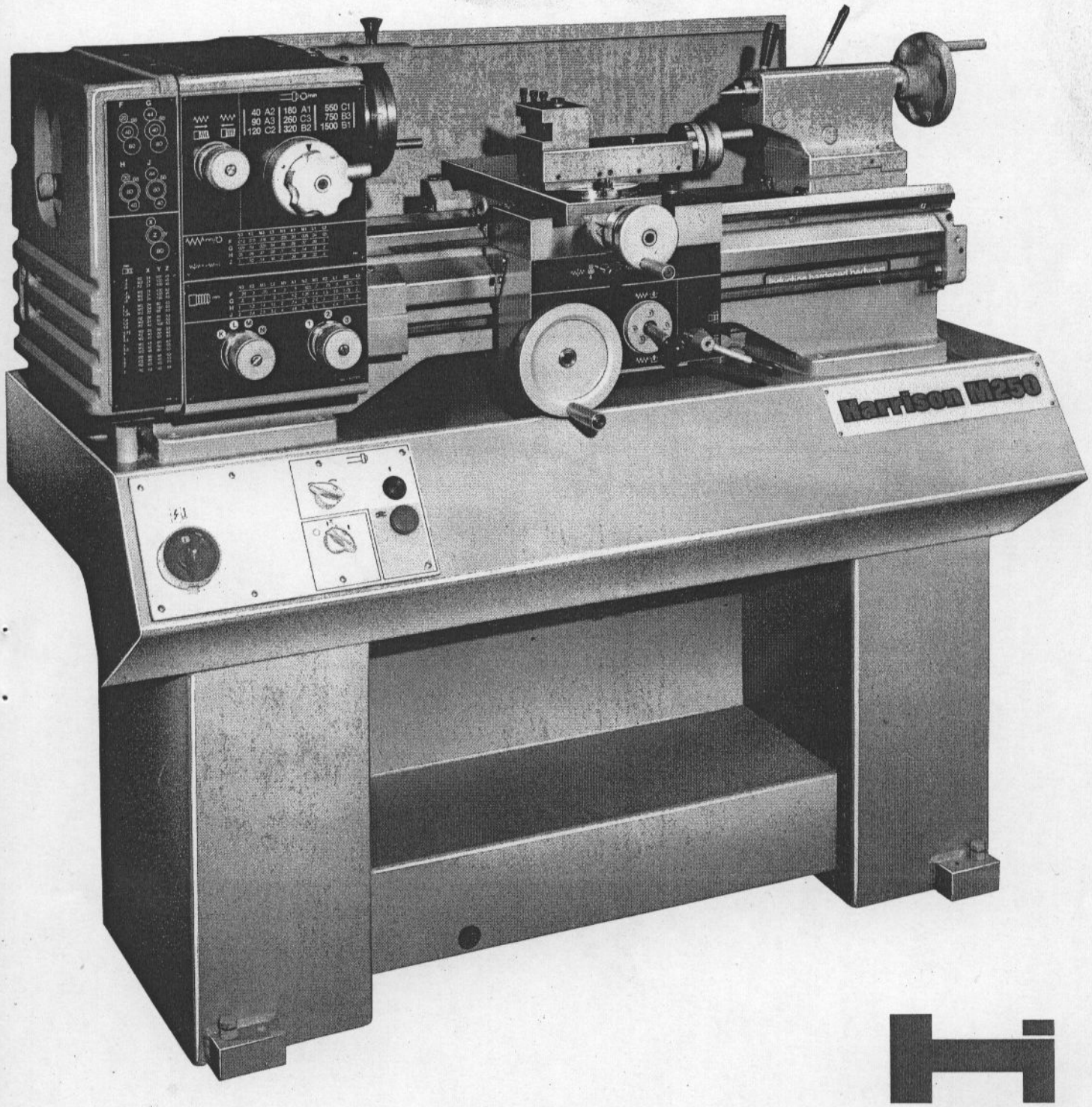
# Harrison M250

## 280mm (11in) swing centre lathe




Harrison

# machine manual

## Contents

# 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)
Admits Between . . . . . 500mm (20 in)
or . . . . . 750mm (30 in)

**Swing** Over Bed . . . . . 280mm (11 in)
Over Cross Slide . . . . . 178mm (7 in)

**Spindle** Bored to Pass . . . . . 35mm (1.375 in)
Nose . . . . . D1-3
Morse Taper In Nose Bush. . . . . .3

**Speeds** Number. . . . . .9

**50 Hz Machines**
Range . . . . . 40 - 1500 rpm
Motor . . . . . 0.9 kW (1.2hp)
or
Range . . . . . 80 -3000 rpm
Motor . . . . . 1.3 kW (1.8hp)
or
Range . . . . . 40 - 1500 rpm
Motor (Single Phase) . . . . . 1.1 kW (1.5hp)

**60 Hz Machines**
Range . . . . . 40 - 1500 rpm
Motor . . . . . 1.5 hp
or
Range . . . . . 52 - 2000 rpm
Motor . . . . . 1.5 hp
or
Range . . . . . 52 - 2000 rpm
Motor (Single Phase) . . . . . 1.5 hp

**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
**(available by changewheels supplied as additional equipment)*
Feeds Longitudinal (21) . . . .0.012 - 0.4mm
Cross (21) . . . . . .0.006 - 0.2mm

**English Gearbox with 4 TPI Leadscrew**
Threads English Pitches (56) . . . . 4 - 84 TPI
Metric Pitches (23)*. . . . . 0.4 - 10mm
**(available by changewheels supplied as additional equipment)*
Feeds Longitudinal (24) . . 0.0006 - 0.016 in
Cross (24) . . 0.0003 - 0.008 in

**Bed** Width Over Ways. . . . . 190mm (7.5 in)
Depth Under Headstock . . . . 230mm (9 in)

**Cross Slide** Width . . . . . 130mm (5.1 in)
Travel . . . . . 165mm (6.5 in)

**Top Slide** Width . . . . . 76mm (3 in)
Travel . . . . . 92mm (3.6 in)

**Tailstock** Quill Diameter . . . . . .38mm (1.5 in)
Travel . . . . . .95mm (3.7 in)

**Weight** 500mm (20 in) Centres. . . .356 kg (785 lbs)
750mm (30 in) Centres. . .457 kg (1008 lbs)

*Shipping Data*

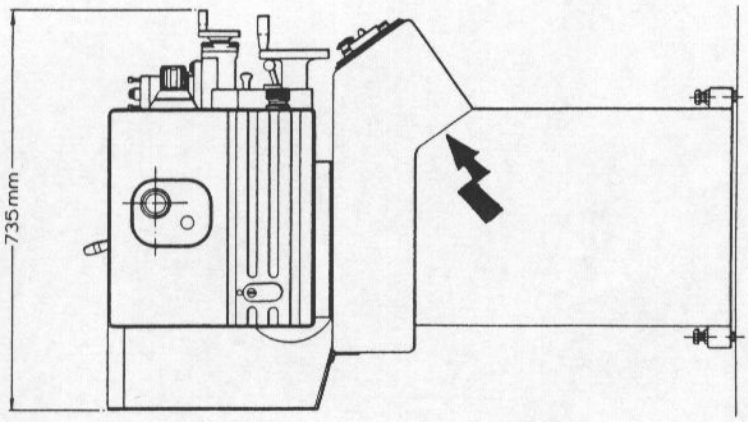
| Gross Weight | Packing Case Dimensions L W H |
|---|---|
| **500mm (20 in) Centres** | |
| 457 kg (1008 lbs) | 1574 x 838 x 1371mm (62" x 33" x 54") |
| **750mm (30 in) Centres** | |
| 559 kg (1232 lbs) | 1828 x 838 x 1371mm (72" x 33" x 54") |

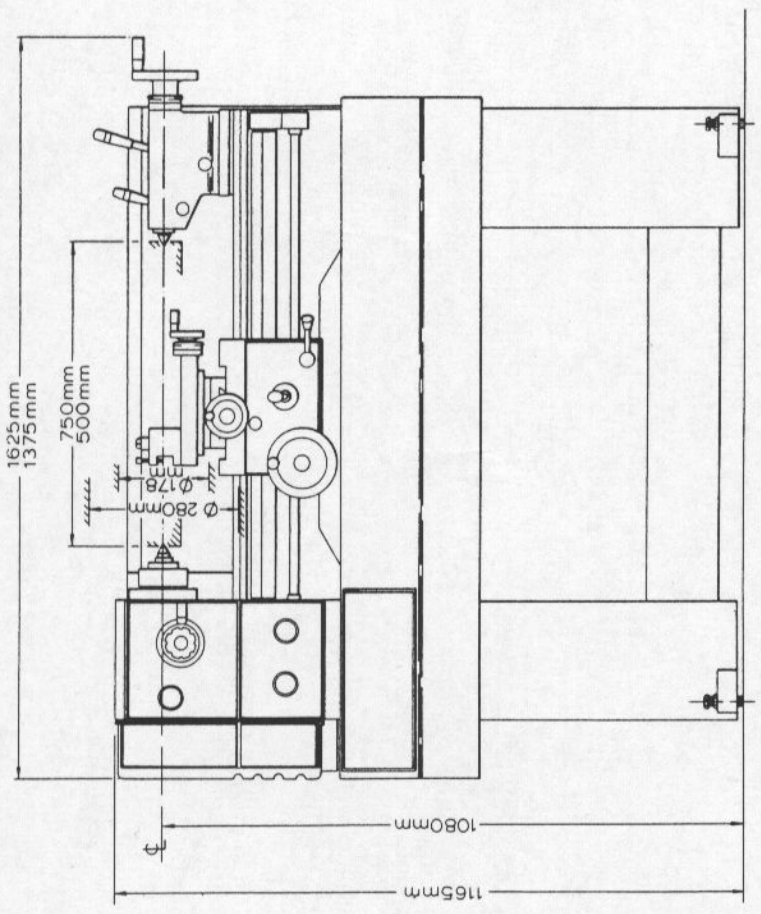
## standard equipment

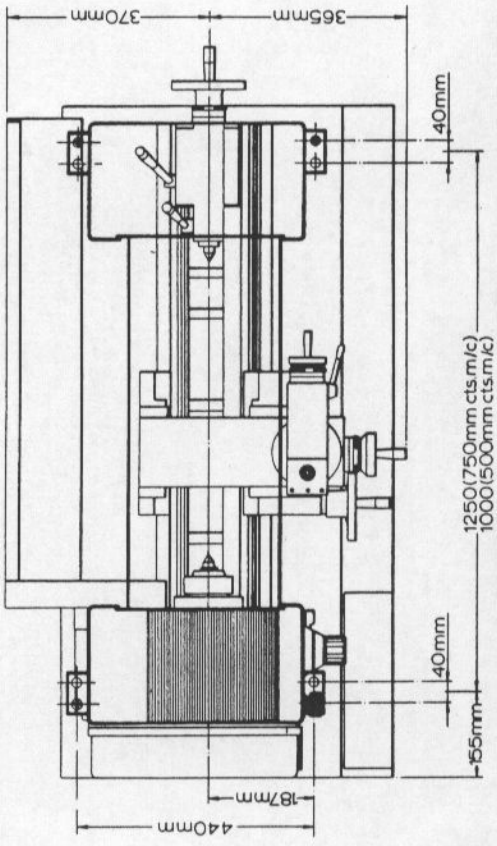
Single Toolpost
Work Driver Plate
No. 5/3 Morse Centre Bush
2 No. 3 M.T. Centres
Spanners, Keys and Oil Gun
Machine Manual
& Standard Inspection Certificate

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

# Installation


735mm


1625mm
1375mm
750mm
500mm
Ø 178
Ø 280mm
1080mm
1165mm


370mm
365mm
40mm
1250(750mm cts.m/c)
1000(500mm cts.m/c)
40mm
155mm
187mm
440mm

## 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

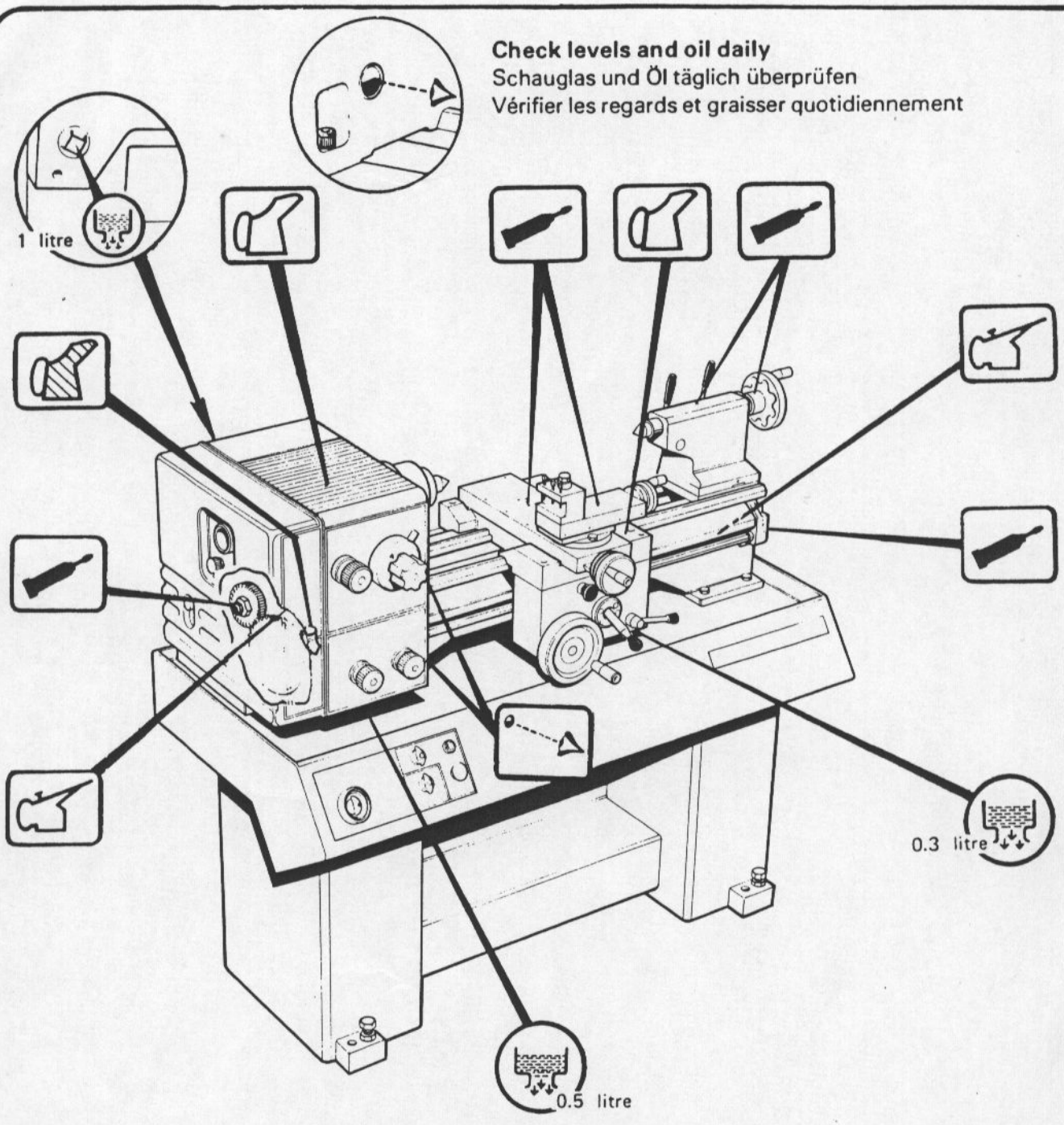
For optimum bearing life and performance it is recommended that high spindle speeds be avoided during the initial life of the machine.

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

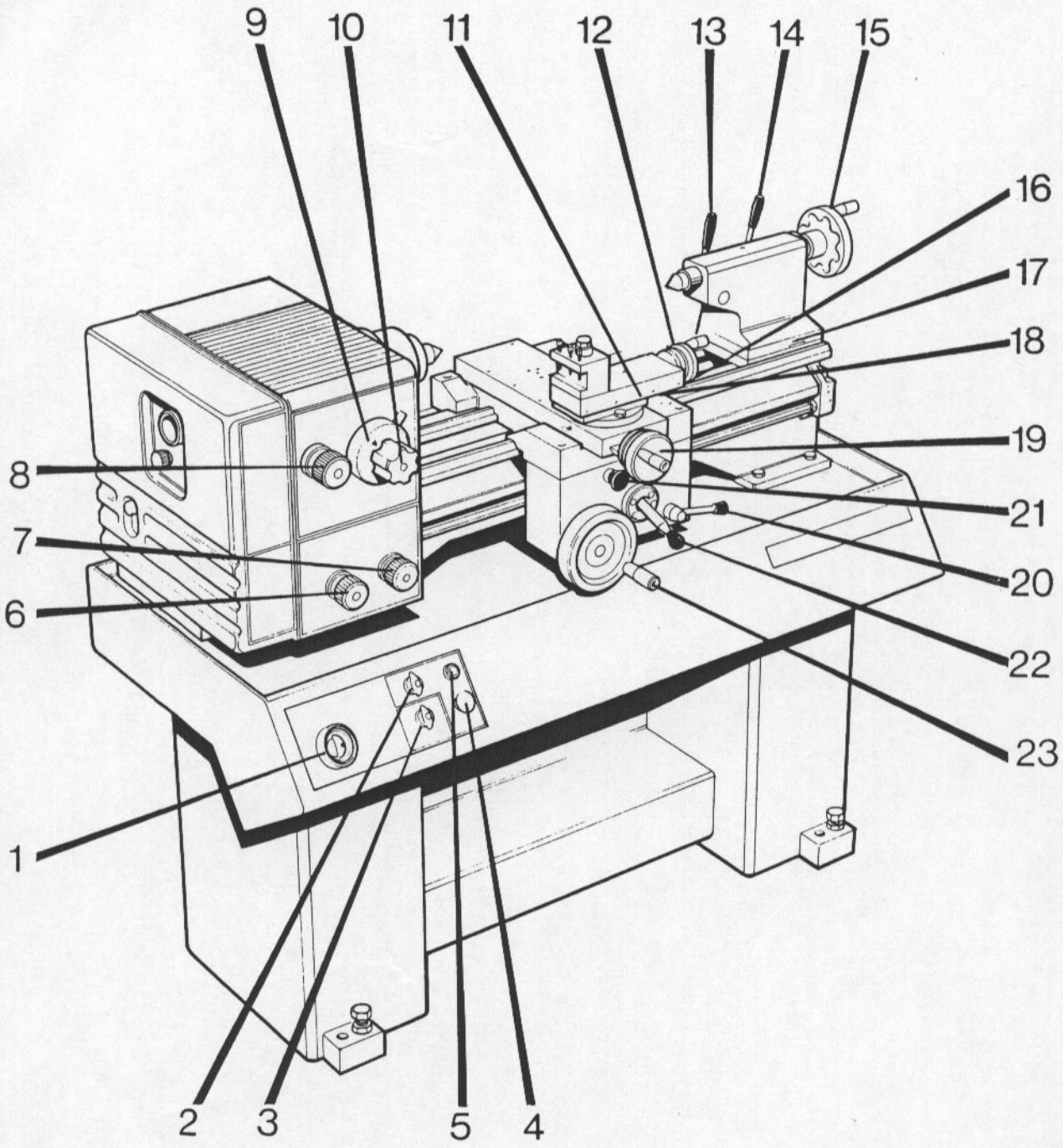
# Lubrication

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




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

## 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

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).

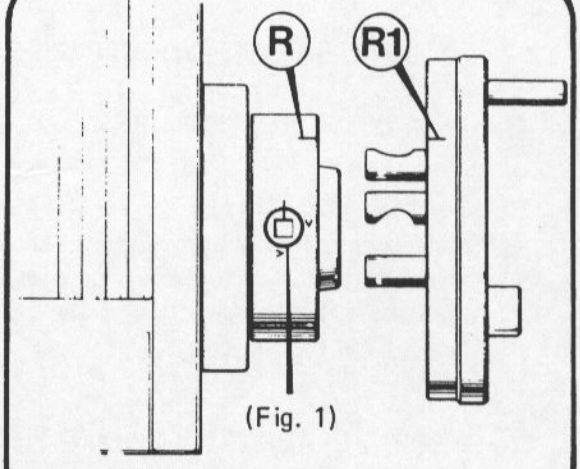
**Mount** the attachment on to the spindle nose and lock each cam by turning it clockwise using the key provided.

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

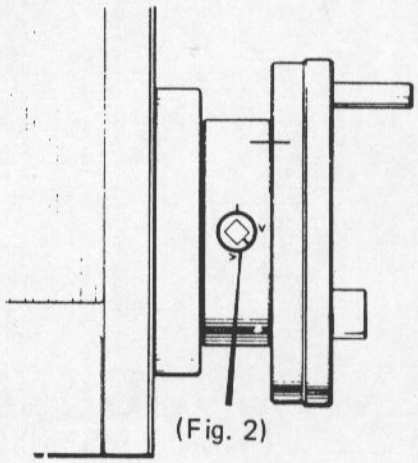
NOTE:-

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.



(Fig. 1)


(Fig. 2)

TO ADJUST 'CAMLOCK STUDS'

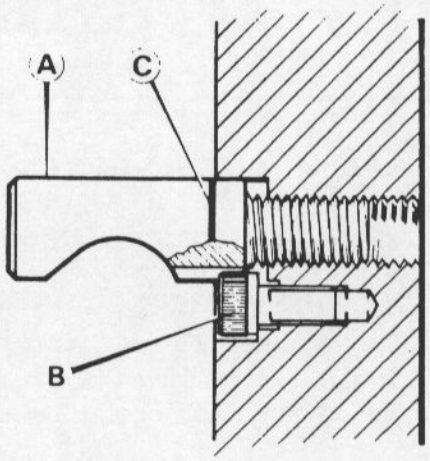
**Remove** Lockscrew (B).

**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.

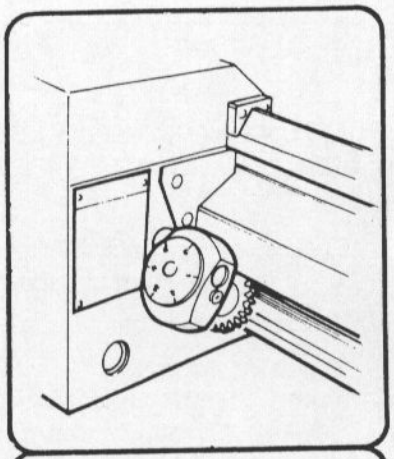
in column 3. The dial numbers at which the leadscrew nuts may be engaged.

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 |

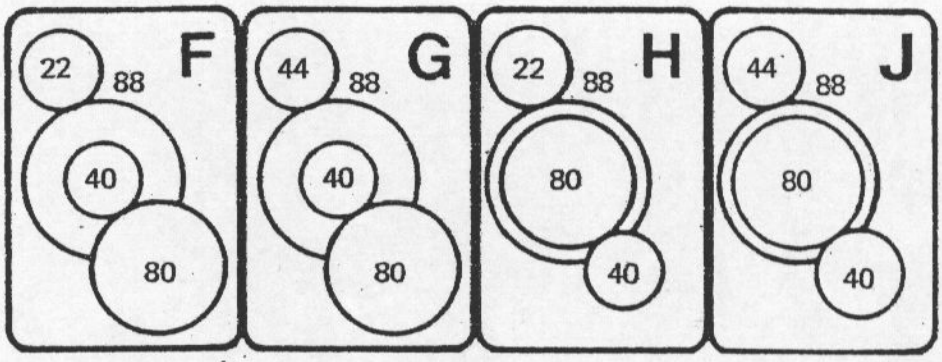
(B) ENGLISH THREADS on METRIC LEADSCREW MACHINES
or
METRIC THREADS on ENGLISH LEADSCREW MACHINES
or
ALL THREADS ON MACHINES NOT FITTED WITH THREAD INDICATOR

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).

