

SHARP

PRECISION ENGINE LATHE OPERATION MANUAL & PARTS LIST

1340VS

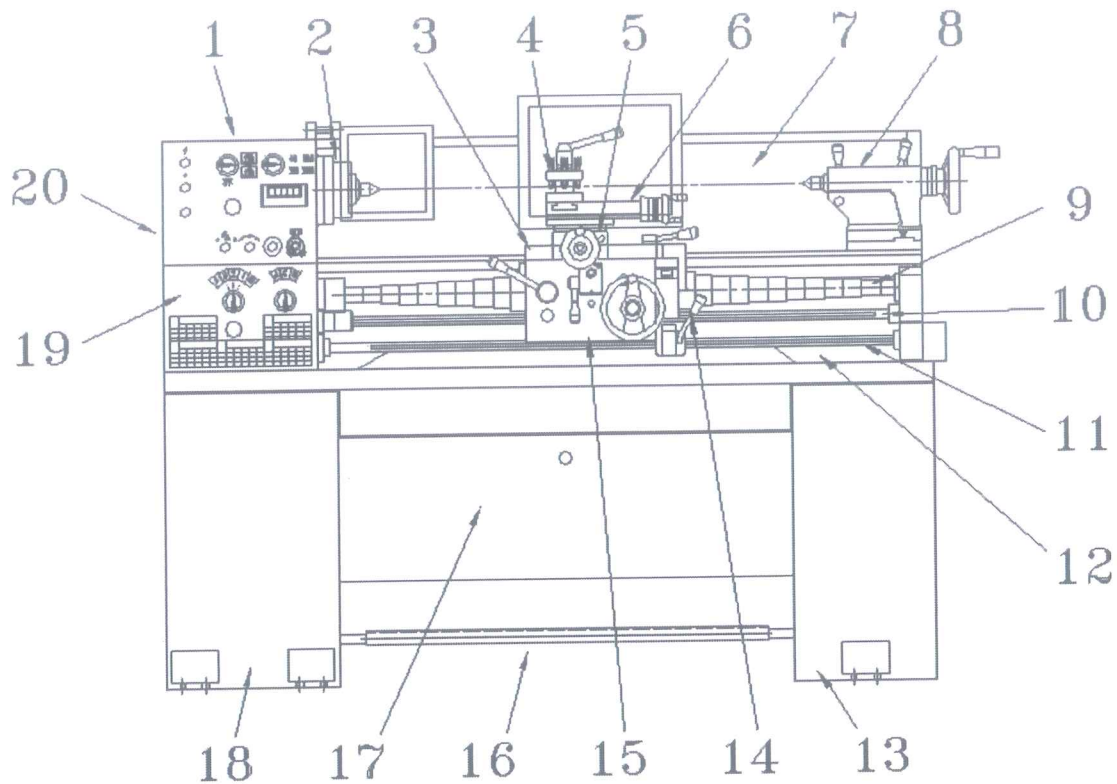


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SPECIFICATION AND ACCESSORIES

GENERAL LAYOUT OF LATHE



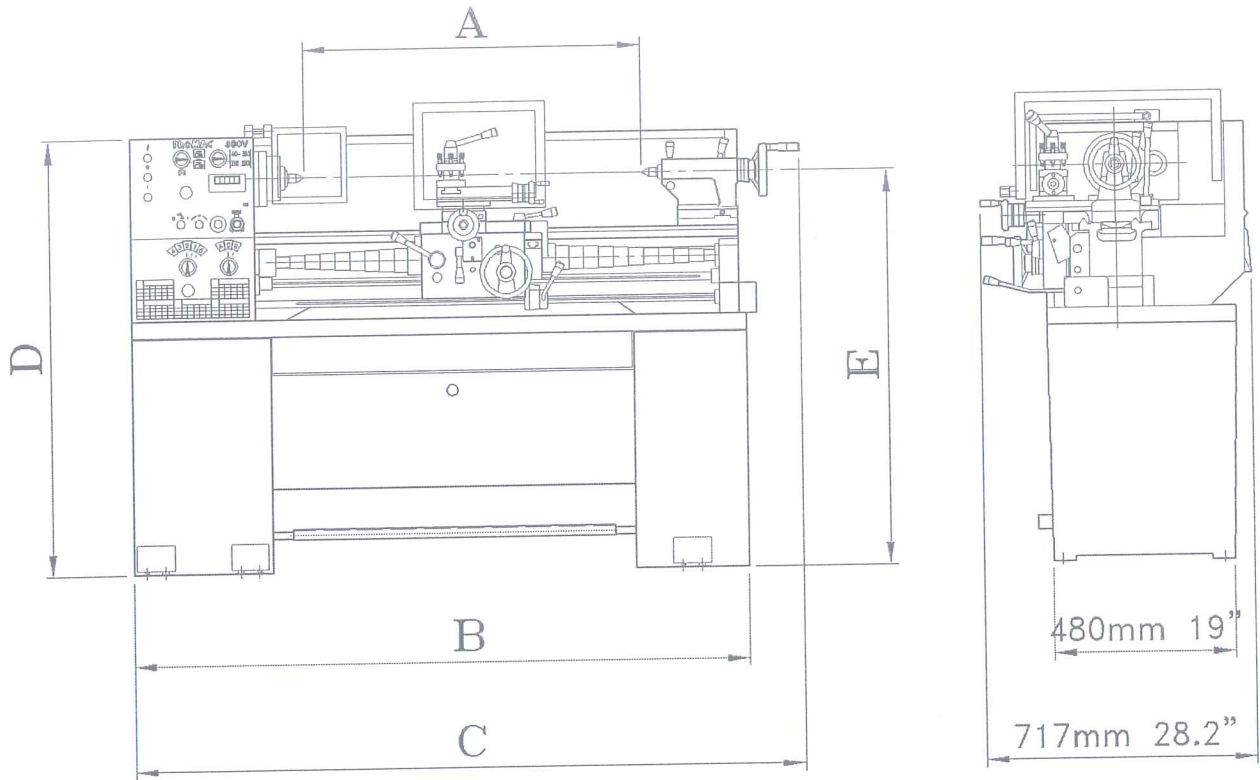
- | | |
|------------------------------|----------------------------|
| 1. Headstock | 11. Switch control rod |
| 2. Spindle | 12. Bed |
| 3. Saddle | 13. Stand |
| 4. Toolpost | 14. Spindle rotation lever |
| 5. Cross-slide | 15. Apron |
| 6. Compound-rest (Top slide) | 16. Footbrake |
| 7. Splash Guard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

SPECIFICATION AND ACCESSORIES

BRIEF SPECIFICATION			
MODEL	1224	1236	1340
NOMINAL SIZE			
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 7-1/2in		
Total Length of Bed	1220mm 48in	1525mm 60in	1625mm 64in
Gap Type	445mm 17-1/2in		470mm 18-1/2in
	240mm 9-1/2in		
	150mm 6in		
SPINDLE			
Spindle nose mounting	D1-4 CAMLOCK		
Spindle bore	40mm 1-9/16in		
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 6-3/4in		
Total travel of top slide	90mm 3-1/2in		
Max. size cutting tool	13mm 1/2in		
TAIL STOCK			
Total travel of tailstock barrel	100mm 4in		
Taper in tailstock barrel	M.T.#3		
Diameter of barrel	40mm 1-9/16in		
THREADS			
Lead screw diameter & pitch	Dia. 22mm 7/8in Pitch : 4mm 8 T.P.I.		
Inch threads	3-24 T.P.I. (8Nos) for metric system 2-56 T.P.I. (34Nos) for inch system		
Metric pitches	0.5-10 mm (21Nos) for metric system 0.5-12mm (33Nos) for inch system		
FEEDS			
Feed rod diameter	Dia. 19mm 3/4in		
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 net weight	620kgs	670kgs	720kgs
We reserve the right to modify and improve our products.			

SPECIFICATION AND ACCESSORIES

MEASUREMENT



MODEL	A	B	C	D	E
1224	610mm 24in	1335mm 50-1/2in	1480mm 58-1/4in	1150mm 45-1/4in	1043mm 41in
1236	900mm 36in	1640mm 64-1/2in	1785mm 70-1/4in	1150mm 45-1/4in	1043mm 41in
1340	1000mm 40in	1740mm 68-1/2in	1885mm 74-1/4in	1163mm 45-3/4in	1056mm 41-1/2in

SPECIFICATION AND ACCESSORIES

STANDARD ACCESSORIES

Electrical equipment &	
Motor 3 Hp, 3 PH -----	1 set
Set of change gears -----	1 set
Center sieve 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

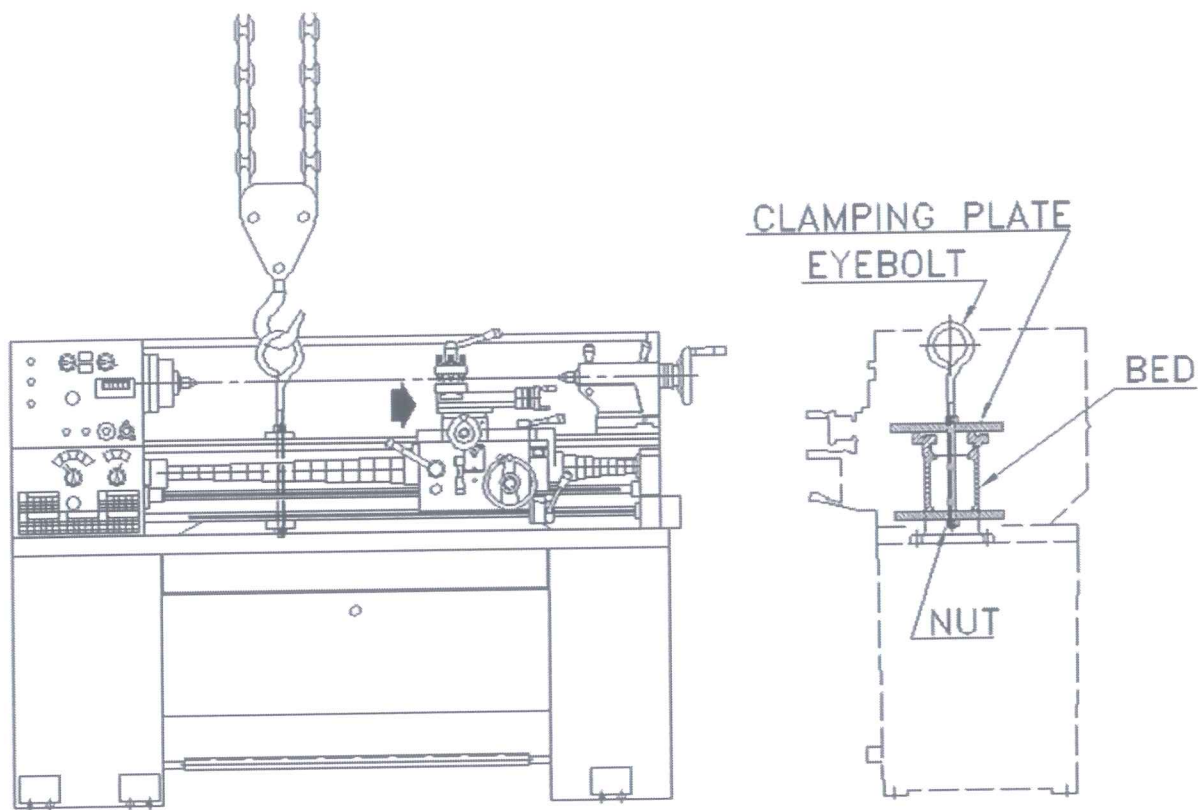
INSTALLATION

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.

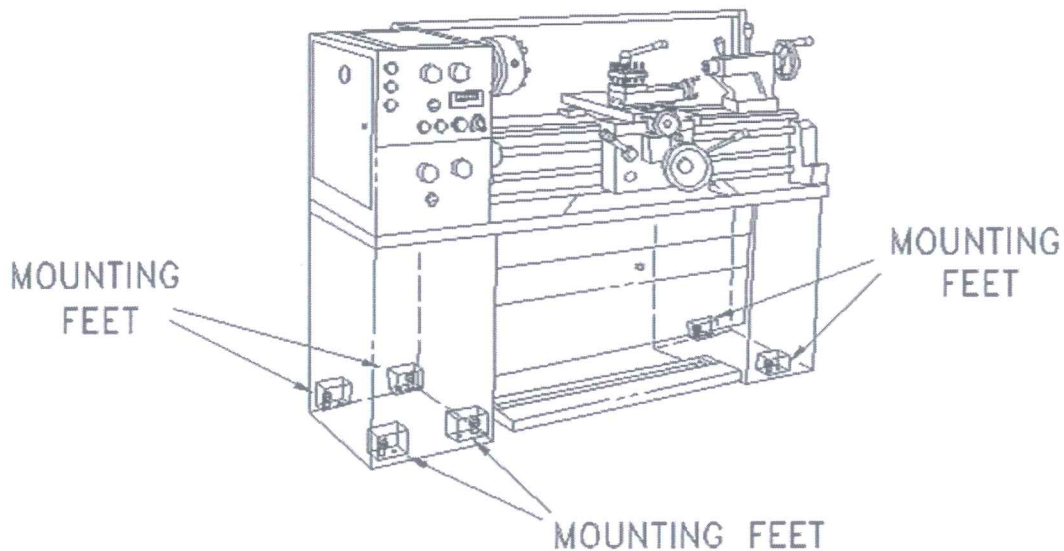
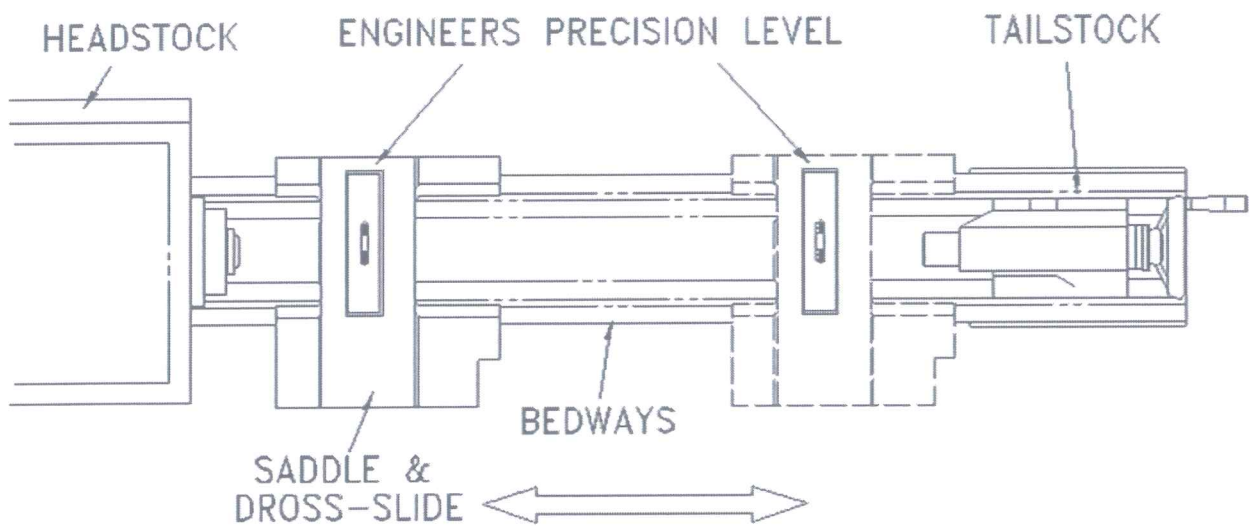
INSTALLATION

INSTALLING

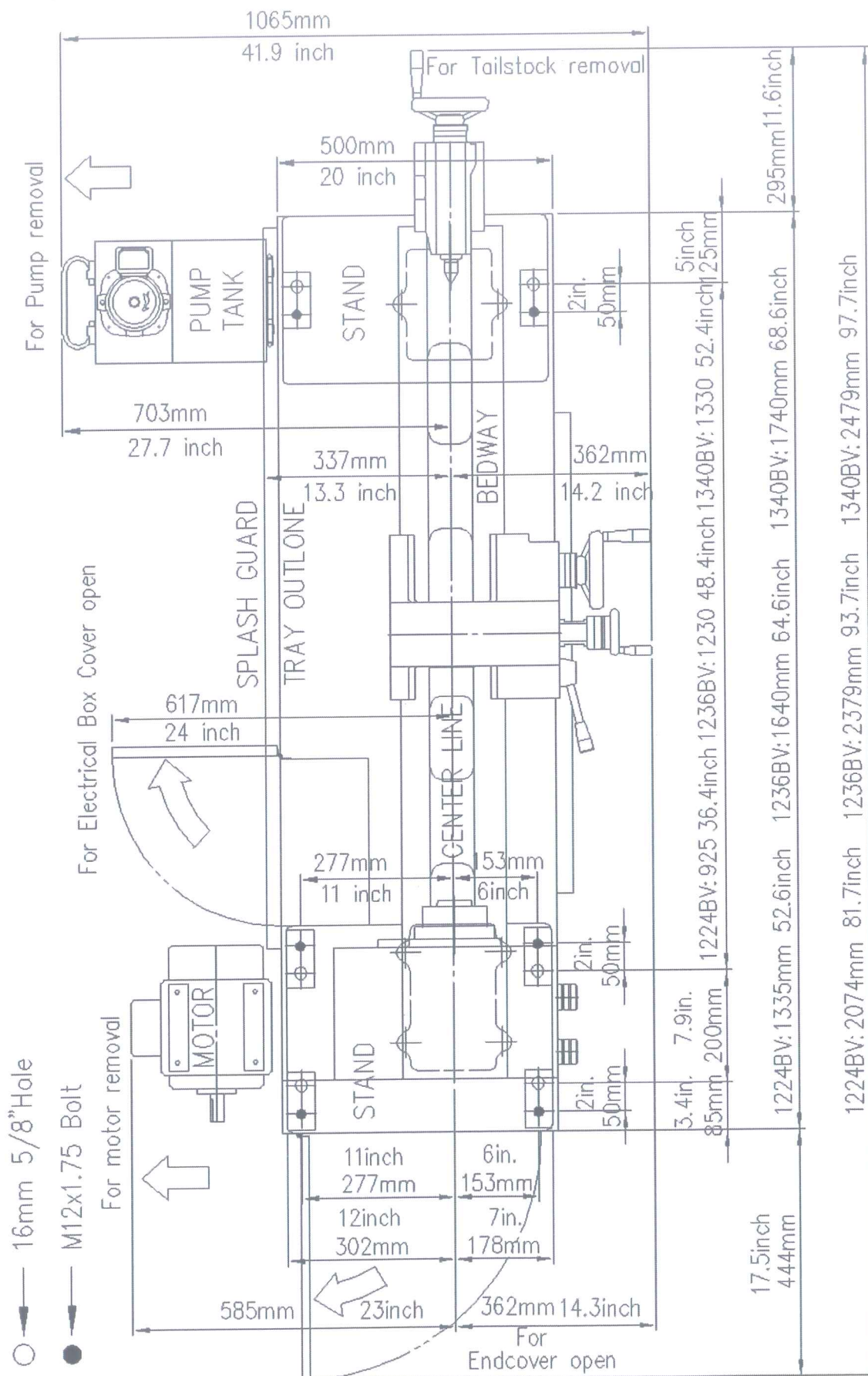
Located the machine on a solid foundation, allowing sufficient area all round for easy working and maintenance (see Foundation Plan). The lathe maybe used free-standing or bolted to the foundation.

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.



SPECIFICATION AND ACCESSORIES



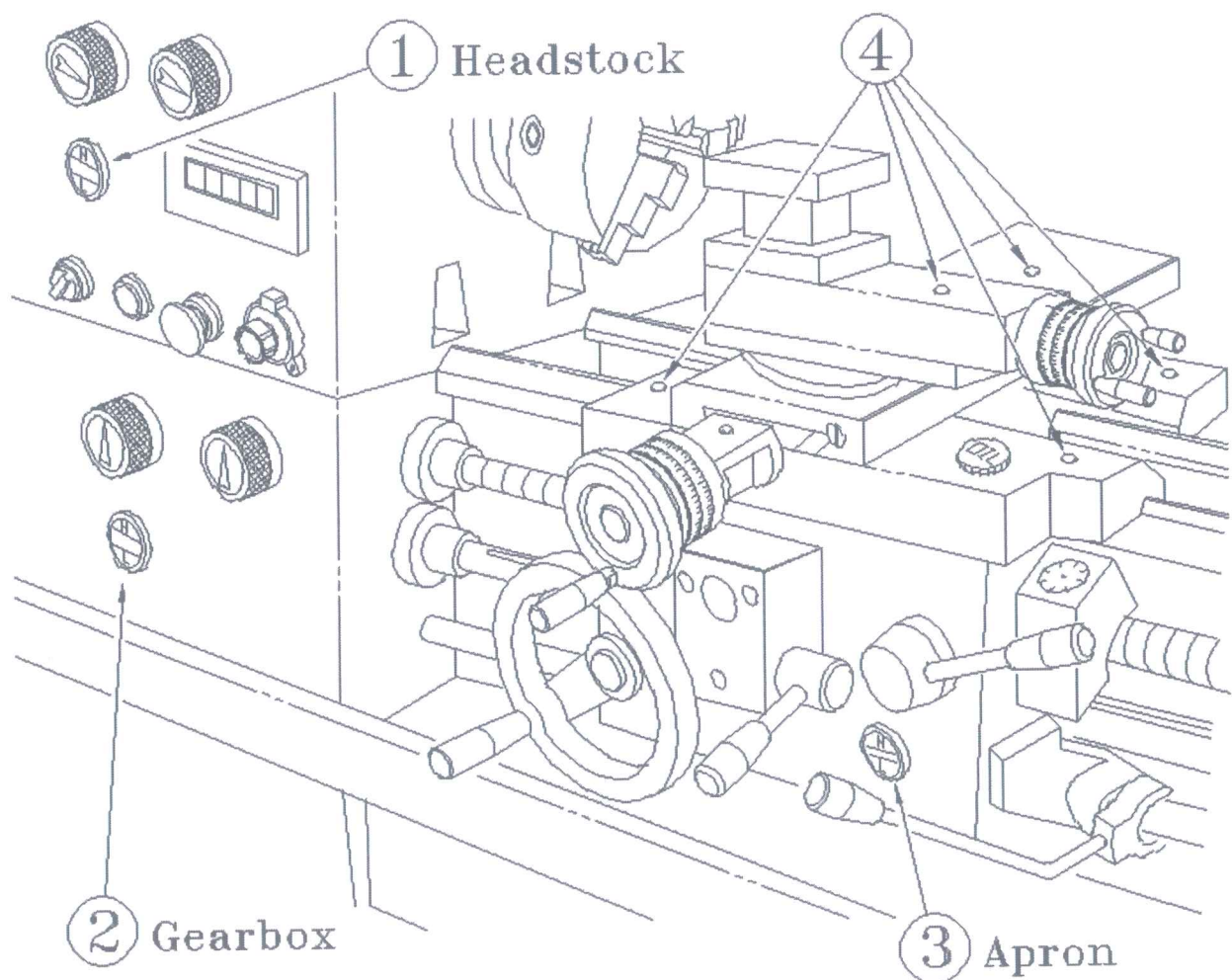
FOUNDATION PLAN

INSTALLATION

LUBRICATION CHECKS

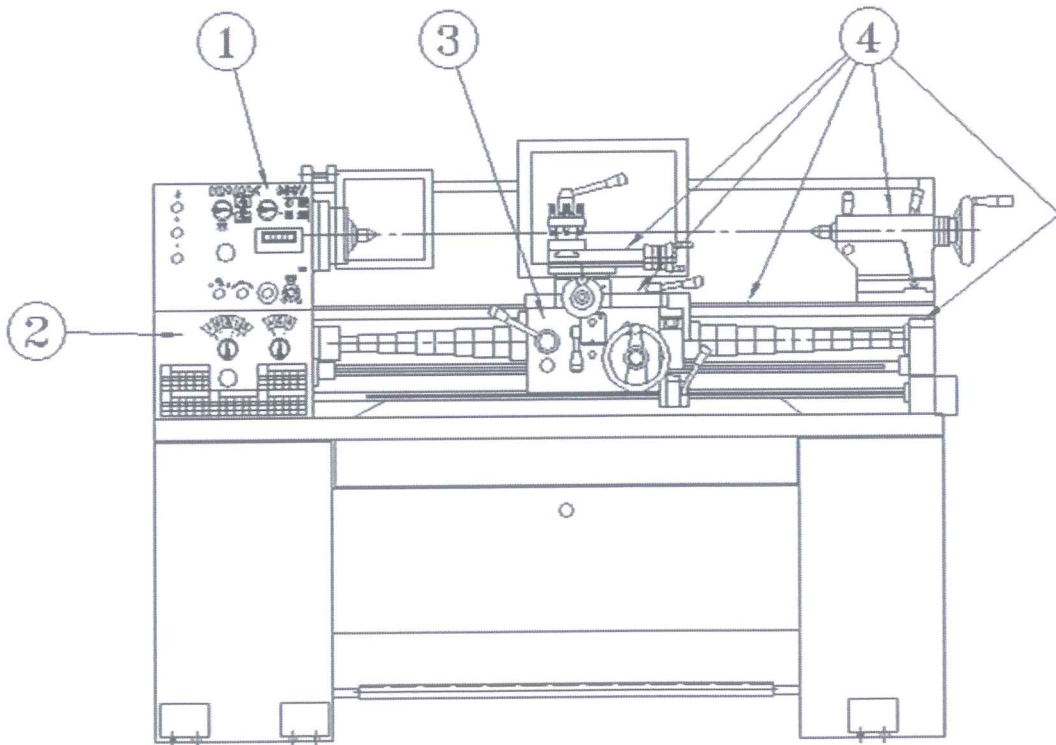
Before operating the machine make the following important checks:

1. That the headstock is filled to level marked on oil sight window with Shell Tellus Oil 27.
2. That the gearbox is 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.



