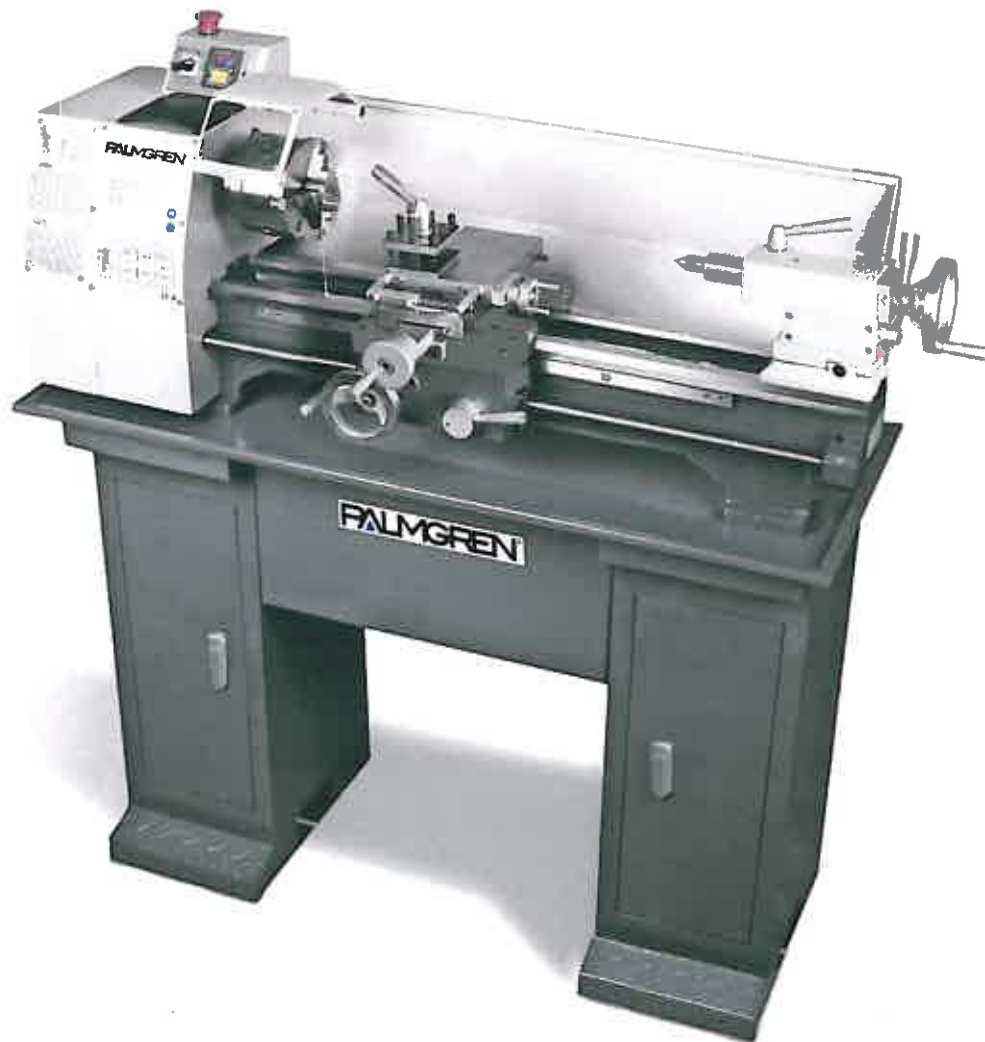


PALMGREN[®]
a CH Hanson brand

9 x 20 BENCH LATHE



***Read carefully and follow all safety rules and operating instructions before
First use of this product***

Dear customer,

Thank you for acquiring a quantum product. quantum metal working machines offer maximum quality, ideal technical solutions and optimum value. Ongoing development and product innovation ensure the latest technological and safety features. We want to help you in your work and make sure you are satisfied with our products and get the best from our machines.

For safety reasons and to ensure problem-free working, we recommend that you read the operating manual carefully before commissioning the machine and keep it in a safe place for future reference.

Information

This operating manual provides all the necessary indications for fault-free use of the machine and any necessary maintenance work. You can use it to submit claims during the warranty period. Our distribution network is always at your disposal for after-sales service, spare parts and pending orders, to help you get the most out of our machines.

We always appreciate any suggestions you may have about this operating manual that might help us improve the service quantum offers its customers.

The illustrations and information in this manual may vary from those of your machine. The manufacturer constantly endeavours to improve and update its products. For this reason, visual and technical modifications may be introduced without prior notice. We hold no liability for any alterations or errors contained in this manual.

This manual has been drawn up by the manufacturer and is an integral component of the machine equipment. The information compiled in this manual is intended for the user. The manual determines the intended purpose of the machine and contains all the necessary information for safe and correct usage. Observing the indications set out in this manual at all times will ensure the safety of personnel and the machine, economical operation and a long service life. To aid comprehension, this manual is divided into various sections covering the most important issues. The table of contents gives a quick overview of the individual issues. Important passages are marked in bold type and are preceded by the following symbols:

Explanations:



Note

Refers to situations that could cause injury to persons, damage to the machine and/or the surroundings or financial loss.



Attention!! Rotating parts. DANGER OF INJURIES!



Attention!! Use protective goggles! DANGER OF INJURIES!



Attention!! Pull mains plug before starting work. DANGER OF INJURIES!

*The term "machine" is used instead of the usual trade name of the device to which the operating manual refers (see fly leaf)

The term "technical personnel" refers to personnel who have sufficient experience, technical preparation and knowledge and understanding of the legal provisions to carry out necessary operations and recognize and avoid possible situations of danger during operation, commissioning, usage and maintenance of the machine from the start.

If you have any further questions, please contact your local dealer.

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1. Machine markings

The machine bears a characteristics plate containing the name of the machine, the item number and key technical data. Keep it clean and legible at all times.

2. Proper use

The lathe described is a universal lathe and has been designed and manufactured for straight turning and facing round or regularly-formed three-, six- or twelve-square workpieces in metal, plastics or similar materials. The leadscrew also enables thread-cutting.

The machine may not be used to tool materials that constitute a health hazard or create dust, such as wood, Teflon[®] etc.

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

Follow the indications of the operating manual as well as the information labels on the machine.

The machines are suitable for use in schools, craft and industrial workshops and for do-it-yourself work.



Note:

Any unauthorised modifications to the machine, improper use or disregard for the safety standards will exempt the manufacturer from any liability for resulting harm to persons or objects and shall result in the invalidity of claims under the guarantee!

3. Technical data

Power connection		9X20" Lathe
connection		1HP/115V/60HZ/1PH

Machine data		
height of centres [mm]		125
max. turning diameter [mm]		250
width of centres [mm]		550
spindle speed [min ⁻¹]		125 - 2000
spindle taper	MT3	
spindle hole [mm]	21	
bed width [mm]	135	
top slide - operating travel [mm]	70	
cross slide - operating travel [mm]	110	
tallstock taper	MT2	
tallstock - sleeve travel [mm]	70	
longitudinal feed [mm/turn]	0,1 - 0,2	
Pitch - Metric [mm/turn]	0,4 - 3	
Pitch - Inches [turns/inch]	10 - 44	

Dimensions		9X20" Lathe
height [mm]		500
length [mm]		1015
depth [mm]		
total weight [kg]		125

Environmental conditions		9X20" Lathe
temperature	5 - 35 °C	
humidity	25 - 80 %	

Operating material		9X20" Lathe
bright steel parts and lubricating nipples	e.g. machine oil (Mobile oil, Fina, ...). We recommend the use of weapon oil, weapon oil is free from acid, stains and resin.	

4. Safety indications



Note:

Read the operating and maintenance instructions carefully before starting, using or performing maintenance work on the machine, and prior to any other operations on the machine. Only authorised personnel who are completely familiar with the machine's handling and working principles are authorised to use it.



Attention:

Repair, maintenance and upgrading may only be carried out by technical personnel and with the machine stopped (Pull mains plug!)



- Check that the workpiece is properly positioned before starting the machine!
- Never place your hands close to rotating parts when working with the machine!
- Do not remove sharp-edged chips with your hands; use a handbrush or a chip hook!

- Use the protection devices and attach them firmly. Never work without protection devices; keep them in proper working condition. Check that they are operative before starting work.
- Keep the machine and its working environment clean at all times. Provide sufficient lighting.
- Make absolutely sure to secure your workpiece with adequate clamping devices when working. Provide an adequate supporting surface.

- The general design and concept of the machine should not be altered. The machine must not be used for purposes other than those indicated by the manufacturer.
- Never work on the machine if your concentration is reduced as a result of illness, fatigue, drugs, alcohol or medication.
- Remove keys and other loose parts after assembling or repairing the machine and before starting it.
- All safety and danger instructions on the machine must be observed and kept intact and legible.

- Keep children and persons unfamiliar with the machine away from the work area, the machine itself and the tools.
- The machine may only be used, set up and maintained by persons familiar with and instructed in the relevant dangers.
- During maintenance, commissioning or repair, always switch off the machine! You should also pull the mains plug or disconnect the machine from the power supply!
- To remove the plug from the power outlet, do not pull the power cord. Protect the cord from heat, oil and sharp edges.

- Make sure the main switch is in the OFF position when connecting the machine to the mains in order to prevent it from starting up accidentally.
- Wear a well-fitting work suit, safety goggles, safety shoes and ear protection. Tie long hair back. Do not wear watches, bracelets, necklaces, rings or gloves during work (Rotating parts!).
- Immediately eliminate any anomaly which might affect safety.

- Never leave the machine unattended when running. Stay by it until the tool has come to a complete halt. Pull the plug to prevent the machine from being switched on accidentally.
- Keep the machine dry (Danger of short circuit!).
- Never use electrical tools and machines near inflammable liquids and gases (Danger of explosion!).

- Before using the machine, make sure that no components are damaged. Damaged components must be replaced immediately in order to prevent possible sources of danger!
- Do not overload the machine! It is better and safer to work within the indicated performance range. Use the right tool! Make sure that the tools are not blunt or damaged.
- In order to prevent risk of danger and accident, only use original spare parts and accessories.

4.1 Residual risk

Even when all safety standards are observed and the machine is used properly, there still remain some residual risks. These are listed below:

- Touching rotating pieces or tools
- Breakage of tools
- Damage as a result of components or parts of components flying off at high speed
- Fire hazard in case of insufficient ventilation of the motor
- Contact with live parts
- Damage to hearing when working for long periods without ear protection



Note:

All machines involve some residual risk. Any operations (including the most simple ones) should be performed with due care. Safe working depends on you!

5. Transport of the machine

The machine will normally be delivered in a special transport case. Keep it and reuse it. All bright metal parts are lubricated to protect them from humidity and dirt.

Do not slack the machines. To prevent damage, do not deposit objects on the machine during transport and storage.

Protect the machine from moisture and rain. Be very careful to keep the electrical equipment dry.



Note:

Take the weight into account when transporting and installing the machine. Make sure the means of transport and the base on which the machine will be deposited can bear the load.

6. Unpacking and cleaning

6.1 Unpacking

The machine comes pre-assembled. Please check immediately after receiving the machine for any damage suffered during transport. If you spot any damage, immediately inform the corresponding transport operator and the authorised dealer.

6.2 Cleaning the machine

Before leaving the works all bright parts of the machine are thoroughly greased with protective wax and protective greases to avoid corrosion. Before commissioning, clean the machine with a suitable, environment-friendly cleaning agent (We recommend the use of stove distillate!). Do not use any solvents, thinners or other cleaning agents which might corrode the varnish on the machine. Follow the specifications and indications of the manufacturer of the cleaning agent. Pay attention to good ventilation during cleaning work in order to avoid health hazards due to toxic fumes.

Once the machine has been cleaned, all bright metal parts must be lightly lubricated. Use a non-corrosive lubricating oil for this purpose.



ATTENTION!

Many cleaning agents are combustible and highly inflammable. You must not smoke when handling cleaning agents. Fire and naked flames are forbidden!



Note:

Oil, grease and cleaning agents are pollutants and must not be disposed of through the drains or in normal refuse. Dispose of those agents in accordance with current legal requirements on the environment. Cleaning rags impregnated with oil, grease and cleaning agents are easily inflammable. Collect cleaning rags or cleaning wool in a suitable closed vessel and dispose of them in an environmentally sound way - do not put them with normal refuse!

7. Extent of supply and accessories

7.1 Extent of supply

- Lathe
- 3-jaw chuck
- Quadruple toolholder
- Chip sump
- Rear splash guard
- Lathe chuck protection
- 2 centres
- Tool kit with accessories and change gears
- Operating manual (English)

7.2 Extras

We recommend the exclusive use of high-quality original quantum accessories. Faultless operation and optimum working results can only be guaranteed with original accessories.

7.2.1 Accessories

Name

- Revolving centre
- Cutting tool set
- Steady rest
- Follow rest
- Lathe chuck flange
- Face plate
- Cutting tool set 12 mm, 9 pcs
* unassembled

7.2.2 Accessories

Name

- Röhmi 3-jaw chuck 125mm (Lathe chuck flange required for holding!)
- Röhmi 4-jaw chuck 125 mm (Lathe chuck flange required for holding!)
- Lathe chuck flange 125 mm *
- Steady rest
- Follow rest
- Face plate *
- Substructure
- Substructure
- Revolving centre MK2
- Quick-action tool holder SWH 1-A *
- Factory assembly SWH
- Cutting tool set 10 mm, 11 pcs.
- Tool cutting set 12 mm, 9 pcs., with reversible HM carbide tips
- Collet chuck holder
- Collet chuck holder
- Collet chuck set 3-16 mm

* unassembled

8. Installing the machine

When choosing the workplace, bear the following points in mind:

- The device must only be installed and operated in a dry and well-ventilated place.
- Avoid locations near chip- or dust-generating machines
- Vibration-free site at certain distance from stamping machines, planing machines, etc.
- Suitable base (bearing capacity and evenness of the floor) Compensate possible unevenness with suitable padding.
- Sufficient space for the user!
- Provide sufficient lighting! (recommend value approx. 300 Lux)
- Current supply?



