

Operating instructions

High power hydraulic wrench HPR



PLARAD®
Torque & Tension Systems



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

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Translation of the original operating instructions

pA# 78465, 2, en_GB



Information about this manual



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

The manual is a component of the high power hydraulic 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 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 versions of the high power hydraulic wrench:

- HPR 500
- HPR 1000
- HPR 1500

Other applicable documents

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

- Rating plate
- EU declaration of conformity
- Torque chart
 - Correlation of fastening operations and 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.*

Manufacturer

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1 Unpacking

Delivery



Fig. 1: Example, transport case

The high power hydraulic 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:

- High power hydraulic wrench
- Reaction arm
- Ring spanner bit (optional)
- Circlip pliers for assembly of circlips for reaction arm/pin
- Transport case
- Lubricant
- Document folder
 - Operating instructions
 - Torque chart
 - EU declaration of conformity

Options:

- Any accessory ordered
- 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 high power hydraulic wrenches 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 high power hydraulic 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 high power hydraulic 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 54.*
- Seal all openings (couplings, nipples).

2 Getting to know the high power hydraulic wrench

2.1 Illustration of high power hydraulic wrench

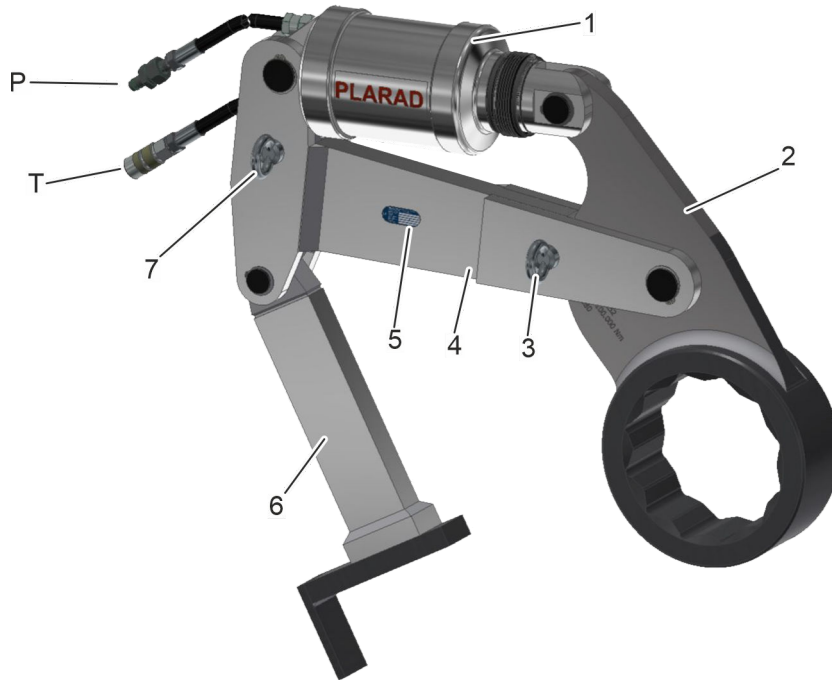


Fig. 2: Illustration of HPR

P	Pressure connection	4	Reaction arm
T	Return	5	Rating plate
1	Hydraulic drive cylinder	6	Reaction brace (application-specific)
2	Ring spanner bit (optional accessory)	7	Lifting eye
3	Lifting eye		

2.2 Brief description

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

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

The HPR high power hydraulic wrench is designed for use with the PLARAD® XE1hpr electric hydraulic power pack.

At corresponding pressure (☞ torque chart), the hydraulic cylinder generates a force that is applied to the ring spanner bit through a lever system. The ring spanner bit then moves through an angle of approximately 30° to 35° around the lever axis to transmit the torque to the bolted connection.

To take up the reaction force, the swivelling reaction arm must be braced in a suitable position.

When using ring spanner bits without a ratchet function, the unit needs to be taken off the bolt or nut after completing the turning motion; the drive cylinder is retracted and the unit is placed onto the bolted connection again for the next turning motion.

Ring spanner bits with ratchet function can remain on the bolt or nut you are tightening. The drive cylinder can retract. To switch between 'tighten' or 'loosen' mode, you need to flip the high power hydraulic wrench to place it on the bolt or nut the other way around.

2.3 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

2.4 High power hydraulic wrench controls

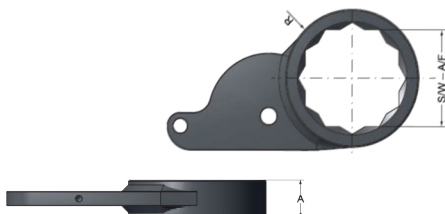


The high power hydraulic wrench is controlled exclusively through the hydraulic power pack's remote control unit.

2.5 Accessories

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

- Ring spanner bits of various size



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.

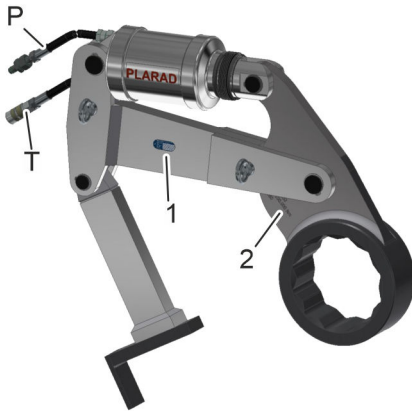
Other markings

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 high power hydraulic wrench

Overview



- T Coupling for return line hydraulic hose
- P Nipple for connecting pressure line hydraulic hose
- 1 Rating plate
- 2 Technical data for ring spanner
-  'Danger of crushing' on page 14
-  'Hot surface' on page 15
-  'Follow the manual' on page 15
-  'Test badges' on page 15

Fig. 3: Symbols on the high power hydraulic wrench

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.

You will find the following symbols and information notices on the high power hydraulic 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.

Follow the manual



Read the operating instructions before use.

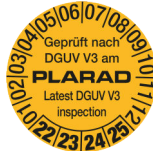
Test badges

The test badges state the dates of the respective tests.

Date of the next PLARAD[®] service



Date of the last DGUV-V3 test



For tools with certificate:

Date of the last torque inspection



3.3 Intended use

The high power hydraulic 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 54*).

The high power hydraulic wrench is powered hydraulically.

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

The high power hydraulic 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 high power hydraulic wrench can lead to dangerous situations.

