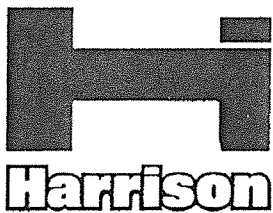


Harrison

Harrison M250

280mm - 11in swing centre lathe

machine manual



T. S. Harrison & Sons Ltd.

Union Street, Heckmondwike, Yorkshire, England, WF16 0HN

Telephone: 0924-403751/6 Telegrams: Harrison, Heckmondwike Telex: 55217

0924-409391/6

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600

machine manual

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Machine Specification

280mm (11in) swing Centre Lathe

500mm MODEL – 500mm (20 in) between centres
 750mm MODEL – 750mm (30 in) between centres

This machine is manufactured to British metric standards throughout, and is available in two bed lengths

Metric or English gear boxes and drive screws (together with the appropriate micrometer dials) are optional variations.

summarised specification

Centres	Height	145mm (5.7 in)	English Gearbox with 4 TPI Leadscrew	Threads English Pitches (56)	4 - 84 TPI
	Admits Between	500mm (20 in) or 750mm (30 in)		Threads Metric Pitches (23)*	0.4 - 10mm
Swing	Over Bed	280mm (11 in)	<i>*(available by changewheels supplied as additional equipment)</i>		
	Over Cross Slide	178mm (7 in)	Feeds Longitudinal (24)	0.0006 - 0.016 in	
Spindle	Bored to Pass	35mm (1.375 in)	Cross (24)	0.0003 - 0.008 in	
	Nose	D1-3	Bed	Width Over Ways	190mm (7.5 in)
	Morse Taper In Nose Bush	3		Depth Under Headstock	230mm (9 in)
Speeds	Number	9	Cross Slide	Width	130mm (5.1 in)
	50 Hz — Range	40 - 1500 rpm		Travel	165mm (6.5 in)
Machines	Motor	0.9 kW (1.2hp)	Top Slide	Width	76mm (3 in)
	or Range	80 - 3000 rpm		Travel	92mm (3.6 in)
or	Motor	1.3 kW (1.8hp)	Tailstock	Quill Diameter	38mm (1.5 in)
	or Range	40 - 1500 rpm		Travel	95mm (3.7 in)
60 Hz —	Motor (Single Phase)	1.1 kW (1.5hp)	Weight	500mm (20 in) Centres	356 kg (785 lbs)
	or Range	40 - 1500 rpm		750mm (30 in) Centres	457 kg (1008 lbs)
Machines	Motor	1.5 hp	Shipping Data	Gross Weight Packing Case Dimensions	
	or Range	52 - 2000 rpm		L W H	
or	Motor	1.5 hp	500mm (20 in) Centres	457 kg (1008 lbs) 1574 x 838 x 1371mm	
	or Range	52 - 2000 rpm		(62" x 33" x 54")	
Motor (Single Phase)	Motor (Single Phase)	1.5 hp	750mm (30 in) Centres	559 kg (1232 lbs) 1828 x 838 x 1371mm	
	Motor (Single Phase)	1.5 hp		(72" x 33" x 54")	
Leadscrew	Diameter	25mm (0.98 in)			
	Thread	6mm pitch or 4 TPI			
Metric Gearbox with 6mm pitch Leadscrew	Threads Metric pitches (33)	0.25 - 8mm			
	English Pitches (33)*	3 - 72 TPI			
	<i>*(available by changewheels supplied as additional equipment)</i>				
	Feeds Longitudinal (21)	0.012 - 0.4mm			
	Cross (21)	0.006 - 0.2mm			

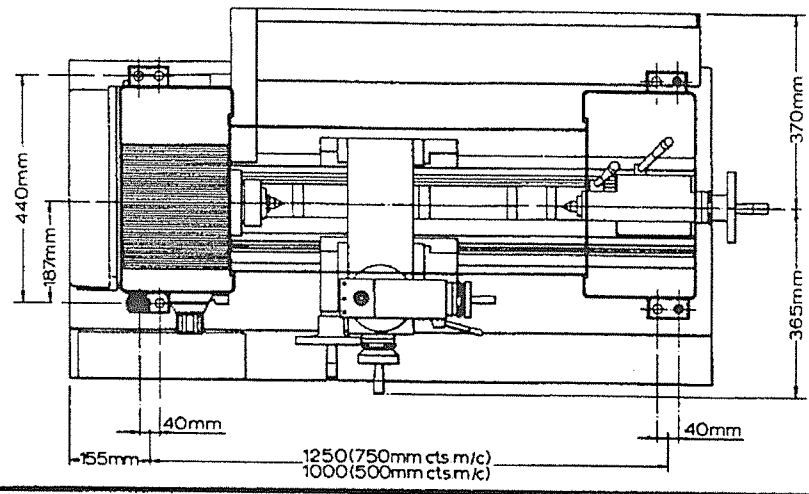
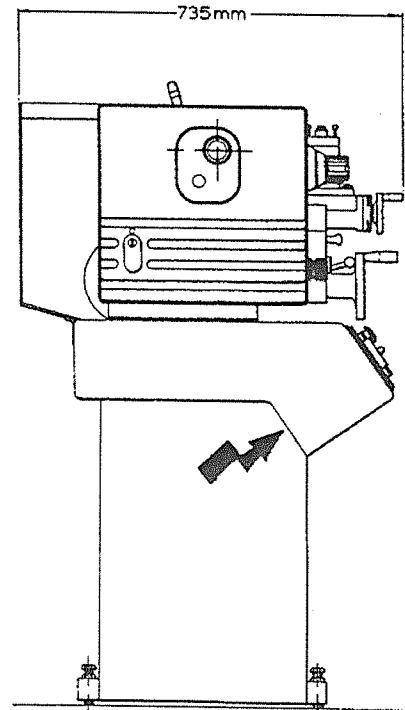
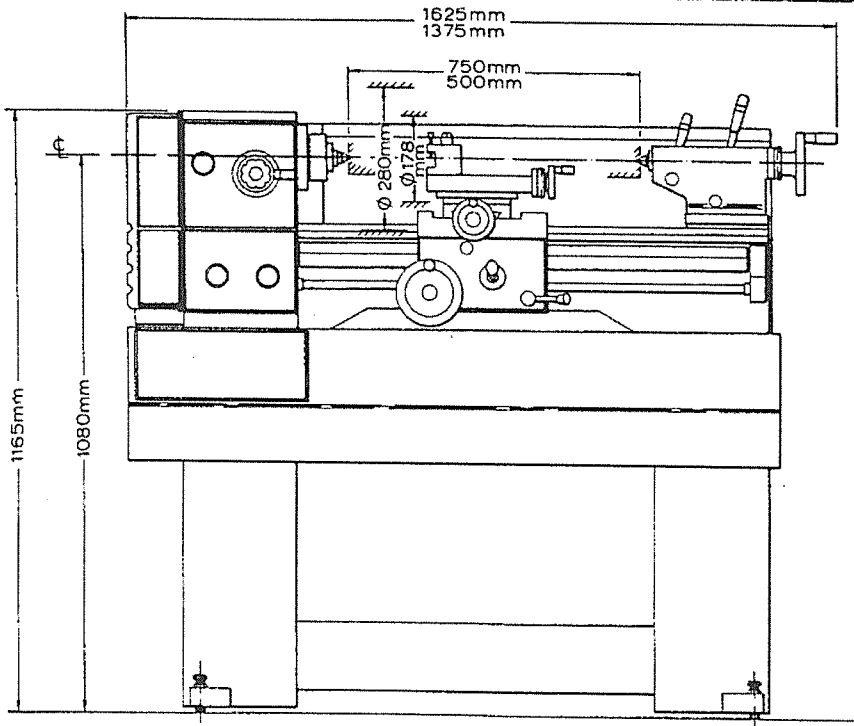
standard equipment

Single Toolpost
 Work Driver Plate
 No. 5/3 Morse Centre Bush
 2 No. 3 M.T. Centres

Spanners, Keys and Oil Gun
 Machine Manual
 & Standard Inspection Certificate

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

Installation



Lifting

The approximate weights of the machine are:-

500mm Model (500 mm/20") between centres - 400 kg (880 lbs)

750mm Model (750 mm/30") between centres - 460 kg (1010 lbs)

The machine should be lifted using a rope sling 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).

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.

Electrical Supply

Power should be supplied through an external fused isolator - recommended fuses being 15 amp for 220 volts supply and 10 amp for 380 to 440 volts supply. External wiring should be of a permanent character and be undertaken by a competent electrician. SEE GENERAL ARRANGEMENT AND FOUNDATION DRAWING FOR CABLE ENTRY.

Line connections and a substantial earth continuity conductor should be connected to the terminal block (SEE ELECTRICAL WIRING DIAGRAM).

If main spindle rotation does not coincide with that indicated by forward/reverse switch at control station, interchange two line connections.

continued

Lubrication (Refer to Lubrication diagram)

Ensure that the headstock, gearbox and apron are filled to the level of the relevant oil sight windows - and oil the cross-slide nut, dials and changewheel stud etc. through the appropriate oil nipples using the oil gun provided.

Running-in

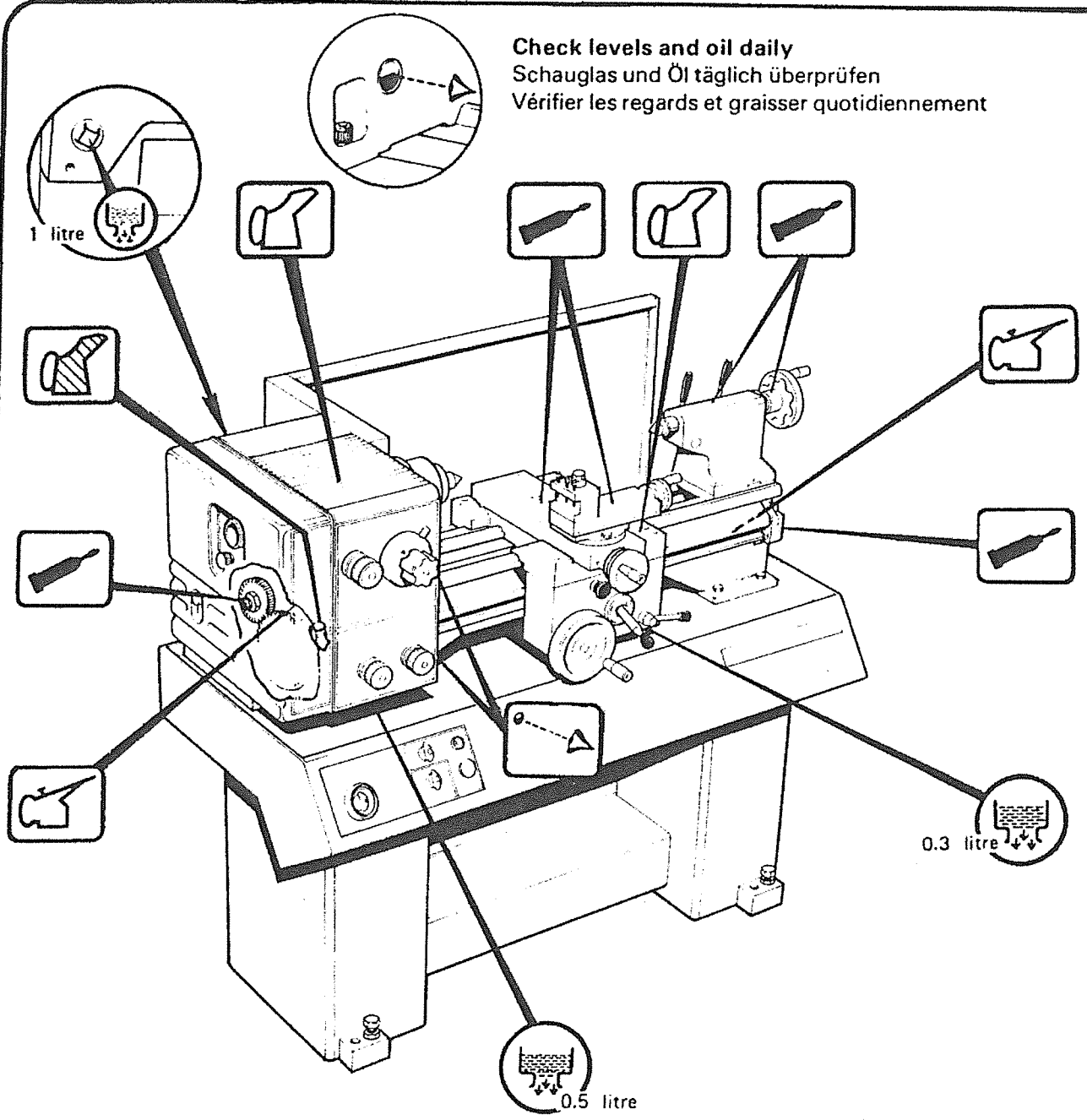
For optimum bearing life and performance it is recommended that high spindle speeds be avoided during the initial life of the machine.

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 260 rpm
then for 1 hour at 550 rpm
then for ½ hour at 750 rpm

Lubrication

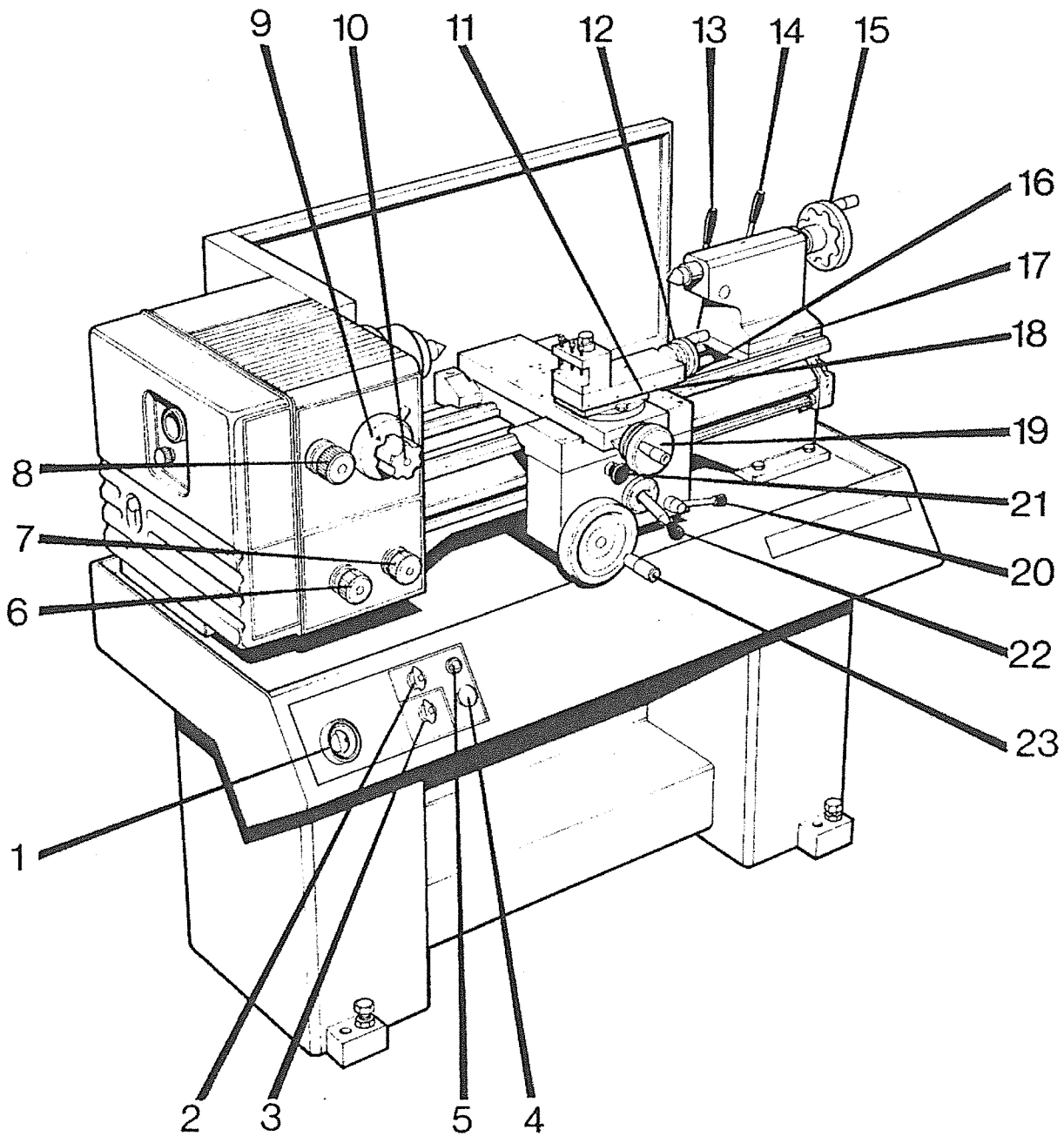
Check levels and oil daily
 Schauglas und Öl täglich überprüfen
 Vérifier les regards et graisser quotidiennement



-
-
-
-

Mobil	BP	Castrol		Esso	Shell	TEXACO
DTE OIL HEAVY MEDIUM	ENERGOL HLP 68 (ISO)	HYSPIM 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



- | | | |
|------------------------------|--|-------------------------------------|
| 1. MAINS ISOLATOR | 9. SPEED SELECTOR LEVER | 17. TAILSTOCK SET-OVER SCREW |
| 2. FORWARD/REVERSE SWITCH | 10. SPEED RANGE SELECTOR DIAL | 18. CARRIAGE LOCK |
| 3. COOLANT ON/OFF SWITCH | 11. TOP SLIDE LOCK | 19. CROSS TRAVERSE HANDLE |
| 4. EMERGENCY STOP PUSHBUTTON | 12. TOP SLIDE TRAVERSE HANDLE | 20. TREADCUTTING ENGAGEMENT |
| 5. START PUSHBUTTON | 13. QUILL LOCK | 21. FEED AXIS SELECTOR |
| 6. FEED SELECTOR | 14. TAILSTOCK CLAMP | 22. FEED ENGAGE |
| 7. FEED SELECTOR | 15. QUILL TRAVERSE HANDWHEEL | 23. LONGITUDINAL TRAVERSE HANDWHEEL |
| 8. FEED DIRECTION SELECTOR | 16. CROSS-SLIDE LOCK (in R.H. side of cross slide) | |

Starting the Machine

1. Ensure that lubrication has been carried out in accordance with the Lubrication diagram.
2. Check that the feed engage lever (22) and thread-cutting lever (20) 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 (21).
Select - Direction of feed - by means of the headstock lower selector (8)
Select - Feed Rate - by referring to the charts on the headstock and selecting (in the sequence listed) the appropriate positions on the gearbox selectors (6) and (7). (Engagement of the feed gears may be assisted by turning the main spindle)
Select ** Spindle speed by turning the speed range selector dial (10) to present the appropriate range i.e. A B or C, then turn the speed selector lever (9) to point to the required speed from the chart.
(Engagement of the drive gears may be assisted by manually turning the spindle)
4. Switch on the electrical supply at the mains isolator (1) which is the red knob at the L.H. end of control station.
5. Select direction of spindle rotation by means of forward/reverse switch (2).
6. Start the spindle by means of start push-button (5).
7. Start and stop the feed motion as required by means of the feed engage lever (22)

Stopping the Machine

The machine may be stopped by the Emergency Stop pushbutton (4).

Operational Notes

FACEPLATES

NOTE MAXIMUM SPEEDS:-

1500 rpm for 260 mm (12") dia.

COARSE SCREWCUTTING/
FEED RANGE 'J'

SHOULD NOT BE USED WITH
SPINDLE SPEEDS ABOVE 750 RPM.

NOTES

** See Installation instructions (RUNNING-IN) if starting the machine for the first time.

continued

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 (23) may be disengaged by pulling it away from the apron face.

Tailstock set over adjustment - is provided in the form of socket screws (17) 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 14)

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.

Leadscrew Drive

Drive to the leadscrew is obtained by first removing the torque limiter cover plate. Then slide the driving sleeve towards the gearbox so engaging the shear pin with the leadscrew shaft. When not in use it is recommended that the leadscrew be disengaged.

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).

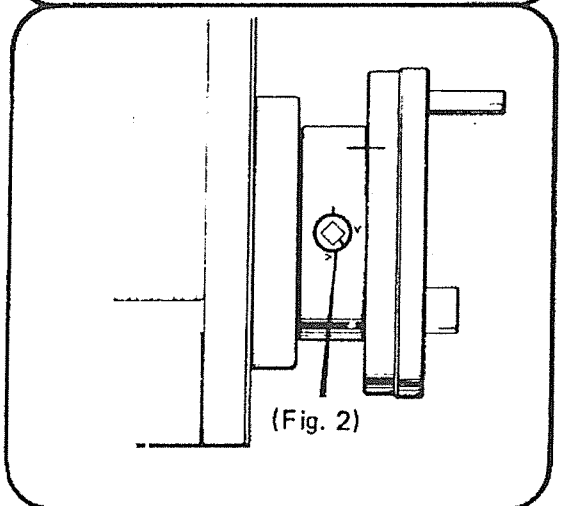
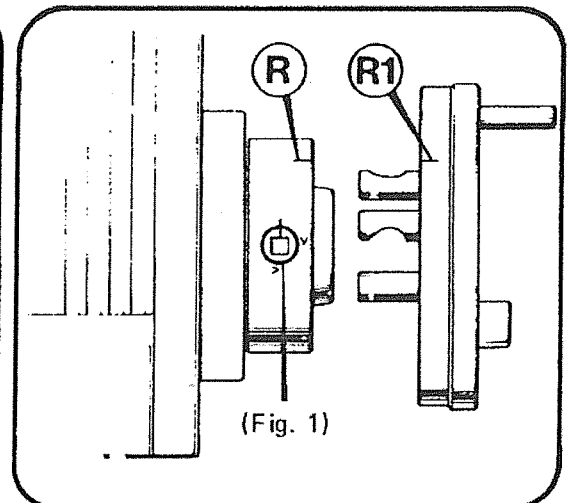
Mount the attachment on to the spindle nose and lock each cam by turning it clockwise using the key provided.

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'

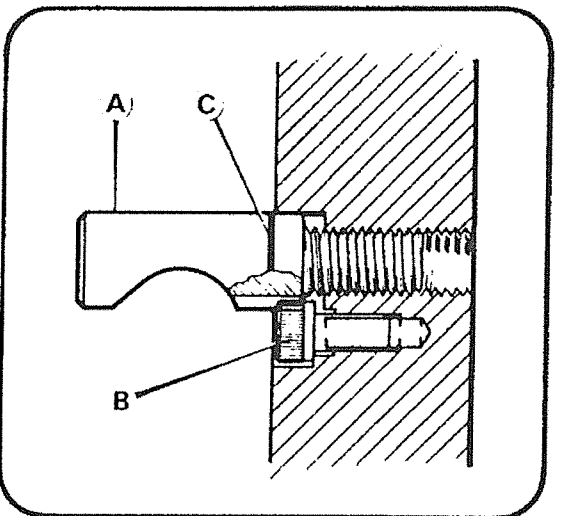
Remove Lockscrew (B).

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.



Spindle Nose

(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 are re-engaged in accordance with the chart mounted on the front face of the dial unit.

