GLOBAL

ZZ 566 TD

Zig-zag sewing machine

CSMP

spare parts &
instruction manual

Part A - Instruction manual

Part B - Instructions for assembling

Part C - Instructions for setting individual mechanisms

Part D - Spare parts list

Contents - part A - Instruction manual:

1. Proper use of the machine 1

2. Description of the machine 1

3. Machine subclasses 1

4. Survey of equipment 1

4.1 -for the subclass -101 1
4.1.1 Necessary equipment 1
4.1.2 Sewing equipment 2
4.1.3 Optional equipment 2

4.2 -for the subclass -105 2
4.2.1 Necessary equipment 2
4.2.2 Sewing equipment 2
4.2.3 Optional equipment 2

5. Technical data 3

6. Operation of the machine 3
6.1 Upper thread threading 3
6.2 Winding of thread on the hook bobbin 3
6.3 Needle insertion 4
6.4 Adjustment of the upper thread tension 4
6.5 Change of the hook bobbin, threading and setting of the bottom thread tension 5
6.6 Adjustment of the stitch length, reverse stitching 5
6.7 Adjustment of the zigzag stitch width and position 5
6.8 Regulation of the presser foot pressure, presser foot lifting 6

7. Machine maintenance 6
7.1 Cleaning 6
7.2 Lubrication 7

8. Electronic control of the machine 7
8.1 Control of sewing by means of control elements 7
8.1.1 Via treadle 7
8.1.2 Via pushbutton 7
8.1.3 Via control panel Efka V 810/V 820 8
8.2 Adjustment of automatic functions via control panel for stop motor 8
8.2.1 By using stop motor Efka with panel V 810 8
8.2.1.1 Adjustment by means of buttons with fixed setting function 9
8.2.1.2 Setting by means of parameters 10
8.2.2 By using stop motor Efka with panel V 820 11
8.2.2.1 Adjustment by means of buttons with fixed setting function 11
8.2.2.2 Setting by means of parameters 13

Operating instructions for eventual trouble shooting 13

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!

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 is destined for sewing on under collars into neck openings of jackets, for sewing on top collars on falls of under collars, for sewing on lining collars into the top parts of trousers, for sewing on pocket facings on trouser bags, for overedging of edges and similar operations in making-up outerwear, for sewing materials of wool, cotton and materials with admixture of synthetic fibres and woven fabrics of 100 % polyamide fibres. In general, only dry material may be sewn on these machines, which should not be thicker than 4 mm when being compressed by the presser foot. The material should not contain any hard objects, because in such opposite case the sewing operation would be possible only with an eye protector. Such eye protector is not supplied for the time being. When sewing very hard or compact materials with a thicker needle, the total thickness thereof is limited. In such case it is also necessary to reduce substantially the sewing speed below the value quoted in the par. 5. These machines may be installed and operated only in dry and maintained rooms.
As manufacturers of industrial sewing machines we start from the supposition that our machines will be operated at least by a trained staff, so that all usual operating activities and their eventual risks may be supposed to be known.

Machine noisiness

The noisiness of machines is measured according to ISO 3746, ISO 11204 at the maximum sewing speed.
Laeq = equivalent noise level of the machine itself on the working place converted in % of the machine utilization (dB) – is given in the following table

Type of the machine	Noisiness dB	% machine employment
524-101	83	20
524-105	83	20

2. Description of the machine

It is flat-bed single-needle machine. It sews with double-thread zigzag lock-stitch, with two-way drop feed. The stitch length is adjustable using a knob. The backward stitching is controlled by a hand lever, eventually, by pedal or by electromagnet in accordance with the equipment of the machine. The position and the width of the zig-zag stitch are adjustable by levers situated on the machine arm. The presser foot lifting is controlled by a hand lever, eventually, by pedal, or by a knee lever or by electromagnet in accordance with the machine equipment.
The machine is provided with a large diameter horizontal hook. It has a 1.8 x greater reserve (volume) of threads than a standard hook. The lubricating system of the machine is of a group wick-feed type with automatic regreasing of the hook.

3. Machine subclasses

Table 1

Machine type	Hook	Presser foot lifting		Backtacking			Thread trimmer
Class-subclass	Large	Via knee lever or pedal	Via electro-magnet	Via hand lever	Via pedal	Via electro-magnet	
524-101	●	●		●	●		
524-105	●	●	o	●	●	o	●

● standard equipment
o optional equipment

4. Survey of equipment

This survey does not include the equipment assembled on the stand (see part B).

4.1 -for the subclass -101

4.1.1 Necessary equipment

S791 995068 Parts of backtacking (with pedal)

4.1.2 Sewing equipment

S791 124032 35 Sewing equipment 525 E 032
S791 124033 35 Sewing equipment 525 E 033 - standard
S791 124034 35 Sewing equipment 525 E 034
S791 224075 35 Sewing equipment 525 E 075

4.1.3 Optional equipment

S791 149001	Attachment for serging operation
S791 151016	Hinged foot with front thread slit - zig-zag stitch width 6 mm
S791 151017	Hinged foot with front thread slit - zig-zag stitch width 10 mm
S791 947001	Adjustment gauges
S794 222012	Sewing lamp
S741 610118 40	High mortality spare parts kit in a plastics box

4.2 -for the subclass - 105

4.2.1 Necessary equipment

S791 995068	Parts of backtacking (with pedal)
S980 094051	Connecting cable to drive EFKA DC 1600/DA82GA and EFKA VD 552/6F82FA

4.2.2 Sewing equipment

S791 124032 35	Sewing equipment 525 E 032
S791 124033 35	Sewing equipment 525 E 033
S791 124034 35	Sewing equipment 525 E 034 - standard
S791 224075 35	Sewing equipment 525 E 075

4.2.3 Optional equipment

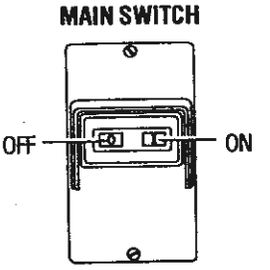
S791 149001	Equipment for overedging
S791 151016	Hinged foot with front thread slit - zig-zag stitch width 6 mm
S791 151017	Hinged foot with front thread slit - zig-zag stitch width 10 mm
S791 947001	Adjustment gauges
S794 222012	Sewing lamp
S791 995153	Presser foot lift via electromagnet
S791 995154	Backtacking via electromagnet
S980 094057	Push button for backtacking EFKA DC 1600/DA82GA
S980 094060	Push button for backtacking EFKA VD 552/6F82FA
S741 610518 40	High mortality spare parts kit in a plastics box

5. Technical data

Sewing speed	4400 SPM - maximum 3500 SPM - standard
Stitch type	double-thread zigzag lockstitch - 304
Stitch length	max. 5 mm
Zig-zag stitch width	max. 10 mm
Presser foot lifting	5 mm - via hand lever 7 mm - via knee lever, pedal, electromagnet
Hook	S980 008250 - horizontal, large diameter
Needle	system 134 No. 80-110
Drive	clutch motor 2800 RPM (min. 0,35 kW) stop motor (min. 0,4 kW)
Head weight	max. 38 kg
Stand weight	61 kg
Opening space of machine head	265 x 120 mm
Bedplate dimension	178 x 476 mm
Length of trimmed thread ends	up to 20 mm
Machine power imput with clutch motor	max. 700 W
Machine power imput with stop motor	max. 800 W
Equivalent sound pressure level of the machine alone at the working spot with 20 % utilization of the machine during the working shift at the standard sewing conditions	83 dB/A
Ground plan machine dimensions (including stand)	1060 x 550 mm
Machine height (including stand and thread stand)	1490 mm

6. Operation of the machine

Caution!
Do not use this sewing machine without using the finger guard (C, Fig. 4) and without the take-up lever guard (P, Fig. 2).



6.1 Upper thread threading (Fig. 1, 2)

Caution!
Before starting the threading operation, switch off the main switch and put off the feet from the pedals on the stand to avoid the starting of the machine by treading the pedal.

After having inserted the bobbin with thread on the thread stand (N), unwind the thread in sufficient length and pass it through the holes in the thread stand (N). Direct it then through the thread guide (A) and through the guide (B) - with the machines without any thread cutter, or through the auxiliary thread tensioner (L) with the machines provided with such thread cutter. Feed the thread between the dishes of the tensioner (C). Direct the thread through the adjusting spring (D) around the guide (E) and through the guide (F) and (G) into the take-up lever eye (H). From here the thread is directed downward through the guides (F) and (J) and through the hole of the thread guide (K) on the needle bar towards the needle eye. Thread the thread into the needle eye from the front (from the sewer) rearward.

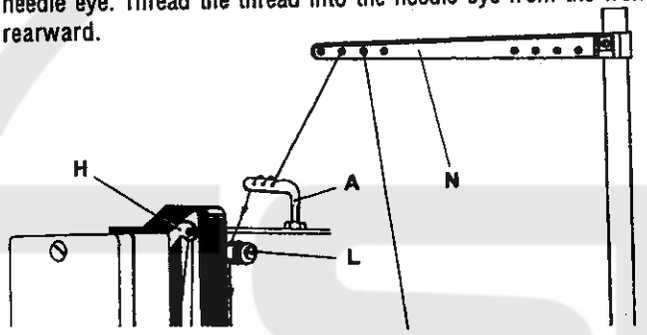


Fig. 1

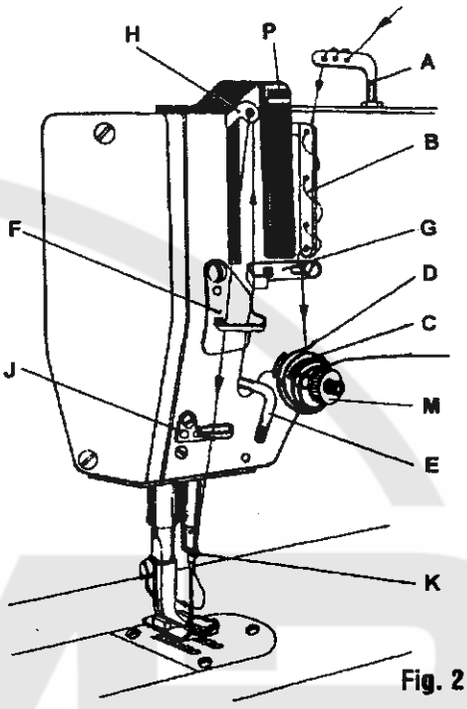


Fig. 2

6.2 Winding of thread on the hook bobbin (Fig. 3)

From the thread stand the thread is directed to the tensioner (A) through the guide (B) on the machine head. From the guide the thread is directed on the hook bobbin mounted on the shaft (C) of the winder. Wind up the thread end several times on the bobbin in the clockwise direction and feed it towards the spring (D). Introduce the thread between the coils thereof and, when pulling it slightly, cut it with the knife which is mounted inside the spring. Engage the winder by means of the lever (E). After having wound up the thread on the bobbin, the winder stops automatically. After having removed the bobbin from the winder shaft it is possible to cut the thread with the knife protected by the spring (D) or to cut it with scissors. The thread (A) serves for regulating the tension of the thread for winding.

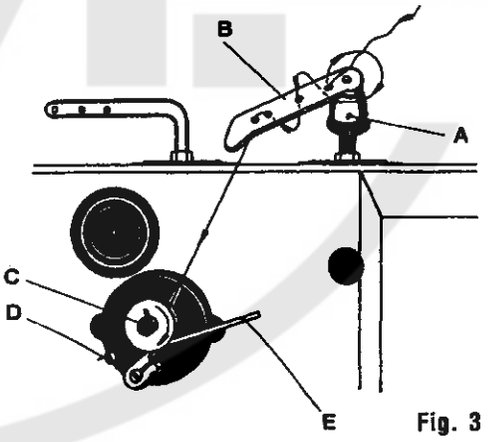


Fig. 3

6.3 Needle insertion (Fig. 4)

Caution!
Before starting the operation of the needle change, switch off the main switch and put the feet off the pedals on the stand to avoid the machine start by treading the pedal.

After having chosen the correct needle thickness (number) corresponding to the system of the prescribed type (usually the system 134), loosen the screw (A) in the needle holder and insert the needle (B) up to the bottom of the hole in the needle holder. Turn it in such a way, so that its long groove is directed ahead (towards the sewer).
Caution - when choosing a thicker needle it is necessary to check, whether the hook beak does not catch the needle - the eventual setting of the hook position is to be carried out by a qualified person. Check up, whether the needle passes through the centre of the needle hole, change a faulty needle.

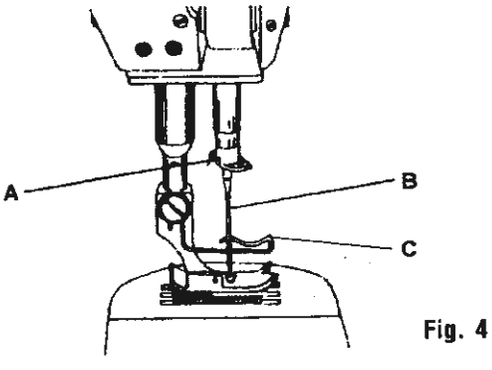


Fig. 4

6.4 Adjustment of the upper thread tension (Fig. 1, 2, 5)

Correct adjustment of the tension of both threads

Incorrect adjustment

Incorrect adjustment

Fig. 5

The tension of the upper and that of the bottom thread must be mutually adjusted in such a way, so that the stitch locking is being done in the middle of the sewn material (Fig. 5). The tension of the upper thread is to be adjusted by turning a bit the nut of the tensioner (M, Fig. 2). In turning the nut to the right (in the clockwise direction), we increase the tension of the upper thread, in turning it in the opposite direction, we reduce the tension of the thread.
When the machine is provided with a thread cutter of thread (version -105), its correct function is to be given major attention in adjusting correctly the thread tension. It is necessary to set correctly the auxiliary tensioner (L, Fig. 1) the function of which influences the length of the upper thread end which is projecting from the needle eye after having cut the thread. When correctly setting of the tensioner, the quality of the initial stitches is good and no unthreading of the thread out from the needle occurs. When increasing the adjusted tension of the auxiliary tensioner this end is shorter (the seam starts are of better quality), but there is an increased danger that this length will not be sufficient for starting further stitching, when the thread would leave the needle eye. In the opposite case, namely with a too small tension, the given ends are uselessly too long which worsens the quality of the stitch start on the rear side of the sewn material.

6.5 Change of the hook bobbin, threading and setting of the bottom thread tension (Fig. 6, 7)

Caution!
Do not start the machine before placing the hook covers in their working (protective) position.

Before changing the bobbin in the hook, switch off the main switch and put your feet off the pedals on the stand to avoid the machine start by treading the pedal.

Using the flap (F), remove the bobbin case from the hook.
Put the full bobbin (A) into the bobbin case (B) and guide the thread through the groove (C) under the braking spring (D) and then into the hole (E).
Let free about 5 – 6 cm of the thread end. It is recommended to turn the bobbin in the arrow direction when pulling the thread. After having inserted the bobbin case into the hook be sure in assuring this by the flap (F). As usual, by means of the the upper thread, we thread the bottom thread above the throat plate.
The tension of the bootom thread is regulated by a screw (G). In turning it in the (+) direction, the pulling power increases, in the (-) direction it is reduced. When the tension of the bottom thread is correctly adjusted, then a good stitch laying is generally being ensured by the respective adjustment of the upper thread tension by means of the tensioner nut.

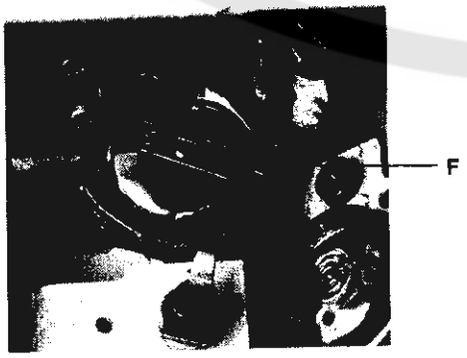
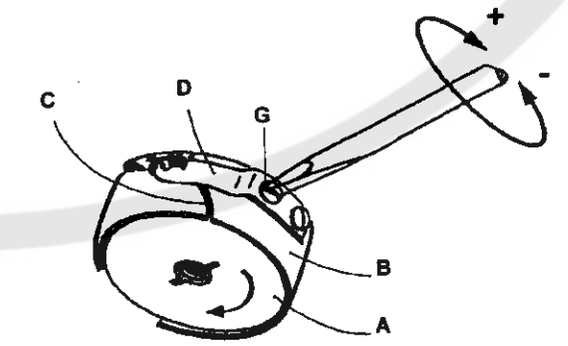


Fig. 6



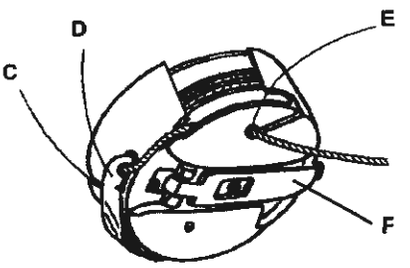


Fig. 7

6.6 Adjustment of the stitch length, reverse stitching (Fig. 8, 9)

The stitch length is changed in turning the knob (A), which is placed on the arm web, according to the numbers indicating the stitch length against the symbol (B) on the machine arm. In turning the knob in the direction of the arrows, the stitch length is increased (+) or reduced (-).
The direction change of feeding the stitched material is mechanically controlled by the reversible stitch lever (C) in pushing it in the direction of the arrow (S).
According to the chosen accessory, the machine can be provided with an electromagnetic backtacking control (see Part B, par. 8) or with a control by a backward stitch pedal (P).

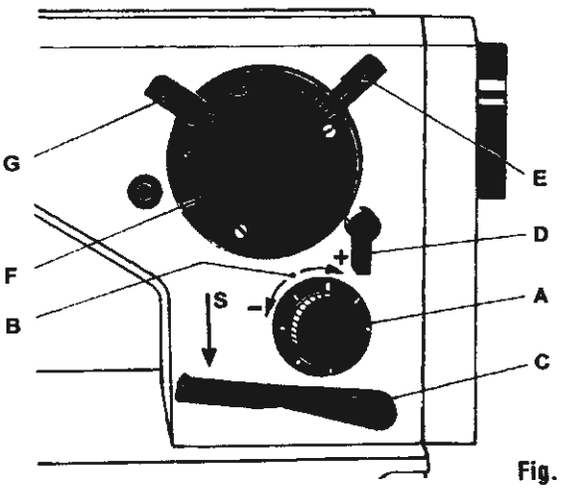


Fig. 8

6.7 Adjustment of the zigzag stitch width and position (Fig. 8)

Before any change of the zigzag stitch width or before changing the zigzag stitch position the machine is to be stopped in such a way, so that the needle is in its top position. Further it is necessary to turn a bit the arresting lever (D) to the left (in counterclockwise direction) and to have it loosened until having proceeded the required change of adjustment. In turning a bit the lever in the opposite direction (to the right) there occurs the blocking of the adjusted width and position of the zigzag stitch.
The width of the zigzag stitch is continuously adjustable acording to the machine types from 0 up to 10 mm. It is adjusted by the lever (E) projecting above the cover (F) of the zigzag stitch mechanism. In moving the lever to the right (towards the hand wheel) we increase the width of the zigzag stitch up to the maximum, in moving the lever to the left, we reduce the width of the zigzag stitch up to zero. The position of the zigzag stitch is adjusted by the lever (G) projecting on the side of the cover (F) of the zigzag stitch mechanism. The basic (middle) zigzag stitch is adjusted with the middle position of the lever (G) on the mark ⊂•⊃. In this position, the lever fits into the arresting slot. If we want to sew with a zigzag stitch to the right, we shall shift this lever, after having slightly depressed it in the direction from the sewer and upwards up to the stop towards the mark ⊂•⊃ . When adjusting the left zigzag stitch, we shift this lever again after having slightly depresserd tlever in the direction from the sewer up to the stop towards the mark ⊂•⊃ . After having ended the adjustment of the desired stitch position, we turn a bit the arresting lever (D) to the right in securing so the chosen stitch position. When using the machine for sewing using straight stitch, we recommend to use it with the adjustment of the middle zigzag stitch on the mark ⊂•⊃.

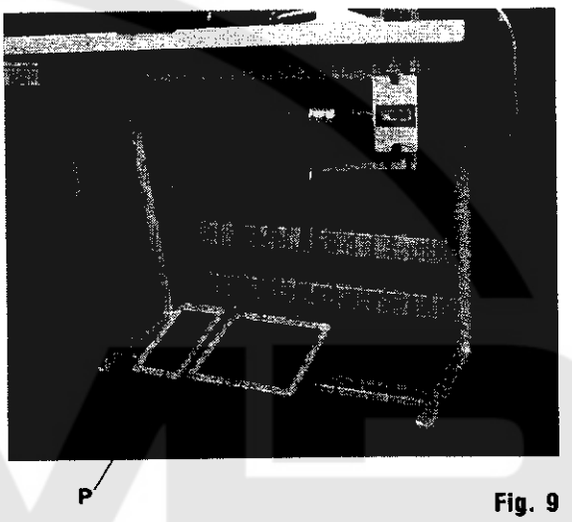


Fig. 9

6.8 Regulation of the presser foot pressure, presser foot lifting (Fig. 10)

The pressure of the presser foot is regulated using an adjusting screw in the hole (A) which is placed below the top cover of the machine arm and is accessible from above through the hole in this cover. In turning the adjusting screw in the direction of the arrows we increase (+) or reduce (-) the pressure of the presser foot. The pressure of the presser foot must be sufficient for ensuring a reliable and continuous feeding of the sewn materila with the maximum sewing speed. A correct adjustment of the pressure of the pressure bar influences, whether the sewn material is being continuously fed without any damage and whether the stitch length is uniform.
The mechanical lifting of the presser foot is enabled by means of the hand lever (B) which when lifted arrests the presser foot in its top position. The presser foot can be lifted with the knee lever or with the left pedal too - according to the machine subclass.
The assembling procedure of the automatic presser foot lifting using electromagnet is described in the part B, par. 7.

Fig. 10

7. Machine maintenance

Caution!
Before cleaning and lubricating the machine switch off the main switch and put your your feet off the pedals on the stand to avoid starting the machine by treading the pedal.

7.1 Cleaning

Maintain the machine clean and at least once a day (according to the processed material) remove dirt from the hook and feeder space by means of a brush, with the machines provided with a thread cutter, from the cutting space as well. Avoid using volatile liquids for cleaning purposes, they damage the machine and the health too. Check up the filtering sieve on the electric motor for not being choked with dust.

7.2 Lubrication (Fig. 11, 12, 13)

For lubricating the machine use Esso SP-NK 10 oil or another oil of the same quality (viscosity at 40° C: 10 mm²/s; inflammation point: 150°C). Before starting the stitching operation, put one oil drop into the holes marked with red colour on the machine (Fig. 12, 13). Check up specially the oil level on the oil level gauge (1) for lubricating the hook. Refill oil through the hole (2) above the oil level gauge only when the oil lever considerably sinks below the middle of the oil level gauge.
From time to time, oil is to be dropped into the hole of the hook gearbox (Fig. 13). The quantity of the oil fed for lubricating the hook is regulated by turning a bit a regulation pin (3) using a screwdriver within the extent of 0 - MAX, that is to the left, in counterclockwise direction. The pin is placed on the front side of the oil vessel under the bedplate. When setting the indicator of the regulation pin on "0", the minimum oil feeding to the hook is ensured, so that its seizure is avoided. After having put the machine into operation, check and refill regularly the oil level in the oil vessel at the hook and in the oil vessel on the machine arm. It is necessary to refill ESSO BEACON EP2 grease in the shafts of the feeding mechanism (4, 5).

Fig. 11

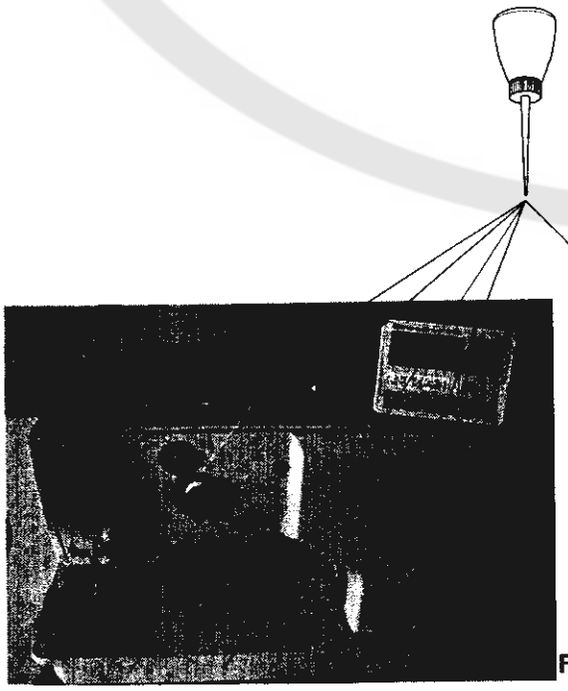


Fig. 12

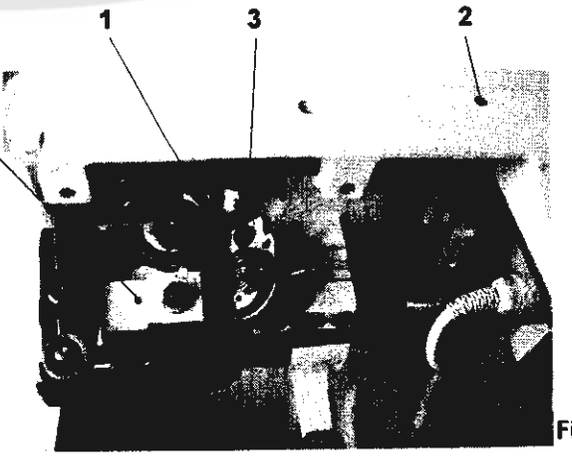


Fig. 13

8. Electronic control of the machine

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

8.1 Control of sewing by means of control elements

8.1.1 Via treadle (treadle positions and function possibilities) (Fig. 14)

The position of the treadle is read by the reader, which can recognise 16 levels. Its meaning is shown on the table and see Fig. 14.

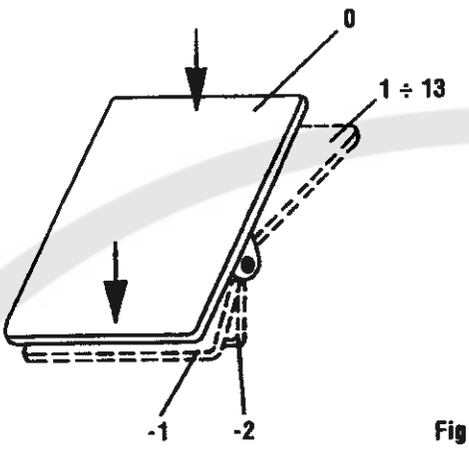


Fig. 14

Treadle position	Treadle	Meaning
-2	Foot full backwards	Command for thread trimming (seam finishing)
-1	Foot slightly	Commandlifting the foot up
0	Neutral position	Note
1	Slightly forwards	Command releasing foot
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).

8.1.2 Via pushbutton (Fig. 15)

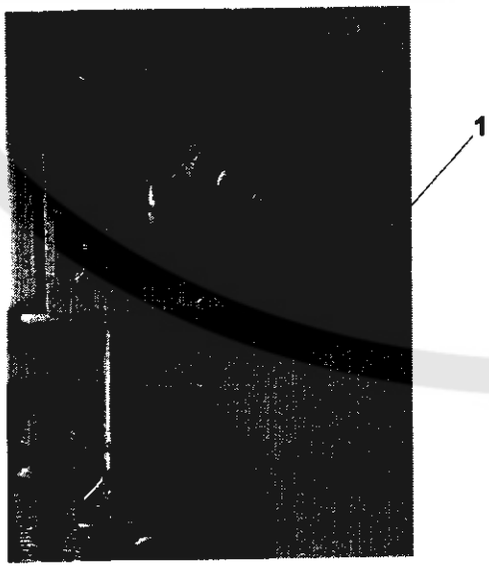


Fig. 15

The pushbutton has got a firmly set function of bar operation (when depressing the push button during the sewing operation, the sewn material is being reverse fed).

8.1.3 Via control panel Efka V 810/V 820 (Fig. 16, 17)

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

A - cancelling (recalling) the bar
B - needle up/down

Note: Function of the A,B pushbuttons can be changed by different adjustment of parameters 293,294 (see original operating instruction Efka DA82GA).

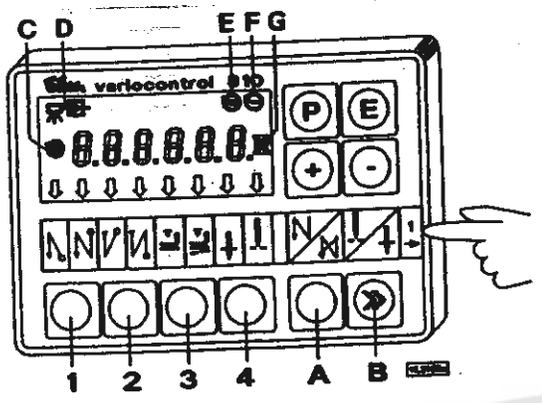


Fig. 16

8.2 Adjustment of automatic functions via control panel for stop motor

8.2.1 By using stop motor Efka with panel V 810 (Fig 16)

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 foot lifting after stopping at the seam ON/OFF Automatic foot lifting after thread trimming (end of seam) ON/OFF
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.

8.2.1.1 Adjustment by means of buttons with fixed setting function (Fig. 16)

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

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.

8.2.1.2 Setting by means of parameters (Fig. 16)

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

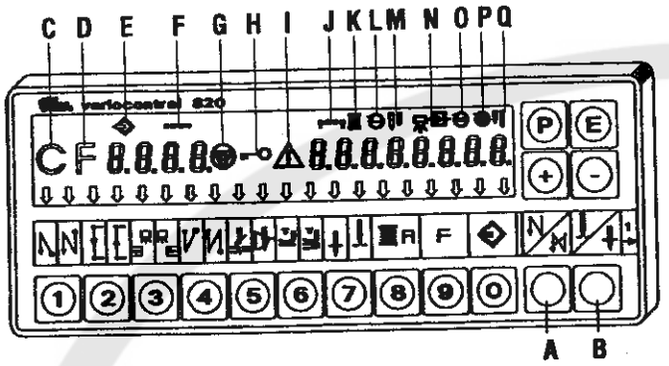


Fig. 17

8.2.2 By using stop motor Efka with panel V 820 (Fig. 17)

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 foot lifting after having stopped inside the seam ON/OFF Automatic foot lifting after trimming ON/OFF
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 barrlee 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.

8.2.2.1 Adjustment by means of buttons with fixed setting function (Fig. 17)

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 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

8.2.2.2 Setting by means of parameters (Fig. 17)

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.

Operating instructions for eventual trouble shooting

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 Instructions for assembling, part B, par. 12.5.2.

