
INSTRUCTION DE SERVICE

A remettre à la personne chargée de la conduite de la machine.

SERVICE INSTRUCTIONS

To be handed to the operator in of the machine.

BETRIEBSANWEISUNG

Diese Anweisung ist für die Maschine bedienende Person bestimmt.

**PLEASE RETURN
TO P.E.D.**

Machine	SCHAUBLIN	type	:	102-80
Machine / Maschine		N°	:
BL		N°	:	256'684
Tension / Spannung		Volts	:	420

FABRIQUE DE MACHINES **SCHAUBLIN S.A.** BÉVILARD/SUISSE

F38 HEADSTOCK WITH ANTIFRICTION BEARINGS (CLOSED DESIGN)

Type 102-36 with quick-closing lever

- a) Lubrication by oil gun for normal and special I speed ranges
- b) Lubrication by oil mist for normal, special I and special II speed ranges

SPECIFICATION

Item Nr. 102-36

Thread on spindle nose	diam. 67.6 x 3 mm (2.661 x .118")
Length of thread on spindle nose	15 mm (19/32")
Cylindrical seat of spindle nose	diam. 68 x 10 mm (2.677 x 13/32")
Spindle bore	diam. 38 mm (1 1/2")
Maximum bore through standard collet (*)	diam. 32 mm (1 1/4")
Internal taper of collet sleeve	15°
Width of pulley steps	47 mm (1 27/32")
Diameters of pulley steps	100/125 mm (4/5")
Weight in kg (lbs)	34.500 kg (76.06 lbs)

(*) Note : For a through bore greater than 29.5 mm (1 5/32") diameter and up to 32 mm (1 1/4") diameter it is necessary to remove the internal protective tube (102-36.031) situated at the rear of the spindle (102-36.002).

To do this, proceed as follows :

1. Open the collet
2. Unscrew the nut (102-36.019).
3. Withdraw the tube (102-36.031).
4. Refit the nut (102-36.019).

**PLEASE RETURN
TO P.E.D.**

MAINTENANCE

A. Cleaning on receipt

All external and internal machined parts are given a coat of anti-rust grease prior to despatch.

This grease has no lubricating property. Its presence may cause serious seizures, even several weeks after the machine has been put into use. Clean the entire unit with a chemically neutral white cloth (free of acid or chlorine) soaked in paraffin. Avoid using alcohol or petrol (which often contains alcohol) or any other organic product that would dissolve the cellulose paint.

B. Lubrication of bearings (applicable only to lubrication by oil gun)

The front and rear bearings are lubricated through two nipples placed on the headstock. Use a good mineral oil with a viscosity of about 3°E at 50°C (see lubrication chart ING 57-1). For lubrication, use the oil gun supplied with the machine.

The lubricant and the method of lubrication used have an effect on the friction and temperature of the bearings. Any large accumulation of lubricant can cause overheating.

Lubricate often, but little. (At the most once a day in normal service). Never use grease. Any excessive amount of grease can restrict the motion of the rolling elements to such an extent that they only slide on the tracks.

C. Lever-operated quick-closing attachment

The fulcrum pin of the lever (102-36.004) is provided with an oil nipple (K7)

Give a few shots of oil to this point once a week. Oil also the dogs (102-36.012). Remove the spindle-nose nut (102-36.011) and lubricate the clamping elements inside the spindle.

The bearing (ND 993-L11) is prepacked with grease.

(See lubrication chart ING 57-1).

ADJUSTMENT OF SPINDLE BEARINGS

The two bearings are carefully adjusted during assembly of the headstock. No subsequent adjustment is necessary until after a relatively long period of running.

Only a skilled person should be permitted to make the adjustments described below, as they call for the greatest possible care.

A. Taking up axial and radial play in the front and rear bearings

1. Determine the exact amount of radial play by means of a comparator reading to within 1/1000 mm (.00004").
2. Pull the lever (102-36.004) towards you and unscrew the nut (102-36.019).
3. Unscrew the sleeve (102-36.014).
4. Remove the support (102-36.005) together with the quick-closing assembly. The support (102-36.005) is secured by four screws.
5. Loosen the screw of nut (102-36.018) and tighten the latter according to the amount of play to be taken up.
6. Firmly tighten the screw of nut (102-36.018).
7. Refit the quick-closing unit and check the axial play of the bearings which must be :
 .003 to .005 mm (.000120 to .000197") in the case of the normal speed range,
 .005 to .007 mm (.000197 to .000276") in the case of the special I speed range
 and
 .008 to .010 mm (.000315 to .000390") in the case of the special II speed range,
 if perfect running conditions are to be obtained.
 This check must be made with the two (TIMKEN bearings 39236-39412) completely dry.
8. Refit all the parts in the reverse order of dismantling.

SPINDLE-LOCKING DEVICE

The piston (102-34.021), actuated by a knurled pinion, is brought into mesh with the teeth of the gear (102-36.016) and allows the spindle to be locked as and when required.

The gear (102-36.016) is designed also to drive the screwcutting attachment (102-35.500) made for mounting on the F27, F38 and F64 headstock with antifriction bearings (closed design).

LEVER-OPERATED QUICK-CLOSING ATTACHMENT

A. Fitting and operation

The support (102-36.005) is fixed to the frame of the headstock by means of 4 screws (CCM M8x22).

To clamp the workpiece, push the lever (102-36.004) to the left. To unclamp the workpiece, pull the lever to the right.

Important! When handling bar work, avoid whip by placing a guide bush in the nut (102-36.019).

B. Adjustment of closing

1. Screw the nose nut (102-36.011) right up.
2. Arrange the dogs (102-36.012) horizontally and check whether the ring (102-36.017) is correctly placed.
3. Exert an axial pressure on the collet from the front of the headstock to ensure that the dogs (102-36.012) are placed in position.
4. Push the lever (102-36.004) to the left.
5. Clamp the workpiece lightly by screwing up the sleeve (102-36.014).
6. Pull the lever (102-36.004) towards you and make the final adjustment of the closing with the sleeve (102-36.014).

The sleeve (102-36.014) is automatically locked in all its positions by two spring-loaded pistons.

C. Adjustment of the bearing sleeve (102-36.007)

Whenever the quick-closing attachment has been removed, it is necessary, after refitting it, to readjust the perpendicularity of the sleeve (102-36.007).

To do this, run the machine at a reduced speed and adjust the two eccentric screws (102-21.615) until the sleeve is immobilized in the vertical plane.

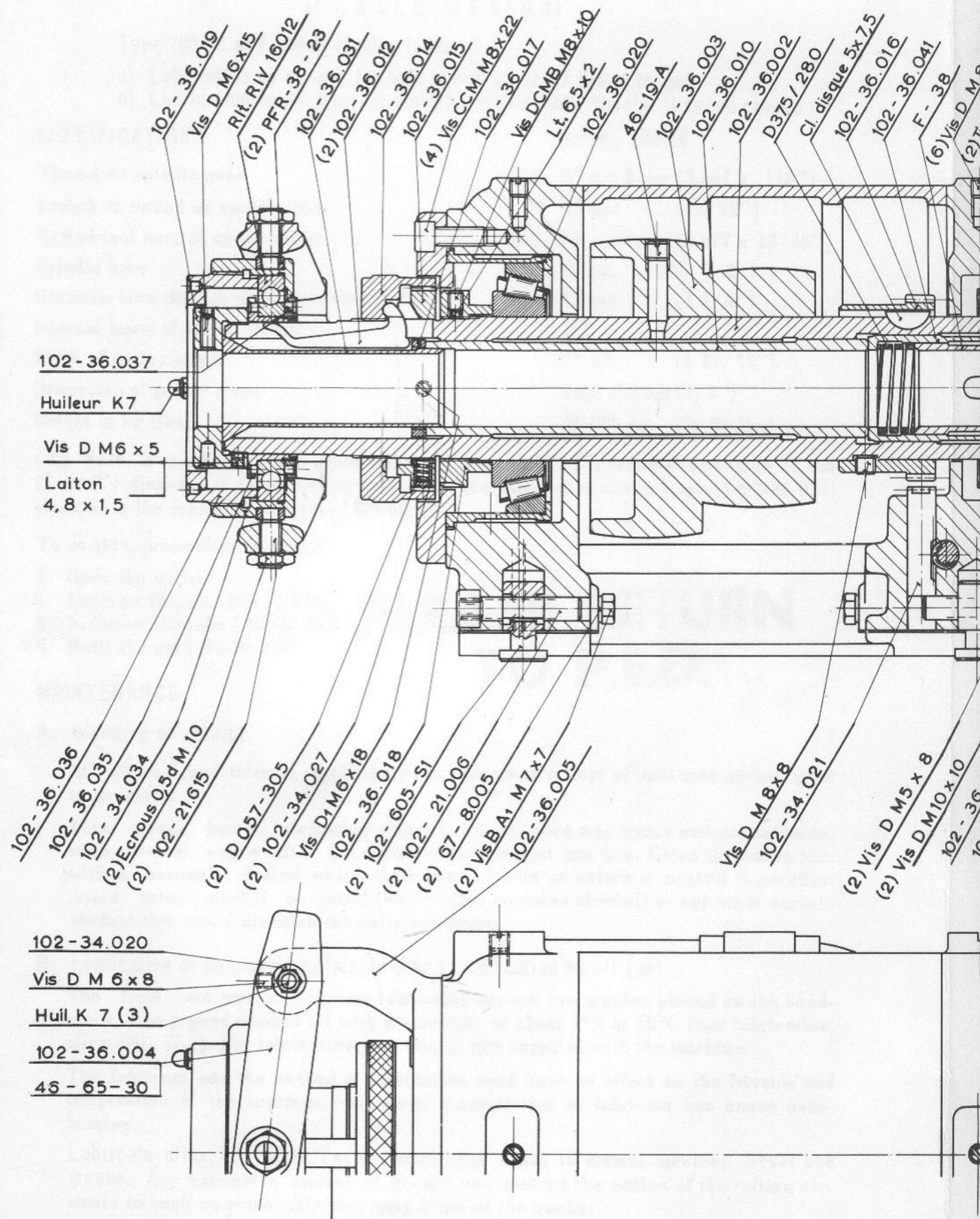
Note! Any distortion in the sleeve (102-36.007), however slight, can cause very rapid wear in the bearing (NN 993-L11).

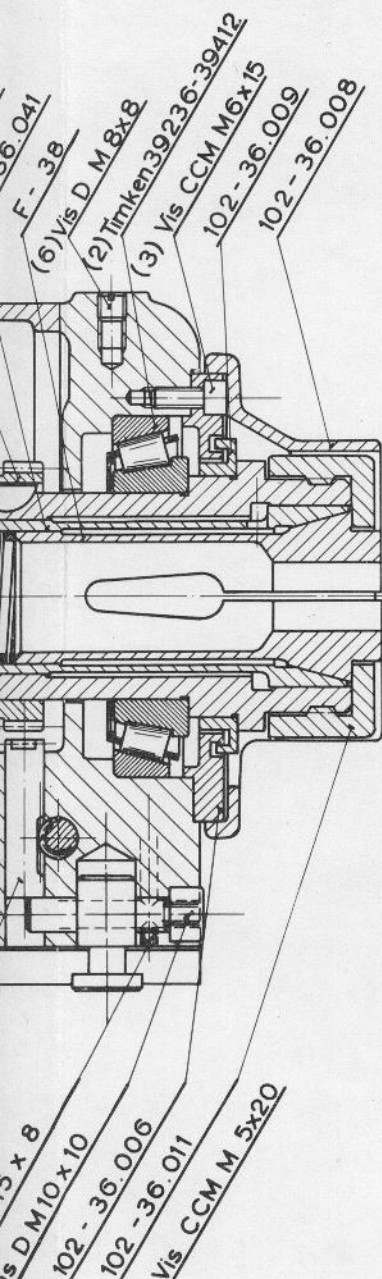
D. Replacement of the clamping dogs

When replacing the clamping dogs (102-36.012), it is essential to fit two parts of the same number.

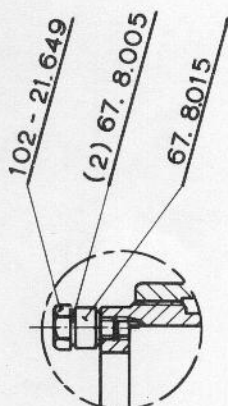
To replace, proceed as follows :

1. Slightly loosen the sleeve (102-36.014) to minimize the pressure on the clamping dogs.
2. Release the pin (102-34.020) by undoing the screw (D M6x8) and withdraw it.
3. Take out the lever (102-36.004). If necessary, slightly slacken the 2 eccentric screws (102-21.615).
4. Unscrew the nut (102-36.019) and take out the sleeve (102-36.007), the nut (102-36.013) and the ball bearing (ND 993-L11) together, without dismantling this assembly.
5. Withdraw the internal protective tube (102-36.031).
6. Unscrew and remove the sleeve (102-36.014).
7. Mount the internal protective tube (102-36.031) in the spindle and adjust the new dogs.
8. Refit the whole assembly in the reverse order of dismantling (see sections B & C, above).

