

13" X 30" Compact Precision Bench Lathe



⚠ WARNING



Please read and understand the product manual completely before assembly

- Check the parts list to make sure all parts are received.
- Wear safety goggles or other protective gear while assembling.
- Do not return products to dealers, who are not equipped to handle returns.

Missing parts or questions about assembly?

Email: cs@tmgindustrial.com

Or visit: tmgindustrial.com



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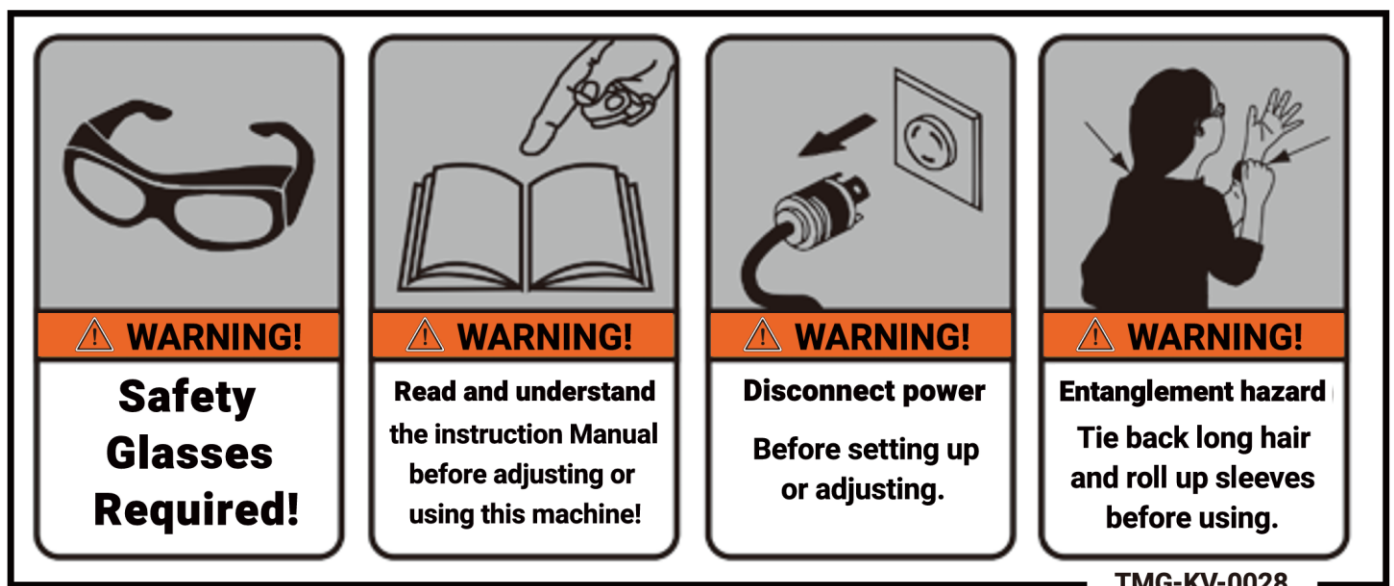
1. General Safety Instructions

Extreme caution should be used in operating all power tools. Know your power tool and be familiar with its operation. Read the owner's manual and practice safe usage procedures at all times.

- Connect the machine only to the power source specified on the machine nameplate.
- Wear safety glasses, respirators, hearing protection and safety shoes when operating heavy machinery. Safety glasses must be worn at all times.
- Do not wear loose clothing or jewelry when operating machinery.
- A safe working environment is essential. Keep the area free of dust, dirt and other debris in the immediate vicinity of the machine.
- Stay alert at all times. Do not operate the machine while under the influence of drugs, alcohol, or medication that may impair your ability or judgment.
- Disconnect the power source when changing tool bits or any equipment components.
- Always keep all safety guards in place and ensure they function properly.
- Always remove all adjustment tools before operating the machine.
- Always secure the workpiece with appropriate clamps or vises.
- Always keep bystanders safely away from the working area during machine operation.
- Prioritize safety and work safely at all times. Never attempt any operating procedure if it feels unsafe or uncomfortable.

2. Safety and Information Symbols

Pictogram symbols are fitted on the machine to deliver key product information and operating instructions.

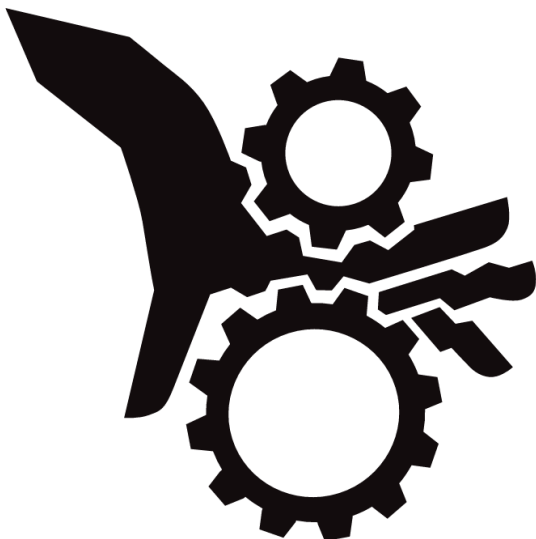


WARNING

TO REDUCE THE RISK OF SERIOUS PERSONAL INJURY WHILE USING THIS MACHINE:

1. Read and understand the owner's manual before operating.
2. Always wear approved safety glasses and face shield.
3. Plug the power cord only into a grounded outlet.
4. Disconnect power before setting up, servicing, or changing bits.
5. Avoid entanglement with spindle—tie back long hair, roll up long sleeves, and **DO NOT** wear loose clothing, gloves, or jewelry.
6. Properly set up machine before starting.
7. Keep all guards and covers in place during operation.
8. Clamp workpiece to table to prevent unexpected rotation.
9. Avoid positioning hands where they could slip into rotating bits.
10. Always remove chuck keys and other tools before starting.
11. Never attempt to slow or stop spindle with hands or tools.
12. Use correct speeds for each type of drill bit and workpiece.
13. Do not operate when tired or under the influence of drugs or alcohol.
14. Do not expose the machine to rain or use in wet locations.
15. Prevent unauthorized use by children or untrained users; restrict access or disable machine when unattended.

WARNING



PINCH ENTANGLEMENT HAZARD!

**Disconnect power
before opening door.
Stay clear of rotating
outboard spindle.**

NOTICE

Only trained personnel should operate this machine. If safe operation procedures are not clearly understood, get additional training before using.

CAUTION

FILL GEARBOX WITH SAE 90 GEAR LUBE

Gearbox is shipped without oil.
Oil must be added before operation.

TMG-ATTA-2023



⚠ WARNING

ENTANGLEMENT HAZARD!

Remove or secure loose clothing, hair, or jewelry to reduce the risk of serious injury or death.

NOTICE

**Do not fill gearbox
beyond center of oil
sight glass.**



⚠ WARNING

INJURY HAZARD!

Do not use machine if you have not read the manual.



⚠ WARNING

EYE INJURY HAZARD!

Always wear ANSI-approved safety glasses or face shield when using this equipment.



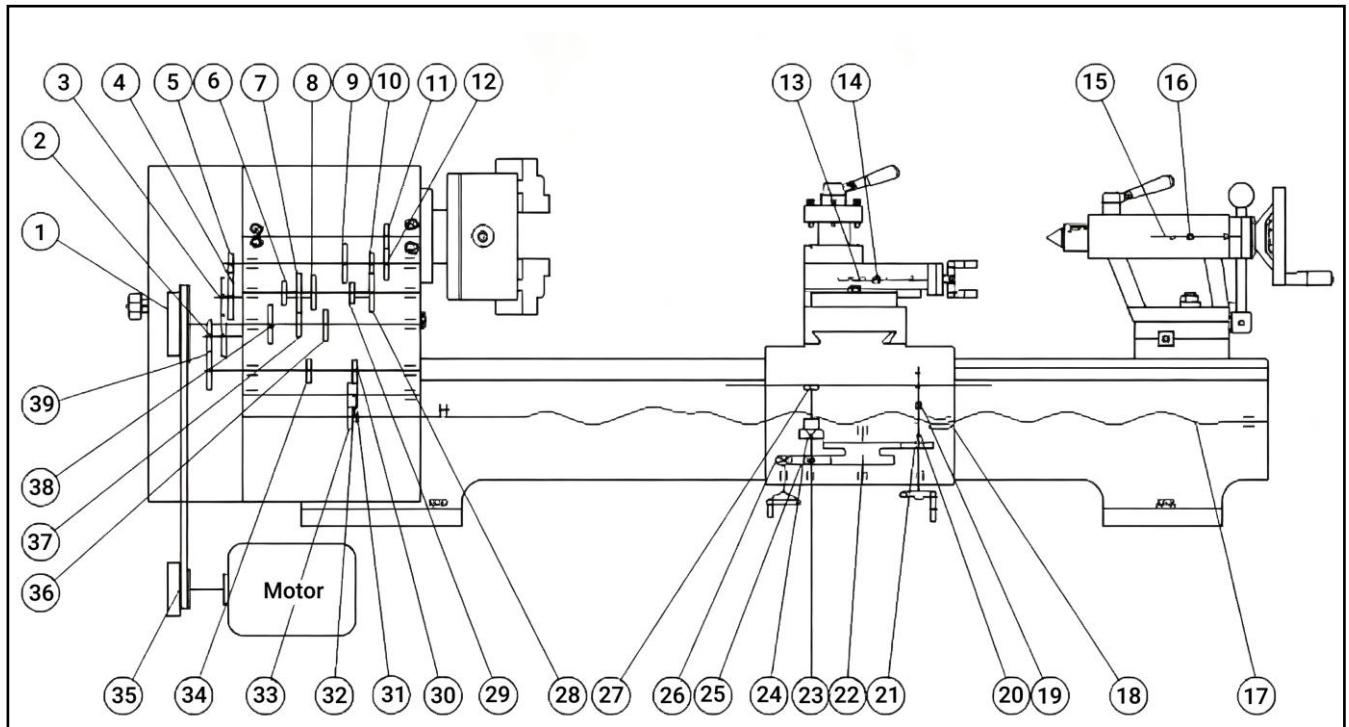
3. Metal Bench Lathe

We are proud to offer the MT13BL precision geared-head lathe as part of our growing line of metalworking equipment. By following the instructions and procedures laid out in this owner's manual, you will receive years of excellent service and satisfaction. The MT13BL is a professional tool. Like all power tools, it requires proper care, and all safety procedures should be followed.

Features and Specifications

Model	MT13BL
Swing over bed	13" (330mm)
Swing over cross slide	8.7" (220mm)
Distance between centers	29.5" (750mm)
Taper of spindle bore	MT5
Width of bed	6.3" (160mm)
Spindle bore	1.5" (38mm)
Range of spindle speeds	12 speeds / 60-1800rpm
Range of longitudinal auto-feeding	0.010–1.5 mm/rev
Range of cross auto-feeding	0.025–0.6 mm/rev
Inch threading	8-40 TPI
Metric threading	0.5-4 mm
Travel of compound slide	3.1" (80mm)
Tool Section	16 × 16mm
Travel of cross slide	6.3" (160mm)
T-Slot	90 × 10mm, 2 slots
Tailstock quill travel	3.1" (80mm)
Taper of tailstock quill	MT3
Motor power	1.5 HP (1.1 kW)
Machine Weight	540 lbs (245 kg) / 595 lbs (270 kg)

4. Illustrated Features



Ref.	Description	Ref.	Description
01	Input Pulley	21	Gear
02	Change gear	22	Gear
03	Change gear	23	Gear
04	Change gear	24	Worm Gear
05	Change gear	25	Worm
06	Gear	26	Gear
07	Gear	27	Gear
08	Gear	28	Gear
09	Gear	29	Gear
10	Gear	30	Gear
11	Spindle Gear	31	Gear
12	Gear	32	Gear
13	Tool Post Lead Screw	33	Gear
14	Tool Post Nut	34	Gear
15	Tailstock leadscrew	35	Motor Pulley
16	Tool Post Nut	36	Gear
17	Longitudinal Screw	37	Gear
18	Longitudinal Nut	38	Gear
19	Cross Nut	39	Gear
20	Cross Lead Screw		

5. Lifting & Installation

Use a crane or hoist to lift this machine, as it is very heavy.