Trouble	Cause	Method of troubleshooting
1. Machine runs with difficulty.	1.1 Machine out of use for certain time, dried oil and dirt in bearings.	Inject some drops of kerosene into all oiling holes and on sliding surfaces and put the machine in quick running to clean out the oiling holes in the bearings. Lubricate then the machine with oil for sewing machines according to par. 7, part A.
2. Machine starts with slow running.	2.1 Insufficient tension of the belt from electic motor.	Tension the belt according to par. 5.1.2, part B.
3. Upper thread tearing.	3.1 Thread guides incised.	Check up and replace the guides.
	3.2 Sharp hook point.	Repair.
	3.3 Bad feeding.	Set tension according par. 3; 6; 7, part C.
	3.4 Incorrect guiding or upper thread threading.	Thread upper thread according to par. 6.1, part A.
	3.5 Excessive thread tension.	Set tension according par. 6.4, part A.
	3.6 Needle incorrectly mounted or damaged.	Replace needle according to par. 6.3, part A.
	3.7 Thread thickness does not anwer the thickness of sewn material.	Use more suitable thread.
	3.8 Machine excessively dirty.	Unscrew throat plate and clean out te machanism. Remount the throat plate according to the par. 5, part C.
	3.9 Thread wound up on the hook.	Remove thread.
	3.10 Thread too thin or insufficiently resistant.	Use a more suitable thread.
4. Lower thread tearing.	4.1 Incorrect threading of the thread in the bobbin case.	Thread correctly the thread according to par.. 6.5, part A.
	4.2 Thread too weak or insufficiently resistant.	Use a more suitable thread.
	4.3 Thread incorrectly wound up on the hook bobbin.	Rewind the bobbin.
	4.4 Bobbin damaged.	Replace bobbin.
	4.5 Sharp pressure spring on the bobbin case.	Replace spring.
5. Skipping of stitches.	5.1 Needle incorrectly mounted.	Insert correctly needle according par. 6.3, part A.
	5.2 Needle blunt or bent.	Replace needle accordingd to par. 6.3, part A.
	5.3 Hook point incised or broken.	Replace hook.
	5.4 Big needle hole in throat plate.	Replace throat plate and mount it according to par. 5, part C.
	5.5 Broken adjusting spring for tensioning upper thread.	Replace spring and set upper thread tension according to par. 6.4, part A.
	5.6 Needle bar too high or too low.	Set according to par. 10, part C.
	5.7 Hook overrun, incorrect timing adjustment.	Adjust hook timing according to par. 11, part C.
	5.8 Dirty hook mechanismus.	Clean out with kerosene and lubricate with oil.
6. Needle breaking.	6.1 Feeder too high.	Set the feeder height according to par. 3, part C.
	6.2 Negligent sewing, pulling of the material.	Let material pass freely.

	6.3 Needle too thin for thick material.	Replace needle according to par. 6.3, part A.
	6.4 Needle incorrectly mounted.	Mount correctly needle according to par. 6.3, part A.
	6.5 Throat plate loosened.	Mount throat plate according to par. 5, part C.
	6.6 Upper thread tension too high.	Set tension according to par. 6.4, part A.
7. Difficult and uneven machine feeding.	7.1 Feeder too low.	Set the feeder height according par. 3, part C.
	7.2 Feeder used.	Replace.
	7.3 Feeder teeth fouled or blunt.	Clean or replace feeder.
	7.4 Insufficient presser foot pressure.	Increase pressure according to par. 6.8, part A.
8. Incorrect stitch locking. Threads locked on the top side of sewn material.	8.1 Incised spring on bobbin case, lower thread insufficiently braked.	Replace spring.
	8.2 Lower thread not threaded under bobbin case spring.	Rethread thread according to par. 6.5, part A.
	8.3 Lower thread retained under the bobbin case spring.	Clean.
	8.4 Unequal setting of upper and lower thread tension.	Set thread tension according to par. 6.4 and 6.5, part A.
	8.5 Machine feeds too soon.	Set feeding according to par. 3; 6; 7, part C.
9. Incorrect stitch locking. Threads locked on the bottom side of sewn material.	9.1 Tensioning disks incised by upper thread.	Replace disks and set upper thread tension according to par. 6.4 and 6.5, part A.
	9.2 Thread does not pass around hook or is retained by the bobbin case.	Clean hook and set up bobbin case.
	9.3 Upper thread not threaded between the tensioning disks.	Thread correctly the thread according to par. 6.1, part A.
	9.4 Lower thread retained between the tensioning disks.	Clean thread tensioner and set it according. 6.4, part A.
	9.5 Unequal setting of upper and lower thread tension.	Set correctly according to par. 6.4, part A.
10. Hook blocked.	10.1 Lower thread wastes retained in hook.	Move hand wheel in spite of considerable resistance in both senses until the threads in the hook get cut up. After having removed them, let run the machine unthreaded a while and then lubricate the hook with 2-3 drops of oil recommended in the par. 7, part A.
11. Little reserve of upper thread, machine does not start sewing, upper thread leaves needle eye at the start of next sewing.	11.1 Excessive tension of auxiliary tensioner.	Reduce tension according to par. 6.1, part A.
	11.2 Cam time setting too quick.	Delay according to par. 23, part C.
	11.3 Machine stops before upper dead center.	Set according 29, part C.
	11.4 Electromagnet loosening main tensioner is out of function.	Find out the cause and repair.
	11.5 Incorrect upper thread unwinding.	Repair.
12. Little reserve of lower thread, machine does not start sewing.	12.1 Lower thread end drawn into bobbin case.	Increase lower thread winding up tension according to par. 6.2, part A.
	12.2 Excessive winding up speed.	Maintain maximum number of revolutions 140/min.
	12.3 Excessive lower thread tension.	Reduce according to par. 6.5, part A.
	12.4 Burr on the covering hook sheet.	Polish up.
13. Thread ends untrimming or insufficiently trimming.	13.1 Incorrectly set up (little) pressure of fixed knife.	Set according to par. 28, part C.
	13.2 Blunt fixed or trimming knife.	Replace or sharpen.

14. Low quality of stitch start on rear side.	14.1 Upper thread end too long.	Increase tension of auxiliary tensioner according to par. 6.1, part A. Adjust time setting of cam according to 23, part C.
15. No upper or lower thread trimming.	15.1 Incorrect cam time setting.	Set correctly cam according to par. 23, part C.
	15.2 Skipped stitches with slow machine revolutions.	Set up.
	15.3 Incorrect thread division with trimming knife.	Set or replace trimming knife according to par. 27; 32, part C.
	15.4 Low lifting of trimming knife.	Set up according to par. 27, part C.
16. No upper and lower thread trimming, but machine rotates from lower to top position.	16.1 Incorrect cam time setting.	Set cam correctly according to par. 23, part C.
	16.2 Incorrect function of electromagnet for trimming control (it gets seized).	Check up connection-replace eventually electromagnet.
	16.3 Insufficient trimming knife lifting.	Set up according to par. 24, part C.
17. Machine starts sewing only after having skipped some stitches.	17.1 Insufficient upper thread reserve.	Set up according to par. 6.1, part A; par. 23 and 29, part C.
	17.2 Insufficient lower thread reserve.	Polish up trimming knife and hook.
18. When starting sewing operation, upper thread end projects above the sewn material.	18.1 Upper thread reserve too big.	Increase tension of auxiliary tensioner according 6.1, part A. Change cam time setting according 23, part C. Adjust machine stopping with needle bar in top dead centre according par. 29, part C.

Contents - part B - The instructions for assembling:

1. Safety instructions 1

2. Method of delivering the machine 1
2.1 Complete head with accessories 1
2.2 Stand 1
2.3 Motor 2
2.4 Motor pulley 2

3. Stand table top 2

4. Assembly of the stand frame and height setting 2

5. Assembly and screwing on of the stand table top 5
5.1 Assembly of stand table top 5
5.1.1 Placing of the machine head on the stand 5
5.1.2 Assembly of motor pulley, belt, belt covers 5

6. Mounting of a position reader and of a control panel of the stop motor 6

7. Mounting of the equipment for presser foot lifting using electromagnet 6

8. Mounting of the equipment for backward stitching 7

9. Mounting of the lighting 7

10. Composition and assembly of the thread stand 8

11. Preparation of the machine for sewing 8

12. Instructions for putting the electronically controlled drive into operation 9
12.1 Power supply 1 x 230 V - DC motor 9

12.2 Power supply 3 x 400 V - five wire power distribution, power supply 3 x 230 V - four wire or five wire power distribution 10

12.3 Power supply 3 x 400 V - four wire power distribution plus 1 x 230 V - two wire cable 10

12.4 Electrical connection of machine head to the stop motor 11

12.5 Stop motor setting S359 600045 XXX - EFKA DC 1600/DA82GA 13
12.5.1 Setting position reader 13
12.5.2 Changes of setting parameters of stop motor setting considering original producer ssetting 13

12.6 Stop motor setting S359 600052 XX - EFKA VD 552/6F82FA 13
12.6.1 Setting position reader 13
12.6.2 Changes of setting parameters of stop motor setting considering original producer setting 14

Part B - Instructions for assembling

1. Safety instructions

Caution!
The assembly of the machine is to be done only by a trained mechanician.
All operations connected with the electric installation of this sewing machine are to be done only by an authorized electromechanician. It is absolutely necessary to get acquainted with the instructions concerning the drive supplied by the manufacturer thereof.

2. Method of delivering the machine

The content of the delivery is given by the agreement between the supplier and the buyer. There are the following possibilities:

2.1 Complete head with accessories

In this case the delivery contains:
- Complete head.
- Selected spare parts.
- Standard accessories (containing tools – see catalogue of spare parts).
- Special accessories (containing some components of the stand - see catalogue of spare parts).

2.2 Stand

The delivery contains components of the stand, but without the stand components contained in the special accessories delivered with the machine head (see par. 2. 1) and without any electric components.
When not otherwise agreed, the stand will be delivered in disassembled state. When an assembled stand is required, then special accessories from the head delivery will be used.

Stand complete (ordered number S072 500100 for subclasses -101 and -105) contains following items:

MG53 000501	Stand frame
MG53 002501	Big pedal
0907 021084	Set of parts for stand
S615 000316	Stand table top

Equipments for stand (It has to be ordered separately):

Presser foot lifting by pedal:

S522 000450	Small pedal
S980 044982	Presser foot lifting draw bar

Reverse stitching:

S522 000450	Small pedal
S980 060028	Reverse stitching draw bar

2.3 Motor

The delivery contains the proper motor, switch - circuit breaker, complete cabling and connecting material. According to the motor type, it may contain a control panel. When not otherwise agreed, it is delivered in disassembled state. The machine without thread cutting device is provided with a clutch motor with lever. When positioning or presser foot lifting or backward stitching with electromagnet are required, the machine without thread cutting device must be provided with a stop motor.

Motors are to be chosen according to the following table:

Machine subclass	Ordered number	Name	ø of pulley mm	Machine rev. max./min	Approx. specification
101	S359 600030 88 S359 600030 75 S359 600030 58	FIR 1148 3 x 400/230 V, 50/60 Hz	88 75 58	3800 3200 2500	asynchronous bipolar clutch motor switch-circuit breaker with cabling connection material
105	S359 600045 810 S359 600045 820	Stopmotor EFKA DC 1600/DA82GA 1 x 230 V, 50/60 Hz	58 58	adjustable adjustable	D-C motor (A-C servo); switch-circuit breaker control panel EFKA V 810/V820 connection material and cabling
	S359 600052 88 S359 600052 75 S359 600052 58	Stopmotor EFKA VD 552/6F82FA 3 x 400/230 V, 50/60 Hz	88 75 58	3800 3200 2500	asynchronous bipolar stopmotor with friction clutch and brake switch-circuit breaker with cabling connection material control panel EFKA V 810/V820 *

* 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.

The given stop motors have been tested on the machine and comply with the functional requirements. Other types of stop motors may or may not have suitable parameters.The manufacturer thereof does not recommend any use of different stop motor without having tested it.

2.4 Motor pulley

By stopmotor EFKA DC 1600/DA82GA is revolutions are set continuously by electronics.
The pulley for the maximum or other sewing speed will be supplied on express wish of the customer.
The pulley are to be chosen according to the following table:

Motor	Sewing speed 50 Hz	Sewing speed 60 Hz	ø of pulley mm	Ordered number of pulley
FIR 1148/552/3 EFKA VD552	1810	2170	42	S980 045548
	2020	2430	47	S980 045377
	2150	2580	50	S980 045491
	2330	2790	54	S980 045361
	2500	3000	58	S980 045472
	2710	3260	63	S980 045378
	2890	3460	67	S980 045476
	3020	3620	70	S980 045370
	3230	3880	75	S980 045384
	3450	4140	80	S980 045479
	3660	4400	85	S980 045480
	3790	-	88	S980 045383
	3880	-	90	S980 045481
	4310	-	100	S980 045483

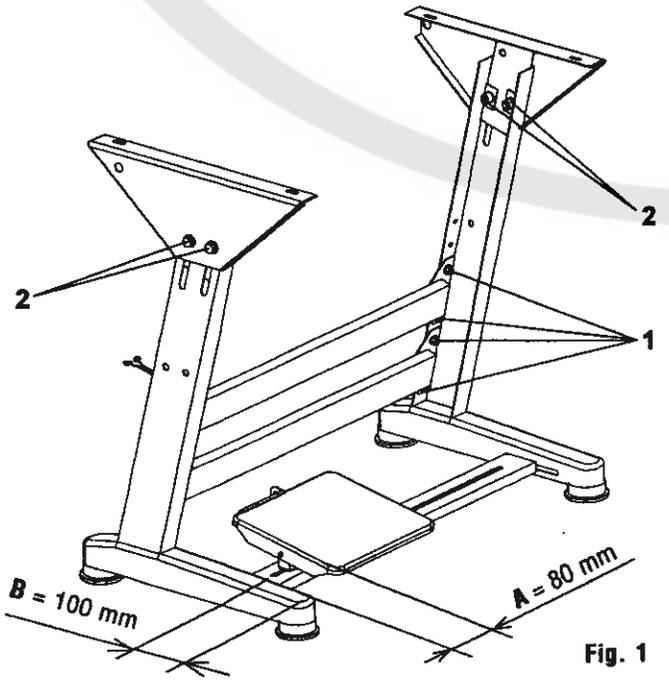


Fig. 1

3. Stand table top

For the event when the customer will ensure his own stand table top, its drawing is given on the page 4 (Fig. 5).

4. Assembly of the stand frame and height setting (Fig. 1)

Proceed to the assembly of the stand frame according to the Fig. 1. The dimension "B" is destined for a middle-high stature of the machine attending person. For a higher stature it is necessary to increase the dimension "B" and inversely. The machine feet are to be levelled with the floor in loosening the screws (1). Using the screws (2) it is possible to set up the height of the stand table top.

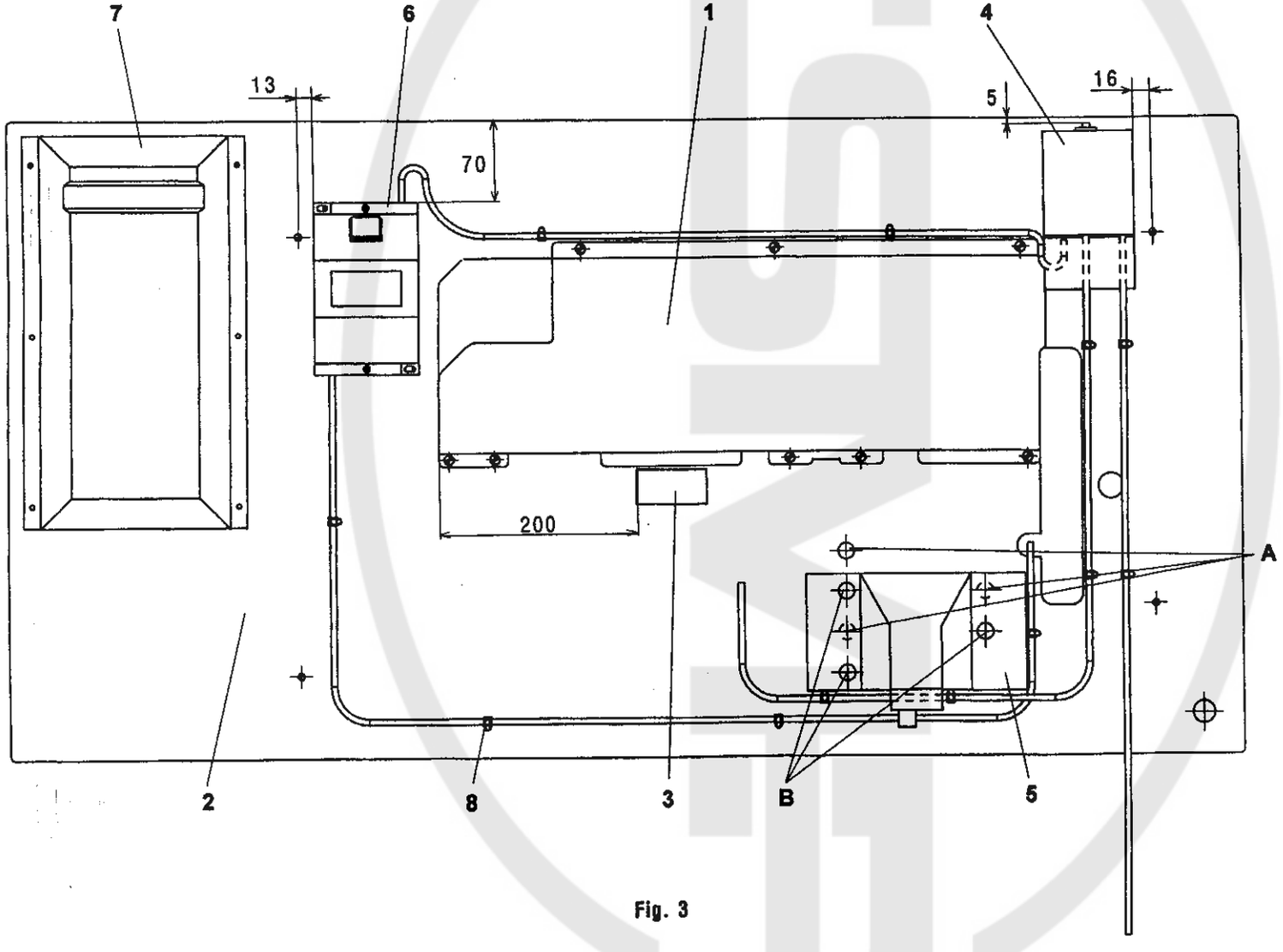


Fig. 3

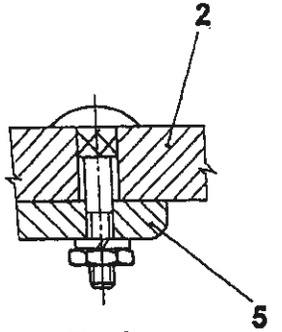


Fig. 4

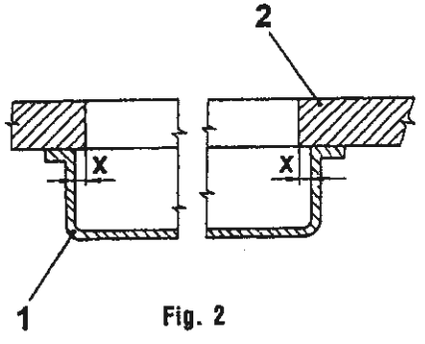
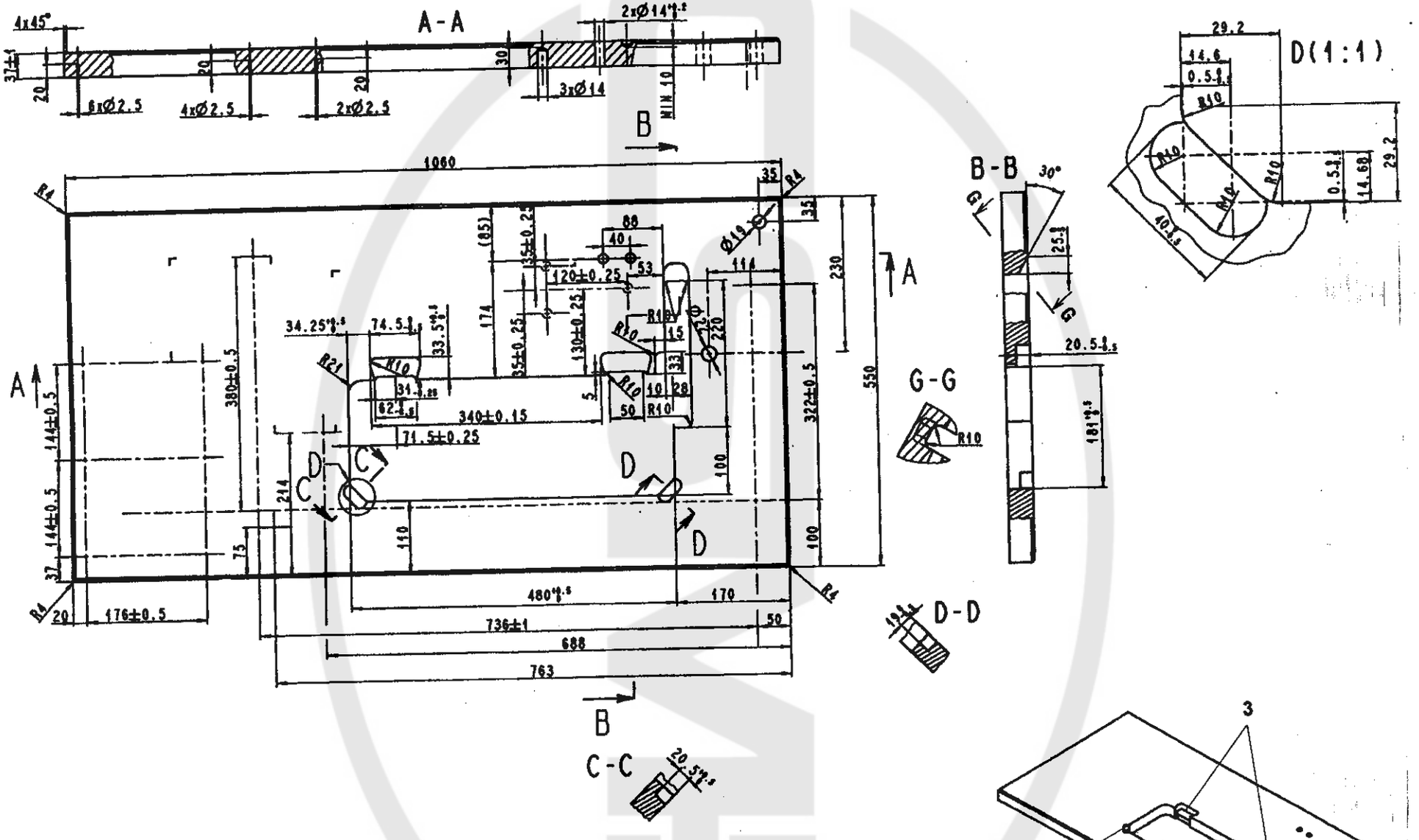


Fig. 2



3 x THREADED INLAY M8 SCREWED INTO HOLES ø 14; DEPTH 30

3x ZÁVITOVÁ VLOŽKA M8 ZAŠROUBOVANÁ DO DĚR Ø14; hl. 30

Fig. 5

5. Assembly and screwing on of the stand table top

5.1 Assembly of stand table top (Fig. 2, 3, 4, 5)

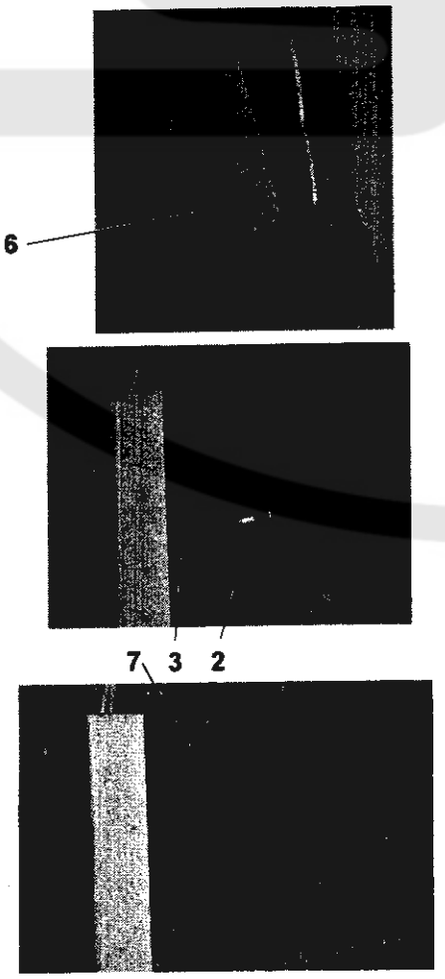
Put the rubber inserts for placing the machine head into the stand table top into the recess (2 and 3, Fig. 5). For better fastening, we recomment to stick on the inserts. When mounting the tray (1, Fig. 2) be sure in maintaining the distance "X" on the whole perimeter of the tray between the interior of the tray and the perimeter of the stand table top recesss (2).
Screw on the main switch (4) on the stand table top (2, Fig. 3).
Fasten the rubber bumper (3, Fig. 3).
Screw on the motor holder (5) according to the Fig. 3 and 4.
Screw on the lighting transformer (6, Fig. 3) for the lighting – if delivered.
Install electric conductors using clamps (8, Fig. 3) Connection differs according to the given motor, supply voltage and according to the number of conductors of the electric supply. In case of a four-conductor 3 x 400 supply the lighting transformer must be fed by a separate lead-in cable 1 x 230 V – see par. 12.3.
Screw on the drawer (7, Fig. 3).
In its working and tilted position, the machine head should not be in contact with the tray. The motor pulley diameter must comply with the maximum prescribed revolutions of the given type of the sewing machine and of the used motor.Adjust the motor circuit-breaker current according the nominal current given on the motor plate.

5.1.1 Mounting and placing of the machine head on the stand (Fig. 8)

The machine head is in each case supplied with fitted hinges and with a lower cover metal plate meant only for the machine transport. Do not omit to remove the plate bofore setting the machine head on its stand. Place the machine head into the stand table top.
Put the supporting pin, which is included in the accessory of the machine, into the hole (7).
Mount the thread guides on the machine head.

5.1.2 Assembly of motor pulley, belt, belt covers (Fig. 6)

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) by clutch lever motor.
Assemble upper cover belt (6) and position reader by stop motor but only after electrical connection of the head to the stopmotor.



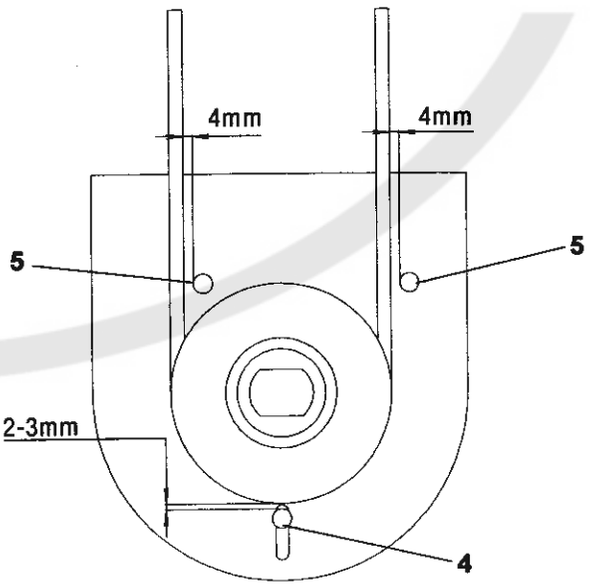


Fig. 6

6. Mounting of a position reader and of a control panel of the stop motor (Fig. 7, 8)

Put the position reader (2) on the pin of the hand wheel in such a way, so that the arresting groove of the reader is placed on the arresting stop (4) (in this way, the movement of the position reader body is avoided). Fasten the reader in tightening two screws with an inner hexagon.

With the EFKA stop motor, mount the control panel V 810 (1) onto the upper guard using two screws (3) which are situated on the guard.

With the EFKA stop motor, mount the holder (5) to the panel V 820 (6) using a screw and screw on the holder with the panel to the machine table top.

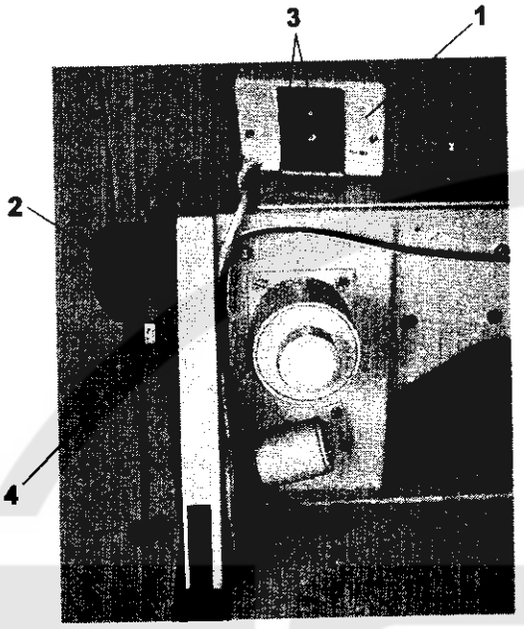


Fig. 7

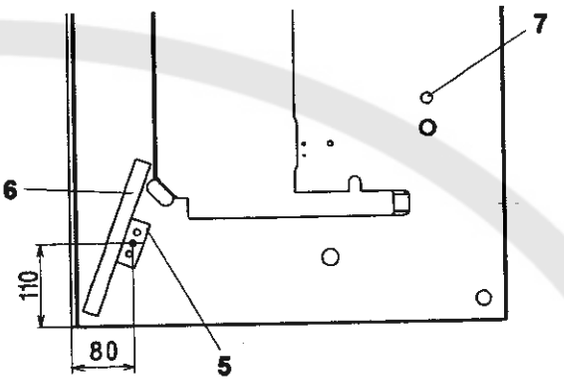


Fig. 8

7. Mounting of the equipment for presser foot lifting using electromagnet (Fig. 9, 10)

Loosen the lever (1), remove the spring with the lever (for mechanical presser foot lifting) and mount the spring (2) and the lever (3). Set up the lever (1).

Mount the magnet (4) with the plate (5) using the screws (6) on the machine head according to the given illustrations.

Set the position between the lever (3) and the core of the electromagnet (4) - minimum clearance – presser foot in its bottom dead centre.

Through the slot in the plate connect the magnet to the outlet on the interconnecting cable of the motor and of the head - see par. 12.4.

Remove the supporting pin from the table top (Fig. 8, pos. 7), insert the cover caps (7) into the holes.

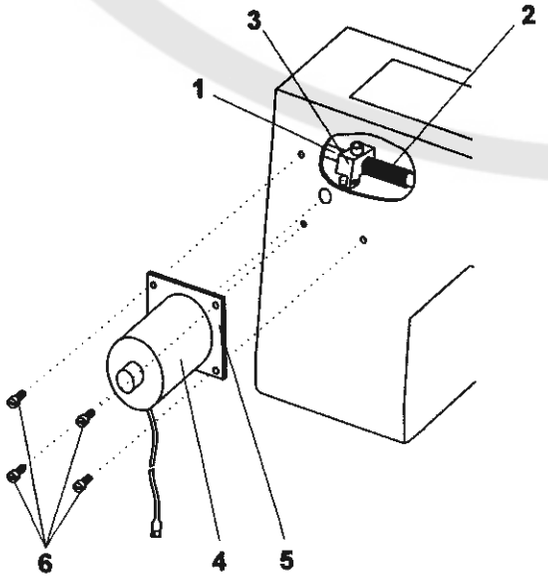


Fig. 9

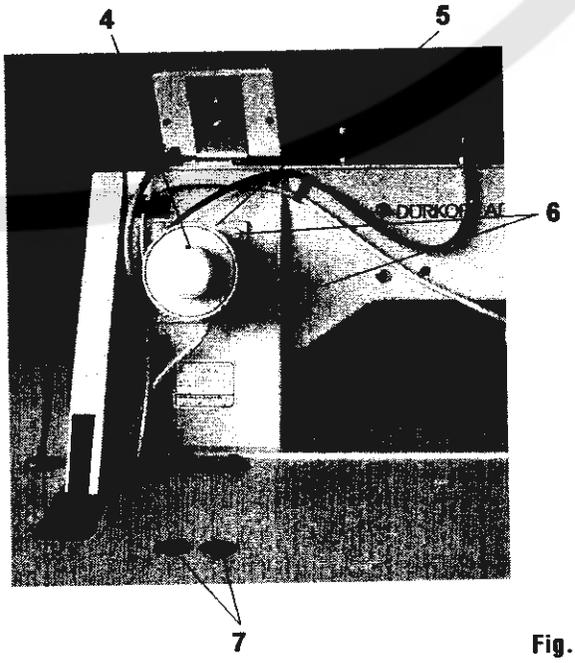


Fig. 10

8. Mounting of the equipment for backward stitching (Fig. 11, 12)

Remove the backward stitching lever and the knob for setting the stitch length.
Mount the knob (1) and the shaft (2).
Put on the lever (3) with the magnet (4) on the shaft (2) and fasten the magnet with screws (5) to the machine arm. Using the screw (6), fasten the lever (3) on the shaft (2).
Connect the magnet conductor through the cutout in the table top into the outlet on the motor and head interconnecting cable. - see par. 12.4.
Using the screws (7), fasten the push button holder (8) to the machine arm. Fasten then the conductor using the clips (9) to the machine arm.

