OPTIMUM®
MASCHINEN - GERMANY

Operating manual

Version 2.1.1

Geared drill

OPTIdrill® B 40GSP

Part no. 3034403

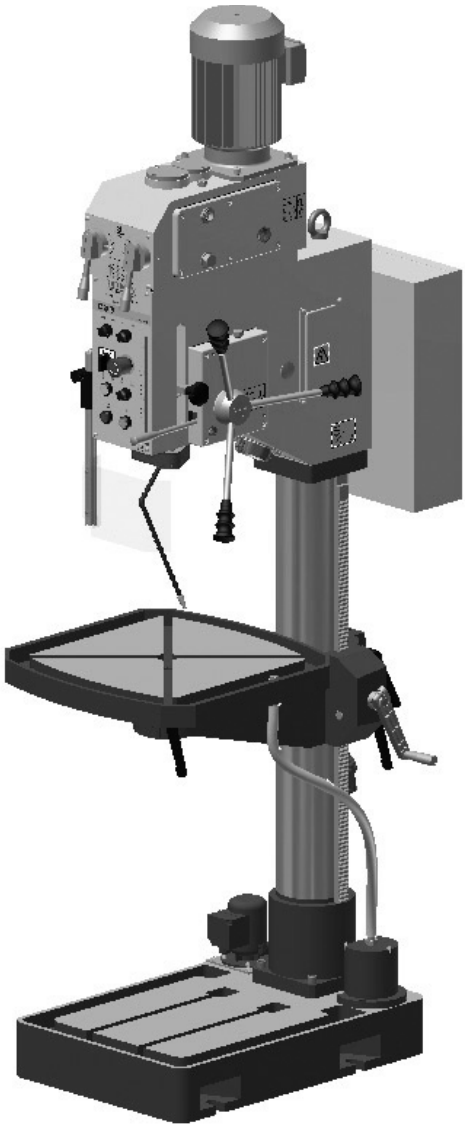


Table of contents

B40GSP_GBIVZ.fm

B40GSP_GBIVZ.fm

Preface

Dear customer,

Thank you very much for purchasing a product made by OPTIMUM.

OPTIMUM metal working machines offer a maximum of quality, technically optimum solutions and convince by an outstanding price performance ratio. Continuous enhancements and product innovations guarantee state-of-the-art products and safety at any time.

Before commissioning the machine please thoroughly read these operating instructions and get familiar with the machine. Please also make sure that all persons operating the machine have read and understood the operating instructions beforehand.
Keep these operating instructions in a safe place nearby the machine.

Information

The operating instructions include indications for safety-relevant and proper installation, operation and maintenance of the machine. The continuous observance of all notes included in this manual guarantee the safety of persons and of the machine.

The manual determines the intended use of the machine and includes all necessary information for its economic operation as well as its long service life.

In the paragraph "Maintenance" all maintenance works and functional tests are described which the operator must perform in regular intervals.

The illustration and information included in the present manual can possibly deviate from the current state of construction of your machine. Being the manufacturer we are continuously seeking for improvements and renewal of the products. Therefore, changes might be performed without prior notice. The illustrations of the machine may be different from the illustrations in these instructions with regard to a few details. However, this does not have any influence on the operability of the machine.
Therefore, no claims may be derived from the indications and descriptions. Changes and errors are reserved!

Your suggestion with regard to these operating instructions are an important contribution to optimising our work which we offer to our customers. For any questions or suggestions for improvement, please do not hesitate to contact our service department.

If you have any further questions after reading these operating instructions and you are not able to solve your problem with a help of these operating instructions, please contact your specialised dealer or directly the company OPTIMUM.

Optimum Maschinen Germany GmbH

Dr.- Robert - Pfleger - Str. 26

D-96103 Hallstadt

Mail: info@optimum-maschinen.de

Internet: www.optimum-maschinen.com

1 Safety

Glossary of symbols

☞	gives further advice
➜	calls on you to act
❍	enumerations

This part of the operating instructions

- ❍ explains the meaning and use of the warning notices included in these operating instructions,
- ❍ defines the intended use of the geared drill,
- ❍ points out the dangers that might arise for you or others if these instructions are not observed,
- ❍ informs you about how to avoid dangers.

In addition to these operation instructions, please observe

- ❍ the applicable laws and regulations,
- ❍ the legal regulations for accident prevention,
- ❍ the prohibition, warning and mandatory signs as well as the warning labels on the geared drill.

Always keep this documentation close to the geared drill.

INFORMATION

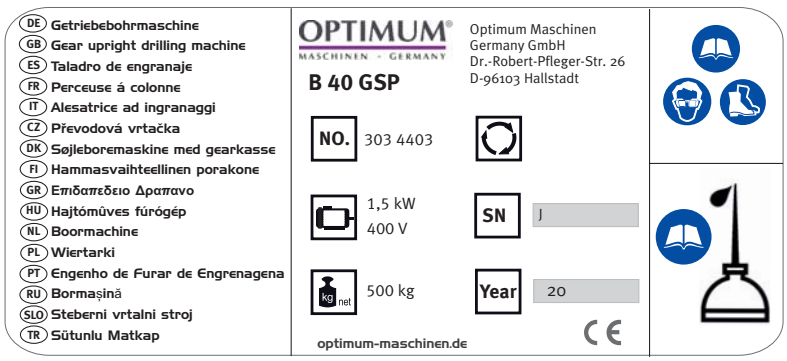
If you are unable to solve a problem using these operating instructions, please contact us for advice:

Optimum Maschinen Germany GmbH
Dr. Robert-Pfleger-Str. 26

D-96103 Hallstadt

Email: info@optimum-maschinen.de

1.1 Rating plate



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1.2 Safety instructions (warning notes)

1.2.1 Classification of hazards

We classify the safety warnings into various levels. The table below gives an overview of the classification of symbols (ideogram) and the warning signs for each specific danger and its (possible) consequences.

Ideogram	Warning alert	Definition / consequence
	**DANGER!**	Threatening danger that will cause serious injury or death to people.
	WARNING!	A danger that might cause severe injury to the staff or can lead to death.
	CAUTION!	Danger of unsafe procedure that might cause injury to the staff or property damages.
	**ATTENTION!**	Situation that could cause damage to the geared drill and products and other types of damage. No risk of injury to people.
	**Information**	Application tips and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

In case of specific dangers, we replace the pictogram by


general danger


by a warning of


injury of hands,


hazardous electrical voltage,

or


rotating parts.

1.2.2 Other pictograms


Warning of danger of slipping!


Warning risk of stumbling!


Warning hot surface!


Warning biological hazard!


Warning of automatic start-up!


Warning tilting danger!


Warning of suspended loads!


Caution, danger of explosive substances!


Activation forbidden!


Use ear protection!


Read the operating instructions before commissioning!


Disconnect the mains plug!


Use protective glasses!


Use protective gloves!


Use protective boots!


Use protective suit!

1.3 Intended use

WARNING!

In the event of improper use, the machine

- **will endanger personnel,**
- **the machine and other material property of the operating company will be endangered,**
- **the correct function of the machine may be affected.**

The geared drill is designed and manufactured for holes in cold metals or other non flammable materials or that not constitute a health hazard using a rotating filing-stripping tool that has a number of grooves for collecting the filings.

If the geared drill is used in any way other than described above, modified without authorization of Optimum Maschinen Germany GmbH, then the geared drill is being used improperly.

We will not be held liable for any damages resulting from any operation which is not in accordance with the intended use.

We expressly point out that the guarantee or CE conformity will expire due to any constructive technical or procedural changes which had not been performed by the company Optimum Maschinen Germany GmbH.

It is also part of intended use that

- observe the limits of the geared drill,
- the operating manual is observed,
- the inspection and maintenance instructions are observed.

☞ Technical data on page 18

WARNING!

Hazard of heaviest injury.

It is forbidden to make any modifications or alternations to the operation values of the geared drill. They could endanger the staff and cause damage to the geared drill.

1.4 Reasonably foreseeable misuses

Any other use as the one determined under the "Intended use" or any use beyond the described use shall be deemed as not in conformity and is forbidden.

Any other use has to be discussed with the manufacturer.

It is only allowed to process metal, cold and non-inflammable materials with the geared drill.

In order to avoid misuses it is necessary to read and understand the operating instructions before the first commissioning.

The operators must be qualified.

1.4.1 Avoiding misuses

➜ Use of suitable cutting tools.
➜ Adapting the speed adjustment and feed to the material and workpiece.
➜ Clamp workpieces firmly and vibration-free.

ATTENTION!

The workpiece is always to be fixed by a machine vice, jaw chuck or by another appropriate clamping tool such as for the clamping claws.

WARNING!

Risk of injury caused by workpieces flying off.

Clamp the workpiece in the machine vice. Make sure that the workpiece is firmly clamped in the machine vice resp. that the machine vice is firmly clamped on the machine table.

➜ Use cooling and lubricating agents to increase the durability of the tool and to improve the surface quality.
➜ Clamp the cutting tools and workpieces on clean clamping surfaces.
➜ Sufficiently lubricate the machine.
➜ Correctly adjust the bearing clearance and the guidings.

It is recommended:

➜ Insert the drill in a way that it is exactly positioned between the three clamping jaws of the quick action chuck.

When drilling make sure that

➜ the suitable speed is set depending on the diameter of the drill,
➜ the pressure must only be such that the drill can cut without load
➜ in case of too strong pressure the drill will get worn early or even might break resp. get jammed in the hole. If the drill gets jammed immediately stop the main motor by pressing the emergency stop button,
➜ for hard materials, e.g. steel, use commercial cooling / lubricating agents,
➜ generally always drive the turning spindle out of the workpiece.

1.5 Possible dangers caused by the geared drill

The geared drill is state-of-the-art.

Nevertheless, there is a residual risk as the geared drill operates with

❍ at high speeds,
❍ rotating parts,
❍ with electrical voltages and currents.

We have used construction resources and safety techniques to minimize the health risk to persons resulting from these hazards.

If the geared drill is used and maintained by the staff who are not duly qualified, there may be a risk resulting from incorrect or unsuitable maintenance of the geared drill.

INFORMATION

Everyone involved in the assembly, commissioning, operation and maintenance must

❍ be duly qualified,
❍ strictly follow these operating instructions.

In the event of improper use

❍ there may be a risk to the staff,
❍ there may be a risk to the machine and other material values,

❍ the correct function of the geared drill may be affected.

Always disconnect the geared drill if cleaning or maintenance work is being carried out.

WARNING!

The geared drill may only be used with the safety devices activated.

Disconnect the geared drill immediately whenever you detect a failure in the safety devices or when they are not mounted!

All additional devices installed by the operator have to be equipped with the prescribed safety devices.

This is your responsibility being the operating company!

☞ **Safety devices on page 12**

1.6 Qualification of personnel

1.6.1 Target group

This manual is addressed to

❍ the operating companies,
❍ the users,
❍ the staff for maintenance works.

Therefore, the warning notes refer to both operation and maintenance of the geared drill.

Determine clearly and explicitly who will be responsible for the different activities on the machine (operation, maintenance and repair).

Unclear responsibilities constitute a safety risk!

Always disconnect plug of the geared drill from the electrical power supply. This will prevent it from being used by unauthorized staff.

The qualifications of the staff for the different tasks are mentioned below:

Operator

The operator is instructed by the operating company about the assigned tasks and possible risks in case of improper behaviour. Any tasks which need to be performed beyond the operation in the standard mode must only be performed by the operator if it is indicated in these instructions and if the operating company expressively commissioned the operator.

Electrical specialist

Due to his professional training, knowledge and experience as well as his knowledge of respective standards and regulations the electrical specialist is able to perform works on the electrical system and to recognise and avoid any possible dangers himself.

The electrical specialist is specially trained for the working environment in which he is working and knows the relevant standards and regulations.

Specialist staff

Due to their professional training, knowledge and experience as well as their knowledge of relevant regulations the specialist staff is able to perform the assigned tasks and to recognise and avoid any possible dangers themselves.

Instructed persons

Instructed persons were instructed by the operating company about the assigned tasks and any possible risks in case of improper behaviour.

1.6.2 Authorized persons

WARNING!

Inappropriate operation and maintenance of the geared drill constitutes a danger for the staff, objects and the environment.

Only authorized staff may operate the geared drill!

Persons authorized to operate and maintain should be trained technical staff and instructed by the ones who are working for the operating company and for the manufacturer.

The operating company must

Obligations of the operating company

- train the staff,
- instruct the staff in regular intervals (at least once a year) on
  - all safety standards that apply to the machine,
  - the operation,
  - accredited technical guidelines,
- check staff's state of knowledge,
- document the trainings/instructions,
- require staff to confirm participation in training/instructions by means of a signature,
- check whether the staff is working safety- and risk-conscious and observe the operating instructions.

The operator must

Obligations of the operator

- have obtained a training regarding the handling of the geared drill,
- know the function and mode of action,
- before taking the machine in operation
  - have read and understood the operating manual,
  - be familiar with all safety devices and instructions.

Additional requirements regarding the qualification

For work on the following parts there are additional requirements:

- Electric components or operating materials: Must only be performed by a qualified electrician or person working under the instructions and supervision of a qualified electrician.

Before carrying out work on electrical components or operating units, the following measures must be taken, in the order given.

➜ Disconnect all poles.

➜ Secure against switching on.

➜ Check if the machine is zero potential.

1.7 Operators positions

The operator's position is in front of the geared drill.

Img.1-1: Operator positions

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INFORMATION

The mains plug of the geared drill must be freely accessible.

1.8 Safety measures during operation

CAUTION!

Risk due to inhaling of health hazardous dusts and mist.

Dependent on the material which need to be processed and the used auxiliaries dusts and mist may be caused which might impair you health.

Make sure that the generated health hazardous dusts and mist are safely sucked off at the point of origin and is dissipated or filtered from the working area. To do so, use a suitable extraction unit.

CAUTION!

Risk of fire and explosion by using flammable materials or cooling lubricants.

Before processing inflammable materials (e.g. aluminium, magnesium) or using inflammable auxiliary materials (e.g. spirit) it is necessary to take additional preventive measures in order to safely avoid health risks.

CAUTION!

Risk of winding-up or cutting damages when using hand tools.

The machine is not designed for the use of hand tools (e.g. emery cloth or files). It is forbidden to use any hand tools on this machine.

1.9 Safety devices

Use the geared drill only with properly functioning safety devices.

Stop the geared drill immediately if there is a failure on the safety device or if it is not functioning for any reason.

It is your responsibility!

If a safety device has been activated or has failed, the geared drill must only be used if you

- have removed the cause of the failure,
- have verified that there is no danger resulting for the staff or objects.

WARNING!

If you bypass, remove or override a safety device in any other way, you are endangering yourself and other persons working on the geared drill. The possible consequences are

- **injuries due to components or parts of components flying off at high speed,**
- **contact with rotating parts,**
- **fatal electrocution.**

WARNING!

The separating protective equipment which is made available and delivered together with the machine is designed to reduce the risk of workpieces or fractions of them which being expelled, but not to remove them completely. Always work carefully and observe the limit values of your chipping process.

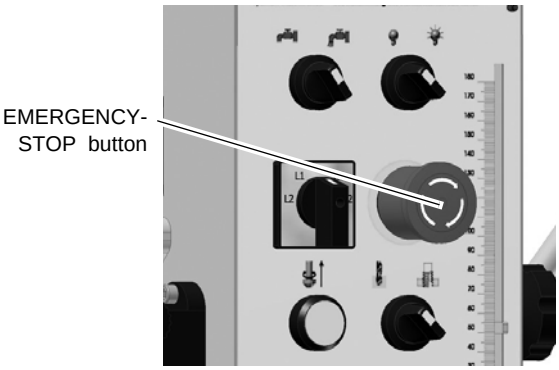
The geared drill includes the following safety devices:

- an EMERGENCY STOP push button,
- a lockable main switch,
- a drilling table with T-slots to fix the workpiece or a vice,
- a drill chuck guard, in order to prevent interference with the rotating tool.

1.9.1 EMERGENCY-STOP push button

CAUTION!

Also after actuating the EMERGENCY-STOP switch, the drilling spindle is turning - depending on the previously selected speed - for a few seconds more.

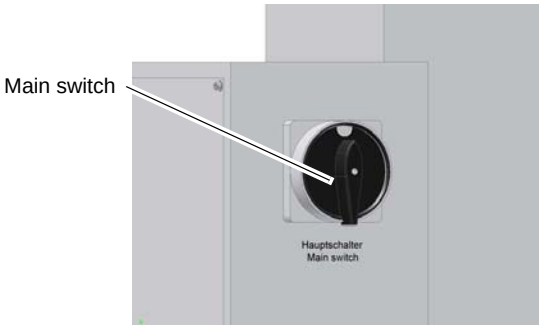


Img. 1-2: EMERGENCY-STOP button

1.9.2 Main switch

The lockable main switch can be secured in position "0" by a padlock to prevent unauthorized or accidental activation.

When the main switch is off, the power supply to the machine is completely interrupted.



Img. 1-3: Main switch

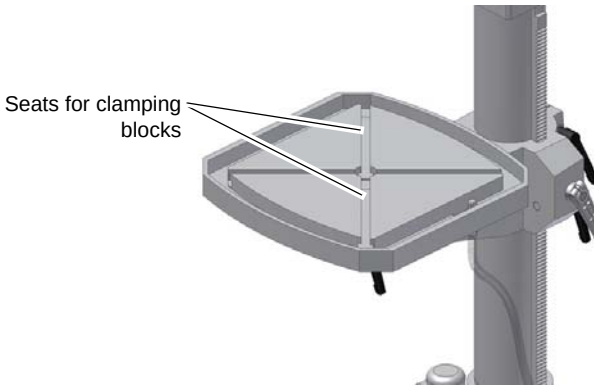
Except for the areas marked by the pictogram in the margin. In these areas there might be voltage, even if the main switch is switched-off.

1.9.3 Drilling table

Seats for T-slots are attached to the drilling table.

WARNING!

Risk of injury due to parts flying off at high speed. Securely fix the workpiece on the drilling table.



Img. 1-4: Drilling table

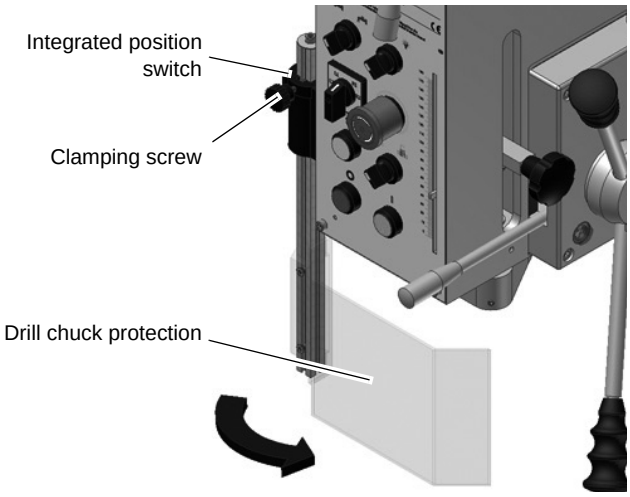
1.9.4 Drill chuck protection

Adjust the protective equipment to the correct height before you start working. To do so, detach the clamping screw, adjust the required height and re-tighten the clamping screw.

A switch is integrated in the fixture of the spindle protection which monitors that the cover is closed.

INFORMATION

You cannot start the machine if the drill chuck protection is not closed.



Img.1-5: Drill chuck protection

1.9.5 Prohibition, warning and mandatory signs

INFORMATION

All warning signs must be legible. Check them regularly.

1.10 Safety check

Check the geared drill before each start-up or at least once per shift. Inform the person responsible immediately of any damage, defect or change in operating function.

Check all safety devices

- at the beginning of each shift (with the machine stopped),
- once a week (with the machine in operation),
- after every maintenance and repair work.

Check that prohibition, warning and information signs and the labels on the geared drill

- are legible (clean them, if necessary),
- are complete (replace if necessary).

INFORMATION

Use the following table in order to organize the checks.

General check		
Equipment	**Check**	**OK**
Protective covers	Mounted, firmly bolted and not damaged	
Signs, Markings	Installed and legible	
Date:	**checked by (signature):**	

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Functional check		
Equipment	**Check**	**OK**
EMERGENCY-STOP push button	After actuating an EMERGENCY STOP push button the geared drill must be switched off.	
Drill chuck protection	The geared drill must only be switched on, if the drill chuck protection is closed. The engine must switch off when the drill chuck protection is opened during operation.	
Date:	**checked by (signature):**	

1.11 Individual protection gear

For certain work individual protection gear as protective equipment. This includes:

- Safety helmet,
- Protective goggles or face guard,
- Protective gloves,
- Safety shoes with steel toe caps,
- Ear protection.

Before starting work, make sure that the prescribed individual protective equipment is available in the workplace.

CAUTION!

Dirty or contaminated personnel protective equipment can cause diseases.

Clean your individual protection gear

- **after each use,**
- **regularly, at least once a week.**

Personal protective equipment for special works

Protect your face and eyes: Wear a safety helmet with facial protection when performing works where your face and eyes are exposed to hazards.

Use protective gloves when handling pieces with sharp edges.

Use safety shoes when you assemble, disassemble or transport heavy components.

1.12 Safety during operation

We specially point out the specific dangers when working with and on the geared drill.

WARNING!

Before switching on the geared drill make sure that there are no

- **no dangers generated for persons,**
- **not cause damage to equipment.**

Avoid any risky working practices:

- Make sure that nobody is endangered by your work.
- The instructions mentioned in these operating instructions have to be strictly observed during assembly, operation, maintenance and repair.
- Do not work on the geared drill, if your concentration is reduced, for example, because you are taking medication.

- Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company.
- Inform the supervisor about all endangerments or errors.
- Stay at the geared drill until all movements have come to a complete standstill.
- Use the prescribed personnel protective equipment. Make sure to wear a well-fitting work suit and, if necessary, a hairnet.
- Do not use protective gloves when drilling or milling.

1.13 Safety during maintenance

Inform the operators in good time about any maintenance and repair works.

Report all safety relevant changes and performance details of the geared drill. Document all changes, have the operating instructions updated accordingly and train machine operators.

