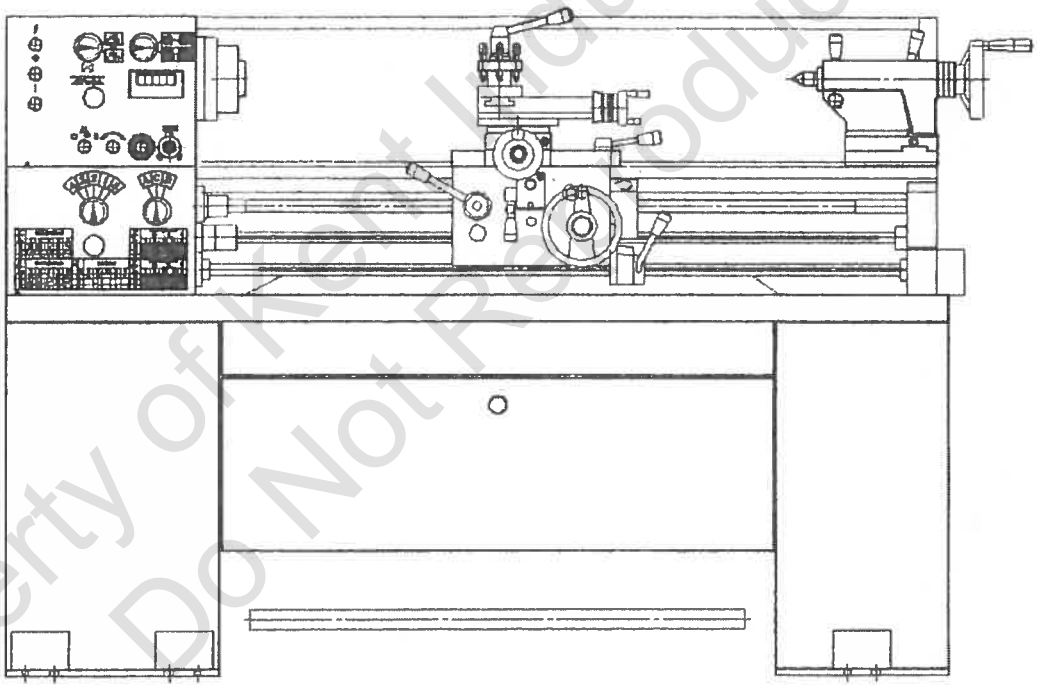
VARIABLE SPEED CHANGE LATHE

INSTRUCTION MANUAL AND PARTS LIST



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MODEL: 1224VS, 1236VS, 1340VS

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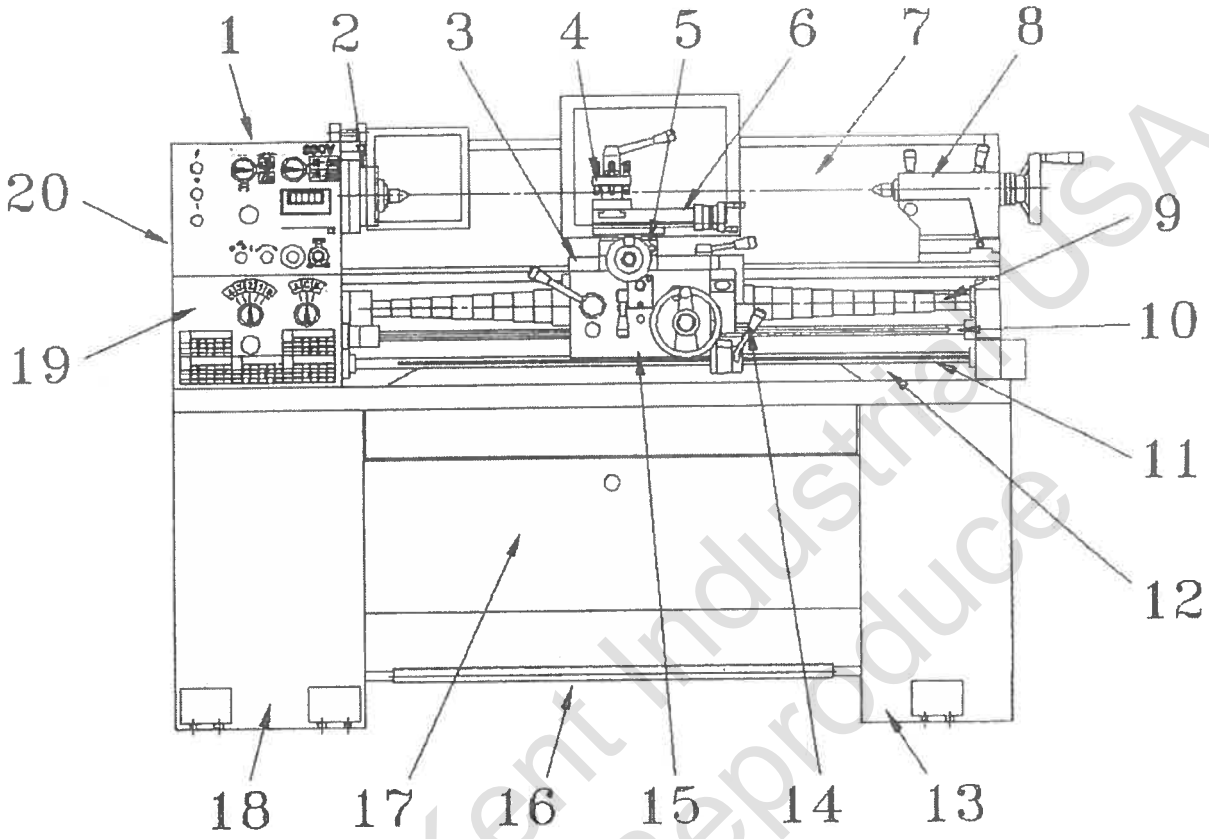
SPECIFICATION AND ACCESSORIES

GENERAL LAYOUT OF LATHE



1. Headstock
2. Spindle
3. Saddle
4. Toolpost
5. Cross-slide
6. Compount-rest (Top slide)
7. Splash Guard
8. Tailstock
9. Lead screw
10. Feed road
11. Switch control road
12. Bed
13. Stand
14. Spindle rotation lever
15. Apron
16. Footbrake
17. Cabinet (Tool box)
18. Head end stand
19. Geadbox
20. End cover

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BRIEF SPECIFICATION:

MODEL	1224VS	1236VS	1340VS
Swing over Bed	306mm 12in		330mm 13in
Swing over Cross Slide	186mm 7-5/16in		210mm 8-5/16in
Height of Center	150mm 6in		165mm 6-1/2in
Distance Between Centers	610mm 24in	915mm 36in	1000mm 40in
BED			
Width of Bedways	190mm 7-1/2inch		
Total Length of Bed Gap Type	1220mm 48in	1525mm 60in	1625mm 64in
Swing over Gap	445mm 17-1/2in		470mm 18-1/2in
Length of gap	240mm 9-1/2inch		
Width in front of face plate	150mm 6inch		
SPINDLE			
Spindle nose mounting	D1-4 Camlock		
Spindle bore	40mm 1-9/16inch		
Taper of spindle bore	M.T. #5		
Number of spindle speeds	Variable speed change		
Range of spindle speeds	40-2000 R.P.M.		
TOOL SLIDE			
Total travel of cross slide	170mm 6-3/4inch		
Total travel of top slide	90mm 3-1/2inch		
Max. size cutting tool	13mm 1/2inch		
TAIL STOCK			
Total travel of tailstock barrel	100mm 4inch		
Taper in tailstock barrel	M.T. #3		
Diameter of barrel	40mm 1-9/16inch		
THREADS			
Lead screw diameter & pitch	Dia. 22mm Pitch 4mm, 7/8inch 8TPI		
Inch threads	3-24 TPI (8Nos) for metric system 2-56 TPI (34Nos) for inch system		
Metric pitches	0.5-10mm (21Nos) for metric system 0.5-12mm (33Nos) for inch system		
FEEDS			
Feed rod diameter	Dia. 19mm 3/4inch		
Longitudinal feeds	0.0016-0.0460in/rev. (25) for inch system		
Cross feeds	0.0005-0.0150in/rev. for inch system		
MOTOR			
Main spindle motor	2HP 1.47KW		3HP 2.2KW
Coolant pump motor	1/8HP 0.1KW		
Machine net weight	500kgs	550kgs	600kgs
Machine gross weight	620kgs	670kgs	720kgs

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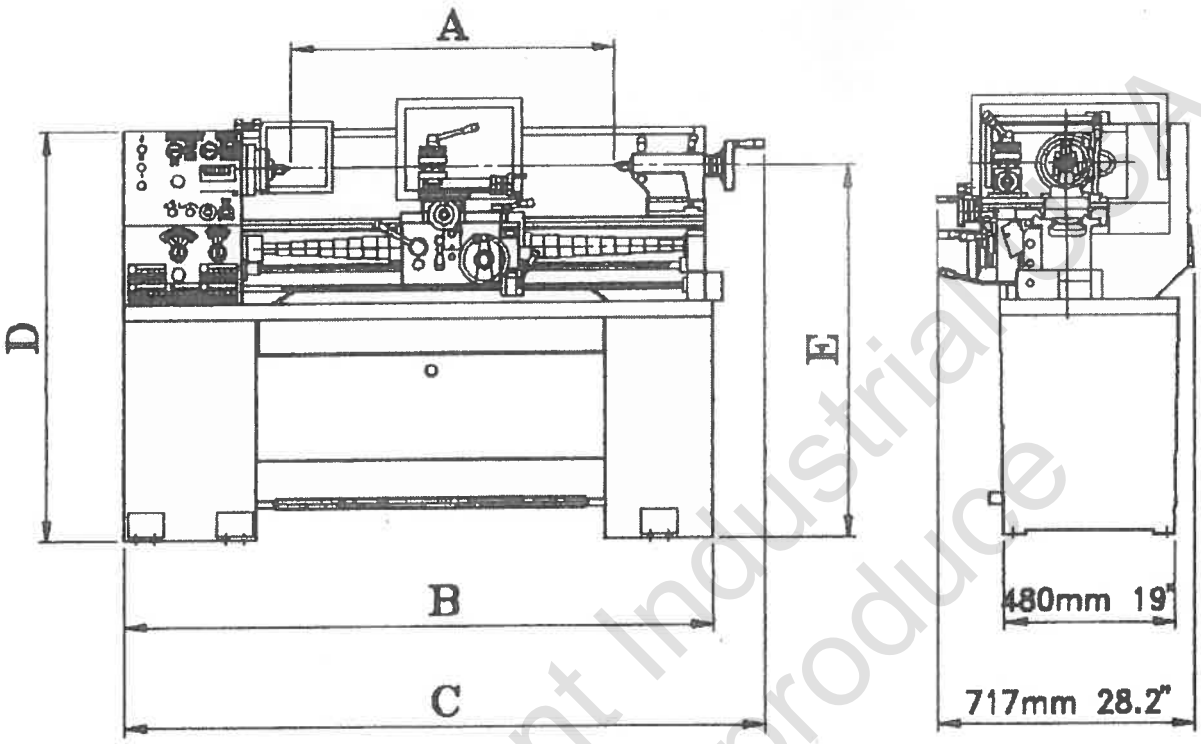
SPECIFICATION AND ACCESSORIES

MEASUREMENT



SIZE / TYPE	A	B	C	D	E
1224VS	610mm 24in	1335mm 52-1/2in	1480mm 58-1/4in	1150mm 45-1/4in	1043mm 41in
1236VS	900mm 36in	1640mm 64-1/2in	1785mm 70-1/4in	1150mm 45-1/4in	1043mm 41in
1340VS	1000mm 40in	1740mm 68-1/2in	1885mm 74-1/4in	1163mm 45-3/4in	1056mm 41-1/2in

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SPECIFICATION AND ACCESSORIES

STANDARD ACCESSORIES

Electrical equipment & Motor 3 Hp, 3 PH	1 set
Set of change gears	1 set
Center sieeve M.T.No. 5x3	1 pc.
Two centers M.T.No. 3	1 set
Threading dial indicator	1 set
Toolbox; set of spanners & Keys	1 set
4-ways turret toolpost	1 pc.
Toolpost wrench	1 set
6inch(150mm) dia. backplates	1 pc.

OPTIONAL ACCESSORIES

3-jaw scroll chuck 6inch (150mm)
4-jaw independent chuck 8inch (200mm)
Face plate 10inch (250mm)
Steady rest
Follow rest
Coolant pump equipment
Splash guard
Single carriage stop
Taper turning attachment
American toolpost
Micro carriage stop

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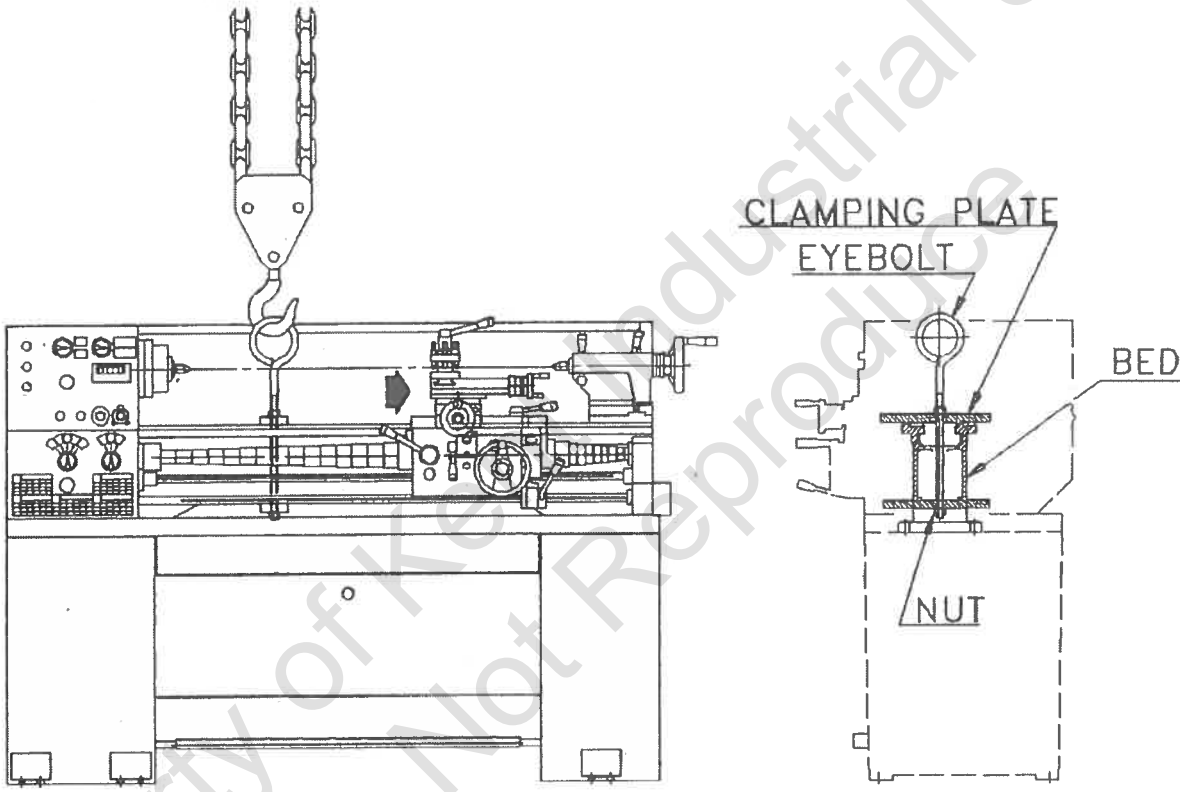
INSTALLATION

LIFTING

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

Raising and lowering the machine should be done carefully, especially when you lower the machine, be sure not to bump the machine against the floor.

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



CLEANING

Before operating and 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.

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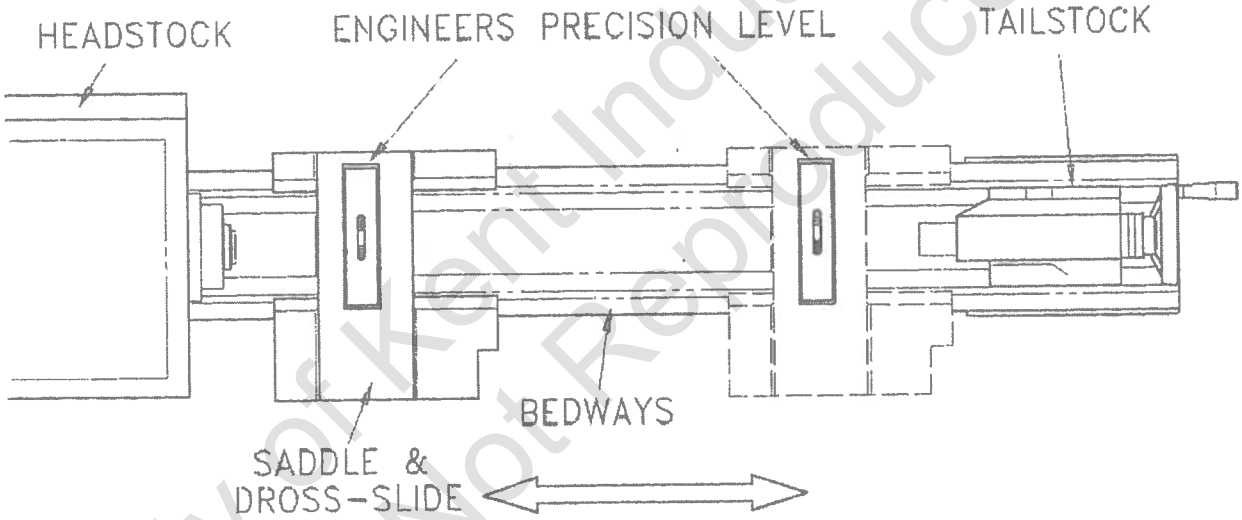
INSTALLATION

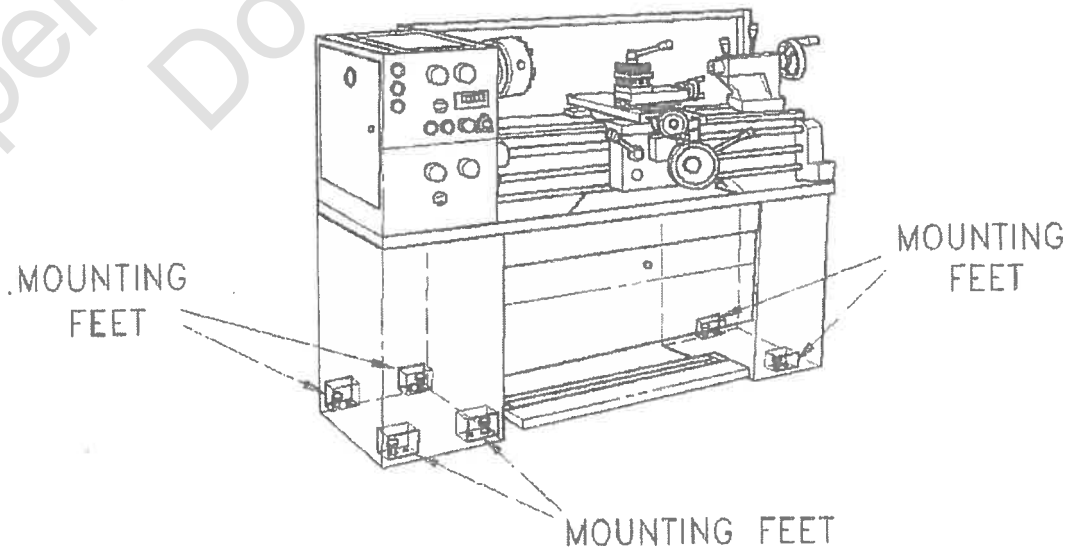
INSTALLING

Located the machine on a solid foundation, allowing sufficient area all round for easy working and maintenance (see Foundation Plan). The lathe maybe 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 Figure) adjust the feet to level up machine. Periodically check bed level to ensure continued Lathe accuracy.

Fixed installation: Position lathe over six bolts (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 Figure, then tighten hold-down bolts and recheck bed level.





