

TRIUMPH 2000

22096—28051

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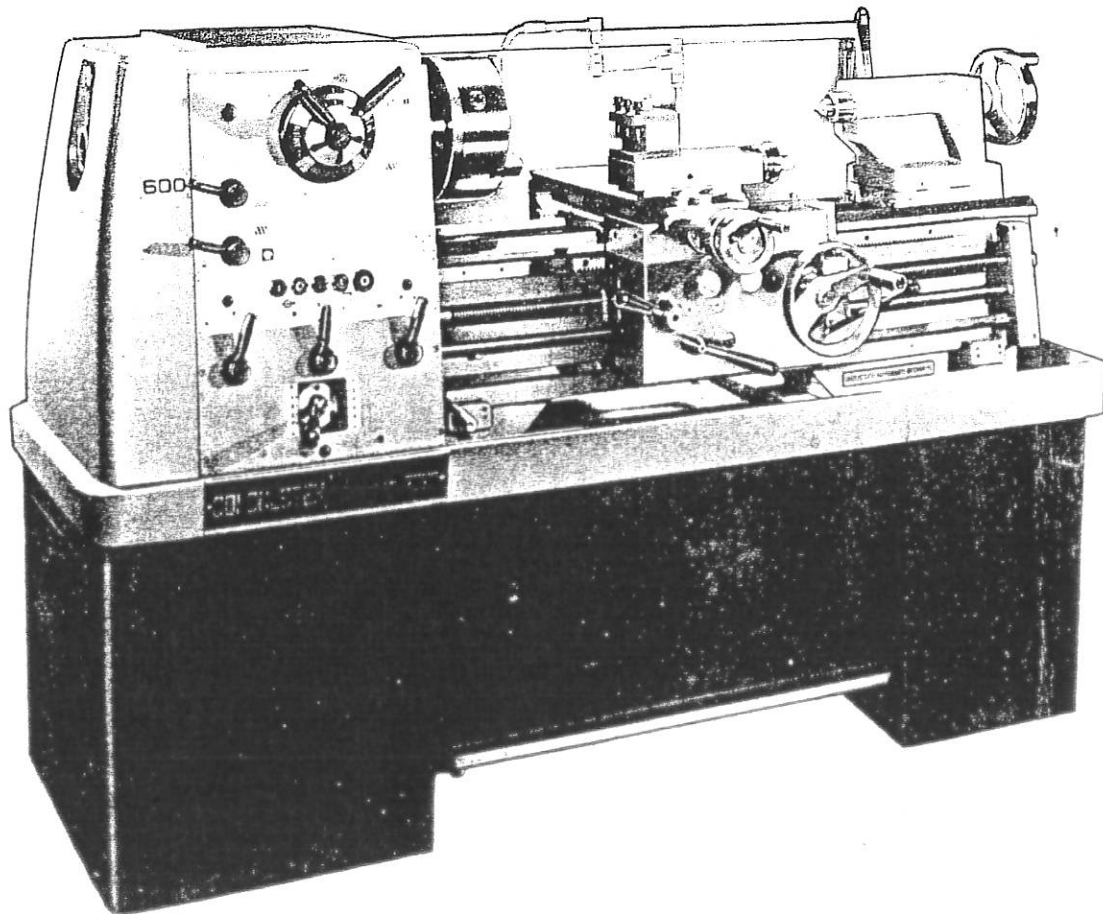
**PLEASE WRITE YOUR MACHINE NUMBER HERE FOR
FUTURE REFERENCE, THIS TO BE QUOTED WHENEVER
SPARE PARTS ARE REQUIRED.**

MCH NO.

**INSTRUCTION AND
SPARE PARTS MANUAL**

INSTRUCTION & PARTS MANUAL

TRIUMPH 2000 LATHES Lathes



This manual applies only to the machine having the serial number shown; this is stamped on the front of the lathe bed at the tailstock end and MUST be quoted in all communications.

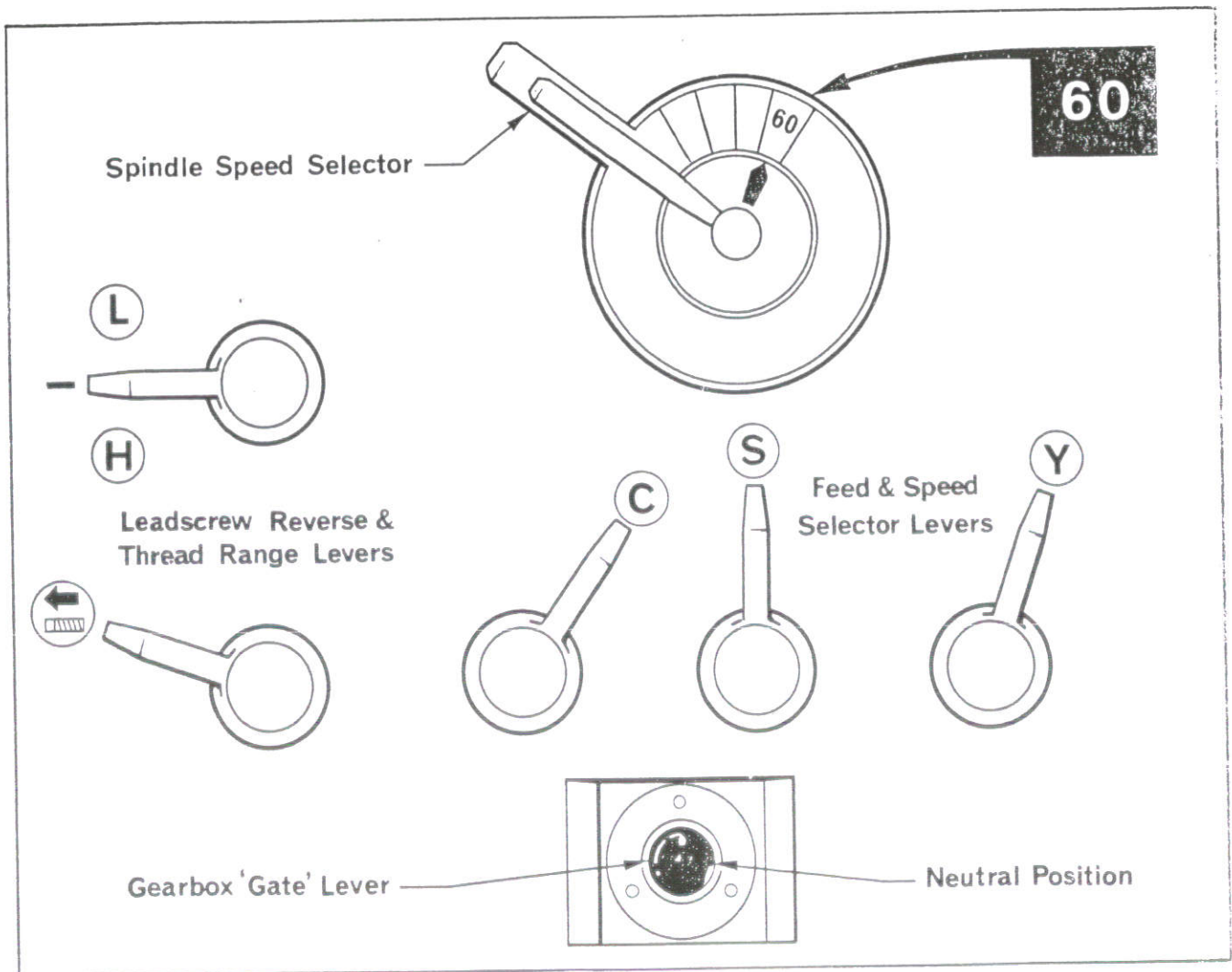
Machine Serial Number

THE COLCHESTER LATHE COMPANY LTD.
Colchester Essex England

Please read before starting machine

Before this machine leaves the factory the controls are pre-set, as detailed below, to avoid damage by accidental starting on high speeds and coarse feeds.

Before starting the machine check the settings and ensure that the controls are in the correct positions. Before operating the machine read carefully — OPERATION INSTRUCTIONS pages 8-13 in the Manual.



1. SPINDLE ROTATION LEVER
The spindle rotation lever is set in the neutral position.
2. SPINDLE SPEED SELECTOR
The spindle speed selector lever is set at 60 r.p.m.
3. LEADSCREW REVERSE & THREAD RANGE LEVERS
The leadscrew reverse lever and the thread range lever are both set in the neutral position.
4. FEED & SPEED SELECTOR LEVERS
The three Feed and Speed selector levers are set (from left to right) at positions (C) (S) and (Y) respectively.
5. GEARBOX 'GATE' LEVER
The gearbox 'gate' lever is set in the neutral position.

BRIEF SPECIFICATION

Height of centres	7½ in.
Distance between centres	30 in. or 50 in.
Swing: over bed	15¼ in.
over cross-slide	9⅜ in.
in gap	
(gap-bed lathes)	22½ in.
Spindle nose	6 in. D1 Camlock
Spindle bore	
(max. bar diam.)	2⅛ in.
Taper of centres	No. 4 Morse
Drive:	7½ h.p.
Weight (approx):	
Short Bed	2600 lb (1180 kg)
Long Bed	2840 lb (1290 kg)

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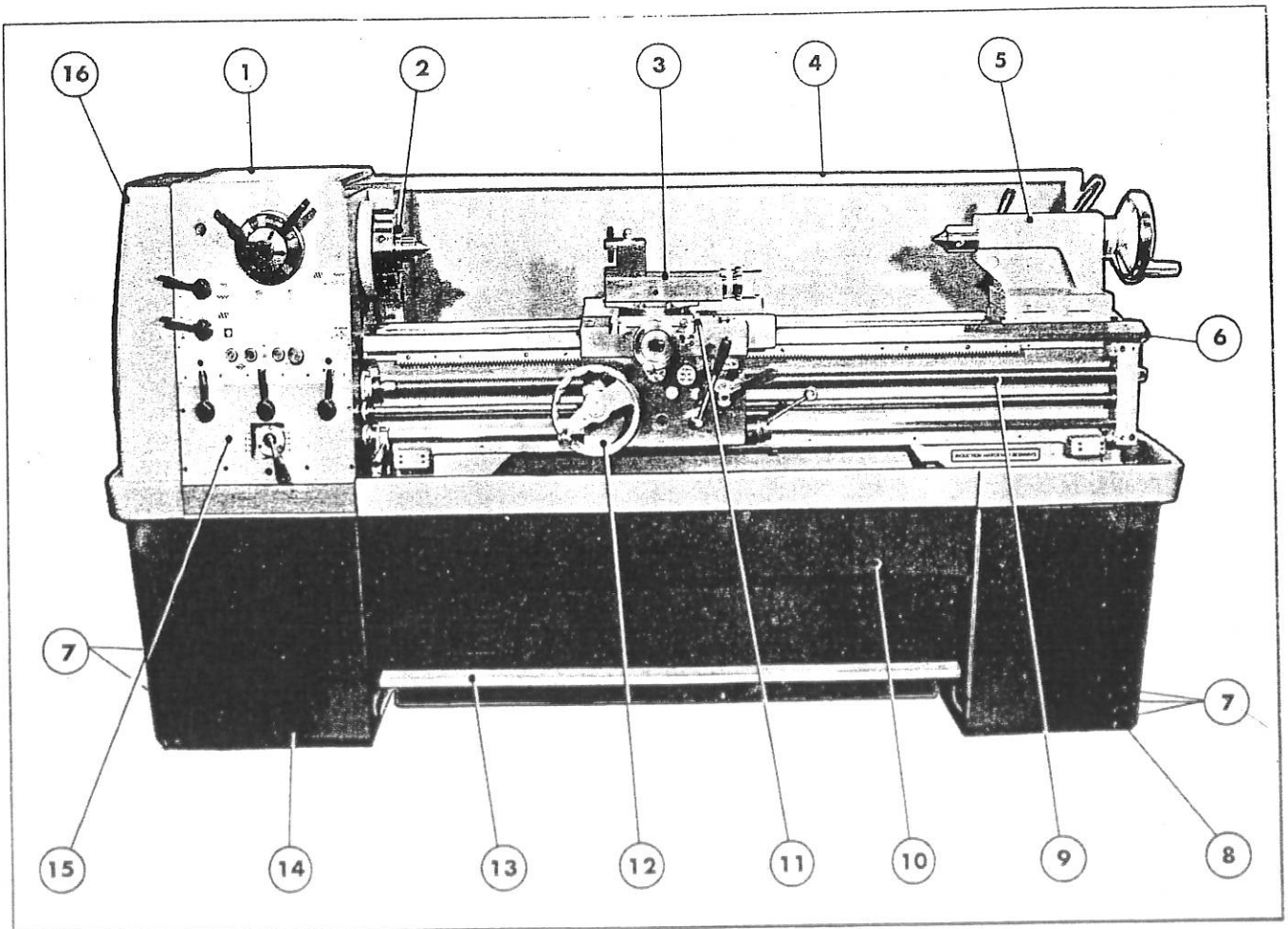
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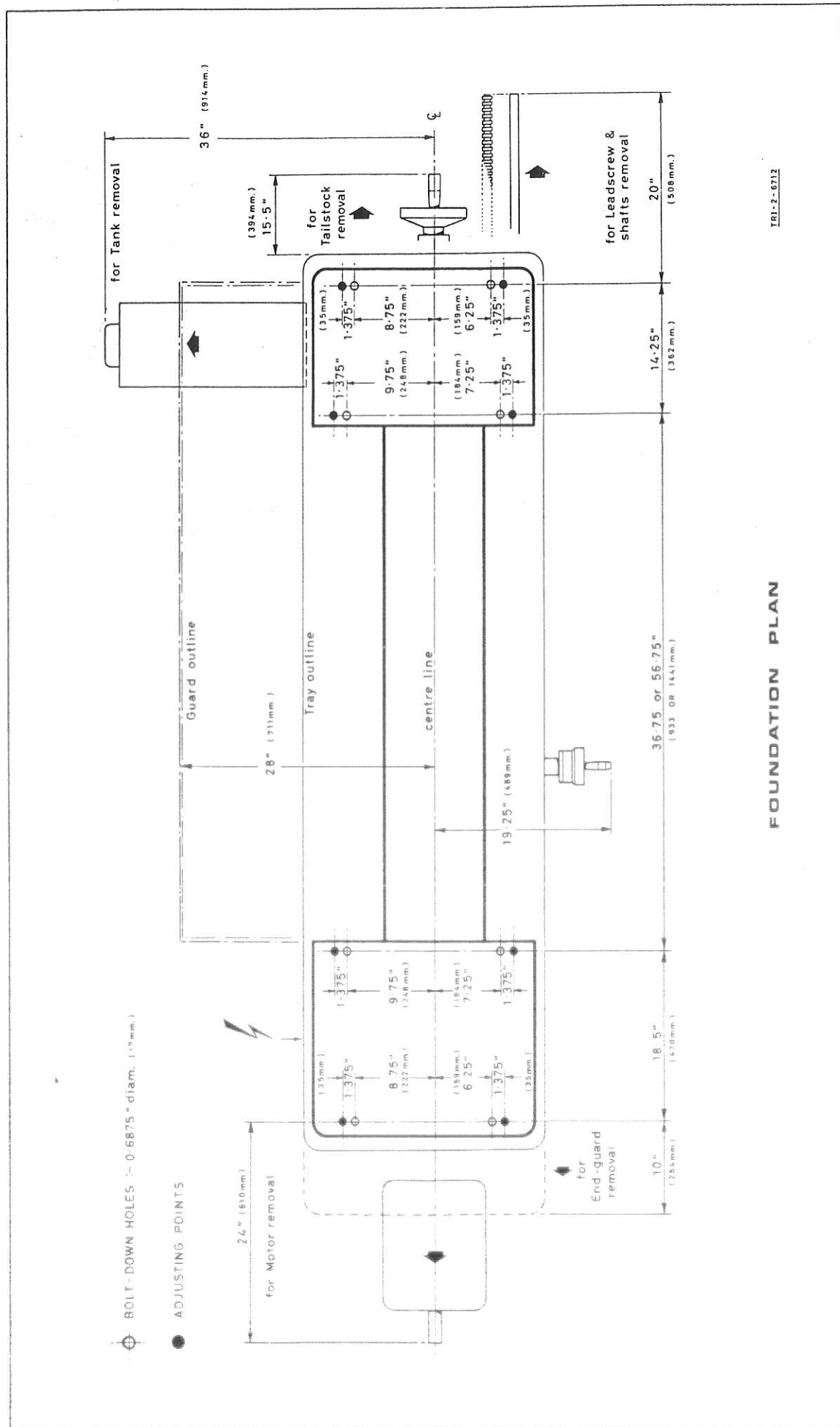
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LEGEND

- 1 Headstock
- 2 Spindle
- 3 Topslide
- 4 Splash guard
- 5 Tailstock
- 6 Bed
- 7 Mounting feet
- 8 Tail-end plinth
- 9 Leadscrew
- 10 Coolant tray
- 11 Saddle and cross-slide
- 12 Apron
- 13 Footbrake
- 14 Head-end plinth
- 15 Gearbox
- 16 End cover (gear train)



TRI-2-6712

FOUNDATION PLAN

CLEANING

Before operating any controls, remove the anti-corrosion coating from all slideways and the end gear train, see Fig. 1, using white spirit or Kerosene.