- Never operate without the reaction arm.
- Do not use the high power hydraulic wrench as a driving motor without consulting PLARAD[®] first.
- Do not operate the high power hydraulic wrench in continuous operation.
- Never subject the high power hydraulic wrench, bolts or accessories to loads exceeding the permitted 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 high power hydraulic 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 55.*
- Comply with the maintenance intervals.
- Top up using only new and clean hydraulic oil ↗ *'Oil specifications' on page 55.*

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 high power hydraulic 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 high power hydraulic wrench or individual components can result in serious injuries.

- Do not use the high power hydraulic wrench if the particulars of the fastening operation are not entirely clear.
- Note the torque chart.
- Check reaction arm and reaction brace for signs of damage before use. Do not use damaged components.
- Brace correctly ↪ *Chapter 7 'Bracing' on page 36.*
- Do not operate the high power hydraulic wrench in continuous operation and do not use it as a drive unit.
- 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 high power hydraulic wrench, reaction arm, reaction brace, bracing surface and bolts. When tightening or loosening, there is a danger of crushing between these components:

- Reaction brace and bracing surface
- Reaction arm and reaction brace
- Reaction arm and ring spanner bit and drive cylinder

The high weight of the high power hydraulic wrench can cause crushing if it falls down.

- Handle the high power hydraulic 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 high power hydraulic wrench safely despite its high weight.
- Do not reach between the reaction brace and bracing surface.
- Do not reach between the reaction arm and reaction brace.
- Do not reach between the reaction arm, ring spanner bit and drive cylinder.
- Secure the high power hydraulic wrench against falling when working at height.
- Wear personal protective equipment.
- 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 high power hydraulic wrench dry, clean and free of lubricants. Clean them immediately if they are dirty.



Inserting tools



NOTICE!

Damage due to use of the wrong tools!

- Only use tools suitable for the fastening operation (ring spanner bits, impact wrench sockets, ratchet heads, interchangeable inserts etc.).
- Ensure a flawless, positive connection between the high power hydraulic wrench, tool and bolt.

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!

Injuries to the musculoskeletal system from the high weight of the high power hydraulic 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 high power hydraulic wrench as close to your body as possible.
- Only carry small high power hydraulic wrenches.
- Lift heavy high power hydraulic wrenches by their lifting eyes only.
- Avoid lopsided lifting. Avoid twisting your spine. Do not carry one-handed.
- 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 high power hydraulic 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 high power hydraulic wrench seems familiar to you after frequent use.
- When the high power hydraulic wrench is not in use, always store it securely in the transport case out of reach of 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 high power hydraulic wrench is equipped with the following safety devices and safety functions:

Circlip

The pins fastening the ring spanner bit between the hydraulic cylinder and reaction arm are prevented from falling out by circlips.

Lifting eyes

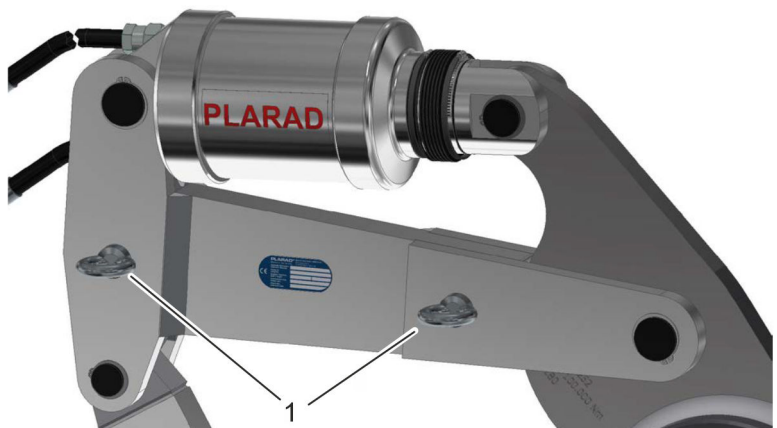


Fig. 4: Lifting eyes

Suitable lifting gear can be attached to the two lifting eyes (Fig. 4/1) to make transporting and positioning the wrench on nuts and bolts easier.

3.7 Operator's obligations

The high power hydraulic wrench is used in the commercial sector. The operator of the high power hydraulic 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 high power hydraulic wrench's area of application must be adhered to.

The following specifically applies in this regard:

- Operators 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 high power hydraulic wrench's operating site. The findings of this risk assessment must be used to draft safety instructions for operating the high power hydraulic wrench.
- During the entire time the high power hydraulic 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 high power hydraulic 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 high power hydraulic wrench and ensure that only commissioned and instructed personnel work with the high power hydraulic wrench. Personnel being trained or instructed and personnel undertaking vocational training must always be supervised by an experienced person when working with or on the high power hydraulic wrench.
- The operator must ensure that the high power hydraulic 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 further responsible for ensuring that the high power hydraulic 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 high power hydraulic wrench?



WARNING!

Danger of injury if personnel are insufficiently qualified!

If unqualified personnel perform work on or with the high power hydraulic 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 damage.

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

User

Users of the high power hydraulic wrench have the requisite knowledge and the requisite training for handling hydraulics. 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.

Users are trained in how to use the personal protective equipment, are familiar with the most important specifications, situations and information relating to working with high power hydraulic wrenches and are capable of using the high power hydraulic wrench safely. This includes connecting hydraulic hoses.

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 high power hydraulic wrench.

Qualified high power hydraulic wrench personnel

Qualified high power hydraulic 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 high power hydraulic wrench, recognise and avoid potential dangers independently and indicate them to users.

Specific capabilities of qualified high power hydraulic wrench personnel include:

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

- Uphold safety, occupational safety and health protection when using the hydraulic power pack and high power hydraulic 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 high power hydraulic 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 24

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 9.3 'Having service tasks performed by the manufacturer' on page 49

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.

Protective cap



The protective cap (hairnet) is used to protect the hair from being pulled in by rotating and moving parts, such as bolts.

The wearing of a protective cap is mandatory if your hair is longer than the circumference of the moving shaft.

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.

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 hydraulic 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 hydraulic 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 hydraulic 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 high power hydraulic 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 high power hydraulic 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 suitable tools (impact wrench sockets, ring spanner bits, interchangeable inserts etc.).
- Never put the high power hydraulic wrench into operation if the reaction arm or tools are unsecured.

- Personnel: ■ Qualified high power hydraulic 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 high power hydraulic wrench must be prepared.

Determining the particulars of the fastening operation

Reaction brace

Attaching the ring spanner bit

1. ➤ Ensure that the particulars of the fastening operation have been determined ➤ *Chapter 4 'Determining the particulars of the fastening operation' on page 29* and that all parameters are available.
2. ➤ Make sure that the reaction brace is undamaged and that it is suitable for your fastening operation.