1.13.1 Disconnecting and securing the geared drill.

Turn off the main switch of the geared drill before starting any maintenance or repair work.

Use a padlock to prevent the switch from being turned on without authorization and keep the key in a safe place.

All machine parts as well as any dangerous voltages are switched off. Excepted are only the positions which are marked with the adjoining pictogram.

Attach a warning sign on the machine.

1.13.2 Using lifting equipment

WARNING!

The use of unstable lifting and load suspension gear that might break under load can cause severe injuries or even death.

Check that the lifting and load suspension gear

- **they have sufficient load carrying**
- **and that it is in perfect condition.**

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company.

Fasten the loads properly. Never walk under suspended loads!

1.13.3 Mechanical maintenance work

Remove or install protection safety devices before starting any maintenance work and re-install them once the work has been completed.This includes:

- Covers,
- Safety indications and warning signs,
- earth (ground) connections.

If you remove protection or safety devices, refit them immediately after completing the work. Check if they are working properly!

1.14 Accident report

Inform your superiors and Optimum Maschinen Germany GmbH immediately in the event of accidents, possible sources of danger and any actions which almost led to an accident (near misses).

There are many possible causes for "near misses".

The sooner they are notified, the faster the causes can be eliminated.

1.15 Electrical system

Have the machine and/or the electric equipment checked regularly. Immediately eliminate all defects such as loose connections, defective wires, etc.

A second person must be present during work on live components to disconnect the power in the event of an emergency. Disconnect the lathe immediately if there is a malfunction in the power supply!

Comply with the required inspection intervals in accordance with the factory safety directive, operating equipment inspection.

The operator of the machine must ensure that the electrical systems and operating equipment are inspected with regards to their proper condition, namely,

- by a qualified electrician or under the supervision and direction of a qualified electrician, prior to initial commissioning and after modifications or repairs, prior to recommissioning
- and at certain intervals.

The deadlines must be set so that arising, foreseeable defects can be detected in time.

The relevant electro-technical rules must be followed during the inspection.

The inspection prior to initial commissioning is not required if the operator receives confirmation from the manufacturer or installer that the electrical systems and operating equipment comply with the accident prevention regulations, see conformity declaration.

Permanently installed electrical systems and operating equipment are considered constantly monitored if they are continually serviced by qualified electricians and inspected by means of measurements in the framework of operation (e.g. monitoring the insulation resistance).

1.16 Inspection deadlines

Define and document the inspection deadlines for the machine in accordance with the Factory Safety Act and perform an operational risk analysis in accordance with the Work Safety Act. Also use the inspection intervals in the maintenance section as reference values.

2 Technical data

The following information gives the dimensions and weight and is the manufacturer's authorised machine data.

2.1 Electrical connection	
Total connected load	3 x 400V; 1.5 KW
Coolant pump	400V ~40W
permitted voltage tolerance	380 V - 420 V
Degree of protection	IP 54
2.2 Drilling capacity	
Drilling capacity in steel [mm]	35
Tapping in steel [mm]	M 24
Drilling capacity in cast [mm]	45
Tapping in cast [mm]	M 30
Throat [mm]	350
Sleeve travel [mm]	180
2.3 Spindle seat	
Spindle seat	MT4
Spindle sleeve feed [mm/rev]	2 stages 0.1 and 0.2
2.4 Drilling table	
Table measurements [mm] Length x Width of work area	560 x 560
T-slot size [mm]	18
Maximum distance [mm] spindle - table	780
Work area of foot [mm] Length x Width of work area	510 x 500
Maximum distance [mm] spindle - foot	1320
max. bearing load [kg]	250
2.5 Working area	
Height [mm]	2400
Depth [mm]	1800
Width [mm]	1400
Weight [kg]	500
2.6 Speeds	
Spindle speeds [min^{-1}]	50 - 1450 (at connection ~ 50Hz) 60 - 1740 (at connection ~ 60Hz)

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Number of steps	18
2.7 Environmental conditions	
Temperature [° C]	5 - 35
rel. humidity [% rel.]	25 - 80
2.8 Operating material	
Gear oil for spindle sleeve gear 4.5 liters	Mobilgear 627 or a comparable oil ☞ Lubricant on page 69
Toothed rod and drill column	commercial slide bearing grease
2.9 Coolant equipment	
Max. height of pressure [m]	3
Tank capacity [liter]	5
Rate of flow [liter/min.]	2

2.10 Emissions

The airborne noise of the drilling machine is 76 to 80 dB (A) at the operator position and operating conditions in accordance with DIN ISO 8525. If the machine is installed in an area where various machines are in operation, the noise exposure (immission) on the operator of the drilling machine at the working place may exceed 85 dB(A).

INFORMATION

This numerical value was measured on a new machine under proper operating conditions. Depending on the age respectively on the wear of the machine it is possible that the noise behaviour of the machine changes.

Furthermore, the factor of the noise emission is also depending on manufacturing influencing factors, e.g. speed, material and clamping conditions.

INFORMATION

The mentioned numerical value is the emission level and not necessarily a safe working level.

Though there is a dependency between the degree of the noise emission and the degree of the noise disturbance it is not possible to use it reliably to determine if further precaution measures are required or not.

The following factors influence the actual degree of the noise exposure of the operator:

- Characteristics of the working area, e.g. size or damping behaviour**,**
- Other noise sources, e.g. the number of machines,
- Other processes taking place in the proximity and the period of time during which the operator is exposed to the noise.

Furthermore, it is possible that the admissible exposure level might be different from country to country due to national regulations.
This information about the noise emission shall allow the operator of the machine to more easily evaluate the endangering and risks.

CAUTION!

Depending on the overall noise exposure and the basic limit values the machine operators must wear an appropriate hearing protection.

We generally recommend to use a noise protection and a hearing protection.

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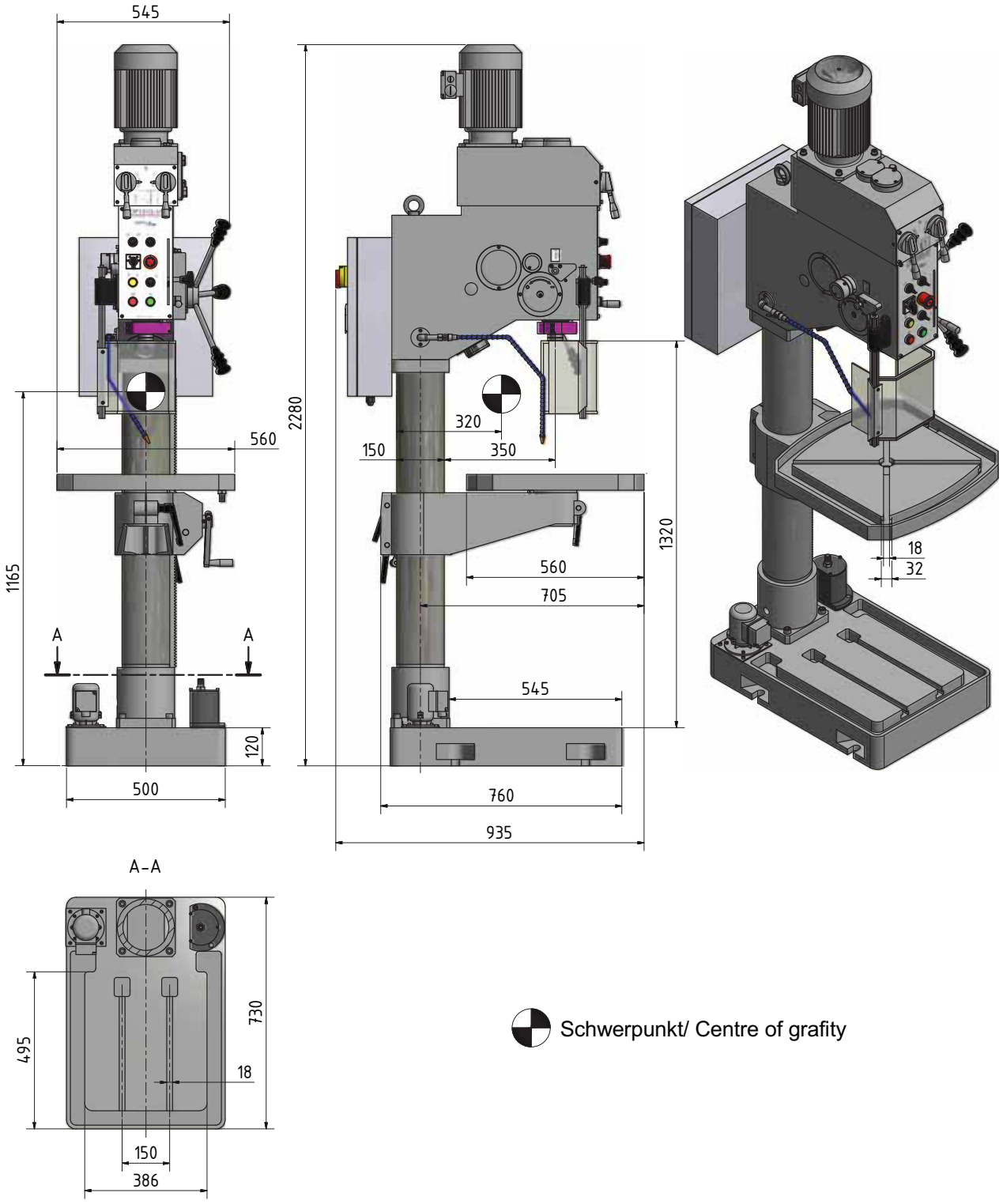
2.11 Dimensions



Img. 2-1: Dimensions B40GSP

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3 Delivery, interdepartmental transport, assembly and commissioning

3.1 Notes on transport, installation, commissioning

Improper transport, installation and commissioning is liable to accidents and can cause damage or malfunctions to the machine for which we do not assume any liability or guarantee.

Transport the scope of delivery secured against shifting or tilting with a sufficiently dimensioned industrial truck or a crane to the installation site.

WARNING!

Severe or fatal injuries may occur if parts of the machine tumble or fall down from the forklift truck or from the transport vehicle. Follow the instructions and information on the transport box.

Note the total weight of the machine. The weight of the machine is indicated in the "Technical data" of the machine. When the machine is unpacked, the weight of the machine can also be read on the rating plate.

Only use transport devices and load suspension gear that can hold the total weight of the machine.

WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death. Check that the lifting and load suspension gear has sufficient load-bearing capacity and that it is in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company. Fasten the loads properly.

3.1.1 General risks during internal transport

WARNING: TILTING DANGER!

The machine may be lifted unsecured by a maximum of 2 cm.

Employees must be outside the danger zone, i.e. the reach of the load.

Warn employees and advise them of the hazard.

Machines may only be transported by authorized and qualified persons. Act responsibly during transport and always consider the consequences. Refrain from daring and risky actions.

Gradients and descents (e.g. driveways, ramps and the like) are particularly dangerous. If such passages are unavoidable, special caution is required.

Before starting the transport check the transport route for possible danger points, unevenness and faults.

Danger points, unevenness and disturbance points must be inspected before transport. The removal of danger spots, disturbances and unevenness at the time of transport by other employees leads to considerable dangers.

Careful planning of interdepartmental transport is therefore essential.

3.2 Unpacking the machine

Transport the drilling machine in its packing crate near its final installation location with a lift truck before unpacking it. If the packaging shows signs of possible transport damage, take the necessary precautions not to damage the machine when unpacking it. If any damage is discovered, the carrier and/or shipper must be notified immediately to be able to initiate the necessary steps for a claim.

Inspect the machine completely and carefully, making sure that all materials, such as shipping documents, manuals and accessories supplied with the machine have been received.

3.3 Scope of delivery

Check the machine immediately after delivery for transport damage, missing parts and loose locking bolts. Compare the scope of delivery with the attached packing list.

3.4 Transport

- Centres of gravity

- Load suspension points (Marking of the positions for the load suspension gear)

- Prescribed transportation position (Labelling of the top surface)

- Means of transport to be used
- Weights

3.5 Set-up and assembly

3.5.1 Assembly

WARNING!

Danger of crushing and overturning.
The installation of the geared drill must be performed by at least 2 persons.

3.5.2 Installation site requirements

INFORMATION

The place must comply with ergonomic workplace requirements.

➜ Organize the working area around the geared drill according to the local safety regulations.

- The work area for operation, maintenance and repair must not be restrictive. (☞ Dimensions on page 20 and ☞ Working area on page 18).

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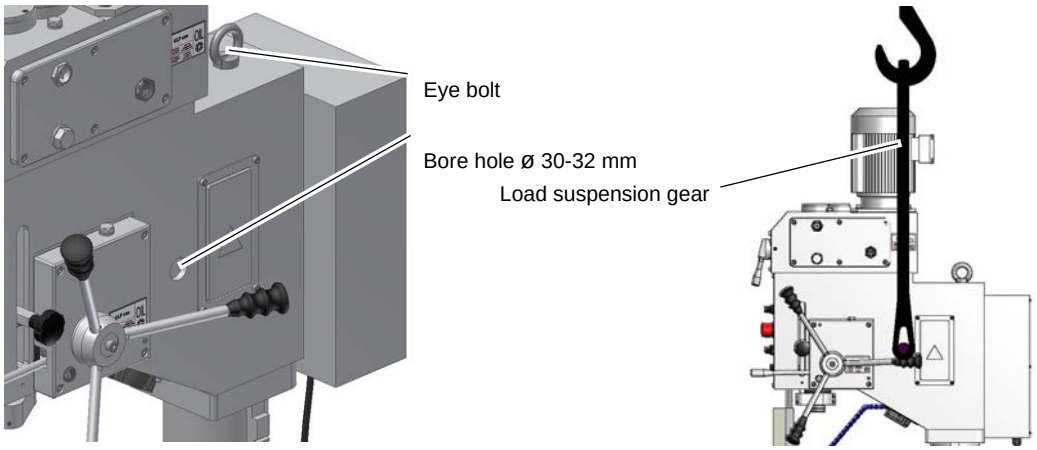
3.5.3 Load attachment point in unpacked condition



Img. 3-1: Example of load suspension and lifting loads

➜ Pass a piece of steel of sufficient thickness (round C 45 steel, thick-walled pipe) through the hole in the head. Make sure that the piece of steel does not damage any electric wire when passing through the head.

➜ Suspend a load suspension gear (e.g. lifting loop) to each of the two sides of the head and to the ends of the piece of steel.

➜ Fasten the load end agent on the an adequate conveyor equipment, for instance a crane.

3.6 Installation

➜ Check that the geared drill foundation is horizontal with a spirit level.

➜ Check that the foundation has sufficient load-bearing capacity and rigidity. The total weight is 500 kg.

➜ Place the geared drill on the provided foundation.

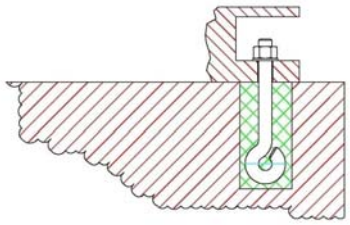
➜ Fix the geared drill base to the substructure through the holes pre-drilled for this purpose.

WARNING!

The condition of the underground and the fixing type of the machine foot to the underground must be in a way that it can bear the loads of the geared drill. The foundation must be level. Check that the geared drill foundation is horizontal with a spirit level.

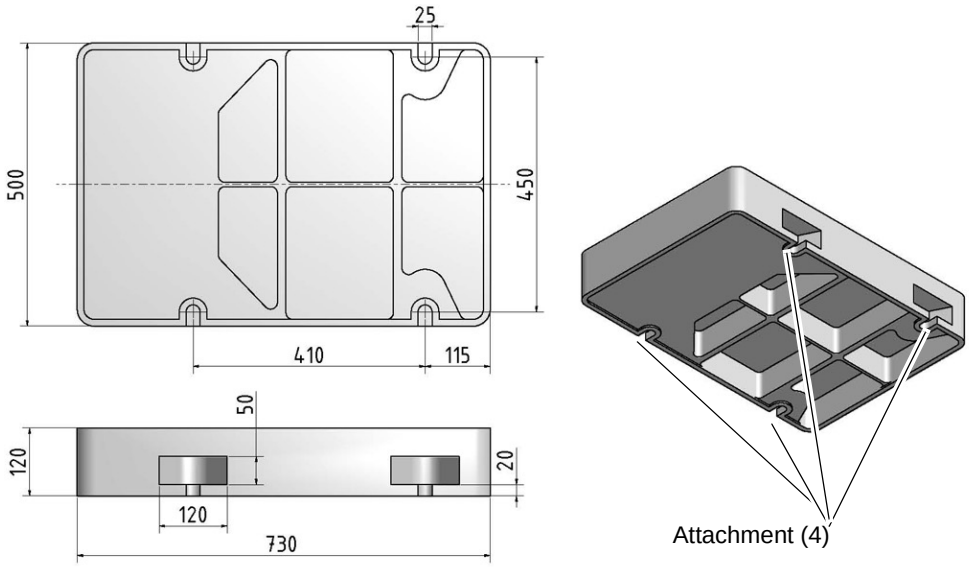
3.6.1 Fixing

➜ In order to provide for the necessary stability of the drilling machine connect the machine with its foot to the substructure. We recommend that you use shear connector cartridges or heavy-duty anchors.



Img. 3-2: Attachment to the base

3.6.2 Assembly drawing



Img.3-3: Assembly drawing

ATTENTION!

Tighten the fixing screws of the geared drill only as much that it is safely fixed and cannot break away or tilt over.

If the fixing screws are too tight in particular in connection with an uneven substructure it may result in a broken stand of the machine.

3.7 Cleaning of the machine

CAUTION!

Do not use compressed air to clean the machine.

Your new machine must be completely cleaned after it is unpacked to ensure that all moving parts and sliding surfaces are not damaged when the machine is operated. Each unit leaves the factory with all exposed parts and sliding surfaces suitably greased to avoid oxidation during the time that elapses before it is placed into operation. Remove all the wrapping and clean all the surfaces with a degreaser to soften and remove the protecting greases and coatings.

Clean all the surfaces with a clean cotton cloth and lubricate the machine as explained in the following section, before connecting the power and beginning to operate the machine.

3.7.1 Lubrication

The lubrication and initial greasing of your new machine consists of checking the oil sight glasses. The oil tanks must be filled to half way up the sight glass. Once these operations have been carried out, the machine can be started up.

➜ The oil must be changed 200 hours after being filled for the first time, then after every 2000 operating hours.

☞ Changing the oil in the gear of the drilling spindle sleeve on page 41

☞ Changing the oil in the gear for the spindle sleeve feed on page 42

➜ Use the oil types recommended in the reference table ☞ Operating material on page 19. This table can be used to compare the characteristics of each different type of oil of your choice.

3.7.2 Electrical connection

CAUTION!

Install the connection cable of the machine in such a way that people will not stumble over it.

The machine is installed ready for operation with a 400V three-phase plug. Please verify if the type of current, voltage and protection fuse correspond to the values specified. A protective earth ground wire connection must be available. Mains fuse 10A to 16A

Make sure that the direction of rotation of the drive motor is correct. The switch position of the rotation selector switch for right-handed rotation (R) has to turn the drill spindle clockwise. If necessary two phase terminals on three-phase connector or your three-phase connection must be exchanged.

WARNING!

The three-phase electrical connection may only be performed by an electrician or under the guidance and supervision of an electrician.

3.8 First commissioning

WARNING!

First commissioning may only take place after proper installation.

There is a danger to persons and equipment, if the first commissioning carried out by inexperienced personnel. We do not accept any liability for damages caused by incorrectly performed commissioning.

ATTENTION!

Before commissioning the machine, all bolts, fastenings and protections must be checked and retightened as necessary!

3.8.1 Checks

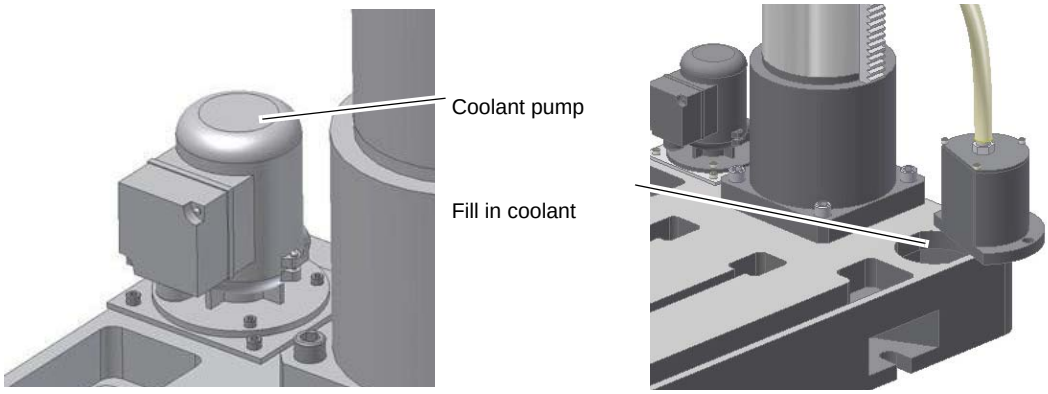
➜ Check the geared drill as indicated under ☞ Safety check on page 14.

➜ Check the geared drill as indicated under ☞ Oil level of the gear of the drilling spindle sleeve on page 40.

3.9 Coolant pump

ATTENTION!

The coolant pump also delivers if it turns in the wrong direction. Due to the wrong turning direction the pump is destroyed within a short time.



