Pneumatic nut runner

DPA/DPA-W

DPM/DPM-W

Operating manual

Store for future reference.

PLARAD®
Torque & Tension Systems

Contents

1. Manufacturer

Maschinenfabrik Wagner GmbH & Co. KG
53804 Much, Germany
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2. Notes

2.1. CE mark

The products are labelled with the CE mark. The Declaration of Conformity verifies that the products are in compliance with the safety directives of the European Union.

2.2. Directives

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

2.3. Information about this manual

This manual contains important instructions on how to operate, set up and connect the tool. Read these instructions carefully before putting the tool into operation. This is for your own protection and will provide you with important information on how to connect and use the tool in a safe manner.
The operating manual is an integral part of the tool. Store it close to the tool where it is available at all times. Observing every detail of the operating manual is a requirement for using the tool correctly and as intended. For this reason, pass this operating manual on to the next owner when selling the tool. Please note that details of the illustrations and technical specifications contained in this operating manual may be different from the product you purchased. The information provided in this operating manual is current as of the time it was printed. We reserve the right to make changes at any time without prior notice.

2.4. Information about the workplace

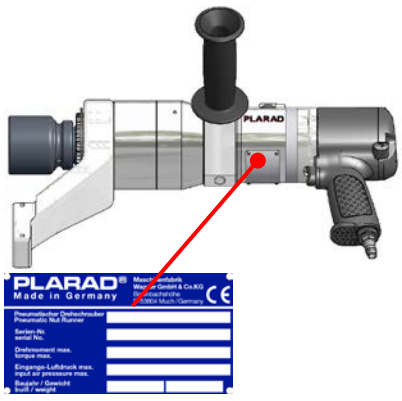
The safety of the operator and the trouble-free operation of the tool are only guaranteed if you use original Plarad components. This applies both to all tool components and spare parts. If different components are used, Maschinenfabrik Wagner cannot guarantee the safe and reliable operation of the tool.

2.5. General safety information

When operating the tool, observe all applicable laws and regulations at the operating site.
Verify every time before using the tool that it operates in a reliable manner and is in proper condition. The user must be familiar with the operation of the tool. Before putting the tool into operation, check the tool and the hose lines for damage. Never continue using a defective tool or a tool with defective hose lines or connectors! Replace damaged cables and connectors before resuming operation. Disconnect the tool from the compressed air supply before all repair and maintenance work.

2.6. Product identification

The nut runner is identified by its type plate.



2.7. Symbols and warnings

CE mark

Follow the instructions for installation and use

Wear hearing protection

Use protective eye wear

Use protective footwear

Crushing hazard warning

Hazard warning.
The hazard category is specified in the text found next to the respective warning

Service seal specifying the date of the next inspection

3. Product information

3.1. Procedural description

The pneumatic nut runner can be used to tighten bolted connections. The generated torque is controlled.

Type DPA, optional DPA-W

The pneumatic nut runner is equipped with a two-speed automatic drive and torque setting control that is dependent on air pressure. It offers clockwise and counter-clockwise operation. When running idle or at low torque, the tool will be operating with a high output speed in fast motion. This mode of operation allows you to thread down or twist off the nut with a speed that is six times higher than load mode during effortless bolting applications. As soon as the torque resistance increases, the two-speed automatic drive will switch to load mode with low output speed and high torque.
Once the set torque has been reached, the automatic system will switch the nut runner off. When dealing with stiff bolting applications and during loosening, the two-speed automatic drive immediately switches to load mode, operating at low speed and high torque.

Once the bolt or nut has been loosened sufficiently, you can briefly switch the tool to the opposite rotational direction before switching it back on in the release direction. This will cause the gearbox to switch to fast motion.

Important!

To keep the tool from switching off too early during tightening, you can lock the two-speed automatic drive in lock mode. To do so, turn the knurled ring on the DPA from mark "A" to "L". Switch from “A” to “L” with the motor running. You can use the included actuator pin for this purpose. Insert the actuator pin into the hole in the knurled ring and use the pin as a lever.

Position “A” – Automatic mode:
The tool switches automatically from fast motion to load mode and vice versa when reaching a specific torque.

Position “L” – Load mode:
The tool operates in load mode permanently.

Type DPM, optional DPM-W
The pneumatic nut runner is equipped with a manual shift gearbox. You set the tool to fast motion by setting the rotary knob to "1". Setting the rotary knob to "2" will switch the tool to load mode. When set to position “1” (fast motion), the DPM and DPM-W models cover a wider torque range than the DPA or DPA-W models.