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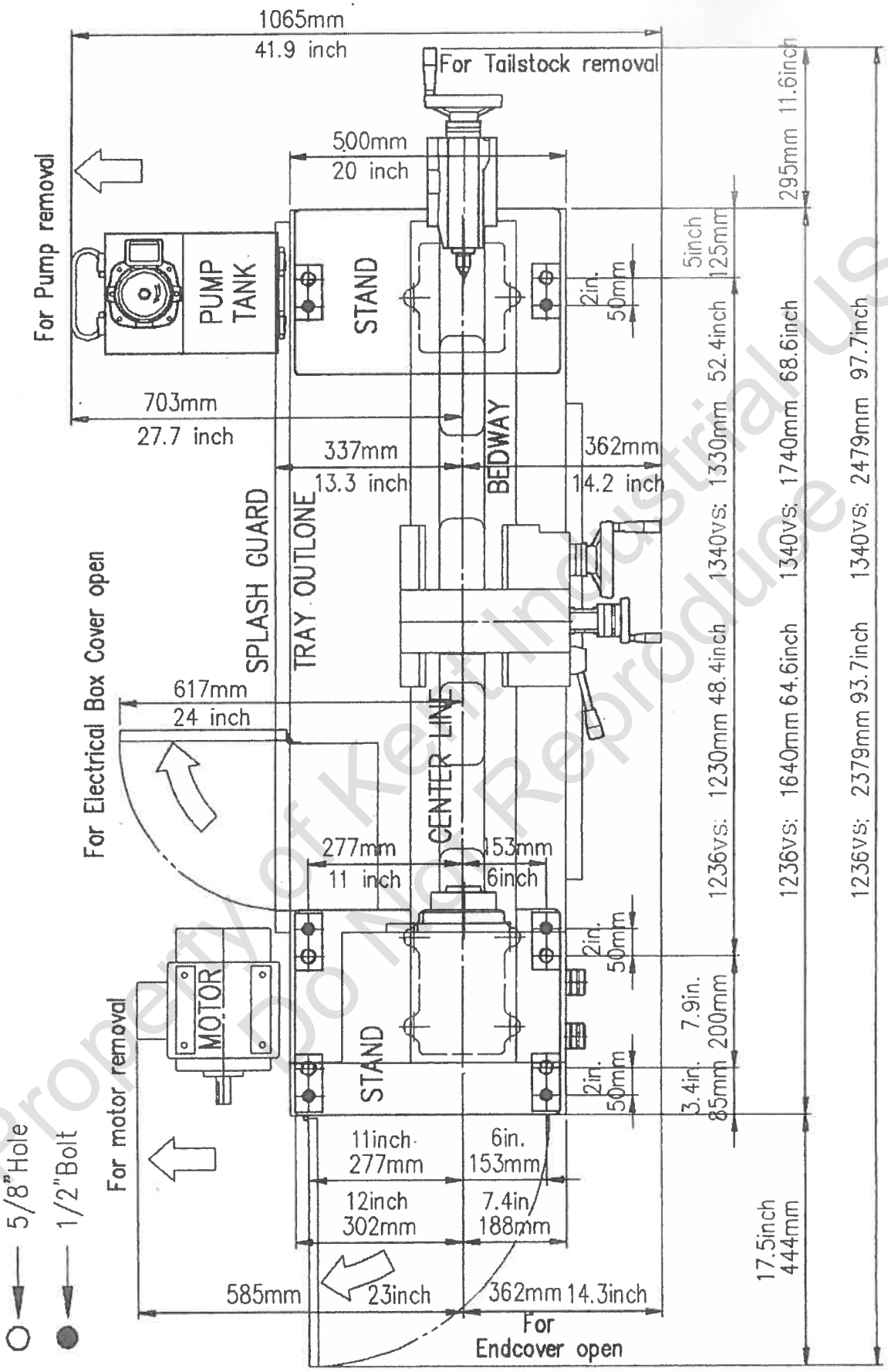
SPECIFICATION AND ACCESSORIES



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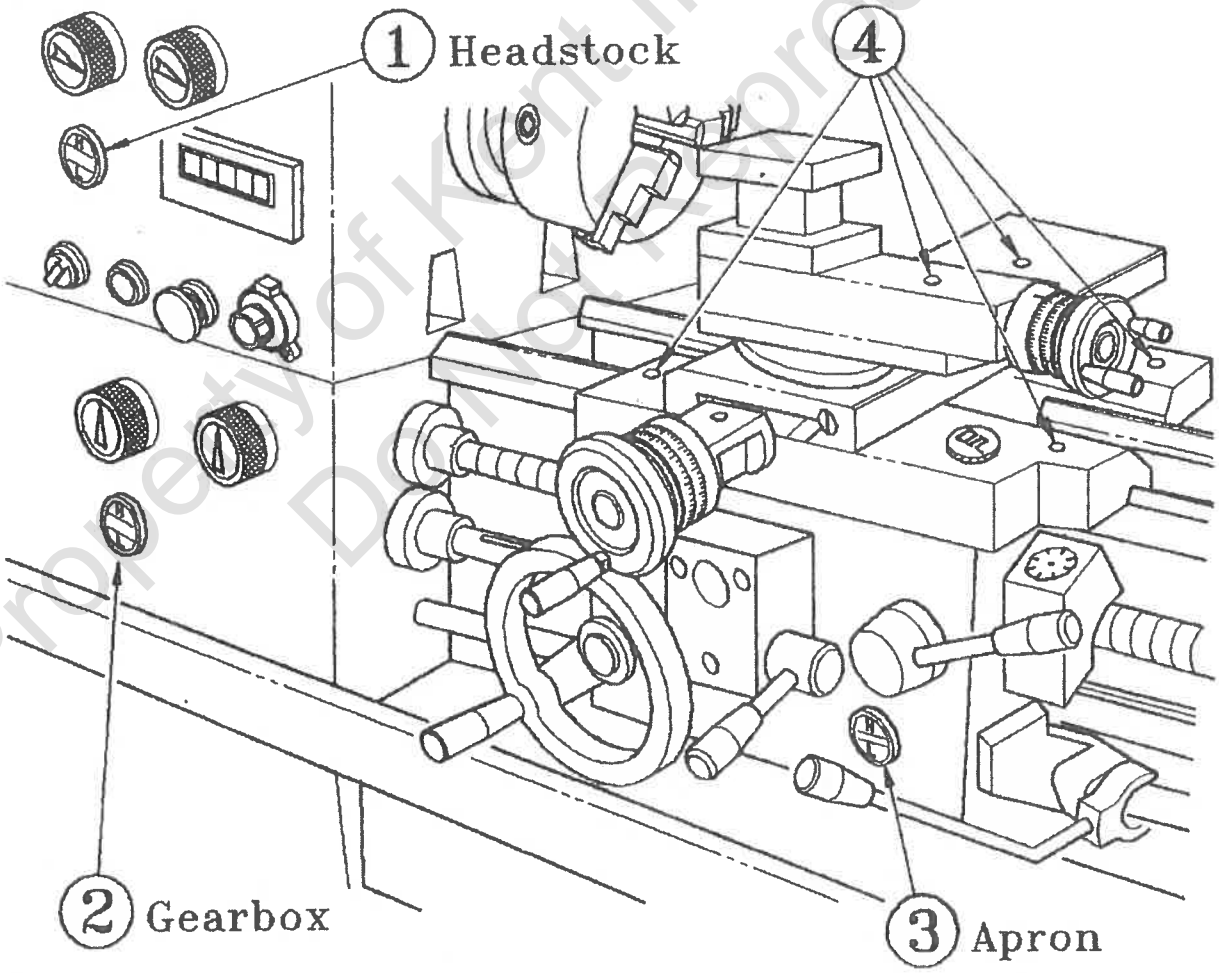
INSTALLATION

LUBRICATION CHECKS

Before operating the machine make the following important checks:

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



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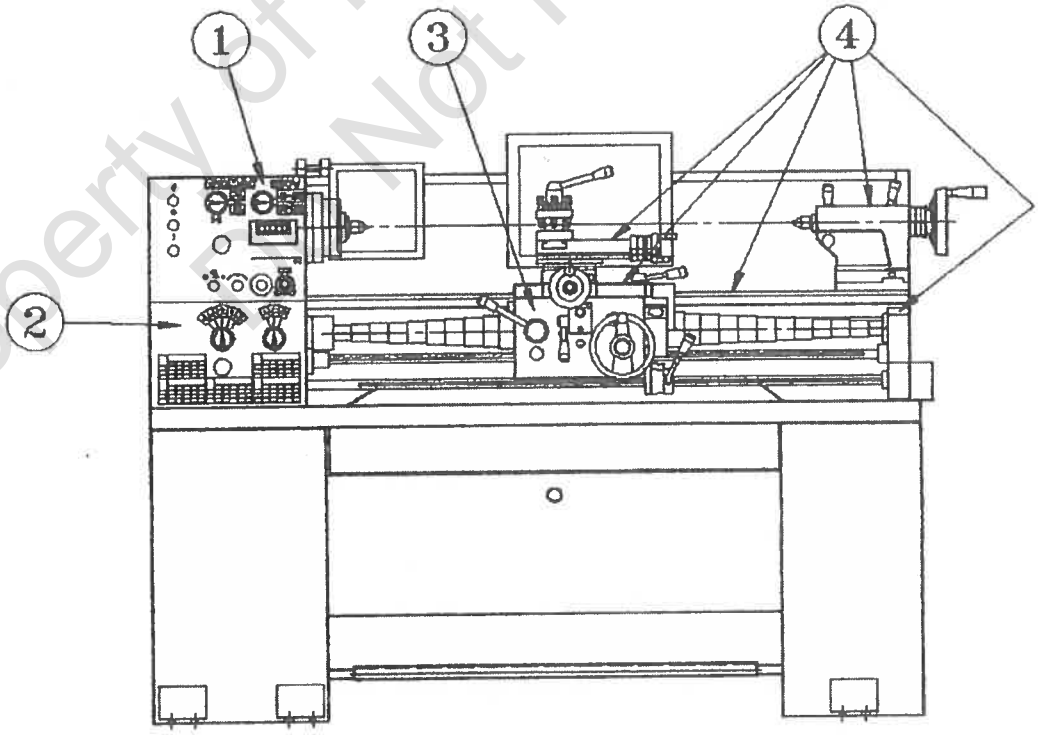
SERVICING AND MAINTENANCE

Part to be lubricated		① HEADSTOCK	② GEARBOX	③ APRON	④ SLIDE & TAILSTOCK
Recommendable 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		4.5 liter	1.5 liter	0.9 liter	
Make up	Interval	3 Month	3 Month	1 Month	1 Day
	Quantity	0.5 liter	0.5 liter	0.2 liter	A little
Exchange	Interval	1 Year	1 Year	1 Year	
	Quantity	4.5 liter	1.5 liter	0.9 liter	



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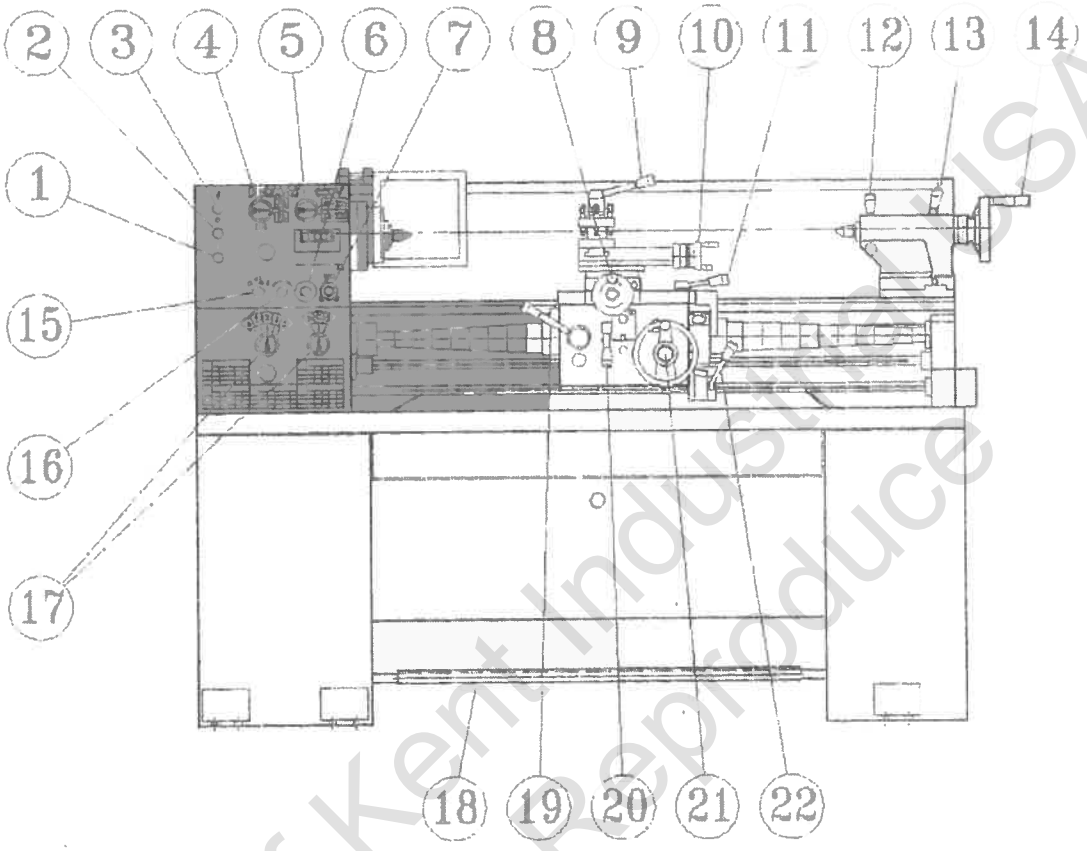
OPERATION

LATHE CONTROL



1. Power switch ON
2. Power switch OFF
3. Pilot lamp
4. Positive-Reverse lever
5. Spindle speeds selectors
6. Emergency stop switch
7. Variable speed selectors
8. Slide cross feed handwheel
9. Toolpost clamping lever
10. Top slide handwheel
11. Saddle clamping lever
12. Tailstock barrel clamping lever
13. Tailstock clamping lever
14. Tailstock handwheel
15. Coolant pump ON/OFF button
16. Inching button
17. Threads and feeds selectors
18. Foot brake
19. Thread cutting half-nut lever
20. Automatic feed lever
21. Apron longitudinal feed handwheel
22. Spindle rotation (Forward and Reverse)

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INSTALLATION

CHUCKS AND CHUCK MOUNTING

When mounting chucks or faceplate, first, ensure that spindle and chuck tapers are scrupulously clean and that all cams lock in the correct positions, see Fig. 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 slot lining up with the locking screw hole (see Fig)

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 makes 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 FACEPLATES BETWEEN LATHES WITHOUT CHECKING FOR CORRECT CAM LOCKING BEFOREHAND.

IMPORTANT: Take careful note of speed limitation when using faceplate; 10 inch faceplates should not be run at speeds greater than 1000 rev/min. and 12" faceplate at not more than 770 rev/min.

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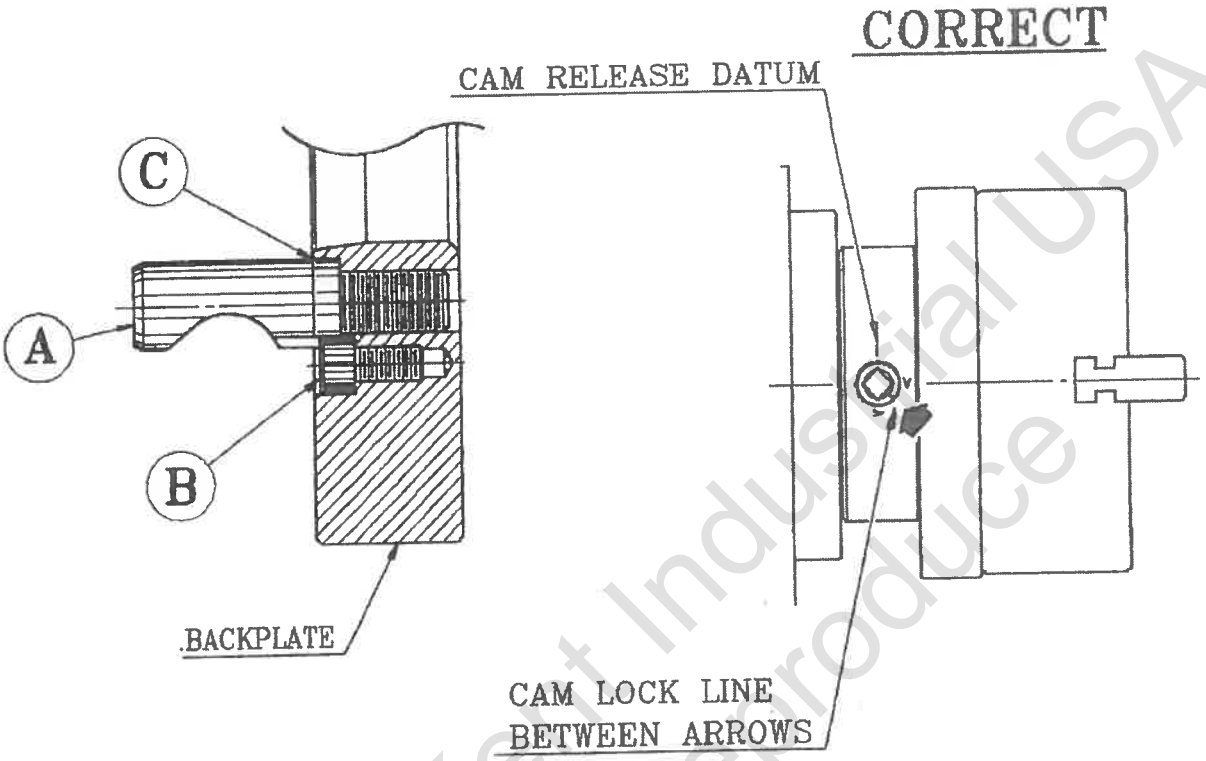
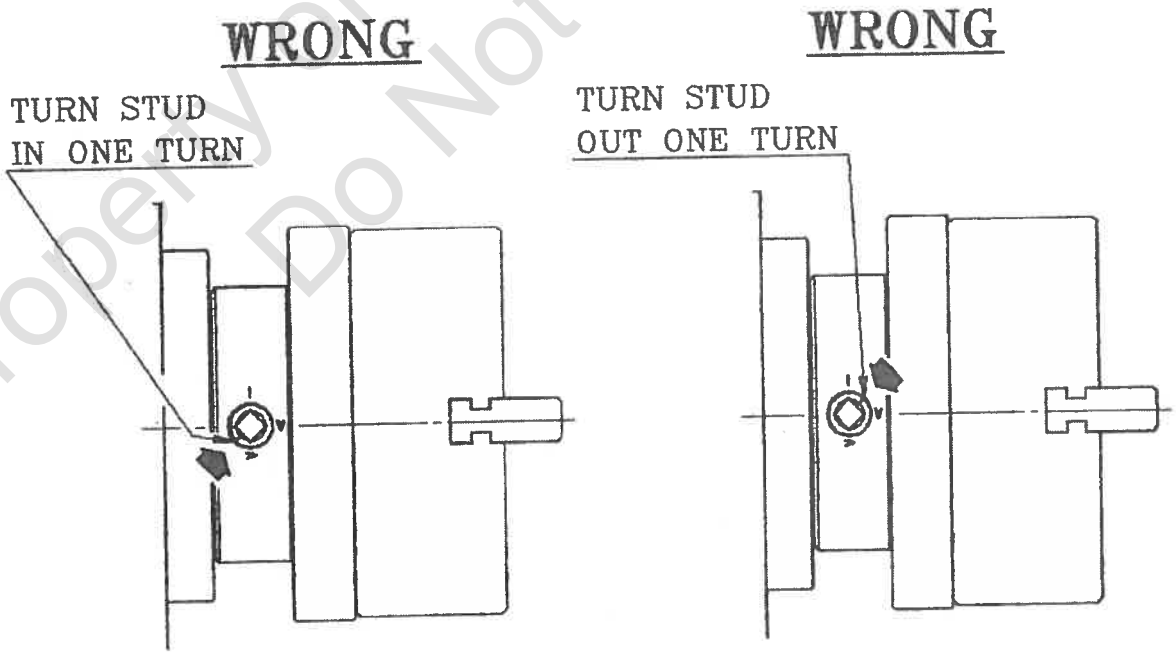
INSTALLATION

CHUCKS AND CHUCK MOUNTING





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OPERATION

ELECTRICAL CONTROLS

The Main power switch are fitted on the front of Electrical box behind the Lathe (Head-end)

All electrical controls are fitted to the front face of the Headstock and the top of Electrical box on the top of Headstock.

(1),(2),POWER SWITCH BUTTON: when push the power switch button red color (1) on the top of headstock, the pilot lamp (3) glows and the electricity is on. When push the power switch green color (2). the electricity is off.

(3) PILOT LAMP: When power is on, the pilot lamp glows.

(4) EMERGENCY STOP SWITCH: press the RED mushroom-head button to stop electric power, to stop the main motor and coolant pump.

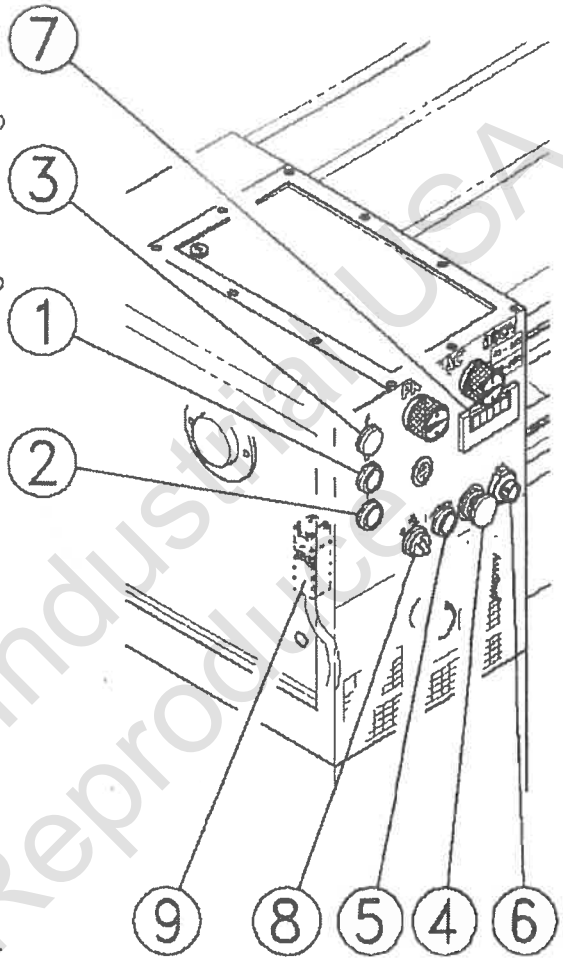
(5) INCHING: Press the GREEN button to move spindle slightly, it will make spindle speed selection very easy. (While the spindle rotation lever is set in the neutral position)

(6) VARIABLE SPEED SELECTORS: adjusting spindle speed.

(7) Spindle speed chart.

(8) Coolant pump ON/OFF swithch.

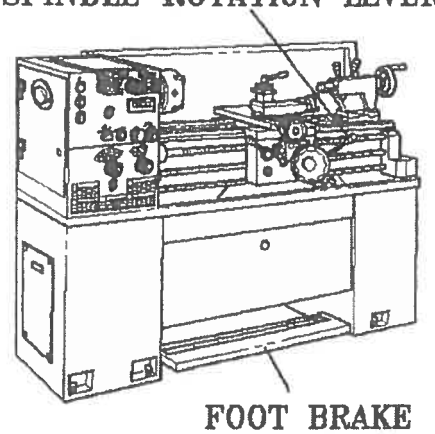
(9) End cover switch: While operator openend cover door for adjustment or main-tenance, it will stop automatically allrotation movement.



MAIN MOTOR CONTROLS

A. Main motor rdtation: Selected by the lever controls (The located on right-hand side of the Apron). Move lever out and upward to engage forward rotation of spindle, or out and down to engage reverse rotation. or re-turned to the central position to disengage drive.

B: Foot brake: A foot pedal between plinths operates the spindle brake.



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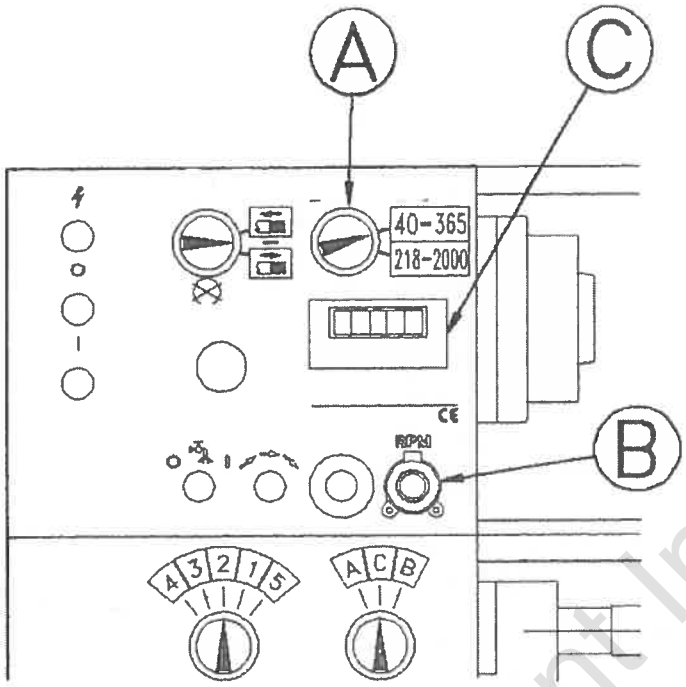
OPERATION

SPINDLE SPEED SELECTORS

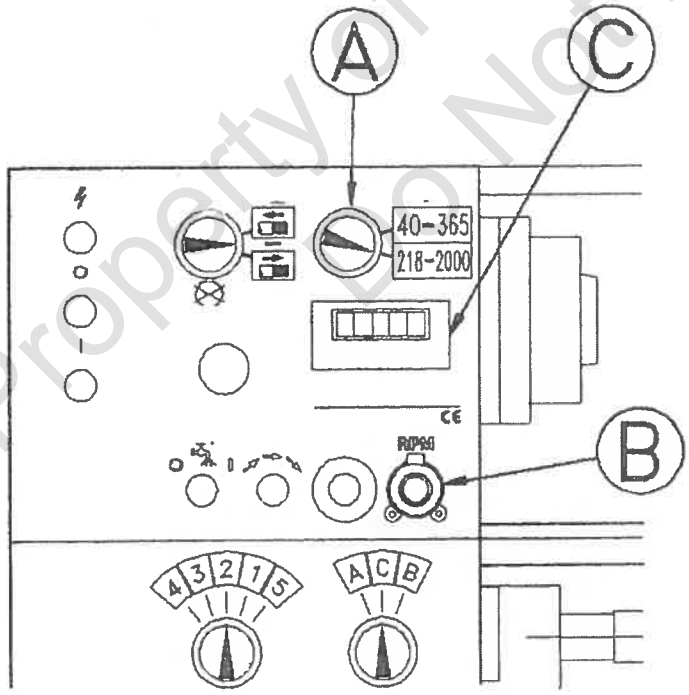
LOWER SPEED (40–365RPM)



Main spindle can be variable controlled, from 2000 RPM to 40 RPM, divided into two groups, HIGH SPEED 2000–218 RPM, and LOWER SPEED 365 – 40 RPM.

