

*new 13"*



# Colchester

## STUDENT 2500

**330mm — 13in swing centre lathe**

### INSTRUCTION & SPARE PARTS MANUAL

# Colchester

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SUMMARISED SPECIFICATION

330mm (13in) swing CENTRE LATHE

630mm MODEL – 630mm (25”) between centres  
1000mm MODEL – 1000mm (40”) between centres

This machine is manufactured to British metric standards throughout, and is available in two bed lengths - each with either gap or straight bed versions.

A left or right hand apron handwheel and either Metric or English drive screws (together with the appropriate micrometer dials) are optional variations.

summarised specification

Centres	Height . . . . .	167mm (6 <sup>9</sup> / <sub>16</sub> ”)	Feeds	16 Metric (R.10 Series) . .	from .03 to
	Admits between . . . . .	635mm (25”)			1mm/rev
	or . . . . .	1000mm (40”)		16 English . . . . .	from .001 to
					.40”/rev.
Swing	Over Bed . . . . .	330mm (13”)	Cross Feeds Half Longitudinal Values		
	Over Cross Slide . . . . .	210mm (8 <sup>1</sup> / <sub>4</sub> ”)			
	In Gap Diameter . . . . .	480mm (19”)	Cross Slide	Width . . . . .	140mm (5 <sup>1</sup> / <sub>2</sub> ”)
	Gap (from Faceplate) . . . . .	115mm (4 <sup>39</sup> / <sub>64</sub> ”)		Travel . . . . .	190mm (7 <sup>1</sup> / <sub>2</sub> ”)
Spindle	Bored to Pass . . . . .	38mm Ø (1 <sup>1</sup> / <sub>2</sub> ”Ø)	Top Slide	Width . . . . .	82mm (3 <sup>1</sup> / <sub>4</sub> ”)
	Nose . . . . .	No. 4-D1		Travel . . . . .	92mm (3 <sup>5</sup> / <sub>8</sub> ”)
		Camlock	Tool	Max. Section . . . . .	16 x 20mm
	Morse Taper in Nose . . . . .	No. 5		( <sup>5</sup> / <sub>8</sub> ” x <sup>3</sup> / <sub>4</sub> ”)	
	in Bush . . . . .	No. 3	Tailstock	Quill - Diameter . . . . .	42mm (1 <sup>21</sup> / <sub>32</sub> ”)
Speeds	Number . . . . .	12		- Travel . . . . .	110mm (4 <sup>3</sup> / <sub>8</sub> ”)
	Progression Ratio . . . . .	1.46		- Morse Taper . . . . .	No. 3
	Range . . . . .	40 to 2500 r.p.m		Set-Over . . . . .	± 12mm (± <sup>1</sup> / <sub>2</sub> ”)
Motor	(1500 r.p.m. @ 50Hz) . . . . .	2.2kW 3hp	Weight	630mm Model	
Leadscrew	Diameter . . . . .	28mm (1 <sup>1</sup> / <sub>8</sub> ”)		630mm (25”) Cts . . . . .	583kg (1288 lbs)
	Thread . . . . .	6mm pitch or		1000mm Model . . . . .	
		4 TPI		1000mm (40”) Cts . . . . .	685kg (1512 lbs)
Threads	39 Metric Pitches . . . . .	from 0.2 to			
		14mm Pitch			
	35 English Pitches . . . . .	from 2 to 56 TPI			
	18 Module Pitches . . . . .	from 0.3 to			
		3.5 MOD.			
	18 Diametral Pitches . . . . .	from 8 to 56 DP			

Shipping Data	Gross Weight	Packing Case Dimensions		
		L	W	H
25in centres (630mm)	762Kg(1680lb)	1.7m	x .94m	1.47m
40in centres (1000mm)	889Kg(1960lb)	2.08m	x .94m	1.47m

standard equipment

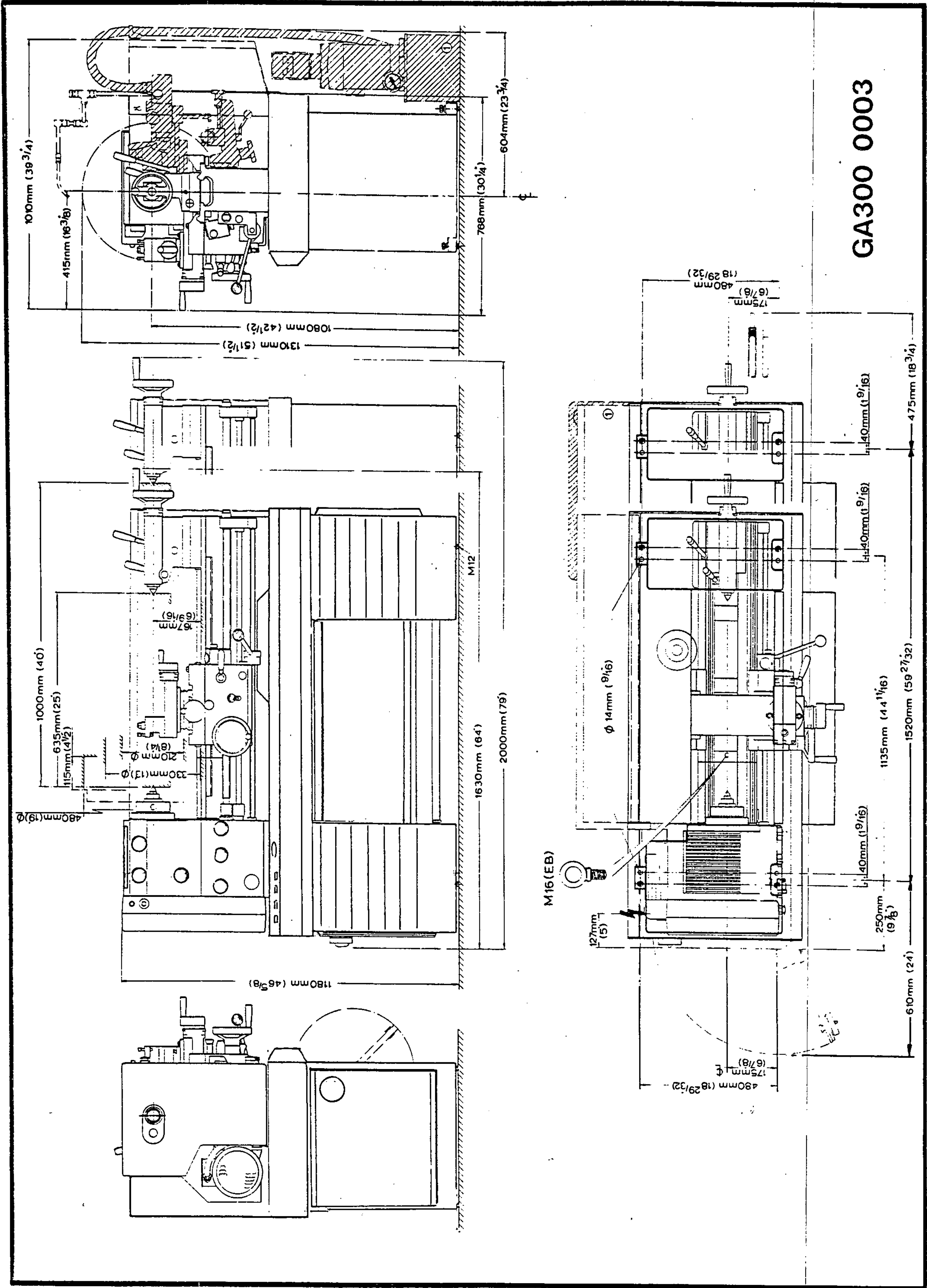
Single Toolpost	Spanners, Keys and Oil Gun
Work Driver Plate	Machine Manual
No. 5/3 Morse Centre Bush	& Standard Inspection Certificate
2 No. 3 M.T. Centres	Rear Splash Guard

Illustrated or specified data is not binding in detail: The manufacturers reserve the right to modify design, specification and price without notice.

# Installation



# INSTALLATION - FLOOR PLAN



## Lifting

The approximate weights of the machine are:-

630mm Model (630 mm/25" between centres) - 583 kg (1285 lb).

1000mm Model (1000 mm/40" between centres) - 685 kg (1512 lb).

The machine should be lifted using the eye-bolt supplied (SEE GENERAL ARRANGEMENT AND FOUNDATION PLAN) with the apron/saddle assembly positioned, as despatched, towards the tailstock end of the bed.

Alternatively, a rope sling may be used, - being looped under both ends of the swarf tray.

## Cleaning

Bright surfaces are coated with an anti-corrosive compound at despatch and this must be completely removed using White Spirit or Paraffin (Kerosene) before operating the controls or moving the slides. DO NOT USE CELLULOSE SOLVENTS. Oil the bright surfaces and slideways AFTER CLEANING. (see Lubrication diagram).

## Siting the Machine

The following points should be considered when choosing the site for the machine:

- (a) The ground must be suitable for machine foundations. It is recommended for efficient operation of the machine that it be mounted on steel plates (8) on a concrete or stone base of 300mm thick on a firm sub-structure.
- (b) The machine must not be positioned near any machinery causing abnormal vibrations, e.g. presses, guillotines, or near welding and high frequency equipment.
- (c) Ensure adequate space is provided around the machine for all ancillary services, e.g. work loading, swarf removal, maintenance, etc.
- (d) The ideal ambient temp is 20°C, however, a range from 10°C/30°C can be accommodated.
- (e) Ensure that high voltage electrical cables are not in the proposed area.

## Positioning

Locate the machine on a solid foundation allowing sufficient area for operation and maintenance access. (SEE GENERAL ARRANGEMENT AND FOUNDATION PLAN).

The lathe may be used when free standing, but for maximum performance it should be bolted down.

- (1) **Free standing.** Position the machine on its foundation and adjust each of the four levelling screws to take an equal share of the weight. Then using an engineer's precision level on the bedways make further adjustments for level conditions.
- (2) **Fixed installation.** Position the machine over four 12 mm (1/2") diameter foundation bolts, set to suit the base. (SEE GENERAL ARRANGEMENT AND FOUNDATION PLAN).

Accurately level the machine as in (1), then tighten the foundation bolts evenly to avoid distortion and finally re-check for level conditions.



# INSTALLATION

## Electrical Supply

Power should be supplied through an external fused isolator - recommended fuses being 25 amp for 220 volts supply and 16 amp for 380 to 440 volts supply. External wiring should be of a permanent character and be undertaken by a competent electrician. Electrical entry is at the rear left-hand end of the cabinet. (SEE GENERAL ARRANGEMENT AND FOUNDATION PLAN).

Line connections should be to the isolator terminals and a substantial earth continuity conductor must be connected to the earth terminal on the panel. (SEE ELECTRICAL WIRING DIAGRAM).

Main spindle rotation must be anti-clockwise (looking from tailstock) for a downward movement of the spindle control lever. Interchanging two line connections should rectify wrong direction of rotation.

## Lubrication (Refer to Lubrication diagram)

Ensure that the headstock, gearbox and apron are filled to the level of the relevant oil sight windows - operate the centralised slideway lubrication system by pulling and releasing the knob at the bottom corner of the apron and oil the cross-slide nut, dials and changewheel stud etc. through the appropriate oil nipples using the oil gun provided.

## Running-in

For optimum bearing life and performance it is recommended that high spindle speeds be avoided during the initial life of the machine.

Alternatively a running-in procedure should be adopted as follows:-

Make a low feed rate selection and run the machine light for 3 hours at 540 rpm  
then for 2 hours at 800 rpm  
then for 1 hour at 1200 rpm  
then for 1/2 hour at 1700 rpm

## Lubrication



LUBRICATION

Check levels and oil daily  
Schauglas und Öl täglich überprüfen  
Vérifier les regards et graisser quotidiennement

1 litre

0.5 litre

0.3 litre

Mobil	BP	Castrol	C	Esso	Shell	TEXACO
DTE OIL HEAVY MEDIUM	ENERGOL HLP 68 (ISO)	HYSPIN AWS 68	P.W.L.C.	NUTO H68	TELLUS 68 OR R68	RANDO HD 68
DTE EXTRA HEAVY	ENERGOL HP 150 (ISO)	ALPHA ZN 220	WLM	NURAY 100	VITREA 220	REGAL R & O 220

**Operation**

# **LATHE OPERATOR SAFETY**

## **LATHE OPERATOR SAFETY**

Colchester Lathes are fast, powerful machines which can be dangerous if used under improper circumstances. Please read and observe the following Health and Safety Guidance Notes before and during the use of the machine.

### **HEALTH AND SAFETY AT WORK ETC. ACT 1974**

In accordance with the requirements of the Health and Safety at Work etc. Act 1974 this manual contains the necessary information to ensure that the machine tool can be operated properly and with safety. It is assumed that the operator has been properly trained, has the requisite skill and is authorised to operate the machine, or, if undergoing training, is under the close supervision of a skilled and authorised person.

Attention is drawn to the importance of compliance with the various statutory regulations which may be applicable, such as "The Protection of Eyes Regulations". It is further stressed that good housekeeping, common sense and the maintenance of good established work shop practice is essential.

Adequate information is also provided to enable the machine to be properly serviced and maintained by persons with the necessary skills and authority. It is recommended that a "Permit to Work" system, such as that detailed in Code of Practice BS 5304; 1974. Safeguarding of Machinery should be operated.

### **MACHINE CAPACITY**

The dimensions of a component which can be accommodated on the lathe are limited only by the physical restrictions of the machine itself but responsibility for the following points with respect to machining a component must inevitably rest with the user.

- (1) Ensuring that the operator has had suitable training and possesses the required degree of skill and experience to undertake the work.
- (2) Providing suitable work holding and/or supporting equipment, i.e. chucks, steadies, revolving centres, etc.
- (3) Ensuring that suitable tooling is provided and correctly mounted.
- (4) Ensuring that suitable feeds and speeds are selected (if in doubt select the lowest).
- (5) Providing suitable workpiece guards and ensuring that these are consistently used.

### **OPERATING SAFETY PRECAUTIONS**

1. Keep the machine and work area neat, clean and orderly.
2. Ensure all guards and cover plates are in place and all machine cabinet doors closed before starting machine.
3. Never lay anything on the working surfaces of the machine, or inside the machining chamber, where it may foul with rotating or moving parts.



4. Do not touch or reach over moving or rotating machine parts.
5. ENSURE YOU KNOW HOW TO STOP THE MACHINE BEFORE STARTING IT.
6. Do not operate the machine in excess of its rated capacity.
7. Do not wear rings, watches, ties or loose sleeved clothing.
8. STOP MACHINE IMMEDIATELY ANYTHING UNEXPECTED HAPPENS.
9. DO NOT interchange chucks or other spindle mounting items without checking for correct locking (see Operational Notes).
10. Do not use other workholding devices without checking for compatability with The Colchester Lathe Co. Ltd. and workholding manufacturer.
11. Check load capacity of revolving centres for application in hand.
12. Stop motors and switch off isolator when leaving machine unattended.

### OPERATING HAZARDS

When using the machine be FULLY AWARE of the following operating hazards detailed under the following instructions:

#### a) Cancer of the Skin Caused by Oil

Cancer of the skin may be produced by continuous contact with oil, particularly with straight cutting oils, but also with soluble oils. The following precautions should be taken:

1. Avoid unnecessary contact with oil.
2. Wear protective clothing.
3. Use protective shields and guards.
4. Do not wear oil soaked or contaminated clothing.
5. Use barrier creams provided.
6. Do not wash hands in coolant.
7. After work thoroughly wash all parts of the body that have come into contact with oils.

#### b) Safe Operation of Lathe Chucks

Where details of operating speeds and of maximum recommended operating speeds are supplied these are intended only as a guide. Such details must be regarded as for general guidance only for the following reasons:

They apply only to chucks in sound condition.

If a chuck has sustained damage, high speeds may be dangerous. This applies particularly to chucks with grey cast iron bodies wherein fractures may occur.

The gripping power required for any given application is not known in advance.

The actual gripping power being used for any given application is not known by the chuck manufacturer.



# **LATHE OPERATOR SAFETY**

There is the possibility of the workpiece becoming insecurely gripped due to the influence of centrifugal force under certain conditions. The factors involved include:—

- (a) Too high a speed for a particular application.
- (b) Weight and type of gripping jaws if non-standard.
- (c) Radius at which gripping jaws are operating.
- (d) Condition of chuck — inadequate lubrication.
- (e) State of balance.
- (f) The gripping force applied to the workpiece in the static condition.
- (g) Magnitude of the cutting forces involved.
- (h) Whether the workpiece is gripped externally or internally.

Careful attention must be paid to these factors. As they vary with each particular application, a manufacturer cannot provide specific figures for general use, the factors involved being outside his control.

## **GENERAL PRINCIPLES CONCERNING OPERATOR SAFETY FOR ALL TURNING MACHINES**

1. Do not hold a lathe part with grease or oil on it.
2. Hold all lathe parts firmly.
3. Do not attempt to hold lathe parts that are too awkward or too hard to hold.
4. Do not hold or lift lathe parts that weigh too much.
5. Know how to properly hold lathe parts when lifting.
6. Use the correct type of sling when lifting workpieces or equipment by crane.
7. Stand clear when lifting workpieces or equipment by crane.
8. Obtain assistance when mounting heavy or awkwardly shaped workpieces.
9. Be sure to clean oil or grease from hand tools and levers and handles.
10. Be sure there is enough texture on the surface of the hand tool or lever handle for proper safe hand contact.
11. Hold hand tools and lever handles firmly.
12. Always choose the proper hand tool and appropriate hand position on the lever handle.
13. Do not use hand tools or lever handles in an awkward position.
14. Always use the recommended number of hands to grasp hand tools and lever handles.
15. Do not get turning or hand tools caught in the chuck or other holding device.
16. Do not use broken or chipped tools.
17. Be sure work piece cannot move in chuck or other holding device.
18. Beware of irregular shaped work pieces.

## LATHE OPERATOR SAFETY

19. Beware of burrs on work pieces and remove if possible.
20. Always select the proper tool for the job.
21. Always attend to your lathe operation — do not run the machine unattended.
22. Do not use tools without handles.
23. Do not apply too much pressure with tools.
24. Do not use defective tools.
25. Always secure your work piece.
26. Always completely secure tool in sockets and screw slots.
27. Do not rely on work tool sockets, screw slots, nuts or bolts.
28. Do not rely on fasteners beyond your reach.
29. Beware of obstructions that prevent complete tightening of fasteners.
30. Do not work in a hurry.
31. Do not overtighten equipment.
32. Never substitute the wrong size tools if the correct size tool is not available in the shop.
33. Never substitute the wrong sized tool if you cannot locate the correct tool in the shop.
34. Do not move guards while lathe is under power.
35. Do not place hand or body part in path of moving parts.
36. Beware of touching lathe parts that will move or fall.
37. Be aware of where you are moving your hand or body part.
38. Beware of holding a tool or other parts inserted in or attached to the chuck or work piece.
39. Be aware of hand or other body part that is in position to be hit by a chuck or work piece.
40. Be aware of your resting position.
41. Do not lean on the machine.
42. Beware of accidentally engaging clutch or turning the power on.
43. Know your controls.
44. Read and understand operation notes before attempting to use the machine.
45. Do not touch revolving chuck, spindle or work piece.
46. Never place your hand on chuck, spindle, or work piece to stop rotation of the lathe.
47. Make sure clutch is disengaged.
48. Make sure power has been turned off.
49. Beware of chuck drifting to a stop before operating it.
50. Always check chuck area.
51. Never engage power with chuck wrench in the chuck.
52. Remove the chuck key immediately after use.

## **LATHE OPERATOR SAFETY**

53. Do not operate lathe while talking.
54. Keep your mind on the job.
55. Beware of lathe dangers when attending to other aspects of lathe operation.
56. Beware of loose clothing near the rotating parts of the lathe.
57. Button up overalls and roll up sleeves or button the cuffs.
58. Beware of loose hair near the rotating parts of the lathe.
59. Keep hair short or wear a cap and hair net.
60. Beware of performing another operation while in close proximity to rotating parts on the lathe.
61. Be aware when changing body positions.
62. Always attend to filing and deburring operations.
63. Always pay attention to file or deburring tools close to the chuck.
64. Files and deburring tools may catch on chuck.
65. Beware of clutch position when jogging the spindle to different positions for gauging.
66. Beware of hands resting on clutch levers.
67. Be sure lathe is in neutral position when placing gauges on components gripped in the chuck.
68. Be sure motor is not running when using gauges on the machine.
69. Be sure speed is set at 0 RPM when placing gauges on mounted workpieces.
70. Always wear protection before operating the lathe.
71. Always wear the right protection before operating the lathe, i.e. safety glasses, overalls, protective shoes, etc.
72. Never remove protection for even a short time when operating the lathe.
73. Wear protective devices correctly.
74. Know the correct way to wear protective devices.
75. Beware of foreign material flying from the lathes.
76. Keep protective shields at the point of operation.
77. Know how to set or attach protective guards properly.
78. Never use the wrong protective guard.
79. Know how to select the proper guards.
80. Never reach over, under or around a work piece to make an adjustment.
81. Never reach over, under or around a work piece to retrieve a hand tool or lathe part.
82. Beware of where you leave your tools during set up.
83. Never reach over, under or around work piece to move hand tool/lathe to another position.
84. Never reach over, under or around the work piece to tighten a lathe part.
85. Never reach over, under or around work piece to remove cuttings.

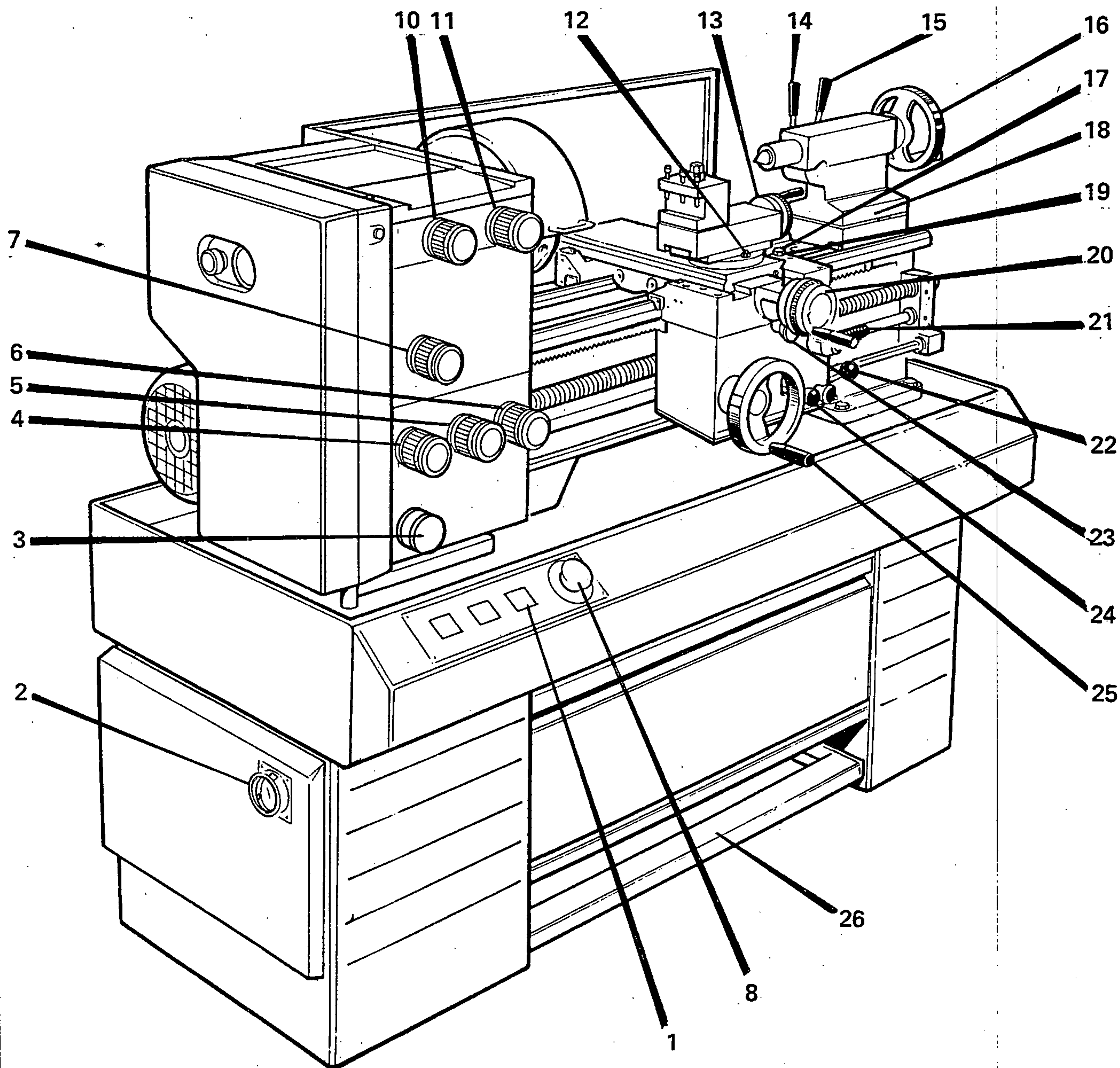


## LATHE OPERATOR SAFETY

86. Beware of time/space relationships.
87. Beware of weight/force relationships.
88. Know the proper procedure for applying force.
89. Never apply force from an awkward position.
90. Never mount a work piece too large for the lathe to handle.
91. Never mount a work piece too large for the worker to handle.
92. Use the equipment necessary for handling work pieces.
93. Never apply more force on the accessory or control lever than you can handle.
94. Secure all work pieces.
95. Secure all jaws, nuts, bolts and locks.
96. Avoid unsafe procedures.
97. Never use undersized parts.
98. Always use the proper equipment.
99. Tighten all fasteners.
100. Never take excessive cuts in machine operation.
101. Never use excessive force in polishing, filing and deburring.
102. Always use the proper hand tool to remove cuttings.
103. Never hurry to remove cuttings.
104. Beware of cuttings wrapped around the chuck or work piece.
105. Never change gears by moving item with your hands.
106. Never remove gear guards.
107. Beware of tools/lathe parts falling on controls.
108. Do not remove swarf with bare hands, use a rake or a brush.
109. Do not interfere with electrical equipment.
110. Do not keep tools in overall pockets.
111. Report any accident, however small, immediately it happens.
112. Use only high speed chucks.
113. Note maximum permissible speeds of faceplates (see operational notes).
114. Check — spindle control lever is in stop position before starting motors  
spindle speed selected  
feed rate selected  
direction of feed, and that feed and thread cutting levers are disengaged  
before starting the spindle
115. Do not remove work from the machine without retreating the tool to a safe position.



# CONTROLS



- |  |   |  |
|--|---|--|
| 1. COOLANT PUMP STARTER<br>(When fitted) | 10. SPEED SELECTOR                                    | 18. TAILSTOCK SET-OVER<br>SCREW        |
| 2. MAINS ISOLATOR                        | 11. SPEED SELECTOR                                    | 19. CARRIAGE LOCK                      |
| 3. FEED SELECTOR DIAL                    | 12. TOP SLIDE LOCK                                    | 20. CROSS TRAVERSE HANDLE              |
| 4. FEED SELECTOR HANDLE                  | 13. TOP SLIDE TRAVERSE<br>HANDLE                      | 21. THREADCUTTING<br>ENGAGEMENT        |
| 5. FEED SELECTOR HANDLE                  | 14. QUILL LOCK  | 22. SPINDLE CONTROL LEVER              |
| 6. FEED SELECTOR HANDLE                  | 15. TAILSTOCK CLAMP                                   | 23. FEED AXIS SELECTOR                 |
| 7. FEED DIRECTION<br>SELECTOR            | 16. QUILL TRAVERSE<br>HANDWHEEL                       | 24. FEED ENGAGE                        |
| 8. EMERGENCY STOP                        | 17. CROSS-SLIDE LOCK<br>(In R.H. side of cross-slide) | 25. LONGITUDINAL TRAVERSE<br>HANDWHEEL |
|  |   | 26. BRAKE PEDAL                        |

## Starting the Machine

1. Ensure that lubrication has been carried out in accordance with the Lubrication diagram.
2. Check that the spindle control lever (22) is in the central (STOP) position, the feed engage lever (24) and thread-cutting lever (21) are in the disengaged positions and that the changewheel cover is firmly secured in place.
3. Select - Feed Axis - i.e. cross or longitudinal by means of the apron push-pull knob (23).  
 Select - Direction of feed - by means of the headstock lower selector handle (7)  
 Select - \*Feed Rate - by referring to the charts on the headstock and selecting (in the sequence listed) the appropriate positions on the gearbox selector dial (3) and handles (4), (5) and (6) (Engagement of the feed gears may be assisted by turning the main spindle)  
 Select \*\*Spindle speed - by means of the selector handles (10) and (11).  
 NOTE: THE SPINDLE SPEED SELECTORS ARE TO BE PUSHED IN BEFORE TURNING AND THAT SPEED SELECTIONS ARE TO BE MADE ONLY WHEN THE SPINDLE IS STATIONARY.  
 (Engagement of the drive gears may be assisted by manually turning the spindle).
4. Switch on the electrical supply at the mains isolator (2) which is the red knob at the L.H. end of the cabinet, when 'SUPPLY ON' will be indicated by the white lamp (9) mounted adjacent to the emergency stop push-button (8).
5. Start the spindle in the direction of rotation required by lifting (FOR REVERSE) or lowering (FOR FORWARD) the "gated" spindle control lever (22) on the apron.
6. Start and stop the feed motion as required by means of the feed engage lever (24).

## Stopping the Machine

The machine may be stopped in the following ways:

- Return the spindle control lever (22) to its central (STOP) position
- OR Depress the full-length foot-brake pedal (26)
- OR Press the emergency stop push-button (8).

## Operational Notes

- CHUCKS - USE ONLY HIGH SPEED TYPES
- FACEPLATES - NOTE MAXIMUM SPEEDS:-  
 1200 rpm for 300 mm (12") dia.  
 and 800 rpm for 460 mm (18") dia.
- COARSE FEED RANGE - (i.e. when secondary changewheels are inverted to give 88/44T) SHOULD NOT BE USED WITH SPINDLE SPEEDS ABOVE 540 RPM.

### NOTES

- \* Feed selections from the charts automatically disengage the leadscrew drive at the gearbox (i.e. by calling for selector position X) - and for minimum wear the thread indicator dial should be disengaged by swinging the pinion out of mesh with the leadscrew when not in use.
- \*\* See Installation instructions (RUNNING-IN) if starting the machine for the first time.

continued



## OPERATION

### Operational notes continued

Micrometer dials are direct reading (for work piece diameter reduction on the cross-slide) and are of the friction-grip type for easy index settings.

Longitudinal traverse handwheel (25) may be disengaged by pulling it away from the apron face.

**Tailstock set over adjustment** - is provided in the form of socket screws (18) mounted in each side of the tailstock body, - a similar but 'location-screw' is fitted in the rear face of the body.

Set-over adjustment is made as follows:-

Unclamp the tailstock - (lever (15))

Slacken the rear 'location-screw' (say one half turn)

**Then** — Alternatively slacken one set-over screw and tighten the other until the required setting is achieved.

Tighten the rear 'location-screw'

**And** Re-clamp the tailstock.

## MOUNTING OF CHUCKS, FACEPLATES and other SPINDLE MOUNTED ATTACHMENTS

Ensure that the location faces on both nose and attachment are scrupulously clean.

Check that all the cams are in the release position (Fig. 1).