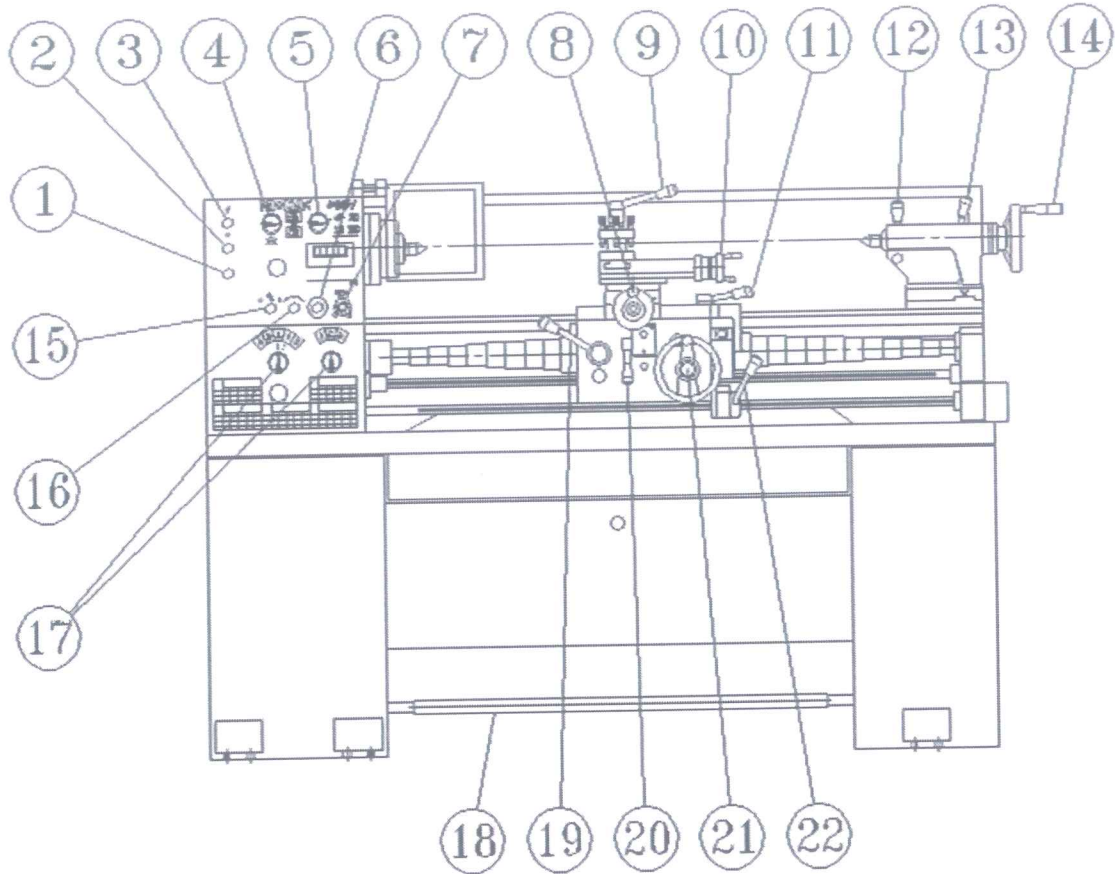
SERVICING AND MAINTENANCE

Part to be lubricated		①	②	③	④
		HEADSTOCK	GEARBOX	APRON	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	



OPERATION

LATHE CONTROL



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

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 marks 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.

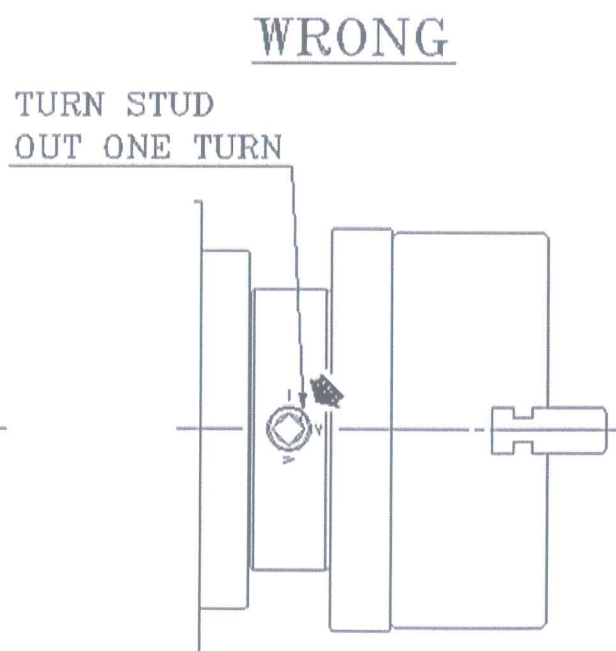
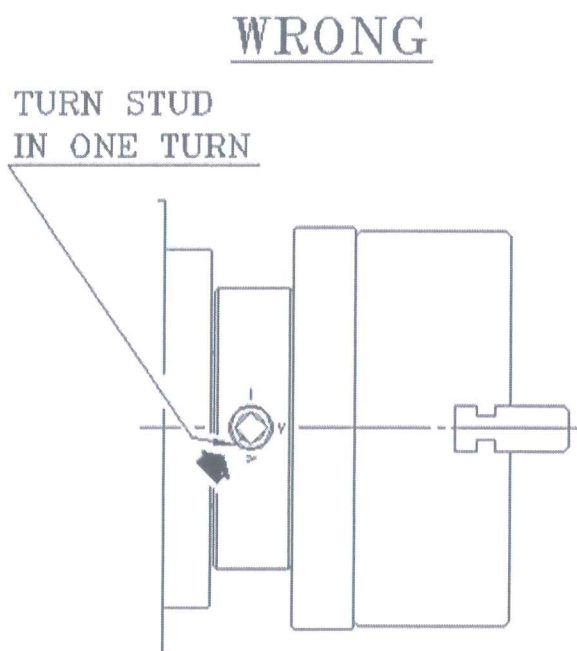
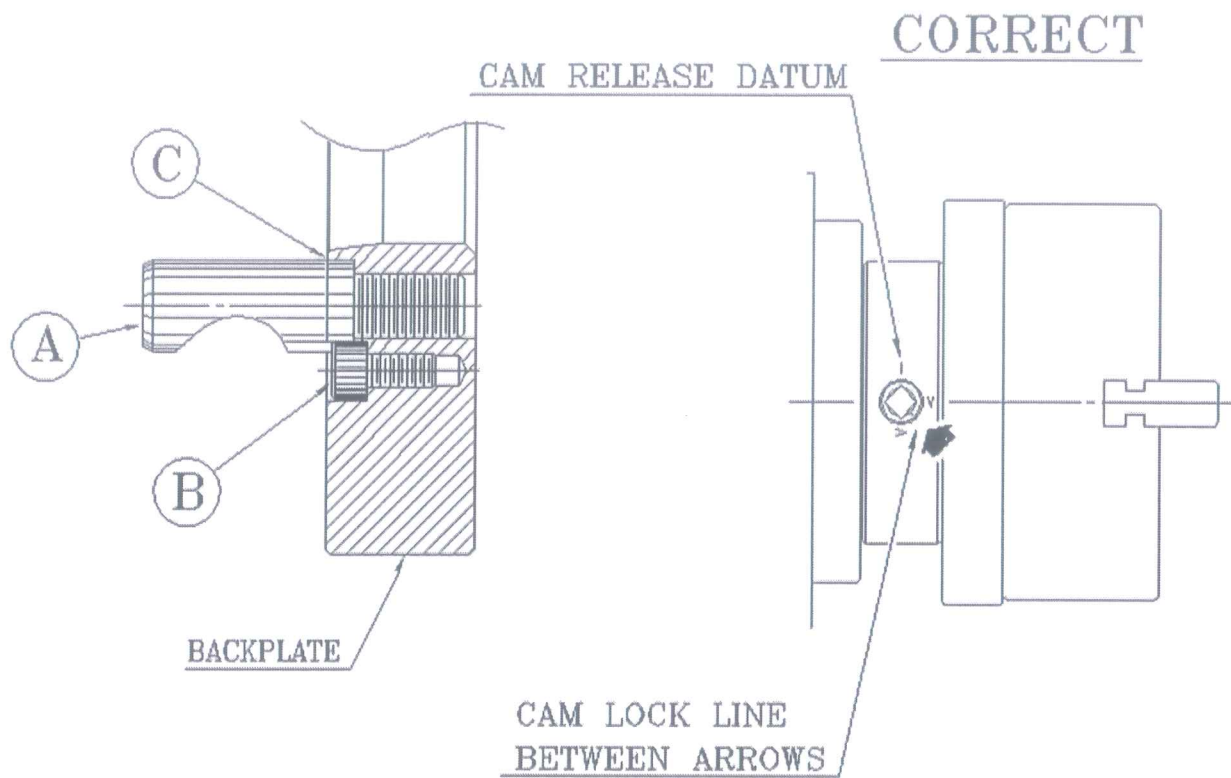
This will assist subsequent remounting.

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.

INSTALLATION

CHUCKS AND CHUCK MOUNTING



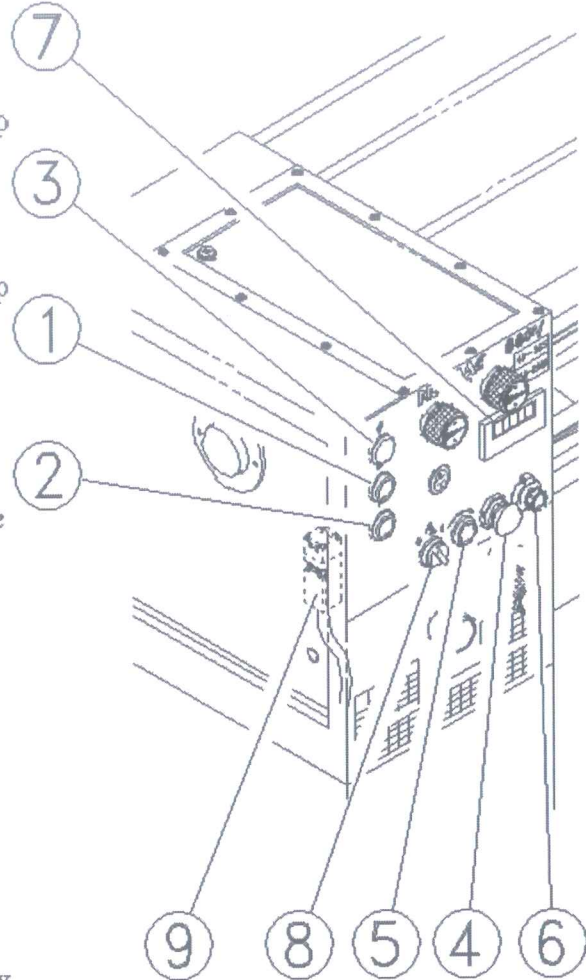
OPERATION

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.

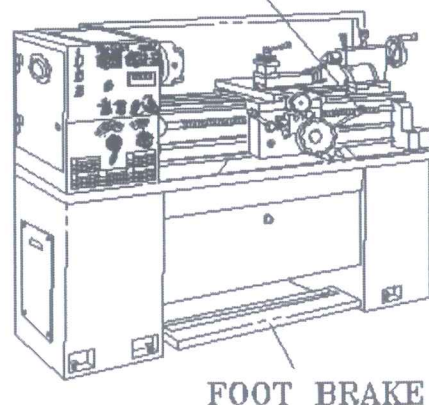
- (1),(2),POWER SWITCH BUTTON: when push the power switch button red color (1) on the top of headstock, the pilot lamp (3) glows and the electricity is on. When push the power switch green color (2), the electricity is off.
- (3) PILOT LAMP: When power is on, the pilot lamp glows.
- (4) EMERGENCY STOP 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 switch.
- (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 returned to the central position to disengage drive.
- B: Foot brake: A foot pedal between plinths operates the spindle brake.

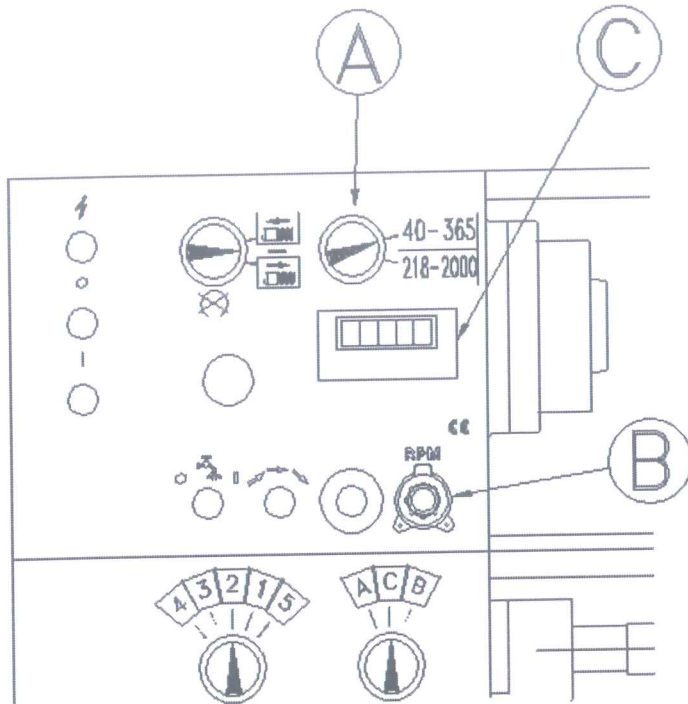
SPINDLE ROTATION LEVER



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.

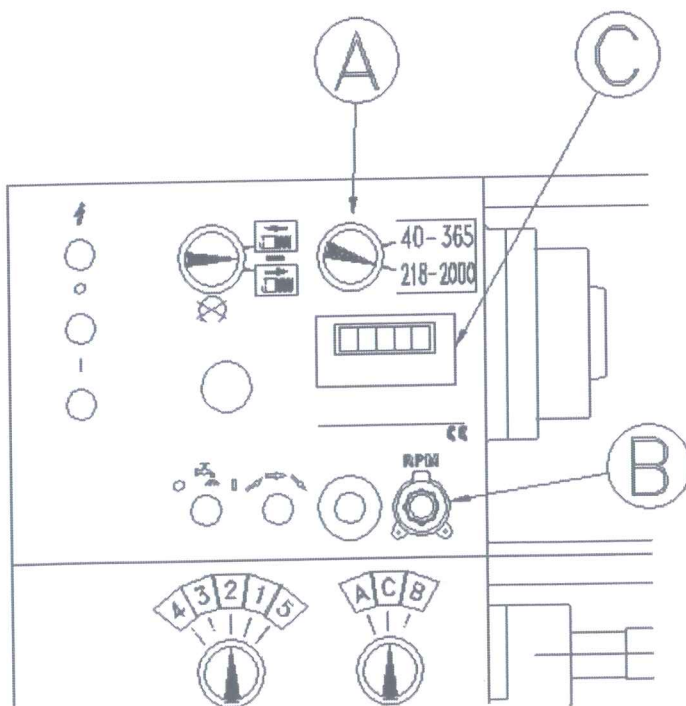
Firstly, put the upper right-hand Handle(A) on the Headstock to needed speed range. (Note: DON'T CHANGE HANDLE'S POSITION WITH SPINDLE IN MOTION. SPINDLE MUST BE MOTIONLESS WHEN CHANGE HANDLE'S POSITION)

Then, adjust Variable Speed Selectors(B) to needed spindle speed.

Selectors(B) can change speed while spindle is rotating.

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

HIGH SPEED (218-2000RPM)



OPERATION

THREADS AND FEEDS

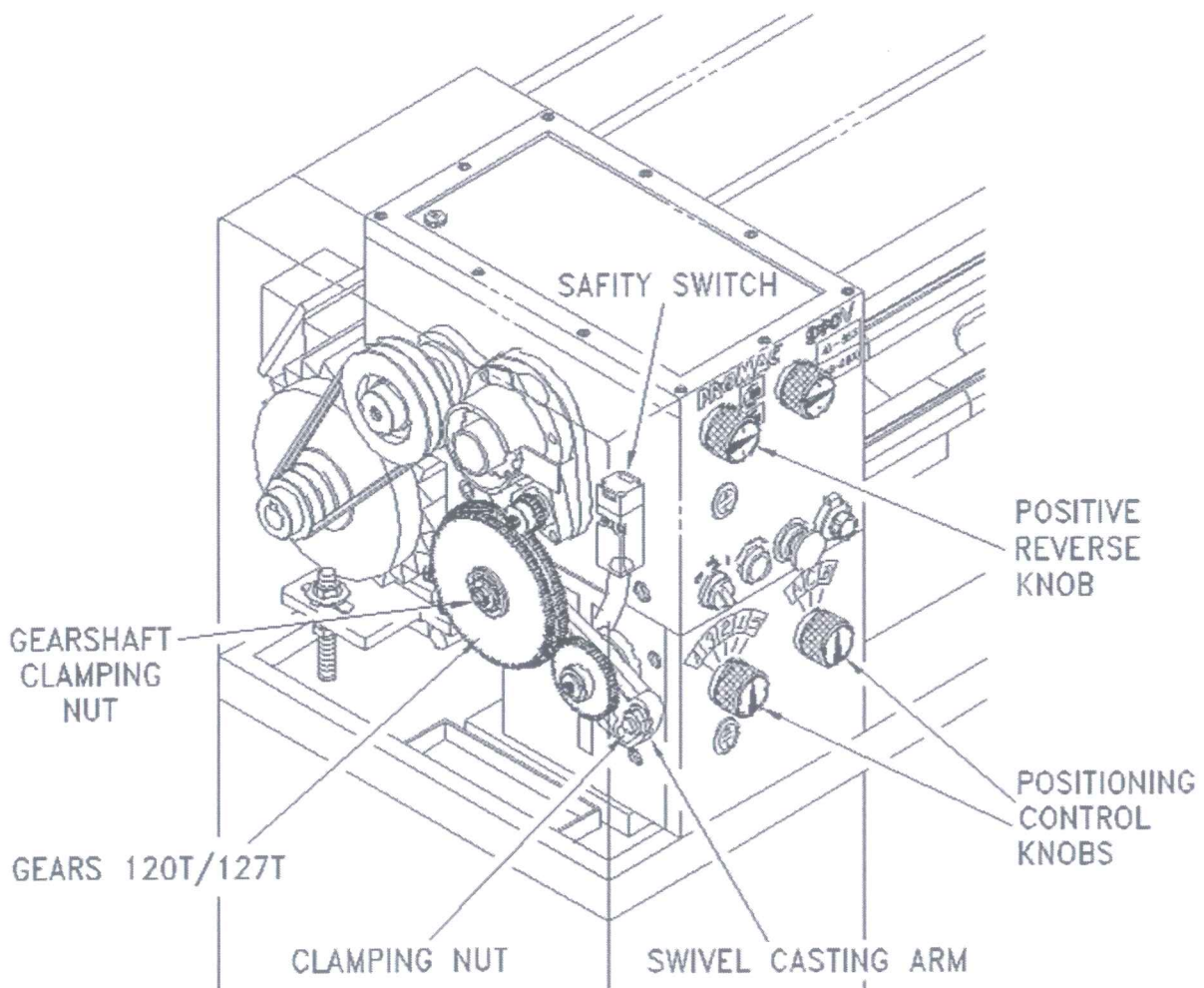
All the threads and feeds directly available from the gearbox are show on the data plate fitted on the front of the Gearbox cover, with the setting of control levers.

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

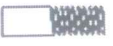


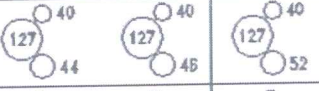
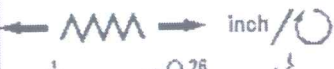




The end gear train should be arranged as in the diagrams show on the data plate to suit threading requirements.

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.



