



Operating Manual

Version 1.0.5

Lathe

OPTiturn®
TH 3610

3402050
3402060



TH3610D



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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

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1 Safety

Glossary of symbols

	provides further instructions
	calls on you to act
	listings

This part of the operating instructions

- explains the meaning and use of the warning notes included in these operating instructions,
- defines the intended use of the lathe,
- 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 statutory provisions for accident prevention,
- the prohibition, warning and mandatory signs as well as the warning notes on the lathe.

European standards must be observed during the installation, operation, maintenance and repair of the lathe.

If European standards have not yet been incorporated in the national legislation of the country of destination, the specific applicable regulations of each country must be observed.

If applicable, necessary measures must be taken to comply with the country-specific regulations before commissioning the lathe.

Always keep this documentation close to the lathe.

If you would like to order another operating manual for your machine, please indicate the serial number of your machine. The serial number is located on the type plate.

1.1 Rating plates

DE Drehmaschine GB Lathe ES Torno FR Tour CZ Soustruh DK Drejbænk FI Kärkisorvi GR Τόρνος HU Esztergápad IT Tornio NL Draaibank PL Tokarka PT Torno RO Strung SE Bänksvarv SK Sústruh TR Torna Tezgahi	OPTIMUM[®] MASCHINEN - GERMANY TH 3610 NO. 3402050 2.000 U/min 15 kW 400 V ~50 Hz 610 kg Year 20 TYP 1 (DIN EN 23125) ≤ 2000 mm ≤ 500 mm www.optimum-maschinen.de	DE Drehmaschine GB Lathe ES Torno FR Tour CZ Soustruh DK Drejbænk FI Kärkisorvi GR Τόρμος HU Esztergápad IT Tornio NL Draaibank PL Tokarka PT Torno RO Strung SE Bänksvarv SK Sústruh TR Torna Tezgahi	OPTIMUM[®] MASCHINEN - GERMANY TH 3610D NO. 3402060 2.000 U/min 15 kW 400 V ~50 Hz 610 kg Year 20 TYP 1 (DIN EN 23125) ≤ 2000 mm ≤ 500 mm www.optimum-maschinen.de
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INFORMATION

If you are unable to rectify an issue using these operating instructions, please contact us for advice:

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1.2 Safety instructions (warning notes)

1.2.1 Classification of hazards

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

Symbol	Alarm expression	Definition / consequence
	DANGER!	Impending danger that will cause serious injury or death to people.
	WARNING!	A danger that can cause serious injury or death.
	CAUTION!	A danger or unsafe procedure that can cause personal injury or damage to property.
	ATTENTION!	Situation that could cause damage to the lathe and the product and other types of damage. No risk of injury to persons.
	INFORMATION	Practical 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 with



1.2.2 Pictograms





Switching on forbidden!



Do not climb onto the machine!



Do not clean with compressed air!



Read the operating instructions before commissioning!



Wear protective glasses!



Wear protective gloves!



Wear safety shoes!



Wear a protective suit!



Use ear protection!



Only switch when stopped!



Protect the environment!



Contact address

1.3 Intended use

WARNING!

Improper use of the lathe will result in

- will endanger personnel,
- will endanger the lathe and other material property of the operator,
- the correct function of the lathe may be affected.



The lathe is designed and manufactured for longitudinal and straight turning of round and regular formed

workpieces in cold metal, their diameter and weight are within the limits of the given specifications. The lathe must only be installed and operated in a dry and ventilated place.

The lathe is designed and manufactured to be used in environments where there is no potential danger of explosion.

If the lathe is used in any way other than described above, or modified without the approval of Maschinen Germany GmbH, then the lathe 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, if any constructive, technical or procedural changes are not performed by the company Optimum Maschinen Germany GmbH.

It is also part of the intended use that you

- observe the limits of the lathe,
- observe the operating instructions,
- and comply with the inspection and maintenance instructions.

In order to achieve optimum cutting performance, it is essential to choose the right turning tool, feed, tool pressure, cutting speed and coolant.



WARNING!

Extremely severe injuries due to non-intended use.

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



1.4 Reasonably foreseeable misuse

Any other use other than that specified under "Intended use" or any use beyond the described use shall be deemed as non-intended use and is not permissible.

Any other use has to be discussed with the manufacturer.

The lathe must not be used to process metal, cold and non-inflammable materials.

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

The operators must be qualified.

1.4.1 Avoiding misuse

- Use of suitable cutting tools.
- Do not create in processing any continuous chips. Adjust the cutting speed when continuous chips are produced. Adapting the speed adjustment and feed to the material and workpiece.
- Insert the workpiece tightly, without vibration and without one-sided imbalances.
- 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.
- The machine is not suitable for attachment kits for cylindrical grinding. When mounting attachment kits for cylindrical grinding, additional protective devices must be fitted.
- The machine is not designed to allow long parts to protrude beyond the spindle hole. If longer parts have to protrude beyond the spindle hole, an additional operator-side, permanent device must be mounted, which completely covers the protruding part and provides complete protection against spinning parts.
- Long workpieces must be propped up. Use the steady rest or follow rest in conjunction with the tailstock spindle to support longer parts and prevent the workpiece from flapping around and flying away.
- Risk of fire and explosion due to the use of 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 avoid health risks.
- When processing carbons, graphite and carbon-fibre-reinforced carbons, the machine is no longer being used as intended. When processing carbons, graphite and carbon-fibre-reinforced carbons and similar materials, the machine can be damaged quickly, even if the dusts generated are completely sucked out during the work process.
- The processing of plastics with the lathe leads to static charge. The static charge of machine parts from processing plastics cannot be safely conducted away from the lathe.
- When using lathe dogs as carriers for rotating workpieces between the lathe centres, the standard lathe chuck shield must be replaced with a circular lathe chuck shield.

1.5 Potential dangers that can be caused by the lathe

The lathe has been tested for operational safety. The construction and type are state of the art.

Nevertheless, there is a residual risk as the lathe operates with

- high revolutions,
- with rotating parts,
- electrical voltage and currents,



We have used design and safety engineering to minimize the health risk to personnel resulting from these hazards.

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

INFORMATION

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

- be duly qualified,
- and strictly follow these operating instructions.

In the event of improper use

- there may be a risk to personnel,
- there is a risk of damage to the lathe and other property,
- the correct function of the lathe may be affected.

Always disconnect the lathe, when cleaning or maintenance work is being carried out.



WARNING!

The lathe may only be used with the safety devices activated.

Disconnect the lathe 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.

As the operating company, this is your responsibility!

 **Safety devices on page 13**



1.6 Qualification of personnel

1.6.1 Target group

This manual is addressed to

- the operating companies,
- the operators,
- the maintenance personnel.

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

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

Unclear responsibilities constitute a safety risk!

Always disconnect the main plug of the lathe and secure the main switch using a lock. This will prevent it from being used by unauthorized persons.

The qualifications of the personnel 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 performed beyond operation in standard mode may only be performed by an operator if they are described in these instructions and if the operator has been specifically trained to perform them by the operating company.

Qualified electrician

With professional training, knowledge and experience as well as knowledge of respective standards and regulations, qualified electricians are able to perform work on the electrical system and recognise and avoid any possible dangers.





Qualified electricians have been specially trained for the working environment, in which they are working and know the relevant standards and regulations.

Qualified personnel

Due to their professional training, knowledge and experience as well as knowledge of relevant regulations, qualified personnel are able to perform the assigned tasks and to independently recognise and avoid any possible dangers.

Instructed person

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

1.6.2 Authorized persons

WARNING!

Inappropriate operation and maintenance of the lathe constitutes a danger for the personnel, objects and the environment.



Only authorized personnel may operate the lathe!

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

1.6.3 Obligations of the operating company

The operator must instruct the personnel at least once a year regarding

- all safety standards that apply to the lathe.
- the operation,
- generally accepted engineering standards.

The operating company must also

- check the personnel's knowledge level,
- document the training/instruction,
- require personnel to confirm participation in training/instruction by means of a signature,
- check whether the personnel is working in a safety and risk-conscious manner and following the operating instructions.
- Define and document the machine inspection deadlines in accordance with section 3 of the Factory Safety Order and perform an operational risk analysis in accordance with section 6 of the Safety at Work Act.

1.6.4 User's obligations

The operator must

- have read and understood the operating instructions,
- be familiar with all safety devices and regulations,
- be able to operate the lathe.

1.6.5 Additional requirements regarding the qualification

Additional requirements apply for work on electrical components or equipment:

- Must only be performed by a qualified electrician or person working under the instructions and supervision of a qualified electrician.
- Before starting work on electrical parts or operating agents, following measures are to be performed in the following order:
 - ➔ disconnect all poles,
 - ➔ secure against restarting,
 - ➔ Ensure that there is no voltage.



1.7 User positions

The operator position is in front of the lathe.

1.8 Safety measures during operation

CAUTION!

Danger due to inhaling dust and mist that is hazardous to health.

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 becoming entangled or lacerations 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 lathe only with properly functioning safety devices.

Stop the lathe 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 deactivated or is defective, the lathe can only be used again if you

- the cause of the fault has been eliminated,
- you have verified that there is no danger to personnel 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 lathe. The possible consequences are:

- injuries due to components or workpieces flying off at high speed,
- contact with rotating parts and
- fatal electrocution,
- pulling-in of clothes.



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 limits of their machining process.



The lathe includes the following safety devices:

- a lockable main switch,
- an EMERGENCY-STOP mushroom switch,
- a lathe chuck protection with position switch,
- a mechanical spindle brake,

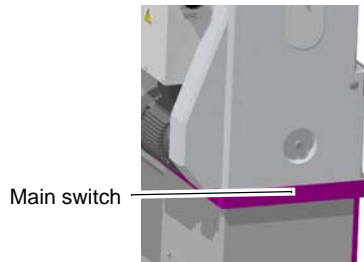


- a protective cover on the headstock with position switch,
- a recoil spring as protective cover on the lead screw, the coil spring prevents the pulling-in of clothes into the lead screw.
- an overload clutch on the feed rod,
- safety screws for the Camlock bolts on the workpiece holder.
- a chips shield.

1.9.1 Lockable main switch

In the "0" position, the lockable main switch can be secured against accidental or non-authorized switching on by means of a padlock.

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



Img. 1-1: Main switch

WARNING!

Dangerous voltage even if the main switch is switched off.

The areas marked by the pictogram might contain live parts, even if the main switch is switched off.



1.9.2 EMERGENCY-Stop button

CAUTION!

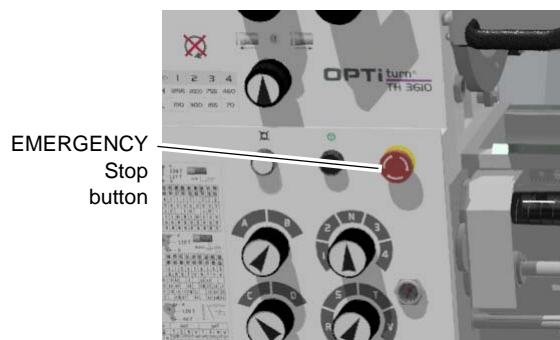
The drive or the lathe chuck will continue to run for a while, depending on the mass moment of inertia of the lathe chuck and the workpiece. Use the spindle brake to slow down the lathe more effectively.

The emergency stop button brings the machine to a standstill.

Turn the knob to the right to unlock the emergency stop mushroom switch.

CAUTION!

Only press the emergency stop button in a genuine emergency. An operational shut-down of the machine must not be executed using the emergency stop mushroom switch.



Img. 1-2: EMERGENCY-STOP mushroom switch





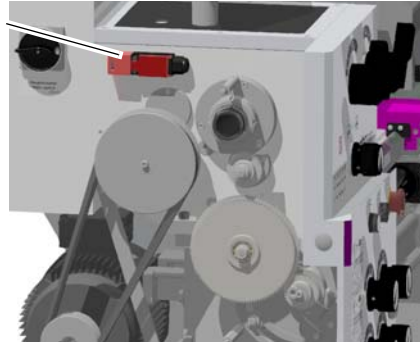
1.9.3 Protective cover with interlock switch

The headstock of the lathe is equipped with a separating protective cover with interlock switch. The protective cover can only be opened when the main switch of machine is switched off.

The drive only starts when the protective cover is closed.

Turn the main switch off, when the protective cover is to be opened for maintenance or changing of gears.

Interlock switch

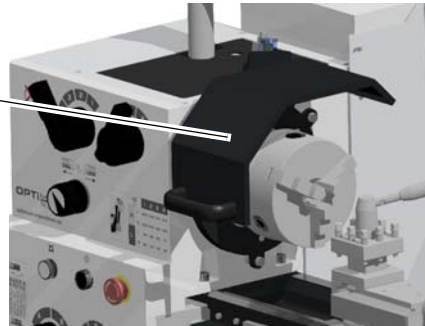


Img. 1-3: Protective cover of the headstock

1.9.4 Lathe chuck protection with position switch

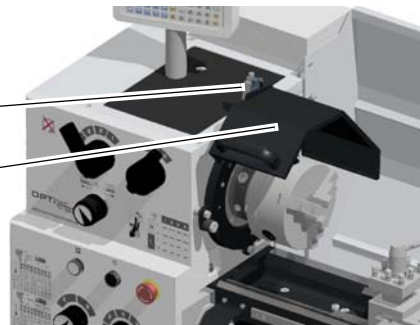
The lathe is equipped with a lathe chuck protection. The lathe can only be switched on if the lathe chuck protection is closed.

Lathe chuck protection closed



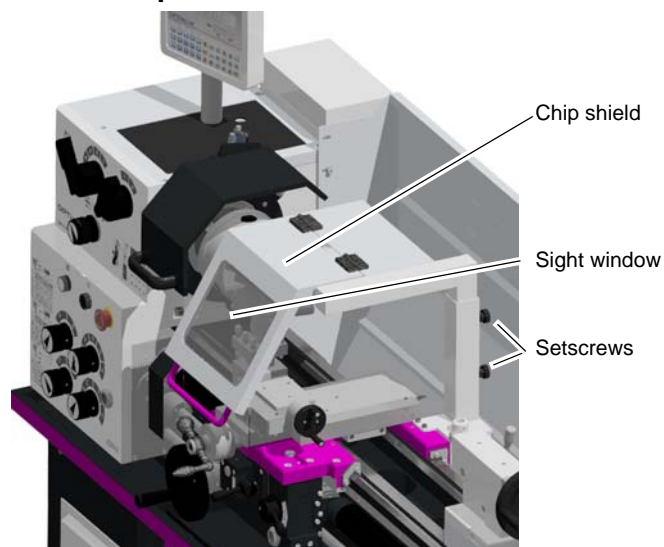
Positions switch

Lathe chuck protection open



Img. 1-4: Lathe chuck protection

1.9.5 Chip shield



Img. 1-5: Chip shield

Polycarbonate windows

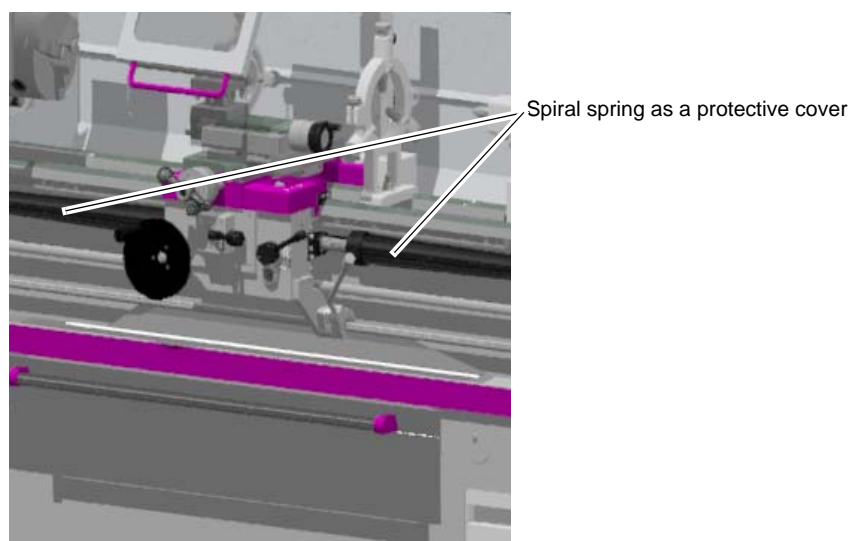
Polycarbonate viewing window in chip protection, must be visual inspected by the customer responsible personnel at regular intervals to guarantee the operational safety of the machine.

Polycarbonate viewing panes are subject to an ageing process and are classified as wear parts.

The aging of polycarbonate windows can not be detected by visual inspection. It is therefore necessary to replace the polycarbonate windows after a certain time.

Prolonged exposure from polycarbonate windows to cutting fluids can lead to accelerated ageing, i.e. deterioration of the mechanical properties (brittleness). Coolant vapours, detergents, greases and oils or other corrosive substances from the operator side can also lead to a deterioration of the polycarbonate windows. The result is a reduced retention capability of the polycarbonate viewing pane against chips and potentially flying parts.

1.9.6 Protective cover on the lead screw



Img. 1-6: Protective cover of lead screw



1.9.7 Prohibition, warning and mandatory signs

INFORMATION

All warning and mandatory signs must be legible. They must be checked regularly.



1.10 Safety check

Check the lathe at least once per shift. Inform the person responsible immediately of any damage, defects or changes in the 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 all maintenance and repair work.

Check that prohibition, warning and information signs and the labels on the lathe

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

INFORMATION

Organise the checks according to the following table;



General check		
Equipment	Check	OK
Guards	Mounted, firmly bolted and not damaged	
Signs, Markers	Installed and legible	
Date:	Checked by (signature):	

Functional check		
Equipment	Check	OK
EMERGENCY-STOP mushroom switch	After activating the emergency stop mushroom button, the control voltage on the lathe will shut off. The spindle continues to rotate for a while, depending on the mass moment of inertia of the spindle and workpiece.	
Positions switch Lathe chuck protection	The spindle drive of the lathe must only be switch on if the lathe chuck protection is closed.	
Positions switch Protective cover of the headstock	The spindle drive of the lathe must only be switch on if the protective cover of the headstock is closed.	
Positions switch Spindle brake	The lathe must be switched off if the mechanical spindle brake is activated.	
Date:	Checked by (signature):	

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1.11 Personnel protective equipment

For certain work personal protective equipment is required.

- Protect your face and your eyes: Wear a safety helmet with facial protection when performing work where your face and eyes are exposed to hazards.
- Wear protective gloves when handling pieces with sharp edges.
- Wear safety shoes when you assemble, disassemble or transport heavy components. Use ear protection if the noise level (emission) in the workplace exceeds 80 dB (A).
- Before starting work make sure that the required personal protective equipment is available at the work place.



CAUTION!

Dirty or contaminated personnel protective equipment can cause illness. It must be cleaned after each use and at least once a week.



1.12 For your own safety during operation

We provide information about the specific dangers when working with and on the lathe in the descriptions for these types of work.

WARNING!

Before activating the lathe ensure that this will neither endanger other persons nor cause damage to equipment.



Avoid any unsafe work methods:

- Make sure that your work does not endanger anyone.
- Clamp the workpiece tightly before activating the lathe.
- Observe the maximum lathe chuck opening.
- Wear safety goggles.
- Do not remove the turning chips by hand. Use a chip hook and / or a hand brush to remove turning chips.
- Clamp the turning tool at the correct height and with the least possible overhang.
- Turn off the lathe before measuring the workpiece.
- The instructions described in these operating instructions must be strictly observed during assembly, operation, maintenance and repair.
- Do not work on the lathe 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 supervisory authorities responsible for your company.
- Inform the supervisor about all hazards or faults.
- Stay at the lathe 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.

1.13 Safety during maintenance

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

Report all safety-relevant changes and performance characteristics of the lathe. Any changes must be documented, the operating instructions updated and machine operators instructed accordingly.



1.13.1 Disconnecting and securing the lathe

Turn off the main switch of the lathe 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 all dangerous voltages are switched off.

Excepted are only the positions which are marked with the adjoining pictogram. These positions may be live, even if the main switch is switched off.

Attach a warning sign to the lathe.



WARNING!

Live parts and moves of machine parts can injure you or others dangerously!

Proceed with extreme care if you cannot switch off the lathe by turning off the main switch for necessary procedures (e.g. functional control).



1.13.2 Using lifting equipment

WARNING!

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

Check to ensure that the lifting and load-suspension equipment are of sufficient load-bearing capability and are in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities applicable to 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 or after completing any maintenance work; this include:

- covers,
- safety instructions and warning signs,
- grounding cables.

If you remove protection or safety devices, refit them immediately after completing the work.

Check that they are working properly!

1.14 Accident report

Inform your supervisors 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 quicker the causes can be eliminated.

INFORMATION

We provide information about the dangers of working with and on the lathe in these work descriptions.



1.15 Electrical system

Qualified electrician on page 11



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. If there is a fault in the power supply, switch off the lathe immediately!

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 a timely manner.

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.

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

1.16 Inspection deadlines

Define and document the inspection deadlines for the machine in accordance with § 3 of the Factory Safety Act and perform an operational risk analysis in accordance with § 6 of the Work Safety Act. Also use the inspection intervals in the maintenance section as reference values.  Check up, inspection and maintenance on page 62.



2 Technical specification

The following information represents the dimensions and indications of weight and the manufacturer's approved machine data.

	TH3610	TH3610D
2.1 Electrical connection		
	3 x 400V ~ 1.5 KW ~ 50 Hz (~60Hz)	
2.2 Drive motor power		
	1.5 KW	
2.3 Work areas		
Height of centres [mm]	180	
Distance between centres [mm]	980	
Swing diameter over machine bed [mm]	356	
Swing diameter over cross slide [mm]	225	
Main spindle bore [mm]	52	
Maximum weight of workpiece between centers [kg]	240	
Passage follow-rest [Ø mm]	10 - 60	
Passage steady-rest [Ø mm]	10 - 70	
2.4 Headstock		
Main spindle nose	DIN ISO 702-2 no. 5 - Camlock	
Main spindle morse taper	MT6	
Spindle speeds ~ 50 Hz [min ⁻¹]	70 - 2000	
Spindle speeds ~ 60 Hz [min ⁻¹]	84 - 2400	
Gear levels	8	
total speed levels	8	
2.5 Feeds and pitches		
Longitudinal feed [mm/rev]	0.052 - 1.392 (32 pcs.)	
Cross feed [mm/rev]	0.014 - 0.38 (32 pcs.)	
Metric thread [mm / rev]	0.4 - 7 (26 pcs.)	
Inch threads [threads / inch]	56 - 4 (34 pcs.)	
Pitch lead screw	3mm	
2.6 Slides		
Travel cross slide [mm]	170	
Travel top slide [mm]	100	
Travel lathe saddle [mm]	840	
maximum dimension for lathe tool in quadruplicate tool holder [mm]	16 x 16	

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	TH3610	TH3610D
Scale on the handwheel cross slide	4mm/rev - splitting 0.025mm	
Scale on the handwheel top slide	4mm/rev - splitting 0.025mm	
Swivel range top slide	+ / - 180°	
Swivel scale at top slide	+ / - 60°	
Scale on the handwheel bed slide	14mm/rev - splitting 0.15mm	
2.7 Tailstock		
Quill diameter [mm]	42	
Quill travel [mm]	120	
Scale on quill [mm]	0 - 100	
Taper in the quill	MT3	
2.8 Steady and follow rest		
Steady rest passage min. - max. [mm]	10 - 70	
Follow rest passage min. - max. [mm]	10 - 60	
2.9 Work area, weights		
Keep a work area of at least one metre around the machine free for operation and maintenance.		
Net weight [kg]	570	572
2.10 Environmental conditions		
Temperature	5 - 35 °C	
Relative humidity	25 - 80 %	
2.11 Operating material		
Headstock Mobilgear 627 or a comparable oil;	1.5 litres	
Apron gearbox Mobilgear 629 or a comparable oil;	0.4 litres	
Feed gear Mobilgear 629 or a comparable oil;	0.8 litres	
Bare steel parts and lubricating nipple,	Acid-free lubricating oil	

2.12 Emissions

The generation of noise emitted by the lathe is 78 dB(A).

INFORMATION

This numerical value was measured on a new machine under the operating conditions specified by the manufacturer. The noise behaviour of the machine might change depending on the age and wear of the machine.





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

INFORMATION

The specified numerical value represents the emission level and does 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 of damping behaviour,
- other noise sources, e.g. the number of machines,
- other processes taking place in 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 should, however, allow the machine operator to evaluate the hazards and risks more easily.

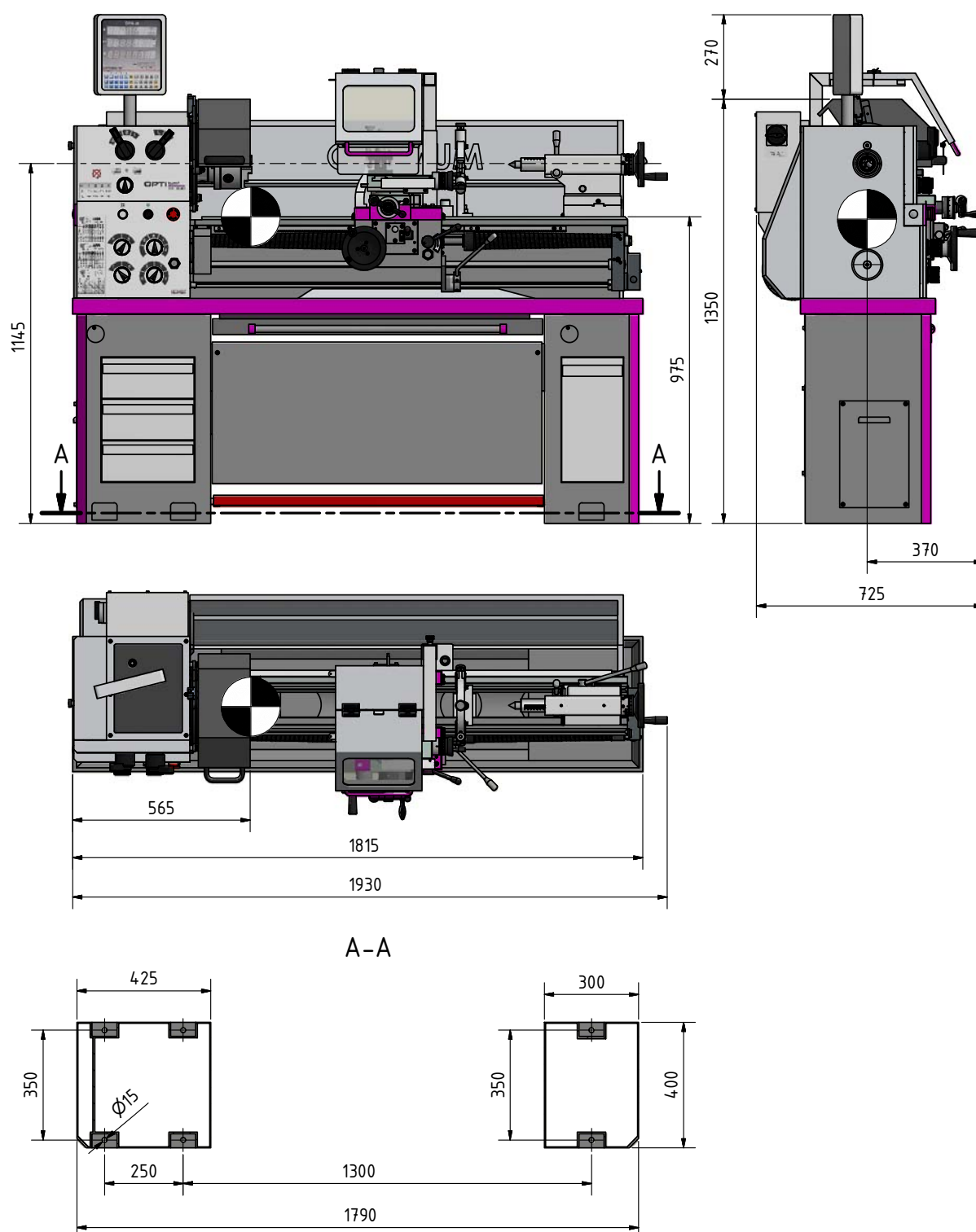
CAUTION!

Depending on the total noise exposure and the basic threshold values, machine operators must wear appropriate hearing protection.

We generally recommend the use of noise and ear protection.



2.13 Dimensions, installation plan



Img.2-1: Dimensions, installation plan



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

INFORMATION

The lathe is delivered pre-assembled.

Transporting the Drehmaschine with the packing crate near its final installation location with a forklift before unpacking it. If the packaging shows signs of possible transport damage, take the necessary precautions not to damage the machine when unpacking. If any damage is discovered, the carrier and/or shipper must immediately be notified of this fact to establish any claim which might arise.

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

When the lathe is delivered, please check immediately that it has not been damaged during transport.

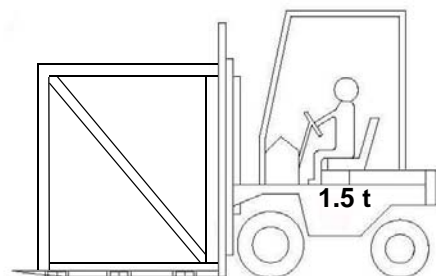
Also check that no fastening screws have come loose. Compare the scope of delivery with the attached packing list or the delivery note.

3.4 Transport

○ Weights

📖 Dimensions, installation plan on page 24

Weight of the lathe 📖 „Net weight [kg]“ on page 22



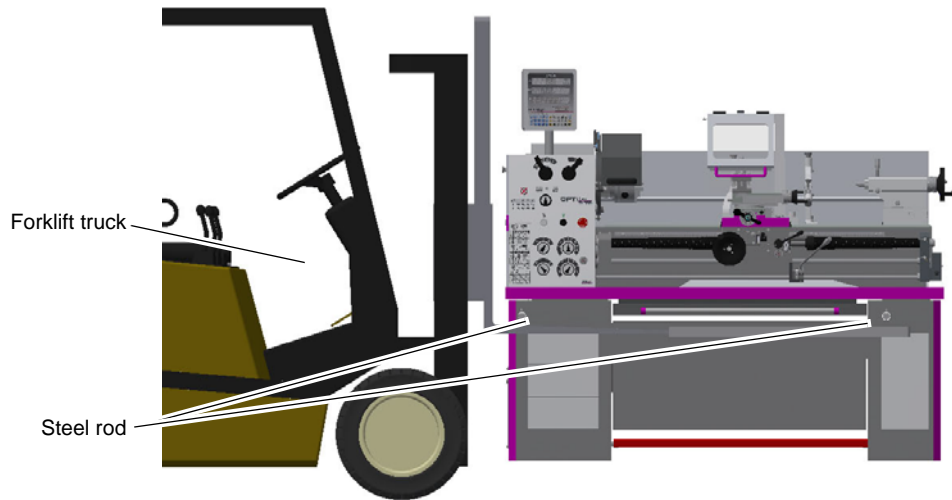
3.4.1 Load suspension point

3.4.2 Gravity of the machine

📖 Dimensions, installation plan on page 24

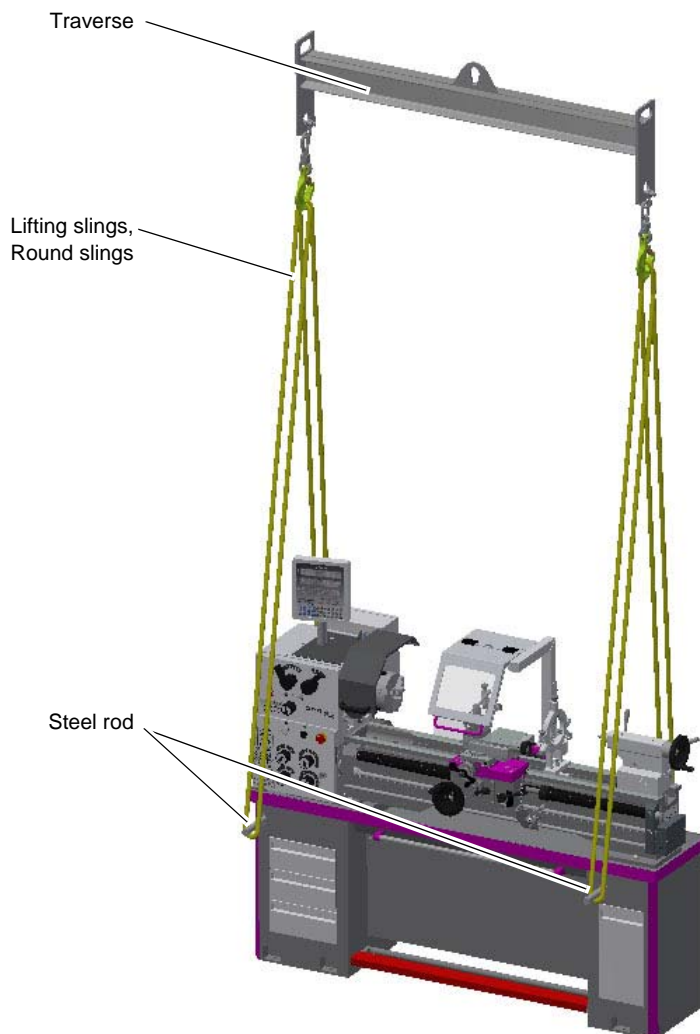


3.4.3 Lifting with a forklift



- ➔ Put two steel rods with a diameter of 30 to 34mm (round steel C45, thick - walled tube) and a length of one meter through the holes of the machine substructure.
- ➔ Firmly clamp the tailstock.
- ➔ Slowly raise the machine on the steel rods with a forklift. Use long forks.

3.4.4 Lifting by crane



- ➔ Disassemble the splashguard on the lathe.
- ➔ Put an adequately thick piece of steel with a diameter of 30 to 34mm (round steel C45, thick - walled tube) and a length of one meter through the hole of the machine substructure.
- ➔ Suspend a lifting sling to each of the two sides of the machine bed and to the ends of the piece of steel. Secure the lifting slings on the steel rods with clamping rings to prevent slipping.
- ➔ Firmly clamp the tailstock.
- ➔ Slowly raise the machine using the crane.



3.5 Installation and assembly

3.5.1 Requirements regarding the installation site

To achieve sufficient security against falls by slipping, the accessible area must be provided in the machining area of the machine with a slip resistance.

The anti-slip mat and / or the anti-slip flooring must be at least according German BGR 181 R11. The shoes used must be suitable for use in these processing areas. The pedestrian areas must be cleaned.

Organize the working area around the lathe according to the local safety regulations.

The work area for operation, maintenance and repair must not be restricted.

INFORMATION

In order to attain good functionality and a high processing accuracy as well as a long service life of the machine, the place of installation should fulfil certain criteria.



Please observe the following points:

- The machine must only be installed and operated in a dry and well-ventilated place.
- Avoid places near machines generating chips or dust.
- The installation site must be free from vibrations also at a distance of presses, planing machines, etc.
- The ground must be suitable for the lathe. Make sure that the floor has sufficient load-bearing capacity and is level.
- The ground must be prepared in a way that potential coolants cannot penetrate the floor.
- Any parts sticking out such as stops, handles, etc. have to be secured by measures taken by the customer if necessary in order to avoid endangering persons.
- Provide sufficient space for the personnel preparing and operating the machine and transporting the material.
- Also make sure the machine is accessible for setting and maintenance works.
- Provide for sufficient backlight (Minimum value: 500 lux, measured at the tool tip). At lower illumination intensities, additional illumination has to be ensured e.g. by means of a separate workplace lamp.