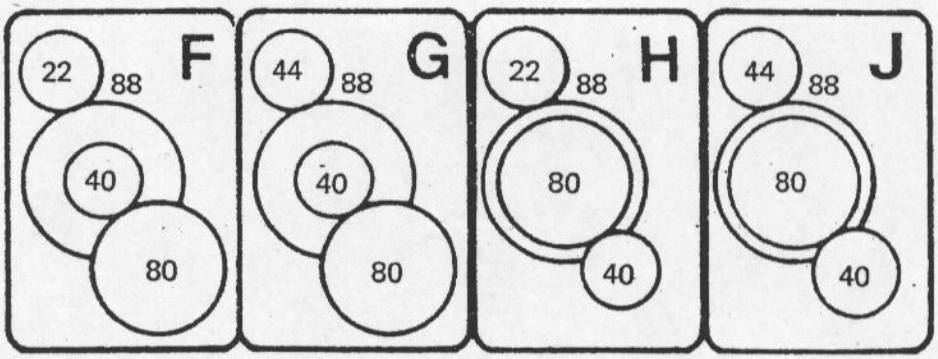
# Thread–cutting

Fig. 2A for Metric Leadscrew Machines




6 mm. pitch Leadscrew

Fig. 2B for English Leadscrew Machines




4 tpi. Leadscrew

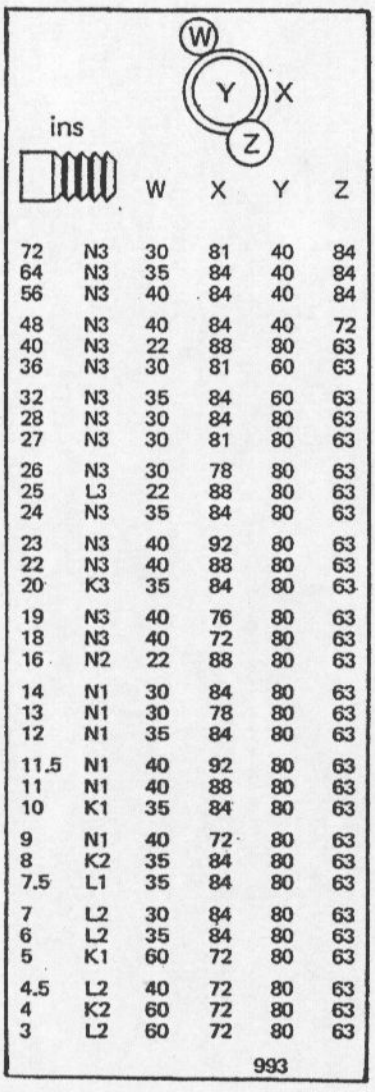
## THREADCUTTING — METRIC GEARBOX

### STANDARD THREADS AVAILABLE

mm

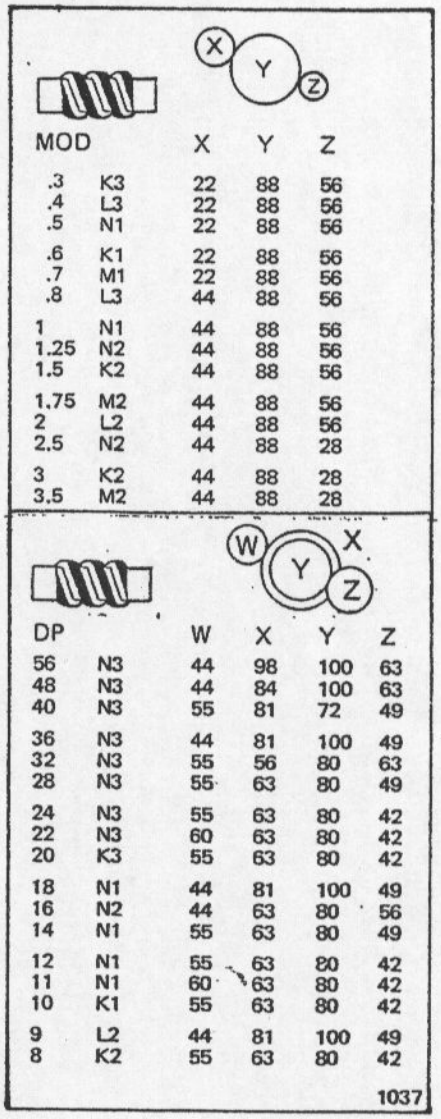
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0.25 | N3F | 0.7 | M1F | 1.2 | K1G | 2 | L2G | 3.5 | M2H |
| 0.3 | K3F | | M3G | | K3H | | N1H | 4 | L2H |
| 0.35 | M3F | 0.75 | K2F | 1.25 | N2G | | N3J | | N1J |
| 0.40 | L3F | 0.8 | L1F | 1.4 | M1G | 2.4 | K1H | 4.8 | K1J |
| 0.5 | N1F | | L3G | | M3H | | K3J | 5 | N2J |
| | N3G | 0.875 | M2F | 1.5 | K2G | 2.5 | N2H | 5.6 | M1J |
| 0.6 | K1F | 1 | L2F | 1.6 | L1G | 2.8 | M1H | 6 | K2J |
| | K3G | | N1G | | L3H | | M3J | 6.4 | L1J |
| 0.625 | N2F | | N3H | 1.75 | M2G | 3 | K2H | 7 | M2J |
| | | | | | | 3.2 | L1H | 8 | L2J |
| | | | | | | | L3J | | |

### THREADS AVAILABLE WITH ADDITIONAL CHANGEWHEELS




| ins | | W | X | Y | Z |
|---|---|---|---|---|---|
| 72 | N3 | 30 | 81 | 40 | 84 |
| 64 | N3 | 35 | 84 | 40 | 84 |
| 56 | N3 | 40 | 84 | 40 | 84 |
| 48 | N3 | 40 | 84 | 40 | 72 |
| 40 | N3 | 22 | 88 | 80 | 63 |
| 36 | N3 | 30 | 81 | 60 | 63 |
| 32 | N3 | 35 | 84 | 60 | 63 |
| 28 | N3 | 30 | 84 | 80 | 63 |
| 27 | N3 | 30 | 81 | 80 | 63 |
| 26 | N3 | 30 | 78 | 80 | 63 |
| 25 | L3 | 22 | 88 | 80 | 63 |
| 24 | N3 | 35 | 84 | 80 | 63 |
| 23 | N3 | 40 | 92 | 80 | 63 |
| 22 | N3 | 40 | 88 | 80 | 63 |
| 20 | K3 | 35 | 84 | 80 | 63 |
| 19 | N3 | 40 | 76 | 80 | 63 |
| 18 | N3 | 40 | 72 | 80 | 63 |
| 16 | N2 | 22 | 88 | 80 | 63 |
| 14 | N1 | 30 | 84 | 80 | 63 |
| 13 | N1 | 30 | 78 | 80 | 63 |
| 12 | N1 | 35 | 84 | 80 | 63 |
| 11.5 | N1 | 40 | 92 | 80 | 63 |
| 11 | N1 | 40 | 88 | 80 | 63 |
| 10 | K1 | 35 | 84 | 80 | 63 |
| 9 | N1 | 40 | 72 | 80 | 63 |
| 8 | K2 | 35 | 84 | 80 | 63 |
| 7.5 | L1 | 35 | 84 | 80 | 63 |
| 7 | L2 | 30 | 84 | 80 | 63 |
| 6 | L2 | 35 | 84 | 80 | 63 |
| 5 | K1 | 60 | 72 | 80 | 63 |
| 4.5 | L2 | 40 | 72 | 80 | 63 |
| 4 | K2 | 60 | 72 | 80 | 63 |
| 3 | L2 | 60 | 72 | 80 | 63 |

993




| MOD | | X | Y | Z |
|---|---|---|---|---|
| .3 | K3 | 22 | 88 | 56 |
| .4 | L3 | 22 | 88 | 56 |
| .5 | N1 | 22 | 88 | 56 |
| .6 | K1 | 22 | 88 | 56 |
| .7 | M1 | 22 | 88 | 56 |
| .8 | L3 | 44 | 88 | 56 |
| 1 | N1 | 44 | 88 | 56 |
| 1.25 | N2 | 44 | 88 | 56 |
| 1.5 | K2 | 44 | 88 | 56 |
| 1.75 | M2 | 44 | 88 | 56 |
| 2 | L2 | 44 | 88 | 56 |
| 2.5 | N2 | 44 | 88 | 28 |
| 3 | K2 | 44 | 88 | 28 |
| 3.5 | M2 | 44 | 88 | 28 |




| DP | | W | X | Y | Z |
|---|---|---|---|---|---|
| 56 | N3 | 44 | 98 | 100 | 63 |
| 48 | N3 | 44 | 84 | 100 | 63 |
| 40 | N3 | 55 | 81 | 72 | 49 |
| 36 | N3 | 44 | 81 | 100 | 49 |
| 32 | N3 | 55 | 56 | 80 | 63 |
| 28 | N3 | 55 | 63 | 80 | 49 |
| 24 | N3 | 55 | 63 | 80 | 42 |
| 22 | N3 | 60 | 63 | 80 | 42 |
| 20 | K3 | 55 | 63 | 80 | 42 |
| 18 | N1 | 44 | 81 | 100 | 49 |
| 16 | N2 | 44 | 63 | 80 | 56 |
| 14 | N1 | 55 | 63 | 80 | 49 |
| 12 | N1 | 55 | 63 | 80 | 42 |
| 11 | N1 | 60 | 63 | 80 | 42 |
| 10 | K1 | 55 | 63 | 80 | 42 |
| 9 | L2 | 44 | 81 | 100 | 49 |
| 8 | K2 | 55 | 63 | 80 | 42 |

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# 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

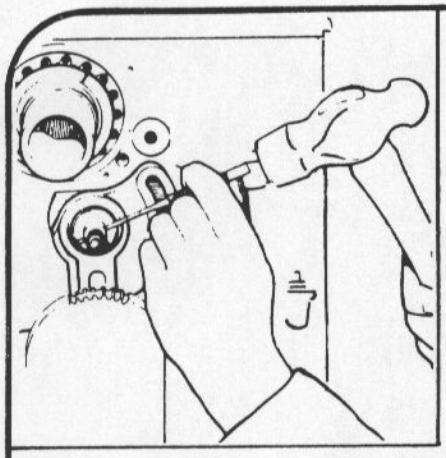


FIG. 1

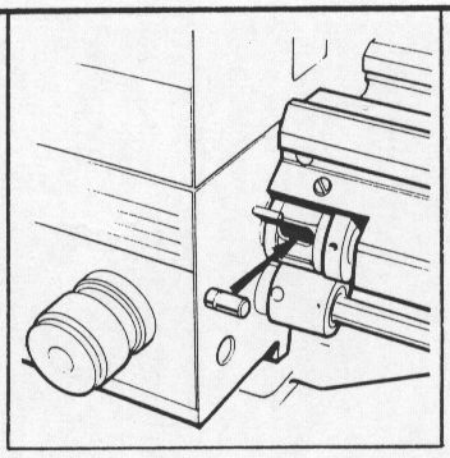


FIG. 2

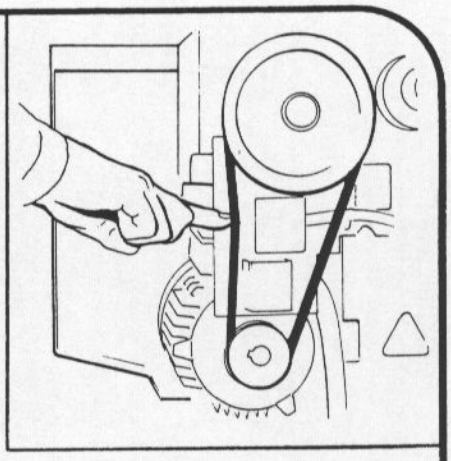


FIG. 3

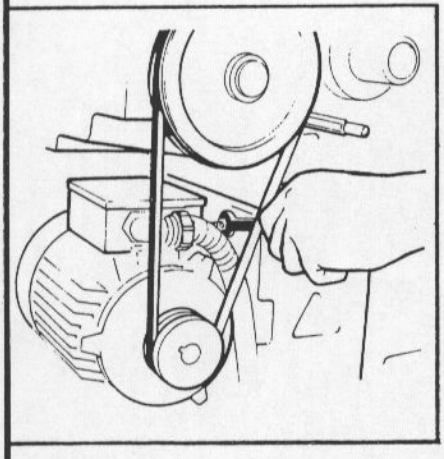


FIG. 4

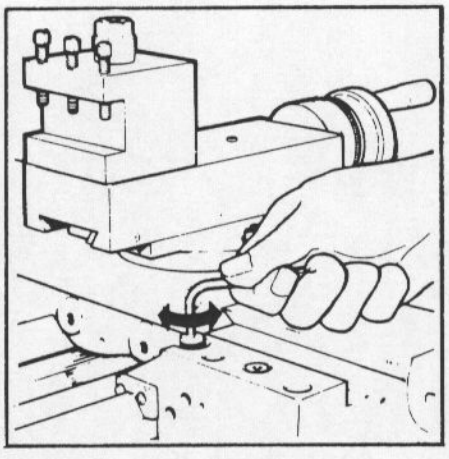


FIG. 5

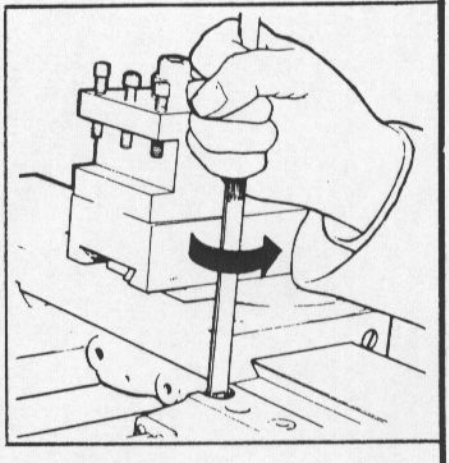


FIG. 6

FIG. 7

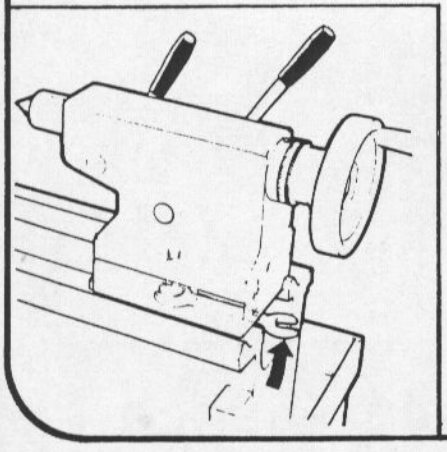


FIG. 8

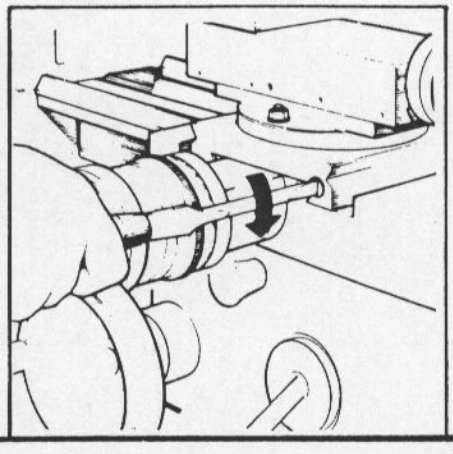
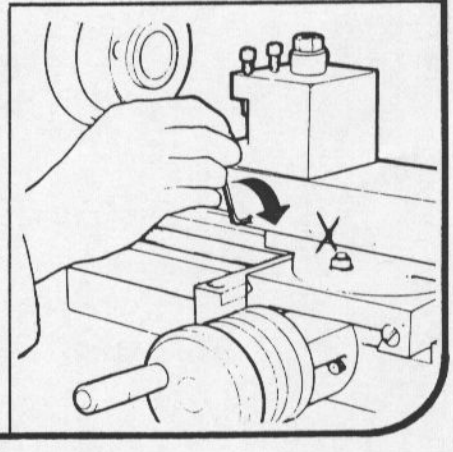


FIG. 9



## 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 accross 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 $30^{o}$ 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 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.

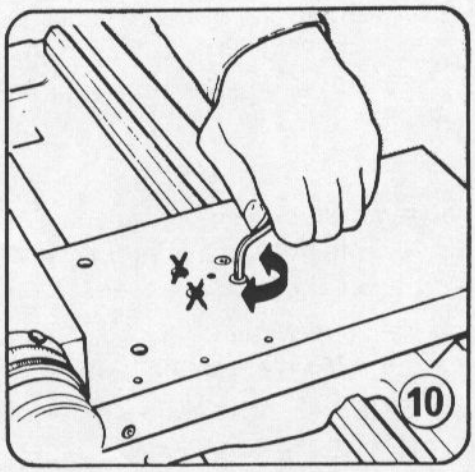
## Top Slide (Fig. 9)

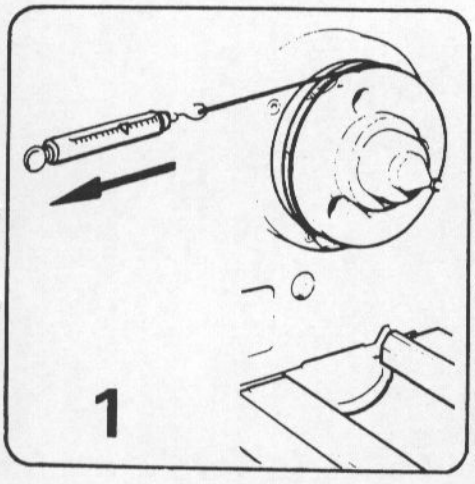
Take up for wear on the top slide strip is by means of the four (self-locking) socket set screws in the front face of the top slide casting.

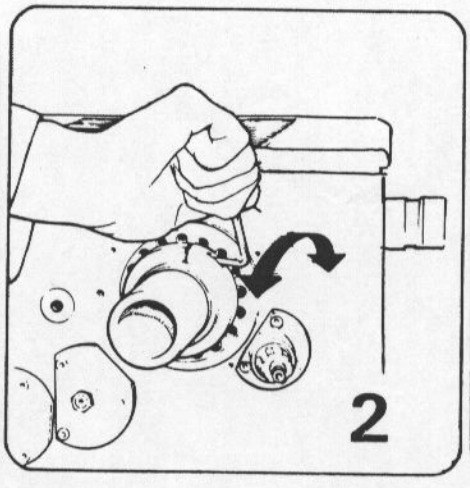
## Cross-slide Nut (Fig. 10)

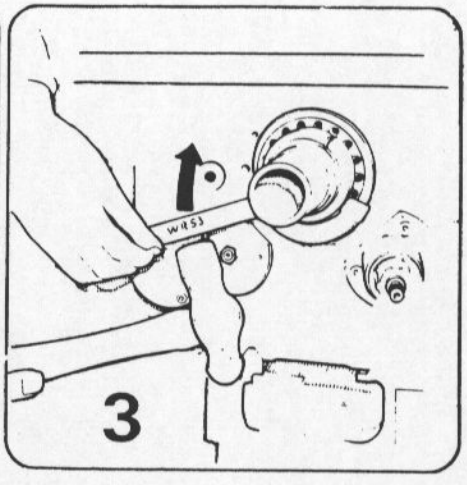
Provision is made for the elimination of backlash in the cross-slide nut, the procedure for adjustment being as follows:-

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

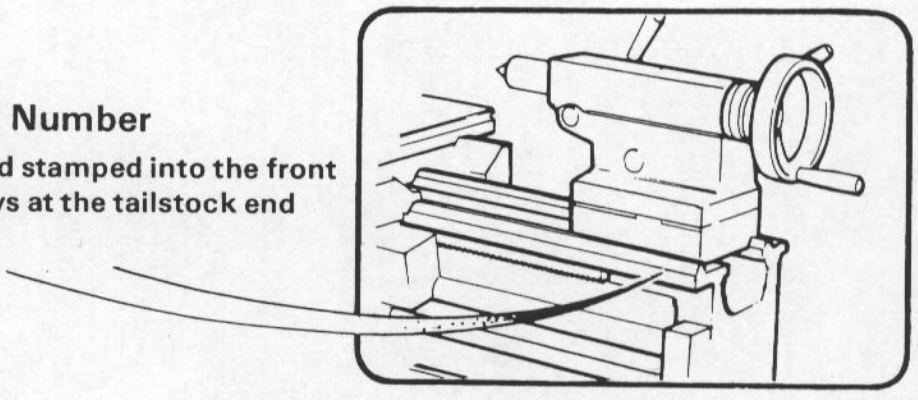
Remove end drive guard, changewheels, swing frame and rear bearing cover.

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.

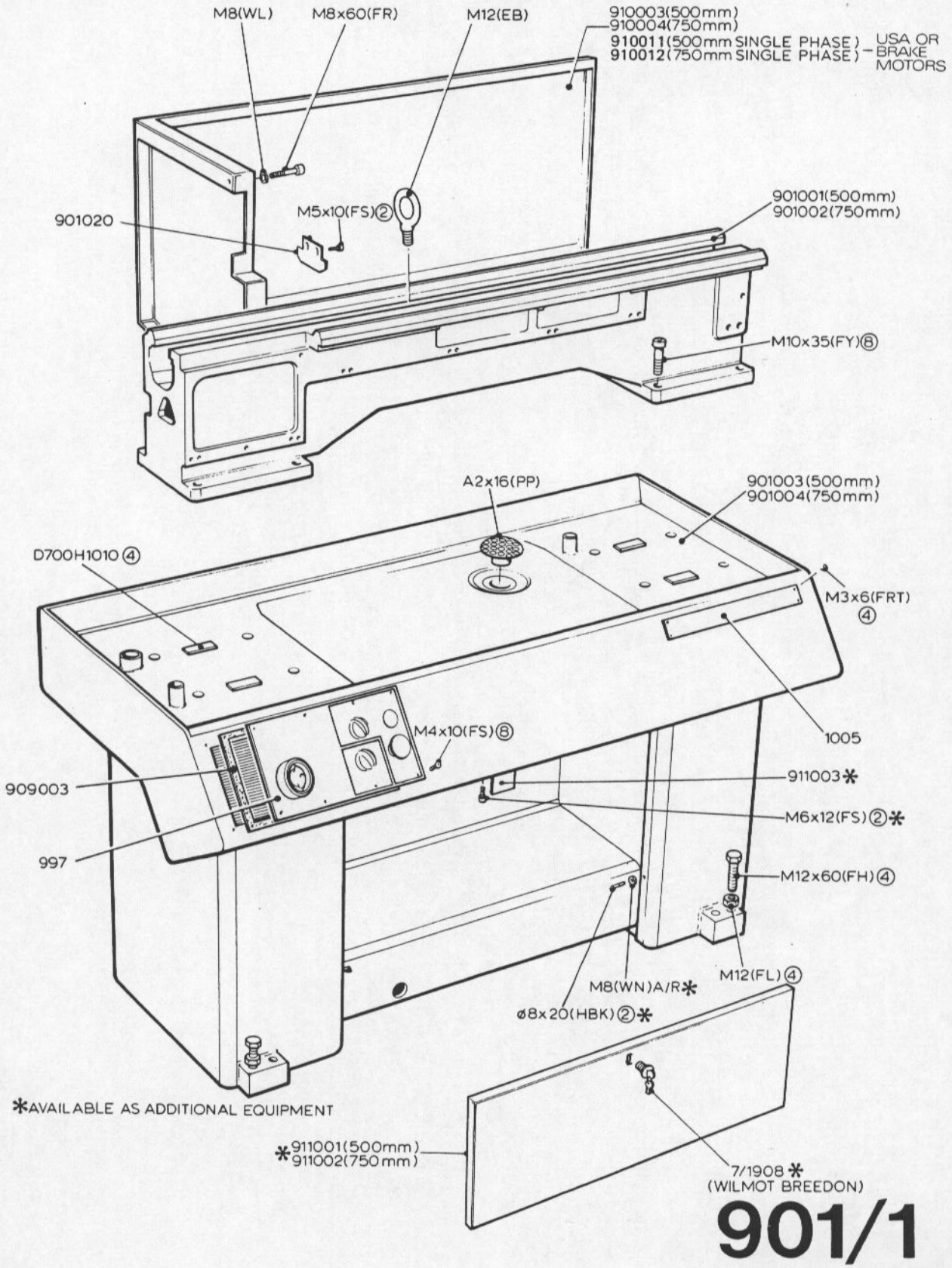
Where part numbers change with machine bed length then the model number is given, vis.

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.