OPERATION

 T.P.I.																										
																										
	1	2	3	4	5																					
A	32	36	40	48	56																					
B	16	18	20	24	28																					
C	8	9	10	12	14																					
																										
	1	2	3	4	5																					
A	8	9	10	12	14																					
B	4	4½	5	6	7																					
C	2	2½	2½	3	3½																					
																										
	3	3	3																							
A	22	A 23	A 26																							
B	11	B 11½	B 13																							
C	5½	C 5¾	C 6½																							
																										
																										
	1	2	3	4	5																					
A	0.0028	0.0025	0.0023	0.0019	0.0016																					
B	0.0057	0.0051	0.0046	0.0038	0.0032																					
C	0.0115	0.0102	0.0092	0.0076	0.0065																					
																										
	1	2	3	4	5																					
A	0.0115	0.0102	0.0092	0.0076	0.0065																					
B	0.0230	0.0204	0.0184	0.0153	0.0131																					
C	0.0460	0.0409	0.0368	0.0307	0.0263																					
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	26	35	30																							
	52	40	50																							
	4	3	5	4	2 1																					
PC MM	A	0.5	0.6	0.75	0.875	0.8	0.9																			
	B	1.0	1.2	1.5	1.75	1.6	1.8																			
	C	2.0	2.4	3.0	3.5	3.2	3.6																			
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	30	50	52	50	52																					
	40	40	26	30	26																					
	2	1	4	1	4	3	1	1																		
A	1.0	1.125	1.25	1.375	2.0	2.4	2.5	3.0																		
B	2.0	2.25	2.5	2.75	4.0	4.8	5.0	6.0																		
C	4.0	4.5	5.0	5.5	8.0	9.6	10	12																		

THREADS AND FEEDS

Leadscrew 8 TPI

Change gear: 8 Pcs.

26, 30, 35, 40, 44, 46, 50, 52
(26T & 52T mount on the machine)

Number of Inch pitches:

34 Kinds

2 ~ 56 T.P.I.

Range of longitudinal feeds:

25 Kinds

0.0016" ~ 0.0460"

Number of Metric pitches:

40 Kinds

0.5 ~ 12 T.P.I.

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 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.

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.

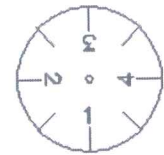
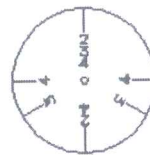
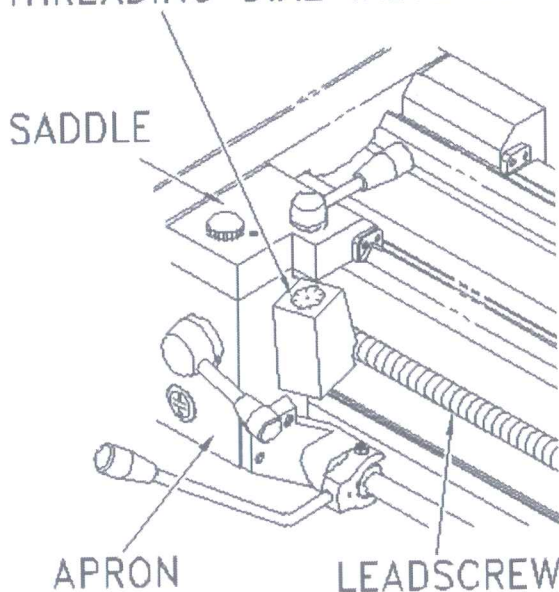
B. Whitworth threads

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 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 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.

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.

THREADING DIAL INDICATOR



METRIC THREAD DIAL					
PC	T	L	PC	T	L
0.4	20	4	1.4	21	3
0.46	27	3	1.5	27	3
0.5	20	4	1.625	26	2
0.56	22	2	1.75	21	3
0.6	27	3	2.0	20	4
0.625	20	4	2.25	27	3
0.65	28	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	28	2	7.0	21	3
1.375	22	2			

LEADSCREW PITCH 4MM

WHITWORTH THREAD DIAL					
TPI	J	TPI	J	TPI	J
4	1-8	12	1-8	38	1-8
4 1/2	12	13	1-4	40	1-8
4 3/4	1	14	1-8	44	1-8
5	1-4	16	1-8	48	1-8
5 1/4	12	18	1-8	52	1-8
6	1-8	19	1-8	56	1-8
6 1/2	12	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
9 1/2	12	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.

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 manual operation. If move lever (A) downwards, it would do cross-feed operation.

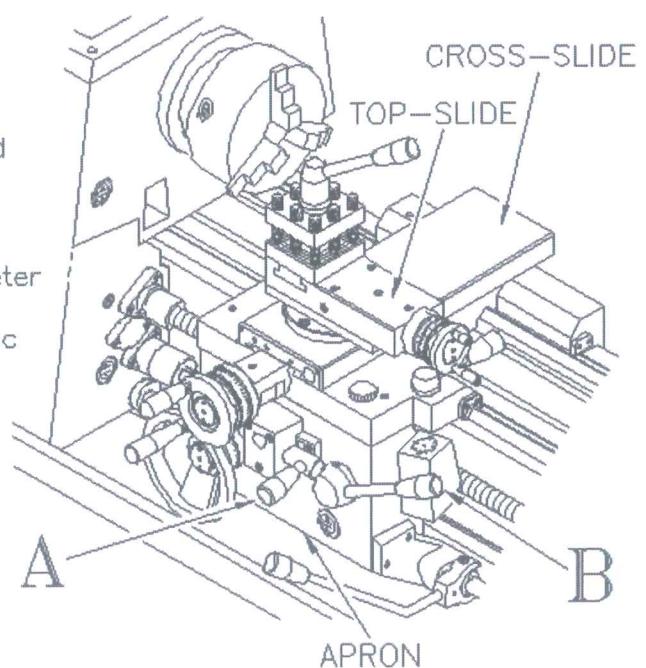
Lever (B) is pressed downward to engage the leadscrew nut for screwcutting. To avoid undue wear. Release the nut except when screwcutting.

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 fitted.

The cross-slide can be power operated by pulled downward the 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.

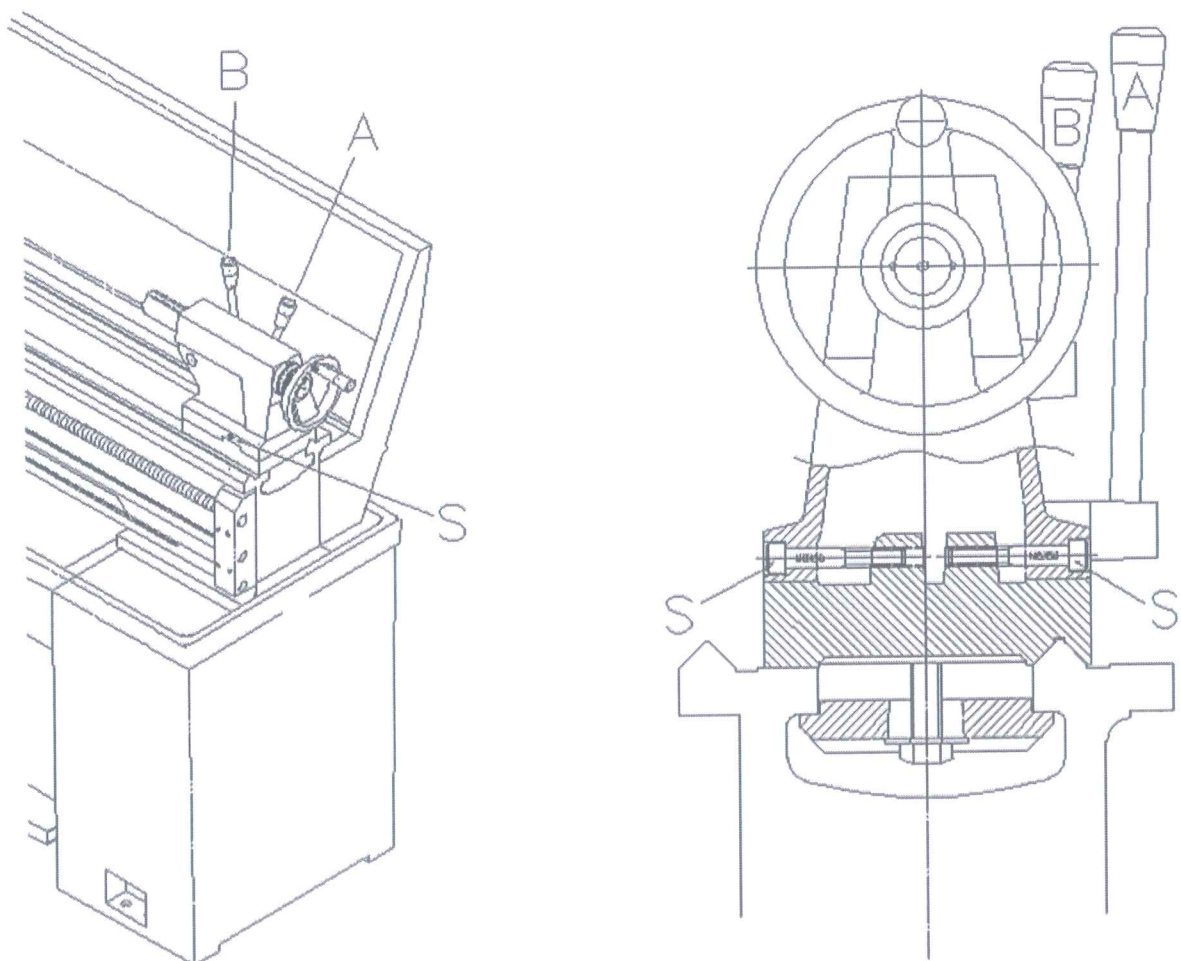


TAIL STOCK

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.



SERVICING AND MAINTENANCE

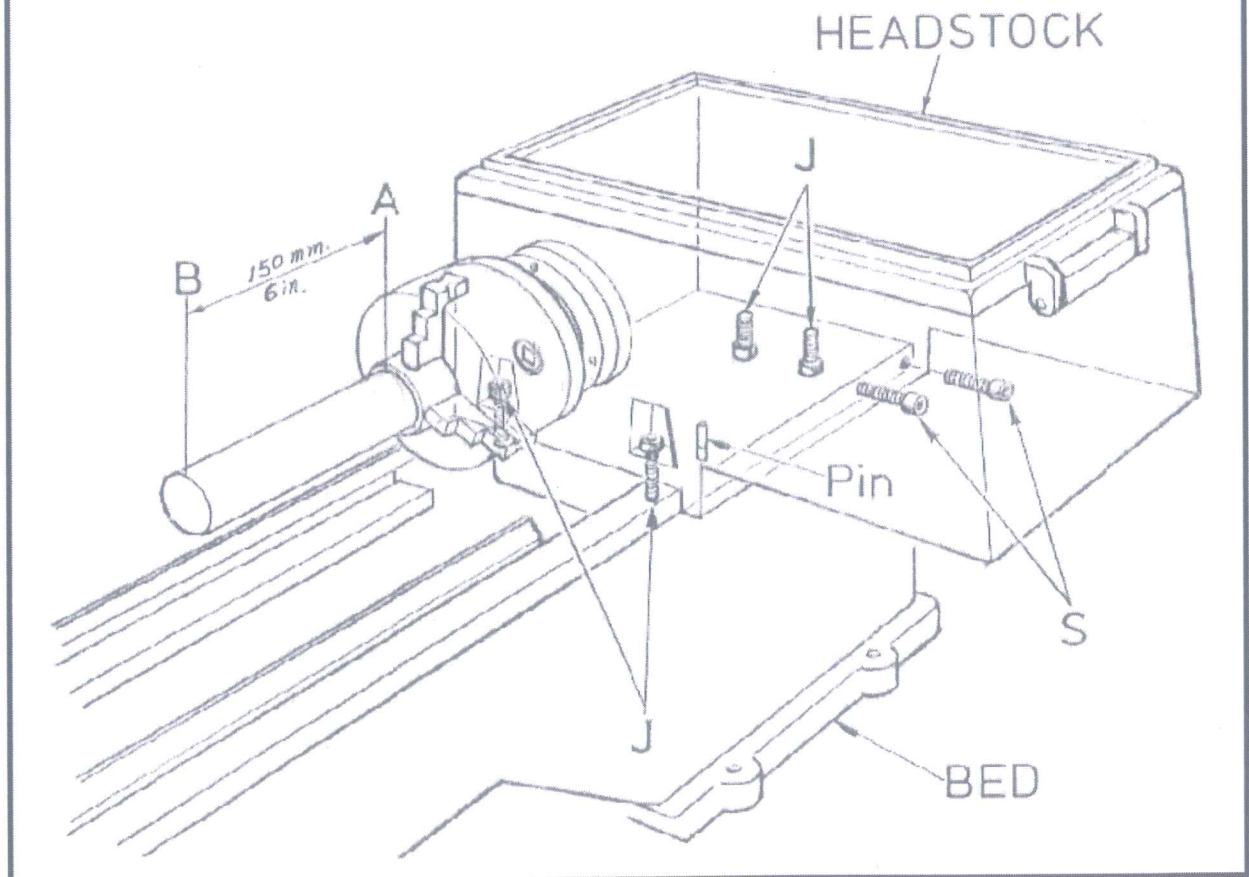
LATHE ALIGNMENT (Part.1)

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 6 in (150mm.) length of 2 in. dia. (50mm.) steel bar gripped in the chuck but not supported at the feed end. Micrometer readings at each end of the turbed length (at A and B) should be the same.

To correct a difference in readings, slacken the four headstock hold-down screws (S) and adjust the set-over pad (P) beneath the headstovk, to pivot the headstock about the dowel (D). Tighten all screws, after adjustment and repeat the test-cut / micrometer-reading, sequence until micrometer readings are indentical, so machine now cutting absolutely parallel.

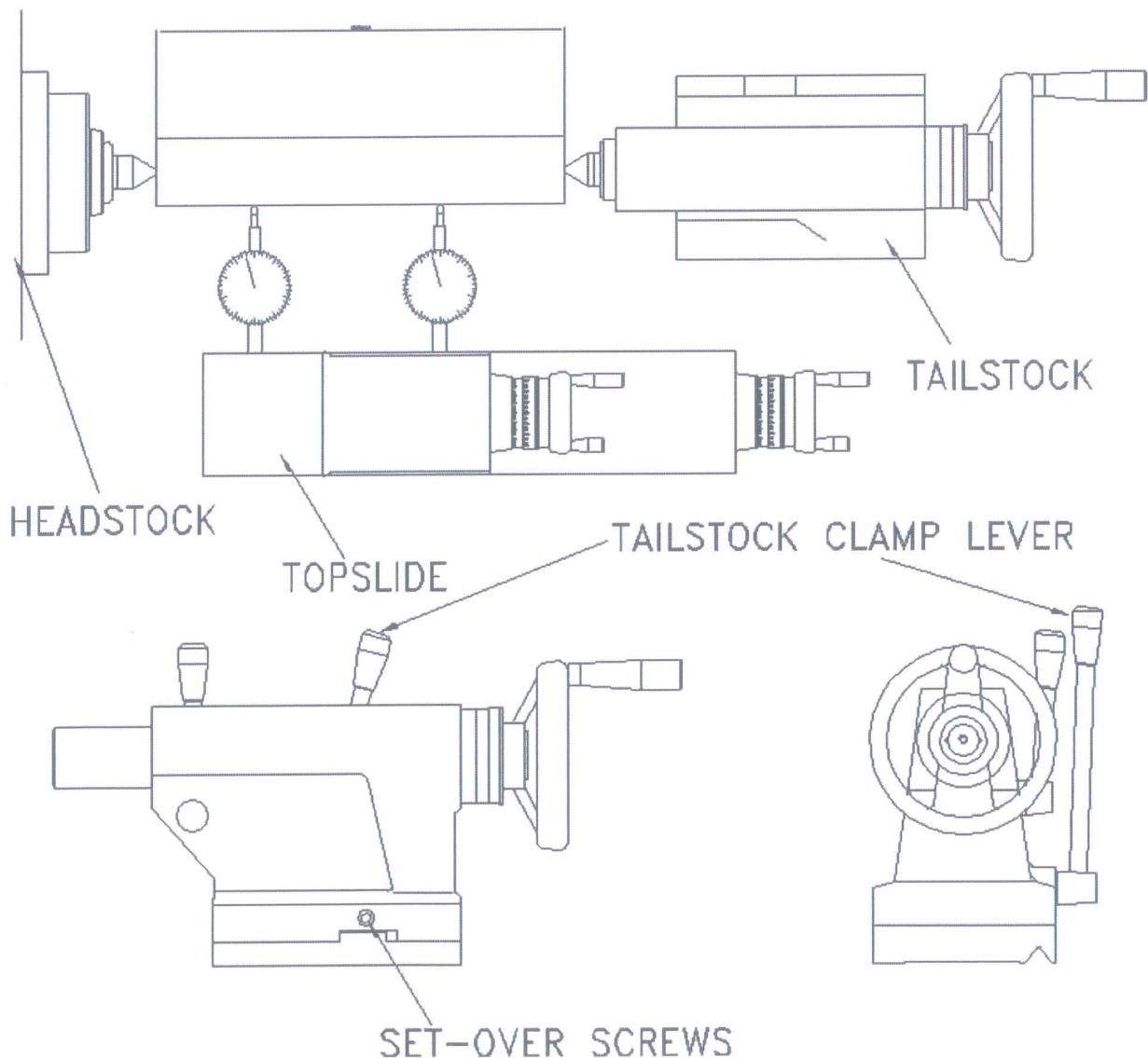


OPERATION

LATHE ALIGNMENT (part2)

Tailstock check: Using a 12 in. (305mm.) 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.

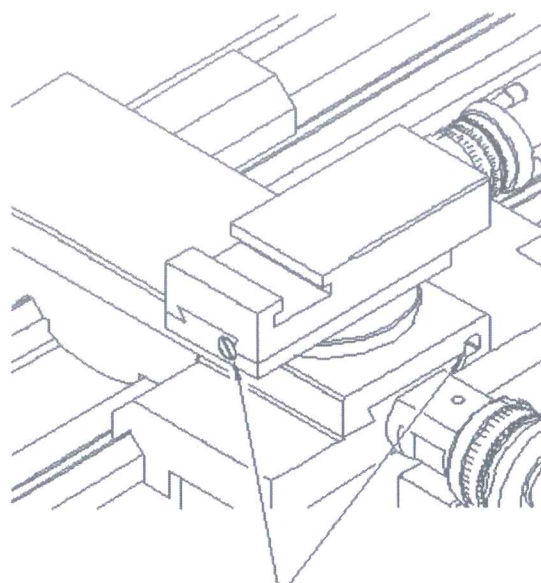


SERVICING AND MAINTENANCE

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.

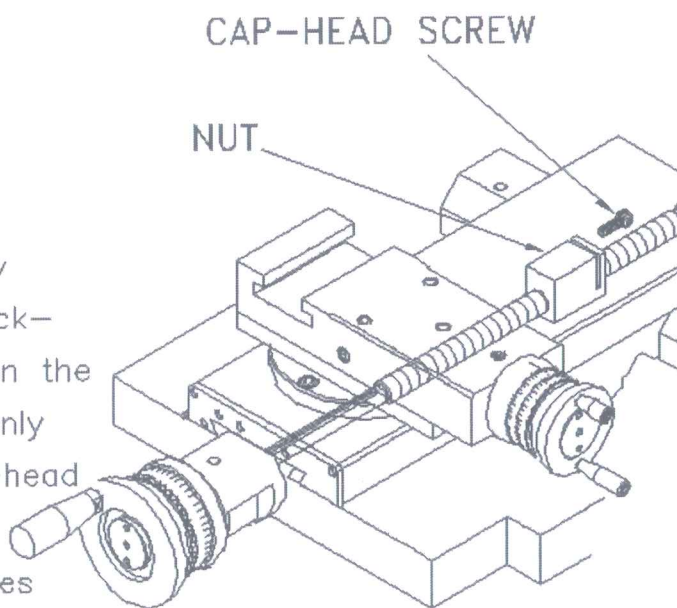
Ensure that slideways are thoroughly cleaned and lubricated before attempting adjustment. Then reset the gibs by slackening the rear gib screw and tightening the front screw. Check constantly for smooth action throughout full slide travel. Avoid over-adjustment which can result in increased wear-rate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



CAP-HEAD SCREW

NUT

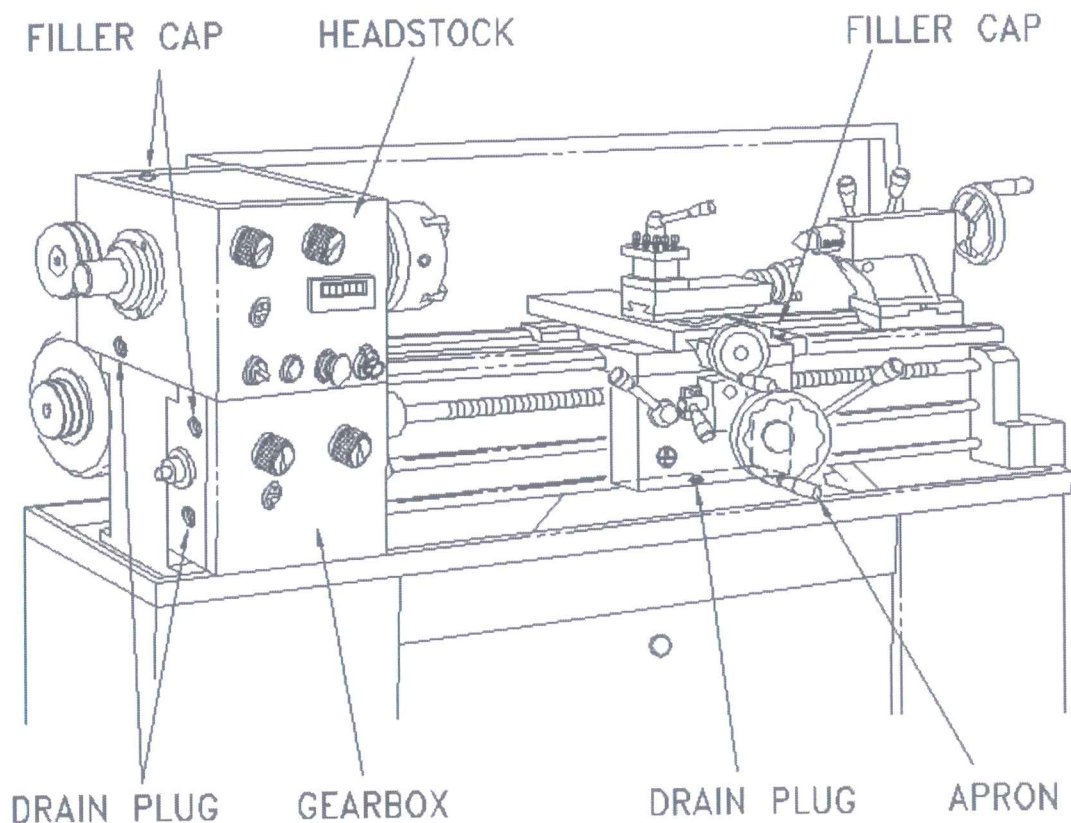
SERVICING AND MAINTENANCE

LUBRICATION (Part.1)

Headstock bearing and gears are splash lubricated. Ensure that oil level is kept between H-L lever mark on the sight glass in the front of headstock. 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 from 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.