INFORMATION

The main switch of the lathe must be freely accessible.



3.6 Cleaning the machine

CAUTION!

Do not use compressed air to clean the machine.

Your new lathe must be completely cleaned after being unpacked to make sure that all the moving parts and sliding surfaces are not damaged when the machine is operated. Each unit leaves the factory with all its polished parts and sliding surfaces suitably greased to avoid oxidation in the period of time that elapses, until it is started up. 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 lathe as explained in the following section, before connecting the power and beginning to operate the machine.



3.6.1 Lubrication

The lubrication and initial greasing of your new lathe consists of checking the oil levels through the headstock, apron and feed box 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 of the headstock, gear and apron must be changed 200 hours after being filled for the first time, then annually.

☞ Feed gear on page 65

☞ Apron on page 65

☞ Headstock on page 66

→ Use the oil types recommended in the reference table ☞ Operating material on page 22. This table can be used to compare the characteristics of each different type of oil of your choice.

→ The lubrication nipples must be lubricated every 8 hours using an oiler. Furthermore, it is also recommended to lubricate the slide tracks of the machine bed once a day.

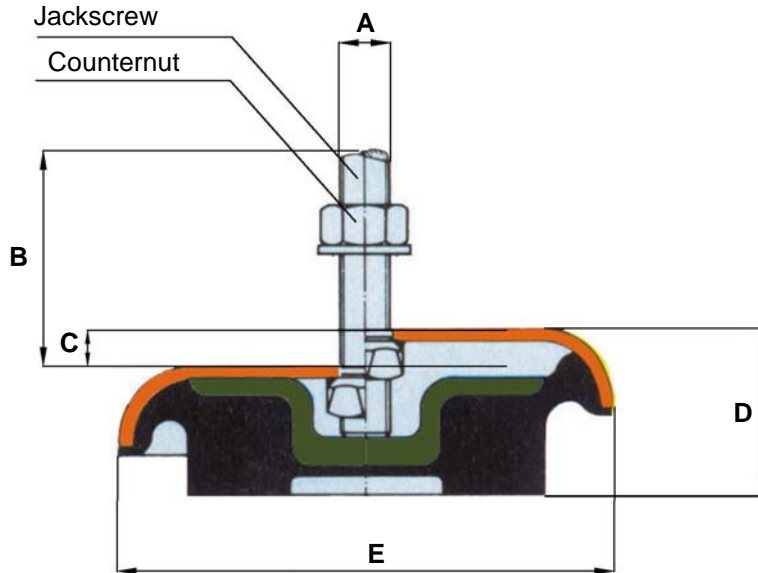




3.7 Anchor-free assembly

Attaching a solid surface at each contact point between the foundation and machine base or use of vibration dampers type SE1, part no. 3381012 The 6 pcs. SE1 vibration dampers are fixed on the 6 pcs. through holes of the machine base. The maximum height adjustment per element is 10mm. Tighten the jackscrew, the vibration damper lifts up.

3.7.1 Dimension of vibration damper

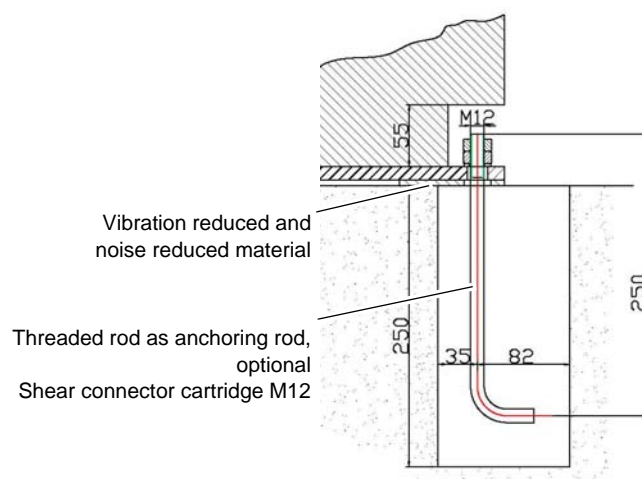


	A	B [mm]	C [mm]	D [mm]	E [mm]
SE1	M12	70	10	32	120
SE2	M16	90	12	35	160
SE3	M20	130	12	40	185

3.8 Anchored assembly

Use the anchored assembly in order to attain a firm connection to the ground. An anchored assembly is always reasonable if parts are manufactured to the maximum capacity of the lathe.

📖 Dimensions, installation plan on page 24



Img.3-1: Drawing of the anchoring

3.9 First commissioning

WARNING!

The machine may only be commissioned after proper installation.





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

ATTENTION!

Before initially operating the machine, check all screws, fixtures and/or safety devices and tighten up the screws if necessary!



WARNING!

Risk from using improper workpiece clamping materials or operating the machine at an inadmissible speed.



Only use the tool clamping devices (e.g. lathe chuck) that were delivered with the machine or those offered by OPTIMUM as optional equipment.

Only use tool clamping devices in the intended admissible speed range.

3.10 Electric three-phase connection

- Connect the electrical supply cable. The connection points are at the terminal block for the main switch and are marked with L1, L2, L3.
- Check the fusing (fuse) of your electrical supply according to the technical instructions regarding the total connected power of the Drehmaschine.
- Main Fuse 16A.



ATTENTION!

Ensure that all 3 phases (L1, L2, L3) and the ground wire are connected correctly.

The neutral conductor (N) of its power supply is not connected.

ATTENTION!

Make sure that the direction of rotation of the drive motor is correct. If the rotational direction switch is switched to the down position, the lathe spindle must rotate anticlockwise. If necessary, exchange two phase connections. The guarantee will become null and void if the machine is connected incorrectly.



3.11 Warming up the machine

ATTENTION!

If the lathe and in particular the lathe spindle are immediately operated at maximum load when cold, this 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.



3.12 Functional check

- Check if all spindles are running smoothly.

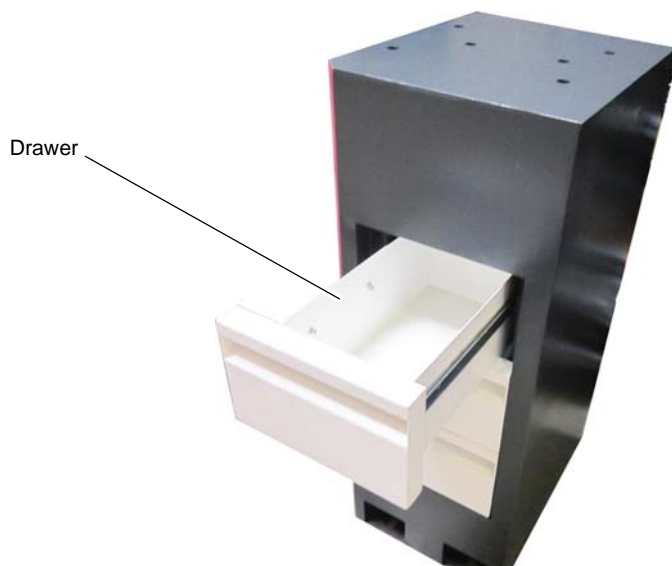


4 Machine substructure

To screw the machine onto the substructure, first remove the drawers.

4.1 Drawer Removal

→ Pull out completely, the upper drawer.

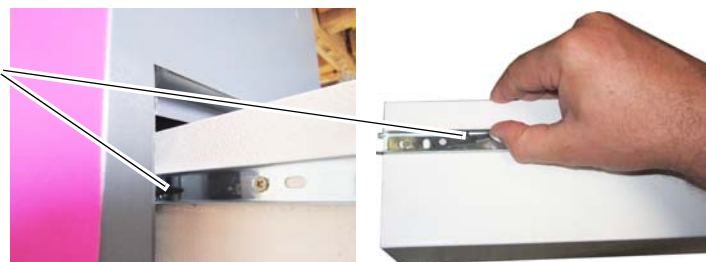


The drawer is provided respectively on the left and right sides with a lock to prevent unintentional removal.



➔ To remove the drawer, simultaneously press the left lock drawer on top and the right lock drawer down and pull the drawer out slowly.

Drawer lock left



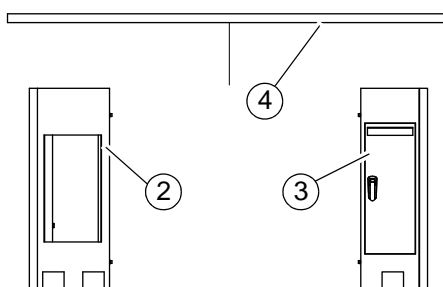
Drawer lock right



To re-assemble the drawer, proceed in reverse order.

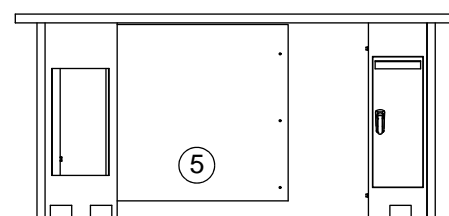
The substructure (2) with the drawers is placed on the left. The substructure (3) with the door is placed on the right.

Place the chip tray (4) on the two substructures and align using the through holes.

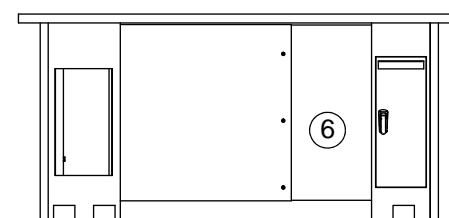


Place the two-part connecting elements (5) and (6) on the substructures and screw them tightly together.

Fix the substructure to the floor and only then place the lathe on the prepared substructure with chip tray and screw together.



After the complete screwing the drawers can be reinstalled.





4.2 Assembly and installation

4.2.1 Anchor-free assembly

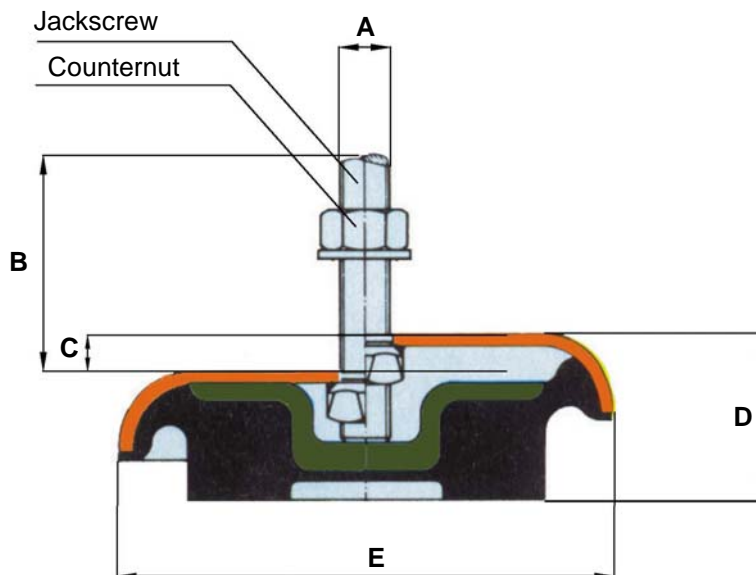
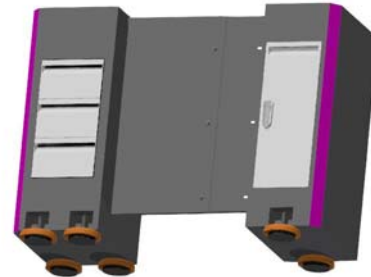
This must be done by laying down a strong base on each support of the levelling points, between the foundation and the machine foot.

4.2.2 Installation with levelling discs

Optional levelling discs

Attaching of 6 pieces SE1 levelling disc on levelling points between the foundation and machine stand.

Dimension of levelling discs



	A	B [mm]	C [mm]	D [mm]	E [mm]
SE1	M12	70	10	32	120
SE2	M16	90	12	35	160
SE3	M20	130	12	40	185

4.2.3 Installation with vibration dampers

Optional vibration dampers

Attaching of 6 pieces SE55 vibration dampers on levelling points between the foundation and machine stand.

In order to obtain optimum anti-slip protection, the subfloor must be free of oil and grease before the machine or system is installed.

CAUTION!

The max. load per element refers to the sum of static plus dynamic forces. The machine must not be moved after the machine has been lowered!



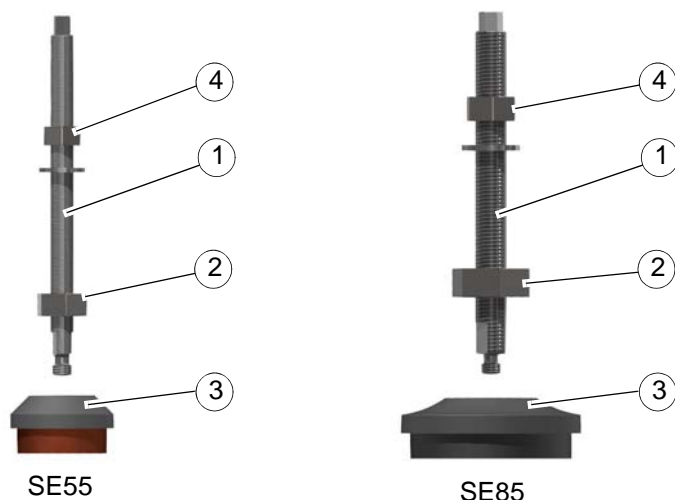


For machines with transverse forces greater than max. 0.5 kN, machine shoes e.g. SEU1 must be used. Therefore, place the machine as far down as possible on the levelling nuts.

Lift the machine with suitable lifting gear so that the SE55 or SE85 elements can be pushed underneath. Insert the levelling screw (1) without the lower large levelling nut (2) from above into the through hole of the machine foot. Then screw the levelling nut (2) onto the levelling screw from below. Adjust the levelling screw with the levelling nut until it stands up in the spherical holder of the levelling disc (3). The screw must be vertical in the through hole. Carry out these preparations at all support points, and now carefully lower the machine further and level it via the levelling nut by holding it against the upper hexagon or lower two-edge of the levelling screw. After levelling, screw the upper lock nut (4) with washer onto the levelling screw and tighten. The lock nut can also be fitted underneath the levelling nut if the height is not a decisive factor. A levelling screw (threaded rod) M16 in 300mm length incl. nut M16 with the article no. 3352988 is optionally available. The levelling screw M16 is suitable for both elements SE55 and SE85.

	SE55	SE85
maximum load per element	600 kg	1500 kg
Levelling screw (threaded rod)	M12x1 x 150mm	M16x2 x 150mm
Vibration damper	Ø 47mm	Ø 83 mm

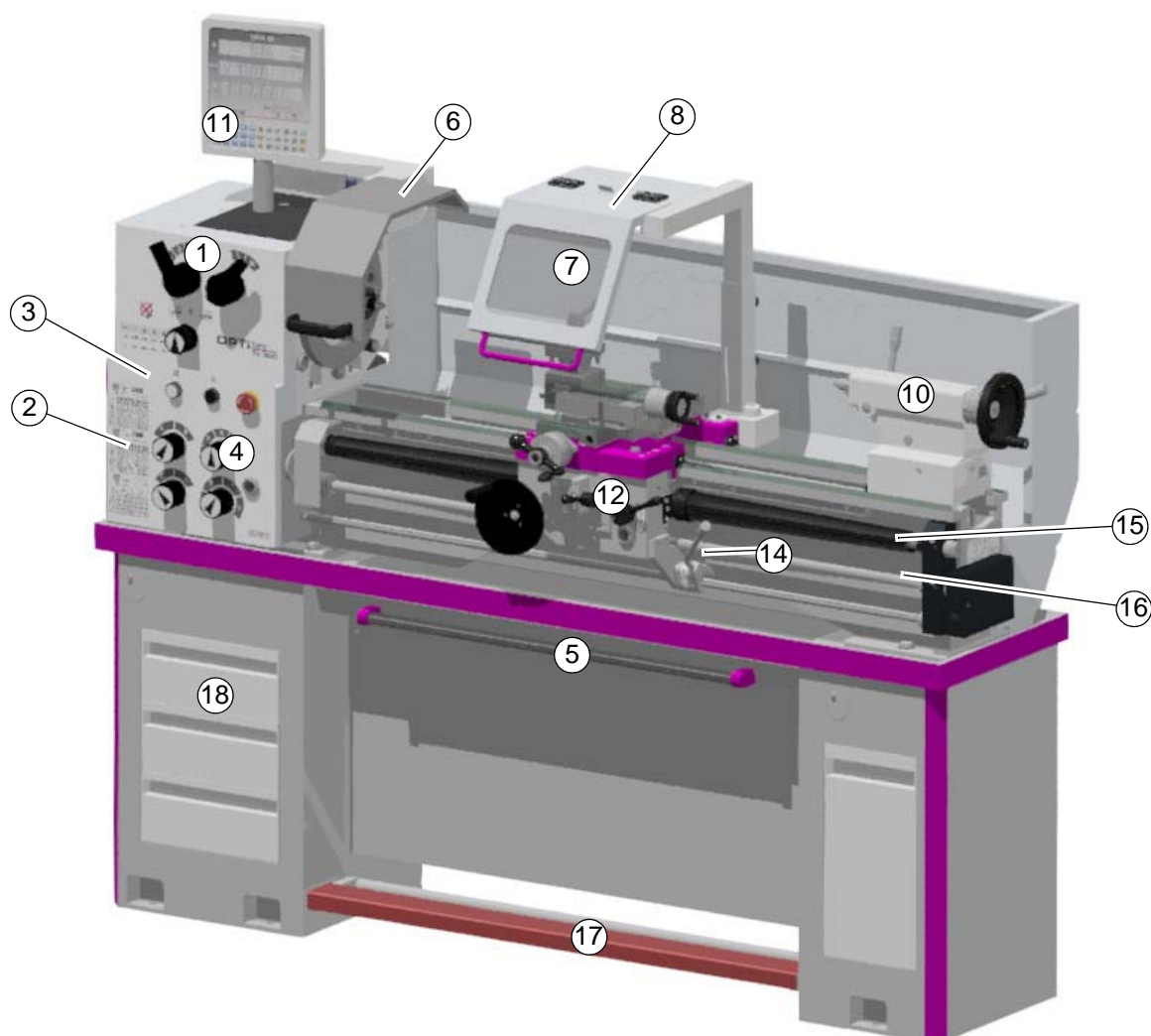
Note: The machine base stands on the levelling nut (2) and not on the levelling disc with vibration damper (3).





5 Operation

5.1 Control and indicating elements



Pos.	Designation	Item	Designation
1	Selector lever speed adjustment	2	Change wheel and infeed table
3	Control panel	4	Selector lever feed gear
5	Chip sump	6	Lathe chuck protection
7	Chip shield	8	Machine lighting (hidden behind the chip shield)
10	Tailstock	11	Digital Position Indicator DPA 21 (TH3610D only)
12	Control panel lathe saddle	14	Spindle rotation actuating lever
15	Lead screw	16	Feed rod
17	Spindle brake	18	Drawer

TH3610_TH3610D_GB_4.fm



5.2 Safety

Commission the lathe only under the following conditions:

- The lathe is in proper working order.
- The lathe is used as prescribed.
- Follow the operating instructions.
- All safety devices are installed and activated.





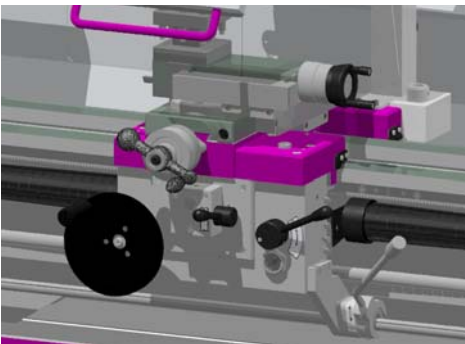
Eliminate or have all malfunctions rectified promptly. Stop the lathe immediately in the event of any abnormality in operation and make sure it cannot be started-up accidentally or without authorisation.



Notify the person responsible immediately of any modification.

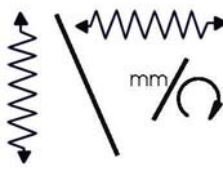
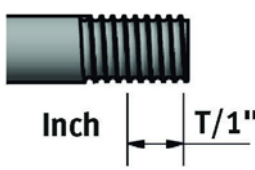
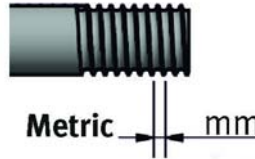




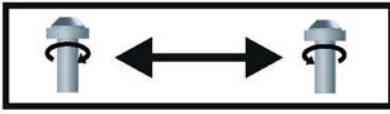


👉 For your own safety during operation on page 18

5.2.1 Overview of the control elements

 <p>lockable main switch</p>	 <p>Selector lever gearbox - speed setting</p>
 <p>Feed adjustment selector switch</p>	 <p>Control panel on headstock</p>
 <p>Bed slide</p>	



5.2.2 Control elements

 <p>Crossfeed / Longitudinal feed</p>	 <p>Inch thread [threads / inch]</p>
 <p>Metric thread [mm / spindle revolution]</p>	 <p>mm per spindle revolution</p>
 <p>Feed direction</p>	 <p>Refill oil</p>
 <p>Check filling level</p>	 <p>Turning direction</p>
 <p>Read the maintenance manual ☞ Check up, inspection and maintenance on page 62</p>	 <p>Direct run, momentary switch</p>

5.3 Switching the machine on

- Switch on the main switch.
- The control lamp for operation must be on.
- Check that the EMERGENCY-STOP button is not pressed or is unlocked. Turn the EMERGENCY-STOP mushroom switch to the right in order to unlock it.
- Close the lathe chuck protection.
- ☞ Malfunctions on page 117

5.4 Switching the machine off

- Switch off the main switch.
- If the lathe has been shut off for a longer period of time, switch it off using the main switch and secure it against being unintentionally switched back on. ☞ Disconnecting and securing the lathe on page 19



CAUTION!

The emergency stop button may only be activated in an emergency. You should not use the **EMERGENCY STOP** button to stop the machine during normal operation.



5.5 Resetting an emergency stop condition

- Set the rotational direction control lever to the neutral position.
- Unlock the emergency stop switch again.
- Switch the control on.

5.6 Power failure, Restoring readiness for operation

- Set the rotational direction control lever to the neutral position.
- Switch the control on.

5.7 Momentary switch, direct run

Use the direct run to facilitate engaging the gearbox settings. The spindle starts turning, while the momentary switch is activated. The lathe chuck protection must be closed for this. Press the direct run button only short.

5.8 Foot brake

Activating the foot brake deactivates the drive and brakes the spindle.

- Set the lever of rotational direction back to the neutral position.

5.9 Speed setting

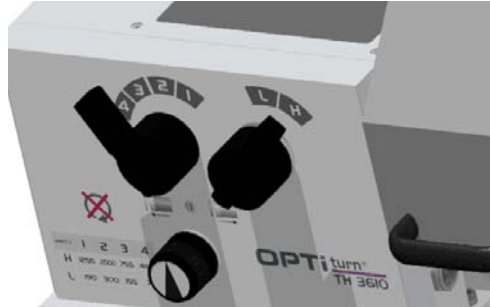
ATTENTION!

Only adjust the speed when the machine has come to a complete halt.

There are 8 speeds available.

The speed is adjusted with the two selection levers 4 / 3 / 2 / 1 and L / H. In dependence on the V-belt position, you will get the speed according to the following table.

Use the direct run to facilitate engaging the gearbox settings.



5.9.1 Speed table TH3610 | TH3610D - Connecting ~ 50Hz

mm/rev	1	2	3	4
H	1255	2000	755	460
L	190	300	155	70

Img.5-1: ~50 Hz



5.9.2 Speed table TH3610 | TH3610D - Connecting ~ 60Hz

mm/↻ ~60 Hz	1	2	3	4
H	1506	2400	906	552
L	228	360	186	84

Img.5-2: ~60 Hz

5.10 Turning direction

With the control lever the rotation of lathe is switched. The lathe can only be switched on, when the lathe chuck protection is closed.

- Turn the control lever down if you want the turning direction to be anti-clockwise.
- Turn the control lever up if you want the turning direction to be clockwise.

ATTENTION!

Wait until the lathe has come to a complete halt before changing the rotational direction by turning the actuating lever rotational direction.

A change of direction of rotation during operation leads to the destruction of components.



INFORMATION

It may take up to one second until the spindle of the TH3309V begins to rotate.

The controller regulates the speed slowly to the preset level on the control knob for the speed. This measure avoids a too high starting current at full load.



5.11 Feed

The selector levers are used to set the feed or the pitch required for the thread-cutting.

ATTENTION!

Only adjust the speed when the lathe is being completely stopped.

If required, use the direct run to facilitate the engaging of the gear lever.



Img.5-3: Selector switch infeed



ATTENTION!

Damage to couplings, mechanical parts. The automatic feed is not designed to move onto mechanical stops or the mechanical end of the headstock.



5.11.1 Infeed speed

There are rates of feed in the range from 0.052 - 1.392 (32 pcs.) and 0.014 - 0.38 (32 pcs.) mm per spindle rotation at disposal. Use the table on the lathe to adjust the rate of feed.

5.11.2 Feed direction

The selection lever is used to change the feed direction.

- ➔ Turn the selector lever to the left or right according to the symbols for production of longitudinal feed in direction to the spindle head or for the production of a left handed thread.

Selector switch
Feed direction

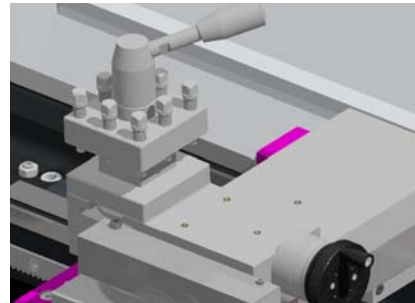


Img.5-4: Selector lever feed direction

5.12 Tool holder

Clamp the lathe tool into the tool holder.

The lathe tool needs to be clamped as short and tight as possible when turning in order to be able to absorb the cutting force during the chip formation well and reliably.

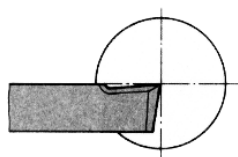


Img.5-5: Tool holder

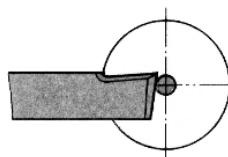
Adjust the height of the tool. Use the tailstock with the center point in order to determine the required height. If necessary, put the steel washers beneath the lathe tool to achieve the required height.

Tool height

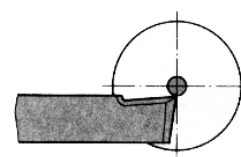
For the facing process, the cutting edge of the tool must be exactly aligned with the height of the lathe centre to obtain a shoulder-free face. The facing process is a turning operation in which the turning tool feeds perpendicular to the axis of rotation of the workpiece in order to produce a flat surface. The different methods are transversal facing, transversal slicing and longitudinal facing.



Lathe tool
adjusted to center height



Lathe tool set above
adjusted to center height



Lathe tool set below
adjusted to center height

Img.5-6: Height of tool

Lathe tool angle

ATTENTION!

The lathe tool must be clamped with its axis perpendicular to the axis of the workpiece. If it is clamped at an angle, the lathe tool may be sucked into the workpiece.



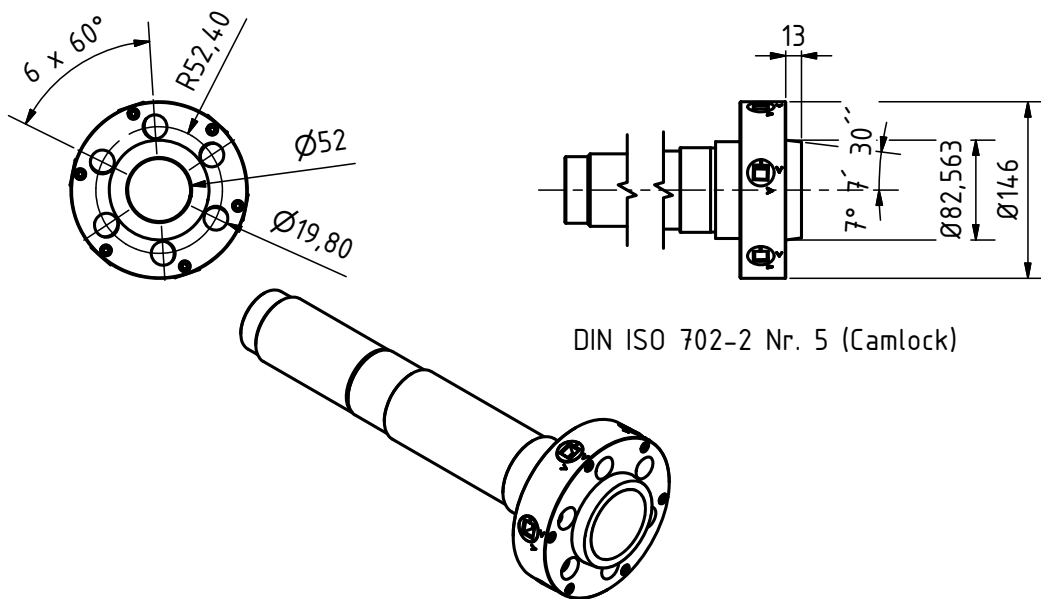


Lathe tool clamped perpendicular
to the axis of the workpiece

Lathe
clamped at tool
an

Img.5-7: Lathe tool angle

5.13 Lathe spindle fixture



WARNING!

Do not clamp any workpieces that exceed the permitted chucking capacity of the lathe chuck. The clamping force of the chuck is too low if its capacity is being exceeded. The clamping jaws may loosen.

Only use lathe chucks designed for the speed of the machine.

Do not use lathe chucks with an external diameter that is too large.

Please ensure that lathe chucks are manufactured to EN 1550 standards.

The spindle nose is designed as a Camlock 5 DIN ISO 702-2 holding fixture.



CAUTION!

Regularly check the closed status of the clamp bolt.



INFORMATION

Mark each workpiece holder for instance by a nick in order to facilitate the recover of the precision of the concentric run and the axial run-out deviation.

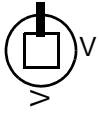




5.13.1 Fasten workpiece holder

→ Fasten the workpiece holder by turning the clamping bolts clockwise.

The right clamp position is reached when the reference marker at the clamp holder are between the two marks at the lead spindle seat.



Marking clamp bolt
"Open position"



Marking clamp bolt
"Closed position"

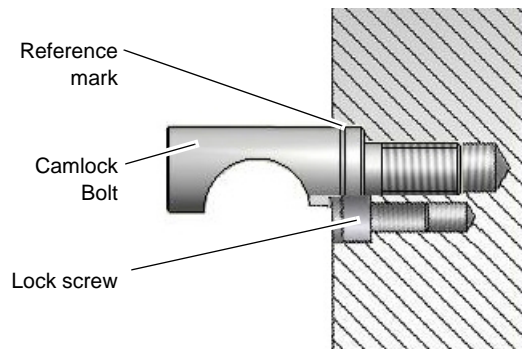
Img.5-8: Marking clamp bolt

Adjusting the Camlock bolts to the workpiece holder

→ Detach the safety screw.

→ Turn the Camlock bolt by one complete revolution in or out, according to the correction necessary.

→ Mount the safety screw



Img.5-9: Camlock seat

INFORMATION

The reference mark on each Camlock bolt serves as orientation for the correct adjustment.



5.13.2 Lathe chuck

During turning, the workpiece is subject to cutting forces, weight forces and unbalance forces which have to be absorbed by a sufficiently strong clamping force. Massive workpieces with higher degrees of stiffness lead to a considerable loss of clamping force. This loss of clamping force is lower for thin-walled, distortion-sensitive workpieces with less stiffness.

The maximum rotational speed of a lathe chuck may only be applied at maximum actuating force and with perfectly working chucks.

Lathe chucks must be designed for the maximum rotational speed of the machine, the permissible lathe chuck speed with respective jaws and/or top jaws, as well as the maximum measured static clamping force at maximum introduced force must be specified in the operating instructions for the lathe chuck or be indicated on the lathe chuck itself. Replacement lathe chucks must comply with EN 1550 standards. The minimum distance to the machine bed must not be less than 25 mm.

WARNING!

Do not clamp any workpieces that exceed the permitted chucking capacity of the lathe chuck. The clamping force of the chuck is too low if its capacity is being exceeded. The clamping jaws may loosen.

Only use lathe chucks designed for the speed of the machine.

Do not use lathe chucks with an external diameter that is too large.

Please ensure that lathe chucks are manufactured to EN 1550 standards.





5.13.3 Speed information, maintenance recommendations, reference speed in accordance with DIN 6386

The reference speed is the number of rotations, at which the mathematical centrifugal force with the corresponding jaw design correlates with the greatest tensioning force when the machine is at a standstill. The reference speed applies for jaws mounted inside in tiers, whereby they must not protrude past the outer diameter of the chuck.

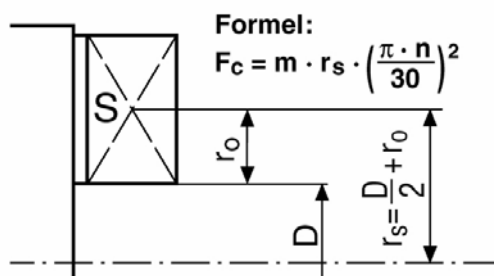
At the determined reference speed, 1/3 of the tensioning force which is available when the machine is at a standstill, is available for clamping the workpiece. The prerequisite is that the clamping chuck is in proper working order.

In general, the labels on the clamping jaws and lathe chuck (perm. speed, max. turning diameter, ...), the information in the respective lathe chuck operating instructions and, for special jaws, the additional information on the respective drawing must be observed.

5.13.4 Influencing factors that significantly impact the tensioning force

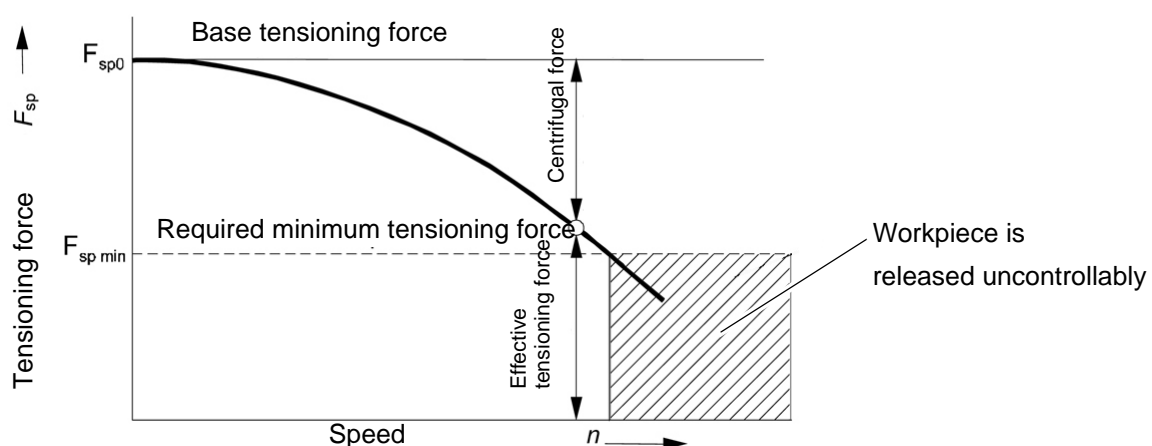
Clamping jaw centrifugal force

To calculate the required tensioning force for processing a workpiece, the centrifugal force of the clamping jaws must be taken into account.



