

METAL WORKING BENCH LATHE

MODEL: BL330E/1 OPERATING INSTRUCTION



ANHUI PAN-SINO MACHINE BUILDING CO., LTD.
HUANGSHAN, CHINA

GENERAL SAFETY INSTRUCTIONS

EXTREME CAUTION SHOULD BE USED IN OPERATION ALL POWER TOOLS. KNOW YOUR POWER TOOL, BE FAMILIAR WITH ITS OPERATION. READ THE OWNER'S MANUAL AND PRACTICE SAFE USAGE PROCEDURES AT ALL TIMES.

- ◆ **CONNECT** your machine **ONLY** to the matched and specified power source.
- ◆ **WEAR SAFETY GLASSES, RESPIRATORS, HEARING PROTECTION and SAFETY SHOES** when operating heavy machinery. **Always wear safety glasses.**
- ◆ **DO not** wear loose clothing or jewellery when operating machinery.
- ◆ **A Safe Environment is important.** Keep the area free of dust, dirt and other debris in the immediate vicinity of the machine.
- ◆ **BE ALERT!** Do Not Use prescription or other drugs that may affect your ability or judgments to safely use this machine.
- ◆ **DISCONNECT** the power source when changing tool bits and or any equipment.
- ◆ **NEVER** leave an operating tool unattended.
- ◆ **ALWAYS** keep blades, knives or bits sharp and properly aligned.
- ◆ **ALWAYS** keep all safety guards in place and ensure their proper function.
- ◆ **ALWAYS** make sure that any tools used for adjustments are removed before operating the machine.
- ◆ **ALWAYS** secure your work with the appropriate clamps or vises.
- ◆ **ALWAYS** keep bystanders safely away while operating machinery.
- ◆ **DO NOT** change speed while spindle is running.
- ◆ 3-JAW CHUCK OR 4-JAW CHUCK **MAX.SPEED 2500r/min**
- ◆ **THINK SAFELY. WORK SAFELY.** Never attempt a procedure if it does not feel safe or comfortable.

BL330E PRECISION GEAR HEAD LATHE

As part of the growing line of metalworking equipment, we are proud to offer the BL330E Metal Lathe. The name guarantees ANHUI PAN-SINO. By following the instructions and procedures laid out in this owner's manual, you will receive years of excellent service and satisfaction. The BL330 is a professional tool and like all power tools, proper care and safety procedures should be adhered to.

Specifications

Max. Swing over bed:	330mm
Max. Length of work piece:	700 mm
Max. Swing carriage:	220mm
Bed width:	160mm
Spindle Bore:	38mm
Spindle Taper:	MT 5#
Spindle Speeds:	12 Steps
Spindle Speeds Range:	60; 90; 120; 160; 220; 300; 380; 500; 640; 850; 110; 1650rpm
Max Lateral Stroke over tool post:	160mm
Max Longitudinal stroke of tool post:	100mm
Metric Thread kinds:	17 Kinds
Metric Thread range:	0.5-4 mm
Inch Thread kinds:	24 Kinds
Inch Thread range:	9-40 TPI
Longitudinal-feed range:	0.1-1.396mm/r
Cross-feed range:	0.025-0.34mm/r
Tailstock Quill Diameter:	40mm
Travel of Tail-stock Quill:	70mm
Tail-stock Quill Taper:	MT 3#
Motor Power:	1.1kw
Net Weight:	240kg
Packing Size (Without Stand):	1470*770*580mm
Packing Size (With Stand):	1470*770*1350mm

Illustrated Features

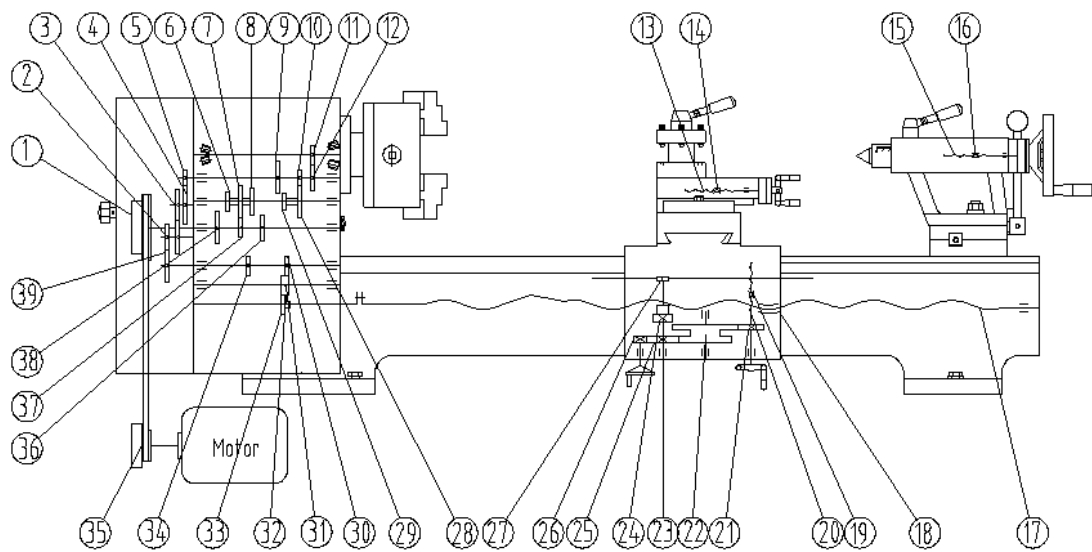


Fig 1. Driving system drawing.

- | | |
|---------------------------|------------------|
| 01. Input Pulley | 21. Gear |
| 02. Gear Change | 22. Gear |
| 03. Gear Change | 23. Gear |
| 04. Gear Change | 24. Worm Gear |
| 05. Gear Change | 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. Tail Stock Lead Screw | 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 | |

Lifting & Installation

It is recommended that this machine is lifted by the use of a crane or hoisting mechanism as it is very heavy.

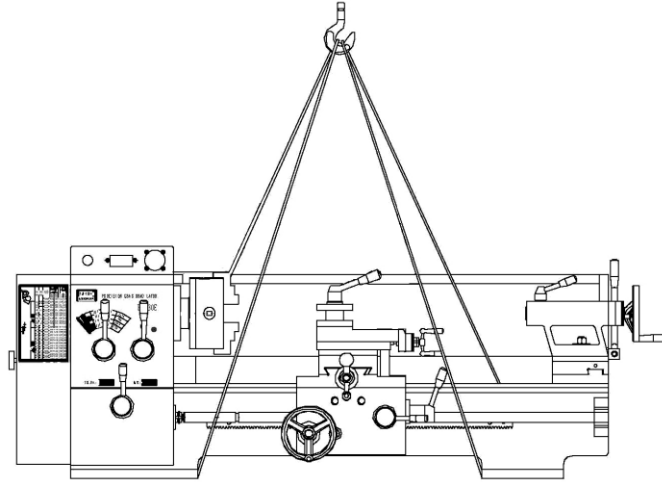


Fig 2. Lifting drawing.

Lifting & Installation

Please refer to figure 3 when installing this machine. As this lathe is for the most part pre-assembled at the factory, there is not a great deal of assembly for the end user. Line up the four bolt holes with the stand and carefully place the lathe on the stand.

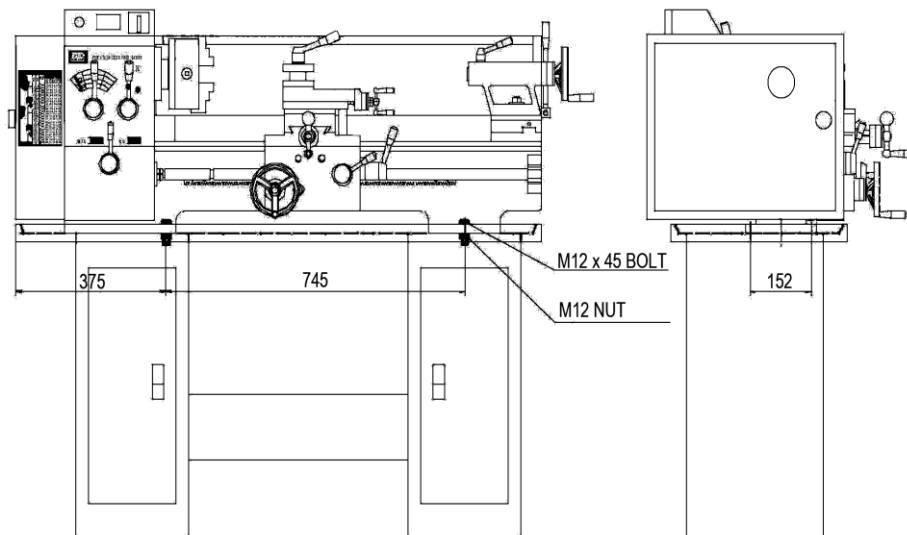


Fig 3. Installation drawing.

