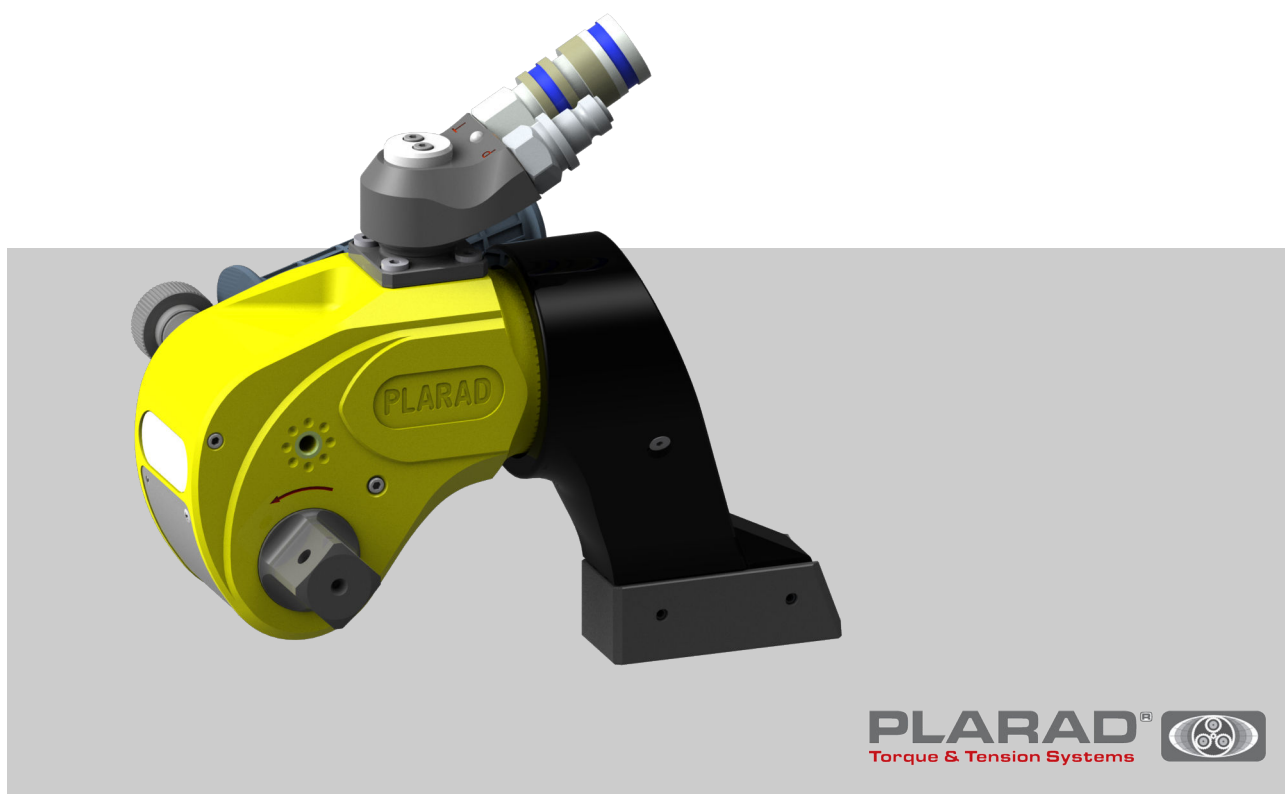


Operating instructions

Hydraulic Torque Wrench
MSX, MX-EC, LT



Read the manual carefully before use!
Keep for future use.

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Translation of the original operating instructions

pA# 69618, 6, en_GB



Information about this manual



This manual enables safe and efficient handling of the hydraulic torque wrench (referred to in the following as “torque wrench”).

The manual is a component of the torque wrench and must be kept in its immediate vicinity so that the user can access it at any time.

The user must have read and understood this manual prior to commencing any tasks. A basic prerequisite for ensuring that work is performed safely is compliance with all safety instructions and guidelines in this manual. In addition, the local accident prevention regulations and general safety provisions for the torque wrench's area of application apply.

Illustrations in this manual serve to provide a basic understanding and may differ from the actual design.

Versions

This manual applies to the following torque wrench versions:

MX-EC	MSX
MX-EC 5 TS	MSX 250 TS
MX-EC 10 TS	MSX 400 TS
MX-EC 20 TS	MSX 650 TS
MX-EC 45 TS	
MX-EC 75 TS	
MX-EC 95 TS	
MX-EC 120 TS	
MX-EC 155 TS	
MX-EC 200 TS	

- LT 5TS
- LT 10 TS
- LT 20 TS
- LT 50 TS
- LT 100 TS

Other applicable documents

The following documents must be observed in addition to this manual:

- Rating plate
- EU declaration of conformity
- Torque chart
 - Correlation of torque to hydraulic pressure
- Hydraulic power pack operating instructions
- Certificates (option)
- Technical data sheet

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Further development of the manual

This manual was compiled with great care. If you notice any errors, have any questions or identify any inconsistencies, please notify us in writing. Your suggestions for improvement will help us design a user-friendly manual.

Follow-up order

Further copies of this manual can be ordered subject to an additional fee.

Contact ☎ *'Manufacturer' on page 4.*

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1 Unpacking

Delivery



Fig. 1: Example, transport case

The torque wrench and remaining items of delivery are packed for transport in packaging that has been specially chosen according to the transport route and delivery location. Smaller deliveries are packed in a plastic or metal box.

Larger deliveries are packed in wooden boxes and delivered on a pallet.

Checking the delivery



Check the delivery for transport damage and ensure it is complete immediately upon receipt. If it is incomplete or if there are defects, note the extent of the damage on the transport documents and lodge a complaint immediately.

Scope of delivery

The scope of delivery includes:

- Torque wrench
- Reaction arm with safety lock
- Lubricant
- Allen key
- Document folder
 - Operating instructions
 - Torque chart
 - EU declaration of conformity

Options:

- Any accessory ordered
Bracing, square drive adapter, impact wrench socket, bracing ring, socket, hexagon insert bit
- Test reports



*Technical data sheet is available online at:
<https://www.plarad.de/download-center.html>*

Handling packaging material

The individual packages are packed according to the expected transport conditions. Only environmentally friendly materials are used for the packaging.

The packaging should provide protection against transport damage, corrosion and other damage. For this reason, do not destroy the packaging and do not remove it until shortly before use.

Dispose of packaging material in accordance with the applicable statutory provisions and local regulations.



ENVIRONMENT!

Danger to the environment due to incorrect disposal!

Packaging materials are valuable raw materials and, in many cases, can be further utilised or appropriately reconditioned and recycled. Incorrect disposal of packaging materials can be hazardous to the environment.

- Reuse pallets.
- Dispose of packaging materials in an environmentally sound manner.
- Observe the locally applicable disposal regulations. If necessary, engage the services of a specialist company with regard to disposal.

Transport by hand

1. ➤ Remove any hoses that are connected.
2. ➤ Seal all couplings and nipples with sealing caps before transport.
3. ➤ Make sure that all attached parts (handle, bracing, tools) are fastened securely and cannot drop.

4. ➤



WARNING!

Danger of injury from high weight!

Carry small tools by their handle.

For larger versions, use suitable transport aids. Attach to lifting gear properly.

**Transport after operation****WARNING!****Danger of burns from hot surfaces or hydraulic oil!**

In high ambient temperature and after prolonged operation, the torque wrench can reach surface temperatures of up to 80°C. The hydraulic oil gets hot when pressurised. Contact with hot surfaces and hot hydraulic oil could result in severe burns.

- Let the torque wrench cool down prior to transport.
- Seal all openings.
- Wear personal protective equipment.

Storage

- Disconnect the hydraulics from the hydraulic power pack when storing. Disconnect the hydraulic hoses.
- Comply with ambient conditions ↗ *Chapter 12 'Technical data' on page 68.*
- Seal all openings (couplings, nipples).

2 Getting to know the torque wrench

2.1 Illustration of hydraulic torque wrench MX-EC, MSX

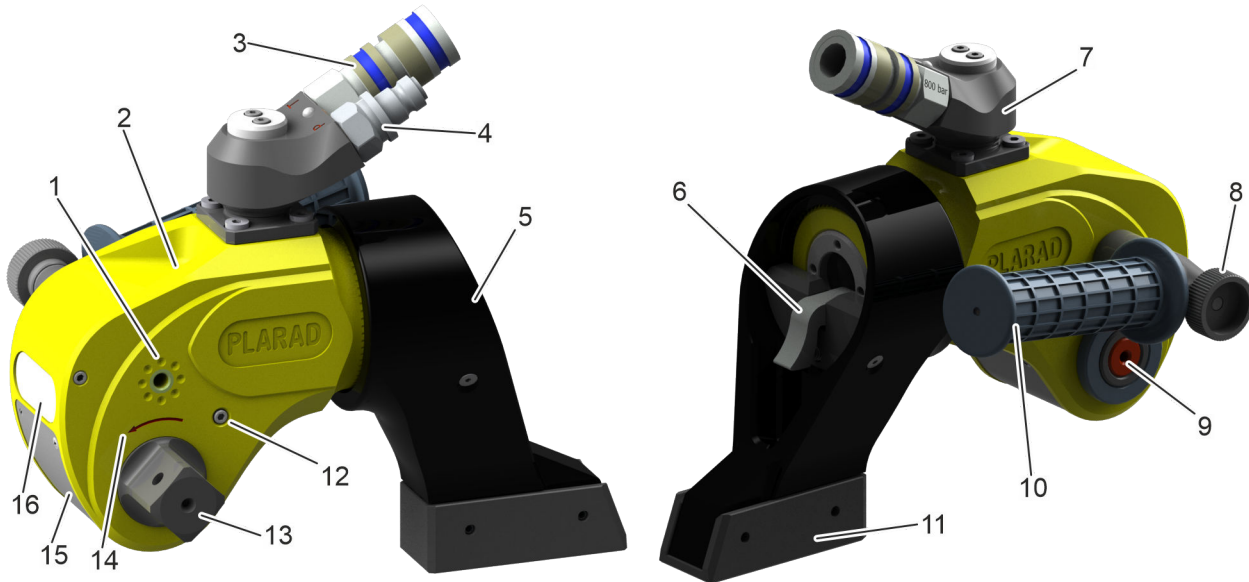


Fig. 2: Illustration MX-EC, MSX

- | | | | |
|---|--|----|--|
| 1 | Attachment point for handle | 9 | Square drive quick-release |
| 2 | Lubrication point for lever/connecting rod connection | 10 | Handle |
| 3 | T: Return | 11 | Bracing surface |
| 4 | P: Pressure port, maximum 800 bar | 12 | Sealing plug |
| 5 | Reaction arm (bracing) | 13 | Square drive (tool holder) |
| 6 | Reaction arm (bracing) safety lock | 14 | Arrow indicating direction of rotation |
| 7 | 360° pivoting hydraulic hose port, optionally swivelling | 15 | Cover panel |
| 8 | Handle adjuster screw | 16 | Rating plate |



2.2 Illustration of hydraulic torque wrench LT

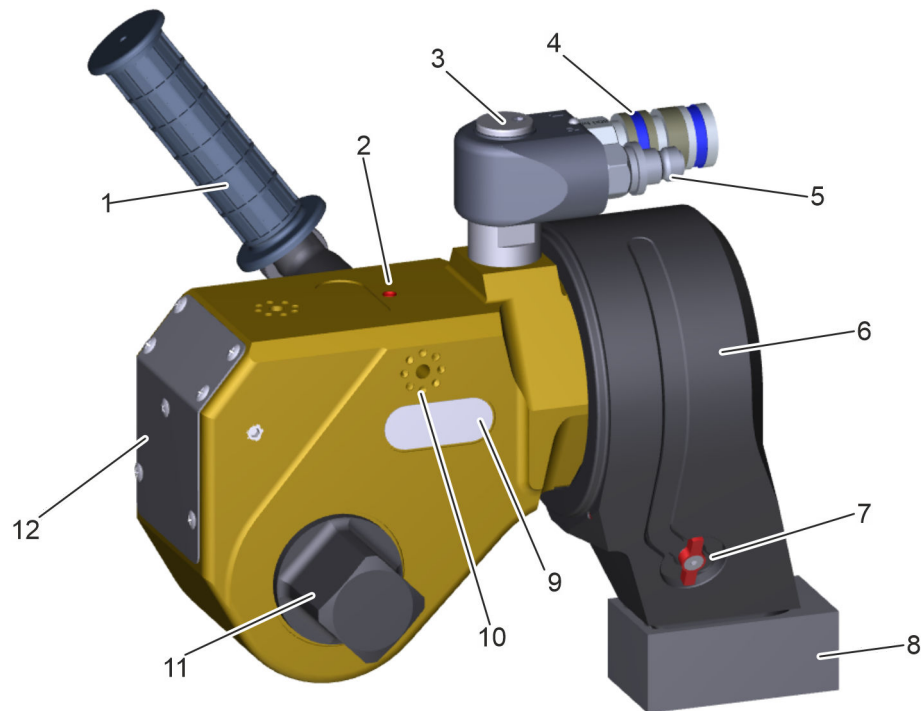


Fig. 3: Illustration LT

- | | | | |
|---|--|----|------------------------------------|
| 1 | Handle | 7 | Reaction arm (bracing) safety lock |
| 2 | Lubrication point for lever/connecting rod connection | 8 | Bracing surface |
| 3 | 360° pivoting hydraulic hose port, optionally swivelling | 9 | Rating plate |
| 4 | T: Return | 10 | Attachment point for handle |
| 5 | P: Pressure port, maximum 800 bar | 11 | Square drive (tool holder) |
| 6 | Reaction arm (bracing) | 12 | Cover panel |

2.3 Brief description

The hydraulic torque wrench is a hand-held tool for tightening and loosening bolted connections.

The torque wrench is powered by a hydraulic power pack. The hydraulic power pack generates hydraulic pressure. This pressure is shown on a pressure gauge or digital pressure indicator and can be adjusted by means of a pressure reducing valve. Hydraulic hoses (supply and return lines) deliver the hydraulic oil to the torque wrench.

The torque wrench uses a lever-and-ratchet system to convert the hydraulic pressure to torque. The ball joint coupling between the lever-and-ratchet system ensures optimal transmission of the torque generated. In the event of release shock, the piston disengages from the lever and re-engages automatically. No link exists that could fracture. The integrated release shock absorber prevents release shock from damaging the housing. The precision-meshing ratchet system means that stroke does not necessarily have to be used in full.

An individually adjustable reaction arm is used to brace the tool against the torque. The reaction arm can be pivoted through 360° easily and quickly. A safety lock prevents the reaction arm from disengaging inadvertently.

The torque wrench is also available in a single-hose version.

2.4 Rating plate



The following data is inscribed on the rating plate:

- Name of the manufacturer including their full address
- Machine designation
- Type designation
- Article/serial number
- Year of construction
- Weight
- Maximum torque
- Maximum operating pressure
- CE mark

2.5 Controls



The torque wrench is controlled exclusively through the hydraulic power pack's remote control unit.

Handle

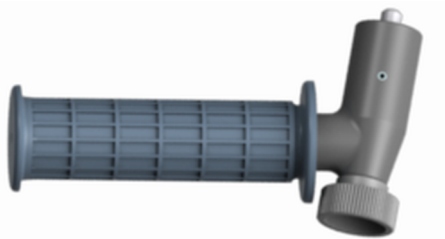


Fig. 4: Handle

The torque wrench can be gripped securely and carried by the handle.



