Instruction manual

4220i - 6

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Foreword

This instruction manual is intended to help the user to become familiar with the machine and take advantage of its application possibilities in accordance with the recommendations.

The instruction manual contains important information on how to operate the machine securely, properly and economically. Observation of the instructions eliminates danger, reduces costs for repair and down-times, and increases the reliability and life of the machine.

The instruction manual is intended to complement existing national accident prevention and environment protection regulations.

The instruction manual must always be available at the machine/sewing unit.

The instruction manual must be read and applied by any person that is authorized to work on the machine/sewing unit. This means:

- Operation, including equipping, troubleshooting during the work cycle, removing of fabric waste
- Service (maintenance, inspection, repair and/or)
- Transport.

The user also has to assure that only authorized personnel work on the machine.

The user is obliged to check the machine at least once per shift for apparent damages and to immediatly report any changes (including the performance in service), which impair the safety.

The user company must ensure that the machine is only operated in perfect working order.

Never remove or disable any safety devices.

If safety devices need to be removed for equipping, repairing or maintaining, the safety devices must be remounted directly after completion of the maintenance and repair work.

Unauthorized modification of the machine rules out liability of the manufacturer for damage resulting from this.

Observe all safety and danger recommendations on the machine/unit! The yellow-and-black striped surfaces designate permanend danger areas, eg danger of squashing, cutting, shearing or collision.

Besides the recommendations in this instruction manual also observe the general safety and accident prevention regulations!

General safety instructions

The non-observance of the following safety instructions can cause bodily injuries or damages to the machine.

1. The machine must only be commissioned of the instruction book and operated by persons with appropriate training.
2. Before putting into service also read the safety rules and instructions of the motor supplier.
3. The machine must be used only for the purpose intended. Use of the machine without the safety devices is not permitted. Observe all the relevant safety regulations.
4. When gauge parts are exchanged (e.g. needle, presser foot, needle plate, feed dog and bobbin) when tread-ing, when the workplace is left, and during service work, the machine must be disconnected from the mains by switching off the master switch or disconnecting the mains plug.
5. Daily servicing work must be carried out only by appropriately trained persons.
6. Repairs, conversion and special maintenance work must only be carried out by technicians or persons with appropriate training.
7. For service or repair work on pneumatic systems the machine must be disconnected from the compressed air supply system. Exceptions to this are only adjustments and functions checks made by appropriately trained technicians.
8. Work on the electrical equipment must be carried out only by electricians or appropriately trained persons.
9. Work on parts and systems under electric current is not permitted, except as specified in regulations DIN VDE 0105.
10. Conversion or changes to the machine must be authorized by us and made only in adherence to all safety regulations.
11. For repairs, only replacement parts approved by us must be used.
12. Commissioning of the sewing head is prohibited until such time as the entire sewing unit is found to comply with EC directives.



It is absolutely necessary to respect the safety instructions marked by these signs.
Danger of bodily injuries !
Please note also the general safety instructions.

IMPORTANT WARNING!

To the feeding network cord, it is necessary to connect the respective network plug which has been approved in the country of utilizing the machine. This operation should be performed by a worker acquainted with the electric safety rules being in force in the given country. The supplier is not responsible for any damages caused by defective plug or owing to incorrect assembly of the plug.

In spite of all safety measures made on the machines, inappropriate actions of the operator may lead to dangerous situations. In industrial sewing machines, attention should be paid to the following still remaining possible sources of injury:

1. Moving sewing needle
   - risk of injury when sewing with raised pressure foot or top roller, because the finger guard is then positioned too high.

2. Moving thread take-up lever
   - risk of injury when inadvertently or intentionally inserting the finger(s) between the thread take-up lever and its guard.

3. Moving pressure member
   - risk of injury when holding sewn work in immediate vicinity of the pressure member and beginning to insert under the pressure member a considerably thicker sewn work portion,
   - risk of injury when sinking the pressure member.

4. When switched off, the clutch motor slows down by inertia but would be reactivated by an accidental tread-ing down of the motor treadle. To avoid such risk, it is advised to hold the handwheel by hand and slightly to depress the motor treadle.

Part A - Instruction manual
1. Proper use of the machine

The machine can be used in the shoemaking industry for sewing of light medium and heavy shoe uppers. It is suitable for sewing natural and man made leathers, leatherette, shoemaking textiles and even plastic parts of sports shoes.
The machine is also used in the fancy goods industry for sewing bags, handbags, rucksacks and cases from the usual fancy goods materials.
The machine sews with a double needle stitch. It is standardly equipped with needles of the 134 KKLR system which are suitable for sewing leather. When sewing textile materials it is necessary to install the needle of the 134 system. The machine enables the sewing of both technical and decorative seams which have almost the constant length of the stitch at a different sewing speed. Only a dry material, which cannot be thicker than 6 mm when depressed by top roller, can be sewn by these machines, generally. The material cannot contain any hard subjects, to the contrary case it is possible to work only with applied eye-protective shield. Such a shield is not available to delivery at this time. Generally threads up to size 1000 dtex x 1 x 3 (Labelled number 10) have been used namely synthetic, cotton or core threads. Whoever should like to use other special threads, that one should consider the resulting risks and make appropriate safety measures.
The total thickness is determined by sewing with a thicker needle of very strong material. In cases like this it is also necessary substantially reduce the speed of sewing below the value shown in paragraph 5.
These special machines may be installed a operated only in dry and kept up expanses. We, as industrial sewing machines manufacturers, agree with the fact that our products are operated, at the least, so far learned operators who can carry out all usual operating functions and suppose their possible risks as perceptible.

Machine noisiness

Machine noisiness has been measured in accordance with the standards ISO 3746, ISO 11204 at maximum speed.
Laeq = equivalent machine noise of the self-standing machine on the working place, converted to % machine employment (dB) - stated in the table

Type of the machine	Noisiness dB	% machine employment
4220i-XXX-100	82	20
4220i-XXX-200	79	20
4220i-XXX-300	73	20
4220i-XXX-400	70	20

2. Description of the machine

It is double-needle machine. It sews with a double threaded lock-stitch. It has a lower drop feed and a top roller which is driven. The one-step feeding occurs at the moment when the needle is in the position above the throat plate. Feeding can be in both directions. The stitch length can be adjusted with an adjusting dial.
The machine is delivered in two versions:

1. Stitch length up to 5 mm at max. sewing speed up to 2500 rpm.
2. Stitch length up to 7 mm at max. sewing speed up to 1600 rpm.



Caution!
Maximum allowed speed must not be exceeded for the given version and sewing category. Otherwise it can cause damage to the feeding mechanism.

The machine is equipped with a large-diameter vertical hooks and is protected by an safety clutch.
The machine uses a wick lubrication system with central oil supply. Each hook is lubricated from an independent oil source.
The simplest sub-class is standardly equipped with a knee operated lever. Specially for the Czech republic and if required with treadle. Reverse stitching is with a manually operated lever.
Higher sub-classes have always mechanical control like the simplest sub-class, and furthermore there is a possibility of levelling the needle, thread trimmer, electromagnetic top roller lift and electromagnetic reverse stitching (according to your order).
Each sub-class can be delivered in four sewing categories. Sewing category is determined by the number of the thread label and the corresponding number of the needle. Each sewing category is available with a range of needle distances. In the factory, the machine has been adjusted to the ordered needle distance and sewing category. Readjustments to another needle distance or sewing category should be carried out by an experienced mechanician. A stand with wedge is in the simplest sub-class equipped with a lever clutch motor and if required with a stop motor which enables the levelling of the needle.
Higher sub-classes always have a stop motor. The type of mechanical top roller lift depending on the stand has one or two treadles.

3. Machine sub-classes and sewing categories

3.1 Sub-class

Table 1

Type of the machine	Top roller lift				Reverse stitching		Thread trimmer
Class-subclass -sewing category	Via knee lever	Treadle	Via electro-mag. + knee lever	Via electro-mag. + treadle	Via hand lever	Via electro-mag. + hand lever	
4220i-611-XXX	●				●		
4220i-621-XXX*		●			●		
4220i-647-XXX			●			●	●
4220i-657-XXX*				●		●	●

* only for Czech republic

3.2 Sewing categories

This code indication includes the equipment assembled on the machine head, both necessary equipment and optional equipment. The standard configuration of the equipment has been preset, according to the under mentioned table, in the factory which includes only necessary equipment. If the buyer demands a different configuration then the factory allocates a new code indication.

Table 2
Standard configuration - the numbers in brackets stand for ordering Nos. when ordering separately the Equipment in question.

Type	Needle distance	Needle size	Top roller	Feeder	Throat plate insert
Class-sub-class -sewing category	Throat plate		Diameter	Pitch of teeth	Width of hole
	mm	0.01mm	mm	mm	mm
4220i-6XX-100	1,2	80	35	1.0	1.3
	(M 218)	(S548 000255)	(M 173)	(M 261)	(M 224)
4220i-6XX-200	1,6	90	35	1.0	1.6
	(M 219)	(S548 000260)	(M 173)	(M 261)	(M 226)
4220i-6XX-300	2,0	130	35	1.5	2.2
	(M 220)	(S548 000312)	(M 173)	(M 262)	(M 229)
4220i-6XX-400	2,4	180	35	1.5	2.5
	(M 221)	(S548 000330)	(M 173)	(M 262)	(M 233)

4. Survey of equipment

This survey does not include the equipment assembled on the stand.

4.1 Equipment (at least one of each from the following group of equipment is assembled)

4.1.1 Needles

M 132 - needle 134 KKLR size 80
M 133 - needle 134 KKLR size 90
M 134 - needle 134 KKLR size 130
M 303 - needle 134 KKLR size 180

4.1.2 Feeders

M 261 - feeder with pitch of teeth 1.0 mm
M 262 - feeder with pitch of teeth 1.5 mm

4.1.3 Top roller holders

M 156 - holder for the top roller ø 25 mm
M 157 - holder for the top roller ø 35 mm
M 295 - holder for the top roller ø 45 mm

4.1.4 Top rollers

M 172 - top roller ø 25 mm
M 173 - top roller ø 35 mm
M 174 - rubberized top roller ø 25 mm
M 175 - rubberized top roller ø 35 mm
M 310 - smooth top roller ø 25 mm
M 311 - smooth top roller ø 35 mm
M 296 - top roller ø 45 mm - width 2.0 mm
M 297 - top roller ø 45 mm - width 3.8 mm

4.1.5 Throat plates

M 218 - throat plate for needle distance of 1.2 mm
M 219 - throat plate for needle distance of 1.6 mm
M 220 - throat plate for needle distance of 2.0 mm
M 221 - throat plate for needle distance of 2.4 mm
M 222 - throat plate for needle distance of 3.2 mm

4.1.6 Throat plate inserts

M 224 - insert for throat plate for needle distance of 1.2 mm (for needle 60-80)
M 225 - insert for throat plate for needle distance of 1.6 mm (for needle 60-80)
M 226 - insert for throat plate for needle distance of 1.6 mm (for needle 80-110)
M 227 - insert for throat plate for needle distance of 1.6 mm (for needle 110-140)
M 228 - insert for throat plate for needle distance of 2.0 mm (for needle 80-110)
M 229 - insert for throat plate for needle distance of 2.0 mm (for needle 110-140)
M 230 - insert for throat plate for needle distance of 2.0 mm (for needle 140-160)
M 231 - insert for throat plate for needle distance of 2.4 mm (for needle 80-110)
M 232 - insert for throat plate for needle distance of 2.4 mm (for needle 110-140)
M 233 - insert for throat plate for needle distance of 2.4 mm (for needle 140-180)
M 234 - insert for throat plate for needle distance of 3.2 mm (for needle 140-180)

4.1.7 Connecting cables of the head to the drive

M 163 - connecting cable to the drive EFKA DC 1600/DA82GA; EFKA VD 552/6F82FA and EFKA VD 554/6F82FA
M 055 - connecting cable without any specified drive (with free cable end)

Note: For the machine provided with a minimotor, the cable is component part of the drive thereof.

4.2 Optional equipment

M 010 - built-in lighting (including transformer 230/12V)
M 018 - sewn work guide
M 194 - rear guide holder
M 149 - sewn work guide
M 242 - setting gauge
4220 611001V - high mortality spare parts kit in plastic box for sub-class without thread trimmer
4220 647001V - high mortality spare parts kit in plastic box for sub-class with thread trimmer
S794 222012 - halogen lighting (12 V, 20 W - contains transformer)

5. Technical data

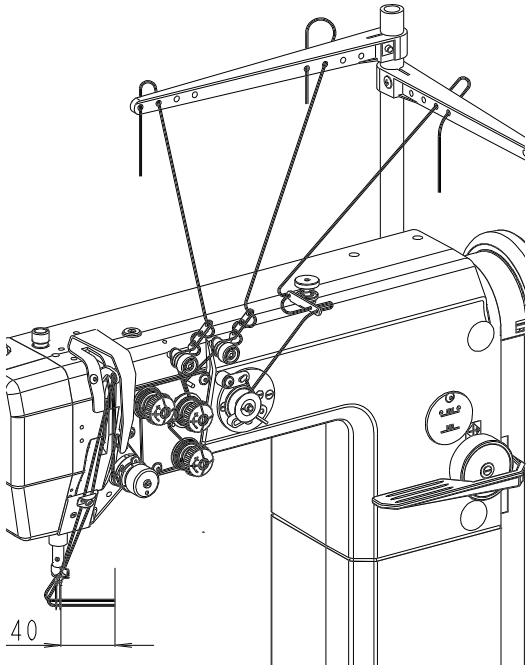
Table 3

Sewing category	Material sewn		Stitch length		Labelled number of polyester thread		Number of needle		Sewing speed		Hook
	Standard										
	Thickness of one layer	Number of layers	Standard	Maximum	Standard	Range	Standard	Range	Standard	Maximum	
	mm	-	mm	mm	-	-	0,01mm	0,01mm	SPM	SPM	
-100 -light	0,8	2	2	3	70	80,70, 60	80	60-80	2500	2500	* R 820 
-200 -medium	1	2	3	5	40	50,40, 30	90	80-110	2000	2000	* R 820 
-300 -medium heavy	1,5	1-2	5	7	20	25,20	130	110-140	1200	1600	** R 820 
-400 - heavy (decorative)	2	1-2	5	7	10/20	20,10	180	140-180	800	1200	** R 820 

* The splice with the so-called spur is being mounted as a standard with the sewing categories 100 and 200 and is designed for sewing thin materials. For sewing thicker materials with a maximum stitch length it is possible to use a splice without spur.