After installation, be sure to clean the antiseptic coat (used to preserve and protect during shipping) off the guide carriage, tail stock, change gear and pulley with a clean cloth and non-corrosive cleaner.

Lubrication Positions

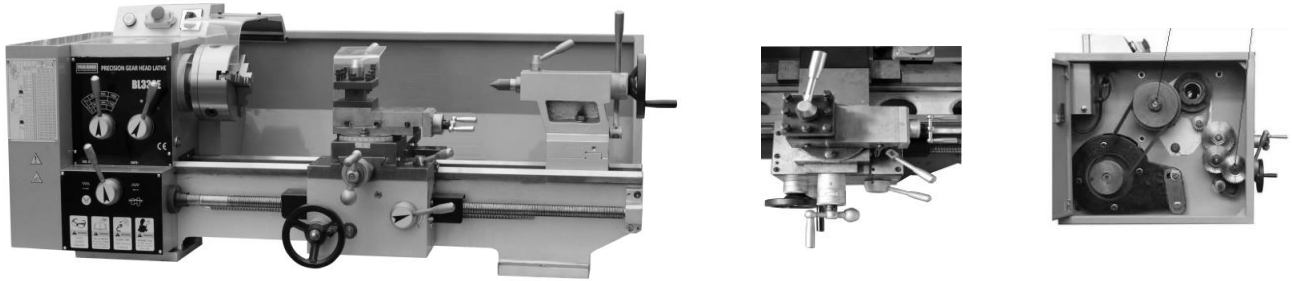


Fig 4. Lubrication positions drawing.

Refer to the Lubrication chart on the following page in order to properly lubricate and maintain your Lathe. Proper lubrication of any tools, especially Metal Lathes should not be ignored.

Lubrication Positions

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

- Notes:**
1. Recommend to fill 3# Ca grease 20# machine oil
 2. The parts lubricated by grease should be cleaned and the machine oil in feed box should be changed and renewed up to the center line of the oil indicator regularly.

Electrical System Drawing

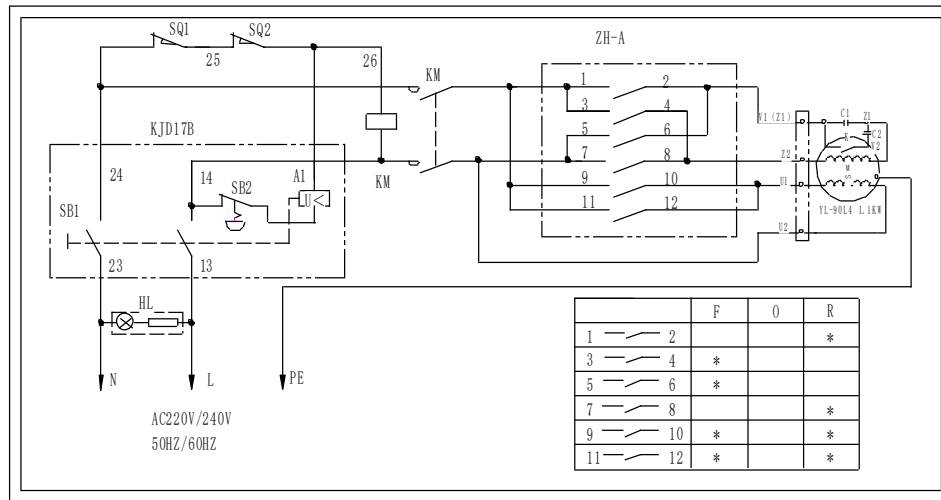


Fig5. Electric System Drawing (SINGLE PHASE)

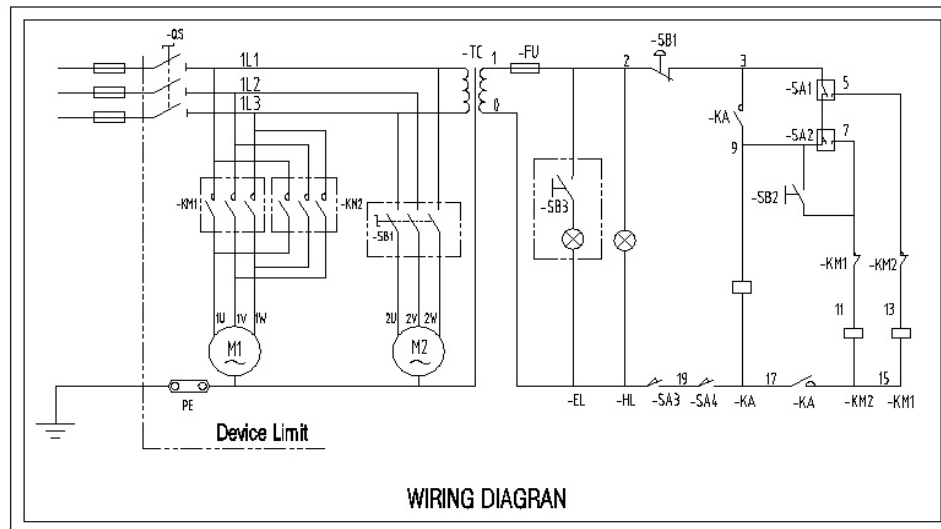


Fig6. Electric System Drawing (THREE PHASES)

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 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.

Thread & Feed Table

Cutting threads and feeding movement can be performed by the manual use of the change gears and handle (refer to Operating Controls)

Thread & Feed Chart

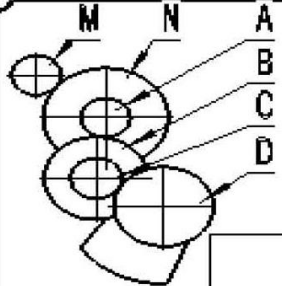

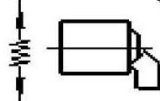
		$\frac{A}{B} \times \frac{C}{D}$				
			M=24 N=60	M=28 N=35	M=24 N=60	M=28 N=35
		$\frac{24}{50} \times \frac{25}{48}$	0.105	0.210	0.022	0.044
		0.5	1		0.175	0.350
		0.6			0.209	0.418
		0.7			0.244	0.488
		$\frac{28}{36} \times \frac{30}{40}$	0.244	0.488	0.052	0.104
		$\frac{25}{40} \times \frac{32}{32}$	0.262	0.524	0.056	0.112
		0.75	1.5		0.279	0.558
		$\frac{28}{32} \times \frac{32}{42}$	0.279	0.558	0.059	0.118
		0.8			0.349	0.698
		1	2		0.349	0.698
		$\frac{32}{36} \times \frac{30}{32}$	0.437	0.874	0.074	0.148
		1.25	2.5		0.437	0.874
		$\frac{30}{32} \times \frac{40}{36}$	0.524	1.048	0.093	0.186
		1.5	3		0.524	1.048
		$\frac{30}{36} \times \frac{42}{28}$	0.611	1.222	0.111	0.222
		1.75	3.5		0.611	1.222
		$\frac{35}{30} \times \frac{40}{32}$	0.698	1.396	0.129	0.258
		2	4		0.698	1.396
		$\frac{35}{30} \times \frac{40}{28}$	0.698	1.396	0.148	0.296
		2	4		0.698	1.396
		$\frac{32}{34} \times \frac{35}{28}$	0.0194	0.0388	0.0041	0.0082
		18	9		0.0194	0.0388
		$\frac{32}{38} \times \frac{35}{28}$	0.0183	0.0366	0.0038	0.0076
		19	9½		0.0183	0.0366
		$\frac{30}{27} \times \frac{40}{42}$	0.0174	0.0348	0.0037	0.0074
		20	10		0.0174	0.0348
		$\frac{32}{30} \times \frac{38}{40}$	0.0158	0.0316	0.0034	0.0068
		22	11		0.0158	0.0316
		$\frac{27}{42} \times \frac{40}{28}$	0.0151	0.0302	0.0032	0.0064
		23	11½		0.0151	0.0302
		$\frac{30}{34} \times \frac{32}{32}$	0.0145	0.0290	0.0031	0.0062
		24	12		0.0145	0.0290
		$\frac{32}{35} \times \frac{32}{38}$	0.0134	0.0268	0.0028	0.0056
		26	13		0.0134	0.0268
		$\frac{30}{27} \times \frac{34}{50}$	0.0124	0.0248	0.0026	0.0052
		28	14		0.0124	0.0248
		$\frac{35}{32} \times \frac{27}{42}$	0.0116	0.0232	0.0025	0.0050
		30	15		0.0116	0.0232
		$\frac{35}{34} \times \frac{27}{42}$	0.0109	0.0218	0.0023	0.0046
		32	16		0.0109	0.0218
		$\frac{30}{34} \times \frac{28}{42}$	0.0097	0.0194	0.0021	0.0042
		36	18		0.0097	0.0194
		$\frac{30}{32} \times \frac{27}{48}$	0.0087	0.0174	0.0018	0.0036
		40	20		0.0087	0.0174

