



Operating Instructions

BB-1174en

Disc-Type Tool Turret

434.020

revision 2024/11/18

The present manual is part of the product.

- The manual should be kept in an easily accessible place during the product's lifetime.
- The manual should be passed on to the next owner /user of the product.
- Make sure that any possible supplement received is duly added to the manual.

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Declaration

1. The customer should carefully read this product operational manual to ensure correct use of the product.
2. The customer should ensure that the following items meet the requirements specified by the manufacturer: hydraulic pressure, diameter & length of oil tube, and voltages of electrical appliances. The manufacturer will not uphold warranty in cases of failures such as short-circuit burning, collision, and gear damage resulting from incorrect operation or human error.
3. The customer should carefully read "Safety Notes" to prevent personal injury or damage to the machine.
4. This product is covered by a 1-year warranty for non-human factors.
5. When the product is delivered, the customer should check the product and its accessories with the delivery personnel to make sure all items are included. After the check is completed, responsibility for this product is immediately transferred to the customer. If parts are found to be missing afterwards, the customer will be deemed to have lost them, and the cost of replacements will be based upon the price of individual products.
6. The parameters of the servo drive have been set and optimized by our engineers before delivery. The parameters of each servo drive are different from one other and cannot be used on other turrets; doing so may cause accuracy, operations and deviation errors.
7. The parameters of the servo drive are password protected. The password will not be provided if it is not absolutely necessary, to prevent the customer or user from arbitrarily changing the parameters and causing damage to the turret or servo drive. If changing the parameters is necessary, please contact our after-sales service team.
8. If you have any product- or technical-related issues, please contact us.
9. Note: For high-pressure (over 50 bar) coolant turrets, a high-pressure tool holder must be used.

Type plate on turret housing:

 GPM CO., LTD MADE IN TAIWAN	Typ	①
	Id.-Nr.	②
		③
		④

1. Classification number (series, size)
2. Identification number
3. Order number
4. Gear ratio

BB-1174

Classification number :	Identification number :
434.020	

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1 Safety notes

The turret corresponds to the state of the art and the recognized technical safety rules. Nevertheless, hazards and risks can occur.

1.1 Use within specifications

- Install and operate turret only in machines complying with the relevant regulations for workspace protection.
- Operate turret only in perfect condition and in compliance with the Operating Instructions.
- Attention : High pressure turret exceeding 50 bar : For safety purpose, it is required to use high pressure tool holders which match specifications of turret.

BMT interface

- Exclusively use tool holders/spindle units with specification dimensions in accordance with the given SK: → [SK-1663](#) or [SK-1666](#)
- Use tool holders for static tools together with the GPM closing plug with O-ring only.
- Seal all unoccupied tool holding fixtures:
 - each with GPM closing plug with O-ring and with GPM closing plate.

1.2 Required skills

- Work may only be performed on these turrets by qualified staff.
- These are persons who are able to identify risks and to prevent possible hazards on the basis of their special training and their experience (IEC 60 201-1).
- All work on the electrical system is to be carried out only by a qualified electrical engineer.
- Only trained and competent personnel may work on these turrets; this personnel must have been trained in accordance with the Operating Instructions and directly on these turrets.

1.3 Notes on product-specific risks

Setting tasks require a 24V DC power supply.



Clearing required prior to any work:

- Switch the machine power off.
- Depressurize turret. → [Hydraulic Diagram](#)



WARNING

- Injury hazard.
- On startup, unexpected rotation of the tool disk is possible.
- Following installation of the turret, line A must be pressurized first.



WARNING

- Injury hazard.
- In the event of a fault or collision, unexpected rotation of the tool disk is possible.
- Perform any work on the turret, in particular in the swiveling range of the tools, only, if the turret has been depressurized.



WARNING

Risk of injury posed by moving machinery components.

If power supply and hydraulic circuits are turned on for adjustment operations:

- Secure workplace with warning sign.
- Prevent actuation by other persons; secure control panel.
- Do not stay close to moving machinery components, especially within the swiveling range of the tools.



CAUTION

Risk of material damage.

The tool drive motor must be set in order to enable correct coupling.

- Remove all tool holders/spindle units.
- Perform basic adjustments for the tool drive motor.



CAUTION

Risk of material damage.

The coupling for the spindle unit can be seriously damaged.

- Exclusively use tool holders/spindle units with specification dimensions in accordance with the given SK: → [SK-1663](#) or [SK-1666](#)



CAUTION

Risk of material damage.

- Use tool holders for static tools together with the GPM closing plug with O-ring only.
- Seal all unoccupied tool holding fixtures:
 - each with GPM closing plug with O-ring and with GPM closing plate.



CAUTION

Do not attempt any further switching operations, if the turret is damaged, as otherwise considerable consequential damage may be caused.

- Call GPM Service.

1.4 Disposal

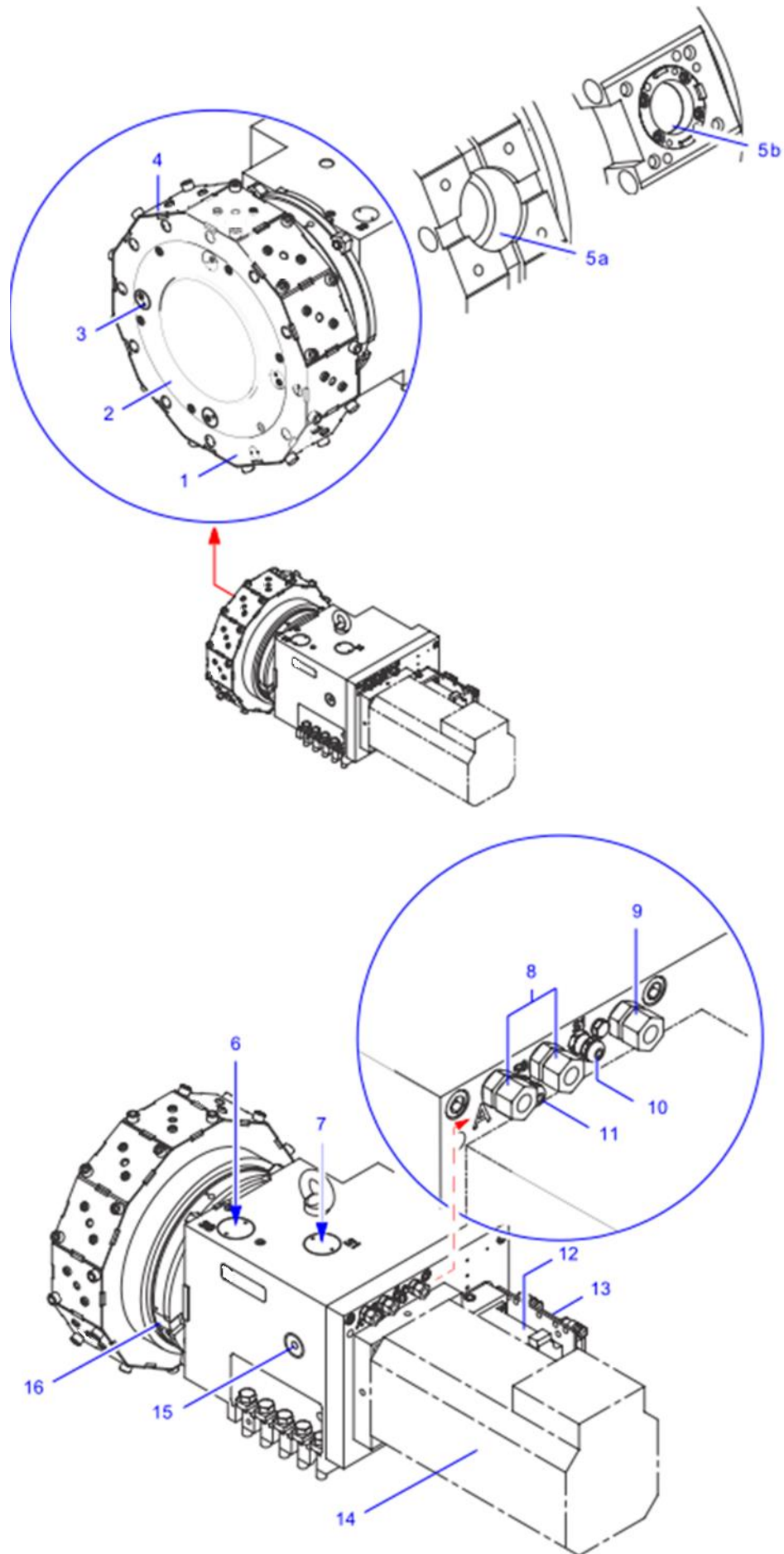
- Comply with all national and regional disposal regulations and laws.

2 Product description

2.1 Overview of product variants

Turret drive	
GPM turret motor with incremental encoder	→Page 65
GPM turret motor with absolute encoder	→Page 12
Turret motor not from GPM	→Page 12
Tool drive	
Version Direct drive with coupling	→Page 13,
Tool drive motor not from GPM	Page 30
Tool disk	
Tool holding fixture/coupling profile BMT	→SK-1663
Tool holding fixture/coupling profile Mori-Seiki	→SK-1666
Tool holders/spindle unit	→Page 22
Closing plug for tool holding fixture	
Draining without any air purge through outlet apertures inside the tool disk	→Page 29
Cooling lubricant valve	→Page 42
cartridge	
with valve carrier	

2.2 Designation of parts



1. Tool disk
2. Closing plate for the tool disk
3. Aperture for draining the tool disk
4. GPM closing plug for tool holding fixture¹⁾

- 5a Interface for spindle unit BMT
- 5b Interface for spindle unit Mori-Seiki

6. Proximity switch S8
7. Proximity switch S1

8. Hydraulic connections A and B
9. Cooling lubricant connection

10. Cable lead-through for proximity switch S1
11. Cable lead-through for proximity switch S8

12. Turret motor ²⁾
13. Terminal box ²⁾

14. Tool drive motor ^{2) 3)}
15. Screw plug at opening for alignments
16. Cooling lubricant valve ²⁾

¹⁾ depending on the interface

²⁾ depending on the order

³⁾ not included in scope of delivery

2.3 Technical data

Turret			
Number of indexing positions	8 or 12 or 16		
Perm. advance force F_z at $r = 250\text{mm}$	20000		N
Perm. transverse force F_x at $a = 200\text{mm}$	16000		N
Perm. tangential load (turret locked)	3600		Nm
Perm. mass moment of inertia of tool disk, tool holders, and tools out of this: Perm. unbalance (load moment) caused by tool holders and tools Rotation of tool disk – incl. acceleration and braking per fractional pitch – without acceleration and braking per additional fractional pitch	Load range		
	Standard ¹⁾	high loads ^{1) 2)}	
	3.2	5.0	kgm ²
	40	63	Nm
	0.15	0.17	s
	0.09	0.09	s
Unlocking time	0.13		s
Locking time	0.13		s
Perm. indexing frequency (median switching angle ϕ_m)	16		min ⁻¹
Hydraulic operating pressure	50 ± 10%		bar
Absorption volume Lock or unlock turret	45		cm ³
Operating pressure for cooling lubricant ³⁾	5 ... 25		bar
Turret mass (without tool disk)	approx. 70		kg
Max. mass of tool disk and tooling	160		kg
Perm. ambient temperature range	+10 ... +40		°C
	+50 ... +104		°F

¹⁾ Turret motor not from GPM

²⁾ GPM Turret motor

³⁾ In order to achieve an extended service life of the cooling lubricant valve, it is advisable to filter the cooling lubricant by $\leq 100\mu\text{m}$. Post-connected loads (spindle units with internal cooling lubricant guide a.o.) may require a higher degree of filter fineness. Note and comply with the manufacturer's instructions!

Tool drive ^{1) 2)} (Standard)				
Gear ratio	i	1		
Perm. speed ²⁾ on tool drive coupling	n _{perm}	4000		
Max. perm. torque ^{3) 4)} on tool drive coupling	M _{perm}	25	40	63
Transferable power ²⁾	P _{perm}	6	8	10
Suitable for spindle units coupling profile		BMT45	BMT55	BMT65

Upgraded version Tool drive ^{1) 2)} (Option)				
Gear ratio	i	1		
Perm. speed ²⁾ on tool drive coupling	n _{perm}	8000		
Max. perm. torque ^{3) 4)} on tool drive coupling	M _{perm}	25	40	63
Transferable power ²⁾	P _{perm}	6	8	10
Suitable for spindle units coupling profile		BMT45	BMT55	BMT65

¹⁾ The data stated here may differ on special versions.

²⁾ → [Technical data 4xx.x20-TI02](#)

³⁾ The drive motor torque must be limited to the permissible values mentioned for turret and tool drives (power limits to be adjusted on the motor frequency converter). The drive motor must be operated with a separate set of parameters for the turret drive and tool drive respectively. The transmission ratio must be taken into consideration, if ancillary transmissions are involved.

⁴⁾ The permissible torque can be utilized for non-pulse machining operations. For strongly pulsed machining operations - e.g. inserted tooth milling cutters and others - only a significantly reduced drive torque should be applied to protect the gears against any overloads.

3 Assembly and installation

Condition of supply

- The tool drive motor is not included in the scope delivery.
Part of the coupling is already mounted with a spacer for assembly; spacer bush, driver and the second coupling part are supplied.
- The tool disk and gear head are aligned.
- All unoccupied tool holding fixtures are sealed - each with GPM closing plug with O-ring and with GPM closing plate.
- The turret is vented.
- The turret is test run.

3.1 Overview

Assembling	
Turret motor	
Turret Motor not from GPM	→Page 12
Tool drive motor	
for tool drive Version Direct drive with coupling	→Page 13
Connecting	
Electrical installation (motors, sensors)	
GPM turret motor	→EPB-1343
Turret Motor not from GPM	→EPB-1332
Control lines (sensors, Control Unit, machine control)	→Circuit diagram of the control unit
Cooling lubricant [operating pressure, filter fineness]	→Page 9

3.2 Turret motor

Turret motor not from Messrs. GPM



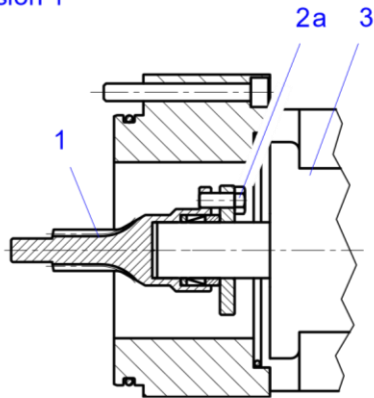
Preparation

Clearing required prior to any work:

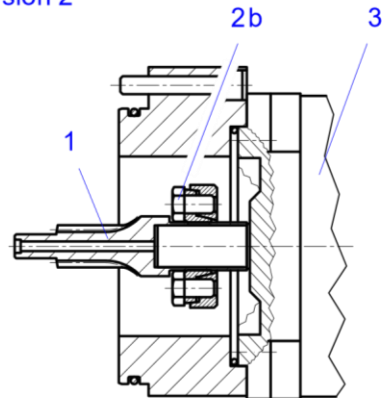
- Switch the machine off.

Assembling

version 1



version 2



- 1 Pinion shaft
- 2a Screws M5×12 - 10.9 for clamping (pinion)
- 2b Screws M6 for clamping (pinion)
- 3 Motor, screws for fastening (not included in scope of delivery)



IMPORTANT

- Attach pinion axially to stop at front end of shaft or on shaft collar, depending on the version involved.
- Tighten screws (2) crosswise.

M5



8.5Nm

or

M6



12Nm

- Mount turret motor with pinion.
- Screw the motor to the flange.

Basic settings → [Page 15](#)

3.3 Tool drive motor

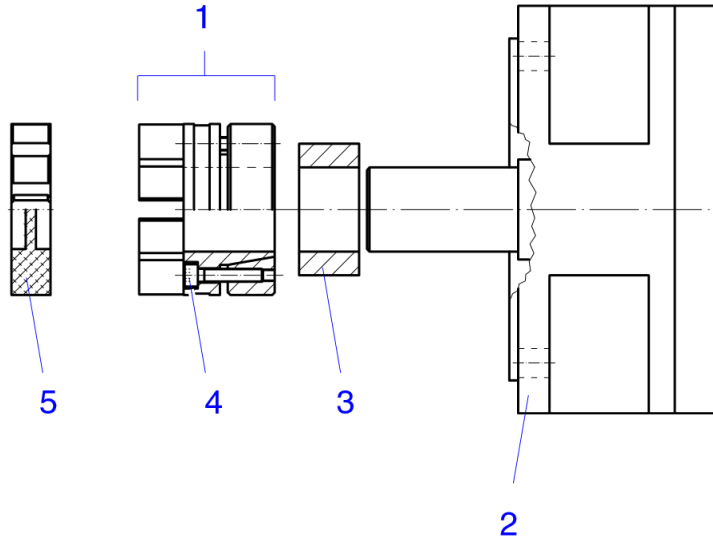


Preparation

Clearing required prior to any work:

- Switch the machine off.

Assembling



- Push the spacer sleeve (3) onto the shaft end as far as the stop.
- Push the coupling part (1) onto the stop and align with the previously mounted coupling part.
- Tighten screws (2) crosswise.
- Screw in clamping screws (4) down to stop and tighten slightly.
- Tighten clamping screws evenly and crosswise until the appropriate tightening torque is reached.



7 Nm

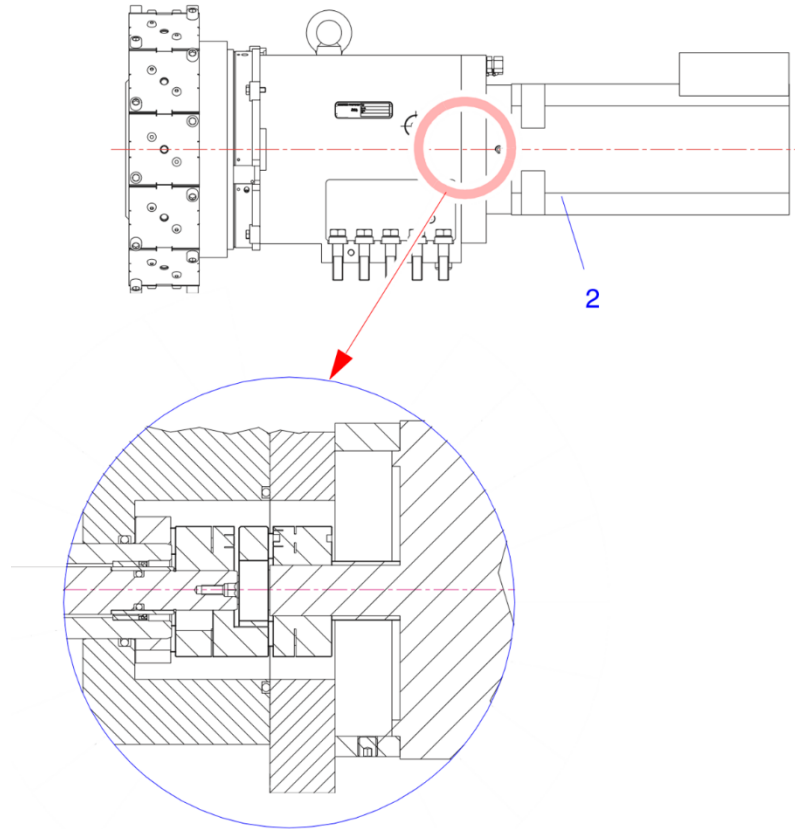
- Oil the flanks of the driver (5).



Sliding oil free of molybdenum disulphide

- Install driver (5).

Assembling

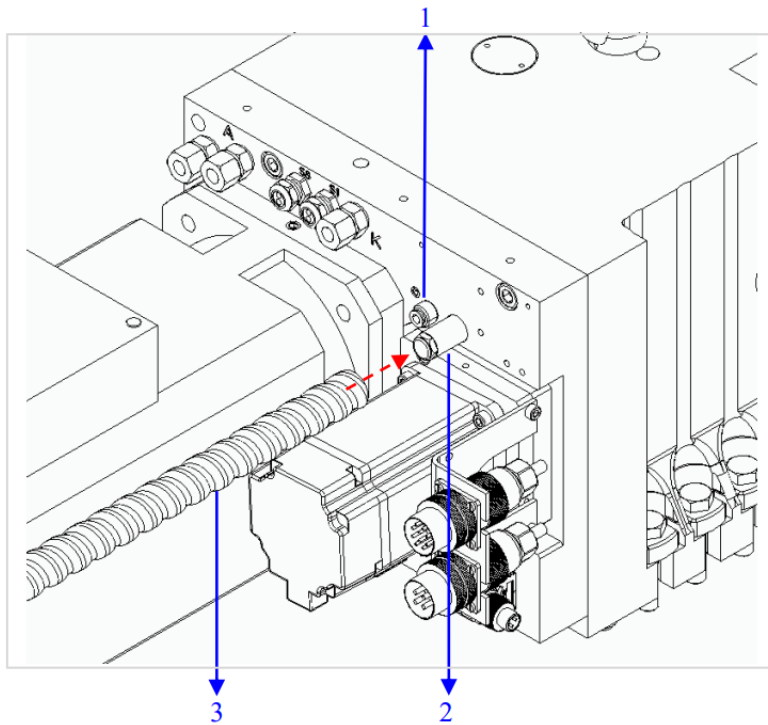


- Join the coupling.
- Screw the motor (2) to the flange.

Basic settings → [Page 17](#)

3.4 Turret air cooling system

BMT upgraded Turret features



- 1 Air inlet
- 2 Air outlet (hot air)
- 3 Flexible conduit

- Air pressure opening time synchronized with the customer's power motor.
- The power motor selected by the customer must have fan cooling.
- The internal temperature limit of the turret is 70°C, monitored by a temperature sensor.
- The customer can cover the air outlet with a flexible conduit themselves.

4 Start-up

4.1 Safety notes



DANGER

Danger of death due to high electrical voltage.

Risk of injury due to live and/or rotating parts.

Risk of injury due to hot surfaces.

- All work on electric motors must be carried out by a skilled electrician.

Electric and hydraulic supply may have to be switched on for aligning and adjusting work.



WARNING

Risk of injury posed by moving machinery components.

- Secure workplace with warning sign.
- Prevent actuation by other persons; secure control panel.
- Do not stay close to moving machinery components, especially within the swiveling range of the tools.

4.2 Overview

Checking	
Hydraulic system	→HP-544
Vent hydraulic system	→Page 19
Basic settings	
for the turret motor	→Page 15
for the tool drive motor	→Page 17
Function check	→SK-1598

4.3 Turret motor

Basic settings



IMPORTANT

The turret reference point may have to be redefined, if necessary, after turret motor assembly as well as after failures/ repairs.



WARNING

Risk of injury posed by moving machinery components. If power supply and hydraulic circuits are turned on for adjustment operations:

- Secure workplace with warning sign.
- Prevent actuation by other persons; secure control panel.
- Do not stay close to moving machinery components, especially within the swiveling range of the tools.



CAUTION

Risk of material damage.

The tool drive motor must be set in order to enable correct coupling.

➤ Remove all tool holders/spindle units.