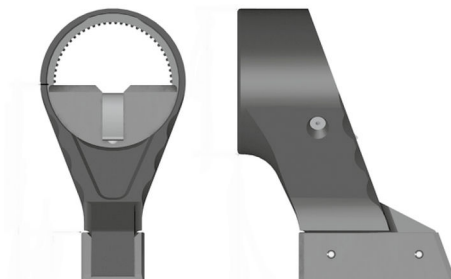
2.6 Accessories

The following accessories are available for ordering together with the torque wrench and may be included in the delivery:

- Square drive adapter



- Bracing units with safety lock



- Bracing rings with safety lock



- Safety sockets





- Safety hexagon insert bit

Special accessories

Contact PLARAD[®] service.



3 Before you begin

This section provides an overview of all important safety aspects for protecting personnel and for ensuring safe and fault-free operation. Further task-specific safety instructions can be found in the sections of the individual chapters.

3.1 Symbols in this manual

Safety instructions

Safety instructions are indicated by symbols in this manual. The safety instructions are initiated by signal words that indicate the degree of the danger.



DANGER!

This combination of symbol and signal word indicates an imminently dangerous situation which, if not avoided, will result in death or serious injury.



WARNING!

This combination of symbol and signal word indicates a potentially dangerous situation which, if not avoided, could result in death or serious injury.



CAUTION!

This combination of symbol and signal word indicates a potentially dangerous situation which, if not avoided, could result in slight or minor injuries.



NOTICE!

This combination of symbol and signal word indicates a potentially dangerous situation which, if not avoided, could result in damage to property.



ENVIRONMENT!

This combination of symbol and signal word indicates potential dangers to the environment.

Safety instructions in specific instructions

Safety instructions may refer to specific, individual instructions. Such safety instructions are integrated into the instruction so that they do not interrupt the flow of reading when carrying out the task. The signal words described above are used.

Example:

1. ➞ Loosen the screw.

2. ➞



CAUTION!
Risk of pinching by cover!

Close the cover carefully.

3. ➞ Tighten the screw.

Tips and recommendations



This symbol highlights useful tips and recommendations as well as information designed to ensure efficient and smooth operation.

Other markings

The following markings are used in this manual in order to highlight instructions, outcomes, lists, references and other elements:

Marking	Explanation
➞	Step by step instructions
⇒	Outcomes of steps
↗	References to sections of this manual and to other applicable documents
■	Lists without a fixed order

3.2 Symbols on the torque wrench

Illustrations

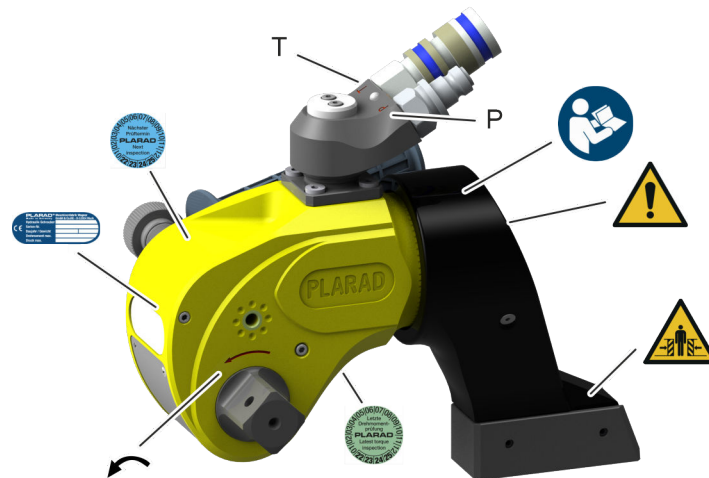


Fig. 5: Symbols on the torque wrench

- T Coupling for return line hydraulic hose
P Nipple for connecting pressure line hydraulic hose
↻ Square drive direction of rotation
⚠ 'General warning sign' on page 18



- ⚠ 'Danger of crushing' on page 17
📖 'Follow the manual' on page 18
📄 'Test badges' on page 18
📖 Chapter 2.4 'Rating plate' on page 12

Illegible signage



WARNING!

Danger in the event of illegible signage!

Over time, signs and stickers can become dirty or be rendered unrecognisable by other means, such that hazards cannot be recognised and necessary operating instructions cannot be followed. This creates a danger of injury.

- Keep all safety notices, warnings and operating instructions in a clearly legible state at all times.
- Replace damaged signs and stickers immediately.

The following symbols and information notices are located on the torque wrench:

Danger of crushing



Keep your hands away from areas bearing this warning.

There is a danger of body parts being crushed, pulled in or otherwise injured.

There is a danger of crushing injury on work equipment (e.g. machinery) or building parts (e.g. hoods, panelling, walls, fences).

It is necessary to pay greater attention when performing work at the marked locations.

Hot surface



Hot surfaces, such as the housing of the drive motor, cannot always be identified as such. Do not touch surfaces marked in this way without protective gloves.

General warning sign



Warns of a hazard in the work area.

Follow the manual



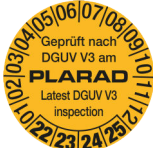
Read the operating instructions prior to using the torque wrench.

Test badges



The test badges state the dates of the respective tests.

Date of the next PLARAD[®] service



Date of the last DGUV-V3 test



For torque wrenches with certificate:

Date of the last torque inspection

3.3 Intended use

The torque wrench is a hand-held tool and may only be used for tightening and loosening bolted connections within the defined specifications (↪ *Chapter 12 'Technical data' on page 68*).

The torque wrench is hydraulically powered.

The hydraulic power pack may only be used for commercial purposes and only in conjunction with PLARAD[®] hydraulic power packs.

The torque wrench must never be used in a potentially explosive atmosphere.



Intended use includes compliance with all of the stipulations in this manual.



WARNING!

Danger of injury from unadjusted torque levels!

The correlation of operating pressure to torque was determined in a test setup according to ISO 5393 (medium test). If these values do not correspond to the actual fastening operation, this could result in injuries and property damage.

- Determine the specific fastening operation and adjust the torque levels.

3.4 Misuse

Any use beyond the intended use as well as any other use is considered misuse.



WARNING!

Danger in the event of misuse!

Misuse of the torque wrench can lead to dangerous situations.

- Never operate without the reaction arm.
- Do not operate the torque wrench as a driving motor without consulting PLARAD® first.
- Do not operate the torque wrench in continuous operation.
- Never subject the torque wrench, bolts and accessories to loads in excess of the permissible torque.
- Never operate unless properly braced.
- Observe the oil specifications at all times.
- Never operate without lubrication.
- Never operate outside the permissible environmental conditions.
- Never exceed the maximum operating pressure.
- Never operate if there are signs of leaking.

3.5 Residual risks

The following section outlines the residual risks potentially posed by the torque wrench even when it is used as intended.

To reduce the risks of personal injury and property damage and to avoid dangerous situations, observe the safety instructions listed here and the safety instructions in the other sections of this manual.

3.5.1 Danger due to hydraulics

Pressurised hydraulic fluid



WARNING!

Pressurised hydraulic components could result in life-threatening injuries!

Inadvertent opening or defects could result in the discharge of hydraulic fluid under high pressure.

Hydraulically powered drives could move unexpectedly.

Contact with hot hydraulic oil could result in severe burns.

- Prior to commencing all work, check the hydraulic power pack, connections, hoses and tools for visible damage and leaks. Have all identified defects remedied immediately.
- Prior to commencing work on the hydraulic system, first switch it off, then depressurise it and let it cool down. Fully relieve all accumulators of pressure. Check to ensure a depressurised state.
- Do not change pressure settings such that they exceed the maximum values.
- Comply with the maintenance intervals.
- Always ensure that hydraulic hoses are properly connected and locked. Quick-release couplings must be engaged. Bolted connections must be fully secured.

Exceeding the maximum pressure



WARNING!

Danger of bursting due to excessive hydraulic pressure!

If the hydraulic pressure exceeds the maximum permissible pressure for connections, hoses, tools or components of the hydraulic power pack, these could burst. Airborne parts and hydraulic fluid discharged under high pressure could cause serious injuries.

- Ensure that all components are designed for the maximum applied hydraulic pressure and that none of the components are damaged.
- Check for defects, damage and leaks. Have all identified defects remedied immediately.
- Comply with the maintenance intervals.



Hydraulic oil



WARNING!

Damage to health and secondary illnesses due to contact with hydraulic oil!

Contact with hydraulic oil could cause allergic reactions, skin and eye irritation, nausea and other secondary illnesses.

- Wear personal protective equipment for all work with hydraulic oil.
- Do not eat, drink or smoke in areas in which work involving hydraulic oil is performed.
- Upon completion of the work, clean or dispose of clothing and personal protective equipment contaminated with hydraulic oil in the proper manner.
- Note the safety data sheet for the hydraulic oil in use.

Oil specifications



NOTICE!

Property damage from non-compliance with the oil specifications!

Incorrect hydraulic oils and the use of contaminated hydraulic oils can result in damage. Hydraulic oil overflowing as a result of excessive oil level can result in pollution.

- Only connect purged hydraulic hoses.
- Ensure that the hydraulic hoses and hydraulic power pack are filled with identical hydraulic oil and that the hydraulic oil meets the oil specifications ↪ *'Oil specifications' on page 69.*
- Comply with the maintenance intervals.
- Top up using only new and clean hydraulic oil ↪ *'Oil specifications' on page 69.*

3.5.2 Mechanical dangers

Moving components and rotational movements



WARNING!

Danger of injury from moving components!

Moving components can cause serious injuries. There is a danger of being pulled in during rotational movements.

- During operation, do not reach into moving components or handle moving components. Do not touch the reaction arm/bracing, drive axis, impact wrench socket, socket etc.
- Secure the reaction arm/bracing and impact wrench socket properly before activating.
- Do not switch on the torque wrench while carrying it.
- Wear tight fitting work clothing with seams that will tear readily.
- Wear safety goggles.
- Protect long hair from being pulled in by rotating parts using a protective cap (hair net).

Incorrect bracing and overloading



WARNING!

Danger of injury from incorrect bracing, overloading, breakage!

Incorrect bracing or overloading of the torque wrench or individual components can result in serious injuries.

- Do not use the wrench if the particulars of the fastening operation are not entirely clear.
- Note the torque chart.
- Check the reaction arm for visible damage prior to use. Do not use the reaction arm if it is damaged.
- Brace correctly ↪ *Chapter 7 'Bracing' on page 44.*
- Do not use continuously for prolonged periods and do not use as a drive element.
- Use only PLARAD[®] original parts.



Crushing



WARNING!

Danger of crushing when bracing and due to high weight!

During operation, very strong forces act on the torque wrench, reaction arm, bracing surface and bolts. There is a danger of crushing between the reaction arm and bracing surface during tightening and loosening. The high weight of the torque wrench can cause crushing if it falls down.

- Handle the torque wrench with care and as intended.
- Give due consideration to the weight during transport and during all work.
- Have work performed only by persons who are physically capable of using the torque wrench safely despite its high weight.
- Do not reach between the reaction arm and bracing surface.
- Secure the torque wrench against falling when working at height.
- Secure the torque wrench against falling when working at height.
- Wear safety shoes.
- Also wear an industrial safety helmet for overhead work.

Dirt and scattered objects



CAUTION!

Danger of injury from falling over dirt and scattered objects!

People may slip on or stumble over dirt and scattered objects. Falling may cause injuries.

- Always keep the work area clean.
- If objects are no longer needed, remove them from the work area and especially if such objects are at ground level.
- Mark unavoidable stumbling points with hazard tape.
- Keep handles and gripping surfaces of the torque wrench dry, clean and free of lubricants. Clean them immediately if they are dirty.

Impact wrench sockets



NOTICE!

Property damage due to incorrect use of impact wrench sockets!

- Use impact wrench sockets suitable for the bolting process without exception.
- Ensure a flawless, positive connection between the torque wrench, impact wrench socket and bolt.

Ensure that there is a positive connection between the tool holder and square drive of the impact socket wrench.

3.5.3 Noise and ergonomics

Noise



WARNING!

Danger of injury from noise!

The noise level of 70 dB(A) (3 dB(A) measurement uncertainty) occurring in the work area can cause hearing damage.

- Always wear hearing protection when working.
- Remain in the danger zone only for as long as your presence is required.

Hot surfaces



WARNING!

Danger of injury from hot surfaces!

Component surfaces may become very hot during operation. Surface temperatures of up to 80°C could develop. Contact between the skin and hot surfaces will result in severe burns to the skin.

- Always wear heat-resistant protective work clothing and safety gloves when working in the vicinity of hot surfaces.



Inadequate ergonomics



CAUTION!

Damage to the musculoskeletal system from the high weight of the torque wrench!

Lifting and carrying heavy loads can cause permanent damage to the musculoskeletal system.

- Ensure stable footing and sufficient room for movement.
- Keep your back as straight as possible. Do not lift with your upper body hunched over, bent forward, or with your back arched.
- Lift the torque wrench as close to your body as possible.
- Only carry small torque wrenches.
- Avoid lopsided lifting. Avoid twisting your spine. Do not carry one-handed.
- Never move the torque wrench abruptly.
- Use suitable aids and lifting gear.

Inattention



WARNING!

Danger of injury due to distraction, inattention or irresponsible use!

Distraction, inattention or irresponsible use can result in losing control of the torque wrench and thus cause serious injuries.

- Always keep the work area well-lit.
- Keep children and unauthorised persons away.
- Work purposefully and in a responsible manner. Do not allow yourself to be distracted.
- Do not work if you are tired or under the influence of drugs, alcohol or medicine.
- Do not be lulled into a false sense of security. Do not disregard the safety information and instructions in this manual, even if the torque wrench seems familiar to you after frequent use.
- When the torque wrench is not in use, always store it in the transport case out of reach from children and other unauthorised persons.
- Wear the prescribed personal protective equipment.

3.6 Safety devices

Faulty safety devices



WARNING!

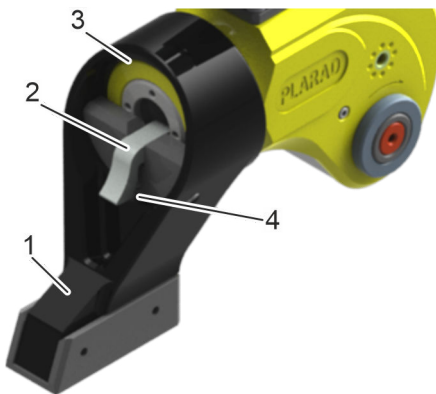
Danger of death due to inoperative safety devices!

If safety devices or safety functions are inoperative or disabled, there is a danger of serious injuries.

- Prior to commencing work, check that all safety devices are operative and correctly installed.
- Never disable or bypass safety devices or safety functions.

The torque wrench is equipped with the following safety devices and safety functions:

MSX, MX-EC: Reaction arm safety lock



- 1 Reaction arm
- 2 Safety lock
- 3 Serration
- 4 Spring

The adjustable reaction arm needs to be attached firmly to the torque wrench in the desired position using the safety lock. The safety lock must engage fully.

Fig. 6: Safety lock



LT: reaction arm safety lock

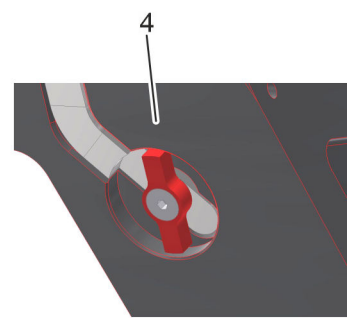
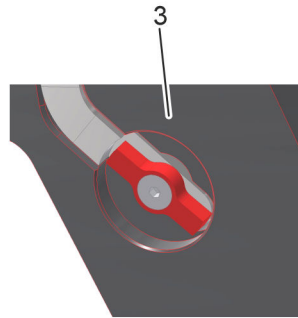
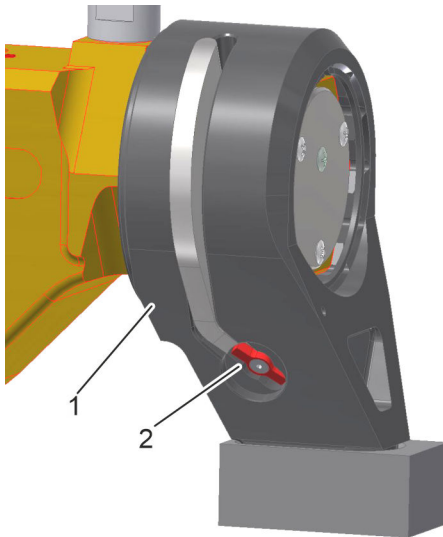


Fig. 7: LT: reaction arm safety lock

- 1 Reaction arm
- 2 Safety lock

- 3 Safety lock engaged
- 4 Safety lock disengaged

The adjustable reaction arm needs to be attached firmly to the torque wrench in the desired position using the safety lock. The safety lock must engage fully.

