

WARRANTY CARD

1. KH Trading machines and tools are covered by 6/24 months warranty, starting on the date of purchase, as described in the Civil Code (proof of purchase or invoice receipt must be enclosed with the warranty card when making a claim).
2. This warranty does not cover defects caused by unprofessional handling, machine overloads, not complying with instructions contained in this manual, using accessories that are not approved, unauthorized repair, regular wear and tear and damages occurred during transport. Further, this warranty does not cover parts and accessories such as the motor, carbon brushes, seals and hot-air operated parts and parts that need to be changed regularly.
3. If the repair is to be found as not covered by the warranty policy, all costs including the repair and shipping to and from the repair centre will be paid by the customer, according to valid price list. See www.
4. When making a claim, you must present the warranty card, showing the date of the purchase, the serial number of the machine, vendor stamp and signature of sales clerk, as well as the proof of purchase receipt.
5. Warranty claim shall be made at the vendor shop where you bought your machine or you may mail it to a service centre. The vendor is obligated to fill out the warranty card (date of sale, serial number, vendor stamp and signature). All these information must be filled in at the time of sale.
6. The warranty period will be extended for the period of time for which the machine has been in the service centre possession. If the repair or defect is not covered by the warranty policy, all costs including the repair and shipping will be paid by the owner of the machine / tool. We recommend sending the machine in its original packaging. Please, also enclose brief description of the defect with the packaging.
7. Before sending the machine for repair, clean it thoroughly. If the received machine is dirty, it may be rejected by the service shop or you may be charged a cleaning fee.

SERVICE

Logistic centre Klecany

Topolová 483

250 67 Klecany

Czech Republic

Claim department phone number: 266 190 156

266 190 111

Fax:

260 190 100

<http://www.KHnet.cz>

Email: servis@KHnet.cz

T-mobile: 603 414 975

O2: 601 218 255

Vodafone: 608 227 255

Product: MULTIPURPOSE LATHE WITH MILLING MACHINE AT320	
Type: AT320	Serial number (product series):
Date of manufacture:	Repair centre notes:
Date of sale, stamp, signature:	

Without the correctly filled warranty card or without proof of purchase receipt, including the product type (invoice, purchase receipt) no warranty claim will be processed.

uni-max

USER'S MANUAL

MULTIPURPOSE LATHE WITH MILLING MACHINE AT320



AT320

Dear customer. Thank you for purchasing equipment from KH Trading, s.r.o.
Our company is ready to offer you our services - before, during and after you buy our product.
If you have any question, comment or idea, please contact our business centre. We will do our best to address your comment or question in timely matter.

Before first use, please read this manual carefully. It is your responsibility to study all instructions, necessary for safe use and operation and to understand all risks that may be involved during the use of power machines.
WARNING! Do not try to use this machine before reading this entire manual and before you know how to handle it. Keep this manual for future reference.
Pay special attention to safety instructions. Not complying with safety rules may cause injury to the operating person or to people standing by or it may cause damage to the machine or to the work piece.
Pay special attention to safety notes and safety labels on the machine.
Never remove or damage them.

Please, write information such as the invoice number and the number of the sale receipt here in this box.

DESCRIPTION

Machine description
This multipurpose machine may be used in various industrial fields, repair shops, schools and manufacturing shops.
This machine is divided in two blocks; the lathe and the milling/drilling machine.
This combined design offers many advantages and enables you to perform turning and machining operations on one machine. Both machines are powered independently.
After you remove the knife support, you will gain an access to the table with the "T" groves enabling you to fasten the work piece for milling operations. The machine is equipped with longitudinal and cross feeds, as well as with options to cut M and W threads.
It has been designed for cutting and machining of inner and outer surfaces, (conical and flat, as well as for metric and Whitworth thread manufacturing). You may also perform drilling, machining or milling operations and various other machining and metal cutting operations.

Number of operating persons required:1

WARNING: If your machine is not delivered with a power plug, have the appropriate plug (compatible with your wall outlet) installed by qualified technician.

REPAIR AND MAINTENANCE REPORT

Report and maintenance report:

DATE	REPAIR AND MAINTENANCE REPORT	SERVICE SHOP

REVISION REPORT

The user is obligated to perform tests and revisions of electrical equipment of the machine in accordance with valid rules and regulations. Result report:

[illegible]

TECHNICAL SPECIFICATION

Lathe turning operations:

Voltage	~400 V / 50 Hz
Power input	1,100 + 370 W
Maximum cutting diameter above the bed (L)	Ø 320 mm
Maximum cutting diameter above the support (S)	Ø 200 mm
Maximum work piece length (X)	750 mm
Inner chuck diameter	Ø 38 mm
Chuck cone (lathe)	.5 Mk
Tailstock cone	.3 Mk
Speed (revolutions) range (lathe)	.60 - 1,600 (12) rpm
M thread pitch (degree)	.0.5 - 4 (17) mm (degree)
W thread pitch (degree)	.11 - 40 (20) 1/" (degree)
Maximum cutting knife feed	.100 mm
Maximum feed of the cross support	.500 mm
Maximum longitudinal feed	.750 mm
Automatic longitudinal feed	.0.01 - 1.5 mm/revolution
Automatic cross feed	.0.025 - 0.34 mm/revolution
Continuous setting	.NONE
Adjustable longitudinal feed	.YES
Adjustable cross feed	.YES
Tailstock range	.80 mm
Number of uni chuck jaws	.3
Fastening diameter of the uni chuck outer/inner (Ui/o)	Ø 160/200 mm
Speed (revolutions) setting (milling/drilling machine)	.260 - 2,620 (4) rpm (degree)
Head tilt angle	.60
Table dimensions	.280 × 130 mm
Spindle cone (milling/drilling machine)	.3 Mk
Max. drill diameter	Ø 16 mm
Fine spindle feed	.200/60 mm
Spindle set out	.180 mm
Maximum distance between the spindle and the table	.265 mm
Overall dimensions (l x w x h), excluding the base	.1,500 × 625 × 1,200 mm
Gross weight	.400 kg

The accuracy of instructions, graphs and information contained herein, depends on the printing date. Due to continuous product improvement, the manufacturer reserves the right to change technical parameters of the product, without prior customer notification.

SAFETY PRECAUTIONS

- **This device may be used by a qualified person, 18 years or older who has been trained in work and environmental safety procedures.**
- **Any person using this equipment must possess a medical certificate demonstrating his eligibility to operate this equipment.**

We recommend placing work safety regulations notices at your workshop:

- **"Prevent most common injuries" - MILLING MACHINES**
- **"Prevent most common injuries" - LATHES**

Symbols used in this manual



Warning!

This symbol informs you about the risk of personal injury or damage to the machine or materials.



Caution!

You are using electrically powered machine!
Risk of injuries by electrical current.



Risk of being caught by spinning machine parts!
Caution! Loose clothing or body parts may get caught by moving machine parts.



Warning!

Danger of damage.



Note:

Additional information.



Use personal protective gear.



In case of fire do not use water or foam fire extinguishers



Use protective gloves



Use face protective shield



Danger of having fingers cut



Caution! Electrical equipment



Read manual before use



Caution! Danger of being caught by machine moving parts



Before use, close the protective cover



General instructions

- Make sure you know how to control your tool or machine and that you are familiar with its operating procedure. Know the hazards that may occur, if not used correctly.
- If other person is using this machine make sure that he knows how to safely operate this equipment and that he is familiar with hazards and risk that may occur, if not used correctly.
- Pay special attention to safety notes and safety labels on the machine. Do not remove or damage them. If the warning label becomes unreadable, please contact your vendor.
- Dirty and disorganized workplace may cause accidents.
- Never work in poorly lit, narrow or too crowded rooms. Always keep stable posture.
- Maintain your tools clean and in safe working conditions.
- Handles must be kept free of grease and dirt.
- Make sure no children, unauthorized persons or animals have access to your workshop.