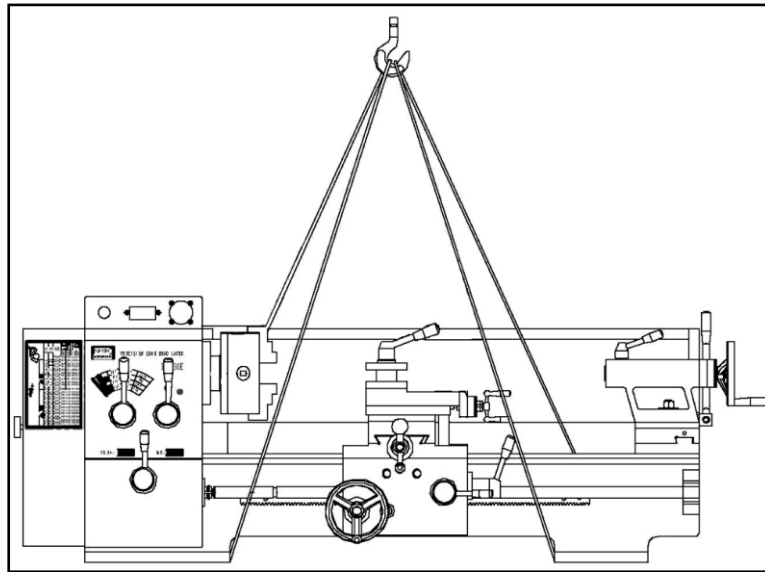


Fig.2 Lifting drawing

Please refer to figure 3 when installing this machine. Because the lathe is largely pre-assembled at the factory, very little assembly is required by the end user. Line up the four bolt holes with the stand and carefully place the lathe on the stand.

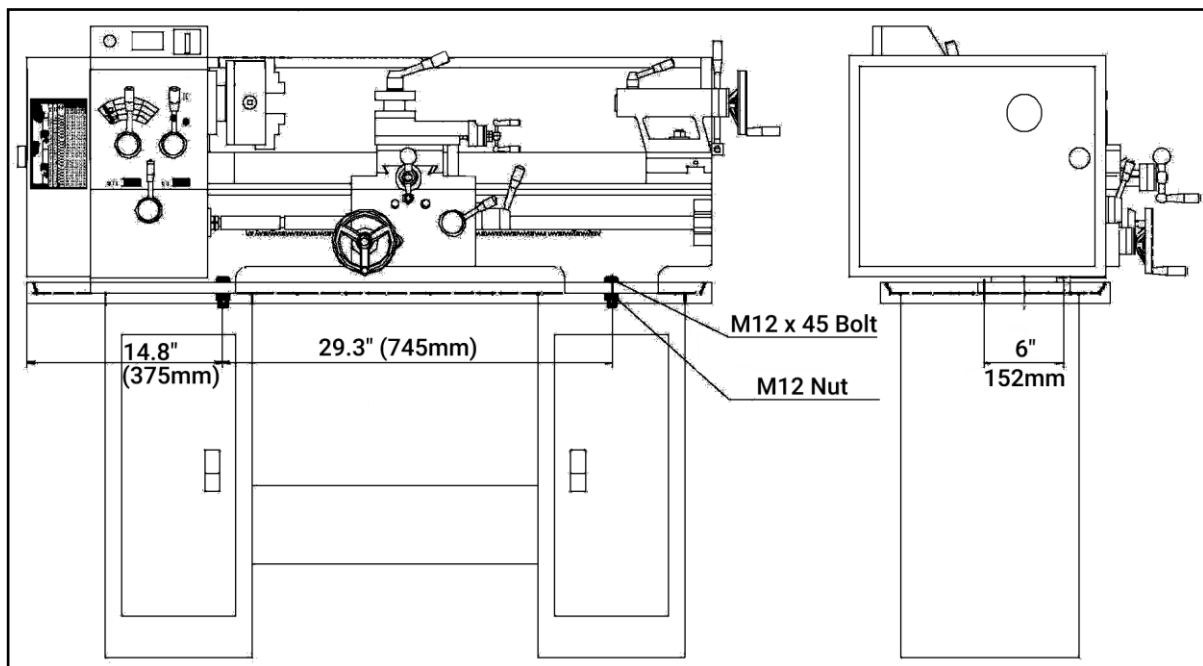


Fig.3 Installation drawing

After installation, be sure to clean the anti-rust coating (used to preserve and protect during shipping) off the guide carriage, tailstock, change gears, and pulley with a clean cloth and non-corrosive cleaner.

6. Lubrication Positions

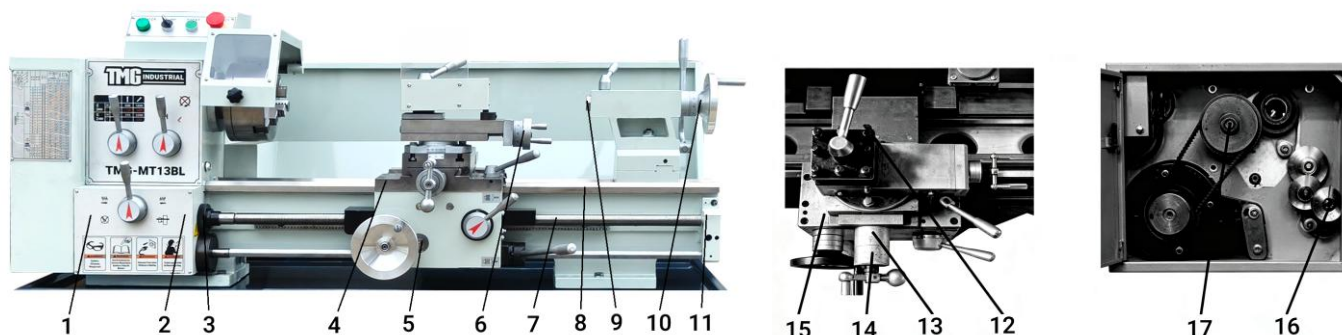


Fig.4 Lubrication positions drawing

Refer to the lubrication chart below to properly lubricate and maintain your lathe. Proper lubrication of any machine tool—especially a metal lathe—should not be neglected.

No.	Lubrication Position	Located part	Method	Lubrication Oil	Period
1	Gears, bush bearing	Left trestle	Gun	Machine oil	Daily
2	Spindle bearing	Lathe head	Greasing	Grease	1/year
3	Thrust ball bearing	Left trestle	Greasing	Grease	1/year
4	Ways, leadscrew, guide surfaces	Apron parts	Gun	Machine oil	2/day
5	Gears, racks	Apron parts	Greasing	Grease	1 month
6	Tool post lead screw, guide surface	Tool carriage	Gun	Machine oil	2/day
7	Longitudinal lead screw	Lead screw	Gun	Machine oil	2/day
8	Lathe bed guide	Lathe bed	Gun	Machine oil	2/day
9	Tail stock sleeve	Tailstock	Gun	Machine oil	2/day
10	Tailstock lead screw bush bearing	Tailstock	Gun	Machine oil	2/day
11	Bearing pedestal	Lathe bed	Gun	Machine oil	2/day
12	Cross nut lead screw	Small carriage	Gun	Machine oil	2/day
13	Bearing bush	Small carriage	Gun	Machine oil	2/day
14	Thrust bearing	Lead screw pedestal	Greasing	Grease	Every 6 months
15	Tailstock lead screw bush bearing	Tailstock	Gun	Machine oil	2/day
16	Change gear shaft	Compound box	Gun	Machine oil	Every 2 months
17	Bearing	Input pulley	Greasing	Grease	Every 6 months

Notes:

1. It is recommended to fill with 3# calcium grease and 20# machine oil.
2. Grease-lubricated parts should be cleaned, and the oil in the feed gearbox should be changed and replenished to the center line of the oil sight glass regularly.

7. Electrical System Drawing

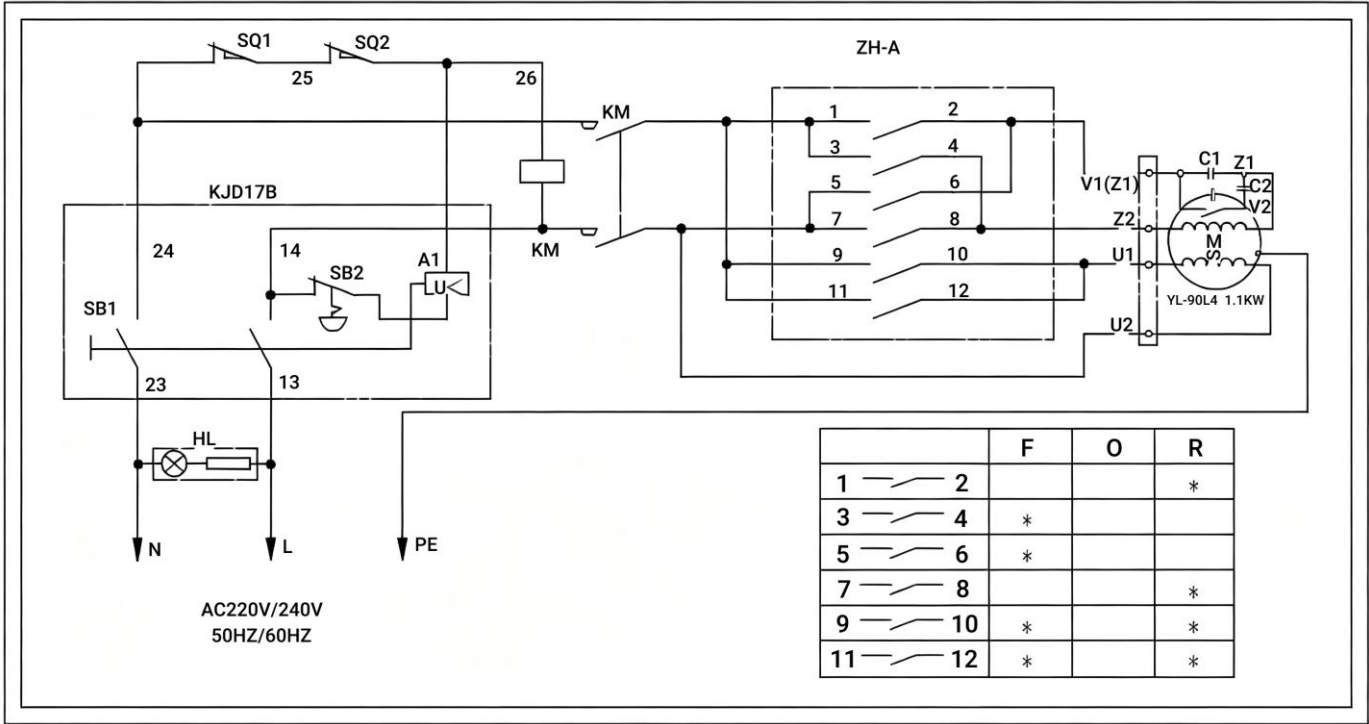


Fig.5 Electrical System Drawing (Single-Phase)

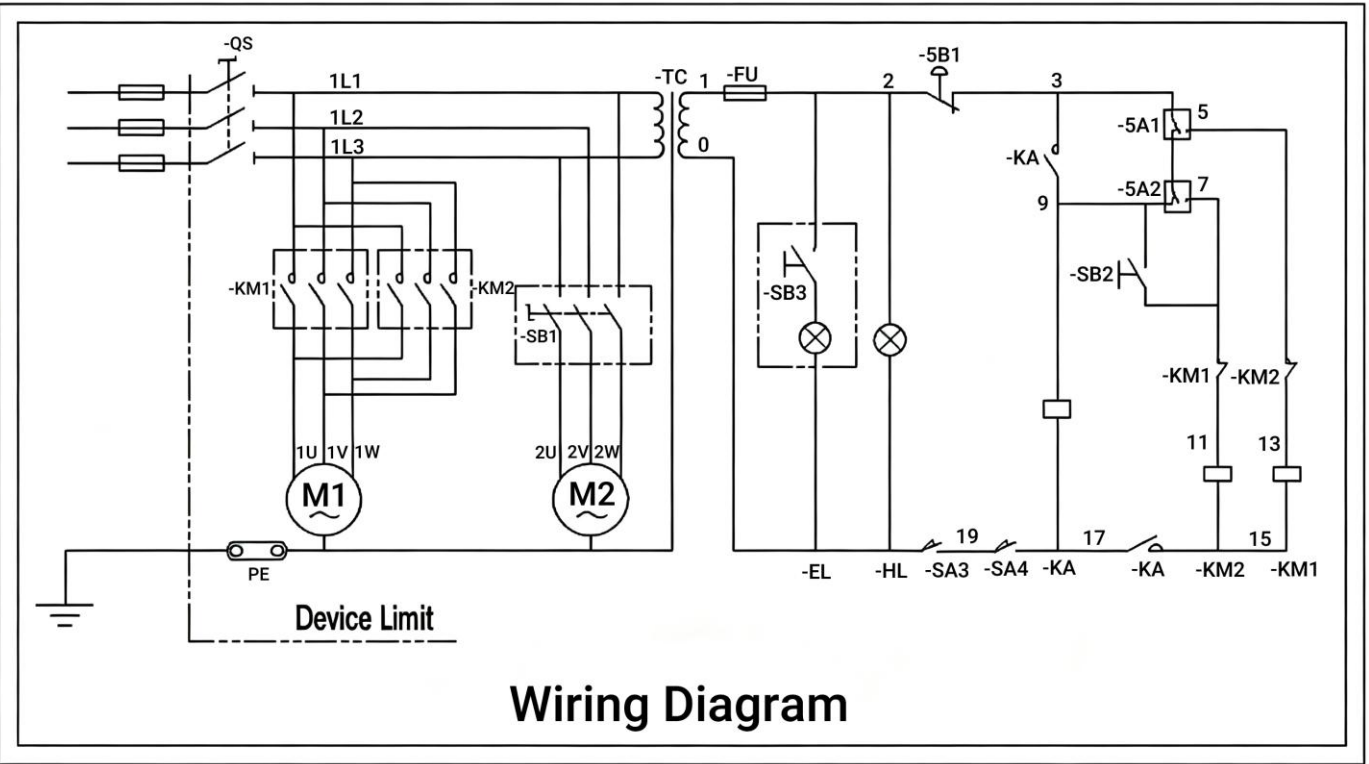


Fig.6 Electrical System Drawing (Three-Phase)