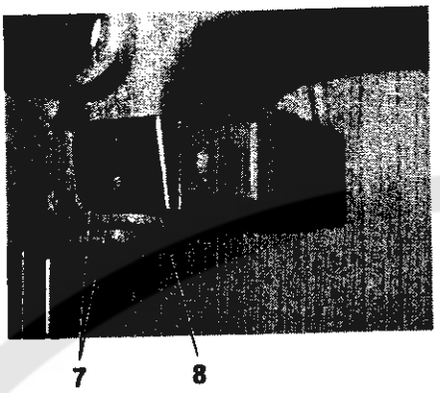


Fig. 11a

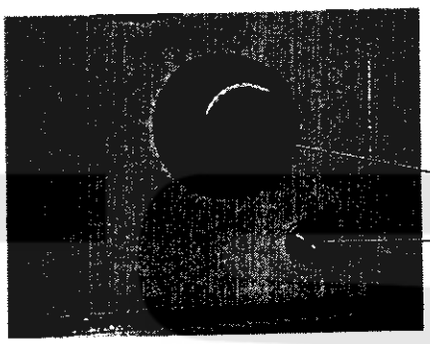


Fig. 11b

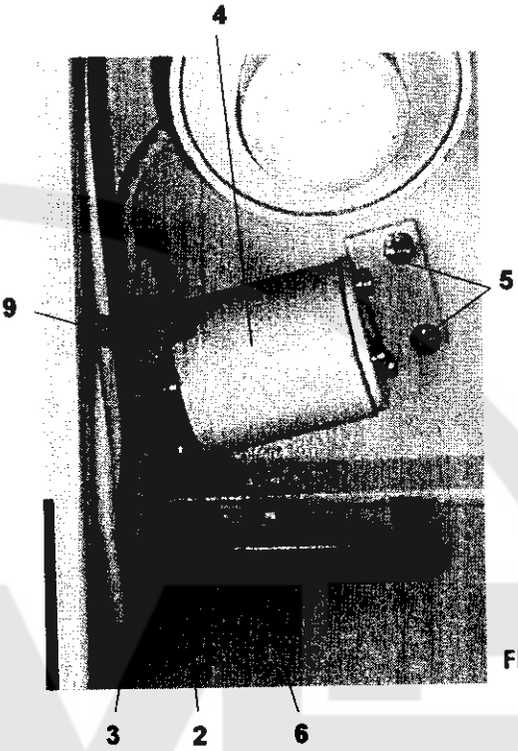


Fig. 12

9. Mounting of the lighting (Fig. 13, 14)

Screw on the roller (2) using the screw (1) on the machine head, put on the lighting on the roller (2) and tighten it with the crank-handle (3).
The assembling procedure of the transformer is described in par. 5.1.

Fig. 13

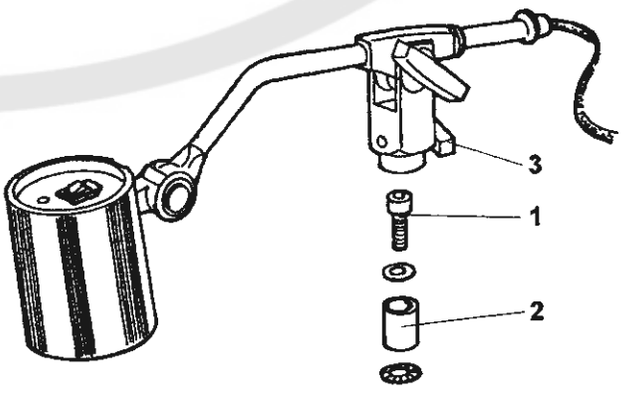


Fig. 14

10. Composition and assembly of the thread stand (Fig. 15, 16)

Assemble the thread stand and mount it into the hole in the plate so that its arms would be parallel to the longer edge of a table top.

Each thread may be fed only through one hole in the thread stand arm.

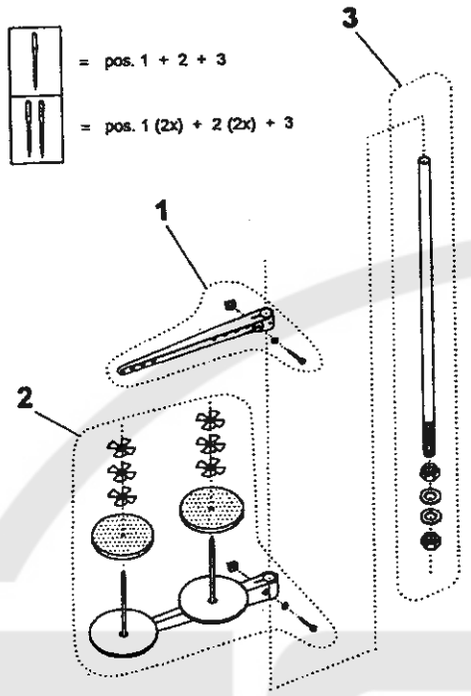


Fig. 15

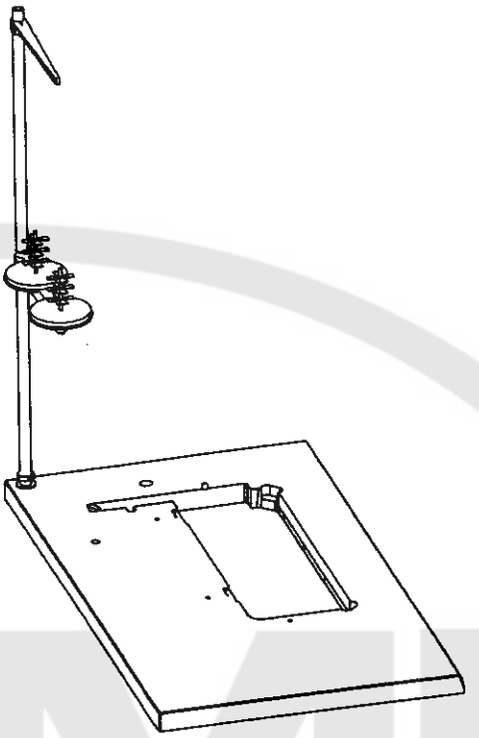


Fig. 16

11. Preparation of the machine for sewing

Inspect carefully the machine, clean and try it, if it turns easily and if it is correctly adjusted.

Fill with oil the oil tank for lubricating the hook and for the central wick-feed lubrication – the lubricating spots are marked with red colour on the machine (part A, par, 7.2 - Fig 12, 13).

For lubricating, use oil ESSO SP-NK 10 or an oil with an equivalent quality. Connect the machine to the mains.

With the sewing drives with three-phase motor, check up the direction of the motor rotation through a short-run connecting of the motor switch. The direction of the machine rotation is marked with an arrow on the belt guard.

In case of an incorrect direction of rotation, inverse mutually two phases in the mains plug. Before utilizing the machine in full power, let run it for some minutes on low speed.

12. Instructions for putting the electronically controlled drive into operation

When putting these drives into operation, observe the hints mentioned in the accompanying documentation of the manufacturer of this drive. The inobservance of these hints may cause damage of the drive or of the sewing machine head.

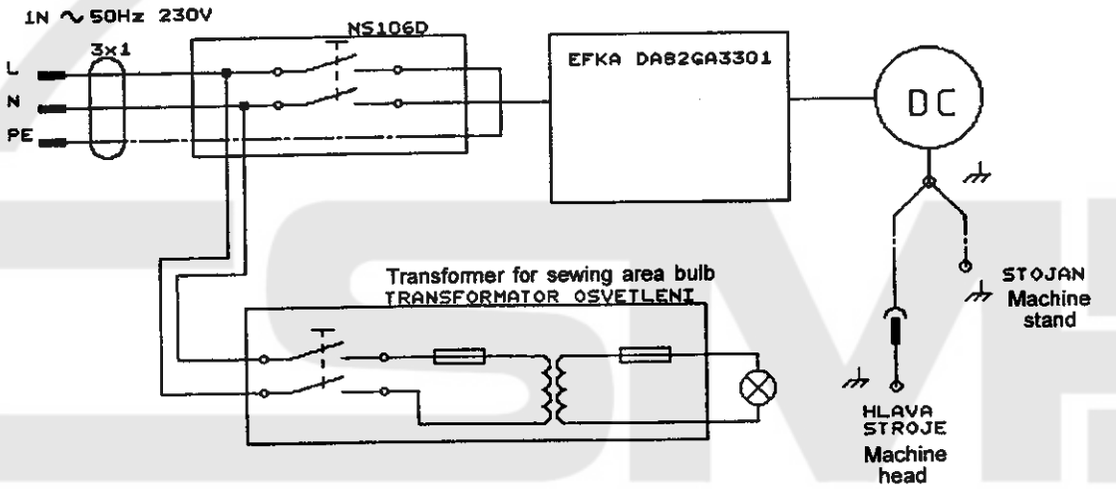
Caution!
The voltage in the mains must comply with the voltage given on the drive plate.

Caution!
The lighting transformer is not switched off by the main switch (EN 60204-3-1). When proceeding to a repair in the transformer box (e.g. replacement of fuses), it is absolutely necessary to disconnect the mains plug from the mains! Such operations may be carried out only by workers having the respective electrotechnical qualification.

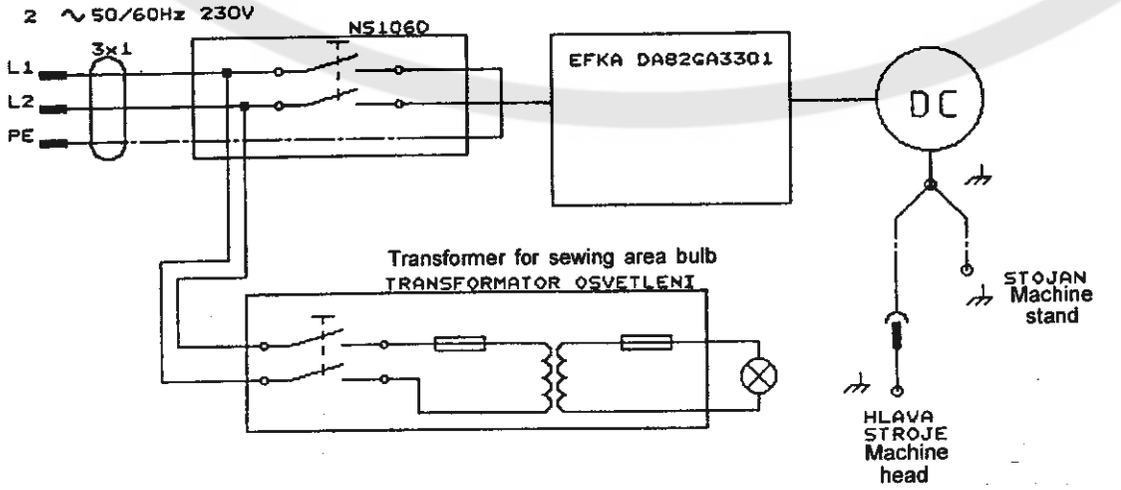
Choose the suitable connection variant according to the following figures:

12.1 Power supply 1 x 230 V - DC motor

Circuit layout - Evropa

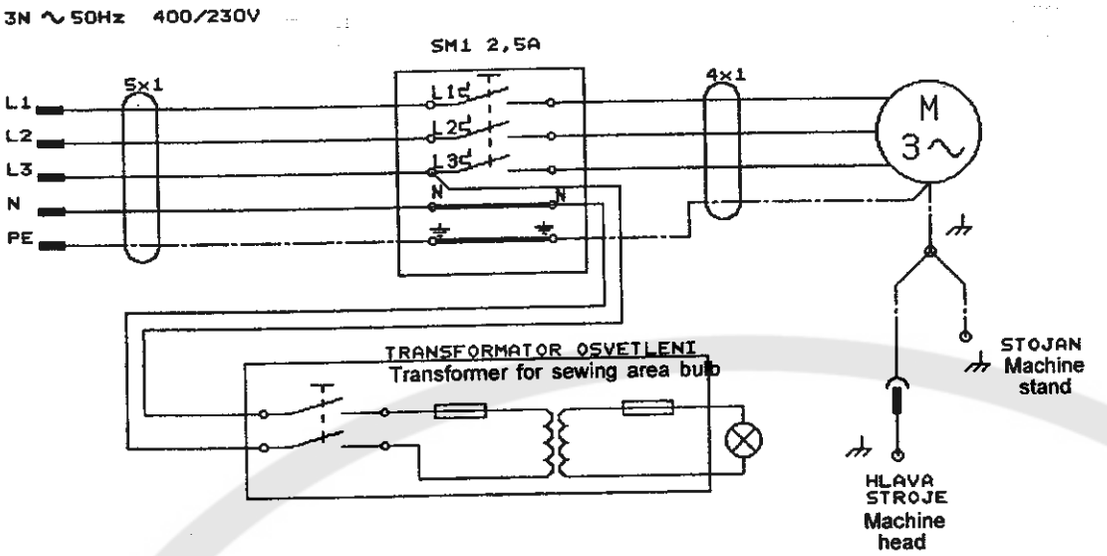


Circuit layout - Amerika

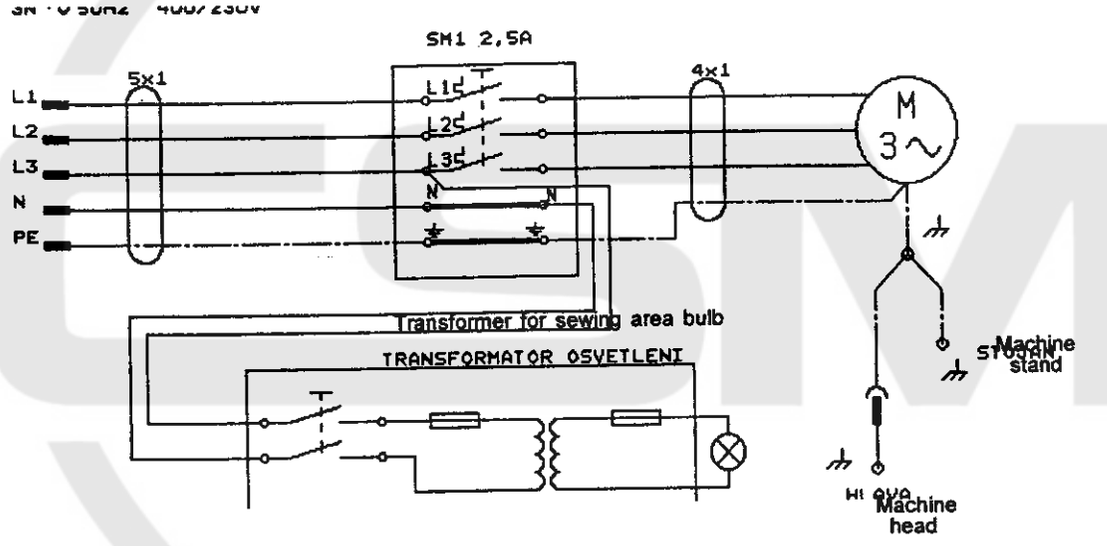


12.2 Power supply 3 x 400 V - five wire power distribution, power supply 3 x 230 V - four wire or five wire power distribution

Circuit layout - Evropa

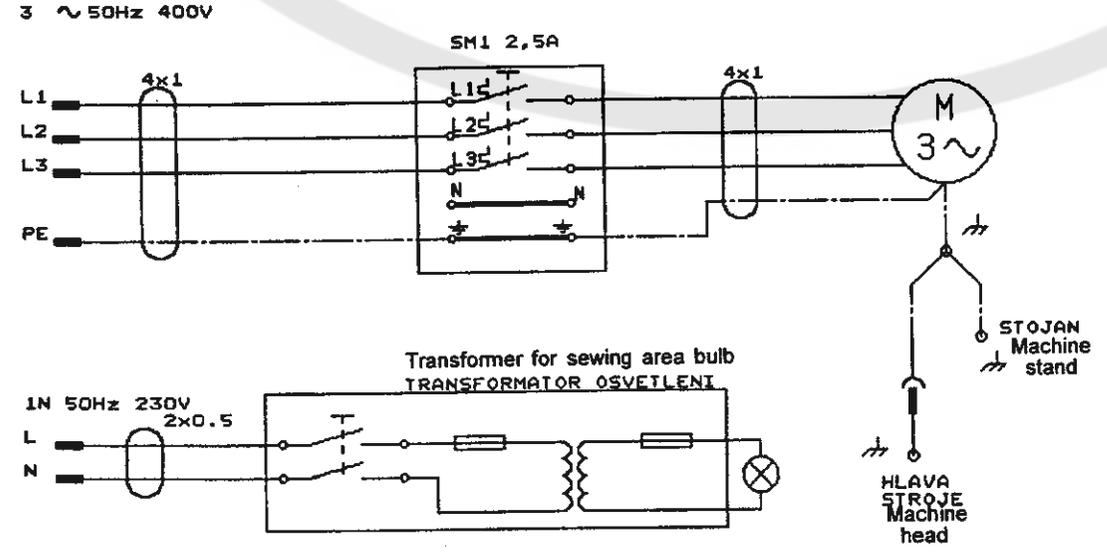


Circuit layout - Amerika



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

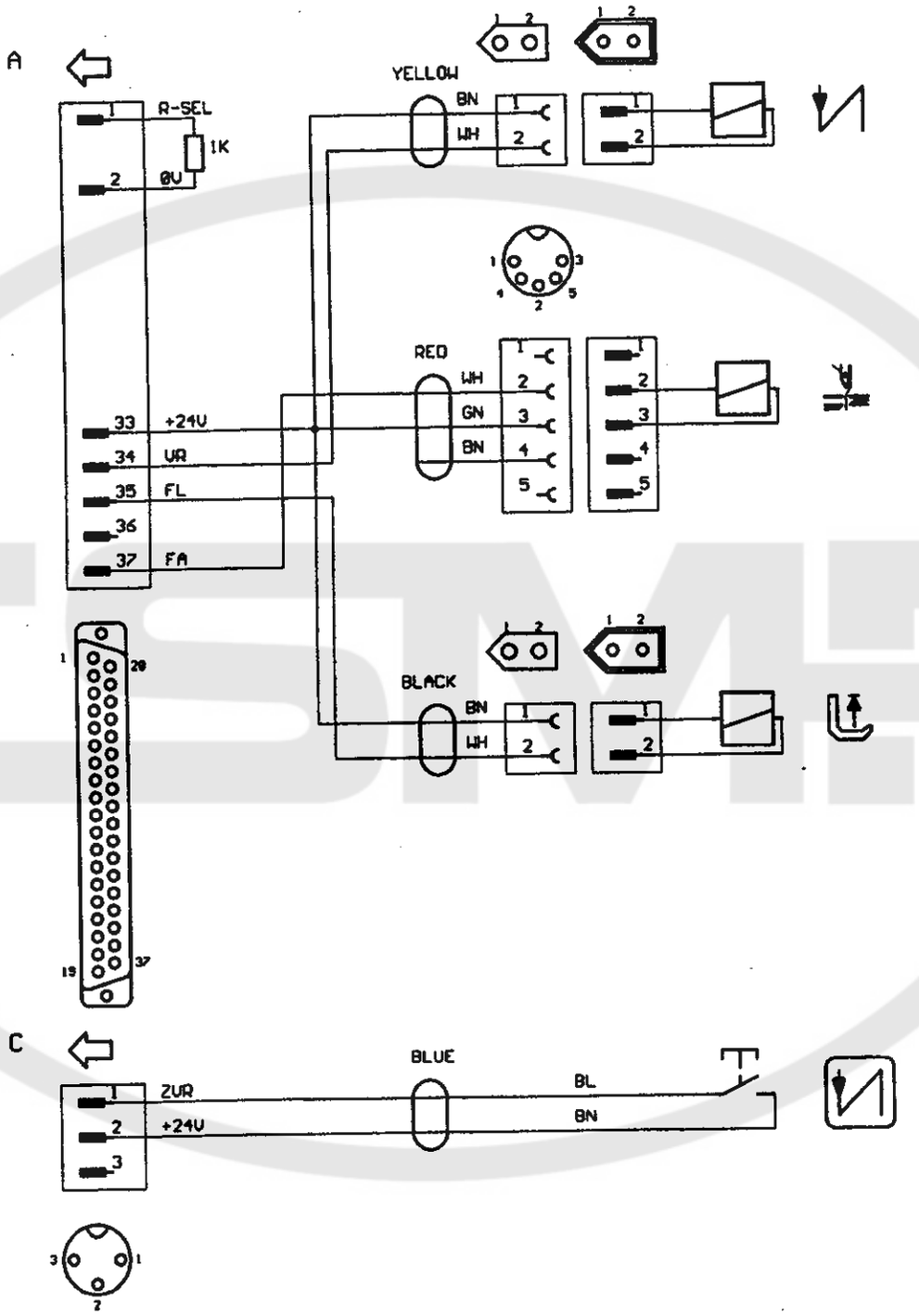
Circuit layout



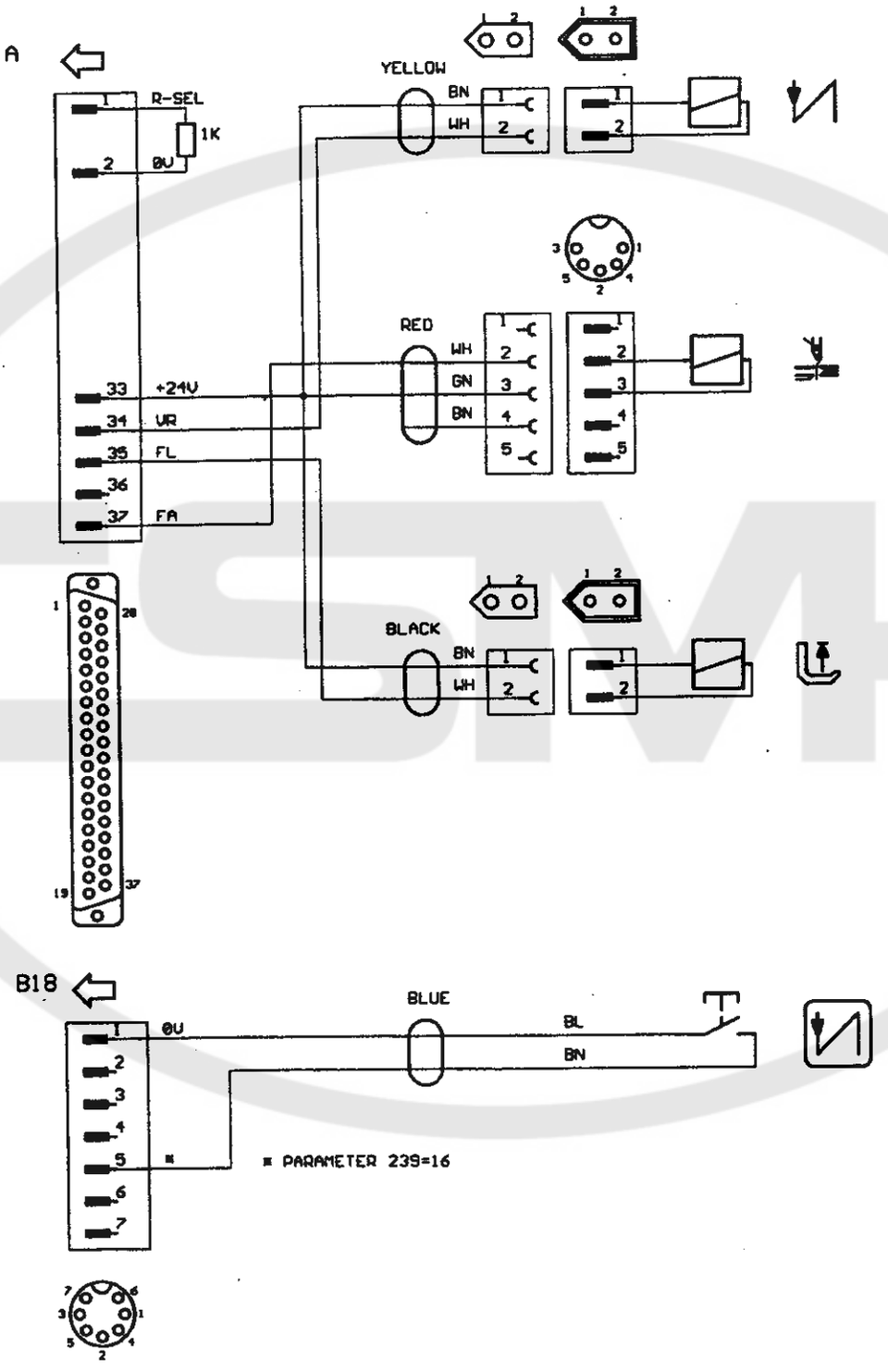
12.4 Electrical connection of machine head to the stop motor

Stop motor S359 600045 XXX - EFKA DC 1600/DA82GA

Circuit layout



Circuit layout



12.5 Stop motor setting S359 600045 XXX - EFKA DC 1600/DA82GA

12.5.1 Setting position reader

- set the parameter **170**, the display will show **Sr1** (reference position)
- depress the pushbutton >>, the display will show **PoS 0** and the changing rotation symbol
- turn the hand wheel until the rotation symbol disappears
- turn the hand wheel in such a way, so that the needle point ,when moving downward, is on the level of the throat plate
- depress the pushbutton **E** and pass to the parameter **171**

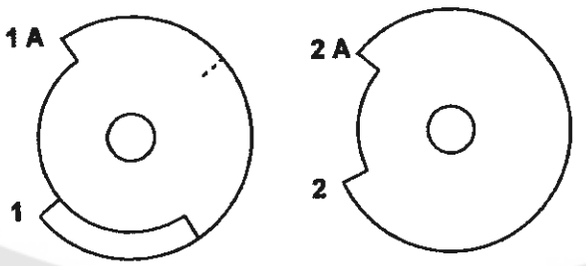
- set the parameter **171**, the disply will show **Sr2** (all positions)
- depress the pushbutton >>
- the display will show **1 XXX** (value of the bottom position)
- turn the hand wheel, until the value **XXX** begins to change
- turn the hand wheel at the value of the bottom position angle (**160** on the panel)
- depress the pushbutton **E**
- the display will show **2 XXX** (value of the top position)
- turn the hand wheel, until the value **XXX** begins to change
- turn the hand wheel at the value of the top position angle (**460** on the panel)
- depress the pushbutton **P 2x** (return to the sewing mode)
- tread shortly forward the pedal (memory entry)

12.5.2 Changes of setting parameters of stop motor setting considering original producer setting

Parameter No	Parameter value	
111	-	Max. revolutions (according to a type of machine)
170	-	Reference position
171	1 160	Lower position
	2 460	Upper position
190	300	Switch on angle of thread trimmer (210°)
202	120	Delay of start run after switch off the signal foot
210	200	Stopping time for fancy bar
213	5	Time off full power of backtacking

12.6 Stop motor setting S359 600052 XX - EFKA VD 552/6F82FA

12.6.1 Setting position reader



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

Setting of the lower position:
- dismount the guard of the position reader
- switch on the mains switch
- tread shortly pedal forward (the machine stops in the needle lower position)
- switch off the mains switch
- turn the beginning of the recess **1** of the overlapping disks in such a way, so that the machine stops with the needle in the position of 3 mm behind the bootom dead center
- check up in repeating the procedure

Setting of the top position of the thread lever:
- tread the pedal rearward (the machine stops in the needle upper position)
- switch off the mains switch
- turn the beginning of the recess **2** in such a way, so that the machine stops with the thread lever in the top dead centre
- check up in repeating the procedure.

12.6.2 Changes in parameters of stop motor setting considering original producer setting

Parameter No	Parameter value	
111		Max. revolutions (according to a type machine)
190	100	Switch on angle of thread trimmer
202	120	Delay of start run after switch off the signal foot
210	200	Stopping time for fancy bar
213	5	Time off full power of backtacking
239	16	Function of the pushbutton on B 18/5

Contens - Part C - Instructions for setting individual:

1. General safety instructions 1
2. Introduction 1
3. Setting of the feeder height above the throat plate 2
4. Setting of the needle and feeder movement 2
5. Mounting of the throat plate 2
6. Setting of the elliptical path of the feeder 2
7. Setting of the feeding length 3
8. Presser foot replacement 3
9. Presser foot lifting setting 3
10. Setting of the needle bar height 3
11. Adjustment of the hook timing 4
12. Setting of the middle part of the hook holder 4
13. Setting of the opening hook of the hook 5
14. Dismounting and mounting of the driving belt 5
15. Setting the needle punch into the middle of the needle groove in the throat plate in longitudinal direction 6
16. Setting of the needle punch into the middle of the needle groove in the throat plate in transversal direction 6
17. Setting of the zigzag stitch mechanism for the right and left position 6
18. Setting of the zigzag stitch shifting 7
19. Setting of the controlling force of the zigzag stitch adjusting 7
20. Setting the controlling force of the continuous adjusting of the zigzag stitch position 7
21. Taking up of the teeth clearance in the zigzag stitch gearing 7
22. Setting of the needle bar and of the hook shaft position 8
23. Time setting of the control cam of the thread cutter 8
24. Setting of the movable cutting knife lifting 9
25. Setting of the upper thread tensioner releasing 9
26. Setting of the adjusting spring function 9
27. Setting of the starting position of the movable thread cutter 9
28. Setting of the stationary knife presure 9
29. Setting of the stop in the top position of the needle 10
30. Making an upper thread reserve 10
31. Dismounting and mounting of the plate 10
32. Dismounting and mounting of the movable cutting knife 10

Part C - Instructions for setting individual mechanisms

1. 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, top roller, needle plate, feed dog and bobbin) when treading, 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

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 treading 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.

2. Introduction

This part contains instruction for regulating the mechanisms of the sewing machine head.

For setting the machine, simple setting aids are used which are included in the accessory of the machine. Besides these aids, universal measuring devices are used, such as slide calliper, feeler gauges and dynamometer for measuring the thread tension.

It is adviceable to order the locating fixture S791 947001 for setting:
- the feeder planeness and and height
- the hook timing
- the hook medium part holder
- presser foot lifting

3. Setting of the feeder height above the throat plate (Fig. 1, 2, 3)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

The height of the feeder teeth (11) above the throat plate (10) is to be set within the extent of 0.8 – 1.2 mm according to the nature of the sewn material. The setting thereof is to be done in loosening the screw (2) of the lifting lever (8) on the shaft (6) and in setting the necessary height of the feeder teeth. Tighten firmly the screw. The evenness of the teeth can be set using the eccentric pin (5) in loosening the screw (1) in the feeding lever (9) on the shaft (7) and, in turning a bit the pin (5) set the feeder at the level of the throat plate. Tighten then the screw (1).
Check the height and the planeness of the feeder teeth using the locating fixture (12).
The figure 2 shows the method of using of the locating fixture for checking the planeness and height of the feeder teeth 0.8 mm above the throat plate. The figure 3 shows the method of using of the locating fixture for checking the planeness and height of the feeder teeth 1.2 mm above the throat plate.