Notes:

Make sure that no unauthorised personnel and children are in the danger area of the machine during operation, especially in the zone around the lathe chuck!

The base must be conditioned so that split coolant or oil cannot penetrate the floor.

8.1.1 Using a substructure

We recommend the use of the original quantum substructure as the optimum installation base.

Make sure that the substructure is placed on even ground and that the machine is levelled exactly with a machine spirit level. If not, there is a danger that the lathe bed might become warped, making the machine inoperative.

Attach the machine firmly to the substructure!

8.1.2 Using the machine with the substructure

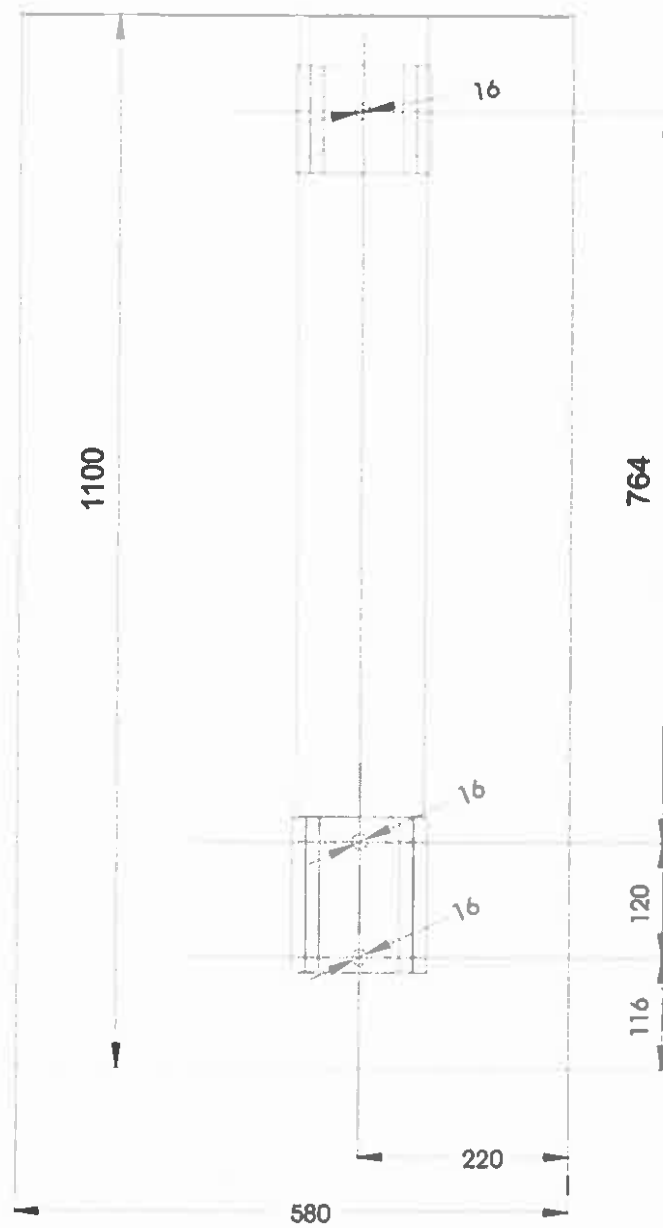
When using an existing working table or a work bench, also check the evenness of the installation surface and use the spirit level (as indicated above) for levelling. Make sure that the machine is firmly attached. Only use a base suitable for the machine.



We do not recommend that unattached machines be operated, as the machine will move during operation (risk of injury)!

8.1.3 Installation drawing

The installation drawings described below may differ from the real dimensions (cast parts). The tolerances are in the range of the general tolerances according to DIN 7168 g.



9. Power connection



Note:

Connection of the lathe and all other electrical work may only be carried out by an authorised electrician!



Before connecting the machine to the mains, make sure that the electrical values of the mains supply are the same as those for the lathe's electrical components. Use the wiring diagram for connecting the lathe to the mains supply.

We recommend that you connect the machine separately to other power-consuming appliances, using a fused and lockable connection.

In the case of the 400 V motors, check the rotating direction of the motor after connection. If the phases are properly connected, the motor will turn clockwise when looking at the V-belt pulley. The lathe spindle turns anti-clockwise (when looking from the tailstock).

If the turning direction is not correct, change the phase connection order at the terminal or plug.

Make sure that all 3 phases (L1, L2 and L3) are connected. Defective or incorrect connection will render the guarantee null and void.

Indicators are:

Motor runs hot immediately (3-4 minutes)

Motor doesn't run silently and has no power

9.1 Lathes with frequency converter



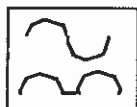
ATTENTION!

On lathes of the type "VARIO" the frequency converter (driving regulator) might release the FI protected switch of your electrical supply. In order to avoid malfunction, you either need an FI protected switch sensitive for pulse current or AC/DC sensitive.

In case of a malfunction or release of the FI protected switch, please check the type installed. The following signs indicate if you have one of the FI protected switches described above.

FI protected switch sensitive to pulse current type A

FI protected switch sensitive to AC/DC type B



300 mA



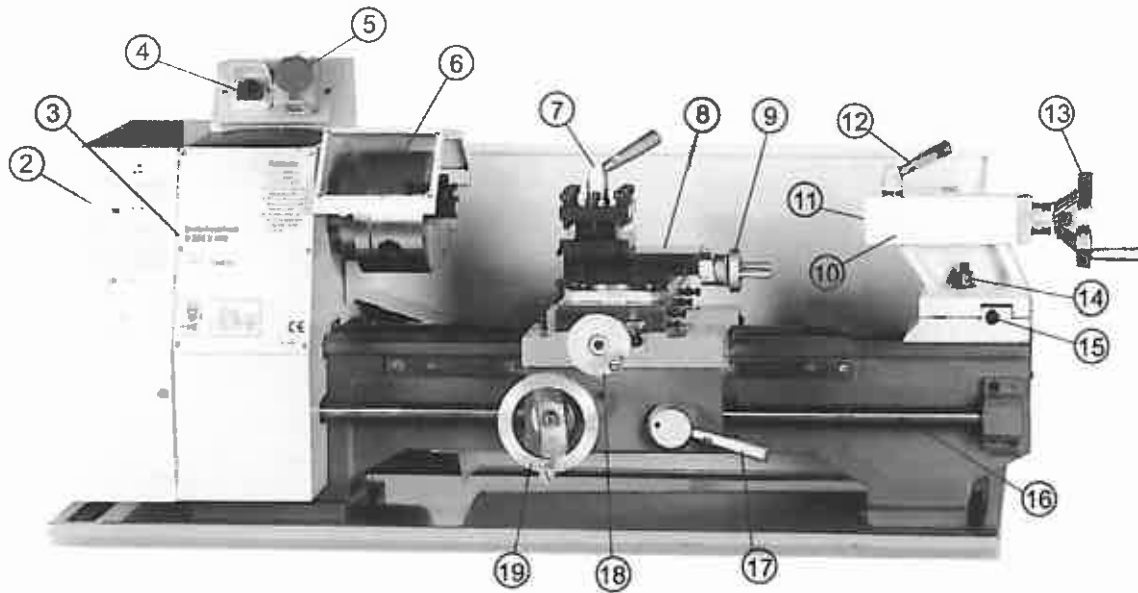
300 mA



We recommend you to use an FI protected switch sensitive to AC/DC. FI protected switches sensitive to AC/DC (RCCB, type B) are adequate for 1 phase and 3 phase fed frequency converters (driving regulator).

An FI protected switch type AC (only for alternating current (AC)) is not appropriate for frequency converters. FI protected switches type AC are no longer used.

10. Control elements



Pos.	Name
1	Belt cover
2	Change gear and feed table
3	Characteristics plate with speed table
4	Left/Right switch
5	Emergency stop switch
6	Lathe chuck
7	Quadruple toolholder
8	Top slide
9	Handwheel for top slide
10	Tailstock

Pos.	Name
11	Tailstock sleeve
12	Clamping lever of tailstock sleeve
13	Handwheel of tailstock sleeve
14	Clamping screw of tailstock
15	Adjusting screw for taper (only Turner250)
16	Leadscrew
17	Feed lever
18	Handwheel for cross slide
19	Handwheel for lathe saddle

11. Design of the lathe

Bear in mind the following points to ensure that you get the expected results from your work.



Note:

Rotating parts! Start working carefully. Pay close attention to your work. Pay special attention to rotating parts. Wear a well-fitting work suit! MAKE SURE that your hair or clothes are not caught in rotating parts! Wear a helmet. Do not wear Jewellery when working with the machine.



Chips and parts flying off at high speed! It is essential to use protective goggles! Protect your eyes from chips and other splinters flying off at high speed.

Before starting any work, check the following points:

- Check that cables, cable connections, etc. are not damaged!
- Only use sharp tools!
- Check that the workpiece and the tool are firmly clamped!
- Note that you need different speeds for different materials and different operations.
- Check the feed speed.
- Lubricate regularly as indicated in the chapter "Maintenance".

11.1.1 Lathe bed

The lathe bed needs to be especially rigid and vibration-free. It is therefore cast in a single piece and provided with strong stiffening ribs.

The lathe bed integrates the headstock and drive unit, for attaching the lathe saddle and leadscrew and for guiding the lathe saddle and tailstock.

11.1.2 Headstock

The headstock houses the work spindle with bearing arrangement and the drive unit.

The work spindle transmits the main movement during the turning process. It also holds the workpieces and clamping devices (e.g. 3-jaw chuck).

The work spindle is driven by an electromotor, via pulleys.

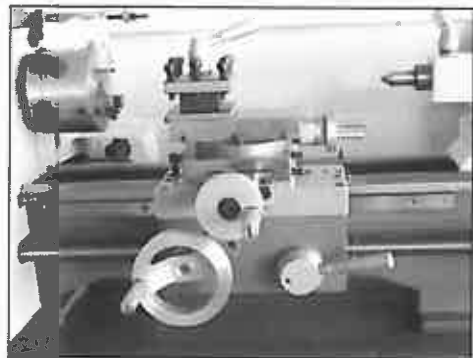


11.1.3 Lathe saddle

The lathe saddle contains the control elements for the different feeds and supports the apron.

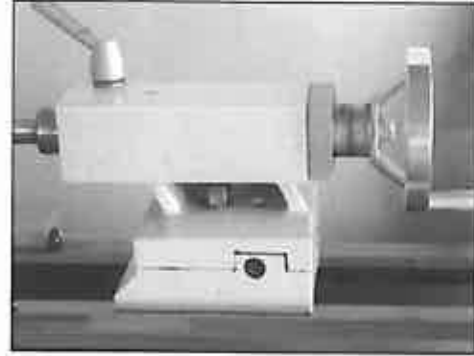
The following functions are carried out:

- Manual feed via handwheel of lathe saddle
- Movement of the cross slide via handwheel
- Automatic longitudinal feed via the leadscrew
- Threading with the leadscrew



11.1.4 Tailstock

The tailstock is used for centring and drilling, supporting long shafts, turning between centres as well as turning long, thin tapers.



12. Operation of the lathe

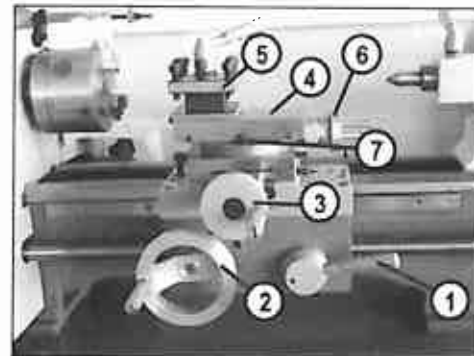
12.1 Lathe saddle with cross and top slide

The automatic longitudinal feed and the feed for thread-cutting are activated and deactivated using the feed lever (1). The feed is transmitted via the leadscrew nut. Push the feed lever down to engage the automatic longitudinal feed.

The handwheel (2) is used to manually traverse the lathe saddle.

The cross slide is moved forward and backward manually with the handwheel (3).

The top slide (4) bears the quadruple toolholder (5) and is therefore also known as the tool slide. Use the handwheel (6) to move the top slide.



12.1.1 Turning tapers with the top slide

It is also possible to turn short tapers with the top slide.

To do this, loosen the two nuts (7) to the left and the right of the top slide. You can then rotate the top slide. After setting the required position, retighten the top slide.

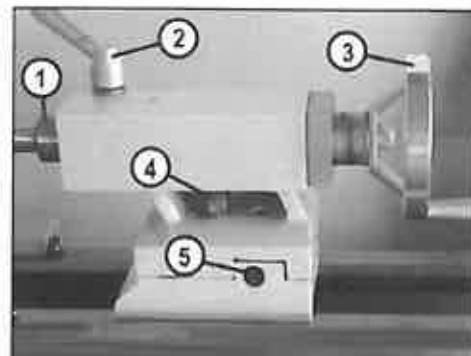
12.2 Tailstock

The tailstock sleeve (1) is used to hold the tools (bits, lathe centres, ...). The spindle sleeve has a millimetre scale. The spindle sleeve is clamped using the clamping lever (2).

The spindle sleeve is extended and retracted with the handwheel (3).

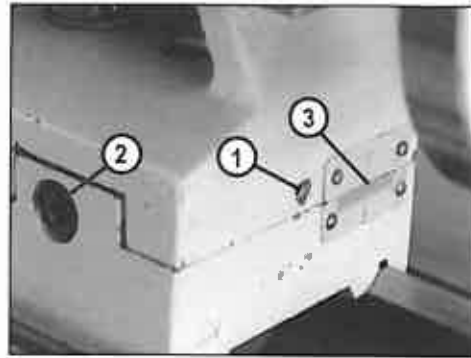
The tailstock on the lathe bed can be clamped with the locking nut (4).