DO NOT USE CELLULOSE SOLVENTS FOR CLEANING AS THEY WILL DAMAGE THE PAINT FINISH.

Oil all bright machined surfaces immediately after cleaning using machine oil or slideway lubricant; use heavy oil or grease on the end gears.

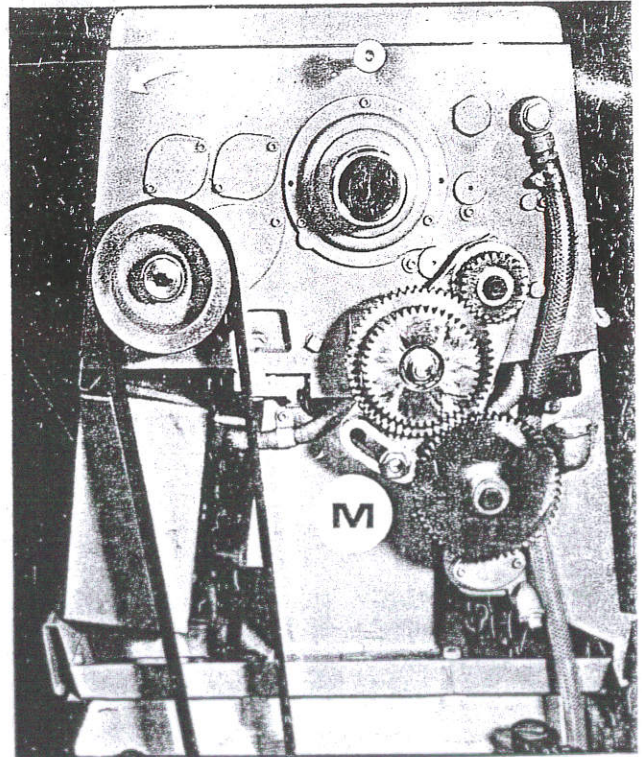


Fig. 1.

LIFTING

Use the bed-clamping plate and eyebolt to sling the lathe as in Fig. 2. Position the saddle and tailstock along the bed to obtain balance.

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

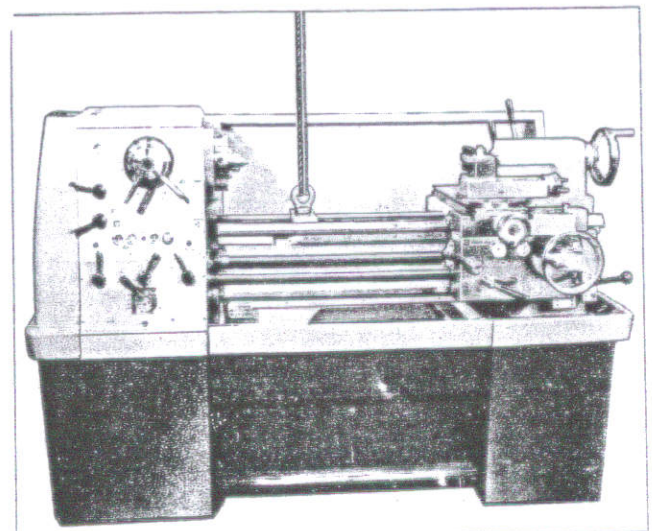


Fig. 2.

INSTALLING

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

Free-standing: Position lathe on foundation and adjust each of the eight mounting feet to take equal share of the load. Then using an engineers' precision level on the bedways (as in Fig. 3) adjust the feet to level up machine. Periodically check bed level to ensure continued lathe accuracy.

Fixed installation: Position lathe over eight bolts ($\frac{1}{2}$ in. or 16mm. diam.) set into the foundation to correspond with holes in the mounting feet; dimensions are shown on Foundation Plan. Accurately level the machine, as in Fig. 3, then tighten hold-down bolts. Re-check bed level.

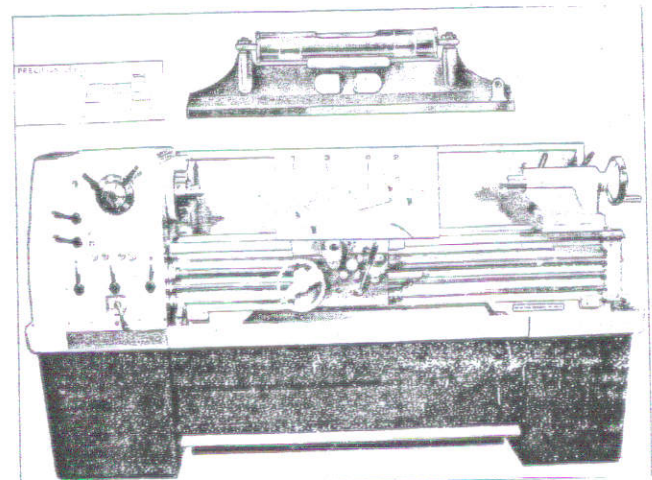


Fig. 3.

ELECTRIC SUPPLY CONNECTION

Input wires should be connected to mains terminals of the isolator switch on the electrical panel in back of the bed, below the headstock, see Fig. 4.

Main motor rotation must be anti-clockwise viewed from the pulley end. Should motor run in wrong direction, interchange any two of the three phase lines. Appropriate wiring diagrams are included in Servicing and Maintenance Section of this manual.

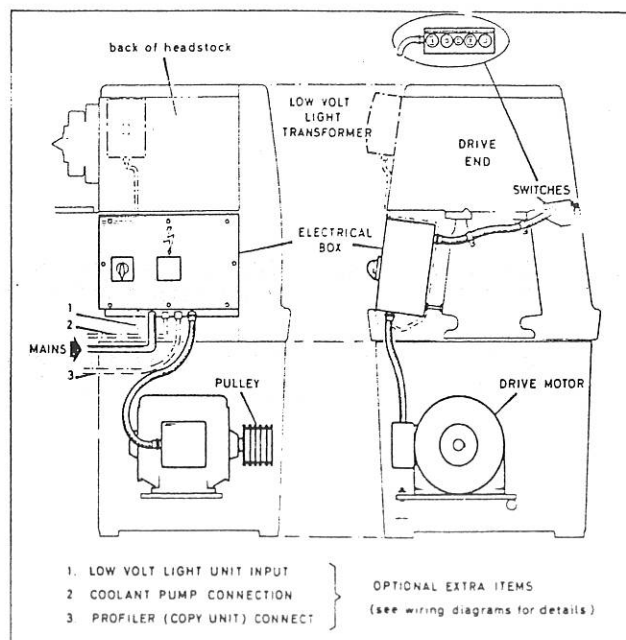


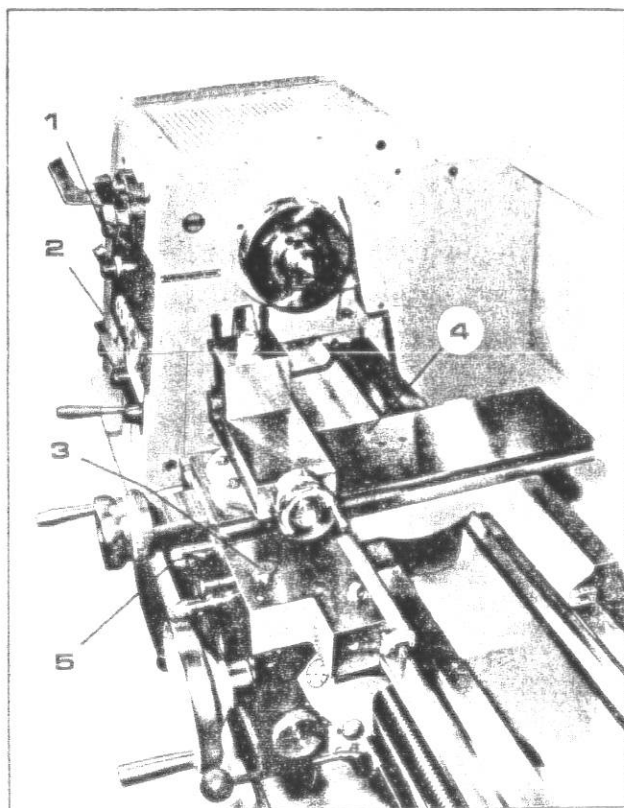
Fig. 4.

LUBRICATION CHECKS

Before operating the machine make the following important checks:

1. That the oil tank in the head-end plinth is filled to correct level indicated by dipstick with Shell Tellus Oil 27.
2. That the gearbox is filled to level marked on oil sight window with Shell Tellus Oil 27.
3. That the carriage apron is filled to level mark on oil sight window with Shell Tonna 33.
4. In addition, apply an oil can to the points shown on lubrication diagram which require daily oiling. Use light machine oil or way lubricant.
5. Before each working shift, operate the manual lubrication pump to ensure adequate lubrication of carriage slideways.

NOTE: When the lathe motor is switched on, the oil sight window in front of the headstock should fill with oil—indicating that the pump is operative. If this does not occur stop the machine and investigate the cause.



CHUCKS AND CHUCK MOUNTING

WARNING: USE ONLY HIGH-SPEED CHUCKS WITH THESE MACHINES.

When fitting chucks or faceplates, first ensure that spindle and chuck tapers are scrupulously clean and that all cams lock in the correct positions; see Fig. 5. It may be necessary when mounting a new chuck to re-set the camlock studs (A). To do this, remove the cap-head locking screws (B) and set each stud so that the scribed ring (C) is flush with the rear face of the chuck—with the slot lining up with the locking screw hole (see inset, Fig. 5).

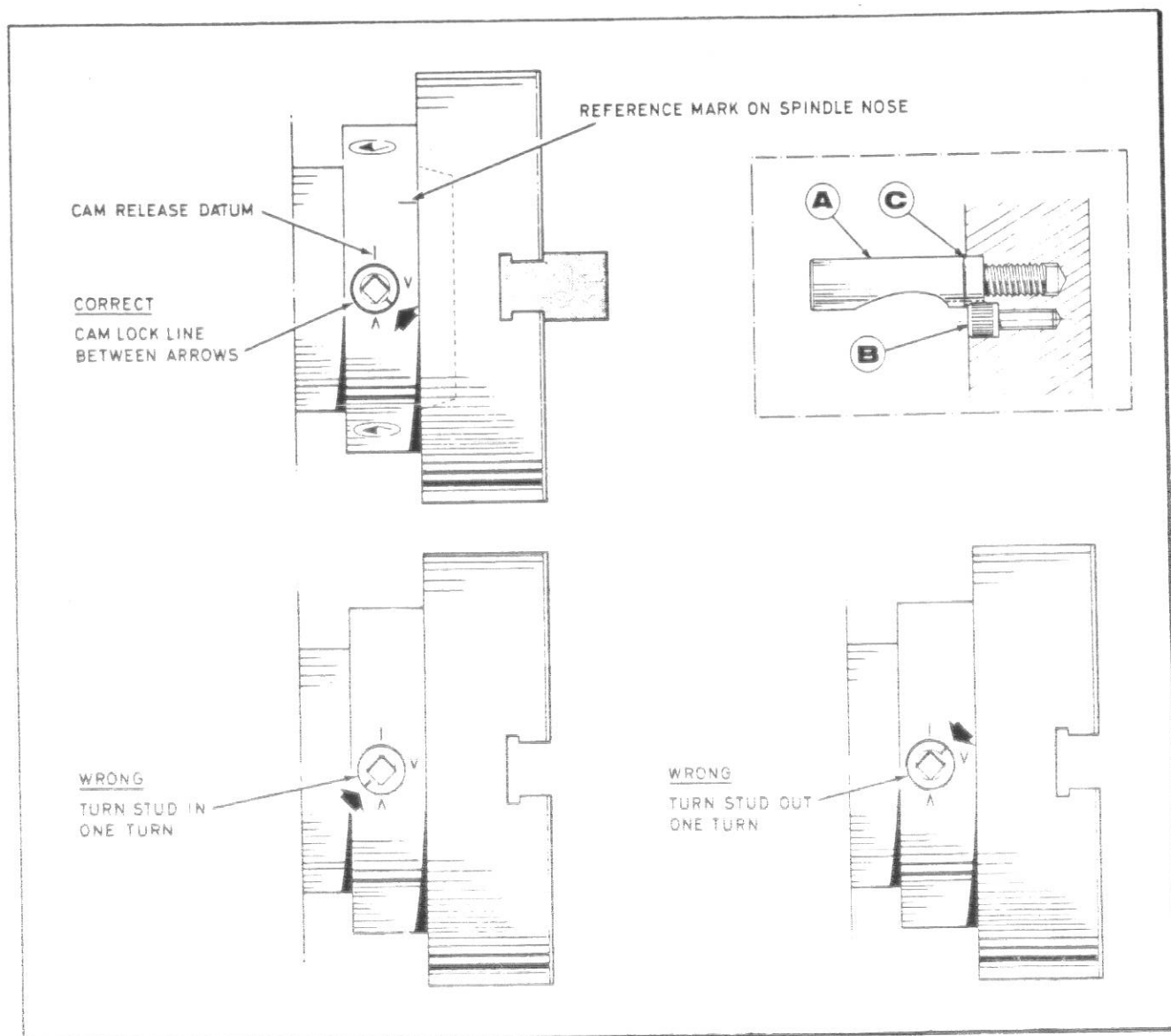
Now mount the chuck or faceplate on the spindle nose and tighten the six cams in turn. When fully tightened, the cam lock line on each cam should be between the two V marks on the spindle nose.

If any of the cams do not tighten fully within these limit marks, remove the chuck or faceplate and re-adjust the stud as indicated in the illustration. Fit and tighten the locking screw (B) at each stud before remounting the chuck for work.

A reference mark should be made on each correctly fitted chuck or faceplate to coincide with the reference mark scribed on the spindle nose. This will assist subsequent remounting. **DO NOT INTERCHANGE CHUCKS OR FACE PLATES BETWEEN LATHES WITHOUT CHECKING FOR CORRECT CAM LOCKING.**

IMPORTANT: Take careful note of speed limitations when using faceplates; 21 in. faceplates should not be run at speeds greater than 625 rev/min. and 14 in. faceplates at not more than 840 rev/min.