Basic procedure

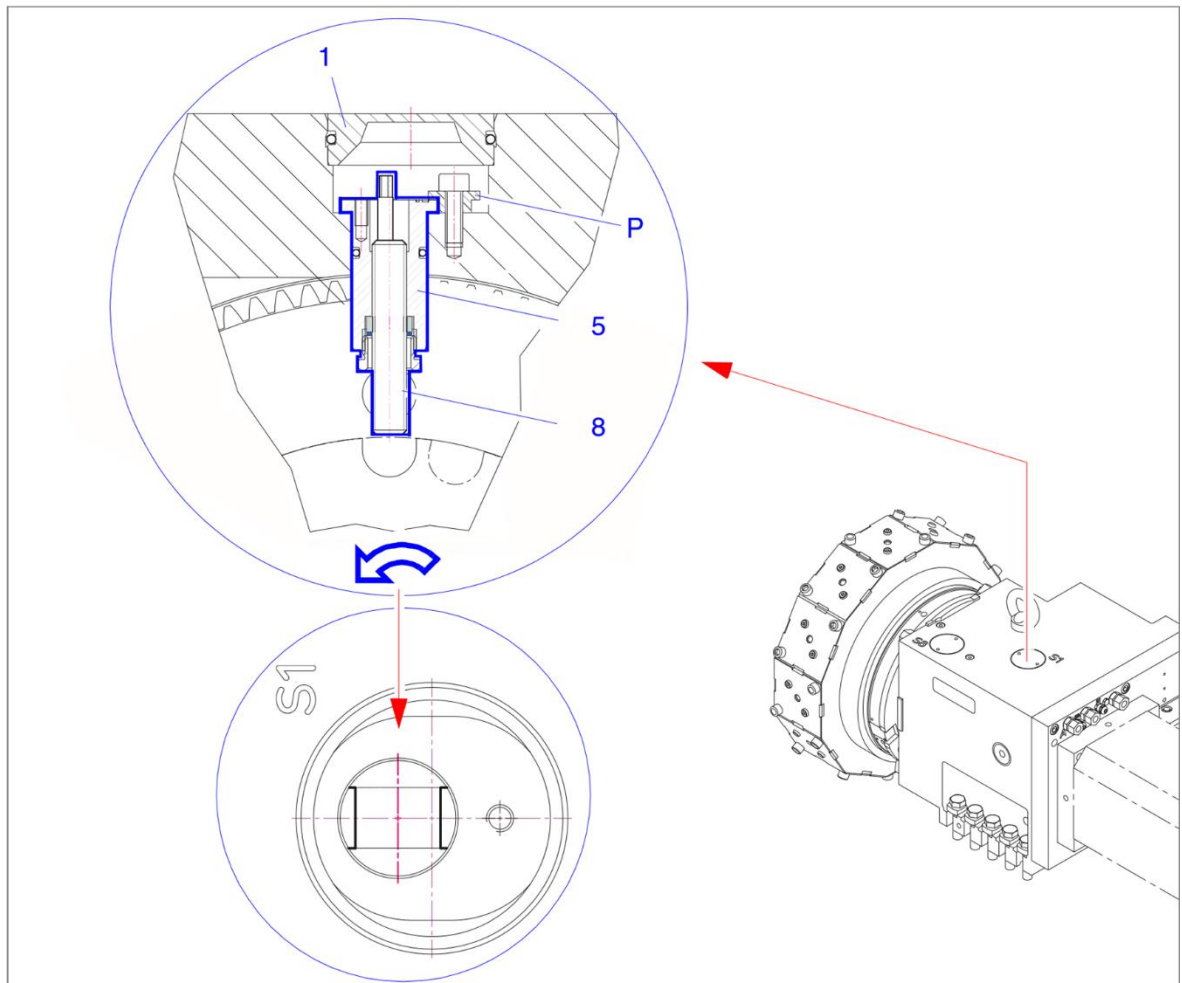
1.	Unlock turret.
2.	Determine position 1.
	Proximity switch S1 is mounted: → <i>Drive to position 1</i>
	Proximity switch S1 is faulty or not mounted: → <i>Adjust position 1</i>
3.	Lock turret.
4.	Pass the position/value for position 1 to the control unit.

Drive to position 1

➤ Rotate tool disk step by step until proximity switch S1 is no longer activated.

⇨ LED OFF/ signal "Position 1".

Adjust position 1



- Lock turret.
- Remove plug (1) with plug extractor.
- Loosen claw (P).
- Turn the tool disk until the hole (1) is visible.
- Pull out holder (5).
- ⇨ The groove can be observed through the bore.
- Unlock turret.
- Rotate tool disk until the groove is situated in the center of the bore.
- Lock turret.
- Insert holder (5) and fasten with claw (P).
- Insert plug (1).

Checking

Proximity switch S1 is not activated (LED OFF and/or no signal).

4.4 Tool drive motor



WARNING

Risk of injury posed by moving machinery components. If power supply and hydraulic circuits are turned on for adjustment operations:

- Secure workplace with warning sign.
- Prevent actuation by other persons; secure control panel.
- Do not stay close to moving machinery components, especially within the swiveling range of the tools.



CAUTION

Risk of material damage.

The tool drive motor must be set in order to enable correct coupling.

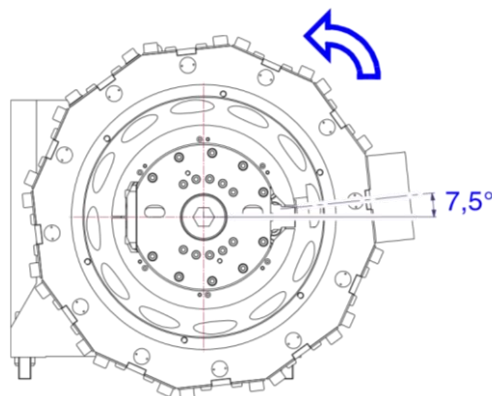
- Remove all tool holders/spindle units.
- Perform basic adjustments for the tool drive motor.

Preparation

- Take turret motor and tool drive motor out of control.

The low-potential circuit of the machine control unit must remain active when doing so.

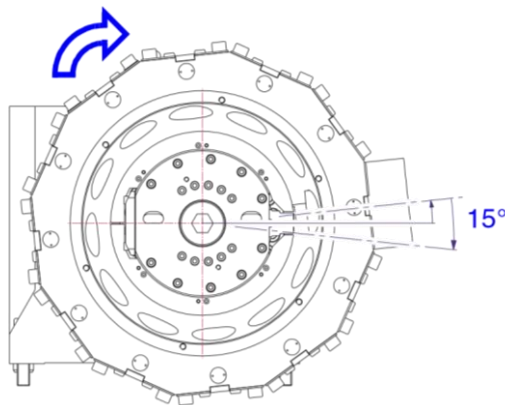
- Unlock turret.



- Rotate the tool disk manually by 7.5 degrees.
- Lock turret.
- Remove the closing plug of the tool holding fixture in working position.
- Insert a spindle unit into the working position, but do not screw down.

Basic settings

1. Turn the spindle unit shaft manually until a resistance can be felt.
Read off the tool spindle position on the machine control and record as value 1.
 2. Then turn the spindle unit shaft in the opposite direction until a resistance can be felt.
Read off the tool spindle position on the machine control and record as value 2.
- Remove spindle unit.
 - Unlock turret.



- Rotate tool disk manually by 15 degrees in the opposite direction.
 - Lock turret.
 - Insert a spindle unit into the working position, but do not screw down.
3. Repeat steps 1 and 2, recording the respective values.
 4. Determine the average value of the recorded values and enter in the machine control as reference point offset for the tool drive motor.

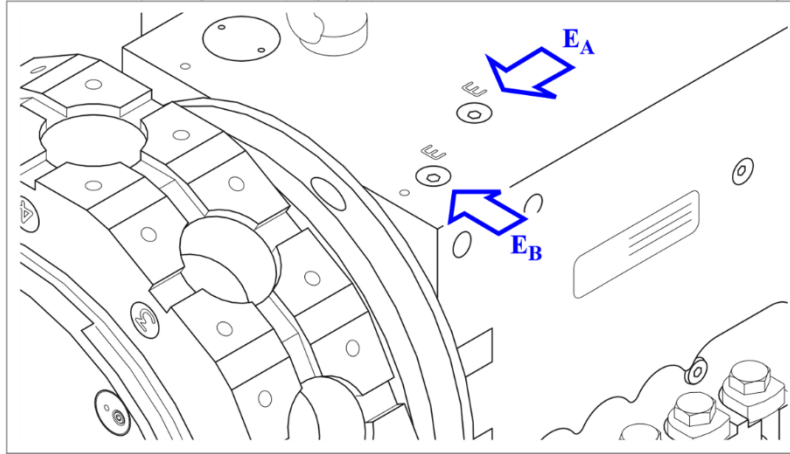
Function Checking

- Mount spindle unit. → [Page 22](#)
- Check function. → [SK-1598](#)

4.5 Hydraulic system

Condition of supply

- The cylinders of the turret are filled with hydraulic oil.
- Hydraulic connections A and B are closed.
- The turret is vented.



- Each internal hydraulic line features **at least 1** venting bore.
- All venting bores are provided with venting screws and marked with an **E**.

Connecting



IMPORTANT

It must be possible to pressurize the hydraulic lines of the turret for locking and unlocking operations, even if the machine is stopped.

→ [Hydraulic diagram](#)

→ [Hydraulic operating pressure: Technical data, page 9](#)



IMPORTANT

Air penetrates into the hydraulic system of the turret during installation and connection to the hydraulic circuit of the machine.

Air inside the hydraulic system poses a risk to trouble-free turret operation.

After installation and connection:

- Vent carefully in a technically appropriate manner.
- Perform the electrical installation of the turret.
- Switch on turret motor and tool drive motor.
 - ⇔ This makes it possible to keep the tool disk to its position following unlocking operations.
- Switch hydraulic supply on.



WARNING

Risk of injury posed by moving machinery components.

- Secure workplace with warning sign.
- Prevent actuation by other persons; secure control panel.
- Do not stay close to moving machinery components, especially within the swiveling range of the tools.

Venting

**IMPORTANT**

Several liters of oil may have to be drained for complete venting, if necessary, depending on the size of the hydraulic system/length of the hydraulic hoses.

➤ Collect the hydraulic oil and dispose of it in a technically appropriate manner.

Start with one hydraulic line, e.g. line A

1. Adjust pressure for hydraulic line A: max. 50bar.

**WARNING**

Risk of injury by high pressure inside the hydraulic system.

➤ Do not unscrew venting screw.

2. Loosen venting screw with a maximum of 2 revolutions, allow the oil to escape and close the venting screw again.

Lock and unlock the turret several times over.

Repeat the whole process several times over.

3. For complete venting, the hydraulic line must be vented successively by means of all venting bores installed.

⇔ The hydraulic line is entirely vented when oil flows out of the venting bores without any bubbles.

➤ Vent the remaining lines by applying the same principle.

5 Operation

5.1 Overview

Changing	
Tools	→Page 21
Tool holders for static tools	→Page 22
Spindle units for driven tools	→Page 22
Werkzeugaufnahme/Kupplungsprofil BMT	→SK-1663
Werkzeugaufnahme/Kupplungsprofil Mori-Seiki	→SK-1666
Sealing for all unoccupied tool holding fixture	→Page 22
Checking	
Hydraulic system	→HP-544
Vent hydraulic system	→Page 19
Drainage for the tool disk	→Page 29
Fault elimination	→Page 25

5.2 Tools



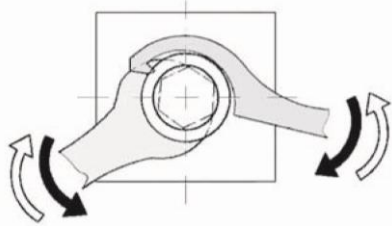
CAUTION

Risk of machine damage due to changing a driven tool incorrectly:

Impacts on the tool holding fixture can damage the turret drive train.

Therefore, always change driven tools as follows:

- When loosening /clamping the tool holding fixture, always support it with a second spanner.



or

- Remove spindle unit, change tool and refit spindle unit.

5.3 Tool holders and spindle units



CAUTION

To ensure safe sealing of the tool disk interior and to avoid potential damage to property:
and

To avoid damage to the coupling for the spindle unit:

- Observe the coupling profile. → [Technical data, page 9](#)
- Exclusively use tool holders/spindle units with specification dimensions in accordance with the given SK: → [SK-1663 or SK-1666](#)
- Use tool holders for static tools together with the GPM closing plug with O-ring only.
- Seal all unoccupied tool holding fixtures:
 - each with GPM closing plug with O-ring and with GPM closing plate. → [Figure, Page 23](#)



IMPORTANT



- Do not clean with compressed air!
- Only use cloth to clean.

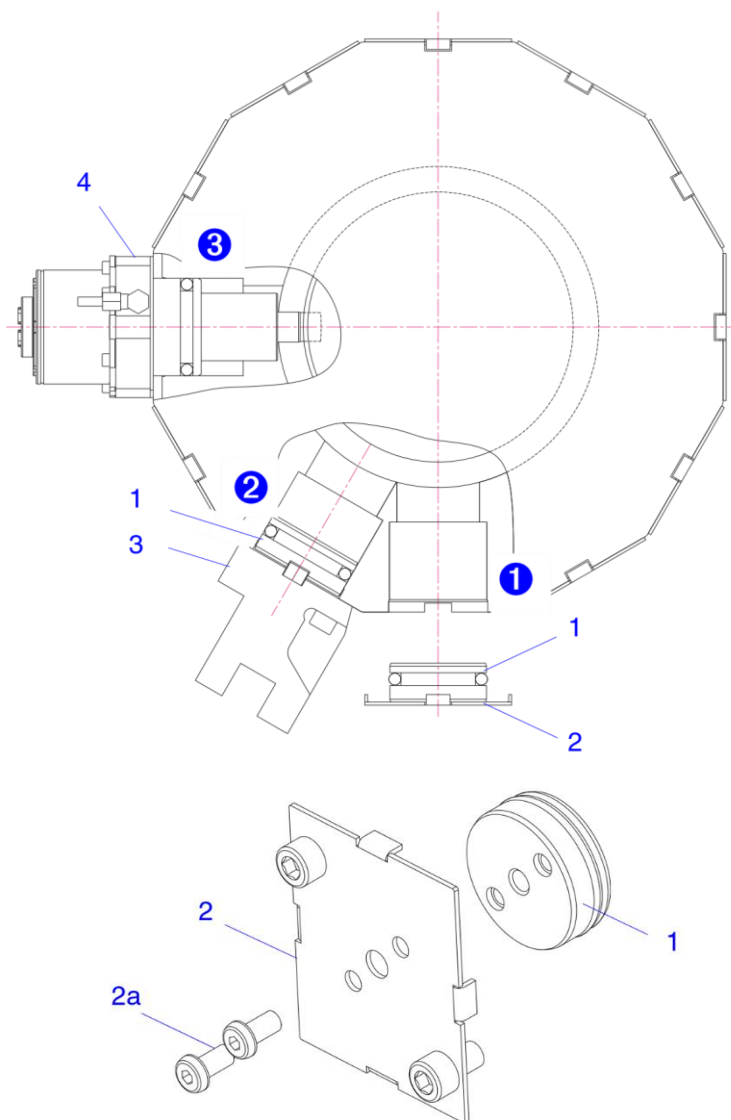
Establish initial state



WARNING

Risk of injury posed by moving machinery components.

- Secure workplace with warning sign.
- Prevent actuation by other persons; secure control panel.
- Do not stay close to moving machinery components, especially within the swiveling range of the tools.
- Move tool drive motor to its zero position (e.g. using "Positioning spindle").
- Unlock turret.
- Rotate the tool disk until the position to be equipped is placed in horizontal position.
- Lock turret.
- Deenergize turret motor and tool drive motor.
- If a tool is mounted in the position to be equipped, disassemble it.
- Clean tool disk coarsely.



1	GPM closing plug with O-ring
2	GPM closing plate
2a	Screws for fastening of the GPM closing plug with O-ring
3	Tool holder for static tools
4	Spindle unit for driven tools

- Depending on variant ①, ② or ③, disassemble the equipment from the tool disk.
- Clean the contact surface of the tool disk.
- Clean the disassembled equipment and check O-rings, replace if necessary.



IMPORTANT

A GPM closing plug with O-ring (1) is required for equipment variant ②.

- This can be disassembled from an unneeded GPM closing plate (2).

Otherwise:

- Store the unneeded GPM closing plates (2) and GPM closing plugs with O-ring (1).
- Clean new equipment if necessary.

Check O-rings and replace if necessary.









In addition, for spindle units:

- Check the coupling profile for wear, replace spindle unit if necessary.

Assembling









➤ Insert GPM closing plug with O-ring (1) and tool holder (3) or spindle unit (4).

➤ Tighten screws, noting screw-in depth and tightening torque!

BMT 45		4 x M8 - 8.8		25 Nm
BMT 55		4 x M10 - 8.8		49 Nm
BMT 65		4 x M12 - 8.8		86 Nm
Mori-Seiki Ø40		4 x M10 - 8.8		49 Nm

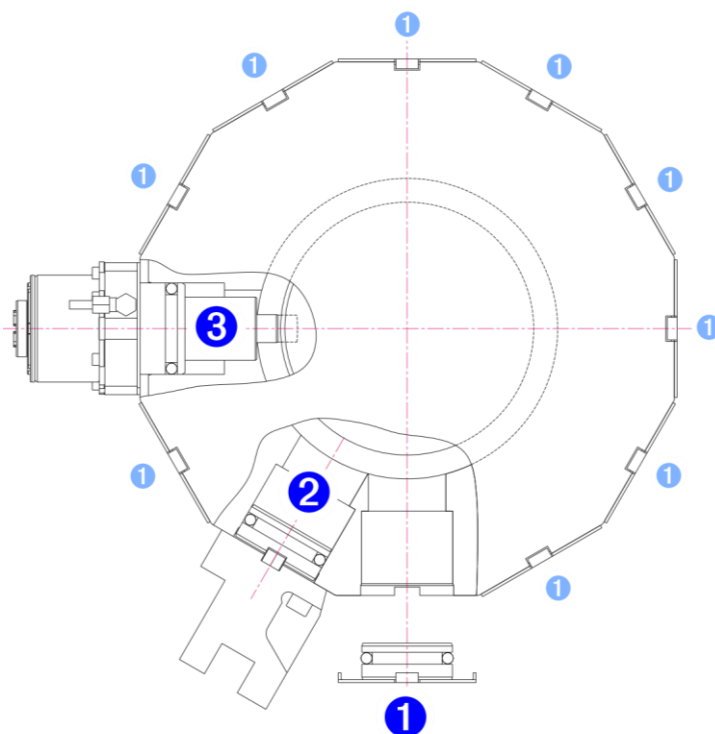
➤ Seal all unoccupied tool holding fixtures:

- each with GPM closing plug with O-ring (1) and GPM closing plate (2).

BMT 45		2 x M8 - 8.8		25 Nm
BMT 55		2 x M10 - 8.8		49 Nm
BMT 65		2 x M12 - 8.8		86 Nm
Mori-Seiki Ø40		2 x M10 - 8.8		49 Nm

Check tool disk

Are all tool holding fixtures occupied?



③	For driven tools
	Spindle unit with specification dimensions in accordance with the given SK
②	For static tools
	GPM closing plug with O-ring
	and
	Tool holder with specification dimensions in accordance with the given SK
①	Without tools
	GPM closing plug with O-ring
	and
	GPM closing plate

5.4 Possible faults and remedies



Clearing required prior to any work:

- Switch the machine power off.
- Depressurize turret.

Fault	Cause	Remedy	Who carries out this task?
Turret			
Incorrect center height, tool disk offset relative to locating disk	Collision when turret is locked	Align tool disk	User → Page 34
Tool disk does not rotate	Gearwheels are defective	Replace defective parts	GPM Service
	Turret motor or control unit defective	see Operating Instructions of the machine	
Turret does not lock	Axis has rotated out of position relative to the locating disk	Align axis to gearwheel	GPM Service
	Proximity switch S8 does not switch	Check proximity switch S8, set or replace if necessary	User → Page 40
Reference point travel for turret not possible	Proximity switch S1 does not switch	Check proximity switch S1, set or replace if necessary	User → Page 38
Tool disk rotates in one direction only	Turret motor or control unit defective	see Operating Instructions of the machine	
Tool disk does not stop in the selected position or positions into place with strong impact	Turret motor or control unit defective		

Fault	Cause	Remedy	Who carries out this task?
Leakage oil escapes	Seals are defective	Replace defective parts	GPM Service
Cooling lubricant is not being transferred	Cooling lubricant valve is defective	Replace defective parts	User → Page 42
	Cooling lubricant valve/line is blocked	Blow cooling lubricant valve/line clear	
Cooling lubricant escapes between tool disk and turret	Cooling lubricant valve is defective	Replace defective parts	
Tool drive			
Tool is not driven	Gearwheels are defective	Replace defective parts	GPM Service
	Tool drive motor is defective	Replace defective parts	User → Page 30
Collision between tool disk and gear head	Tool disk is displaced	Align tool disk	User → Page 34
	Gear head is not in the correct position	Align gear head	GPM Service → Page 30

6 Maintenance

Safety notes → [Page 4](#)

6.1 Overview

Planned preventive maintenance	→ Service intervals, Page 27
Repairs after fault conditions	→ Possible faults and remedies, Page 25

6.2 Service life

The service life of the turret is approx. 8 million switchings or approx. 5 years.

The service life of the tool drive unit is approx. 8000 operating hours.

These values apply to

- collision-free operation,
- compliance with the specified operating conditions and the permissible loads, → [Technical data](#)

6.3 Service intervals

Plan your tasks carefully in order to provide for trouble-free operation and reduce necessary downtimes to a minimum.



IMPORTANT

➤ Maintenance intervals must be adapted to the operating conditions involved.

after 500 operating hours of the machine and/or every month respectively	Clean apertures for drainage of the tool disk.	User → Page 29
	Check tool holders/spindle units on tool disk for proper seating.	User → Page 22
	Check sealing rings on tool holders/ spindle units and replace tool holders/ spindle units, if necessary.	
after 4000 operating hours of the machine respectively	Check cooling lubricant valve for wear and leakage. Replace any defective parts.	User → Page 42
	Check turret gearbox chamber.	User → Page 28
after 2½ years respectively	Check all electrical and hydraulic lines and connections for mechanical damage as well as embrittlement. Replace any defective parts.	User Specialist electrical engineer ¹⁾
after 8000 operating hours of the machine respectively	The service life of the tool drive unit may possibly be reached, depending on the operating conditions involved. A general overhaul is recommended for further trouble-free operation.	GPM Service
after approx. 8 million indexing operations and/or approx. 5 years respectively	A general overhaul is recommended for further trouble-free operation.	GPM Service

¹⁾ These are persons who are able to identify risks and to prevent possible hazards on the basis of their special training and their experience (IEC 60 201-1).

6.4 Maintenance work

Turret gear chamber

- The product is lubricated with grease. Lubricant used:

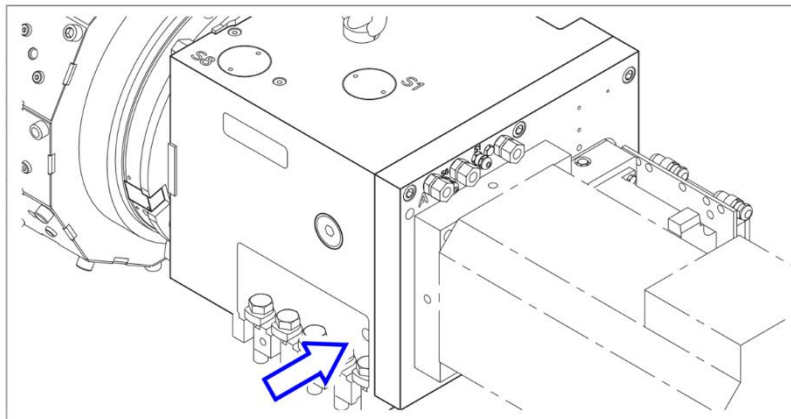
CENTOPLEX CX4/375 (KLÜBER)

- Lubrication must be checked after 4,000 operating hours respectively.