Fig 7. Thread & Feed Chart

REFER TO THE DIAGRAM BELOW FOR THE BL330E operation controls.

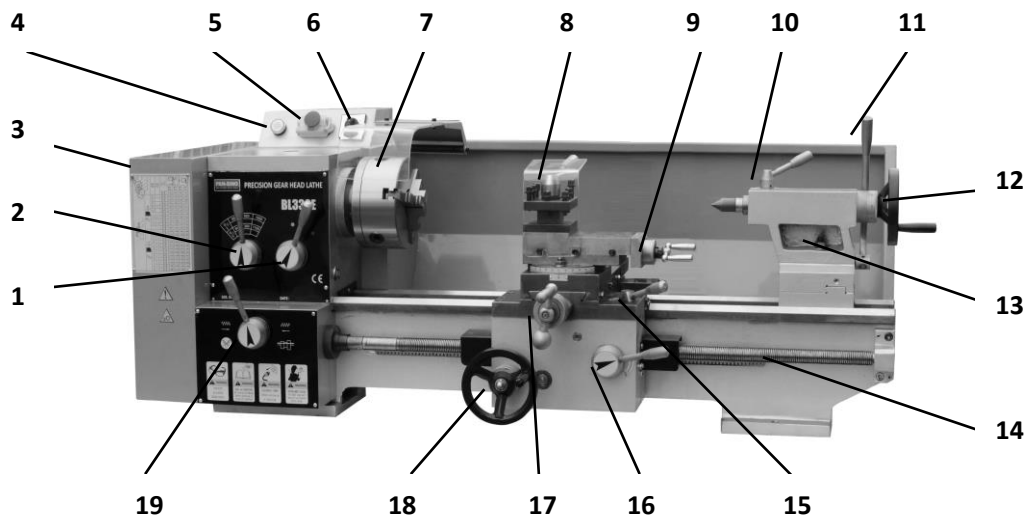


Fig 8. Operation Parts Fig.

1. Handler of Spindle Speed Change A
2. Handler of Spindle Speed Change B
3. Change Gear Box
4. Power Indicator
5. Emergency Stop Switch
6. Forward-Stop-Reverse Switch
7. Self-centering 3 Jaw Chuck
8. Handler of 4-way Tool Post
9. Tool Post Feeding Handler
10. Handle Lock for tailstock center
11. Lever to lock Tailstock
12. Tailstock hand-wheel
13. Tailstock Offset Screw
14. Main Lead-screw
15. Longitudinal-cross feed handle
16. Handler of Auto-Feed (Half Nut)
17. Carriage Cross Feed hand wheel
18. Apron feed hand-wheel
19. Handle of forward/reverse for lead screw

Operating Controls

Replacement of Chuck

The head spindle holding fixture is cylindrical. Loose three set Screw/nut (A. Fig. 9) on the flange to remove the chuck. Replace new chuck and fix it by the same set screws and nuts.

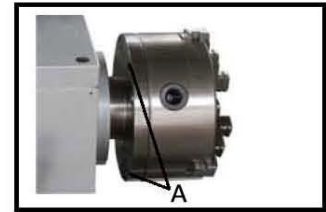


Fig.9

Replacement of Chuck Jaw

The jaws are in two types – the internal jaws and the external Jaws(Fig. 10). Please pay notice that the number of jaws fit with the number inside the chucks groove. Do not mix them together. When you are going to mount them, please mount them in Ascending order, and when taking them out, take them out in descending order (3-2-1) one by one. After finished this procedure, rotate the jaws to the smallest diameter and make sure there fit is right.

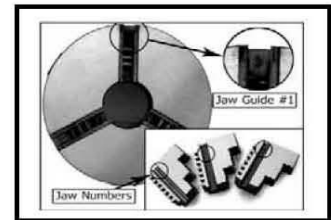


Fig. 10

Tool Set-up

Set correction and clamp the cutting tool into the tool-post. The tool must be clamped firmly. When turning, the tool has a tendency to bend under the cutting force generated during the chip formation(Fig. 11). For best results, tool overhang should be kept to a minimum of 3/8" or less.

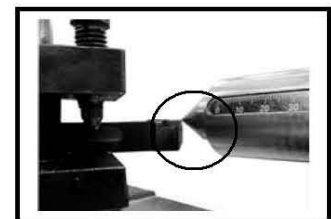


Fig. 11

Manual Turning

Handwheel of Apron travel(A), cross travel(B) and top slide(C) can be operated for longitudinal or cross feeding (Fig. 12)

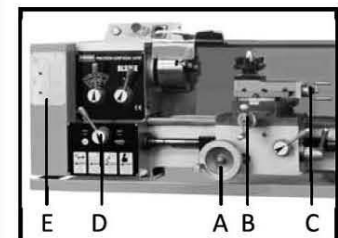


Fig. 12

Longitudinal Turing with Auto-feeding

1. Set the selector knob (D. Fig. 12) to select the feed direction and the feed speed
2. Use the table (E. Fig. 12) on the lathe for selecting the feed speed or the thread. Adjust the change gear if the required feed or thread cannot be obtained with the installed gear set

Change High/low Speed

Set the belt in inside groove of pulley (Fig. 13A) is running at high speed.

Likewise, remove the belt from inside groove (Fig. 13A) to outside groove (Fig. 13B) is to be run with low speed, which should be removed by manual or tools.



Fig. 13A

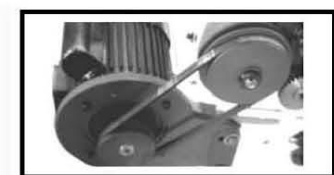


Fig. 13B

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)

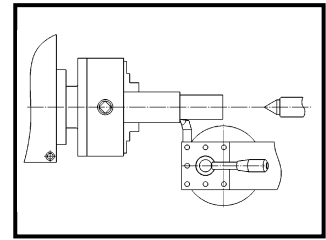


Fig. 14

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)

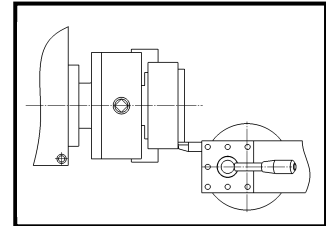


Fig. 15

Turning Between Centers

For turning between centers, it is necessary to remove the chuck from the spindle. Fit the MT 5 center into the spindle nose and the tailstock. Mount the workpiece fitted with the driver dog between the centers. The driver is driven by a catch or face plate.