Fig. 5



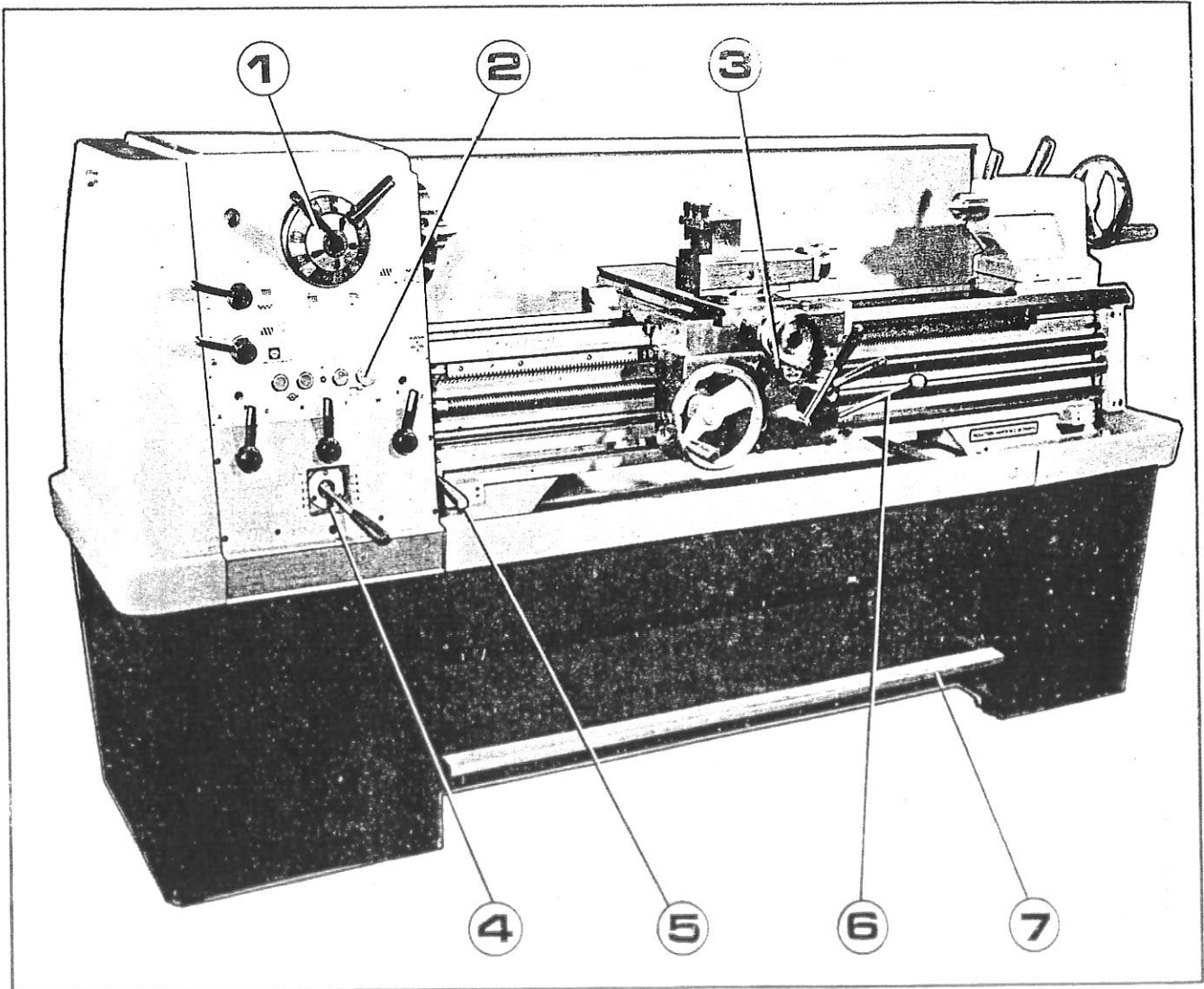


Fig. 6

LATHE CONTROLS (See Fig. 6)

1. Spindle speed selector
2. Electrical push buttons
3. Apron, surfacing or sliding feeds
4. Gearbox, threads and feeds
5. Spindle rotation (reverse only)
6. Spindle rotation (forward and reverse)
7. Footbrake

ELECTRICAL CONTROLS (See Fig. 7)

With the exception of the lathe isolator, all electrical controls are fitted into the front face of the headstock:—

1. Press the **GREEN** button to start the main drive motor.
2. The indicator lamp glows whilst the motor is running.
3. Press the **RED** mushroom-head button to stop the main motor and also electrical supply to ancillary services.
4. Coolant pump **ON/OFF** push buttons.

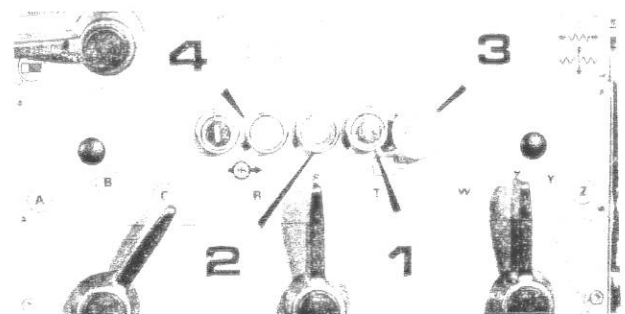


Fig. 7

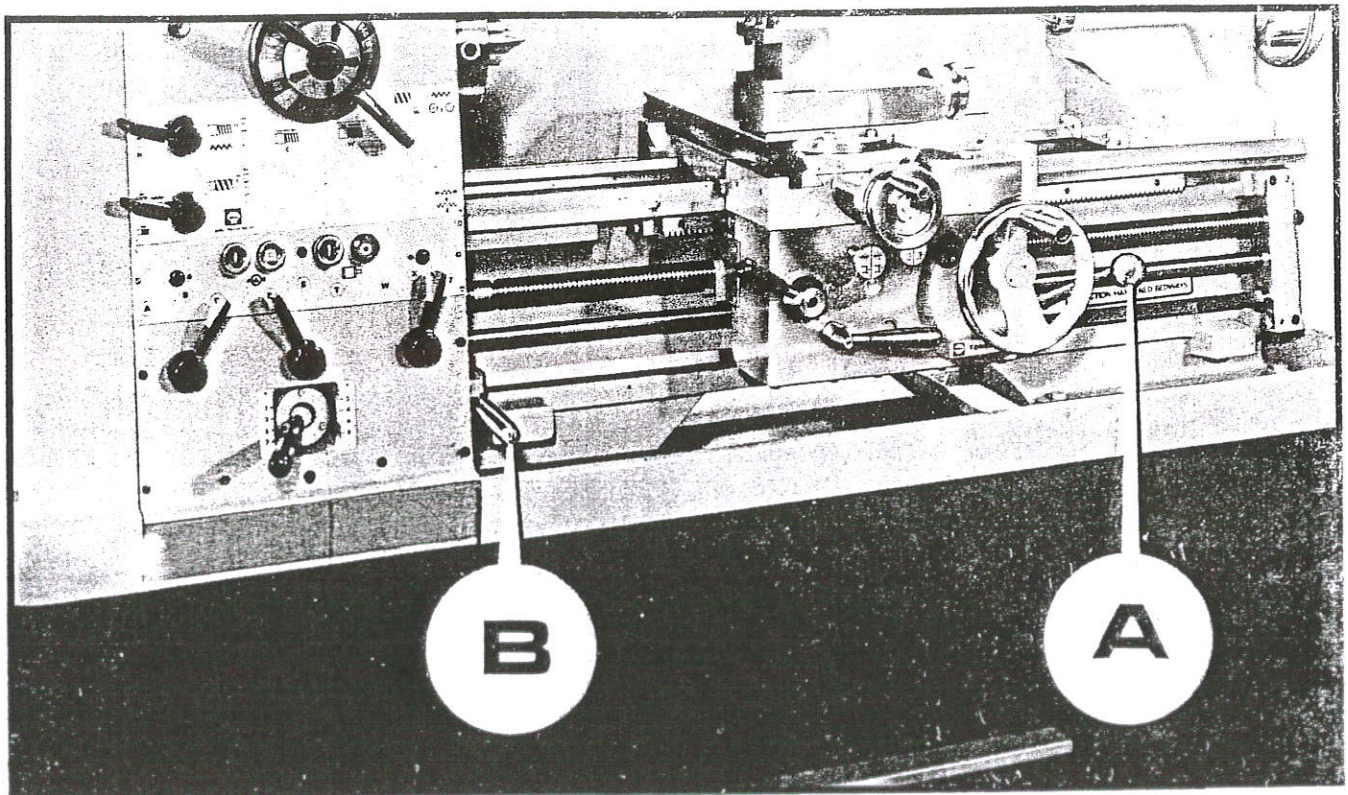


Fig. 8

SPEED CONTROLS (Standard lathes)

Spindle Rotation: Selected by the lever controls A and B (Fig. 8). The apron lever (A) for forward, free and reverse selections, the lever (B) for reverse and free selections only.

With the main motor running; move lever A out and down to engage forward rotation of spindle, or straight upward to engage reverse rotation. Lever B can be moved only upward to engage reverse rotation or returned to the central position to disengage drive.

Footbrake: A foot pedal between plinths operates the spindle brake and at the same time returns selector levers A and B to the central (disengaged) position.

Height of the foot pedal depends upon the position of a pin engaged in the bar (Fig. 9); a choice of three positions is provided.

Spindle speeds: Selected by the grouped dial controls on the headstock (Fig. 10).

The sixteen available speeds are shown directly on the lever-operated dial (A) in four groups—each of which is further divided into four displayed spindle speeds. Rotate this dial, using the large handle, to bring the required speed-group uppermost and opposite the fixed section (B). Now rotate the other handled dial (C) until the appropriately coloured arrow is aligned with the required speed on the uppermost dial group.

DO NOT SELECT SPEEDS WHILST SPINDLE IS ROTATING OR CLUTCHES ENGAGED—APRON CONTROL MUST BE CENTRAL (DISENGAGED) TO AVOID GEAR DAMAGE

To free the spindle for hand rotation, set any one of the blank spaces on the group-dial to the mid-position of the fixed section (B).

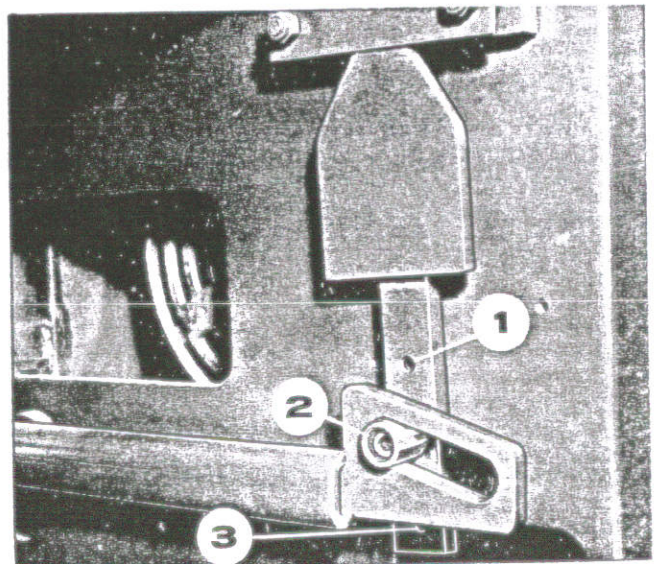


Fig. 9

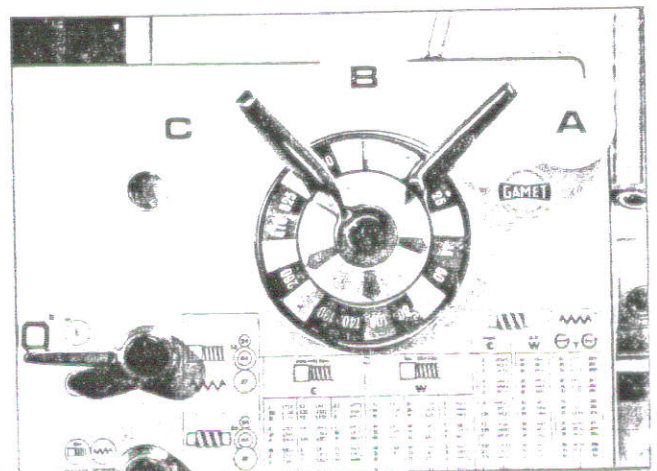


Fig. 10

THREADS AND FEEDS

All the threads and feeds directly available from the gearbox are shown on the data plate fitted on the front of the headstock (Fig. 11). The setting of control levers is shown in Fig. 12.

The L position of lever (Y) provides a range of fine threads, the H position a coarse thread range. Do not select the coarse range (H position) at spindle speeds higher than 625 rev/min.

Threads available:

45 Whitworth threads	: 2 to 72 t.p.i.
39 Metric threads	: 0.2 to 14 mm pitch
18 Metric modules	: 0.3 to 3.5 mod.
21 Diametral pitches	: 8 to 44 D.P.

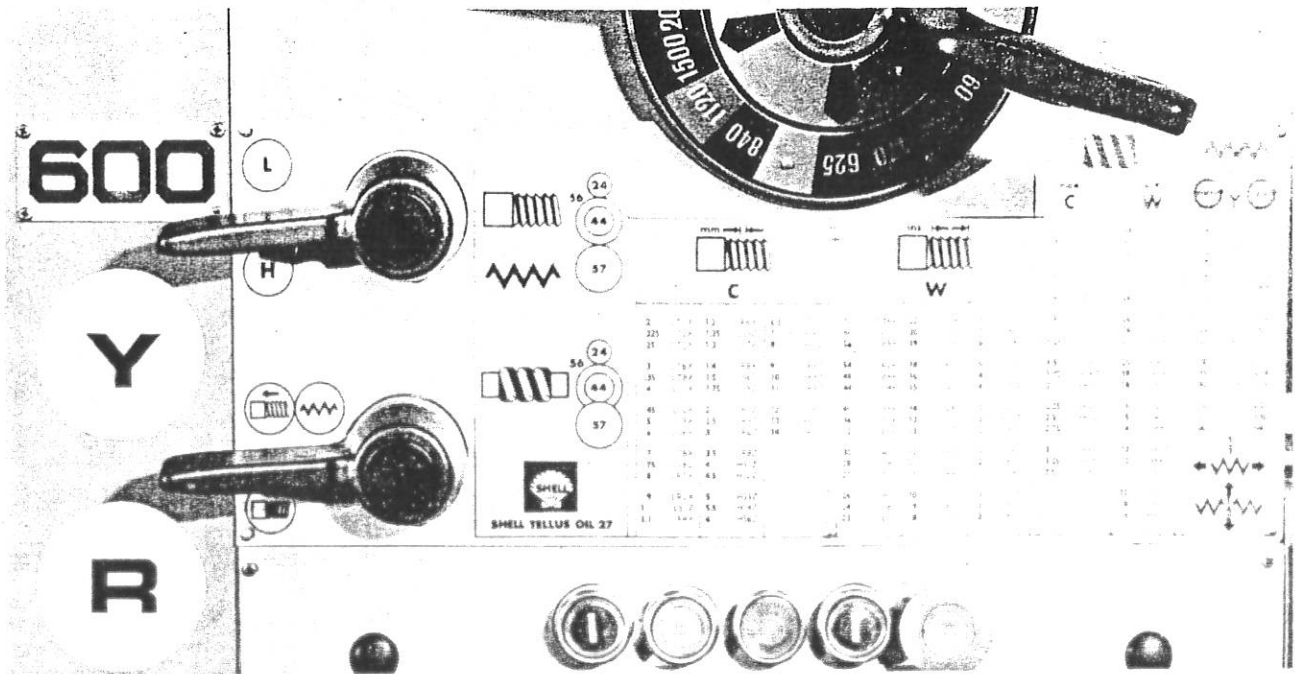


Fig. 11

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

Change gears: our Technical Department will specify the most convenient change-gears required for any special thread not shown on data plate.

Feeds: Sliding feeds per spindle revolution range from .0015 to .040 in. (0.04 to 1.0 mm). Surfacing feeds per spindle revolution range from .00075 to .020 in. (0.02 to 0.5 mm) or half the sliding feed.

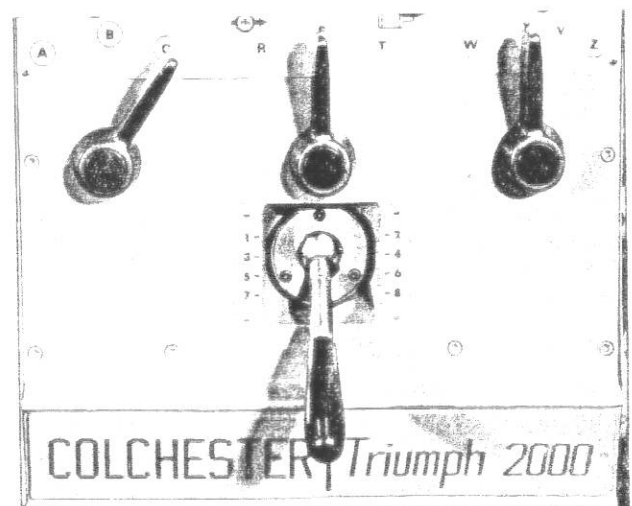


Fig. 12

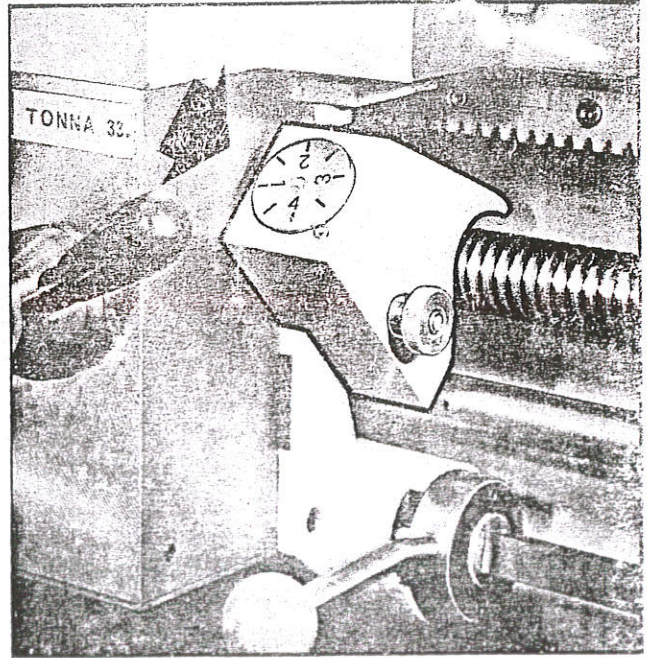
THREADING DIAL INDICATOR

Located on right-hand side of the apron on lathes having an English leadscrew, except when a rapid-threader unit is fitted as optional extra. Engage the indicator pinion with the leadscrew and tighten the handnut to retain indicator in engagement. Release handnut, swing indicator out of engagement and secure with the handnut when not required.