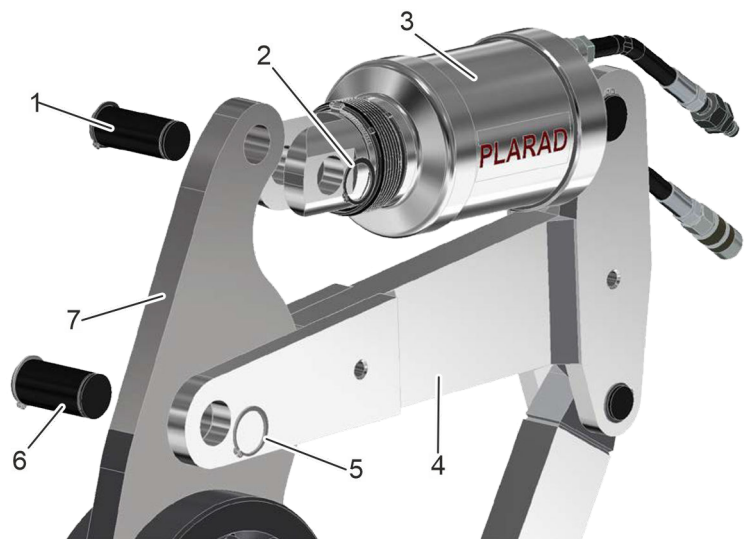


Fig. 5: Attaching the ring spanner bit

- 1 Fastening pin
 - 2 Circlip
 - 3 Drive cylinder
 - 4 Reaction arm
 - 5 Circlip
 - 6 Fastening pin
 - 7 Ring spanner bit
3. ➤ To attach a ring spanner bit, slide the fastening pin (Fig. 5/1) all the way through the holes in the ring spanner bit (Fig. 5/7) and drive cylinder (Fig. 5/3).



Fig. 6: Circlip pliers

4. ➤ Fasten the fastening pin (Fig. 5/1) with a circlip. To do so, slide on the circlip (Fig. 5/2) with the aid of the circlip pliers (Fig. 6) and clamp it.
5. ➤ Slide the fastening pin (Fig. 5/6) all the way through the holes in the ring spanner bit (Fig. 5/7) and reaction arm (Fig. 5/4).
6. ➤ Fasten the fastening pin (Fig. 5/6) with a circlip. To do so, slide on the circlip (Fig. 5/5) with the aid of the circlip pliers (Fig. 6) and clamp it.
7. ➤ Attach further accessories if such accessories have been identified as necessary for the fastening operation.

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 54.*

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 33.*
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

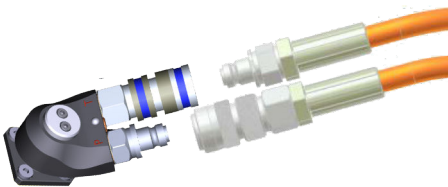


Fig. 7: Example of connecting hydraulic hoses

4. ➤



- The hydraulic torque wrench may feature a variety of coupling systems.*
- The universal hydraulic 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 55.*
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 hydraulic torque wrench.

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

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

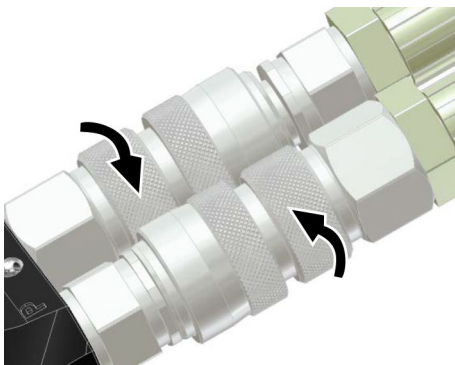


Fig. 8: Firmly connecting the hydraulics

Purging

Setting the operating pressure

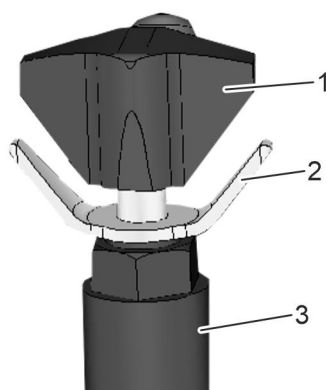


Fig. 9: Pressure adjustment valve

- 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

Reaction brace

Torques can only be generated if the reaction forces are absorbed properly. This is what the reaction brace on the high power hydraulic wrench is for.

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

Crushing



WARNING!

Danger of crushing when bracing and due to high weight!

During operation, very strong forces act on the high power hydraulic wrench, reaction arm, reaction brace, bracing surface and bolts. When tightening or loosening, there is a danger of crushing between these components:

- Reaction brace and bracing surface
- Reaction arm and reaction brace
- Reaction arm and ring spanner bit and drive cylinder

The high weight of the high power hydraulic wrench can cause crushing if it falls down.

- Handle the high power hydraulic 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 high power hydraulic wrench safely despite its high weight.
- Do not reach between the reaction brace and bracing surface.
- Do not reach between the reaction arm and reaction brace.
- Do not reach between the reaction arm, ring spanner bit and drive cylinder.
- Secure the high power hydraulic wrench against falling when working at height.
- Wear personal protective equipment.
- Also wear an industrial safety helmet for overhead work.



Incorrect bracing and overloading



WARNING!

Danger of injury from incorrect bracing, overloading, breakage!

If the high power hydraulic 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 high power hydraulic wrench. Incorrect bracing or overloading of the reaction arm, bolts or other components can result in serious injuries and damage the high power hydraulic wrench.

- Do not use the high power hydraulic wrench if the particulars of the fastening operation are not entirely clear.
- Note the torque chart.
- Check the reaction brace for signs of damage before use. Do not use the reaction brace if it is damaged.
- Always ensure that the reaction brace lies flush on the respective surface.
- Never brace using the hydraulic hose connection.
- Use only PLARAD[®] original reaction braces.
- Brace the reaction brace correctly. Note the following instructions regarding bracing.

Bracing

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

1. Find the ideal bracing surface for the fastening operation.
2. Make sure that the reaction brace is free of damage.

Ideal bracing situations

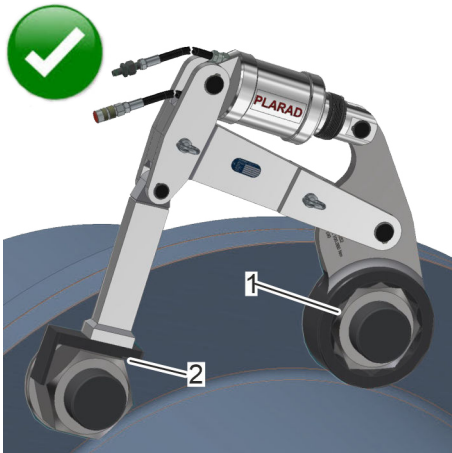


Fig. 10: Ideal bracing situation

- 1 Suitable insert
- 2 Reaction brace lies flush

3. Ensure that the reaction brace lies flush on the bracing surface (Fig. 10/2) and cannot slip out of place.

If this will not work with your reaction brace, contact PLARAD® service.