F_c	Centrifugal force in N
m	Mass in kg/set
r_s	Centre of gravity distance to the centre of the chuck in metres
n	Speed min^{-1}
r_0	Centre of gravity distance to the clamping jaw

The permissible speeds can be determined in accordance with VDI Guideline 3106 "Determining the permissible speed for lathe chucks (jaw chucks). This guideline also allows for the residual tensioning force at a specified speed to be determined.





5.13.5 Lathe chuck maintenance

A crucial prerequisite for fault-free functionality of a lathe chuck is regular and thorough lubrication of the sliding surfaces. This prevents the reduction of tensioning force and premature wear and tear.

Always observe the manufacturer's maintenance instructions when using replacement lathe chucks.

Coolant squirts on the lathe chuck and removes the grease from the jaws. In order to maintain the tensioning force and the long-term accuracy of the lathe chuck, the lathe chuck must be lubricated regularly. Insufficient lubrication will result in malfunctions with significantly reduced tensioning force, which affects the accuracy and causes excessive wear and seizing.

Lubricate the installed lathe chuck at least once per week. The used lubricant should be of high quality and provided for high pressure bearing surfaces. The lubricant should withstand the coolant and other chemicals.

We recommend the use of ALTEMP Q NB 50 by Klueber for the lubrication of the sliding surfaces and clamping fixture of the supplied lathe chucks. You may optionally use a lubricant for lathe chucks from other renowned lathe chuck manufacturers.

Clamping jaws and jaw mounting screws are wear and tear parts. The service life is limited. We therefore recommend having them inspected at regular intervals by a specialist (e.g. inspection for cracks using a dye penetration process or magnet powder test (fluxing), eddy current testing, ultrasound testing) and replace if necessary.

5.13.6 Clamping long workpieces

- through the hollow shaft of the spindle

CAUTION!

Long rotating parts that protrude from the hollow shaft of the spindle must be secured by the operator using suitable covers. A cover can be a sleeve that is mounted on the headstock that, as a permanent safety device, completely covers the protruding workpiece.



- between the tips

CAUTION!

Long workpieces must be additionally supported. They are supported by the tailstock sleeve and, if necessary, a rest.

 Follow and steady rests on page 47



- with a lathe dog

CAUTION!

When clamping workpieces between the tips of the lathe while using a lathe dog, the existing lathe chuck protection must be replaced with a circular lathe chuck protection.





5.13.7 Mounting workpiece holder

Centering point

- Clean the taper bore of the lathe spindle holding fixture.
- Clean the reducing bush and the taper of the centring point.
- Press the centring point with the reducing bush into the taper bore of the lathe spindle holding fixture.

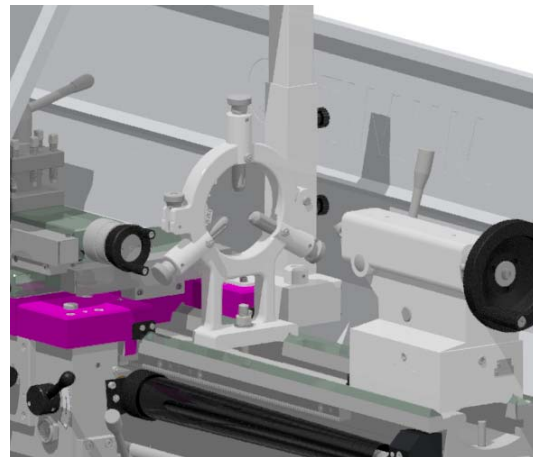
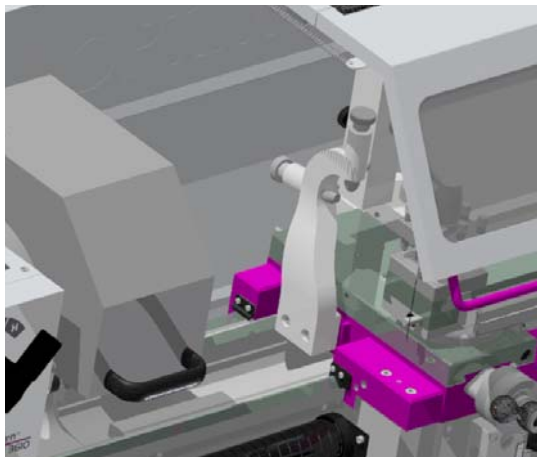


Img.5-10: Centring point with reducing bush

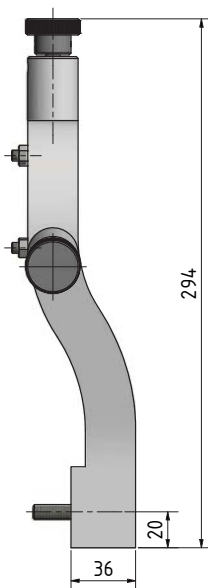
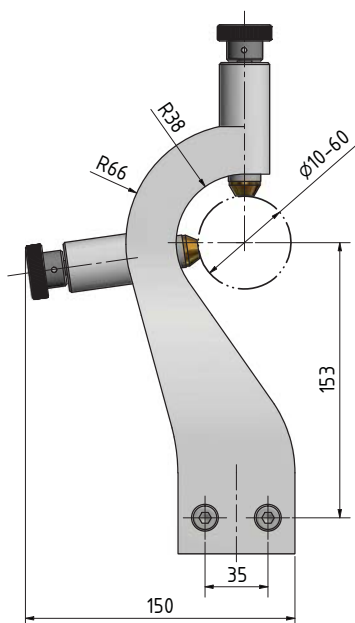
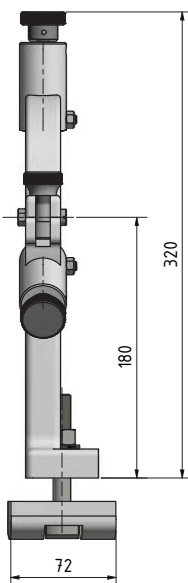
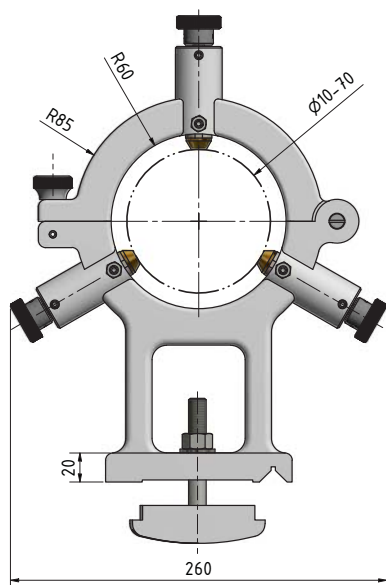
5.14 Mounting of rests

5.14.1 Follow and steady rests

Use follow or steady rests to support long turned parts if the shear forces of the turning tool would bend the turning parts.



Img.5-11: Follow rest Steady rest



5.15 Bed insert

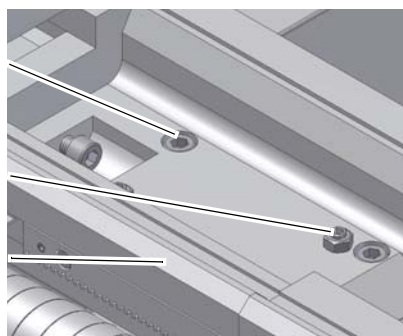
Remove the bed insert if the diameter of the workpiece turned is larger. By removing the bed insert, the rotational diameter can be increased.

- ➔ First detach the fastening screws and then pull out the alignment pins.
- ➔ For re-assembly, proceed the other way around.

Fixing screws

Dowel pins

Bed insert

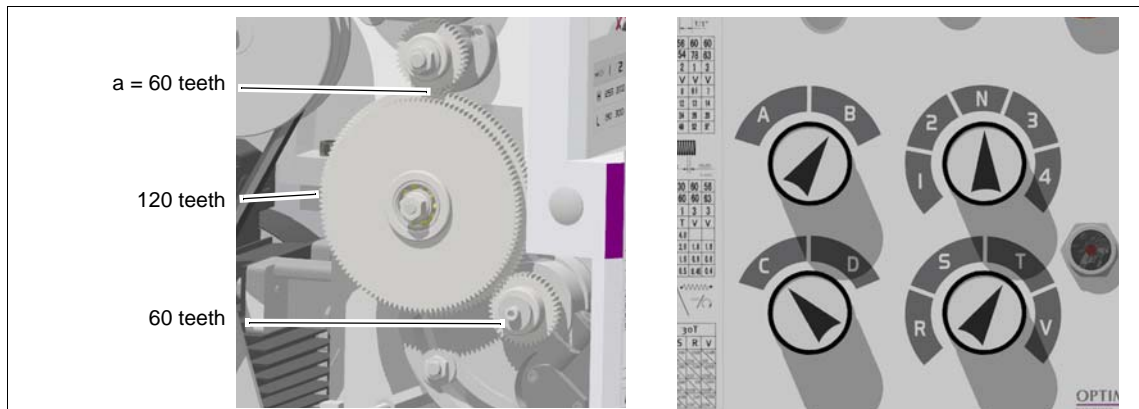


Img.5-12: Bed insert



5.16 Setting the feed

Example: Feed 0.07 mm / spindle revolution With the same settings you will achieve a longitudinal feed of 0.261mm / spindle revolution.



ATTENTION!

The change wheels have to be mounted according to the layout of the feed table in order to achieve the indicated feed rate.

Set selection switch to A - C - N - R

N = neutral position

☞ Cutting speeds on page 59

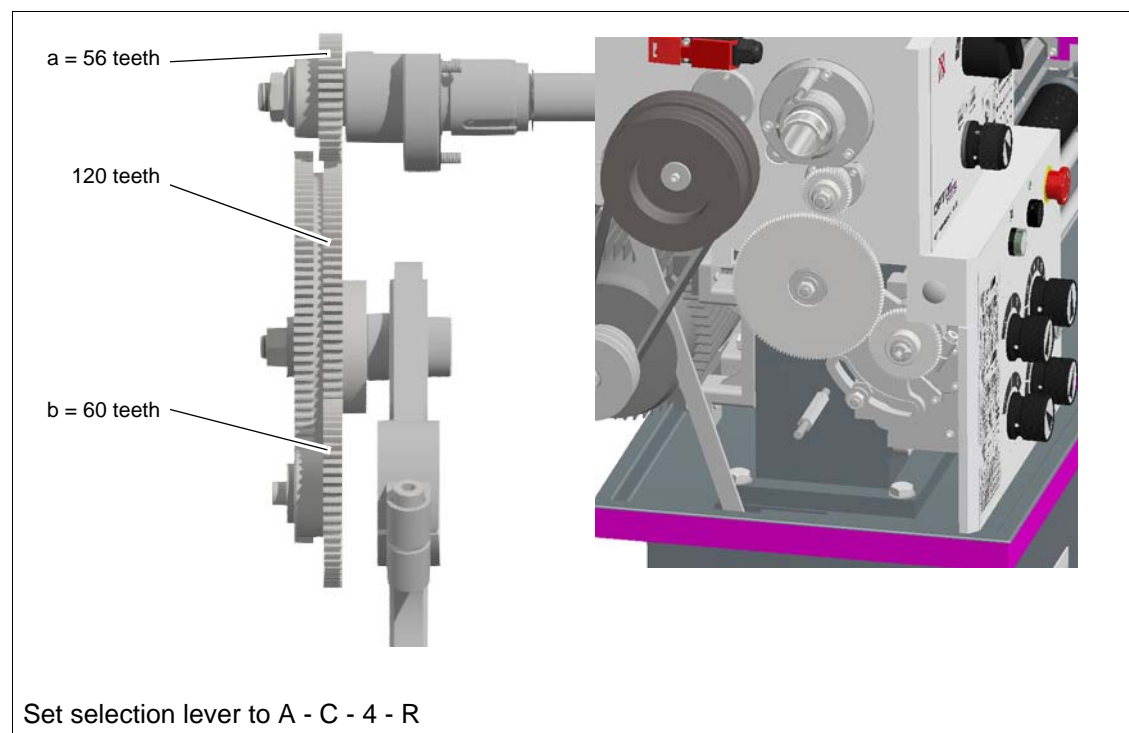


If necessary, use the ☞ Overview of the control elements on page 38 as a reference for the following description.

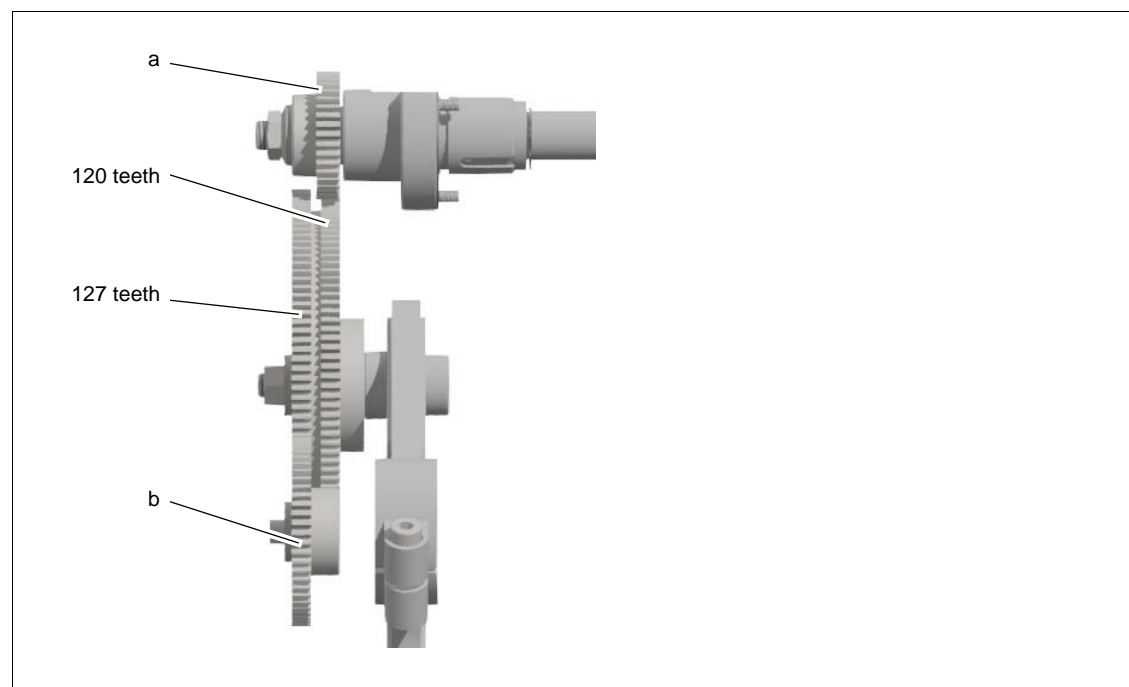
- ➔ Detach or clamp the clamping screw on the lathe saddle in dependence on the feed used
☞ „Img.5-19: Lathe saddle tightening screw“ on page 54
- ➔ Select the required feed with the "selector switch cross- longitudinal feed" on the apron.
- ➔ Activate the automatic crossfeed by pushing down the engaging lever.
- ➔ Activate the automatic longitudinal feed by pulling out and pushing up the engaging lever.
- ➔ Move the hand wheel of the corresponding slide to facilitate the locking of the engaging lever.

5.17 Adjusting threads

Example: Thread pitch 1.75 mm per revolution





Example: Arrangement inch thread






5.17.1 Change gear table

									
	60	60	60	60	40	40	56	40	60
b	60	54	57	60	44	46	54	52	63
	4	1	1	1	1	1	2	1	3
	V	V	V	V	V	V	V	V	V
A D	4	4 1/2		5	5 1/2		6	6 1/2	7
B D	8	9	9 1/2	10	11	11 1/2	12	13	14
A C	16	18	19	20	22	23	24	25	26
B C	32	36	38	40	44	46	48	52	56

									
a	56	60	60	30	60	60	30	60	56
b	60	60	60	60	60	60	60	60	63
	4	1	3	4	1	3	1	3	3
	R	R	S	T	V	R	T	V	V
A D	7	6		5		4,5	4		
B D	3,5	3		2,5		2,25	2	1,8	1,6
A C	1,75	1,5	1,4	1,25	1,2		1	0,9	0,8
B C		0,75	0,7		0,6		0,5	0,45	0,4

									
a	60 T				30 T				
	V	S	R	V	T	S	R	V	
A D	1,392	1,3	1,044	0,835	0,696	0,65	0,522	0,418	
B D	0,38	0,351	0,282	0,226	0,188	0,175	0,141	0,113	
B D	0,696	0,65	0,522	0,418	0,348	0,325	0,261	0,208	
A C	0,188	0,176	0,141	0,113	0,094	0,088	0,07	0,056	
A C	0,348	0,325	0,261	0,208	0,174	0,162	0,130	0,104	
B C	0,094	0,088	0,07	0,056	0,047	0,44	0,035	0,028	
B C	0,174	0,162	0,13	0,104	0,087	0,081	0,065	0,052	
B C	0,047	0,044	0,035	0,028	0,024	0,022	0,017	0,014	

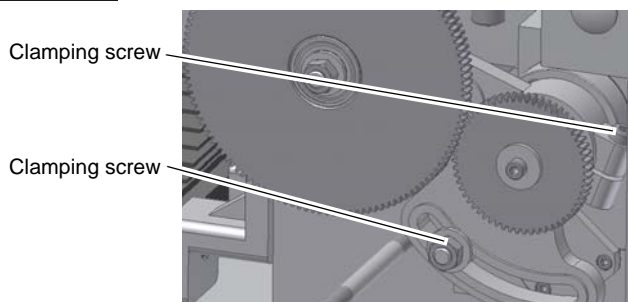
5.17.2 Exchange, change of position of the change gears

The change gears for the feed are mounted to a quadrant respectively directly on the lead screw and feed gear.

- ➔ Always disconnect the main plug of the lathe and secure the main switch by a padlock, against unauthorized or accidental activation.
- ➔ Open the protective cover of the change gears.
- ➔ Disassemble two thumbscrews ① and ② and open the protective cover of change gear.



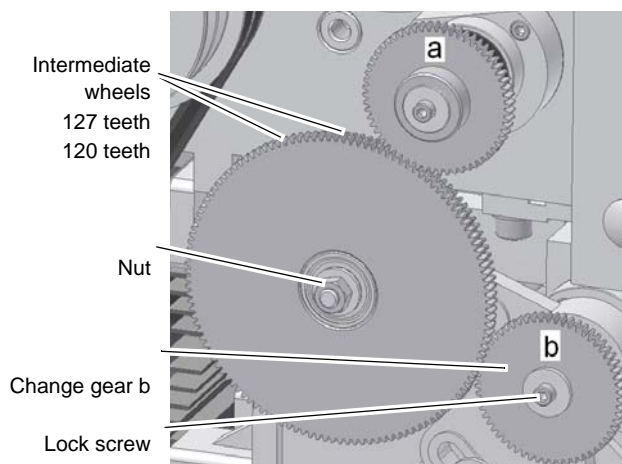
- ➔ Loosen the clamping screw on the quadrant.
- ➔ Slew the quadrant up.
- ➔ Mount and position the change gears as indicated on the table.



Img.5-13: Change gears

Example:

- ➔ Loosen the screws of the change wheel **b** and the nut on the stay rod of the intermediate wheels.
- ➔ Replace the change wheel **b** according to the change wheel table.
- ➔ Adjust the intermediate wheels in the long hole until the toothed wheels are engaging.
- ➔ Position the quadrant in a way that the toothed wheels are cammed in.



Img.5-14: Change gears

- ➔ Turn the change wheel **a** or **b** by 180° in order to achieve for instance the pace with the intermediate wheel 127 teeth.

INFORMATION

Adjust the clearance of the tooth profile with the help of a piece of paper (80g/m²). Clamp the paper as a spacing between the tooth profiles of the toothed wheels.





5.18 Tailstock

The tailstock sleeve is used to hold the tools (bits, centres, etc.)

- ➔ Clamp the required tool in the tailstock sleeve.
- Use the scale on the sleeve to re-adjust and / or adjust the tool.
- ➔ Clamp the sleeve with the clamping lever.

Use the hand wheel to move the sleeve back and forth.

The sleeve of the tailstock can a drill chuck used for the recording of drilling and countersinking tools are set.

INFORMATION

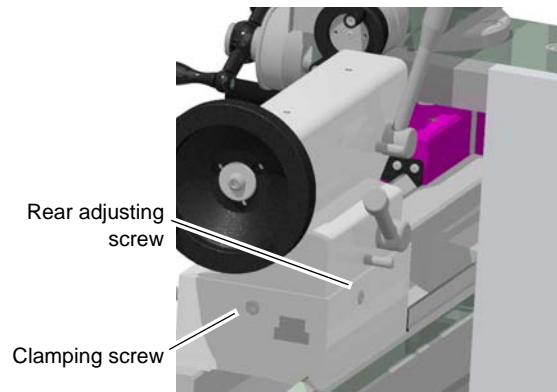
When using different tools, it can happen that you cannot start with the quill marking with scale value 0, because the tool is already ejected in this position by the expulsion flap. In such cases we recommend to start at a value of 10mm and to convert from here on.



5.18.1 Cross-adjustment of the tailstock

The cross-adjustment of the tailstock is used for turning long, thin bodies.

- ➔ Loosen the clamping screws in the front and in the rear of the tailstock.
- ➔ Loosen the adjusting screws in the front and in the rear of the tailstock.
- By alternately loosening and tightening the two (front and rear) adjusting screws, the tailstock is moved out of the central position. The desired cross-adjustment can be read off the scale.



Img.5-15: Cross-adjustment of the tailstock

- ➔ Re-tighten the adjusting screws and the clamping screw of the tailstock.

INFORMATION

The tailstock may be cross-adjusted to each direction by approximately + - 10 mm.

Example:

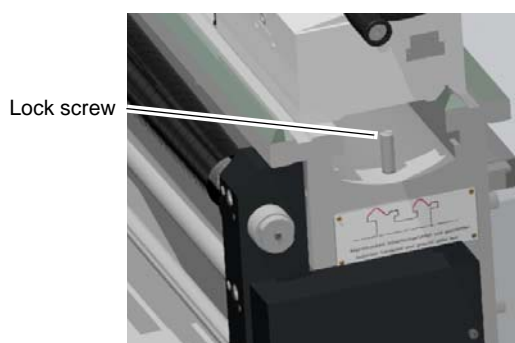
A 300 mm long shaft is to be taper-turned between the centres with an angle of 1°.

Cross-adjustment of the tailstock = 300 mm x Tan 1°. The tailstock must be cross-adjusted by approximately 5.236 mm.



CAUTION!

Check clamping of the tailstock and the sleeve, respectively for the turning jobs between the centres! Tighten the securing screw at the end of the lathe bed in order to prevent the tailstock from unintentional drawing-out of the lathe bed.

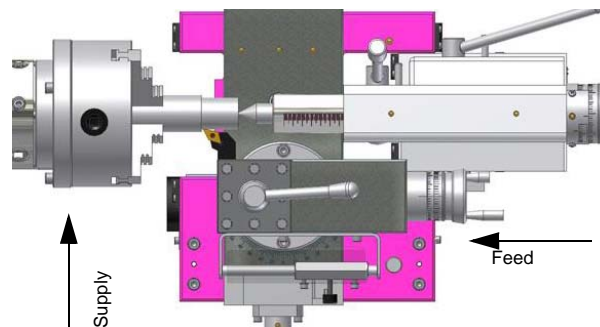


Img.5-16: Lathe bed

5.19 General operating instructions

5.19.1 Longitudinal turning

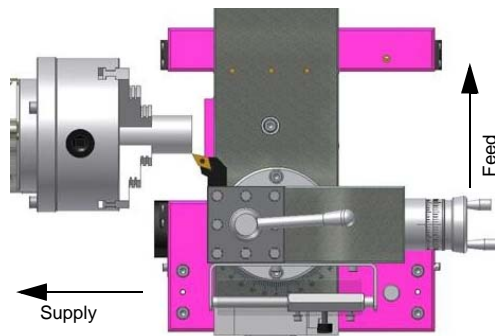
In the straight turning operation, the tool feeds parallel to the axis of rotation of the workpiece. The feed can be either manual - by turning the handwheel on the lathe saddle or the top slide - or by activating the automatic feed. The cross feed for the depth of cut is achieved using the cross slide.



Img.5-17: Illustration: Longitudinal turning

5.19.2 Face turning and recessing

In the facing operation, the tool feeds perpendicular to the axis of rotation of the workpiece. Feed is done manually, using the cross-slide hand wheel. The infeed for cut depth is made with the top slide or lathe saddle.

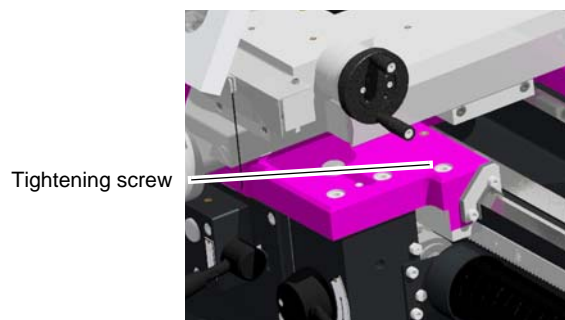


Img.5-18: Illustration: Face turning

5.19.3 Fixing the lathe saddle

The cutting force produced during facing, recessing or slicing processes may displace the lathe saddle.

- ➔ Secure the lathe saddle using the tightening screw.



Img.5-19: Lathe saddle tightening screw



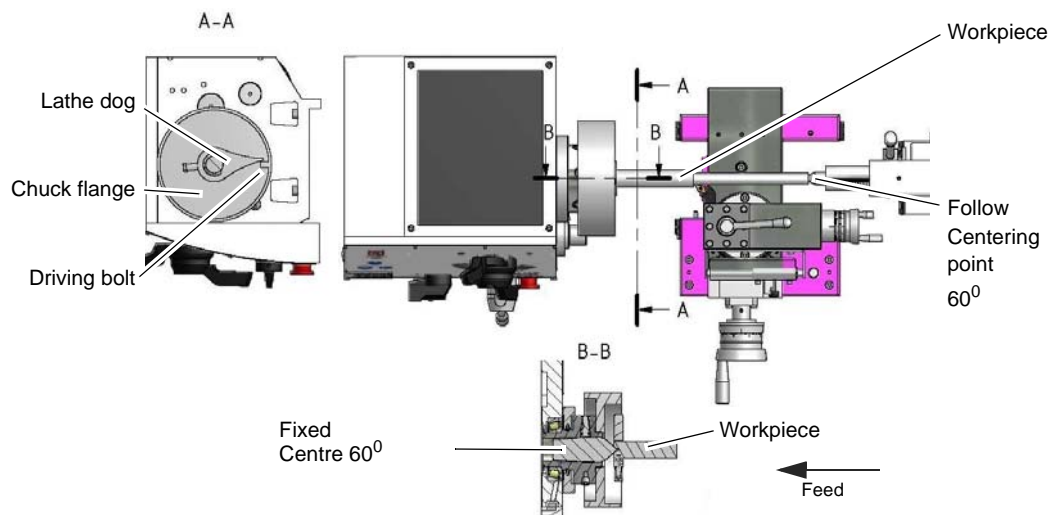
5.19.4 Turning between centres

CAUTION!

When clamping workpieces between the tips of the lathe while using a lathe dog, the existing lathe chuck protection must be replaced with a circular lathe chuck protection.



Workpieces that require a high concentricity precision are machined between the centres. For holding purposes, a centre hole is drilled into both plain machined faces of the workpiece.



Img.5-20: Illustration: Turning between centres

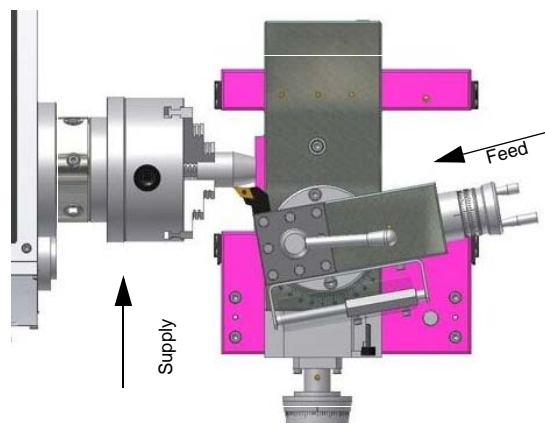
The lathe dog is clamped onto the workpiece. The driving bolt, which is screwed into the flange for the lathe chuck, transmits the torque to the lathe dog.

The fixed centre glides into the centre hole of the workpiece on the spindle nose side. The follow centre glides into the centre hole of the workpiece at the tailstock side.

5.19.5 Turning short tapers with the top slide

Short tapers are turned manually with the top slide. Swivel the top slide to the required angle. The infeed is achieved with the cross slide.

- ➔ Loosen the two clamping screws in the front and in the rear of the top slide.
- ➔ Swivel the top slide.
- The required setting of the angular degree may be read from the scale.
- ➔ Clamp the top slide again.



Img.5-21: Illustration: Turning tapers

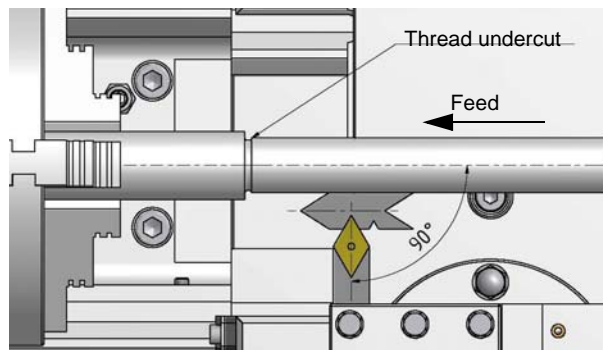
5.19.6 Thread cutting

The thread cutting process requires that the operator has a good knowledge of turning and sufficient experience.

NOTES!

Example of an external thread:

- The workpiece diameter must have been turned to the diameter of the desired thread.
- The workpiece requires a chamfer at the beginning of the thread and an undercut at the thread run out.
- The speed must be as low as possible.
- The thread cutting tool must be exactly the same shape as the thread, it must be absolutely rectangular and must be clamped in a way that it coincides exactly with the turning centre.
- The threading engaging lever must be engaged during the whole thread cutting process. This does not apply to thread pitches that can be carried out with the thread gauge.
- The thread is produced in various cutting steps in a way that the cutting tool has to be turned out of the thread completely (with the cross slide) at the end of each cutting step.
- The tool is withdrawn with the lead screw nut engaged and the thread cutting tool disengaged by actuating the "Direction of rotation control lever".
- Stop the lathe and feed the thread cutting tool in low cut depths using the cross slide.



Img.5-22: Illustration: Thread cutting

- Before each passage, place the top slide approximately 0.2 to 0.3 mm to the left and right alternately in order to cut the thread free. In this way, the thread cutting tool cuts only on one thread flank with each passage. Do not execute any more free cutting, just before reaching the full thread depth.

5.19.7 Cooling agent

Friction during the cutting process causes high temperatures at the cutting edge of the tool.

The tool should be cooled during the milling process. Cooling the tool with a suitable cooling lubricant ensures better working results and a longer service life of the cutting tool.

INFORMATION

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

Make sure that the cooling agent is properly retrieved. Respect the environment when disposing of lubricants and coolants. Follow the manufacturer's disposal instructions.



5.19.8 Cooling lubricants

INFORMATION

The lathe is lacquered with a **one-component paint**. Consider this fact when selecting your cooling lubricant.

The company Optimum Maschinen Germany GmbH does not assume any guarantee for subsequent damages due to unsuitable cooling lubricants.

The flashpoint of the emulsion must be higher than 140°C.





When using non-water-miscible cooling lubricants (oil content > 15%) with a flashpoint, ignitable aerosol air mixtures might develop. There is a potential danger of explosion.

The selection of cooling lubricants and slideway oils, lubricating oils or greases as well as their care are being determined by the machine operator or operating company.

Therefore, Optimum Maschinen Germany GmbH cannot be held liable for machine damages caused by unsuitable coolants and lubricants as well as by inadequate maintenance and servicing of the coolant. In case of problems with the cooling lubricant and the slideway oil or grease, please contact your mineral oil supplier.





6 Cutting speeds

6.1 Selecting the cutting speed

The variety of factors makes it impossible to present universal indications about the "correct" cutting speed.

Tables with reference values about cutting speeds to be set must be evaluated with utmost caution since they only apply for very particular cases. The reference values without cooling (no best values) which are indicated in AWF documents are highly recommended. Furthermore, the tables of reference values of the manufacturers of cutting materials should be evaluated e.g. for hard metal cutting materials the indications of the company Friedrich Krupp Widia-Fabrik, Essen applies.

V_{c60} is the cutting speed at 60 min. service life, V_{c240} according for 240 min. service life. Select V_{c60} for simple, easily replaceable lathe tools; V_{c240} for simple tool sets depending on one another; V_{c480} for complicated tool sets where the tool change requires more time due to the dependencies on one another and the accuracies of the cutting insert. The same considerations apply with regard to maintenance of the tools. It generally applies: High cutting speeds result in low-time chipping, little cutting speeds result in cost-efficient chipping.

6.2 Influences on the cutting speed

V_c = Cutting speed in [m/min]

t = Service life in [min]

The service life t is the period of time in minutes during which the cutting insert performs cutting tasks until it is necessary to re-sharpen it. It is of utmost commercial importance. For the same material t is smaller the higher you select the value V_c e.g. only a few minutes at $V_c = 2000$ m/min. Different materials require different V_c for the same t . All considerations of this type require that the other cutting conditions are maintained constant (material, tool and setting conditions). If only one of these condition changes it is also necessary to change V_c in order to obtain the same t . Therefore, only cutting speed tables are reasonable which show all relevant cutting conditions.

6.3 Example for the determination of the required speed on your lathe

The necessary speed is depending on the diameter of the workpiece, of the material to be machined, of the turning tool, as well as of the setting of the turning tool (cutting material) to the workpiece.

Material to be turned: St37

Cutting material (turning tool): Hard metal

Setting angle [k_r] of the turning tool to the workpiece: 90°

selected infeed [f]: about 0.16mm/rev

the cutting speed [V_c] according to the table: 180 meters per minute

diameter [d] of your workpiece: 60mm = 0.06m [meters]

$$\text{Speed } n = \frac{V_c}{\pi \times d} = \frac{180 \text{m}}{\text{min} \times 3,14 \times 0,06 \text{m}} = 955 \text{min}^{-1}$$

Set the speed on you lathe below the calculated speed.

