INSTRUCTION MANUAL

CHOLET 350-435-550

H. ERNAULT - SOMUA
169 rue d'Alesia - Paris 14

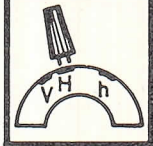
SPINDLE SPEEDS

The complete range of spindle speeds is obtained by selector lever (9) on the gear box and selector lever (7) direct drive-gearing.

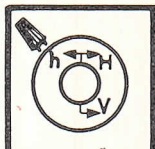
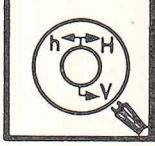
By pulling out the gear box selector lever, the action of the lever on the box is neutralised. This means that the lever can always be located in a convenient position without having any effect on the speed selected.

The indicator plate located on the hub of this lever shows clearly the range of speeds available. This range is as shown in the table below.

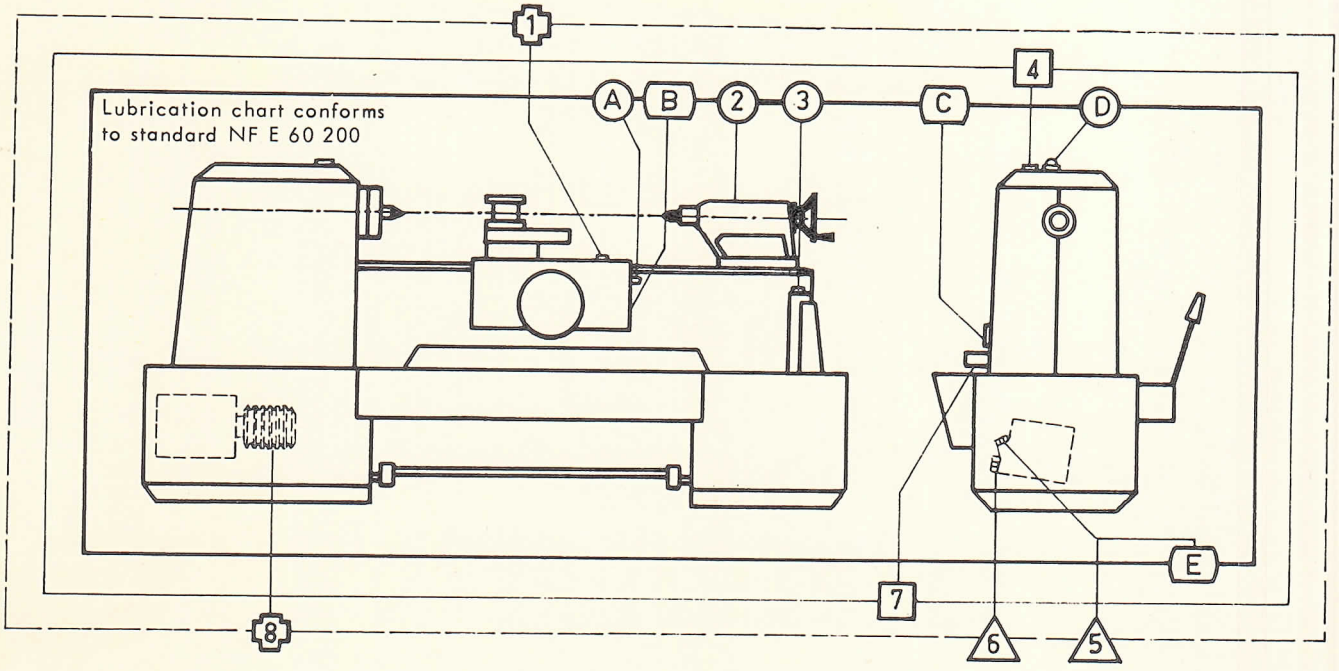
CHOLET 350 LATHE

		NORMAL RANGE						SLOW RANGE TO ORDER					
	2nd Gearing (h)	45	57	71	90	114	142	22	28	35	45	57	71
	1st Gearing (H)	160	200	250	320	400	500	80	100	125	160	200	250
	Direct Drive (V)	640	800	1000	1260	1600	2000	320	400	500	640	800	1000

CHOLET 435 - 550 LATHE

	2nd Gearing (h)	32	40	50	64	80	100	16	20	25	32	40	50
	1st Gearing (H)	125	160	200	250	320	400	64	80	100	125	160	200
	Direct Drive (V)	500	640	800	1000	1270	1600	250	320	400	500	640	800

GENERAL LUBRICATION REQUIREMENTS



IMPORTANT : Clean all lubricating points carefully before carrying out lubrication

OPERATIONS	QUANTITY	PRODUCT	FREQUENCY						UNITS
			Daily	Weekly	Monthly	3 Months	6 Months	As shown	
Filling Checking the level Draining	3l	B 5		E		5 6			GEARBOX
Greasing		JMFR						8 *	GEARBOX PULLEY
Filling Checking circulation Checking the level Draining	5l	B5	D	C	4 7				HEADSTOCK FEEDBOX
Filling Lubricating Oil level	1l	GL5	A***	B				1**	SADDLE APRON (Hand pump)
LUB oiling points		B5	2						TAILSTOCK
Filling	3cl	B5	3						END SUPPORT

* Every 3 or 4 years - ** Depending upon oil level in reservoir -
*** 4 strokes per day.

IMPORTANT NOTE : These lubrication details as shown above, refer to normal weekly operation. If this is not the case (two shifts, continuous operation or reduced operation etc...) the lubrication frequency should be modified in proportion.

PARTS & ACCESSORIES U.S.A. INC
316 W. UNIVERSITY DRIVE
ARLINGTON HEIGHTS, ILLINOIS
6000 R

INSTRUCTION MANUAL

CHOLET 350-435-550

H. ERNAULT - SOMUA
169 rue d'Alésia - Paris 14

This manual is intended to assist you in the correct installation and maintenance of your lathe.

If you follow the instructions provided in this handbook, we are sure you will obtain complete satisfaction from this machine.

If you encounter any problems which cannot be solved with the aid of this handbook, please get in touch with us and specify the number of your machine with your query. This is marked on the machine plate which is located at the rear of the bed.

Our After Sales Service Department will be pleased to receive any queries.

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CONTENTS

MAINTENANCE

ACCESSORIES

INSTALLATION AND OPERATION

CLEANING

The lathe is generally protected by an anti-corrosion grease. This grease must be removed and the machine must be cleaned carefully to ensure that there is no dust or impurities which could cause premature wear of the slide-ways, lead screw and other mechanical units.
It is advisable to use paraffin, and volatile solvents (trichoethylene etc.) should not be used.
It is very important not to move any units until the machine has been thoroughly cleaned as this could cause seizure of sliding parts.

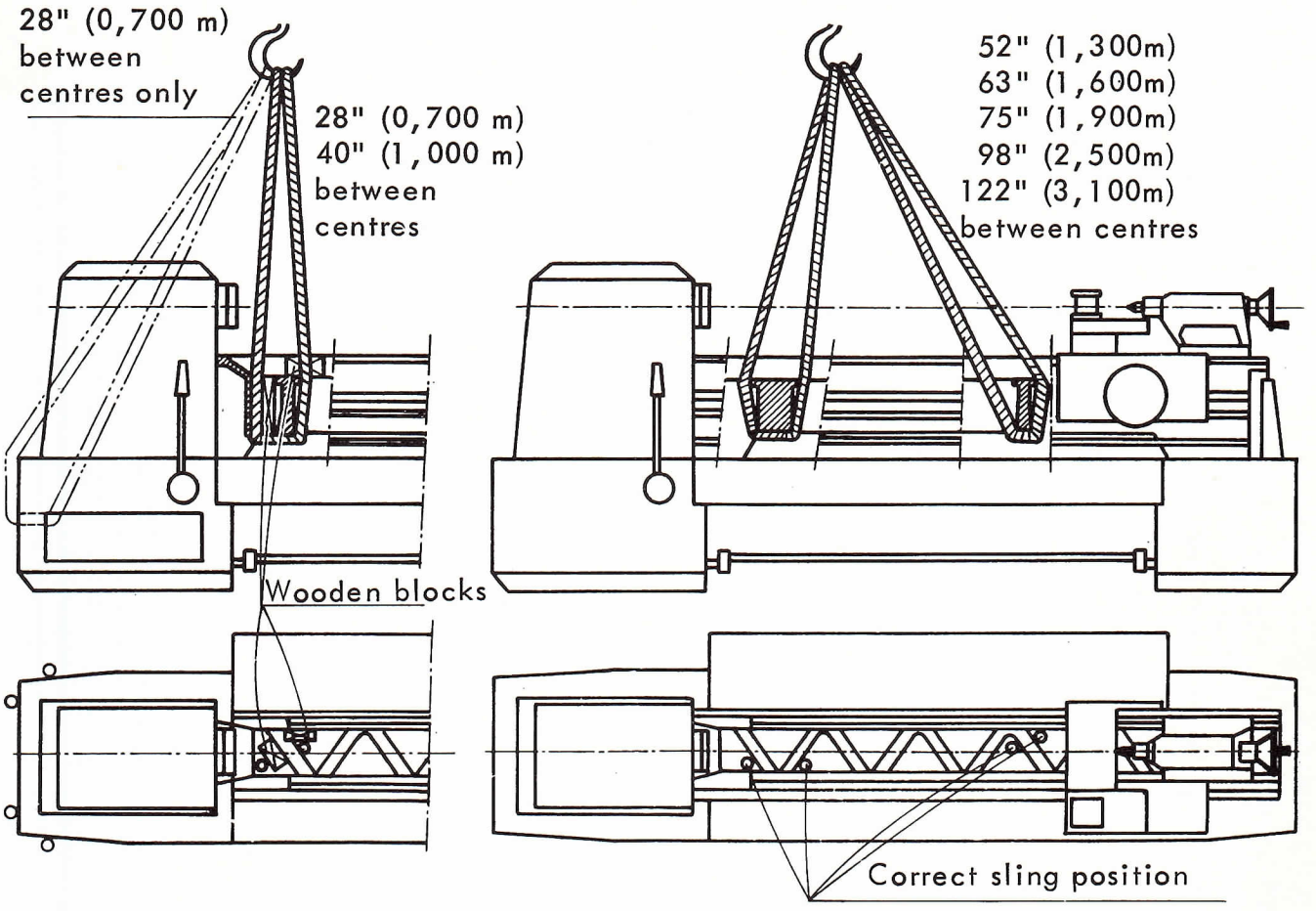
SLINGING

Follow the arrangements shown on the drawings. Depending upon the length of the lathe, move the saddle longitudinally to distribute the weight equally about the sling. For the I m machine only one sling is used, and the lathe can be balanced by bringing the saddle to the end of its travel at the tailstock end, with the tailstock projecting about 4" (100 mm) over the end of the bed. For the 28" (0,700 m) machines, sling as for the I m machine. However, to obtain a balance at the headstock end, two additional slings must be placed through the openings in the lower base, after having removed the sheet steel covers to provide access for the sling. In this case rags must be used between the painted surface of the lathe and the sling and care must be taken not to catch any of the levers with the sling when lifting. Wooden blocks should be used as required to keep the sling away from the various push buttons and levers. On lathes fitted with a copying attachment the attachment must be brought as close as possible to the top slide, with the cross slide in its end of travel position towards the front, so that a transversal balance is achieved.

WEIGHT OF CHOLET LATHES

Between Centres	28" (0,700m)	40" (1,000m)	52" (1,300m)	63" (1,600m)	75" (1,900m)	98" (2,500m)	122" (3,100m)
CHOLET 350	1650 kg	1735 kg					
CHOLET 435	1675 kg	1760 kg	1845 kg	1970 kg			
CHOLET 550		2150 kg		2450 kg	2635 kg	3050 kg	3300 kg

SLINGING DIAGRAM



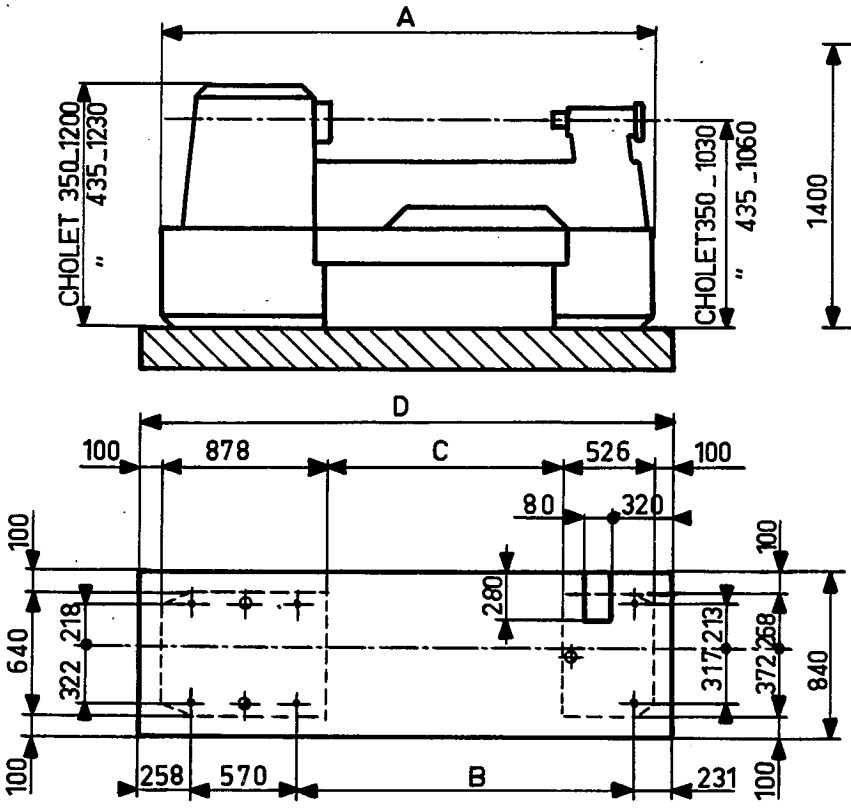
FOUNDATIONS

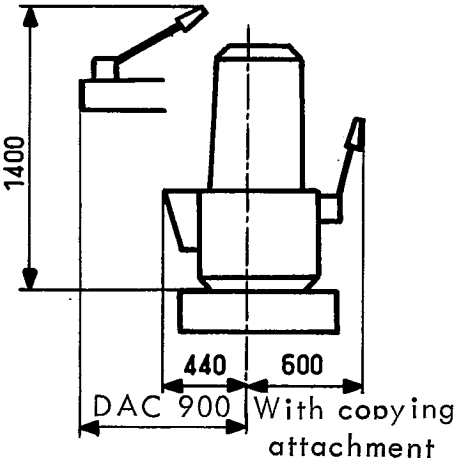
The machine must be located on solid foundations, and it is necessary to provide a concrete base about 12" (300 mm) thick on a solid ground. A 160/250 kg mortar mix should be used dosed with 350 kg of cement per cubic metre.

When pouring, 4" x 4" x 6" (100 x 100 x 150 mm) wooden shutters should be used at the holding down bolt locations. These should be filled with cement after the machine has been positioned with the holding down bolts as described in the relevant chapter.

A channel must be provided at the position shown on the foundation drawing for the electrical wiring entry. This channel should be about 3" 1/4 (80 mm) wide, 8" 3/4 (220 mm) long,and 3" 1/4 (80 mm) deep.