To cut threads of an even number per inch, close the leadscrew nut as ANY line on the dial passes the datum mark. To cut threads of odd numbers per inch, close the leadscrew nut at any NUMBERED line.

Fractional threads of $\frac{1}{2}$ or $\frac{1}{4}$ t.p.i. may be cut by closing the nut at the SAME numbered line on each pass of the tool.

This dial cannot be used with an English leadscrew to cut metric threads, D.P., module pitches or fractional threads other than those shown. For these the leadscrew nut must be kept closed and the machine reversed by use of the apron control lever after each cutting pass and tool withdrawal. For lathes having a metric leadscrew a dial indicator combination unit is supplied, and, by selection of the correct pinion, all metric pitches shown on the data plate can be cut in the manner used for English threads on an English leadscrew.



MULTI-START THREADS

Multi-start threads can be cut on a lathe in three ways:—

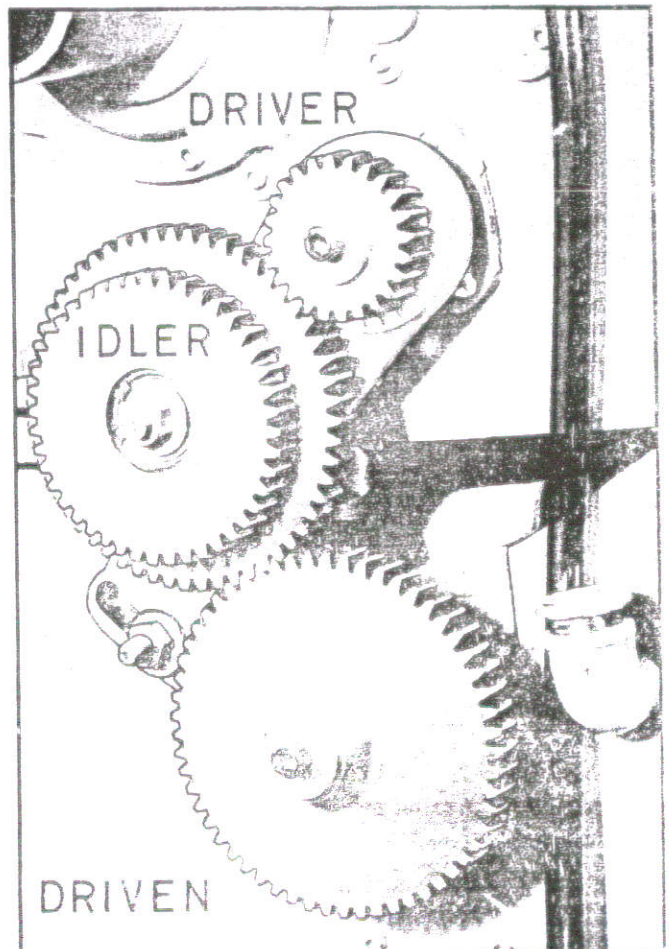
1. By repositioning the compound (top) slide one pitch forward for each start. Note that the slide is normally set at 90 deg. to the axis of the machine cross-slide. The accuracy of this method depends upon the skill of the operator.
2. By using an accurately-divided driver plate and turning the workpiece one division forward for each start.
3. By advancing the driver gear a calculated number of turns to advance the spindle by one pitch of the thread to be cut. The accuracy of this method is that of the machine.

With Colchester Triumph 2000 lathes, two ratios exist between the spindle and driver gear shaft; i.e. the LOW range where the ratio is 1:2, and the HIGH range where the ratio is 2:1.

In order to use this method, the number of teeth on the driver gear must be divisible by the number of starts being cut. The driver gear is then advanced by **half** this number of teeth when in LOW range and, conversely, by **twice** the number of teeth when in HIGH range.

The limitation of this method depends upon whether the number of starts required can be divided equally into the number of teeth on the driver gear without a remainder.

On the standard end gear train for this machine the driver gear has 24 teeth; so that two, three or four start threads can readily be cut. For other odd numbers of starts a choice must be made of methods 1 or 2.



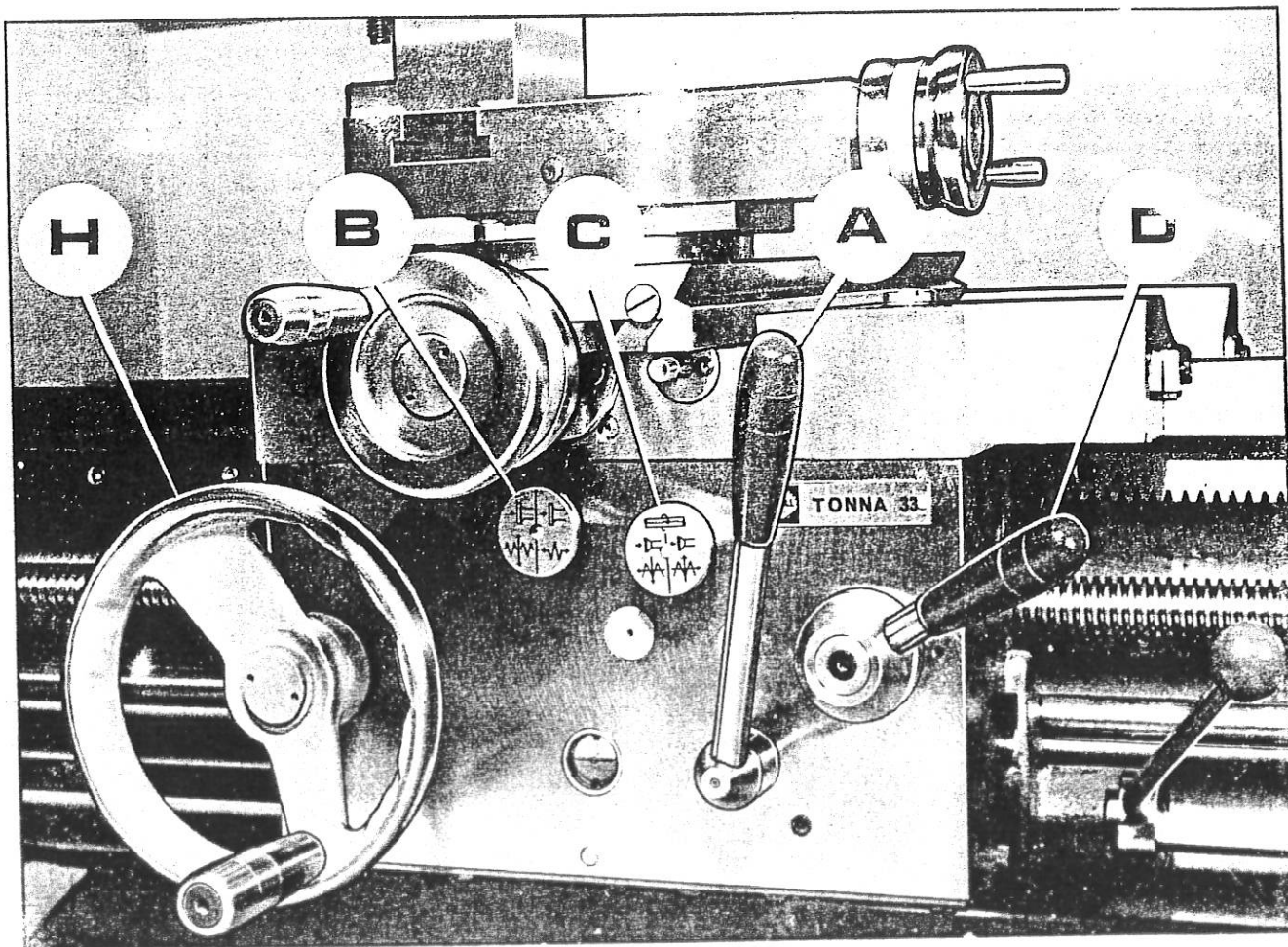


Fig. 13.

APRON CONTROLS

In addition to handwheel traverse, the carriage can be power-operated through controls on the front of the apron, see Fig. 13. Lever (A) is moved up for power feed engagement and down for manual operation.

The push-pull knob (B) selects power surfacing (cross-feed) when pulled out, sliding feeds are selected when the knob is pushed right in. The adjacent push-pull handle (C) controls forward or reverse feed direction.

Lever (D) is pressed downward to engage the leadscrew nut for screwcutting. To avoid undue wear, release the nut except when screwcutting. An interlock within the apron prevents inadvertent engagement of levers A and D at the same time.

NOTE: Do not use headstock lever for reversing feeds except during left-hand screwcutting; use, instead, the apron handle (C).

Feed-trip adjustment: A trip mechanism is incorporated in the apron, enabling saddle and/or cross-slide to be fed up to fixed stops. Trip loads can be set high or low by adjustment of the knurled handwheel on the side of the apron. The apron handwheel may be disengaged from its gear train during power operation or when screwcutting, by pulling the handwheel outwards to another spring-ball detent.

NOTE: This does not apply when the longitudinal dial accessory is fitted.

CROSS-SLIDE AND TOPSLIDE—see Fig. 14

A solid topslide is fitted as standard to the cross-slide, carried on a rotatable base which is marked 0-90-0-90 deg. for accurate indexing. Handwheel dials are graduated in inch or metric divisions to suit the operating screw and nut fitted.

The cross-slide can be power operated by pulling out the hand knob (B), at half sliding feed per spindle revolution; or it can be hand-operated using the large-diameter dial graduated in either inch or metric divisions to suit the operating screw and nut fitted.

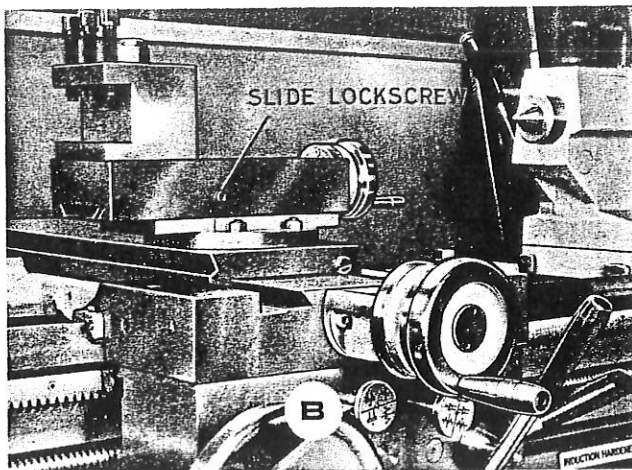


Fig. 14

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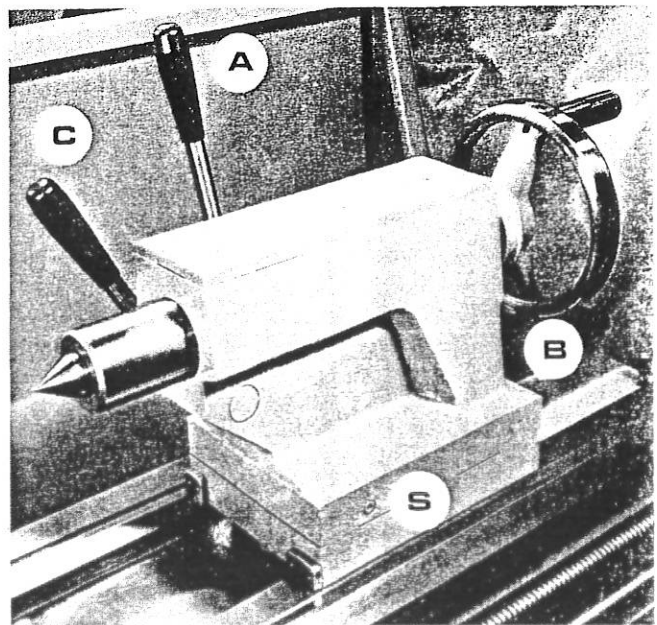


Fig. 15

TAILSTOCK

Can be freed for movement along the bed by unlocking the clamp lever (A). Additional clamping may be obtained by tightening the large nut (B) located in a recess below the handwheel.

Release this clamping nut before attempting to move the tailstock and on completion of the need for extra clamping.

The tailstock barrel is locked by lever (C), see Fig. 15.

The tailstock can be set-over for production of shallow tapers or for re-alignment. Release the clamping lever and adjust screws (S) at each side of the base (Fig. 15) to move tailstock laterally across the base. An indication of the set-over is given by the datum mark (D) at the tailstock end face, as shown in Fig. 16. Apply clamp lever after adjustment of set-over.

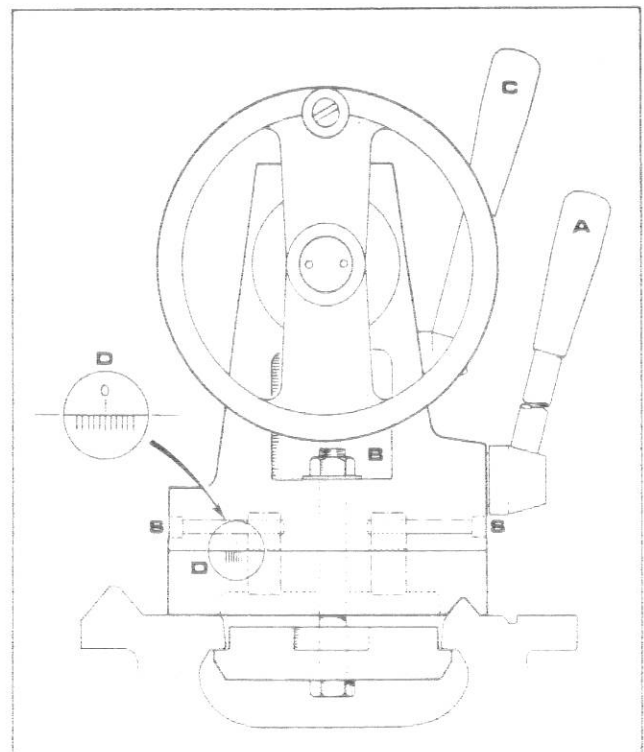


Fig. 16

LATHE ALIGNMENT

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

Headstock check: Take a light cut with a keen tool over a 6 in. (150 mm) length of 2 in. dia. (50 mm) steel bar gripped in the chuck but not supported at the free end. Micrometer readings at each end of the turned length (at A and B of Fig. 17) should be the same.

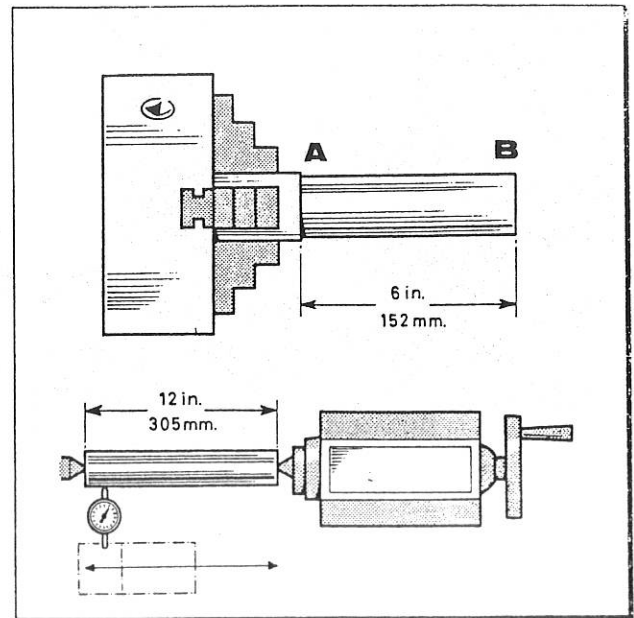


Fig. 17

To correct a difference in readings, slacken the four headstock hold-down screws (J) shown in Fig. 18 and adjust the set-over pad (K) beneath the headstock to pivot the headstock about the dowel (L). Tighten all screws after adjustment and repeat the test-cut / micrometer-reading sequence until micrometer readings are identical, i.e. machine now cutting absolutely parallel.

Tailstock check: Using a 12 in. (305 mm) ground steel bar fitted between headstock and tailstock centres, check the alignment by fitting a dial-test indicator to the topslide and traversing the centre line of the bar (lower sketch, Fig. 17). To correct error release the tailstock clamp lever and adjust the two set-over screws provided. Continue with checking and correction until the alignment is perfect.