METRIC LEADSCREW MACHINES
(METRIC THREADS ONLY)

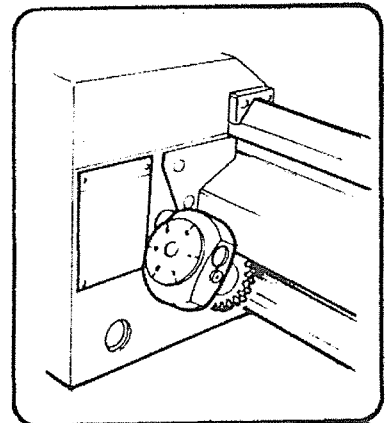
The chart shows:-

- in column 1. mm pitch to be cut.
- in column 2. (☼) The requisite gear of the double pinion should be arranged to mesh with the leadscrew.
- 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

0.25	20	14	1.4	21	135
0.3	20	14	1.5	20	14
0.35	21	135	1.75	21	135
0.4	20	14	2	20	14
0.5	20	14	2.5	20	14
0.6	20	14	3	20	14
0.7	21	135	3.5	21	135
0.75	20	14	4	20	14
0.8	20	14	5	20	14
1	20	14	6	20	14
1.2	20	14	7	21	135
1.25	20	14	8	20	1

ins

4	1-6	11	1-6	28	1-6
4½	135	12	1-6	30	1-6
5	1-6	14	1-6	32	1-6
5½	135	15	1-6	36	1-6
6	1-6	16	1-6	38	1-6
6½	135	18	1-6	40	1-6
7	1-6	19	1-6	44	1-6
7½	135	20	1-6	48	1-6
8	1-6	22	1-6	52	1-6
9	1-6	24	1-6	54	1-6
9½	135	26	1-6	56	1-6
10	1-6	27	1-6	60	1-6

(B) ENGLISH THREADS on METRIC LEADSCREW MACHINES
or
METRIC THREADS on ENGLISH LEADSCREW MACHINES
or
ALL THREADS ON MACHINES NOT FITTED WITH THREAD INDICATOR

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 reverse switch (2) 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).

Thread – cutting

Lathe Safety

Every effort has been made in the design and production of the M250 lathe to comply with statutory safety requirements and to provide a fundamentally safe machine tool. Its safety features include:-

Covered leadscrew

Torque limiter on Feed Shaft

Fail-Safe switch operates if End Guard removed.

Shear Pin for leadscrew

Interlock in Apron prevents simultaneous engagement of feed shaft and leadscrew.

In the further interests of safety, attention should be given to the following notes:-

A. Machine Capacity

The dimensions of a component which can be accommodated on the M250 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.

B. Lathe Safety Rules

- (1) Read and understand operation notes before attempting to use the machine.
- (2) Keep lathe work areas clean.
- (3) Keep area surrounding machine tidy.
- (4) ENSURE YOU KNOW HOW TO STOP THE MACHINE BEFORE STARTING IT.
- (5) Do not interchange chucks or other spindle mounting items between lathes without checking for correct locking (see operational notes).
- (6) Use only 'high speed' chucks.
- (7) Note maximum permissible speeds of faceplates (see operational notes).
- (8) Remove chuck key immediately after use.
- (9) Check load capacity of revolving centres.
- (10) Ensure workpiece guards are in position before starting machine.
- (11) Do not use cracked or chipped tools.
- (12) Check —
 - Spindle speed selected.
 - Feed rate selected.
 - Direction of feed, and that
 - Feed & thread cutting levers are disengaged before starting the spindle.
- (13) STOP MACHINE IMMEDIATELY ANYTHING UNEXPECTED HAPPENS.
- (14) Do not use coarse feed range on high spindle speeds (see operational notes).
- (15) Do not change spindle speeds when spindle is rotating.
- (16) Do not touch revolving chuck, spindle, or workpiece.
- (17) Do not remove work from the machine without retreating the tool to a safe position.
- (18) Stop motors and switch off isolator when leaving machine unattended.

C. Personal Safety Rules

- (1) Report any accident, however small, immediately it happens.
- (2) Wear safety glasses.
- (3) Wear safety shoes.
- (4) Use barrier creams provided.
- (5) Wear your overalls buttoned up.
- (6) Roll sleeves up, or button the cuffs.
- (7) Keep hair short or wear a cap.
- (8) Use the correct size spanners at all times.
- (9) Be careful of, and remove if possible, burrs and sharp edges.
- (10) Use the correct type of sling when lifting workpieces, of the correct safe working load and ensure it is not worn or damaged.
- (11) Stand clear when lifting workpieces or equipment by crane.
- (12) Obtain assistance when mounting heavy or awkwardly shaped workpieces.
- (13) **Do not** wear rings, watches, ties, etc.
- (14) **Do not** keep tools (scribers, etc.) in overall pockets.
- (15) **Do not** remove guards unless machine is stationary.
- (16) **Do not** wash hands in coolant.
- (17) **Do not** remove swarf with bare hands, use a rake or brush.
- (18) **Do not** manually lift heavy equipment.
- (19) **Do not** use files, scrapers, etc. without handles.
- (20) **Do not** lean on the machine.
- (21) **Do not** interfere with electrical equipment.

Maintenance

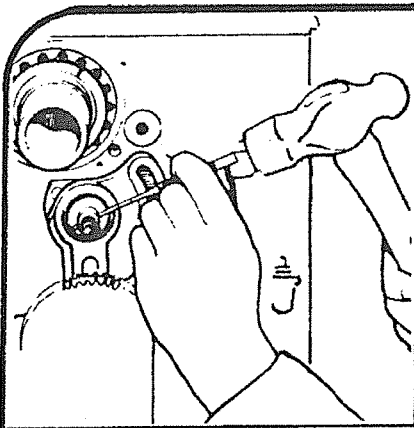


FIG. 1

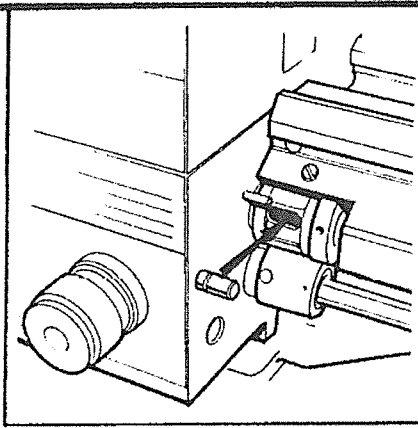


FIG. 2

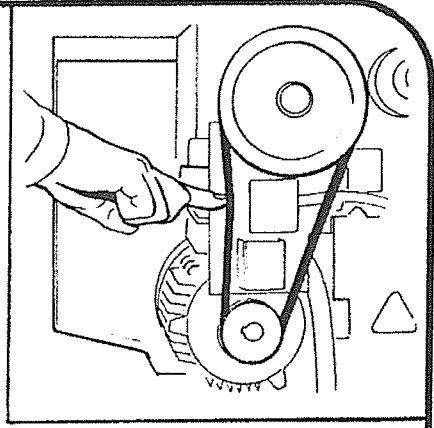


FIG. 3

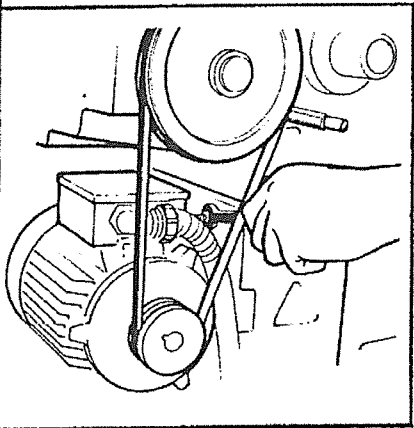


FIG. 4

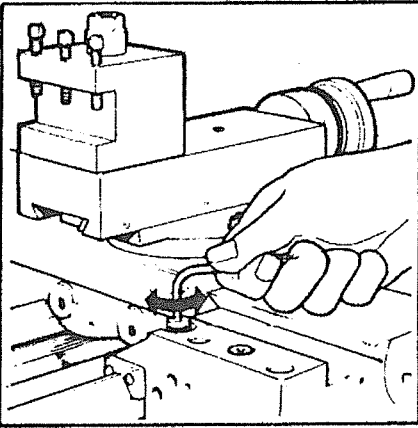


FIG. 5

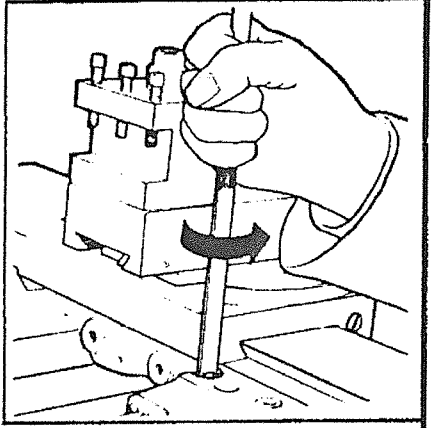
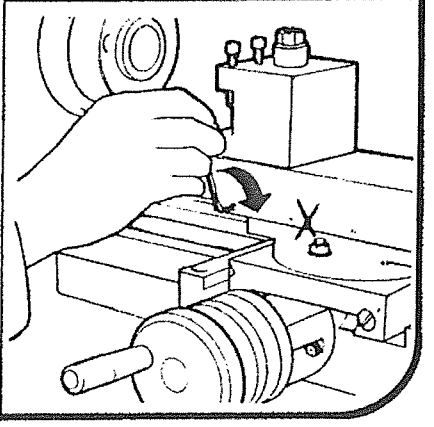
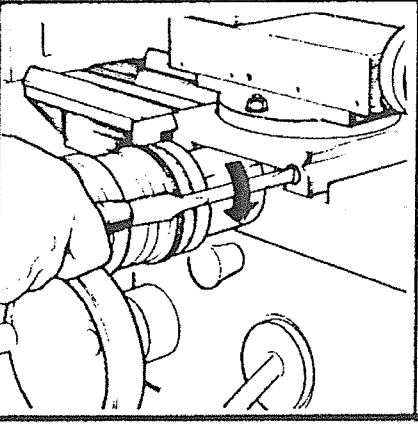
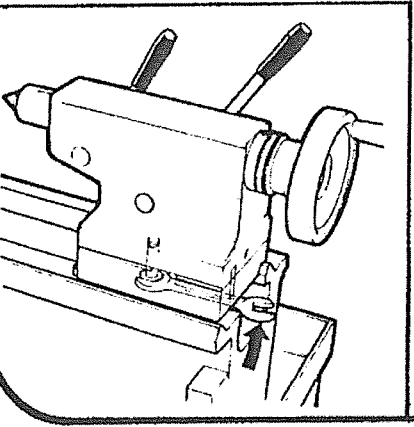


FIG. 6

FIG. 7

FIG. 8

FIG. 9



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.

Leadscrew Shear Pin (Fig.2)

A shear pin device is incorporated on the leadscrew adjacent to the gearbox, as protection against overload. Instructions for replacing the shear pin are as follows:-

Remove the torque limiter cover plate.

Disengage shear pin assembly by sliding away from gearbox face.

Rotate spring steel cover on its locating sleeve until access slot is exposed.

Release M5 dog-point set screw in sleeve and rotate sleeve and cover until shear pin is exposed through slot.

Replace shear pin as shown in illustration (2) and re-assemble ensuring that the dog point of the M5 set screw is correctly located.

Drive Belts (Fig. 3 and 4)

Access to the Drive Belt is gained by removal of the moulded end guard when vee Belt tension may be assessed by applying finger pressure on the belt at a point midway between the two pulleys (fig. 3). For correct tension a deflection of about 10 mm should be possible.

To adjust the vee belt tension – release the lock nut on the adjusting screw (fig. 4) to increase tension, tighten screw against the bed until correct tension is obtained then re-tighten lock nut.

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. 5 and 6)

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. 7)

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. 8)

Wear on the taper-gib strip may be adjusted 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.

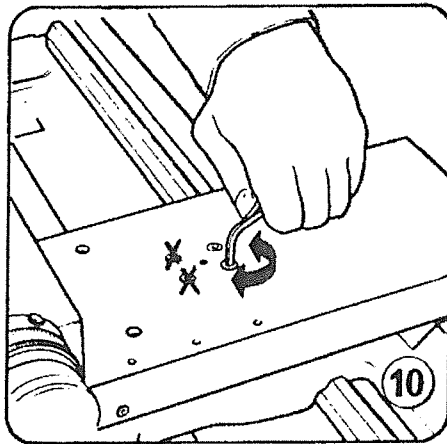
Top Slide (Fig. 9)

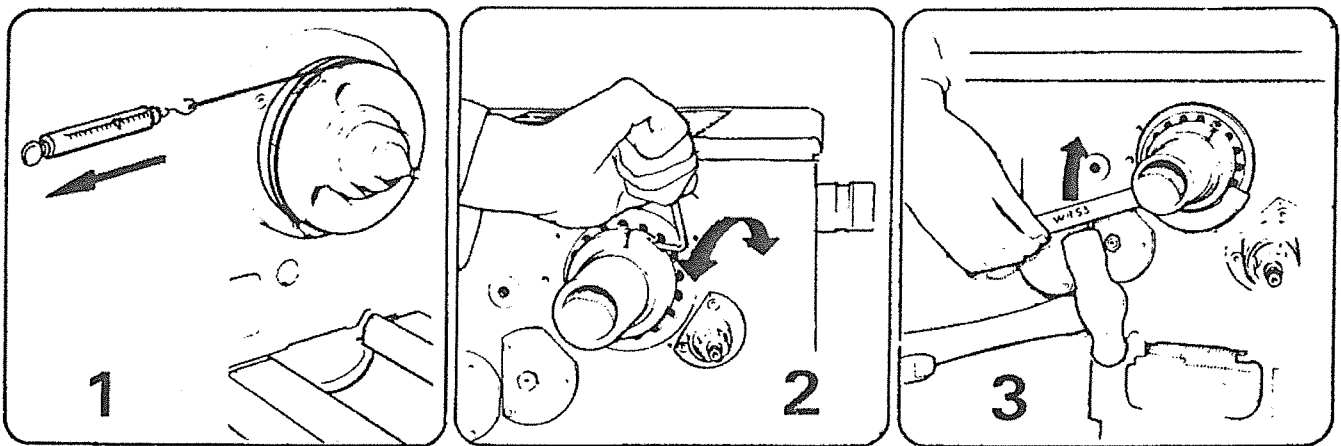
Take up for wear on the top slide strip is by means of the four (self-locking) socket set screws in the front face of the top slide casting.

Cross-slide Nut (Fig. 10)

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

Release only the rear pair of socket cap head screws in the top face of the cross-slide, which allows a spring loaded device to automatically remove backlash. Re-tighten cap head screws.





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

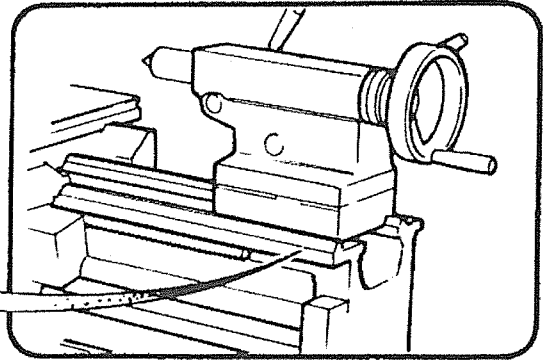
Remove end drive guard, changewheels, swing frame and rear bearing cover.

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 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.

500

or

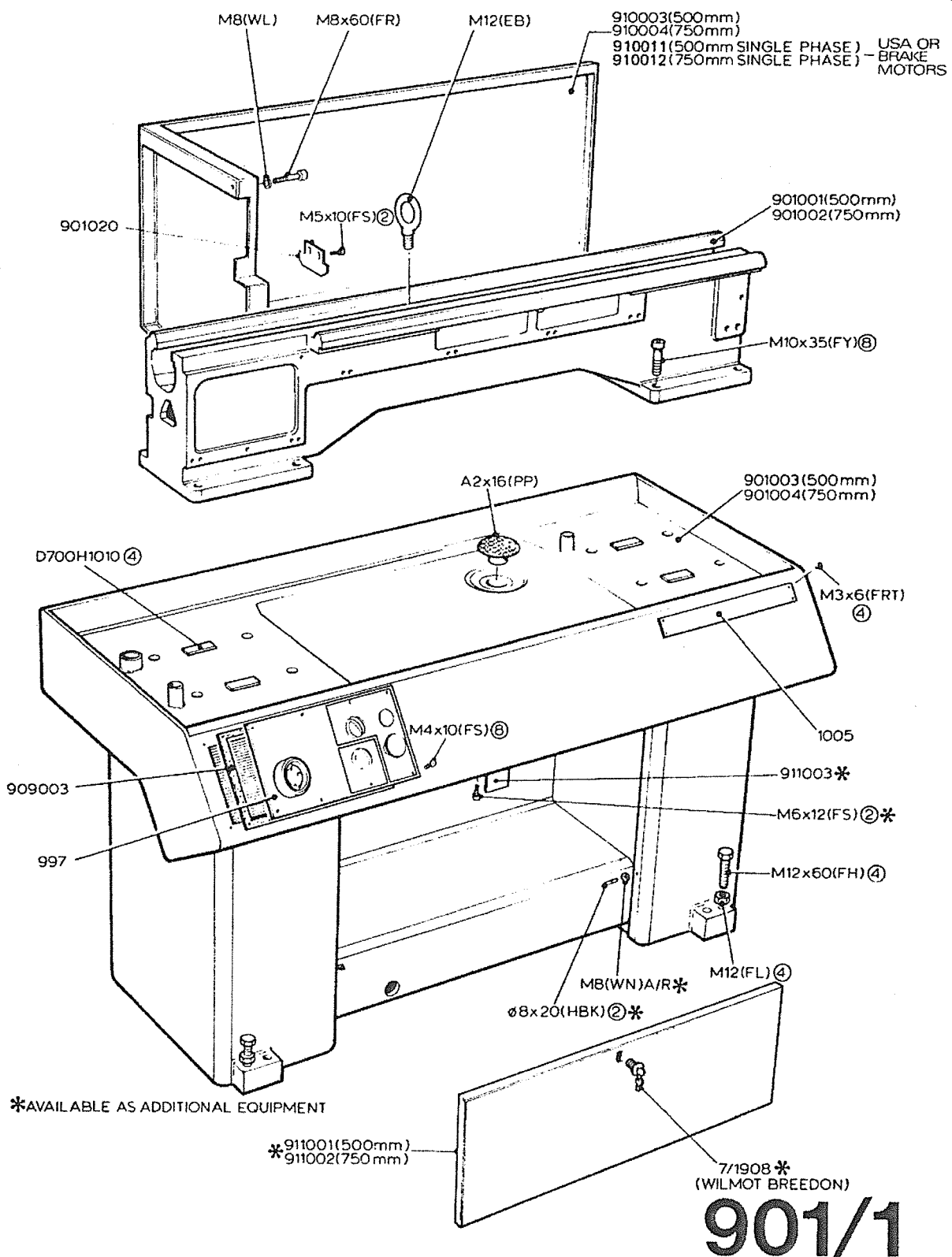
750

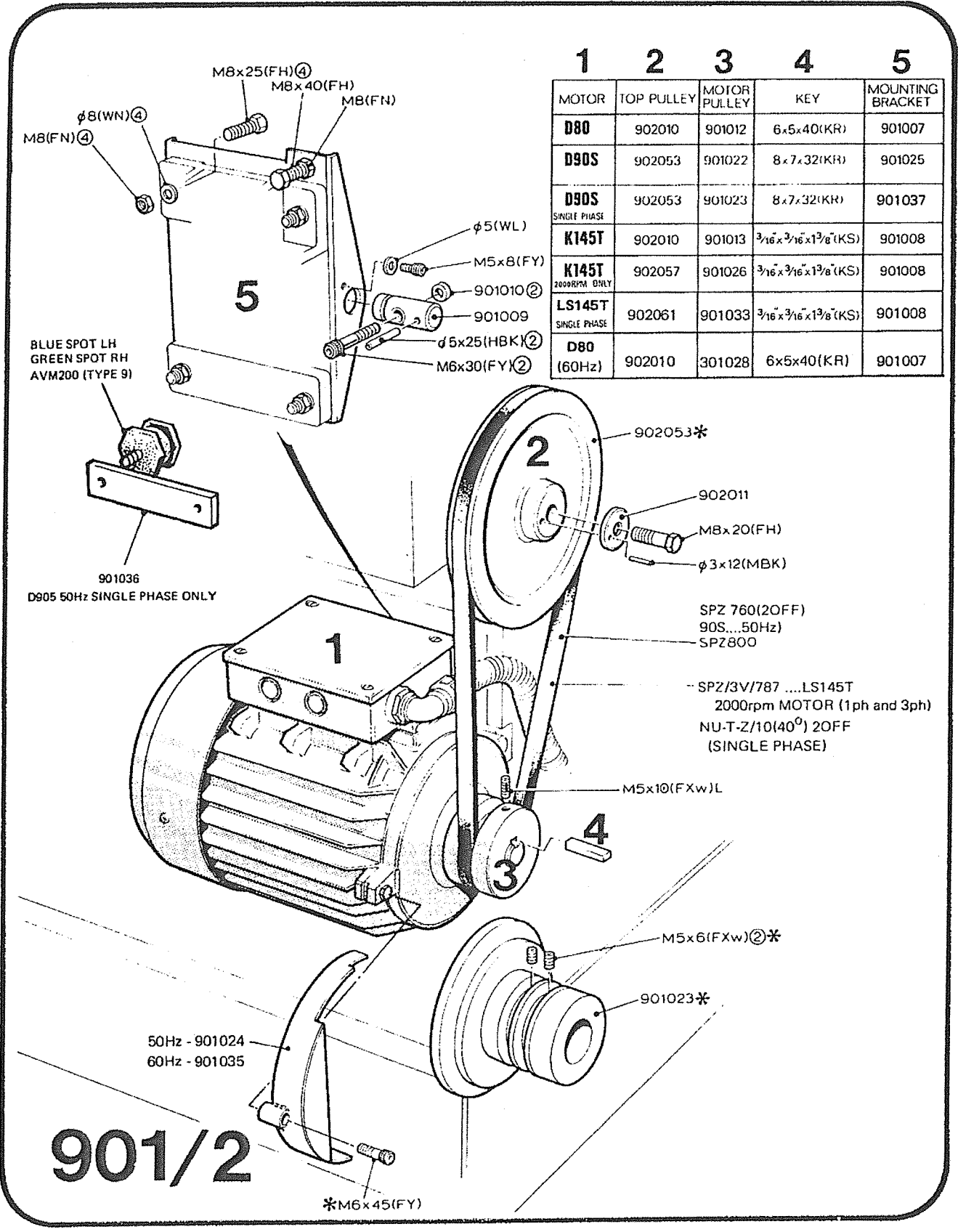
Standard/Proprietary Parts (i.e. items which can be purchased from local Engineering suppliers) may be identified by the "bracketed" letter code included in the Part Number, and reference to the appendix at the end of this manual will provide a full description of such items.