Clearing required prior to any work:

- Switch the machine power off.
- Depressurize turret.



- Clear access to opening on turret housing.
- Remove screw plug off opening.
- Take grease sample and assess grease condition:

Condition	Cause	Measure
Grease: black or brown, without metallic abrasion	Trace of natural wear	–
No grease visible on gear	Natural consumption	➤ Replenish grease. CENTOPLEX CX4/375
Grease: black or brown, with metallic abrasion	Internal parts of turret are damaged	➤ Request GPM Service!
Grease: white, mixed with cooling lubricant	Turret sealings are damaged	
Grease mixed with oil		

- Re-insert screw plug.

Tool disk

- The outlet apertures inside the tool disk must be checked after 500 operating hours respectively.

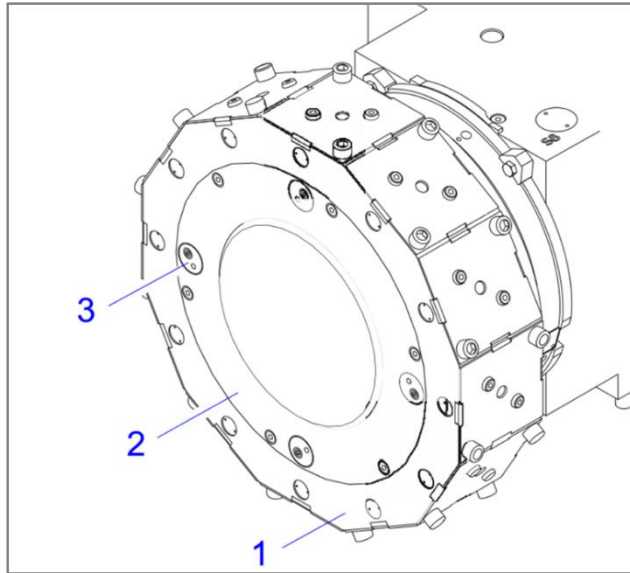


Clearing required prior to any work:

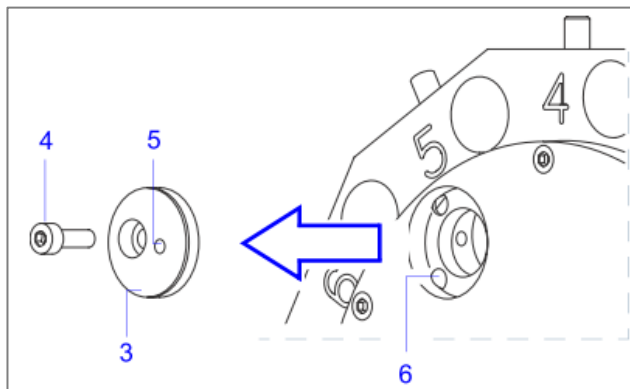
- Switch the machine power off.
- Depressurize turret.

Clean outlet apertures inside the tool disk

There may be slight differences compared to the figures.



- 1 Tool disk
- 2 Closing plate for the tool disk
- 3 Bolt
- 4 Screw
- 5 Extracting thread
- 6 Outlet aperture inside the closing plate



Clean

1. Clean coarse dirt from closing plate for tool disk using a cloth.
2. Unscrew screw.
3. Rotate screw a few times to screw it into the extracting thread and take out bolt.
4. Clean bolt.
5. Replace parts, if necessary. → [Page 54](#)
6. Clean aperture inside closing plate using a cloth.
7. Re-attach bolt and screw in screw.
8. Clean all outlet apertures in line with this principle.

Function check

- Check, whether air is flowing out of all outlet apertures.
- Clean again, if necessary.

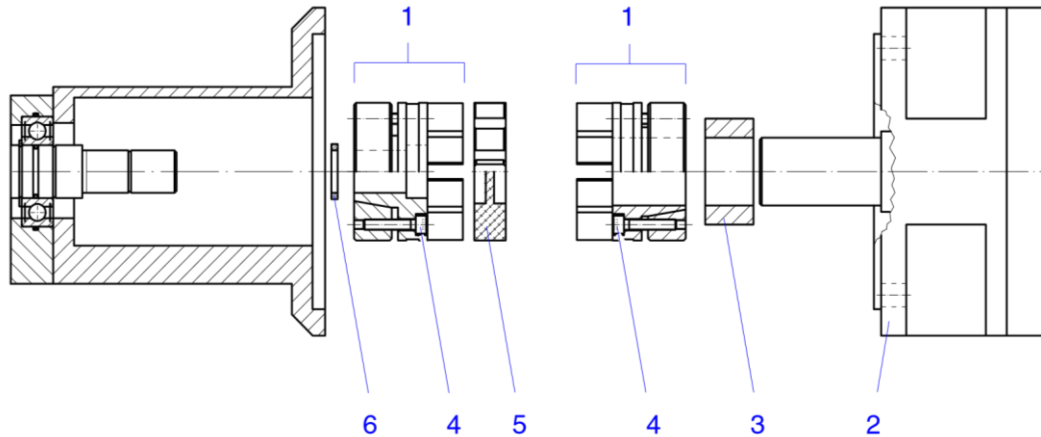
6.5 Tool drive motor



Clearing required prior to any work:

- Switch the machine power off.
- Depressurize turret.

Disassembling



- Remove motor (2) and driver (5).
- Loosen clamping screws (4) (several revolutions).
- Remove the clamping screws located close to each forcing thread, and screw into the forcing thread down to stop.
- Tighten the screws evenly and crosswise, and continue to remove the remaining clamping screws, if necessary.
 - ⇨ The clamping ring is pushed by the conical clamping ring hub.
- Extract coupling components (1).

Assembling → [Page 13](#)

Basic settings → [Page 17](#)

6.6 Gear head



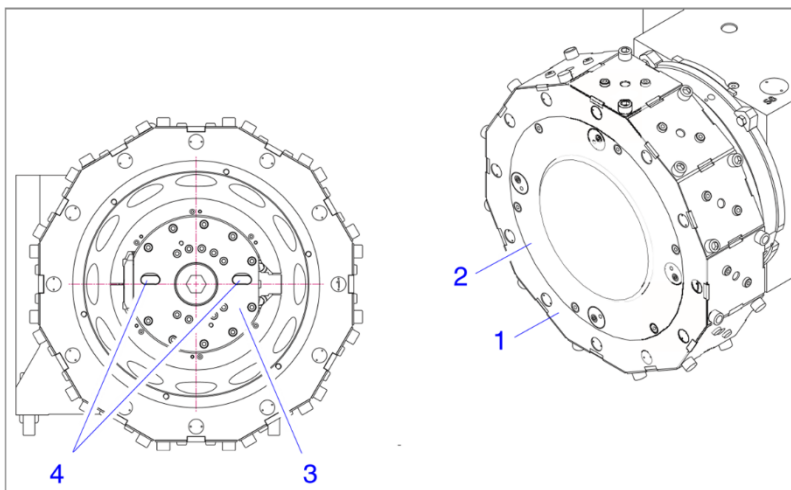
IMPORTANT

The gear head may need to be realigned after faults/repair work.

Basic procedure

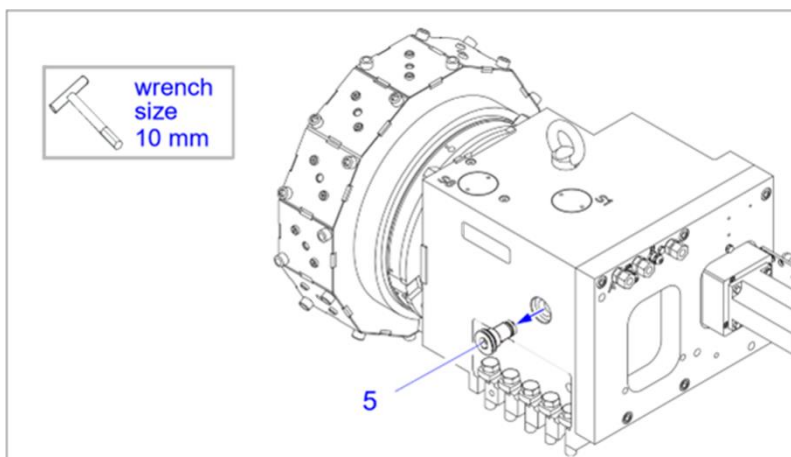
1.	Lock turret.	
2.	Depressurize turret.	
3.	Deenergize turret motor.	
If the tool drive motor is mounted:		
4.	Deenergize tool drive motor.	
5.	Remove all tool holders/spindle units.	
6.	Align gear head.	→ Page 32
7.	Adjust tool drive motor.	→ Page 17

Preparation



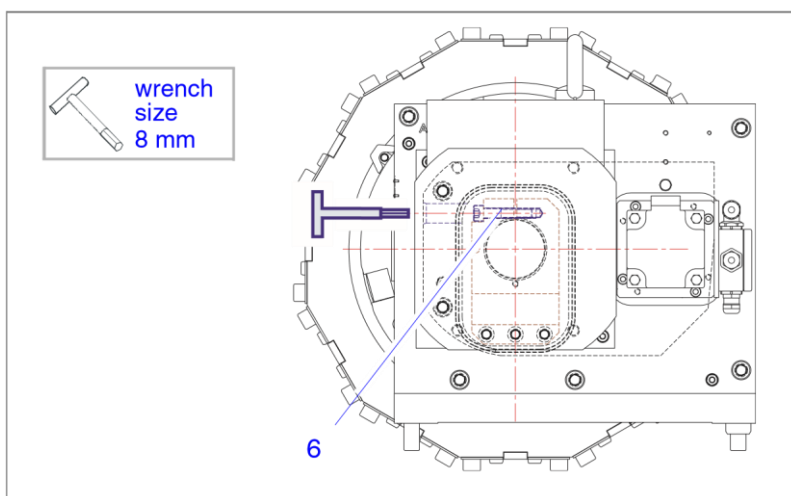
➤ Remove closing plate (2) for the tool disk (1) (6 screws).

⇨ It will then be possible to check the position of the slots (4) in the gear head (3) during alignment.



➤ Unscrew screw plug (5).

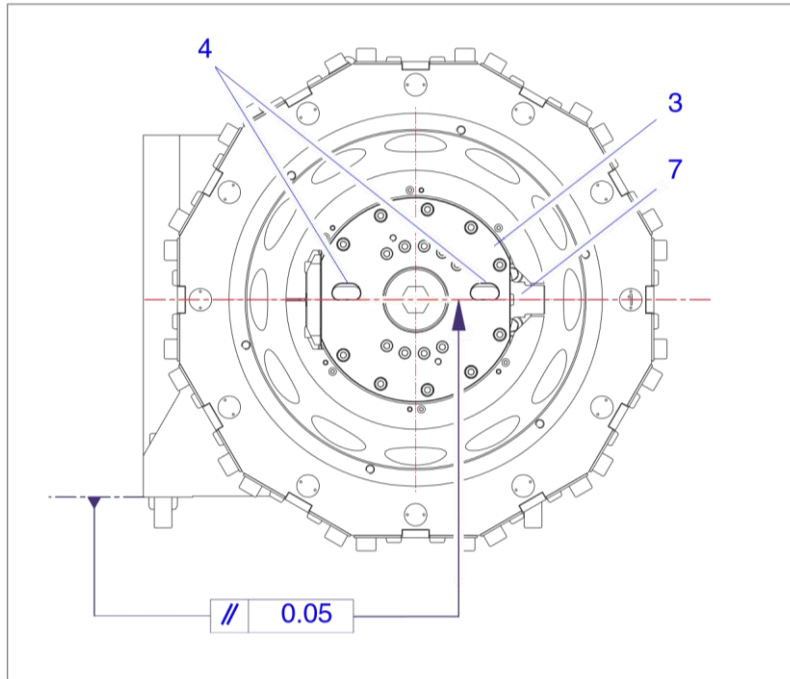
⇨ The screw (6) on the clamping plate is accessible through the bore.



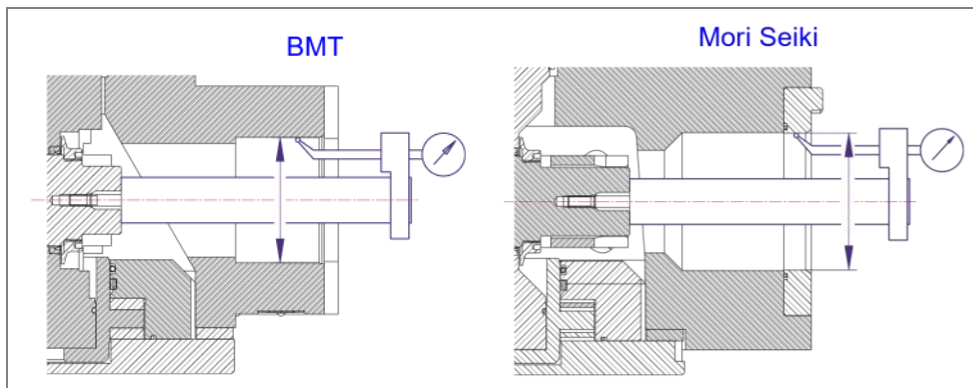
➤ Loosen screw (6).

➤ Turn the gear head (3) until the coupling (7) for the spindle unit is in the working position.

Aligning

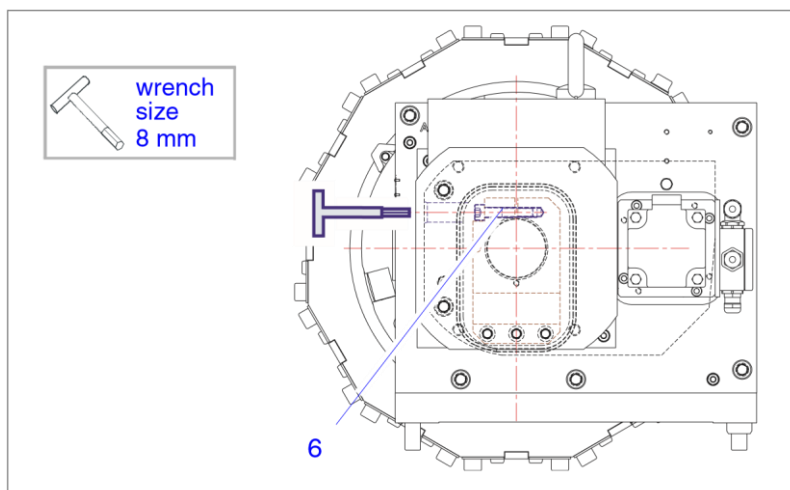


➤ Align slots (4) with the bolt-down surface of the turret. or

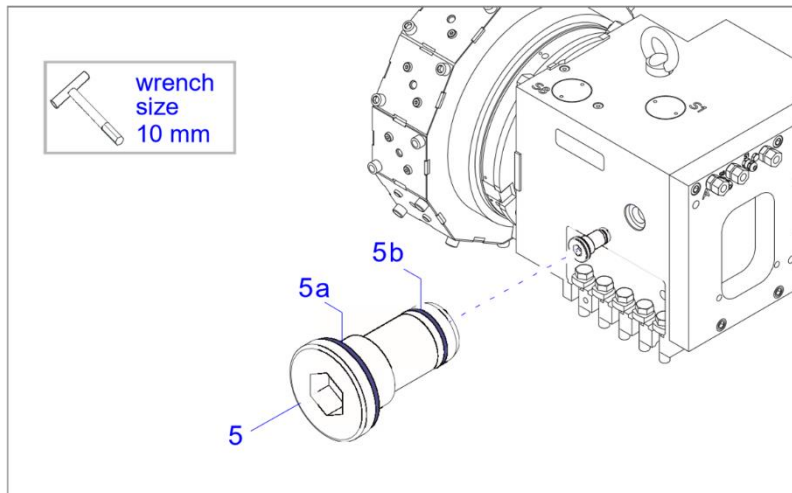
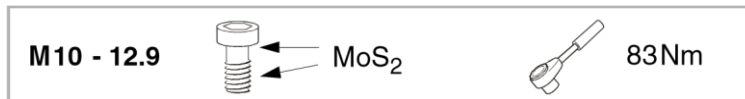


➤ Align the tool drive motor concentrically with the locating hole in the tool disk.

runout error	max. 50µm	BMT
	max. 20µm	Mori-Seiki



➤ Tighten screw (6).



➤ Check sealing ring (5a) and O-ring (5b) and replace if necessary.

➤ Screw in screw plug (5).

➤ Screw on closing plate (2) for the tool disk (1) again.

Mount tool drive motor, if necessary → [Page 13](#)

Basic settings → [Page 17](#)

6.7 Tool disk



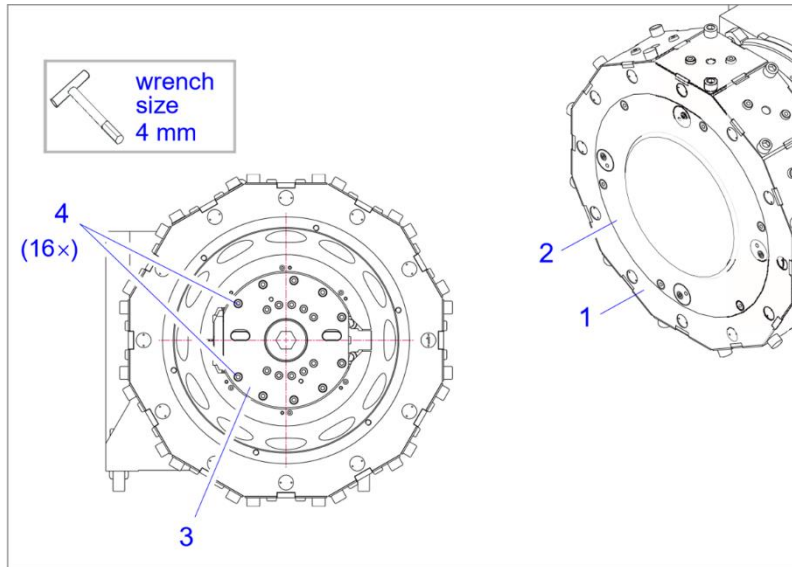
IMPORTANT

The tool disk may need to be realigned after faults/repair work.

Basic procedure

Preparation		
1.	Lock turret.	
2.	Depressurize turret.	
3.	Deenergize turret motor.	
4.	Deenergize tool drive motor.	
5.	Remove all tool holders/spindle units.	
Checking		
6.	Check the adjustment of the tool disk.	→ Page 36
Aligning		
7.	Dismantle tool drive motor.	→ Page 30
8.	Dismantle gear head.	→ Page 35
9.	Align tool disk.	→ Page 36
10.	Mount gear head.	
11.	Align gear head.	→ Page 30
12.	Mount tool drive motor.	→ Page 13
Adjusting		
13.	Adjust tool drive motor.	→ Page 17

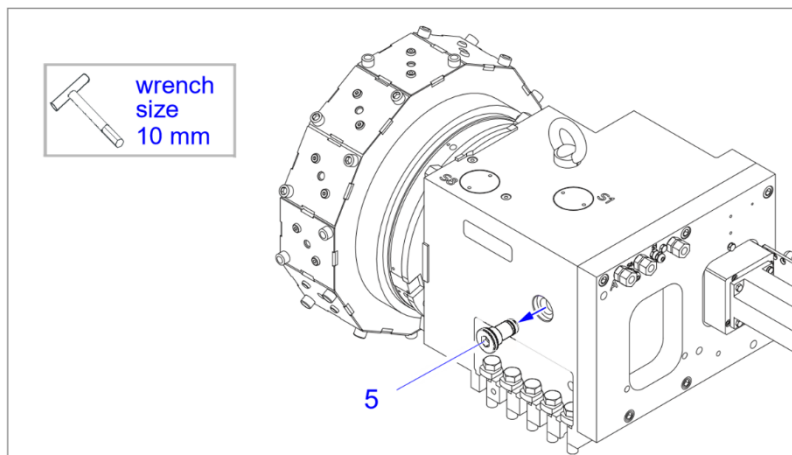
Dismantling the gear head



➤ Remove closing plate (2) for the tool disk (1) (6 screws).

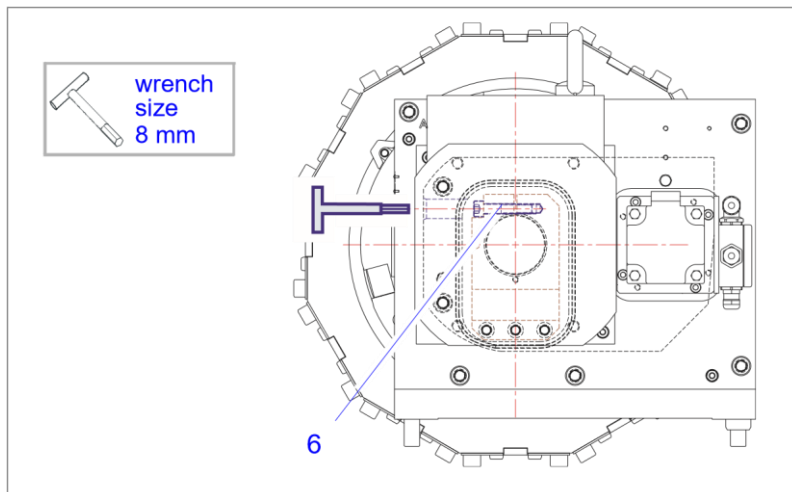
⇨ The gear head (3) is accessible.

➤ Unscrew screws (4) in the gear head (3).



➤ Unscrew screw plug (5).

⇨ The screw (6) on the clamping plate is accessible through the bore.



➤ Loosen screw (6).

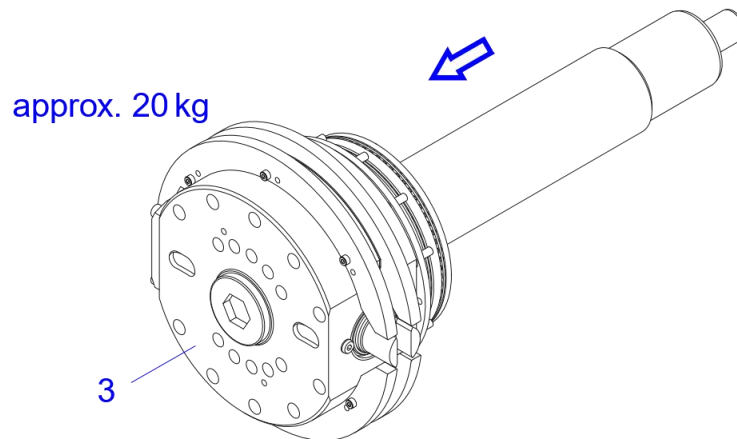


WARNING

Risk of injury.

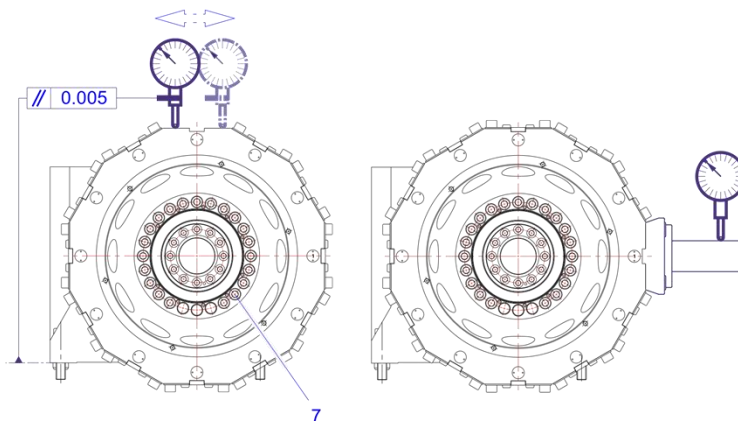
In order to avoid hand injuries (crushing) when dismantling the gear head or to prevent the gear head from slipping out (depending on the installation position):

- Pay attention to mass and mass distribution.
- Secure the gear head if necessary.