6.4 Table cutting speeds

Reference values for cutting speeds V_c in m/min when turning high speed steel and hard metal. (Excerpt from VDF 8799, Gebr. Boehringer GmbH, Göppingen)

Material	Tensile strength R _m in N/mm ²	Cutting material ³⁾	Infeed <i>f</i> in mm/rev. and setting angle <i>k_r</i> ^{1) 2)}																											
			0.063			0.1			0.16			0.25			0.4			0.63			1			1.6			2.5			
			45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	
St 34; St 37; C22; St 42	up to 500	High-speed steel							50	40	34.5	45	35.5	28	35.5	28	22.4	28	22.4	18	25	20	16	20	16	12.5	16	12.5	10	
		P 10	250	236	224	224	212	200	200	190	180	180	170	160	162	150	140	140	132	125	125	118	112	112	106	100				
St 50; C 35	500...600	High-speed steel							45	35.5	28	35.5	28	22.4	28	22.4	18	25	20	16	20	16	12.5	16	12.5	10	12.5	10	8	
		P 10	224	212	200	200			180	170	160	160	150	140	140	132	125	125	118	112	112	106	100	100	95	90				
St 60; C45	600...700	High-speed steel							35.5	28	22.4	28	22.4	18	25	20	16	20	16	12.5	16	12.5	10	12.5	10	8	10	8	6.3	
		P 10	212	200	190	190	180	170	170	160	150	150	140	132	132	125	118	118	112	106	106	100	95							
St 70; C60	700...850	High-speed steel							28	22.4	18	25	20	16	12.5	16	12.5	16	12.5	10	12.5	10	8	10	8	6.3	8	6.3	5	
		P 10	180	170	160	160	150	140	140	132	125	125	118	112	106	100	95	95	90	85	85	80	75							
Mn-; CrNi-, CrMo- among others alloyed steels	700...850	High-speed steel							25	20	16	20	16	12.5	16	12.5	10	12.5	10	8	11	9	7	9	7	5.6	7.5	6	4.5	
		P 10	180	170	160	160	150	140	140	132	125	125	118	112	106	100	95	95	90	85	85	80	75							
	850...1000	High-speed steel							20	16	12.5	16	12.5	10	12.5	10	8	10	8	6.3	8	6.3	5	7.1	5.6	4.5	5.6	4.5	3.6	
		P 10	140	132	125	125	118	112	100	95	90	90	85	80	71	67	63	63	60	56	56	53	50							
	1000...1400	High-speed steel							14	11	9	11	9	7	9	7	5.6	7	5.6	4.5	5.6	4.5	3.6	4.5	3.6	2.8	3.6	2.8	2.2	
		P 10	80	75	71	71	67	63	63	60	56	56	53	50	50	47.5	45	45	42.5	40	33.5	33.5	31.5							
Rust-resistant steel	600..700	P 10	80	75	71	71	67	63	56	53	50	50	47.5	45	45	42.5	40	33.5	33.5	31.5	31.5	30	28							
Tool steel	1500..1800	High-speed steel							9	7	5.6	5.6	4.5	3.6	4	3.2	2.5													
		P 10	45	42.5	40	40	37.5	35.5	35.5	33.5	31.5	28	26.5	25	25	23.4	22	22	21	20	18	17	16							
Mn - High-carbon steel		P 10	33.5	33.5	31.5	31.5	30	28	28	26.5	25	22	21	20	20	19	18	18	17	16										
GS-45	300..500	High-speed steel							45	35.5	28	35.5	28	22	31.5	25	20	25	20	16	20	16	12.5	16	12.5	10	12.5	10	8	
		P 10	150	140	132	118	112	106	106	100	95	95	90	85	85	80	75	75	71	67	67	63	60							
GS-52	500..700	High-speed steel							28	22	18	25	20	16	20	16	12.5	16	12.5	10	12.5	10	8	11	9	7	9	7	5.6	
		P 10	106	100	95	95	90	85	85	80	75	75	71	67	67	63	60	60	56	53	53	50	47.5							
GS-15	HB...2000	High-speed steel							45	40	31.5	31.5	28	22	22	20	16	18	16	12.5	12.5	11	9	11	10	8	9	8	6.3	
		K20	125	118	112	112	106	106	100	95	95	90	85	85	80	75	75	71	67	67	63	60								
GS-25	HB 2000..2500	High-speed steel							28	25	20	20	18	14	14	12.5	10	11	10	8	9	8	6.3	7.5	6.7	5.3	6	5.3	4.25	
		K10	95	90	85	85	80	75	75	71	67	67	63	60	60	56	53	53	50	47.5	47.5	45	42.5	42.5	40	37.5				
GTS-35 GTW-40		High-speed steel							37.5	33.5	33.5	28	26.5	25	22	21	20	18	17	16	12.5	12	11	11	10	10	9	8.5	8	
		K10/P10	95	90	85	85	80	75	75	71	67	67	63	60	60	56	53	53	50	47.5	47.5	45	42.5	42.5	40	37.5				
White cast iron	RC420..570	K10	19	18	17	17	16	15	15	14	13.2	13.2	12.5	11.8	11.8	11.2	10.6	10.6	10	9.5	9	8.5	8	8	7.5	7.1				
Cast bronze DIN 1705		High-speed steel							53	50	47.5	47.5	45	42.5	42.5	40	37.5	37.5	35.5	33.5	31.5	30	28	28	26.5	25	25	23.6	22.4	
		K 20	315	300	280	280	265	250	250	236	224	224	212	200	200	190	180	180	170	160	160	150	140	140	132	125				
Red brass DIN 1705		High-speed steel							75	71	67	63	60	56	50	47.5	45	40	37.5	35.5	31.5	30	28	28	26.5	25	25	23.6	22.4	
		K 20	425	400	375	400	375	355	355	335	315	335	315	300	300	280	265	265	250	236	250	236	224	236	224	212				
Brass DIN 1709	HB 800..1200	High-speed steel							112	106	100	90	85	80	67	63	60	50	47.5	45	37.5	33.5	33.5	26.5	25	23.6				
		K 20	500	475	450	475	450	425	450	425	400	400	375	355	355	335	315	335	315	300	300	280	265	280	265	250				
AL cast DIN 1725	300..420	High-speed steel	125	118	112	100	95	85	75	71	67	56	53	50	42.5	40	37.5	31.5	30	28	25	23.6	22.4							
		K 20	250	236	224	224	212	200	200	190	180	180	170	160	160	150	140	140	132	125	125	118	112	118	112	106	100	95	90	
Mg alloy DIN 1729		High-speed steel	850	800	750	800	750	710	750	710	670	670	630	600	630	600	560	600	560	530	600	560	530	560	530	500	530	500	475	
		K 20	1600	1500	1400	1320	1250	1250	1180	1120	1120	1120	1060	1000	1000	950	900	900	850	800	800	750	710	710	670	630	630	600	560	

- 1) The entered values apply for a chipping depth of up to 2.24 mm. From 2.24 mm to 7.1 mm the values must be reduced by 1 stage of the row R10 by approximately 20%. From 7.1 mm to 22.4 mm the values must be reduced by 1 stage of the row R5 by approximately 40%.
- 2) The values v_c must be reduced by 30 to 50% for turning a crust, for removal of cast skin or for sand inclusions.
- 3) The service life t for hard metal P10, K10, K20 = 240 min; for high speed steel SS = 60 min.

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7 Maintenance

In this chapter you will find important information about

- Inspection
- Maintenance
- Repair

of the lathe.

ATTENTION!

Properly performed regular maintenance is an essential prerequisite for

- operational safety,
- failure-free operation,
- long durability of the lathe and
- the quality of the products which you manufacture.

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



7.1 Safety

WARNING!

The consequences of incorrect maintenance and repair work may include:

- extremely serious injuries to those working on the lathe and
- damage to the lathe.

Only qualified personnel should carry out maintenance and repair work on the lathe.

Electrical systems and operating materials may only be installed, modified and repaired by a trained electrician or supervised and under the control of a trained electrician and must comply with electrotechnical regulations.



WARNING!

Do not climb onto or into the machine while working.



7.1.1 Preparation

WARNING!

Only carry out work on the lathe, if the main switch is switched off and secured against restarting by means of a padlock.

☞ Disconnecting and securing the lathe on page 19

Attach a warning sign.



7.1.2 Restarting

Before restarting, run a safety check.

☞ Electrical system on page 19

☞ Safety check on page 17

WARNING!

Before starting the lathe, you must check that there is no danger for persons and that the lathe is not damaged.





7.1.3 Cleaning

CAUTION!

Use a chip hook for removal of chips and wear suitable protective gloves.



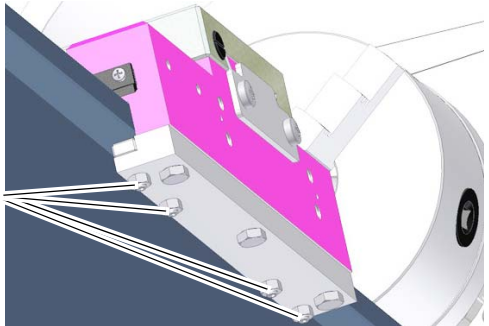
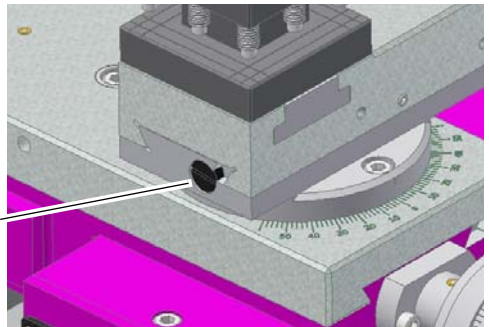
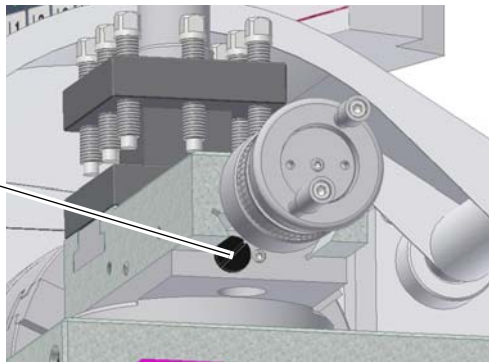
7.2 Check up, inspection and maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.

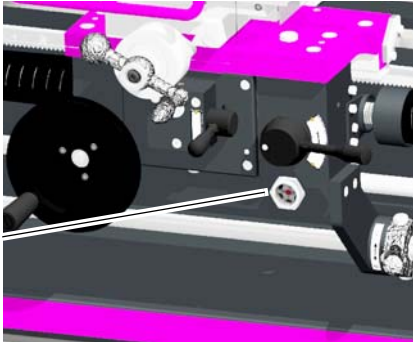
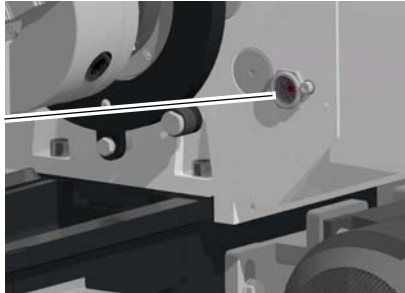



Interval	Where?	What?	How?
Start of work, after every maintenance or repair work	Lathe	👉 Safety check on page 17	
	Lathe	Oiling	<ul style="list-style-type: none"> ➔ Oil all guides. ➔ Lubricate the change gears lightly with lithium-based grease lubricating 👉 Exchange, change of position of the change gears on page 52
	Camlock clamp bolt Lathe spindle fixture	Mounting check	👉 Mounting workpiece holder on page 47

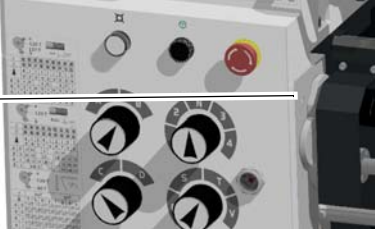
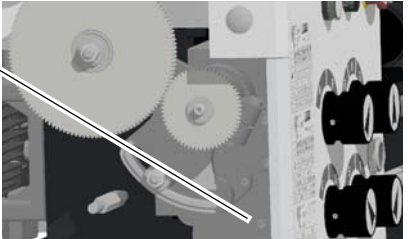
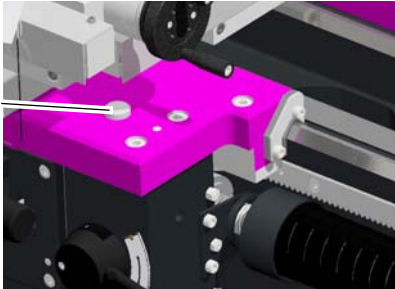
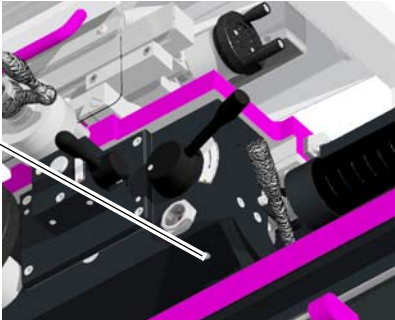


Interval	Where?	What?	How?
When necessary	Slideways	Readjust	<p>Excessive clearance in the slideways can be reduced by readjusting the tapered gibs.</p> <p>➔ Turn the take-up screw clockwise. The tapered gib is moved to the rear and reduces the clearance of the corresponding slideway.</p>    <p>Img.7-1: Take-up screws slideways</p>



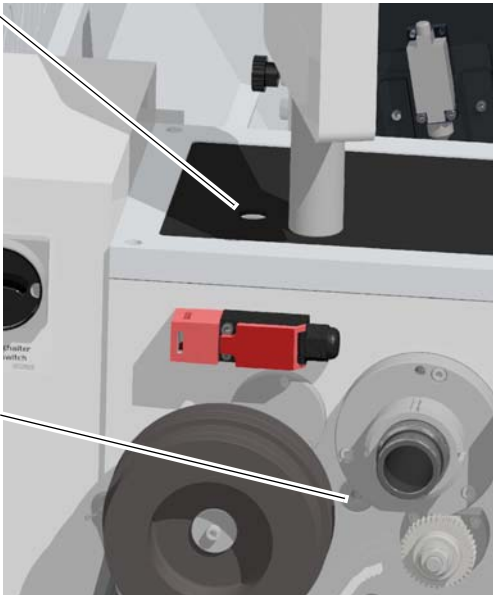

Interval	Where?	What?	How?
Start of work, after every maintenance or repair work	feed gear / apron / headstock	Visual inspection	<div><p>➔ Check the oil level in the inspection glass</p><ul style="list-style-type: none">○ of the feed gear,○ of the apron,○ of the headstock.<p>➔ The oil level must at least attain the centre resp. top marking of the oil sight glass. 📖 Operating material on page 22.</p></div> <div><p>Apron inspection glass</p></div> <div><p>Headstock inspection glass</p></div> <div><p>Feed gear inspection glass</p></div> <p>Img.7-2: Oil-sight glasses</p>



Interval	Where?	What?	How?
First after 200 hours in service, then once a year	Feed gear	Oil change	<ul style="list-style-type: none">➔ For oil change use an appropriate collecting container with sufficient capacity.➔ Unscrew the screw from the drain hole.➔ Unscrew the screw from the filler hole.➔ Close the drain hole if no more oil drains.➔ Fill up to the middle of the reference mark of the oil sight glass into the filler hole using a suitable container. ➔  <p>Feed gear charging hole</p>  <p>Feed gear outlet</p> <p>Operating material on page 22 Img. 7-3: Feed gear openings</p>
	Apron	Oil change	 <p>Apron charging hole</p>  <p>Apron drain hole</p> <p>Img. 7-4: Apron openings</p>

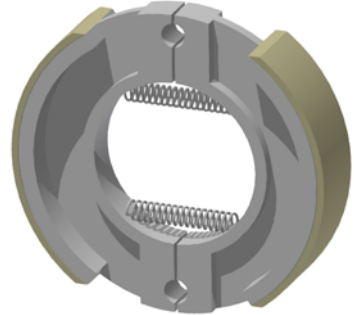
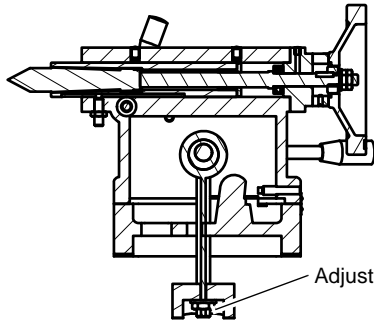
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Interval	Where?	What?	How?
First after 200 hours in service, then once a year	Headstock	Oil change	 <p>filler hole Headstock</p> <p>Outlet Headstock</p> <p>Img. 7-5: Openings headstock</p>
When necessary		V-belt check, re-tighten	<p>Exchange of the V-belt set:</p> <ul style="list-style-type: none"> → Open the protective cover of the change gears. → Unfasten the fixing screw of the motor plate. → Pry the motor plate to the top. This will relax the V-belt set. → Exchange the V-belt set. → Tighten the adjusting screws in a way that one single V-belt may be squeezed approximately 5 mm.  <p>Lock screw</p> <p>Img. 7-6: Adjusting equipment V-belt</p> <p>Tighten the V-belt set as required.</p> <p>ATTENTION!</p> <p>Only exchange the complete set of V-belts, never a single one.</p>

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Interval	Where?	What?	How?
When necessary	Spindle brake	check	<p>→ If necessary, replace the brake shoes. In the event of wear of the brake drum, completely change the pulley above.</p>  <p>Img.7-7: Brake shoes spindle brake</p> <p>From highest speed, the braking time without workpiece carrier and workpiece should take about 2 seconds.</p>
Weekly	Lathe chuck	Lubricating	<p>☞ Lubricating and cleaning the lathe chuck on page 69</p>
When necessary	Tailstock	tighten	<p>→ If the tailstock clamping wears off. Shorten the clamping distance by adjusting the nut below the tailstock.</p>  <p>Adjusting nut</p>
Weekly	Apron	Oiling	<p>→ Lubricate respectively fill-in all lubricating nipples and oiler cups with machinery oil.</p>
Weekly	Lathe saddle / Cross slide / Top slide / Lead screw / Feed rod / Tailstock	Oiling	<p>→ Lubricate respectively fill-in all lubricating nipples and oiler cups with machinery oil.</p>

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Interval	Where?	What?	How?
based on operator's empirical values in accordance with German DGUV (BGV A3)	Electronics	Electrical inspection	<ul style="list-style-type: none"> ☞ Obligations of the operating company on page 12 ☞ Electrical system on page 19
after 3 years		The service life off the position switch on the rotational direction switch may have been reached due to the operating conditions. Replacement is recommended to ensure further, fault-free operation.	<p>By the service technicians</p> <ul style="list-style-type: none"> ☞ Customer service technician on page 69

7.3 Recommended wear and tears parts

Drive V-belt assembly
Polycarbonate viewing pane
Position switch rotational direction switch
Stripper on the guide tracks
Brake shoes spindle brake



7.4 Lubricating and cleaning the lathe chuck

ATTENTION!

Do not use compressed air to remove dust and foreign substances from the lathe chuck.

Coolant squirts on the lathe chuck and removes the grease from the master jaws. In order to maintain the tensioning force and the long-term accuracy of the lathe chuck, the lathe chuck must be lubricated regularly. Insufficient lubrication will result in malfunctions at reduced tensioning force, which affects the accuracy and causes excessive wear and seizing.

Depending on the chuck type and operating state, the tensioning force of a lathe chuck can decrease by up to 50 percent of the nominal tensioning force.

A presumably securely clamped workpiece can then fall out of the chuck during processing.

Lubricate the lathe chuck at the worm and at the lubricating nipple. Lubricate the lathe chuck at least once per week. The used lubricant should be of high quality and provided for high pressure bearing surfaces. The lubricant should withstand the coolant and other chemicals.

Numerous different lathe chucks are available on the market which distinguish themselves considerably based on the lubricating method. Follow the operating instructions of the corresponding lathe chuck manufacturer.



7.5 Repair

7.5.1 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.

The company Optimum Maschinen Germany GmbH does not take any liability nor does it guarantee against damage and operating malfunctions resulting from failure to observe this operating instructions.

For repairs, only use

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

8 Ersatzteile - Spare parts

8.1 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.*

8.2 Hotline Ersatzteile - Spare parts Hotline



+49 (0) 951-96555 -118

ersatzteile@stuermer-maschinen.de



8.3 Service Hotline



+49 (0) 951-96555 -100

service@stuermer-maschinen.de

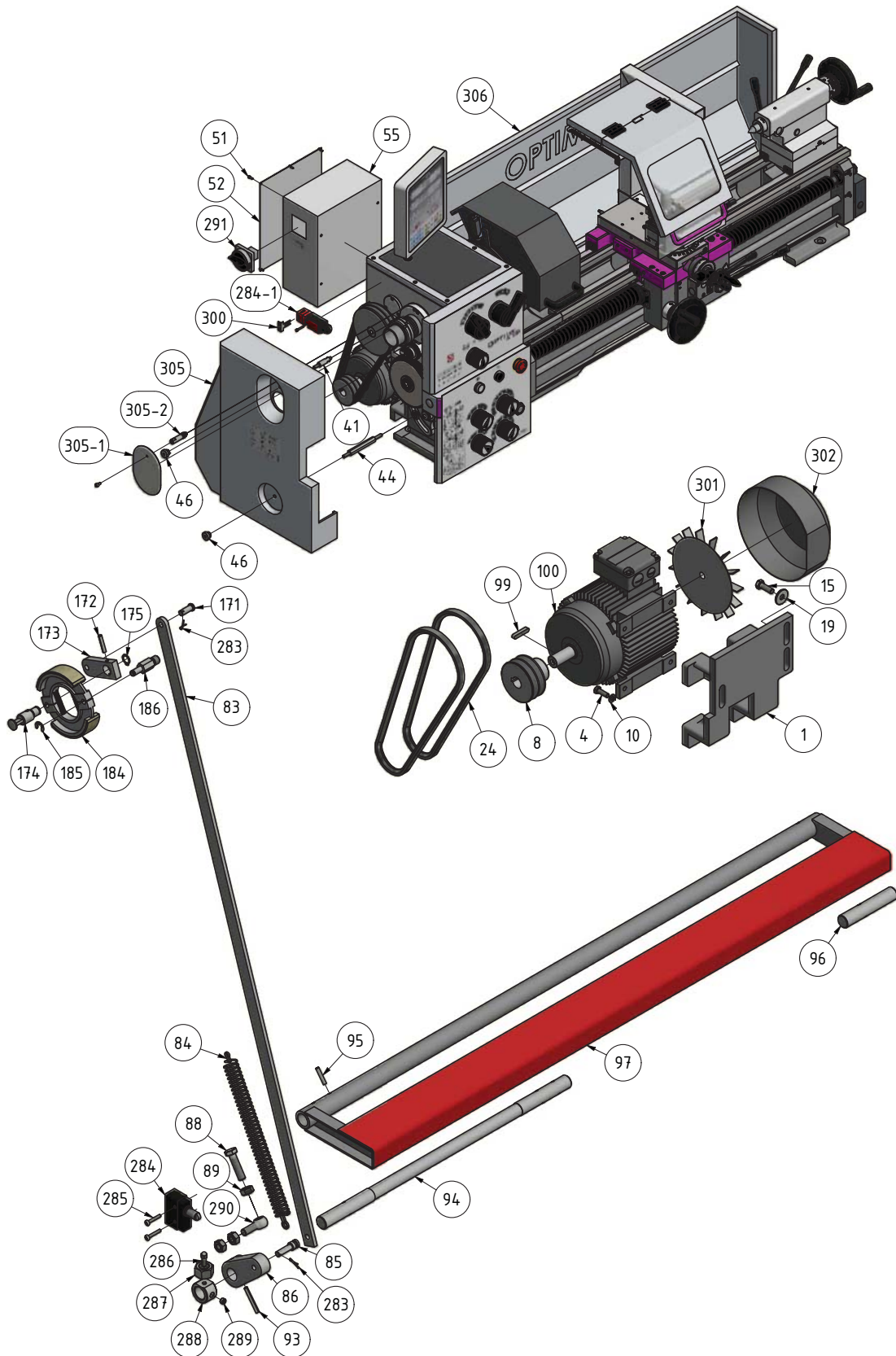


8.4 Elektrische Ersatzteile - Electrical spare parts

8.5 Schaltplan - Wiring diagram

Der aktuelle Schaltplan mit Ersatzteilliste befindet sich im Schaltschrank der Drehmaschine.
The current circuit diagram and spare parts list is located in the control cabinet of the lathe.

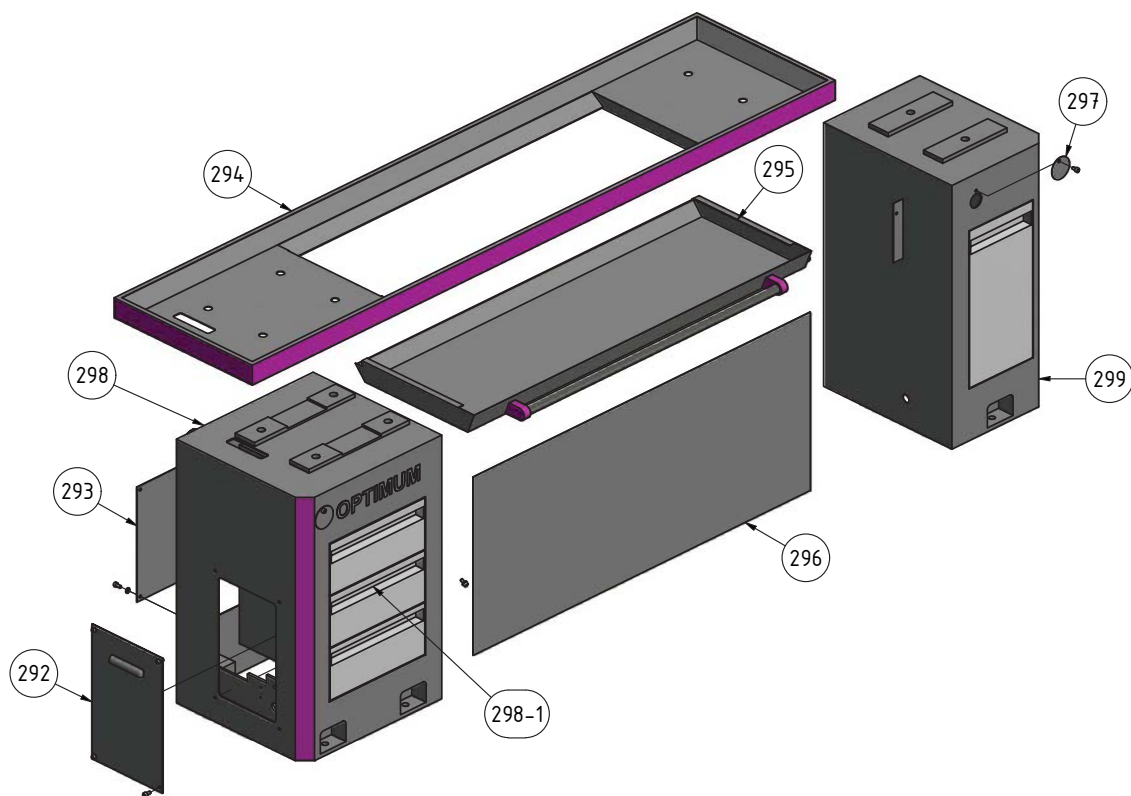
8.6 Antrieb - Drive



Img.8-1: Antrieb - Drive

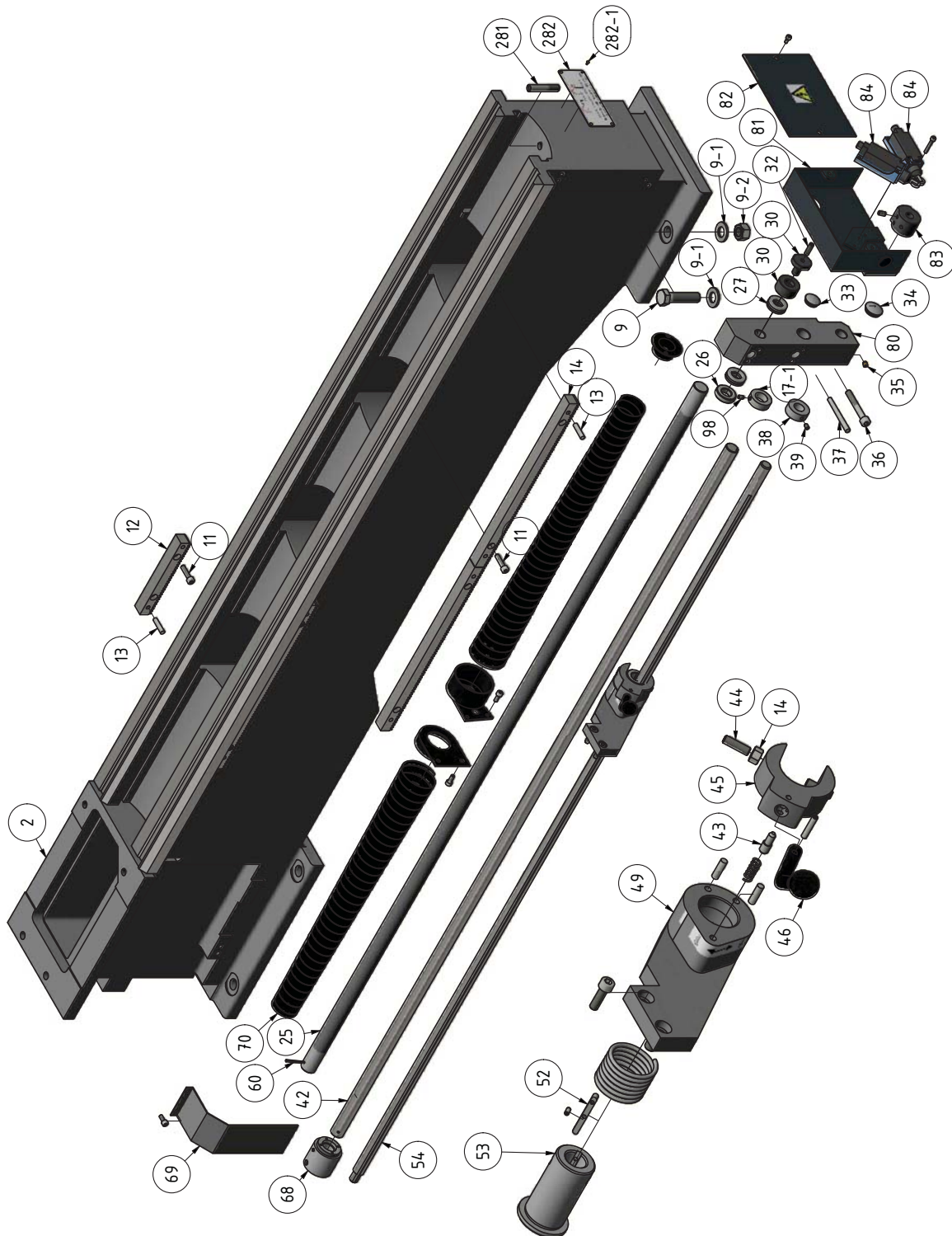
TH3610_TH3610D_parts.fm

8.7 Maschinenunterbau - Machine substructure



Img.8-2: Maschinenunterbau - Substructure

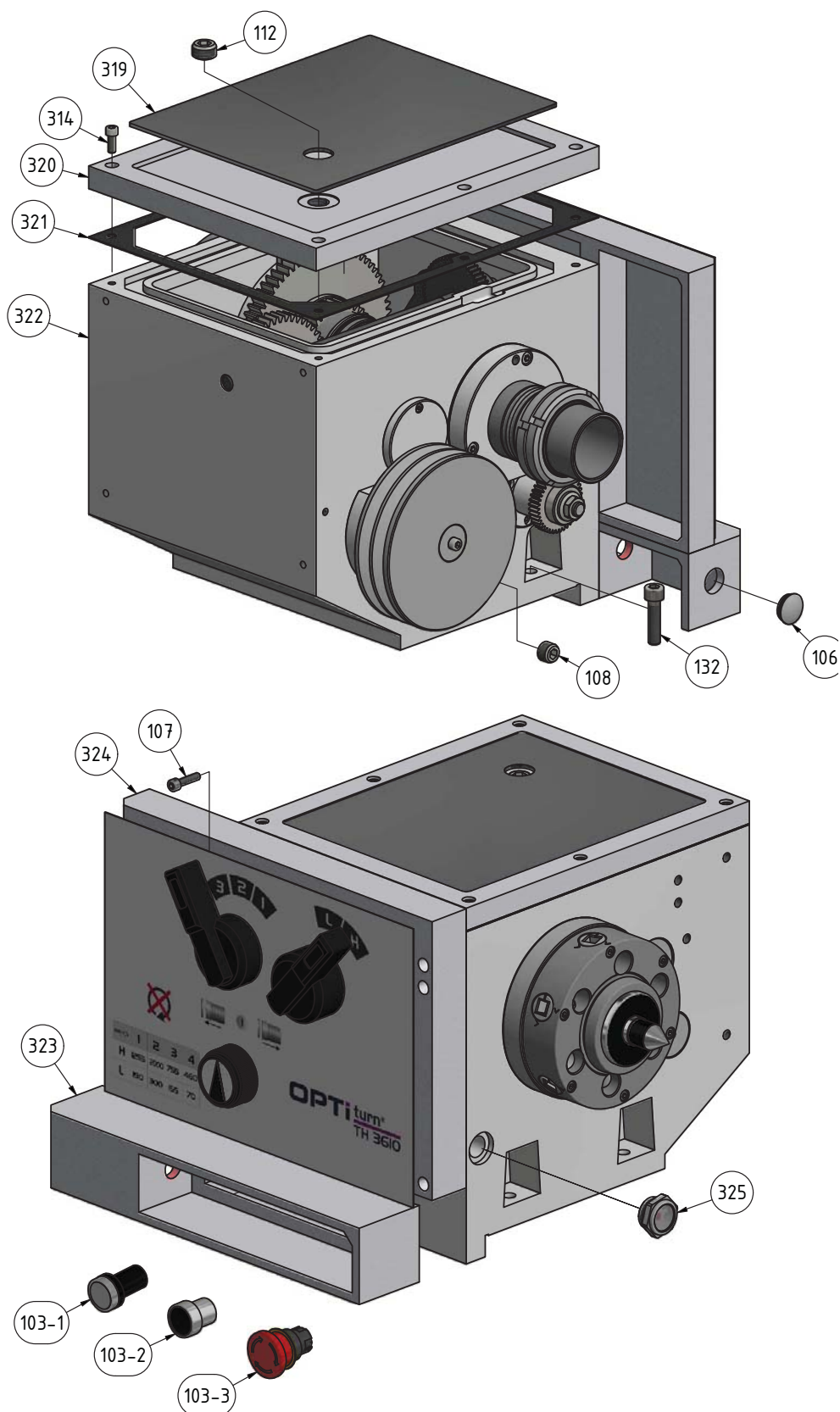
8.8 Maschinenbett, Steuerung - Machine bed, control