Parts Section

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	1	2	3	4	5
	MOTOR	TOP PULLEY	MOTOR PULLEY	KEY	MOUNTING BRACKET
	D80	902010	901012	6x5x40(KR)	901007
	D90S	902053	901022	8x7x32(KR)	901025
	D90S	902053	901023	8x7x32(KR)	901037
	K145T	902010	901013	3/16"x3/16"x13/8"(KS)	901008
	K145T 2000RPM ONLY	902057	901026	3/16"x3/16"x13/8"(KS)	901008
	LS145T SINGLE PHASE	902061	901033	3/16"x3/16"x13/8"(KS)	901008
	D80 (60Hz)	902010	301028	6x5x40(KR)	901007

901/2

1035-METRIC THREAD ENGLISH GEAROX
993-ENGLISH THREAD METRIC GEARBOX)

1037(METRIC)
1038(ENGLISH)

901019

ø6x40(HBK)

(24CE31-C3 (USA) KB5EQR
(BURGESS) 901014

M5x10(FS) ③

M3(FN) ②

M5(FN) ②

ø5(WN) ②

901015

M5x40
(FY) ②

M3x25(FV) ②

TYPE D/MB(WSS)

ø4x22
(MBK)

ø8x08(CE)

901017

M5(FN)

ø5(WN)

901016

M5xø6x12(FU)

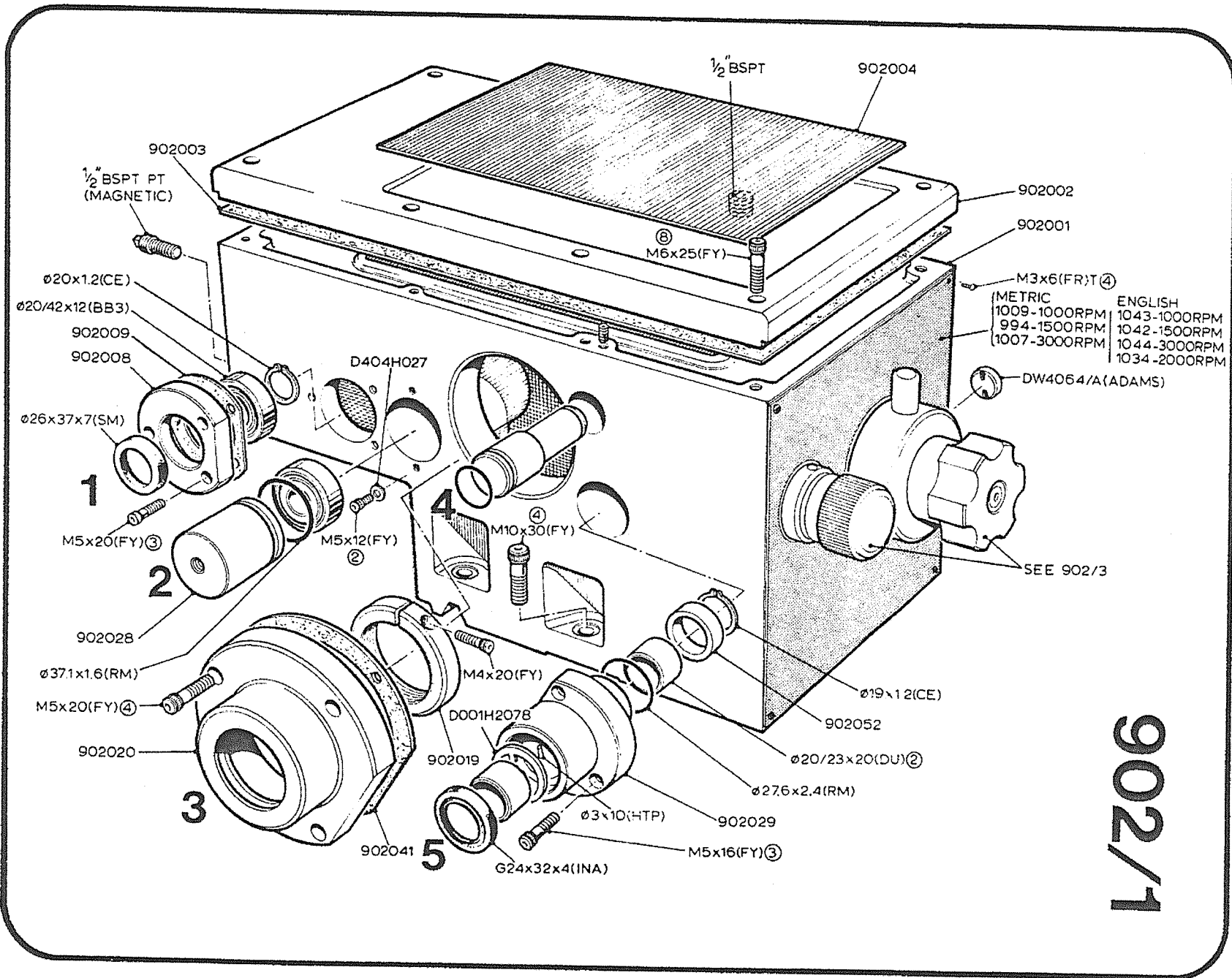
901021

D112H2009

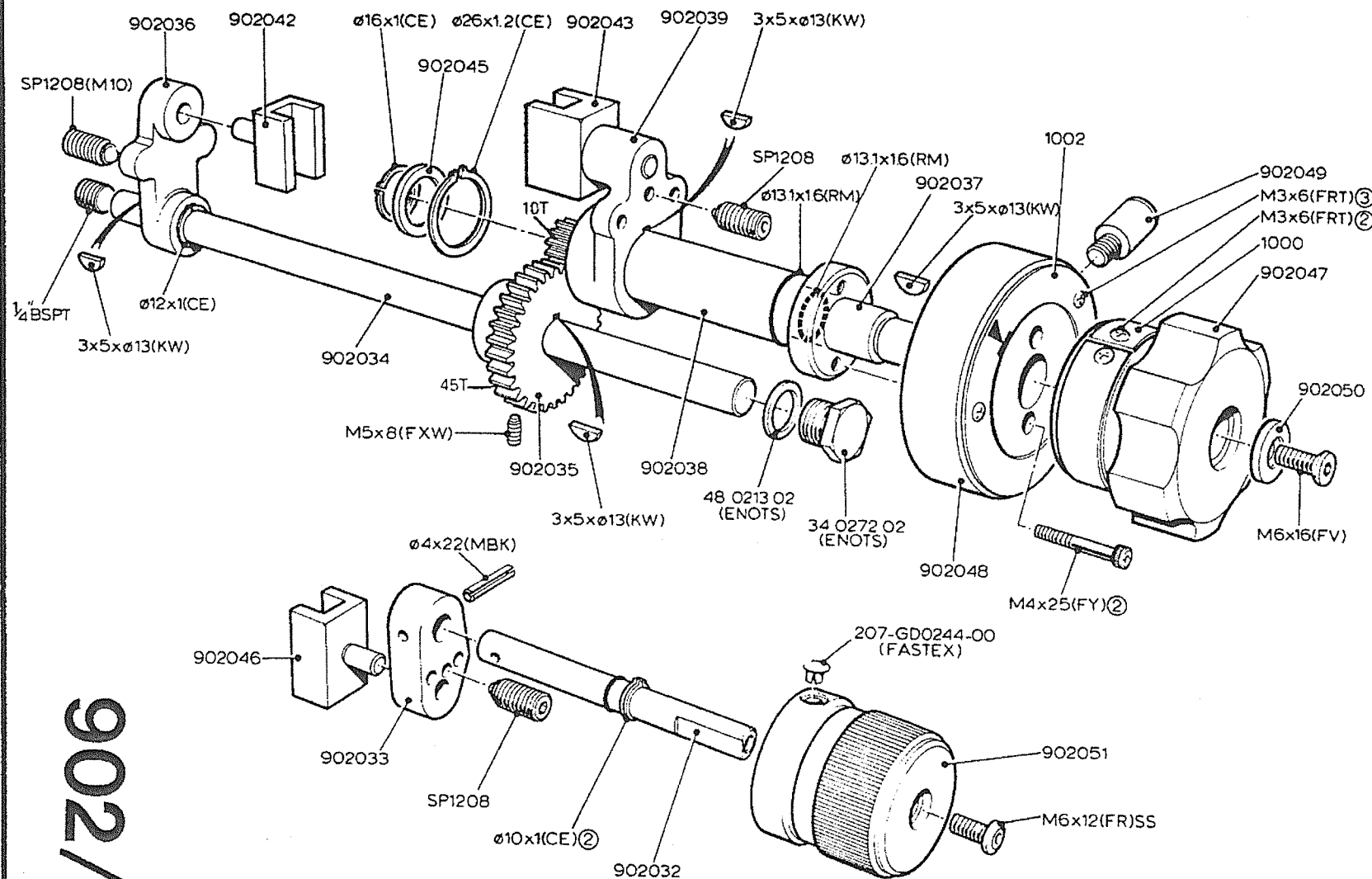
M5x6(FXW)

901018

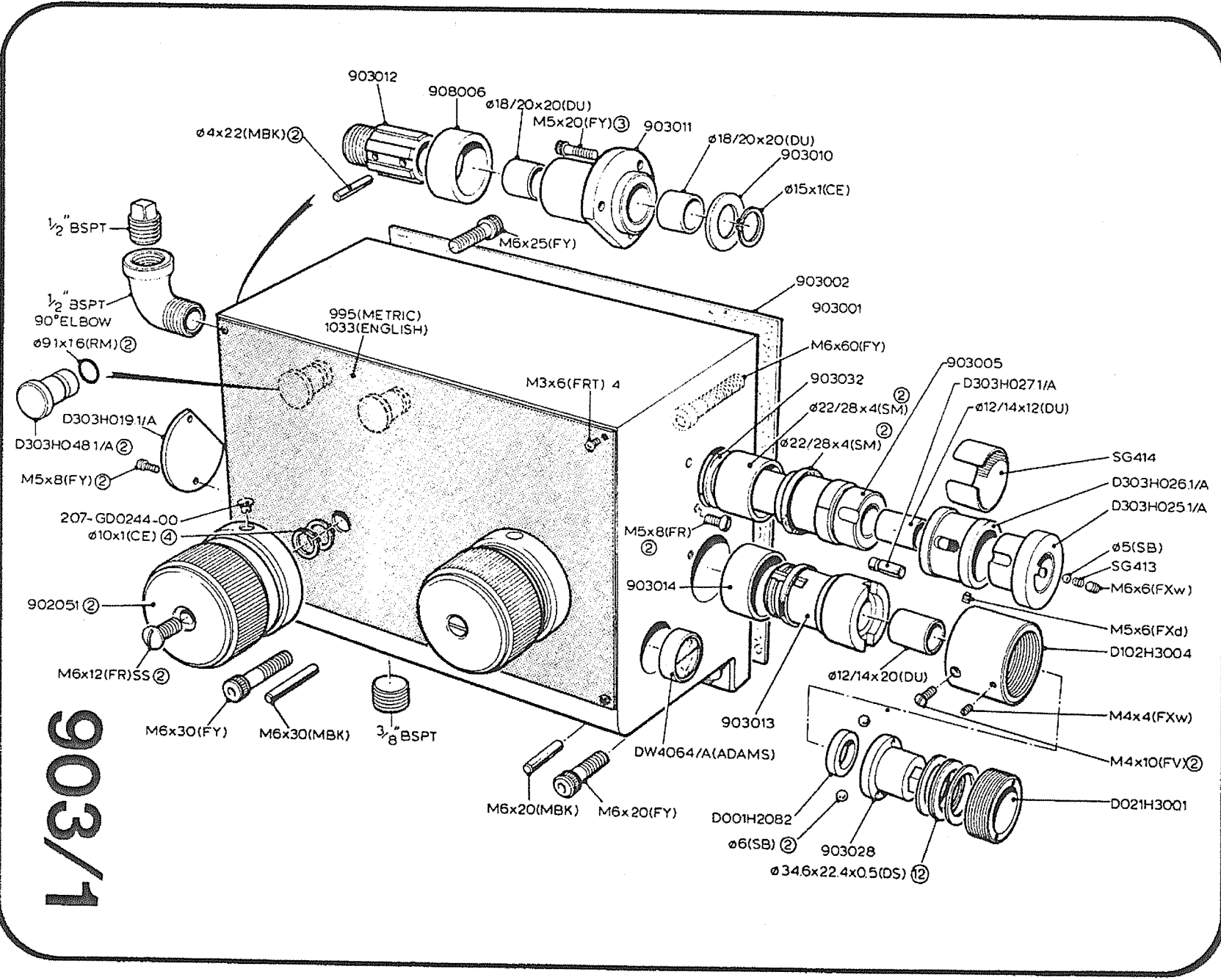
901/3



902/1



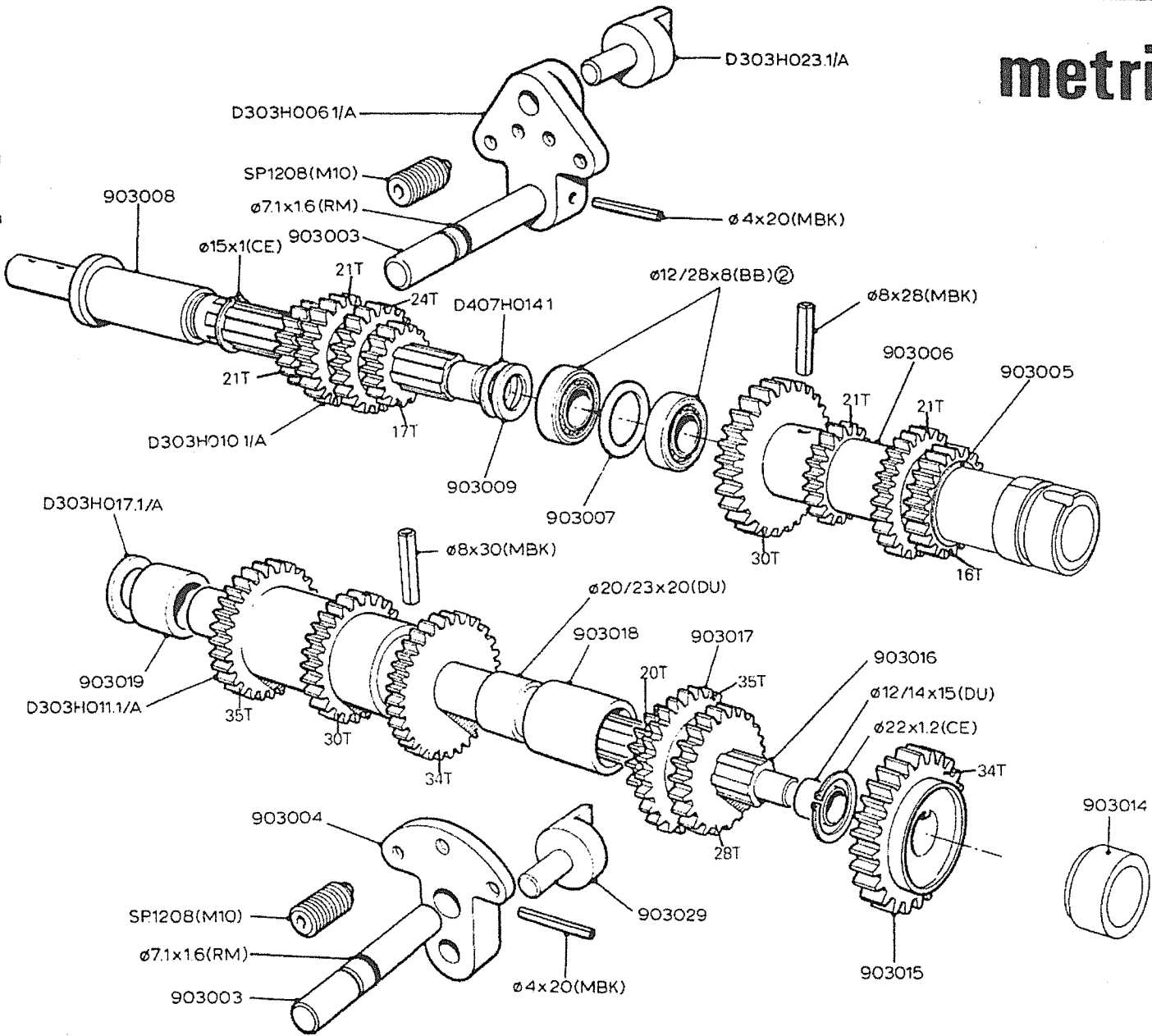
902/3



903/1

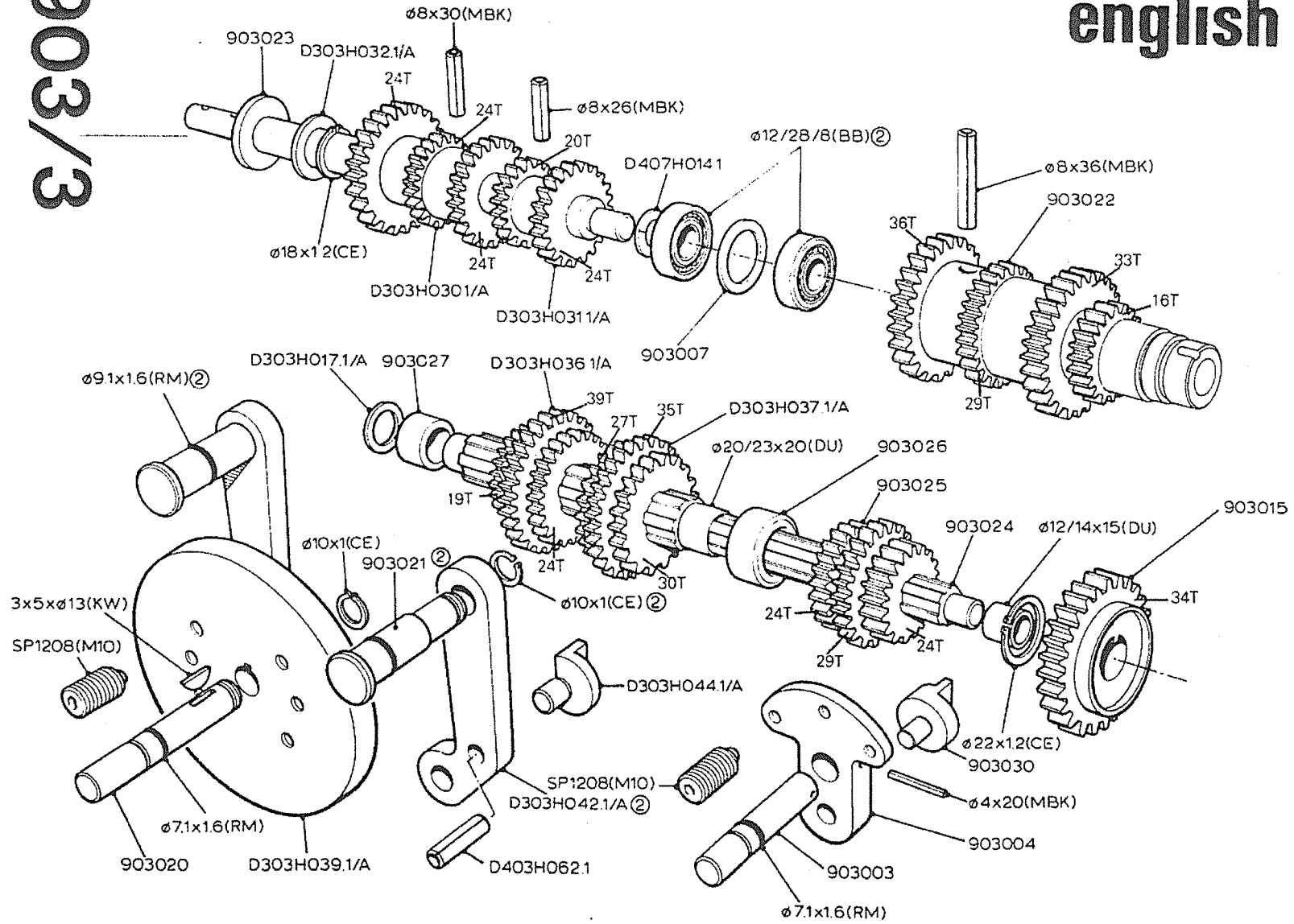
903/2

metric

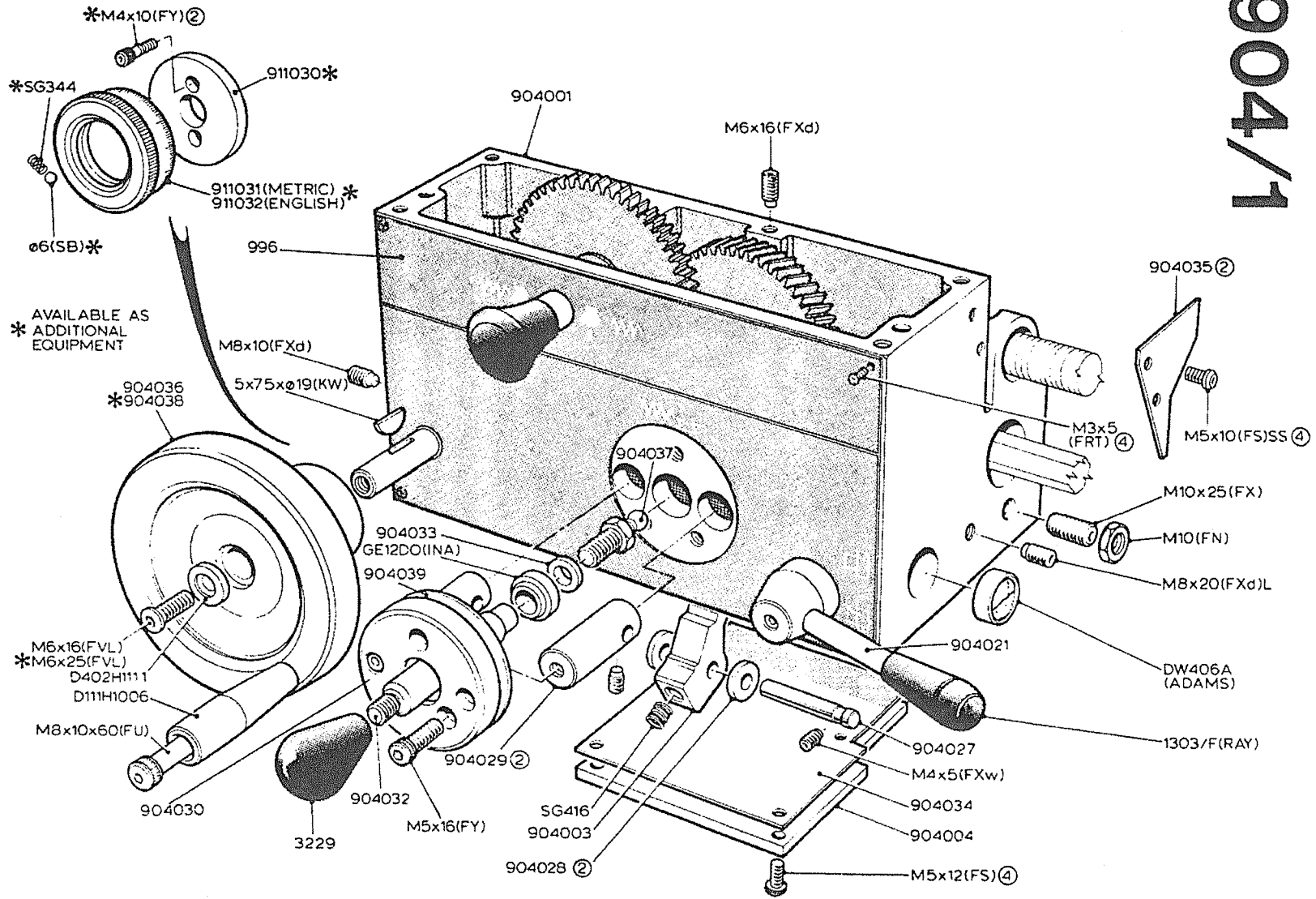


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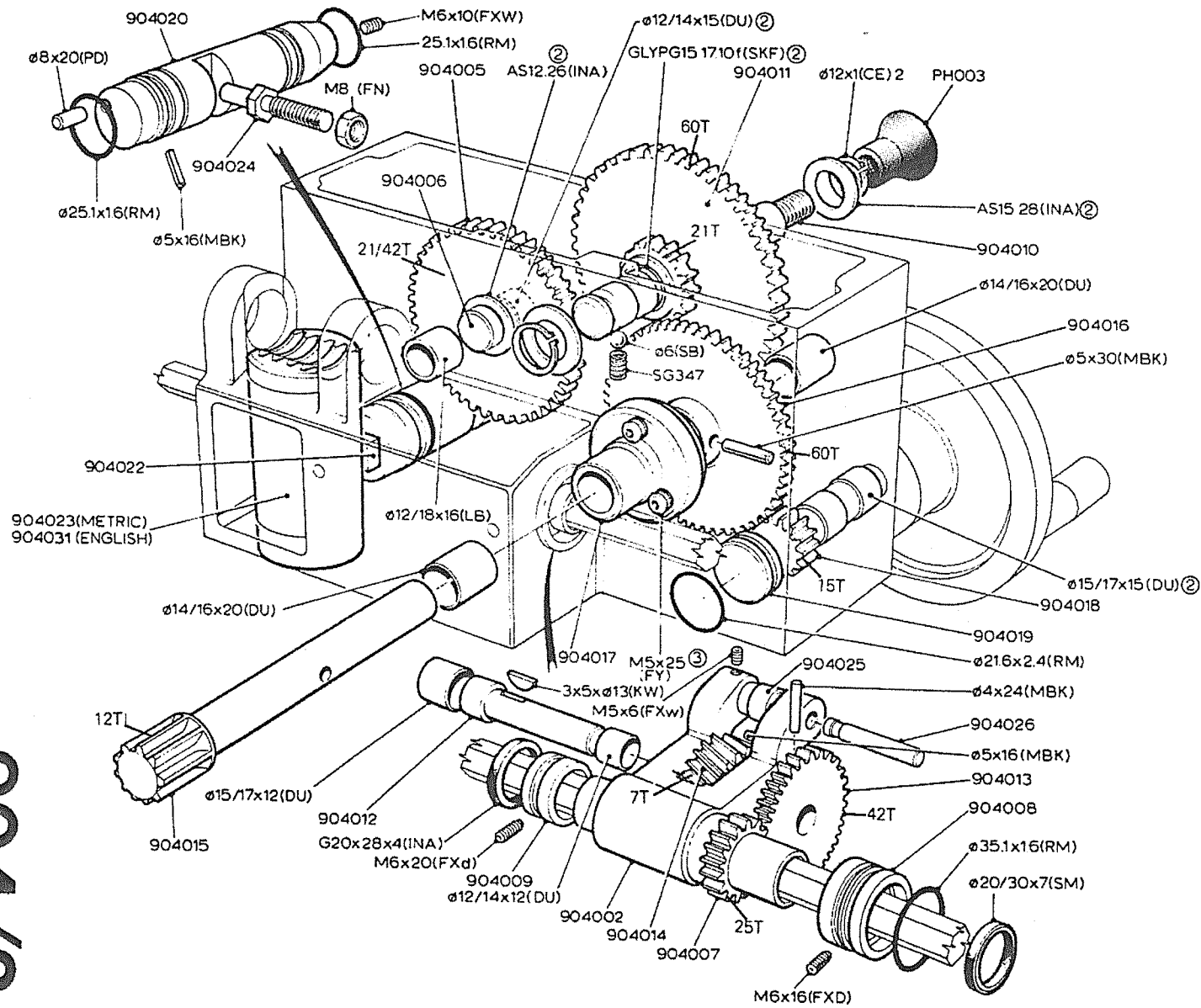
english