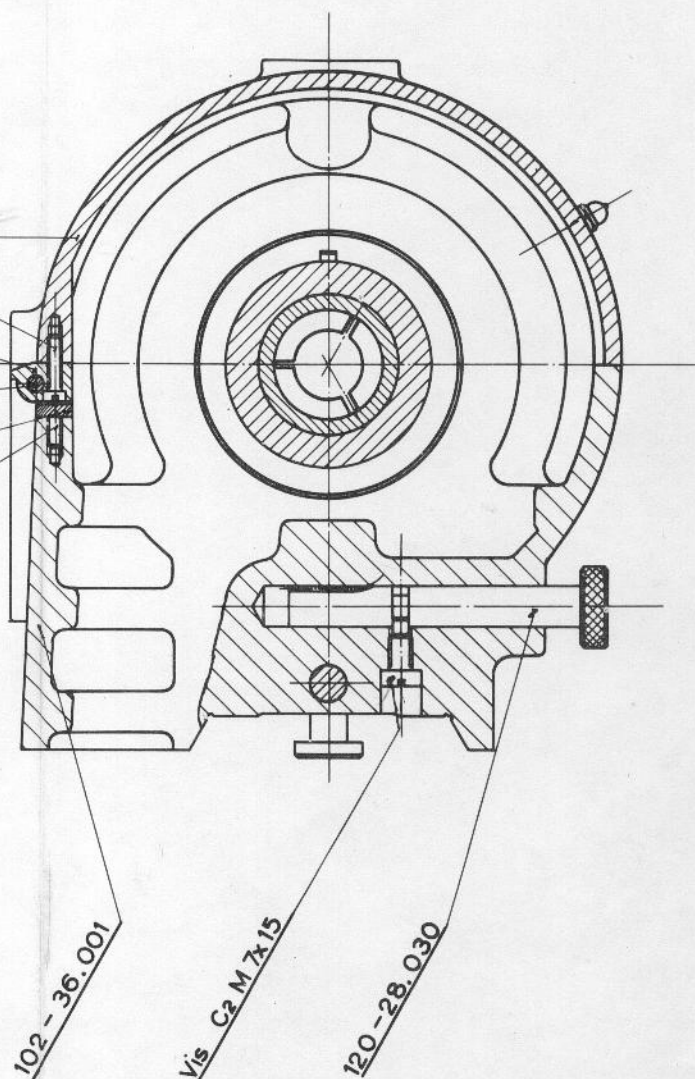
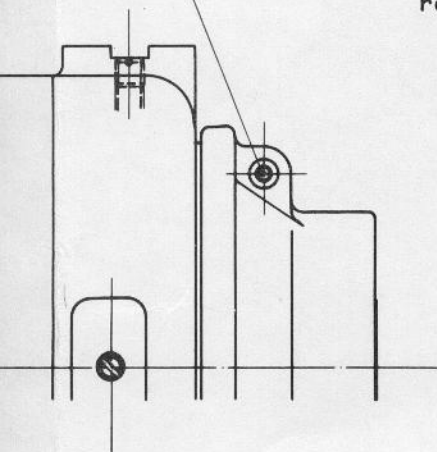




- 102-35.002
 (2) Vis C M 4x16
 102-22.005
 G. cyl. E 5 x 49,5
 102-22.006
 (2) Vis C M 4x20/12



Lubrification du serrage
rapide par brouillard d'huile



**PLEASE RETURN
TO P.E.D.**

Poupée F38 à roulements
 (Exécution fermée)
 avec serrage rapide par levier à main
 Art. N° 102-36

MECHANICALLY CONTROLLED CLUTCH AND BRAKE

The clutch-and-brake device (102-81.030) comprises a clutch cone (102-81.043) integral with the drive shaft (102-81.059) and a fixed braking cone (102-81.044) integral with the bracket (102-80.102). These two cones are mounted on each side of a double sliding housing (102-81.037/038) keyed on to the shaft (102-81.060) of the intermediate gearing and moved laterally by means of a system of levers controlled by the pedal (102-81.006).

A. Adjustment of the braking time

The brake is actuated by the pedal (102-81.006). To avoid too violent braking, it is essential to position the pedal so that the rod (102-81.015) touches the floor at the end of the stroke. The braking time thus becomes independent of the pressure exerted on the pedal and can be extended when the spindle nose is equipped with a chuck or faceplate that is liable to unscrew itself in the event of a too sudden stoppage. Make sure that the safety ring behind the chuck or faceplate is securely locked on the spindle nose.

To adjust, proceed as follows :

1. Unlock the screw (CCM M8x20).
2. Set the position of the pedal (102-81.006).
- c) Relock the screw (CCM M8x20) securely.

B. Adjustment of the clutch pressure

Adjust the tension of the compression spring (D122-561) by means of the spring-holding screw (102-81.074).

Note : Do not overtighten the screw (102-81.074) as this may put the brake out of action by preventing shifting of the fork (102-81.068). If this happens, loosen the screw until the brake becomes operative again.

C. Replacement of the friction linings

To replace the linings (102-81.043) and (102-81.044) when they are worn, proceed as follows :

- a) Unscrew the spring-holding screw (102-81.074) completely and withdraw the spring (D122-561).
- b) Unscrew the four screws (102-81.056) and remove the cover (102-81.032). Then take off the belts and withdraw the assembly comprising the end pulleys, the friction cones, and the brake and clutch drums.
- c) To replace the lining (102-81.043), separate the two parts (drum and lining) and remove the lining (held by three screws (CCM M6x15) and two cylindrical pins).

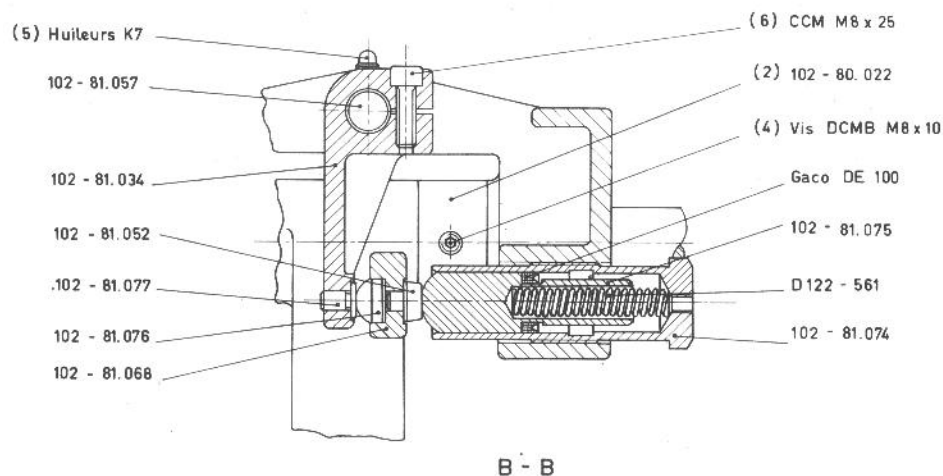
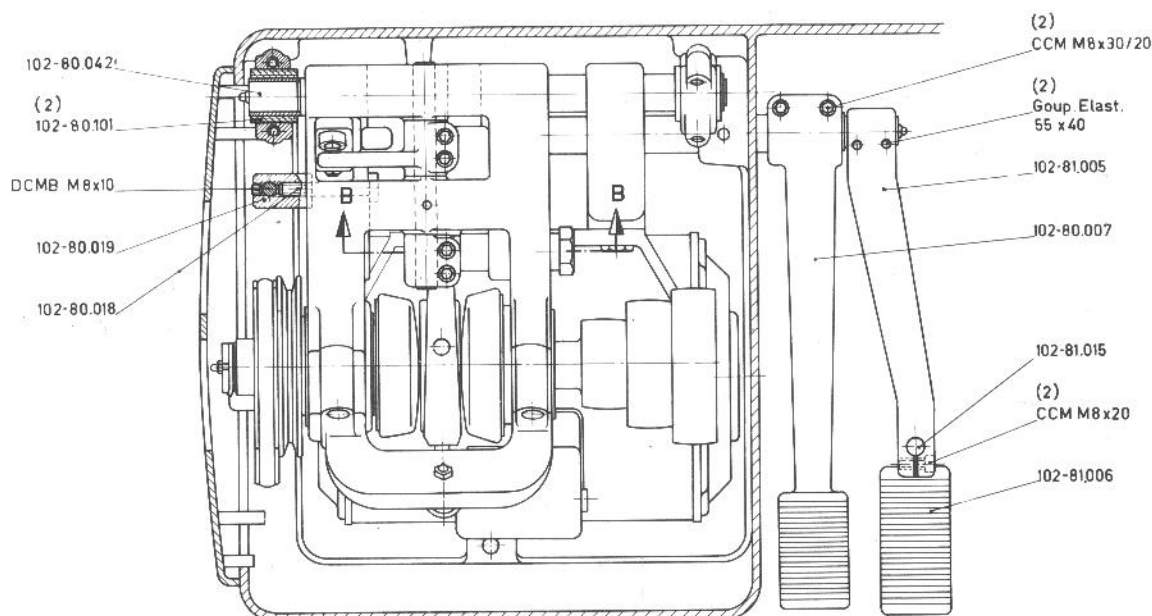
d) To replace the lining (102-81.044), proceed as follows :

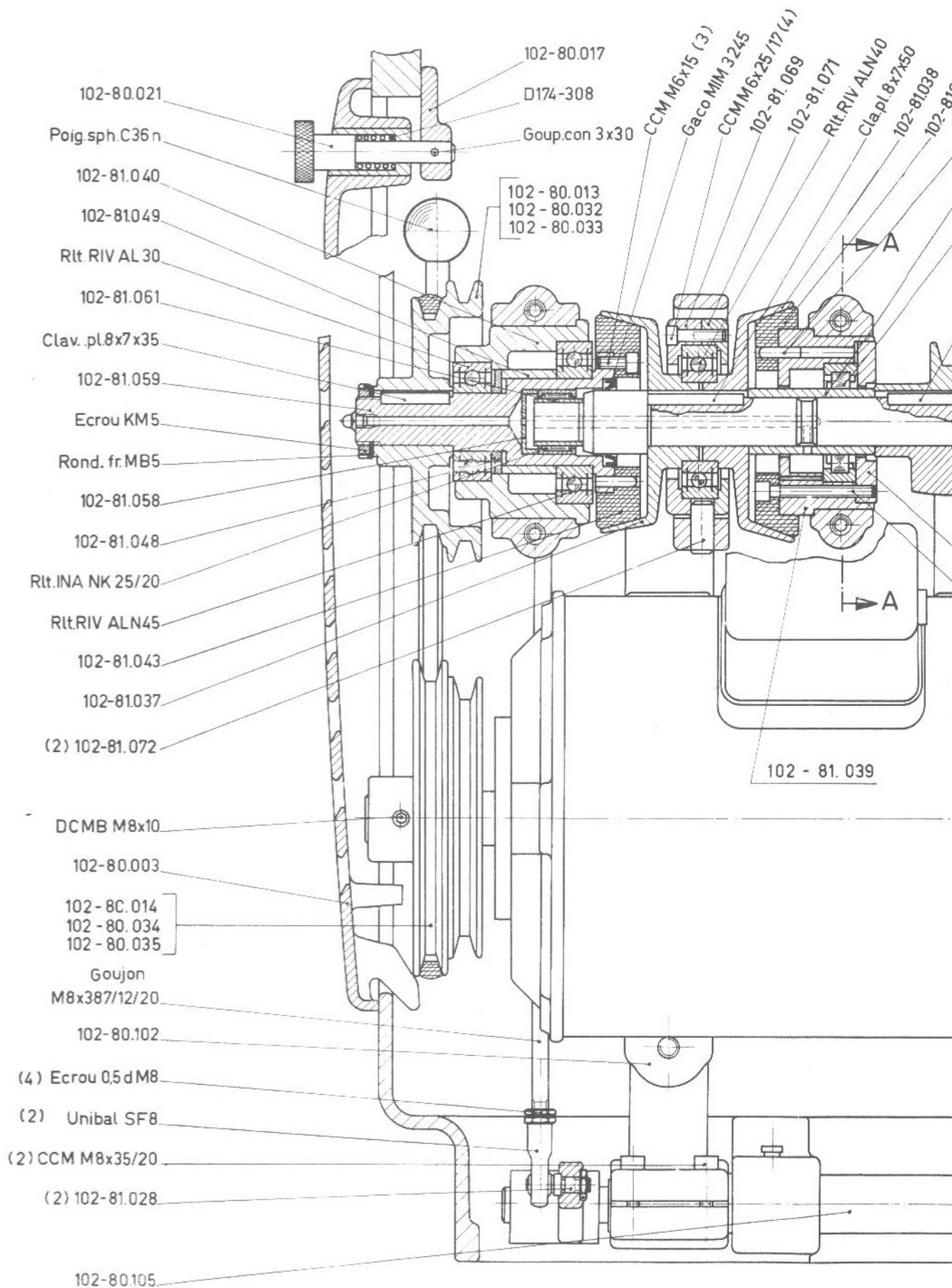
Unscrew the nut (KM5), withdraw the pulley (102-80.010), (102-80.011), or (102-80.012) (depending on the type of headstock fitted to the machine), and extract the key (8x7x50). Separate the lining, mounted on the bush (102-81.039), from the drum (102-81.038). Remove the worn lining, held by three screws (CCM M6x55/17), and two cylindrical pins.