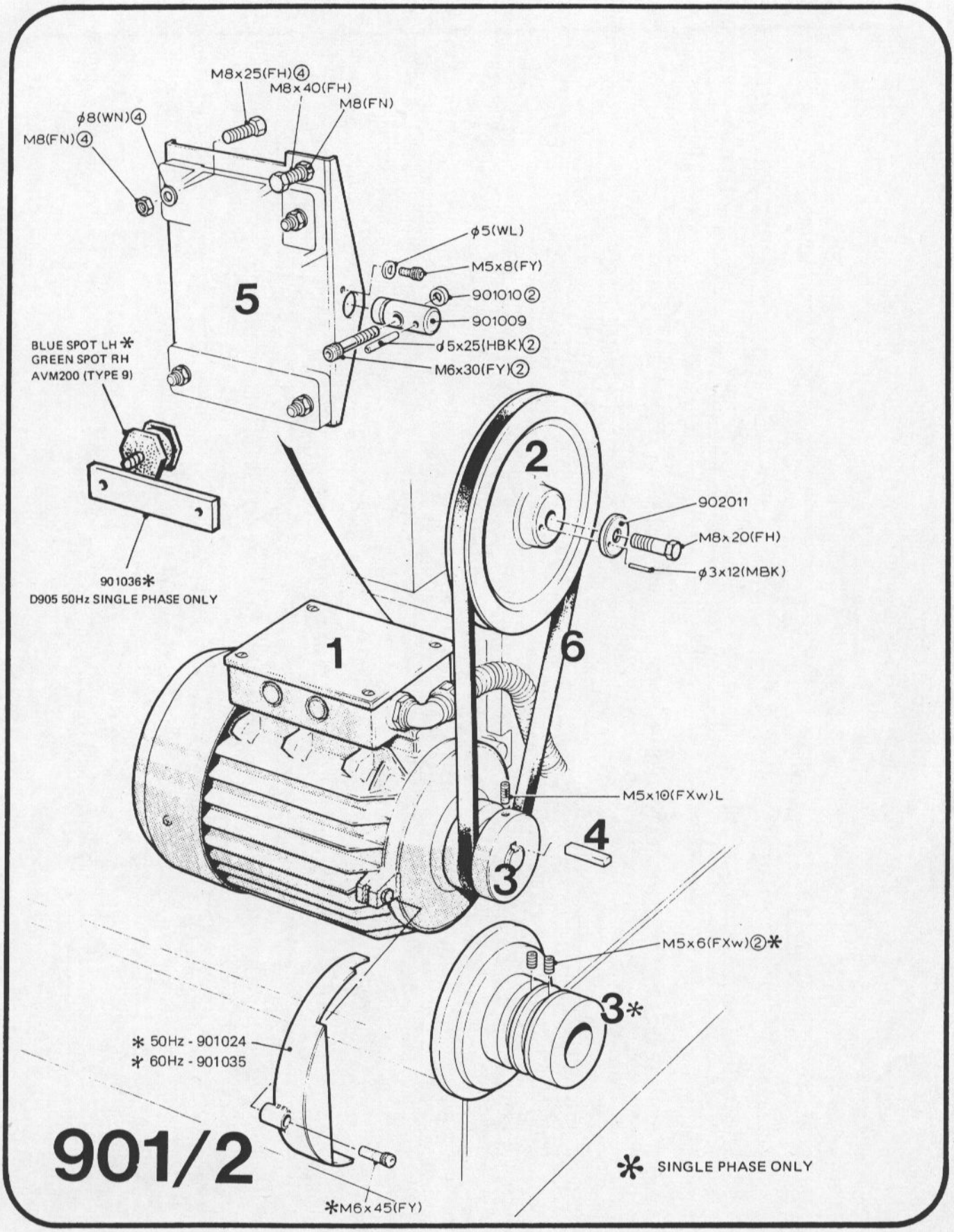
## Parts Section

## Contents List




*AVAILABLE AS ADDITIONAL EQUIPMENT

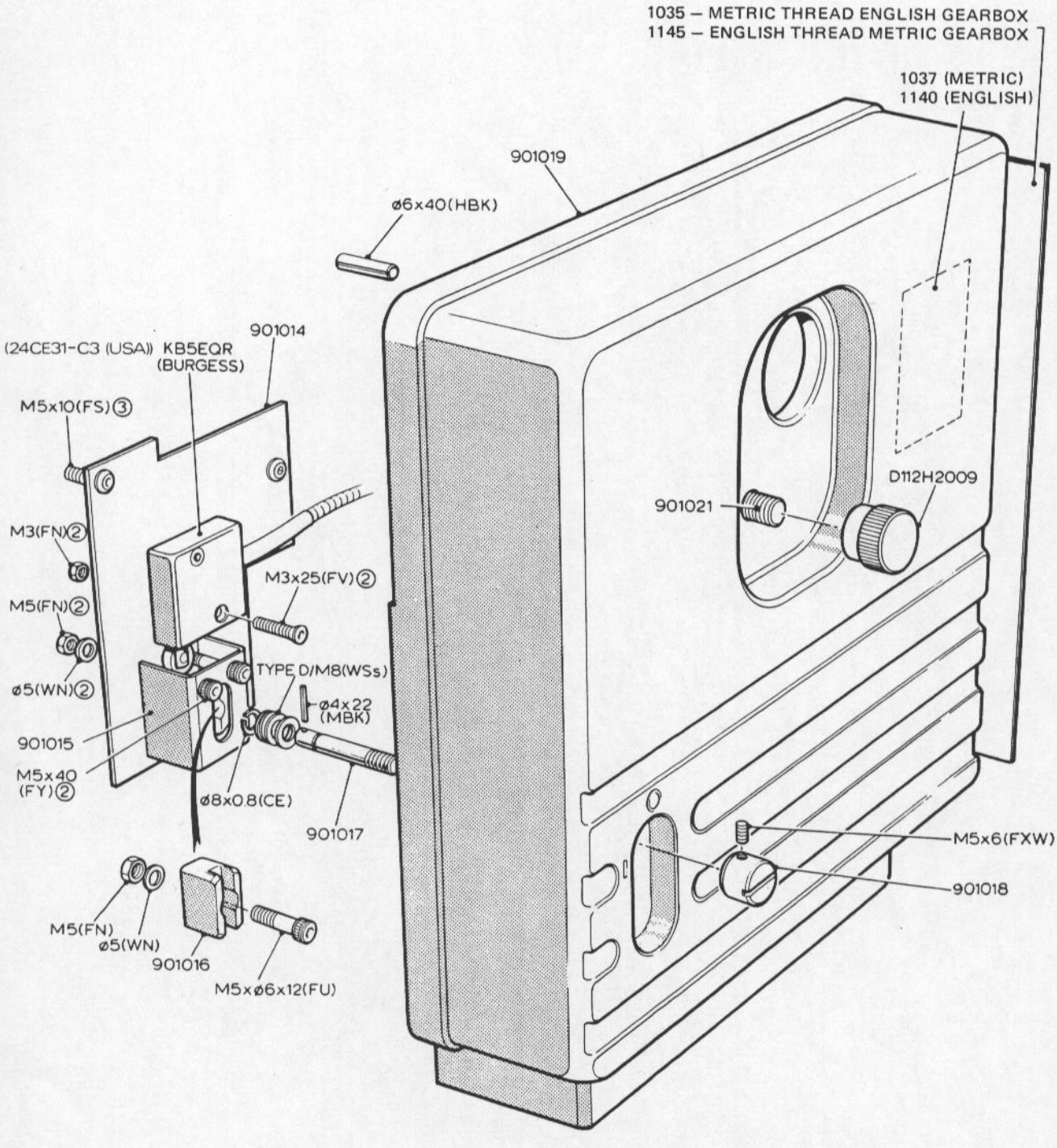
# 901/1


M8x25(FH)④
M8x40(FH)
M8(FN)
φ8(WN)④
M8(FN)④
φ5(WL)
M5x8(FY)
901010②
901009
φ5x25(HBK)②
M6x30(FY)②
5
BLUE SPOT LH ✻
GREEN SPOT RH
AVM200 (TYPE 9)
901036✻
D905 50Hz SINGLE PHASE ONLY
2
902011
M8x20(FH)
φ3x12(MBK)
1
6
M5x10(FXw)L
4
3
M5x6(FXw)②✻
3✻
✻ 50Hz - 901024
✻ 60Hz - 901035
✻M6x45(FY)
✻ SINGLE PHASE ONLY

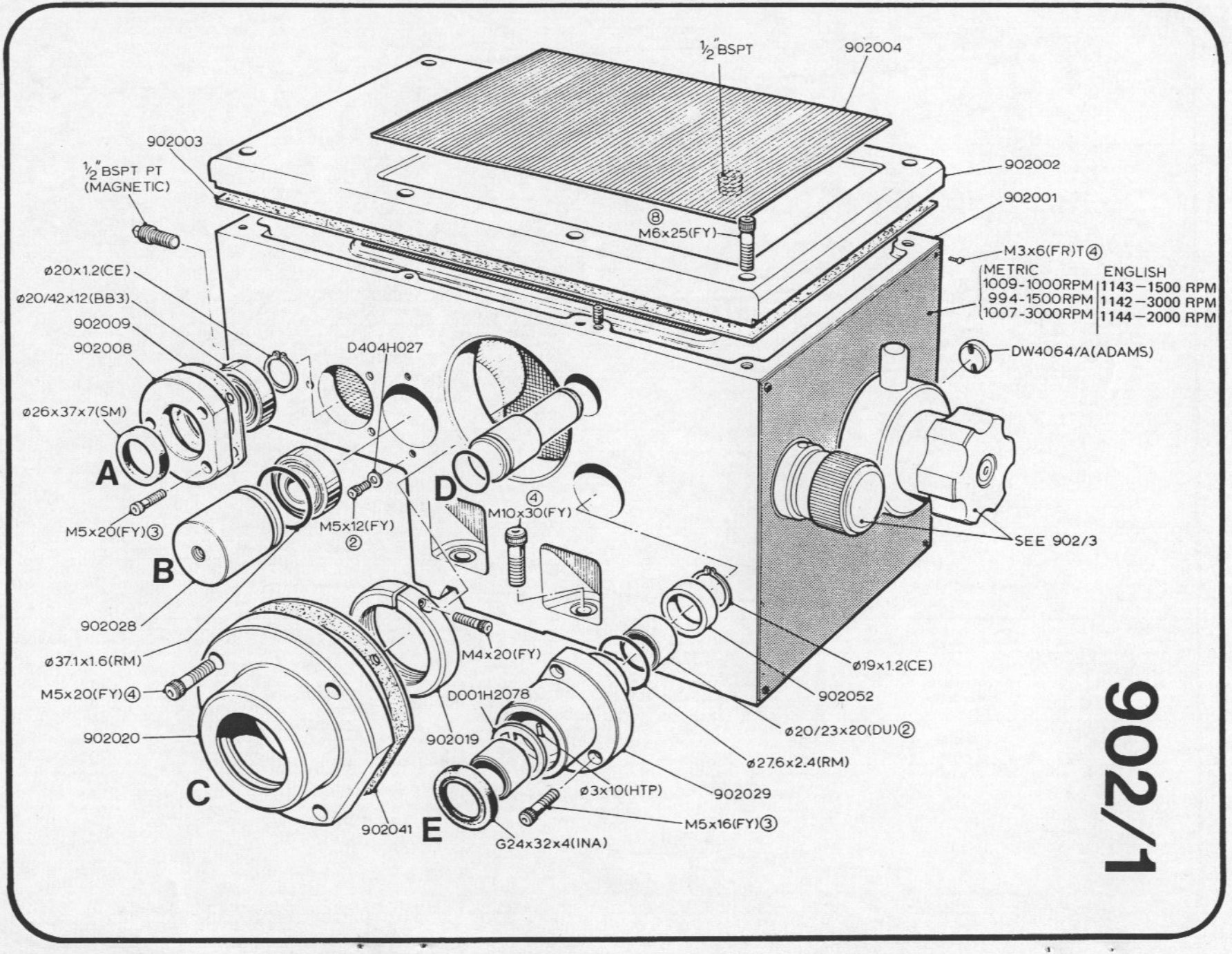
# 901/2

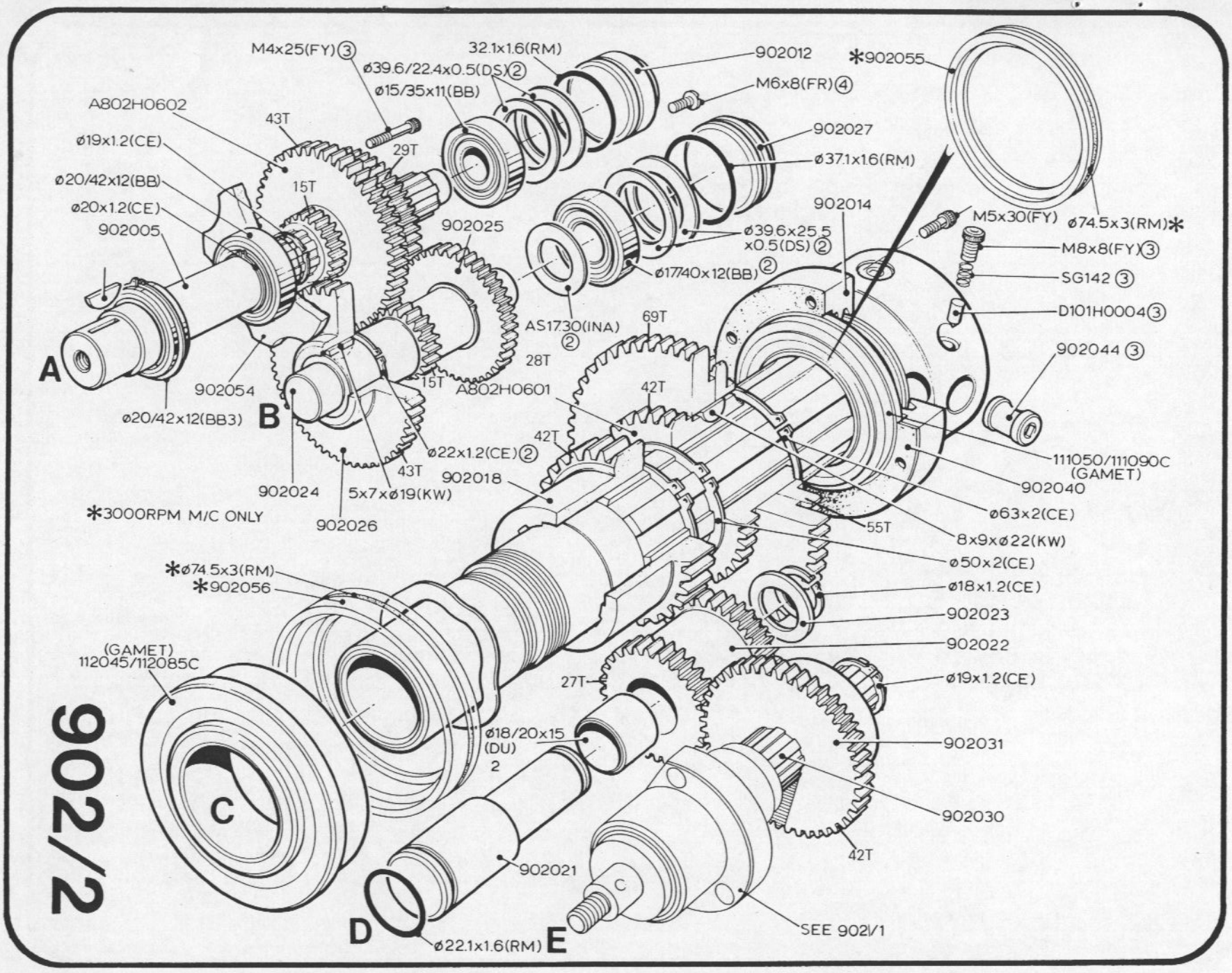
## KEY TO DRIVE ASSEMBLY COMPONENTS (901/2)

| 1 | | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| MOTOR | | TOP SPEED SPINDLE | TOP PULLEY | MOTOR PULLEY | KEY | MOUNTING BRACKET | BELTS |
| D80 | 3 PH 50Hz | 1500 3000 | 902010 | 901012 | 6x5x40 (KR) | 901007 | SPZ 800 |
| D90S | Single PH 50Hz | 1500 | 902053 | 901023 | 8x7x32 (KR) | 901037 | NU-T-Z/10(40°) Brammer ② |
| D80 | 3 PH 60Hz | 1500 3000 | 902010 | 901028 | 6x5x40 (KR) | 901007 | SPZ 800 |
| LS145T | 3 PH 60Hz | 1500 | 902010 | 901013 | 3/16"x3/16"x1.3/8"(KS) | 901008 | SPZ 800 |
| LS145T | 3 PH 60Hz | 2000 | 902057 | 901026 | 3/16"x3/16"x1.3/8"(KS) | 901008 | SPZ/3V 787 |
| EL145T | Single PH 60Hz | 2000 | 902061 | 901033 | 3/16"x3/16"x1.3/8"(KS) | 901008 | SPZ/3V 787 |
| EL145T | Single PH 60Hz | 1500 | 902089 | 901051 | 3/16"x3/16"x1.3/8"(KS) | 901008 | SPZ 800 |


1035 – METRIC THREAD ENGLISH GEARBOX
1145 – ENGLISH THREAD METRIC GEARBOX
1037 (METRIC)
1140 (ENGLISH)
901019
ø6x40(HBK)
901014
(24CE31-C3 (USA)) KB5EQR
(BURGESS)
M5x10(FS)③
M3(FN)②
M5(FN)②
ø5(WN)②
M3x25(FV)②
TYPE D/M8(WSs)
ø4x22
(MBK)
901015
M5x40
(FY)②
ø8x0.8(CE)
901017
M5(FN)
ø5(WN)
901016
M5xø6x12(FU)
901021
D112H2009
M5x6(FXW)
901018

# 901/3


½"BSPT
902004
902003
½"BSPT PT
(MAGNETIC)
902002
902001
⑧
M6x25(FY)
M3x6(FR)T④
METRIC
ENGLISH
1009-1000RPM
1143—1500 RPM
994-1500RPM
1142—3000 RPM
1007-3000RPM
1144—2000 RPM
ø20x1.2(CE)
ø20/42x12(BB3)
902009
902008
D404H027
DW4064/A(ADAMS)
ø26x37x7(SM)
A
D
④
M10x30(FY)
M5x20(FY)③
M5x12(FY)
②
SEE 902/3
B
902028
ø37.1x1.6(RM)
M4x20(FY)
ø19x1.2(CE)
M5x20(FY)④
D001H2078
902052
902020
902019
ø20/23x20(DU)②
ø27.6x2.4(RM)
ø3x10(HTP)
902029
C
902041
E
M5x16(FY)③
G24x32x4(INA)
902/1


902/2
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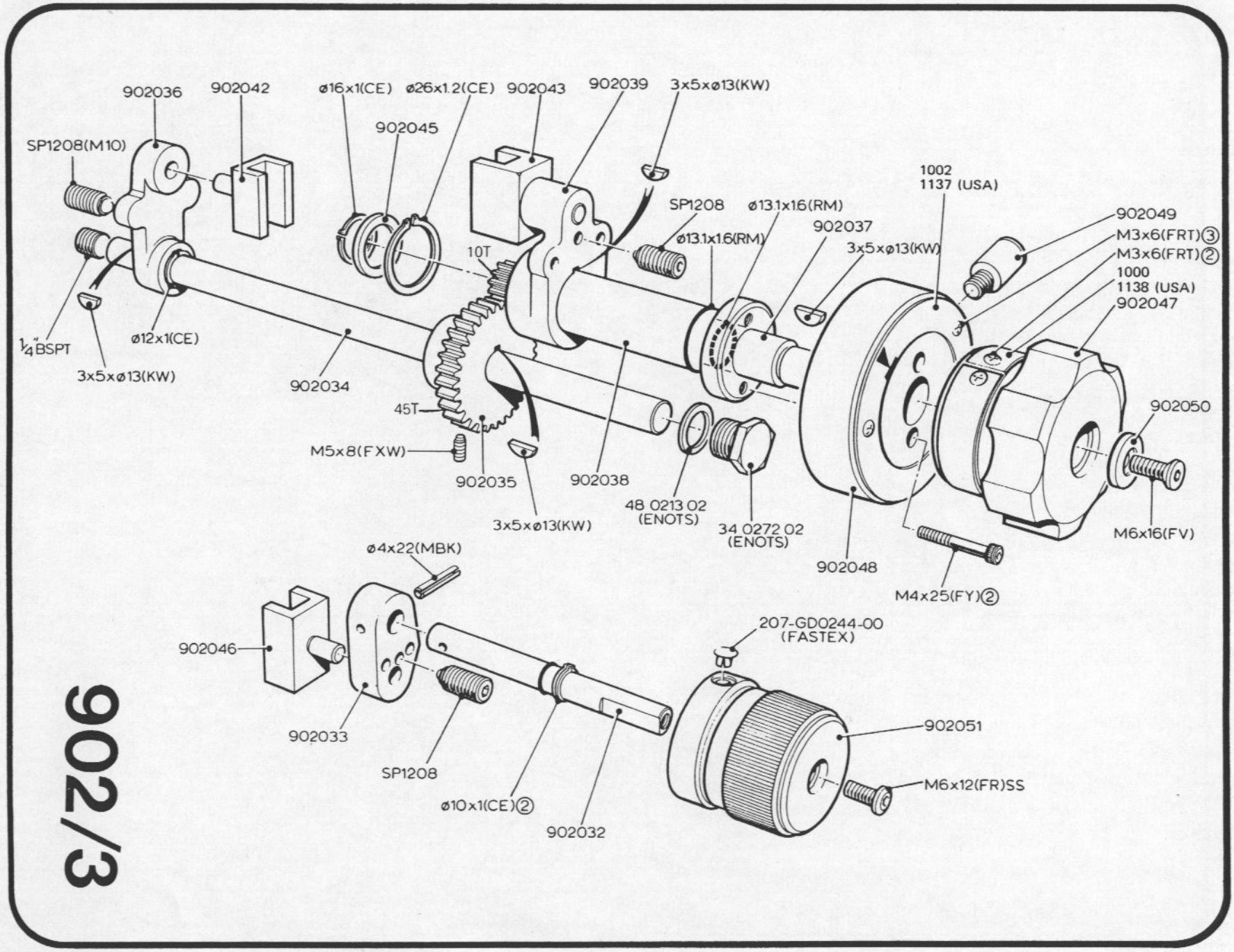
ø39.6/22.4x0.5(DS)②
32.1x1.6(RM)
902012
✻902055
M6x8(FR)④
ø15/35x11(BB)
A802H0602
43T
ø19x1.2(CE)
29T
902027
ø37.1x1.6(RM)
ø20/42x12(BB)
15T
ø20x1.2(CE)
902005
902025
902014
M5x30(FY)
ø74.5x3(RM)✻
ø39.6x25.5
x0.5(DS)②
M8x8(FY)③
ø17/40x12(BB)②
SG142 ③
D101H0004③
AS1730(INA)
②
69T
28T
902044 ③
A
902054
15T
A802H0601
42T
ø20/42x12(BB3)
B
42T
111050/111090C
(GAMET)
ø22x1.2(CE)②
43T
902018
902040
902024
5x7xø19(KW)
ø63x2(CE)
✻3000RPM M/C ONLY
902026
55T
8x9xø22(KW)
ø50x2(CE)
✻ø74.5x3(RM)
✻902056
ø18x1.2(CE)
902023
902022
(GAMET)
112045/112085C
27T
ø19x1.2(CE)
ø18/20x15
(DU)
2
902031
C
902030
42T
902021
C
SEE 902I/1
D
ø22.1x1.6(RM)
E


902036
902042
ø16x1(CE)
ø26x1.2(CE)
902043
902039
3x5xø13(KW)
902045
SP1208(M10)
1002
1137 (USA)
SP1208
ø13.1x16(RM)
902037
902049
M3x6(FRT)③
M3x6(FRT)②
10T
ø13.1x1.6(RM)
3x5xø13(KW)
1000
1138 (USA)
902047
1/4"BSPT
ø12x1(CE)
3x5xø13(KW)
902034
45T
902050
M5x8(FXW)
902035
902038
48 0213 02
(ENOTS)
34 0272 02
(ENOTS)
M6x16(FV)
902048
M4x25(FY)②
ø4x22(MBK)
207-GD0244-00
(FASTEX)
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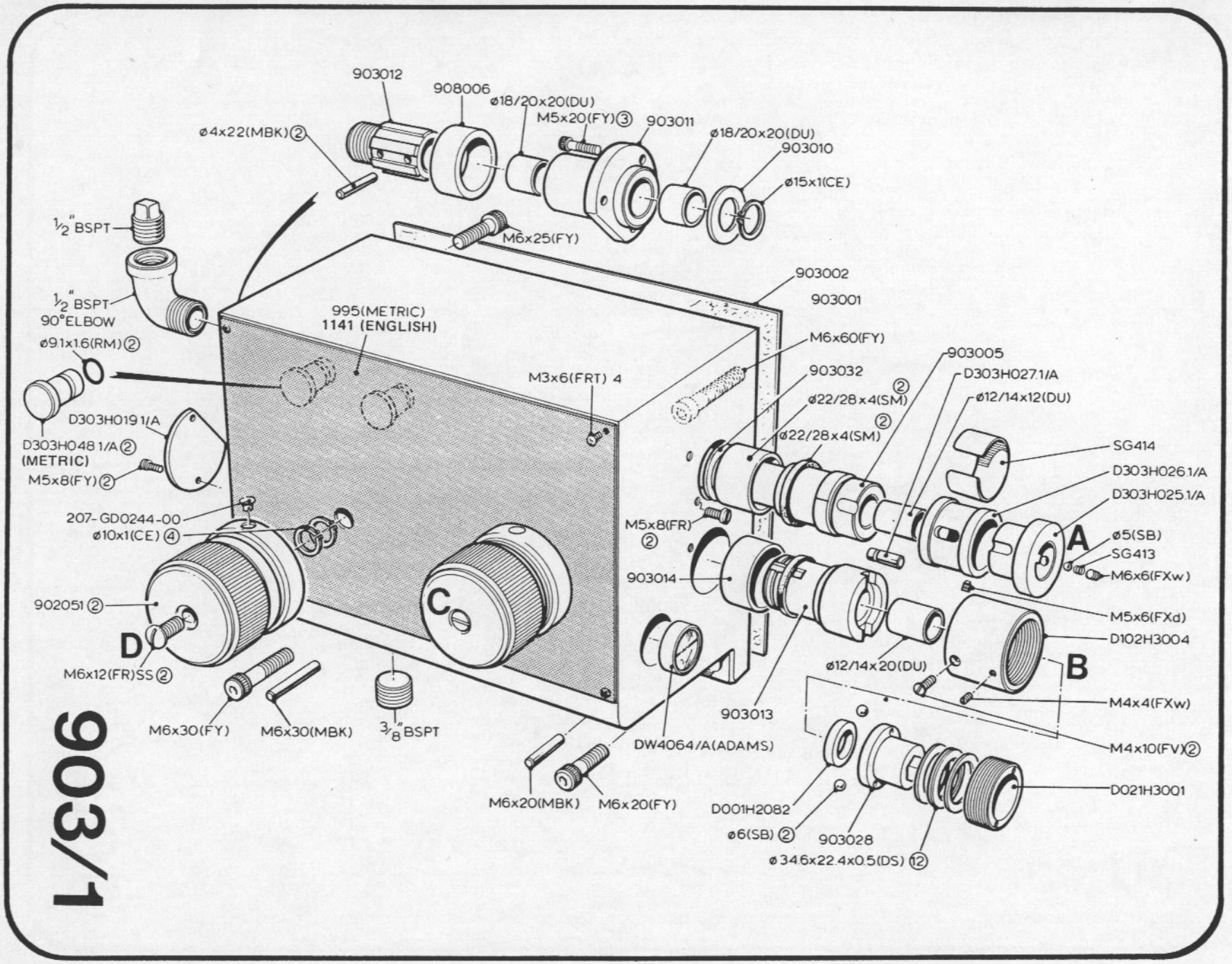
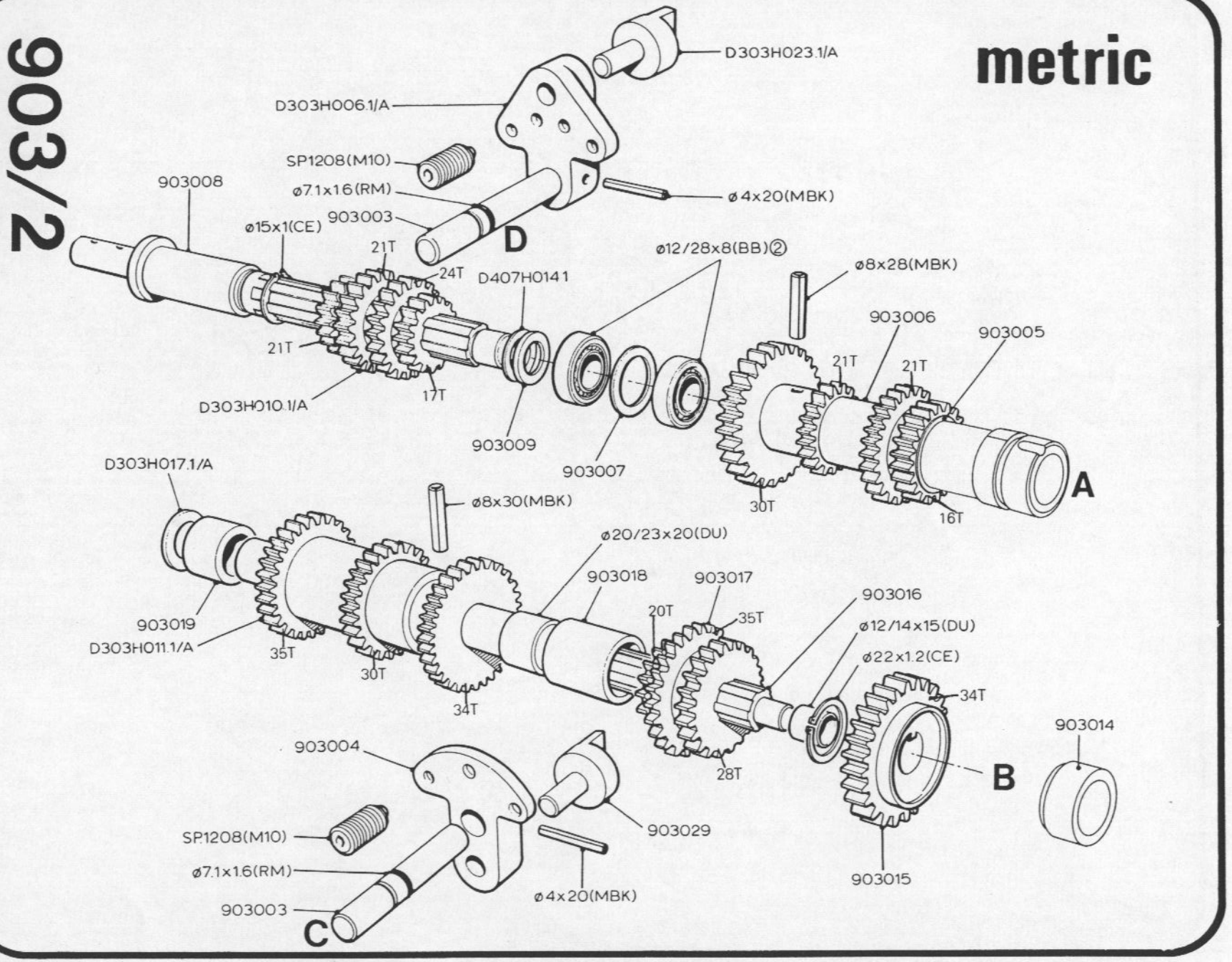
902051
902033
SP1208
M6x12(FR)SS
ø10x1(CE)②
902032
902/3