- Carefully remove the gear head (3).

Aligning the tool disk



- Loosen screws (7).
- Align the locating hole to center height of the machine.
- Tighten screws (7).

M10 - 12.9



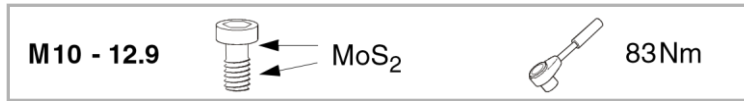
MoS₂



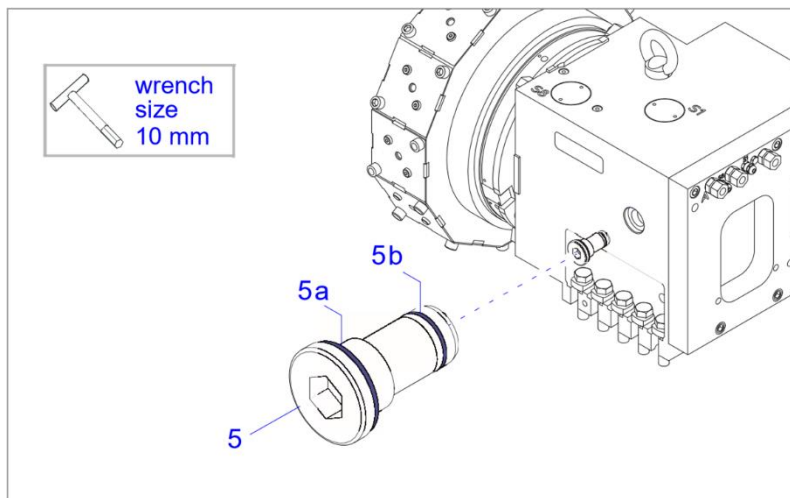
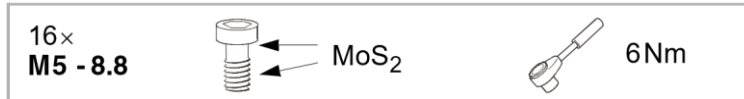
77Nm

Mounting the gear head

- Carefully insert the gear head (3).
- Tighten screw (6).



- Screw in screws (4) and tighten.



- Check sealing ring (5a) and O-ring (5b) and replace if necessary.
- Screw in screw plug (5).
- Screw on closing plate (2) for the tool disk (1) again.

Mounting the tool drive motor → [Page 13](#)

Aligning the gear head → [Page 30](#)

Basic settings → [Page 17](#)

6.8 Proximity switch S1

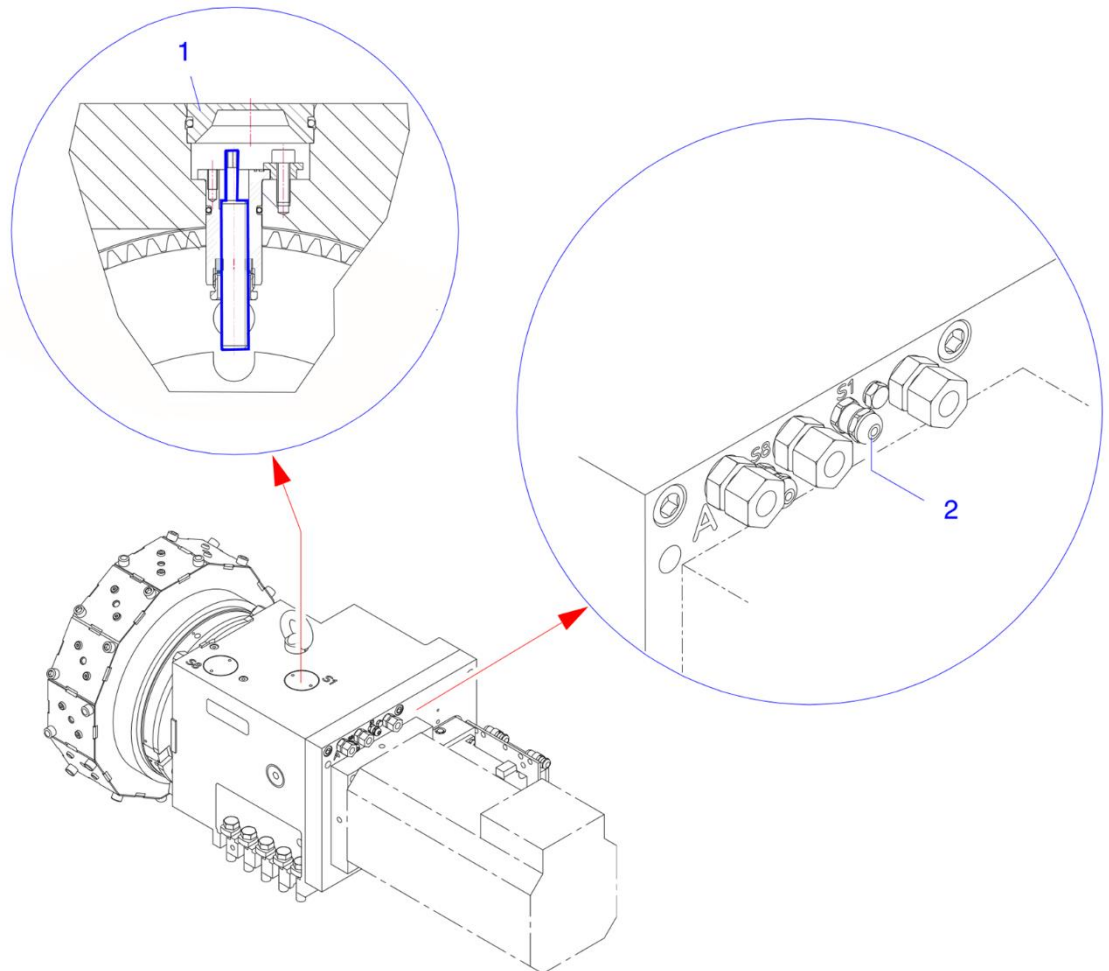


IMPORTANT

Setting tasks require a 24V DC power supply.

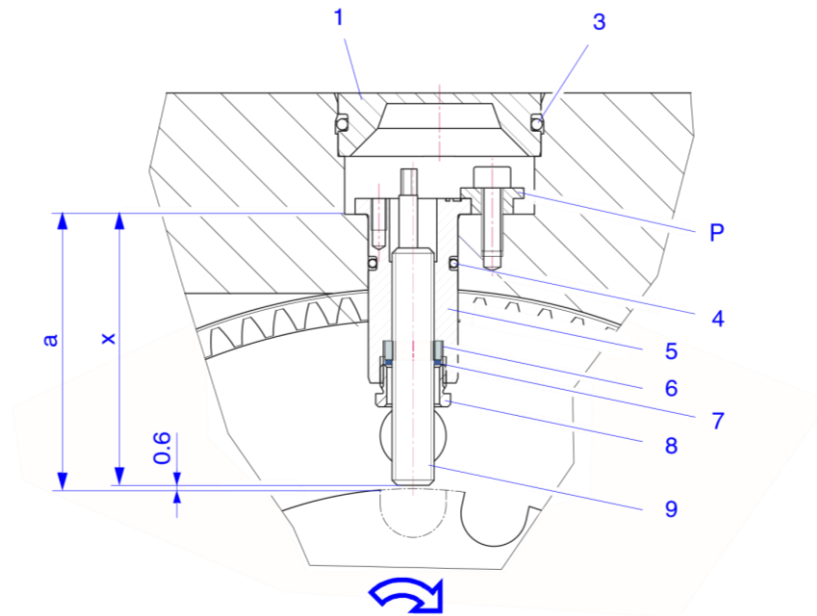
Preparation

➤ Lock turret.



- Remove plug (1) using a plug extractor.
- Uninstall proximity switch.
- Slacken traction relief (2) and pull cable through.

Replacing



- Loosen claw (4).
- Pull out holder (5).
- Measure dimension x and record.
- Unlock turret.
- Do not rotate tool disk to position 1, but to any other position.
 - ⇨ As a result, the distance a can be measured accurately on gear (8).
- Measure distance a with depth gauge and record.
- Lock turret.
- Apply *Replacement parts group* [parts (4) ... (9)].
- Loosen pressure screw (8).

Adjusting

- Set the proximity switch according to the noted dimension x or to $x = a - 0.6$ mm.
- Lock proximity switch (11) with pressure screw (10), during that control dimension x.
- Insert holder (5) and fasten with claw (P).
- Pull cable through and fasten.
- Insert plug (1).
- Connect proximity switch electrically.

Function check

- Unlock turret.
 - ⇨ Proximity switch S8 is no longer activated (LED OFF/no signal).
- Rotate tool disk step by step until proximity switch S1 is no longer activated.
 - ⇨ LED OFF/ signal "Position 1".
- Lock turret.
 - ⇨ Proximity switch S8 is activated (LED ON/signal "Turret locked").

6.9 Proximity switch S8

Position of the proximity switch: → [Page 67](#)

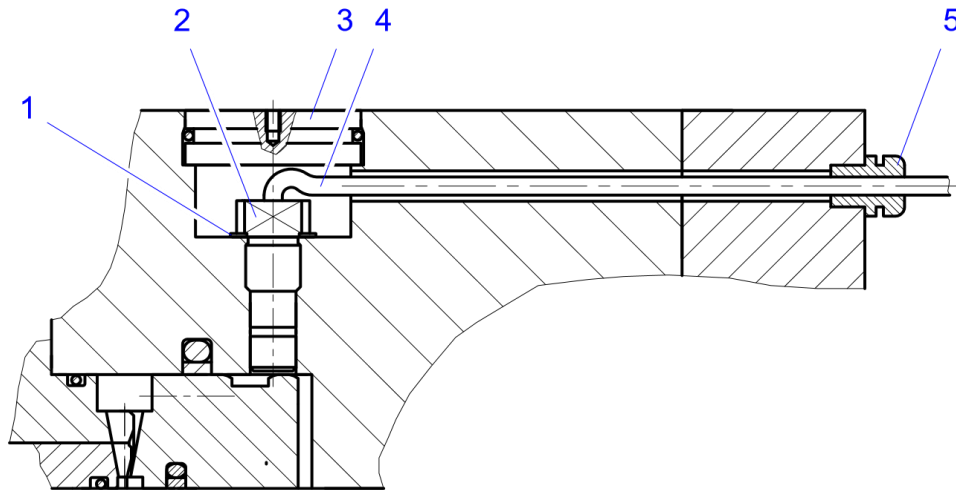


IMPORTANT

Setting tasks require a 24V DC power supply.

Preparation

➤ Lock turret.



Replacing



WARNING

Injury hazard.

Proximity switch extending inside the pressurized chamber.

- Depressurize turret!
- Remove plug (3) using a plug extractor.
- Slacken traction relief (5) and pull cable (4) through.
- Unscrew defective proximity switch (2) using an appropriate wrench.
- Screw in new proximity switch by re-using already available shims (1).

Function check

**WARNING**

Risk of injury posed by moving machinery components.

If power supply and hydraulic circuits are turned on for adjustment operations:

- Secure workplace with warning sign.
- Prevent actuation by other persons; secure control panel.
- Do not stay close to moving machinery components, especially within the swiveling range of the tools.
- Turn on hydraulic supply system.

Tightness

1. Check proximity switch for tightness.

Lock/ unlock in any position and check signals:

2. Lock turret.
 - ⇨ Proximity switch S8 is activated (LED ON and/or signal "Turret locked").
3. Unlock turret.
 - ⇨ Proximity switch S8 is no longer activated (LED OFF and/or no signal).

If a different result is obtained: → [Replacing](#)

Lock in specified position and check signals:

4. Unlock turret.
5. Affix marking to tool disk and rotate tool disk manually by 3-3.5 degrees.
 - ⇨ Hirth coupling is in "head-to-head" position.
6. Lock turret.
 - ⇨ Proximity switch S8 is no longer activated (LED OFF and/or no signal).

In this case, proximity switch S8 is correctly adjusted. → [proceed with step 7](#).

Otherwise: Perform steps → [Replacing](#) and use a further shim/further shims.

Final check

7. Unlock turret.
8. Turn tool disk manually back by 3-3.5 degrees (marking).
9. Lock turret.
 - ⇨ Proximity switch S8 is activated (LED ON and/or signal "Turret locked").
- Insert plug (3).

6.10 Cooling lubricant valve

- Cooling lubricant valves for GPM Disk-type tool turrets are executed depending on the order involved. The cooling lubricant connection may be situated on the valve.
- Cooling lubricant valves are wearing parts and must therefore be inspected after 4,000 operating hours of the machine respectively.
- For ordering replacement parts, the identification number of the cooling lubricant valve can be indicated, if engraved. Otherwise, the order number (i.e. Comm. No. on the turret nameplate) must be given.
- Operating pressure and filter fineness for cooling lubricant: → [Technical data](#)

Replacing the cooling lubricant valve



Clearing required prior to any work:

- Switch the machine power off.
- Depressurize turret.
- Turn off cooling lubricant supply unit.

Cooling lubricant valve

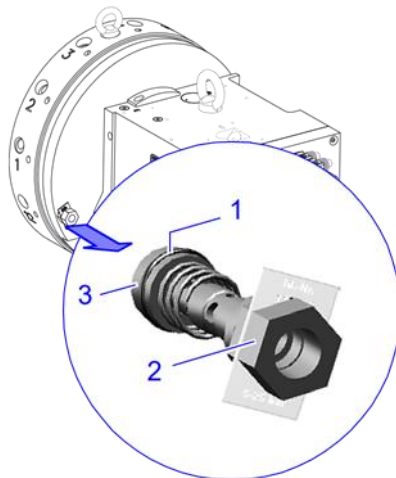
with valve carrier

→ [Page 43](#)

Cartridge

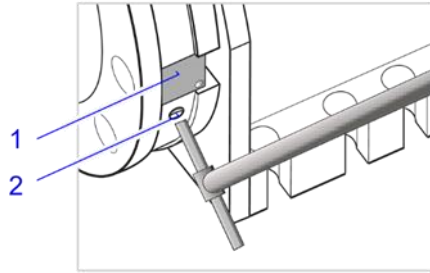
→ [Page 42](#)

Cooling lubricant cartridge

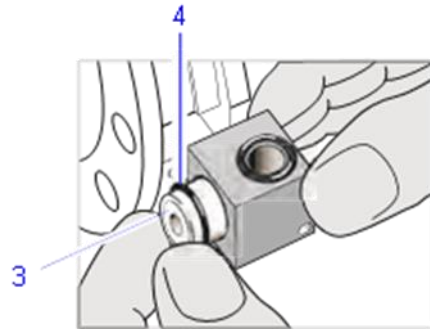


- Unscrew screw plug (2).
- Withdraw cooling lubricant cartridge complete with screw plug (2).
- Check cooling lubricant cartridge; if necessary, replace bushing (3) and O-ring seal (1).
- Refit cooling lubricant cartridge complete with screw plug.

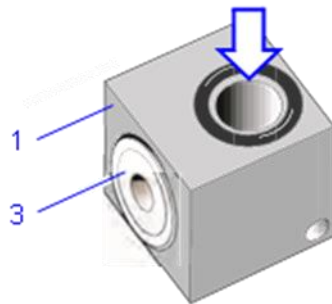
Cooling lubricant valve with valve carrier



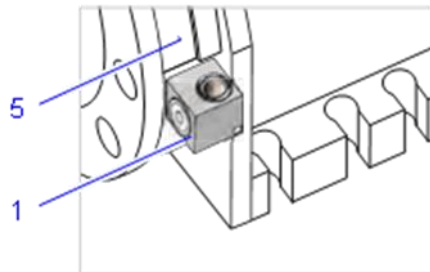
- Loosen setscrew (2).
- Withdraw valve carrier (1).



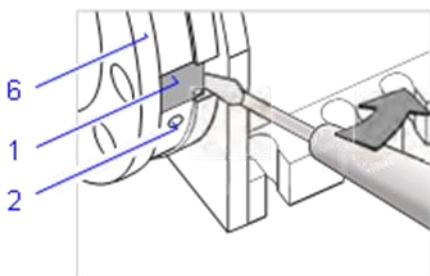
- Remove valve bushing (3), note any loose internal parts!
- Check O-ring seal (4).
- Replace cooling lubricant valve, if necessary.



- Insert valve bushing (3), with land on the inside, into the valve carrier (1) such that the openings for cooling lubricant supply are located one above the other.



- Insert valve carrier (1) into the cooling lubricant ring (5).



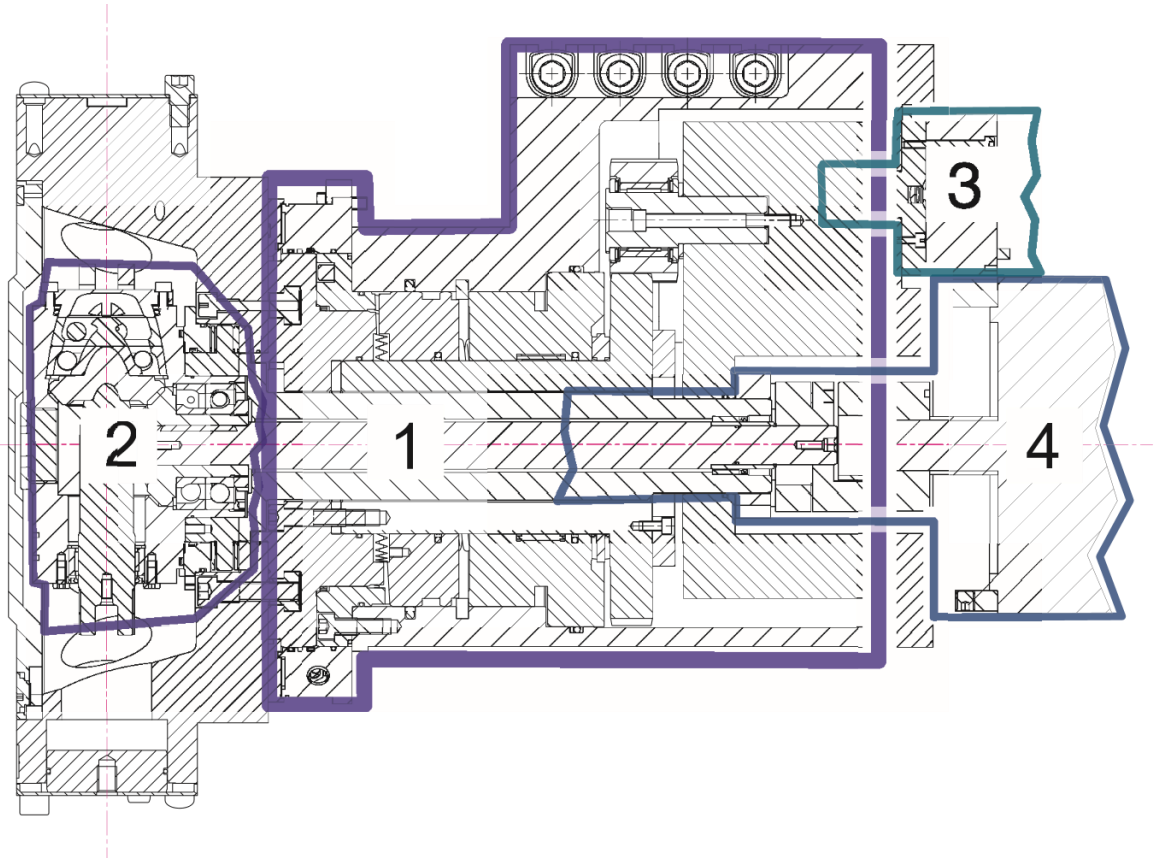
- Press valve carrier (1) against locating disk (6).
- Tighten setscrew (2).
- In the process, ensure that setscrew (2) engages in the groove of valve carrier (1).