72	AT320-09-042	Right transmission cover
73	M8×40 GB4141.14-84	Long socket ball grip
74	8×50×12 GB4141.15-84	Handle lever
75	M4×16 GB67-76	Screws with cylindrical head and groove
76	M8 GB923-76	Enclosed nut
77	AT320-09-024	Adjustment washer
78	AT320-09-025	Handle housing
79	AT320-09-026	Calibrated dial
80	AT320-09-043	Elastic lamella
81	M4×8 GB818-85	Screw
82	AT320-09-045	Handle lever
83	AT320-09-027	Spring seat
84	AT320-09-033	Fastening base
85	AT320-09-028	Secondary shaft
86	5×10 GB1096-72	Flat spline
87	M5×10 GB819-85	Screw

- Use only for purposes for which it has been designed.
- Use personal protective gear such as safety goggles, ear protection, respirator, safe working shoes etc.
- Do not overreach, use both hands.
- Never work under the influence of alcohol or other drugs.
- Do not use the machine/tool if you feel dizzy or weak.
- Any modifications or improvements to the machine are strictly prohibited. DO NOT USE if you discover bent part, crack or other damage.
- Never perform any maintenance during operation.
- If you see any unusual sign or hear any strange sound, switch off the machine immediately.
- Do not forget to remove all wrenches and screwdrivers from the machine after use.
- Before use, make sure all screws are tightened securely.
- Perform maintenance regularly. Before use make sure the machine is in good working conditions and without any damage.
- Use only original spare parts during repairs.
- Using extension pieces or accessories not approved by the manufacturer may cause injuries to the operating personnel.
- Use suitable tool for particular type of work. Do not overload tools, accessories or the machine. For large work volume use more powerful machine.
- Do not overload your device. Measure the work load in such way, so it could be done with comfortable speed. Damages due to machine overload are not covered by the warranty policy.
- Do not expose to extremely high temperature or direct sunlight.
- This machine is not designed for use in humid environments or under water.
- If you are not using your machine, store it in a dry and safe place, out of reach of children.
- Before use make sure that all safety elements work correctly and efficiently. Make sure all moving parts are in good working conditions.
- Before use make sure that no part is cracked or stuck, Make sure all parts are attached and assembled as designed. Beware of all other conditions that may have a negative effect on the proper functioning of your machine.
- If not stated otherwise in this manual, all damaged parts and safety elements must be repaired or changed.



Assembly

- Do not use the machine unless completely assembled.



Electrical equipment

- Observe all basic safety rules when using electrical equipment to prevent risk of fire, injuries by electrical shock and other hazards. Before using this device, read this manual entirely and follow all safety instructions.
- Make sure the power cable plug is plugged into the correct wall outlet. The voltage in the wall outlet must be the same as shown on the specification label to prevent damage to the electric motor. Too low voltage will not provide your machine with enough power.
- Before connecting the machine to the wall outlet make sure that the main switch is in the "OFF" position. When you finished your work, disconnect the power plug from the wall outlet and switch off the main switch.

- Never carry electrical tools and appliances by their power cord. When disconnecting the plug from the wall outlet, never pull the cable by its cord.
- Protect the power cable from high temperatures, oils, paint thinners and make sure that the cable is not hanging over sharp edges.
- Inspect the power cable regularly. If damaged have it replaced by qualified technician. Inspect extension cables regularly. If damaged, have it replaced.
- If you need to use an extension cable, use cable with appropriate power rating. Use only completely unwound. Inspect extension cables regularly. Damaged cable must be repaired or changed immediately.
- Before performing any maintenance, repair or adjustment, switch off the main switch and disconnect the power cable from the wall outlet.
- Make sure no one may switch you machine incidentally on. Do not keep your fingers close to the main switch, unless absolutely necessary.
- If you mount your machine to the work table, release the safety button after installation.
- Do not use in environments where explosives are stored or used (paint shops, warehouse with flammables etc.).
- Do not use in humid environments or if wet.



Rotary tools/machines

- Always wear suitable work clothing (do not wear loose clothing, ties, jewellery etc.). Long hair must be covered and tied up behind you head. Do not wear worn out working shoes. Sleeves must be rolled up. Loose clothing or body parts may get caught by moving machine parts.
- Do not remove safety covers. Make sure the operating personnel is well-protected.
- Do not touch or come close with moving machine parts during work. Keep your hands away from moving and spinning machine parts.



Machining and turning operations

- Always securely fasten the work piece on the work table using appropriate clamping equipment or vise. Do not hold the work piece in your hands during work. Use both hands to hold the handles of the machine/tool.
- Do not overreach. Maintain stable posture on both legs. That way you will not be thrown out of balance in case of a reverse impact.
- Keep your tools clean and sharp.
- When changing tools or during maintenance, follow safety instructions.
- To feed or move the work piece use appropriate extension tool.
- Make sure the work piece complies with required technical parameters and that it is securely fastened.
- Use extra caution when releasing the work piece from the fastening device.



Drilling

- Make sure the work piece is properly fastened to the work table and secured against turning during drilling.
- Before switching your machine on make sure the chuck is turning in the right direction, based on the used tool.

35	5×25 GB117-86	Conical stud
36	AT320-09-041	Large shifting fork
37	AT320-09-029	Shaft socket
38	AT320-09-030	Stopper screw
39	AT320-09-031	Adjustment socket
40	AT320-09-32	Safety nut
41	AT320-09-001A	Drilling/milling spindle box
42	M8×18 GB79-85	Screw with inner hexagonal head slot
43	JY7124 370W	Motor
44	10 GB97.2-85	Regular washers
45	M10 GB6170-86	Hexagonal nut
46	AT320-09-031	Shifting fork shaft
47	AT320-09-039	Small shifting fork
48	M8×20 GB70-76	Screws with inner hexagonal head slot
49	AT320-09-002	Engine assembly plate
50	M6×20 GB70-76	Screws with inner hexagonal head slot
51	AT320-09-004A	Input shaft
52	AT320-09-005	Flat spline
53	M2×5 GB818-85	Screw
54	40 JB/GQ0251-89	Bearing socket
55	50207 GB277-89	Radial ball bearing
56	17 GB894.1-86	Outer safety ring
57	AT320-09-003A	Double toothed gear
58	60201 GB278-89	Radial ball bearing
59	12 GB894.1-86	Outer safety ring
60	12 GB894.1-86	Outer safety ring
61	32 JB/GQ0251-89	Bearing socket
62	50207 GB277-89	Radial ball bearing
63	AT320-09-015A	Toothed gear
64	AT320-09-016	Socket spacer
65	AT320-09-006	Toothed gear
66	AT320-09-007	Toothed gear
67	AT320-09-017	Middle shaft
68	5×55 GB1096-72	Flat spline
69	60201 GB278-89	Radial ball bearing
70	12 GB894.1-86	Outer safety ring
71	M5×16 GB70-76	Screws with inner hexagonal head slot