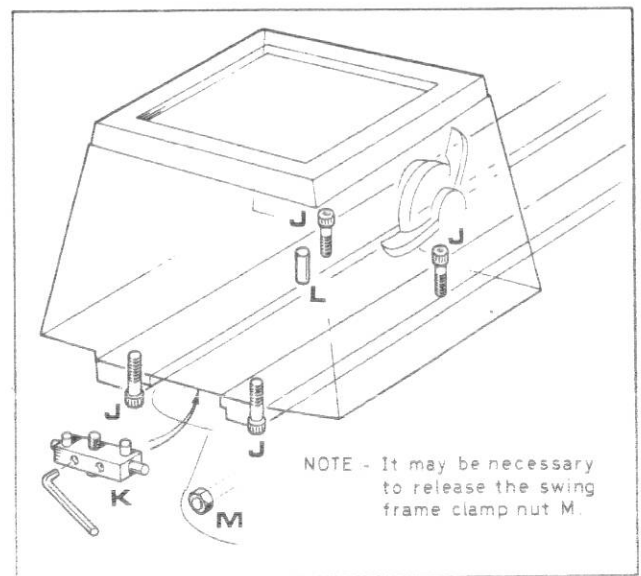


Fig. 18

END GEAR TRAIN

Drive from headstock to gearbox is transmitted through a gear train enclosed by the headstock end-guard. Intermediate gears are carried on an adjustable swing-frame (M) shown in Fig. 19. Gears must be thoroughly cleaned before fitting and backlash maintained at .005 in. (.127 mm) for correct meshing. Lubricate gears regularly with thick oil or grease.

DRIVING BELTS

To alter belt tension, remove the cover plate in back of the headstock plinth and adjust the two screws (X Fig. 20) on the hinged motor platform. Ensure that the motor is correctly aligned with the lathe axis.

Light finger pressure at a point midway between motor and headstock pulleys should produce about $\frac{1}{2}$ in. (19 mm) movement of each belt when under correct tension, see Fig. 21.

NOTE: The oil pump driving belt is automatically tensioned by its own spring-loaded jockey pulley.

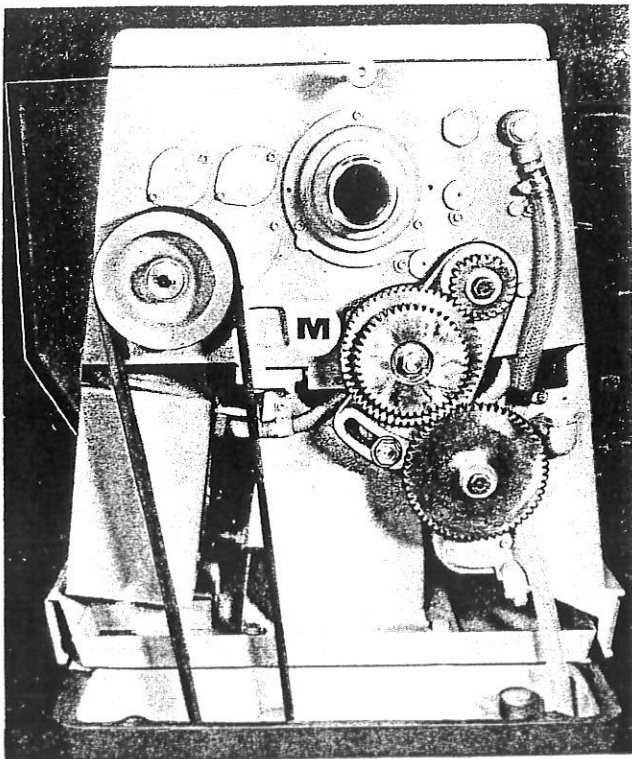


Fig. 19.

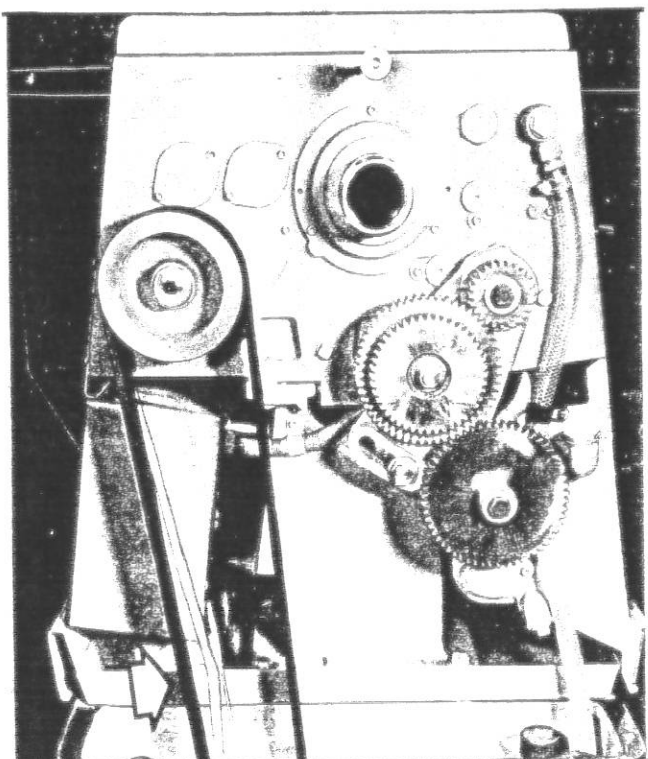


Fig. 21

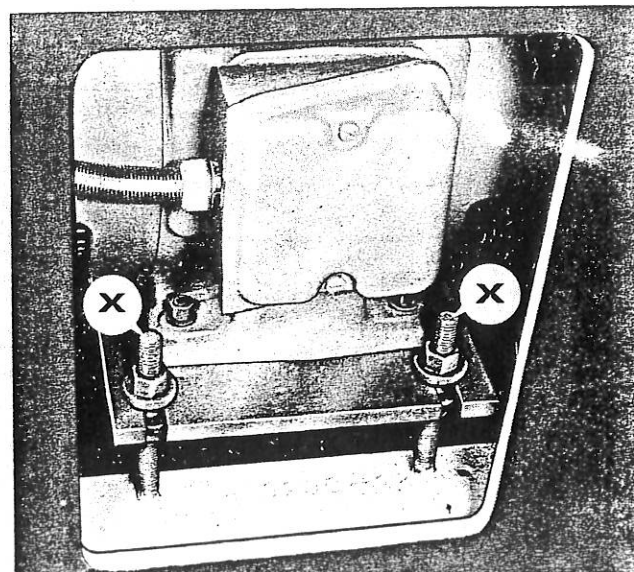


Fig. 20

LEADSCREW SHEARPIN

The transmission is protected against severe overload by a shearpin fitted into the leadscrew drive, just forward of the gearbox, see Fig. 22.

To replace a sheared pin, first disengage drive to the leadscrew (F) by setting the right-hand lever of the gearbox to the position Y. Then rotate the flanged shaft (A) carrying the broken pin to the slot at the bottom of the gearbox housing (B). Press the spring-loaded collar (C) to the right and push the pin into the slot. Rotate the shroud washer (D) to expose the pin head for removal from the collar (C).

Align the holes in flanged-shaft (A), collar (C) and shroud washer (D) then insert a new pin (E) and rotate the shroud washer to cover and retain the new shearpin.

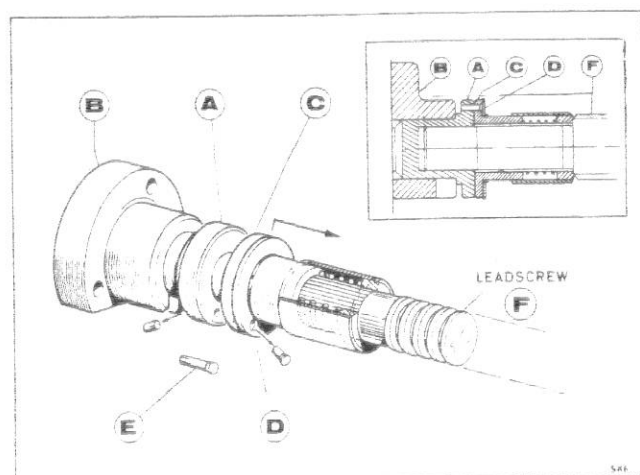


Fig. 22

CAUTION: USE ONLY CORRECT REPLACEMENT SHEARPINS OF MATERIAL $\frac{1}{8}$ in. DIAMETER STEEL, 30 TON TENSILE STRENGTH.

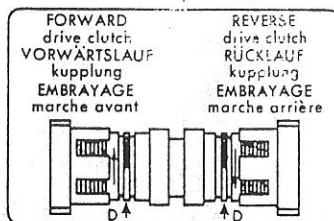
Vérifier que les courroies motrices principales soient correctement tendues avant d'ajuster les embrayages.

RÉGLAGE DE L'EMBRAYAGE

1. Couper le courant à l'interrupteur principal.
2. Placer le levier de commande de l'embrayage sur le trainard en position neutre.
3. Enlever le couvercle à l'arrière de la poupée principale faire coulisser vers l'arrière la bague de blocage moletée (D) et tourner d'un cran dans le sens de la flèche pour rattraper le jeu de l'embrayage.
4. Faire coulisser la bague de blocage vers l'avant pour bloquer le réglage.
5. Vérifier le fonctionnement de l'embrayage. Lorsque l'embrayage est correctement réglé, il est capable d'amener la broche prise à l'arrêt à une vitesse de 2000 T/min. en un temps de 3 à 4 secondes, lorsque celle-ci est équipée du mandrin à 3 mors de 254 mm de diamètre, sans aucune pièce montée dans le mandrin.

ATTENTION—AVIS IMPORTANT!

Si l'on resserre trop l'embrayage, on risque d'endommager sérieusement l'embrayage ou le mécanisme sans amélioration des performances.



Ensure main drive belts correctly tensioned before adjusting clutches.

CLUTCH ADJUSTMENT

1. Isolate main power supply.
2. Set apron clutch control lever to neutral.
3. Remove cover from rear of headstock, slide back knurled lock-ring (D) and rotate one notch in direction of arrow to tighten clutch.
4. Slide lock-ring forward to lock setting.
5. Check performance. When correctly set the clutches accelerate the spindle from rest to 2000 r.p.m. within 3 to 4 seconds with 10.0 inch—3 jaw chuck fitted and no workpiece.

WARNING

Over adjustment will cause serious damage to clutches or operating mechanism with no gain in performance.

Vorgeschriebene Riemenspannung beachten bevor Kupplungen justiert werden.

KUPPLUNGEN JUSTIEREN

1. Stromzufuhr zur Maschine unterbrechen.
2. Schaltwellen-Steuerhebel am Schloßkasten in "neutral" stellen.
3. Hintere Spindelstock-Abdeckhaube entfernen—Rändelsicherungsring (D) zurückschieben und um einen Zahn in Pfeilrichtung zum Verstärken des Druckes verdrehen.
4. Rändelsicherungsring zum Arretieren nach vorn schieben.
5. Leistung prüfen. Bei richtiger Einstellung läuft Maschine mit 250 mm 3—Backenfutter OHNE Werkstück von 0 auf 2000 U/min. in 3—4 Sekunden an.

WARNING!

Überjustierung verursacht schwere Schäden an Kupplungen ohne die Leistung derselben zu erhöhen.

537 — 0798

Fig. 23

DRIVE CLUTCHES

Two multi-plate clutches (A and B of Fig. 23) provide drive for forward and reverse headstock spindle rotation.

Initial bedding-in of the friction surfaces will usually necessitate some adjustment. To adjust clutches:

1. Isolate the lathe from mains power supply at the switch on rear electrical panel then disengage the clutches by setting red-handled apron control to the central position.
2. Remove the rectangular cover plate from back of headstock for access to both clutches.
3. Before attempting to adjust clutches, read carefully the instructions given on the access cover plate. These will vary according to the type of clutch fitted to individual machines (see Fig. 23).
4. Refit cover plate and check performance. When correctly set, clutches should accelerate the spindle from rest to 2000 rev/min. within 3-4 seconds; when fitted with a standard 10½ in. (267 mm) 3-jaw chuck without work-piece.

AVOID OVER ADJUSTMENT WHICH MAY CAUSE SERIOUS DAMAGE TO CLUTCHES OR OPERATING MECHANISM WITH NO GAIN IN PERFORMANCE

CROSS-SLIDE NUT

This is adjustable for elimination of slackness which may develop in service. Reduce backlash by slackening rear cap-head screw in top of cross-slide (A in Fig. 24) then carefully screw in the center screw (B) to adjust a wedge within the split nut.

Make only small adjustment at a time and re-tighten screw A before operating the cross-slide several times by hand to be sure of smooth operation throughout full travel.

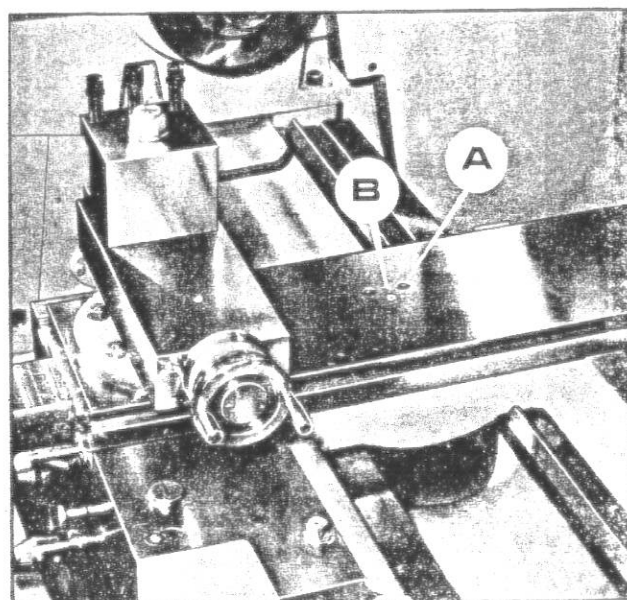


Fig. 24

LUBRICATION SYSTEM

Headstock bearings and gears are supplied with oil delivered by an impeller-type pump attached to a tank in the head-end plinth. A distributor within the headstock supplies oil to the drive clutches, bearings and gears. The oil pump is driven by a vee-belt from the main motor, insuring continuous supply whilst the main motor is running; evidence of supply is shown through an oil sight window in the headstock front face. A self-adjusting jockey pulley ensures constant belt tension.

A large-bore pipe returns oil from the bottom of the headstock into the tank. Ensure that the oil level in the tank is kept topped up to the mark on the filler-cap dipstick, see Fig. 25. Check oil level weekly and change the oil every year using Shell Tellus Oil 27 or equivalent grade (see below). Tank capacity is $3\frac{1}{2}$ gallons.

To empty the tank, set apron control lever to central position and stop the main motor. Detach the delivery pipe at the headstock, remove pipe cleats and with the pipe directed into a suitable container restart the main motor so causing the pump to empty the tank contents. The small quantity of oil left in the tank below the level of the pump intake can then be drained off through the drain plug projecting from the end of tank through the plinth wall.

The gearbox is splash-lubricated from an internal reservoir of oil (Shell Tellus 27). Check the oil level constantly to the mark on the oil sight window in the front end face of the gearbox; a weekly check is recommended, with the oil changed every year. Top up through a filler cap in the top of the gearbox, enclosed by the end-guard. Drain from a drain plug in the bottom of the gear-box, see Fig 25.

NOTE: Use of incorrect grades of oil can cause damage.

Where Shell Tellus Oil 27 is not obtainable, a grade with the following characteristics must be used:—

Specific gravity (20°C)	0.870
Flash point closed	210°C (410°F)
Pour point	-29°C (-20°F)
Viscosity, Redwood No. 1	70°F — 320 secs. 140°F — 68 secs. 200°F — 41 secs.
Viscosity, Engler degrees	10.5

NEWMAN MOTORS — Bearing Lubrication

LUBRICANT:— Use Shell Alvania Grease RA or Shell Alvania Grease 2 obtainable from Shell companies throughout the world.

LUBRICATION INTERVAL:— Every 6 months for motors running 8 hours or more per day. Every 12 months for motors running less than 8 hours per day.