** Splice without spur is mounted as a standard with the sewing categories 300, 400.

Stitch type	Double thread lock-stitch
Top roller stroke	6 mm - via hand lever 12.5 mm via knee lever, treadle, electromagnet
Hook	R 820 - vertical large
Needle	System 134 KKLR; 134 KK
Driving unit	Lever clutch 4 poles change motor min. 0.4 kW, lewer clutch 2 poles change motor min. 0.4 kW Stopmotor min. 0.4 kW
Weight of the head	max. 54 kg (60 kg head with minimotor)
Weitght of the stand	max. 61 kg (38 kg for head with minimotor)
Height of post bed	173 mm
Opening space of machine head	270 x 298 mm
Dimension of bed plate	178 x 518 mm
Length of trimmed thread ends	10....19 mm
Input machine with clutch motor	max. 700 W
Input machine with stop motor	max. 800 W (600 W with minimotor)
Equivalent accoustic presser level of the sole machine at work place by 20% use of the machine during a shift	82 dB/A
Layout dimensions of the machine (including the stand)	1060 x 550 mm
Height of the machine (including the stand)	1680 mm

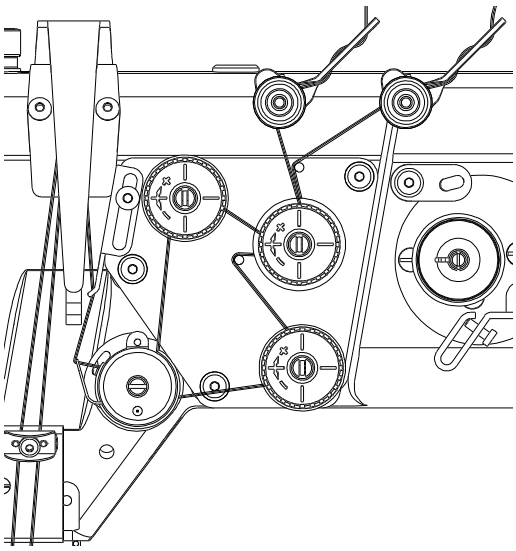


6. Operation of the machine

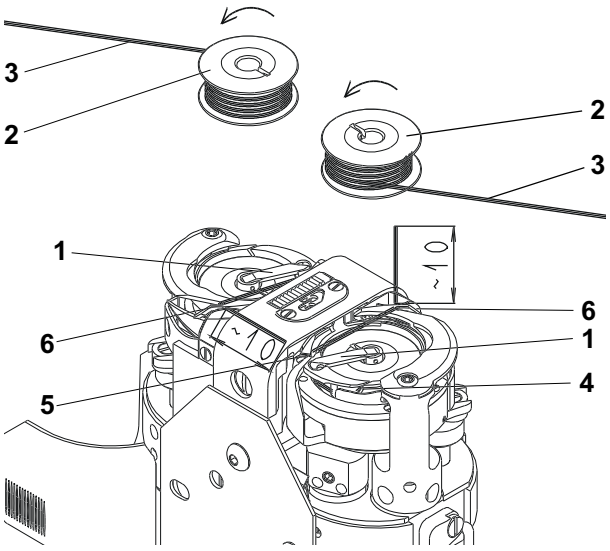
6.1 Threading a thread

Caution! Risk of injury!
Before threading a thread, turn the main switch off and wait until the machine stops!

Thread the threads as it is shown in picture.



Caution!
Not following the correct method of threading a thread may cause serious damage to the function of the machine.

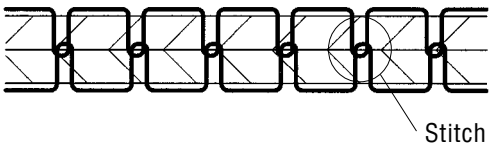


6.2 Inserting the bobbin and threading the lower thread

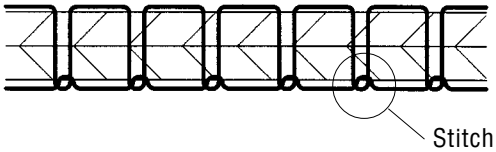
Caution! Risk of injury!
Turn the main switch off and wait until the motor stops!

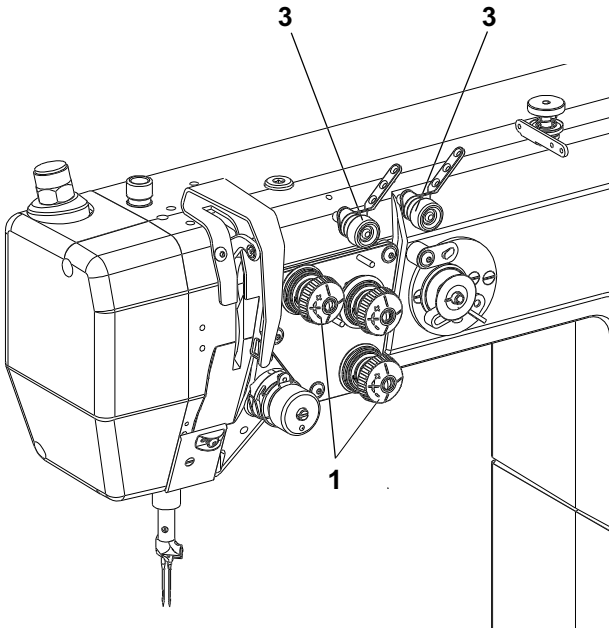
- Tilt the shutter (1) up.
- Insert the bobbin (2) with thread end (3) in the direction as shown in the picture.
- Thread the thread through the notch (4) and the space (5) and place under the spring (6).
- Cut off the thread end as shown.

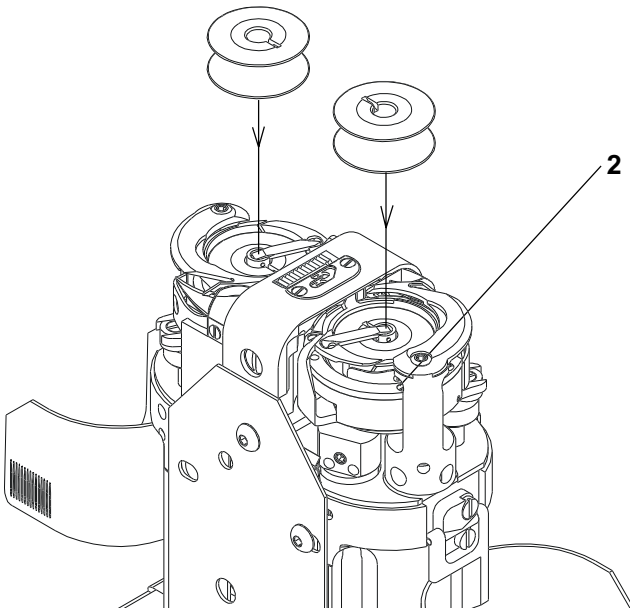
Fitting seam



Decorative seam







6.3 Regulating the thread tension

The thread tension must conform to the thickness of the sewn threads, thickness and hardness of sewn material (thin and soft material will fold with high tension) and the kind of seam. An ordinary fitting seam should be formed with stitches knitted in the middle of the sewn material.

A decorative seam is mostly used with rough threads (10, 20) on thin material and it has tied up threads on the reverse side of the material for achieving a decorative appearance.
Thread tension adjustment is by standard sewing (table 3) conditions in accordance with table No. 4.
If achieving of a decorative seam with stitch knitting on the underside is wished, it is necessary to decrease the upper thread tension, it is carried out by turning of nuts (1), in the counter-clockwise sense.

Thread tension
Table 4

Sewing category	Kind of seam	Identified value upper thread tension	Maximum tension of lower thread
		N	N
1	-	3	1
2	-	4.5	1.5
3	Fitting	8	2
	Decorative	5	
4	Fitting	12	2
	Decorative	10	2.5

If the maximum lower thread tension exceeds the values given in table No. 4, it may cause problems in the beginning of sewing after the previous thread trim.

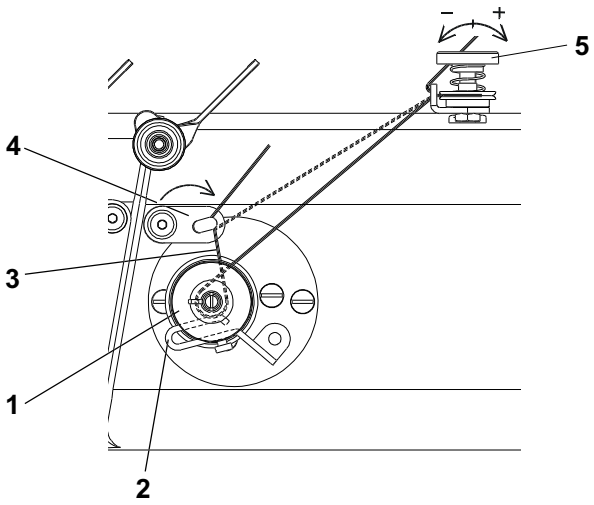
Measurement of tension is done by dynamometer.

Warning:
The upper thread tensioner has been loosened automatically after every trimming and top roller lifting. In these cases the thread tension cannot be measured.

Regulating the thread tension

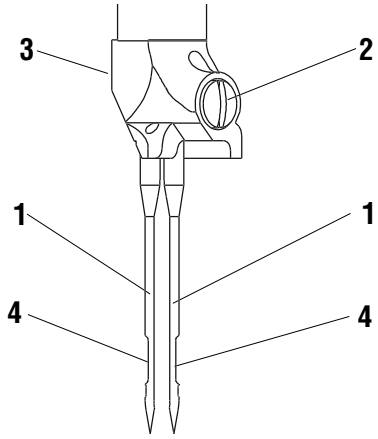
Caution! Risk of injury!
Before regulating the lower thread tension, turn the main switch off and wait until the motor stops.

The upper thread tension is adjusted with nuts (1). Its clockwise turning increases the tension.
The tension of the auxiliary tensioner (3) should be as low as possible but it should be on a level so that the upper thread would not pull out of the tensioner when the work is being removed.
The lower thread tension is adjusted with a screw (2). Its clockwise turning increases the tension.
Tension correlation rate defines the depth of the seam tied through. The result of raising the upper tension will be the decreasing depth of tie through. The opposite will apply with the lower thread.



6.4 Bobbin thread winding

- Insert the bobbin (1).
- Spool counter-clockwise manually onto the bobbin, minimum six threads of the lower thread (3).
- Insert the thread ends into the equipment (4) and cut off the ends.
- Press the lever (2) until it reaches its limit.
- Switch on the machine.
- The winder will automatically switch off after winding.
- Take off the hook bobbin and cut off the end in the equipment (4).
- The nut (5) is instrumental to thread tension control for winding. Turning clockwise sense the thread tension is increased and the single threads are more firmly fixed on the bobbin.
- The tension cannot be so extensive as far as slipping of the winder friction drive has occured.

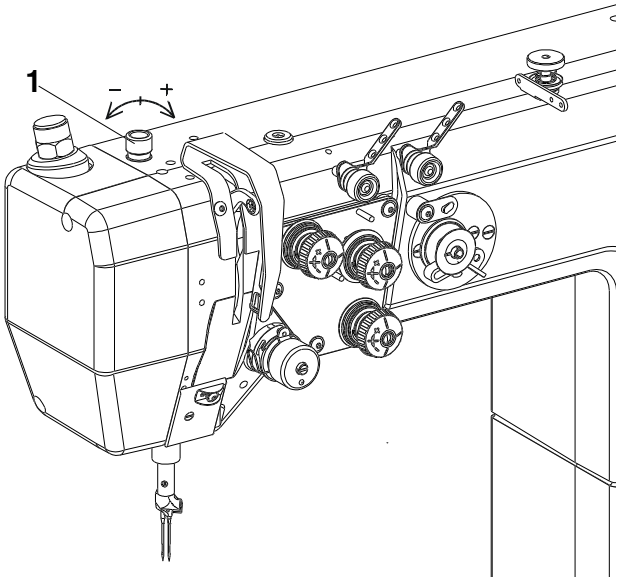


6.5 Needle replacement

Caution! Risk of injury!
Before removing and inserting the needle turn the main switch off and wait until the motor stops!

- Turn with the hand wheel as far as the top needle (1) position has been reached.
- Loosen the screw (2), (3) and remove the required needle.
- When inserting a new needle, care is to be taken that groove (4) above the needle's eye was in the same direction as the hook.
- Tighten the screw (2), (3).

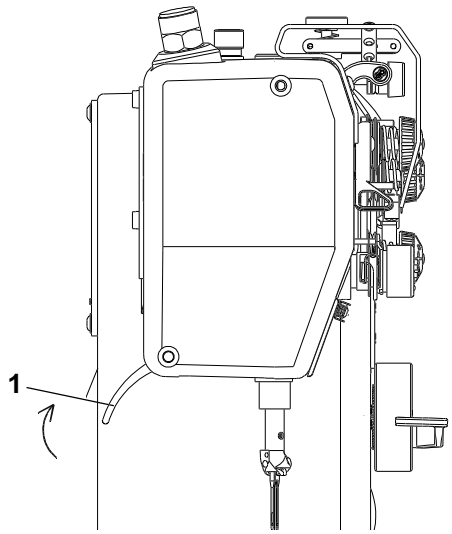
The inserted needle must respond to the sewing category according to paragraph No. 5, table 3. Otherwise it will cause damage to sewing, or eventually the machine could be broken.



6.6 Regulation of pressing the top roller

The pressing of the top roller should be as low as possible but on a level so that the top roller would not fly over when needle comes off the material and that the feeding power got over the thread pull by stitch tightening.
By turning of the screw (1) clockwise pressing of the top roller has been increased, by counter-clockwise turning pressing of the top roller has been decreased.

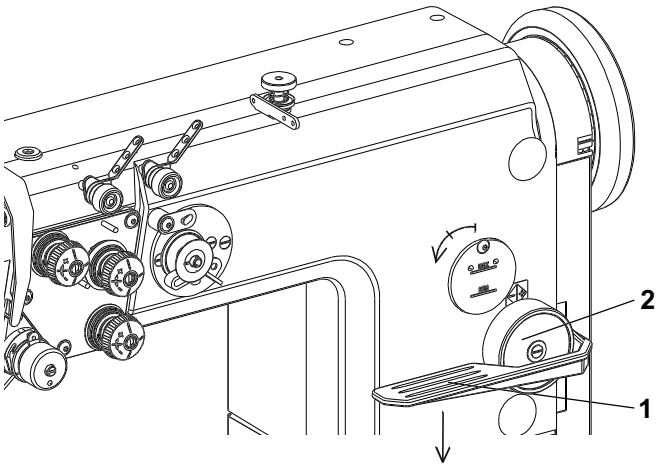
6.7 Lifting the top roller up



Mechanical lifting of the top roller is enabled by means of the hand lever (1), which contemporarily, after it has been lifted in the arrow direction, is locking the top roller in its top position and turning (adjustment) of the machine is possible. The top roller can be lifted via knee lever or left treadle - depending on the machine sub-class. Automatical lifting by means of electromagnet is described in the paragraph No. 7.