SERVICING AND MAINTENANCE

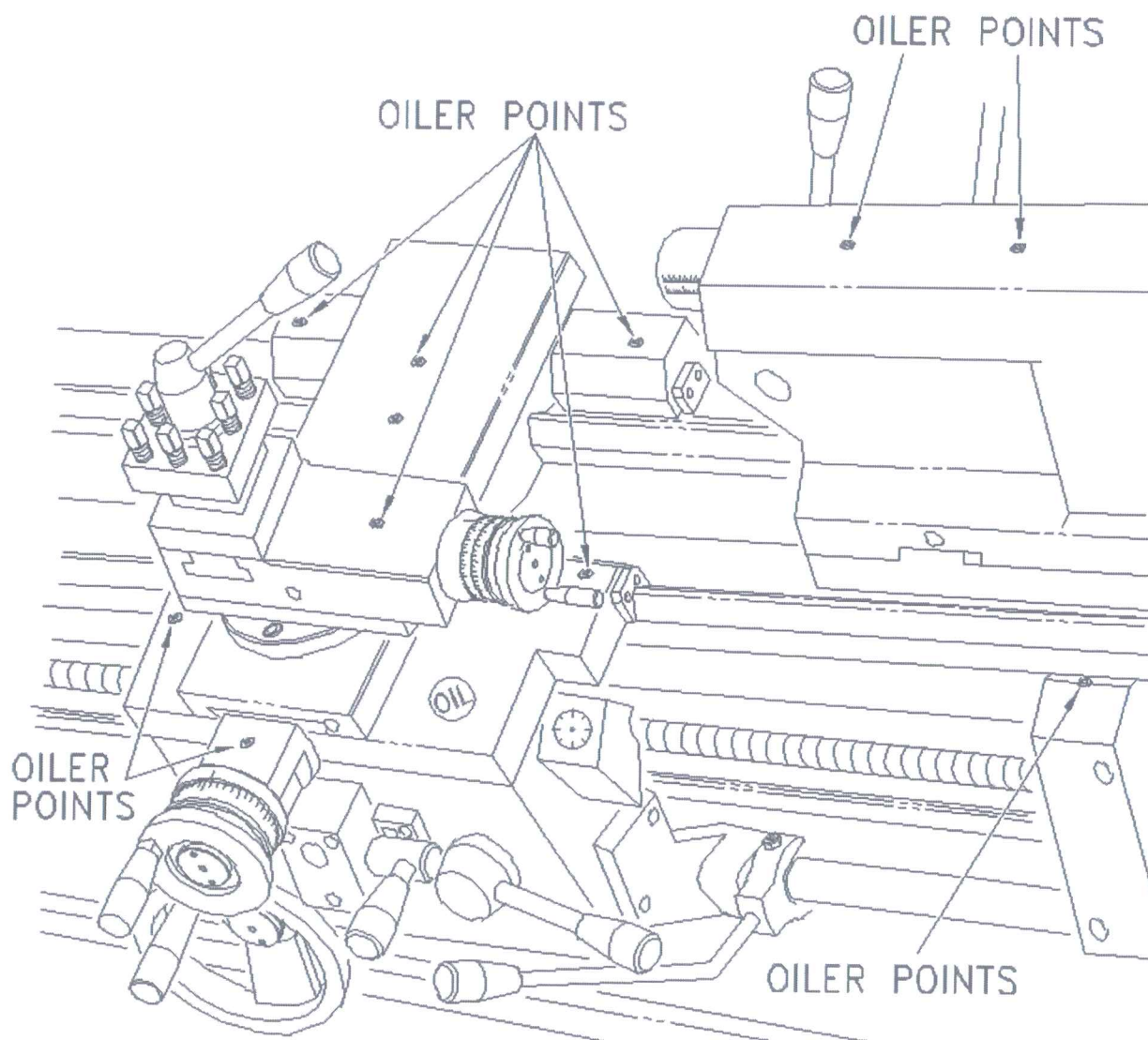
LUBRICATION (Part.2)

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.

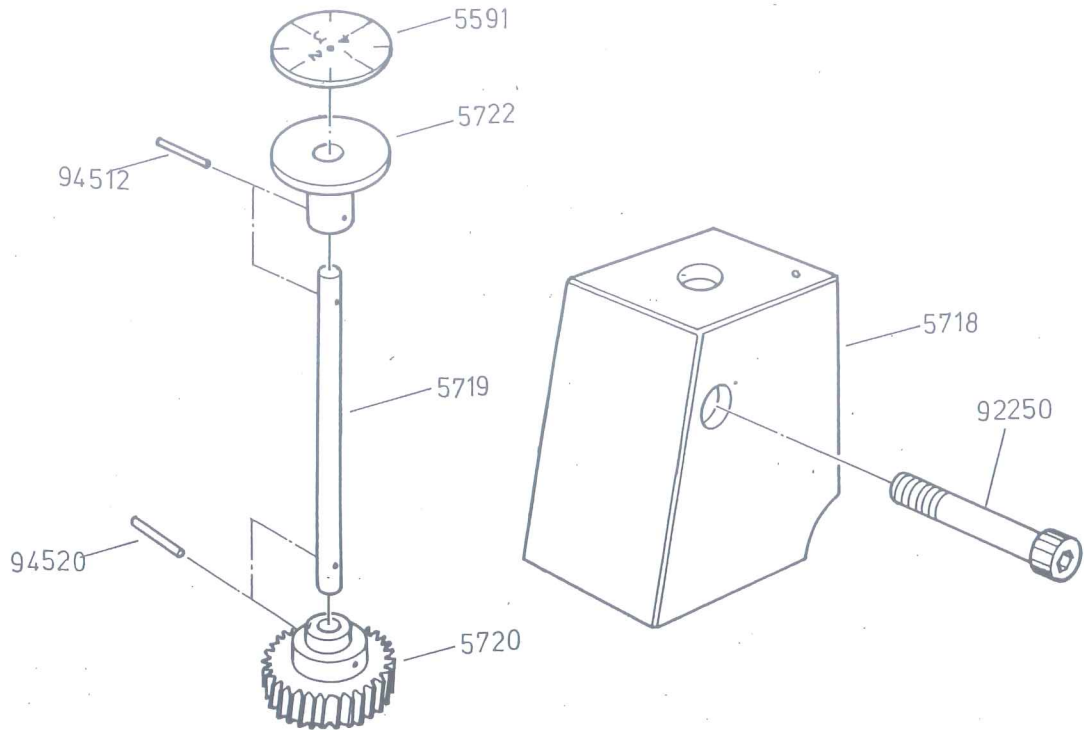
NOTE: Using incorrect grade of oil can cause damage.



ASSEMBLY THREADING DAILS

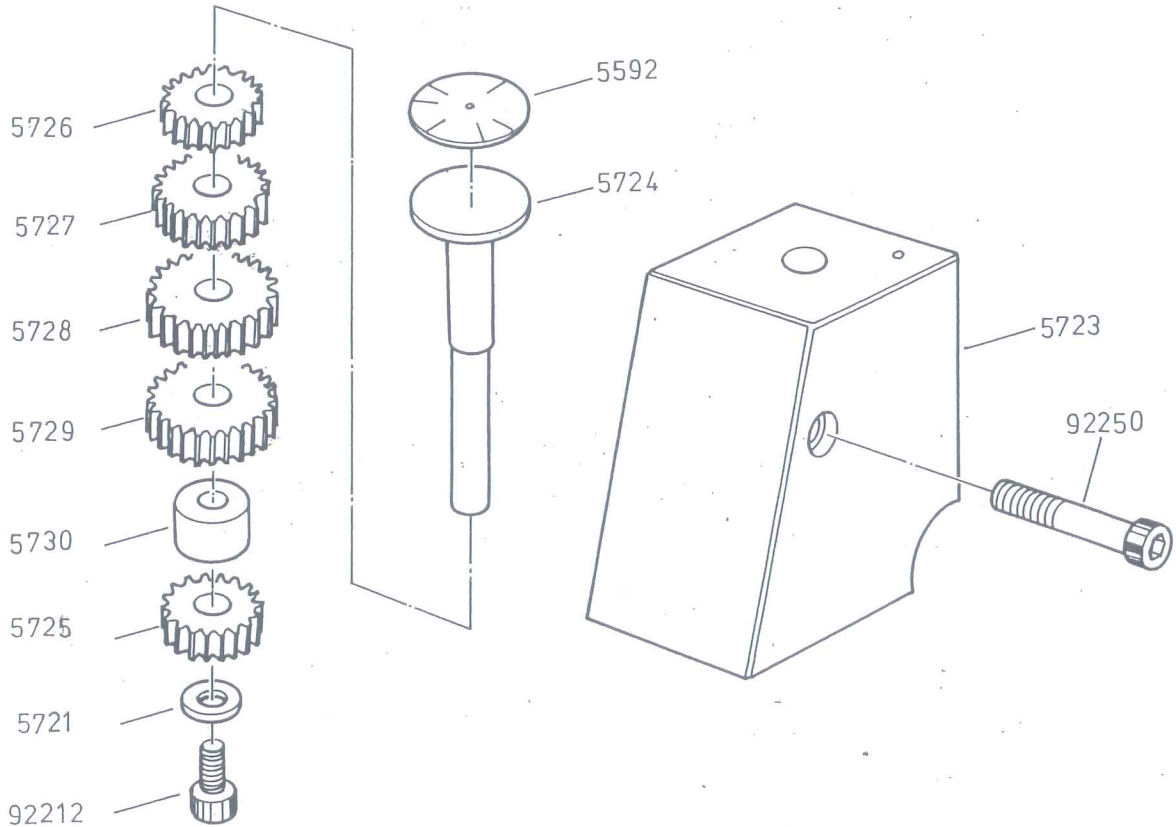
ENGLISH

(LEADSCREW 8 TPI)

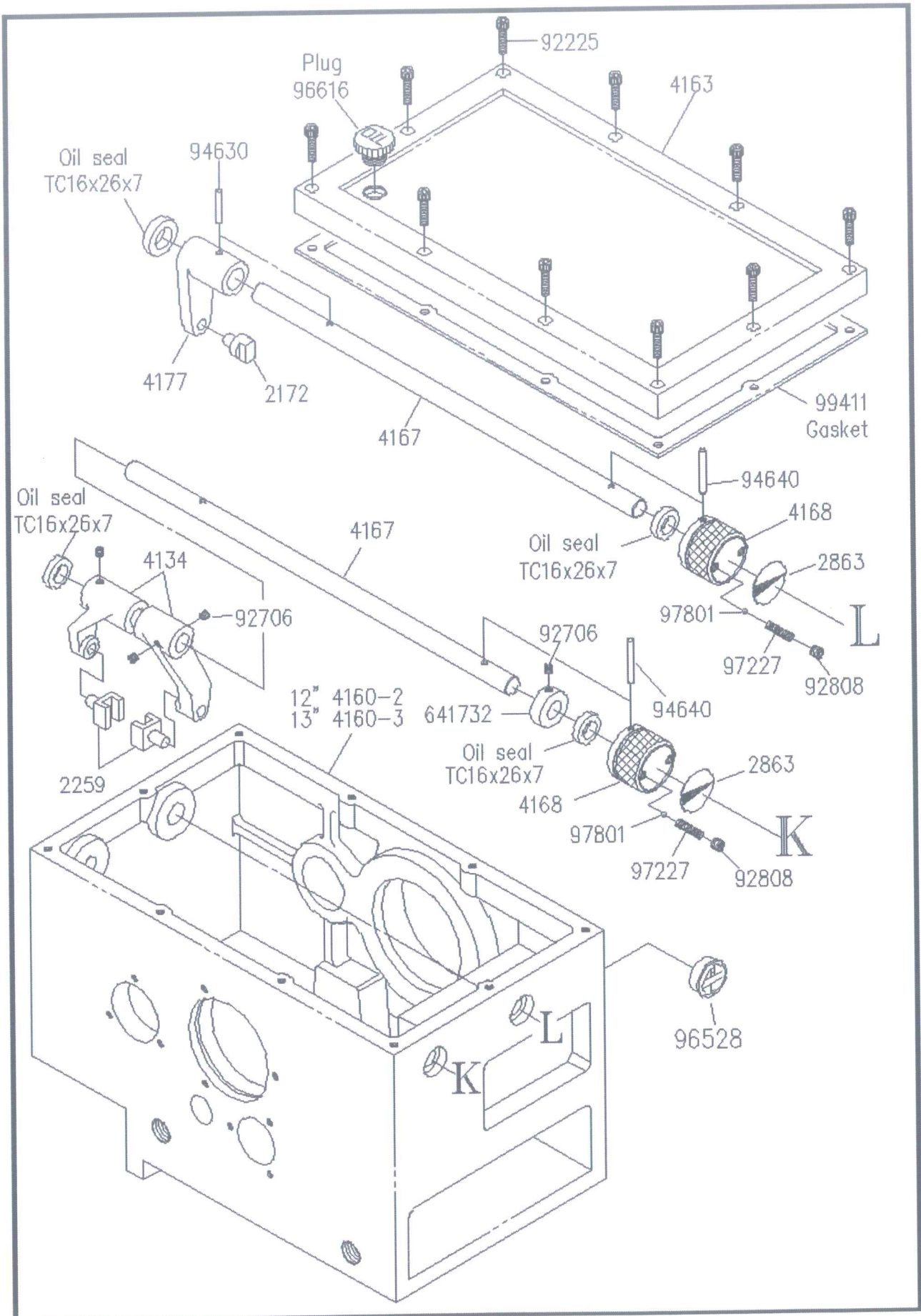


METRIC

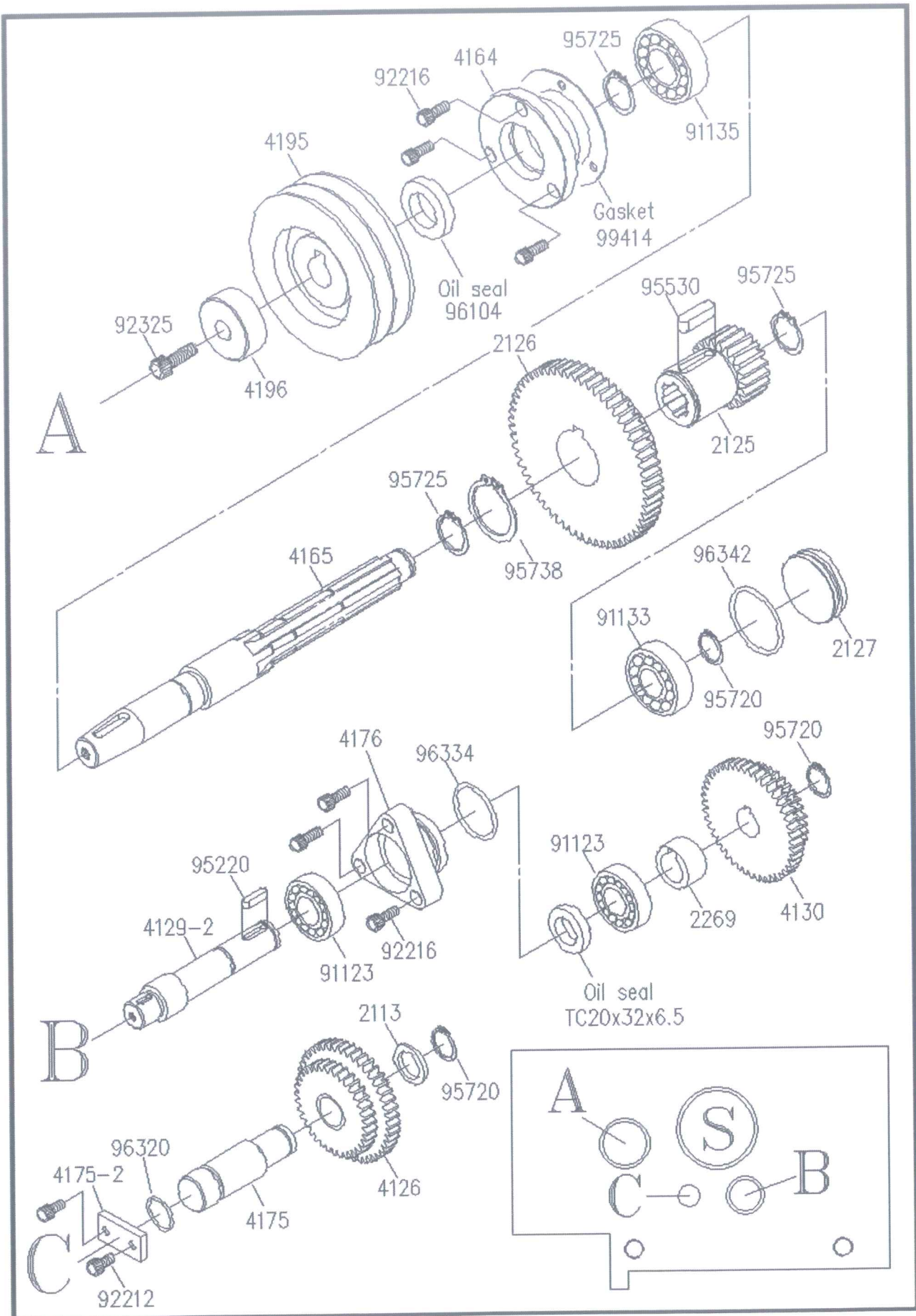
(LEADSCREW PITCH 4 MM)



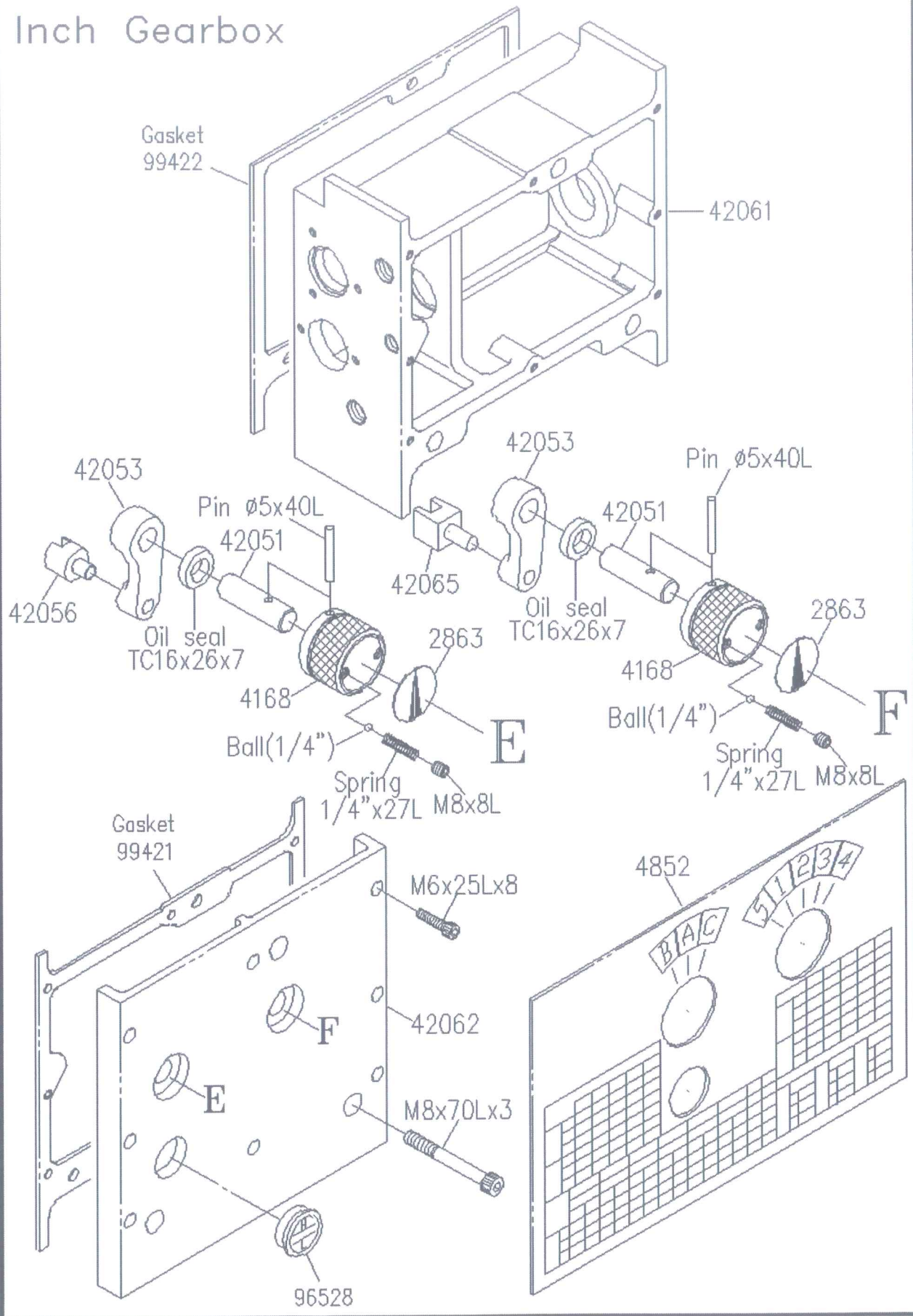
ASSEMBLY Headstock (Casting & Lever)



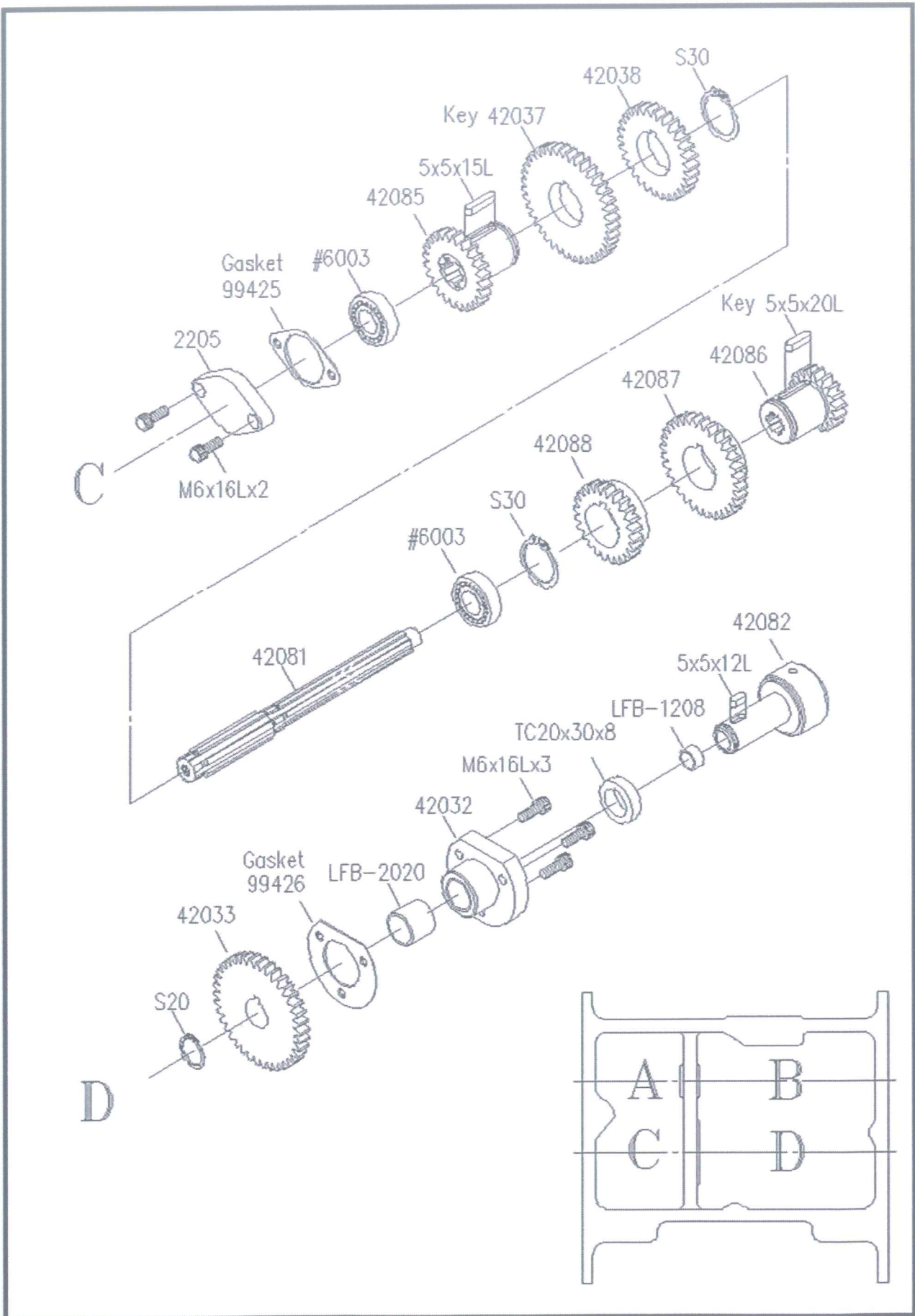
ASSEMBLY Headstock (Casting & Lever)