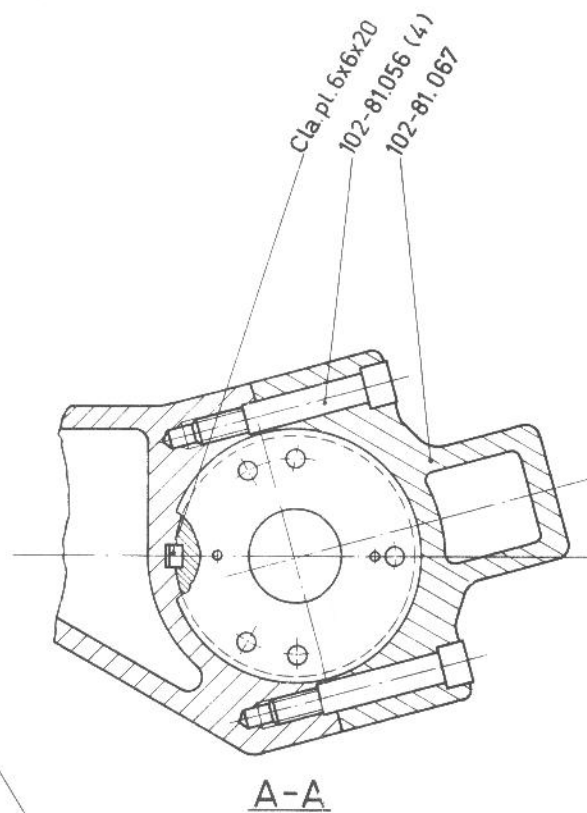
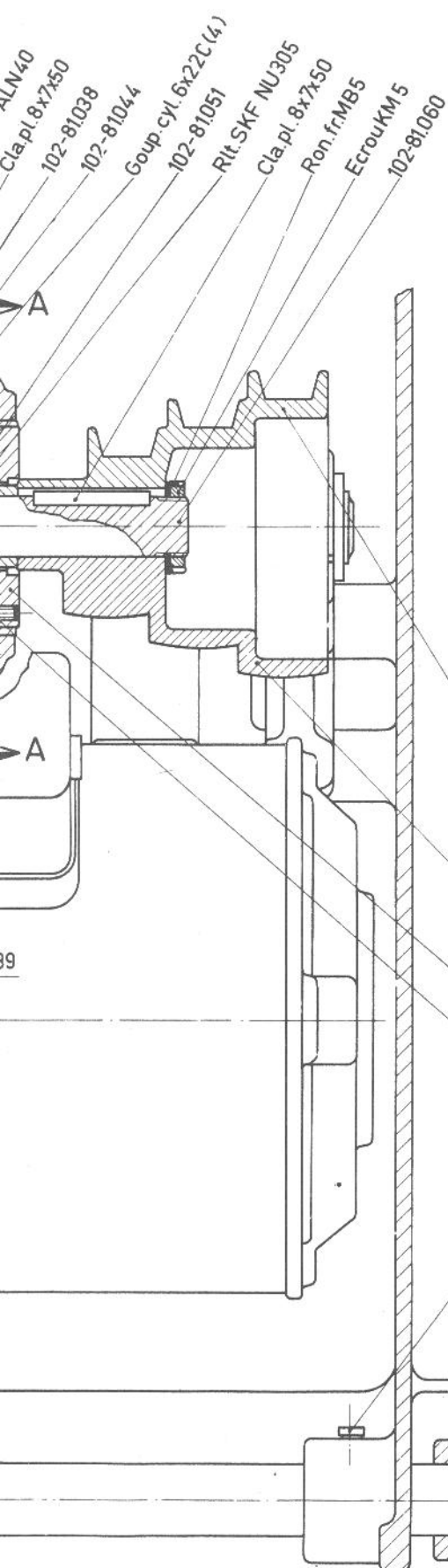
e) After fitting the new linings, remachine the cones slightly : to 14° in the case of lining (102-81.043) and to 20° in the case of lining (102-81.044). Make sure that the cones are then perfectly concentric.

f) Carefully refit all the parts in the reverse order of dismantling. (Do not allow any oil or grease to get on to the linings or inside the drums).

g) After assembly check that the maximum play of the fork (102-81.068) does not exceed 1 mm (.04") (as measured on the axis of the spring).







W 20/W25 102-5.182
F27 102-5.097
F38 102-5.099

W 20/W25 102-80.010
F27/ W 31.75 102-80.011
F38/F64 102-80.012

102-81.041

CCM M6x55/17 (3)

Huileur "Conus" N°1

102-81017

Embrayage et frein
Kupplung und Bremse
Clutch and Brake

BASE 102-80 ELECTRICAL EQUIPMENT

The base is supplied with the complete spindle motor equipment (input terminals, protection switches, switch and wiring) and is ready for connection to the mains.

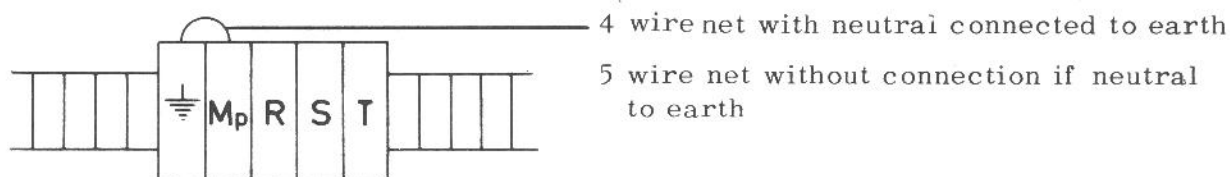
M a i n s s u p p l y

Before connecting the motor, make sure that the voltage marked on the motor data plate corresponds to that of the mains. The whole layout is shown in the diagram overleaf.

The supply line is led to the input terminals through the opening PG 21 in the bottom of the switch box 80.009.

To earth the machine proceed as follow :

Connect the feeding wires to the terminals of the control cabinet according to diagram given below.



Should the motor rotate in reverse direction, inverse two of the three wires R, S and T.

M a i n t e n a n c e

The control equipment requires no maintenance.

The motor's ball bearings are provided with sufficient grease to last 12 months' of normal running.

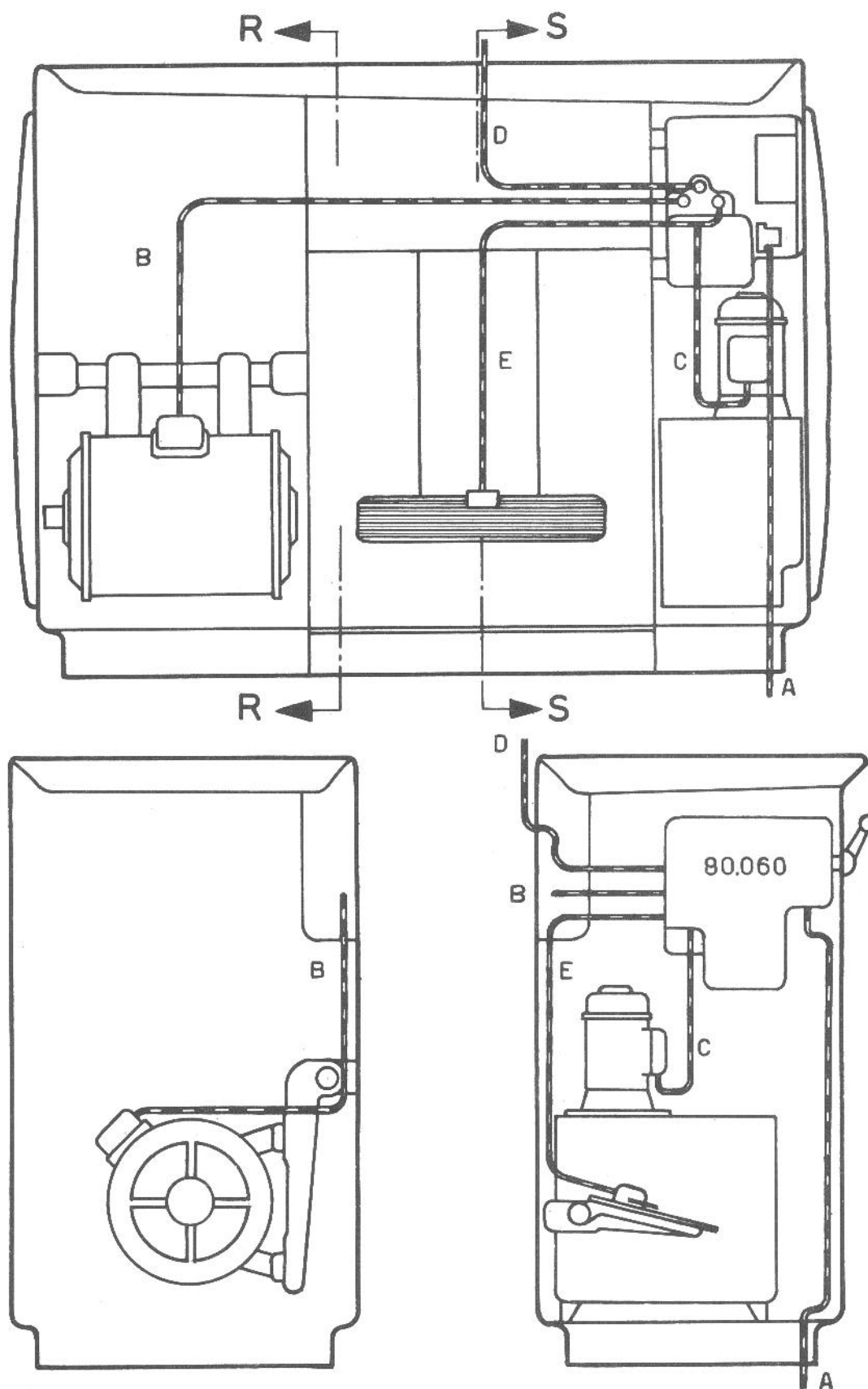
When renewing this supply, use a good ball bearing grease.

When ordering replacement parts for the motor, be sure to state the serial number and type of motor; these are marked on the motor data plate.

- A Supply lead
- B Motor lead
- C Pump motor lead
- D Motor lead milling and grinding attachment
- E Foot switch lead

80.009 Switch box

Leads A and B form part of the lathe's standard equipment, while leads C, D and E are only supplied in the appurtenant attachments are ordered. Switch box 80.009 is equipped to take these various leads whenever they are required.



COUPE R-R

COUPE S-S

FABRIQUE DE MACHINES **SCHAUBLIN S.A.** BÉVILARD/SUISSE

PEDESTAL 102-80

TRANSPORTATION

Depending on its equipment the lathe may weigh up to 500 kg. To transport it by crane, sling the ropes as shown in the diagram overleaf.

CONCRETE FOUNDATION

The Schaublin 102 Lathe should be placed on a concrete foundation having the dimensions shown in the diagram overleaf. The depth of the foundation will depend on the nature of the soil; the foundation must rest on firm ground.

If current is led in from below ground level, a conduit emerging at point 6 must be provided in the concrete foundation. The lead-in cable should be about 100 cm from the ground.

The machine is anchored by means of three foundation bolts. Holes 27 mm in diameter, 90 mm deep and in alignment with the holes in the pedestal must be drilled in the concrete foundation to accommodate the foundation bolts. The pedestal lays on five set-screws supported on plates 100 mm in diameter.

Align the machine by taking the lathe bed as reference surface.