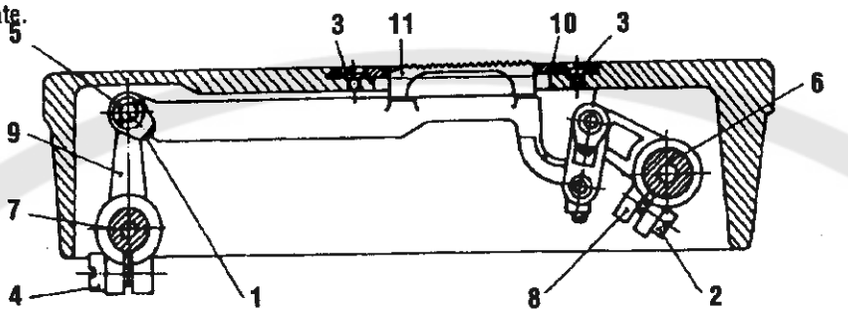


Fig. 1

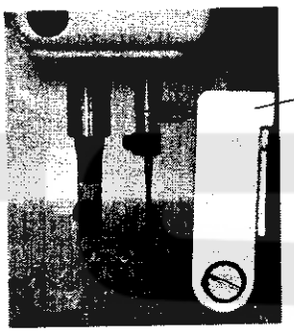


Fig. 2

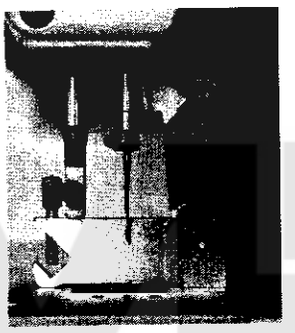


Fig. 3

4. Setting of the needle and feeder movement

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

In turning by hand the hand wheel, set the feeder into the position, where the feeding ends and where the feeder teeth are at the level of the throat plate. Loosen two screws on the lower belt wheel and turn a bit the hand wheel until the needle point, when moving downward, is set about 5 mm above the throat plate, and tighten the screws on the belt wheel.

5. Mounting of the throat plate (Fig. 1)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

The throat plate (10) must be correctly placed and tightened by the screws (3) in such a way, so that the needle passes through the centre of the needle hole. The needle hole should not be damaged or abraded by the needle or thread, eventually otherwise damaged. Each damage of this kind influences on the quality of sewing.

6. Setting of the elliptical path of the feeder (Fig. 1)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

With a correctly set machine the feeder describes an elliptical path in both feeding directions. We proceed to the respective setting as follows: The adjustable eccentric is set by means of a pin into the hole in the bottom shaft and determines the size of the feeding length. The second (fixed) eccentric situated in front of the adjustable eccentric determines the correct ellipse. The fixed eccentric is secured with two screws which are placed in its collar.
The eccentric is of a constant eccentricity, so that the height of the ellipse remains the same with different setting of the height of the feeder teeth. With a zero eccentricity of the adjustable eccentric (i.e. with a zero feeding), we set the feeder holder with the feeder in the centre of the slot in the throat plate with the loosened screws (4) of the lever (9) on the feeding shaft (7).
It is necessary to observe the principle that the maximum feeder lifting is about in the middle of the feeding path.

7. Setting of the feeding length (Fig. 4)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

On the regulating knob of the stitch length (1) the zero position with the loosened screw of the lever on the pin of the hand lever of the back stitch (2) is to be set. Set now the sliding sleeve of the adjustable eccentric in such a way, so that the height of the ellipse remains the same with different setting of the feeder teeth height. and, in this position, tighten the screw of the lever. Check up thereafter, if the feeding is the same in the forward and rearward direction.

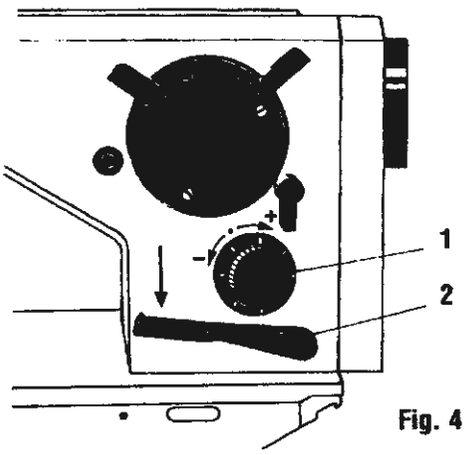


Fig. 4

8. Presser foot replacement (Fig. 5)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

When replacing the presser foot (1), switch off the stop motor, lift first the pressure bar (11) into its top position and secure it with the hand lifting lever (12). Lift the needle too in its highest position.Loosen then the fastening screw of the presser foot (5) with the washer (7), dismount the finger protector (9) and remove the presser foot (1) from the presser bar (11). Remount the presser foot in an inverse procedure. After having fixed a new presser foot, check up (in lifted position), whether the moving needle bar does not strike on the presser foot.

9. Presser foot lifting setting (Fig. 5, 6, 7, 8)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

Remove the needle, Using the lifting lever (12) lift the presser foot. Place the locating fixture (Fig. 6) under the presser foot. Loosen the the screw (14) and shift the guide (15) in such a way, so that it fits on the lifting sheet (16). Tighten then the screw (14). Remove the locating fixture and lower the presser foot onto the throat plate. Loosen the screw (17) of the lever (18) and set the lever 1 mm above the upper shaft (19). In this position, tighten duly the screw (17). check the axial clearance of the shaft (20) which Is to be the least possible. Lift the presser foot using the knee lever or pedal and check its lifting using the locating fixture (Fig.8).

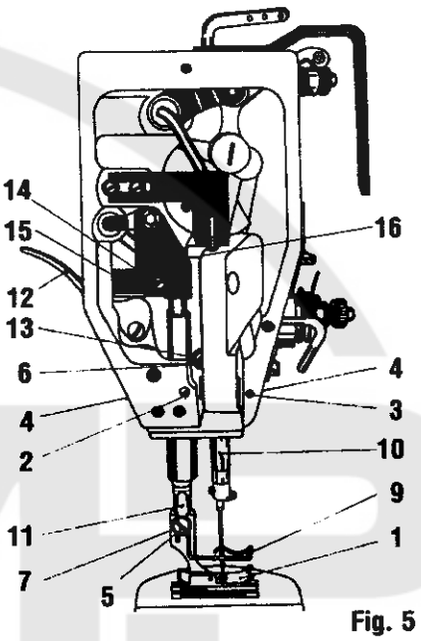


Fig. 5

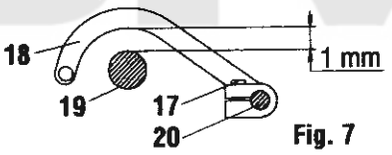


Fig. 7

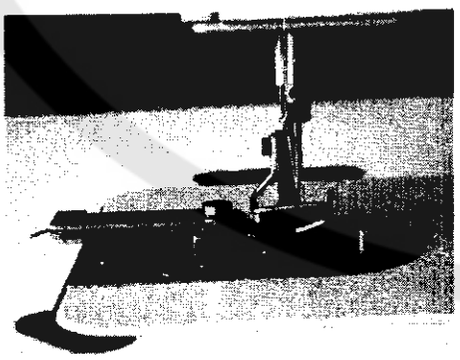


Fig. 6

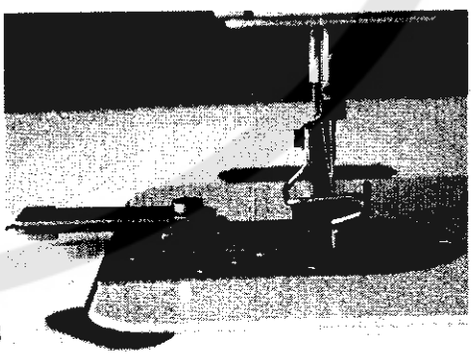


Fig. 8

10. Setting of the needle bar height (Fig. 5)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

The hook together with the needle must be set in such a way, so that, at the moment when the hook point picks up the loop of the upper thread, the top edge of the needle eye is in the lefthand position of the needle bar, with the maximum width of the zigzag stitch, about 0,6 mm below the hook point. When the needle bar height does not comply with this request, proceed as follows: Remove the front guard. Loosen the screw (6) of the carrier (13) of the needle bar (10) and set it correctly. Tighten screw (6). Mount the front guard.

Caution !
An incorrect setting of the needle bar height may cause the striking of the hook point against the needle.

11. Adjustment of the hook timing (Fig. 9, 10)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

Set a zero zigzag sitch on the machine. Turn the hand wheel towards ourselves, until the needle bar descends in its lowest point and then ascends by 2.1 + 0.3 mm upwards. In this position, the hook point must be on the needle axis. The max. space between the needle and the hook is to be 0.05 mm. If it is not so, dismount the throat plate proceed to the correct setting of the hook timing using the locating fixture. When the needle bar is in its lowest position, screw on the locating fixture (Fig. 9) onto the needle bar together with gauges giving the hook timing size, namely 2.1 + 0.3 mm (gauge 1.8 + gauge 0.3).
Tilt the gauges in thickness of 1.8 and 0.3, lift the needle bar by the hook timing value upwards (Fig. 10). In this position, the hook point must be on the needle axis. Secure the correct hook position in tightening the screws and proceed to the mounting of the throat plate.

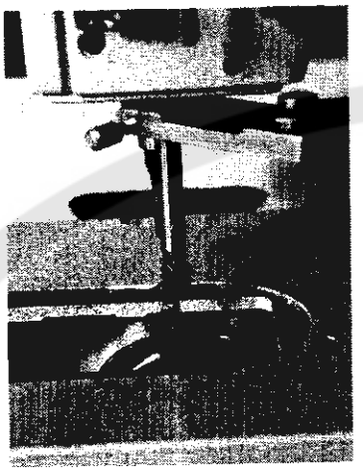


Fig. 9

Fig. 10

12. Setting of the middle part of the hook holder (Fig. 11, 12)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

Set the middle part hook holder (7) in such a way, so that the space between the holder nose and the bottom of the groove of the middle hook part is about 0.7 mm. Proceed to this setting after having loosened the holding screw (10) using a locating jig (Fig. 11) - see equipments part A, par. 4.2, 4.4.

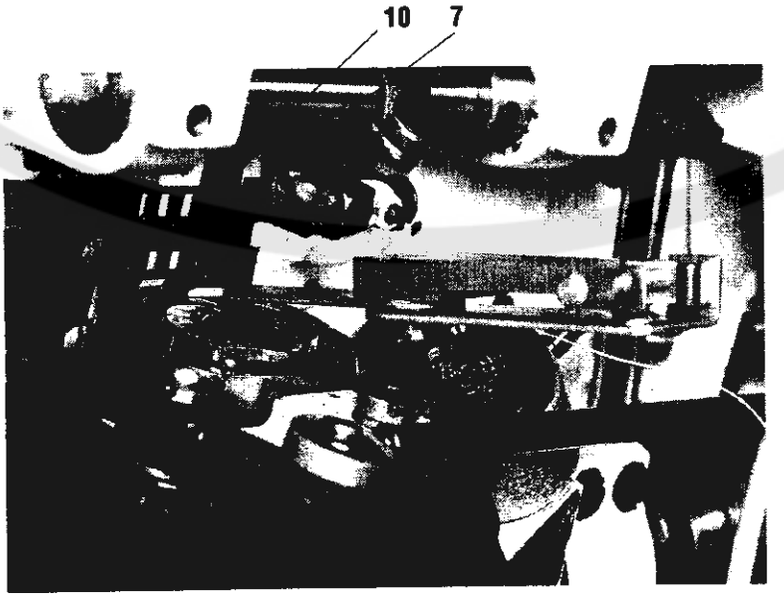


Fig. 11

13. Setting of the opening hook of the hook (Fig. 12, 13)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

The space between the sides of the middle part of the hook and the middle part hook holder (7) is forcibly produced during the machine running by means of the opening hook (8) and the eccentric (6) for an easier passing of the thread between the middle part of the hook and the holder of the middle part of the hook (7). This setting is to be done after having set the zero zig-zag stitch. Set first the opening size, namely the space produced between the holder of the hook middle part and the groove sides in the middle part of the hook. Together with this setting proceed to the setting of the opening hook, namely to the axial clearance taking up between the opening hook nose (8) and the projection on the hook middle part.

Unscrew first four screws (3) on the cover (9) of the hook box, remove the cover and withdraw therefrom the lubricating insert. Loosen the screw (1) which secures the position of the sleeve (5), on which the pin (4) with the opening hook bears on. Set the bobbin case lifter in such a way, so that there is 0.8 mm clearance between its nose and the hook medium part and tighten the screw (1). Loosen at the same time the screw (11) and set the opening hook in such a way, so that it forms with the projection of the hook middle part the clearance of 0.5 mm necessary for the thread passage. After having set the opening hook tighten the screw (11) with the maximum eccentric turning. This setting is to be done with the removed throat plate. Proceed to the time setting of the opening hook against the the hook during the running-in phase of the machine. Loosen two screws (2) on the eccentric (6) and, in turning it a bit on the bottom shaft, set the opening of the middle part of the hook in such a way, so that it begins at the moment, before the upper thread starts passing between the groove sides in the middle part of the hook and the hook holder nose. At the same time check the correct passage of the upper thread over the maximum hook diameter, when the opening hook approaches the opening projection for the purpose of opening the passage of the upper thread around the middle part of the hook. The correctness of this setting can be best checked in observing the adjusting spring on the tensioner of the upper thread. Be careful in having free passage of the thread when the adjusting spring has to produce in this phase only a slight movement. After having set the eccentric, tighten the screws and proceed to the remounting of the hook box guard including the lubricating insert.

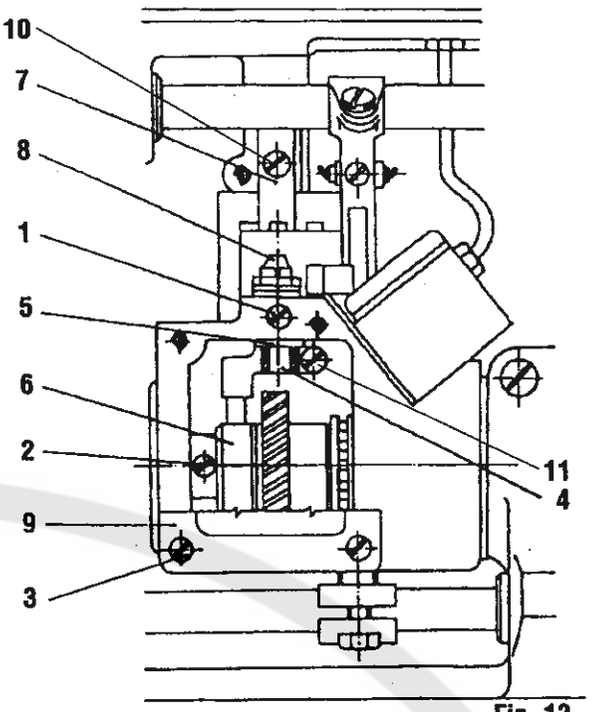


Fig. 12

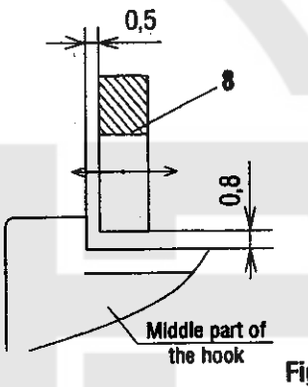


Fig. 13

14. Dismounting and mounting of the driving belt (Fig. 14)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

Dismount first the position sensor (A). When there is no marking of the synchronizer position against the hand wheel, mark it. Dismount the upper belt guard (2) after having unscrewed the screws (1). Remove the V-belt from the hand wheel.After having loosened two screws (3) shift out the hand wheel with the bearing)4) from the machine arm and from the upper shaft (5). Pull the driving belt (6) through the hole in the machine arm and around the upper shaft and put it on both belt wheels. Remount the hand wheel on the upper shaft in such a way, so that the first screw (3) in the direction of the hand wheel rotation, after being tightened, bears on the flat on the upper shaft. Secure the hand wheel with the second screws (3). Put the V-belt on the hand wheel and proceed to the mounting of the belt guard and of the position sensor up to the position mark.

Notice!
After having mounted or replaced the driving belt, it is always necessary to proceed to the timing adjustment of the hook. and of the feeding according to the above paragraphs. When the mounting is not done by any skilled mechanician, then we recomend to remove the needle from the needle bar before starting the mounting.

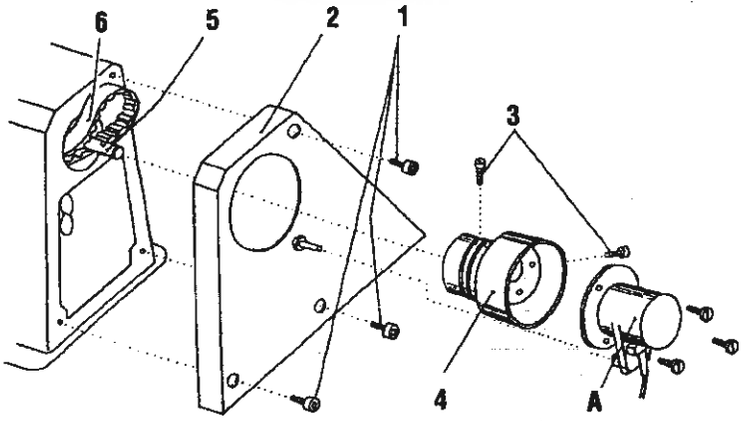


Fig. 14

15. Setting the needle punch into the middle of the needle groove in the throat plate in longitudinal direction (Fig. 5)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

This setting is to be done after having set the zero zigzag stitch. In turning the hand wheel set the needle bar with the needle into its bottom position. The needle is to stand in the middle of the needle groove both in the longitudinal and in the transversal direction. When this is not so in the longitudinal direction (in the direction of feeding the sewn material), remove the front guard after having unscrewed two fastening screws and loosen the securing screws (2) and (3). Now it is possible, by a fine turning of the screws (4) on the front and on the rear side of the arm, to set the needle into the middle of the groove in the throat plate in the longitudinal direction Tighten thereafter the screws (2) and (3) and proceed to the mounting of the front guard.

Notice!
When setting the needle position in the throat plate, not tighten fully the adjusting screws (4). Between these screws and the needle bar holder there must be let a minimum clearance, so that the side movement of the needle bar holder with the zigzag stitch is without any resistance. Without observing the necessary clearance between the adjusting screws (4) and the needle bar holder the mechanism may be damaged. Check up the space between the hook point and the needle.

16. Setting of the needle punch into the middle of the needle groove in the throat plate in transversal direction (Fig. 15, 16)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

This setting is to be done after having set the zero zigzag stitch. In turning the hand wheel set the needle bar with its needle in its bottom position. The needle should stand in the middle of the needle groove both in the transversal and in the longitudinal direction. When it is not so, remove the guard (1) from the front part of the arm after having unscrewed the screw (2) and the plug from the rear opposite part of the arm. Loosen thereafter both screws (3) and set the complete needle bar holder (4) in such a way, so that the needle is in the middle of the groove of the throat plate in transversal direction. After having set this, tighten the screws (3) and proceed to the mounting of the guard and the plug. Check up the needle punch with the maximum stitch width and bear in mind to have a clearance between the needle and the groove side in both needle positions. When turning the hand wheel and with the set zero zigzag stitch, the needle bar with the needle should not perform any side movement. If it is so, then it is necessary to set the basic zero position of the driving mechanism of the zigzag stitch. But this setting is of a larger extent, it needs more time and is to be done by a mechanician with a good knowledge of the machine having some practice in the sewing machines line.

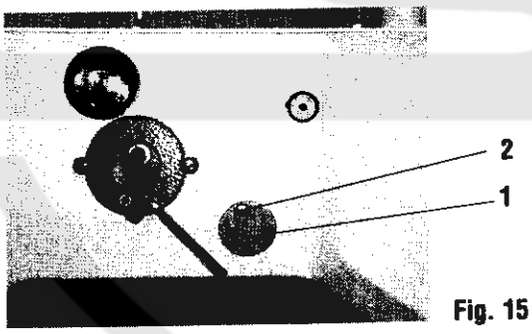


Fig. 15

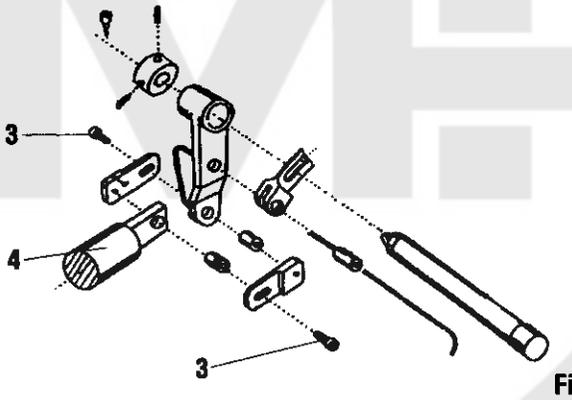
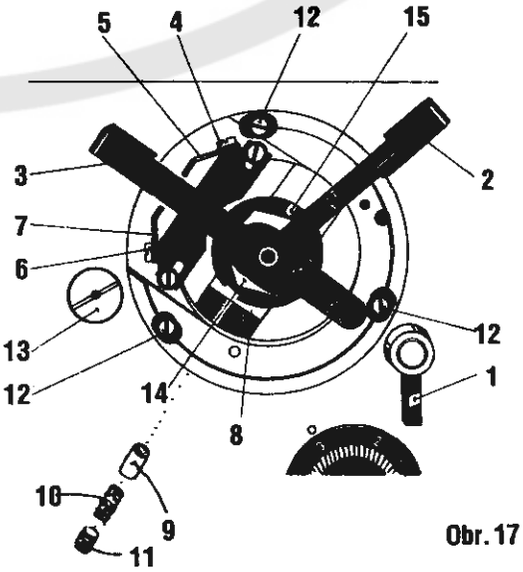


Fig. 16

17. Setting of the zigzag stitch mechanism for the right and left position (Fig. 17)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

After having set the middle position and the maximum width of the zigzag stitch, we can proceed to the setting of the left and right position of the zigzag stitch. Remove the zigzag stitch mechanism guard after having unscrewed two fastening screws. After having loosened the arresting lever (1) set the zero zigzag stitch using the lever (2). In turning the hand wheel set the needle bar with its needle into its bottom position. Shift the lever (3) upwards, namely in its right position. When shifting this lever, follow up the movement of the needle in the groove of the throat plate, until the needle shifts in its extreme right position. After having loosened the screw (4) set the stop (5) in such a way, so that the projection fits into the recess in the lever (3). Tighten then the screw (4) up. Proceed in a similar way when setting the left needle position, when shifting the lever (3) to the opposite side., i.e downwards towards the bedplate. After having loosened the screw (6) set correctly the stop (7) and tighten anew the screw (6). After having set the left and the right position, proceed to the mounting of the zigzag stitch mechanism guard.



Obr. 17

18. Setting of the zigzag stitch shifting (Fig. 18)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

With the correctly set up machine, the needle bar shifts with the maximum zigzag stitch width at the moment, when the needle is about 4 mm above the throat plate and its path (shifting) is symmetrical against the axis of the groove in the throat plate. Proceed to the necessary setting after having unscrewed four screws (6) and after having removed the guard (1). Loosen the screws (2) of the toothed wheel (3) on the upper shaft (4). Turn the hand wheel and change the mutual position of the upper shaft (4) and the wheel (3). After having moderately tightened check the needle shifting. After having attained the correct needle shifting tighten the screws (2) and proceed to the mounting of the guard.

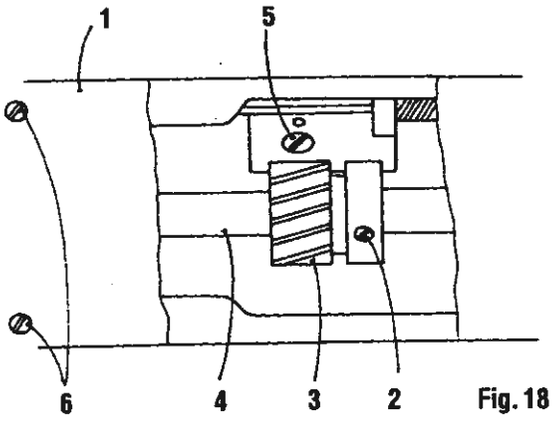


Fig. 18

19. Setting of the controlling force of the zigzag stitch adjusting (Fig. 17, 19)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

To get a continuous tilting of the slot link of the zigzag stitch (19) there is placed in the insert (8) the braking roller (9) with the spring (10) and with the regulating screw (11). In turning the screw to the right, the pressure upon the roller increases in increasing so the force necessary for setting the zigzag stitch width. The proper securing of the zigzag stitch setting is done by means of a arresting mechanism controlled by the lever (1). Proceed to any setting of the zigzag stitch width only after having loosened this lever in turning it to the left. The zigzag stitch width is set by shifting the lever (2). In its zero position (up to the stop) the zigzag stitch width is zero, in shifting the lever to the right it is increased up to 10 mm. The numerical designation on the guard (16) corresponds approximately to the set values. The shifting force is regulated after having withdrawn the complete zigzag stitch mechanism from the web of the arm. Unscrew first two screws (17) on this mechanism and remove the guard (16) therefrom. Unscrew three fastening screws (12) from the body of the zigzag stitch mechanismu. Unscrew the lock screw (18) on the pin (20) and pull this pin out from the guide (19). Loosen the arresting lever (1) and disengage the pin (21). In this way the body of the zigzag stitch mechanism is loosened to be removed from the machine arm. The remounting thereof is done in the inverse procedure.

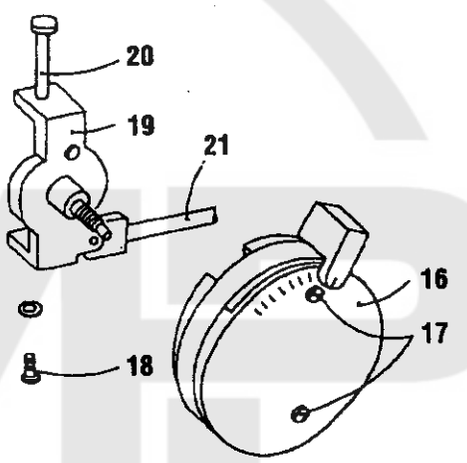


Fig.19

20. Setting the controlling force of the continuous adjusting of the zigzag stitch position (Fig. 17, 19)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

For setting continuous adjustment of the zigzag stitch position (partially that of the zigzag stitch width too) there are screwed on the guide (19) the nut (15) and the lock nut (14). By suitable tightening of the nut (15), ensure the necessary shifting force as well as the force maintaining the adjusted position of the zigzag stitch. Secure the position of the nut (15) in tightening the lock nut (14). Any change of the zigzag stitch position is to be done with the loosened arresting lever (1).

21. Taking up of the teeth clearance in the zigzag stitch gearing (Fig. 17, 18)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

For taking up the teeth clearance in the zigzag stitch gearing there serves the eccentric pin (13, Fig. 17). If we want to change the clearance, we must dismount first the upper guard (1, Fig. 18) after having unscrewed four fastening screws (6, Fig. 18). After having loosened the screw (5, Fig. 18) which is placed on the riser in the arm space, proceed, in turning a bit the eccentric pin (13, Fig. 17), to taking up of the teeth clearance in the zigzag stitch gearing, namely between the toothed wheel on the complete cam and the toothed wheel (3, Fig. 18) on the upper shaft. Secure the adjusted position by tightening orderly the screw (5, Fig. 18).

22. Setting of the needle bar and of the hook shaft position (Fig. 20, 21)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

After a larger repair of the machine it is suitable to check up the mutual position of the needle bar in its central position and that of the hook shaft. The axis of the hook shaft is shifted to the left from the axis of the needle bar. Proceed to the respective setting after having loosened two screws (3), which secure the clamping joint between the bedplate and the hook gearbox. In its correct position, the hook gearbox is pushed to the riser of the bed plate and the axis of the hook shaft is parallel with the plane of the bedplate. Secure the box position in tightening both screws (3).

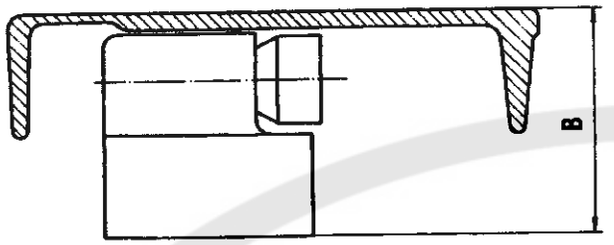


Fig. 20

Fig. 21

Notice!
In case of dismounting the hook gearbox it is necessary to respect, when remounting it, the parallelism of the axis of the hook shaft with the plane of the bed plate. This parallelism is measured e.g. by means of two shafts, which we place on the top surface of the bedplate and on the machined surface of the gearbox. We check up this parallelism in measuring the value (B).

23. Time setting of the control cam of the thread cutter (Fig. 22)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

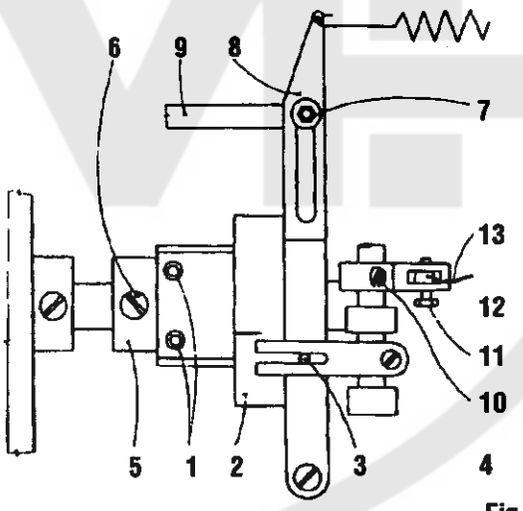


Fig. 22

For a safe and correct thread catching under the throat plate it is necessary to set the correct position of the control cam which is placed on the bottom shaft. From this cam, the movement of the thread wiper derived for catching the upper and bottom thread including its cutting, and the mechanisme of the tensioner. With the machine switched off, tilt the machine head and, using the hand wheel, set the take-up lever into its top position. Loosen two screws (1) of the cam (2) and set the loosened cam in such a way, so that we set the gauge mark on the cam (marked with colour) into the axis of the pin (3) and secure the cam anew by the screws (1). This position is to be taken as a basic setting of the cam and it is necessary to eventually reset it according to the thread or sewn material type. The start of the thread wiper movement is to be set in slight turning of the cam on the bottom shaft. Push the lever (4), in this way the pin (3) is put into the straight course of the groove. In turning the hand wheel in the direction towards the sewer (in counter-clockwise direction) check the start of the movement of the thread wiper from the starting into the rear position.
Check the correct position of the thread wiper as follows:
At the moment when the loop of the upper thread and the bottom thread will leave the knocking-over slide of the hook and form so a characteristic triangle, the point of the thread wiper should be in its close vicinity. When further turning the hand wheel, the point of the thread wiper must pass through the triangle (one branch of the upper thread loop, bottom thread on one side of the thread wiper and the other upper thread loop branch on the other side of the thread wiper). The thread lying on the side of the wiper provided with a cutout, must fit into this cutout.
After having loosened two screws (1) on the cam (2) set the start of the thread wiper movement. In turning the cam in the direction of the bottom shaft rotation the start of the thread wiper is accelerated and, inversely, it is delayed. After having set up the cam, check whether the pin (3), after pushing on the lever (4), fits easily onto the straight part of the cam (2) groove. Push the carrier ring (5) to the cam set up in this way and tighten it up with the screws (6) on the bottom shaft.