Firstly, put the upper right-hand Handle(A) on the Headstock to needed speed range.
(Note: DON'T CHANGE HANDLE'S POSITION WITH SPINDLE IN MOTION. SPINDLE MUST BE MOTIONLESS WHEN CHANGE HANDLE'S POSITION)
Then, adjust Variable Speed Selectors(B) to needed spindle speed.
Selectors(B) can change speed while spindle is rotating.

HIGH SPEED (218–2000RPM)



Spindle Speed Chart(C) equiped on the face of the Headstock shows the RPM while spindle rotating.

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OPERATION

THREADS AND FEEDS

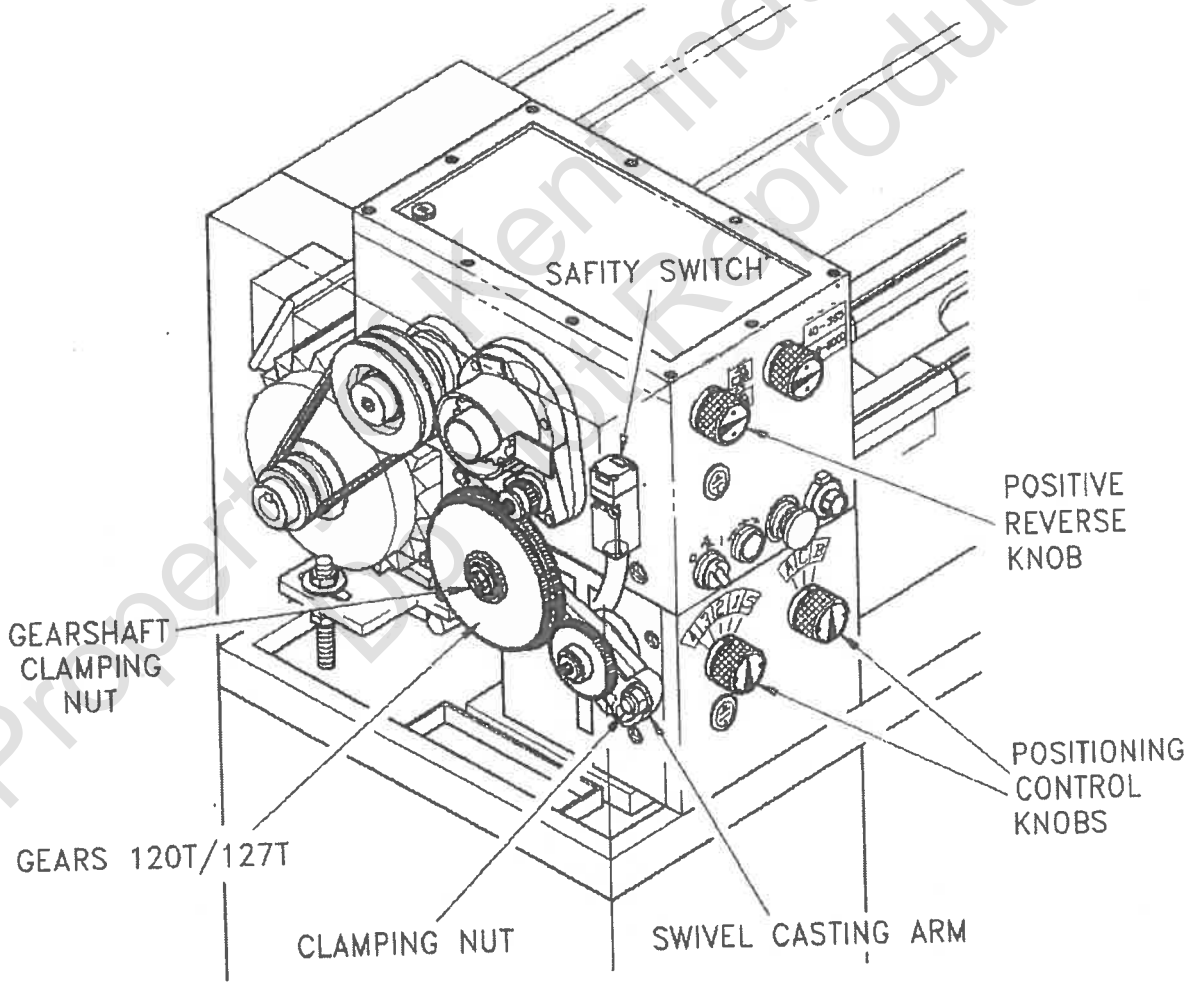
All the threads and feeds directly available from the gearbox are show on the data plate fitted on the front of the Gearbox cover, with the setting of control levers.

Threads and feeds direction can be changed by Positive–Reverse Knob on the headstock, and positioning control Knobs and Levers on the gearbox.

The end gear train should be arranged as in the diagrams show on the data plate to suit threading requirements.

Loosen the clamping nut of swivel casting arm to exchange the transmission shaft gear with another gear, and to adjust clutching in screw cutting work as well as in feed work. Change of driven gear is made by loosening the 120T and 127T gears shift clamping nuts. Suitable backlash is necessary to intermediate the gear in booth cases.

P.S. Limit switch equipped in the lower–right side, while operator open End cover to permute change–gear, in order to protect operator's safty, all the machine movement will be stopped automatically.



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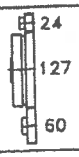
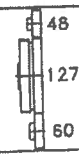
OPERATION

THREADS AND FEEDS

Leadscrew pitch: 4 mm



	METRISCH/METRIQUE				
	1	2	3	4	5
A	0.5	0.6	0.7	0.8	1.0
B	1.25	1.5	1.75	2.0	2.5
C	2.5	3.0	3.5	4.0	5.0



	METRISCH/METRIQUE				
	1	2	3	4	5
A	1.0	1.2	1.4	1.6	2.0
B	2.5	3.0	3.5	4.0	5.0
C	5.0	6.0	7.0	8.0	10.0

	ZOLL/POUCE				
	1	2	3	4	5
A	24	20		15	12
B		8		6	
C		4		3	

	VORSCHUB/VITESSES MM 1/1 1/2				
	1	2	3	4	5
A	0.040	0.048	0.056	0.064	0.080
B	0.100	0.120	0.140	0.160	0.200
C	0.200	0.240	0.280	0.320	0.400

	VORSCHUB/VITESSES MM 1/1 1/2				
	1	2	3	4	5
A	0.080	0.096	0.112	0.128	0.160
B	0.200	0.240	0.280	0.320	0.400
C	0.400	0.480	0.560	0.640	0.800

Number of Metric pitches:

21

Range of Metric pitches:

0.5–10 mm

Number of Inch pitches:

8

Range of Inch pitches:

3–24 mm

Number of feed change:

21

Range of longitudinal feeds:

0.040–0.080 mm/rev.

Range of cross feeds:

0.020–0.400 mm/rev.

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OPERATION

THREADING DIAL INDICATOR

A. Metric threads

The thread dial used for cutting metric screw threads on lathes equipped with metric leadscrew. To provide for the variouspitches of metric threads, several gears having different numbersof teeth are mounted on the lower endof the shaft. The verticalposition of the thread dial indicator is changed asrequired so that the correst gear for the pitch of the thread to be cut will mesh with the leadscrew.

Each guaduation 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.

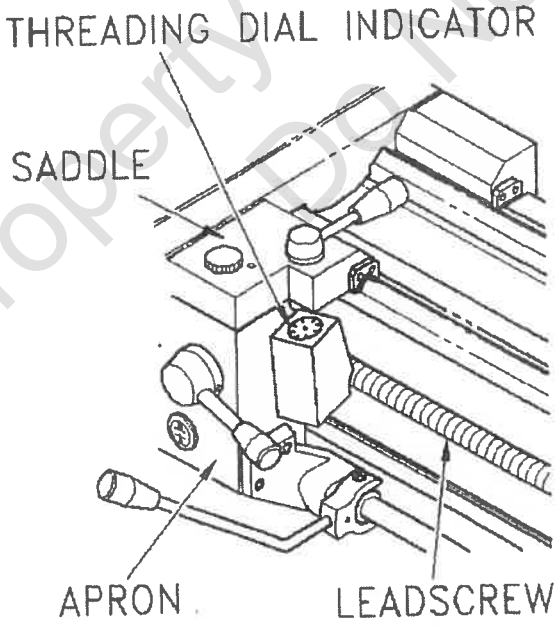
This dial cannot be used with an Metric leadscrew to cut Inch metric threads. For these the leadscrew nut must be kept closed and the machine reversed by use of the Changeover switch, after each cutting pass and tool with drawal.

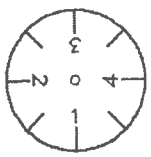
B. Whitworth threads

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 theleadscrew 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 1/2 or 1/4 t.p.i. may be cut by closing the nut at the SAME numbered line on each pass of the tool.

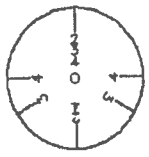
This dial cannot be used with an English leadscrew to cut metric threads, or fractional threads. For these the leadscrew nut must be kept closed and the machine reversed by use of the Changeover switch, after each cutting pass and tool with drawal.





WHITWORTH THREAD DIAL							
TPI	↓	TPI	↓	TPI	↓		
4	1-8	12	1-8	38	1-8		
4½	1-8 2-4	13	1-4	40	1-8		
4½	1	14	1-8	44	1-8		
5	1-4	16	1-8	48	1-8		
5½	1-8 2-4	18	1-8	52	1-8		
6	1-8	19	1-8	56	1-8		
6½	1-8 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	1-8 2-4	28	1-8	88	1-8		
10	1-8	32	1-8	96	1-8		
11	1-4	36	1-8	104	1-8		

LEADSCREW PITCH 8T.P.I.



METRIC THREAD DIAL					
PC	↓	↓	PC	↓	↓
0.4	20	4	1.4	21	3
0.45	27	3	1.5	21*	3
0.5	20	4	1.625	28	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			

LEADSCREW PITCH 4MM

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OPERATION

APRON CONTROLS

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

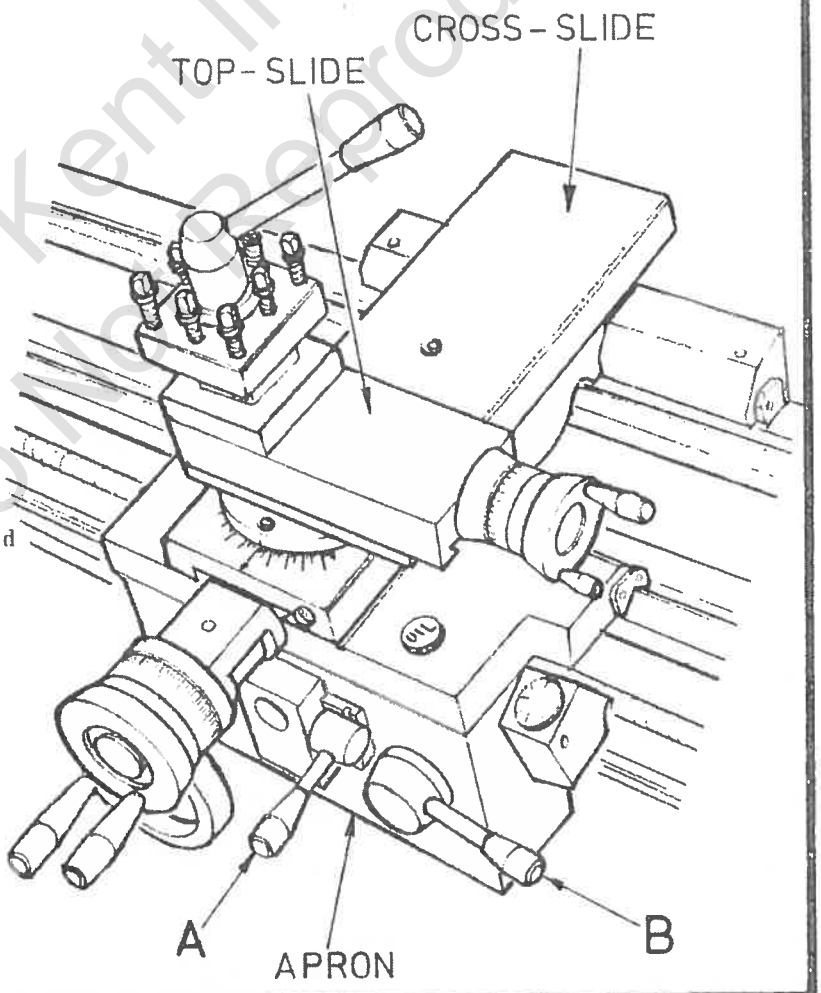
Lever (B) is pressed downward to engage the leadscrew nut for screw-cutting. To avoid undue wear, release the nut except when screwcutting. An interlock within the apron prevents in advertent engagement of automatic feed lever (A) and half nut lever (B) at the same time.

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 division to suit the operating screw and nut fitted.

The cross-slide can be power operated by pulled downward the automatic feed lever at half sliding feed per spindle revolution, or if can be hand-operated using the large-diameter dial graduated in either inch or metric divisions to suit the operating screw and nut fitted.



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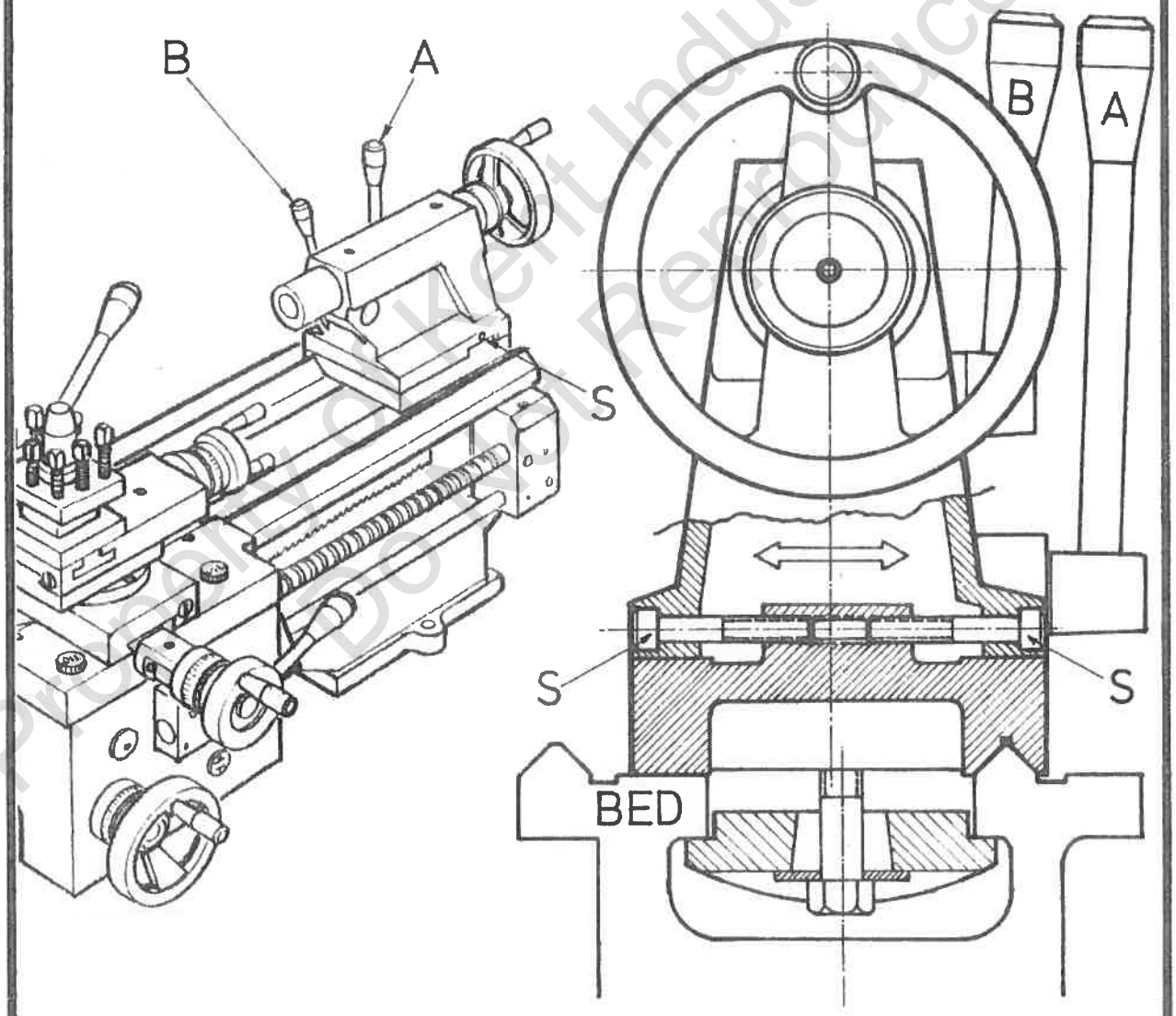
OPERATION

TAIL STOCK

Can be freed for 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-aligment. Release the clamping lever(A) and adjust screws (S) at each side of the base to move Tailstock laterally across the base. Retightening and checking after adjustment of set over.



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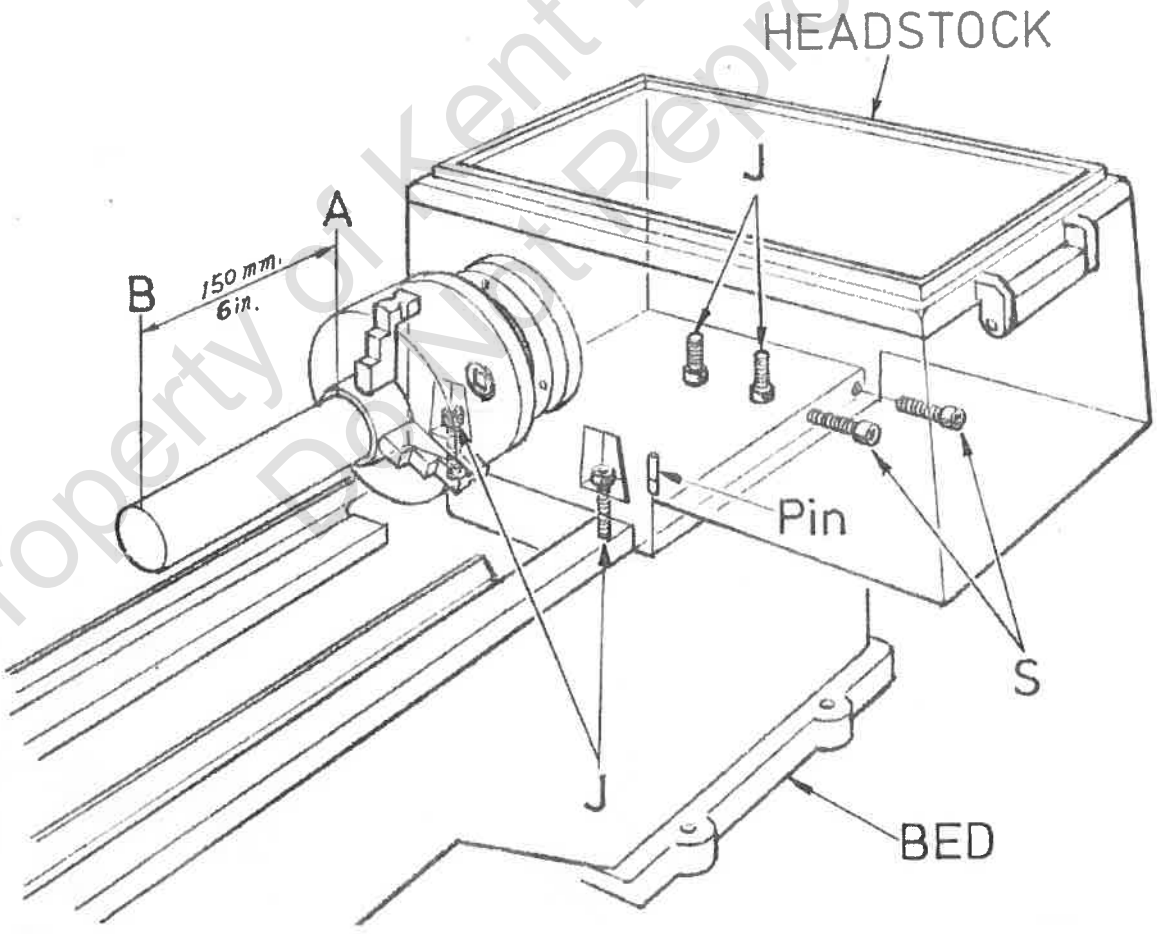
LATHE ALIGNMENT (Part. 1)

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

A. Headstock check

Take a light cut with a keen tool over a 6in. (150mm.) length of 2in. 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) should be the same.

To correct a difference in readings, lossen the four headstock hold-down screws (J) and adjust the two adjecting screws (S) beneath the headstock, then tighten all screws, after adjustment and repeat the test-cut/micrometer-reading, sequence until micrometer readings are indentical, so machine now cutting absolutely parallel.