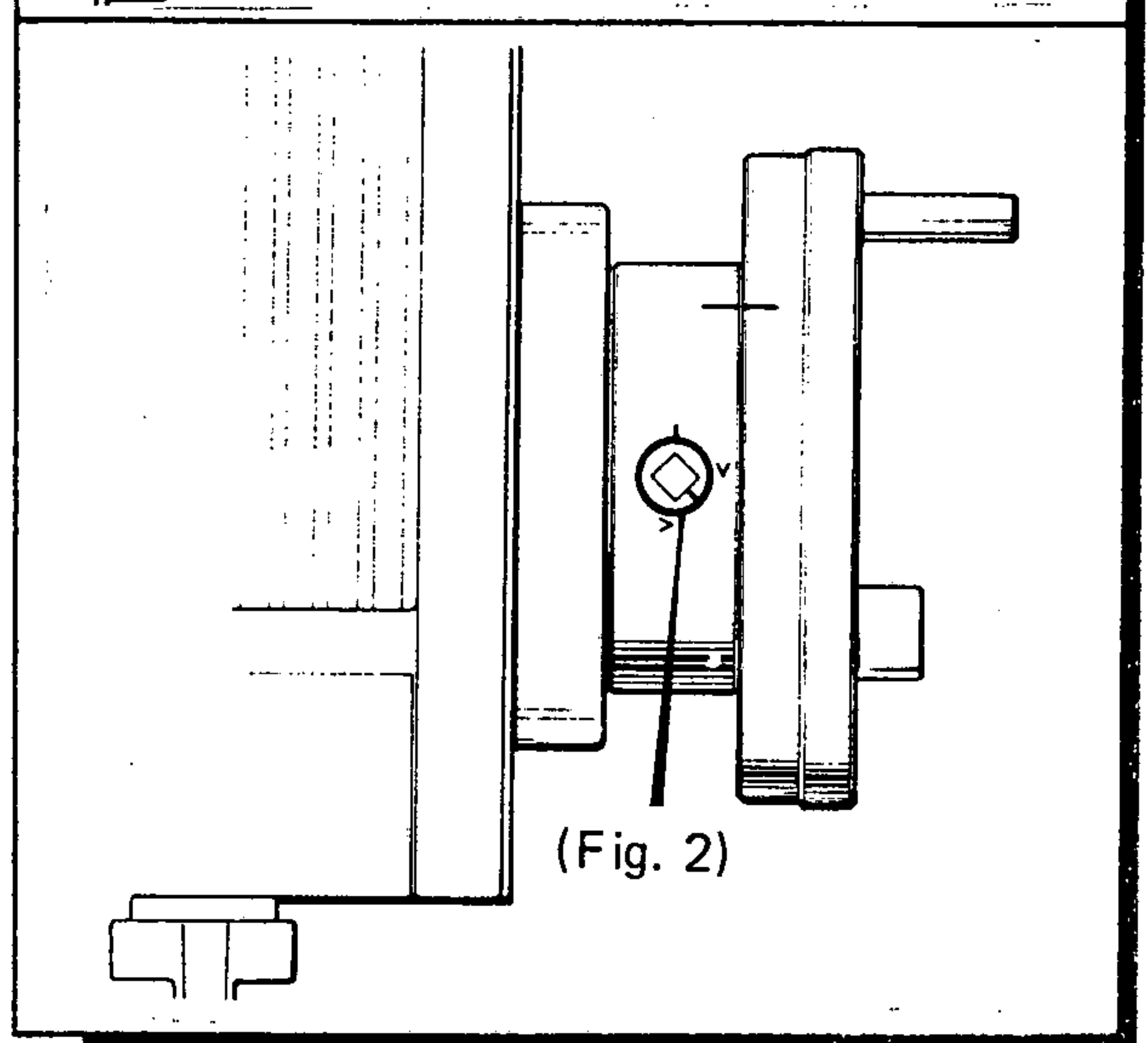
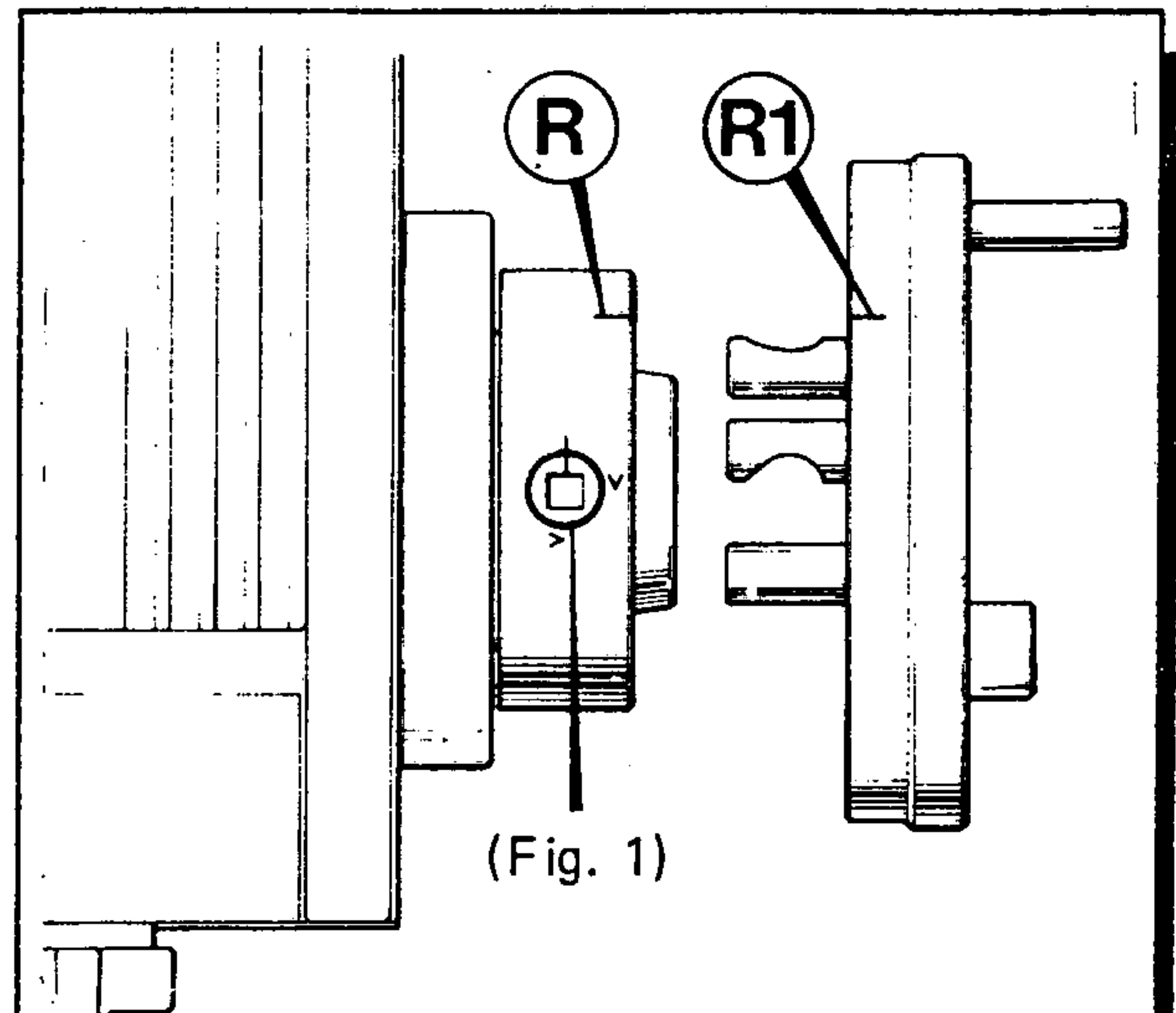
Mount the attachment on to the spindle nose and lock each cam by turning it clockwise using the key provided.

A reference line R1 (Fig. 1) should be scribed on each chuck or faceplate to coincide with the reference line R on the spindle nose. This assists subsequent re-mounting

### NOTE:

For correct locking conditions each cam must tighten with its index line between the two vee marks on the nose (Fig. 2).

**DO NOT INTERCHANGE CHUCKS OR OTHER SPINDLE MOUNTING ITEMS BETWEEN LATHES WITHOUT CHECKING EACH CAM FOR CORRECT LOCKING.**



## TO ADJUST 'CAMLOCK STUDS'

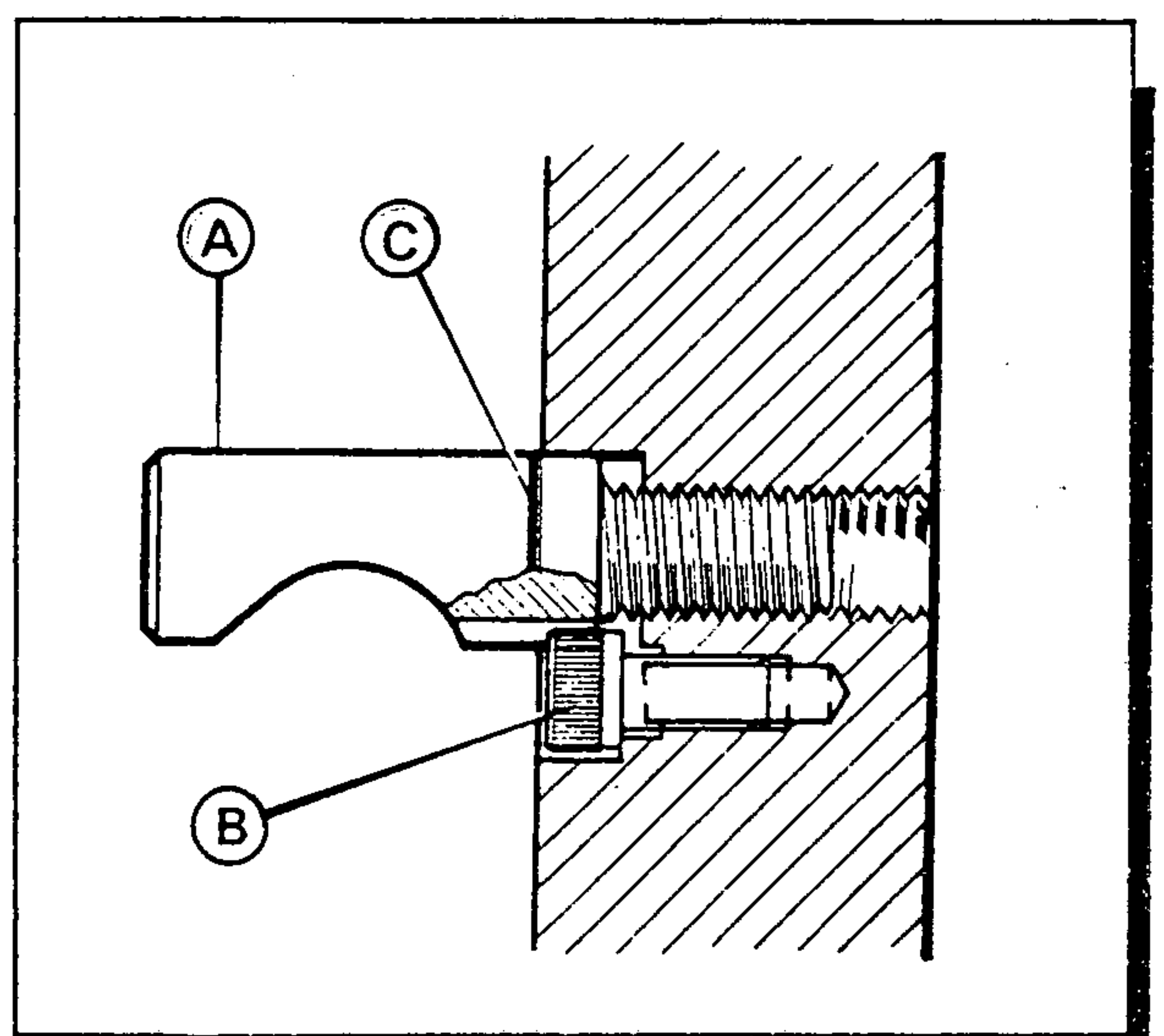
Remove Lockscrew (B).

Turn Stud (A) one full turn, in or out as required.

Re-fit and tighten lockscrew (B).

### NOTE:-

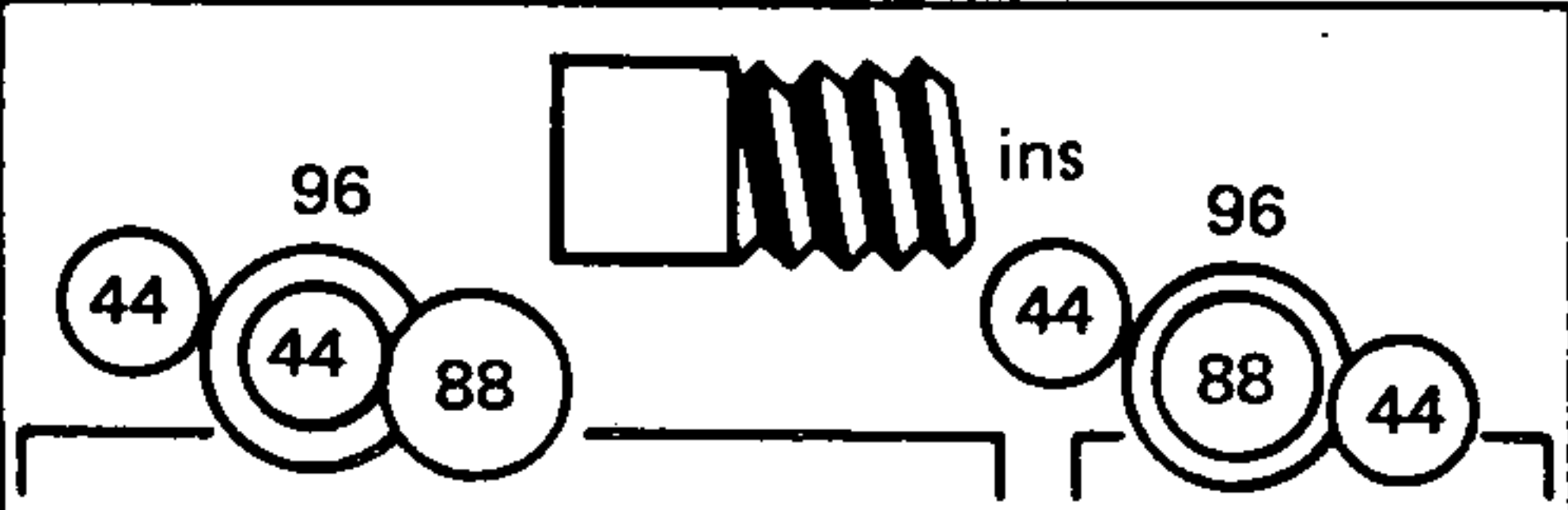
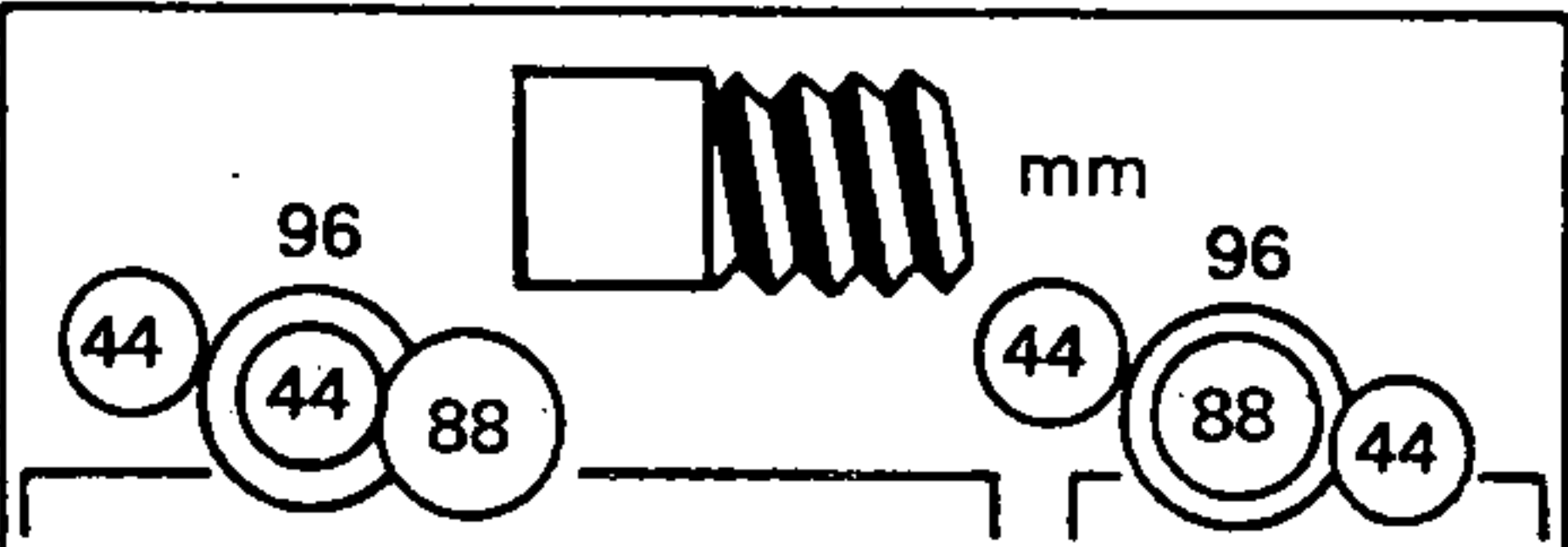
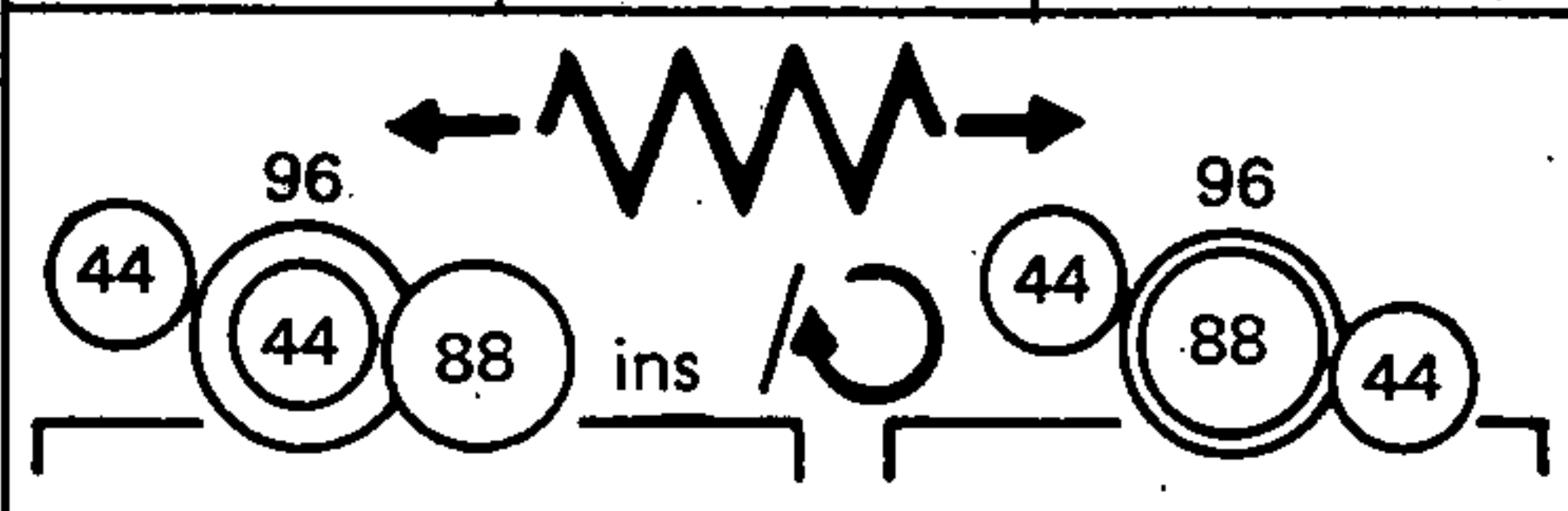
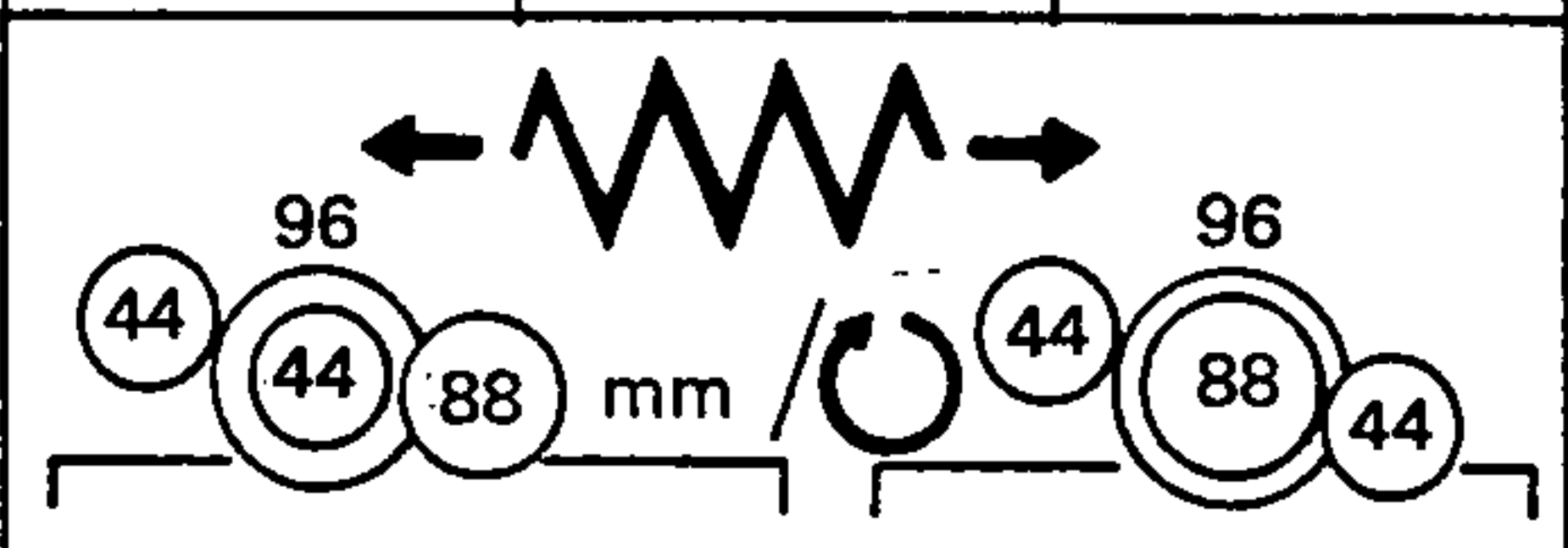
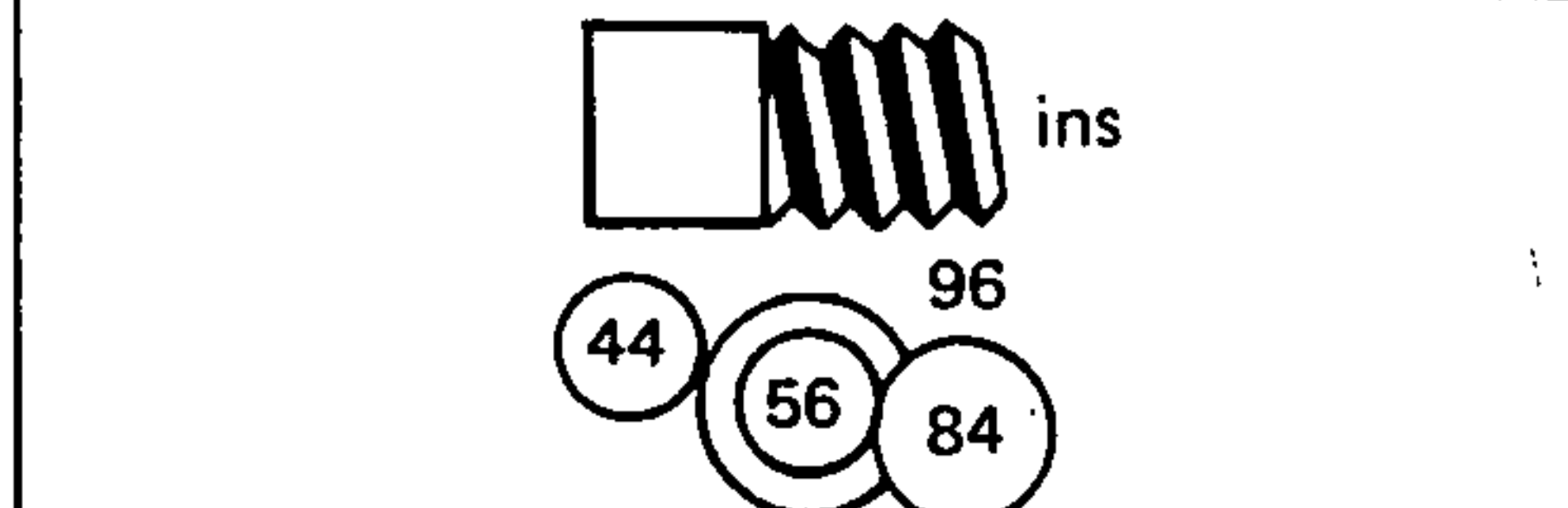

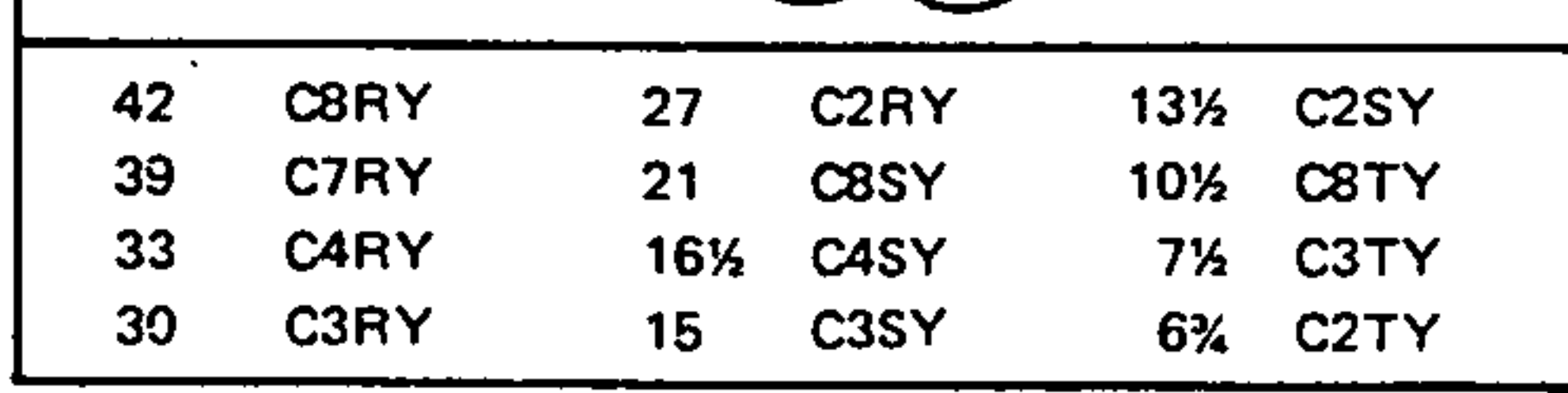
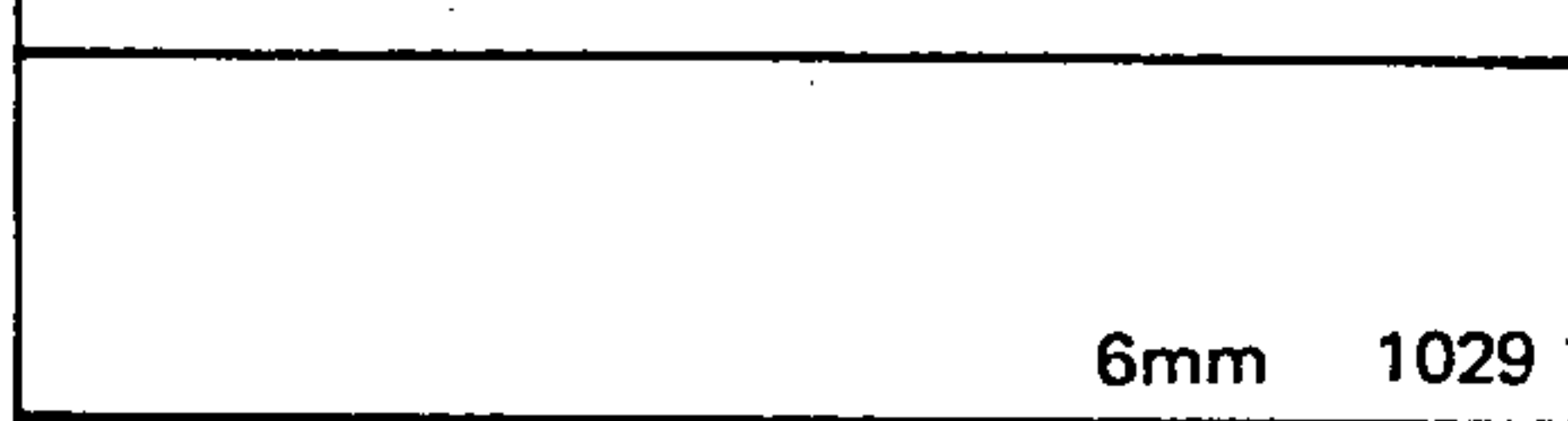
A datum ring (C) is marked on each stud as a guide to the original or initial setting.