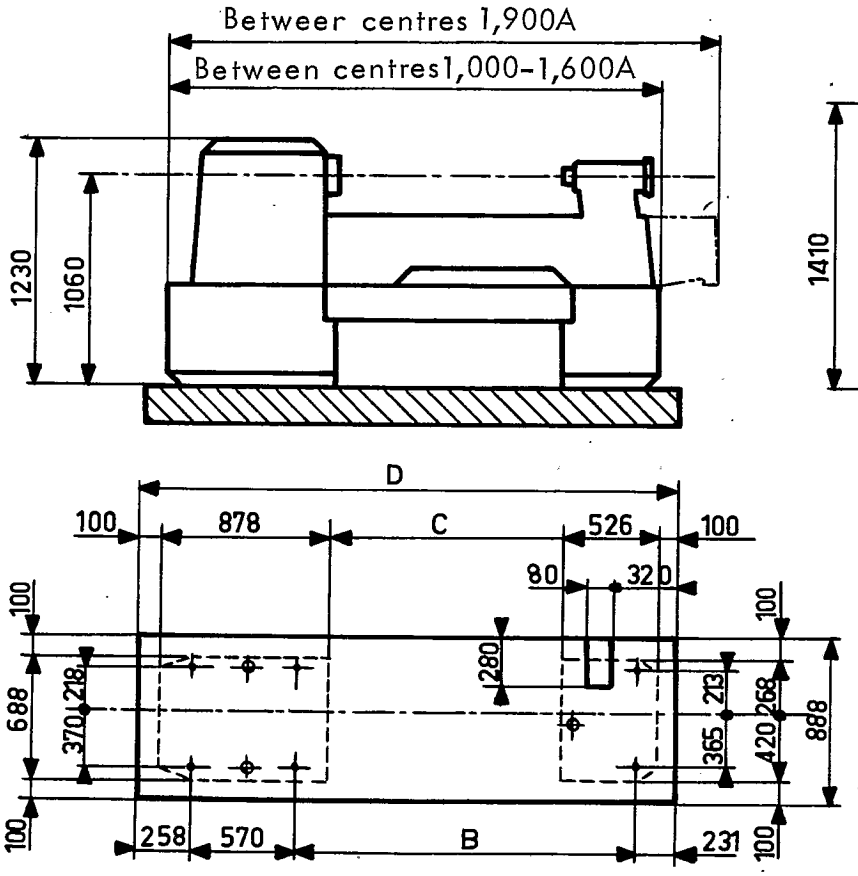
FOUNDATION DRAWING

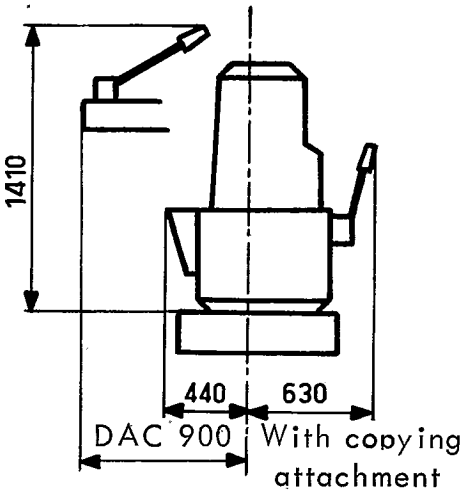




CHOLET 350_435

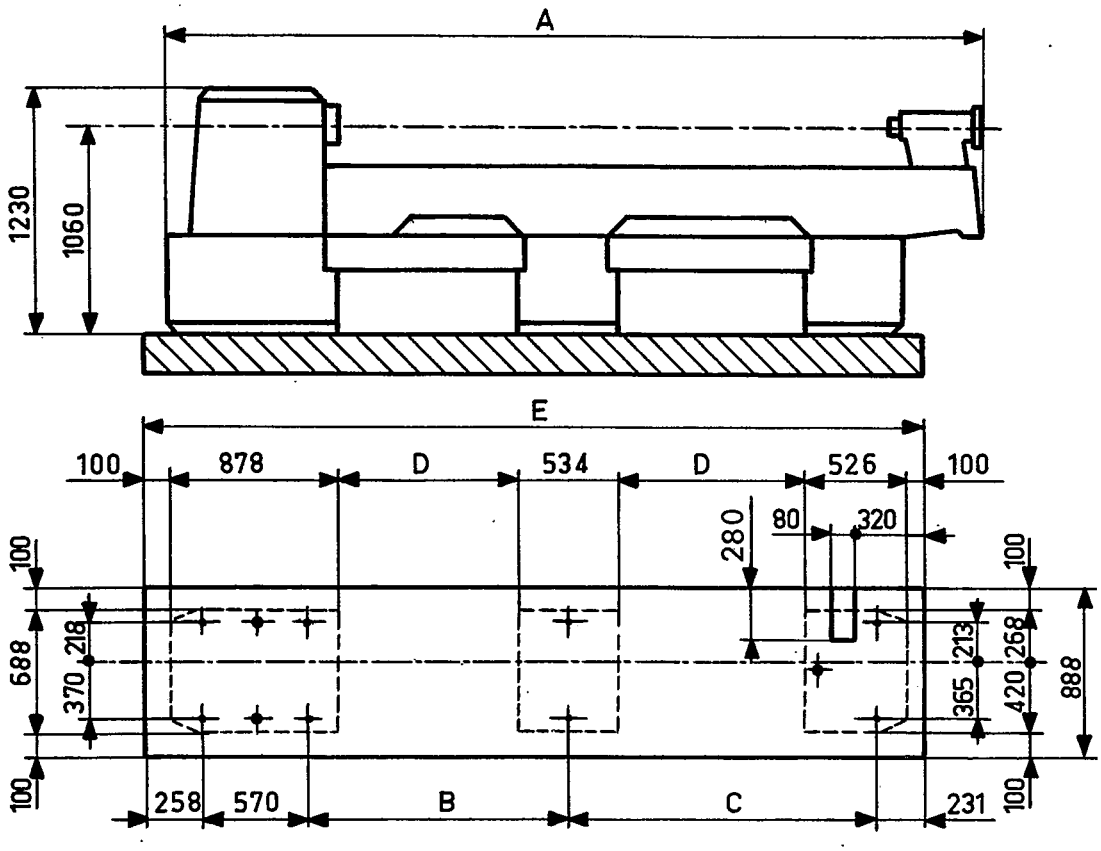
	A	B	C	D
0,700	2370	1511	966	2570
1,000	2670	1811	1266	2870
1,300	2970	2111	1566	3170
1,600	3270	2411	1866	3470





CHOLET 550

	A	B	C	D
1000	2670	1811	1266	2870
1600	3270	2411	1866	3470
1900	3570	2411	1866	3470



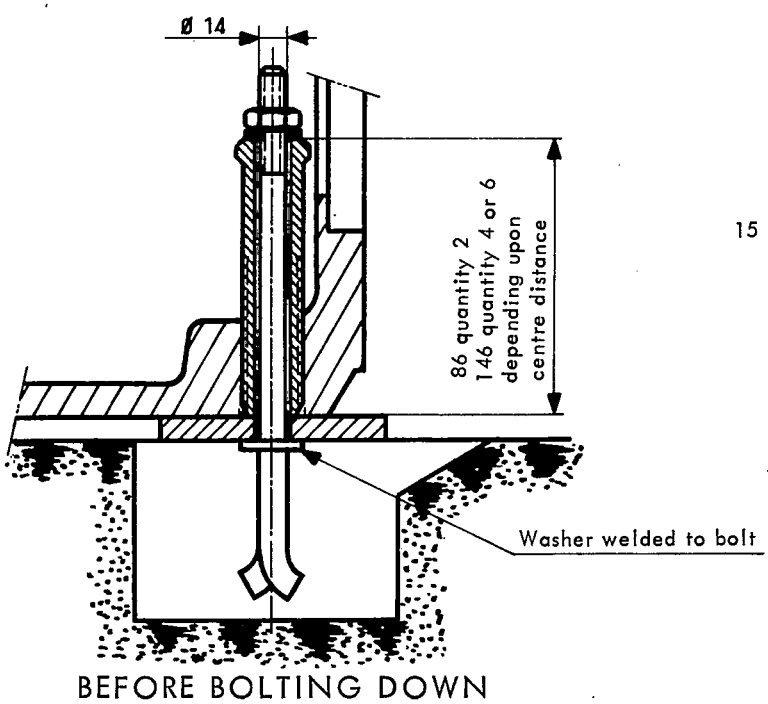
	A	B	C	D	E
2500	4135	1383	1628	966	4070
3100	4735	1683	1928	1266	4670

BOLTING DOWN

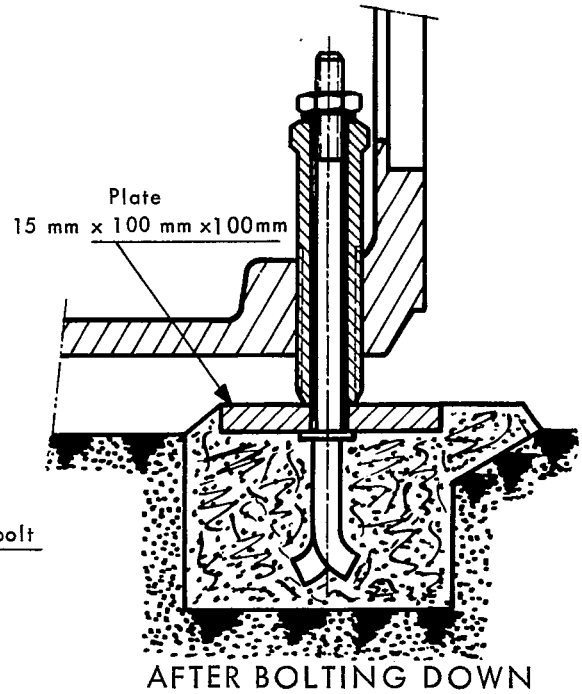
Remove all the covers from the lower base to provide access to the levelling screws and holding down bolts.

Carry out approximate levelling using three screws (shown by a circle on the foundation drawing).

Fill up the holding down bolt housings as shown below (holding down bolts are not supplied with the machine) .



BEFORE BOLTING DOWN



AFTER BOLTING DOWN

LEVELLING

Accurate levelling is very important if maximum accuracy is to be obtained . It is therefore necessary to use a precision level graduated in 2/I00 to 5/I00 mm per metre.

Levelling operations

I) Slacken off completely the 3 screws not covered by the holding down bolts (shown by a circle on the foundation drawing)

2) Place the level on the blocks supplied with the machine, and place the block on the slideways close to the headstock at the end of the rear slideway.

3) Adjust the base levelling screws beneath the headstock located near each holding down bolt to achieve correct transversal levelling ; this should be extremely accurate.

4) Effect transversal levelling at the tailstock end of the bed, and if applicable, in the centre of each intermediate support, by moving the level block each time over the support to be adjusted.

5) Re-check the levelling at the headstock end and correct it if necessary, by carrying out the preceding operations until accurate levelling is obtained at each control point.

6) Tighten up all the holding down bolt nuts which also serve as locknuts for the levelling screws.

7) Bring the three levelling screws mentioned above into contact with the ground, but do not over-tighten which would affect the previous levelling. These levelling screws are only provided to eliminate any vibrations.

8) Pour cement between the ground and the base to obtain better seating and to avoid swarf entering the base.

9) Re-check the levelling once more before using the machine and re-fit the various covers.

Periodical Levelling Check

The levelling of the lathe should be checked every three months.

WIRING-UP

The mains connection is in the base beneath the tailstock, on the support bracket of the mains fuses.

Provision should be made in the foundations for a cable channel, and this channel must be sealed off. Swarf and coolant fluid which is very often present around the base of the machine, could easily cause a short circuit.

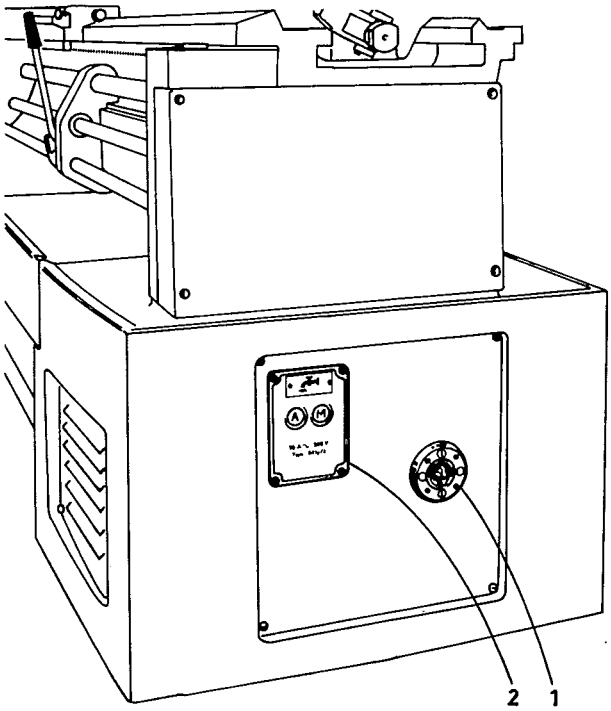
The table below shows in mm2 the sections of mains wires. These sections are relative to copper conductors.

Motor HP	3 Phase		2 Phase
	220 V	380 V	220 V
7 HP	6	4	6
10 HP	10	6	10
12 HP	10	10	10

Main circuit breakers are used to protect the electrical equipment and act as isolators, and so prevent the machine from being live. The fuse wire is calibrated for twice the nominal current of the main motor. Details are given below of the fuse wires required, either in aluminium or in silver.

Diameter of wire in 1/10 mm	8	9	10	12	14	16	18
Normal current (Aluminium	20	25	30	40	50	60	70
in Amps. (Silver	30	40	48	65	85		

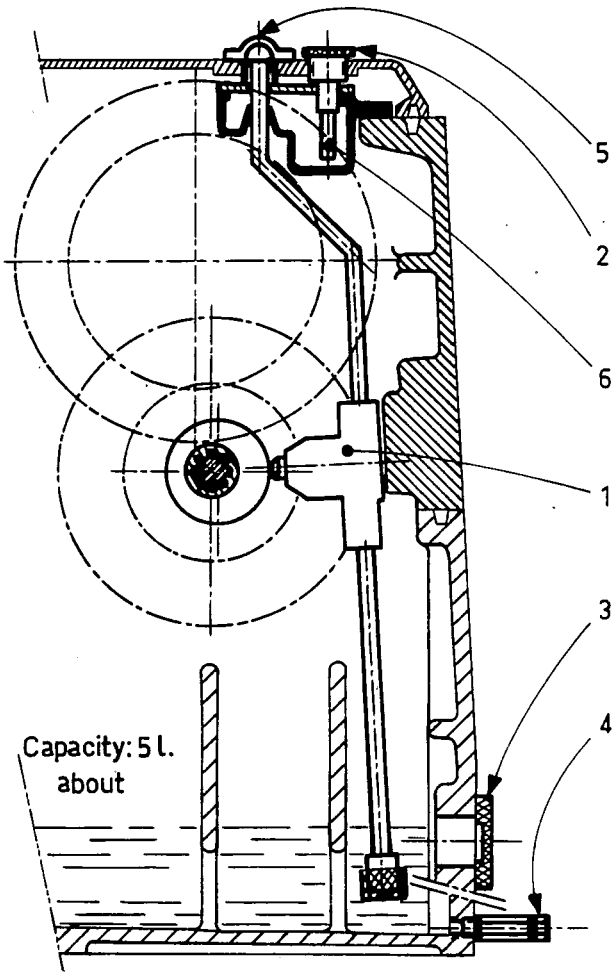
SWITCHING ON



Switching on is by means of the switch (I) located on the door in the base beneath the tailstock. The coolant pump is started by pressing the "start-button" on the switch - box marked Coolant Pump (2).

GENERAL LUBRICATION

Before using the machine, check that the machine is completely lubricated and that the lubrication functions are operating correctly as shown below.



Headstock and Feedbox

Lubrication is by means of a piston pump (I) driven from an eccentric fixed to the largest back gear.

Filling is carried out through plug (2) up to level (3) located at the rear of the machine.

Use an oil with a specification corresponding to B5 covered by AFNOR E 60 200 standard which is used by all industrial oil suppliers. The quantity required is about 5 litres.

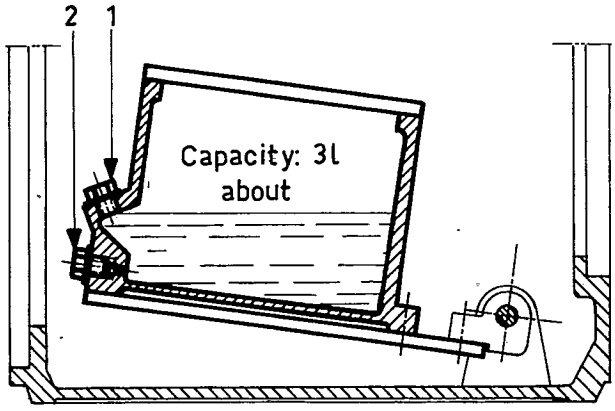
Draining is carried out by plug (4).

In order to check the condition of the lubricant and to remove any impurities which may be carried in the lubricant, draining should be carried out for the first time after one working week and then at least every month during the use of the machine.

Important

When the machine is running, check that oil is circulating by means of the sight glass (5) . If not, the machine should be stopped immediately and the reason for this interruption traced before running the machine again.

From time to time and especially when the machine is drained, it is necessary to clean the magnet which is incorporated in the filler plug (2). This magnet should be cleaned of all metallic particles every day during the first two weeks of using the machine.

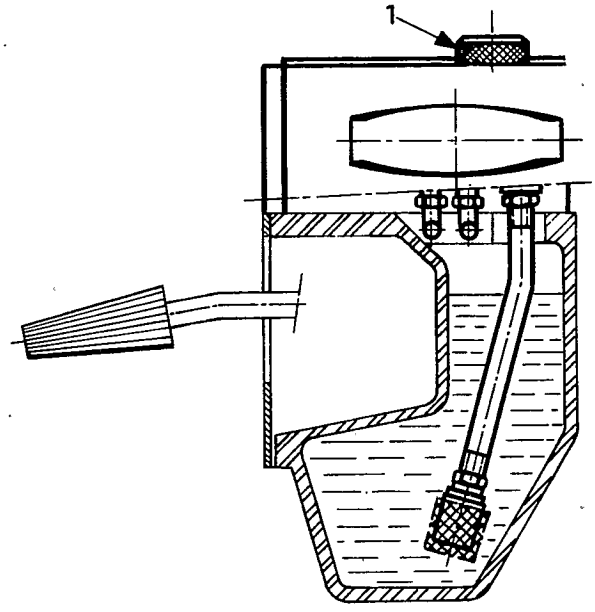


Gear Box

The gear box is splash lubricated. To fill the box, remove the rear door in the base. Remove the plug (I) marked "oil", and fill with oil up to the level on the plate located to the left of the hole. Draining is carried out by unscrewing plug (2) and should be done about every two months. To drain the box completely it should be tipped up, having first removed the belts from the lower pulley.

Use the same oil as for the headstock (capacity about 3 litres).

Lubrication of the pulley bearings is independent of the gear box lubrication These bearings are packed with grease in our works and this is sufficient for three or four years of use. After this period, remove the pulley and its flange. Clean thoroughly and fill with fresh grease. Use a bearing grease having a pour point more than or equal to I40°C . The specification for this grease is given in the AFNOR E 60200 standard under reference J.M.F.R.