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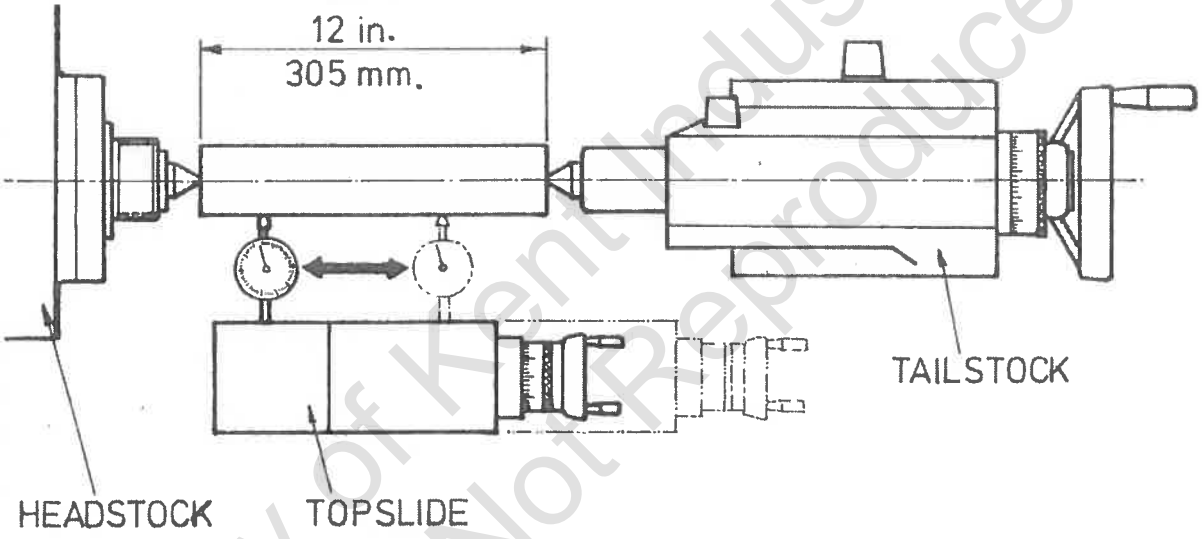
SERVICING & MAINTENANCE

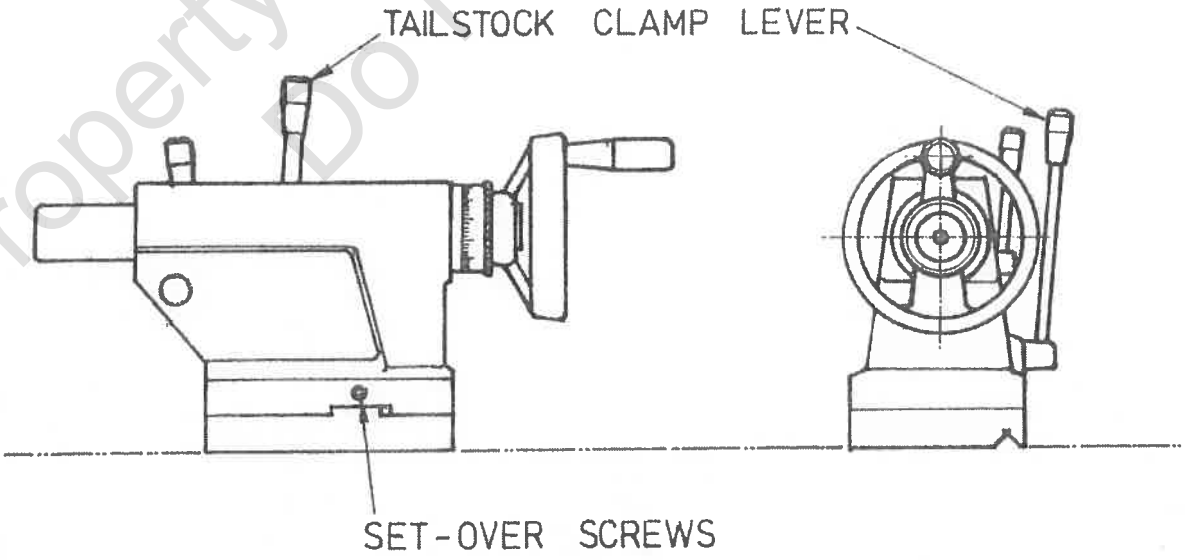
LATHE ALIGNMENT (Part. 2)

B. Tailstock check

Using a 12in. (305mm.) ground steel bar fitted between headstock and tailstock centers, check the alignment by fitting a dail-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 continue with checking and correction until the alignment is perfect.





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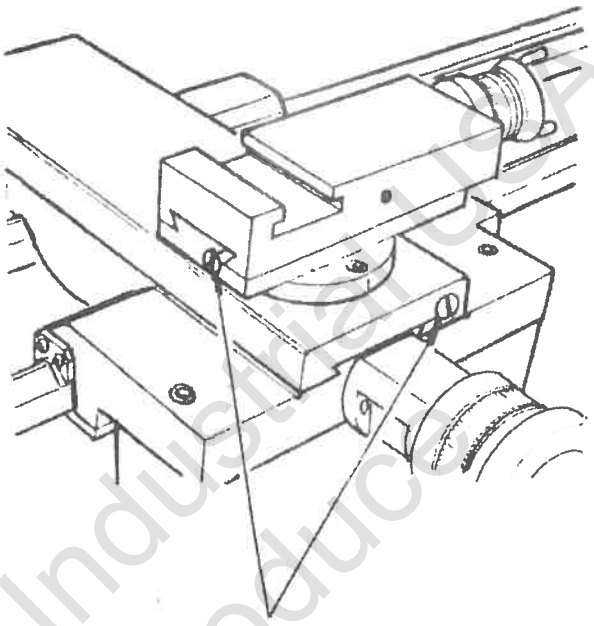
SLIDE WAYS ATTENTION

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.

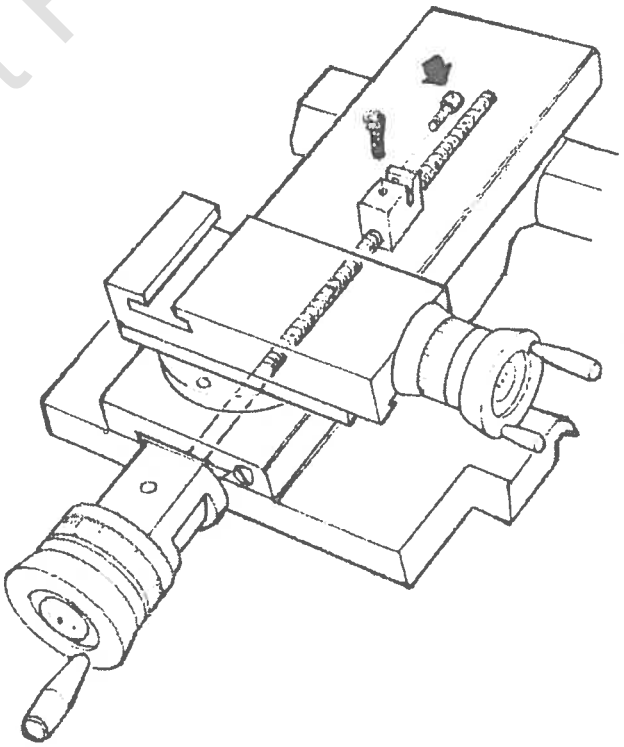
Ensure that slideways are throughly cleaned and lubricated before attempting adjustment. Then reset the gibs by slackening the rear gib screw and tightening the front screw, a little at a time. Check constantly for smooth action throughout full slide travel; avoid overadjustment which can result in increased 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 rear of the nut, then make only small adjustment by the cap-head screw. Before operating the cross-slide several times by hand to be sure of smooth operation throughout travel.



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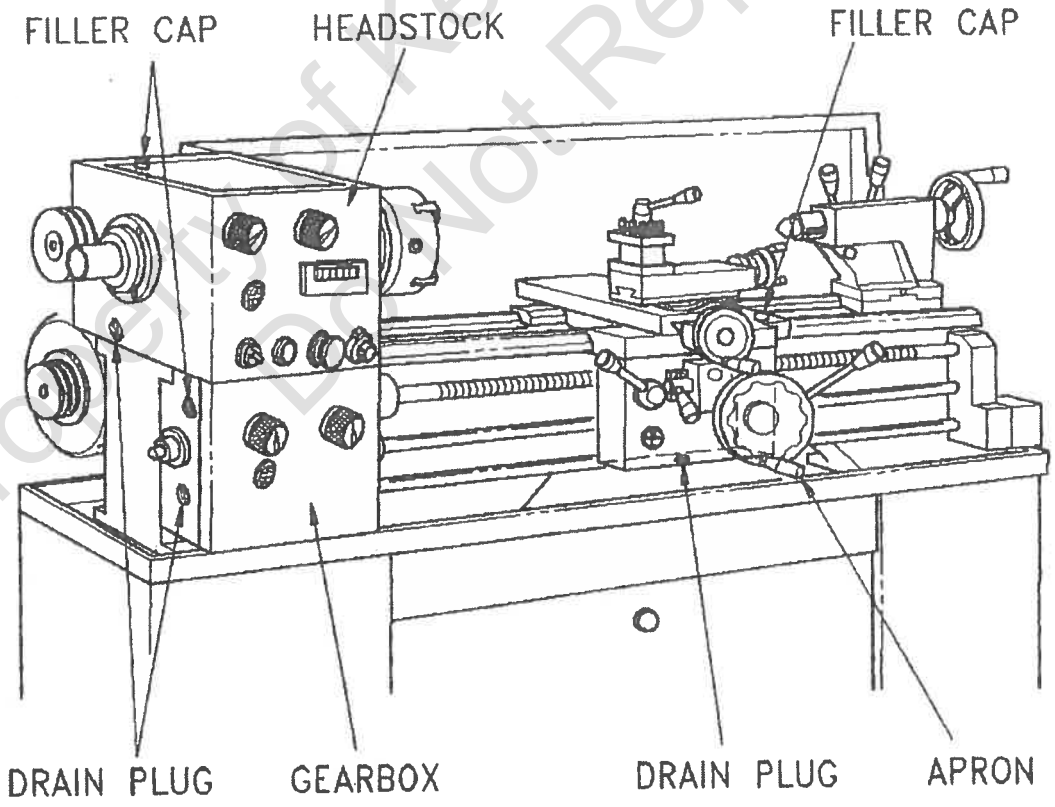
SERVICING AND MAINTENANCE

LUBRICATION (Part.1)

Headstock bearing and gears are splash lubricated. Ensure that oil lever is kept between H-L lever mark on the sight glass in the front of head-stock. After long time of operation, when the headstock lubrication oil becomes unclean, it should be drained out to refill fresh lubrication oil.

To change oil in headstock, set apron control lever to central position and stop the main motor. Unscrew the drain plug beside headstock, then the oil tank can be easily drained out for changing oil. A filler plug is fitted beside the left end of headstock accessible after removal of the end guard.

The gearbox and apron are splash-lubricated form an internal reservoir of oil. Check the oil level constantly to the mark on the oil sight window at the right side face of the gear box; a weekly check is recommended, with the oil changed every year. Fill oil through a filler cap in the top of the gearbox, enclosed by the end-guard. Drain from a drain plug in the bottom of the gearbox. The apron can be drained by unscrewing a hex-headed drain plug in the bottom.



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SERVICING AND MAINTENANCE

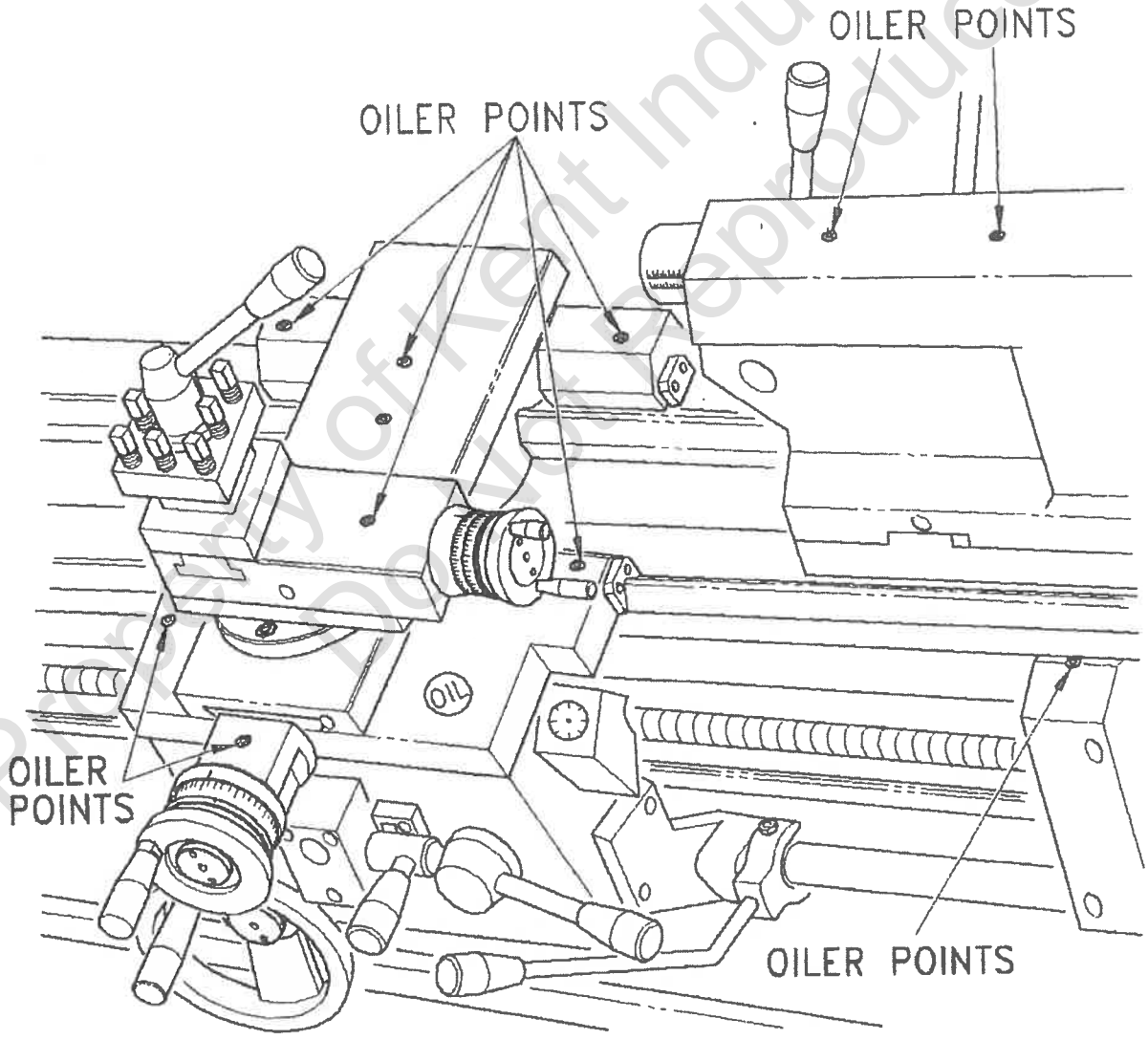
LUBRICATION (Part.2)

In addition, oil gun is provided to oil the oiler points on the saddle, cross-slide, cross-slide nut and top-slide with light machine oil or way lubricant, see Fig.

Oiler points, on the top of tailstock and on the bracket for leadscrew & feed road, must to be poured into oil every day by using oil gun.

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 grade of oil can cause damage.



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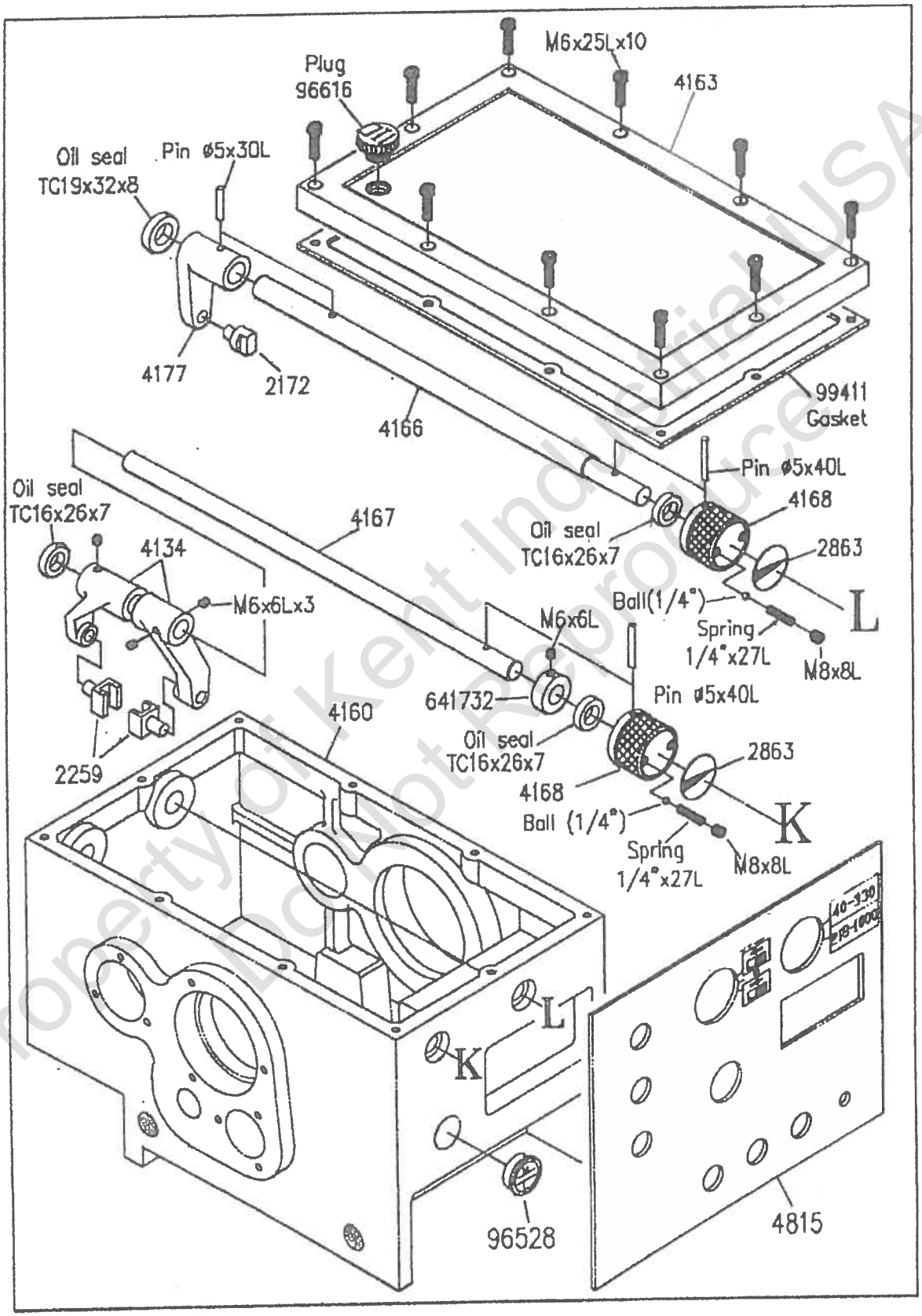

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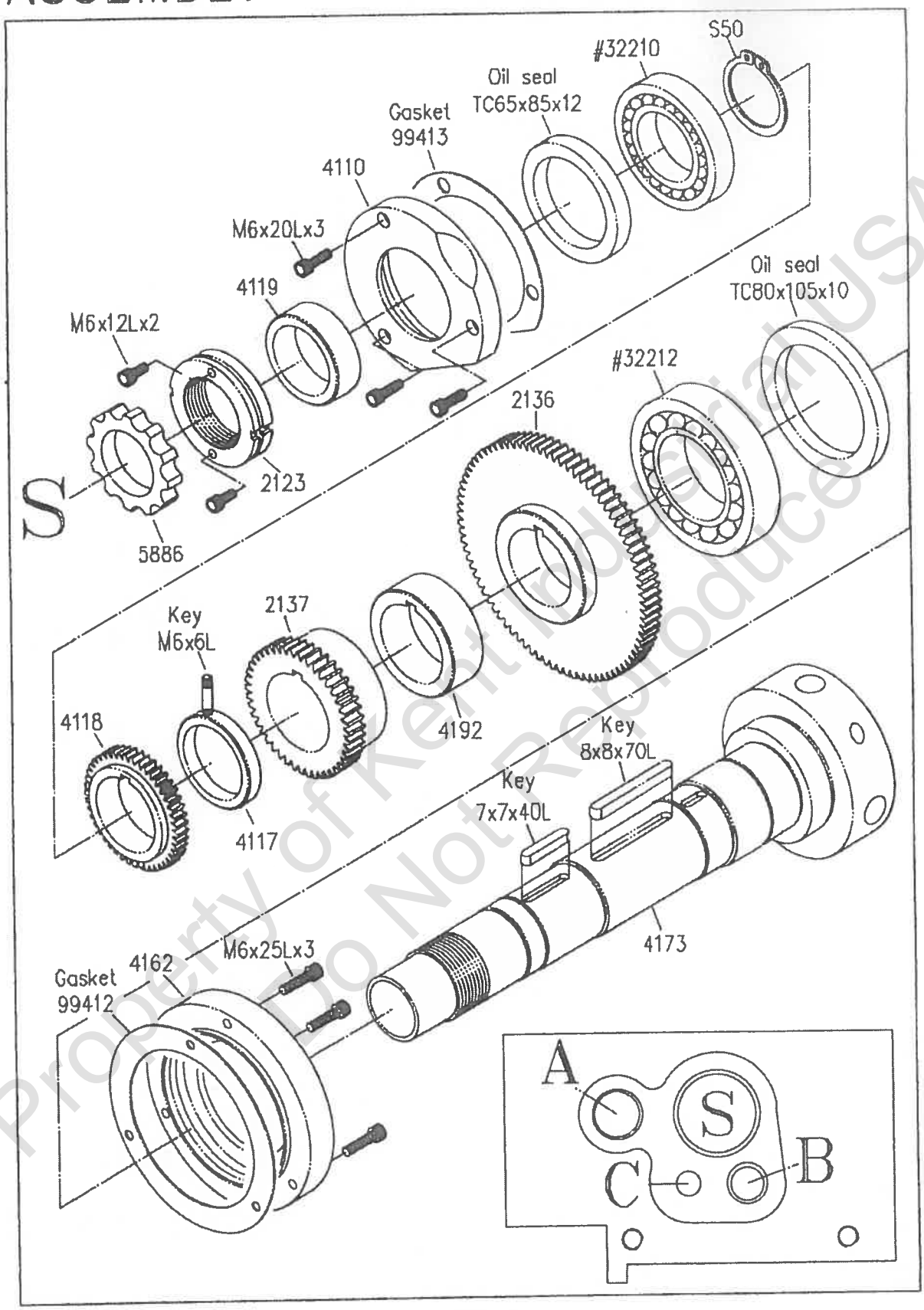
ASSEMBLY GEARBOX (Casting & Lever)



