



INSTRUCTION MANUAL

L1330G / 1440-V Trainer

Precision Engine Lathe



Instruction and Spare Parts Manual

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1 Safety

Read this manual before you install, operate or service the lathe. The warnings below are repeated in the sections where they apply.

■ WARNING

Fit only ductile iron chucks. Grey-iron chucks must not be fitted on this high-speed lathe.

■ WARNING

Do not run 10in faceplates at speeds greater than 770 rev/min.

■ WARNING

Do not interchange chucks or faceplates without checking that they camlock correctly.

■ CAUTION

Do not put lifting slings around the bed. The leadscrew and feed shaft may be bent.

■ CAUTION

Do not change the position of the speed-range handle while the spindle is turning. The spindle must be stationary.

■ CAUTION

Do not clean the machine with cellulose solvents. They damage the paint finish.

■ CAUTION

Using incorrect grades of oil can cause damage.

NOTE This manual covers two versions of the lathe: the 2-speed motor models (L1330G) and the Variable speed models (1440-V / 1440UV). Where information applies to one version only, the heading says so.

2 Specifications

2.1 Machine specification

Table 2-1 gives the specification for all four sizes in the range. Each size is built as a 2-speed motor version (1330, 1340, 1430, 1440) and as a variable speed version (1330 SV, 1340 SV, 1430 SV, 1440 SV). All models have the universal gearbox with 43 feeds and a 6mm or 4 TPI leadscrew.

Table 2-1: Machine specification

Item	1330 / 1330 SV	1340 / 1340 SV	1430 / 1430 SV	1440 / 1440 SV
Nominal size				
Swing over bed	330mm 13"	330mm 13"	356mm 14"	356mm 14"
Swing over cross slide	195mm 7-5/8"	195mm 7-5/8"	220mm 8-5/8"	220mm 8-5/8"
Height of centre	165mm 6-1/2"	165mm 6-1/2"	178mm 7"	178mm 7"
Distance between centres	750mm 30"	1000mm 40"	750mm 30"	1000mm 40"
Bed				
Width of bedways	206mm 8-1/2"	206mm 8-1/2"	206mm 8-1/2"	206mm 8-1/2"
Total length of bed	1430mm 56"	1680mm 66"	1430mm 56"	1680mm 66"
Gap: swing over gap	490mm 19"	490mm 19"	515mm 20"	515mm 20"
Gap: length of gap	240mm 9-7/16"	240mm 9-7/16"	240mm 9-7/16"	240mm 9-7/16"
Gap: width in front of face plate	146mm 5-3/4"	146mm 5-3/4"	146mm 5-3/4"	146mm 5-3/4"
Spindle (all models)				
Spindle nose mounting	D1-4 Camlock	D1-4 Camlock	D1-4 Camlock	D1-4 Camlock
Spindle bore	38mm 1-1/2"	38mm 1-1/2"	38mm 1-1/2"	38mm 1-1/2"
Taper of spindle bore	M.T. No.5	M.T. No.5	M.T. No.5	M.T. No.5
Number / range of spindle speeds: standard	8, 90-1800 R.P.M.	8, 90-1800 R.P.M.	8, 90-1800 R.P.M.	8, 90-1800 R.P.M.
Number / range of spindle speeds: 2-speed motor	16, 45-1800 R.P.M.	16, 45-1800 R.P.M.	16, 45-1800 R.P.M.	16, 45-1800 R.P.M.
Number / range of spindle speeds: variable speed (SV)	Variable, 30-2200 R.P.M.	Variable, 30-2200 R.P.M.	Variable, 30-2200 R.P.M.	Variable, 30-2200 R.P.M.
Tool slide				
Total travel of cross slide	160mm 6-1/4"	160mm 6-1/4"	165mm 6-1/2"	165mm 6-1/2"
Total travel of top slide	90mm 3-1/2"	90mm 3-1/2"	100mm 4"	100mm 4"
Max. size cutting tool	16mm 5/8"	16mm 5/8"	22mm 7/8"	22mm 7/8"
Tailstock (all models)				
Total travel of barrel	120mm 4-3/4"	120mm 4-3/4"	120mm 4-3/4"	120mm 4-3/4"
Taper in barrel	M.T. No.3	M.T. No.3	M.T. No.3	M.T. No.3
Diameter of barrel	45mm 1-3/4"	45mm 1-3/4"	45mm 1-3/4"	45mm 1-3/4"
Machine net weight	650 Kgs	700 Kgs	700 Kgs	750 Kgs

Table 2-2: Threads, feeds and motors (all models)

Leadscrew diameter and pitch	Dia. 25mm, pitch 6mm / Dia. 1", 4 T.P.I.
Metric threads	34 Nos, 0.2-7.0mm
Inch threads	39 Nos, 4-72 T.P.I.
Module pitches (MP)	18 Nos, 0.3-3.5 mod
Diametral pitches (DP)	21 Nos, 8-44 DP
Feed rod diameter	Dia. 19mm
Number of feed changes	43 (metric system)
Range of longitudinal feeds	0.037-0.800mm/rev
Range of cross feeds	0.018-0.400mm/rev
Main spindle motor	2.2kW, 3HP
Coolant pump motor	0.175kW, 1/8HP

NOTE MACH reserves the right to modify and improve its products.

2.2 Dimensions

Figure 2-1 shows the overall dimensions A to E for the three versions of the lathe. Tables 2-3 to 2-5 give the values.

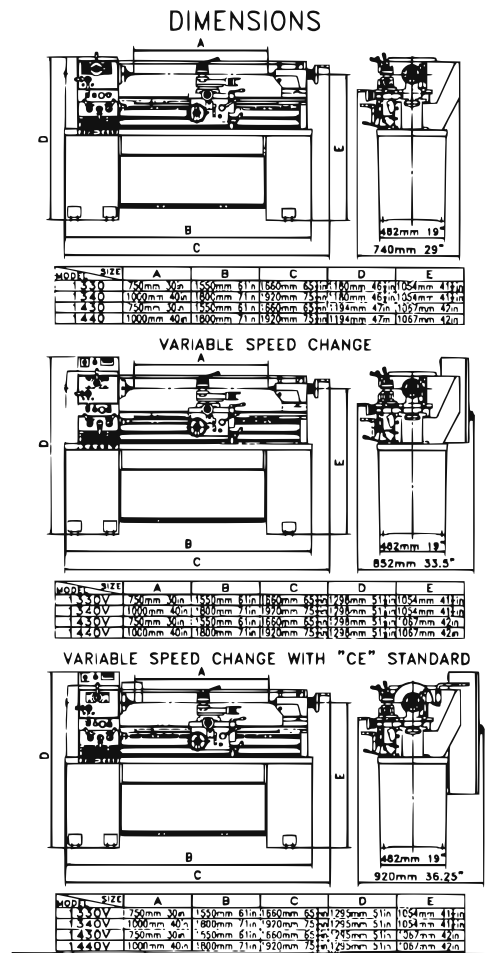


Figure 2-1: Machine dimensions: 2-speed motor version (top), variable speed version (centre), variable speed version to "CE" standard (bottom)

Table 2-3: Dimensions, 2-speed motor version (height 740mm 29", depth 482mm 19")

Model	A	B	C	D	E
1330	750mm 30in	1550mm 61in	1660mm 65-1/2in	1180mm 46-1/2in	1054mm 41-1/2in
1340	1000mm 40in	1800mm 71in	1920mm 75-1/2in	1180mm 46-1/2in	1054mm 41-1/2in
1430	750mm 30in	1550mm 61in	1660mm 65-1/2in	1194mm 47in	1067mm 42in
1440	1000mm 40in	1800mm 71in	1920mm 75-1/2in	1194mm 47in	1067mm 42in

Table 2-4: Dimensions, variable speed version (height 852mm 33.5", depth 482mm 19")

Model	A	B	C	D	E
1330V	750mm 30in	1550mm 61in	1660mm 65-1/2in	1298mm 51-1/8in	1054mm 41-1/2in
1340V	1000mm 40in	1800mm 71in	1920mm 75-1/2in	1298mm 51-1/8in	1054mm 41-1/2in
1430V	750mm 30in	1550mm 61in	1660mm 65-1/2in	1298mm 51-1/8in	1067mm 42in
1440V	1000mm 40in	1800mm 71in	1920mm 75-1/2in	1298mm 51-1/8in	1067mm 42in

Table 2-5: Dimensions, variable speed version to "CE" standard (height 920mm 36.25", depth 482mm 19")

Model	A	B	C	D	E
1330V	750mm 30in	1550mm 61in	1660mm 65-1/2in	1295mm 51in	1054mm 41-1/2in
1340V	1000mm 40in	1800mm 71in	1920mm 75-1/2in	1295mm 51in	1054mm 41-1/2in
1430V	750mm 30in	1550mm 61in	1660mm 65-1/2in	1295mm 51in	1067mm 42in
1440V	1000mm 40in	1800mm 71in	1920mm 75-1/2in	1295mm 51in	1067mm 42in

NOTE The inch fractions in the dimension tables are hard to read in the original. See errata.

2.3 General layout of the lathe

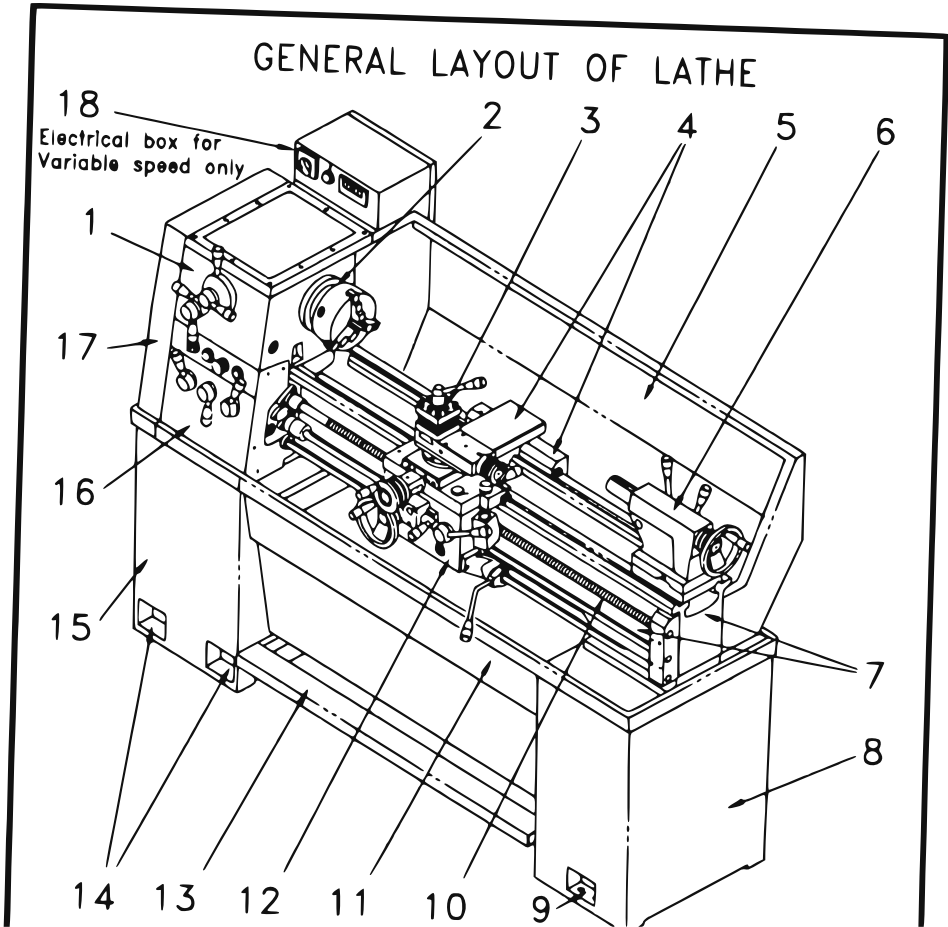


Figure 2-2: General layout of the lathe

3 Installation

3.1 Foundation plan

Figure 3-1 gives the foundation plan, the positions of the 16mm (5/8in) holding-down holes and 1/2in-12NC adjusting screws, and the space to leave around the machine for maintenance access (removal of the tailstock, pump, motor and end cover).

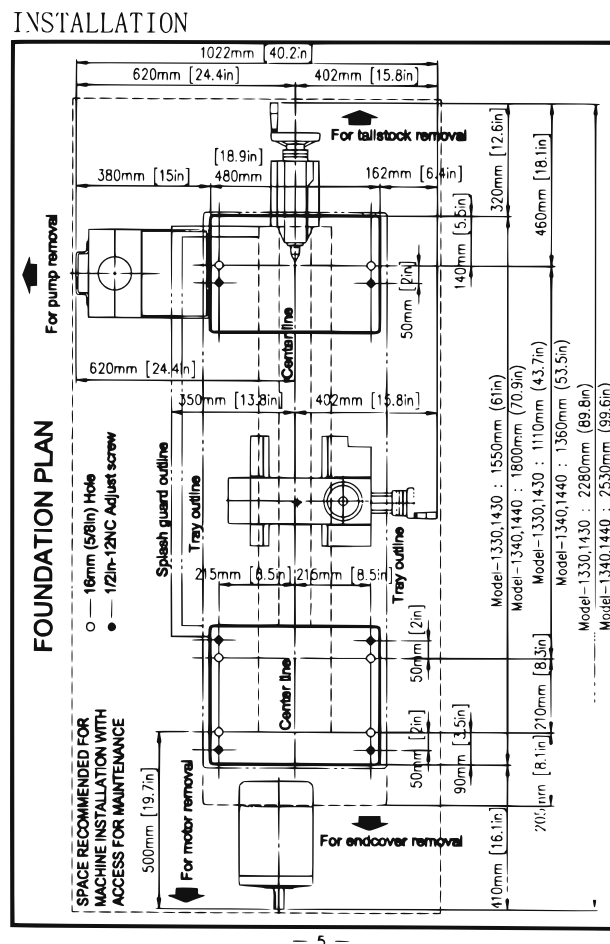


Figure 3-1: Foundation plan and space recommended for installation with access for maintenance

3.2 Lifting

- 1 Sling the lathe with sling-chains in the position shown in Figure 3-2, using the clamping plate, eyebolt and nut under the bed.
- 2 Move the saddle and tailstock along the bed until the machine hangs in balance.

■ CAUTION

Do not put slings around the bed. The leadscrew and feed shaft may be bent.

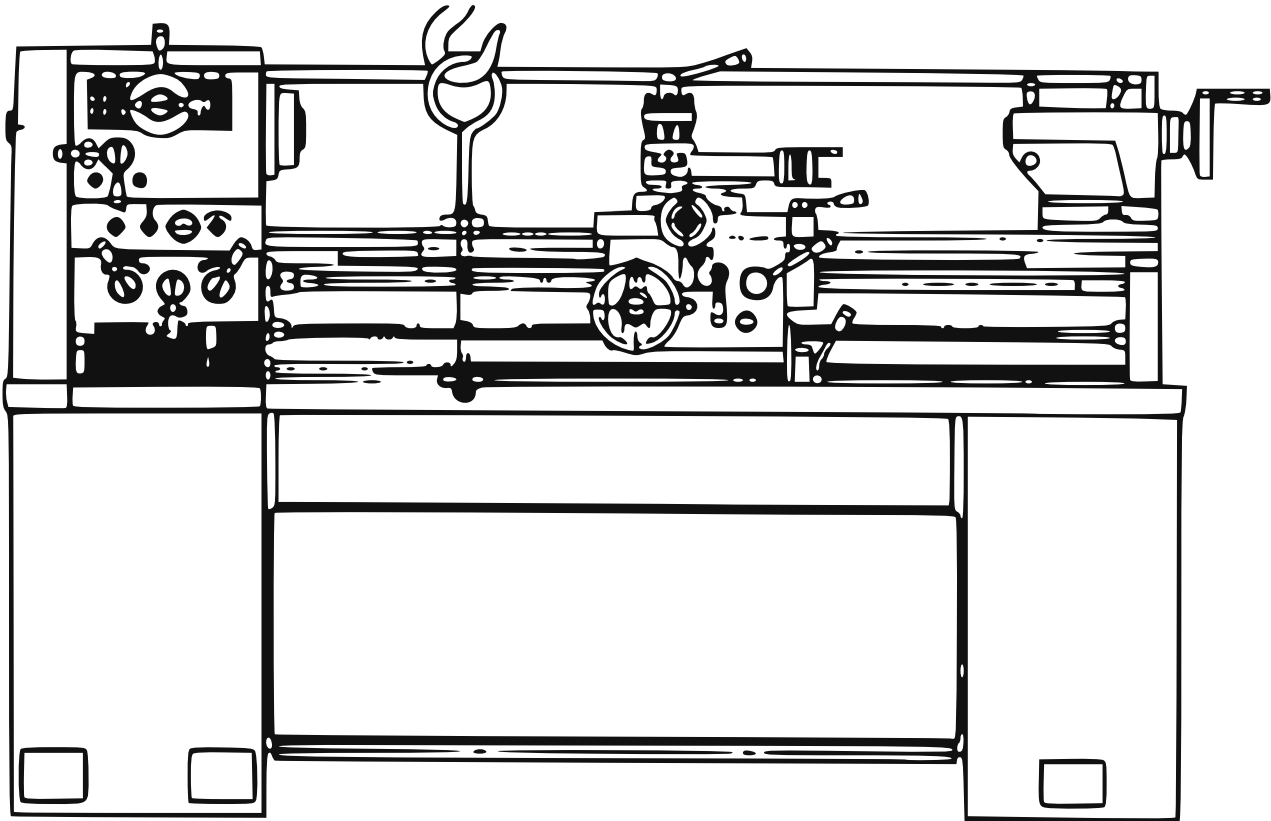


Figure 3-2: Lifting the lathe

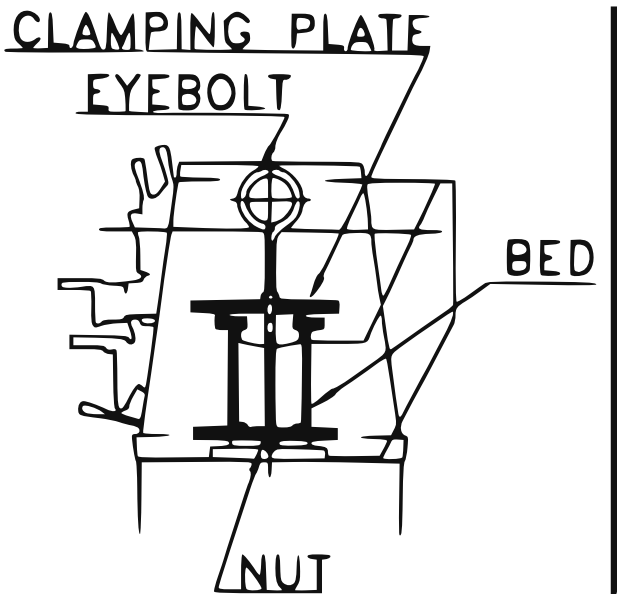


Figure 3-3: Lifting clamp detail

3.3 Cleaning

- 1 Before you operate the machine or its controls, remove the anti-corrosion coating from all slideways and the end gear train with white spirit or kerosene.
- 2 Wipe the machined surfaces with machine oil or slideway lubricant. They become bright immediately after cleaning.
- 3 Apply heavy oil or grease to the end gears.

■ CAUTION

Do not use cellulose solvents for cleaning. They damage the paint finish.

3.4 Installing

Place the machine on a solid foundation, with enough space all round for easy working and maintenance (see 3.1). You can use the lathe free-standing or bolted to the foundation.

3.4.1 Free-standing installation

- 1 Position the lathe on the foundation.
- 2 Adjust each of the six mounting feet so that they take an equal share of the load.
- 3 Place an engineer's precision level on the bedways, as shown in Figure 3-4.
- 4 Adjust the feet until the machine is level.

Check the bed level periodically to keep the lathe accurate.

3.4.2 Fixed installation

- 1 Set six bolts (1/2in or 12mm diam.) into the foundation to line up with the holes in the mounting feet.
- 2 Position the lathe over the bolts.
- 3 Level the machine accurately, as shown in Figure 3-4.
- 4 Tighten the hold-down bolts.
- 5 Check the bed level again.