Drilling/milling head

Position	Dimensions	Name
1	35 GB894.1-86	Outer safety ring
2	207 GB276-89	Cylindrical bearing
3	AT320-09-020	Shaft socket
4	AT320-09-021A	Toothed gear
5	50207 GB277-89	Radial ball bearing
6	72 JB/GQ0251-89	Bearing socket
7	35 GB894.1-86	Outer safety ring
8	AT320-09-018	Levelling ledge
9	8×45 GB1097-79	Flat spline
10	M3×8 GB67-85	Round head setting screw
11	M4×8 GB68-85	Sink head screws with groove
12	M30×1.5 GB812-88	Round nut
13	2007106 GB297-84	Conical bearing
14	AT320-09-008A	Spindle socket
15	D2007107 GB297-84	Conical bearing
16	AT320-09-022	T - wedge
17	AT320-09-009A	Drilling/milling spindle
18	45 JB/GQ0324-89	Felt ring
19	M4×12 GB71-85	Setting screws with conical tip
20	AT320-09-013	Bearing cover
21	AT320-09-034	Handle housing
22	1×7×12 GB2089-80	Spring
23	AT320-09-035	Connecting screw
24	5×50 GB117-86	Conical stud
25	AT320-09-044	Positioning handle
26	BM8×40 GB4141.14-84	Long socket round grip
27	M4×8 GB67-85	Round head setting screw
28	5×45 GB119-86	Cylindrical stud
29	AT320-09-036	Positioning plate
30	M5×16 GB70-76	Screws with inner hexagonal head slot
31	4×20 GB117-86	Conical stud
32	AT320-09-042	Left transmission cover
33	AT320-09-040	Shifting fork shaft
34	AT320-09-038	Swivelling gate



Milling

- Make sure the material is fed to the machine in the correct direction that is, against the directions of the spinning cutting head.



Lathe turning operations

- Do not allow unauthorized persons to stand close to your machine to prevent injuries by spinning work piece.
- Make sure that the operating person wears personal protection gear to prevent injuries from flying and spinning metal cuts and sawdust.
- Do not carry objects in your upper pocket. Do not wear jewellery. Always place tools and measuring equipment on the same place.
- The operating personnel must wear working cloth and must not wear gloves. Long hair must be tied behind your head to prevent injuries by spinning parts.
- Stairs for the operating personnel must be equipped with skid-proof surface. Always keep secure and stable position during work. Do not lean over and above the machine. Do not overreach.
- Do not work with work pieces that do not comply with the dimensioning requirements and with the machine specifications.
- Make sure that the work piece and the cutting tools are securely fastened. After you have fastened the cutting tool, make sure to remove all wrenches and other fastening tools from the spindle or chuck. Before starting the machine, make sure the operating personnel always removes all wrenches, screwdrivers and other fastening tools from the machine.
- Make sure to choose and use correct tools. Work piece must be always securely fastened. Do not touch the work piece.
- Perform maintenance, adjustment or tool changing only if the machine is switched off and the spindle has completely stopped.
- Never leave the running machine unattended. You may leave the machine only if it is switched off and the chuck or spindle came to a complete stop.
- Also beware of other risks and dangerous situations that may occur during operation.



Power equipment

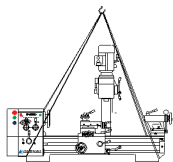
- If your machine is equipped with depressed springs, use suitable device to release them slowly and safely.

ASSEMBLY

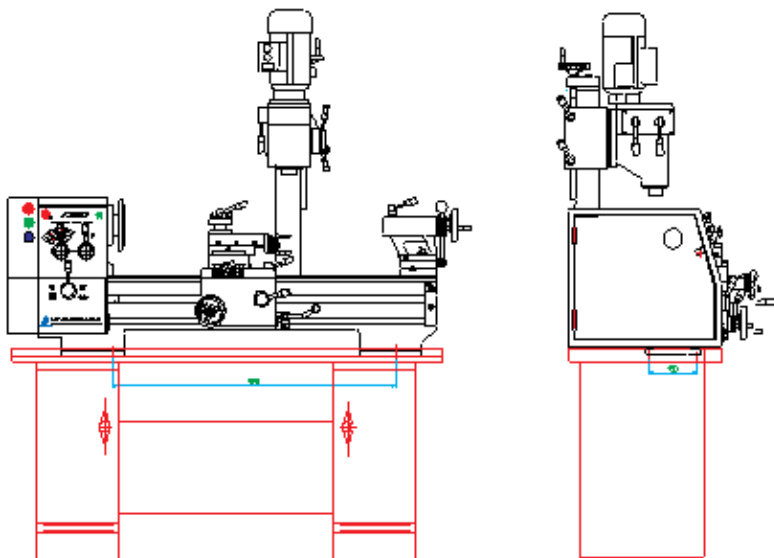
- Make sure no part is left inside the packaging box before throwing the packaging materials out. If so, take it out and install it. Use the part listing for check-up and the installation drawing for guidance.
- We recommend to use lifting method shown on picture 2 or you may use forklift. Level the machine during transport and installation to prevent flipping over. After you have balanced the machine, you may turn the drilling and milling head by 180°.

Machine lifting

Follow the procedure shown on picture 3. Use water/air level to align the guide and small stand. Mount the machine to the base with bolts. The machine base may be manufactured according to special customer requirements.



- Follow the assembly procedures shown on the picture. Use water/air level to align the guide and small stand. Mount the machine to the base with bolts.
- You may use the machine only if it is securely mounted and fastened. Otherwise dangerous vibrations may occur during work.



- Before starting the machine make sure that the voltage in the wall outlet (or the power source) is the same as shown on the specification label of your machine. Also make sure that the power cable is equipped with grounding pin. Your machine must be properly grounded to prevent injuries by electric shock.
- Do not use the machine in harsh environments, do not install it on a wet place and protect it from rain. Use only in dry environments. Humid environment may cause corrosion of metal parts or may damage the electric system of your machine.

Bed/stand

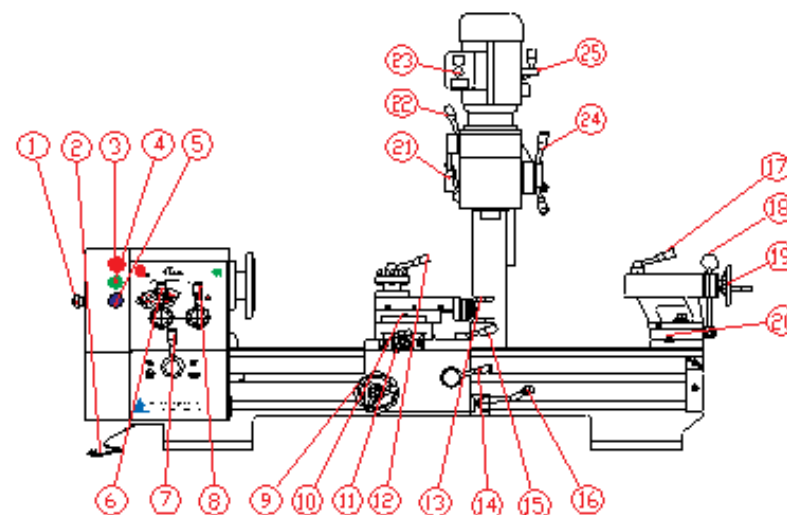
Position	Dimensions	Name
1	AT320-00-007	Pedestal
2	8×35 GB117-86	Conical stud
3	12 GB93-87	Washer
4	M12×40 GB70-85	Screw with inner hexagonal head slot
5	12 GB93-87	Washer
6	M12×55 GB70-85	Screw with inner hexagonal head slot
7	AT320-00-001	Stand
8	AT520-01-004	Head of column
9	M6×20 GB70-85	Screw with inner hexagonal head slot
10	8106 GB301-84	Bearing
11	AT320-00-004	Upper column housing
12	30 GB858-88	Washer
13	M30×1.5 GB812-88	Round nut
14	M10 GB923-88	Nut
15	B12×100 GB4141.22-84	Manual wheel
16	8103 GB301-84	Bearing
17	4×12 GB1096-79	Flat spline
18	AT320-00-005	Height adjustment guiding screw
19	17 GB894.1-86	Outer safety ring
20	M6×25 GB70-85	Screw with inner hexagonal head slot
21	AT520-01-006	Height adjustment nut
22	AT320-00-002	Revolving housing
23	M10×45 GB5783-86	Screws
24	AT320-00-003	Screw
25	AT320-00-008	Adjustment socket
26	AT320-00-009	Self-cutting screw
27	AT300-00-123	Handle housing
28	3×25 GB117-86	Conical stud
29	M8×40 GB4141.15-84	Handle lever
30	M8×40 GB4141.14-84	Ball hand grip