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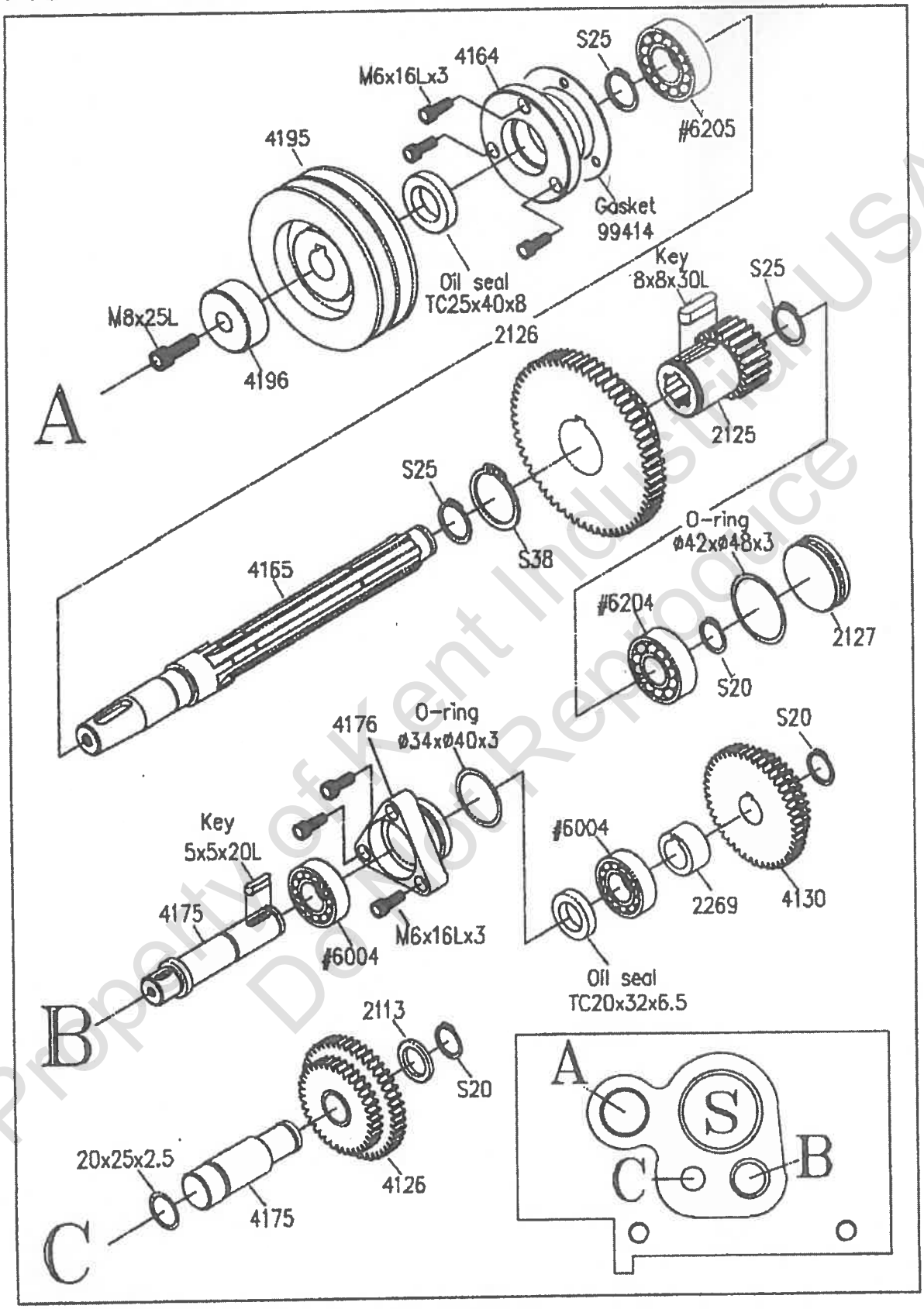
ASSEMBLY GEARBOX (Casting & Lever)



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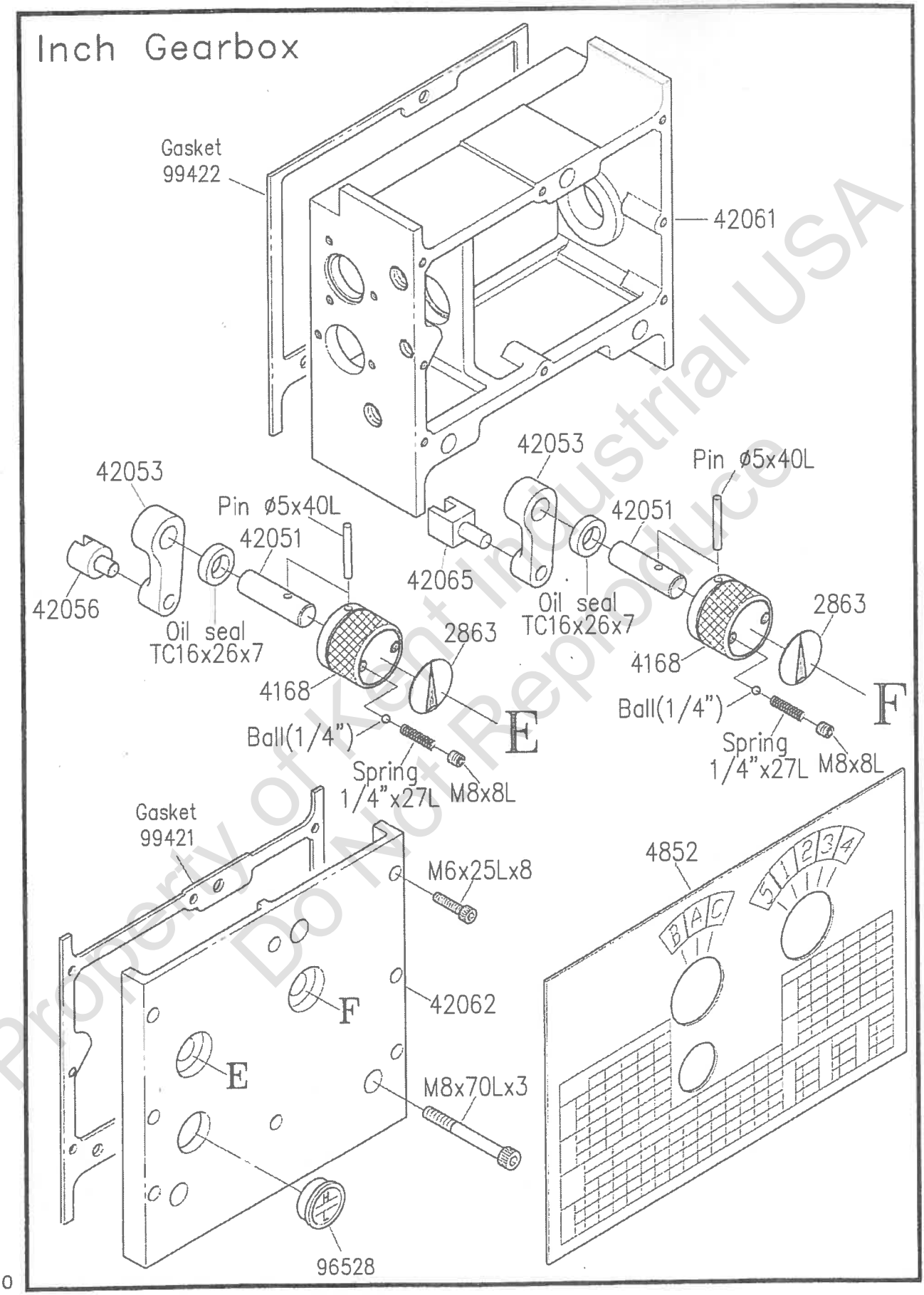
Inch Gearbox



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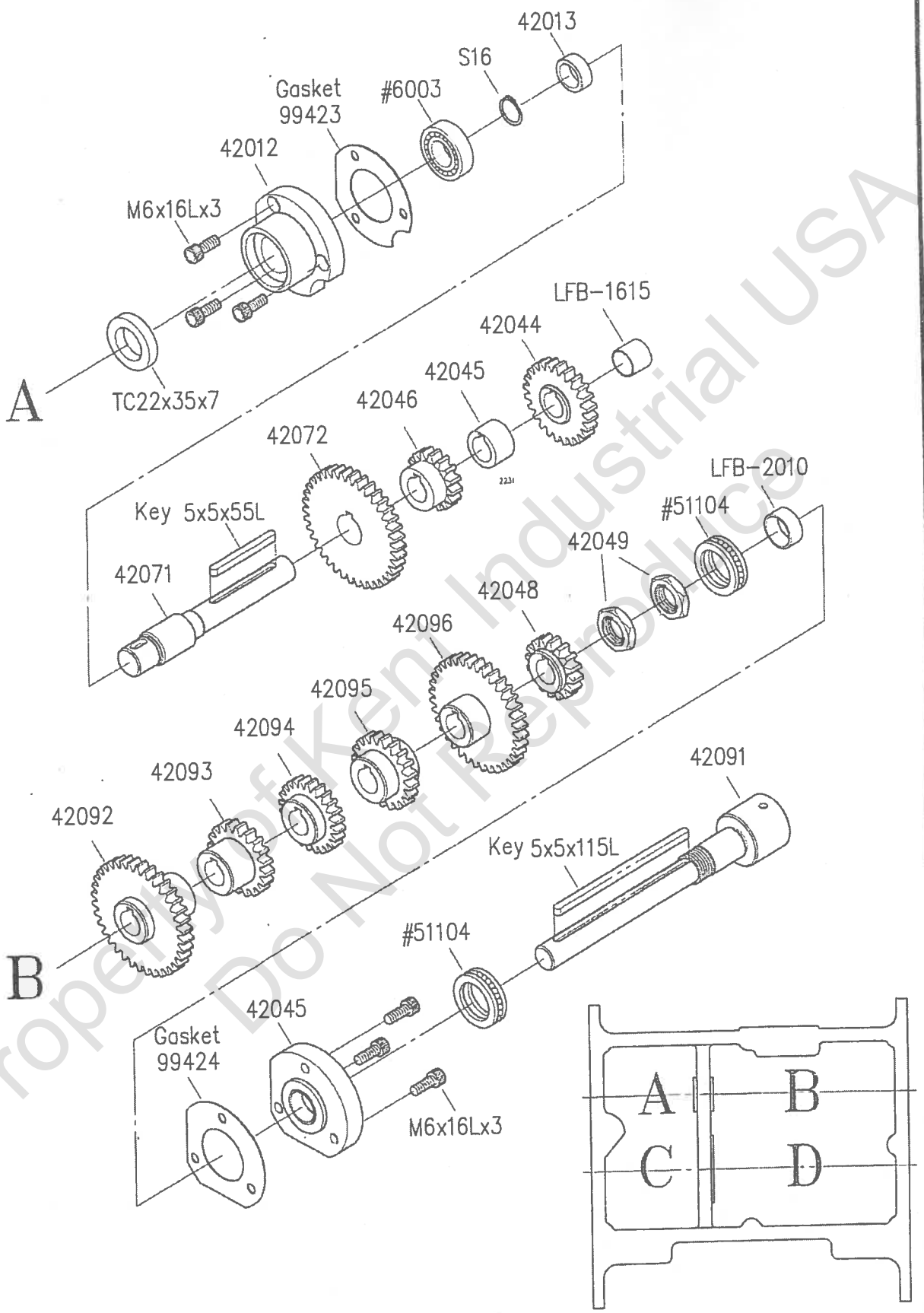
GEARBOX Inch Gearbox



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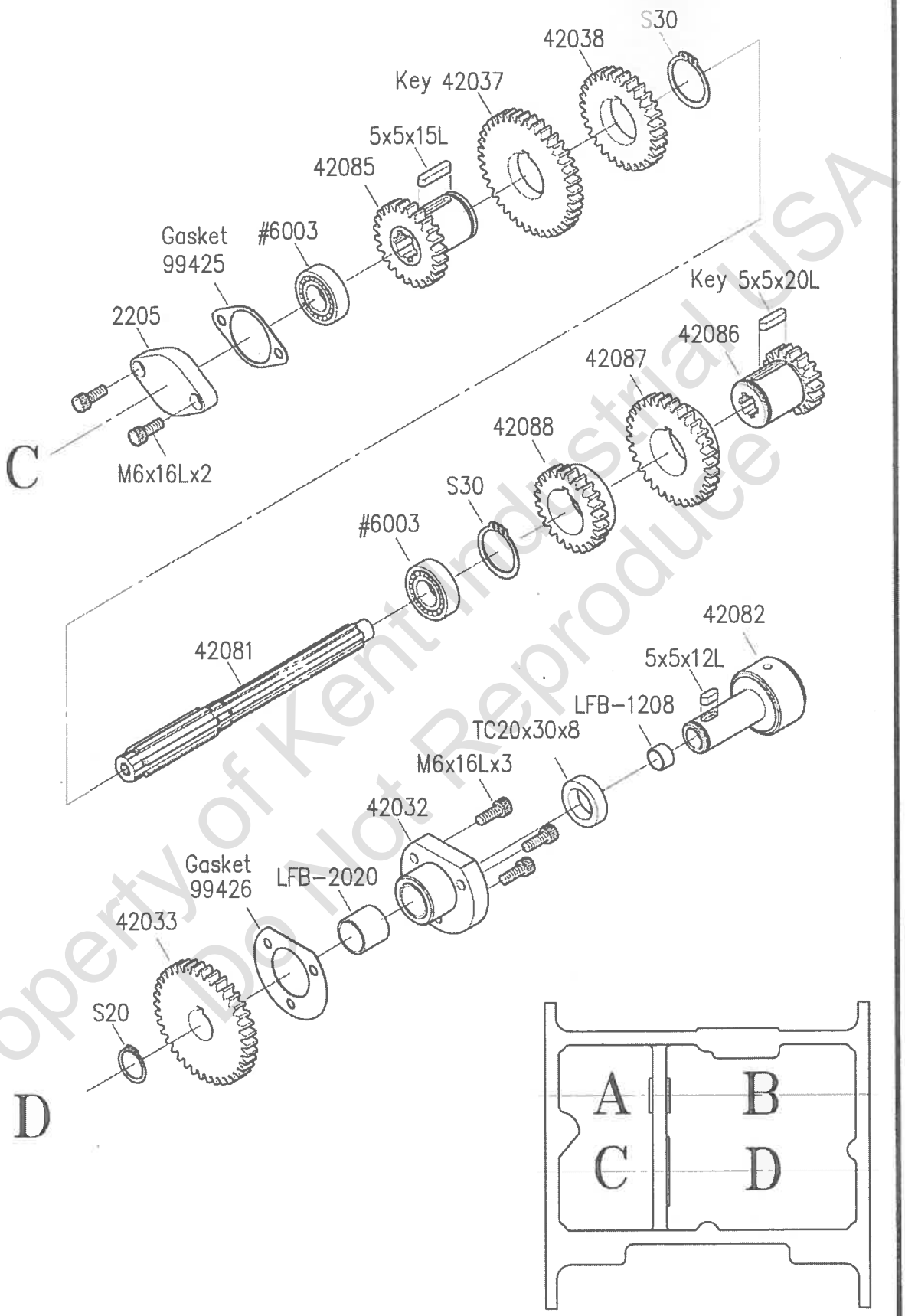
GEARBOX Inch Gearbox



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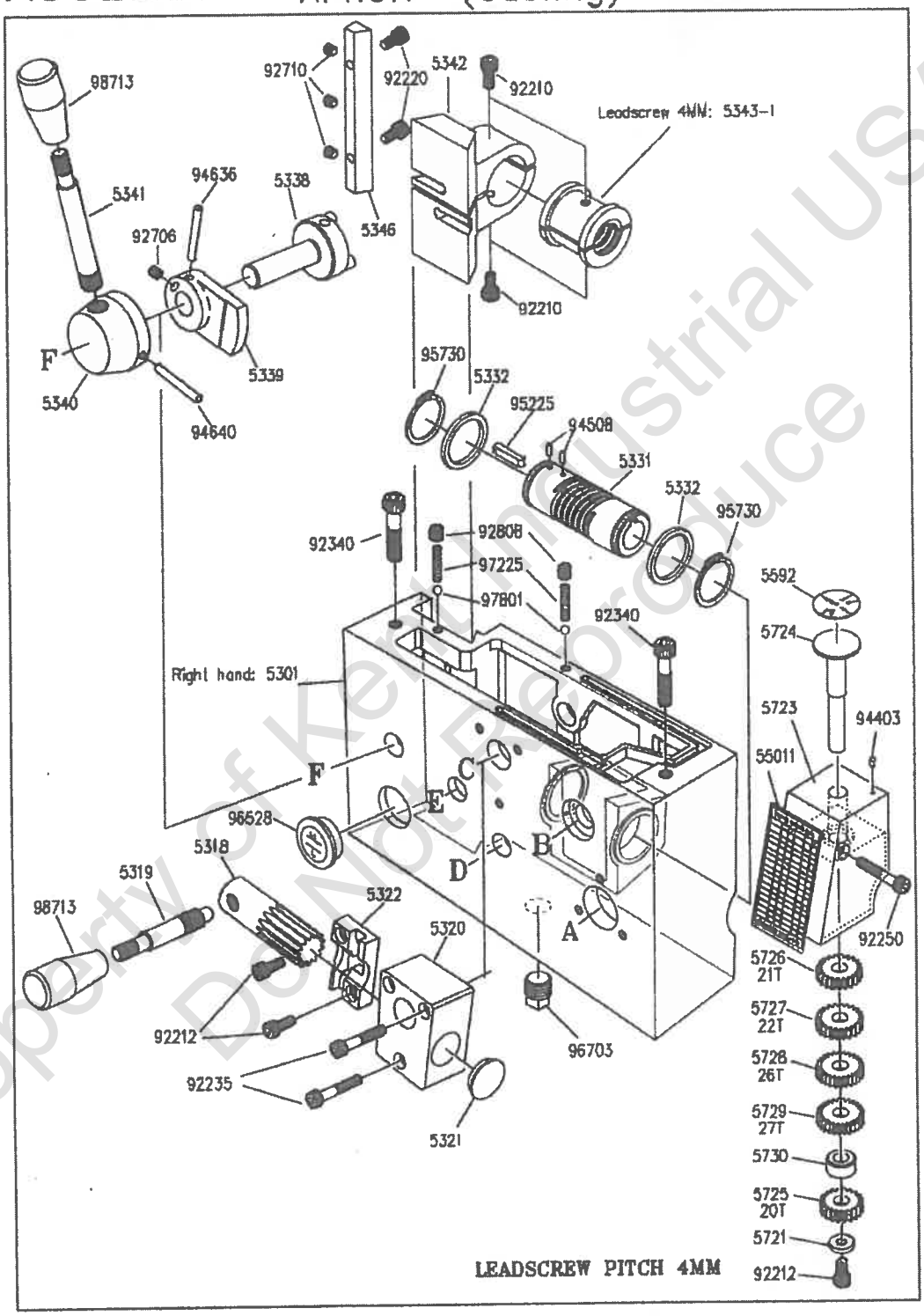
ASSEMBLY APRON (Casting)



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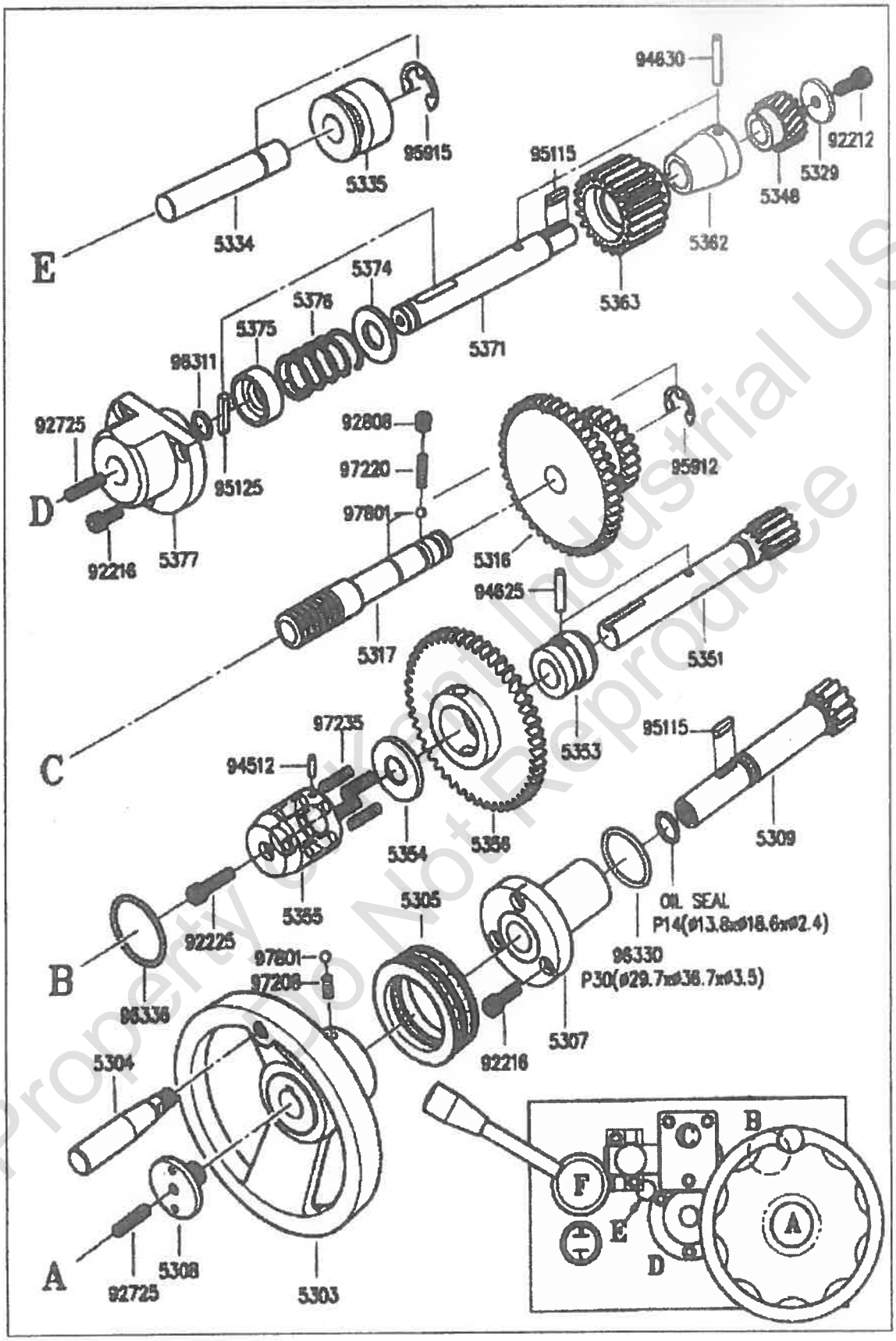