Saddle-Apron

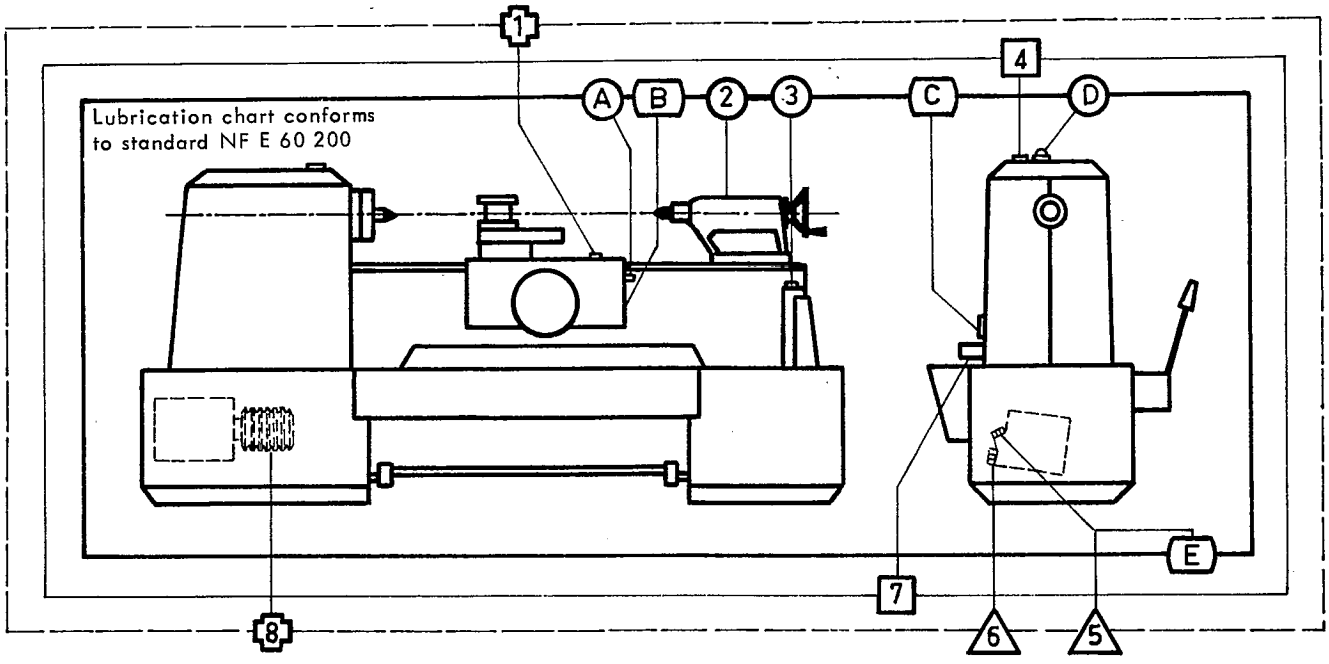
The saddle and apron are lubricated by hand pump located on the right hand part of the saddle. This draws lubricant from the reservoir located below and distributes it through piping to all the points requiring lubrication (bed slideways, cross-slide ways , transversal screw nut and leadscrew, apron gearing).
Filling is by means of plug (I) up to the maximum reservoir level.
The oil to be used is given in the AFNOR E 60200 standards under reference G L 5 .

Check the contents of the reservoir every week by means of the sight glass located on the right hand side of the apron. If this is insufficient, it should be topped up immediately. Every morning, it is necessary to operate the pump four times. To ensure that the cross feed screw is lubricated when the pump is operated, the cross slide must be brought into the correct position.

To do this bring the front end of the cross slide in line with the mark G which is engraved on the saddle slide-ways.

In addition to the handpump, a second pump driven by an eccentric on the rack pinion and pumping oil from the same reservoir as the hand pump is used to lubricate the front slide-way of the saddle.

GENERAL LUBRICATION REQUIREMENTS



IMPORTANT : Clean all lubricating points carefully before carrying out lubrication

OPERATIONS	QUANTITY	PRODUCT	FREQUENCY						UNITS
			○ Daily	▭ Weekly	□ Monthly	△ 3 Months	⬡ 6 Months	✣ As shown	
Filling Checking the level Draining	3l	B5		E		5 6			GEARBOX
Greasing		JMFR						8*	GEARBOX PULLEY
Filling Checking circulation Checking the level Draining	5l	B5	D	C	4 7				HEADSTOCK FEEDBOX
Filling Lubricating Oil level	1l	GL5	A***	B				1**	SADDLE APRON (Hand pump)
LUB oiling points		B5	2						TAILSTOCK
Filling	3cl	B5	3						END SUPPORT

* Every 3 or 4 years - ** Depending upon oil level in reservoir -
*** 4 strokes per day.

IMPORTANT NOTE : These lubrication details as shown above, refer to normal weekly operation. If this is not the case (two shifts, continuous operation or reduced operation etc...) the lubrication frequency should be modified in proportion.

COOLANT EQUIPMENT

A suitable coolant should be used. There is no specification to follow, but it should be remembered that some of the more recent lubricants, whilst very suitable for tool lubrication, are liable to damage paint work and cause rusting. These lubricants should not of course be used in spite of the apparent advantages which they offer. It is not possible to specify a recommended draining frequency, as this is extremely variable and relative to the degree of contamination and the ambient temperature, heat, in particular, having a tendency to decompose this type of coolant fairly quickly.

The reservoir should be filled by pouring coolant directly into the swarf bin at the base of the lathe. The capacity is between 30 to 50 litres depending upon the length between. centres of the machine

The details of coolant controls are given in the " starting up" chapter.

SPECIFICATION

DETAILS OF THE STANDARD MACHINE

- Rapid traverse to slides.
- Automatic longitudinal and transversal stops.
- Double geared headstock.
- Sealed feedbox.
- Pressure lubrication of saddle and apron.
- Extended steel cross slide with precision square turret.
- Quick clamp tailstock.
- Concentric chuck with one pieces jaws
- Catch plate.
- Fixed steady.
- Independent motorised coolant pump with reservoir.
- Solid headstock and tailstock centres.
- Spanners and operating manual.

NOTE : There are versions of the CHOLET 350 - 435 and 550 lathe without rapid traverse and automatic longitudinal and transversal stops.

SPECIFICATION

	350	435	550
CAPACITIES			
Height of centres	6 5/8″ 170 mm	7 7/8″ 200 mm	9 7/8″ 250 mm
Max. ⌀ swing over bed in front of face-plate	13 3/4″ 350 mm	17 1/8″ 435 mm	21 5/8″ 550 mm
Max. ⌀ swing over bed	13 3/4″ 350 mm	16 1/8″ 410 mm	19 3/4″ 500 mm
Max. ⌀ swing over cross slide	6 7/8″ 175 mm	9″ 230 mm	12 1/4″ 312 mm
Max. ⌀ swing over special side (on request)	7 1/2″ 190 mm		13″ 330 mm
Max. ⌀ swing in semi - gap			23 5/8″ 600 mm
Max. ⌀ swing in gap		24″ 610 mm	28″ 710 mm
Width of gap or semi - gap (in front of 4 jaw chuck)		5 1/8″ 130 mm	7″ 180 mm
Width of gap or semi - gap (in front of hole faceplate)		7 1/2″ 190 mm	9 1/2″ 240 mm
Width of bed	12 1/4″ 312 mm	12 1/4″ 312 mm	15 1/8″ 384 mm
Centre distances straight bed	28″ - 40″	28″ - 40″ - 52″	40″ - 63″
Centre distances semi-gap bed			75″ - 98″ - 122″
Centre distances gap bed		40″ - 63″	40″ - 63″ - 75″
HEADSTOCK			
Spindle nose	ASA-A1-6″ (ISO A6)	ASA-A1-6″ (ISO A6)	ASA-A1-6″ (ISO A6)
Spindle bore	1 5/8″ 42 mm	1 5/8″ - 42 mm or 2 1/16″ - 52 mm	2 1/16″ 52 mm
Bore taper	50 Metric	50 Metric (60 with 2 1/16″ bore)	60 Metric
gearing reduction ratio	1/4 and 1/14	1/4 and 1/16	1/4 and 1/16
SPINDLE SPEEDS			
Standard range	18 from 45 to 2000 r.p.m.	18 from 32 to 1600 r.p.m.	18 from 32 to 1600 r.p.m.
Slow range	18 from 22 to 1000 r.p.m.	18 from 16 to 800 r.p.m.	18 from 16 to 800 r.p.m.
Special ranges (extra to order) :			
Standard range (2 speed motor)	21 from 22 to 2000 r.p.m.	21 from 16 to 1600 r.p.m.	21 from 16 to 1600 r.p.m.
Fast range (single speed motor)	18 from 57 to 2500 r.p.m.	18 from 50 to 2500 r.p.m.	18 from 50 to 2500 r.p.m.
Other ranges (on request)			
Power with single speed motor (50 cycles)	Standard 10 h.p. to order for 7 or 12 h.p.	Standard 10 h.p. to order for 7 or 12 h.p.	Standard 10 h.p. to order for 7 or 12 h.p.
Power with 2 speed motor (50 cycles)	7.7/11 h.p.	7.7/11 h.p.	7.7/11 h.p.
FEEDBOX			
Longitudinal feeds	28 from 0.002″ to 0.028″	28 from 0.002″ to 0.028″	28 from 0.002″ to 0.028″
Transverse feeds	28 from 0.0015″ to 0.018″	28 from 0.0015″ to 0.018″	28 from 0.0015″ to 0.018″
Metric pitches } without changing quadrant gears	28 from 0.5 to 7	28 from 0.5 to 7	28 from 0.5 to 7
Whitworth pitches } without changing quadrant gears	28 from 56 to 4 T.P.I.	28 from 56 to 4 T.P.I.	28 from 56 to 4 T.P.I.
Number of pitches with amplification	84 Metric, 84 English	84 Metric, 84 English	84 Metric, 84 English
Pitches with quadrant gears	Module & circumferential	Module & circumferential	Module & circumferential
Leadscrew pitch	4 T.P.I. 6 mm	4 T.P.I. 6 mm	4 T.P.I. 6 mm
SADDLE			
Cross slide travel	9″ 230 mm	9″ 230 mm	13 3/4″ 350 mm
Cross feed screw pitch	6 T.P.I. 4 mm	6 T.P.I. 4 mm	5 T.P.I. 5 mm
SLIDES			
Tool slide travel	5 1/8″ 131 mm	6 1/8″ 156 mm	6 1/8″ 156 mm
Toolslide screw pitch	10 T.P.I. 2,5 mm	10 T.P.I. 2,5 mm	10 T.P.I. 2,5 mm
Tool section	3/4″×3/4″	1″×1″	1″×1″
QUICK CLAMPING TAILSTOCK			
Sleeve diameter	2 1/2″ 64 mm	2 7/8″ 72 mm	3 1/4″ 82 mm
Taper in sleeve	No. 4 Morse	No. 5 Morse	No. 5 Morse
Sleeve travel	4 3/4″ 120 mm	4 3/4″ 120 mm	4 3/4″ 120 mm
COPYING ATTACHMENT			
Copying slide stroke	3 1/2″ 90 mm	3 1/2″ 90 mm	3 1/2″ or 5 1/2″ 90 ou 140 mm

NOTE *There is also another version of CHOLET 350, 435 and 550 lathes, without rapid traverse, nor automatic longitudinal and transversal trip stops.*

SUPPLEMENTARY EQUIPMENT

	350	435	550
- Copying attachment with hydraulic power pack and electro-magnetic control of slide return.			
a) piston stroke 3"1/2 (90 mm)	+	+	+
b) piston stroke 5"1/2 (140 mm)			+
- Rotating tailstock centre with extended spindle (for lathe with copying attachment)	+	+	+
- Leadscrew reversing equipment controlled from apron and automatic screwcutting stop.	+	+	+
- Short spindle nose, 2" (52 mm) bore		+	
- D 6" cam-lock spindle nose	+	+	+
- Cam-lock type chucks for cam-lock spindle in lieu of standard chuck	8" 1/2 (Ø215mm)	8" 1/2 (Ø215mm)	10" (Ø250mm)
- "Good Chap" No. 1 turret with No. 1 toolholder in lieu of standard square toolpost	+	+	+
- No. 1 - 2 - 3 - 4 toolholders for "Good Chap" turret	+	+	+
- Spindle clutch unit	+	+	+
- Machine lighting with transformer	+	+	+
- Pneumatic operation of tailstock sleeve	+	+	+
- Tailstock with built-in rotating centre	2"13/16 (Ø72mm)	2"13/16 (Ø72mm)	3" 1/4 (Ø82mm)
- Tailstock as above with pneumatic operation	2"13/16 (Ø72mm)	2"13/16 (Ø72mm)	3" 1/4 (Ø82mm)
- Swarf guard on cross slide with built-in light (lathe without copying attachment)	+	+	+
- Chuck guard up to 16" (410 mm) diameter	+	+	+

	350	435	550
- Rear guard with sliding doors (lathe with or without copying attachment)	+	+	+
- Taper turning attachment (lathe without copying attachment)	+	+	+
- Dial type screwcutting indicator	+	+	+
- Reduction sleeves for spindle internal taper (ask for details)	+	+	+
- 3 pad fixed steadies 6" 1/2 (165 mm) capacity	+	+	
- 3 pad fixed steadies 11" 1/2 (295 mm) capacity		+	+
- 3 pad following steady (capacity in mm)	1/2" - 2"1/4 (12-58)	3/8" - 2"1/2 (10-65)	3/8" - 3"1/2 (10-90)
- Roller type pads for above steadies (ask for details)	+	+	+
- Single rear tool block (lathe without copying attachment)	+	+	+
- Double rear tool block (lathe without copying attachment)	+	+	+
- Adaptor for rear tool block	+	+	+
- 4 jaw independent chuck with reversible jaws for standard spindle			
12" (Ø 300 mm)	+	+	+
14" (Ø 350 mm)		+	+
16" (Ø 400 mm) } except for straigt bed lathe		+	+
20" (Ø 500 mm) } except for straigt bed lathe			+
- Hole face plates for standard spindle			
14" (Ø 330 mm)	+	+	+
15" 1/2 (Ø 390 mm)		+	+
20" (Ø 500 mm) } except for straight bed lathe		+	+
24" (Ø 600 mm) } except for straight bed lathe		+	+
27" (Ø 700 mm)) gap bed only			+
- Set of 4 driver jaws	+	+	+

	350	435	550
- Rotating tailstock centre (lathe without copying attachment)	+	+	
- Screwcutting gears			
46 teeth for 11.5 t.p.i.	+	+	+
57 teeth for 19 t.p.i.	+	+	+
45 - 53 - 74 teeth for module pitches (supplied in a set of 3)	+	+	+
from 20 to 29 teeth for special pitches (see screwcutting table)	+	+	+
- Automatic work driver with two direction operation and fixed centre	+	+	+
- Spring loaded spindle centre	+	+	+
- Hydraulic chuck with rear cylinder 45 x 110 and headstock mounted hand control	8" 1/2 (Ø215mm)	8" 1/2 - 11" (Ø215mm Ø280mm)	8" 1/2 - 11" (Ø215mm Ø280mm)
- Power pack for hydraulic chuck (lathe without copying attachment)	+	+	+
- Additional tapping for hydraulic chuck (lathe with copying attachment)	+	+	+
- Air chuck with rear cylinder and headstock mounted hand control	8" 1/2 (Ø215mm)	8 " 1/2 - 11" (Ø215mm Ø280mm)	8" 1/2 - 11" (Ø215mm Ø280mm)
- Hard or soft jaws for air or hydraulic chucks mentioned above (in set of 3)	+	+	+
- Quick acting GIRINDEX collet chuck (capacity 5/32" - 1" 3/16) (4 to 30 mm)	+	+	+
- Quick acting GIRINDEX collet chuck (capacity 5/16" - 1" 11/16 (8 to 42 mm)	+	+	+
- Collet for above chuck (in 5/10 mm steps)	+	+	+
- 3 jaw concentric chuck 10" (Ø 250 mm)	+	+	

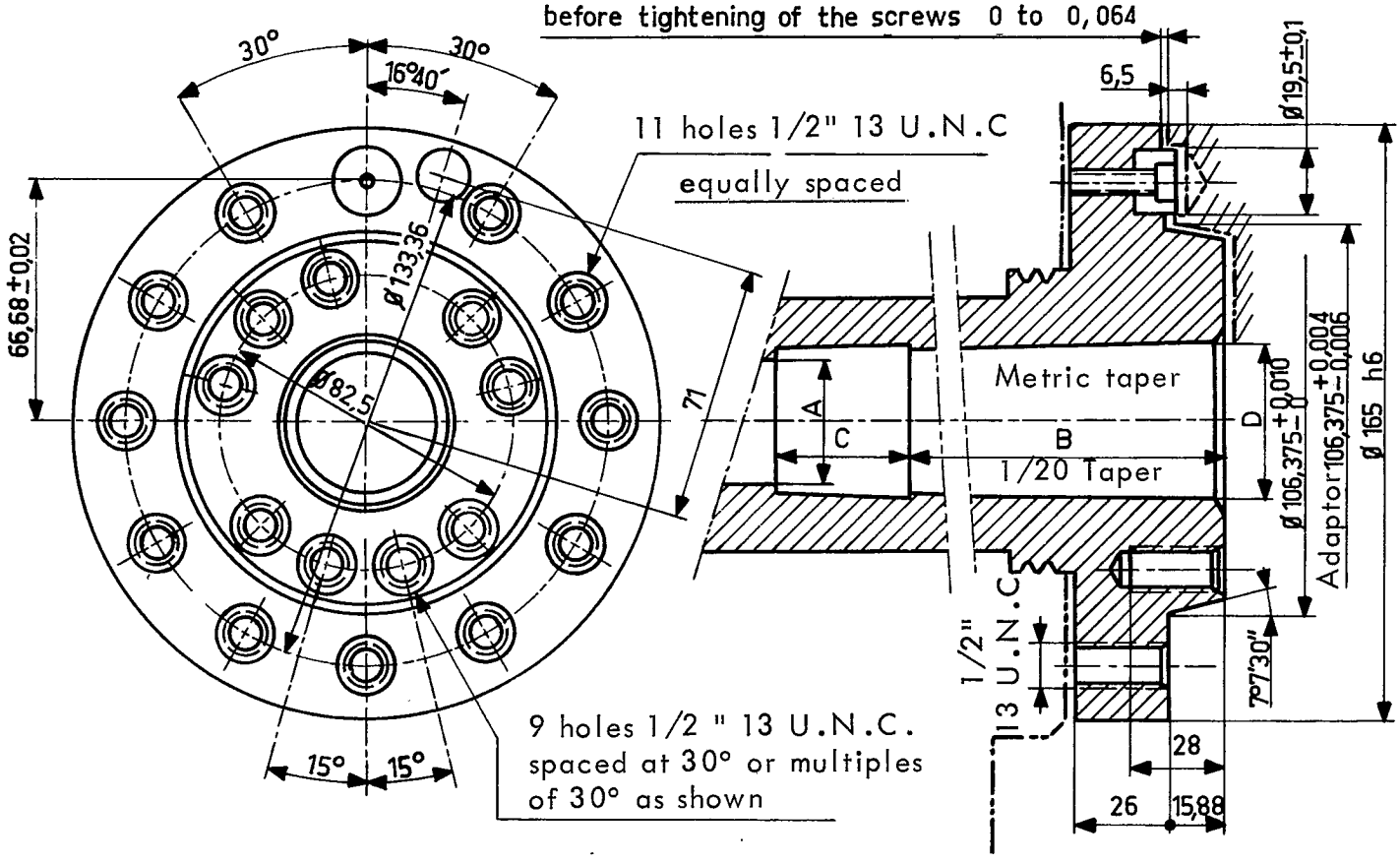
	350	435	550
- 3 jaw concentric chuck 12"(Ø 300 mm)	+	+	+
- Soft jaws for 3 jaw concentric chuck 8" 1/2 - 10" - 12" (Ø 215 - 250 or 300 mm)	+	+	+
- High precision "FORKARDT" chuck 10" (Ø 250 mm) type F with set of hard and soft jaws	+	+	+
- Extra soft jaws for "FORKARDT" chuck	+	+	+
- Adaptor plate for 3 jaw chuck (to suit chuck diameter)	+	+	+
- Special speed ranges using special pulleys and in certain cases different motor	+	+	+
- Main motor cooling fan	+	+	+
- Automatic star-delta starter for 3 phase single speed motor	+	+	+
- Automatic statoric starter (to suit type of motor and mains supply voltage)	+	+	+

ATTENTION : hydraulic and pneumatic chucks should not be used at speeds above 1600 r.p.m. and automatic workdrivers above 1000 r.p.m.