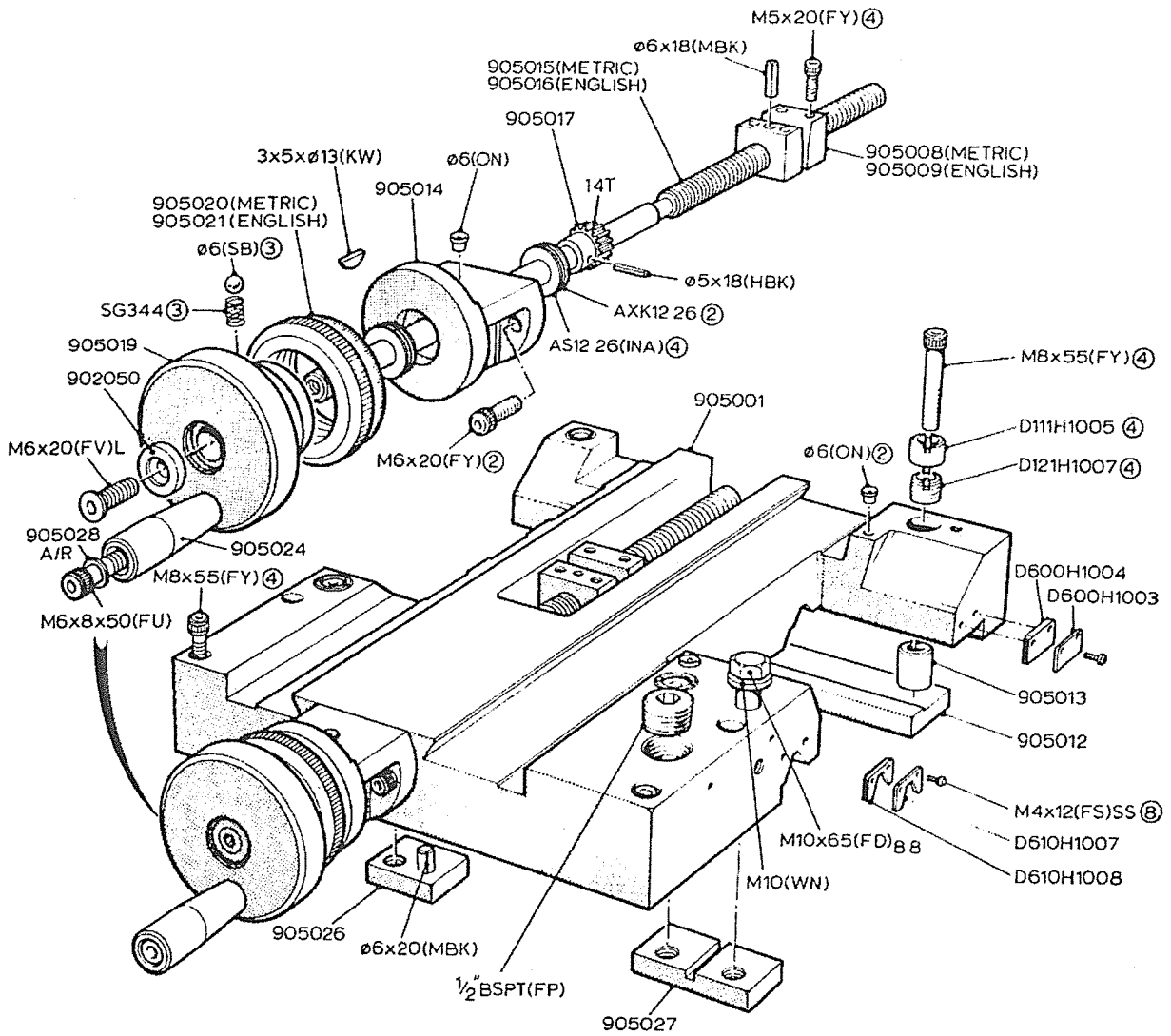
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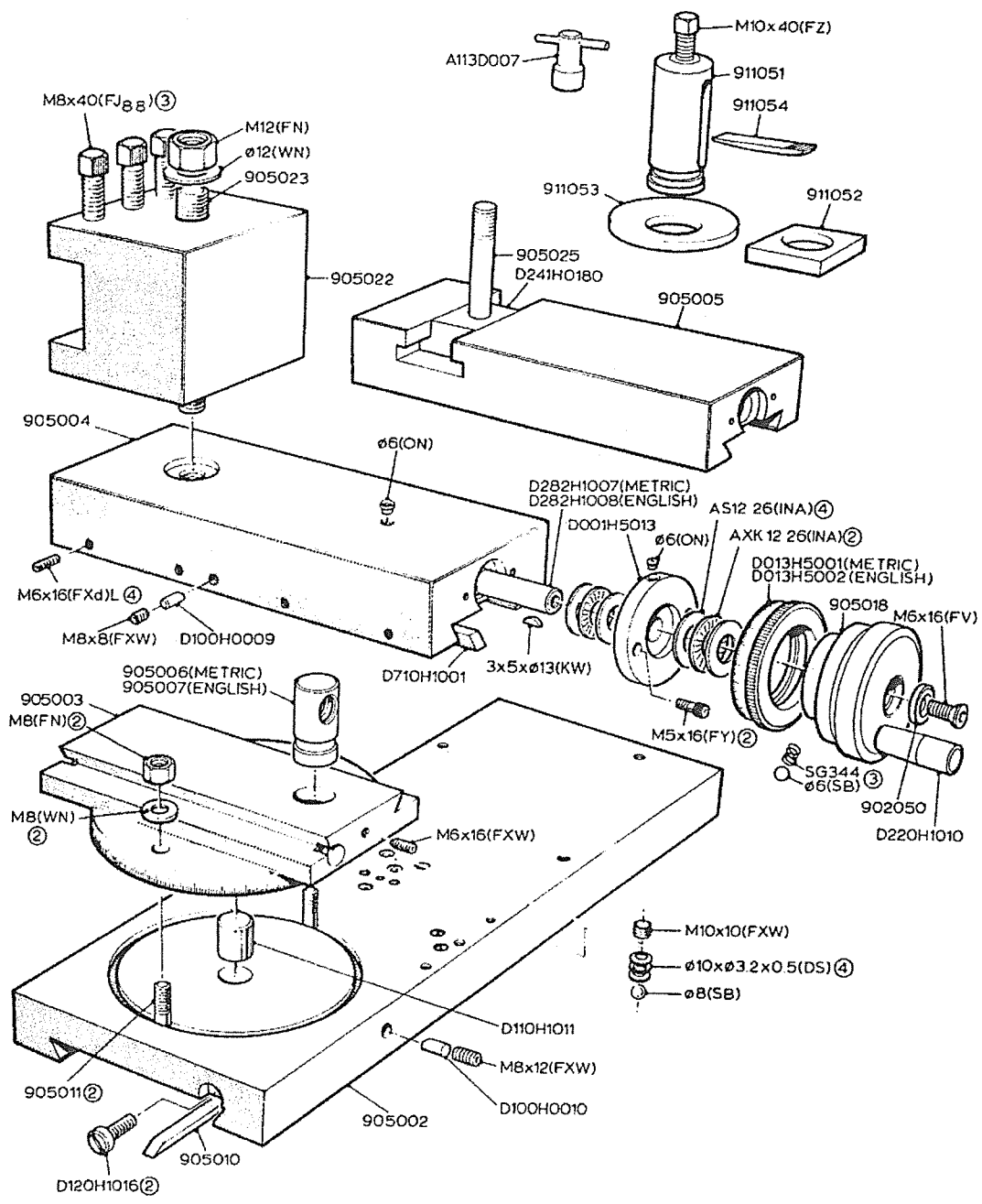


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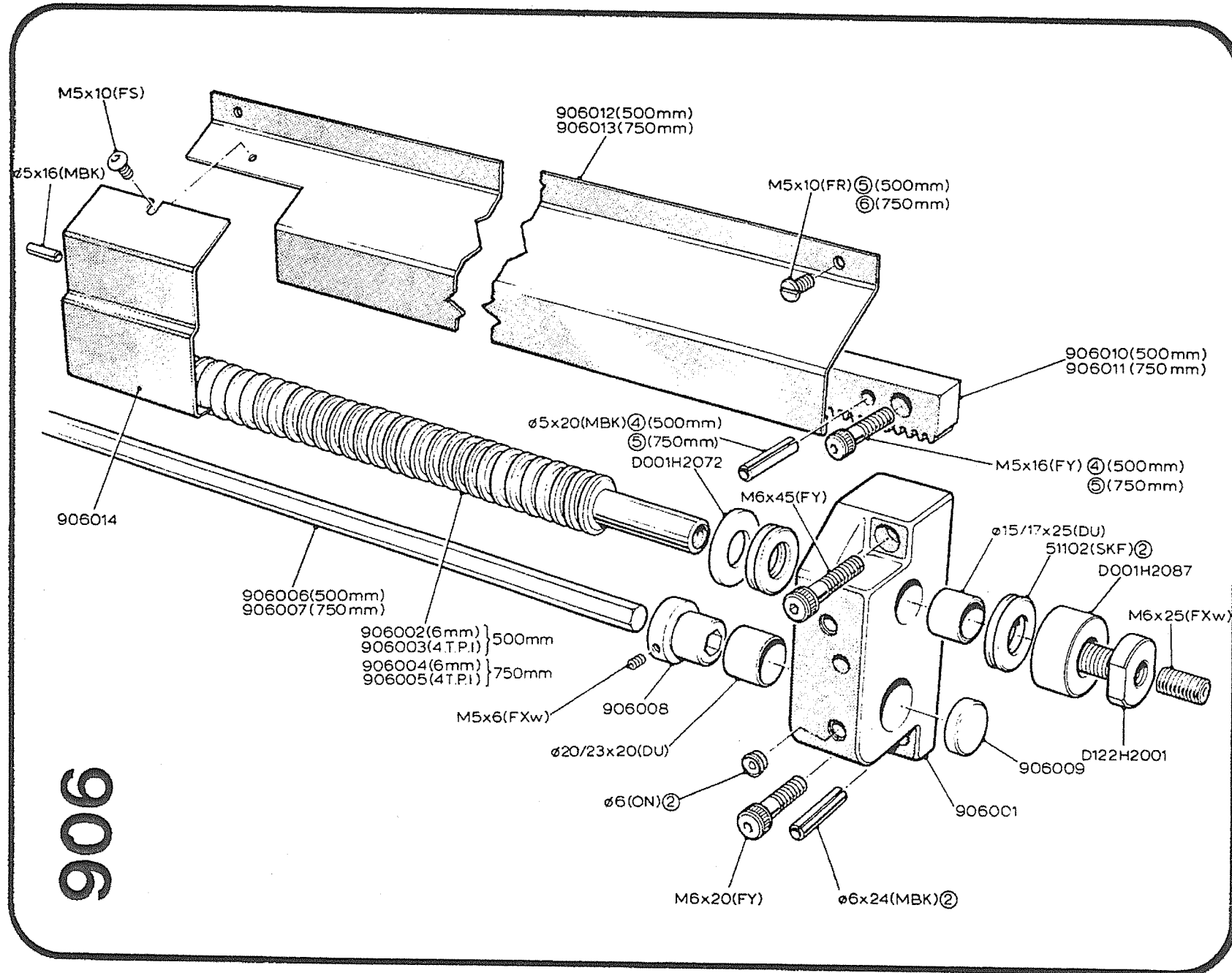


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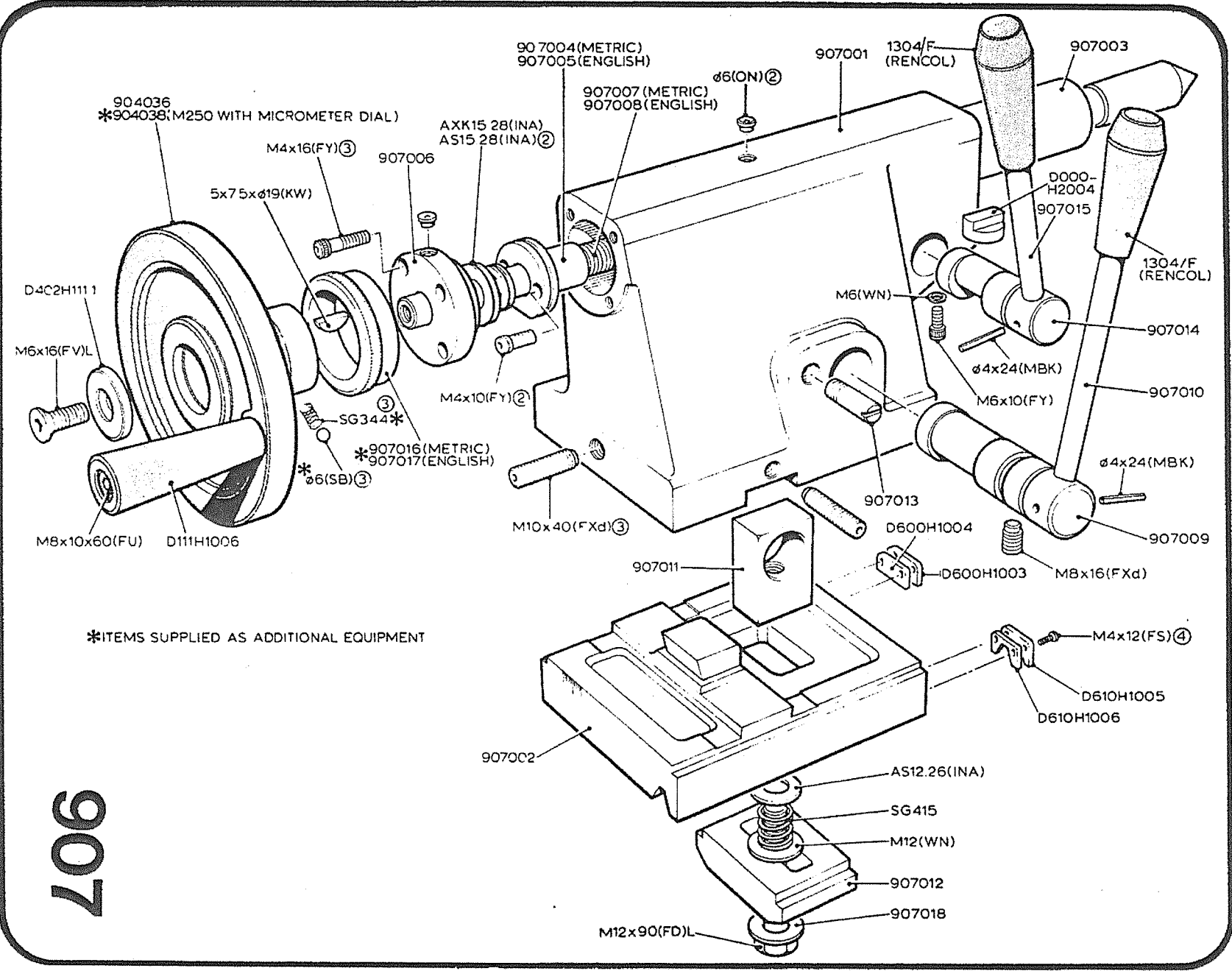




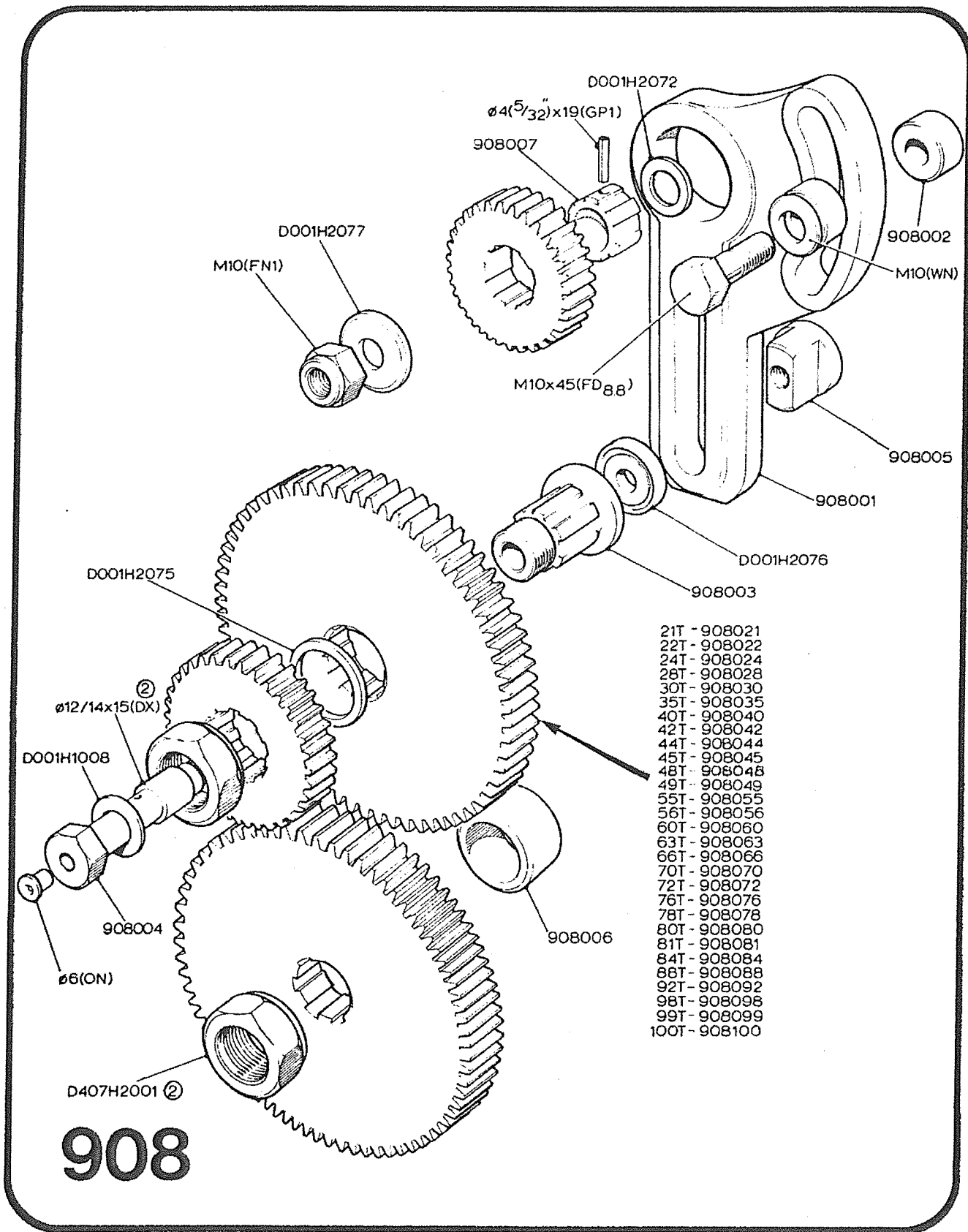
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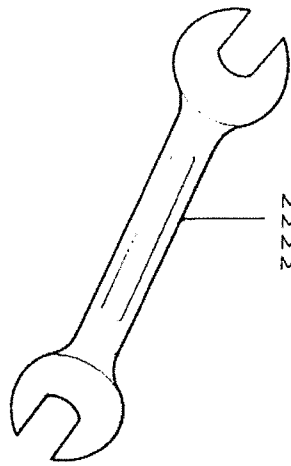


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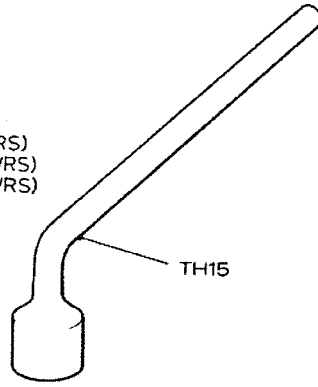


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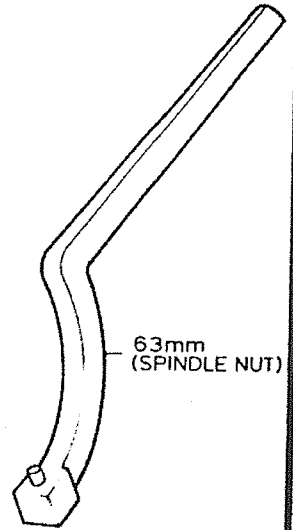




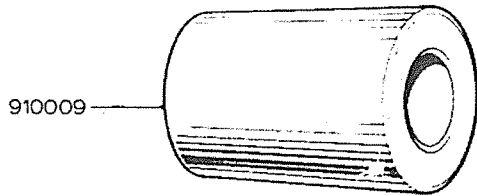
M8/13mm x 15mm (WRS)
M10/17mm x M12/19mm (WRS)
M14/22mm x M16/24mm (WRS)
M18/27mm x M22/32mm (WRS)



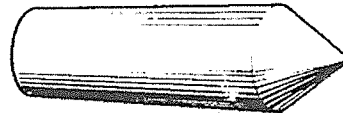
TH15



63mm
(SPINDLE NUT)



910009



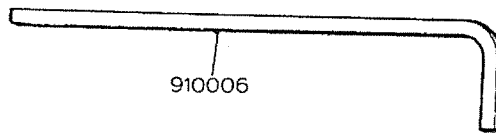
L5-585A

910001

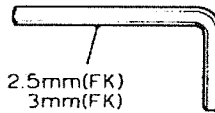
D101H2094

M12x25
(FY)

D220H1013



910006

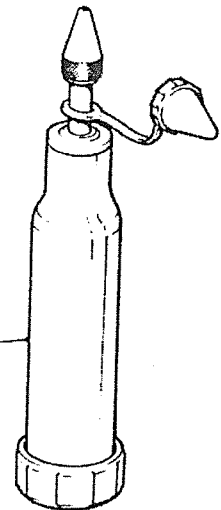


2.5mm (FK)
3mm (FK)
4mm (FK)
5mm (FK)
6mm (FK)
8mm (FK)

M6x12 (FY) ③

910005 ③

F60
(OIL GUN)