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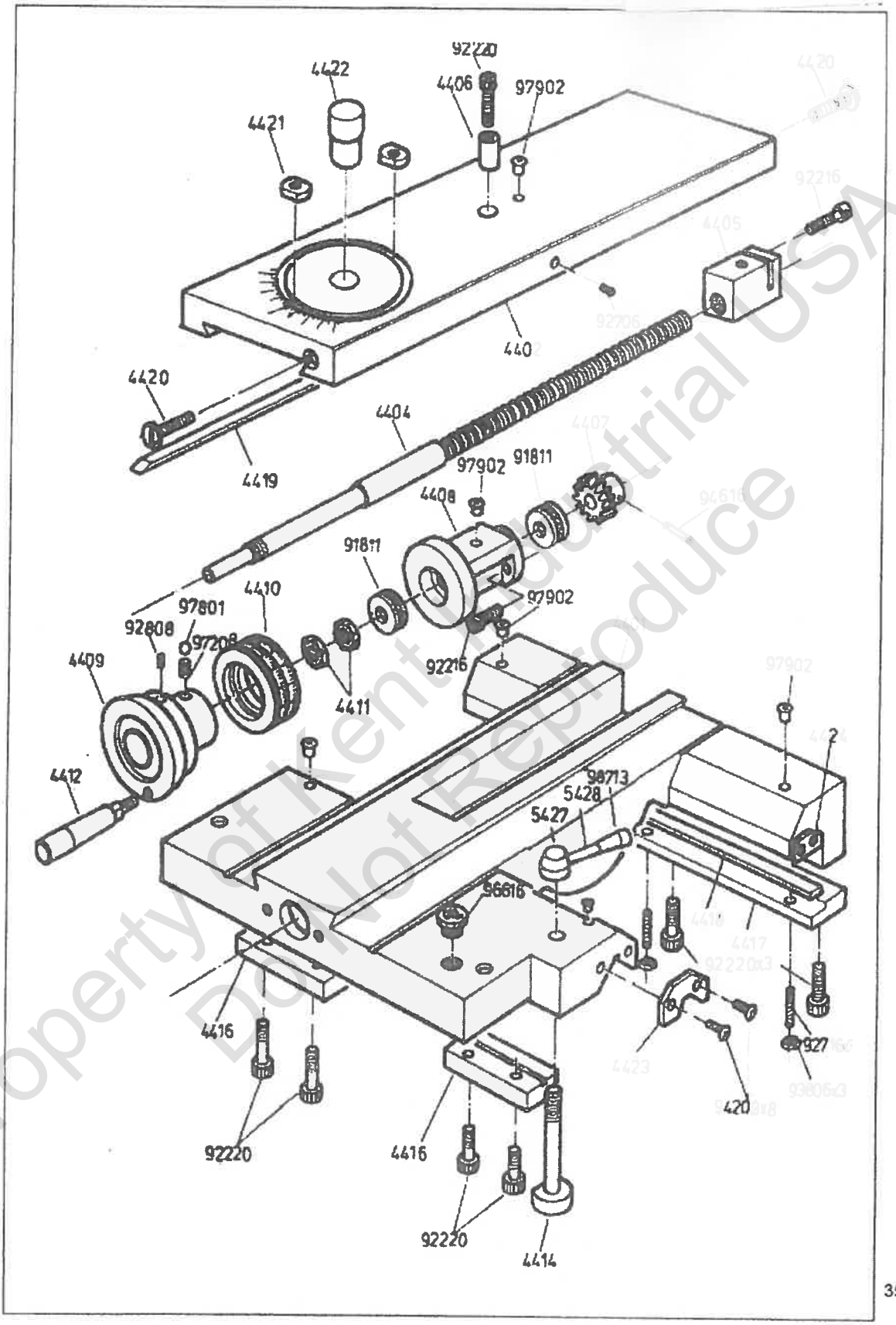

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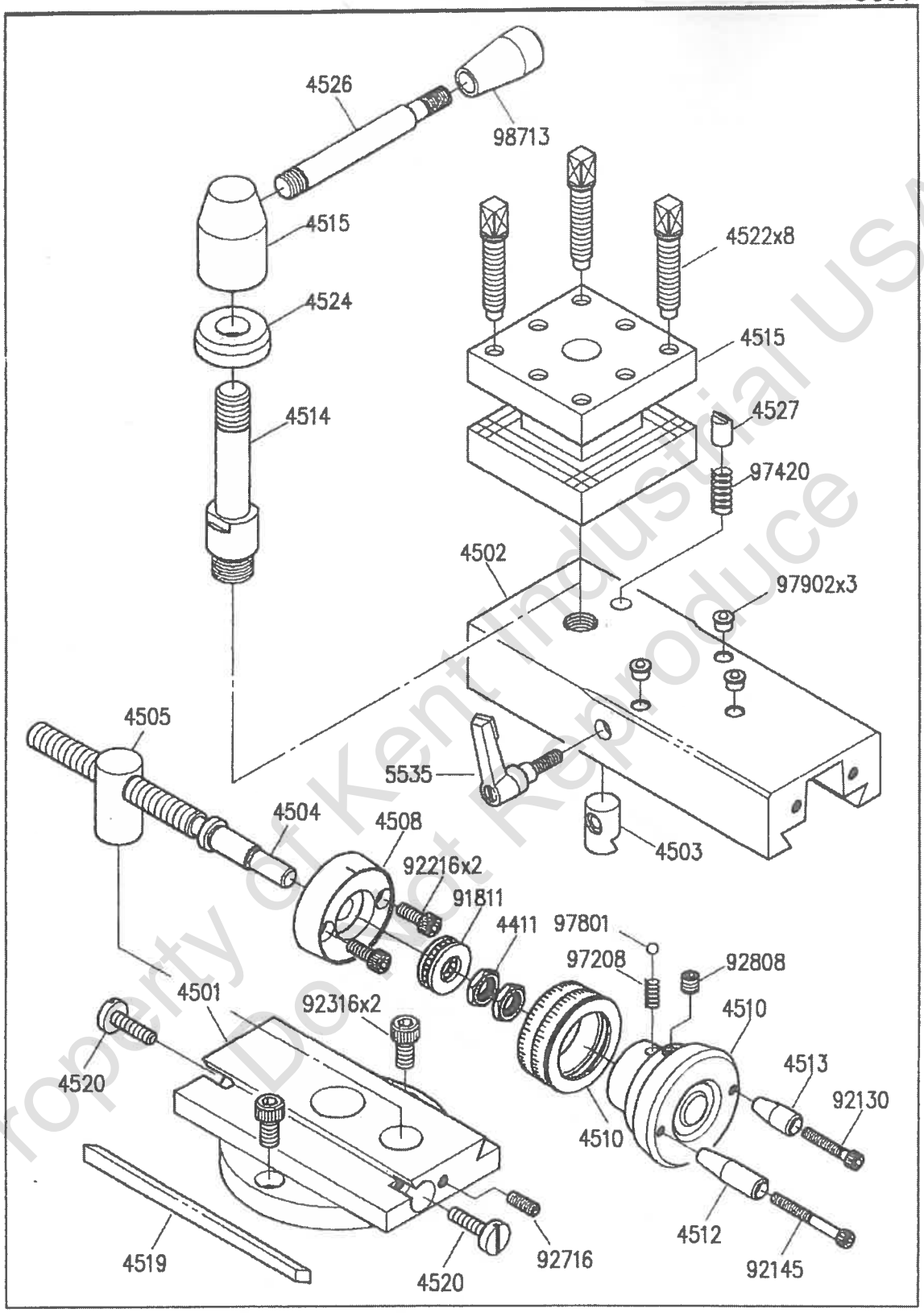

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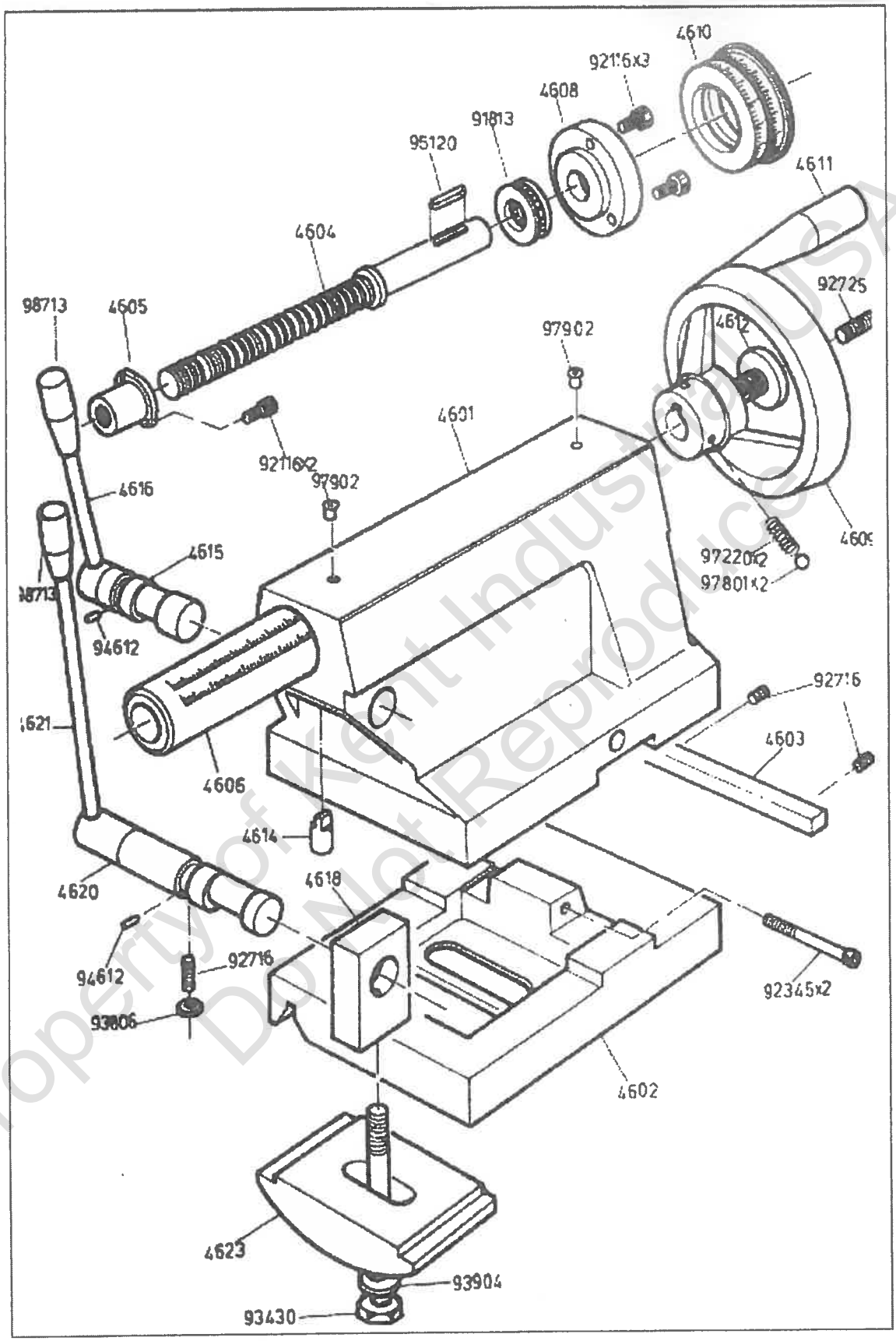

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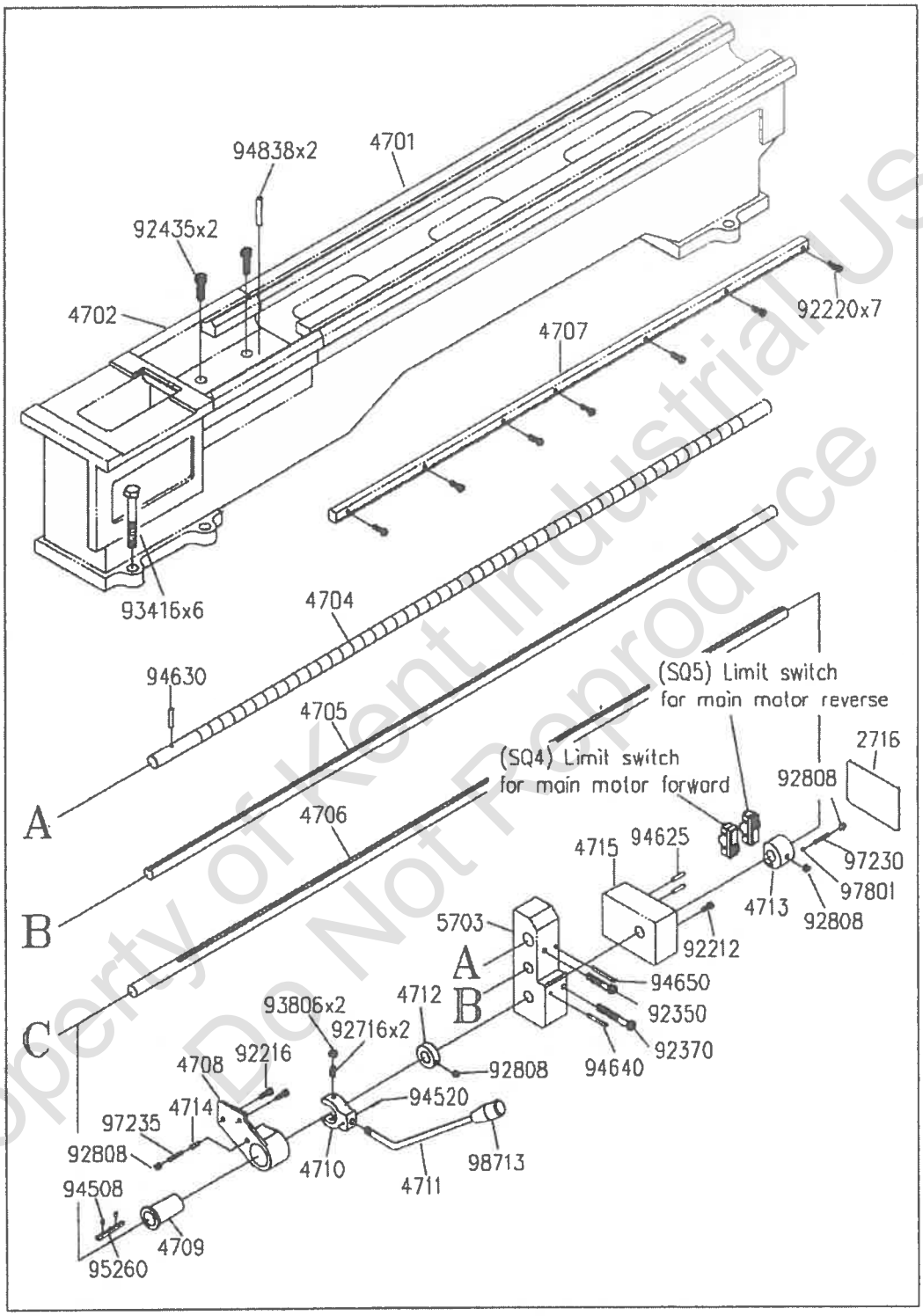

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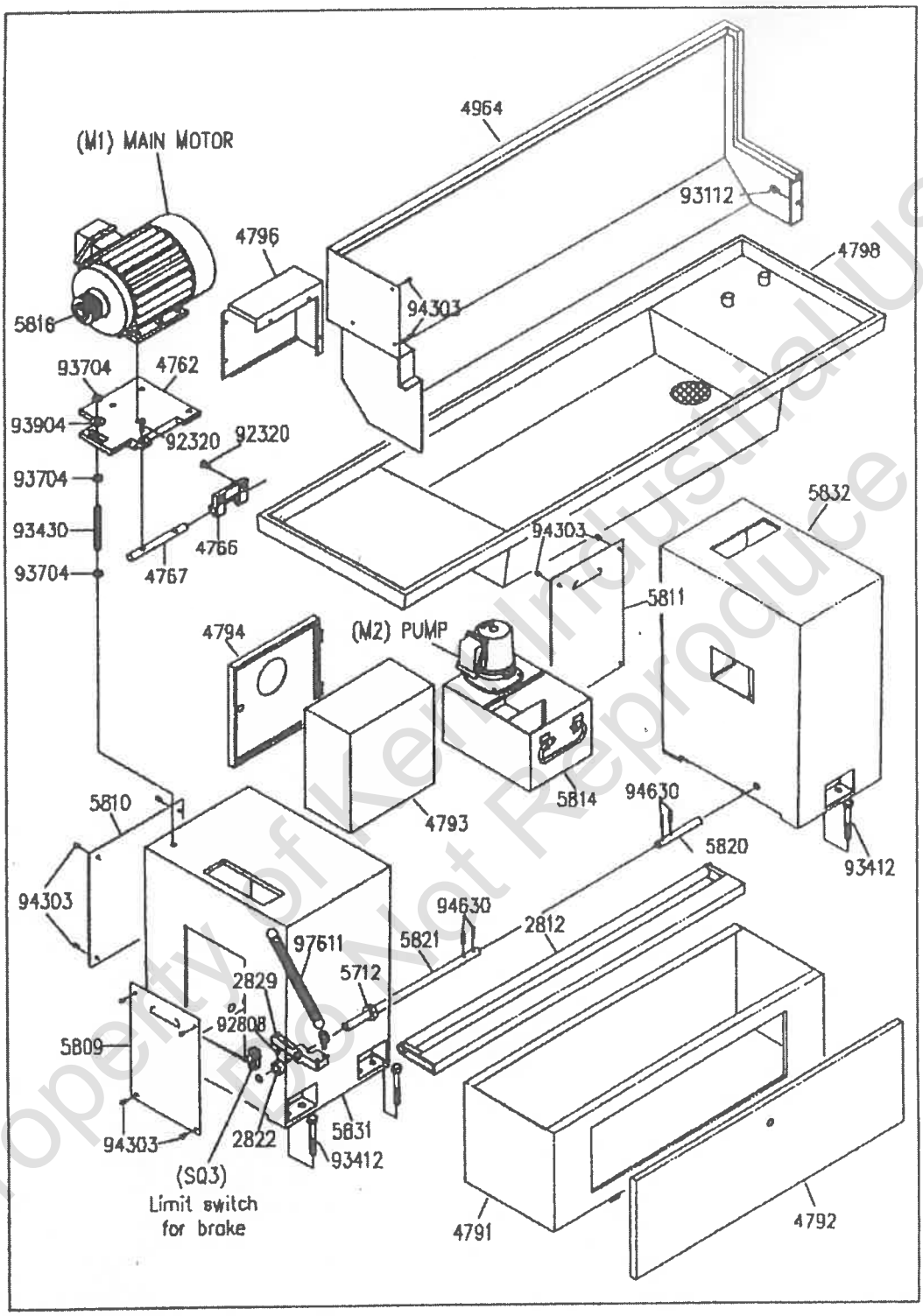

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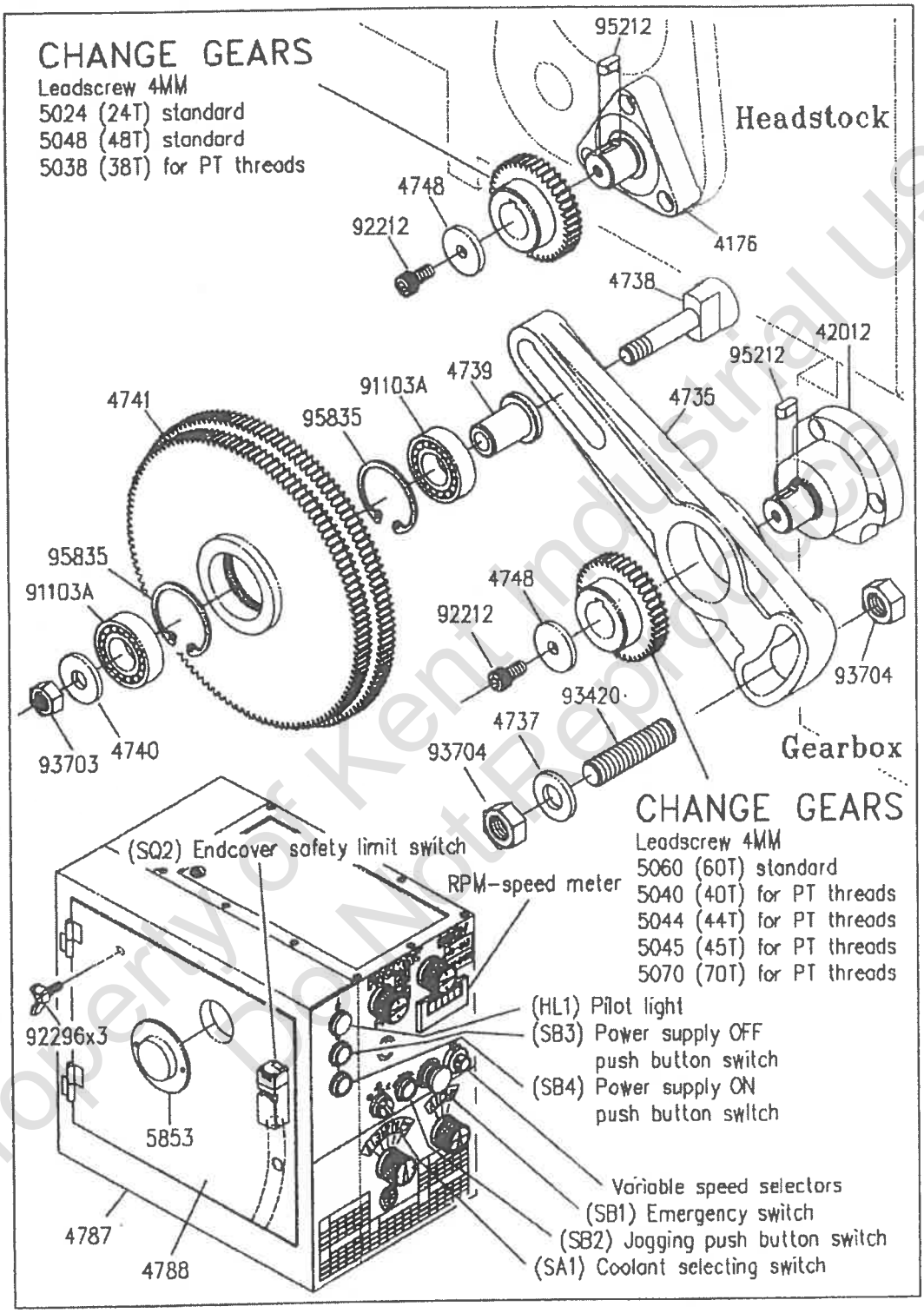
ASSEMBLY SWING FRAME,END GEARS & COVER



