Centurion 3 in 1 Machine

Operation Manual

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Introduction

Chester UK Limited is a specialist company that has been supplying the machine tool industry for over 15 years. The Chester UK Head Office comprises of a 30,500-sq.ft factory complete with offices and a showroom. Specialising in conventional machine tools, Chester has built a reputation for quality and reliability, which is highly regarded in the machine tool industry and the model engineering market.

There are several divisions within the company; Export, Education, Model Engineering & UK Sales, all with dedicated sales personnel who are trained to answer your questions.

When buying from Chester you can be assured of a complete back-up service with mechanical and electrical engineers that are available to give advice if required.

Stock is a large part of any business and Chester have always invested substantially in building a large quantity of machines and spares, ready to satisfy customer requirements. Chester UK has one of the largest stocks of conventional new machines and accessories within Great Britain. Please take time to visit our website: www.chesteruk.net

Health & Safety

As with all machinery there are certain hazards involved with the operation and use of the lathe. Using the machine with respect and caution will considerably lessen the possibility of person injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.
This machine was designed for certain applications only. We strongly recommend that the machine is not modified, and / or used for any application other than which it was designed. **If you have any questions relative to its application do not use the machine, until you have first been in contact with Chester UK.**
The lathe may not arrive with a power socket or plug. In the event of this happening, please inform Chester UK on Tel: (01244) 531 631.

Safety rules for all tools

User

1. **Wear correct apparel**
   No loose clothing, gloves, rings, bracelets or other jewellery to get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
2. **Always wear eye protection**
   Refer to ANSLZ87.1 standard for appropriate recommendations. Also use face and / or a dust mask if the cutting operation is dusty.
3. **Don't overreach**
   Keep a proper footing and balance at all times.
4. **Never stand on a tool**
   Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.
5. **Never leave the tool running unattended**
   Turn power off. Leave tool until it comes to a complete stop.
6. **Drugs, alcohol and medication**
   Do not operate the tool while under the influence of drugs, alcohol or any medication.
7. **Make sure the tool is disconnected from the power supply**
   While motor is being mounted, connected or reconnected.
8. **Always**
   Keep hands and fingers away from any moving parts.
9. **Stop**
   The machine before moving chips.
10. **Shut-off**
    Power and clean the lathe and work area before leaving the machine.

Use of the machine

1. **Remove adjusting keys and wrenches**
   Form a habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it 'on'.
2. **Don't force the tool**
   It will do the job better and be safer at the rate for which it was designed.
3. **Use the right tool**
   Don't force the tool or attachment to do a job for which it was not designed.
4. **Secure work**
   Use clamps or a vice to hold work when practical. It's safer than using your hands, and frees both to operate the machine.
5. **Maintain tools in top condition**
   Keep tools sharp and clean for the best and safest performance. Follow instructions for lubricating and changing accessories.
6. **Use recommended accessories**
   Consult Chester UK for recommended accessories. The use of improper accessories may cause hazards.

7. **Avoid accidental starting**
Make sure the switch is in the **'OFF'** position before plugging in power cord.

8. **Stop**
The machine before putting material in the vice.

9. **Always**
Have stock firmly clamped in the vice before starting the cut.

10. **Ground all tools**
If the tool is equipped with a three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter plug must be attached to a known ground. Never remove the third prong.

Adjustment

Make all adjustments with the power off. When assembling follow the manuals instructions, this will ensure correct instruction and a safe structure.

Working environment

1. **Keep the work area clean**
Cluttered areas and benches invite accidents.

2. **Don't use in a dangerous environment**
Don't use power tools in damp or wet locations, or expose to rain. Keep the work area well lit.

3. **Keep children etc at a safe distance.**
All children etc should be kept at a safe distance from the work area.

4. **Don't**
Install & use this machine in an explosive dangerous environment.

Maintenance

1. **Disconnect**
Machine from the power source when making repairs.

2. **Check damaged parts**
Before further use of the tool, a guard or other part that is damaged should be carefully checked to ensure that it would operate properly and perform its intended function check for alignment of moving parts, binding of moving parts, breakage of parts, mounting and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

3. **Disconnect tools**
Before servicing and when changing accessories such as blades bits, cutters, etc.

4. **To prevent**
The corrosion of machined surfaces when a soluble is used as coolant, pay particular attention to wiping dry the surfaces where fluid accumulates and does not evaporate quickly, such as between the machine bed and vice.

Safety Device

1. Interlock switch on pulley cover. As soon as the pulley cover is open, the machine will come to a stop with the function of this switch. Do not remove this switch from the machine for any reason, and check it's function frequently.

2. Interlock switch on cutting area. As soon as the pulley cover is open, the machine will come to a stop with the function of this switch. Do not remove this switch from the machine for any reason, and check it's function frequently.

Transportation & Installation

Unpacking

The crate should be removed carefully – DO NOT remove the skids until the lathe has been positioned in its working location.

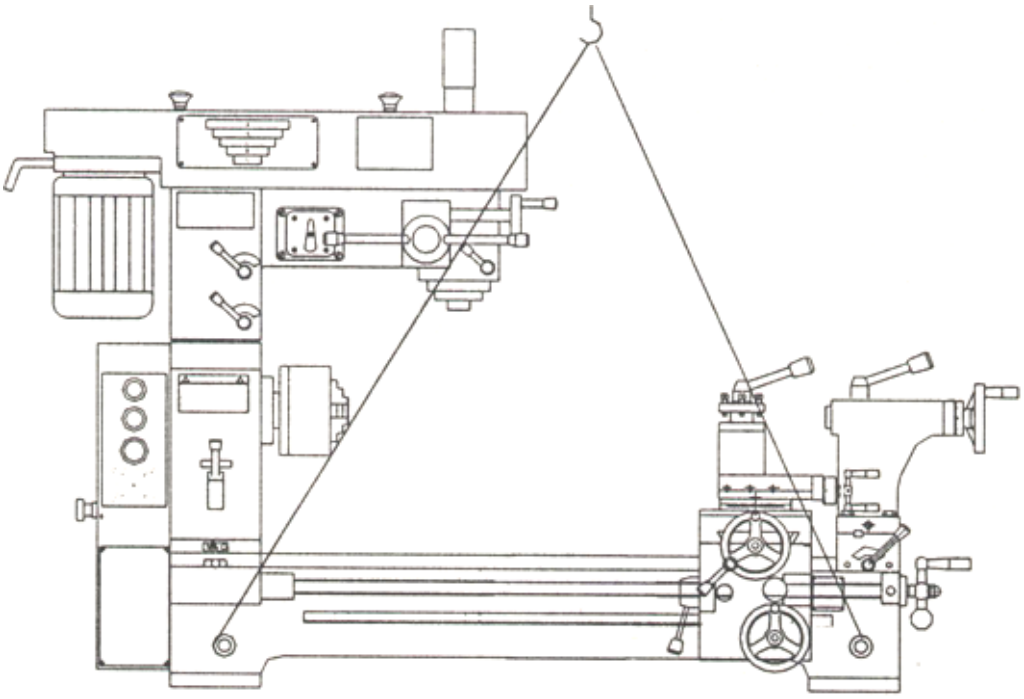
After un-packing, inspect the machine carefully. In the event of shortages or damaged parts, notify the supplier immediately giving a clear indication as to which parts are damaged / missing.

Lifting The Machine

In order to maintain a balanced condition before lifting, it is necessary to move the tailstock to the right hand end of the bed and secure it. Ensure the bed ways are clean before moving the carriage or tailstock. (see section on "Cleaning The Machine").

Handling the machine after un-packing must be done by a lifting device i.e. crane of adequate capacity and well in excess of the weight of the machine for safety reasons. Ensure the correct method of hoisting is in accordance with the equipment's construction and geographical features of the plant. Chain, wire cable or rope may be used to lift the machine, but using a wooden block must protect the finished surfaces of the machine.

Make sure the load is well balanced and that the chain / wire cable or rope, does not touch the leadscrew or control rod before lifting.



Do not stand under the suspended machine.

Cleaning The Machine

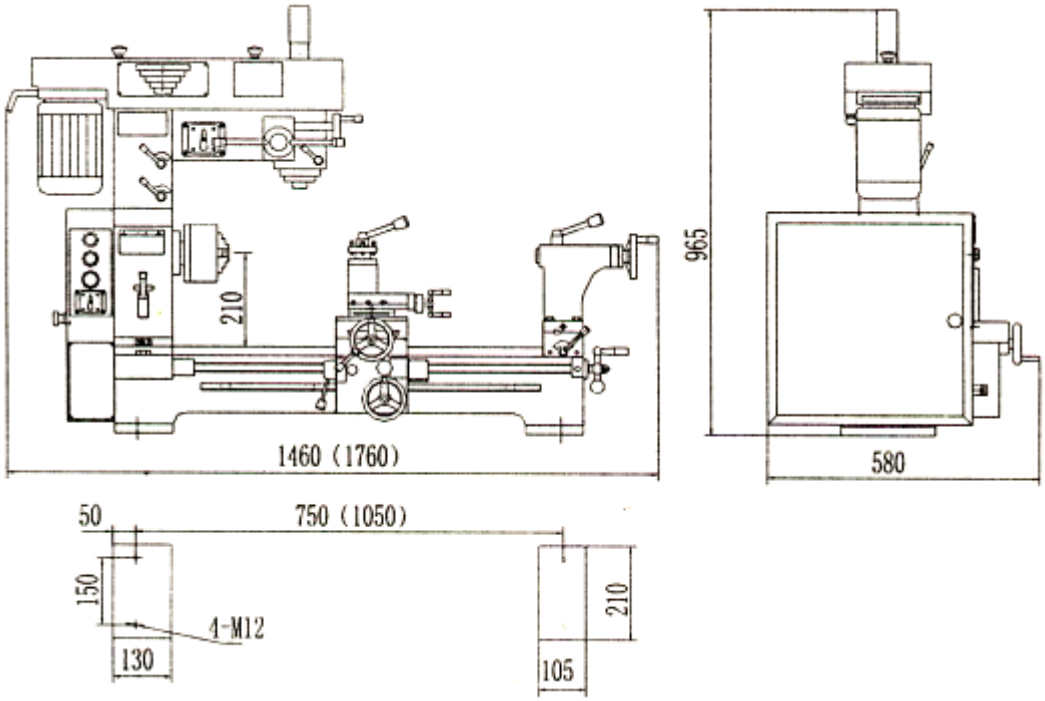
Do not move the carriage or tailstock on the Bedways before thoroughly cleaning and oiling the ways. A good clean grease solvent is recommended to remove the slushing compound and dirt accumulated in transit. Do not use an air hose, as this will force the grit and dirt into important functions of the machine. Use a stiff bristle brush to clean the leadscrew thoroughly. When the machine has been cleaned, apply clean machine oil over all ways and ensure no grit remains.

Before moving the carriage on the bed, remove the filler plug on the top of the carriage and fill the apron with the correct oil as recommended in the 'Lubrication' Section. Oil the carriageways on the bed and move the carriage to balance the load. Also, check the end gearing for correct meshing of gears.

Locating The Machine

The machine must be installed and suitably positioned on well-prepared foundations in order to ensure reliable operation and high accuracy. It is important that the area is well lit, as dry as possible and free from vibration. It should be located so that adequate space is provided for utilisation of maximum ranges together with maintenance. It is recommended that 28 inches clearance be provided at the ends and rear of the machine, with at least 40 inches at the front for the operator.

General Dimension

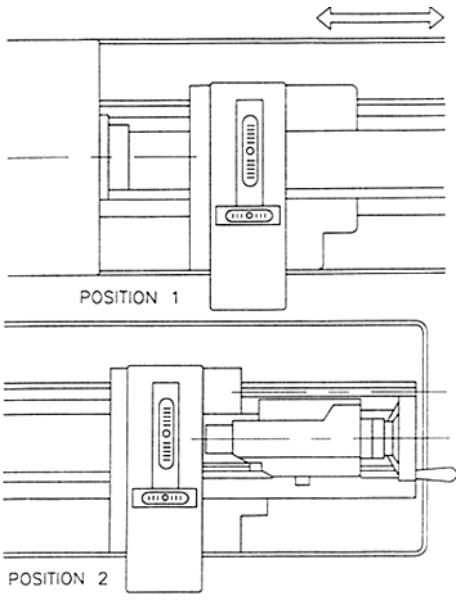


Foundation

A substantial concrete foundation is recommended for this machine. If it is located on a wooden floor, ensure that it is adequately supported and free from vibration. If it is to be located on an upper floor, position it directly over a supporting beam or girder to reduce any vibration generated from nearby machinery.

Levelling The Machine

Use a precision level graduated to at least 0.001 inch per foot. The levelling procedure is carried out two stages. The first being the preliminary levelling and the second the final levelling. The preliminary levelling is to remove any pronounced twist in the bed and adjust the screws under the headstock until the reading is zero. Move the level to the tailstock and adjust the screws until the reading is zero. Re-check and carry out any minor adjustments necessary with the level at each of the above positions.



For final levelling, place the level lengthways on the front flat way, close the headstock end and adjust the screws under the headstock end leg until the reading is zero, at the same time, check with the level across the top of the Bedways to ensure that these adjustments do not cause a twist in the bed. Place the level lengthways on the front flat way close to the tailstock and repeat the operations above. Also, check with the level across the vee ways to eliminate any twist.