Inadmissible bracing situations

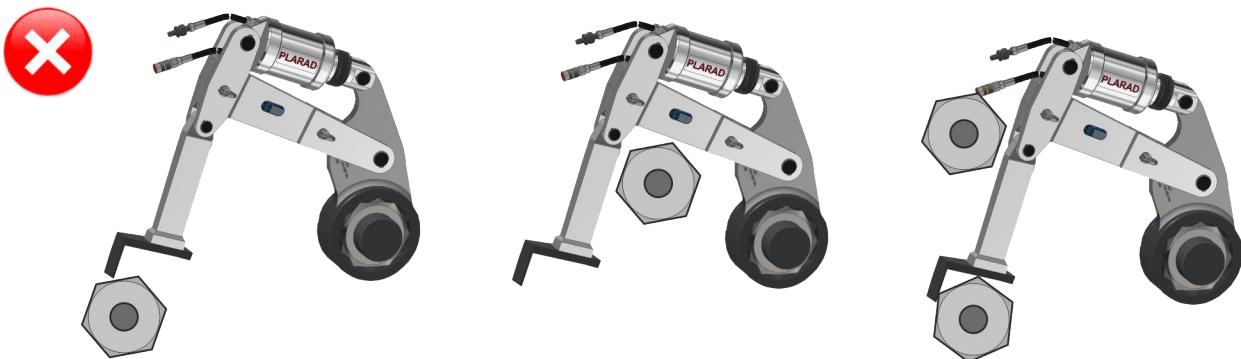


Fig. 11: Inadmissible bracing situations

- 4.



NOTICE!

Danger of fracture from point loads!

Ensure that the torque is not being opposed by unsuitable points, such as in Fig. 11.

8 Tightening and loosening

Residual risks during operation



WARNING!

Danger of injury from improper use!

During operation, very strong forces act on the high power hydraulic wrench, reaction arm, reaction brace, ring spanner bit, 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.

When tightening or loosening, there is a danger of crushing between these components:

- Reaction brace and bracing surface
- Reaction arm and reaction brace
- Reaction arm and ring spanner bit and drive cylinder
- Handle the high power hydraulic 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 high power hydraulic wrench safely despite its high weight.
- Do not reach between the reaction brace and bracing surface.
- Do not reach between the reaction arm and reaction brace.
- Do not reach between the reaction arm, ring spanner bit and drive cylinder.
- Secure the high power hydraulic wrench against falling when working at height.
- Wear personal protective equipment.
- Also wear an industrial safety helmet for overhead work.
- 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, reaction brace, ring spanner bit and all other components for signs of damage. Do not use damaged components.
- Brace the reaction arm and reaction brace correctly ↪ *Chapter 7 'Bracing' on page 36.*
- Use PLARAD[®] attachments only.
- If you have questions, contact PLARAD[®] service.

Hot surface



WARNING!

Danger of burns from hot surfaces!

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

- Wear personal protective equipment.
- Allow the high power hydraulic 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 high power hydraulic 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 high power hydraulic 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

Personnel: ■ Qualified high power hydraulic wrench personnel

Protective equipment: ■ Protective work clothing
■ Safety shoes

- 1.** ➤ To switch between tightening and loosening, flip over the high power hydraulic wrench to position it on the bolt the other way up.
- 2.** ➤ If necessary, swap the interchangeable insert or tool to the other side.

8.2 Tightening



WARNING!

Danger of injury from component fracture!

Components or the bolted connection may tear while working. The high power hydraulic wrench may eject at force from the bolting point.

- Stay clear of the high power hydraulic wrench's longitudinal axis.
- Load high power hydraulic wrench, attached parts and bolts only up to the permitted maximum torque.

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

Fulfilling prerequisites

1. ➔ Make sure that the following conditions are met:
 - The hydraulic power pack is operational and the remote control is within reach.
 - ↳ Hydraulic power pack operating instructions
 - The high power hydraulic wrench is ready for use.
 - ↳ Chapter 5 'Preparing the high power hydraulic wrench' on page 30
 - The hydraulic hoses have been connected.
 - ↳ Chapter 6 'Supplying with energy' on page 33
 - The high power hydraulic wrench has been properly braced.
 - ↳ Chapter 7 'Bracing' on page 36

Positioning

2. ➔ If possible, tighten the bolt by hand beforehand.
3. ➔ Carefully position the ring spanner bit in the high power hydraulic wrench on the bolt head or nut. The bolt head or nut must be completely covered by the ring spanner. Adjust the accessories accordingly.

4. ➔



WARNING!

Danger of injury from component fracture!

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

Stay clear of the high power hydraulic wrench's longitudinal axis.

Starting



Fig. 12: Example remote control XE1HPR

5. ➤



WARNING!
Danger of crushing!

Keep all body parts clear of the potential crushing areas between:

- Reaction brace and bracing surface
- Reaction arm and reaction brace
- Reaction arm and ring spanner bit and drive cylinder

6. ➤



Example of operation – PLARAD® XE1HPR hydraulic power pack:

- *White button*
 - *Switches on the hydraulic power pack*
 - *Extends working cylinder*
- *Black button*
 - *Retracts working cylinder*
- *Red button*
 - *Switches off the hydraulic power pack*

To start the hydraulic power pack, press the white button on the remote control & hydraulic power pack operating instructions.

Ring spanner bits without ratchet function

7. ➤

Briefly tap the white button to check the position of the swivelling reaction brace. Correct the position.

8. ➤

Press and hold the white button to fasten.

⇒ The drive cylinder extends. The ring spanner turns.

9. ➤

Release the white button.

⇒ The ring spanner's turning motion stops.

10. ➤

Take the high power hydraulic wrench off the bolt.

11. ➤

Press the black button to retract the working cylinder.

12. ➤

Position the high power hydraulic wrench on the bolt. Make sure that the reaction brace is properly in position.

13. ➤

Repeat this procedure – fasten, take from bolt, retract working cylinder, re-position on bolt – until the torque set by the operating pressure has been reached.

⇒ The turning motion stops.

14. ➤

Press the red button to switch off the hydraulic power pack.