MSX, MX-EC: Square drive adapter lock



The square drive adapter has a lock. The square drive adapter can be unlocked to change it.

Fig. 8: Square drive adapter lock

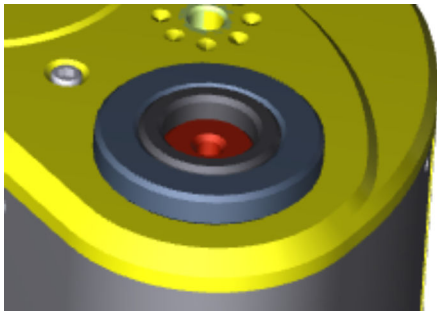
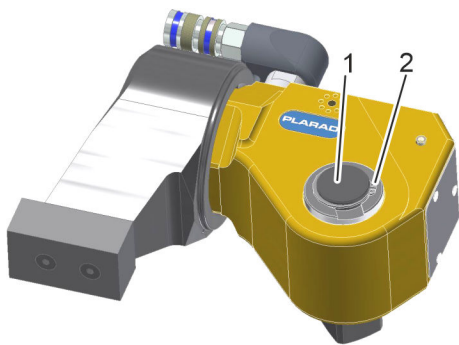


Fig. 9: Square drive adapter unlocked

LT: square drive adapter circlip

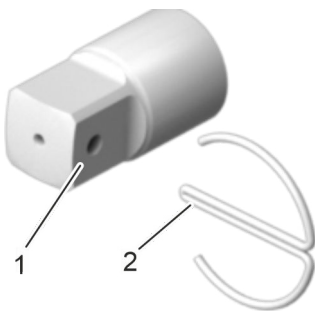


- 1 Square drive adapter
- 2 Circlip

The square drive adapter is prevented from falling out by a circlip.

Fig. 10: LT: square drive adapter circlip

Spring clip



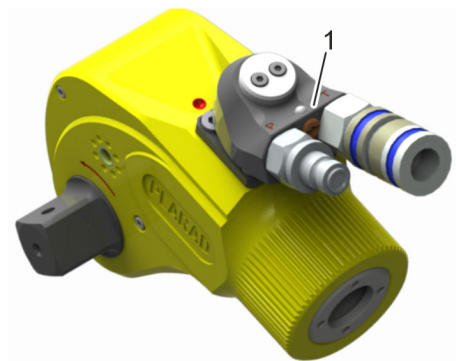
- 1 Square drive with hole
- 2 Spring clip

The impact wrench socket is secured against outward ejection by means of a spring clip on the square drive of the torque wrench.

Fig. 11: Spring clip



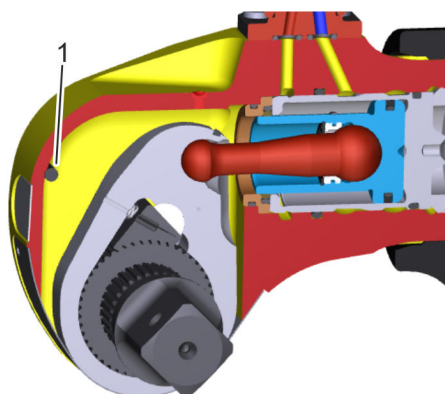
Pressure relief



if there is no return stroke hose connected, or if there are faulty couplings in the return stroke line, a pressure relief valve opens in the two-hose units' hose port. The dammed oil drains harmlessly.

Fig. 12: Pressure relief (1)

MSX, MX-EC: Release shock absorber



The integrated release shock absorber (Fig. 13/1) prevents release shock from damaging the housing.

Fig. 13: MSX, MX-EC: Release shock absorber

3.7 Operator's obligations

The torque wrench is used in the commercial sector. The operator of the torque wrench is therefore subject to the statutory obligations pertaining to occupational safety.

In addition to the safety instructions in this manual, the applicable safety, occupational safety and environmental protection regulations for the torque wrench's area of application must be adhered to.

The following specifically applies in this regard:

- The operator must familiarise themselves with the applicable occupational safety regulations and, as part of a risk assessment, determine additional dangers that arise as a result of the specific operating conditions at the operating site of the torque wrench. This risk assessment must be implemented in the form of safety instructions for operation of the torque wrench.
- During the entire time the torque wrench is in use, the operator must check whether the safety instructions they have compiled reflect current regulations and, if necessary, the operator must change the instructions accordingly.
- The operator must clearly define and regulate responsibilities for all work on and with the torque wrench. The authority and responsibilities of personnel regarding operation, set-up, maintenance and repair must be clearly defined.
- The operator must reliably check the use of the torque wrench and ensure that only commissioned and instructed personnel work with the torque wrench. Only allow personnel to be trained or instructed and those undertaking vocational training to work on the torque wrench under the supervision of an experienced person.
- The operator must ensure that the torque wrench is not opened and that no work is performed on the electrical equipment by unauthorised persons.
Work on electrical equipment may only be performed by an electrician or by trained persons under the guidance and supervision of an electrician. Adhere to electrotechnical regulations for safety reasons.

The operator is also responsible for ensuring that the torque wrench is in technically flawless condition at all times. The following applies for this reason:

- The operator must ensure adherence to the maintenance intervals described in this manual.
- The operator must have the functionality and integrity of all safety devices checked on a regular basis.



3.8 Who is permitted to use the torque wrench?



WARNING!

Danger of injury if personnel are insufficiently qualified!

If unqualified personnel perform work on or with the torque wrench or if such persons are present in the danger zone while work is being performed, dangers arise that could cause serious injuries and considerable property damage.

- Have all tasks performed by suitable qualified personnel without exception.
- Keep unqualified personnel away from the danger zones and work areas.

User

The user of the torque wrench has the requisite knowledge and the requisite training for handling electrical tools. Furthermore, during training by the operator, users have been trained in relation to the tasks assigned to them and the potential dangers associated with improper conduct.

The user is trained in how to use the personal protective equipment, is familiar with the most important specifications, situations and information relating to the specific fastening operation and is physically capable of using the torque wrench safely despite its weight. This includes overhead work, working at heights etc.

The user must be older than the legally permissible minimum age.

Users may only perform tasks that exceed operation under normal operating conditions if this is specified in this manual and the operator has expressly entrusted the users with the performance of such tasks.

The user knows who their supervisor is, can contact their supervisor if they have questions or in an emergency, and is able to communicate with their supervisor.

The user is familiar with all residual risks and is trained in the practical handling of the torque wrench. The user is specifically able to:

- Select and use the functions of the torque wrench enabled for them.

Qualified torque wrench personnel

Qualified torque wrench personnel are trained for the specific task area in which they work and are familiar with the relevant standards and regulations.

Due to their professional training and experience, qualified personnel are able to perform work with the torque wrench, recognise and avoid potential dangers independently and indicate them to users.

Specific capabilities of qualified torque wrench personnel include:

- Operate the torque wrench safely.
- Use all functions of a hydraulic power pack.

- Uphold safety, occupational safety and health protection when using the hydraulic power pack and torque wrench and convey this to users.
- Determine the condition and suitability of hydraulic hoses for the respective application.
- Identify damage and arrange for repairs or get in touch with the manufacturer.
- Instruct users in the proper manner.

Operator

The operator is the person who operates the torque wrench for commercial or economic purposes themselves, or makes it available for a third party to use, and who bears legal responsibility for the product vis-à-vis protection of personnel and third parties during operation.

🔗 Chapter 3.7 'Operator's obligations' on page 30

PLARAD® service

Certain work may only be performed by PLARAD® service or by personnel authorised by Maschinenfabrik Wagner GmbH & Co. KG. Other personnel are not authorised to perform this work. Contact PLARAD® service or authorised PLARAD® partners regarding performance of the work that is due.

Contact: www.plarad.de

🔗 Chapter 9.4 'Having service tasks performed by the manufacturer' on page 64

Unauthorised persons



WARNING!

Danger of death for unauthorised persons due to dangers in the danger zone and work area!

Unauthorised persons, who do not meet the requirements described in this manual, are not aware of the dangers in the danger zone. There is therefore a danger of serious injuries or even death for unauthorised persons.

- Keep unauthorised persons away from the danger zone and work area.
- If in doubt, address the respective persons and instruct them to leave the danger zone and work area.
- Suspend work while there are unauthorised persons loitering in the work and danger zone.



3.9 Personal protective equipment

Safety gloves



Safety gloves are used to protect the hands from friction, abrasions, punctures or deeper injuries and from contact with hot surfaces.

Safety shoes



Safety shoes protect the feet from crushing, falling parts and from slipping on slippery ground.

Hearing protection



Hearing protection is used to protect against hearing damage caused by noise.

Safety goggles



Safety goggles are used to protect the eyes from airborne parts and liquid jets.

Protective work clothing



Protective work clothing is tight fitting work clothing with a low tearing resistance, with tight sleeves and without any protruding parts.

Industrial safety helmet



Industrial safety helmets are used to protect the head from falling objects, suspended and swinging objects and from bumping into stationary objects.

An industrial safety helmet must be worn for overhead work involving the torque wrench.

3.10 Environmental protection



ENVIRONMENT!

Danger of pollution from incorrect handling of environmentally hazardous substances!

If environmentally hazardous substances are handled incorrectly, especially if such substances are disposed of incorrectly, this could cause significant damage to the environment.

- Always adhere to the instructions given below in relation to the handling of environmentally hazardous substances and the disposal thereof.
- If environmentally hazardous substances accidentally enter the environment, adopt suitable measures immediately. If in doubt, notify the competent local authority of the damage and inquire about suitable measures to be taken.

The following environmentally hazardous substances are used:

Lubricants

Lubricants, such as greases and oils, contain toxic substances. Such substances must not enter the environment.

If lubricants do escape, arrange for them to be disposed of by a specialist disposal company.

Observe the manufacturer's safety data sheet.

Hydraulic oil

Hydraulic oil can contain harmful and environmentally hazardous substances. It must not enter the environment (soil, water), sewage system or household waste. Dispose of hydraulic oil and waste containing hydraulic oil separately via an approved disposal company.

Observe the manufacturer's safety data sheet.



4 Determining the particulars of the fastening operation

Information about bolted connections

The torque wrench reacts differently to “soft” and “hard” bolted connections.

“Soft” and “hard” bolted connections themselves each react differently to each other, as the thread and lubrication state can vary from bolted connection to bolted connection.

The torque wrench’s torque, and thus the associated hydraulic power pack pressure, must be set for each fastening operation individually and checked directly during the fastening operation.

Use a rotating, electrical measuring transducer or a calibrated torque spanner for checking purposes.

Personnel: ■ Operator

The torque wrench can only be used safely and properly if the particulars of the fastening operation are known.

1. ➤ Determine the particulars of the fastening operation. To do so:

Determine a suitable bracing surface and select a suitable reaction arm for proper bracing.

Determine suitable tools (impact wrench socket, ring spanner bit etc.).

2. ➤ Determine the torques, angles and hydraulic pressure settings required for the fastening operation.

3. ➤ Make further accessories (bracing aids, suspension etc.) available according to the situation.

5 Preparing the torque wrench

Unsecured or overloaded components



WARNING!

Danger of injury from unsecured or overloaded components!

Unsecured components or components subjected to loads exceeding the intended use could result in uncontrolled torque wrench behaviour, outward ejection of components or breakage and thereby cause serious injuries.

- Carefully determine all the particulars of the fastening operation.
- Ensure that all components are used within the scope of their intended use.
Never exceed load limits (e.g. maximum torques).
- Only use impact wrench sockets.
- Never put the torque wrench into operation if the reaction arm or impact wrench socket are unsecured.

- Personnel: ■ Qualified hydraulic torque wrench personnel
- Protective equipment: ■ Protective work clothing
■ Safety shoes

Prior to being used for tightening or loosening, the particulars of the fastening operation must be known and the torque wrench must be prepared.

Determining the bolting process

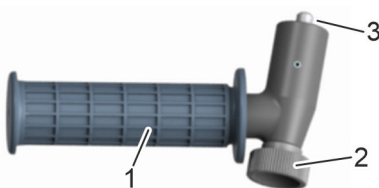


Fig. 14: Adjusting the handle

1. ➤ Ensure that the particulars of the fastening operation have been determined & Chapter 4 'Determining the particulars of the fastening operation' on page 35 and that all parameters are available.
2. ➤ Make sure that the handle is firmly attached to its torque wrench connection (Fig. 14/3).
3. ➤ Adjust the handle (Fig. 14/1). To do so, loosen the wheel (Fig. 14/2), turn the handle to the desired position and refasten the wheel.



You can attach the handle to either side of the torque wrench.



5.1 MSX, MX-EC

Securing the reaction arm

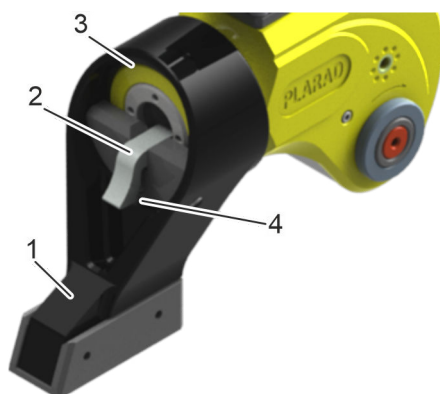


Fig. 15: Safety lock

- 1 Reaction arm
- 2 Safety lock
- 3 Serration
- 4 Spring

1. Slot the reaction arm (Fig. 15/1) onto the serration (Fig. 15/3) on the torque wrench in the desired position.
2. Keep on pushing the reaction arm until the safety lock (Fig. 15/2) on the torque wrench engages.
⇒ The reaction arm is secured.

Changing the square drive adapter

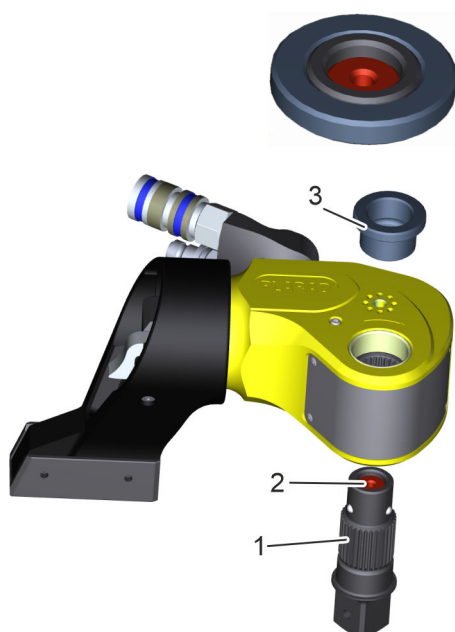
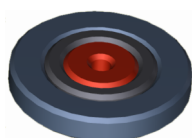


Fig. 16: Changing the square drive adapter

3. To change the square drive adapter for another or to change the direction of rotation, disengage the square drive adapter. Press the disengage button (Fig. 16/2) to do so.
4. Pull the square drive adapter (Fig. 16/1) down and out.
5. Take out the bushing (Fig. 16/3).
6. Slot the new square drive adapter into the torque wrench and insert the bushing (Fig. 16/3). To change the direction of rotation to loosening mode, slot the adapter into the torque wrench from the other side.