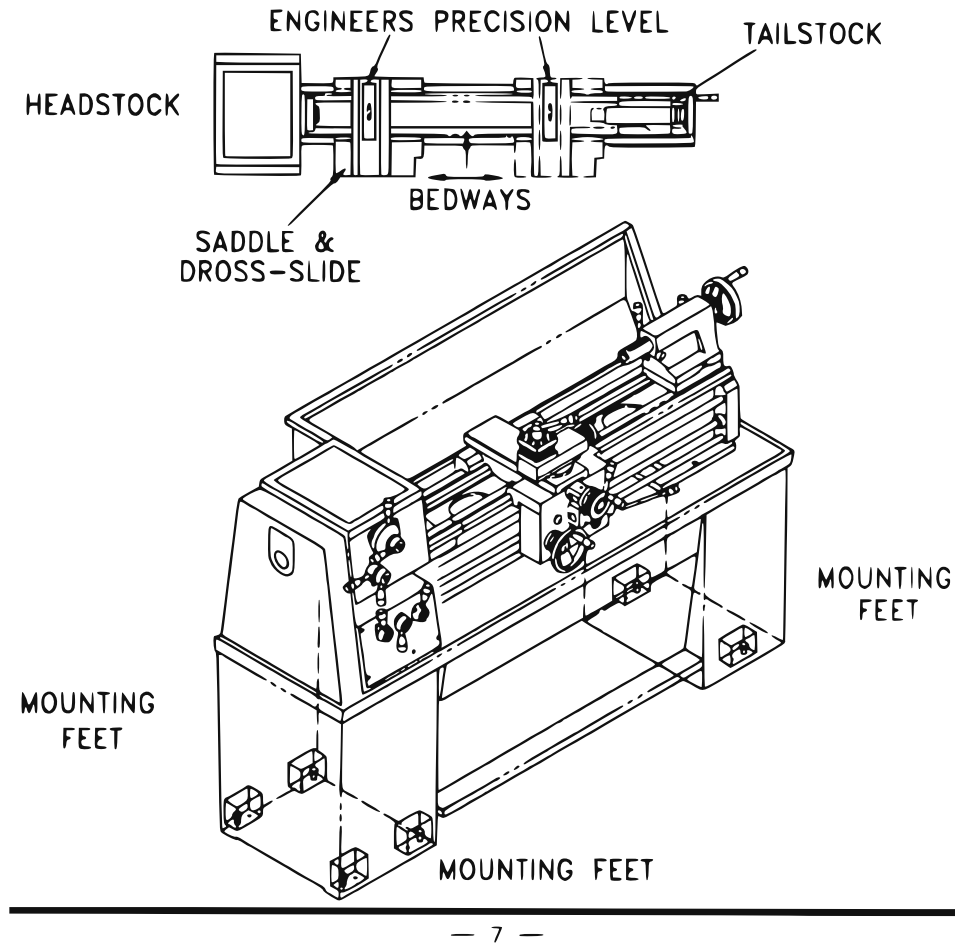
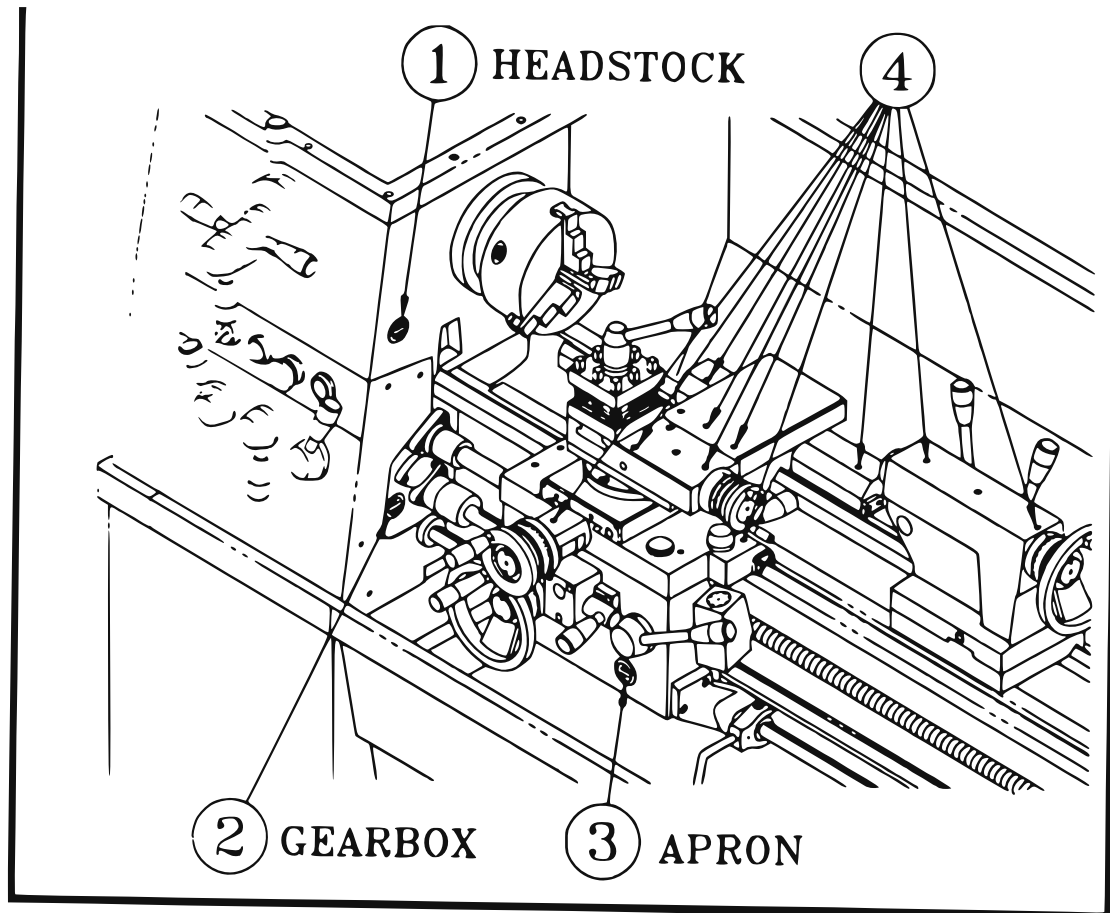


Figure 3-4: Levelling the bedways with an engineer's precision level

3.5 Lubrication checks before start-up

Before you operate the machine, make these checks (see Figure 3-5):

- 1 Check that the headstock (1) is filled to the level mark on its oil sight window with Shell Tellus oil 27.
- 2 Check that the gearbox (2) is filled to the level mark on its oil sight window with Shell Tellus oil 27.
- 3 Check that the carriage apron (3) is filled to the level mark on its oil sight window with Shell Tonna 33.
- 4 Apply light machine oil or way lubricant to the daily oiling points (4) shown on the lubrication diagram (see 6.4).



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Figure 3-5: Lubrication check points

3.6 Chucks and chuck mounting

■ WARNING

Grey-iron chucks must not be fitted on this high-speed lathe. Use only ductile iron chucks.

Before you fit a chuck or faceplate, make sure that the spindle and chuck tapers are scrupulously clean and that all cams lock in the correct positions. When you mount a new chuck, you may need to reset the camlock studs (A), as shown in Figure 3-6.

3.6.1 Setting the camlock studs

- 1 Remove the cap-head locking screws (B).
- 2 Set each stud so that the scribed ring (C) is flush with the rear face of the chuck, with the slit lined up with the locking screw hole (see Figure 3-6).

3.6.2 Mounting the chuck or faceplate

- 1 Mount the chuck or faceplate on the spindle nose.
- 2 Tighten the three cams in turn.
- 3 Check each cam. When fully tightened, the cam lock line on each cam must be between the two V marks on the spindle nose (see Figure 3-7).
- 4 If any cam does not tighten fully within these limit marks, remove the chuck or faceplate and readjust the stud as shown in Figure 3-8.
- 5 Fit and tighten the locking screw (B) at each stud before you remount the chuck for work.

This will assist subsequent remounting.

■ CAUTION

Do not interchange chucks or faceplates on the lathe without checking that they camlock correctly.

■ WARNING

Take note of the speed limits when you use a faceplate. Do not run 10in faceplates at speeds greater than 770 rev/min.

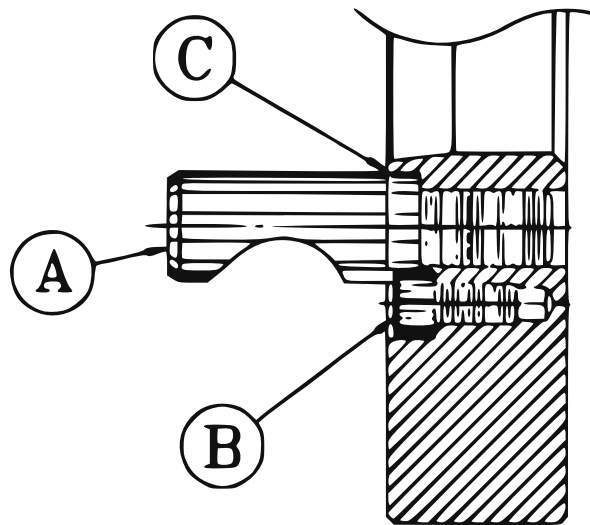


Figure 3-6: Camlock stud

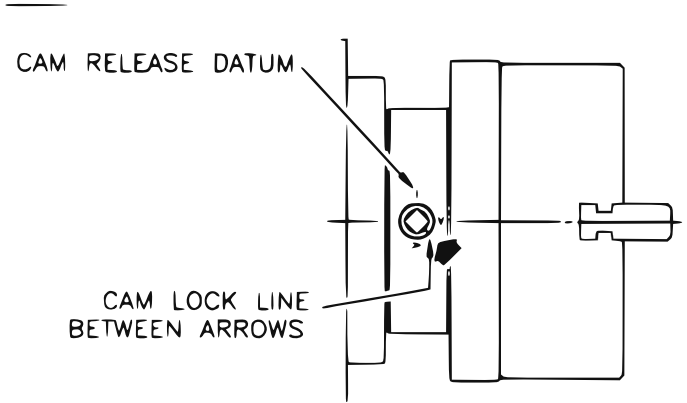


Figure 3-7: Correct cam position: the cam lock line is between the arrows

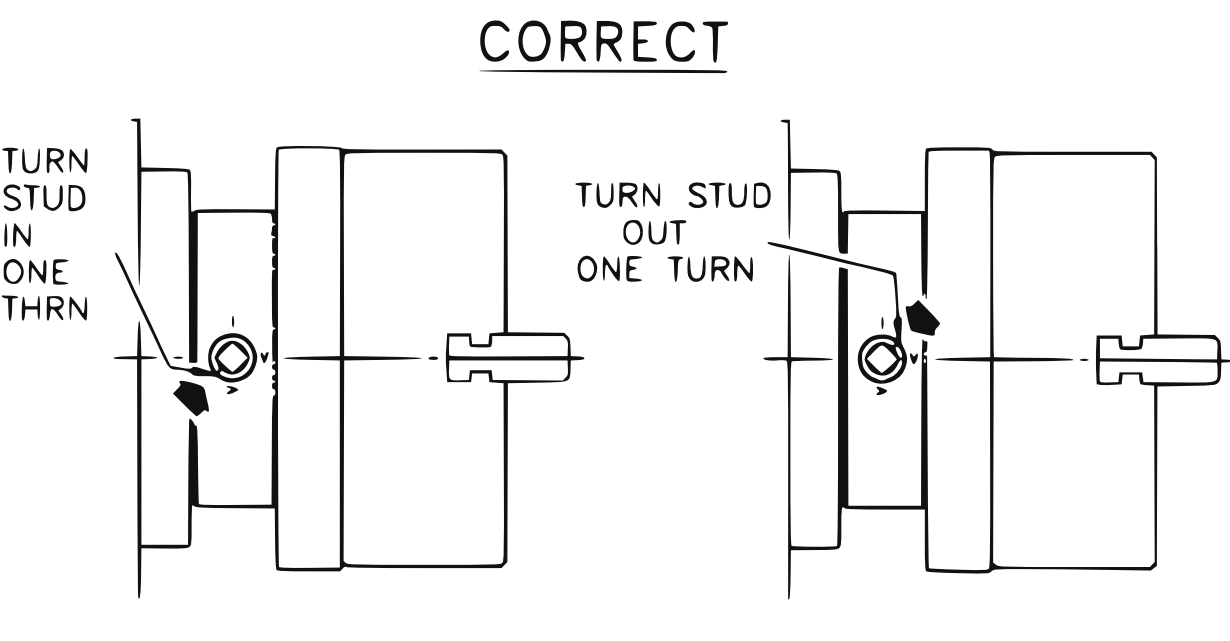
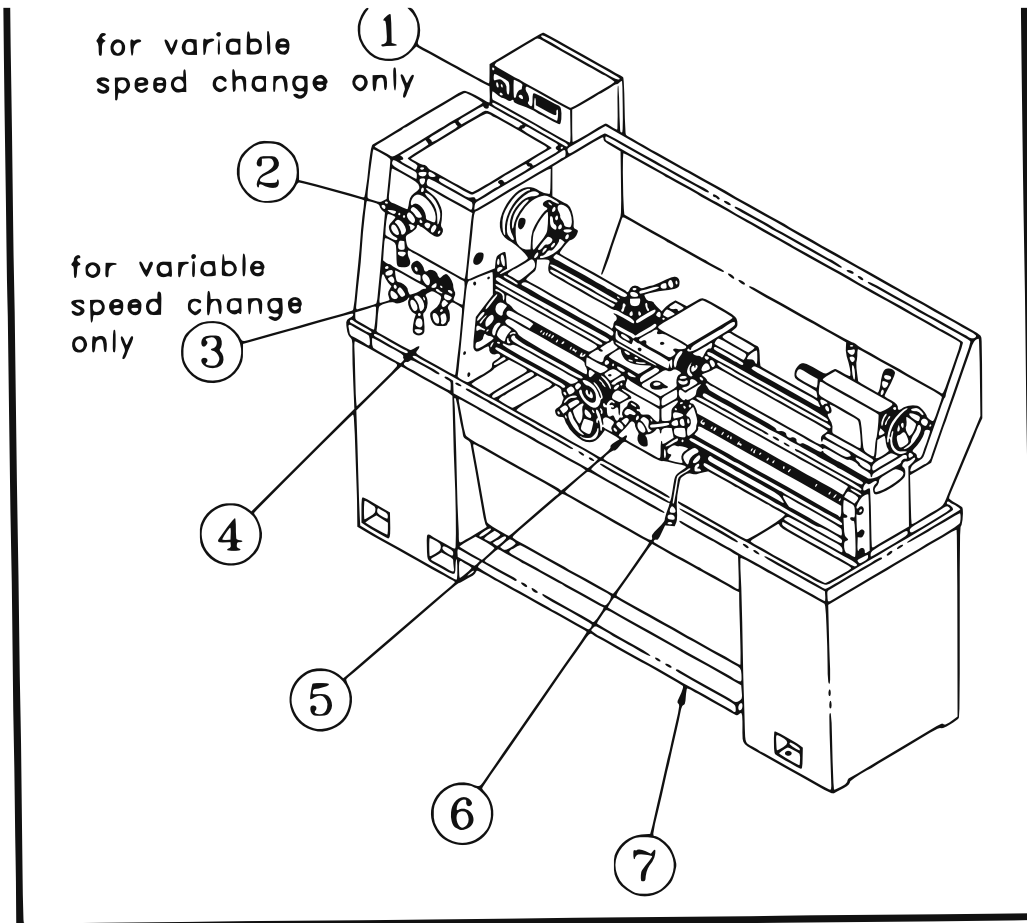


Figure 3-8: Adjusting the camlock stud: turn the stud in or out one turn

4 Controls and Operation

4.1 Lathe controls



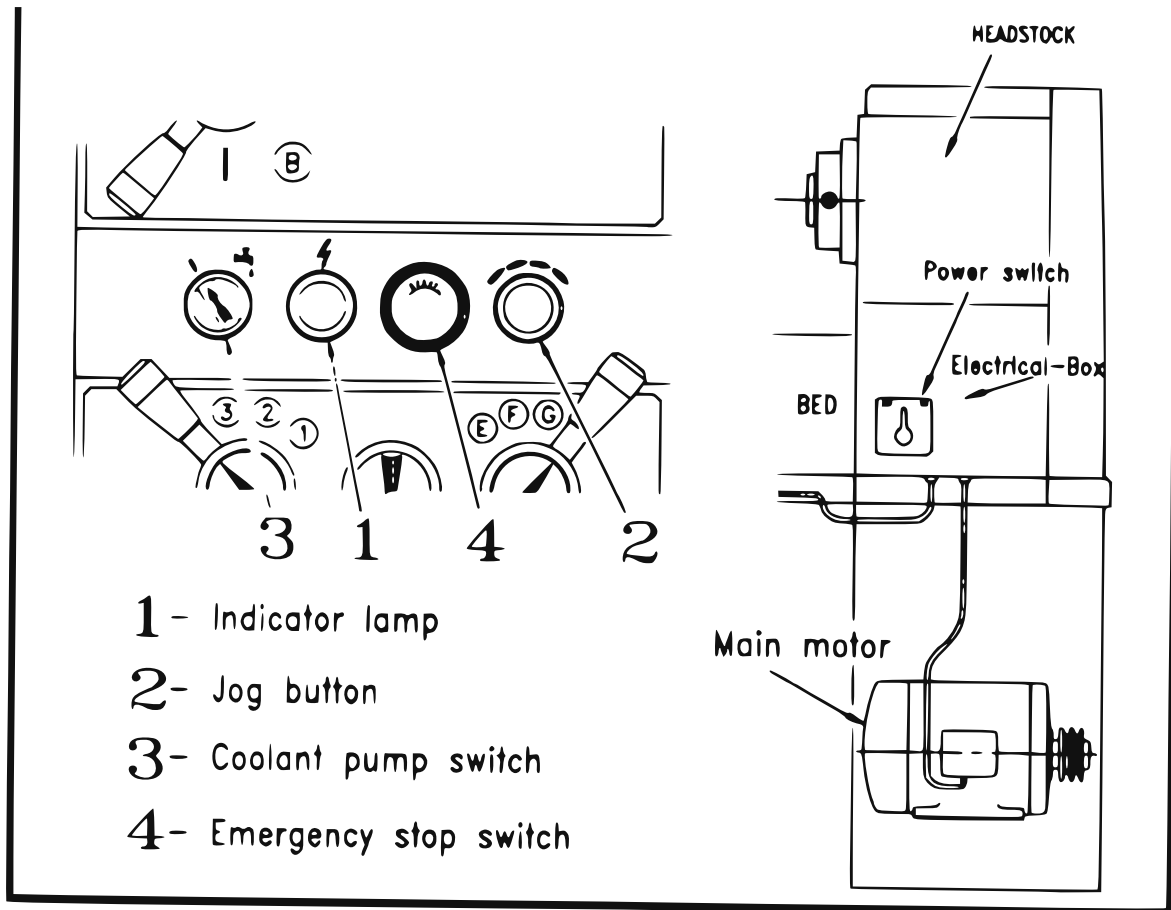
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Figure 4-1: Lathe controls

4.2 Electrical controls: 2-speed motor models (L1330G)

The power switch is on the face of the electrical box at the back of the headstock. All the other electrical controls are on the front of the headstock (see Figure 4-2).

- 1 Set the power switch to ON. The indicator lamp (1) lights.
- 2 To run the main drive motor for a moment, press the JOG button (2). Keep the motor rotation lever in the neutral position while you do this.
- 3 Use the coolant pump switch (3) to switch the coolant pump on or off.
- 4 To stop the main motor and the coolant pump, press the RED button (4).



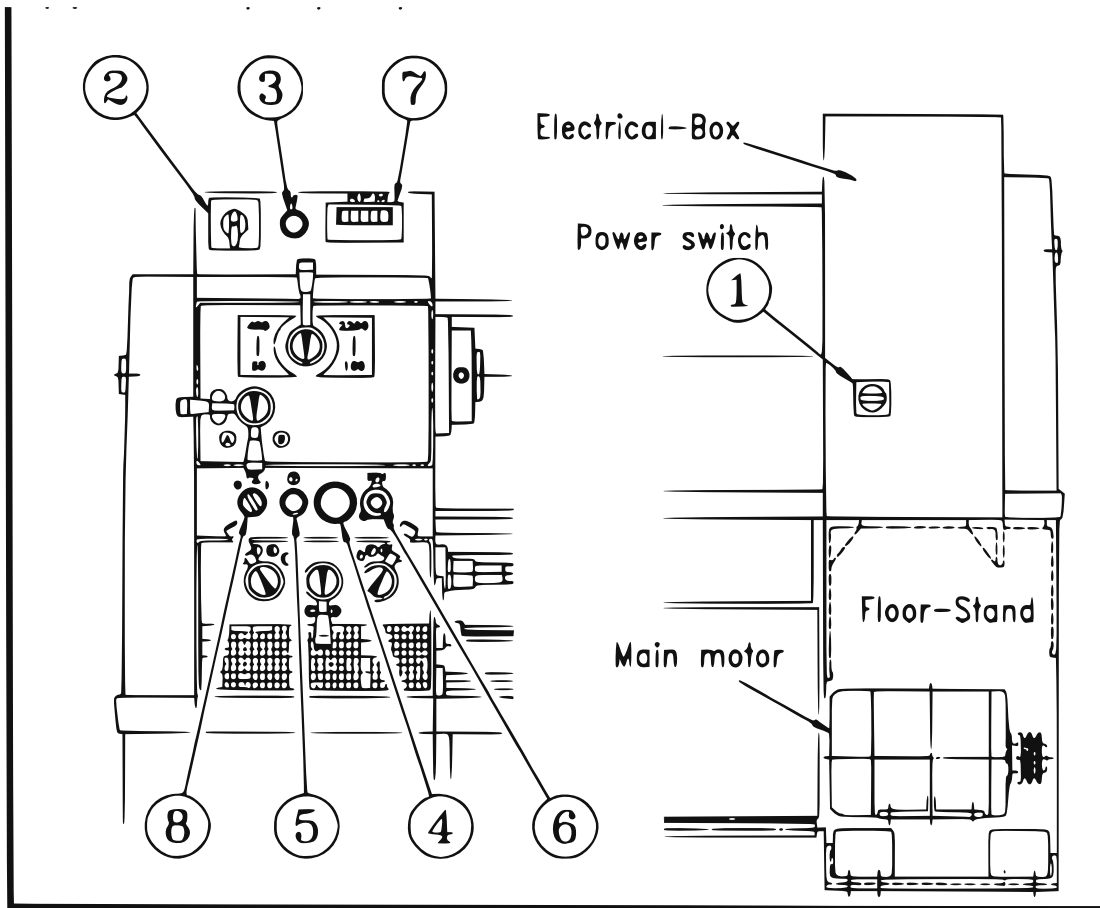
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Figure 4-2: Electrical controls, 2-speed motor version

4.3 Electrical controls: Variable speed models (1440-V / 1440UV)

The main power switch is on the front of the electrical box behind the lathe (head end). All the other electrical controls are on the front face of the headstock and on the electrical box on top of the headstock (see Figure 4-3).

- (1), (2) Power switch buttons: switch on the main power switch (1) on the electrical cover and the switch (2) on top of the headstock. The pilot lamp (3) lights and the power is on.
- (3) Pilot lamp: lights when the power is on.
- (4) Emergency stop switch: press the RED mushroom-head button to cut the power and stop the main motor and the coolant pump.
- (5) Inching: press the GREEN button to move the spindle slightly. This makes spindle speed selection easy. Keep the spindle rotation lever in the neutral position while you do this.
- (6) Variable speed selectors: adjust the spindle speed.
- (7) Spindle speed chart.
- (8) Coolant pump ON/OFF switch.



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Figure 4-3: Electrical controls, variable speed version

4.4 Speed controls: 2-speed motor models (L1330G)

You select the spindle speed with the two levers on the headstock and the electrical switch on the stand. The data plate shows all sixteen speeds (see Table 4-1 and Figure 4-4).

- 1 Set the electrical switch to the required position: (1) for the high range or (2) for the low range.
- 2 Turn the small lever to the right-hand side or to the left-hand side, as given in Table 4-1.
- 3 Move the large lever to the coloured arrow that lines up with the required speed on the data plate.

With the small lever in the upper or bottom position, the spindle is free for hand rotation.

Table 4-1: Spindle speeds, 2-speed motor version (r.p.m.)