15. ➤

Press and hold the white button to fasten.

⇒ The drive cylinder extends. The ring spanner turns.

Ring spanner bits with ratchet function

- 16.** ➤ Release the white button.
⇒ The ring spanner's turning motion stops.
- 17.** ➤ Press the black button to retract the working cylinder.
- 18.** ➤ Keep repeating fastening and work cylinder retraction until the torque set by the operating pressure has been reached.
⇒ The turning motion stops.
- 19.** ➤ Press the red button to switch off the hydraulic power pack.

8.3 Loosening



WARNING!

Danger of injury from component fracture!

Components or the bolted connection may tear while working. The high power hydraulic wrench may eject at force from the bolting point.

- Stay clear of the high power hydraulic wrench's longitudinal axis.
- Load high power hydraulic wrench, attached parts and bolts only up to the permitted maximum torque.

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



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

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

Fulfilling prerequisites

- 1.** ➤ Make sure that the following conditions are met:
 - The hydraulic power pack is operational and the remote control is within reach.
⇒ Hydraulic power pack operating instructions
 - The high power hydraulic wrench is ready for use.
⇒ Chapter 5 'Preparing the high power hydraulic wrench' on page 30
 - The hydraulic hoses have been connected.
⇒ Chapter 6 'Supplying with energy' on page 33
 - The high power hydraulic wrench has been properly braced.
⇒ Chapter 7 'Bracing' on page 36

Positioning

2. ➤ Carefully position the ring spanner bit in the high power hydraulic wrench on the bolt head or nut. The bolt head or nut must be completely covered by the ring spanner. Adjust the accessories accordingly.

3. ➤



WARNING!

Danger of injury from component fracture!

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

Stay clear of the high power hydraulic wrench's longitudinal axis.

4. ➤



WARNING!

Danger of crushing!

Keep all body parts clear of the potential crushing areas between:

- Reaction brace and bracing surface
- Reaction arm and reaction brace
- Reaction arm and ring spanner bit and drive cylinder

Starting



Fig. 13: Example remote control XE1HPR

5. ➤



Example of operation – PLARAD® XE1HPR hydraulic power pack:

- White button
 - Switches on the hydraulic power pack
 - Extends working cylinder
- Black button
 - Retracts working cylinder
- Red button
 - Switches off the hydraulic power pack

To start the hydraulic power pack, press the white button on the remote control & hydraulic power pack operating instructions.

6. ➤ Briefly tap the white button to check the position of the swivelling reaction brace. Correct the position.
7. ➤ Press and hold the white button to loosen.
 - ⇒ The drive cylinder extends. The ring spanner turns.
8. ➤ Release the white button.
 - ⇒ The ring spanner's turning motion stops.
9. ➤ Take the high power hydraulic wrench off the bolt.

Ring spanner bits without ratchet function

Ring spanner bits with ratchet function

- 10.** ➤ Press the black button to retract the working cylinder.
- 11.** ➤ Position the high power hydraulic wrench on the bolt. Make sure that the reaction brace is properly in position.
- 12.** ➤ Repeat this procedure – loosen, take from bolt, retract working cylinder, re-position on bolt – until you can remove the bolt.
 - ⇒ The turning motion stops.
 - ⇒ Loosening is complete when the hydraulic power pack's pressure is close to 0 bar when the tool is turning.
- 13.** ➤ Press the red button to switch off the hydraulic power pack.
- 14.** ➤ Press and hold the white button to loosen.
 - ⇒ The drive cylinder extends. The ring spanner turns.
- 15.** ➤ Release the white button.
 - ⇒ The ring spanner's turning motion stops.
- 16.** ➤ Press the black button to retract the working cylinder.
- 17.** ➤ Keep repeating loosening and working cylinder retraction until you can remove the bolt.
 - ⇒ The turning motion stops.
 - ⇒ Loosening is complete when the hydraulic power pack's pressure is close to 0 bar when the tool is turning or when you can turn the nut/bolt by hand.
- 18.** ➤ Press the red button to switch off the hydraulic power pack.

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 hydraulic 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 ring spanner bit and circlip for damage and correct operation. ■ Check the reaction brace for damage and correct operation. ■ Check the lifting eyes for damage and firm attachment. ■ Check for leaks. ■ Check all moving parts for correct operation. 🔗 Chapter 9.2 'Maintenance by the user' on page 48	User
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	■ Check the high power hydraulic 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 slide bearings for damage and replace them if damaged. ■ Calibrate the high power hydraulic wrench. ■ Check the accessories for damage and replace them if damaged. ■ Exchange damaged markings. 🔗 Chapter 9.3 'Having service tasks performed by the manufacturer' on page 49	PLARAD [®] service
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		

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 hydraulic 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 high power hydraulic 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 high power hydraulic 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 connections yourself.

Ring spanner bit

4. ➤ Check the ring spanner bit, pin and circlip for damage, deformation and correct operation. Arrange for exchange if there is damage.

Reaction arm

5. ➤ Check the reaction arm for damage and deformation. Arrange for exchange if there is damage.

Reaction brace

6. ➤ Check the reaction brace for damage and deformation. Arrange for exchange if there is damage.

7. →



WARNING!

Danger of injury from faulty high power hydraulic wrench!

Do not use the high power hydraulic wrench if it is faulty. Have it repaired immediately or have the faulty parts exchanged. Contact PLARAD[®] service.

Transport case

8. →

Store the clean, undamaged high power hydraulic wrench in its transport case until its next use.

9.3 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.
Hydraulic torque wrench	Exchange damaged markings.

Component	Service task
	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
Malfunctioning high power hydraulic wrench	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
High power hydraulic wrench is not working for no apparent reason.	High power hydraulic wrench is damaged	Contact ☎ <i>'PLARAD[®] service'</i> on page 4	PLARAD [®] service
	Overloading	Use the high power hydraulic wrench at up to 75% of its maximum torque power only. Use a more powerful high power hydraulic wrench.	Qualified high power hydraulic wrench personnel
	Insufficient power	Check hydraulic hoses, couplings and nipples and have them replaced if damaged.	
	Serration on accessories faulty	Contact ☎ <i>'PLARAD[®] service'</i> on page 4.	PLARAD [®] service
Damage to bracing, bolts, reaction brace, ring spanner bit or other attached parts	Overloading	Replace damaged components. Reduce the torque. Note the torque chart. Reconfigure bracing.	Qualified high power hydraulic wrench personnel PLARAD [®] service
Hydraulic hose connection leaking	Hydraulic hose, connection, coupling or nipples faulty	Have faulty components replaced.	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 hydraulic torque wrench!