72	CQ9332A-01-008	Cam
73	M4×6 GB71-85	Setting screws with groove and conical tip
74	CQ9332A-01-013	Rack poles
75	10 GB93-87	Washer
76	M10×40 GB70-85	Screws with inner hexagonal head slot
77	M10×35 GB70-85	Screws with inner hexagonal head slot
78	CQ9332-00-016	Cover
79	M5×10 GB70-85	Screws with inner hexagonal head slot

OPERATION

- **Caution:** If you are using your machine in low temperature, let it run for about 20 minutes at 160 rpm to warm it up.
- After you have assembled your machine you must remove the anti-corrosion coatings with paraffin oil from the guides, columns, support, exchangeable gears and pulleys. Then you must lubricate it with proper lubrication oil or grease.

Control buttons and elements



1. Transmission cover star-grip wheel
2. 5 pin power cable
3. Emergency stop button
4. Power on control light. Indicating that the machine is connected to the power source.
5. Main switch
6. Speed/rpm gear selector (lathe). You may switch gear only if the engine is stopped.
7. Longitudinal feed direction switch.
9. Manual wheel of the longitudinal support.
10. Milling plate
11. Manual cross feed wheel of the knife head and small stand.
12. Knife head safety and release handle It is used during tool changing.
13. Manual wheel for fine longitudinal feed control of the knife head.
14. ON/OFF switch of the longitudinal feed.
15. ON/OFF switch of the cross feed.
16. ON/OFF switch of the cross feed.
17. Locking handle of the tip socket.
18. Tailstock locking handle.
19. Manual wheel of the tip socket feed control.
20. Adjusting screw. Used for concentric aligning of the revolving tip centre with the chuck spindle.
21. Setting of the drilling/milling head position.
22. Spindle gear shifting lever.
23. Drilling/milling head engine switch.
24. Fine vertical feed of the drilling/milling head.
25. Manual wheel for drilling/milling head lifting.

Electric control of machine power drives.

Lathe



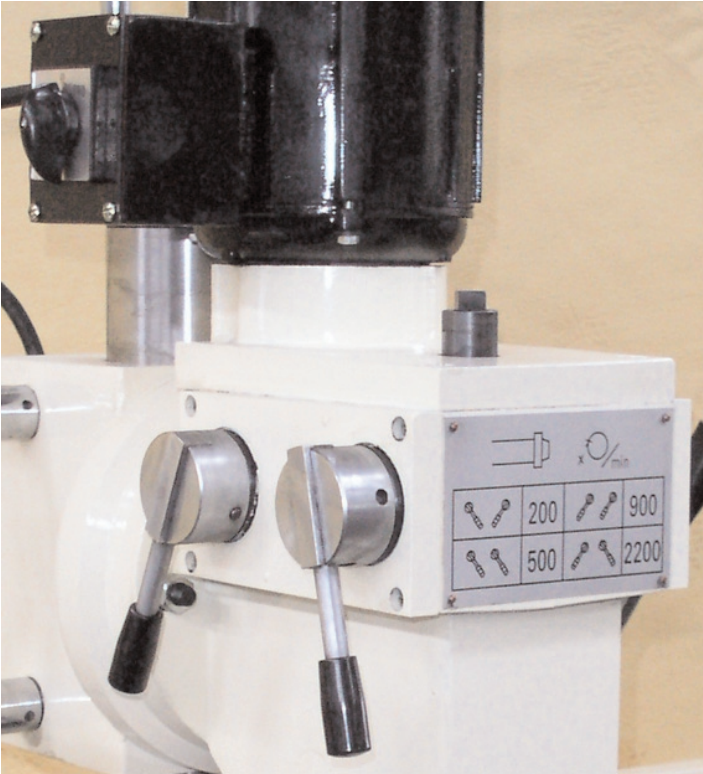
Red round button: Stop button - emergency stop.
Stops the entire machine.

Green round control light: Indicates power on - main
switch in the ON position.

Green round button: main switch.

Red switch (in the lower middle part): switches
on/off the cooling fluid pump.

Milling/drilling spindle



Black switch. Switches on/off the spindle engine - seen on the left side of the picture.

35	M10 GB923-88	Nut
36	CQ9332-05-008	Cross feed guiding screw housing
37	M8×40 GB70-85	Screws with inner hexagonal head slot
38	CQ9332-01-007	Base platform
39	CQ9332-5-005	Front platform
40	CQ9332A-05-002	Stand
41	HA300-05-042	Grooved plate - in left rear side
42	HA300-05-044	Grooved plate - in left front side
43	6 GB1155-79	Oil lubrication cap
44	AT320-01-009	Cross nut
45	AT320-00-006	Work table
46	AT320-01-002	Longitudinal feed screw
47	CQ9332A-01-010	Right pedestal
48	6 GB1155-79	Oil lubrication cap
49	M8×20 GB70-85	Screws with inner hexagonal head slot
50	CQ9332-01-010	Socket
51	CQ9332-02-011	Guiding studs
52	AT520-03-106	Guiding studs
53	CQ9332A-01-012	Socket
54	5×30 GB117-86	Conical stud
55	M8×60 GB70-85	Screws with inner hexagonal head slot
56	M5×10 GB71-85	Setting screws with groove and conical tip
57	5×35 GB119-86	Cylindrical stud
58	CQ9332A-01-007	Adjustment handle housing
59	CQ9332A-01-004	Control socket
60	M10×32 GB4141.12-84	Ball handle socket
61	M6×12 GB70-85	Screws with inner hexagonal head slot
62	CQ9332A-01-009	Pedestal
63	CQ9332A-01-006A	Shaft socket
64	CQ9332A-01-003A	Control pole
65	M8×8 GB73-85	Setting screw with flat tip
66	0.5×6×15 GB2089-80	Spring
67	6 GB307-88	Steel ball
68	M8×15 GB71-85	Setting screws with groove and conical tip
69	0.5×6×25 GB2089-80	Spring
70	4×25 GB117-86	Conical stud
71	AT520-03-014	Connecting socket