Img.3-4: Coolant pump, coolant filler hole

3.10 Warming up the machine

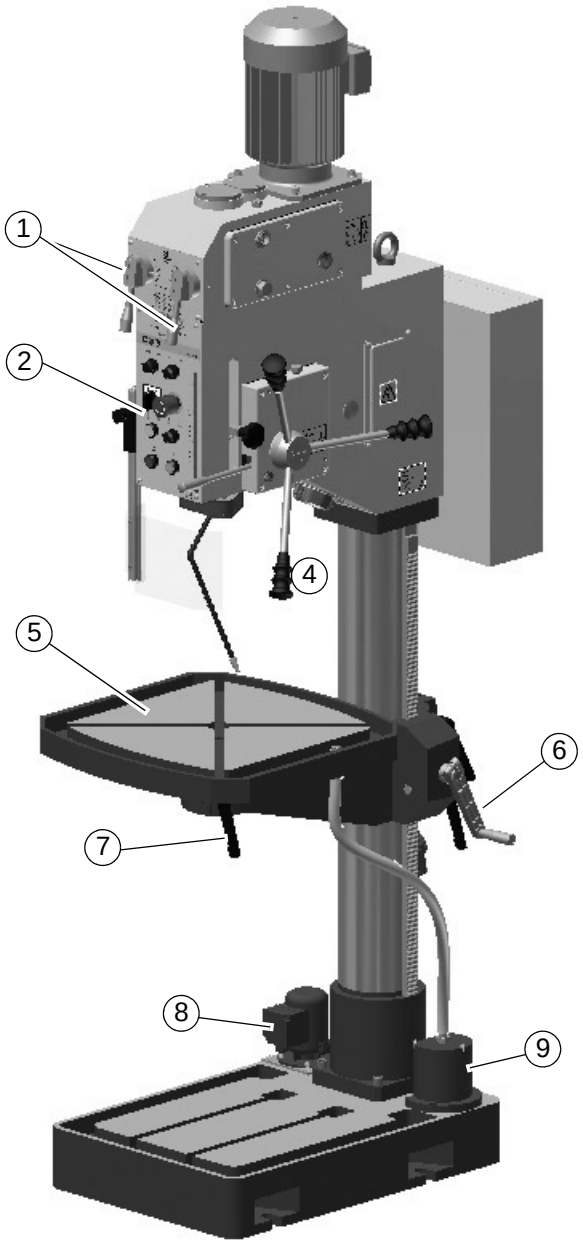
ATTENTION!

If the geared drill and in particular the drilling spindle is immediately operated at maximum load when it is cold it may result in damages.

If the machine is cold, e.g. directly after having transported the machine, it should be warmed up at a spindle speed of only 500 1/min for the first 30 minutes.

4 Handling

4.1 Control and indicating elements



Pos.	Designation	Pos.	Designation
1	Gear selector for speed increments	2	Control panel
3	Drill chuck protection	4	Spindle sleeve lever
5	Drilling table	6	Table height adjustment
7	Clamping lever table revolution	8	Coolant pump
9	Chip filter		

4.2 Safety

Use the machine only under the following conditions:

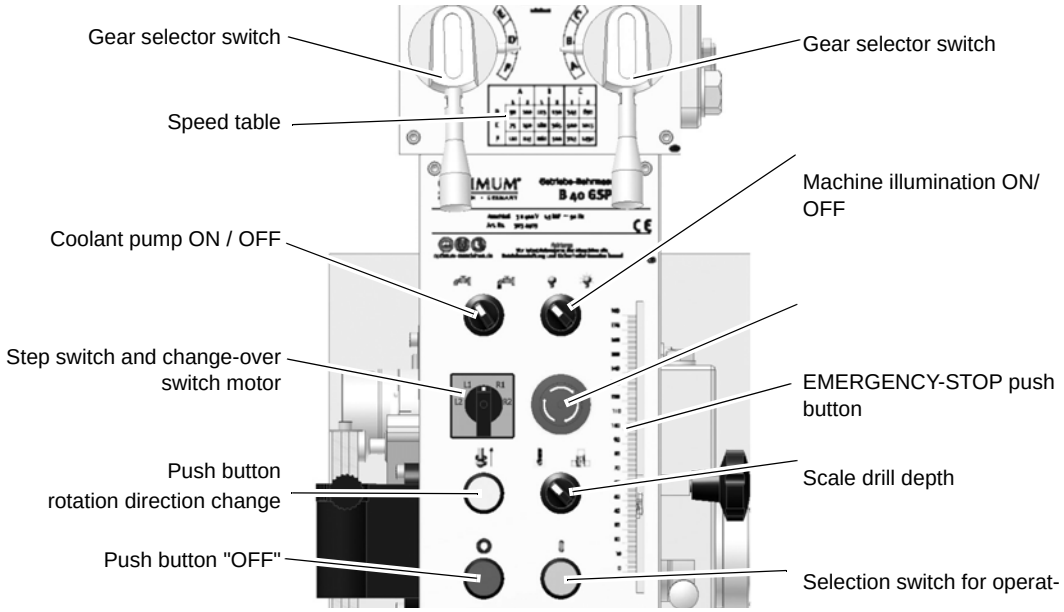
- The machine is in proper working order.
- The machine is used as prescribed.
- The operating manual is followed.
- All safety devices are installed and activated.

All failures should be eliminated immediately. Stop the machine immediately in the event of any anomaly in operation and make sure it cannot be started up accidentally or without authorization

Notify the person responsible immediately of any modification.

☞ Safety measures during operation on page 12

4.2.1 Control panel



Img.4-1: Operating element on the control panel

Operating mode selection switch

"Threading or Drilling" is selected with the selection switch.

Drill depth stop

The geared drill has two micro switches in the depth stop.

The position of adjustable switching point is adjusted with the drill depth stop screw.

Push button direction of rotation

The push button changes the direction of rotation of the drill spindle. The push button change of direction is only active in tapping mode.

Steps / rotation switch

With the steps / rotation switch the speed stage or direction of rotation of the motor is selected.

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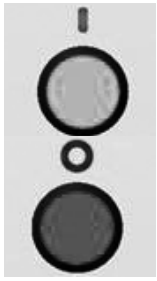
Push button ON



The push button "ON" switches on the rotation of the drilling spindle.

Push button OFF

The "push button OFF“ switches the rotation of the drilling spindle off.

Coolant pump ON / OFF

Switches the coolant pump.

Machine illumination ON/OFF

Switches the illumination on or off.

Microswitch depth stop

The geared drill has an micro switch in the depth stop. The microswitch switches to the set position of the drilling depth stop. The micro switch activates the function of the push button change of direction.

The function of the micro-switch is only active in the tapping mode.

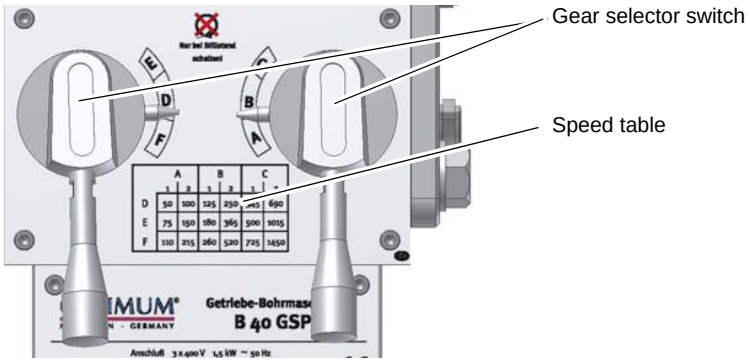
Gear selector switch

With the gear selector switches the speed stage of the drill spindle is selected.

ATTENTION!

Changing the speed when the bit-holder spindle is turning may cause damage to the machine.

- **Disconnect the machine before changing the speed.**
- **Wait until the bit-holder spindle has come to a complete halt.**

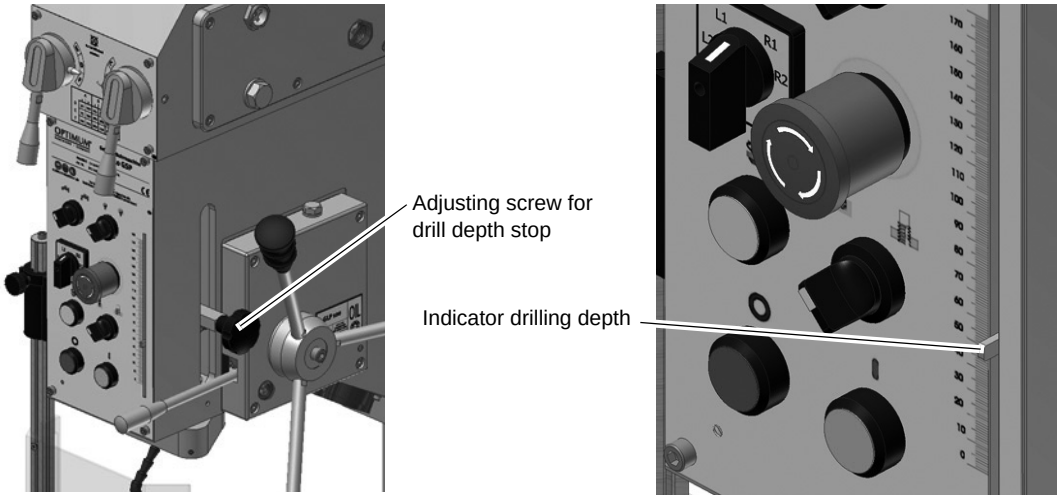


Img. 4-2: Gear selector switch

INFORMATION

When choosing the right rate, use the speed table on the bit-holder head.

4.3 Drill depth stop



Img.4-3: Drill depth stop

❍ Use the drilling depth stop when drilling several holes of the same depth.

➜ Loosen the adjusting screw for drill depth stop and move it until the desired drilling depth is identical to the indicator.

➜ Retighten the adjusting screw.

❍ The spindle can now only be lowered to the set depth.

INFORMATION

When using the automatic spindle feed, the feed is switched off when it reaches the set value. The sleeve is returned to its initial position by spring force.

4.4 Spindle sleeve feed

Spindle sleeve feed can be manual or automatic.

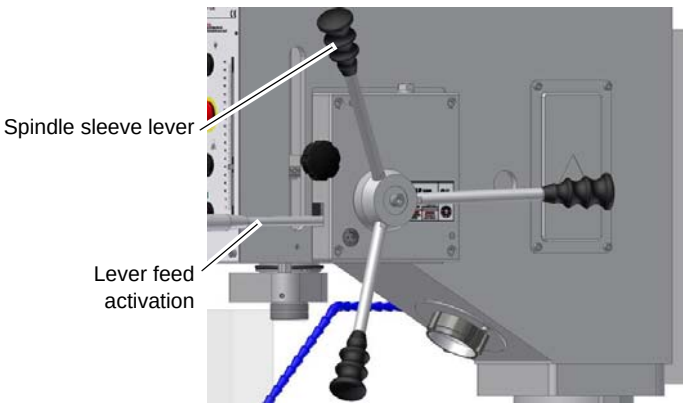
4.4.1 Manual spindle sleeve feed

Move the sleeve downward by means of the spindle sleeve lever. The sleeve is returned to its initial position by means of the spring force.

4.4.2 Automatic spindle sleeve feed

➜ Press the spindle sleeve lever upward.

➜ Move the spindle sleeve lever so that the feed lever engages easier.



Img.4-4: Feed activation and spindle sleeve lever

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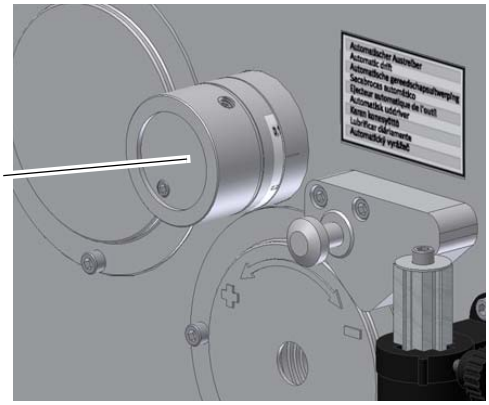
➜ Select the speed of the spindle sleeve feed actuating the selector rotary switch:
- 0.10 mm / turn
- 0.20 mm / turn



Img. 4-5: Selector rotary switch for the speed of the spindle feed

INFORMATION

The higher the preset number of revolutions, the greater the feed speed in the sleeve. Adjust the correct speed depending on the used material and on the drill diameter.

➜ Adjust the depth stop ☞ Drill depth stop on page 30.

➜ Press the feed lever upward. This way the sleeve feed is activated.

❍ When the preset depth is reached, the drill depth stop pushes the feed lever mechanically down and disables the automatic drill feed. The drilling sleeve returns to the top position by spring force.

4.5 Tool holder

4.5.1 Unfitting the drill chuck

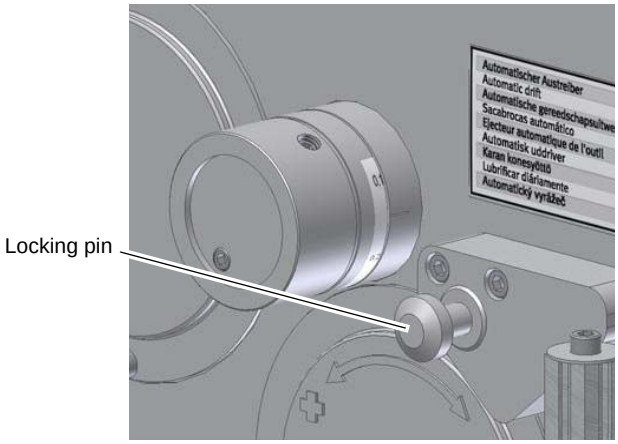
WARNING!

Perform the following work only when you have switched off and locked the main switch.

Disassembly with separate drill drift

➜ Move the sleeve downwards until you can introduce the locking pin completely.

➜ Turn the drilling spindle until the openings of the sleeve and of the drilling spindle are superimposed. Switch the gear selector to a higher speed level in order to facilitate the turning of the sleeve.



Img. 4-6: Locking pin

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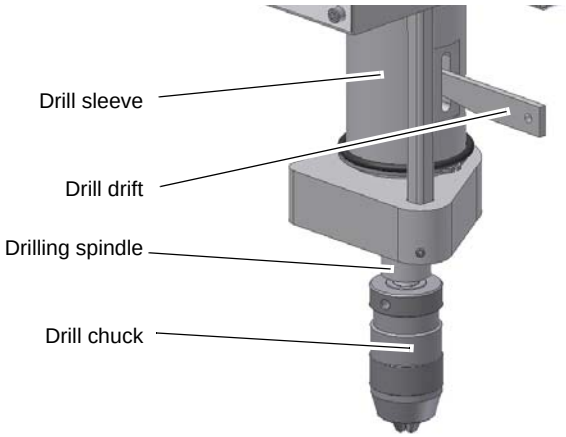
➜ Loosen the conical chuck from the bit-holder using a drift.



Img.4-7: Drill sleeve

Disassembly with integrated drill drift

ATTENTION!

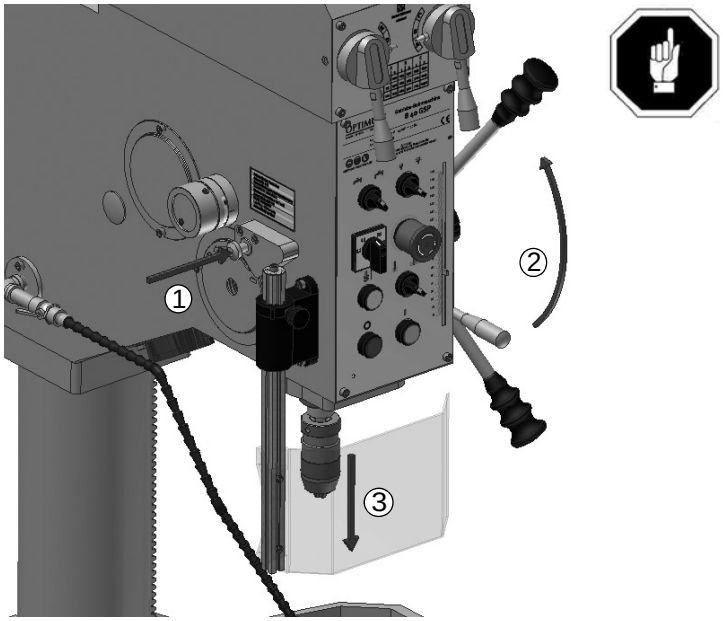
Hold the tool ③ or drill chuck tight.

With the below described procedure the taper mandrel is being loosened from the drilling spindle. The tool and/or the drill chuck will fall down.

➜ Move the sleeve downwards until you can introduce the locking pin ① a little.

➜ Press the spindle sleeve lever ② upward.

❍ The taper mandrel is pressed out of the drill spindle.



Img.4-8: Disassembly

4.5.2 Fitting the drill chuck

➜ Check and, if necessary, clean the conical seat in the drilling spindle and at the taper mandrel of the tool or the drill chuck.

➜ Press the taper mandrel into the drilling spindle.

4.6 Cooling

WARNING!

Ejection and overflowing of coolants and lubricants. Make sure you do not get the cooling lubricants on the floor. Spilled on the floor cooling agents must be removed immediately.

The friction generated during rotation can cause the edge of the tool to become very hot.

The tool should be cooled during the drilling process. Cooling the tool with a suitable cooling lubricant ensures better working results and a longer edge life of the tools.

This is best realised by a separate cooling equipment. If there is no cooling equipment included in the delivery volume, you can cool by means of a spray gun or a washing bottle.

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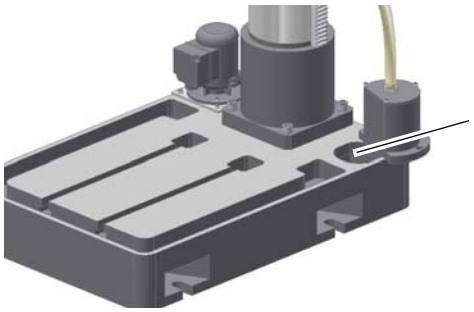
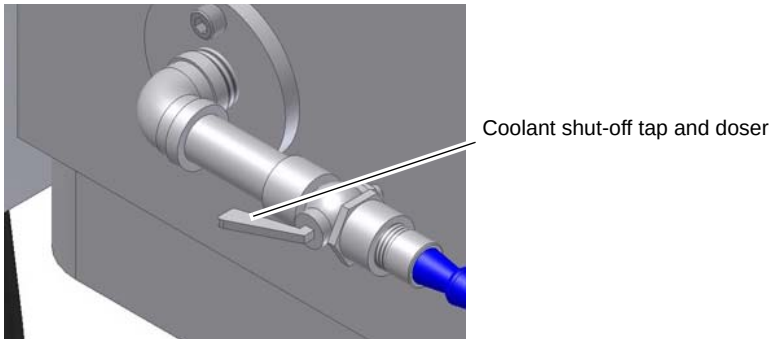


Img. 4-9: Filler hole



Img. 4-10: Coolant shut-off tap and doser

➜ Adjust the flow using the shut-off and dosing tap.

ATTENTION!

Failure of the pump in case of dry running.

The pump is lubricated by the cooling agent. Do not start up the pump without cooling agent.

CAUTION!

Danger of injury due to brushes getting caught or pulled in.

Use a spray gun or a washing bottle for cooling.

INFORMATION

Use a water-soluble and non-pollutant drilling emulsion as a cooling agent.This can be acquired from authorised distributors.

Make sure that the cooling agent is being collected.

Respect the environment when disposing of any lubricants and coolants.

Follow the manufacturer's disposal instructions.

4.7 Working with the machine

4.7.1 Preparation

WARNING!

For drilling jobs, it is necessary to clamp the workpiece firmly to prevent the bit catching on the pieces. A machine vice or clamping claws is a suitable clamping device.

Put a wooden or plastic board beneath the workpiece to avoid drilling through to the work table, vice, etc.

If necessary, adjust the required drilling depth using the depth stop to obtain a constant result.

Please make sure to use a suitable dust suction when treating wood since wood dust may be health hazardous.

Wear a suitable dust mask when performing works at which dust is generated.

➜ First, select the speed of the bit. This will depend on the diameter of the bit being used and on the material. ☞ Determining the cutting speed and the speed on page 35

4.7.2 During work

The spindle sleeve is advanced by means of the star wheel. Make sure that the feed is constant and not too fast.

The spindle sleeve is returned to its initial position by the return spring.

WARNING!

Seizing of clothes and / or hair.

- **Make sure to wear well-fitting work during drilling work.**
- **Do not use gloves.**
- **If necessary, use a hairnet.**

CAUTION!

Danger of bumps from the levers on the star wheel.

Do not release the star wheel when repositioning the drilling spindle sleeve.

Pull back the drilling spindle sleeve by hand.

CAUTION!

Danger of crushing. Do not place your hand between the drilling head and the spindle sleeve.

INFORMATION

The smaller the bit the more easily it may break.

In the case of deep drilling, remove the bit from time to time to remove filings from the drill. Add a few drops of oil to reduce friction and prolong the service life of the bit.