Engaging the square drive adapter



7. Engage the square drive adapter. To do so, press the disengage button (Fig. 16/2).
- ⇒ The square drive is ready for use.

Securing the impact wrench socket

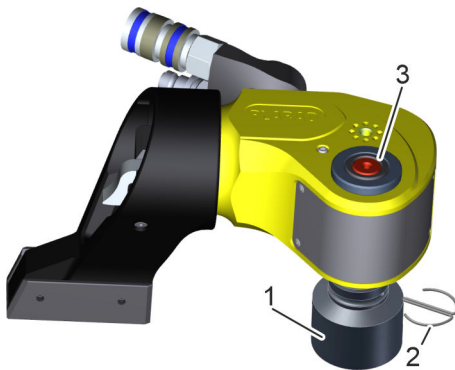


Fig. 17: Impact wrench socket

- 1 Impact wrench socket
- 2 Spring clip for impact wrench socket
- 3 Engaged square drive adapter

- 8. ➔ Attach the impact wrench socket (nut) to the square drive on the torque wrench and secure it.
To do so, push the impact wrench socket (Fig. 18/1) fully onto the square drive (Fig. 18/3). The bores (Fig. 18/2 and 3) for securing must be on top of each other.
Fully insert the spring clip (Fig. 18/4) in all bores (Fig. 18/2 and 3) until the ring is fully seated.
⇒ The impact wrench socket is secured.
- 9. ➔ Attach further accessories if such accessories have been identified as necessary for the fastening operation.

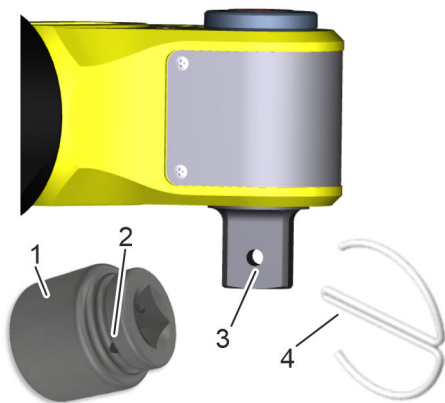


Fig. 18: Securing the impact wrench socket

- 1 Impact wrench socket
- 2 Bore
- 3 Square drive with bore
- 4 Spring clip for impact wrench socket

5.2 LT

Securing the reaction arm

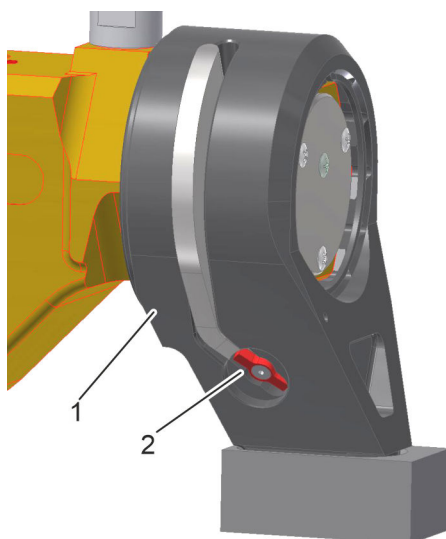
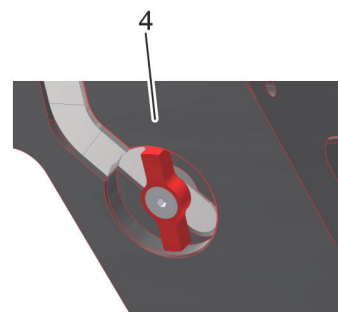
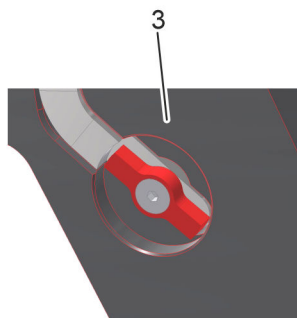


Fig. 19: LT: reaction arm safety lock

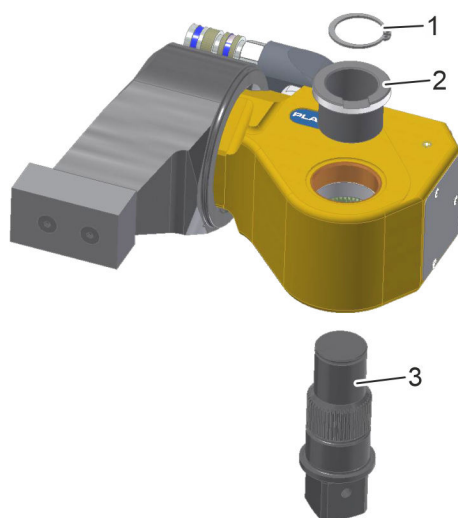
- 1 Reaction arm
- 2 Safety lock



- 3 Safety lock engaged
- 4 Safety lock disengaged

1. Slot the reaction arm (Fig. 19/1) onto the serration on the torque wrench in the desired position and push it all the way onto the serration.
2. Engage the safety lock (Fig. 19/2).
⇒ The reaction arm is secured.

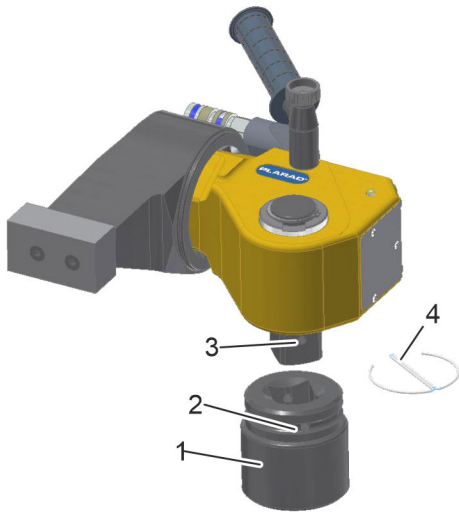
Changing the square drive adapter



3. To change the square drive adapter for another or to change the direction of rotation, unfasten the circlip (Fig. 20/1) with a set of circlip pliers.
4. Pull the square drive adapter (Fig. 20/3) down and out.
5. Take out the bushing (Fig. 20/2).
6. Slot the new square drive adapter (Fig. 20/3) into the torque wrench and insert the bushing (Fig. 20/2). To change the direction of rotation to loosening mode, slot the adapter into the torque wrench from the other side.
7. Fasten the circlip (Fig. 20/1) with the circlip pliers.
⇒ The square drive is ready for use.

Fig. 20: LT: Changing the square drive adapter

Securing the impact wrench socket



- 8.** → Attach the impact wrench socket (Fig. 21/1) to the square drive (Fig. 21/3) on the torque wrench and secure it.

To do so, push the impact wrench socket (Fig. 21/1) fully onto the square drive (Fig. 21/3). The bores (Fig. 21/2 and 3) for securing must be on top of each other.

Fully insert the spring clip (Fig. 21/4) in all bores (Fig. 21/2 and 3) until the ring is fully seated.

⇒ The impact wrench socket is secured.

- 9.** → Attach further accessories if such accessories have been identified as necessary for the fastening operation.

Fig. 21: LT: Securing the impact wrench socket

- 1 Impact wrench socket
- 2 Bore
- 3 Square drive with bore
- 4 Spring clip for impact wrench socket



6 Supplying with energy

Pressurised hydraulic fluid



WARNING!

Danger of injury from pressurised hydraulic fluid jets!

Faulty or improperly connected hydraulic hoses can cause hydraulic fluid to eject under high pressure, causing critical injuries.

Contact with hot hydraulic oil could result in severe burns.

- Prior to commencing all work, check the hydraulic power pack, connections, hoses and tools for visible damage and leaks. Have all identified defects remedied immediately.
- Do not change pressure settings such that they exceed the maximum values.
- Only use hydraulic hoses approved for operating pressures of at least 800 bar.
- Comply with the maintenance intervals.
- Always ensure that hydraulic hoses are properly connected and locked. Quick-release couplings must be engaged. Bolted connections must be fully secured.

Hydraulic power pack

Energy is supplied from a hydraulic power pack. Observe the specifications ↗ 'Hydraulic power pack' on page 69.

Connecting hydraulic hoses

- Personnel: ■ User
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes

1. ➤ Ensure that the hydraulic power pack meets the relevant specifications ↗ 'Hydraulic power pack' on page 41.
2. ➤ Ensure that the hydraulic power pack is ready for use ↗ hydraulic power pack operating instructions. When doing so, make sure that the oil specifications are being observed, that the hydraulic hoses have been purged and that there is a sufficient quantity of oil in the hydraulic power pack's surge tank.
3. ➤ Ensure that the hydraulic hoses have not exceeded the maximum period of use.

Period of use



Hose check:

- The maximum period of use must not be exceeded.
Comply with the exchange interval. Use for a maximum of 5 years.
- The maximum pressure must not be reached.
- Use filled hydraulic hoses only.
- Oil specifications must match.
- Couplings and nipples must be compatible and be undamaged.
- There is no visible damage.

Connection

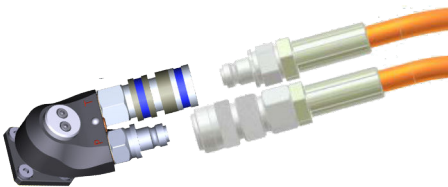


Fig. 22: Example of connecting hydraulic hoses

4. ➤



The torque wrench may feature a variety of coupling systems.

Ensure that the coupling/nipple combination is suitable and free of damage.

5. ➤ Ensure that the maximum permissible pressures of all components are sufficient.
6. ➤ Ensure that the hydraulic hose is fully filled with suitable hydraulic oil ↗ 'Oil specifications' on page 69.
7. ➤ Ensure that coupling and nipples are unsoiled. Remove any soiling.



Sequence to observe

8. ➔



Connect hydraulic hoses only in a depressurised state!

The hydraulic power pack's motor may be running.

Connect the hydraulic hoses to the hydraulic power pack and torque wrench.

When connecting the torque wrench, proceed according to the following sequence:

1. - Hydraulic power pack pressure port
2. - Torque wrench pressure port
3. - Hydraulic power pack return line
4. - Torque wrench return line

9. ➔

Check that the hydraulic hoses are locked in place.



Older couplings have counter-threads. Tighten to lock.

New couplings have a bayonet closure. Let it fully engage.

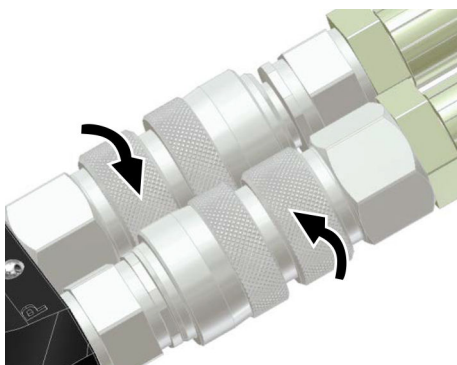


Fig. 23: Firmly connecting the hydraulics

Purging

Setting the operating pressure

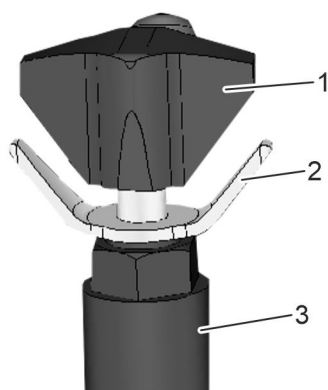


Fig. 24: Pressure adjustment valve

- 1 Knob
- 2 Adjustment lock
- 3 Pressure adjustment valve

10. ➔

Purge ⚡ hydraulic power pack operating instructions.

11. ➔

Set the operating pressure ⚡ hydraulic power pack operating instructions, ⚡ torque chart.

7 Bracing

Explosion protection

**WARNING!****Danger of explosion from spark ignition!**

Mechanically generated sparks can cause a potentially explosive atmosphere to explode.

- Ensure that only specifically approved torque wrenches are used in EX zones.
- Prevent contact between rusty steel and aluminium when using the reaction arm on a bracing surface (abutment).
- Handle the torque wrench with care.

Reaction arm

Torques can only be generated if the reaction forces are absorbed. The reaction arm fulfils this function on the torque wrench.

The scope of delivery for the torque wrench contains a standard reaction arm. The torque wrench may only be used with the reaction arm included in the delivery. Modifications to the reaction arm will invalidate the included torque chart.

For fastening operations for which the standard reaction arm is unsuitable, contact PLARAD[®] service.

Danger of crushing

**WARNING!****Danger of crushing when bracing!**

During operation, very strong forces act on the torque wrench, reaction arm, bracing surface and bolts. Body parts could get between the reaction arm and bracing surface. This could result in serious injuries.

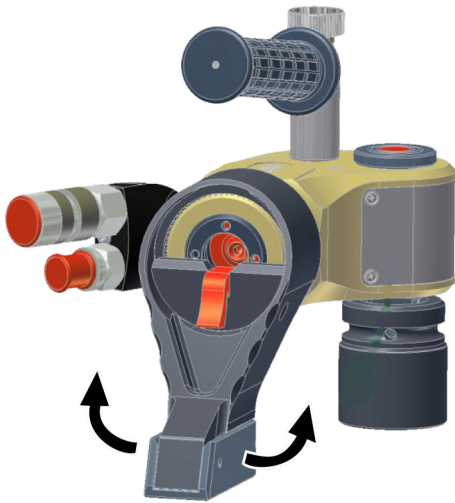
- Never reach between the reaction arm and bracing surface.
- Keep hands and other body parts clear of the mating surface.

**Incorrect bracing and overloading****WARNING!****Danger of injury from incorrect bracing, overloading, breakage!**

If the torque wrench is not sufficiently braced, it can slip out of place and be ejected. Any point contact between the reaction arm and the corners of a bracing element can cause considerable forces to act on the torque wrench. Incorrect bracing or overloading of the reaction arm, bolts or other components can result in serious injuries and damage to the torque wrench.

- Do not use the torque wrench if the particulars of the fastening operation are not entirely clear.
- Note the torque chart.
- Check the reaction arm for visible damage prior to use. Do not use the reaction arm if it is damaged.
- Brace the reaction arm correctly. Note the following instructions regarding bracing.
- Always ensure that the reaction arm is in full contact with the surface.
- Never brace using the hydraulic hose connection.
- Use only PLARAD® original reaction arms.

Bracing



To tighten or loosen, you need to brace the reaction arm against an abutment in opposition to the direction of rotation before switching on the torque wrench.

1. Find the ideal bracing surface for the fastening operation. Place the reaction arm fully on the serration and engage it in place.
2. Make sure that the reaction arm is fully engaged ↗ Chapter 5 'Preparing the torque wrench' on page 36.

Fig. 25: Adjusting the reaction arm

Ideal bracing situations

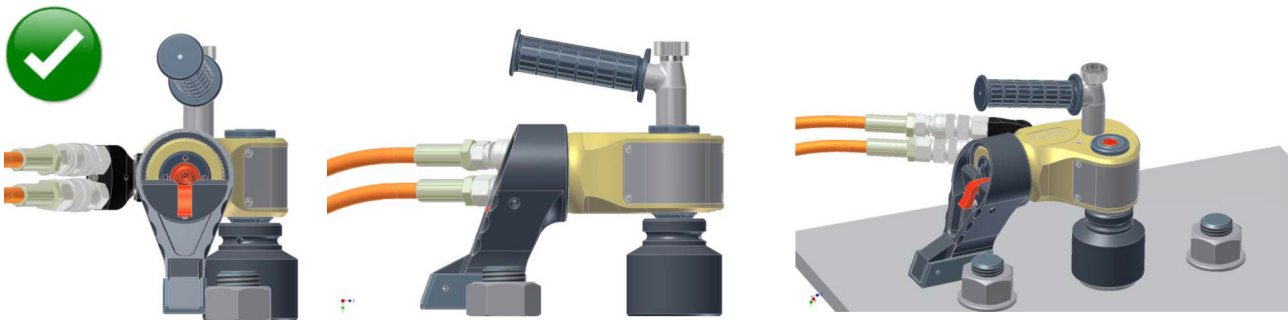


Fig. 26: Ideal bracing situation

3. Ensure that the reaction arm is in full contact with the bracing surface and cannot slip out of place.



If the standard reaction arm is not suitable for this, use a suitable reaction arm. If you have questions, contact PLARAD® service.