The adjusting screws (5) to the left and the right of the tailstock are used to "de-centre" the tailstock to turn long, thin tapers. The locking nut (4) must be loosened for this purpose!



"De-centring" the tailstock:

Check that the locking nut of the tailstock is loosened. Unscrew the locking screw (1) at the rear side approximately 1/2 turn. Move the tailstock out of its centered position by alternately loosening and tightening the two adjusting screws (2). The desired cross-adjustment can be read off the scale (3). First retighten the rear locking screw and then the two adjusting screws. Retighten the tailstock with the locking nut.



In order to avoid accidental extraction of the tailstock out of the lathe bed, a securing screw (1) has been fitted at the end of the lathe bed.



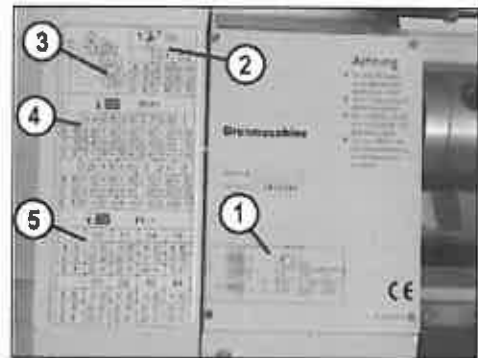
Note:
Check clamping of the tailstock and the sleeve, respectively, for turning jobs between centres.



12.3 Speed and feed

The characteristics plate is attached to the headstock. It also shows the speed table (1).

The feed table is attached to the belt cover. It shows the feeds for straight turning (2), the change gear arrangement (3) for longitudinal feed and for thread-cutting, change gear table for metric threads (4) and for English threads (5).

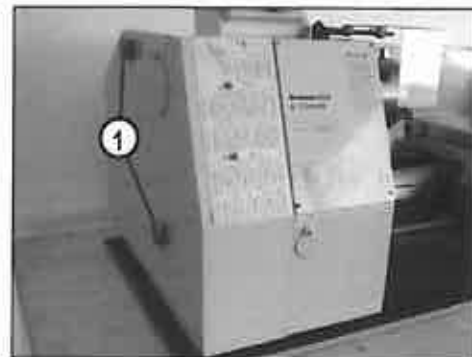


In order to change the speed or feed, you must first remove the protective cover.



Before removing the belt cover check that the machine has been disconnected from the mains supply!

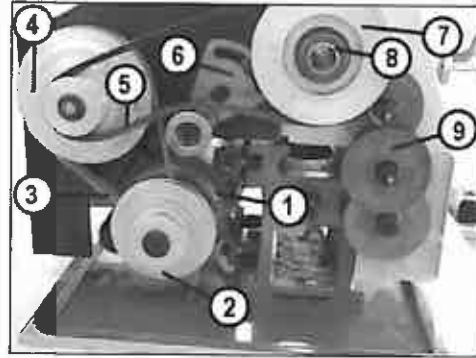
Loosen the two safety nuts (1). The belt cover can now be removed leftwards from the two stud bolts.



12.3.1 Arrangement of belt drive and feed gear

Belt drive and feed gear in the form of the change gears under the belt cover:

- Electric motor (1)
- Motor pulley (2)
- Synchronous belt (3)
- Pulley of the primary transmission (4)
- V-belt (5)
- Tensioning pulley holder with tensioning pulley (6)
- Spindle pulley (7)
- Lathe spindle (8)
- Change gears on quadrant (9)



12.3.2 Adjusting the speed



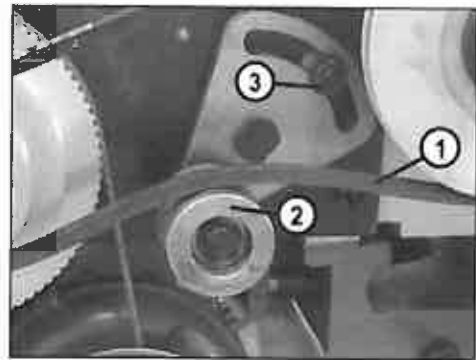
Disconnect the machine plug from the mains!
Choose the speed according to the speed table.



The V-belt (1) is tensioned by the tensioning pulley (2). Loosen the nut (3) on the tensioning pulley holder and release the tension of the V-belt. Then lift the V-belt to the desired position. Depending on the speed selected, the V-belt will have to be lifted directly onto the motor pulley or onto the pulley of the primary transmission. The V-belt (1) now has to be retensioned with the tensioning pulley (2) and the nut (3) must be retightened.



Make sure the tensioning pulley is in contact with the outside of the V-belt at all times!



12.3.3 Adjusting the feed



Disconnect the machine plug from the mains!

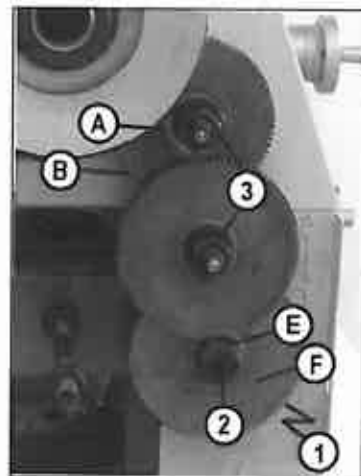
The change gears for the feed are mounted on a quadrant. After loosening the lower right clamping screw (1) on the quadrant - behind the change gear (F) - you can swing the quadrant out to the right.



Unscrew the bolt (2) from the leadscrew or the nuts (3) from the quadrant bolts to remove the change gears from the front. Fit the gear couples as indicated in the feed and change gear table and secure them with the nuts (3) and the screw (2), respectively. Then pivot the quadrant to the left until the gearwheel (B) engages with the intermediate wheel (Z40) again. Reset the backlash by putting a normal sheet of paper (80 g/m²) between the gearwheels as an adjusting aid.

Immobilise the quadrant with the locking screw (1).

Attach the belt cover and reconnect the machine to the mains supply.





Note on the change gear arrangement:

The positions of the change gears are indicated in the feed table with letters A through F. The illustrated example shows the setting of the feed of 0.1 mm according to the table. The change gears are fitted as follows:

- (A) = 33 teeth Quadrant, upper quadrant bolt; front side
- (B) = 80 teeth Quadrant, upper quadrant bolt; rear side
- (C) = 25 teeth Quadrant, centre quadrant bolt; rear side (not visible)
- (D) = 90 teeth Quadrant, centre quadrant bolt; front side
- (E) = H = Bush Leadscrew; (Bush disengaged)
- (F) = 90 teeth Leadscrew; rear side

To aid identification, engaged gearwheels are marked with a vertical connecting line (|) in the table for better distinction.

Example of feed 0.1 mm: Gearwheel A (33) engages with gearwheel C (90).

12.3.4 Pitches for thread-cutting

The different pitches for thread-cutting can be seen in the tables located on the bell cover.

The adjustment for the corresponding feeds is carried out in the same way as in chapter 12.3.3 "Adjusting the feed".

The table with the thread pitches shows various positions with "H" for bush (disengaged). For these positions, it is also possible to fit an arbitrary (small) gearwheel to the quadrant bolt. But make sure to choose only gearwheels that do not engage with other gearwheels!

13. Adjustments on the lathe

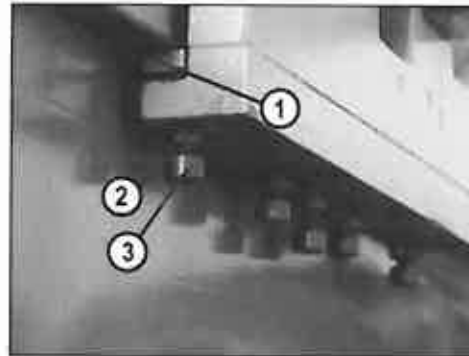
13.1 Guide rail with adjusting gib on the lathe saddle

The slack in the rear guide rail (1), increased by wear and abrasion, can be readjusted with the help of the Allen screws.

Loosen all nuts (2) first and readjust the Allen screws (3) clockwise slightly. Then retighten the nuts.

Note:

When turning the adjusting screw, proceed only in small steps. A 90° turn of the Allen screw corresponds to a travel of the adjusting screw of approximately 0.2 mm.



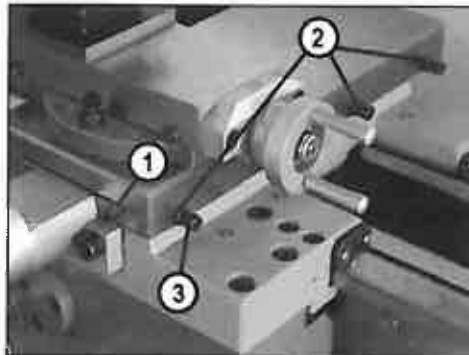
13.2 Tapered gib on the cross slide

Excessive slack in the cross slide can be reduced by readjusting the tapered gib (1).

Loosen the nuts (2) and readjust the Allen screws (3) clockwise slightly. Then retighten the nuts.

Note:

When turning the adjusting screw, proceed only in small steps. A 90° turn of the Allen screw corresponds to a travel of the adjusting screw of approximately 0.2 mm.



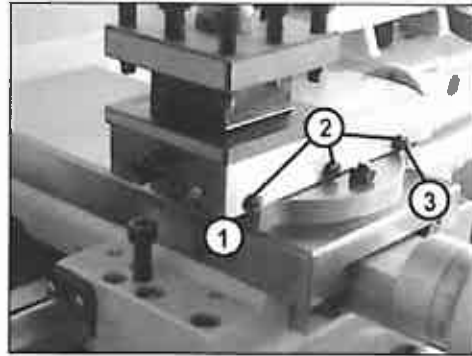
13.3 Tapered gib on the top slide

Excessive slack in the top slide can also be reduced by readjusting the tapered gib (1).

Loosen the nuts (2) and readjust the headless pins (3) clockwise slightly. Then retighten the nuts.

Note:

When turning the adjusting screw, proceed only in small steps. A 90° turn of the headless pins corresponds to a travel of the adjusting screw of approximately 0.2 mm.



13.4 Adjusting the tapered gib for the leadscrew nut

The tapered gib for guiding the leadscrew nut has been factory-set and does not normally need to be readjusted.

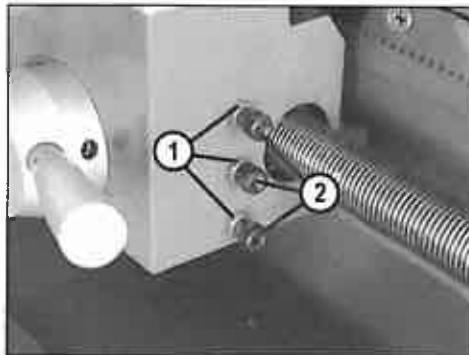
Excessive slack can be reduced by readjusting the tapered gib.

The adjusting screws can be found on the right side of the apron.

Loosen the nuts (1) and readjust the adjusting screw (2) clockwise slightly. Then retighten the nuts.

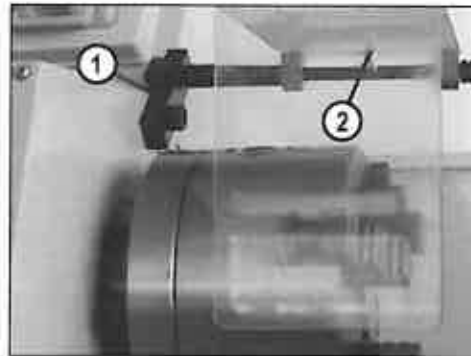
Note:

When turning the adjusting screw, proceed only in small steps. A 90° turn of the headless pins corresponds to a travel of the adjusting screw of approximately 0.2 mm.



13.5 Adjusting the lathe chuck protection

The lathe chuck protection is attached to the headstock. It can be readjusted by regulating the holder (1) or the stop screw (2) beneath the chuck protection.



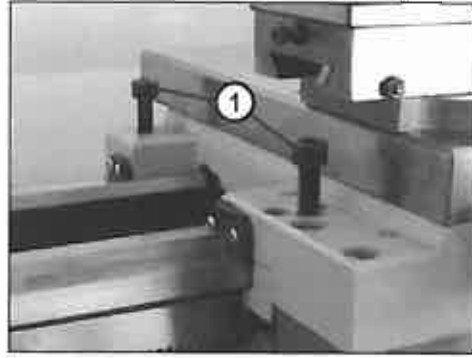
13.6 Replacing the clamping devices on the head spindle holding fixture

The head spindle holding fixture is cylindrical. Unscrew the 3 nuts (1) on the lathe chuck flange to remove the clamping device (in this case, the three-jaw chuck). Take the clamping device holder off. To make it easier to remove, you can loosen the clamping device by hitting the device gently with a plastic-tipped hammer or rubber mallet.



13.7 Fitting the follow rest (optional)

2 threaded bores have already been provided in the lathe saddle to fit a follow rest. The threaded bores are covered by the fastening screws (1) thus protecting them against damage. In order to fit the follow rest remove the two screws, attach the rest and fix it in place with the two screws.

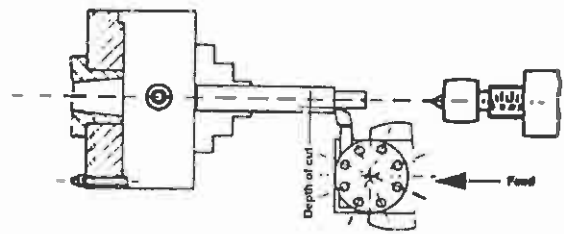


14. Working notes and tools

14.1 Turning operations

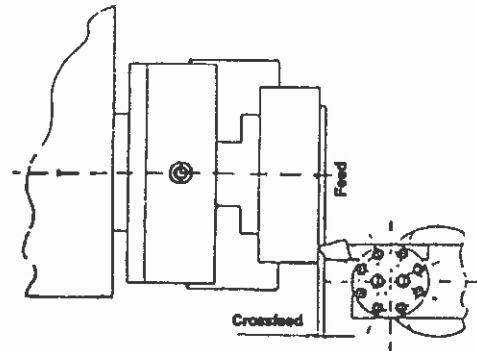
14.1.1 Straight turning

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 crossfeed for the depth of cut is achieved using the cross slide.