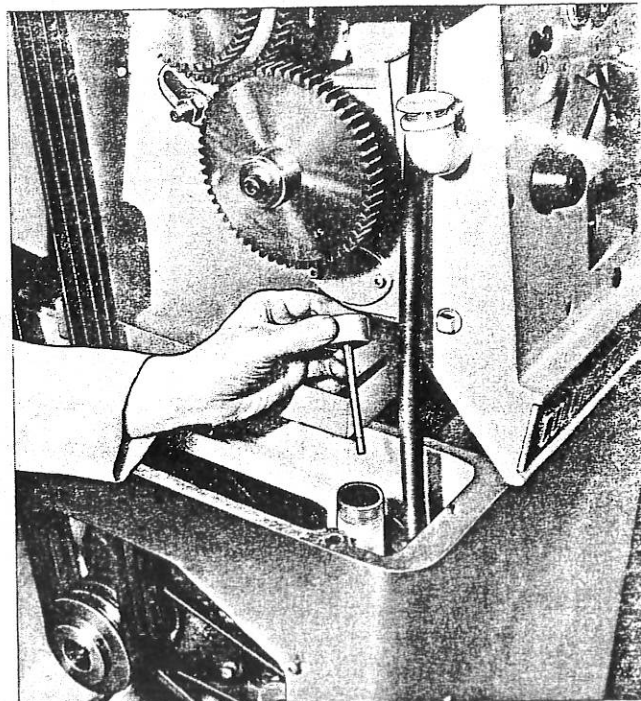
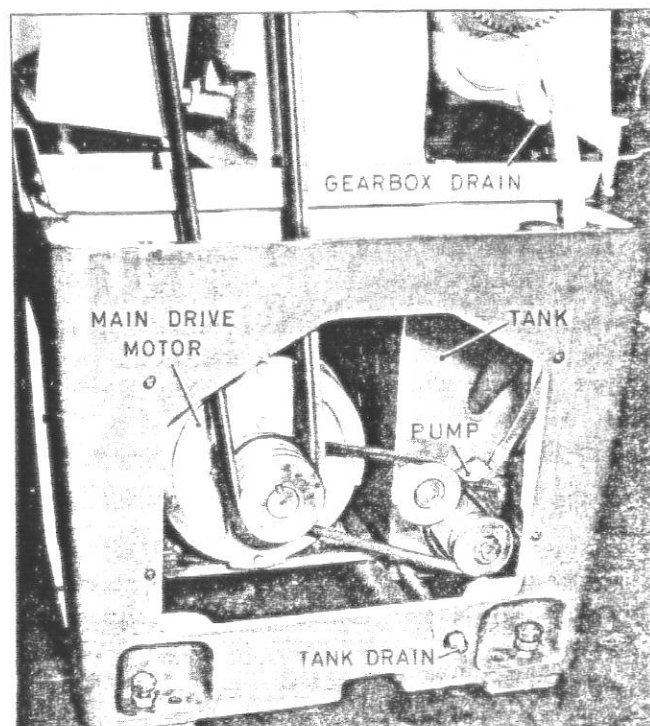
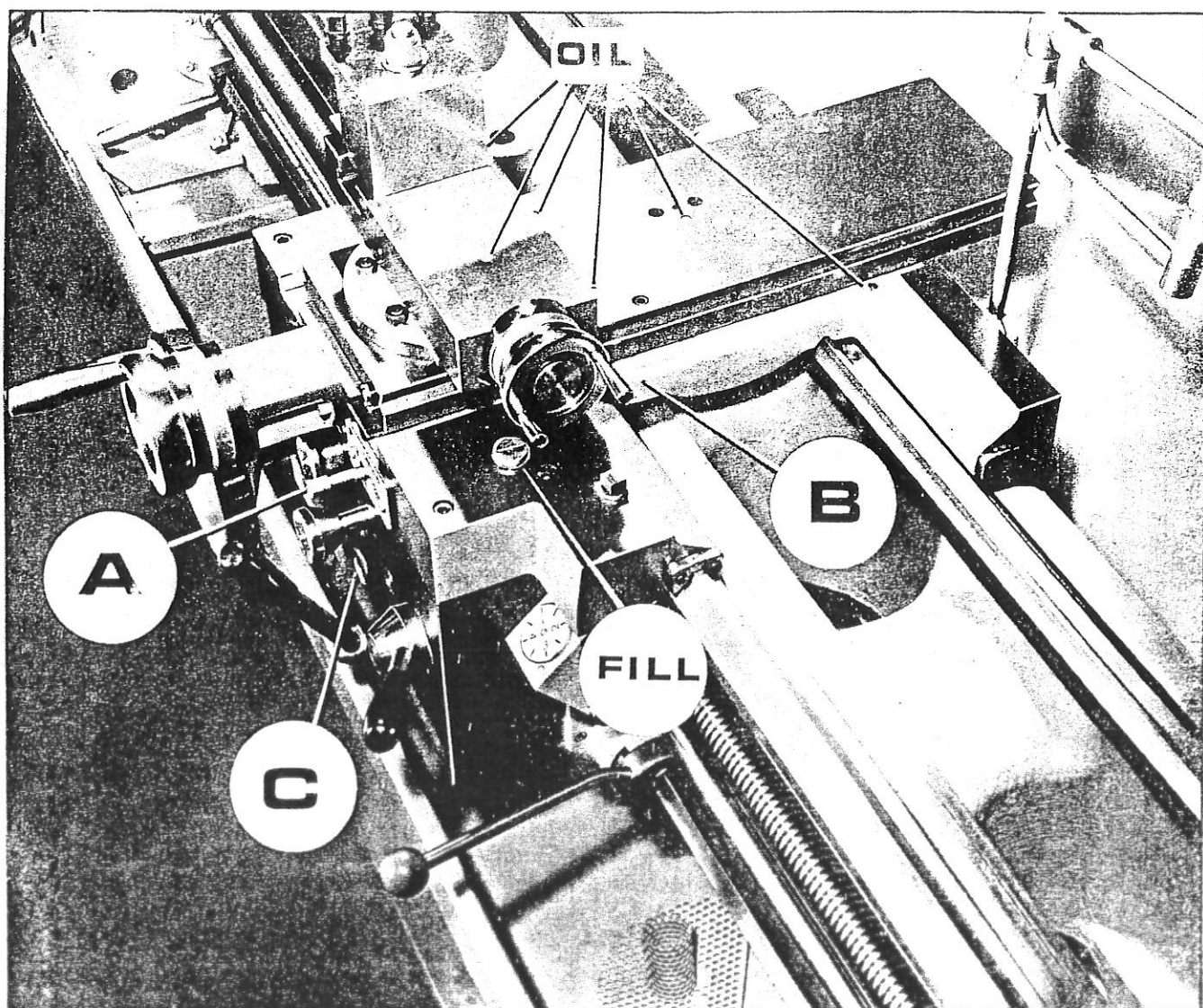


Fig. 25





GENERAL LUBRICATION

Apron and Slideways. (Fig. 26) A manually operated lubricating pump (A) is incorporated into the apron. Drawing oil from the apron reservoir it enables the operator to ensure that the slideways are kept adequately lubricated. The pump should be operated; before commencing work and occasionally during the work period, until oil flows from the tell tale hole (B) in the carriage saddle, indicating that the system has received a full supply of oil. Should no oil appear at (B) refill the reservoir to the level of the oilsight (C) with Shell Tonna Oil 33.

The apron can be drained by unscrewing a hex-headed drain plug in the bottom plate.

In addition to pump-fed lubrication, oiler points are provided for the saddle, cross-slide, cross-slide nut and top-slide (compound slide) screw using a standard pump-type can with light machine oil or way lubricant, see Fig. 26.

On the tailstock, oiler points are provided for daily attention from a standard oil can.

It is recommended that all slideways, the lead-screw and feed shaft are cleaned off (a bristle paint brush is useful for this) and lightly oiled after each period of work.

SLIDEWAYS ATTENTION

Tapered gib strips are fitted to slideways of saddle cross-slide and top (compound) slides so that any slackness which may develop can be rectified.

Ensure that slideways are thoroughly cleaned and lubricated before attempting adjustment. Then reset the gibs by slackening the rear gib screw and tightening the front screw, a little at a time. Check constantly for smooth action throughout full slide travel; avoid over-adjustment which can result in increased wear-rate and stiff or jerky action.

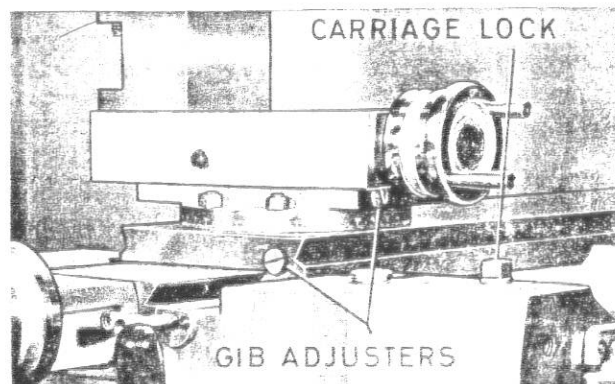
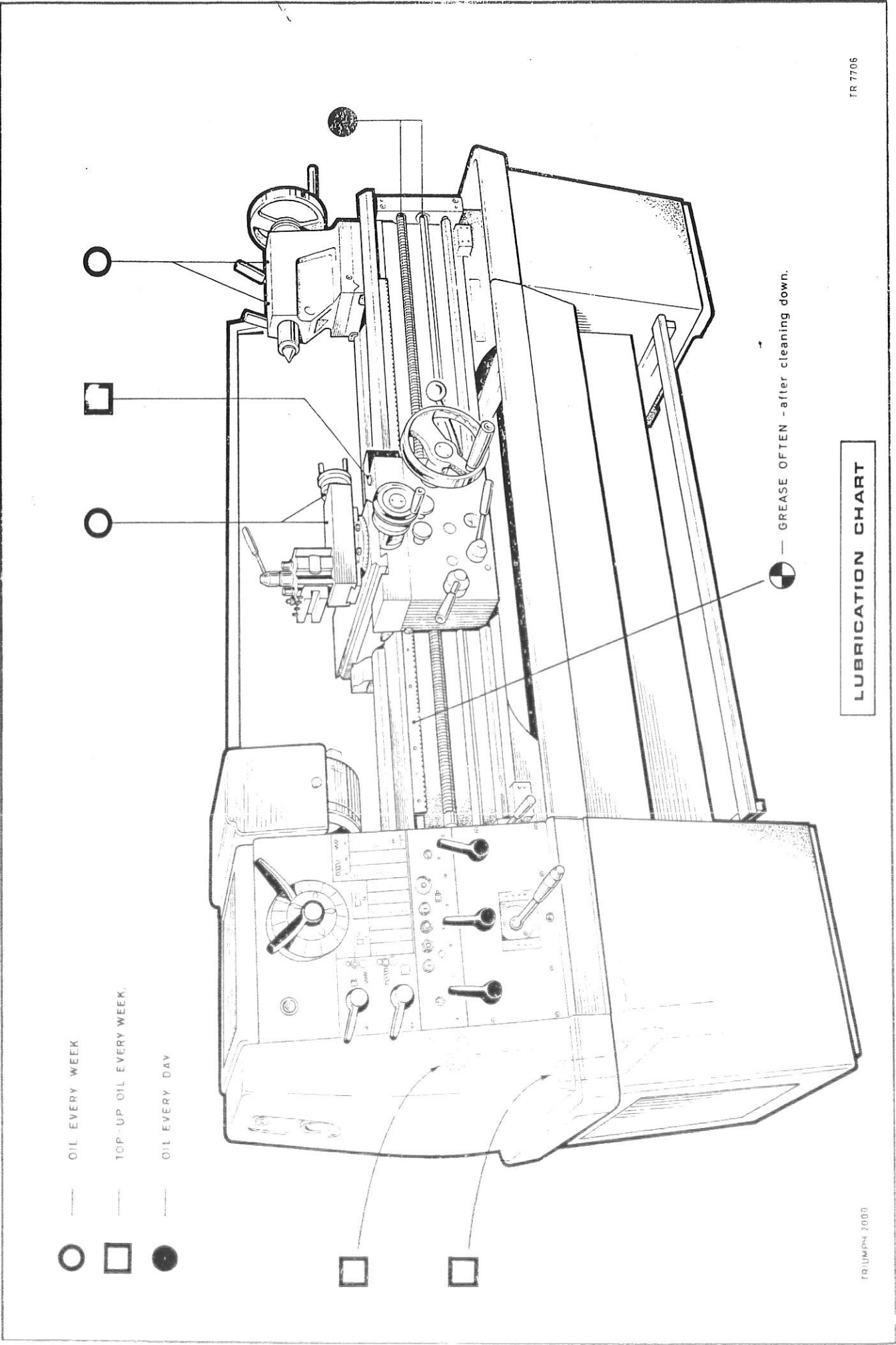


Fig 27



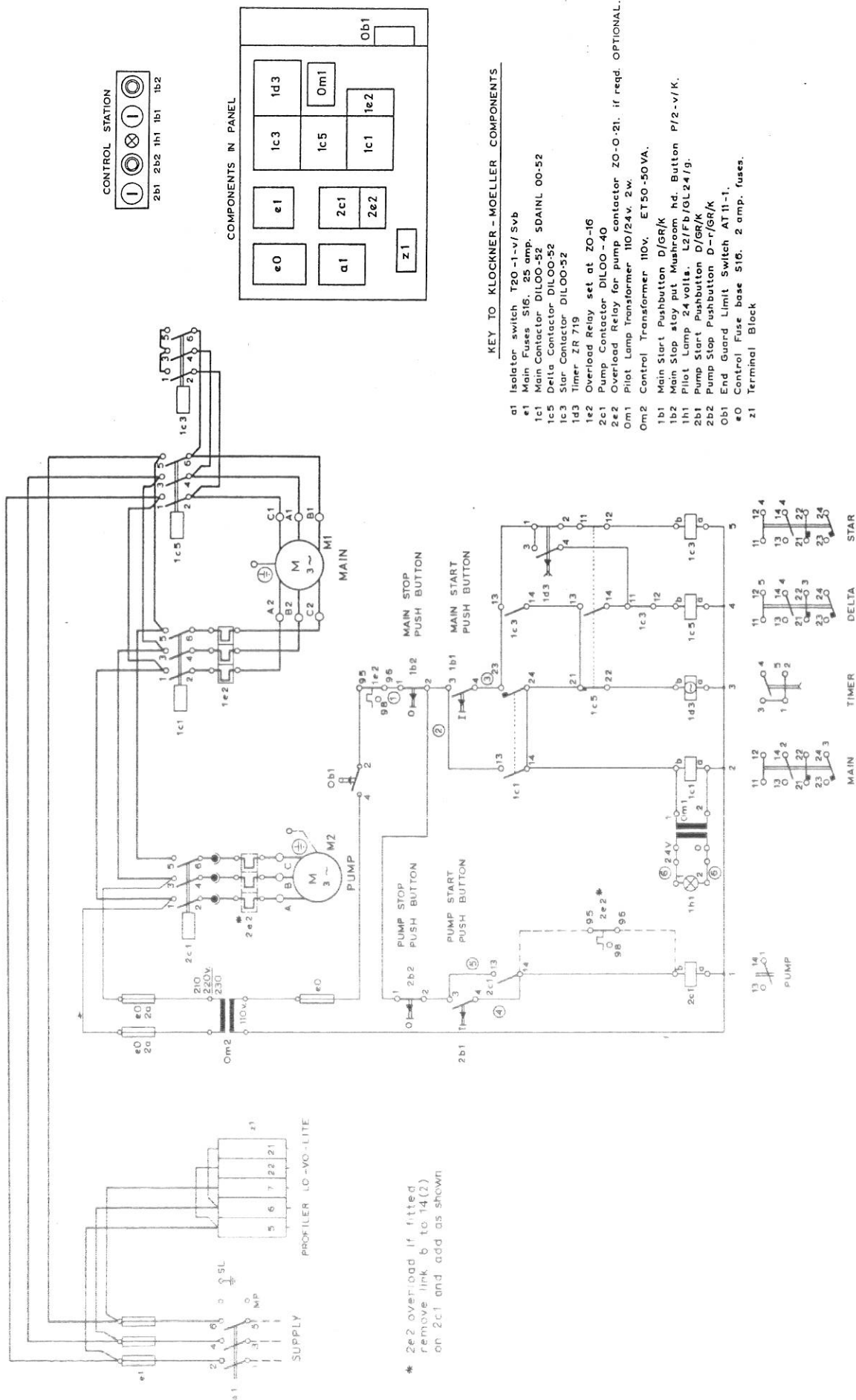
- OIL EVERY WEEK
- TOP-UP OIL EVERY WEEK
- OIL EVERY DAY

— GREASE OFTEN - after cleaning down.