Img.8-3: Antrieb, Steuerung - Actuation, control

TH3610_TH3610D_parts.fm

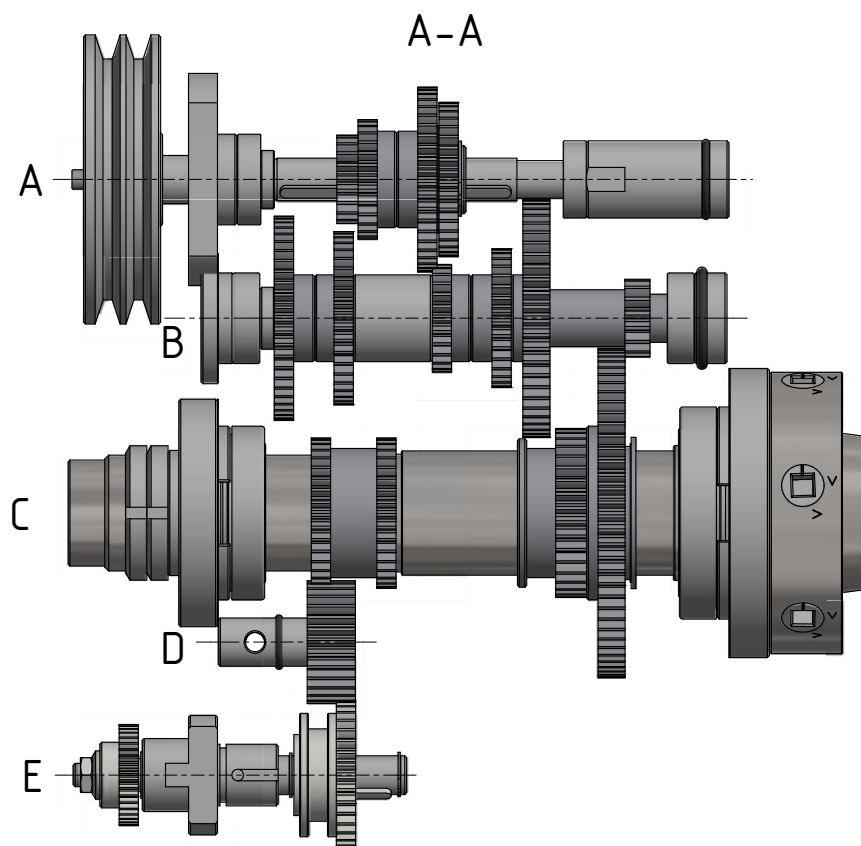
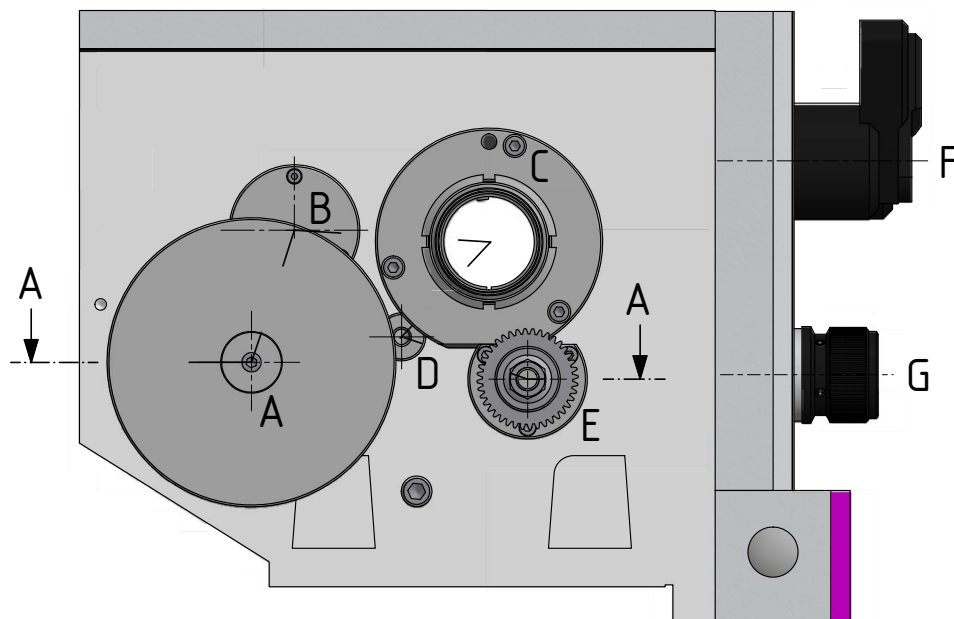
8.9 Getriebe Spindelstock 1-6 - Headstock gear 1-6



Img.8-4: Getriebe Spindelstock 1-6 - Headstock gear 1-6

TH3610_TH3610D_parts.fm

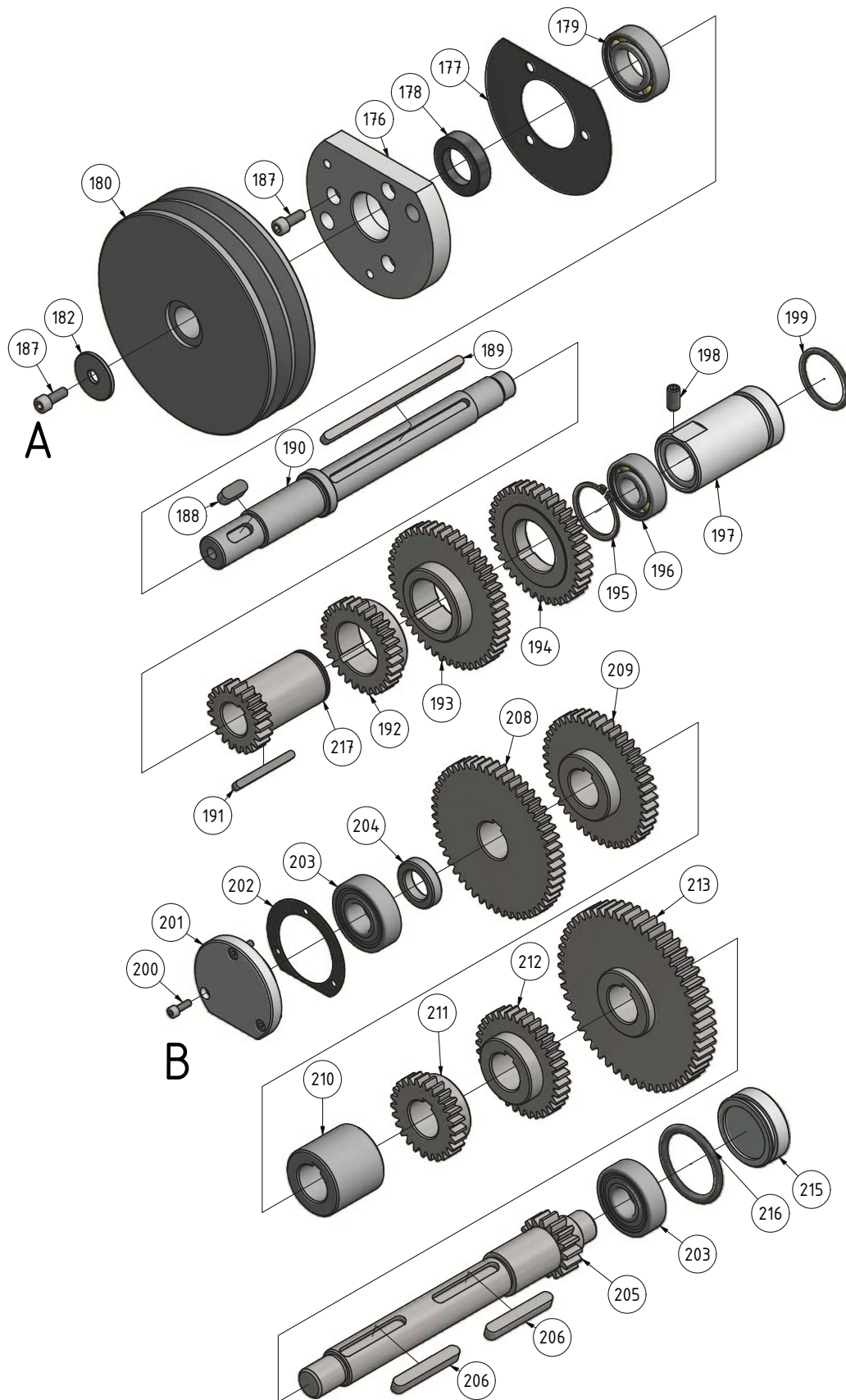
8.10 Getriebe Spindelstock 2-6 - Headstock gear 2-6



Img. 8-5: Getriebe Spindelstock 2-6 - Headstock gear 2-6

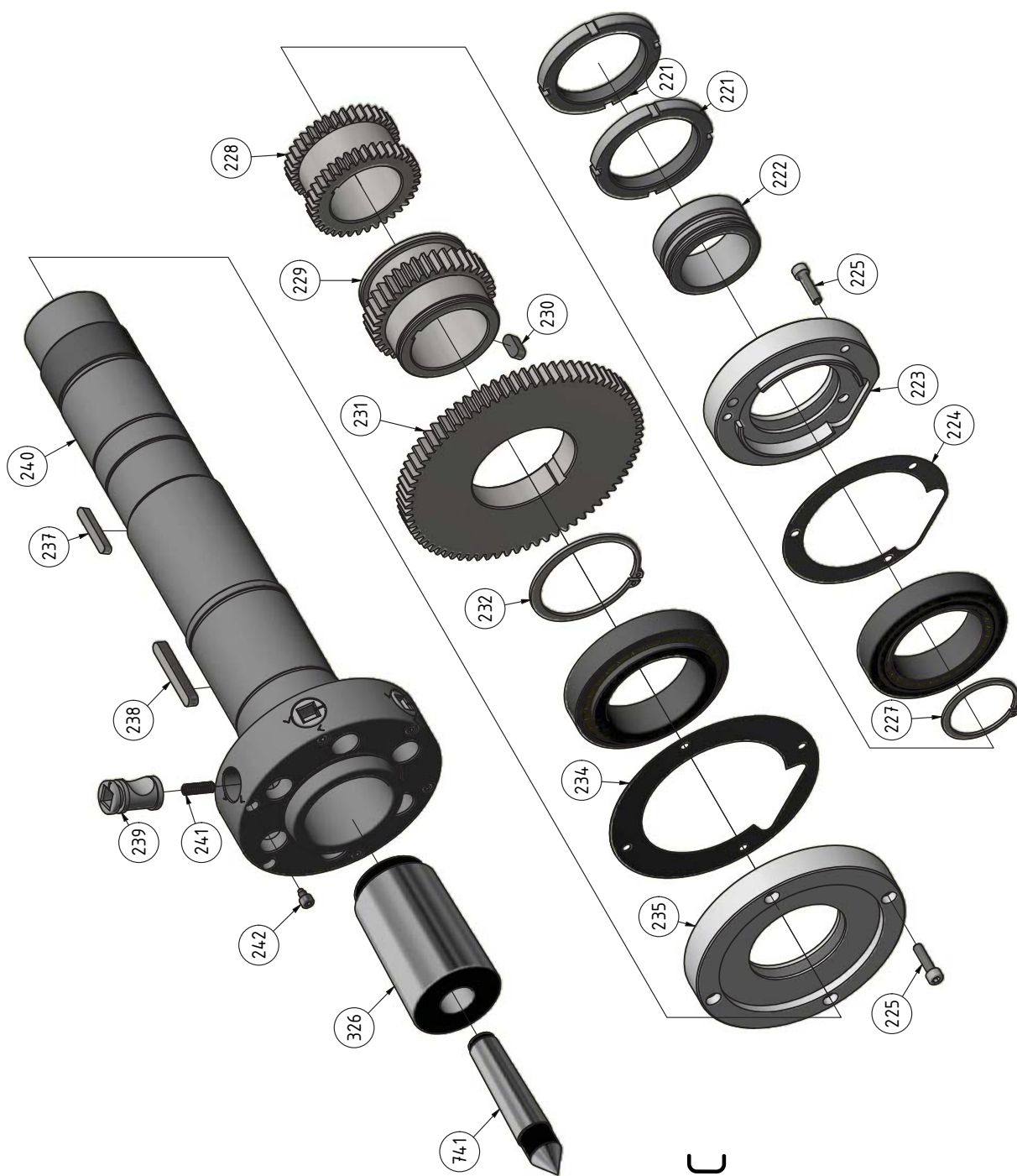
TH3610_TH3610D_parts.fm

8.11 Getriebe Spindelstock 3-6 - Headstock gear 3-6



Img.8-6: Getriebe Spindelstock 3-6 - Headstock gear 3-6

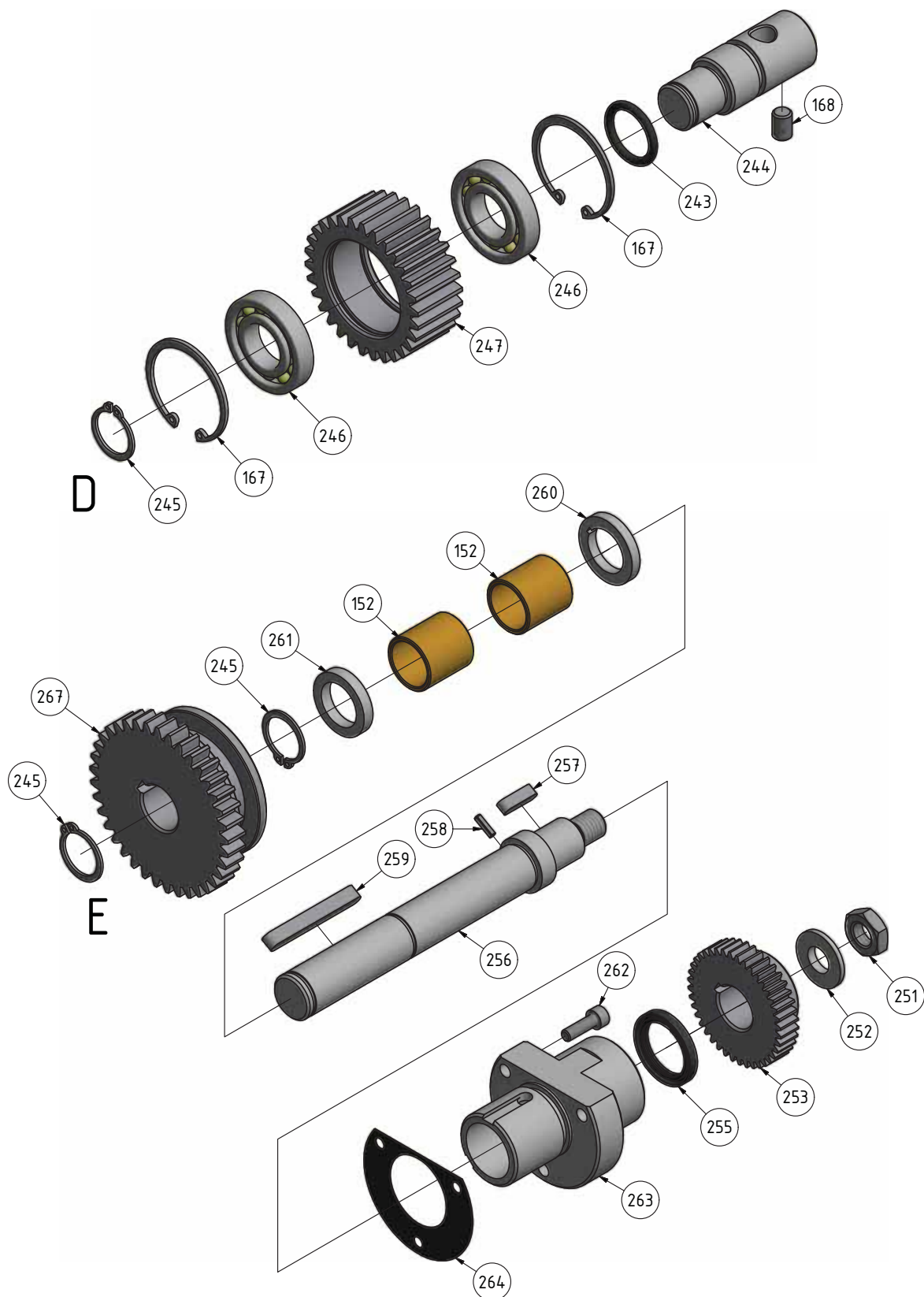
8.12 Getriebe Spindelstock 4-6 - Headstock gear 4-6



Img. 8-7: Getriebe Spindelstock 4-6 - Headstock gear 4-6

TH3610_TH3610D_parts.fm

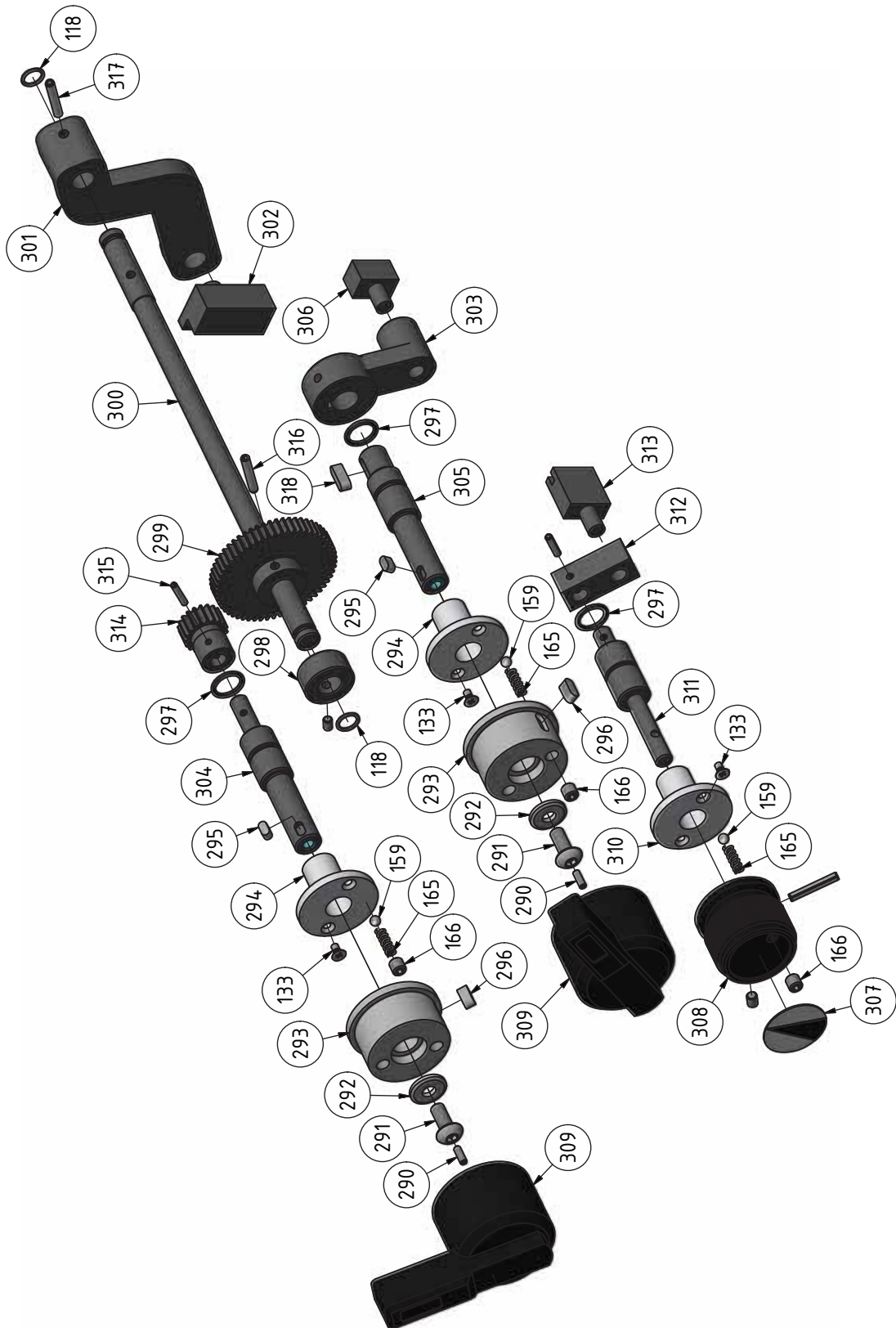
8.13 Getriebe Spindelstock 5-6 - Headstock gear 5-6



Img.8-8: Getriebe Spindelstock 5-6 - Headstock gear 5-6

TH3610_TH3610D_parts.fm

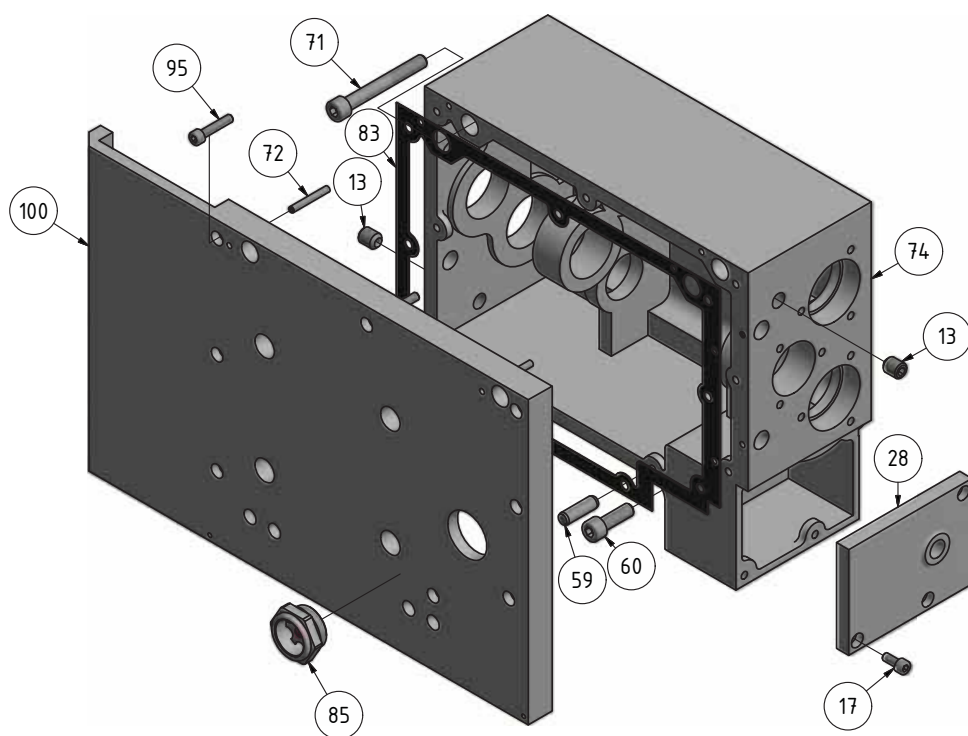
8.14 Getriebe Spindelstock 6-6 - Headstock gear 6-6



Img.8-9: Getriebe Spindelstock 6-6 - Headstock gear 6-6

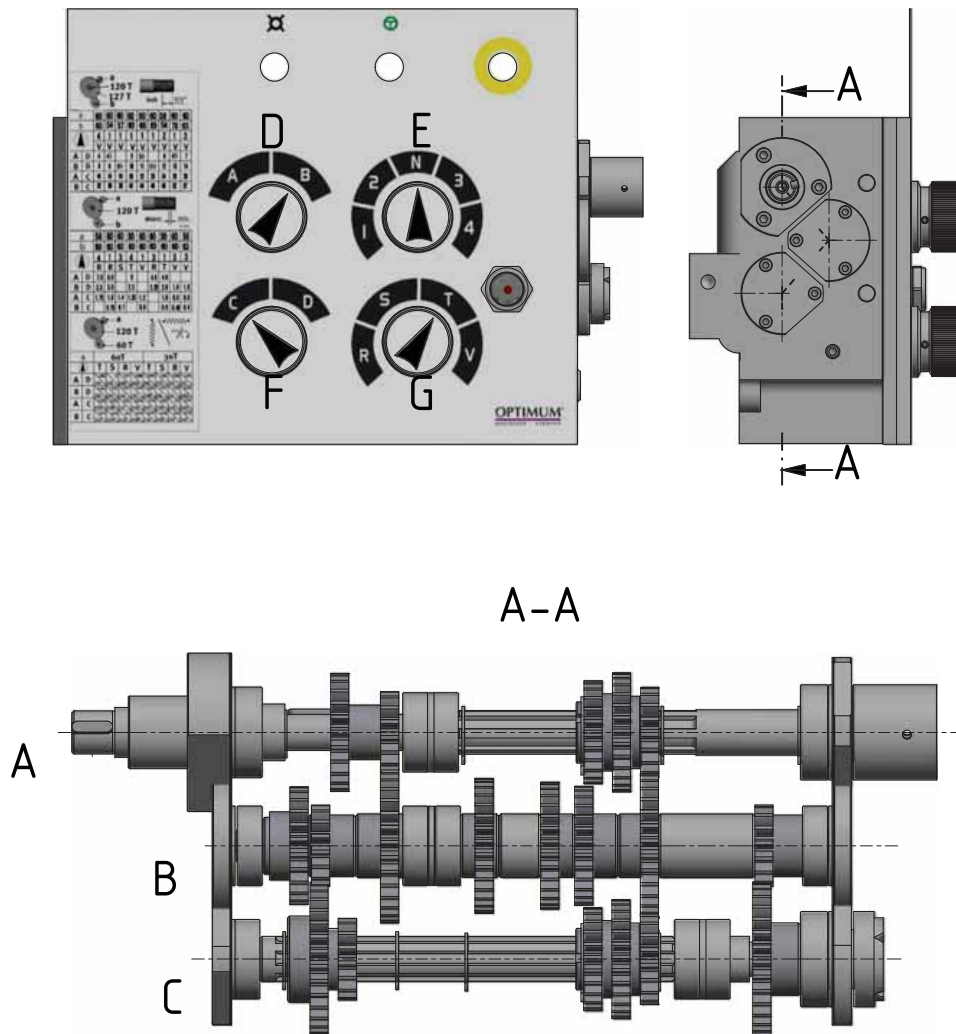
TH3610_TH3610D_parts.fm

8.15 Vorschubgetriebe 1-6 - Feed gear 1-6



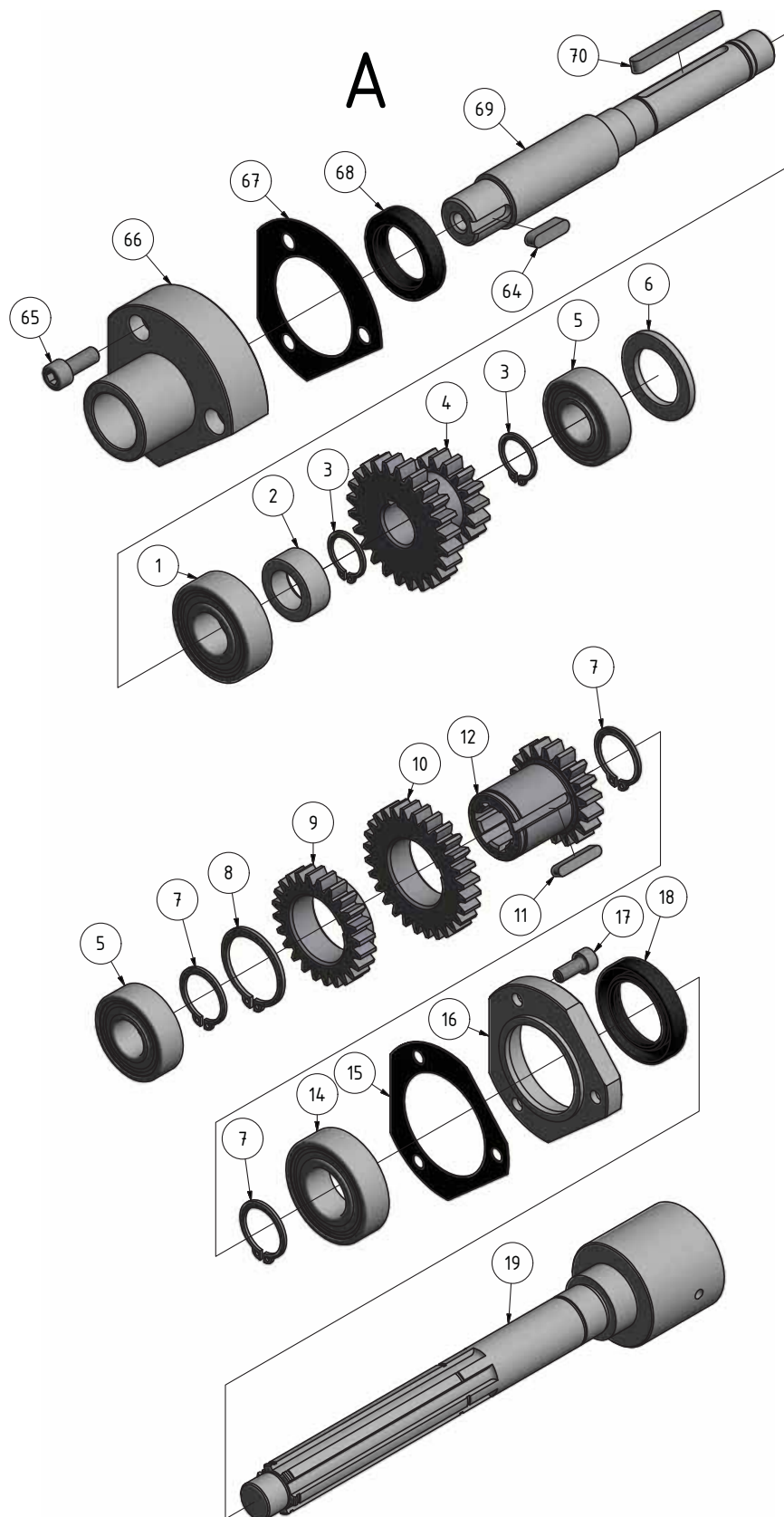
Img.8-10: Vorschubgetriebe 1-6 - Feed gear 1-6

8.16 Vorschubgetriebe 2-6 - Feed gear 2-6



Img.8-11: Vorschubgetriebe 2-6 - Feed gear 2-6

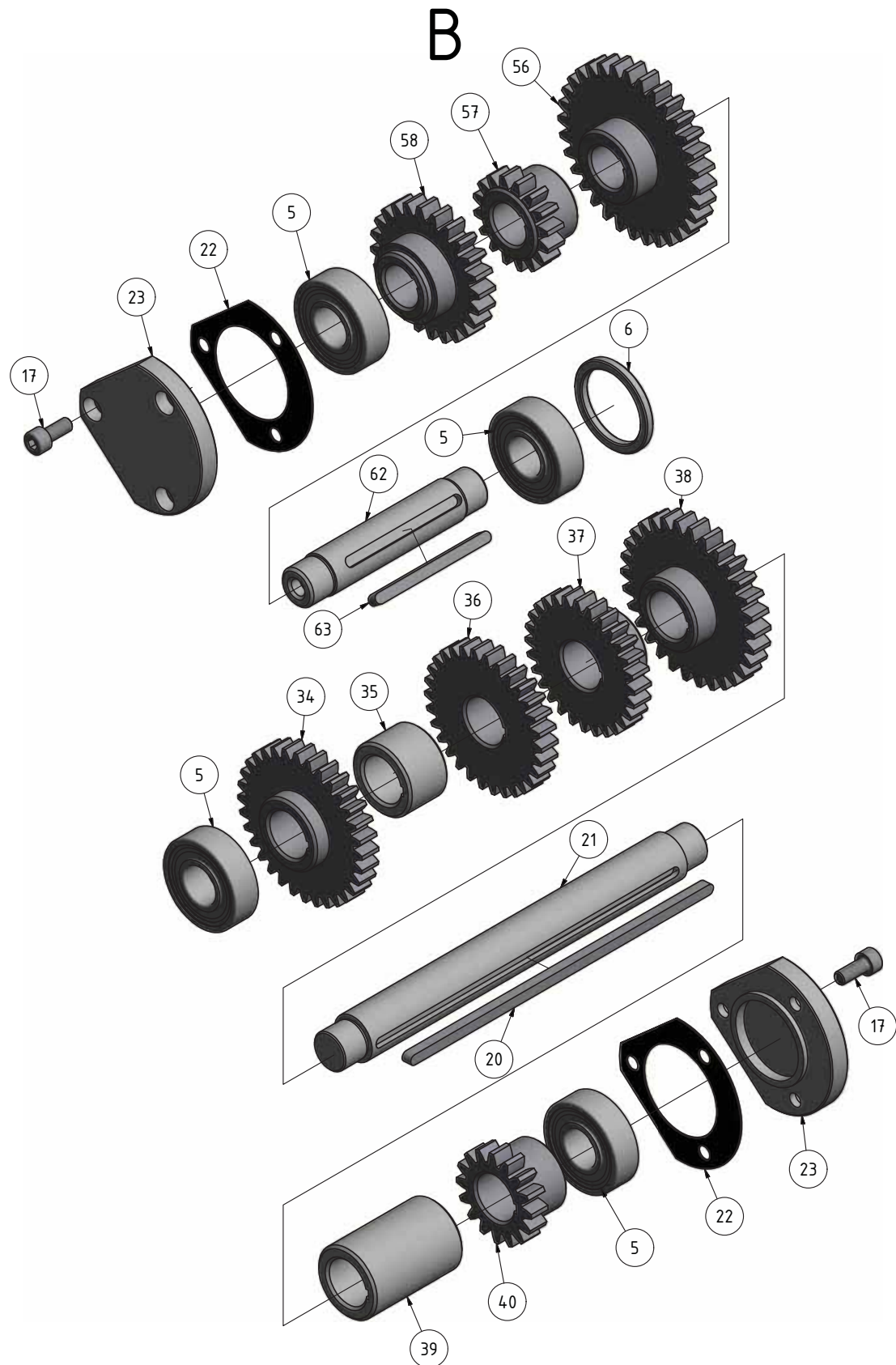
8.17 Vorschubgetriebe 3-6 - Feed gear 3-6



Img.8-12: Vorschubgetriebe 3-6 - Feed gear 3-6

TH3610_TH3610D_parts.fm

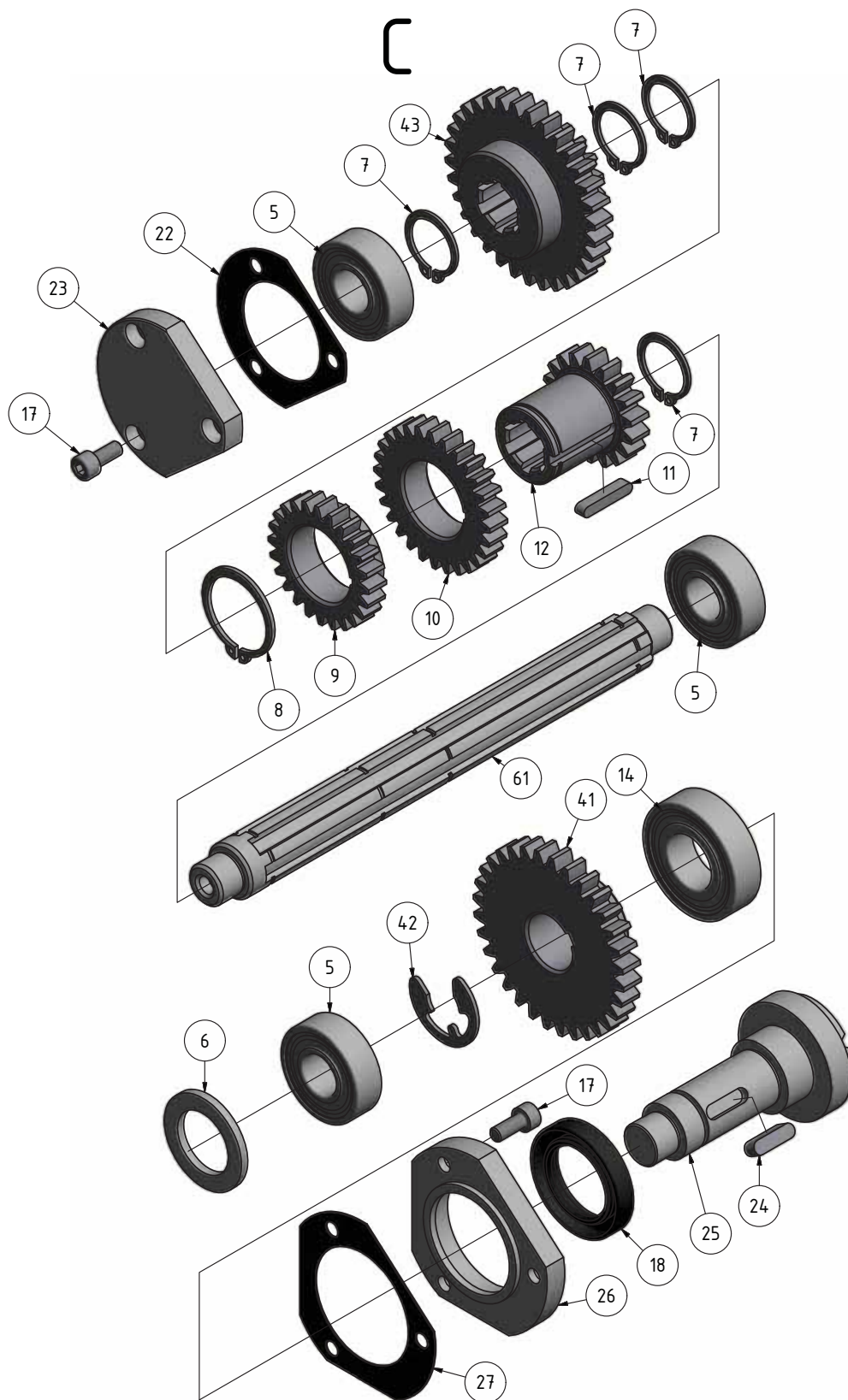
8.18 Vorschubgetriebe 4-6 - Feed gear 4-6