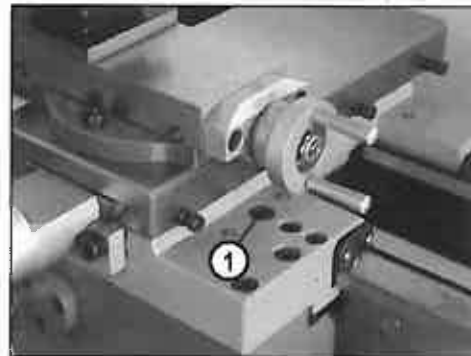


14.1.2 Facing and recesses

In the facing operation, the tool feeds perpendicular to the turning axis of the workpiece. With these machines, feed is exclusively by hand, using the handwheel of the cross slide. The crossfeed for the depth of cut is achieved using the lathe saddle or the top slide. By using the manual feed of the cross slide you can also make recesses or cut off part of the material.



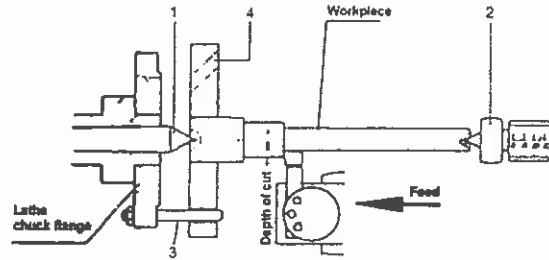
To prevent the lathe saddle from moving axially during the facing process (e.g. due to the cutting pressure), the lathe saddle can be immobilised with the help of the locking screw (1). When making recesses, we also recommend that you immobilise the slide.



14.1.3 Turning between centres

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.

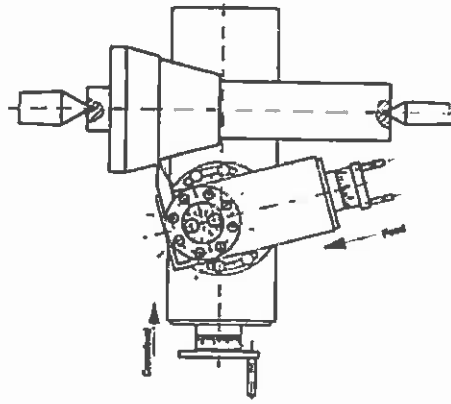
The driving bolt screwed into the driving flange or the face plate engages with the dog (lathe dog) clamped onto the workpiece. The fixed centre glides into the centre hole of the workpiece at the spindle nose side, and the follow centre glides into the centre hole of the workpiece at the tailstock side.



1. Fixed centre 60°
2. Revolving centre 60°
3. Dog drive pin
4. Lathe dog

14.1.4 Turning short tapers with the top slide

Short tapers are turned manually with the top slide. This is achieved by swivelling the top slide. The crossfeed is performed with the cross slide.



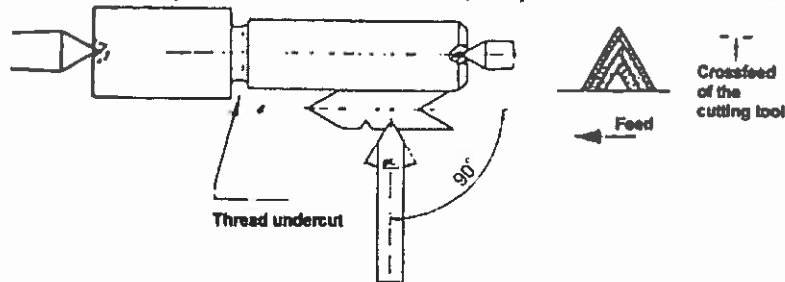
14.1.5 Thread-cutting (example of male thread)

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



Consider the following indications:

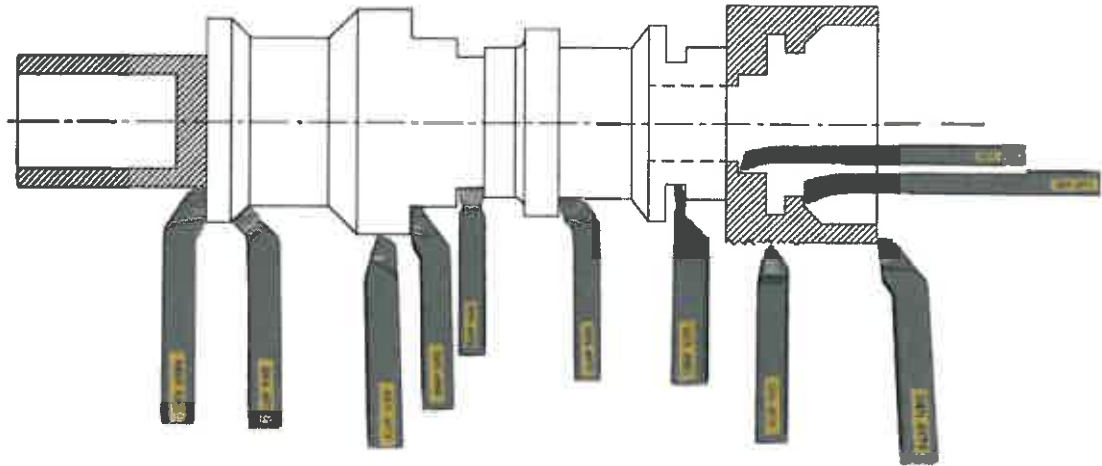
- The workpiece diameter must be reduced to the diameter of the thread.
- The workpiece requires a chamfer at the beginning of the thread and an undercut at the thread runoff.
- The change gears must be fitted according to the required pitch.
- The thread cutting tool must be exactly the same shape as the thread, must be absolutely rectangular and must be clamped so that it coincides exactly with the turning centre.
- The leadscrew nut remains closed throughout the whole thread-cutting process (feed lever engaged)! The thread is produced in various cutting steps so 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 leadscrew nut engaged by inverting the rotating direction with the Left/Right switch (= inverting the feed direction). Then switch off the machine, readjust the crossfeed and turn it on again.



Crossfeed of the thread-cutting tool is achieved with the cross slide, but only in small depths of cut. In this process, move the top slide 0.02 - 0.03 mm slightly once to the left and once to the right in each passage (= cutting free). This means that the thread-cutting tool cuts only on one thread flank with each passage. Cut the thread centrally just before reaching the full thread depth.

14.2 Cutting tool types and indications

The following illustration gives an overview of the cutting tools used to carry out the different turning operations. Depending on the work requirements, the cutting tools shown may come in different shapes:



Tool types:

DIN 4971 – ISO 1

Straight turning tools with carbide tips

DIN 4972 – ISO 2

Bent turning tools with carbide tips

DIN 4973 – ISO 8

Internal side turning tools for corner work with carbide tips

DIN 4974 – ISO 9

Internal side turning tools for corner work with carbide tips

DIN 4975

Pointed straight turning tools with carbide tips

DIN 4976 – ISO 4

Wide face square nose tools with carbide tips

DIN 4977 – ISO 5

Offset face turning tools with carbide tips

DIN 4978 – ISO 3

Offset turning tools for corner work with carbide tips

DIN 4980 – ISO 6

Offset side turning tools with carbide tips

DIN 4981 – ISO 7

Parting-off tools with carbide tips

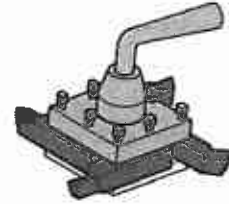
All cutting tools are available as left and right side tools.

Clamping the cutting tools:

For machining, the cutting tools must be clamped with such force that they absorb well and reliably the cutting force generated during chip formation. Suitable clamping devices and auxiliary tools are used to achieve this.

When clamping the cutting tools follow the corresponding clamping rules.

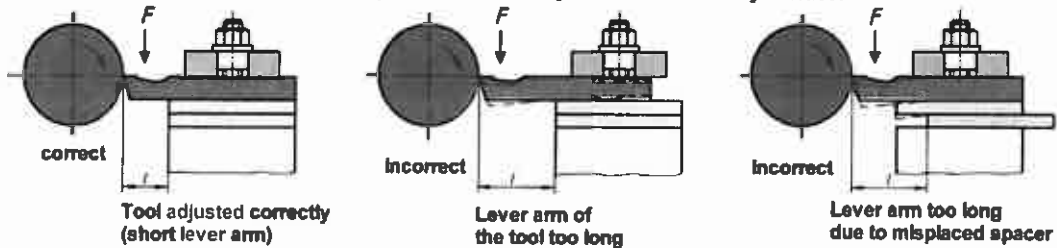
The quadruple holder can be used to clamp various tools at a time. Swivel the holder to position the required tool into the working position.



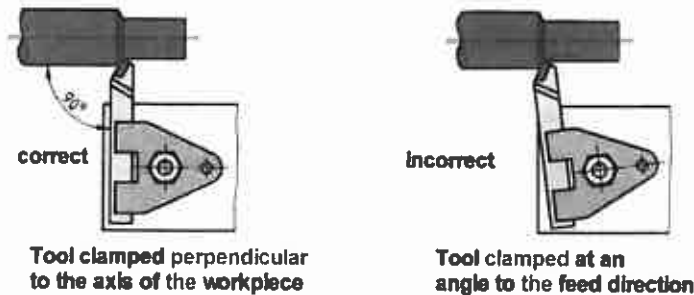
Usage:

Clamping various tools for different machining stages

Due to the forces generated during machining, the tool must be clamped firmly and with the least possible overhang. With a long lever arm, the tool bends down and up again. The cutting edge penetrates the workpiece non-uniformly and creates a wavy surface.



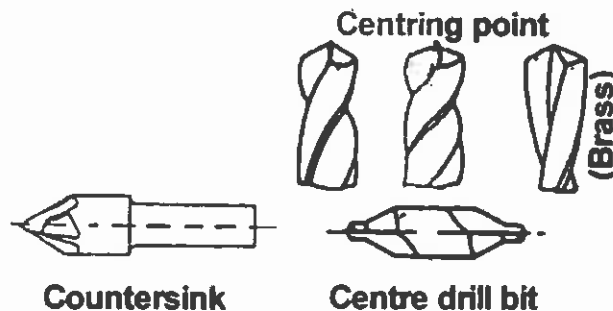
The tool must be clamped with its axis perpendicular to the axis of the workpiece. If it is clamped at an angle, the tool may be sucked into the workpiece. Damage to objects may be the consequence.



14.3 Bits and countersinks

The sleeve of the tallstock can be used to introduce a drill chuck for holding bits and countersinks. The most important tools are:

- Twist drill bits for making bore holes
- Centre drill bits for applying a centre
- Countersinks for burr removing and countersinking bore holes



15. Maintenance

In order to retain the machine's precision and functionality, it is essential to treat it with care, keep it clean and grease and lubricate it regularly. Only through good care can you be sure that the working quality of the machine will remain constant.

We recommend only the use of premium lubricants on a mineral oil basis.



Disconnect the machine plug from the mains supply whenever you carry out cleaning, maintenance or repair work!



Note:

Oil, grease and cleaning agents are pollutants and must not be disposed of through the drains or in normal refuse. Dispose of those agents in accordance with current legal requirements on the environment. Cleaning rags impregnated with oil, grease and cleaning agents are easily inflammable. Collect cleaning rags or cleaning wool in a suitable closed vessel and dispose of them in an environmentally sound way - do not put them with normal refuse!



15.1 Machine care

As a basic rule, the machine should be cleaned after every use. Remove chips with the machine deactivated using a chip hook, handbrush or brush. The use of compressed air for cleaning is not recommended, as the fine chips might get blown into the slideways.

For disposing of chips, refer to local regulations. In all cases, chips and coolant should be separated. We recommend a chip box with a coolant separator for this purpose.

Once the machine has been cleaned, all bright metal parts must be lightly lubricated.



Note:

Do not remove the chips with your bare hands. There is a risk of cuts due to sharp-edged chips! Never use flammable solvents or cleaning agents or agents that generate noxious fumes! Protect electrical components such as motors, switches, switch boxes, etc. against humidity when cleaning!

15.2 Lubrication

Lubricate all slideways lightly before every use. The change gears and the leadscrew must also be lightly lubricated with a lithium base grease.

Every 4 weeks:

Lubricate the lubricating nipples regularly with machine oil (Mobil oil, Fina, ...).

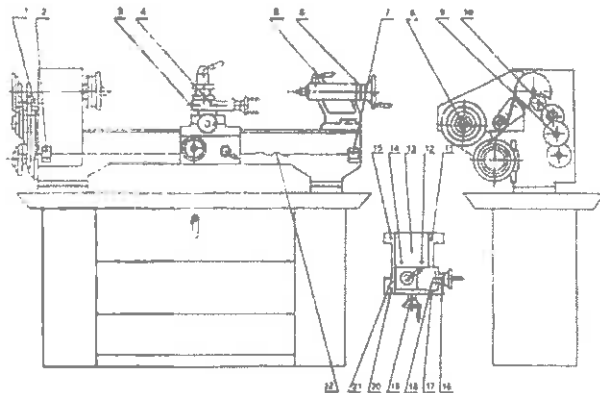
15.3 Maintenance

Due to wear it may be necessary to perform repair work on the machine.



Note:

Repair work may only be carried out by qualified personnel with the corresponding mechanical and/or electrical knowledge.