903012
908006
ø18/20x20(DU)
M5x20(FY)③
903011
ø18/20x20(DU)
903010
ø15x1(CE)
ø4x22(MBK)②
½" BSPT
M6x25(FY)
903002
903001
½" BSPT
90°ELBOW
995(METRIC)
1141 (ENGLISH)
M6x60(FY)
ø9.1x1.6(RM)②
903005
903032
D303H027.1/A
ø22/28x4(SM)②
ø12/14x12(DU)
M3x6(FRT) 4
D303H019.1/A
ø22/28x4(SM)②
SG414
D303H048.1/A②
(METRIC)
M5x8(FY)②
D303H026.1/A
D303H025.1/A
207-GD0244-00
ø10x1(CE)④
M5x8(FR)②
A
ø5(SB)
SG413
M6x6(FXw)
903014
902051②
M5x6(FXd)
D102H3004
D
C
B
M6x12(FR)SS②
ø12/14x20(DU)
M4x4(FXw)
903013
M6x30(FY)
M6x30(MBK)
⅜" BSPT
DW4064/A(ADAMS)
M4x10(FV)②
D021H3001
M6x20(MBK)
M6x20(FY)
D001H2082
ø6(SB)②
903028
ø34.6x22.4x0.5(DS)⑫

# 903/1

# 903/2

**metric**


D303H023.1/A
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SP1208(M10)
ø7.1x1.6(RM)
903003
D
ø4x20(MBK)
903008
ø15x1(CE)
21T
24T
D407H0141
ø12/28x8(BB)②
ø8x28(MBK)
903006
903005
21T
21T
21T
17T
D303H010.1/A
903009
903007
30T
16T
A
D303H017.1/A
ø8x30(MBK)
ø20/23x20(DU)
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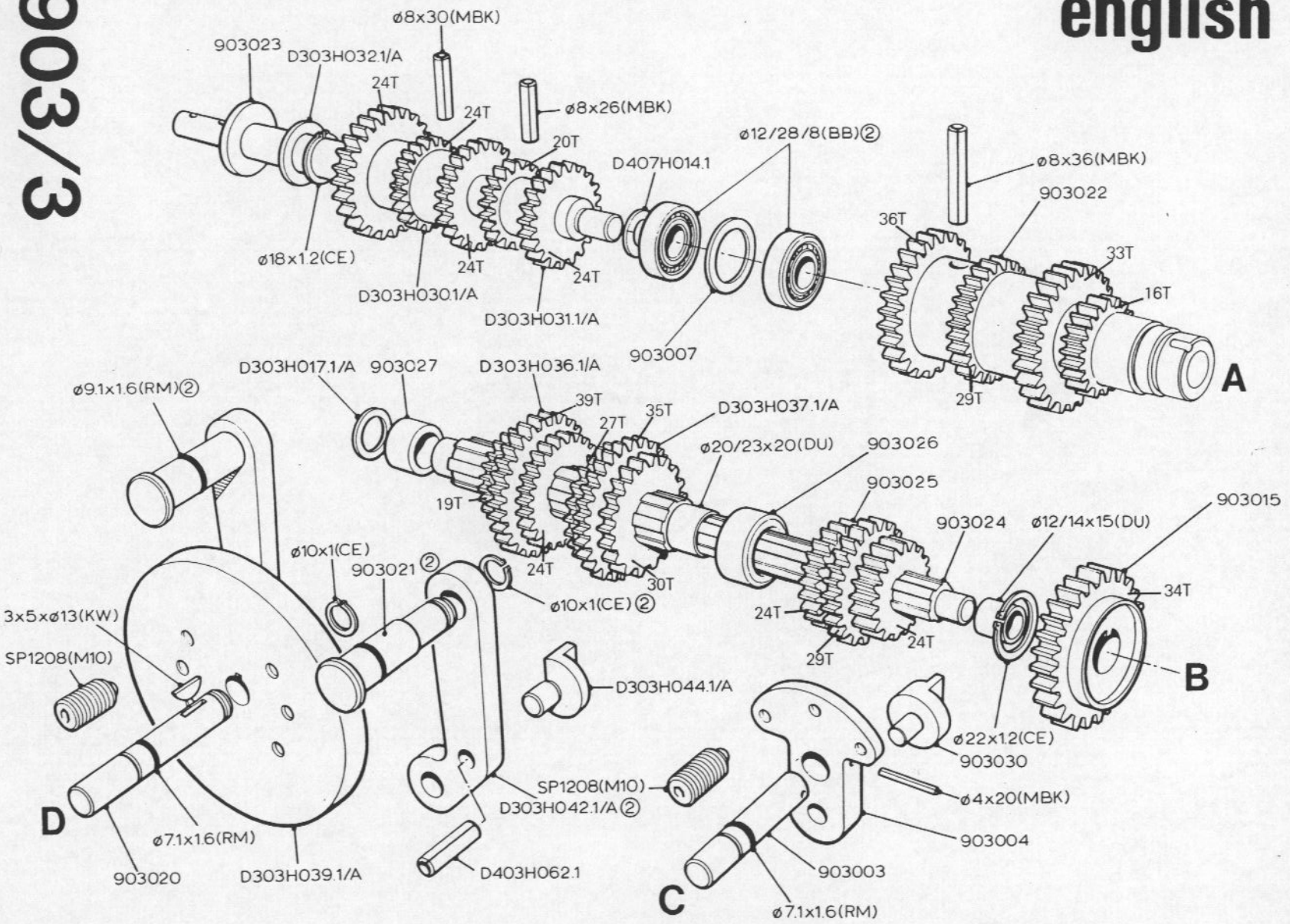
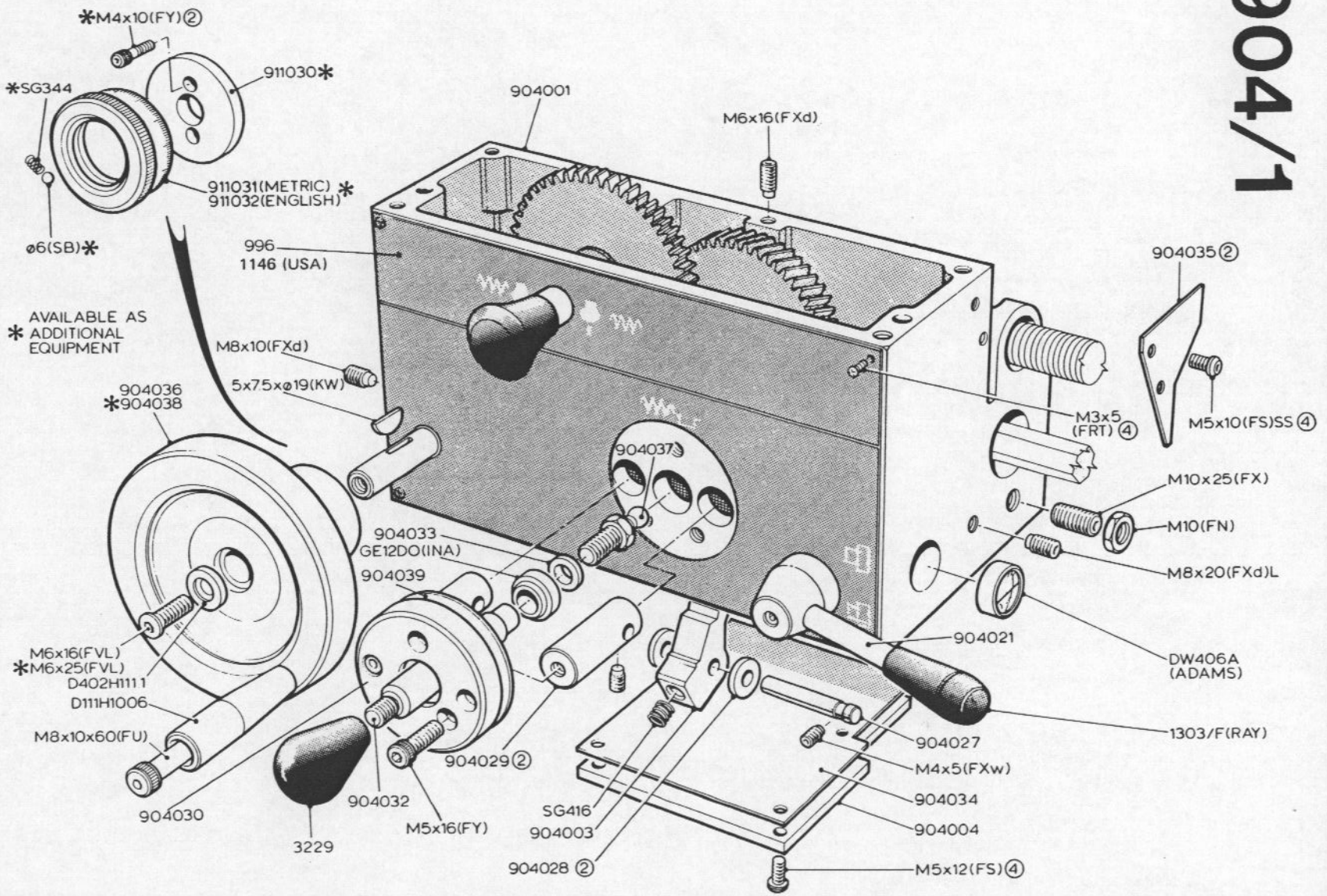
903017
903016
903019
D303H011.1/A
35T
30T
34T
20T
35T
ø12/14x15(DU)
ø22x1.2(CE)
34T
28T
B
903014
903004
903029
SP1208(M10)
ø7.1x1.6(RM)
903003
ø4x20(MBK)
903015
C

# 903/3

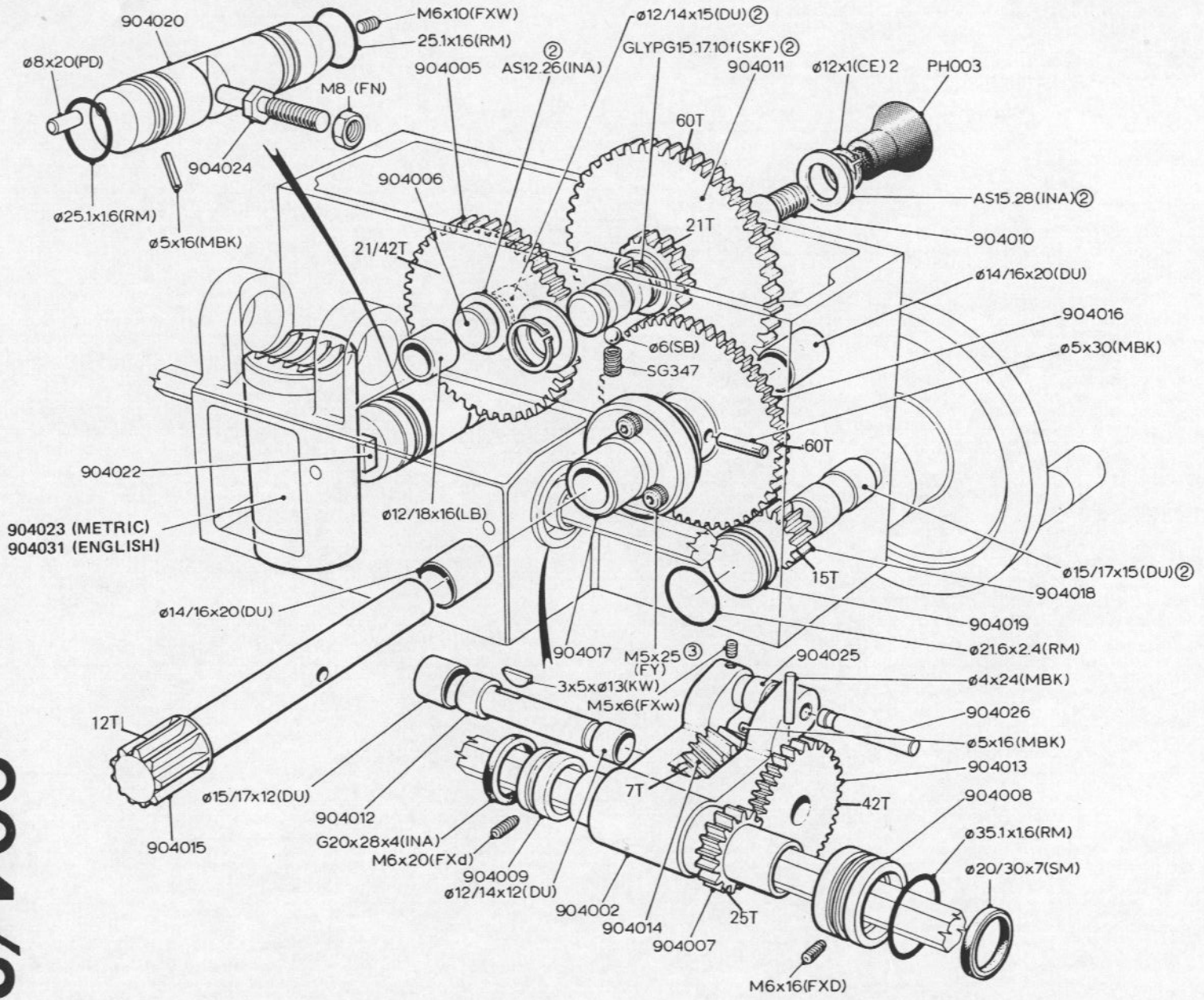
# english

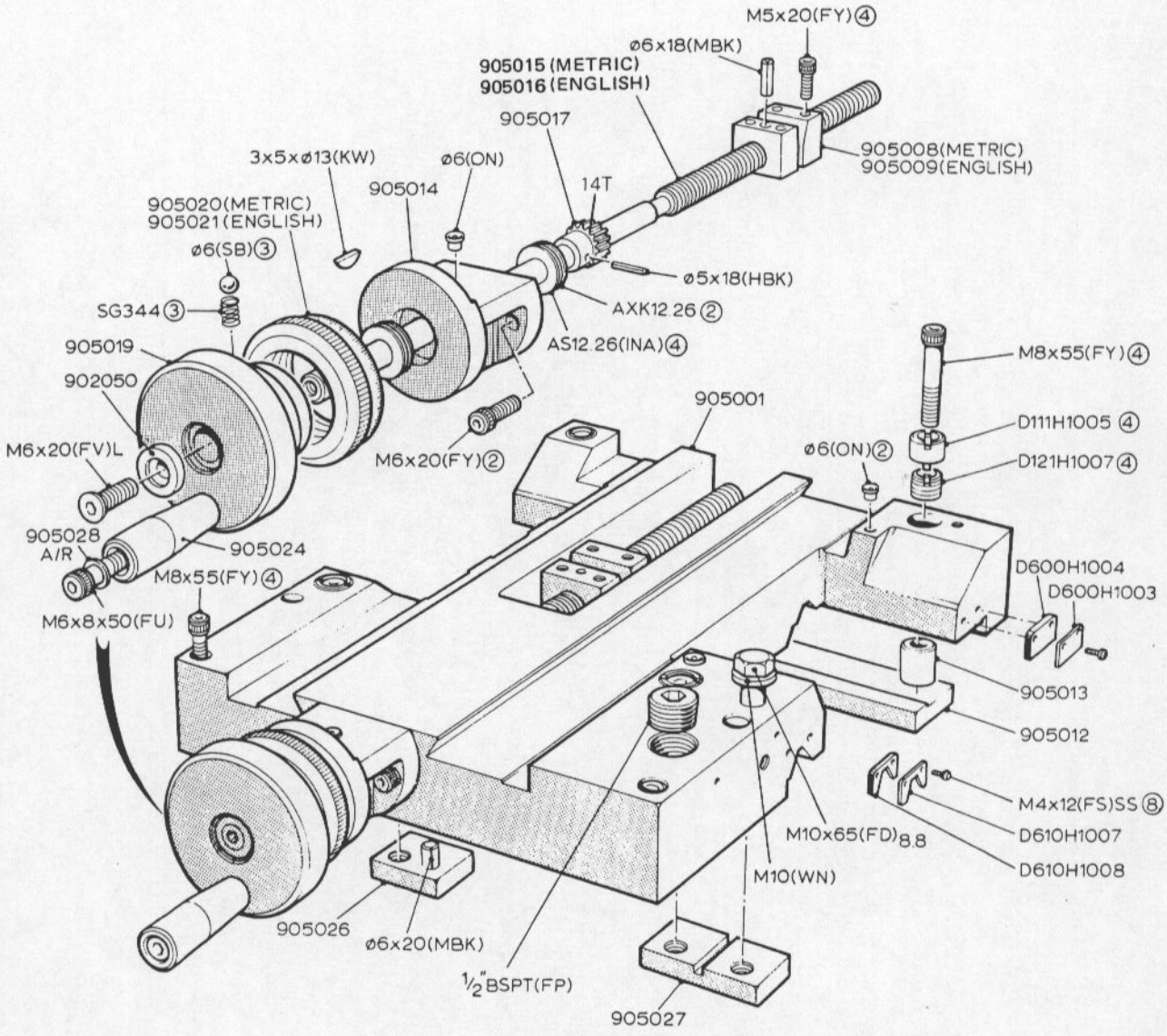


# 904/1

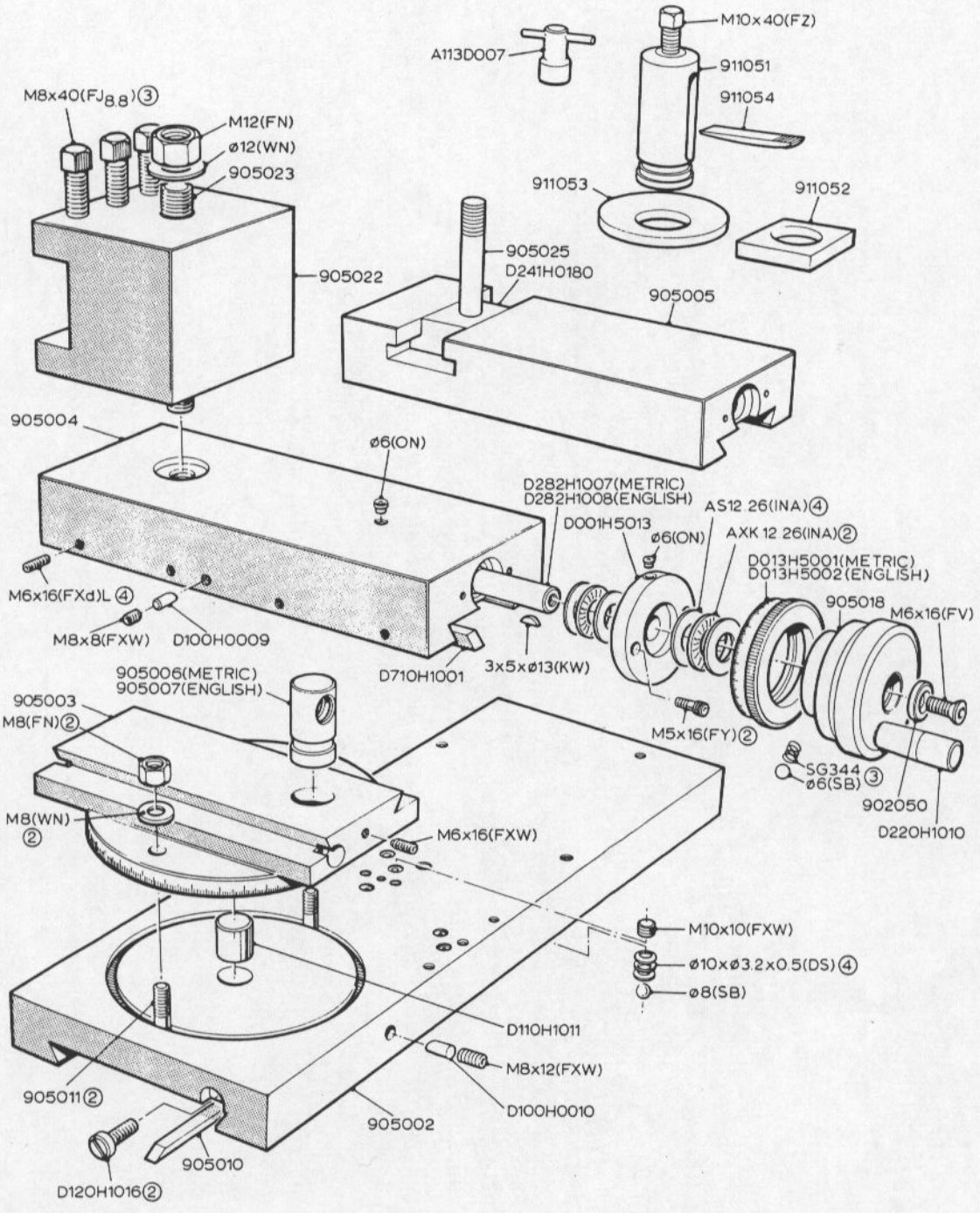

*M4x10(FY)②
911030*
*SG344
911031(METRIC) *
911032(ENGLISH)
ø6(SB)*
904001
M6x16(FXd)
996
1146 (USA)
904035②
* AVAILABLE AS ADDITIONAL EQUIPMENT
M8x10(FXd)
5x7.5xø19(KW)
904036
*904038
M3x5 (FRT) ④
M5x10(FS)SS ④
904037
M10x25(FX)
M10(FN)
904033
GE12DO(INA)
M8x20(FXd)L
904039
904021
DW406A (ADAMS)
M6x16(FVL)
*M6x25(FVL)
D402H1111
D111H1006
M8x10x60(FU)
1303/F(RAY)
904027
M4x5(FXw)
904029②
904032
904034
904030
SG416
M5x16(FY)
904003
904004
3229
904028 ②
M5x12(FS)④