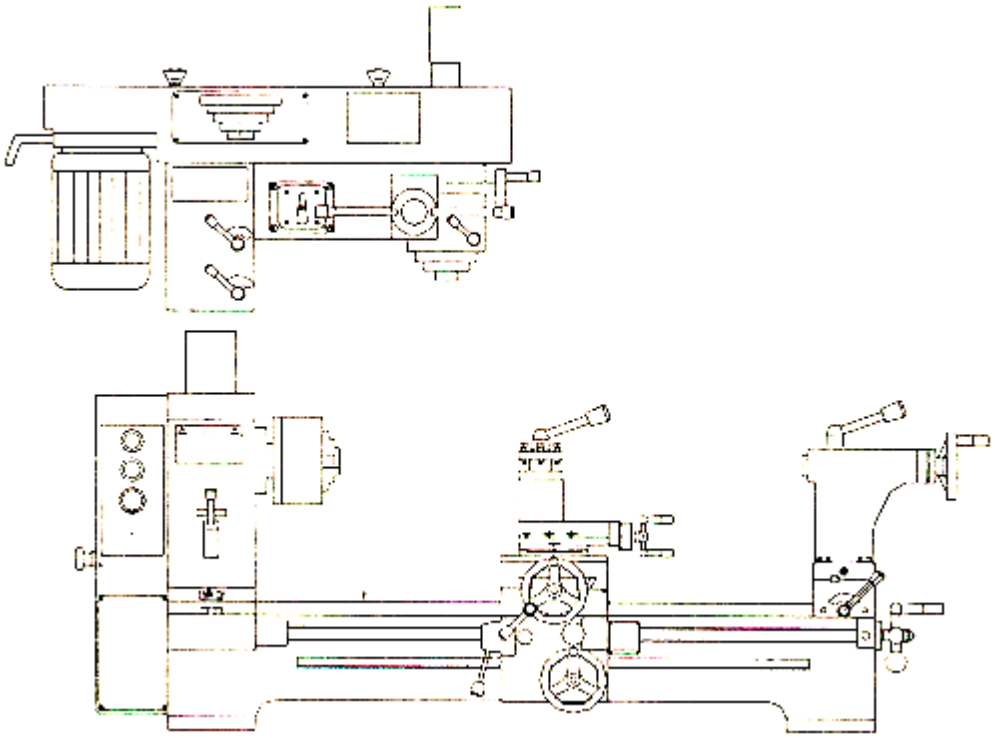
Repeat the operations and make whatever minor adjustments are required.

The next procedure is to level the machine cross ways by placing the level across the carriage wings and moving the carriage from one end of the bed to the other without disturbing the position of the level. If the level shows any variation throughout its travel, the screws nearest the point where the variation occurs should be rested or lowered to bring back to zero.

Any adjustments made to render the machine level in one direction, may affect the level of the machine in the other direction and it is only a combination of adjustments that will bring the machine into the correct level.

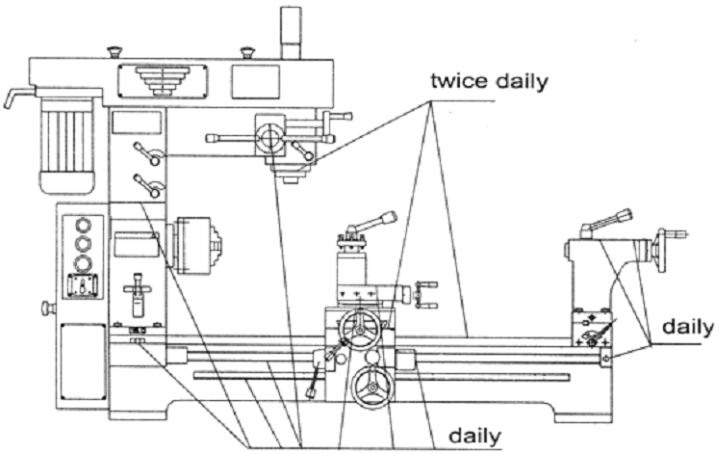
During the first week of operation or until the foundation has set, the level of the machine should be checked frequently. Periodic checks should be made at six monthly intervals.

Installation Of The Drilling & Milling Head



Firstly, clean the connecting parts of the machine, then place the head on, fit the brake nut, lever, cork etc and your done.

Lubrication



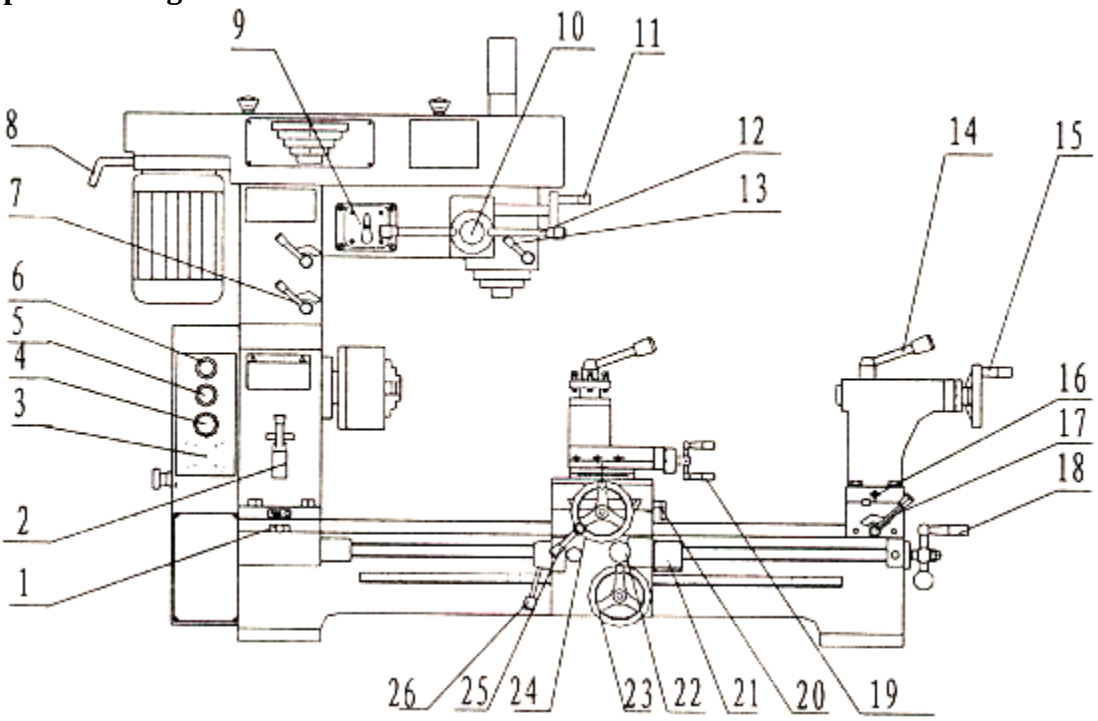
Lubricate according to the points in the diagram. The drive bearings should be lubricated with grease regularly, with a good clean once a year. The gears in the headstock should be lubricated with oil (contact Chester UK), level according to the oil gauge.
Change the oil in the headstock regularly, the first time after a period of about half a month, second after 45 days and from then on about once each half year.

Machine Specification

	500	800
Centre Height	210mm	210mm
Maximum Swing	420mm	420mm
Swing Over Cross Slide	160mm	160mm
Distance Between Centres	520mm	800mm
Width Of Bed	139mm	139mm
Longitudinal Travel	510mm	790mm
Spindle Bore	28mm	28mm
Spindle Taper	MT4	MT4
Number Of Speeds For Lathe	7	7
Range Of Speeds	160-1360rpm	160-1360rpm
Metric Thread Steps	0.2-67mm in 22 Steps	0.2-67mm in 22 Steps
Imperial Thread	4-120tpi in 38 Steps	4-120tpi in 38 Steps
Automatic Feeds	0.05-0.35 in 12 Steps	0.05-0.35 in 12 Steps
Tailstock Taper	MT3	MT3
Tailstock Quill Travel	80mm	80mm
Compound Slide Travel	80mm	80mm
Crosslide Travel	200mm	200mm
Mill Head Spindle Taper	MT3	MT3
Mill Head Quill Travel	110mm	110mm
Distance Between Spindle & Table	306mm	306mm
Maximum Distance Spindle To Column	285mm	285mm
Mill Head Spindle Speeds	16	16
Range Of Speeds	120-3000rpm	120-3000rpm
Milling Table Size	475x160mm	475x160mm
Drilling Capacity	25mm	25mm
End Mill Capacity	28mm	28mm
Fly Cutter Capacity	80mm	80mm
Lathe Motor	3/4hp	3/4hp
Milling Power	3/4hp	3/4hp
Power Supply	240volt	240volt
Net Weight	250kgs	300kgs
Dimensions	1270x690x955mm	1570x480x955mm

Operation

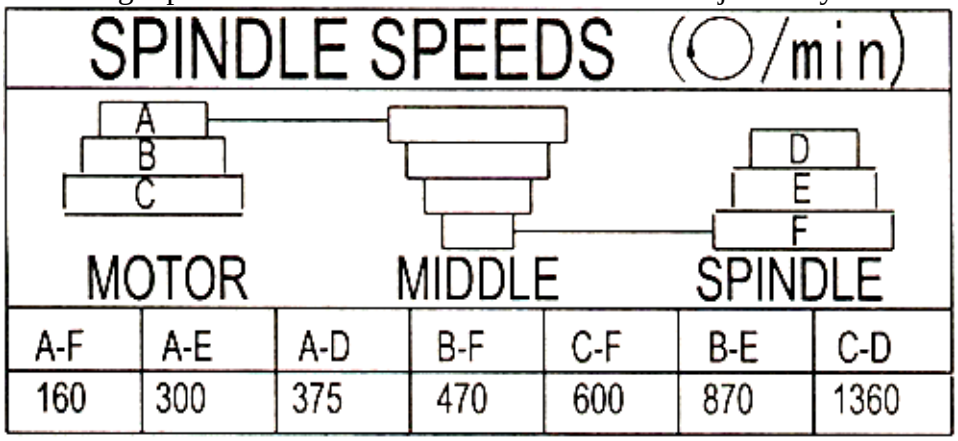
Principal Components Diagram



1. Lead Screw Clutch Handle	**2.** Change Lever	**3.** Shift Switch
4. Emergency Switch	**5.** Start Switch	**6.** Pilot
7. Locking Lever	**8.** Belt Tension Lever	**9.** Drilling-Milling Shift Switch
10. Micro Feed Clutch Lever	**11.** Micro Feed Handle	**12.** Spindle Locking Lever
13. Spindle Feed Lever	**14.** Tailstock Barrel Lock	**15.** Tailstock Handwheel
16. Rest Screw	**17.** Tailstock Locking Lever	**18.** Longitudinal Feed Handle
19. Toolpost Feed Handwheel	**20.** Slide Lock Lever	**21.** Threading Dial
22. Longitudinal Cross-Feed Clutch Handle	**23.** Longitudinal Feed Handwheel	**24.** Cross Feed Handwheel
25. Saddle Lock Lever	**26.** Half Nut Lever	

Main Spindle Driving

Before starting the machine, a check on the tension of the belt should be made. The belt should be depress about 10mm under normal finger pressure. The tension of the belts can be adjusted by lever 8.



A-F	A-E	A-D	B-F	C-F	B-E	C-D
160	300	375	470	600	870	1360

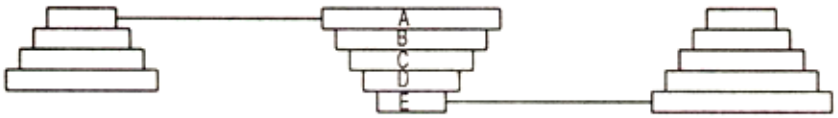
The main spindle running; stop, forward and reverse function can be realized by the shift switch 3. If you need to change the direction of rotation, turn the shift switch to the middle position, wait a moment, then switch to the required direction.

By loosening the lock lever, the belt position on the tower pulley can be changed. Re-tighten the belt and then proceed at the next speed.

Drilling-Milling Spindle Driving

Firstly, make sure all the guards are in place, and then push the start switch to turn on the machine. The pilot light will indicate that the machine is on. Shift switch 9 will turn the machine in either a forward or reverse motion.

THE DRILLING-MILLING UNIT SPEEDS (○/min)



— A	— B	—A	—C	—A	— D	— B	—A
E —	E —	D —	E —	C —	E —	D —	B —
125	200	310	350	400	450	530	600
— B	— C	— B	— D	— C	— D	— C	— D
C —	D —	A —	C —	B —	B —	A —	A —
660	900	1380	1450	1670	2140	2350	3000

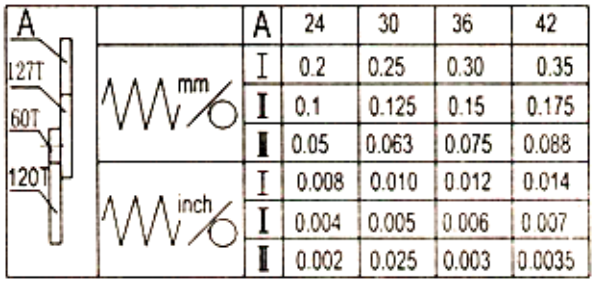
Drilling milling spindle feeding can be changed by lever 13. If a micro feed is needed, pull out the drilling-milling clutch lever 10, and then operate lever 11 for the micro feed.

The speed of the drilling-milling spindle can be adjusted via lever 8. Push the lever backwards (this will loosen the belt), then change the belt position on the pulley to the desired speed, push the lever forwards (to tighten the belt). Finally, lock lever 8. This process can be used to achieve 16 different speeds.

Longitudinal Feed

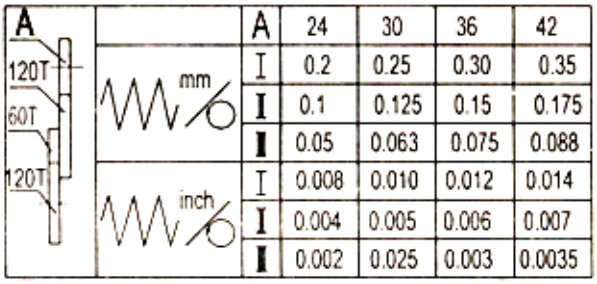
Hand Feeding: Turn the clutch handle (1) to the middle position, half-nut lever (26) in disengaged position, turn the hand wheel (23), now longitudinal hand feeding can be achieved.

Automatic Feeding: The half-nut lever (26) in engaged position, longitudinal-cross feed clutch handle (22) in inner position. Now cross auto-feeding can be made. By changing the handle (2) position and gear A, B, C, D, 12 kinds of automatic feed amount can be obtained as follows.