MACHINE THREAD PLATES

THREADING PLATES – METRIC MACHINE

					
56 C8RY	18 C2SY	7 C8SY	.2 AT1W	1 AR3W	4 BS1W
52 C7RY	16 C1SY	6½ C7SY	.225 AT2W	1.1 AR4W	4.5 BS2W
48 C6RY	14 C8TY	6 C6SY	.25 AT3W	1.2 AR6W	5 BS3W
46 C5RY	13 C7TY	5½ C4SY	.3 AT6W	1.25 BS3W	5.5 BS4W
44 C4RY	12 C6TY	5 C3SY	.35 AT8W	1.3 AR7W	6 BS6W
40 C3RY	11½ C5TY	4½ C2SY	.4 AS1W	1.4 AR8W	6.5 BS7W
36 C2RY	11 C4TY	4 C1SY	.45 AS2W	1.5 BS6W	7 BS8W
32 C1RY	10 C3TY	3½ C8TY	.5 AS3W	1.75 BS8W	8 BR1W
28 C8SY	9 C2TY	3¼ C7TY	.55 AS4W	2 BR1W	9 BR2W
26 C7SY	8 C1TY	3 C6TY	.6 AS6W	2.25 BR2W	10 BR3W
24 C6SY		2½ C5TY	.65 AS7W	2.5 BR3W	11 BR4W
23 C5SY		2¼ C4TY	.7 AS8W	2.75 BR4W	11.5 BR5W
22 C4SY		2½ C3TY	.75 BT6W	3 BR6W	12 BR6W
20 C3SY		2¼ C2TY	.8 AR1W	3.25 BR7W	13 BR7W
19 B2SY		2 C1TY	.9 AR2W	3.5 BR8W	14 BR8W
					
.001 AT1X	.005 AR1X AT1X	.025 BS1X	.03 AT1X	.12 AR1X AT1X	.6 BS1X
.0016 AT4X	.006 AR4X AT4X	.030 BS4X	.04 AT4X	.16 AR4X AT4X	.8 BS4X
.002 AT8X	.008 AR8X AT8X	.040 BS8X	.05 AT8X	.2 AR8X AT8X	1 BS8X
.0025 AS1X	.010 BS8X AS2X	.050 BR2X	.06 AS1X	.25 BS8X AS2X	1.2 BR2X
.003 AS4X	.012 BR1X BT1X	.060 BR4X	.08 AS4X	.3 BR1X BT1X	1.5 BR4X
.0035 AS7X	.016 BR4X BT4X	.070 BR6X	.09 AS7X	.4 BR4X BT4X	1.8 BR6X
.004 AS8X	.020 BR8X BT8X	.080 BR8X	.1 AS8X	.5 BR8X BT8X	2 BR8X
					
56 C8RY	24 C6SY	13 C7TY	.3 AT6W	.9 AR2W	2.25 BR2W
48 C6RY	22 C4SY	12 C6TY	.4 AS1W	1 AR3W	2.5 BR3W
40 C3RY	20 C3SY	11 C4TY	.5 AS3W	1.25 BS3W	2.75 BR4W
36 C2RY	18 C2SY	10 C3TY	.6 AS6W	1.5 BS6W	3 BR6W
32 C1RY	16 C1SY	9 C2TY	.7 AS8W	1.75 BS8W	3.25 BR7W
28 C8SY	14 C8TY	8 C1TY	.8 AR1W	2 BR1W	3.5 BR8W
					
42 C8RY	27 C2RY	13½ C2SY			
39 C7RY	21 C8SY	10½ C8TY			
33 C4RY	16½ C4SY	7½ C3TY			
30 C3RY	15 C3SY	6½ C2TY			

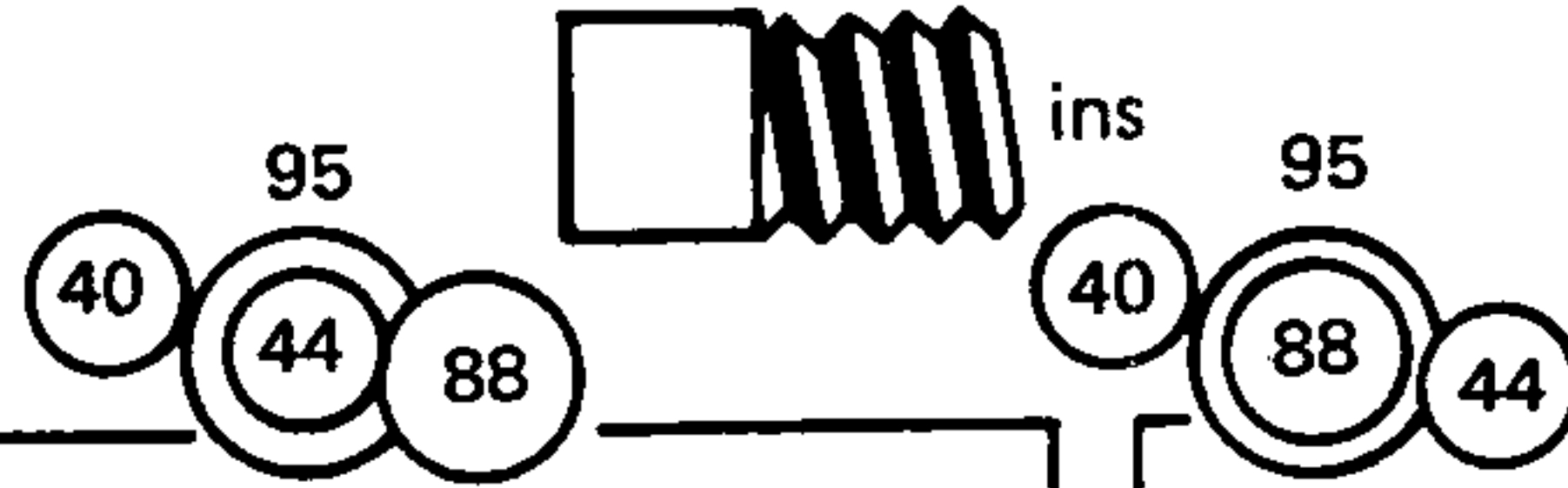

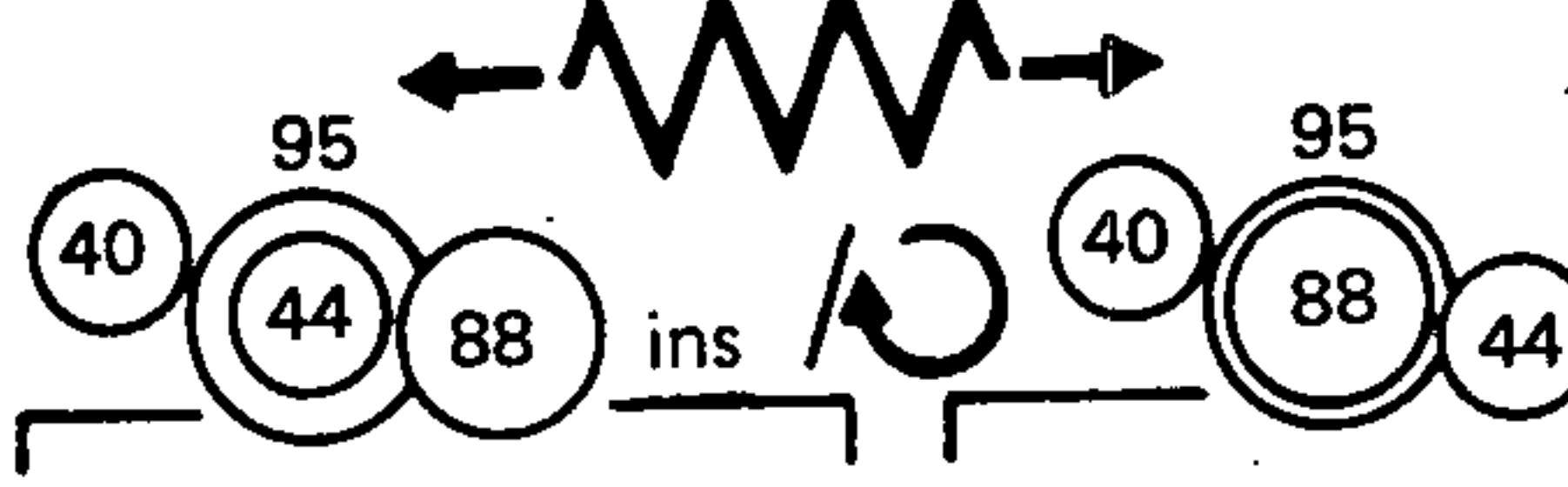
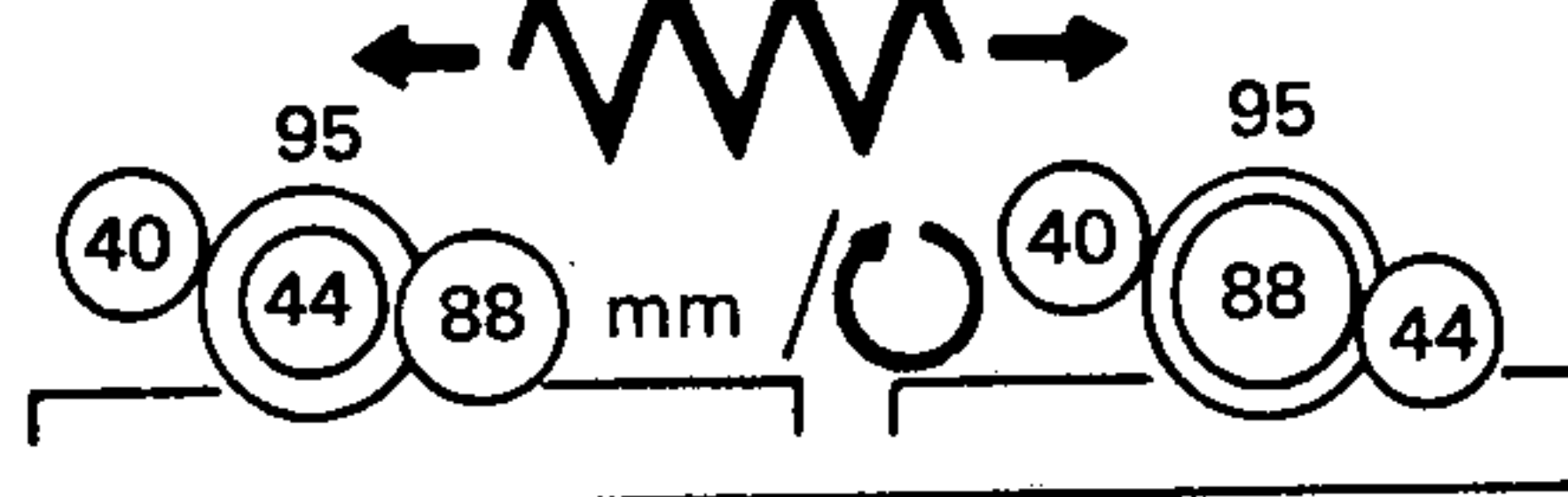
6mm 1030

6mm 1029

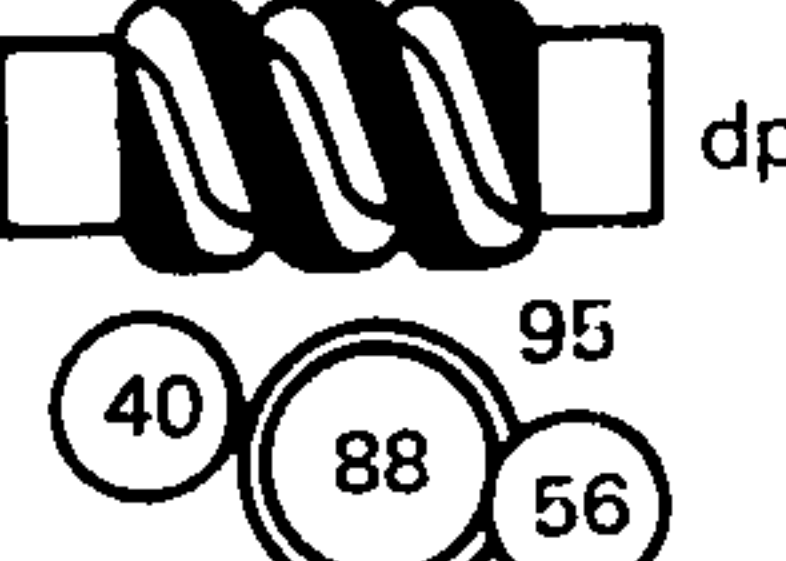
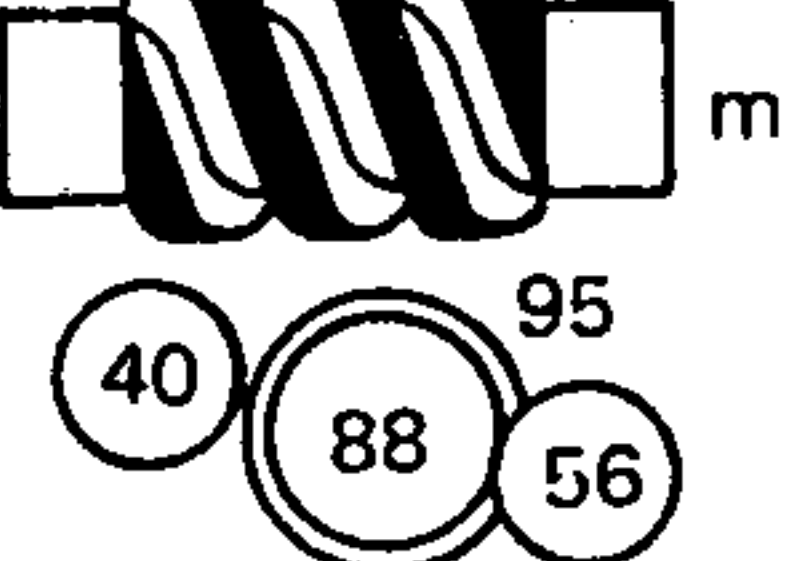
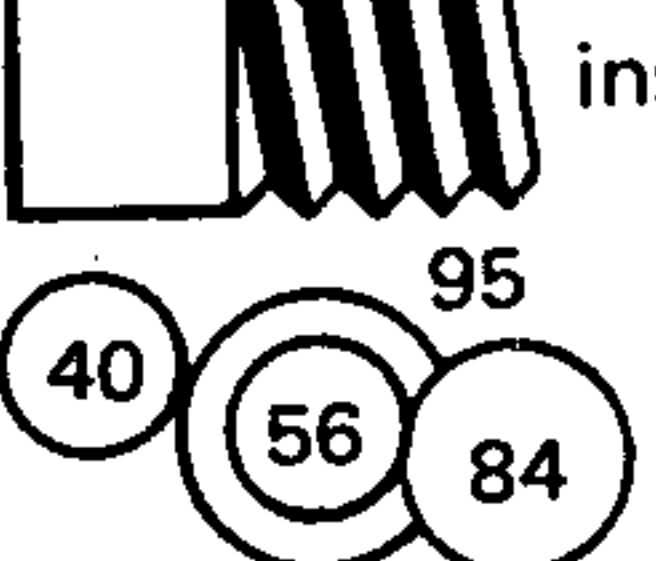
SPECIAL THREADS NOT SHOWN ABOVE MAY BE CALCULATED ON REQUEST.

# MACHINE THREAD PLATES

## THREADING PLATES — ENGLISH MACHINE

							
56 C8RY	18 C2SY	7 C8SY		.2 AT1W	1 AR3W	4 BS1W	
52 C7RY	16 C1SY	6 1/2 C7SY		.225 AT2W	1.1 AR4W	4.5 BS2W	
48 C6RY	14 C8TY	6 C6SY		.25 AT3W	1.2 AR6W	5 BS3W	
46 C5RY	13 C7TY	5 1/2 C4SY		.3 AT6W	1.25 BS3W	5.5 BS4W	
44 C4RY	12 C6TY	5 C3SY		.35 AT8W	1.3 AR7W	6 BS6W	
40 C3RY	11 1/2 C5TY	4 1/2 C2SY		.4 AS1W	1.4 AR8W	6.5 BS7W	
36 C2RY	11 C4TY	4 C1SY		.45 AS2W	1.5 BS6W	7 BS8W	
32 C1RY	10 C3TY	3 3/4 C8TY		.5 AS3W	1.75 BS8W	8 BR1W	
28 C8SY	9 C2TY	3 3/4 C7TY		.55 AS4W	2 BR1W	9 BR2W	
26 C7SY	8 C1TY	3 C6TY		.6 AS6W	2.25 BR2W	10 BR3W	
24 C6SY		2 7/8 C5TY		.65 AS7W	2.5 BR3W	11 BR4W	
23 C5SY		2 3/4 C4TY		.7 AS8W	2.75 BR4W	11.5 BR5W	
22 C4SY		2 1/2 C3TY		.75 BT6W	3 BR6W	12 BR6W	
20 C3SY		2 1/4 C2TY		.8 AR1W	3.25 BR7W	13 BR7W	
19 B2SY		2 C1TY		.9 AR2W	3.5 BR8W	14 BR8W	
							
.001 AT1X	.005 AR1X AT1X	.025 BS1X		.03 AT1X	.12 AR1X AT1X	.6 BS1X	
.0016 AT4X	.006 AR4X AT4X	.030 BS4X		.04 AT4X	.16 AR4X AT4X	.8 BS4X	
.002 AT8X	.008 AR8X AT8X	.040 BS8X		.05 AT8X	.2 AR8X AT8X	1 BS8X	
.0025 AS1X	.010 BS8X AS2X	.050 BR2X		.06 AS1X	.25 BS8X AS2X	1.2 BR2X	
.003 AS4X	.012 BR1X BT1X	.060 BR4X		.08 AS4X	.3 BR1X BT1X	1.5 BR4X	
.0035 AS7X	.016 BR4X BT4X	.070 BR6X		.09 AS7X	.4 BR4X BT4X	1.8 BR6X	
.004 AS8X	.020 BR8X BT8X	.080 BR8X		.1 AS8X	.5 BR8X BT8X	2 BR8X	

4TPI 1026

							
56 C8RY	24 C6SY	13 C7TY		.3 AT6W	.9 AR2W	2.25 BR2W	
48 C6RY	22 C4SY	12 C6TY		.4 AS1W	1 AR3W	2.5 BR3W	
40 C3RY	20 C3SY	11 C4TY		.5 AS3W	1.25 BS3W	2.75 BR4W	
36 C2RY	18 C2SY	10 C3TY		.6 AS6W	1.5 BS6W	3 BR6W	
32 C1RY	16 C1SY	9 C2TY		.7 AS8W	1.75 BS8W	3.25 BR7W	
28 C8SY	14 C8TY	8 C1TY		.8 AR1W	2 BR1W	3.5 BR8W	
							
42 C8RY	27 C2RY	13 1/2 C2SY					
39 C7RY	21 C8SY	10 1/2 C8TY					
33 C4RY	16 1/2 C4SY	7 1/2 C3TY					
30 C3RY	15 C3SY	6 1/2 C2TY					

4TPI 1025

SPECIAL THREADS NOT SHOWN ABOVE MAY BE CALCULATED ON REQUEST.

THREAD INDICATOR DIAL

(A) METRIC THREADS on METRIC LEADSCREW MACHINES  
or  
ENGLISH THREADS on ENGLISH LEADSCREW MACHINES

For these threads it is recommended that the "thread indicator dial" be used - this allows the leadscrew nuts to be disengaged at the end of each screwcutting pass, provided that they re-engaged in accordance with the chart mounted on the face of the dial unit.

METRIC LEADSCREW MACHINES  
(METRIC THREADS ONLY)

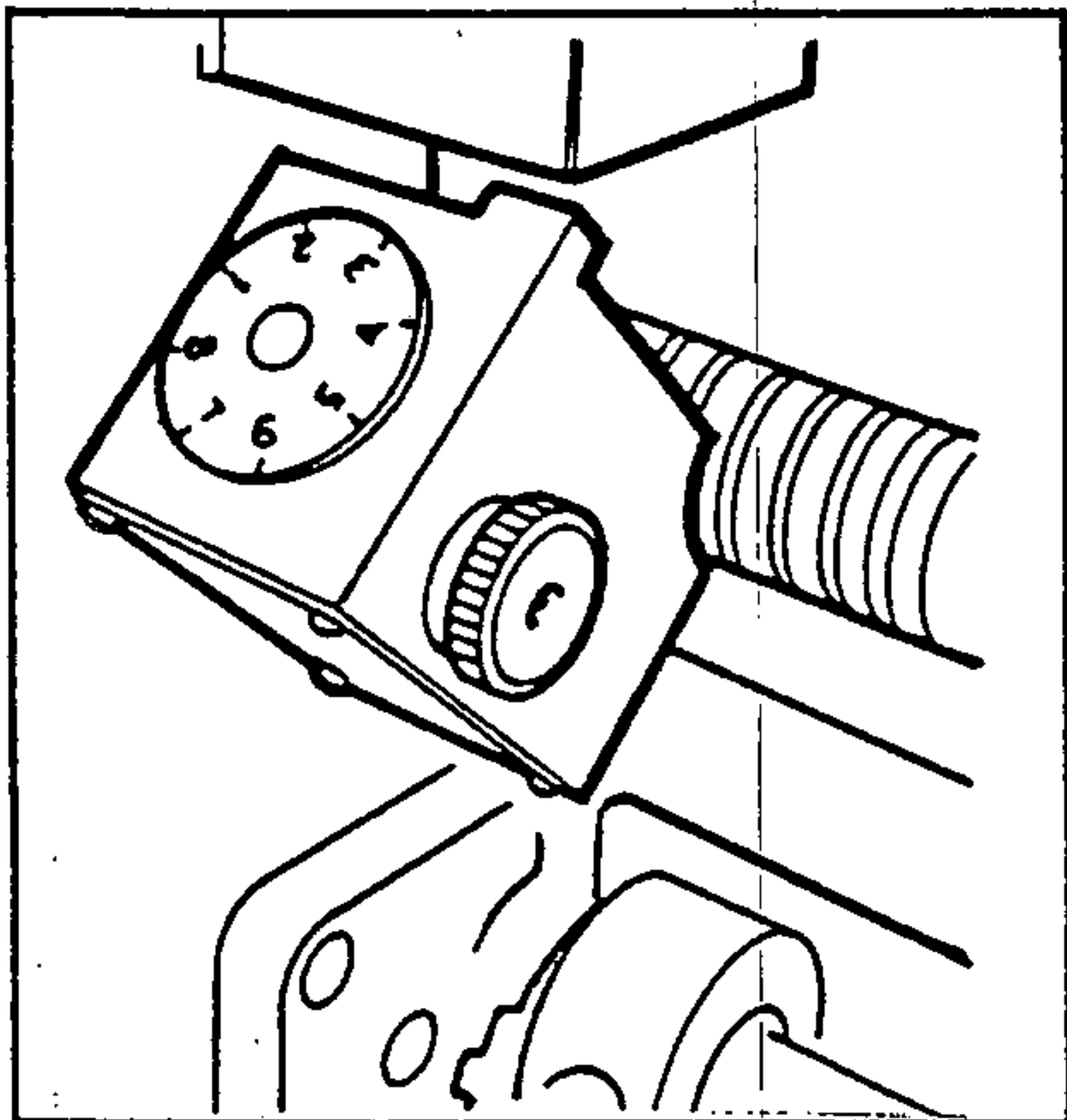
The chart shows:-

- in column 1. mm pitch to be cut.
- in column 2. (★) The number of teeth in the 'pick-off gear' arranged to mesh with the leadscrew, (this being selected from the stack, stored on the bottom of the dial spindle).
- in column 3. The dial numbers at which the leadscrew nuts may be engaged.

ENGLISH LEADSCREW MACHINES  
(ENGLISH THREADS ONLY)

The chart shows:-

- in column 1. T.P.I. to be cut.
- in column 2. Dial numbers at which the leadscrew nuts may be engaged.



mm		
★	★	
225	18 15	4 16 1-8
25	16 1-8	4-5 18 15
75	16 1-8	5 20 1357
1	16 1-8	5-5 22 15
1-25	20 1357	6 16 1-8
1-5	16 1-8	7 14 15
1-6	16 1357	8 16 1357
1-75	14 15	9 18 15
2	16 1-8	10 20 1357
2-5	20 1357	11 22 15
3	16 1-8	12 16 1-8
3-5	14 15	14 14 15
812		

ins		
2 1-8	8 1-8	22 1-8
2 1/2 15	9 1357	24 1-8
2 3/4 1	10 1-8	26 1-8
3 1357	11 1357	27 1357
3 1/2 1	11 1/2 15	28 1-8
3 3/4 15	12 1-8	30 1-8
4 1-8	13 1357	32 1-8
4 1/2 15	14 1-8	36 1-8
5 1357	16 1-8	40 1-8
6 1-8	18 1-8	44 1-8
7 1357	19 1357	48 1-8
7 1/2 15	20 1-8	56 1-8
813		

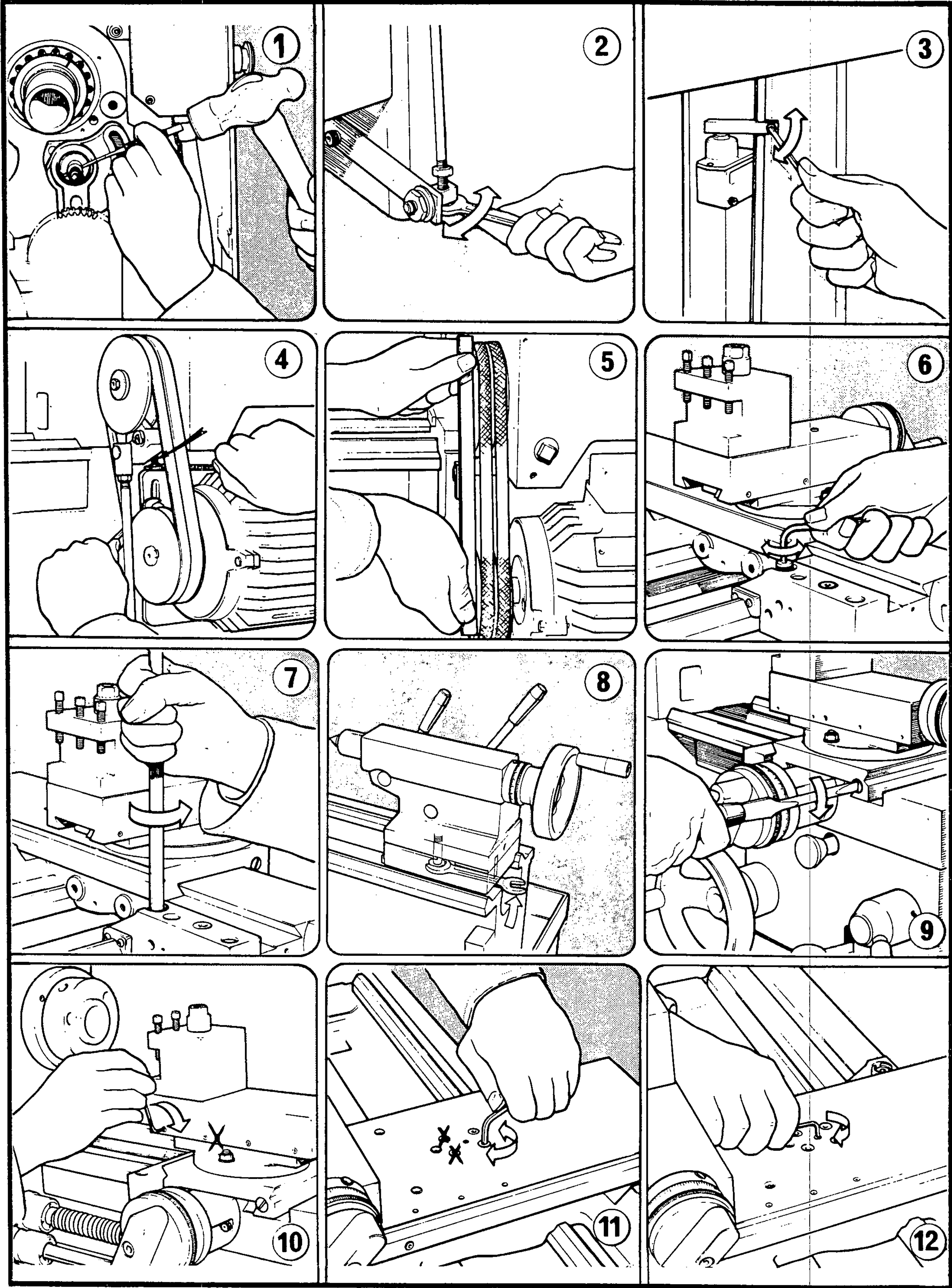
(B) ENGLISH THREADS on METRIC LEADSCREW MACHINES  
or  
METRIC THREADS on ENGLISH LEADSCREW MACHINES

For these threads the leadscrew nuts are kept engaged throughout the cutting of any one thread. This involves reversing the whole drive by means of the 'spindle control lever' (24) at each end of the screwcutting pass whilst at the same time relieving or increasing the cut as required. (Threads 'A' may also be cut by this method).

**Maintenance**



MAINTENANCE





### **Changewheel Shear Pin (Fig. 1)**

A protection against accidental overload in the end gear train is provided in the form of a shear pin fitted in the splined sleeve on the top changewheel shaft. In the event of replacement being necessary a 4 mm (5/32") diameter x 20 mm (3/4") long mild steel pin should be fitted as follows:-

Remove the hexagon nut, washer and changewheel, pull off the splined sleeve and remove the broken pin parts from both sleeves and shaft. Fit new pin.

NOTE: The pin acts in single shear and will only enter the sleeve from the 'big-hole' side.

### **Brake Adjustments (Fig.2 and 3)**

Adjustment for wear on the brake pad (which is mounted on the headstock pulley) is made at the pivot connection between the foot brake pedal and the vertical link rod. This is readily accessible from the rear of the machine where adjustment is made by turning the two locknuts on the link rod. A limit switch is mounted on the cabinet higher up the link rod and a slight re-positioning of the contact block may be necessary after adjustment for brake pad wear.

NOTE: The function of the limit switch is to cut-out the motor drive when the brake pedal is operated, i.e. the plunger should be depressed when the brake pedal is in its free position and released at the moment the brake pedal is operated.

### **Drive Belts (Fig. 4 and 5)**

Access to the vee belts is gained by removal of the rear splash guard (when fitted) and the sheet metal drive covers.

The drive motor is bolted to a slotted mounting plate which is vertically adjustable on the rear face of the bed. This is clamped by three hexagon head screws. Belt tension adjustment is achieved by adjusting the two vertical screws against the top edge of the mounting plate.

It is important that when making adjustments a straight edge be placed across the face of each pulley to ensure that correct alignment is maintained.

### **Saddle Strips (Fig. 6 and 7)**

Wear on the rear and front saddle strips may be accommodated by adjustment of the retaining sleeves located in the top face of the saddle; two for the rear and one each for the two front strips.

The procedure for adjustment is to first release the socket head screw, slightly turn the slotted head sleeve anti-clockwise and then re-clamp the cap screw. Care should be taken to avoid over adjustment; a 30° turn at the sleeve represents approximately 0.1 mm (.004") take up in the strip.

### **Tailstock Bed Clamp (Fig. 8)**

The angular lock position of the bed clamp lever is adjusted by means of the self-locking hexagon headed bolt located on the underside of the tailstock and between the bed ways.

continued

### **Cross-slide** (Fig. 9)

Wear on the taper-gib strip may be adjusted for by clockwise rotation of the slotted head screw on the front face of the cross-slide. The procedure being to first slacken the similar screw at the rear then re-tighten this after adjustment to clamp the strip in its new position.

### **Top Slide** (Fig. 10)

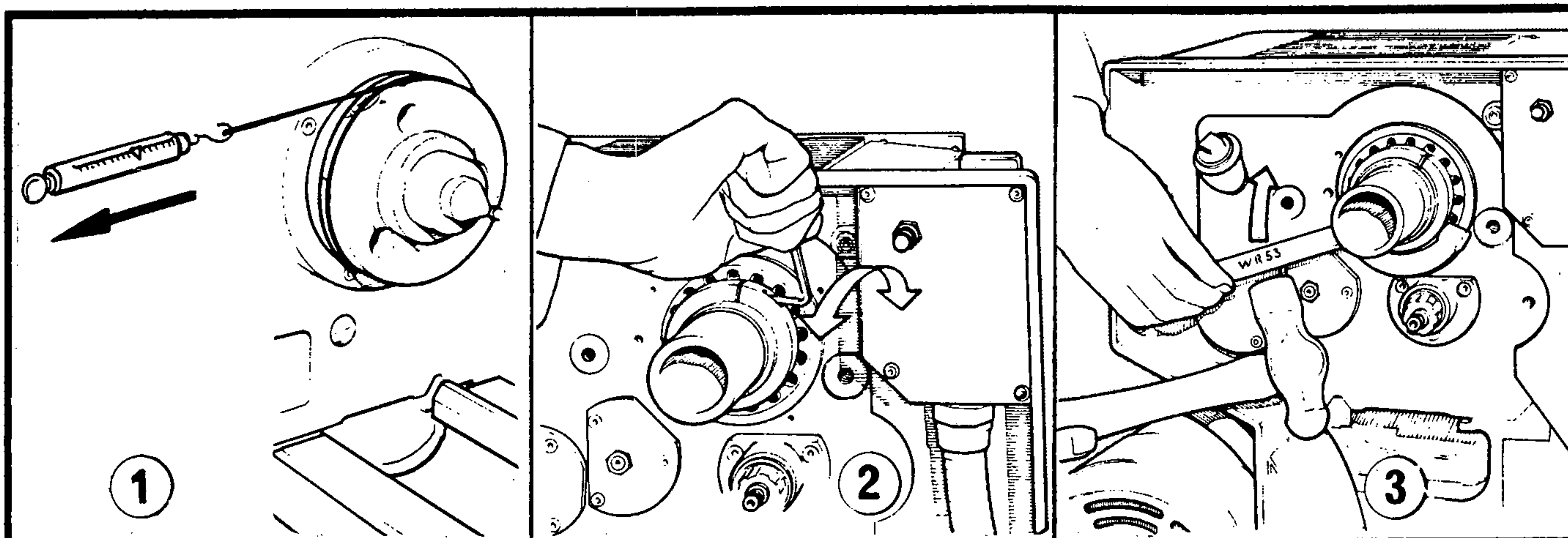
Take up for wear on the top slide strip is by means of the four (self-locking) socket set screws in the front face of the top slide casting.

### **Cross-slide Nut** (Fig. 11 and 12)

Provision is made for the elimination of backlash in the cross-slide nut, the procedure for adjustment being as follows:-

Slightly release, only the rear pair of socket cap head screws in the top face of the cross-slide, turn the centre socket set screw in a clockwise direction as required then re-clamp the two rear cap screws. Care should be taken to avoid over adjustment; a  $120^{\circ}$  turn at the centre screw represents approximately 0.1 mm (.004") take up of backlash.





The spindle bearing assembly is carefully set before despatch of the Lathe from our Works which should ensure a high standard of performance without the need for further attention.

THE USER IS ADVISED NOT TO DISTURB THIS SETTING DURING NORMAL USE OF THE MACHINE AND TO CONSULT OUR SERVICE DEPARTMENT IN THE UNLIKELY EVENT OF A BEARING PROBLEM.

WHERE ADJUSTMENT IS UNDERTAKEN THEN IT IS ESSENTIAL THAT THE FOLLOWING PROCEDURES ARE STRICTLY COMPLIED WITH.

## TO CHECK FOR CORRECT SETTING

Checks should be carried out with the headstock in a warm condition achieved by running at a spindle speed of 800 rpm for approximately ten minutes.

The correct bearing torque setting is 0.9/1.1 Nm (8/10 in lbs) and can be determined as follows (Fig. 1):-

Wrap a length of string approximately three turns around the body of the chuck.

To the free end of the string attach a light spring balance and pull gently until spindle commences to turn, continuing to apply a steady load just sufficient to maintain the spindle in motion and noting the steady load registered on the balance.

Example: Using a 160 mm (6¼ in) chuck, the spring balance reading should be 1.14/1.36 kg (2½/3 lbs).

## BEARING ADJUSTMENT

Remove end drive guard, changewheels, swing frame and rear bearing cover.

Release locking screw in the bearing adjusting nut, Fig. 2. With the pin-key provided adjust the nut as required - clockwise rotation to increase bearing load, Fig. 3. As over tightening will seriously impair the life of the bearings it is recommended that adjustment be made in increments not exceeding 3 mm (1/8 in) measured on the nut periphery. After each incremental adjustment, the spindle should be run for a few minutes and the bearing load re-checked, as described above.