Small lever	Electrical switch at (1)	Electrical switch at (2)
Right-hand side	1800, 1170, 770, 510	900, 585, 385, 255
Left-hand side	330, 215, 140, 90	165, 108, 70, 45

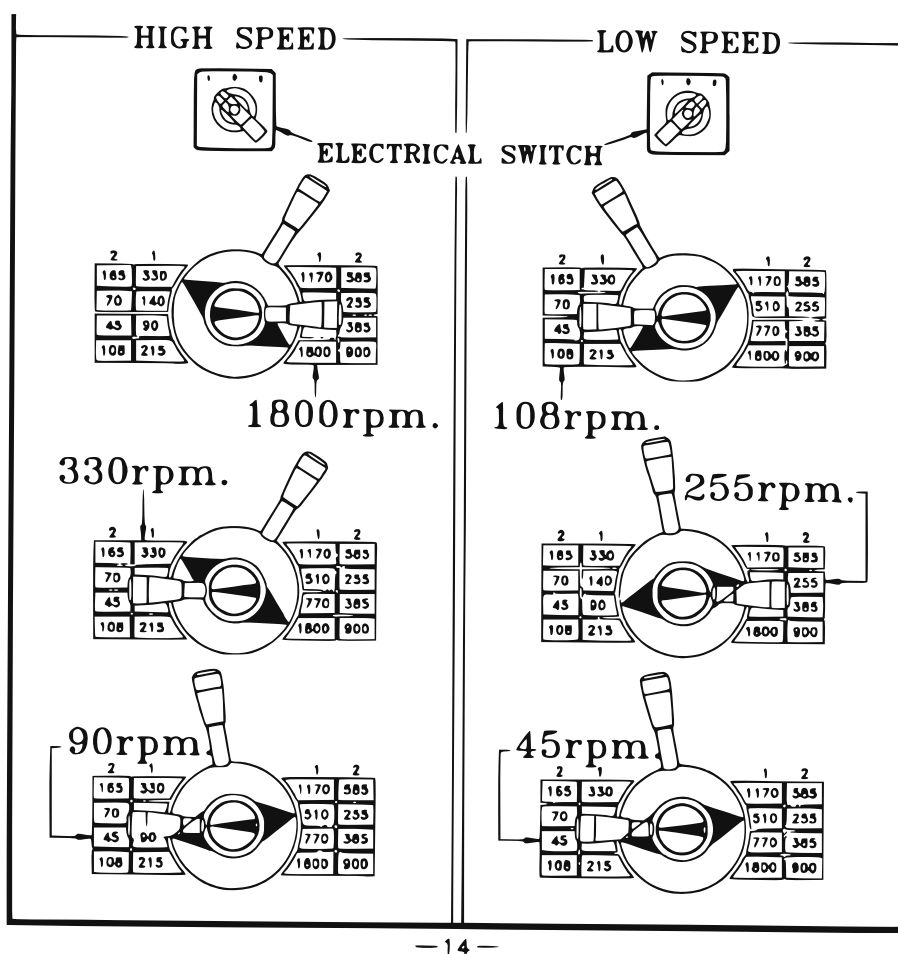


Figure 4-4: Speed control lever positions and data plate, 2-speed motor version (HIGH SPEED and LOW SPEED switch settings)

4.5 Spindle speed selectors: Variable speed models (1440-V / 1440UV)

The main spindle speed is variable from 2200 RPM down to 30 RPM in two ranges: HIGH SPEED, 2200-165 RPM, and LOWER SPEED, 145-30 RPM. The chart on the speed-range handle marks the low range as 405-30 RPM. See errata.

■ CAUTION

Do not change the position of handle (A) while the spindle is turning. The spindle must be stationary when you change the handle's position.

- 1 Stop the spindle.
- 2 Set the upper handle (A) on the headstock to the required speed range.
- 3 Adjust the variable speed selector (B) to the required spindle speed. You can use selector (B) while the spindle is turning.
- 4 Read the spindle speed on the spindle speed chart (C) on top of the headstock while the spindle turns.

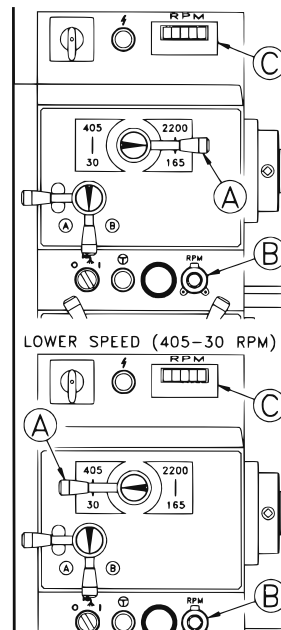


Figure 4-5: Variable speed selector panels

4.6 Threads and feeds

The data plate on the front of the end cover shows all the threads and feeds available directly from the gearbox. Set the control levers (1), (2), (3), (4) and (5) to the code given on the data plate (see Figure 4-1 and Tables 4-3 to 4-7). Lever (6) is the saddle longitudinal motion handle.

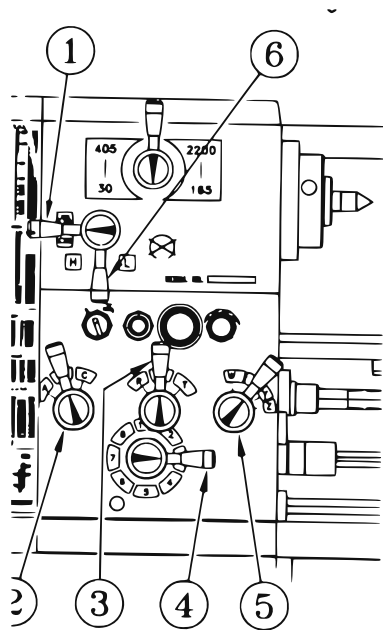


Figure 4-6: Gearbox lever positions (1) to (6)

4.6.1 Example: cutting a 20 T.P.I. inch thread

- 1 Find 20 T.P.I. on the data plate. The setting code is L, B, S, W, 3.
- 2 Set the levers to the letters and numbers given.
- 3 The machine is now set to cut threads of 20 T.P.I.

Find longitudinal and cross feeds on the data plate in the same way.

All T.P.I. and metric threads, and all longitudinal and cross feeds, use one change gear setting of 32/98-98/76 tooth gears. No other change gears are needed.

DP and MOD threads are also given on the data plate. For these threads, change the change gears to 32/98-77/76 tooth.

NOTE The 32/98-98/76 and 32/98-77/76 gear sets match the inch system (4 TPI leadscrew) end gears in Figure 9-19. The data plate for the 6mm leadscrew shows 63T, 55T/96T and 81T gears (99T for DP and MOD). See errata.

4.6.2 Threads and feeds available

Table 4-2: Threads and feeds available

Inch threads	39, 4-72 T.P.I.
Metric threads	34, 0.2-7.0mm
D.P. threads	21, 8-44 DP
MOD threads	18, 0.3-3.5 MOD
Longitudinal feeds	.0014-.020 inch / .035-0.50mm
Cross feeds	.0007-.0100 inch / .017-.250mm

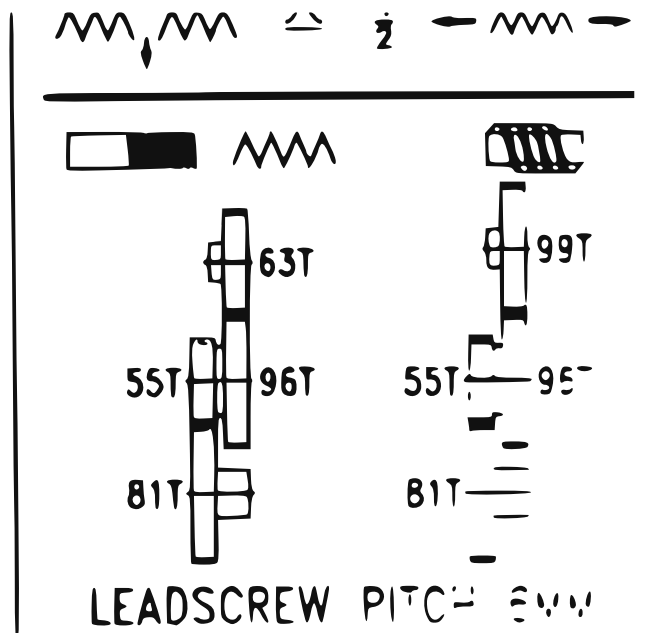


Figure 4-7: Data plate: end gear train

Table 4-3: Inch threads (T.P.I.) and lever settings

T.P.I.	Setting
72	LARW6
60	LARW3
56	LBRW8
54	LARW2
48	LBRW6
44	LBRW4
40	LBRW3
36	LBRW2
32	LBRW1
30	LASW3
28	LBSW8
27	LASW2
26	LBSW7
24	LBSW6
23	LBSW5
22	LBSW4
20	LBSW3
19	LCSW8
18	LBSW2
16	LBSW1
15	LATW3
14	LBTW8
13-1/2	LATW2
13	LBTW7
12	LBTW6
11-1/2	LBTW5
11	LBTW4
10	LBTW3
9	LBTW2
8	LBTW1
7-1/2	HATW3
7	HBTW8
6-1/2	HBTW7
6	HBTW6
5-3/4	HBTW5
5-1/2	HBTW4
5	HBTW3

T.P.I.	Setting
4-1/2	HBTW2
4	HBTW1

Table 4-4: Metric threads (mm pitch) and lever settings

Pitch (mm)	Setting
0.2	LCTX1
0.225	LCTX2
0.25	LCTX3
0.3	LCTX6
0.35	LCTX8
0.4	LCSX1
0.45	LCSX2
0.5	LCSX3
0.6	LCSX6
0.7	LCSX8
0.75	LCTZ6
0.8	LCRX1
0.9	LCRX2
1.0	LCSZ1
1.1	LCRX4
1.2	LCRX6
1.25	LCSZ3
1.3	LCRX7
1.4	LCRX8
1.5	LCSZ6
1.75	LCSZ8
2.0	LCRZ1
2.25	LCRZ2
2.5	LCRZ3
2.75	LCRZ4
3.0	LCRZ6
3.5	LCRZ8
4.0	HCRZ1
4.5	HCRZ2
5.0	HCRZ3
5.5	HCRZ4
6.0	HCRZ6
6.5	HCRZ7
7.0	HCRZ8

Table 4-5: Diametral pitch (DP) threads and lever settings

DP	Setting
44	LBSW4
40	LBSW3
36	LBSW2
32	LBSW1
30	HASW3
28	HBSW8
26	HBSW7
24	HBSW6
22	HBSW4
20	HBSW3
19	HCSW8
18	HBSW2
16	HBSW1
15	HATW3
14	HBTW8
13	HBTW7
12	HBTW6
11	HBTW4
10	HBTW3
9	HBTW2
8	HBTW1

Table 4-6: Module (MOD) threads and lever settings

Module	Setting
0.3	LCSX6
0.4	HCSX1
0.5	HCSX3
0.6	HCSX6
0.7	HCSX8
0.8	HCRX1
0.9	HCRX2
1.0	HCSZ1
1.25	HCSZ3
1.5	HCSZ6
1.75	HCSZ8
2.0	HCRZ1
2.25	HCRZ2
2.5	HCRZ3
2.75	HCRZ4
3.0	HCRZ6
3.25	HCRZ7
3.5	HCRZ8

Table 4-7: Longitudinal feeds per spindle revolution and lever settings (cross feed is half the longitudinal feed)

Feed (mm)	Setting	Feed (inch)
.035	LCTY1	.0014
.04	LCTY2	.0016
.045	LCTY3	.0018
.05	LCTY5	.002
.055	LCTY6	.0021
.06	LCTY7	.0023
.065	LCTY8	.0025
.075	LCSY1	.0028
.08	LCSY2	.003
.09	LCSY3	.0035
.1	LCSY4	.0038
.11	LCSY5	.004
.12	LCSY7	.0045
.15	HCSY1	.0055
.16	HCSY2	.006
.18	HCSY3	.007
.2	HCSY5	.008
.24	HCSY7	.009
.25	HCSY8	.01
.3	HCRY1	.012
.35	HCRY3	.014
.4	HCRY4	.015
.45	HCRY6	.017
.5	HCRY8	.02

End gears shown on the data plate for the 6mm leadscrew: 63T driving 55T/96T and 81T for threads and feeds; 99T driving 55T/96T and 81T for DP and MOD threads.

THREADING DIAL INDICATOR

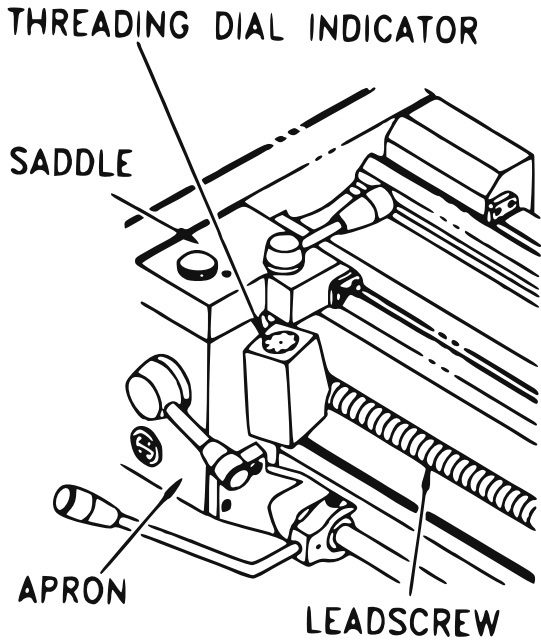


Figure 4-8: Threading dial indicator and leadscrew

4.7.1 Whitworth (inch) threads

The threading dial indicator is on the right-hand side of the apron on lathes with an English (inch) leadscrew. Engage the indicator pinion with the leadscrew and tighten the handnut to hold the indicator in engagement.

- Even number of threads per inch: close the leadscrew nut as ANY line on the dial passes the datum mark.
- Odd number of threads per inch: close the leadscrew nut at any NUMBERED line.
- Fractional threads of 1/2 or 1/4 t.p.i.: close the nut at the SAME numbered line on each pass of the tool.

You cannot use this dial with an English leadscrew to cut metric threads or fractional threads. For these, keep the leadscrew nut closed and reverse the machine with the change-over switch after each cutting pass and tool withdrawal.

4.7.2 Metric threads

Lathes with a metric leadscrew use a thread dial for metric threads. To suit the various metric pitches, several gears with different numbers of teeth are mounted on the lower end of the dial shaft. Change the vertical position of the thread dial indicator so that the correct gear for the pitch to be cut meshes with the leadscrew.

Each graduation on the dial is marked with a letter or number. This shows the points at which you can engage the half nuts for a given thread. Tables 4-8 and 4-9 show which gear (T) and which graduation to use for each metric pitch (P.C.).

Table 4-8: Metric thread dial, leadscrew pitch 4mm

P.C.	T	Graduation	P.C.	T	Graduation
0.4	20	4	1.4	21	3
0.45	27	3	1.5	27	3
0.5	20	4	1.625	26	2
0.55	22	2	1.75	21	3
0.6	27	3	2.0	20	4
0.625	20	4	2.25	27	3
0.65	26	2	2.5	20	4
0.7	21	3	2.75	22	2
0.75	27	3	3.0	27	3
0.8	20	4	3.25	26	2
0.875	21	3	3.5	21	3
0.9	27	3	4.0	20	4
1.0	20	4	4.5	27	3
1.1	22	2	5.0	20	4
1.125	27	3	5.5	22	2
1.2	27	3	6.0	27	3
1.25	20	4	6.5	26	2
1.3	26	2	7.0	21	3
1.375	22	2			

Table 4-9: Metric thread dial, leadscrew pitch 6mm

P.C.	T	Graduation	P.C.	T	Graduation
0.4	16	4	2.0	16	4
0.45	15	5	2.25	15	5
0.5	16	4	2.4	16	4
0.6	16	4	2.5	15	3
0.7	14	2	2.8	14	2
0.75	16	4	3.0	16	4
0.8	16	4	3.2	16	2
0.9	15	5	3.5	14	2
1.0	16	4	3.6	15	5
1.2	16	4	4.0	16	4
1.25	15	3	4.5	15	5
1.4	14	2	4.8	16	4
1.5	16	4	5.0	15	3
1.6	16	4	5.6	14	1
1.75	14	2	6.0	16	4
1.8	15	5	7.0	14	2

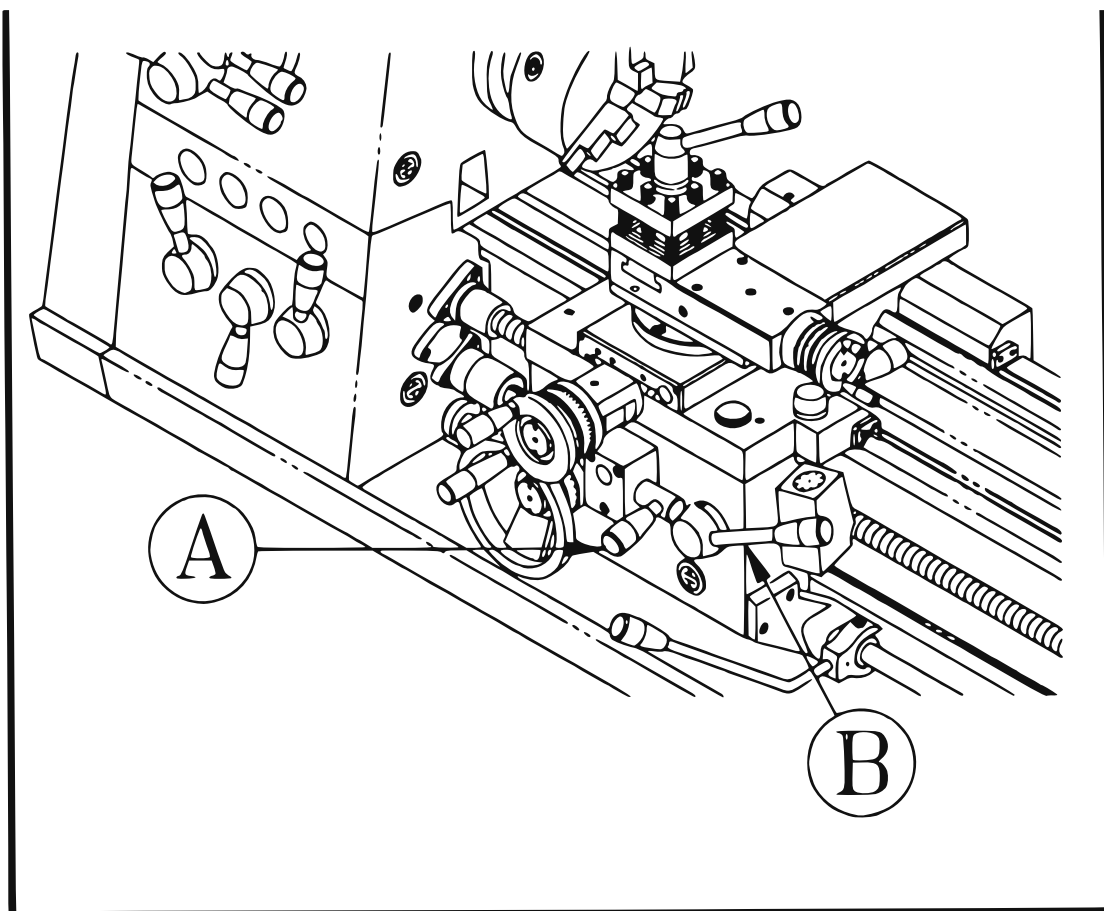
The threading dial assemblies for 8 TPI, 4 TPI, 4mm and 6mm leadscrews are shown in Figures 9-20 to 9-22.

4.8 Apron controls (lever type)

As well as traversing the carriage by handwheel, you can power-feed it with the controls on the front of the apron (see Figure 4-9).

- Handle (A) up: longitudinal feed.
- Handle (A) in the middle position: manual operation.
- Handle (A) down: cross feed.

Press lever (B) down to engage the leadscrew nut for screwcutting. To avoid undue wear, release the nut except when screwcutting.



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Figure 4-9: Apron controls, lever type

4.9 Cross-slide and top slide

A solid top slide is fitted to the cross-slide as standard. It is carried on a rotatable base marked 90-0-90 deg. for accurate indexing. The handwheel dials are graduated in inch or metric divisions to suit the operating screw fitted.

You can power-feed the cross-slide by moving lever (A) up or down (see 4.8), or move it by hand with the large-diameter dial. The dial is graduated in inch or metric divisions to suit the operating screw and nut fitted.

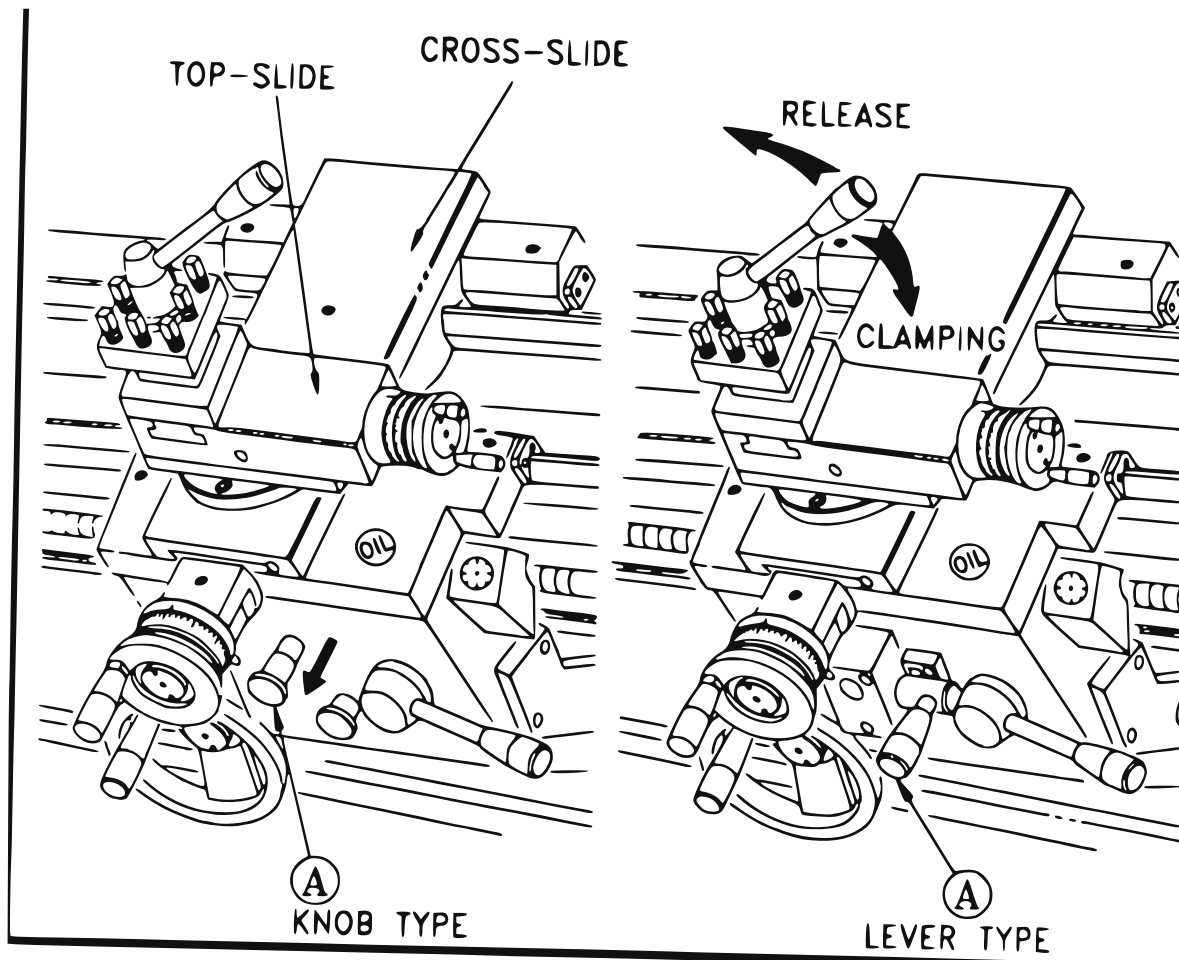


Figure 4-10: Cross-slide and top slide: knob and lever types

4.10 Tailstock

- Unlock the clamp lever (A) to move the tailstock freely along the bed.
- Lock the tailstock barrel with lever (B).

