

INSTRUCTION MANUAL

AL-540C Centre Lathe (240V) 356 x 1000mm Turning Capacity

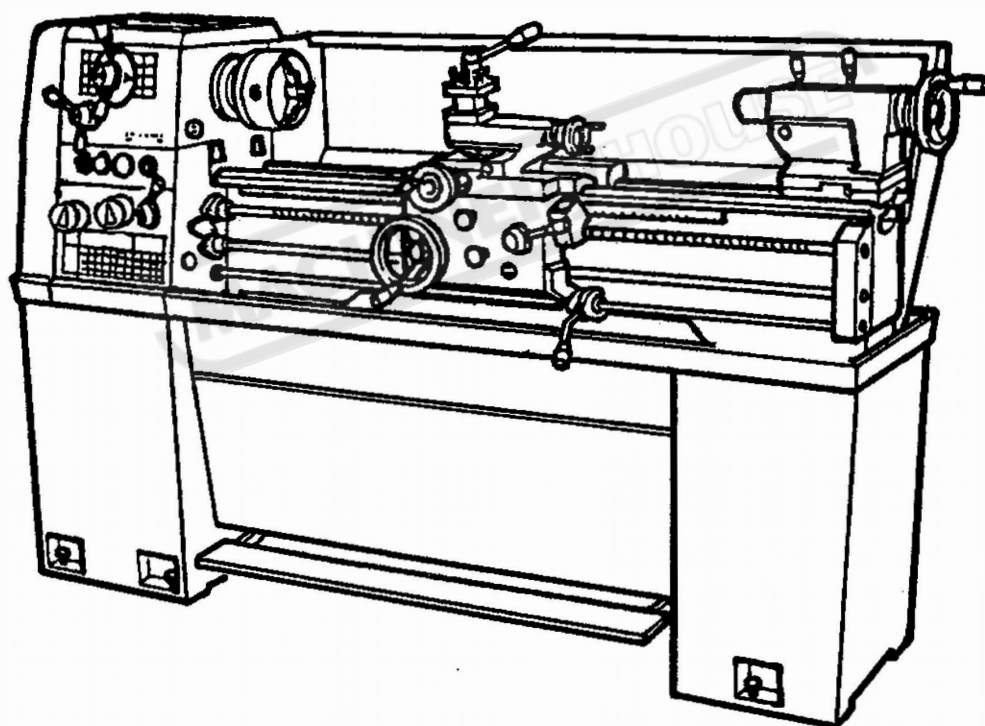


L188

L188 AL-540C 240V 2LT

PRECISION CENTER LATHE

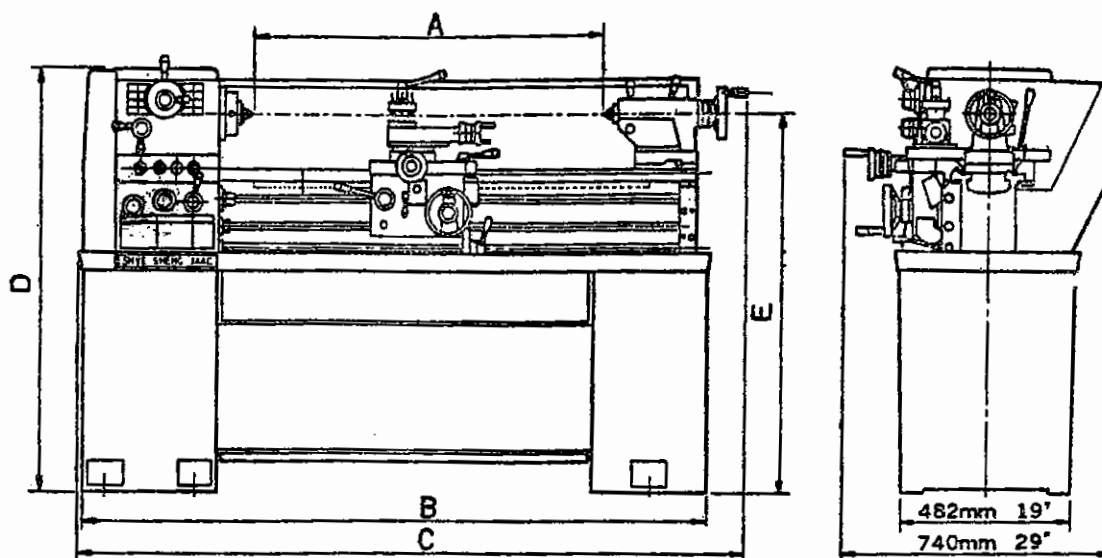
INSTRUCTION MANUAL AND PARTS LIST



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BRIEF SPECIFICATION

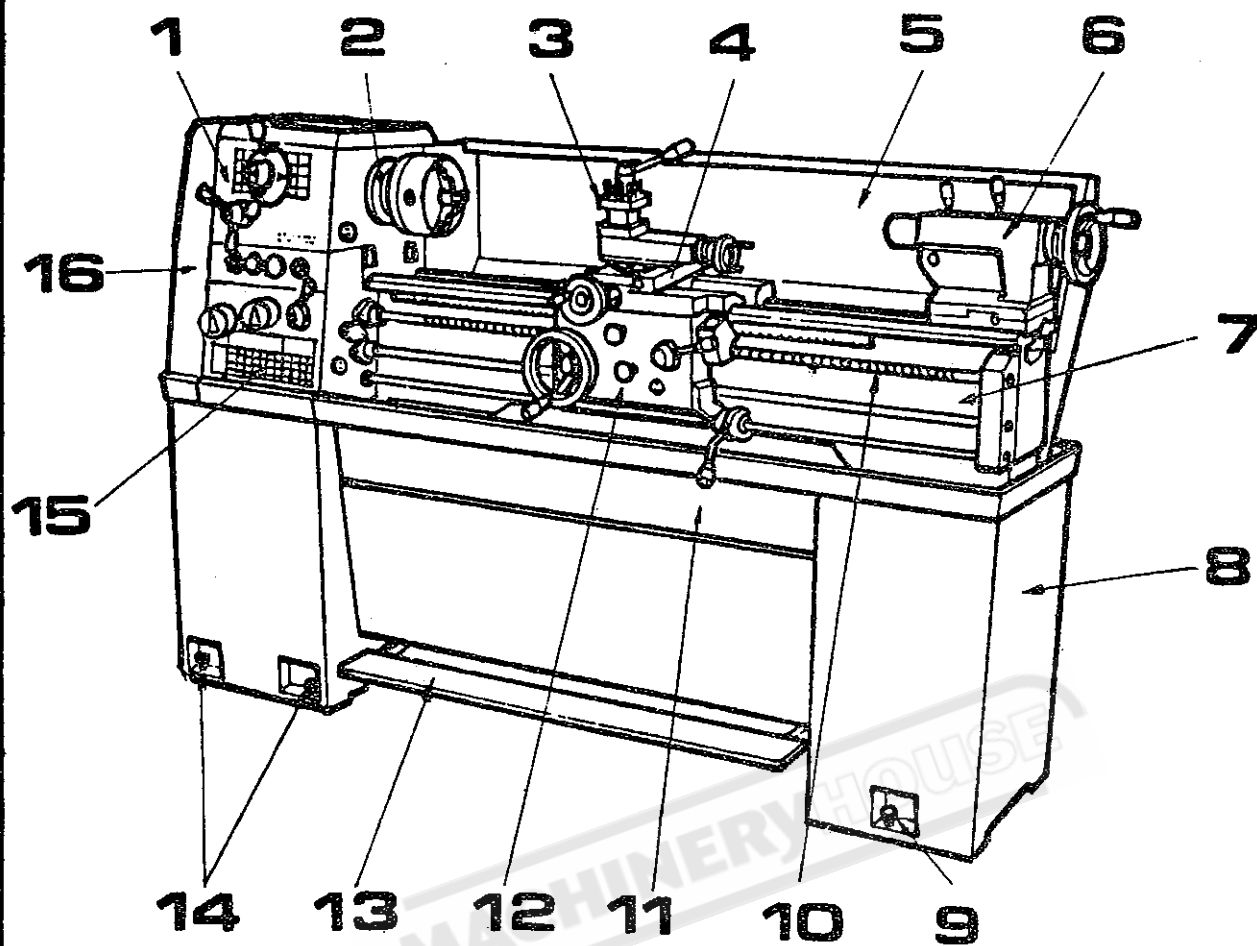


MODEL	SIZE	A	B	C	D	E
1340		1000mm 40in	1800mm 71in	1920mm 75½in	1180mm 46½in	1054mm 41½in
1330		750mm 30in	1550mm 61in	1680mm 65½in	1180mm 46½in	1054mm 41½in
1440		1000mm 40in	1800mm 71in	1920mm 75½in	1194mm 47in	1067mm 42in
1430		750mm 30in	1550mm 61in	1660mm 65½in	1194mm 47in	1067mm 42in

SPECIFICATIONS

DESCRIPTION	INCH SYSTEM				METRIC SYSTEM			
MODEL	1340	1330	1440	1430	1340	1330	1440	1430
SWING OVER BED	13"	13"	14"	14"	330	330	356	356
SWING OVER CROSS SLIDE	7-5/8"	7-5/8"	8-5/8"	8-5/8"	195	195	220	220
DISTANCE BETWEEN CENTERS	40"	30"	40"	30"	1000	750	1000	750
SWING OVER GAP	19"	19"	20"	20"	480	480	506	506
WIDTH OF BED	8-1/9"	8-1/9"	8-1/9"	8-1/9"	206	206	206	206
NUMBERED OF SPINDLE SPEEDS	8 or 16 (2 speed motor)				8 or 16 (2 speed motor)			
RANGE OF SPINDLE SPEEDS	90 or 45 – 1800 RPM				90 or 45 – 1800 RPM			
HOLE THROUGH SPINDLE	1-1/2"				38			
SPINDLE NOSE	D1-4 Camlock				D1-4 Camlock			
TAPER OF SPINDLE BORE	M.T. No. 5				M.T. No. 5			
TAILSTOCK QUILL TAPER	M.T. No. 3				M.T. No. 3			
TAILSTOCK QUILL TRAVEL	4-1/2"				115			
CROSS SLIDE TRAVEL	6-1/2"	6-1/2"	7"	7"	165	165	180	180
COMPOUND REST TRAVEL	3-1/2"	3-1/2"	4"	4"	90	90	100	100
NUMBER OF METRIC THREADS	22				37			
RANGE OF METRIC THREADS	0.45 – 7.5 MM				0.4 – 7.0 MM			
NUMBER OF INCH THREADS	40				28			
RANGE OF INCH THREADS	4 – 112 TPI				4 – 56 TPI			
LONGITUDINAL FEEDS	(40) 0.0012 – 0.0294 in/rev.				(42) 0.043 – 0.653 mm/rev			
CROSS FEEDS	(40) 0.0003 – 0.0100 in/rev.				(42) 0.027 – 0.413 mm/rev.			
MACHINE NET WEIGHT	1540 lb	1430 lb	1650 lb	1540 lb	700 kg	650 kg	750 kg	700 kg
GROSS WEIGHT	1810 lb	1700 lb	1936 lb	1826 lb	820 kg	770 kg	880 kg	830 kg

GENERAL LAYOUT OF LATHE



1. Headstock

9. Tail-end plinth

2. Spindle

10. Lead screw

3. Top slide

11. Chip pan

4. Saddle & cross-slide

12. Apron

5. Splash guard

13. Foot brake

6. Tailstock

14. Head-end plinth

7. Bed

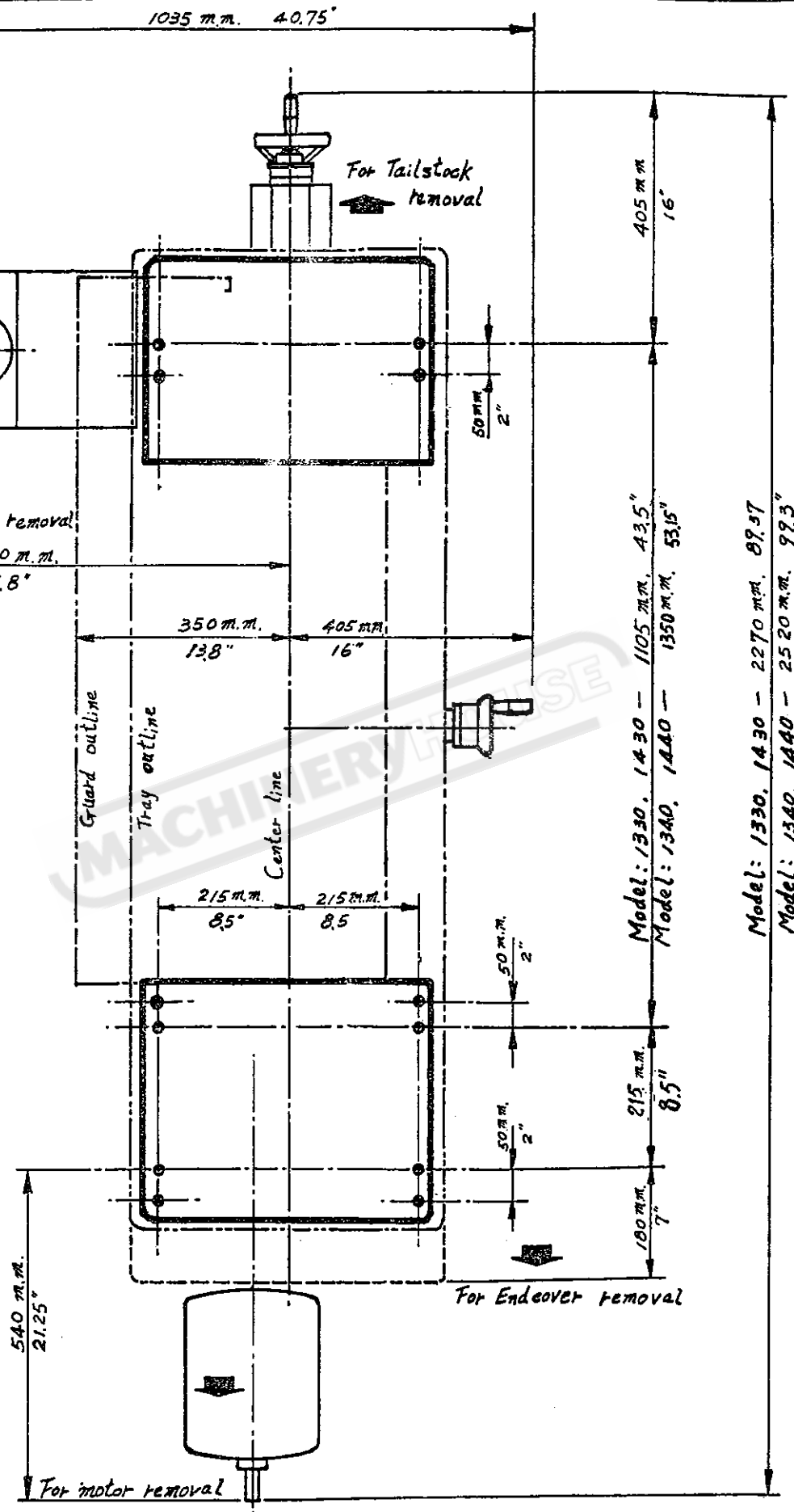
15. Gear box

8. Mounting feet

16. End cover

FOUNDATION PLAN

- — $\frac{5}{8}$ " Hole
- — M12 Bolt



LIFTING

Use the sling-chain to sling lathe showed as in fig 4 position the saddle and tailstock along the bed to obtain balance.

IMPORTANT: DO NOT USE SLINGS AROUND BED AS LEADSCREW AND FEEDSHAFT MAY BE BENT.

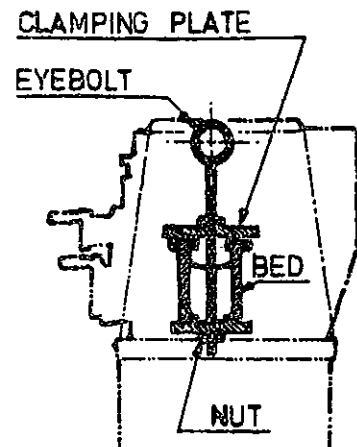
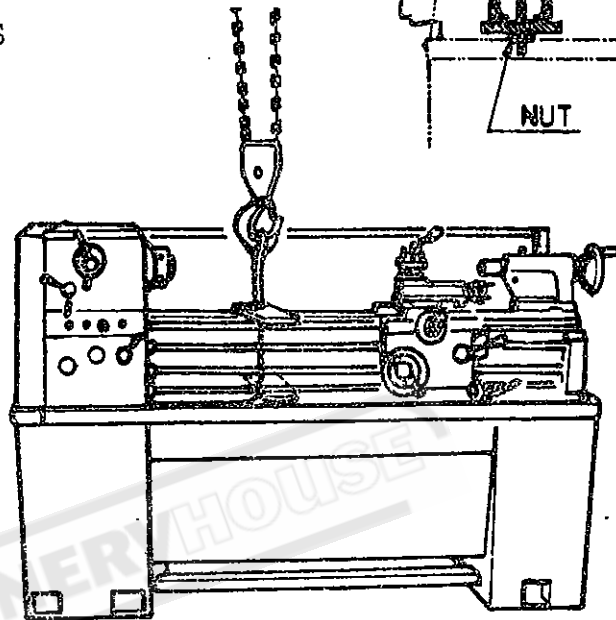


Fig. 4



CLEANING

Before operating any controls, use white spirit or kerosene to remove the anticorrosion coating from all slideways and the endgear train.

DO NOT USE CELLULOSE SOLVENTS FOR CLEANING AS THEY WILL DAMAGE THE PAINT FINISH.

Machine surface becomes bright immediately after cleaning using machine oil or slideway lubricant. Use heavy oil or grease on the end gears.

INSTALLING

Located the machine on a solid foundation, allowing sufficient area all round for easy working and maintenance (see Foundation Plan). The lathe may be used free-standing or bolted to the foundation.

Free-standing: Position lathe on foundation and adjust each of the six mounting feet to take equal share of the load. Then using an engineers precision level on the bedways (as in Fig 5), adjust the feet to level up machine. Periodically check bed level to ensure continued lathe accuracy.

Fixed installation: Position lathe over six bolts ($\frac{1}{2}$ in. or 12 mm. diam.), set into the foundation to correspond with holes in the mounting feet. Accurately level the machine as in Fig 5, then tighten hold-down bolts and recheck bed level.