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5 Determining the cutting speed and the speed

5.1 Table cutting speeds / infeed

Material table						
Material to be processed	Recommended cutting speed **Vc** in m/min	Recommended infeed **f** in mm/revolution				
		Drill bit diameter **d** in mm				
		2...3	>3...6	>6...12	>12...25	>25...50
Unalloyed construction steels < 700 N/mm²	30 - 35	0.05	0.10	0.15	0.25	0.35
Alloyed construction steels > 700 N/mm²	20 - 25	0.04	0.08	0.10	0.15	0.20
Alloyed steels < 1000 N/mm²	20 - 25	0.04	0.08	0.10	0.15	0.20
Steels, low stability < 800 N/mm²	40	0.05	0.10	0.15	0.25	0.35
Steel, high stability > 800 N/mm²	20	0.04	0.08	0.10	0.15	0.20
non-rust steels > 800 N/mm²	12	0.03	0.06	0.08	0.12	0.18
Cast iron < 250 N/mm²	15 - 25	0.10	0.20	0.30	0.40	0.60
Cast iron > 250 N/mm²	10 - 20	0.05	0.15	0.25	0.35	0.55
CuZn alloy brittle	60 - 100	0.10	0.15	0.30	0.40	0.60
CuZn alloy ductile	35 - 60	0.05	0.10	0.25	0.35	0.55
Aluminum alloy up to 11% Si	30 - 50	0.10	0.20	0.30	0.40	0.60
Thermoplastics	20 - 40	0.05	0.10	0.20	0.30	0.40
Thermosetting materials with organic filling	15 - 35	0.05	0.10	0.20	0.30	0.40
Thermosetting materials with anorganic filling	15 - 25	0.05	0.10	0.20	0.30	0.40

5.2 Speed table

Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100
Drill bit **Ø** in mm	Speed **n** in rpm															
1,0	1274	1911	2548	3185	3822	4777	5732	6369	7962	9554	11146	12739	15924	19108	25478	31847
1,5	849	1274	1699	2123	2548	3185	3822	4246	5308	6369	7431	8493	10616	12739	16985	21231
2,0	637	955	1274	1592	1911	2389	2866	3185	3981	4777	5573	6369	7962	9554	12739	15924
2,5	510	764	1019	1274	1529	1911	2293	2548	3185	3822	4459	5096	6369	7643	10191	12739
3,0	425	637	849	1062	1274	1592	1911	2123	2654	3185	3715	4246	5308	6369	8493	10616
3,5	364	546	728	910	1092	1365	1638	1820	2275	2730	3185	3640	4550	5460	7279	9099
4,0	318	478	637	796	955	1194	1433	1592	1990	2389	2787	3185	3981	4777	6369	7962
Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100

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Drill bit **Ø** in mm	Speed **n** in rpm															
4,5	283	425	566	708	849	1062	1274	1415	1769	2123	2477	2831	3539	4246	5662	7077
5,0	255	382	510	637	764	955	1146	1274	1592	1911	2229	2548	3185	3822	5096	6369
5,5	232	347	463	579	695	869	1042	1158	1448	1737	2027	2316	2895	3474	4632	5790
6,0	212	318	425	531	637	796	955	1062	1327	1592	1858	2123	2654	3185	4246	5308
6,5	196	294	392	490	588	735	882	980	1225	1470	1715	1960	2450	2940	3920	4900
7,0	182	273	364	455	546	682	819	910	1137	1365	1592	1820	2275	2730	3640	4550
7,5	170	255	340	425	510	637	764	849	1062	1274	1486	1699	2123	2548	3397	4246
8,0	159	239	318	398	478	597	717	796	995	1194	1393	1592	1990	2389	3185	3981
8,5	150	225	300	375	450	562	674	749	937	1124	1311	1499	1873	2248	2997	3747
9,0	142	212	283	354	425	531	637	708	885	1062	1238	1415	1769	2123	2831	3539
9,5	134	201	268	335	402	503	603	670	838	1006	1173	1341	1676	2011	2682	3352
10,0	127	191	255	318	382	478	573	637	796	955	1115	1274	1592	1911	2548	3185
11,0	116	174	232	290	347	434	521	579	724	869	1013	1158	1448	1737	2316	2895
12,0	106	159	212	265	318	398	478	531	663	796	929	1062	1327	1592	2123	2654
13,0	98	147	196	245	294	367	441	490	612	735	857	980	1225	1470	1960	2450
14,0	91	136	182	227	273	341	409	455	569	682	796	910	1137	1365	1820	2275
15,0	85	127	170	212	255	318	382	425	531	637	743	849	1062	1274	1699	2123
16,0	80	119	159	199	239	299	358	398	498	597	697	796	995	1194	1592	1990
17,0	75	112	150	187	225	281	337	375	468	562	656	749	937	1124	1499	1873
18,0	71	106	142	177	212	265	318	354	442	531	619	708	885	1062	1415	1769
19,0	67	101	134	168	201	251	302	335	419	503	587	670	838	1006	1341	1676
20,0	64	96	127	159	191	239	287	318	398	478	557	637	796	955	1274	1592
21,0	61	91	121	152	182	227	273	303	379	455	531	607	758	910	1213	1517
22,0	58	87	116	145	174	217	261	290	362	434	507	579	724	869	1158	1448
23,0	55	83	111	138	166	208	249	277	346	415	485	554	692	831	1108	1385
24,0	53	80	106	133	159	199	239	265	332	398	464	531	663	796	1062	1327
25,0	51	76	102	127	153	191	229	255	318	382	446	510	637	764	1019	1274
26,0	49	73	98	122	147	184	220	245	306	367	429	490	612	735	980	1225
27,0	47	71	94	118	142	177	212	236	295	354	413	472	590	708	944	1180
28,0	45	68	91	114	136	171	205	227	284	341	398	455	569	682	910	1137
29,0	44	66	88	110	132	165	198	220	275	329	384	439	549	659	879	1098
30,0	42	64	85	106	127	159	191	212	265	318	372	425	531	637	849	1062
31,0	41	62	82	103	123	154	185	205	257	308	360	411	514	616	822	1027
32,0	40	60	80	100	119	149	179	199	249	299	348	398	498	597	796	995
33,0	39	58	77	97	116	145	174	193	241	290	338	386	483	579	772	965
34,0	37	56	75	94	112	141	169	187	234	281	328	375	468	562	749	937
35,0	36	55	73	91	109	136	164	182	227	273	318	364	455	546	728	910
36,0	35	53	71	88	106	133	159	177	221	265	310	354	442	531	708	885
37,0	34	52	69	86	103	129	155	172	215	258	301	344	430	516	689	861
38,0	34	50	67	84	101	126	151	168	210	251	293	335	419	503	670	838
Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100

Drilling_Vc_GB.fm

Drill bit Ø in mm	Speed **n** in rpm															
39,0	33	49	65	82	98	122	147	163	204	245	286	327	408	490	653	817
40,0	32	48	64	80	96	119	143	159	199	239	279	318	398	478	637	796
41,0	31	47	62	78	93	117	140	155	194	233	272	311	388	466	621	777
42,0	30	45	61	76	91	114	136	152	190	227	265	303	379	455	607	758
43,0	30	44	59	74	89	111	133	148	185	222	259	296	370	444	593	741
44,0	29	43	58	72	87	109	130	145	181	217	253	290	362	434	579	724
45,0	28	42	57	71	85	106	127	142	177	212	248	283	354	425	566	708
46,0	28	42	55	69	83	104	125	138	173	208	242	277	346	415	554	692
47,0	27	41	54	68	81	102	122	136	169	203	237	271	339	407	542	678
48,0	27	40	53	66	80	100	119	133	166	199	232	265	332	398	531	663
49,0	26	39	52	65	78	97	117	130	162	195	227	260	325	390	520	650
50,0	25	38	51	64	76	96	115	127	159	191	223	255	318	382	510	637

5.2.1 Examples to calculatory determine the required speed for your drilling machine

The necessary speed is depending on the diameter of the drill bit, on the material which is being machined as well as on the cutting material of the drill bit.

Material which needs to be drilled: St37

Cutting material (drill bit): HSS spiral bit

Set point of the cutting speed [V_C] according to the table: 40 meters per minute

Diameter [d] of your drill bit: 30 mm = 0,03 m [meters]

Selected infeed [f] according to the table: about 0.35 mm/rev

Speed $n = \frac{\vartheta c}{\pi \times d} = \frac{40 m}{min \times 3,14 \times 0,03 m} = 425 (rpm)$

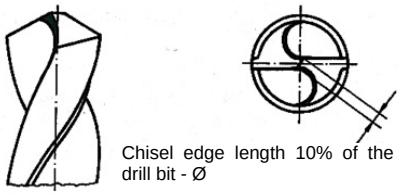
Set a speed on your drilling machine which is less than the determined speed.

INFORMATION

In order to facilitate the production of larger drill holes they need to be pre-drilled. This way, you reduce the cutting forces and improve the guiding of the drill bit.

The pre-drilling diameter is depending on the length of the chisel edge. The chisel edge does not cut, but it squeezes the material. The chisel edge is positioned at an angle of 55° to the major cutting edge.

As a general rule of thumb it applies: The pre-drilling diameter is depending on the length of the chisel edge.



Chisel edge length 10% of the drill bit - Ø

Recommended working steps for a drilling diameter of 30 mm

Example:

1st working step: Pre-drilling with Ø 5 mm.

2nd working step: Pre-drilling with Ø 15 mm.

3rd working step: Drilling with Ø 30 mm.

Drilling_VC_GB.fm

6 Maintenance

In this chapter you will find important information about

- Inspection
- Maintenance
- Repairs

ATTENTION!

Properly performed regular maintenance is an essential prerequisite for

- **operational safety,**
- **failure-free operation,**
- **long service life of the machine and**
- **the quality of the products which you manufacture.**

Installations and equipment from other manufacturers must also be in good order and condition.

ENVIRONMENTAL PROTECTION

During work on the spindle head, please make sure that

- **collector tanks are used with sufficient capacity for the amount of liquid to be collected.**
- **liquids and oils should not be split on the ground.**

Clean up any spilt liquid or oils immediately using proper oil-absorption methods and dispose of them in accordance with current legal requirements on the environment.

Collect leakages

Do not re-introduce liquids split outside the system during repair or as a result of leakage from the reserve tank:collect them in a collecting container to be disposed of.

Disposal

Never dump oil or other substances which are harmful for the environment in water inlets, rivers or channels.

Used oils must be delivered to a collection centre. Consult your supervisor if you do not know where the collection centre is.

6.1 Safety

WARNING!

The consequences of incorrect maintenance and repair work may include:

- **very serious injury to personnel working on the machine,**
- **damage to the machine.**

Only qualified staff should carry out maintenance and repair work on the machine.

Validation

Check and maintain all safety-relevant stop, control and measuring devices (validation).

Documentation

Record all tests and works in a operator's log resp. log book.

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6.1.1 Preparation

WARNING!

Only carry out work on the machine if it has been unplugged from the mains power supply. ☞ Disconnecting and securing the geared drill. on page 16

Attach a warning sign.

6.1.2 Restarting

Before restarting run a safety check.

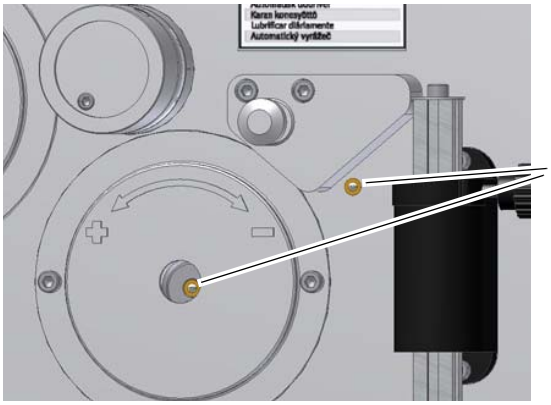
☞ Safety check on page 14

WARNING!

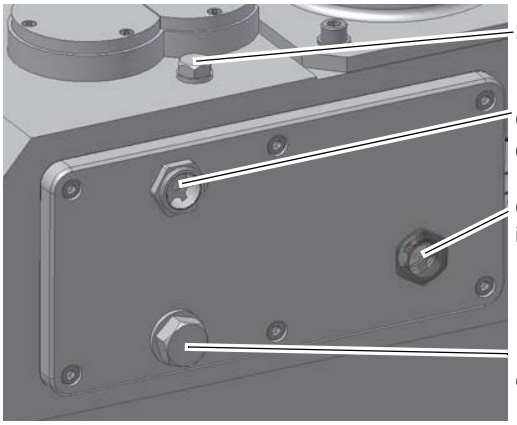
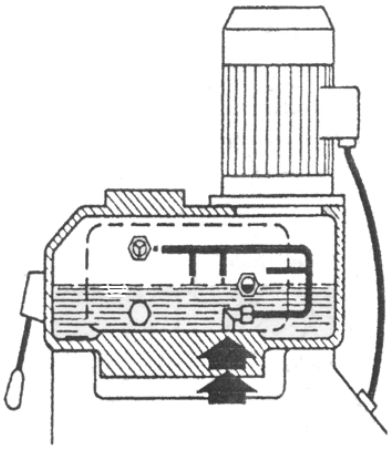
Before starting the machine you must be sure that
- **no dangers generated for persons,**
- **the machine is not damaged.**

6.2 Inspection and maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. For this reason, all the intervals are only valid for the authorised conditions.

Interval	Where?	What?	How?
Start of shift **after every maintenance or repair work**	**Clean machine**	☞ **Safety check on page 14**	
every day	**Drill head**	**Lubricating**	➜ Lubricate the lubricating nipples on the lathe saddle.  Img. 6-1: Lubricating nipple drill head

B40GSP_GB_5.fm

Interval	Where?	What?	How?
Start of shift **after every maintenance or repair work**	**Drill head**	**Oil level of the gear of the drilling spindle sleeve**	➜ Check the oil level in the inspection glass The glass oil level (deposed) should be half-covered.  Abb. 6-2: Oil level of the gear of the drilling spindle sleeve  Abb. 6-3: Functional schematic

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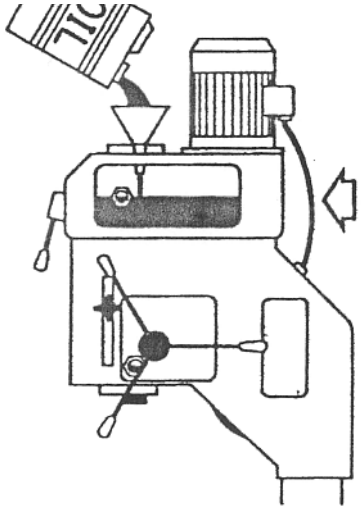
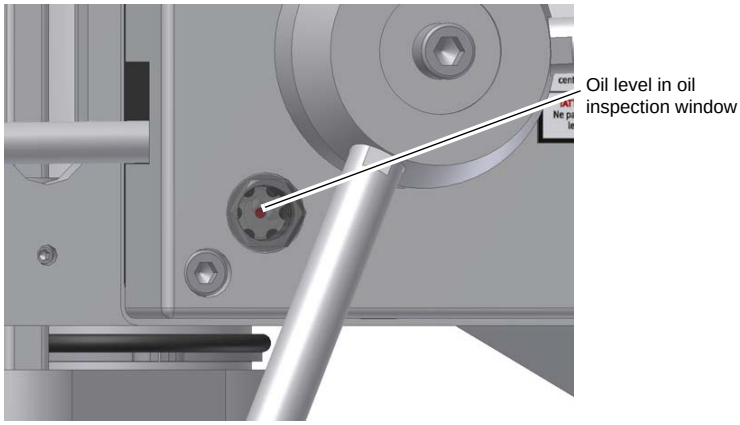
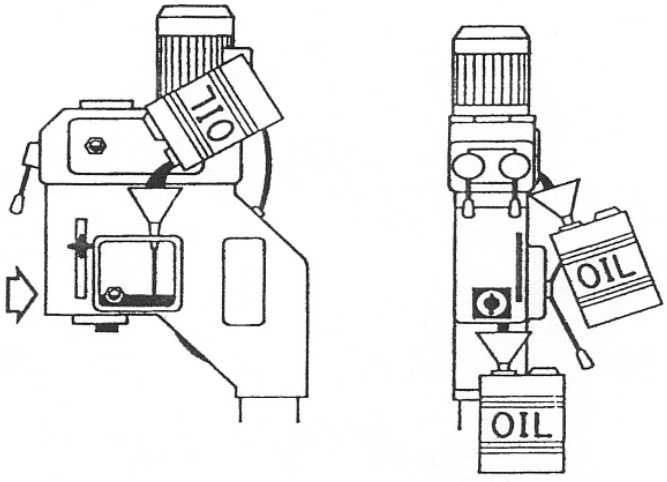
Interval	Where?	What?	How?
First after 200 operatingm hours, then every 2000 operating hours	**Drill head**	**Changing the oil in the gear of the drilling spindle sleeve**	For oil change use an appropriate collecting tray of sufficient capacity. ➜ Unscrew the screw from the drain hole.  Img. 6-4: Changing the oil in the gear of the drilling spindle sleeve Re-fill the gear with gear oil. Approx. consumption 4.5 litres. Pay attention to the correct level. ☞ Operating material on page 19.
Start of shift **after every maintenance or repair work**	**Drill head**	**Oil level of the gear for the spindle sleeve feed**	➜ Check the oil level in the inspection glass The sight glass should be half-covered.  Img. 6-5: Oil level of the gear for the spindle sleeve feed

Interval	Where?	What?	How?
First after 200 operatingm hours, then every 2000 operating hours	**Drill head**	**Changing the oil in the gear for the spindle sleeve feed**	For oil change use an appropriate collecting tray of sufficient capacity. ➜ Unscrew the screw from the drain hole.  Img.6-6: Oil filling screw ➜ Re-fills the gear of the spindle sleeve feed with gear oil. Approx. consumption 0.5 litres. Pay attention to the correct level. ☞ Operating material on page 19  Img.6-7: Changing the oil in the gear for the spindle sleeve feed
Every month	**Drill column and toothed rack**	**Lubricate**	➜ Oil the drilling column in regular intervals using standard oil. ➜ Lubricate the rack regularly with commercial grease (e.g. friction bearing grease).
as required	**Coolant equipment**	**Coolant pump**	The coolant pump is maintenance-free. ☞ Cooling lubricants and tanks on page 44 ☞ Inspection plan for water-mixed cooling lubricants on page 45 ➜ Rinse the coolant pump if you use coolants that leave residues.

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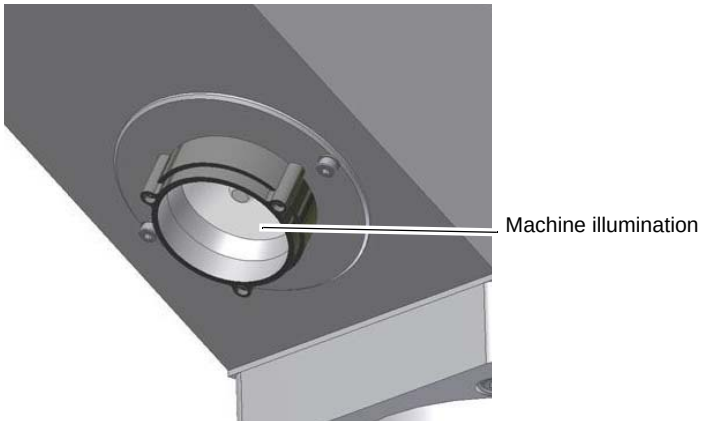
Interval	Where?	What?	How?
as required	**Illumination**	**Replacing the light bulb**	If the light bulb is defective: ➜ Unscrew the glass cover of the machine illumination. ➜ Unscrew the light bulb by turning it to the left and by slightly pressing the bulb into the socket (bayonet). ➜ Replace the light bulb. ➜ Screw the glass cover onto the machine illumination.  Img.6-8: Machine illumination
based on operator's empirical values in accordance with German DGUV (BGV A3)	**Electrical system**	Electrical inspection	☞ Obligations of the operating company on page 11 ☞ Electrical system on page 17 ☞ Validation on page 38

6.3 Repair

6.3.1 Customer service technician

For any repair work request the assistance of an authorised customer service technician. Contact your specialist dealer if you do not have customer service's information or contact Stürmer Maschinen GmbH in Germany who can provide you with a specialist dealer's contact information. Optionally, the

Stürmer Maschinen GmbH

Dr.-Robert-Pfleger-Str. 26

D- 96103 Hallstadt

can provide a customer service technician, however, the request for a customer service technician can only be made via your specialist dealer.

If the repairs are carried out by qualified technical personnel, they must follow the indications given in these operating instructions.

Optimum Maschinen Germany GmbH accepts no liability nor does it guarantee against damage and operating malfunctions resulting from failure to observe these operating instructions.

For repairs, only use

- faultless and suitable tools,
- original parts or parts from series expressly authorised by Optimum Maschinen Germany GmbH.

6.4 Cooling lubricants and tanks

CAUTION!

The cooling lubricant can cause diseases. Avoid direct contact with cooling lubricant or parts covered in cooling lubricant.

Cooling lubricant circuits and tanks for water-cooling lubricant mixtures must be completely emptied, cleaned and disinfected as needed, but at least once per year or every time the cooling lubricant is replaced.

If fine chips and other foreign matters are accumulated in the coolant tank, the machine can no longer be correctly supplied with coolant. Furthermore, the lifetime of the coolant pump is reduced.

When processing cast iron or similar materials generating fine chips, cleaning the coolant tank more often is recommended.

Limit values

The cooling lubricant must be replaced, the cooling lubricant circuit and tank emptied, cleaned and disinfected if

- the pH value drops by more than 1 based on the value during initial filling. The maximum permissible pH value during initial filing is 9.3
- there is a perceivable change in the appearance, odour, floating oil or increase of the bacteria to more than 10/6/ml
- there is an increase in nitrite content to more than 20 ppm (mg/1) or nitrate content to more than 50 ppm (mg/1)
- there is an increase in the N-nitrosodiethanolamine (NDELA) to more than 5 ppm (mg/a)

CAUTION!

Comply with the manufacturer's specifications for mixture ratios, hazardous substances, e.g. system cleaners, including their permissible minimum use times.

CAUTION!

Since the cooling lubricant escapes under high pressure, pumping out the coolant by using the existing cooling lubricant pump via a pressure hose into a suitable tank is not recommended.

ENVIRONMENTAL PROTECTION

During work on the cooling lubricant equipment please make sure that

- **collector tanks are used with sufficient capacity for the amount of liquid to be collected.**
- **liquids and oils should not be spilled on the ground.**

Clean up any spilled liquid or oils immediately using proper oil-absorption methods and dispose of them in accordance with current statutory environmental regulations.

Collect leakages

Do not re-introduce liquids spilled outside the system during repair or as a result of leakage from the reserve tank, instead collect them in a collecting container for disposal.

Disposal

Never dump oil or other substances which are harmful to the environment into water inlets, rivers or channels. Used oils must be delivered to a collection centre. Consult your supervisor if you do not know where the collection centre is.