You can set the tailstock over to turn shallow tapers or for realignment:

- 1 Release the clamping lever.
- 2 Adjust the screws (S) at each side of the base to move the tailstock across the base.
- 3 Read the amount of set-over from the datum mark (C) on the tailstock end face (see Figure 4-12).
- 4 Apply the clamp lever after you adjust the set-over.

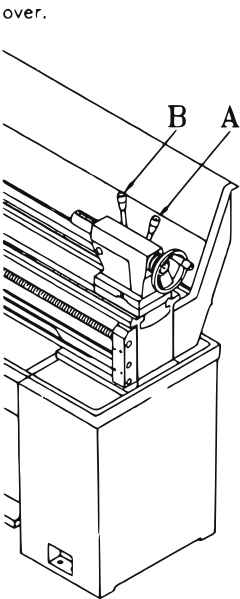


Figure 4-11: Tailstock clamp lever (A) and barrel lock lever (B)

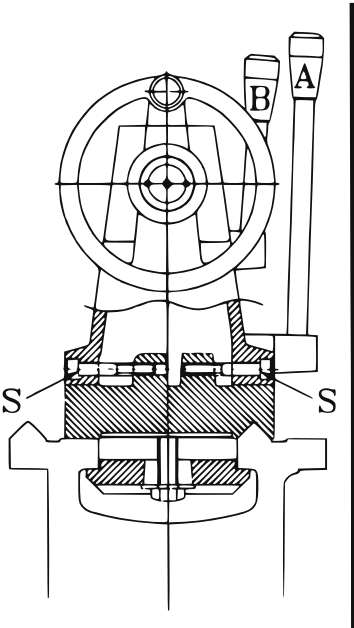


Figure 4-12: Tailstock set-over screws (S)

5 Servicing and Maintenance

5.1 Lathe alignment

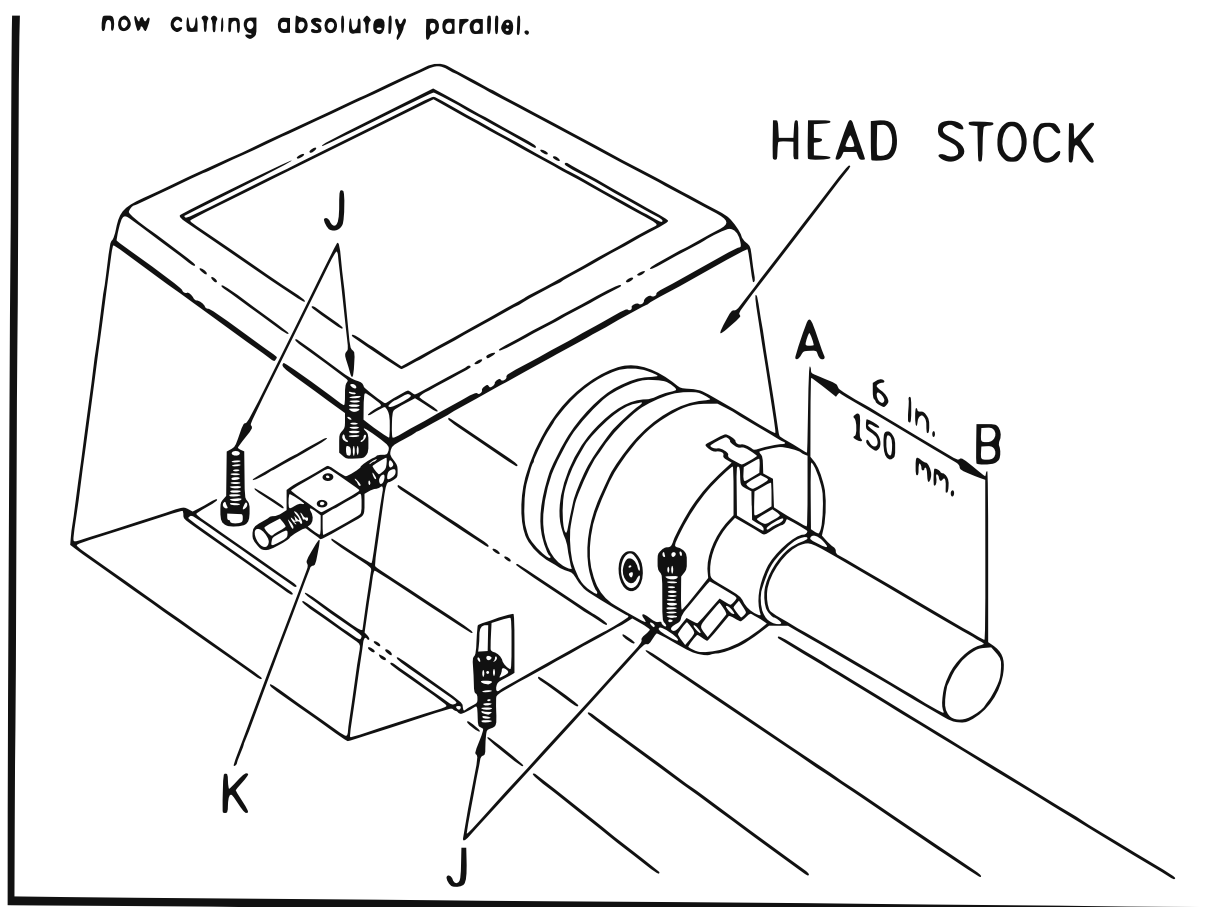
When the lathe is installed and running, check the machine alignment before you start work. Check the levelling and alignment at regular intervals to keep the lathe accurate.

5.1.1 Headstock check

- 1 Grip a 2in dia. (50mm) steel bar in the chuck. Do not support it at the free end.
- 2 Take a light cut with a sharp tool over a 6in (150mm) length.
- 3 Measure the turned length with a micrometer at each end (A and B). The readings must be the same.

To correct a difference in the readings:

- 1 Slacken the four headstock hold-down screws (S).
- 2 Adjust the set-over pad (P) beneath the headstock to pivot the headstock about the dowel (D).
- 3 Tighten all the screws.
- 4 Repeat the test cut and micrometer readings. Continue until the readings are identical and the machine cuts parallel.



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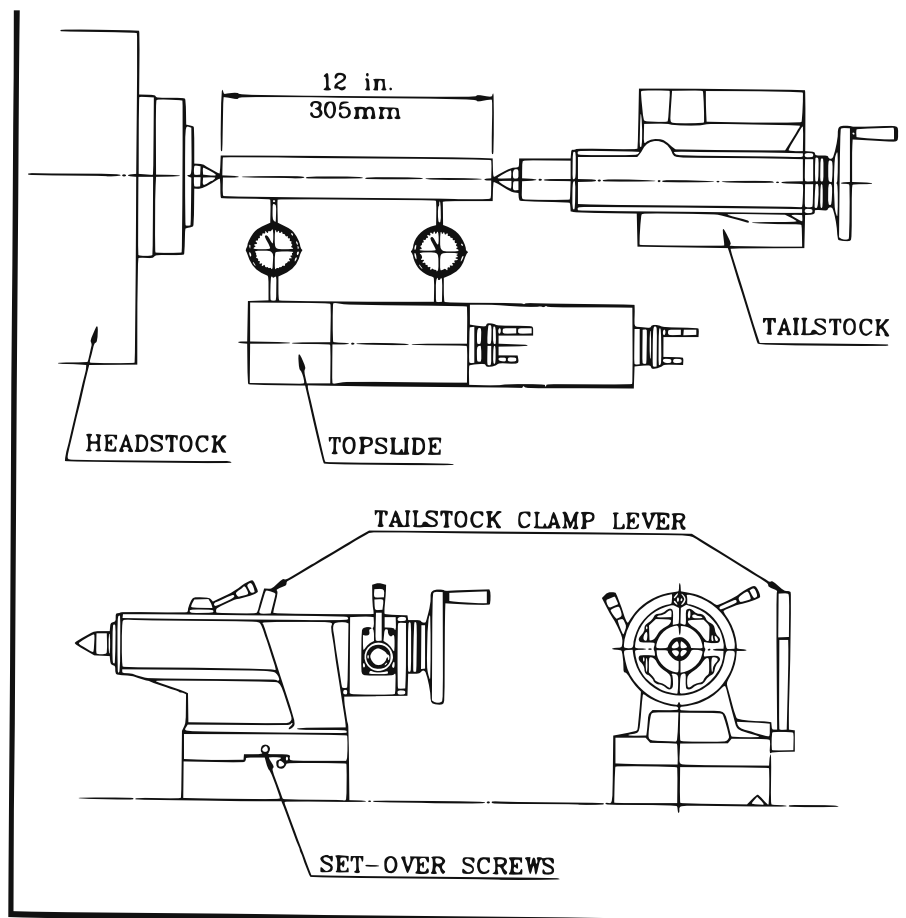
Figure 5-1: Headstock alignment check

5.1.2 Tailstock check

- 1 Fit a 12in (305mm) ground steel bar between the headstock and tailstock centres.
- 2 Fit a dial test indicator to the top slide.
- 3 Traverse the indicator along the centre line of the bar to check the alignment.

To correct an error:

- 1 Release the tailstock clamp lever.
- 2 Adjust the two set-over screws.
- 3 Check again. Continue checking and correcting until the alignment is perfect.



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Figure 5-2: Tailstock alignment check

5.2 End gear train

The drive from the headstock to the gearbox goes through a gear train enclosed by the headstock end guard. The intermediate gears are carried on an adjustable swing frame (M).

- Clean the gears thoroughly before fitting.
- Keep the backlash at .005in (.127mm).
- Lubricate the gears regularly with thick oil or grease.

5.3 Driving belts

- 1 Remove the cover plate at the back of the headstock.
- 2 Use the two screws (X) on the hinged motor platform to alter the belt tension.
- 3 Make sure that the motor is correctly aligned with the lathe axis.
- 4 Check the tension. Light finger pressure midway between the motor and headstock pulleys should give about 3/4 in (19mm) movement of each belt.

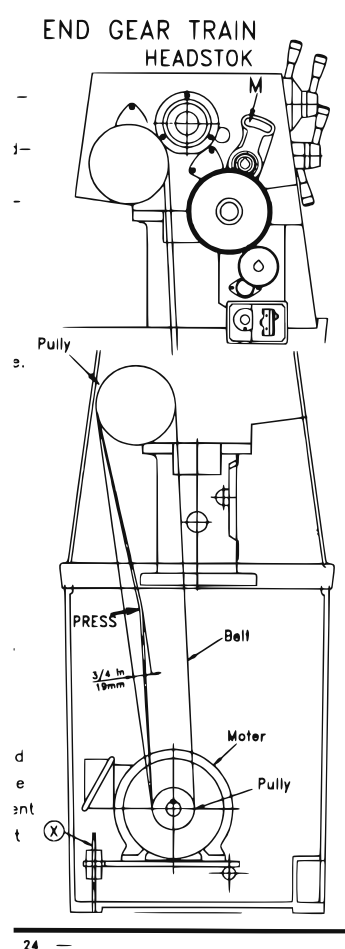


Figure 5-3: End gear train and driving belts

5.4 Slideway gibs

Tapered gib strips are fitted to the slideways of the saddle, cross-slide and top (compound) slide so that you can take up any slackness that develops.

- 1 Clean and lubricate the slideways thoroughly before you adjust them.
- 2 Slacken the rear gib screw.
- 3 Tighten the front gib screw.
- 4 Check for smooth action throughout the full slide travel.

■ CAUTION

Avoid over-adjustment. It increases the wear rate and gives a stiff or jerky action.

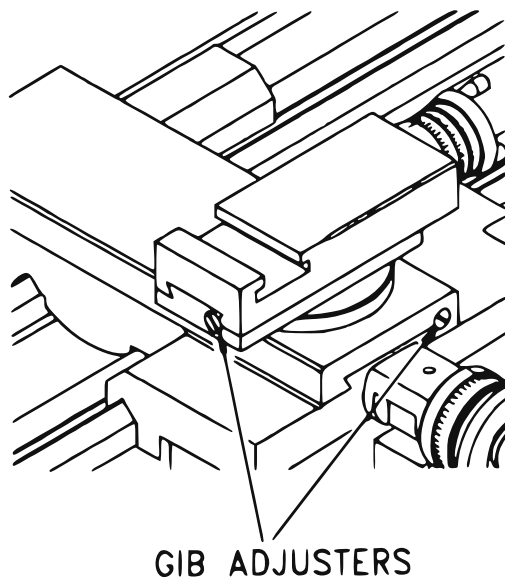


Figure 5-4: Slideway gib adjusting screws

5.5 Cross-slide nut

The cross-slide nut is adjustable to take up slackness that develops in service.

- 1 Reduce the backlash with the cap-head screw at the rear of the nut. Make only small adjustments.
- 2 Before you operate the cross-slide, turn it by hand several times to check that it moves smoothly throughout its travel.

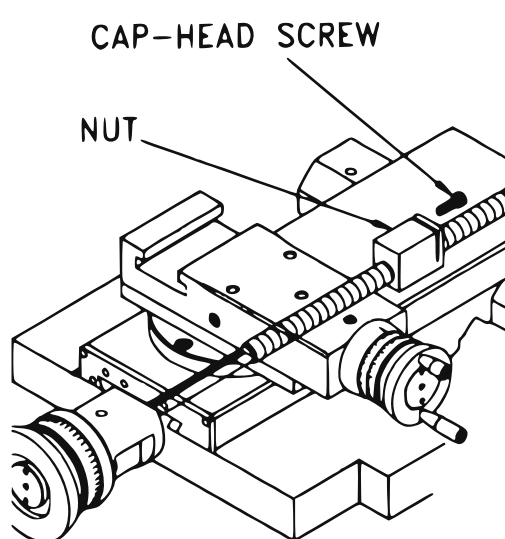


Figure 5-5: Cross-slide nut adjustment

6 Lubrication

6.1 Headstock and gearbox

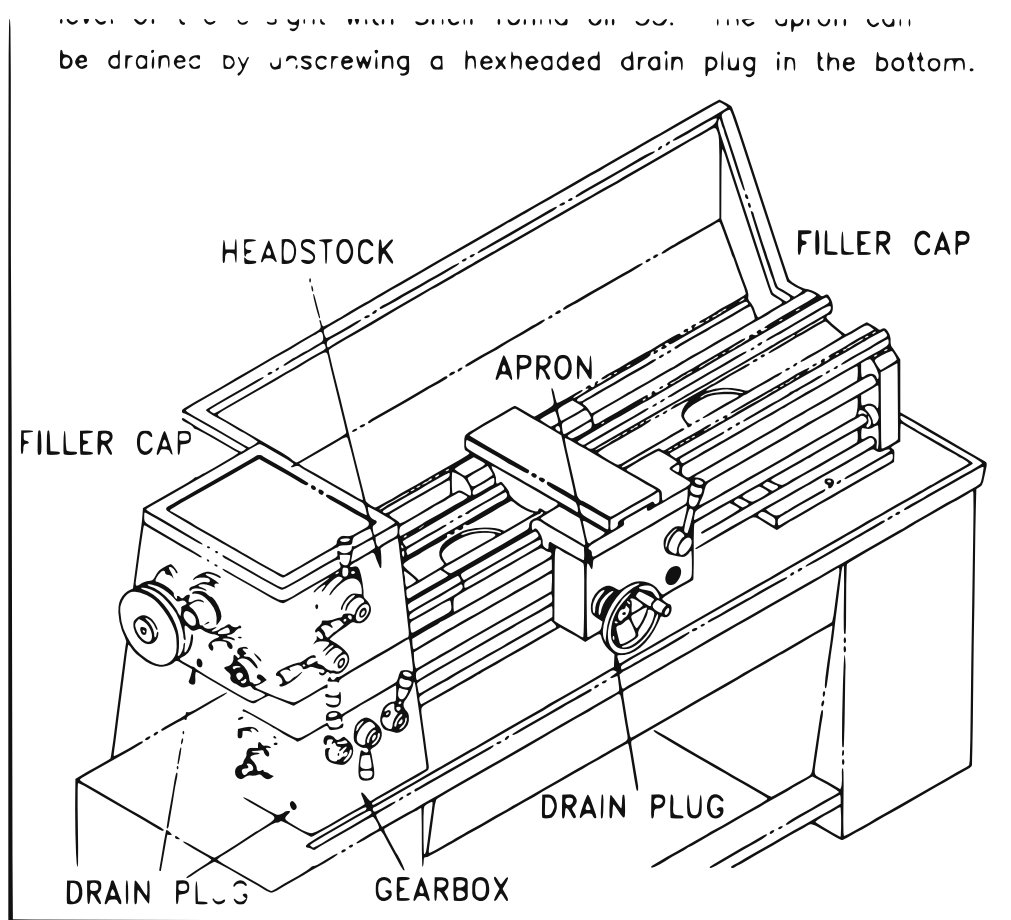
The headstock and gearbox are splash-lubricated from an internal oil reservoir (Shell Tellus 27).

- Check the oil level against the mark on the oil sight window in the front end face of the headstock and gearbox. A weekly check is recommended.
- Change the oil every year.
- Fill through the filler cap in the top of the headstock and gearbox. The filler cap is covered by the end guard.
- Drain through the drain plug in the bottom of the headstock and gearbox.

6.2 Apron

The apron is lubricated from an internal oil reservoir. The oil sight window is in the front of the apron and the filler cap is in the top of the saddle.

- Refill the reservoir to the level of the oil sight with Shell Tonna oil 33.
- To drain the apron, unscrew the hexagon-headed drain plug in the bottom.



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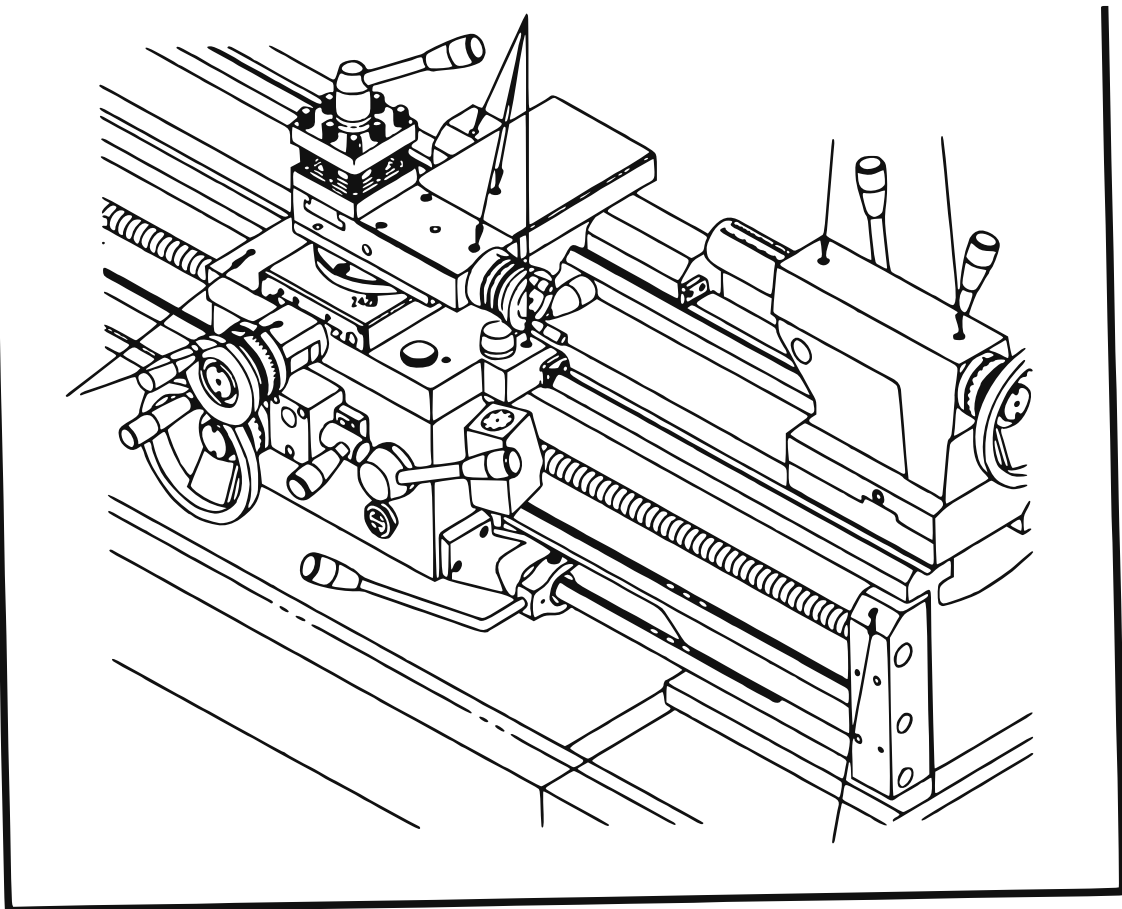
Figure 6-1: Filler caps and drain plugs

6.3 Saddle, slides, leadscrew and tailstock

- Use the oil gun provided to oil the saddle, cross-slide, cross-slide nut and top slide (compound slide).
- Oil the leadscrew with light machine oil or way lubricant, using the oil gun.
- Oil the tailstock oil points daily from a standard oil can.
- Clean the slideways, leadscrew and feed shaft after each period of work (a bristle paint brush is useful for this) and oil them lightly.

■ CAUTION

Using incorrect grades of oil can cause damage.



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Figure 6-2: Saddle, slide and tailstock oiling points

6.4 Lubrication chart

Table 6-1: Lubrication chart

	1 Headstock	2 Gearbox	3 Apron	4 Slide and tailstock
Recommended lubricant	Shell Tellus oil 27	Shell Tellus oil 27	Shell Tellus oil 33	Shell Tellus oil 33 ~ 41
Filling method	Oil jug	Oil jug	Oil jug	Oil gun
Initial charge quantity	10 litre	1.5 litre	0.9 litre	
Make-up interval	3 Month	3 Month	1 Month	1 Day
Make-up quantity	0.5 litre	0.5 litre	0.2 litre	A little
Exchange interval	1 Year	1 Year	1 Year	
Exchange quantity	4.5 litre	1.5 litre	0.9 litre	

NOTE The chart gives Shell Tellus oil 33 for the apron. Sections 3.5 and 6.2 give Shell Tonna 33. See errata.