1. Transversal alignment, headstock side:

Tighten foundation bolts 1 and 2 provisionally, align with set screws 1 and 2, and then firmly tighten foundation bolt 1 and 2

2. Longitudinal alignment, with reference to the entire length of the lathe bed :

Tighten foundation bolt 3 provisionally, align by means of set-screw 3 and firmly tighten foundation bolt 3

3. Transversal alignment, tailstock side : effected by means of set-screws 4 and 5.

We supply, on request, a set of "Seetru" flexible foundation bolts with appropriate supporting plates 100 mm in diameter. The set-screws are part of the lathe's standard equipment; the trough holes in the pedestal and in the set-screws are 15 mm in diameter.

Accurate alignment is very important if the lathe is to work with a high degree of precision.

Use only a precision spirit-level (1 division - 0.02 mm over a length of 1000 mm). It cannot be emphasized too strongly that this work must be carried out with the greatest care; half-measures are not sufficient.

The lathe should be accessible from all sides.

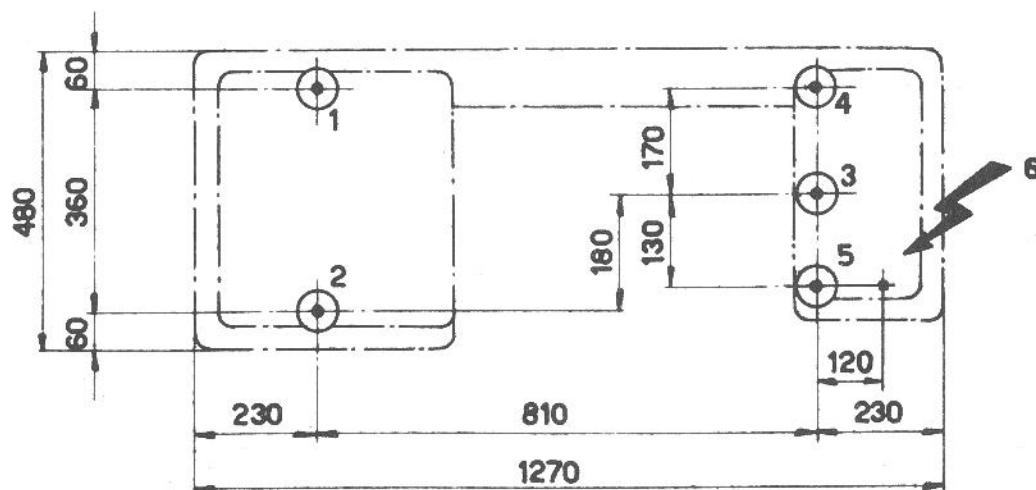
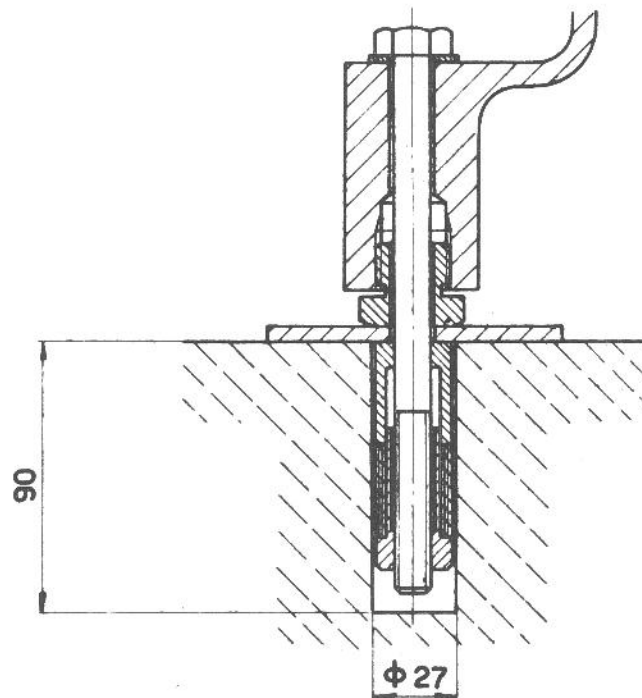
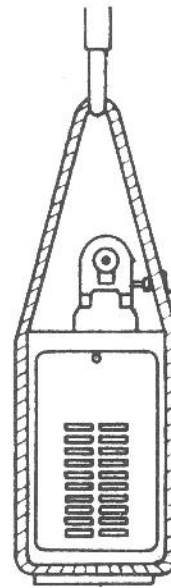
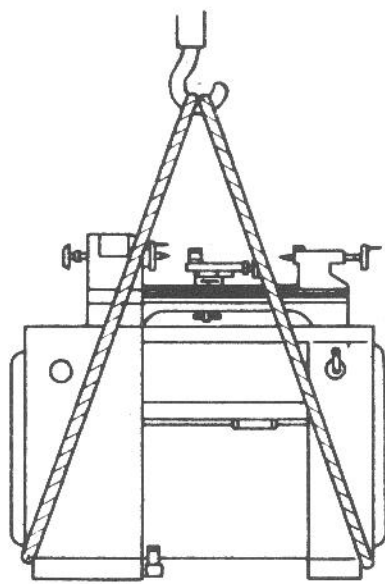
CLEANING

For degreasing and cleaning, use only clean, chemically neutral and preferably white rags. First remove the anti-rust grease with a dry cloth, then rub down the surfaces with a rag soaked in petroleum (kerosen) and wrung out. The anti-rust grease has no lubricating properties and must be completely removed for its presence may cause serious seizing - often weeks after the lathe has been put into operation. When cleaning, be careful not to scratch the surfaces, particularly those of the lathe bed and slideways. Then cover all exposed surfaces with a thin film of lubricating oil.

LUBRICATION

The pedestal contains two oil holes with covers, which can be filled with the aid of an oil-can; a further oil nipple is supplied by means of the hand-operated oil-pump included in the standard accessories.

One lubrication a week is sufficient, using a good mineral oil with a viscosity of 3°E at 50°C.



FABRIQUE DE MACHINES **SCHAUBLIN S.A.** BÉVILARD / SUISSE

COOLING SYSTEM 102-80.600

The motor immersion pump is mounted on a tank with a capacity of 14 litres. This tank can take either water-soluble oil emulsions or insoluble oils (cutting-oils). The coolant passes through an articulated pipe provided with a cock on to the workpiece, and from there through the inclined chip tray, a chip filter and separator in the tank back to the pump which is also fitted with a filter.

CLEANING

The pump, tank, pipes and filters should be completely drained and dismantled at least twice a year. Clean the various parts thoroughly with petrol or kerosene.

It is most advisable to change the cutting oil, and particularly the soluble oil emulsions frequently. If the latter decompose, their fatty substances combine with the chips (especially those of light alloys) and other impurities to form a sticky mass which clogs the filters and pipes.

To prevent premature destruction of the fresh coolant, clean the pipes and tanks thoroughly when changing the oil.

The pump should not be operated unnecessarily or without coolant; also do not forget to switch it off during standstills for it runs noiselessly.

LUBRICATION

The grease in the ball bearings must be renewed once a year; clean the bearings thoroughly with petroleum beforehand and use only a good ball-bearing grease.

ELECTRICAL EQUIPMENT

See connection-diagram.

INSTRUCTIONS FOR FITTING A COOLANT SYSTEM DELIVERED SUBSEQUENTLY BY OUR FACTORY

Fit switch in the switch box and make the connections as per diagram. Drill front plate to admit the push-buttons.

The lead between motor protection switch and pump motor should have 4 insulated wires (1 mm^2) and be placed in a metal sheath PG 9. This lead must be long enough to enable the tank to be removed together with the pump, without the motor needing to be disconnected.

On the motor housing there is a junction box equipped with 6 terminals to which the phases are connected. The motor is designed for 2 voltages (220 - 300 V Δ / 380 - 500 V Y). Connect the motor as shown in the diagram.

To change the direction of rotation, all that has to be done is to permute two phases.



Service Instructions

14 08 0102 20

Immersed Coolant Pump KMT 68-1-180

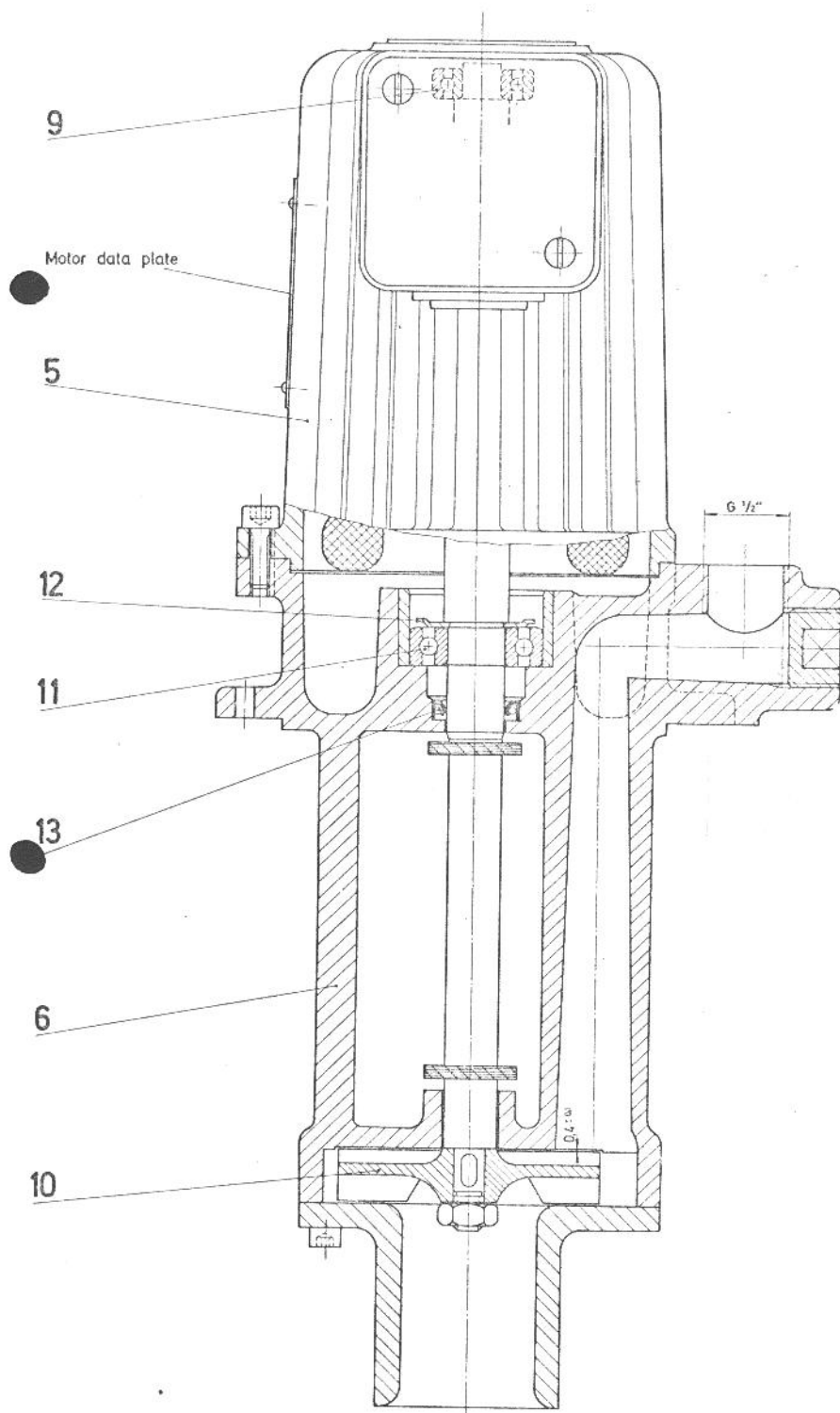
Legende:

- 5 Motor
- 6 Pump casing
- 9 Ball bearing $\varnothing 10/26 \times 8$
- 10 Impeller
- 11 Ball bearing $\varnothing 15/35 \times 11$
- 12 Cover plate
- 13 Shaft seal $\varnothing 24/15 \times 7$

Attendance:

Under normal conditions, the maintenance required by the pump is confined to periodic attendance of the rolling bearings. This is necessary after about 4500 working hours. As a rule, after that time the rolling bearings are changed for new ones and, for simplicity, the shaft seal is also renewed. The rolling bearings have to be lubricated with good ball-bearing grease, free from acid. A motor safety switch, adjusted to the nominal current, has to be connected in series with the motor.

Direction of rotation: right



TURRET CARRIAGE WITH 6 TOOLHOLDERS (102-58.000)

1. SPECIFICATION

Longitudinal working stroke	: 80 mm (3 5/32")
Height of centre above bed	: 102 mm (4 1/64")
Diameter of bores for toolholders	: 20 mm (.787")
Depth of bores for toolholders	: 34 mm (1 11/32")

Accurate and rapid automatic indexing of turret, operated by carriage return.