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6.4.1 Inspection plan for water-mixed cooling lubricants

Company: No.: Date: used cooling lubricant			
size to be checked	Inspection methods	Inspection intervals	Procedure and comment
noticeable changes	Appearance, odour	daily	Find and rectify causes, e.g. skim off oil, check filter, ventilate cooling lubricant system
pH value	Laboratory techniques electrometric with pH meter (DIN 51369) Local measurement method: with pH paper (Special indicators with suitable measuring range)	weekly [1)]	if pH value decreases > 0.5 based on initial filing: Measures in accordance manufacturer's recommendations > 1.0 based on initial filing: Replace cooling lubricant, clean cooling lubricant circulation system
Usage concentration	Manual refractometer	weekly [1)]	Method results in incorrect values with tramp oil content
Base reserve	Acid titration in accordance with Manufacturer's recommendation	as required	Method is independent of tramp oil content
Nitrite content	Test sticks method or laboratory method	weekly [1)]	> 20 mg/L nitrite: Replace cooling lubricant or part or inhibiting additives; otherwise NDELA (N-nitrosodiethanolamine) in the cooling lubricant system and in the air must be determined > 5 mg/L NDELA in the cooling lubricant system: Replacement, clean and disinfect cooling lubricant circulation system, find nitrite source and, if possible, rectify.
Nitrate/nitrite content of the preparation water, if this is not removed from the public grid	Test sticks method or laboratory method	as required	Use water from the public grid if there is water from the pubic grid has > 50 mg/l nitrate: Inform the waterworks

[1)] The specified inspection intervals (frequency) are based on continuous operation. Other operational conditions can result in other inspection intervals; exceptions are possible in accordance with Sections 4.4 and 4.10 of the TGS 611.

Editor:

Signature:

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7 Ersatzteile - Spare parts

7.1 Ersatzteilbestellung - *Ordering spare parts*

Bitte geben Sie folgendes an - *Please indicate the following :*

- Seriennummer - *Serial No.*
- Maschinenbezeichnung - *Machines name*
- Herstellungsdatum - *Date of manufacture*
- Artikelnummer - *Article no.*

Die Artikelnummer befindet sich in der Ersatzteilliste. *The article no. is located in the spare parts list.* Die Seriennummer befindet sich am Typschild. *The serial no. is on the rating plate.*

7.2 Hotline Ersatzteile - Spare parts Hotline

+49 (0) 951-96555 -118

ersatzteile@stuermer-maschinen.de

7.3 Service Hotline

+49 (0) 951-96555 -100

service@stuermer-maschinen.de

7.4 Getriebe Bohrspindel - Gear box main spindel

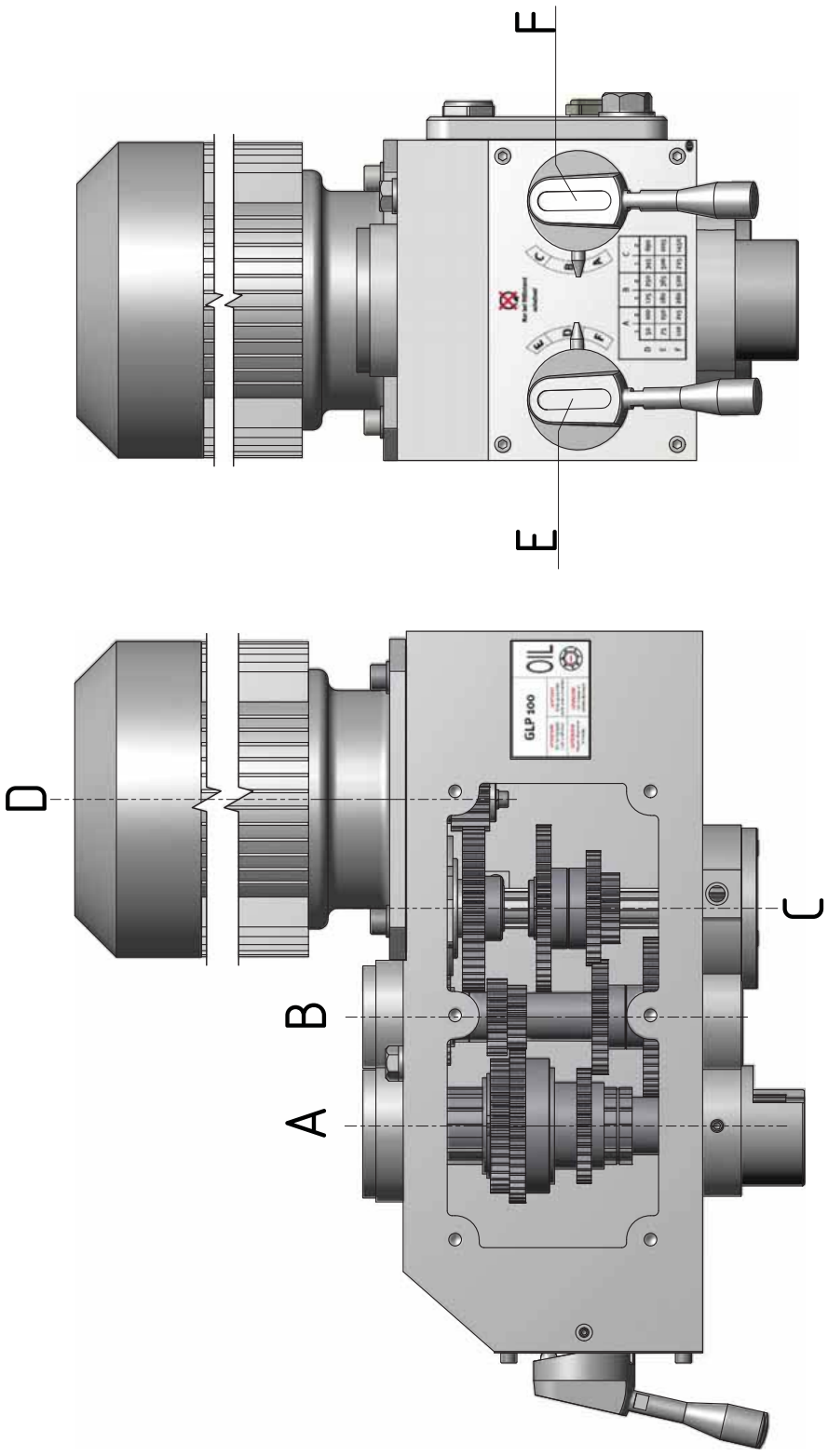

Abb. 7-1: Getriebe Bohrspindel - Gear box main spindel

7.5 Getriebe Bohrspindel 1 von 4 - Gear box main spindel 1 of 4

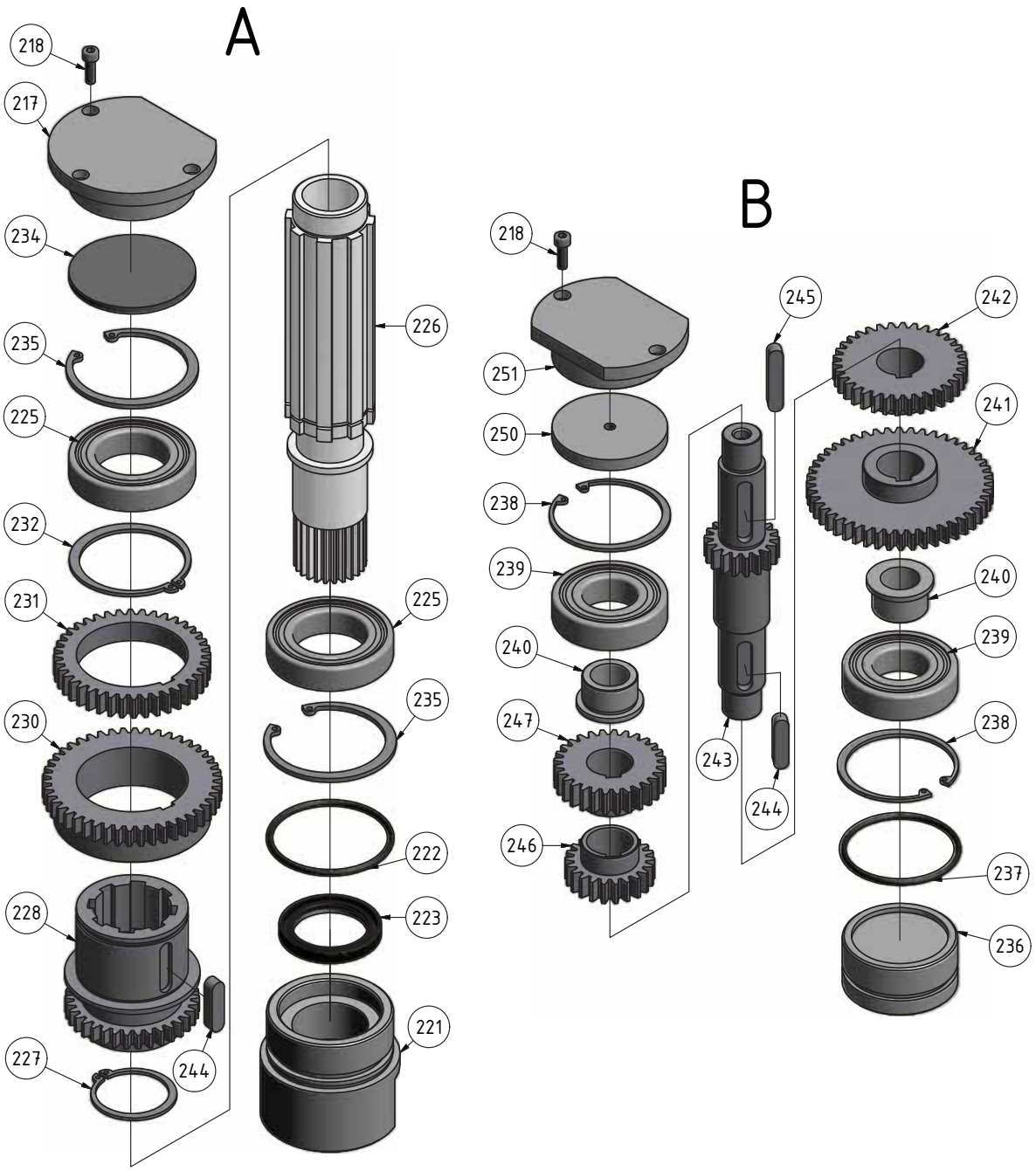

Abb. 7-2: Getriebe Bohrspindel 1 von 4 - Gear box main spindel 1 von 4

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7.6 Getriebe Bohrspindel 2 von 4 - Gear box main spindel 2 of 4

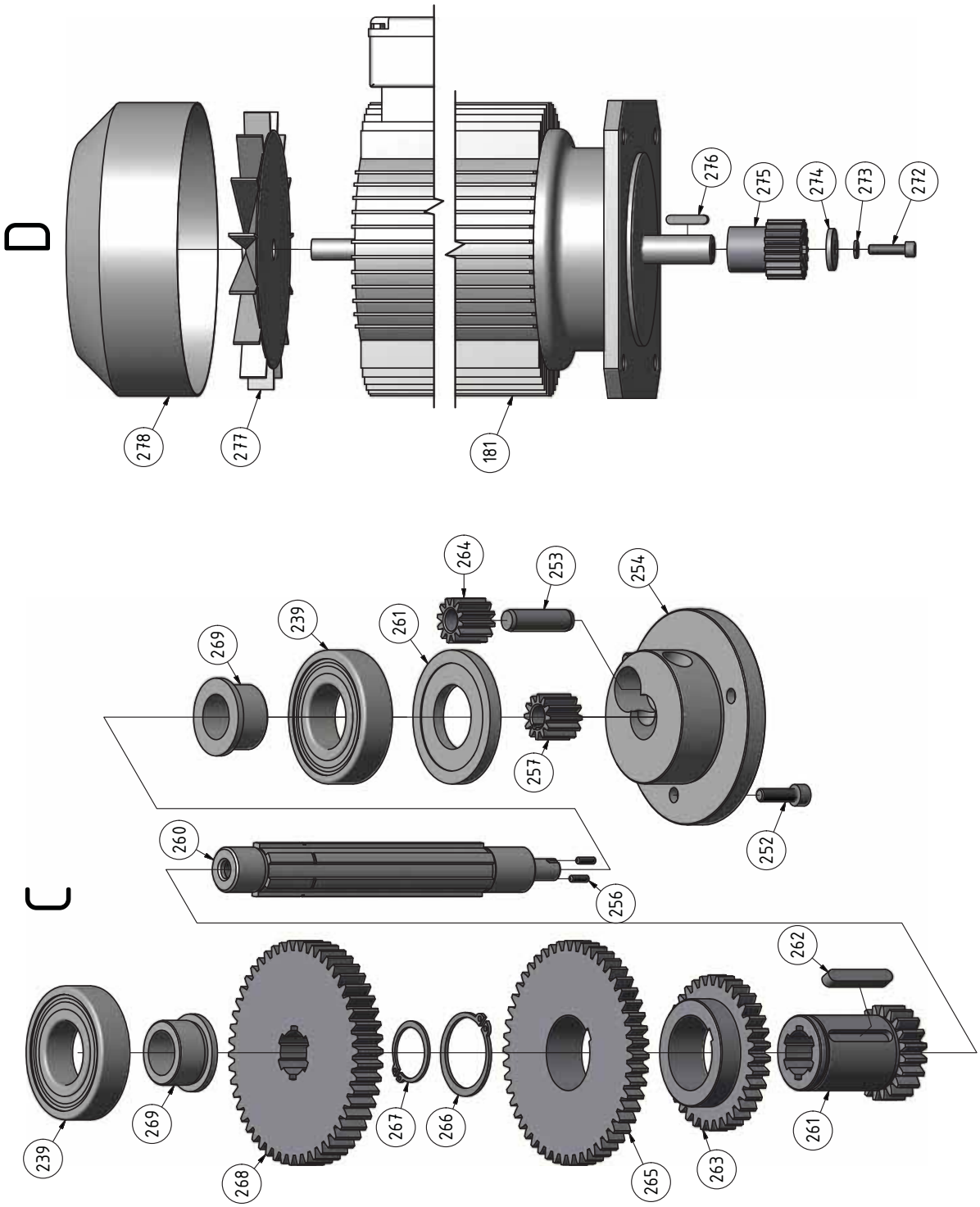

Abb. 7-3: Getriebe Bohrspindel 2 von 4 - Gear box main spindel 2 von 4

7.7 Getriebe Bohrspindel 3 von 4 - Gear box main spindel 3 of 4

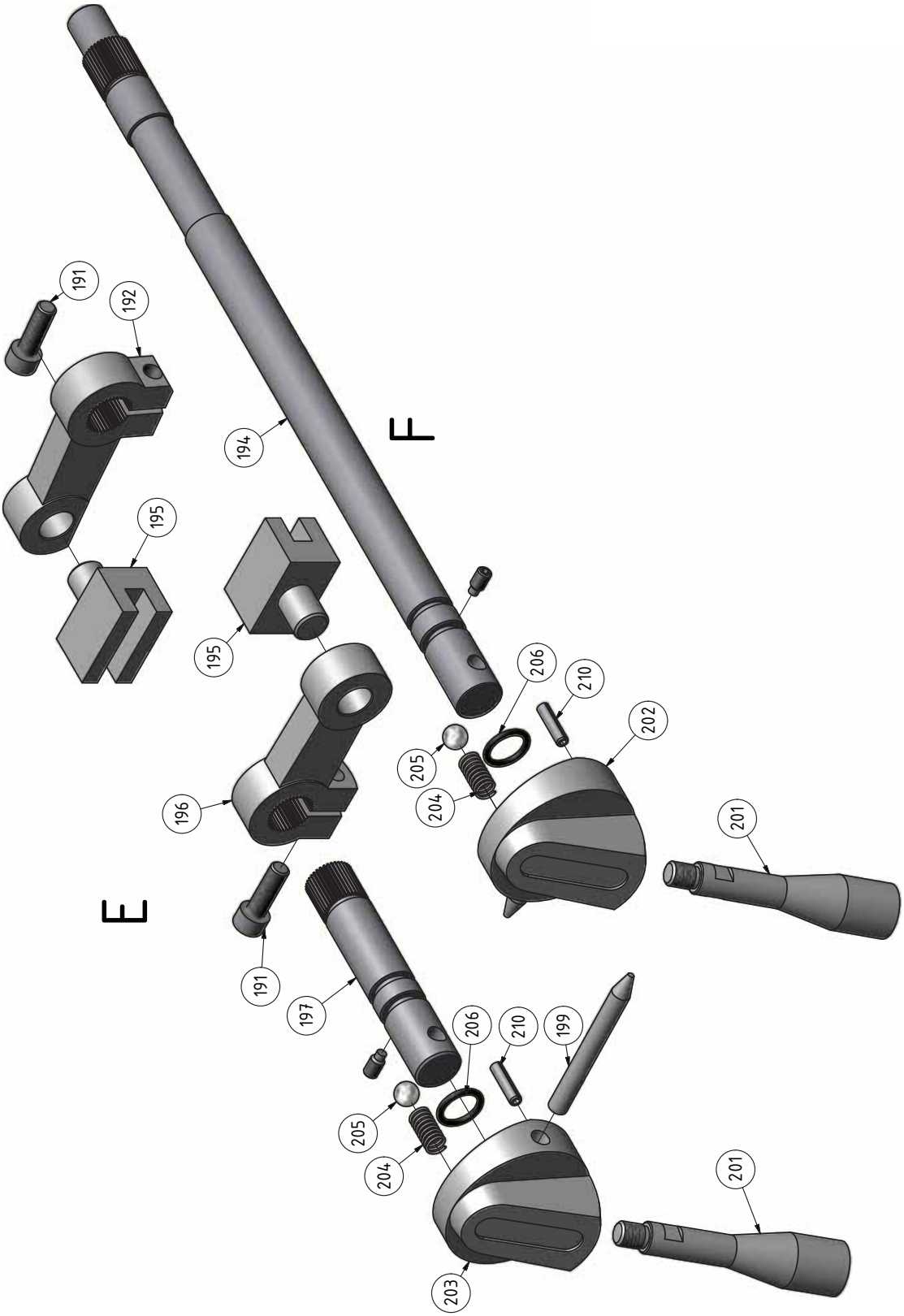

Abb. 7-4: Getriebe Bohrspindel 3 von 4 - Gear box main spindel 3 von 4

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7.8 Getriebe Bohrspindel 4 von 4 - Gear box main spindel 4 of 4

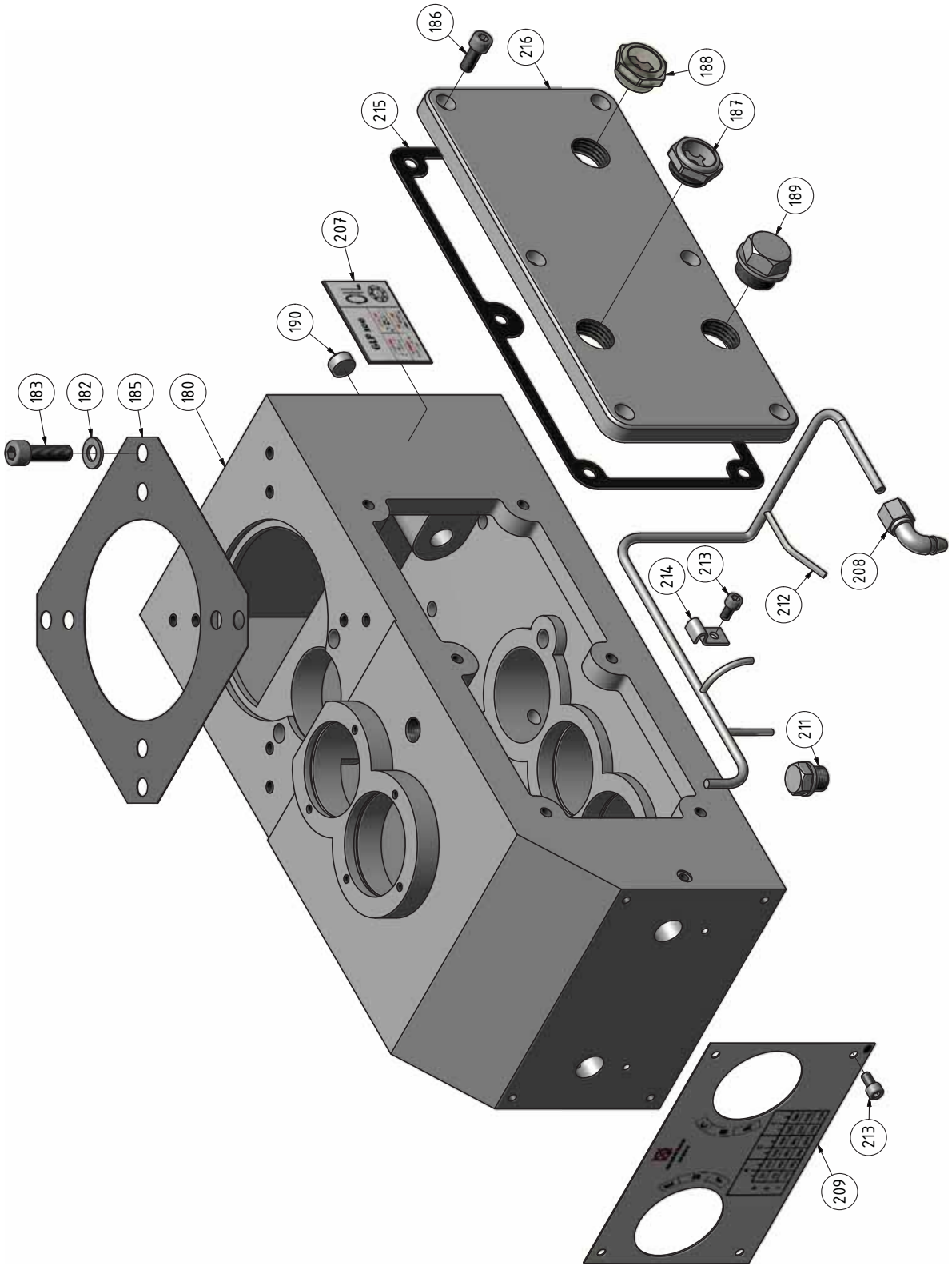

Abb. 7-5: Getriebe Bohrspindel 4 von 4 - Gear box main spindel 4 von 4

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B40 GSP - Ersatzteilliste Getriebe Bohrspindel - Spare part list gear box main spindel					
Pos.	Bezeichnung	Designation	Menge	Größe	Artikelnummer
			Qty.	Size	Item no.
180	Getriebegehäuse	Gear housing	1		03334403180CPL
181	Motor	Motor	1		03334400171
182	Scheibe	Washer	4	DIN 125 - A 10,5	
183	Innensechskantschraube	Socket head screw	4	GB 70-85 - M10 x 35	
185	Flachdichtung	Gasket	1		03334400174
186	Innensechskantschraube	Socket head screw	6	GB 70-85 - M8 x 20	
187	Ölschauglas	Oil sight glass	2	M27x1,5 / Kunststoff	03334400177
188	Ölschauglas	Oil sight glass	1	M27x1,5 / Alu	03334400178
189	Ablassschraube	Drain plug	1		03334403189
190	Stöpsel	Plug	1		
191	Innensechskantschraube	Socket head screw	2	GB 70-85 - M8 x 25	
192	Verschiebehebel	Fork lever	1		03334400182
194	Welle	Shaft	1		03334403194
195	Gabel	Fork	2		03334400183
196	Hebel	Lever	1		03334403196
197	Welle	Shaft	1		03334400187
199	Stift	Pin	2		03334400189
201	Hebel	Lever	2		03334400191
202	Aufnahme	Hub	1		03334400192
203	Aufnahme	Hub	1		03334400193
204	Feder	Spring	2		03334400194
205	Stahlkugel	Steel ball	2	Ø10mm	042KU10
206	O-Ring	O-Ring	2	DIN 3771 - 15 x 2,65	03334400196
207	Schild Ölkontrolle	Label oil control	1		
208	Adapter	Adapter	1		
209	Label	Label	1		03334400199
211	Belüftungsschraube	Vent screw	1		
212	Schmierungsrohr	Lubrication tube	1		03334403212
213	Innensechskantschraube	Socket head screw	5	GB 70-85 - M6 x 12	
214	Rohrklemme	Tube terminal	1		
215	Dichtung	Gasket	1		03334400205
216	Getriebedeckel	Cover	1		03334400206
217	Deckel	Cover	1		
218	Innensechskantschraube	Socket head screw	4	GB 70-85/M5x16	
221	Flansch	Flange	1		03334400207
222	O-Ring	O-Ring	1	DIN 3771 - 61,5 x 3,55	
223	Wellendichtring	Rotary shaft seal	1	DIN 3760 - AS - 40 x 55 x 7	04140557
225	Kugellager	Ball bearing	2	6008-2RZ	0406008R
226	Welle	Shaft	1		03334400212
227	Sicherungsring	Retaining ring	1	DIN 471 - 42x1,75	042SR42W