A	24	30	36	42
I	0.2	0.25	0.30	0.35
II	0.1	0.125	0.15	0.175
III	0.05	0.063	0.075	0.088
I	0.008	0.010	0.012	0.014
II	0.004	0.005	0.006	0.007
III	0.002	0.025	0.003	0.0035

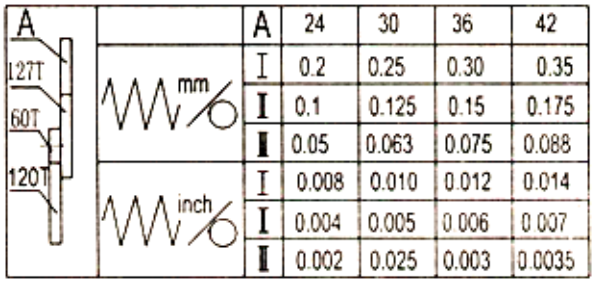
Imperial



A	24	30	36	42
I	0.2	0.25	0.30	0.35
II	0.1	0.125	0.15	0.175
III	0.05	0.063	0.075	0.088
I	0.008	0.010	0.012	0.014
II	0.004	0.005	0.006	0.007
III	0.002	0.025	0.003	0.0035

Metric

Cross Feeding



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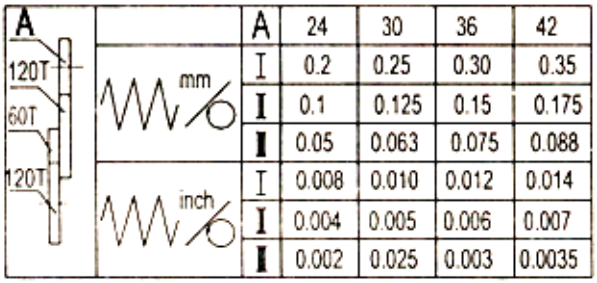
Imperial



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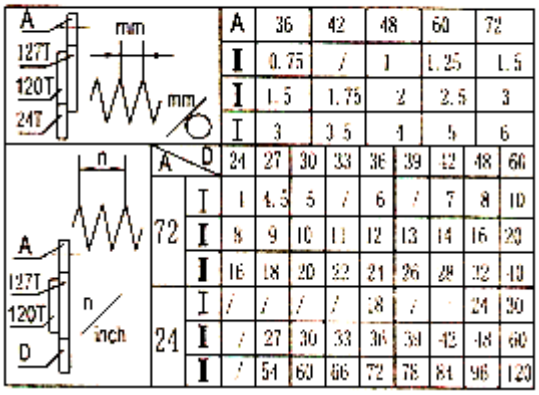
I	0.1	0.125	0.15	0.175
I	0.05	0.063	0.075	0.088
I	0.008	0.010	0.012	0.014
I	0.004	0.005	0.006	0.007
I	0.002	0.025	0.003	0.0035

Metric

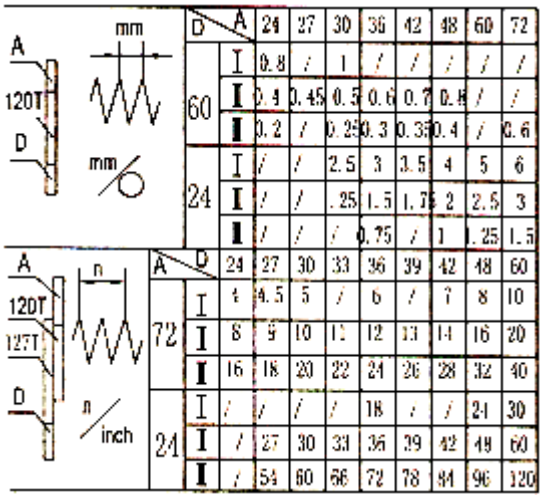
Hand feeding can be accomplished by operating hand wheel 24, where as automatic feeding can be engaged as follows.
Engage half nut lever 26 in the engaged position, pull out the longitudinal-cross feed clutch handle 22, you can now cross automatic feed.
By changing handle 2 and gear A, B, C, D, 12 kinds of automatic can be obtained as above.

Thread Cutting



A	36	42	48	60	72
I	0.75	/	1	1.25	1.5
I	1.5	1.75	2	2.5	3
I	3	3.5	4	5	6

A \ D	24	27	30	33	36	39	42	48	60
72 I	4	4.5	5	/	6	/	7	8	10
72 I	8	9	10	11	12	13	14	16	20
72 I	16	18	20	22	24	26	28	32	40
24 I	/	/	/	/	18	/	/	24	30
24 I	/	27	30	33	36	39	42	48	60
24 I	/	54	60	66	72	78	84	96	120



D \ A	24	27	30	36	42	48	60	72
60 I	0.8	/	1	/	/	/	/	/
60 I	0.4	0.45	0.5	0.6	0.7	0.8	/	/
60 I	0.2	/	0.25	0.3	0.35	0.4	/	0.6
24 I	/	/	2.5	3	3.5	4	5	6
24 I	/	/	.25	1.5	1.75	2	2.5	3
24 I	/	/	/	0.75	/	1	1.25	1.5

A \ D	24	27	30	33	36	39	42	48	60
72 I	4	4.5	5	/	6	/	7	8	10
72 I	8	9	10	11	12	13	14	16	20
72 I	16	18	20	22	24	26	28	32	40
24 I	/	/	/	/	18	/	/	24	30
24 I	/	27	30	33	36	39	42	48	60
24 I	/	54	60	66	72	78	84	96	120

Run the main spindle at a low speed, engage lever 1 in the left position. Now refer to the chart for the correct set up for the thread that you wish to cut, adjust gearshift lever 2 to the appropriate position. Now thread cutting can begin. Altering the set up ie by changing the positions of Lever 2 and gears A, B, C, and D can cut different threads.

Tailstock

The tailstock moves up and down the bed freely and can be locked into place via lock lever 17. The tailstock barrel position can be adjusted by turning the tail stock hand wheel 15, and locked by lever 14.
Before leaving the factory the tailstock is aligned with the tailstock centre and the spindle centre. If you need to use the tailstock centre to cut small tapers, you should loosen the screw, adjust the two reset screws (16) to make the deviation between spindle centre and tailstock centre.
When finished, follow the above instructions to reset the tailstock to its original position. When the tailstock is used to external cut and you get a taper, adjust the reset screw 16 as above to eliminate the taper.

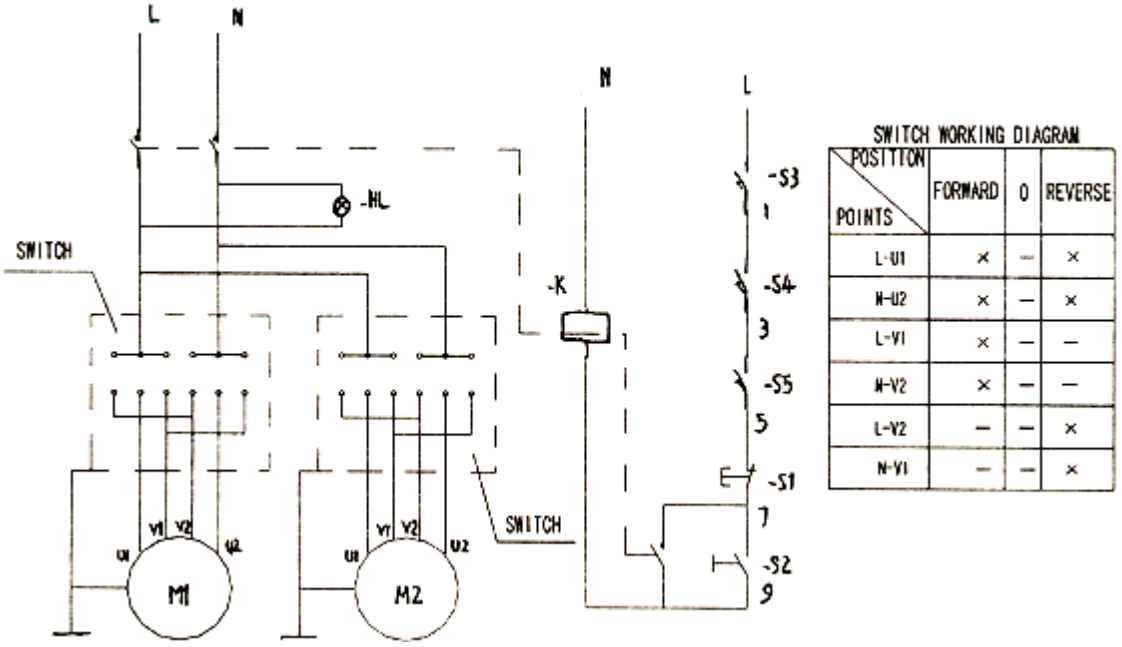
Electrical System

Composition

The system consists of alternating current contactor (-K), red emergency button (-SI), green (-S2), pilot (-HL), micro switch (-S3,-S4,-S5), shift switch, etc. the system has the protection of lose-voltage, and cutting off the current when the cover is opened.

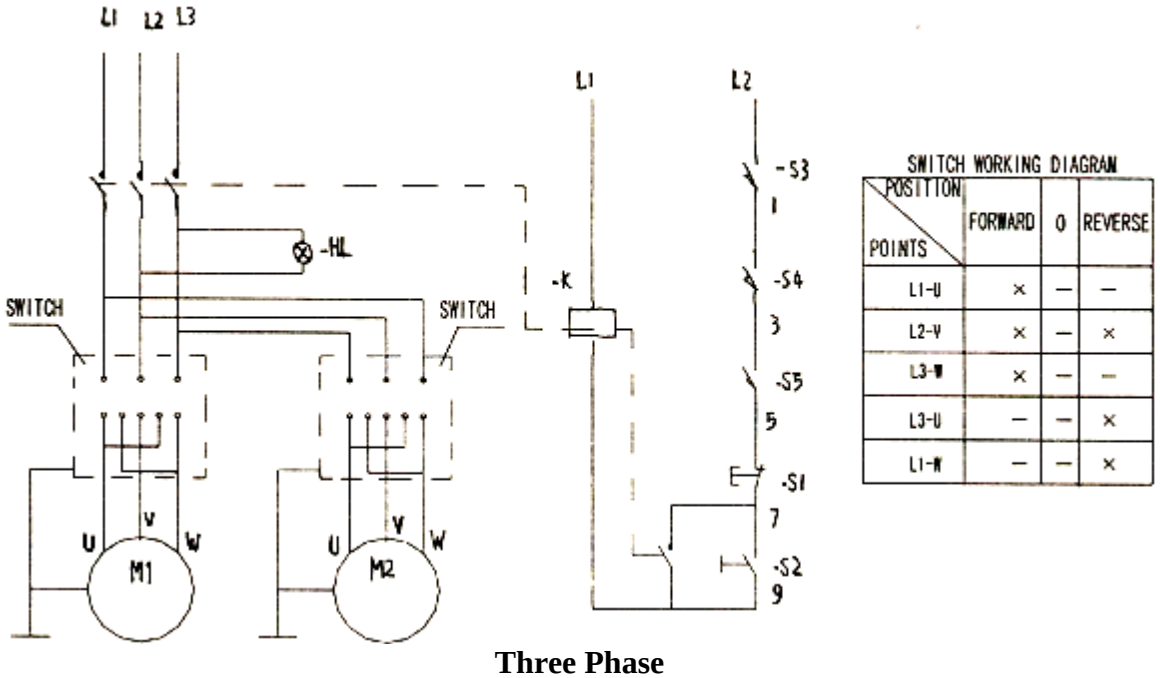
Operation

When you have finished your job on the lathe, close the entire protection instrument; return the red button to the original position. Now you can push the green button, the pilot light will now come on (this shows that the alternating contactor has been put through the main circuit) and the machine is now ready to use again.
Pushing the red emergency button will cause the alternating contactor to break down, this shut down the entire machine. Another way of accomplishing this would be to open the doors for the machine, or lifting the guard up.



POSITTON / POINTS	FORWARD	0	REVERSE
L-U1	×	—	×
N-U2	×	—	×
L-V1	×	—	—
N-V2	×	—	—
L-V2	—	—	×
N-V1	—	—	×

Single Phase



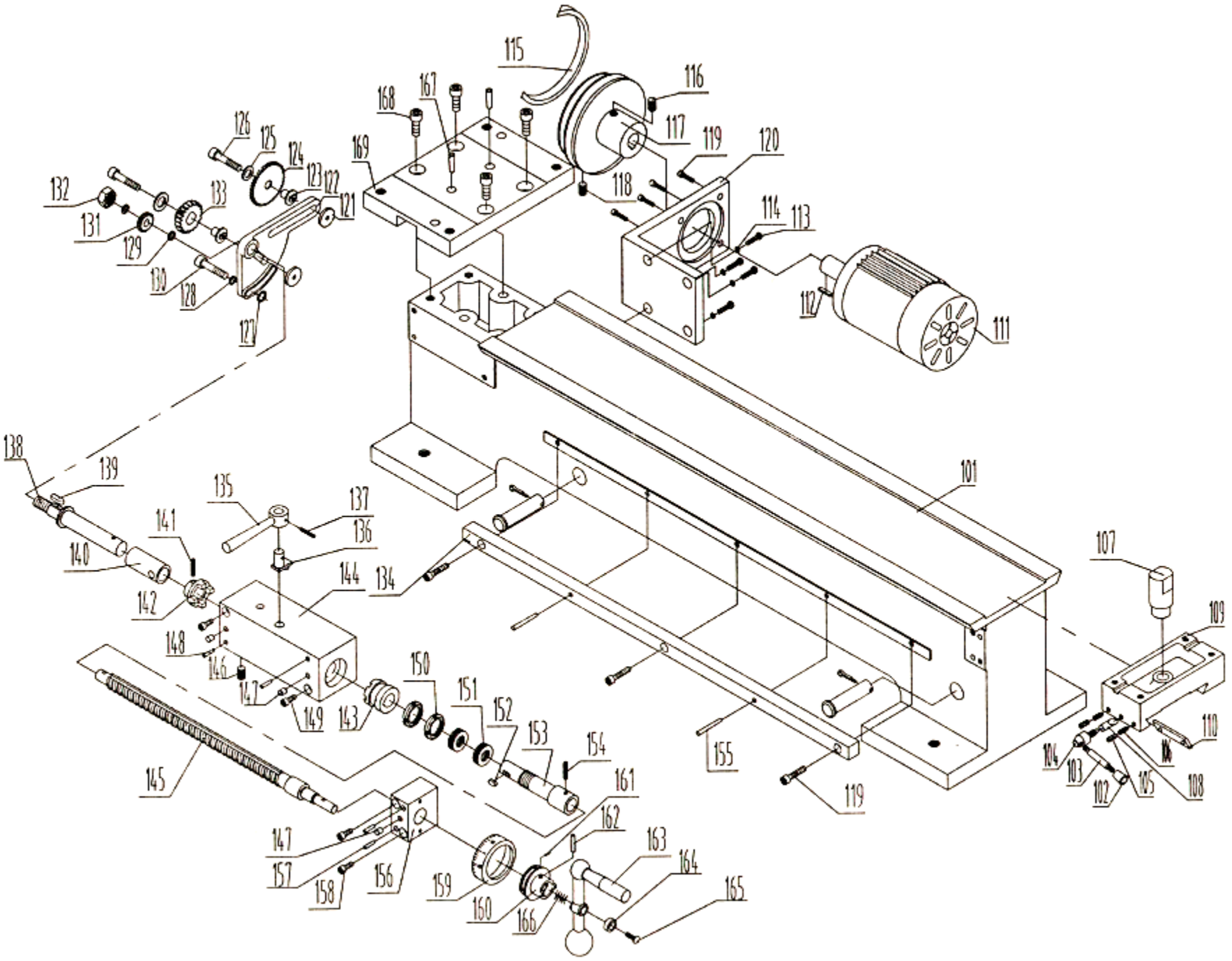
POSITTON / POINTS	FORWARD	0	REVERSE
L1-U	×	—	—
L2-V	×	—	×
L3-W	×	—	—
L3-U	—	—	×
L1-W	—	—	×