SPINDLE NOSE DETAILS

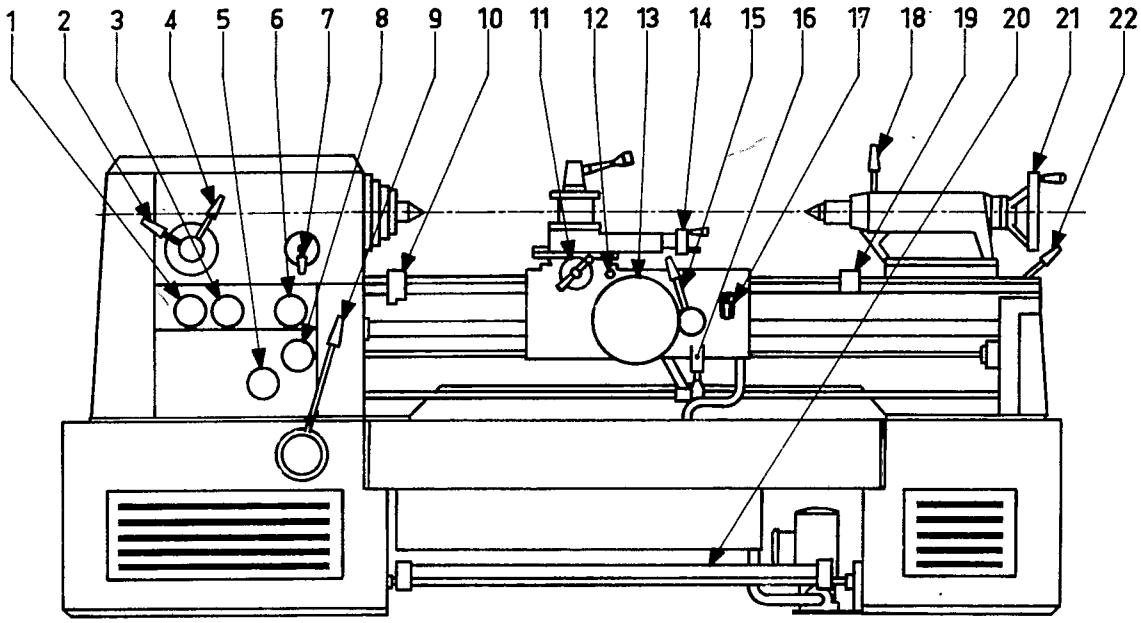
I.S.O Type A1 6"

LATHE	A	B	C	TAPER
CHOLET 350-435	42	128	40	METRIC 50
CHOLET 550	52	135	30	METRIC 60



USING THE MACHINE

TERMINOLOGY OF MAIN UNITS



1 - Feed and screw cutting selector
2 - Control lever for standard and amplified pitches and disengagement
3 - Selector for metric and English threads and turning feeds
4 - Feed and screw cutting direction reversing lever
5 - Selector for feeds and pitches
6 - Selector for metric and English pitches and turning feeds
7 - Selector lever for direct drive-gearing
8 - Drive disconnection knob
9 - Spindle speed selector lever
10 - Longitudinal stop
11 - Transversal handwheel
12 - Opérating knob for transversal stop bar
13 - Longitudinal handwheel
14 - Tool slide handwheel
15 - Lead screw nut operating lever
16 - Remote control for starting spindle and selecting direction of rotation
17 - Slide traverse selector (work feed and rapid traverse longitudinal transversal)
18 - Tailstock sleeve clamping
19 - Longitudinal safety stop
20 - Main motor stop and brake pedal
21 - Tailstock sleeve handwheel
22 - Tailstock clamping lever

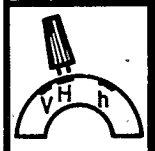
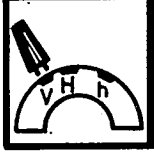
SPINDLE SPEEDS

The complete range of spindle speeds is obtained by selector lever (9) on the gear box and selector lever (7) direct drive-gearing.

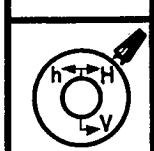
By pulling out the gear box selector lever, the action of the lever on the box is neutralised. This means that the lever can always be located in a convenient position without having any effect on the speed selected.

The indicator plate located on the hub of this lever shows clearly the range of speeds available. This range is as shown in the table below.

CHOLET 350 LATHE

		NORMAL RANGE						SLOW RANGE TO ORDER					
	2nd Gearing (h)	45	57	71	90	114	142	22	28	35	45	57	71
	1st Gearing (H)	160	200	250	320	400	500	80	100	125	160	200	250
	Direct Drive (V)	640	800	1000	1260	1600	2000	320	400	500	640	800	1000

CHOLET 435 - 550 LATHE

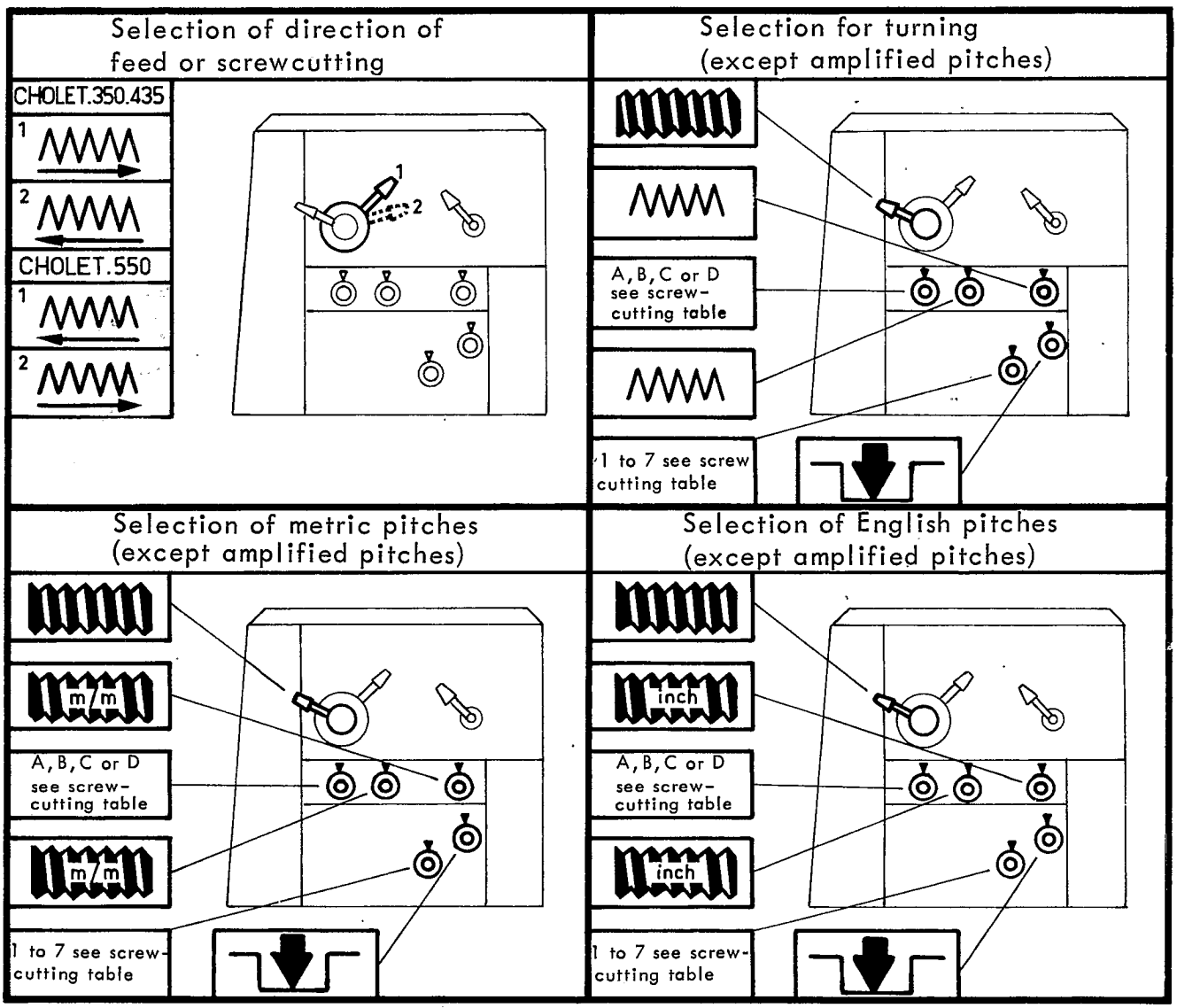
	2nd Gearing (h)	32	40	50	64	80	100	16	20	25	32	40	50
	1st Gearing (H)	125	160	200	250	320	400	64	80	100	125	160	200
	Direct Drive (V)	500	640	800	1000	1270	1600	250	320	400	500	640	800

SCREWCUTTING SELECTOR

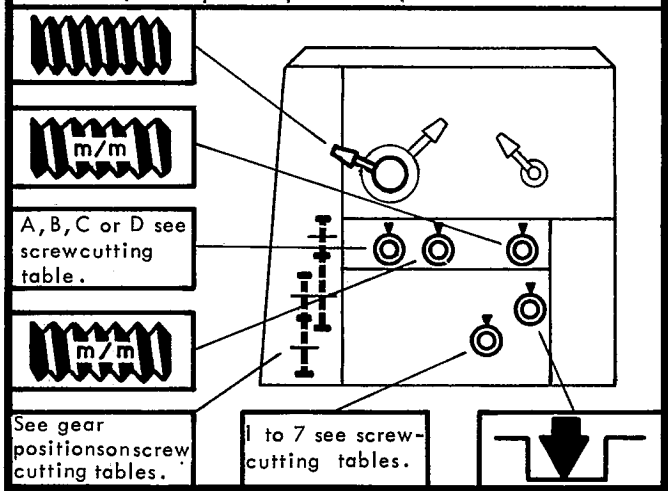
The feed box provides metric, English, module, circumferential, amplified and special pitches as shown in the table on page 34.

To abtain the various pitches follow the instructions shown on the sketches below.

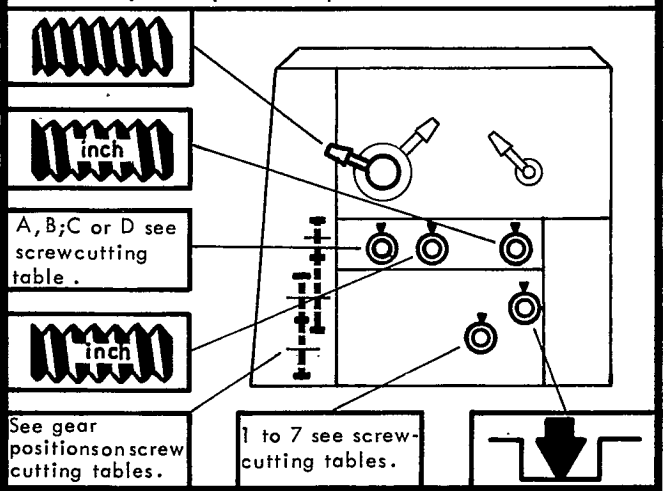
These tables only show the type of pitch or feed obtained and not its actual value, for this latter see tables on page 34 and 35.



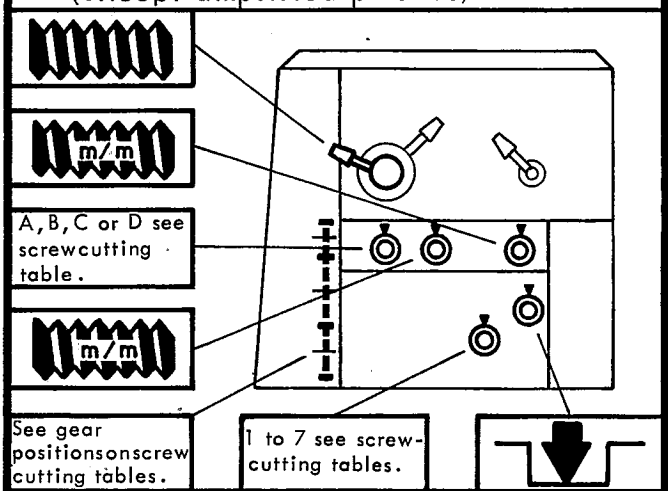
Selection of module pitches (except amplified pitches)



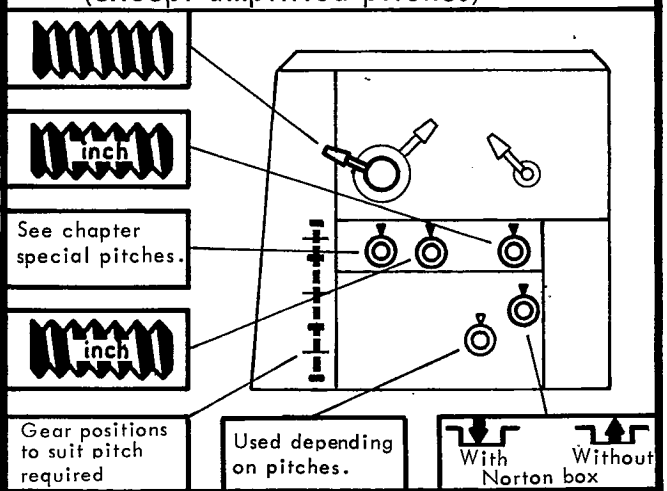
Selection of circumferential pitches (except amplified pitches)



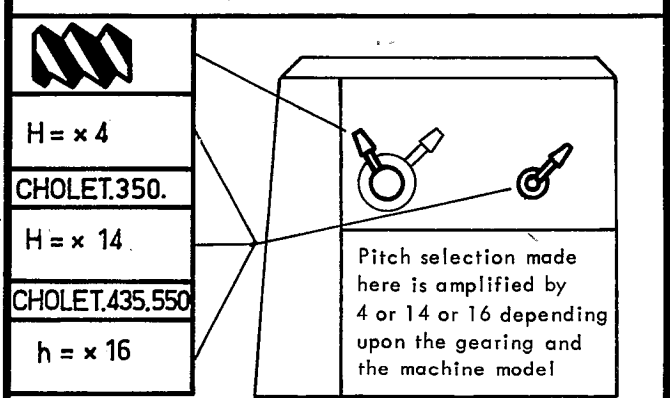
Selection of non-standard pitches (except amplified pitches)



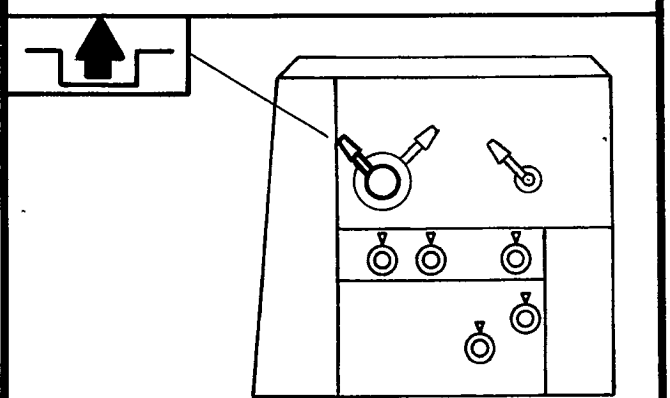
Selection of special pitches (except amplified pitches)



Amplified pitches

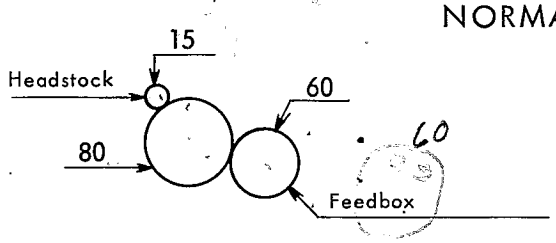


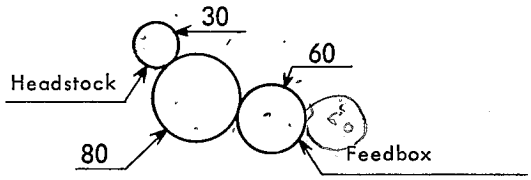
Feedbox released position



SCREWCUTTING TABLE

NORMAL FITTING





METRIC PITCHES

LEVER	1	2	3	4	5	6	7
A	0,25	0,281	0,312	0,343	0,375	0,406	0,437
B	0,5	0,562	0,625	0,687	0,75	0,812	0,875
C	1	1,125	1,25	1,375	1,5	1,625	1,75
D	2	2,25	2,5	2,75	3	3,25	3,5

LEVER	1	2	3	4	5	6	7
A	0,5	0,562	0,625	0,687	0,75	0,812	0,875
B	1	1,125	1,25	1,375	1,5	1,625	1,75
C	2	2,25	2,5	2,75	3	3,25	3,5
D	4	4,5	5	5,5	6	6,5	7

ENGLISH PITCHES (T.P.I.)