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228	Zahnrad	Gear	1		03334403228
230	Zahnrad	Gear	1		03334400216
231	Zahnrad	Gear	1		03334400217
232	Sicherungsring	Retaining ring	1	DIN 471 - 60x2	042SR60W
234	Deckel	Cover	1		
235	Sicherungsring	Retaining ring	2	DIN 472 - 68 x 2,5	042SR68I
236	Deckel	Cover	1		
237	O-Ring	O-Ring	1	DIN 3771 - 58 x 3,55 - N - NBR 70	03334400223
238	Sicherungsring	Retaining ring	2	DIN 472 - 62x2	042SR62I
239	Kugellager	Bearing ring	4	6206-2RZ	0406206R
240	Hülse	Bushing	4		03334400226
241	Zahnrad	Gear	1		03334400227
242	Zahnrad	Gear	1		03334400228
243	Welle	Shaft	1		03334400229
244	Passfeder	Fitting key	2	DIN 6885 - A 8 x 7 x 32	042P8735
245	Passfeder	Fitting key	1	DIN 6885 - A 8 x 7 x 40	042P8740
246	Zahnrad	Gear	1		03334400232
247	Zahnrad	Gear	1		03334400236
250	Abdeckung	Cover	1		
251	Abdeckung	Cover	1		
252	Innensechskantschraube	Socket head screw	3	GB 70-85 - M6 x 20	03334400241
253	Zylinderstift	Straight pin	1	GB 119-86 - B 10 x 35	03334400242
254	Lagerdeckel	Bearing cover	1		03334400243
256	Gewindestift	Grub screw	2	GB 80-85 - M3 x 10	03334400245
260	Welle	Shaft	1		03334400249
261	Zahnrad	Gear	1		03334400250
262	Passfeder	Fitting key	1	DIN 6885 - A 6 x 6 x 36	
263	Zahnrad	Gear	1		03334400252
264	Zahnrad	Gear	1		03334400253
265	Zahnrad	Gear	1		03334400254
266	Sicherungsring	Retaining ring	1	DIN 471 - 35x1,5	042SR35W
267	Sicherungsring	Retaining ring	1	DIN 471 - 25x1,2	042SR25W
268	Zahnrad	Gear	1		03334400257
269	Hülse	Bushing	4		03334400248
272	Innensechskantschraube	Socket head screw	1	GB 70-85 - M6 x 25	03334400258
273	Federring	Spring ring	1	DIN 127 - A 6	03334400259
274	Scheibe	Washer	1		03334400260
275	Zahnrad	Gear	1		03334400261
276	Passfeder	Fitting key	1	DIN 6885 - A 6 x 6 x 28	042P6628
277	Motorlüfter	Motor fan	1		03334400301
278	Motorlüfterdeckel	Motor fan cover	1		03334400302

7.9 Vorschubgetriebe - Feed gear box

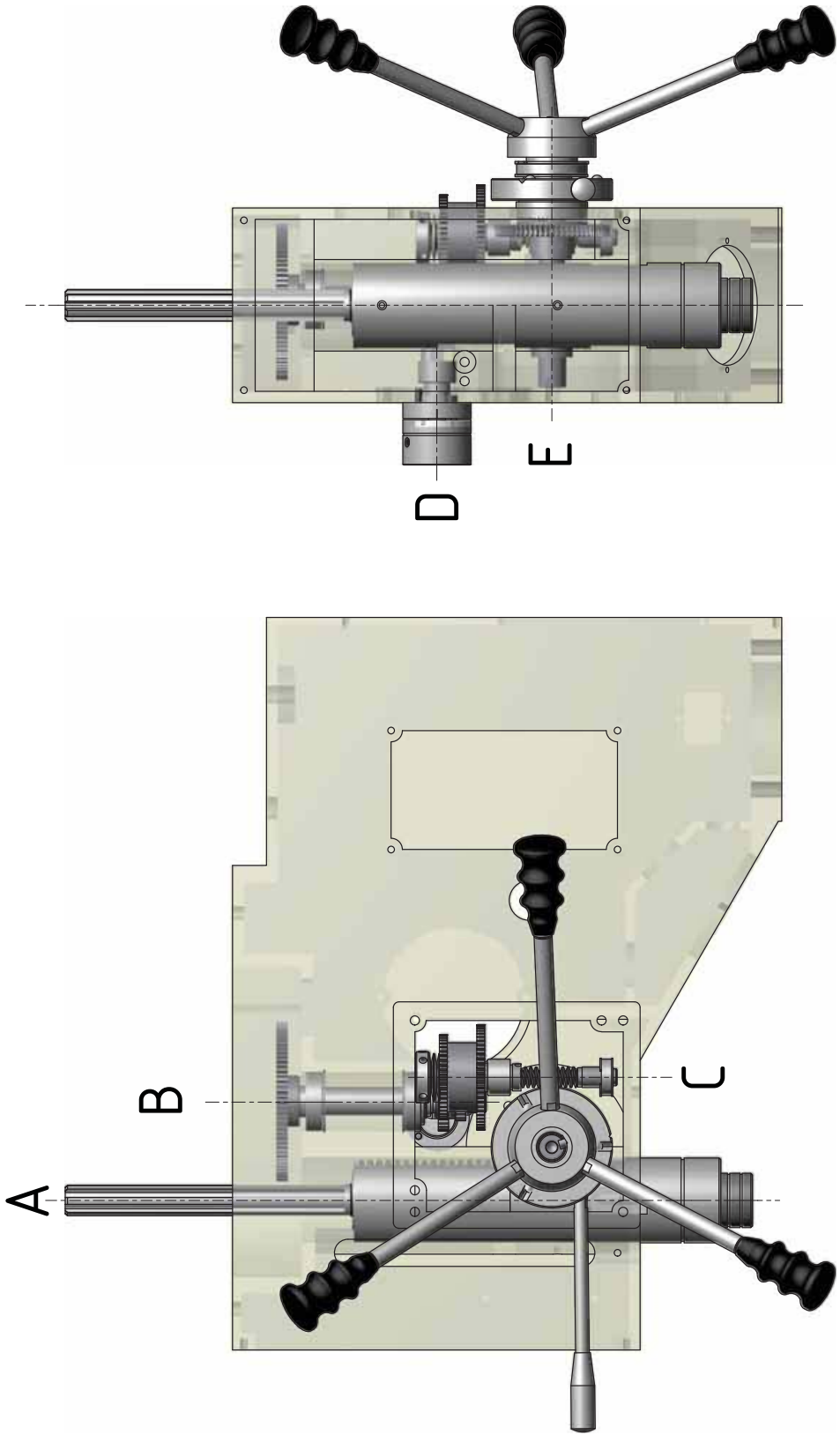

Abb. 7-6: Vorschubgetriebe - Feed gear box

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7.10 Vorschubgetriebe 1 von 4 - Feed gear box 1 of 4

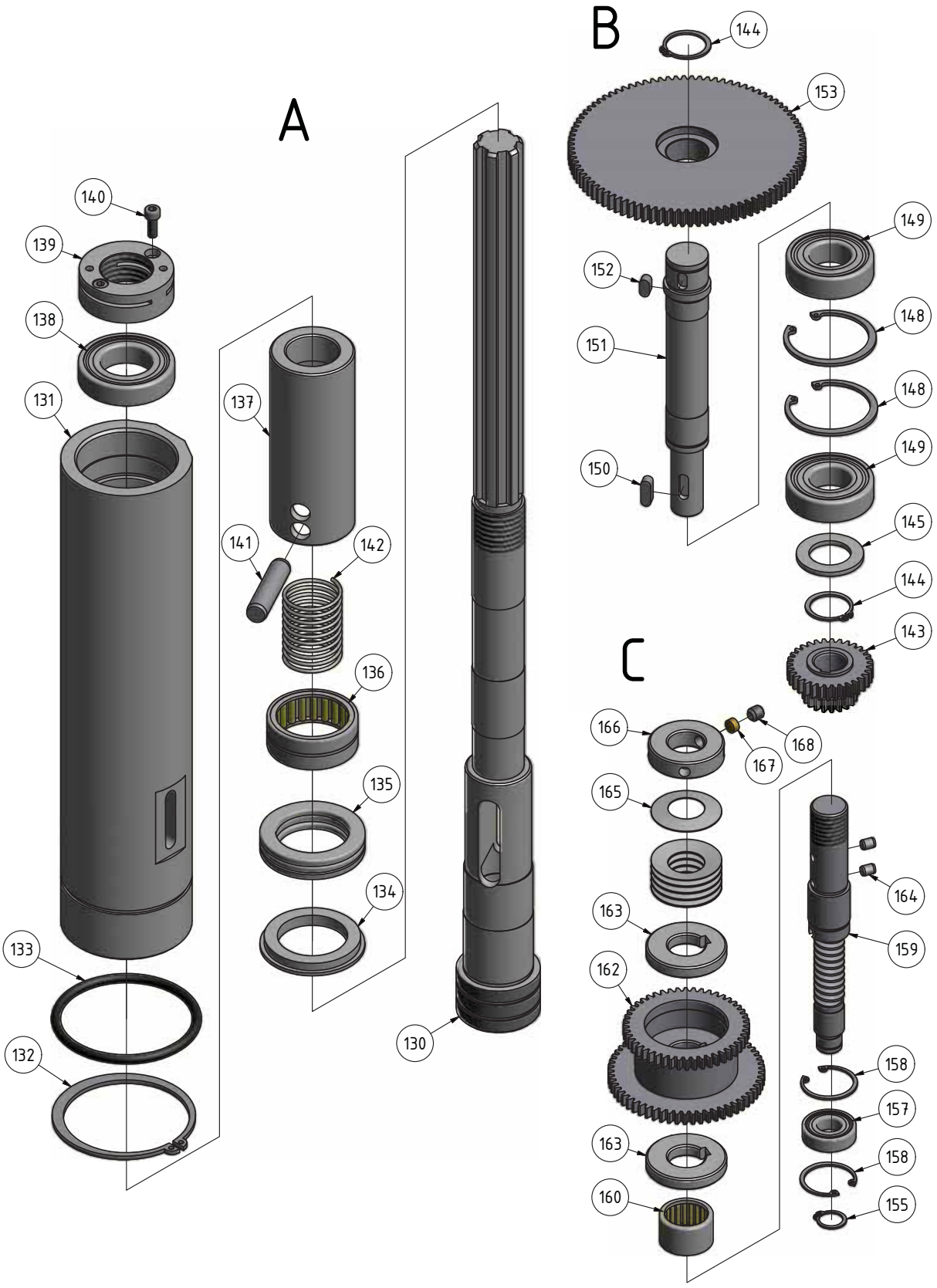

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Abb. 7-7: Vorschubgetriebe 1 von 4 - Feed gear box 1 of 4