An improperly repaired hydraulic torque wrench can cause serious injuries.

- Never start up a faulty hydraulic torque wrench again.

11 Disposing of the high power hydraulic wrench

The high power hydraulic 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 high power hydraulic wrench from the power supply.
2. ➔ Remove attached parts.
⇒ Reuse these components if necessary.
3. ➔ Do not dismantle the high power hydraulic wrench any further.

Disposal

Insofar as no take-back or disposal agreement has been put in place, dispose of the high power hydraulic 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.

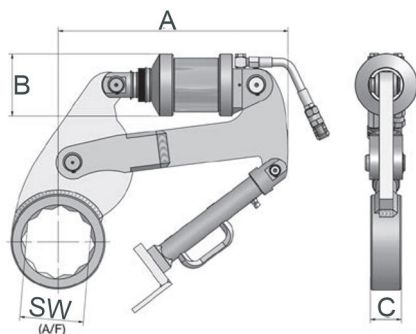
12 Technical data

Technical data sheet



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

Dimensions and weight



Dimensions and weight depend on the version. See the technical data sheet for specific values.

HPR	A	B	C	Weight
HPR 500	550 mm	132 mm	550 mm	34 kg
HPR 1000	600 mm	180 mm	600 mm	45 kg
HPR 1500	825 mm	320 mm	560 mm	76 kg

Performance values

HPR	Torque range	Wrench size max.	A/F max.
HPR 500	5,000 – 50,000 Nm	185 mm	7 1/4"
HPR 1000	10,000 – 100,000 Nm	230 mm	9 1/8"
HPR 1500	15,000 – 150,000 Nm	320 mm	12"

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 HPR high power hydraulic wrench is designed for use with the PLARAD® XE1hpr electric hydraulic power pack.

Data	Value	Unit
Pressure, maximum	350	bar

Data	Value	Unit
Oil temperature, maximum	90	°C
Flow rate at 350 bar	3.5	l/min
Hydraulic oil	Shell Tellus S2 VX 15	

Oil specifications

Data	Value
Hydraulic oil	Shell Tellus S2 VX 15

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Appendix



A Shell Tellus S2 VX 15

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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : Shell Tellus S2 VX 15
Product code : 001F8430
UFI : ESN0-T0QJ-Y00M-46N5

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

Use of the Substance/Mixture : Hydraulic oil
Uses advised against :
This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the supplier.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier : **Shell UK Oil Products Limited**
Shell Centre
London
SE1 7NA
United Kingdom
Telephone : (+44) 08007318888
Telefax :
Email Contact for Safety Data Sheet : If you have any enquiries about the content of this SDS please email lubricantSDS@shell.com

1.4 Emergency telephone number
: +44 (0) 151 350 4595 (This telephone number is available 24 hours per day, 7 days per week)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Aspiration hazard, Category 1 H304: May be fatal if swallowed and enters airways.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



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Signal word : Danger

Hazard statements :

H304
PHYSICAL HAZARDS:
Not classified as a physical hazard according to CLP criteria.
HEALTH HAZARDS:
May be fatal if swallowed and enters airways.
ENVIRONMENTAL HAZARDS:
Not classified as environmental hazard according to CLP criteria.

Precautionary statements : **Prevention:**

Response:
P331
P301 + P310
Do NOT induce vomiting.
IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
Storage:
P405
Store locked up.
Disposal:
P501
Dispose of contents/ container to an approved waste disposal plant.

Hazardous components which must be listed on the label:
Contains Distillates (Fischer - Tropisch), heavy, C18-50 - branched, cyclic and linear.

2.3 Other hazards

This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.
Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Used oil may contain harmful impurities.
High-pressure injection under the skin may cause serious damage including local necrosis.
Not classified as flammable but will burn.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Highly refined mineral oils and additives.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.
Classification based on DMSO extract content < 3% (Regulation (EC) 1272/2008, Annex VI, Part 3, Note L).

: * contains one or more of the following CAS-numbers (REACH registration numbers): 64742-53-6 (01-2119480375-34), 64742-54-7 (01-2119484627-25), 64742-55-8 (01-2119487077-29), 64742-56-9 (01-2119480132-48), 64742-65-

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0 (01-2119471299-27), 68037-01-4 (01-2119486452-34), 72623-86-0 (01-2119474878-16), 72623-87-1 (01-2119474889-13), 8042-47-5 (01-2119487078-27), 848301-69-9 (01-0000020163-82), 68649-12-7 (01-2119527646-33), 151006-60-9 (01-2119523580-47), 163149-28-8 (01-2119543695-30).

Hazardous components

Chemical name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration (% w/w)
Interchangeable low viscosity base oil (<20,5 cSt @40°C) *	Not Assigned	Asp. Tox.1; H304	0 - 90

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.

If inhaled : No treatment necessary under normal conditions of use.
If symptoms persist, obtain medical advice.

In case of skin contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.

When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.
Obtain medical attention even in the absence of apparent wounds.

In case of eye contact : Flush eye with copious quantities of water.
Remove contact lenses, if present and easy to do. Continue rinsing.
If persistent irritation occurs, obtain medical attention.

If swallowed : Call emergency number for your location / facility.
If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

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If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Defatting dermatitis signs and symptoms may include a burning sensation and/or a dried/cracked appearance. Ingestion may result in nausea, vomiting and/or diarrhoea.

Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Potential for chemical pneumonitis. Call a doctor or poison control center for guidance.

High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media : Do not use water in a jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide may be evolved if incomplete combustion occurs. Unidentified organic and inorganic compounds.

5.3 Advice for firefighters

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- | | | |
|---|---|--|
| Special protective equipment for firefighters | : | Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469). |
| Specific extinguishing methods | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- | | | |
|----------------------|---|---|
| Personal precautions | : | 6.1.1 For non emergency personnel:
Avoid contact with skin and eyes.
6.1.2 For emergency responders:
Avoid contact with skin and eyes. |
|----------------------|---|---|

6.2 Environmental precautions

- | | | |
|---------------------------|---|---|
| Environmental precautions | : | Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. |
|---------------------------|---|---|

6.3 Methods and materials for containment and cleaning up

- | | | |
|-------------------------|---|---|
| Methods for cleaning up | : | Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly. |
|-------------------------|---|---|

6.4 Reference to other sections

For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.,
For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.