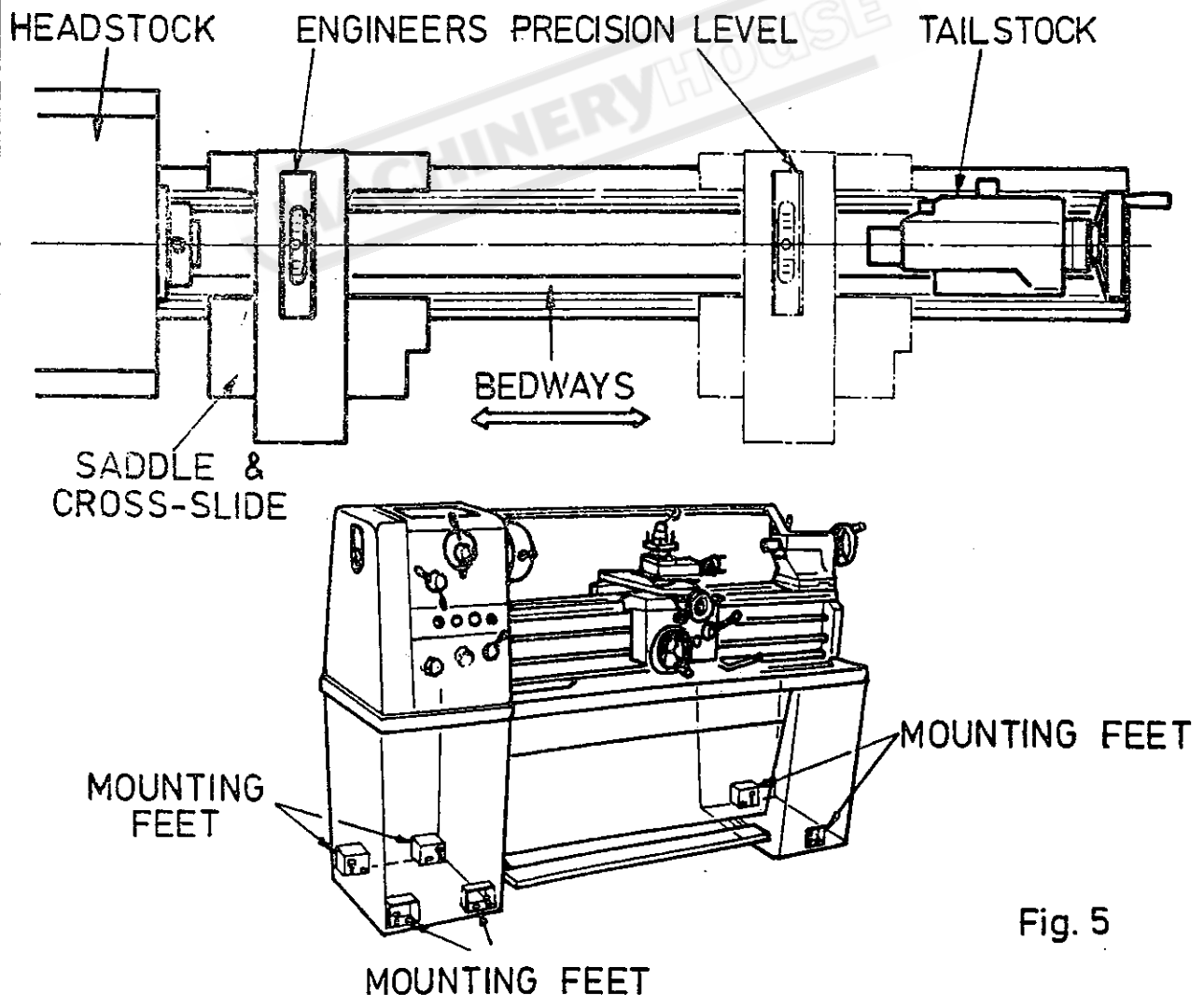
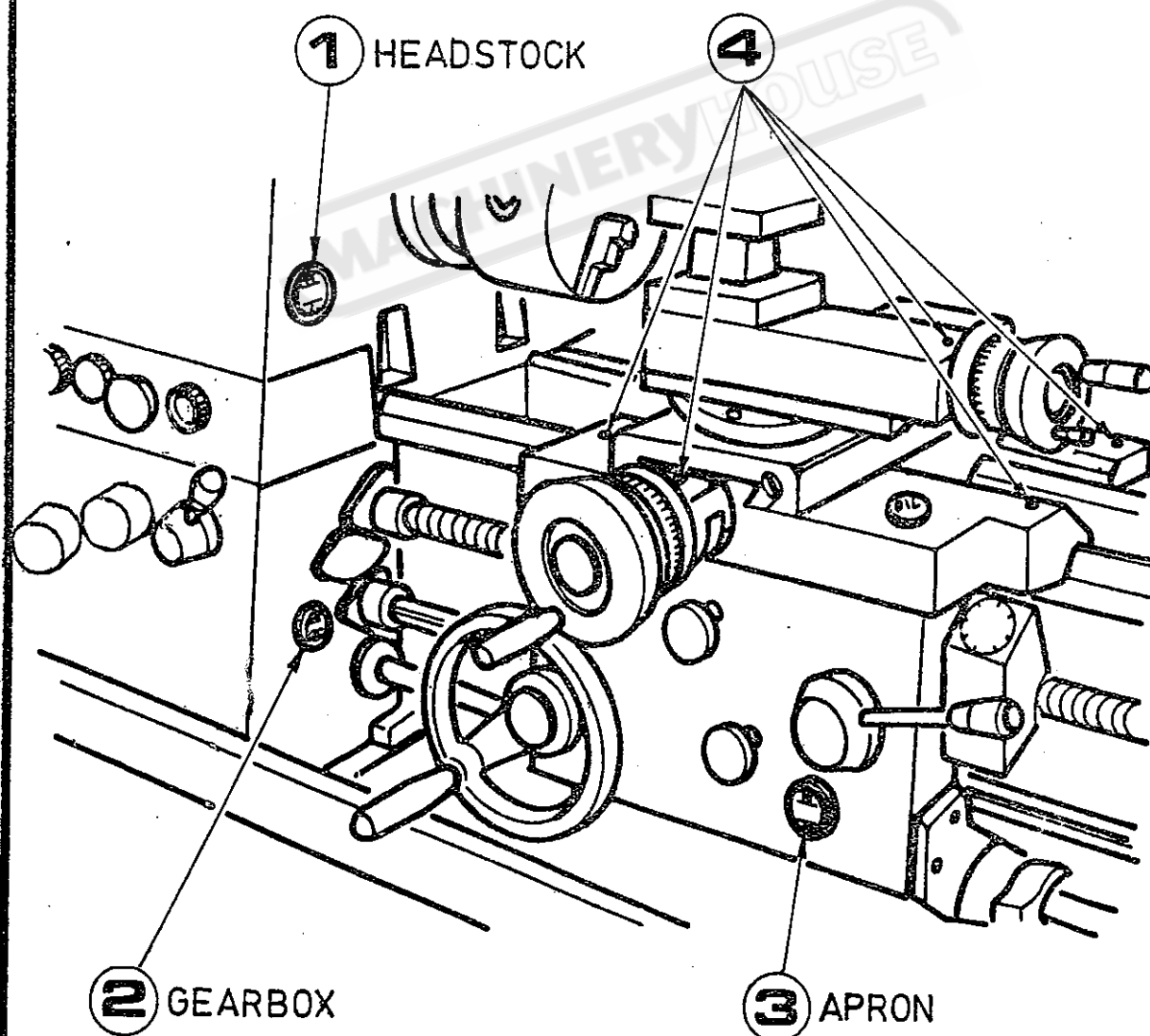


Fig. 5

LUBRICATION CHECKS

Before operating the machine, make the following important checks:

1. The headstock is filled to level marked on oil sight window with Shell Tellus Oil 27.
2. The gearbox is filled to level marked on oil sight window with Shell Tellus Oil 27.
3. The carriage apron is filled to level marked on oil sight window with Shell Tonna 33.
4. In addition, apply light machine oil or way lubricant to the points shown on lubrication diagram which require daily oiling.



CHUCKS AND CHUCK MOUNTING

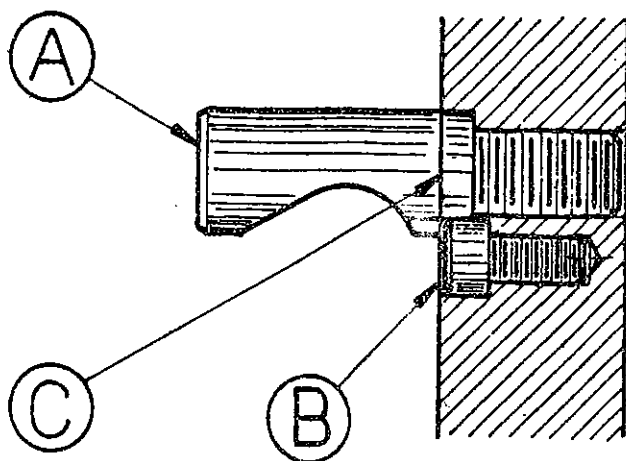
WARNING: GREY-IRON CHUCKS MUST NOT BE FITTED ON THIS HIGH-SPEED LATHE. USE ONLY DUCTILE IRON CHUCKS.

When fitting chucks or faceplate, first ensure that spindle and chuck tapers are scrupulously clean and that all cams lock in the correct positions. See Fig 7, it may be necessary when mounting a new chuck to re-set the camlock studs (A) to do this. Remove the cap-head locking screws (B) and set each stud so that the scribed ring (C) is flush with the rear face of the chuck-with the slit lining up with the locking screw hole (see Fig 7).

Now mount the chuck or faceplate on the spindle nose and tighten the three cams in turn. When fully tightened, the cam lock line on each cam should be between the two V on the spindle nose. If any of the cams do not tighten fully within these limit marks, remove the chuck or faceplate and re-adjust the stud as indicated in the illustration. Fit and tighten the locking screw (B) at each stud before remounting the chuck for work.

This will assist subsequent remounting. DO NOT INTERCHANGE CHUCKS OR FACE PLATES IF LATHE WITHOUT CHECKING UP CORRECT CAMLOCKING.

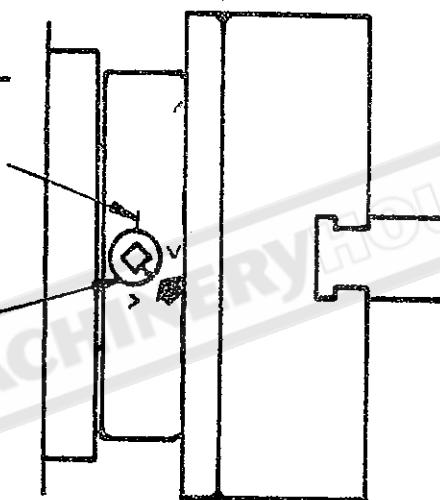
IMPORTANT: Take care note of speed limitations when using faceplate. 10 in. faceplates should not be run at speeds greater than 770 rev/min.



CORRECT

CAM RELEASE DATUM

CAM LOCK LINE
BETWEEN ARROWS



WRONG

TURN
STUD
IN
ONE
TURN

TURN STUD
OUT
ONE TURN

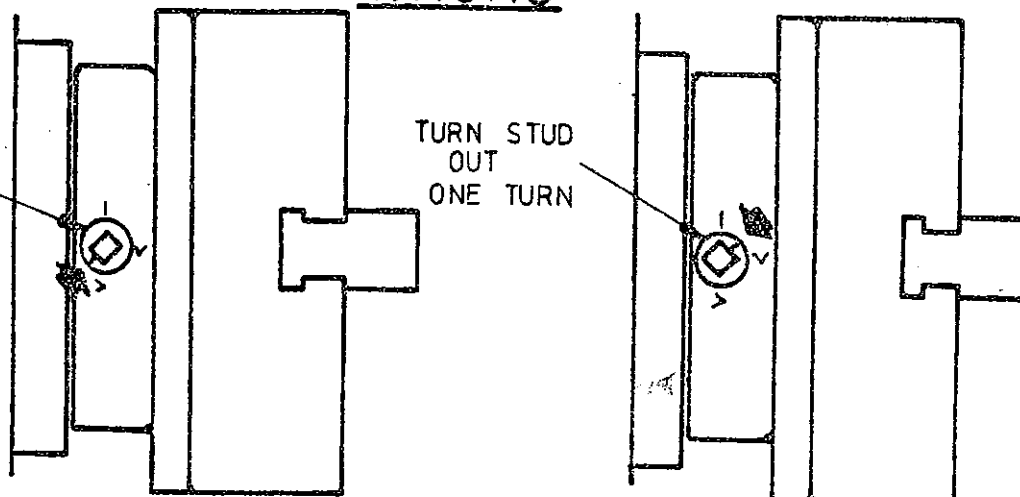
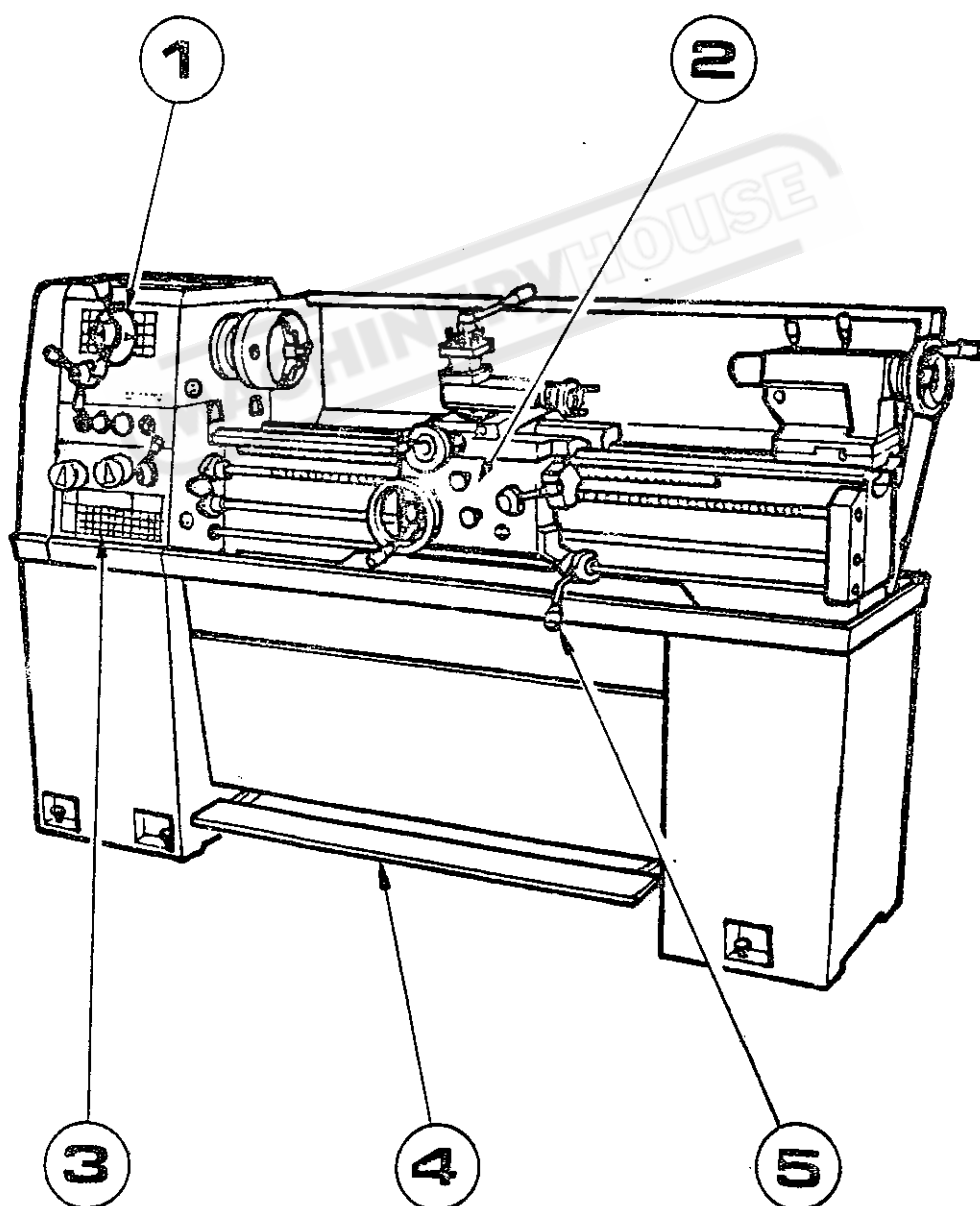


Fig. 7

LATHE CONTROLS

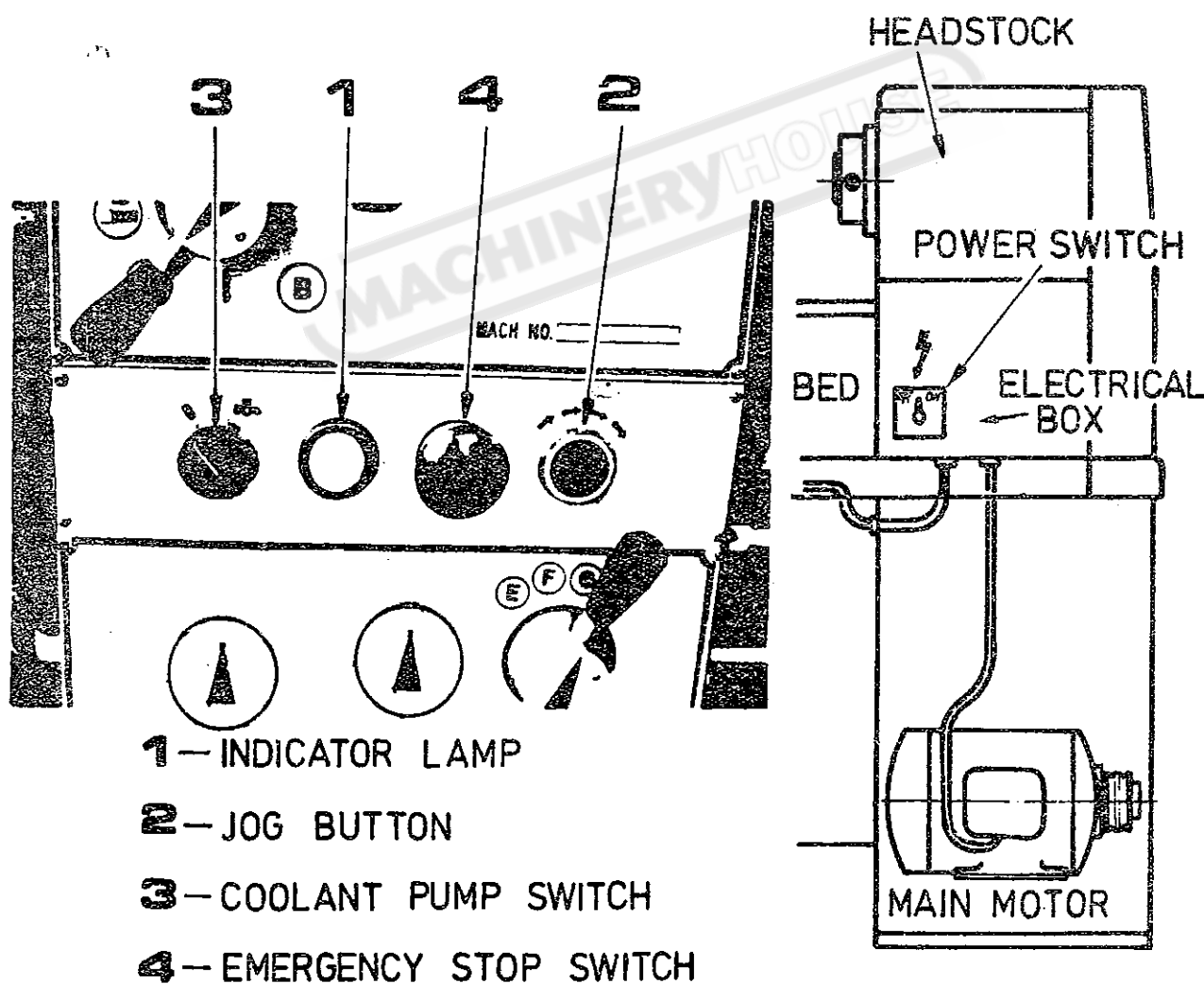
1. Spindle speed selector.
2. Apron, surfacing or sliding feeds.
3. Gearbox, threads and feeds.
4. Footbrake.
5. Main motor rotation (forward and revers).



ELECTRICAL CONTROLS

The power switches are fitted on the face of electrical box in back of the bed and below the headstock. Except the main switch, all electrical controls are fitted in the front of the headstock.