## Parts Section

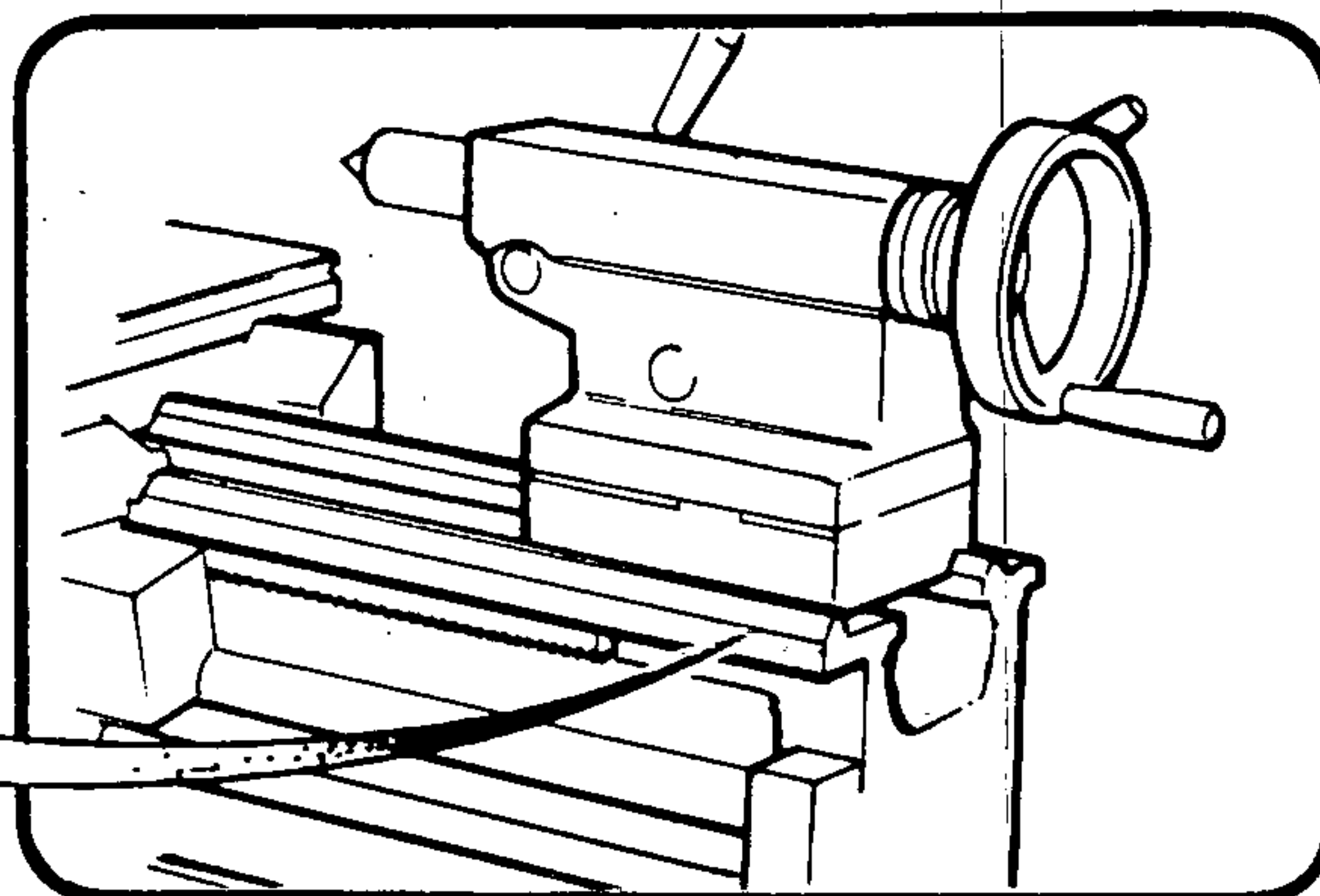
## PARTS ORDERING PROCEDURE

# 1

**Quote:**

**Machine Serial Number**

which will be found stamped into the front face of the bedways at the tailstock end.



# 2

Refer to the appropriate assembly and

**Quote:**

**Individual Part Numbers taken direct from the Illustrations**

NOTE: Quantity used (when other than one) is given in a circle following the Part Number itself.

Where part numbers change with machine bed length then the model number is given, vis.

630mm

or

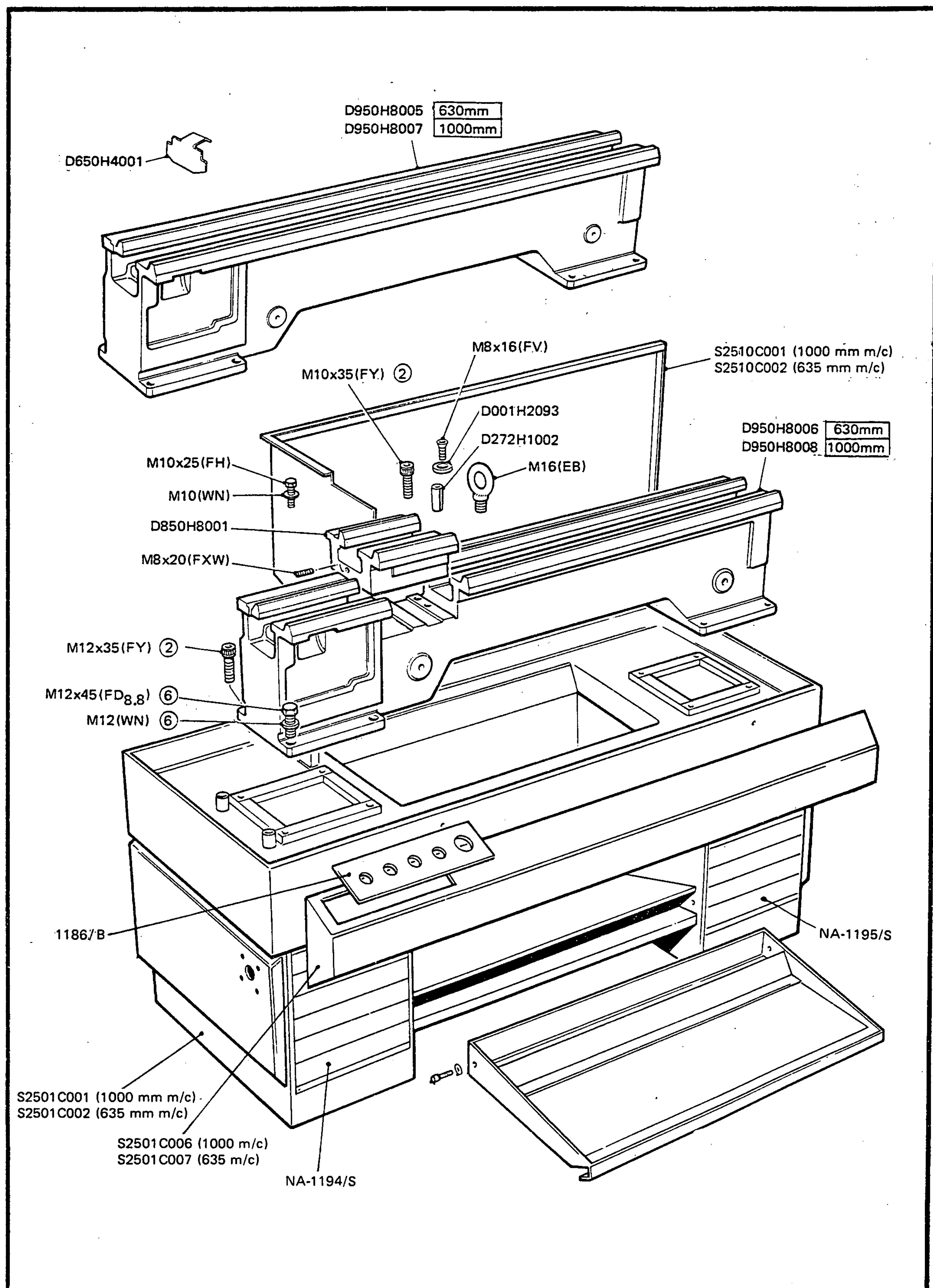
1000mm

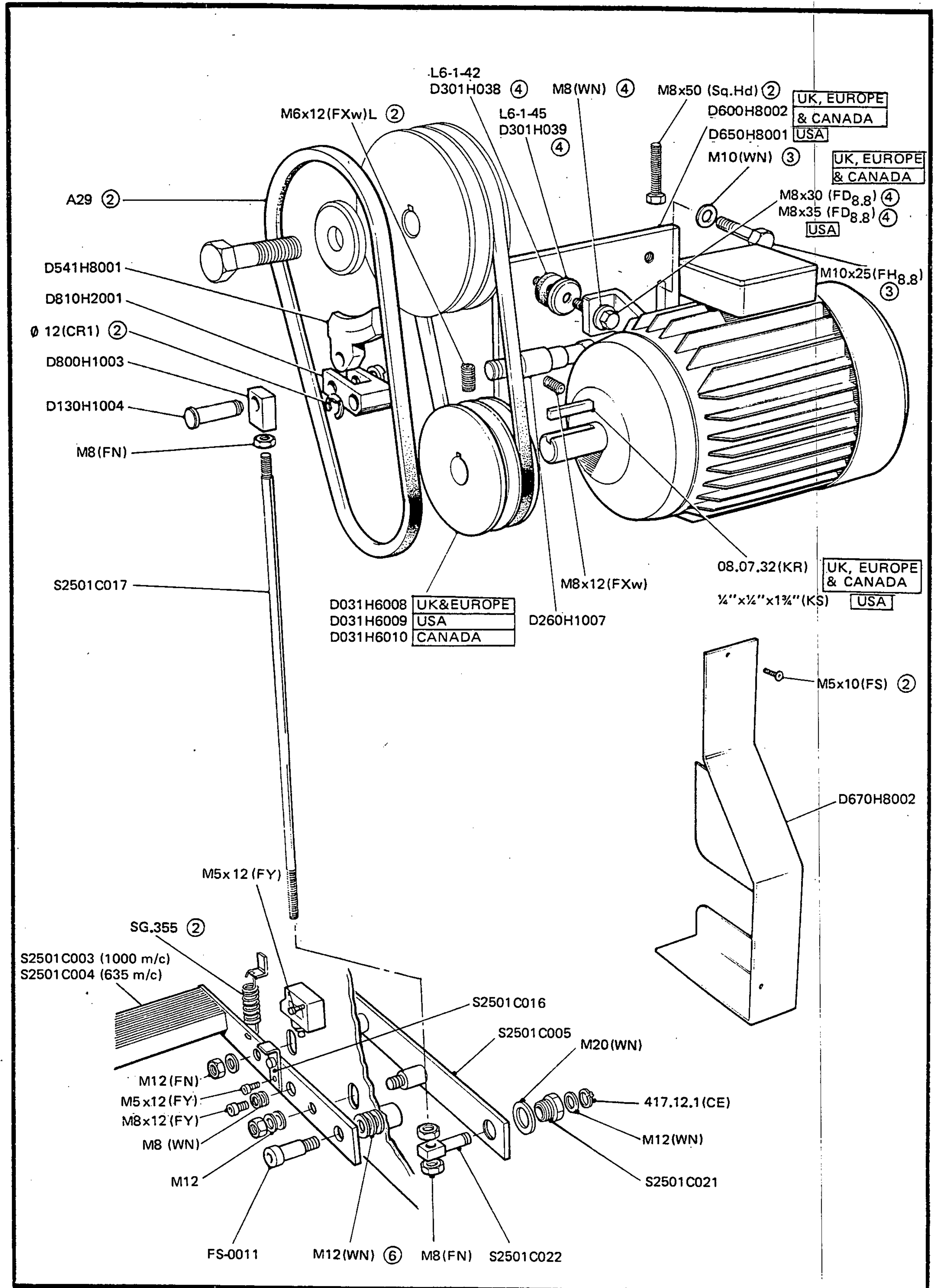
Standard/Proprietary Parts (i.e. items which can be purchased from local Engineering suppliers) may be identified by the "bracketed" letter code included in the Part Number, and reference to the appendix at the end of this manual will provide a full description of such items.



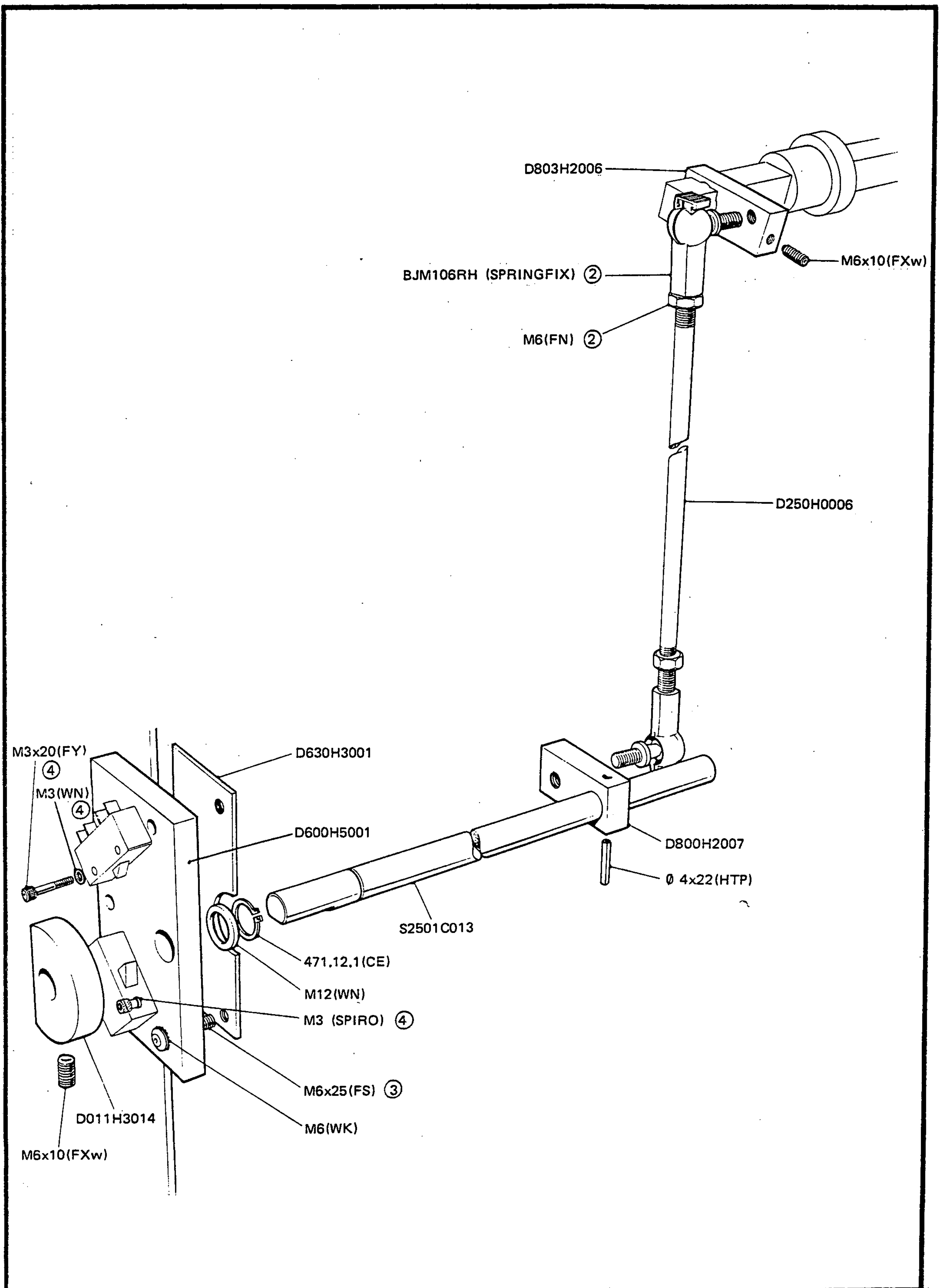
## PARTS SECTION CONTENTS

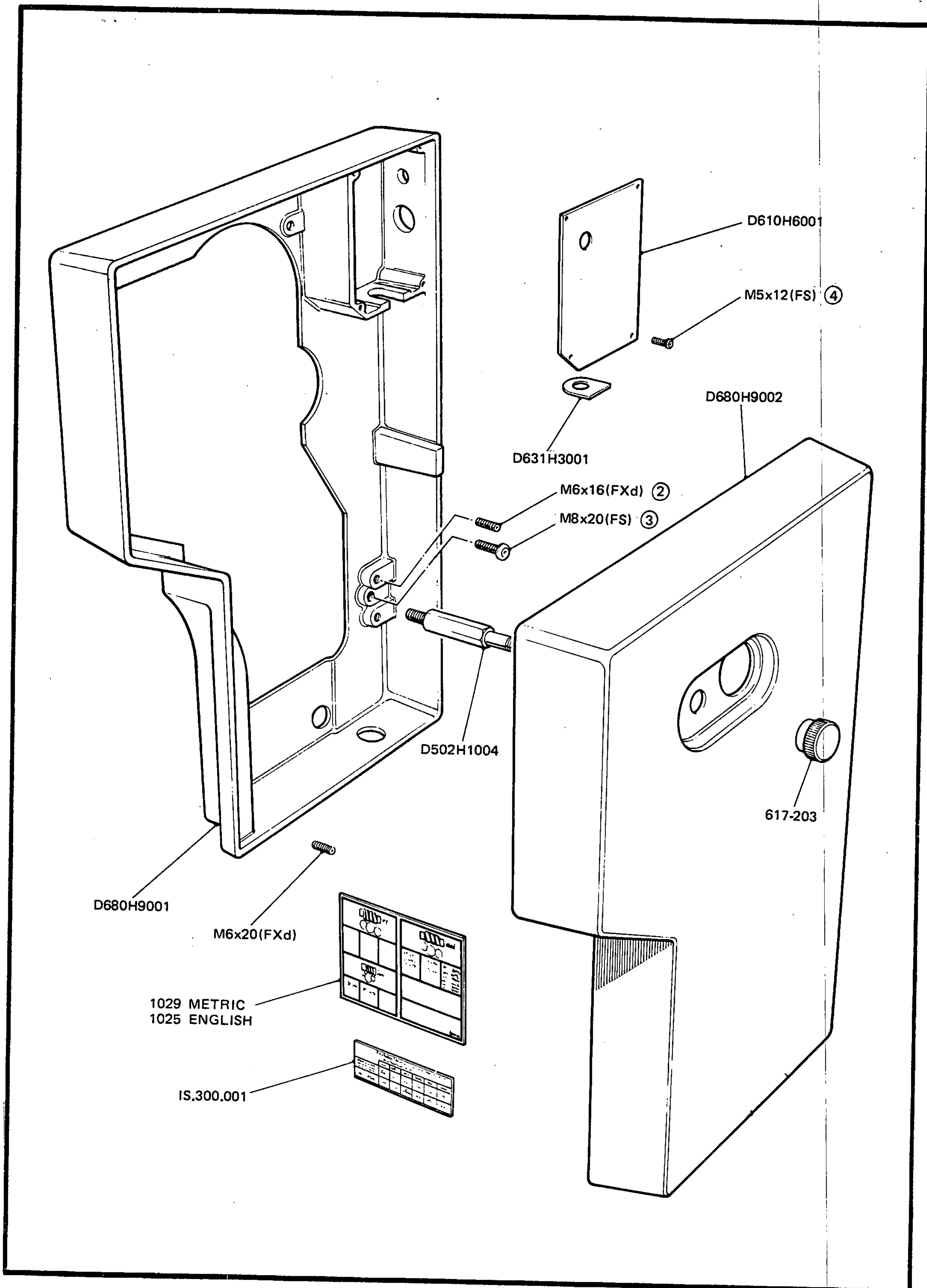
	PAGE NO.
301/1	BED AND CABINET 33
301/2	BRAKE AND DRIVE 34
301/3	SWITCH LINKAGE 35
301/4	CHANGEWHEEL GUARDS 36
302/1	HEADSTOCK CONTROLS AND CASTING 37
302/2	HEADSTOCK GEARS AND SHAFTS 38
303/1	GEARBOX CONTROLS AND CASTING 39
303/2	GEARBOX, GEARS AND SHAFTS 40
304/1	APRON L.H. 41
304/2	APRON R.H. 42
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306	SHAFTS, RACK AND BRACKET 47
307	TAILSTOCK 48
308	CHANGEWHEELS AND SWING FRAME 49
310	STANDARD EQUIPMENT 50
311	ADDITIONAL EQUIPMENT 51
	(SEE SECTION LIST)
	ATTACHMENTS 66
	(SEE SECTION LIST)