LUBRICATION CHART

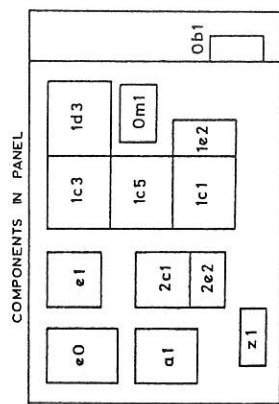
TRIUMPH 2000

TR 7705



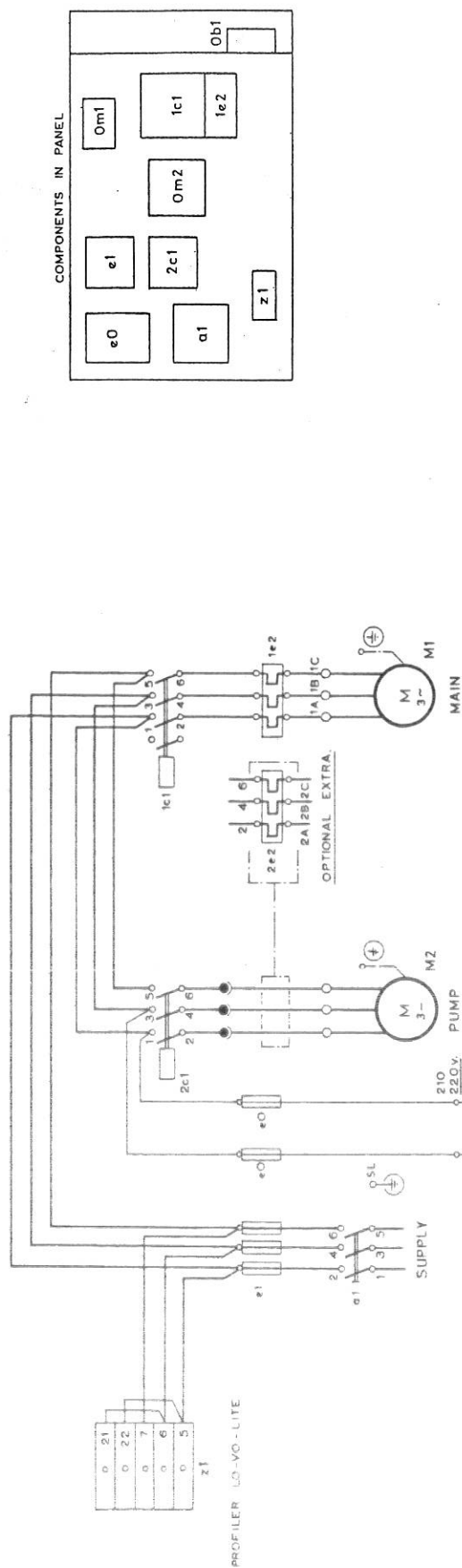
* 2e2 overload if fitted
remove link b to 14(2)
on 2c1 and add as shown

110v. CONTROL
WIRING DIAGRAM for 220-3-50
Star Delta - Metric



KEY TO KLOCKNER-MOELLER COMPONENTS

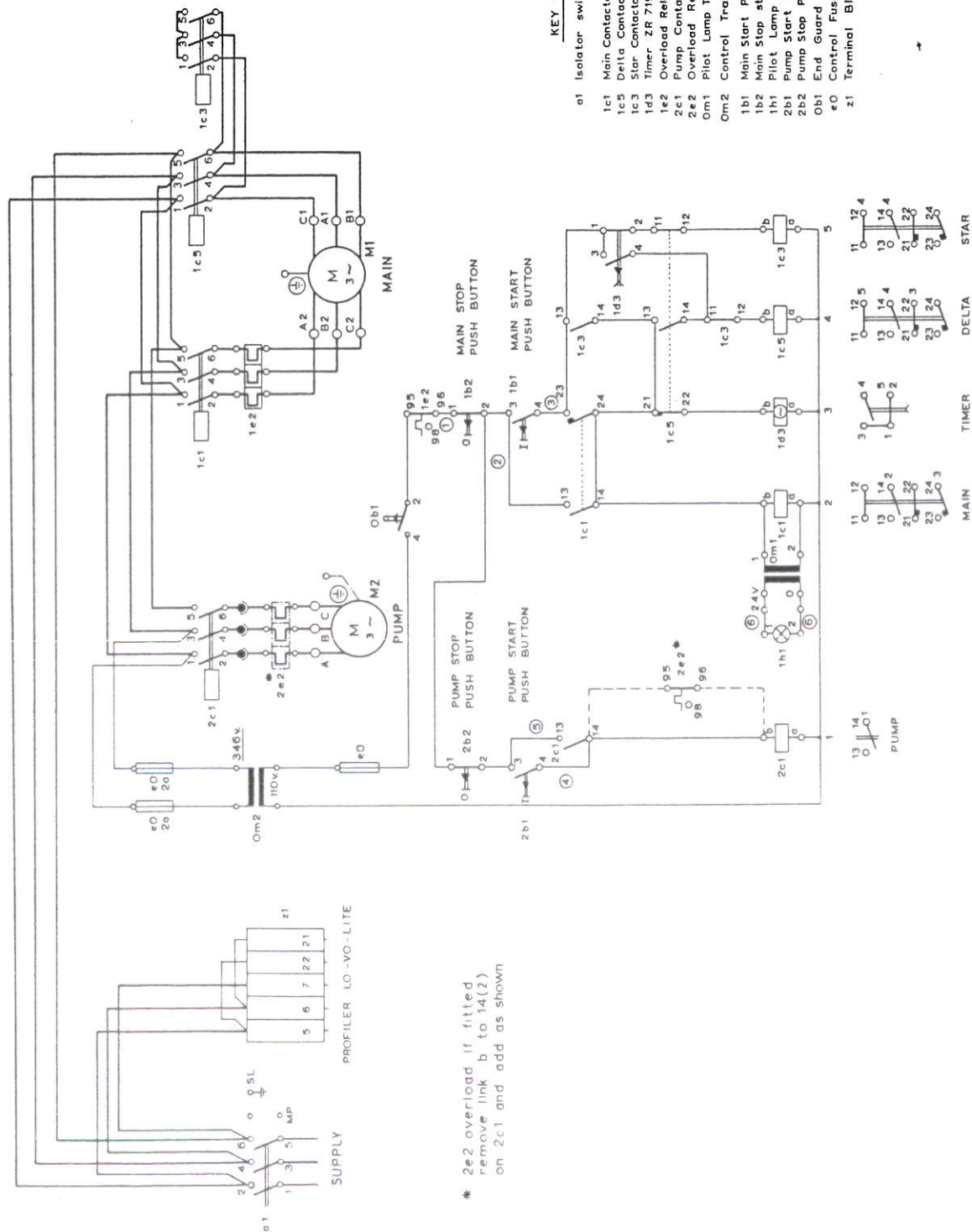
- a1 Isolator switch T20-1-v/Svb
- e1 Main Fuses S16, 25 amp.
- 1c1 Main Contactor D100-52 SDAINL 00-52
- 1c5 Delta Contactor D100-52
- 1c3 Star Contactor D100-52
- 1d3 Timer ZR 719
- 1e2 Overload Relay set at ZO-16
- 2c1 Pump Contactor D100-40
- 2e2 Overload Relay for pump contactor ZO-O-21, if reqd. OPTIONAL.
- Om1 Pilot Lamp Transformer 110/24v, 2w.
- Om2 Control Transformer 110v, ET50-50VA.
- 1b1 Main Start Pushbutton D/GR/K
- 1b2 Main Stop aty put Mushroom hd. Button P/2-v/K.
- 1h1 Pilot Lamp 24 volta. L2/Fb/QL24/9.
- 2b1 Pump Start Pushbutton D/GR/K
- 2b2 Pump Stop Pushbutton D-r/GR/K
- Ob1 End Guard Limit Switch AT 11-1.
- e0 Control Fuse base S16, 2 amp. fuses.
- z1 Terminal Block



KEY TO KLOCKNER-MOELLER COMPONENTS

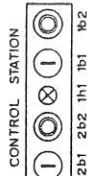
- a1 Isolator switch T20-1-v/Svb
- e1 Main Fuses S.33. 85amps.
- 1c1 Main Contactor DILO-a-22
- 1e2 Overload Relay for motor starter ZO-22-5
- 2c1 Pump Contactor DILOO -40
- 2e2 Overload Relay for pump contactor ZO-O-21. If required. OPTIONAL.
- 1b1 Main Start Push Button D/GR/K
- 1b2 Main Stop stay put Mushroom hd. Button P/2-v/K
- 2b1 Coolant Start Push Button D/GR/K
- 2b2 Coolant Stop Push Button D-r GR/K
- 1h1 Pilot Lamp. 24 volts, L2/Fb/BL 24/g
- Om1 Pilot Lamp Transformer 125/24v. 2w.
- Om2 Control Transformer 110v. ET50-50VA.
- Ob1 End Guard Limit Switch. AT11-1
- e0 Control Fuse base S16. 2 amp. fuses.
- z1 Terminal Block.

110V CONTROL
WIRING DIAGRAM for 220-3-50
D.O.L. - Metric

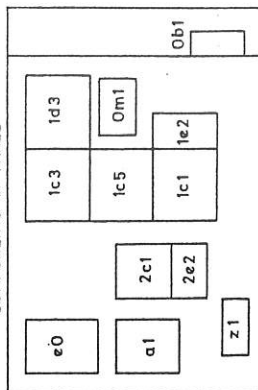


* 2e2 overload if fitted
remove link b to 14(2)
on 2c1 and add as shown

110V. CONTROL
WIRING DIAGRAM for 346-3-50
Star Delta - English.

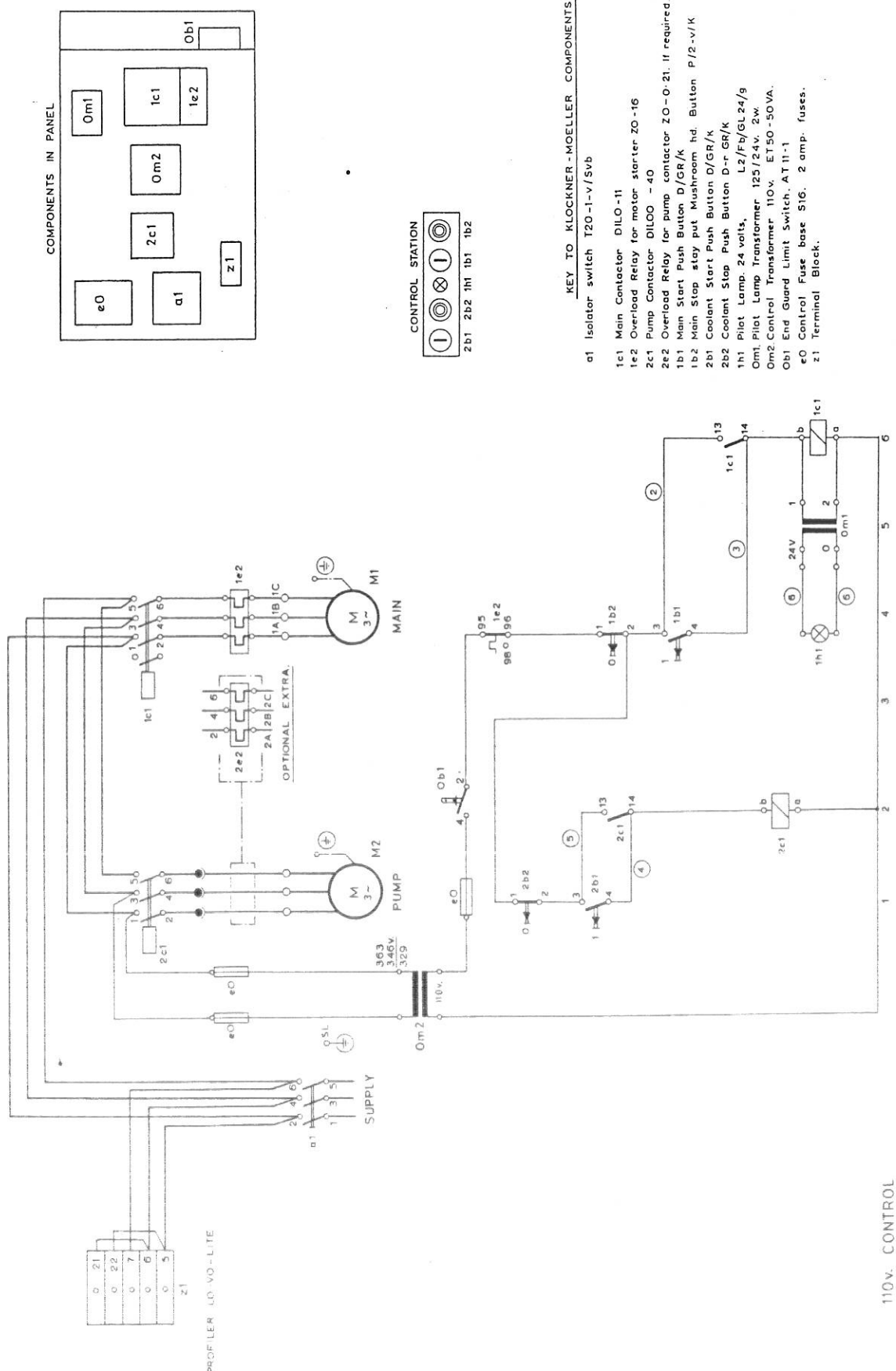


COMPONENTS IN PANEL

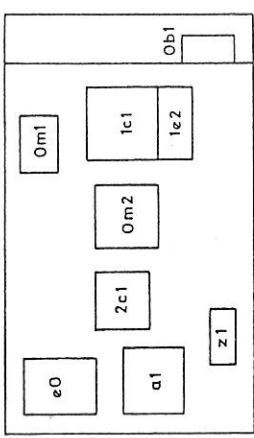


KEY TO KLOCKNER - MOELLER COMPONENTS

- a1 Isolator switch T20 -1-v/Svb
- 1c1 Main Contactor DILOO-52
- 1c3 Delta Contactor DILOO-52
- 1c5 Star Contactor DILOO-52
- 1d3 Timer ZR 719
- 1e2 Overload Relay set at ZO-6-7
- 2c1 Pump Contactor DILOO-40
- 2e2 Overload Relay for pump contactor ZO-O-21. If reqd. OPTIONAL.
- Om1 Pilot Lamp transformer 110/24v. 2w.
- Om2 Control Transformer 110v. ET50-50VA.
- 1b1 Main Start Pushbutton D/GR/K
- 1b2 Main Stop stay put Mushroom hd. Button P/2-v/K.
- 1h1 Pilot Lamp 24 volts. L2/FB/GL24/g.
- 2b1 Pump Start Pushbutton D/GR/K
- 2b2 Pump Stop Pushbutton D-r/GR/K
- Ob1 End Guard Limit Switch AT11-1.
- e0 Control Fuse base S16. 2 amp. fuses.
- z1 Terminal Block