Lever for disengaging indexing motion (allowing turret to be rotated by hand).

Adjustable stops ensuring constant depth for each tool.

Protection of slide by means of leather cover.

2. MAINTENANCE AND LUBRICATION

The turret carriage is lubricated through three nipples, i.e., two (K7) and one (K2), in which the oil is injected by means of the gun supplied with the lathe.

Once a week, give a few shots of oil to these nipples.

An oil-can must be used for lubricating the drum (102-632-D1).

Once a week, pour a few drops of oil into the notch provided for this purpose.

Use a good mineral oil with a viscosity of approx. 3°E at 50°C (122°F).

(For the oil quality, see Lubricating Chart, ING 57-1).

3.1 Taking up axial and radial play in the turret bearing

This bearing is adjusted, with all the necessary care, during assembly of the carriage at our works.

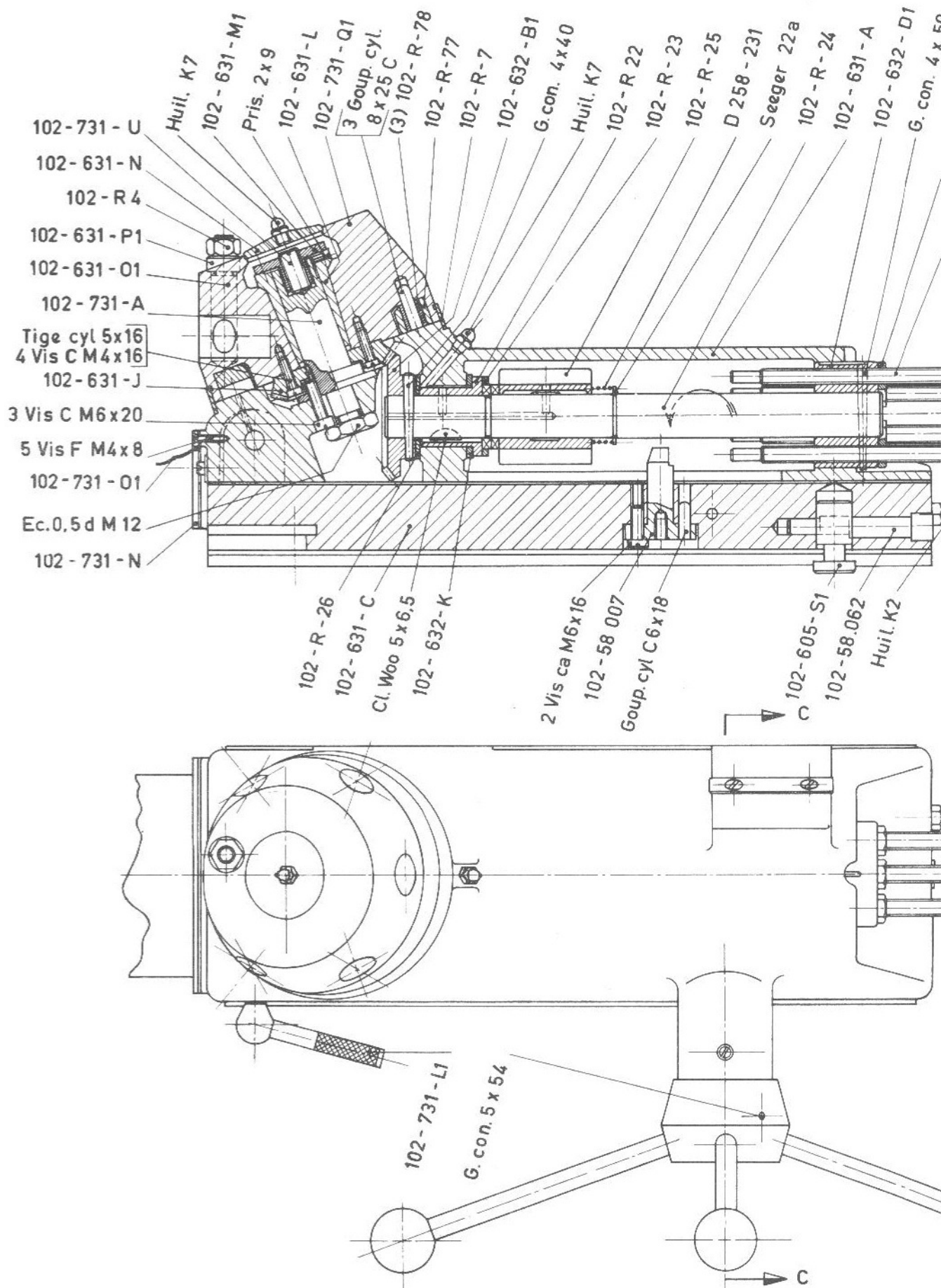
No subsequent adjustment will be necessary until the machine has been used for a very long time. However, it is advisable to check the play in the bearing, from time to time, and take up any excess as follows :

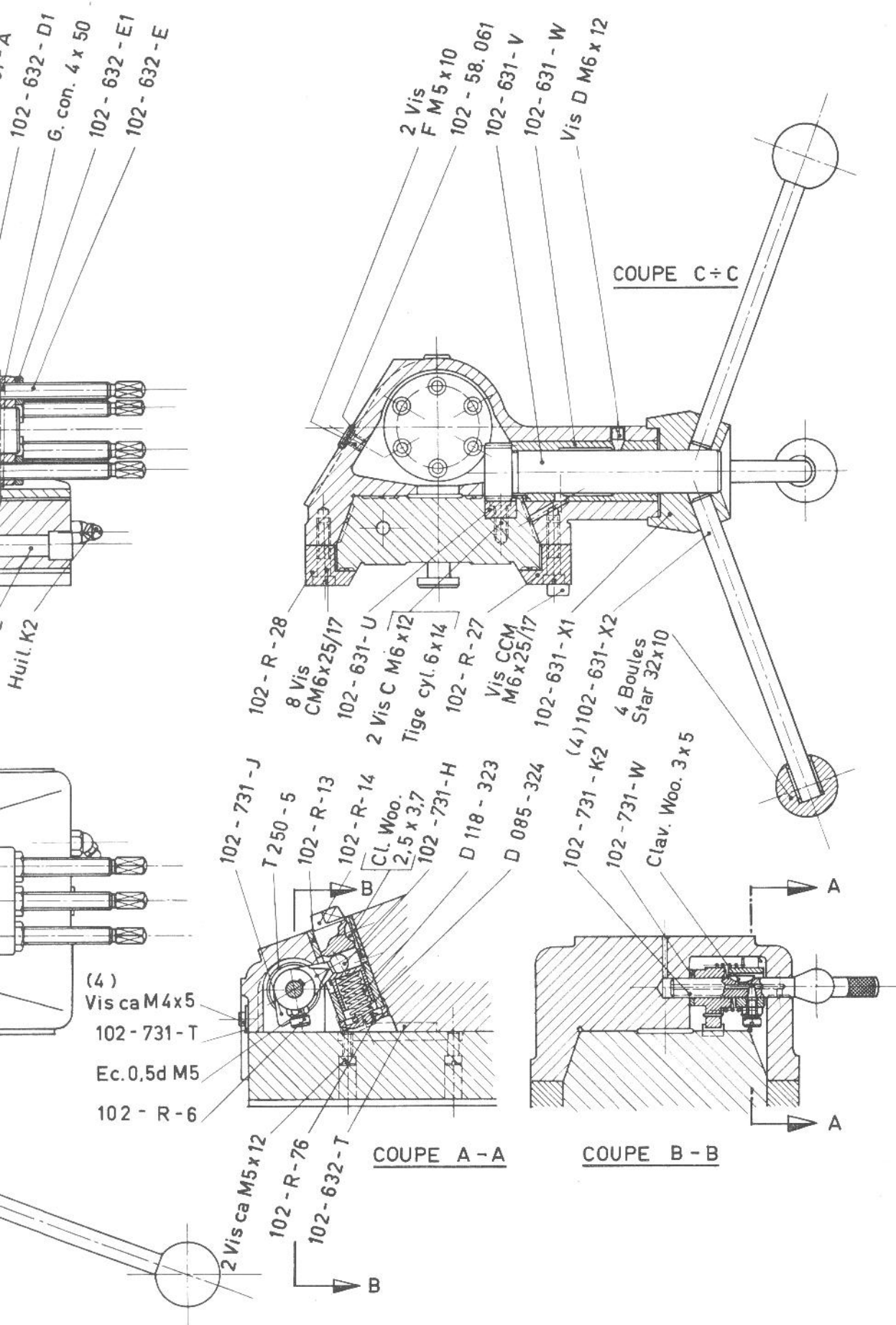
- a) Unscrew the oil nipple (K7) on the turret head.
- b) In place of the nipple, fit an M6 threaded rod at least 12 mm (1/2") long.
- c) Screw this rod in until the cover (102-631-N) is released.
- d) Unlock the screw (102-731-U).
- e) Screw down the nut (102-631-M1) according to the amount of play to be taken up.
- f) Retighten the screw (102-731-U).
- g) Make, at least, one complete revolution of the turret by operating the carriage forwards and backwards by the star wheel.
- h) Check the final amount of play and then refit all the parts referred to above, proceeding in the reverse order of dismantling.

3.2 Taking up play in the slideway

Should the slideway develop an excessive amount of play, (this will happen only after a very long period of use), take up this play as follows :

- a) Check the play in the slideway with the aid of an accurate comparator.
- b) Remove the guide strips (102-R-27) and (102-R-28), each of which is secured by four screws.
- c) Machine the upper face of each of the guide strips according to the amount of play to be taken up.
- d) Refit and lubricate everything.





102-58

Chariot revolver
 Revolverschlitten
 Turret carriage

TANGENTIAL KNEE-TOOL
 Type **SCHAUBLIN 102-59.180/200/220/240/260/300/340**
 (see catalogue **SCHAUBLIN 102/57** pages 65 and 66)
 for Turret carriage with 6 positions of **SCHAUBLIN TR 102** Lathe

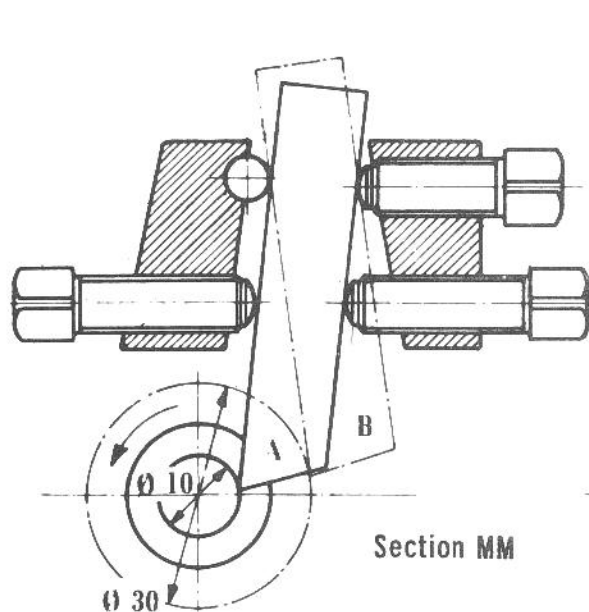
TECHNICAL DATA

Toolholder Art. N°	Capacities		Toolholder body		Tool	
	Ø mm	Length mm	Ø mm	Central bore mm *	Inclination of tool position	Profile
102-59.180	55	30	20	12	6°	10x12
102-59.200	38	40	20	12	6°	10x12
102-59.220	22	40	20	12	6°	10x12
102-59.240 **	22	25	20	9,5	6°	10x12
102-59.260	16	16	20	10	6°	10x12
102-59.300 **	20	55	20	9,5	30°	10x12
102-59.340 **	14	40	20	9,5	0° - 15° - 30°	10x12

* Allows the use of centre drill Ø 9,5 mm or 12 mm respectively with or without reduction bush «e».

** Double toolholders.

EXAMPLE OF MOUNTING AND ADJUSTMENT



A = Position of tool for turning a Ø of 10 mm
 B = Position of tool for turning a Ø of 30 mm.