Note: Always use a small amount grease on the tailstock center to prevent center tip on overheating. (Fig. 16)

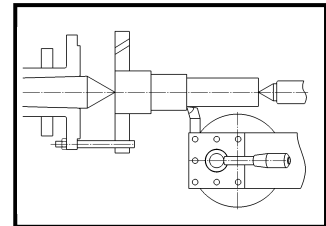


Fig. 16

Taper Turning Using Tailstock Off-set

Work to a side angle it can be turned by off-setting 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 the screw (A) to deflect the quill center line off-track from spindle center line, for getting the desired taper, please refer to the value in scale plate (E).

Taper direction adjustment:

To get the forward-off-track (operator side), be lose the nut (A) in front and tighten the nut (A) in back to move the body of tailstock forward to the desired value against scale plate, and then tighten the nut (A) in front. For backward-off-track, as same procedures as above mentioned. Must be clamped the screw (E) after taper turned, and the tailstock should be returned to its original position according to the zero position on scale of tailstock.

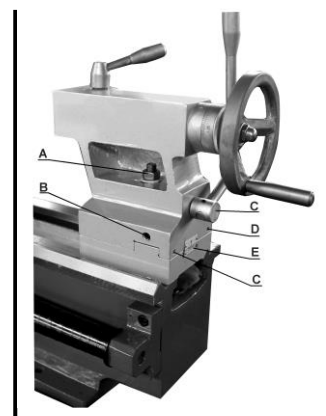


Fig. 17

Taper Turning by Setting top Slide

By angle the top slide, tapers may be turned manually with the Top slide (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.

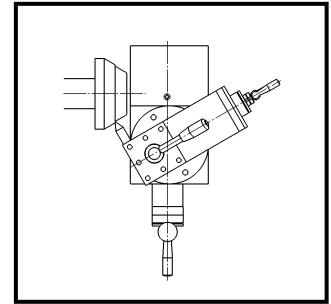


Fig. 18

Threads Cutting

Set the machine up to 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		N		A		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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15	15.5	16	16.5	17	17.5	18	18.5	19	19.5	20	20.5	21	21.5	22	22.5	23	23.5	24	24.5	25	25.5	26	26.5	27	27.5	28	28.5	29	29.5	30	30.5	31	31.5	32	32.5	33	33.5	34	34.5	35	35.5	36	36.5	37	37.5	38	38.5	39	39.5	40	40.5	41	41.5	42	42.5	43	43.5	44	44.5	45	45.5	46	46.5	47	47.5	48	48.5	49	49.5	50	50.5	51	51.5	52	52.5	53	53.5	54	54.5	55	55.5	56	56.5	57	57.5	58	58.5	59	59.5	60	60.5	61	61.5	62	62.5	63	63.5	64	64.5	65	65.5	66	66.5	67	67.5	68	68.5	69	69.5	70	70.5	71	71.5	72	72.5	73	73.5	74	74.5	75	75.5	76	76.5	77	77.5	78	78.5	79	79.5	80	80.5	81	81.5	82	82.5	83	83.5	84	84.5	85	85.5	86	86.5	87	87.5	88	88.5	89	89.5	90	90.5	91	91.5	92	92.5	93	93.5	94	94.5	95	95.5	96	96.5	97	97.5	98	98.5	99	99.5	100	100.5	101	101.5	102	102.5	103	103.5	104	104.5	105	105.5	106	106.5	107	107.5	108	108.5	109	109.5	110	110.5	111	111.5	112	112.5	113	113.5	114	114.5	115	115.5	116	116.5	117	117.5	118	118.5	119	119.5	120	120.5	121	121.5	122	122.5	123	123.5	124	124.5	125	125.5	126	126.5	127	127.5	128	128.5	129	129.5	130	130.5	131	131.5	132	132.5	133	133.5	134	134.5	135	135.5	136	136.5	137	137.5	138	138.5	139	139.5	140	140.5	141	141.5	142	142.5	143	143.5	144	144.5	145	145.5	146	146.5	147	147.5	148	148.5	149	149.5	150	150.5	151	151.5	152	152.5	153	153.5	154	154.5	155	155.5	156	156.5	157	157.5	158	158.5	159	159.5	160	160.5	161	161.5	162	162.5	163	163.5	164	164.5	165	165.5	166	166.5	167	167.5	168	168.5	169	169.5	170	170.5	171	171.5	172	172.5	173	173.5	174	174.5	175	175.5	176	176.5	177	177.5	178	178.5	179	179.5	180	180.5	181	181.5	182	182.5	183	183.5	184	184.5	185	185.5	186	186.5	187	187.5	188	188.5	189	189.5	190	190.5	191	191.5	192	192.5	193	193.5	194	194.5	195	195.5	196	196.5	197	197.5	198	198.5	199	199.5	200	200.5	201	201.5	202	202.5	203	203.5	204	204.5	205	205.5	206	206.5	207	207.5	208	208.5	209	209.5	210	210.5	211	211.5	212	212.5	213	213.5	214	214.5	215	215.5	216	216.5	217	217.5	218	218.5	219	219.5	220	220.5	221	221.5	222	222.5	223	223.5	224	224.5	225	225.5	226	226.5	227	227.5	228	228.5	229	229.5	230	230.5	231	231.5	232	232.5	233	233.5	234	234.5	235	235.5	236	236.5	237	237.5	238	238.5	239	239.5	240	240.5	241	241.5	242	242.5	243	243.5	244	244.5	245	245.5	246	246.5	247	247.5	248	248.5	249	249.5	250	250.5	251	251.5	252	252.5	253	253.5	254	254.5	255	255.5	256	256.5	257	257.5	258	258.5	259	259.5	260	260.5	261	261.5	262	262.5	263	263.5	264	264.5	265	265.5	266	266.5	267	267.5	268	268.5	269	269.5	270	270.5	271	271.5	272	272.5	273	273.5	274	274.5	275	275.5	276	276.5	277	277.5	278	278.5	279	279.5	280	280.5	281	281.5	282	282.5	283	283.5	284	284.5	285	285.5	286	286.5	287	287.5	288	288.5	289	289.5	290	290.5	291	291.5	292	292.5	293	293.5	294	294.5	295	295.5	296	296.5	297	297.5	298	298.5	299	299.5	300	300.5	301	301.5	302	302.5	303	303.5	304	304.5	305	305.5	306	306.5	307	307.5	308	308.5	309	309.5	310	310.5	311	311.5	312	312.5	313	313.5	314	314.5	315	315.5	316	316.5	317	317.5	318	318.5	319	319.5	320	320.5	321	321.5	322	322.5	323	323.5	324	324.5	325	325.5	326	326.5	327	327.5	328	328.5	329	329.5	330	330.5	331	331.5	332	332.5	333	333.5	334	334.5	335	335.5	336	336.5	337	337.5	338	338.5	339	339.5	340	340.5	341	341.5	342	342.5	343	343.5	344	344.5	345	345.5	346	346.5	347	347.5	348	348.5	349	349.5	350	350.5	351	351.5	352	352.5	353	353.5	354	354.5	355	355.5	356	356.5	357	357.5	358	358.5	359	359.5	360	360.5	361	361.5	362	362.5	363	363.5	364	364.5	365	365.5	366	366.5	367	367.5	368	368.5	369	369.5	370	370.5	371	371.5	372	372.5	373	373.5	374	374.5	375	375.5	376	376.5	377	377.5	378	378.5	379	379.5	380	380.5	381	381.5	382	382.5	383	383.5	384	384.5	385	385.5	386	386.5	387	387.5	388	388.5	389	389.5	390	390.5	391	391.5	392	392.5	393	393.5	394	394.5	395	395.5	396	396.5	397	397.5	398	398.5	399	399.5	400	400.5	401	401.5	402	402.5	403	403.5	404	404.5	405	405.5	406	406.5	407	407.5	408	408.5	409	409.5	410	410.5	411	411.5	412	412.5	413	413.5	414	414.5	415	415.5	416	416.5	417	417.5	418	418.5	419	419.5	420	420.5	421	421.5	422	422.5	423	423.5	424	424.5	425	425.5	426	426.5	427	427.5	428	428.5	429	429.5	430	430.5	431	431.5	432	432.5	433	433.5	434	434.5	435	435.5	436	436.5	437	437.5	438	438.5	439	439.5	440	440.5	441	441.5	442	442.5	443	443.5	444	444.5	445	445.5	446	446.5	447	447.5	448	448.5	449	449.5	450	450.5	451	451.5	452	452.5	453	453.5	454	454.5	455	455.5	456	456.5	457	457.5	458	458.5	459	459.5	460	460.5	461	461.5	462	462.5	463	463.5	464	464.5	465	465.5	466	466.5	467	467.5	468	468.5	469	469.5	470	470.5	471	471.5	472	472.5	473	473.5	474	474.5	475	475.5	476	476.5	477	477.5	478	478.5	479	479.5	480	480.5	481	481.5	482	482.5	483	483.5	484	484.5	485	485.5	486	486.5	487	487.5	488	488.5	489	489.5	490	490.5	491	491.5	492	492.5	493	493.5	494	494.5	495	495.5	496	496.5	497	497.5	498	498.5	499	499.5	500	500.5	501	501.5	502	502.5	503	503.5	504	504.5	505	505.5	506	506.5	507	507.5	508	508.5	509	509.5	510	510.5	511	511.5	512	512.5	513	513.5	514	514.5	515	515.5	516	516.5	517	517.5	518	518.5	519	519.5	520	520.5	521	521.5	522	522.5	523	523.5	524	524.5	525	525.5	526	526.5	527	527.5	528	528.5	529	529.5	530	530.5	531	531.5	532	532.5	533	533.5	534	534.5	535	535.5	536	536.5	537	537.5	538	538.5	539	539.5	540	540.5	541	541.5	542	542.5	543	543.5	544	544.5	545	545.5	546	546.5	547	547.5	548	548.5	549	549.5	550	550.5	551	551.5	552	552.5	553	553.5	554	554.5	555	555.5	556	556.5	557	557.5	558	558.5	559	559.5	560	560.5	561	561.5	562	562.5	563	563.5	564	564.5	565	565.5	566	566.5	567	567.5	568	568.5	569	569.5	570	570.5	571	571.5	572	572.5	573	573.5	574	574.5	575	575.5	576	576.5	577	577.5	578	578.5	579	579.5	580	580.5	581	581.5	582	582.5	583	583.5	584	584.5	585	585.5	586	586.5	587	587.5	588	588.5	589	589.5	590	590.5	591	591.5	592	592.5	593	593.5	594	594.5	595	595.5	596	596.5	597	597.5	598	598.5	599	599.5	600	600.5	601	601.5	602	602.5	603	603.5	604	604.5	605	605.5	606	606.5	607	607.5	608	608.5	609	609.5	610	610.5	611	611.5	612	612.5	613	613.5	614	614.5	615	615.5	616	616.5	617	617.5	618	618.5	619	619.5	620	620.5	621	621.5	622	622.5	623	623.5	624	624.5	625	625.5	626	626.5	627	627.5	628	628.5	629	629.5	630	630.5	631	631.5	632	632.5	633	633.5	634	634.5	635	635.5	636	636.5	637	637.5	638	638.5	639	639.5	640	640.5	641	641.5	642	642.5	643	643.5	644	644.5	645	645.5	646	646.5	647	647.5	648	648.5	649	649.5	650	650.5	651	651.5	652	652.5	653	653.5	654	654.5	655	655.5	656	656.5	657	657.5	658	658.5	659	659.5	660	660.5	661	661.5	662	662.5	663	663.5	664	664.5	665	665.5	666	666.5	667	667.5	668	668.5	669	669.5	670	670.5	671	671.5	672	672.5	673	673.5	674	674.5	675	675.5	676	676.5	677	677.5	678	678.5	679	679.5	680	680.5	681	681.5	682	682.5	683	683.5