3.2. Intended use

The Plarad pneumatic nut runner is a hand-held tool that is designed exclusively for tightening and loosening bolted connections. It may only be used for commercial purposes.
Each bolting application requires the use of suitable impact sockets/tools.
The suitability for use of tools other than impact sockets must be tested and approved by the manufacturer. Make sure there is a proper positive connection between the impact socket and the bolt. Make sure there is a proper positive connection between the output square drive of the tool and the square retainer of the impact socket. The tool is designed for indoor and outdoor operation within an ambient temperature range of -20 °C to +50 °C. If intending to deviate from these conditions, consult the manufacturer first. The nut runner may only be operated with a compressed air supply that complies with the specifications given in chapters 5 “Technical specifications” and 5.1 “Pneumatic power supply".

The pneumatic nut runner is not suitable for continuous operation as a drive unit!

Allow only Maschinenfabrik Wagner or bodies authorised by Maschinenfabrik Wagner to install, readjust, modify, expand and repair the tool. Use the tool only as described in the operating manual. Operating the unit in a safe and reliable manner will otherwise not be possible. Unauthorised modifications may lead to unexpected hazards.

The safety of the operator and the trouble-free operation of the tool are only guaranteed if you use original Plarad components. This applies both to all tool components and spare parts. If different components are used, Maschinenfabrik Wagner cannot guarantee the safe and reliable operation of the tool.

3.3. Non-intended use

Any use deviating from or exceeding the scope of intended use is considered to be improper. The risk is borne solely by the owner/user.

3.4. Other applicable operating manuals

- EU safety data sheet Klübersynth GE – 151
- EU safety data sheet Shell Cassida Fluid HF 32
- Ingersoll-Rand compressed-air impact wrench, type designation: 2130 XP / 2131 PSP

4. Scope of delivery

Operating manual including EC Declaration of Conformity, torque table and (optional) test certificate.

4.1. Accessories

- Retaining ring for reaction arm
- Lock for socket

5. Technical specifications

Range of capacity:	See included torque table
Maximum operating pressure:	8 bar
Volume flow:	5.5 l/s at 4 bar
Weight:	See type plate
Vibration emission value:	ah < 2.5 m/s2
Sound pressure level:	73 to 95 dB(A) (depending on the set flow pressure/torque)
Lubricating grease:	MOBILTEMP SHC 100
Mist oil:	Shell Cassida Fluid HF 32

If using a lubricating grease other than the one specified above, the grease must comply with the specifications provided in the other applicable operating manual.
For the nut runner dimensions, refer to the technical data sheets which are available at www.plarad.de. All specifications also apply to the tools DPA-W and DPM-W which are equipped with an angle drive.

5.1. Pneumatic power supply

Operation of the Plarad pneumatic nut runner requires the use of a compressed air regulation unit including water separator (filter), pressure regulator and mist lubricator. Connect the pressure regulation unit between compressed air supply and nut runner by following the arrow direction given in the following pattern:

Filter →pressure reducer →lubricator

The connecting hose must not be longer than 3 m. The clearance width of the connecting hose must be at least 13 mm. Using longer and thinner hoses will have a negative impact on flow pressure and air throughput.
We recommend that you use the Plarad pressure regulation unit, order number B17.010.1.01001.

Attention!

The tool may only be operated with compressed air that complies with the specifications given in chapter 5. "Technical specifications".

5.2. Filter

Drain condensation on a regular basis, but no later than the time the water level in the water separator reaches the "Max. Level" marking.

If clogged, the sinter filter needs to be cleaned as follows:

1. Loosen the bolting.
2. Remove the tank.
3. Loosen the fastening nut on the sinter filter.
4. Take out the sinter filter.
5. Place the sinter filter in solvent or other suitable cleaning solution, agitate and dry.
6. Reinsert the sinter filter. Ensure a tight seal when doing so.

5.3. Pressure reducer

Lightly lubricate the o-rings on sealing cone and pin every once in a while following the steps below:

1. Shut off the compressed air and depressurise the tool.
2. Unscrew the sealing cap (knurled nut).
3. Remove the sealing cone.
4. Lightly lubricate o-ring and pin.

Proceed as follows when putting the compressed air line into service:

1. Before putting the compressed air line into service, relieve the pressure reducer by unscrewing the control screw.
2. Screw the control screw back in until the pressure gauge on the pressure reducer indicates the desired operating pressure.