7 Replacement parts



IMPORTANT

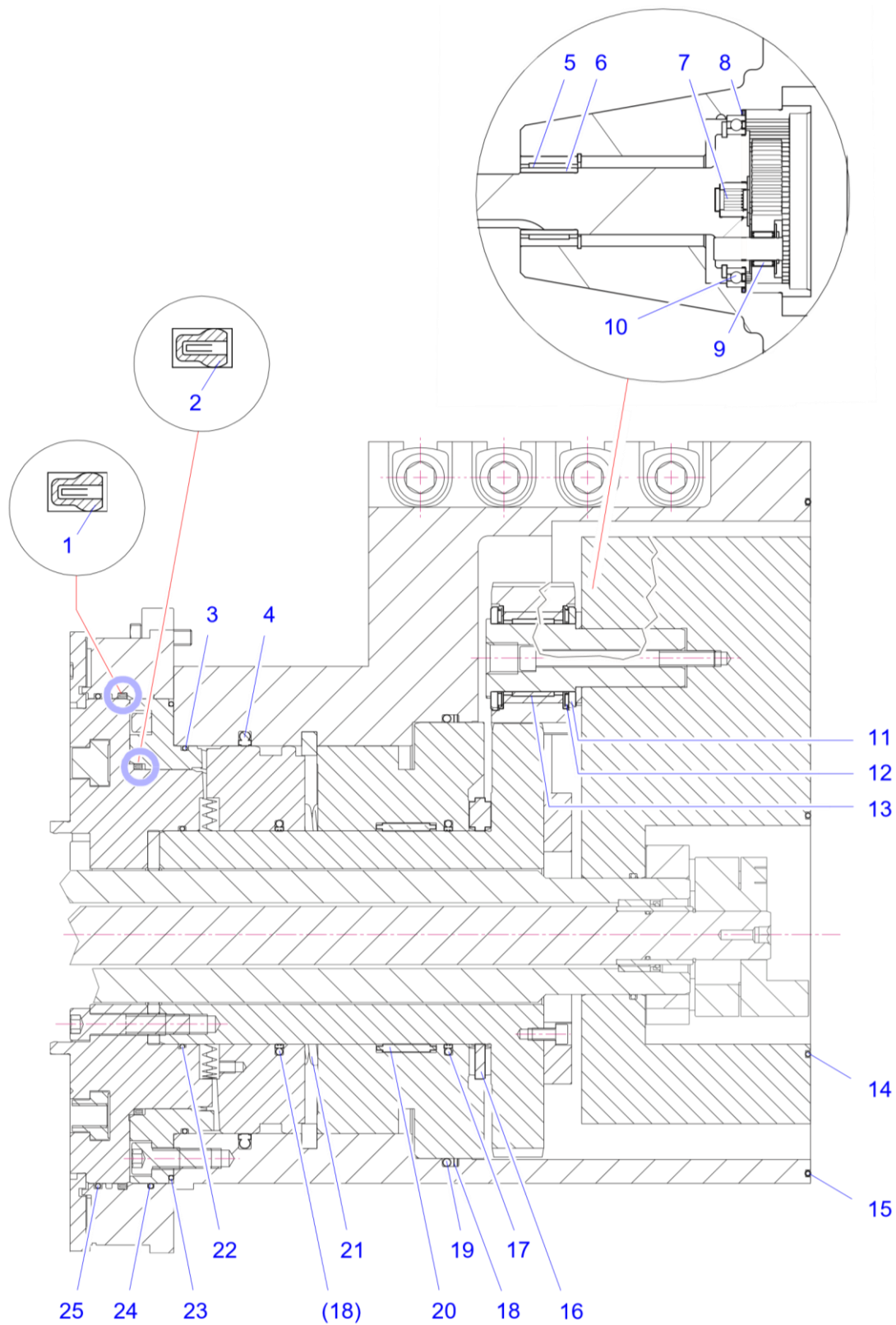
- Please contact GPM Services.
- Please follow the ordering instructions. → [Information at the end of the present manual](#)



1	Turret (without drive) - 434.020		
	- 135 354	→ page 45	- 138 472 → page 47
	- 143 864	→ page 49	- 147 098 → page 51
	- 150 881	→ page 53	- 151 162 → page 55
	- 151 402	→ page 57	- 154 330 → page 59
2	Gear head	for interfaces BMT 45, BMT 55	→ page 61
		for interfaces BMT 65, Mori-Seiki	→ page 62
3	Turret Drive	Turret motor not from Messrs. GPM	→ page 64
		Turret motor from Messrs. GPM	→ page 65
4	Tool drive	Version Direct drive with coupling	→ page 66
	Proximity switches		→ page 67
	Screw plug for turret housing		→ page 68
	Tool disk	Closing plug for tool holding fixture	→ page 69
		Drainage	→ page 70

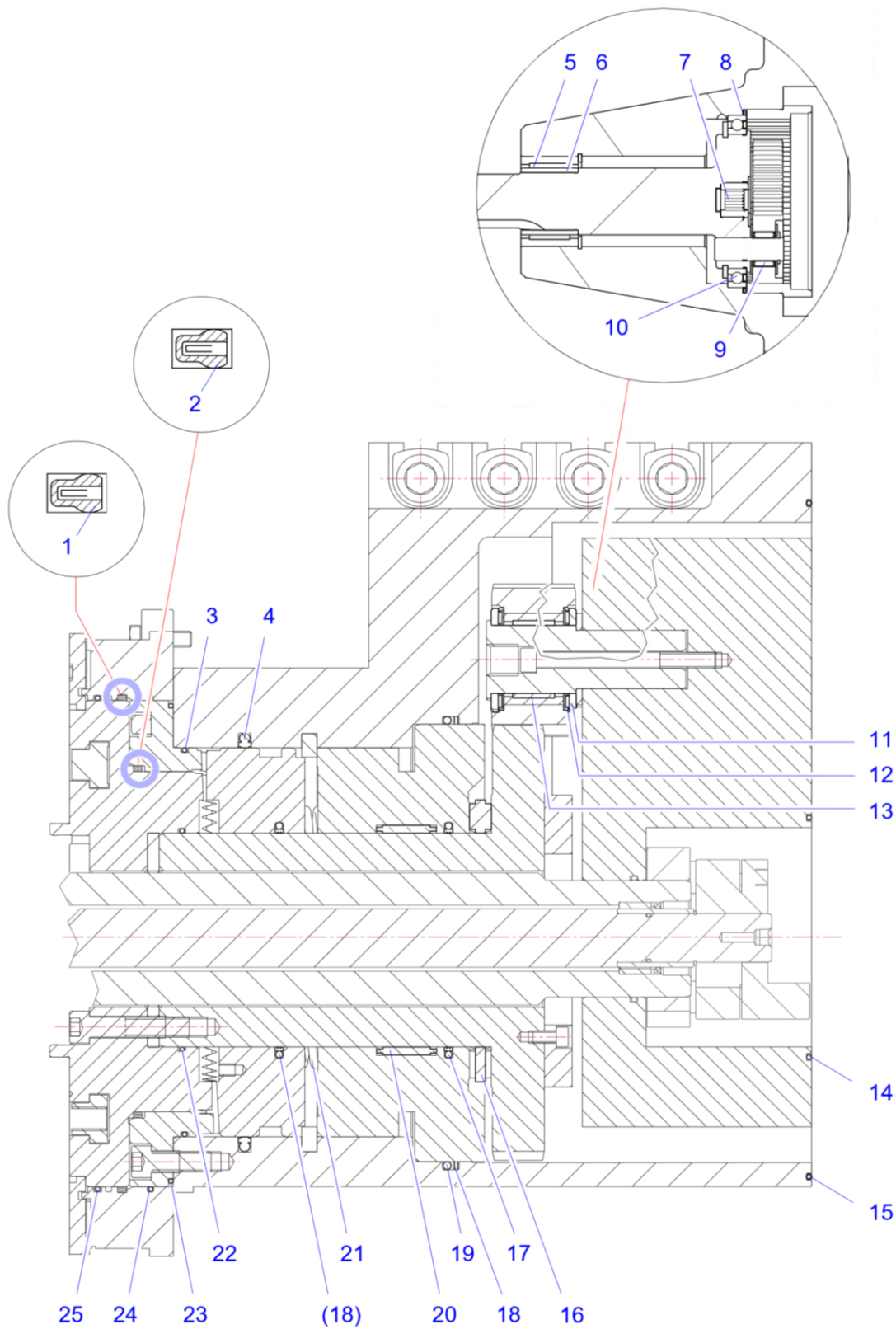
7.1 Turret (without drive)

434.020 - 135 354



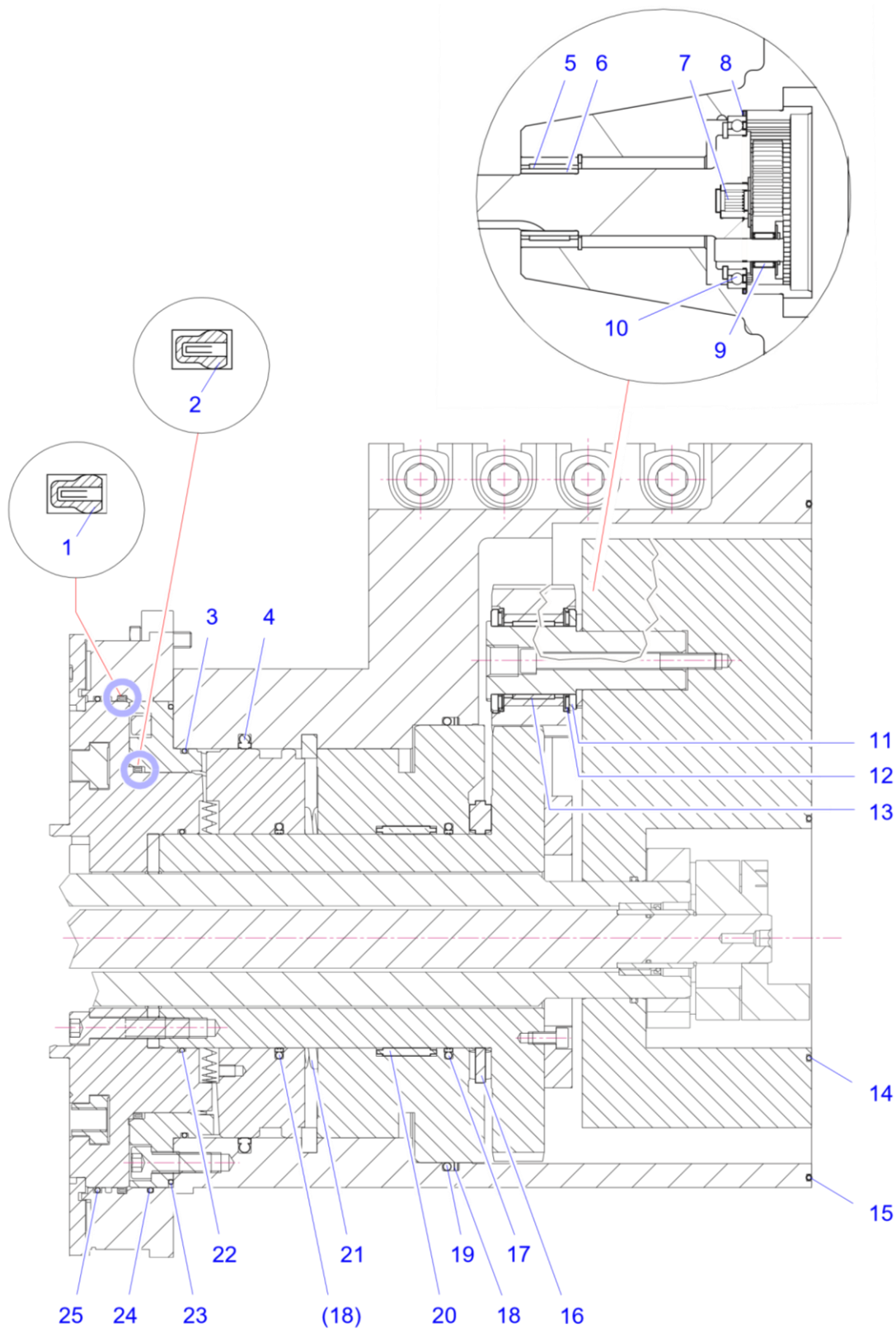
No.	Ident No.	Designation	Qty.
1	034 592	FU groove ring	1
2	071 224	FU groove ring	1
3	082 506	O-ring seal	1
4	079 667	Surface ring	1
5	120 548	Needle bearing	1
6	038 533	Inner ring	1
7	107 299	Needle bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
10	065 715	Deep groove ball bearing	1
11	061 094	Thrust bearing disk	2
12	077 875	Thrust bearing	2
13	120 548	Needle bearing	1
14	058 075	O-ring seal	1
15	074 384	O-ring seal	1
16	084 608	Thrust needle roller and cage assembly	1
17	083 073	Surface ring	2
18	117 796	Supporting ring	1
19	001 102	O-ring seal	1
20	118 574	Needle roller and cage assembly	1
21	004 653	Compression spring	3
22	065 718	O-ring seal	1
23	058 073	O-ring seal	1
24	058 506	O-ring seal	1
25	036 588	Spaghetti hose	0.63m

434.020 - 138 472



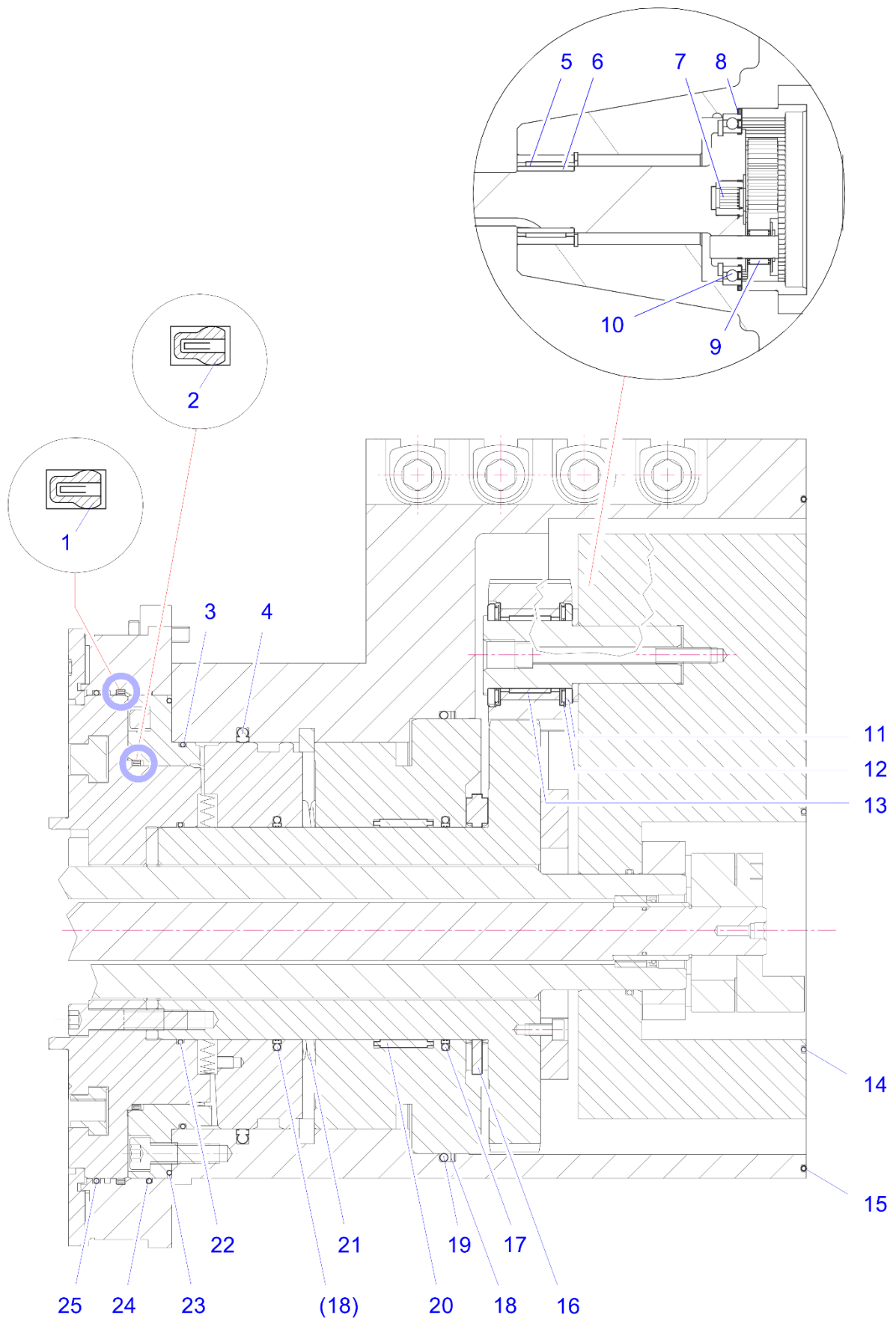
No.	Ident No.	Designation	Qty.
1	034 592	FU groove ring	1
2	071 224	FU groove ring	1
3	082 506	O-ring seal	1
4	079 667	Surface ring	1
5	120 548	Needle bearing	1
6	038 533	Inner ring	1
7	107 299	Needle bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
10	065 715	Deep groove ball bearing	1
11	061 094	Thrust bearing disk	2
12	077 875	Thrust bearing	2
13	120 548	Needle bearing	1
14	058 951	O-ring seal	1
15	061 914	O-ring seal	1
16	084 608	Thrust needle roller and cage assembly	1
17	083 073	Surface ring	2
18	143 836	Supporting ring	1
19	001 098	O-ring seal	1
20	118 574	Needle roller and cage assembly	1
21	004 653	Compression spring	3
22	065 718	O-ring seal	1
23	058 073	O-ring seal	1
24	058 506	O-ring seal	1
25	036 588	Spaghetti hose	0.63m

434.020 - 143 864



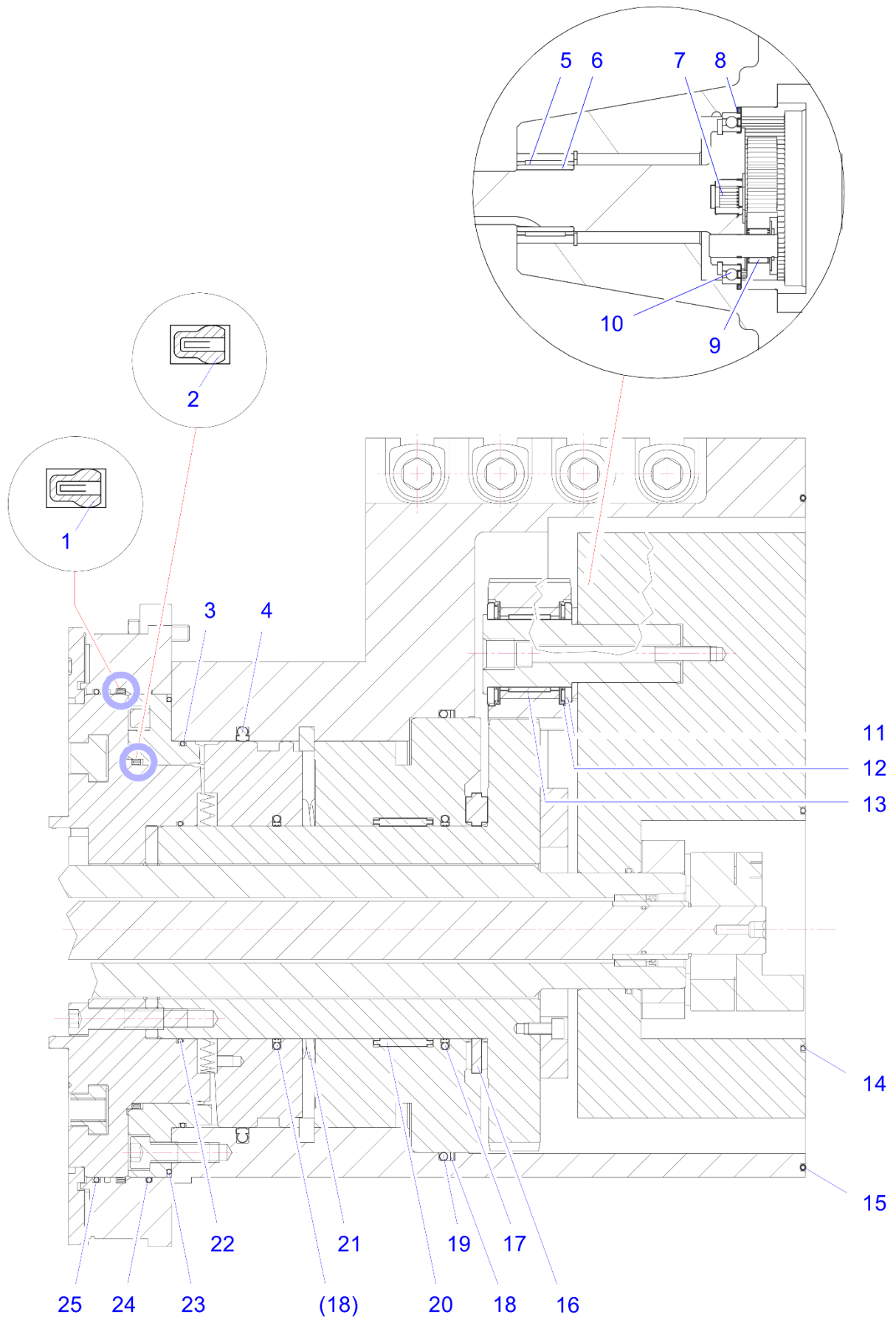
No.	Ident No.	Designation	Qty.
1	034 592	FU groove ring	1
2	071 224	FU groove ring	1
3	082 506	O-ring seal	1
4	079 667	Surface ring	1
5	120 548	Needle bearing	1
6	038 533	Inner ring	1
7	107 299	Needle bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
10	065 715	Deep groove ball bearing	1
11	061 094	Thrust bearing disk	2
12	077 875	Thrust bearing	2
13	120 548	Needle bearing	1
14	058 951	O-ring seal	1
15	061 914	O-ring seal	1
16	084 608	Thrust needle roller and cage assembly	1
17	083 073	Surface ring	2
18	143 836	Supporting ring	1
19	001 098	O-ring seal	1
20	118 574	Needle roller and cage assembly	1
21	004 653	Compression spring	3
22	065 718	O-ring seal	1
23	058 073	O-ring seal	1
24	058 506	O-ring seal	1
25	036 588	Spaghetti hose	0.63m

434.020 - 147 098



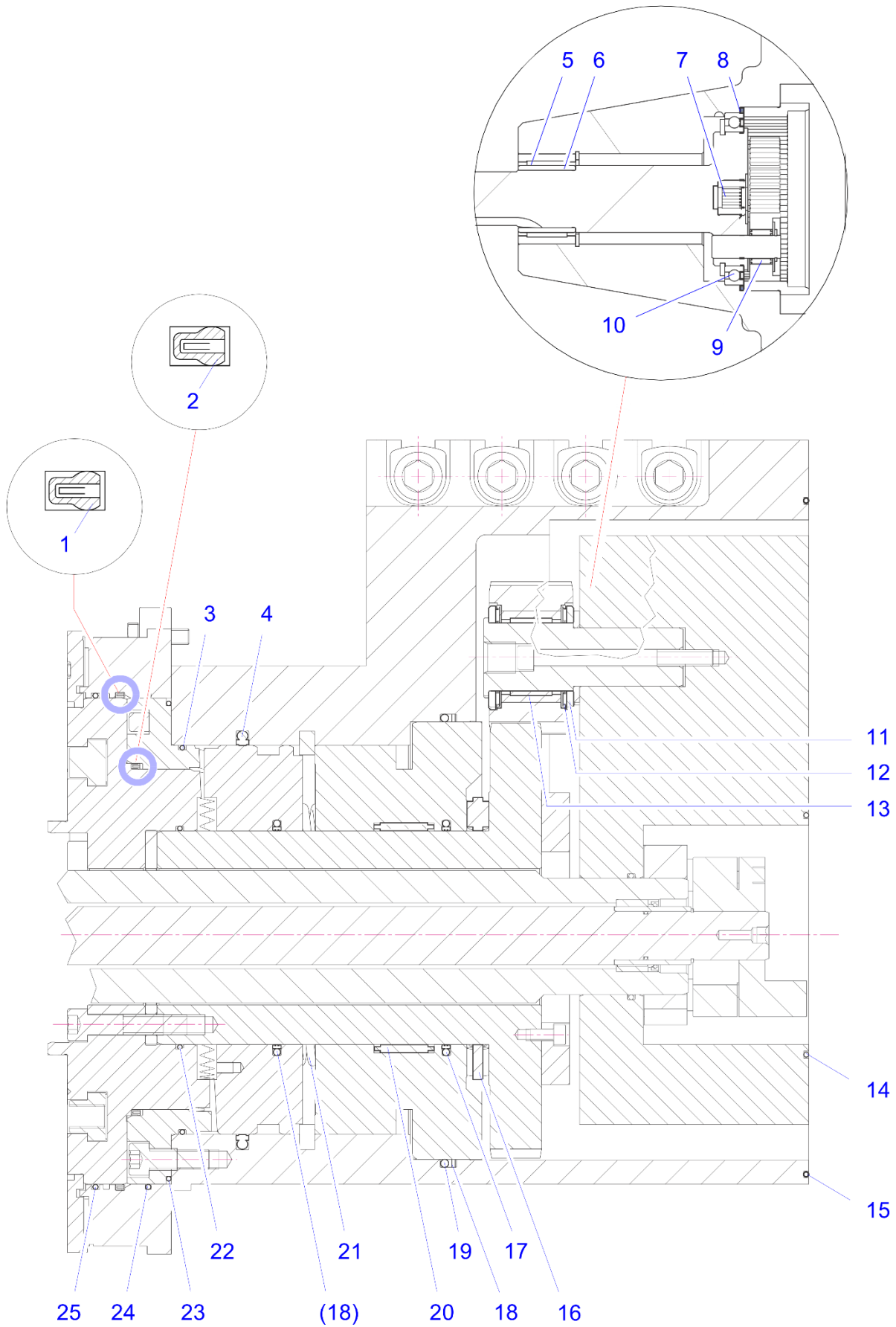
No.	Ident No.	Designation	Qty.
1	034 592	FU groove ring	1
2	071 224	FU groove ring	1
3	082 506	O-ring seal	1
4	079 667	Surface ring	1
5	120 548	Needle bearing	1
6	038 533	Inner ring	1
7	107 299	Needle bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
10	065 715	Deep groove ball bearing	1
11	061 094	Thrust bearing disk	2
12	077 875	Thrust bearing	2
13	120 548	Needle bearing	1
14	058 951	O-ring seal	1
15	074 384	O-ring seal	1
16	084 608	Thrust needle roller and cage assembly	1
17	083 073	Surface ring	2
18	117 796	Supporting ring	1
19	001 102	O-ring seal	1
20	118 574	Needle roller and cage assembly	1
21	004 653	Compression spring	3
22	065 718	O-ring seal	1
23	058 073	O-ring seal	1
24	058 506	O-ring seal	1
25	036 588	Spaghetti hose	0.63m