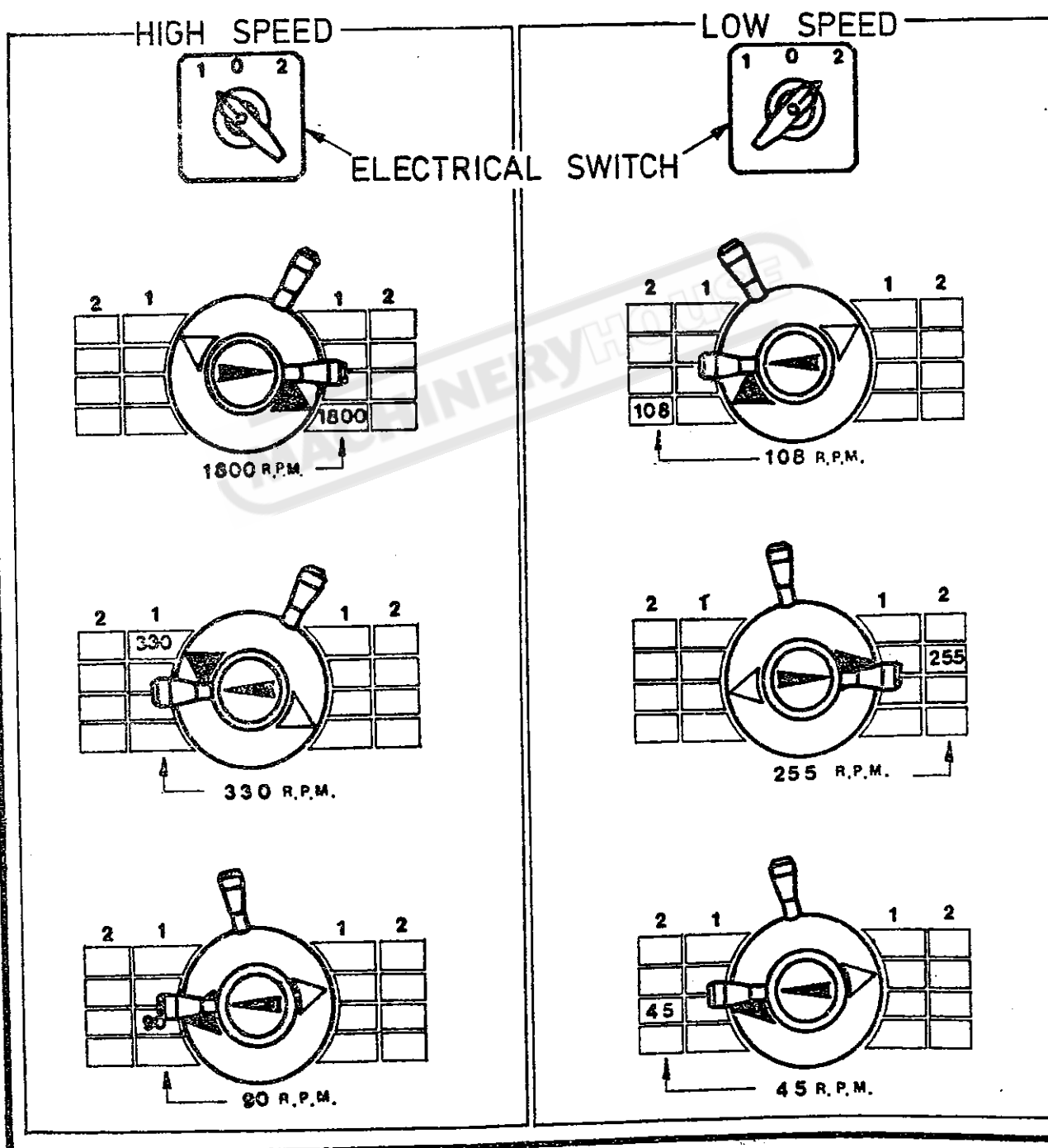
1. Move the power switch set at ON position then the indicator lamp glows.
2. Press the GREEN button. The main drive motor can be running with a moment. (While the main motor rotation lever is set in the neutral position.)
3. Coolant pump ON/OFF push button.
4. Press the RED button to stop the main motor and coolant pump.



SPEED CONTROLS (2 SPEED MOTOR)

Spindle speeds: Selected by the two lever controls and a electrical switch, on the headstock and stand. The sixteen available speeds are shown directly on the data plate. While the electrical switch set at (1) position, the small lever roated right-hand side, it provides speeds from 1800-510 r.p.m., and rotated to left-hand side, ot provides speeds from 330-90 r.p.m. Then move the large lever to the appropriately coloured arrow aligned with the required speed on the data plate. While the electrical switch set at (2) position, it provides speeds from 900-255 r.p.m. and 165-45 r.p.m.

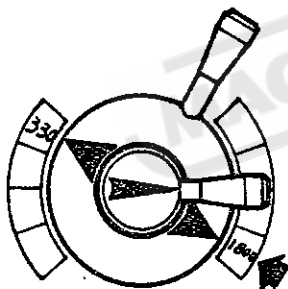
When the small lever set at upper or bottom position, the spindle is free for hand rotation.



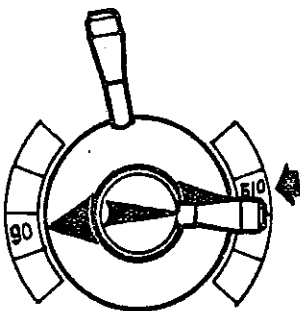
SPEED CONTROLS

Spindle speeds: Selected by the two lever controls on the head-stock. The eight available speeds are shown directly on the data plate. Rotate the small lever to right-hand slide, speeds can run from 1800-510 r.p.m. and rotate to left-hand side, provided speeds can be from 330-90 r.p.m. Then move the large lever until the appropriately coloured arrow is aligned with the required speed on the date plate. When the small lever set at upper or bottom position the spindle is free for hand rotation.

HIGH SPEED

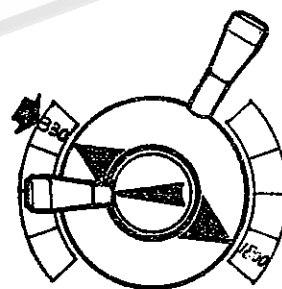


1800 r.p.m.

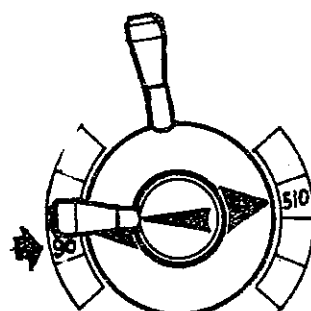


510 r.p.m.

LOW SPEED



330 r.p.m.



90 r.p.m.

THREADS AND FEEDS (Metric Gearbox)

All the threads and feeds directly available from the gear box are shown in the data plate fitted on the front of the gear—box. The setting of control levers is shown in bellow.

The B position of lever (Y) can provide a range of fine threads; the A position a coarse thread range. Do not select the range (A position) at spindle speeds higher than 770 rev min.

THREADS AVAILABLE

37 Metric threads 0.4 to 7.0 mm.pitch

28 Whitworth threads 4 to 56 t.p.i.

The endgear train should be arranged as in the diagrams shown on the data plate to suit threading requirements.

Feeds: longitudinal feeds per spindle revolution range from 0.043 to 0.653 mm.

cross feeds per spindle revolution range from 0.027 to 0.413 mm.

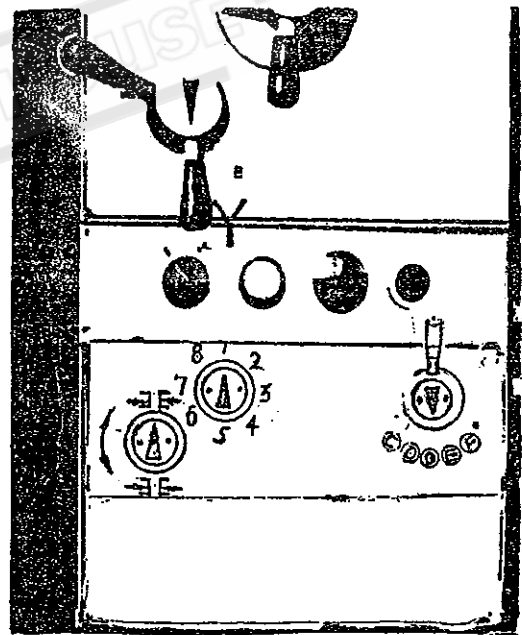
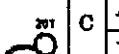


Fig.12

																												
		1	2	3	4	6	7	8		1	2	3	4	6	7	8		2	1	2	2	1	1	1				
	C	A	4.0	4.5	5.0	5.5	6.0	6.5	7.0	D	A	0.373	0.428	0.483	0.513	0.561	0.606	0.653			40	40	32	32	30	30	30	
		B	2.0	2.25	2.5	2.75	3.0	3.25	3.5		B	0.186	0.214	0.233	0.256	0.280	0.303	0.327			60	60	60	66	60	65	70	
	E	A	1.0	1.125	1.25	1.375	1.5	1.625	1.75	F	A	0.109	0.122	0.135	0.149	0.163	0.177	0.190		C	A	4	4 1/2	5	5 1/2	6	6 1/2	7
		B	0.5		0.625		0.75		0.875		B	0.054	0.060	0.067	0.074	0.081	0.088	0.095			B	8	9	10	11	12	13	14
	E	A	0.8	0.9	1.0	1.1	1.2	1.3	1.4	F	A	0.087	0.098	0.109	0.119	0.131	0.141	0.152	E	A	16	18	20	22	24	26	28	
		B	0.4	0.45	0.5	0.55	0.6	0.65	0.7		B	0.043	0.049	0.054	0.059	0.065	0.071	0.076		B	32	36	40	44	48	52	56	

THREADS AND FEEDS (Inch Gearbox)

All the threads and feeds directly available from the gear box are shown on the data plate fitted on the front of the gear—box. The setting of control levers is shown in Fig 13.

The B position of lever (Y) can provide a range of fine threads; the A position a coarse thread range. Do not select the range (A position) at spindle speeds higher than 770 rev/min.

THREADS AVAILABLE

40 Whitworth threads 4.0 to 112 t.p.i.

22 Metric threads 0.45 to 7.5 mm. pitch

The endgear train should be arranged as in the diagrams shown on the data plate to suit threading requirements.

Feeds: longitudinal feeds per spindle revolution range from .0012 to .0294 in (0.0030 to 0.746 mm.)

cross feeds per spindle revolution range from .0004 to .0108 in. (0.010 to 0.271 mm.)

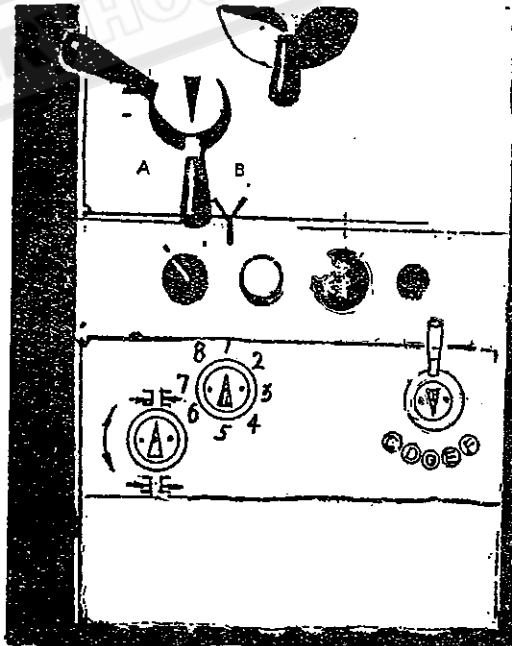


Fig.13

T.P.I.										MM		127 50		127 50		127 45	
		1	2	3	4	5	6	7	8								
	A	C	4	4½	5	5½	5¾	6	6½	7							
		D	.0294	.0261	.0235	.0214	.0205	.0196	.0181	.0168							
	A	C	8	9	10	11	11½	12	13	14							
		D	.0147	.0131	.0117	.0107	.0102	.0098	.0090	.0084							
	B	C	16	18	20	22	23	24	26	28							
		D	.0073	.0065	.0058	.0053	.0051	.0049	.0045	.0042							
	A	E	32	36	40	44	46	48	52	56							
		F	.0042	.0038	.0034	.0031	.0030	.0028	.0026	.0024							
	B	E	64	72	80	88	92	96	104	112							
		F	.0021	.0019	.0017	.0015	.0015	.0014	.0013	.0012							

THREADING DIAL INDICATOR

A. Whitworth threads

Located on right-hand side of the apron on lathes having an English leadscrew. Engage the indicator pinion with the leadscrew and tighten the handnut to retain indicator in engagement.

To cut threads of an even number per inch, close the leadscrew nut as ANY line on the dial passes the datum mark. To cut threads of odd numbers per inch, close the leadscrew nut at any NUMBERED line.

Fractional threads of $\frac{1}{2}$ or $\frac{1}{4}$ t.p.i. may be cut by closing the nut at the SAME numbered line on each pass of the tool.

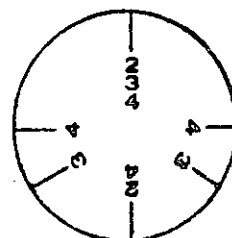
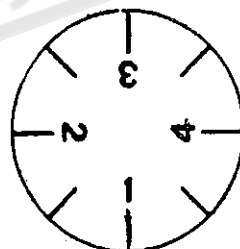
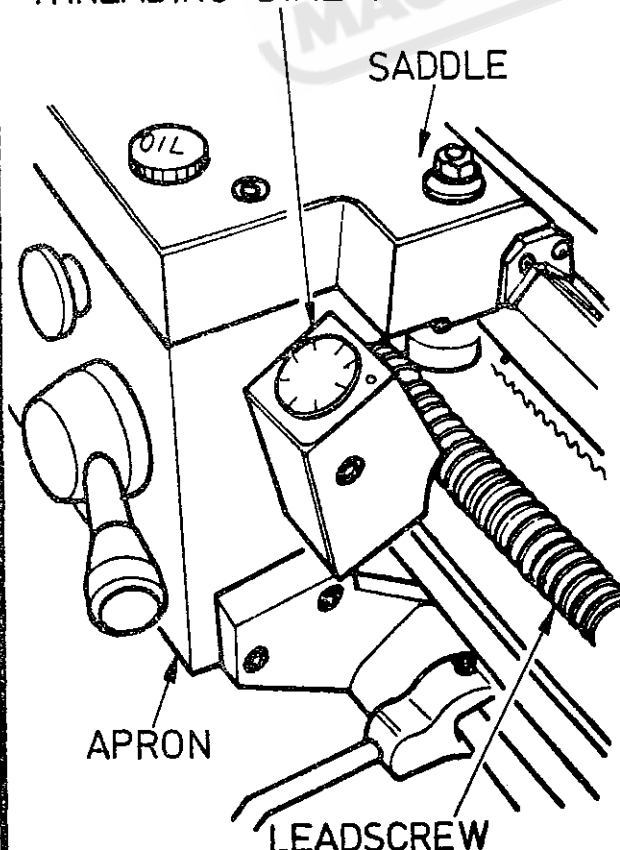
This dial cannot be used with an English leadscrew to cut metric threads, or fractional threads. For these the leadscrew nut must be kept closed and the machine reversed by use of the Change-over switch, after each cutting pass and tool with drawal.

B. Metric threads

The thread dial used for cutting metric screw threads on lathes equipped with metric leadscrew. To provide for the various pitches of metric threads, several gears having different numbers of teeth are mounted on the lower end of the shaft. The vertical position of the thread dial indicator is changed as required so that the correct gear for the pitch of the thread to be cut will mesh with the leadscrew.

Each graduation on the dial is marked with a letter which indicates the points at which the halfnuts may be engaged for certain threads. A diagram is supplied with the thread dial to show which gear and which graduations must be used for each pitch of metric screw thread.

THREADING DIAL INDICATOR



WHITWORTH THREAD DIAL

TPI	↓	TPI	↓	TPI	↓
4	1-8	12	1-8	38	1-8
4½	1.3 2.4	13	1-4	40	1-8
4¾	1	14	1-8	44	1-8
5	1-4	16	1-8	48	1-8
5½	1.3 2.4	18	1-8	52	1-8
6	1-8	19	1-4	56	1-8
6½	1.3 2.4	20	1-8	64	1-8
7	1-4	22	1-8	72	1-8
8	1-8	24	1-8	76	1-8
9	1-4	26	1-8	80	1-8
9½	1.3 2.4	28	1-8	88	1-8
10	1-8	32	1-8	96	1-8
11	1-4	36	1-8	100	1-8

LEADSCREW PITCH 8 T.P.I.

METRIC THREAD DIAL

P.C.	T	↓	P.C.	T	↓
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			

LEAD SCREW PITCH 4MM

APRON CONTROLS (Knob type)

In addition to handwheel traverse, the carriage can be power-operated through controls on the front of the apron, see Fig 15 knob (A) is pulled out for power feed engagement and pushed in for manual operation.

The push-pull knob (B) selects power surfacing (cross-feed) when pulled out, sliding feeds are selected when the knob is pushed right in.

Lever (C) is pressed downward to engage the leadscrew nut for screwcutting. To avoid undue wear, release the nut except when screwcutting.

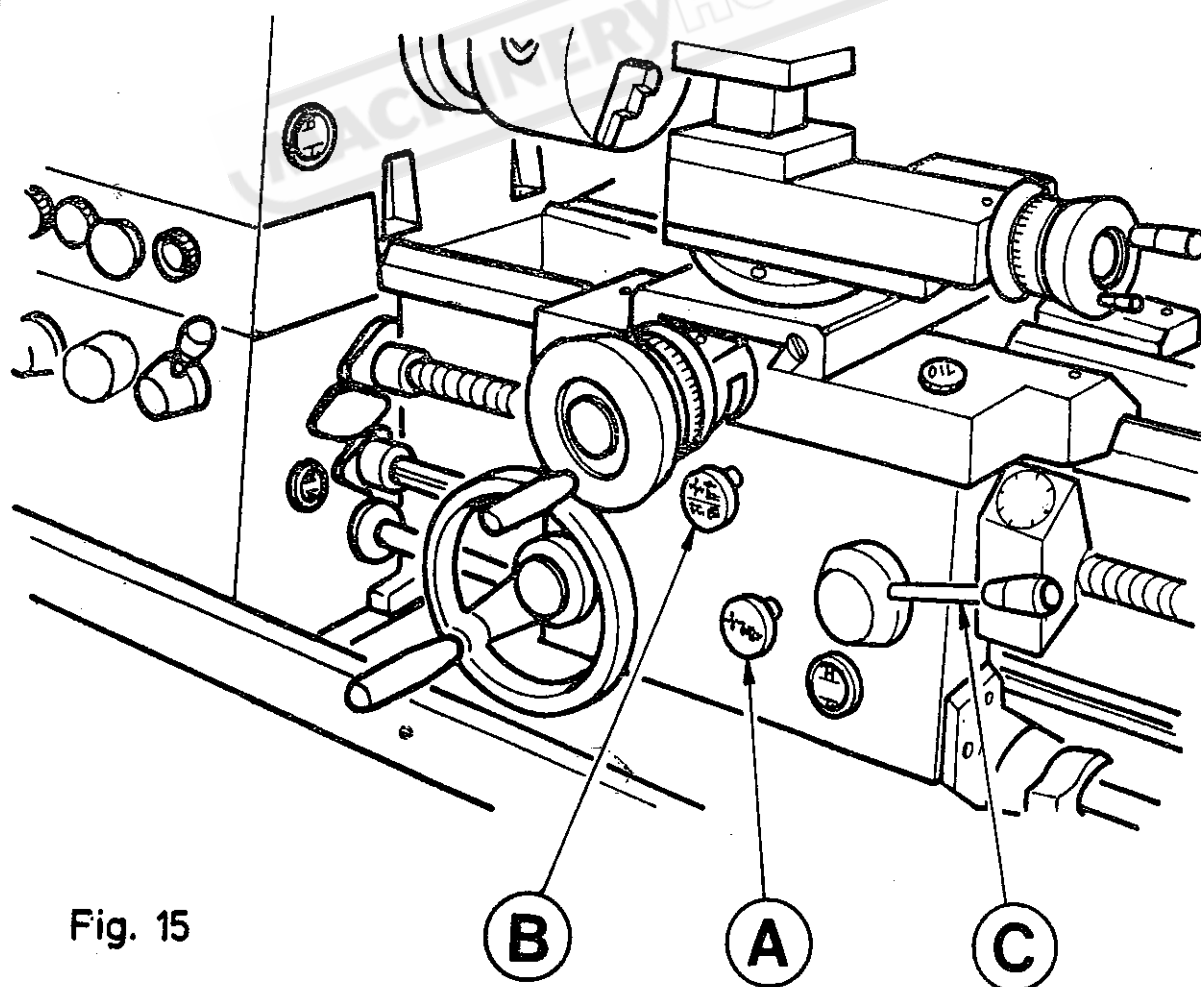


Fig. 15

APRON CONTROLS (Lever type)

In addition to handwheel traverse, the carriage can be power-operated through controls on the front of the apron, see Fig 16 knob (A). If move handle (A) upwards, carriage would do longitudinal-feed operation. If move handle (A) in middle position, it would do manual operation. If move handle (A) downwards, it would do cross-feed operation.

Lever (B) is pressed downward to engage the leadscrew nut for screwcutting. To avoid undue wear. Release the nut except when screwcutting.