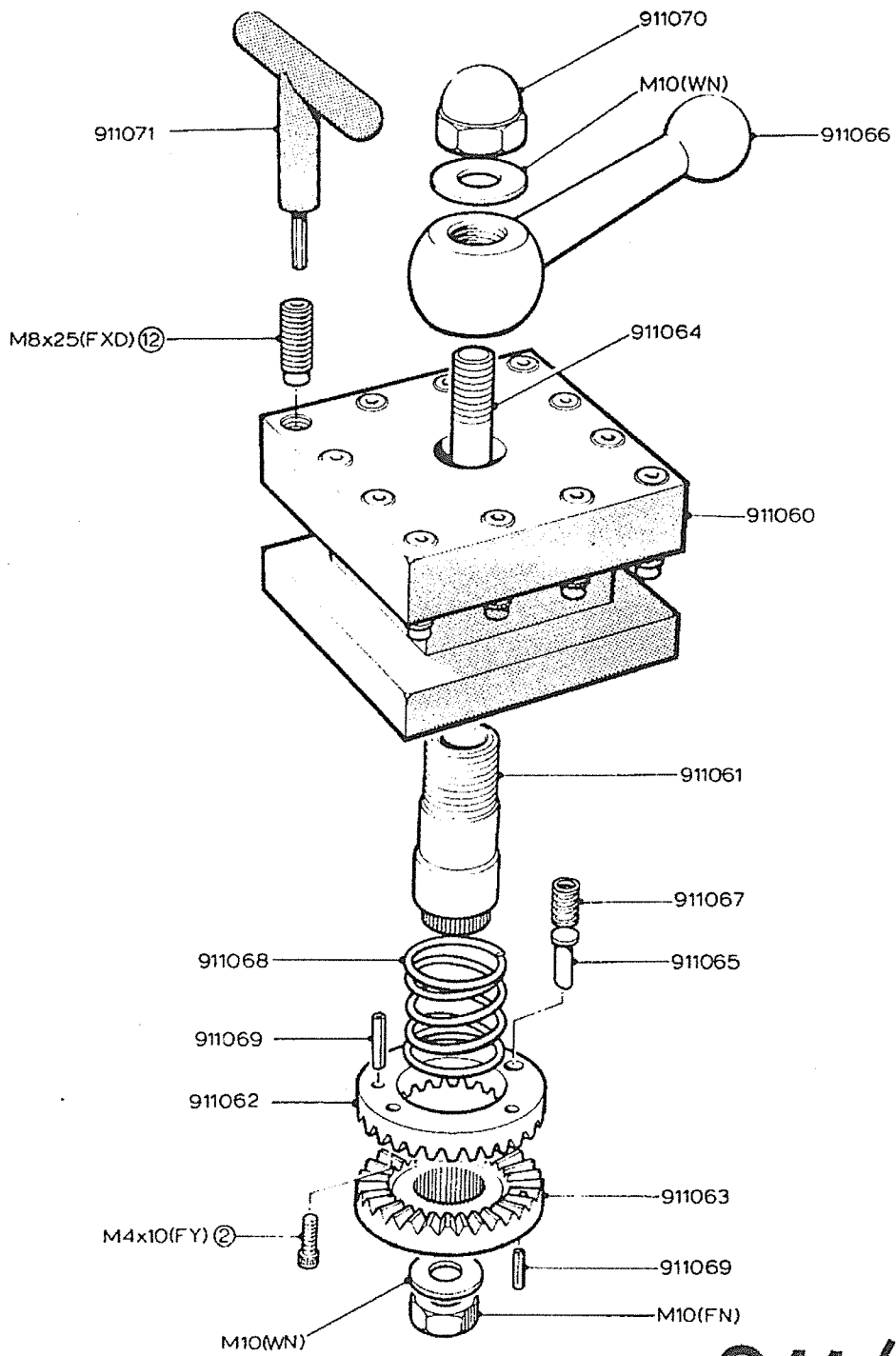
910

Additional Equipment

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911.67	Thread dial indicator assembly	53
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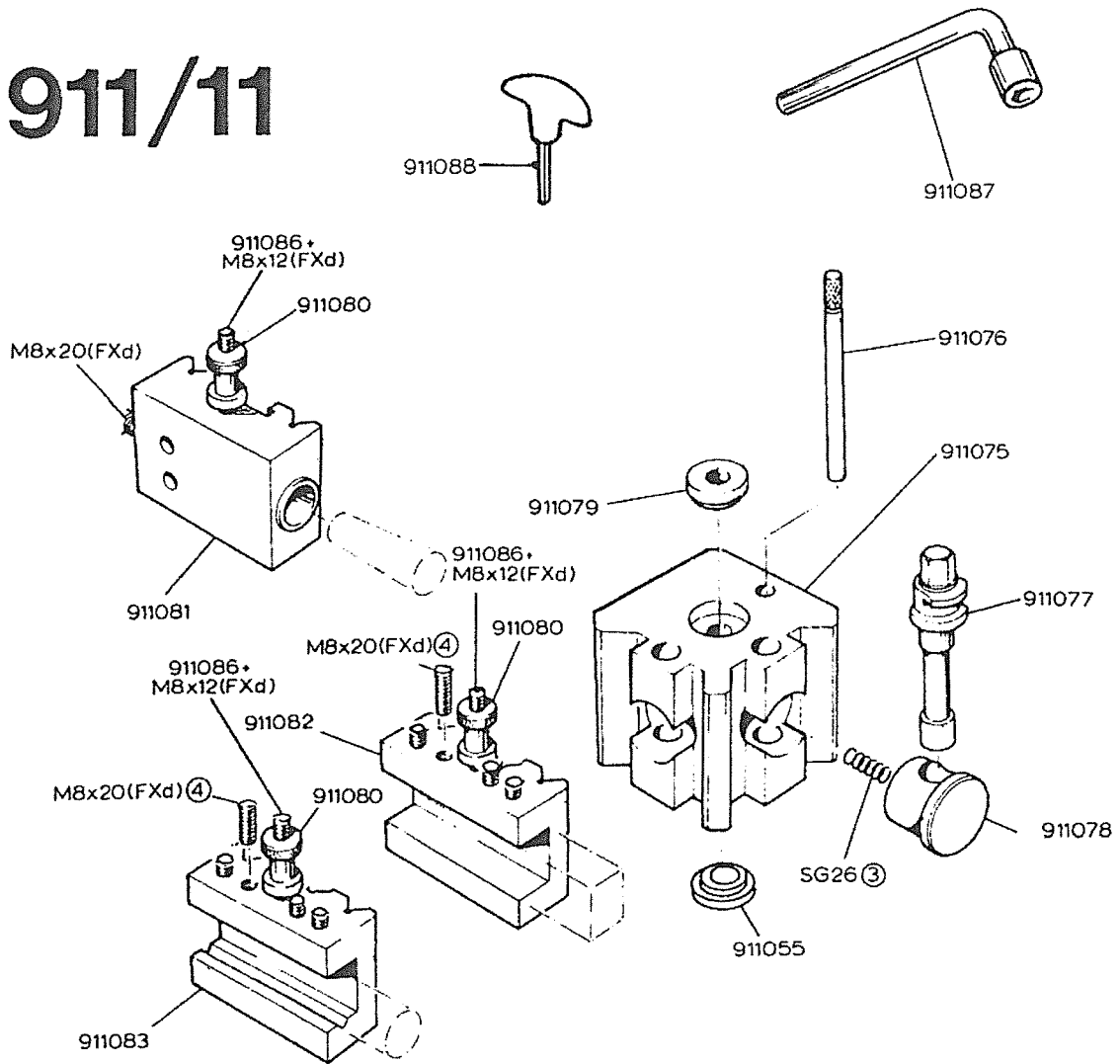
Parts available as assemblies (not illustrated):

911.65	Metric/English dual reading dial - Cross-slide (English cross-slide screw and nut required)	
911.66	Metric/English dual reading dial - Topslide (English topslide screw and nut required)	
911.72	Wattmeter	
1542-21601	4-jaw chuck	
1212-21305	3-jaw chuck	
D911H007.1	Faceplate	

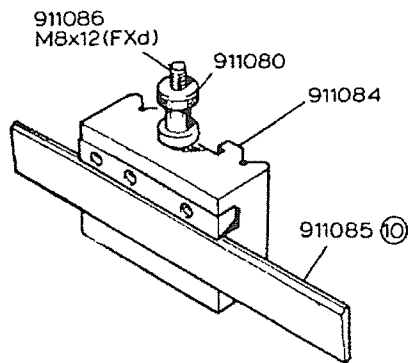


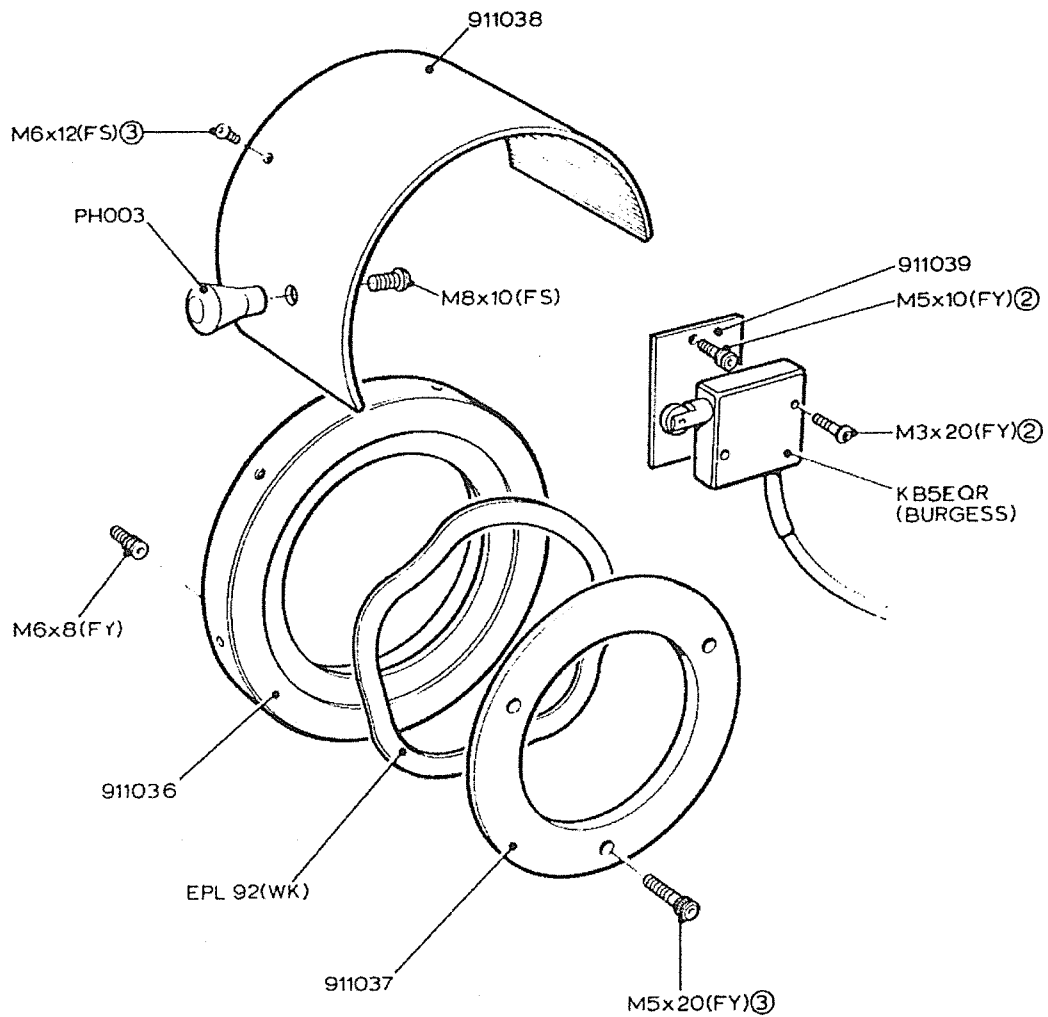
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911/11

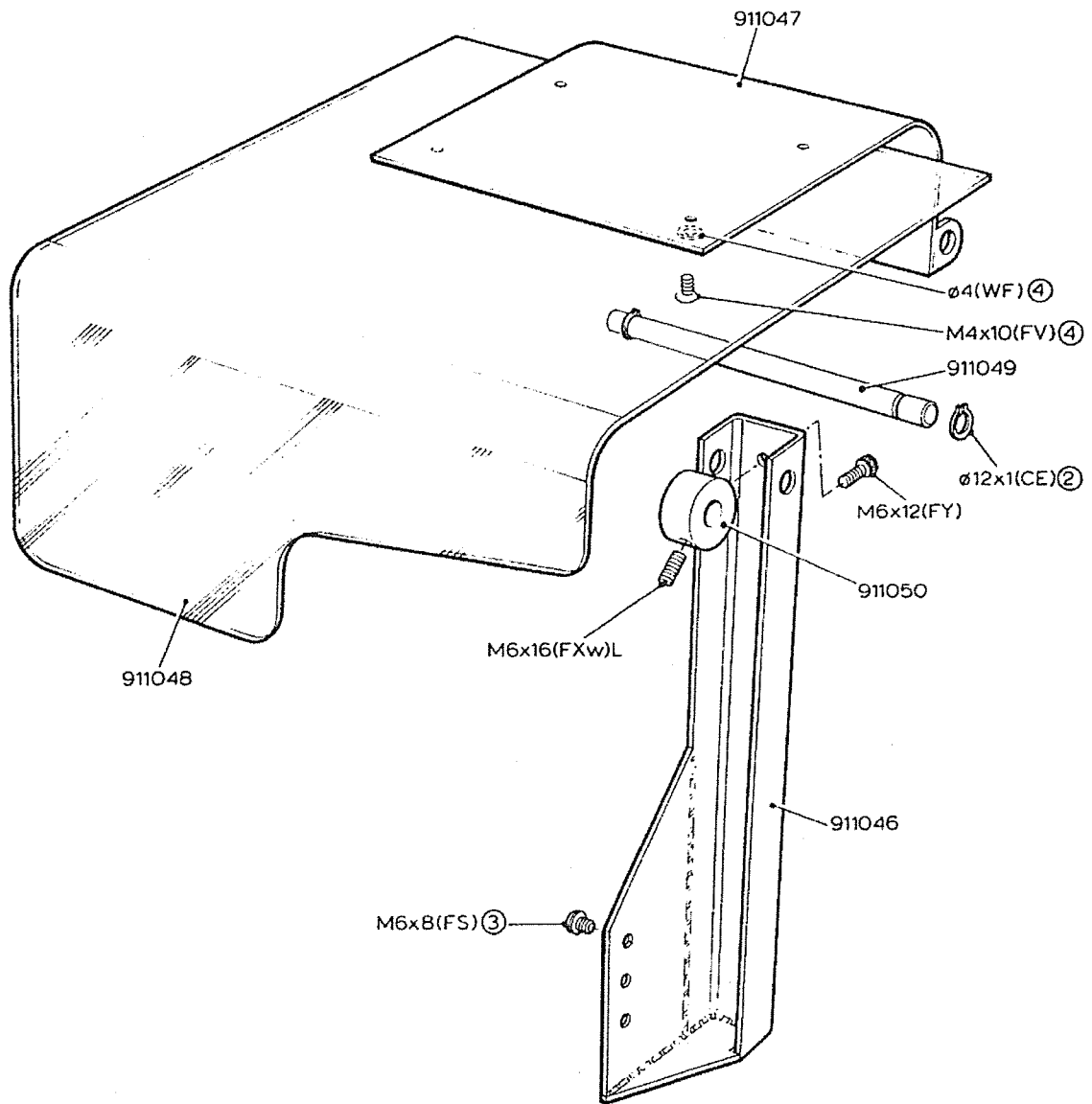


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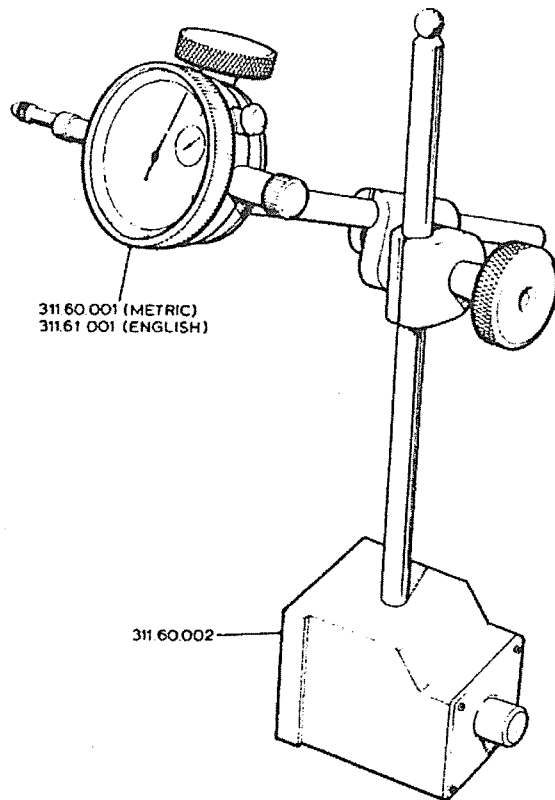
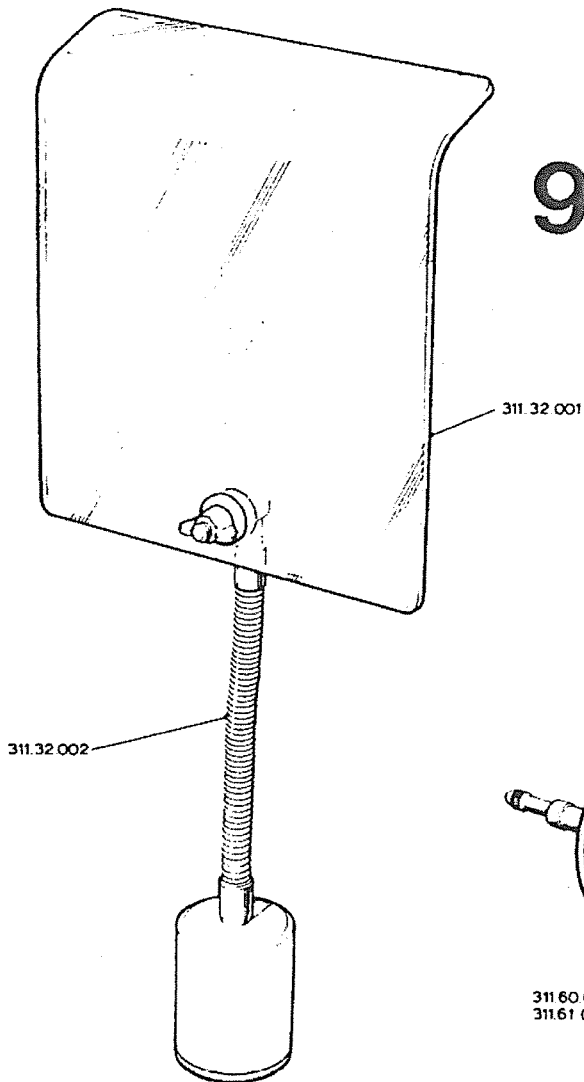


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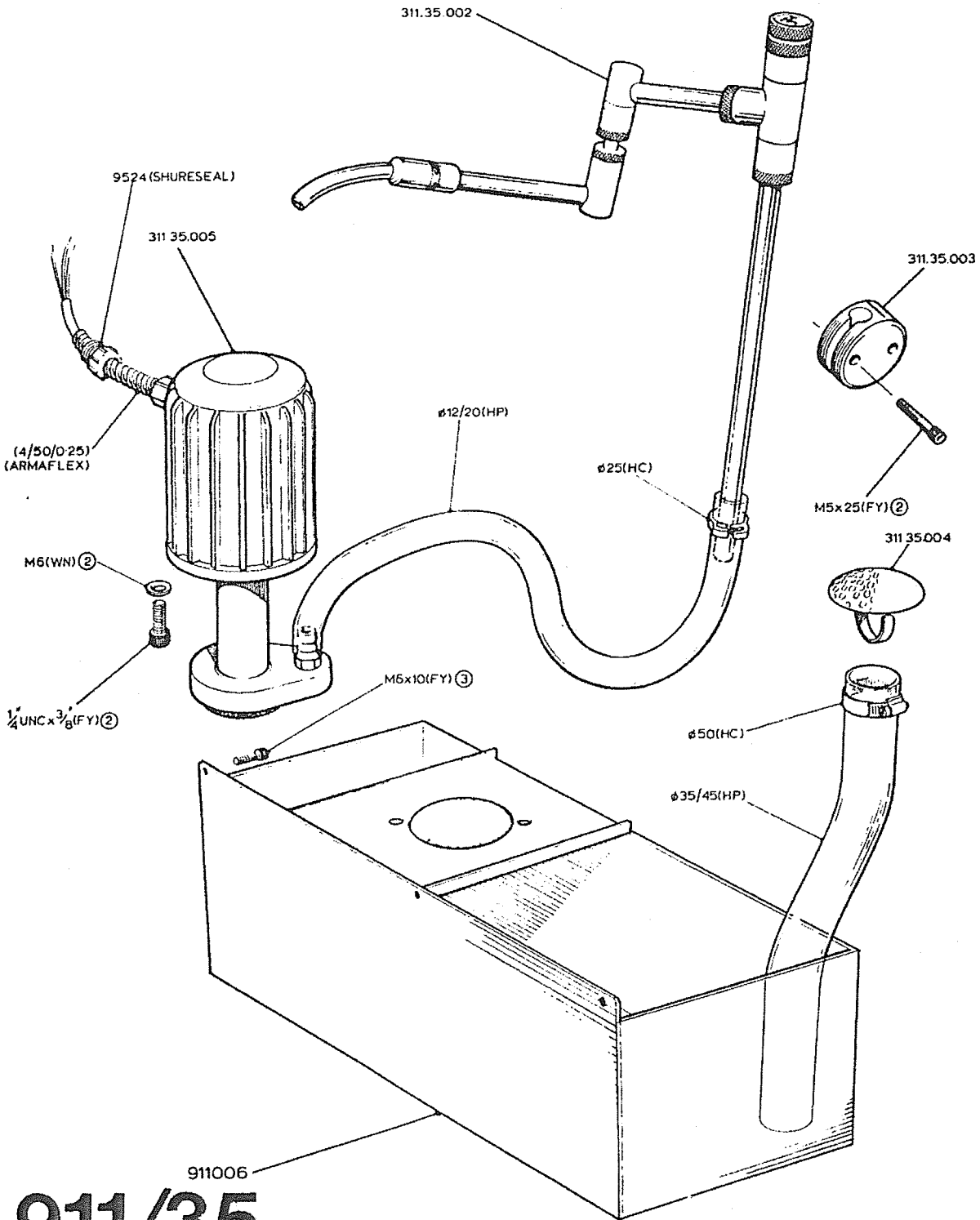