When lifting top roller via knee lever or the treadle or electromagnet, the needle must be in the upper position and the machine has to come to a full stop.

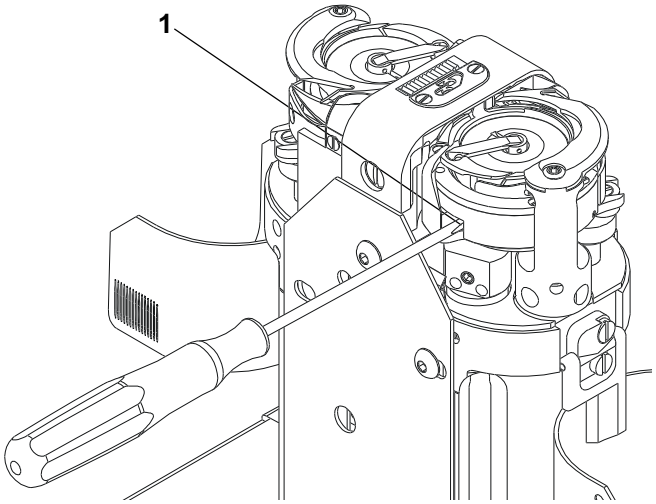
6.8 Reverse stitching



The change of direction of sewn work can be mechanically controlled via a reverse stitching lever (1) by its depression in the arrow direction (down). The sub-class defines whether the machine has electromagnetic reverse stitching – see paragraph No. 7.

6.9 Stitch length adjustment

Stitch length adjustment is by dial (2) by its turning. Turning clockwise stitch length is decreased, turning counter-clockwise stitch is length increased.



6.10 Safety clutch

The machine is provided with a safety clutch which disengages the driving unit, when the hook is blocked. Reconnection must be done in the following way:

Caution! Risk of injury!
Before assembly turn the main switch off and wait until the motor stops!

- Turn the manually operated wheel as far as you can reach the suitable point for inserting a screwdriver into the space(1).
- Continue turning the manually operated wheel in direction of the arrow located on it, until you feel the drop in of the safety clutch.

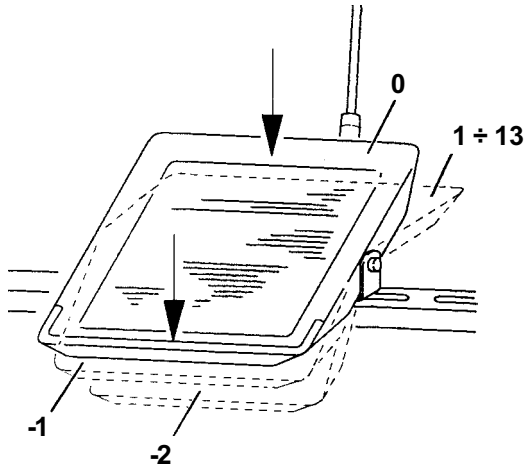
7. Electronic control of the machine

(it is valid for sub-classes equipped with stop motor)

7.1 Control of sewing by means of control elements

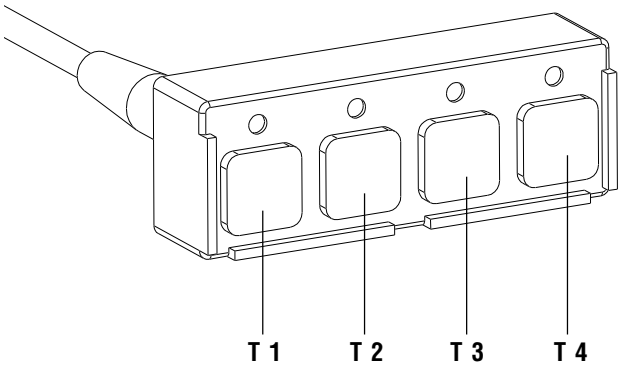
7.1.1 Via treadle (treadle positions and function possibilities)

The position of the treadle is read by the reader, which can recognise 16 levels. Its meaning is shown on the table.



Treadle position	Treadle	Meaning
-2	Foot full backwards	Command for thread trimming (seam finishing)
-1	Foot slightly	Commandlifting the top roller up
0	Neutral position	Note
1	Slightly forwards	Command releasing top roller
2	Continually forwards	Sewing at minimum speed (1. gear)
3	Continually forwards	Sewing at second speed level
:	:	:
13	Fully forwards	Sewing at maximum speed (12. gear)

Note: It is possible to pre-adjust the needle position (up/down) and foot position (up/down) by stopping in seam (introducing the treadle in neutral position). Foot position (up/down) after seam finishing (pressing the treadle by foot fully backwards).



7.1.2 Via pushbutton panel

There are four built-in pushbuttons in the panel with fixed adjustable functions:

T1 - bar operation (by pressing this pushbutton during sewing the sewn work is feed back)

T2 - needle up/down (each press of the pushbutton changes the needle position)

T3 - temporary cancelling (recalling) bar (in case) the bar is pre programmed at the start and end of the seam, by pressing the pushbutton down will uniformly switch off; if it is not chosen it will switch on by pressing the pushbutton

T4 - revolutions limitation (valid for motor Efka DA82GA)
- reduction of pressure of the presser foot for Mini-stop EFKA DA320 (see The instructions for assembling with Mini-stop, par. 5.2.4)

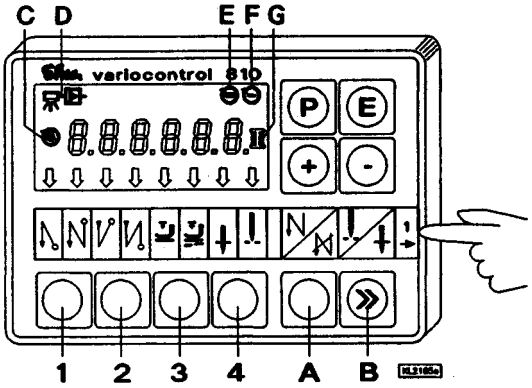
7.1.3 Via control panel Efka V 810/V 820

These functions are standardly assigned to the pushbuttons A, B:

A - cancelling (recalling) the bar (the same function as T3 of the pushbutton panel)

B - needle up/down(the same function as T2 of the pushbutton panel)

Note: function of the A,B pushbuttons can be changed by different adjustment of parameters 293,294 (see the parameters list of driving unit Efka DA82GA).



7.2 Adjustment of automatic functions via control panel for stop motor

7.2.1 By using stop motor Efka with panel V 810

Functioning pushbuttons engagement:

Pushbutton P	Recalling and program mode termination
Pushbutton E	Confirmation of program mode changes
Pushbutton +	Increase of value displayed in program mode
Pushbutton -	Decreasing value displayed in program mode
Pushbutton 1	Start bar SINGLE/DOUBLE/OFF
Pushbutton 2	End bar SINGLE/DOUBLE/OFF
Pushbutton 3	Automatic top roller lifting after stopping at the seam ON/OFF Automatic top roller lifting after thread trimming (end of seam) ON/OFF Automatic reduction of pressure of the presser foot ON/OFF (only for DC 1550/ DA320; see The instructions for assembling with Mini-stop, par. 5.2.4)
Pushbutton 4	Basic position of needle UP/DOWN
Pushbutton A	For cancelling respectively recalling the bar
Pushbutton B	For switch over the needle position UP/DOWN respective shift pushbutton in program mode
Symbol C	Connection of automatic revolutions
Symbol D	Connection of lighting barrier
Symbol E	The machine is running
Symbol F	The revolutions limitation switch on
Symbol G	Connection of lower thread controller, flashing light indicator symbol when the threads supply on the bobbin is running out

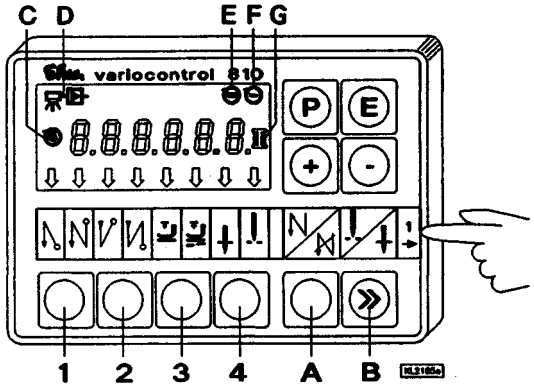
The arrows on the display indicate switching the functions which are displayed by symbols above the pushbuttons on.

7.2.1.1 Adjustment by means of buttons with fixed setting function

Note: It is important to finish the seam in order to reach effective button pressing (press the treadle fully backwards down).

Setting start bar:
Drive enables sewing start bar automatically. It is necessary to choose the type (single, double, off) and number of stitches which will be sewn forwards and backwards.
The arrow above its symbol shows the type of bar (chosen by gradually pressing pushbutton 1). It will be displayed following after pressing pushbutton 1.
Arv (SAv) XXX - number of stitches of start (fancy) bar forwards or
Arr (SAr) XXX - number of stitches of start (fancy) bar backwards) for about 3 sec.
At this time you can change the number of stitches by gradually pressing the pushbutton + or -.

Setting end bar:
The same applies to the start bar (setting by the means of pushbutton 2).
Erv (SEv) XXX - end (fancy) bar number of stitches forwards
Err (SEr) XXX - end (fancy) bar number of stitches backwards



Note: The last section of end bar must have at least 3 stitches.
Foot position adjustment by stopping at the seam (by neutral position of treadle) and after finishing seam (by neutral position of treadle):
Setting is by means of pushbutton 3, arrow indication above the corresponding symbol.

Needle position adjustment by stopping at the seam:
Setting is by means of pushbutton 4.

7.2.1.2 Setting by means of parameters

Drive memory contains the parameters which enables sewing system tuning. These parameters have exact meaning and they are divided into 3 levels. Further parameters which are available only for operation will be quoted. Each parameter has its (sequence) number and value.

General procedure by changing parameters of operation level:
- switch the main switch on or finish the seam by pressing the treadle fully backwards down
- press pushbutton P on the panel V 810
- it will be displayed on the display F 000 (000 it is the number of parameter)
- by several times pressing + (or -) set the requested number of parameter
- push pushbutton E down and it will be shown the value of parameter on the display
- you can change the value by means of pushbutton + or –
- by pushing pushbutton E down you will change the sequence to the following number of parameter
- by pushing pushbutton P down you will leave the mode of changing parameters

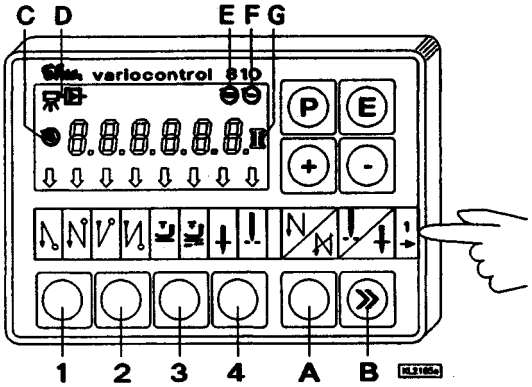
Note: 1. For permanent memory storing of changed parameter, it is necessary to press treadle forwards down after changing of parameters.
2. Mode of changing parameters is possible only after finishing of the seam.

Number of stitches in bars:
Number of stitches is stored in parameter's number.

No. of parameter	Value range of parameter	Description of parameters
000(080)	0-254	Number of stitches of start (fancy) bar forwards
001(081)	0-254	Number of stitches of start (fancy)bar backwards
002(082)	0-254	Number of stitches of end (fancy) bar backwards
003(083)	0-254	Number of stitches of end (fancy)bar forwards

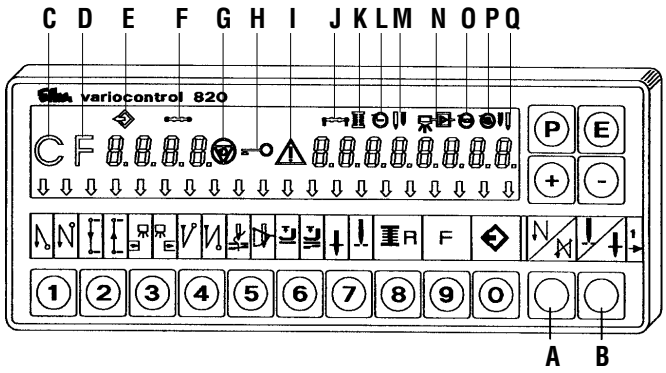
Sewing according to sewing program:
Drive with panel V810 automatically enables sewing of 1 seam with setting number of stitches. It is necessary to set in corresponding number of stitches, and initialisation of sewing program.