434.020 - 150 881

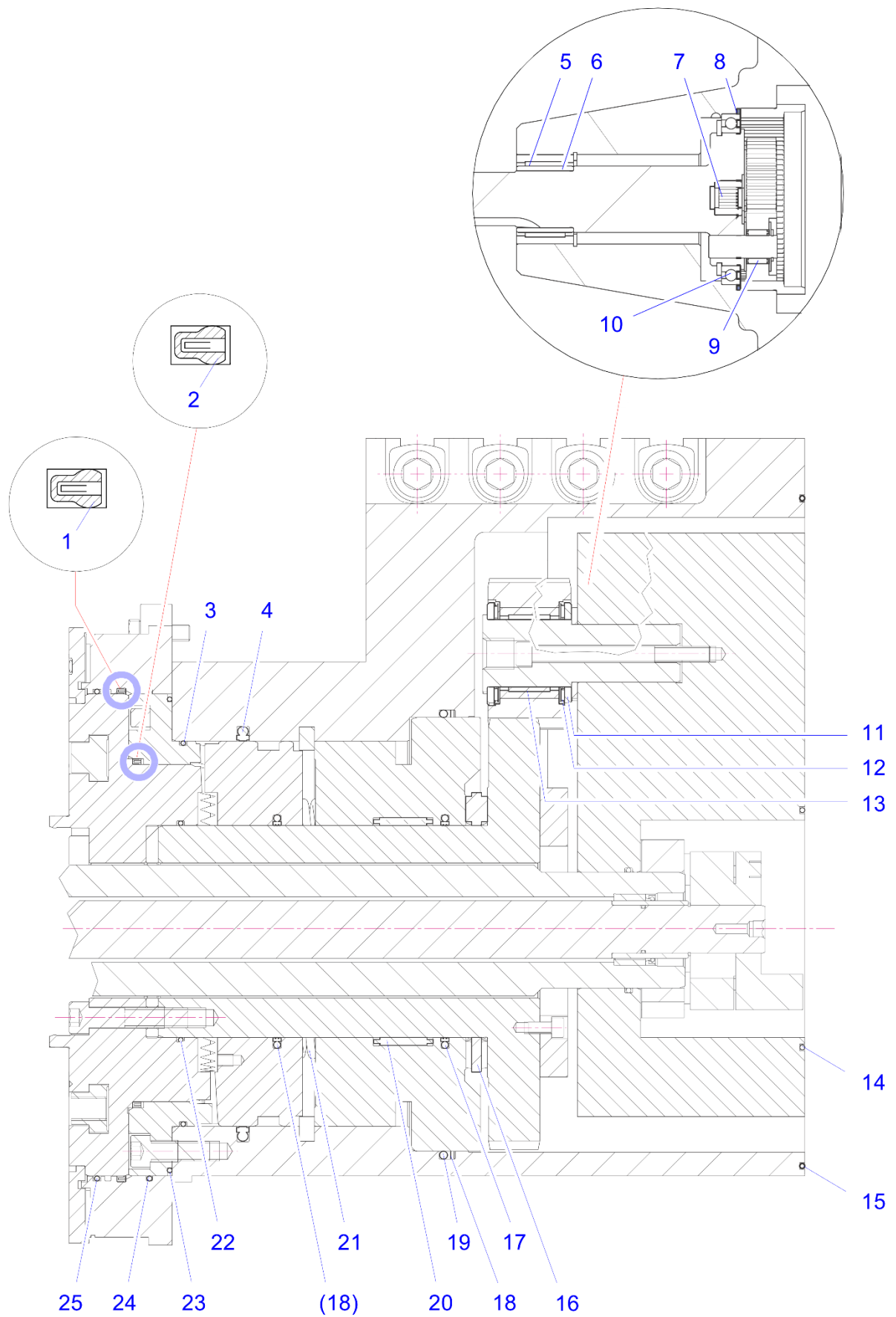


No.	Ident No.	Designation	Qty.
1	034 592	FU groove ring	1
2	071 224	FU groove ring	1
3	082 506	O-ring seal	1
4	079 667	Surface ring	1
5	120 548	Needle bearing	1
6	038 533	Inner ring	1
7	107 299	Needle bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
10	065 715	Deep groove ball bearing	1
11	061 094	Thrust bearing disk	2
12	077 875	Thrust bearing	2
13	120 548	Needle bearing	1
14	058 075	O-ring seal	1
15	074 384	O-ring seal	1
16	084 608	Thrust needle roller and cage assembly	1
17	083 073	Surface ring	2
18	117 796	Supporting ring	1
19	001 102	O-ring seal	1
20	118 574	Needle roller and cage assembly	1
21	004 653	Compression spring	3
22	065 718	O-ring seal	1
23	058 073	O-ring seal	1
24	058 506	O-ring seal	1
25	036 588	Spaghetti hose	0.63m

434.020 – 151 162

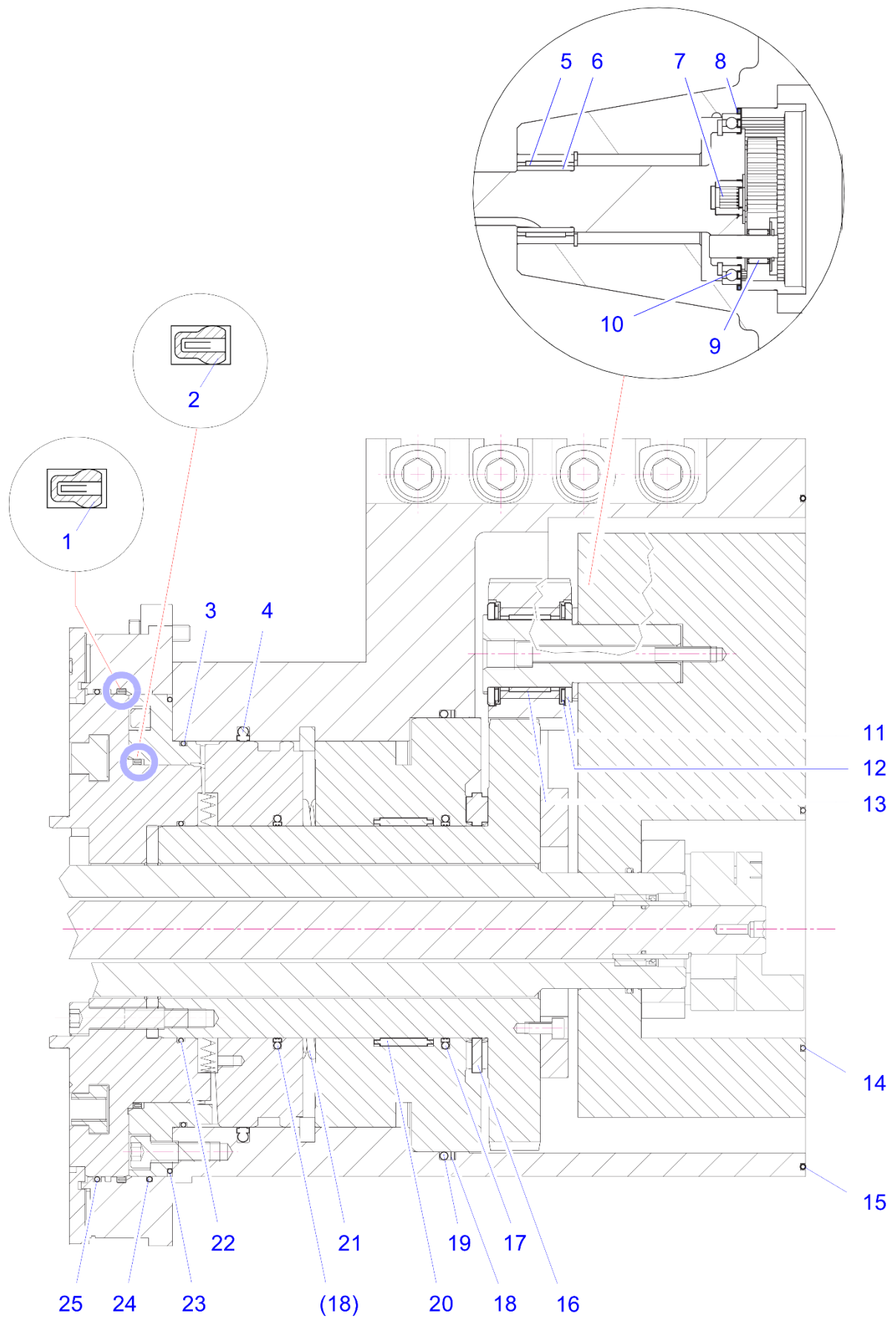


No.	Ident No.	Designation	Qty.
1	034 592	FU groove ring	1
2	071 224	FU groove ring	1
3	082 506	O-ring seal	1
4	079 667	Surface ring	1
5	120 548	Needle bearing	1
6	038 533	Inner ring	1
7	107 299	Needle bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
10	065 715	Deep groove ball bearing	1
11	061 094	Thrust bearing disk	2
12	077 875	Thrust bearing	2
13	120 548	Needle bearing	1
14	058 075	O-ring seal	1
15	074 384	O-ring seal	1
16	084 608	Thrust needle roller and cage assembly	1
17	083 073	Surface ring	2
18	117 796	Supporting ring	1
19	001 102	O-ring seal	1
20	118 574	Needle roller and cage assembly	1
21	004 653	Compression spring	3
22	065 718	O-ring seal	1
23	058 073	O-ring seal	1
24	058 506	O-ring seal	1
25	036 588	Spaghetti hose	0.63m



No.	Ident No.	Designation	Qty.
1	034 592	FU groove ring	1
2	071 224	FU groove ring	1
3	082 506	O-ring seal	1
4	079 667	Surface ring	1
5	120 548	Needle bearing	1
6	038 533	Inner ring	1
7	107 299	Needle bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
10	065 715	Deep groove ball bearing	1
11	061 094	Thrust bearing disk	2
12	077 875	Thrust bearing	2
13	120 548	Needle bearing	1
14	058 075	O-ring seal	1
15	074 384	O-ring seal	1
16	084 608	Thrust needle roller and cage assembly	1
17	083 073	Surface ring	2
18	117 796	Supporting ring	1
19	001 102	O-ring seal	1
20	118 574	Needle roller and cage assembly	1
21	004 653	Compression spring	3
22	065 718	O-ring seal	1
23	058 073	O-ring seal	1
24	058 506	O-ring seal	1
25	036 588	Spaghetti hose	0.63m

434.020 - 154 330



No.	Ident No.	Designation	Qty.
1	034 592	FU groove ring	1
2	071 224	FU groove ring	1
3	082 506	O-ring seal	1
4	079 667	Surface ring	1
5	120 548	Needle bearing	1
6	038 533	Inner ring	1
7	107 299	Needle bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
10	065 715	Deep groove ball bearing	1
11	061 094	Thrust bearing disk	2
12	077 875	Thrust bearing	2
13	120 548	Needle bearing	1
14	058 947	O-ring seal	1
15	062 797	O-ring seal	1
16	084 608	Thrust needle roller and cage assembly	1
17	083 073	Surface ring	2
18	117 796	Supporting ring	1
19	001 102	O-ring seal	1
20	118 574	Needle roller and cage assembly	1
21	004 653	Compression spring	3
22	065 718	O-ring seal	1
23	058 073	O-ring seal	1
24	058 506	O-ring seal	1
25	036 588	Spaghetti hose	0.63m

7.2 Gear head

For interfaces BMT 45, BMT 55



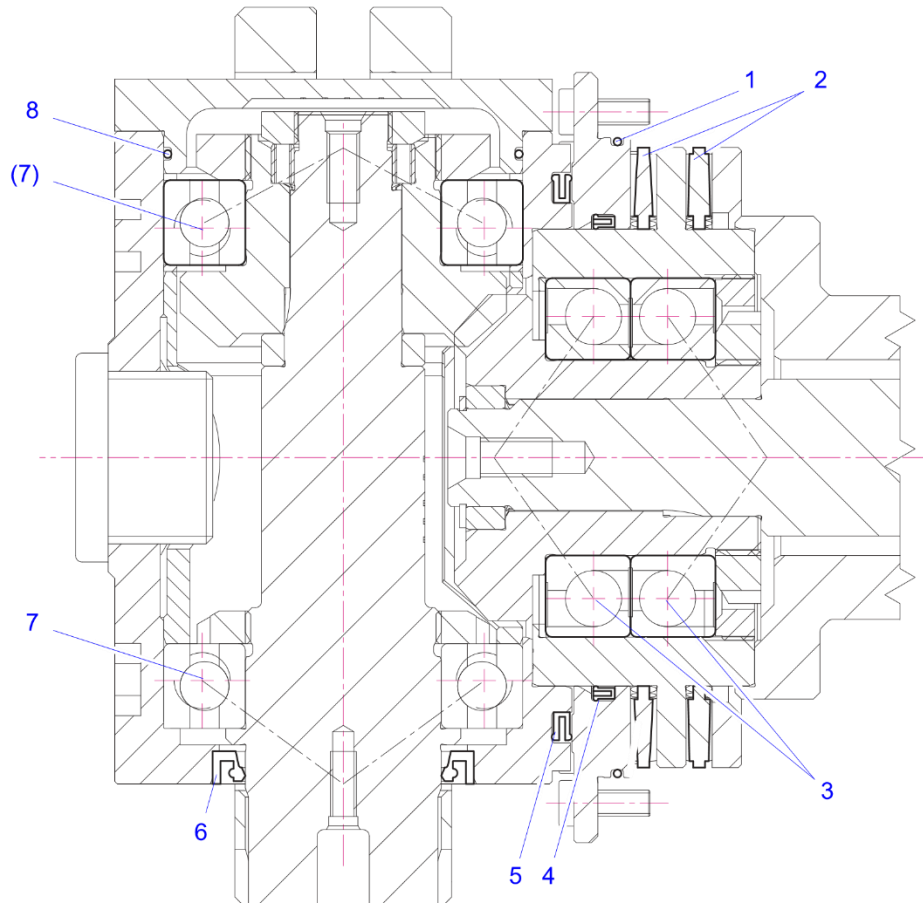
CAUTION

Risk of material damage due to incorrect repair work.

Assembly groups are defined for repair of the gear head.

➤ Always replace all parts in an assembly group, never just individual parts.

➤ Contact GPM Service if necessary.



No.	Ident No.	Designation	Qty.
1	100 879	O-ring seal	1
2	070 006	Thrust needle roller and cage assembly	2
3	146 476	Angular contact ball bearing	2
4	143 950	FU groove ring	1
5	143 949	FU groove ring	1
6	074 861	Radial seal for rotating shaft	1
7	082 535	Spindle bearing	2
8	115 838	O-ring seal	1

For interfaces BMT 65, Mori-Seiki



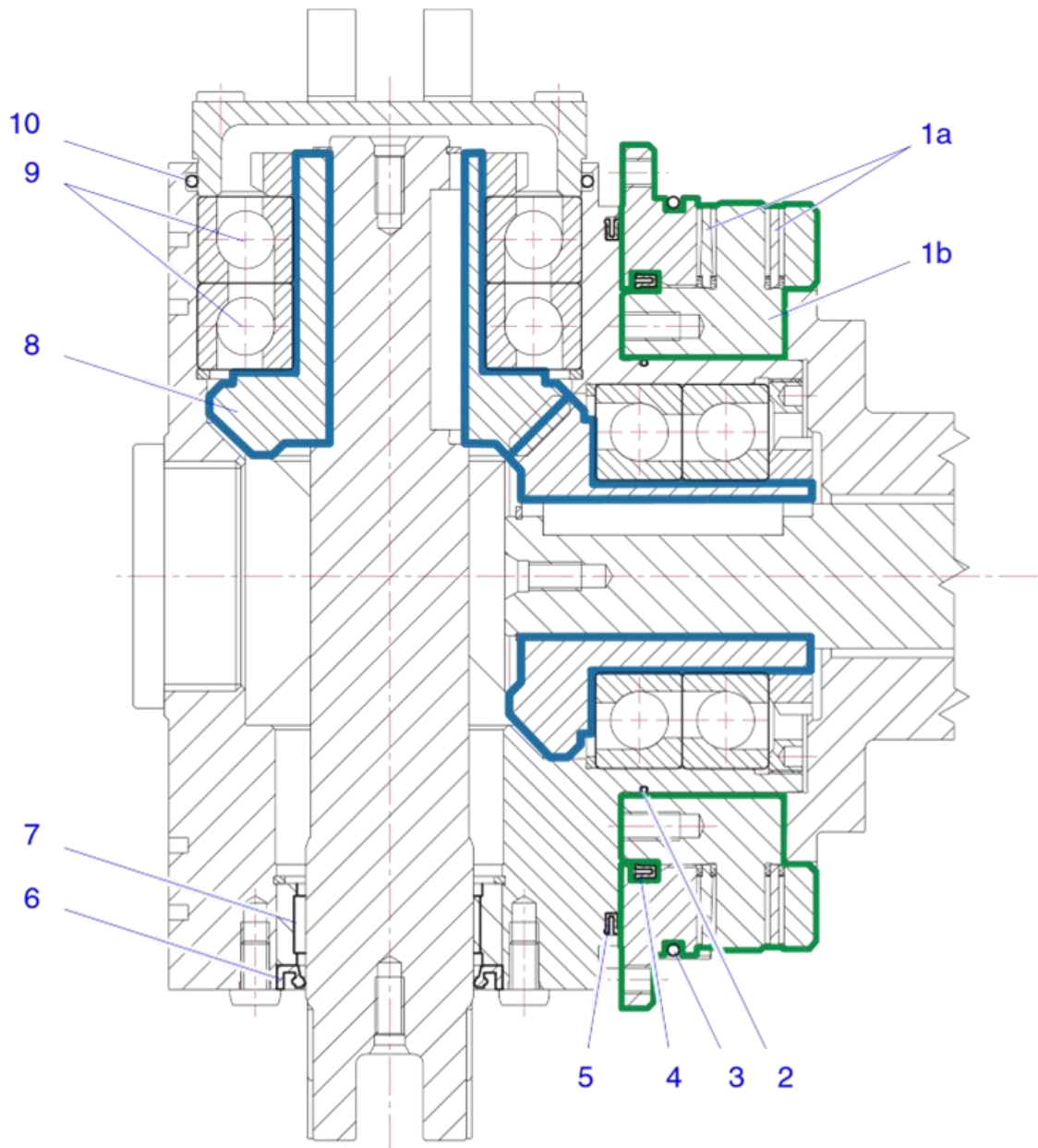
CAUTION

Risk of material damage due to incorrect repair work.

Assembly groups are defined for repair of the gear head.

➤ Always replace all parts in an assembly group, never just individual parts.

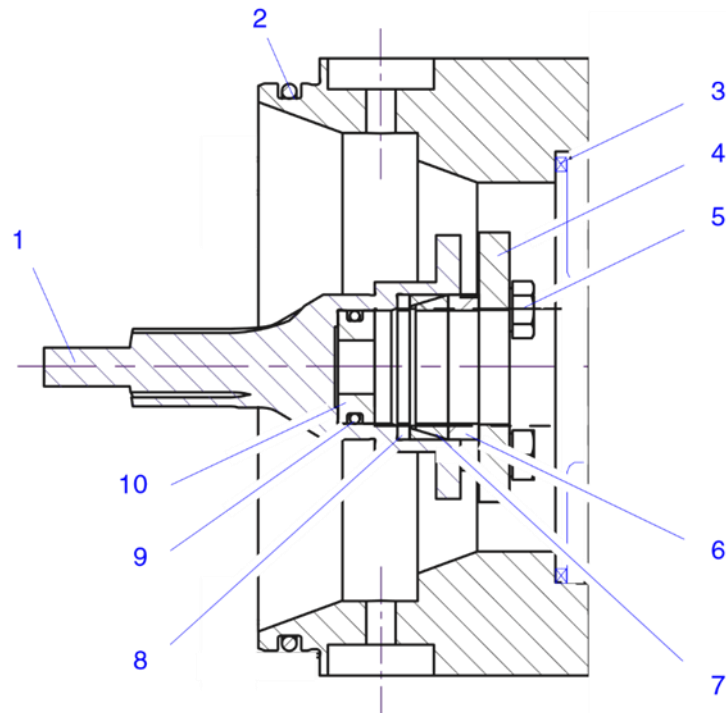
➤ Contact GPM Service if necessary.