16. Warranty

Damage resulting from natural wear and tear, damage during shipping, overload or improper operation and treatment shall not be covered under the warranty. Damage resulting from defects in the material or manufacturer's faults shall be eliminated free of charge by replacement deliveries or repair.

The machine must be returned undismantled and in its original box, accompanied by the purchase and warranty certificates to the dealer.

17. Troubleshooting

Problem	Possible cause	Elimination
Surface of workpiece too rough	Tool blunt Tool springs Feed too high Radius at the tool tip too small	Resharpen tool Clamp tool with less overhang Reduce feed Increase radius
Workpiece becomes coned	Centres are not aligned (tailstock has offset) Top slide not aligned well (cutting with the top slide)	Adjust tailstock to the centre Align top slide well
Lathe is chattering	Feed too high Slack in main bearings	Reduce feed Have the main bearing readjusted
Centre runs hot	Workpiece has expanded	Loosen tailstock centre
Tool has a short edge life	Cutting speed too high Crossfeed too high Insufficient cooling	Reduce cutting speed Lower crossfeed (finishing allowance should not exceed 0.5 mm) More coolant
Flank wear too high	Clearance angle too small (tool "pushes") Tool tip not adjusted to centre height	Increase clearance angle Correct height adjustment of the tool
Cutting edge breaks off	Wedge angle too small (heat build-up) Grinding crack due to wrong cooling Excessive slack in the spindle bearing arrangement (vibrations)	Increase wedge angle Cool uniformly Have the slack in the spindle bearing arrangement readjusted
Cut thread is wrong	Tool is clamped incorrectly or has been started grinding the wrong way Wrong pitch Wrong diameter	Adjust tool to the centre Grind angle correctly Adjust the right pitch Turn the workpiece to the correct diameter
Spindle does not activate	Emergency stop switch activated	Unlock emergency stop switch

18. EC Declaration of Conformity

We hereby declare that the concept and design of the machine named hereafter complies with the relevant basic safety and health requirements of EC directives, as does the version marketed by us. Any modification carried out on the machine without our consent shall cause this declaration to be null and void.

Distributor: Top-Tech Company

Name of machine: 9X20"Lathe

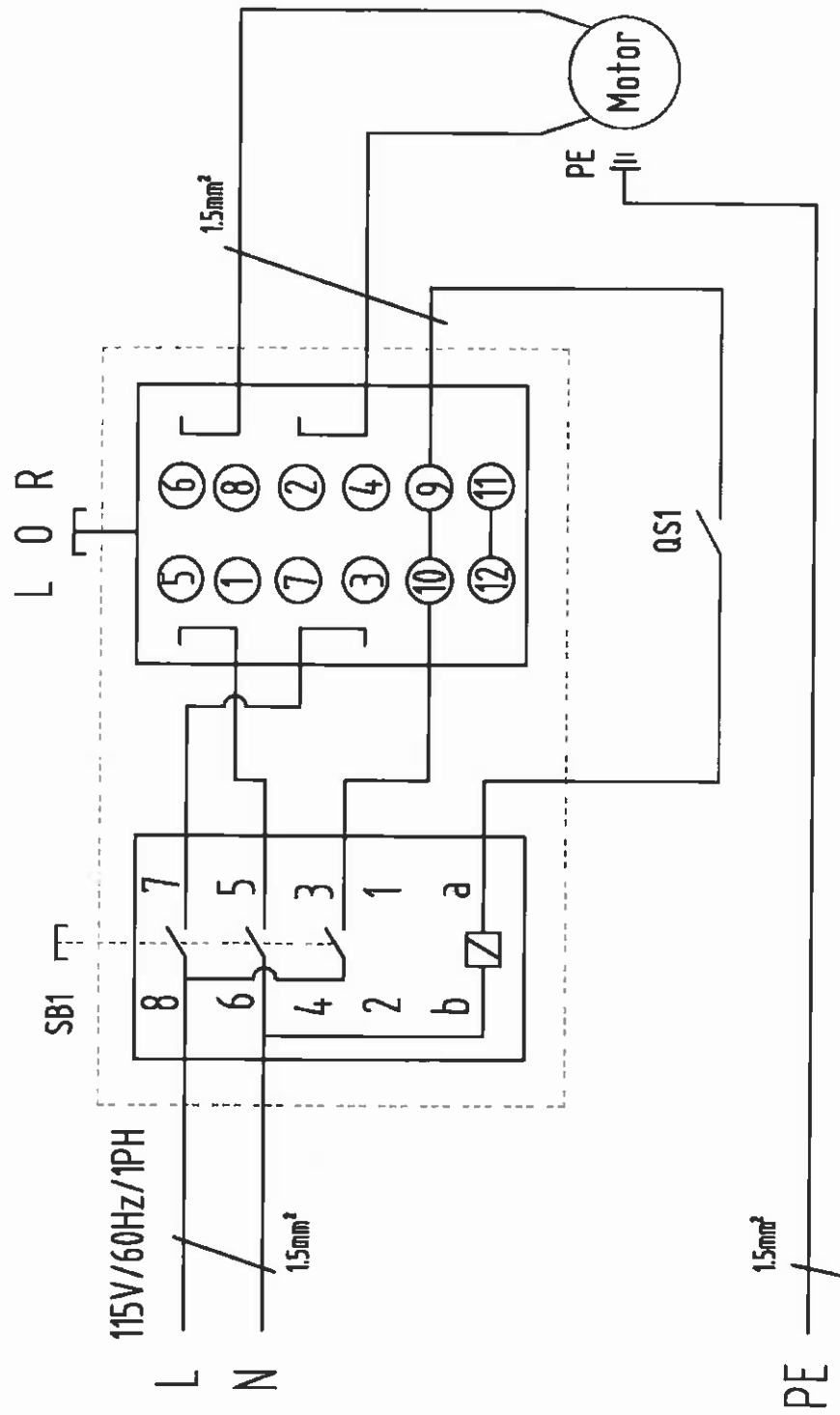
Type of machine: Universal lathe

Relevant EU directives: 98/37/EC Machine Directive, 22/06/98
73/23/EEC Low Voltage Directive as amended 93/68/EEC dated 22/07/93
89/336/EEC EMC Directive as amended 93/68/EEC dated 22/07/93

The following harmonised standards in particular have been applied:

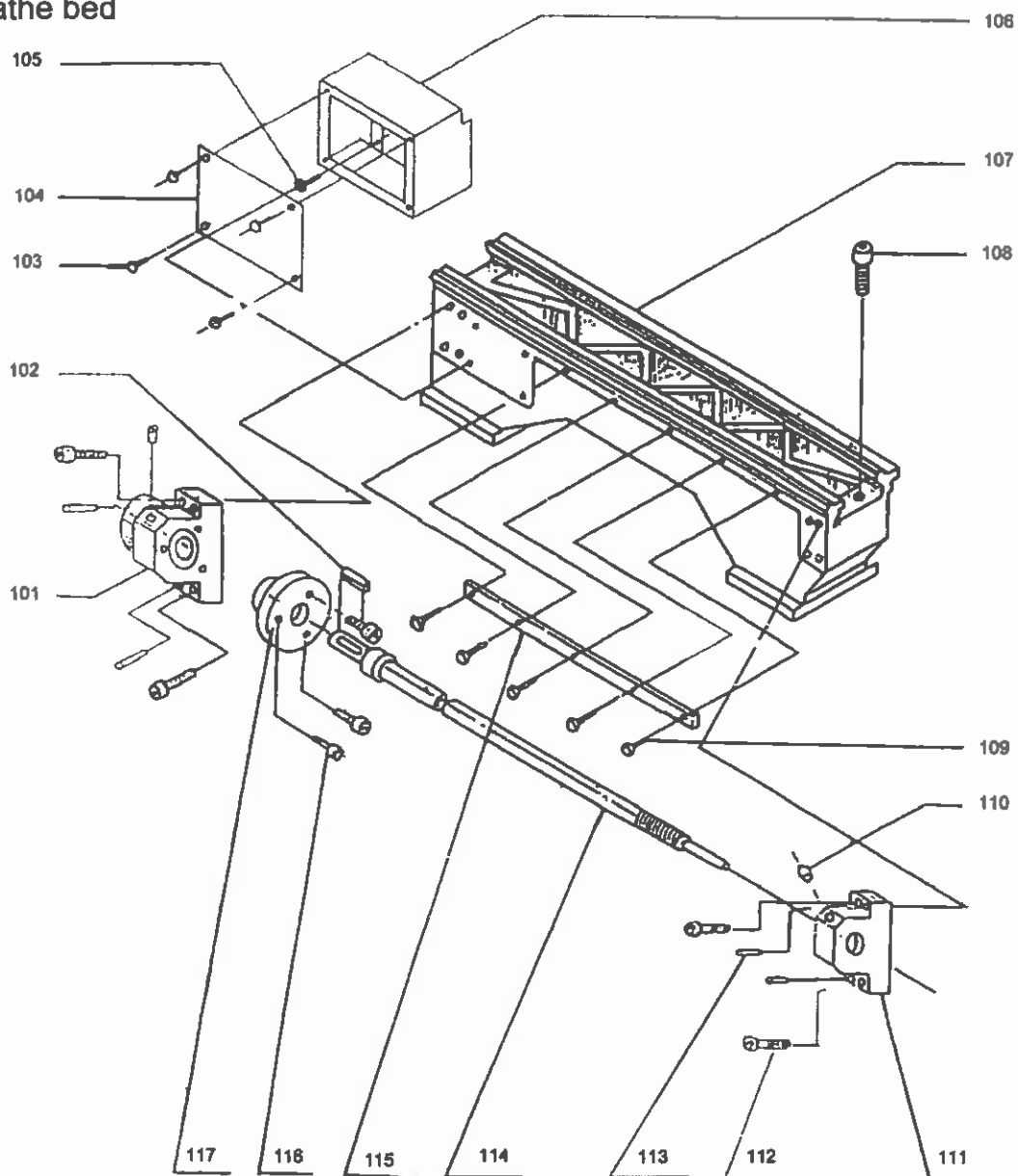
EN 12840-2001; Safety of machine tools – Manually controlled turning machines with or without automatic control.

19. Wiring diagram



20. Exploded views and spare parts lists

Lathe bed

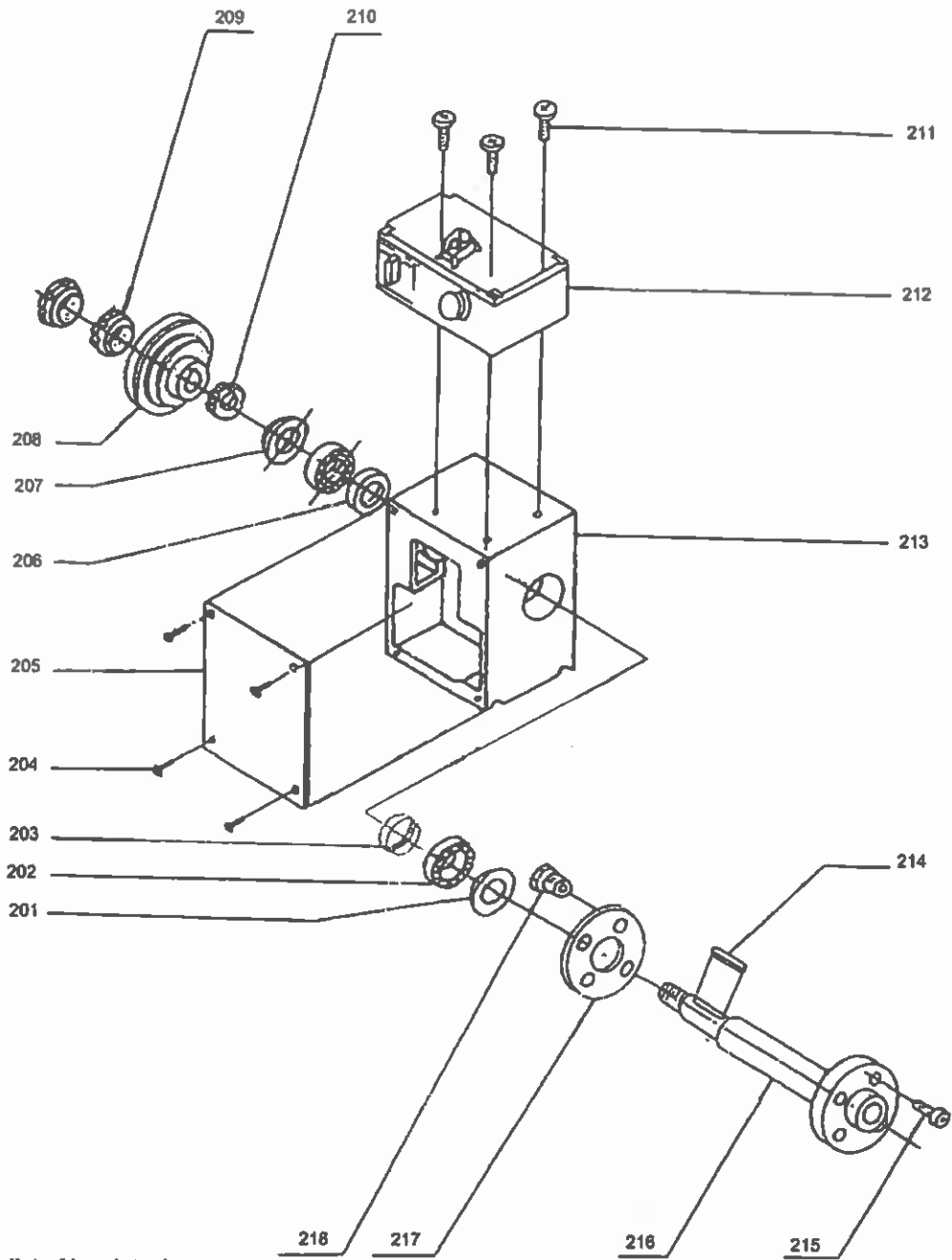


Spare parts list of LATHE BED

Pos.	Name	Qty.	Item no.
101	Bearing pedestal	1	
102	Feather key	1	
103	Screw M3x6	4	
104	Cover	1	
105	Housing	4	
106	Housing	1	
107	Lathe bed	1	
108	Screw M8x12	1	
109	Screw M5x12	5	
110	Lubricating nipple	2	