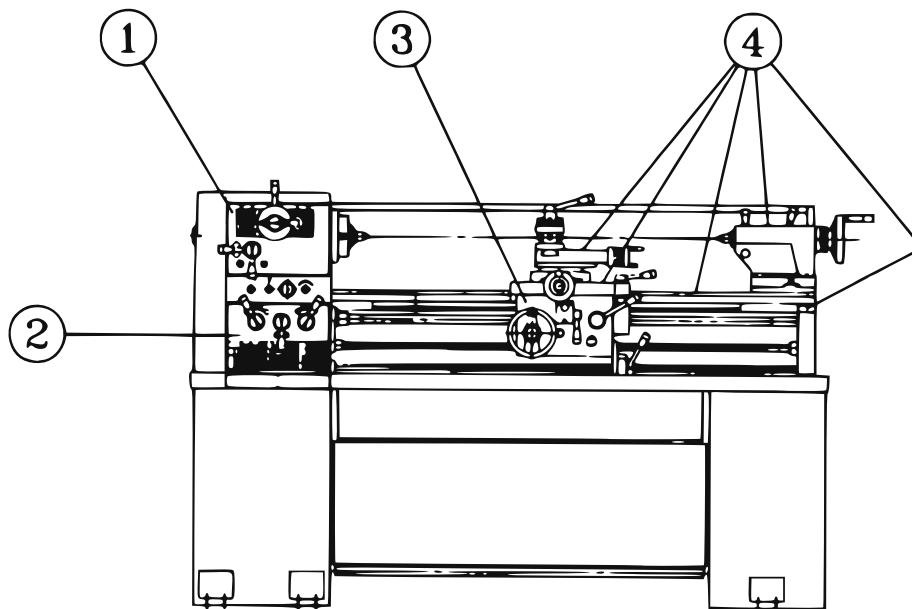
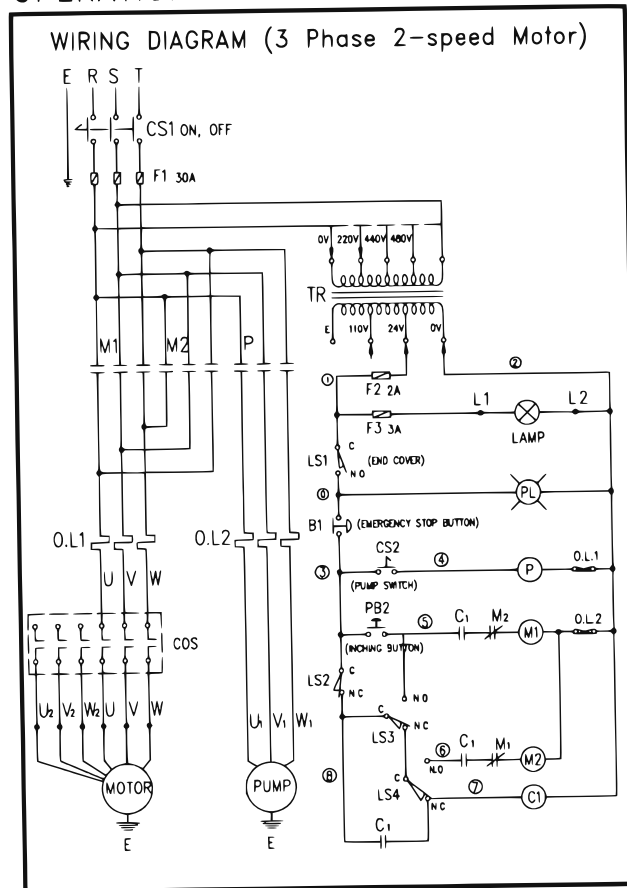


Figure 6-3: Lubrication diagram

7 Electrical

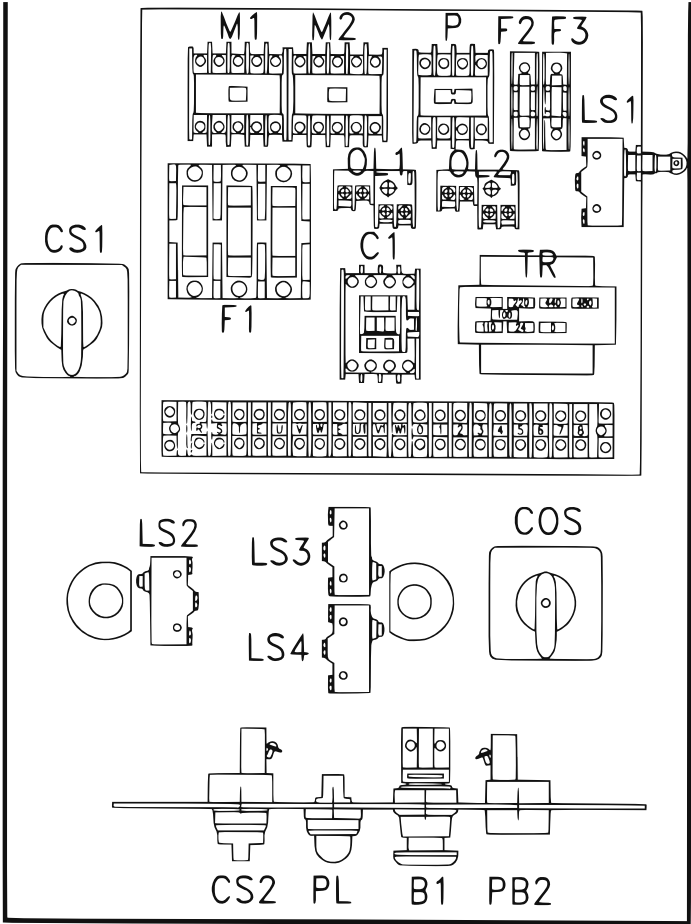
7.1 Wiring diagram: 2-speed motor models (L1330G) (3 phase 2-speed motor)

OPERATION



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Figure 7-1: Wiring diagram, 3 phase 2-speed motor

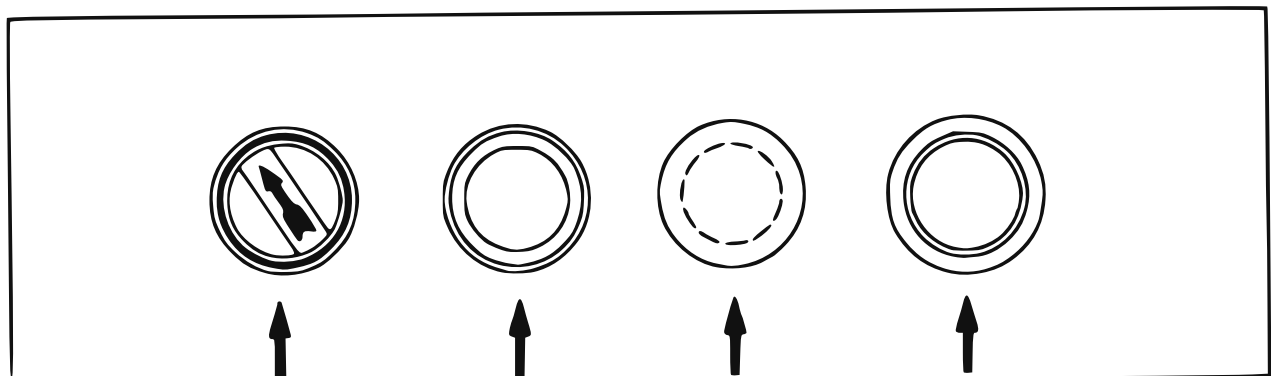


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Figure 7-2: Electrical box component layout, 2-speed motor version

Table 7-1: Electrical components, 2-speed motor version

Symbol	Component
al	Power switch 3Ø 3w 10A
T	Control circuit transformer 100VA
M	Main motor
M1	Pump motor
A	Push button switch (jogging switch) type SB 3051A
B	Flat type push button type SB 3091B
C	Pilot light type SP 301, 110V/15V, colour: white
D	Selecting switch type ST 3021A
e1	Fuse base 600V, 30A, type SR-833
e2	Glass tube fuse 1A
1c1	For main motor reverse: AC magnetic contactor coil AC 110V, type C-11G3A1B
1c2	For main motor forward: AC magnetic contactor coil AC 110V, type C-11G3A1B
2c1	For pump motor: AC magnetic contactor coil AC 110V, type C-11G3A1a
1e1	Thermal overload relay for main motor, type RH-18M
2e1	Thermal overload relay for pump motor, type RH-10E
d	AC magnetic contactor coil AC 110V, type C-11G3A1a
Ls1	Limit switch: end cover safety switch, type 15G 22-B
Ls2	Limit switch: brake precision, type 15GD-B
Ls3	Limit switch: reverse precision, type 15GD-B
Ls4	Limit switch: forward precision, type 15GD-B
Cs1	2-speed motor switch

*Figure 7-3: Electrical control panel: push buttons A to D*

NOTE Symbols A to D are the push buttons and switches on the control panel. The original panel illustration is not reproduced in this draft.

7.2 Circuit diagrams to "CE" standard: 2-speed motor models (L1330G)

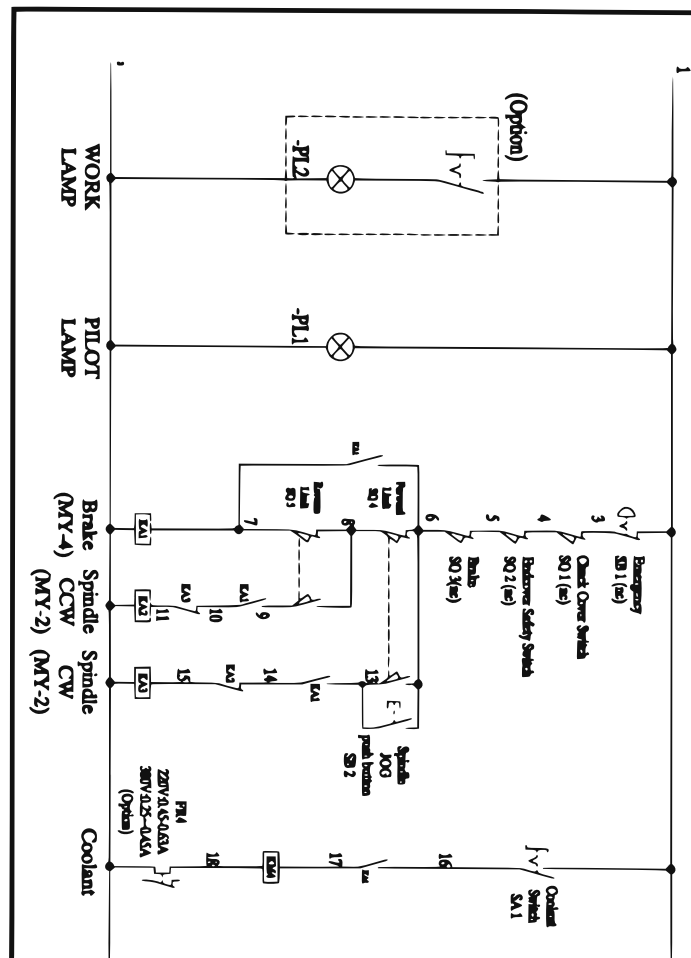
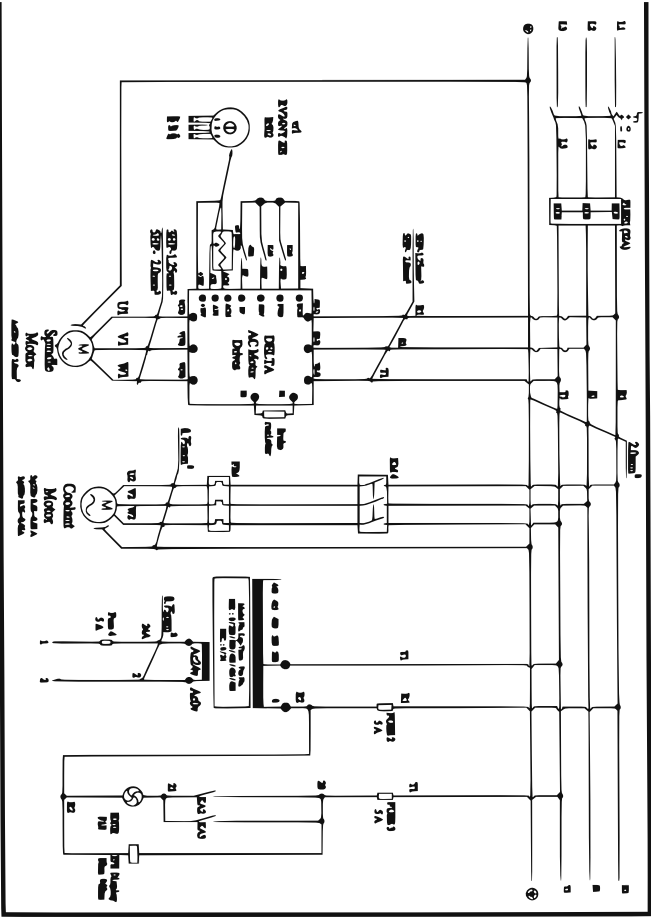


Figure 7-4: Control circuit, "CE" standard (brake, spindle CW/CCW, work lamp and pilot lamp)



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Figure 7-5: Power circuit, "CE" standard

7.4 Circuit diagrams to "CE" standard

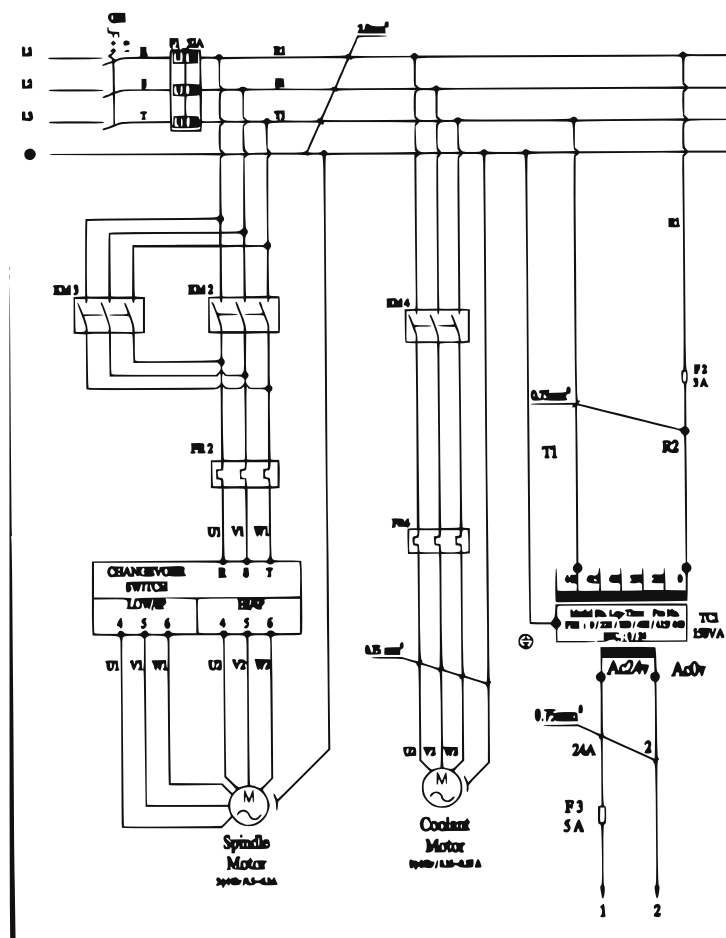


Figure 7-7: Power circuit diagram, "CE" standard

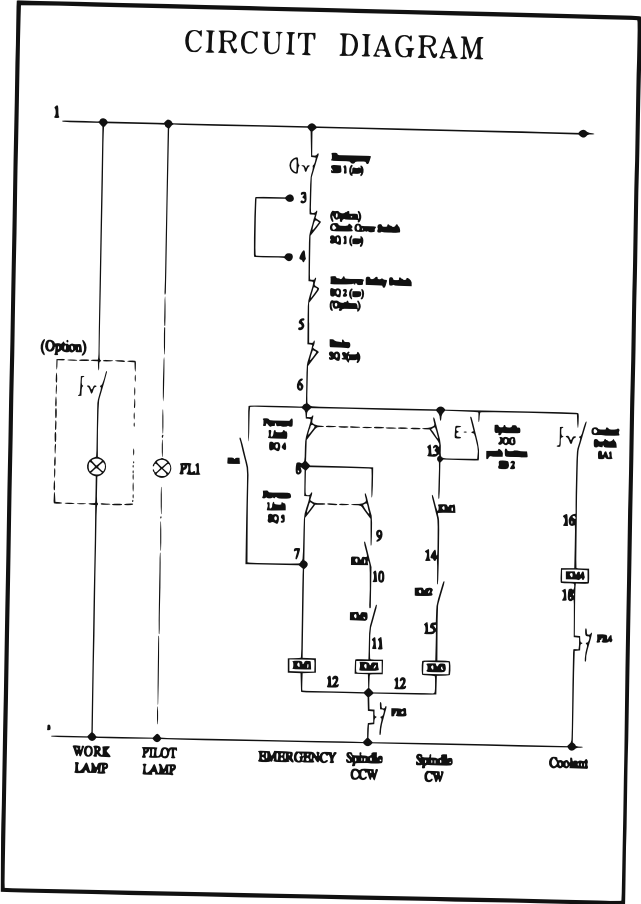


Figure 7-8: Control circuit diagram, "CE" standard

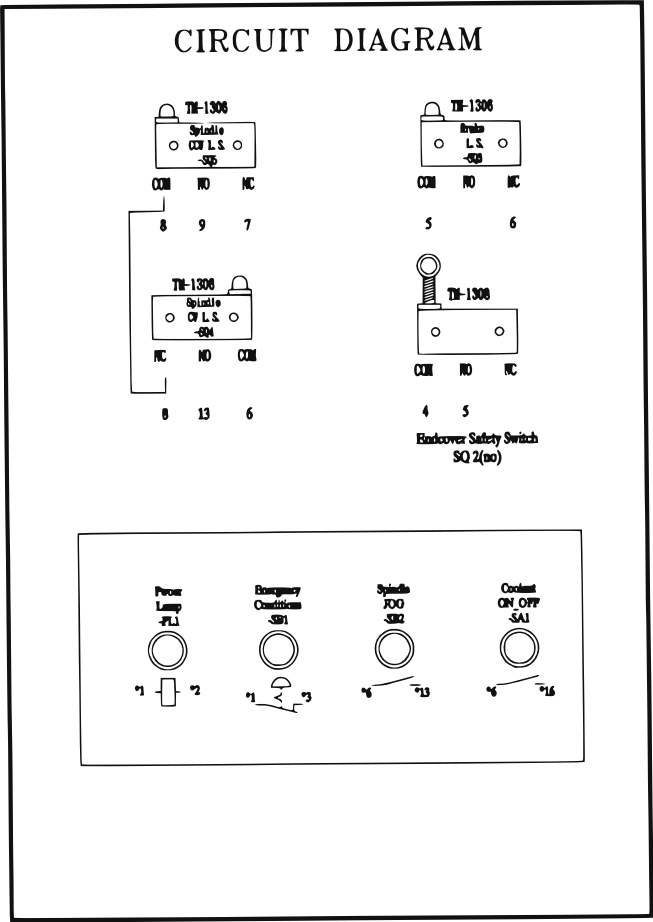


Figure 7-9: Circuit diagrams: limit switches, power lamp PL1, emergency stop SB1 and coolant switch SA1

7.5 Schedule of electrical equipment

Table 7-2 lists the electrical equipment for the precision centre lathe types SSM 1330, 1340, 1430 and 1440 (schedule drawn 30/11/94).