Reference Designator	Component Name
QS	Disconnect Switch
FU	Fuse
TC	Control Transformer
KM1, KM2	AC Contactor
M1, M2	3-Phase Induction Motor
KA	Auxiliary Relay
SB1, SB2, SB3	Pushbutton Switch
5B1	Emergency Stop Pushbutton
5A1, 5A2	Thermal Overload Relay
EL, HL	Indicator Light
SA3, SA4	Limit Switch
PE	Protective Earth
1L1, 1L2, 1L3	Three-Phase Line Conductors
1U/1V/1W, 2U/2V/2W	Motor Terminal Leads
SB1, SB2	Pushbutton
SQ1, SQ2	Limit Switch
KM	AC Contactor
HL	Indicator Light
M	Single-Phase Capacitor Run Motor
KJD17B	Control Module (Safety Relay Unit)
ZH-A	Contactor Contact Block
V1,Z1,U1,U2	Motor Terminal Leads
F / O / R table	Contact State Chart: F = Forward, O = Off, R = Reverse

Grounding Instructions

In the event of a malfunction or breakdown, grounding provides the path of least resistance for electrical current and reduces the risk of electrical shock. This tool is equipped with an electrical cord that has an equipment grounding conductor and a grounding plug. The plug **MUST** be plugged into a matching outlet that has been properly installed and grounded in accordance with ALL local codes and ordinances.

DO NOT MODIFY THE PLUG PROVIDED. If the provided plug will not fit the electrical outlet, have the proper outlet installed by a qualified licensed electrician.

IMPROPER CONNECTION of the equipment grounding conductor can result in risk of electrical shock. The conductor wire with the green insulation (with or without yellow stripes) is the equipment-grounding conductor. If repair or replacement of the electrical cord or plug is required, **DO NOT** connect the equipment grounding conductor to a live terminal.

If in doubt about these instructions consult a qualified, licensed electrician.

USE ONLY A THREE-WIRE EXTENSION CORD with a 3-prong grounding plug.

8. Thread & Feed Table

You must always maintain your MT13BL Lathe to ensure a high working accuracy and long life.

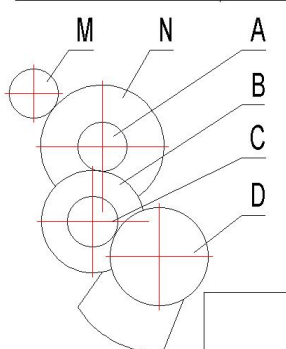
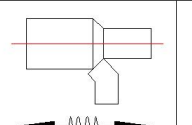
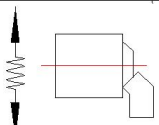
							
M=24 N=60		M=28 N=35		$\frac{A}{B} \times \frac{C}{D}$		M=24 N=60	M=28 N=35
				$\frac{24}{50} \times \frac{25}{48}$		0.105	0.210
				$\frac{28}{35} \times \frac{25}{48}$		0.175	0.350
				$\frac{30}{36} \times \frac{24}{40}$		0.209	0.418
				$\frac{28}{36} \times \frac{30}{40}$		0.244	0.488
				$\frac{25}{40} \times \frac{32}{32}$		0.262	0.524
				$\frac{28}{32} \times \frac{32}{42}$		0.279	0.558
				$\frac{32}{36} \times \frac{30}{32}$		0.349	0.698
				$\frac{30}{32} \times \frac{40}{36}$		0.437	0.874
				$\frac{30}{36} \times \frac{42}{28}$		0.524	1.048
				$\frac{35}{30} \times \frac{40}{32}$		0.611	1.222
				$\frac{35}{30} \times \frac{40}{28}$		0.698	1.396
				$\frac{32}{30} \times \frac{36}{29}$		0.0218	0.0436
				$\frac{32}{34} \times \frac{35}{28}$		0.0194	0.0388
				$\frac{32}{36} \times \frac{35}{28}$		0.0183	0.0366
				$\frac{30}{27} \times \frac{40}{42}$		0.0174	0.0348
				$\frac{32}{30} \times \frac{36}{40}$		0.0158	0.0316
				$\frac{27}{42} \times \frac{40}{28}$		0.0151	0.0302
				$\frac{30}{34} \times \frac{32}{32}$		0.0145	0.0290
				$\frac{32}{35} \times \frac{32}{36}$		0.0134	0.0268
				$\frac{30}{27} \times \frac{34}{50}$		0.0124	0.0248
				$\frac{35}{32} \times \frac{27}{42}$		0.0116	0.0232
				$\frac{35}{34} \times \frac{27}{42}$		0.0109	0.0218
				$\frac{30}{34} \times \frac{28}{42}$		0.0097	0.0194
				$\frac{30}{32} \times \frac{27}{48}$		0.0087	0.0174

Fig.7 Thread & Feed Chart

9. Operating Controls

Replacement of Chuck

The headstock spindle nose is cylindrical. Loosen the three set screws/nuts (A, Fig. 9) on the flange to remove the chuck. Install the new chuck and secure it with the same set screws and nuts.

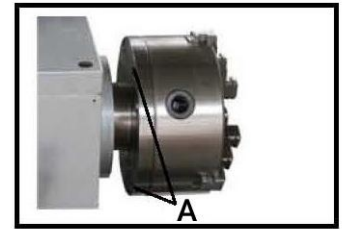


Fig. 9

Replacement of Chuck Jaw

There are two types of jaws: internal jaws and external jaws (Fig. 10). Please note that the number of each jaw matches the number inside the chuck's groove. Do not mix them together. Install the jaws in ascending order and remove them in descending order (3-2-1), one at a time. After completing this procedure, rotate the jaws to the smallest diameter and verify the fit.

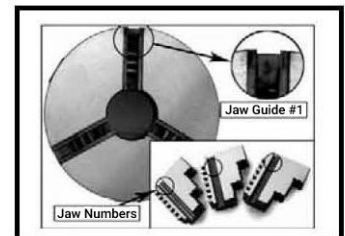


Fig. 10

Tool Set-up

Set the tool correctly and clamp the cutting tool in the tool post.

The tool must be clamped firmly. When turning, the tool tends to bend under the cutting force generated during chip formation (Fig. 11). For best results, tool overhang should be kept to 3/8" or less.

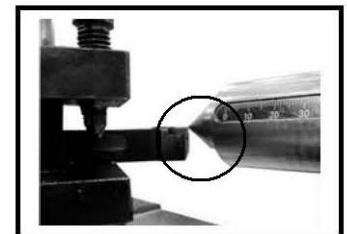


Fig. 11

Manual Turning

The handwheels for the apron travel (A), cross travel (B) and top slide (C) can be operated for longitudinal or cross feeding (Fig. 12)

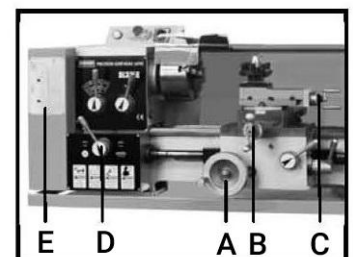


Fig. 12

Longitudinal Turning with Auto-feed

1. Set the belt in the inner groove of the pulley (Fig.13A) for low-speed operation.
2. Use the table (E, Fig. 12) on the lathe to select the feed rate or the thread. Adjust the change gears if the required feed or thread cannot be obtained with the installed gear set.

Changing High/Low Speed

Position the belt in the inner pulley groove (Fig.13A) for low-speed operation.

Moving the belt from the inner groove (Fig. 13A) to the outer groove (Fig. 13B) runs the machine at high speed. Move the belt by hand or with a tool.



Fig. 13A

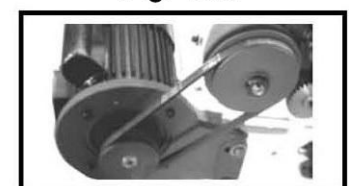


Fig. 13B

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 cross feed for the depth of cut is achieved using the cross slide. (Fig. 14)

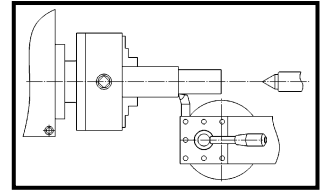


Fig. 14

Facing and Recesses

In the facing operation, the tool feeds perpendicular to the axis of rotation of the workpiece. The feed is made manually with the cross slide handwheel. The cross feed for cut depth is made with the top slide or lathe saddle. (Fig. 15)

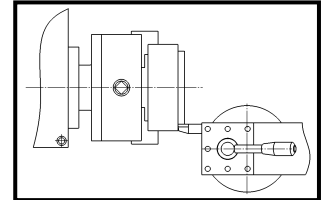


Fig. 15

Turning Between Centers

For turning between centers, it is necessary to remove the chuck from the spindle. Fit the MT5 centers into the spindle nose and the tailstock. Mount the workpiece, fitted with a drive dog, between the centers. The dog is driven by a catch plate or faceplate.

Note: Always apply a small amount of grease to the tailstock center to prevent the center tip from overheating. (Fig. 16)

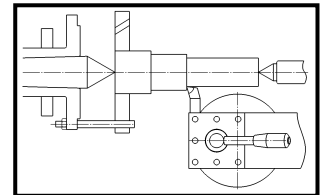


Fig. 16

Taper Turning Using Tailstock Offset

Tapered workpieces can be turned by offsetting the tailstock. The angle depends on the length of the workpiece.

Loosen the nut (A, Fig. 17), handle (C), and two screws (D), then adjust screw (B) to offset the quill centerline from the spindle centerline. To obtain the desired taper, refer to the value on the scale plate (E).

Taper direction adjustment:

To offset the tailstock forward (toward the operator), loosen the front nut (A) and tighten the rear nut (A) until the tailstock body moves to the desired value on the scale plate, then retighten the front nut (A). For a backward offset, follow the same procedure. After the taper is turned, lock the screw, then return the tailstock to its original position using the zero mark on the tailstock scale.

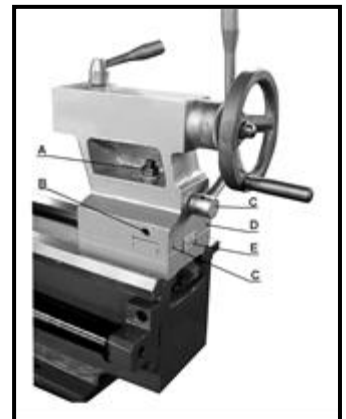


Fig. 17

Taper Turning by Setting the Top Slide

By angling the top slide, tapers may be turned manually (Fig. 18).

Rotate the top slide to the required angle. A graduated scale permits accurate adjustment of the top slide. The cross feed is performed with the cross slide. This method can only be used for short tapers.

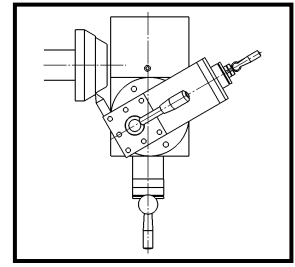


Fig. 18

Thread Cutting

Set the machine for the desired thread pitch (according to the Thread Chart, Fig. 7).
Start the machine and engage the half nut.