24. Setting of the movable cutting knife lifting (Fig. 22)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

After having engaged the pin (3) into the cam (2), turn the hand wheel towards ourselves, until the bottom thread and one branch of the loop enter into the cutout on the side of the cutting knife. When this does not occur, loosen the nut (7) on the tilting lever (8) and shift the draw bar (9) in the groove of the lever (8). To increase the movement, the lever arm is to be lenghtened. Secure the position in tightening up the nut (7).

25. Setting of the upper thread tensioner releasing (Fig. 22)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

The cutting mechanism needs that, within its course, the upper thread is released i.e. that the main thread tensioner is to be released. It is automatically released within the necessary cutting cycle through the cable (13) and the lever system when starting the cutting operation. If there no release thereof occurs, it is necessary to set the tension of the cable (13). This is done when loosening the screw (11) on the lever (12) or in turning slightly the whole lever (12) after having loosened the screw (10).

26. Setting of the adjusting spring function (Fig. 23)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

After having loosened the screw (1) remove the complete upper thread tensioner from the machine arm. The size of the elasticity of the adjusting spring (2) is to be set after having loosened the screw (3) on the sleeve (4) in turning slightly the pin (5) using a screwdriver. In turning the pin to the left, the size of the spring elasticity is being reduced, in turning it to the right, it is increased. In the same way, the lesser or the greater swing of the spring arm is to be set. The correct setting of the adjusting spring is to be checked after having sewn some stitches. Tilt the machine head and check the correct passing of the thread over the hook. The thread passing over the biggest hook diameter should slightly move the adjusting spring without tensioning it.

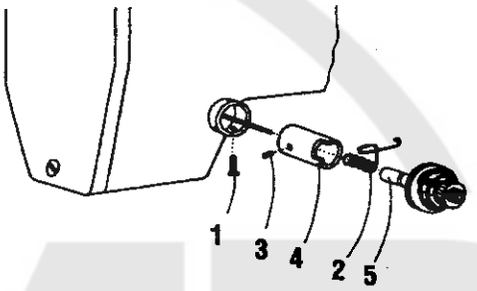


Fig. 23

27. Setting of the starting position of the movable thread cutter (Fig. 24, 25)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

The cutting knife (1) should be set in its starting position in such a way, so that there is between the outer knife edge and the outer edge of the plate (2) the distance of 0,5 - 1 mm (the outer edge of the plate (2) is idential with the outer edge of the bedplate). The plate must be fastened with two screws (3) to the bedplate of the machine in such position, that there is no gap between this plate and the throat plate. The position of the cutting knife is to be set after loosening the lock nuts (5) in turning the connecting draw bar (6). In turning the driving draw bar, its necessary length is to be set for securing the correct position of the thread wiper, then tighten anew the lock nuts (5).

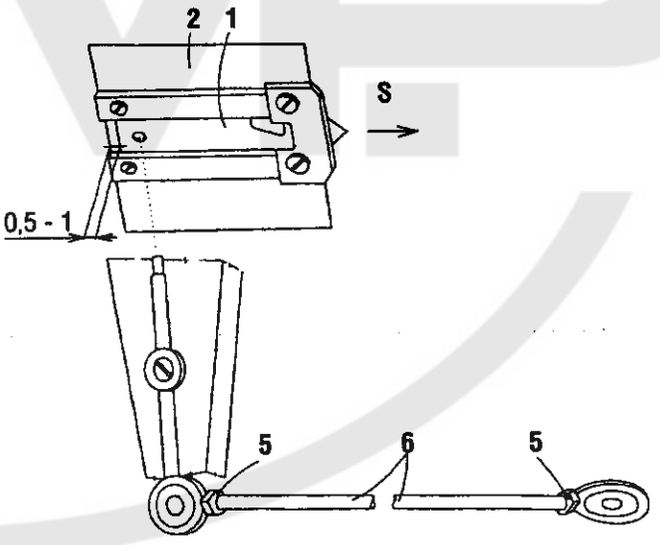


Fig. 24

28. Setting of the stationary knife pressure (Fig. 25)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

For ensuring the correct function of the thread cutting, it is necessary to regulate the pressure of the stationary cutting knife. In screwing the screw (4) in the plate (2), the pressure is increased, in screwing it out, it is reduced. Be careful in having this pressure the least possible when the knife still cuts the thread in a reliable way. In the opposite case there occurs an excessive wear of the stationary and of the movable knife (and that of the thread wiper). When even after having set up no reliable trimming occurs, it is necessary to check up the state of the cutting edge of the stationary knife, to restore this cutting edge or to replace the knife.

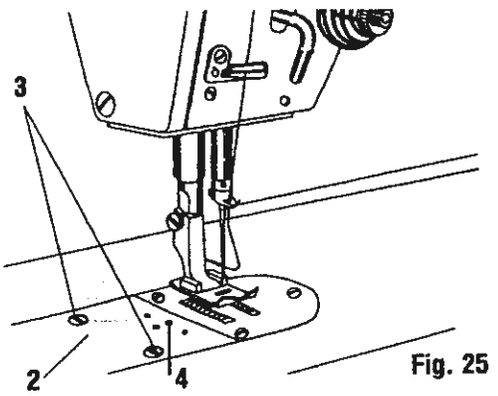


Fig. 25

29. Setting of the stop in the top position of the needle

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

The proper principle of the top position setting is described in detail in the instructions for setting the driving unit. The machine is being delivered from the manufacturing factory after having been tested and after having proceeded to a running-in sewing with the adjusted values, i.e. the machine stops in the top position which varies between 5° - 10° behind the top position of the thread lever.

30. Making an upper thread reserve

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

The reserve of the upper thread may be influenced by several methods:

a) Correct tension of the ausiliary tensioner - the greater is the tension of the auxiliary tensioner, the lesser is the reserve of the upper thread and inversely.
b) Correctly set the top position of the thread lever - in stopping before the top dead centre of the thread lever the reserve of the upper thread is reduced, behind the top dead centre it is increased.

31. Dismounting and mounting of the plate (Fig. 25)

Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

When it is necessary to dismount the plate (2), loosen two screws (3) which secure the firm connection of the plate with the bedplate of the machine, and take out the plate. When remounting it, proceed in the inverse way.

32. Dismounting and mounting of the movable cutting knife (Fig. 24)

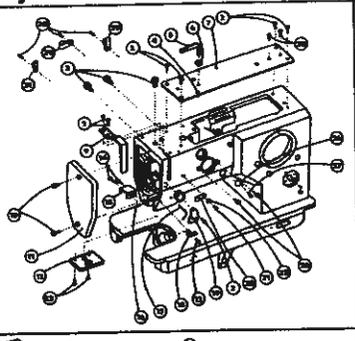
Caution! Danger of injury!
Switch off the main switch! Before starting the setting operation, wait until the motor stops!

Proceed to the dismounting of the plate (2) according to the point 31 and then take out the knife (1) from the guide in the direction of the arrow "S". When remounting it, proceed in the inverse way.

D - Spare parts list - Contents:

Dílce hlavy - Parts of head

tab.1



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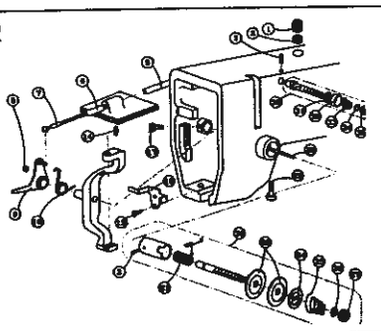

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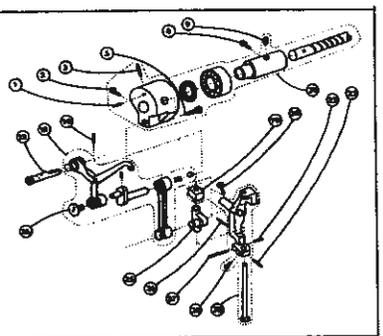

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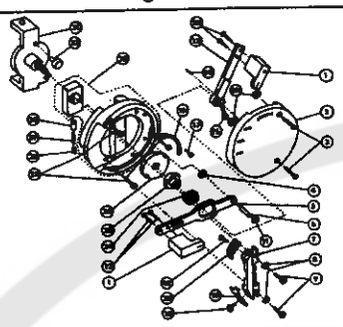

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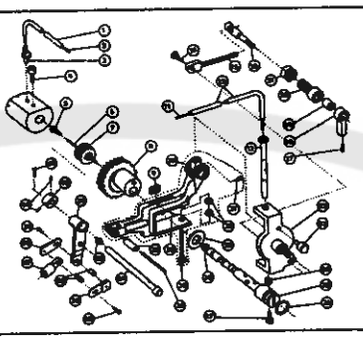

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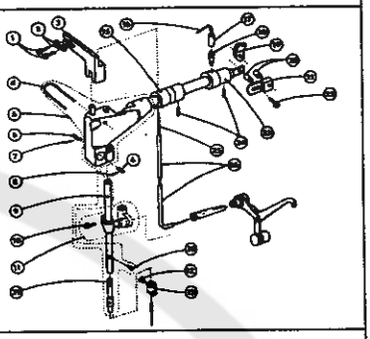

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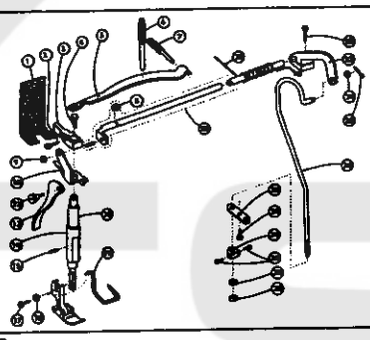

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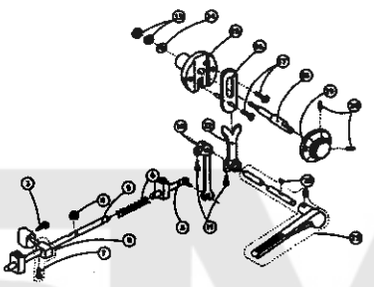

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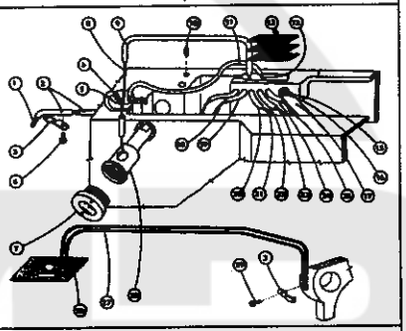

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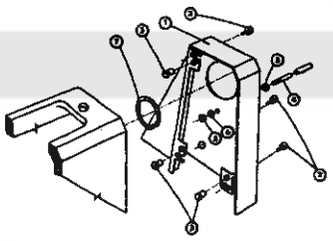

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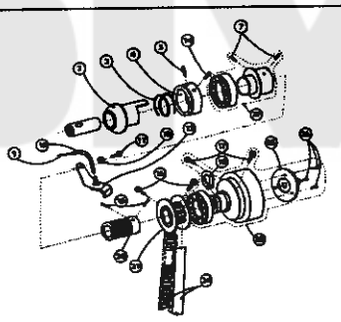

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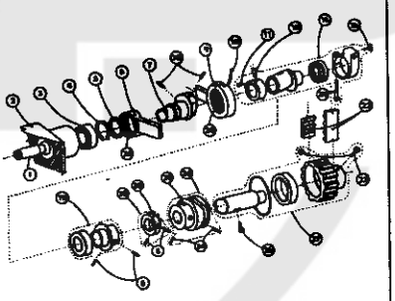

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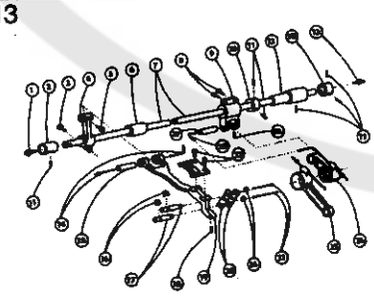

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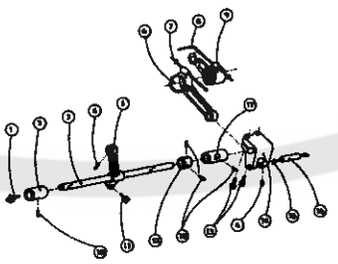

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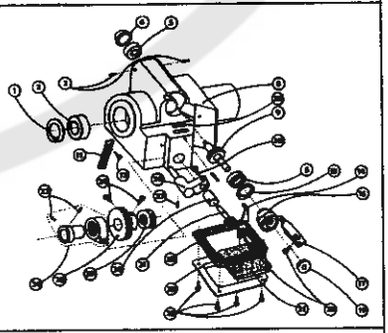

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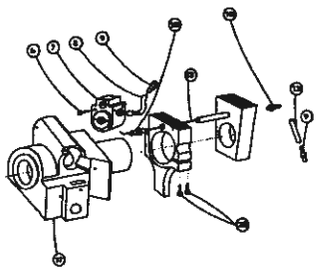

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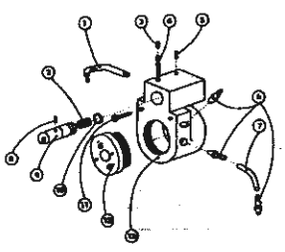

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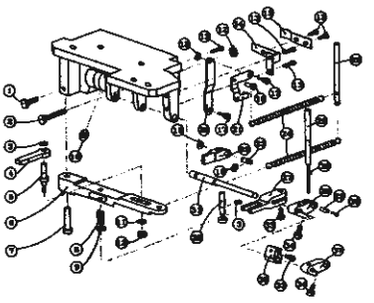

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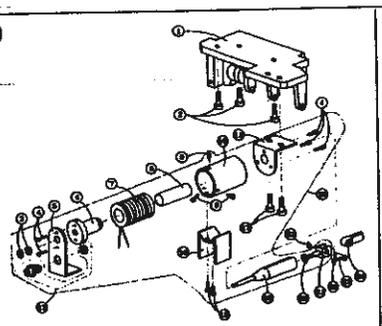

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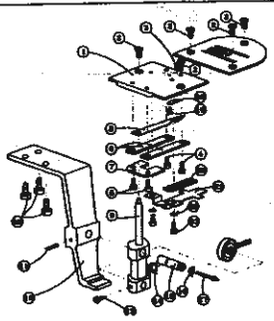

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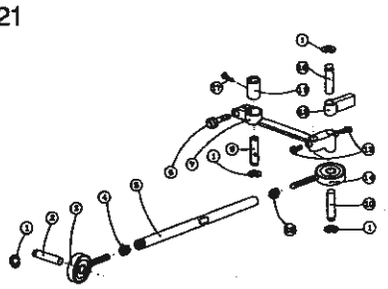

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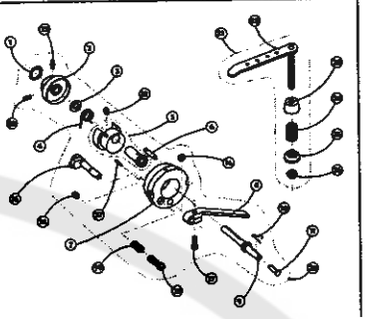
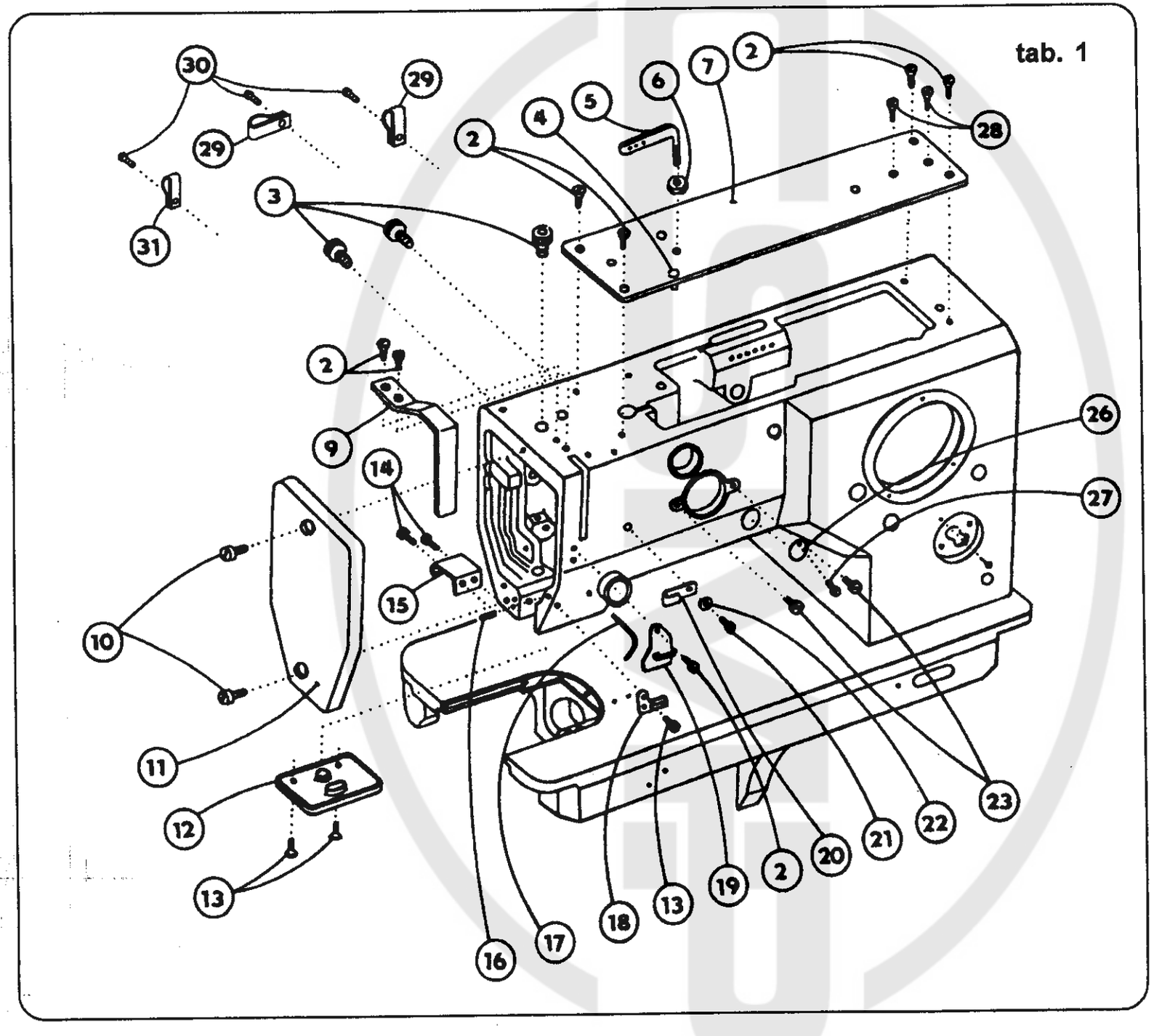
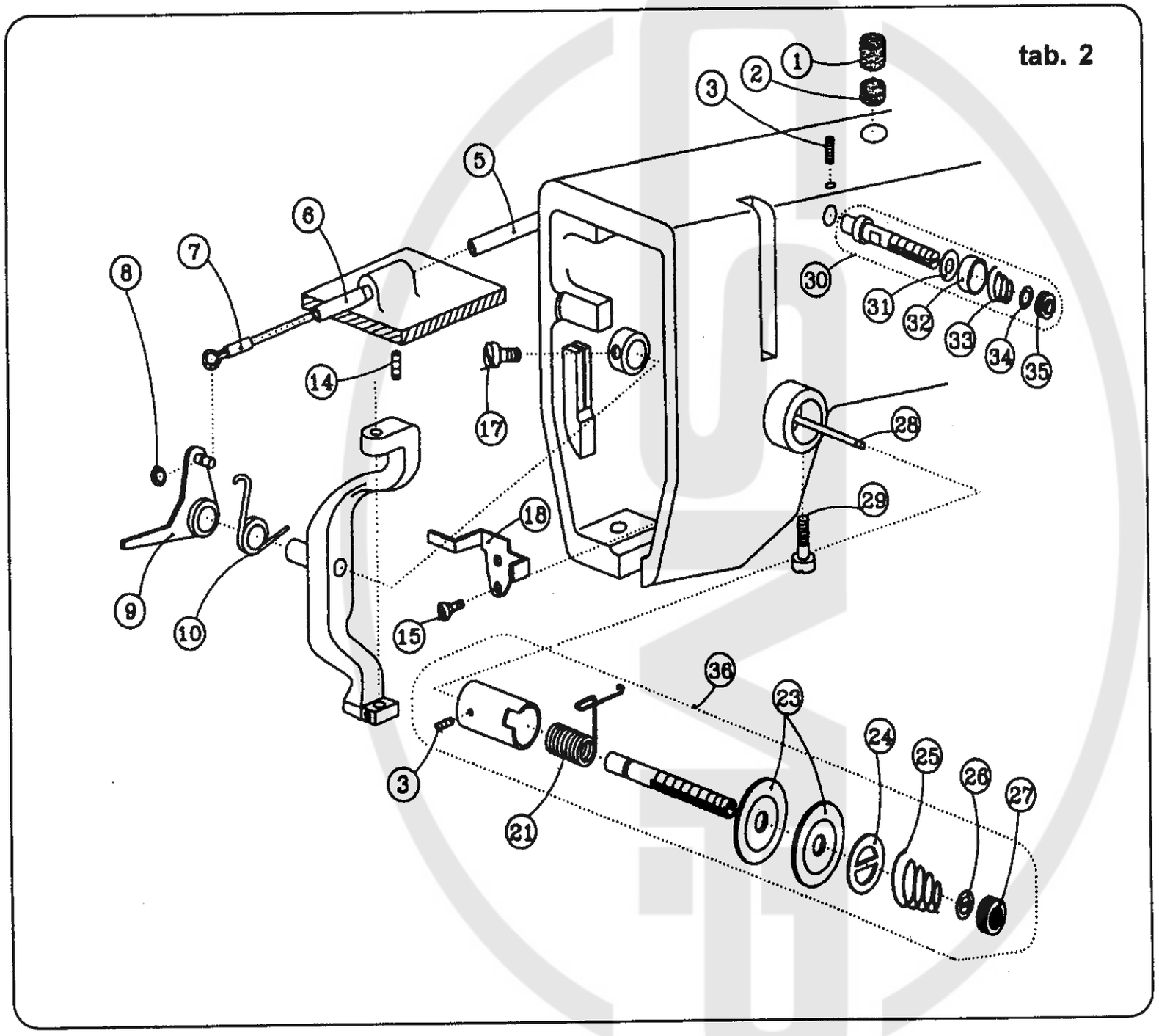


Číslo tabulky Table No.	Objednací číslo Ordered No.		Název objektu Denomination
tab. 23	S980 008250		Chapač Hook
Příbal - Enclosed accessories			
tab. 24	S980 099038	Standard	Zvláštní příslušenství /1 Accessories/1
tab. 25	S980 099038	Standard	Zvláštní příslušenství /2 Accessories/2
tab. 26	S980 099038	Standard	Zvláštní příslušenství /3 Accessories/3
tab. 27	S980 099038	Standard	Zvláštní příslušenství /4 Accessories/4
tab. 28	S980 099038	Standard	Zvláštní příslušenství /5 Accessories/5
tab. 29	S980 092229	Standard	SND Spare parts kit
Nutné vybavení - Necessary equipment			
tab. 30	S980 094051	Standard	Propojovací kabel k pohonu EFKA DC 1600/DA82GA a EFKA VD 552/6F82FA Connecting cable to drive EFKA DC 1600/DA82GA a EFKA VD 552/6F82FA
tab. 31	S791 995068	Standard	Díly pro zpátkování pedálem Parts of backtacking (with pedal)
Šicí vybavení - Sewing equipment			
Tabulka šicích vybavení - Table of sewing equipments			
tab. 32	S791 124033 35		Šicí vybavení Sewing equipment
tab. 32	S791 124034 35	Standard	Šicí vybavení Sewing equipment
tab. 33	S791 124032 35		Šicí vybavení Sewing equipment
tab. 33	S791 124075 35		Šicí vybavení Sewing equipment
Volitelné vybavení - Optional equipment			
tab. 34	S791 149001		Vybavení pro obnitkování okrajů Attachment for serging operation
tab. 35	S791 151016		Otevřená patka Hinged foot with front thread slit
tab. 35	S791 151017		Otevřená patka Hinged foot with front thread slit
tab. 36	S791 995153		Zvedání patky elektromagnetem Presser foot lift via electromagnet
tab. 37 - tab. 38	S791 995154		Zpátkování elektromagnetem Backtacking via electromagnet
tab. 37	S980 094057		Tlačítko pro zpátkování, pro motor EFKA DA82GA Push button for backtacking, for EFKA motor DA82GA
tab. 37	S980 094060		Tlačítko pro zpátkování, pro motor EFKA 6F82FA Push button for backtacking, for EFKA motor 6F82FA
tab. 39	S791 947001		Ustavovací přípravek Adjustment gauges
tab. 40	S741 610518 40		Sada rychleopotřebovatelných náhradních dílů High mortality spare parts kit
tab. 41	S794 222012		Návěsné osvětlení Sewing lamp



524 - 105

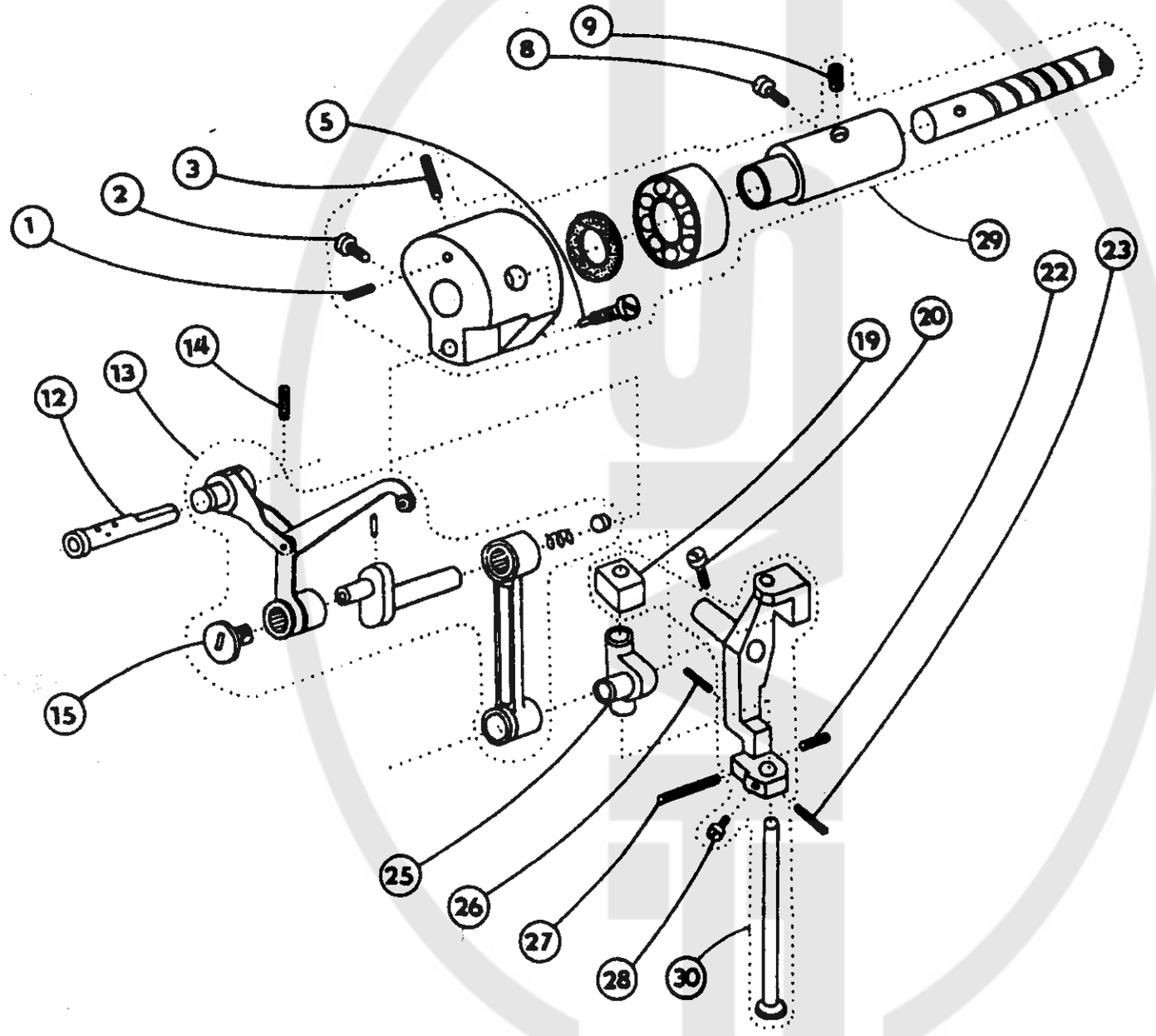
2	S080	123117
3	S321	001000
4	S080	840073
5	S080	313204
6	S080	161138
7	S080	815007
9	S080	831348
10	S080	120248
11	S080	721173
12	S080	827180
13	S080	123122
14	S080	126063
15	S080	823149
16	S080	111227
17	S080	271184
18	S080	821115
19	S080	821077
20	S080	821113
21	S080	120361
22	S080	190368
23	S080	132112
26	S080	831494
27	S080	123166
28	S080	132153
29	9840	120030
30	S080	120331
31	9840	120028