Img.8-13: Vorschubgetriebe 4-6 - Feed gear 4-6

TH3610_TH3610D_parts.fm

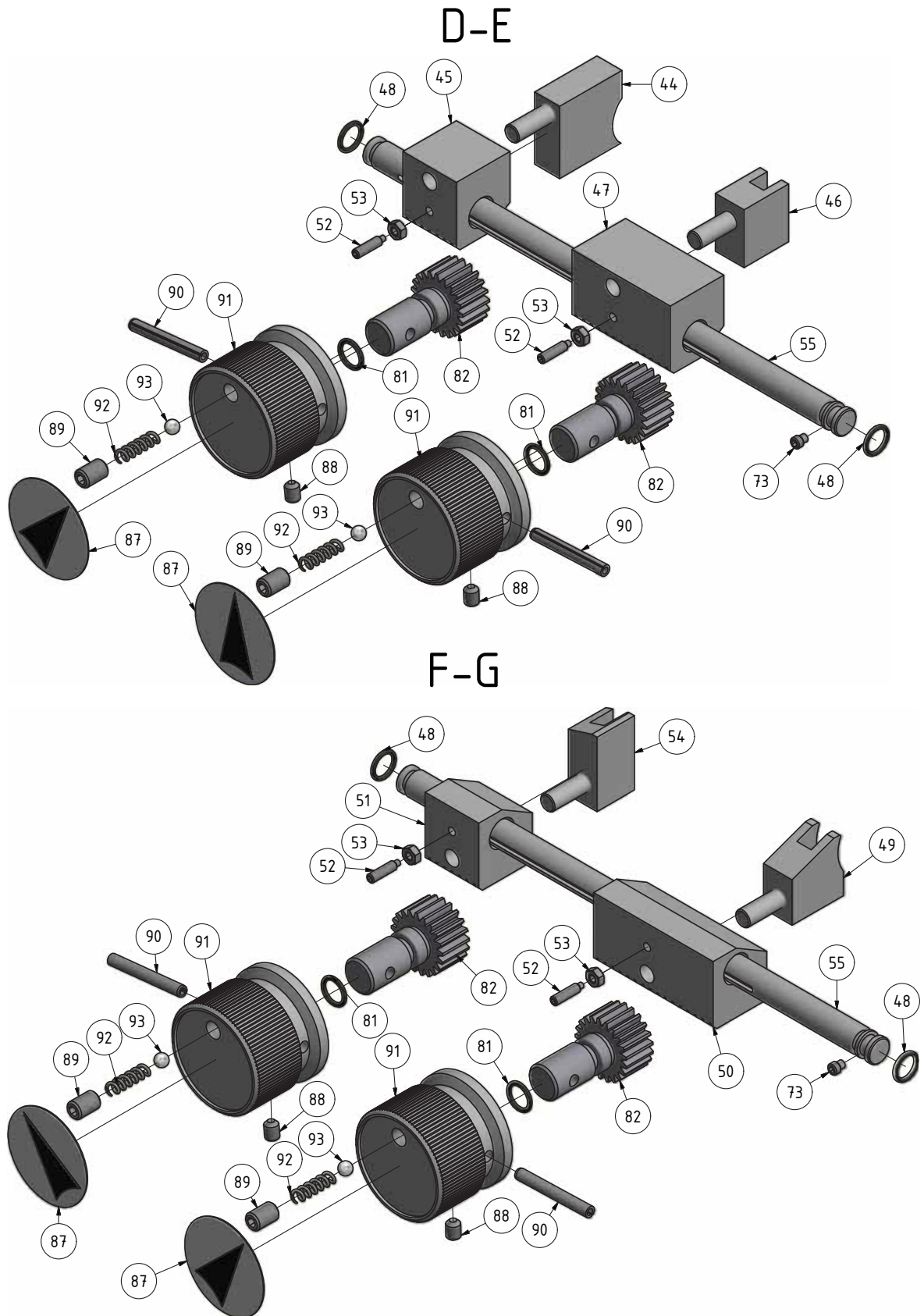
8.19 Vorschubgetriebe 5-6 - Feed gear 5-6



Img.8-14: Vorschubgetriebe 5-6 - Feed gear 5-6

TH3610_TH3610D_parts.fm

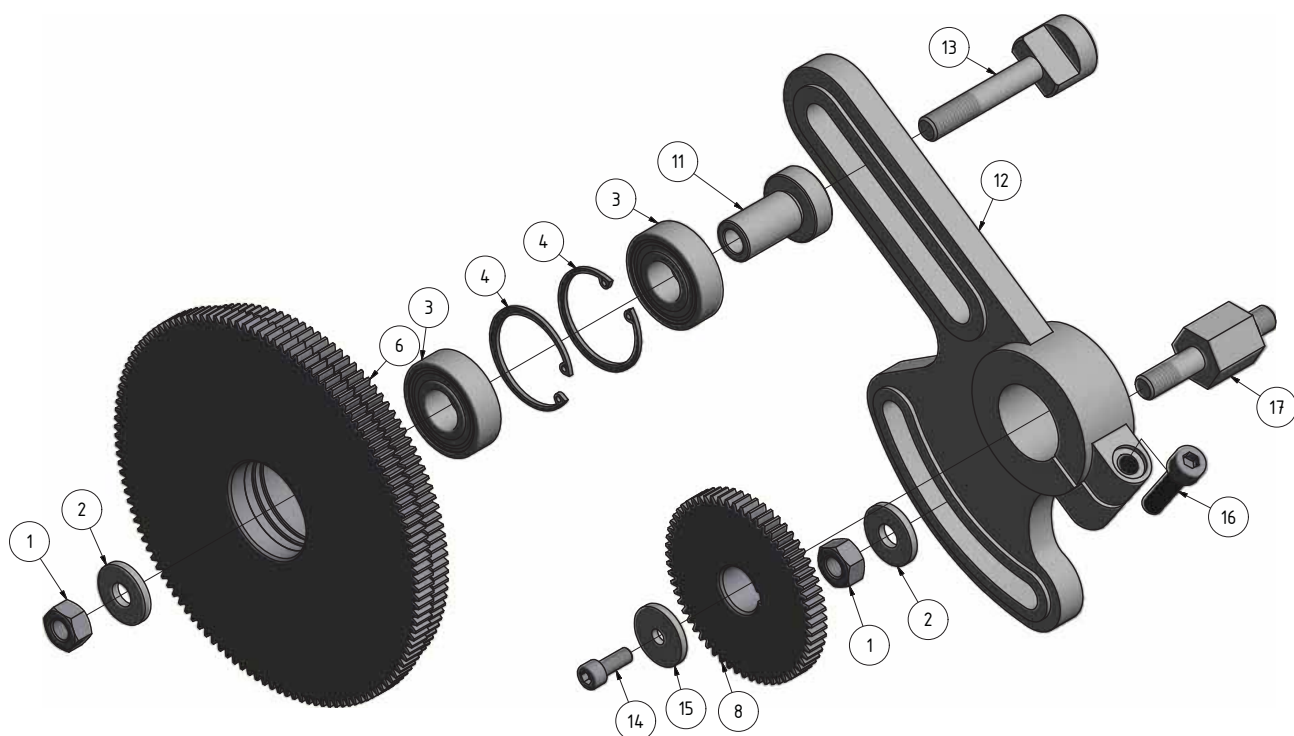
8.20 Vorschubgetriebe 6-6 - Feed gear 6-6



Img.8-15: Vorschubgetriebe 6-6 - Feed gear 6-6

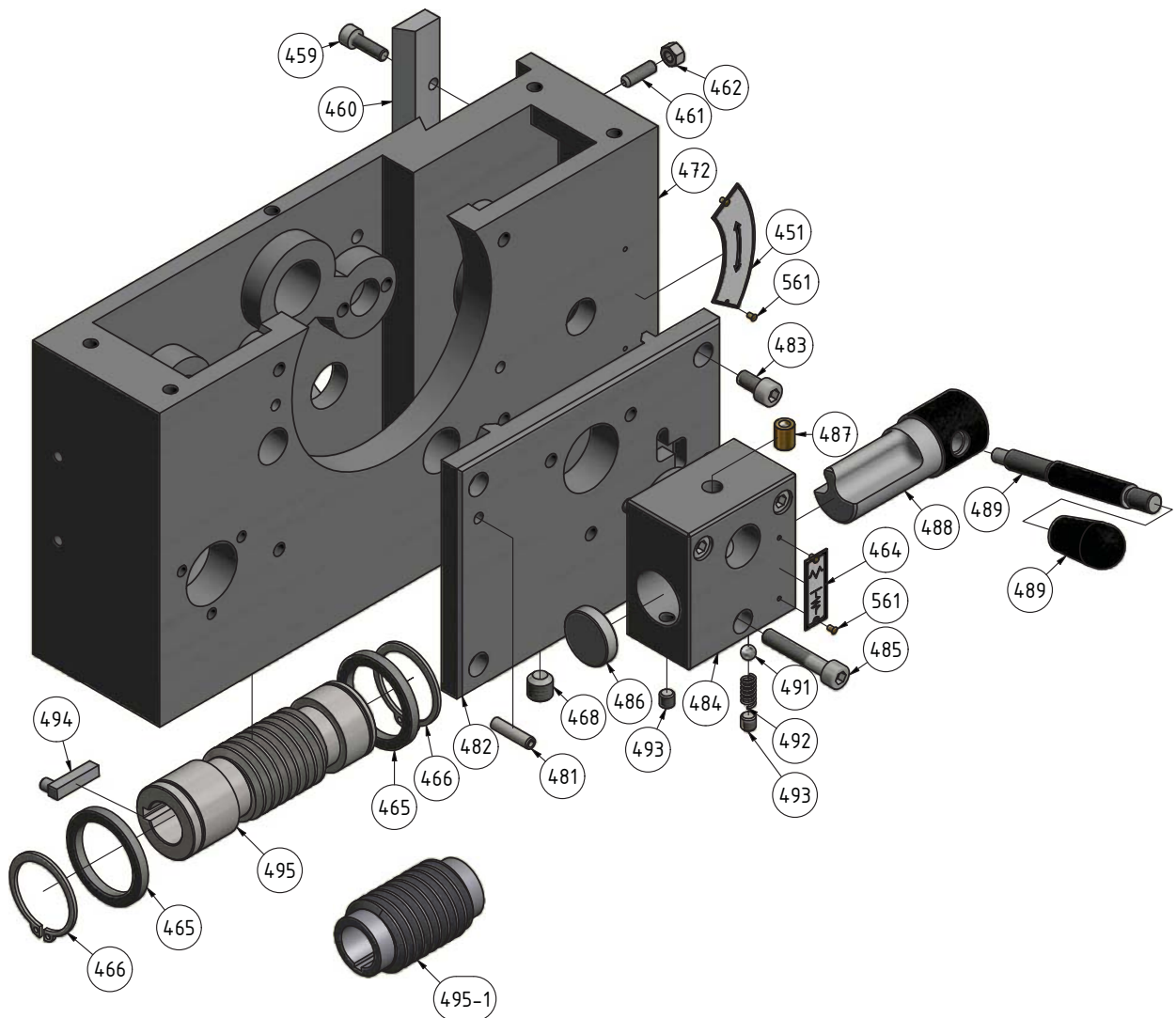
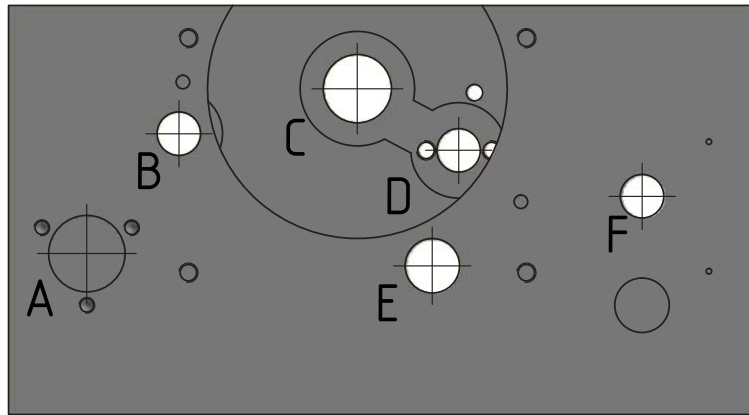
TH3610_TH3610D_parts.fm