7.11 Vorschubgetriebe 2 von 4 - Feed gear box 2 of 4

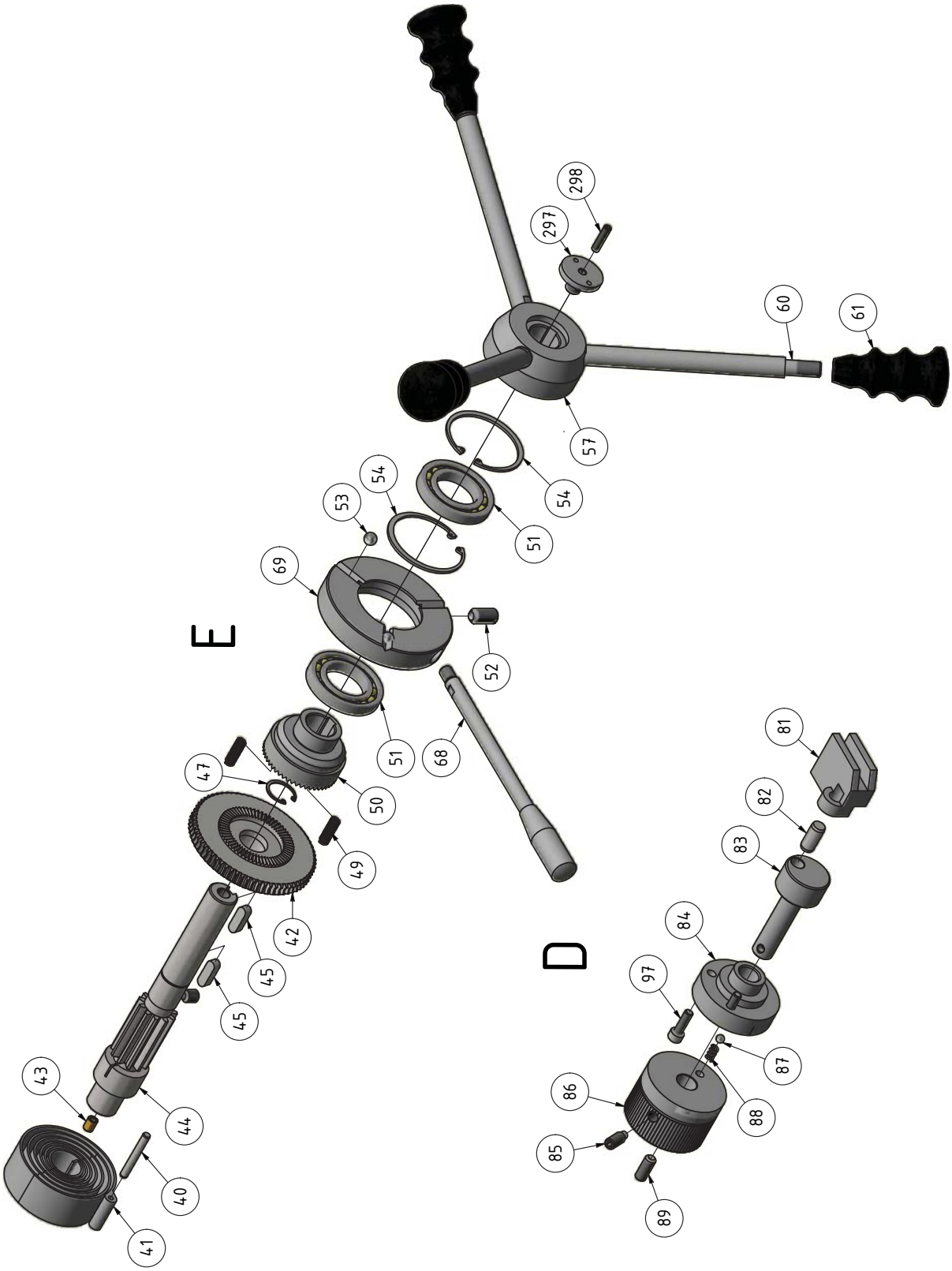

Abb. 7-8: Vorschubgetriebe 2 von 4 - Feed gear box 2 of 4

B40GSP_parts.fm

7.12 Vorschubgetriebe 3 von 4 - Feed gear box 3 of 4

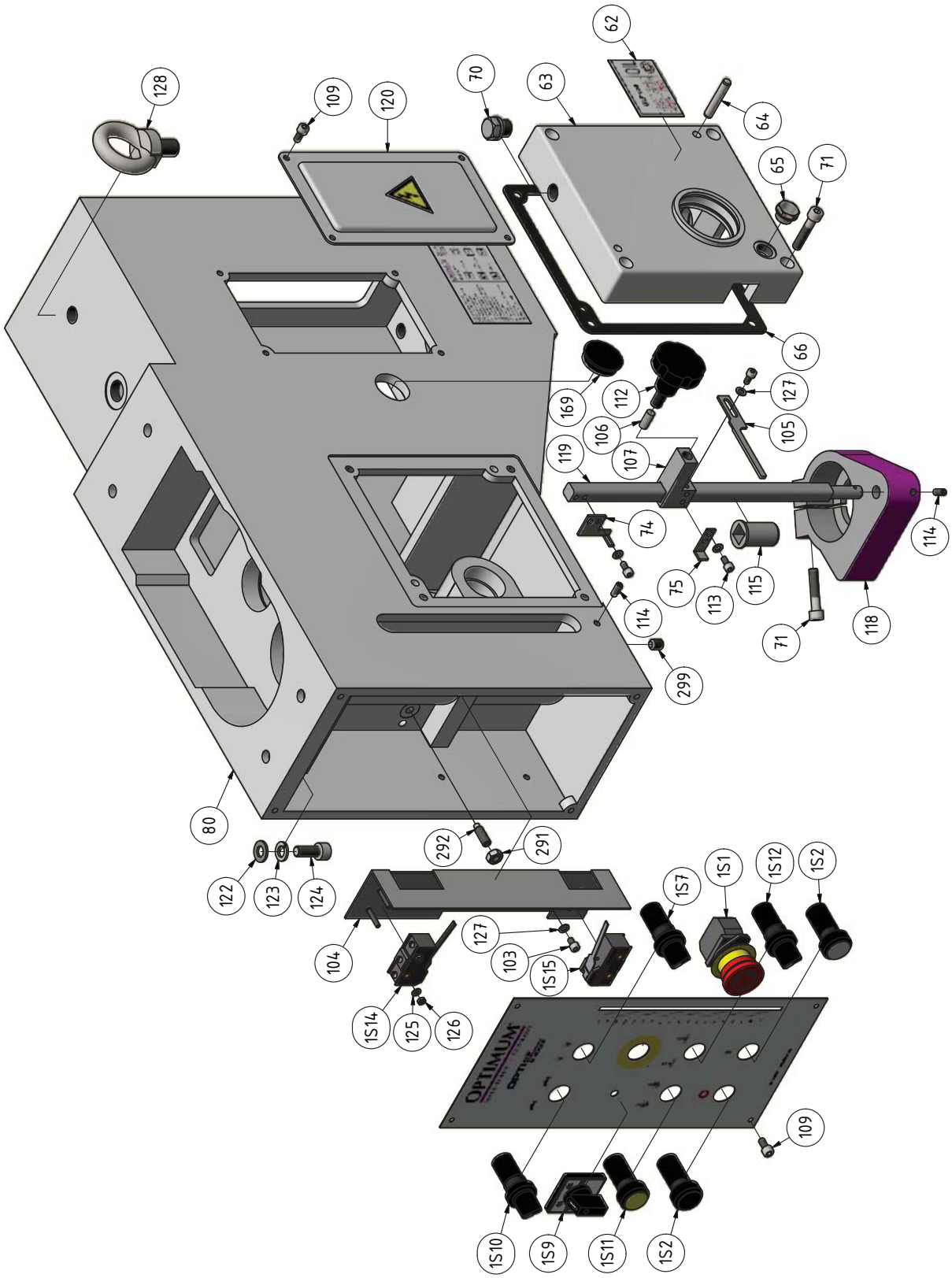

Abb. 7-9: Vorschubgetriebe 3 von 4 - Feed gear box 3 of 4

B40GSP_parts.fm

7.13 Vorschubgetriebe 4 von 4 - Feed gear box 4 of 4

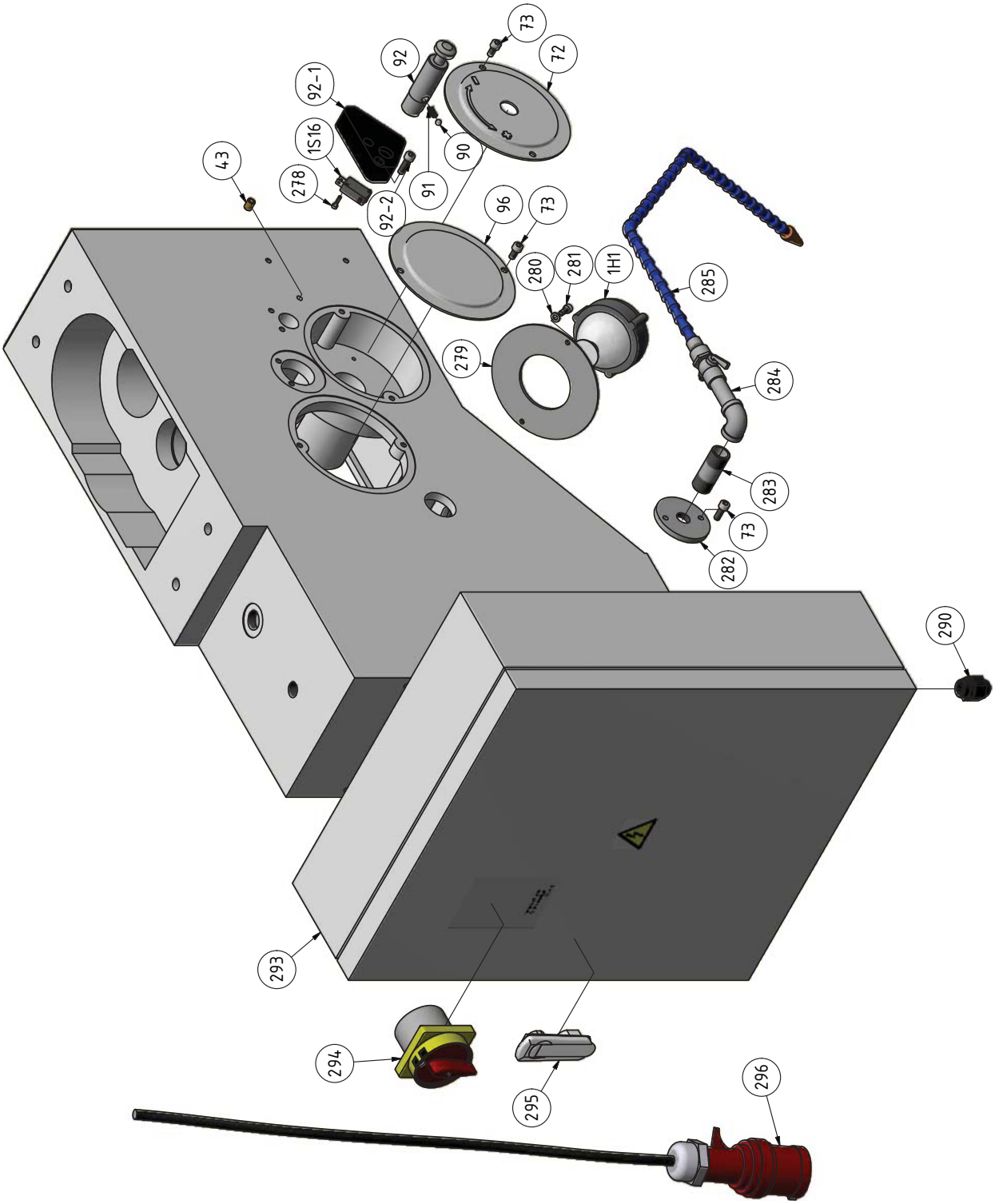

Abb. 7-10: Vorschubgetriebe 4 von 4 - Feed gear box 4 of 4

B40GSP_parts.fm

B40 GSP - Ersatzteilliste Vorschubgetriebe - Spare part list feed gear box					
Pos.	Bezeichnung	Designation	Menge	Größe	Artikelnummer
			Qty.	Size	Item no.
40	Zylinderstift	Straight pin	1	ISO 8734 - 6 x 45 - A	0333440042
41	Rückholfeder	Return spring	1		0333440043
41	Rückholfeder	Return spring	1		0333440043A
42	Zahnrad	Gear	1		0333440342
43	Schmiernippel	Oil Cup	2		0340114
44	Schaftritzel	Pinion shaft	1		0333440344
44	Schaftritzel	Pinion shaft	1		0333440344A
45	Passfeder	Fitting key	2	DIN 6885 - A 8 x 7 x 25	
47	Sicherungsring	Retaining ring	1	DIN 472 - 24x1,2	042SR24I
49	Feder	Spring	2		0333440349
50	Hülse	Sleeve	1		0333440350
51	Kugellager	Ball bearing	2	16007	04016007
52	Schraube	Screw	1		0333440352
53	Kugel	Ball	3	Ø8mm	042SKU08
54	Sicherungsring	Retaining ring	2	DIN 472 - 62x2	042SR62I
57	Nabe	Hub	1		0333440357
58	Scheibe	Washer	1		
60	Pinolenhebel	Level	1		0333440360
61	Griff	Handle	1		0333440361
63	Getriebedeckel	Feed box cover	1		0333440363
CPL	Vorschubgetriebe	Feed Gear box	1		0333440363CPL
64	Zylinderstift	Straight pin	2	ISO 8734 - 8 x 45 - A	
65	Ölschauglas	Sight glass	1		049GN541
66	Dichtung	Gasket	1		0333440062
69	Nabe	Hub	1		0333440369
70	Verschlussstopfen Öleinfüllöffnung	Fill oil plug	1		03334400108
71	Innensechskantschraube	Socket head screw	6	GB 70-85 - M8 x 40	
72	Platte	Plate	1		0333440041
73	Innensechskantschraube	Socket head screw	1	GB 70-85/M10x20	
74	Tiefanschlag oben	Block high	1		
74	Tiefanschlag unten	Block low	1		
80	Bohrkopfgehäuse	Housing	1		0333440380
81	Verschiebegabel	Shift Fork	1	Z5035_03_38	
82	Zylinderstift	Straight pin	1	ISO 8734 - 10 x 22 - A	0333440082
83	Verschiebhebel	Shift lever	1		0333440083
84	Drehsupport	Handle	1		0333440084
85	Gewindestift	Grub screw	1	ISO 4028 - M8 x 20	
86	Drehgriff	Handle	1		0333440086
87	Stahlkugel	Steel Ball	2		
88	Feder	Spring	3		
89	Gewindestift	Grub screw	1	GB 80-85 - M8 x 20	

90	Stahlkugel	Steel ball	1	6	042KU06
91	Feder	Spring	2	0,8x7x12	0333440091
92	Sperrbolzen	Lockbolt			0333440092
92	Sperrbolzen	Lockbolt			0333440092A
92-1	Gehäuse	Housing	1		0333440921
92-2	Innensechskantschraube	Socket head screw	1	GB 70-85/M6x20	
96	Platte	Plate	1		0333440096
97	Innensechskantschraube		4	GB 70-85 - M6 x 20	
103	Innensechskantschraube	Socket head screw	2	GB 70-85 - M5 x 8	
104	Platte	Plate	1		
105	Zeiger	Pointer	1		03334400105
109	Innensechskantschraube	Socket head screw	6	GB 70-85 - M6 x 12	
113	Innensechskantschraube	Socket head screw	6	GB 70-85 - M5 x 10	
114	Gewindestift	Grub screw	2	ISO 4027 - M6 x 16	03334400114
115	Stellring	Collar	1		03334400115
118	Halter	Holder	1		03334400118
119	Stange	Rod	1		03334400119
120	Deckel	Cover	1		03334400120
122	Scheibe	Washer	4	DIN 125 - A 10,5	
123	Federring	Spring washer	4	DIN 127 - A 10	
124	Innensechskantschraube	Socket head screw	4	GB 70-85 - M10 x 25	
125	Scheibe	Washer	4	DIN 125 - A 4,3	
126	Sechskantmutter	Hexagon nut	4	ISO 4032 - M4	
127	Scheibe	Washer	10	DIN 125 - A 5,3	
128	Ringschraube	Ring bolt	1	DIN 580 - M16 x 27	
130	Spindel	Spindle	1		03334400122
131	Pinole	Pinole	1		03334400123
132	Sicherungsring	Retaining ring	1	DIN 471 - 75x2,5	042SR75W
133	O-Ring	O-Ring	1	DIN 3771 - 75 x 5,3	
134	Unterlegscheibe	Washer	1		03334400126
135	Axial-Rillenkugellager	Groove ball thrust bearing	1	51108	04051108
136	Nadellager	Needle bearing	1		040RNA4932
137	Hülse	Bushing	1		03334400129
138	Kugellager	Ball bearing	1	6006-2RZ	0406006R
139	Klemmmutter	Clamping nut	1		03334400131
140	Innensechskantschraube	Socket head screw	2	GB 70-85 - M5 x 14	
141	Zylinderstift	Straight pin	2	ISO 8734 - 12 x 50 - A	03334400133
142	Feder	Spring	1		03334400134
143	Zahnrad	Gear	1		03334400135
144	Sicherungsring	Retaining ring	2	DIN 471 - 25x1,2	042SR25W
145	Scheibe	Washer	1		03334400137
148	Sicherungsring	Retaining ring	2	DIN 472 - 52 x 2	042SR52W
149	Kugellager	Ball bearing	2	6205-2RSL	0406205R
150	Passfeder	Fitting key	1	DIN 6885 - A 6 x 6 x 18	042P6618
151	Welle	Shaft	1		03334400143

B40GSP_parts.fm

152	Passfeder	Fitting key	1	DIN 6885 - A 6 x 6 x 14	042P6614
153	Zahnrad	Gear	1		03334400145
155	Sicherungsring	Retaining ring	1	DIN 471 - 15x1	042SR15W
157	Kugellager	Ball bearing	1	6002-2Z	0406002ZZ
158	Sicherungsring	Retaining ring	2	DIN 472 - 32x1,2	042SR32W
159	Getriebeschnecke	Worm gear	1		03334400151
160	Nadellager	Needle bearing	1	HK 2520	040HK2520
162	Zahnrad	Gear	1		03334400154
163	Stellring	Collar	2		03334400153
164	Zylinderstift	Straight pin	2	ISO 8734 - 6 x 14 - A	03334400156
165	Federscheibe	Spring washer	10		03334400157
166	Klemmmutter	Clamping nut	1		03334400158
167	Stift	Pin	1		03334400159
168	Gewindestift	Grub screw	1	GB 80-85 - M8 x 8	
169	Stopfen	Plug	2		03334400169
278	Innensechskantschraube	Socket head screw	2	GB 70-85 - M3 x 12	
279	Aufnahme	Collet	1		03334400279
280	Scheibe	Washer	10	DIN 125 - A 5,3	
281	Innensechskantschraube	Socket head screw	2	GB 70-85 - M5 x 12	
282	Flansch	Flange	1		
283	Verbindungsstück	Adapter	1		03334400283
284	Dosierhahn/ Kühlmittel	Lever tap/coolant	1		03334400284
285	Kühlmittelschlauch	Coolant hose	1		0340316
286	Schaltkasten alt bis 2012	Electric box old to 2012	1		
290	Zugentlaster	Bushing	1		
291	Sechskantmutter	Hexagon nut	1	DIN4032/M8	
292	Gewindestift	Grub screw	1	ISO4028/M8x25	
293	Schaltkasten alt bis 2012	Electric box old to 2012	1		03334403286CPL
293	Schaltkasten neu ab 2012	Elektik box neu from 2012	1		03334403293CPL
294	Hauptschalter	Main switch	1		03334400294
295	Schloss	Lock	1		03334400295
296	Stecker 400 V	Connector 400V	1		
297	Klemmschraube	Clamp screw	1		03401150457
298	Madenschraube	Grub screw	1	M6x35	
299	Ölablassschraube	Oil drain screw	1		03334400108
0	Pinole kpl.	Pinole cpl.	1		03334400123CPL

7.14 Säule und Bohrtisch - Column and drilling table

Abb. 7-11: Säule und Bohrtisch - Column and drilling table

B40 GSP - Ersatzteilliste Säule und Bohrtisch - Spare part list column and drilling table					
Pos.	Bezeichnung	Designation	Menge	Größe	Artikelnummer
			Qty.	Size	Item no.
1	Maschinenfuß	Machine base	1		0333440001
2	Befestigungsplatte	Plate	1		0333440002
3	Innensechskantschrauben	Hexagon socket screws	4	GB 70-85 - M6 x 12	
4	Kühlmittelpumpe	Coolant pump	1		0333440004
5	Innensechskantschraube	Socket head screw	4	GB 70-85 - M5 x 12	
6	Handgriff	handle	1		0333440006
6-1	Schraube	Screw	1		
7	Hebel	Lever	1		0333440007
8	Gewindestift	Grub screw	2	GB 79-85 - M10 x 10	0300820134
9	Klemmring	Clamping ring	1		0333440009
10	Antriebsschnecke	Worm drive	1		0333440010
11	Klemmhebel	Clamping lever	3		0333440011
12	Gewindestange	Handle shaft	3		0333440012
13	Innensechskantschraube	Socket head screw	2	GB 70-85 - M14 x 60	
14	Platte	Plate	1		
15	Zahnrad	Gear	1		0333440015
16	Innensechskantschraube	Socket head screw	1	GB 70-85 - M8 x 30	
17	Zahnstange	Rack	1		0333440017
18	Bohrsäule	Column	1		0333440018
20	Innensechskantschraube	Socket head screw	8	GB 70-85 - M14 x 60	
21	Abdeckplatte	Cover plate	1		0333440021
22	Innensechskantschraube	Socket head screw	1	GB 70-85 - M8 x 25	
23	Reduzier	Reducing nipple	1		0333440023
25	Flexibler Schlauch	Flexible tube	1	16x1,5x1300	0333440025
27	Verschraubung	Fitting	1		
30	Schmiernippel	Oil cup	2		
31	Welle	Shaft	1		0333440031
32	Bohrtischträger	Support	1		0333440032
33	Bohrtisch	Table	1		0333440033
34	Innensechskantschraube	Socket head screw	4	GB 70-85 - M14 x 50	
35	Scheibe	Washer	3	DIN 125 - A 17	0333440035
36	Kühlmittelfilter	Coolant pump filter	1		03020285304
37	Schlauchbinder	Hose fitting	2		
0	Zubehör kpl.	Accesory box cpl.			0333440000

7.15 Bohrfutterschutz - Drilling chuck protection

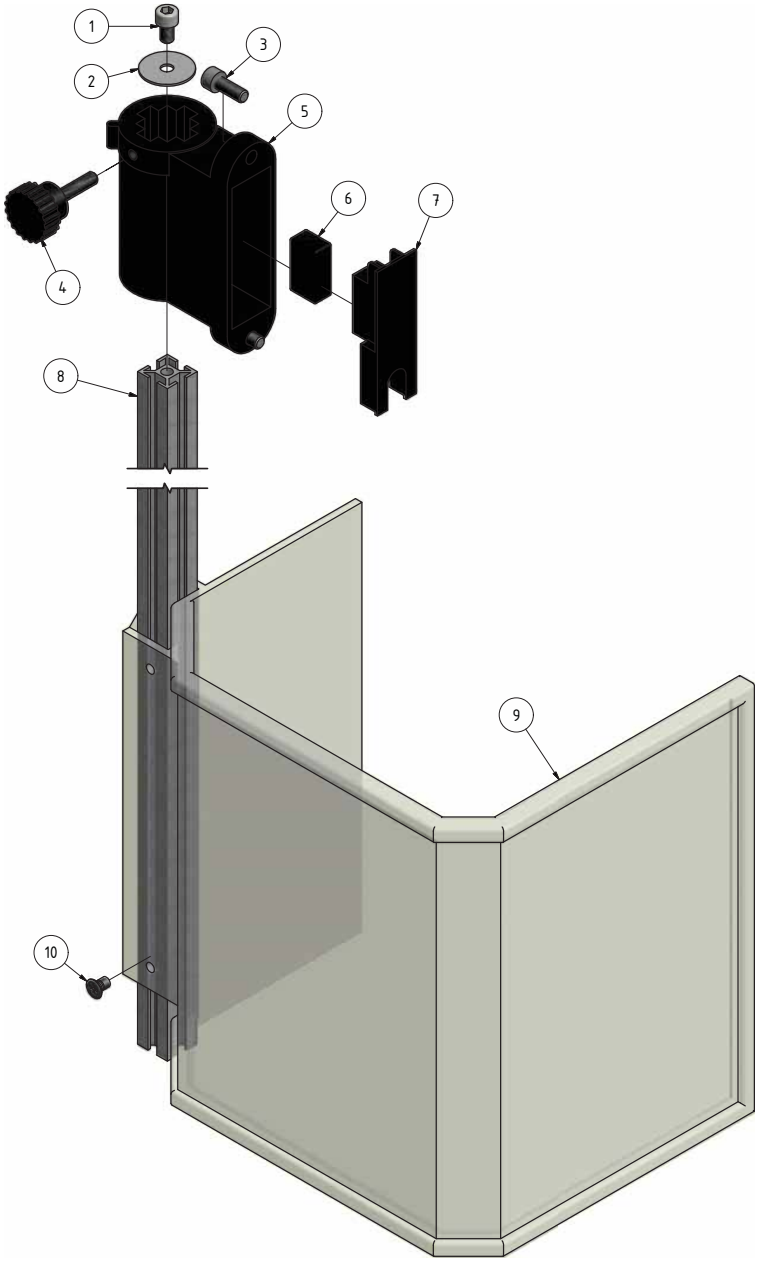

Abb. 7-12: Bohrfutterschutz - Drilling chuck protection

B40 GSP - Ersatzteilliste Bohrfutterschutz- Spare part list drilling chuck protection					
Pos.	Bezeichnung	Designation	Menge	Größe	Artikelnummer
			Qty.	Size	Item no.
1	Innensechskantschraube	Socket head screw	1	GB 70-85 - M6 x 10	
2	Scheibe	Washer	1		
3	Innensechskantschraube	Socket head screw	2	GB 70-85 - M6 x 16	
4	Rändelschraube	Knurled screw	1		03003171208
5	Halterung	Fixture	1		0302024149CPL
6	Mikroschalter	Microswitch	1		030031712018V2

B40GSP_parts.fm

7	Platte	Plate	1		030031712019
8	Alu- Profil	Aluminium profile	1		0302130381
9	Bohrfutterschutz kpl.	Drill chuck protection cpl.	1		03334403170
10	Schraube	Screw	2	GB819-85/M5x8	

7.16 Maschinenschilder - Machine labels

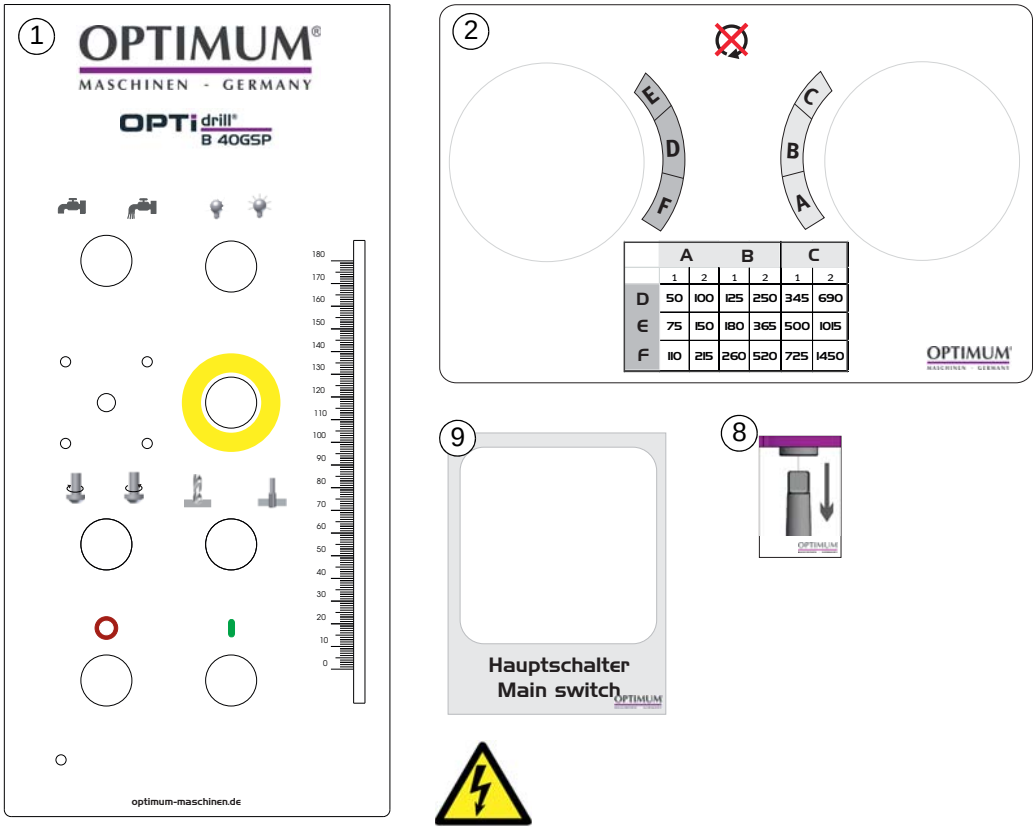

Abb. 7-13: Maschinenschilder - Machine labels

B40 GSP - Maschinenschilder - Machine labels					
Pos.	**Bezeichnung**	**Designation**	**Menge**	**Grösse**	**Artikelnummer**
			Quantity	**Size**	**Article no.**
1	Frontschild	Front label	1		
2	Getriebeschild	Gear box label	1		
4	Hinweisschild	Instruction label	1		03334400199
8	Hinweisschild	Instruction label	1		
9	Schild Hauptschalter	Main switch label	1		