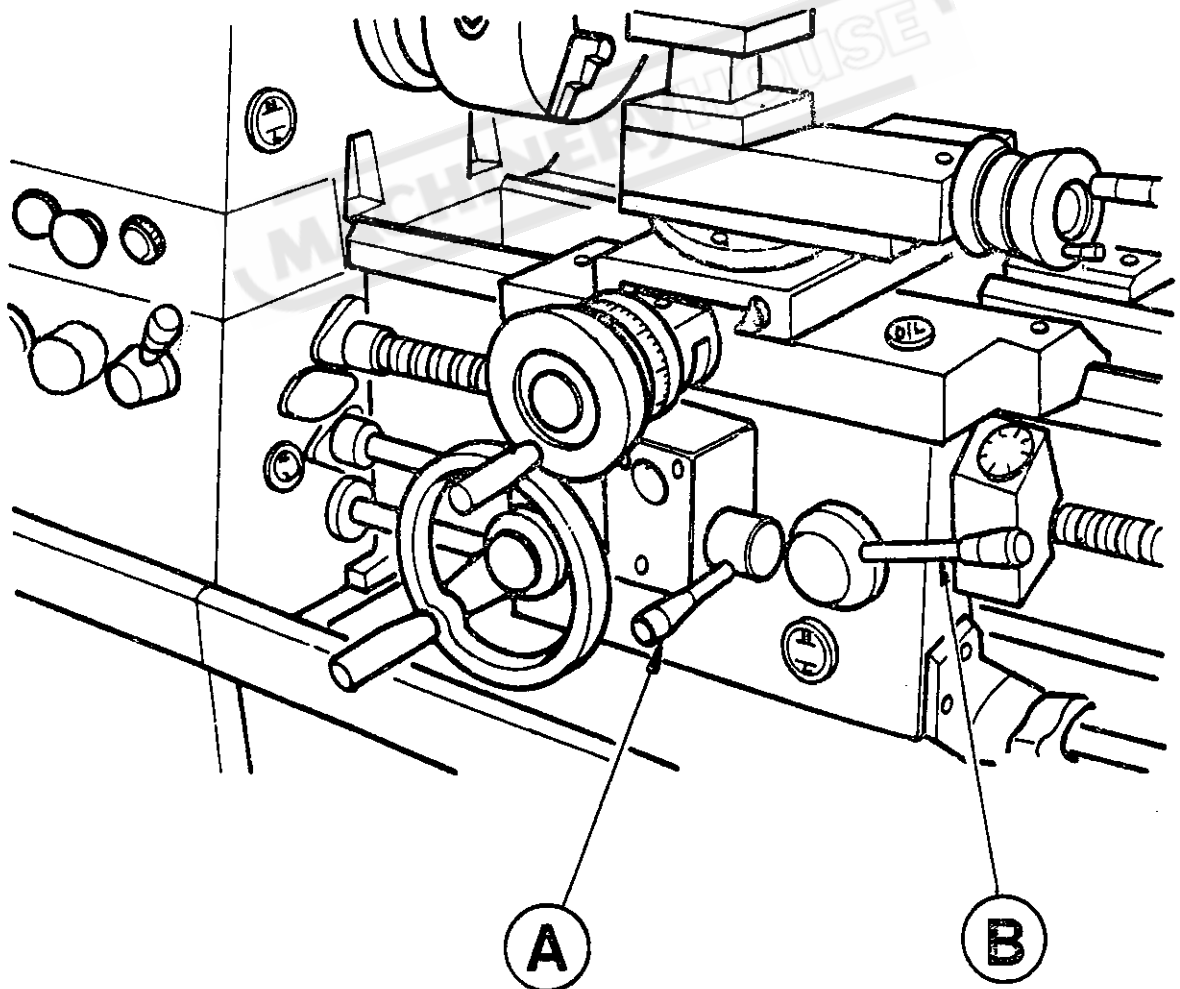


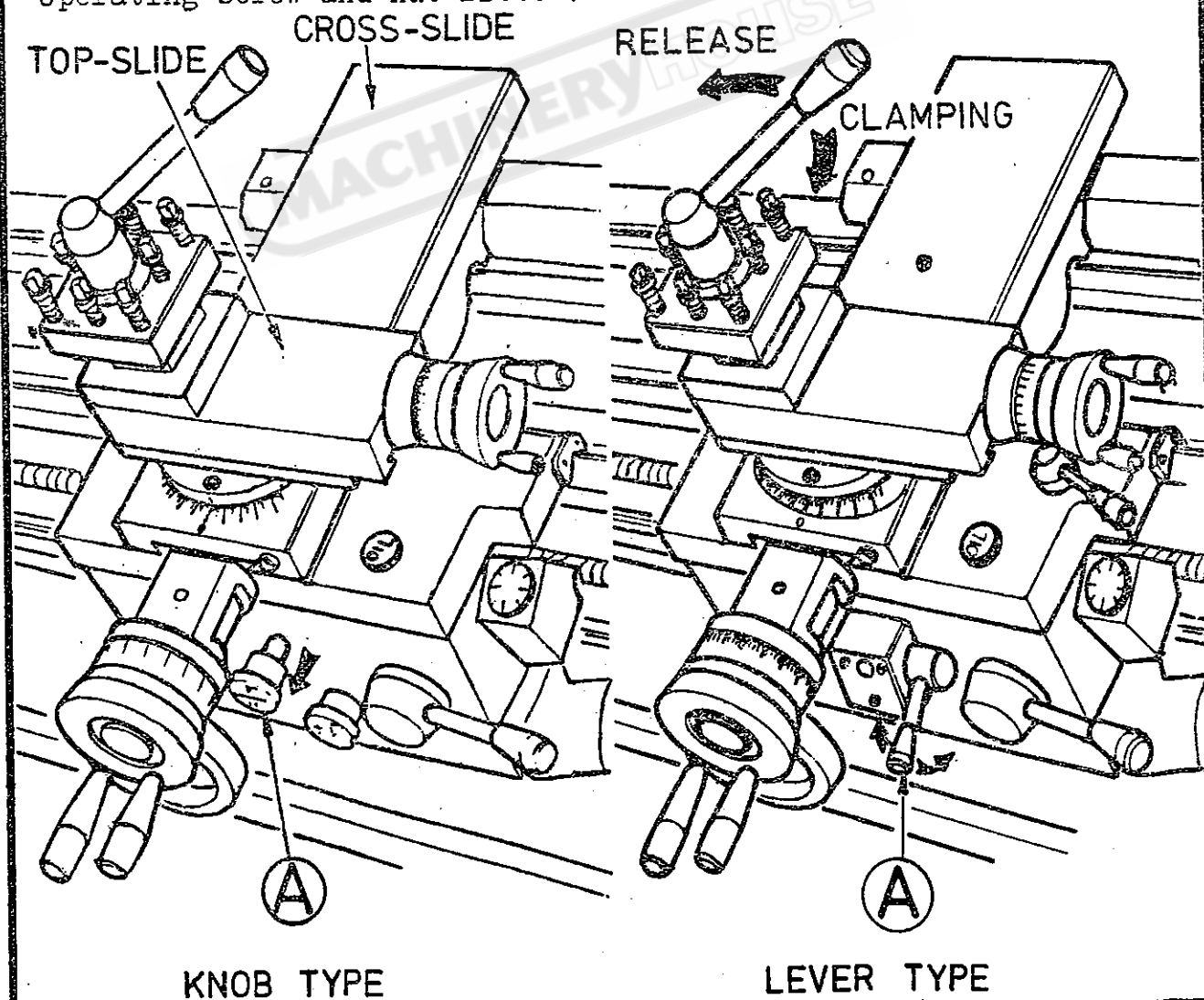
Fig. 16

CROSS-SLIDE AND TOP-SLIDE

A solid topslide is fitted as standard to the cross-slide. Carried on a rotatable base, the cross-slide is marked 45-0-45 deg. for accurate indexing.

Handwheel dials are graduated in inch or metric divisions to suit the operating screw and nut fitted.

The cross-slide can be power operated by pulling out the hand knob (A), at one-third sliding feed per spindle revolution, or it can be hand-operated using the large-diameter dial graduated in either inch or metric division to suit the operating screw and nut fitted.



TAIL STOCK

Can be free movement along the bed by unlocking the clamp lever (A).

The tailstock barrel is locked by lever (B).

The tailstock can be set-over for production of shallow tapers or for re-alignment. Release the clamping lever and adjust screws (S) at each side of the base to move tailstock laterally across the base. An indication of the setover is given by the datum mark (C) at the tailstock end face, as shown in Fig 18. Apply clamp lever after adjustment of set-over.

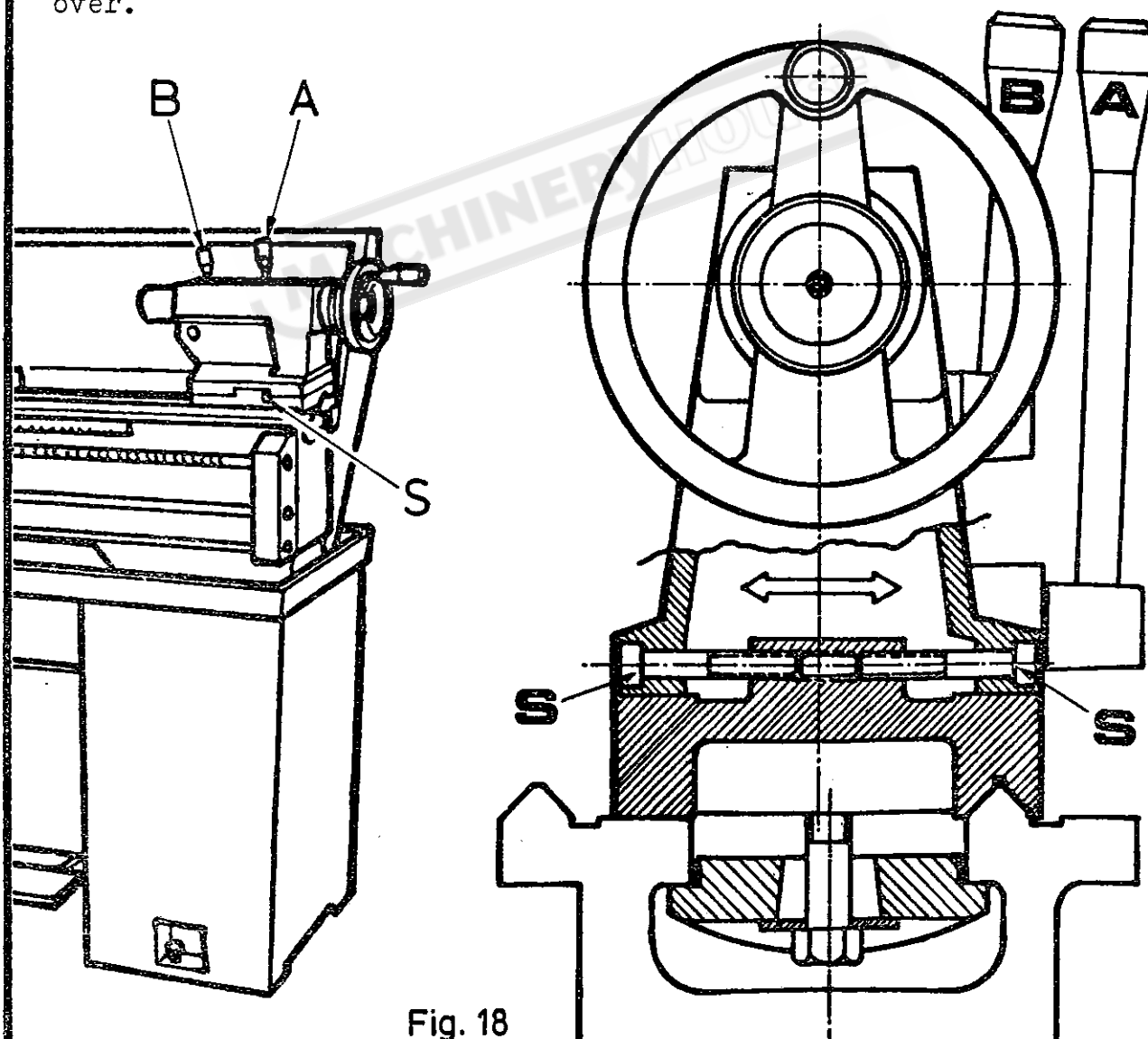


Fig. 18

LATHE ALIGNMENT (part 1)

With the lathe installed and running, we recommend a check on machine alignment before commencing work. Check levelling and machine alignment at regular periods to ensure continued lathe accuracy.

Headstock check: Take a light cut-with a keen tool over a 6 in. (150mm.) length of 2 in. dia. (50mm.) steel bar gripped in the chuck but not supported at the free end. Micrometer readings at each end of the turned length (at A and B of Fig 19) should be the same.

To correct a difference in readings, slacken and release the four headstock hold-down screws (J) shown in Fig 19 and adjust the set-over pad (K) beneath the headstock. Then tighten all screws. After adjustment, repeat the test-cut/micrometer-reading until micrometer readings are identical so that machine cutting will be absolutely parallel.

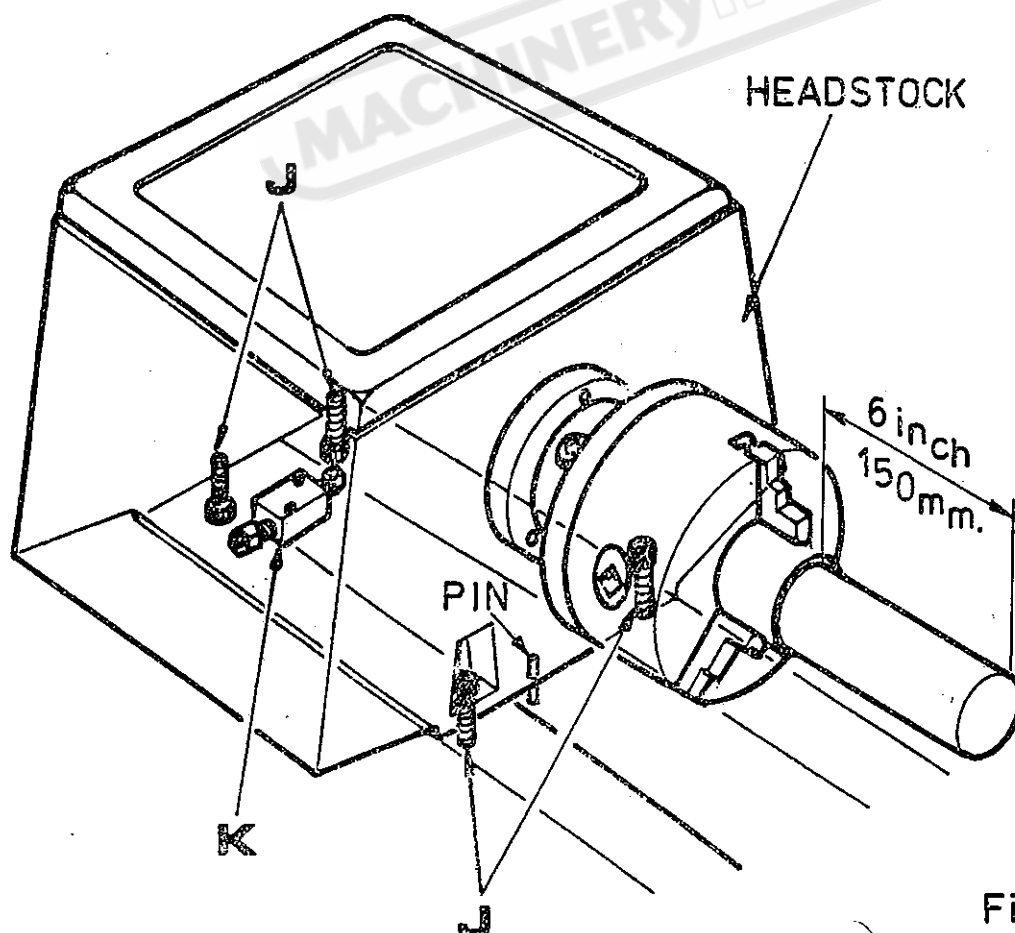
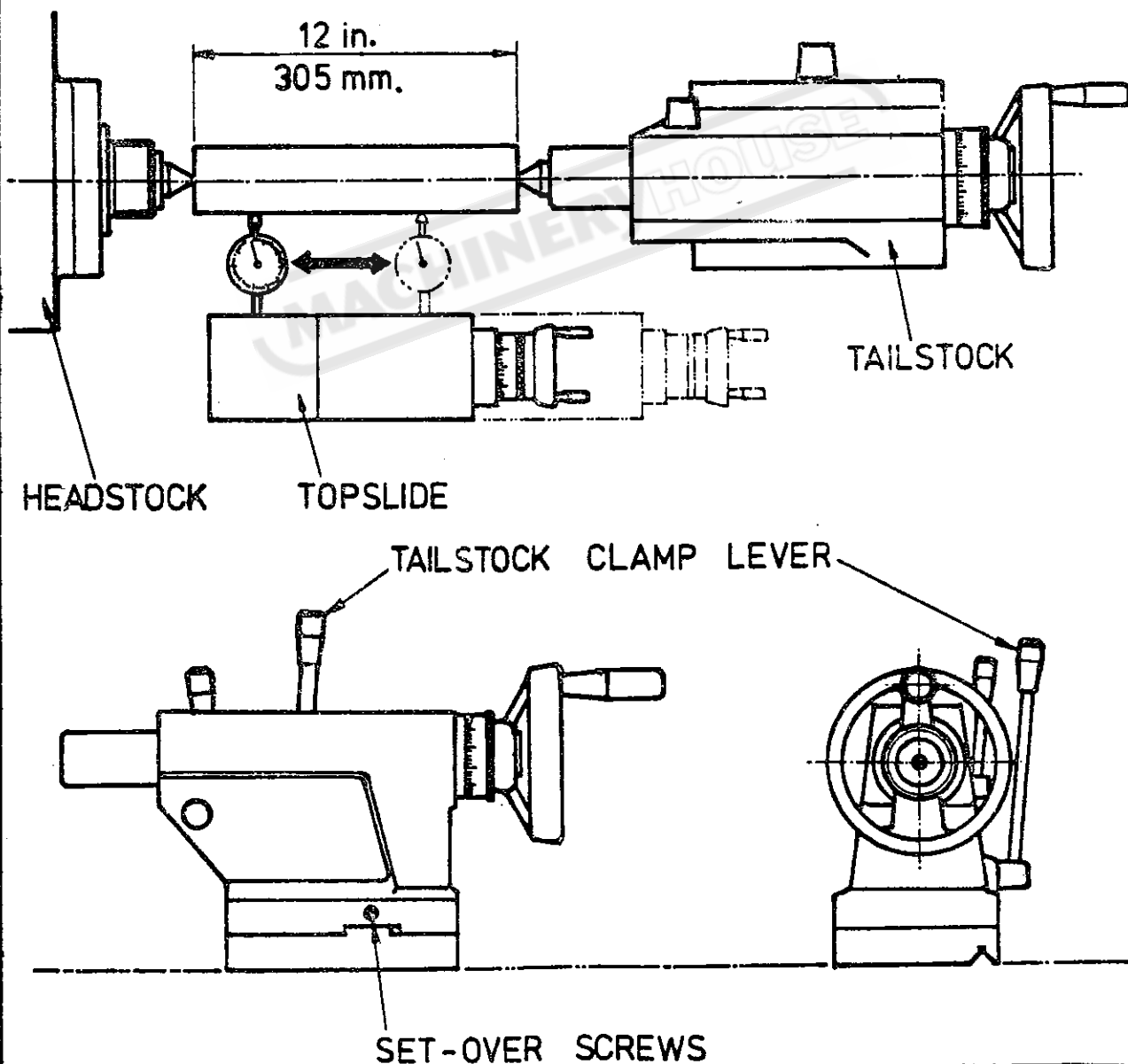


Fig. 19

LATHE ALIGNMENT (part 2)

Tailstock check: Using a 12 in. (305 mm.) ground steel bar fitted between centers of headstock and tailstock. Check the alignment by fitting a dial-test indicator to the topslide and traversing the center line of the bar.