Adjustment

After a period time, wear in some of the moving components may need to be adjusted.

Compound Rest Adjustment

Loosen the two screws (A, Fig. 20), after you have obtained the angle you want, do not forget to tighten them again.

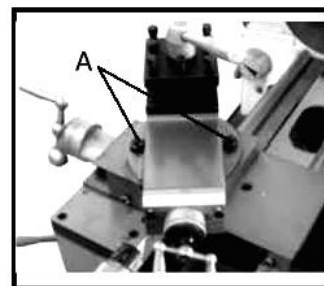


Fig. 20

Belt Adjustment

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

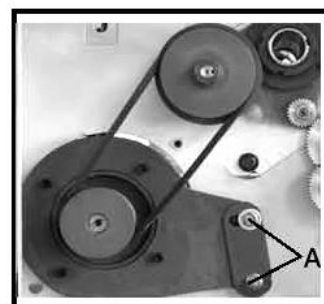


Fig. 21

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 spindle. Tighten 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 bearing

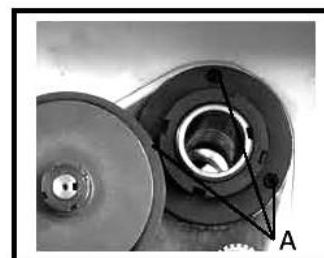


Fig. 22

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 slide moves freely without play. Tighten lock nuts to retain adjustment.

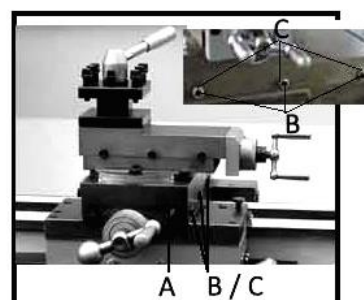


Fig. 23

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 slide moves freely without play. Tighten lock nuts to retain adjustment.

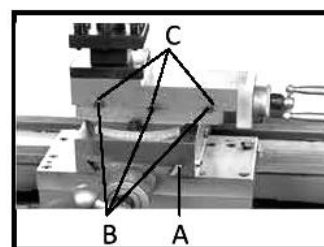


Fig. 24

This exploded view diagram illustrates the assembly of a mechanical unit, possibly a pump or motor. The components are numbered 1 through 97. The main assembly consists of a central housing (1) with a shaft (2) passing through it. The shaft is supported by bearings (3, 4) and has an impeller (5) attached. The impeller is connected to a motor or actuator (6) via a coupling (7). The assembly is secured with various bolts (8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97) and washers (98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 81