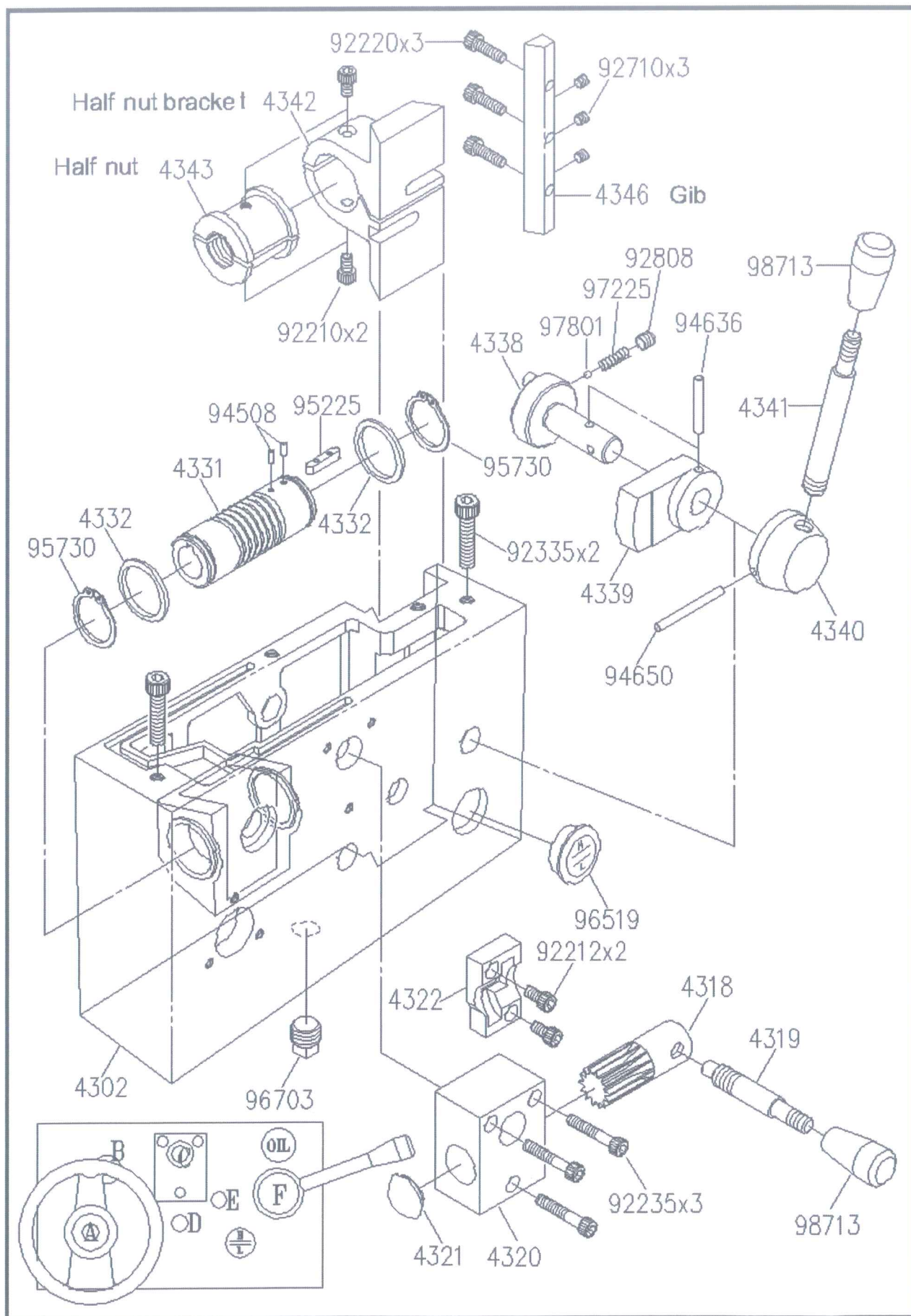
Inch Gearbox



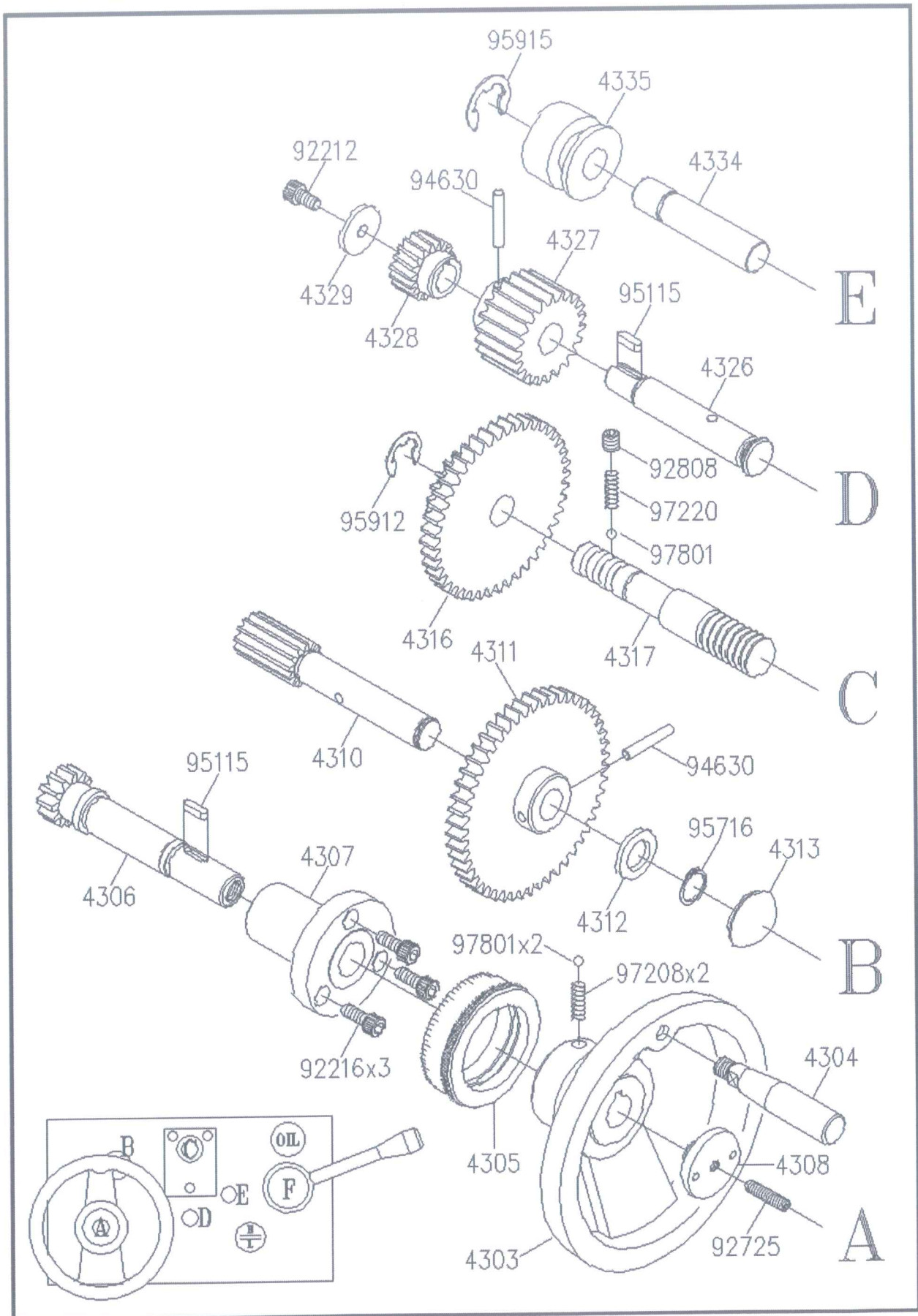
GEARBOX Inch Gearbox



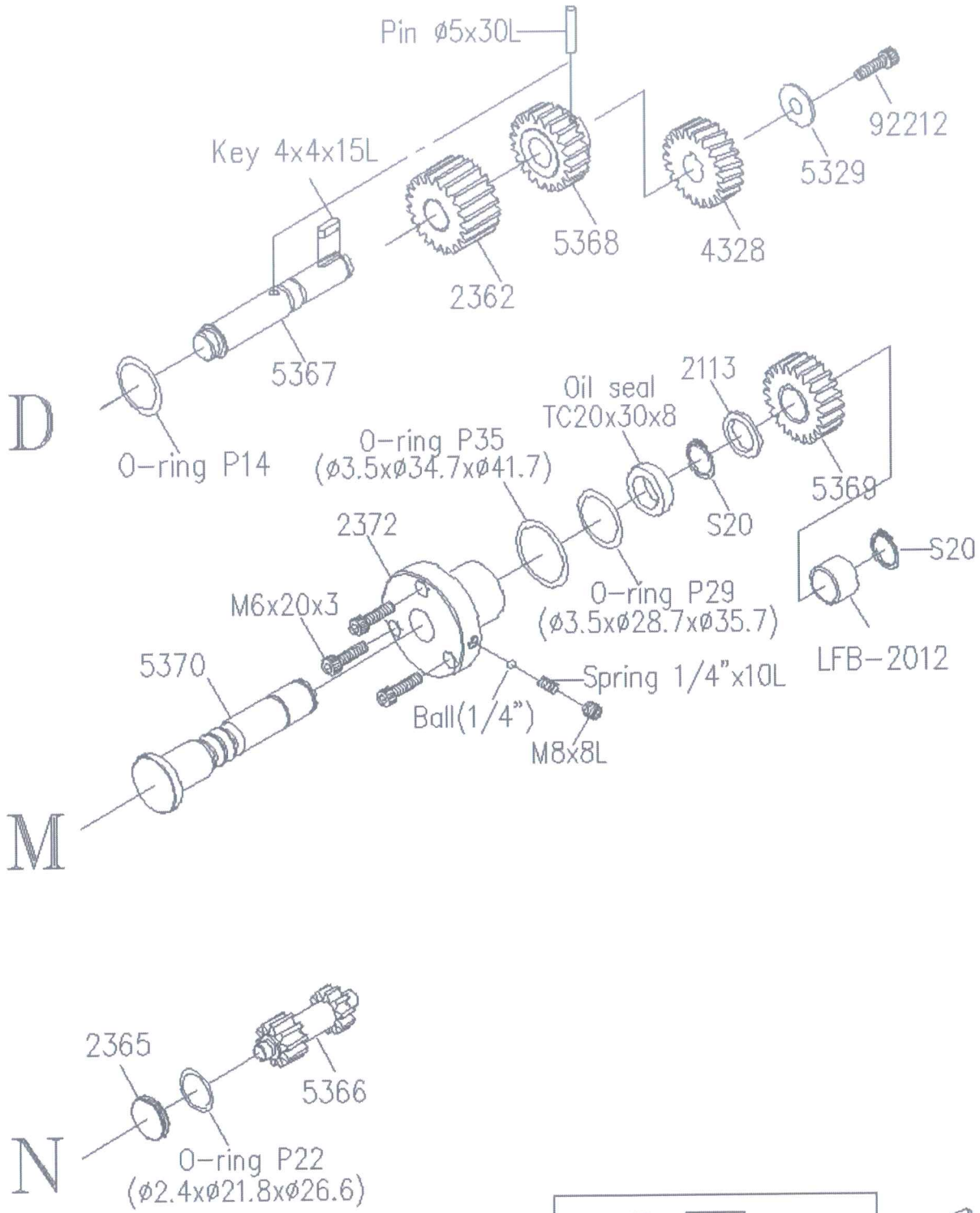
ASSEMBLY APRON (Casting)



ASSEMBLY APRON (Gears & Shaft)



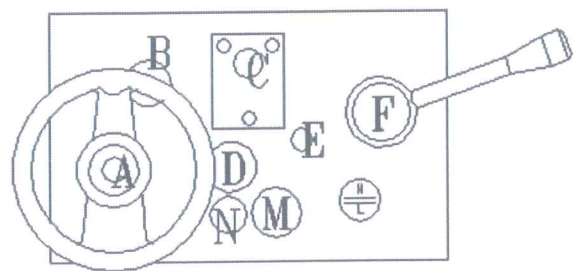
APRON



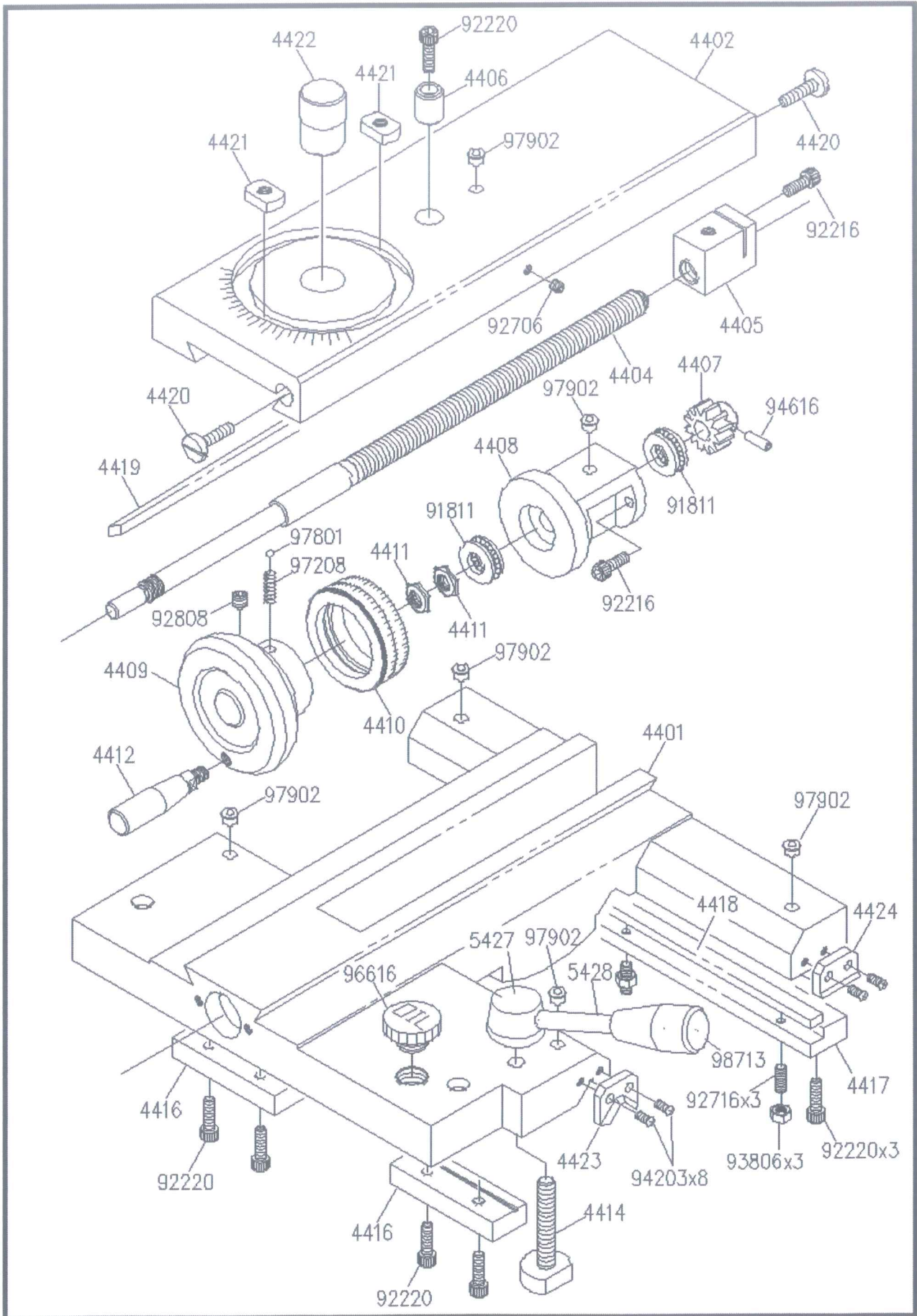
D

M

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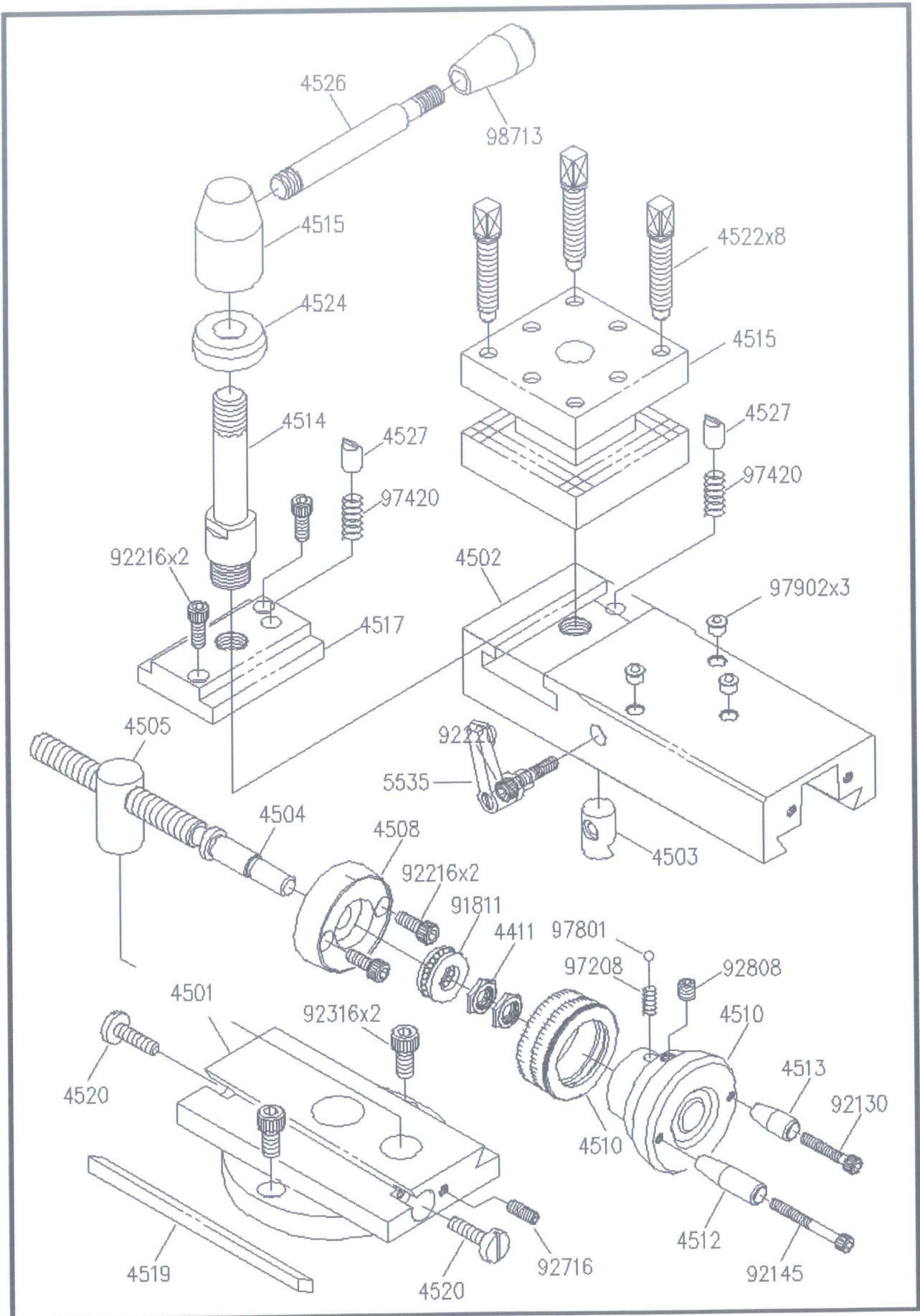