5.4. Mist lubricator

The minimum operating pressure is 0.5 bar. Use the metering screw to adjust the oil quantity during operation as necessary. The drop count is indicated in the sight glass.
A quantity of 1 mm³ of oil per 1 m³ of compressed air is sufficient to keep wear at a minimum and to achieve the proper speed and the optimum torque.

Recommended oil grades:

- SHELL Cassida Fluid HF 32
- VIA Avilup RSL 46
- BP Energol HPL 46
- ESSO Nuto H
- TEXACO Rando Oil HD C 38

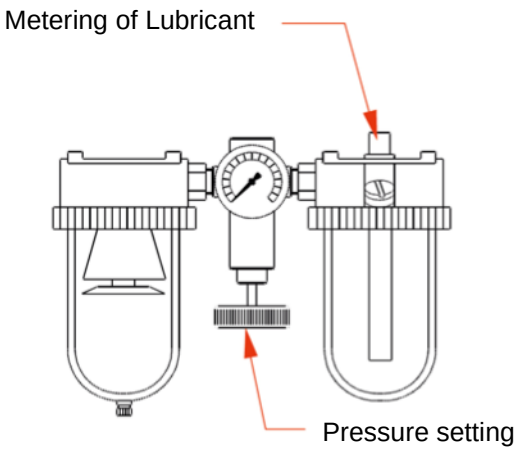
Check the fill level in the mist lubricator on a regular basis and refill oil no later than the time when the level is at the "Min. Level" marking.
Proceed as follows to refill oil:

1. Remove the locking screw.
2. Fill the tank up to the fill level marking and seal the tank again.
3. The refilling of oil can be performed during operation and does not require that the air supply be shut off.

Attention!

Unsuitable cleaning agents will damage the plastic tank of the pressure regulation unit!
Use only water, petroleum or benzine to clean the plastic tank.

- **Do not use petrol. Do not use cleaners or similar agents that contain benzene, acetone or trichloroethylene.**
- **Do not dilute or mix the oil with liquids that contain plasticisers, alcohol or glysantine.**



6. Description of operation

6.1. Preparing the tool

Attention!

Only components and accessories that do not impair the function and safety of the tool are permitted to be used.

- **If in doubt, contact the manufacturer.**

1. Attach the reaction arm to the toothed holder on the nut runner.

2. Secure the reaction arm using the retaining ring.

3. Put the socket insert (socket) on the square drive on the nut runner and secure it. Use only impact sockets.

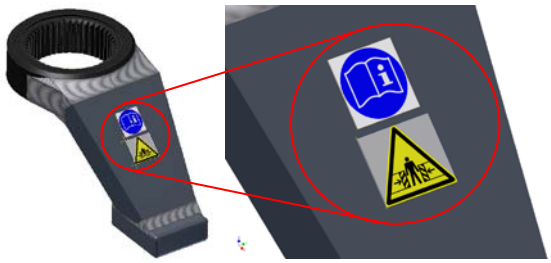
4. Secure the impact socket.

Nut runner with secured reaction arm and secured impact socket.

Warning!

Unsecured components or tools can be flung out.

- **Secure reaction arm and impact socket (socket) prior to start-up!**
- **Follow the instructions and warnings provided on the tool and the accessories.**



6.2. Setting the torque

You adjust the torque using the pressure regulator of the pressure regulation unit.

1. Turn the rotary knob on the pressure regulator to adjust the air pressure and, thus, the torque.
2. Read the air pressure at the pressure gauge on the pressure regulation unit. It is essential that you regulate the dynamic flow pressure rather than the stagnation pressure. The values listed in the included torque tables have been determined on a test rig and correspond to a medium-hard test set-up as required by ISO 5393 in normal ambient temperatures. The torque range may shift if temperatures change.
3. Check the generated torque during an actual bolting application before tightening all bolts during an identical bolting application. We recommend that you verify the torque using a rotating electronic transducer. However, you can also use a certified torque wrench for this purpose.
4. If in need of any such devices, request our range of torque measurement equipment.

Important!

The tool will not reach the set torque unless it can prescribe a torque angle of at least 30° during tightening from the time the bolting process starts until the nut runner is switched off.

6.3. Safety pivot

The safety pivot situated between drive motor and gearbox makes it possible to rotate the grab handle into any desired position - even under load. The reaction force will not affect your hand during this process.