When the tool reaches the part, it will cut the initial threading pass. When the tool reaches the end of cut, stop the machine by turning the motor off and at the same time back the tool out of the part so that it clears the thread. Do not disengage the half nut lever. Reverse the motor direction to allow the cutting tool to traverse back to the starting point. Repeat these steps until you have obtained the desired results.

M		B		C		D		E		F		G		H		I		J		K		L		M		N		O		P		Q		R		S		T		U		V		W		X		Y		Z		AA		AB		AC		AD		AE		AF		AG		AH		AI		AJ		AK		AL		AM		AN		AO		AP		AQ		AR		AS		AT		AU		AV		AW		AX		AY		AZ		BA		BB		BC		BD		BE		BF		BG		BH		BI		BJ		BK		BL		BM		BN		BO		BP		BQ		BR		BS		BT		BU		BV		BW		BX		BY		BZ		CA		CB		CC		CD		CE		CF		CG		CH		CI		CJ		CK		CL		CM		CN		CO		CP		CQ		CR		CS		CT		CU		CV		CW		CX		CY		CZ		DA		DB		DC		DD		DE		DF		DG		DH		DI		DJ		DK		DL		DM		DN		DO		DP		DQ		DR		DS		DT		DU		DV		DW		DX		DY		DZ		EA		EB		EC		ED		EE		EF		EG		EH		EI		EJ		EK		EL		EM		EN		EO		EP		EQ		ER		ES		ET		EU		EV		EW		EX		EY		EZ		FA		FB		FC		FD		FE		FF		FG		FH		FI		FJ		FK		FL		FM		FN		FO		FP		FQ		FR		FS		FT		FU		FV		FW		FX		FY		FZ		GA		GB		GC		GD		GE		GF		GG		GH		GI		GJ		GK		GL		GM		GN		GO		GP		GQ		GR		GS		GT		GU		GV		GW		GX		GY		GZ		HA		HB		HC		HD		HE		HF		HG		HH		HI		HJ		HK		HL		HM		HN		HO		HP		HQ		HR		HS		HT		HU		HV		HW		HX		HY		HZ		IA		IB		IC		ID		IE		IF		IG		IH		II		IJ		IK		IL		IM		IN		IO		IP		IQ		IR		IS		IT		IU		IV		IW		IX		IY		IZ		JA		JB		JC		JD		JE		JF		JG		JH		JI		JJ		JK		JL		JM		JN		JO		JP		JQ		JR		JS		JT		JU		JV		JW		JX		JY		JZ		KA		KB		KC		KD		KE		KF		KG		KH		KI		KJ		KL		KM		KN		KO		KP		KQ		KR		KS		KT		KU		KV		KW		KX		KY		KZ		LA		LB		LC		LD		LE		LF		LG		LH		LI		LJ		LK		LL		LM		LN		LO		LP		LQ		LR		LS		LT		LU		LV		LW		LX		LY		LZ		MA		MB		MC		MD		ME		MF		MG		MH		MI		MJ		MK		ML		MN		MO		MP		MQ		MR		MS		MT		MU		MV		MW		MX		MY		MZ		NA		NB		NC		ND		NE		NF		NG		NH		NI		NJ		NK		NL		NM		NN		NO		NP		NQ		NR		NS		NT		NU		NV		NW		NX		NY		NZ		OA		OB		OC		OD		OE		OF		OG		OH		OI		OJ		OK		OL		OM		ON		OO		OP		OQ		OR		OS		OT		OU		OV		OW		OX		OY		OZ		PA		PB		PC		PD		PE		PF		PG		PH		PI		PJ		PK		PL		PM		PN		PO		PP		PQ		PR		PS		PT		PU		PV		PW		PX		PY		PZ		QA		QB		QC		QD		QE		QF		QG		QH		QI		QJ		QK		QL		QM		QN		QO		QP		QQ		QR		QS		QT		QU		QV		QW		QX		QY		QZ		RA		RB		RC		RD		RE		RF		RG		RH		RI		RJ		RK		RL		RM		RN		RO		RP		RQ		RR		RS		RT		RU		RV		RW		RX		RY		RZ		SA		SB		SC		SD		SE		SF		SG		SH		SI		SJ		SK		SL		SM		SN		SO		SP		SQ		SR		SS		ST		SU		SV		SW		SX		SY		SZ		TA		TB		TC		TD		TE		TF		TG		TH		TI		TJ		TK		TL		TM		TN		TO		TP		TQ		TR		TS		TT		TU		TV		TW		TX		TY		TZ		UA		UB		UC		UD		UE		UF		UG		UH		UI		UJ		UK		UL		UM		UN		UO		UP		UQ		UR		US		UT		UU		UV		UW		UX		UY		UZ		VA		VB		VC		VD		VE		VF		VG		VH		VI		VJ		VK		VL		VM		VN		VO		VP		VQ		VR		VS		VT		VU		VV		VW		VX		VY		VZ		WA		WB		WC		WD		WE		WF		WG		WH		WI		WJ		WK		WL		WM		WN		WO		WP		WQ		WR		WS		WT		WU		WV		WW		WX		WY		WZ		XA		XB		XC		XD		XE		XF		XG		XH		XI		XJ		XK		XL		XM		XN		XO		XP		XQ		XR		XS		XT		XU		XV		XW		XX		XY		XZ		YA		YB		YC		YD		YE		YF		YG		YH		YI		YJ		YK		YL		YM		YN		YO		YP		YQ		YR		YS		YT		YU		YV		YW		YX		YY		YZ		ZA		ZB		ZC		ZD		ZE		ZF		ZG		ZH		ZI		ZJ		ZK		ZL		ZM		ZN		ZO		ZP		ZQ		ZR		ZS		ZT		ZU		ZV		ZW		ZX		ZY		ZZ	
M-24	M-30	M-36	M-42	M-48	M-54	M-60	M-66	M-72	M-78	M-84	M-90	M-96	M-102	M-108	M-114	M-120	M-126	M-132	M-138	M-144	M-150	M-156	M-162	M-168	M-174	M-180	M-186	M-192	M-198	M-204	M-210	M-216	M-222	M-228	M-234	M-240	M-246	M-252	M-258	M-264	M-270	M-276	M-282	M-288	M-294	M-300	M-306	M-312	M-318	M-324	M-330	M-336	M-342	M-348	M-354	M-360	M-366	M-372	M-378	M-384	M-390	M-396	M-402	M-408	M-414	M-420	M-426	M-432	M-438	M-444	M-450	M-456	M-462	M-468	M-474	M-480	M-486	M-492	M-498	M-504	M-510	M-516	M-522	M-528	M-534	M-540	M-546	M-552	M-558	M-564	M-570	M-576	M-582	M-588	M-594	M-600	M-606	M-612	M-618	M-624	M-630	M-636	M-642	M-648	M-654	M-660	M-666	M-672	M-678	M-684	M-690	M-696	M-702	M-708	M-714	M-720	M-726	M-732	M-738	M-744	M-750	M-756	M-762	M-768	M-774	M-780	M-786	M-792	M-798	M-804	M-810	M-816	M-822	M-828	M-834	M-840	M-846	M-852	M-858	M-864	M-870	M-876	M-882	M-888	M-894	M-900	M-906	M-912	M-918	M-924	M-930	M-936	M-942	M-948	M-954	M-960	M-966	M-972	M-978	M-984	M-990	M-996	M-1002	M-1008	M-1014	M-1020	M-1026	M-1032	M-1038	M-1044	M-1050	M-1056	M-1062	M-1068	M-1074	M-1080	M-1086	M-1092	M-1098	M-1104	M-1110	M-1116	M-1122	M-1128	M-1134	M-1140	M-1146	M-1152	M-1158	M-1164	M-1170	M-1176	M-1182	M-1188	M-1194	M-1200	M-1206	M-1212	M-1218	M-1224	M-1230	M-1236	M-1242	M-1248	M-1254	M-1260	M-1266	M-1272	M-1278	M-1284	M-1290	M-1296	M-1302	M-1308	M-1314	M-1320	M-1326	M-1332	M-1338	M-1344	M-1350	M-1356	M-1362	M-1368	M-1374	M-1380	M-1386	M-1392	M-1398	M-1404	M-1410	M-1416	M-1422	M-1428	M-1434	M-1440	M-1446	M-1452	M-1458	M-1464	M-1470	M-1476	M-1482	M-1488	M-1494	M-1500	M-1506	M-1512	M-1518	M-1524	M-1530	M-1536	M-1542	M-1548	M-1554	M-1560	M-1566	M-1572	M-1578	M-1584	M-1590	M-1596	M-1602	M-1608	M-1614	M-1620	M-1626	M-1632	M-1638	M-1644	M-1650	M-1656	M-1662	M-1668	M-1674	M-1680	M-1686	M-1692	M-1698	M-1704	M-1710	M-1716	M-1722	M-1728	M-1734	M-1740	M-1746	M-1752	M-1758	M-1764	M-1770	M-1776	M-1782	M-1788	M-1794	M-1800	M-1806	M-1812	M-1818	M-1824	M-1830	M-1836	M-1842	M-1848	M-1854	M-1860	M-1866	M-1872	M-1878	M-1884	M-1890	M-1896	M-1902	M-1908	M-1914	M-1920	M-1926	M-1932	M-1938	M-1944	M-1950	M-1956	M-1962	M-1968	M-1974	M-1980	M-1986	M-1992	M-1998	M-2004	M-2010	M-2016	M-2022	M-2028	M-2034	M-2040	M-2046	M-2052	M-2058	M-2064	M-2070	M-2076	M-2082	M-2088	M-2094	M-2100	M-2106	M-2112	M-2118	M-2124	M-2130	M-2136	M-2142	M-2148	M-2154	M-2160	M-2166	M-2172	M-2178	M-2184	M-2190	M-2196	M-2202	M-2208	M-2214	M-2220	M-2226	M-2232	M-2238	M-2244	M-2250	M-2256	M-2262	M-2268	M-2274	M-2280	M-2286	M-2292	M-2298	M-2304	M-2310	M-2316	M-2322	M-2328	M-2334	M-2340	M-2346	M-2352	M-2358	M-2364	M-2370	M-2376	M-2382	M-2388	M-2394	M-2400	M-2406	M-2412	M-2418	M-2424	M-2430	M-2436	M-2442	M-2448	M-2454	M-2460	M-2466	M-2472	M-2478	M-2484	M-2490	M-2496	M-2502	M-2508	M-2514	M-2520	M-2526	M-2532	M-2538	M-2544	M-2550	M-2556	M-2562	M-2568	M-2574	M-2580	M-2586	M-2592	M-2598	M-2604	M-2610	M-2616	M-2622	M-2628	M-2634	M-2640	M-2646	M-2652	M-2658	M-2664	M-2670	M-2676	M-2682	M-2688	M-2694	M-2700	M-2706	M-2712	M-2718	M-2724	M-2730	M-2736	M-2742	M-2748	M-2754	M-2760	M-2766	M-2772	M-2778	M-2784	M-2790	M-2796	M-2802	M-2808	M-2814	M-2820	M-2826	M-2832	M-2838	M-2844	M-2850	M-2856	M-2862	M-2868	M-2874	M-2880	M-2886	M-2892	M-2898	M-2904	M-2910	M-2916	M-2922	M-2928	M-2934	M-2940	M-2946	M-2952	M-2958	M-2964	M-2970	M-2976</																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

Change Gear Replacement

1. Disconnect the machine from the power source.
2. Unscrew the two fastening screws and remove the protective cover.
3. Loosen the locking screw (C, Fig. 19) on the quadrant.
4. Swing the quadrant (D, Fig. 19) to the right.
5. Unscrew the bolt (E, Fig. 19) from the leadscrew, or the square bolts (F, Fig. 19) from the quadrant, to remove the change gears from the front.
6. Install the gear pairs according to the Thread & Feed Table (Fig. 7) and screw the gears onto the quadrant again.
7. Swing the quadrant to the left until the gear has engaged again.
8. Readjust the gear backlash by inserting a normal sheet of paper as a distance aid between the gears.
9. Immobilize the quadrant with the locking screw.
10. Install the protective cover of the headstock and reconnect the machine to the power supply.

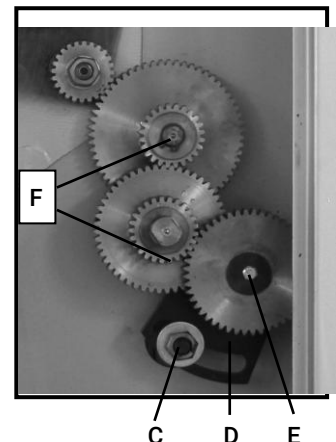


Fig. 19

Adjustment

After extended use, some moving components may wear and require adjustment.