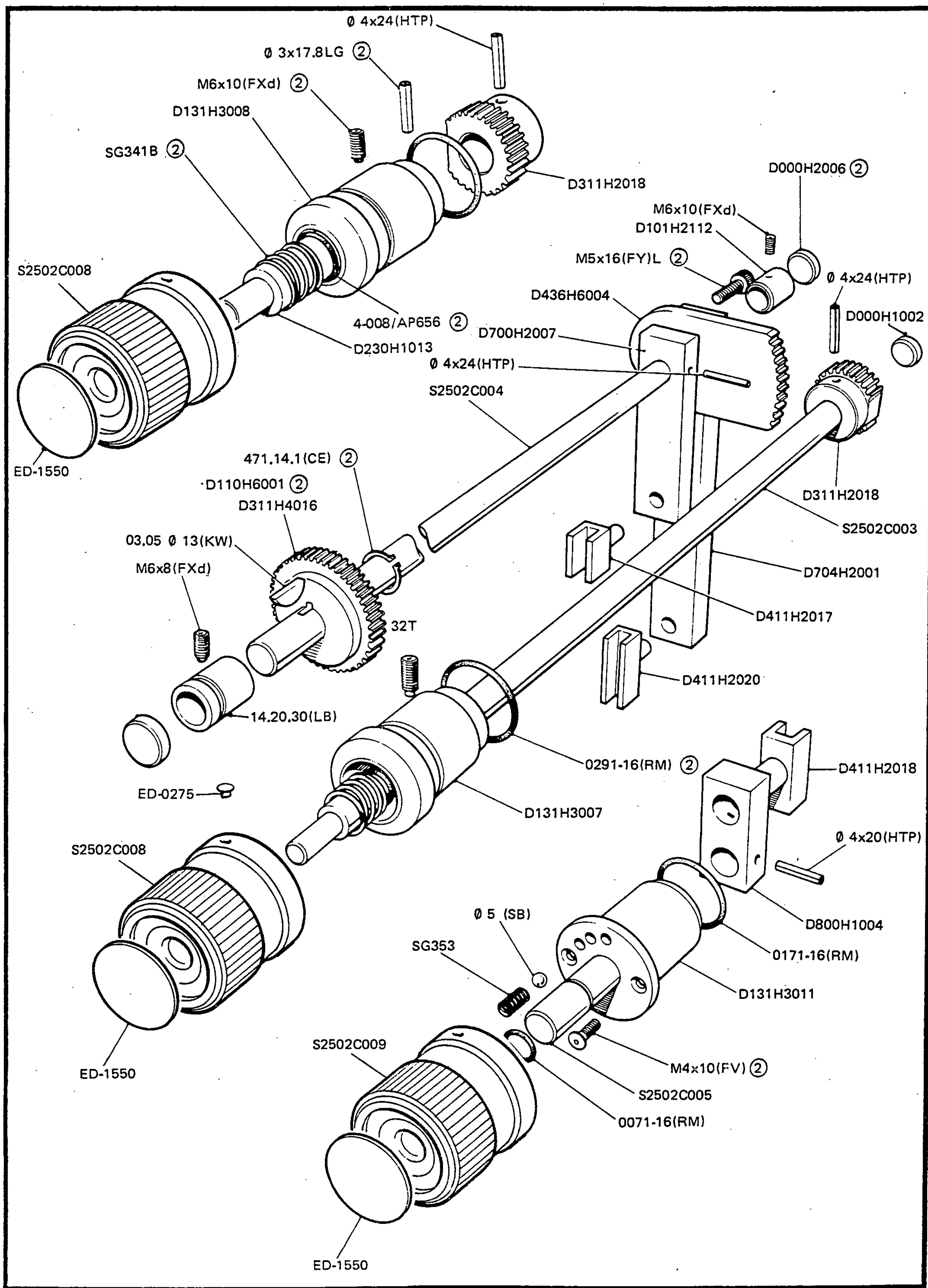




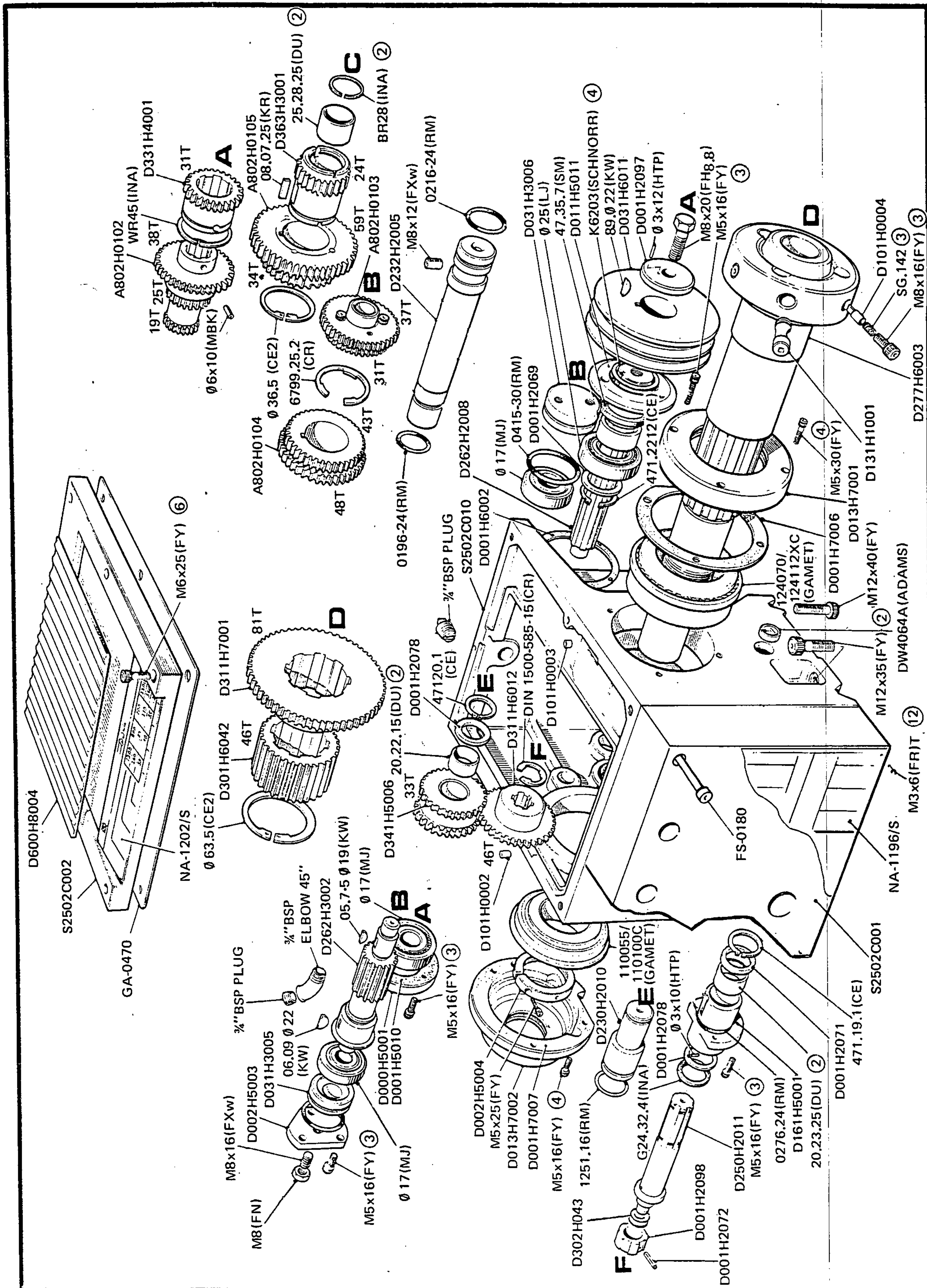




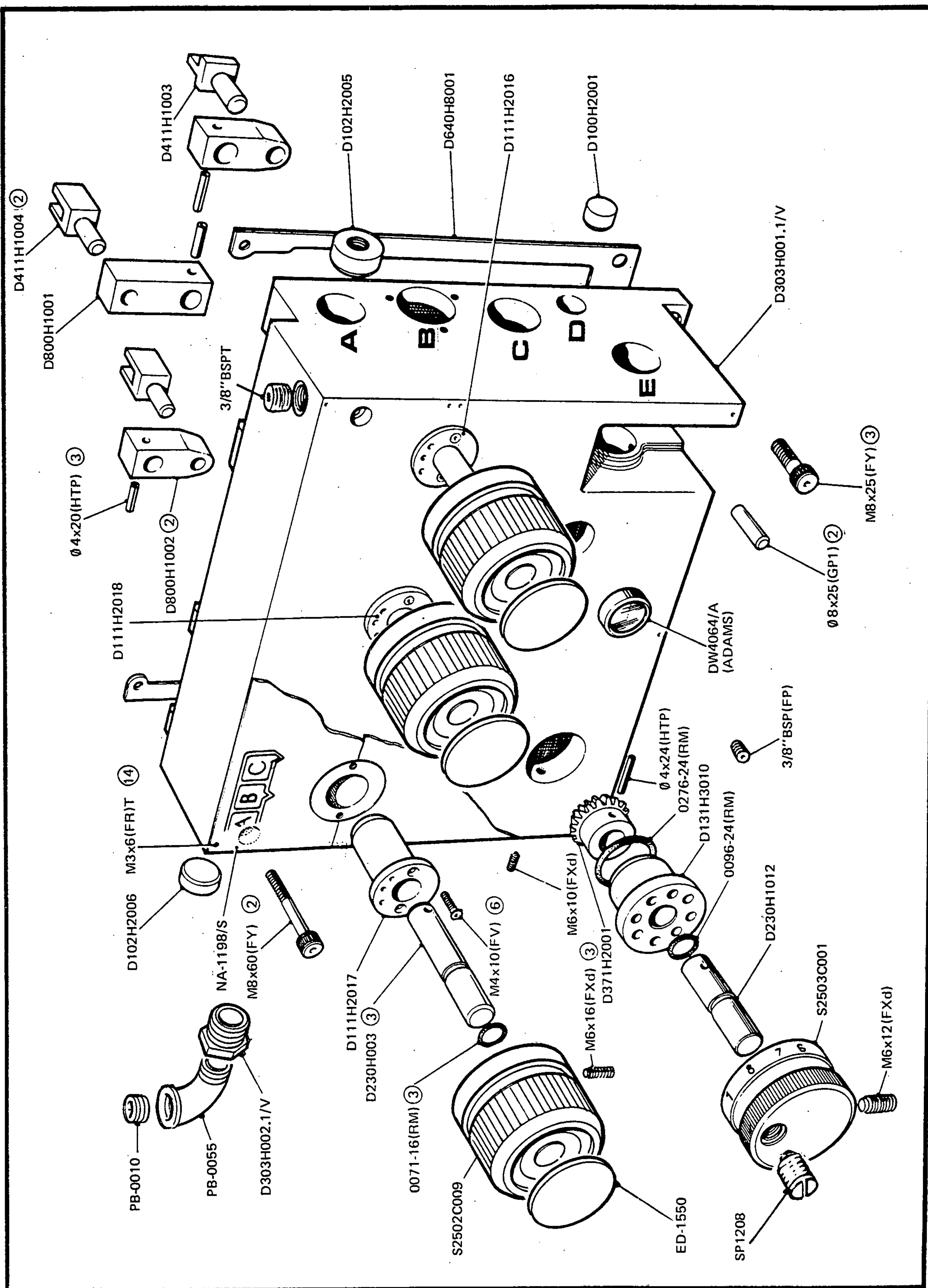




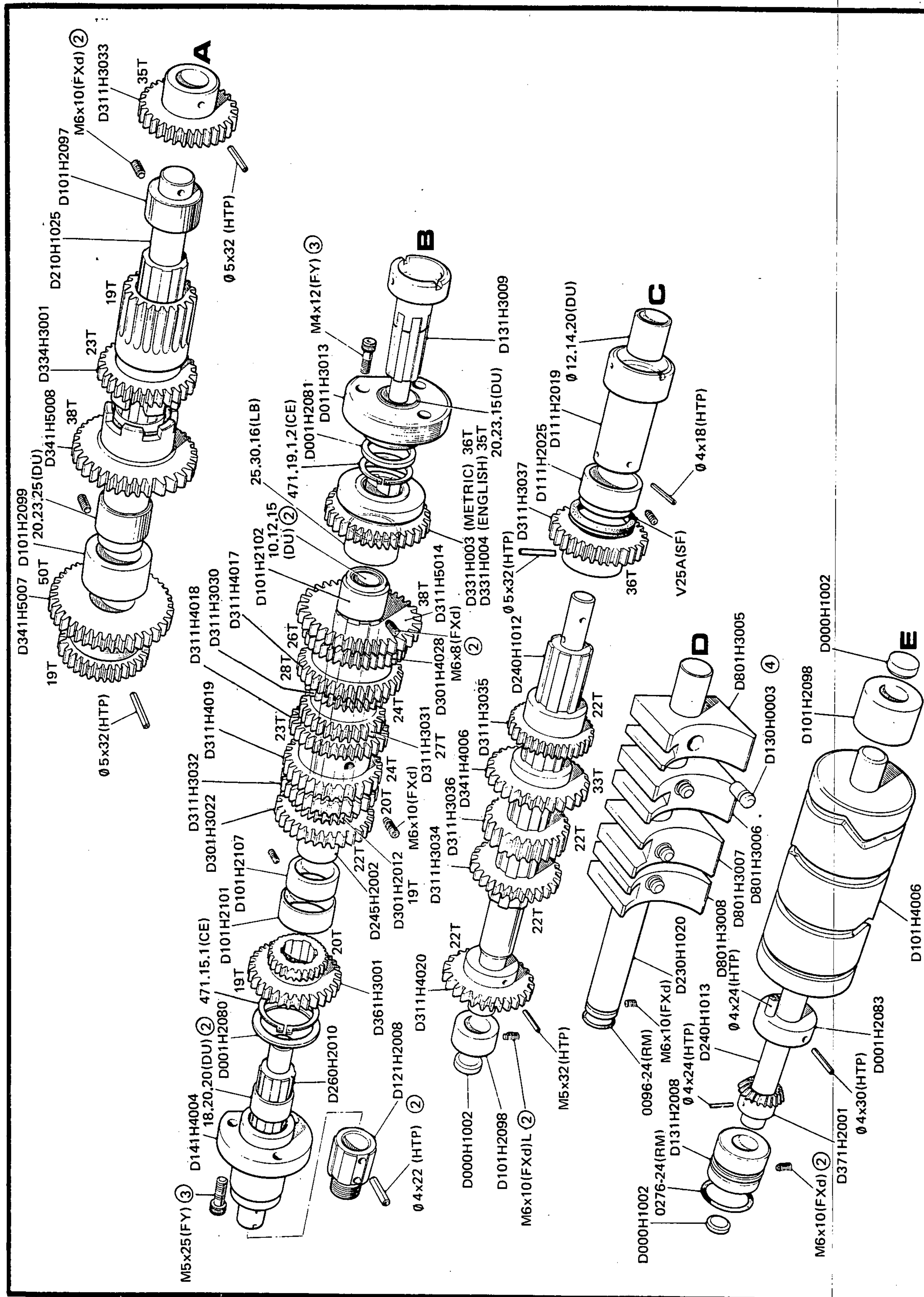








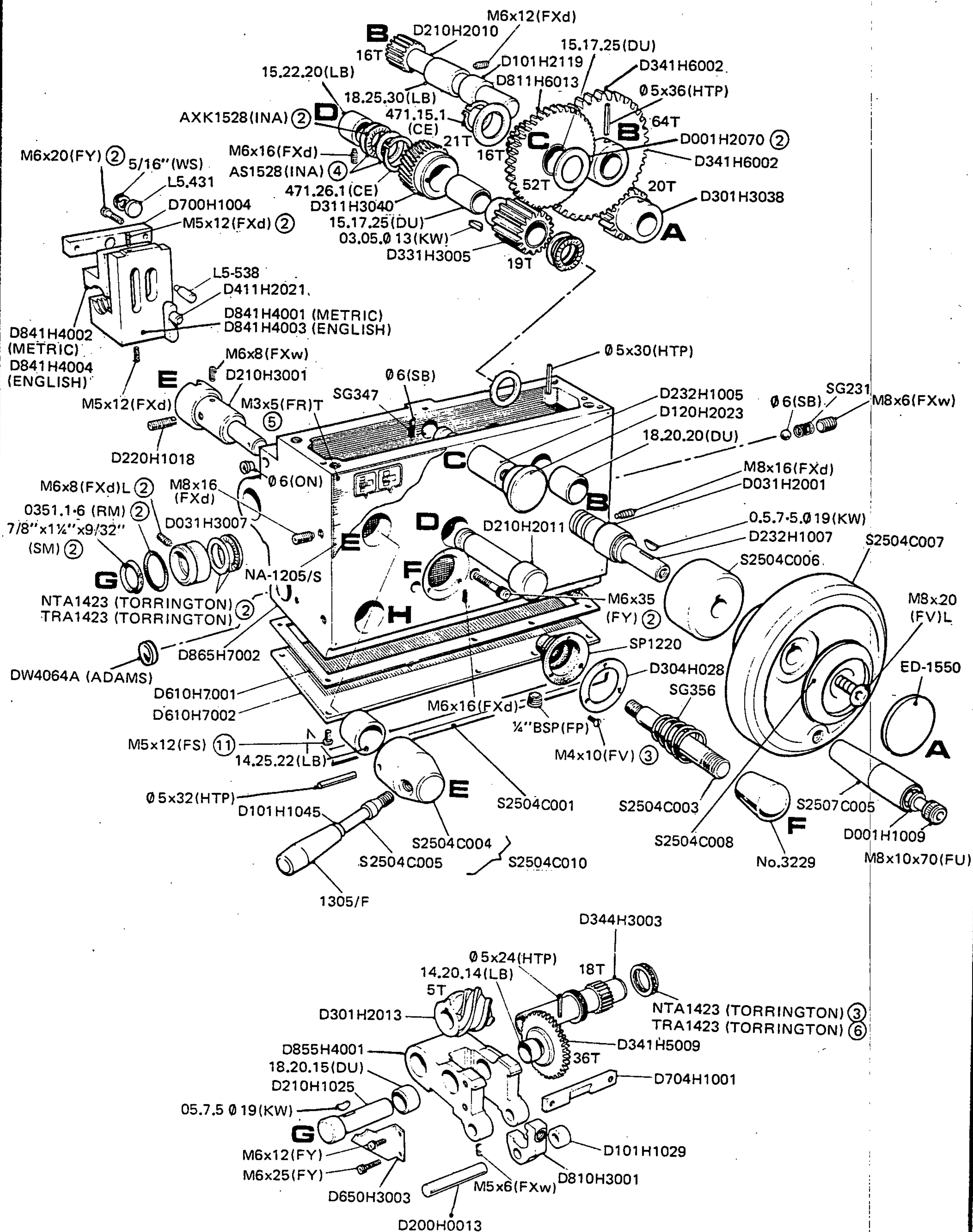


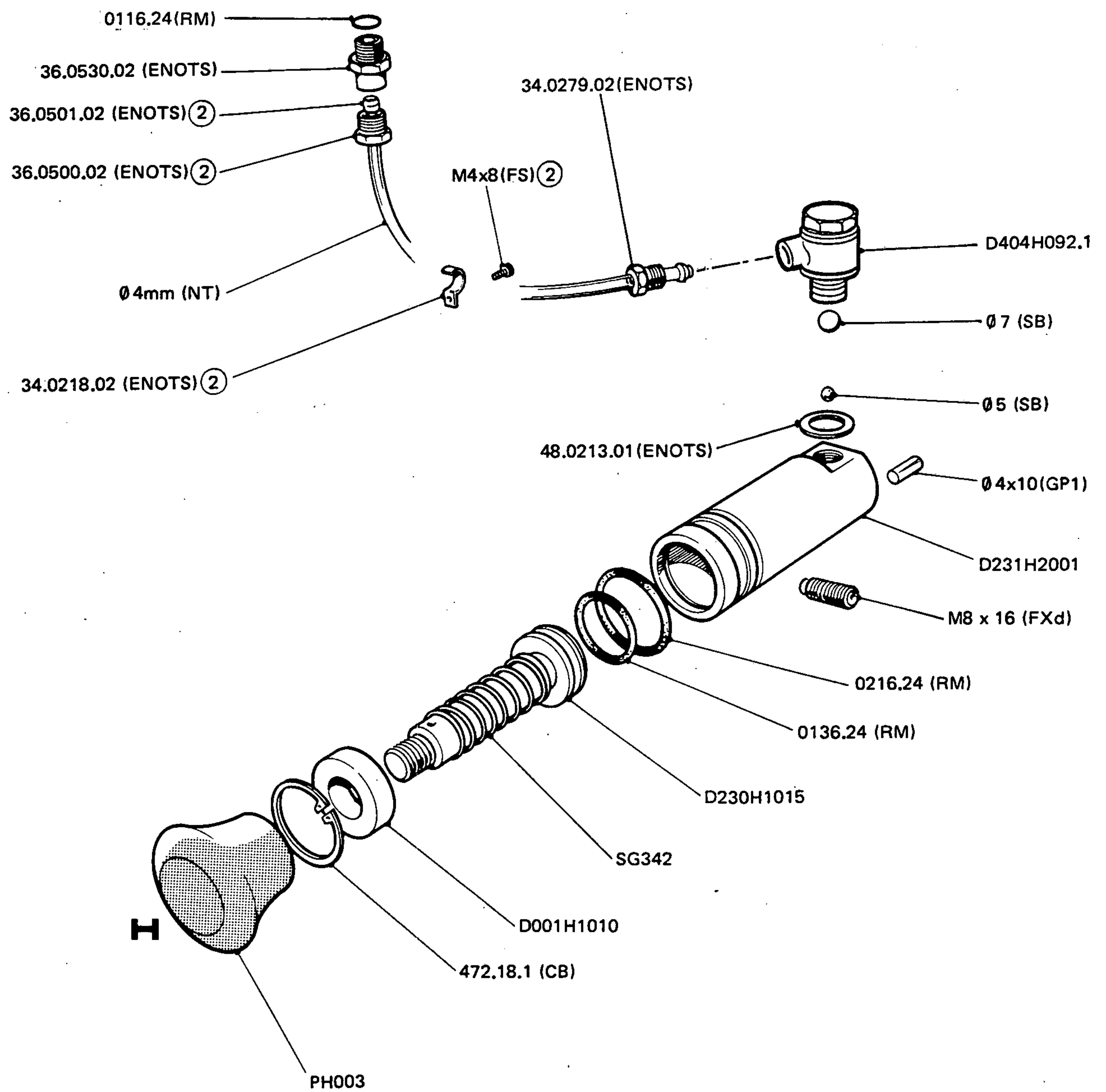




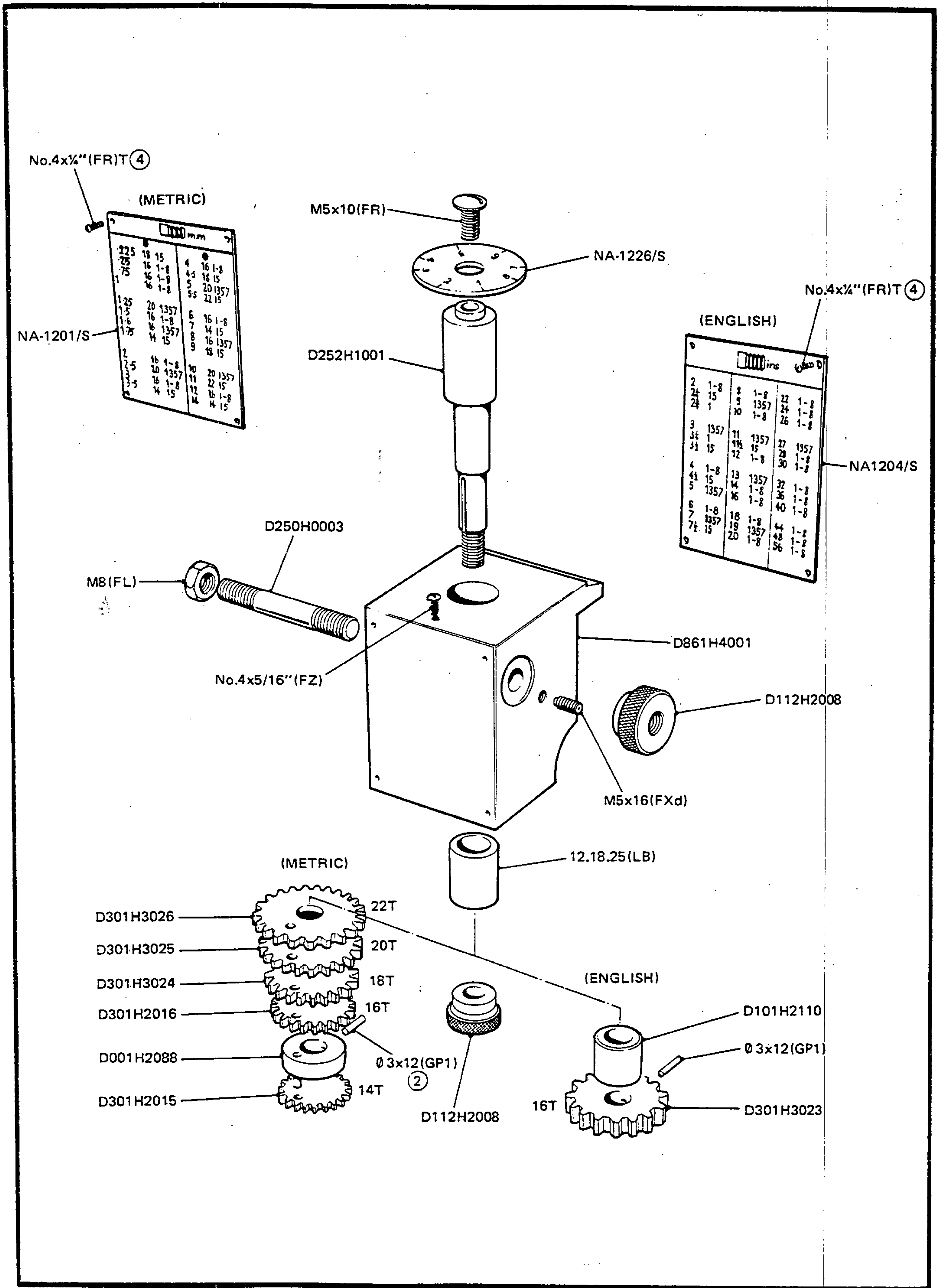


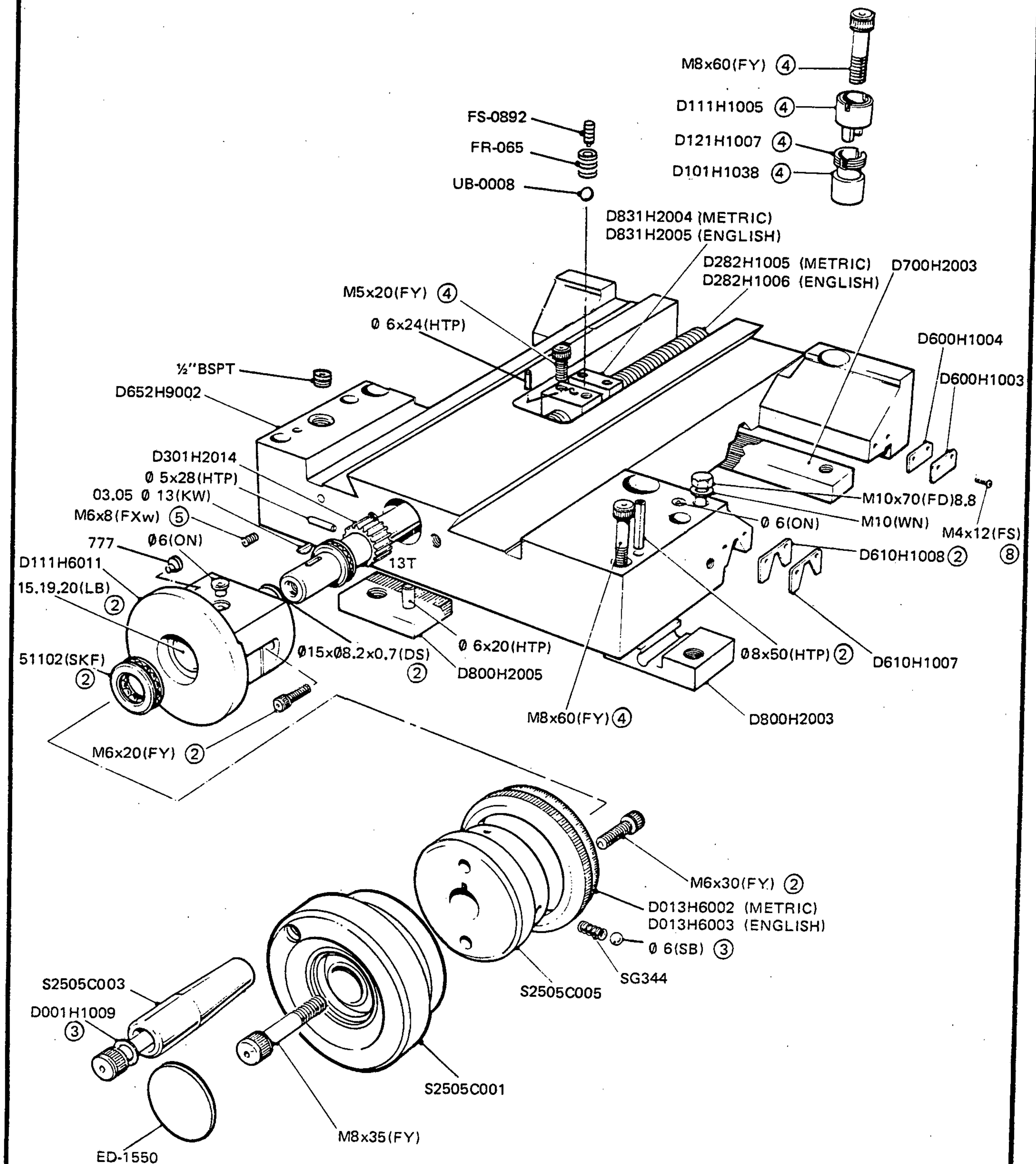


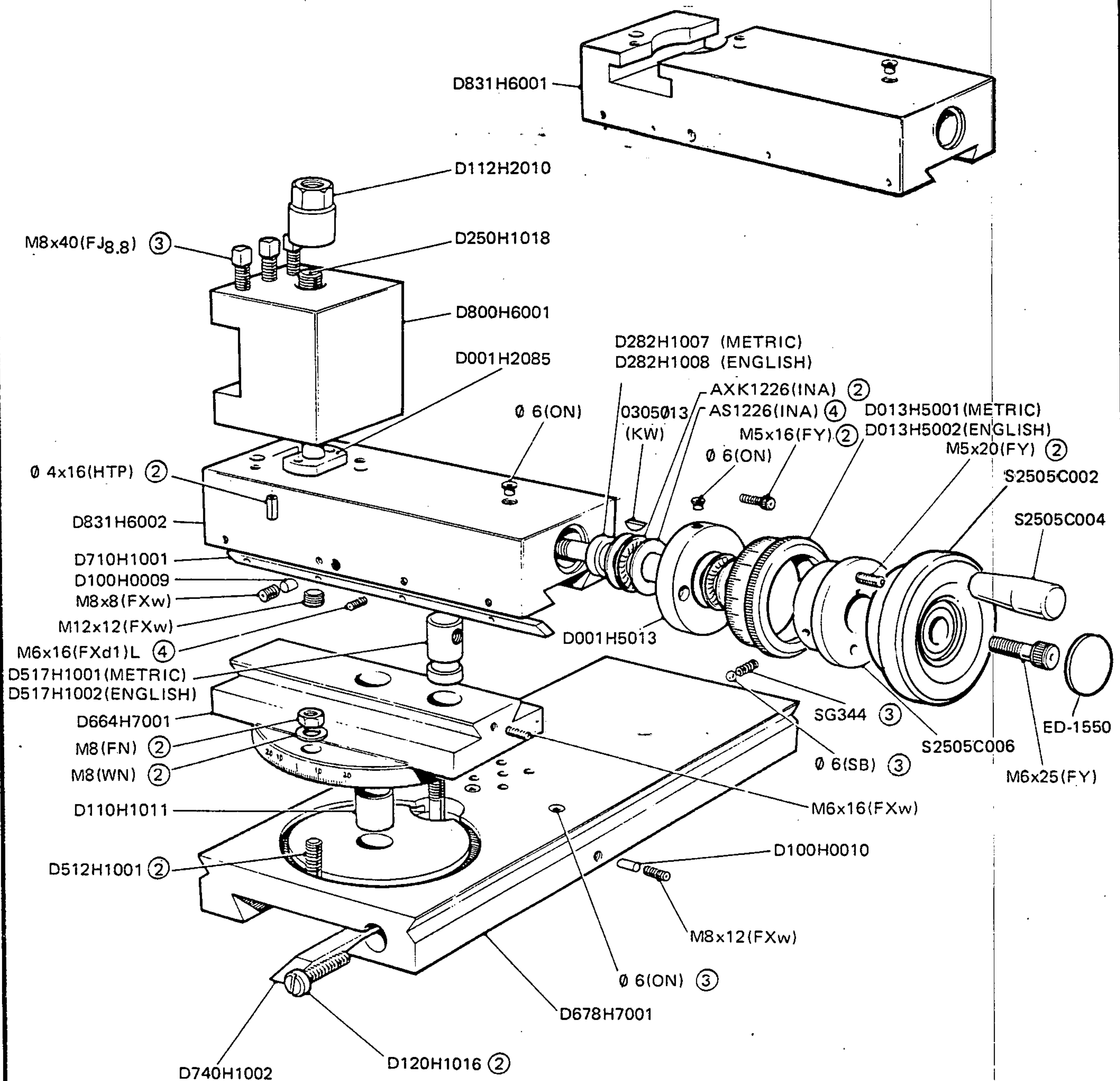




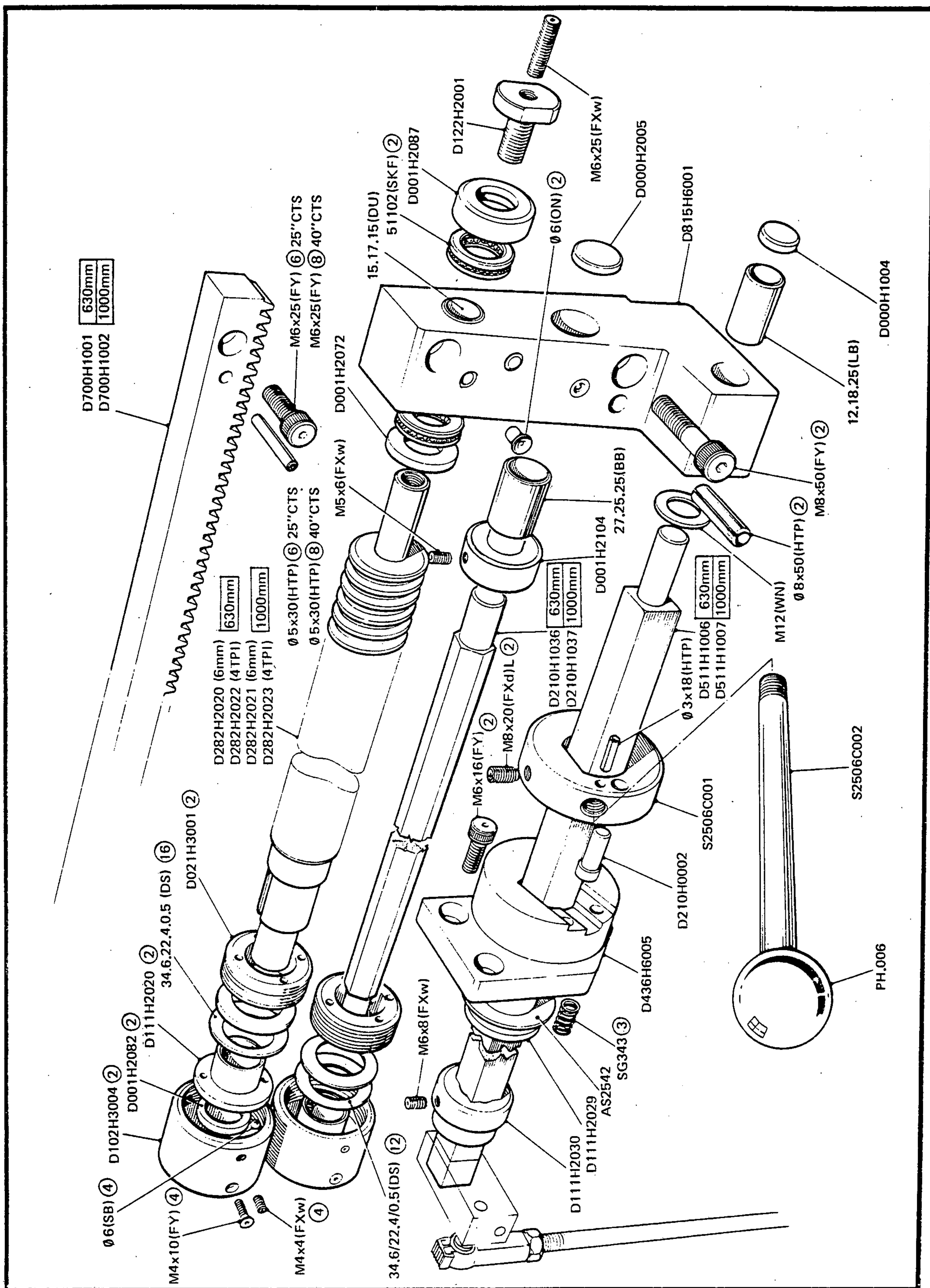




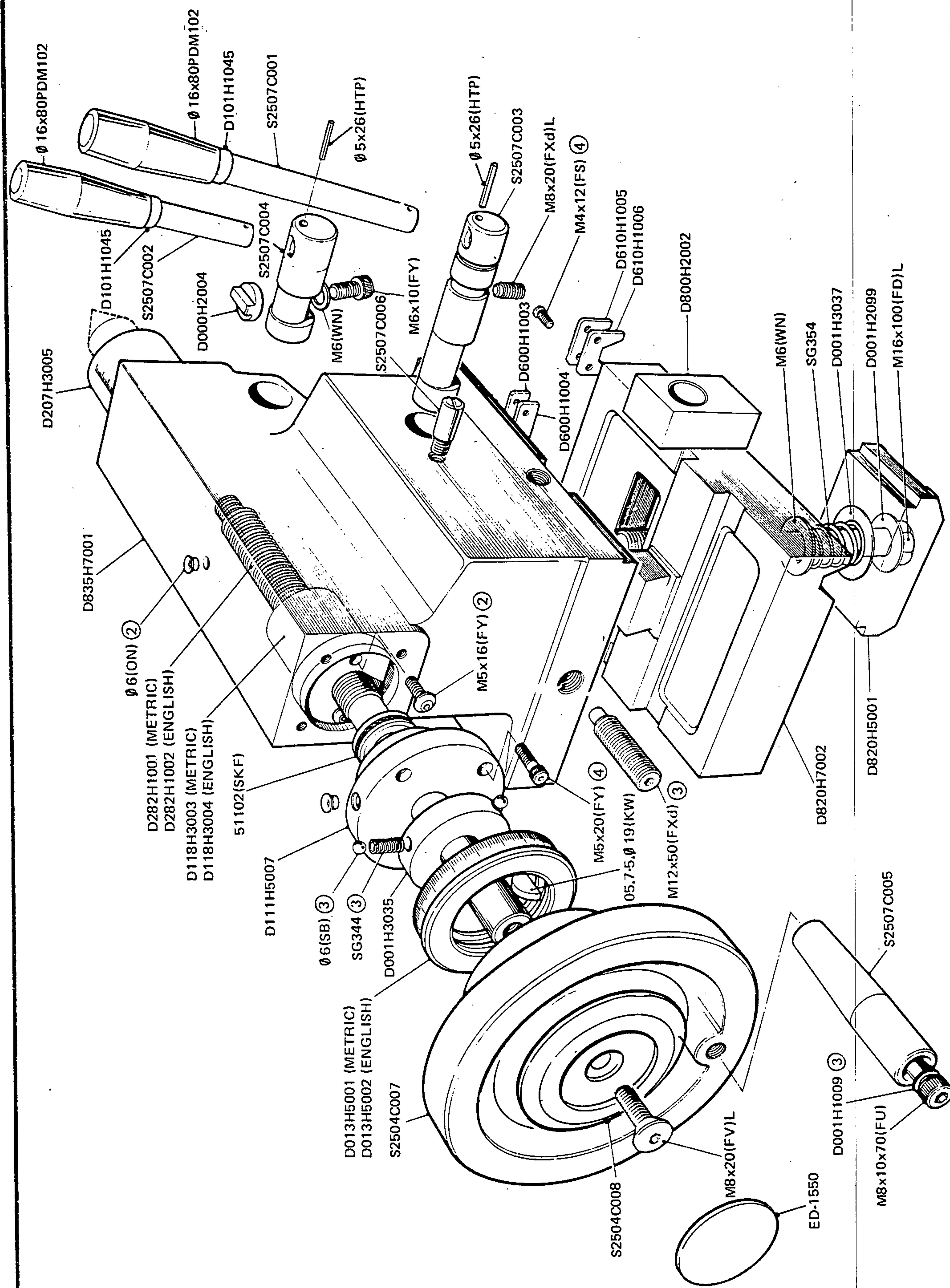


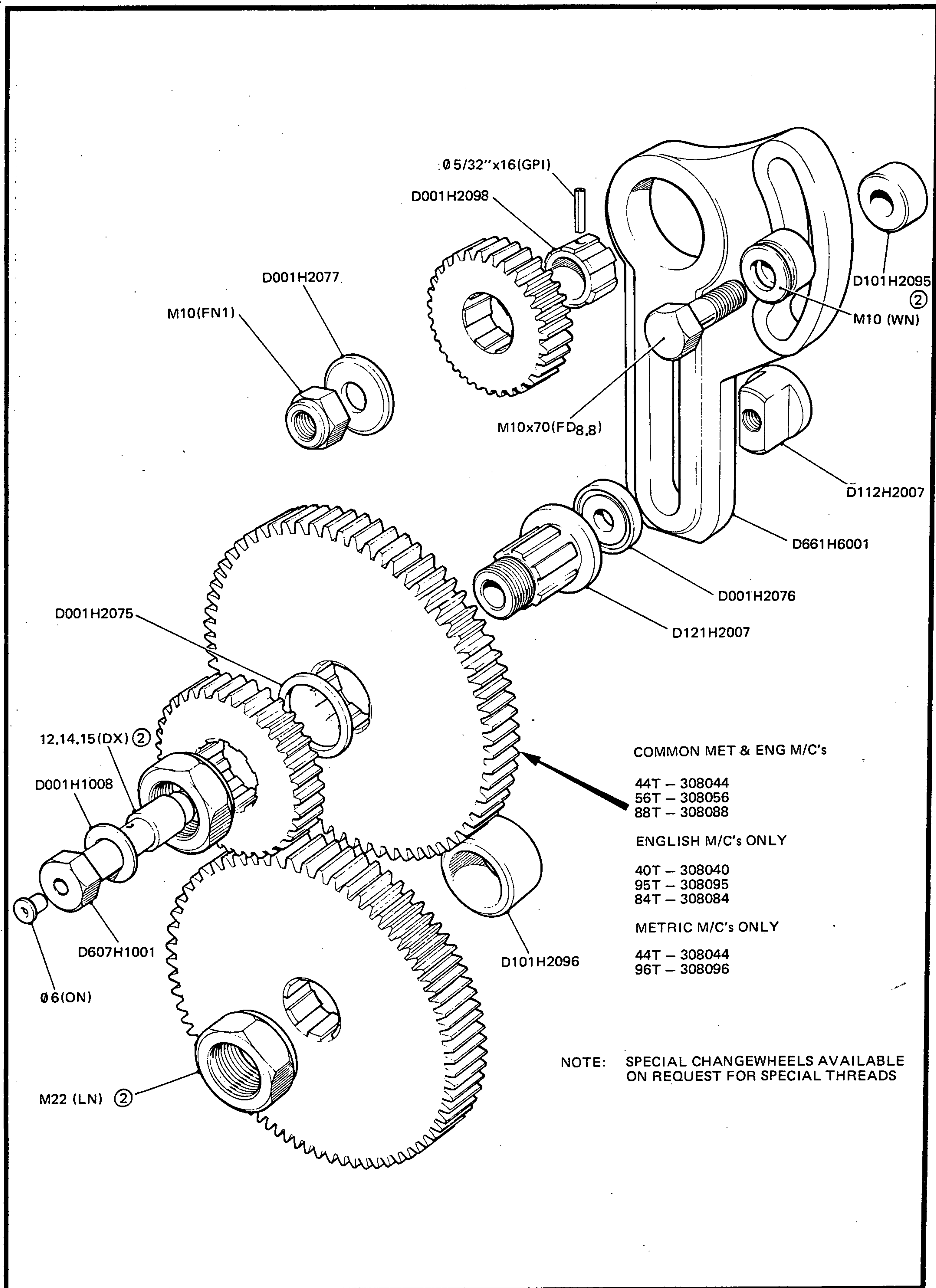




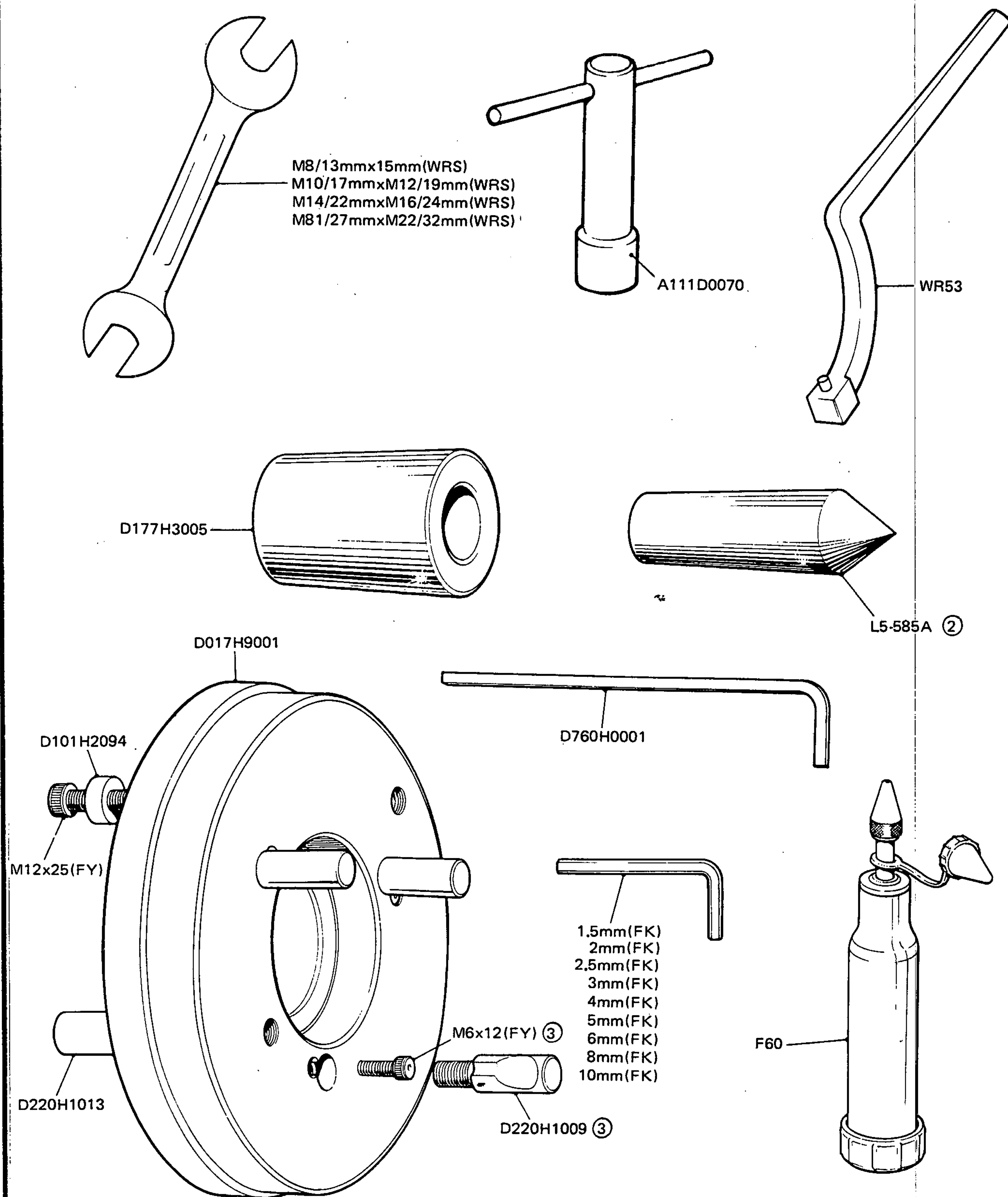












## ADDITIONAL EQUIPMENT

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3709	APRON HANDWHEEL DIAL – ENGLISH GRADUATIONS	64
3812	WATTMETER	65