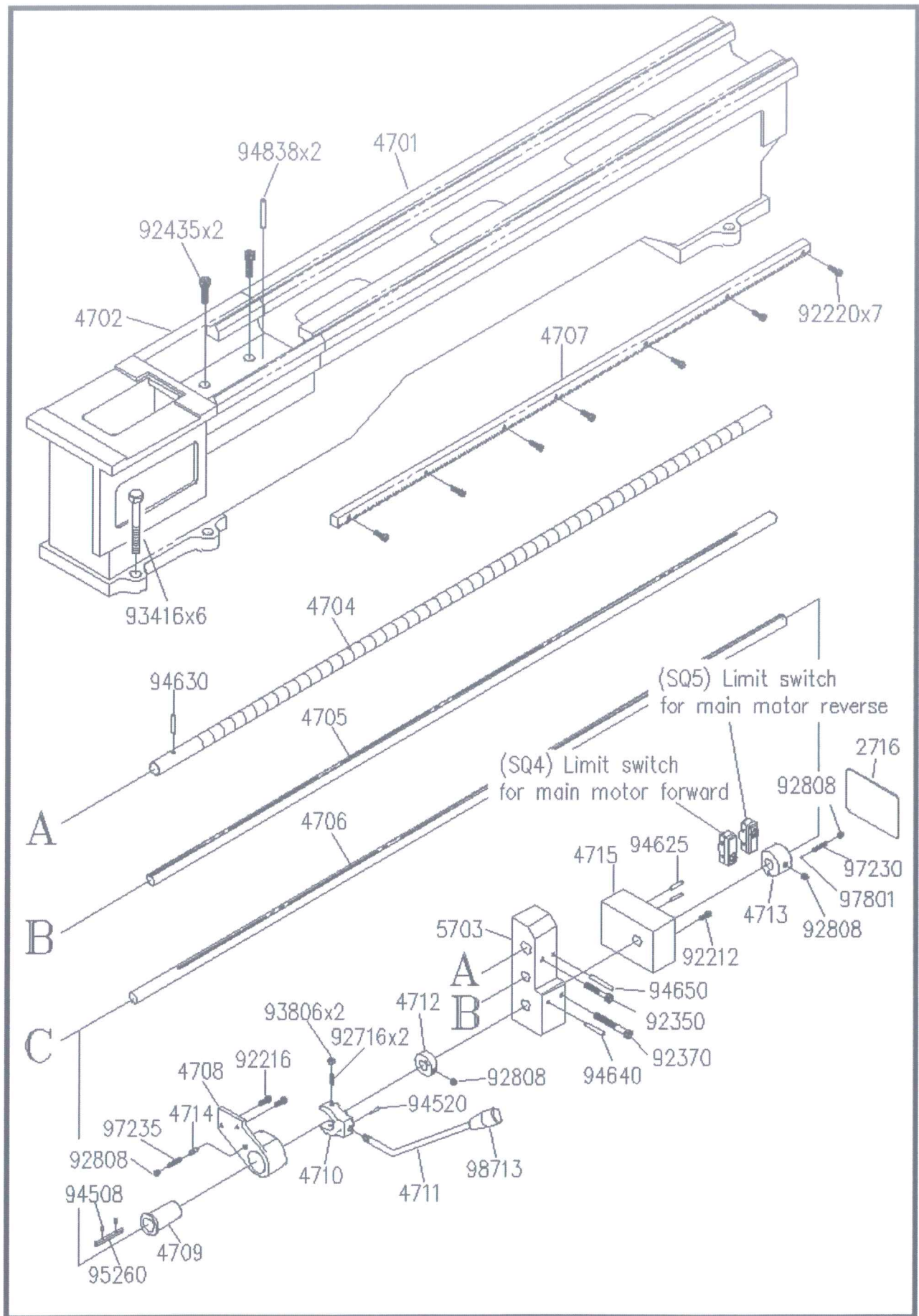
ASSEMBLY SADDLE, CROSS-SLIDE



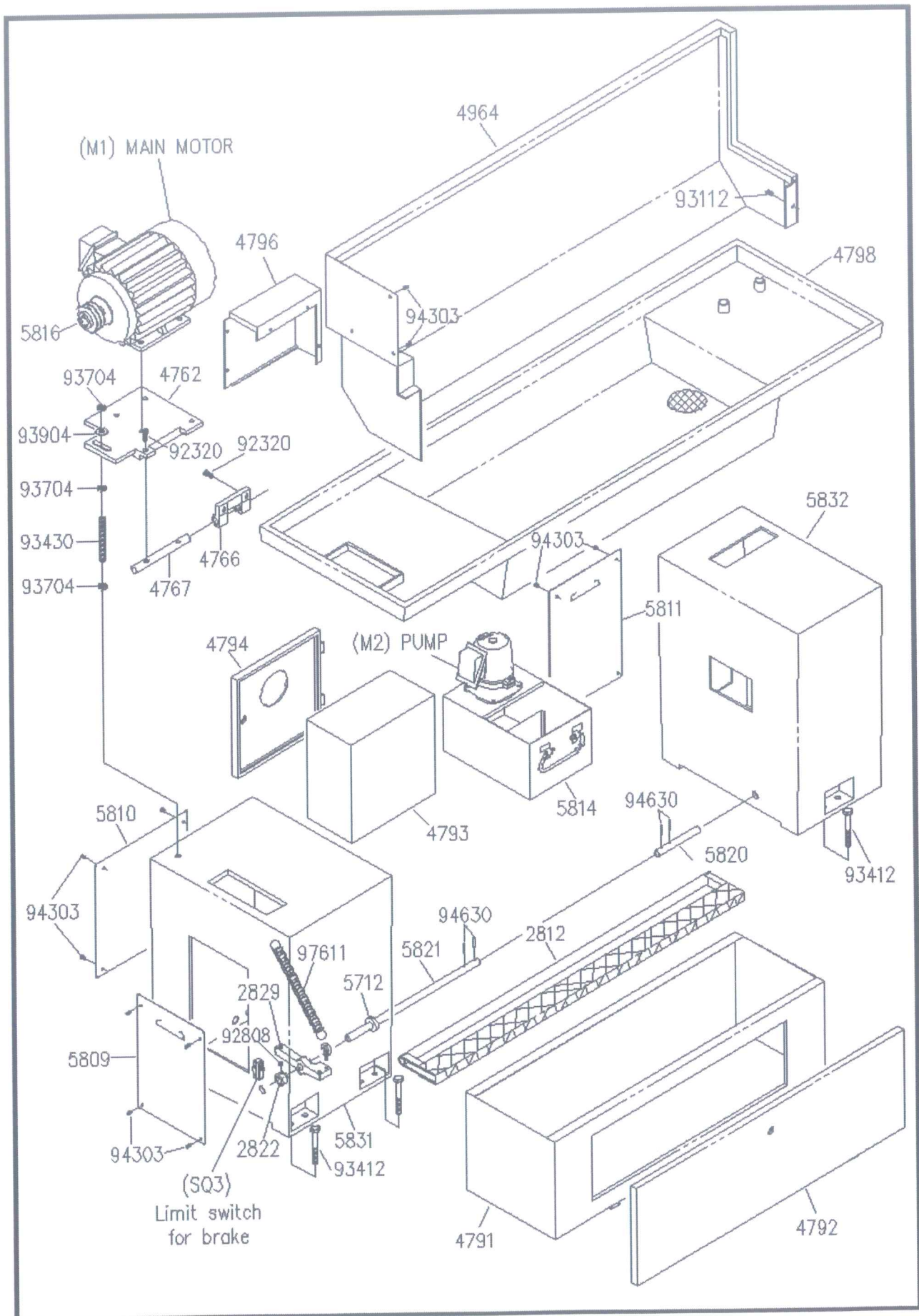
4-40

ASSEMBLY TOP-SLIDE





4-71



ASSEMBLY SWING FRAME, END GEARS & COVER

CHANGE GEARS

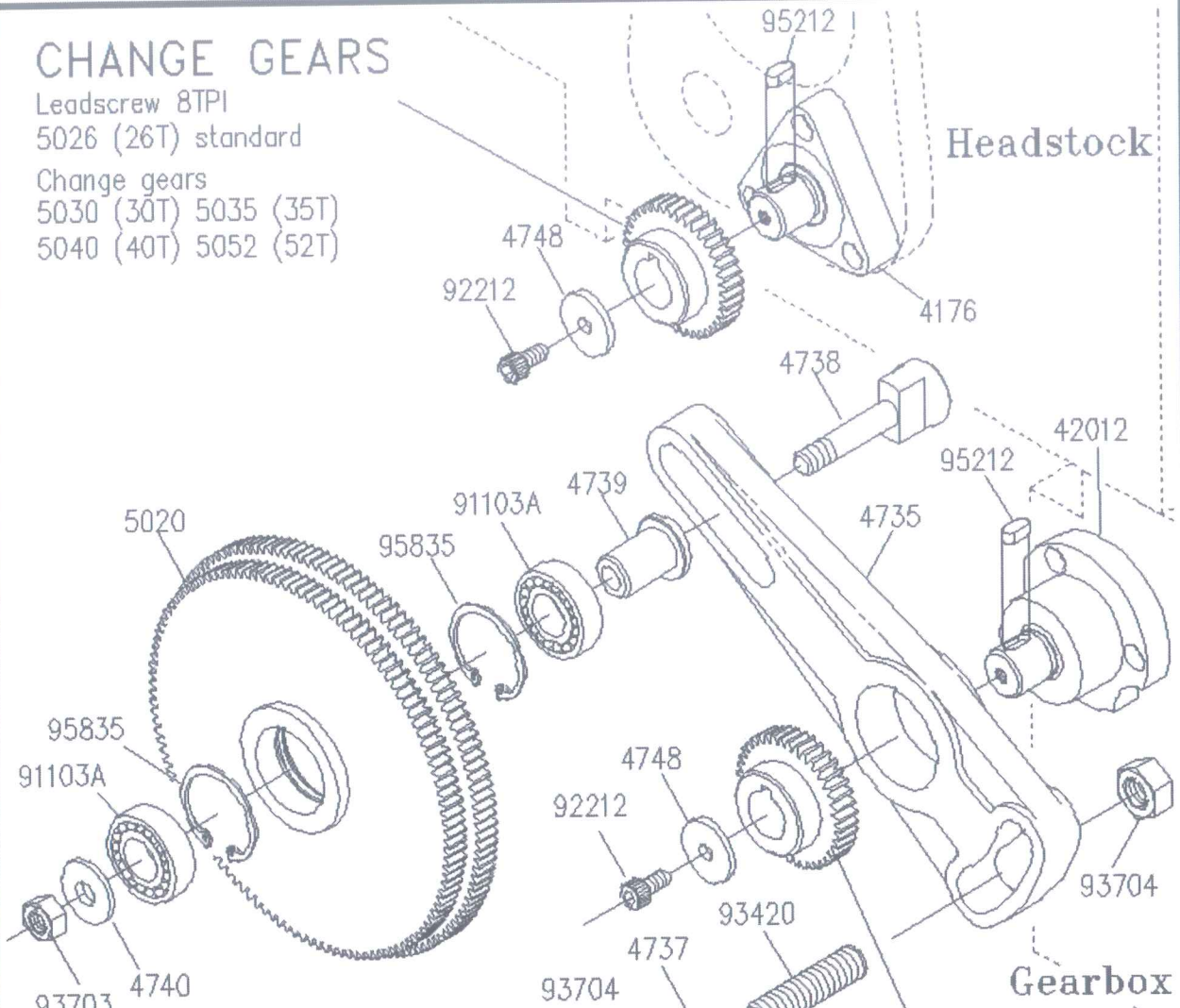
Leadscrew 8TPI

5026 (26T) standard

Change gears

5030 (30T) 5035 (35T)

5040 (40T) 5052 (52T)



Headstock

Gearbox

CHANGE GEARS

Leadscrew 8TPI

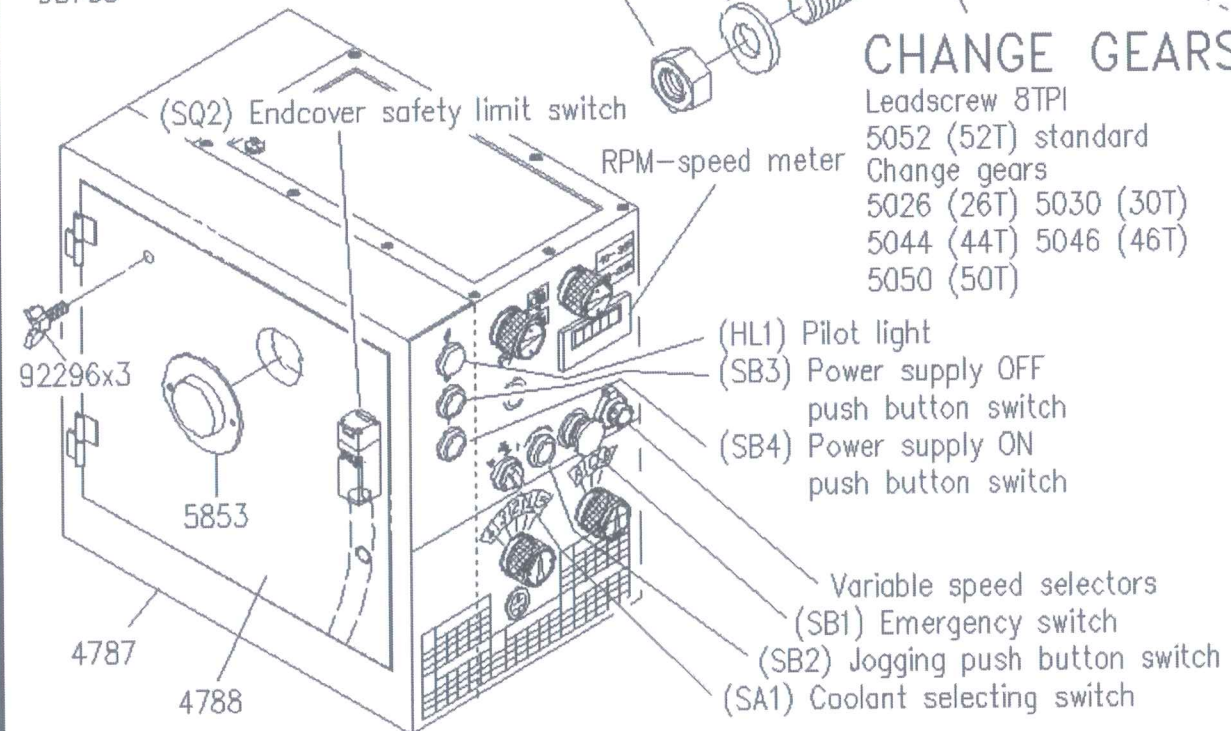
5052 (52T) standard

Change gears

5026 (26T) 5030 (30T)

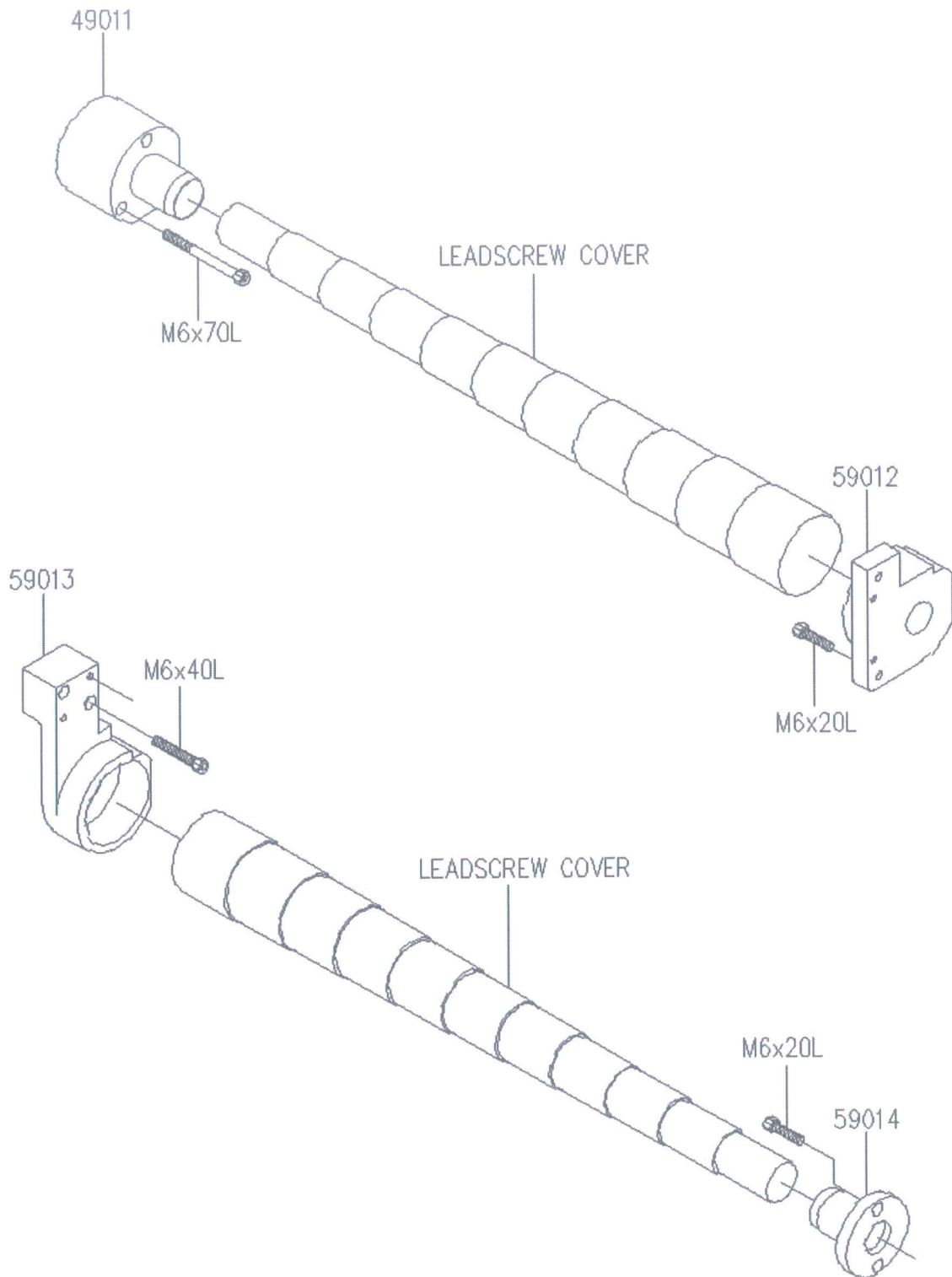
5044 (44T) 5046 (46T)

5050 (50T)