6.4. Absorbing the reaction momentum

Torques cannot be generated without an absorption of the reaction forces. This function is provided by the nut runner's reaction arm. A standard reaction arm is included in the scope of delivery of the tool. The nut runner may only be supported at the attached reaction arm.

Warning!

There is a crushing hazard between the reaction arm and the contact surface. The reaction arm attached to the tool can cause serious crushing injuries.

- **Do not reach between the reaction arm and the contact surface.**
- **Do not place hands/feet close to the contact surface.**

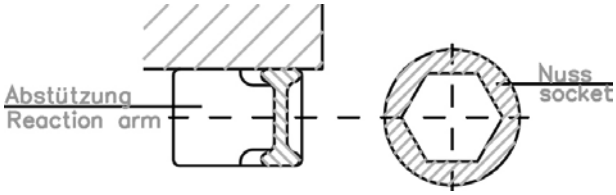
Use only reaction arms or extensions that have been approved by Plarad. Suitable reaction arms - including custom models - are available on request. Reaction arms and reaction feet may not be altered beyond the specified permissible dimensions. Modifications to the reaction arm may render the included original capacity table invalid. Before switching the tool on, bring the reaction arm into contact with the thrust bearing at the bolting position - against the rotational direction of the tool. Pay attention to the rotational direction of the thread.

Warning!
If supported insufficiently, the tool can slip off and be flung out.

- **The thrust bearing at the bolting position must prevent the reaction arm from slipping off at the contact surface!**

6.4.1. Optimum support scenario

Make sure the reaction arm rests fully against the surface!

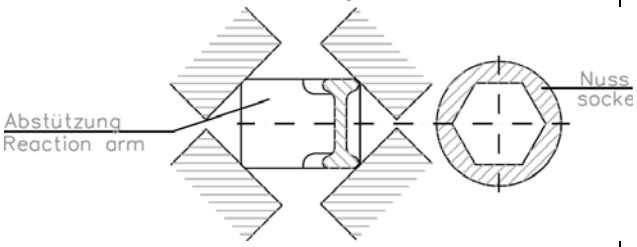


6.4.2. Impermissible support scenario

Warning!

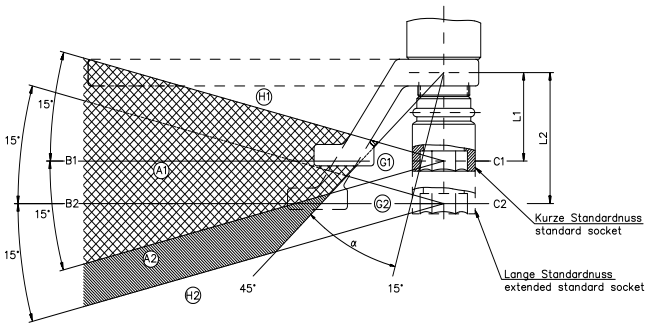
If the reaction arm rests only partially against the surface at the corners of the reaction foot, considerable forces may impact the tool. This may cause the reaction arm to slide off the bolt. The tool accessories may break, and the tool may be flung out.

- **Do not subject the corners of the reaction foot to any loads!**



6.5. Adjusting the reaction arm

To prevent the output square drive, the bearing and the reaction arm of the tool from being overloaded, the point of contact on the reaction arm must be in the dotted area “A1” and “A2” (see image).



The position of the supporting surface varies with the respective length “L1 and L2” of the impact sockets. The ideal tangent is on the line “B1-C1” / “B2-C2”. This is where the support force is the lowest. If the point of contact lies outside of an angle of ±15º (area “H1 and H2”), the impact sockets may wear prematurely. This will result in a loss of torque precision. If the point of contact lies within the angle “α” in area “G1 and G2”, the output square drive may be overloaded, resulting in deformation of the reaction arm.

7. Operation

Warning!
Danger from a falling tool!
- **Only use suitable aids to lift larger tools.**
- **When working overhead, secure the tool and wear headgear and safety shoes.**

Warning!

Hearing damage from noise.
- **Depending on your nut runner setting and the noise level to which the user is exposed, wear well-fitting personal hearing protection during operation.**
- **It is the owner's responsibility to select and provide the right kind of equipment.**

Attention!

Check if valid torque tables are available for the tool. The serial number of the appropriate torque table is specified on the type plate of the tool and included in the "Technical Data Sheet - Wrench". When setting the torque, strictly ensure that the maximum permissible torque of the tool and the accessories is not exceeded.

Attention!

Pay attention to the “Check list for operation” on page 10 before, during and after work with the tool.