Pos.	Name	Qty.	Item no.
111	Right bearing pedestal	1	
112	Screw M6x16	4	
113	Taper pin 6x22	4	
114	Leadscrew	1	
115	Rack	1	
116	Screw M4x16	3	
117	Adjusting flange	1	

Headstock

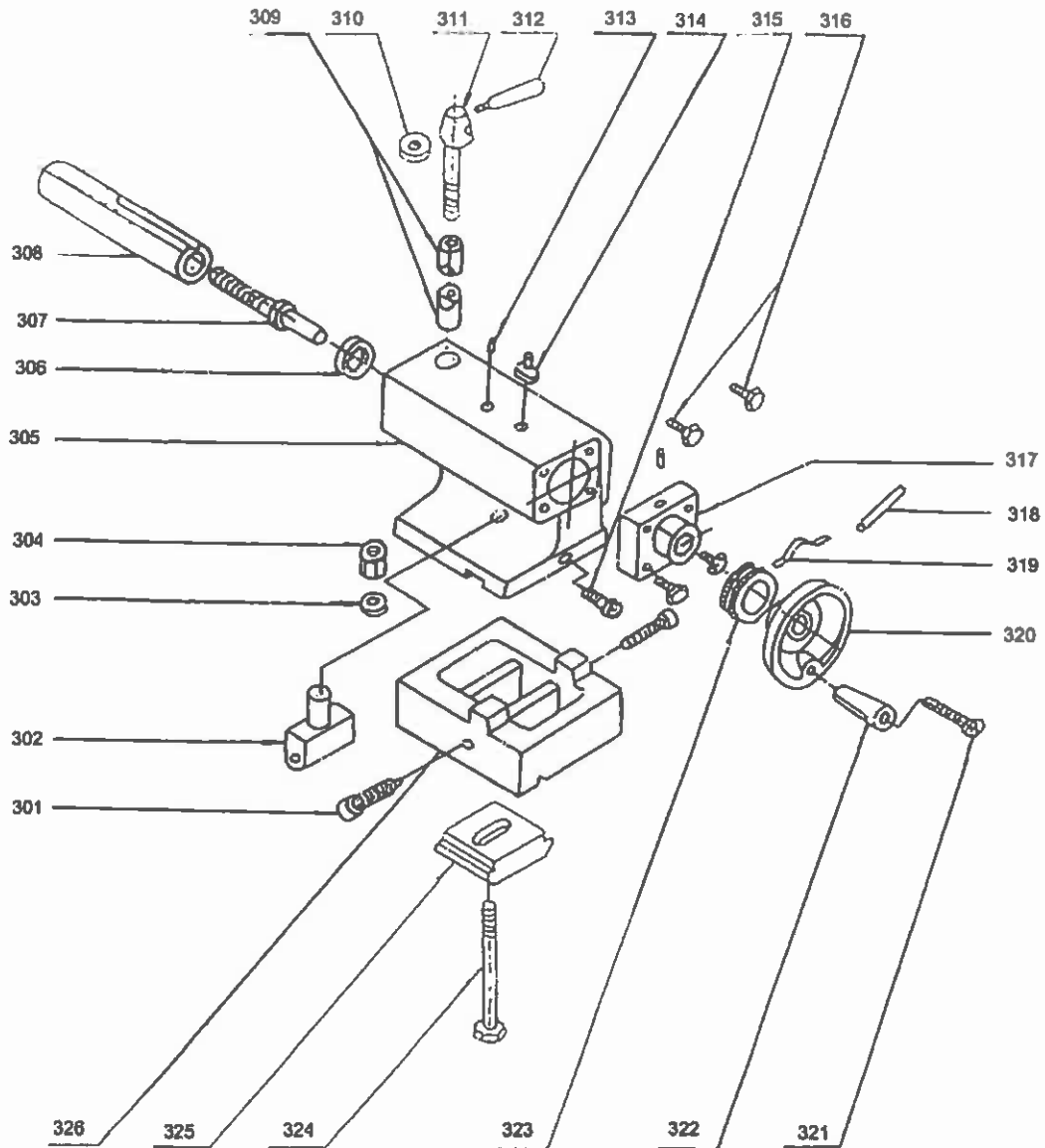


Spare parts list of headstock

Pos.	Name	Qty.	Item no.
201	Seal	1	
202	Spindle bearing	2	
203	Seal	1	
204	Screw M3x8	4	
205	Cover	1	
206	Seal	1	
207	Spacer ring	1	
208	Pulley	1	
209	Nut M27x1.5	2	
210	Gearwheel	1	

Pos.	Name	Qty.	Item no.
211	Screw M5x10	3	
212	Switch box	1	
213	Headstock	1	
214	Feather key 4x40	1	
215	Screw M6x16	3	
216	Work spindle	1	
217	Adjusting ring	1	
218	Screw	1	

Tailstock

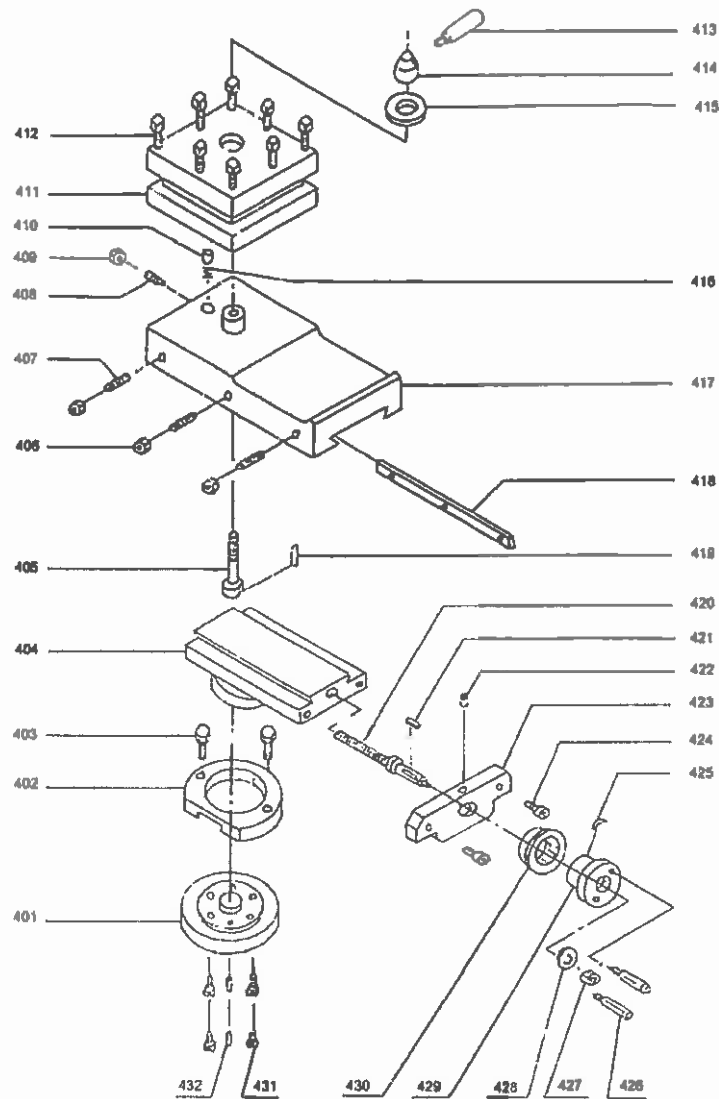


Spare parts list of tailstock

Pos.	Name	Qty.	Item no.
301	Headless pin M8x30	2	
302	Nut	1	
303	Washer B12	1	
304	Nut M12	1	
305	Tailstock upper part	1	
306	Thrust bearing 12x26x9	1	
307	Spindle	1	
308	Tailstock sleeve	1	
309	Spill taper socket (set)	1	
310	Washer B8	1	
311	Clamping screw	1	
312	Handle	1	
313	Lubricating nipple 6	2	
314	Sliding pad	1	
315	Screw M6x16	1	

Pos.	Name	Qty.	Item no.
316	Screw M5x16	4	
317	Guide flange	1	
318	Parallel pin 4x30	1	
319	Sinuous spring	1	
320	Handwheel (tailstock)	1	
321	Screw for handle	1	
322	Handle	1	
323	Graduated collar	1	
324	Screw M12x100	1	
325	Clamping claw	1	
326	Tailstock lower part	1	
327	Complete tailstock D210		
327a	Complete tailstock D250		

Top slide with lathe tool holder

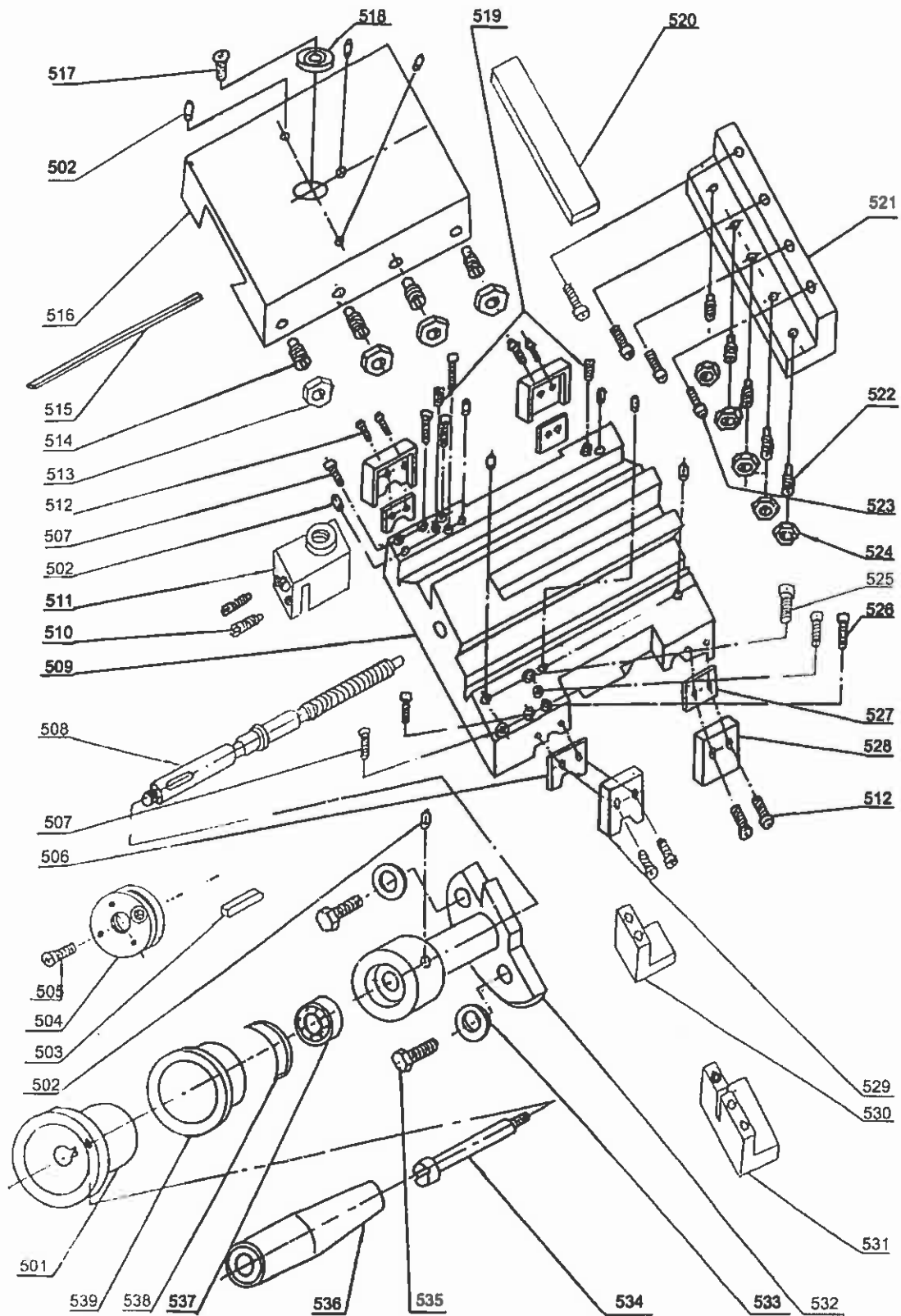


Spare parts list of TOP SLIDE with LATHE TOOL HOLDER

Pos.	Name	Qty.	Item no.
401	Graduated dial	1	
402	Intermediate flange	1	
403	Screw M8x20	2	
404	Slide guideway	1	
405	Straining screw	1	
406	Nut M4	3	
407	Screw M4x40	3	
408	Screw M4x12	1	
409	Nut M4	1	
410	Pin	1	
411	Lathe tool holder	1	
412	Square-head bolt M8x25	8	
413	Handle	1	
414	Clamping piece	1	
415	Washer	1	
416	Compression spring	1	
417	Top slide	1	

Pos.	Name	Qty.	Item no.
418	Guide bead	1	
419	Parallel pin 3x10	1	
420	Top slide spindle	1	
421	Feather key 3x10	1	
422	Lubricating nipple 6	2	
423	Bearing pedestal	1	
424	Screw M5x16	2	
425	Sinous spring	1	
426	Handle	2	
427	Nut M8	1	
428	Washer B8	1	
429	Handwheel	1	
430	Graduated collar	1	
431	Screw M6x16	4	
432	Parallel pin 4x16	2	
For 404	Scale of top slide		