No.	Ident No.	Designation	Qty.
1	Assembly group		
1a	036 580	Thrust needle roller and cage assembly	2
1b	136 289	Flange (Assembly group)	1
2	063 360	O-ring seal	1
3	061 136	O-ring seal	1
4	136 198	FU groove ring	1
5	030 021	FU groove ring	1
6	136 497	Radial seal for rotating shaft	1
7	041 395	Needle bearing	1
8	Assembly group		
	136 424	Bevel wheel	1
9	140 579	Angular contact ball bearing	4
10	060 614	O-ring seal	1

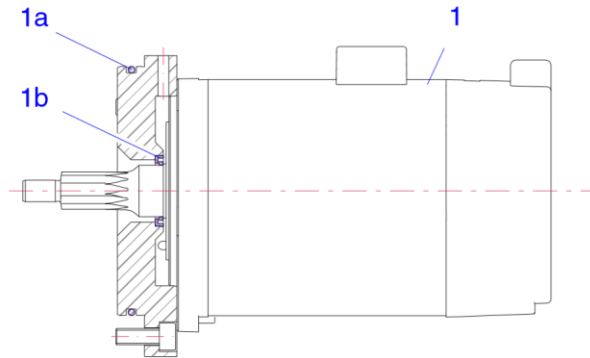
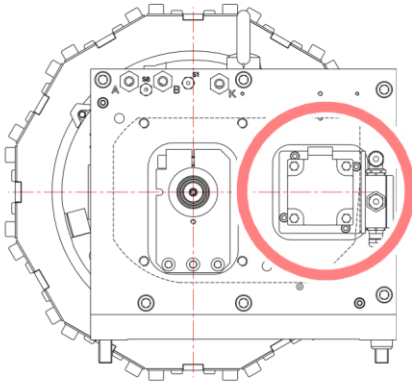
7.3 Turret Drive

Turret motor not from Messrs. GPM



No.	Ident No.	Designation	Qty.
1	107 128	Pinion shaft	1
2	063 462	O-ring seal	1
3	066 853	O-ring seal	1
4	107 127	Flange	1
5	001 237	Screw	4
6	107 187	Ring	1
7	030 062	Tensioning element	1
8	107 129	Ring	1
9	074 558	O-ring seal	1
10	121 542	Ring	1

Turret motor from Messrs. GPM



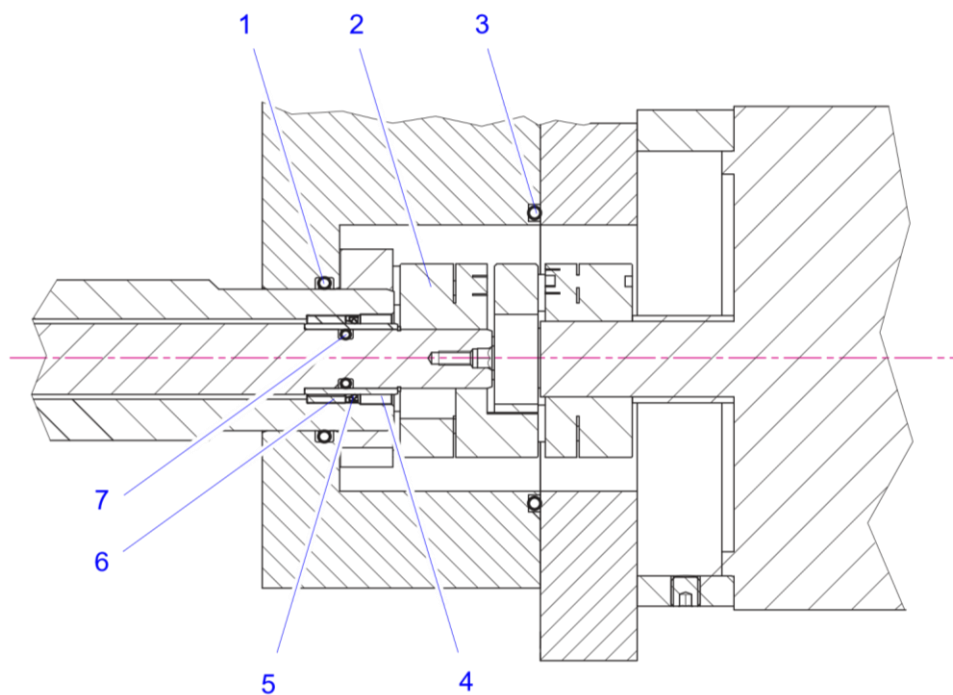
No.	Ident No.	Designation	Qty.
1		GPM Turret motor ¹⁾ ²⁾	1
2	063 462	O-ring seal	1
3		Radial seal for rotating shaft ¹⁾	1

¹⁾ depending on the order

²⁾ data according to motor's nameplate

7.4 Tool drive

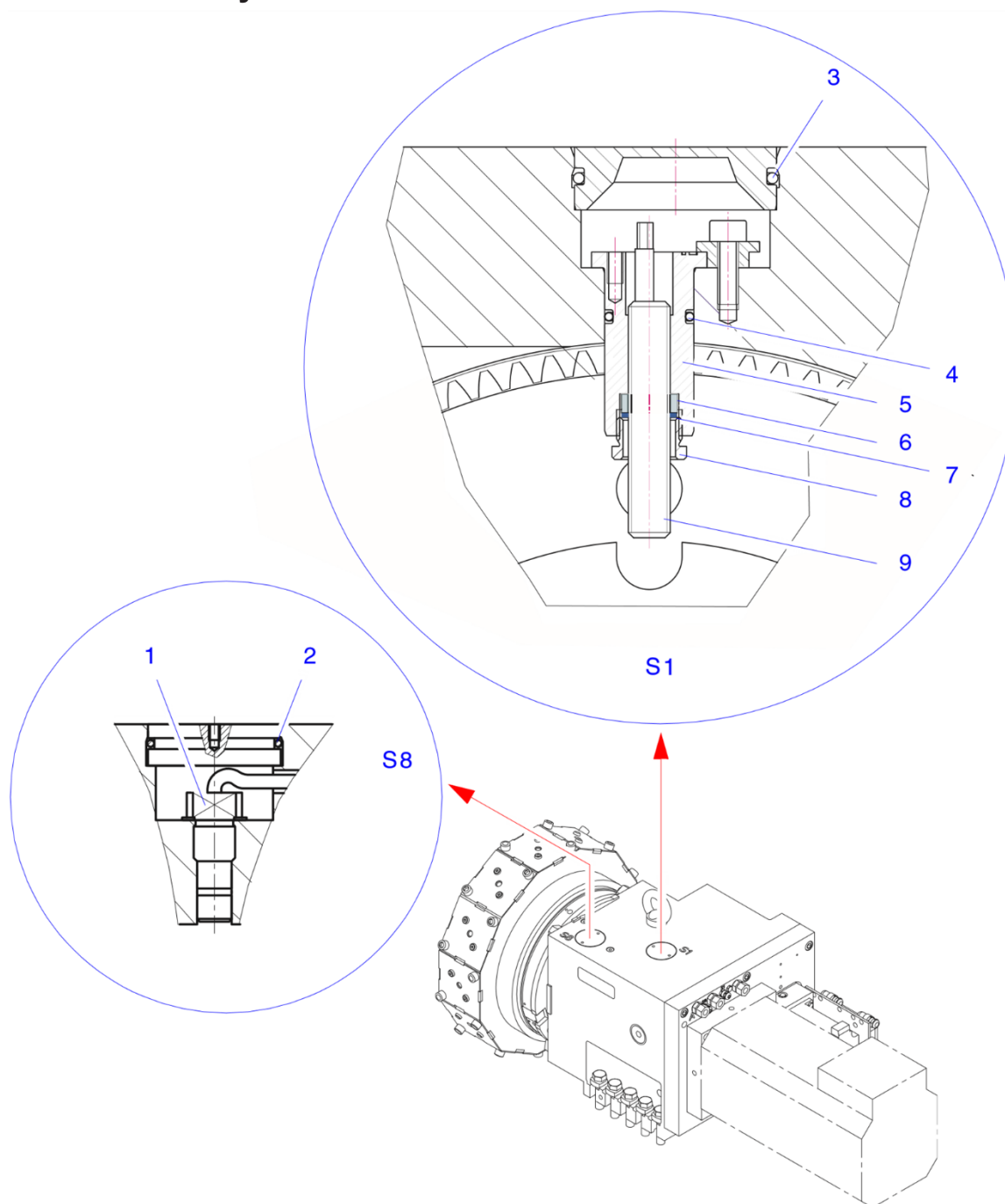
Version Direct drive with coupling



No.	Ident No.	Designation	Qty.
1	080 559	O-ring seal	1
2	136 203	Coupling ¹⁾	1
3	058 075	O-ring seal	1
4	076 733	Inner ring	1
5	075 184	Radial seal for rotating shaft	1
6	061 771	Needle bearing cup with open ends	1
7	058 546	O-ring seal	1

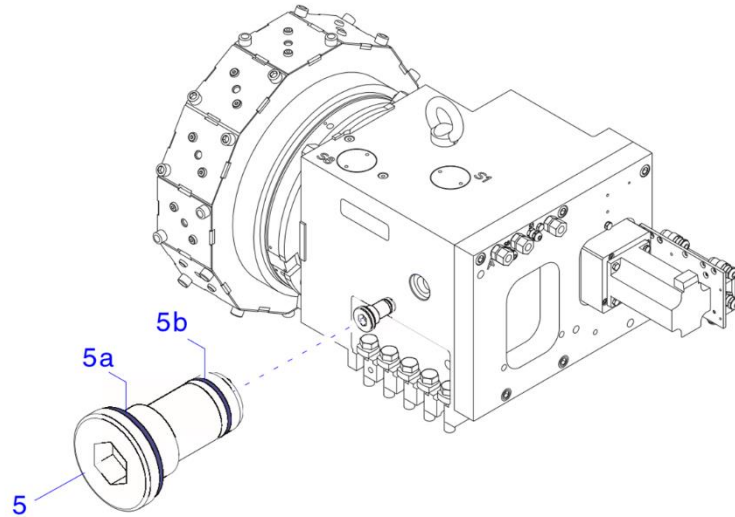
¹⁾ depending on the order

7.5 Proximity switches



No.	Ident No.	Designation	Qty.
1	105 582	Proximity switch	1
2	082 505	O-ring seal	1
3	082 505	O-ring seal	1
4...9	107 297	Replacements parts group <i>Limit switch</i>	1

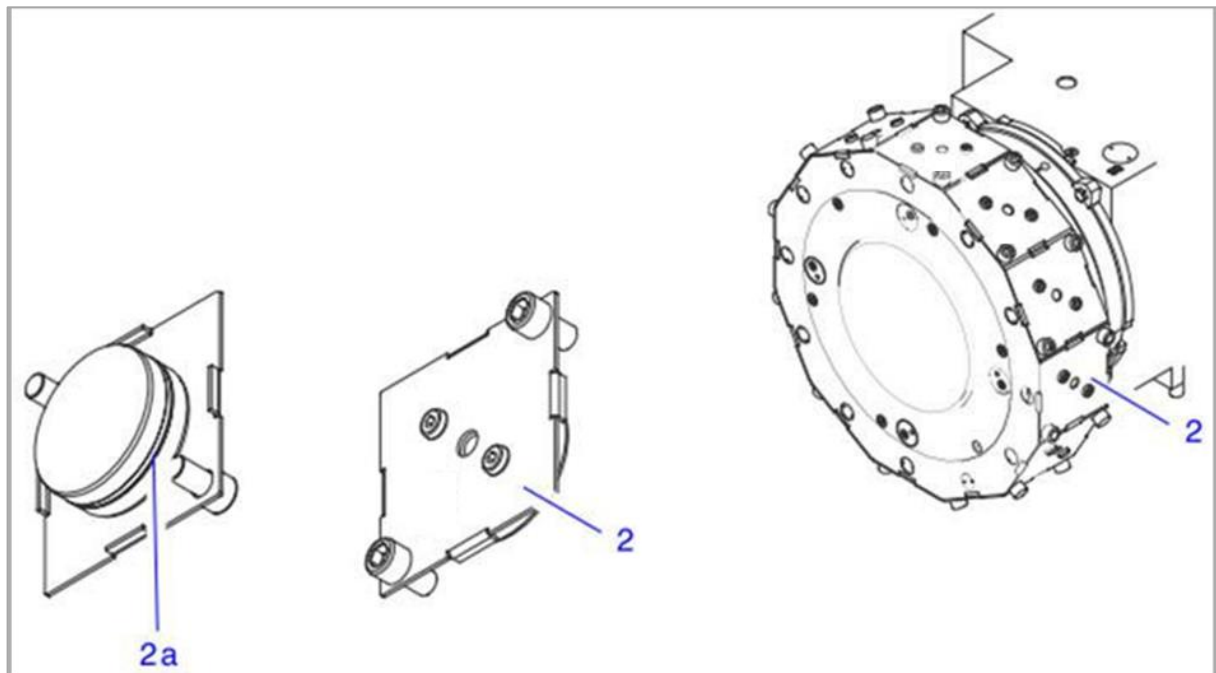
7.6 Screw plug for turret housing

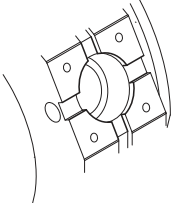
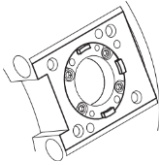


No.	Ident No.	Designation	Qty.
5	136 333	Screw plug	1
5a	038 306	Sealing ring	1
5b	065 089	O-ring seal	1

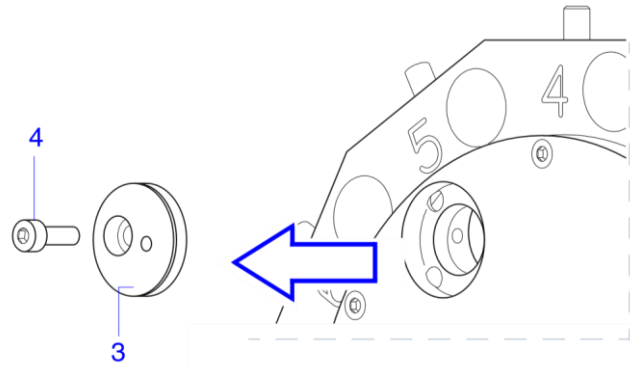
7.7 Tool disk

Closing plugs for tool holding fixture



	No.	Ident No.	Designation	Qty.
	for interface BMT 45			
	2	151 627	GPM closing plug with O-ring seal	1
	2a	060 647	O-ring seal	1
	for interface BMT 55			
	2	143 890	GPM closing plug with O-ring seal	1
	2a	080 559	O-ring seal	1
	for interface BMT 65			
	2	136 376	GPM closing plug with O-ring seal	1
	2a	065 517	O-ring seal	1
	for interface Mori-Seiki			
	2	139 516	GPM closing plug with O-ring seal	1
	2a	082 497	O-ring seal	1

Drainage



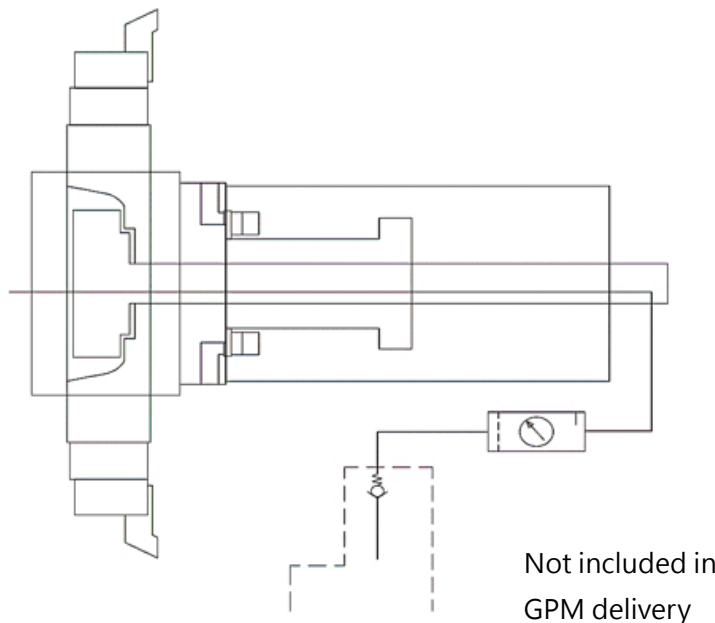
Apertures for drainage of the tool disk

Drainage without air purge

No.	Ident No.	Designation	Qty.
6	121 883	Bolt	4
4	000 445	Screw	4

Appendix

Disk-type tool turret		
Wiring diagram	EPB-1343	434.0xx GPM Turret motor
	EPB-1332	434.0xx Turret Motor not from GPM
Hydraulic diagram	HP-544	434.0xx
Diagram of functions	SK-1598	434.0xx
Tool Drive		
Technical data	4xx.x20-TI02	Performance data of tool drive
Tool disk/tooling		
Specification dimensions for tooling	SK-1663	for tool holding fixtures BMT
	SK-1666	for tool holding fixtures Mori-Seiki



- Application: Turret cooling circuit
- Use 4.5~5bar air pressure
- Compressed air-three-point combination conditions

Compressed air quality acc. ISO 8573-1		
filtered	class5	5µm
dried	class4	+3 ° C
oiled	class3	<1 mg/m ³



- The air supplied to the cooling circuit needs to be filtered through a three-point combination.
- The air pressure opening time is synchronized with the customer's power motor

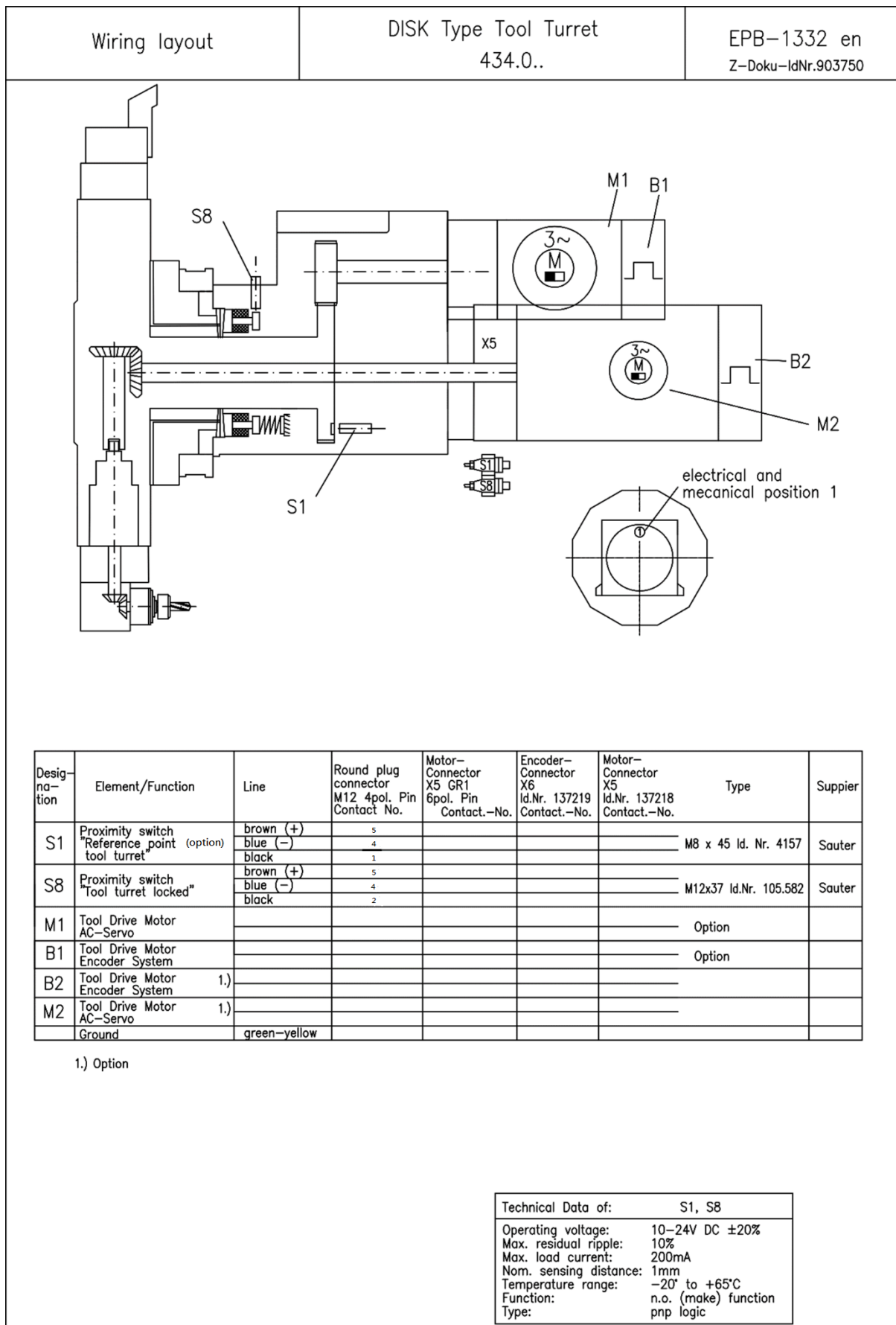
2/2

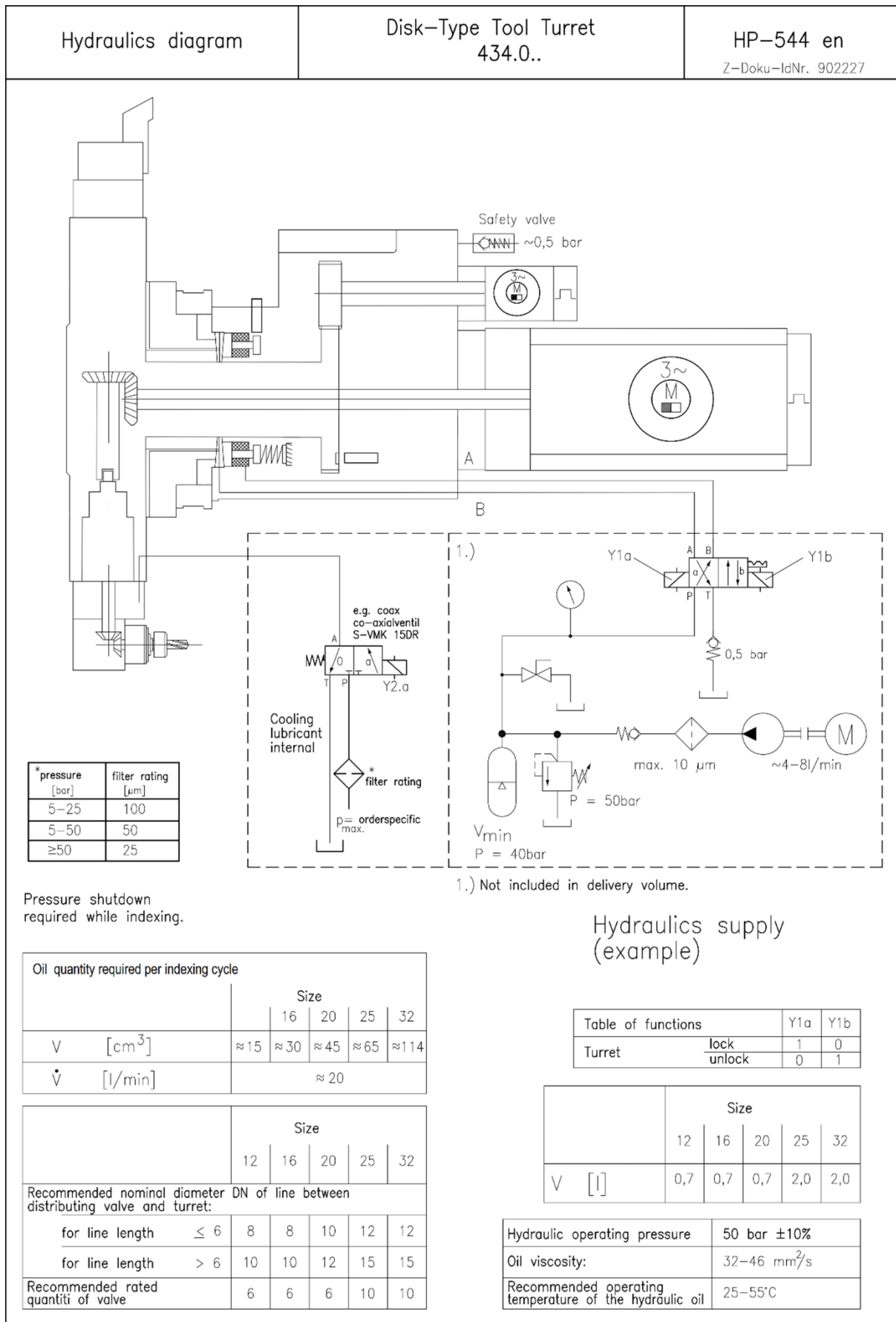
Wiring layout

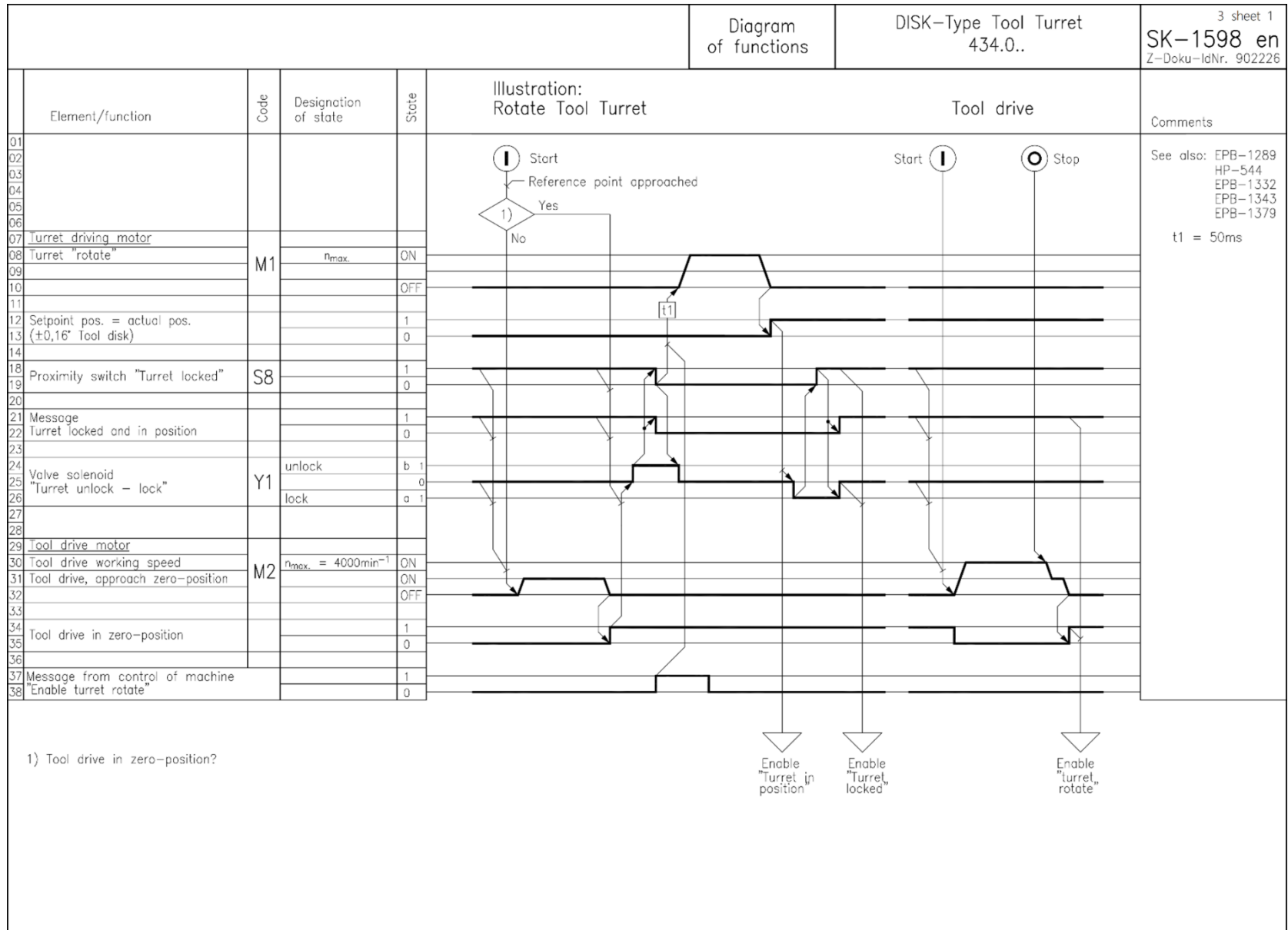
DISK Type Tool Turret
434.0..
Tool Turret Driving motor DELTA