7.1. Check list for operation

Prior to operation	During operation	Following operation
Visual inspection: • approved equipment and accessories • all parts have been properly installed / connected	**Bolted connection:** • correctly set torque (see chapter 6.2.) • socket approved for the application (permissible torque, width across flats)	**Visual inspection:** • no damage on bolted connection and thrust bearing • no damage on tool and accessories
Function check: • all moving parts in order • socket and reaction arm approved for the application • supply lines and couplings operational • no leaks at the output square drive • no leaks at connecting points of drive, intermediate gearbox and planetary gearbox • rotational direction correct • function check of regulation unit, compressed air lubricator, filter and pressure reducer	**Application** • thrust bearing provides sufficient stability • positive connection of reaction arm and thrust bearing (see chapter 6.4.)	**Function check:** • when finished working, flush the compressed air motor with low-viscosity oil or provide for a different type of corrosion protection • clean the tool • all moving parts in order • socket and reaction arm are undamaged • supply lines and couplings operational • no leaks at the output square drive • no leaks at connecting points of drive, intermediate gearbox and planetary gearbox

7.2. Bolting process

1. Attach the reaction arm to the toothed holder on the nut runner and secure it.
2. Put the socket wrench insert (socket) on the output square drive on the nut runner and secure it. Use only impact sockets!
3. Use a compressed air regulation unit to connect the tool to the compressed air supply.
4. Pre-select the rotational direction on the hand lever.
5. Press the ON button and set the flow pressure on the compressed air regulation unit based on the torque table that specifies the torque required for the tool.
6. Place the nut runner with the socket wrench insert on top of the bolt head or the nut you wish to turn.
7. Attach the reaction arm to the thrust bearing against the desired rotational direction of the nut runner. For DPA-W/ DPM-W tools: use the clamping lever to secure the planetary gear in this position opposite the angle drive (see image below).

Clamping lever

8. Press the ON button to switch on the tool.

Warning!

Components or the bolted connections may tear during work. The tool can be flung out of the bolting position.

- **Do not subject tool and accessories to more than the permissible torque.**

7.3. Tightening

Warning!

If supported insufficiently, the tool can slip off and be flung out.

- **The thrust bearing at the bolting position must prevent the reaction arm from slipping off at the contact surface!**

Automatic tool DPA, optional DPA-W

1. Pre-select the rotational direction on the selector switch or the control valve.
2. Press down and hold the power button until the nut runner switches off.
3. Check the torque using suitable means if necessary.

Attention!

Uncontrolled torque increase due to multiple bolting processes. The screw and the accessories may break and be flung out.

- **Do not turn on the tool at the same bolting position for a second time after it was switched off automatically upon reaching the set torque.**

Manual tool DPM, optional DPM-W

1. Pre-select the rotational direction on the

selector switch or the control valve.
2. Select the desired speed using the rotary knob: "1" = fast motion; "2" = load mode. When tightening bolts, start at speed “1”.
3. Press down and hold the power button until the nut runner switches off.
4. When the tool has come to a stop at speed “1”, switch to speed “2” if necessary to generate more torque.
5. Check the torque using suitable means if necessary.

Important!
You can switch from speed “1” to speed “2” during operation without causing damage to the tool.

Attention!

Uncontrolled torque increase due to multiple bolting processes. The screw and the accessories may break and be flung out.

- **Do not turn on the tool at the same bolting position for a second time after it was switched off automatically upon reaching the set torque.**

7.4. Loosening

Loosening boltings often requires higher levels of torque than are necessary for tightening boltings. When faced with a situation like this, you will find that standard sockets and accessories often do not provide the necessary stability. Also, the power of the tool is usually greater than the load capacity of the accessories. Make sure not to subject the accessories to a higher load than the maximum torque specified on the parts.

Important!
Nut runners cannot be used to test and tighten pretensioned bolts.

- **Loosen tightened bolts.**
- **Retighten the bolt in order to achieve a minimum torque angle of 30°.**

Automatic tool DPA, optional DPA-W

1. Set the suitable torque at the pressure regulation unit.
2. Pre-select the rotational direction on the selector switch or the control valve.
3. Press down and hold the power button until the bolt or the nut has been loosened. Do not press the power button more than once!