Three Phase

Specification Of Fuse

VOLTAGE	SINGLE PHASE	THREE PHASE
110V	30A	
220V	20A	10A
380V		7.5A

PARTS LISTS AND DIAGRAMS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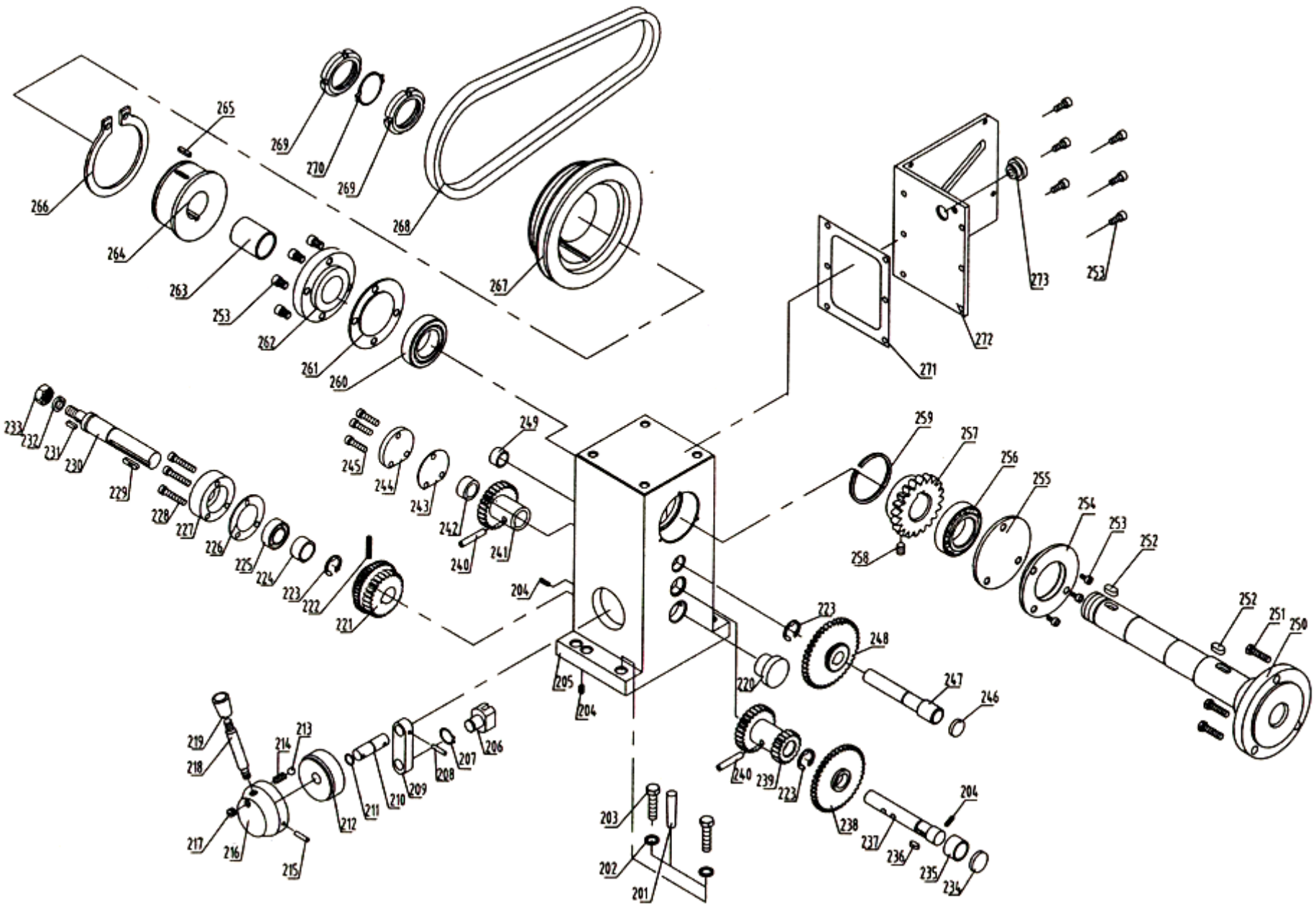
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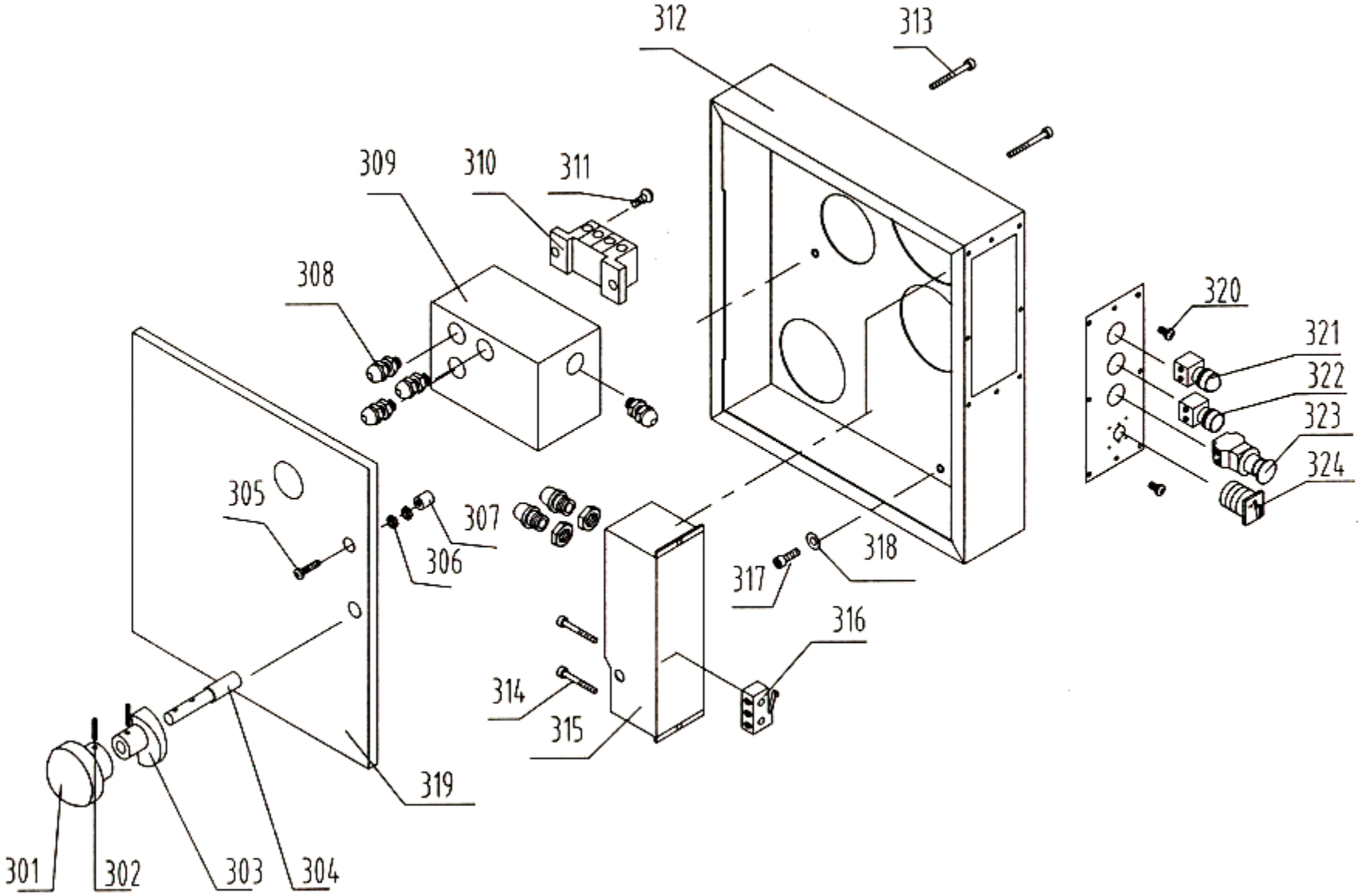
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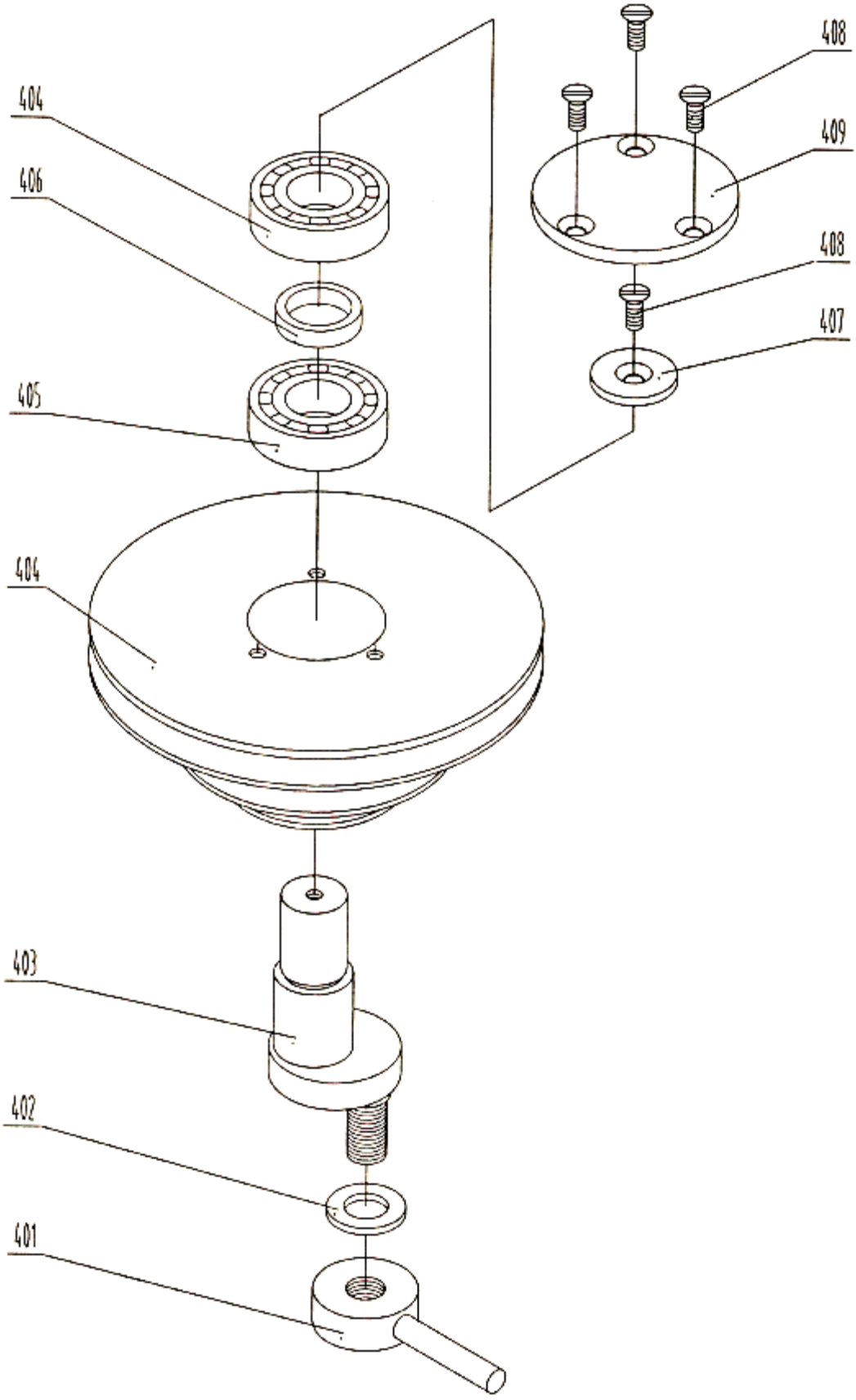