Fig. 1

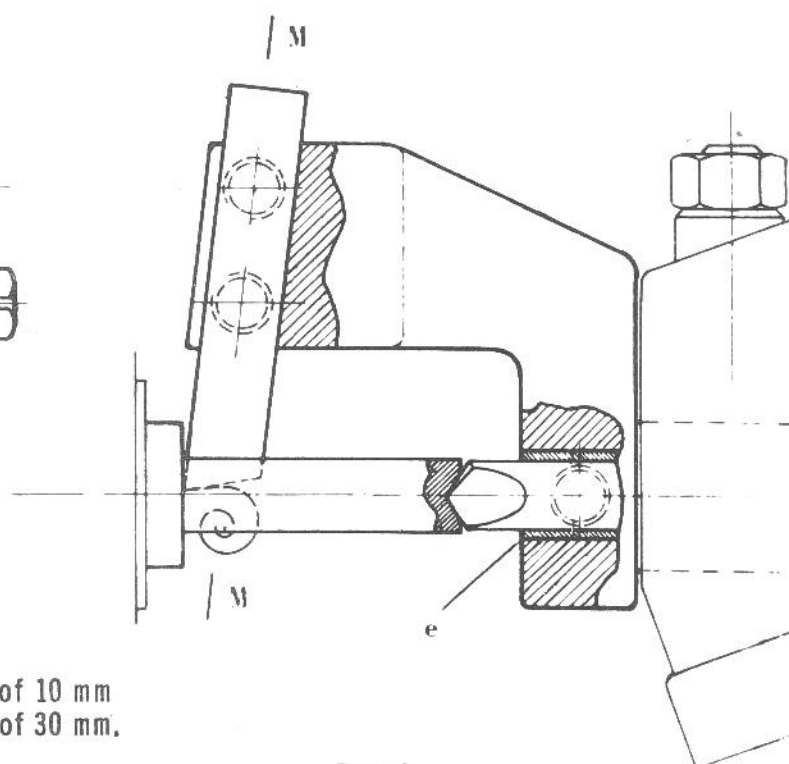


Fig. 2

According to the work which must be done (roughing or finishing cut), the tip of the tool should be ground to the following angles for steel :

ROUGHING CUT (Fig. 3)		FINISHING CUT (Fig. 4)	
up to 38 t.s.i.	above 38 t.s.i.	up to 38 t.s.i.	above 38 t.s.i.
a = 10°	8°	e = 10 - 12°	8 - 10°
b = 10°	8°	f = 15 - 18°	8 - 10°
c = 8 - 10°	8 - 10°	g = 70 - 74°	70 - 74°
d = 70 - 72°	72 - 74°		

Since the cutting edge of the finishing tool as per Fig. 4 is straight, i.e., parallel to the axis, it is advisable to give a sharper cut, as per intermittent line h, when lachining drawn mild steel (quality 00.11 or 37.11, e.g.).

The face of the tangential tool should be above the middle at a distance x. (See Fig. 4).

x = about 1/8 of the turned \varnothing for steel of 38 t.s.i. tensile and more.

x = about 1/10 of the turned \varnothing for steel below 38 t.s.i. tensile.

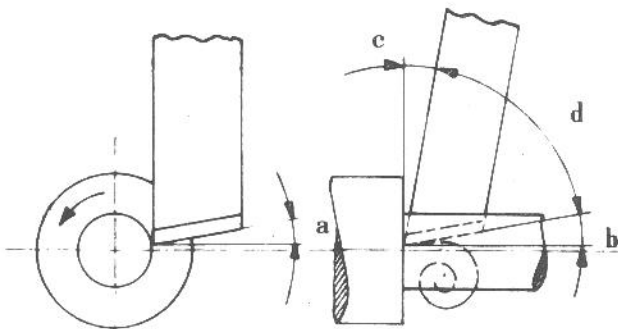


Fig. 3

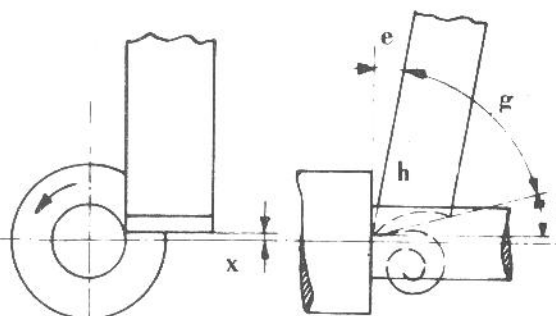


Fig. 4

TANGENTIAL KNEE-TOOL

Type SCHAUBLIN 102-59.180/200/220/240/260/300/340
 (see catalogue SCHAUBLIN 102/57 pages 65 and 66)
 for Turret carriage with 6 positions of SCHAUBLIN TR 102 Lathe

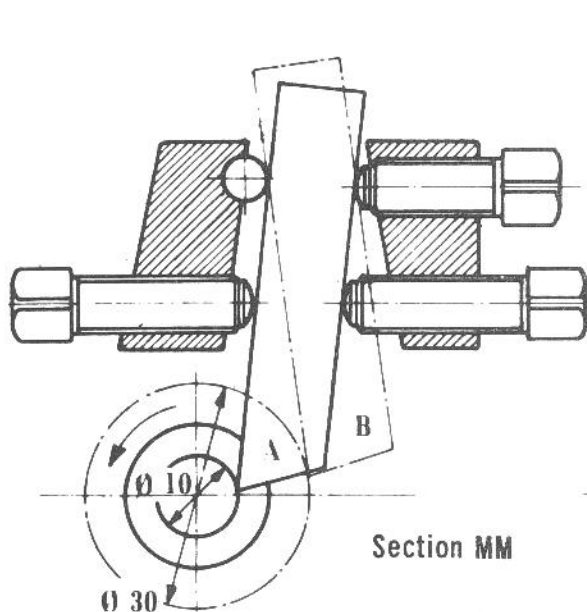
TECHNICAL DATA

Toolholder Art. N°	Capacities		Toolholder body		Tool	
	Ø mm	Length mm	Ø mm	Central bore mm *	Inclination of tool position	Profile
102-59.180	55	30	20	12	6°	10x12
102-59.200	38	40	20	12	6°	10x12
102-59.220	22	40	20	12	6°	10x12
102-59.240 **	22	25	20	9,5	6°	10x12
102-59.260	16	16	20	10	6°	10x12
102-59.300 **	20	55	20	9,5	30°	10x12
102-59.340 **	14	40	20	9,5	0° - 15° - 30°	10x12

* Allows the use of centre drill Ø 9,5 mm or 12 mm respectively
 with or without reduction bush «e».

** Double toolholders.

EXAMPLE OF MOUNTING AND ADJUSTMENT



A = Position of tool for turning a Ø of 10 mm
 B = Position of tool for turning a Ø of 30 mm.

Fig. 1

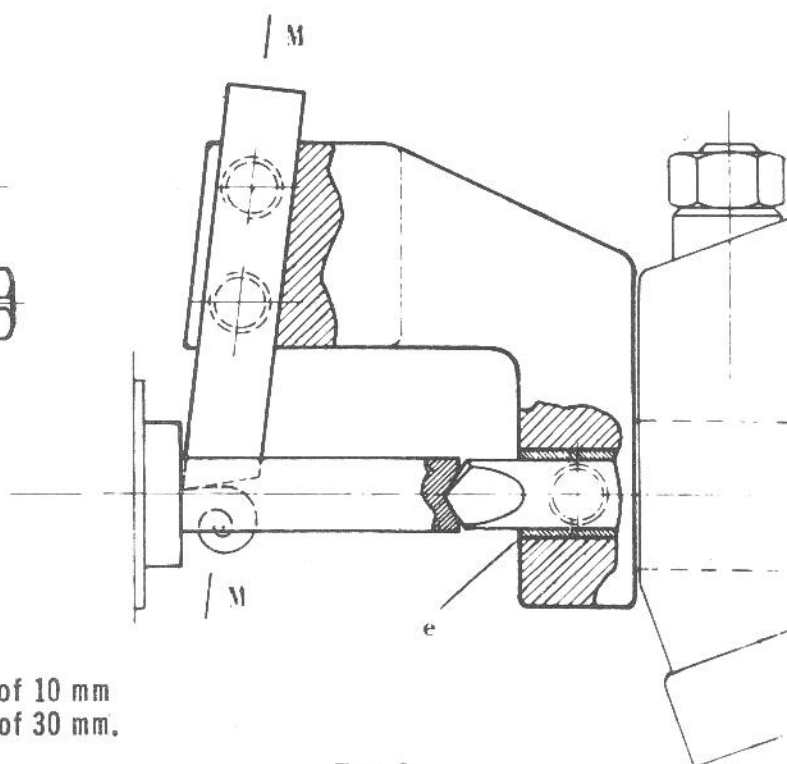


Fig. 2

According to the work which must be done (roughing or finishing cut), the tip of the tool should be ground to the following angles for steel :

ROUGHING CUT (Fig. 3)		FINISHING CUT (Fig. 4)	
up to 38 t.s.i.	above 38 t.s.i.	up to 38 t.s.i.	above 38 t.s.i.
a = 10°	8°	e = 10 - 12°	8 - 10°
b = 10°	8°	f = 15 - 18°	8 - 10°
c = 8 - 10°	8 - 10°	g = 70 - 74°	70 - 74°
d = 70 - 72°	72 - 74°		

Since the cutting edge of the finishing tool as per Fig. 4 is straight, i.e., parallel to the axis, it is advisable to give a sharper cut, as per intermittent line h, when lachining drawn mild steel (quality 00.11 or 37.11, e.g.).

The face of the tangential tool should be above the middle at a distance x. (See Fig. 4).

x = about 1/8 of the turned \varnothing for steel of 38 t.s.i. tensile and more.

x = about 1/10 of the turned \varnothing for steel below 38 t.s.i. tensile.

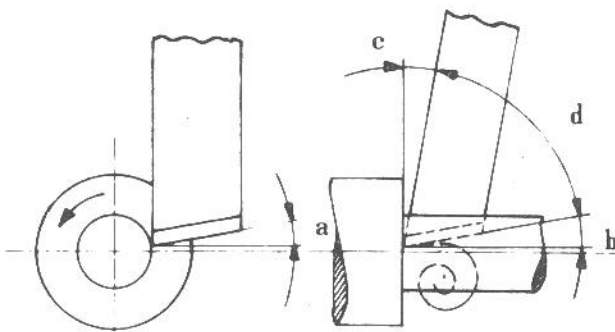


Fig. 3

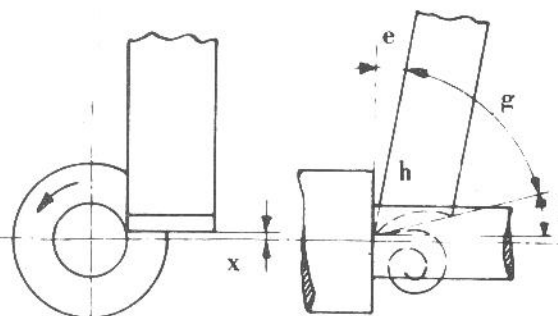


Fig. 4

TANGENTIAL KNEE-TOOL
Type SCHAUBLIN 102-59.180/200/220/240/260/300/340
 (see catalogue SCHAUBLIN 102/57 pages 65 and 66)
 for Turret carriage with 6 positions of SCHAUBLIN TR 102 Lathe

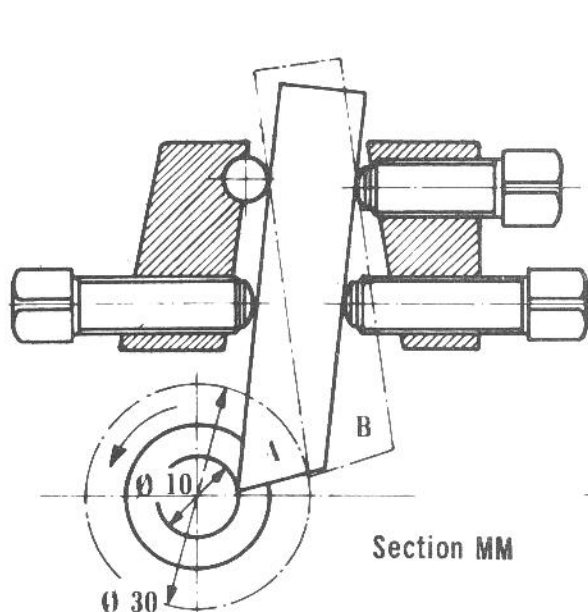
TECHNICAL DATA

Toolholder Art. N°	Capacities		Toolholder body		Tool	
	Ø mm	Length mm	Ø mm	Central bore mm *	Inclination of tool position	Profile
102-59.180	55	30	20	12	6°	10x12
102-59.200	38	40	20	12	6°	10x12
102-59.220	22	40	20	12	6°	10x12
102-59.240 **	22	25	20	9,5	6°	10x12
102-59.260	16	16	20	10	6°	10x12
102-59.300 **	20	55	20	9,5	30°	10x12
102-59.340 **	14	40	20	9,5	0° - 15° - 30°	10x12

* Allows the use of centre drill Ø 9,5 mm or 12 mm respectively with or without reduction bush «e».