Table 7-2: Schedule of electrical equipment

Item	Circuit	Description and function	Technical data	Qty	Supplier	Supplier's reference	Remarks
KM1	2,3	Magnetic contactor for main motor reverse	Ue=380V~; coil 50Hz 22V~, 60Hz 24V~; AC3lth=AC1=25A; Ui 660V~; 3<<a>>+1<>	1	TAIAN	CN-16	VDE 0660, IEC 947-4-1, BS 5424
KM2	2,3	Magnetic contactor for main motor forward	As KM1	1	TAIAN	CN-16	VDE 0660, IEC 947-4-1, BS 5424
KM3	2,3	Magnetic contactor for coolant pump	Ue=380V~; coil 50Hz 22V~, 60Hz 24V~; AC3lth=AC1=25A; Ui 660V~; 4<<a>>	1	TAIAN	CN-11	VDE 0660, IEC 947-4-1, BS 5424
KA1	3	Magnetic contactor for brake	Ue=22V~; lth=6A; 4<<a>>	1	TAIAN	RAN-4	VDE 0660, IEC 947-4-1, BS 5424
FU1, FU2, FU3	1	Fuse boxes	10m/m x 38m/m; 100KA; 500V aM16A	1	LEGRAND	133-10	IEC 269-2
FU4	1	Fuse box	20mm 250V 1A	1	WAGO	282-122	VDE 0660, IEC 947
FU5	1	Fuse box	20mm 250V 1A	1	WAGO	282-122	VDE 0660, IEC 947
FU6	1	Fuse box	20mm 250V 4A	1	WAGO	282-122	VDE 0660, IEC 947
FR1	2,3	Thermal overload relay for main motor	380V: 4-6A (5.2); 220V: 6-9A (8.9)	1	TAIAN	RHN-18	VDE 0660, IEC 947-4-1, BS 4941
FR2	2,3	Thermal overload relay for coolant pump	380V: 0.16-0.24A (0.19); 220V: 0.24-0.36A (0.3)	1	TAIAN	RHN-18	VDE 0660, IEC 292-1, BS 4941
QS1	1	Main power switch	Ui 380V~; lth 20A	1	KLOCKNER MOELLER	TO-2-1/V/S VB	VDE 0660, IEC 947, EN 60947
HL1	3	Pilot light	22Ø VCH24V 2W	1	TELEMECANIQUE	XB2-BV63	VDE 0660, IEC 947-5-1, EN 60947-5-1
TC1	1	Control circuit transformer	Prim. 220V/380V; Sec. 22V, 24V, 150VA	1	TAIAN	TA-300	
SA1	3	Selecting switch	22Ø 600V 10A	1	TELEMECANIQUE	XB2-BD21	VDE 0660, IEC 947-5-1, EN 60947-5-1
SB1	3	Off hand switch, emergency	22Ø 600V 10A	1	TELEMECANIQUE	XB2-BS542	VDE 0660, IEC 947-5-1, EN 60947-5-1

Item	Circuit	Description and function	Technical data	Qty	Supplier	Supplier's reference	Remarks
SB2	3	Push button switch (jogging switch)	22Ø 600V 10A	1	TELEMEC ANIQUE	XB2-BA21	VDE 0660, IEC 947-5-1, EN 60947-5-1
SQ1	3	Chuck guard switch	500V 6KV 10A	1	TELEMEC ANIQUE	XCK-P102	VDE 0660, IEC 947-5-1, EN 60947-5-1
SQ2	3	Limit switch, end cover safety switch	500V 6KV 10A	1	KLOCKNER MOELLER	ATO-11-1-I	VDE 0660, IEC 947, EN 60947
SQ3	3	Limit switch for brake	250V 15A	1	OMRON	Z15GD-B	
SQ4	3	Limit switch for main motor forward	250V 15A	1	OMRON	Z15GD-B	
SQ5	3	Limit switch for main motor reverse	250V 15A	1	OMRON	Z15GD-B	
M1	2	Squirrel-cage motor, foot-mounted	50Hz, 220/380V; 1400 rev/min; class E insulation; 100L; type ASEC, 2.2kW	1	SEING	ASEC	
M2	2	Coolant pump	50/60Hz, 220/380V; 2850/3400 rev/min; type MT, 0.1kW	1	MING YIH	MT	

7.6 Location diagram

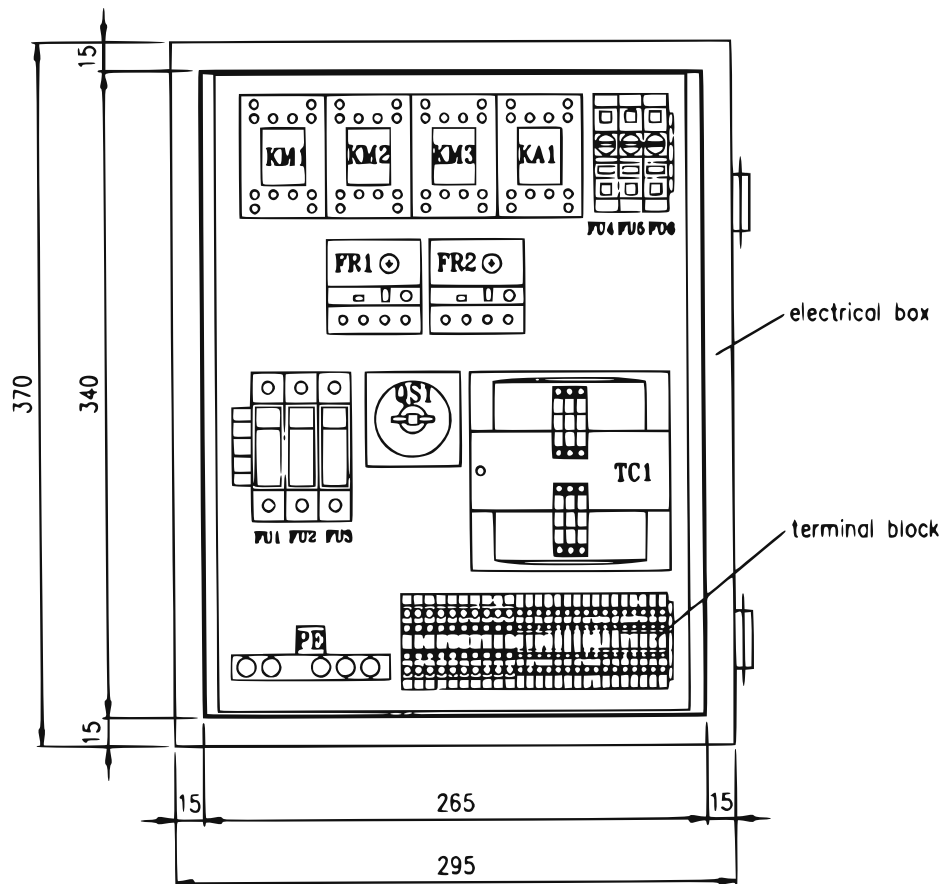


Figure 7-10: Electrical box location diagram (all dimensions in millimetres)

7.7 Installation diagram

Figure 7-11 shows the position of the operating station (SA1, HL1, SB1, SB2), the electrical box and the switches on the machine. Power supply: 220/380V, 50/60Hz + PE, 4 x 2.5mm cable, recommended fuse 16A.

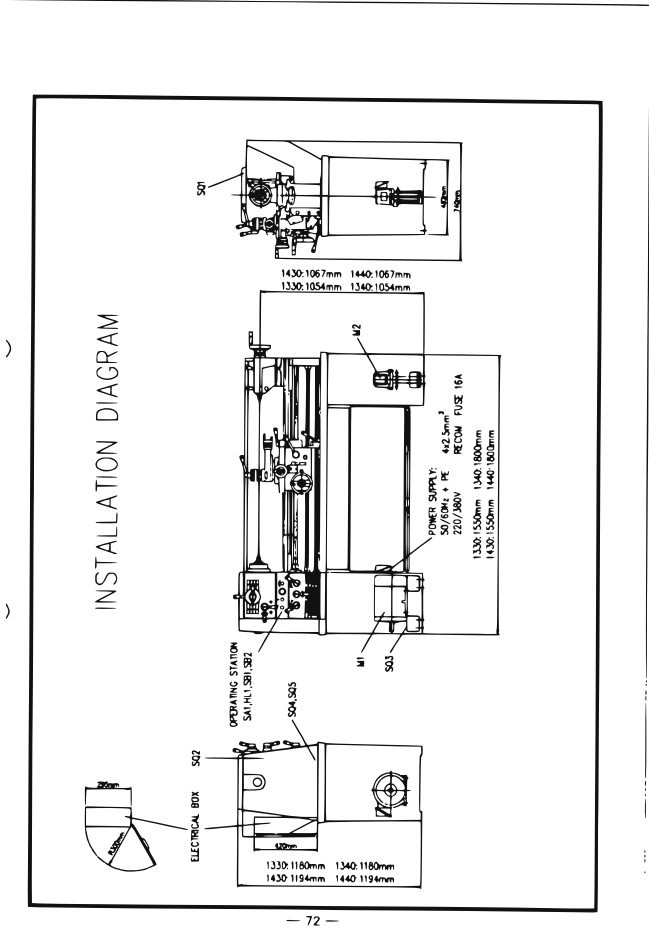


Figure 7-11: Electrical installation diagram

7.8 Electrical box wiring: Variable speed models (1440-V / 1440UV)

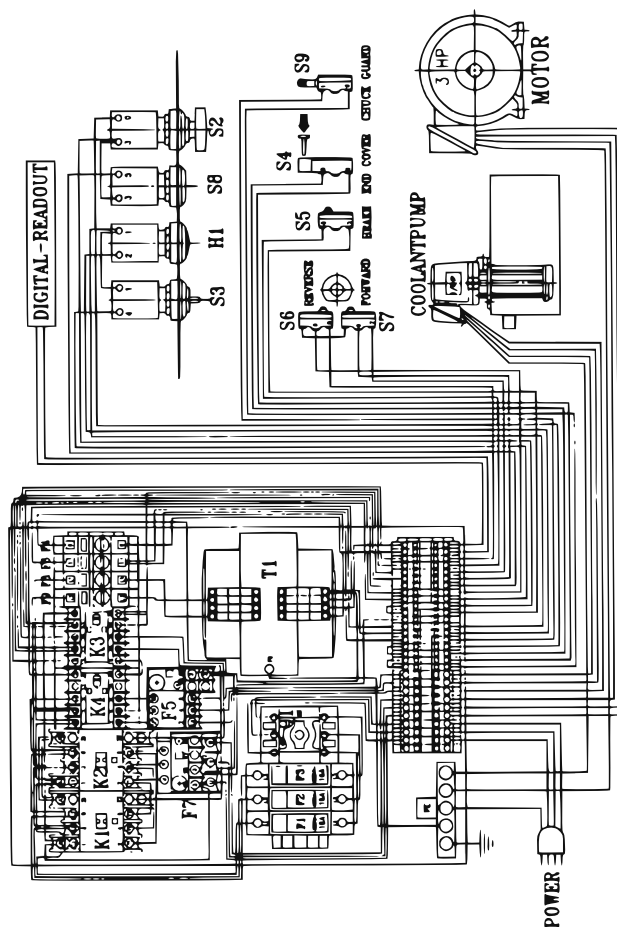


Figure 7-12: Electrical box wiring layout, variable speed version (digital readout, coolant pump, motor, power)

8 Accuracy Test

Each lathe is tested to the static accuracy test in Table 8-1 before dispatch. The measured errors are recorded on the test certificate for the individual machine.

Table 8-1: Static accuracy test (CNS)

No.	Subject of measurement	Permissible error
1	Levelling of machine: (a) in longitudinal direction	$\pm 0.04\text{mm/m}$ (convex)
1	Levelling of machine: (b) in transverse direction	$\pm 0.04\text{mm/m}$
2	Taper of spindle runs true (300mm long test bar)	Position A: 0.01mm; Position B: 0.02mm
3	Spindle parallel with traverse of carriage: (a) in vertical plane	0.02/300mm
3	Spindle parallel with traverse of carriage: (b) in horizontal plane	0.02/300mm
4	Upper slide (parallelism of the slide longitudinal movement to the spindle axis)	0.01/150mm
5	Axis of centres parallel with bed in vertical plane	0.02/300mm
6	Tailstock spindle parallel with carriage guides (carriage traverse): (a) in vertical plane	0.02/150mm
6	Tailstock spindle parallel with carriage guides (carriage traverse): (b) in horizontal plane	0.01/150mm
7	Centring register of spindle runs true	0.01mm
8	Spindle for axial float and true running of face of spindle flange	0.015mm
9	Centre runs true	0.015mm
10	Working accuracy of lathe on cylindrical turning (fine finished, 150 long, D=25mm~50mm)	0.015mm (cylindricity)

9 Spare Parts

9.1 How to use the parts lists

The numbers on the exploded views are part numbers. Look up each part number in the table for the assembly, or in Table 9-10 for standard parts (bearings, screws, keys, circlips, seals, springs and gaskets). Quote the part number, description and machine serial number when you order spare parts.

NOTE Some numbers on the drawings are not in the parts lists, and the gearbox drawings use a different numbering scheme. See errata.

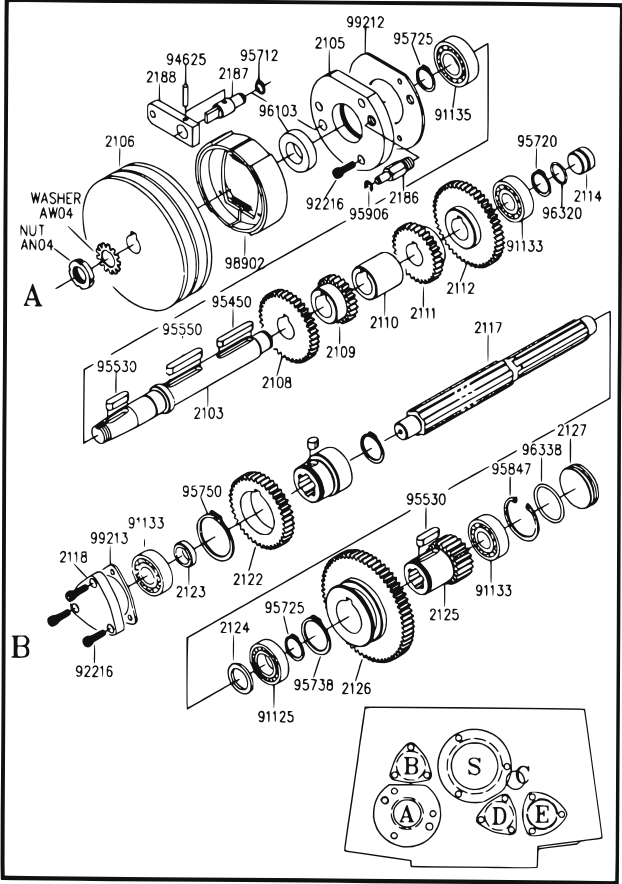
9.2 Headstock

Table 9-1: Headstock parts

Part No.	Description	Quantity
2101	Main casting	1
2102	Cover	1
2104	Shaft	1
2105	Cover	1
2106	Pulley	1
2107	Washer	1
2108	Gear 2M 38T	1
2109	Gear 2M 23T	1
2110	Collar	1
2111	Gear 2M 30T	1
2112	Gear 2M 21T	2
2113	Collar	3
2114	Bore plug	1
2117	Shaft	1
2118	Collar	1
2119	Gear 2M 31T	1
2120	Gear 2M 47T	1
2121	Gear 2M 54T	1
2122	Gear 2M 39T	1
2123	Collar	1
2124	Collar	1
2125	Gear 2M 21T	1
2126	Gear 2M 60T	1
2127	Bore plug	1
2131	Spindle	1
2132	Nut	1
2133	Cover	1
2134	Cover	1
2135	Collar	1
2136	Gear 2M 82T	1
2137	Gear 2M 43T	1
2138	Gear 2M 38T	1
2141	Shaft	1
2142	Gear 2M 21T	1
2143	Gear 2M 32T	1
2144	Gear 2M 32T	1

Part No.	Description	Quantity
2147	Shaft	1
2148	Cover	1
2149	Gear 2M 42T	1
2150	Collar	1
2151	Gear 2M 32T	1
2152	Collar	1
2153	Gear 2M 32T	1
2156	Shaft	1
2157	Cover	1
2158	Gear 2M 38T	1
2159	Bracket	1
2161	Range selector	1
2162	Range selector	1
2163	Collar	2
2164	Shaft	1
2165	Pin	1
2166	Lever	1
2167	Gear 1.5M 35T	1
2168	Gear 1.5M 45T	1
2169	Shaft	2
2170	Shift lever	1
2171	Shift lever	1
2172	Shift fork	2
2173	Lever	4
2174	Lever	3
2175	Handle	5
2176	Collar	1
2177	Handle	2
2178	Shaft	1
2179	Shift lever	1
2180	Shift fork	1
2181	Collar	1
2182	Shift lever	1
2183	Shift fork	1
2184	Collar	1
2186	Stud	1
2187	Stud	1
2188	Lever	1

HEADSTOCK for Variable speed change



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Figure 9-4: Headstock for variable speed change: input shaft, pulley, brake and gear shafts

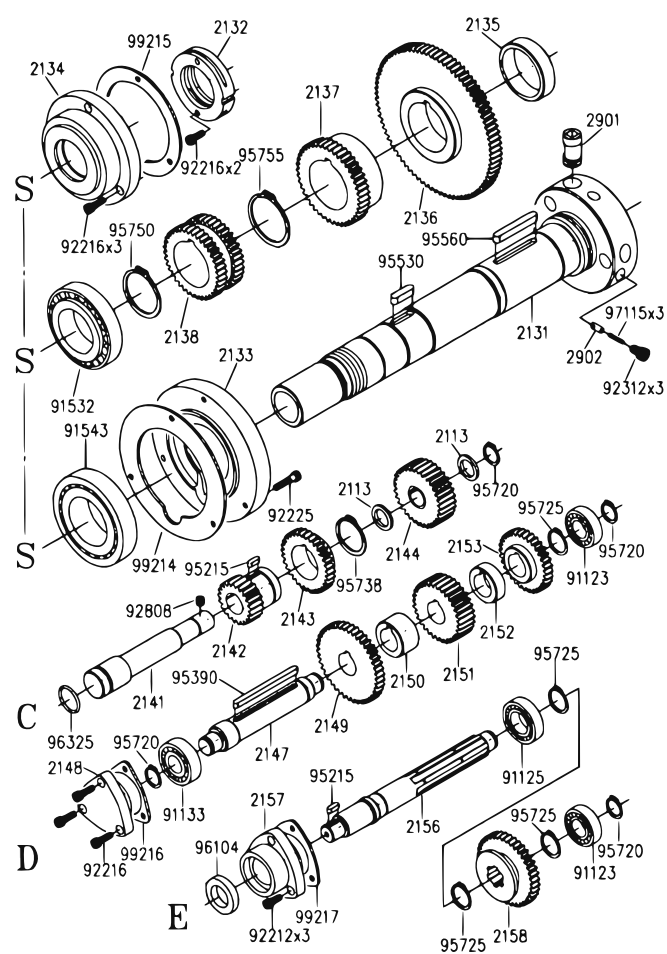


Figure 9-5: Headstock: spindle and gear shafts

9.3 Gearbox

Table 9-2: Gearbox parts

Part No.	Description	Quantity
2201	Casting (INCH)	1
2202	Front cover	1
2204	Shaft	1
2205	Cover	3
2206	Gear 1.75M 26T	1
2207	Gear 2M 20T	1
2208	Gear 2M 18T	1
2209	Gear 2M 16T	1
2210	Collar	1
2211	Gear 2M 16T	1
2214	Shaft	1
2215	Cover	1
2216	Gear 1.75M 24T / 2M 24T	1
2219	Shaft	1
2220	Gear 1.75M 28T	1
2221	Gear 2M 24T	1
2223	Gear 2M 22T	1
2224	Gear 2M 23T	1
2226	Gear 2M 18T	1
2227	Shear pin	1
2228	Cover	1
2229	Nut	2
2230	Gear 1.75M 32T	1
2231	Cover	1
2232	Gear 1.75M 34T	1
2233	Collar	1
2236	Shaft	1
2237	Gear 1.75M 34T / Gear 1.75M 16T	1
2238	Gear 2M 24T / 2M 24T	1
2239	Shaft	1
2240	Shaft	1
2241	Shaft	1
2242	Fl. brg.	1
2243	Gear 1.75M 36T	1
2244	Gear 1.75M 21T	1
2245	Nut	1

Part No.	Description	Quantity
2248	Handle	3
2249	Gear 1.25M 20T	1
2250	Shaft	1
2251	Gear 1.25M 28T	1
2252	Lever	1
2253	Fork	1
2255	Handle	3
2256	Shaft	2
2257	Lever	1
2258	Lever	1
2259	Fork	2
2261	Casting (METRIC)	1
2262	Front cover	1
2263	Shaft	1
2264	Shaft	1
2265	Shaft	1
2266	Shaft	1
2269	Collar	1
2270	Collar	1
2271	Washer	1

GEARBOX

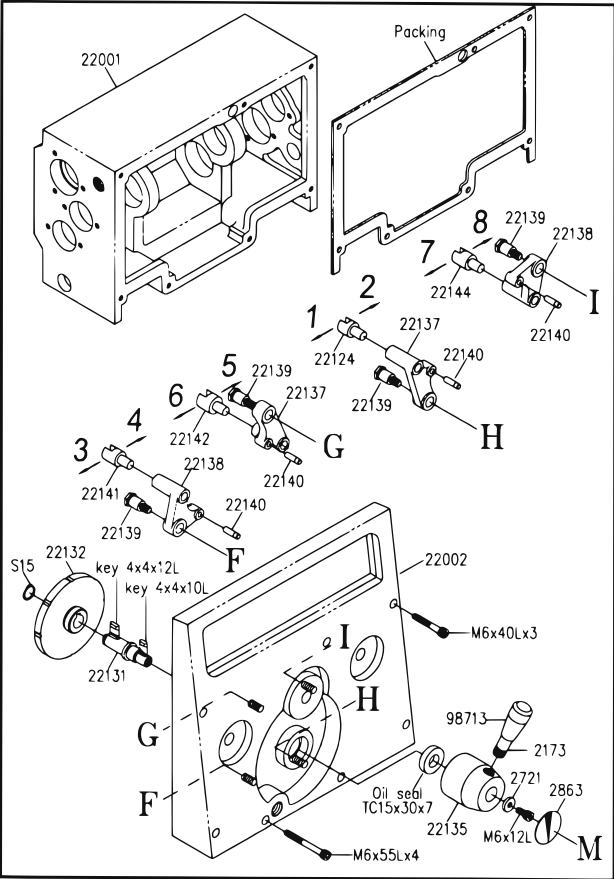


Figure 9-6: Gearbox: housing, front cover and selector shafts

GEARBOX

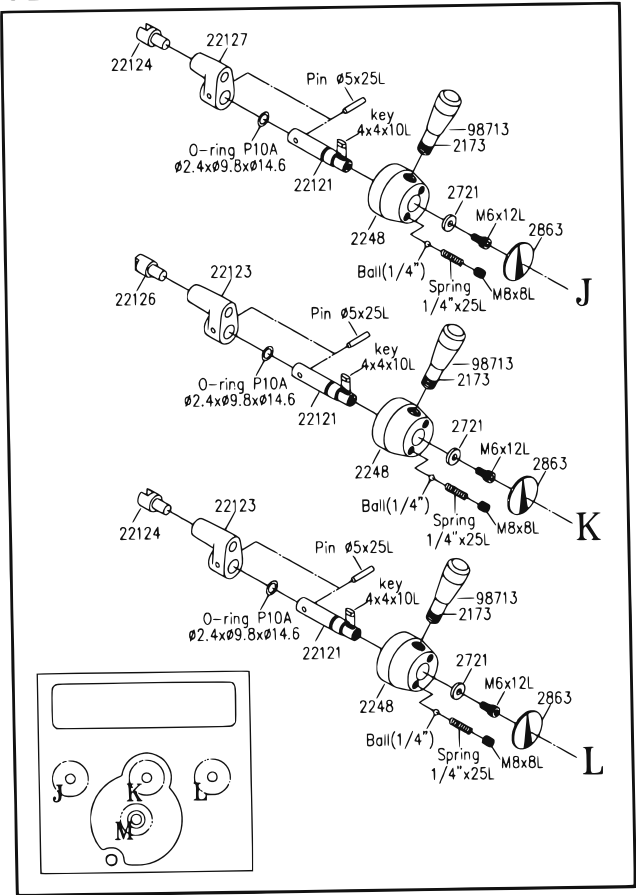
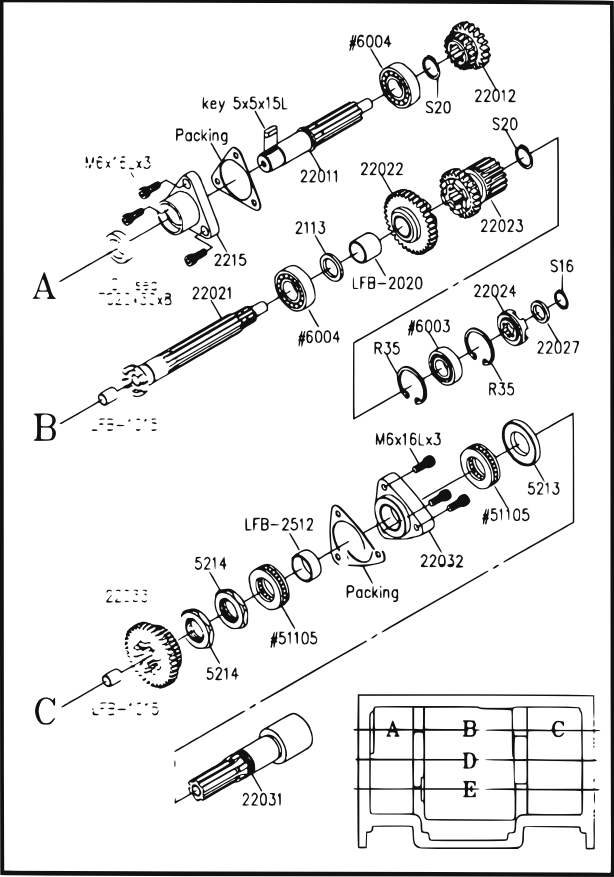