COMPONENTS IN PANEL



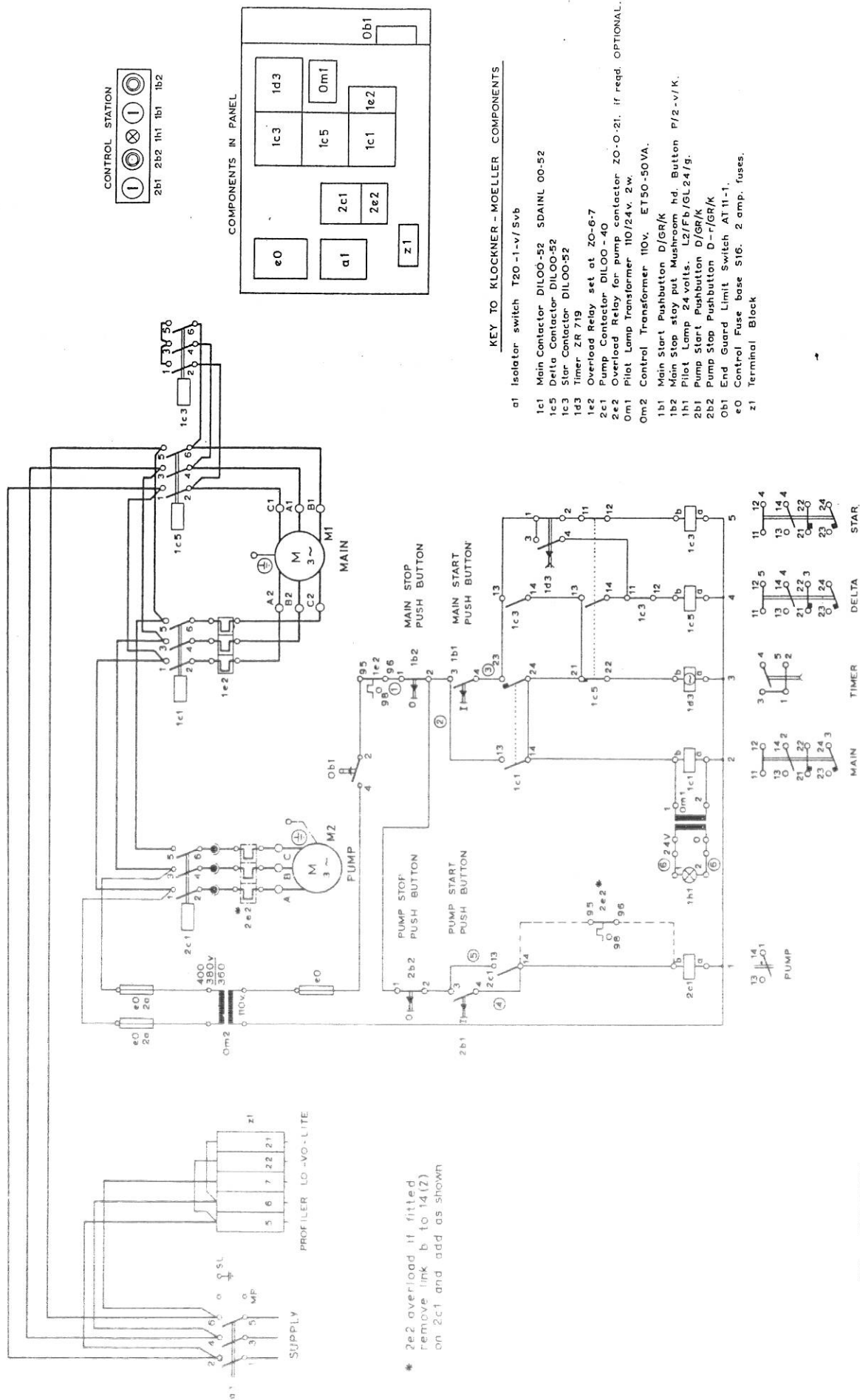
CONTROL STATION



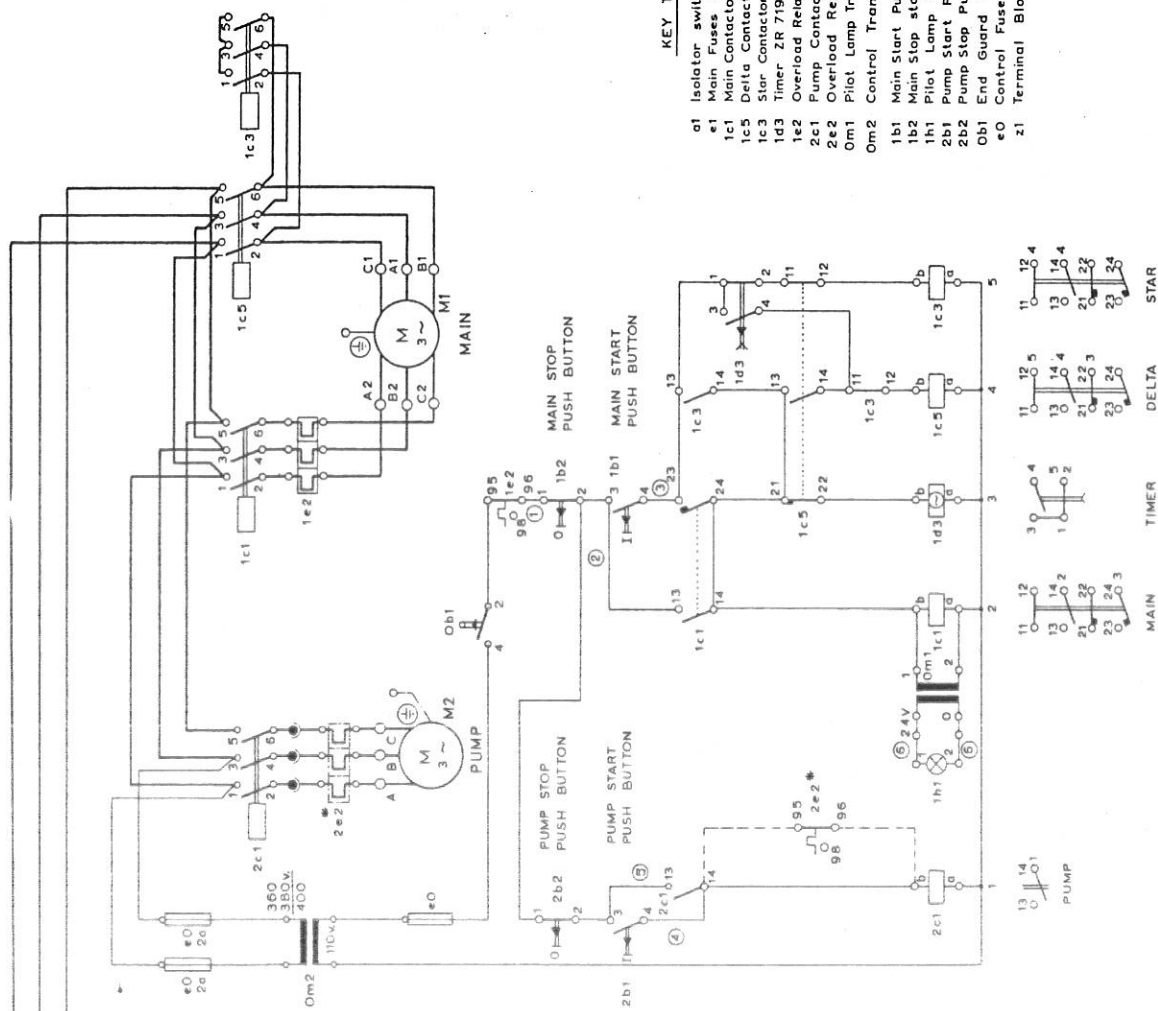
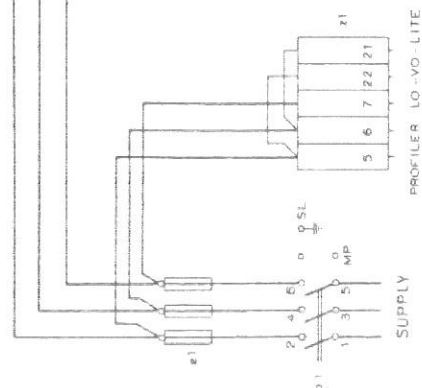
KEY TO KLOCKNER-MOELLER COMPONENTS

- a1 Isolator switch T20-1-v/5vb
- 1c1 Main Contactor DILO-11
- 1e2 Overload Relay for motor starter ZO-16
- 2c1 Pump Contactor DILOO - 40
- 2e2 Overload Relay for pump contactor ZO-O-21. If required OPTIONAL
- 1b1 Main Start Push Button D/GR/K
- 1b2 Main Stop stay put Mushroom hd. Button P/2-v/K
- 2b1 Coolant Start Push Button D/GR/K
- 2b2 Coolant Stop Push Button D-r GR/K
- 1h1 Pilot Lamp. 24 volts, L2/F5/G/L24/9
- Om1 Pilot Lamp Transformer 125/24v. 2w.
- Om2 Control Transformer 110v. ET50-50VA.
- Ob1 End Guard Limit Switch. AT 11-1
- e0 Control Fuse base S16. 2 amp. fuses.
- z1 Terminal Block.

110V. CONTROL
WIRING DIAGRAM for 346-3-50
D.O.L. - English.

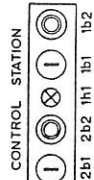


110V. CONTROL
WIRING DIAGRAM for 380-3-50
Star Delta - English

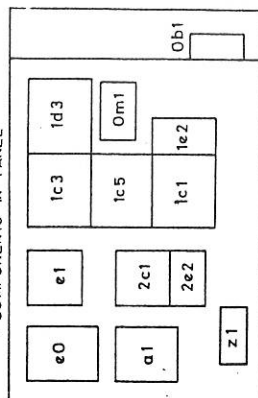


* 2e2 overload if fitted
remove link b to 14(2)
on 2c1 and add as shown

110V CONTROL
WIRING DIAGRAM for 380-3-50
Star Delta - Metric.

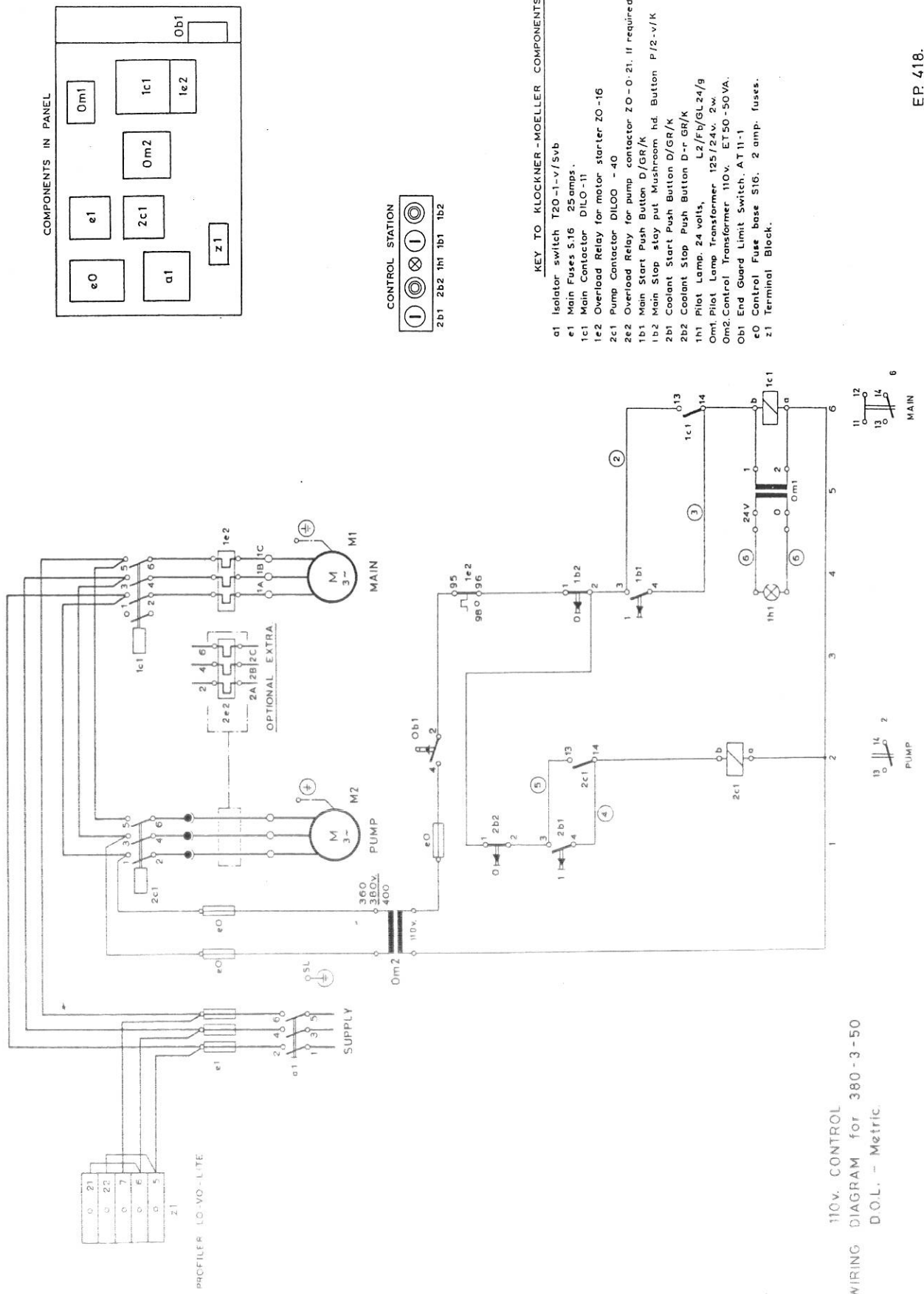


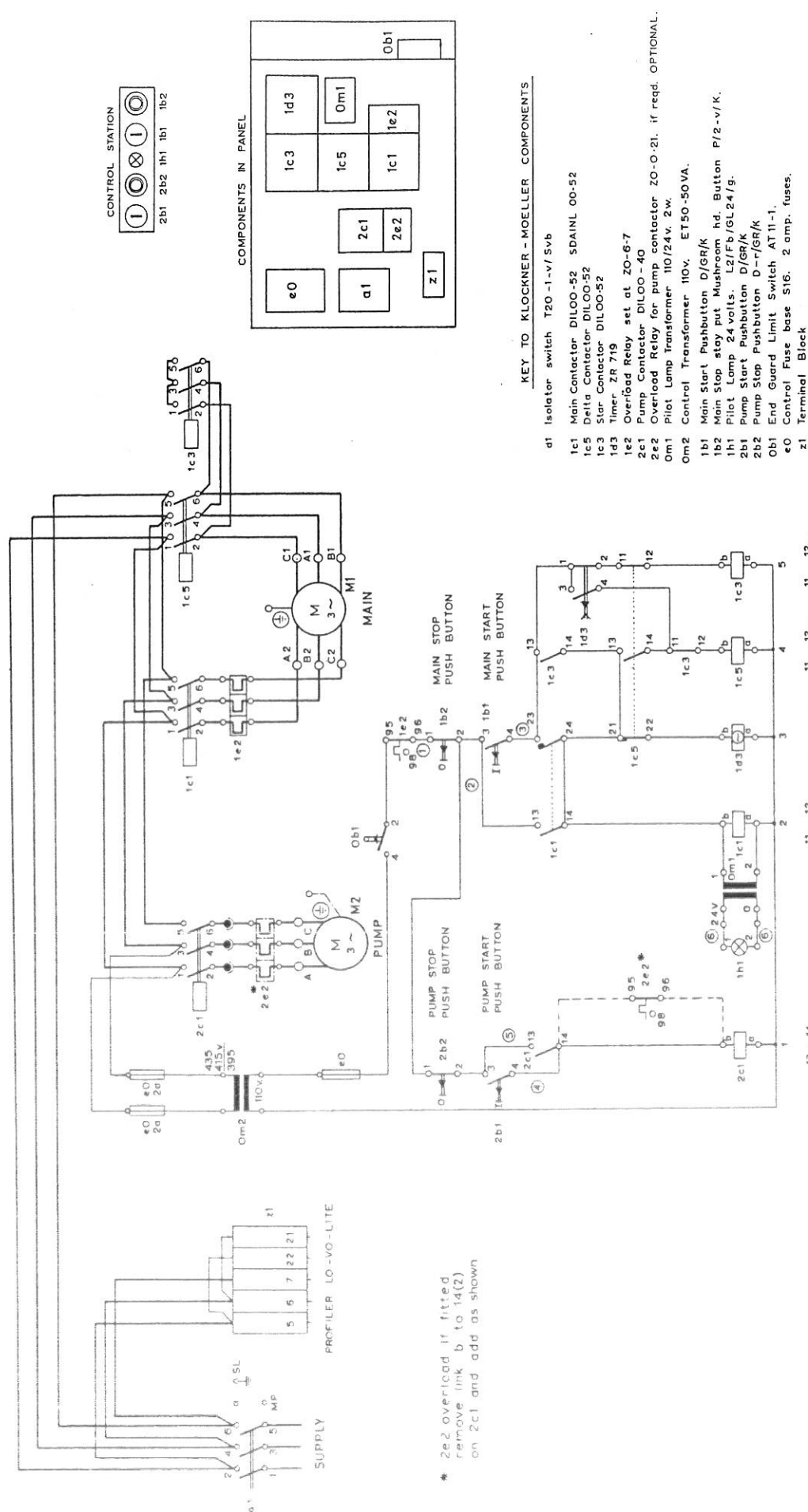
COMPONENTS IN PANEL



KEY TO KLOCKNER-MOELLER COMPONENTS

- a1 Isolator switch T20-1-v/Svb
- e1 Main Fuses S16, 20 amp.
- 1c1 Main Contactor DIL00-52
- 1c5 Delta Contactor DIL00-52
- 1c3 Star Contactor DIL00-52
- 1d3 Timer ZR 719
- 1e2 Overload Relay set at ZO-12.
- 2c1 Pump Contactor DIL00-40
- 2e2 Overload Relay for pump contactor ZO-O-21. If reqd. OPTIONAL.
- Om1 Pilot Lamp Transformer 110/24v. 2w.
- Om2 Control Transformer 110v. ET50-50 VA.
- 1b1 Main Start Pushbutton D/GR/K
- 1b2 Main Stop push Mushroom hd. Button P/2-v/K.
- 1h1 Pilot Lamp 24 volts. L2/Fb/GL24 f/g.
- 2b1 Pump Start Pushbutton D/GR/K
- 2b2 Pump Stop Pushbutton D-r/GR/K
- Ob1 End Guard Limit Switch AT 11-1.
- e0 Control Fuse base S16. 2 amp. fuses.
- z1 Terminal Block





110V. CONTROL
WIRING DIAGRAM for 415-3-50
Star Delta - English