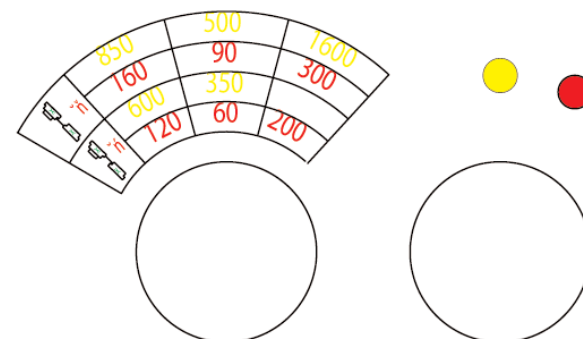
PART LISTING

Column

Position	Dimensions	Name
1	CQ9332A-01-001	Bed/stand
2	CQ9332-01-003	Rack poles
3	6×18 GB117-86	Conical stud
4	M8×16 GB70-85	Screws with inner hexagonal head slot
5	CQ9332-01-005	Block
6	CQ9332-05-015	Washer
7	M5×12 GB68-85	Screw
8	M6×25 GB75-85	Screw
9	M6 GB6170-86	Hexagonal nuts
10	M6×35 GB70-85	Screws with inner hexagonal head slot
11	8 GB1155-79	Oil lubrication cap
12	6×40 GB117-86	Conical stud
13	M6×30 GB70-85	Screws with inner hexagonal head slot
14	M6×45 GB70-85	Screws with inner hexagonal head slot
15	M6×40 GB5782-86	Screws with hexagonal head
16	HA300-05-044	Grooved plate - in right front side
17	M5×10 GB818-85	Screws with sink cross-conical head
18	CQ9332-01-008	Block
19	M8×20 GB79-85	Setting screws with inner hexagon and conical tip
20	M8 GB6170-86	Hexagonal nuts
21	HA300-05-041	Grooved plate - in right front side
22	CQ9332-05-027	Chain tackle gear
23	CQ9332-05-006	Toothed gear
24	AT320-05-004	Cross feed guiding screw
25	5×16 GB1096-79	Flat spline
26	4×18 GB1096-79	Flat spline
27	8201 GB301-84	Cylindrical bearing
28	6 GB1155-79	Oil lubrication cap
29	M6×16 GB70-85	Screws with inner hexagonal head slot
30	5×20 GB117-86	Conical stud
31	CQ9332-05-024	Dial
32	AT300-03-139	Spring lamella
33	AT300-03-138	Dial socket
34	12×40 GB4141.9-84	Handles with socket

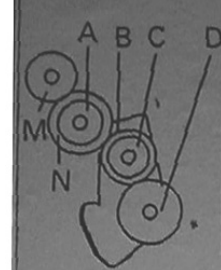


Manual machine control

Gear shifting chart (lathe)



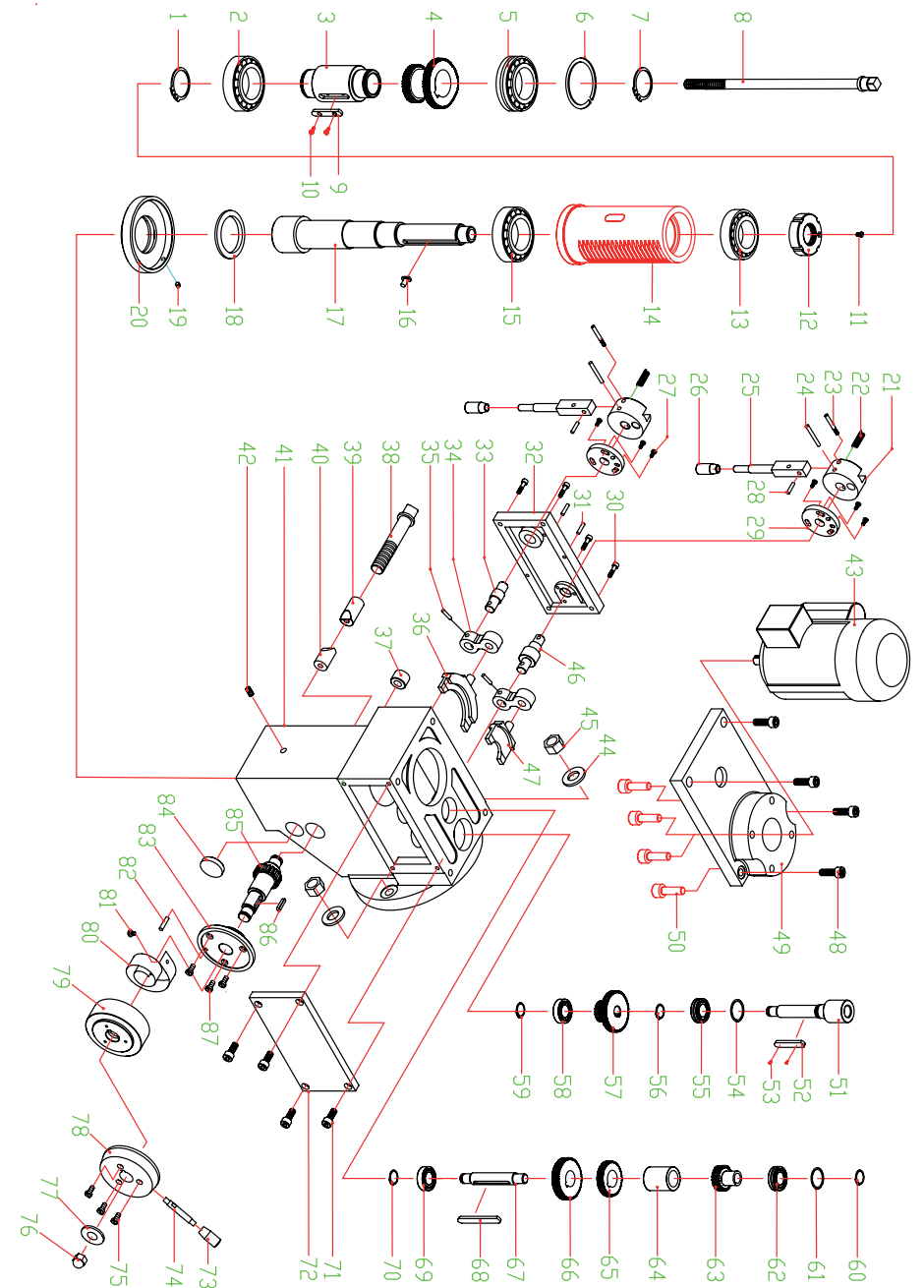
Thread cutting:

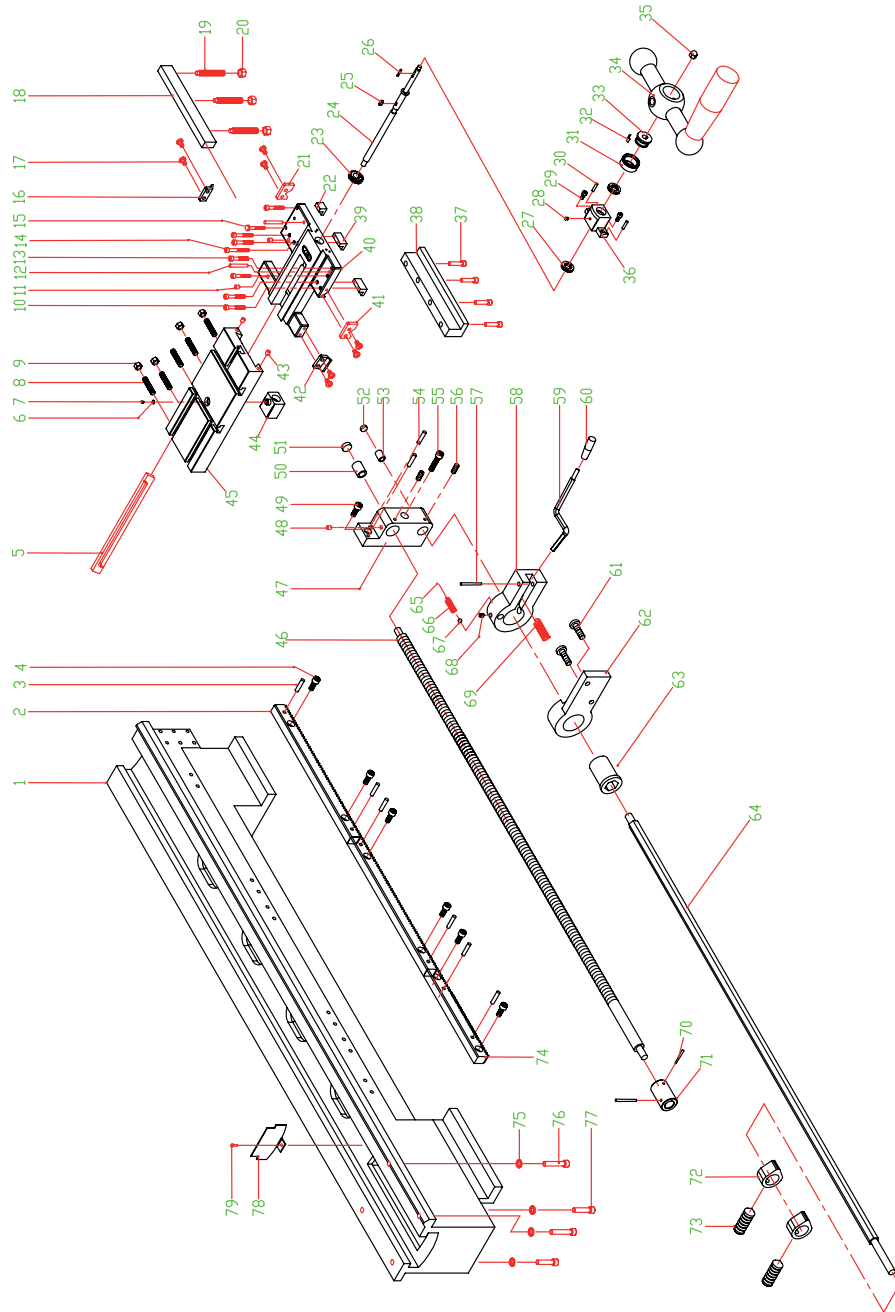
- During thread cutting make sure that the positions of the toothed gears are the same as the positions of the shifting levers to ensure correct thread pitch.
- The relationship between the gear and the lever position is shown in the chart. During operation follow the instructions on the transmission label or in the following chart.

M=24	M=28	$\frac{A}{B} \times \frac{C}{D}$	mm		mm	
N=60	N=35		M=24 N=60	M=28 N=35	M=24 N=60	M=28 N=35
		$\frac{24}{50} \times \frac{25}{48}$	0.100	0.200	0.022	0.045
18	9	$\frac{32}{28} \times \frac{35}{34}$	0.493	0.986	0.105	0.210
20	10	$\frac{30}{27} \times \frac{40}{42}$	0.443	0.886	0.095	0.190
22	11	$\frac{32}{30} \times \frac{36}{40}$	0.400	0.800	0.085	0.170
23	11.5	$\frac{27}{42} \times \frac{40}{28}$	0.385	0.770	0.082	0.164
24	12	$\frac{30}{34} \times \frac{32}{32}$	0.370	0.740	0.078	0.156
26	13	$\frac{32}{35} \times \frac{32}{36}$	0.340	0.680	0.072	0.144
28	14	$\frac{30}{27} \times \frac{34}{50}$	0.316	0.632	0.068	0.136
30	15	$\frac{35}{32} \times \frac{27}{42}$	0.295	0.590	0.062	0.124
32	16	$\frac{35}{34} \times \frac{27}{42}$	0.277	0.554	0.059	0.118
34	17	$\frac{32}{36} \times \frac{28}{40}$	0.260	0.520	0.055	0.110
36	18	$\frac{30}{34} \times \frac{28}{42}$	0.246	0.592	0.052	0.104
40	20	$\frac{30}{32} \times \frac{27}{48}$	0.221	0.442	0.047	0.094
48	24	$\frac{25}{32} \times \frac{27}{48}$	0.185	0.370	0.039	0.078
0.5	1	$\frac{28}{35} \times \frac{25}{48}$	0.175	0.350	0.037	0.074
0.6		$\frac{24}{36} \times \frac{30}{40}$	0.210	0.420	0.044	0.088
0.7		$\frac{28}{36} \times \frac{30}{40}$	0.244	0.488	0.052	0.104
0.75	1.5	$\frac{25}{40} \times \frac{32}{32}$	0.262	0.532	0.056	0.112
0.8		$\frac{28}{32} \times \frac{32}{42}$	0.280	0.560	0.060	0.120
1	2	$\frac{30}{32} \times \frac{32}{36}$	0.350	0.700	0.074	0.148
1.25	2.5	$\frac{30}{32} \times \frac{40}{36}$	0.436	0.872	0.093	0.186
1.5	3	$\frac{30}{36} \times \frac{42}{28}$	0.524	1.048	0.111	0.222
1.75	3.5	$\frac{35}{30} \times \frac{40}{32}$	0.612	1.224	0.130	0.260
2	4	$\frac{35}{30} \times \frac{40}{28}$	0.700	1.400	0.150	0.300

Drilling/milling head





Longitudinal feed direction and activation.



See the lever above the cooling fluid pump switch.

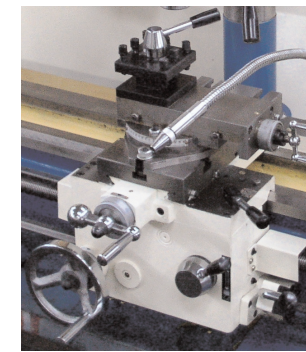
WARNING: The automatic feed is not equipped with end switch or a stopper. If the feed hits the end, it will damage the machine.



Shifting gears during drilling and milling operations.



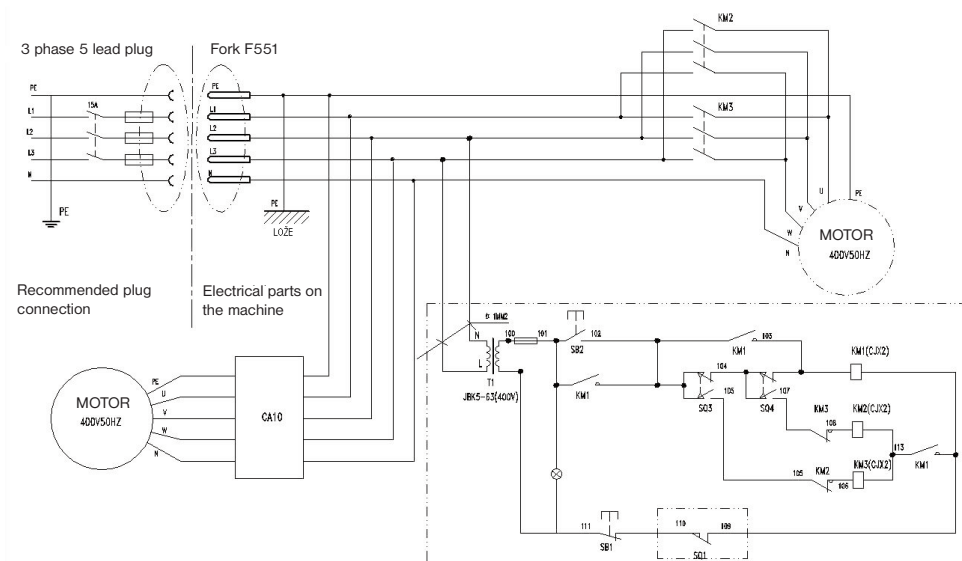
Vertical feed of the drilling/milling head
Rough - manual wheel (seen at the rear of the picture)
Fine - three-arm head



Knife holder with cross and longitudinal feed control

WARNING: The automatic feed is not equipped with end switch or a stopper. If the feed hits the end, it will damage the machine.