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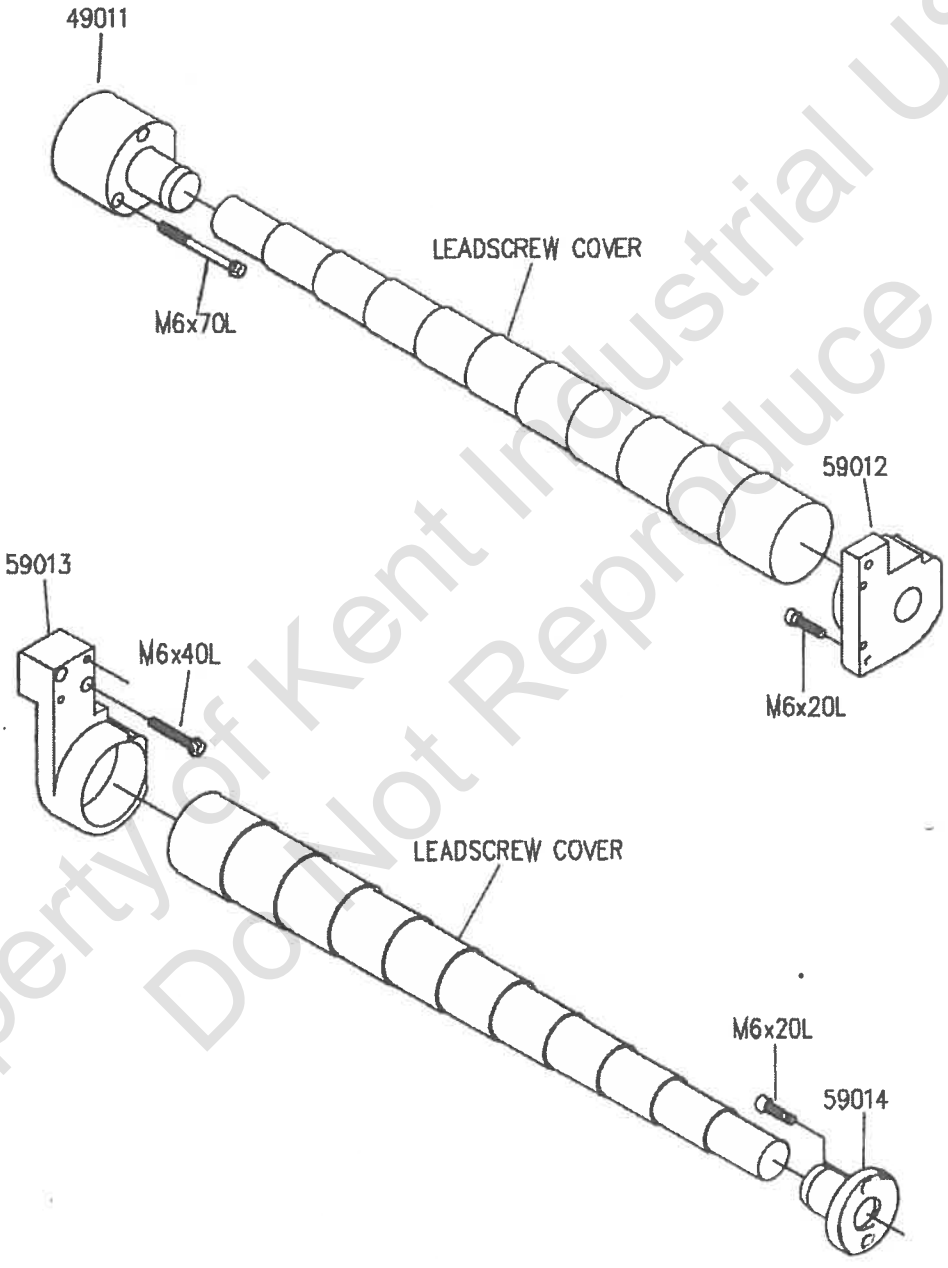
GUARD

Leadscrew cover



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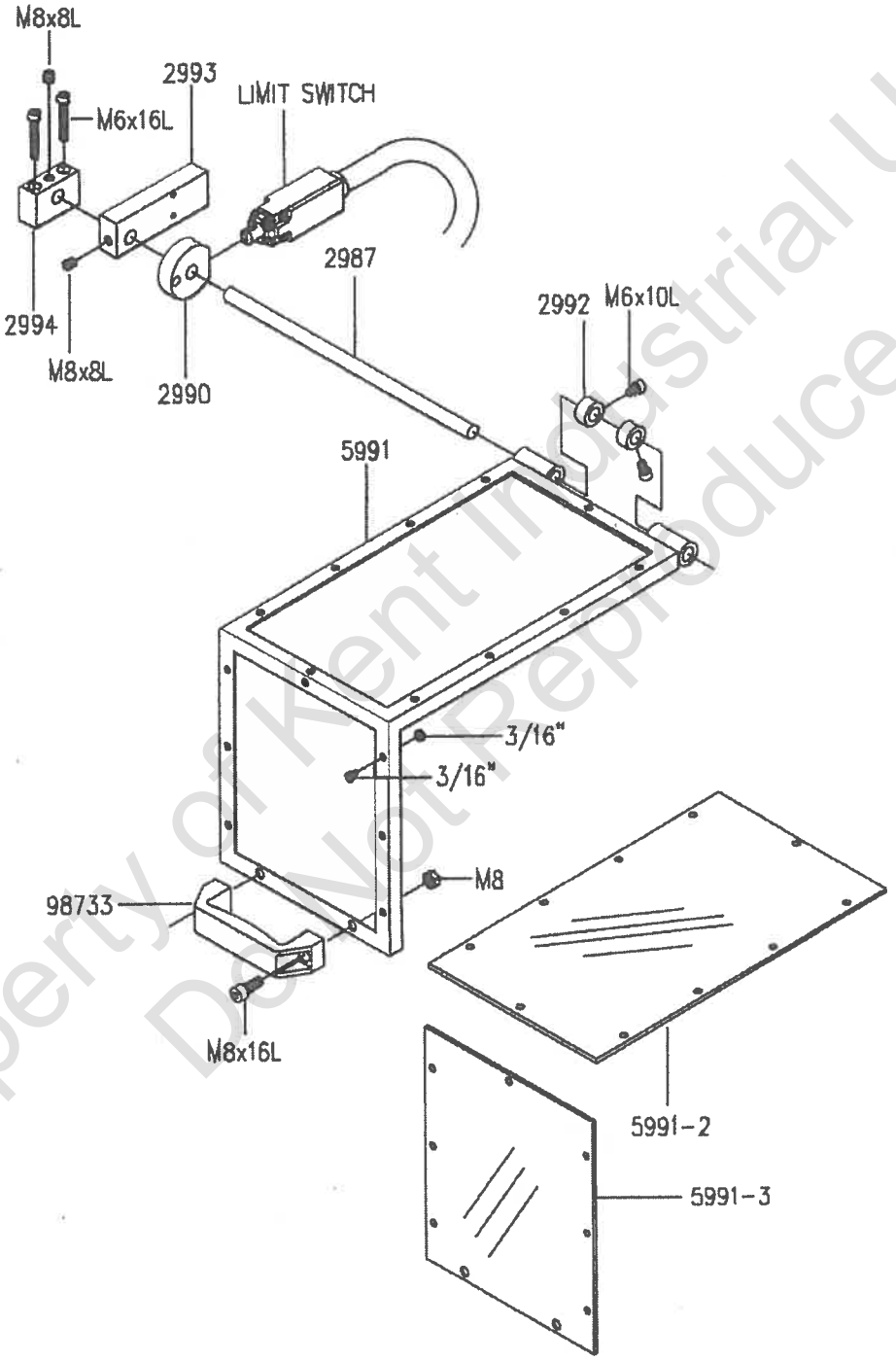
GUARD

Chuck guard



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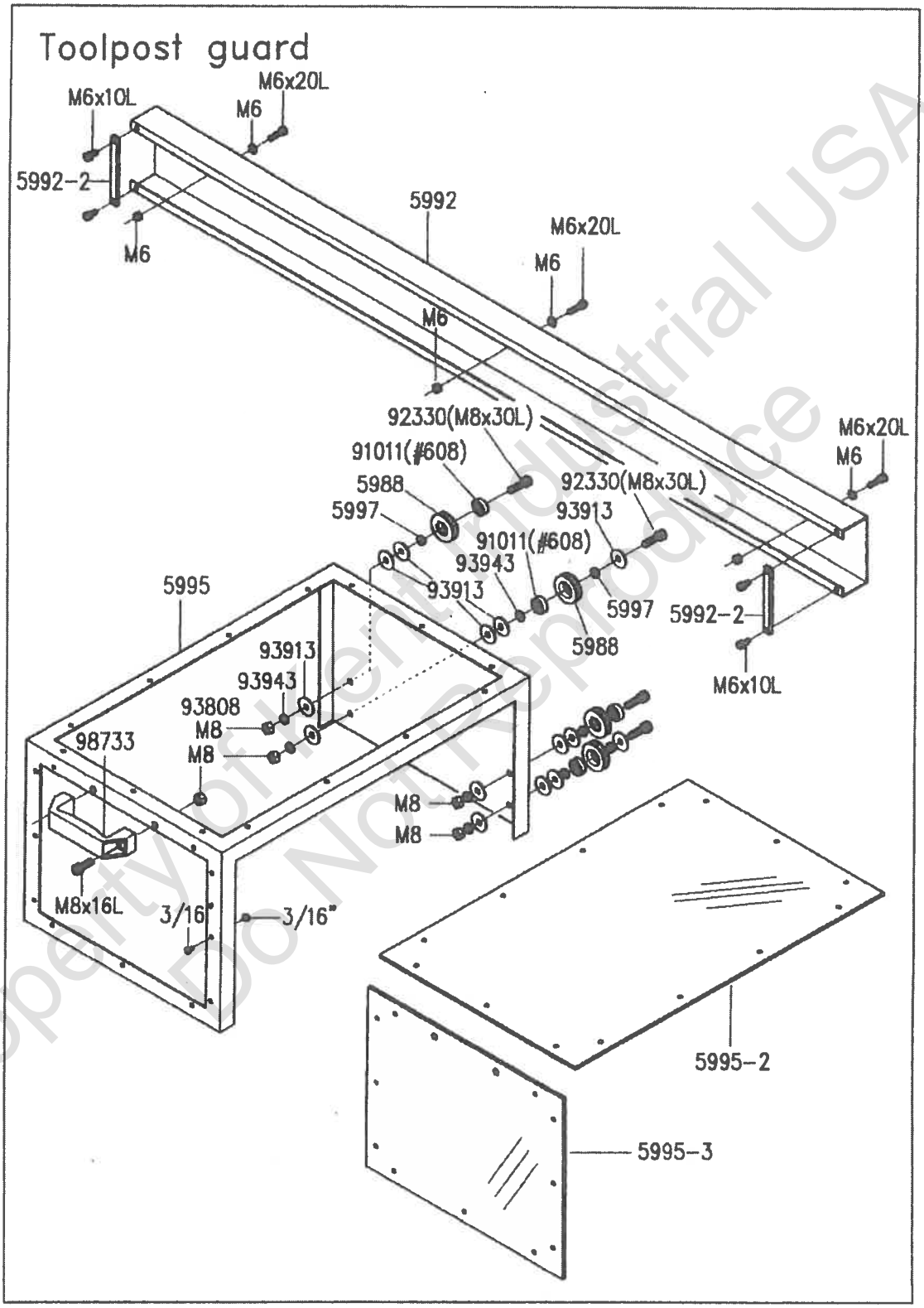
GUARD



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PART LIST

Headstock

Part No.	Description	Q'ty
4110	Cover	1
4117	Collar	1
4118	Gear 1.75M 45T	1
4119	Collar	1
4124	Collar	1
4126	Gear 1.75M 35/45T	1
4129	Shaft	1
4130	Gear 1.75M 35/45T	1
4131	Collar	1
4134	Lever	1
4135	Shift fork	1
2125	Gear 2M 21T	1
2126	Gear 2M 60T	1
2127	Plug	1
2132	Nut	1
2136	Gear 2M 82T	1
2137	Gear 2M 43T	1
2172	Shift fork	2
5886	Index ring	1
641732	Collar	1
4160	Headstock casting	1
4162	Cover	1
4163	Cover	1
4164	Cover	1
4165	Shaft	1
4166	Shaft	1
4167	Shaft	1
4168	Handle	2
4173	Main Spindle	1
4175	Shaft	1
4176	Cover	1
4177	Shift fork	1
4192	Collar	1
4195	Pulley	1
4196	Washer	1
4197	Pulley	1
4198	Pulley	1

Gearbox (Inch)

Part No.	Description	Q'ty
42061	Gearbox casting	1
42062	Cover	1
42012	Cover	1
42013	Collar	1
42022	Cover	1
42032	Cover	1
42033	Gear 2M 38T	1
42037	Gear 2M 40T	1
42038	Gear 2M 30T	1
42042	Cover	1
42044	Gear 2M 24T	1
42045	Collar (2231)	1
42046	Gear 2M 16T	1
42048	Gear 2M 16T	1
42049	Nut	2
42051	Lever	2
42052	Handle	2
42053	Shift lever	2
42055	Shift fork	1
42065	Shift fork	1
42071	Shaft	1
42072	Gear 2M 32T	1
42081	Shaft	1
42082	Shaft	1
42085	Gear 2M 20T	1
42086	Gear 2.25M 20T	1
42087	Gear 2.75M 20T	1
42088	Gear 2M 25T	1
42091	Shaft	1
42092	Gear 2M 30T	1
42093	Gear 2.75M 20T	1
42094	Gear 2.75M 18T	1
42095	Gear 2.75M 16T	1
42096	Gear 2.25M 28T	1

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PART LIST

Apron

Part No.	Description	Q'ty
5301	Apron	1
5303	Handwheel	1
5304	Handle	1
5305	Index ring	1
5306	Shaft 2M 12T	1
5307	Keep assy	1
5308	Plug	1
5309	Shaft 2M 12T	1
5310	Rack pinion 1.5M 13T	1
5311	Gear 2M 50T	1
5312	Collar	1
5313	Plug	1
5316	Gear 2M 44/22T	1
5317	Shaft	1
5318	Gear shaft 1.5M 14T	1
5319	Lever	1
5320	Keep assy	1
5321	Plug	1
5322	Cam	1
5323	Gear shaft 1.5M 14T	1
5324	Lever	1
5326	Shaft	1
5327	Gear 2M 22T	1
5328	Worm gear 1.5M 18T	1
5329	Washer	1
5331	Worm	1
5332	Collar	1
5334	Shaft	1
5335	Collar	1
5338	Shaft	1
5339	Lever	1
5340	Handle	1
5341	Lever	1
5342	Halfnut bracket	1
5343	Halfnut	1
5346	Gib	1
5347	Rack pinion 1.5M 13T	1
5348	Worm gear 1.5M 18T	1
5349	Half nut	1
5381	Apron	1
5382	Shaft	1
5383	Shaft	1

Saddle

Part No.	Description	Q'ty
4401	Saddle casting	1
4402	Crossslide cover	1
4404	Screw	1
4405	Nut	1
4406	Collar	1
4407	Gear 2M 12T	1
4408	Keep assy.	1
4409	Handwheel	1
4410	Index ring	1
4411	Nut	4
4412	Handle	1
4414	Set screw	1
4415	Washer	1
4416	Strip	2
4417	Strip	1
4418	Gib	1
4419	Gib	1
4420	Gib screw	2
4421	Nut	2
4422	Pirot	1
4423	Wipper	2
4424	Wipper	2
5427	Handle	1
5428	Lever	1

Compound rest

Part No.	Description	Q'ty
4501	Swivere slide	1
4502	Top slide	1
4503	Pad	1
4504	Screw	1
4505	Nut	1
4506	Nut	1
4508	Keep assy.	1
4509	Handwheel	1
4510	Index ring	1
4512	Handle	1
4513	Handle	1
4514	Bolt	1
4515	Toolpost	1
4517	Nut	1
4519	Gib	1
4520	Gib screw	2
4522	Screw	8
4524	Washer	1
4525	ScrewHandle	1
4526	Lever	1
4527	Pad	1

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PART LIST

Tailstock

Part No.	Description	Q'ty
4601	Tailstock casting	1
4602	Base	1
4603	Gib	1
4604	Screw	1
4605	Nut	1
4606	Barrel	1
4608	Keep assy.	1
4609	Handwheel	1
4610	Index ring	1
4611	Handle	1
4612	Screw	1
4614	Pad	1
4615	shaft	1
4616	Handle	1
4618	Pirot block	1
4620	Shaft	1
4621	Handle	1
4623	Clamp plate	1

Bed & Floor stand

Part No.	Description	Q'ty
2812	Brake pad	1
4189	Guard	1
4701	Bed casting	1
4702	Gap piece	1
4704	Leadscrew	1
4705	Feed shaft	1
4706	Third-rod shaft	1
4707	Rack	1
4708	Bracket	1
4709	Sleeve	1
4710	Fork	1
4711	Lever	1
4712	Collar	1
4713	Collar	1
4714	Pin	1
4715	Box	1
4716	over	1
4721	Washer	3
4723	Guard	1
4724	Shaft	1
4725	Gear 1.25M 20T	1
4726	Gear 1.25M 21T	1
4727	Gear 1.25M 22T	1
4728	Gear 1.25M 26T	1
4729	Gear 1.25M 27T	1

Bed & Floor stand

Part No.	Description	Q'ty
4730	Collar	1
4735	Swing frame	1
4737	Washer	2
4738	Shaft	1
4739	Shaft collar	1
4740	Washer	1
4748	Washer	2
4762	Motor platform	1
4766	Bracket	1
4767	Shaft	1
4783	Guard	1
4787	End cover	1
4788	End cover	1
4791	Cabinet	1
4792	Front cover	1
4793	Electric box	1
4794	Cover	1
4795	Plate	1
4796	Guard	1
4797	Guard	1
4798	Chip pan	1
4962	Splash guard	1
4991	Chuck guard	1
5716	Cover	1
5809	Cover	1
5810	Cover	1
5811	Cover	1
5814	Coolant tank	1
5831	Floor stand	1
5832	Floor stand	1
5991	Chuck guard	1
5995	Toolpost guard	1
5759	Shear pin	1

Change gear

Part No.	Description	Q'ty
5020	Gear 1.25M 120/127T	1
5024	Gear 1.25M 24T	1
5038	Gear 1.25M 38T	1
5040	Gear 1.25M 40T	2
5044	Gear 1.25M 44T	1
5045	Gear 1.25M 45T	1
5048	Gear 1.25M 48T	1
5060	Gear 1.25M 60T	1
5070	Gear 1.25M 70T	1

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PART LIST

GUARD FOR "CE" STANDARD

Leadscrew cover

Part No.	Description
49011	Support
59012	Bracket
59013	Bracket
59014	Support
92220	Socket head cap screw M6x20mm
92240	Socket head cap screw M6x40mm
92270	Socket head cap screw M6x70mm

Chuck guard

Part No.	Description
2987	Support rod
2992	Collar
2993	Bracket
2994	Support
5991	Chuck guard
5991-2	Chuck guard shield
5991-3	Chuck guard shield
92210	Socket head cap screw M6x10mm
92316	Socket head cap screw M8x16mm
92808	Set screw M8x8mm.
93700	Nut 3/16"
93808	Nut M8
94203	Screw 3/16"x3/8"
98751	Handle

Toolpost guard

Part No.	Description
5992	Guide rod
5992-2	Guide plate
5995	Toolpost guard
5995-2	Toolpost guard
5995-3	Toolpost guard
5988	Roller
5997	Collar
91112	Bearing #608
92210	Socket head cap screw M6x10mm
92220	Socket head cap screw M6x20mm
92316	Socket head cap screw M8x16mm
92325	Socket head cap screw M8x25mm
93700	Nut 3/16"
93806	Nut M6
93808	Nut M8
94203	Screw 3/16"x3/8"
98751	Handle

Gasket

Part No.	Description
99411	Gasket for Headstock cover 4163
99412	Gasket for 4162
99413	Gasket for 4110
99414	Gasket for 4164
99421	Gasket for Gearbox cover 42002
99422	Gasket for Gearbox 42001
99424	Gasket for 42045
99425	Gasket for 2205
99426	Gasket for 42032
99471	Gasket for 4715

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PART LIST

Part No.	Description
91011	Bearing No.#608
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
91544	Bearing No.32212
91812	Thrust No.51101
91813	Thrust No.51102
91814	Thrust No.51103
91815	Thrust No.51104
91816	Thrust No.51105
91823	Thrust No.51202
91824	Thrust No.51203
91841	Thrust No.2901
91842	Thrust No.2902
91843	Thrust No.2903
91844	Thrust 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
92296	Butterfly screw M6x16mm.
92312	Socket head cap screw M8x12mm
92316	Socket head cap screw M8x16mm
92320	Socket head cap screw M8x20mm
92325	Socket head cap screw M8x25mm
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

Part No.	Description
92425	Socket head cap screw M10x25m
92430	Socket head cap screw M10x30m
92435	Socket head cap screw M10x35m
92440	Socket head cap screw M10x40m
92445	Socket head cap screw M10x45m
92525	Socket head cap screw M12x25m
92535	Socket head cap screw M12x35m
92540	Socket head cap screw M12x40m
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.
93700	Nut 3/16 In.
93701	Nut 1/4 In.
93703	Nut 3/8 in.
93704	Nut 1/2 In.
93806	Nut 6 mm.
93808	Nut 8 mm.
93903	Washer 3/8 in.
93904	Washer 1/2 In.
93906	Washer 3/4 In.
93912	Washer 6 mm.
93942	Spring washer 6 mm.
93913	Washer 8 mm.
93943	Spring washer 8 mm.

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PART LIST

Part No.	Description
91011	Bearing No.#608
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
91544	Bearing No.32212
91812	Thrust No.51101
91813	Thrust No.51102
91814	Thrust No.51103
91815	Thrust No.51104
91816	Thrust No.51105
91823	Thrust No.51202
91824	Thrust No.51203
91841	Thrust No.2901
91842	Thrust No.2902
91843	Thrust No.2903
91844	Thrust 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
92296	Butterfly screw M6x16mm.
92312	Socket head cap screw M8x12mm
92316	Socket head cap screw M8x16mm
92320	Socket head cap screw M8x20mm
92325	Socket head cap screw M8x25mm
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

Part No.	Description
92425	Socket head cap screw M10x25m
92430	Socket head cap screw M10x30m
92435	Socket head cap screw M10x35m
92440	Socket head cap screw M10x40m
92445	Socket head cap screw M10x45m
92525	Socket head cap screw M12x25m
92535	Socket head cap screw M12x35m
92540	Socket head cap screw M12x40m
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.
93700	Nut 3/16 In.
93701	Nut 1/4 in.
93703	Nut 3/8 in.
93704	Nut 1/2 In.
93806	Nut 6 mm.
93808	Nut 8 mm.
93903	Washer 3/8 in.
93904	Washer 1/2 In.
93906	Washer 3/4 In.
93912	Washer 6 mm.
93942	Spring washer 6 mm.
93913	Washer 8 mm.
93943	Spring washer 8 mm.

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PART LIST

Part No.	Description
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 2 mm.
94409	Screw 1/4x1 mm.
94508	Pin 3x8 mm.
94512	Pin 3x12 mm.
94520	Pin 3x20 mm.
94524	Pin 3x24 mm.
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.
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.

Part No.	Description
95310	Key 6x10mm.
95315	Key 6x15mm.
95325	Key 6x25mm.
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.
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.

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PART LIST

Part No.	Description
96308	O-ring 8x12x2mm.
96309	O-ring 8.8x12.6x1.9mm.
96311	O-ring 11x16x2.5mm.
96314	O-ring 14x19x2.5mm.
96316	O-ring 15.8x20.6x2.4mm.
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 3/4 in.(19mm.)
96528	Oil sight 1-1/8 in.(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 3/16 In.x 15mm.
97208	Spring 1/4 In.x 8mm.
97210	Spring 1/4 In.x 10mm.
97220	Spring 1/4 In.x 20mm.
97225	Spring 1/4 In.x 25mm.
97230	Spring 1/4 In.x 30mm.
97235	Spring 1/4 In.x 35mm.
97250	Spring 1/4 In.x 50mm.
97420	Spring 3/8 in.x 20mm.
97430	Spring 3/8 in.x 30mm.
97435	Spring 3/8 in.x 35mm.
97440	Spring 3/8 in.x 40mm.
97460	Spring 3/8 in.x 60mm.
97611	Spring
97621	Spring
97801	Ball steel 1/4 in.dia.
97803	Ball steel 3/8 in.dia.

Part No.	Description
97901	Oiler 1/4 in.
97902	Oiler 5/16 in.
98128	Belts Vee A-28 in.
98713	Handle 3/8 in.(black)
98723	Handle 3/8 in.(red)
98733	Handle (black)
98902	Brake shoes assy.