LEVER	1	2	3	4	5	6	7
A	64	72	80	88	96	104	112
B	32	36	40	44	48	52	56
C	16	18	20	22	24	26	28
D	8	9	10	11	12	13	14

LEVER	1	2	3	4	5	6	7
A	32	36	40	44	48	52	56
B	16	18	20	22	24	26	28
C	8	9	10	11	12	13	14
D	4	4½	5	5½	6	6½	7

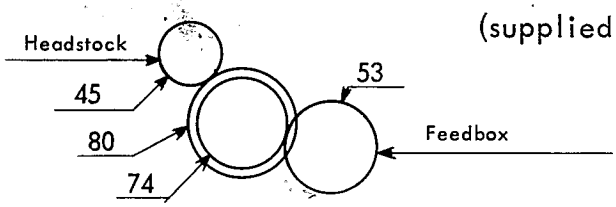
ENGLISH PITCHES (Additional)

Pitch required t.p.i	Gear positions		Lever position to suit : t.p.i
	Headstock	Feedbox	
11½	20	46	C.3
19	15 or 30	57	20

Using amplified pitch selection and gearing drive, the pitches shown are multiplied by 4 or 14 for the Cholet 350 and by 4 or 16 for the Cholet 435 and 550.

MODULE AND CIRCUMFERENTIAL PITCHES (supplied to order)

$\left(\frac{\pi}{\text{DIAMETRAL PITCH}}\right)$



MODULE PITCHES Lever positions on Metric pitches.							CIRCUMFERENTIAL PITCHES Lever positions on English pitches.						
1	2	3	4	5	6	7	1	2	3	4	5	6	7
0,25 π	0,28125	0,3125	0,34375	0,375	0,40625	0,4375	π/64	72	80	88	96	104	112
0,5 π	0,5625	0,625	0,6875	0,75	0,8125	0,875	32	36	40	44	48	52	56
1	1,125	1,25	1,375	1,5	1,625	1,75	16	18	20	22	24	26	28
2	2,25	2,5	2,75	3	3,25	3,5	8	9	10	11	12	13	14

TURNING

Longitudinal feed rates 2/10th metric pitch
Transversal feed rates 1/10th metric pitch

NON-STANDARD PITCHES

These pitches are obtained by replacing the 15 or 30-tooth gear on the headstock by either a 20, 21, 22, 23, 24, 25, 26, 27, 28 or 29 tooth gear which can be supplied as supplementary equipment, and by positioning the feedbox control knobs to the "metric pitch" position.

		1	2	3	4	5	6	7
20 TEETH	A	.013	.0147	.0164	.0180	.0197	.0213	.0228
	B	.026	.0295	.0328	.0360	.0394	.0426	.0456
	C	.052	.059	.0656	.072	.0788	.087	.091
	D	.104	.118	.132	.144	.157	.174	.182
21 TEETH	A	.0138	.0155	.01725	.0190	.0207	.0224	.024
	B	.0276	.031	.0345	.0379	.0414	.0448	.048
	C	.0552	.063	.069	.0758	.083	.0896	.096
	D	.110	.126	.138	.151	.166	.179	.192
22 TEETH	A	.0144	.0162	.0178	.0198	.0215	.0235	.0252
	B	.0288	.0325	.0355	.0395	.043	.047	.0505
	C	.576	.065	.071	.079	.086	.094	.101
	D	.115	.130	.142	.158	.172	.188	.202
23 TEETH	A	.015	.017	.0189	.0206	.0228	.0244	.0264
	B	.030	.034	.0378	.0412	.0455	.0488	.0528
	C	.060	.068	.0756	.082	.091	.0976	.106
	D	.120	.136	.151	.164	.182	.195	.212
24 TEETH	A	.0157	.0177	.0197	.0217	.0236	.0256	.0276
	B	.0315	.0354	.0394	.043	.047	.051	.055
	C	.063	.071	.079	.087	.094	.102	.110
	D	.126	.142	.157	.173	.189	.205	.220
25 TEETH	A	.0163	.0184	.0205	.0225	.0246	.0270	.0287
	B	.0326	.0368	.041	.045	.0492	.054	.0574
	C	.065	.0736	.082	.090	.0984	.108	.115
	D	.130	.143	.164	.180	.197	.216	.230
26 TEETH	A	.017	.0192	.0213	.0236	.0256	.0276	.0298
	B	.034	.0384	.0426	.0472	.051	.055	.0596
	C	.068	.077	.085	.095	.102	.110	.119
	D	.136	.154	.170	.190	.205	.220	.238
27 TEETH	A	.0177	.0199	.0221	.0243	.0268	.02875	.031
	B	.0354	.0400	.0443	.0487	.0537	.0575	.062
	C	.071	.080	.0885	.0975	.1065	.115	.124
	D	.142	.160	.177	.195	.213	.230	.248
28 TEETH	A	.0183	.0207	.0230	.0252	.0276	.0298	.0321
	B	.0366	.0414	.046	.0504	.055	.0596	.064
	C	.073	.0830	.092	.101	.110	.119	.128
	D	.146	.166	.184	.202	.220	.238	.256
29 TEETH	A	.0190	.0214	.0238	.0262	.0285	.0309	.0333
	B	.038	.0428	.0476	.0524	.057	.0618	.0666
	C	.076	.085	.095	.105	.114	.123	.133
	D	.152	.170	.190	.210	.228	.246	.266

GEARS ON HAND

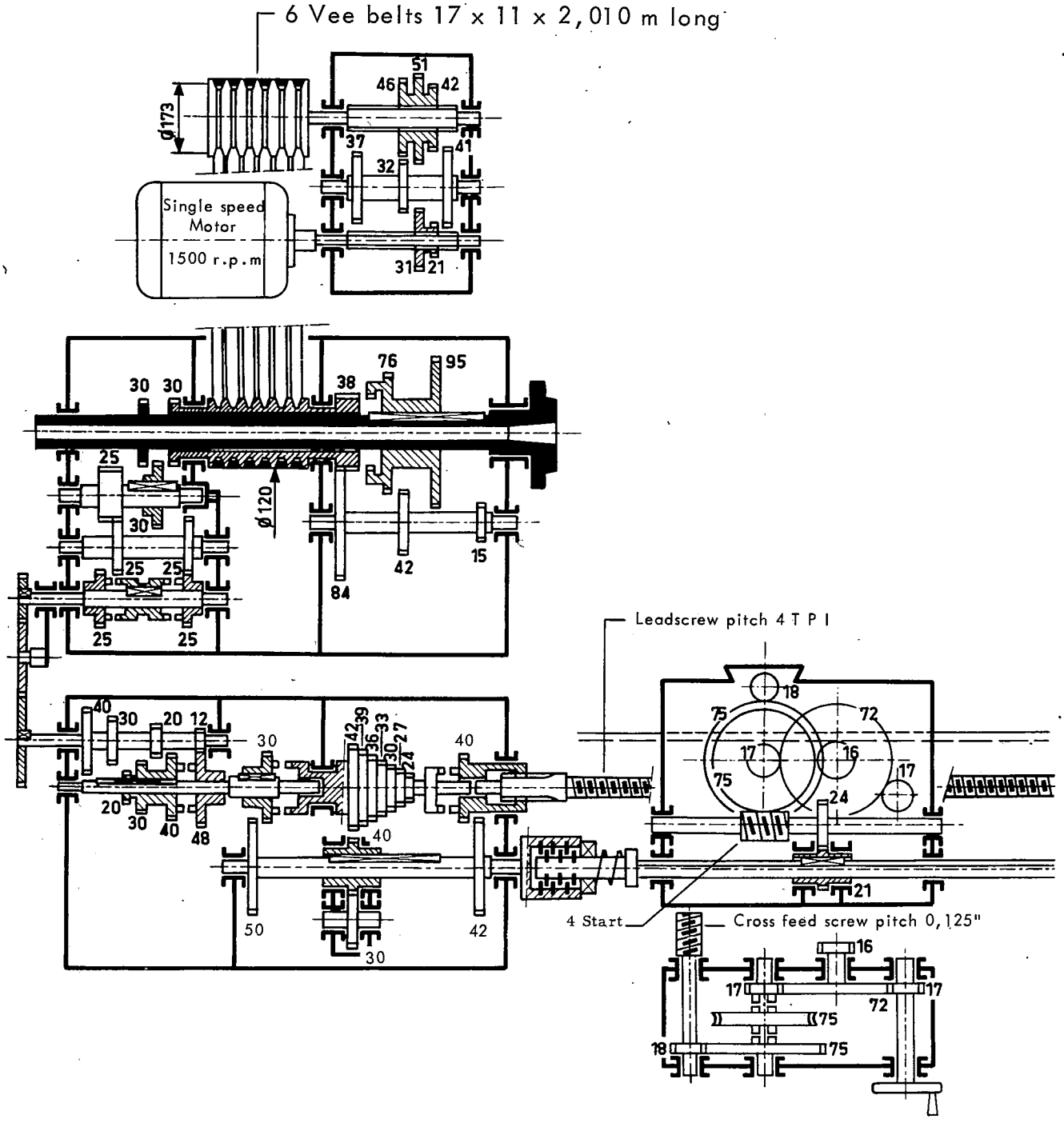
15
20
24
30
45
46
57
2-60
2-80

SPECIAL PITCHES

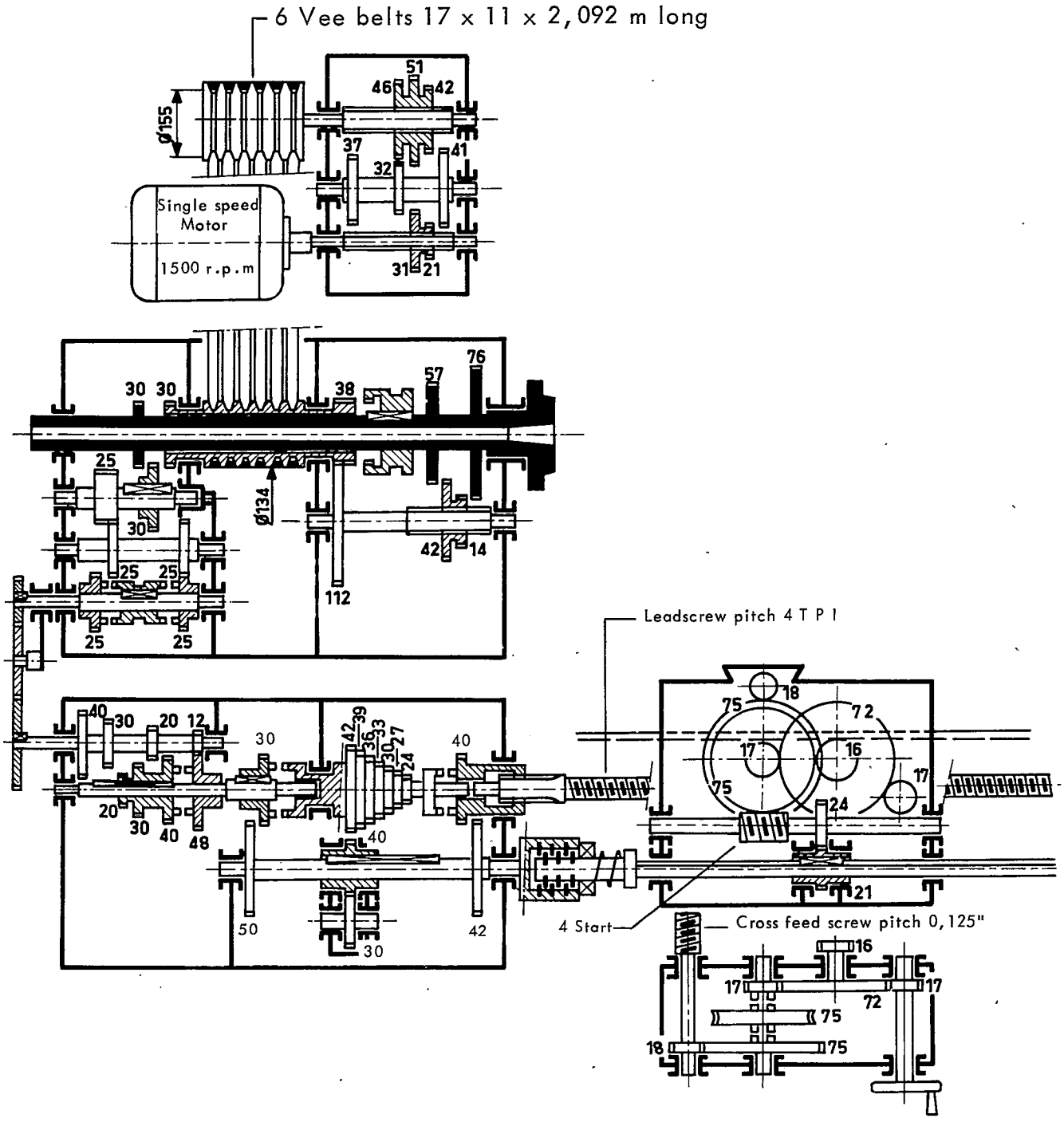
To machine special pitches, fit the necessary gears to the quadrant, position the selector buttons at one of the basic ratios A=1/4, B=1/2, C=1/1, D=2/1, and position the other buttons to "metric pitches" ; (see table page 33). This arrangement couples the leadscrew directly to the basic ratio A, B, C, D, using or not using the NORTON gearing.

It is of course necessary to take into account the basic ratio selected, when calculating the drive gears and driven gears as for the gears on the quadrant, as well as the ratio of the NORTON gearing when this is used.

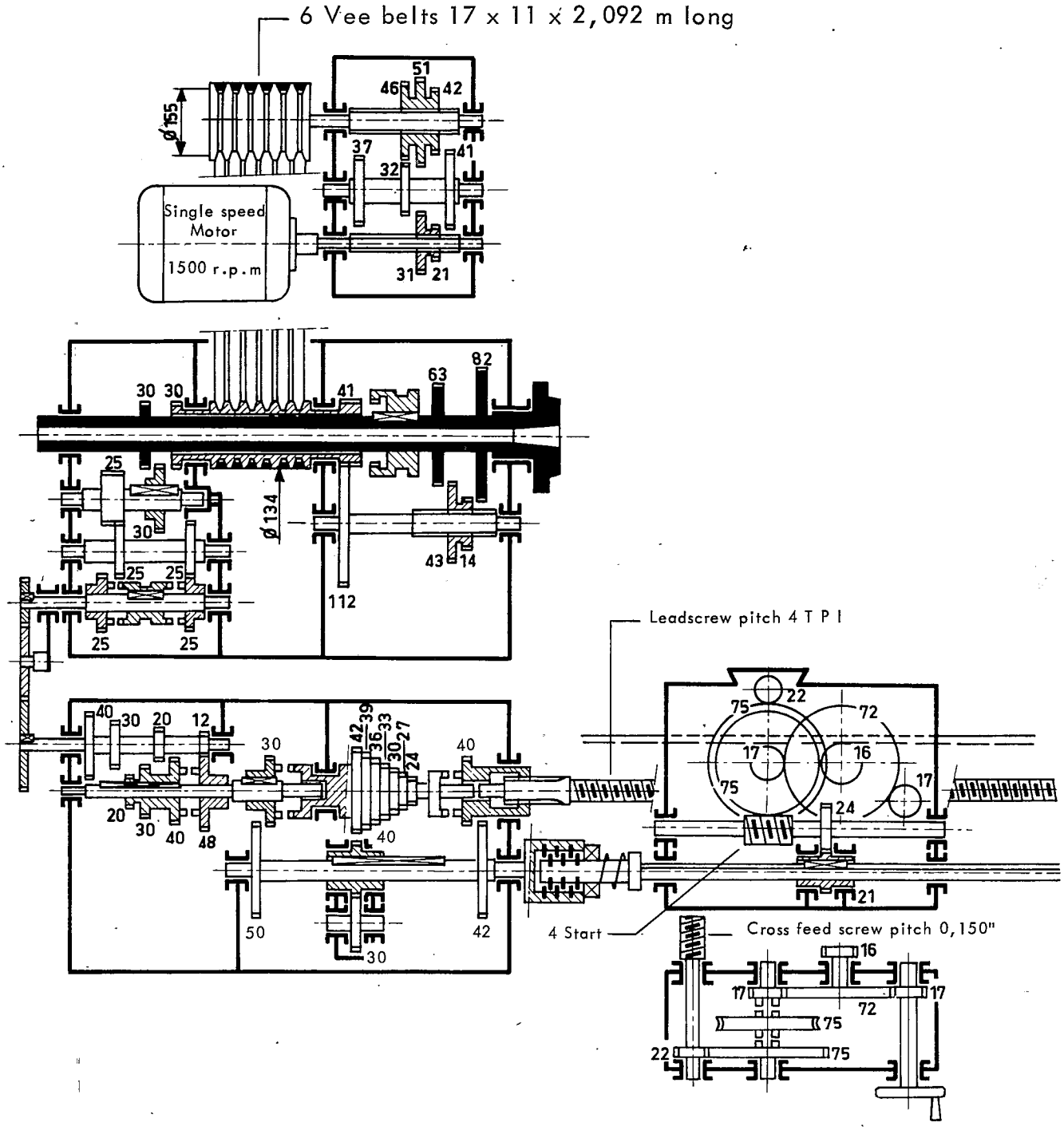
CHOLET 350 DRIVE ARRANGEMENTS



CHOLET 435 DRIVE ARRANGEMENTS



DRIVE ARRANGEMENTS ON CHOLET 550 LATHE



CHANGING SPINDLE SPEED AND FEEDS

To change speeds or feeds, the lathe must be stopped by operating the brake pedal. Release the pedal and only then, operate the levers ans buttons to select the new speed or feed required.

As sliding gears are not synchronised, the machine must be stopped completely before changing speed and feed.

If it is difficult to engage the sliding gears, this can be easily remedied either by turning the spindle by hand (with lever 7 in the "direct drive" position) or by jog operation of the main motor which should then be immediately stopped (lever 7 in " gearing" position) .

Furthermore, except for special pitches, all other pitches are obtained by using the control knob 5 of the NORTON box, so that to change from one ratio to another using this control, the knob (8) must be positioned in its released position. After selection, return this knob to its initial position (engaged).