Figure 9-7: Gearbox: selector levers J, K and L

GEARBOX



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Figure 9-8: Gearbox: shafts A, B and C

9.4 Apron

Table 9-3: Apron parts

Part No.	Description	Quantity
2301	Casting	1
2302	Handwheel	2
2303	Handle	2
2304	Plug	4
2305	Index ring	1
2307	Shaft 2M 13T	1
2308	Keep assy.	1
2310	Rack pinion 2M 9T	1
2311	Gear 2M 50T	1
2312	Collar	4
2313	Plug	1
2315	Shaft	1
2316	Gear 2M 50T/20T	1
2318	Shaft	1
2319	Gear 2M 22T	1
2320	Collar	1
2321	Gear 2M 22T	1
2322	Gear 2M 22T	1
2325	Shaft	1
2326	Gear 2M 22T	1
2327	Collar	1
2330	Shaft	1
2331	Handle	1
2332	Handle	3
2333	Lever	1
2334	Bracket	1
2335	Half nut	1
2336	Gib	1
2338	Worm	1
2339	Cover	2
2341	Casting	1
2342	Shaft	1
2343	Gear shaft	1
2344	Keep assy	2
2345	Cam	1
2346	Lever	1

Part No.	Description	Quantity
2347	Shaft	1
2348	Collar	1
2349	Lever	1
2350	Plug	1
2351	Sliding plate	1

APRON Casting

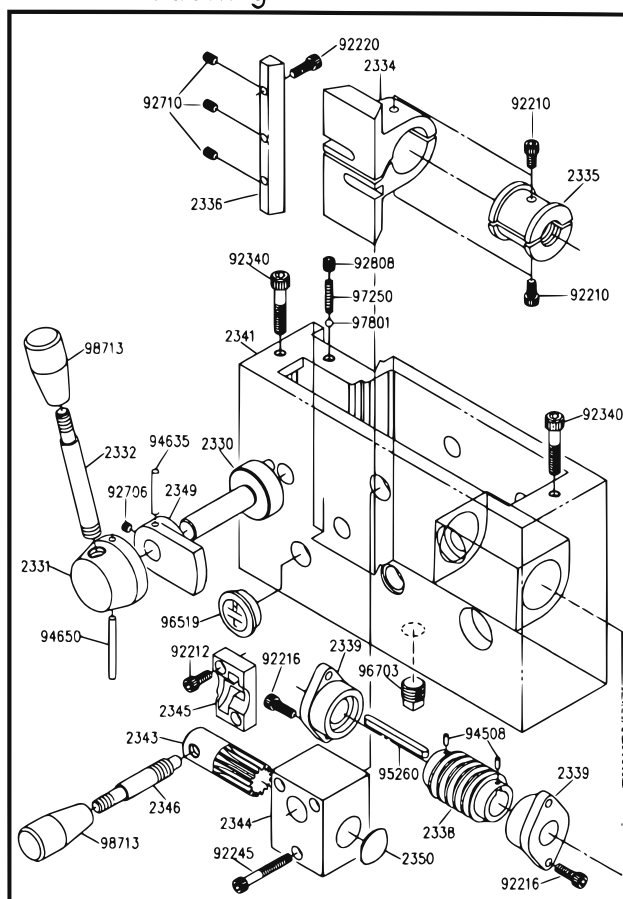
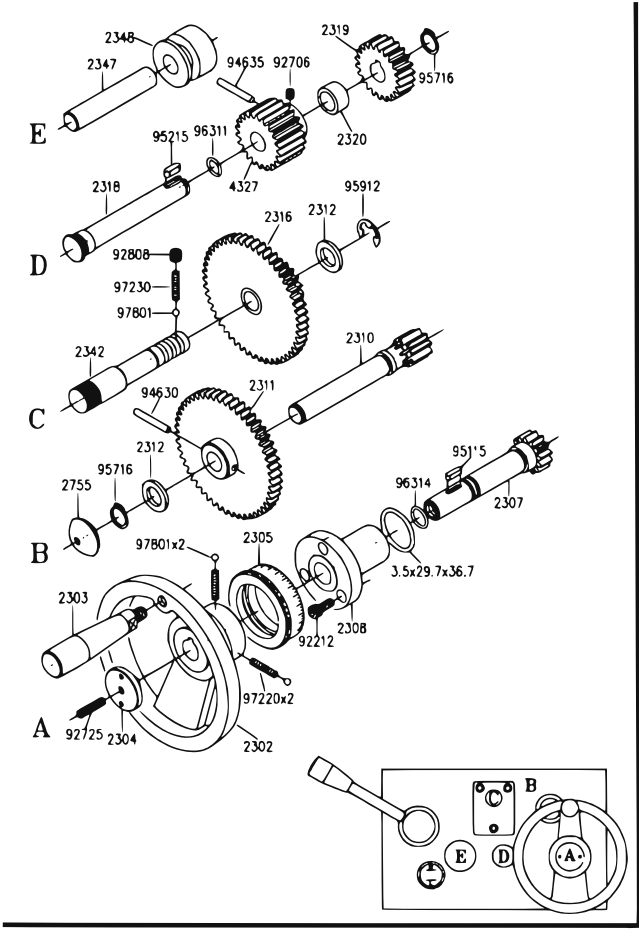


Figure 9-10: Apron casting, left hand



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Figure 9-11: Apron gearing, left hand, lever type

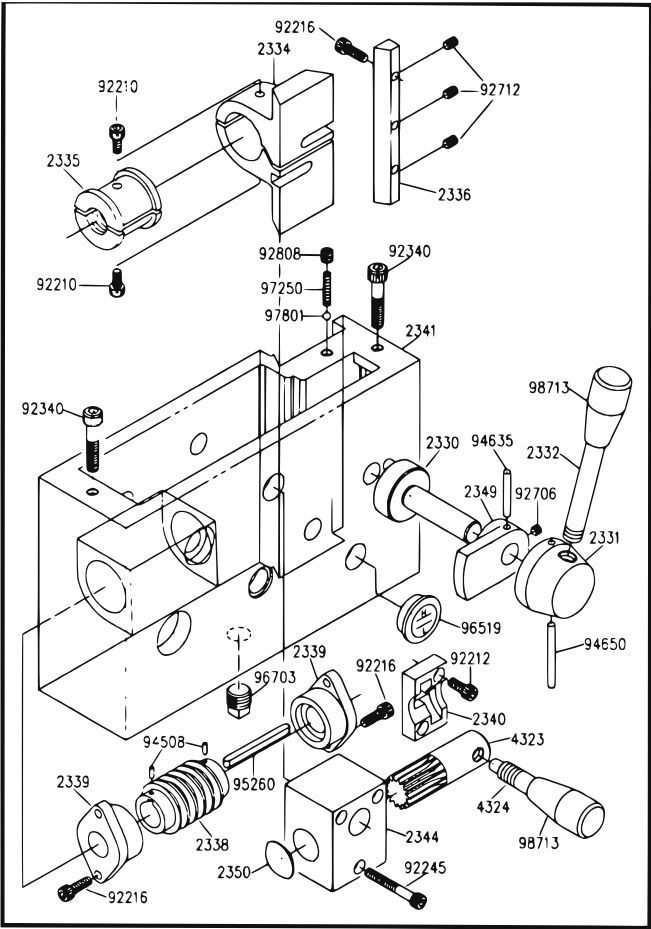
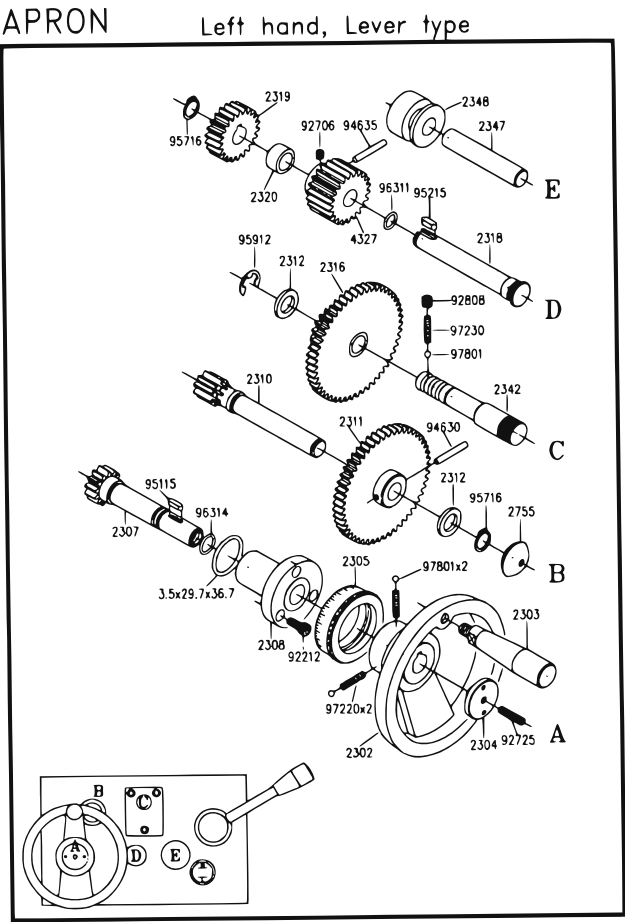


Figure 9-12: Apron casting, right hand, lever type



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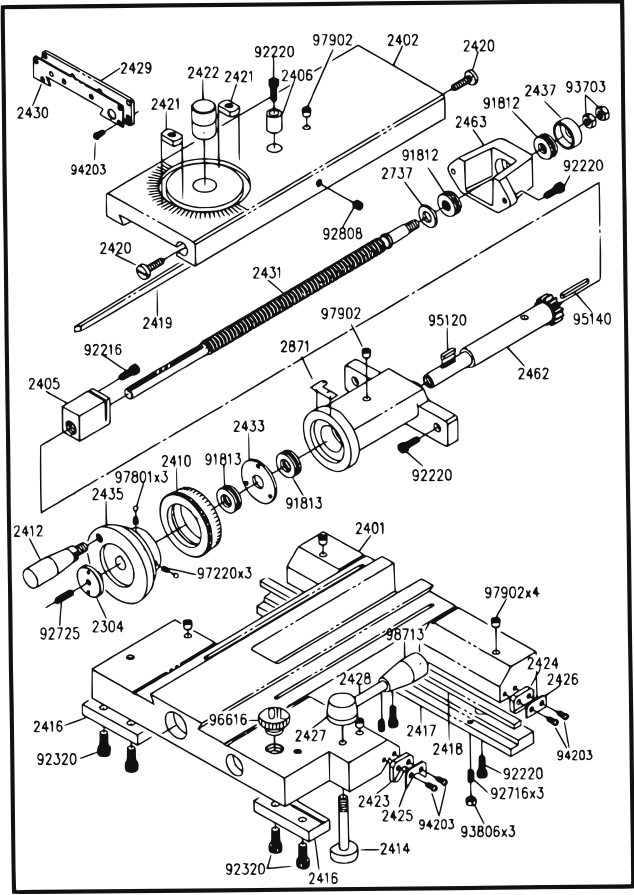
Figure 9-13: Apron gearing, lever type (printed "Left hand"; drawn as the mirror of Figure 9-11)

9.5 Saddle and cross-slide

Table 9-4: Saddle and cross-slide parts

Part No.	Description	Quantity
2401	Saddle casting	1
2402	Cross-slide	1
2404	Screw	1
2405	Nut	1
2406	Collar	1
2407	Gear 2M 14T	1
2408	Keep assy.	1
2409	Handwheel	1
2410	Index ring	1
2412	Handle	1
2413	Collar	1
2414	Screw	1
2415	Washer	1
2416	Strip	2
2417	Strip	1
2418	Gib	1
2419	Gib	1
2420	Gib screws	6
2421	Nut	2
2422	Pivot	1
2423	Wiper	2
2424	Wiper	2
2427	Handle	1
2428	Handle	1
2429	Wiper	1
2431	Screw	1
2432	Gear 2M 14T	1
2433	Washer	1
2434	Keep assy.	1
2435	Handwheel	1
2436	Keep assy.	1
2437	Bearing cover	1

SADDLE & CROSS-SLIDE



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Figure 9-14: Saddle and cross-slide

9.6 Top slide and toolpost

Table 9-5: Top slide and toolpost parts

Part No.	Description	Quantity
2501	Swivel slide	1
2502	Top Slide	1
2503	Pad	1
2504	Screw	1
2505	Nut	1
2508	Keep assy.	1
2509	Handwheel	1
2510	Index ring	1
2512	Handle	1
2513	Handle	1
2514	Bolt	1
2515	Toolpost	1
2516	Bolt	1
2517	Nut	1
2518	Nut	1
2519	Gib	1
2523	Screw	8
2524	Washer	1
2525	Handle	1
2527	Pad	1
2529	Swivel Slide	1
2530	Nut	2
2531	Swivel Slide	1
2532	Top slide	1
2533	Toolpost	1
2534	Nut	1

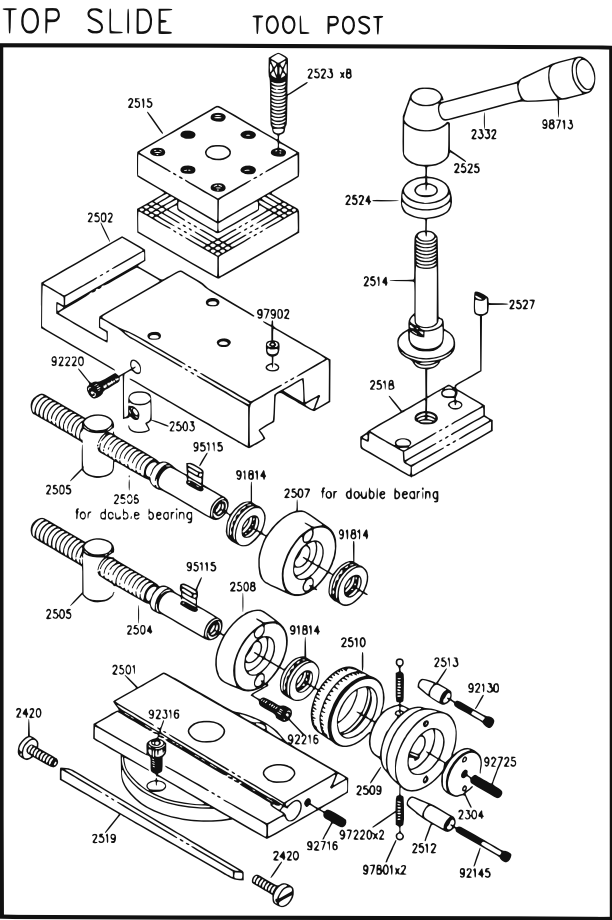


Figure 9-15: Top slide and toolpost

9.7 Tailstock

Table 9-6: Tailstock parts

Part No.	Description	Quantity
2601	Casting	1
2602	Base	1
2603	Gib	1
2604	Screw	1
2605	Barrel	1
2606	Nut	1
2608	Keep	1
2610	Index ring	1
2614	Pad	1
2615	Shaft	1
2618	Pivot block	1
2620	Shaft	1
2621	Handle	1
2622	Pins	2
2623	Clamp plate	1
2624	Screw	1
2625	Nut	1
2626	Keep	1

9.8 Bed, shafts, swing frame, end gears and threading dials

Table 9-7: Bed, shafts, swing frame, end gears and threading dial parts

Part No.	Description	Quantity
2701	Bed	1
2702	Gap piece	1
2703	Bracket	1
2704	Leadscrew	1
2705	Feed shaft	1
2706	Third-rod shaft	1
2707	Rack	1
2708	Bracket	1
2709	Sleeve	1
2710	Fork	1
2711	Handle	1
2712	Collar	1
2713	Collar	1
2714	Pin	1
2715	Box	1
2716	Perspex cover	1
2717	Box	1
2718	Guard	1
2719	Shaft	1
2720	Gear 1M 32T	1
2721	Washer	6
2722	Collar	1
2723	Guard	1
2724	Shaft	1
2725	Gear 1.25M 20T	1
2726	Gear 1.25M 21T	1
2727	Gear 1.25M 22T	1
2728	Gear 1.25M 26T	1
2729	Gear 1.25M 27T	1
2730	Collar	1
2732	Dog	1
2733	Set-over pad	1
2734	Screws	1
2735	Swing Frame	1
2736	Swing Frame	1
2737	Washer	1

Part No.	Description	Quantity
2738	Shaft	1
2739	Shaft collar	1
2740	Washer	1
2741	Gear 1.25M 120T / Gear 1.25M 127T	1
2742	Gear 1.25M 25T	1
2743	Gear 1.25M 50T	2
2744	Gear 1.25M 40T	1
2745	Gear 1.25M 30T	1
2746	Gear 1.25M 32T	1
2748	Washer	6
2749	Gear 1.25M 45T	2
2750	End Cover	1
2751	Stud	2
2752	Nut	2
2753	Stopper	1
2754	Plug (Headstock)	1
2755	Plug (Apron)	1
2756	Gear 1.25M 24T	1
2757	Gear 1.25M 60T	1
2758	Gear 1.25M 65T	1
2759	Gear 1.25M 66T	1
2760	Gear 1.25M 70T	1
2761	Box	1
2762	End cover	1
2763	Bearing cover	1
2764	Slipping clutch	1
2765	Bush	1
2766	Collar	1
2767	Collar	1
2768	Clutch	1
2769	Collar	1

BED & SHAFTS

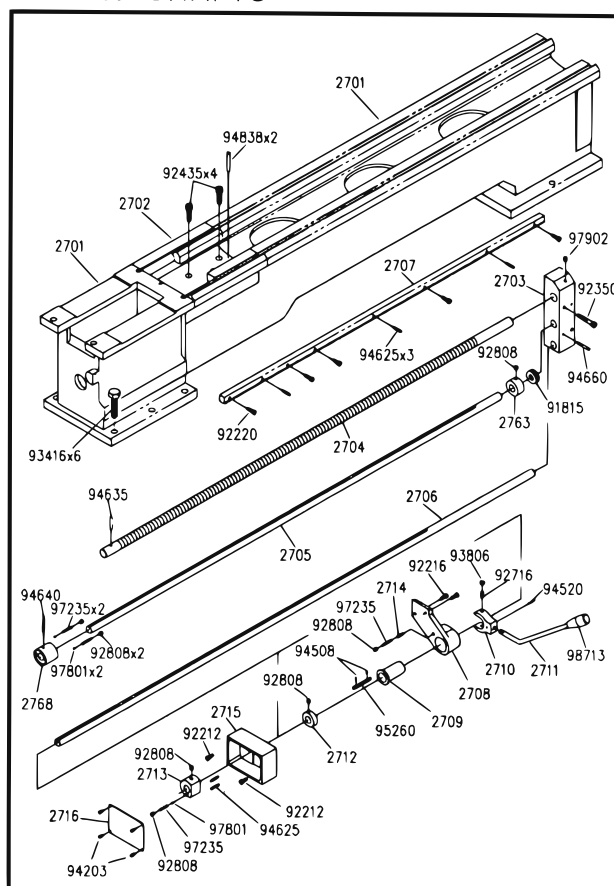


Figure 9-17: Bed and shafts

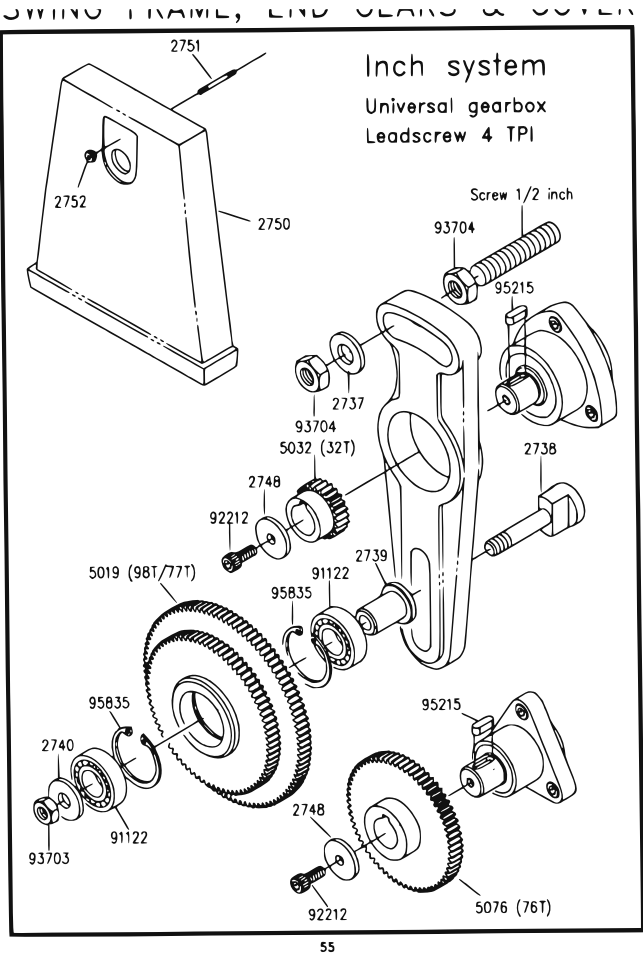


Figure 9-19: Swing frame, end gears and cover: inch system, universal gearbox, leadscrew 4 TPI (32T, 98T/77T, 76T)