Lathe saddle and cross slide

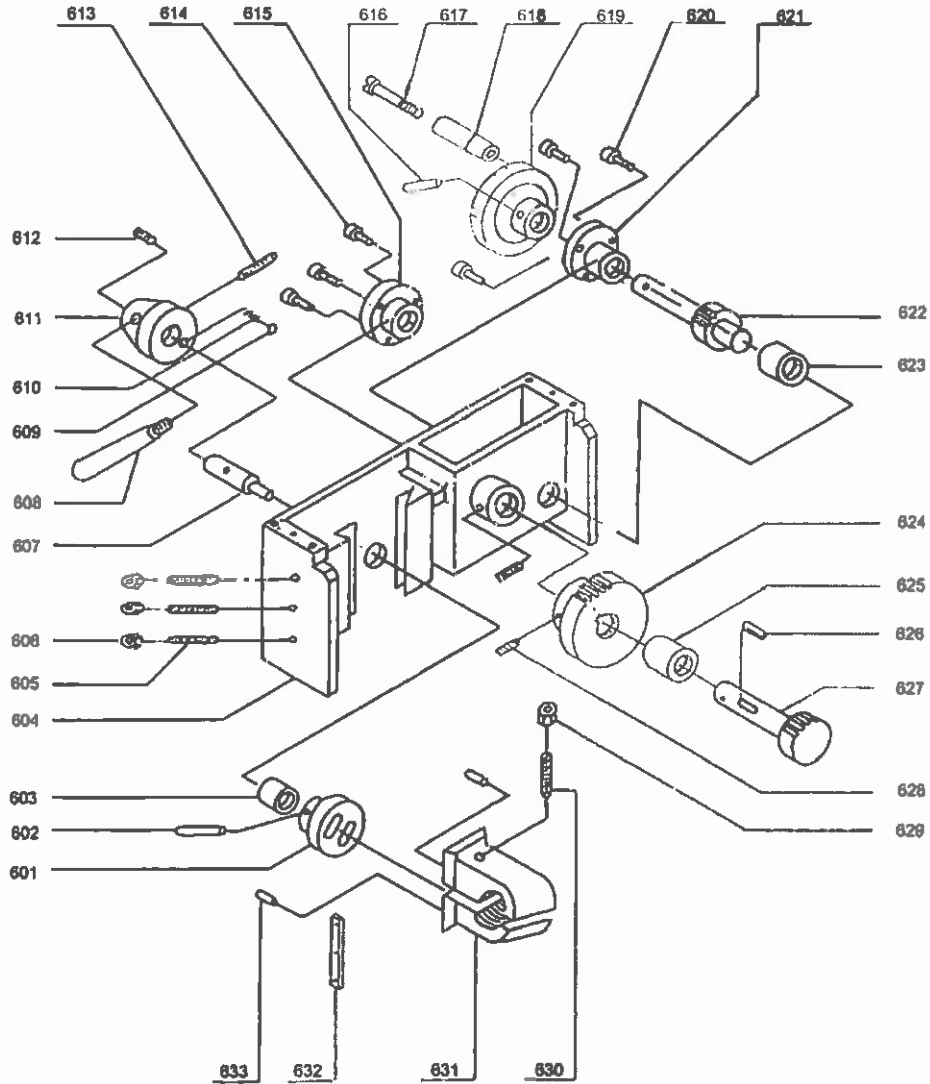


Spare parts list of LATHE SADDLE and CROSS SLIDE

Pos.	Name	Qty.	Item no.
501	Handwheel	1	
502	Lubricating nipple 6	10	
503	Feather key 4x12	1	
504	Round nut	1	
505	Screw M3x6	1	
506	Scraper	2	
507	Screw M6x35	4	
508	Cross slide spindle	1	
509	Lathe saddle	1	
510	Screw M3x12	2	
511	Spindle nut of cross slide	1	
512	Screw M3x12	8	
513	Nut M5	4	
514	Screw M5x25	4	
515	Guide bead	1	
516	Cross slide	1	
517	Screw M5x10	1	
518	Washer	1	
519	Headless pin M8x10	2	
520	Guide bead	1	

Pos.	Name	Qty.	Item no.
521	Guide rail	1	0342567
522	Screw M4x16	5	
523	Screw M5x16	4	
524	Nut M4	5	
525	Screw M8x20	1	
526	Screw	4	
527	Scraper	2	
528	Metal reinforcement	2	
529	Metal reinforcement	2	
530	Front safety block	1	
531	Safety block	1	
532	Guide bearing	1	
533	Washer	2	
534	Handle screw	1	
535	Screw M8x20	2	
536	Handle	1	
537	Rolling bearing 12x26x9	1	
538	Sinus spring	1	
539	Graduated collar	1	

Apron

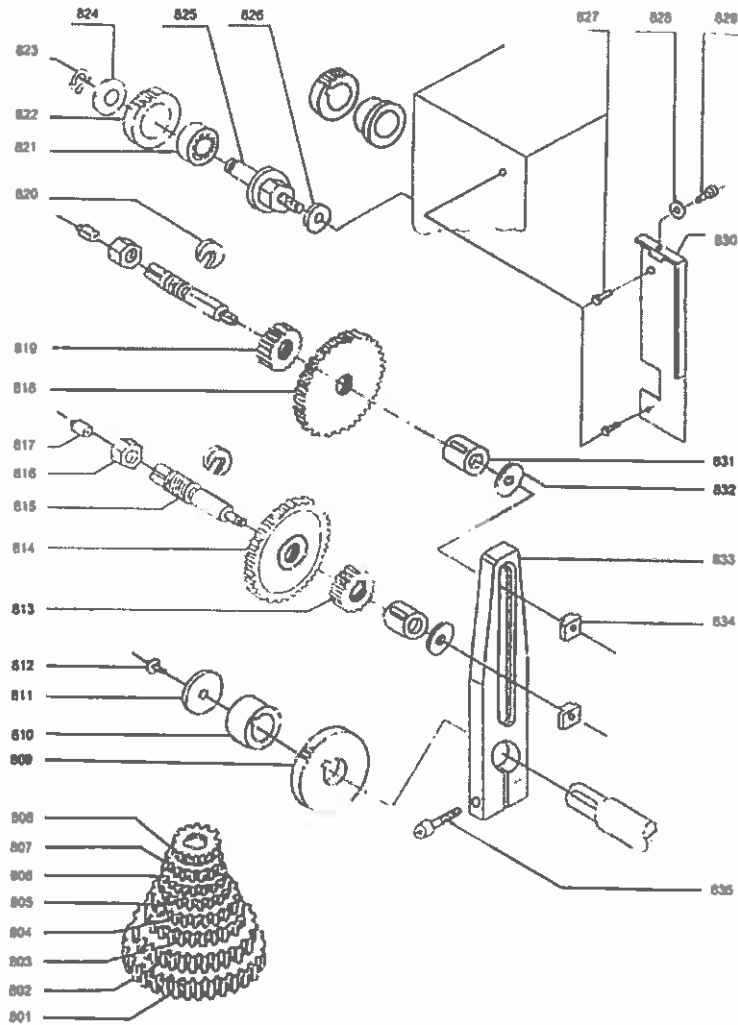


Spare parts list of APRON

Pos.	Name	Qty.	Item no.
601	Eccenter	1	
602	Taper pin 3x20	1	
603	Bush	1	
604	Housing	1	
605	Screw M5x30	3	
606	Nut M5	3	
607	Shaft	1	
608	Handle	1	
609	Steel ball 5	1	
610	Compression spr. 0.8x5x25	1	
611	Engaging hub	1	
612	Screw M6x10	1	
613	Screw M4x8	3	
614	Screw M4x8	3	
615	Flange pedestal	1	
616	Taper pin 3x30	1	
617	Screw	1	
618	Handle	1	

Pos.	Name	Qty.	Item no.
619	Handwheel	1	
620	Screw M4x8	3	
621	Flange pedestal	1	
622	Pinion shaft	1	
623	Bush	1	
624	Gearwheel	1	
625	Bush	1	
626	Feather key 5x10	1	
627	Pinion shaft	1	
628	Screw M4x8	2	
629	Nut M5	1	
630	Screw M5x25	1	
631	Leadscrew nut (set)	1	
632	Guide bead	1	
633	Parallel pin 5x20	2	

Change gear train

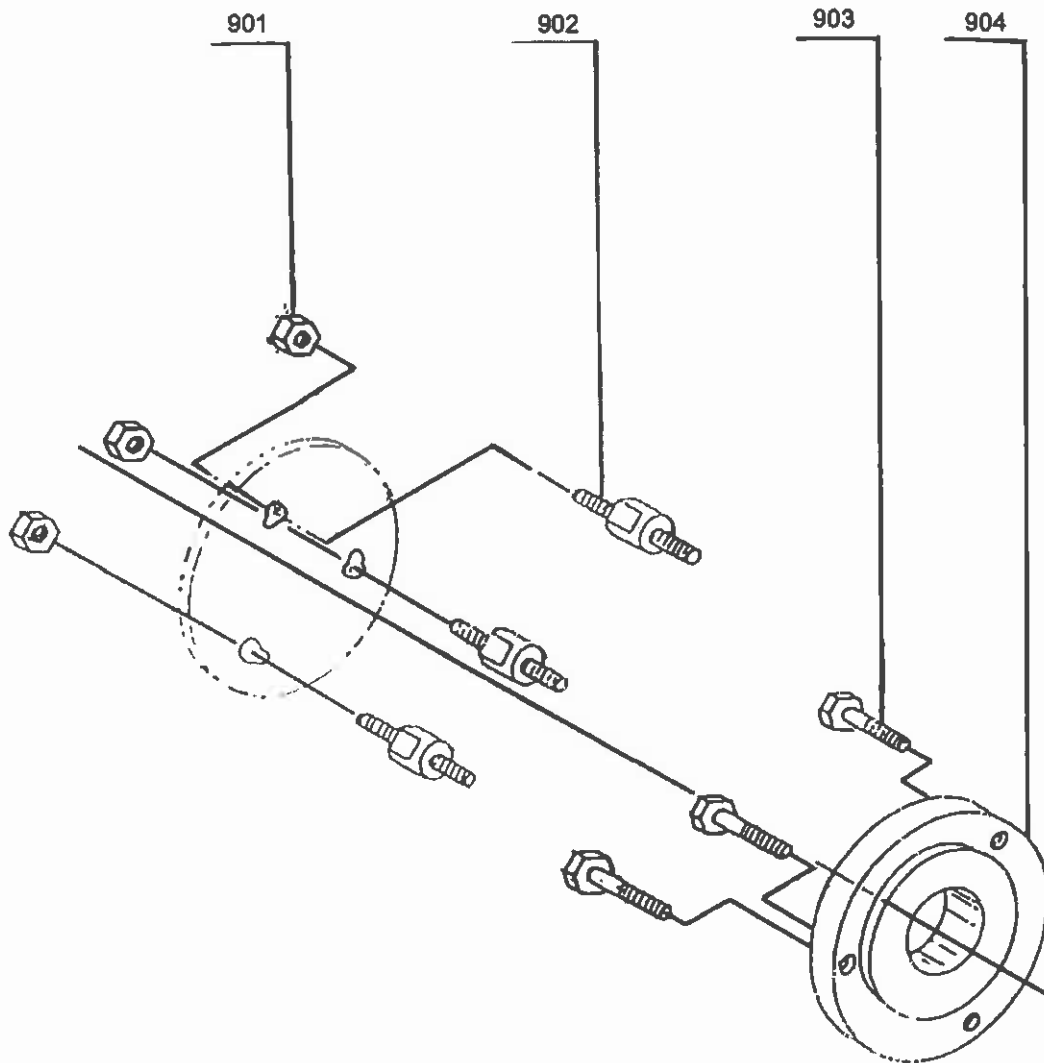


Spare parts list of change gear train

Pos.	Name	Qty.	Item no.
801	Change gear Z=90	2	
802	Change gear Z=80	2	
803	Change gear Z=70	1	
804	Change gear Z=52	1	
805	Change gear Z=50	1	
806	Change gear Z=42	1	
807	Change gear Z=40	1	
808	Change gear Z=33	1	
809	Change gear Z=60	1	
810	Bushing	1	
811	Seeger circlip ring 6	1	
812	Screw M5x8	1	
813	Change gear Z=25	1	
814	Change gear Z=75	1	
815	Quadrant bolt	2	
816	Nut M12	2	
817	Lubricating nipple 6	2	
818	Change gear Z=80	1	
819	Change gear Z=33	1	

Pos.	Name	Qty.	Item no.
820	Washer	2	
821	Rolling bearing 12x26x2	1	
822	Intermediate wheel Z=40	1	
823	Seeger circlip ring 12	1	
824	Washer	1	
825	Fastening bolt intern. wheel	1	
826	Washer 10	1	
827	Screw M5x8	1	
828	Washer 6	1	
829	Screw M6x10	1	
830	Protective cover	1	
831	Plain bearing	2	
832	Washer	3	
833	Quadrant	1	
834	Inserted tongue	2	
835	Screw M6x35	1	
836	Change gear Z=66	1	
837	Change gear Z=30	1	