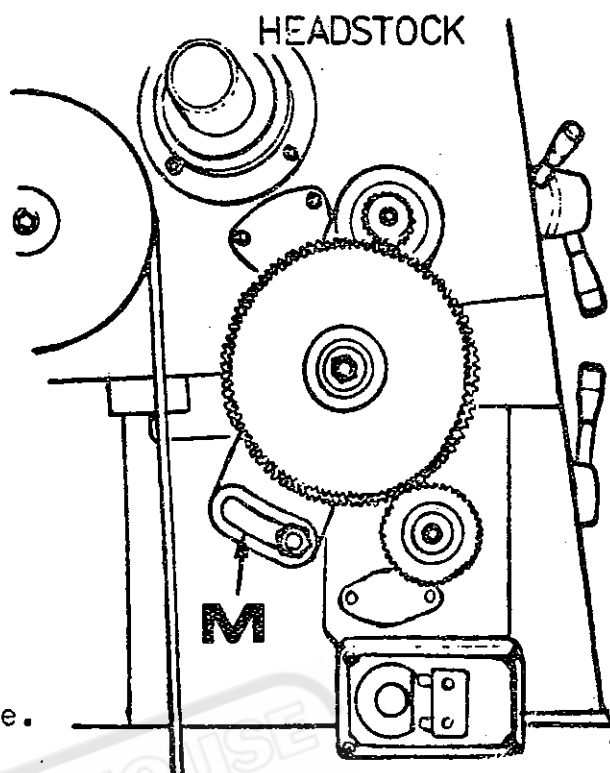
To correct error, release the tailstock clamp lever and adjust the two set-over screws provided. Continuously check and correct until the alignment is perfect.



END GEAR TRAIN

Drive from headstock to gear-box is transmitted through a gear train enclosed by the headstock end-guard. Intermediate gears are carried on an adjustable swing frame (M).

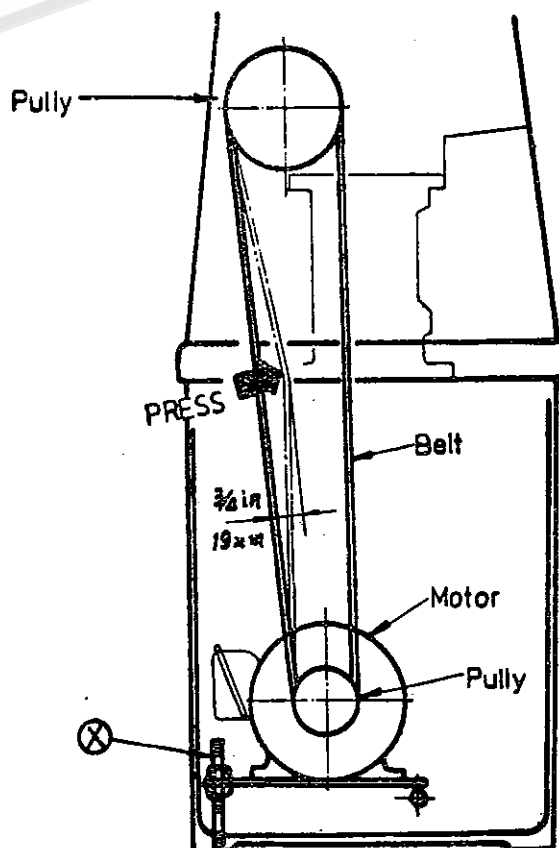
Gears must be thoroughly cleaned before fitting and backlash maintained at .005in. (.127 mm.) Lubricate gears regularly with thick oil or grease.



DRIVING BELTS

To alter belt tension, remove the coverplate in back of the headstock plinth and adjust the two screws (X) on the hinged motor platform. Ensure that the motor is correctly aligned with the lathe axis.

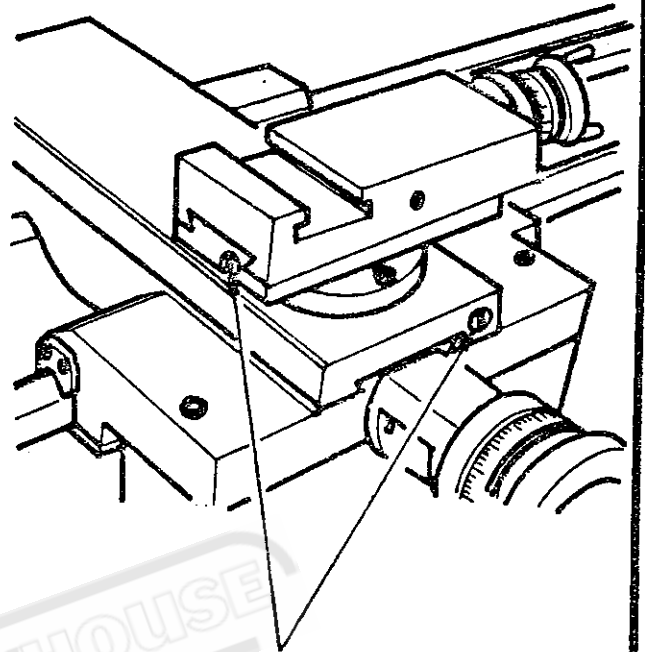
Light finger pressure at a point midway between motor and headstock pulleys should produce about 3/4 in. (19mm.) movement of each belt when under correct tension.



SLIDE WAYS ATTENTION

Tapered gib strips are fitted to slideways of saddle cross-slide and top (compound) slides so that any slackness which may develop can be rectified.

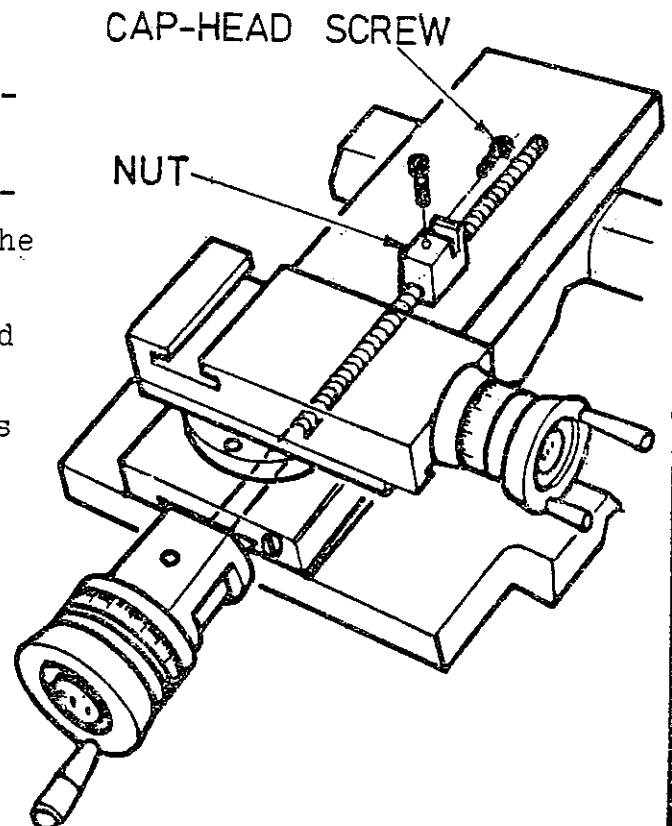
Ensure that slideways are thoroughly cleaned and lubricated before attempting adjustment. Then reset the gibs by slackening the rear gib screw and tightening the front screw. Check constantly for smooth action throughout full slide travel. Avoid over-adjustment which can result in increased wear-rate and stiff or jerky action.



GIB ADJUSTERS

CROSS-SLIDE NUT

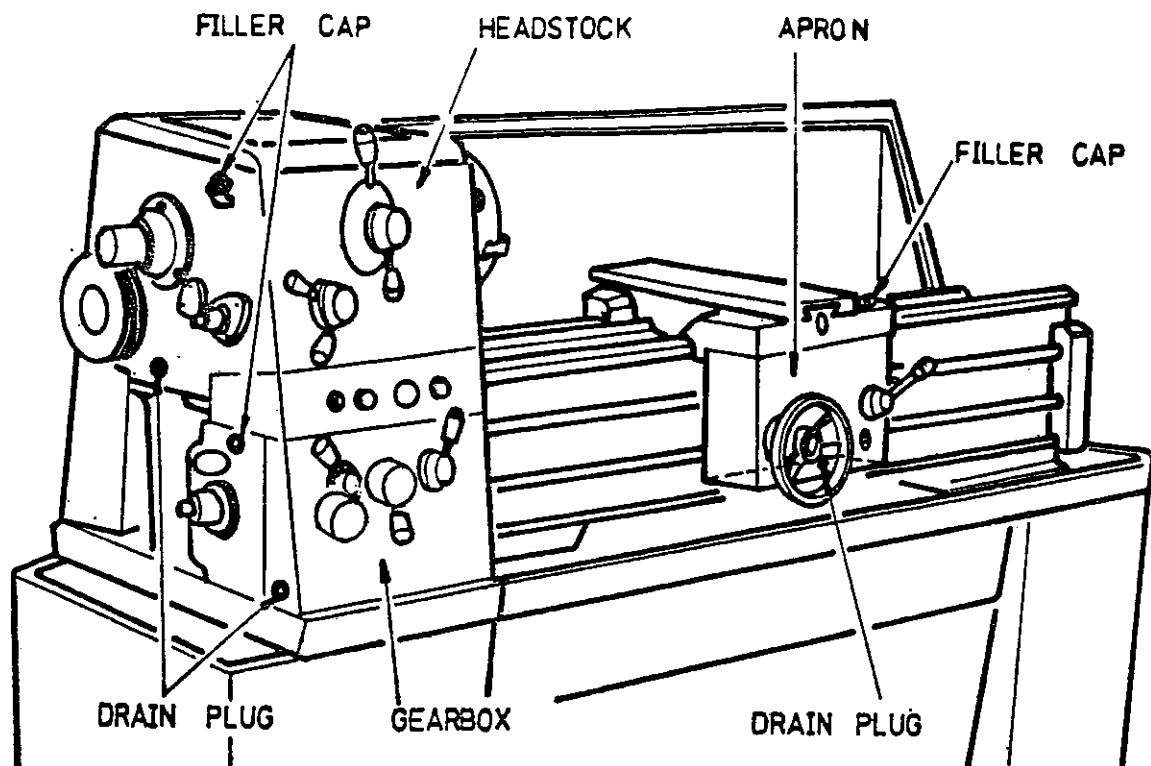
This is adjustable for elimination of slackness which may develop in service. Reduce backlash by the cap-head screw in the rear of the nut. Then make only small adjustment by the cap-head screw. Before operating the cross-slide, check several times by hand to be sure of smooth operation throughout travel.



LUBRICATION (part 1)

The headstock and gearbox are splash-lubricated from an internal reservoir of oil (Shell Tellus 27). Check the oil level constantly to the mark on the oil sight window in the front end face of the headstock and gearbox. A weekly check is recommended. The oil need be changed every year. Oil through a filler cap in the top of the headstock and gearbox is covered by the end-guard. Drain from a drain plug in the bottom of the headstock and gearbox.

The apron is lubricated from an internal reservoir of oil. The oil sight window is in the front of the apron. A filler cap is in the top of the saddle. Refill the reservoir to the level of the oilsight with Shell Tonna oil 33. The apron can be drained by unscrewing a hexheaded drain plug in the bottom.



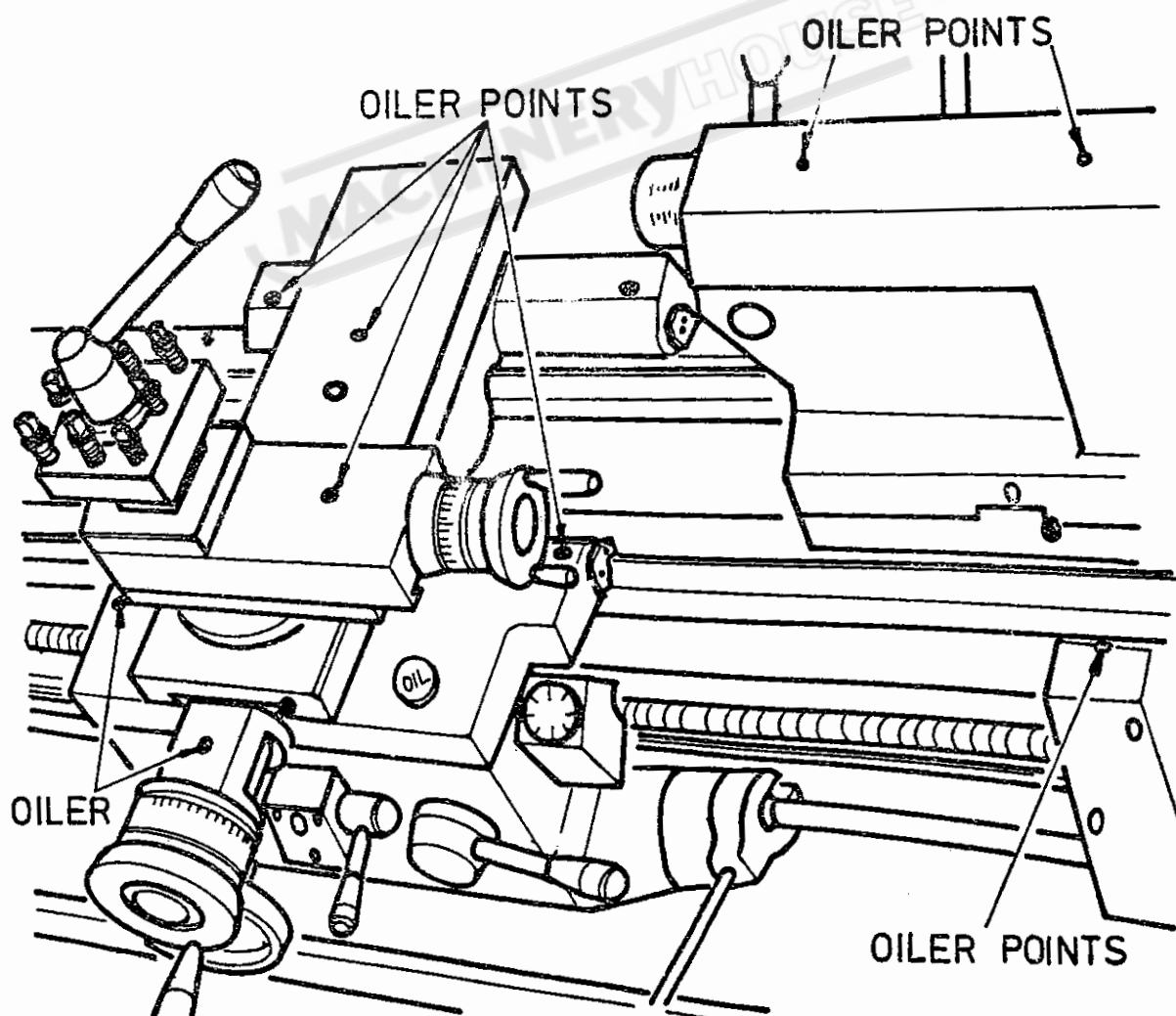
LUBRICATION (part 2)

In addition, oil gun is provided for the saddle, cross-slide, crossslide nut and top-slide(compound slide) to oil. Leadscrew using a oil gun can be oild with light machine oil or way lubricant.

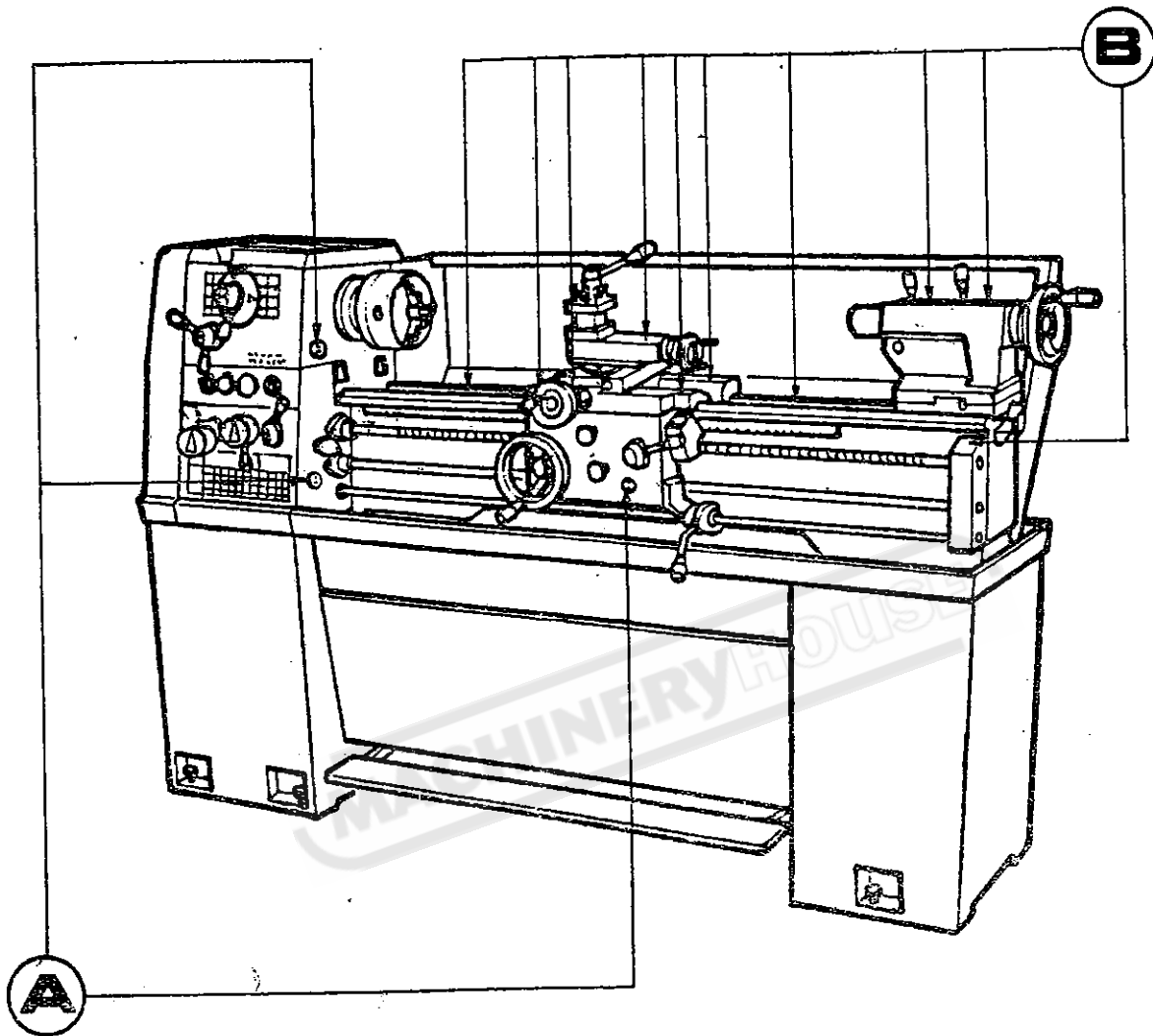
On the tailstock, oil points are provided for daily attention from a standard oil can.

It is recommended that all slideways, leadscrew and feed shaft are cleaned off (a bristle paint brush is useful for this) and lightly oiled after each period of work.

NOTE: Using incorrect grades of oil can cause damage.