NOTE : the numbers mentioned on this page relative to various control units are those shown on the diagram on page 30.

LIMITATIONS OF AMPLIFIED PITCHES

Some amplified pitches involve a high ratio between the leadscrew and the spindle, and this ratio can cause damage to the feedbox. To avoid any damage, the leadscrew is fitted with a shear pin which will break under excessive load. Nevertheless, it is undesirable to work near to the breakage limit, and it is advisable not to exceed a linear saddle speed of 47"/min. (1,20 m/min.). This speed is a combination of the spindle speed and the feet used. It is of course obvious that the depth of cut on amplified pitches should be set to a minimum.

MAXIMUM SPINDLE SPEEDS USED FOR SCREW-CUTTING

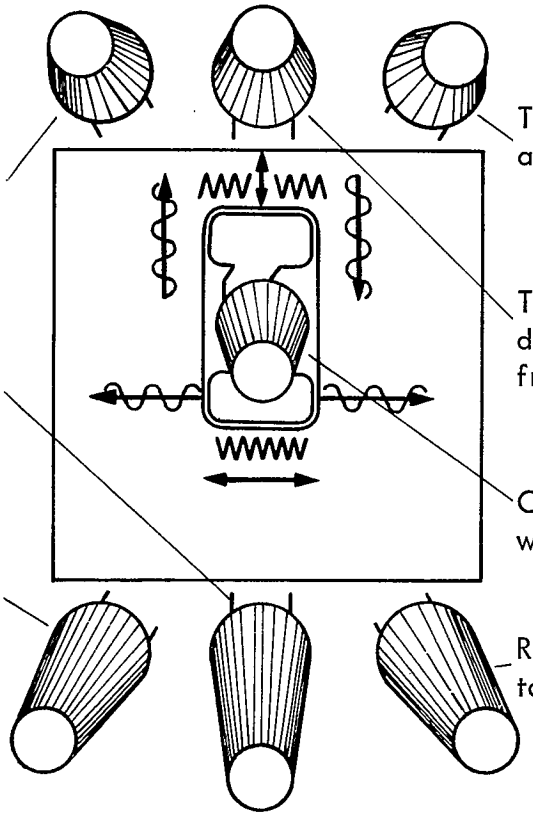
In the same way as for amplified pitches, a maximum spindle speed should be borne in mind when cutting standard pitches. On a conventional lathe, this speed is self limiting due to the operator, who cannot exceed a certain linear saddle speed, as it becomes difficult to stop at an accurate position at the end of screwcutting.

On a CHOLET lathe fitted with apron controlled leadscrew reversing, the stop position at the end of the cut becomes automatic, and in this way, the spindle speed can be increased without exceeding the figures shown below.

Whilst these figures are only approximate, it is advisable to observe them as higher speeds could cause damage to the leadscrew reversing dogs.

Metric pitches	English pitches	Spindle speeds
1	24 threads per inch	640 r.p.m.
2	12 " "	320 r.p.m.
3	8 " "	200 r.p.m.
4	6 " "	160 r.p.m.
5	5 " "	125 r.p.m.
6	4 " "	100 r.p.m.
12	2 " "	50 r.p.m.

SLIDE TRAVERSES

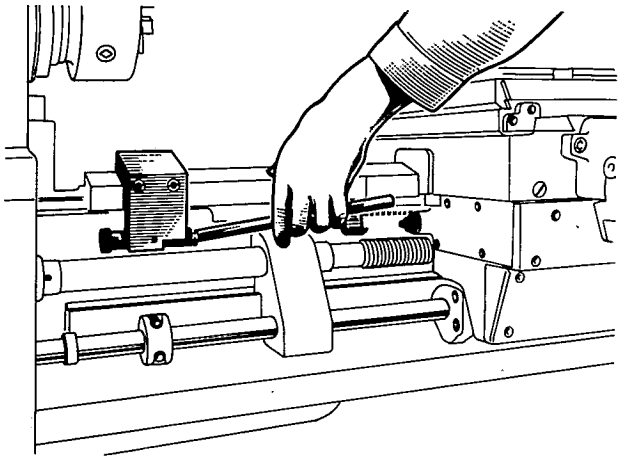


Turning traverses are selected by means of lever I7 (see table giving terminology of units page 30) . This lever selects longitudinal or transversal workfeed and also longitudinal or transversal rapid traverse. However the direction of traverse is selected on the headstock by lever 4 (see table) and the direction of rapid traverse is actuated directly by lever I7. The diagram above shows the different possibilities available with this equipment. To obtain rapid traverse of any type, the lever must be held in position throughout the movement, otherwise it returns automatically to workfeed. However, movement from longitudinal to transversal or vice versa and the return to the neutral position is carried out manually, by moving the lever to the corresponding position.

NOTE : Headstock selection of workfeed is clearly indicated for longitudinal feed. For each selection corresponding to a longitudinal feed towards the headstock there is a corresponding transversal feed towards the work-piece and vice versa.

LONGITUDINAL STOPS

Two longitudinal stops located on either side of the saddle are provided for setting the saddle traverse automatically. Nevertheless the stop at the headstock end is fundamentally different in its use to that at the tailstock end.



I) Headstock end micrometric stop

This stop can be moved along the front bed slideway and clamped in position by means of two Allen screws. Final setting is by means of a micrometer screw which provides accuracy to within .001" (2 to 3/100 mm).

When the saddle which is traversing towards the headstock, contacts this stop, an automatic unit disengages the feed drive in the apron. This will operate both on workfeed and on rapid traverse. However it is extremely inadvisable to come up on this stop on rapid traverse, as this could effect the correct operation and accuracy of the stop.

Two cradles are provided, one on the stop itself and the other on the front bed slideway so that different length bars can be used to provide different saddle stopping positions relative to one setting of the micrometer stop. The operator will position, remove or change the bars manually to obtain the various positions required.

When length bars are used the automatic trip and the accuracy noted above are both available.

The bar diameter should be 5/8" (16mm).

Gap bed lathes are fitted with this stop but have in addition a second stop located on the front cover of the feed box, in view of the gap in the bed. This second stop cannot be moved but otherwise has the same specification as those located on the bed.

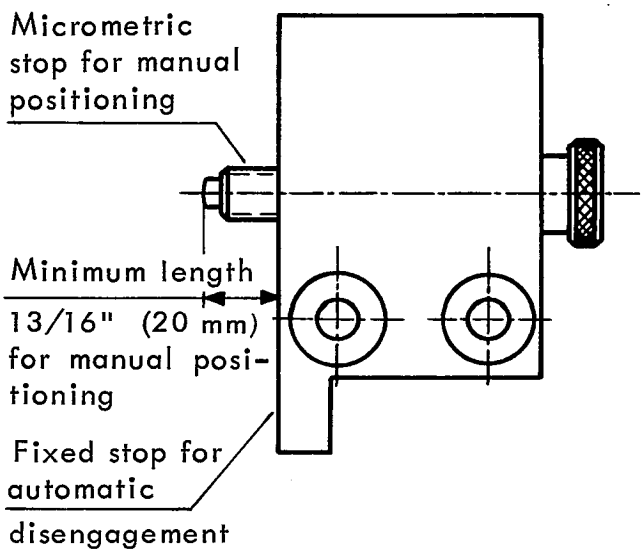
The automatic stop disengages the feed, but does not return the slide traverse lever to the neutral position.

In order to obtain a new longitudinal or transversal workfeed or rapid traverse, the lever must be returned manually to the neutral position and re-engaged for the new traverse selected. This provides a considerable advantage, as it is possible to come to a longitudinal position automatically and then engage transversal feed whilst retaining the accuracy of the longitudinal position.

2) Safety stop at tailstock end

This is not a precision stop. It is only provided to stop rapid traverse towards the tailstock and avoid any possibility of damage. It does not stop the feed completely but trips rapid traverse into workfeed. To stop the saddle completely, the slide traverse lever must be brought manually to the neutral position . It can be seen from this that if workfeed is selected towards the tailstock, after the saddle contacts the stop on rapid traverse, it will tend to continue in the same direction on workfeed and force against the stop. Although the feed shaft has a safety trip, it is inadvisable, to let this happen. In other words it is preferable to use the tailstock end safety stop only when workfeed is selected towards the headstock. This of course does correspond to the more used cycles which is : workfeed towards the headstock and rapid return towards the tailstock.

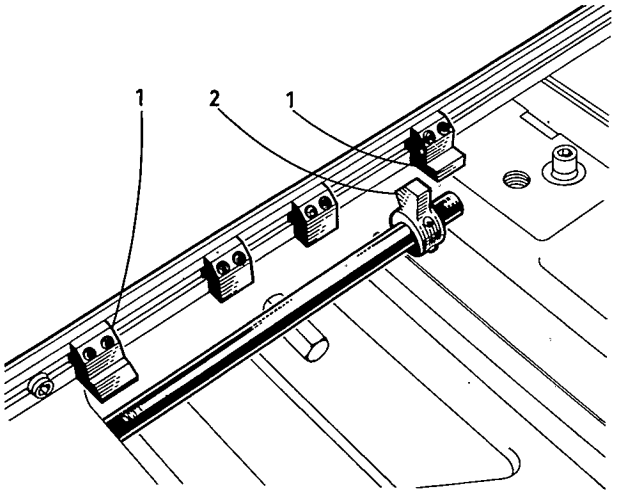
Beneath the fixed trip stop is located a second micrometric stop which provides position stopping of the saddle at the tailstock end. However this stop has no disengagement system, and can therefore only be used for positioning the saddle by means of the longitudinal handwheel.



In order that this micrometric stop can operate, its contact face must project about 13/16" (20 mm) at least from the fixed stop. When the stop is not being used, it should be screwed right into the stop body.

There is a further safety trip for longitudinal traverse towards the tailstock on either workfeed or rapid which disengages the drive in the apron if the saddle contacts the tailstock base, if the safety stop on the bed has not been positioned correctly.

TRANSVERSAL STOPS



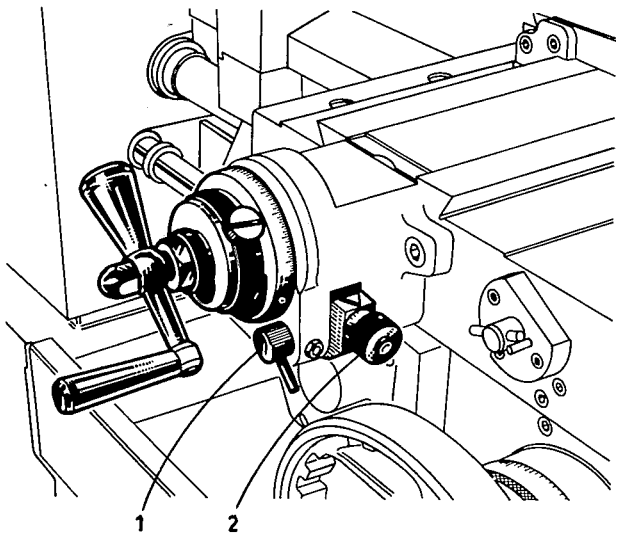
There are four stops located on the right of the cross slide.
They slide along the support slide and are clamped in position by means of two Allen screws. Once set they follow all the cross slide movements. The two outside stops (1) are end of travel limit stops. It is not possible under any circumstances for the swivelling stop (2) which trips the power cross feed, to go past these two stops. In other words, this trip is always located between these two stops. In addition to their function as end of travel stops, these two stops can also be used for transversal positioning of the tool in extreme selected positions, as the stops can be adjusted.

The two other intermediate stops are only used for diameter setting.
During operation they can be located one either side of the trip stop or both at the front, or both at the rear of this trip stop. In the two latter cases, after using one of the stops, it is necessary to move out the trip stop (2) by means of control 12 (see table on page 30) in order to change from one to the other. This trip stop must be repositioned after a transversal movement of the cross slide which will clear the first stop which is already being used.

As for the longitudinal stop, it is essential to return the slide traverse lever to its neutral position after a stop has been contacted, before re engaging it for a new movement.

MICROMETRIC SCREWCUTTING STOP

During screwcutting operation, it is advantageous to take intermediate cuts using the handwheel, and to obtain the final cut accurately without having to check the tool position. This is the function of the screwcutting stop.



Principle

A ball is located between two slotted plates. The first plate is attached to the cross feed screw. It has a rectilinear slot from its centre towards the outside. The second plate has a tangential gear operated by a worm which is fitted with a micrometic vernier (2) . This worm can be disengaged from the gear using the small lever (1) which releases the plate on its spindle. In this condition the cross feed screw can be used to move the cross slide forwards or backwards within the limits of its total travel.

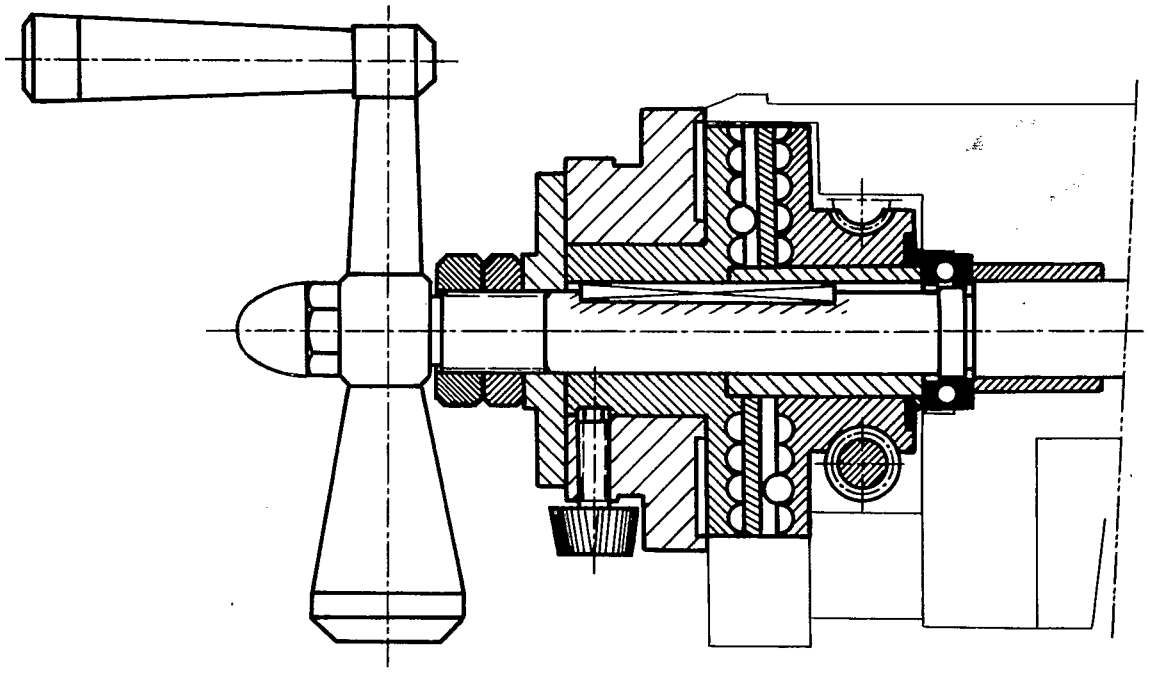
As the worm and wheel system is irreversible, when the worm is engaged it stops the plate from rotating. The slot in this plate is helical, and when it is held in position, action of the cross feed screw displaces the ball in the helical slot until the ball reaches the end of the slot either at the outside or at the centre and stops rotation of the cross feed screw. Operation of the micrometic vernier will move the datum position of this slot and therefore the extreme positions of the tool stop. Between these two extreme positions it is possible to rotate the cross feed screw 6 revolutions which provides a tool movement of 1" (24 mm) for the Cholet 350 and 435 lathes and 1" 1/5 (30 mm) for the Cholet 550.

USE

- Move the cross slide to the rear
- Push down the lever (1)
- Bring the cross slide towards the centre until it contacts the stop
- Lift up the lever (1) which moves the stop out. In this position the ball is located at one end of its ramp.
- Continue to move the slide until the tool reaches its finishing screwcutting position.
- Lift up the lever (1) in this position the stop is located for the finishing cut. It is not possible to move further forward but it is possible to withdraw the tool to the rear for 1" or 1"1/5 (24 or 30 mm) distance depending upon the model of lathe.

- For the next workpiece, the slide can move forwards freely until it reaches the stop position
- If the stop is badly positioned the datum position can be moved using the vernier (2) . Each division on the vernier provides a diameter movement of 0,0001"(1/100 mm)

NOTE : The lever (I) must be moved down for the micrometric vernier to become operative . In other words the screwcutting stop must be in position. When using a rear toolblock or a copying attachment, carry out the same sequence of operations but reverse the datum positions of the stop.