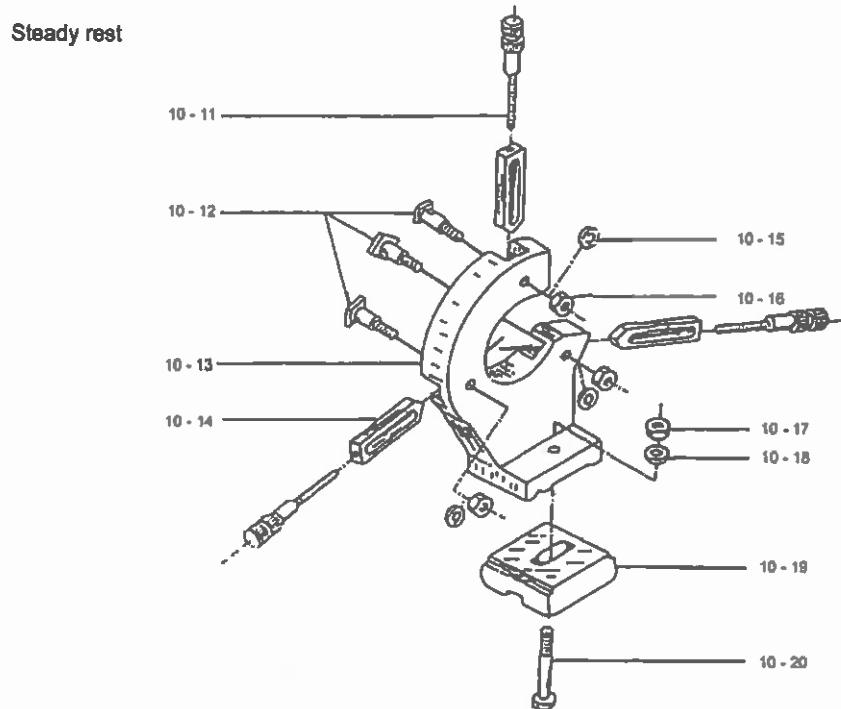
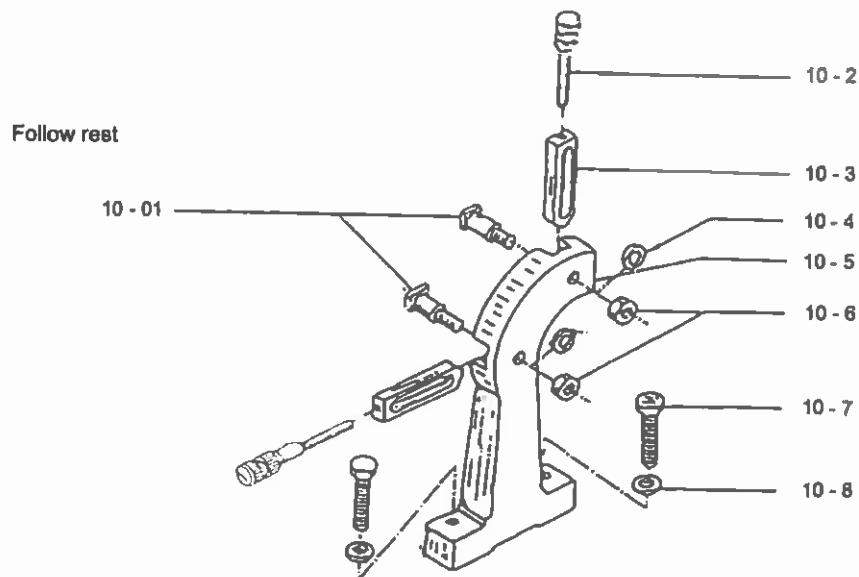
Lathe chuck flange



Spare parts list of LATHE CHUCK FLANGE

Pos.	Name	Qty.	Item no.
901	Nut M10	3	0342546
902	Screw 3	3	0342545
903	Screw M8x25	3	0342544
904	Chuck flange	1	
905	Washer	1	0342561

Follow and steady rest

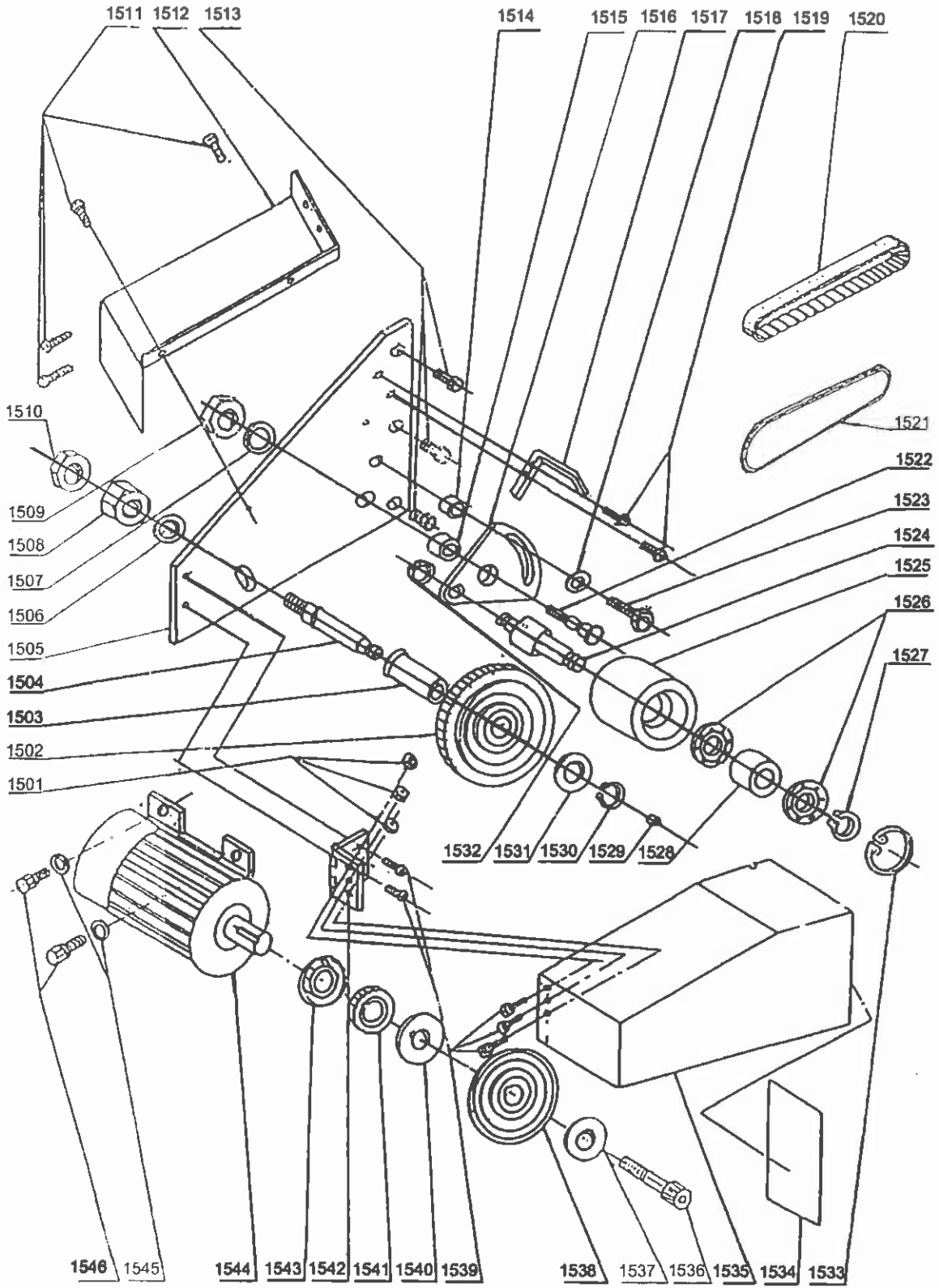


Spare parts list of STEADY REST

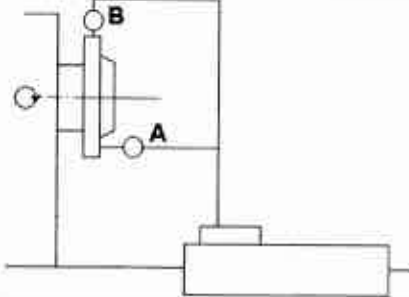
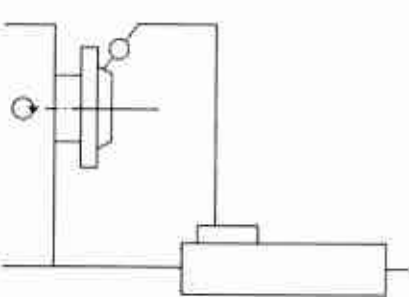
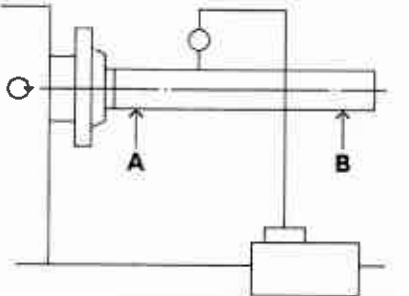
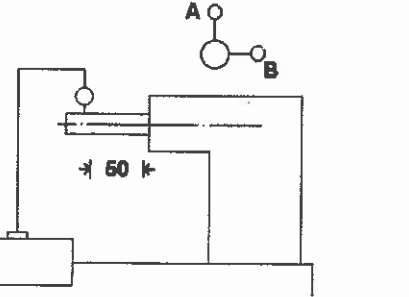
Pos.	Name	Qty.	Item no.
10-01	Screw	2	
10-02	Tightening screw	2	
10-03	Slide jaw	2	
10-04	Lock washer 10	2	
10-05	Rest frame	1	
10-08	Nut M10	2	
10-07	Screw M8x30	2	
10-08	Washer 8	2	

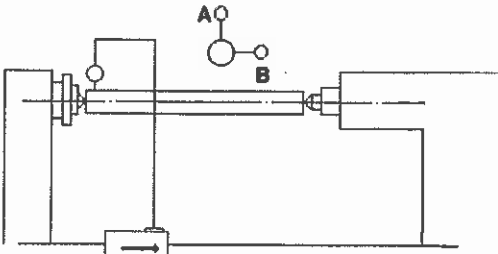
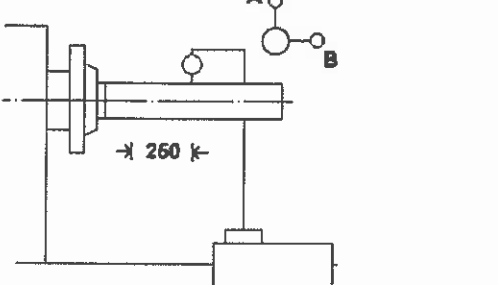
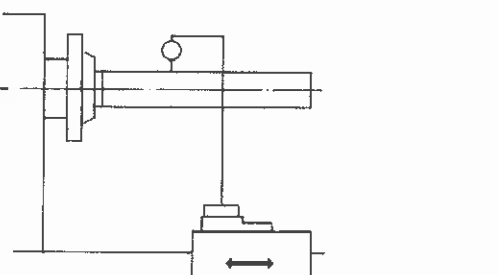
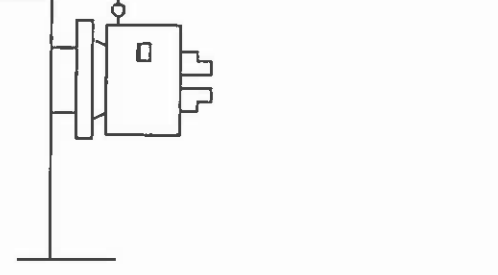
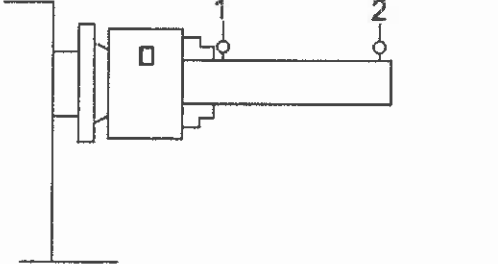
Spare parts list of FOLLOW REST

Pos.	Name	Qty.	Item no.
10-11	Slide jaw	3	
10-12	Rest frame	1	
10-13	Screw	3	
10-14	Set screw	3	
10-15	Lock washer 10	3	
10-16	Nut M10	3	
10-17	Nut M12	1	
10-18	Washer 12	1	
10-19	Clamping claw	1	
10-20	Screw M12x70	1	



Test Report

No	Object of testing	Drawing	Permissible [mm]	Measured [mm]
1	Run-out of spindle and periodical radial slip of spindle		A: 0,009 B: 0,009	A: B:
2	Run-out of spindle nose		0,009	
3	Run-out of internal taper of spindle		A: 0,015 B: 0,03	A: B:
4	Parallelism of tailstock guide A = in the vertical plane B = in the horizontal plane		A: 0,025/50 B: 0,015/50	A: B:

5	<p>Headstock (MT 3) and tailstock (MT 2) centres for same height above reference plane</p>		A: 0,03	A:
6	<p>Parallelism of spindle axis with carriage movement A = vertical plane B = horizontal plane</p>		<p>A: 0,03/250 B: 0,03/250</p>	<p>A: B:</p>
7	<p>Parallelism of top slide with spindle and carriage movement</p>		0,04/75	
8	<p>Run-out of yaw chuck</p>		0,04	
9	<p>Run-out of yaw chuck Object of testing A: Ø 20mm B: Ø 30mm</p>		<p>A) Ø 20mm 1: 0,04 2: 0,08/100 B) Ø 30mm 1: 0,04 2: 0,08/100</p>	<p>A) 1: 2: B) 1: 2:</p>

Inspector:

Date:

Packing List**9X20"Lathe PR71920**

NO.	Description	Specifications	Quantity	Note
1	Bench Lathe		1	
2	Plastic Sheath		1	
3	Instruction Manual		1	
4	Qualification Certificate		1	
5	Packing List		1	
6	Toolbox(including:)		1	
	1) Fixed Center	MT2,MT3	each 1	
	2) Allen Key	3,4,5,6	each 1	
	3) Handle		3	
	4) Reverse Chuck 3 Jaws	Φ 125 (Φ 100/D210)	1 set	
	5) Chuck Spanner		1	
	6) Open-ended Spanner	8-10/12-14/17-19	each 1	
	7) Change Gear	Z=30,40,42,50,52,60,70,75	each 1	
	8) Synchronized counter pulley	230XL070	1	
	9) V-belt	O-737	1	
	10) Intermediate wheel	Z=40	1	
	11) Tool-holder spanner		1	
	12) T Allen Key	5	1	
	13) Straight Screwdriver		1	
	14) Hook spanner	45-52	1	

Surveyor:		Date:	
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