No. of parameter	Value range of parameter	Description of parameters
007	0-254	Number of stitches
015	ON/OFF	ON/OFF sewing under sewing program



ON/OFF thread trimmer:

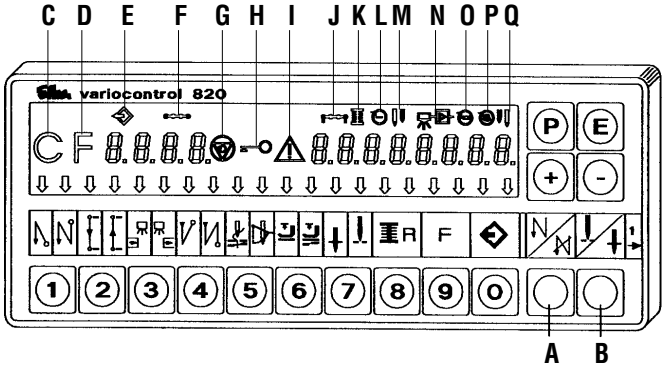
No. of parameter	Value range of parameter	Description of parameters
013	ON/OFF	Thread trimmer ON/OFF



7.2.2 By using stopmotor Efka with panel V 820

Functioning pushbuttons engagement:

Pushbutton P	Call and termination of programming mode
Pushbutton E	Confirmation when changing programming mode
Pushbutton +	Increasing the value displayed in programmingmode
Pushbutton -	Reducing the value displayed in programming mode
Pushbutton 1	Start bar SINGLE/DOUBLE/OFF
Pushbutton 2	Stitch counting FORWARD/BACK/OFF
Pushbutton 3	Light barrier function LIGHT-DARK/DARK-LIGHT/OFF
Pushbutton 4	End bar SINGLE/DOUBLE/OFF
Pushbutton 5	Function TRIMMING/TRIMMING+EJECTOR/OFF
Pushbutton 6	Automatic top roller lifting after having stopped inside the seam ON/OFF Automatic top roller lifting after trimming ON/OFF Automatic reduction of pressure of the presser foot ON/OFF (only for DC 1550/ DA320; see The instructions for assembling with Mini-stop, par. 5.2.4)
Pushbutton 7	Basic needle position UP/DOWN
Pushbutton 8	Lower thread waste controlling ON/OFF
Pushbutton 9	Operation pushbutton - programmable
Pushbutton 0	Programming/processing of 40 possible sewing sections (seams)
Pushbutton A	For cancelling or calling the bar
Pushbutton B	For switching needle position UP/DOWN, resp. shifting pushbutton in the programming mode
Symbol C	Designating symbol C for code number
Symbol D	Designating symbol F for parameter number
Symbol E	Programme number in TEACH IN mode
Symbol F	Seam number in TEACH IN mode
Symbol G	Run blocking ON
Symbol H	Blocked insertion by pushbutton
Symbol I	Fault reporting
Symbol J	Insertion of stitch number in TEACH IN mode
Symbol K	Connected lower thread controller, flashing symbol when running out thread reserve on bobbin
Symbol L	Limitation of revolutions ON
Symbol M	Right needle disconnected
symbol N	Evening stitches for light barriee in the TEACH IN mode
Symbol O	Machine is running



Symbol P Automatic revolutions ON
Symbol Q Left needle disconnected

The arrows on the display indicate switching the functions which are displayed by symbols above the pushbuttons on.

7.2.2.1 Adjustment by means of buttons with fixed setting function

Note: It is important to finish the seam in order to reach effective button pressing (press the treadle fully backwards down).

Setting start bar:
Drive enables sewing start bar automatically. It is necessary to choose the type (single, double, off) and number of stitches which will be sewn forwards and backwards.
The arrow above its symbol shows the type of bar (chosen by gradually pressing pushbutton 1). It will be displayed following after pressing pushbutton 1.
Arv (SAv) XXX - number of stitches of start (fancy) bar forwards or
Arr (SAr) XXX - number of stitches of start (fancy) bar backwards for about 3 sec.
At this time you can change the number of stitches by gradually pressing the pushbutton + or -.

Setting end bar:
The same applies to the start bar (setting by the means of pushbutton 4).
Erv (SEv) XXX - end (fancy) bar number of stitches forwards
Err (SEr) XXX - end (fancy) bar number of stitches backwards

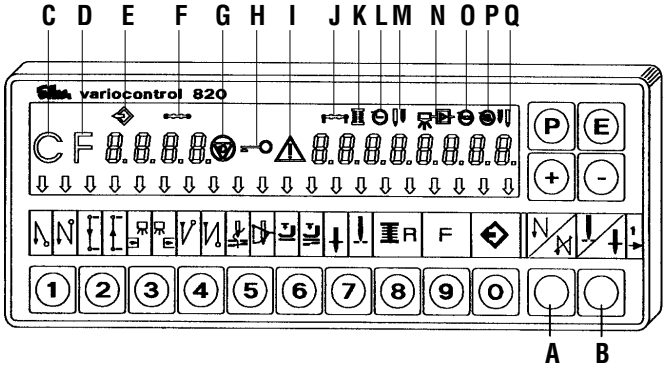
Note: The last section of end bar must have at least 3 stitches.

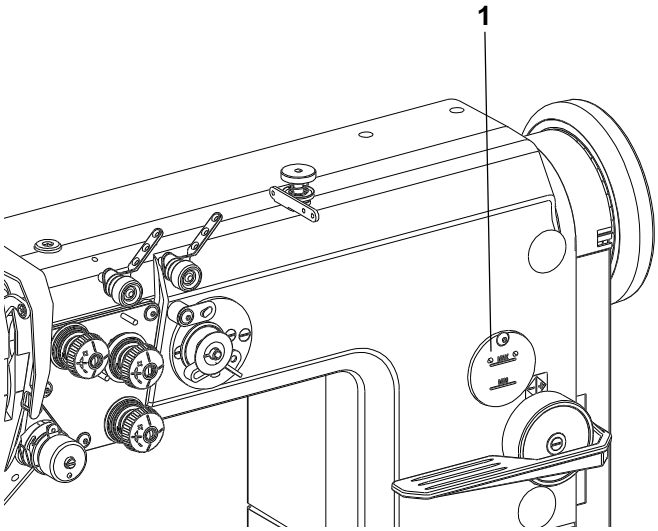
Foot position adjustment by stopping at the seam (by neutral position of treadle) and after finishing seam (by neutral position of treadle):
Setting is by means of pushbutton 6, arrow indication above the corresponding symbol.
Needle position adjustment by stopping at the seam:
Setting is by means of pushbutton 7.
Trimming switched ON/OFF:
To be set using pushbutton 5.
Sewing programme ON:
To be switched on using pushbutton 0.
Switching ON/OFF the function of the pushbutton F:
The pushbutton F on panel can have assigned one of the following functions: Sst - softstart
SrS - fancy bar
Frd - reverse angle after trimming

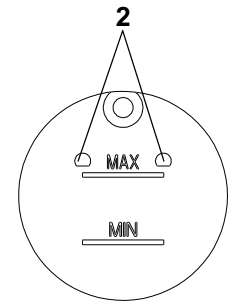
7.2.2.2 Setting by means of parameters

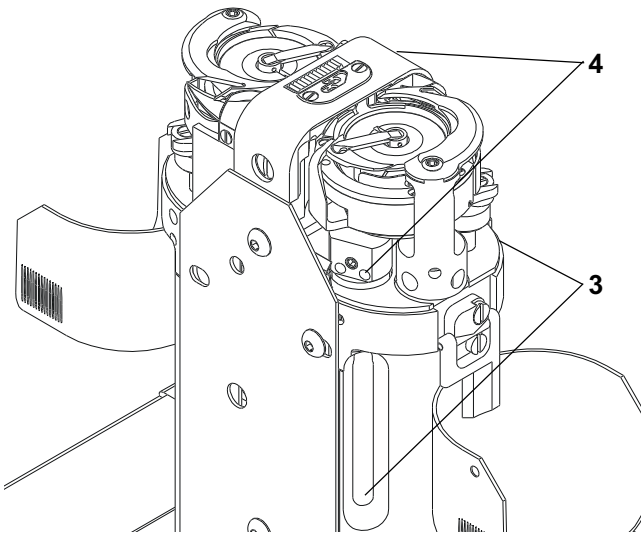
Drive memory contains the parameters which enables sewing system tuning. These parameters have exact meaning and they are divided into 3 levels. Further parameters which are available only for operation will be quoted. Each parameter has its (sequence) number and value.

General procedure by changing parameters of operation level:
- switch the main switch on or finish the seam by pressing the treadle fully backwards down
- press pushbutton P on the panel V 820
- on the display there is no data shown
- by depressing the pushbutton E several times, set the required parameter (without having displayed the parameter number)
- you can change the value using pushbuttons + or -
- by depressing the pushbutton E you will pass in the given sequence to the following parameter
- by depressing the pushbutton P down you will leave the mode of changing parameters









Note: 1. For permanent memory storing of changed parameter, it is necessary to press treadle forwards down after changing of parameters.
2. Mode of changing parameters is possible only after finishing of the seam.

Number of stitches in bars:
Number of stitches is stored in parameter's number.

No. of parameter	Value range of parameter	Description of parameters
000(080)	0-254	Number of stitches of start (fancy) bar forwards
001(081)	0-254	Number of stitches of start (fancy) bar backwards
002(082)	0-254	Number of stitches of end (fancy) bar backwards
003(083)	0-254	Number of stitches of end (fancy) bar forwards

The drive with the panel V 820 enables sewing automatically up to 40 seams distributed up into eight programmes with the given stitch numbers and sewing direction (forwards/rearwards). For more detailed information see the original driving instructions.

8. Maintenance

Caution! Risk of injury!
Maintenance work can only be carried out when the machine is off and the motor stops.

Maintenance work which must be carried out and the intervals between them and set out in the following table.

Maintenance work	Interval
Removing throat plate and its cleaning. Cleaning of feed dog, hooks and space around feeding wheel of material and thread residues. To clean it, use brush. It is prohibited to use compressed air for cleaning without protective guards preventing injury of persons with flying impurities. Hooks lubrication - (one drop of oil).	1 day
Checking the oil level in the hook lubrication oil tanks.	1 week
Checking the oil level in the oil tank of the central distribution.	1 month

For the lubrication of this machine Esso SP-NK 10, DA 10 or an equivalent quality lubricating oil is recommended (viscossity at 40° C: 10 mm^2/s; flash point: 150°C).
The oil tank (1) of the central distribution is to be filled the hole (2) up to the mark max.
The oil tank (3) of the hook lubrication is to be filled the hole (4) up to the upper edge.

Operating instructions for eventual trouble shooting

Meaning of abbreviations: NP - Instruction manual
SK - Instructions for service

Note: When the machine is driven by a stop motor, it is indispensable to check up, before starting its repair, the setting of its parameters according to NP, part B, par. 5.

Trouble	Cause	Method of troubleshooting
1. Upper thread breaking.	1.1 Incorrect threading of the upper thread.	Thread the upper thread according to NP, par. 6.1.
	1.2 Excessive thread tension.	Set the tension according to NP, par. 6.3.
	1.3 Needle incorrectly inserted or damaged.	Replace needle according to NP, par. 6.5.
	1.4 Needle thickness does not suit to that of thread or sewn material.	Use a thicker needle.
	1.5 Hook point sticks the thread.	Set distance between hook and needle according to SK, par. 3.1.3 and 3.1.5.
	1.6 Incorrect side setting of throat plate post or needle bed shifting - little gap between needle and piercing hole edge from hook side.	Set according to SK, par. 3.3.2. Correct distance between needle and hook according to SK par. 3.1.3.
	1.7 Rear needle guide in an excessive back position - the right upper thread is being slid on it.	Set rear needle guide, so that its front edge fits with the rear edge of the right piercing hole.
	1.8 Needle thread excessively elastic.	Increase the hook timing and set the needle bar height according to SK, par. 3.2.3.
	1.9 Low quality thread.	Replace thread.
	1.10 Needle thickness unsuitable for the hole in the throat plate insert.	Replace insert according toNP, par. 4.1.6.
	1.11 Damaged throat plate insert.	Replace insert.
	1.12 Incorrect setting of opening bobbin case lifter (little opening).	Set according to SK, par. 3.1.6.
2. Lower thread breaking.	2.1 Incorrect threading.	Thread according to NP, par. 6.2.
	2.2 Damaged bobbin.	Replace bobbin.
3. Skipped stitches at the seam beginning after previous thread trimming.	3.1 Short thread end in needle after trimming (thread too tensioned in the moment of trimming).	Thread upper thread according to NP, par. 6.1. Reduce tension of pretension unit according to NP, par. 6.4. Accelerate slightly OFF position of main tensioner according to SK, par. 4.8; NP, part B , par. 5.2.2, 5.3.2; Mini-stop, par. 5.2.5 - parameter 192.
	3.2 Excessive thread tension.	Set thread tension according to NP, par. 6.3.
	3.3 Upper thread not squeezed, at the first needle piercing, between sewn material and edge of piercing hole.	Reduce height of feeder according to SK, par. 3.6.3.2.1. Put nearer top roller to needle and shift it rearwards according to SK, par. 3.7.6.2. Reduce rear guide, so that it touches slightly sewn material with lowered top roller.

	3.4 Upper thread incorrectly caught by movable trimming knife. Lumps of thread remaining in hook space.	Set correctly hook opening according to SK, par. 3.1.6 and adjust setting of trimming cam according to SK, par. 4.3.
	3.5 Needle too thick with regard to thickness of thread and sewn material.	Use thinner needle.
4. Stitch skipping.	4.1 Needle incorrectly inserted.	Insert needle according to NP, par. 6.5.
	4.2 Too big distance between needle and hook point.	Set according to SK, par. 3.1.3 and 3.1.5.
	4.3 Incorrectly set needle hook timing or needle height.	Set according to SK, par. 3.1.4 and 3.2.3.
	4.4 Rear needle guide too high - sewn material lifts when moving the needle and the hook point does not catch the upper thread loop.	Set rear guide, so that it touches slightly the sewn material with the lowered top roller.
	4.5 Excessively elastic material or excessively elastic thread.	Increase timing as needed and set the needle bar height according to SK, par. 3.2.3.
	4.6 Damaged hook point.	Replace hook.
5. Incorrect stitch locking. Threads are locked on top side of sewn material.	5.1 Lower thread tension.	Set according to NP, par. 6.3.
	5.2 Incorrect threading and tension setting of upper thread.	Thread according to NP, par. 6.1 set according to NP, par. 6.3.
6. Incorrect stitch locking. Threads are locked on bottom side of sewn material and increasing of tension is of upper thread no help.	6.1 Upper thread out of tensioning dishes.	Thread correctly according to NP par. 6.1.
	6.2 Opening bobbin case lifter incorrectly set (it opens too little).	Set according to SK, par. 3.1.6.
	6.3 Feeder too low - difficult passage of thread between sewn material and throat plate.	Set feeder height according to SK, par. 3.6.3.2.1.
	6.4 Incorrect side setting of the throat plate post or needle bed shifting-insufficient gap between needle and edge of piercing hole in the throat plate insert from the hook side.	Set according to SK par. 3.3.2 (4260-6). Correct setting of the distance between needle and hook according to SK par. 3.1.3.
	6.5 Needle guide set too low - sewn material is pushed against throat plate and upper thread threadning is difficult.	Set guide according to SK par. 3.4.3.
	6.6 Upper thread insufficiently tensioned when passing through hook.	Shift thread limiter to the top according to SK, par. 3.4.5 or by more than the value quoted there.
7. Stitches insufficiently tightened and with irregular positioning. Thread unravelled.	7.1 Low tension of upper and lower threads.	Set tension according to NP, par. 6.3.
	7.2 Upper thread insufficiently tensioned when passing through hook.	Shift thread limiter to the top according to SK, par. 3.5.5 or more than the value quoted there.
	7.3 Thin needle with regard to thread thickness.	Use a thicker needle.