** Double toolholders.

EXAMPLE OF MOUNTING AND ADJUSTMENT



A = Position of tool for turning a Ø of 10 mm
 B = Position of tool for turning a Ø of 30 mm.

Fig. 1

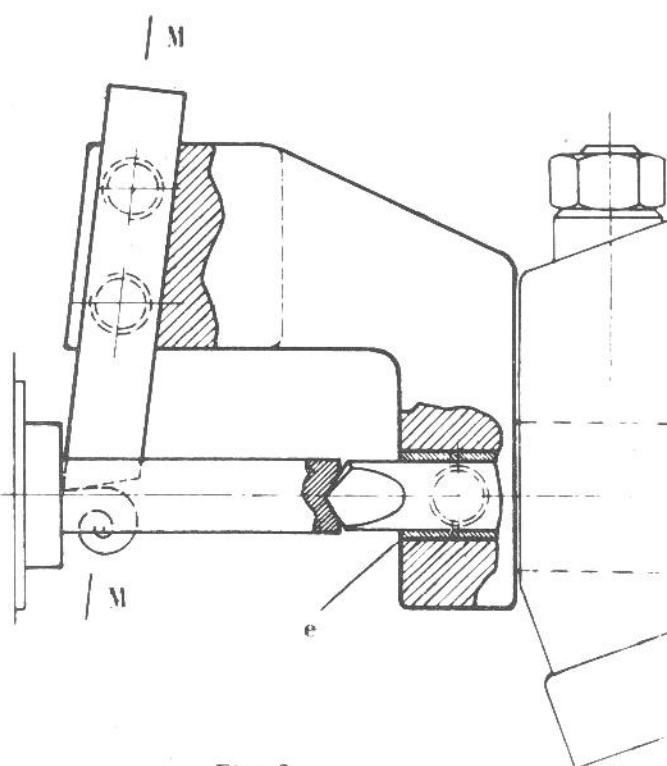


Fig. 2

According to the work which must be done (roughing or finishing cut), the tip of the tool should be ground to the following angles for steel :

ROUGHING CUT (Fig. 3)		FINISHING CUT (Fig. 4)	
up to 38 t.s.i.	above 38 t.s.i.	up to 38 t.s.i.	above 38 t.s.i.
a = 10°	8°	e = 10 - 12°	8 - 10°
b = 10°	8°	f = 15 - 18°	8 - 10°
c = 8 - 10°	8 - 10°	g = 70 - 74°	70 - 74°
d = 70 - 72°	72 - 74°		

Since the cutting edge of the finishing tool as per Fig. 4 is straight, i.e., parallel to the axis, it is advisable to give a sharper cut, as per intermittent line h, when lachining drawn mild steel (quality 00.11 or 37.11, e.g.).

The face of the tangential tool should be above the middle at a distance x. (See Fig. 4).

x = about 1/8 of the turned \varnothing for steel of 38 t.s.i. tensile and more.

x = about 1/10 of the turned \varnothing for steel below 38 t.s.i. tensile.

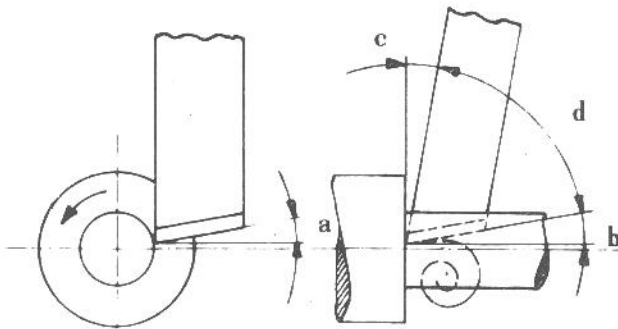


Fig. 3

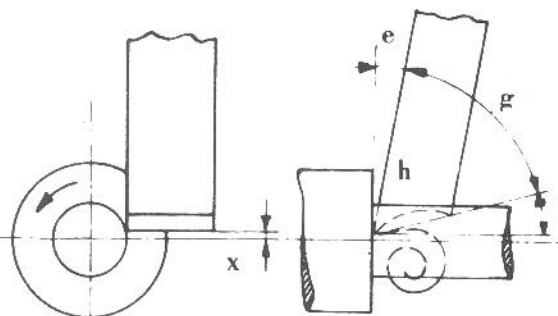
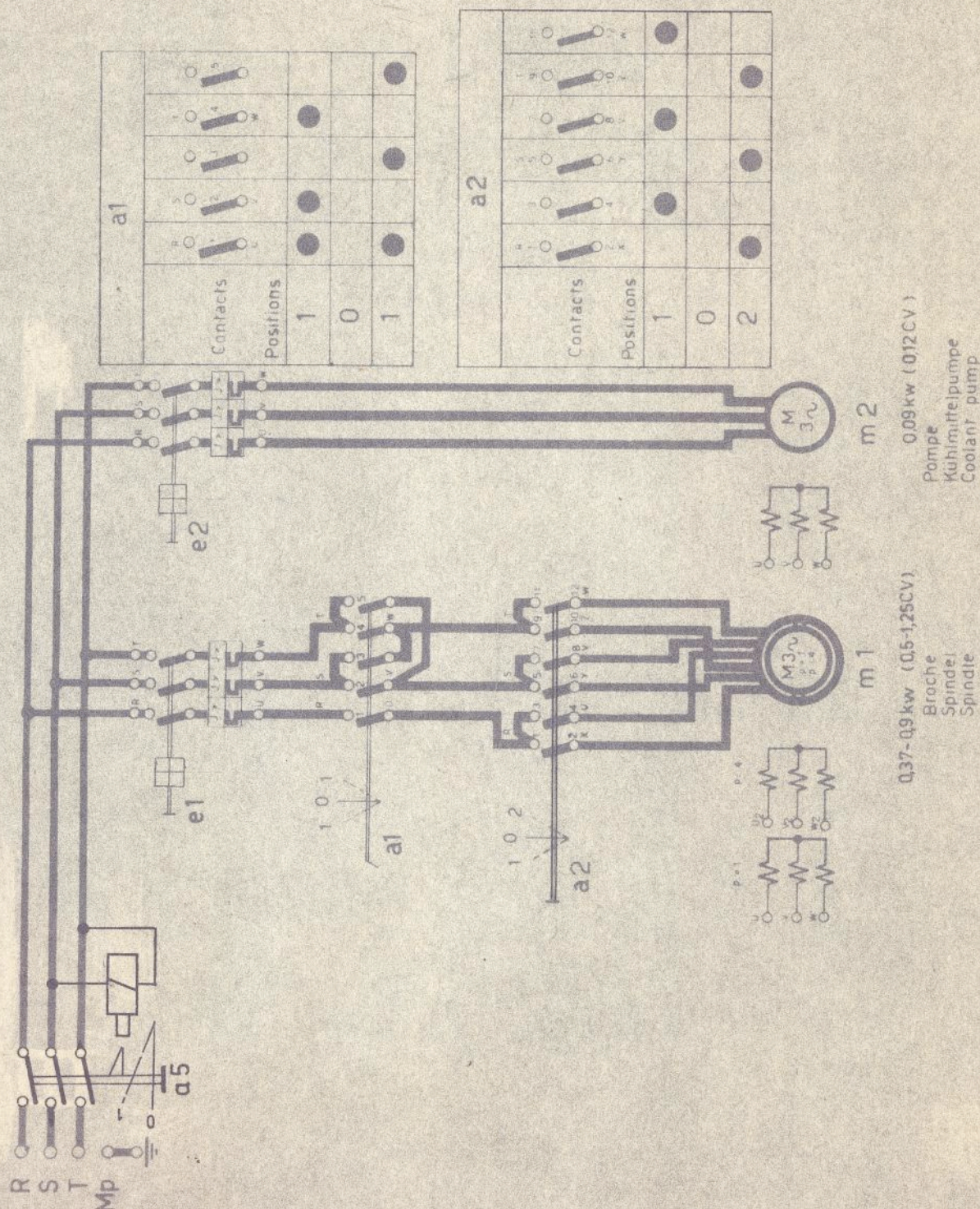


Fig. 4

SOCLE 102-80 SCHÉMA DE CONNECTION
EXÉCUTION AVEC MOTEUR À DEUX VITESSES 750/3000 T/MIN.
AVEC PÉDALE



Pour élément : 70, 102, 103

N° article : 102-80,600

Remarques :

Accessoire pompe

4.10.71 G.B.

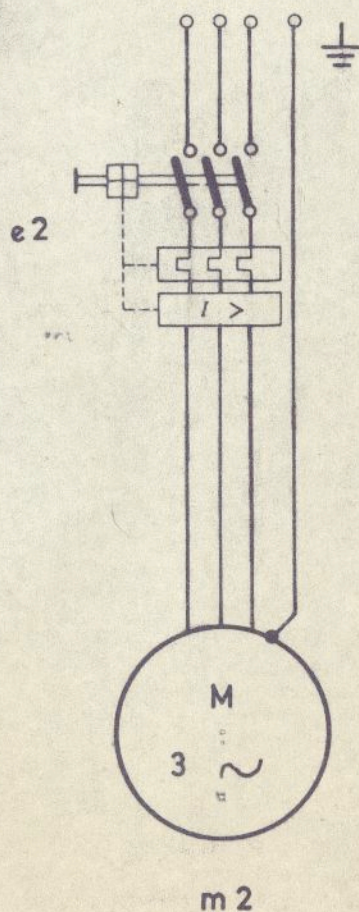
Schéma N° 102-99.095 /

Tension : V. Périodes :

Norme CSA : ☐ Tropique : ☐Norme austr. ☐ Câbl. spéc. ☐

Tension de commande : — V. / — HZ.

N° interne	Nombre	Stock	Contr.	Emball.	Désignation	A Cder	Class.
74220.____	1				Disjoncteur 220-290 V = 0,5-0,75 A = 0050 380-500 V = 0,35-0,5 A = 0035		
76808.____	1				Pompe 220 - 500 V - 50 / 60 Hz = 0567 550 V - 50 Hz = 0555 550 V - 60 Hz = 1655	Cder	
74222.0000	1				Boîtier		



4.10.71 G. Bassin

SCHMIER-ANWEISUNG FÜR WERKZEUGMACHER-NACHDREH- UND REVOLVERDREHBÄNKE "SCHAUBLIN" 65 - 70 - 102 - 120
TABLEAU DE LUBRIFICATION POUR TOURS : OUTILLEURS - DE REPRISE - REVOLVER "SCHAUBLIN" 65 - 70 - 102 - 120
LUBRICATING CHART FOR : TOOLMAKER'S / SECOND-OPERATION / TURRET LATHES "SCHAUBLIN" 65 - 70 - 102 - 120