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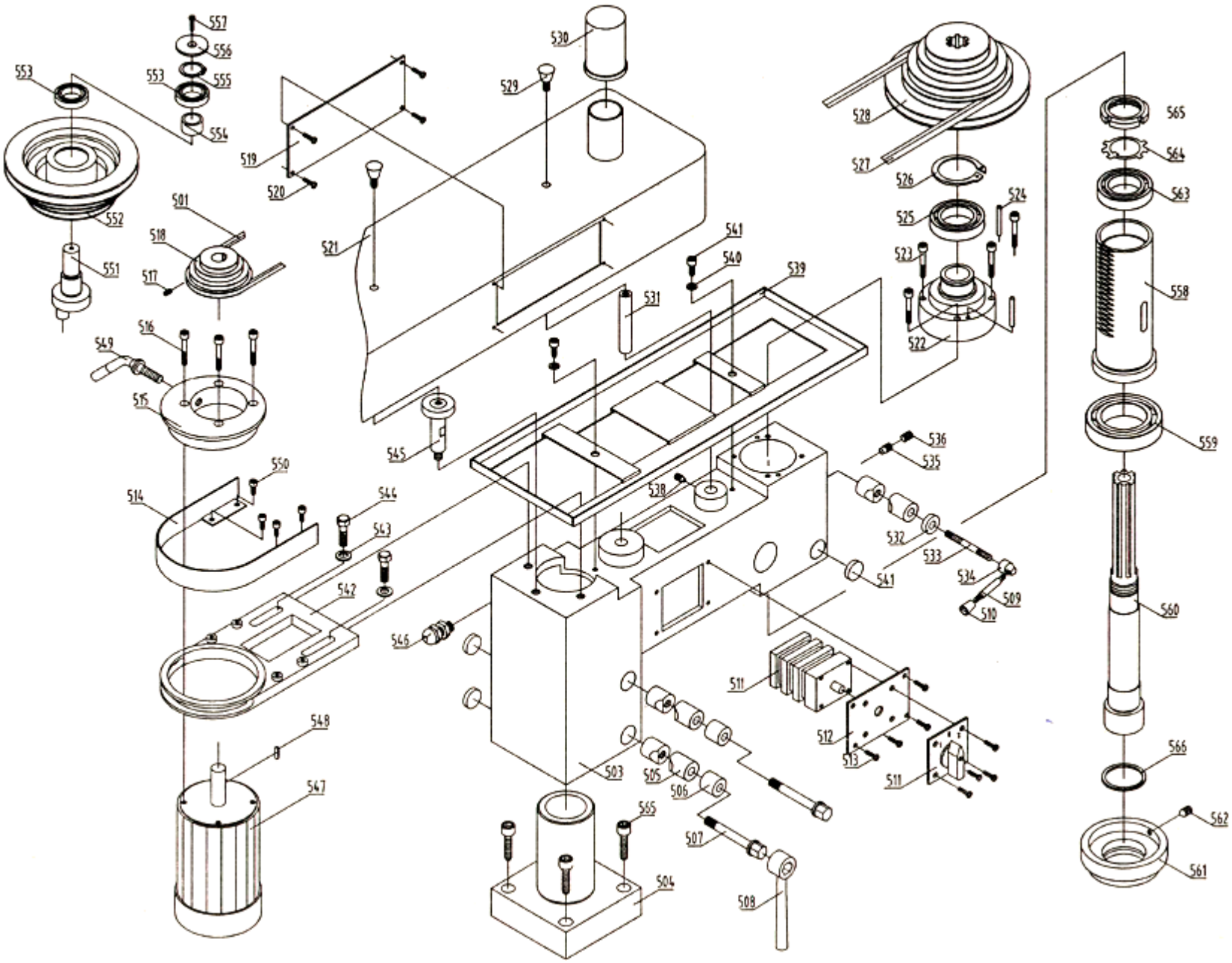
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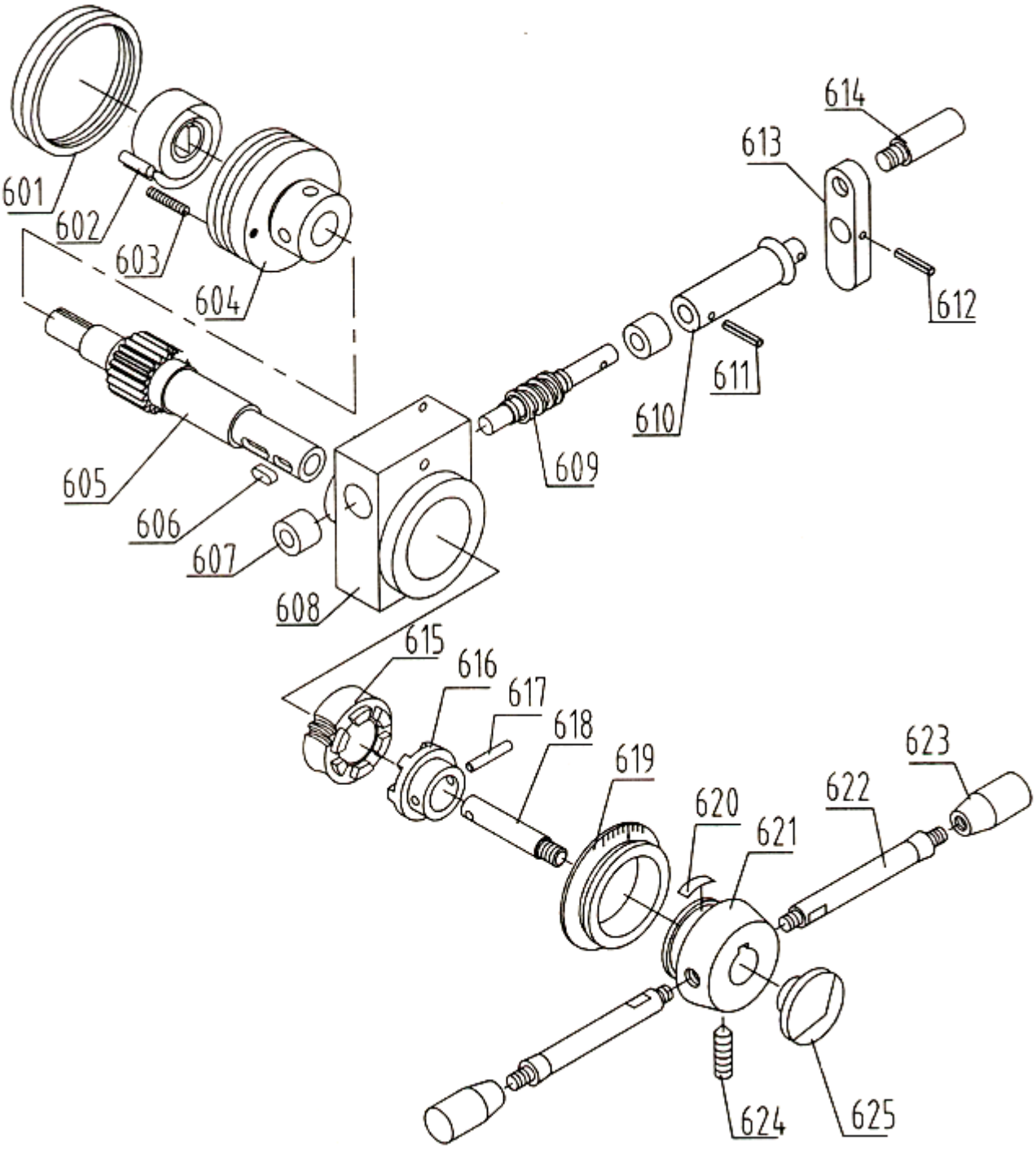
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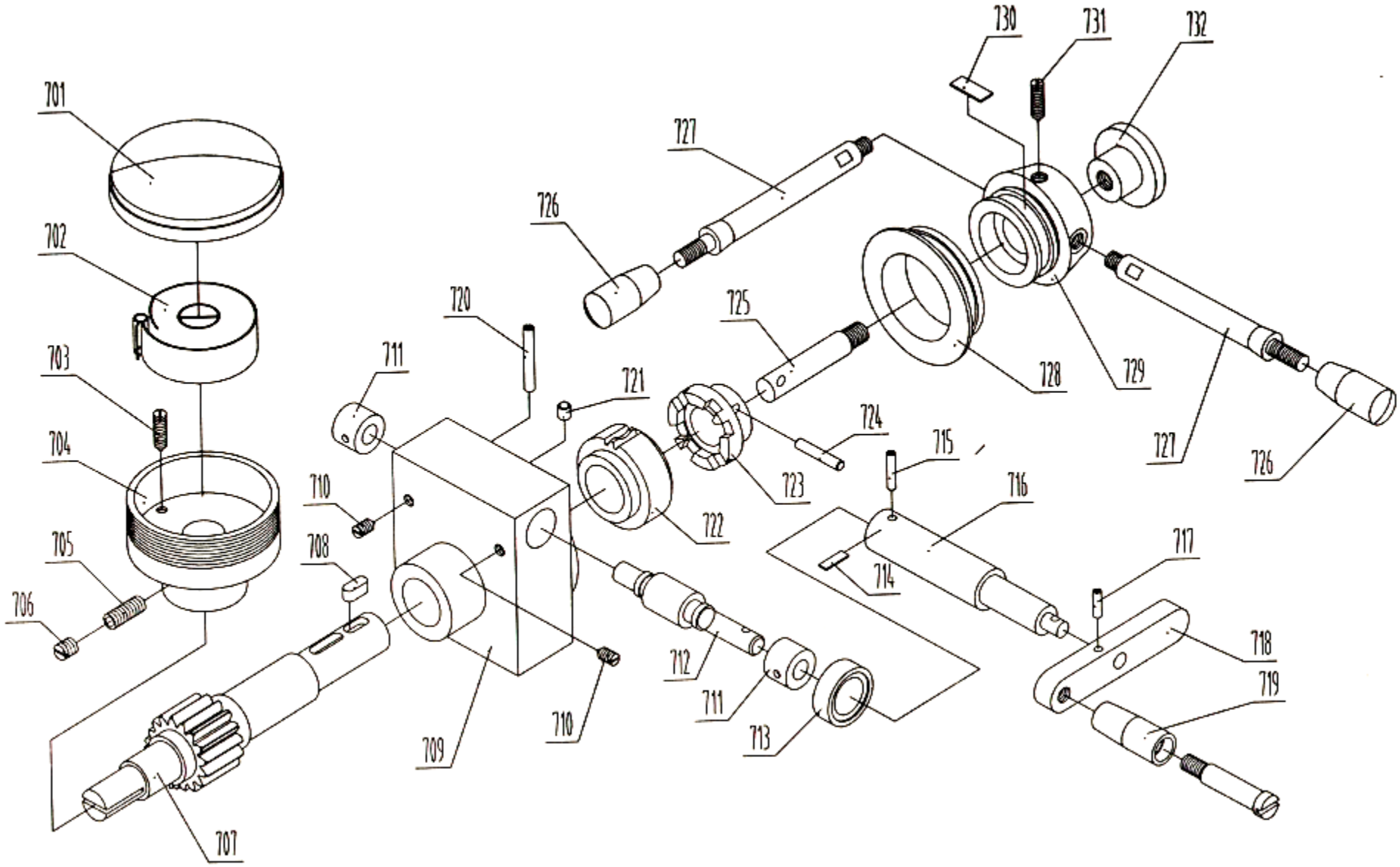
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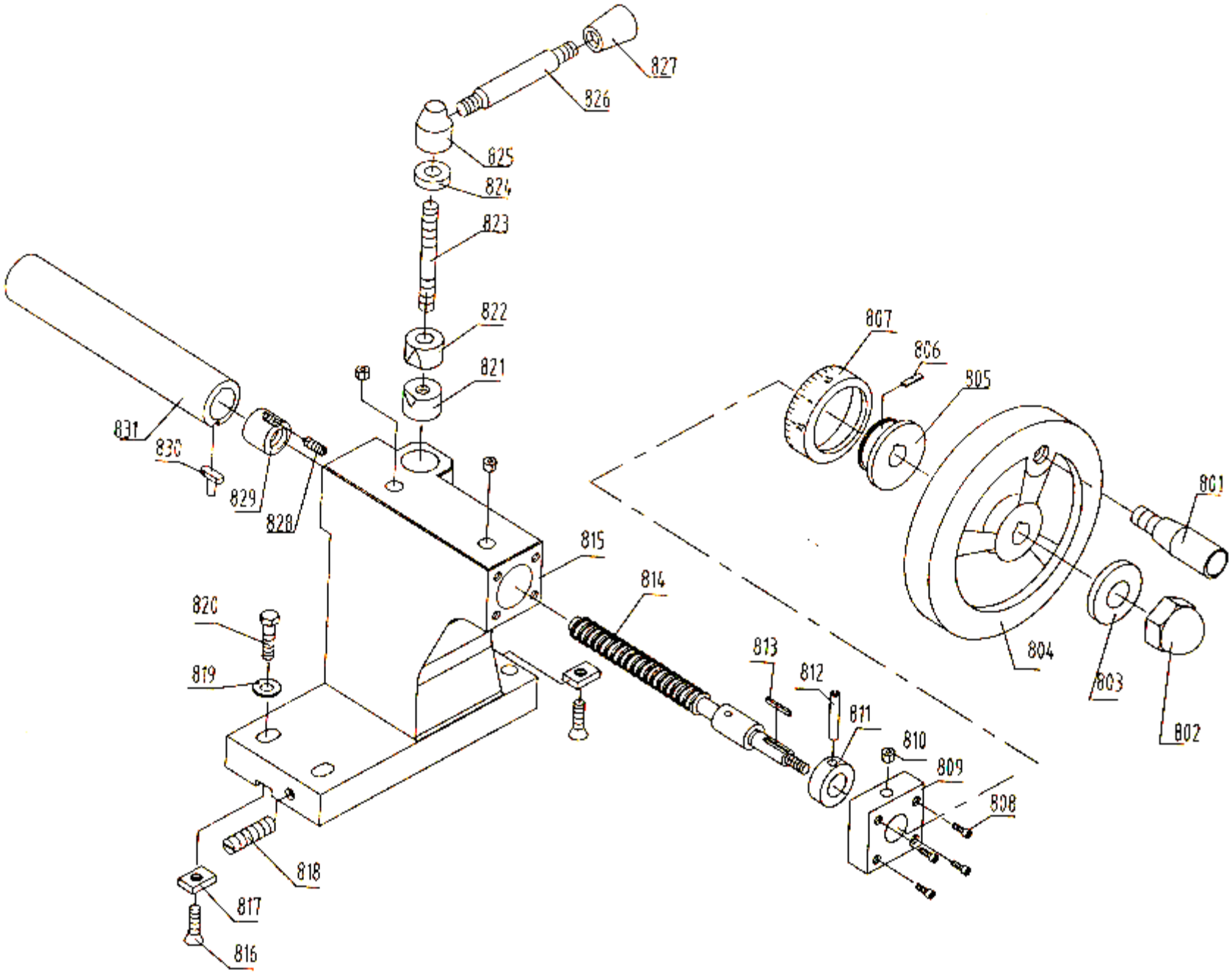
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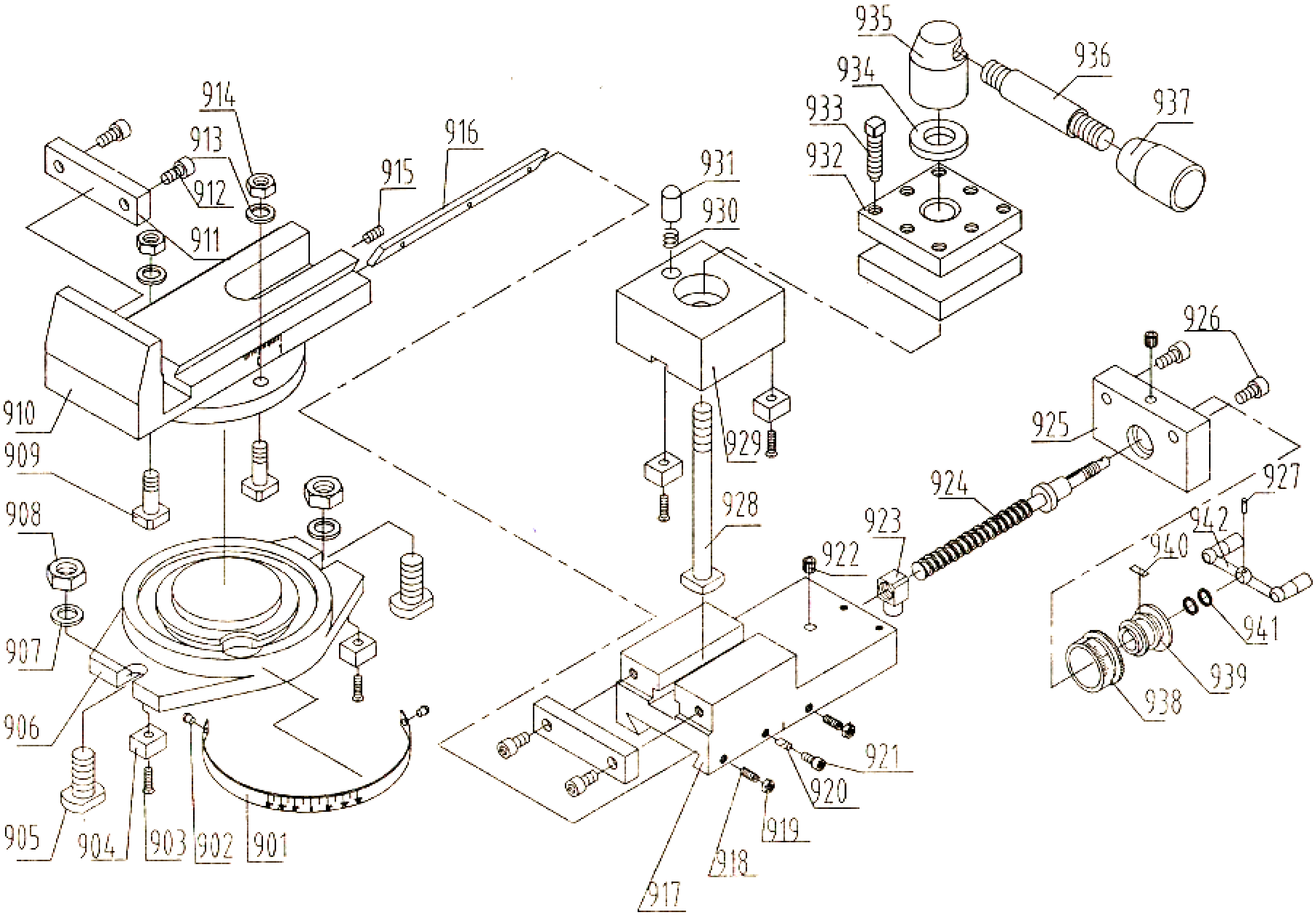