Inadmissible bracing situations

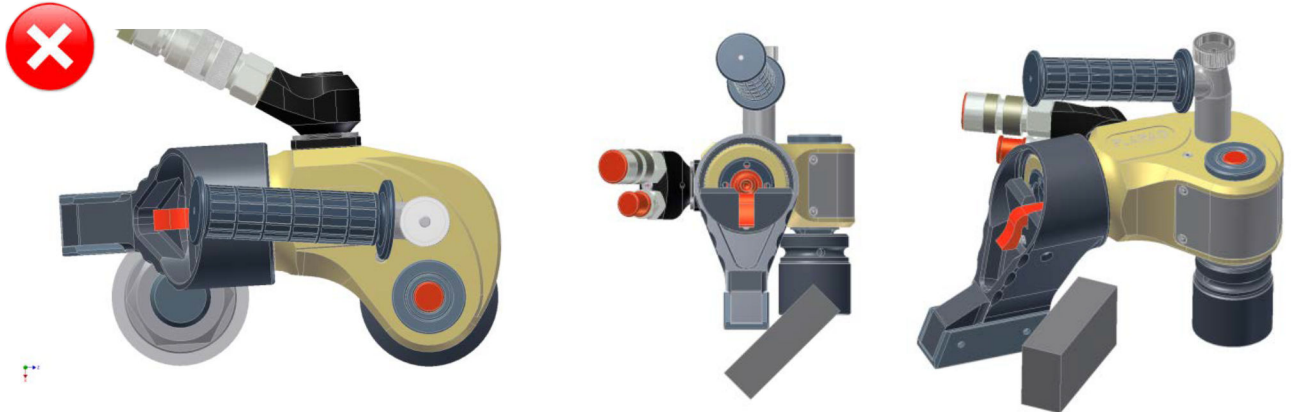


Fig. 27: Inadmissible bracing situations

4.



NOTICE!

Danger of fracture from point loads!

Ensure that the torque is not being opposed by unsuitable points, such as in Fig. 27.

8 Tightening and loosening

Residual risks during operation



WARNING!

Danger of injury from improper use!

During operation, very strong forces act on the tool, reaction arm, bracing surface, bolts and hydraulic hoses. Body parts could get between the reaction arm and bracing surface. Components may become overloaded. Hydraulic oil may escape under high pressure. This could result in serious injuries.

- Never put body parts between the reaction arm and bracing surface.
- Never attempt to hold the reaction arm in place.
- Never touch the reaction arm while the tool is running.
- Secure all detachable components.
- Position the tool with care.
- Only use hydraulic hoses that are approved for the operating pressure and are free of damage.
- Never overload components.
- Note the torque chart. Set the pressure properly.
- Before use, check the reaction arm, hydraulic hoses, impact wrench socket, square drive adapter and all other components for signs of damage. Do not use damaged components.
- Brace the reaction arm correctly ↪ *Chapter 7 'Bracing' on page 44.*
- Use PLARAD[®] attachments only.
- If you have questions, contact PLARAD[®] service.

Hot surface



WARNING!

Danger of burns from hot surface!

In high ambient temperature, the torque wrench can reach surface temperatures of up to 80°C.

- Wear personal protective equipment.
- Allow the torque wrench to cool down before performing any work on it.



Working as a team



WARNING!

Danger of injury from poor coordination!

When two people use the torque wrench and remote control as a team, poor coordination can cause injuries.

- Work alone wherever possible. Have only a single person position and brace the torque wrench and start the hydraulic power pack by remote control.
- If working alone is not possible, ensure good communication at all times.
- If coordination becomes difficult, immediately cease all work.

8.1 Direction of rotation

The square drive's direction of rotation (Fig. 28/1) is indicated on both sides of the torque wrench above the square drive.

Personnel: ■ Qualified hydraulic torque wrench personnel

Protective equipment: ■ Protective work clothing
■ Safety shoes



1. ➤ To switch between tightening and loosening, move the square drive adapter to the other side ↪ *Chapter 5 'Preparing the torque wrench' on page 36.*
2. ➤ After doing so, make sure that the square drive adapter has engaged securely.
3. ➤ If necessary, readjust the handle.

Fig. 28: Direction of rotation

8.2 Tightening



WARNING!

Danger of injury from component fracture!

Components or the bolted connection may tear while working. The torque wrench may be hurled from the bolting point.

- Stay clear of the torque wrench's longitudinal axis.
- Load torque wrench, attached parts and bolts only up to the permitted maximum torque.
- Also wear an industrial safety helmet for overhead work.

- | | |
|-----------------------|----------------------------|
| Personnel: | ■ User |
| Protective equipment: | ■ Protective work clothing |
| | ■ Safety goggles |
| | ■ Safety gloves |
| | ■ Safety shoes |
| | ■ Industrial safety helmet |

Prerequisites

- The hydraulic power pack is operational and the remote control is within reach.
↳ hydraulic power pack operating instructions
- The torque wrench is ready for use.
↳ *Chapter 5 'Preparing the torque wrench' on page 36*
- The hydraulic hoses have been connected.
↳ *Chapter 6 'Supplying with energy' on page 41*
- The torque wrench has been braced properly.
↳ *Chapter 7 'Bracing' on page 44*

Lubrication

1. ➤ Ensure that the bearing parts inside the housing are sufficiently lubricated.
↳ *Chapter 9.3 'Lubricating' on page 57*

2. ➤ If possible, tighten the bolt by hand beforehand.

3. ➤ Make sure that the direction of rotation has been set correctly.

Positioning

4. ➤ Carefully position the tool on the torque wrench (impact wrench socket, ring spanner bit etc.) on the bolt head or nut. The bolt head or nut must be completely covered by the tool. Adjust the accessories accordingly.

5. ➤ Ensure correct bracing ↳ *Chapter 7 'Bracing' on page 44.*



Starting

6. ➔



WARNING!

Danger of injury from component fracture!

Make sure that there is no one in the torque wrench's or hydraulic power pack's danger zone.

Stay clear of the torque wrench's longitudinal axis.

7. ➔

Switch on the hydraulic power pack using the remote control
⚡ hydraulic power pack operating instructions.

⇒ You will hear the sound of the driver being ratcheted over on every return stroke. This indicates that the piston has pulled the ratchet lever back again correctly.

8. ➔

If you cannot hear it ratcheting over, switch off the torque wrench and begin troubleshooting ⚡ *Chapter 10 'Troubleshooting' on page 65.*

9. ➔

Use the remote control to execute the *'tightening'* function until the bolt is no longer being turned.



Depending on the hydraulic power pack, manual and automatic fastening operations may be possible.

⚡ *Hydraulic power pack operating instructions*

⇒ The bolt has been tightened to the torque matching the operating pressure ⚡ torque chart.

8.3 Loosening



WARNING!

Danger of injury from component fracture!

Components or the bolted connection may tear while working. The torque wrench may be hurled from the bolting point.

- Stay clear of the torque wrench's longitudinal axis.
- Load torque wrench, attached parts and bolts only up to the permitted maximum torque.
- Also wear an industrial safety helmet for overhead work.

- Personnel: ■ User
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes
■ Industrial safety helmet



Loosening a bolted connection frequently requires greater torque than originally used to fasten it.

Torque wrench, attached parts and hydraulic power pack must be accordingly approved.

Prerequisites

- The hydraulic power pack is operational and the remote control is within reach.
 ↳ Hydraulic power pack operating instructions
- The torque wrench is ready for use.
 ↳ Chapter 5 'Preparing the torque wrench' on page 36
- The hydraulic hoses have been connected.
 ↳ Chapter 6 'Supplying with energy' on page 41
- The torque wrench has been braced properly.
 ↳ Chapter 7 'Bracing' on page 44

Lubrication

1. ➤ Ensure that the bearing parts inside the housing are sufficiently lubricated. ↳ Chapter 9.3 'Lubricating' on page 57
2. ➤ To ensure that the direction of rotation is correct, make sure that the square drive adapter was moved to the other side after the last tightening operation ↳ Chapter 5 'Preparing the torque wrench' on page 36.

Positioning

3. ➤ Carefully position the tool on the torque wrench on the bolt head or nut. The bolt head or nut must be completely covered by the tool. Adjust the accessories accordingly.
4. ➤ Ensure correct bracing ↳ Chapter 7 'Bracing' on page 44.
5. ➤



WARNING!

Danger of injury from component fracture!

Make sure that there is no one in the torque wrench's or hydraulic power pack's danger zone.

Stay clear of the torque wrench's longitudinal axis.

Starting

6. ➤ Switch on the hydraulic power pack using the remote control
 ↳ hydraulic power pack operating instructions.
 ⇒ You will hear the sound of the driver being ratcheted over on every return stroke. This indicates that the piston has pulled the ratchet lever back again correctly.



7. ➔ If you cannot hear it ratcheting over, switch off the torque wrench and begin troubleshooting ➔ *Chapter 10 'Troubleshooting' on page 65.*
8. ➔ Keep repeating the loosening operation until the bolted connection has been unfastened.



Depending on the hydraulic power pack, manual and automatic fastening operations may be possible.

➔ *Hydraulic power pack operating instructions*

⇒ Loosening is complete when the hydraulic power pack's pressure is close to 0 bar when the tool is turning.

8.4 After use

- Personnel: ■ User
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes

1. ➔ Switch off the the hydraulic power pack ➔ hydraulic power pack operating instructions.
2. ➔ Disconnect the hydraulic hoses and seal all openings with caps.

3. ➔



ENVIRONMENT!

Danger of pollution from hydraulic oil!

Clean the torque wrench, work area, attached parts and hoses.

Mop up spilled hydraulic oil and lubricants properly and dispose of them responsibly together with the cleaning aids.

9 Performing maintenance

9.1 Maintenance schedule

Improperly performed maintenance tasks



WARNING!

Danger of injury from improperly performed maintenance tasks!

Improper maintenance can cause serious injuries and significant property damage.

- Ensure sufficient assembly space prior to commencing the tasks.
- Ensure that the assembly site is clean and tidy. Loosely stacked or randomly scattered components and tools may cause accidents.
- Have all repairs performed by the manufacturer.
- Use only PLARAD[®] original parts.
- Observe the oil specifications.

Faultless operation

The following sections describe the maintenance tasks that are required in order to ensure optimum and faultless operation.

If routine checks reveal increased wear, shorten the requisite maintenance intervals according to the actual signs of wear. If you have questions about maintenance tasks and intervals, contact PLARAD[®] service.



Interval	Maintenance task	Personnel
Before and after every use	■ Clean. ■ Remove any flash rusting. ■ Check surfaces, warning symbols and pictograms for damage. ■ Check hydraulic hose connections, hose couplings and nipples for damage. ■ Check the impact wrench socket and spring clip for damage and correct operation. ■ Check the reaction arm and safety lock for damage and correct operation. ■ Check the handle for damage and firm attachment. ■ Check the square drive, hoses and hose connections for leaks. ■ Check all moving parts for correct operation. 🔗 Chapter 9.2 'Maintenance by the user' on page 56	User
every 20 operating hours	■ Grease joints and running surfaces. 🔗 Chapter 9.3 'Lubricating' on page 57	Qualified torque wrench personnel
Every 3 months ■ In the event of extreme operating conditions (e.g. dust, dirt) ■ In the event of high frequency of use, multi-shift operation ■ In the event of constant work in the upper torque range Every 6 months ■ In the event of standard operating conditions ■ In the event of average frequency of use ■ In the event of work in the medium torque range Every 12 months ■ In the event of low frequency of use ■ If work is conducted in the low torque range only	■ Check the torque wrench for correct operation and damage and replace any damaged components. ■ Grease all joints and running surfaces. ■ Check the seals for damage and replace them if damaged. ■ Check the sliding bearings for damage and replace them if damaged. ■ Calibrate the torque wrench. ■ Check the accessories for damage and replace them if damaged. ■ Exchange damaged markings. 🔗 Chapter 9.4 'Having service tasks performed by the manufacturer' on page 64	PLARAD [®] service

Accessories, spare parts and wear parts

Spare parts must meet the technical requirements specified by PLARAD[®]. This is always ensured by original spare parts. A warranty can only be provided for original spare parts supplied by PLARAD[®].

The installation or use of other spare parts can, under certain circumstances, adversely alter the specified design properties and, consequently, impair active or passive safety.

Any liability and warranty for damage resulting from the use of parts other than the original spare parts and accessory parts is excluded.

Have at least the following information to hand to enable quick and easy processing:

- Client
- Serial number of the torque wrench
- Desired spare part
- Desired quantity
- Desired mode of shipping

🔗 'PLARAD[®] service' on page 4

9.2 Maintenance by the user

Personnel: ■ User

Perform the following maintenance steps before and after every use:

Cleaning

1. ➡



NOTICE!
Damage from improper cleaning!

Clean the torque wrench with a soft cloth. Never use strong cleaning agents, water, brushes, sharp-edged tools or high-pressure cleaners.



WARNING!
Fire hazard!

When using isopropyl alcohol, do not clean the torque wrench near ignition sources. Do not smoke. Let it evaporate.

Surfaces and markings

2. ➡

Check surfaces and markings for damage. Arrange for repairs if there is damage or illegible markings.

Hydraulic hoses

3. ➡

Check the hydraulic hoses and connections for damage and leaks. Replace damaged hydraulic hoses; have damaged connections replaced by PLARAD[®] service.

Never replace them yourself.

Impact wrench socket

4. ➡

Check the impact wrench socket and spring clip for damage, deformation and correct operation. Arrange for exchange if there is damage.

Reaction arm

5. ➡

Check the reaction arm for damage and deformation. Check the circlip for correct operation. Arrange for exchange if there is damage.

**Torque wrench****6.** →**WARNING!****Danger of injury from faulty torque wrench!**

Have the faulty torque wrench repaired or get the faulty parts replaced. Contact PLARAD® service.

Transport case**7.** →

Store the clean, undamaged torque wrench in its transport case until its next use.

9.3 Lubricating**Explosion protection****WARNING!****Danger of explosion from poor lubrication!**

Poor lubrication can lead to spark generation and hot surfaces. This can cause explosions.

- Comply with the maintenance intervals.
- Observe the oil specifications.

Lubricant

The torque wrench is delivered with lubricant.

Use the following lubricant only:

- Castrol Tribol TR 3020/1000

Further details ↗ lubricant safety data sheet.