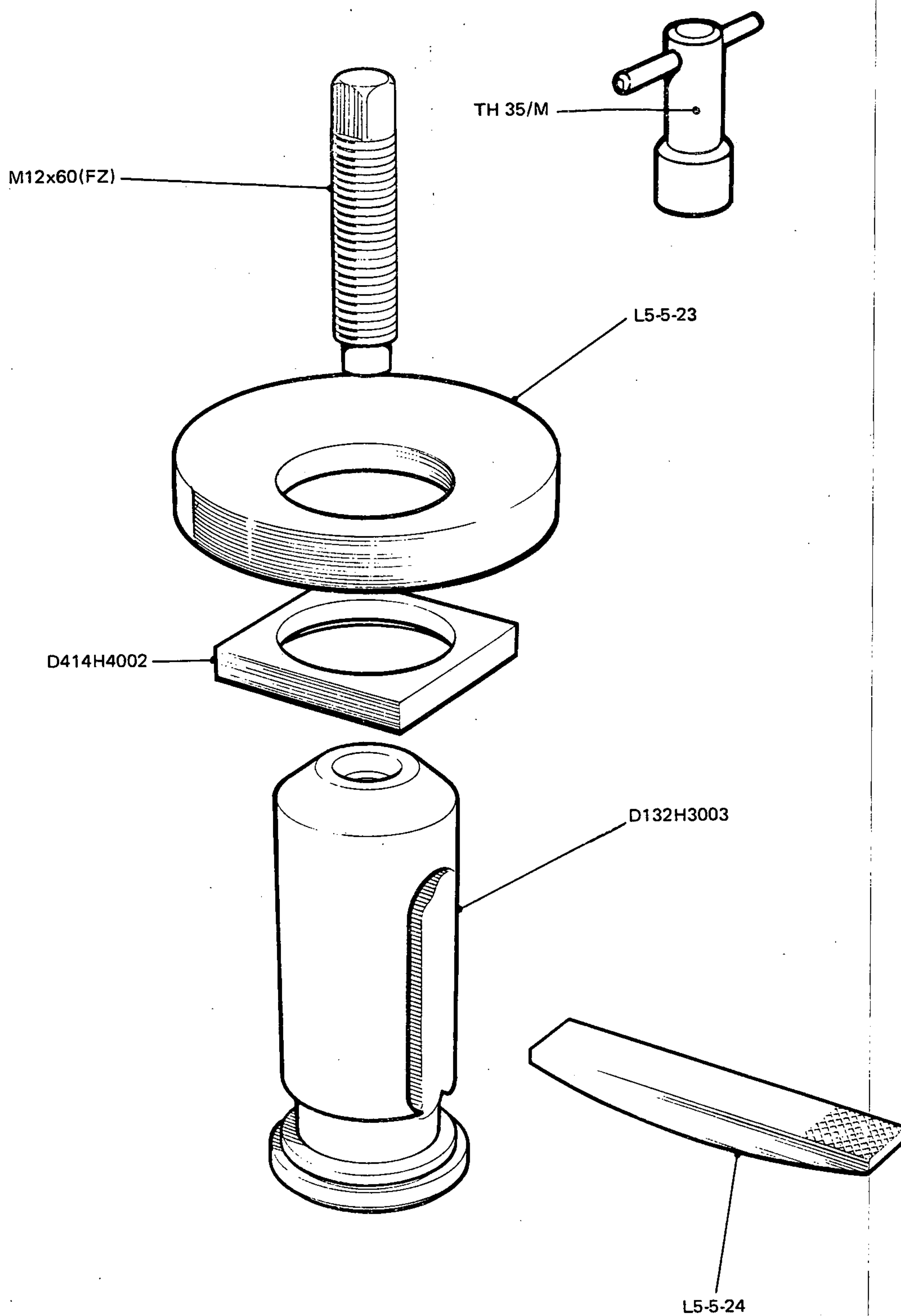
### ITEMS AVAILABLE BUT NOT ILLUSTRATED:

3810	{	METRIC/ENGLISH DUAL READING DIAL – CROSS-SLIDE
		(ENGLISH CROSS-SLIDE SCREW AND NUT REQUIRED)
		METRIC/ENGLISH DUAL READING DIAL – TOP SLIDE
		(ENGLISH CROSS-SLIDE SCREW AND NUT REQUIRED)
		200mm HIGH SPEED 4 JAW INDEPENDENT CHUCK D1-4
		160mm SUPER PRECISION 3 JAW GEARED SCROLL
		SELF-CENTRING CHUCK D1-4
		KC15 38mm BURNERD MULTISIZE KEY OPERATED
		COLLET CHUCK D1-4
		EC2 TO EC13 SET OF 12 COLLETS RANGE 1.6mm–38mm
		JACOB DRILL CHUCK No.3MT SHANK 12.7mm CAPACITY
		300mm DIA FACEPLATE
		460mm DIA FACEPLATE
		38mm MULTISIZE LEVER OPERATED COLLET CHUCK,
		DIRECT MOUNTING
		REAR SPLASH GUARD 25" OR 40" CTS
		MILLING/DRILLING ATTACHMENT
		TOOLPOST GRINDER



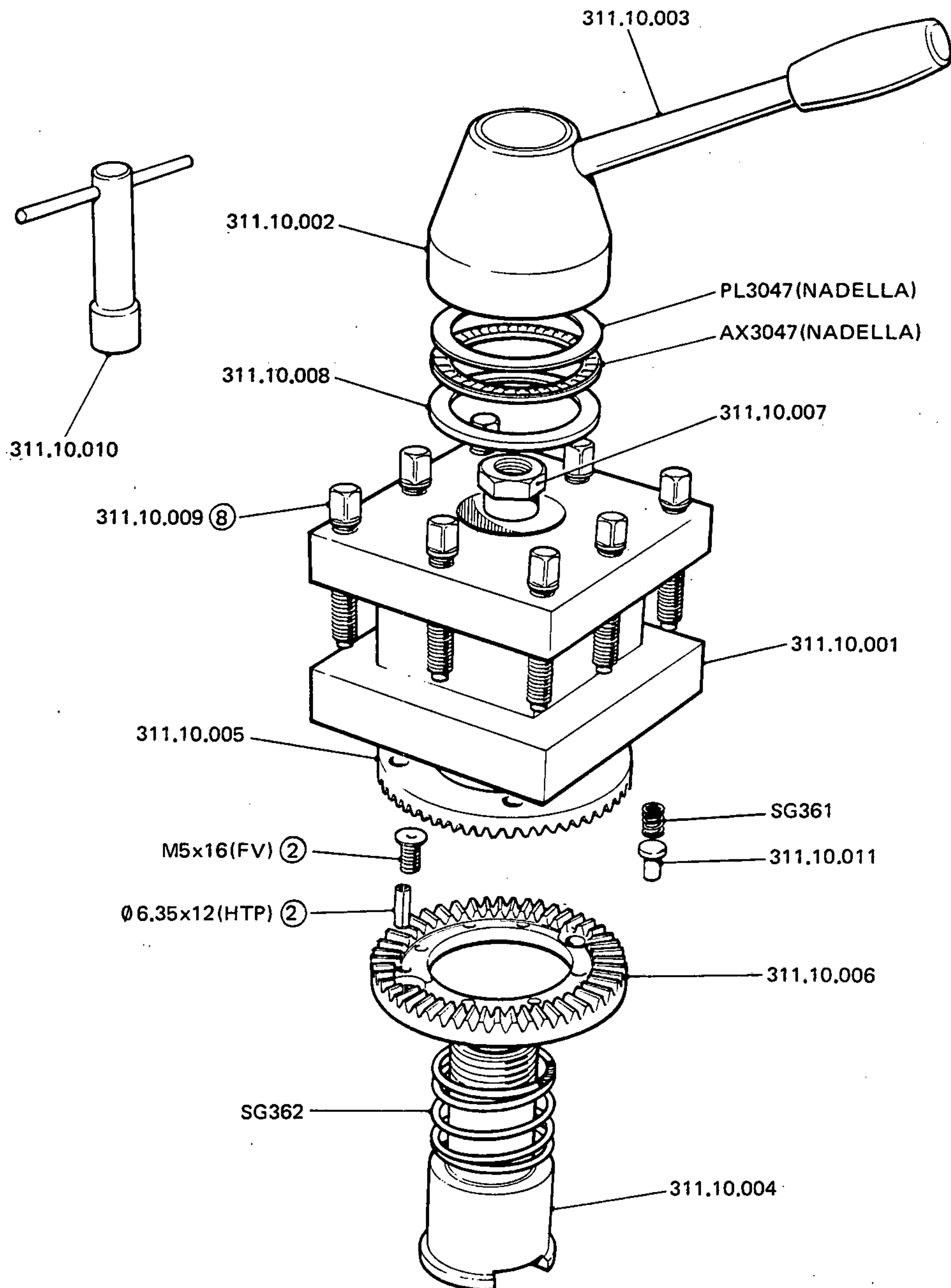
# AMERICAN TOOLPOST

ORDER CODE 305/AT



# 4-WAY HAND-INDEXING TOOLPOST

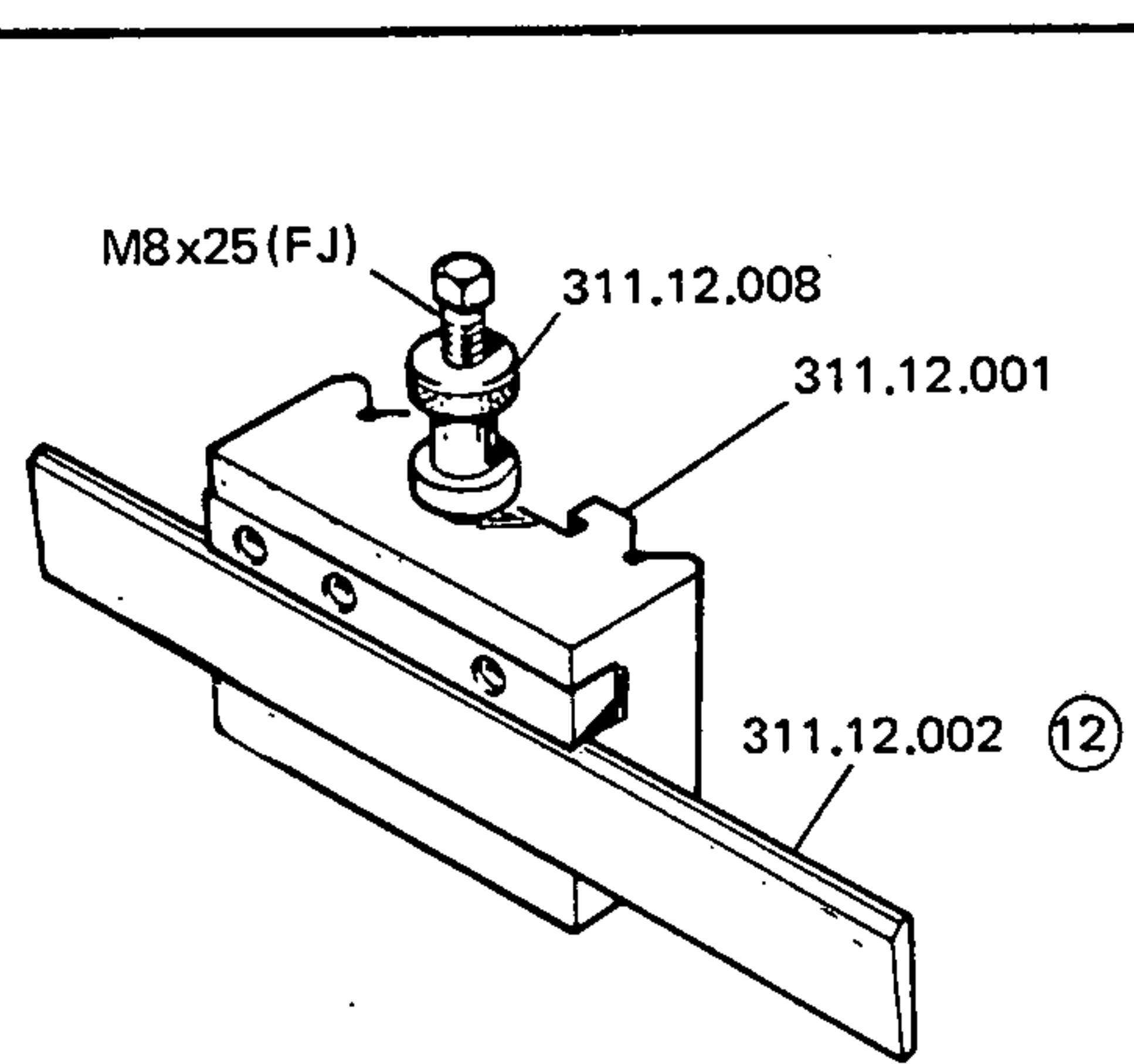
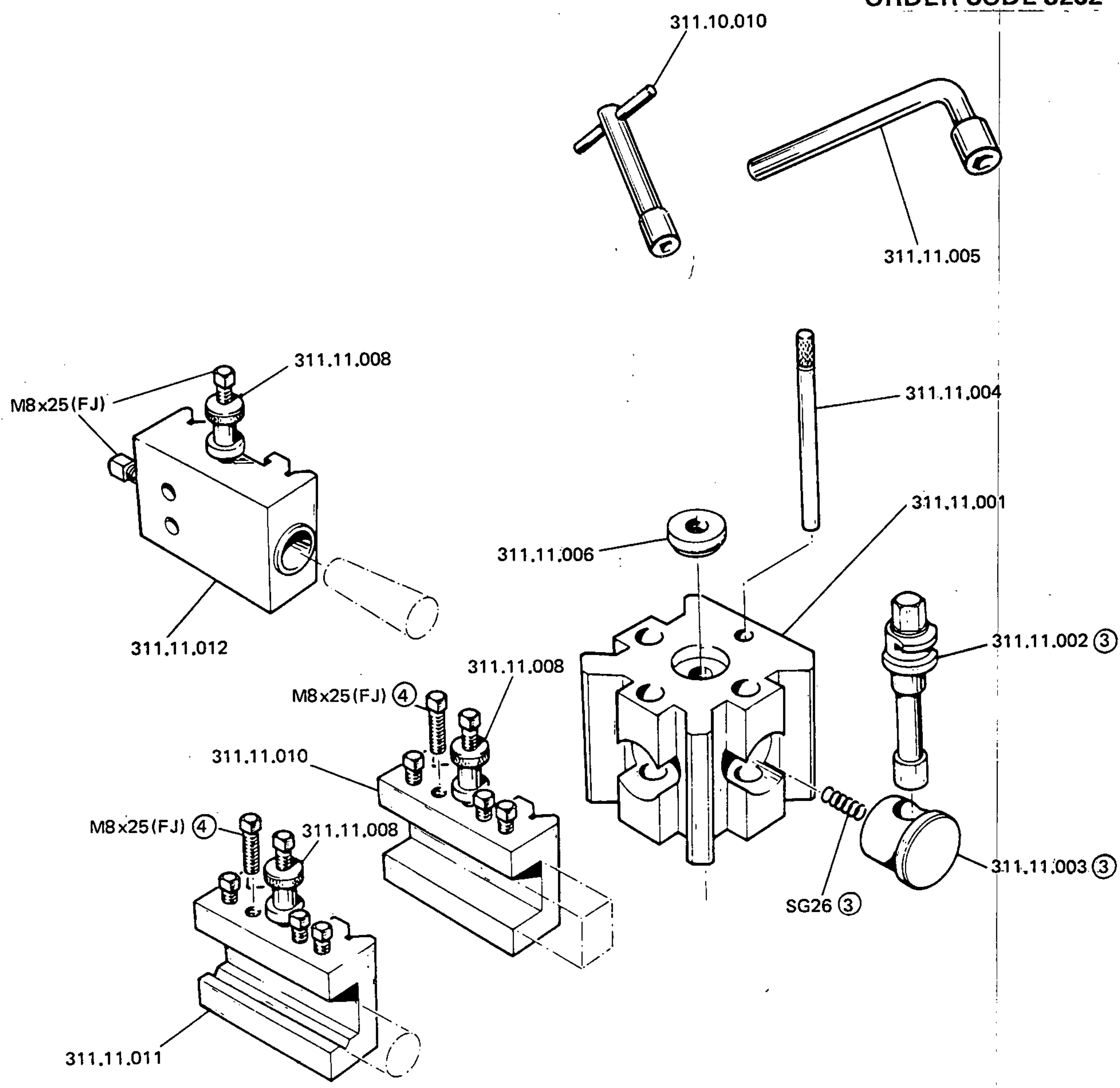
ORDER CODE 3201