Compound Rest Adjustment

Loosen the two screws (A, Fig. 20). After setting the desired angle, retighten them.

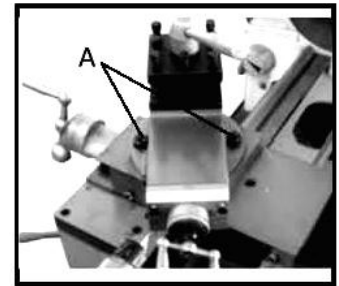


Fig. 20

Belt Adjustment

Loosen the two nuts and screws (A, Fig. 21) to remove the motor mounting plate and reposition it.

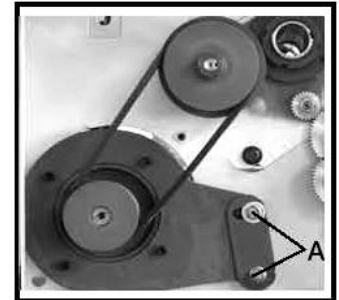


Fig. 21

Main Spindle Bearing Adjustment

The main spindle bearings are adjusted at the factory. If end play becomes evident after considerable use, the bearings may be adjusted. Loosen two hex socket cap screws (A, Fig. 22) in the slotted nut on the back of the spindle. Tighten the slotted nut until all end play is taken up. The spindle should still revolve freely.

Tighten two hex socket cap screws.

CAUTION: Excessive tightening or preloading will damage the bearings.

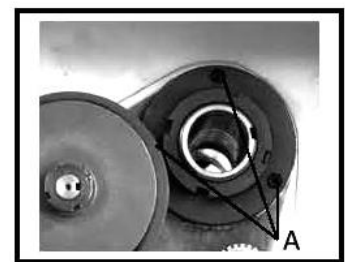


Fig. 22

Cross Slide Adjustment

The cross slide is fitted with a gib strip (A, Fig. 23) and can be adjusted with screw (B, Fig. 23) fitted with lock nuts (C, Fig. 23). Loosen the lock nuts and tighten the set screws until the slide moves freely without play. Tighten the lock nuts to retain the adjustment.

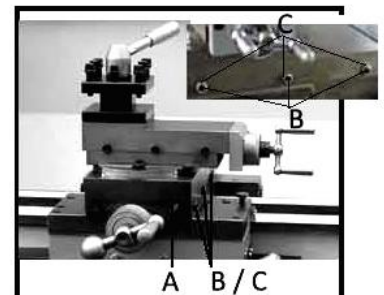


Fig. 23

Top Slide Adjustment

The top slide is fitted with a gib strip (A, Fig. 24) and can be adjusted with screw (B, Fig. 24) fitted with lock nuts (C, Fig. 24). Loosen the lock nuts and tighten the set screws until the slide moves freely without play. Tighten the lock nuts to retain the adjustment.

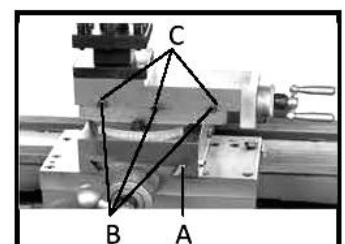


Fig. 24

10. Preventive Maintenance

1. Daily Inspection

Daily inspection should be performed at the start of each shift. Perform the inspection as described in item 1-1 below.

1-1 Check before starting the motor

- 1) Clean-up of machine: Remove dust, chips, and other debris from the sliding surfaces so that the rotating and sliding parts operate smoothly. Clean all other stationary parts regularly to prevent corrosion.
- 2) Greasing and oiling: Regular oiling should be done every day (see lubrication plan sheet) to keep the machine properly lubricated.
- 3) Check the sensitivity & reliability of all manual control levers: Test the speed change function of the headstock feeds and the apron/gearbox, and inspect the starting, stopping, and forward/reverse actions to verify that they operate smoothly and reliably.

1-2 Check after starting the motor

- 1) To check electrical control system:

Press the buttons and verify that starting, stopping, and the indicator lamp operate reliably.

- 2) The sensitivity and reliability of mechanical control device:

Control levers for the forward/reverse spindle, automatic feeds, and thread change should operate smoothly and reliably. Automatic control devices for longitudinal and cross feed, gear change, thread change, carriage travel, and spindle direction should also be accurate.

- 3) Coolant system:

Check the coolant level, then run the coolant pump to verify its operation and check for leaks.

- 4) Lubricating system:

Inspect the entire lubricating system and ensure that all oil lines are free of blockages.

1-3 Caution during operation:

- 1) Temperature of bearings:

Touch the main bearing by hand and check whether the temperature is normal.

- 2) Temperature of motor:

Feel the temperature of motor bearing under full load.

- 3) Noise and vibration:

If you find the noise and vibration of the machine are abnormal or irregular, stop the machine immediately for inspection and adjustment.

- 4) Safety precautions:

A. Stop the machine whenever you leave it.

B. Stop the machine before changing the spindle speed or feed rate.

C. Do not leave tools or workpieces on the sliding surfaces of the bed.

1-4 Check after operation:

1) Cleaning and collection of all tools:

Clean all tools and return them to their storage positions (tool cabinet).

2) Proper position of tailstock, carriage, & tool holder:

Tailstock, carriage and tool holder should be placed in their proper positions.

3) Clean-up of machine:

Remove all oil, chips, and other residue from the machine, then apply a thin film of lubricating oil to the sliding surfaces to prevent corrosion.

2. Weekly Inspection:

1) Lubricating system:

Clean the entire lubricating system and refill it with fresh lubricating oil.

2) Cooling system:

Clean the entire cooling system and refill it with fresh coolant.

3) Transmission system:

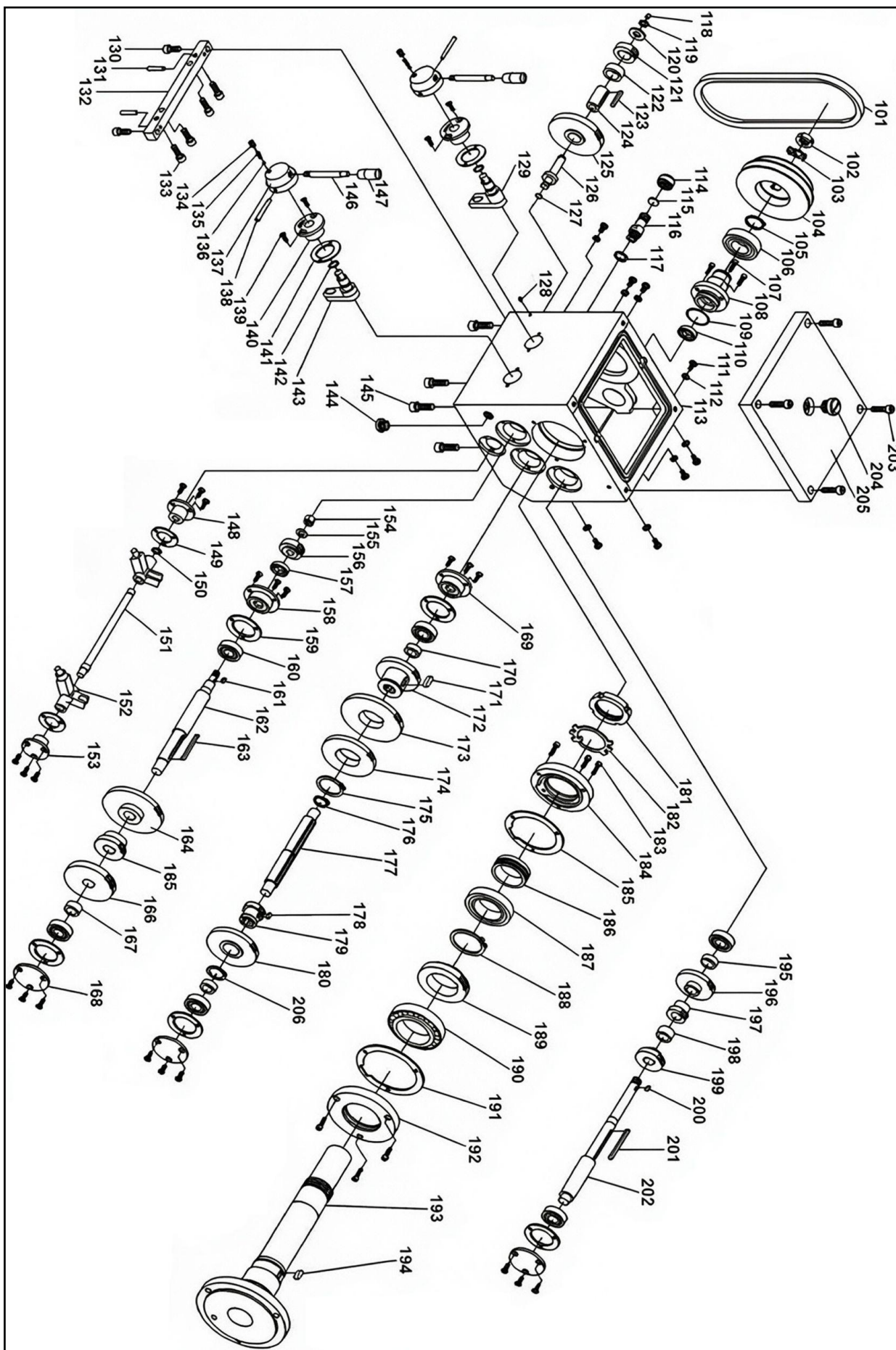
Check the V-belt for damage and readjust the belt tension.

Troubleshooting

Problem	Possible Cause	Remedy
Tool chatters	Gibs too loose on the carriage. Unused feeds not locked. Tool not on centerline. Improper tool shape; tool dull.	Readjust gibs. Lock all feeds except the one in use. Center the tool. Reshape, sharpen, or replace the tool.
Depth of cut is not consistent	Tailstock quill moving. Setup wrong.	Lock the tailstock quill. Make sure setup is parallel to table.
Hole is off center or bit wanders	Tool dull. Tool not mounted correctly. Chuck loose in spindle. Bearings loose or worn. Cutting speed too high.	Use sharp tools. Remount the tool. Remount chuck on spindle. Tighten or replace bearings. Reduce the cutting speed.
Bit turns erratically or stops	Tool fed into the work too fast.	Reduce the feed rate.
Chuck is difficult to tighten or loosen	Chuck sticking. Debris in chuck.	Apply lubricant. Clean chuck inside.
Turn on machine and nothing happens	Machine unplugged. Loose electrical connections.	Plug in the machine. Tighten wiring connections.