SECTION 7: Handling and storage

- | | | |
|---------------------|---|---|
| General Precautions | : | Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. |
|---------------------|---|---|

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7.1 Precautions for safe handling

Advice on safe handling : Avoid prolonged or repeated contact with skin.
Avoid inhaling vapour and/or mists.
When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

7.2 Conditions for safe storage, including any incompatibilities

Other data : Keep container tightly closed and in a cool, well-ventilated place. Use properly labeled and closable containers.

Store at ambient temperature.

Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

The storage of this product may be subject to the Control of Pollution (Oil Storage) (England) Regulations. Further guidance may be obtained from the local environmental agency office.

Packaging material : Suitable material: For containers or container linings, use mild steel or high density polyethylene.
Unsuitable material: PVC.

Container Advice : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

7.3 Specific end use(s)

Specific use(s) : Not applicable

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Oil mist, mineral		TWA	5 mg/m3	US. ACGIH Threshold Limit Values

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

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Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.

Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.

National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods
<http://www.cdc.gov/niosh/>

Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods
<http://www.osha.gov/>

Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances
<http://www.hse.gov.uk/>

Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany
<http://www.dguv.de/inhalt/index.jsp>

L'Institut National de Recherche et de Sécurité, (INRS), France <http://www.inrs.fr/accueil>

8.2 Exposure controls

Engineering measures The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:

Adequate ventilation to control airborne concentrations.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

General Information:

Define procedures for safe handling and maintenance of controls.

Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.

Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.

Drain down system prior to equipment break-in or maintenance.

Retain drain downs in sealed storage pending disposal or subsequent recycle.

Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.

Practice good housekeeping.

Do not ingest. If swallowed, then seek immediate medical assistance

Personal protective equipment

The provided information is made in consideration of the PPE directive (Council Directive 89/686/EEC) and the CEN European Committee for Standardisation (CEN) standards.

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

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Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.
Approved to EU Standard EN166.

Hand protection

Remarks : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model.

Skin and body protection : Skin protection is not ordinarily required beyond standard work clothes.
It is good practice to wear chemical resistant gloves.

Respiratory protection : No respiratory protection is ordinarily required under normal conditions of use.
In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [Type A/Type P boiling point > 65°C (149°F)] meeting EN14387 and EN143.

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Thermal hazards : Not applicable

Hygiene measures : Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication "COSHH Essentials".

Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.
Information on accidental release measures are to be found in section 6.
Take appropriate measures to fulfil the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Section 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : liquid

Colour : clear

Odour Threshold : Data not available

pH : Not applicable

pour point : -42 °C Method: ISO 3016

Melting / freezing point : Data not available

Initial boiling point and boiling range : > 280 °C estimated value(s)

Flash point : 200 °C
Method: ISO 2592

Evaporation rate : Data not available

Flammability (solid, gas) : Data not available

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Upper explosion limit	: Typical 10 %(V)
Lower explosion limit	: Typical 1 %(V)
Vapour pressure	: < 0.5 Pa (20 °C) estimated value(s)
Relative vapour density	: > 1estimated value(s)
Relative density	: 0.820 (15 °C)
Density	: 820 kg/m ³ (15.0 °C) Method: ISO 12185
Solubility(ies)	
Water solubility	: negligible
Solubility in other solvents	: Data not available
Partition coefficient: n-octanol/water	: log Pow: > 6(based on information on similar products)
Auto-ignition temperature	: > 320 °C
Decomposition temperature	: Data not available
Viscosity	
Viscosity, dynamic	: Data not available
Viscosity, kinematic	: 350 mm ² /s (-20 °C) Method: ASTM D445
	15 mm ² /s (40.0 °C) Method: ASTM D445
	3.7 mm ² /s (100 °C) Method: ASTM D445
Explosive properties	: Not classified
Oxidizing properties	: Data not available

9.2 Other information

Conductivity	: This material is not expected to be a static accumulator.
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SECTION 10: Stability and reactivity

10.1 Reactivity

The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.

10.2 Chemical stability

Stable.

No hazardous reaction is expected when handled and stored according to provisions

10.3 Possibility of hazardous reactions

Hazardous reactions : Reacts with strong oxidising agents.

10.4 Conditions to avoid

Conditions to avoid : Extremes of temperature and direct sunlight.

10.5 Incompatible materials

Materials to avoid : Strong oxidising agents.

10.6 Hazardous decomposition products

Hazardous decomposition products : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Basis for assessment : Information given is based on data on the components and the toxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Information on likely routes of exposure : Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity : LD50 rat: > 5,000 mg/kg
Remarks: Low toxicity:
Based on available data, the classification criteria are not met.

Remarks: Aspiration into the lungs may cause chemical pneumonitis which can be fatal.

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Acute inhalation toxicity : Remarks: Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD50 Rabbit: > 5,000 mg/kg
Remarks: Low toxicity:
Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Product:

Remarks: Slightly irritating to skin., Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis., Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation

Product:

Remarks: Slightly irritating to the eye., Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:

Remarks: For respiratory and skin sensitisation:, Not a sensitiser., Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

: Remarks: Non mutagenic, Based on available data, the classification criteria are not met.

Carcinogenicity

Product:

Remarks: Not a carcinogen., Based on available data, the classification criteria are not met.

Material	GHS/CLP Carcinogenicity Classification
Interchangeable low viscosity base oil (<20,5 cSt @40°C) *	No carcinogenicity classification.

Reproductive toxicity

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Product:

:
Remarks: Not a developmental toxicant., Does not impair fertility., Based on available data, the classification criteria are not met.

STOT - single exposure

Product:

Remarks: Based on available data, the classification criteria are not met.

STOT - repeated exposure

Product:

Remarks: Based on available data, the classification criteria are not met.

Aspiration toxicity

Product:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Further information

Product:

Remarks: Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal., ALL used oil should be handled with caution and skin contact avoided as far as possible.

Remarks: High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed.

Remarks: Slightly irritating to respiratory system.

Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

Summary on evaluation of the CMR properties

Germ cell mutagenicity- Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Reproductive toxicity - : This product does not meet the criteria for classification in

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Assessment

categories 1A/1B.

SECTION 12: Ecological information

12.1 Toxicity

Basis for assessment : Ecotoxicological data have not been determined specifically for this product.
Information given is based on a knowledge of the components and the ecotoxicology of similar products.
Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s). (LL/EL/IL50 expressed as the nominal amount of product required to prepare aqueous test extract).

Product:

Toxicity to fish (Acute toxicity) : Remarks: LL/EL/IL50 > 100 mg/l
Practically non toxic:
Based on available data, the classification criteria are not met.

Toxicity to crustacean (Acute toxicity) : Remarks: LL/EL/IL50 > 100 mg/l
Practically non toxic:
Based on available data, the classification criteria are not met.