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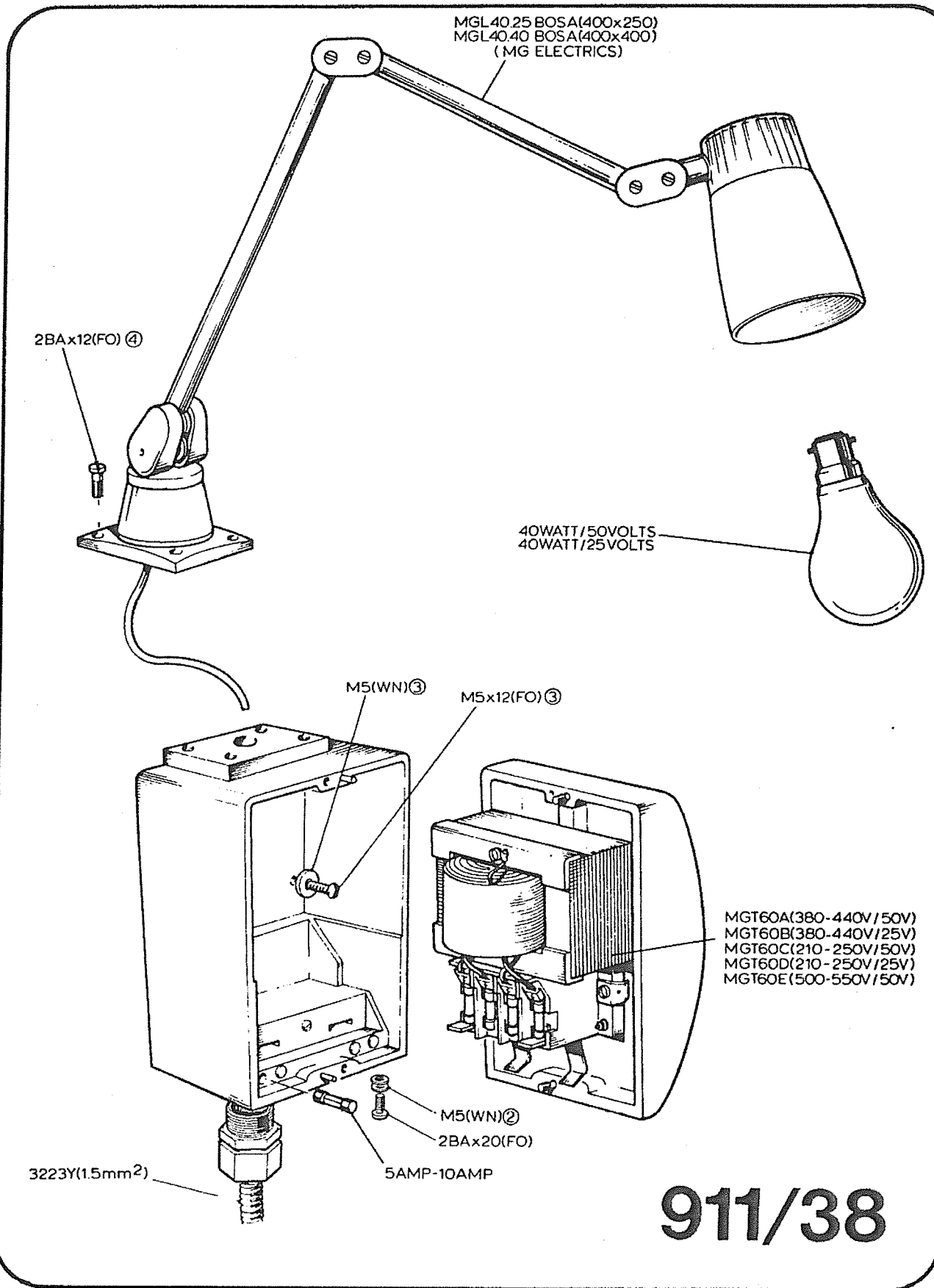
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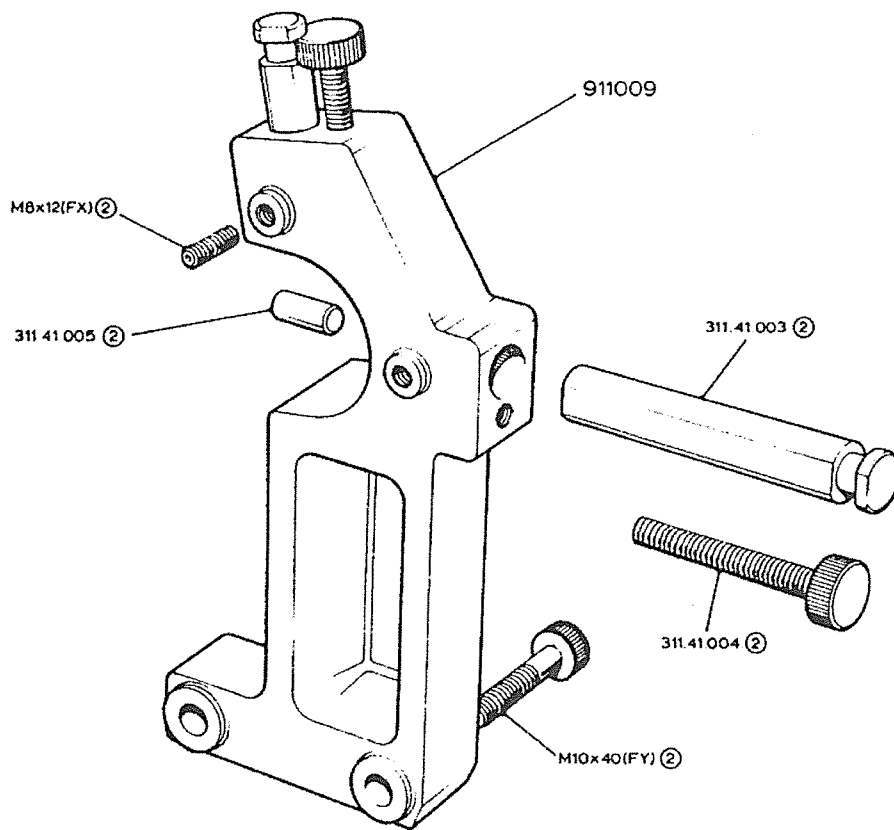


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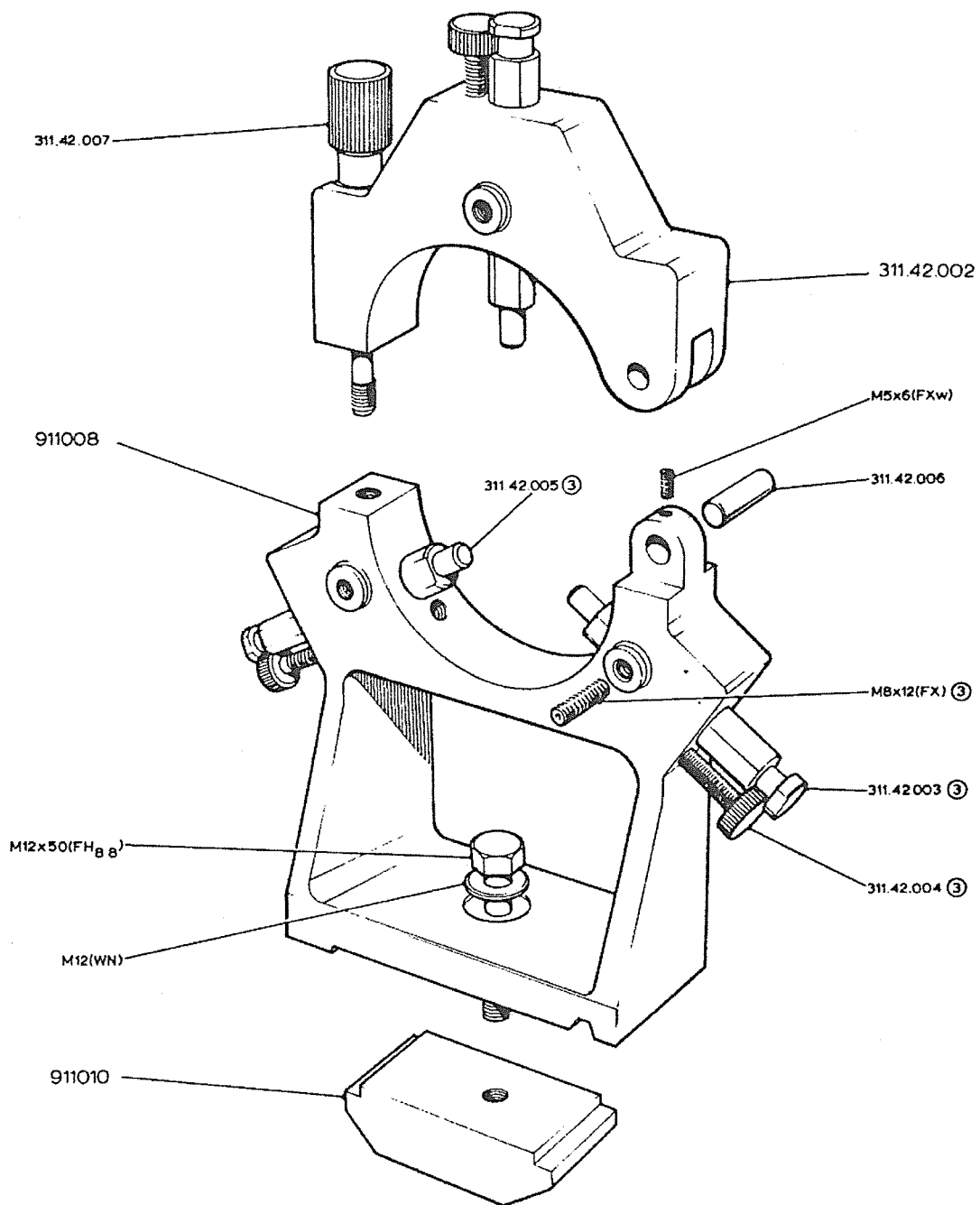


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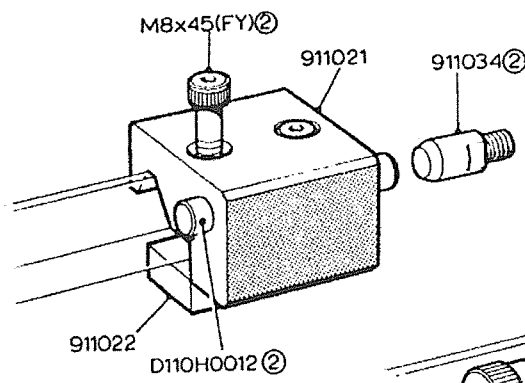




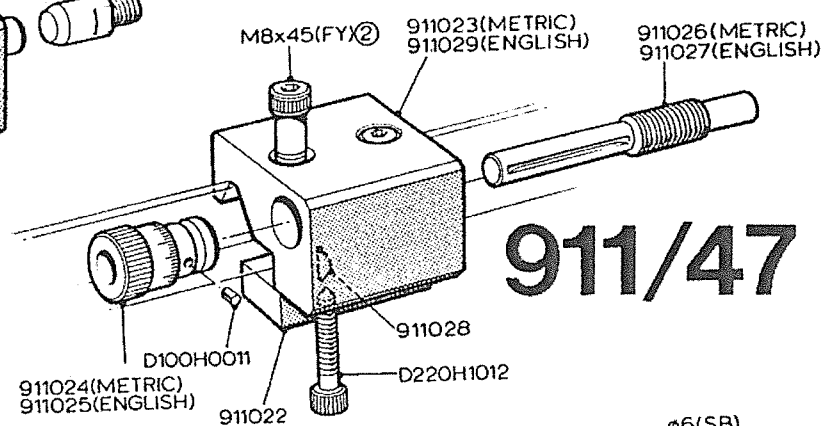
911/41



911/42

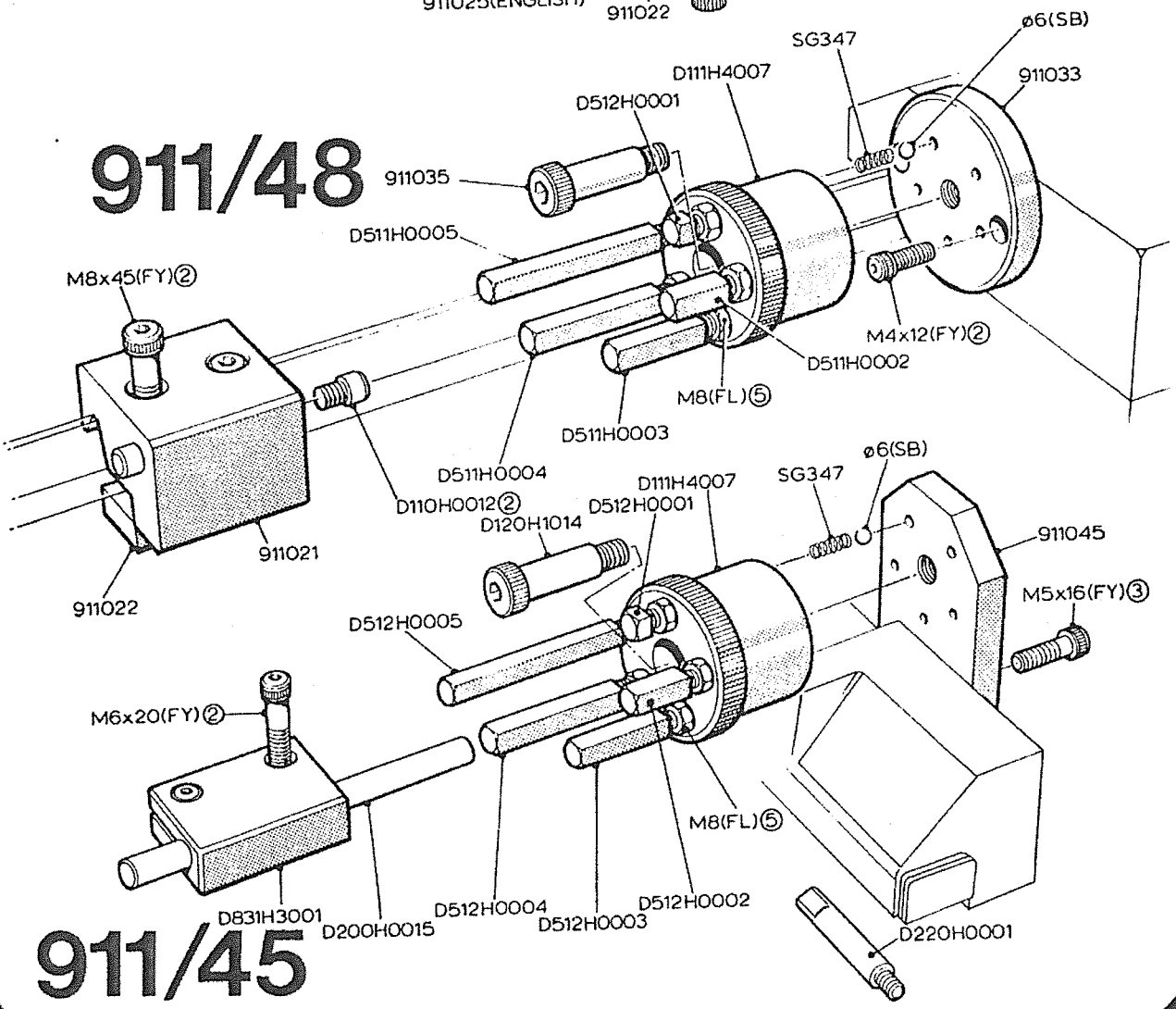


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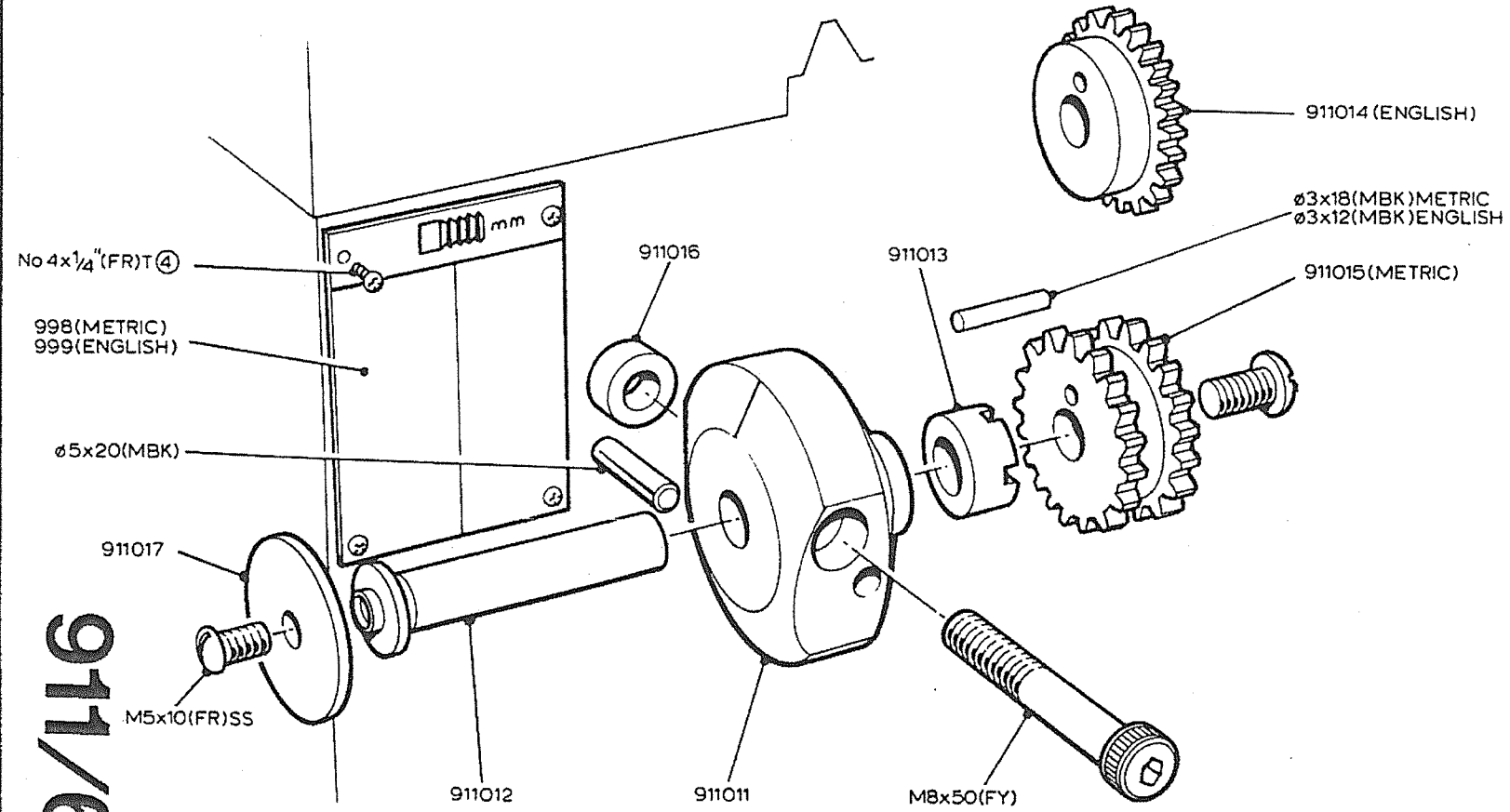


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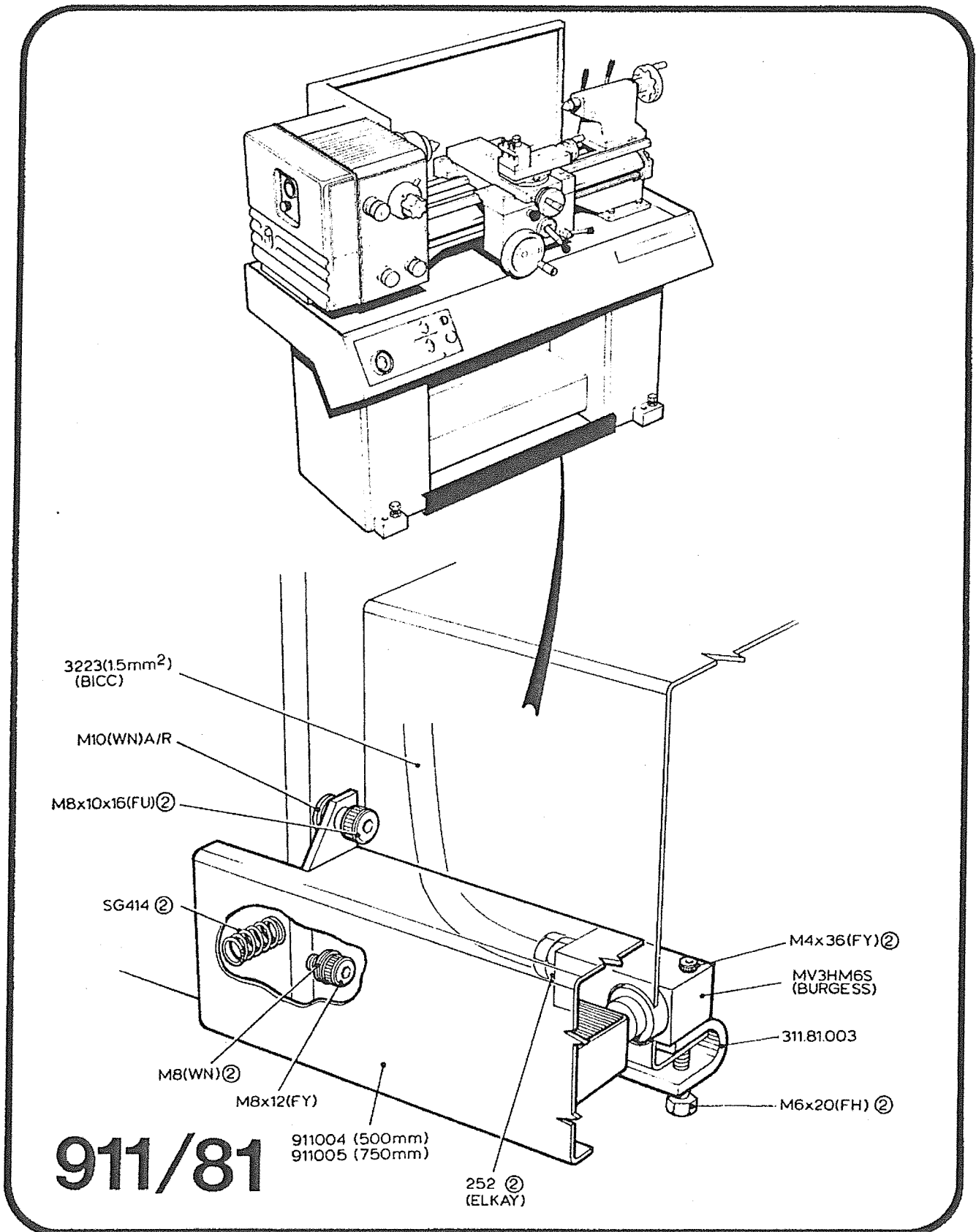
911/48