	7.4 Unsuitably chosen needle type.	Use needle with another needle point (e.g. D).
	7.5 Rear needle guide incorrectly set up.	Set according to SK par. 3.4.3.
8. Sewn material wavy in seam.	8.1 Thread tension to high for sewn material.	Reduce tension of both threads.
9. Machine does not feed or is feeding slowly or in reverse sense.	9.1 Overrun safety clutch against hook overload.	Engage correctly clutch according to NP, par. 6.10.
10. Difficult and iregular machine feed.	10.1 Feeder too low (especially when sewing soft and thick materials).	Raise feeder more from throat plate according to SK, par. 3.6.3.2.1.
	10.2 Feeder teeth unsuitable (too fine) for sewn material.	Use feeder with 1.5 mm teeth pitch. Replace according to SK, par. 3.6.3.2.2.
11. Hook blocked.	11.1 Incorrect lower thread threading when replacing hook bobbin - lower thread caught by hook point.	Thread lower thread according to NP, par. 6.2.
	11.2 Upper thread out of tensioning dishes and 2x caught by hook point.	Thread upper thread according to NP, par. 6.1.
	11.3 Insufficient gap between needle and piercing hole from hook side.	Set according to SK par. 3.3.2 .
12. No upper thread trimming.	12.1 Incorrectly threaded thread.	Thread the thread according to NP, par. 6.1.
	12.2 Upper thread excessively braked when moving upwards due to thin needle, thick elastic material, low feeder position, low thread tension.	Insert thicker needle according to NP, par. 6.5. Lift feeder according to SK, par. 3.6.3.2.1.
	12.3 Tensioner electromagnet cuts soon main tensioner during trimming.	Delay position of cutting the main tensioner according to SK, par. 4.8 and according NP, part B, par. 5.2.2, 5.3.2; Ministop, par. 5.2.5 - parameter 192.
	12.4 Fixed trimming knife does not fit with all its width against movable knife.	Set knives according to SK, par. 4.6.
	12.5 Movable knife does not run over movable knife edge.	Set knife according to SK, par. 4.5.
	12.6 During trimming cycle, safety clutch against hook overload gets disengaged.	Increase clutch disengaging moment according SK, par. 3.10.2 and reduce thread tensioning according to NP, par. 6.3.
13. No lower thread trimming.	13.1 Incorrect movable knife path setting.	Set knife according to SK, par. 4.5.
	13.2 Incorrect cam setting.	Set cam according to SK, par. 4.3.
	13.3 Incorrect trimming knife height setting.	Set height according to SK, par. 4.5.
14. Second and third stitches incorrectly locked at the beginning of sewing after previous trimming.	14.1 Incorrect setting of lower hook thread retaining spring.	Set spring according to SK, par. 4.7.

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Part B1 - The instructions for assembling

1. Safety instructions



Caution !
Assembly of the machine must only be carried out by appropriately trained technician.
Any operations to be performed on the electric installation of the sewing machine are to be done only by a competent electrician.

2. The way of machine supply

The contents of supply will be determined in agreement between the supplier and buyer. There are following possibilities:

2.1 Complete head with accessories

In this case the supply contains:
- Complete head.
- Chosen spare parts in the bag under the presser element (see parts indicated * in catalogue of spare parts).
- Standard accessories (it contains tools-see module in catalogue of spare parts).
- Special accessories (it contains some components of a stand and upper belt cover-see module in catalogue of spare parts).

The supply like this is not complete. Buyer will provide missing components himself or he can put in an extra order to get them according to the following paragraphs.

2.2 Stand

Delivery contains components of a stand, however, without components of a stand included in special accessories supplied with machine head (see par.2.1) and without any electrical components.
If it hasn't been agreed otherwise, the stand is supplied in separate pieces. If the assembled stand is asked, special accessories are used from head supply.

Stand (ordered number S400 010000) contains following items:

MG55 000501	Stand frame
MG53 002501	Big treadle
MG53 007511	Set of parts for a stand
S615 000320	Table top

Equipment for foot lifting by treadle:

S522 000450	Small treadle
S980 060028	Foot lifting rod

2.3 Motor

The supply contains its own motor, switch - circuit breaker, all cabling and material for connection. It can contain a control panel according to the type of motor. If it hasn't been agreed otherwise, it is supplied in separate pieces. A machine without trimming is equipped with clutch lever motor. However if positioning is asked or electromagnetic foot lifting or electromagnetic reverse stitching (bartacking) the machine without trimming must be equipped with stopmotor.

Motors are chosen according to the following table:

Machine subclass	Ordered number	Name	Diameter of pulley	Machine rev. max./min 50 Hz/60 Hz	Approx. specification
X11 X21	S359 600030 63 S359 600030 50 S359 600030 42	FIR 1148 3 x 400/230 V, 2800 RPM, 50 Hz	63 50 42	2500/3000 2000/2400 1600/2000	asynchronous clutch motor; switch-circuit breaker with cabling; connection material
	S359 600031 75 S359 600031 63 S359 600031 42	FIR 1147F 3 x 400/230 V, 1400 RPM, 50 Hz	75 63 42	1500/1800 1200/1500 800/1000	asynchronous clutch motor; switch-circuit breaker with cabling; connection material
X12 X22 X4X X5X	S359 600045 810 S359 600045 820	Stopmotor EFKA DC 1600/DA82GA 1 x 230 V, 50/60 Hz	58 58	adjustable adjustable	DC motor (AC servo) control panel V810; mains switch with cabling; connection material DC motor (AC servo) control panel V820; mains switch with cabling; connection material
	S359 600052 63 S359 600052 50 S359 600052 42	Stopmotor EFKA * VD 552/6F82FA 3 x 400/230 V, 2800 RPM, 50/60 Hz	63 50 42	2500/3000 2000/2400 1600/2000	asynchronous stopmotor with friction clutch and brake; switch-circuit breaker; connection material
	S359 600056 75 S359 600056 63 S359 600056 42	Stopmotor EFKA * VD 554/6F82FA 3 x 400/230 V, 1400 RPM, 50/60 Hz	75 63 42	1500/1800 1200/1500 800/1000	asynchronous stopmotor with friction clutch and brake; switch-circuit breaker; connection material

* Control panel S359 600038/V810 or S359 600050/V820 it is possible to order for setting the stop motor, however, it is not included in supply of the stopmotor and it has to be ordered separately.



Above mentioned stop motors were tested in the machine and they meet functional requirements. Other types of stop motors can have but need not have suitable parameters. Producer does not recommend using the other stopmotor without testing.

2.4 Motor pulley

By stopmotor EFKA DC 1600/DA82GA is revolutions are set continuously by electronics.

With machines where working with a high twisting moment is necessary due to sewing heavy materials (sewing category 3 and 4) the manufacturer recommends using pulley ø 42 (M 048).

The diameter of the motor pulley in mm must be by asynchronous motors according to the following quotation:

$$\text{Diameter of pulley} = 71 \times \frac{\text{sewing speed (st/min)}}{\text{motor revolutions (rev./min)}}$$

The smallest diameter of pulley is 42 mm considering used V-belt. Belt cover on the motor limits the biggest diameter of pulley to 127 mm.
The pulley for the maximum or other sewing speed will be supplied on express wish of the customer.

Motor pulley diameter

Sewing speed of machines: standard [1)]
Mains voltage frequency: 50 Hz

		Ordered number/motor pulley diameter [2)]				
Model	Sewing speed (SPM)	EFKA DC 1600/ DA82GA 3312 4000 RPM	EFKA VD 552/ 6F82FA 2800 RPM	FIR 1148/552/3 2800 RPM	EFKA VD 554/ 6F82FA 1400 RPM	FIR 1147F/554/3 1400 RPM
4220i-6XX-100	2500		S359 600052 63/ø 63	S359 600030 63/ø 63	-	-
-200	2000	S359 600045 810/ø 58	S359 600052 50/ø 50	S359 600030 50/ø 50	-	-
-300	1200	S359 600045 820/ø 58	-	-	S359 600056 63/ø 63	S359 600031 63/ø 63
-400	800		-	-	S359 600056 42/ø 42	S359 600031 42/ø 42

1) When the customer will not order anything else, he will get a pulley for standard sewing speed. Owing to a limited assortment of pulleys, the effective sewing speed may slightly differ from that declared and quoted in the column.
2) The table gives effective pulley diameter which is by 4 to 5 mm lower than the outer diameter.

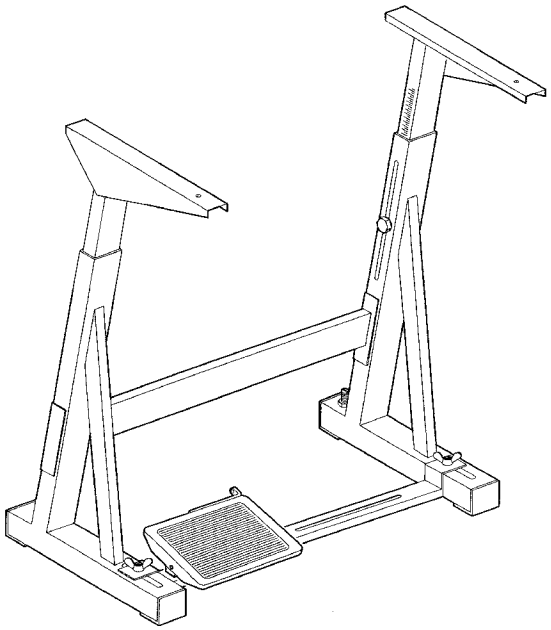
Note.: The effective diameter of the hand wheel pulley is 71 mm.

Sewing speed of machines: standard [1)]
Mains voltage frequency: 60 Hz

		Ordered number/motor pulley diameter [2)]				
Model	Sewing speed (SPM)	EFKA DC 1600/ DA82GA 3312 4000 RPM	EFKA VD 552/ 6F82FA 3360 RPM	FIR 1148/552/3 3360 RPM	EFKA VD 554/ 6F82FA 1680 RPM	FIR 1147F/554/3 1680 RPM
4220i-6XX-100	2500		S359 600052 50/ø 50	S359 600030 50/ø 50	-	-
-200	2000	S359 600045 810/ø 58	S359 600052 42/ø 42	S359 600030 42/ø 42	S359 600056 75/ø 75	S359 600031 75/ø 75
-300	1200	S359 600045 820/ø 58	-	-	S359 600056 42/ø 42	S359 600031 42/ø 42
-400	800		-	-	-	-

When the customer requires another sewing speed than standard, he may additionally order another pulley according to the following table:

Motor	Sewing speed 50 Hz	Sewing speed 60 Hz	Diameter of pulley (mm)	Ordered number
FIR 1148/552/3 EFKA VD552	1660	1990	42	S980 045548
	1850	2220	47	S980 045377
	1970	2370	50	S980 045491
	2130	2560	54	S980 045361
	2290	2740	58	S980 045472
	2480	2980	63	S980 045378
	2640	3170	67	S980 045476
	2760	3310	70	S980 045370
	2960		75	S980 045384
	3150		80	S980 045479
	3350		85	S980 045480
FIR 1147F/554/3 EFKA VD554	830	990	42	S980 045548
	930	1110	47	S980 045377
	990	1180	50	S980 045491
	1060	1280	54	S980 045361
	1140	1370	58	S980 045472
	1240	1490	63	S980 045378
	1320	1590	67	S980 045476
	1380	1660	70	S980 045370
	1480	1770	75	S980 045384
	1580	1890	80	S980 045479
	1680	2010	85	S980 045480
	1770	2130	90	S980 045481
	1970	2370	100	S980 045483
	2090	2510	106	S980 045484
	2210	2650	112	S980 045485
	2500	3010	127	S980 045337



3. Table top

In case buyer will provide his own table top its drawing is shown in supplement.

4. Machine assembly

It is described machine assembly with stand here which is supplied in separate pieces. Otherwise use these instructions adequate.

4.1 Stand frame assembly

A frame is assembled according to the picture.

4.2 Assembly of components on the bottom of table top

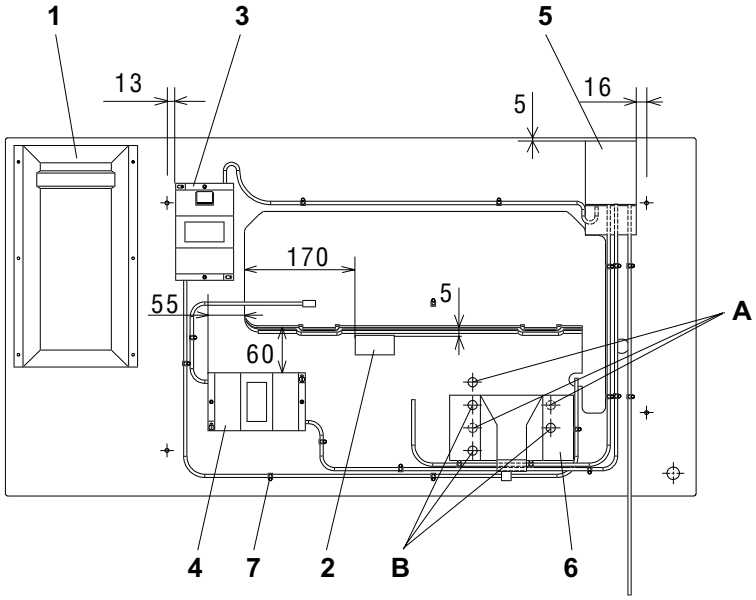
- Put down antiskid (rubber) bands on the stand frame.
- Turn the table top up side down and put it down on prepared bands.
- By means of screws scerw the drawer (1)down.
- Nail down the rubber stop (2).
- By means of screws fasten transformer for lighting (3) if available.
- By means of screws fastened transformer for trimming (4) if available.
- By means of screws fasten switch – circuit breaker (5).
- Screw the motor holder down (6) (possibly motor). Lever clutch motor is assembled into the holes (A). Stopmotor into holes (B).
- By means of clips (7) install transmission line of heavy current conductors. Connection is different from the type of motor, supply voltage and number of conductors of electric supply. In case of quad (four wire) supply 3 x 400 V, transformer for lighting must be supplied with separate supply cable 1 x 230 V.

Caution!
The voltage in the mains must be in conformity with the voltage indicated on the drive plate.