ELECTRICAL DRAWING CONNECTION



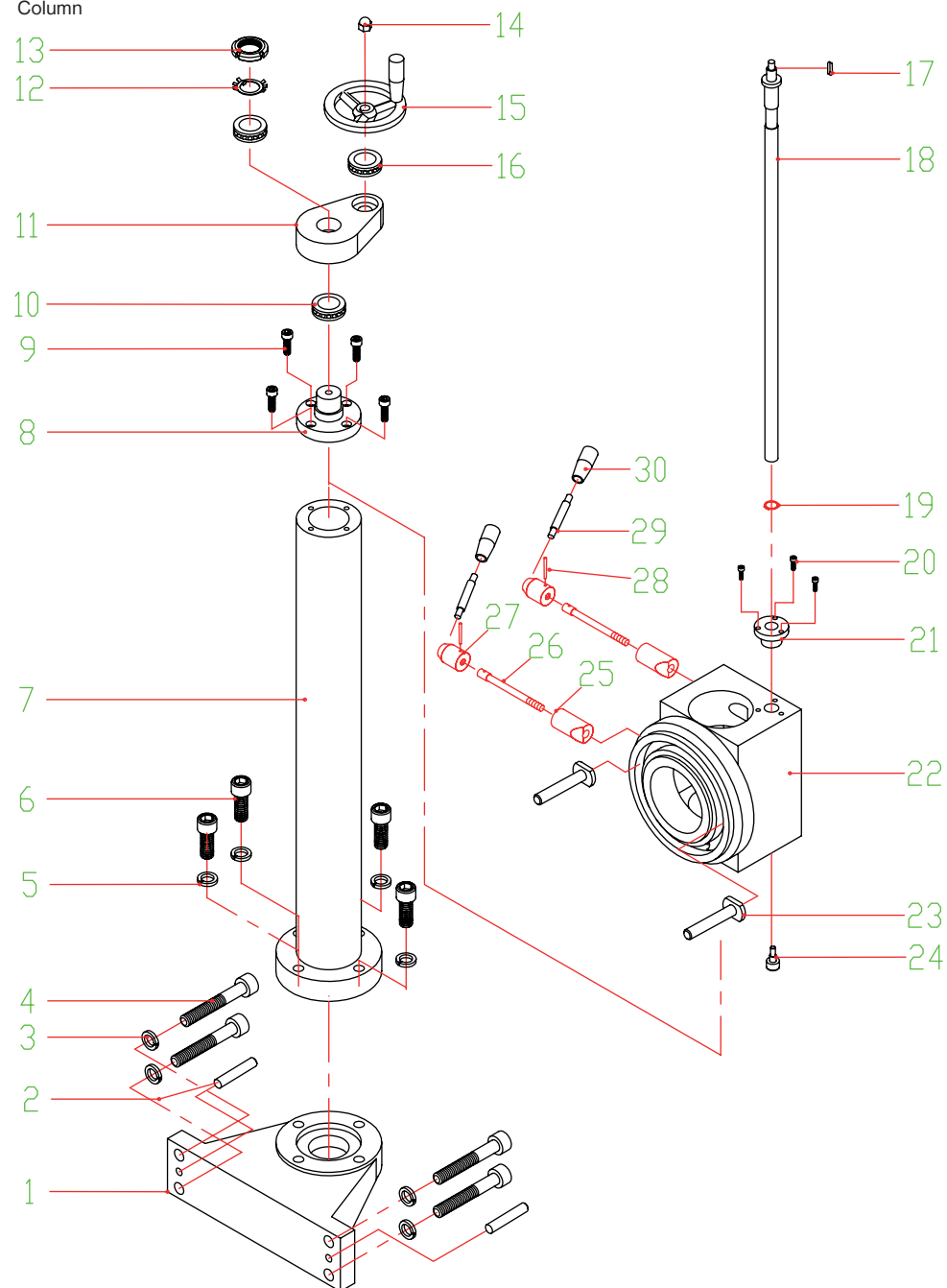
TROUBLESHOOTING

- Make sure that the work piece dimensions are within the specifications shown below.
- If you cannot switch the engine on and the power source is ok, check if the switch is working correctly. For example; check the transmission switch. First check the power plug fuse. Sometimes the defect is caused by the engine breakdown due to improper lubrication, overloads, not sufficient free play etc.

MAINTENANCE

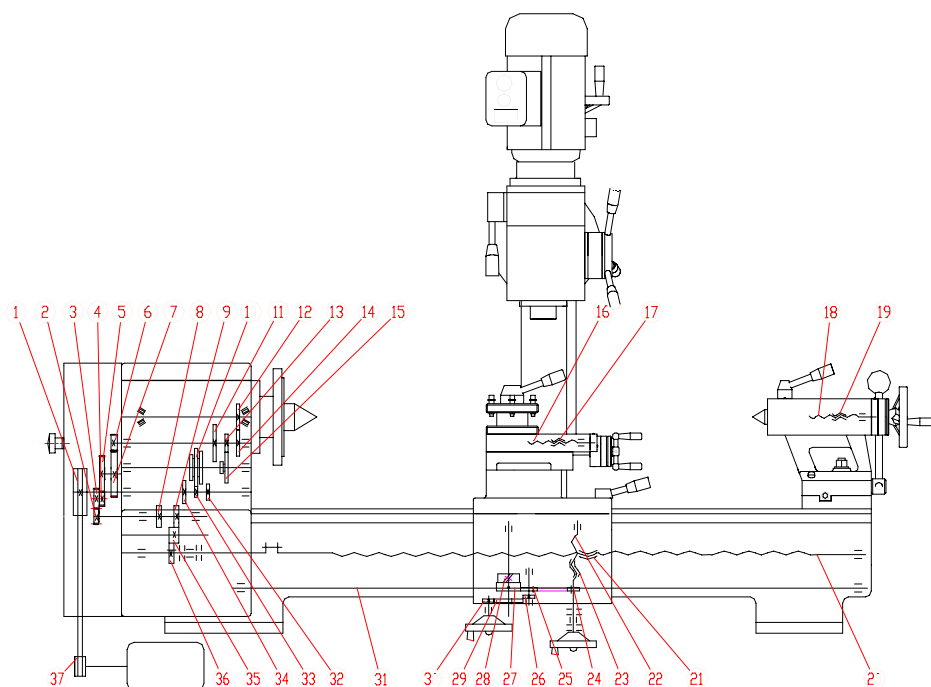
- Keep your tools clean. Dirt may enter the inner mechanism of your machine and cause damage.
- Do not use aggressive cleaning solution or paint thinners to clean the machine.
- Clean plastic parts with cloth dipped in soap water.
- Clean and lubricate metal surfaces with a cloth dipped in paraffin oil.
- If you are not using your machine, lubricate it with suitable grease and store it in a dry place to prevent corrosion.
- To lower friction in the dovetail groove of the small stand support, small steel pieces are placed inside the groove. They are correctly set at the factory. After certain time, the gap may get bigger or smaller. Set their position according to your requirements.

