to exceed the maximum admissible torques for the torque wrench and the accessories. The maximum admissible torque is indicated on the torque wrench.

If you are using a hydraulic power pack not made by Plarad, observe the operating instructions of its manufacturer. The operator must ensure that the specifications set forth in section 6.1 are adhered to.

9. Bolting process

1. Push a suitable reaction arm onto the torque wrench until the lever on the reaction arm snaps into place.



Attention!

Only use PLARAD reaction arms.

2. Plug a socket (nut) onto the square drive adapter at the torque wrench and secure it. In connection with torque wrenches exclusively use sockets suitable for power driven tools.
3. Connect the high-pressure hoses to the hydraulic power pack.
4. Switch on the hydraulic power pack and set the torque on the basis of the torque table for the torque wrench.
5. Attach the torque wrench with socket to the bolt head or nut to be tightened.

Attach the torque wrench to the joint in a way that the bolt head or nut is gripped completely in its total height by the hexagon socket. If that is not possible, the accessories must be loaded with a reduced torque only or a special socket or other accessories must be used.

6. Attach the reaction arm to the contact point in opposite direction to the desired sense of rotation of the torque wrench. Ensure full surface contact.



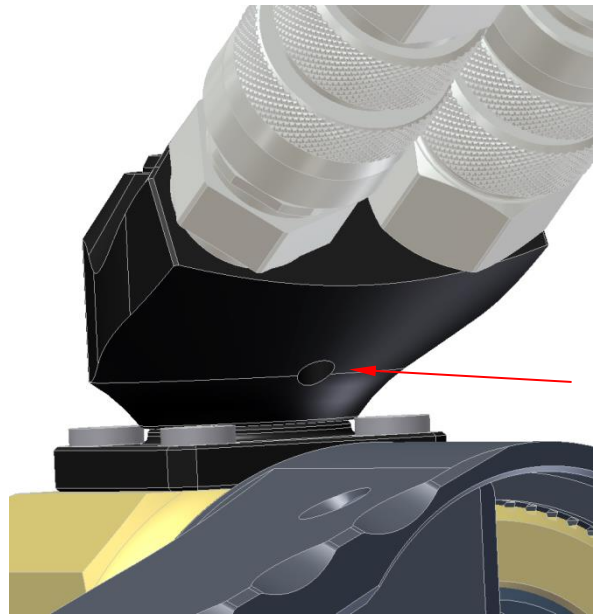
Warning!

During the work, components or the screwed joints may tear off. The torque wrench may then be ejected from the joint.

Do not stand in the direction of the longitudinal axis of the torque wrench.

Load torque wrenches and accessories only within the admissible torque limits. The admissible torques for standard operating conditions are indicated on the torque wrenches.

If the reverse stroke hose is not connected or the couplings in the reverse stroke line are defective, a pressure relief valve in the hose connection of two hose torque wrenches opens. The retained oil escapes without presenting a hazard.



9.1. Tightening

1. Insert suitable accessories into the torque wrench, depending on the sense of rotation.
2. Slide the intermediate bushing onto the shaft and secure it. Upon every change, check that the intermediate bushing and the bearing locations inside the housing are lubricated sufficiently.
3. Hand-tighten the bolt to be tightened.
4. Start the bolting process by pressing the "ON" button.



Attention!

During each reverse stroke a ratcheting noise from the drive pawl must be audible. This way you can be sure that the ratchet lever has been pulled back by the piston.

9.2. Loosening

The torque required to loosen a screwed joint may often be higher than the torque that was used to tighten it.

1. Insert suitable accessories into the torque wrench, depending on the sense of rotation.
2. Slide the intermediate bushing onto the shaft and secure it. Upon every change check that the intermediate bushing and the bearing locations inside the housing are lubricated sufficiently.

3. Start loosening by pressing the "ON" button.

Repeat loosening until the screwed joint is loosened. Loosening is completed when the pressure at the hydraulic power pack is close to 0 while the nut turns.

10. Maintenance / Service

10.1. General considerations

The torque wrench must be serviced to maintain its function and safety.



Attention!

Service work may only be performed by the manufacturer.

Have assembly, readjustment, changes, additions and repairs of the unit performed exclusively by Maschinenfabrik Wagner or service partners authorised by Maschinenfabrik Wagner.

Safety of the operator and trouble-free operation are guaranteed only if original PLARAD components are employed. This especially applies to unit parts and spare parts.

If other components are used, Maschinenfabrik Wagner cannot accept any liability for safe operation and reliable function.