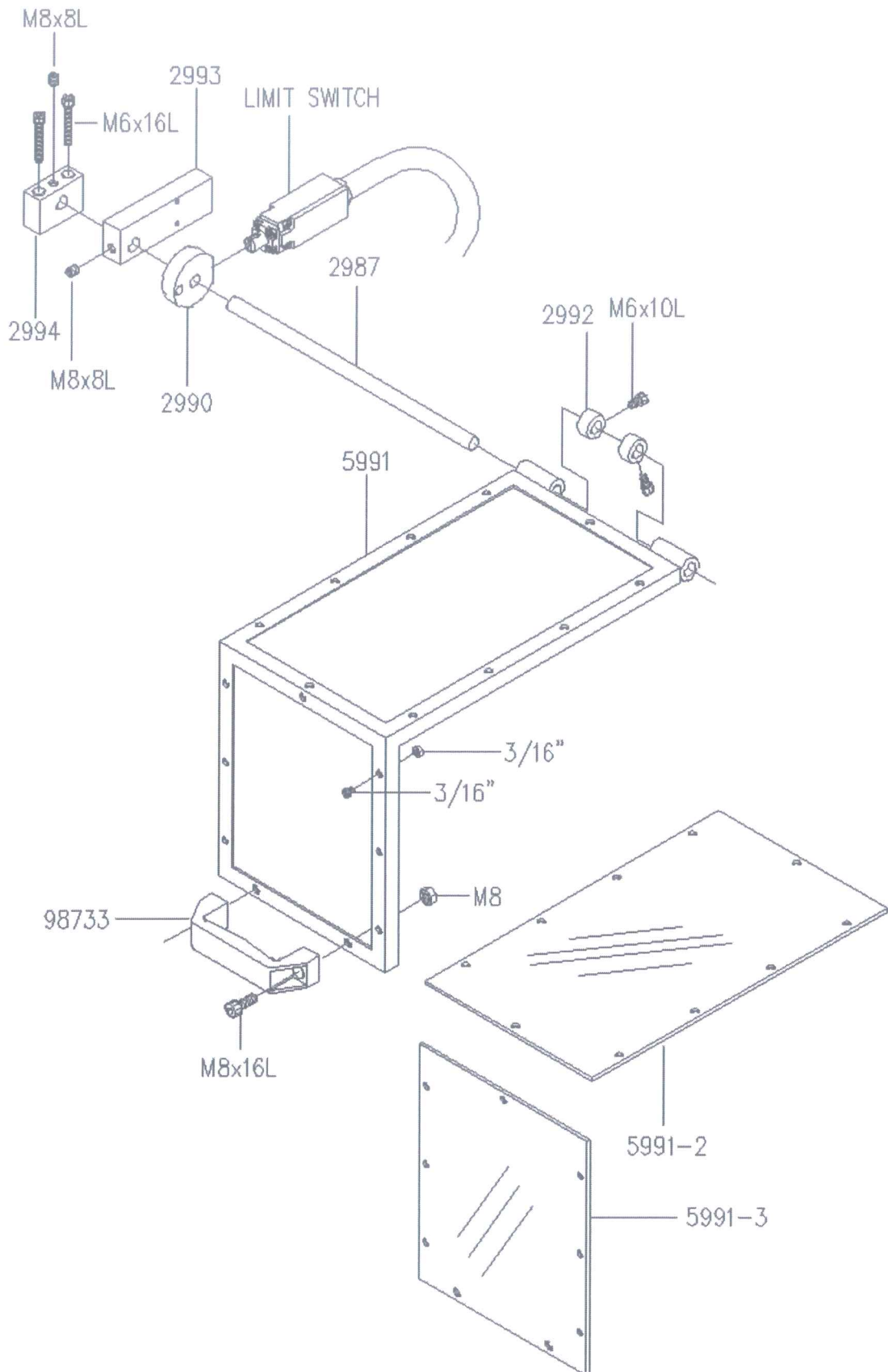
GUARD

Leadscrew cover



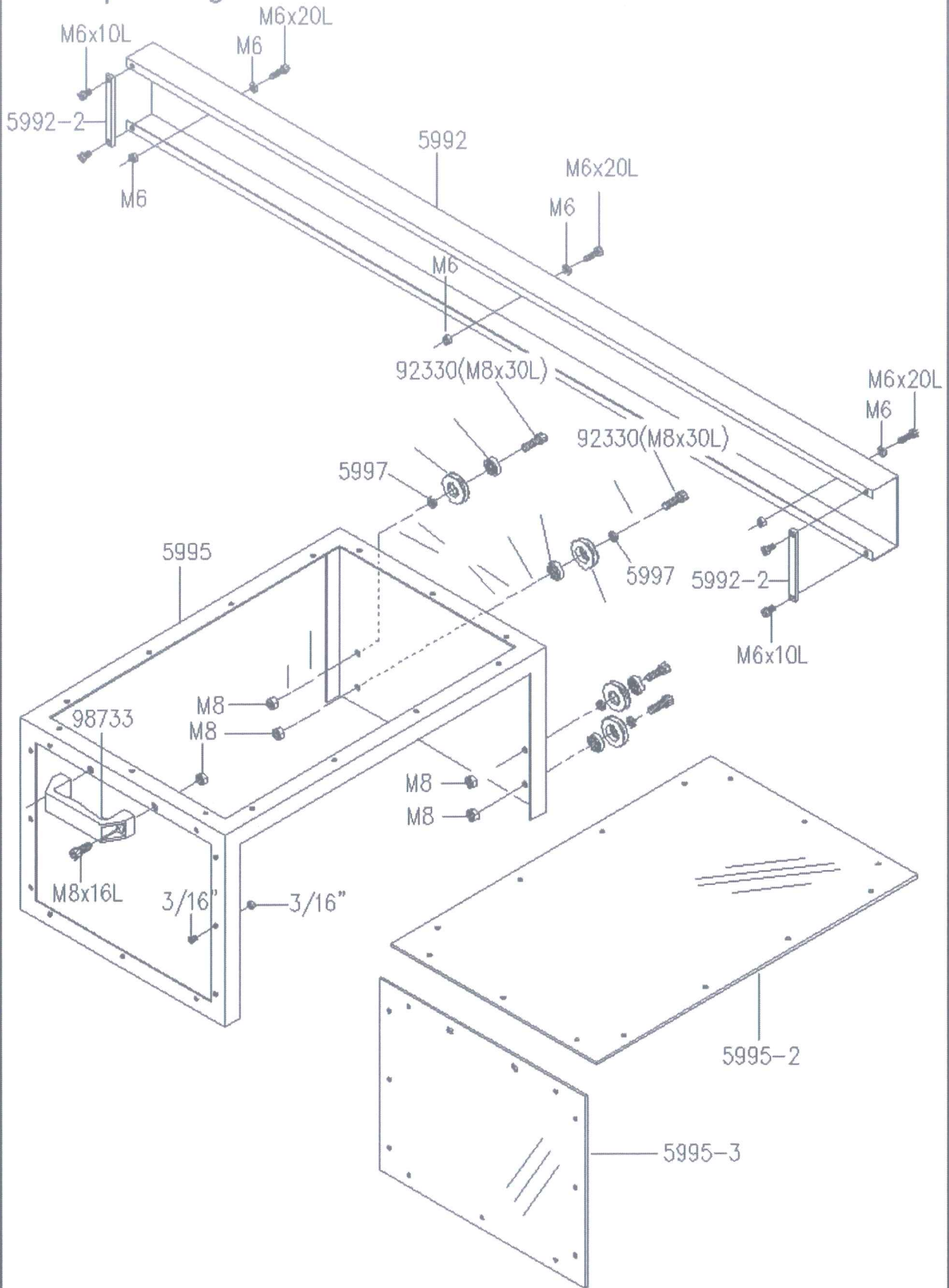
GUARD

Chuck guard



GUARD

Toolpost guard



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

PART LIST

Apron			Saddle		
Part No.	Description	Q'ty	Part No.	Description	Q'ty
5301	Apron	1	4401	Saddle casting	1
5303	Handwheel	1	4402	Crossslide cover	1
5304	Handle	1	4404	Screw	1
5305	Index ring	1	4405	Nut	1
5306	Shaft 2M 12T	1	4406	Collar	1
5307	Keep assy	1	4407	Gear 2M 12T	1
5308	Plug	1	4408	Keep assy.	1
5309	Shaft 2M 12T	1	4409	Handwheel	1
5310	Rack pinion 1.5M 13T	1	4410	Index ring	1
5311	Gear 2M 50T	1	4411	Nut	4
5312	Collar	1	4412	Handle	1
5313	Plug	1	4414	Set screw	1
5316	Gear 2M 44/22T	1	4415	Washer	1
5317	Shaft	1	4416	Strip	2
5318	Gear shaft 1.5M 14T	1	4417	Strip	1
5319	Lever	1	4418	Gib	1
5320	Keep assy	1	4419	Gib	1
5321	Plug	1	4420	Gib screw	2
5322	Cam	1	4421	Nut	2
5323	Gear shaft 1.5M 14T	1	4422	Pivot	1
5324	Lever	1	4423	Wipper	2
5326	Shaft	1	4424	Wipper	2
5327	Gear 2M 22T	1	5427	Handle	1
5328	Worm gear 1.5M 18T	1	5428	Lever	1
5329	Washer	1			
5331	Worm	1	Compound rest		
5332	Collar	1	Part No.	Description	Q'ty
5334	Shaft	1	4501	Swivere slide	1
5335	Collar	1	4502	Top slide	1
5338	Shaft	1	4503	Pad	1
5339	Lever	1	4504	Screw	1
5340	Handle	1	4505	Nut	1
5341	Lever	1	4506	Nut	1
5342	Halfnut bracket	1	4508	Keep assy.	1
5343	Halfnut	1	4509	Handwheel	1
5346	Gib	1	4510	Index ring	1
5347	Rack pinion 1.5M 13T	1	4512	Handle	1
5348	Worm gear 1.5M 18T	1	4513	Handle	1
5349	Half nut	1	4514	Bolt	1
5381	Apron	1	4515	Toolpost	1
5382	Shaft	1	4517	Nut	1
5383	Shaft	1	4519	Gib	1
			4520	Gib screw	2
			4522	Screw	8
			4524	Washer	1
			4525	ScrewHandle	1
			4526	Lever	1
			4527	Pad	1

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	Safy Pin	3

Change gear

Part No.	Description	Q'ty
5020	Gear 1.25M 120/127T	1
5026	Gear 1.25M 26T	1
5030	Gear 1.25M 30T	1
5035	Gear 1.25M 35T	1
5040	Gear 1.25M 40T	1
5046	Gear 1.25M 46T	1
5050	Gear 1.25M 50T	1
5052	Gear 1.25M 52T	1

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

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.

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.

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.

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=380V-460V~ 1.5kW 2HP	1	DELTA	VFD015B43B	IEC947-1
KM1	2,3	Relay contactor for main motor reverse	Res 5A 240VAC 5A 30VDC	1	IDCE	RY4S-U	IEC 255-1 IEC 255-0-20
KM2	2,3	Relay contactor for main motor forward	Coil 24VAC 50/60HZ	1	IDCE	RY4S-U	IEC 255-1 IEC 255-0-20
KM3	2,3	Magnetic contactor for coolantpump	Ue=380V~ coil 50HZ 22V~ U _i 660V~ 60HZ 24V~ 4<<a>> AC3Hb=AC1=25A	1	TAIAN	CN-11	VDE 0660 IEC 947-4-1 BS 5424
KM4	1	Magnetic contactor for power supply	Ue=380V~ coil 50HZ 22V~ AC3Hb=AC1=35A 60HZ 24V~ U _i 660V~3<<a>>+1<<a>>	1	TAIAN	CN-16	VDE 0660 IEC 947-4-1 BS 5424
KA1	3	Magnetic contactor for brake	Ue=22V~ I _{th} =6A 4<<a>>	1	TAIAN	RAN-4	VDE 0660 IEC 947-4-1 BS 5424
FU1	1	Fuse boxes	10m/mx38m/m	1	LEGRAND	133-10	IEC 269-2
FU2			100KA				
FU3			500V aM25A				
FU4	1	Fuse box	20mm 250V 1A	1	WAGO	282-122	VDE 0660 IEC 947
FU5	1	Fuse box	20mm 250V 1A	1	WAGO	282-122	VDE 0660 IEC 947
FU6	1	Fuse box	20mm 250V 4A	1	WAGO	282-122	VDE 0660 IEC 947
FR2	2,3	Thermal overload relay for coolantpump	380V : $\frac{0.16-0.24}{0.19}$ A 220V : $\frac{0.24-0.36}{0.3}$ A	1	TAIAN	RHN-10	VDE 0660 IEC 292-1 BS 4941
QS1	1	Main power switch	U _i 380V~ I _{th} 25A	1	KLOCKNER MOELLER	P1-25/V/SVB	VDE 0660 IEC 947 EN 60947
HL1	3	Pilot light	22∅ VCH24V 2W	1	TELEMECANIQUE	XB2-BV63	VDE 0660 IEC 947-5-1 EN 60947-5-1
TC1	1	Control circuit Transformer	Prim 220V/380V Sec. 22V,24V,150VA	1	TAIAN	TA-300	
SA1	3	Selecting switch	22∅ 600V 10A	1	TELEMECANIQUE	XB2-BD21	VDE 0660 IEC 947-5-1 EN 60947-5-1
SB1	3	Off hand switch Emergency	22∅ 600V 10A	1	TELEMECANIQUE	XB2-BS542	VDE 0660 IEC 947-5-1 EN 60947-5-1
SB2	3	Push button switch (jogging switch)	22∅ 600V 10A	1	TELEMECANIQUE	XB2-BA21	VDE 0660 IEC 947-5-1 EN 60947-5-1
SB3	1	Push button switch (power supply off)	22∅ 600V 10A	1	TELEMECANIQUE	XB2-BA21	VDE 0660 IEC 947-5-1 EN 60947-5-1
SB4	1	Push button switch (power supply on)	22∅ 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	OMRON	Z15GD-B	
SQ4	3	Limit switch for main motor forward	250V 15A	1	OMRON	Z15GD-B	
SQ5	3	Limit switch for main motor reverse	250V 15A	1	OMRON	Z15GD-B	
M1	2	Squirrel-cage motors Foot-mounted	60Hz,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	

Parameter Setting

The parameter can be set during operation.

For DELTA Inverter

*:Twice the value for 460V class.

Parameters A type B type	Explanation	Setting	Factory Setting	Parameters A type B type	Explanation	Setting	Factory Setting
Group 0: User Parameters							
00-00	Identity Code of Drive	Read-Only	##				
00-01	Rated Current Display	Read-Only	##.1				
00-02	Parameter Reset	d10: reset parameter to factory setting	0				
00-03	Start-up Display of AC Drive	d0: F (setting frequency) d1: H (actual frequency) * d2: u (user-defined unit) d3: Multi Function Display d4: FWD/REV	0				
00-04	Content of Multi Function Display	d0: Display output current (A) d1: Display counter value (C) d2: Display process operation (1. tt) d3: Display DC-BUS voltage (U) d4: Display output voltage (E) d5: Output power factor angle (n.) d6: Display output power (kW) d7: Display actual motor speed	0				
00-05	User-Defined Coefficient K _α	0.01 to 160.00	1.00				
00-06	Software Version	Read-only	3.10				
00-07	Password Input	0 to 65535	6				
00-08	Password Setting	0 to 65535	6				
00-09	Control Methods	d0: V/F control d1: V/F control + PG d2: Vector Control d3: Vector Control + PG	0				
				02-01		d2: Master frequency determined by external terminal, STOP key disable. d3: Master frequency determined by RS-485 communication interface, STOP key enable. d4: Master frequency determined by RS-485 communication interface, STOP key disable.	
				02-02	Stop Method	d0: Ramp Stop; E.F. coast stop d1: Coast Stop; E.F. coast stop d0: Ramp Stop; E.F. ramp stop d1: Coast Stop; E.F. ramp stop	00
				71 02-03	PWM Carrier Frequency	0.75kW to 3.7kW (1 to 5 HP): d1 to d15 5.5kW to 18.5kW (7.5 to 25 HP): d1 to d15 22kW to 45kW (30 to 60 HP): d1 to d9 55kW to 75kW (75 to 100 HP): d1 to d9	12 9 9 6
				02-04	Reverse Operation	d0: Enable REV d1: Disable REV	00
				02-05	2-wire/3-wire Operation Control Mode Selection	d0: 2-wire Operation Control Mode (1) d1: 2-wire Operation Control Mode (2) d2: 3-wire Operation Control Mode	00
				02-06	Line Start Lockout	d0: Disable d1: Enable	0
				02-07	Loss of AC1	d0: Decelerate to 0 Hz d1: Stop immediately and display "EF" d2: continue operation by last frequency command	0
Group 1 Basic Parameters				Group 3 Output Function Parameters			
03 01-00	Maximum Output Freq. (Fo, Max)	50.0 to 400 Hz	94	03-00	Multi-Function Output 1 (Relay Output)	d0: Not Used d1: AC Drive Operational d2: Max. Output Freq. Attained d3: Zero speed	08
04 01-01	Maximum Voltage Frequency (Base Freq)(Fmax)	0.1 to 400 Hz	50	03-01	Multi-Function Output 2 (Photocoupler Output)	d4: Over Torque d5: Base-Block (B.B.) d6: Low Voltage Detection d7: AC Drive Operation Mode	01
05 01-02	Maximum Output Voltage (Vmax)	230V series: 0.10V to 255.0V 460V series: 0.10V to 510.0V	400	03-02	Multi-Function Output 3	d8: Fault Indication d9: Desired Freq. Attained d10: PLC Program Running d11: PLC Program Step Complete	02
06 01-03	Mid-Point Frequency (Fmid)	0.10 to 400 Hz	10	03-03	Multi-Function Output 4	d12: PLC Program Complete d13: PLC Program Operation Pause d14: Terminal Count Value Attained d15: Preliminary Count Value Attained d16: Auxiliary Motor No. 1 d17: Auxiliary Motor No. 2 d18: Auxiliary Motor No. 3 d19: Heat Sink Overheat Warning d20: AC Drive Ready d21: Emergency Stop Indication d22: Desired Frequency Attained 2 d23: Software Break Singal d24: Zero Speed Output Singal	20
07 01-04	Mid-Point Voltage (Vmid)	230V: 0.1V to 255V 460V: 0.1V to 510V	3.4	03-04	Desired Freq. Attained	0.00 to 400.00 Hz	0.00
08 01-05	Minimum Output Frequency (Fmin)	0.10 to 400.00 Hz	1.5	03-05	Analog Output Singal	d0: Output frequency d1: Output current d2: Output voltage d3: Frequency command d4: Motor output speed d5: Output power factor	0
09 01-06	Minimum Output Voltage (Vmin)	230V series: 0.1V to 255V 460V series: 0.1V to 510V	3.4				
01-07	Upper bound of freq.	1 to 110%	100				
01-08	Lower bound of freq.	0 to 100%	00				
10 01-09	Accel Time 1 *	0.1 to 3600.0 sec	2				
11 01-10	Decel Time 1 *	0.1 to 3600.0 sec	2				
12 01-11	Accel Time 2 *	0.1 to 3600.0 sec	10.0/60.0				
13 01-12	Decel Time 2 *	0.1 to 3600.0 sec	10.0/60.0				
14 01-13	Jog accel/decel Time *	0.1 to 3600.0 sec	1.0				
23 01-14	Jog Frequency *	0.10 Hz to 400.00 Hz	6.00				
	01-15	Auto Accel/Decel	00				
		d0: Linear Accel/Decel d1: Auto Accel, Linear Decel d2: Linear Accel, Auto Decel d3: Auto Accel/Decel d4: Linear Accel/Decel Stall, Prevention during deceleration					
15 01-16	S-Curve in Accel	00 to 07	00				
15 01-17	S-Curve in Decel	00 to 07	00				
01-18	Accel Time 3 *	0.1 to 3600.0 sec	10.0				
01-19	Decel Time 3 *	0.1 to 3600.0 sec	10.0				
01-20	Accel Time 4 *	0.1 to 3600.0 sec	10.0				
01-21	Decel Time 4 *	0.1 to 3600.0 sec	10.0				
Group 2 Operation Method Parameters							
02-00	Source of Frequency Command	d0: Digital keypad d1: 0 to +10V from AV1 d2: 4 to 20mA from AC1 d3: Potentiometer control (-10 to +10Vdc) d4: RS-485 communication interface	1				
02-01	Source of Operation Command	d0: Determined by digital keypad d1: Master frequency determined by external terminal, STOP key enable.	2				
				03-06	Analog Output Gain *	1 to 200%	100
				03-07	Digital Output Gain *	1 to 20	01
				03-08	Terminal Count Value	0 to 65500	0
				03-09	Preliminary Count Value	0 to 65500	0
				03-10	Desired Freq. attained 2	0.00 to 400.00 Hz	0.00

Parameter Setting

The parameter can be set during operation.

For DELTA Inverter

*:Twice the value for 460V class.

Parameters		Explanation	Setting	Factory Setting	Parameters		Explanation	Setting	Factory Setting		
A type	B type				A type	B type					
Group 4 Input Function Parameters					Group 6 Protection Parameters						
	04-00	Potentiometer Bias Frequency *	0.00 to 350 Hz	10	05-21	Time Duration Step 5	00 to 65500 sec	00			
	04-01	Potentiometer Bias Polarity *	d0: Positive Bias d1: Negative Bias	0	05-22	Time Duration Step 6	00 to 65500 sec	00			
	04-02	Potentiometer Bias Gain *	1 to 200%	100	05-23	Time Duration Step 7	00 to 65500 sec	00			
	04-03	Potentiometer Reverse Motion Enable	d0: Forward Motion Only d1: Reverse Motion Enable d2: Forward and Reverse Motion Enable	0	05-24	Time Duration Step 8	00 to 65500 sec	00			
16	04-04	Multi-Function Input Terminal 1 (MI0, MI1)	d0: Parameter Disable	0	05-25	Time Duration Step 9	00 to 65500 sec	00			
17			d1: Multi-Step Speed Command 1	1	05-26	Time Duration Step 10	00 to 65500 sec	00			
			d2: Multi-Step Speed Command 2	2	05-27	Time Duration Step 11	00 to 65500 sec	00			
18	04-05	Multi-Function Input Terminal 2 (MI2)	d3: Multi-Step Speed Command 3	3	05-28	Time Duration Step 12	00 to 65500 sec	00			
19			d4: Multi-Step Speed Command 4	4	05-29	Time Duration Step 13	00 to 65500 sec	00			
			d5: Reset	5	05-30	Time Duration Step 14	00 to 65500 sec	00			
	04-06	Multi-Function Input Terminal 3 (MI3)	d6: Accel/Decel Speed Inhibit	6	05-31	Time Duration Step 15	00 to 65500 sec	00			
	04-07		d7: First or Second Accel/Decel Time Selection								
	04-08	Multi-Function Input Terminal 4 (MI4)	d8: Third or Fourth Accel/Decel Time Selection								
	04-09	Multi-Function Input Terminal 5 (MI5)	d9: External Base Block (N.C.) Input								
			d10: External Base Block (N.O.) Input								
			d11: Increase Master Frequency								
			d12: Decrease Master Frequency								
			d13: Counter Reset								
			d14: Run PLC Program								
			d15: Pause PLC								
			d16: Auxiliary Motor No.1 Output Failure								
			d17: Auxiliary Motor No.2 Output Failure								
			d18: Auxiliary Motor No.3 Output Failure								
			d19: Emergency Stop (NO)								
			d20: Emergency Stop (NC)								
	04-10	Digital Terminal Input Delay Time	D01 to d20m sec	01							
	05-00	1st Step Speed Freq.	0.00 to 400.00 Hz	0.00	25	06-00	Over-Voltage Stall Prevention	d0: Disable d1: Enable	0		
	05-01	2nd Step Speed Freq.	0.00 to 400.00 Hz	0.00	26	06-01	Over-Current Stall Prevention during Accel	20 to 250%	200		
	05-02	3rd Step Speed Freq.	0.00 to 400.00 Hz	0.00	27	06-02	Over-Current Stall Prevention during Operation	20 to 250%	200		
	05-03	4th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-03	Over-Torque Detection Mode	d0: Disable d1: Enable during constant speed operation and continues until the continuous limit (Pr.06-05) is reached. d2: Enable during constant speed operation and halted after detection. d3: Enable during Accel and continues before Continuous Output Time Limit (Pr.06-05) is reached. d4: Enable during Accel and halted after Over-Torque detection.	00		
	05-04	5th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-04		Over-Torque Detection Level	30 to 200%	150	
	05-05	6th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-05	Continuous Output Time Limit	0.1 to 60.0 Sec	0.1		
	05-06	7th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-06	Electronic Thermal Overload Relay	d0: Reduce Torque Motor d1: Constant Torque Motor d2: Inactive	02		
	05-07	8th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-07		Electronic Thermal characteristic *	30 to 600 Sec	60	
	05-08	9th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-08	Present Fault Record	d0: No Fault occurred d1: Over Current (oc) d2: Over Voltage (ov) d3: Over Heat (oh) d4: Over Load (ol) d5: Over Load (ol1)	00		
	05-09	10th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-09		Second Most Recent	d6: External Fault (EF) d7: IGBT Protection (occ) d8: CPU Fault (cF3) d9: Hardware Protection Failure (HPF)	0	
	05-10	11th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-10			Third Most Recent Fault Record	d10: Current exceed during Acceleration (oca) d11: Current exceed during Deceleration (ocd) d12: Current exceed during Steady State (ocn)	
	05-11	12th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-11				Fourth Most Recent Fault Record	d13: Ground Fault (GF) d14: Lv d15: CF1 d16: CF2 d17: Base Block (b.b.) d18: oL2 d19: CFA d20: codE d21: EF1 (External Emergency Stop)
	05-12	13th Step Speed Freq.	0.00 to 400.00 Hz	0.00		06-12		Over-voltage Stall Level	230V Series: 330V to 410V 460V Series: 660V to 820V		390 780
	05-13	14th Step Speed Freq.	0.00 to 400.00 Hz	0.00							
	05-14	15th Step Speed Freq.	0.00 to 400.00 Hz	0.00							
	05-15	PLC Mode	d0: Disable PLC Operation d1: Execute one program cycle d2: Continuously execute program cycles d3: Execute one program cycle step by step d4: Continuously execute one program cycle step by step	00							
	05-16	PLC Forward/Reverse Motion	00 to 32767 sec (0:FWD 1:REV)	00							
	05-17	Time Duration Step 1	00 to 65500 sec	00							
	05-18	Time Duration Step 2	00 to 65500 sec	00							
	05-19	Time Duration Step 3	00 to 65500 sec	00							
	05-20	Time Duration Step 4	00 to 65500 sec	00							

Parameter Setting

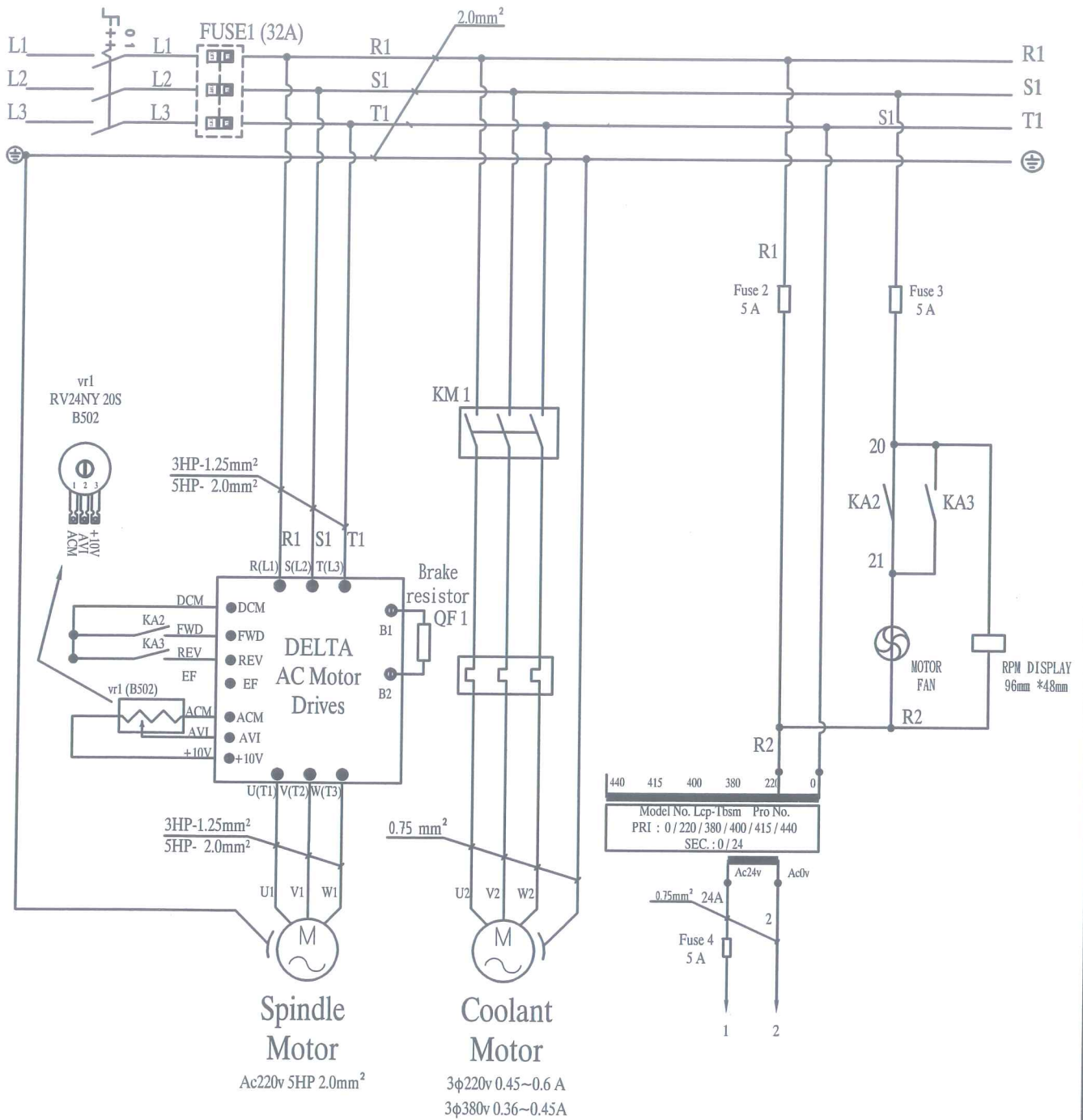
The parameter can be set during operation.