11. Exploded View and Parts List

Headstock

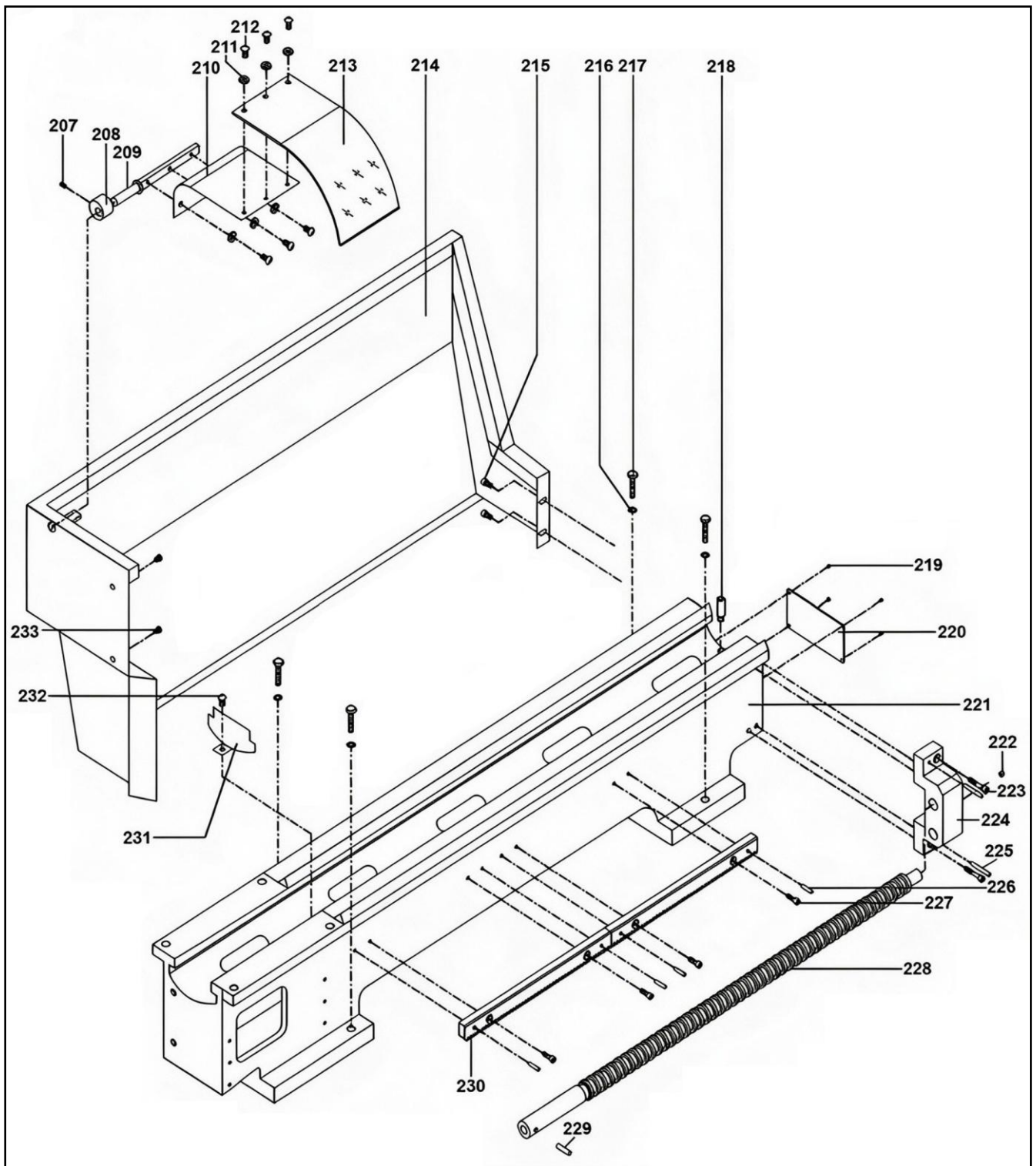


No.	Description	Qty
101	A-Type Belt 686 V710	1
102	Slotted round nut M16 × 1.5	1
103	Lock washer for circular nut M16	1
104	Spindle pulley	1
105	Retaining ring 30	1
106	Deep groove ball bearing 6206	6
107	Hexagon socket head screw M5 × 16	3
108	Pulley seat	1
109	O-ring 35.5 × 2.65	1
110	Felt cover	1
111	Cross recessed pan head screws M6 × 8	3
112	Washer	2
113	Lathe head	1
114	Nut	1
115	Felt cover	1
116	Oil Screw	1
117	Washer	1
118	Oil cup	1
119	Retaining ring 11	1
120	Cover	1
121	Change Gear	1
122	Sleeve spacer	1
123	Plain parallel key A5 × 36	1
124	Sleeve	1
125	Change Gear	1
126	Shaft	1
127	O-ring 9 × 1.8mm	1
128	Screw M5 × 8	1
129	Block	1
130	Hexagon socket head screw M8 × 20	2
131	Taper pins A6 × 30	2
132	Adjust block	2
133	Hexagon socket head screw M8 × 25	4
134	Cone-point set screw M8 × 10	4
135	Spring 0.8 × 5 × 20	1
136	Steel ball	1
137	Handle seat	2
138	Pins	2
139	Screw M5 × 16	4
140	Locating sleeve	2
141	Washer	2
142	O-ring 11.2 × 2.65mm	2
143	External snap ring	2

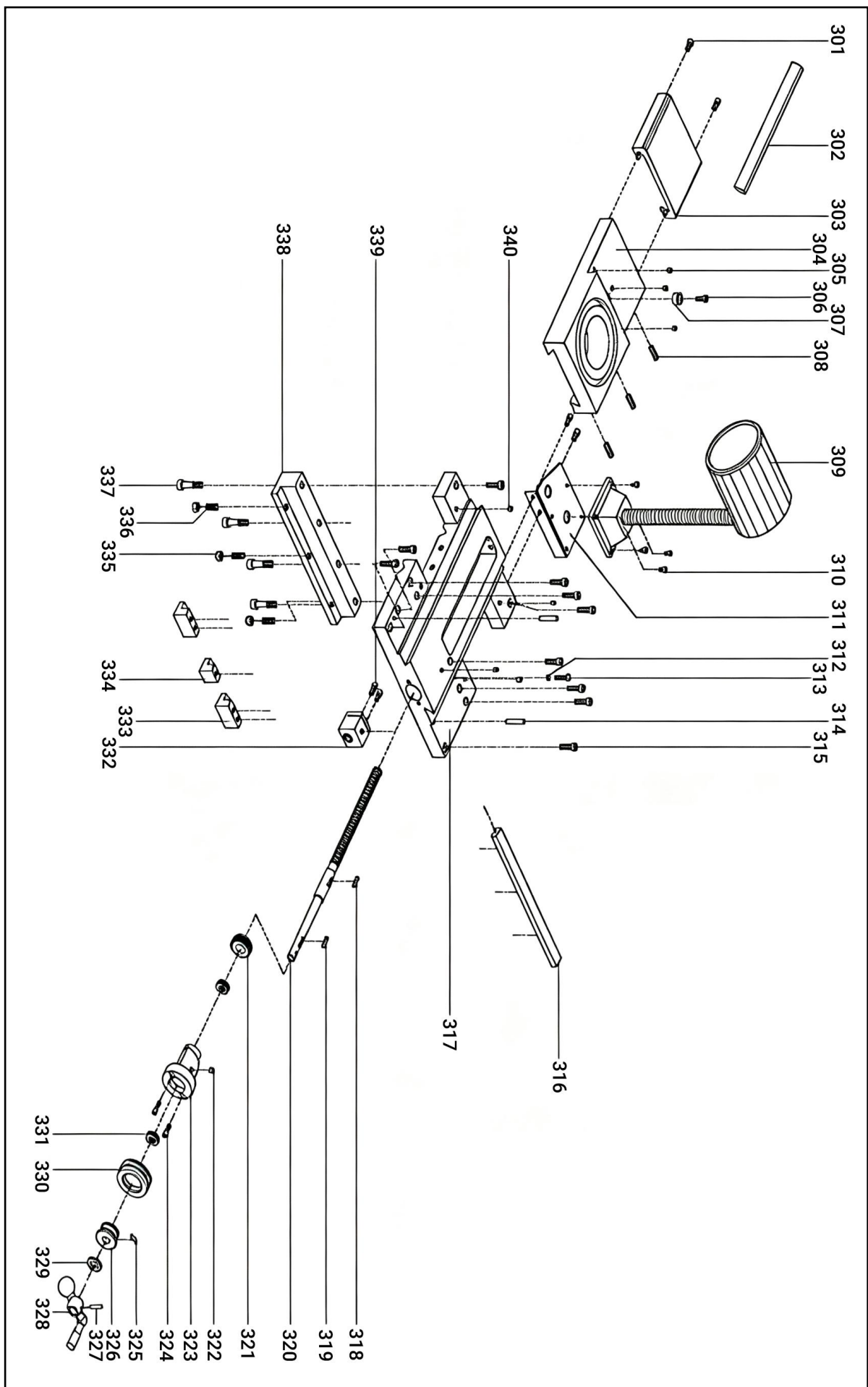
No.	Description	Qty
154	Nut M10	1
155	Plain washers 10	1
156	Gear change	1
157	Felt cover	1
158	Sleeve	1
159	Washer	1
160	Deep groove ball bearing 6203	2
161	Plain parallel key A4 × 10	1
162	Output shaft	1
163	Plain parallel key A5 × 60	1
164	Gear	1
165	Gear	1
166	Gear	1
167	Sleeve spacer	1
168	Sleeve	1
169	Sleeve	1
170	Sleeve spacer	1
171	Plain parallel key A5 × 22	1
172	Gear	1
173	Gear	1
174	Gear	1
175	Retaining ring 42	1
176	Retaining ring 22	1
177	Middle shaft	1
178	Pass feeder 6 × 4 × 10	1
179	Gear	1
180	Gear	1
181	Lock washer for round nut M50 × 1.5	1
182	Lock washer for circular nut	1
183	Hexagon socket head screw M5x20	4
184	Sleeve	1
185	Thrust washer	1
186	Sleeve spacer	1
187	Taper roller bearing	1
188	Retaining ring 55	1
189	Gear	1
190	Taper roller bearing	1
191	Thrust washer	1
192	Spindle bearing oil seal	1
193	Lathe spindle	1
194	Plain parallel key A8 × 16	1
195	Sleeve spacer	1
196	Gear	1

144	Oil Sight A10	2
145	Hexagon socket head screw M10 × 30	2
146	Handle lever	2
147	Knob M8 × 40	2
148	Sleeve	2
149	Washer	2
150	Retaining ring 12	2
151	Shifting fork shaft	2
152	Right shifting fork	1
153	Sleeve	2

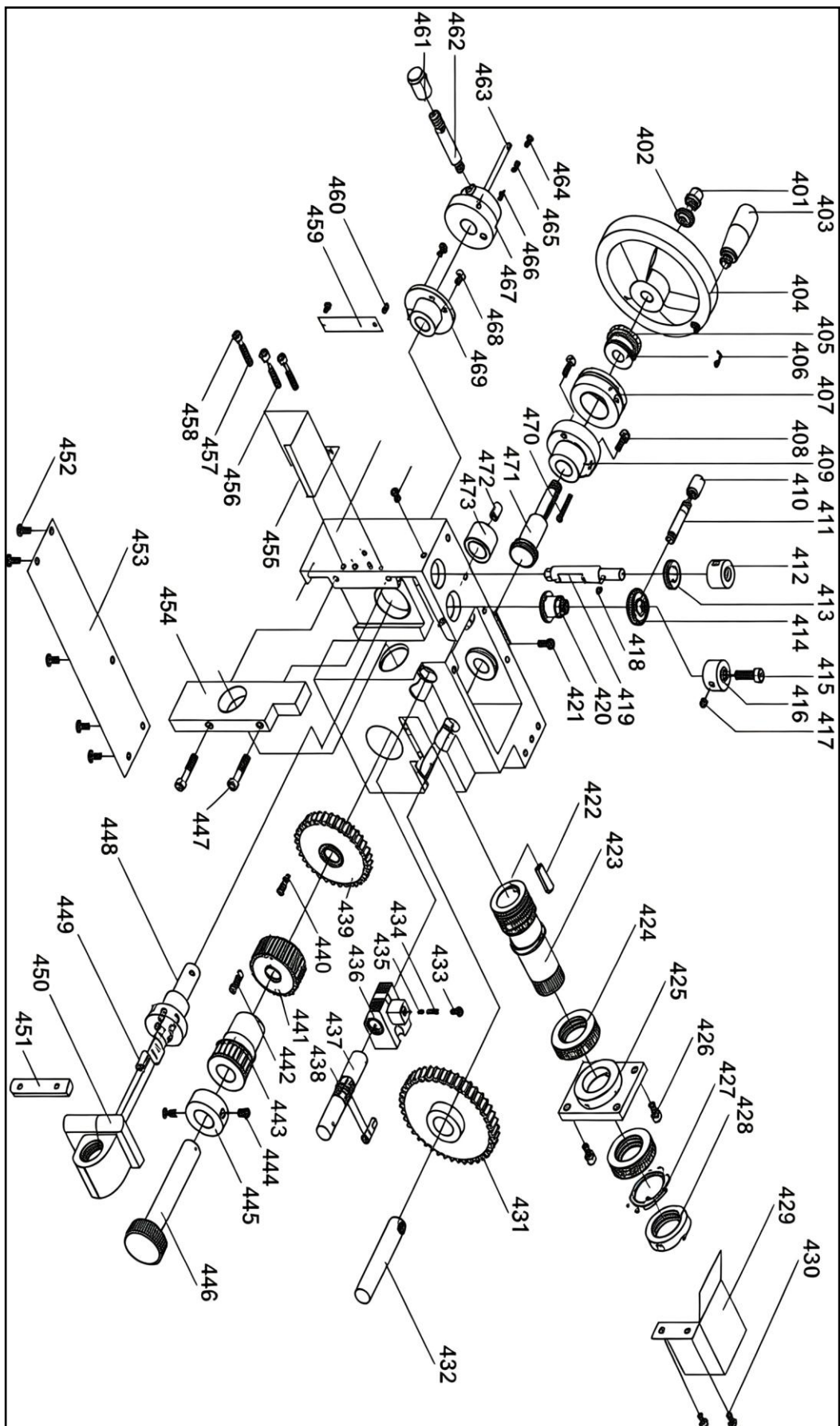
197	Sleeve spacer	1
198	Gear	1
199	Gear	1
200	Plain parallel key A5 × 10	1
201	Plain parallel key A5 × 70	1
202	Single shaft	1
203	Hexagon socket head screw M8 × 30	4
204	Oil port plug	1
205	Transmission cover	1
206	Retaining ring 28	1