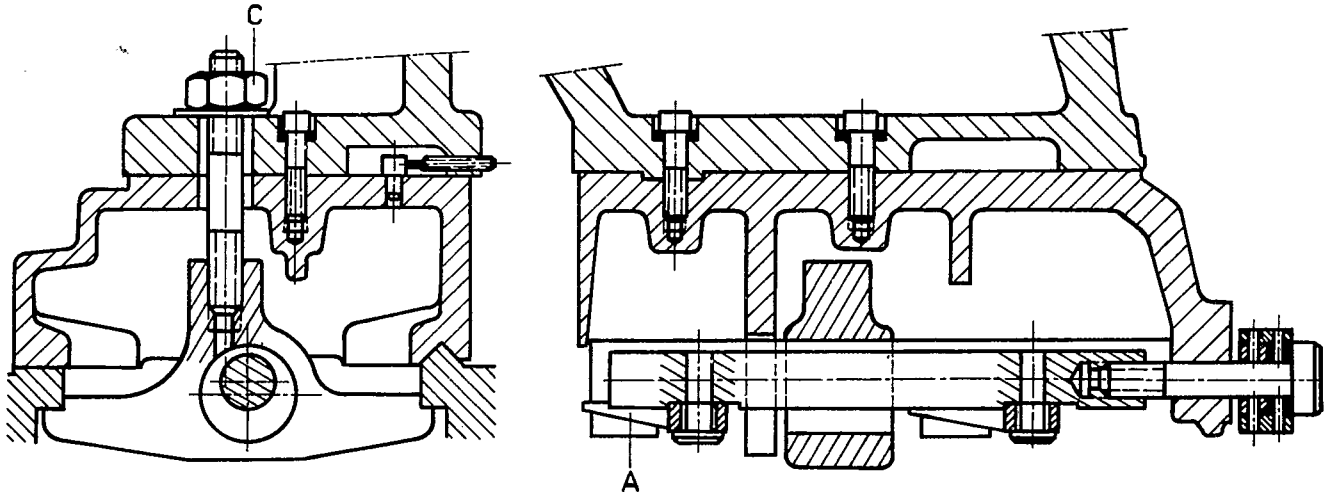


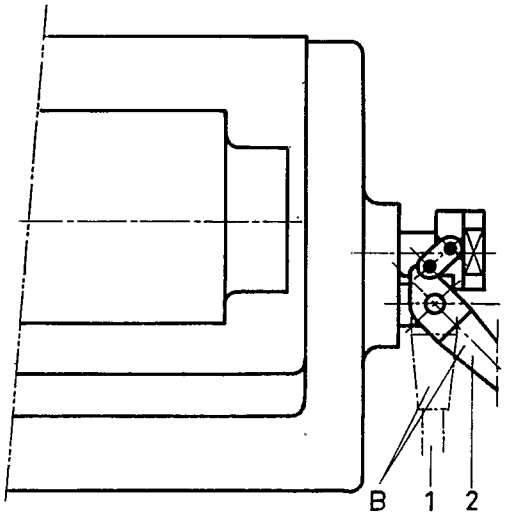
AUTO-CLAMPING TAILSTOCK

The tailstock is retained on the bed by 4 clamping pads (A) which are operated by a lever (B). It is released when the lever is in position 1.

To effect clamping, push the lever towards the rear and rotate the handwheel to clamp the first workpiece securely so that the tailstock is positively clamped.

The tailstock should remain in the clamped position until the lever (B) is operated once more. It is then possible to slacken off the sleeve to provide normal load on the workpiece. For heavy duty operations, clamp the tailstock as shown above, and then tighten the nut (C) which clamps the tailstock firmly in position



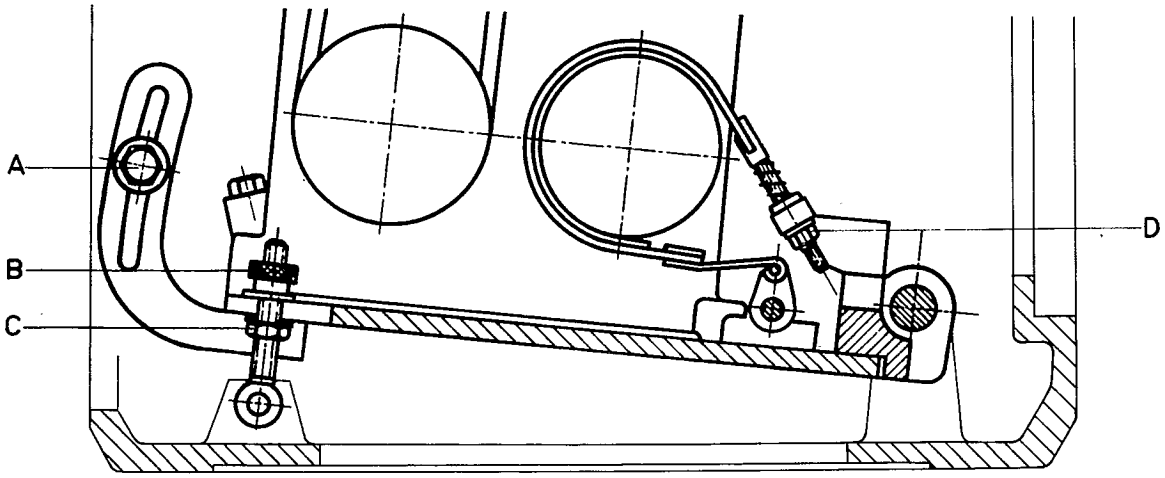


MAINTENANCE

SETTING BELT TENSION

This is done by slackening off the screw (A) completely. Also slacken the locknut (C), and at this point the weight of the gearbox and motor will provide sufficient tensioning of the belts. Bring the nut (B) in contact with the plate and reclamp the screw (A) and the locknut (C).

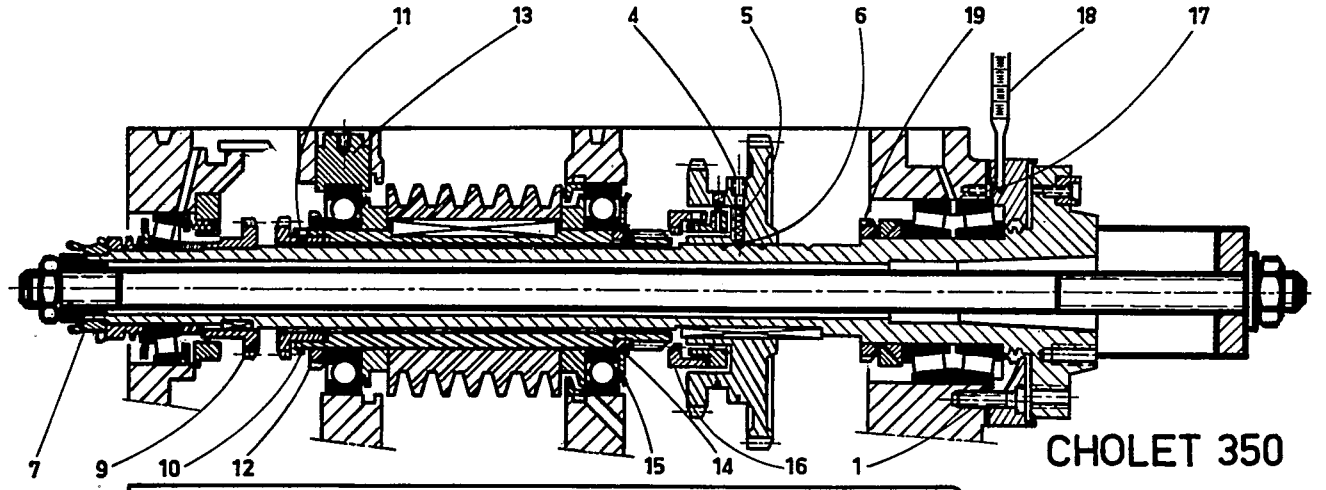
IMPORTANT: Never use the nut (B) to provide additional tension on the belts as this can damage the bearings.



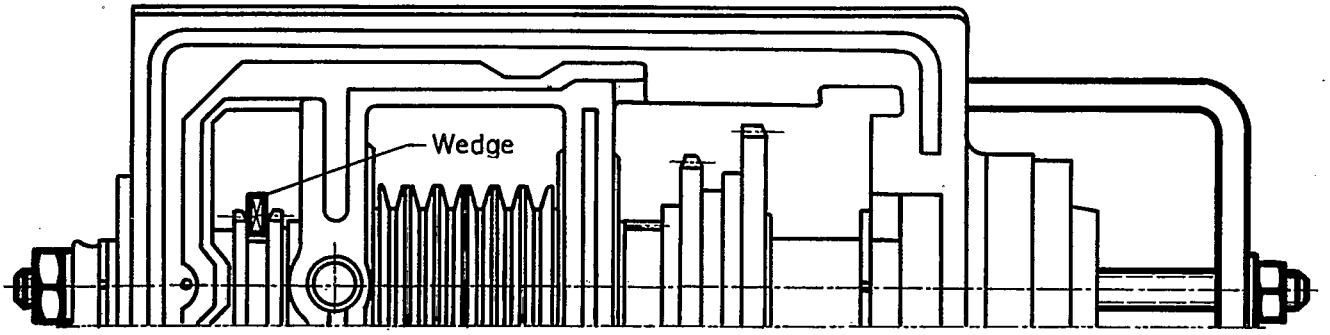
ADJUSTING THE BRAKING MECHANISM

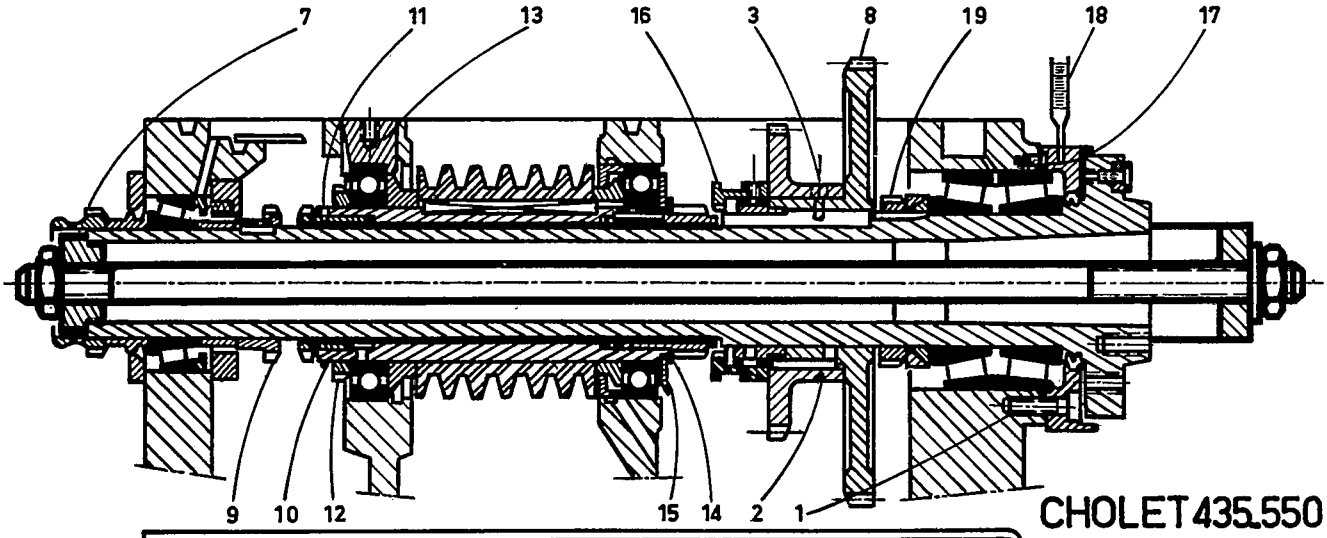
The motor is stopped and braked using the pedal located between the bases. The initial part of the movement switches off the motor by means of a roller type limit switch located at the end of the bar. The second part of the movement operates a flexible lined brake shoe to provide effective braking of the drum which is fitted to the motor shaft . For correct adjustement of braking proceed as follows :

- Stop the motor
- Slacken the nut (D)
- Press the pedal down as far as possible
- In this position tighten the nut (D) so that the brake band rubs on the drum
- Release the pedal
- Tighten the nut (D) 2 or 3 notches to provide the degree of braking required.

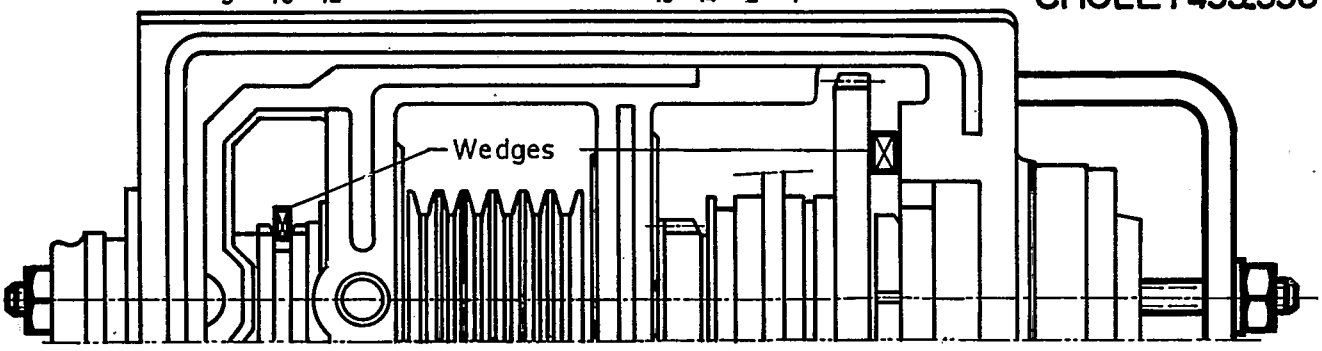


CHOLET 350





CHOLET 435.550



REPLACING BELTS

The pulley is independent of the spindle, and to replace the belts, the spindle must be removed as shown in the diagrams.

a) Remove the front cover plate fixing screws (1)
b) On the CHOLET 435 and 550 lathes, remove the locking wire (2) and the screw (3) from the front gear
For the CHOLET 350, remove the screws (4) the springs (5) and the balls (6) from the front gear
c) Slacken and remove the rear nut (7)
d) For the CHOLET 435 and 550 lathes block the gears (8) and (9) at two points against the headstock casting
For the CHOLET 350, block the gear (9) at two points.
e) Introduce a 1" (24 mm) diameter threaded rod in the spindle bore and locate it at the rear using a coller spigoted in the spindle and locating against it. The end of the threaded rod passes through a drilled stirrup and using a screw against a washer, the spindle can be drawn out.
f) Dismantle the gearing
g) Remove the locking wire (10) and the screw (11). Remove the nut and the eared washer (12) . Remove the bearing locating peg (13) . Remove the circlip (14) and the deflector (15)

Use a piece of soft non ferrous material, and tap the sleeve from the rear until the front spindle bearing is disengaged from its housing. At this point, retain it and withdraw the pulley sleeve towards the rear. The front bearing and its deflector are disengaged. Push the sleeve again towards the front of the headstock until it is completely disengaged.

Excessive force should not be used under any circumstances during this dismantling operation, as the spindle and the pulley sleeve should release quite easily.

NOTE : Due to the special arrangement of the bearings the spindle can be removed and refitted without affecting the bearing adjustment in any way . When refitting, check that the bearings are absolutely clean. Grease the main gear lightly to facilitate its fitting on the spindle.

VERY IMPORTANT : Take care that the direct drive dog (16) does not jam against its operating fork . Also check the position of the outer bearing race on the double front bearing before fitting it into the headstock housing. The locating screw (17) should slide freely in the hole in the collar.

SPINDLE BEARING ADJUSTMENT

These extremely high precision bearings are set in our Factory with an accurately measured clearance.

It is inadvisable, particularly during the guarantee period, to alter this adjustment. It is preferable, before deciding to change the bearing adjustment, to contact our After Sales Department.

Spindle bearing specification . (See figure page 51)

The double row taper roller front bearing provides axial location of the spindle in both directions. The outer race is located radially and held in the headstock housing by the front plate. The rear bearing is a single taper roller type. The outer race slides in the headstock housing and has an elastic preload by means of a set of matched helical springs.

The preload on the rear bearing :

a) Locates the spindle and the rollers of the front bearing in the taper race.
b) Eliminates all clearance in the rear bearing
c) Allows dilatation, retraction, to take place freely towards the rear without effecting the preset front bearing.

TEMPERATURE

Checking the operating temperature can provide the user with a useful guide as to the correct bearing setting, although it must be emphasised that this must be done extremely carefully.

A mercury thermometer (18) (see page 51) should be used in the cavity provided in the upper part of the end plate which should be filled with oil.

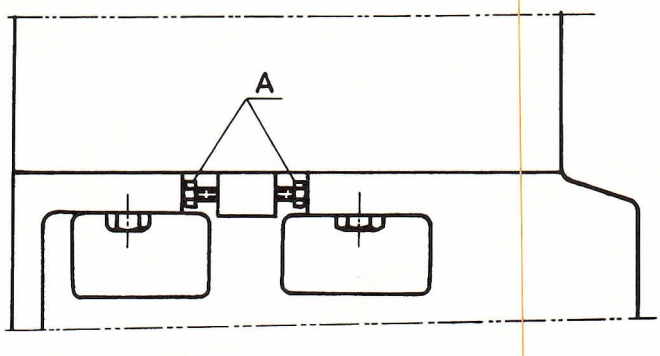
An uninterrupted run of 1 hour and a half at a spindle speed of 1600 r. p. m. should result in a temperature rise of 40°C. over ambient. A higher temperature than this indicates a tight bearing and the test should be stopped.

Any adjustment of the front bearing should be carried out with extreme care and by fractions of a turn (1/16" (1 to 2 mm) on the periphery of the nut 19) (see page 51).

If the bearing has been over tightened, the nut must be slackened off completely and the bearing released by tapping it lightly using a block of aluminium.

If a tight bearing has caused a excessive heating or has caused the spindle to seize, it should be considered as scrap and unsuitable for accurate work.

ADJUSTMENT FOR PARALLELISM

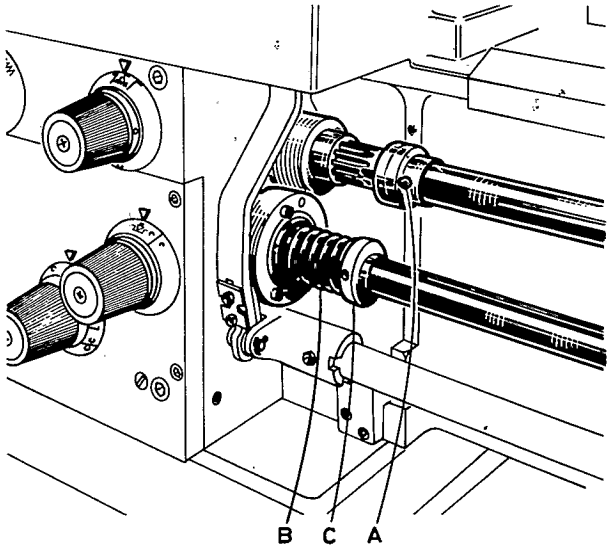


This is done by pivoting the headstock. The pivoting axis is a dowel located on the front of the headstock locating foot.

Slacken the 5 bolts which clamp the headstock to the bed. Move the headstock the necessary amount by adjusting the two hexagon head screws (A) located between the two fixing bolts at the quadrant end.