# 904/2

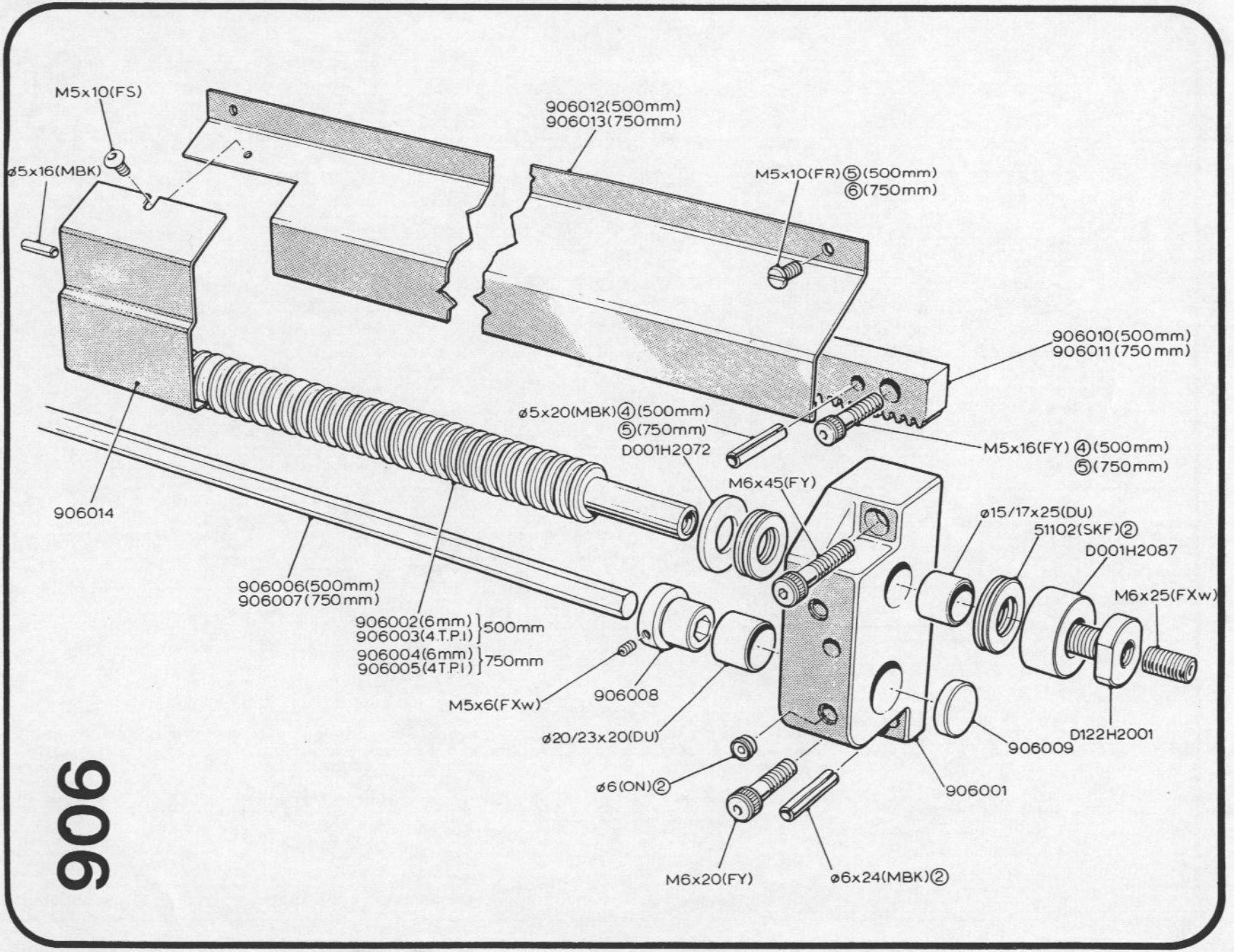

904020
M6x10(FXW)
25.1x1.6(RM)
ø8x20(PD)
M8 (FN)
904024
ø25.1x1.6(RM)
ø5x16(MBK)
904005
AS12.26(INA)②
ø12/14x15(DU)②
GLYPG15.17.10f(SKF)②
904011
ø12x1(CE)2
PH003
60T
AS15.28(INA)②
904010
904006
21T
21/42T
ø14/16x20(DU)
904016
ø5x30(MBK)
ø6(SB)
SG347
60T
904022
904023 (METRIC)
904031 (ENGLISH)
ø12/18x16(LB)
15T
ø15/17x15(DU)②
904018
ø14/16x20(DU)
904019
ø21.6x2.4(RM)
904017
M5x25 ③ (FY)
904025
3x5xø13(KW)
ø4x24(MBK)
M5x6(FXw)
904026
12T
ø5x16(MBK)
904013
7T
42T
904008
ø15/17x12(DU)
904012
G20x28x4(INA)
M6x20(FXd)
904009
ø12/14x12(DU)
904002
904014
904007
25T
ø35.1x1.6(RM)
ø20/30x7(SM)
904015
M6x16(FXD)

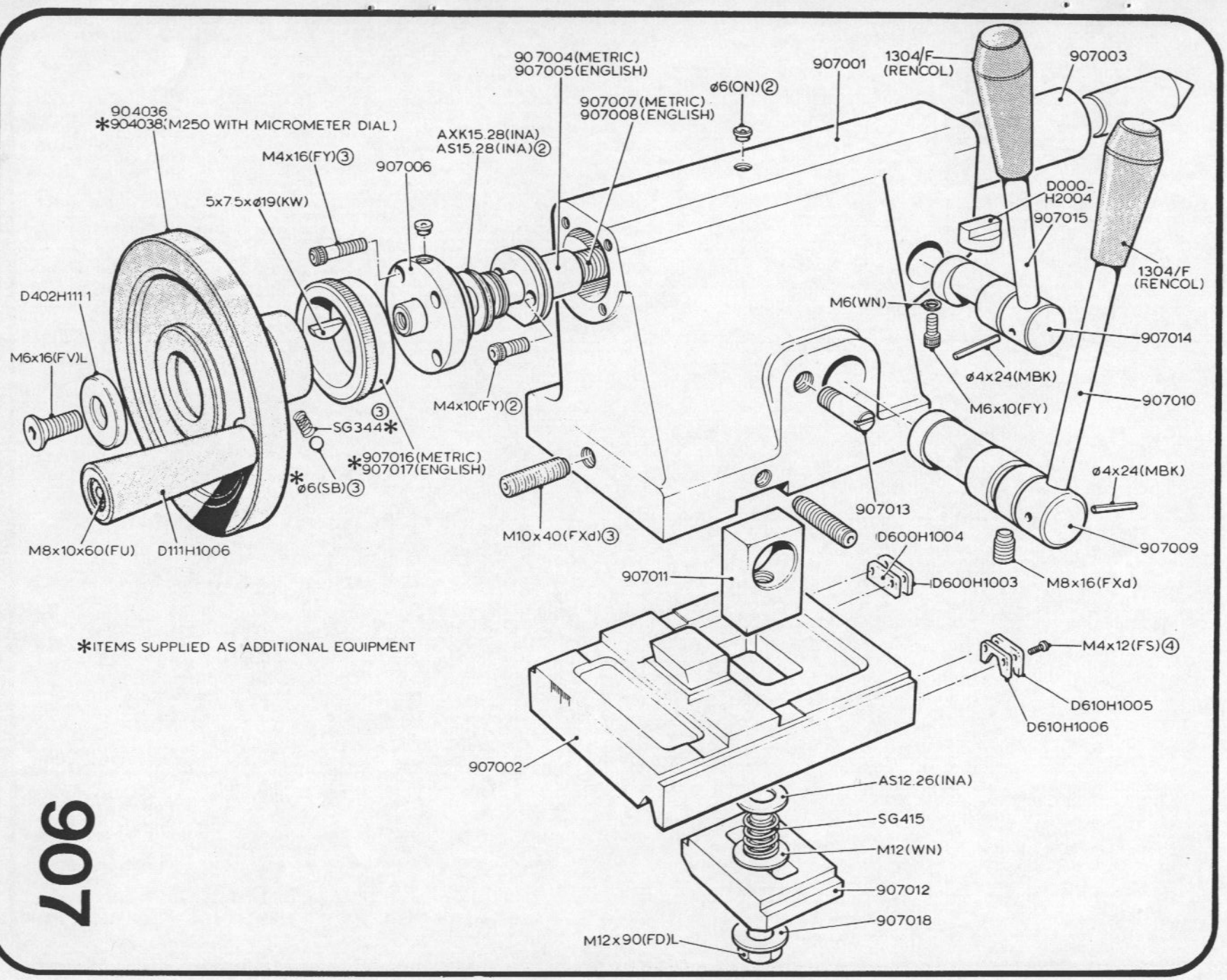

M5x20(FY)④
ø6x18(MBK)
905015 (METRIC)
905016 (ENGLISH)
905017
905008(METRIC)
905009(ENGLISH)
3x5xø13(KW)
ø6(ON)
905014
14T
905020(METRIC)
905021(ENGLISH)
ø6(SB)③
ø5x18(HBK)
SG344③
AXK12 26②
AS12 26(INA)④
905019
902050
M8x55(FY)④
905001
D111H1005 ④
M6x20(FV)L
M6x20(FY)②
ø6(ON)②
D121H1007④
905028
A/R
905024
D600H1004
D600H1003
M8x55(FY)④
M6x8x50(FU)
905013
905012
M4x12(FS)SS⑧
M10x65(FD)8.8
D610H1007
D610H1008
M10(WN)
905026
ø6x20(MBK)
½"BSPT(FP)
905027

# 905/1

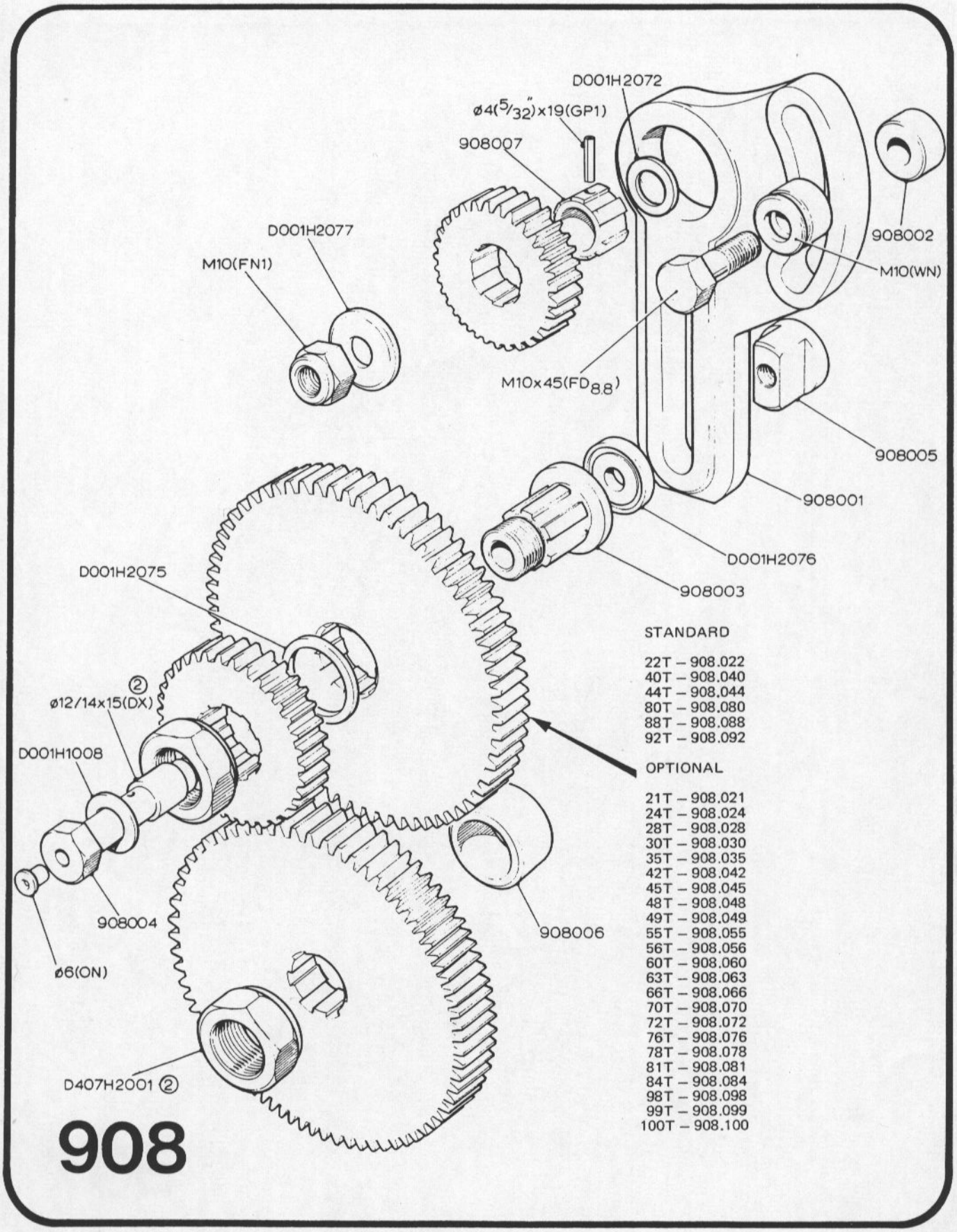

M10x40(FZ)
A113D007
911051
911054
M8x40(FJ8.8)③
M12(FN)
ø12(WN)
905023
911053
911052
905025
D241H0180
905022
905005
905004
ø6(ON)
D282H1007(METRIC)
D282H1008(ENGLISH)
AS12 26(INA)④
D001H5013
ø6(ON)
AXK 12 26(INA)②
D013H5001(METRIC)
D013H5002(ENGLISH)
905018
M6x16(FV)
M6x16(FXd)L ④
M8x8(FXW)
D100H0009
D710H1001
3x5xø13(KW)
905006(METRIC)
905007(ENGLISH)
905003
M8(FN)②
M5x16(FY)②
SG344
ø6(SB)③
902050
D220H1010
M8(WN)
②
M6x16(FXW)
M10x10(FXW)
ø10xø3.2x0.5(DS)④
ø8(SB)
D110H1011
M8x12(FXW)
905011②
D100H0010
905002
905010
D120H1016②

# 905/2


M5x10(FS)
ø5x16(MBK)
906012(500mm)
906013(750mm)
M5x10(FR)⑤(500mm)
⑥(750mm)
906010(500mm)
906011(750mm)
ø5x20(MBK)④(500mm)
⑤(750mm)
D001H2072
M5x16(FY)④(500mm)
⑤(750mm)
906014
M6x45(FY)
ø15/17x25(DU)
51102(SKF)②
D001H2087
M6x25(FXw)
906006(500mm)
906007(750mm)
906002(6mm)
906003(4T.P.I)
500mm
906004(6mm)
906005(4T.P.I)
750mm
M5x6(FXw)
906008
ø20/23x20(DU)
906009
D122H2001
ø6(ON)②
906001
M6x20(FY)
ø6x24(MBK)②
906


907004(METRIC)
907005(ENGLISH)
907001
1304/F
(RENCOL)
907003
ø6(ON)②
907007(METRIC)
907008(ENGLISH)
904036
*904038(M250 WITH MICROMETER DIAL)
AXK15.28(INA)
AS15.28(INA)②
M4x16(FY)③
907006
5x7.5xø19(KW)
D000-
H2004
907015
1304/F
(RENCOL)
D402H1111
M6(WN)
907014
M6x16(FV)L
ø4x24(MBK)
M4x10(FY)②
M6x10(FY)
907010
③
SG344*
*907016(METRIC)
*907017(ENGLISH)
*ø6(SB)③
ø4x24(MBK)
907013
M10x40(FXd)③
D600H1004
907009
M8x10x60(FU)
D111H1006
907011
D600H1003
M8x16(FXd)
*ITEMS SUPPLIED AS ADDITIONAL EQUIPMENT
M4x12(FS)④
D610H1005
D610H1006
907002
AS12.26(INA)
SG415
M12(WN)
907012
907018
M12x90(FD)L

907

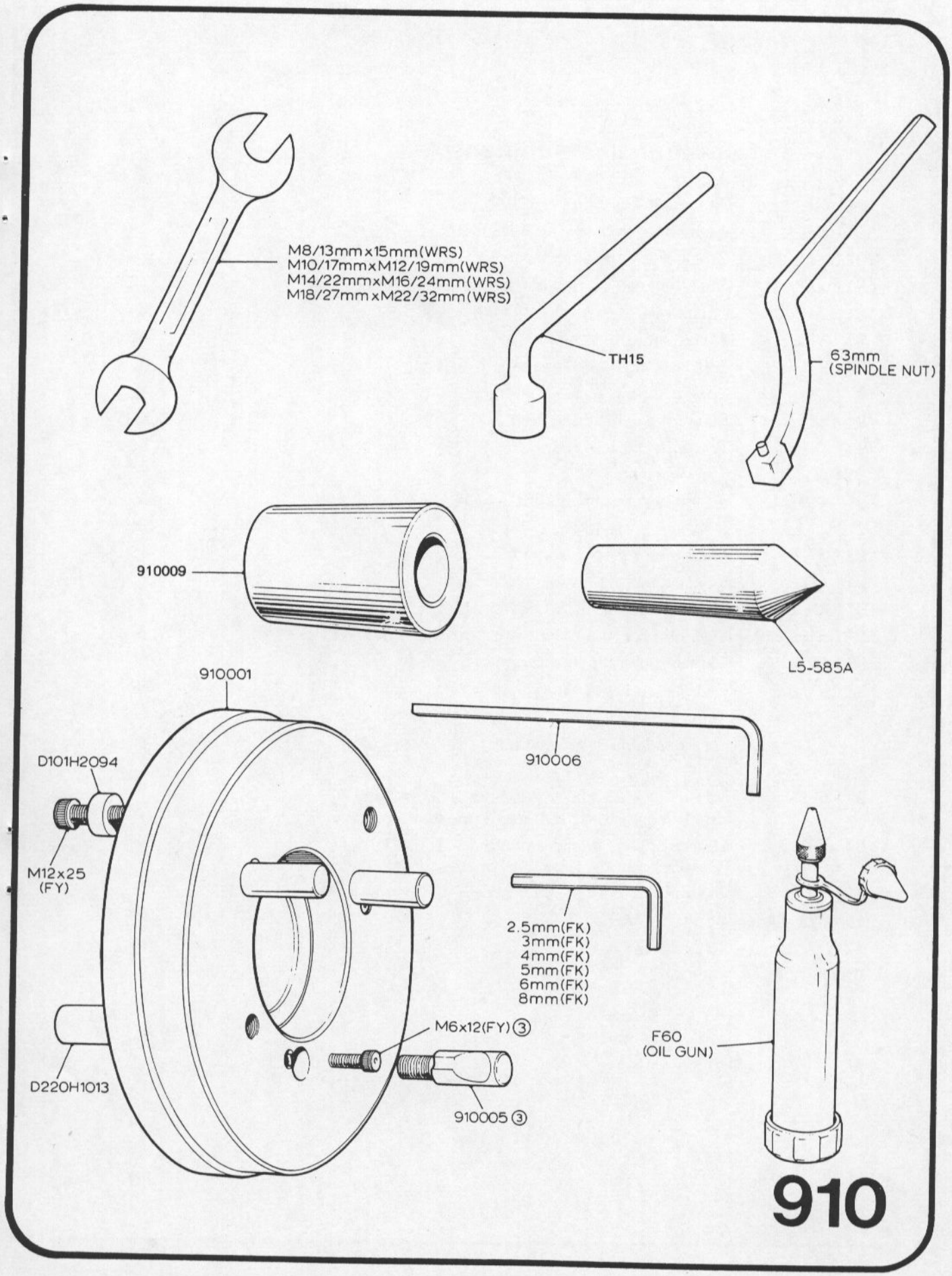



STANDARD

22T – 908.022
40T – 908.040
44T – 908.044
80T – 908.080
88T – 908.088
92T – 908.092

OPTIONAL

21T – 908.021
24T – 908.024
28T – 908.028
30T – 908.030
35T – 908.035
42T – 908.042
45T – 908.045
48T – 908.048
49T – 908.049
55T – 908.055
56T – 908.056
60T – 908.060
63T – 908.063
66T – 908.066
70T – 908.070
72T – 908.072
76T – 908.076
78T – 908.078
81T – 908.081
84T – 908.084
98T – 908.098
99T – 908.099
100T – 908.100


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
910006
D101H2094
M12x25
(FY)
2.5mm (FK)
3mm (FK)
4mm (FK)
5mm (FK)
6mm (FK)
8mm (FK)
M6x12 (FY) ③
F60
(OIL GUN)
D220H1013
910005 ③

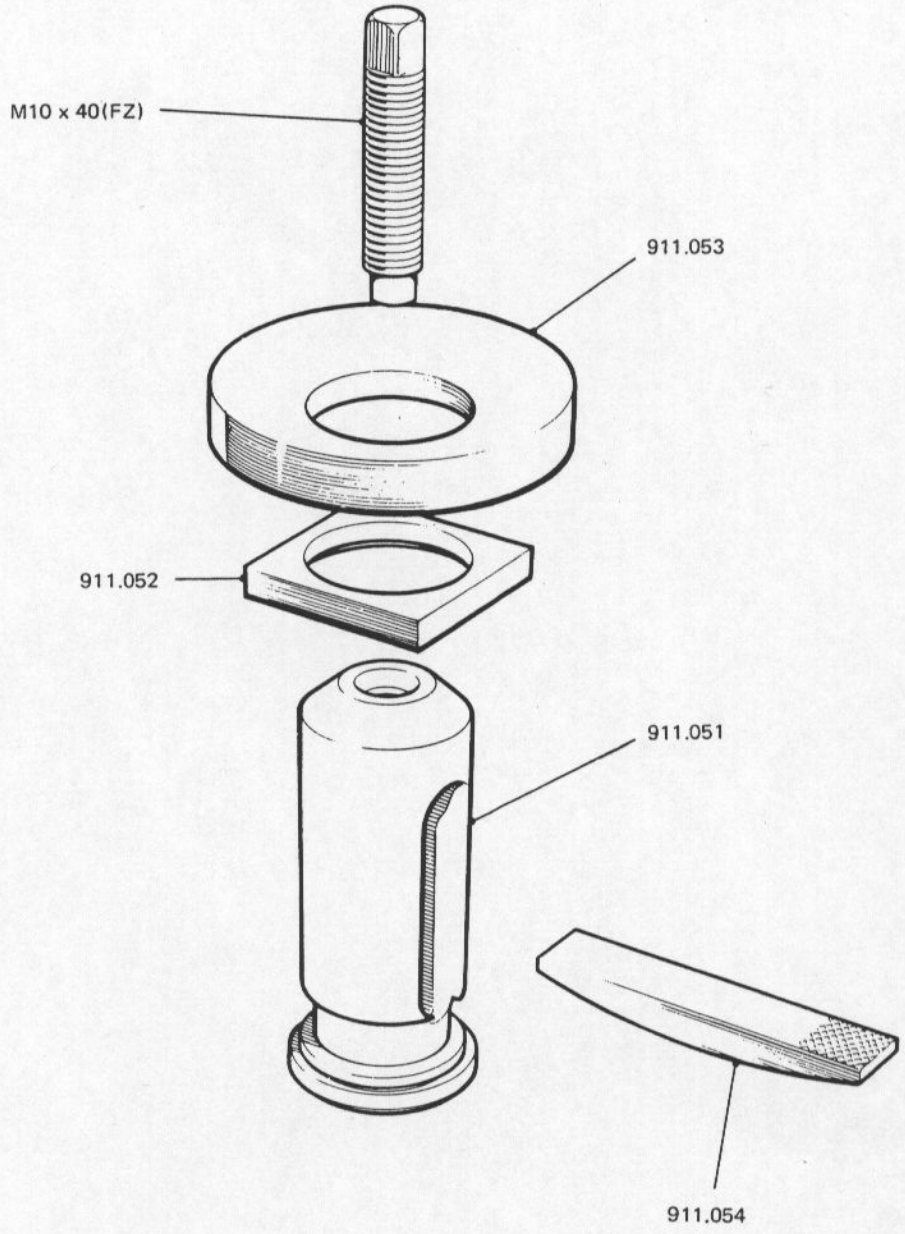
# 910

# Additional Equipment

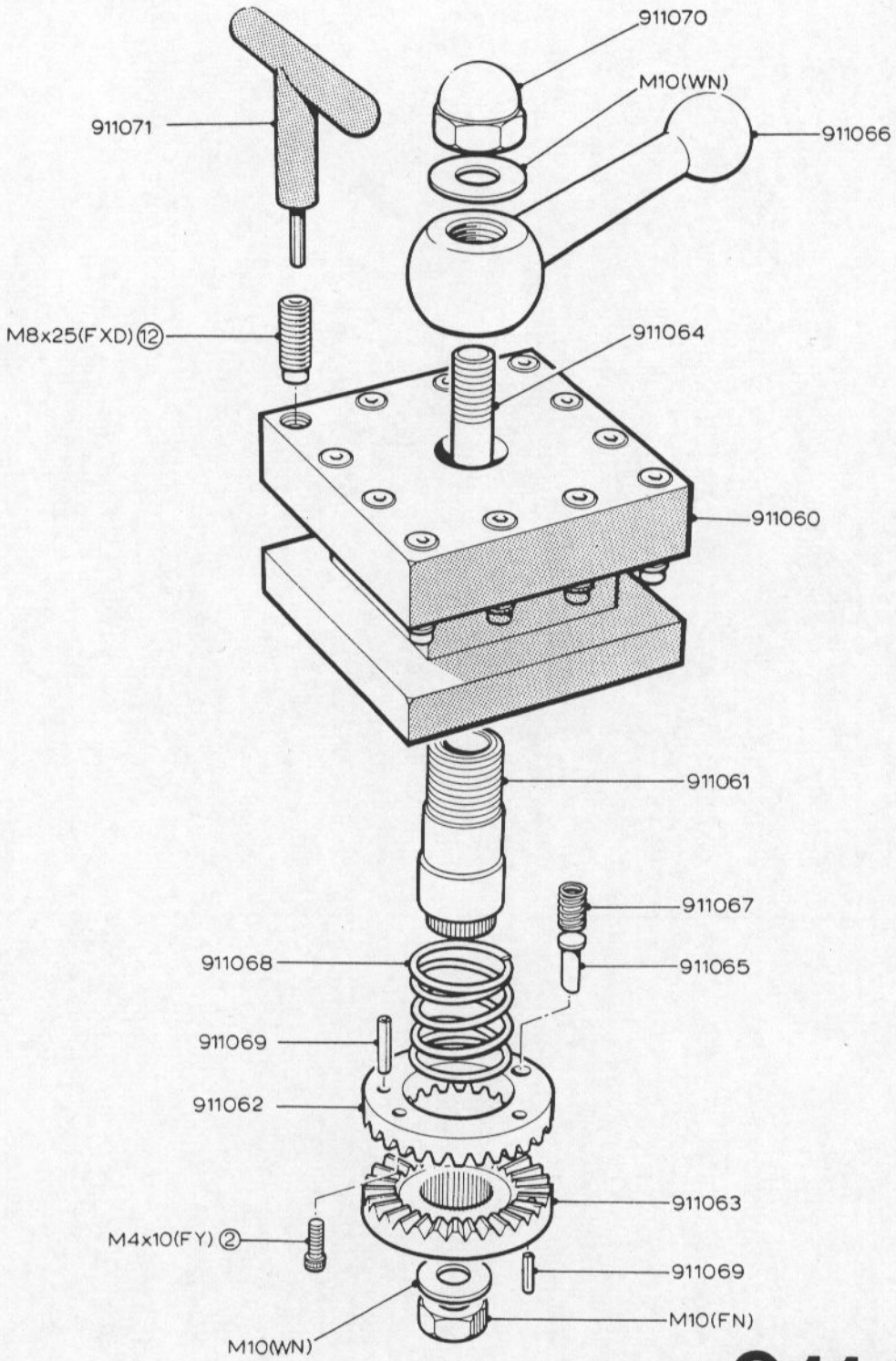


Parts available as assemblies (not illustrated):