Parts Listing- Headstock

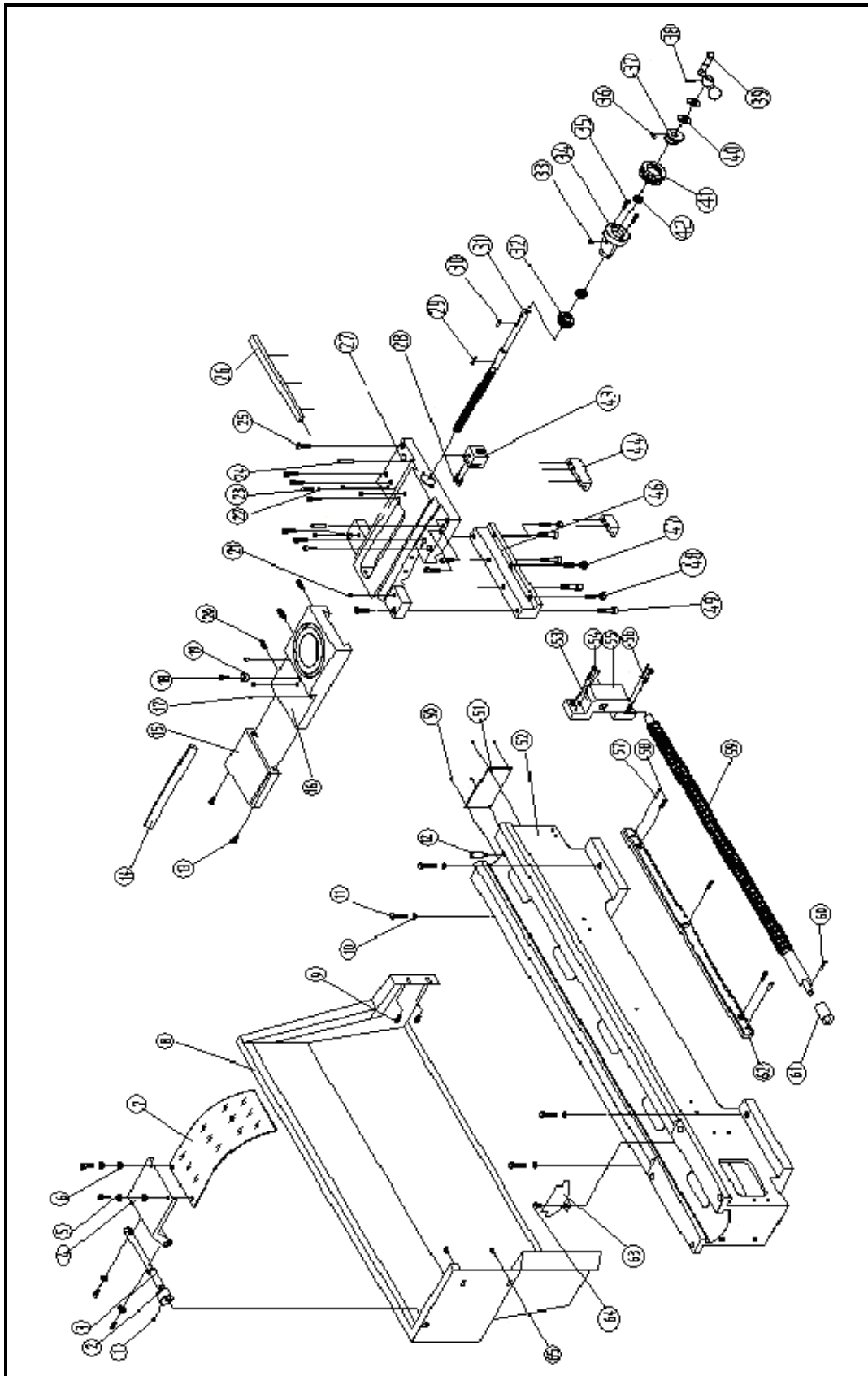
NO.	Description				
1	V-belt type 700	35	Screw	67	C-Clip
2	Spanner nut	36	Localing sleeve	68	Middle shaft
3	Lock washer for circular nut	37	Washer	69	Thin flat key
4	Spindle pulley	38	O-seal ring	70	Gear
5	Taper roller bearing	39	Right Block	71	Gear
6	Hexagon socket head screw	40	Oil Sight	72	C-Clip
7	Pulley seat	41	Sleeve	73	Spanner nut
8	Felt cover	42	C-Clip	74	Lock washer for circular nut
9	Crossrecessed pan head screws	43	Left shifting fork	75	Hexagon socket head screw
10	Plain washers	44	Shifting fork shaft	76	Sleeve
11	Lathe head	45	Right shifting fork	77	Pressurize washer
12-14	/	46	Sleeve	78	Sleeve spacer
15	Oil drain plug	47	Nut	79	Taper roller bearing
16	Oil cup	48	Plain washers	80	C-Clip
17	C-Clip	49	Gear	81	Gear
18	Cover	50	Felt cover	82	Taper roller bearing
19	Change Gear	51	Sleeve	83	Pressurize washer
20	Sleeve spacer	52	Taper roller bearing	84	Main shaft bearing oil seal
21	Plain parallel key	53	Plain parallel key	85	Lathe spindle
22	Sleeve	54	Output shaft	86	Plain parallel key
23	Gear	55	Plain parallel key	87	Sleeve spacer
24	Shaft	56	Gear	88	Gear
25	Screw	57	Gear	89	Gear
26	Left Block	58	Gear	90	Sleeve spacer
27	Handle lever	59	Sleeve spacer	91	Gear
28	Chock	60	Sleeve	92	Plain parallel key
29	Screw	61	Sleeve spacer	93	Plain parallel key
30	Set screws with cone point	62	Plain parallel key	94	Single shaft
31	Spring	63	Gear	95	Hexagon screw
32	Steel ball	64	Gear	96	Oil port plug
33	Handle seat	65	Gear	97	Transmission cover
34	Taper pins	66	C-Clip		

This diagram is an exploded view of a mechanical assembly, likely a pump or motor component. It shows the main housing at the top left, which contains internal components like a rotor and stator. Below the housing, there are two main shaft assemblies. The left shaft assembly includes a long shaft with various bearings, seals, and a coupling. The right shaft assembly is similar but includes a different set of components, possibly for a different model or configuration. Numerous small parts like screws, bolts, and washers are also shown. Each part is labeled with a number from 1 to 50, indicating its position in the assembly sequence.

Parts Listing- Trestle

NO.	Description	NO.	Description
1	Oil cup	28	Sleeve
2	Apron body	29	Change Gear
3	Taper pins	30	Sleeve spacer
4	Hexagon socket head screw	31	Key
5	Handle lever	32	Change gear plate
6	/	33	Sleeve
7	Right shifting fork	34	Key
8	Shaft	35	Shaft
9	Base	36	Key
10	Screw	37	Gear
11	Taper pins	38	Sleeve spacer
12	Handle seat	39	Gear
13	Steel ball	40	Shaft
14	Spring	41	Shaft
15	Screw	42	Sleeve
16	Cover	43	Gear
17	Sleeve	44	Gear
18	C-Clip	45	Sleeve
19	Gear	46	Key
20	Shaft	47	Plain washers
21	Key	48	T Nut
22	Taper pins	49	Shaft
23	Taper roller bearing	50	Key
24	Base	51	Gear
25	Hexagon socket head screw	52	Nut
26	Spanner nut	53	Plain washers
27	Sleeve	54	Screw