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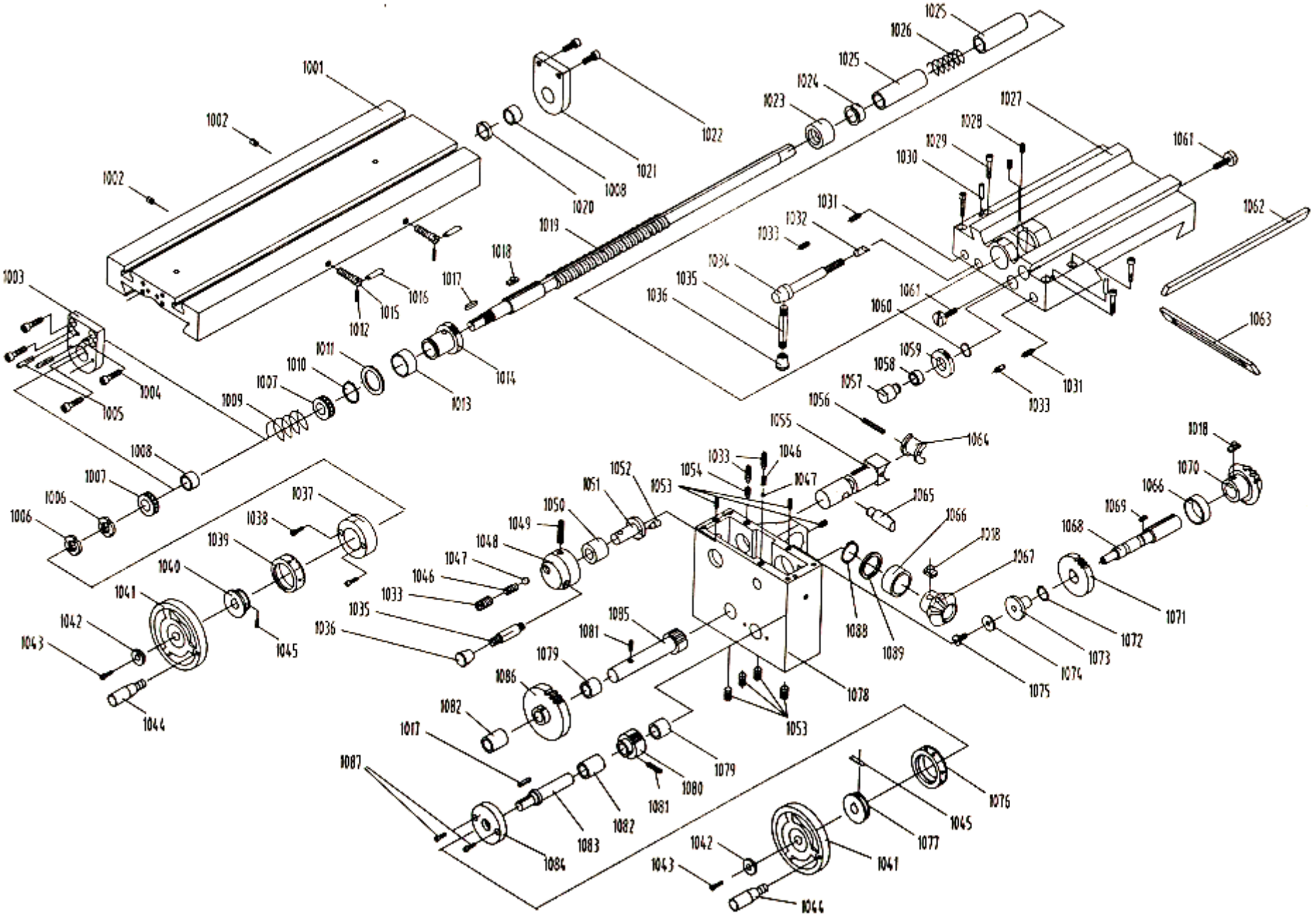
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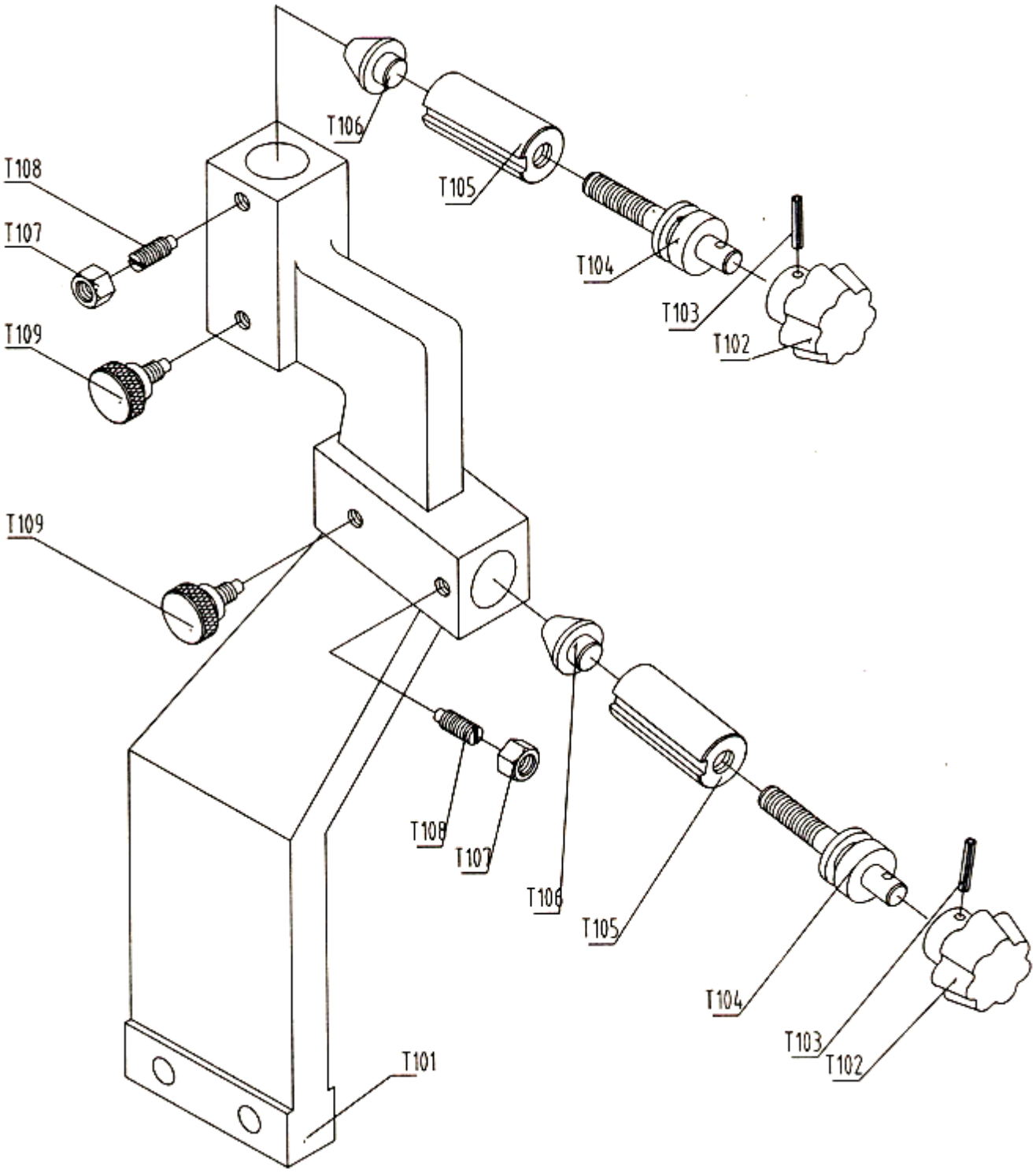
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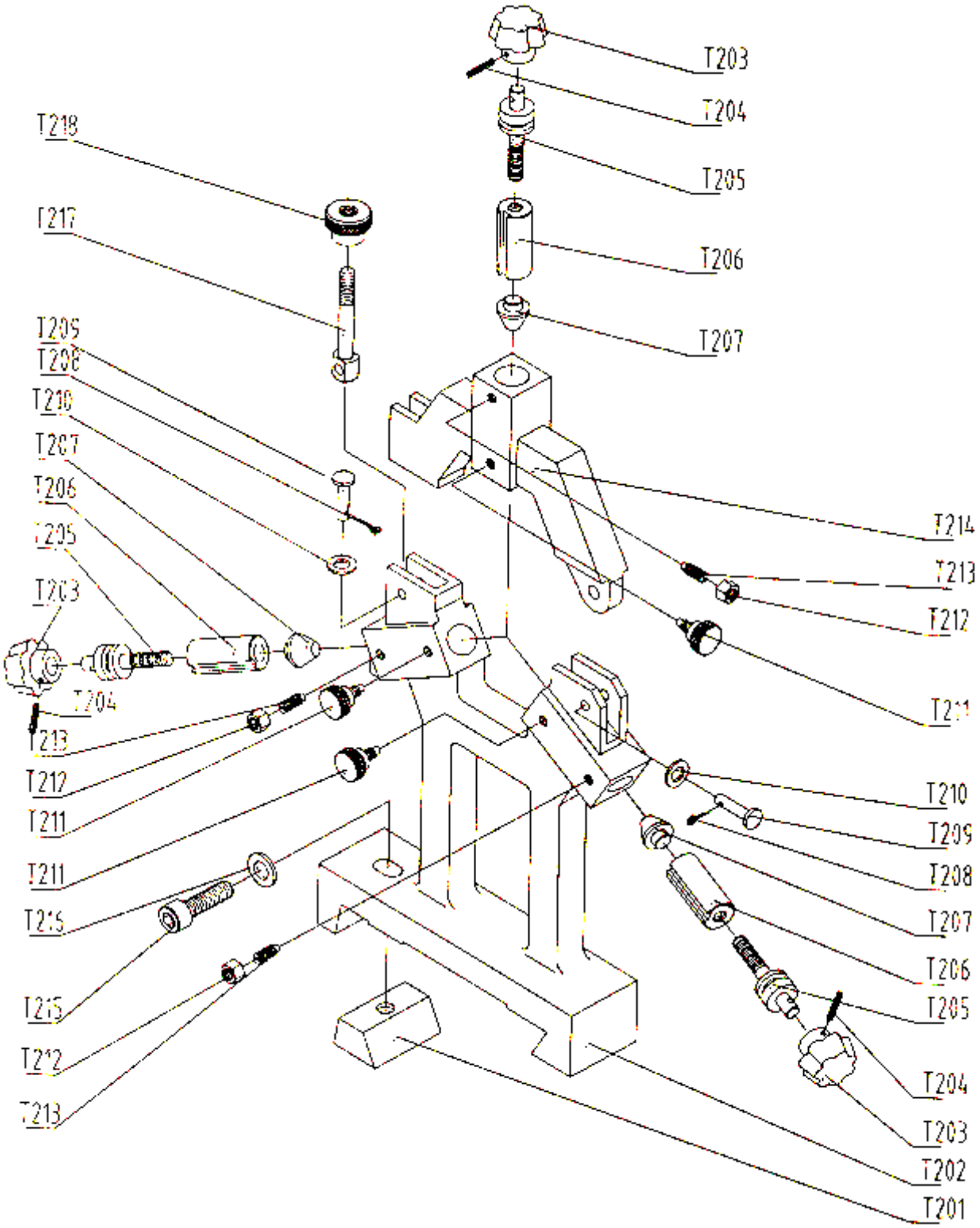
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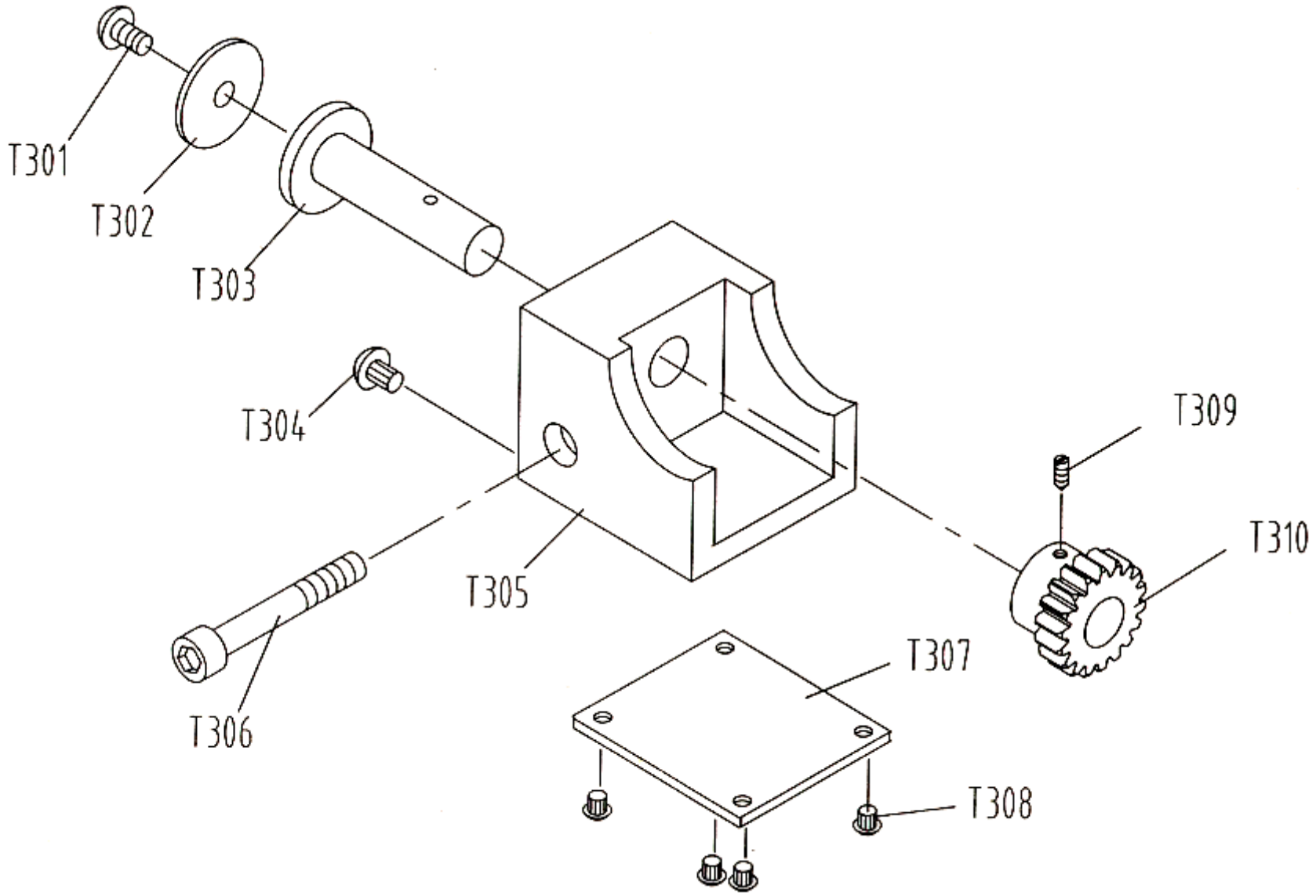
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BED ASSEMBLY