For DELTA inverter

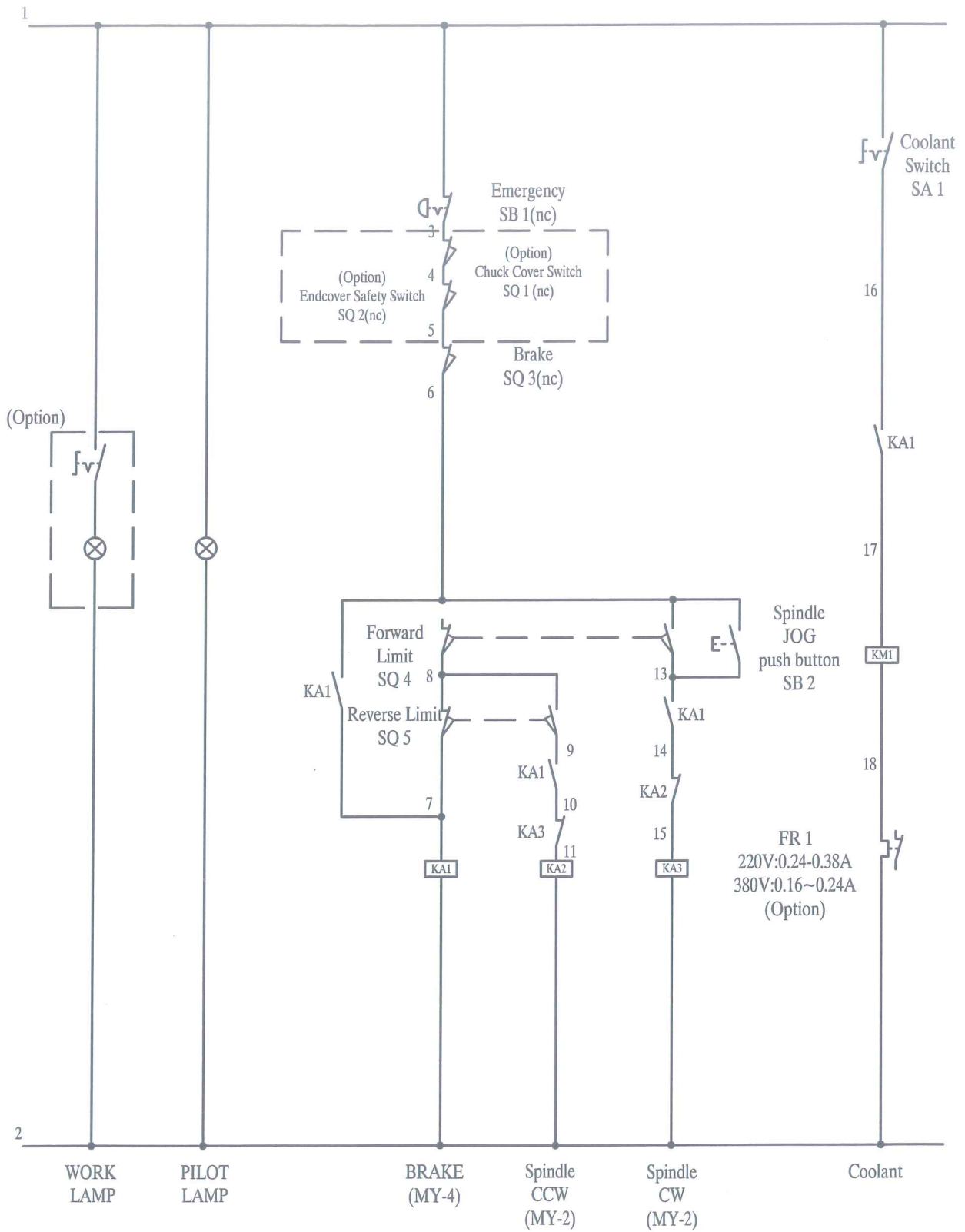
*:Twice the value for 460V class.

Parameters A type/B type	Explanation	Setting	Factory Setting	Parameters A type/B type	Explanation	Setting	Factory Setting			
Group 7 Motor Parameters				Group 9: Communication Parameters						
07-00	Motor Rated Current *	30 to 120%	100	09-00	Communication Address #	1 to 254	1			
07-01	Motor No-load Current *	0 to 90%	40	09-01	Transmission Speed	d0: Baud Rate 4800bps	1			
54 07-02	Torque Compensation *	0 to 10	6			d1: Baud Rate 9600bps				
55 07-03	Slip Compensation *	0.00 to 3.00	1			d2: Baud Rate 19200bps				
07-04	Number of Motor Poles	02 to 10	04			d3: Baud Rate 38400bps				
07-05	Motor Auto Detection	d0: Disable	00	09-02	Transmission Fault Treatment	d0: Warn and keep Operation	0			
		d1: Enable				d1: Warn and Ramp to Stop				
07-06	Motor Line-to-Line Resistance (R1)	0.00 to 655.35	0.00			d2: Warn and Coast to Stop				
07-07	Equivalent Rotor Resistance (R2)	00 to 200%	100			d3: No warning and keep Operation				
07-08	Motor Rated Slip	0 to 20 Hz	3	09-03	Overtime Detection	d0: Disable	1			
07-09	Slip Compensation Limit	0 to 250%	200	d1: Enable						
07-10	Vector Control Current Compensation Limit	d0.0 to d2.0	1.5	09-04	Communication Protocol	d0: *7, N, 2 (Modbus, ASCII)	0			
						d1: 7, E, 1 (Modbus, ASCII)				
						d2: 7, 0, 1 (Modbus, ASCII)				
						d3: 8, N, 2 (Modbus, RTU)				
						d4: 8, E, 1 (Modbus, RTU)				
				d5: 8, 0, 1 (Modbus, RTU)						
Group 8 Special Parameters				Group 10: PID Control Parameters						
28 08-00	DC Braking Current Level	0 to 100%	60	10-00	Input Terminal for Frequency	d0: Inhibit PID operation	00			
29 08-01	DC Braking Time during Start-Up	0.0 to 60.0 Sec	0.0			d1: Input negative PID feedback from external terminal (AV) 0 to +10V				
30 08-02	DC Braking Time during Stopping	0.0 to 60.0 Sec	2			d2: Input negative PID feedback from external terminal (AC) 4 to 20mA				
31 08-03	Start-Point for DC Braking	0.00 to 400.00 Hz	90			d3: Input positive PID feedback from external terminal (AV) 0 to +10V				
32 08-04	Momentary Power Loss	d0: Stop Operation after Momentary Power Loss	0			d4: Input positive PID feedback from external terminal (AC) 4 to 20mA				
		d1: Continues after Momentary Power Loss, speed search starts with Master Frequency								
		d2: Continues after Momentary Power Loss, speed search starts with Minimum Output Frequency.								
33 08-05	Maximum Allowable Power Loss Time	0.3 to 5.0 sec	2.0			10-01		Gain over Frequency Input	d0.01 to d10.0	1.00
34 08-06	B.B. Time for Speed Search	0.1 to 5.0 sec	4			10-02		Proportional Gain (P)	d0.0 to d10.0	1.0
35 08-07	Maximum Speed Search Current Level	30 to 200%	190			10-03		Integral Gain (I)	d0.00 to d100.00 sec	1.00
36 08-08	Skip Frequency 1 Upper Bound	0.00 to 400.00 Hz	0.00			10-04		Derivative Control (D)	d0.00 to d1.00 sec	0.00
		0.00 to 400.00 Hz				0.00		10-05	Upper Bound for Integral Control	0 to 110%
08-09	Skip Frequency 1 Lower Bound	0.00 to 400.00 Hz	0.00			10-06		Derivative Filter Time Constant	0.0 to 2.5 sec	0.0
08-10	Skip Frequency 2 Upper Bound	0.00 to 400.00 Hz	0.00			10-07		PID Output Freq Limit	0 to 110%	100
08-11	Skip Frequency 2 Lower Bound	0.00 to 400.00 Hz	0.00			10-08		Feedback Singal Detection time	d0 to 3600.0 sec	60.0
08-12	Skip Frequency 3 Upper Bound	0.00 to 400.00 Hz	0.00							
08-13	Skip Frequency 3 Lower Bound	0.00 to 400.00 Hz	0.00	10-09	Transmission Fault Treatment	d0: Warn and keep operation	0			
08-14	Auto Restart After Fault	0 to 10	0	d1: Warn and RAMP to stop						
08-15	Auto Energy Saving	d0: Disable	0	d2: Warn and COAST to stop						
08-16	AVR Function	d0: AVR Function Enable	0	10-10	PG Pulse Range	d1 to d40000	600			
		d1: AVR Function Disable		10-11	PG input	d0: Disable PG		00		
		d2: AVR Function Disable for Decel		d1: Single phase						
08-17	Dynamic Braking Voltage	230V: 370 to 430V 460V: 740 to 860V	380 760			d2: Forward / Counterclockwise rotation				
08-18	Base-block Speed Trace	d0: Speed Search Starts with Last Frequency Command	0			d3: Reverse / Clockwise rotation				
		d1: Speed Search Starts with Minimum Output Frequency								
08-19	Speed Search	d0: Speed Search Disable	0	10-12	Proportional Speed control (P)	d0 to d20	0.1			
		d1: Speed Search Enable								
				10-13	Integral Speed Control (I)	0.0 to 100.0	1.0			
				10-14	Speed Control Output Frequency Limit	00 to 20.00 Hz	10.00			
				10-15	PG Detected Output Renewal Time	d1 to d500	500			
				Group 11: Fan & Pump Control Parameters						
				11-00	V/F Curve Selection	d0: V/F Curve determined by Pr.01-00 to Pr.01-06	0			
						d1: 1.5 Power Curve				
						d2: 1.7 Power Curve				
						d3: Square Curve				
						d4: Cube Curve				
				11-01	Start Frequency of the Auxiliary Motor	0.00 to 120.00 Hz	0.00			
				11-02	Stop Frequency of the Auxiliary Motor	0.00 to 120.00 Hz	0.00			
				11-03	Time Delay before Starting the Auxiliary Motor	0.0 to 3600 sec	0.0			
				11-04	Time Delay before Stopping the Auxiliary Motor	0.0 to 3600 sec	0.0			

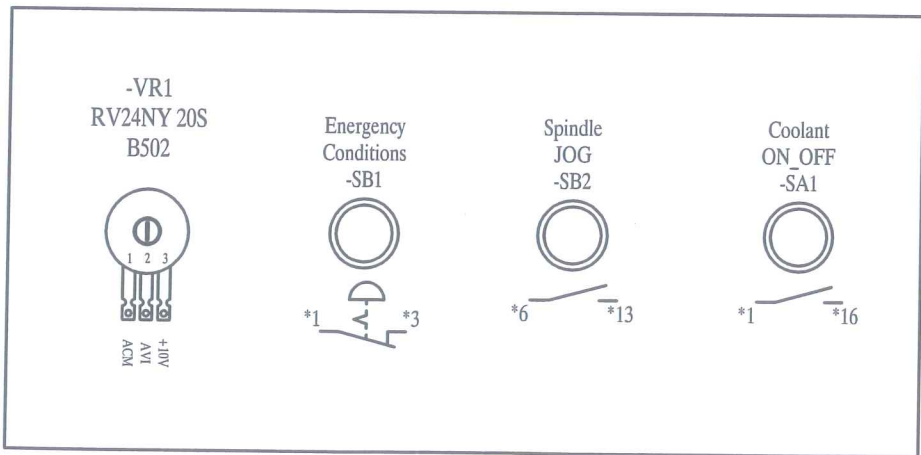
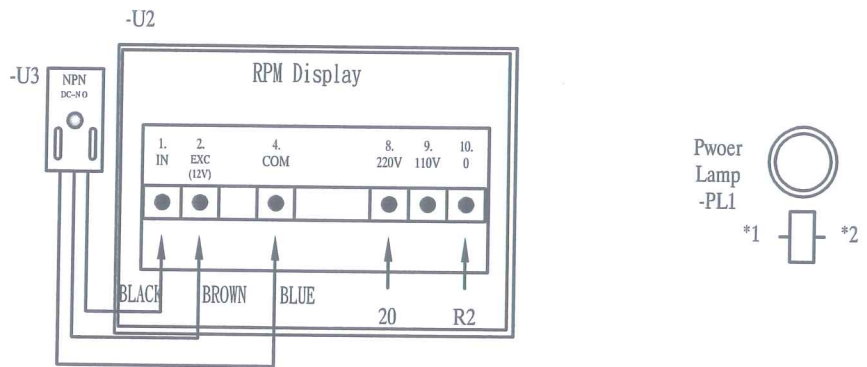
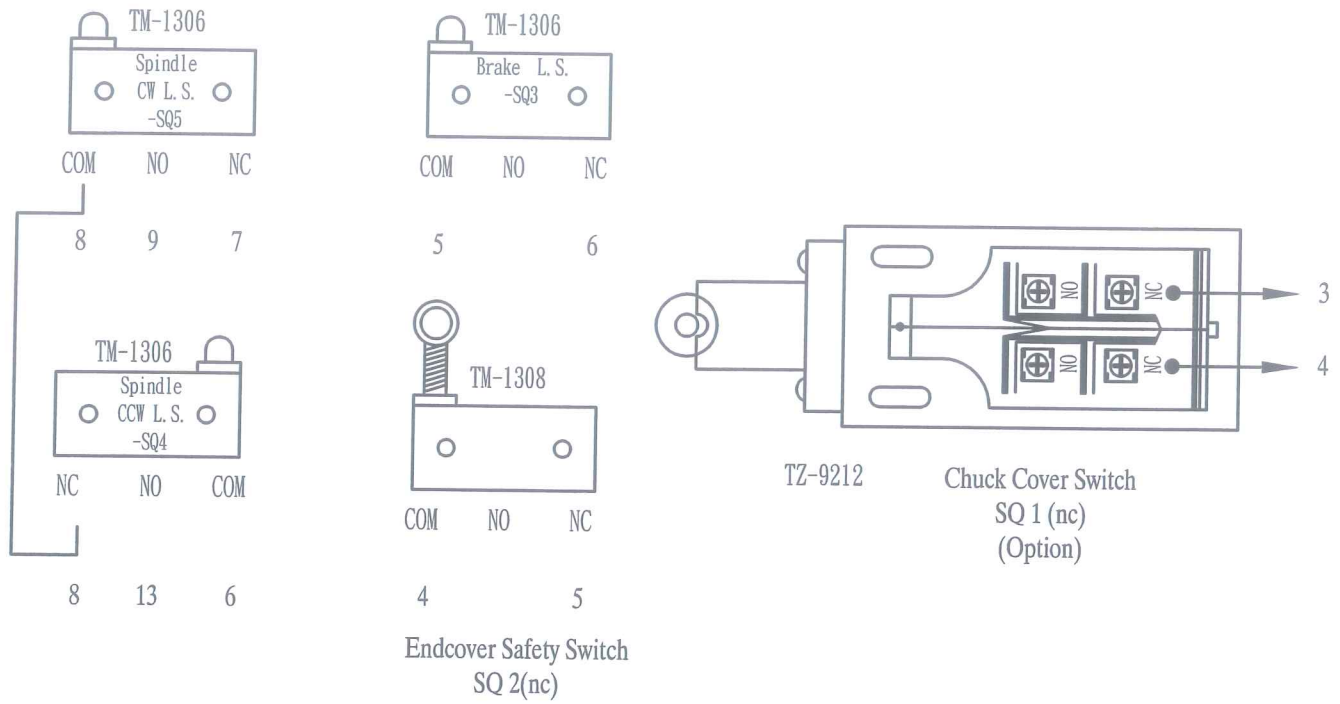
WIRING DIAGRAM



WIRING DIAGRAM

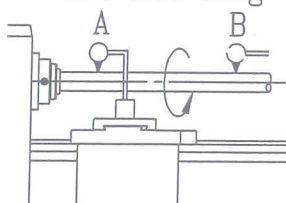
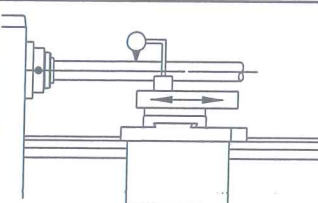
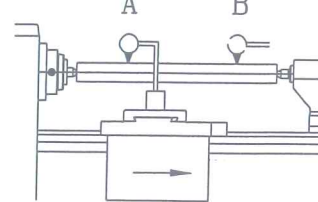


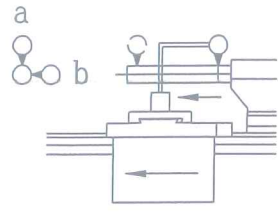
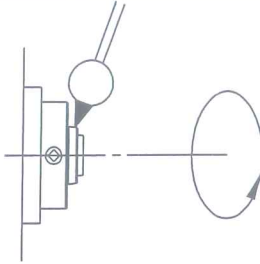
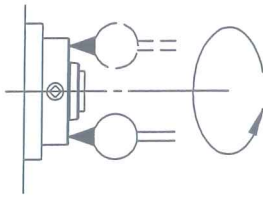
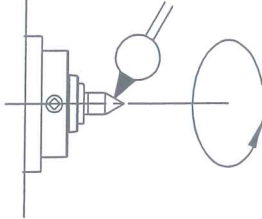
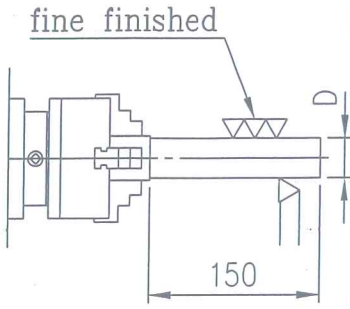
WIRING DIAGRAM



STATIC ACCURACY TEST

CNS

TYPE:		MACHINE SERIAL NO.		
NO.	SUBJECT OF MEASUREMENT	ILLUSTRATION	PERMISSIBLE ERROR	MEASURED ERROR
1.	Levelling of machine	(a) in longitudinal direction	$\pm 0.04 \text{ mm/m}$ (convex)	
		(b) in transverse direction	$\pm 0.04 \text{ mm/m}$	
2.	Taper of spindle runs true	300 mm long 	Position A : 0.01 mm Position B : 0.02 mm	
3.	Spindle parallel with traverse of carriage	(a) in vertical plane	(a) 0.02/300 mm	
		(b) in horizontal plane	(b) 0.02/300 mm	
4.	Upper Slide (Parallelism of the Slide Longitudinal Movement to the Spindle Axis)		0.01/150 mm	
5.	Axis of centres parallel with bed in vertical plane		0.02/300 mm	

6.	Tailstock spindle parallel with carriage guides (carriage traverse)	(a) in vertical plane		(a) 0.02/ 150 mm	
		(b) in horizontal plane		(b) 0.01/ 150 mm	
7.	Centring register of spindle runs true		0.01 mm		
8.	Spindle for axial float and true running of face of spindle flange		0.015 mm		
9.	Centre runs true		0.015 mm		
10.	Working accuracy of lathe on cylindrical turning		0.015mm (cylindricity) (D=25mm ~50mm)		
CHIEF ENGINEER :			INSPECTING ENGINEER :		

1340VS

Parameters	Explanation	參數功能	Factory Setting
00-07	Password Input	參數保護密碼輸入	06
00-08	Password Setting	參數保護密碼設定	06
01-00	Maximum Output Freq. (Fo,max)	最大操作頻率	77
01-03	Mid-Point Frequency (Fmid)	中間頻率設定	9
01-04	Mid-Point Voltage (Vmid)	中間電壓設定	40
01-05	Minimum Output Frequency (Fmin)	最低頻率輸出設定	1.5
01-06	Minimum Output Voltage (Vmin)	最低輸出電壓設定	20
01-09	Accel Time 1	第一加速時間	2
01-10	Decel Time 1	第一減速時間	2
02-00	Source of Frequency Command	頻率指令來源設定	1
02-01	Source of Operation Command	運轉指令來源設定	2
02-03	PWM Carrier Frequency	載波頻率設定	12
04-00	Potentiometer Bias Frequency	類比輸入頻率偏壓	9.8
06-00	Over-Voltage Stall Prevention	過電壓失速防止	0
06-01	Over-Current Stall Prevention during Accel	加速中過電流失速防止	200
06-02	Over-Current Stall Prevention during Operation	運轉中過電流失速防止	200
07-02	Torque Compensation	轉矩補償增益	6
07-03	Slip Compensation	轉差補償增益	1
08-00	DC Braking Current Level	直流制動電流準位	60
08-03	Start-Point for DC Braking	直流制動的起始頻率	78
08-06	B.B. Time for Speed Search	速度追蹤時間	4
08-07	Maximum Speed Search Current Level	速度追蹤最大電流	190

DELTA inverter parameter

Parameters	Explanation	參數功能	Factory Setting
00-07	Password Input	參數保護密碼輸入	06
00-08	Password Setting	參數保護密碼設定	06
01-00	Maximum Output Freq. (Fo,max)	最大操作頻率	77
01-03	Mid-Point Frequency (Fmid)	中間頻率設定	9
01-04	Mid-Point Voltage (Vmid)	中間電壓設定	40
01-05	Minimum Output Frequency (Fmin)	最低頻率輸出設定	1.5
01-06	Minimum Output Voltage (Vmin)	最低輸出電壓設定	20
01-09	Accel Time 1	第一加速時間	2
01-10	Decel Time 1	第一減速時間	2
02-00	Source of Frequency Command	頻率指令來源設定	1
02-01	Source of Operation Command	運轉指令來源設定	2
02-03	PWM Carrier Frequency	載波頻率設定	12
04-00	Potentiometer Bias Frequency	類比輸入頻率偏壓	9.8
06-00	Over-Voltage Stall Prevention	過電壓失速防止	0
06-01	Over-Current Stall Prevention during Accel	加速中過電流失速防止	200
06-02	Over-Current Stall Prevention during Operation	運轉中過電流失速防止	200
07-02	Torque Compensation	轉矩補償增益	6
07-03	Slip Compensation	轉差補償增益	1
08-00	DC Braking Current Level	直流制動電流準位	60
08-03	Start-Point for DC Braking	直流制動的起始頻率	78
08-06	B.B. Time for Speed Search	速度追蹤時間	4
08-07	Maximum Speed Search Current Level	速度追蹤最大電流	190

SHARP

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