No.	Description	Qty
207	Hexagon socket head screw M6 × 12	2
208	Off-Power Cam	1
209	Shaft	1
210	Support Board	1
211	Screw M5	2
212	Round Nut M5 × 12	2
213	Chuck Cover	1
214	Splash Guard	1
215	Hexagon socket head screw M6 × 10	2
216	Round Nut M10	4
217	Bolt M10 × 50	4
218	Positioning Screw	1
219	Round Nut 2.5 × 5	4
220	Cover	1
221	Machine Bed	1
222	Pin	2
223	Hexagon socket head screw M8 × 25	2
224	Leadscrew bracket	1
225	Hexagon socket head screw M4 × 24	2
226	Hexagon socket head screw M6 × 35	3
227	Pin M8 × 20	3
228	Leadscrew	1
229	Taper Pin 6 × 35mm	1
230	Racks	1
231	Cover	1
232	Hexagon socket head screw M6 × 8	1
233	Hexagon socket head screw M6 × 8	2

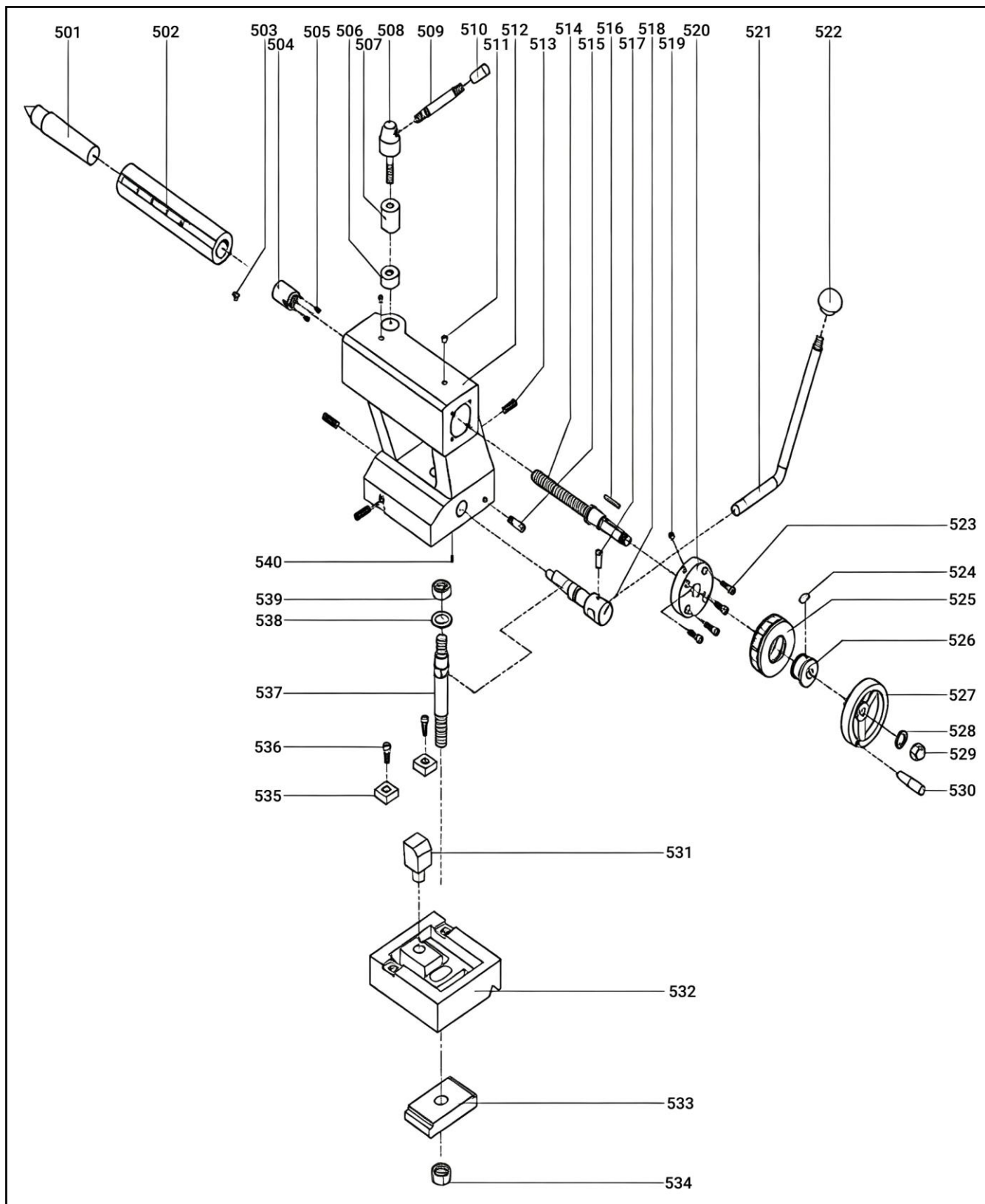


No.	Description	Qty
301	Hexagon socket head screw M8 × 30	2
302	Gib	1
303	Shield	1
304	Middle carriage	1
305	Oil cup 6	2
306	Hexagon socket head screw M6 × 12	1
307	Washer	1
308	Cone-point set screw M6 × 20	2
309	Lamp 24V 50W	1
310	Hexagon socket head screw M5 × 10	4
311	Lamp Mount	1
312	Oil Cup	4
313	Hexagon socket head screw M6 × 40	4
314	Pin 6 × 40mm	2
315	Hexagon socket head screw M6 × 35mm	4
316	Gib	1
317	Carriage	1
318	Plain parallel key 4 × 16mm	1
319	Plain parallel key 4 × 16mm	1
320	Cross feed screw rod	1
321	Gear	1
322	Oil Cup	1
323	Cross feed screw seat	1
324	Hexagon socket head screw M6 × 60	2
325	Spring lamination 51101	1
326	Dial sleeve	1
327	Taper pins 4 × 25mm	1
328	Handles with sleeve M12 × 40	1
329	Plain washers	1
330	Dial	1
331	Rolling bearing	2
332	Cross nut	1
333	Chain up block	1
334	Forward board	1
335	Hexagon nuts M8	3
336	Cone-point set screw M8 × 30	3
337	Hexagon socket head screw M8 × 35	3
338	Backward Board	1
339	Hexagon socket head screw M5 × 14	2
340	Oil Cup 6	2

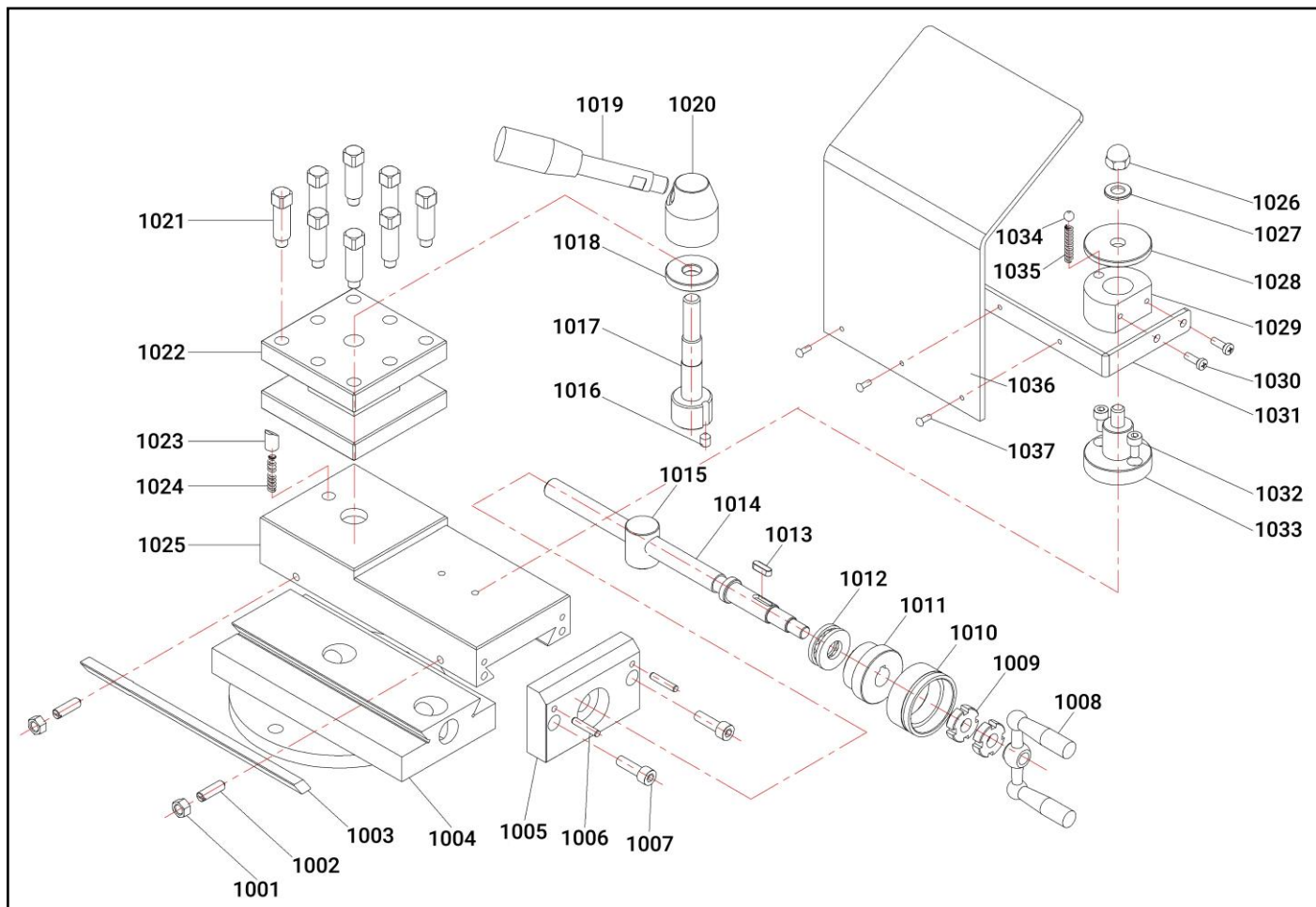


No.	Description	Qty
401	Domed cap nuts M10	1
402	Spring washer M10	1
403	Sleeve	1
404	Hand wheel B12 × 125	1
405	Sleeve	1
406	Spring lamination	1
407	Dial	1
408	Hexagon socket head screw M4 × 20	2
409	Flange sleeve	1
410	Handle sleeve B-plastic M8 × 25	1
411	Handle lever	1
412	Sleeve	1
413	Gear	1
414	Middle gear	1
415	Hexagon socket head screw M6 × 25	1
416	Sleeve	1
417	Cone-point set screw M5 × 10	1
418	Pin 4x6mm	1
419	Shaft	1
420	Shaft	1
421	Screws M6 × 20	4
422	Key	1
423	Worm shaft	1
424	Thrust ball bearing	2
425	Worm shaft	1
426	Hexagon socket head screw M5 × 12	4
427	Lock washer 30	1
428	Round nut M30 × 1.5	1
429	Safety shield	1
430	Hexagon socket head screw M5 × 10	2
431	Gear	1
432	Slippage shaft	1
433	Screws M6 × 8	1
434	Spring 0.8 × 4 × 12mm	1
435	Steel ball	1
436	Shifting fork	1
437	Shifting fork shaft	1
438	Pin 5 × 25mm	1
439	Gear	1
440	Pin 6 × 12mm	1
441	Gear	1
442	Pin	1
443	Worm gear	1
444	Screws M6 × 10	2
445	Sleeve	1
446	Gear shaft	1