9.3.1 Lubricating MSX and MX-EC

- Personnel: ■ Qualified hydraulic torque wrench personnel
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes

The ball head on the piston rod (Fig. 29/2) in the torque wrench engages in a matching ball socket in the ratchet lever (Fig. 29/1), where it is held in place by a spring bolt (Fig. 29/5). To lubricate these parts, you need to disengage the piston rod (Fig. 29/2) from the ratchet lever (Fig. 29/1) by proceeding as follows:

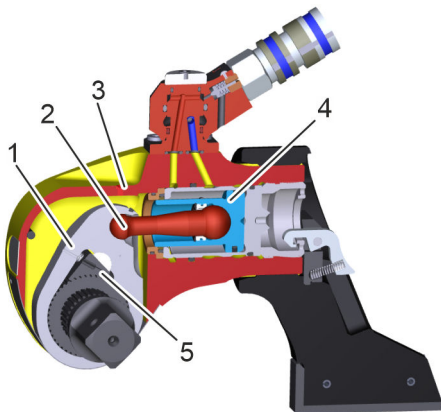


Fig. 29: Lubricating MSX and MX-EC

- 1 Ratchet lever
- 2 Piston rod
- 3 Lubrication point
- 4 Piston
- 5 Spring bolt

Retracting the piston

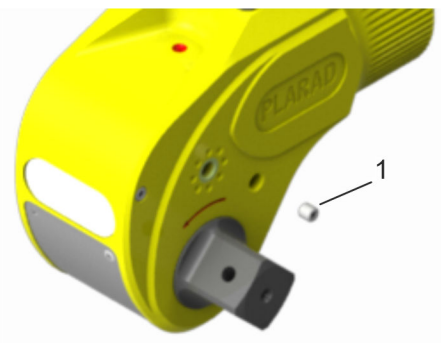


Fig. 30: Stud bolt (1)

1. To decouple the ratchet lever, retract the piston (Fig. 29/4). To do so, unscrew the hex socket stud bolt (Fig. 30/1) on the housing's side using the included Allen key.



Removing the cover panel

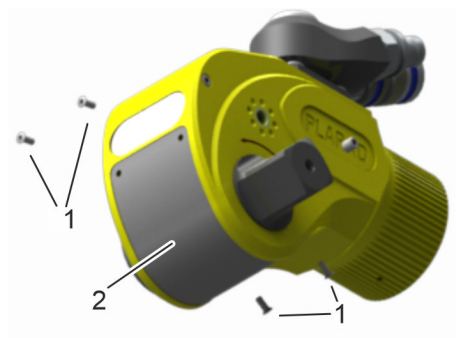


Fig. 31: Cover panel

2. ➔ Undo the bolts (Fig. 31/1) in the cover panel (Fig. 31/2) and take off the cover panel.

Connecting the hydraulic power pack

3. ➔ Connect the torque wrench to the hydraulic power pack with the hydraulic hoses.

⇒ Chapter 6 'Supplying with energy' on page 41

⇒ Hydraulic power pack operating instructions

Moving the piston to front end position

4. ➔ Move and hold the piston and ratchet lever to the front end position at low pressure (approx. 10 bar).

5. ➔ Insert the longer end of the Allen key (Fig. 32/1) into the vacated hole to hold the ratchet lever in this position.

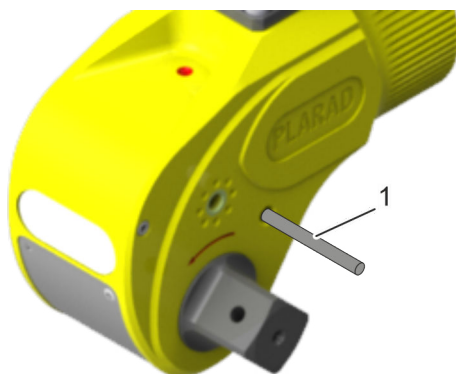


Fig. 32: Allen key

Decoupling the ratchet lever

6. ➔ Let go of the button on the hydraulic power pack's remote control.

⇒ The piston automatically moves to the torque wrench's rear end position. The ratchet lever decouples.

7. ➔ Take the Allen key (or other tool) used as a locking bar out of the hole.

Dismantling



Fig. 33: Square drive adapter

8. ➔ Dismantle the square drive adapter & 'Changing the square drive adapter' on page 37.

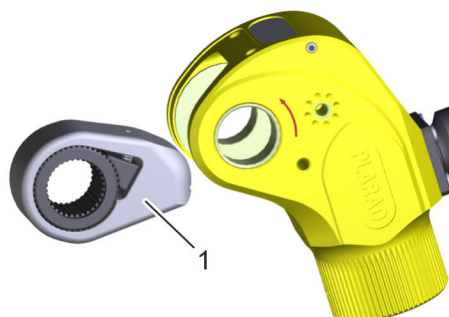


Fig. 34: Ratchet lever

9. ➔ Take out the ratchet lever (Fig. 34/1).

Lubricating

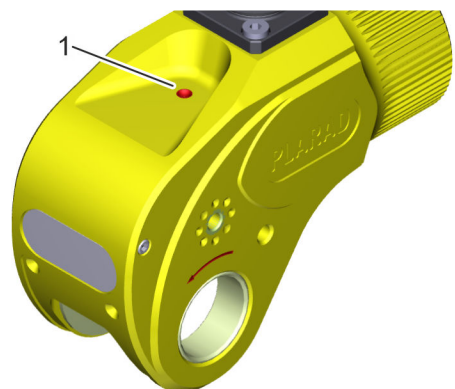


Fig. 35: Lubrication point (1)

10. ➔ Lubricate the piston rod's ball head and the ball socket on the lever. Do so by letting lubricant drip onto the ball head from a grease gun.

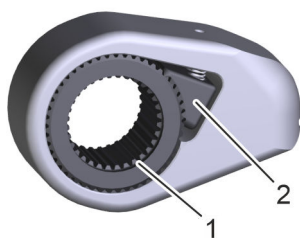


Fig. 36: Ratchet lever

Assembling

- 11.** ➤ Clean and grease the serration on the driver (Fig. 36/2) and toothed bushing (Fig. 36/1).

- 12.** ➤ Fit the lubricated ratchet lever in the housing and lock it in position with the square drive adapter and bushing.
- 13.** ➤ Engage by moving the piston to the front end position at low pressure ⚡ hydraulic power pack operating instructions.



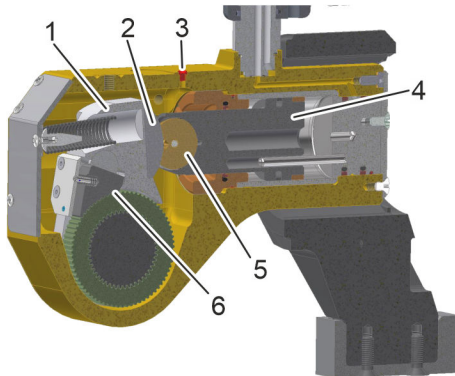
The ratchet lever is prevented from slipping forwards by a stop at the front of the housing.

⇒ Piston and piston rod engage automatically.

- 14.** ➤ Screw the stud bolt back into the hole in the side of the housing using the Allen key (Fig. 30).
- 15.** ➤ Fasten the cover panel (Fig. 31).

9.3.2 Lubricating LT

- Personnel: ■ Qualified hydraulic torque wrench personnel
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes

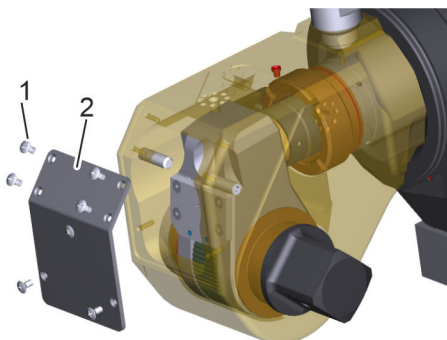


The ball head (Fig. 37/2) in the ratchet lever (Fig. 37/1) engages in a matching ball socket in the piston (Fig. 37/5) inside the torque wrench, where it is held in place by a spring bolt (Fig. 37/6). These parts require lubrication.

Fig. 37: Lubricating LT

- 1 Ratchet lever
- 2 Ball head in ratchet lever
- 3 Lubrication point
- 4 Piston
- 5 Ball socket
- 6 Spring bolt

Removing the cover panel



1. → Undo the bolts (Fig. 38/1) in the cover panel (Fig. 38/2) and take off the cover panel.

Fig. 38: LT: Cover panel

Dismantling

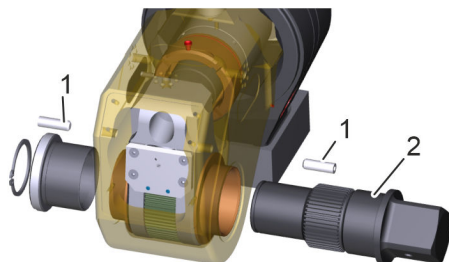


Fig. 39: LT: square drive

2. ➔ Dismantle (↪ 'Changing the square drive adapter' on page 39) the square drive adapter (Fig. 39/2) and unscrew the stud bolts (Fig. 39/1).

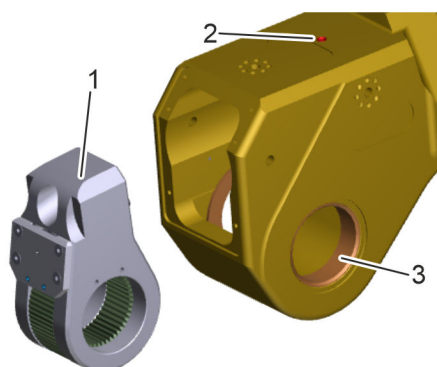


Fig. 40: LT: ratchet lever

- 1 Ratchet lever
- 2 Lubrication point
- 3 Bushing

3. ➔ Take out the ratchet lever (Fig. 40/1).

Lubricating

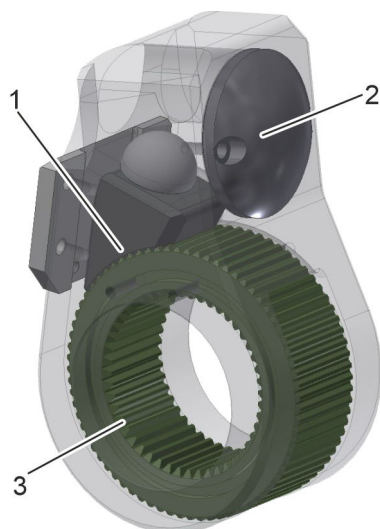


Fig. 41: LT: ratchet lever

- 1 Serration on driver
- 2 Ball head
- 3 Toothed bushing

4. ➔ Lubricate the mating area between ratchet lever (ball head) and piston (ball socket). Do so by letting lubricant drip from a grease gun into the ball socket through the lubrication point (Fig. 40/2).
5. ➔ Clean and grease the serration on the driver (Fig. 41/1) and toothed bushing (Fig. 41/3).
6. ➔ **Assemble**
Fit the lubricated ratchet lever (Fig. 41) in the housing and lock it in position with the square drive adapter (Fig. 39) and bushing (Fig. 40/3).
7. ➔ Screw the stud bolt back into the hole in the side of the housing using the Allen key.
8. ➔ Fasten the cover panel (Fig. 38).

9.4 Having service tasks performed by the manufacturer

Service intervals

The service intervals are dependent on the conditions of use and the operating site.

Service interval	Conditions
Every 3 months	■ In the event of extreme operating conditions (e.g. dust, dirt) ■ In the event of high frequency of use, multi-shift operation ■ In the event of constant work in the upper torque range ■ In the event of soft fastening operations
Every 6 months	■ In the event of standard operating conditions ■ In the event of average frequency of use ■ In the event of work in the medium torque range
Every 12 months	■ In the event of low frequency of use ■ In the event of work in the low torque range

Contacting service



WARNING!

Danger of injury from improperly performed service tasks!

Contact PLARAD® service in good time regarding the following service tasks.

Do not perform service tasks yourself.

Service tasks

Personnel: ■ PLARAD® service

Component	Service task
Accessories	Check for damage; exchange.
	Exchange damaged markings.
Torque wrench	Exchange damaged markings.
	Check for damage, replace damaged components.
	Recalibrate. Determine characteristics.
	Create torque chart/factory certificate.
	Lubricate and check joints, seals, sliding bearings; replace if damaged.



10 Troubleshooting

10.1 Identifying faults

Malfunctions and faults can become noticeable in different ways:

Fault description	Cause	Remedy	Personnel
Torque wrench does not work properly	Power supply problems	Connect the hydraulic hoses properly, make sure that the couplings engage correctly. Check and adjust the operating pressure settings. Note the torque chart and the hydraulic power pack's operating instructions.	User
	Insufficient lubrication	Lubricate and clean ↗ <i>Chapter 9.3 'Lubricating' on page 57.</i>	Qualified hydraulic torque wrench personnel
Torque wrench is not working for no apparent reason.	Torque wrench is damaged	Contact ↗ <i>'PLARAD® service' on page 4</i>	PLARAD® service
	Overloading	Use the torque wrench at up to 75% of its maximum torque power only. Use a more powerful torque wrench.	Qualified hydraulic torque wrench personnel
	Insufficient power	Check hydraulic hoses, couplings and nipples and have them replaced if damaged.	User
	Serration in torque wrench faulty	Contact ↗ <i>'PLARAD® service' on page 4.</i>	PLARAD® service
Damage to bracing, bolts, tool or other attached parts	Overloading	Replace damaged components. Reduce the torque. Note the torque chart. Reconfigure bracing.	Qualified hydraulic torque wrench personnel PLARAD® service
Hydraulic hose connection leaking	Hydraulic hose, connection, coupling or nipples faulty	Have faulty components replaced.	PLARAD® service
Square drive leaking	Torque wrench faulty	Contact ↗ <i>'PLARAD® service' on page 4.</i>	PLARAD® service

10.2 Performing troubleshooting

Improperly performed troubleshooting



WARNING!

Danger of injury from improperly performed troubleshooting!

Improper troubleshooting can cause serious injuries and significant property damage.

- With regard to maintenance tasks, only allow “Clean” and “Check for damage” to be performed by the user.
- Have all repairs performed by the manufacturer.
- Use only PLARAD[®] original parts.

Device damage

- ➔ Contact ☎ *‘PLARAD[®] service’ on page 4* if there is any damage.

Power supply

1. ➔ Check hydraulic hoses, couplings and nipples and have them replaced if damaged.
2. ➔ Check the hydraulic power pack pressure.

Returning to service after remedying the error



WARNING!

Danger of injury from faulty torque wrench!

If a torque wrench is not properly repaired, this can cause serious injuries.

- Never start up a faulty torque wrench again.



11 Disposing of the torque wrench

The torque wrench must be disposed of in an environmentally sound manner at the end of its service life.

Disassembly



WARNING!

Danger of injury from stored residual energy!

Damaged components can cause injuries through undissipated residual energy.

1. ➤ Disconnect the torque wrench from the power supply.
2. ➤ Remove attached parts.
⇒ Reuse these components if necessary.
3. ➤ Do not dismantle the torque wrench any further.

Disposal

Insofar as no take-back or disposal agreement has been put in place, dispose of the torque wrench in accordance with local regulations. Use authorised collection points.



ENVIRONMENT!

Danger of pollution from incorrect disposal!

Incorrect disposal can be hazardous to the environment.

- Dispose of hydraulic oil and objects contaminated with hydraulic oil responsibly. They must not enter the environment.
- If in doubt, obtain information about environmentally sound disposal from the local municipal authority or from specialist disposal companies.

12 Technical data

Technical data sheet



Technical data sheet is available online at:
<https://www.plarad.de/download-center.html>

Dimensions and weight

Dimensions and weight are dependent on the torque wrench version. See the technical data sheet for specific values for the torque wrench.

MX-EC:

Data	Value	Unit
Weight*	2.9 – 20.5	kg
Length	160 – 323	mm
Width	50 – 112	mm
Height	137 – 254	mm

MSX:

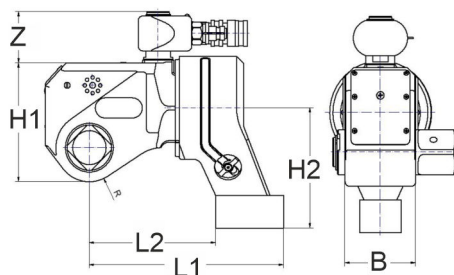
Data	Value	Unit
Weight*	29.5 – 77.7	kg
Length	290 – 415	mm
Width	118 – 155	mm
Height	308 – 402	mm

* See the rating plate for specific details.