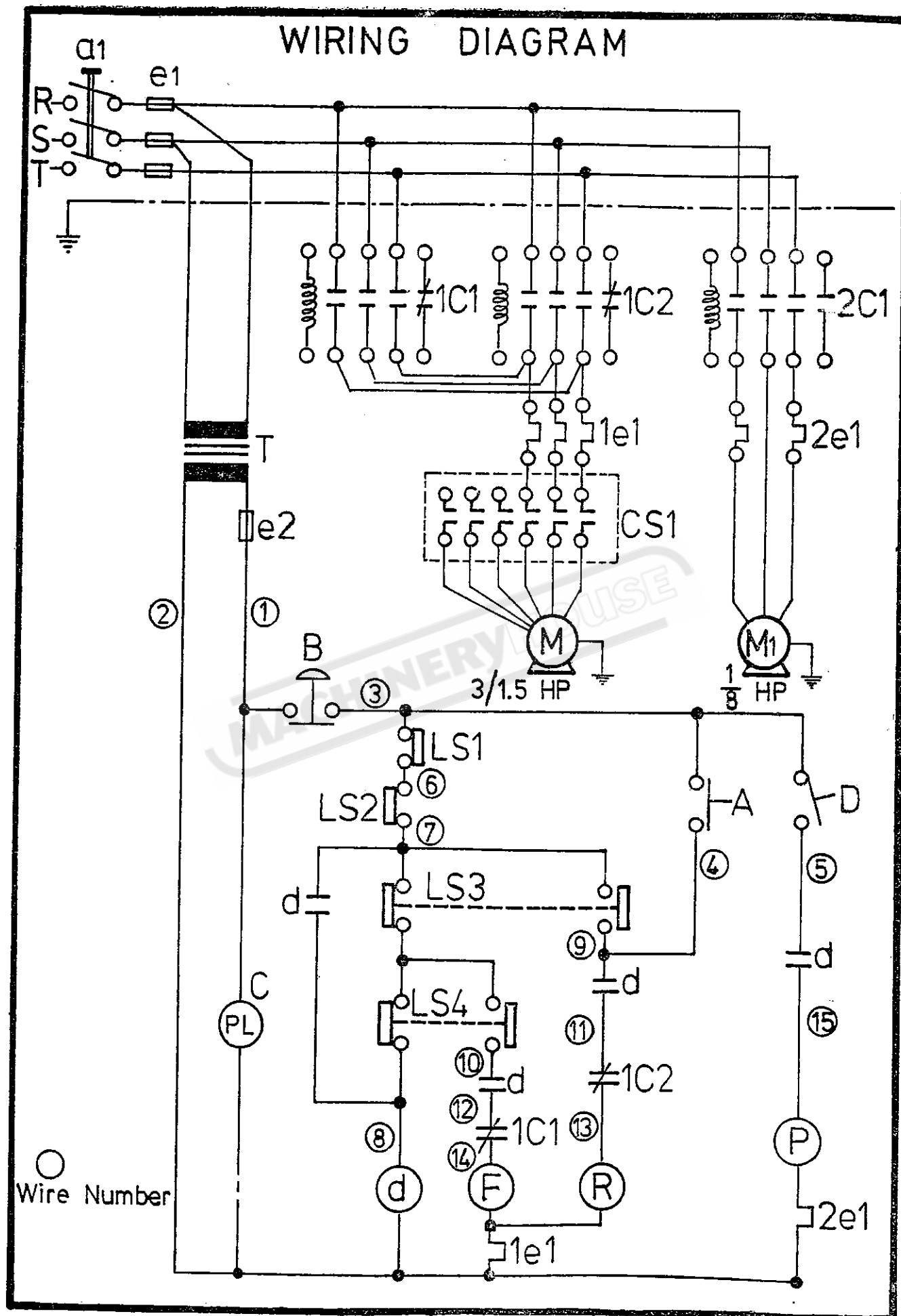


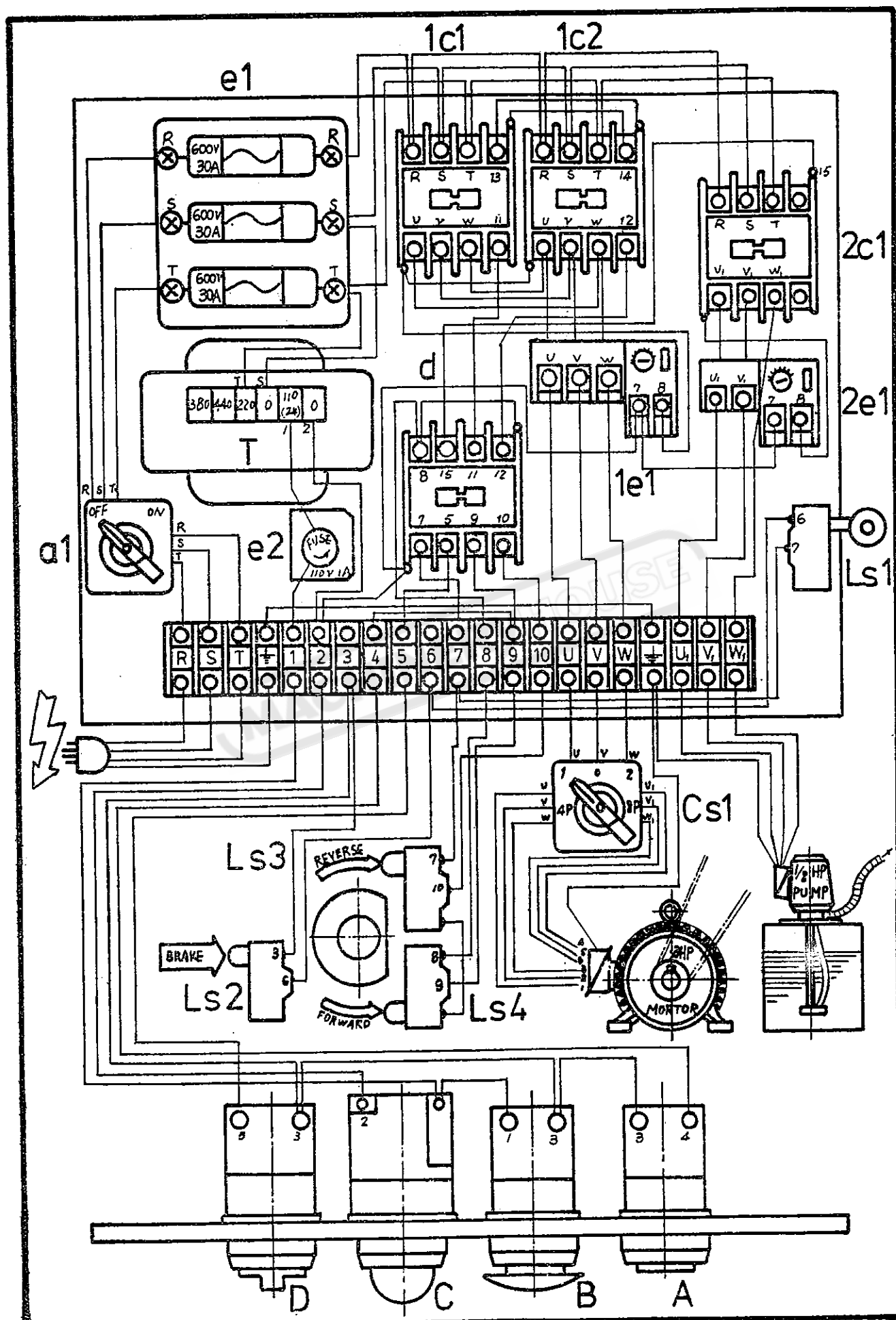
LUBRICATION DIAGRAM

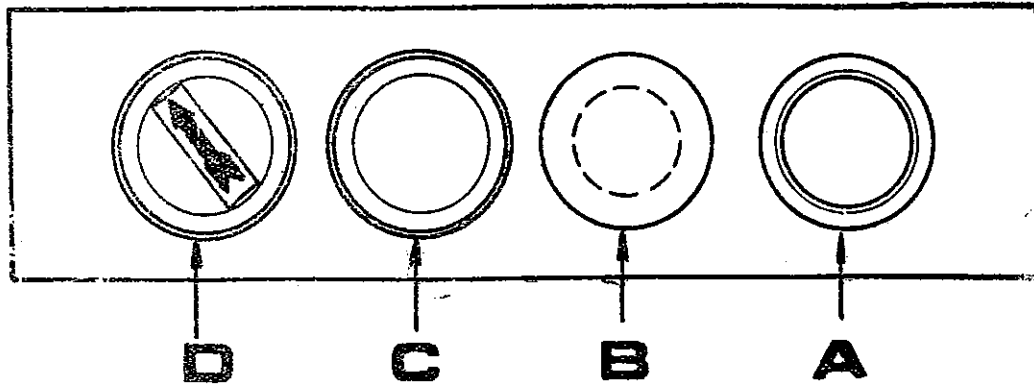


Ⓐ — TOP-UP EVERY WEEK

Ⓑ — OIL EVERY DAY







ai: Power switch 3 ϕ 3w 10A.

T : Control circuit Transformer 100VA.

M : Main Motor.

M1: Pump motor.

A : Push button switch(jogging switch)type SB 3051A.

B : Flate type push button type SB 3091B.

C : Pilot light type.SP 301,110V/15V, color:white.

D : Selecting switch. type ST 3021A.

e1: Fuse base 600V, 30A, type SR—833.

e2: Grass 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 AC110V. 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.

HEADSTOCK

GB70 M6x35(10)

04-04

04-09

GB3452.1 14x2.65(4)

04-02

04-74

GB77 M8x12(2)

GB2089 1x5x22

GB78 M6x6

GB308 9x2 M5x15

GB879 5x30

GB78 M6x6

GB879 M5x30

04-76

GB879 5x30

04-75

04-07

04-08

04-01

04-73

04-72

GB879 M5x30

04-70

GB1096 5x18

04-84

GB3452.1 15x2.625

04-67

04-63

GB77 M12x12(2)

04-68

GB70 M6x12(2)

04-61

04-95

04-82(2)

04-83

GB70 M12x30(2)

GB4141.14 BM10x50

04-81

04-62

GB70 M6x12

GB5781 M10x40(2)

04-91

04-90

GB70 M6x12

04-94

04-88

04-68

04-80

GB4141.14 BM10x50

04-98

04-97

04-62

GB70 M6x12

04-81

GB4141.14 BM10x50

GB70 M12x35

04-71

04-69

GB308 9x2

GB2089 0.9x9x40(2)

GB3452.1 15x2.65(2)

04-70

GB1096 5x18

04-84

GB3452.1 15x2.625

04-67

04-63

GB77 M12x12(2)

04-68

GB70 M6x12(2)

04-61

04-95

04-82(2)

04-83

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GB4141.14 BM10x50

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GB70 M6x12

GB5781 M10x40(2)

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GB70 M6x12

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GB4141.14 BM10x50

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GB4141.14 BM10x50

GB70 M12x35

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04-69

GB308 9x2

GB2089 0.9x9x40(2)

GB3452.1 15x2.65(2)

04-70

GB1096 5x18

04-84

GB3452.1 15x2.625

04-67

04-63

GB77 M12x12(2)

04-68

GB70 M6x12(2)

04-61

04-95

04-82(2)

04-83

GB70 M12x30(2)

GB4141.14 BM10x50

04-81

04-62

GB70 M6x12

GB5781 M10x40(2)

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GB70 M6x12

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GB4141.14 BM10x50

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GB70 M6x12

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GB4141.14 BM10x50

GB70 M12x35

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GB308 9x2

GB2089 0.9x9x40(2)

GB3452.1 15x2.65(2)

04-70

GB1096 5x18

04-84

GB3452.1 15x2.625

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GB77 M12x12(2)

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GB4141.14 BM10x50

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GB308 9x2

GB2089 0.9x9x40(2)

GB3452.1 15x2.65(2)

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GB1096 5x18

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GB3452.1 15x2.625

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GB77 M12x12(2)

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GB4141.14 BM10x50

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GB70 M6x12

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GB4141.14 BM10x50

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GB70 M6x12

04-81

GB4141.14 BM10x50

GB70 M12x35

04-71

04-69

GB308 9x2

GB2089 0.9x9x40(2)

GB3452.1 15x2.65(2)

04-70

GB1096 5x18

04-84

GB3452.1 15x2.625

04-67

04-63

GB77 M12x12(2)

04-68

GB70 M6x12(2)

04-61

04-95

04-82(2)

04-83

GB70 M12x30(2)

GB4141.14 BM10x50

04-81

04-62

GB70 M6x12

GB5781 M10x40(2)

04-91

04-90

GB70 M6x12

04-94

04-88

04-68

04-80

GB4141.14 BM10x50

04-98

04-97

04-62

GB70 M6x12

04-81

GB4141.14 BM10x50

GB70 M12x35

04-71

04-69

GB308 9x2

GB2089 0.9x9x40(2)

GB3452.1 15x2.65(2)

04-70

GB1096 5x18

04-84

GB3452.1 15x2.625

04-67

04-63

GB77 M12x12(2)

04-68

GB70 M6x12(2)

04-61

04-95

04-82(2)

04-83

GB70 M12x30(2)

GB4141.14 BM10x50

04-81

04-62

GB70 M6x12

GB5781 M10x40(2)

04-91

04-90

GB70 M6x12

04-94

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GB4141.14 BM10x50

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GB70 M6x12

04-81

GB4141.14 BM10x50

GB70 M12x35

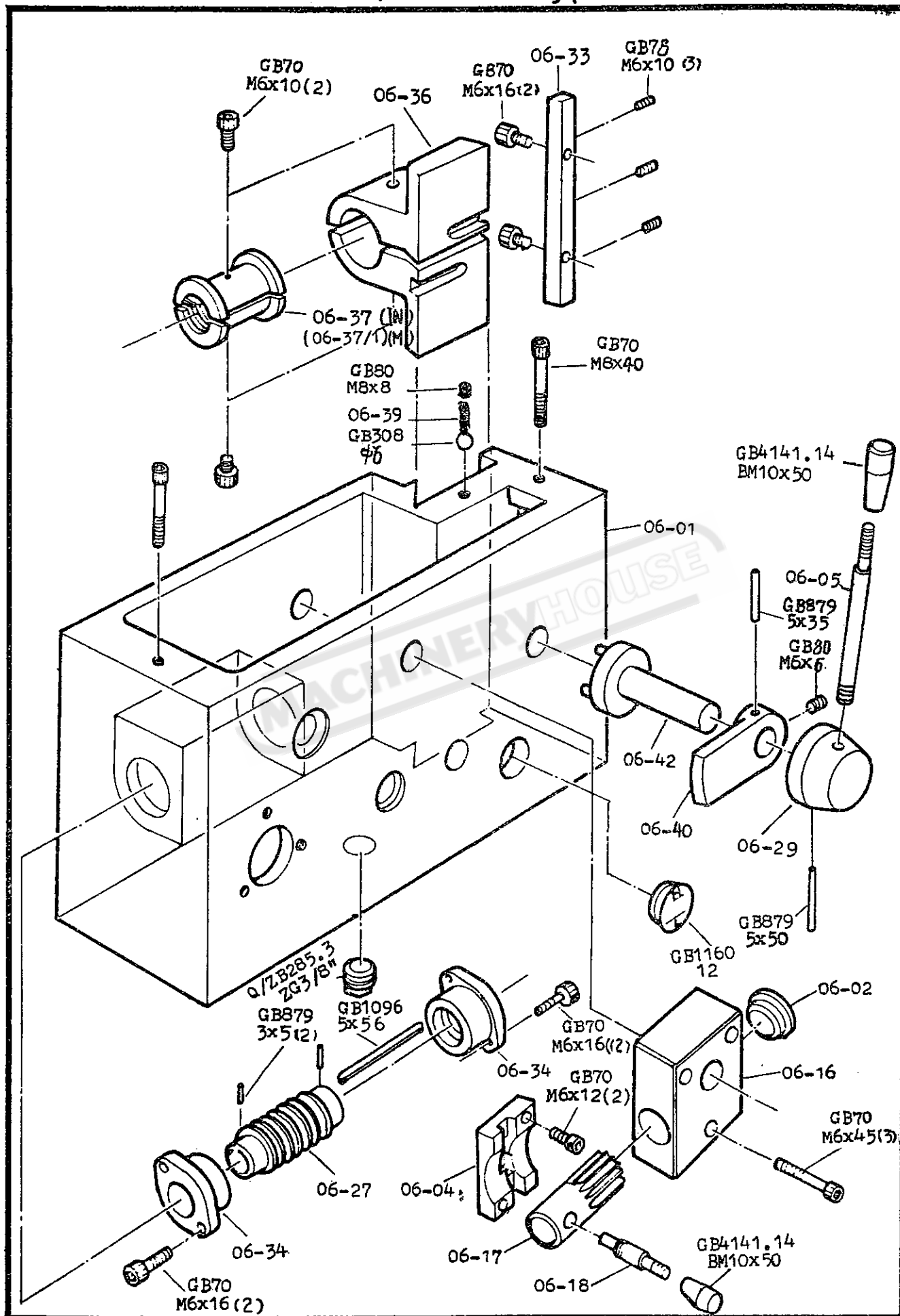
04-71

This diagram illustrates the exploded view of a mechanical assembly, showing various components and their assembly sequence. The components are labeled with part numbers and standards:

- Top Section:**
 - GB1096 5x14
 - 05-40
 - 05-21
 - GB276 104
 - GB70 M6x16
 - 05-38
 - 05-39
 - GB70 M6x20(3)
 - 05-41
 - 05-42
 - 05-36
 - GB1096 5x75
 - 05-27
 - 05-34
 - 05-32
 - 05-30
 - 05-28
 - 05-29
 - 05-33
 - 05-31
 - 05-35
 - GB276 7000102
- Middle Section:**
 - 05-67
 - GB276 103
 - GB894.1 20
 - 05-48
 - 05-47
 - GB70 M6x16(2)
 - 05-66
 - GB894.1 20
 - GB276 202
 - 05-49
 - GB276 1000804(2)
 - GB276 202
 - GB893.1 32(2)
 - 05-52
 - GB894.1 20
 - 05-37
 - 05-47
 - 05-48
 - GB276 202
 - GB70 M6x16(2)
- Bottom Section:**
 - GB1096 5x14
 - GB1096 6x14
 - 05-16
 - GB301 8104
 - GB3452.1 15x2.65
 - 05-17
 - GB70 M6x16(3)
 - 05-53
 - 05-19
 - 05-25
 - GB276 103
 - GB876 15
 - 05-24
 - 05-22
 - 05-20(2)
 - GB301 8104
 - 05-18
 - GB70 M6x16(3)
 - 05-23
 - GB1096 5x14
 - GB301 8104
 - 05-26
 - GB894.1 15
 - GB276 202

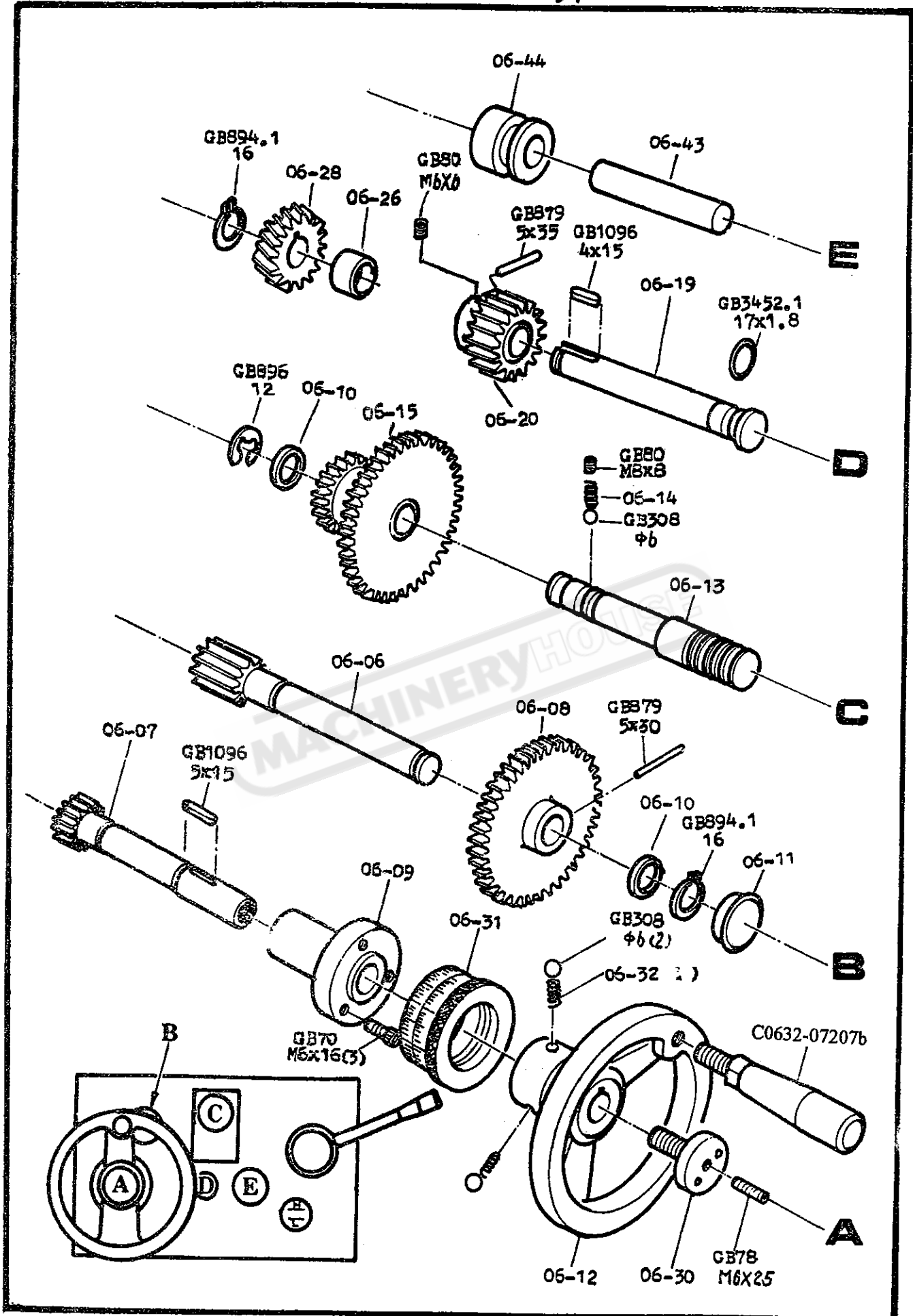
The diagram is divided into sections labeled B, C, and D, indicating different parts of the assembly.