524 - 105

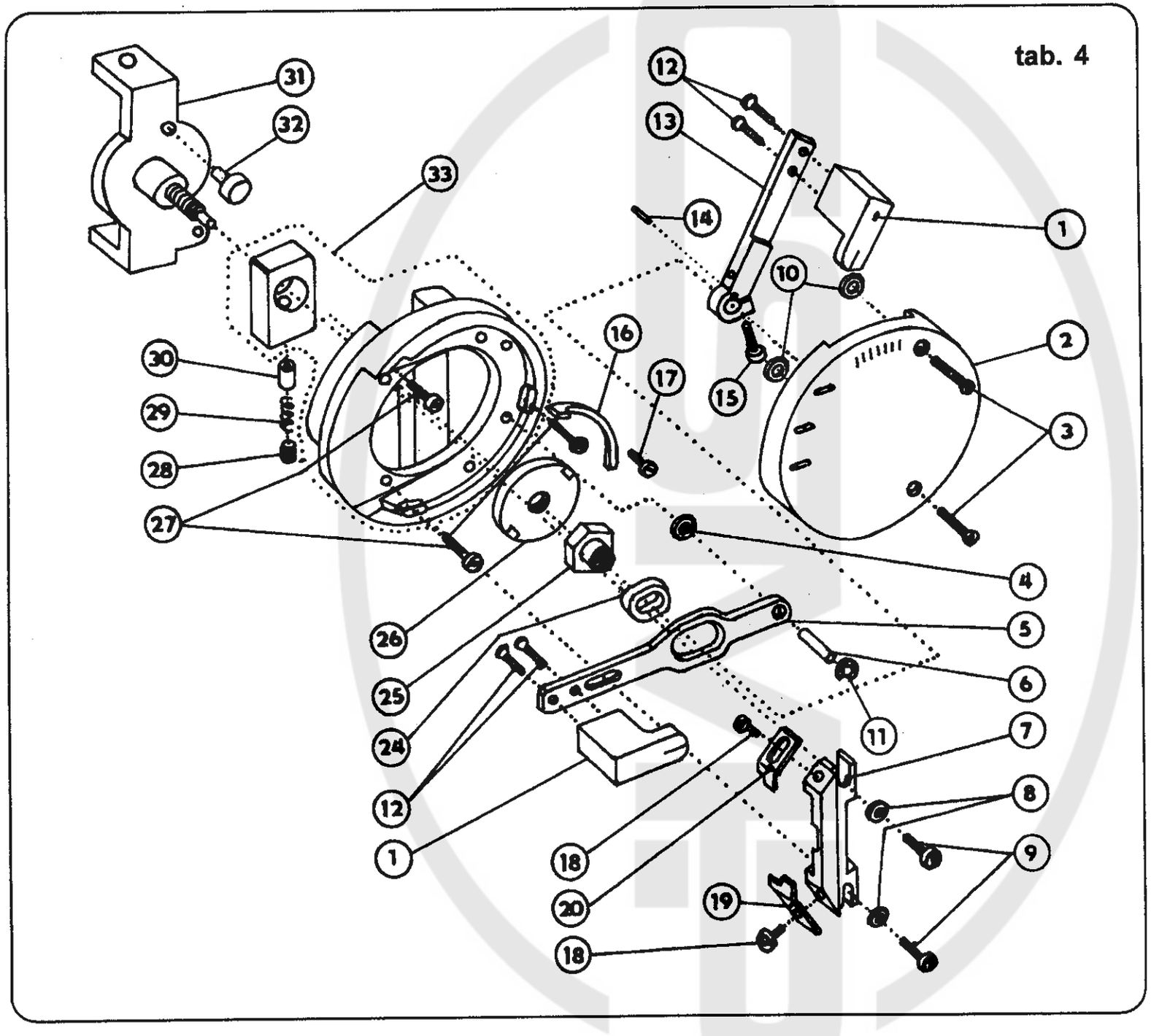
1	S080	945188
2	S080	945100
3	S080	111227
5	S080	278009
6	S080	410511
7	S980	049786
8	S080	274104
9	S980	049806
10	S080	264274
14	S080	111245
15	S080	131027
17	S080	120248
18	S080	822424
21	S315	264294
23	S080	828079
24	S080	828080
25	S080	262073
26	S080	195041
27	S080	171037
28	S080	310428
29	S080	120246
30	S980	025160
31	S080	828051
32	S080	827174
33	S080	262065
34	S081	200025
35	S080	171030
36	S980	025245

tab. 3



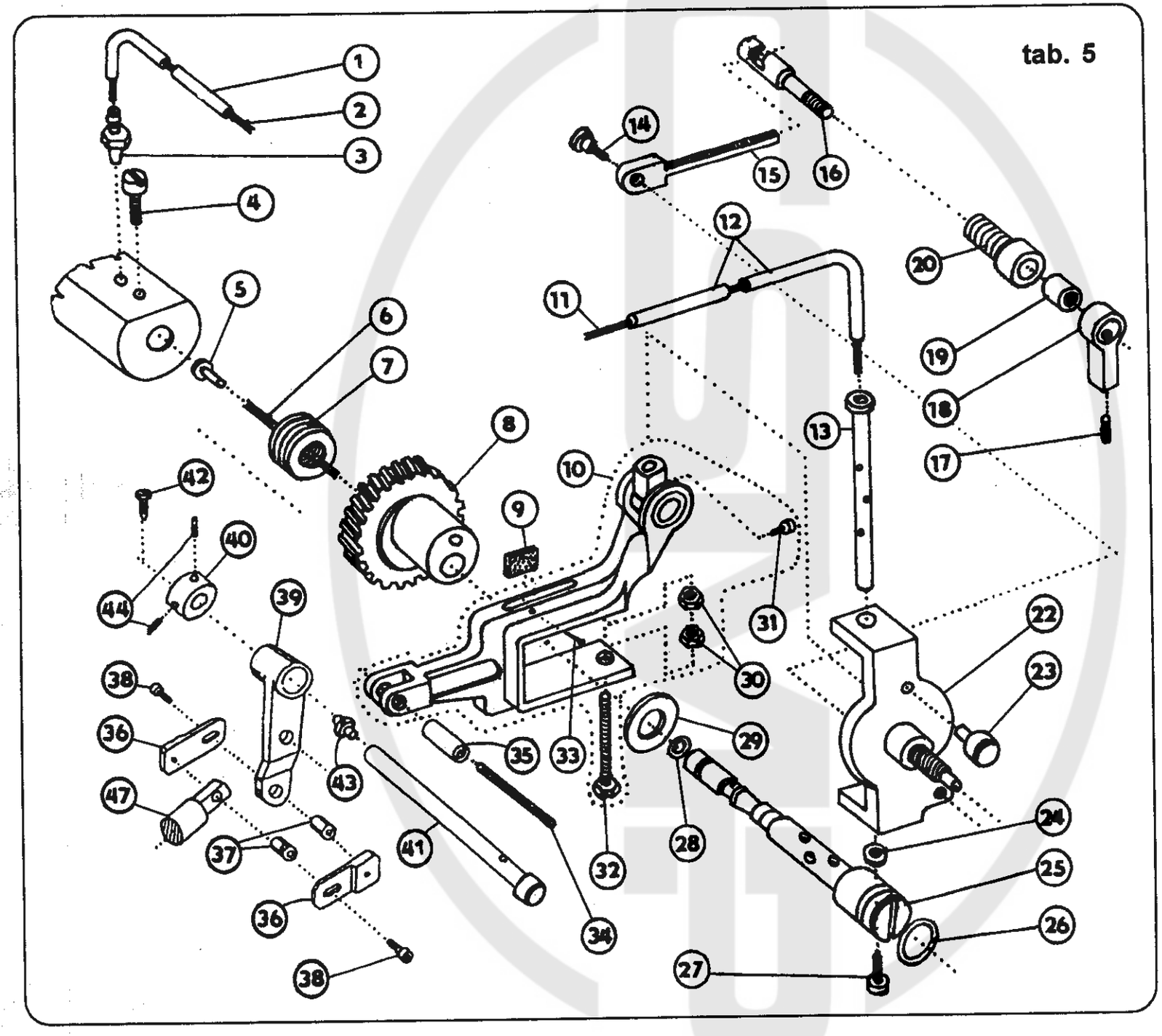
524 - 105

1	S080	111238
2	S080	122008
3	S080	112015
5	S080	138009
8	S080	120006
9	S080	953139
12	S080	328005
13	S980	044727
14	S080	112014
15	S080	120062
19	S080	953159
20	S080	120248
22	S080	111214
23	S080	111295
25	S080	452047
26	S080	111273
27	S080	111126
28	S080	120216
29	S980	043298
30	S980	035318



524 - 105

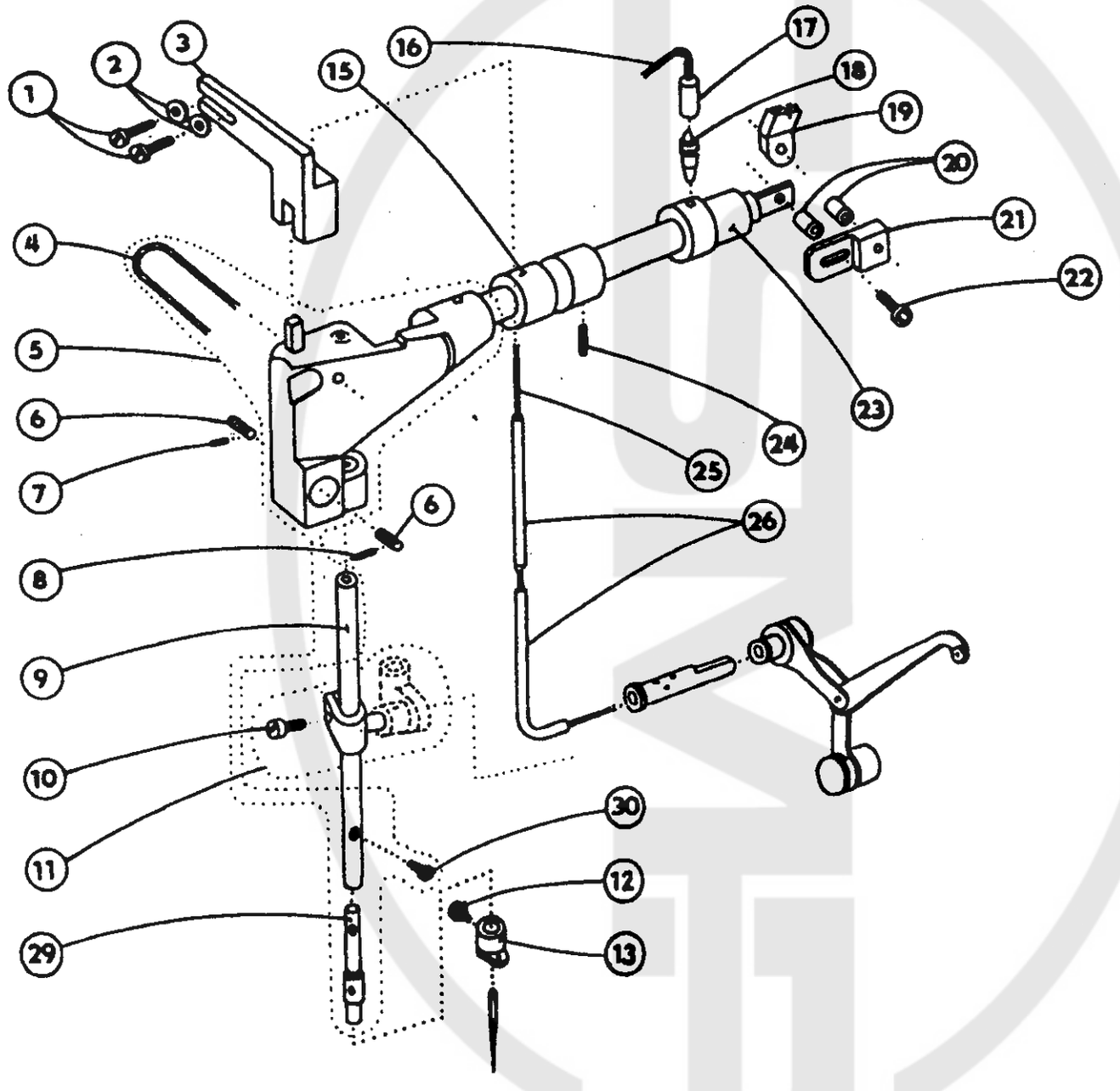
1	S080	952251
2	S080	954046
3	S080	123130
4	S080	192061
5	S080	633194
6	S080	310190
7	S080	647220
8	S080	190353
9	S080	120324
10	S273	959814
11	S311	732040
12	S080	126101
13	S080	613472
14	S311	515006
15	S080	120543
16	S080	839010
17	S080	120218
18	S080	120217
19	S080	825857
20	S080	825858
24	S080	413328
25	S080	161229
26	S080	174066
27	S080	120276
28	S080	111099
29	S080	260139
30	S321	020000
31	S080	646027
32	S080	322247
33	S980	035505



524 - 105

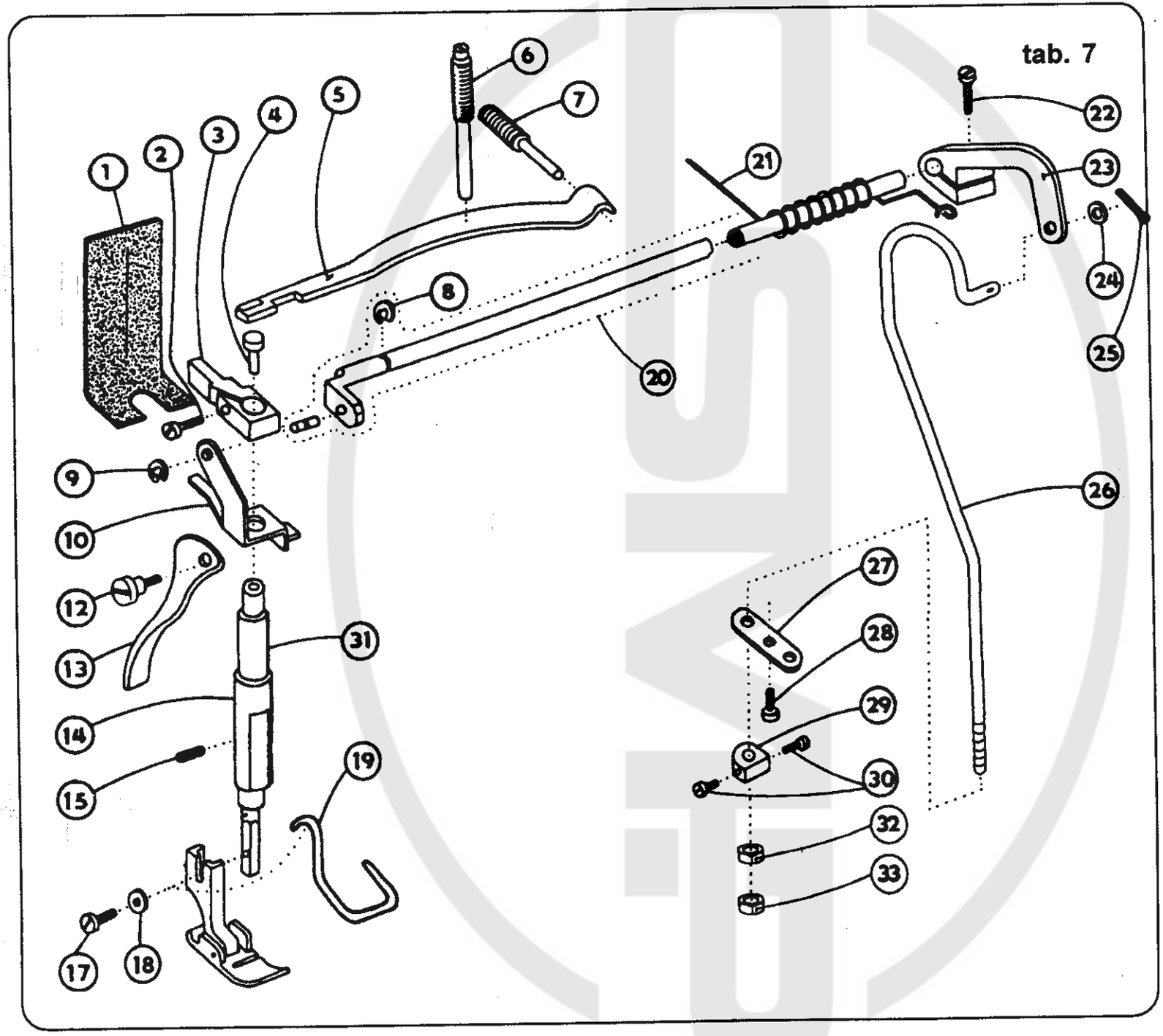
1	S283	002005
	ø 3,5/ø 4,8 x 100 mm	
2	S708	130002
	ø 2 x 140 mm	
3	S080	424051
4	S080	120233
5	S080	951327
6	S708	002105
7	S324	010000
8	S980	035376
9	S080	945326
10	S980	024263
11	S708	130002
	ø 2 x 270 mm	
12	S283	002005
	ø 3,5/ø 4,8 x 210 mm	
13	S080	335101
14	S080	131391
15	S080	152099
16	S080	334097
17	S080	112101
18	S080	612342
19	S080	163093
20	S080	422184
22	S080	646027
23	S080	322247
24	S080	190359
25	S080	335105
26	S273	007000
27	S080	120221
28	S273	001001
29	S080	190526
30	S080	161233
31	S080	120291
32	S080	141223
33	S738	002000
34	S708	130002
	ø 2 x 150 mm	
35	S080	318210
36	S080	648132
37	S080	410595
38	S080	120589
39	S080	613519
40	S080	436000
41	S080	320289
42	S080	132203
43	S425	041000
44	S080	112013
47	S980	021353

tab. 6



524 - 105

1	S080	120276
2	S080	190353
3	S080	646104
4	S708	002105
	ø 1,5 x 80 mm	
5	S980	021338
6	S080	113115
7	S080	111229
8	S080	111248
9	S080	391155
10	S080	124050
11	S980	035499
12	S080	135029
13	S080	627170
15	S080	413311
16	S708	002105
	ø 1,5x 250 mm	
17	S283	002005
	ø 3,5/ø 4,8 x 190 mm	
18	S080	424051
19	S080	613519
20	S080	410595
21	S080	648132
22	S080	120589
23	S080	421341
24	S080	111222
25	S708	002105
	ø 1,5 x 150 mm	
26	S283	002005
	ø 3,5/ø 4,8 x 70 mm	
29	S080	394167
30	S080	136082



524 - 105

1	S080	945317
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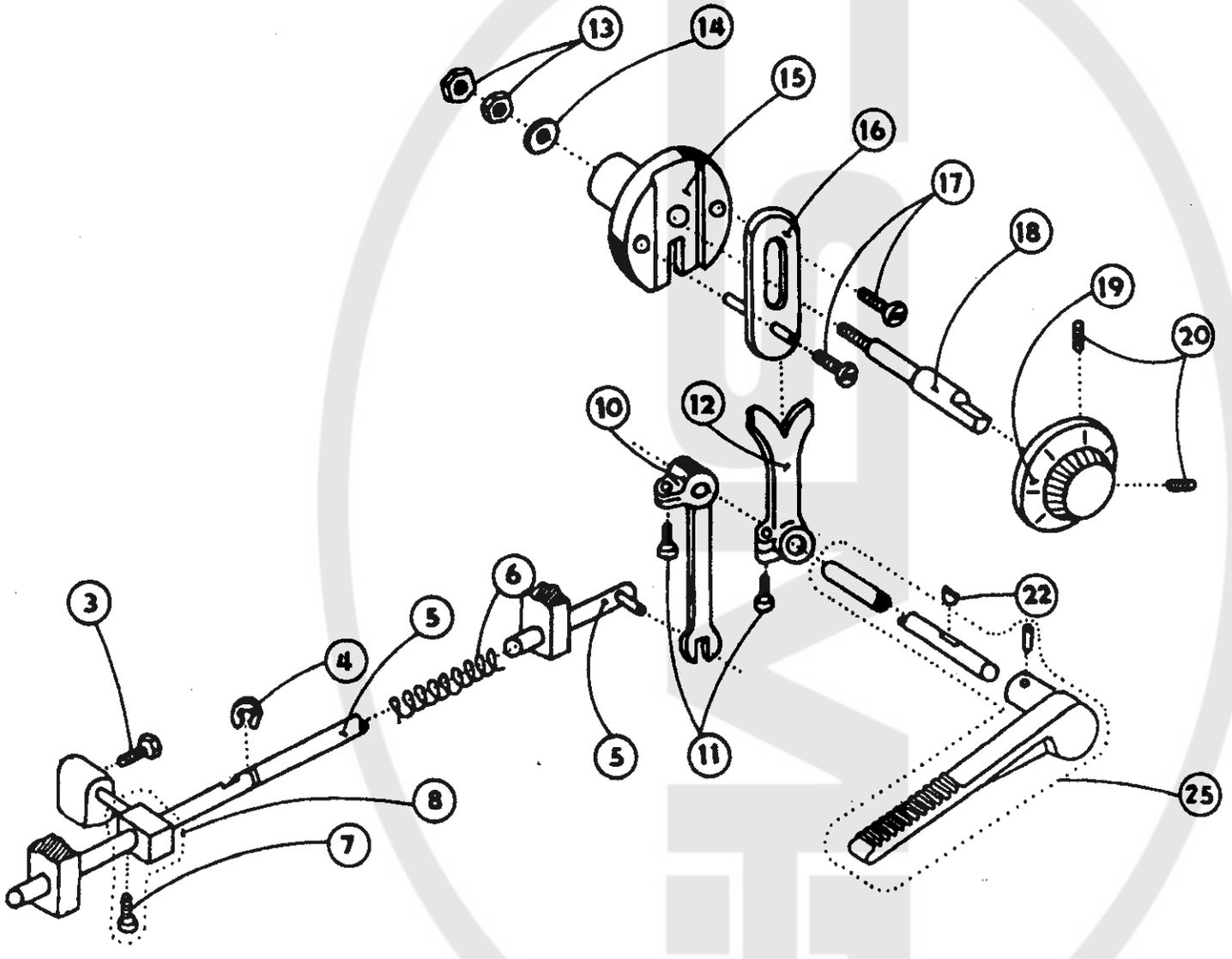
3	S080	623249
4	S080	326213
5	S080	283152
6	S080	113122
7	S080	113123
8	S311	732060
9	S311	732040
10	S080	839215
12	S080	136023
13	S080	615021
14	S080	421330
15	S080	112014
17	S080	120239
18	S080	190554
19	S080	271393
20	S980	060209
21	S080	264288
22	S080	120221
23	S080	633196
24	S080	190346
25	S080	271337
26	S080	382101
27	S080	814014
28	S080	120217
29	S080	436331
30	S080	120050
31	S080	392105
32	S080	161139
33	S080	161333

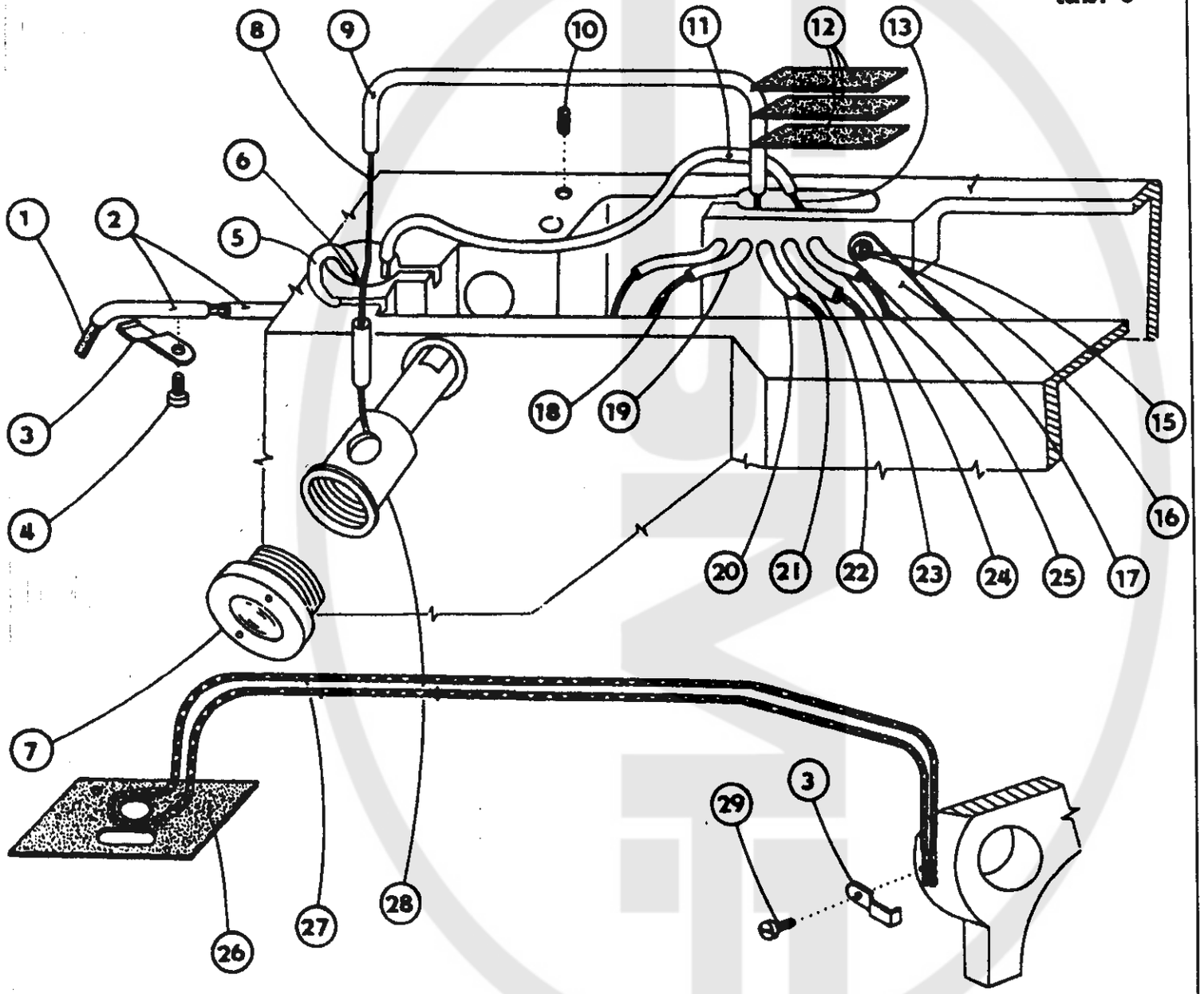
tab. 8



524 - 105

3	S080	141102
4	S311	732070
5	S980	043301
6	S080	260547
7	S080	120227
8	S980	022126
10	S080	613373
11	S080	120221
12	S080	613328
13	S080	161142
14	S080	192061
15	S080	441187
16	S980	049785
17	S080	120246
18	S080	342258
19	S980	233031
20	S080	112013
22	S311	728537
25	S980	044714

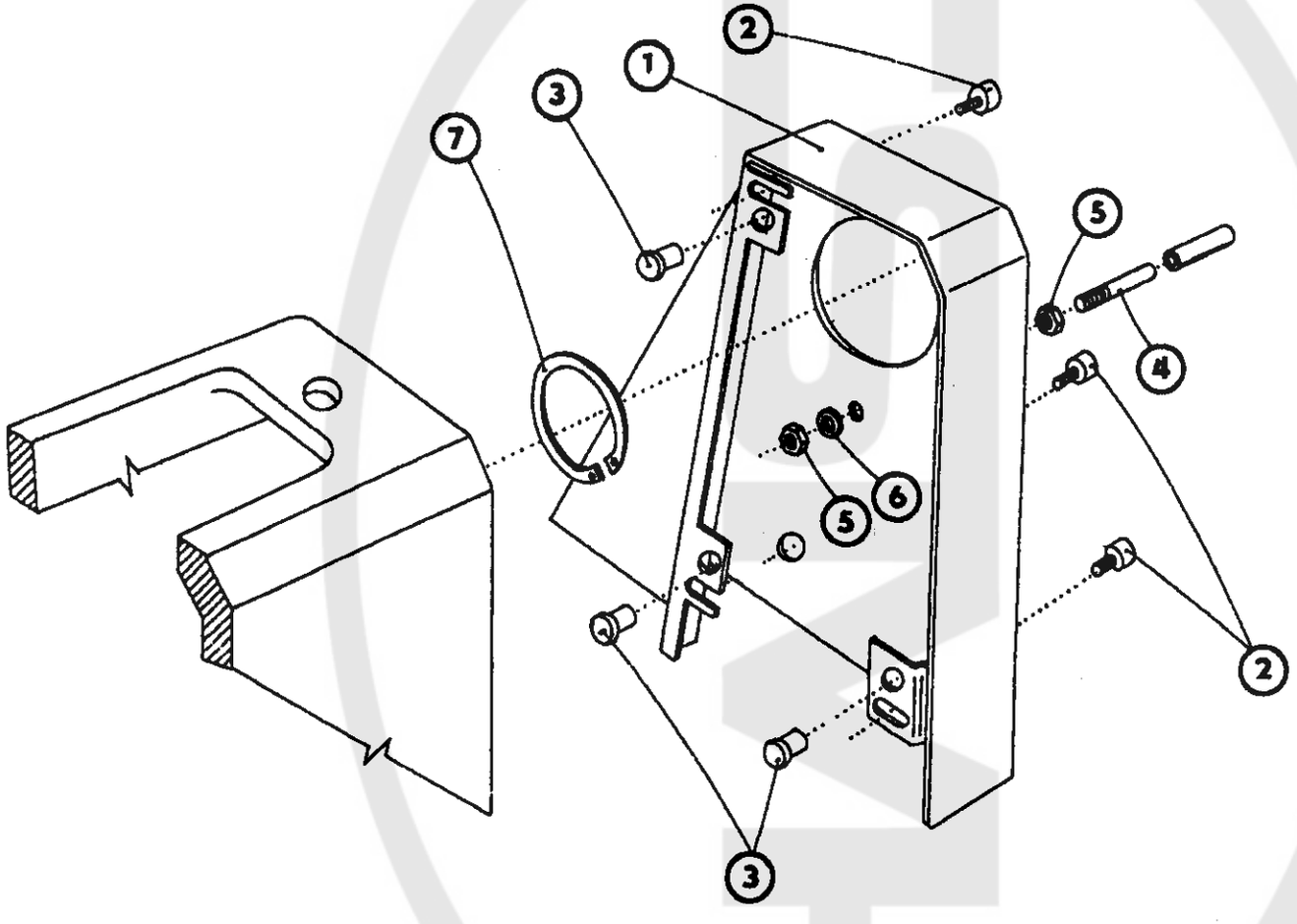
tab. 9



524 - 105

1	S080	945180
2	S283	002001
	ø 3,5/ø 4,8 x 65 mm	
3	S080	824095
4	S080	120245
5	S283	002001
	ø 3,5/ø 4,8 x 80 mm	
6	S708	130002
	ø 2 x 140 mm	
7	S321	001000
8	S708	002105
	ø 1,5 x 380 mm	
9	S283	002005
	ø 3,5/ø 4,8 x 150 mm	
10	S080	111245
11	S283	002005
	ø 3,5/ø 4,8 x 150 mm	
12	S080	945316
13	S708	002105
	ø 1,5 x 380 mm	
15	S080	120259
16	S080	190359
17	S980	041176
18	S708	130002
	ø 2 x 320 mm	
19	S283	002005
	ø 3,5/ø 4,8 x 250 mm	
20	S283	002005
	ø 3,5/ø 4,8 x 210 mm	
21	S708	130002
	ø 2 x 270 mm	
22	S283	002005
	ø 3,5/ø 4,8 x 90 mm	
23	S708	130002
	ø 2 x 130 mm	
24	S283	002005
	ø 3,5/ø 4,8 x 100 mm	
25	S708	130002
	ø 2 x 140 mm	
26	S080	945286
27	S708	130004
	ø 4 x 1120 mm	
28	S080	441313
29	S080	120216