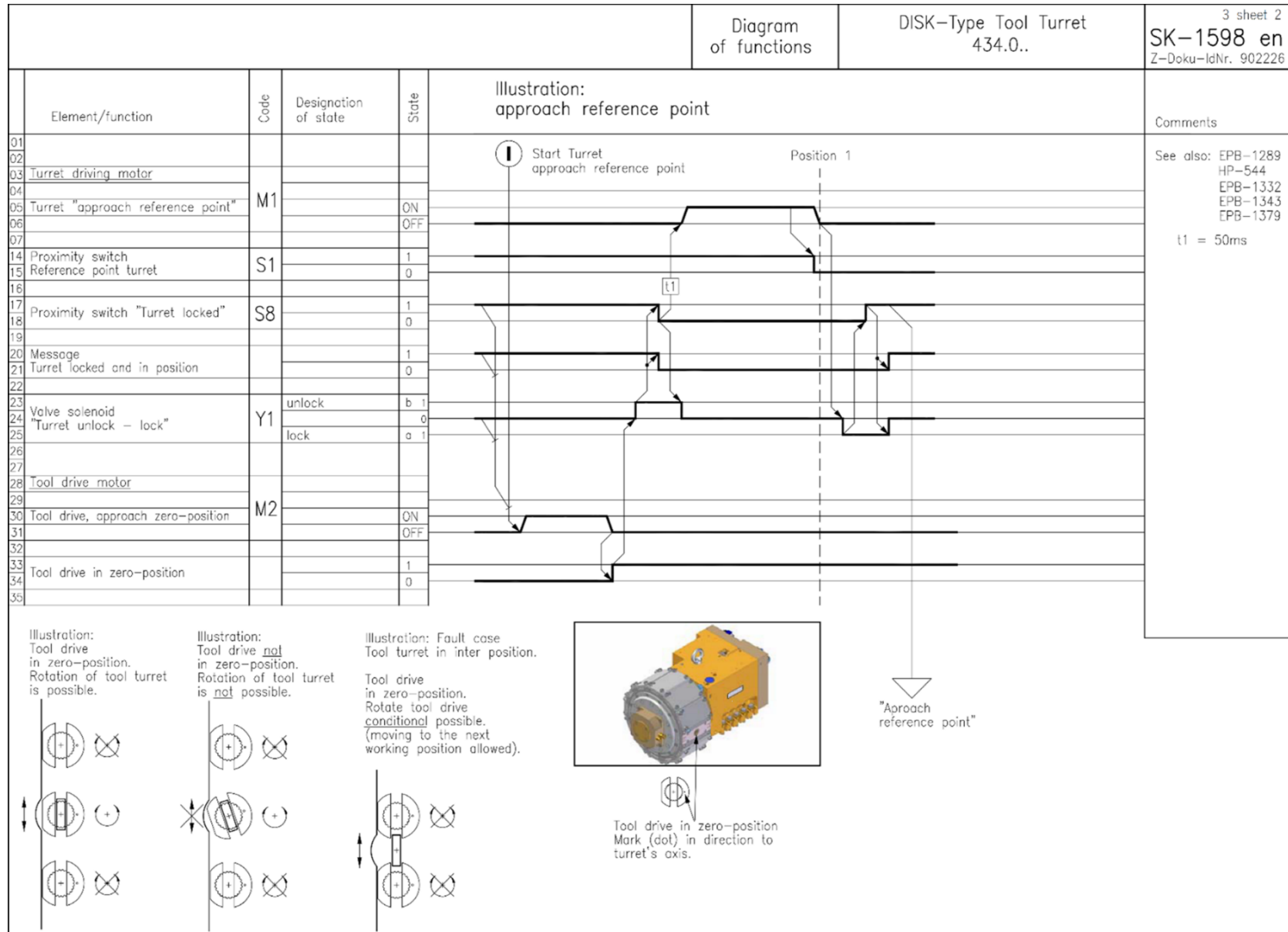
Designation	Element / Function	Line	M12 round 5pin Connector	X5 motor 6pin ground connector	X6 encoder connector	X5 motor connector	Type	Supplier
T1	Temperature sensing (option)	white	1				PT100	GPM
		red	3					
S8	Proximity switch "Tool turret locked"	brown (+)	5				M12x37 Id.Nr.105582	GPM
		blue (-)	4					
		black	2					
M1	Tool Turret driving motor AC-Servo	black		1				GPM
		blue		2				
		brown		6				
	Ground	green-yellow						
	Tool Turret driving motor AC-Servo	red				U1	DELTA A2	GPM
white					V1			
black					W1			
Ground								
	Tool Turret driving motor AC-Servo						Option	
B1	Encoder system Tool turret	A	black (thin)		A			GPM
		A	red-black		B			
		B	white		C			
		B	red-white		D			
		Z	orange		E			
		Z	red-orange		F			
		GND	blue		H			
		VCC	brown		G			
		isolation net	black (thick)		I			
	動力馬達 編碼器系統						Option	
B2	Tool Drive driving motor AC-Servo						Option	
M2	Encoder System Tool Drive						Option	
	Ground	green-yellow						

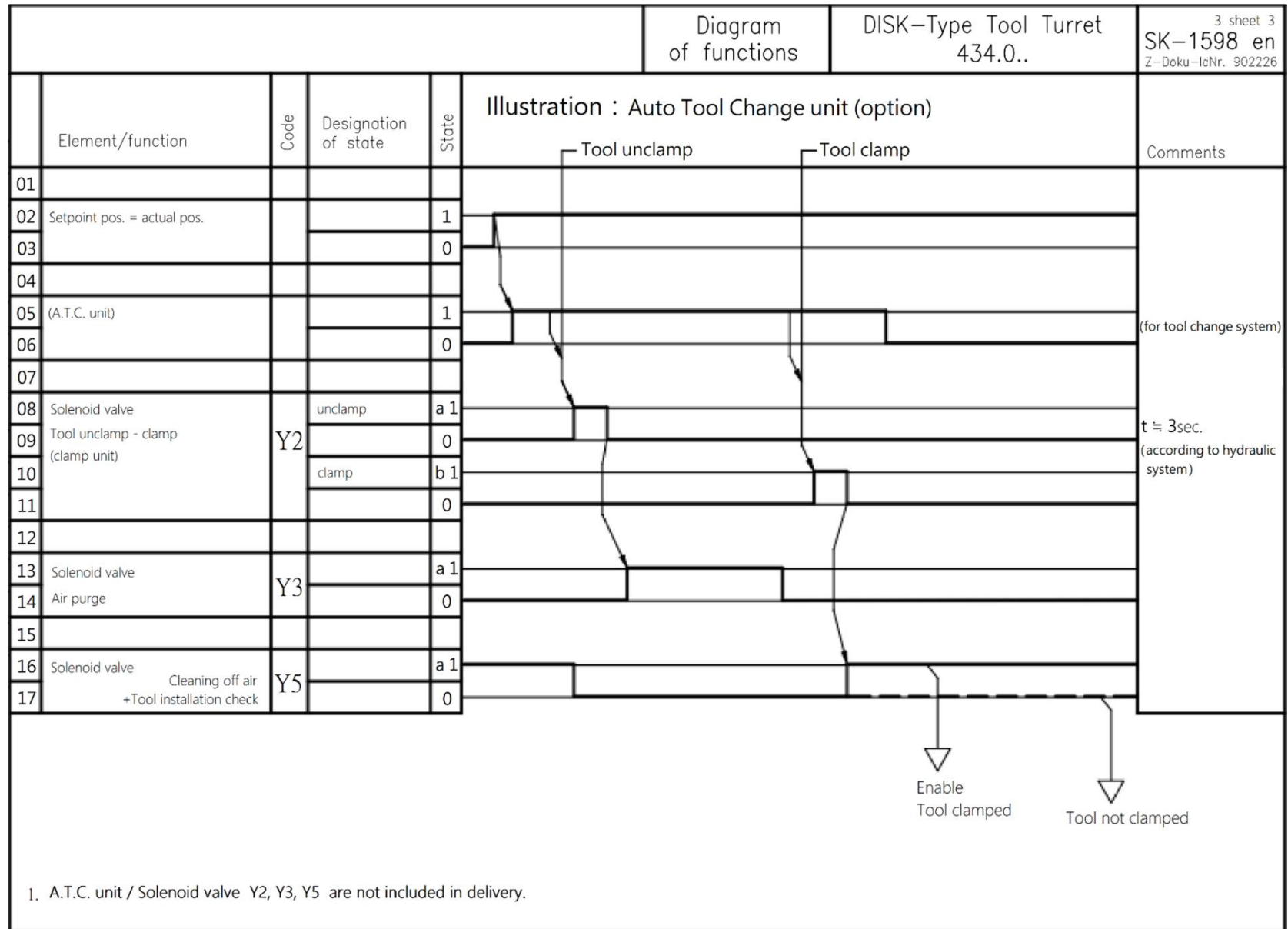
Technical Data of : S8	
Operating voltage :	10-24V DC ±20%
Max. residual ripple :	10%
Max. load current :	200 mA
Nom. sensing distance :	1 mm
Temperature range :	-20° to +65° C
Function :	n.o. (make) function
Type :	pnnp logic











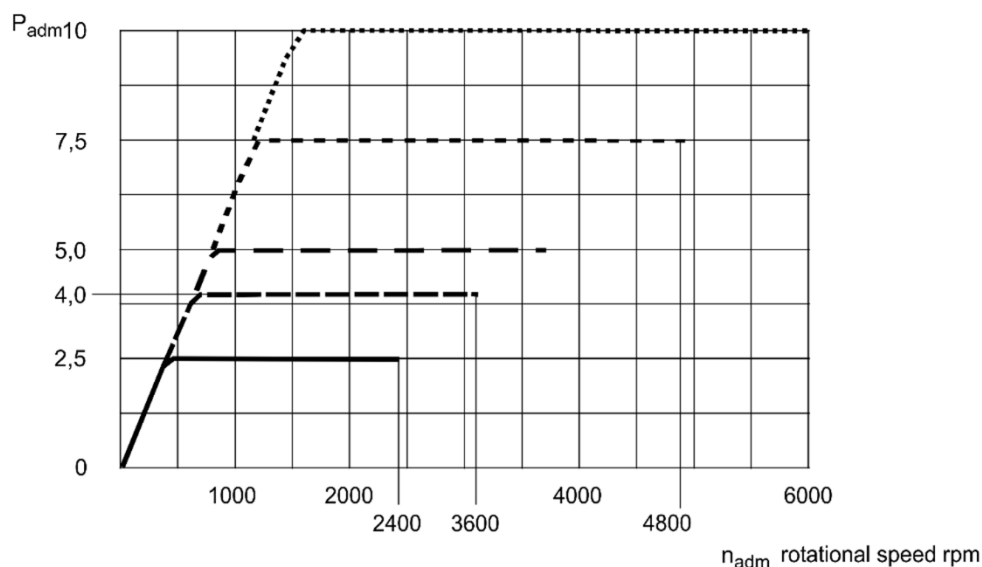
Technical Data

Performance Data Tool Drive (grease lubricated)

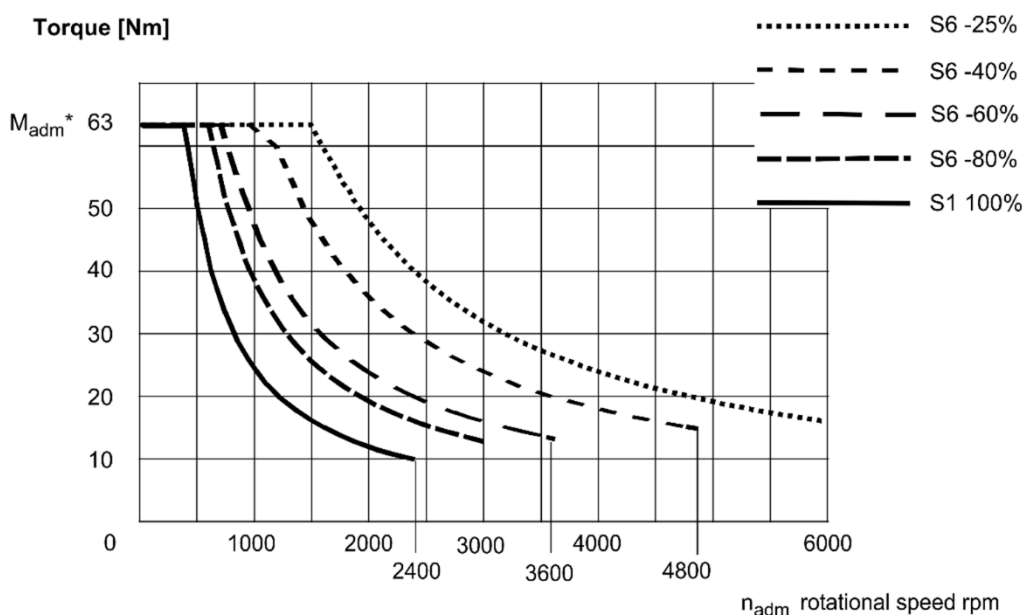
4xx.x20-TI02 en

Id. Nr. 904554

Power [kW]



Torque [Nm]



The data for duty type ED are valid for 10 min. duty cycle.

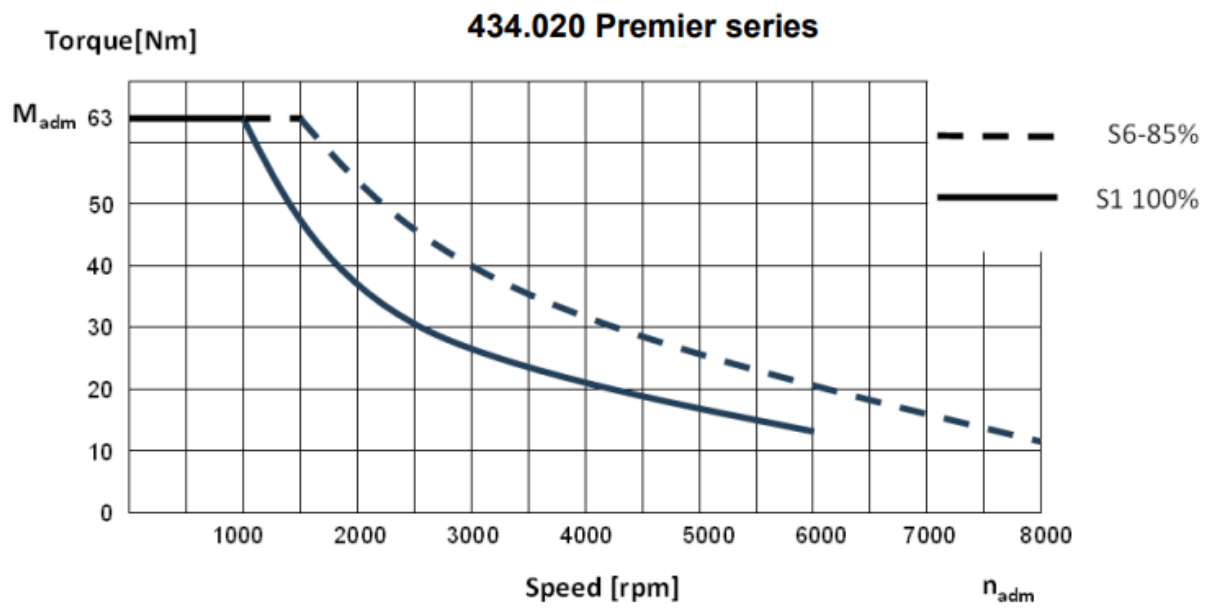
* In dependence of the limitation of the torque tool interface may be required.

Limitation of the torques

Tool Holder	M _{adml} [Nm]
BMT 45	20
BMT 55	32

technical changes reserved

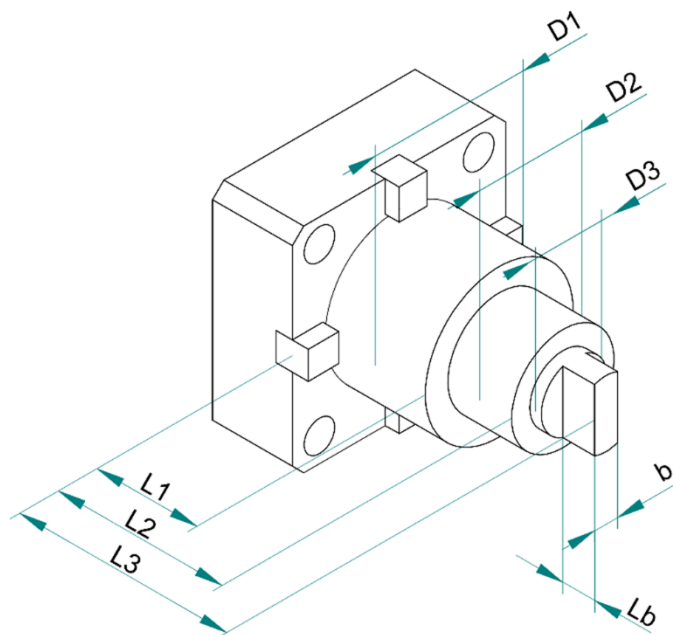
Performance data of tool drive for 434.020 Premier Series



Control measures for tooling	Disk-type tool turret with tool drive and disk-type radial	SK 1663 Id. Nr. 904517
---	--	--------------------------------------

Valid for Disk-type tool turret (only BMT interface)

434.016	437.616
434.020	437.620
434.025	437.625
434.032	

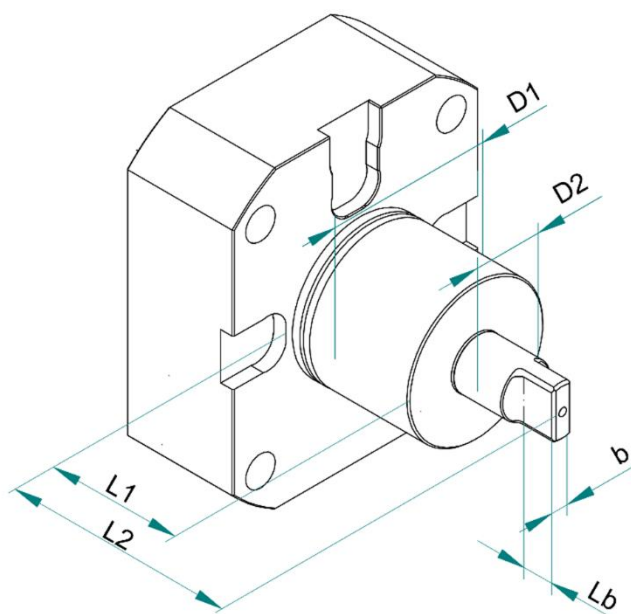


Tooling for interface	control measures [mm]							
	D1	D2	D3	b	L1	L2	L3	Lb
BMT 45	44,9 _{-0,05}	35	23	6 _{-0,02}	40	60	84 _{-0,3}	8
BMT 55	54,9 _{-0,05}	40	29	8 _{-0,02}	30	75	104 _{-0,3}	10
BMT 55 short	54,9 _{-0,05}	40	29	8 _{-0,02}	30	54	83 _{-0,3}	10
BMT 65	64,9 _{-0,05}	45	29	10 _{-0,02}	32	81	112 _{-0,3}	14
BMT 65 short	64,9 _{-0,05}	45	29	10 _{-0,02}	44	72	91 _{-0,3}	14
BMT 75	74,9 _{-0,05}	55	38	14 _{-0,02}	43	80	110 _{-0,3}	15
BMT 85	84,9 _{-0,05}	65	30	16 _{-0,02}	48	100	140 _{-0,3}	20

Control measures for tooling	Disk-type tool turret with tool drive and disk-type radial	SK 1666 Id. Nr. 904517
---	--	---

Valid for Disk-type tool turret (only for Mori Seiki interface)

434.016	437.616
434.020	437.620
434.025	437.625



Tooling for interface	Control measures [mm]					
	D1	D2	b	L1	L2	Lb
Mori-Seiki Ø40	39,9 ¹⁾ _{-0,1}	22	7,9 ^{-0,03} _{-0,05}	32	69	11
Mori-Seiki Ø60	59,9 ¹⁾ _{-0,1}	21,8	7,9 ^{-0,03} _{-0,05}	53	91	13

1) Centering at diameter possible with straight drive tools, here Ø40^{-0,01}_{-0,025} and Ø60^{-0,01}_{-0,025}

Contact / Order information

	Service GPM CO., LTD No. 368, Sec. 4, Huan Zhong Rd., Nan tun District, Taichung City, Taiwan
	+886-4-23805836
	+886-4-23805832
	www.GPMcnc.com
	info@gpmcnc.com



IMPORTANT

Please indicate in your orders:

Product data as per nameplate on the housing


1. Classification number (series, size)
2. Identification number
3. Order number
4. Gear ratio

Ordering data as per replacement-parts drawing and table

5. Identification number and quantity of the spare part requested.

Client

6. Company
7. Client's name and phone number.

 The new Revolution GPM CO., LTD MADE IN TAIWAN	Typ	①
	Id.-Nr.	②
		③
		④