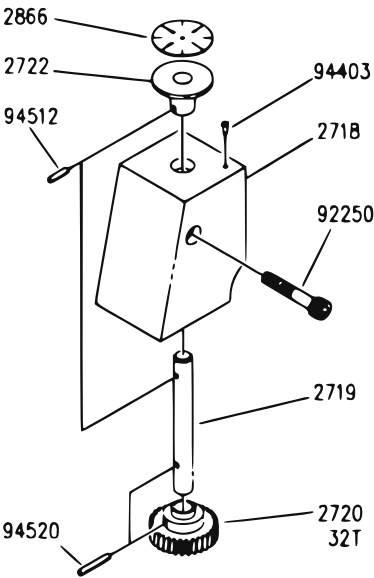


Figure 9-20: Threading dial, leadscrew pitch 8 TPI

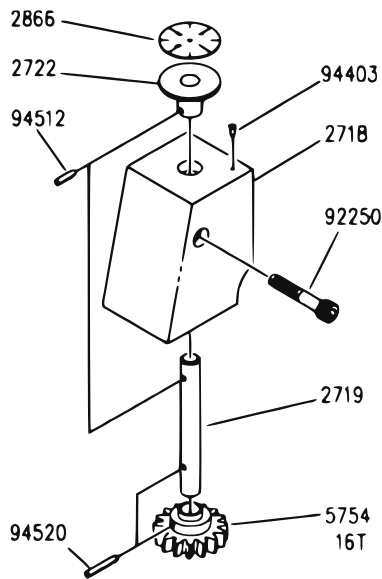


Figure 9-21: Threading dial, leadscrew pitch 4 TPI

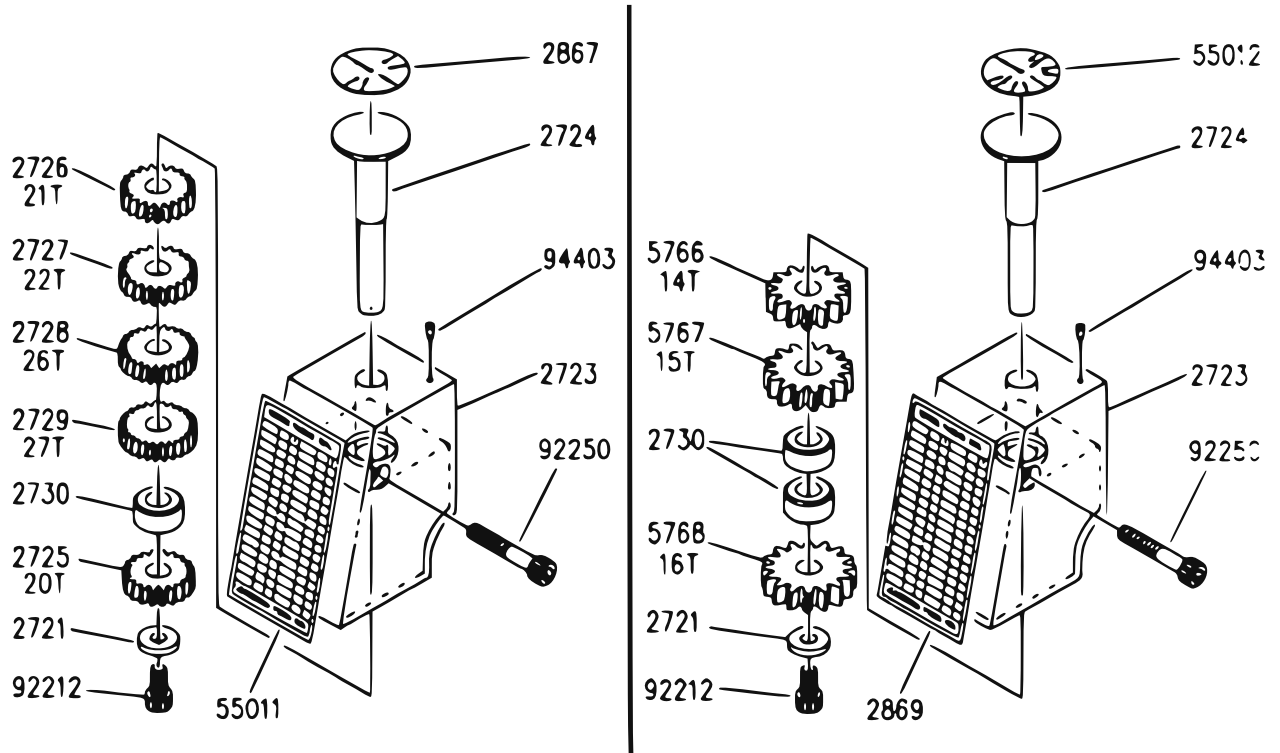


Figure 9-22: Threading dials, leadscrew pitch 4mm and 6mm

9.9 Cabinet and panels

Table 9-8: Cabinet and panel parts

Part No.	Description	Quantity
2801	Plinth (Stand)	1
2802	Plinth (Stand)	1
2803	Tray	1
2804	Chip Tray	1
2805	Front plate	1
2806	Box	1
2807	Plate	1
2808	Tray	1
2809	Cover	1
2810	Cover	1
2811	Cover	1
2812	Pedal	1
2813	Platform	1
2814	Bracket	1
2815	Guard	1
2816	Pulley	1
2817	Shaft	1
2819	Screw	1
2820	Shaft	1
2821	Shaft	1
2822	Collar	1
2823	Lever	1
2824	Guard	1
2825	Bar	1
2826	Fulcrum	1
2827	Fulcrum	1
2828	Bolt	2
2829	Bolt	1

CABINET & PANELS

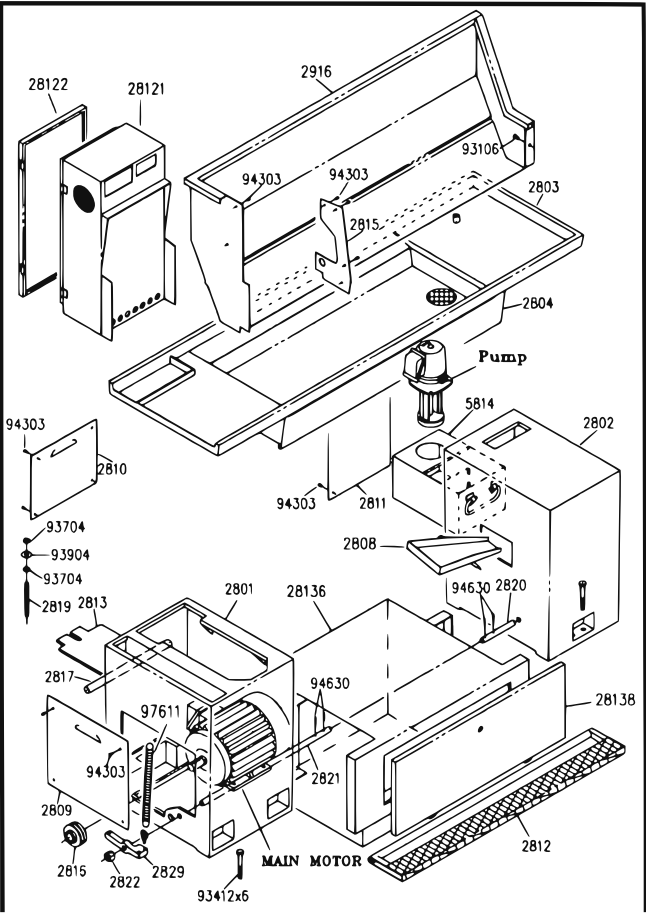


Figure 9-23: Cabinet and panels

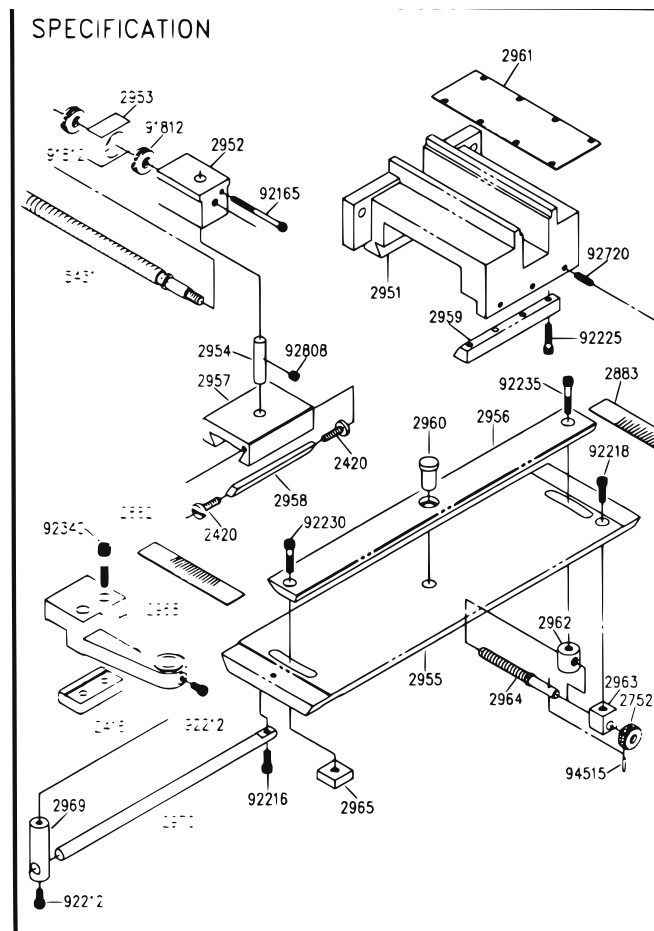
9.10 Camlock and accessories

Table 9-9: Camlock and accessory parts

Part No.	Description	Quantity
2930	Cover	3
2901	Cam	3
2902	Pin	3
2903	Stud	3
2904	Camlock wrench	1
2915	Centre sleeve	1

9.11 Taper turning attachment

NOTE The original titles this drawing "Specification". It shows the taper turning attachment. Its part numbers (2951 to 2970, 2882, 2883, 5431) are not in the parts list.



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Figure 9-24: Taper turning attachment (printed "Specification")

9.12 Guards

NOTE The guard part numbers are not in the parts list. Use the numbers on the drawings.

GUARD

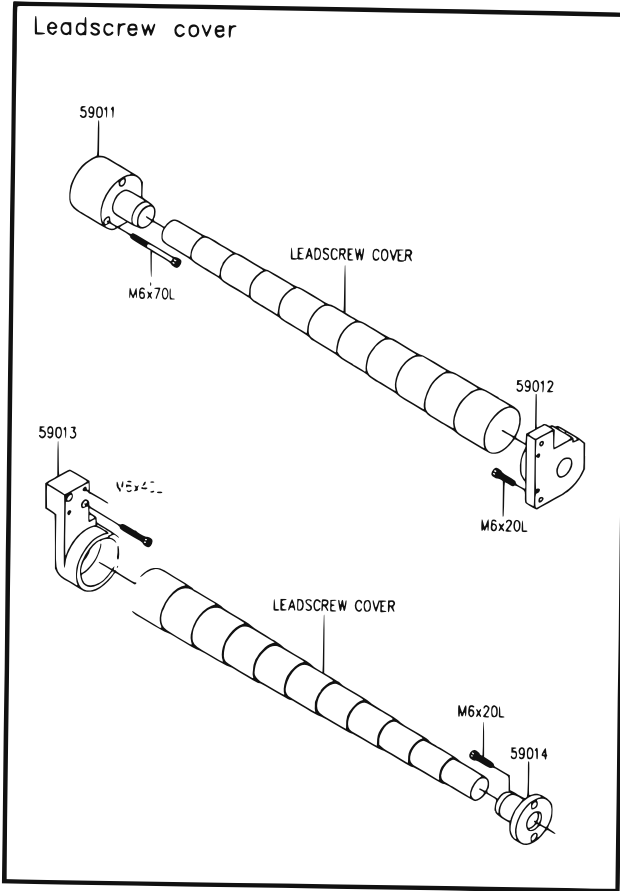
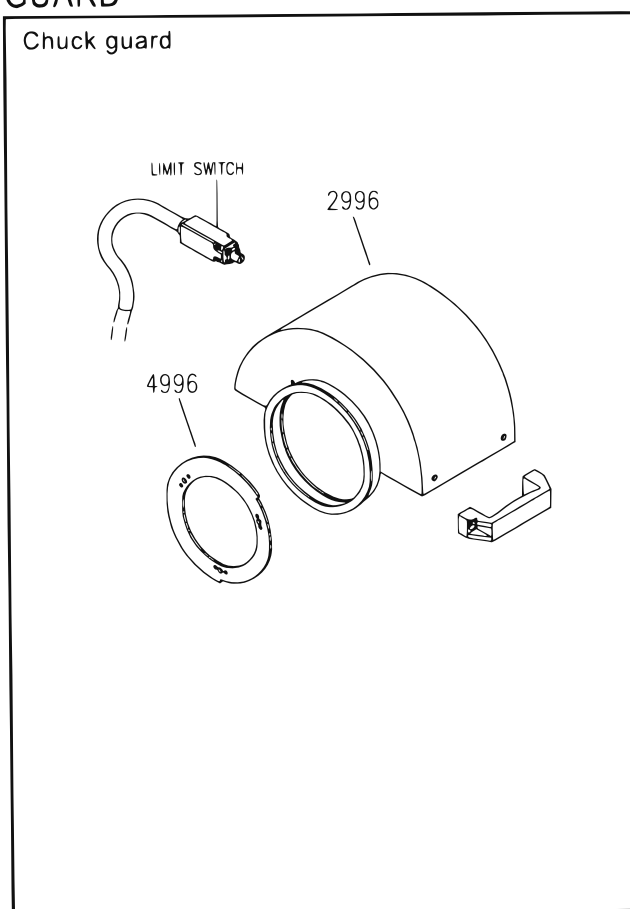


Figure 9-25: Leadscrew cover

GUARD

Chuck guard



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Figure 9-26: Chuck guard

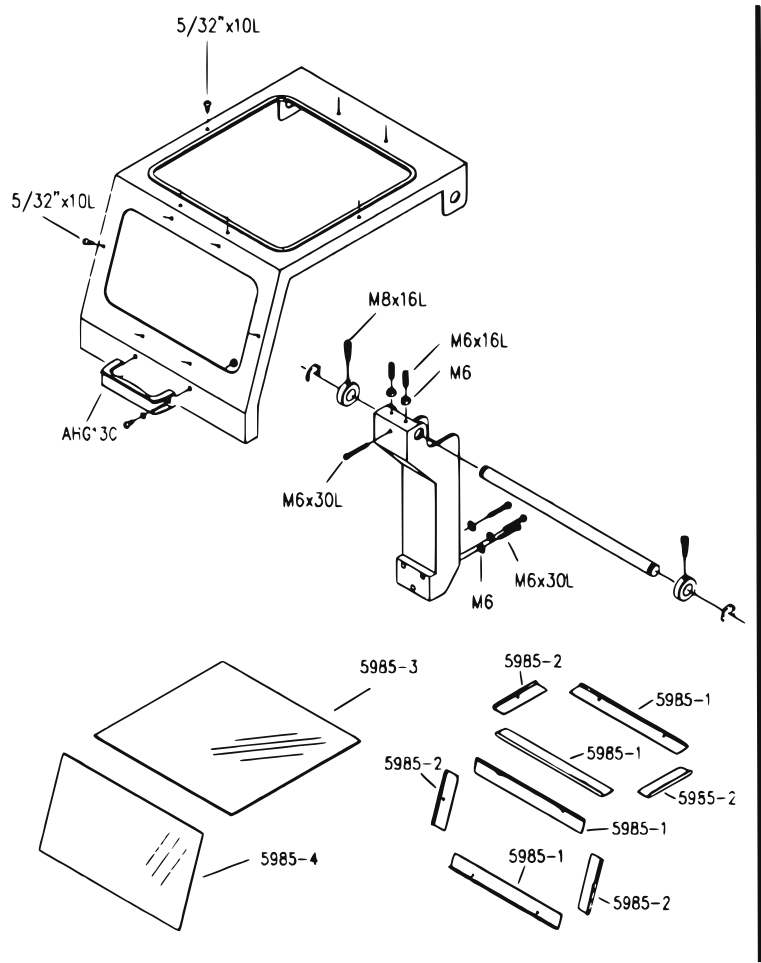


Figure 9-27: Toolpost guard

9.13 Standard parts

Table 9-10: Standard parts

Part No.	Description	Size
91121	Bearing	No.6003
91122	Bearing	No.6003Z
91123	Bearing	No.6004
91125	Bearing	No.6005
91131	Bearing	No.6202
91133	Bearing	No.6204
91135	Bearing	No.6205
91532	Bearing	No.30210
91543	Bearing	No.32211
91544	Bearing	No.32212
91812	Thrust bearing	No.51101
91813	Thrust bearing	No.51102
91814	Thrust bearing	No.51103
91815	Thrust bearing	No.51104
91816	Thrust bearing	No.51105
91823	Thrust bearing	No.51202
91824	Thrust bearing	No.51203
91841	Thrust bearing	No.2901
91842	Thrust bearing	No.2902
91843	Thrust bearing	No.2903
91844	Thrust bearing	No.2904
92116	Socket head cap screw	M5x16mm
92130	Socket head cap screw	M5x30mm
92145	Socket head cap screw	M5x45mm
92210	Socket head cap screw	M6x10mm
92212	Socket head cap screw	M6x12mm
92216	Socket head cap screw	M6x16mm
92220	Socket head cap screw	M6x20mm
92225	Socket head cap screw	M6x25mm
92230	Socket head cap screw	M6x30mm
92235	Socket head cap screw	M6x35mm
92240	Socket head cap screw	M6x40mm
92245	Socket head cap screw	M6x45mm
92250	Socket head cap screw	M6x50mm
92255	Socket head cap screw	M6x55mm
92312	Socket head cap screw	M8x12mm

Part No.	Description	Size
92316	Socket head cap screw	M8x16mm
92320	Socket head cap screw	M8x20mm
92330	Socket head cap screw	M8x30mm
92335	Socket head cap screw	M8x35mm
92340	Socket head cap screw	M8x40mm
92345	Socket head cap screw	M8x45mm
92350	Socket head cap screw	M8x50mm
92370	Socket head cap screw	M8x70mm
92435	Socket head cap screw	M10x25mm
92430	Socket head cap screw	M10x30mm
92435	Socket head cap screw	M10x35mm
92440	Socket head cap screw	M10x40mm
92445	Socket head cap screw	M10x45mm
92525	Socket head cap screw	M12x25mm
92535	Socket head cap screw	M12x35mm
92540	Socket head cap screw	M12x40mm
92706	Set screw	M6x6mm
92708	Set screw	M6x8mm
92710	Set screw	M6x10mm
92712	Set screw	M6x12mm
92716	Set screw	M6x16mm
92720	Set screw	M6x20mm
92725	Set screw	M6x25mm
92808	Set screw	M8x8mm
92814	Set screw	M8x14mm
92012	Set screw	M12x12mm
93112	Cap screw	1/41-1/4 in.
93314	Cap screw	3/8x1-1/2 in.
93320	Cap screw	3/8x2 in.
93324	Cap screw	3/8x2-1/2 in.
93330	Cap screw	3/8x3 in.
93406	Cap screw	1/2x3/4 in.
93412	Cap screw	1/2x1-1/4 in.
93414	Cap screw	1/2x1-1/2 in.
93416	Cap screw	1/2x1-3/4 in.
93420	Cap screw	1/2x2 in.
93424	Cap screw	1/2x2-1/2 in.
93430	Cap screw	1/2x3 in.

Part No.	Description	Size
93701	Nut	1/4 in.
93703	Nut	3/8 in.
93704	Nut	1/2 in.
93806	Nut	6mm
93903	Washer	3/8 in.
93904	Washer	1/2 in.
93906	Washer	3/4 in.
94102	Screw	1/8x1/4 in.
94103	Screw	1/8x3/8 in.
94202	Screw	3/16x1/4 in.
94203	Screw	3/16x3/8 in.
94303	Screw	1/4x3/8 in.
94308	Screw	5/32x3/16 in.
94403	Nail	2mm
94409	Screw	1/4x1mm
94508	Pin	3x8mm
94512	Pin	3x12mm
94520	Pin	3x20mm
94524	Pin	3x24mm
94612	Pin	5x12mm
94616	Pin	5x16mm
94620	Pin	5x20mm
94625	Pin	5x25mm
94630	Pin	5x30mm
94634	Pin	5x34mm
94635	Pin	5x35mm
94636	Pin	5x36mm
94640	Pin	5x40mm
94645	Pin	5x45mm
94650	Pin	5x50mm
94660	Pin	5x60mm
94830	Taper pin	4x30mm
94838	Taper pin	4x38mm
95110	Key	4x10mm
95115	Key	4x15mm
95120	Key	4x20mm
95140	Key	4x40mm
95210	Key	5x10mm

Part No.	Description	Size
95212	Key	5x12mm
95215	Key	5x15mm
95220	Key	5x20mm
95225	Key	5x25mm
95230	Key	5x30mm
95235	Key	5x35mm
95240	Key	5x40mm
95244	Key	5x44mm
95245	Key	5x45mm
95250	Key	5x50mm
95260	Key	5x60mm
95270	Key	5x70mm
95310	Key	6x10mm
95315	Key	6x15mm
95325	Key	6x25mm
95397	Key	6x110mm
95398	Key	6x115mm
95375	Key	6x75mm
95390	Key	6x90mm
95420	Key	7x20mm
95440	Key	7x40mm
95450	Key	7x50mm
95460	Key	7x60mm
95520	Key	8x20mm
95530	Key	8x30mm
95540	Key	8x40mm
95550	Key	8x50mm
95560	Key	8x60mm
95570	Key	8x70mm
95712	Circlip	S-12mm
95715	Circlip	S-15mm
95716	Circlip	S-16mm
95718	Circlip	S-18mm
95720	Circlip	S-20mm
95725	Circlip	S-25mm
95730	Circlip	S-30mm
95738	Circlip	S-38mm
95740	Circlip	S-40mm

Part No.	Description	Size
95750	Circlip	S-50mm
95755	Circlip	S-55mm
95835	Circlip	R-35mm
95847	Circlip	R-47mm
95906	Circlip	E-6mm
95912	Circlip	E-12mm
95915	Circlip	E-15mm
95919	Circlip	E-19mm
96103	Oil seal TC	25x45x11mm
96104	Oil seal TC	25x40x8mm
96308	O-ring	8x12x2mm
96311	O-ring	11x16x2.5mm
96314	O-ring	14x19x2.5mm
96320	O-ring	20x25x2.5mm
96324	O-ring	24x30x3.0mm
96325	O-ring	25x31x3.0mm
96334	O-ring	34x40x3.0mm
96338	O-ring	38x45x3.5mm
96343	O-ring	43x51x4.0mm
96344	O-ring	44x50x3.0mm
96358	O-ring	58x64x3.0mm
96519	Oil sight	3/4in (19mm)
96528	Oil sight	1-1/8in (28mm)
96603	Plug	3/8 G.P.
96616	Plug	3/4 in. (P.V.C.)
96703	Plug	3/8 G.P.
96704	Plug	1/2 G.P.
96803	Elbow	3/8 G.P.
97115	Spring	3/16in. x 15mm
97208	Spring	1/4in. x 8mm
97210	Spring	1/4in. x 10mm
97220	Spring	1/4in. x 20mm
97225	Spring	1/4in. x 25mm
97230	Spring	1/4in. x 30mm
97235	Spring	1/4in. x 35mm
97250	Spring	1/4in. x 50mm
97420	Spring	3/8in. x 20mm
97430	Spring	3/8in. x 30mm

Part No.	Description	Size
97435	Spring	3/8in. x 35mm
97440	Spring	3/8in. x 40mm
97460	Spring	3/8in. x 60mm
97611	Spring	
97621	Spring	
97801	Ball steel	1/4in. dia.
97803	Ball steel	3/8in. dia.
97902	Oil	5/16in.
98175	Belts Vee	A-75in.
98713	Headle	3/8 in. (Black)
98902	Brake shoe assy.	
99211	Gasket	
99212	Gasket	
99213	Gasket	
99214	Gasket	
99215	Gasket	
99216	Gasket	
99217	Gasket	
99221	Gasket	
99222	Gasket	
99223	Gasket	
99224	Gasket	
99225	Gasket	



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