After adjustments, check that the 5 bolts are really tightened

LEADSCREW OVERLOAD



The leadscrew is driven through a shear pin (A) which goes through two discs ; In the case of excessive overload, the pin will shear between the two discs, and stop the leadscrew.

If the pin shears frequently, never use a pin made of harder material, but find the cause of the trouble by checking the operating conditions.

FEED SHAFT DRIVE

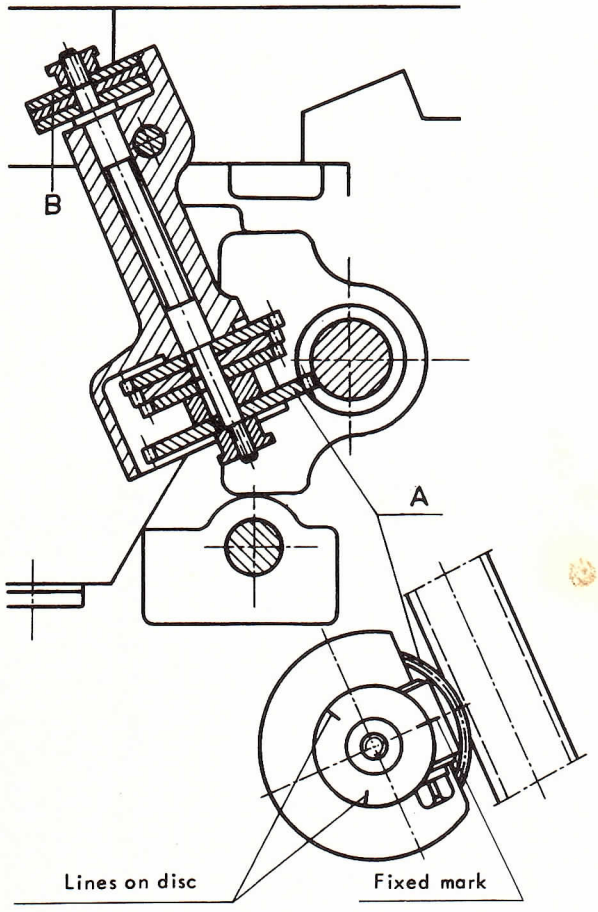
The feed shaft is driven through a number of friction discs which are held in contact by a spring (B) which is set by us in the Factory for the maximum torque.

In the case of excessive overload on powered longitudinal or transversal feed, the unit will act as a slipping clutch.

Never adjust the spring without specific reason. If adjustment is absolutely necessary, set the nut (C) so that a weight of 30 kg attached to the apron hand-wheel will stop the feed movement through the friction discs; under no circumstances should the spring (B) be allowed to become coil bound, which would not leave enough length for disengagement.

ACCESSORIES

SCREWCUTTING INDICATOR



Pitch required	Driving pinion A	Indicator disc B
	Number of teeth	Number of lines
2	36	18
2 1/4	32	2
2 1/2	32	4
2 3/4	32	2
3	36	9
3 1/4	32	2
3 1/2	32	4
4		
4 1/2	32	4
5	36	9
5 1/2	32	4
6	36	18
6 1/2	32	4
7	36	9
8		
9	36	9
10	36	18
11	36	9
12		
13	36	9
14	36	18
16		
18	36	18
20		
22	36	18
24		
26	36	18
28		

The table above provides for each thread to be cut :

I) The number of pinion teeth (A) which meshes with the leadscrew which acts as a rack and is located on the lower part of the unit.

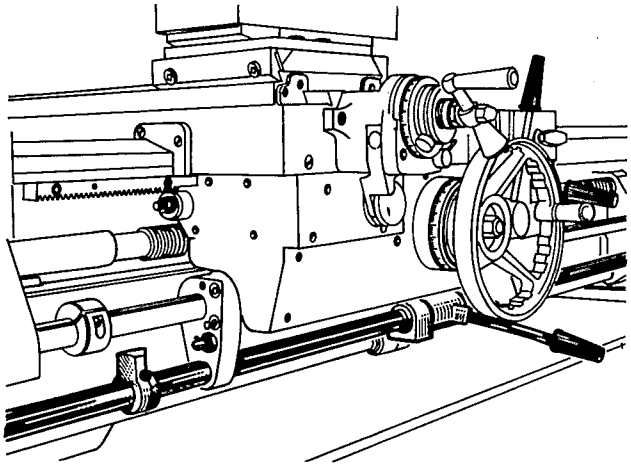
2) The number of lines on the corresponding indicator disc B, which is fitted on the upper part of the unit .

In this way, the leadscrew rotation imparts an angular movement to the spindle of the unit relative to one tooth of the gear (A) . The position of the slide, at the start of screwcutting, is determined by the condition that any one of the lines on the indicator disc is in fact in line with the fixed line, when the operator should engage the leadscrew nut and the leadscrew drive.

Having taken the first screwcutting path, the leadscrew nut is disengaged at any position and without stopping workpiece rotation; the slides are then returned manually to the start position at the tailstock end; re-engagement of the thread is obtained by engaging the leadscrew nut as for the start of screwcutting, that is when the fixed line and one of the lines on the indicator disc correspond.

Threads of : 4-8-12-16-20-24-28 T.P.I. are always within the 4 T.P.I. pitch of the leadscrew.

LEADSCREW REVERSING CONTROL



The CHOLET lathe is fitted with leadscrew reversing controlled from the headstock; as standard. In fact , this is more a control of the direction of rotation of the screw rather than a reversing system for screwcutting as the operation lever is not really convenient to the operator's hand.

Note can be made of reversing by means of reversing the spindle motor but the disadvantages of this are obvious and the main disadvantage is the excessive load imposed on the electrical equipment and the rotating units.

For this reason , the CHOLET lathe can be equipped with a leadscrew reversing control which is synchronised and operated from the apron, and is convenient to operate for screwcutting , including short length. With control from the apron the control on the headstock is nevertheless retained.

Operation :

The reversing mechanism is located in the headstock on the quadrant drive shaft. It consists of a double dog clutch with one engaged position, on the front and rear drive trains.

The control on the apron follows all the saddle movements, and operates the headstock unit by means of a bar located beneath the apron. In this way the lever is always convenient to the operator. By pivoting this bar about its axis the leadscrew rotation can be reversed and there is a neutral position between the two which stops the leadscrew.

Furthermore, a special sliding stop on the reversing control bar at the headstock end provides for automatic disengagement of screwcutting feed towards the headstock. This adjustable stop can be clamped on the bar at any position and can be used for any type of screwcutting over the full length of the machine.

The stop operates as follows: after having engaged the leadscrew to traverse the saddle towards the headstock, the saddle contacts the inclined end of the stop.

A dowel located on the saddle contacts the edge of the stop, and causes the stop and the control bar to swivel which stops the leadscrew rotation. In other words, when the saddle contacts this stop, it moves the leadscrew

reversing control to the neutral position. It is merely necessary to move the bar further in the same direction manually using the operating lever, for the leadscrew to reverse direction. All these operations are carried out without stopping the spindle.

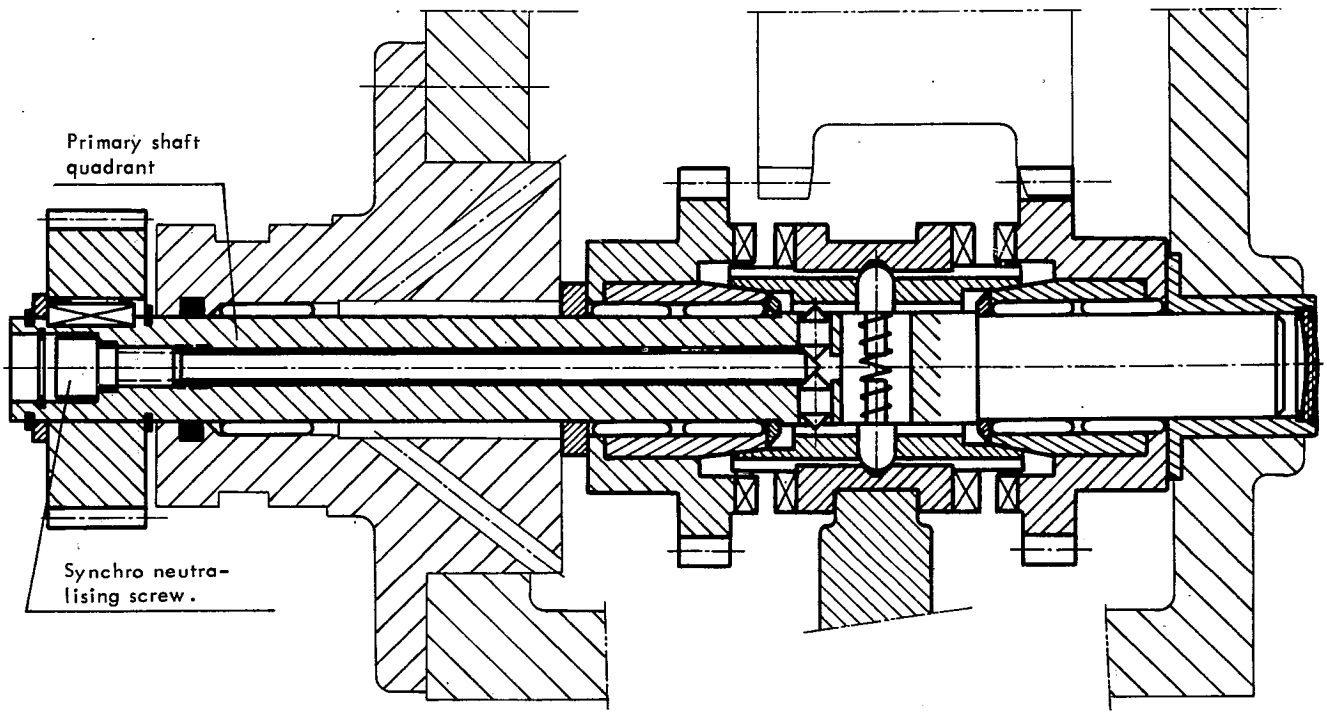
Limitation in use

Due to its construction the leadscrew reversing mechanism rotates at the same speed as the spindle. As the reversing dogs have only one position of engagement it is obvious that when the drive from the spindle to the leadscrew is disengaged during reversing, the difference between these two units consists of a whole number of spindle revolutions.

On the other hand, when amplified pitches are used, this introduces a fractional ratio between the reversing mechanism and the spindle which is equal to and in inverse ratio to that of the gearing.

Consequently, the use of the reversing mechanism will in this case, result in an unacceptable difference of a fractional number of spindle revolutions between the spindle and the leadscrew drive.

It can be seen from this that the leadscrew reversing mechanism is not compatible with amplified pitch operation and that it can only be used correctly for normal pitches.

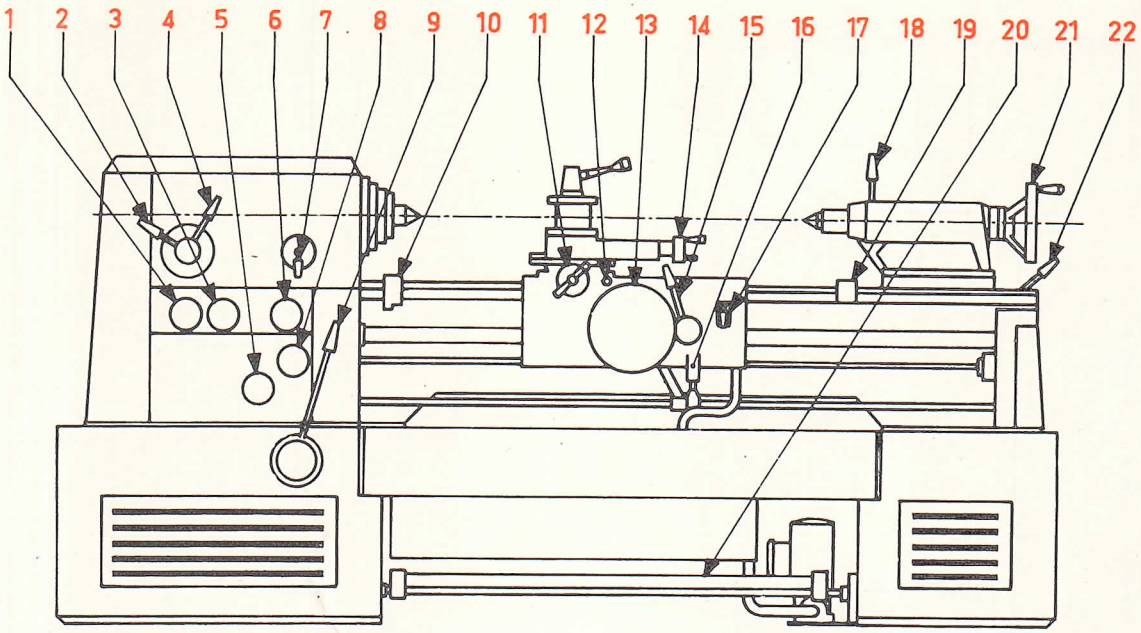


Furthermore, as explained in the chapter describing " maximum spindle speeds for screwcutting " (see page 41) the reversing mechanism cannot be used at the highest spindle speeds, and it is advisable not to use higher speeds than those listed in this chapter relative to the pitch to be cut.

Similarly, at spindle speeds below 80 r. p. m. the synchros have a tendency to drive the front or rear trains positively before the dog clutch is engaged, which will affect the precise positioning of the take-up of the thread . Under these conditions the synchro functions must be neutralised. This is done by tightening the screw at the end of the quadrant primary shaft which neutralises the synchronisation effect as shown in the diagram.

Slacken this screw completely to re-engage synchronisation for higher speeds.

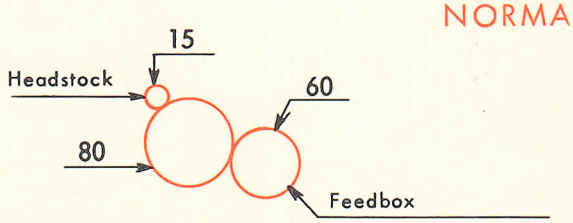
TERMINOLOGY OF MAIN UNITS

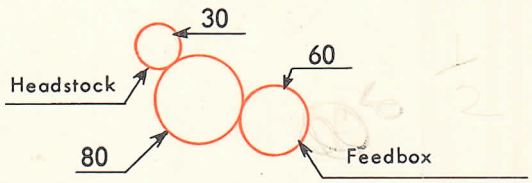


1 - Feed and screw cutting selector
2 - Control lever for standard and amplified pitches and disengagement
3 - Selector for metric and English threads and turning feeds
4 - Feed and screw cutting direction reversing lever
5 - Selector for feeds and pitches
6 - Selector for metric and English pitches and turning feeds
7 - Selector lever for direct drive-gearing
8 - Drive disconnection knob
9 - Spindle speed selector lever
10 - Longitudinal stop
11 - Transversal handwheel
12 - Opérating knob for transversal stop bar
13 - Longitudinal handwheel
14 - Tool slide handwheel
15 - Lead screw nut operating lever
16 - Remote control for starting spindle and selecting direction of rotation
17 - Slide traverse selector (work feed and rapid traverse longitudinal transversal)
18 - Tailstock sleeve clamping
19 - Longitudinal safety stop
20 - Main motor stop and brake pedal
21 - Tailstock sleeve handwheel
22 - Tailstock clamping lever

SCREWCUTTING TABLE

NORMAL FITTING





LEVER	1	2	3	4	5	6	7	LEVER	1	2	3	4	5	6	7
METRIC PITCHES															
A	0,25	0,281	0,312	0,343	0,375	0,406	0,437	A	0,5	0,562	0,625	0,687	0,75	0,812	0,875
B	0,5	0,562	0,625	0,687	0,75	0,812	0,875	B	1	1,125	1,25	1,375	1,5	1,625	1,75
C	1	1,125	1,25	1,375	1,5	1,625	1,75	C	2	2,25	2,5	2,75	3	3,25	3,5
D	2	2,25	2,5	2,75	3	3,25	3,5	D	4	4,5	5	5,5	6	6,5	7
ENGLISH PITCHES (T.P.I.)															
A	64	72	80	88	96	104	112	A	32	36	40	44	48	52	56
B	32	36	40	44	48	52	56	B	16	18	20	22	24	26	28
C	16	18	20	22	24	26	28	C	8	9	10	11	12	13	14
D	8	9	10	11	12	13	14	D	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7

ENGLISH PITCHES (Additional)

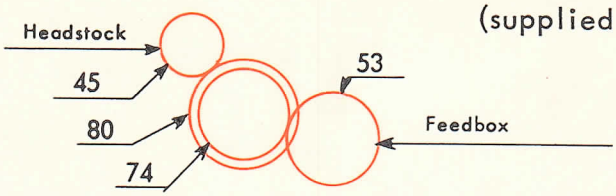
Pitch required t.p.i	Gear positions		Lever position to suit : t.p.i
	Headstock	Feedbox	
$11\frac{1}{2}$	20	46	C.3
19	15 or 30	57	20

Using amplified pitch selection and gearing drive, the pitches shown are multiplied by 4 or 14 for the Cholet 350 and by 4 or 16 for the Cholet 435 and 550.

MODULE AND CIRCUMFERENTIAL PITCHES

(supplied to order)

$$\left(\frac{\pi}{\text{DIAMETRAL PITCH}}\right)$$



MODULE PITCHES Lever positions on Metric pitches.							CIRCUMFERENTIAL PITCHES Lever positions on English pitches.						
1	2	3	4	5	6	7	1	2	3	4	5	6	7
0,25 π	0,28125	0,3125	0,34375	0,375	0,40625	0,4375	π/64	72	80	88	96	104	112
0,5 π	0,5625	0,625	0,6875	0,75	0,8125	0,875	32	36	40	44	48	52	56
1	1,125	1,25	1,375	1,5	1,625	1,75	16	18	20	22	24	26	28
2	2,25	2,5	2,75	3	3,25	3,5	8	9	10	11	12	13	14

TURNING

Longitudinal feed rates 2/10th metric pitch
Transversal feed rates 1/10th metric pitch