8.21 Wechselradgetriebe - Change gear



Img.8-16: Wechselradgetriebe- Change gear

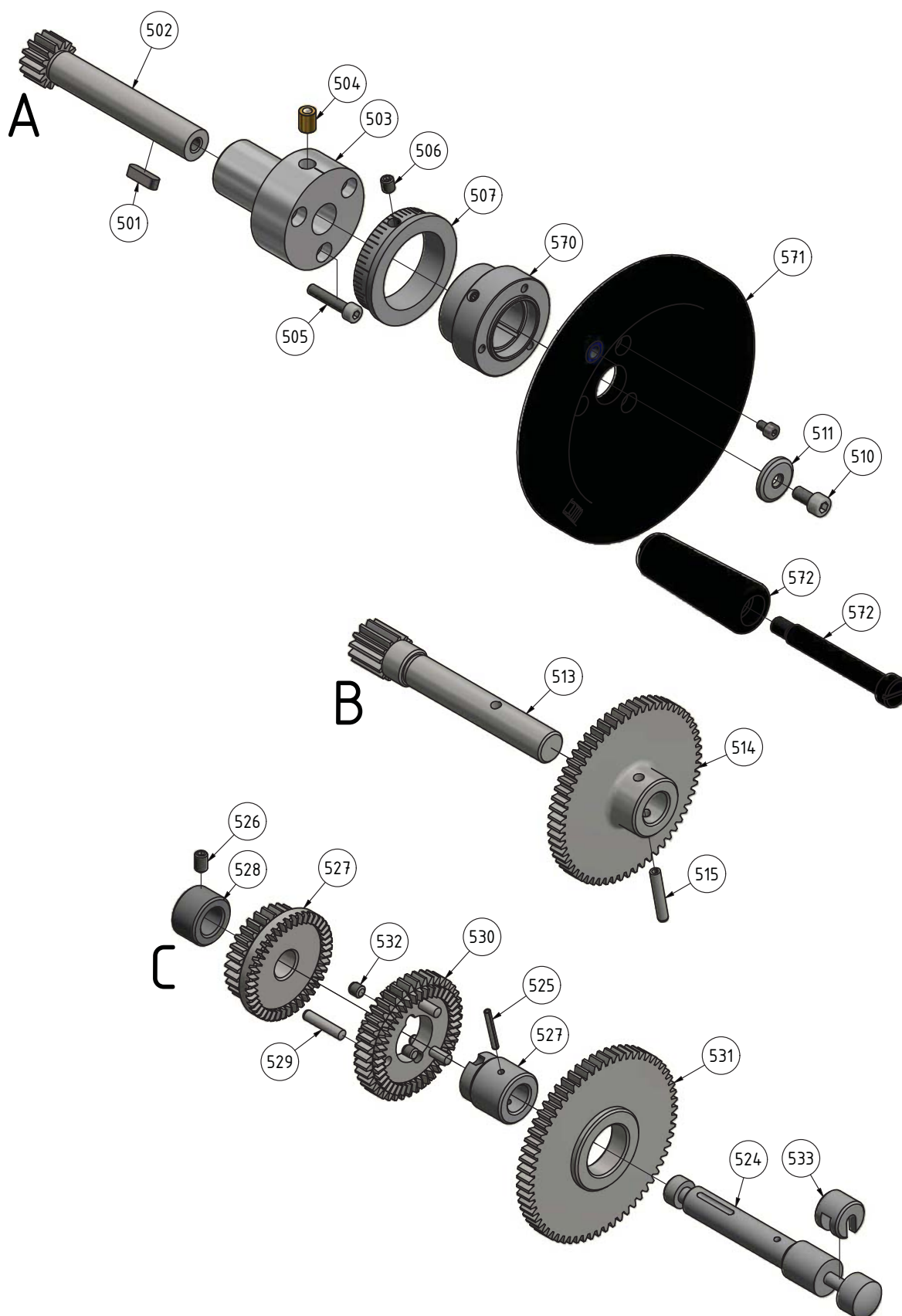
8.22 Schlosskasten 1-3 - Apron 1-3



Img.8-17: Schlosskasten 1-3 - Apron 1-3

TH3610_TH3610D_parts.fm

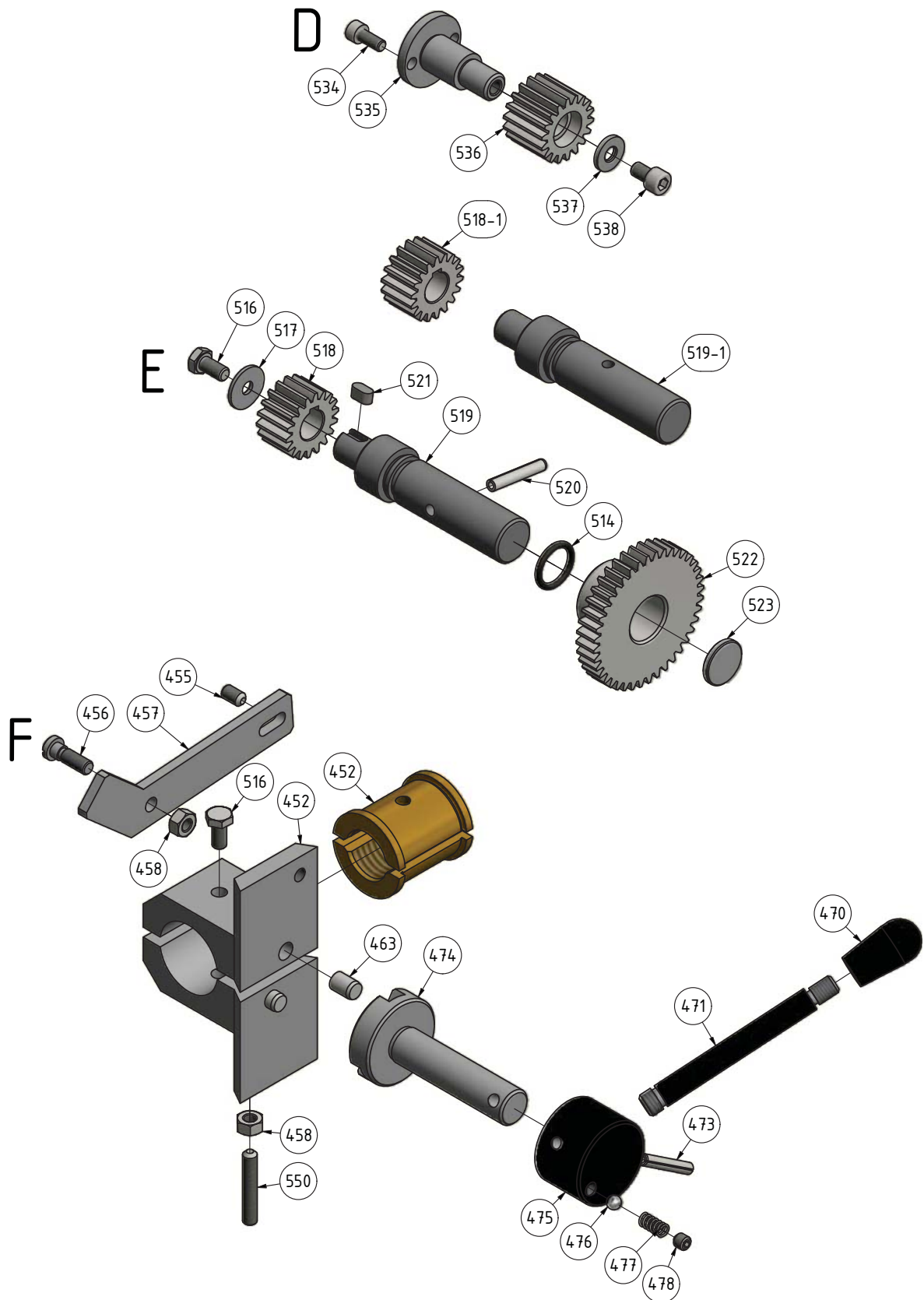
8.23 Schlosskasten 2-3 - Apron 2-3



Img.8-18: Schlosskasten 2-3 - Apron 2-3

TH3610_TH3610D_parts.fm

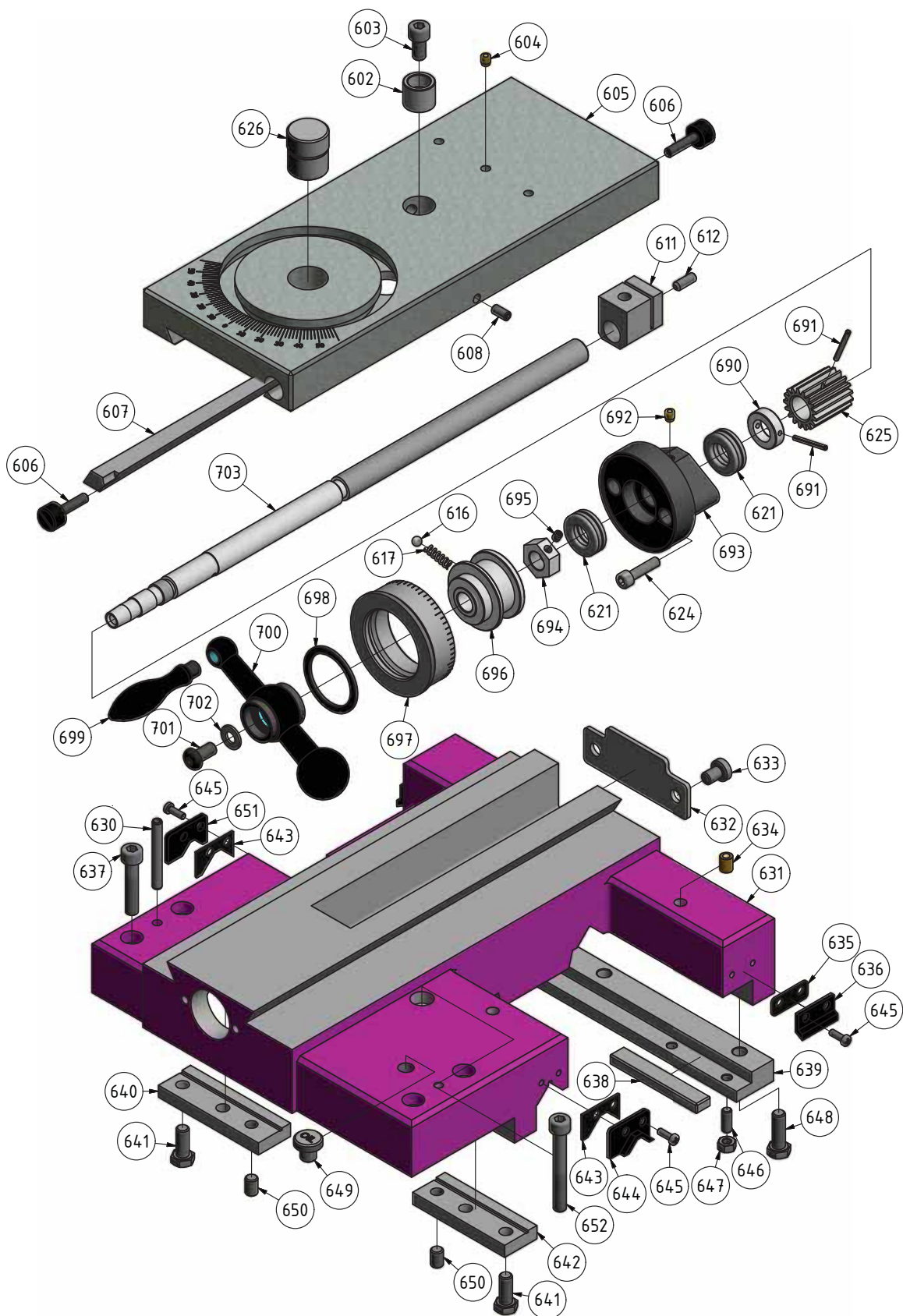
8.24 Schlosskasten 3-3 - Apron 3-3



Img. 8-19: Schlosskasten 3-3 - Apron 3-3

TH3610_TH3610D_parts.fm

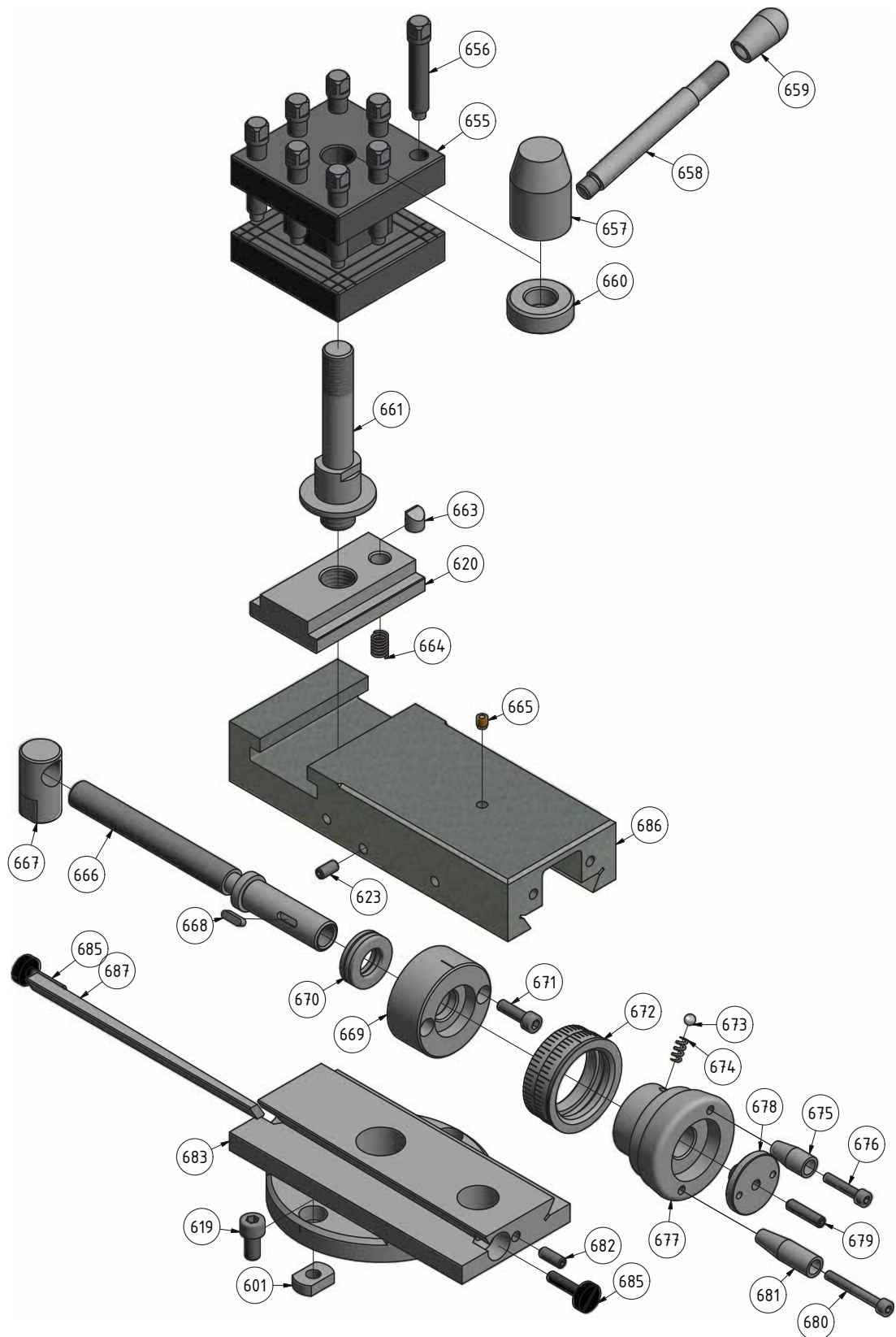
8.25 Planschlitten - Cross slide



Img.8-20: Planschlitten - cross slide

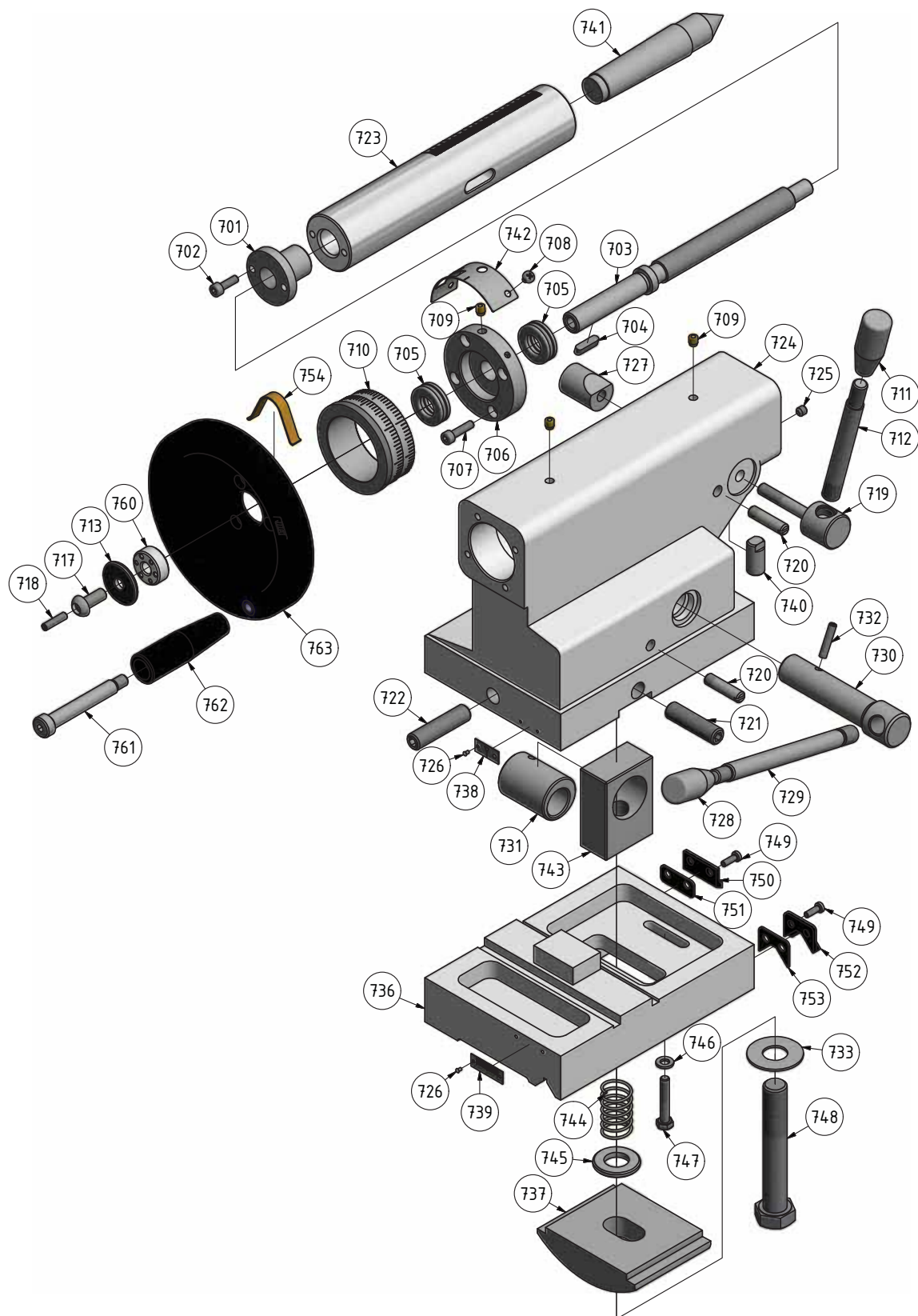
TH3610_TH3610D_parts.fm

8.26 Oberschlitten - Top slide



Img.8-21: Oberschlitten - Top slide

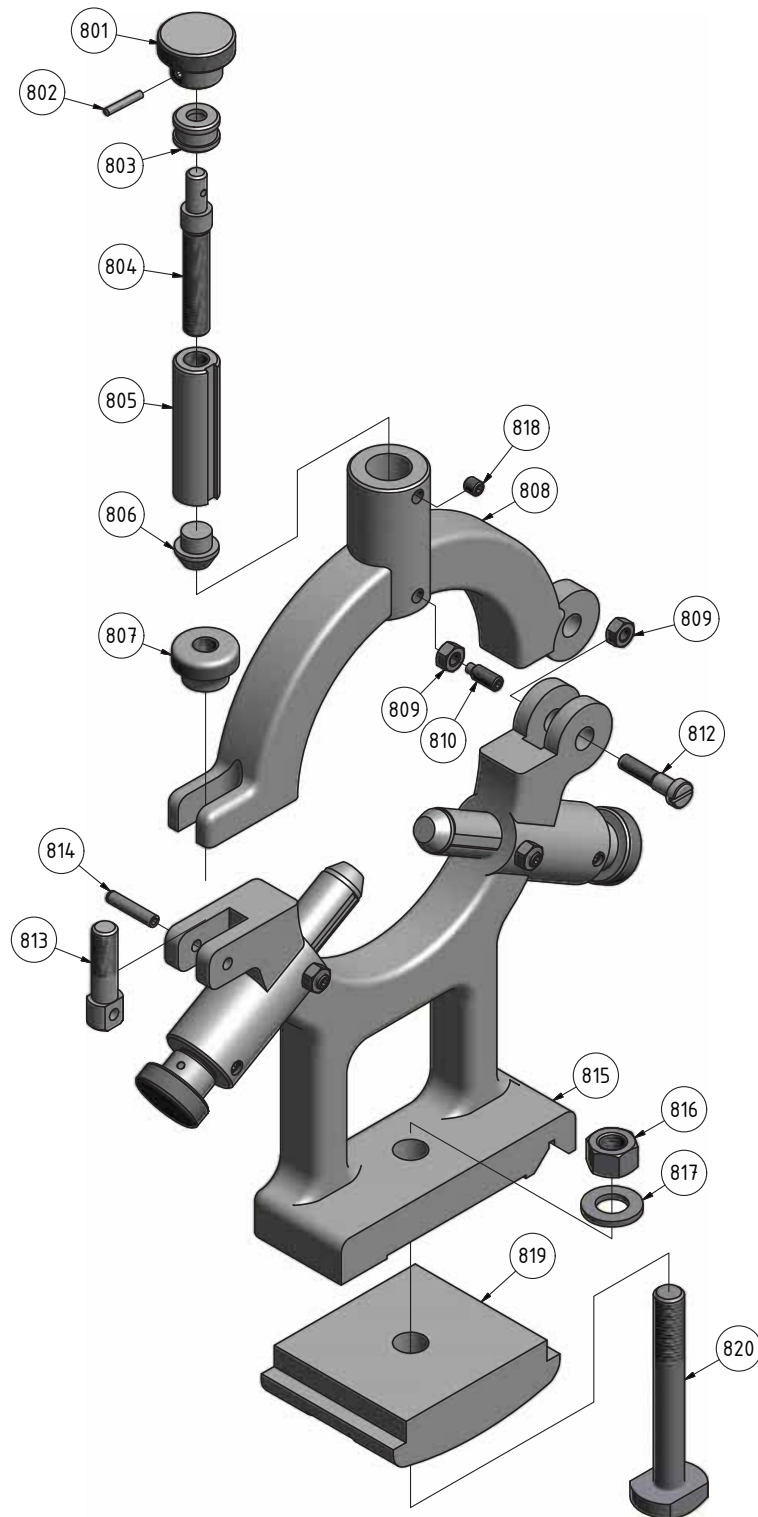
8.27 Reitstock - Tailstock



Img.8-22: Reitstock - Tailstock

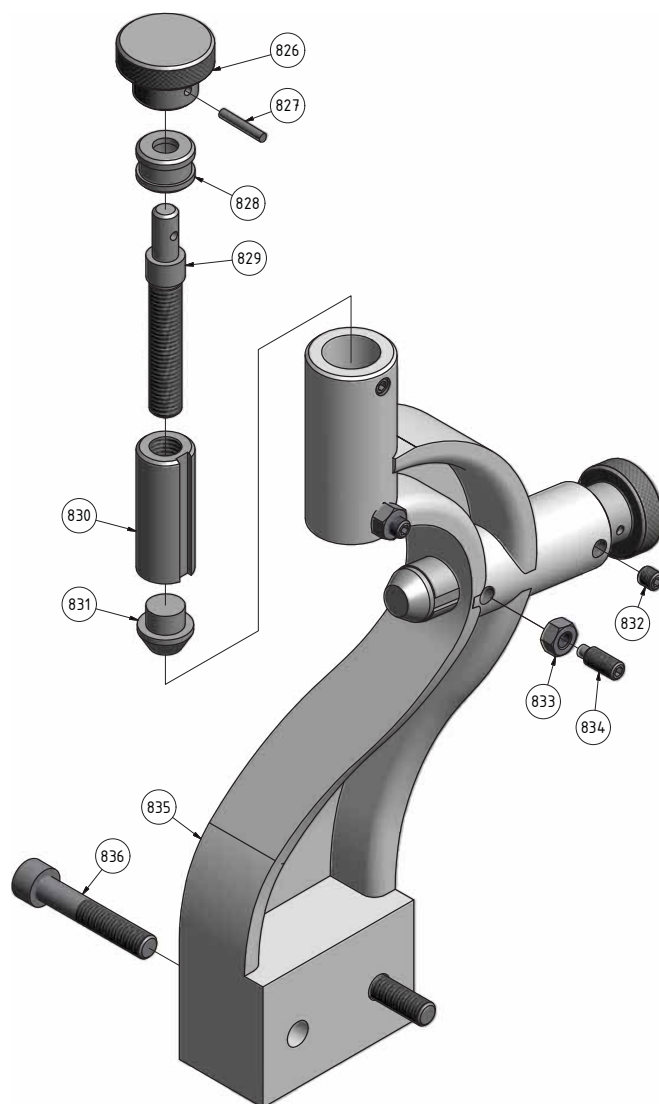
TH3610_TH3610D_parts.fm

8.28 Feststehende Lünette - Steady rest



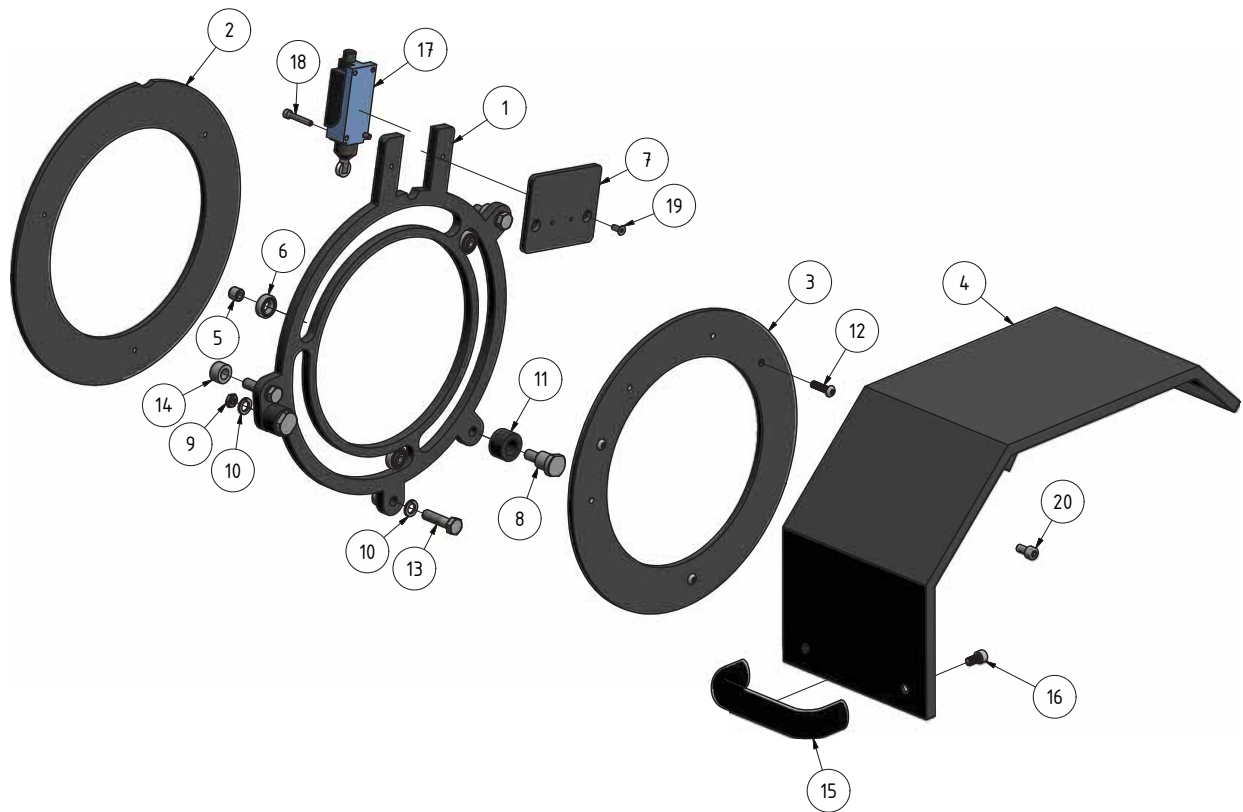
Img.8-23: Feststehende Lünette - Steady rest

8.29 Mitlaufende Lünette - Follow rest



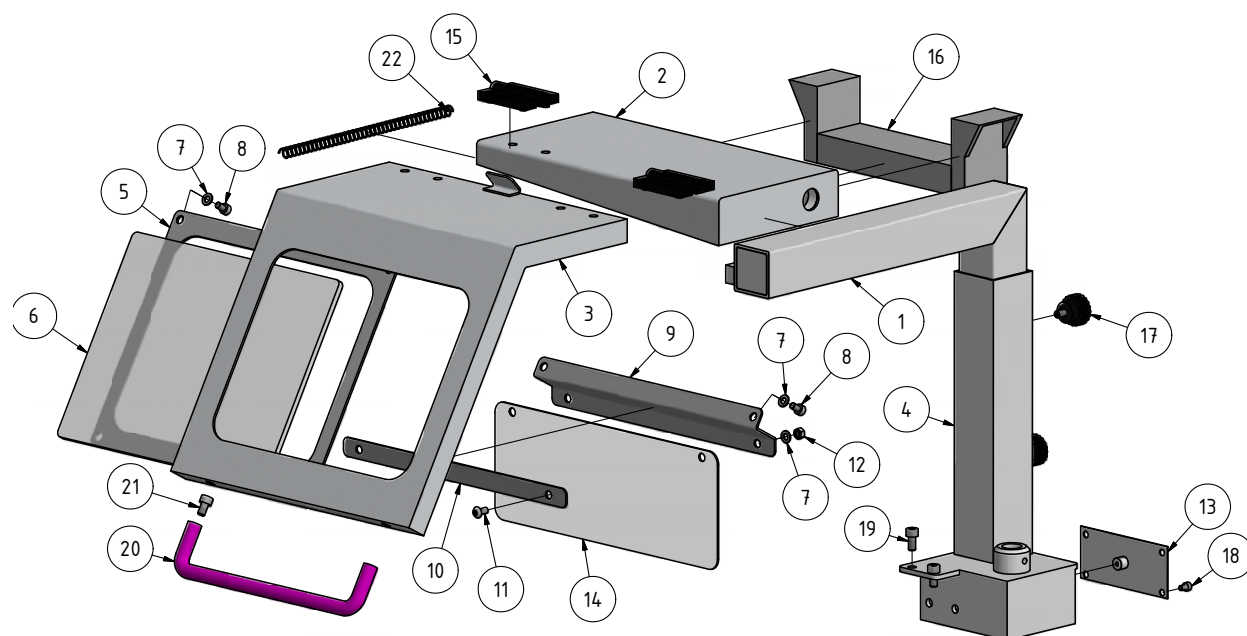
Img.8-24: Mitlaufende Lünette - Follow rest

8.30 Drehfutterschutz - Chuck protection



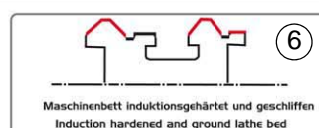
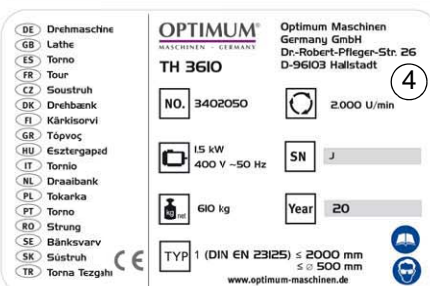
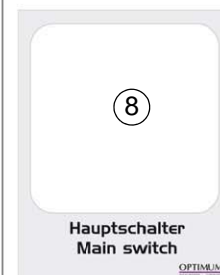
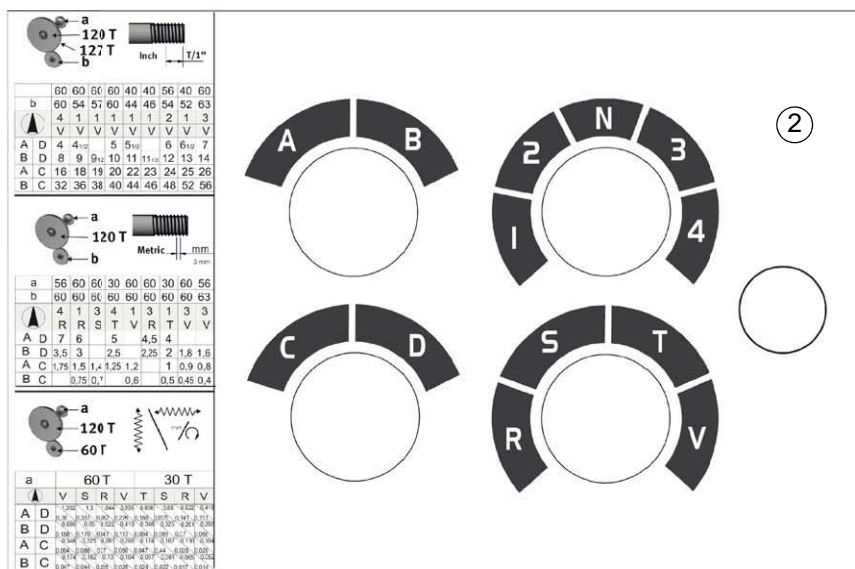
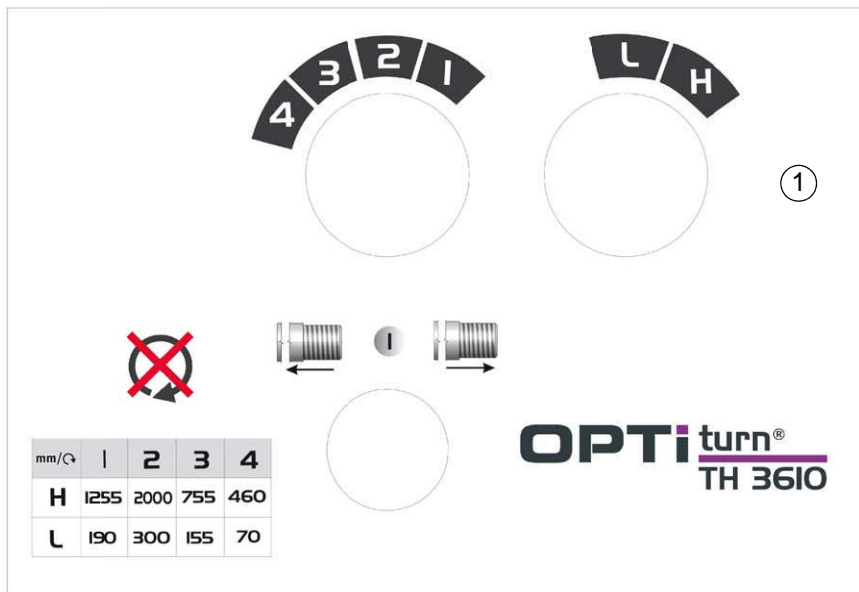
Img. 8-25: Drehfutterschutz - Chuck protection

8.31 Späneschutz - Chip protection



Img.8-26: Späneschutz - Chip protection

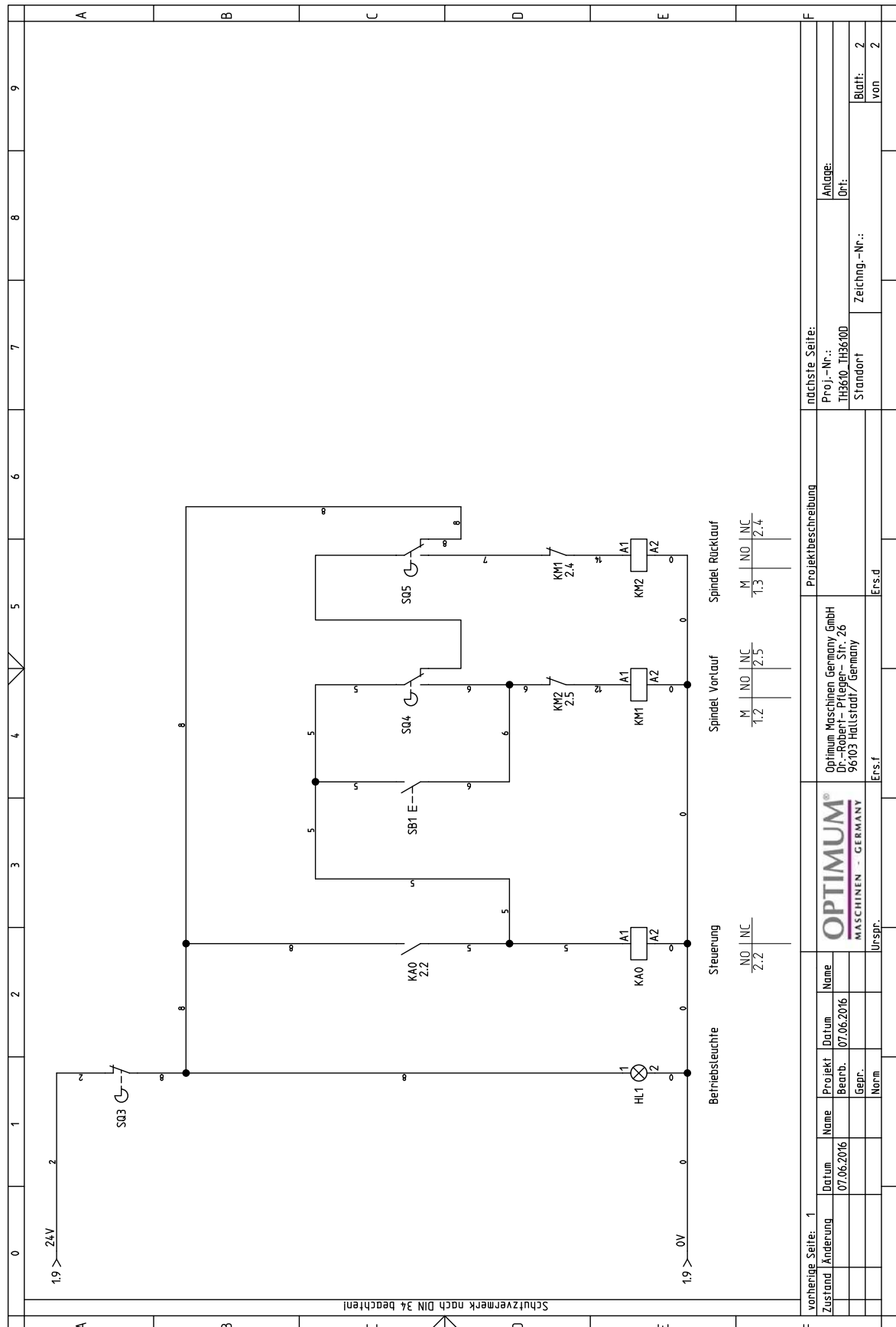
8.32 Maschinenschilder - Machine labels



Img.8-27: Maschinenschilder - Machine labels

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8.34 Schaltplan - Wiring diagram 400V, 2 - 2



Img.8-29: Schaltplan - Wiring diagram

8.35 Ersatzteilliste - Spare parts list

Ersatzteilliste Antrieb, Maschinenunterbau, Spindelbremse - Spare parts list, drive, machine base, spindle break					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
1	Befestigungsplatte Motor	Motor plate	1		03400923809
4	Sechskantschraube	Hexagon screw	4	GB 5783-86 - M8x25	
8	Keilriemenscheibe	Motor pulley	1		0340100008
10	Scheibe	Washer	4	8	
15	Sechskantschraube	Hexagon screw	3	GB 5783-86 - M10x30	
19	Scheibe	Washer	3	10	
24	Keilriemen	V-belt	1		039A315
41	Stehbolzen	Bolt	1		03402050841
44	Stehbolzen	Bolt	1		03402050844
46	Rändelmutter	Knurled nut	2		
51	Innensechskantschraube	Socket head screw	4	GB 70-86 - M4x10	
52	Deckel	Cover	1		0340100052
55	Elektro Schaltkasten	Electric box	1		0340100055
83	Stange	Rod	1		0340100083
84	Feder	Spring	1		0340100084
85	Bolzen	Bolt	1		03402050885
86	Hebel	Lever	1		0340100086
88	Schraube	Screw	1		
89	Sechskantmutter	Hexagon nut	3		
93	Spanstift	Spring pin	1	GB 879-86 - 5x40	
94	Stange	Rod	1		0340100094
95	Spanstift	Spring pin	1	GB 879-86 - 5x26	
96	Stange	Rod	1		0340100096
97	Bremspedel	Brake pedal	1		0340100097
99	Passfeder	Fitting key	1	DIN 6885 - A 8 x 7 x 40	042P8740
100	Motor	Motor	1		0340092310
171	Wellenzapfen	Shaft bolt	1		03401000171
172	Spanstift	Spring pin	1	GB 879-86/5x26	
173	Platte	Plate	1		03401000173
174	Hebelwelle Bremse	Brake shaft	1		03401000174
175	Sicherungsring	Retaining ring	1	DIN 471 - 12x1	042SR12W
184	Spindelbremse Bremsbacken	Brake pad	1		03401000184
185	Sicherungsring	Retaining ring	1	DIN 6799 - 8	042SR8W
283	Splint	Cotter pin	2	GB 81-96 - 2x12	
284	Schalter Spindelbremse	Switch spindle brake	1		0460012
284-1	Positionsschalter Schutzabdeckung Spindelstock	Position switch	1		0329035017
285	Schraube	Screw	2	GB 818-85 - M4x25	
286	Schraube	Screw	1		
287	Sechskantmutter	Hexagon nut	1	DIN 4032 - M6	
288	Buchse	Bushing	1		03401000288
289	Gewindestift	Grub screw	1	GB 80-85 - M8x6	
290	Bolt	Bolzen	1		03401000290
291	Hauptschalter	Main switch	1		0460010
292	Abdeckung	Cover	1		034020508292
293	Abdeckung	Cover	1		034020508293
294	Spänewanne	Chip tray	1		034020508294

295	Spänewanne	Chip tray	1		034020508295
296	Platte	Plate	1		034020508296
297	Abdeckung	Cover	4		034020508297
298	Unterbau links	Maschine stand left	1		034020508298
298-1	Schubblade	Drawer	3		0340205082981
299	Unterbau rechts	Machine stand right	1		034020508299
300	Druckplatte Endschalter	Pressure plate limit switch	1		0460054
301	Lüfterrad	Fan wheel	1		0313115ML
302	Motordeckel	Motor cover	1		0313115MLD
305	Abdeckung	Cover	1		034020508305
305-1	Schwingdeckel Spindelbohrung	Swinging lid spindle bore	1		
305-2	Stehbolzen	Bolt	1		
306	Spritzwand	Splash back	1		034020508306
Ersatzteilliste Maschinenbett, Steuerung - Spare part list lathe bed, control					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
2	Maschinenbett	Lathe bed	1		
4	Sechskantschraube	Hexagon screw	4	GB 5783-86 - M8x25	
9	Innensechskantschraube	Socket head screw	6	GB 70-85 - M12x60	
9-1	Scheibe	Washer	6	12	
9-2	Sechskantmutter	Hexagon nut	6	DIN 4032-M12	
11	Innensechskantschraube	Socket head screw	8	GB 70-85 - M6x22	
12	Zahnstange	Rack	1		0340100012
13	Zylinderstift	Straight pin	8	GB 117-86 - 6x28	
14	Zahnstange	Rack	3		0340100014
17-1	Ring	Ring	1		
25	Leitspindel	Lead screw	1		03402050825
26	Buchse	Sleeve	1		03402050826
27	Lager	Bearing	2	51102	04051102
30	Lagerdeckel	Bearing Cover	1		03402050830
32	Innensechskant Justierschraube	Socket head set screw	1	M6x20	
33	Abdeckstopfen	Plug	1		03400923833
34	Abdeckstopfen	Plug	1		03400923834
35	Schmiernippel	Lubrication cup	2	GB70-85 / 6	0340105
36	Innensechskantschraube	Socket head cap screw	2	M8x60	
37	Kegelstift	Taper pin	2	GB117-86 /5x60	
38	Manschette	Sleeve	1		
39	Innensechskant Justierschraube	Socket head set screw	1	GB77-85/M6x8	
42	Zugspindel	Feed rod	1		03402050842
43	Positionseinstellstift	Position setting pin	1		
44	Innensechskant Justierschraube	Socket head set screw	1	GB79-85 /M8x16	
45	Gesteuerter Block	Gated Block	1		03402050845
46	Spindelkontrollhebel	Spindle control lever	1		03402050846
48	Innensechskantschraube	Socket head cap screw	2	GB70-85/M6x16	
49	Halteklammer	Bracket	1		03402050849
50	Druckfeder	Compression spring	1	1x6x20	
51	Einsatzstück	Thrust Piece	1		
52	Keil	Key	1		
53	Buchse	Sleeve	1		03402050853
54	Schaltstange	Switch rod	1		03402050854
60	Abscherstift	Shear pin	1		
68	Rutschkupplung kpl.	Friction clutch cpl.	1		03400923857CPL

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69	Abdeckung	Cover	1		03402050869
70	Leitspindelabdeckung kpl.	Lead screw cover cpl.	1		03402050870
75	Spannstift	Spring pin	1		
80	Lagerbock	Bearing Block	1		03402050880
81	Schaltergehäuse	Switch housing	1		03402050881
82	Abdeckung	Cover	1		03402050882
83	Exzenter	Excenter	1		03402050883
84	Drehrichtungsschalter	Switch	2		03402050884
98	Gewindestift	Grub screw	1	M6x8	
281	Bolzen	Bolt	1		034010008281
282	Label	Label	1		034020508282
282-1	Niet	Rivet	4		
Ersatzteilliste Getriebe Spindelstock - Spare parts list headstock gear					
i P.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
103-1	Kontrollleuchte	Control light	1		0460019
103-2	Momenttaster	Rapid break	1		
103-3	NOT-HALT Taster	Emergency stop button	1		0460049
106	Verschluss	Closing	1		
107	Innensechskantschraube	Socket head screw	6	GB 70-85 - M6 x 30	
108	Ablassschraube	Drain plug	1		
112	Öleinfüllschraube	Oil plug screw			034020501112
118	O-Ring	O-ring	2	10	
132	Innensechskantschraube	Socket head screw	4	M10x40	
133	Senkkopfschraube	Counter sunk screw	2	GB 819-85 - M4x8	
152	Buchse	Bushing	2		034020501152
159	Stahlkugel	Steel ball	3	6mm	042KU06
165	Feder	Spring	3		
167	Sicherungsring	Retaining ring	2	DIN 472-42x1,75	042SR42W
168	Gewindestift	Grub screw	1	M8x12	
169	Gewindestift	Grub screw	1	GB 78-85-M8x8	
176	Flansch	Flange	1		034020501176
177	Dichtung	Gasket	1		034020501177
178	Dichtring	Gasket	1	RWDR-25x40x10	041254010
179	Kugellager	Ball bearing	1	6005	0406005R
180	Keilriemenscheibe	Pulley	1		034020501180
182	Scheibe	Washer	1		
186	Bolzen	Bolt	1		
187	Innensechskantschraube	Socket head screw	8	GB 70-85 - M6 x 16	
188	Passfeder	Fitting key	1	DIN 6885 - A8x 7 x 30	042P8730
189	Passfeder	Fitting key	1	DIN 6885 - A 6 x 6 x 120	
190	Welle	Shaft	1		034020501190
191	Passfeder	Fitting key	1	DIN 6885 - A 5 x 5 x 50	042P5550
192	Zahnrad	Gear	1		034020501192
193	Zahnrad	Gear	1		034020501193
194	Zahnrad	Gear	1		034020501194
195	Sicherungsring	Retaining ring	1	DIN 471 - 35x1,5	042SR35W
196	Kugellager	Bearing ring	1	6203	0406203R
197	Welle	Shaft	1		034020501197
198	Gewindestift	Grub screw	1	GB 80-85 - M8 x 16	
199	O-Ring	O-Ring	1	DIN 3771 - 34,5 x 3,55	
200	Innensechskantschraube	Socket head screw	3	GB 70-85 - M4 x 12	
201	Blindflansch	Cover	1		034020501201

202	Dichtung	Gasket	1		034020501202
203	Kugellager	Ball bearing	2	6204	0406204R
204	Scheibe	Washer	1		034020501204
205	Welle	Shaft	1		034020501205
206	Passfeder	Fitting key	2		034020501206
208	Zahnrad	Gear	1		034020501208
209	Zahnrad	Gear	1		034020501209
210	Buchse	Bushing	1		034020501210
211	Zahnrad	Gear	1		034020501211
212	Zahnrad	Gear	1		034020501212
213	Zahnrad	Gear	1		034020501213
215	Abdeckkappe	Cover	1		034020501215
216	O-Ring	O-Ring	1		034020501216
217	Zahnrad	Gear	1		034020501217
221	Nutmutter	Nut	2		034020501221
222	Ring	Ring	1		034020501222
223	Flansch	Flange	1		034020501223
224	Dichtung	Gasket	1		034020501224
225	Innensechskantschraube	Socket head screw	7	GB 70-85 - M6 x 25	
226	Kegelrollenlager	Taper roller bearing	1	32013	04032013
227	Sicherungsring	Retaining ring	1	DIN 471 - 50x2	042SR50W
228	Zahnrad	Gear	1		034020501228
229	Zahnrad	Gear	1		034020501229
230	Passfeder	Fitting key	1		
231	Zahnrad	Gear	1		034020501231
232	Sicherungsring	Retaining ring	1		
233	Kegelrollenlager	Taper roller bearing	1	32014	04032014
234	Dichtung	Gasket	1		034020501234
235	Frontdeckel	Cover	1		034020501235
236	Welle	Shaft	1	DIN ISO 702-2 no. 5 (D1-5)	034020501236
237	Passfeder	Fitting key	1		
238	Passfeder	Fitting key	1		
239	Bolt	Bolt	1		034020501239
240	Welle	Shaft	1		034020501240
241	Feder	Spring	6		034020501241
242	Innensechskantschraube	Socket head screw	6		034020501242
243	O-Ring	O-Ring	1		
244	Welle	Shaft	1		034020501244
245	Sicherungsring	Retaining ring	3		
246	Kugellager	Ball bearing	2	6004	0406004R
247	Zahnrad	Gear	1		034020501247
251	Sechskantmutter	Hexagon nut	1		
252	Scheibe	Washer	1		
253	Zahnrad	Gear	1		034020501253
255	Dichtring	Seal ring	1		034020501255
256	Welle	Shaft	1		034020501256
257	Passfeder	Fitting key	1		
258	Spannstift	Spring pin	1		
259	Passfeder	Fitting key	1		
260	Scheibe	Washer	1		034020501260
261	Ring	Ring	1		034020501261
262	Innensechskantschraube	Socket head screw	3		
263	Flansch	Flange	1		034020501263
264	Dichtung	Gasket	1		034020501264

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267	Zahnrad	Gear	1		034020501267
268	Innensechskantschraube	Socket head screw	3		
290	Gewindestift	Grub screw	2		
291	Schraube	Screw	2		
292	Scheibe	Washer	2		
293	Buchse	Bushing	2		034020501293
294	Flansch	Flange	2		034020501294
295	Passfeder	Fitting key	2		
296	Passfeder	Fitting key	2		
297	O-Ring	O-ring	3		
298	Buchse	Bushing	1		034020501298
299	Zahnrad	Gear	1		034020501299
300	Welle	Shaft	1		034020501300
301	Schaltklaue	Shifting claw	1		034020501301
302	Platte	Plate	1		034020501302
303	Schaltklaue	Shifting claw	1		034020501303
304	Welle	Shaft	1		034020501304
305	Welle	Shaft	1		034020501305
306	Platte	Plate	1		034020501306
307	Anzeige	Indicator	1		
308	Wahlschalter	Mode switch	1		034020501308
309	Schalthebel	Switch lever	2		034020501309
310	Flansch	Flange	1		034020501310
311	Welle	Shaft	1		034020501311
312	Schaltklaue	Shifting claw	1		034020501312
313	Gabel	Fork	1		034020501313
314	Zahnrad	Gear	1		034020501314
315	Spannstift	Spring pin	1		
316	Spannstift	Spring pin	1		
317	Spannstift	Spring pin	1		
318	Passfeder	Fitting key	1		
319	Gummiablage	Rubber plate	1		034020501319
320	Deckel	Cover	1		034020501320
321	Dichtung	Seal	1		034020501321
322	Gehäuse Spindelstock	Headstock housing	1		
323	Schaltergehäuse	Switch housing	1		034020501323
324	Abdeckung	Cover	1		034020501324
325	Ölschauglas	Oil sight glass	1		034020501325
326	Reduzierhülse MK6 - MK3	Reducing sleeve MT6 - MT3	1		
Ersatzteilliste Vorschubgetriebe - Spare part list feed gear					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
1	Rillenkugellager	Deep groove ball bearing	1	GB/T276-94/6203	0406203R
2	Manschette	Collar	1		03402050302
3	Sicherungsring	Retaining ring	2	GB894.2-86/Ø 16	042SR16W
4	Zahnrad	Gear	1		03402050304
5	Rillenkugellager	Deep groove ball bearing	9	6202-2RS	0406202ZZ
6	Abstandstück	Spacer	3		03402050306
7	Sicherungsring	Retaining ring	7	Ø 20	042SR20W
8	Sicherungsring	Retaining ring	2	Ø 28	042SR28I
9	Zahnrad	Gear	2		03402050309
10	Zahnrad	Gear	2		03402050310
11	Doppelrundkopfkeil	Double round head key	2	GB1096-86/C4x22	
12	Zahnrad	Gear	2		03402050312

13	Ölablassstopfen	Oil Plug	2	Q/ZB285-3/ZG 3/8"	03400923313
14	Rillenkugellager	Deep groove ball bearing	1	6004 - 2RS	0406004R
15	Dichtung	Seal	1		03402050315
16	Lagerabdeckung	Bearing cover	1		03402050316
17	Innensechskantschraube	Socket head cap screw	18	GB70-86/M5x12	
18	HG4 - 692 - 67 Öldichtung	HG4 - 692 - 67 Oil Seal	3	25x40x7	04125407
19	Welle	Shaft	1		03402050319
20	Doppelrundkopfkeil	Double round head key	1	GB1096-86/C4x145	
21	Welle	Shaft	1		03402050321
22	Dichtung	Gasket	3		03402050322
23	Lagerabdeckung	Bearing cover	3		03402050323
24	Doppelrundkopfkeil	Double round head key	1	GB1096-86/5x18	042P5520
25	Welle	Shaft	1		03402050325
26	Lagerabdeckung	Bearing Cover	1		03402050326
27	Dichtung	Gasket	1		03402050327
28	Abdeckung	Cover	1		03402050328
34	Zahnrad	Gear	1		03402050334
35	Abstandstück	Spacer	1		03402050335
36	Zahnrad	Gear	1		03402050336
37	Zahnrad	Gear	1		03402050337
38	Zahnrad	Gear	1		03402050338
39	Buchse	Sleeve	1		03402050339
40	Zahnrad	Gear	1		03402050340
41	Zahnrad	Gear	1		03402050341
42	Sicherungsring	Retaining ring	1	GB896-86/Ø 15	042SR15I
43	Zahnrad	Gear	1		03402050343
44	Verschiebbare Gabel	Shifting fork	1		03402050344
45	Halterung	Rack	1		03402050345
46	Verschiebbare Gabel	Shifting fork	1		03402050346
47	Halterung	Rack	1		03402050347
48	O-Ring	O-Ring	4	GB1235-76 /12x1.9	
49	Verschiebbare Gabel	Shifting fork	1		03402050349
50	Halterung	Rack	1		03402050350
51	Halterung	Rack	1		03402050351
52	Senkschraube	Counter sunk flat screw	4	GB79-85/M4x16	
53	Sechskantmutter	Hexagon nut	4	GB6170-86 /M4	
54	Verschiebbare Gabel	Shifting fork	1		03402050354
55	Welle	Shaft	2		03402050355
56	Zahnrad	Gear	1		03402050356
57	Zahnrad	Gear	1		03402050357
58	Zahnrad	Gear	1		03402050358
59	Kegelstift mit Gewinde	Taper pin with thread	2	GB 117-85/Ø8x26	
60	Innensechskantschraube	Socket head cap screw	2	GB70 - 85/M8x25	
61	Welle	Shaft	1		03402050361
62	Welle	Shaft	1		03402050362
63	Doppelrundkopfkeil	Double round head key	1	GB1096-79/4x55	
64	Passfeder	Fitting key	1	GB1096-79/5x18	042P5520
65	Innensechskantschraube	Socket head cap screw	1	GB70-85/M6x16	
66	Flansch	Flange	1		03402050366
67	Dichtung	Seal	1		03402050367
68	Öldichtung	Oil seal	1	GB9877.1-88/22x35x7	04122357
69	Antriebswelle	Input shaft	1		03402050369
70	Doppelrundkopfkeil	Double round head key	1	GB70 - 85/5x5x45	042P5550
71	Innensechskantschraube	Socket head cap screw	2	GB70 - 85/M8x65	