APRON Left hand, Lever type



APRON

Left hand, Lever type

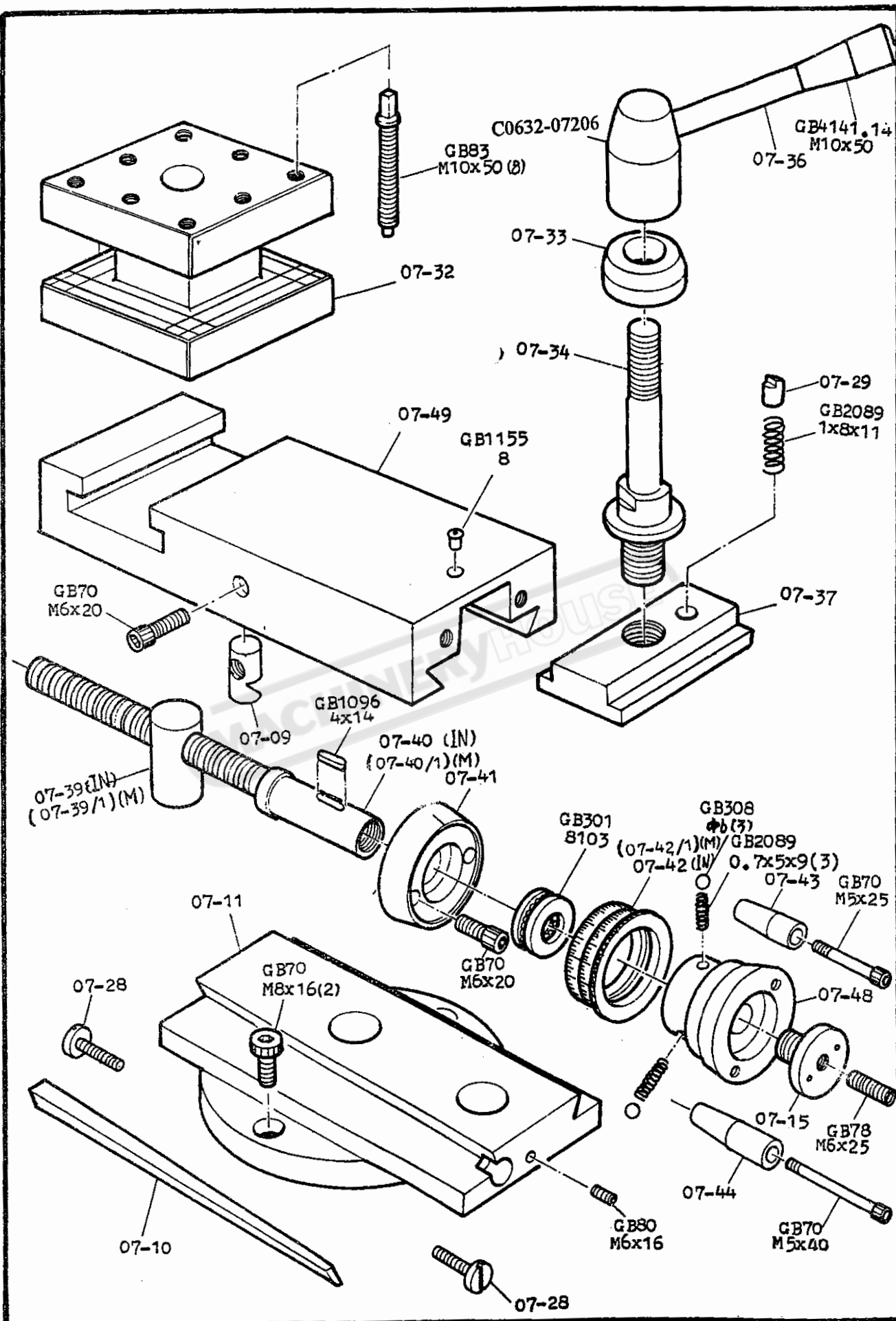


This diagram illustrates the exploded view of a mechanical assembly, likely a pump or motor component. The main body is a rectangular block with a central circular feature. Various parts are shown in their relative positions, with callouts indicating their part numbers and specifications. Key components include:

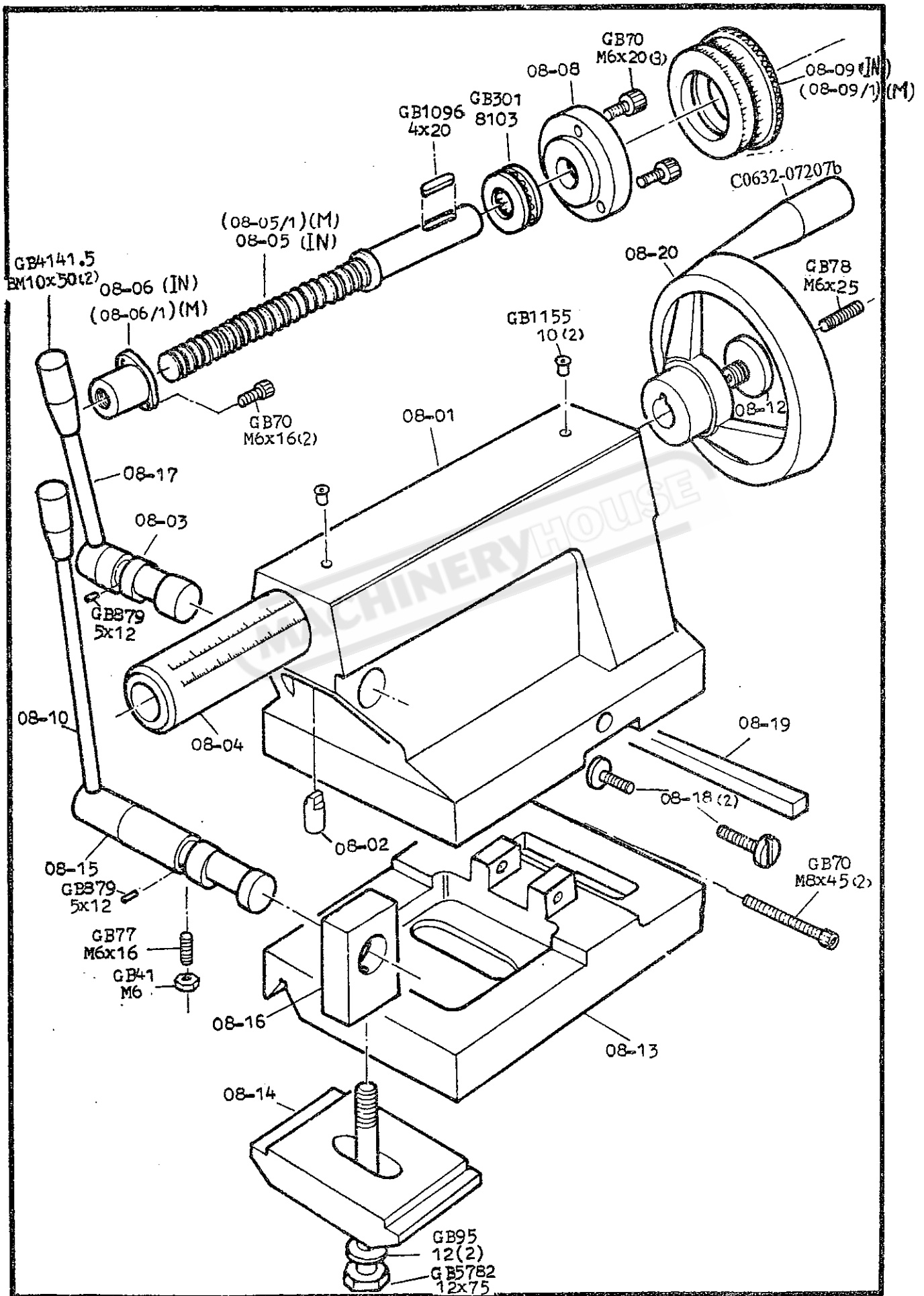
- Top Cover/Plate:** Labeled with 07-01, 07-02, 07-03, 07-05, 07-07, 07-08, 07-12, 07-28, and 07-38.
- Internal Components:** Includes a central shaft assembly with a pulley (07-15), gears (07-16, 07-17, 07-18, 07-19, 07-20, 07-21), and a motor or actuator (07-22, 07-23, 07-24, 07-25, 07-26, 07-27, 07-28, 07-29, 07-30, 07-31, 07-32, 07-33, 07-34, 07-35, 07-36, 07-37, 07-38, 07-39, 07-40, 07-41, 07-42, 07-43, 07-44, 07-45, 07-46, 07-47, 07-48, 07-49, 07-50, 07-51, 07-52, 07-53, 07-54, 07-55, 07-56, 07-57, 07-58, 07-59, 07-60, 07-61, 07-62, 07-63, 07-64, 07-65, 07-66, 07-67, 07-68, 07-69, 07-70, 07-71, 07-72, 07-73, 07-74, 07-75, 07-76, 07-77, 07-78, 07-79, 07-80, 07-81, 07-82, 07-83, 07-84, 07-85, 07-86, 07-87, 07-88, 07-89, 07-90, 07-91, 07-92, 07-93, 07-94, 07-95, 07-96, 07-97, 07-98, 07-99, 07-100).
- Fasteners and Hardware:** Numerous bolts, nuts, and washers are specified, including GB70 M6x20, GB1155 8, GB301 8101, GB308 8102(2), GB308 8103(2), GB308 8104(2), GB308 8105(2), GB308 8106(2), GB308 8107(2), GB308 8108(2), GB308 8109(2), GB308 8110(2), GB308 8111(2), GB308 8112(2), GB308 8113(2), GB308 8114(2), GB308 8115(2), GB308 8116(2), GB308 8117(2), GB308 8118(2), GB308 8119(2), GB308 8120(2), GB308 8121(2), GB308 8122(2), GB308 8123(2), GB308 8124(2), GB308 8125(2), GB308 8126(2), GB308 8127(2), GB308 8128(2), GB308 8129(2), GB308 8130(2), GB308 8131(2), GB308 8132(2), GB308 8133(2), GB308 8134(2), GB308 8135(2), GB308 8136(2), GB308 8137(2), GB308 8138(2), GB308 8139(2), GB308 8140(2), GB308 8141(2), GB308 8142(2), GB308 8143(2), GB308 8144(2), GB308 8145(2), GB308 8146(2), GB308 8147(2), GB308 8148(2), GB308 8149(2), GB308 8150(2), GB308 8151(2), GB308 8152(2), GB308 8153(2), GB308 8154(2), GB308 8155(2), GB308 8156(2), GB308 8157(2), GB308 8158(2), GB308 8159(2), GB308 8160(2), GB308 8161(2), GB308 8162(2), GB308 8163(2), GB308 8164(2), GB308 8165(2), GB308 8166(2), GB308 8167(2), GB308 8168(2), GB308 8169(2), GB308 8170(2), GB308 8171(2), GB308 8172(2), GB308 8173(2), GB308 8174(2), GB308 8175(2), GB308 8176(2), GB308 8177(2), GB308 8178(2), GB308 8179(2), GB308 8180(2), GB308 8181(2), GB308 8182(2), GB308 8183(2), GB308 8184(2), GB308 8185(2), GB308 8186(2), GB308 8187(2), GB308 8188(2), GB308 8189(2), GB308 8190(2), GB308 8191(2), GB308 8192(2), GB308 8193(2), GB308 8194(2), GB308 8195(2), GB308 8196(2), GB308 8197(2), GB308 8198(2), GB308 8199(2), GB308 8200(2).

The diagram is a technical drawing showing the exploded view of a mechanical assembly. It includes numerous callouts for various parts, such as bolts, nuts, washers, and structural components. The parts are labeled with part numbers and specifications, including GB70 M6x20, GB1155 8, GB301 8101, GB301 8102, GB301 8103, GB301 8104, GB301 8105, GB301 8106, GB301 8107, GB301 8108, GB301 8109, GB301 8110, GB301 8111, GB301 8112, GB301 8113, GB301 8114, GB301 8115, GB301 8116, GB301 8117, GB301 8118, GB301 8119, GB301 8120, GB301 8121, GB301 8122, GB301 8123, GB301 8124, GB301 8125, GB301 8126, GB301 8127, GB301 8128, GB301 8129, GB301 8130, GB301 8131, GB301 8132, GB301 8133, GB301 8134, GB301 8135, GB301 8136, GB301 8137, GB301 8138, GB301 8139, GB301 8140, GB301 8141, GB301 8142, GB301 8143, GB301 8144, GB301 8145, GB301 8146, GB301 8147, GB301 8148, GB301 8149, GB301 8150, GB301 8151, GB301 8152, GB301 8153, GB301 8154, GB301 8155, GB301 8156, GB301 8157, GB301 8158, GB301 8159, GB301 8160, GB301 8161, GB301 8162, GB301 8163, GB301 8164, GB301 8165, GB301 8166, GB301 8167, GB301 8168, GB301 8169, GB301 8170, GB301 8171, GB301 8172, GB301 8173, GB301 8174, GB301 8175, GB301 8176, GB301 8177, GB301 8178, GB301 8179, GB301 8180, GB301 8181, GB301 8182, GB301 8183, GB301 8184, GB301 8185, GB301 8186, GB301 8187, GB301 8188, GB301 8189, GB301 8190, GB301 8191, GB301 8192, GB301 8193, GB301 8194, GB301 8195, GB301 8196, GB301 8197, GB301 8198, GB301 8199, GB301 8200. The diagram also shows a central shaft assembly with a pulley and a motor or actuator. The main body is a rectangular block with a central circular feature. The diagram is a technical drawing showing the exploded view of a mechanical assembly. It includes numerous callouts for various parts, such as bolts, nuts, washers, and structural components. The parts are labeled with part numbers and specifications, including GB70 M6x20, GB1155 8, GB301 8101, GB301 8102, GB301 8103, GB301 8104, GB301 8105, GB301 8106, GB301 8107, GB301 8108, GB301 8109, GB301 8110, GB301 8111, GB301 8112, GB301 8113, GB301 8114, GB301 8115, GB301 8116, GB301 8117, GB301 8118, GB301 8119, GB301 8120, GB301 8121, GB301 8122, GB301 8123, GB301 8124, GB301 8125, GB301 8126, GB301 8127, GB301 8128, GB301 8129, GB301 8130, GB301 8131, GB301 8132, GB301 8133, GB301 8134, GB301 8135, GB301 8136, GB301 8137, GB301 8138, GB301 8139, GB301 8140, GB301 8141, GB301 8142, GB301 8143, GB301 8144, GB301 8145, GB301 8146, GB301 8147, GB301 8148, GB301 8149, GB301 8150, GB301 8151, GB301 8152, GB301 8153, GB301 8154, GB301 8155, GB301 8156, GB301 8157, GB301 8158, GB301 8159, GB301 8160, GB301 8161, GB301 8162, GB301 8163, GB301 8164, GB301 8165, GB301 8166, GB301 8167, GB301 8168, GB301 8169, GB301 8170, GB301 8171, GB301 8172, GB301 8173, GB301 8174, GB301 8175, GB301 8176, GB301 8177, GB301 8178, GB301 8179, GB301 8180, GB301 8181, GB301 8182, GB301 8183, GB301 8184, GB301 8185, GB301 8186, GB301 8187, GB301 8188, GB301 8189, GB301