Performance values

Data	Value	Unit
Pressure, maximum*	800	bar
MX-EC: Torque, maximum	210 – 20500	Nm
MSX: Torque, maximum	2500 – 65000	Nm

* See the rating plate for specific details.


LT – dimensions


Type	L2 - L1	Width	H1	H2	R	Z
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
LT 20 TS	176 – 111	63	99.5	105	29	62.7
LT 50 TS	215 – 140	83	128.5	130	37	55.7
LT 100 TS	238 – 153	91	159	152	49	73.7

LT – performance values and weight

Type	Square drive	Performance range	Weight*
		[Nm]	[kg]
LT 20 TS	1"	200 – 2,000	4.9
LT 50 TS	1.1/2"	500 – 5,000	9.2
LT 100 TS	1.1/2"	1,000 – 10,000	14.1

Environment

Data	Value	Unit
Temperature range	-20 – 70	°C
Relative humidity, maximum	Non-condensing	

Emissions

Emission levels as per EN 60745

Data	Value	Unit
Emission sound pressure level	< 70	dB(A)
Measurement uncertainty of emission sound pressure level	3	dB(A)

Hydraulic power pack

The hydraulic power pack chosen as a power supply must meet the following performance data.

Data	Value	Unit
Pressure, maximum	800	bar
Hydraulic oil	Shell Tellus S2 VX 15	
Oil temperature, maximum	90	°C

Oil specifications

Data	Value
Hydraulic oil	Shell Tellus S2 VX 15

Data	Value
Lubricant	Castrol Tribol 3020/1000



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Appendix



A Castrol – Tribol GR 3020/1000-0 PD

Section 1. Identification

Product name Tribol GR 3020/1000-00 PD
SDS # 468588
Code 468588-DE03

Relevant identified uses of the substance or mixture and uses advised against

Product use Grease for industrial applications
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

Supplier BP Lubricants USA Inc.
1500 Valley Road
Wayne, NJ 07470
Telephone: +1-888-CASTROL

EMERGENCY HEALTH INFORMATION: +1-800-447-8735

EMERGENCY SPILL INFORMATION: +1-800-424-9300 (CHEMTREC USA)
+1-703-527-3887 (CHEMTREC outside the US)

Section 2. Hazards identification

OSHA/HCS status This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture Not classified.

GHS label elements

Signal word No signal word.

Hazard statements No known significant effects or critical hazards.

Precautionary statements

Prevention Not applicable.

Response Not applicable.

Storage Not applicable.

Disposal Not applicable.

Hazards not otherwise classified None known.

Section 3. Composition/information on ingredients

Substance/mixture Mixture
Highly refined mineral oil and additives. Thickening agent.

Ingredient name	CAS number	%
Distillates (petroleum), hydrotreated heavy naphthenic	64742-52-5	≥75 - ≤90
Benzenesulfonic acid, di-C10-18-alkyl derivatives, calcium salts	93820-57-6	≤3
Molybdenum, bis(dibutylcarbamodithioato)di-μ-oxodioxodi-, sulfurized	68412-26-0	≤3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Product name Tribol GR 3020/1000-00 PD

Product code 468588-DE03

Page: 1/8

Version 4 **Date of issue** 01/04/2022.

Format CCSA

Language ENGLISH

Section 3. Composition/information on ingredients

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.
Skin contact	Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.
Inhalation	If inhaled, remove to fresh air. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. Get medical attention if symptoms occur.
Ingestion	Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	Treatment should in general be symptomatic and directed to relieving any effects. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. Note: High Pressure Applications Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discolored and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimize tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.
Specific treatments	No specific treatment.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	In case of fire, use water fog, alcohol resistant foam, dry chemical or carbon dioxide extinguisher or spray.
Unsuitable extinguishing media	Do not use water jet.

Specific hazards arising from the chemical	No specific fire or explosion hazard.
---	---------------------------------------

Hazardous combustion products	 Combustion products may include the following: metal oxide/oxides carbon oxides (CO, CO ₂) (carbon monoxide, carbon dioxide) sulfur oxides (SO, SO ₂ etc.) nitrogen oxides (NO, NO ₂ etc.)
--------------------------------------	--

Special protective actions for fire-fighters	No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.
Special protective equipment for fire-fighters	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

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Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.

For emergency responders

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill

Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill

Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. If emergency personnel are unavailable, contain spilled material. Suction or scoop the spill into appropriate disposal or recycling vessels, then cover spill area with oil absorbent. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep away from heat and direct sunlight. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Distillates (petroleum), hydrotreated heavy naphthenic	ACGIH TLV (United States). TWA: 5 mg/m ³ 8 hours. Issued/Revised: 11/2009 Form: Inhalable fraction OSHA PEL (United States). TWA: 5 mg/m ³ 8 hours. Issued/Revised: 6/1993
Benzenesulfonic acid, di-C10-18-alkyl derivatives, calcium salts	None.
Molybdenum, bis(dibutylcarbamodithioato)di-μ-oxodioxodi-, sulfurized	ACGIH TLV (United States). TWA: 10 mg/m ³ , (as Mo) 8 hours. Issued/Revised: 2/2001 Form: Inhalable fraction TWA: 3 mg/m ³ , (as Mo) 8 hours. Issued/Revised: 2/2001 Form: Respirable fraction OSHA PEL (United States).

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Section 8. Exposure controls/personal protection

TWA: 15 mg/m³, (as Mo) 8 hours. Issued/
Revised: 6/1993 Form: Total dust

While specific OELs for certain components may be shown in this section, other components may be present in any mist, vapor or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained. Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.

The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Body protection

Use of protective clothing is good industrial practice.

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.

For protection against metal working fluids, respiratory protection that is classified as "resistant to oil" (class R) or oil proof (class P) should be selected where appropriate. Depending on the level of airborne contaminants, an air-purifying, half-mask respirator (with HEPA filter) including disposable (P- or R-series) (for oil mists less than 50mg/m³), or any powered, air-purifying respirator equipped with hood or helmet and HEPA filter (for oil mists less than 125 mg/m³).

Where organic vapours are a potential hazard during metalworking operations, a combination particulate and organic vapour filter may be necessary.

The correct choice of respiratory protection depends upon the chemicals being handled,

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Section 8. Exposure controls/personal protection

the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacture and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

Physical state	Grease
Color	Yellow.
Odor	Not available.
Odor threshold	Not available.
pH	Not applicable.
Melting point/freezing point	Not available.
Boiling point, initial boiling point, and boiling range	Not available.
Flash point	Closed cup: 226°C (438.8°F) [Estimated. Based on Lubricants - Base Oils]
Evaporation rate	Not available.
Flammability	Not applicable. Based on - Physical state
Lower and upper explosion limit/flammability limit	Not applicable.
Vapor pressure	Not available.
Relative vapor density	Not applicable.
Density	<1000 kg/m ³ (<1 g/cm ³) at 20°C
Solubility	insoluble in water.
Partition coefficient: n-octanol/water	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not available.
Viscosity	Not available.
Particle characteristics	
Median particle size	Not available.

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame).
Incompatible materials	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

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Section 11. Toxicological information

Information on toxicological effects

Information on the likely routes of exposure

Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact

No known significant effects or critical hazards.

Skin contact

No known significant effects or critical hazards.

Inhalation

Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion

No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact

No specific data.

Skin contact

Adverse symptoms may include the following:
irritation
dryness
cracking

Inhalation

No specific data.

Ingestion

No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects

Not available.

Potential delayed effects

Not available.

Long term exposure

Potential immediate effects

Not available.

Potential delayed effects

Not available.

Potential chronic health effects

General

No known significant effects or critical hazards.

Carcinogenicity

No known significant effects or critical hazards.

Mutagenicity

No known significant effects or critical hazards.

Teratogenicity

No known significant effects or critical hazards.

Developmental effects

No known significant effects or critical hazards.

Fertility effects

No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

No testing has been performed by the manufacturer.

Persistence and degradability

Not expected to be rapidly degradable.

Bioaccumulative potential

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Section 12. Ecological information

Not available.

Mobility in soil

Soil/water partition
coefficient (K_{oc})

Not available.

Mobility

Grease. insoluble in water.

Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user

Not available.

Transport in bulk according to IMO instruments

Not available.

Section 15. Regulatory information

U.S. Federal regulations

United States inventory
(TSCA 8b)

All components are active or exempted.

Other regulations

Australia inventory (AIC)

All components are listed or exempted.

Canada inventory

At least one component is not listed in DSL but all such components are listed in NDSL.

China inventory (IECSC)

All components are listed or exempted.

Japan inventory (CSCL)

At least one component is not listed.

Korea inventory (KECI)

All components are listed or exempted.

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Section 15. Regulatory information

Philippines inventory (PICCS)	At least one component is not listed.
Taiwan Chemical Substances Inventory (TCSI)	All components are listed or exempted.
REACH Status	The company, as identified in Section 1, sells this product in the EU in compliance with the current requirements of REACH.

Section 16. Other information

History

Date of issue/Date of revision 01/04/2022.

Date of previous issue 06/23/2021.

Prepared by Product Stewardship

Key to abbreviations

ACGIH = American Conference of Industrial Hygienists
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS Number = Chemical Abstracts Service Registry Number
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
OEL = Occupational Exposure Limit
SDS = Safety Data Sheet
STEL = Short term exposure limit
TWA = Time weighted average
UN = United Nations
UN Number = United Nations Number, a four digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods.
Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