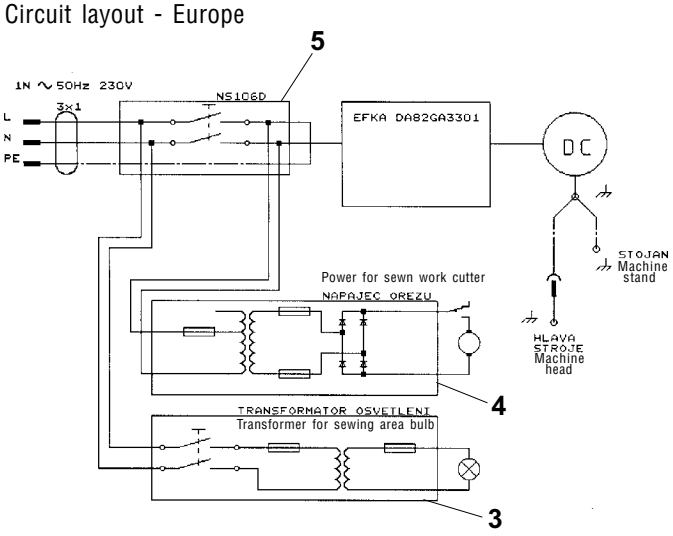
Caution!
The transformer of the bulb for the sewing area is not switched off by the main switch (EN 60204-3-1). Before proceeding to any repair operation in the transformer box (such as a fuse exchange) the plug categorically must be taken out of the socket. Such operations may be carried out only by persons with adequate electrotechnical skill.

Choose the suitable variant according to the pictures:

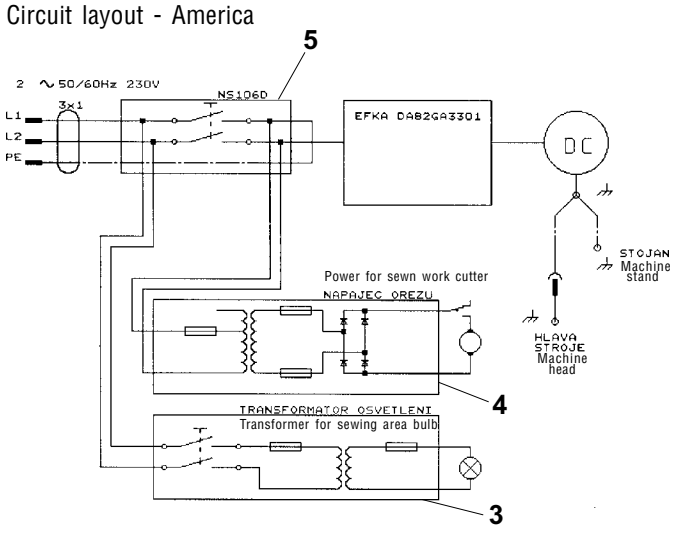
4.2.1 Power supply 1 x 230 V - DC motor



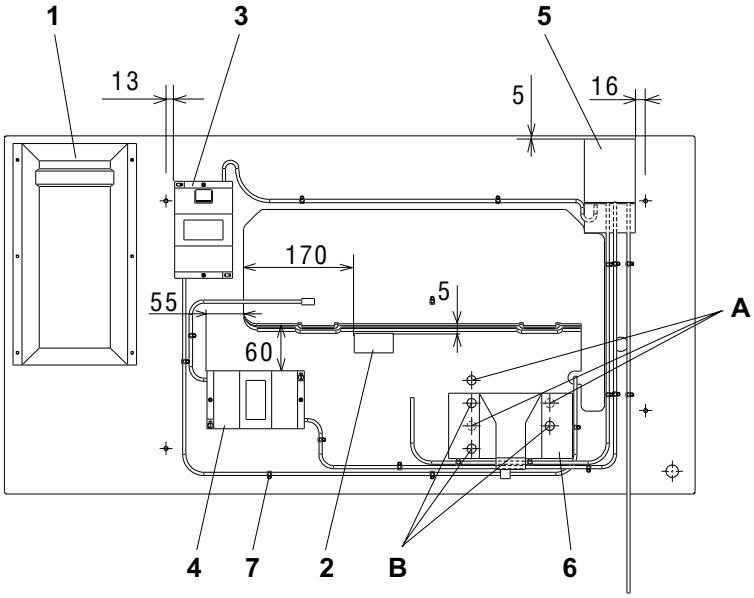
Circuit layout - Europe



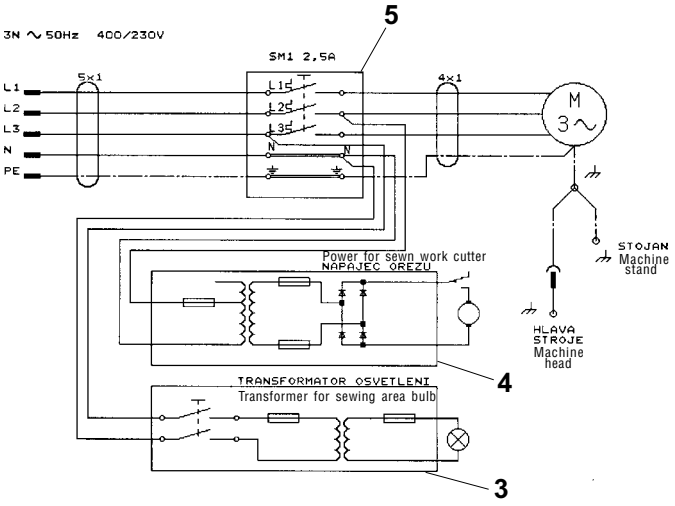
Circuit layout - America



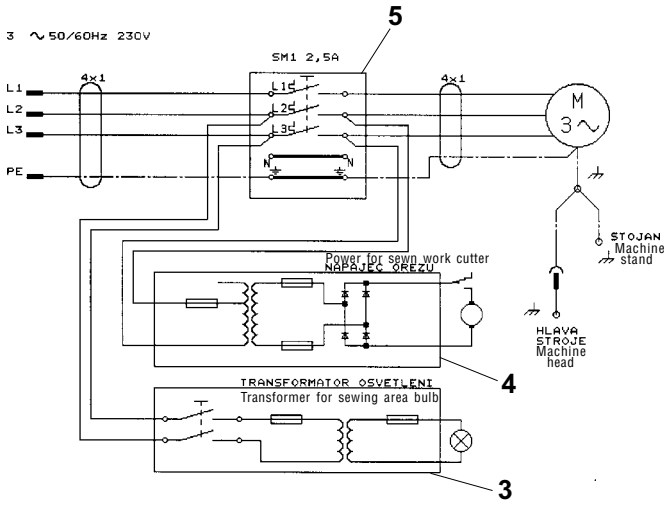
4.2.2 Power supply 3 x 400 V - five wire power distribution, power supply 3 x 230 V - four wire or five wire power distribution



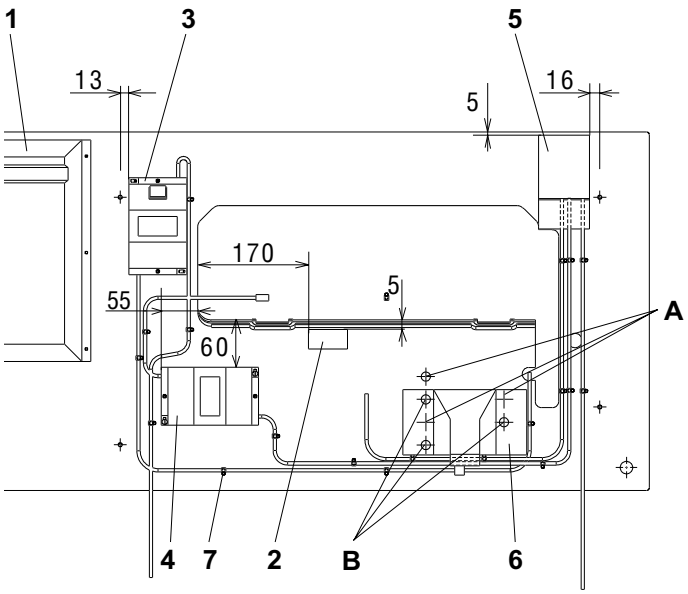
Circuit layout - Europe



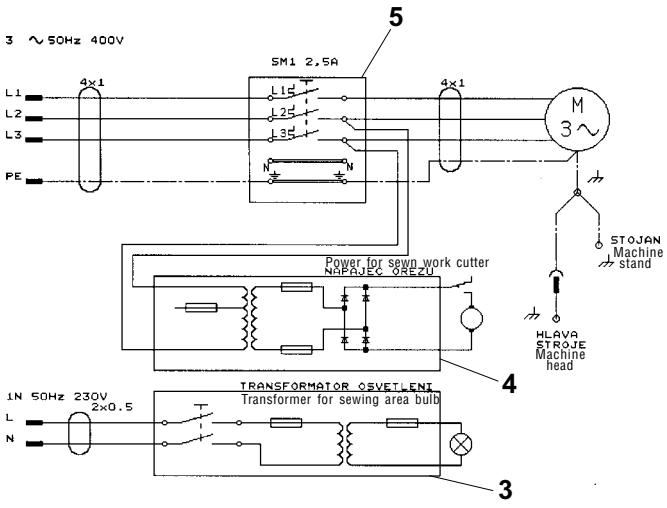
Circuit layout - America

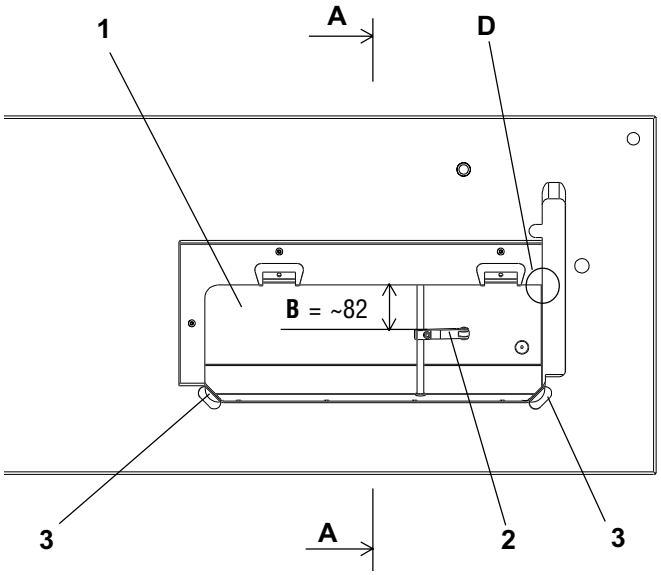


4.2.3 Power supply 3 x 400 V - four wire power distribution plus 1 x 230 V - two wire cable

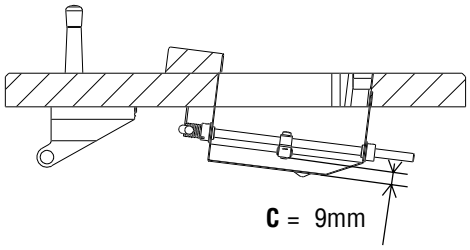


Circuit layout

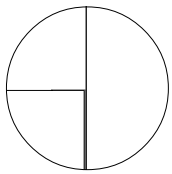




A - A

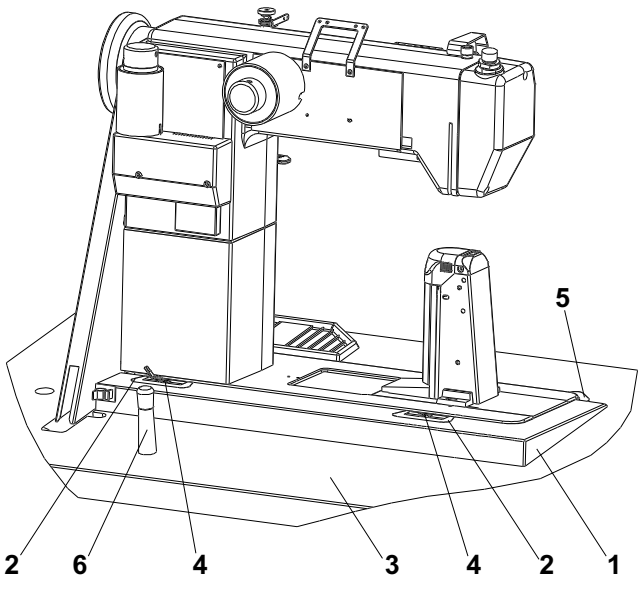


D



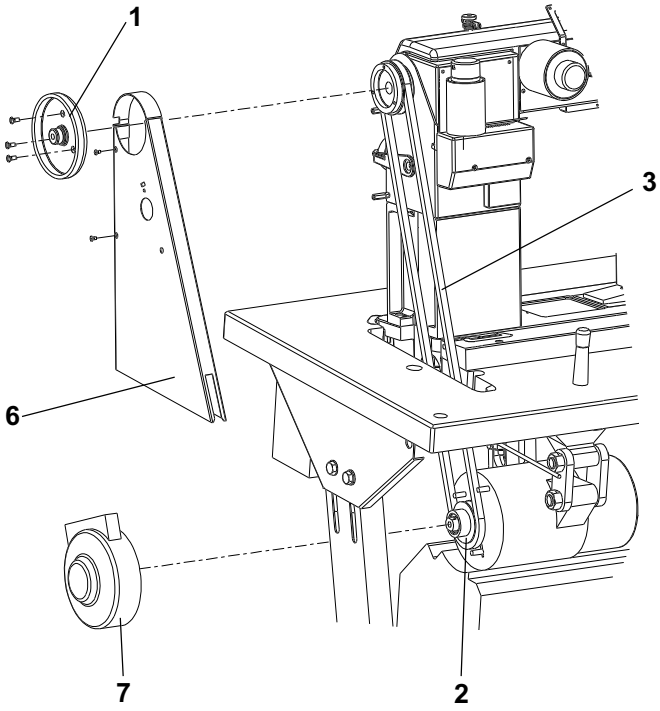
4.3 Assembly of a table top on a stand frame, assembly of oil tank

- Turn the table top around and screw it down to the frame by means of screw ø 8 x 35 mm.
  When applying a frame different from that recommended by the producer, be sure to adapt its position so as to ensure the stability of the machine head in its tilted state.
- Oil tank (1) with assembled lever (2) insert through the bottom part into the cut hole in the table top and put down as shown in detail (D) in that way, that the edge of the tank would fit in with the edge of the cut hole in the table top. Set the height of the tank according to the section A-A. Tank may not protrude out of upper surface of a table top. Nail down the tank with nails ø 2 x 40 mm.
- Adjust the lever (2) to the dimensions “B“ and “C“.
- Insert rubber inlays (3) into the groove in a table top.