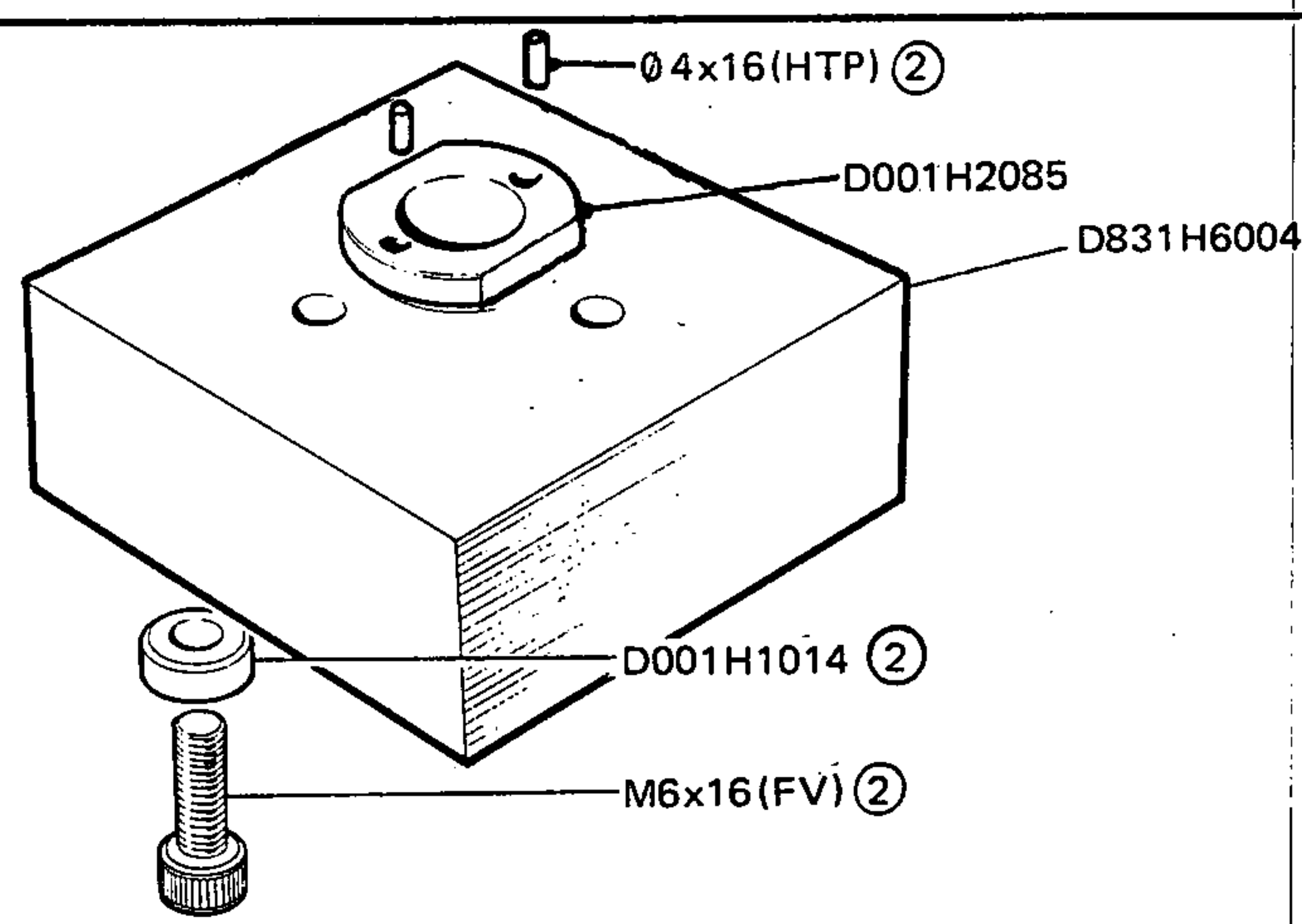


QUICK CHANGE TOOLPOST

ORDER CODE 3202

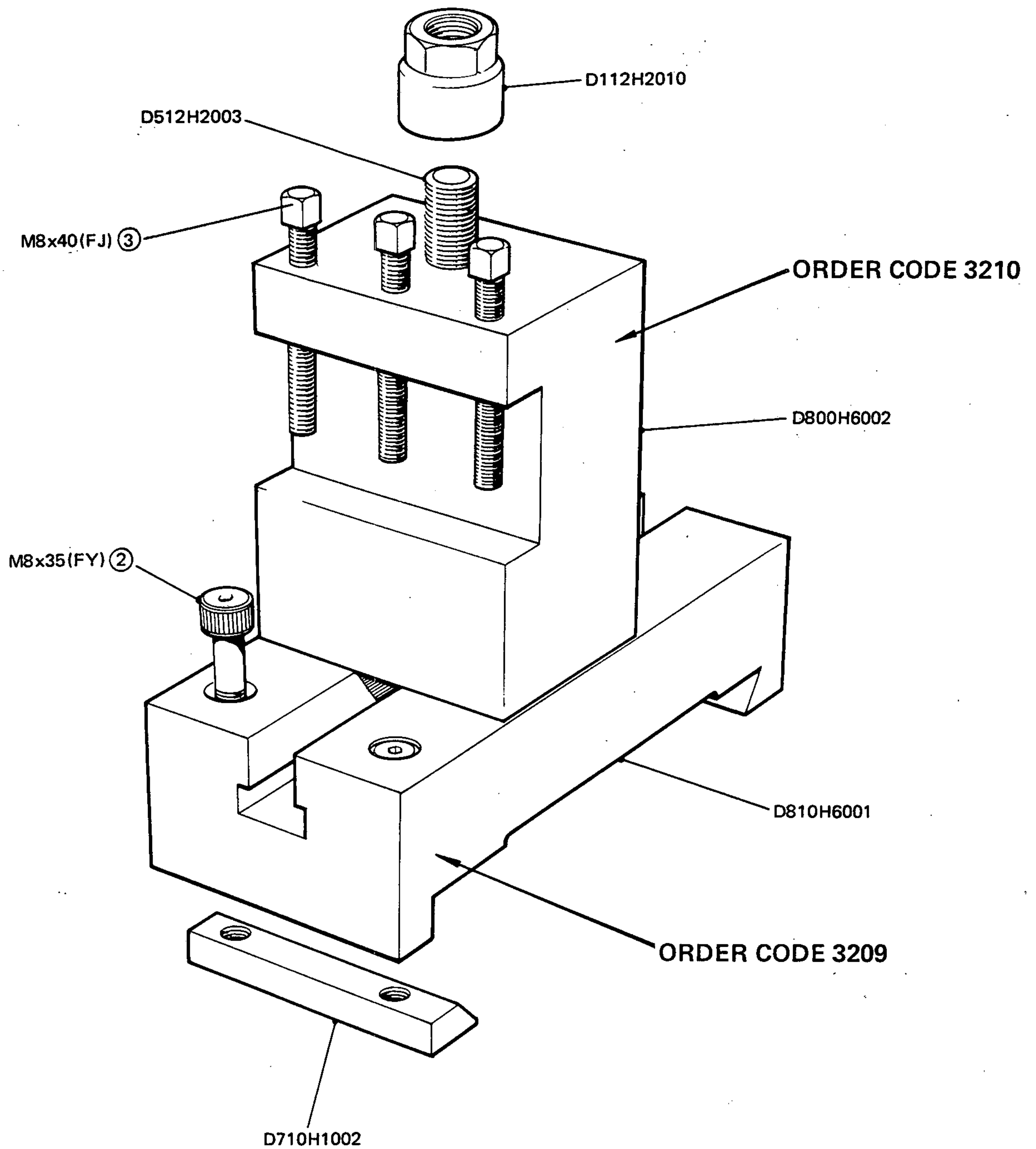


**QUICK CHANGE  
PARTING-OFF  
TOOLHOLDER**  
ORDER CODE 3206



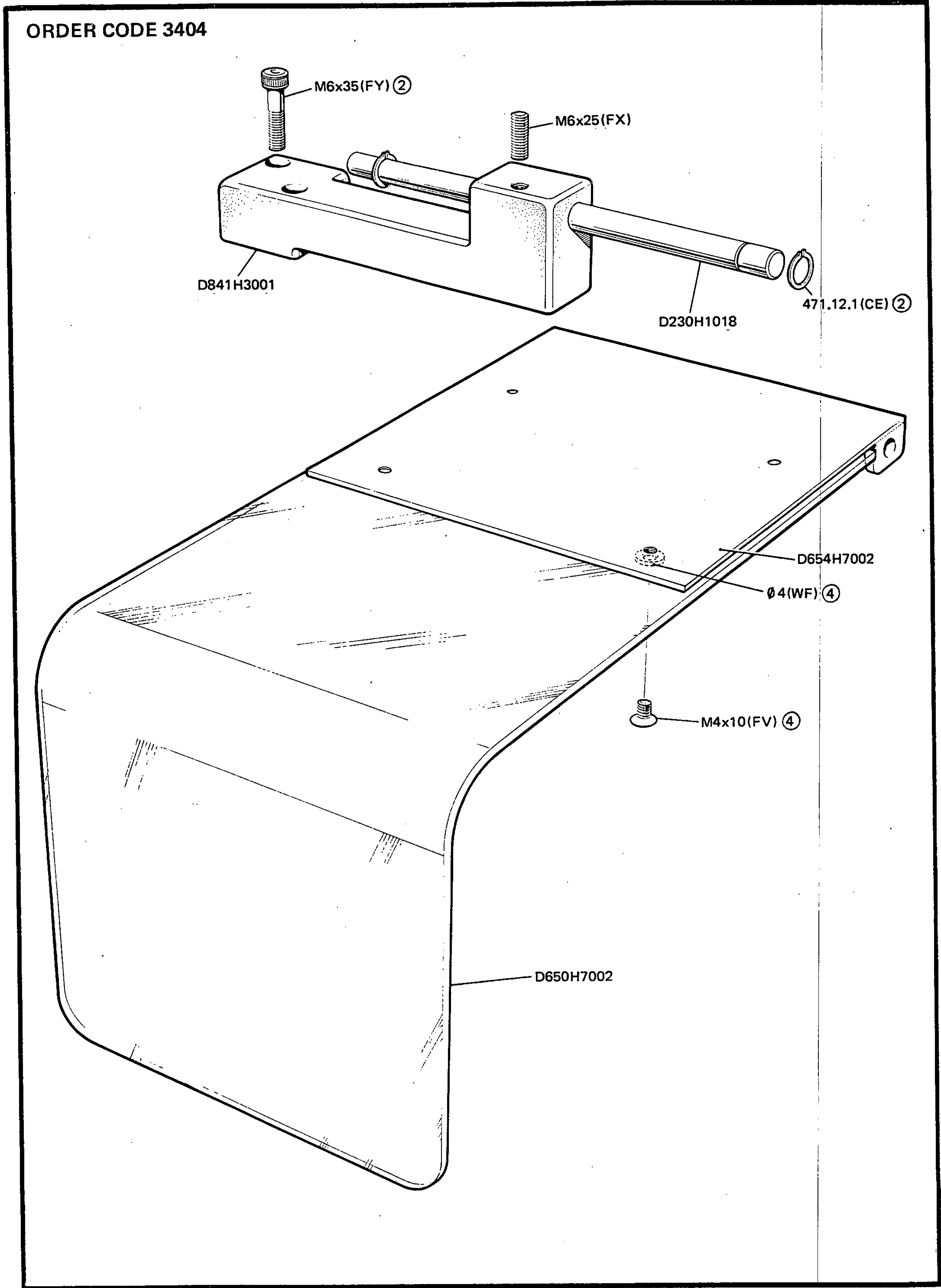
**RAISER BLOCK**  
ORDER CODE 3208

# SINGLE TOOLPOST AND AUXILIARY REAR SLIDE



PERSPEX CHUCK GUARD - HEADSTOCK MOUNTING

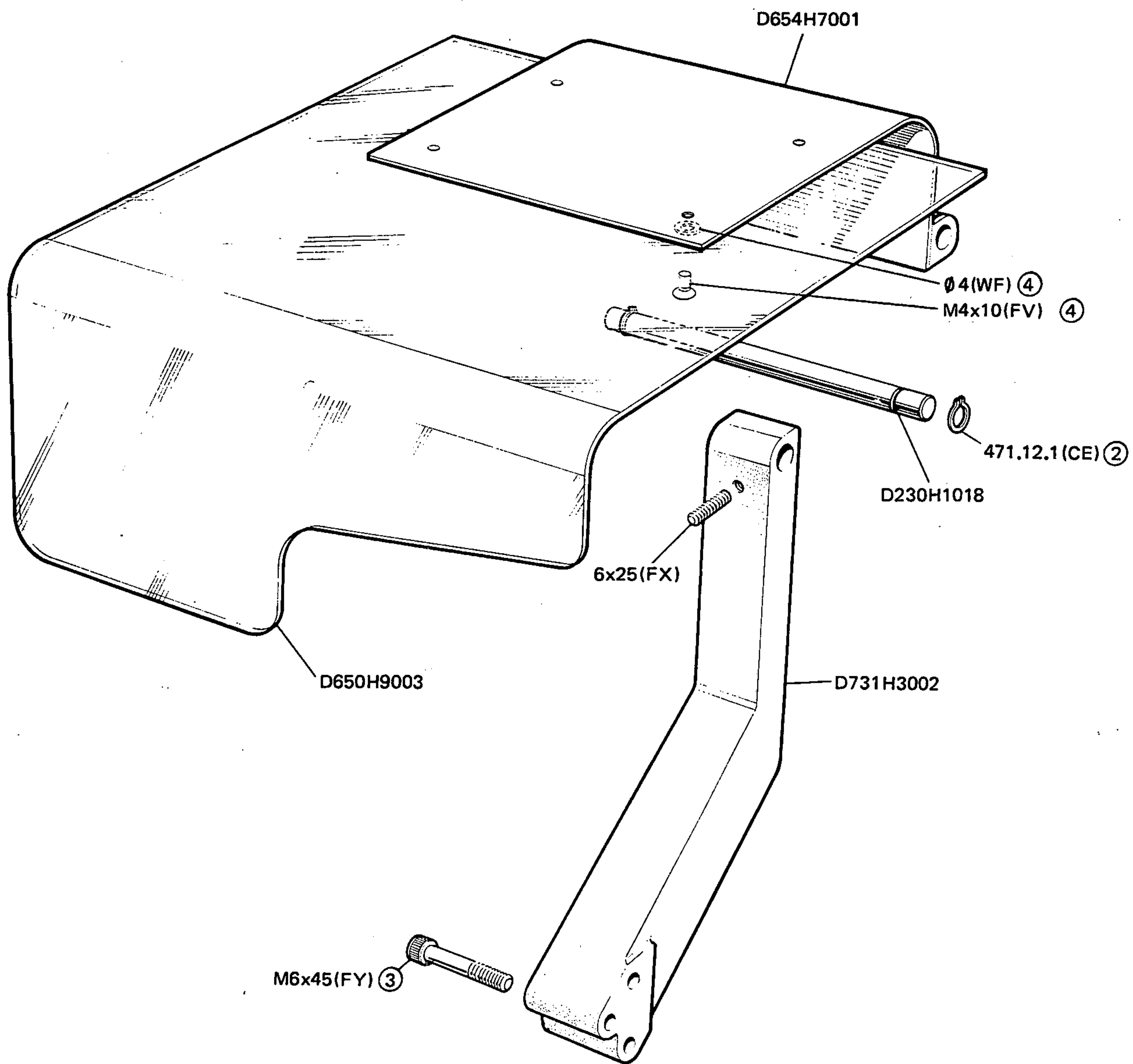
ORDER CODE 3404



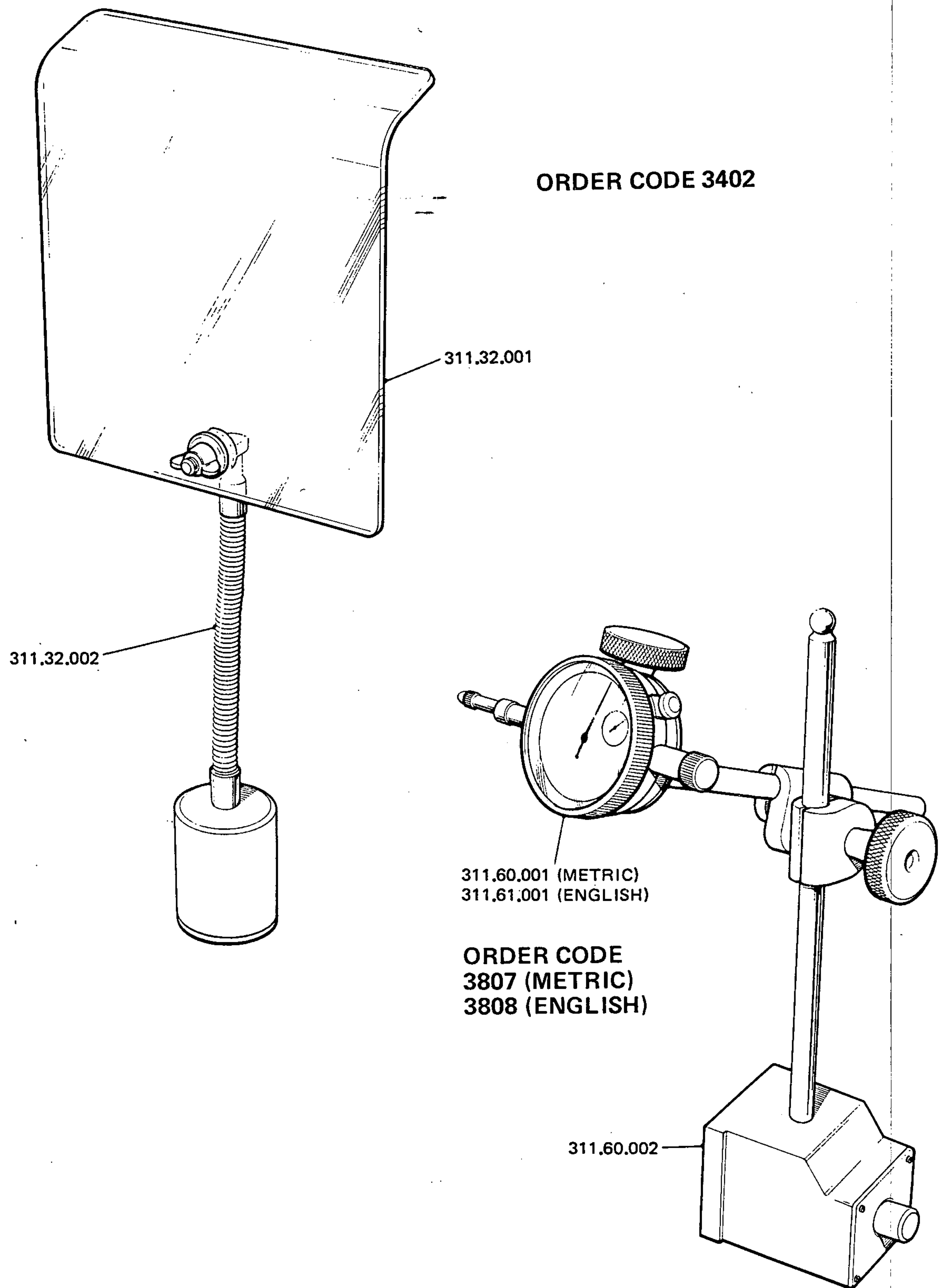


# PERSPEX CHIPGUARD - SADDLE MOUNTING

ORDER CODE 3401

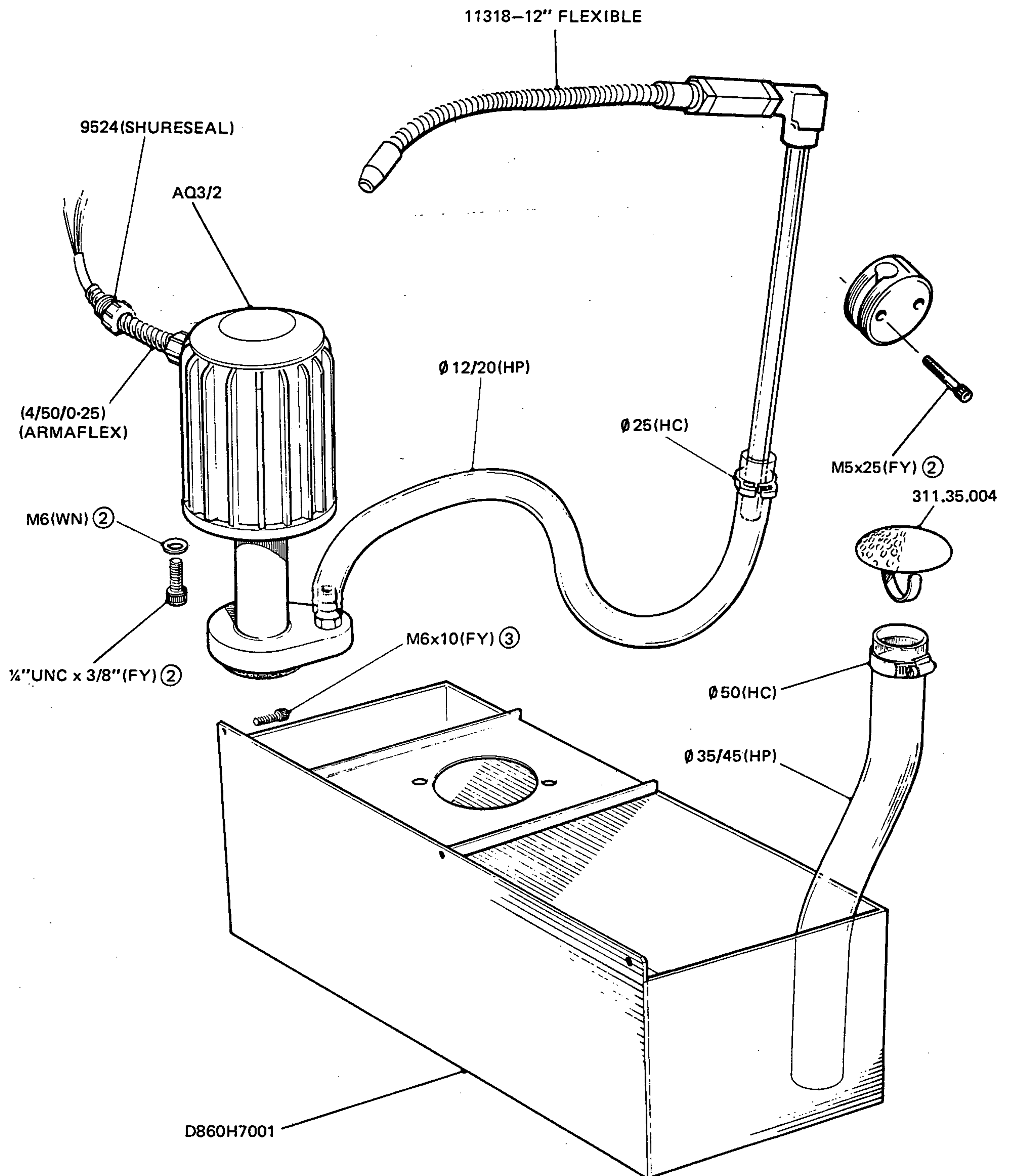


MAGNETIC BASED CHIPGUARD & DIAL INDICATOR



# COOLANT PUMP, TANK AND FITTINGS

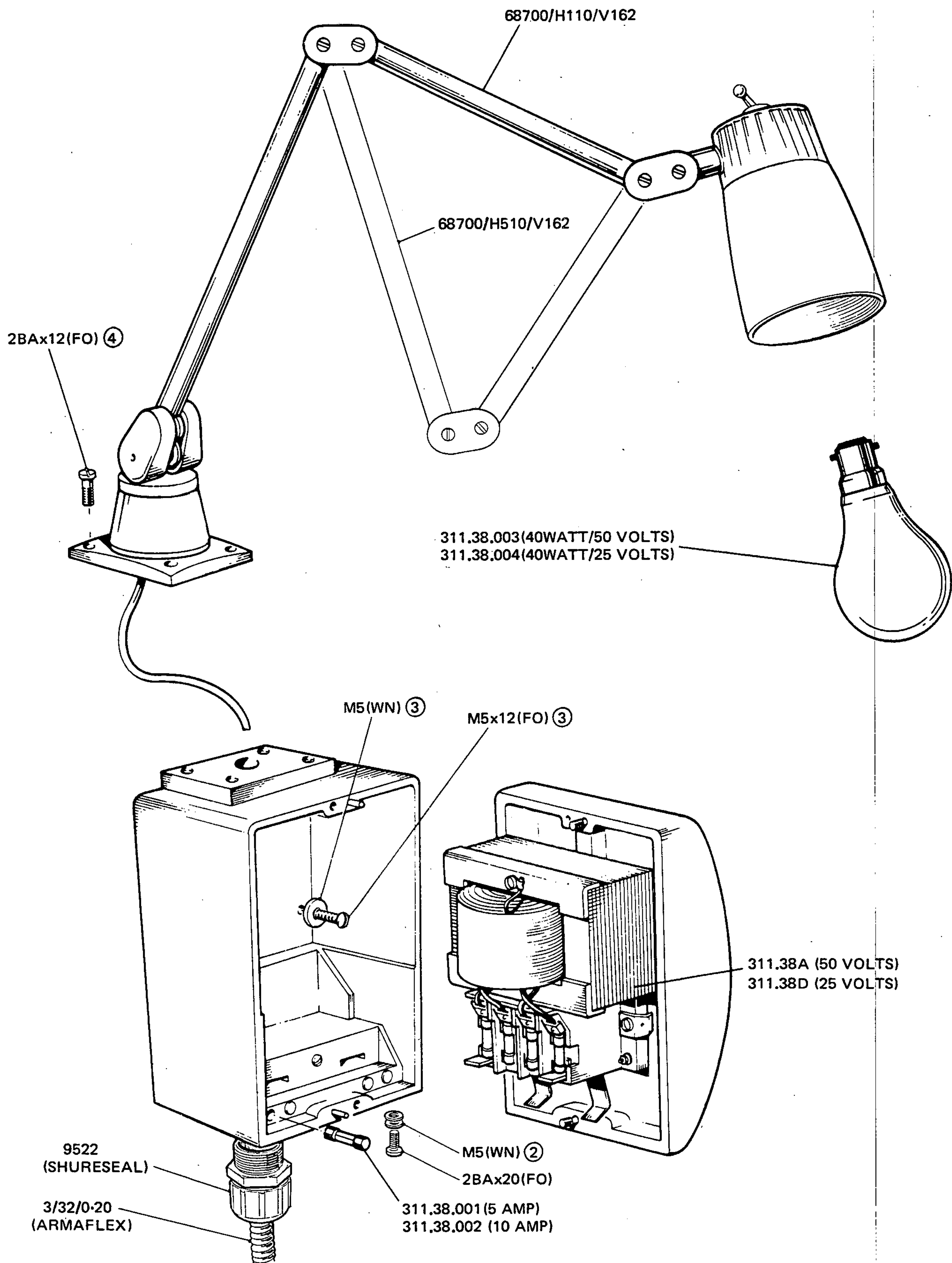
ORDER CODE 3451 (3-PHASE)



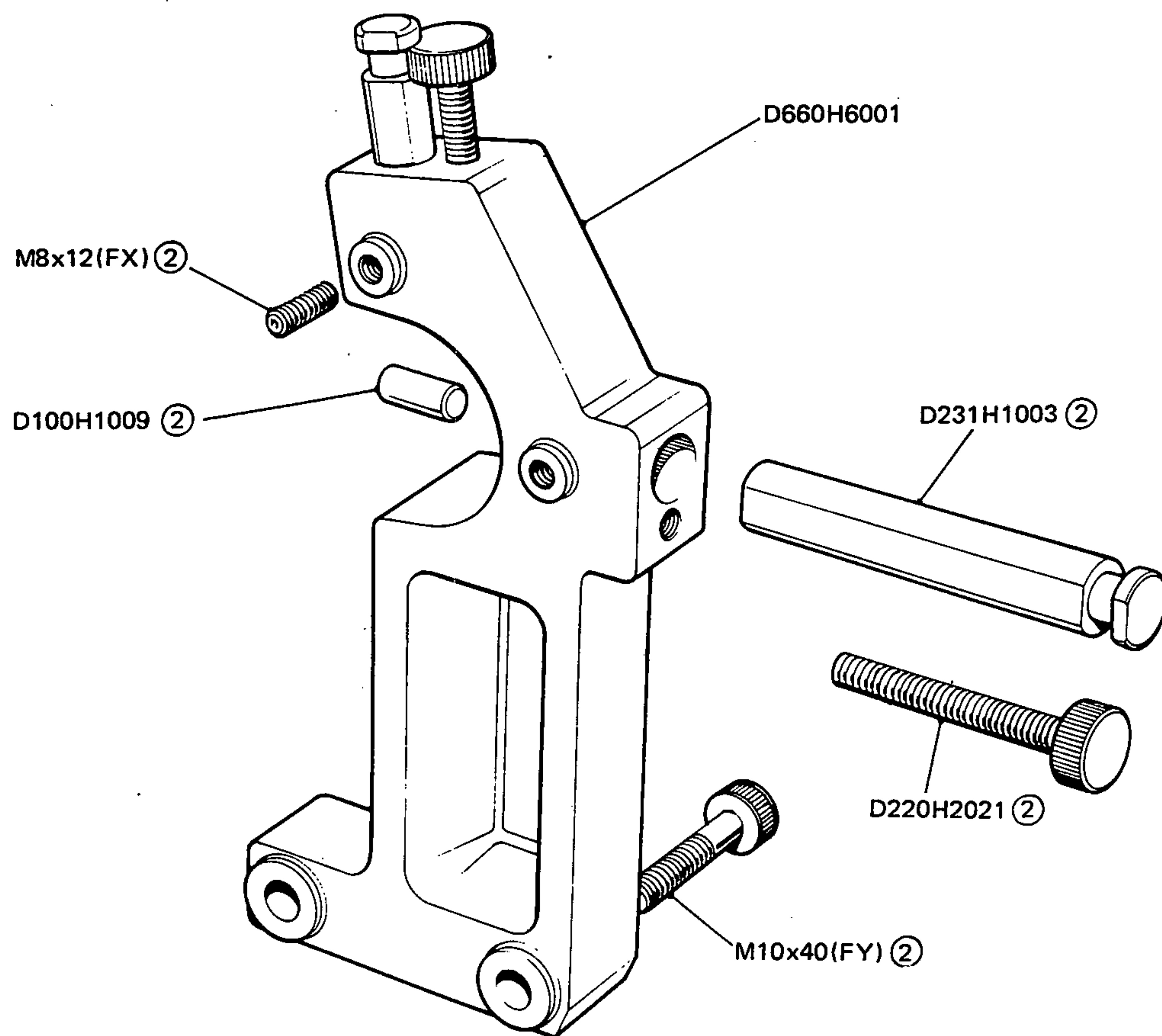


# LOW VOLTAGE MACHINE LIGHTING

ORDER CODE 3501

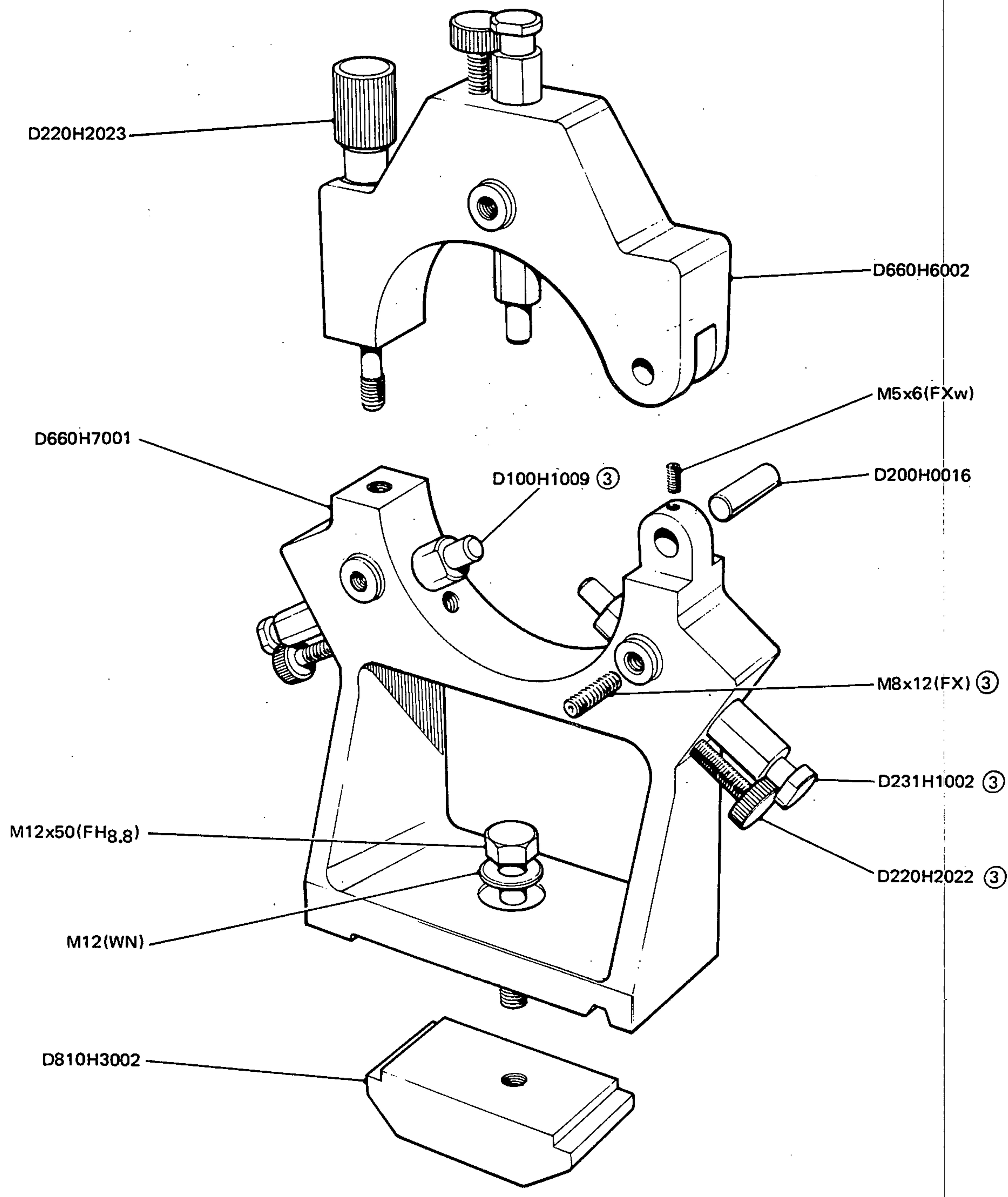


ORDER CODE 3601



STATIONARY STEADY

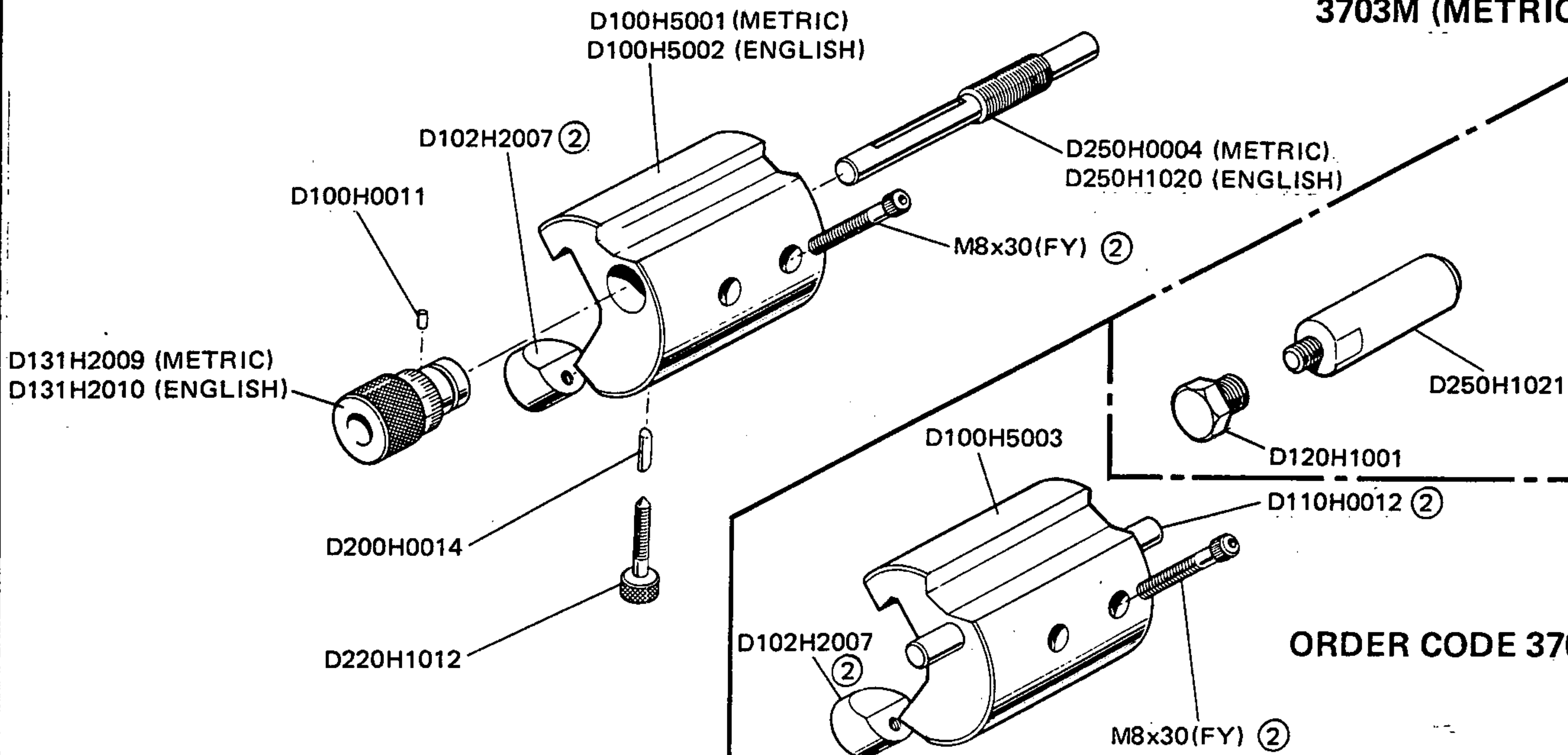
ORDER CODE 3603





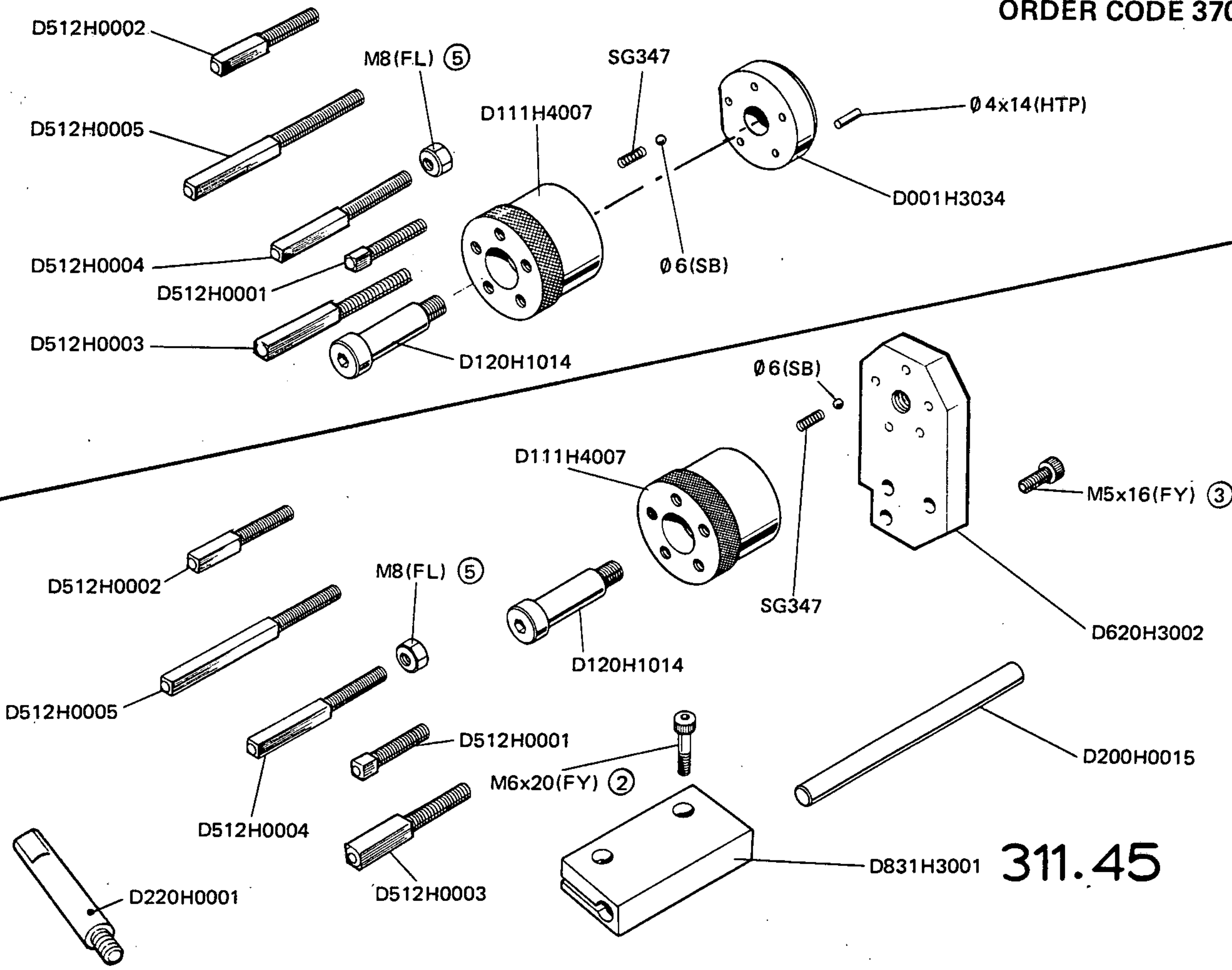
BED STOPS

ORDER CODE  
3703E (ENGLISH)  
3703M (METRIC)