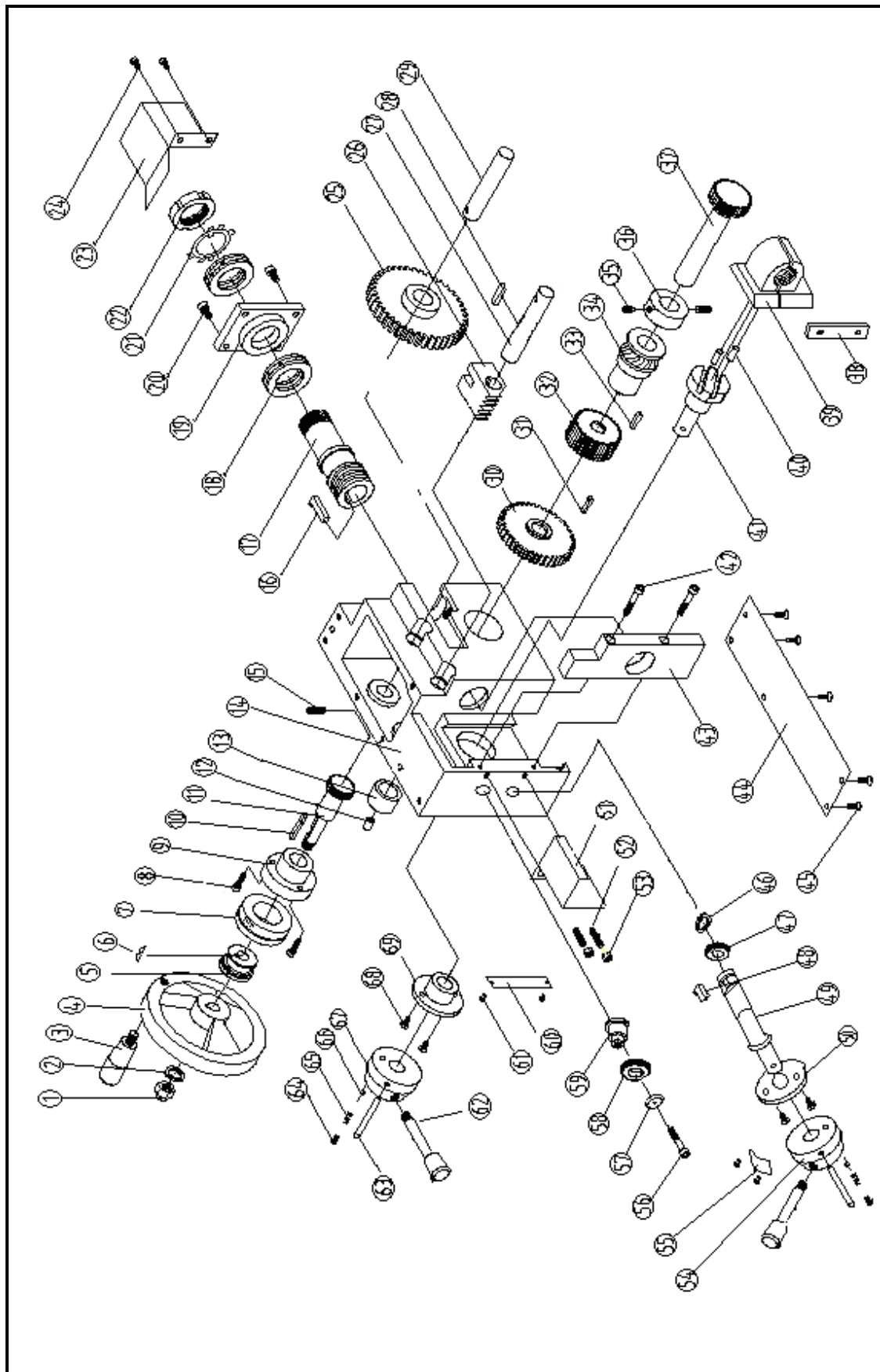
Parts Diagram- Bed



Parts Listing- Bed

NO.	Description	NO.	Description
1	Hexagon socket head screw	34	Cross feed screw seat
	Cam sleeve	35	Hexagon socket head screw
3	Switch bar	36	Spring lamination
4	Connecting plate	37	Dial sleeve
5	Plain washers	38	Taper pins
6	Nut	39	Handles with sleeve
7	Shield	40	Spanner nut
8	Shield	41	Dial
9	Hexagon socket head screw	42	Rolling bearing
10	Plain washers	43	Cross nut
11	Hexagon head screw	44	Chain up block
12	Hexagon socket head screw	45	/
13	Hexagon socket head screw	46	Behind board
14	Chock	47	Hexagon nuts
15	Shield	48	Set screws with cone point
16	Middle carriage	49	Hexagon socket head screw
17	Oil cup	50	Rivet
18	Hexagon socket head screw	51	Table
19	Washer	52	Bed
20	Set screws with cone point	53	Oil cup
21	Oil cup	54	Hexagon socket head screw
22	Plain washers	55	Right pedestal
23	Hexagon head bolts	56	Taper pins
24	Taper pins	57	Taper pins
25	Hexagon socket head screw	58	Hexagon socket head screw
26	Chock	59	Longitudinal feed screw
27	Carriage	60	Taper pins
28	Hexagon socket head screw	61	Washer
29	Plain parallel key	62	Racks
30	Plain parallel key	63	Shield
31	Cross feed screw rod	64	Screw
32	Gear	65	Hexagon socket head screw
33	Oil cup		

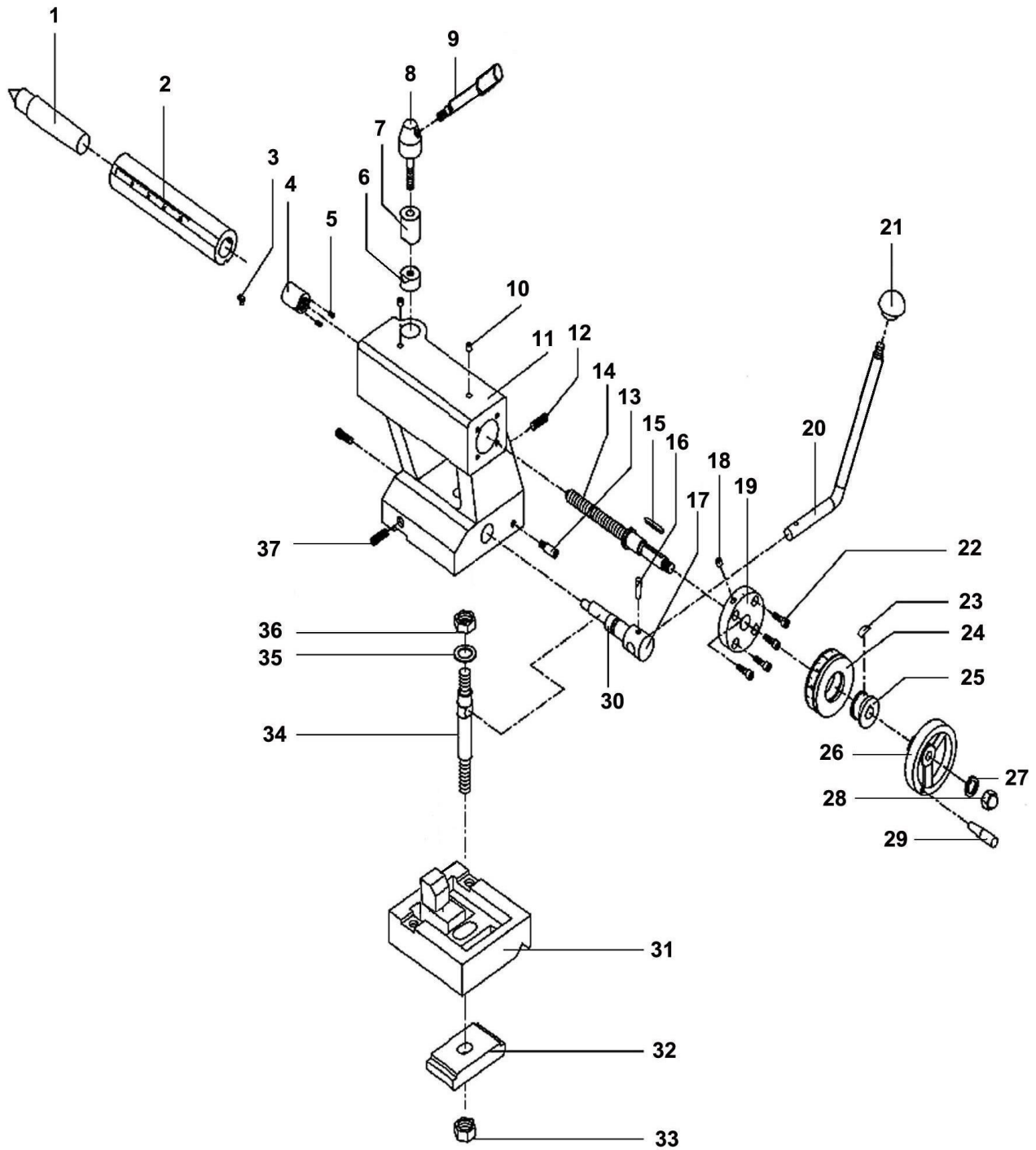
Parts Diagram- Apron



Parts Listing- Apron

NO.	Description	NO.	Description
1	Domed cap nuts	36	Sleeve
2	Spring washer	37	Gear shaft
3	Sleeve	38	Chock
4	Hand wheel	39	Screw nut
5	Sleeve	40	Column pins
6	Spring lamination	41	Shaft
7	Dial	42	Hexagon socket head screw
8	Hexagon socket head screw	43	Apron body right cover
9	Flange sleeve	44	Cover
10	Pin	45	Screw
11	Gear shaft	46	C-Clip
12	Oil cup	47	Gear
13	Sleeve	48	Pin
14	Apron body	49	Axis
15	Screws	50	Sleeve
16	Key	51	Safe shield
17	Worm shaft	52	Screw
18	Thrust ball bearing	53	Hexagon nuts
19	Worm shaft	54	Handle seat
20	Hexagon socket head screw	55	Table
21	Lock washer	56	Hexagon socket head screw
22	Round nut	57	Spring washer
23	Safe shield	58	Middle gear
24	Hexagon socket head screw	59	Shaft
25	Gear	60	Table
26	Shifting fork	61	Rivet
27	Shifting fork shaft	62	Handle lever
28	Pin	63	Taper pins
29	Slippage shaft	64	Screw
30	Gear	65	Spring
31	Pin	66	Steel ball
32	Gear	67	Handle seat
33	Pin	68	Screw
34	Worm gear	69	Sleeve
35	Screws		