911/45



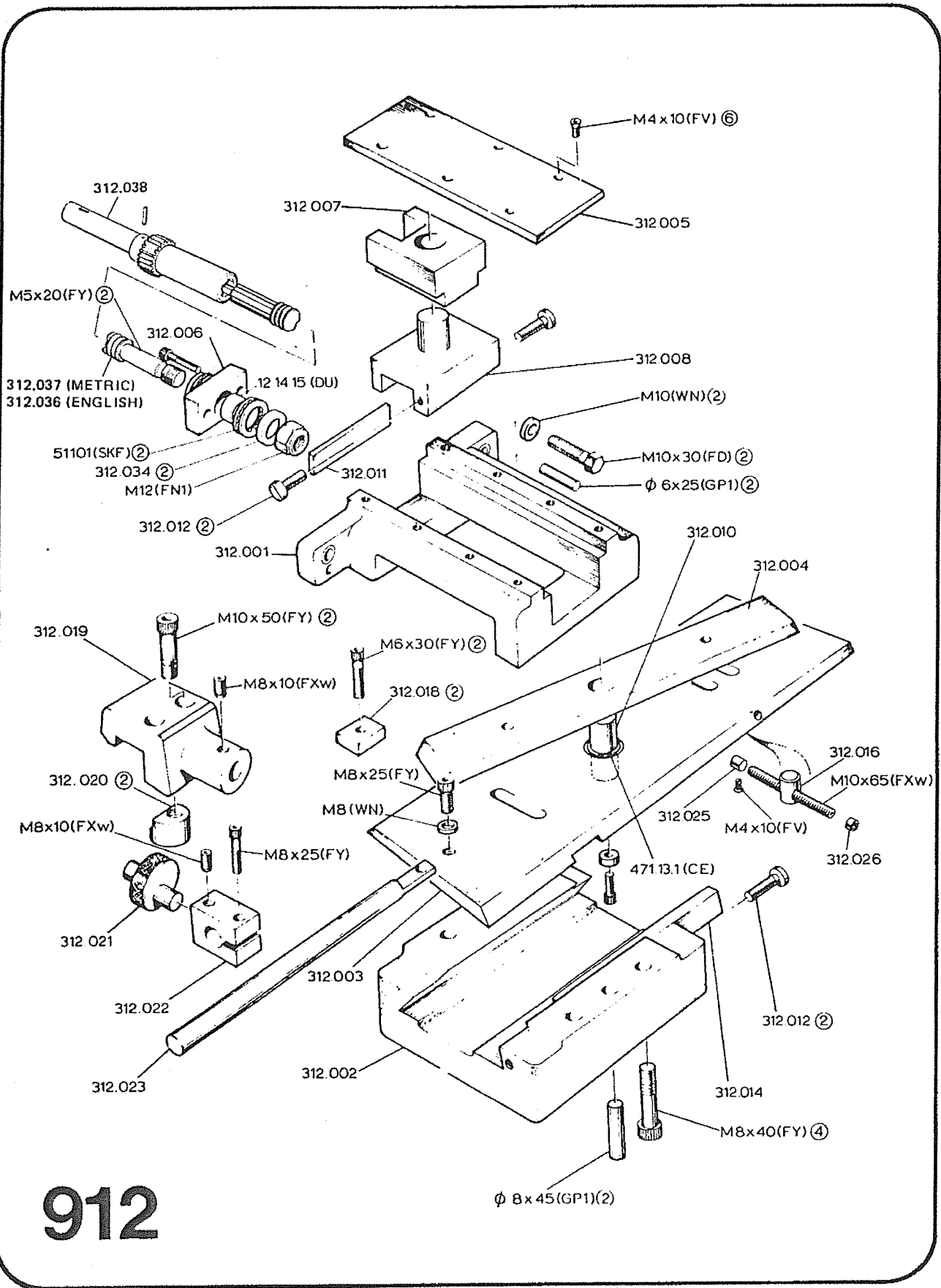
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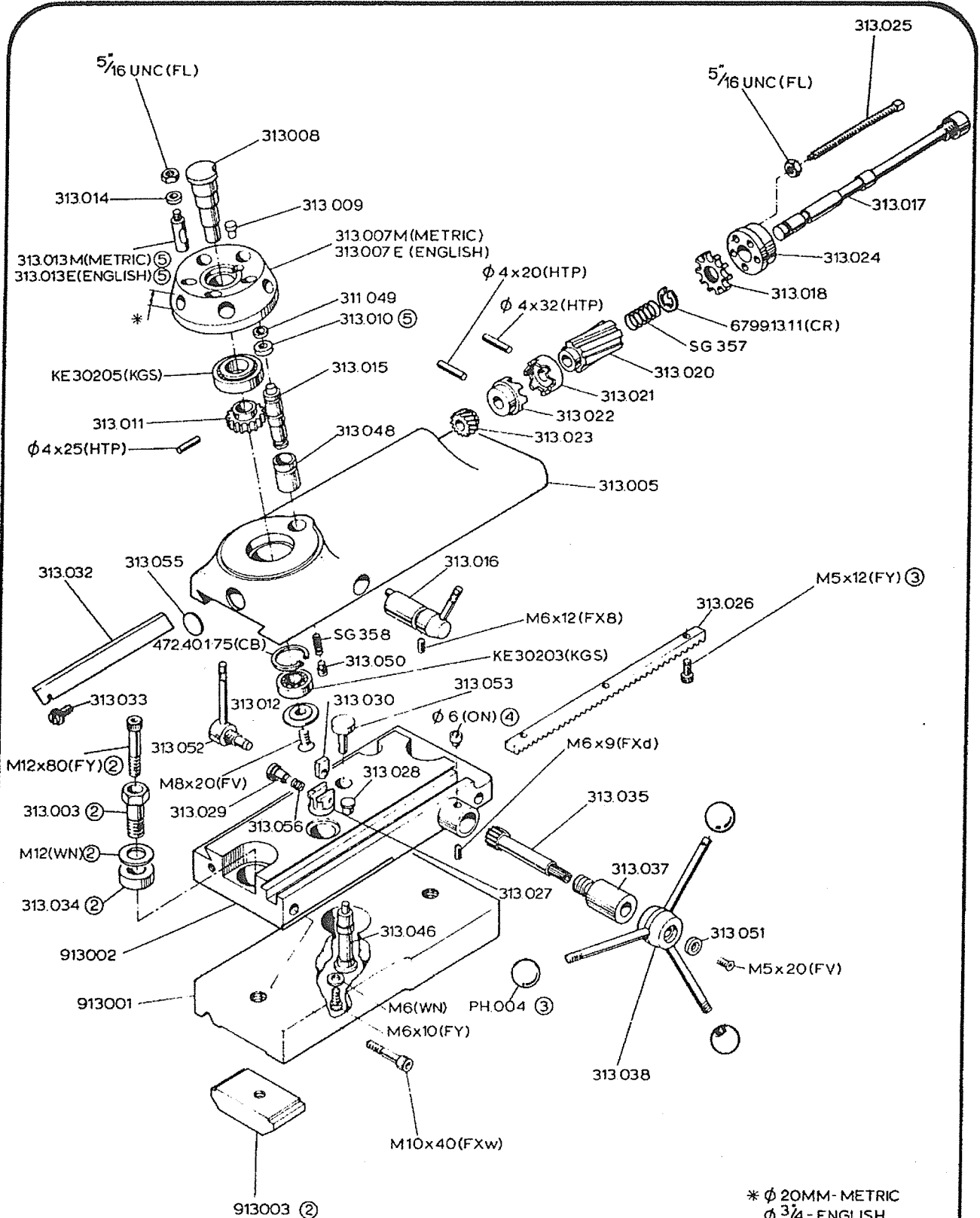
911/81

Attachments

	Page No.
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313 Bed capstan unit	57



912



* Ø 20MM - METRIC
 Ø 3/4 - ENGLISH

913

Standard/Proprietary Parts

'Bracketed'
Letter Code

Component

Letter Codes

Conventional
Description Given

Screws and Nuts

FX	Socket Set (Grub) Screw: Flat Point
FXd	" " " " Dog Point (Normal)
FXd1	" " " " Dog Point (Long)
FXc	" " " " Cone Point
FXw	" " " " Cup, knurled or 'W' Point

Thread X O/all Length

" " " "

" " " "

" " " "

" " " "

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 'B.B' 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

" "

Thread Inserts

T11 Press in Type Thread Insert

Thread details

T12 Coil Type Thread Insert

" "

Washers

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

'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	" " "
GP2	" " 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 leng
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 Leng
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)	

'Bracketed'
Letter Code

Component

Conventional
Description Given

Seals

SM	Standard Oil Seal
SF	'V' Ring Seal (FORSHEDA)
RM	Standard 'O' Ring Seal
RM1	'Nu-Lip Ring' (Pioneer)

Nom Shaft \emptyset O.D. and Width
Manufacturers Part No.
Internal \emptyset of Ring, and Section \emptyset
Manufacturers Part No.

Lubrication Equipment

ON	Concave Oil Nipple: Drive in Type
ONI	" " " Threaded Type
OS	Oil Sight Glass
OS1	Oil Level Glass
OW	Oil Wick

Nom Hole \emptyset
Thread details
Nom Outside \emptyset
" "
Nom \emptyset X Length

For Compression and other Pipe Fitting — Manufacturers Name is quoted as Letter Code vis.

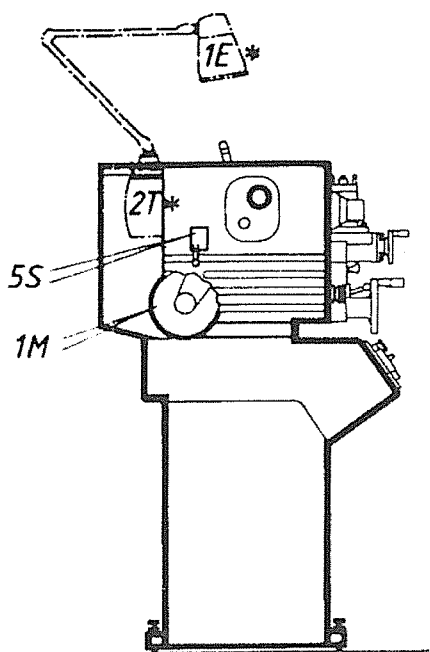
(ENOTS.)
or (TECALEMIT)

Manufacturers Part Number
Quoted

Miscellaneous Items

BJ	Ball Joint
SB	Steel Ball
FK	Hexagon Wrench Key
HP	P.V.C. Hose
HC	Hose Clip
PP	Plastic Plug
WRS	Standard Spanner
EB	Eye Bolt
OW	Oil wick
CT	Copper tube
NT1	Nylon Tube Natural
NT2	Nylon Tube Blue
NT3	Nylon Tube Green
NT4	Nylon Tube Red

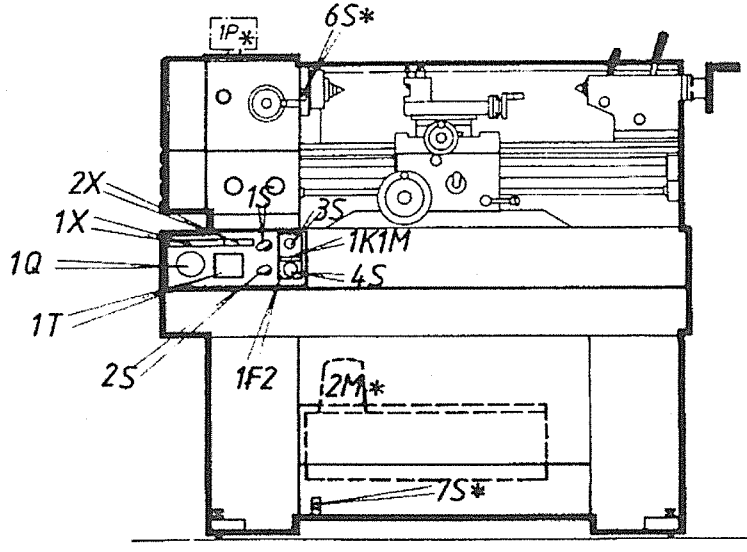
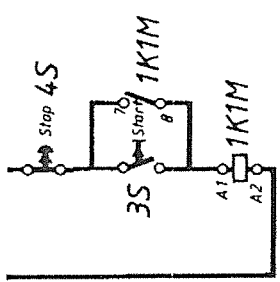
Thread Details
Nom \emptyset
Nom width across flats
Nom Bore and O.D.
Max. Hose \emptyset
Manufacturers Part Number
Std. Bolt size and width
across flats
Thread details
Nom \emptyset X Length
Nom outside \emptyset
Nom Bore
" "
" "
" "



KEY & COMPONENT LIST

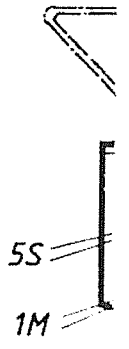
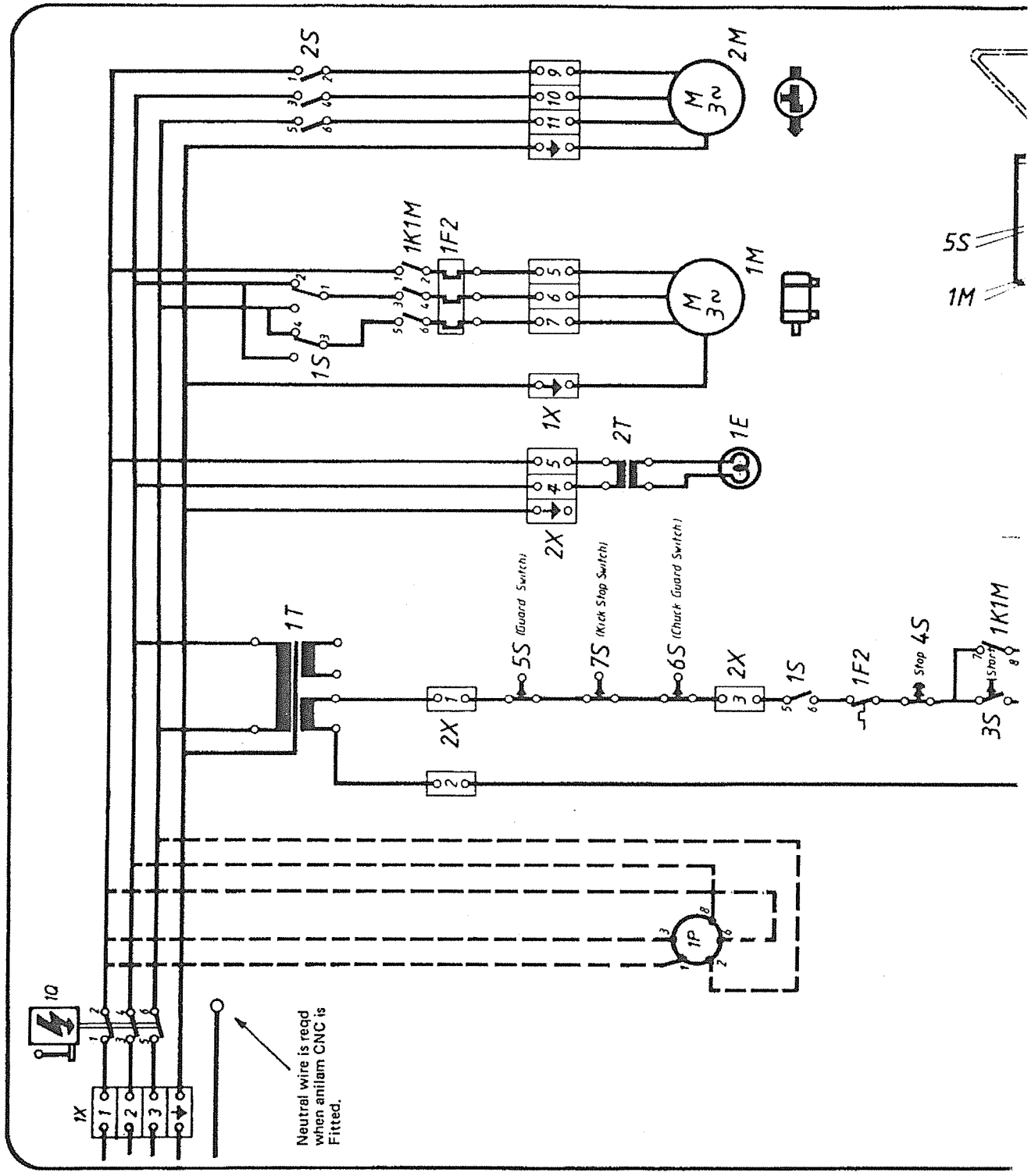
REF	ITEM	SUPPLY	MANUFACTURER	TYPE
PANEL MOUNTED COMPONENTS				
1Q.	Main disconnect switch (Isolator)	All	Klockner Moeller	P1-25
1K1M	Main contactor	All	Yaskawa	HE-16S
1F2	Overload relay	380V 475V	Yaskawa	RH-10/3K
		220V	Yaskawa	RH-10/4K
1T.	Control circuit transformer	All	Ramarth or alt	220V/380V 475 & 440V Primary with 110V & 12V Secondary @VA
1S.	Reverse switch	All	Klockner Moeller	T1-3-2
2S	Coolant on off switch	All	Klockner Moeller	T1-3-50
3S	Start pushbutton (main motor)	All		
4S	Stop pushbutton (main motor)	All		
1X	Terminal block	All	Klippon	BK-12
2X.	Terminal block	All	Klippon	BK-12
MACHINE MOUNTED COMPONENTS				
1M	Main motor	To suit supply G E C voltage		D80/0.9Kw/1.2 HP 1500 RPM
5S	Guard limit switch	All	Burgess	KB 5EQR
* 6S	Chuck guard limit switch	All	Burgess	KBS EQR
* 7S	Kick stop limit switch	All	Burgess	(M)V3HM6S1
* 2M	Coolant pump motor	All	MG Electrics	AQ32Q
* 1E	Machine light unit 2 arm fitting (400X250)		MG Electrics	MGL 4025 BOSA
	2 arm fitting (400X400)		MG Electrics	MGL 4040 BOSA
* 2T	Transformer unit 50V (318/414/440)		MG Electrics	MGT 60A
	Machine light: 25V (318/414/440)		MG Electrics	MGT 60B
	50V (210/230/250)		MG Electrics	MGT 60C
	25V (210/230/250)		MG Electrics	MGT 60D
	50V (500/550)		MG Electrics	MGT 60E
* 1P	Wattmeter		Crompton Inst	057-216B

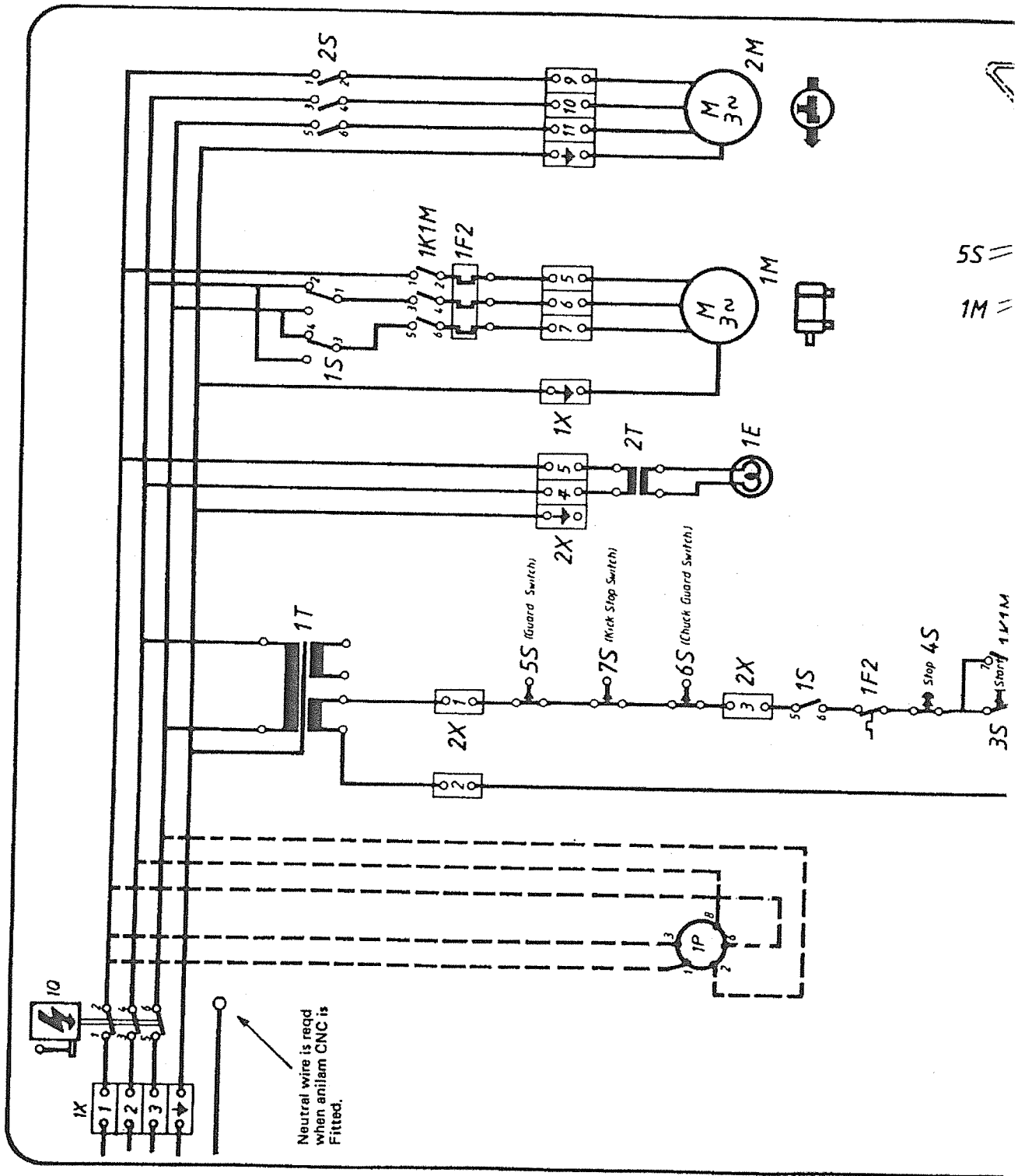
* When Fitted

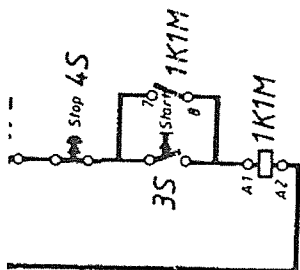
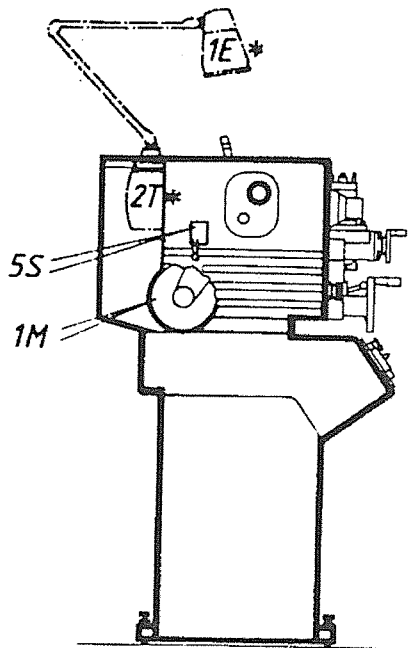