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72	Federstift	Spring pin	2	GB879 - 86/Ø 4x30	
73	Gewindestift	Grub screw	1	GB78-85/M5x6	
74	Gehäuse	Housing	1		
81	O-Ring	O-Ring	4	GB1235-76/P7xW1.9	
82	Ritzelwelle	Pinion shaft	4		03402050382
83	Dichtung	Gasket	1		03402050383
85	Ölschauglas	Oil Glass from	1		
87	Antriebsabdeckung 4	Plate 4	4		
88	Feststellschraube	Set screw	4	GB80-85/M6x8	
89	Feststellschraube	Set screw	4	GB77-85/M6x10	
90	Federstift	Spring pin	4	GB879-86/Ø 5x40	
91	Noppe	Knob	4		03402050391
92	Feder	Spring	4	GB2089-80/Ø 1x5x20	
93	Stahlkugel	Steel ball	4	GB308-89/Ø 6	042KU06
95	Schraube	Screw	8	GB70-85/M5x25	
100	Abdeckung	Cover	1		034020503100

Ersatzteilliste Wechselradgetriebe - Spare parts list change gear

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
1	Mutter	Nut	1	GB6170-86/M10	
2	Buchse	Sleeve	1		
3	Lager	Bearing	2	6203/2RS	0406203R
4	Sicherungsring	Retaining ring	2	GB893.1-87/40	042SR40W
6	Zahnrad	Gear	1	M1.25 x 120x127	03400923206
8	Zahnrad	Gear	2	CL6232-05-41/M1.25 x 60	03402050208
11	Buchse	Sleeve	1		03400923211
12	Schwingrahmen	Swing frame	1		03400923212
13	Tellerschraube	Setting bolt	1		03400923213
14	Innensechskantschraube	Socket hand cap screw	1		
15	Scheibe	Washer	1		
16	Schraube	Screw	1	GB70-85/M8x30	
17	Befestigungsschraube	Clamping bolt	1		03402050217
0	Wechselrad	Change gear	1	M1.25x78	03400923218
0	Wechselrad	Change gear	1	M1.25x69	03400923219
0	Wechselrad	Change gear	1	M1.25x66	03400923220
0	Wechselrad	Change gear	1	M1.25x63	03400923221
0	Wechselrad	Change gear	1	M1.25x57	03400923222
0	Wechselrad	Change gear	1	M1.25x56	03400923223
0	Wechselrad	Change gear	1	M1.25x54	03400923224
0	Wechselrad	Change gear	1	M1.25x30	03400923225

Ersatzteilliste Schlosskasten - Spare part list apron

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
451	Richtungsanzeige	Scale	1		
452	Schloßmuttergehäuse	Apron nut housing	1		03401000452CPL
455	Gewindestift	Grub screw	2	GB 80-85 - M6 x 10	
456	Schraube	Screw	1		03401000456
457	Leiste	Gib	1		03401000457
458	Sechskantmutter	Hexagon nut	2	GB 6170-86 - M6	
459	Innensechskantschraube	Socket head screw	3	GB 70-85 - M5 x 16	
460	Leiste	Gib	1		03401000460
461	Gewindestift	Grub screw	3	GB 80-85 - M5 x 16	
462	Sechskantmutter	Hexagon nut	3	GB 6170-86 - M5	

463	Zylinderstift	Straight pin	2	GB 119-86 - A 8 x 14	
464	Anzeige	Scale	1		
465	Scheibe	Washer	2		03401000465
466	Sicherungsring	Retaining ring	2	DIN 471-32x1,5	042SR32W
467	Ölschauglas	Oil glass	1		0343025
468	Verschlussstopfen	Oil plug	1		
470	Griff	Handle	2		03401000470
471	Hebel	Lever	1		
472	Gehäuse Schlosskasten	Apron housing	1		03401000472CPL
473	Gewindestift	Grub screw	1	GB 879-86 - 5 x 32	
474	Schaltwelle	Switching shaft	1		
475	Aufnahme Schalthebel	Collar	1		03401000475
476	Stahlkugel	Steel ball	2		
477	Feder	Spring	2		
478	Gewindestift	Grub screw	1	GB 80-85 - M6 x 6	
481	Spannstift	Spring pin	2	GB 879-86 - 5 x 20	
482	Abdeckplatte	Cover	1		03401000482
483	Gewindestift	Grub screw	5	GB 70-85 - M6 x 12	
484	Gehäuse	Housing	1		03401000484
485	Gewindestift	Grub screw	3	GB 70-85 - M6 x 35	
486	Stopfen	Plug	1		
487	Öler	Oiler	3	8	0340114
488	Schaltwelle	Shaft	1		03401000488
489	Schalthebel	Lever	1		03401000489
491	Stahlkugel	Steel ball	2		
492	Feder	Spring	2		03400923467
493	Gewindestift	Grub screw	2	GB 78-85 - M6 x 6	
494	Passfeder	Key	1		
495	Getriebebeschnecke	Worm gear	1		03401000495
495-1	Getriebebeschnecke alte Ausführung	Worm gear old building	1		03401000495A
501	Passfeder	Fitting key	1	DIN 6885 - A 5 x 5 x 18	042P5520
502	Ritzelwelle	Gear shaft	1		03401000502
503	Lagerbock	Bearing block	2		03401000503
504	Stift	Pin	3		
505	Gewindestift	Grub screw	3	GB 70-85 - M5 x 25	
506	Gewindestift	Grub screw	1	GB 80-85 - M6 x 8	03401000506
507	Skalenring	Scale ring	1		03401000507
510	Innensechskantschraube	Socket head screw	5	GB 70-85 - M6 x 12	
511	Scheibe	Washer	1		
513	Ritzelwelle	Gear shaft	1		03401000513
514	Zahnrad	Gear	1		03401000514
515	Spannstift	Spring pin	2	GB 879-86 - 5 x 30	
516	Sechskantschraube	Hexagon nut	3	GB 5783-86 - M6 x 12	
517	Scheibe	Washer	1		
518	Zahnrad	Gear	1		03401000518
518-1	Zahnrad, alte Ausführung	Gear, old building	1		03401000518A
519	Welle	Shaft	1		03401000519
519-1	Welle, alte Ausführung	Shaft, old building	1		03401000519A
520	Spannstift	Spring pin	2	GB 879-86 - 5 x 30	
521	Passfeder	Fitting key	1	DIN 6885-A5x5x10	042P5510
522	Zahnrad	Gear	1		03401000522
523	Verschlusskappe	Cap	1		
524	Welle	Shaft	1		03401000524

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525	Spannstift	Spring pin	1	GB 879-86 - 3 x 24	
526	Gewindestift	Grub screw	2	GB 80-85 - M6 x 10	
527	Buchse	Sleeve	1		03401000527
528	Deckel	Cover	1		
529	Zylinderstift	Straight pin	3	GB 119-86 - A 5 x 24	
530	Zahnrad	Gear	1		034020504530
531	Zahnrad	Gear	1		03401000531
532	Stiftschraube	Set screw	1	M6 x 6	
533	Schaltgabel	Switching fork	1		
534	Innensechskantschraube	Socket head screw	2	GB 70-85 - M5 x 12	
535	Welle	Shaft	1		03401000535
536	Zahnrad	Gear	1		03401000536
537	Scheibe	Washer	1		
538	Innensechskantschraube	Socket head screw	1	GB 70-85 - M6 x 10	
550	Gewindestift	Grub screw	1	GB 80-85/M6x30	
561	Niet	Rivet	2		
570	Kupplung	Clutch	1		034020504570
571	Handrad	Handle	1		034020504571
572	Hülse	Sleeve	1		034020504572
Ersatzteile Planschlitten, Oberschlitten - Spare parts list cross slide, top slide					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
601	Nutenstein	Slot nut	2		03401000601
602	Hülse	Bushing	1		03402050602
603	Innensechskantschraube	Socket head screw	1	GB 70-85 - M8 x 16	
604	Öler	Oller	3	6mm	0340105
605	Planschlitten	Cross slide	1		03401000605
606	Nachstellschraube Keilleiste	Adjusting screw	2		03401000606
607	Keilleiste	Gib	1		03401000607
608	Gewindestift	Grub screw	1	GB 77-85 - M6 x 12	
611	Spindelmutter	Spindle nut	1		034020506611
612	Gewindestift	Grub screw	1	GB 80-85 - M6 x 16	
616	Stahlkugel	Steel ball	2		
617	Feder	Spring	2		
619	Innensechskantschraube	Socket head screw	2	GB 70-86-M8x16	
620	Führung	Guide	1		034020507620
621	Rillenkugellager	Ball bearing	1	51102	04051102
623	Gewindestift	Grub screw	1	GB 77-85-N6x12	
624	Innensechskantschraube	Socket head screw	2	GB 70-85 - M6 x 25	
625	Zahnrad	Gear	1		034020506625
626	Bolzen	Bolt	1		034020506626
630	Spannstift	Spring pin	2	ISO 13337/6x50	
631	Bettschlitten	Bed slide	1		03401000631
632	Abdeckplatte	Plate	1		034020506632
633	Schraube	Screw	2	GB 823-88 - M8 x 12	
634	Öler	Oiler	2	8mm	0340114
635	Abstreifer	Wiper	2		03401000635
636	Halter Abstreifer	Holder	2		03401000636
637	Innensechskantschraube	Socket head screw	4	GB 70-85-N8x40	
638	Nachstelleiste	Gib	2		03401000638
639	Führungsschiene	Guide rail	1		03401000639
640	Führungsplatte	Guide plate	1		03401000640
641	Sechskantschraube	Hexagon screw	4	GB 5783-86 - M8 x 20	
642	Führungsplatte	Guide plate	1		03401000642

643	Abstreifer	Wiper	2		03401000643
644	Halter Abstreifer	Holder	1		03401000644
645	Schraube	Screw	8	GB 823-88 - M4 x 12	
646	Gewindestift	Grub screw	4	GB 77-85 - M6 x 16	
647	Sechskantmutter	Hexagon nut	4	GB 6170-86 - M6	
648	Sechskantschraube	Hexagon screw	3	GB 5783-86 - M8 x 25	
649	Verschraubung	Fitting	1		
650	Gewindestift	Grub screw	4	GB 77-85-M8x12	
651	Halter Abstreifer	Holder	1		
652	Klemmschraube	Clamping screw	1	GB70-85/M8x60	
655	Vierfachstahlhalter	Toolholder	1		034020507655
656	Klemmschraube	Clamping screw	8	GB 83-88 - M10 x 50	034020507656
657	Griffhalter	Holder	1	M16	034020507657
658	Hebel	Lever	1	M10x50	034020507658
659	Hebelgriff	Handle	1		034020507659
660	Scheibe	Washer	1		
661	Gewindebolzen	Bolt	1		034020507661
663	Rastknopf	Knob	1		034020507663
664	Feder	Spring	1	1x8x11	034020507664
665	Öler	Oiler	1	8mm	0340114
666	Spindel	Spindle	1		034020507666
667	Spindelmutter	Spindle nut	1		034020507667
668	Passfeder	Fitting key	1	DIN 6885 - A 4 x 4 x 14	042P4414
669	Halterung	Holder	1		034020507669
670	Rillenkugellager	Ball bearing	1	51103	04051103
671	Innensechskantschraube	Socket head screw	2	GB 70-85 - M6 x 20	
672	Skalenring	Scale ring	1		034020507672
673	Stahlkugel	Steel ball	2		
674	Feder	Spring	2	0,7x5x9	
675	Kurbelgriff	Handle	1		03401000675
676	Innensechskantschraube	Socket head screw	1	GB 70-85 - M5 x 25	03401000676
677	Handrad	Handwheel	1		
678	Justierkappe	Screw	1		
679	Gewindestift	Grub screw	1	M6x15	
680	Befestigungsschraube	Screw	1		03401000680
681	Kurbelgriff	Handle	1		03401000681
682	Gewindestift	Grub screw	1		
683	Unterteil Oberschlitten	Top slide guide	1		
685	Stellschraube Keilleiste	Adjusting screw	2		03401000685
686	Oberteil Oberschlitten	Top slide	1		034020507686
687	Keilleiste	Gib	1		034020507687
690	RIng	Ring	1		034020506690
691	Federstift	Spring pin	2	3x28	
692	Schmiernippel	Lubrication cup	1	6	0340105
693	Flansch	Flange	1		034020506693
694	Klemmmutter	Clamping nut	1		034020506694
695	Gewindestift	Grub screw	1	M5x6	
696	Buchse	Bushing	1		034020506696
697	Skalenring	Scale ring	1		034020506697
698	RIng	Ring	1		034020506698
699	Handhebel	Handle	1		034020706433
700	Hebel	Lever	1		034020506700
701	Schraube	Screw	1		

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702	Scheibe	Washer	1		
703	Spindel	Spindle	1		034020506703
Ersatzteile Reitstock - Spare parts list tailstock					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
701	Spindelmutter	Spindle nut	1		034020509701
702	Gewindestift	Grub screw	2	GB 70-85 - M5 x 16	
703	Spindel	Spindle	1		034020509703
704	Passfeder	Fitting key	1	DIN 6885 - A 5 x 5 x 20	042P5520
705	Kugellager	Ball bearing	2	51102	04051102
706	Lagerbock	Bearing block	1		034020509706
707	Innensechskantschraube	Socket head screw	4	GB 70-85 - M5 x 20	
708	Gewindestift	Grub screw	1	GB 818-85 - M4 x 5	
709	Öler	Oiler	3	6mm	0340105
710	Skalenring	Scale ring	1		034020509710
711	Griff	Handle	1		034020509711
712	Klemmhebel	Lever	1		034020509712
713	Scheibe	Washer	1		
717	Justierschraube	Screw	1		
718	Innensechskantschraube	Grub screw	1	GB 78-85 - M5 x 20	
719	Welle	Shaft	1		034020509719
720	Schraube	Screw	2		
721	Innensechskantschraube	Grub screw	2	GB 78-85 - M12 x 45	
722	Innensechskantschraube	Grub screw	1	GB 78-85 - M12 x 50	
723	Pinole	Pinole	1		034020509723
724	Reitstockkörper	Housing	1		
725	Gewindestift	Grub screw	1	GB 80-85 - M6 x 6	
726	Niet	Rivet	4		
727	Exzenter	Excenter	1		034020509727
728	Griff	Handle	2		
729	Hebel	Lever	1		034020509729
730	Welle	Shaft	1		034020509730
731	Exzenter	Excenter	1		034020509731
732	Gewindestift	Grub screw	1	GB 879-86 - 5 x 24	
733	Scheibe	Washer	1		
736	Führungsgrundplatte	Guide plate	1		034020509736
737	Klemmplatte Maschinenbett	Clamping plate	1		034020509737
738	Skala oben	Scale top	1		
739	Skala unten	Scale under	1		
740	Rastbolzen	Locking bolt	1		
741	Feste Zentrierspitze MK3	Steady centers MT3	2		
742	Skala Reitstock	Scale tailstock	1		
743	Aufnahme	Collet	1		034020509743
744	Feder	Spring	1		034020509744
745	Scheibe	Washer	1		
746	Scheibe	Washer	1		
747	Sechskantschraube	Hexagon screw	1	GB 5782-86 - M6x35	
748	Sechskantschraube	Hexagon screw	1	GB 5782-86 - M16x100	
749	Sechskantschraube	Hexagon screw	4	GB 823-88 - M4 x 12	
750	Halter Abstreifer	Holder wiper	1		034020509750
751	Abstreifer	Wiper	1		034020509751
752	Halter Abstreifer	Holder wiper	1		034020509752
753	Abstreifer	Wiper	1		034020509753

754	Federblech	Spring sheet	1		
760	Buchse	Bushing	1		
761	Schraube	Screw	1		
762	Hülse	Sleeve	1		
763	Handrad	Handle	1		034020509763
CPL	Spindel komplett	Spindle complete	1		034020509703CPL
CPL	Reitstock komplett	Tailstock complete	1		034020509724CPL

Ersatzteile Feststehende Lünette - Spare parts steady rest

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
801	Rändelgriff	Knurled handle	3		
802	Zylinderstift	Straight pin	3	GB 119-86 - C 3 x 18	
803	Überwurfmutter	Nut	3		
804	Gewindestange	Threaded rod	3		
805	Zentrierhülse	Centering bushing	3		
806	Endstück	End piece	3		
807	Mutter	Nut	1		
808	feststehende Lünette Oberteil	Steady rest upper section	1		
809	Sechskantmutter	Hexagon nut	4	GB 6170-86 - M6	
810	Gewindestift	Grub screw	3	GB 79-85 - M6 x 16	
812	Schraube	Screw	1		
813	Gewindebolzen	Threaded bolt	1		
814	Spannstift	Spring pin	1	GB 879-86 - 5 x 24	
815	feststehende Lünette Unterteil	Follow rest lower part	1		
816	Sechskantmutter	Hexagon nut	1		
817	Scheibe	Washer	1	DIN 125 - A 13	
818	Gewindestift	Grub screw	3	GB 78-85 - M6 x 6	
819	Klemmplatte	Clamping plate	1		
820	Klemmschraube	Clamping screw	1	GB 37-88 - M12x90	
0	feststehende Lünette komplett	Steady rest complete			03402050LFF

Ersatzteile mitlaufende Lünette - Spare parts follow rest

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
826	Rändelgriff	Knurled handle	2		
827	Gewindestift	Grub Screw	2	GB 119-86 - C 3 x 18	
828	Überwurfmutter	Sleeve nut	2		
829	Gewindestange	Threaded rod	2		
830	Zentrierhülse	Centering bushing	2		
831	Endstück	End piece	2		
832	Gewindestift	Grub Screw	2	GB 78-85 - M6 x 6	
833	Sechskantmutter	Hexagon nut	2	GB 6170-86 - M6	
834	Gewindestift	Grub screw	2	GB 79-85 - M6 x 16	
835	Körper mitlaufende Lünette	Body follow rest	1		
836	Innensechskantschraube	Socket head screw	2	GB 70-85 - M8 x 45	
0	mitlaufende Lünette komplett	Follow rest complete	1		03402050LM

Ersatzteile Drehfutterschutz - Spare parts chuck protection

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
1	Mittelring	Middle ring	1		
2	Ring links	Ring left	1		
3	Ring rechts	Ring right	1		

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4	Drehfutterschutz	Lathe chuck cover	1		
5	Buchse	Bushing	3		03402050FS05
6	Kugellager	Ball bearing	3	6000	0406000ZZ
7	Platte	Plate	1		
8	Bolzen	Bolt	2		
9	Sechskantmutter	Hexagon nut	2	M8	
10	Federscheibe	Spring washer	5	8	
11	Hülse	Sleeve	2		
12	Schraube	Screw	3	M5X20	
13	Sechskantschraube	Hexagon screw	3	M8X35	
14	Abstandshülse	Sleeve	3		
15	Griff	Handle	1		
16	Innensechskantschraube	Socket head screw	2	ISO 4762 - M5 x 8	
17	Endschalter	Limit switch	1		
18	Innensechskantschraube	Socket head screw	2	ISO 4762 - M4 x 25	
19	Innensechskantschraube	Socket head screw	2	ISO 4762 - M4 x 12	
20	Innensechskantschraube	Socket head screw	3	ISO 4762 - M6 x 12	
CPL	Drehfutterschutz komplett	Chuck protection cpl	1		03402050FS

Ersatzteilliste Späneschutz - Spare part list chip protection

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
1	Führung	Guide	1		
2	Platte	Plate	1		
3	Späneschutz	Chip guard	1		
4	Halter	Holder	1		
5	Klemmplatte	Clamping plate	1		
6	Schutzglass	Safety glass	1		034020501206
7	Scheibe	Washer	10	5	
8	Schraube	Screw	4	M5	
9	Platte	Plate	1		
10	Klemmplatte	Clamping plate	1		
11	Schraube	Screw	2	M5	
12	Sechskantmutter	Hexagon nut	2	M5	
13	Abdeckung	Cover	1		
14	Flexible Abdeckung	Flexible cover	1		
15	Scharnier	Hinger	2		
16	LED Lampe	LED Lamp	1	DC 24V - PGB-221-6W	034020301216
17	Klemmschraube	Clamping screw	2		
18	Innensechskantschraube	Socket head screw	4	ISO 4762 - M4 x 6	
19	Innensechskantschraube	Socket head screw	2	ISO 4762 - M6 x 12	
20	Griff	Handle	1		
21	Innensechskantschraube	Socket head screw	2	ISO 4762 - M6 x 10	
22	Feder	Spring	1		034020301222
CPL	Späneschutz komplett	Chip protection cpl	1		034020501203CPL

Ersatzteilliste Wegmeßsystem - Spare part list path measurement system

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
	Digitale Positionsanzeige		1	DPA21	
	Haltestange	Holding rod	1		
	Glasmeßstab Oberschlitten	Glass scale top slide	1	ML 100 mm	
	Abdeckung Glasmeßstab	Cover class scale	1		
	Befestigung Glasmeßstab	Fixing glass scale	1		
	Befestigung Lesekopf Glasmeßstab	Reading head mounting glass scale	1		

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	Glasmeßstab Planschlitten	Glass scale cross slide	1	ML 170 mm	
	Abdeckung Glasmeßstab	Cover class scale	1		
	Befestigung Glasmeßstab	Fixing glass scale	1		
	Befestigung Lesekopf Glasmeßstab	Reading head mounting glass scale	1		
	Glasmeßstab Bettschlitten	Glass scale lathe saddle	1	ML 1020 mm	
	Abdeckung Glasmeßstab	Cover class scale	1		
	Befestigung Lesekopf Glasmeßstab	Reading head mounting glass scale	1		
	Befestigung Glasmeßstab	Fixing glass scale	2		

Ersatzteilliste Maschinenschilder - Spare part list machine labels








Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
1	Schild Spindelstock	Headstock lable	1	TH3610	03402050L01
1	Schild Spindelstock	Headstock lable	1	TH3610D	03402060L01
2	Schild Vorschubgetriebe	Gear feed box lable	1		03402050L02
3	Schild Steuerung	Control lable	1		03402050L03
4	Maschinenschild	Machine lable	1	TH3610	03402050L04
4	Maschinenschild	Machine lable	1	TH3610D	03402060L04
5	Schild Information	Info lable	1		03402050L05
6	Schild Maschinenbett	MACHINE bed lable	1		03402050L06
7	Schild Information	Info lable	1		03402050L07
8	Schild Hauptschalter	Main switch lable	1		03402050L08
9	Schild Sicherheit	Safety lable	1		03402050L09
10	Schild Sicherheit	Safety lable	1		03402050L10

Ersatzteilliste elektrische Bauteile - Spare part list electrical components

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Article no.
A	Digitalpositionsanzeige	Digital position display	1	DPA 21	
EL	Maschinenlampe	Machine lamp	1	JC38C-24V/50W	034020301216
HL1	Betriebskontrollleuchte	Work light	1	LA 103-M/36-24V	0460019
K1	Steuerrelais Nothalt	Emergency stopping relay	1	Schneider RSB1A120BD/24VDC	
K2	Steuerrelais Nothalt	Emergency stopping relay	1	Schneider RSB1A120BD/24VDC	
KA0	Steuerrelais	Control relay	1	Schneider RSB1A120BD/24VDC	
KM1	Motorschütz Vorlauf	Motor contactor CW	1	Siemens 3TS33/24VDC	0460023DC
KM2	Motorschütz Rücklauf	Motor contactor CCW	1	Siemens 3TS33/24VDC	0460023DC
M1	Antriebsmotor	Drive motor	1	YS9034/400V-50HZ/1,5kW	0340092310
QM1	Sicherungsautomat	Circuit breaker	1	GV2-M10/4-6,3A	0460070
QM2	Sicherungsautomat	Circuit breaker	1	GC2-M05/0,63-1A	
QM3	Sicherungsautomat	Circuit breaker	1	OSM-1P/C5	
SA	Hauptschalter	Main switch	1	LW8GS-20/4	0460010
SB0	Not-Aus-Schlagschalter	Emergency stop button	1	LA103-01ZS/1	0460049
SB1	Momenttaster	Direct run button	1	LA103-10BN/2	0460002
SQ2	Schalter Drehfutterschutz	Lathe chuck safety switch	1	KEDU QKS7	0460078
SQ4	Schalter Spindelbremse	Spindle brake switch	1	KEDU QKS7	03300181671
SQ4	Endschalter Drehrichtung	Rotating direction switch	1	KEDU QKS7	03300181671
SQ5	Endschalter Drehrichtung	Rotating direction switch	1	KEDU QKS7	03300181671
SQ3	Sicherheitsschalter Riemenabdeckung	Belt cover safety switch	1	KEDU QKS8	
TC	Netzteil	Power pack	1	Delta DRP0-24V/120W	03462110G

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Schmierstoffe Lubricant Lubrifiant	Viskosität Viscosity Viscosité ISO VG DIN 51519 mm²/s (cSt)	Kennzeich- nung nach DIN 51502							
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 Energ grease 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 Greaserex 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 BW X 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	<p>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</p>								
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-Aquacut_C1-EC-datasheet_3530030_DE.pdf		Aral Emusol	BP Sevora	Esso Kutwell		Mobilcut	Shell Adrana	Chevron Soluble Oil B



9 Malfunctions

Malfunction	Cause/ possible effects	Solution
Machine does not turn on	<ul style="list-style-type: none"> Position switch spindle brake machine switches off Position switch lathe chuck protection machine switches off Position switch protective cover headstock machine switches off EMERGENCY-STOP mushroom switch activated 	<ul style="list-style-type: none"> Check position switch spindle brake, adjust Check position switch lathe chuck protection, adjust Check position switch protective cover headstock adjust EMERGENCY-STOP mushroom switch unlock
Indicator light is not lit	<ul style="list-style-type: none"> Control transformer is defective Indicator light is defective 	<ul style="list-style-type: none"> Replace the transformer Replace indicator light
Indicator light is not lit	<ul style="list-style-type: none"> Control transformer is defective 	<ul style="list-style-type: none"> Replace the transformer
Motor hums	<ul style="list-style-type: none"> Fuse is defective 	<ul style="list-style-type: none"> Replace the fuse
Surface of workpiece too rough	<ul style="list-style-type: none"> Lathe tool blunt Lathe tool springs Feed too high Radius at lathe tool tip too small 	<ul style="list-style-type: none"> Resharpen lathe tool Clamp lathe tool with less overhang Reduce feed Increase radius
V-belt squeaks V-belt slips	<ul style="list-style-type: none"> V-belt wear down V-belt tension is too loose 	<ul style="list-style-type: none"> 🔧 V-belt check, re-tighten on page 66
Speed of rotation varies too much	<ul style="list-style-type: none"> V-belt wear down V-belt tension is too loose 	<ul style="list-style-type: none"> 🔧 V-belt check, re-tighten on page 66
Workpiece becomes conical	<ul style="list-style-type: none"> Centre are not aligned (tailstock offset) Top slide is not exactly set to zero (when turning with the top slide) 	<ul style="list-style-type: none"> Align the tailstock to the center Align the top slide exactly
Lathe rattles	<ul style="list-style-type: none"> Feed too high Main bearings have clearance 	<ul style="list-style-type: none"> Reduce feed Have the main bearings readjusted
Center runs hot	<ul style="list-style-type: none"> Workpiece has expanded 	<ul style="list-style-type: none"> Loosen tailstock center
Lathe tool has a short service life	<ul style="list-style-type: none"> Cutting speed too high For large infeed Insufficient cooling 	<ul style="list-style-type: none"> Reduce cutting speed Lower delivery / finishing stock allowance not over 0.5 mm) More cooling
Flank wear too high	<ul style="list-style-type: none"> Clearance angle too small (lathe tool "pushes") Lathe tool tip not adjusted to centre height 	<ul style="list-style-type: none"> Increase clearance angle Correct height adjustment of the lathe tool
Cutting edge breaks off	<ul style="list-style-type: none"> Wedge angle too small (heat buildup) Grinding cracks due to improper cooling Excessive play in the spindle bearings (oscillations occur) 	<ul style="list-style-type: none"> Set greater wedge angle Cool uniformly Have the clearance in the spindle bearing arrangement re-adjusted
Turned threaded is wrong	<ul style="list-style-type: none"> Lathe tool is clamped incorrectly or grinding has been started the wrong way Wrong pitch Wrong diameter 	<ul style="list-style-type: none"> Set the lathe tool to the centre, grind angle correctly Use 60° lathe tool for metric threads, 55° lathe tool for inch thread Adjust right pitch Turn the workpiece to the correct diameter

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10 Appendix

10.1 Copyright

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Subject to technical changes without notice.

10.2 Terminology/Glossary

Term	Explanation
Headstock	Housing for the feed gear and the synchronous belt pulleys.
Lead screw nut	Split nut which engages the lead screw.
Lathe chuck	Clamping tool for holding the workpiece.
Drill chuck	Drill bit adapter
Bed slide	Slide on the slideway of the machine bed which feeds parallel to the tool axis.
Cross slide	Slide on the lathe saddle which moves transversely to the tool axis.
Top slide	Swivelling slide on the cross slide.
Taper mandrel	Taper of the drill bit, the drill chuck or the centering point.
Tool	Lathe tool, drill bit, etc.
Workpiece	Piece to be turned or machined.
Tailstock	Movable turning aid.
Rest	Follow or steady support for turning long workpieces.
Lathe dog	Device or clamping aid for driving pieces to be turned between centres.

10.3 Change information manual

Chapter	Short summary	new version number
parts	Wiring diagram added	1.0.1
1 + 2 + 4	Speeds for ~ 60Hz Connection	1.0.2
parts	Used measuring gibs	1.0.3
2.3 , parts	Removing of bed bridge	1.0.4
2 ; 3	Net weight + interdepartmental transport	1.0.5



10.4 Liability claims/warranty

Besides 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 were promised as part of a single contractual provision.

- Liability or warranty claims are processed at OPTIMUM GmbH's discretion 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. Ownership of replaced products or components is transferred 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 from 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
 - Unauthorized 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 also not subject to 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 fulfil any additional warranty are neither an acceptance of the defects nor an acceptance of its obligation to compensate. These services neither delay nor interrupt the warranty period.
- The court of jurisdiction for legal disputes between businessmen is Bamberg.
- If any of the aforementioned agreements is totally or partially inoperative and/or invalid, a provision which nearest approaches the intent of the guarantor and remains within the framework of the limits of liability and warranty which are specified by this contract is deemed agreed.



10.5 Storage

ATTENTION!

Incorrect and improper storage might result in damage or destruction of electrical and mechanical machine components.

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

Follow the instructions and information on the transport box:



- Fragile goods
(Goods require careful handling)
- Protect against moisture and humid environment
- 🔊 Environmental conditions on page 22



- Prescribed position of the packing case
(Marking the top surface - arrows pointing up)

- Maximum stacking height

Example: not stackable - do not stack further packing case on top of the first one.

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 specified here .

10.6 Dismantling, disassembling, packing and loading

INFORMATION

Please take care in your interest and in the interest of the environment that all component parts of the machine are only disposed of in the intended and admitted way.

Please note that the electrical devices comprise a variety of reusable materials as well as environmentally hazardous components. Please ensure that these components are disposed of separately and professionally. 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.

Please make sure that electrical components are disposed of professionally and in accordance with the statutory provisions.

The machine contains electrical and electronic components and must not be disposed of as household waste. According to the European directive 2002/96/EG regarding disused electrical and electronic devices and the implementation in national law, disused electrical tools and electrical equipment must be stored separately and recycled in an environmentally friendly manner.

As the equipment operator, you should obtain information regarding the authorized collection or disposal system which applies for your company.

Please make sure that electrical components are disposed of professionally and in accordance with legal regulations. Please only dispose of used batteries via the collection boxes in shops or at municipal waste management companies.





10.6.1 Decommissioning

CAUTION!

Used machines need to be decommissioned in a professional manner in order to avoid later misuse and endangerment of the environment or persons.






- Disassemble the machine if required into easy-to-handle and reusable assemblies and component parts.
- Dispose of machine components and operating fluids using the intended disposal methods.


10.6.2 Dismantling

- ➔ Pull the power cord or disassemble the connection cable and disconnect the connection cable.

10.6.3 Disassembly

- ➔ Drain the oil
 - from the headstock, drain hole  „Headstock“ on page 66
 - from the feed gear, drain hole  „Feed gear“ on page 65
 - from the apron, drain hole  „Apron“ on page 65
- ➔ Disassemble the drive motor

10.6.4 Packing and loading

- ➔ Place the machine on 2 pallets to allow for removal transport
 -  Transport on page 26
- ➔ Bolt the machine to the through holes of the machine base with the pallets.
- ➔ Dismantle the splash guard.
- ➔ Tense up the machine with tensioning belts on the machine bed.

10.7 Disposal of new device packaging

All used packaging materials and packaging aids from 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 passed to a collection station or to the appropriate waste management enterprise.

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

10.8 Disposal of lubricants and cooling lubricants

ATTENTION!

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



INFORMATION

Used coolant emulsions and oils should not be mixed since it is only possible to reuse oils without pre-treatment when they have not been mixed.

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





10.9 Disposal via municipal collection facilities

Disposal of used electrical and electronic components

(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 handled as common household waste, but that it needs to be disposed of at a central collection point for recycling. Your contribution to the correct disposal of this product will protect the environment and the public health. Incorrect disposal constitutes a risk to the environment and public health. Recycling of material will help reduce the consumption of raw materials. For further information about the recycling of this product, please consult your District Office, municipal waste collection station or the shop where you have purchased the product.

10.10 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 lathe which might be important for other users
- Recurring malfunctions

Optimum Maschinen Germany GmbH

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EC - Declaration of Conformity

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: Hand controlled lathe

Type designation: TH3610
TH3610D

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 lathe without numerical control

The following other EU Directives have been applied:

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

The following harmonized standards were applied:

EN ISO 23125:2015 - Machine tools - Safety - Turning machines

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

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



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Optimum Drehmaschinen und CNC Drehmaschinen:
Optimum TH 3610 Übersicht

- OPTImill TH 3610 CNC
 - OPTImill TH 3610 Ersatzteile
 - OPTImill TH 3610 Zubehör

- OPTImill Zubehör

Ihr Ersatzteil nicht in den Listen?

Direkt zum >>**Formular Download**<<. Tragen sie Ihr Maschinenmodell, samt Bauteil und Artikelnr. ein und wir unterbreiten Ihnen ein Angebot.

Allgemeine Betriebsmittel

- Öle und Schmiermittel
- Minimalmengenschmierung

Weitere interessante Verweise

- Bohrmaschinen / CNC Steuerungen
- Drehmaschinen / CNC Drehmaschinen
- Drucklufttechnik / Kompressoren