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SCHEDULE OF ELECTRICAL EQUIPMENT

Item designation	Circuit	Description and function	Technical data	Quantity	Supplier	Suppliers reference	Remarks
U1	1	For main motor spindle Inverter	Ue=220V 2.2kW 3HP	1	Allen Bradley	POLER FLEX	
KA3	2,3	Relay contactor for main motor reverse	Res 5A 240VAC 5A 30VDC Coil 24VAC 50/60HZ	1	OMRON	MY2N-J	IEC 255-1 IEC 255-0-20
KA2	2,3	Relay contactor for main motor forward		1	OMRON	MY2N-J	IEC 255-1 IEC 255-0-20
KM2	2,3	Magnetic contactor for coolantpump	Ue=380V~ coil 50Hz 22V~ 60Hz 24V~ Ui 660V~ 4<<a>> AC3Ith=AC1=25A	1	TECO	CU-11	VDE 0660 IEC 947-4-1 BS 5424
KM4	1	Magnetic contactor for power supply	Ue=380V~ coil 50HZ 22V~ 60HZ 24V~ AC3Ith=AC1=35A Ui660V~3<<a>>+1<<a>>	1	TECO	CU-11	VDE 0660 IEC 947-4-1 BS 5424
KA1	3	Magnetic contactor for brake	Ue=22V~ Ith=6A 4<<a>>	1	OMRON	MY4N-J	IEC 255-1 IEC 255-0-20
FU1	1	Fuse boxs	10m/mx38m/m 100KA 500V aM25A	1	C T	CT-FB101	IEC 269-2
FU2							
FU3							
FU4	1	Fuse box	20mm 250V 1A	1	TEND	TFBR-101	VDE 0660 IEC 947
FU5	1	Fuse box	20mm 250V 1A	1	TEND	TFBR-101	VDE 0660 IEC 947
FU6	1	Fuse box	20mm 250V 4A	1	TEND	TFBR-101	VDE 0660 IEC 947
FR2	2,3	Thermal overload relay for coolantpump	380V : 0.16-0.24 / 0.19 A 220V : 0.24-0.38 / 0.3 A	1	TAIAN	RHN-10	VDE 0660 IEC 292-1 BS 4941
QS1	1	Main power switch	Ui 380V~ Ith 25A	1	KLOCKNER MOELLER	P1-25/V/SVB	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	TECO	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
SB2	3	Push button switch (jogging switch)	22ø 600V 10A	1	TELEMECANIQUE	XB2-BA21	VDE 0660 IEC 947-5-1 EN 60947-5-1
SB3	1	Push button switch (power supply off)	22ø 600V 10A	1	TELEMECANIQUE	XB2-BA21	VDE 0660 IEC 947-5-1 EN 60947-5-1
SB4	1	Push button switch (power supply on)	22ø 600V 10A	1	TELEMECANIQUE	XB2-BA21	VDE 0660 IEC 947-5-1 EN 60947-5-1
SQ1	3	Chuck guard switch	500V 6KV 10A	1	TELEMECANIQUE	XCK-P102	VDE 0660 IEC 947-5-1 EN 60947-5-1
SQ2	3	Limit switch Endcover 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	TEND	TM-1306	
SQ4	3	Limit switch for main motor forward	250V 15A	1	TEND	TM-1306	
SQ5	3	Limit switch for main motor reverse	250V 15A	1	TEND	TM-1306	
M1	2	Squirrel-cage motors Foot-mounted	50Hz,220/380V 1400 rev/min class E insulation 100L type ASEC, 1.5kW	1	SEING	ASEC	
M2	2	Coolantpump	50/60Hz,220/400V 2850/3400 rev/min type MT, 0.1kW	1	MING YIH	MT	

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AB inverter Parameter setting

d Group Parameter			P Group Parameter		
Item	Explanation	Value	Item	Explanation	Value
d001	Output Freq	0.1	P101	Motor NP Volts	220
d002	Commanded Freq	0.1	P102	Motor NP Hertz	60
d003	Output Current	0.01	P103	Motor OL Current	3
d004	Output Voltage	0.1	P104	Minimum Freq	9.0
d005	DC Bus Voltage	1	P105	Maximum Freq	65
d006	Drive Status	1	P106	Start Source	2
d007	Fault 1 Code	F1	P107	Stop Mode	3
d008	Fault 2 Code	F1	P108	Speed Reference	2
d009	Fault 3 Code	F1	P109	Accel Time 1	3.0
d010	Process Display	0.01	P110	Decel Time 1	2.0
d012	Control Source	1	P111	Motor OL Ret	0
d013	Contrl In Status	1	P112	Reset To Defalts	0
d014	Dig In Status	1			
d015	Comm Status	1			
d016	Control SW Ver	0.01			
d017	Drive Type	1			
d018	Elapsed Run Time	1			
d019	Testpoint Data	1			
d020	Analog In 0-10V	0.1			
d021	Analog In 4-20mA	0.1			
d022	Drive Temp	0.1			

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AB inverter Parameter setting

t Group Parameter			C Group Parameter		
Item	Explanation	Value	Item	Explanation	Value
t201	Digital In1 Sel	4	C301	Language	1
t202	Digital In2 Se	4	C302	Comm Data Rate	9600
t211	Anlg In 0-10V Lo	0	C303	Comm Node Addr	100
t212	Anlg In 0-10V Hi	97	C304	Comm Loss Action	0
t213	Anlg In4-20mA Lo	0	C305	Comm Loss Time	5
t214	Anlg In4-20mA Hi	100	C306	Comm Format	0
t221	Relay Out Sel	0	C307	Comm Write Mode	0
t222	Relay Out Level	0			

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AB inverter Parameter setting

A Group Parameter			A Group Parameter		
Item	Explanation	Value	Item	Explanation	Value
A401	Accel Time 2	20.0	A436	Compensation	1
A402	Decel Time 2	20.0	A437	Slip Hertz @ FLA	2.0
A403	S Curve %	0	A438	Process Time Lo	0
A404	Jog Frequency	10.0	A439	Process Time Hi	0
A405	Jog Accel/Decel	10.0	A440	Process Factor	30.0
A409	Internal Freq	60.0	A441	Bus Reg Mode	1
A410	Preset Freq 0	0.0	A442	Current Limit	0.5
A411	Preset Freq 1	5.0	A444	Motor OL Select	0
A412	Preset Freq 2	10.0	A446	PWM Frequency	6.2
A413	Preset Freq 3	20.0	A448	SW Current Trip	0.0
A418	Skip Frequency	0	A450	Fault Clear	0
A419	Skip Freq Band	0	A451	Auto Rstrt Tries	0
A424	DC Brake Time	0.0	A452	Auto Rstrt Delay	1.0
A425	DC Brake Level	0.5	A453	Boost Select	6.0
A427	DB Resistor Sel	0	A457	Maximum Voltage	220
A428	DB Duty Cycle	5	A458	Program Lock	0
A433	Start At PowerUp	0	A459	Testpoint Sel	400
A434	Reverse Disable	0	A461	Motor NP FLA	22
A435	Flying Start En	0			

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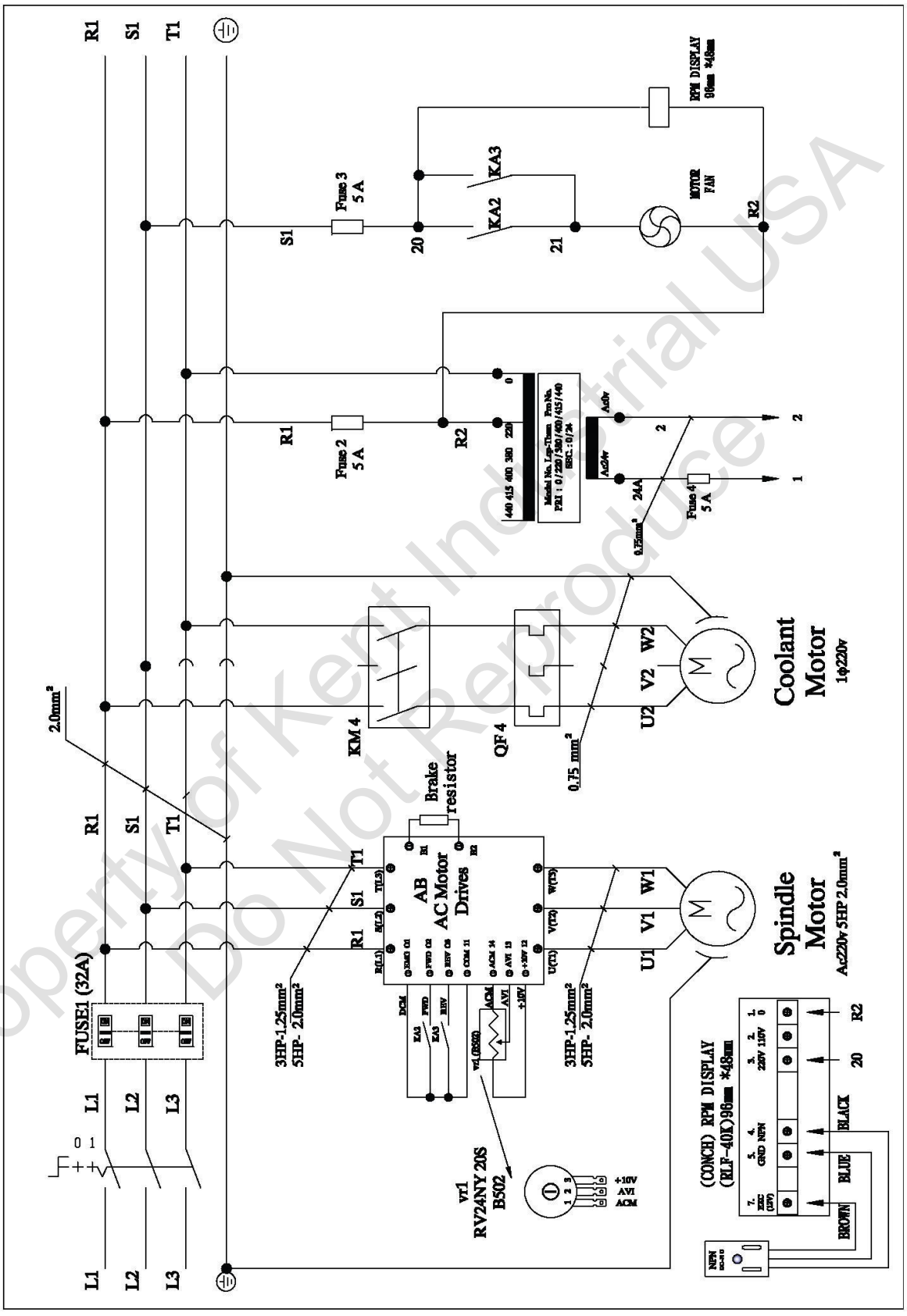

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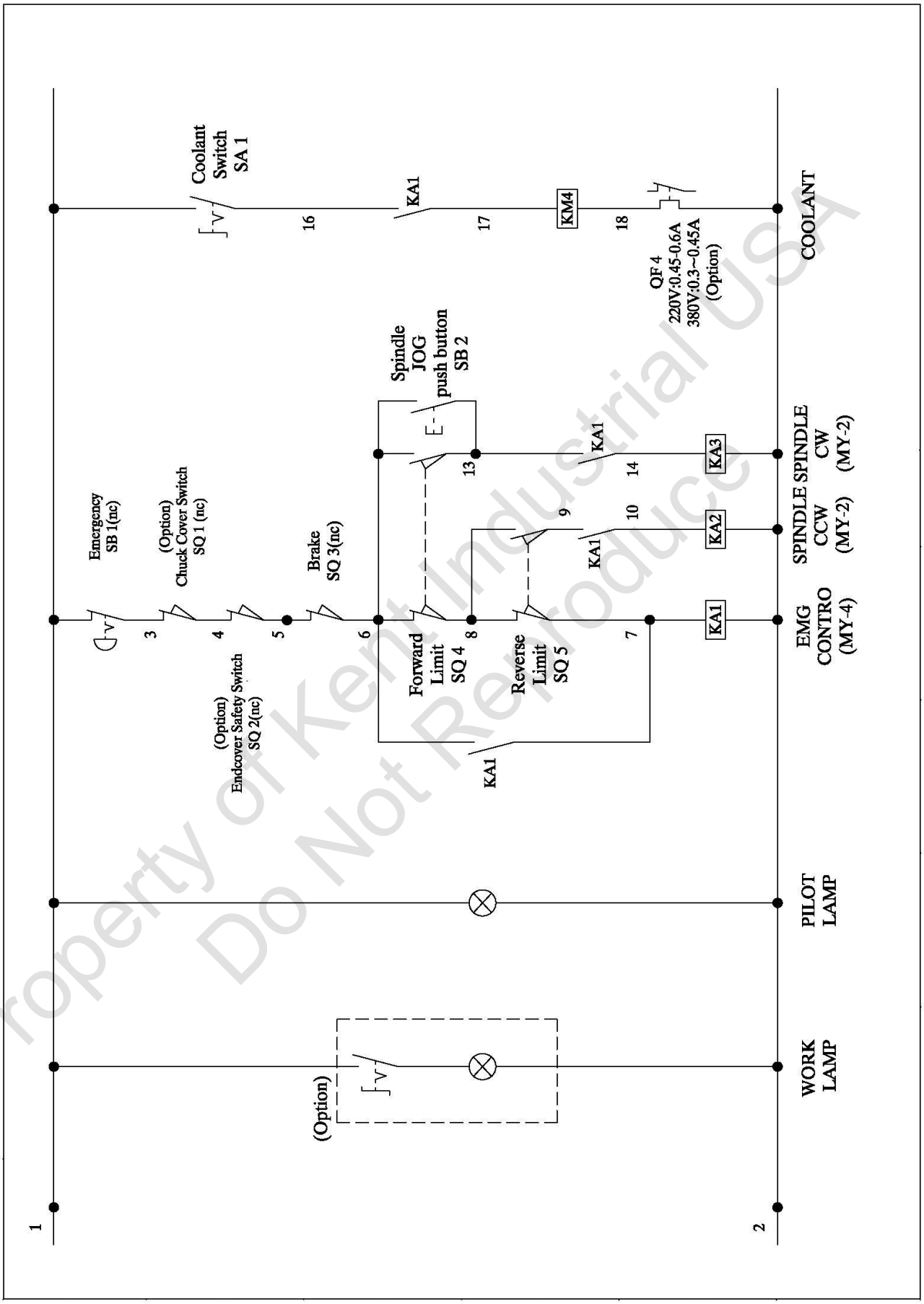

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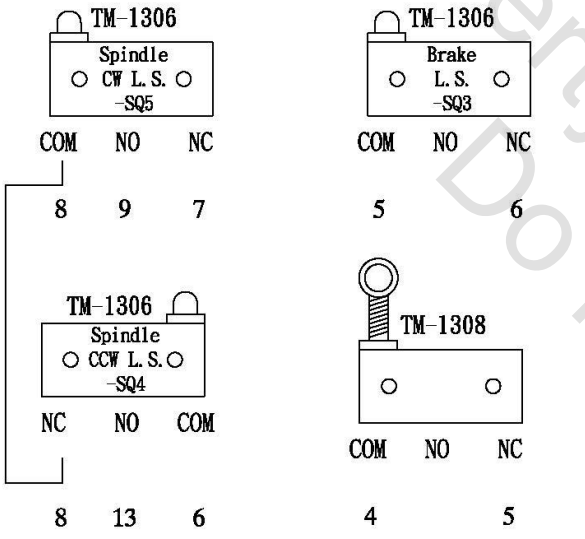
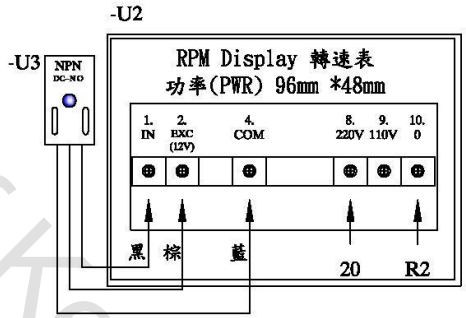
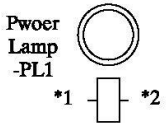
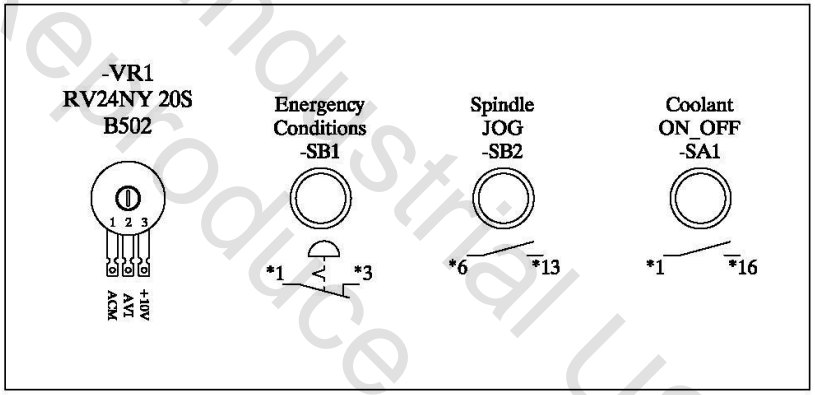
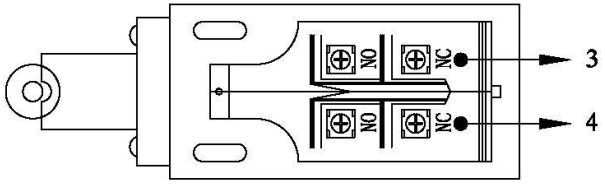


Endcover Safety Switch
SQ 2(nc)



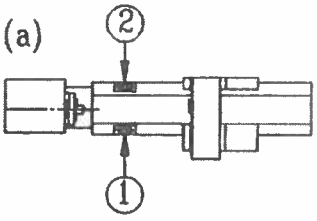
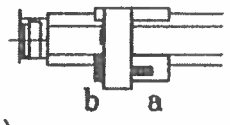
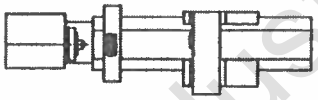
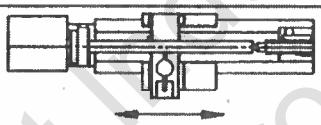
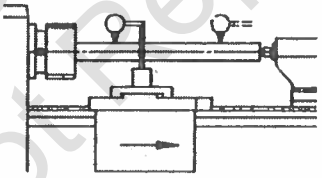
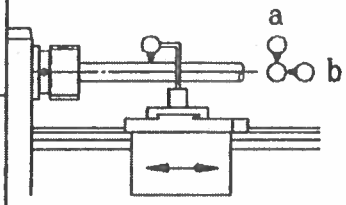






TZ-9212 Chuck Cover Switch
SQ 1 (nc)

STATIC ACCURACY TEST

TYPE:			MACHINE SERIAL NO.		
NO.	SUBJECT OF MEASUREMENT		ILLUSTRATION	PERMISSIBLE ERROR	MEASURED ERROR
1.	Levelling of machine	(a) in longitu-dinal direction	(a) 	(1) Front bedway 0.04	
				(2) Rear bedway +0.01 mm/m -0.02 mm/m	
		(b) in transverse direction	 (b) 	±0.02 mm/m	
2.	Traverse of carriage straight in horizontal plane		 minimun length 600 mm	0.02 mm over length of test mandrel	
3.	Axis of centres parallel with bed in vertical plane		 300 mm long	0.02 mm	
4.	Taper of spindle runs true			Position A : 0.01 mm	
				Position B : 0.02 mm	
5.	Spindle parallel with traverse of carriage	(a) in vertical plane		(a) 0.02/ 300 mm	
		(b) in horizontal plane		(b) 0.02/ 300 mm	

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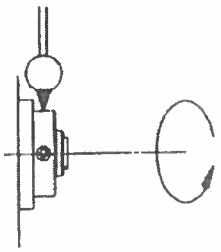
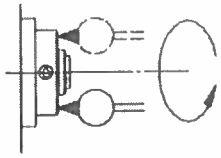
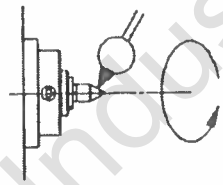
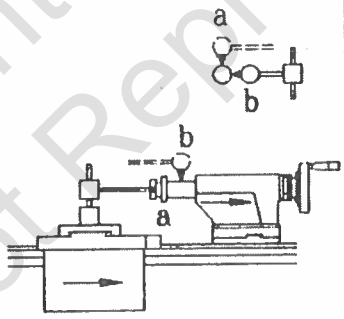
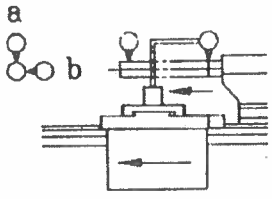
6.	Centring register of spindle runs true			0.01 mm	
7.	Spindle for axial float and ture running of face of spindle flange			0.015 mm	
8.	Centre runs true			0.015 mm	
9.	Traverse of carriage parallel with tailstock guideways	(a) in vertical plane		(a) 0.03/ 1000 mm	
		(b) in horizontal plane		(b) 0.02/ 1000 mm	
10.	Tailstock spindle parallel with carriage guides (carriage traverse)	(a) in vertical plane		(a) 0.01 mm	
		(b) in horizontal plane		(b) 0.01 mm	

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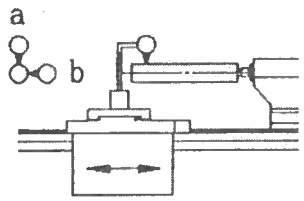
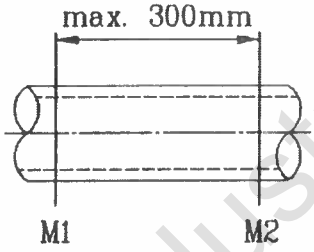
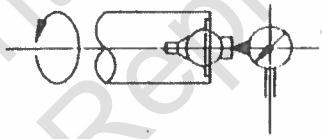
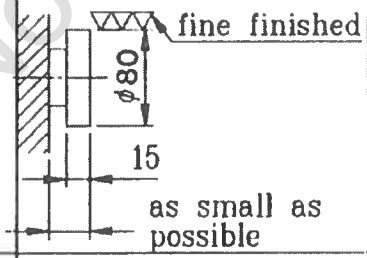
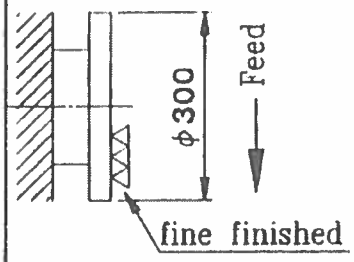
11.	Taper in tailstock spindle parallel with carriage traverse	(a) in vertical plane		(a) 0.03/ 300 mm	
		(b) in horizontal plane		(b) 0.03/ 300 mm	
12.	Pitch accuracy of lead-screw			0.03/ 300 mm	
13.	Leadscrew for axial float			0.01mm in either direction	
14.	Working accuracy of lathe on cylindrical turning			0.01mm	
15.	Working accuracy of lathe on surfacing work			0.02mm	
CHIEF ENGINEER :			INSPECTING ENGINEER :		

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