ORDER CODE 3702

ORDER CODE 3704

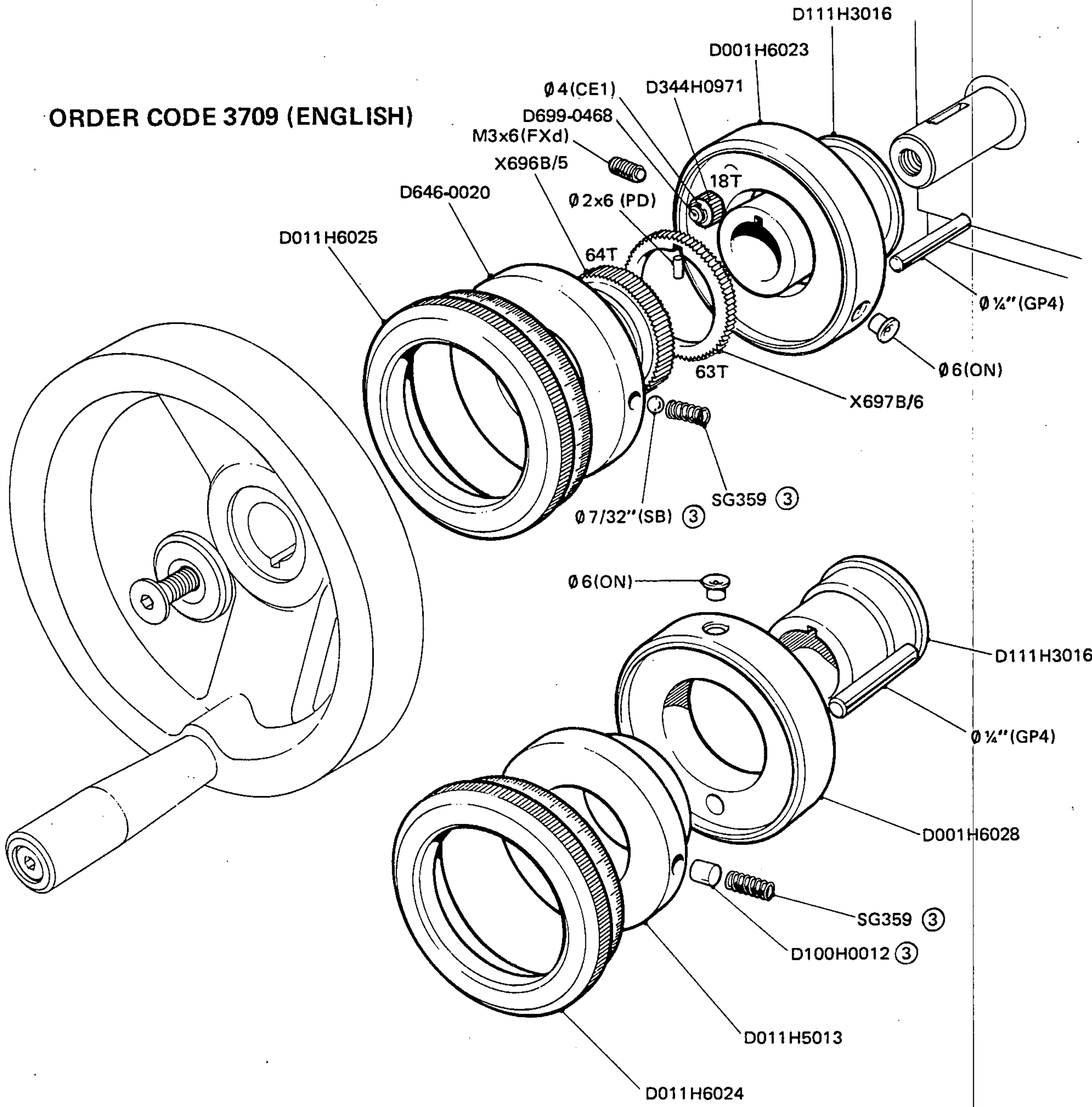


311.45

ORDER CODE 3701

APRON DIALS

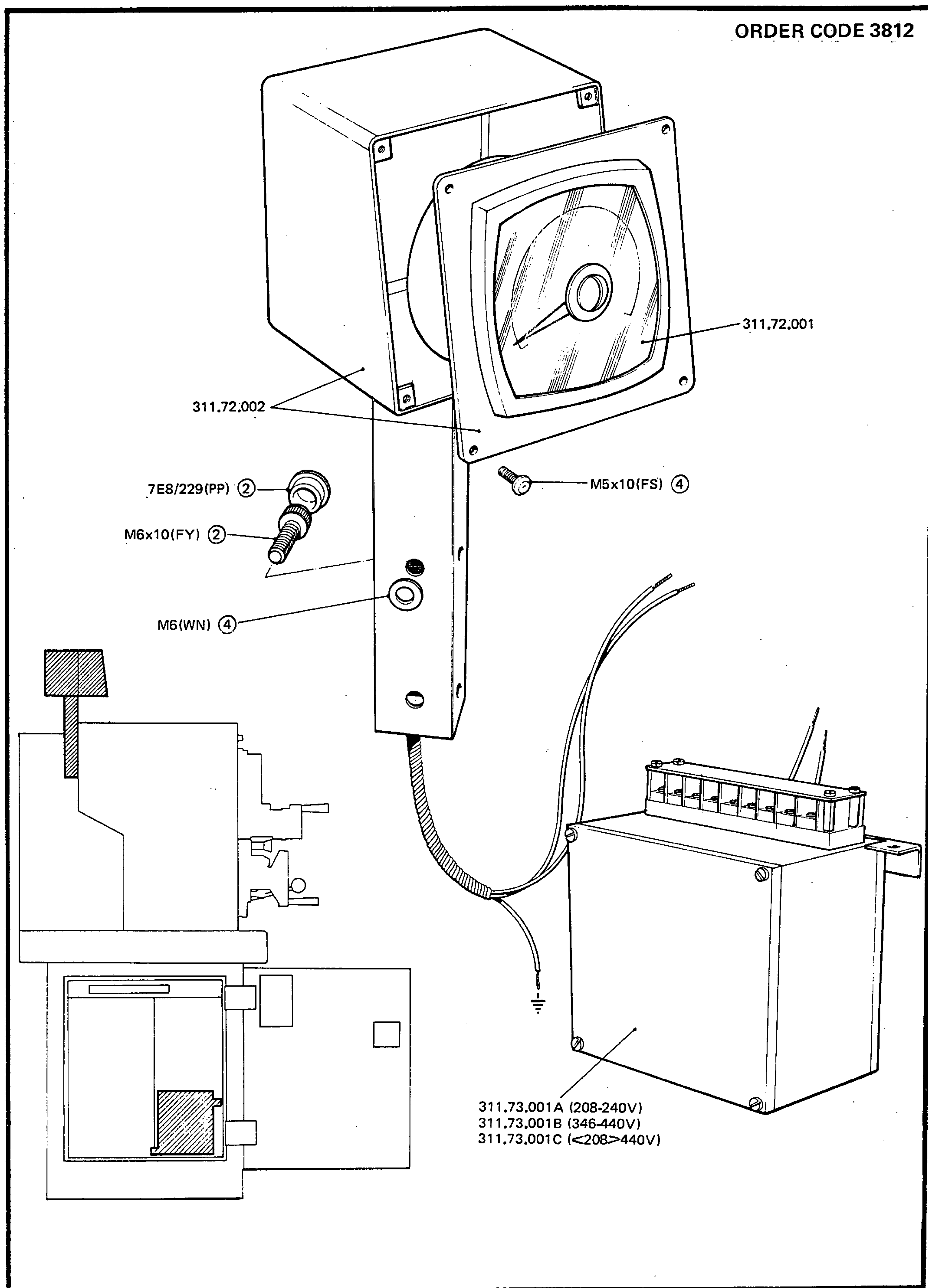
ORDER CODE 3709 (ENGLISH)



ORDER CODE 3708 (METRIC)

# WATTMETER

ORDER CODE 3812



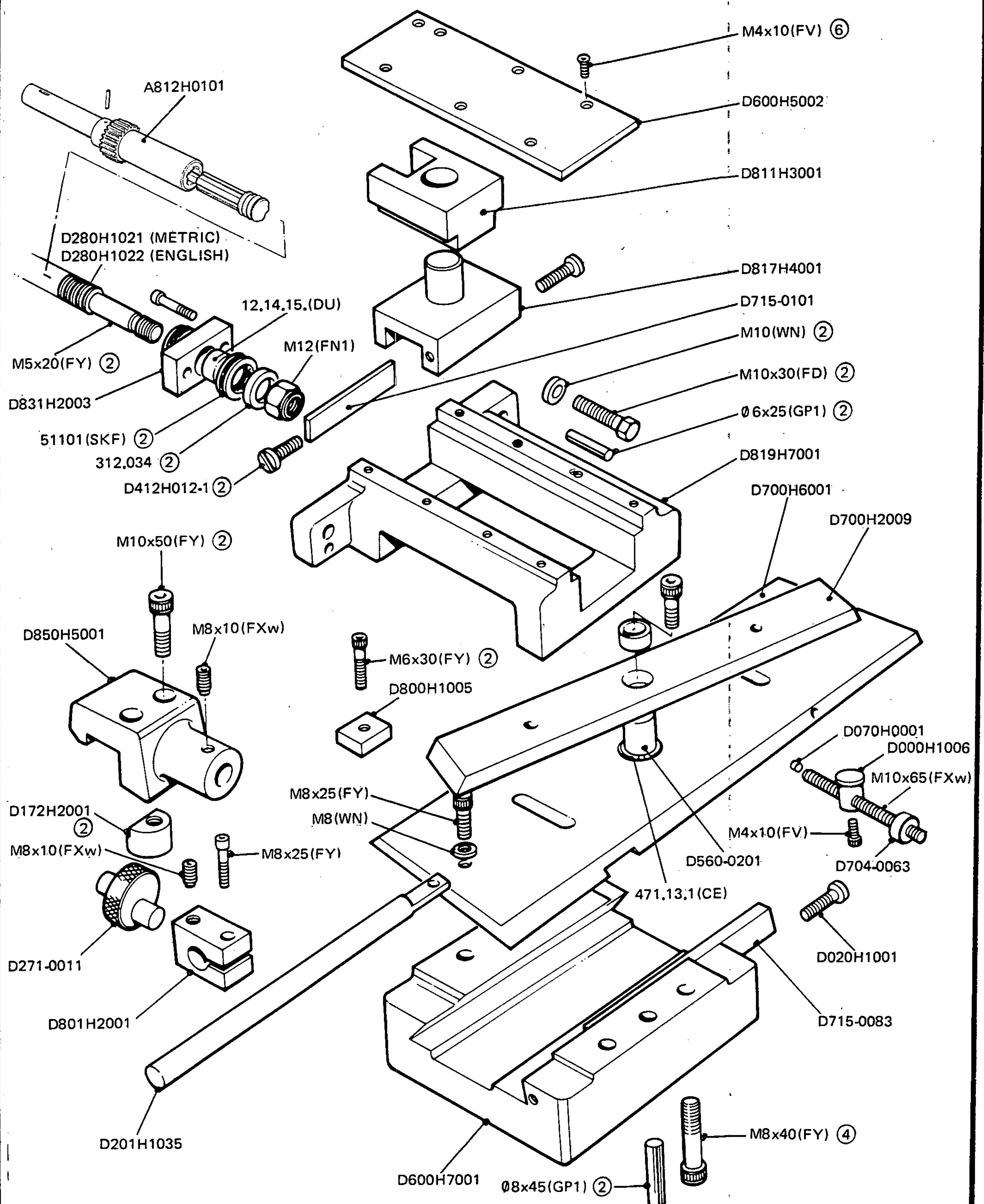


**ATTACHMENTS**

ORDER CODE		PAGE NO.
3903(M/E)	TAPER TURNING ATTACHMENT	67
3905	BED CAPSTAN UNIT	68
3907/25/M	HIGH SPEED THREADING ATTACHMENTS	69 & 70
3907/40/M		
3908/25/E		
3908/40/E		
3910/25/E	HYDRAULIC COPYING ATTACHMENT (SEE SEPARATE MANUAL)	
3910/25/M		
3910/40/E		
3910/40/M		

# TAPER TURNING ATTACHMENT

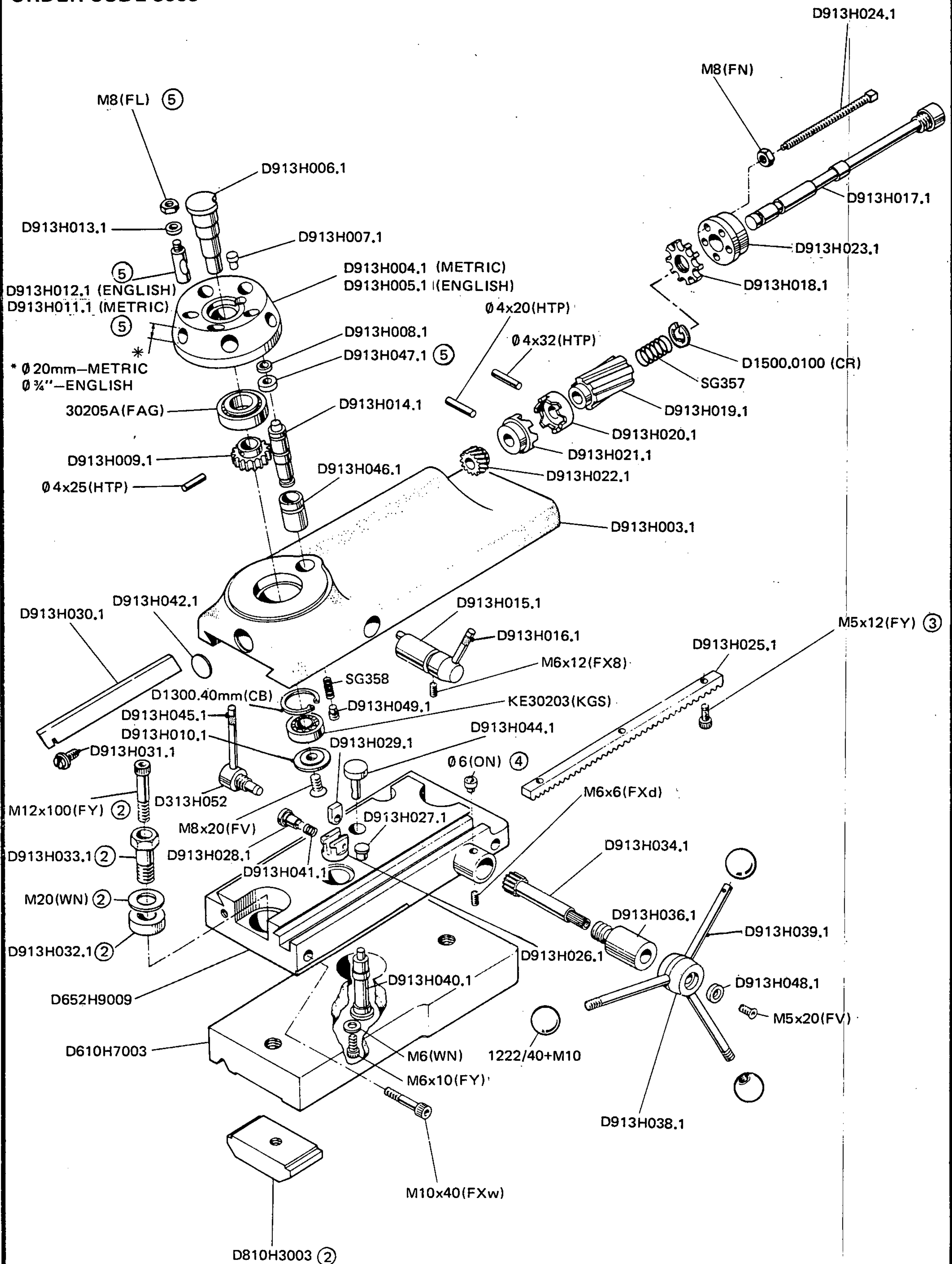
**ORDER CODE 3903 (M/E)**





# BED CAPSTAN UNIT

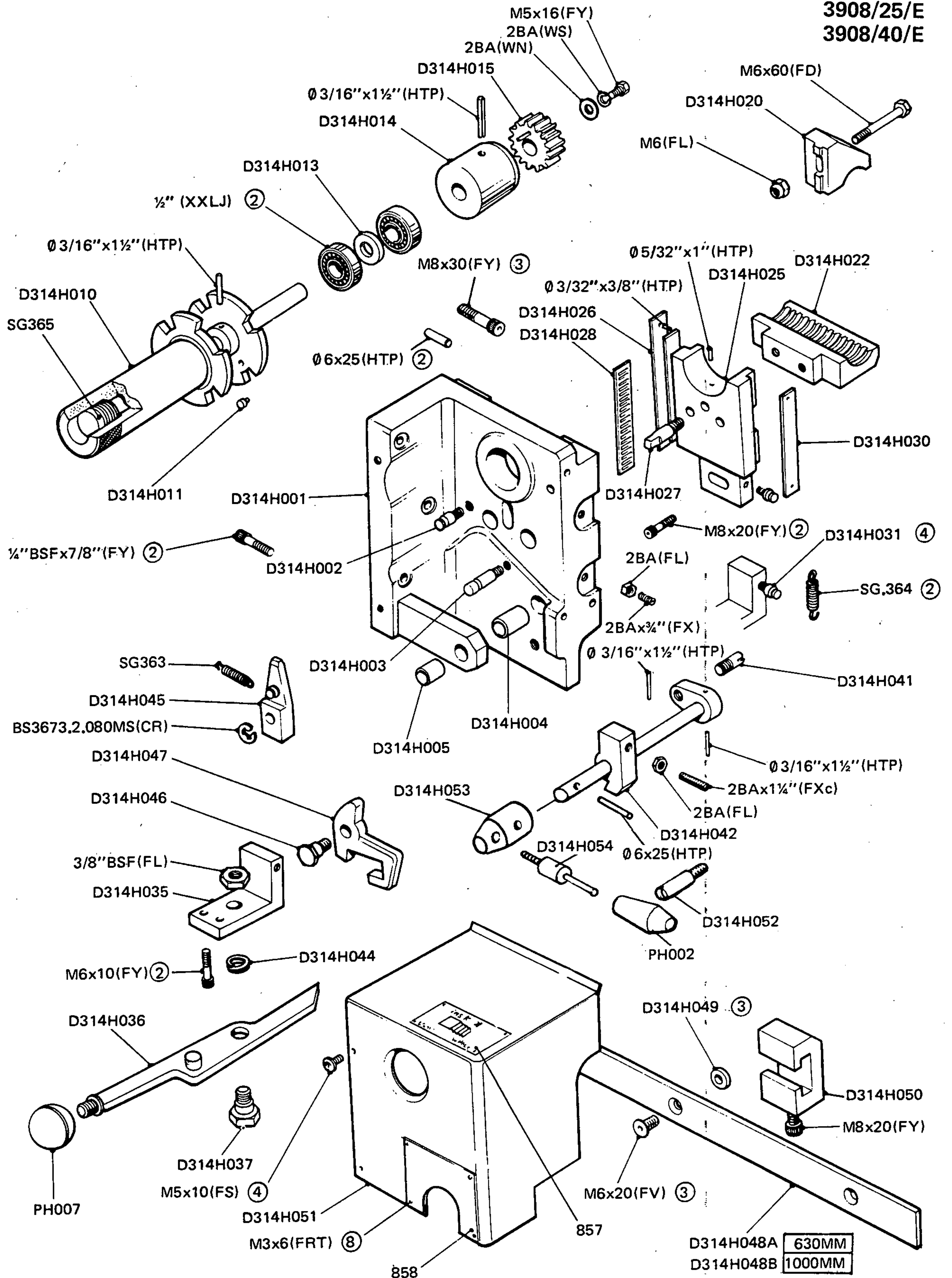
ORDER CODE 3905





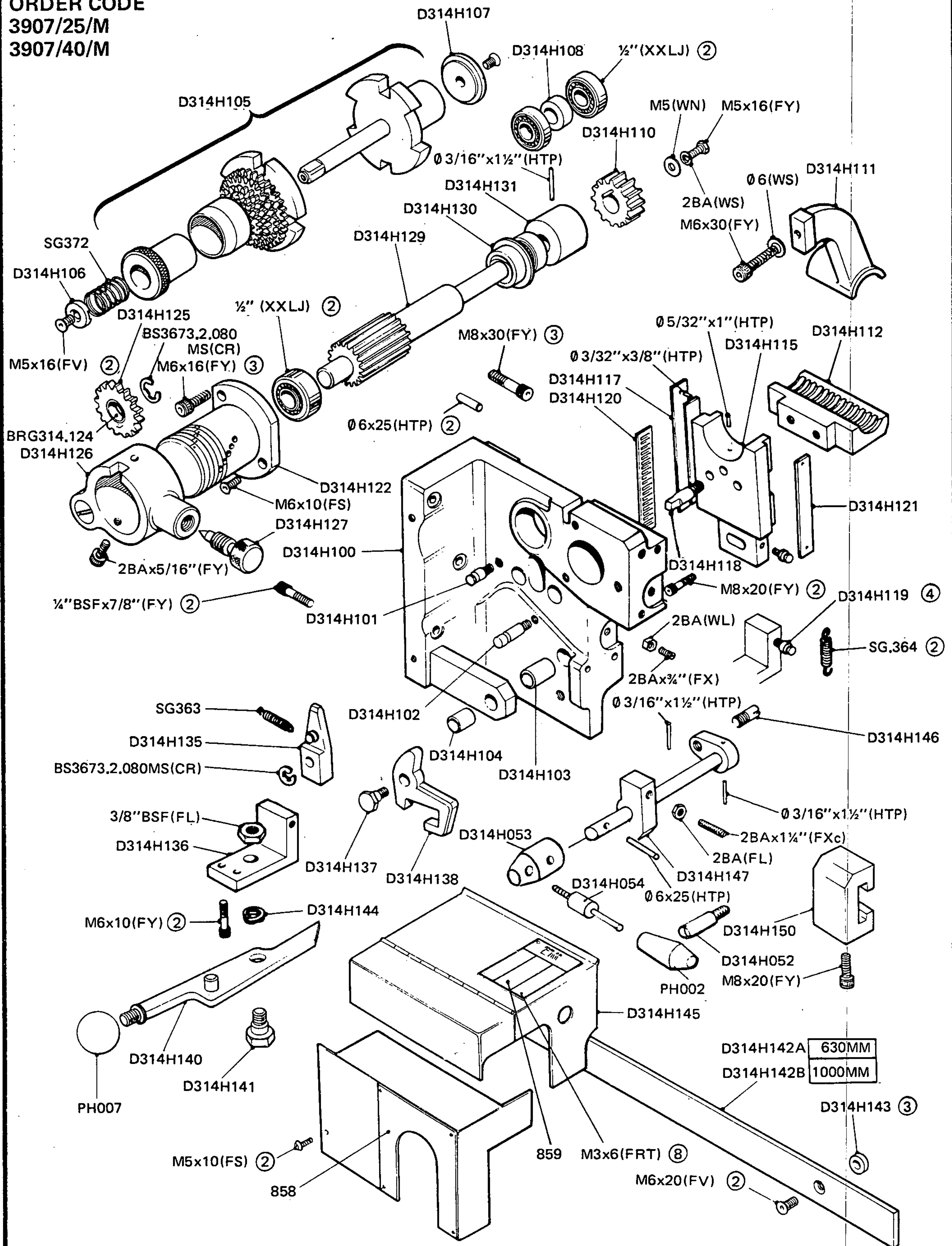
# HIGH SPEED THREADING ATTACHMENT (ENGLISH)

ORDER CODE  
3908/25/E  
3908/40/E



# HIGH SPEED THREADING ATTACHMENT (METRIC)

ORDER CODE  
3907/25/M  
3907/40/M





# STANDARD PROPRIETARY PARTS

'Bracketed' Letter Code      Component		Letter Codes Conventional Description Given
<b>Screws and Nuts</b>		
FX	Socket Set (Grub) Screw: Flat Point	Thread X O/all Length
FXd	" " " " Dog Point (Normal)	" " " "
FXd1	" " " " Dog Point (Long)	" " " "
FXc	" " " " Cone Point	" " " "
FXw	" " " " Cup, knurled or 'W' Point	" " " "
FY	Socket Head Cap Screw	Thread X Length under head
FY1	Socket Head Cap Screw (Threaded to Head)	" " " "
FV	Socket Countersunk Screw	" " " "
FS	Socket Button Head Screw	" " " "
FU	Socket Shoulder Screw	Thread X Ø Shank X Shank length
FP	Socket Pressure Plug	Thread and Form
FPS	Press Plug (Square Head)	" "
FO	Slotted Set (Grub) Screw	Thread X O/all Length
FT	Slotted or Pozidriv Screw: Countersunk Head	Thread X length under head
FI	" " " " Raised C/sunk Head	" " " "
FR	" " " " Pan Head	" " " "
FE	" " " " Cheese Head	" " " "
	Suffix 'B' for Thread Forming Type	
	Suffix 'T' for Thread Cutting Type	
	Suffix 'SS' for Stainless Steel	
FJ	Square Head (Toolpost) Screw	Thread X Length under head
FH	Hexagon Head Screw	Thread X Length under head
FD	" " Bolt	" " " "
FN	Standard Hexagon Nut	" " " "
FL	" " " Locknut	" " " "
	Suffix '8.8' for High Tensile Types	
	Suffix 'L' for 'Self-Locking' versions of the above	
FZ	Hammer Drive Screw	Nom Ø X Length under head
FW	Wing Nut	Thread details
DN	Domed Nut	Thread details
CN	Castle or Slotted Type Nut	" "
FN1	Nylon Ring Locking Nut	" "
<b>Thread Inserts</b>		
TI1	Press in Type Thread Insert	Thread details
TI2	Coil Type Thread Insert	" "
<b>Washers</b>		
WN	Bright Washer: Normal Diameter	Nominal Hole Ø
WL	" " Large Diameter	" "
WK	Crinkle (Wavy) Washer	" "
WS	Spring Washer: Single Coil	" "
WSs	" " Double Coil	" "
WC	Folded Copper Sealing Washer	" "
WF	Felt Washer	" "
DS	Disc Spring (Belleville Washer)	Nom. Hole Ø X O.D. X thickness



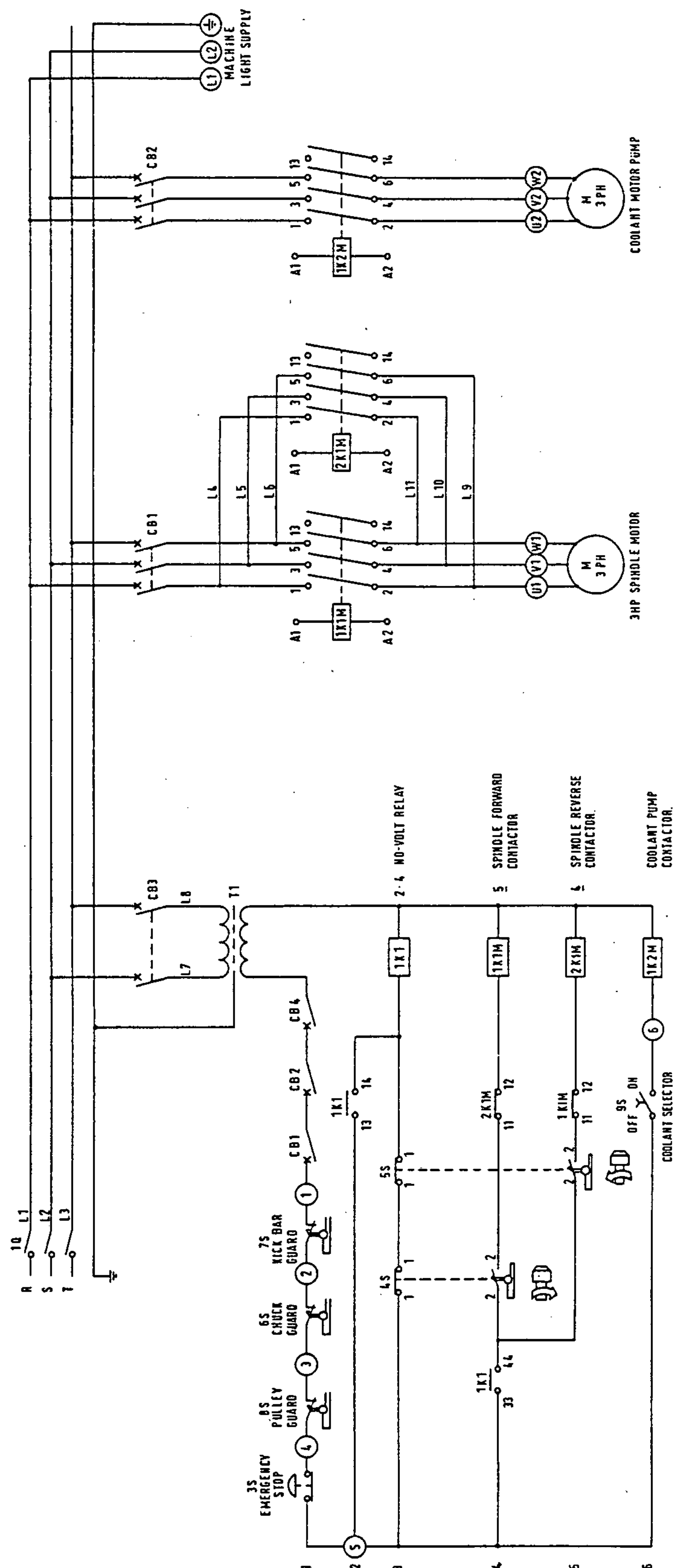
STANDARD PROPRIETARY PARTS

'Bracketed' Letter Code	Component	Conventional Description Given
Pins and Dowels		
GP1	Grooved Pin: Full length groove — Tight at one end	Nom. Ø X O/all length
GP2	" " Half length groove — Tight on end	" " "
GP3	" " Full length groove — Parallel	" " "
GP4	" " Half length groove — Tight at centre	" " "
GP5	" " Centre groove	" " "
PD	Dowel Pin	Nom Ø X O/all length
PB	Brass Pin or Pad	" " "
PT	Taper Pin	Nom Ø (small end) X O/all length
PS	Split Pin	Nom Ø X O/all length
LTP	Tension Pin: Light Duty	Nom Ø X O/all length
HTP	" " Heavy Duty	" " "
Keys		
KS	Square Parallel Key	Width X Thickness X Length
KR	Rectangular Parallel Key	" " " "
KW	Woodruff Key	Width X Height X Diameter
Circlips		
CE	External Circlip: DIN 471	DIN. Ref. Nom Shaft Ø and Thickness
CE1	Round Section Circlip	Nom. Shaft Ø, Wire Ø
CE2	Inverted Retainer (Truarc)	" " "
CB	Internal Circlip: DIN 472	DIN. Ref. Nom Bore and Thickness
CR	Radial Fitting Circlip. DIN 6799	DIN Ref. Nom Ø and Thicknes
CR1	Radial Retaining Clip (Spring fix)	Nom shaft Ø
CR2	Radial Fitting Circlip BS3673/3	" "
Plain Bearings		
DU	Composite Bearing Bush 'Glacier'	Nom Bore. O.D. and Length
DX	" " " " "	" " " "
LB	Sintered Bronze Bush	Nom Bore O.D. and Length
Ball & Roller Bearings		
BB	Std. Ball Bearing	Nom Bore Outside Ø and Length
BB1	Std. Ball Bearing with Shield or Seal one side	" " " " "
BB2	Std. Ball Bearing with Shield or Seal both sides	" " " " "
BB3	Std. Ball Bearing with Snap Ring	" " " " "
BBT	Angular Contact Ball Bearing	" " " " "
RB	Cylindrical Roller Bearing	" " " " "
For Needle Roller Brgs, Needle Thrust Races Ball Thrust Brgs. and Taper Roller Bearings — Manufacturers Name is Quoted as Letter Code — vis.		
(INA.)	(TORRINGTON)	Manufacturers Part No. Quoted
(SKF)	or (GAMET)	

# STANDARD PROPRIETARY PARTS

'Bracketed' Letter Code	Component	Conventional Description Given
Seals		
SM	Standard Oil Seal	Nom Shaft Ø O.D. and Width
SF	'V' Ring Seal (FORSHEDA)	Manufacturers Part No.
RM	Standard 'O' Ring Seal	Internal Ø of Ring, and Section Ø
RM1	'Nu-Lip Ring' (Pioneer)	Manufacturers Part No.
Lubrication Equipment		
ON	Concave Oil Nipple: Drive in Type	Nom Hole Ø
ONI	" " " Threaded Type	Thread details
OS	Oil Sight Glass	Nom Outside Ø
OS1	Oil Level Glass	" "
OW	Oil Wick	Nom Ø X Length
For Compression and other Pipe Fitting — Manufacturers Name is quoted as Letter Code vis. (ENOTS.) or (TECALEMIT)		Manufacturers Part Number Quoted
Miscellaneous Items		
BJ	Ball Joint	Thread Details
SB	Steel Ball	Nom Ø
FK	Hexagon Wrench Key	Nom width across flats
HP	P.V.C. Hose	Nom Bore and O.D.
HC	Hose Clip	Max. Hose Ø
PP	Plastic Plug	Manufacturers Part Number
WRS	Standard Spanner	Std. Bolt size and width across flats
EB	Eye Bolt	Thread details
OW	Oil wick	Nom Ø X Length
CT	Copper tube	Nom outside Ø
NT1	Nylon Tube Natural	Nom Bore
NT2	Nylon Tube Blue	" "
NT3	Nylon Tube Green	" "
NT4	Nylon Tube Red	" "

# ELECTRICAL SECTION





## ELECTRICAL SECTION

<u>REF.</u>	<u>TYPE</u>	<u>DESCRIPTION</u>	<u>QTY</u>
T1	HX1 55VA	TRANSFORMER	1
1K1	CA2-DN1319FA65	CONTACTOR	1
1K1M	LC1-D099FA65	CONTACTOR	1
2K1M	LC1-D099FA65	CONTACTOR	1
1K2M	LC1-D093FA65	CONTACTOR	1
CB1	GV1-M10(4-6A)	CIRCUIT BREAKER	1
CB2	GV1-M01(0.1-1.6A)	CIRCUIT BREAKER	1
CB3	GV1-M07(1.6-2.5A)	CIRCUIT BREAKER	1
CB4	GB2-CB06(1A)	CIRCUIT BREAKER	1
CB1 & CB2	GV1-A01	CB AUXILIARY CONTACT	2
1Q	P1-25/v/5vb	ISOLATOR	1
4S & 5S	K5C	LIMIT SWITCH	2
6S	XCM-A1022	LIMIT SWITCH	1
7S	M2V3HM6S	LIMIT SWITCH	1
8S	KB5EQR	LIMIT SWITCH	1
	SAK 2.5/35	TERMINALS	20
	EK4/35	EARTH TERMINALS	5
3S	D3C1R	EMERGENCY STOP PUSHBUTTON	1
9S	D1G3S	SELECTOR SWITCH	1
3S & 9S	DA11	CONTACT BLOCK	2