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

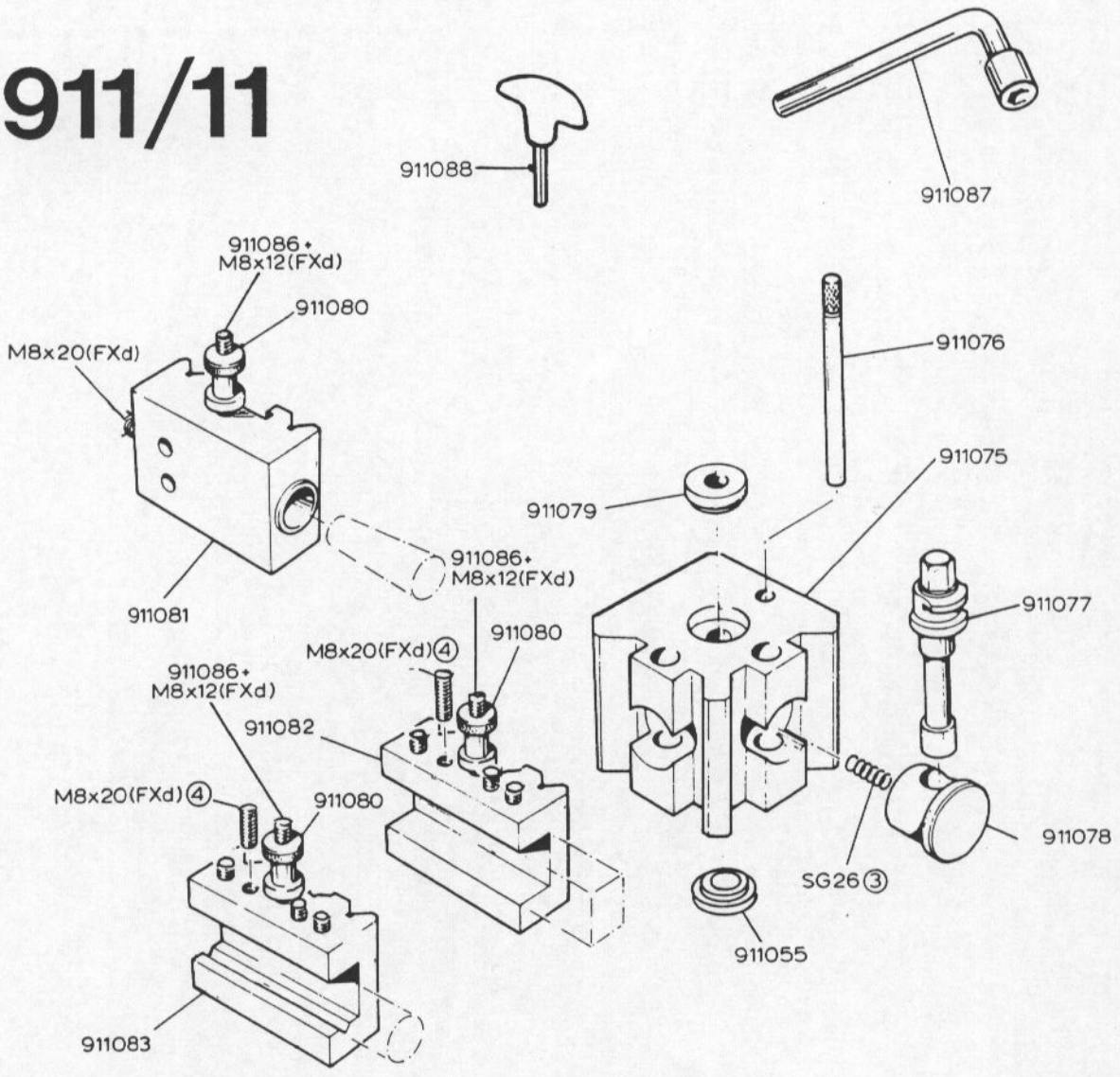



# 911/09

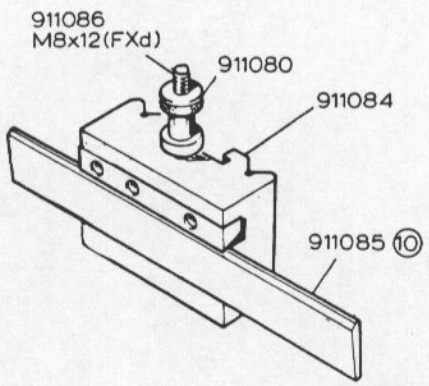

911070
M10(WN)
911071
911066
M8x25(FXD) ⑫
911064
911060
911061
911067
911068
911065
911069
911062
911063
M4x10(FY) ②
911069
M10(FN)
M10(WN)

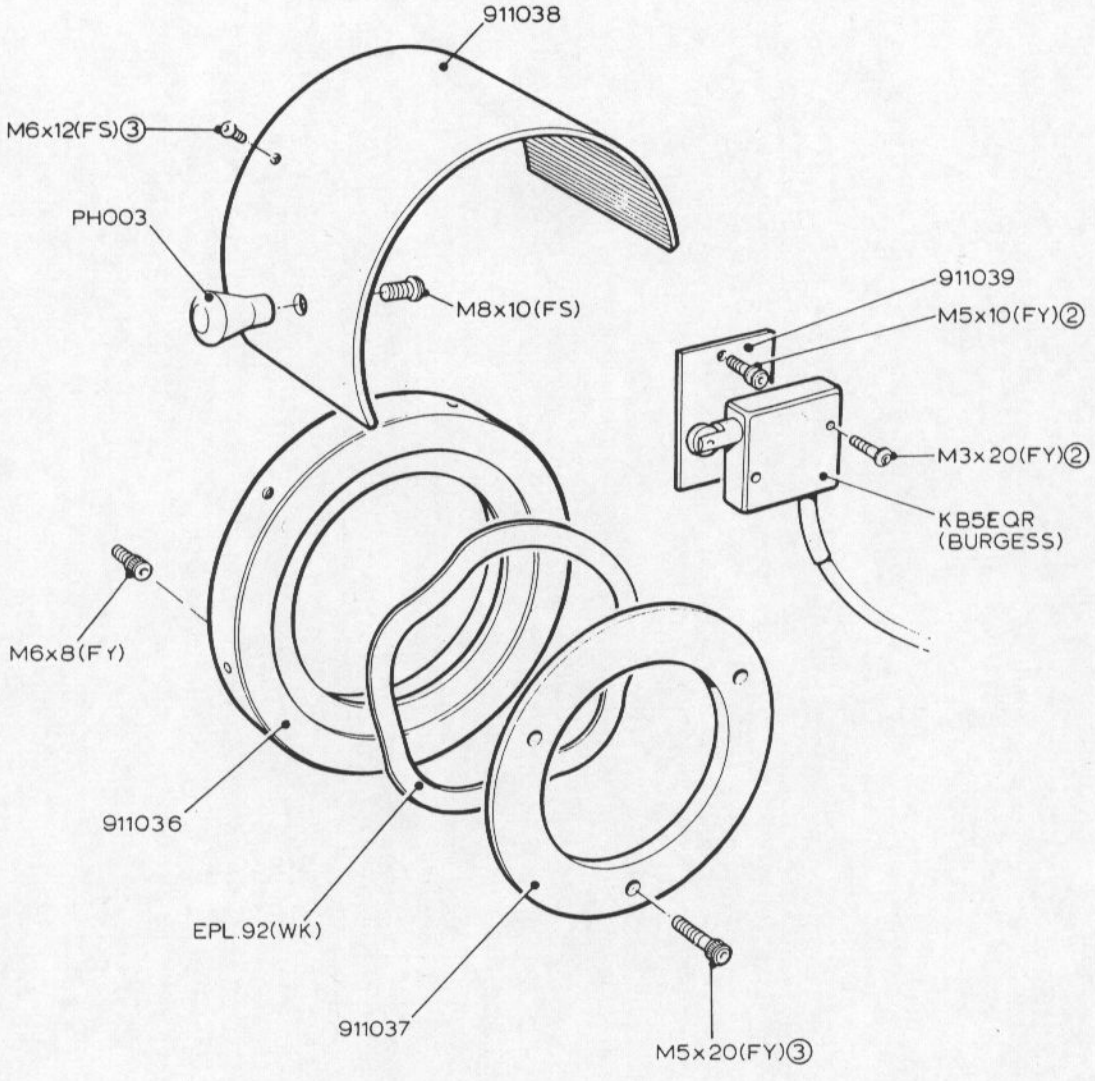
# 911/10

# 911/11

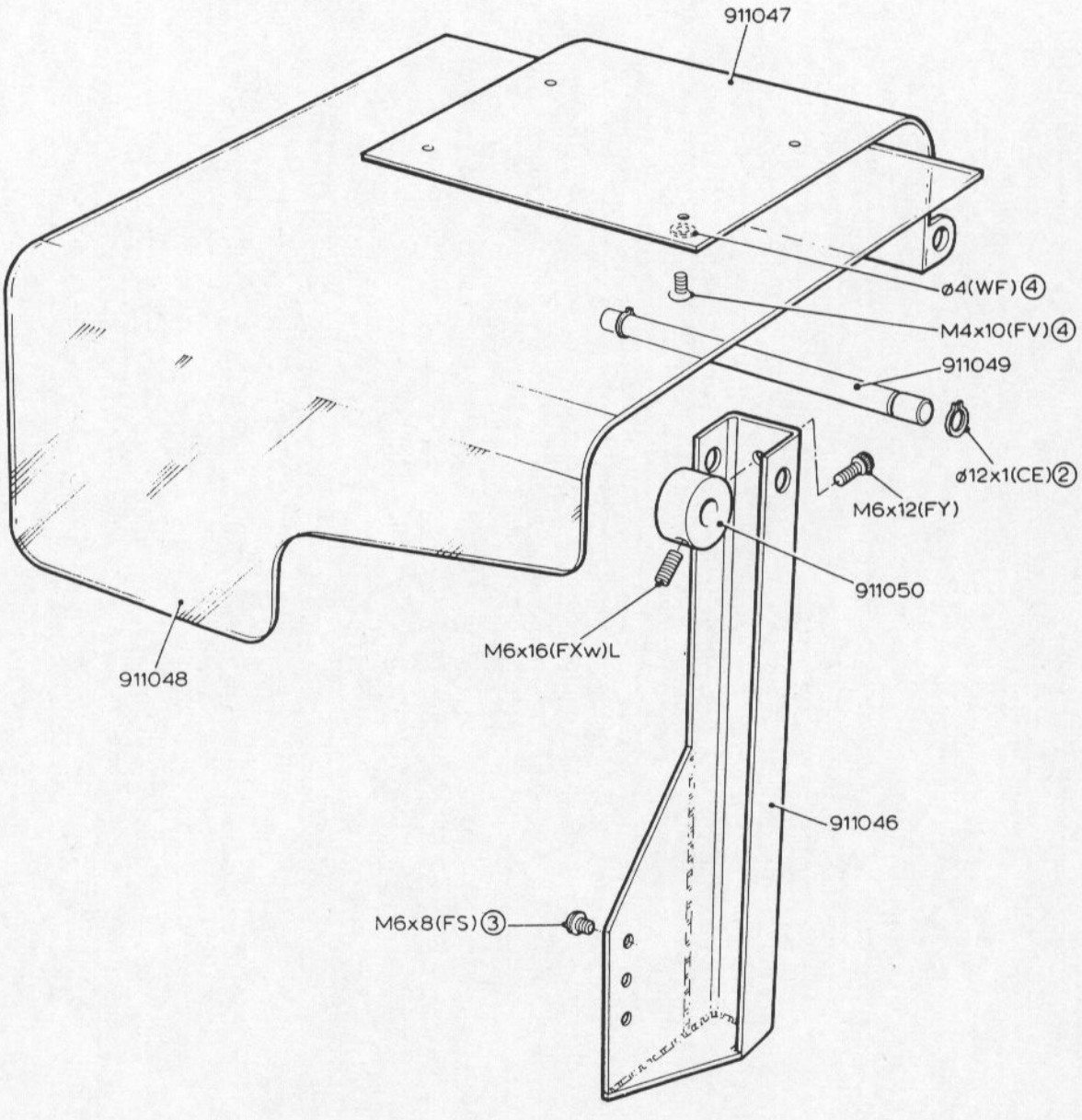

911088
911087
911086 • M8x12(FXd)
911080
M8x20(FXd)
911076
911075
911079
911081
911086 • M8x12(FXd)
911077
M8x20(FXd) ④
911080
911086 • M8x12(FXd)
911082
M8x20(FXd) ④
911080
911078
SG26 ③
911055
911083

# 911/12


911086 M8x12(FXd)
911080
911084
911085 ⑩

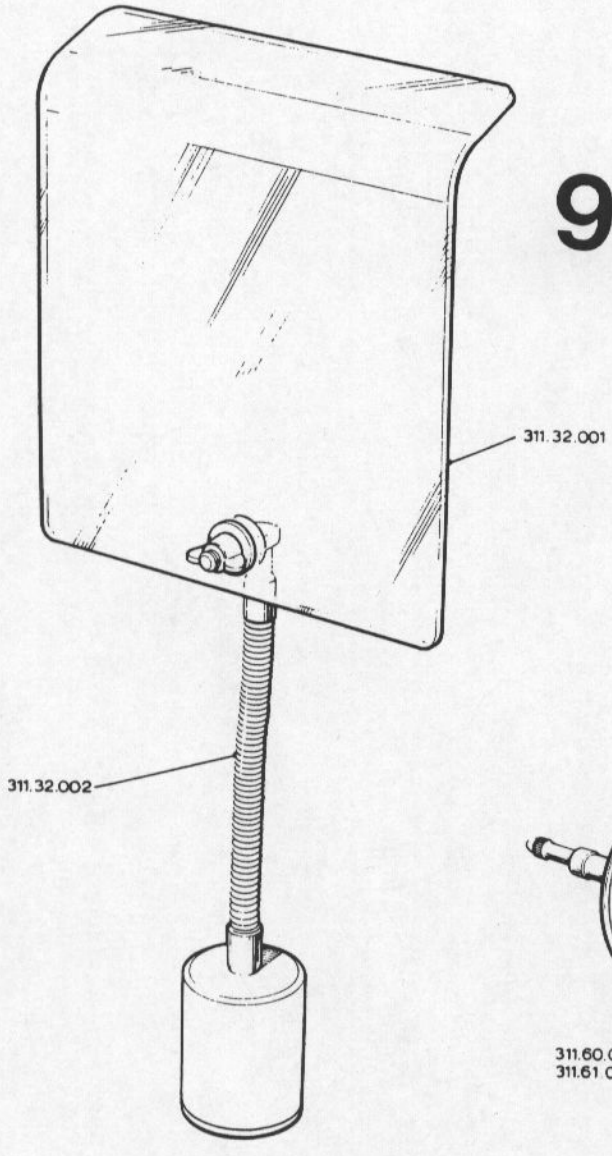

911038
M6x12(FS)③
PH003
M8x10(FS)
911039
M5x10(FY)②
M3x20(FY)②
KB5EQR
(BURGESS)
M6x8(FY)
911036
EPL.92(WK)
911037
M5x20(FY)③

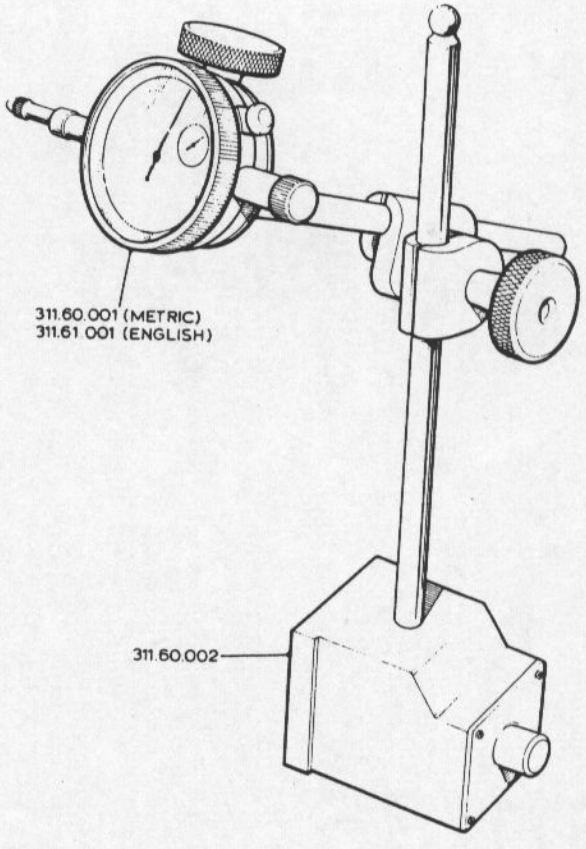
# 911/14


911047
ø4(WF)④
M4x10(FV)④
911049
ø12x1(CE)②
M6x12(FY)
911050
M6x16(FXw)L
911048
911046
M6x8(FS)③

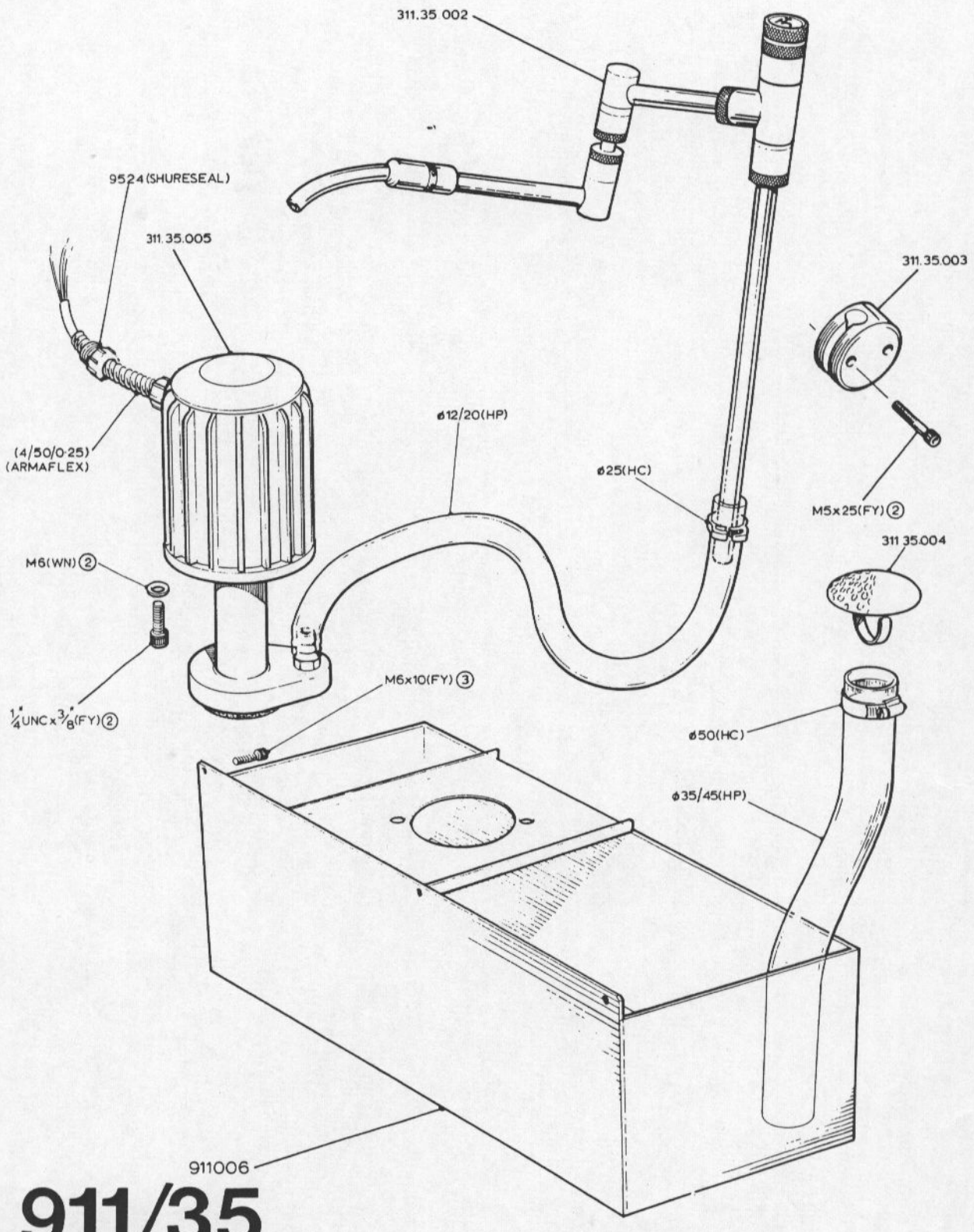
# 911/31

# 911/32

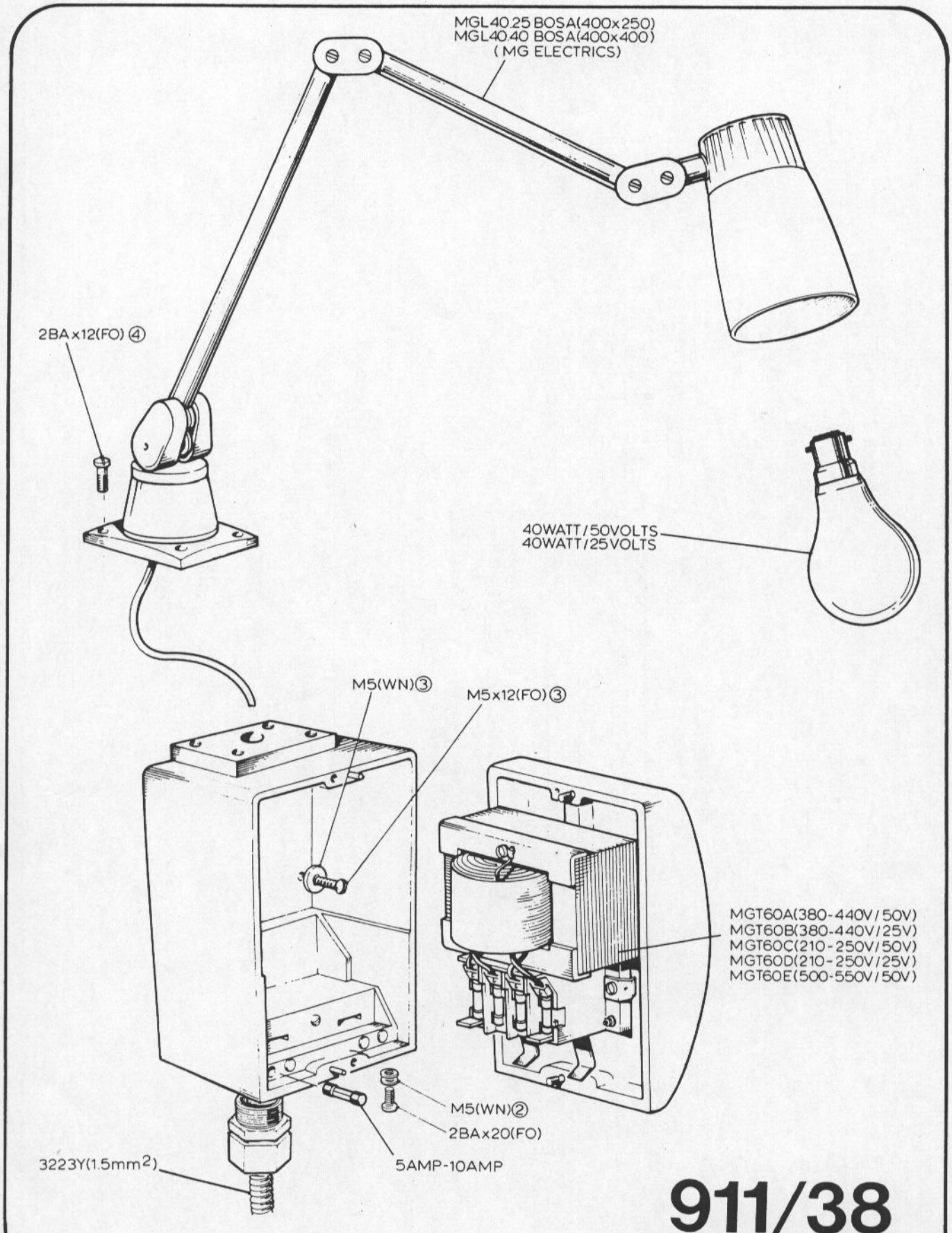


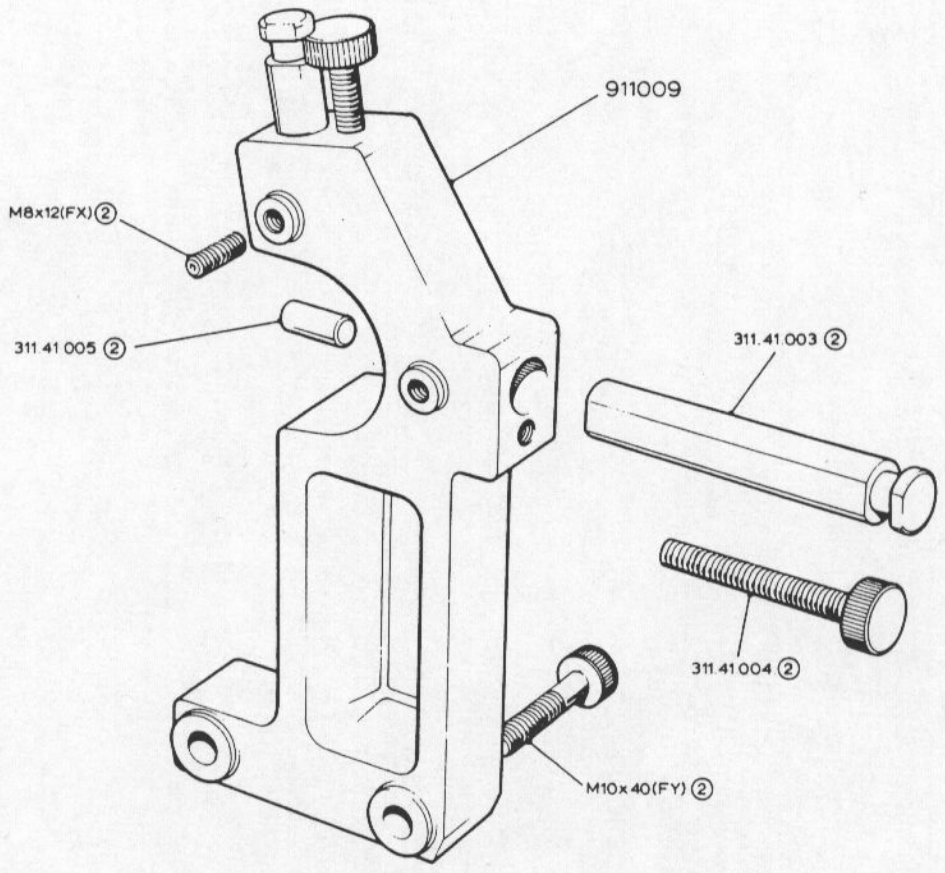

# 911/60-61


311.35 002
9524 (SHURESEAL)
311.35.005
311.35.003
(4/50/0·25)
(ARMAFLEX)
ø12/20(HP)
ø25(HC)
M5x25(FY) ②
311.35.004
M6(WN) ②
M6x10(FY) ③
¼"UNC x ⅜"(FY) ②
ø50(HC)
ø35/45(HP)
911006