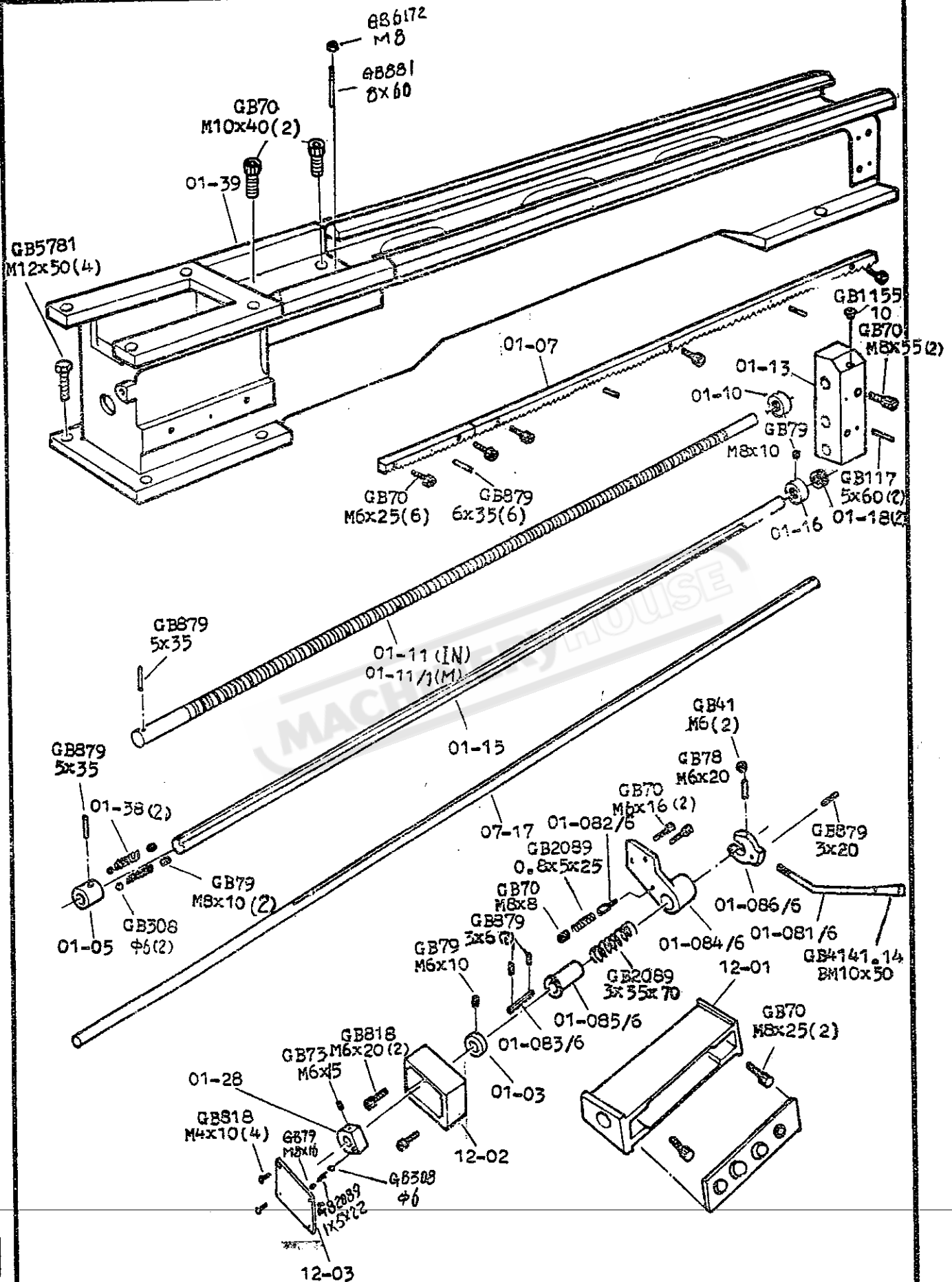
TOP SLIDE, TOOL POST



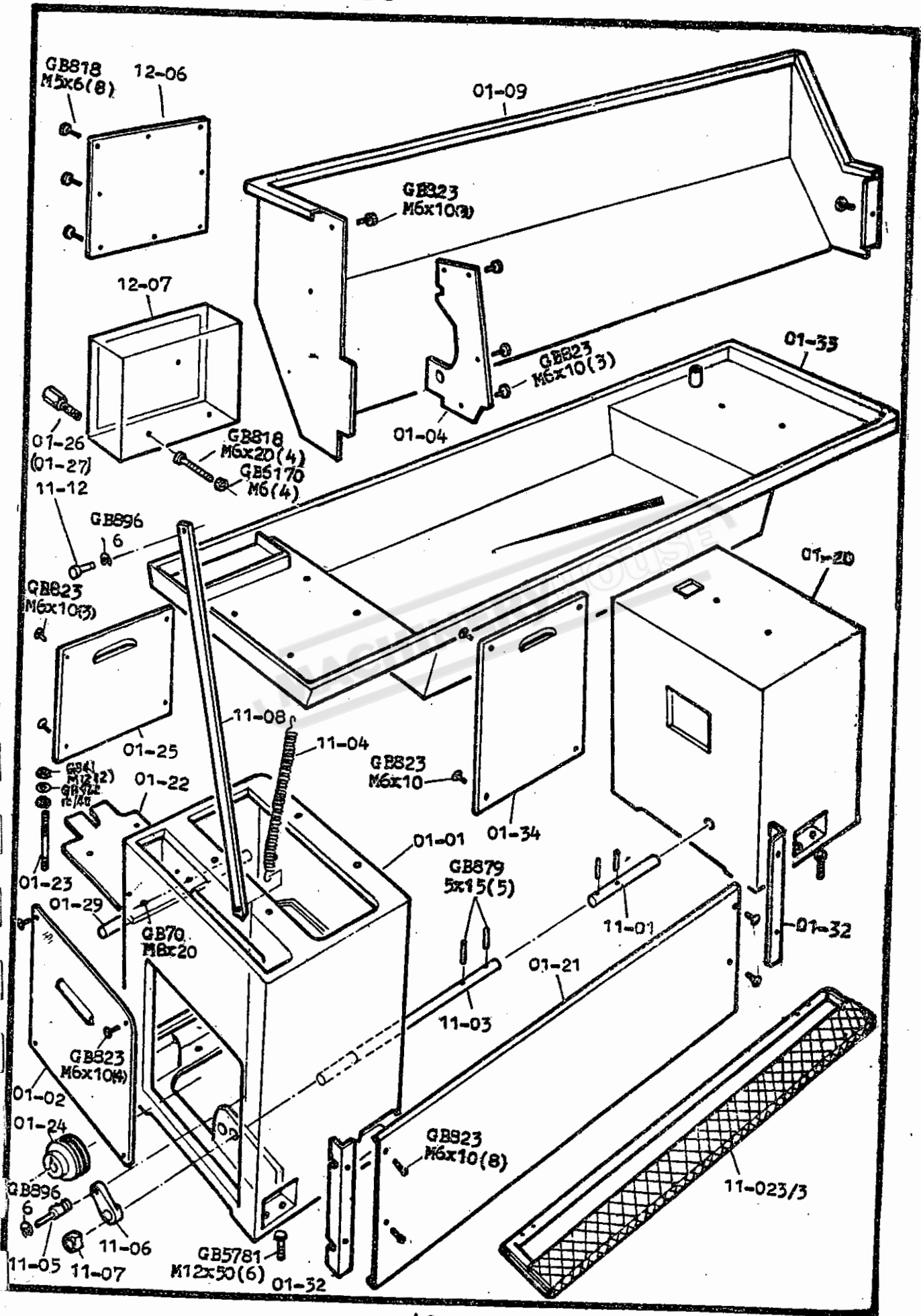
TAILSTOCK



BED & SHAFTS

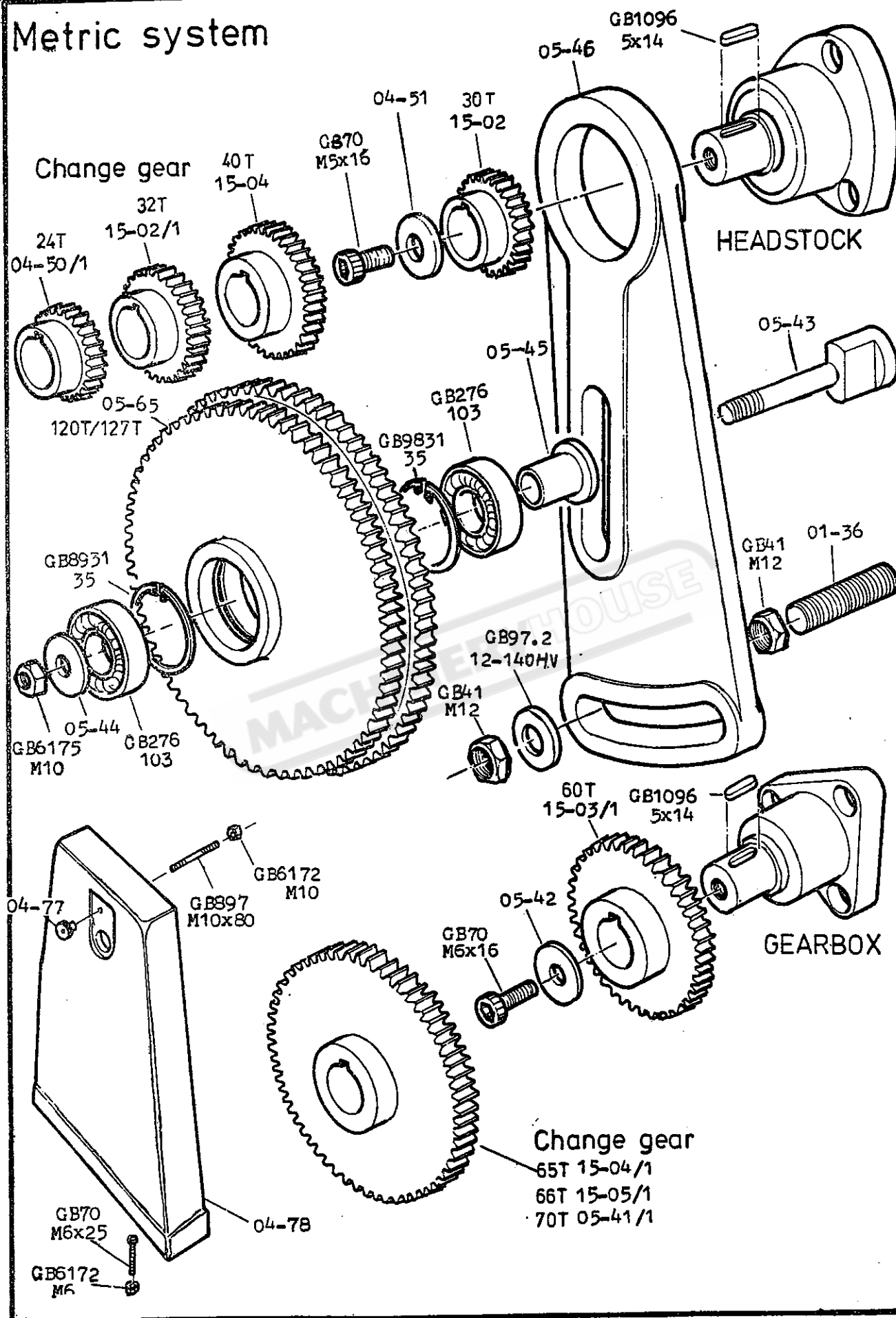


CABINET & PANELS



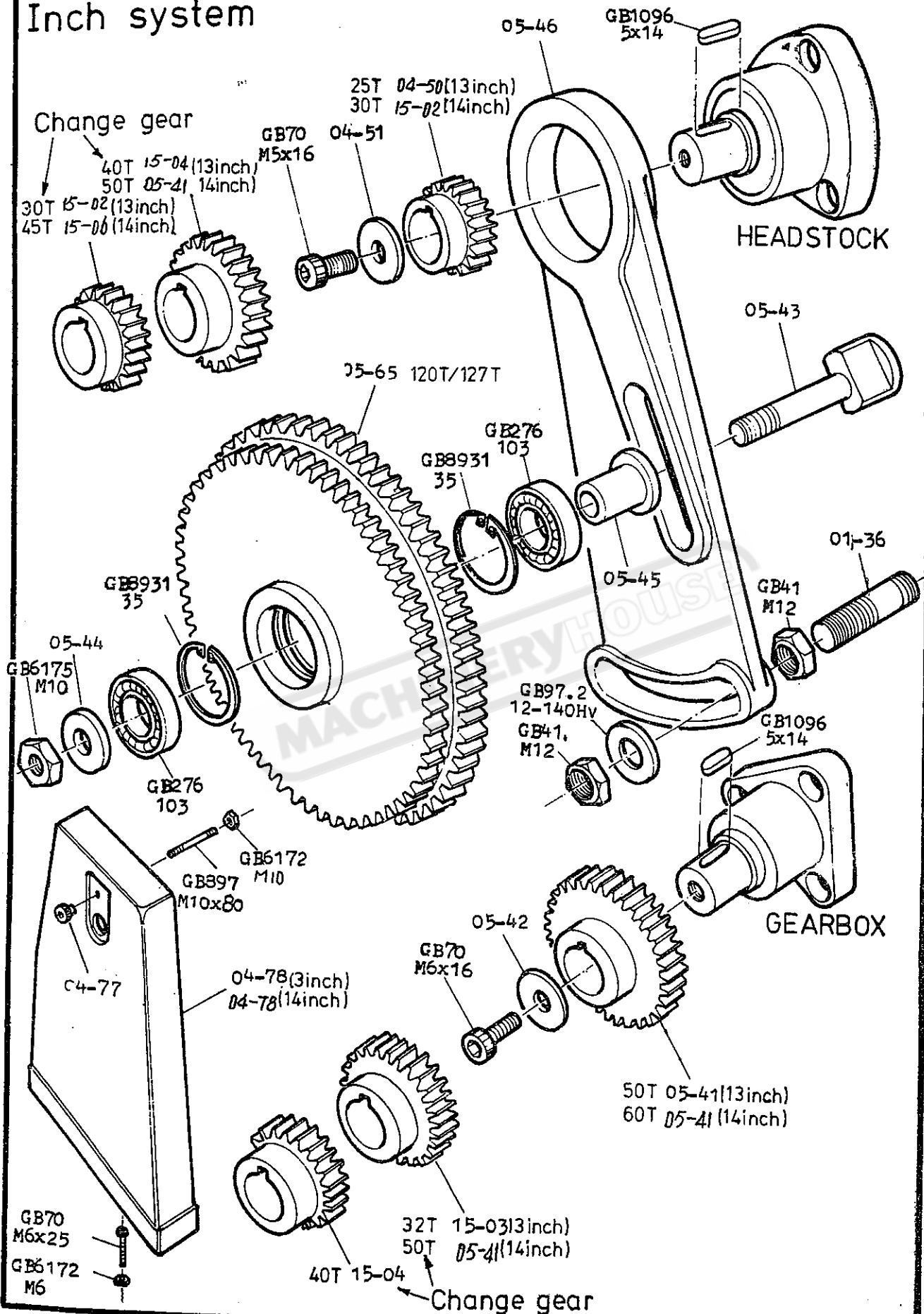
SWING FRAME, END GEARS & COVER

Metric system



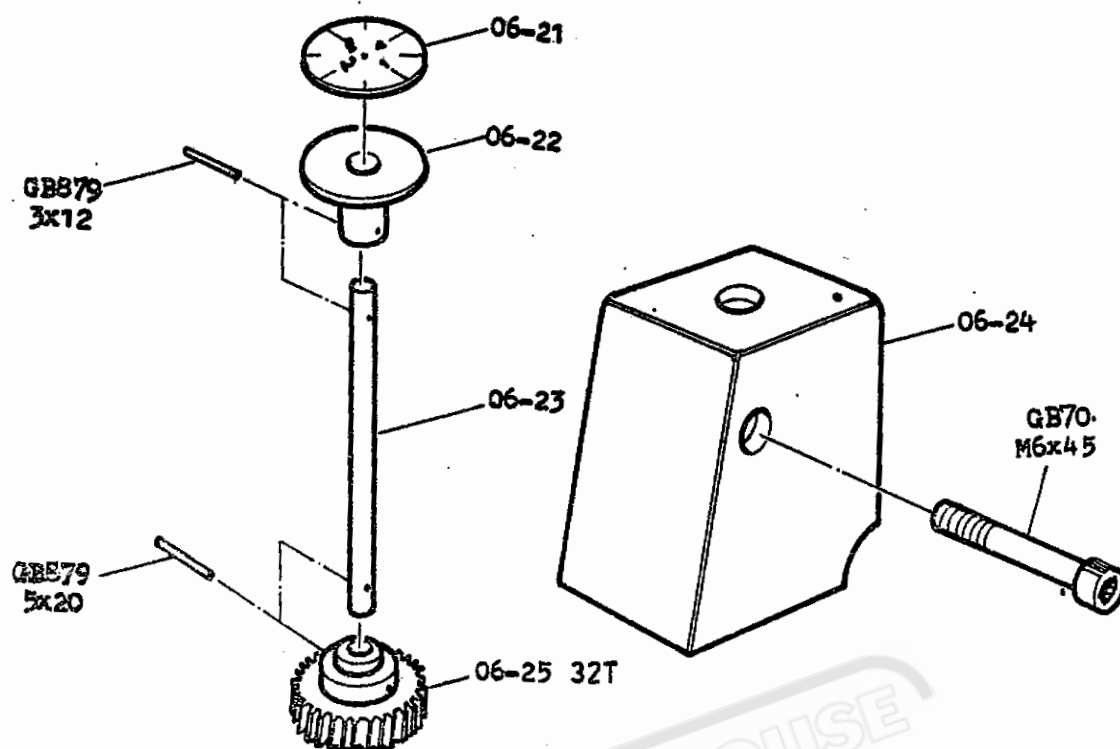
SWING FRAME, END GEARS & COVER

Inch system

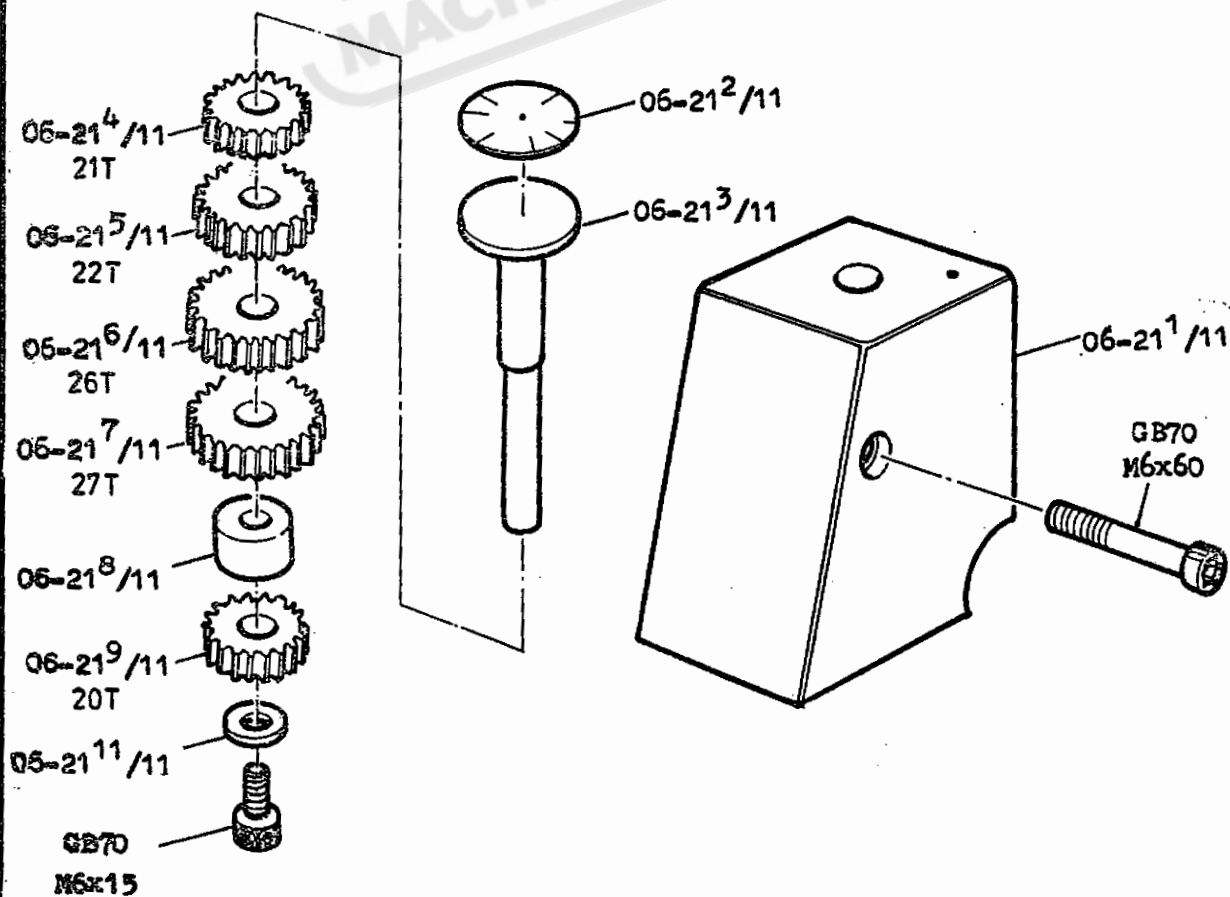


THREADING DIALS

INCH



MM



APPEARANCE INSPECTION SHEET

Machine Type :

Machine No:

Area	Inspection Item	Result		
		Good	fair	bad
Sand Casting	1. No sand hole.			
	2. No crack and discontinuity.			
	3. No deformation.			
	4. No sharp conner and edge.			
	5. Sands removed.			
Finished Surface	1. Flatness.			
	2. Smoothness.			
	3. No tool mark.			
	4. Chamfer.			
Connecting Surface	1. No gap.			
	2. No step.			
Fasteners	1. Bolts and screws.			
	2. Nuts.			
	3. Pins.			
	4. Keys.			
Assemblys	1. Gear mating.			
	2. Pulleys and belts.			
	3. Handles and levers.			
	4. Gages and indicators.			
	5. Switches.			
	6. Grommets.			
Painting	1. Smoothness.			
	2. Brightness.			
	3. No cracks.			
plating & Black finish	1. Smoothness.			
	2. Evenness.			
	3. No Peel-off.			

chief engineer:

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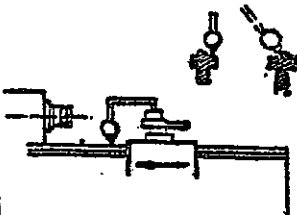
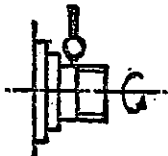
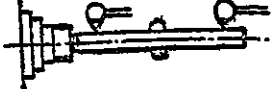
inspecting engineer:

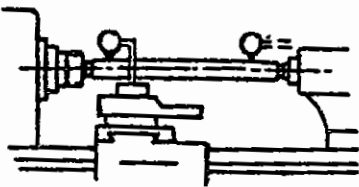
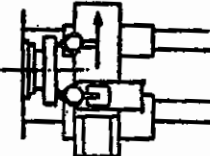
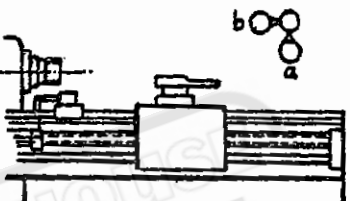
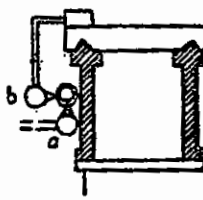
STATIC ACCURACY TEST

Machine Type :

Machine No:

Unit: mm

NO.	Inspection Item	Diagram of measuring method	Tolerance.	Inspection record
1.	Straightness of bed slide-ways.	a. Longitudinal direction (in vertical plane)	0.02 protruding	0.016
		b. Transverse direction (in vertical plane)	0.04/m	0.028
		c. Longitudinal direction (in horizontal plane)	0.01	0.006
2.	Parallelism of bed slideways		0.02	0.013
3.	Spindle nose runout		0.01	0.007
4.	Spindle taper hole runout		At fixed end of test bar : 0.01 At point of 300mm : 0.02	0.006 0.018

11.	Difference in centre height between headstock and tailstock.			0.02	0.01 b
12.	Squareness of motion of cross slide with centre line of main spindle.			0.02/300	0.015
13.	Parallelism centre line of lead screw end bearing to carriage slideways.	In vertical plane		0.10	0.02 b
		In horizontal plane		0.10	0.08
14.	Deviation in alignment of centre line of lead screw end bearing with centre line of half nut.	In vertical plane		0.15	0.15
		In horizontal plane		0.15	0.15
15.	Axial slip of lead screw.			0.01	0.006
16.	Accuracy of outside turning.	Roundness		0.01	0.008
		Cylindricity		0.02/300	0.015
17.	Accuracy of face turning.			0.02/300	0.01 b

chief engineer: C. M. X

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inspecting engineer: L. A. S