Parts Diagram-Tailstock



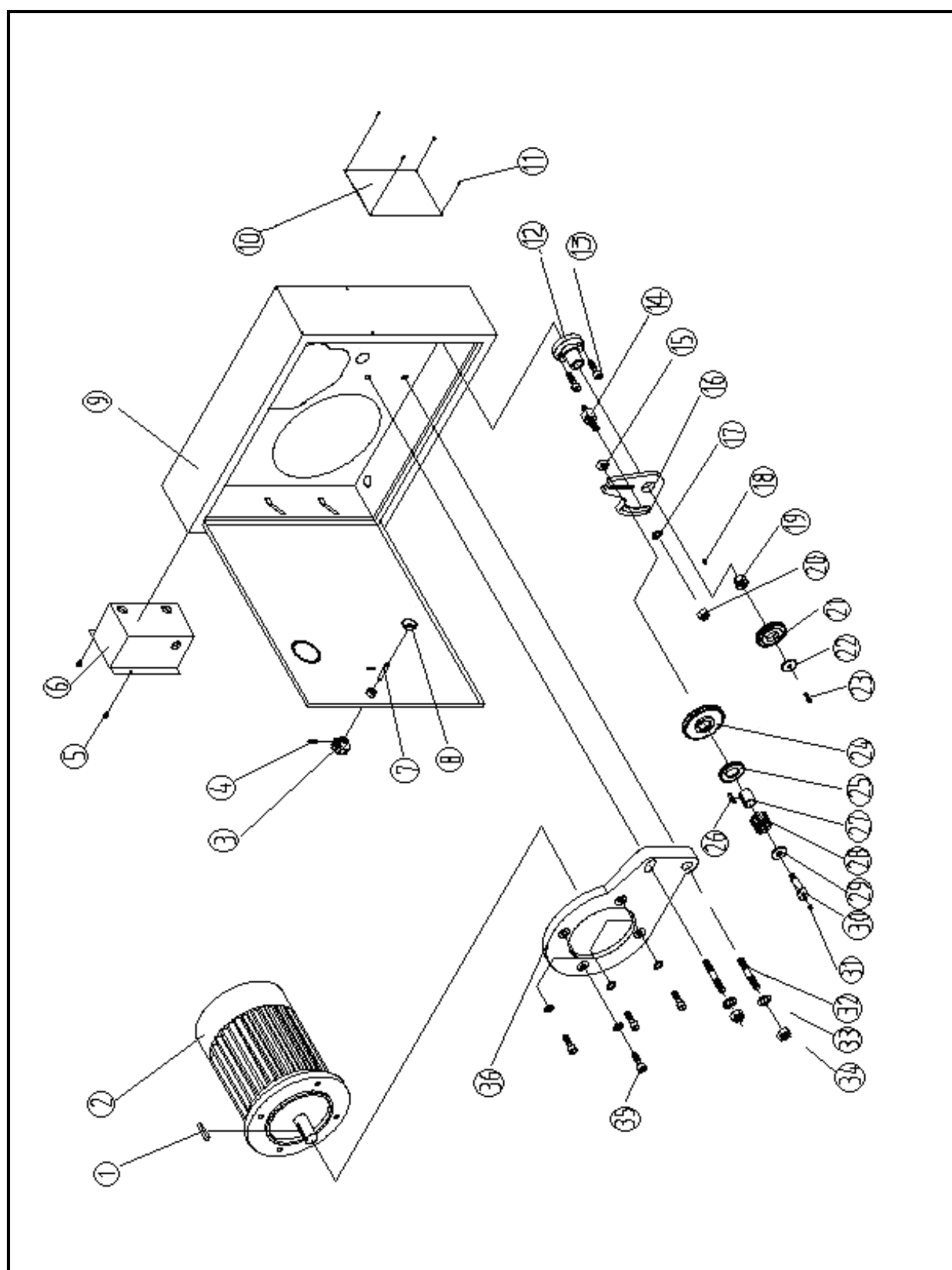
Parts Listing- Tailstock

NO.	Description
1	Rolling center
2	Tailstock center sleeve
3	T-Key
4	Tailstock Nuts
5	Set screws with cone point
6	Locking nuts
7	Locking Sleeve
8	Handle seat
9	Handle lever
10	Oil cup
11	Tailstock
12	Set screws with cone point
13	Pin
14	Tailstock screw stem
15	Plain parallel key
16	Taper pins
17	Shaft
18	Oil cup
19	Sleeve
20	Handle lever
21	Handle ball
22	Hexagon socket head screw
23	Spring lamination
24	Dial
25	Sleeve
26	Hand wheel
27	Plain washers
28	Domed cap nuts
29	Handles with sleeve
30	Set screws with cone point
31	Tailstock carriage
32	Chock
33	Hexagon thin nuts
34	Pull pole set
35	Plain washers
36	Hexagon nuts
37	Set screws with cone point

Parts Listing- Change Gear Box

NO.	Description
1	Plain parallel key
2	Motor 1.1kw
3	Start-grip knob
4	Taper pins
5	Screw
6	Safe box
7	Shaft
8	Door-knob
9	Compound box
10	Thread table
11	Rivet
12	Sleeve
13	Hexagon socket head screw
14	Screw
15	T-nut
16	Change gear plate
17	Plain washers
18	Plain parallel key
19	Sleeve
20	Hexagon thin nuts
21	Gear
22	Sleeve
23	Hexagon socket head screw
24	Change Gear
25	Change Gear
26	Plain parallel key
27	Sleeve
28	Roller
29	Sleeve
30	Shaft
31	Oil cup
32	Screw
33	Plain washers
34	Hexagon nuts
35	Hexagon socket head screw
36	Motor mount plate

Parts Diagram-Change Gear Box



PREVENTIVE MAINTENANCE

1. DAILY INSPECTION

In principle the daily inspection lathe is carried out on basis of each shift. The inspection work according to the following item 1-1.

1-1 Check before starting the motor.

- 1) Clean-up of machine: Dust, chips and other articles should be removed from sliding surface of machine to make the rotating or sliding parts performing easy and smoothly. All other static parts be often also cleaned to avoid the 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: To try the speed change rate function of headstock feeds and apron in gear box and inspect their starting, stopping and forward & reverse action whether they are sensitive and reliable or not.

1-2 Check after starting the motor.

- 1) To check electrical control system:
To put button and examine the sensitiveness of starting, stopping and pilot lamp strictly.
- 2) The sensitivity and reliability of mechanical control device:
Control levers for forward and reverse main spindle, automatic feeds and threads change should be sensitive and reliable. Automatic control devices for longitudinal and cross feed, gear change threads change, carriage, and spindle direction change should be accurate also.
- 3) Coolant system:
Check the quantity of coolant oil and start the oil pump for inspecting its function and leakage.
- 4) Lubricating system:
Examine all lubricating system carefully and ensure all flowing line without obstacles.

1-3 Caution during operation:

- 1) Temperature of bearings:
Touch the main bearing by hand and feel the temperature is normally or not.
- 2) Temperature of motor:
To feel the temperature of motor bearing at the case of 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 affairs:
 - a. Must stop operation when you leave the machine.
 - b. When changing main spindle speed or feeding speed stop running first.
 - c. All tools and products are strictly not allowed to be left on sliding surface of bed.

1-4 Check after operation:

1) Cleaning and collection of all tools:

All tools should be kept clean first then put back to original position (tool cabinet)

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

Tailstock, carriage, & tool holder should be placed to proper position.

3) Clean-up of machine:

All of the oily matters, chips etc, on the machine should be removed completely and put a thin lubricating oil on the sliding surface of machine to prevent the corrosion.

2. WEEKLY INSPECTION:

1) Lubricating system:

Clean-up the whole lubricating system and replenish with fresh lubricating oil.

2) Cooling system:

Clean-up the whole cooling system and replenish with new cooling oil.

3) Transmission system:

Check the damage of rubber V-belt and readjust the tensile strength of V-belt.

Trouble Shooting

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