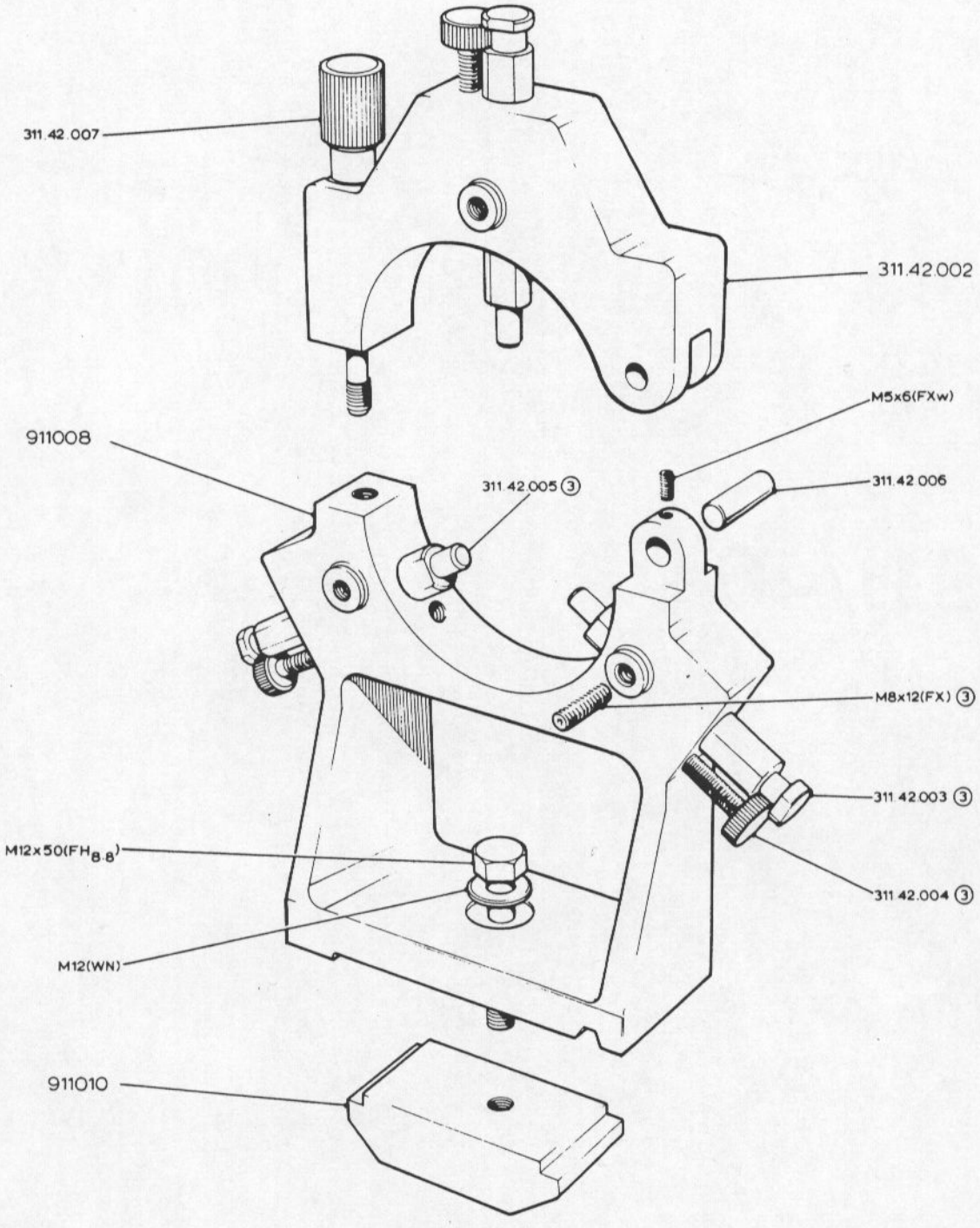
# 911/35


MGL40.25 BOSA(400x250)
MGL40.40 BOSA(400x400)
(MG ELECTRICS)
2BA x12(FO) ④
40WATT/50VOLTS
40WATT/25VOLTS
M5(WN)③
M5x12(FO)③
MGT60A(380-440V/50V)
MGT60B(380-440V/25V)
MGT60C(210-250V/50V)
MGT60D(210-250V/25V)
MGT60E(500-550V/50V)
M5(WN)②
2BA x20(FO)
3223Y(1.5mm²)
5AMP-10AMP

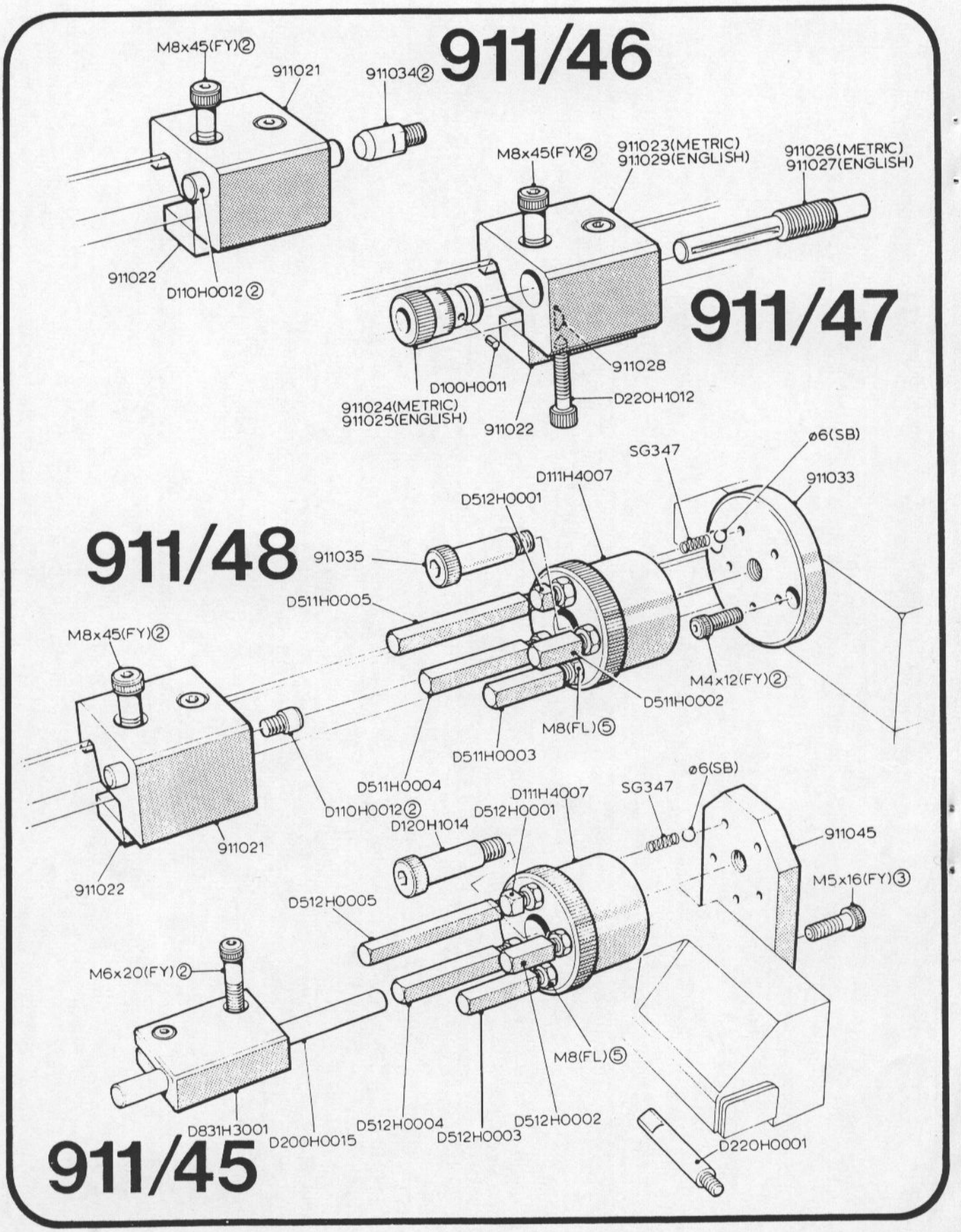
# 911/38


911009
M8x12(FX) ②
311.41.005 ②
311.41.003 ②
311.41.004 ②
M10x40(FY) ②

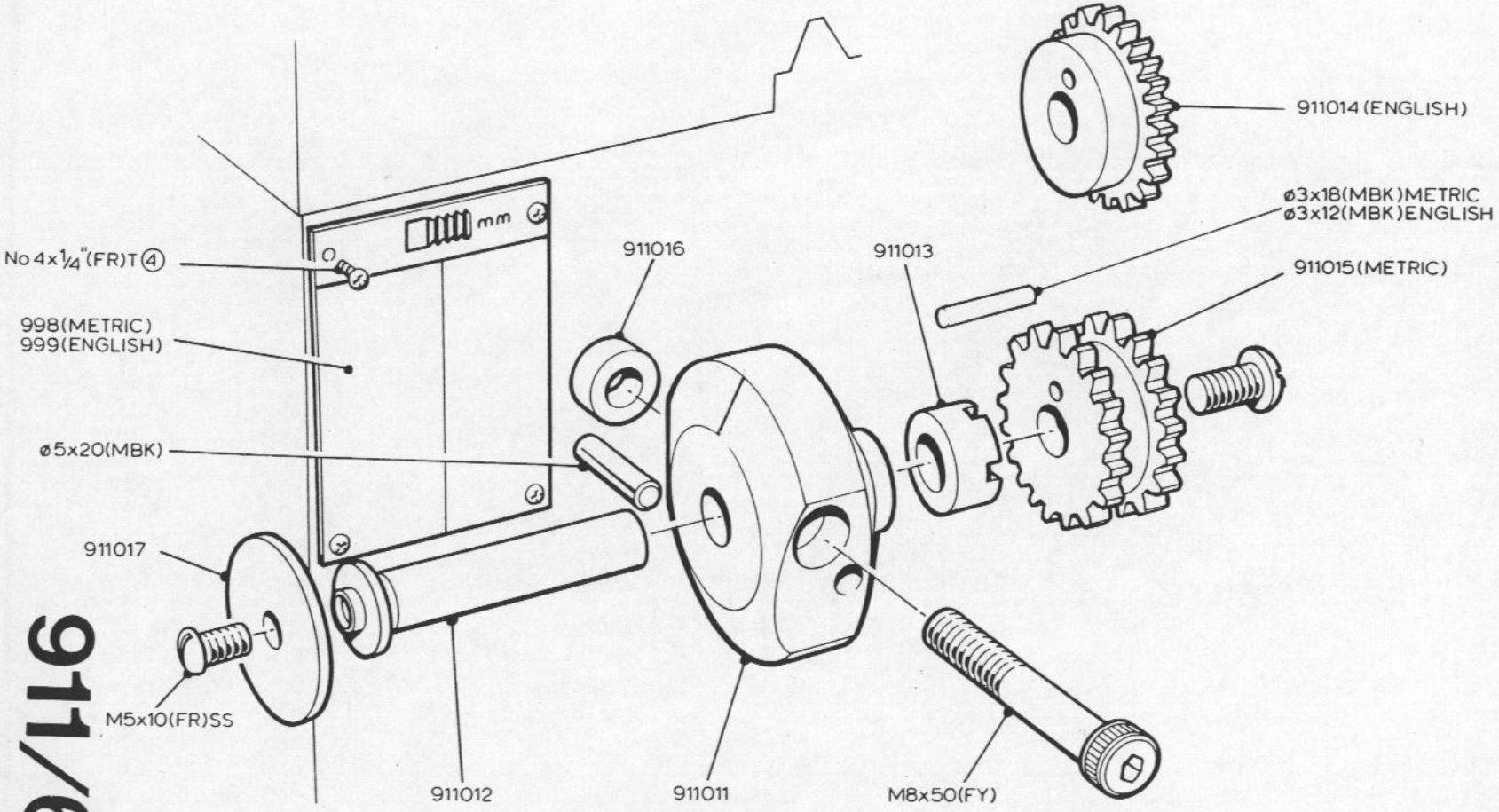
# 911/41

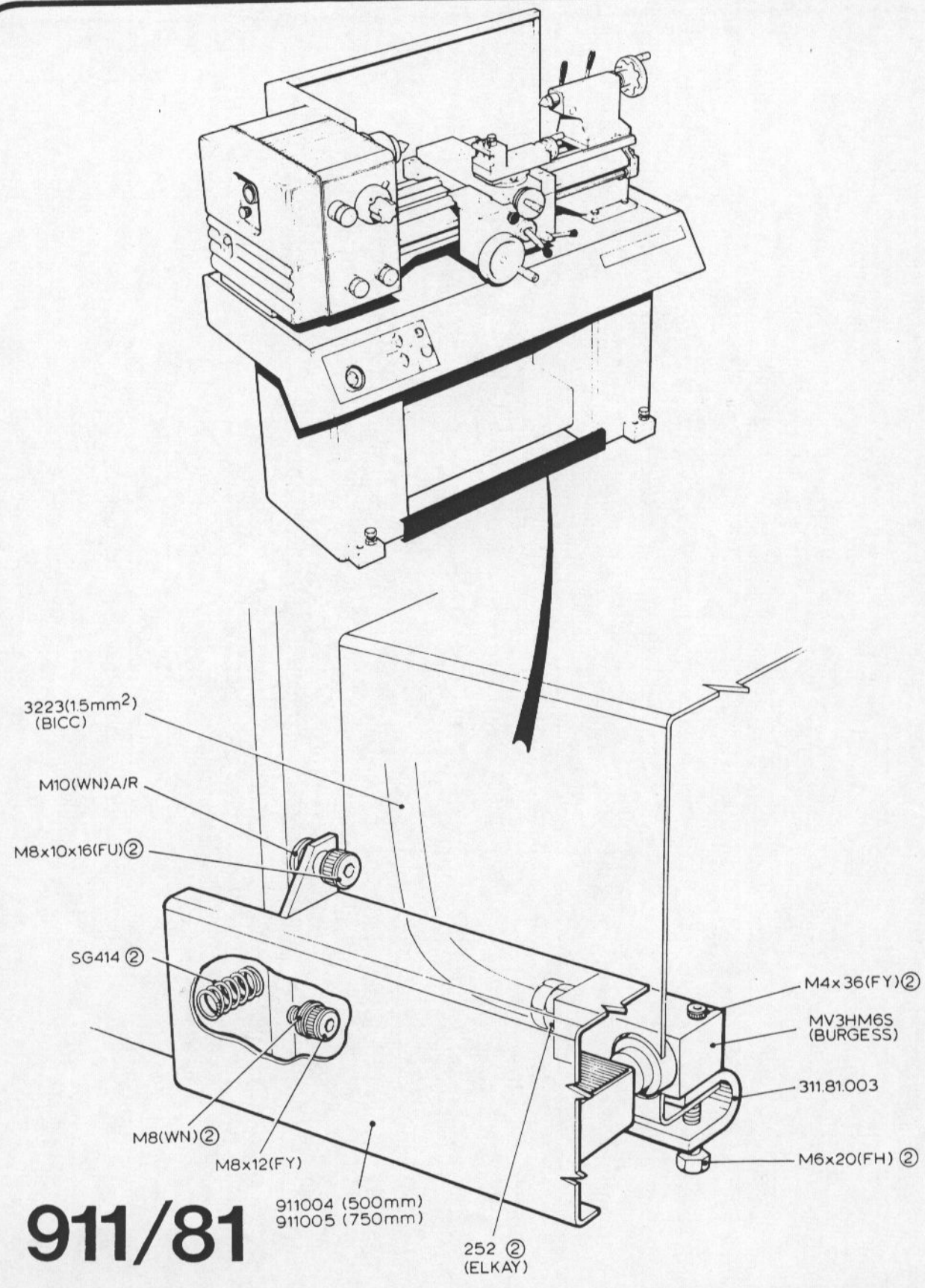

311.42.007
311.42.002
M5x6(FXw)
911008
311.42.005 ③
311.42.006
M8x12(FX) ③
311.42.003 ③
M12x50(FH8.8)
311.42.004 ③
M12(WN)
911010

# 911/42


911/46
M8x45(FY)②
911021
911034②
911022
D110H0012②
911/47
M8x45(FY)②
911023(METRIC)
911029(ENGLISH)
911026(METRIC)
911027(ENGLISH)
911028
D100H0011
911024(METRIC)
911025(ENGLISH)
911022
D220H1012
911/48
ø6(SB)
SG347
911033
D111H4007
D512H0001
911035
D511H0005
M8x45(FY)②
M4x12(FY)②
D511H0002
M8(FL)⑤
D511H0003
D511H0004
D110H0012②
911021
911022
ø6(SB)
SG347
D111H4007
D512H0001
D120H1014
911045
M5x16(FY)③
D512H0005
M6x20(FY)②
M8(FL)⑤
D831H3001
D200H0015
D512H0004
D512H0003
D512H0002
D220H0001
911/45

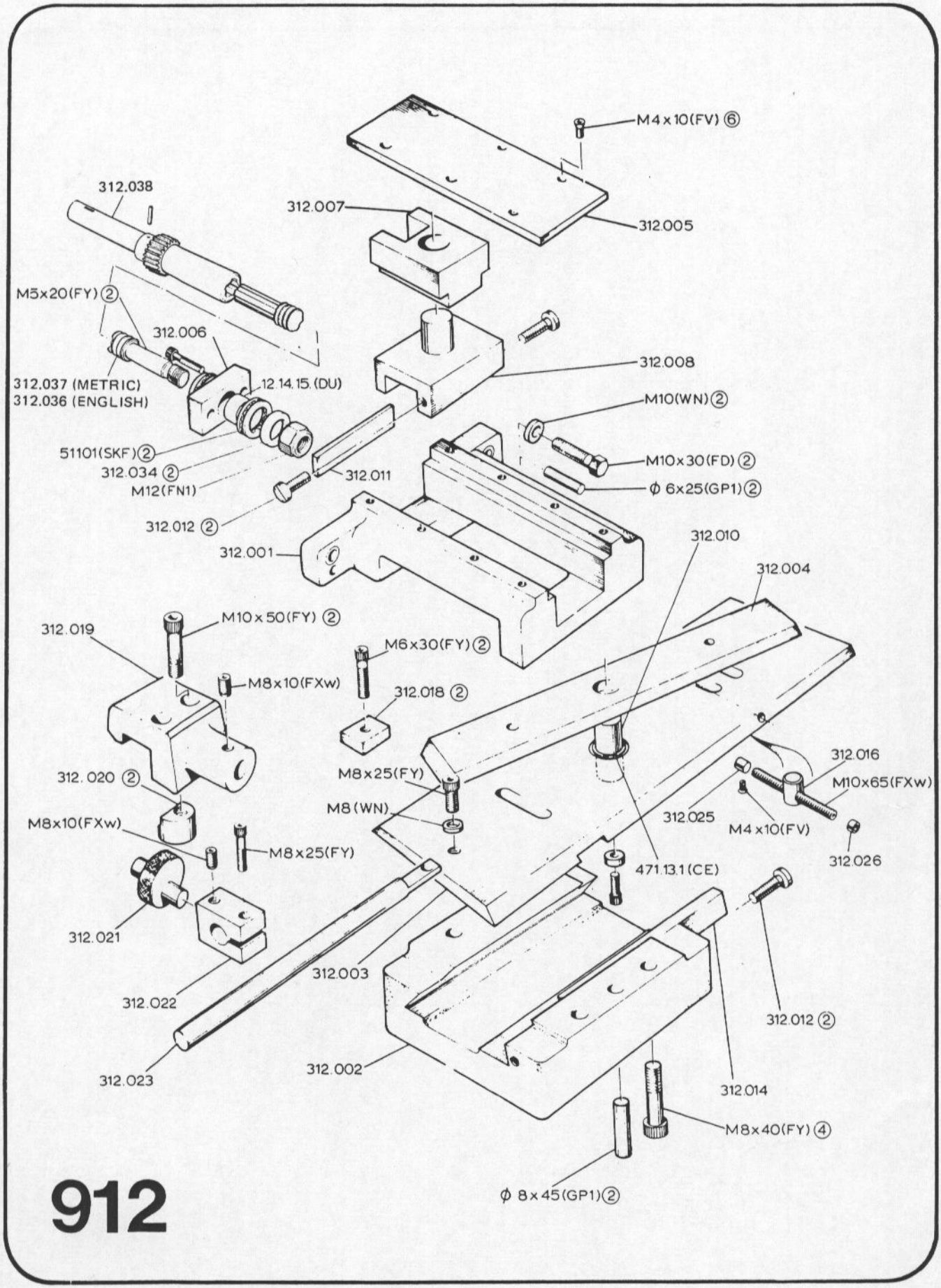
# 911/67


911014 (ENGLISH)
ø3x18(MBK)METRIC
ø3x12(MBK)ENGLISH
911015(METRIC)
911013
911016
No 4x1¼"(FR)T④
998(METRIC)
999(ENGLISH)
ø5x20(MBK)
911017
M5x10(FR)SS
911012
911011
M8x50(FY)

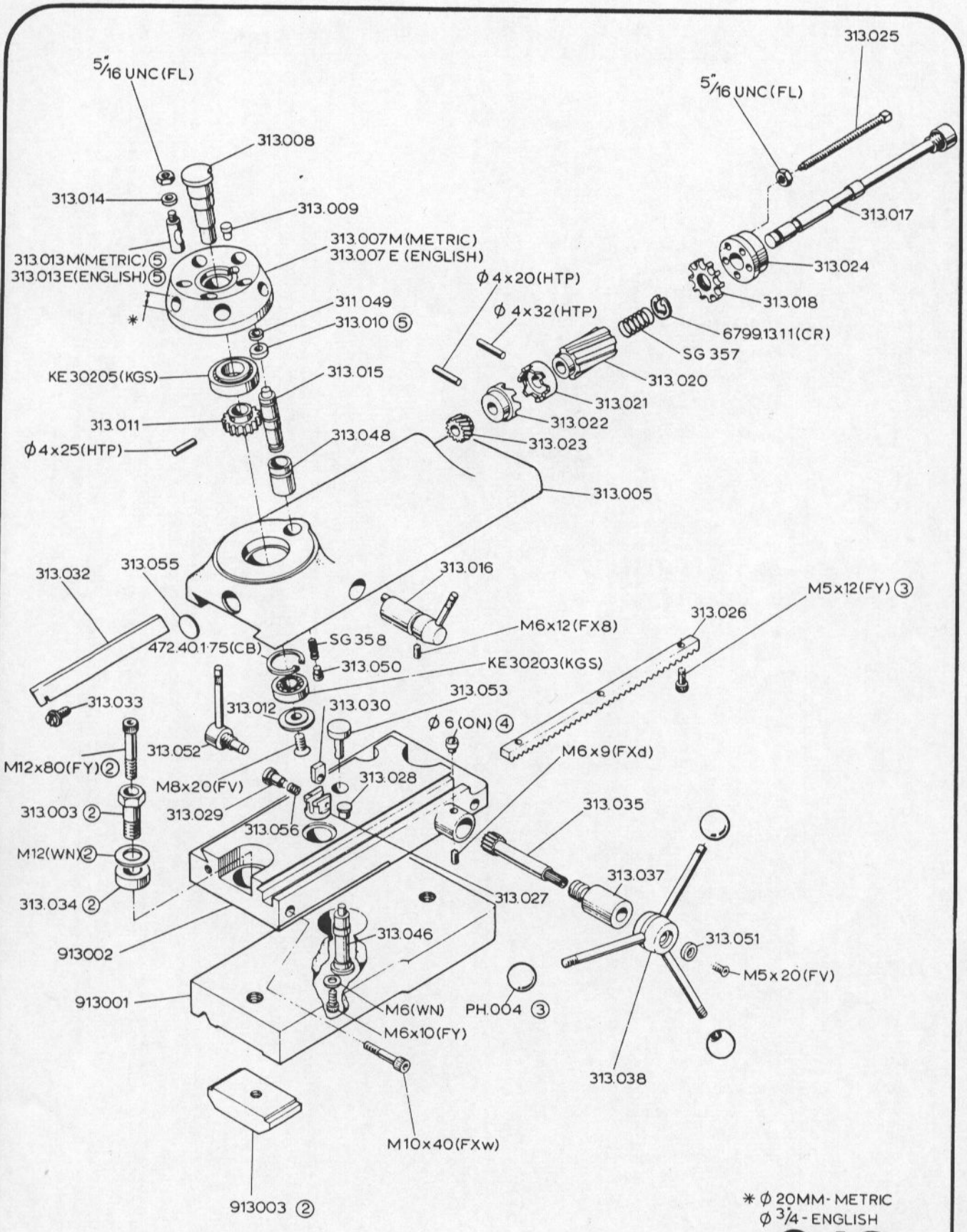

3223(1.5mm²)
(BICC)
M10(WN)A/R
M8x10x16(FU)②
SG414 ②
M8(WN)②
M8x12(FY)
911004 (500mm)
911005 (750mm)
252 ②
(ELKAY)
M4x36(FY)②
MV3HM6S
(BURGESS)
311.81.003
M6x20(FH) ②