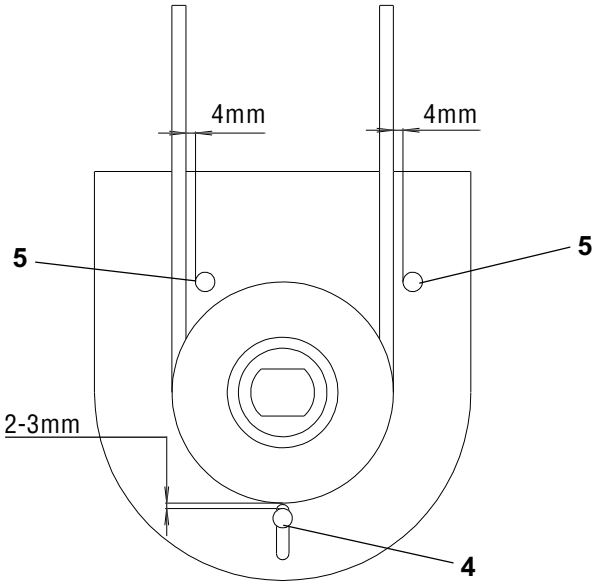


4.4 Assembly of machine head onto a stand

- Stick down rubber inlays (2) with glue into the groove in a wedge (1) and put the wedge down on the table top (3).
- Disassemble trasported tank (cover) from the machine head and assemble hangers (4) on the head.
- Put the head down into the rubber inlays (2) and (5).
- Define space along circumference of basic machine plate. 2 mm forwards, 1 mm backwards (head will later move forward because of its own weight), along sides 1,5 mm up to 2 mm.
- Conforming with holes in a wedge (1) and in hangers (4) drill holes through the table top ø3,5 in length approx. 30 mm in the table top.
- Screw the wedge down to the table top with screws ø5 x 30 mm.
- Screw the hangers down to the table top with screws ø5 x 40 mm. Tighten the screws so that oscillating of the head on rubber inlays would not be reduced.
- Insert supporting pin (6).

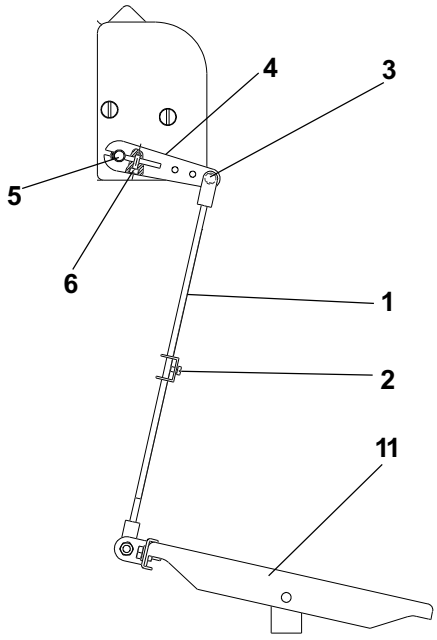


D



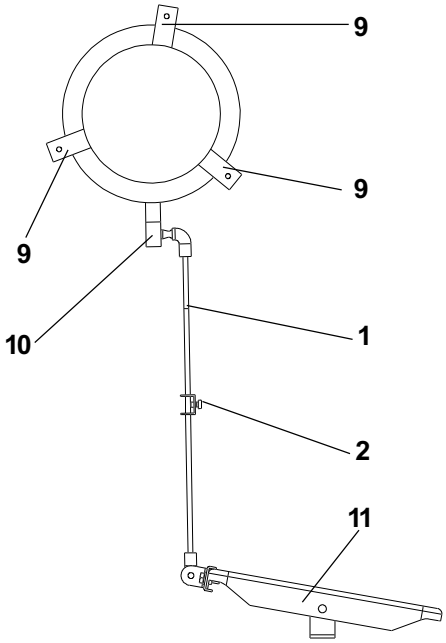
4.5 Assembly of motor pulley, belt, belt covers, hand wheel

- Disassemble hand wheel (1).
- Assemble motor pulley (2).
- Insert V-belt (3) and tighten it by leaning out of the motor. V-belt is tightened correctly when the opposite sides of belt are approaching to each other in distance of about 20 mm with power 10 having an effect in the middle of both sides. Stop motor should be leveled so that the bottom surface of its control panel would be horizontal.
- Adjust the stop (4) by bigger pulleys against falling the belt out of the pulley so that the distance from the belt will be 2-3 mm. Adjust pins by smaller pulleys (5) according to the detail (D).
- Assemble the bottom cover belt (7) on to the motor.
- Assemble upper cover belt (6) and hand wheel (1)by clutch lever motor.
- Assemble upper cover belt (6), hand wheel (1) and position reader by stop motor but only after electrical connection of the head to the stopmotor (see par. 4.7).

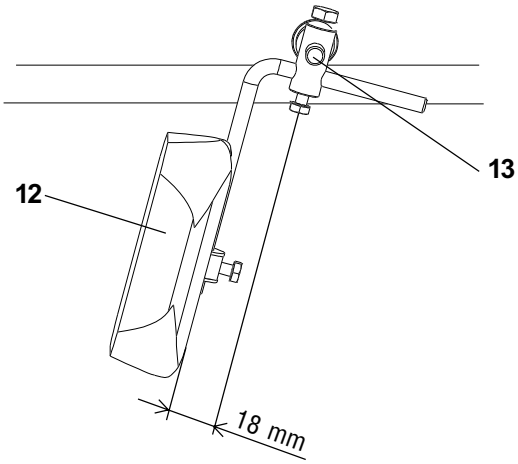


4.6 Assembly of treadle rod, setting rod and of position reader, knee lever

- Insert treadle rod (1) on pins.
- Adjust approx. length of rod by means of screw (2).If the ends of rod are too long, shorten them.
- Install the pin into the hole (3) by stopmotor EFKA. Adjust the lever (4) so that it would be approx. square angle at a rod (1) - take off the ring (5), loosen the screw (6), take of the lever (4) and assemble it into desirable position.



- Loosen the screws (9) by clutch lever motor and turn the motor with lever in such a way that the lever (10) would be in direction of the rod axis (1).
- Adjust angular turning of treadle (11). The position of treadle is correctly adjusted if there is a square angle at the shinbone of the operator to the treadle.



- Fasten knee lever (12) onto the shaft (13) and adjust it in a position that it is shown in the picture (slightly leant out).

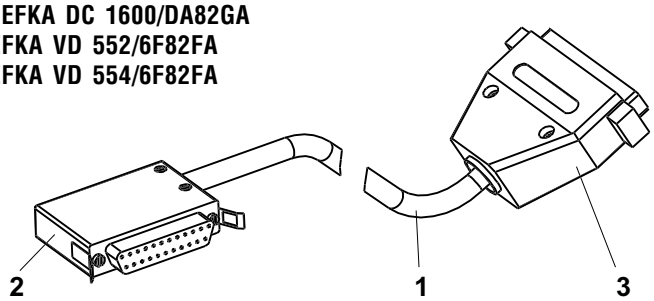
4.7 Electrical connection of machine head to the stopmotor

4.7.1 Connecting cable

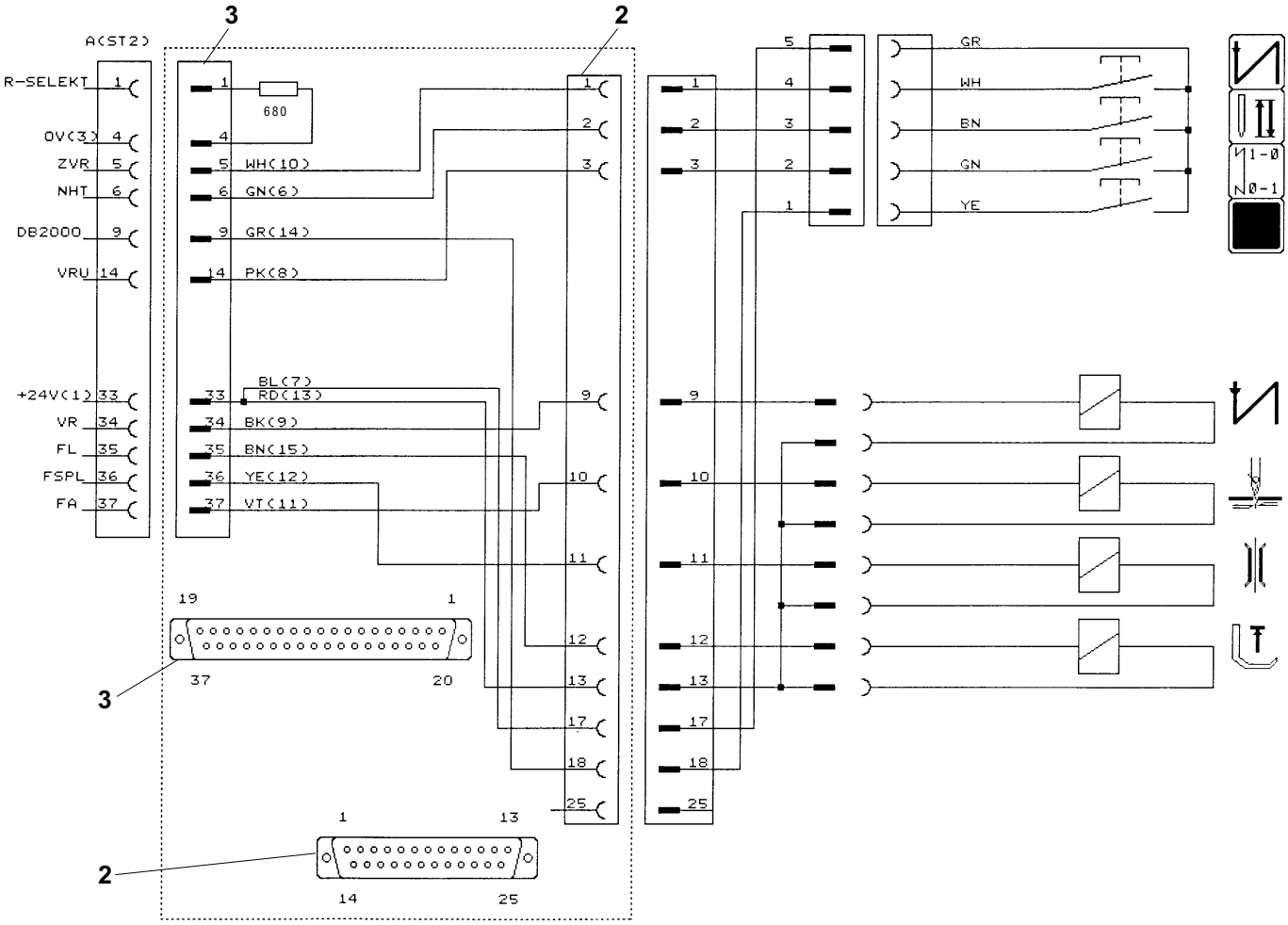
Together with the machine head there is supplied a connecting cable for the following drives:
EFKA DC 1600/DA82GA 3311 and higher
EFKA VD 552/6F82FA 2315 and higher
EFKA VD 554/6F82FA
When there is no drive specified, a cable without any connecting power plug is supplied (mind the caution 2.3).
For the information sake, there are given the respective circuit layout.
The colours are indicated with numbers in brackets (6 – green, 7 – blue, 8 – pink, 9 – black, 10 – white, 11 – violet, 12 – yellow, 13 – red, 14 – grey, 15 – brown). Included insulating covers PVC (5) are put on the bunches and they are put together with remaining part of cable insulation by means of contracted tube (4) (it is heated up with fire of lighter).

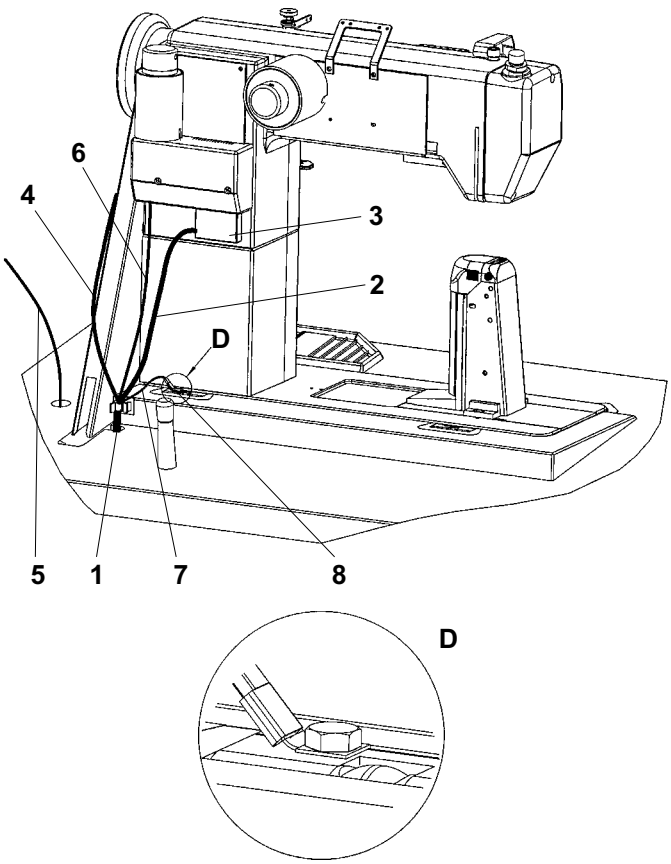
Power connecting cable is marked off with dotted line in circuit layout.