Index No.	Part No.	Description	QTY.
101	HQ500-01-003(2)	Bed	1
102	GB/T4141.2	Handle knob M6×20	1
103	HQ400-00-016	Handle	1
104	HQ400-11-022	Locking screw	1
105	GB/T77	Screw M8×25	2
106	GB/T75	Screw M8×14	2
107	HQ400-11-034	Adjusting block	1
108	HQ400-11-015	Locking pin	1
109	HQ400-11-004	Tailstock carriage	1
110	HQ400-11-016	Gib	1
111	YC-7144	Motor (0.55KW)	1
112	GB/T1096	Key A5×16	1
113	GB/T5782	Bolt M10×25	4
114	GB/T97.1	Washer 10	5
115	GB/T1171	V-belt Z630	1
116	GB/T78	Screw M8×8	1
117	HQ500-01-010	Pulley	1
118	GB/T78	Screw M8×6	1
119	GB/T70	Screw M6×20	4
120	HQ400/4-01-005	Motor mount	1
121	HQ400/3-01-009	T-nut	2
122	HQ400/4-01-001	Bracket	1
123	HQ400/3-01-010	T-bushing	2
124	HQ400/3-F-01	Change gear	1
125	HQ400/3-01-011	Washer	2
126	GB/T70	Screw M6×40	2
127	HQ400/3-01-013	Washer	1
128	GB/T97.1	Washer 6	1
129	HQ400/3-01-012	Washer	1
130	GB/T70	Screw M6×30	1
131	HQ400/3-F-01-009	Change gear	1
132	GB/T6170	Hex nut M10	1
133	HQ400/3-F01-015	Gear	1
134	HQ500-01-011	Rack	1
135	GB/T4141.7	Handle A10×80	1
136	HQ500-09-002	Eccentric lever	1
137	GB/T879	Spring pin 3×20	1
138	HQ400/3-04-001	Transmission shaft	1
139	GB/T1096	Key A4×12	1
140	HQ500-09-005	Sleeve	1
141	GB/T879	Spring pin 5×22	1

Index No.	Part No.	Description	QTY.
142	HQ400/3-04-003	Clutch jaw A	1
143	HQ500-09-001	Clutch jaw B	1
144	HQ500-09-003	Transmission box	1
145	HQ400/4-01-002	Leadscrew	1
146	GB/T78	Screw M6×8	1
147	GB/T1155	Oil ball 6	2
148	GB/T117	Taper pin B5×55	2
149	GB/T70	Screw M6×50	2
150	HQ500-09-006	Spanner nut M17×1.5	2
151	GB/T301	Bearing 8103	2
152	GB/T1096	Key 5×10	1
153	HQ500-09-004	Shaft connector	1
154	GB/T879	Spring pin 4×24	1
155	GB/T879	Spring pin 5×30	2
156	HQ500-01-004	Leadscrew seat	1
157	GB/T118	Taper pin 6×55	2
158	GB/T70	Screw M6×45	2
159	HQ500-01-006	Dial	1
160	HQ500-01-007	Dial seat	1
161	HQ500-10-016	Spring piece	1
162	GB/T879	Spring pin 4×20	1
163	HQ500-01-009	Crank handle	1
164	HQ500-01-008	Washer	1
165	GB/T819	Screw M4×12	1
166	GB/T2089	Spring 14×1×15	1
167	GB/T117	Taper pin B10×35	2
168	GB/T70	Screw M10×25	4
169	HQ500-01-003(1)	Fixing block	1

Headstock Assembly

Index No.	Part No.	Description	QTY.
201	GB/T117	Taper bin 8×40	2
202	GB/T97.2	Washer 10	4
203	GB/T5781	Bolt M10×35	4
204	GB/T78	screw M5×12	3
205	HQ500-02-005	Headstock	1
206	HQ500-02-027	Fork	1
207	GB/T894.1	Retain ring (external)12	1
208	GB/T879.1	Roll bin 5×18	1
209	CZ300-03-050	Fork arm	1
210	HQ400/3-02-041	Straight pin	1
211	GB/T3452.1	O-ring 8.5×1.8	1
212	HQ500-02-013	Spacer	1
213	GB/T308	Steel ball Φ6.5	1
214	GB/T2089	Spring 1×6×15	1
215	GB/T879	Spring pin 4×40	1
216	CZ300A-03-016	Handle seat	1
217	GB/T73	flat point set screw M8×5	1
218	HQ400-13-005	Handle rod	1
219	GB/T4141.12	Handle knob M10×32	1
220	GB/T1160	Oil level indicator	1
221	HQ500-02-025	Triplex gear	1
222	GB/T879	Spring pin 3×8	1
223	GB/T894.1	Retain ring (external)14	3
224	HQ500-02-015	Brass bushing	1
225	HG4-692-67	O ring PD15×30×10	1
226	HQ400/3-02-005	Gasket	1
227	HQ400/3-02-002	O-ring seat	1
228	GB/T65	Bolt M5×20	3
229	HQ500-02-028	Key	1
230	HQ500-02-021	Shaft D	1
231	GB/T1096	Key 4×8	1
232	GB/T848	Washer 10	1
233	GB/T6170	Nut M10	1
234	HQ500-02-020	Hole plug	1
235	HQ500-02-014	Brass bushing	1
236	GB/T1096	Key 5×14	1
237	HQ500-02-017	Shaft C	1
238	HQ400/3-02-012	Gear C	1
239	HQ500-02-026(2)	Gear C(2)	1
240	GB/T879	Spring pin 4×20	2

Index No.	Part No.	Description	QTY.
241	HQ500-02-026(1)	Gear C(1)	1
242	HQ400/3-02-038	Brass bushing	1
243	HQ400/3-02-026	Gasket	1
244	HQ500-02-022	Cover	1
245	GB/T818	Screw M5×12	3
246	HQ500-02-019	Hole plug	1
247	HQ500-02-009	Shaft B	1
248	HQ400/3-02-013	Duplex gear B	1
249	HQ400/3-02-030	Brass bushing	1
250	HQ500-02-010	Spindle	1
251	GB/T5783	Bolt M8×25	3
252	GB/T1096	Key 8×22	2
253	GB/T70	screw M5×16	13
254	DIY1619-02-036	Cover	1
255	DIY1619-02-037	Gasket	1
256	GB/T297	Taper roller bearing 2007109	1
257	HQ500-02-006	Gear A	1
258	GB/T71	screw M8×10	1
259	GB/T921	Locking ring 47	1
260	GB/T297	Taper roller bearing 2007108	1
261	HQ500-02-003	Gasket	1
262	HQ500-02-002	Flange	1
263	HQ500-02-004	Spacer	1
264	HQ500-02-024	Pulley spacer	1
265	GB/T1096	Key 10×25	1
266	GB/T894.1	Retain ring (external) 63	1
267	HQ500-02-001	Pulley	1
268	GB/T1171	V-belt O-710	1
269	GB/T812	Spanner nut M40×1.5	2
270	GB/T858	Locking washer 40	1
271	HQ500-02-012	Gasket	1
272	HQ500-02-011	Bracing plate	1
273	CM1224C-03-034	Oil plug	1

HEADSTOCK GUARD ASSEMBLY

Index No.	Part No.	Description	QTY.
301	GB4141.29	Knob A8×32	1
302	GB879	Pin 3×14	2
303	CZ300A-08-005	Clamping block	1
304	CZ300A-08-008	Rod	1
305	GB/T65-85	Screw M5×35	1
306	GB/T41-86	Nut M5	2
307	HQ500-03-009	Adjustive pin	1
308	D97-4-20	Wire connector	4
309	HQ500-03-003	Electrical box	1
310	B16	AC connector	1
311	GB/T818-85	Screw M4×8	7
312	HQ500-03-002	Guard	1
313	GB/T819-85	Screw M4×12	2
314	GB/T67-85	Screw M4×25	2
315	HQ500-03-006	Switch box	1
316	LX5-11N	Limit switch	1
317	GB/T70-85	Screw M5×10	5
318	GB/T96	Washer 5	5
319	HQ500-03-001	Guard door	1
320	GB/T819	Screw M4×10	2
321	AD11	Indicator light	1
322	LA19	Button	1
323	LAY3	Emergency stop button	1
324	HZ5	Compose switch	1

MIDDLE PULLEY ASSEMBLY

Index No.	Part No.	Description	QTY.
401	GB/T4141.8	Handle	1
402	GB/T97.1	Washer 12	1
403	HQ400/4-04-001	Pulley arbor	1
404	HQ400/3-02-034	Middle pulley	1
405	GB/T276	Bearing 104	2
406	HQ400/3-02-035	Spacer	1
407	HQ400/3-02-036	Cover	1
408	GB/T68	Screw M5×10	4
409	HQ400/3-02-037	Cover	1

MILLING & DRILLING ASSEMBLY

Index No.	Part No.	Description	QTY.
501	GB/T1154-89	V-belt Z800	1
502	GB/T70	Screw M10×40	4
503	HQ500-05-002	Milling-drilling headstock	1
504	HQ500-05-001	Support column	1
505	HQ500-05-003	Locking block (pair)	3
506	HQ500-05-004	Spacer	3
507	HQ500-05-022	Screw	2
508	CX16-03-006	Handle	2
509	GB/T4141.15-84	Handle M10×50	2
510	GB/T4141.12-84	Handle knob BM10×32	2
511	HZ5-10	On-off switch	1
512	HQ500-05-020	Switch plate	1
513	GB/T818	Screw M5×8	4
514	HQ500-05-018	Frame cover	1
515	HQ500-05-014	Eccentric flange	1
516	GB/T 70	Screw 6×20	4
517	GB/T 73	Screw M8×12	1
518	HQ500-05-015	Motor pulley	1
519	GB/T 818	Screw M4×6	4
520	HQ500-05-011	See-through window	1
521	HQ500-05-016	Upper cover	1
522	HQ500-05-009	Pulley seat flange	1
523	GB/T 70	Screw M6×40	4
524	BG/T 117-86	Taper pin A5×45	2
525	GB/T 276	Ball bearing 108Z	1
526	GB/T 894.1	Retain ring (External) 40	1
527	GB1154-89	V-belt Z860	1
528	HQ500-05-010	Milling-drilling pulley	1
529	GB4141.26-84	Knob CM8×25	2
530	HQ400-24-021	Cap	1
531	HQ500-05-019	Upper cover post	1
532	HQ500-05-004	Spacer	2
533	GB/T899	Stud AM10×80	2
534	GB/T4141.16-84	Handle seat BM10×20	1
535	GB/T75	Screw M10×14	1
536	GB/T73	Screw M10×12	1
537	HQ500-05-005	Hole plug	3
538	GB/T79	Screw M8×12	1
539	HQ500-05-008	Lower cover	1
540	GB/T97.1	Washer 6	1

541	GB/T70	Screw M6×12	2
542	HQ500-05-013	Motor mount	1
543	GB/T 97.1-85	Washer 10	1
544	GB/T5781	Hex head screw M10×30	2
545	HQ500-05-012	Mill-drill cover post	1
546	D97-4-18(20)	Connection tube M18(20)×1.5	3
547	YL7144	Motor	1
548	GB/T1096-79	Key A5×16	1
549	HQ500-05-017	Tension handle	1
550	GB/T68	Screw M5×8	4
551	HQ500-06-004	Eccentric shaft	1
552	HQ500-06-003	Middle pulley	1
553	GB/T276	Ball bearing 104Z	2
554	HQ500-06-002	Spacer	1
555	GB/T893.1	Retain ring (external) 42	1
556	HQ500-06-001	Bearing cover	1
557	GB/T68	Screw M5×10	1
558	HQ500-08-001	Quill	1
559	GB/T297	Ball bearing 2007107	1
560	HQ500-08-002	Spindle	1
561	HQ400-22-002	Cover	1
562	GB/T71	Screw M5×8	1
563	GB/T297	Bearing 2007106	1
564	GB/T812	Spanner nut M30×1.5	1
565	GB/T858	Washer Φ30	1
566	HQ400-22-001	Gasket	1