# 911/81

# Attachments


M4x10(FV) ⑥
312.038
312.007
312.005
M5x20(FY) ②
312.006
312.008
312.037 (METRIC)
312.036 (ENGLISH)
12.14.15.(DU)
M10(WN) ②
51101(SKF) ②
312.034 ②
312.011
M10x30(FD) ②
M12(FN1)
φ 6x25(GP1) ②
312.012 ②
312.001
312.010
312.004
M10x50(FY) ②
312.019
M6x30(FY) ②
M8x10(FXw)
312.018 ②
312.016
312.020 ②
M8x25(FY)
M10x65(FXw)
M8 (WN)
312.025
M8x10(FXw)
M4x10(FV)
M8x25(FY)
312.026
471.13.1(CE)
312.021
312.003
312.022
312.012 ②
312.023
312.002
312.014
M8x40(FY) ④
φ 8x45(GP1) ②

# 912




* Φ 20MM - METRIC
Φ 3/4 - ENGLISH

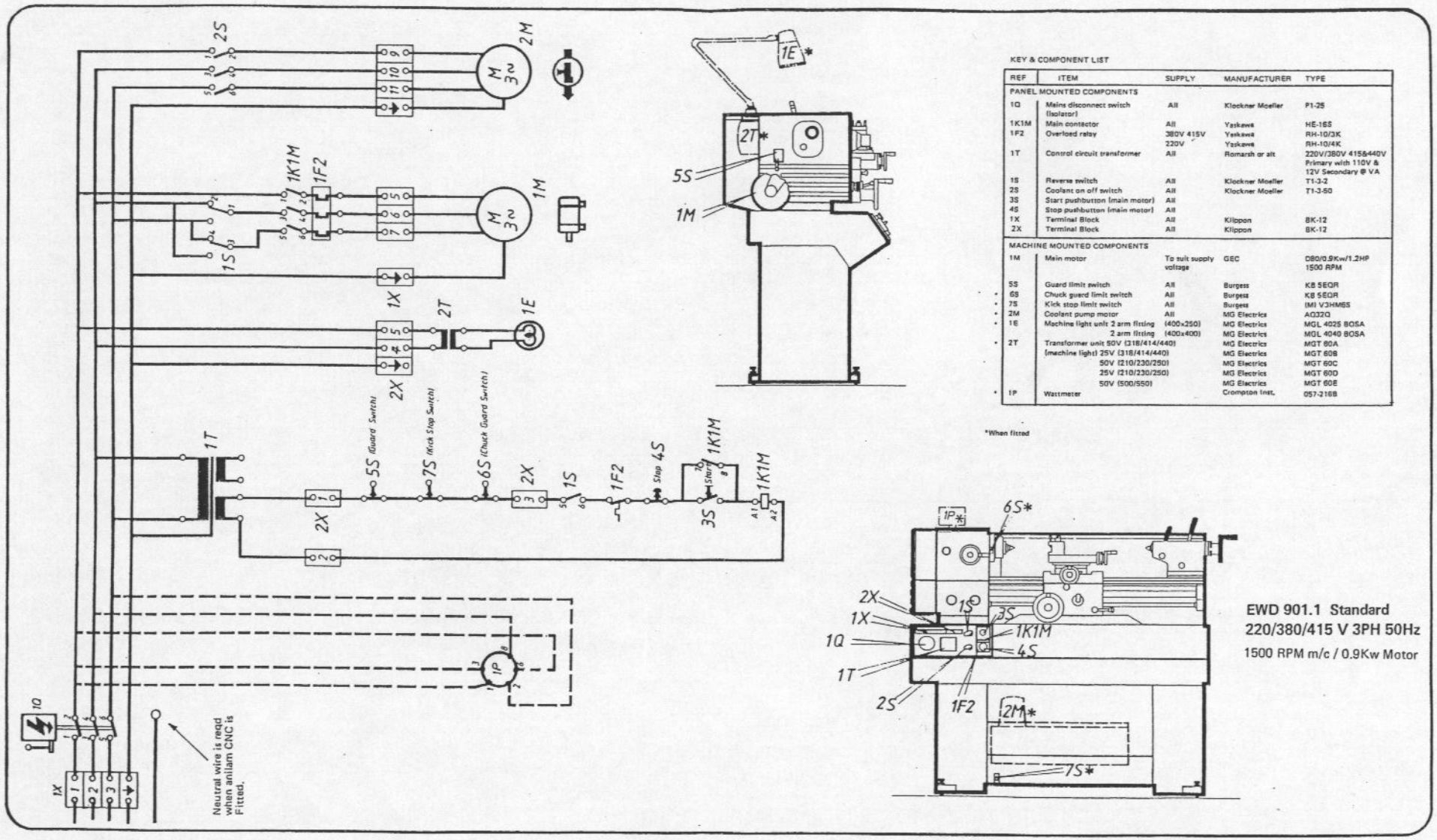
# 913

## Standard/Proprietary Parts

| 'Bracketed' Letter Code | Component | Letter Codes Conventional Description Given |
|---|---|---|
| **Screws and Nuts** | | |
| FX | Socket Set (Grub) Screw: Flat Point | 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 of Slotted Type Nut | " " |
| FN1 | Nylon Ring Locking Nut | " " |
| **Thread Inserts** | | |
| TI1 | Press in Type Thread Insert | Thread details |
| TI2 | 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 | ,, ,, ,, |
| 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 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 — Manufactuers Name is Quoted as Letter Code — vis. | | |
| (INA.) (SKF) | (TORRINGTON) or (GAMET) | Manufacturers Part No. Quoted |

| '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 | ,, ,, |



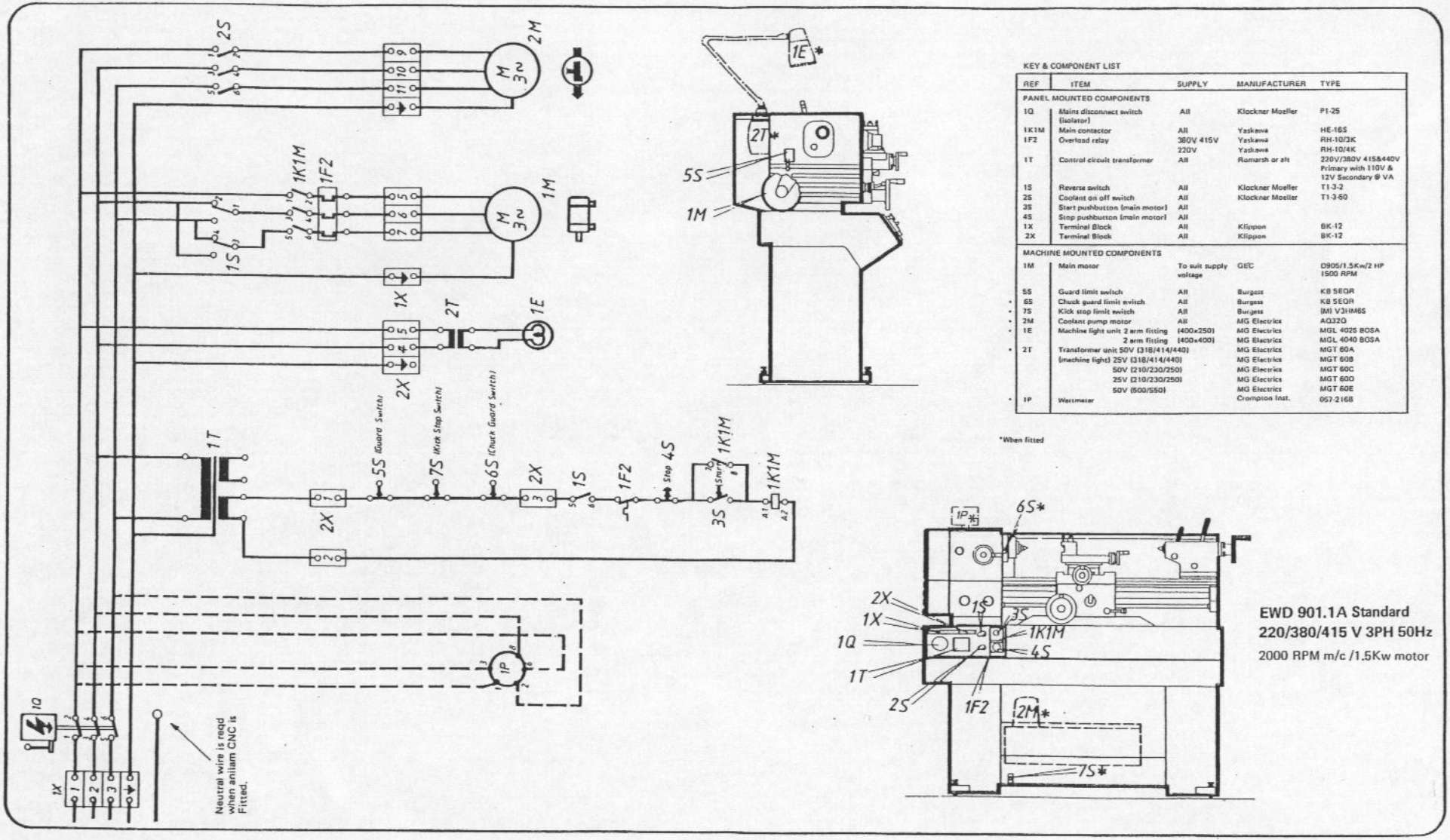

KEY & COMPONENT LIST

| REF | ITEM | SUPPLY | MANUFACTURER | TYPE |
|---|---|---|---|---|
| PANEL MOUNTED COMPONENTS | | | | |
| 1Q | Mains disconnect switch (Isolator) | All | Klockner Moeller | P1-25 |
| 1K1M | Main contactor | All | Yaskawa | HE-16S |
| 1F2 | Overload relay | 380V 415V | Yaskawa | RH-10/3K |
| | | 220V | Yaskawa | RH-10/4K |
| 1T | Control circuit transformer | All | Romarsh 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 | Klippon | SK-12 |
| 2X | Terminal Block | All | Klippon | SK-12 |
| MACHINE MOUNTED COMPONENTS | | | | |
| 1M | Main motor | To suit supply voltage | GEC | D80/0.9Kw/1.2HP 1500 RPM |
| 5S | Guard limit switch | All | Burgess | KB SEQR |
| * 6S | Chuck guard limit switch | All | Burgess | KB SEQR |
| * 7S | Kick stop limit switch | All | Burgess | (M) V3HM6S |
| * 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



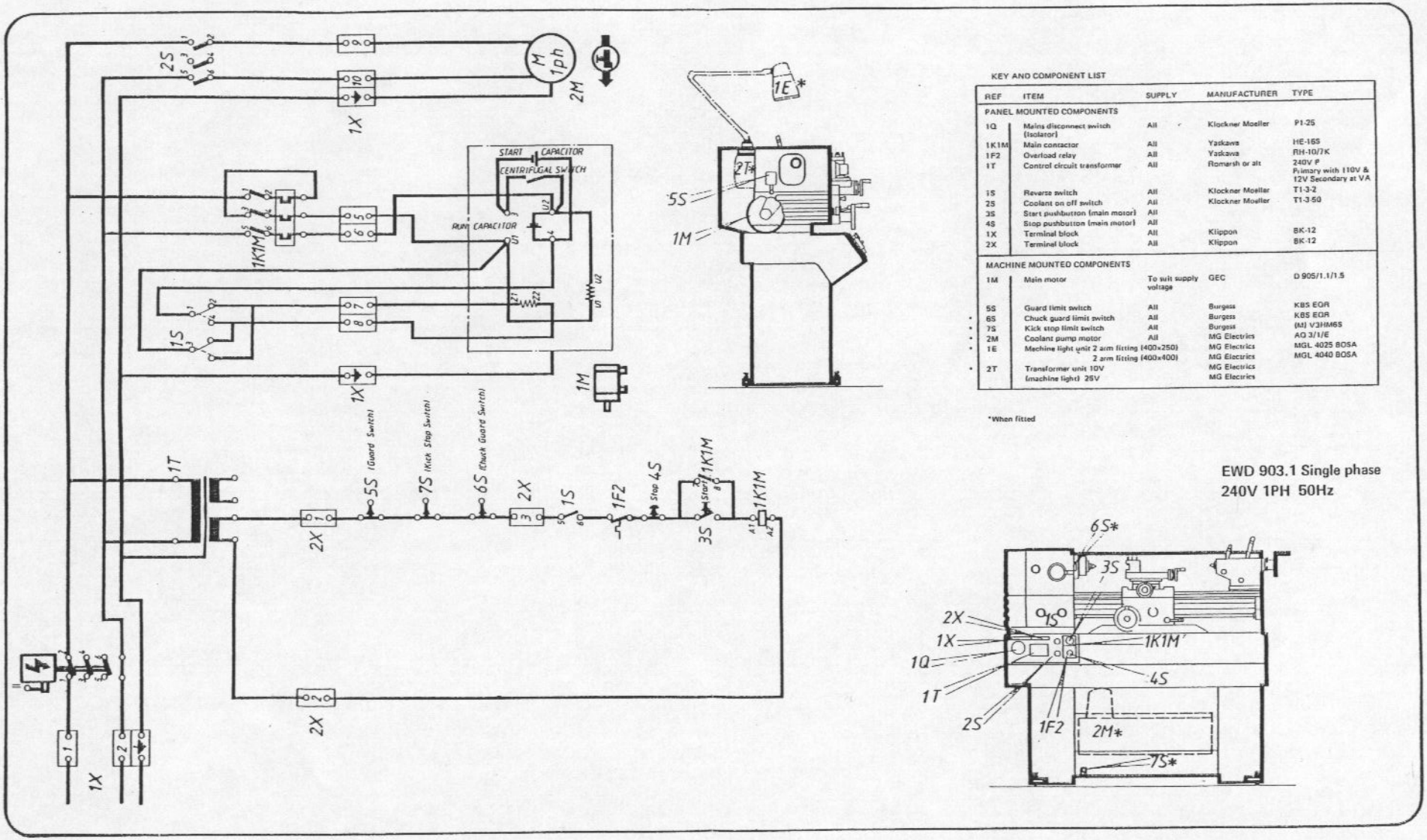

KEY & COMPONENT LIST

| REF | ITEM | SUPPLY | MANUFACTURER | TYPE |
|---|---|---|---|---|
| **PANEL MOUNTED COMPONENTS** | | | | |
| 1Q | Mains disconnect switch (isolator) | All | Klockner Moeller | P1-25 |
| 1K1M | Main contactor | All | Yaskawa | HE-16S |
| 1F2 | Overload relay | 380V 415V | Yaskawa | RH-10/3K |
| | | 220V | Yaskawa | RH-10/4K |
| 1T | Control circuit transformer | All | Ramarsh 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 | T1-3-60 |
| 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 voltage | GEC | D90S/1.5Kw/2 HP 1500 RPM |
| 5S | Guard limit switch | All | Burgess | KB 5EQR |
| * 6S | Chuck guard limit switch | All | Burgess | KB 5EQR |
| * 7S | Kick stop limit switch | All | Burgess | (M) V3HM6S |
| * 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. | 057-2168 |

*When fitted

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

# Wiring Diagram




KEY AND COMPONENT LIST

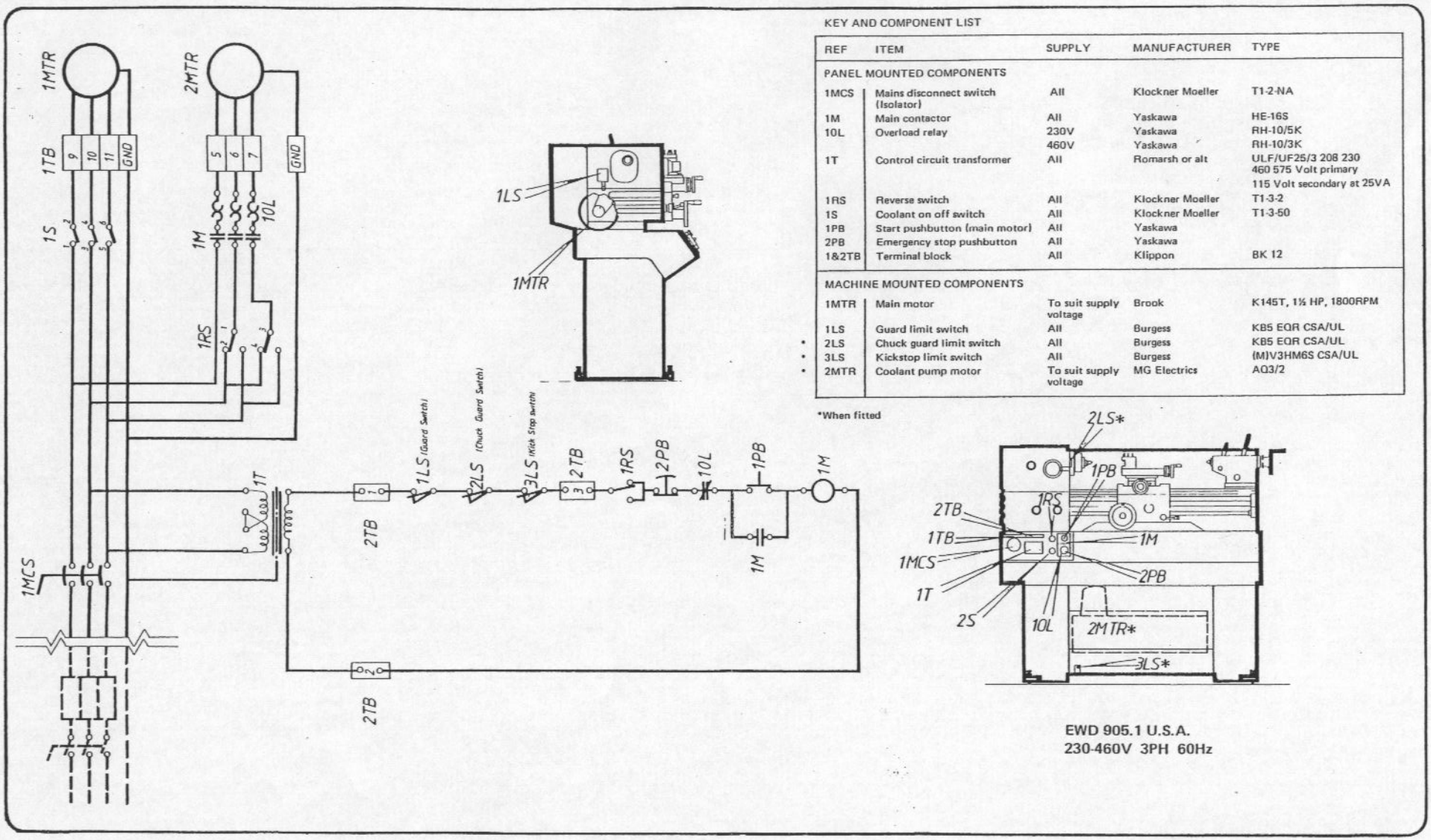
| REF | ITEM | SUPPLY | MANUFACTURER | TYPE |
|---|---|---|---|---|
| **PANEL MOUNTED COMPONENTS** | | | | |
| 1Q | Mains disconnect switch (Isolator) | All | Klockner Moeller | P1-25 |
| 1K1M | Main contactor | All | Yaskawa | HE-16S |
| 1F2 | Overload relay | All | Yaskawa | RH-10/7K |
| 1T | Control circuit transformer | All | Romarsh or alt | 240V P Primary with 110V & 12V Secondary at 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 voltage | GEC | D 905/1.1/1.5 |
| 5S | Guard limit switch | All | Burgess | KBS EQR |
| * 6S | Chuck guard limit switch | All | Burgess | KBS EQR |
| * 7S | Kick stop limit switch | All | Burgess | (M) V3HM6S |
| * 2M | Coolant pump motor | All | MG Electrics | AQ 3/1/E |
| * 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 10V (machine light) 25V | | MG Electrics<br>MG Electrics | |

*When fitted

**EWD 903.1 Single phase**
**240V 1PH 50Hz**




## Wiring Diagram



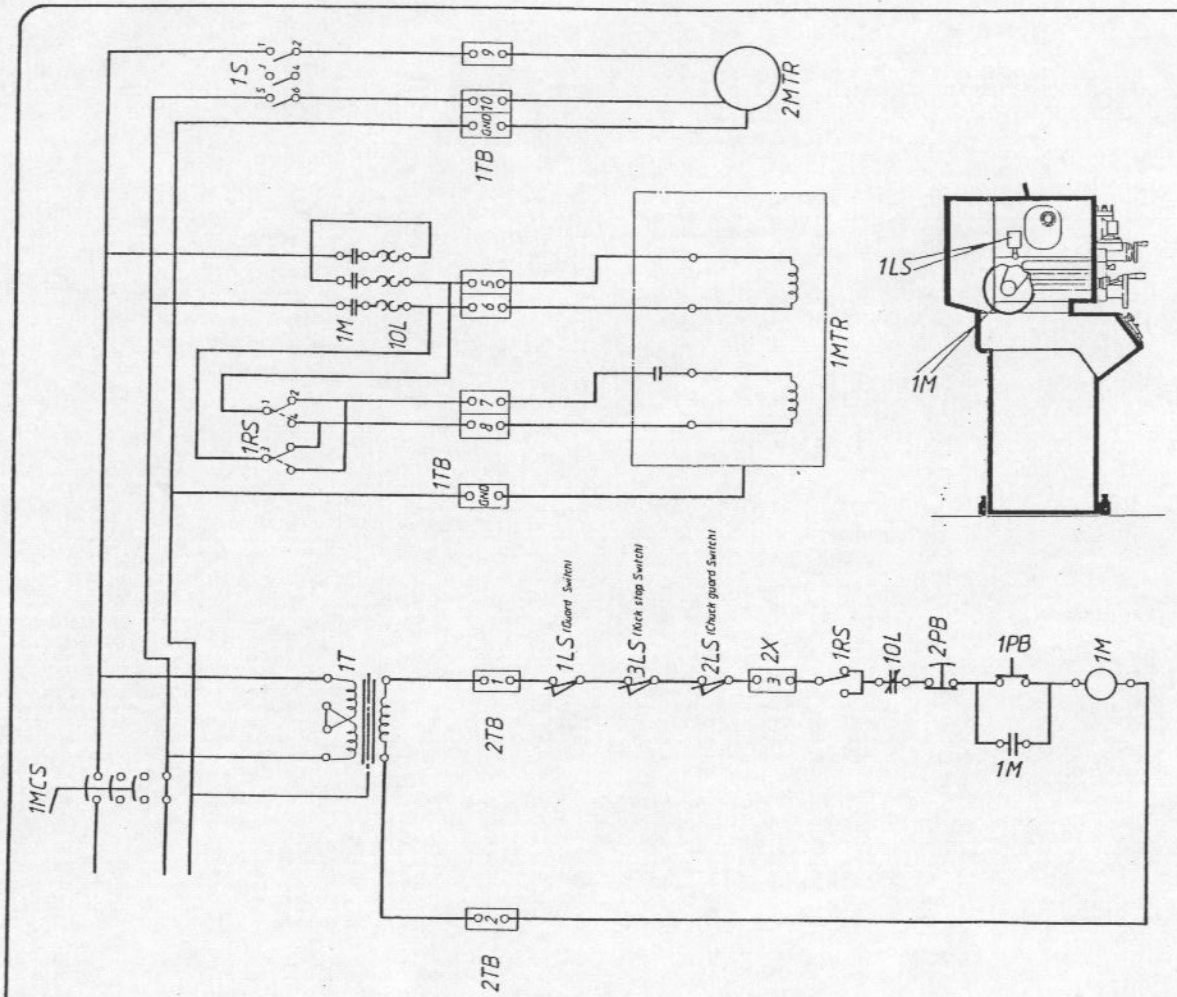

KEY AND COMPONENT LIST

| 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 | 230V | Yaskawa | RH-10/5K |
| | | 460V | Yaskawa | RH-10/3K |
| 1T | Control circuit transformer | All | Romarsh or alt | ULF/UF25/3 208 230 460 575 Volt primary 115 Volt secondary at 25VA |
| 1RS | Reverse switch | All | Klockner Moeller | T1-3-2 |
| 1S | Coolant on off switch | All | Klockner Moeller | T1-3-50 |
| 1PB | Start pushbutton (main motor) | All | Yaskawa | |
| 2PB | Emergency stop pushbutton | All | Yaskawa | |
| 1&2TB | Terminal block | All | Klippon | BK 12 |
| **MACHINE MOUNTED COMPONENTS** | | | | |
| 1MTR | Main motor | To suit supply voltage | Brook | K145T, 1½ HP, 1800RPM |
| 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 | (M)V3HM6S CSA/UL |
| * 2MTR | Coolant pump motor | To suit supply voltage | MG Electrics | AQ3/2 |

*When fitted

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

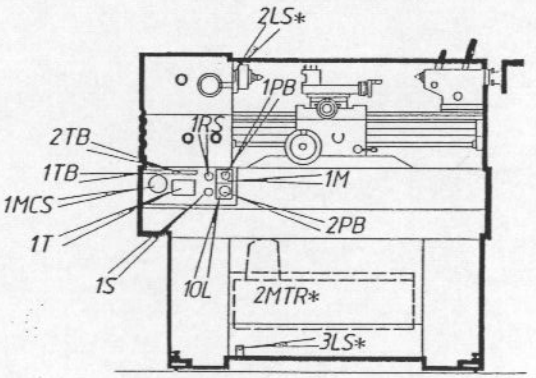
## Wiring Diagram




KEY AND 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-10/10K |
| 1T | Control circuit transformer | All | Romarsh or alt | 220V primary with 115V secondary |
| 1RS | Reverse switch | All | Klockner Moeller | T1-3-2/NA |
| 1S | Coolant on/off switch | All | Klockner Moeller | T1-3-50/NA |
| 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, 1½HP 1800RPM 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 | IMI V3HM6S CSA/UL |
| * 2MTR | Coolant pump motor | All | M G Electrics | AQ3/2 CSA/UL |

*When fitted




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

## Wiring Diagram