Column



DETAILED PART DRAWING

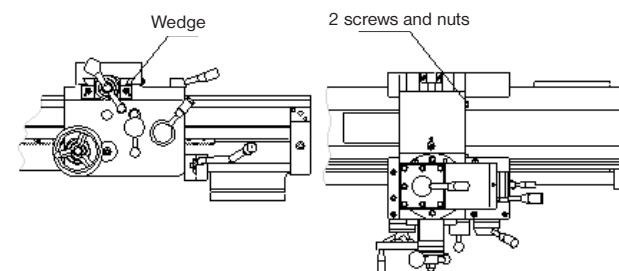
Drive train



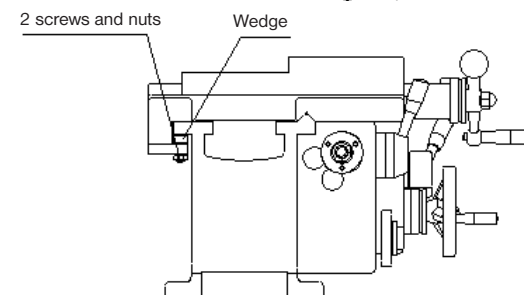
The power drive parts are marked as follows:

- | | |
|--------------------------------------|-----------------------------|
| 1. Driving pulley | 19. Tailstock nut |
| 2. Changeable toothed gear | 20. Longitudinal feed screw |
| 3. Changeable toothed gear | 21. Long divided nut |
| 4. Changeable toothed gear | 22. Cross guiding screw |
| 5. Changeable toothed gear | 23. Cross nut |
| 6. Driving toothed gear | 24. Toothed gear |
| 7. Toothed gear | 25. Toothed gear |
| 8. Toothed gear | 26. Toothed gear |
| 9. Toothed gear | 27. Worm gear |
| 10. Triple and moveable toothed gear | 28. Worm screw |
| 11. Toothed gear | 29. Toothed gear |
| 12. Shaft wheel | 30. Toothed gear |
| 13. Shaft wheel | 31. Toothed gear |
| 14. Toothed gear | 32. Toothed gear |
| 15. Double and moveable toothed gear | 33. Toothed gear |
| 16. Guiding screw of the knife head | 34. Moveable toothed gear |
| 17. Nut of the knife head | 35. Toothed gear |
| 18. Tailstock guiding screw | 36. Engine pulley |

Renewing the position of wedge number I



Renewing the position of wedge number II

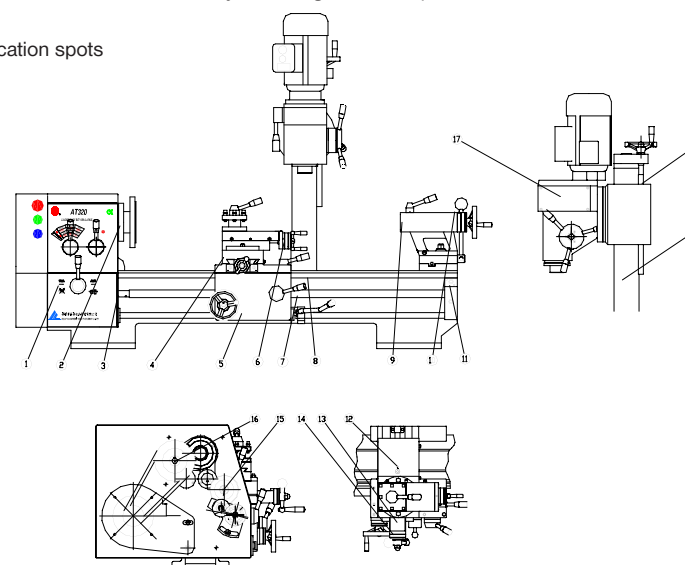


Lubrication

Lubricate working surfaces with suitable grease regularly.

- Make sure to lubricate your machine during operation. Pay special to guiding surfaces. Not enough oil on the column surface make cause severe damages.
- Recommendation: inspect your machine regularly. Have defects repaired in timely manner. That way you eliminate other damages that may be direct result of the damages that you did not paid attention to.
- The parameters of the vertical drilling/milling feed cannot be higher than the specified values. The best position is at 90° angle.
- Note: The contents of the manual may be changed without prior notification.

- List of lubrication spots



Position on picture 6	Lubrication spots	Location	Method of lubrication	Grease type	Lubrication period
1	Exchangeable toothed gears, shaft protection case	Left pedestal	Lubricate with pressurized oil	Machine oil	One year
2	Spindle shaft bearing (lathe)	Lathe spindle	Lubricate with grease	Lubrication grease	One year
3	Power drive bearing	Left pedestal	Lubricate with grease	Lubrication grease	One year
4	Dovetail guide, screw	Support	Lubricate with pressurized oil	Machine oil	Twice a day
5	Toothed gears, toothed rack	Drilling/milling spindle	Lubricate with grease	Lubrication grease	Once a month
6	Guiding screw of the knife head, surface guides	Knife head	Lubricate with pressurized oil	Machine oil	Twice a day
7	Longitudinal feed screw	Feed screw	Lubricate with pressurized oil	Machine oil	Twice a day
8	Bed/stand guide	Bed/stand	Lubricate with pressurized oil	Machine oil	Twice a day
9	Tip socket	Tailstock	Lubricate with pressurized oil	Machine oil	Twice a day
10	Bearing case	Tailstock	Lubricate with pressurized oil	Machine oil	Twice a day
11	Bearing contact surface	Bed/stand	Lubricate with pressurized oil	Machine oil	Twice a day
12	Cross nut, guiding screw	Small support	Lubricate with pressurized oil	Machine oil	Twice a day
13	Bearing case	Small support	Lubricate with pressurized oil	Machine oil	Twice a day
14	Power drive bearing	Guide screw housing	Lubricate with grease	Lubrication grease	Six times per year
15	Counter gear	Transmission	Lubricate with pressurized oil	Machine oil	Twice a day
16	Bearing	Driving pulley	Lubricate with grease	Lubrication grease	Once a day
17	Toothed gear	Drilling/milling spindle	Lubricate with grease	Lubrication grease	Once a year
18	Elevator guide screw, nut	Drilling/milling spindle	Lubricate with pressurized oil	Machine oil	Twice a day
19	Column	Drilling/milling spindle	Lubricate with pressurized oil	Machine oil	Once a day

Note:

- We recommend using lubrication grease with consistency number 3. Applies to the "Lubrication grease" in the chart.
- Use machine oil SAE 20. Applies to the "Machine oil" in the chart.
- All lubricated parts must be cleaned and lubricated. Follow the support oil changing periods. Refill the oil up to the marking.
- Follow the lubrication periods recommended in the chart.

DISPOSAL

- Used oils and cooling fluids must be disposed off in accordance with the applicable Waste management law.

When the operational life of your device is over, dispose off it in accordance with valid rules and regulations. Your product is made of metal and plastic parts that may be recycled when separated.

1. Disassemble all parts.
2. Separate all parts according to the material they are made of (e.g. metals, rubber, plastics, etc.). Take the separated parts to the recycling facility near you for further processing.
3. Electrical waste (used electrical power tools, electric motors, recharging equipment, electronics, accumulators, batteries etc.).

Dear customer. In accordance with the valid regional rules and regulations describing the management of electrical waste, electrical waste is considered dangerous. Disposal of electrical waste must be therefore handled as dangerous waste in accordance with waste management rules valid in the state you are in.

It is prohibited to mix electrical waste with regular household waste.

You may return your used electrical appliance to a recycling facility near you. More information about electrical and dangerous waste disposal may be obtained from your local authority or from the Internet.

CAUTION

If the machine breaks down, send it back to the vendor for quick repair.

Please, enclose brief description of the defect. That makes repair easier. If the machine is still covered by warranty, enclose the warranty card and proof of purchase receipt. After the warranty period expires, we repair your machine for a special price.

To prevent possible damages during shipping, packed the machine carefully or use the original packaging material. We are not liable for shipping damages due to incorrect packaging of your machine. If making a claim at the shipping company the level and method of packaging plays a major role during claim evaluation process.

Note: Pictures and contents in this manual may slightly differ from the actual product or accessories. It is due to continuous improvement of our products. Such small differences have no effect on the product functionality.