MILLING&DRILLING FEED ASSEMBLY

Index No.	Part No.	Description	QTY.
601	HQ400-24-019	Spring box cover	1
602	HQ500-05-006	Spring	1
603	GB/T73-1985	Screw	1
604	HQ500-05-007	Spring box	1
605	HQ500-07-001	Gear shaft	1
606	GB/T1096-1979	Key 6×14	1
607	HQ400-23-010	Collar	2
608	HQ500-07-002	Feed box	1
609	HQ400-23-004	Worm	1
610	HQ500-07-003	Handle shaft	1
611	GB/T879-1986	Spring pin 4×20	1
612	GB/T879-1986	Spring pin 4×14	1
613	HQ500-07-004	Arm	1
614	GB/T4141.4	Handle M8×40	1
615	HQ400-23-005	Worm gear	1
616	HQ400-23-006	Clutch tooth	1
617	GB/T119-1979	Pin D5×28	1
618	HQ400-23-009	Shaft	1
619	HQ400-23-007	Dial ring	1
620	HQ400-23-008	Spring piece	1
621	HQ400-23-013	Dial seat	1
622	HQ400-23-001	Handle	2
623	GB/T4141.14	Handle knob BM8×40	2
624	GB/T71-1979	Screw M6×18	1
625	GB/T4141.27	Knurled knob BM10×40	1

SPINDLE FEEDING ASSEMBLY

Index No.	Part No.	Description	QTY.
701	HQ400-24-019	Cover	1
702	HQ500-05-006	Volute spring	1
703	GB/T71	Screw M5×25	1
704	HQ400/4-05-007	Volute spring box	1
705	GB/T78	Screw M8×20	2
706	GB/T73	Screw M8×12	3
707	HQ400/4-07-001	Gear shaft	1
708	GB/T1096	Key A6×14	1
709	HQ400/4-07-002	Feeding box	1
710	GB/T71	Screw M6×8	2
711	Hq400-23-010	Bushing	2
712	HQ400-23-004	Worm	1
713	HQ500-05-005	Dial	1
714	HQ500-10-016	Spring piece	1
715	GB/T879	Spring pin 4×20	1
716	HQ400/4-07-003	Handle	1
717	GB/T879	Spring pin 4×14	1
718	HQ400/4-07-004	Handle	1
719	GB/T4141.4	Rotational handle	1
720	GB/T879	Spring pin 5×35	1
721	GB/T1155	Oil ball 6	1
722	HQ400-23-005	Worm wheel	1
723	HQ400-23-006	Clutch	1
724	GB/T119	Pin D5×28	1
725	Hq400-23-009	Shaft	1
726	GB/T4141.14	Handle knob BM8×40 2	2
727	HQ400-23-001	Handle	2
728	HQ400-23-007	Dial	1
729	HQ400-23-013	Dial seat	1
730	HQ400-23-008	Spring piece	1
731	GB/T71	Screw M6×18	1
732	GB/T4141.27	Handle BM10×40	1

TAILSTOCK ASSEMBLY

Index No.	Part No.	Description	QTY.
801	JB/T7270.5-94	Handle M6×50	1
802	GB/T923-88	Acorn Nut M10	1
803	GB/T97-85	Flat Washer 10	1
804	JB/T7273.3-94	Hand Wheel B12×100	1
805	HQ400/4-10-015	Scale ring base	1
806	HQ500-10-016	Spring piece	1
807	HQ400-13-010	Scale ring	1
808	GB/T70-85	Screw M5×20	4
809	HQ400-13-009	Feed Screw Socket	1
810	JB/T7940.4-95	Oiler	3
811	HQ400-13-008	Bracket	1
812	GB/T119-86	Pin D5×24	1
813	GB/T1096-79	Key C4×18	1
814	HQ400-13-006	Feed Screw	1
815	HQ400-13-001	Tail Stock Body	1
816	GB/T819-85	Screw M5×14	2
817	HQ400-13-004	Key	2
818	GB/T73-85	Screw M10×50	2
819	GB/T97.2-85	Washer 10	4
820	GB/T5780-86	Screw M10×40	4
821	HQ400-13-011	Locking block (Bottom)	1
822	HQ400-13-012	Locking block (Top)	1
823	GB/T899-85	Double-Screw Bolt AM10×40	1
824	HQ400-13-013	Washer	1
825	HQ400-13-004	Locking Nut	1
826	HQ400-13-005	Locking Lever	1
827	JB/T7271.3-94	Knob M10×32	1
828	GB/T71-85	Set Screw M4×8	1
829	HQ400-13-007	Feed Nut	1
830	HQ400-13-003	T-Key	1
831	HQ400-13-002	Tail Stock Barrel	1

TOOL POST ASSEMBLY

Index No.	Part No.	Description	QTY.
901	HQ400-14T02-002(1)	Angle ruler	1
902	GB/T827-1985	Rivet 2.5×5	2
903	GB/T68-1985	Screw M4×12	2
904	HQ400-14T02-010	Key	2
905	HQ400-14T02-001	"T"-Bolt	2
906	HQ400-14T02-002	Base	1
907	GB/T97.1-1985	Washer1 0	2
908	GB/T6170-2000	Nut M10	2
909	HQ400-14T02-003	Bolt	2
910	HQ400-14T02-005	Vice base	1
911	HQ400-14T02-006	Vice block	2
912	GB/T70.1-2000	Screw M5×14	4
913	GB/T97.1-1985	Washer 8	2
914	GB/T6170-2000	Nut M8	2
915	GB/T77-2000	Screw M5×6	1
916	HQ400-14T02-014	Gib	1
917	HQ400-14T02-004	Moving vice	1
918	GB/T71-1985	Screw M5×14	2
919	GB/T6170-2000	Nut M5	2
920	HQ400-14T02-007	Locking block	1
921	GB/T70.1-2000	Screw M5×8	1
922	JB/T7940.4-1995	Oiler Ø6	2
923	HQ400-14T02-011	Nut Tr12	1
924	HQ400-14T02-012	Lead screw Tr12	1
925	HQ400-14T02-013	Lead screw bracket	1
926	GB/T70	Screw M6×16	2
927	GB/T117-2000	Pin3×16	1
928	HQ400-14T02-009	Bolt M10×100	1
929	HQ400-14T02-008	Tool post base	1
930	GB/T1358-1993	Spring 5×0. 6×30	1
931	HQ400-14-007	Set pin	1
932	HQ400-14-003	Tool post	
933	GB/T85-1988	Screw M8×25	8
934	HQ400-14-005	Compensating washer	1
935	HQ400-13-010	Nut M10	1
936	HQ400-14-006	Handle	1
937	JB/T7271.3-1994	Knob M10×32	1
938	DJ136/2-012	Dial	1
939	DJ136/2-010	Dial seat	1
940	DJ136/2-011	Spring piece	1
941	GB/T810	Slotted round nut M10×1	2
942	GB/T4141.10	Bi-lever balance handle8×25	1

SADDLE AND APRON ASSEMBLY

Index No.	Part No.	Description	QTY.
1001	HQ500-10-003	Table	1
1002	JB/T 7940.4-4	Oil ball 6	6
1003	HQ500-10-010	Lead screw seat (B)	1
1004	GB/T 70-85	Screw M5 × 16	4
1005	GB/T 879-5	Spring pin 5 × 20	2
1006	GB/T 810-13	Spanner nut M14 × 1.5	2
1007	GB/T 301-11	Thrust ball bearing8102	2
1008	HQ500-10-011	Spacer A	2
1009	HQ500-10-048	Spring B	1
1010	GB/T 894.1-9	Retain ring (external) 26	1
1011	HQ500-10-046	Washer	1
1012	GB/T 879-7	Spring pin 2 × 10	2
1013	HQ500-10-045	Spacer G	1
1014	HQ500-10-010	Gear A	1
1015	HQ500-10-006	Locking screw	2
1016	CM1224C-05-022B	Locking lever	2
1017	GB/T 1096-14	Key 4 × 18	2
1018	HQ500-10-030	T-Key	2
1019	HQ500-10-008	Cross feeding lead screw	1
1020	HQ500-10-050	Washer	1
1021	HQ500-10-007	Lead screw (A)	1
1022	GB/T 70-85	Screw M6X16	2
1023	HQ500-10-009	Cross feeding lead nut	1
1024	HQ500-10-051	Spacer	1
1025	HQ500-10-049	Spacer	2
1026	HQ500-10-047	Spring A	1
1027	HQ500-10-002	Saddle	1
1028	GB/T 71-85	Screw M6 × 8	10
1029	GB/T 70-85	Screw M6 × 35	4
1030	GB/T 117-6	Tap pin A5 × 25	2
1031	GB/T 75-85	Screw M8 × 16	2
1032	HQ400-11-014	Locking washer	1
1033	GB/T 73-85	Screw M8 × 8	5
1034	HQ500-10-025	Locking screw	1
1035	HQ400-00-016	Handle rod	2
1036	JB/T 7271.3-23	Handle knob M6 × 20	2
1037	HQ500-10-013	Fixing sleeve (A)	1
1038	GB/T 70-85	Screw M5 × 16	4
1039	HQ500-10-014	Dial	1
1040	HQ500-10-015	Dial seat (A)	1
1041	JB/T 7273.3-16	Hand wheel B12 × 100	2
1042	HQ500-10-018	Washer	2
1043	GB/T 70-15	Screw M4 × 12	2
1044	JB/T 7270.4-17	Handle M6 × 50	2

Index No.	Part No.	Description	QTY.
1045	HQ500-10-016	Spring piece	2
1046	CM1224C-06-007	Spring	2
1047	GB/T 308-2	Steel ball 6.5	2
1048	HQ500-10-036	Handle seat	1
1049	GB/T 879-26	Pin 4 × 40	1
1050	HQ500-10-035	Spacer (E)	1
1051	HQ500-10-034	Eccentric wheel	1
1052	HQ400/3-06-003	Arm	1
1053	GB/T 71-85	Screw M6 × 8	10
104	HQ500-10-001	Screw	1
1055	HQ500-10-033	Half nut seat	1
1056	GB/T 879-25	Spring pin 4 × 30	1
1057	HQ500-10-043	Shaft	1
1058	HQ500-10-037	Spacer (F)	1
1059	HQ500-10-042	Gear T32	1
1060	GB/T 894.1-27	Retain ring (external) 12	1
1061	HQ500-10-004	Screw	2
1062	HQ500-10-005	Table gib	1
1063	HQ500-10-026	Saddle gib	1
1064	HQ400/3-06-002B	Half nut	1
1065	HQ500-10-032	Stop pin	1
1066	HQ500-10-031	Spacer (D)	2
1067	HQ500-10-029A	Bevel gear	1
1068	HQ500-10-017	Shaft	1
1069	GB/T 1096-29	Key A5 × 8	1
1070	HQ500-10-029	Gear	1
1071	HQ500-10-027	Gear T48	1
1072	GB/T 894.1-27	Retain ring (external) 14	1
1073	HQ500-10-038	Pull-push knob	1
1074	GB/T 96-85	Washer 6	1
1075	GB/T 818-19	Screw M6 × 8	1
1076	HQ500-10-041	Dial	1
1077	HQ500-10-019	Dial seat (B)	1
1078	HQ500-10-028	Apron	1
1079	HQ500-10-024	Spacer (C)	2
1080	HQ500-10-023	Gear T25	1
1081	GB/T 879-21	Spring pin 4 × 20	2
1082	HQ500-10-022	Spacer (B)	2
1083	HQ500-10-020	Shaft	1
1084	HQ500-10-021	Fixing sleeve B)	1
1085	HQ500-10-040	Shaft gear T21	1
1086	HQ500-10-039	Gear T65	1
1087	GB/T 70-85	Screw M4 × 12	4
1088	GB894.1-86	Retain ring (external) 28	1
1089	HQ500-10-029B	Washer	1

FOLLOW REST ASSEMBLY

Index No.	Part No.	Description	QTY.
T101	HQ500-10T04-005	Follow rest frame	1
T102	JB/T72714.40	Handle 8×32	2
T103	GB/T879	Spring pin 3×16	2
T104	HQ500-10T04-001	Adjusting bolt	2
T105	HQ500-10T04-003	Sleeve	1
T106	HQ500-10T04-004	Brass head	2
T107	GB/T41	Hex nut M6	2
T108	GB/T75	Set screw M6×16	2
T109	HQ500-10T04-002	Knurled screw	2

STEADY REST ASSEMBLY

Index No.	Part No.	Description	QTY.
T201	HQ500-10T05-005	Locking block	1
T202	HQ500-10T05-001	Steady rest base	1
T203	JB/T7274.4	Handle 8×32	1
T204	GB/T879	Spring pin3×16	3
T205	HQ500-10T04-001	Adjusting bolt	3
T206	HQ500-10T04-003	Sleeve	3
T207	HQ500-10T04-004	Brass head	3
T208	GB/T91	Cotter pin1.6×20	2
T209	GB/T882	Pin A6×26	2
T210	GB/T848	Washer 8	2
T211	HQ500-10T04-002	Knurled screw	3
T212	GB/T41	Hex nut M6	3
T213	GB/T75	Set screw M6×16	3
T214	HQ500-10T05-004	Steady rest head	1
T215	GB/T70	Screw M10×35	1
T216	GB/T848	Washer 10	1
T217	HQ500-10T05-002	Locking bolt	1
T218	HQ500-10T05-003	Knob	1

THREADING DIAL

Index No.	Part No.	Description	QTY.
T301	GB/T818	Screw M4×12	1
T302	HQ500-10T01-004	Indicator plate	1
T303	HQ500-10T01-002	Arbor	1
T304	GB/T827	Rivet 2×4	1
T305	HQ500-10T01-001	Threading dial seat	1
T306	GB/T70	Screw M6×50	1
T307	HQ500-00-017	Threading plate	1
T308	GB/T827	Rivet 2×4	4
T309	GB/T71	Screw M5×8	1
T310	HQ500-10T01-003	Gear T24	1

WARNING

DO NOT USE FORWARD/ NEUTRAL/ REVERSE TO SWITCH MOTORS ON OR OFF.

SELECT MOTOR DIRECTION FIRST THEN PRESS GREEN START BUTTON FOR ON, PRESS STOP BUTTON TO SWITCH MOTOR OFF.