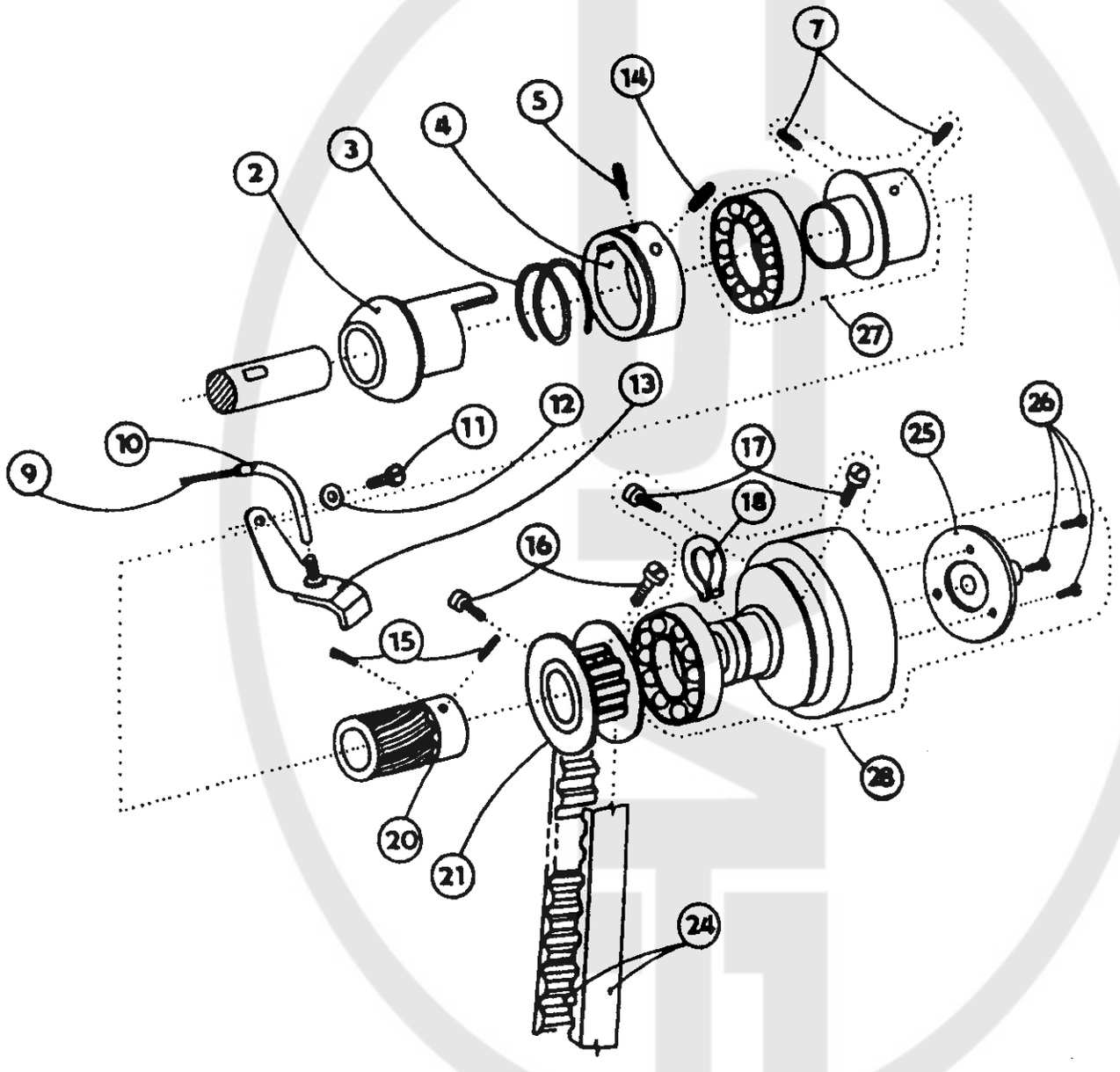
tab. 10



524 - 105

1	S980	041162
2	S080	120346
3	S273	005001
4	S080	316096
5	S080	161151
6	S080	191112
7	S311	733620

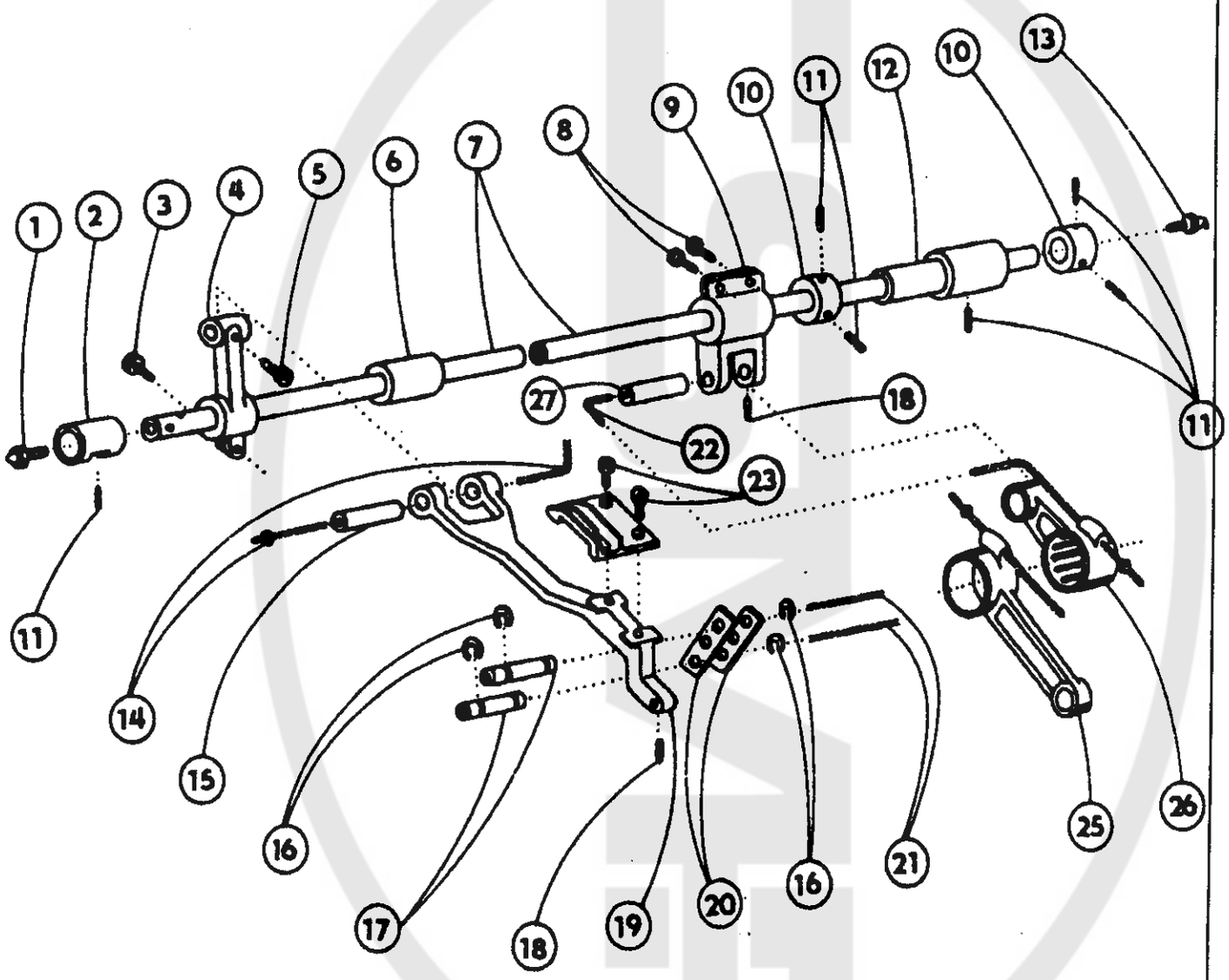
tab. 11



524 - 105

2	S080	441541
3	S080	260467
4	S080	436338
5	S080	113115
7	S080	111225
9	S708	130002 ø 2 x 130 mm
10	S283	002001 ø 3,5/ø 4,8 x 90 mm
11	S080	120259
12	S080	190359
13	S980	041176
14	S080	112013
15	S080	111343
16	S080	122029
17	S080	120006
18	S311	733300
20	S980	045330
21	S980	045315
24	S272	011015
25	S080	442548
26	S080	120252
27	S980	035849
28	S980	045301

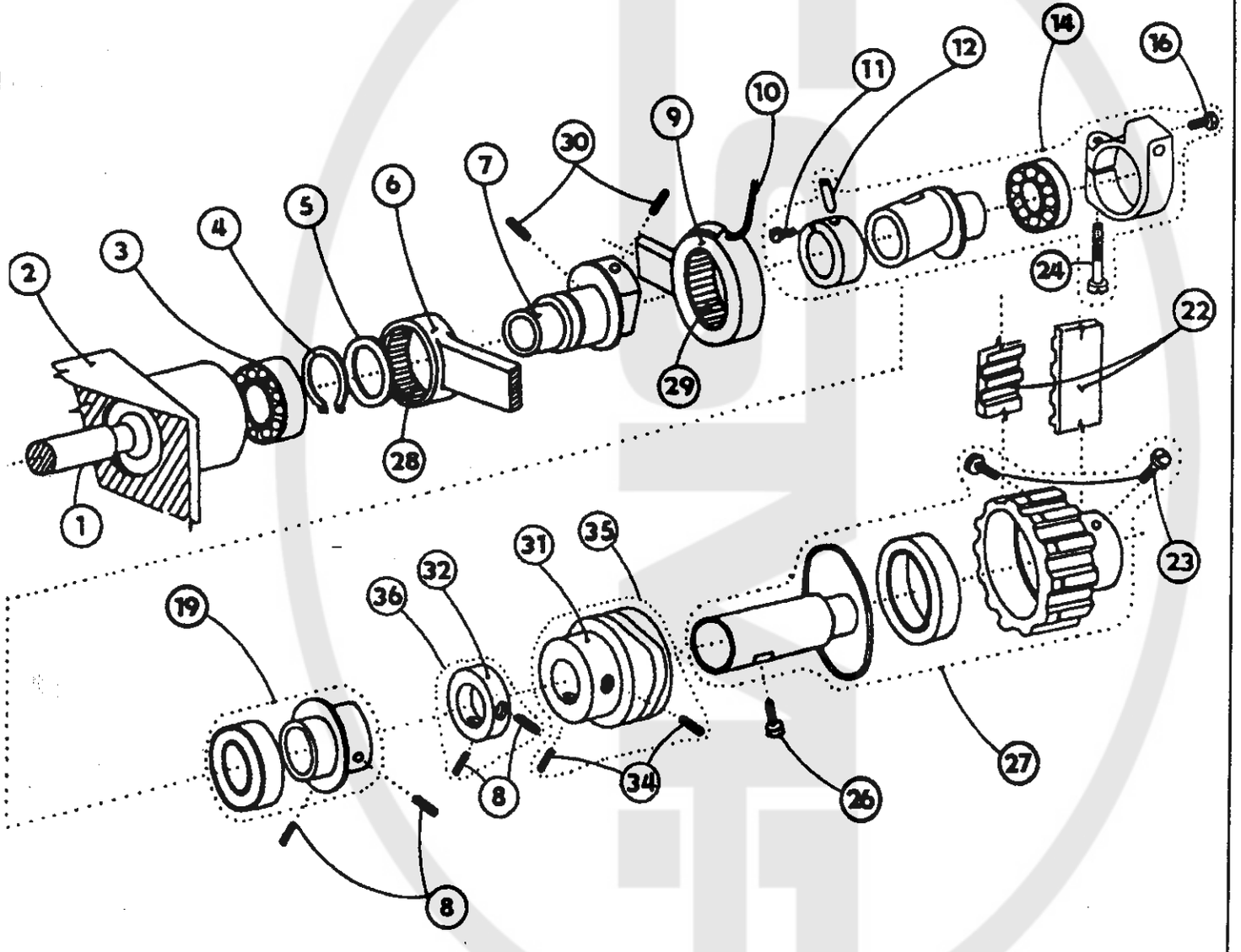
tab. 12



524 - 105

1	S425	041000
2	S080	413252
3	S080	141133
4	S080	613495
5	S080	124050
6	S080	410532
7	S080	345067
8	S080	120229
9	S080	613216
10	S080	436000
11	S080	112013
12	S080	412193
13	S425	061000
14	S708	002105
	ø 1,5 x 160 mm	
15	S080	338069
16	S311	732050
17	S080	318144
18	S080	111227
19	S080	622092
20	S080	612109
21	S708	002105
	ø 1,5 x 60 mm	
22	S708	002105
	ø 1,5 x 350 mm	
23	S080	121157
25	S080	630248
26	S980	044045
27	S080	344035

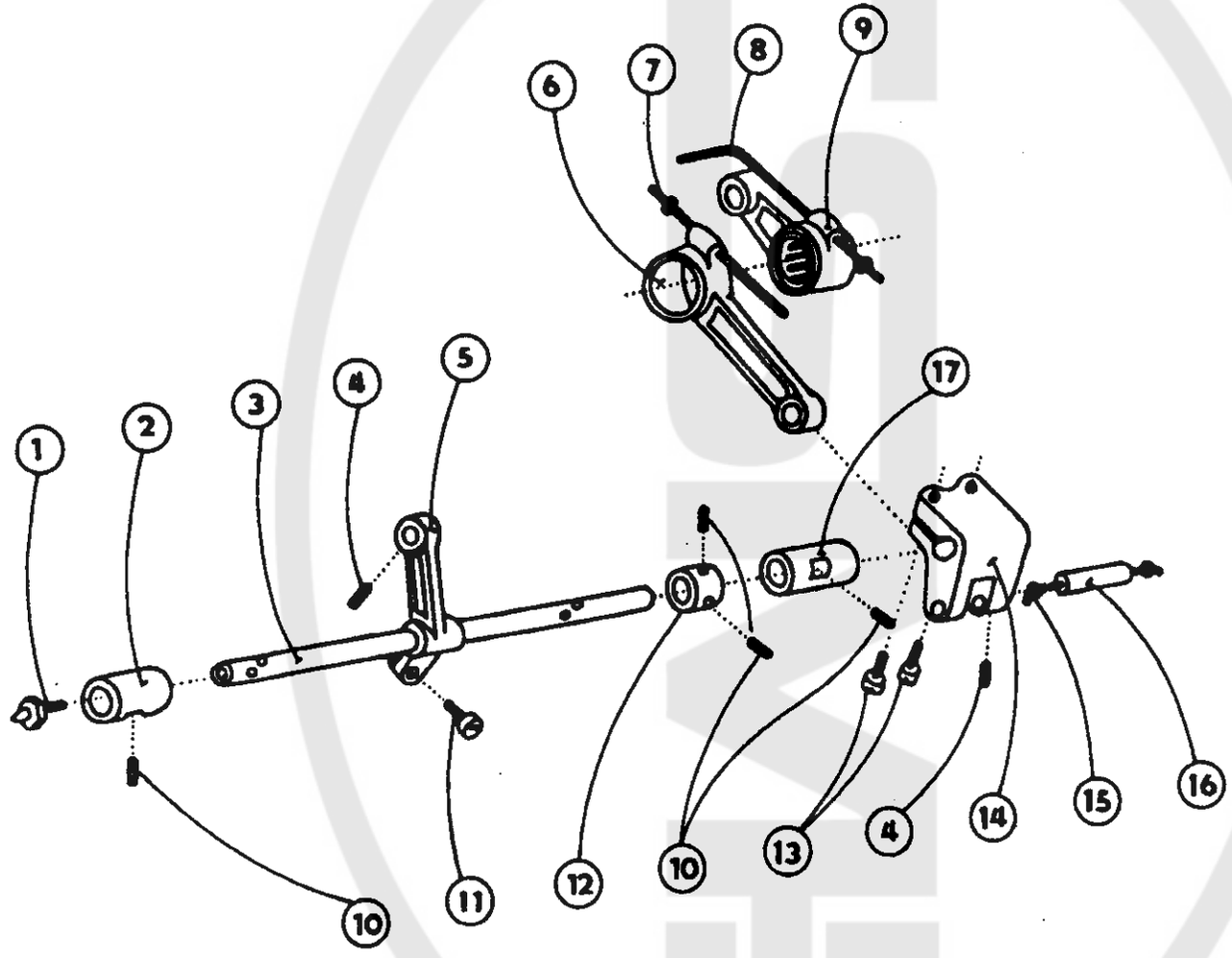
tab. 13



524 - 105

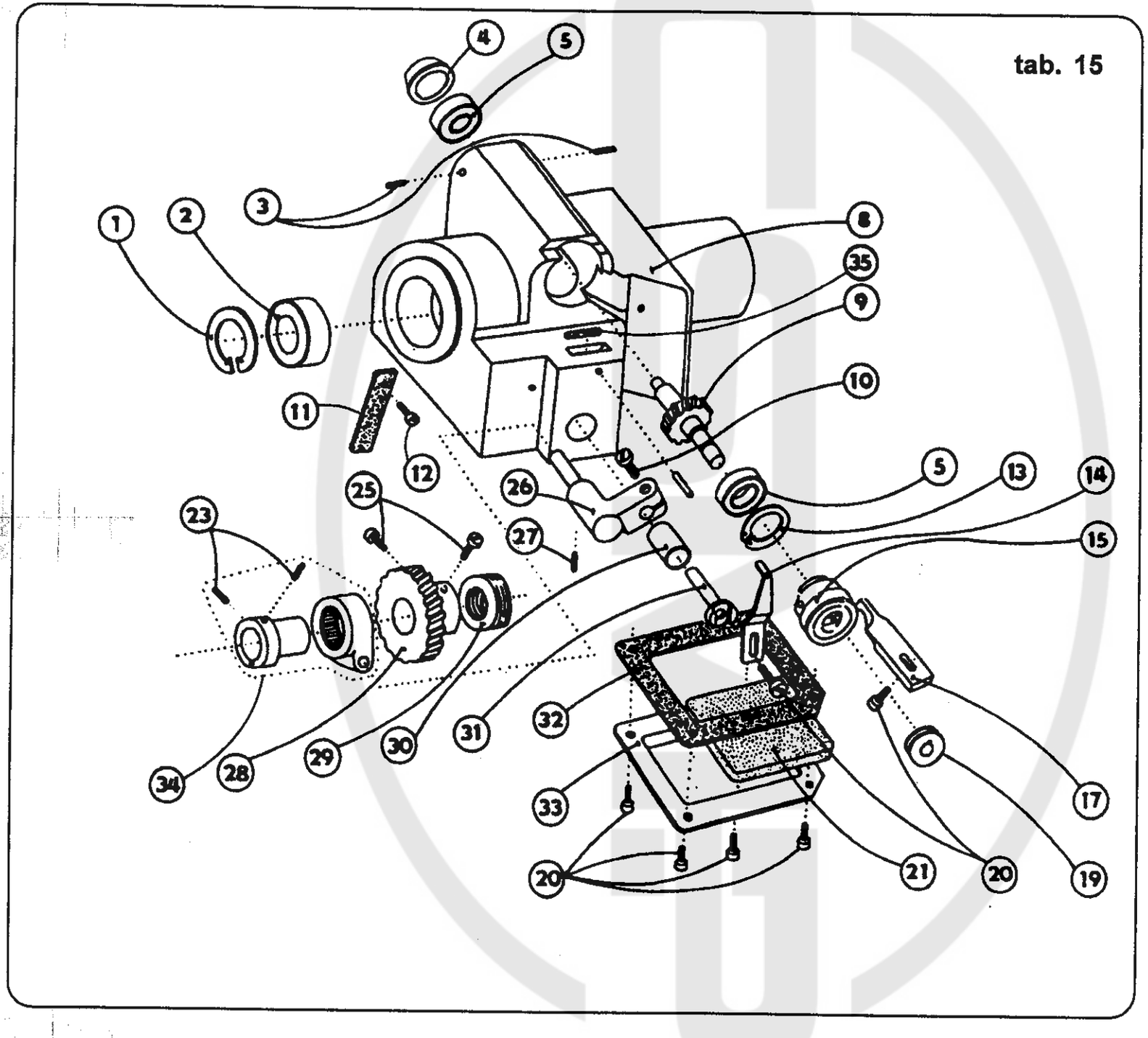
1	S080	342243
2	S080	724134
3	S324	020093
4	S311	733180
5	S080	814338
6	S080	630248
7	S080	671152
8	S080	112013
9	S980	044045
10	S708	002105
	ø 1,5 x 350 mm	
11	S080	141088
12	S080	318103
14	S980	035422
16	S080	141102
19	S980	035420
22	S272	011015
23	S080	122029
24	S080	120222
26	S080	122031
27	S980	045231
28	S324	510900
29	S324	512900
30	S080	111343
31	S080	672166
32	S080	436346
34	S080	120468
35	S980	035570
36	S980	035441

tab. 14



524 - 105

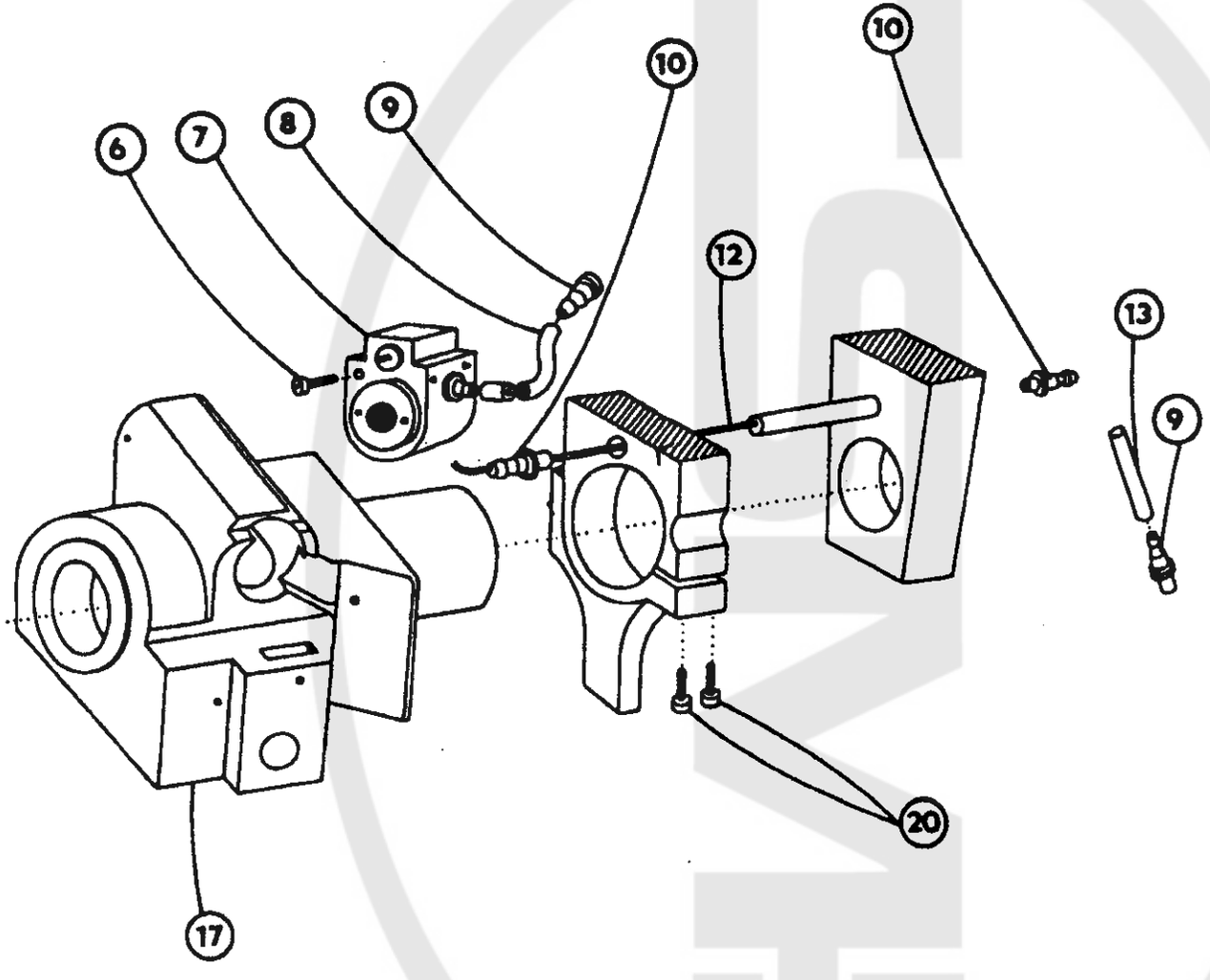
1	S425	041000
2	S080	413251
3	S080	345065
4	S080	111227
5	S080	613195
6	S080	630248
7	S708	002105
	ø 1,5 x 220 mm	
8	S708	002105
	ø 1,5 x 350 mm	
9	S980	044045
10	S080	112013
11	S080	120229
12	S080	436000
13	S080	120231
14	S080	613152
15	S708	130002
	ø 2 x 60 mm	
16	S080	344035
17	S080	410538



524 - 105

1	S311	733261
2	S324	920796
3	S080	111219
4	S080	441287
5	S324	910093
8	S080	724134
9	S080	552168
10	S080	120226
11	S080	945283
12	S080	120601
13	S311	733221
14	S080	825740
15	S980	008250
17	S080	825744
19	S080	685051
20	S080	120246
21	S080	945285
23	S080	111343
25	S080	122007
26	S080	613466
27	S080	111094
28	S080	552167
29	S324	010000
30	S080	410530
31	S080	323155
32	S080	990134
33	S080	827179
34	S980	035406
35	S708	130002
	ø 2 x 40 mm	

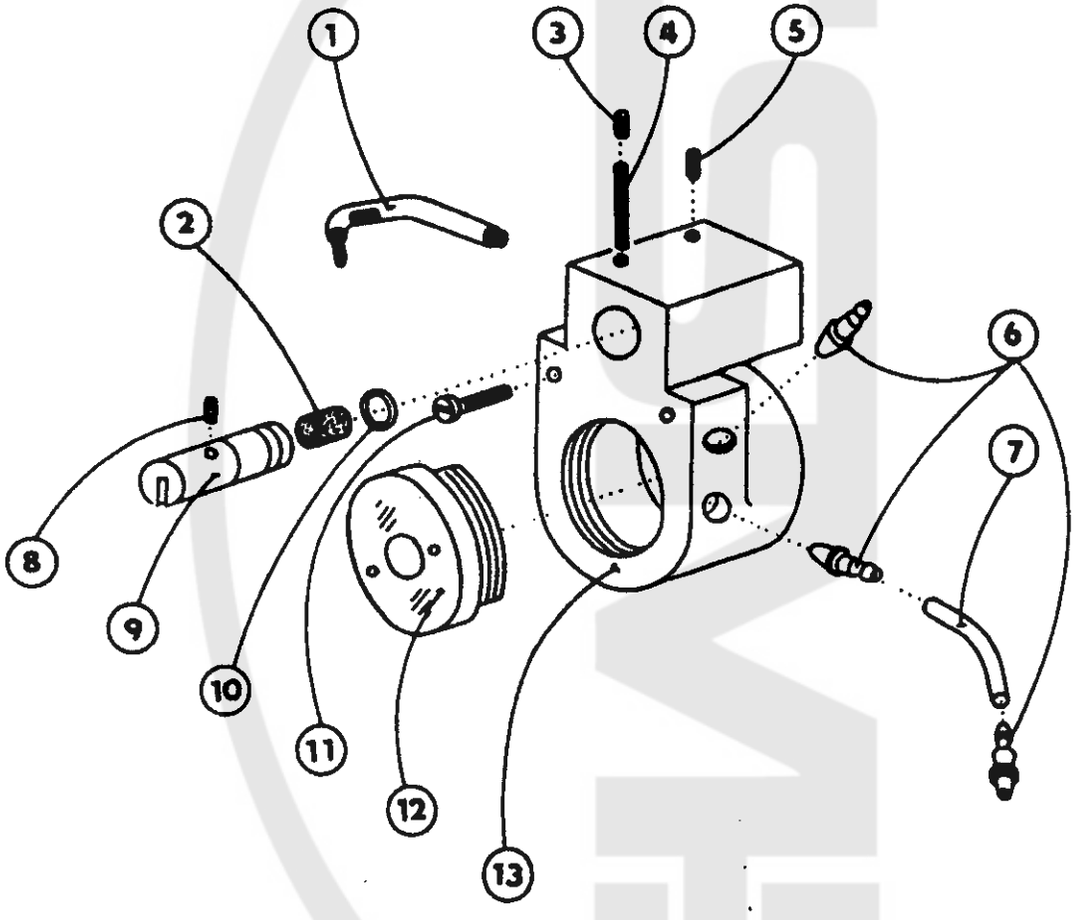
tab. 16



524 - 105

6	S080	120269
7	S980	035527
8	S283	002001
	ø 3,5/ø 4,8 x 100 mm	
9	S080	424051
10	S080	424060
12	S708	130005
	ø 5 x 300 mm	
13	S283	002005
	ø 3,5/ø 4,8 x 170 mm	
17	S080	724134
20	S080	120425

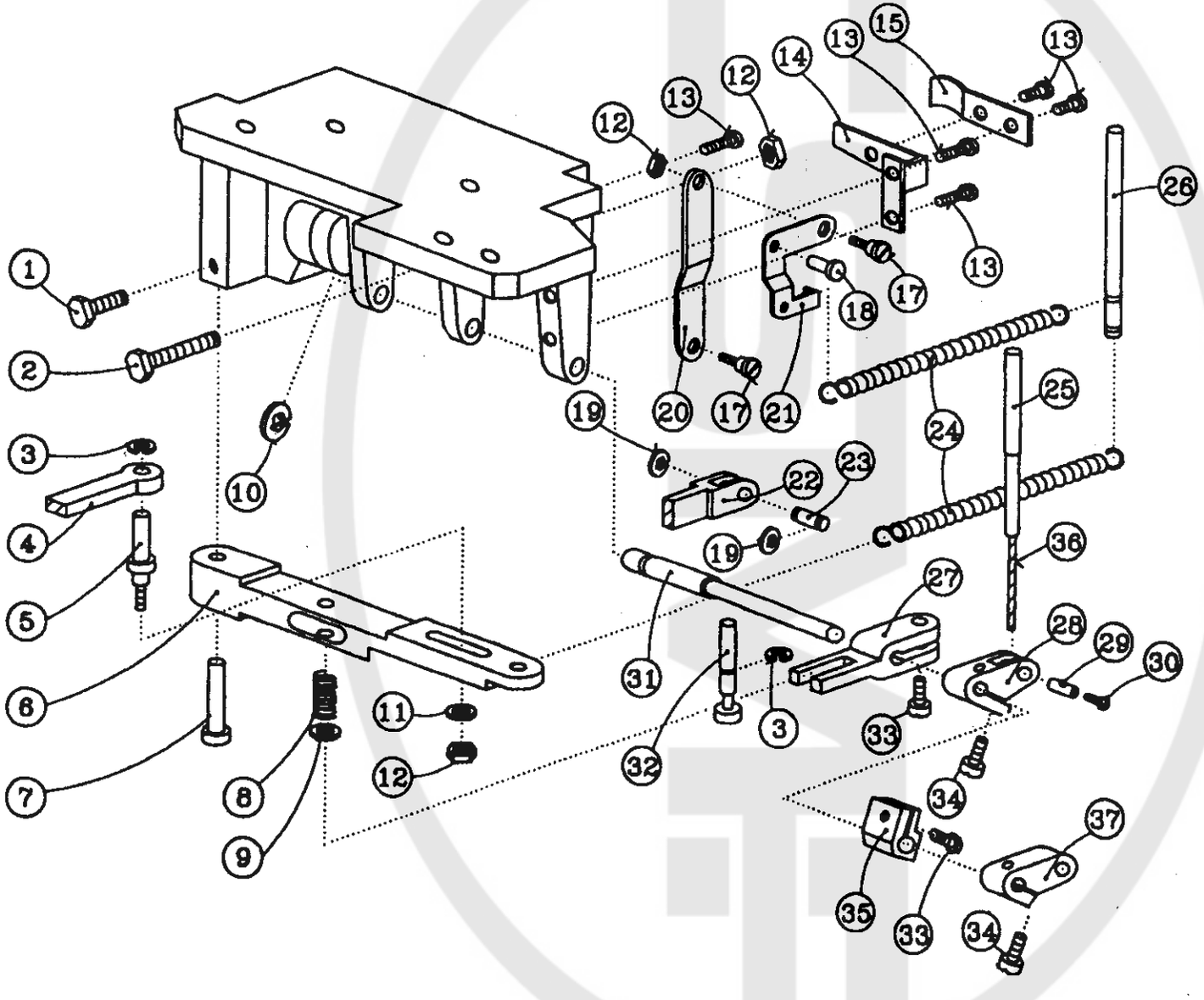
tab. 17



524 - 105

1	S980	035526
2	S080	945077
3	S080	111252
4	S080	945185
5	S080	111233
6	S080	424051
7	S283	002005
	ø 3,5/ø 4,8 x 100 mm	
8	S080	945170
9	S080	346053
10	S273	001001
11	S080	120269
12	S321	001002
13	S080	725023