10.2. Service intervals

Depending on the frequency of use the torque wrench must be serviced regularly. The service intervals specified here are only a guideline. Determine the correct service interval for your operating conditions by discussing these with our representatives or service technicians.

Service may be performed in our service/repair workshop upon prior consultation with our representatives.

Every 3 months

- extreme operating conditions
- frequent use
- multi-shift operation
- constant operation in upper torque range

Every 6 months

- normal operating conditions
- medium frequency of use
- operation at mid torque-range

Every 12 months

- infrequent use

Cleaning:

- clean surface of torque wrench
- remove superficial rust

Visual inspection:

- damage
- leakage

Functional check-up:

- all moving parts okay
- drive and reaction arm without damage
- no leakage at the drive square
- no leakage at the hose connections

Maintenance:

- Before every use of the torque wrench, check the lubrication of the ball joint between piston and lever.
- Lubricate the joints and sliding surfaces after max. 20 operating hours.

10.3. Lubrication

At regular intervals, depending on the operating frequency, check that all joints and sliding surfaces are lubricated sufficiently.

Lubricant is supplied with each unit.

Lubricating point	Lubricant
Connection of lever/piston:	Castrol Tribol 3020/1000-0
Bearing nut bearing, drive pawl toothing, joint:	Castrol Tribol 3020/1000-0

Lubrication points: see attached lubrication diagram:

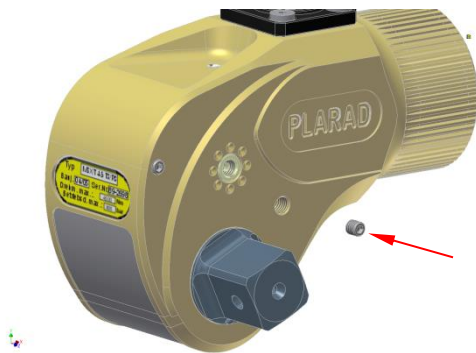


Attention!

Exclusively use grease and oils approved by the manufacturer. The datasheets of the lubricants can be supplied upon request.

The ball head of the piston rod in the MX-EC and MSX torque wrenches engages into a corresponding ball socket in the ratchet lever and is locked inside by a spring bracket. To lubricate these parts, the piston rod must be separated from the ratchet lever as follows:

1. Disconnect the ratchet lever by reversing the piston.
2. Unscrew the threaded pin with internal hexagon at the housing side using the hexagonal socket wrench supplied.



3. Remove the screws at the cover plate and remove the cover plate.



4. Connect the torque wrench to the hydraulic power pack by means of the hydraulic hose.
5. Move the piston and the ratchet lever to the front end stop position at low pressure (approx. 10 bar), maintain the pressure.
6. Push the hexagonal socket wrench with its longer end (or another tool, e. g. a screwdriver) into the now free opening to lock the ratchet lever in the current position.



7. Disconnect the ratchet lever.
8. Release the button on the remote control of the power pack. The piston automatically returns to the final position. This disconnects the ratchet lever.
9. Remove the hexagonal socket wrench or other tool, used to block the ratchet, lever from the bore.
10. Remove the adapter.

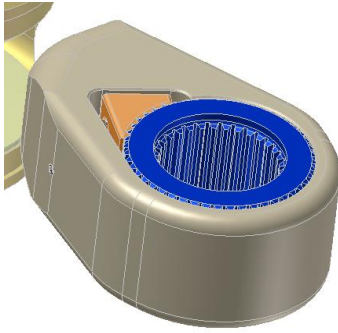


11. Remove the ratchet lever.



Grease the ball head of the connecting-rod or the ball socket at the lever appropriately.

12. Clean and grease the toothing of the drive pawl (brown) and the serrated sleeve (blue).



13. Slide the lubricated ratchet lever into the housing and fix it using adapter and intermediate bushing.

Reconnect as follows:

A stopper at the face end of the housing prevents the ratchet lever from escaping forward. Advance the piston at low pressure until it reaches the front end position. Connecting-rod and piston automatically connect to the ratchet lever.

14. Screw the threaded pin into the bore on the side of the housing using the hexagonal socket wrench.



Attention!

Insufficient lubrication may substantially impair torque accuracy.

Lubricating point at lever / connecting-rod joint



With the piston retracted, use a grease gun to allow lubricant to drop onto the ball head.

11. Instruction for disposal

Dispose of the torque wrench according to the locally applicable regulations.