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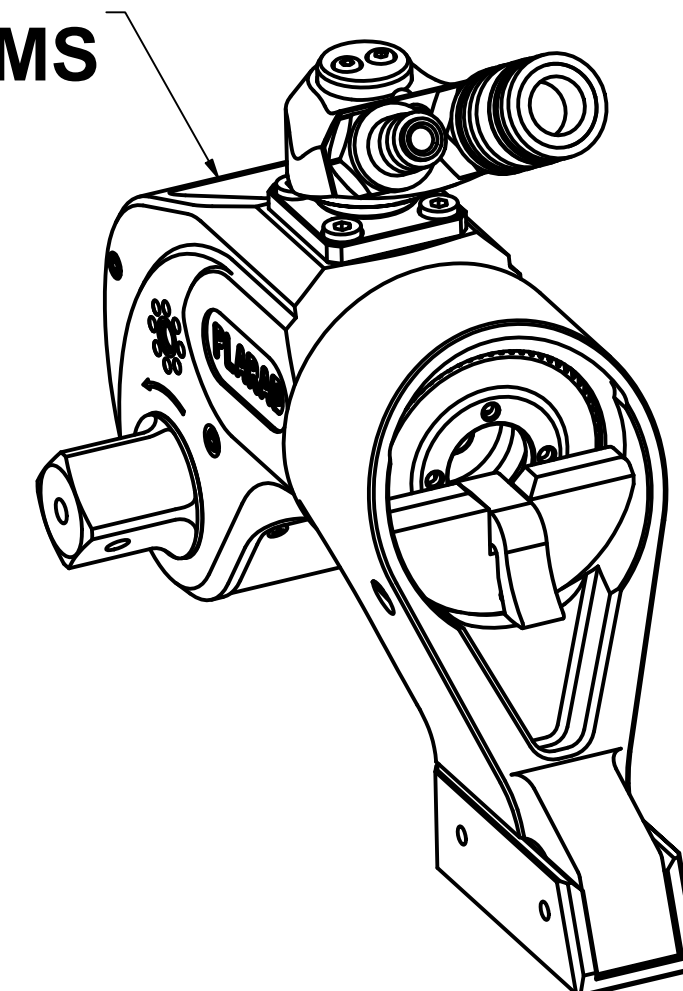
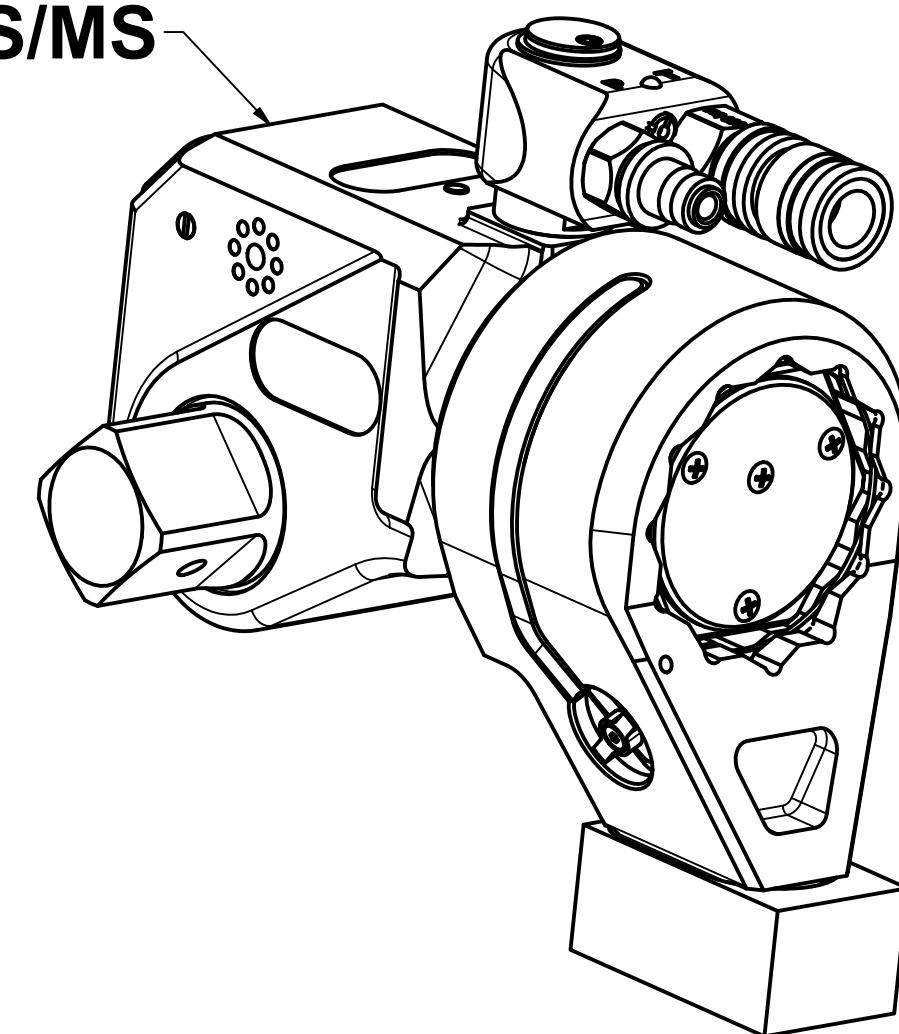
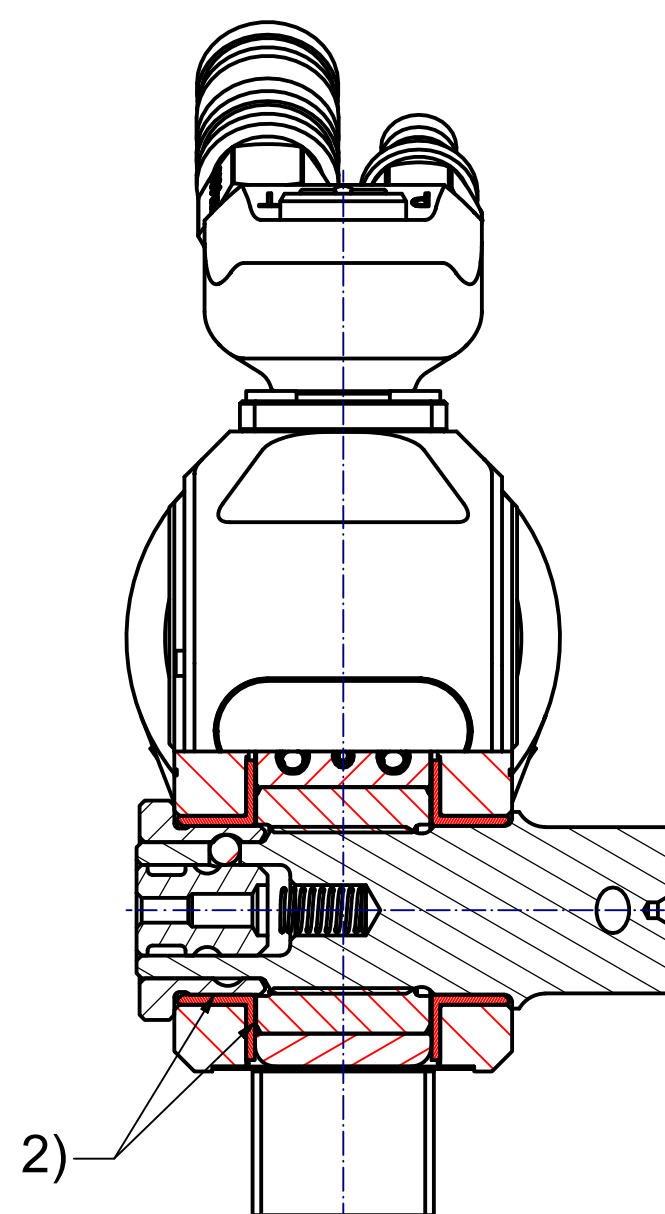
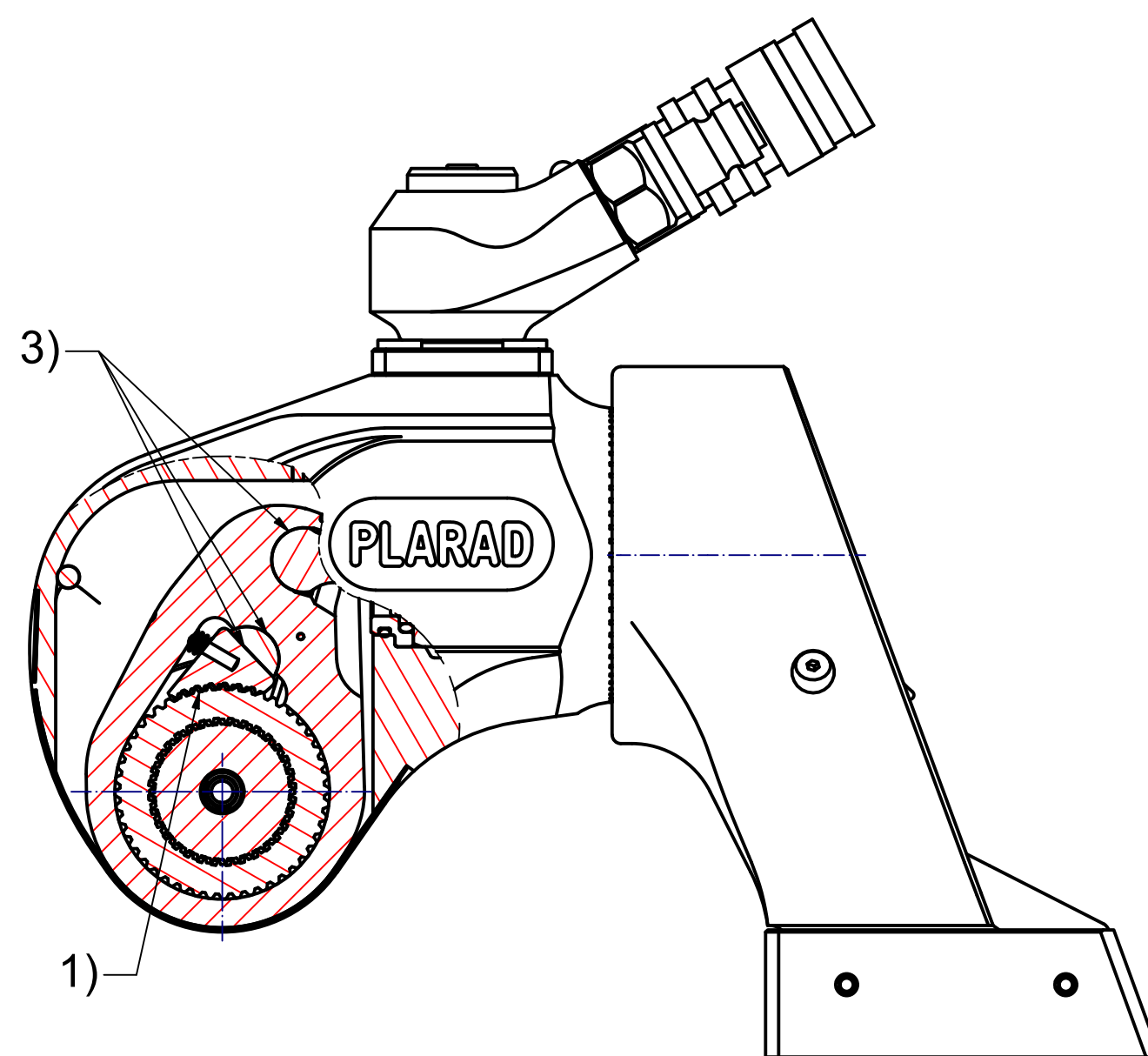
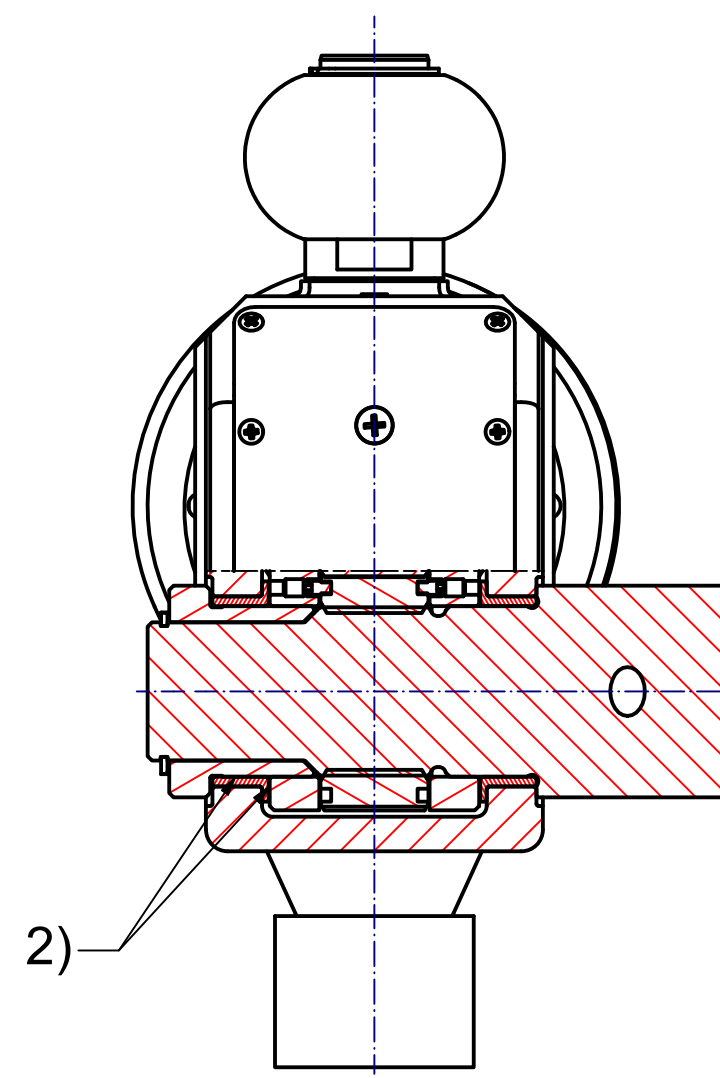
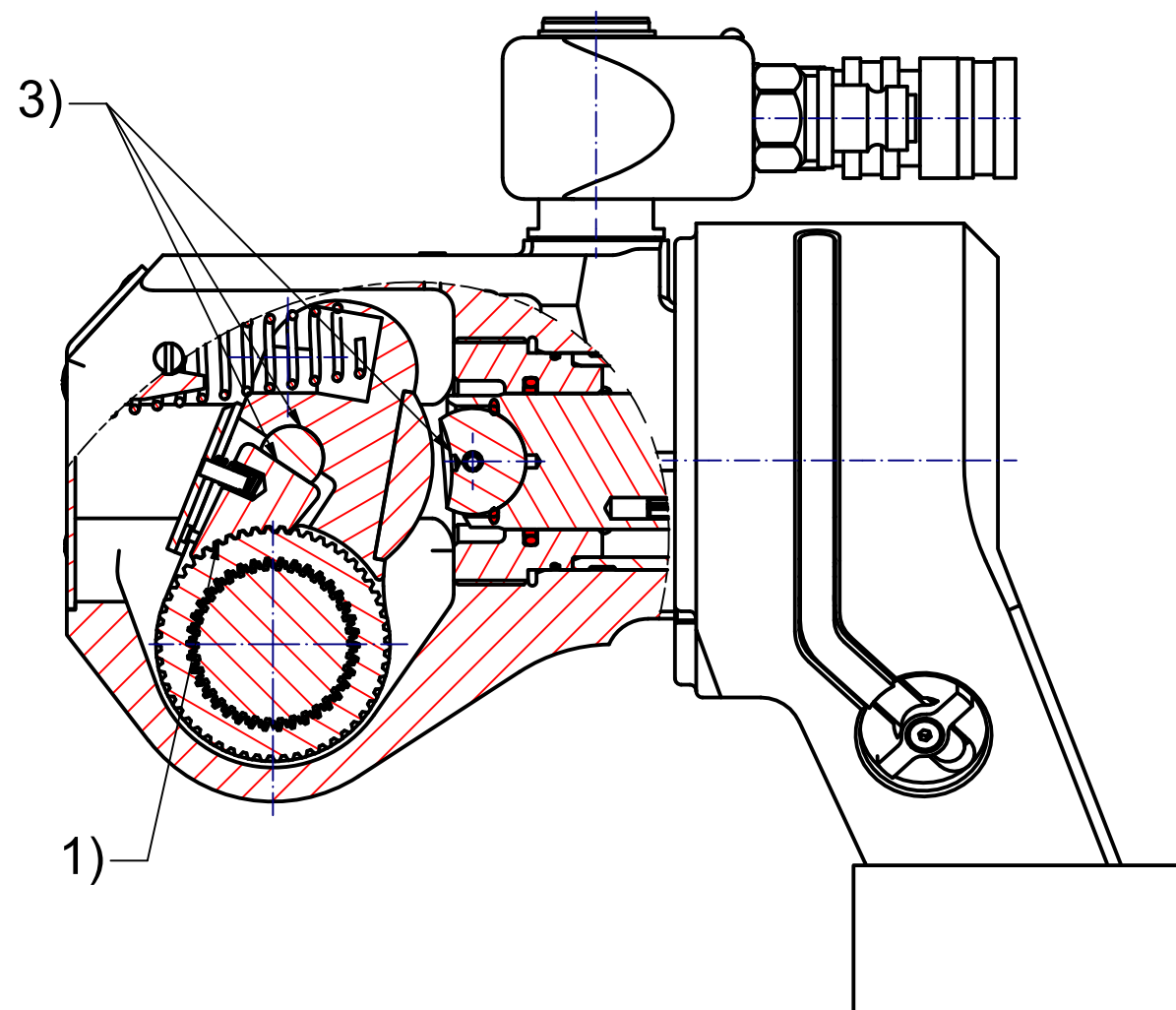
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Schmierstellen
Points of lubrication
Points de graissages
Smoresteder
puntos de engrase
Punti d'ingrassagio
Smeerpunt
Mazání bodů
Punkty smarowania

1)	2)	3)
<u>Tribol GR 3020/1000-0</u>	<u>Tribol GR 3020/1000-0</u>	<u>Tribol GR 3020/1000-0</u>
Mitnehmervverzahnung	Adapterlagerung	Gelenkstück / Verbindung: Hebel-Kolben
Drive pawl	Bearingring for squer drive shaft	Half ball / Joint: Lever-Piston
Les reducteurs d'entraînement	Les reducteurs d'entraînement	Joint articule / Jonction: Levier-Piston
Medbringerfortanding	Adapterlejrjng	Ledforbindelse / Vorbindelse: Arm-Stempel
Arrastre	Alojamiento	Parte de articulación / Conexión: Palanca-Biela
Dentatura	Supporto adattatore	Artcolazione / Raccorrido: Leva-Pistone
Vertanding	Adaptorlagering	Schanier / Verbeinding: Hevel-Zuiger
Ozubení unášeče	Uložení adaptéru	Kloubový díl / Połączenie: dzwignia-tłok
uzębienie	łożysko adapteru	przegłub

[illegible]

EC Declaration of Conformity

**Translation of
original**

Manufacturer	Maschinenfabrik Wagner GmbH & Co. KG
	Birrenbachshöhe 17 53804 Much Germany
Person authorised to compile the technical file	Jörn Grindel
Product name	MX-EC 5 / 10 / 20 / 45 / 75 / 95 / 120 / 155 / 200 / 300 TS MSX / T 20 / 45 / 75 / 120 MS MSX / T 250 / 400 / 650 TS
Type	See rating plate
Serial number Year of manufacture	See rating plate

The manufacturer declares that the machinery conforms to all relevant requirements of the directive:

2006/42/EC	EC Machinery Directive
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The following harmonised standards have been applied:

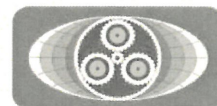
EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN ISO 11148-1:2013-05	Hand-held non-electric power tools - Safety requirements
DIN EN ISO 4413:2011-04	Hydraulic fluid power - General rules and safety requirements for systems and their components
BGR 237	Hydraulic hose lines and hydraulic fluids – regulations for safe application

Much, 22/04/2026	signed Jörn Grindel (Managing Director)
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ISO 9001:2015
ISO 14001:2015
Management
System
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ID 1100012007

PLARAD[®]
Torque & Tension Systems



EG – Konformitätserklärung

Original

Hersteller	Maschinenfabrik Wagner GmbH & Co. KG
	Birrenbachshöhe 17 53804 Much Deutschland
Dokumentations- Verantwortlicher	Jörn Grindel
Produktbezeichnung	MX-EC 5/ 10/ 20/ 45/ 75/ 95/ 120/ 155/ 200/ 300 TS MSX / T 20/ 45/ 75/ 120 MS MSX / T 250/ 400/ 650 TS
Typ	Siehe Typenschild
Seriennummer Baujahr	Siehe Typenschild

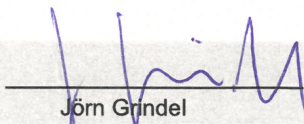
Der Hersteller erklärt, dass die Maschine allen einschlägigen Bestimmungen der Richtlinie entspricht:

2006/42/EG	Maschinenrichtlinie
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Folgende harmonisierte Normen wurden angewandt:

EN ISO 12100:2010	Sicherheit von Maschinen- Allgemeine Gestaltungsgrundsätze- Risikobeurteilung und Risikominderung
DIN EN ISO 11148-1:2013	Handgehaltene nicht elektrisch betriebene Maschinen - Sicherheitsanforderungen
DIN EN ISO 4413:2011	Fluidtechnik - Allgemeine Regeln und sicherheitstechnische Anforderungen an Hydraulikanlagen und deren Bauteile
BGR 237	Hydraulik Schlauchleitung – Regeln für den sicheren Einsatz

Much, den 22.04.2026


Jörn Grindel
(Geschäftsführung)