7.17 Schaltplan - Wiring diagram

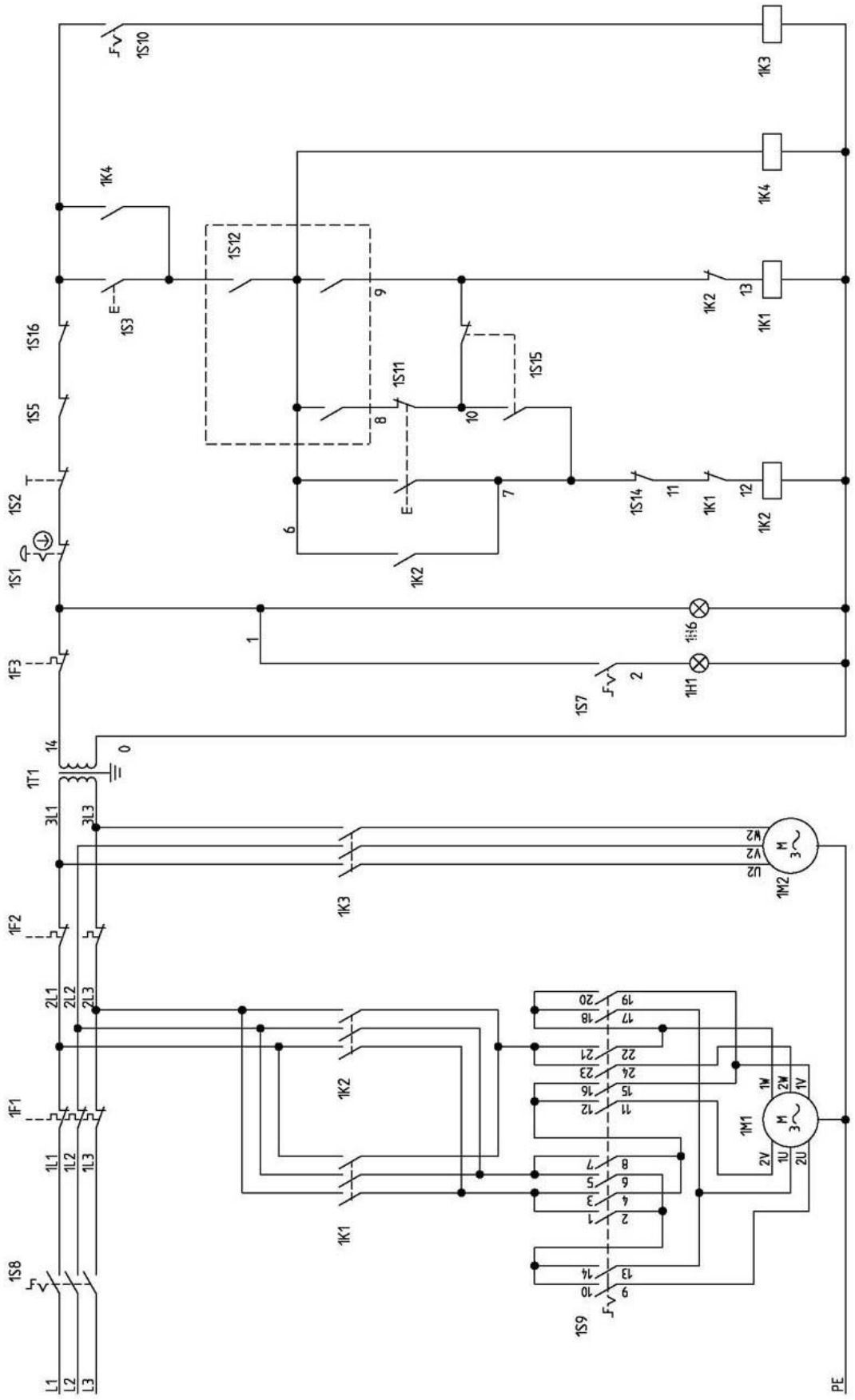

Abb. 7-14: Schaltplan - Wiring diagram

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B40 GSP - Ersatzteilliste Elektrik- Spare part list electric					
Pos.	Bezeichnung	Designation	Menge	Größe	Artikelnummer
			Qty.	Size	Item no.
1S1	NOT-Halt Schalter	Emergency stop button	1	KPMT3-10R	03334400SB0
1S2	Drucktaster "Aus"	Button "off"	1	CP1-10Y-01	0460001
1S3	Schalter "Ein"	Button "on"	1	KB1-11G	03334403SB1
1S5	Schalter Bohrfutterschutz	Drilling chuck safety switch	1		
1S7	Schalter Maschinenbeleuchtung	Switch machine light	1	C2SS1-10B-10	
1S8	Hauptschalter	Main switch	1	LW8GS-20	03334400294
1S9	Stufenschalter Motor	Step switch motor	1	LW8-20/3B312	03334400SA
1S10	Schalter Kühlmittelpumpe	Switch coolant pump	1	C2SS1-10B-10	03034503SA1
1S11	Drehrichtungsschalter	Change over switch	1	CP1-10Y-11	0460011
1S12	Wahlschalter Betriebsart	Operating mode switch	1	K3SS1-10B+KCBH-30	03334400SA2
1S14	Endschalter oben	Limited switch high	1	JW2-11	
1S15	Endschalter unten	Limited switch low	1	JW2-11	
1S16	Schalter Automatischer Austreiber	Automatic drift switch	1		
1H1	Glühlampe Maschinenbeleuchtung	Lamp machine light	1	JC34A/ 50W-24V	
1H6	Betriebskontrollleuchte	Operating control light	1	KCBH-10	
1F1	Motorschutzschalter	Motor protection switch	1	DZ451-63	
1F2	Motorschutzschalter Kühlmittelpumpe	Motor protection switch coolant pump	1	DZ451-63	
1F3	Schutzschalter	Protective switch	1	DZ451-63-C5	
1K1	Relais	Relay	1	3TB4122 24V	0460020
1K2	Relais	Relay	1	3TB4122 24V	0460020
1K3	Relais	Relay	1	3TH8040 24V	0460022
1K4	Relais	Relay	1	3TH8040 24V	0460022
1T1	Transformator	Transformer	1	JBK5-100	0460045
1M1	Antriebsmotor	Driving motor	1	YAL-90L-4V1	03334400171
1M2	Motor Kühlmittelpumpe	Motor cooling pump	1	AYB-12	
0	Schutzglas Tischbeleuchtung	Glas for table light	1		
0	Lampe kpl.	Lamp cpl.	1		03334400EL1

Schmierstoffe Lubricant Lubrifiant	Viskosität Viskosity Viscosité ISO VG DIN 51519 mm²/s (cSt)	Kennzeich-nung nach DIN 51502	ARAL	BP	Esso	Klüber Lubrication	Mobil	Shell	Texaco
Getriebeöl Gear oil Huile de réducteur	VG 680	CLP 680	Aral Degol BG 680	BP Energol GR-XP 680	SPARTAN EP 680	Klüberoil GEM 1-680	Mobilgear 636	Shell Omala 680	Meropa 680
	VG 460	CLP 460	Aral Degol BG 460	BP Energol GR-XP 460	SPARTAN EP 460	Klüberoil GEM 1-460	Mobilgear 634	Shell Omala 460	Meropa 460
	VG 320	CLP 320	Aral Degol BG 320	BP Energol GR-XP 320	SPARTAN EP 320	Klüberoil GEM 1-320	Mobilgear 632	Shell Omala 320	Meropa 320
	VG 220	CLP 220	Aral Degol BG 220	BP Energol GR-XP 220	SPARTAN EP 220	Klüberoil GEM 1-220	Mobilgear 630	Shell Omala 220	Meropa 220
	VG 150	CLP 150	Aral Degol BG 150	BP Energol GR-XP 150	SPARTAN EP 150	Klüberoil GEM 1-150	Mobilgear 629	Shell Omala 150	Meropa 150
	VG 100	CLP 100	Aral Degol BG 100	BP Energol GR-XP 100	SPARTAN EP 100	Klüberoil GEM 1-100	Mobilgear 627	Shell Omala 100	Meropa 100
	VG 68	CLP 68	Aral Degol BG 68	BP Energol GR-XP 68	SPARTAN EP 68	Klüberoil GEM 1-68	Mobilgear 626	Shell Omala 68	Meropa 68
	VG 46	CLP 46	Aral Degol BG 46	BP Bartran 46	NUTO H 46 (HLP 46)	Klüberoil GEM 1-46	Mobil DTE 25	Shell Tellus S 46	Anubia EP 46
	VG 32	CLP 32	Aral Degol BG 32	BP Bartran 32	NUTO H 32 (HLP 32)	Klübersynth GEM 4- 32 N	Mobil DTE 24	Shell Tellus S 32	Anubia EP 32
Hydrauliköl Hydraulic oil Huile hydraulique	VG 32	CLP 32	Aral Vitam GF 32	BP Energol HLP HM 32	NUTO H 32 (HLP 32)	LAMORA HLP 32	Mobil Nuto HLP 32	Shell Tellus S2 M 32	Rando HD HLP 32
	VG 46	CLP 46	Aral Vitam GF 46	BP Energol HLP HM 46	NUTO H 46 (HLP 46)	LAMORA HLP 46	Mobil Nuto HLP 46	Shell Tellus S2 M 46	Rando HD HLP 46
Getriebefett Gear grease Graisse de réducteur		G 00 H-20	Aral FDP 00 (Na-verseift) Aralub MFL 00 (Li-verseift)	BP Energrease PR-EP 00	FIBRAX EP 370 (Na-verseift)	MICRO-LUBE GB 00	Mobilux EP 004	Shell Alva-nia GL 00 (Li-verseift)	Marfak 00

Spezialfette, wasserabweisend Special greases, water resistant Graisses spéciales, déperlant			Aral Aralub	Energrease PR 9143		ALTEMP Q NB 50 Klüberpaste ME 31-52	Mobilux EP 0 Mobil Grea-serex 47		
Wälzlagerfett Bearing grease Graisse de roulement		K 3 K-20 (Li-verseift)	Aralub HL 3	BP Energrease LS 3	BEACON 3	CENTO-PLEX 3	Mobilux 3	Shell Alva-nia R 3 Alva-nia G 3	Multifak Pre-mium 3
Öle für Gleitbahnen Oils for slideways Huiles pour glissières	VG 68	CGLP 68	Aral Deganit BWX 68	BP Maccurat D68	ESSO Febis K68	LAMORA D 68	Mobil Vactra Oil No.2	Shell Tonna S2 M 68	Way lubri-cant X 68
Öle für Hochfrequenzspin-deln Oils for Built-in spindles Huiles pour broches à haute vitesse	VG 68		Deol BG 68	Emergol HLP-D68	Spartan EP 68		Drucköl KLP 68-C	Shell Omala 68	
Fett für Zentralschmierung (Fließfett) Grease for central lubrica-tion Graisse pour lubrification centrale	NLGI Klasse 000 NLGI class 000		ARALUB BAB 000	Grease EP 000	Shell Gadus S4 V45AC	CENTO-PLEX GLP 500	Mobilux EP 023		Multifak 264 EP 000
Fett für Hochfrequenzspin-deln Grease for Built-in spindles Graisse pour broches à haute vitesse	METAFLUX-Fett-Paste (Grease paste) Nr. 70-8508 METAFLUX-Moly-Spray Nr. 70-82 Techno Service GmbH ; Detmolder Strasse 515 ; D-33605 Bielefeld ; (++49) 0521- 924440 ; www.metaflux-ts.de								
Kühlschmiermittel Cooling lubricants Lubrifiants de refroidisse-ment	Schneidöl Aquacut C1, 10 L Gebinde, Artikel Nr. 3530030 EG Sicherheitsdatenblatt http://www.optimum-daten.de/data-sheets/Optimum-Aqua-cut_C1-EC-datas-heet_3530030_DE.pdf		Aral Emusol	BP Sevora	Esso Kutwell		Mobilcut	Shell Adrana	Chevron Soluble Oil B

8 Malfunctions

Malfunction	Cause / possible effects	Solution
Noise during work.	• Spindle is too little lubricated • Tool is blunt or wrongly clamped	• Grease spindle • Use new tool and check securing (fixed setting of the bit, bit holder and chuck).
Bit „burnt“	• Drill speed too high /feed too high • Chips do not come out of the drill hole • Drill blunt • No or too little cooling	• Select another speed Extract drill more often during work Sharpen or use new drill • Use cooling agent
Drill tip is running off centre, the drilled hole is non-round	• Hard points on the workpiece • Length of the cutting spirals/or angles on the tool are unequal. • Drill deformed	• Use new drill
Drill bit defective.	• No base / support used.	• Use support and clamp it with the workpiece
Drill bit runs unround or wobbles.	• Drill deformed • Worn out spindle bearings • Drill is not correctly clamped. • Drill chuck defective	• Use new drill • Have the spindle bearings replaced • Correctly clamp drill • Replace the drill chuck
It is not possible to insert the drill chuck or the taper mandrel	• Dirt, grease or oil on the taper inside of the drill chuck or on the taper surface of the drill spindle	• Clean surfaces well • Keep surfaces free of grease
Motor does not start	• Motor is wrongly connected • Defective fuse	• Have it checked by authorised personnel
Motor is overheating and there is no power	• Motor overloaded • Too low mains voltage • Motor is wrongly connected	• Reduce feed rate Disconnect immediately and have it checked by authorized personnel • Have it checked by authorised personnel
Precision of the work deficient	• Irregularly heavy or tensed workpiece • Inexact horizontal position of the part holder	• Balance the piece statically and secure without straining • Adjust part-holder
Drilling spindle sleeve does not return to its initial position	• Spindle return spring does not work • Locking bolt inserted	• Check spindle return spring, replace it, if necessary • Pull out locking pin
The drilling sleeve may not be moved downwards.	• Locking bolt inserted • Drill depth adjustment no released	• Pull out locking pin • Release drill depth adjustment
Spindle bearing overheating	• Bearing worn down • Bearing pretension is too high • Working at high drilling speed over a longer period of time.	• Replace • Reduce bearing slack for fixed bearing (conical-roller bearing) • Reduce drill speed and feed rate

Malfunction	Cause / possible effects	Solution
Working spindle rattling on rough piece surfaces	• Excessive slack in bearing • Working spindle moves up and down • Adjustment strip loose • Clamping chuck is loose • Tool is blunt • Workpiece is loose	• Readjust bearing slack or replace bearing • Readjust bearing clearance (fixed bearing) • Adjust strip to the correct slack using the adjusting screw • Check, re-tighten. • Sharpen or replace tool • Clamp the workpiece firmly.

9 Appendix

9.1 Liability claims for defects / warranty

Beside the legal liability claims for defects of the customer towards the seller the manufacturer of the product, OPTIMUM GmbH, Robert-Pfleger-Straße 26, D-96103 Hallstadt, does not grant any further warranties unless they are listed below or had been promised in the frame of a single contractual agreement.

- The processing of the liability claims or of the warranty is performed as chosen by OPTIMUM GmbH either directly or through one of its dealers.
  Any defective products or components of such products will either be repaired or replaced by components which are free from defects. The property of replaced products or components passes on to OPTIMUM Maschinen Germany GmbH.
- The automatically generated original proof of purchase which shows the date of purchase, the type of machine and the serial number, if applicable, is the precondition in order to assert liability or warranty claims. If the original proof of purchase is not presented, we are not able to perform any services.
- Defects resulting of the following circumstances are excluded from liability and warranty claims:
  - Using the product beyond the technical options and proper use, in particular due to overstraining of the machine.
  - Any defects arising by one's own fault due to faulty operations or if the operating manual is disregarded.
  - Inattentive or incorrect handling and use of improper equipment.
  - Non-authorized modifications and repairs.
  - Insufficient installation and safeguarding of the machine
  - Disregarding the installation requirements and conditions of use.
  - Atmospheric discharges, overvoltage and lightning strokes as well as chemical influences.
- The following items are as well not subject to the liability or warranty claims:
  - Wearing parts and components which are subject to a standard wear as intended such as e.g. V-belts, ball bearings, illuminants, filters, sealings, etc.
  - Non reproducible software errors
- Any services which OPTIMUM GmbH or one of its agents performs in order to fulfill in the frame of an additional guarantee are neither an acceptance of the defects nor an acceptance of its obligation to compensate. Such services do neither delay nor interrupt the warranty period.
- Place of jurisdiction among traders is Bamberg.
- If one of the above mentioned agreements is totally or partially inefficient and/or null, it is considered as agreed what is closest to the will of the warrantor and which remains in the framework of the limits of liability and warranty which are predefined by this contract.

9.2 Storage

ATTENTION!

In case of wrong and improper storage electrical and mechanical machine components might get damaged and destroyed.

Store packed and unpacked parts only under the intended environmental conditions.

Follow the instructions and information on the transport case:

- Fragile goods
  (Goods require careful handling)

- Protect against moisture and humid environment

☞ Environmental conditions on page 19

- Prescribed position of the packing case
  (marking the top side – arrows pointing upward)

- Maximum stacking height

  Example:not stackable - do not stack a second packing case
  on top of the first packaging case

Consult Optimum Maschinen Germany GmbH if the machine and accessories are stored for more than three months or are stored under different environmental conditions than those given here.

9.3 Note regarding disposal / options to reuse:

Please dispose of your device environmentally friendly by disposing of scrap in a professional way.

Please neither throw away the packaging nor the used machine later on, but dispose of them according to the guidelines established by your city council/municipality or by the corresponding waste management enterprise.

9.3.1 Decommissioning

CAUTION!

Immediately decommission used machines in order to avoid later misuse and endangering of the environment or of persons.

- **Dsconnect the plug from the power supply.**
- **Cut the connection cable.**
- **Remove all environmentally hazardous operating fluids from the used device.**
- **If applicable remove batteries and accumulators.**
- **Disassemble the machine if required into easy-to-handle and reusable assemblies and component parts.**
- **Supply the machine components and operating fluids to the provided disposal routes.**

9.3.2 Disposal of the packaging of new devices

All used packaging materials and packaging aids of the machine are recyclable and generally need to be supplied to the material reuse.

The packaging wood can be supplied to the disposal or the reuse.

Any packaging components made of cardboard box can be chopped up and supplied to the waste paper collection.

The films are made of polyethylene (PE) and the cushion parts are made of polystyrene (PS). These materials can be reused after reconditioning if they are forwarded to a collection station or to the appropriate waste management enterprise.

Only forward the packaging materials correctly sorted to allow a direct reuse.

9.3.3 Disposing of the old device

INFORMATION

Please make sure in your own interest and in the interest of the environment that all component parts of the machine will be disposed of in the provided and admitted ways.

Please note that the electrical devices include lots of reusable materials as well as environmentally hazardous components. Account for separate and professional disposal of the component parts. In case of doubt, please contact your municipal waste management. If appropriate, call on the help of a specialist waste disposal company for the treatment of the material.

9.3.4 Disposal of electrical and electronic components

Please make sure that electrical components are disposed of in a professional way according to the legal requirements.

The device includes electric and electronic components and must not be disposed of with the rubbish. According to the European directive regarding electrical and electronic used devices and the execution of national rights used electrical tools and electrical machines need to be collected separately and be supplied to an environmentally compatible reuse.

Being the machine operator you should obtain information regarding the authorized collection or disposal system which applies for your company.

Please make sure that the batteries and/or accumulators are disposed of in a professional way according to the legal regulations. Please only throw discharged batteries in the collection boxes in shops or at municipal waste management companies.

9.3.5 Disposal of lubricants and coolants

ATTENTION!

Please imperatively make sure to dispose of the used coolant and lubricants in an environmentally compatible way. Observe the disposal notes of your municipal waste management companies.

INFORMATION

Used coolant emulsions and oils should not be mixed up since it is only possible to reuse used oils which had not been mixed up without pre-treatment.

The disposal notes for the used lubricants are made available by the manufacturer of the lubricants. If necessary, request the product-specific data sheets.

9.4 Disposal via municipal collection

Disposal of used electric and electronic machines
(Applicable in the countries of the European Union and other European countries with a separate collecting system for those devices).

The sign on the product or on its packing indicates that the product must not be handles as common household waist, but that is needs to be delivered to a central collection point for recycling. Your contribution to the correct disposal of this product will protect the environment and the health of your fellow men. The environment and the health are endangered by incorrect disposal. Recycling of material will help to reduce the consumption of raw materials. Your District Office, the municipal waste collection station or the shop where you have bought the product will inform you about the recycling of this product.

9.5 Change information operating manual

Chapter	Short note	new version number
1.2	Extension Designated use	2.0.6
3.7: 4.2 4.6	Chip filter	2.0.7
CE	EC declaration	2.0.8
CE	EMC 2014/30/EU & LVD 2014/35/EU	2.0.9 + 2.1.0
3	Interdepartmental transport	2.1.1

9.6 Product follow-up

We are required to perform a follow-up service for our products which extends beyond shipment.

We would be grateful if you could send us the following information:

- Modified settings
- Any experiences with the geared drill which might be important for other users
- Recurring failures

Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26

D-96103 Hallstadt

Fax +49 (0) 951 - 96 555 - 888
Email: info@optimum-maschinen.de

EC - Declaration of Conformity

according to Machinery directive 2006/42/EC, Annex II 1.A

The manufacturer / distributor Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26
D - 96103 Hallstadt, Germany

hereby declares that the following product

Product designation: Drilling machine

Type designation: B40GSP

fulfills all the relevant provisions of the directive specified above and the additionally applied directives (in the following) - including the changes which applied at the time of the declaration.

Description:

Hand-controlled drilling machine.

The following additional EU directives have been applied:

EMC Directive 2014/30/EU ; Restriction of the use of certain hazardous substances in electrical and electronic equipment 2015/863/EU

The following harmonized standards were applied:

EN 12717: 2001 - Machine tools - Safety - Drilling machines

EN 60204-1 - Safety of machinery - Electrical equipment of machines - Part 1: General requirements

EN 1837:1999+A1:2009 - Safety of machinery - Integral lighting of machines

EN 13849-1:2015 - Safety of machinery - Safety related parts of controls - Part 1: General design principles

EN 13849-2:2012 - Safety of machinery - Safety related parts of controls - Part 2: Validation

EN ISO 12100:2013 - Safety of machinery - General principles for design - Risk assessment and risk reduction

Name and address of the person authorized to compile the technical file:

Kilian Stürmer, phone: +49 (0) 951 96555 - 800

Kilian Stürmer (CEO, General Manager)
Hallstadt, 2019-12-11

Index

B40GSP_GBSIX.fm

Quellenverzeichnis von Ihrem Fachhändler Metallbau Mehner

Optimum Bohrmaschinen:

- OPTIdrill B 40GSP
  - OPTIdrill B 40GSP Ersatzteile
  - OPTIdrill B 40GSP Zubehör

- OPTIdrill Zubehör

Ihr Ersatzteil nicht in den Listen?
Direkt zum >>**Formular Download**<<. Tragen sie Ihr Maschinenmodell, samt Bauteil und Artikelnr. und wir unterbreiten Ihnen ein Angebot.

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- Drehmaschinen / CNC Drehmaschinen
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