Important!
If the nut runner fails to automatically switch to fast motion even though the remaining load is low, you can toggle the speed as follows:

- **Briefly switch the tool to the opposite rotational direction before switching it back on in the release direction.**
- **This will cause the gearbox to switch to fast motion.**

Manual tool DPM, optional DPM-W

1. Set the suitable torque at the pressure regulation unit.
2. Pre-select the rotational direction on the selector switch or the control valve.
3. Select load mode at the rotary knob: "2" = load mode.
4. Press down and hold the power button until the bolt or the nut has been loosened. Do not press the power button more than once!

7.5. Directives regarding operation

Mode of operation	Please note	Possible consequences of non-compliance	Remedy
Constant load	Do not subject the tool to more than 75% of its torque capacity	Damage in the gearbox or drive	Choose a more powerful tool if necessary
Tightening to pretensioned bolts	The bolt is not designed for this type of application	Damage from overload	Loosen and retighten the bolt in order to achieve a minimum torque angle of 30°
Repeated switch-on after speed-controlled shut-off	Not allowed, results in significant increase in torque	Damage in the gearboxes from overload	
Shifting from speed “1” to speed “2”	Automatically for “A” Manually for “M” by toggling the control switch on the intermediate gearbox	Incorrect torque levels if failing to observe the torque range	Observe the matching torque range as specified in the torque table!
Support scenario	Follow the directives provided in this operating manual	Overload of the output square drive by bending forces Deformation of the reaction arm Reduced torque output / inaccurate torque levels	Design the reaction arm / support scenario in compliance with this operating manual
Working with the regulation unit	Essential when working with Plarad tools Observe the maximum permissible pressure as specified in the torque table Fill the lubricator with the approved grade of oil only	Defect of the tool from overheating Defect of the drive motor	Use the Plarad regulation unit
Hose connection	Use only hoses with a length of up to 3 m Observe the connecting hose's clearance width of 13 mm	Drop in tool performance	Use the specified hoses
Normal operation	Observe the maintenance intervals as per the operating manual	Malfunction of the tool Damage in the gearbox	Pay attention to proper lubrication and wear

8. Maintenance/Service

8.1. General

The tool needs to be serviced in order to retain its operability and safety.

Attention!

Service work may only be performed by the manufacturer.

Allow only Maschinenfabrik Wagner or bodies authorised by Maschinenfabrik Wagner to install, readjust, modify, expand and repair the tool.

The safety of the operator and the trouble-free operation of the tool are only guaranteed if you use original Plarad components. This applies both to all tool components and spare parts.

If different components are used, Maschinenfabrik Wagner cannot guarantee the safe and reliable operation.

8.2. Service intervals

The nut runner needs to be serviced on a regular basis depending on the frequency with which it is used. The service intervals specified merely represent recommendations. You can determine the service interval that fits your individual conditions of use by consulting one of our field representatives or service technicians.

You can arrange for the service to be performed by our service/repairs department on our premises by consulting our field representatives.

Every 60 operating hours

- Check and, if necessary, lubricate the anti-friction bearing in the compressed air motor every 60 operating hours
- Check the blades and anti-friction bearings in the compressed air motor

Every 3 months

- in extreme conditions of use
- if application frequency is high
- if used during multi-shift operation
- if used continuously for work in the upper torque range

Every 6 months

- in normal conditions of use
- if application frequency is moderate
- if used for work in the medium torque range

Every 12 months

- if application frequency is low

Cleaning:

- Clean the surface of the tool
- Remove flash rust as necessary

Visual inspection:

- Damage
- Leaks

Function check:

- all moving parts in order
- output drive and reaction arm without damage
- no leaks at the output square drive
- no leaks at the hose connections

Function check by the manufacturer (every 300 operating hours):

- Relubricate the anti-friction bearings in the compressed air motor
- Check the grease filling; replace the grease filling if necessary
- Check the seals; replace if necessary
- Check the anti-friction bearings; replace if necessary
- Calibrate the tool
- Function test

Storage:

- Before taking the tool out of operation for an extended period, thoroughly lubricate all interior parts of the compressed air motor to prevent rust formation
- Store the tool in dry rooms only

8.3. Lubrication

Regular lubrication is required to maintain the best possible operating and torque accuracy of the tool. Lubricate the planetary gearbox, the needle bearings and the roller bearings when performing the regular inspection.

Lubricant recommended for planetary gearbox and intermediate gearbox: Klübersynth GE - 151

9. Instructions on disposal

Dispose of the tool in accordance with the applicable local regulations.

PLARAD® Torque & Tension Systems

... eine erfolgreiche Verbindung!

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Last update: 1802

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