EWD 901.1 Standard
220/380/415 V 3PH 50Hz
1500 RPM m/c / 0.9Kw Motor

Wiring Diagram



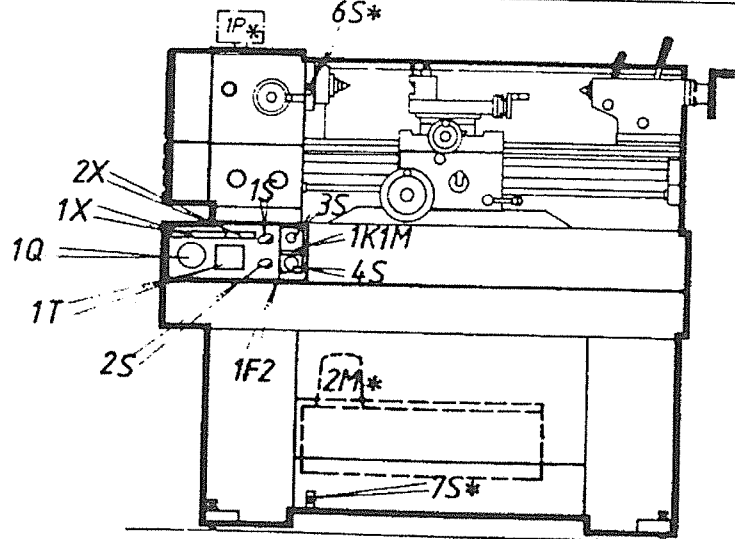




KEY & COMPONENT LIST

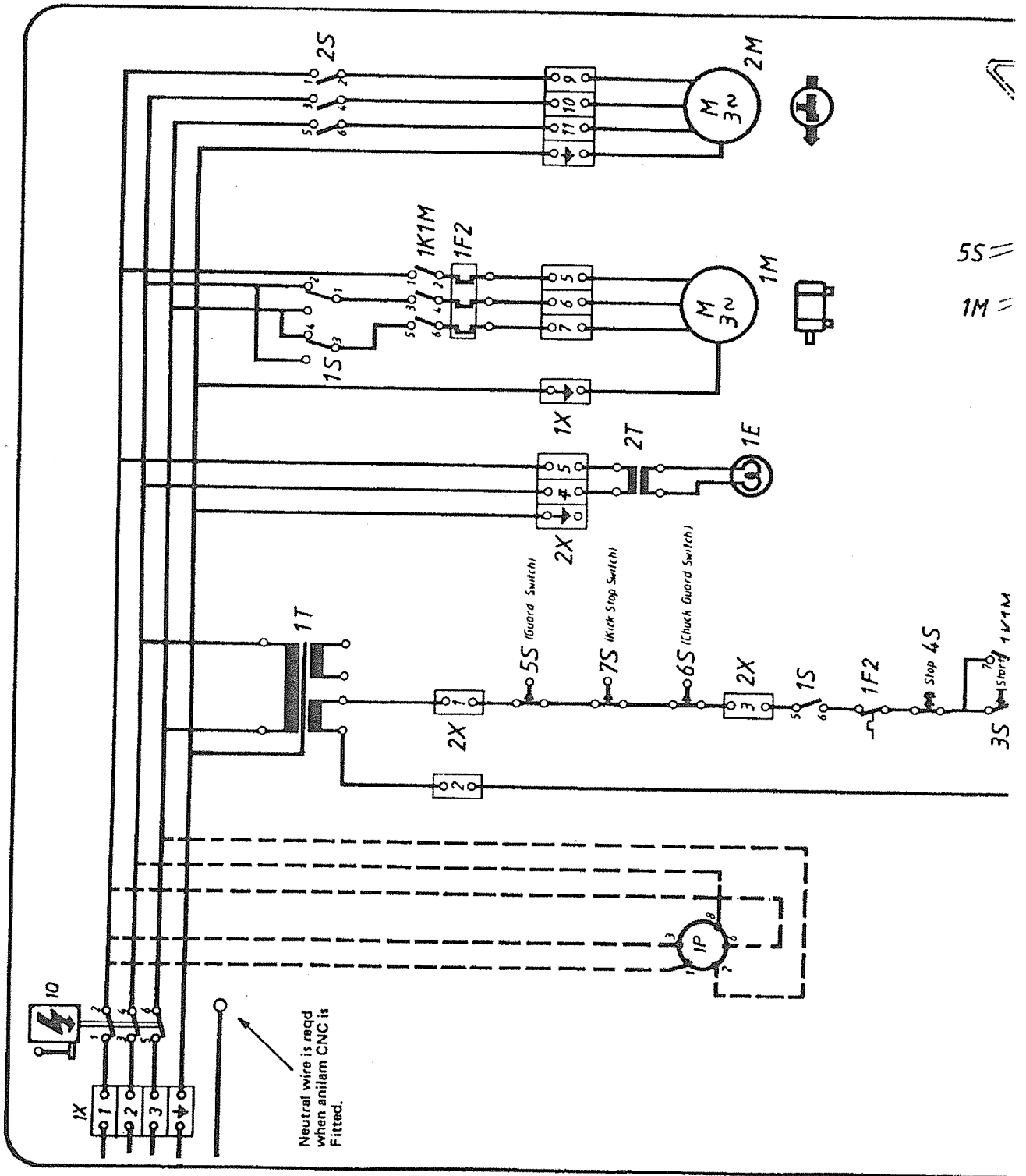
REF	ITEM	SUPPLY	MANUFACTURER	TYPE
PANEL MOUNTED COMPONENTS				
1Q	Mains disconnect switch (isolator)	All	Klockner Moeller	P1-25
1K1M	Main contactor	All	Yaskawa	HE-165
1F2	Overload relay	380V 415V	Yaskawa	RH-10/4K
		220V	Yaskawa	RH-10/K
1T	Control circuit transformer	All	Ramarth or alt	220V/380V 415 & 440V Primary with 110V & 12V Secondary @VA
1S	Reverse switch	All	Klockner Moeller	T1-3-2
2S	Coolant on off switch	All	Klockner Moeller	T1-3-50
3S	Start pushbutton (main motor)	All		
4S	Stop pushbutton (main motor)	All		
1X	Terminal block	All	Klippo	BK-12
2X	Terminal block	All	Klippo	BK-12
MACHINE MOUNTED COMPONENTS				
1M	Main motor	To suit supply GEC voltage		D905/1.5Kw/2 HP 1500 RPM
5S	Guard limit switch	All	Burgess	KB 5EQR
* 6S	Chuck guard limit switch	All	Burgess	KBS EQR
* 7S	Kick stop limit switch	All	Burgess	(M) V3HM6S1
* 2M	Coolant pump motor	All	MG Electrics	AQ 32Q
* 1E	Machine light unit 2 arm fitting (400X250)		MG Electrics	MGL 4025 BOSA
	2 arm fitting (400X400)		MG Electrics	MGL 4040 BOSA
* 2T	Transformer unit 50V (318/414/440)		MG Electrics	MGT 60A
	(machine light) 25V (318/414/440)		MG Electrics	MGT 60B
	50V (210/230/250)		MG Electrics	MGT 60C
	25V (210/230/250)		MG Electrics	MGT 60D
	50V (500/550)		MG Electrics	MGT 60E
* 1P	Wattmeter		Crompton Inst	057-216B

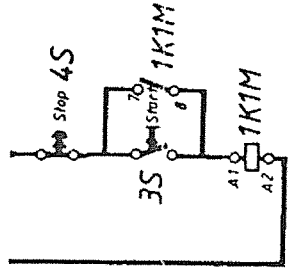
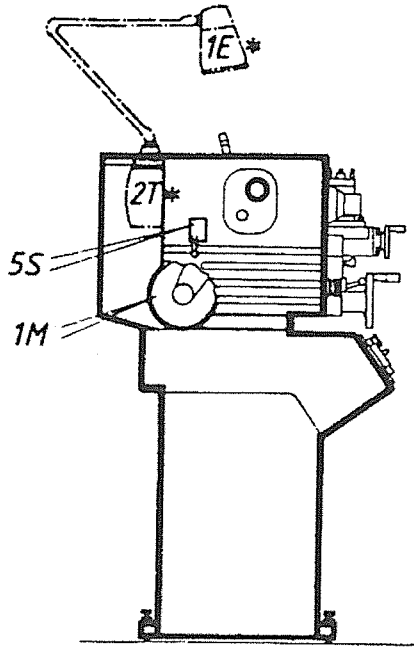
* When Fitted



EWD 901.1A Standard
220/380/415 V 3PH 50Hz
2000 RPM m/c / 1.5Kw motor

Wiring Diagram

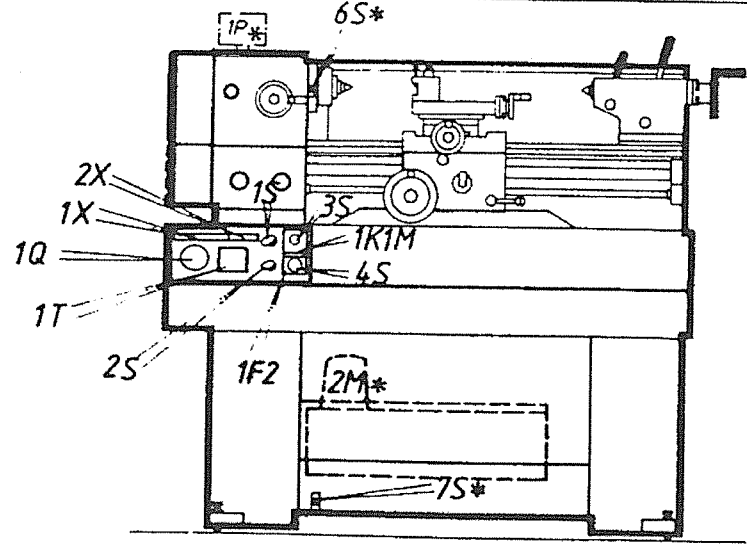




KEY & COMPONENT LIST

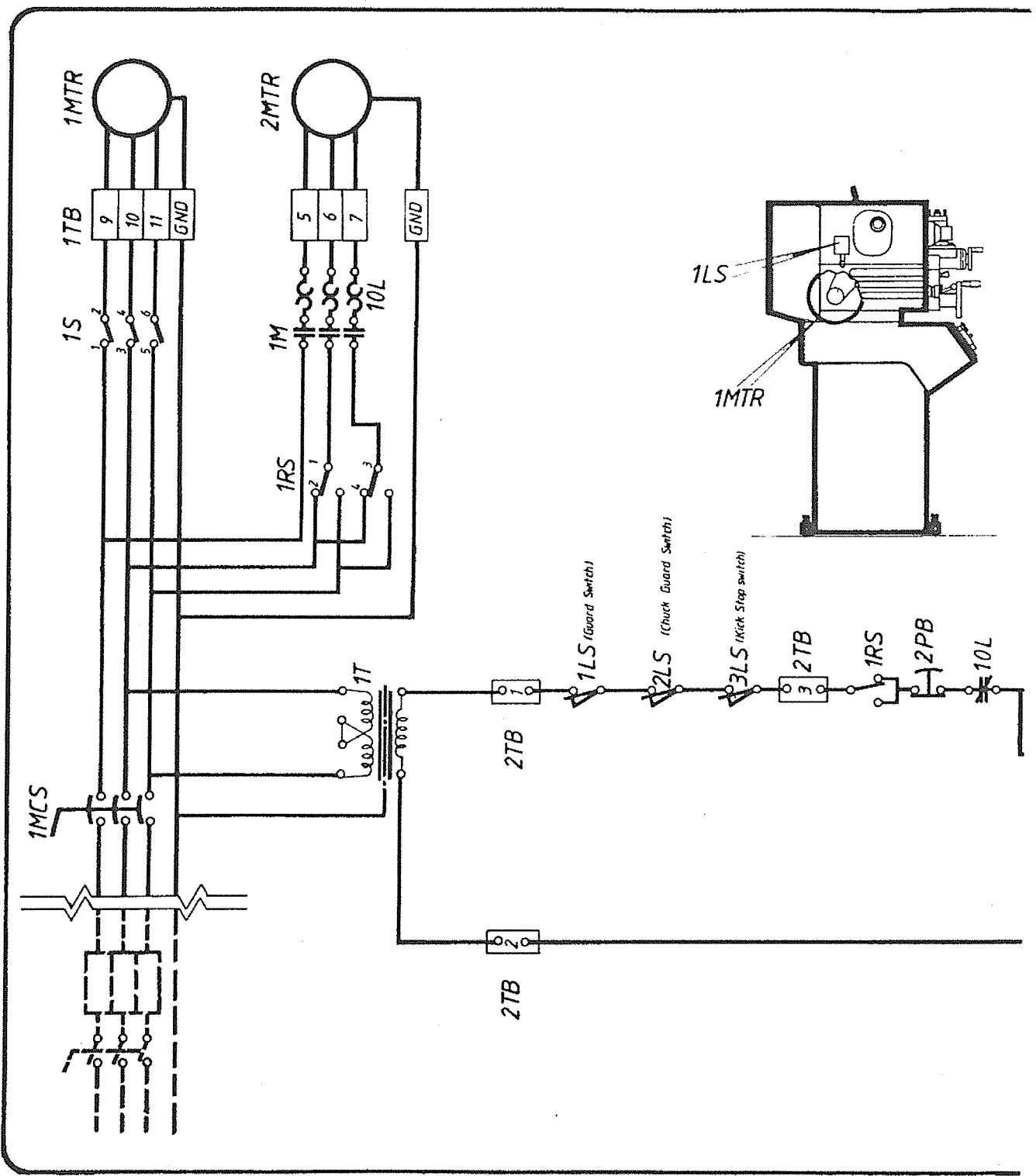
REF	ITEM	SUPPLY	MANUFACTURER	TYPE
PANEL MOUNTED COMPONENTS				
1Q	Main disconnect switch (Isolator)	All	Klockner Moeller	P1-25
1K1M	Main contactor	All	Yaskawa	HE-165
1F2	Overload relay	380V 415V	Yaskawa	RH-10/4K
		220V	Yaskawa	RH-10/K
1T	Control circuit transformer	All	Ramarth or alt	220V/380V 415 & 440V Primary with 110V & 12V Secondary @VA
1S	Reverse switch	All	Klockner Moeller	T1-3-2
2S	Coastant on off switch	All	Klockner Moeller	T1-3-50
3S	Start pushbutton (main motor)	All		
4S	Stop pushbutton (main motor)	All		
1X	Terminal block	All	Klippon	BK-12
2X	Terminal block	All	Klippon	BK-12
MACHINE MOUNTED COMPONENTS				
1M	Main motor	To suit supply G.E.C voltage		D905/1.5Kw/2 HP 1500 RPM
5S	Guard limit switch	All	Burgess	KB5EQR
* 3S	Chuck guard limit switch	All	Burgess	KBS5EQR
* 7S	Kick stop limit switch	All	Burgess	(M1V3HM6S1)
* 2M	Coolant pump motor	All	MG Electrics	AQ32Q
* 1E	Machine light unit 2 arm fitting (400X250)		MG Electrics	MGL 425 BOSA
	2 arm fitting (400X400)		MG Electrics	MGL 404 BOSA
* 2T	Transformer unit 50V (318/414/440)		MG Electrics	MGT 60A
	Machine light 25V (318/414 440)		MG Electrics	MGT 60B
	50V (210/230/250)		MG Electrics	MGT 60C
	25V (210/230/250)		MG Electrics	MGT 60D
	50V (500/550)		MG Electrics	MGT 60E
* 1P	Wattmeter		Crompton Inst	057-216B

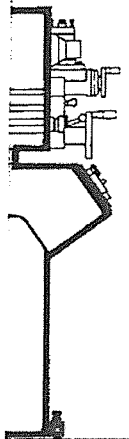
* When Fitted



EWD 901.1A Standard
220/380/415 V 3PH 50HZ
2000 RPM m/c /1.5Kw motor

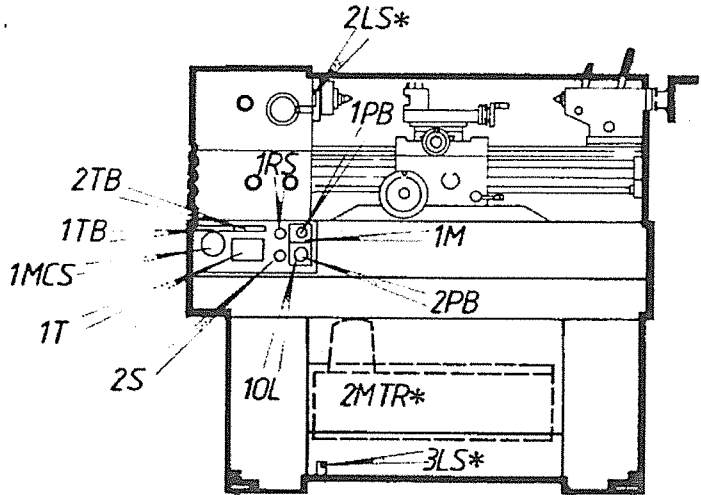
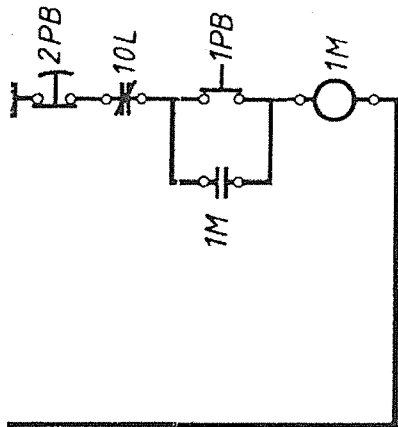
Wiring Diagram





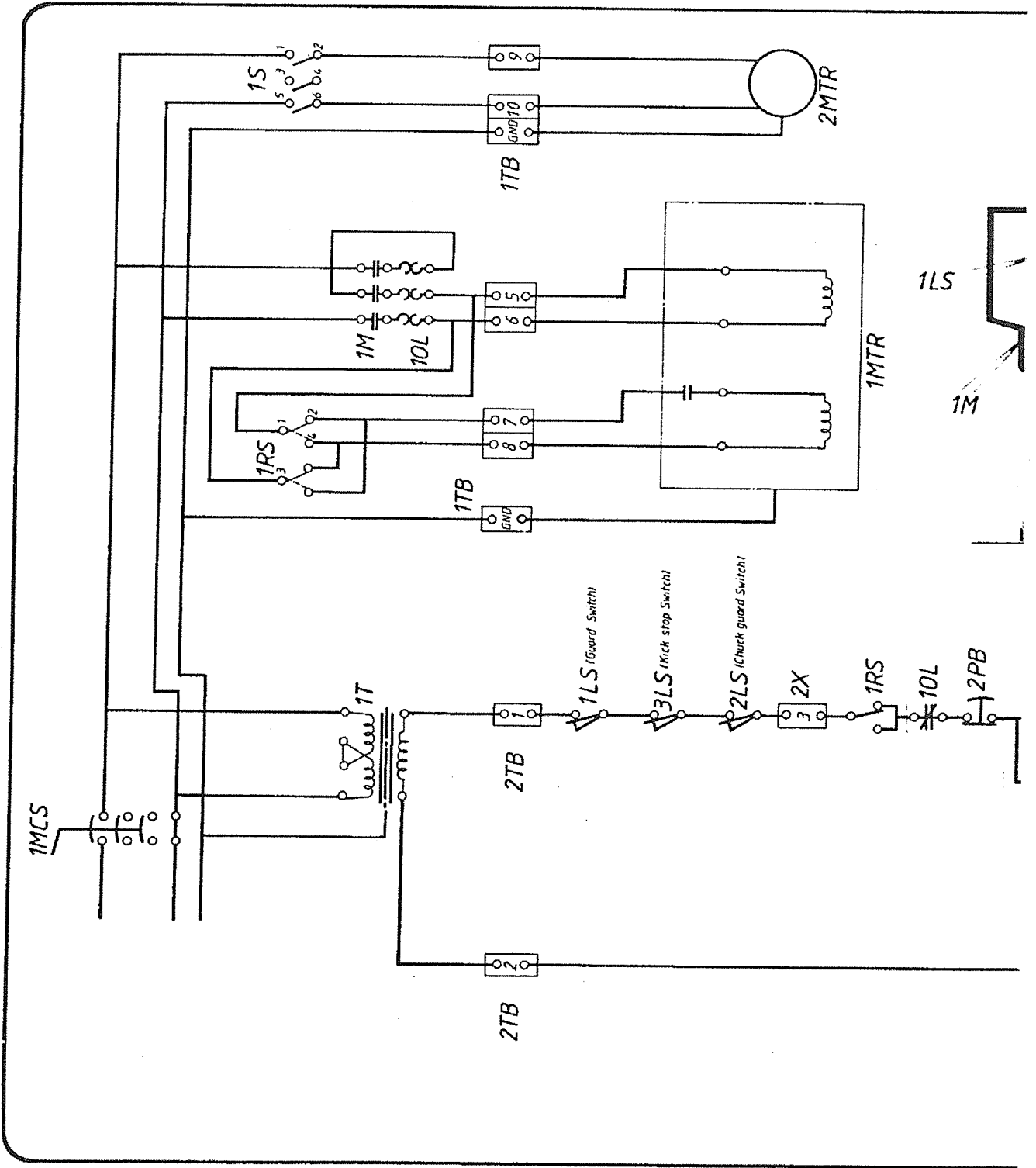
KEY & COMPONENT LIST

REF	ITEM	SUPPLY	MANUFACTURER	TYPE
PANEL MOUNTED COMPONENTS				
1MCS	Mains disconnect switch (Isolator)	All	Klockner Moeller	T1-2-NA
1M	Main contactor	All	Yaskawa	HE-16S
10L	Overload relay	230 V 460 V	Yaskawa	RH-10/5K RH-10/3K
1T	Control circuit Transformer	All	Romarsh or all	ULF/UF25/3 208, 230, 460, 575 Volt primary 115 Volt secondary at 25 VA
1RS	Reverse switch	All	Klockner Moeller	T1-3-2
1S	Coolant on off switch	All	Klockner Moeller	T1-3-50
1PB	Start pushbutton (man motor)	All	Yaskawa	
2PB	Emergency stop pushbutton	All	Yaskawa	
1B 2TB	Terminal block	All	Klippon	BK 12
MACHINE MOUNTED COMPONENTS				
1MTR	Main motor	To suit supply voltage	Brook	K145T 1 1/2 HP, 1800 R.P.M
1LS	Guard limit switch	All	Burgess	KB5 EQR CSA/UL
* 2LS	Chuck guard limit switch	All	Burgess	KB5 EQR CSA/UL
* 3LS	Kickstop limit switch	All	Burgess	1M V3HM65 CSA/UL
* 2MTR	Coolant pump motor	To suit supply voltage	H.G. Electrics	AQ3/2



EWD 905.1 U.S.A
230-460V 3PH 60Hz

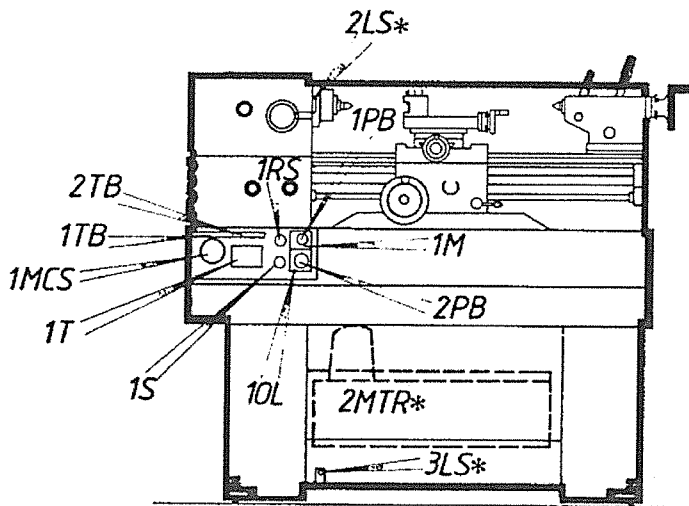
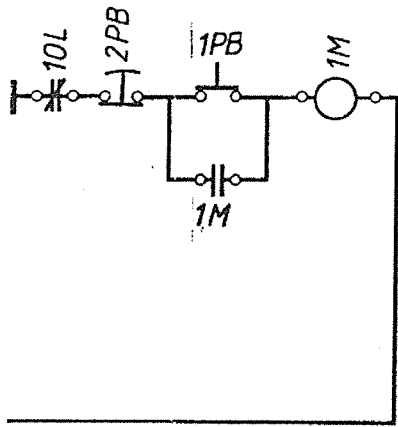
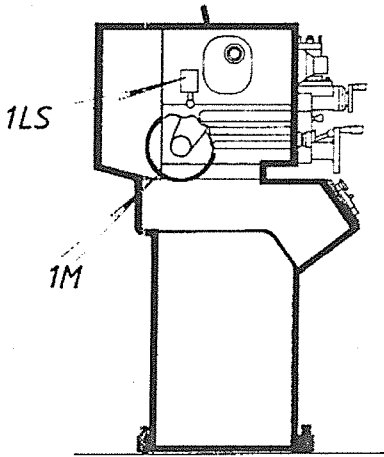
Wiring Diagram



KEY & COMPONENT LIST

REF	ITEM	SUPPLY	MANUFACTURER	TYPE
PANEL MOUNTED COMPONENTS				
1MCS	Mains disconnect switch (Isolator)	All	Klockner Moeller	T1-25 NA
1M	Main contactor	All	Yaskawa	HE-16S
10L	Overload relay	All	Yaskawa	RH-10/10 K
1T	Control circuit transformer	All	Romarsh or alt	220V primary with 115 V Secondary
1RS	Reverse switch	All	Klockner Moeller	T1-3-2/1NA
1S	Coolant on/off switch	All	Klockner Moeller	T1-3-50/1NA
1PB	Start button	All	Yaskawa	
2PB	Stop button (mushroom headed)	All	Yaskawa	
1&2TB	Terminal block	All	Klippon	BK-12
MACHINE MOUNTED COMPONENTS				
1MTR	Main motor	All	Brook	K145T, 1 1/2 HP 1800 RPM Nema
1LS	Guard limit switch	All	Burgess	KB5 EQR CSA/UL
* 2LS	Chuck guard limit switch	All	Burgess	KB5 EQR CSA/UL
* 3LS	Kickstop limit switch	All	Burgess	1M1V3HM6S CSA/UL
* 2MTR	Coolant pump motor	All	M.G. Electrics	AQ3/2 CSA/UL

* When fitted.



EWD 907.1 Single Phase U.S.A.
220/1/60 Hz

Wiring Diagram