Stopmotor S359 600045 XXX - EFKA DC 1600/DA82GA
Stopmotor S359 600052 XX - EFKA VD 552/6F82FA
Stopmotor S359 600056 XX - EFKA VD 554/6F82FA



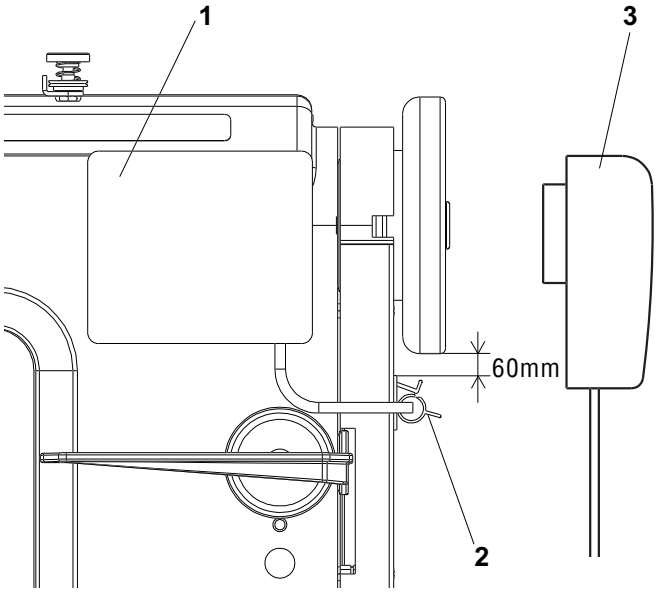
Circuit layout





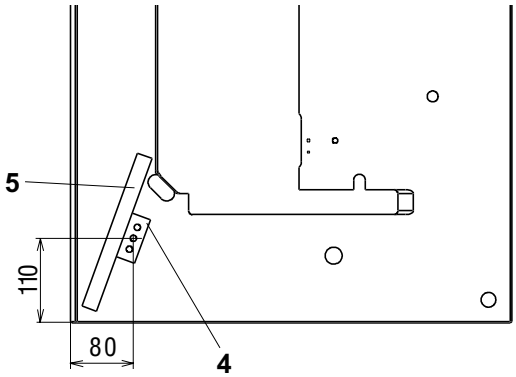
4.7.2 The actual electrical connection

- Stick the clip (1) on wedge (defat the contact surface!).
- Install the power supply cable (2) so that connector (3) is in the direction of a head. The other connector (connectors) is (are) connected into terminal box rack of the stop motor according to the pictographs that are situated on it.
- Install the cable of control panel (4) and connect it to the terminal box of stop the motor according to the pictographs.
- Pass the cable of position reader through (5) and connect it to the terminal box of the stopmotor according to the pictographs.
- Install lighting if available and connect its cable (6)to the cable of transformer.
- Install the earthing cable (7) one end to the hanger (8) and second end to the holder of stopmotor.

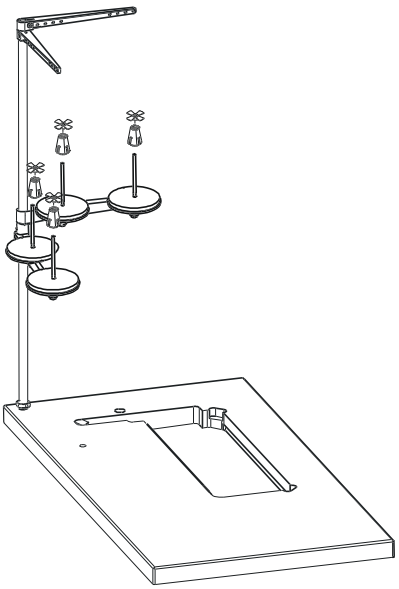


4.7.3 Fastening upper cover belt, position reader, control panel of stopmotor and thread stand

- Screw the stop to the belt guard.
- Assemble upper cover belt and hand wheel according to par.4.5.
- Set the position reader (3) on the handwheel pin so as to match the stop groove of the position reader with the stop (thus immobilizing the position reader).
- Fix the position reader by retightening the two hexagonal screws.
- Fix the control panel of stopmotor:
- Stick the panel V 810 (1) by stopmotor EFKA on the machine head (if any). Defat the contact surface properly. Stick the clip (2) on the cover belt.



- With the Efka stopmotor, mount the holder (4) on the panel V820 (5) (if any) using screw and screw on the holder with the panel to the stand table.



- Assemble the thread stand so that its arms would be parallel to the longer edge of a table top.

5. Basic setting of stopmotor and position reader

5.1 Generally

The procedure of setting parameters of the stopmotor S359 600045 XXX - EFKA DC 1600/DA82GA on the level of the operator is described in the first part of the Instruction manual - par. 7.2.1.2 (V810); par. 7.2.2.2 (V820).
A correct function of the sewing machine with drive is attained when changing some parameters of the drive, which are inaccessible for the attendance of the machine. Hereinafter there is a description of the possible procesures of changing all parameters.

Procedure of changing parameters of the drive Efka S359 600045 810 - DC 1600/DA82GA; S359 600052 XX - VD 552/6F82FA and S359 600056 XX - VD 554/6F82FA (panel V 810)

- depress the pushbutton **P** on panel and switch on thereafter the main switch
- on the display there will appear **C 0000**, the 1st digit flashes
- using pushbutton **+ -** set the 1st digit on the value **3**
- depress the pushbutton **>>**, the 2nd digit flashes
- in the same way set the remaining digits in the way to get displayed on the display **C 3112** (the number of the code for the possibility of changing all parameters of the drive)
- depress the pushbutton **E**, on the display will appear **F 200** (parameter number **200**)
- using pushbuttons **>>, +, -** set the required parameter number and depress the button **E**
- using pushbuttons **+, -** set the required parameter value
- depress the pushbutton **E** (a parameter number following in the sequence will appear) or **P** (the same parameter number will appear)
- carry out the termination of changes in depressing the pushbutton **P** (return to the respective sewing mode)

You will find a detailed information in the original directins for use of the drive.
Note: To get the change of parameters permanently stored, it is necessary, after having changed the parameter, to depress the pedal in forward direction.

Procedure of changing parameters of the drive Efka S359 600045 820 - DC 1600/DA82GA; S359 600052 XX - VD 552/6F82FA and S359 600056 XX - VD 554/6F82FA (panel V 820)

- depress the pushbutton **P** on panel and switch on thereafter the main switch
- on the display there will appear **C 0000**, the 1st digit flashes
- using pushbuton **0 ÷ 9** set **C 3112** on the display (code number for possible changing of all drive parameters)
- depress the pushbutton **E**, on the display will appear **F 200** (parameter number **200**)
- using pushbutton **0 ÷ 9,** set the required parameter number and depress the pushbutton **E**
- using pushbutton **+, -** , set the required parameter value
- depress the pushbutton **E** (there will appear further parameter number in the given sequence) or **P** (return to the given sewing mode)
- the termination of changes is to be done in depressing the pushbutton **P** (return to the sewing mode)

A detailed information is in the original directions for use of the drive.
Note.: To get the change of parameters permanently stored, it is necessary, after having changed the parameter, to depress the pedal in forward direction.

5.2 Stopmotor setting S359 600045 XXX - EFKA DC 1600/DA82GA 3312

5.2.1 Setting position reader

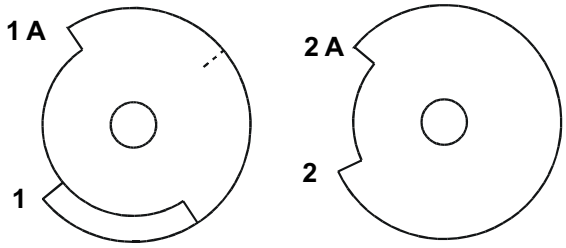
- set parameter **170**, **Sr1** is shown on the display (reference position)
- depress pushbutton **>>**, **PoS 0** appears on the display and changing symbol of rotation
- turn the hand wheel until symbol of rotation disappears
- turn the hand wheel to angular value **105°** of hand wheel (thread tip is approx. in the level of throat plate)
- depress pushbutton **E**, changeover to parameter **171**
- set parameter **171**, **Sr2** is shown on the display (all positions)
- depress pushbutton **>>**
- **1 XXX** is shown on the display (value of first position of needle)
- turn the hand wheel until value **XXX** begins changing
- turn the hand wheel to the angular value of first position (**135°** on the hand wheel respective **30** on the panel)
- depress pushbutton **E**
- **2 XXX** is shown on the display (value of upper position of take-up lever)
- turn the hand wheel until value **XXX** begins changing
- turn the hand wheel to the angular value of upper position (**65°** on the hand wheel respective **450** on the panel)
- depress pushbutton **P** 2x (return to the sewing mode)
- step shortly treadle down forwards (entry to the memory)

5.2.2 Changes of setting parameters of stopmotor setting considering original producer setting

Parameter No	Parameter value	
111	-	Max. revolutions (according to a type of machine)
116	180	Trimming revolutions
170	-	Reference position
171	30	First position of needle
192	340	Delay angle of tensioner switch on
202	120	Delay of start run after switch off the signal foot
225	3	Type of the machine

5.3 Setting stopmotor S359 600052 XX-EFKA VD 552/6F82FA and S359 600056 XX-EFKA VD 554/6F82FA

5.3.1 Setting position reader



Positions are set by means of discs with cut outs directly in position reader.

Setting bottom position:
- Disassemble the cover of position reader
- Disconnect head power supply cable from drive
- Switch on the power supply switch
- Step treadle shortly down forwards (machine stops in first position of needle)
- Switch off the power supply switch
- Turn the beginning of cut out **1** of coinciding discs so that machine would stop at the value **135°** of the hand wheel
- Carry out check by repeating procedure

Setting upper position of thread lever:
- Step treadle down backwards (machine stops in upper position of needle)
- Switch off the power supply switch
- Turn the beginning of cut out **2** of separate disc so that machine would stop at the value **65°** of the hand wheel
- Carry out check by repeating procedure

5.3.2 Changes in parameters of stopmotor setting considering original producer setting

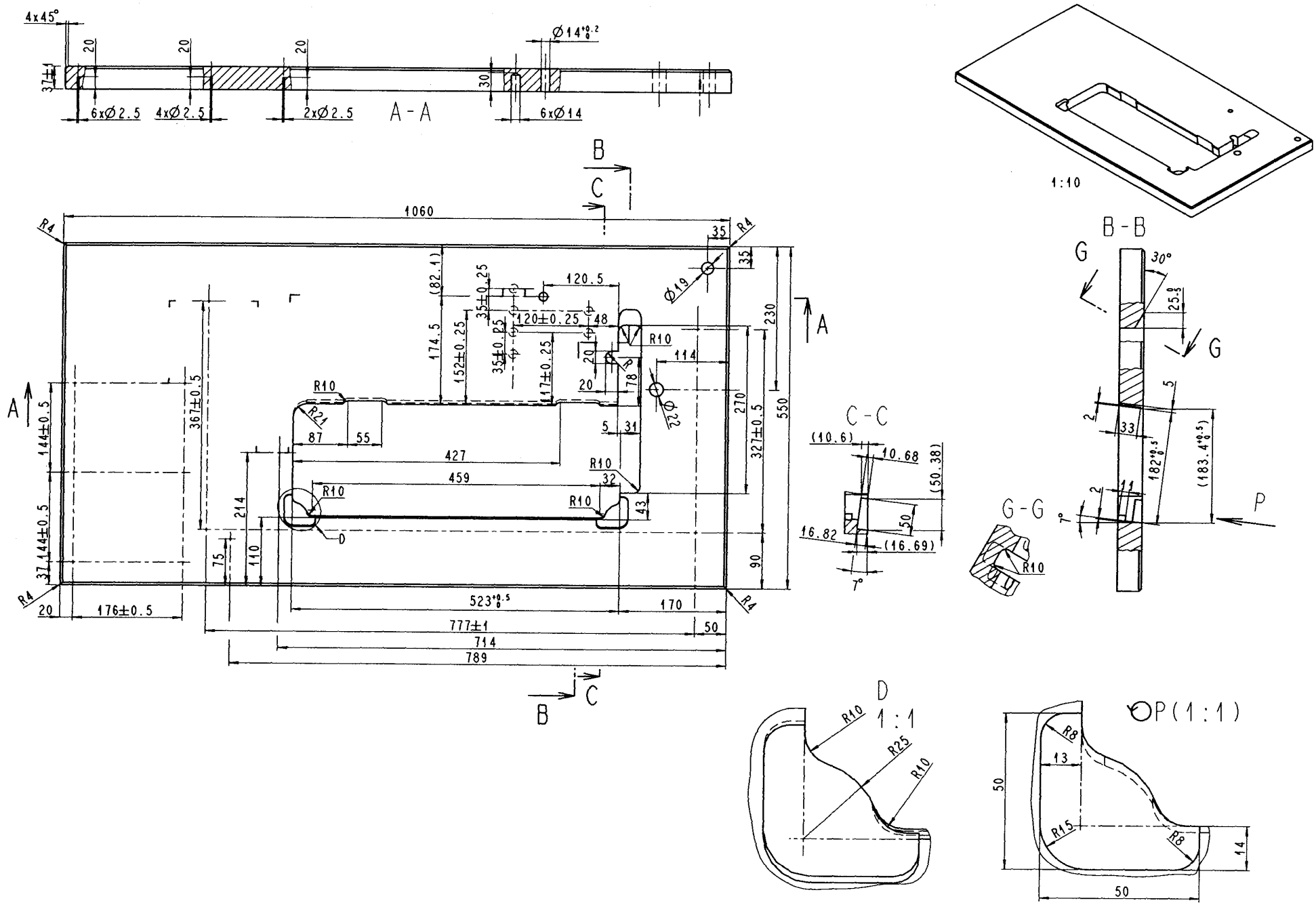
Parameter No	Parameter value	
111		Max. revolutions (according to a type of machine)
116	180	Trimming revolutions
136	ON	Stitch by thread trimmer (back)
192	86	Delay angle of tensioner switch on
202	120	Delay of start run after switch off the signal foot

6. Examination of sewing



Caution! Risk of injury!
Before threading a thread switch the main switch off and wait until the motor stops.

- Check the sense of turning the hand wheel – according to the arrow situated on it.
- Thread a thread.
- Choose sewing material.
- Switch the desirable function on the control panel of stopmotor. Examination should be carried out with selection of fancy bar.
- First sew slowly then speed up the sewing.
- If the stitch does not meet requirements, follow the first part of instructions manual or service book.


4x45°
20
20
20
37±1
6xØ2.5
4xØ2.5
2xØ2.5
A-A
30
Ø14
6xØ14
1:10
B
C
1060
R4
35
120.5
Ø19
(82.1)
174.5
152±0.25
120±0.25
48
R10
114
230
270
327±0.5
550
R10
R21
87
55
427
459
R10
R10
R10
32
43
5
31
78
Ø22
214
110
75
90
367±0.5
144±0.5
144±0.5
37
20
176±0.5
523
170
50
777±1
714
789
D
C-C
(10.6)
10.68
(50.38)
16.82
50
(16.69)
7°
B-B
G
30°
25.8
5
2
33
182
(183.4)
11
7°
P
G-G
R10
D
1:1
R10
R25
R10
P(1:1)
R8
13
50
R15
R8
14
50