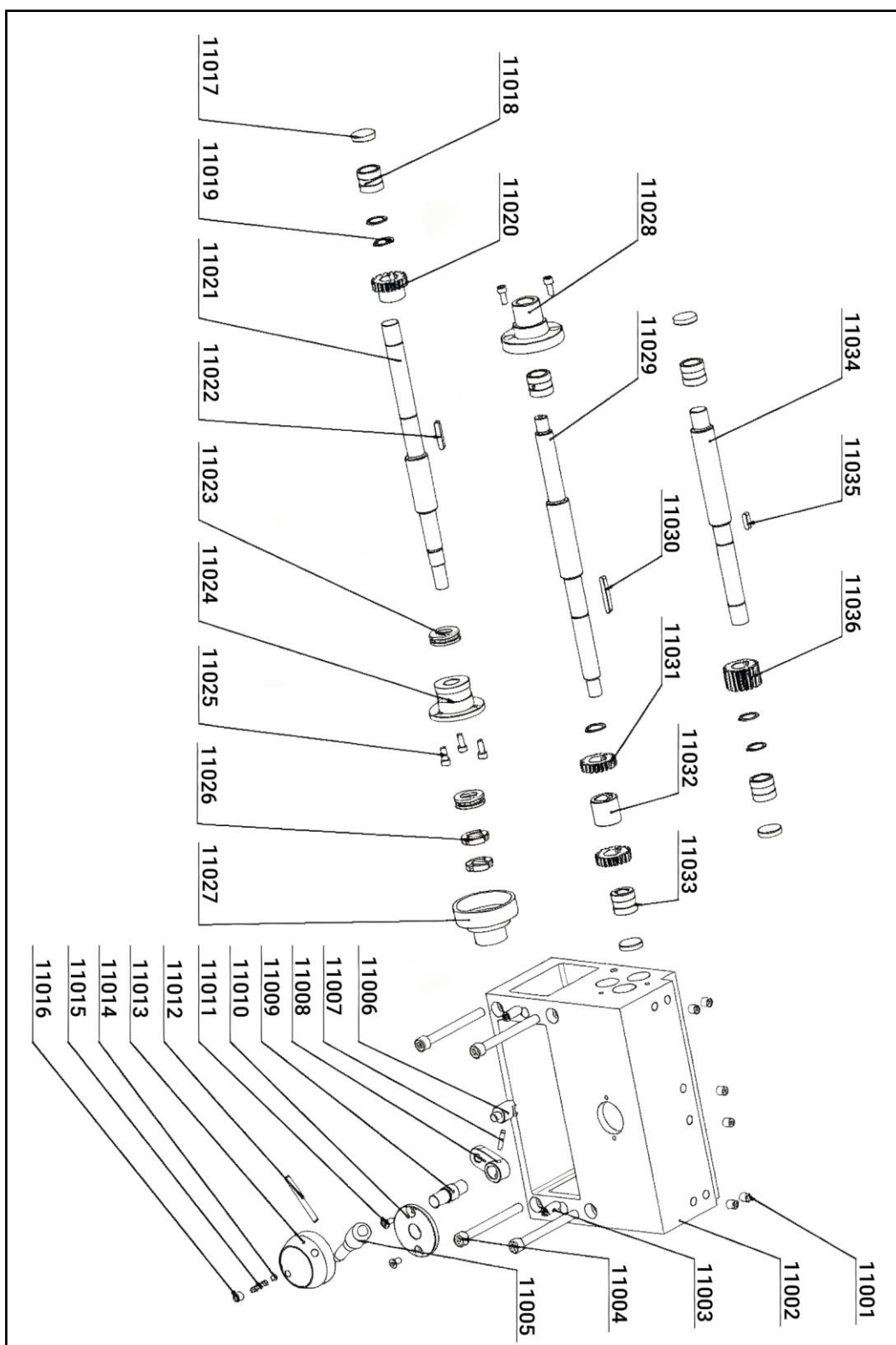
447	Hexagon socket head screw M5 × 35	2
448	Shaft	1
449	Dowel pins 6 × 15mm	1
450	Screw nut	1
451	Gib	1
452	Screw M4 × 8	4
453	Cover	1
454	Apron body right cover	1
455	Safe shield	1
456	Screw M5 × 25	2
457	Hexagon nuts M5	1
458	Screw M5 × 22	1
459	Table	1
460	Rivet 2.5 × 5mm	2
461	Handle sleeve B-plastic M8 × 25	3
462	Handle lever	1
463	Pins 5 × 50mm	1
464	Screw M8 × 10	1
465	Spring 0.8 × 5 × 16mm	1
466	Steel ball 6.5	1
467	Handle seat	1
468	Screw M4 × 12	3
469	Sleeve	1
470	Pin 4 × 28mm	1
471	Gear shaft	1
472	Oil cup	1
473	Sleeve	1
474	Screw	1
475	Apron body	1



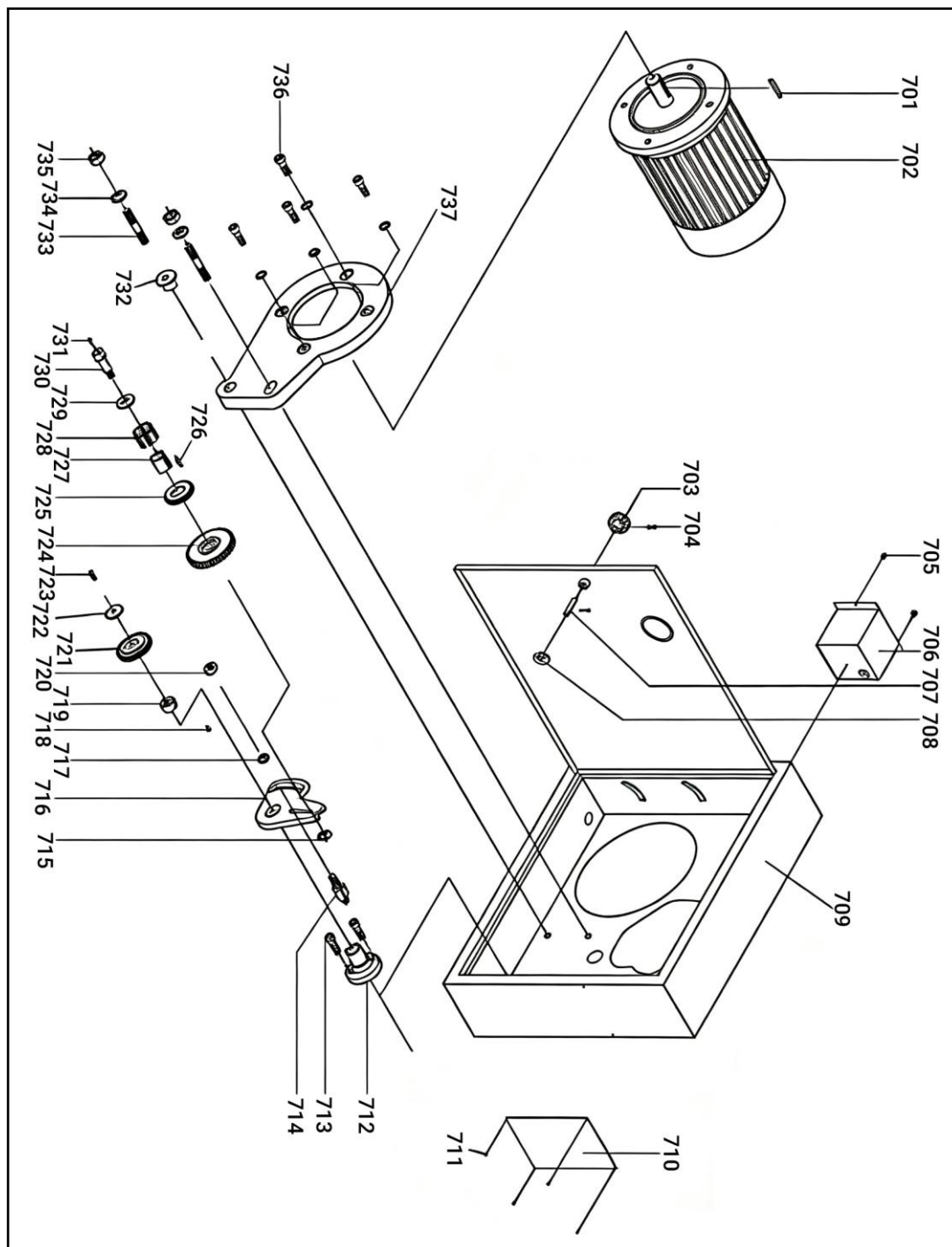
No.	Description	Qty
501	Live center, MT3	1
502	Tailstock center sleeve	1
503	T-Key	1
504	Tailstock Nuts	1
505	Cone-point set screw M6 × 10	2
506	Locking nuts	1
507	Locking Sleeve	1
508	Handle seat	1
509	Handle Lever	1
510	Long sleeve knob M25 × 8	1
511	Oil cup 6	1
512	Tailstock	1
513	Cone-point set screw M10 × 40	2
514	Tailstock leadscrew	1
515	Pin	1
516	Plain parallel key 4 × 28mm	1
517	Pins 8 × 25mm	1
518	Shaft	1
519	Oil cup	3
520	Sleeve	1
521	Handle lever	1
522	Handle ball M10 × 32	1
523	Hexagon socket head screw M5 × 20	4
524	Spring lamination	1
525	Dial	1
526	Sleeve	1
527	Hand wheel B12 × 250	1
528	Plain washers M12	1
529	Domed cap nuts M10	1
530	Handles with sleeve B12 × 250	1
531	Base	1
532	Tailstock carriage	1
533	Gib	1
534	Hexagon thin nuts M12	1
535	Block	1
536	Hexagon socket head screw M5 × 16	2
537	Pull pole set	1
538	Plain washers M12	1
539	Hexagon nuts M12	1
540	Cone-point set screw M6 × 14	1



No.	Description	Qty
1001	Hexagon nuts	2
1002	Cone-point set screw	2
1003	Gib	1
1004	Swivel Slide	1
1005	Leadscrew Flange	1
1006	Round Pin	2
1007	Hexagon socket head screw	2
1008	Handles with sleeve	1
1009	Small Round Nut	2
1010	Scale	1
1011	Shaft Sleeve	1
1012	Bearing	2
1013	Parallel Pin	1
1014	Leadscrew	1
1015	Leadscrew Nut	1
1016	Cone-point set screw	1
1017	Shaft	1
1018	Adjustable Washer	1
1019	Handle Lever	1
1020	Handle Seat	1
1021	Cone-point set screw	8
1022	Square Tool-Post	1
1023	Positioning Pin	1
1024	Spring	1
1025	Small Carriage	1
1026	Cap Nut	1
1027	Washer	1
1028	Pressure Cover	1
1029	Sleeve	1
1030	Round Cross Screw	2
1031	Bracket	1
1032	Hexagon socket head screw	2
1033	Mount	1
1034	Ball	1
1035	Spring	1
1036	PMMA Protection Cover	1
1037	Rivet	3



No.	Description	Qty
11001	Oil Cup	6
11002	Feeding Box	1
11003	A-type round pin	2
11004	Hexagon socket head screw	4
11005	Handle Lever	1
11006	Fork	1
11007	Pins	1
11008	Block	1
11009	Shaft	1
11010	Block Seat	1
11011	Screw M5 × 10	2
11012	Taper pins	1
11013	Handle Seat	1
11014	Ball	1
11015	Spring	1
11016	Cone-point set screw M8 × 10	1
11017	End Cap	1
11018	Sleeve	1
11019	Retaining ring16	2
11020	Gear	1
11021	Output Shaft	1
11022	Parallel Pin	1
11023	Bearing 51102	2
11024	Sleeve	1
11025	Hexagon socket head screw	3
11026	Locking Nut M14 × 1.5	2
11027	Cover	1
11028	Change Gear Bracket Mount	1
11029	Input Shaft	1
11030	Parallel Pin	1
11031	Gear	1
11032	Bush	1
11033	Bush	1
11034	Change Shaft	1
11035	Parallel Pin	1
11036	Gear	1



No.	Description	Qty
701	Parallel Pin A8 × 30	1
702	Motor YL90S-4 B5 1.1 KW	1
703	Door Lock 8 × 32mm	1
704	Screw 5 × 12mm	4
705	Screws M5 × 8	2
706	Limit Switch Box	1
707	Square Block	1
708	Round Nut	1
709	Change Gear Box	1
710	Change Gear Table	1
711	Screws 2.5 × 5mm	4
712	Change Gear Bracket Mount	1
713	Hexagon socket head screw M5 × 12	2
714	Shaft	1
715	T-nut	1
716	Change Gear Bracket	1
717	Washer	1
718	Parallel Pin 5 × 10mm	1
719	Bush	1
720	Round Nut M10	1
721	Change Gear	1
722	Large washer	1
723	Hexagon socket head screw M5 × 10	1
724	Change Gear	1
725	Change Gear	1
726	Parallel Pin 5 × 22mm	1
727	Bush	1
728	Bush	1
729	Washer 2.5 × 24mm	1
730	Shaft	1
731	Oil Cup	1
732	Oil Drain Bolt	1
733	Bolt M10 × 45	1
734	Washer	1
735	Round Nut M10	1
736	Hexagon socket head screw M8 × 20	4
737	Motor Mount	1

WARRANTY INFORMATION:

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For the most up-to-date and comprehensive warranty information, visit www.tmgindustrial.com