Maschinenteile Organes de la machine Machine parts	Art der Schmierung Mode de lubrification Type of lubrication		Schmier- od. Kon- trollfrequenz / Fréquence / Frequency	AMTAR	ARAL	ASEOL	BP	CASTROL	ESSO	GASOLIN	GULF	Mobil	MOTUL	SHELL	VALVOLINE
Spindelstöcke mit Gleitlagern Poupées à paliers lisses Headstocks with plain bearings	Öl Huile Oil	Kanne Burette Can	täglich quotidien daily	Misola A	Aral Öl HTU	16-60V	BP Energol HP 10	Hyspin 100	Teresso 43	Spezialöl K	Harmony 44	Mobil DTE Oil Light	SAF Drive A	Vitrea Oil 27	Magnet 4
Spindelstöcke mit Kugel- & Rollenlagern Poupées à roulements Headstocks with anti-friction bearings	Öl Huile Oil	Handpresse Pompe à main Gun	täglich quotidien daily	"	"	"	"	"	"	"	"	"	"	"	"
Spezialspindelstöcke mit K.- & Rollenlagern Poupées spéciales grandes vitesses à roulem. Special high speed headstocks with anti- friction bearings	Öl Huile Oil	Ölnebel Brouillard Mist	täglich quotidien daily	"	"	"	"	"	"	"	"	"	"	"	"
Reduziergetriebe der Spindelstöcke Réducteur à engrenages des poupées Headstock reduction gears	Öl Huile Oil	Bad Bain Bath	jährlich annuel yearly	"	"	"	"	"	"	"	"	"	"	"	"
Schnellspannvorrichtung der Spannzangen (Hunde & Lagerführung) / Dispositif serrage rapide (axe levier, chiens et vis-pivots du levier) / Quick-closing attachment (lever axle, jaws and pivot-screws of lever)	Öl Huile Oil	Handpr./Kanne Pompe à main Burette	wöchentlich hebdomadaire weekly	"	"	"	"	"	"	"	"	"	"	"	"
Gewindespindeln & Kreuzschlittenführungen Vis de réglage & guidages des coulisseaux des chariots / Micrometer screws and car- riage slide guide ways	Öl Huile Oil	Handpresse Pompe à main Gun	wöchentlich hebdomadaire weekly	"	"	"	"	"	"	"	"	"	"	"	"
Achslager des Riemenstellpedals Paliers de l'axe de la pédale du dérailleur Shaft bearings of belt shifter pedal	Öl Huile Oil	Kanne Burette Can	monatlich mensuel monthly	"	"	"	"	"	"	"	"	"	"	"	"
Achslager der Motorschwenkplatte Paliers du support pivotant du moteur Bearings of motor swivel plate	Öl Huile Oil	Handpresse Pompe à main Gun	monatlich mensuel monthly	"	"	"	"	"	"	"	"	"	"	"	"
Vorgelege Renvoi du socle Base countershaft	Öl Huile Oil	Handpresse Pompe à main Gun	wöchentlich hebdomadaire weekly	"	"	"	"	"	"	"	"	"	"	"	"
Allgemeine Schmierung Lubrification générale General lubrication of machine	Öl Huile Oil	Handpresse Pompe à main Gun	wöchentlich hebdomadaire weekly	"	"	"	"	"	"	"	"	"	"	"	"
Kupplung & Bremse (Zub.) des Motors Embrayage et frein du moteur (Acc.) Motor clutch and brake (Acc.)	Öl Huile Oil	Handpresse Pompe à main Gun	wöchentlich hebdomadaire weekly	"	"	"	"	"	"	"	"	"	"	"	"
Reduziergetriebe (Zub.) im Sockel Réducteur de vitesse dans le socle (Acc.) Speed reduction unit in base (Acc.)	Öl Huile Oil	Bad, Handpresse Bain, Pompe à m. Bath, Gun	jährl./wöchentl. annuel/hebdomad. yearly/weekly	"	"	"	"	"	"	"	"	"	"	"	"
Umschaltgetriebe (Zub.) im Sockel Inverseur de marche dans le socle (Acc.) Reversing unit in base (Acc.)	Öl Huile Oil	Bad Bain Bath	jährlich annuel yearly	"	"	"	"	"	"	"	"	"	"	"	"
Stufenlos regelbares Getriebe (Zub.) Variateur de vitesse dans le socle (Acc.) Stepless variable-speed unit in base (Acc.)	Öl Huile Oil	Handpresse Pompe à main Gun	wöchentlich hebdomadaire weekly	"	"	"	"	"	"	"	"	"	"	"	"
Vorgelegelager des stuf.reg.-Getriebe (Zub.) Variateur de vitesse, palier du renvoi (Acc.) Countershaft bearing of stepless variable- speed unit (Acc.)	Öl Huile Oil	Bad Bain Bath	jährlich annuel yearly	"	"	"	"	"	"	"	"	"	"	"	"
Schleifapparate (Zub.) mit Gleitlagern Appareils à rectifier à paliers lisses (Acc.) Grinding attachments with plain bearings (Acc.)	Öl Huile Oil	Kanne Burette Can	täglich quotidien daily	"	"	"	"	"	"	"	"	"	"	"	"
Schleifapparate (Zub.) mit Kugellagern Appareils à rectifier à paliers à roulements (Acc.) Grinding attachments with ball bearings (Acc.)	Öl Huile Oil	Handpresse Pompe à main Gun	täglich quotidien daily	"	"	"	"	"	"	"	"	"	"	"	"
Fräspannapparat (Zub.) Appareil à fraiser (Acc.) Milling attachment (Acc.)	Öl Huile Oil	Handpresse Pompe à main Gun	wöchentlich hebdomadaire weekly	"	"	"	"	"	"	"	"	"	"	"	"
Kugellager der Schlitten-Gewindespindel Palier à billes des vis de réglage des chariots Ball bearing of slide micrometer screws	Fett Graisse Grease	Packung Garnissage Packed	alle 5 Jahre tous les 5 ans all 5 years	Pebron RT 33	ARAL Fett HL2	Litea G-076	BP Energol LS 2	Spheroel AP 2	Andok B	Deganol I	Gulfcrown Grease No 2	Mobilux Grease No 2	Motul Anifol	Alvania Grease No 2	L.B Grease
Elektromotor Moteur électrique Electric motors	Fett Graisse Grease	Packung Garnissage Packed	jährlich annuel yearly	"	"	"	"	"	"	"	"	"	"	"	"
Einzelantrieb (Zub.) Commande individuelle (Acc.) Individual drive (Acc.)	Fett Graisse Grease	Packung Garnissage Packed	jährlich annuel yearly	"	"	"	"	"	"	"	"	"	"	"	"
Unabhängiges Vorgelege Renvoi indépendant Independent countershaft (Acc.)	Fett Graisse Grease	Staufer "	wöchentlich hebdomadaire weekly	"	"	"	"	"	"	"	"	"	"	"	"

mutator are to be conifer-sunk. The commutator must be kept free of grease and dirt.

For centrifugal-starter motors, a period check of the contacts is necessary in addition to the normal maintenance.

11. Disturbances

There are basically two causes for disturbances:

11.1 Mechanical disturbances, which originate from the ball bearings, e.g. when the bearings are too warm or when they knock or whistle.

Possible causes: bearings is defective, too much grease in the bearing, bearing is dirty, grease is crusted through long storage in a humid or dusty room, too much belt tension and incorrect direct coupling.

11.2 Electrical disturbances. Excessive heating on overload. Motor does not run on no-load or with diminished revolutions, stator becomes too warm, motor revolutions diminish on load, abnormal noise, increased or unequal power consumption, release of the protection switch or the fuse burning. **Possible causes:** wrong connection (see circuit diagram), phase interruption, short circuit in the winding, bad contact in the current lead (switch, fuse, motor terminal), defective fuse, overloading, air channels stopped up, air inlet impeded, too much dampness or strong air current, large over- or under-voltage deviations in the mains.

12. To determine and remove disturbances

We recommend that a specialist be consulted or that the matter be reported to us. Our team of specialists are always at your disposal.

For the repair of ELEMO-EMB as well as of other makes of motors, we recommend our highly efficient repair department.



ELEMO-EMB ELEKTROMOTORENBAU SA
Dinkelbergstrasse 1
4127 BIRSFELDEN / Switzerland
Telephone 061 42 88 88 – Telex 62 678

Mounting and maintenance instructions for alternating current motors

1. Storage

Motors which must be stored for long periods before being put into operation are to be kept in a dry dust-free room and protected in particular from humidity, and acid or alkaline vapour.

2. Erection

The motor should be erected on a firm vibrationless base such that it is easily accessible. The room in which it is to operate should be as dry and as dust-free as possible with a temperature not exceeding 40° C. The cooling air must have a free entrance and exit. Motors with ball-bearings can be wall or ceiling mounted. In the vertical or inclined positions, care must be taken that the weight of the pulley or coupling does not add any appreciable strain on the shaft. The shaft ends are normally ground to ISA tolerance and provided with a VSM cotter, kg up to 48 mm diameter, m6 greater than 48 mm diameter. Couplings or pulleys are to be mounted with as little hammering as possible on the shaft end as this damages the bearing.

For direct-coupled motors the two shaft axes must be exactly lined up. Even the slightest inaccuracy produces an additional load which could lead to a shaft-fracture. The coupling must not exert any pressure on the motor shaft.

For belt drive, the motor shaft must be parallel to the driven shaft. The belts should be tensioned sufficiently enough only to avoid slipping under normal operating conditions. Too much tension in the belts can lead to bearing damage or shaft fracture. The belts must not lie on the bottom of the grooves, and should be able to be depressed easily by hand between pulleys.

The motor must be mounted such as allow for easy adjustment of the belt tension. If higher demands are made on the motors, special executions must be supplied.

3. Connections

The connection to the mains should be undertaken by a technician. Before connecting the motor, care must be taken that the mains voltage corresponds with the voltage inscribed on the rating plate. Only then should the motor be connected.

ELEMO-EMB Elektromotorenbau SA, 4127 Birsfelden/Switzerland
Telephone 061 42 88 88 – Telex 62 678

ted according to the circuit diagram (supplied separately or to be found on the inner side of the terminal cover). The earth terminal is a coded colour screw.

We recommend that either a motor protection switch or a switch with an over-current release be used for the mains connection. Line fuses protect only the leads (short-circuit protection) and not the motor. Only correctly adjusted motor protection switches or switches with over-current release ensure that the motor is protected from overload. The correct current rating for the adjustment of the thermal protection is given on the rating plate. The thermal protection elements built directly into the winding are to be connected according to the appropriate circuit diagram.

4. Putting into operation

Motor with roller or plain bearings without lubrication are delivered from the factory ready for operation with grease- or oil-filled bearings.

Motors with oil ring bearings however are normally delivered without oil filling. Before putting into operation these oil ring bearings must be washed out with pure petrol, emptied and then dried. Only after they are cleaned and dried is the oil to be filled in slowly and carefully up to the oil overflow screw. Too much or too little oil damages the bearings. If too much oil is filled in, it will seep out along the shaft while the motor is running and will continue to draw more oil out with it. A motor with oil ring bearings must never be run – even for a short while – without filling the bearings with oil. One should check that the lubricating ring rotates with the shaft and transports oil.

5. Insulation resistance

In spite of good impregnation, the winding can absorb moisture if the motor is stored for a long period. With a magneto generator the insulation resistance between the motor terminals and casting is measured with current leads disconnected. The resistance should be:

approx. 200 000 Ohms for 220 V motors

approx. 400 000 Ohms for 380 V motors

approx. 500 000 Ohms for 500 V motors

If these values are not realised, the motor must be dried out and if necessary re-impregnated.

6. Switching on

If the motor is switched on by a hand-operated star-delta switch, the switch must be kept in the star (starting) position until such time as the motor has almost reached its normal operating revolutions. Only then must the switch be put into the delta (or operating) position. A star-delta switch can not be used for machines which start on full load. (In the star position the squirrel-cage motor does not quite reach 30 % of its normal torque).

The changeover relays for star-delta switches must be adjusted such that the changeover to delta position occurs when the motor has almost reached its rated r.p.m.

7. Direction of motion

When there is no direction indicated (by arrow) on the motor, it may be operated in both directions. In order to reverse the direction of a.c. motors, two leads must be interchanged. For two-phase and single-phase motors the directions given in the connecting diagrams are to be observed.

8. Operation

The motor should run without strong vibration or excessive noise. In case of doubt uncouple the motor and check how it runs on no load without the driven machine. With a maximum room temperature of 40° C, an increase in temperature (Δt) of the winding of up to 75° C is tolerable. (S.E.V. regulation 3009, 1962). The permissible temperature-rise of a motor can be ascertained as follows:

The ohmic resistance of one phase is measured with disconnected mains supply, first when the motor is cold and then again within 30 seconds of shutting down after prolonged operation. The temperature rise is within limits when the ratio «resistance warm» to «resistance cold» is less than 1,3.

9. Maintenance

Motors without external greasing devices, such as grease nipples or grease cups, are provided with so-called prolonged lubrication which for normal 8-hour operation will last for about 5 to 6 years (or 12 000 operating hours). After this period, the bearing plates must be removed, the bearings and grease chambers washed out with pure petrol, dried, and immediately greased (do not allow the bearings to turn while they are dry). The bearings and grease chamber are to be filled to one-third.

Motors which allow for more frequent periodical greasing must be greased with small quantities (1–2 cm³) about every 6 months for normal 8-hour operation. The grease nipple must first be cleaned. Always use the same type of grease.

For motors with oil ring bearings, the oil must be changed for the first time after about 2 months and then every 6 months for normal 8-hour operation. After draining off the used oil, the bearings must be washed out with pure petrol and then dried. Great care must be taken when filling in new oil that the exact oil level is kept and that the oil is poured in slowly. Only acid-free mineral oil with a viscosity of 6,5° E for 50° C should be used.

10. General cleaning

Depending on the operating conditions, the motor must be cleaned either monthly or yearly. In particular, the air passages and outer surfaces (for motors with cooling fins) must be kept clean of dirt and dust. While cleaning, no dust must be allowed to enter the bearings.

For slip-ring and commutator motors the slip-rings, commutators and brush holders must be cleaned periodically. Worn carbon brushes must be replaced promptly. Rough surfaces on the slip-rings and commutators must be smoothed by a specialist. If necessary the insulations between the laminations of the com-