Toxicity to algae/aquatic plants (Acute toxicity) : Remarks: LL/EL/IL50 > 100 mg/l
Practically non toxic:
Based on available data, the classification criteria are not met.

Toxicity to fish (Chronic toxicity) : Remarks: Data not available

Toxicity to crustacean (Chronic toxicity) : Remarks: Data not available

Toxicity to microorganisms (Acute toxicity) : Remarks: Data not available

12.2 Persistence and degradability

Product:

Biodegradability : Remarks: Not readily biodegradable., Major constituents are inherently biodegradable, but contains components that may persist in the environment.

12.3 Bioaccumulative potential

Product:

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Bioaccumulation : Remarks: Contains components with the potential to bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: > 6Remarks: (based on information on similar products)

12.4 Mobility in soil

Product:

Mobility : Remarks: Liquid under most environmental conditions., If it enters soil, it will adsorb to soil particles and will not be mobile.
Remarks: Floats on water.

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

12.6 Other adverse effects

Product:

Additional ecological information : Does not have ozone depletion potential, photochemical ozone creation potential or global warming potential., Product is a mixture of non-volatile components, which will not be released to air in any significant quantities under normal conditions of use.
Poorly soluble mixture., Causes physical fouling of aquatic organisms.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Do not dispose into the environment, in drains or in water courses

Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment.
Waste, spills or used product is dangerous waste.
Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
Do not dispose of tank water bottoms by allowing them to

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drain into the ground. This will result in soil and groundwater contamination.

MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.

Contaminated packaging : Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand. Disposal should be in accordance with applicable regional, national, and local laws and regulations.

Local legislation

Waste catalogue :
EU Waste Disposal Code (EWC):

Waste Code :
13 01 11*

Remarks : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

Classification of waste is always the responsibility of the end user.

Hazardous Waste (England and Wales) Regulations 2005.

SECTION 14: Transport information

14.1 UN number

ADR : Not regulated as a dangerous good
RID : Not regulated as a dangerous good
IMDG : Not regulated as a dangerous good
IATA : Not regulated as a dangerous good

14.2 Proper shipping name

ADR : Not regulated as a dangerous good
RID : Not regulated as a dangerous good
IMDG : Not regulated as a dangerous good
IATA : Not regulated as a dangerous good

14.3 Transport hazard class

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ADR : Not regulated as a dangerous good
RID : Not regulated as a dangerous good
IMDG : Not regulated as a dangerous good
IATA : Not regulated as a dangerous good

14.4 Packing group

ADR : Not regulated as a dangerous good
RID : Not regulated as a dangerous good
IMDG : Not regulated as a dangerous good
IATA : Not regulated as a dangerous good

14.5 Environmental hazards

ADR : Not regulated as a dangerous good
RID : Not regulated as a dangerous good
IMDG : Not regulated as a dangerous good

14.6 Special precautions for user

Remarks : Special Precautions: Refer to Section 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied. MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

REACH - List of substances subject to authorisation (Annex XIV) : Product is not subject to Authorisation under REACH.

Volatile organic compounds : 0 %

Other regulations : The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Environmental Protection Act 1990 (as amended). Health and Safety at Work etc. Act 1974. Consumers Protection Act 1987. Pollution Prevention and Control Act 1999. Environment Act 1995. Factories Act 1961. The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) Regulations 2011. Chemicals (Hazard Information and Packaging for Supply) Regulations 2009. Control of Substances Hazardous to Health Regulations 2002 (as amended). Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (as amended). Personal Protective Equipment Regulations 2002. Personal Protective Equipment at Work Regulations 1992. Hazardous

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Waste (England and Wales) Regulations 2005(as amended).
Control of Major Accident Hazards Regulations 1999 (as amended). Renewable Transport Fuel Obligations Order 2007 (as amended). Energy Act 2011. Environmental Permitting (England and Wales) Regulations 2010 (as amended). Waste (England and Wales) Regulations 2011 (as amended). Planning (Hazardous Substances) Act 1990 and associated regulations. The Environmental Protection (Controls on Ozone-Depleting Substances) Regulations 2011.

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), annex XIV.
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), annex XVII.
Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work and its amendments.
Directive 1994/33/EC on the protection of young people at work and its amendments.
Council Directive 92/85/EEC on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding and its amendments.

The components of this product are reported in the following inventories:

REACH : All components listed or polymer exempt.
TSCA : All components listed.

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: Other information

REGULATION (EC) No 1272/2008
Aspiration hazard, Category 1, H304

Classification procedure:
Expert judgement and weight of evidence determination.

Full text of H-Statements

H304 May be fatal if swallowed and enters airways.

Full text of other abbreviations

Asp. Tox. Aspiration hazard
Abbreviations and Acronyms : The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell

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Health Services, material suppliers' data, CONCAWE, EU IUCLID data base, EC 1272 regulation, etc).

The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial Hygienists

ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road

AICS = Australian Inventory of Chemical Substances

ASTM = American Society for Testing and Materials

BEL = Biological exposure limits

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

CAS = Chemical Abstracts Service

CEFIC = European Chemical Industry Council

CLP = Classification Packaging and Labelling

COC = Cleveland Open-Cup

DIN = Deutsches Institut für Normung

DMEL = Derived Minimal Effect Level

DNEL = Derived No Effect Level

DSL = Canada Domestic Substance List

EC = European Commission

EC50 = Effective Concentration fifty

ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals

ECHA = European Chemicals Agency

EINECS = The European Inventory of Existing Commercial Chemical Substances

EL50 = Effective Loading fifty

ENCS = Japanese Existing and New Chemical Substances Inventory

EWC = European Waste Code

GHS = Globally Harmonised System of Classification and Labelling of Chemicals

IARC = International Agency for Research on Cancer

IATA = International Air Transport Association

IC50 = Inhibitory Concentration fifty

IL50 = Inhibitory Level fifty

IMDG = International Maritime Dangerous Goods

INV = Chinese Chemicals Inventory

IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables

KECI = Korea Existing Chemicals Inventory

LC50 = Lethal Concentration fifty

LD50 = Lethal Dose fifty per cent.

LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading

LL50 = Lethal Loading fifty

MARPOL = International Convention for the Prevention of Pollution From Ships

NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level

OE_HP V = Occupational Exposure - High Production Volume

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PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of Chemicals
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

Further information

- Training advice : Provide adequate information, instruction and training for operators.
- Other information : A vertical bar (|) in the left margin indicates an amendment from the previous version.
- Sources of key data used to compile the Safety Data Sheet : The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID data base, EC 1272 regulation, etc).

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.