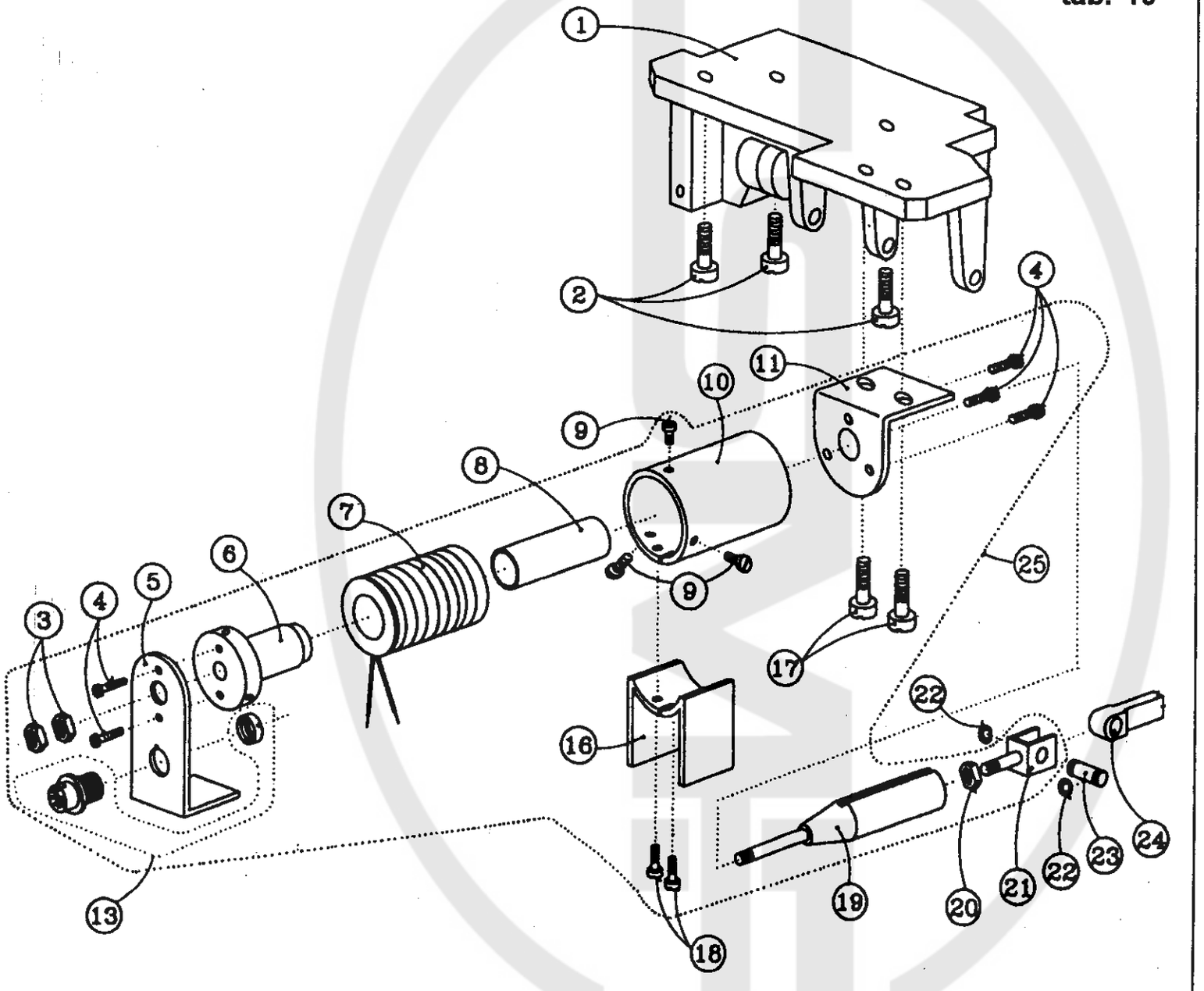
tab. 18



524 - 105

1	S080	141142
2	S080	141204
3	S311	732040
4	S080	632147
5	S080	333121
6	S080	646145
7	S080	320257
8	S080	260434
9	S080	190359
10	S311	732050
11	S080	190353
12	S080	161144
13	S080	120218
14	S080	825856
15	S080	825586
17	S080	131378
18	S080	320258
19	S080	274104
20	S080	822446
21	S080	822409
22	S080	630272
23	S080	314167
24	S080	263103
25	S080	278009
26	S080	310364
27	S080	625132
28	S080	613482
29	S080	334090
30	S080	120246
31	S080	341202
32	S080	322231
33	S080	120220
34	S080	120221
35	S080	627142
36	S080	049786
37	S080	613420

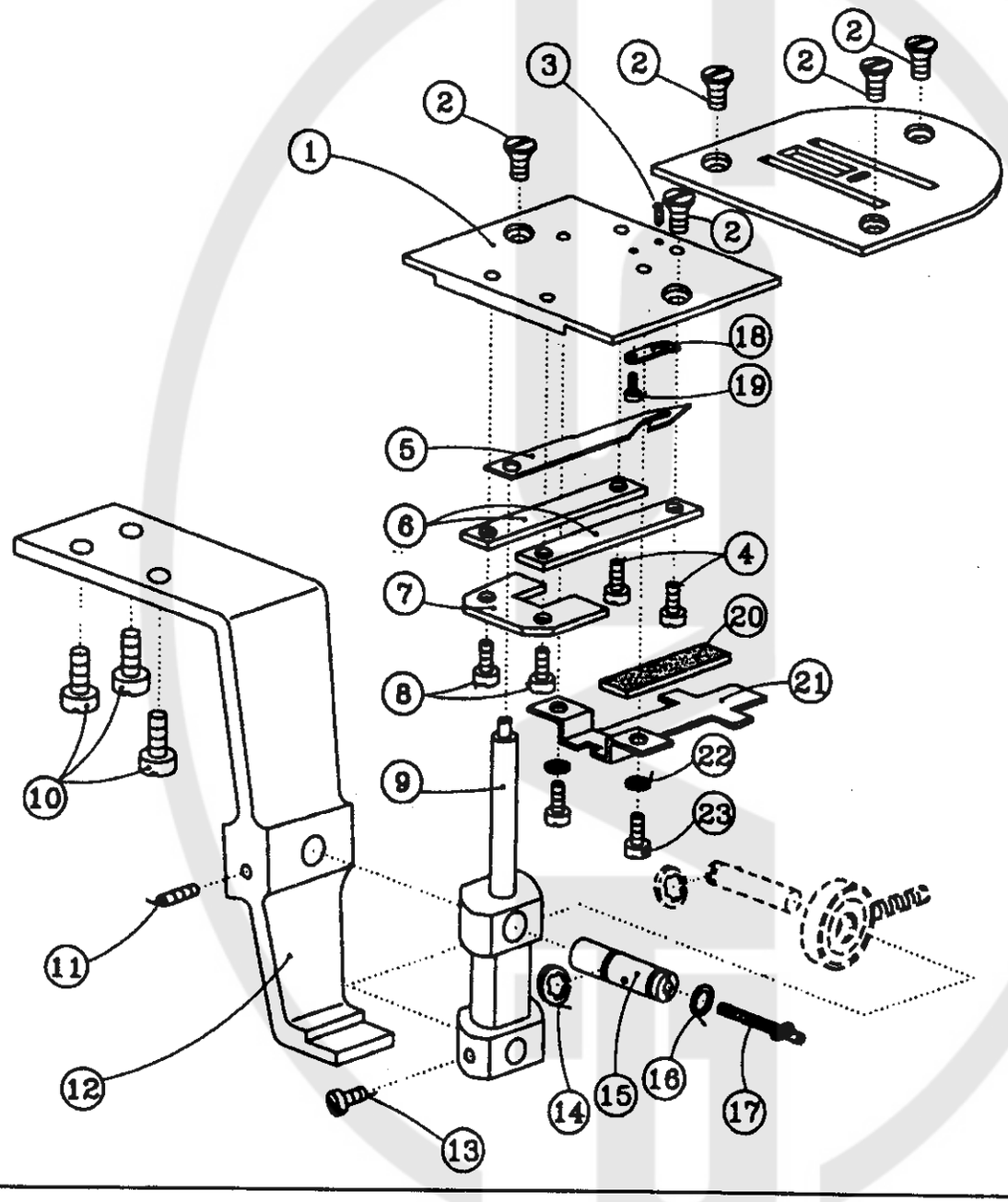
tab. 19



524 - 105

1	S080	744380
2	S080	120322
3	S080	161165
4	S080	126078
5	S080	825591
6	S080	422155
7	S980	091220
8	S323	914064
9	S080	120252
10	S080	422154
11	S080	825590
13	S374	059099
16	S080	952235
17	S080	120220
18	S080	120245
19	S980	091219
20	S080	161143
21	S080	154033
22	S080	274104
23	S080	314167
24	S080	630272
25	S980	091446

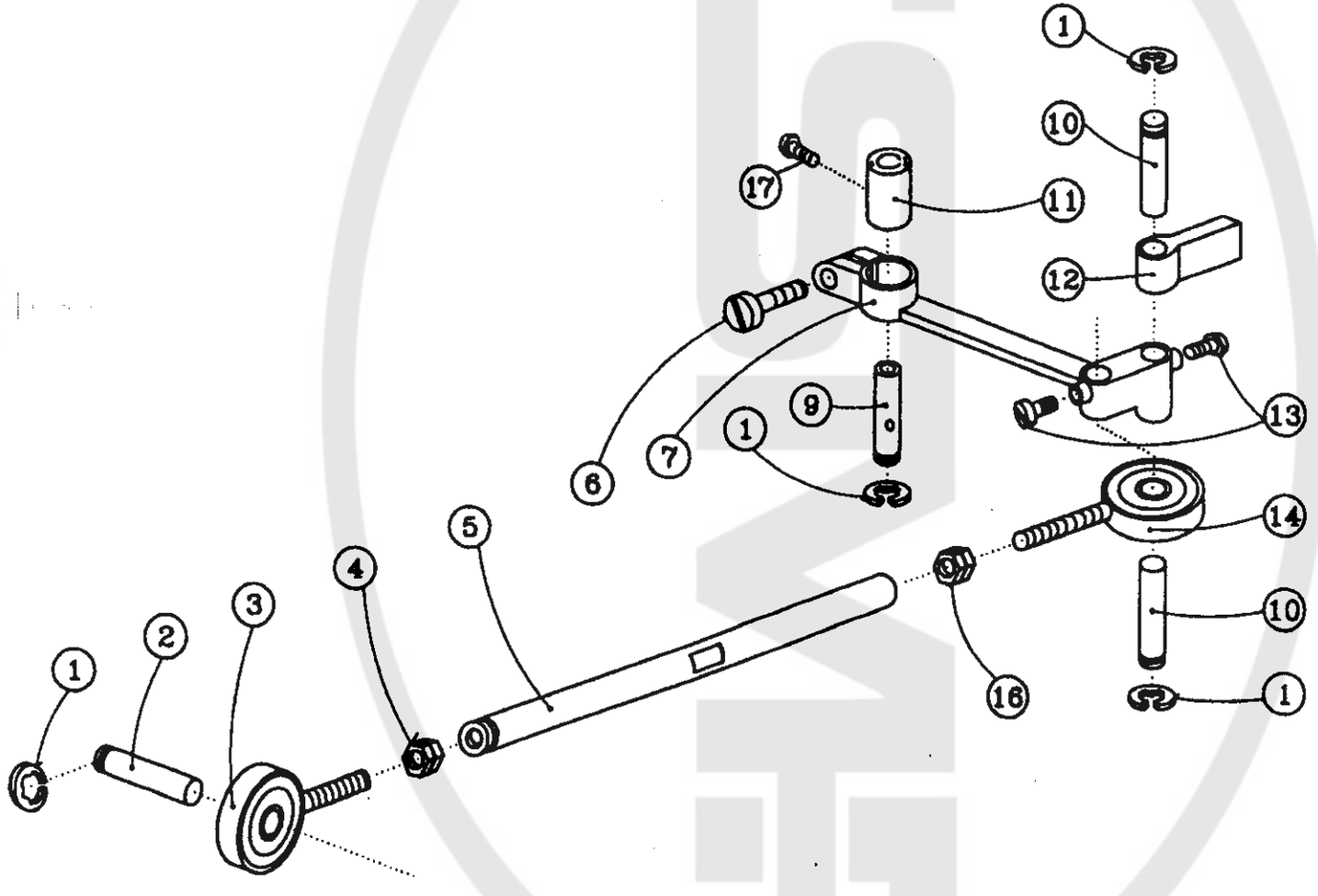
tab. 20



524 - 105

1	S080	647222
2	S080	123117
3	S080	111328
4	S080	120332
5	S080	870167
6	S080	825868
7	S080	826039
8	S080	132153
9	S080	635171
10	S080	120293
11	S080	111244
12	S080	765090
13	S080	120218
14	S080	274093
15	S080	338190
16	S080	190483
17	S708	130003
	ø 3 x	80mm
18	S080	870140
19	S080	132216
20	S080	945315
21	S080	839058
22	S080	191118
23	S080	120215

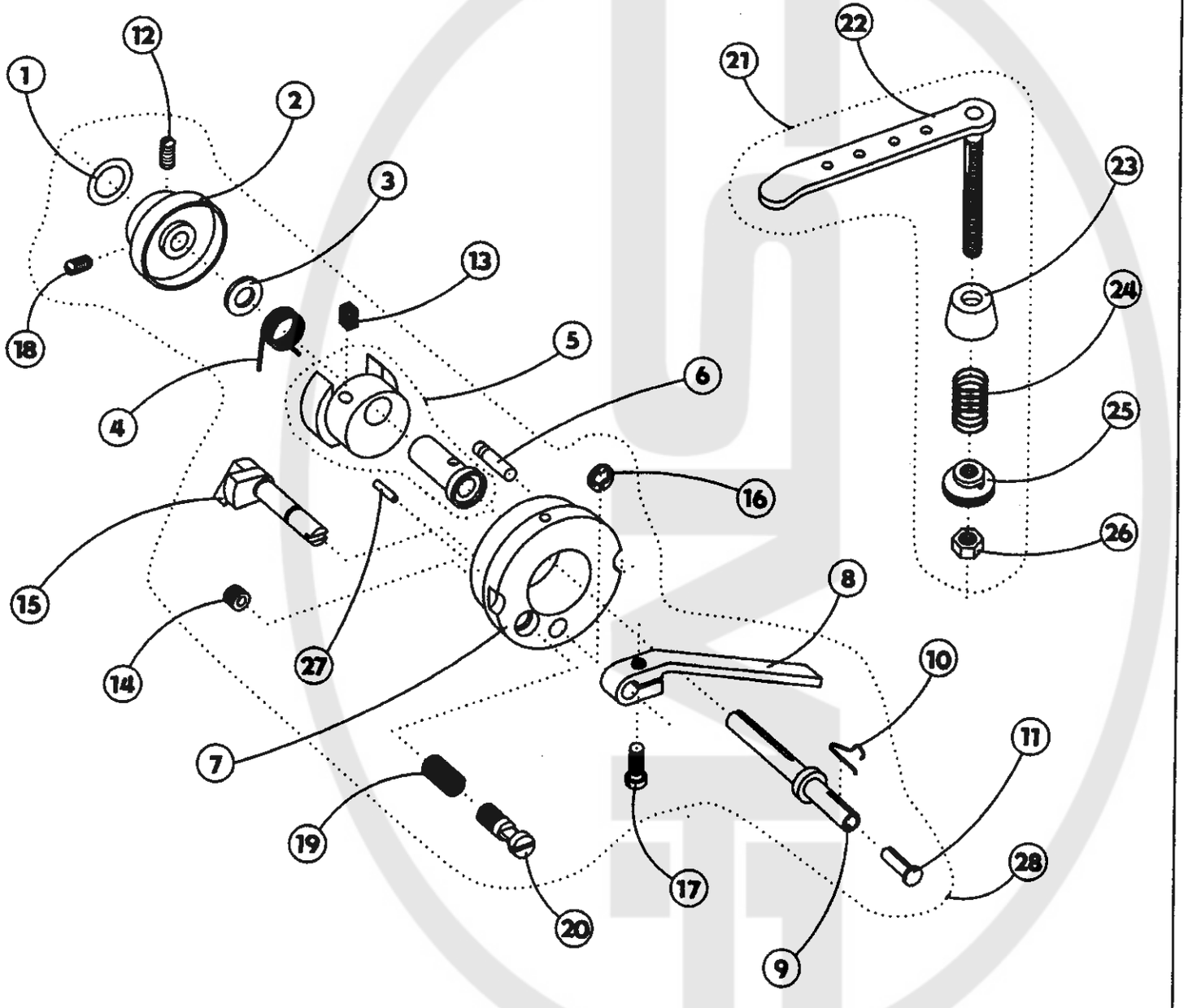
tab. 21



524 - 105

1	S311	732040
2	S080	314165
3	S980	049811
4	S080	161227
5	S080	334093
6	S080	120229
7	S080	636243
9	S080	318171
10	S080	314166
11	S080	410481
12	S080	632147
13	S080	120218
14	S980	049810
16	S080	161144
17	S080	132183

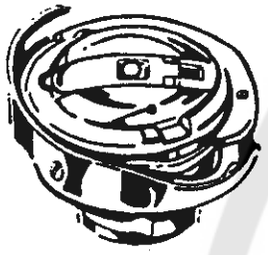
tab. 22

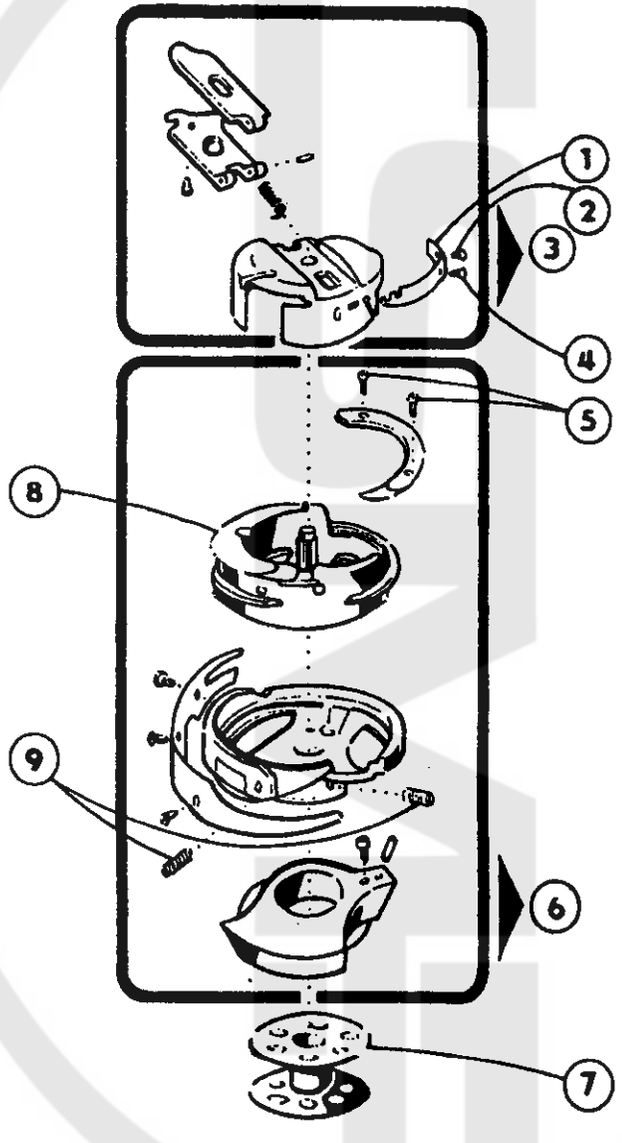


524 - 105

1	S273	025410
2	S080	441560
3	S080	190593
4	S080	264281
5	S980	035654
6	S080	310377
7	S080	441308
8	S080	613468
9	S080	343074
10	S080	265037
11	S321	953200
12	S080	112115
13	S080	945296
14	S080	111094
15	S080	672174
16	S311	732040
17	S080	124050
18	S080	111230
19	S080	260483
20	S080	870170
21	S980	025248
22	S980	025249
23	S080	827194
24	S080	260510
25	S080	163106
26	S080	161138
27	S311	515091
28	S980	036122

tab. 23



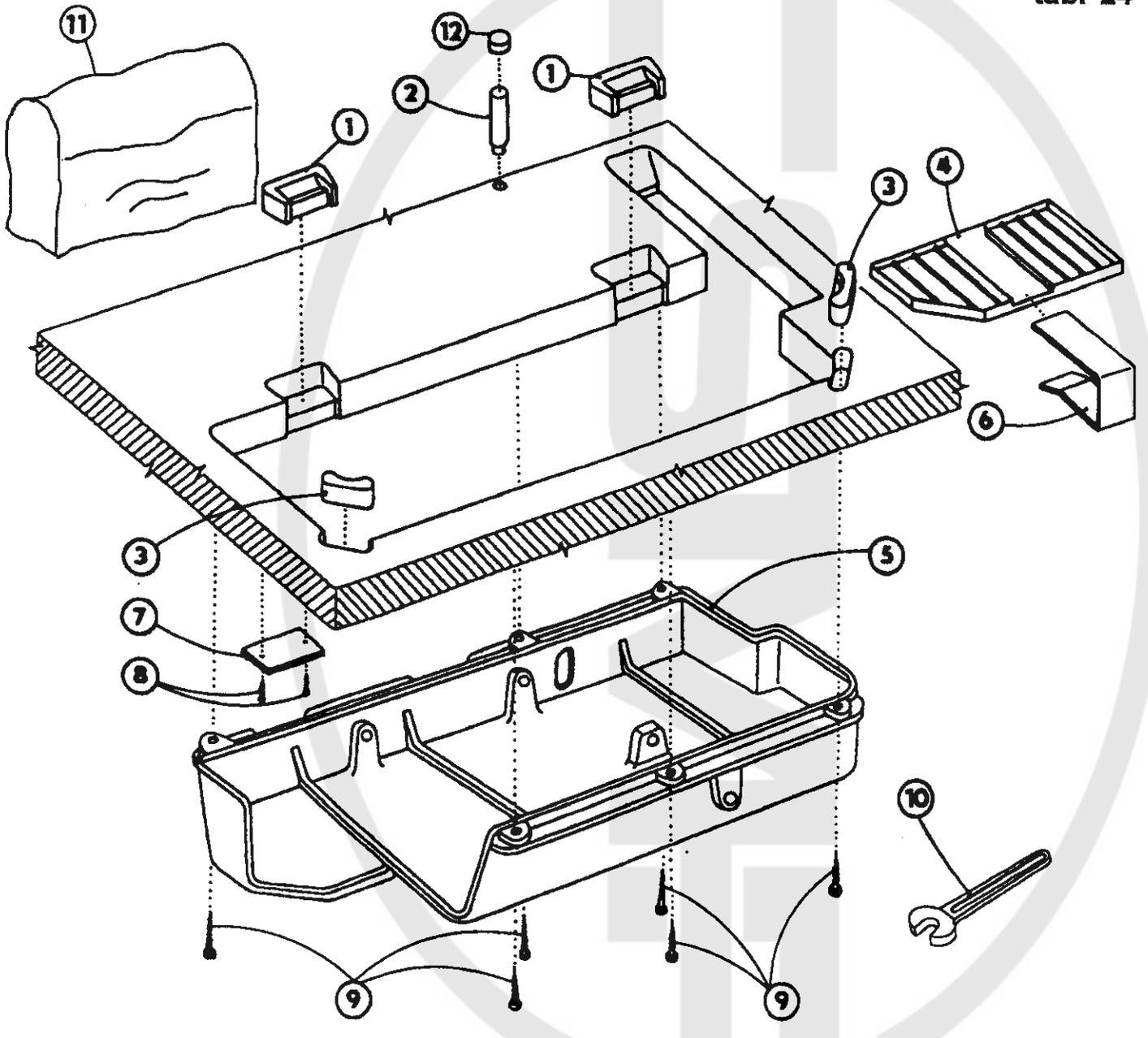


524 - 105

S980 008250

1	S080	690029	
2	S080	683063	
3	S980	081133	
4	S080	683053	
5	S080	683064	2 x
6	S980	081126	
7	S080	685051	
8	S080	677023	
9	S080	683067	2 x

tab. 24

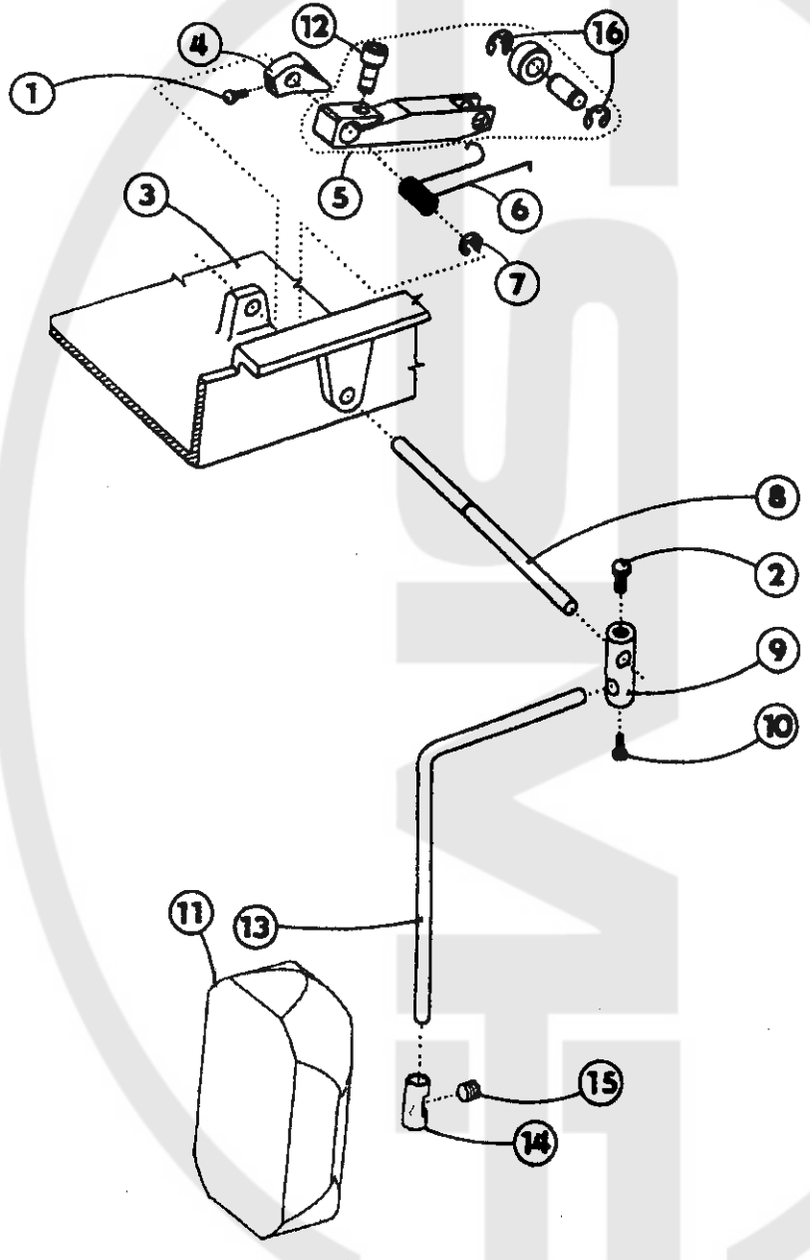


524 - 105

S980 099038 /1

1	S273	940127
2	S615	932046
3	S273	940141
4	S321	953251
5	S080	725050
6	S080	826387
7	S080	941091
8	S314	016020
9	S080	225031
10	S413	100130
11	0APP	000301
12	S321	026000

tab. 25

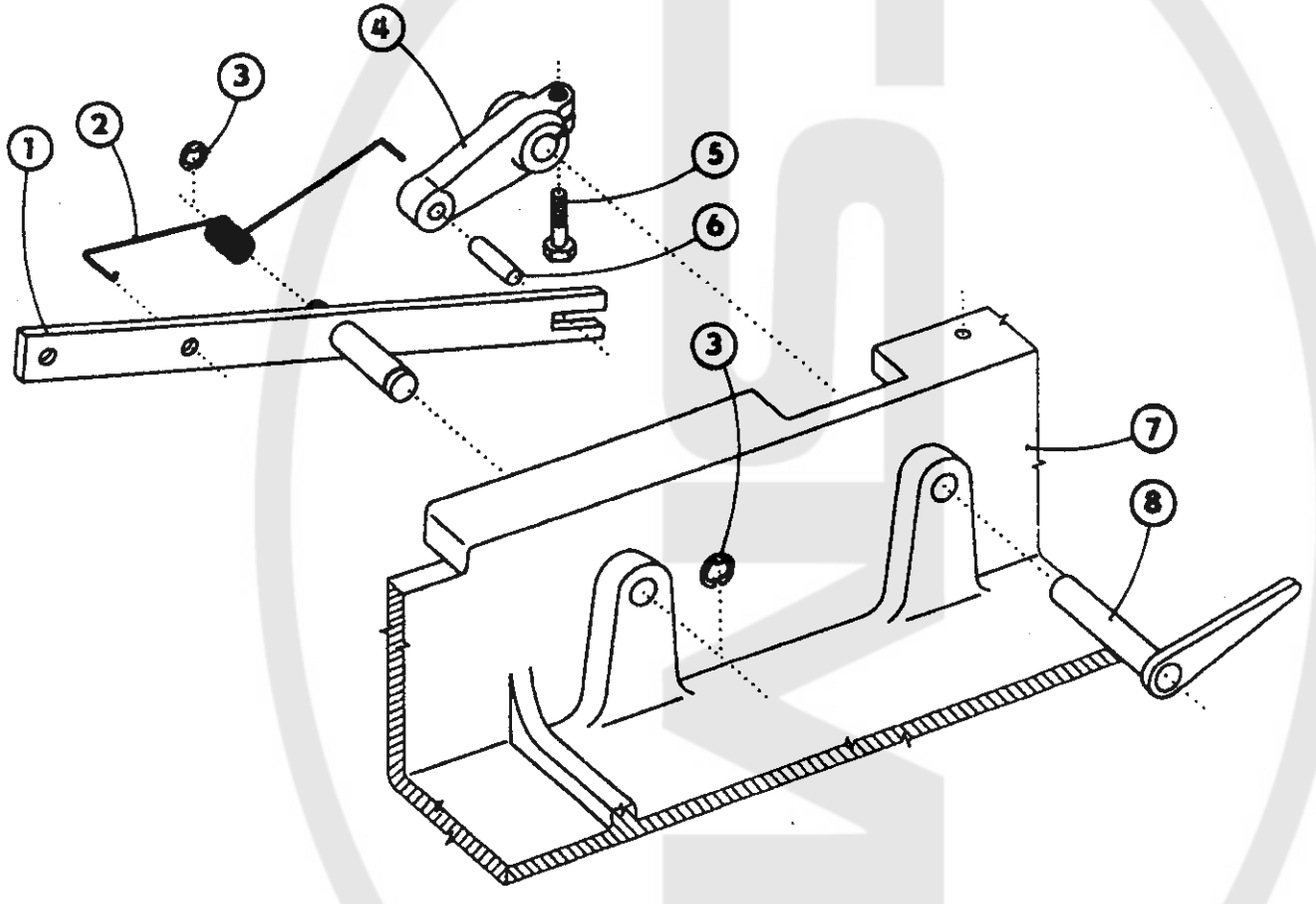


524 - 105

S980 099038 /2

1	S080	141141
2	S080	141121
3	S080	725050
4	S080	625022
5	S980	027603
6	S080	264168
7	S311	732070
8	S080	314065
9	S080	318069
10	S080	141112
11	0396	130013
12	S080	120295
13	S080	383022
14	S080	416146
15	9205	102788
16	S311	732060

tab. 26

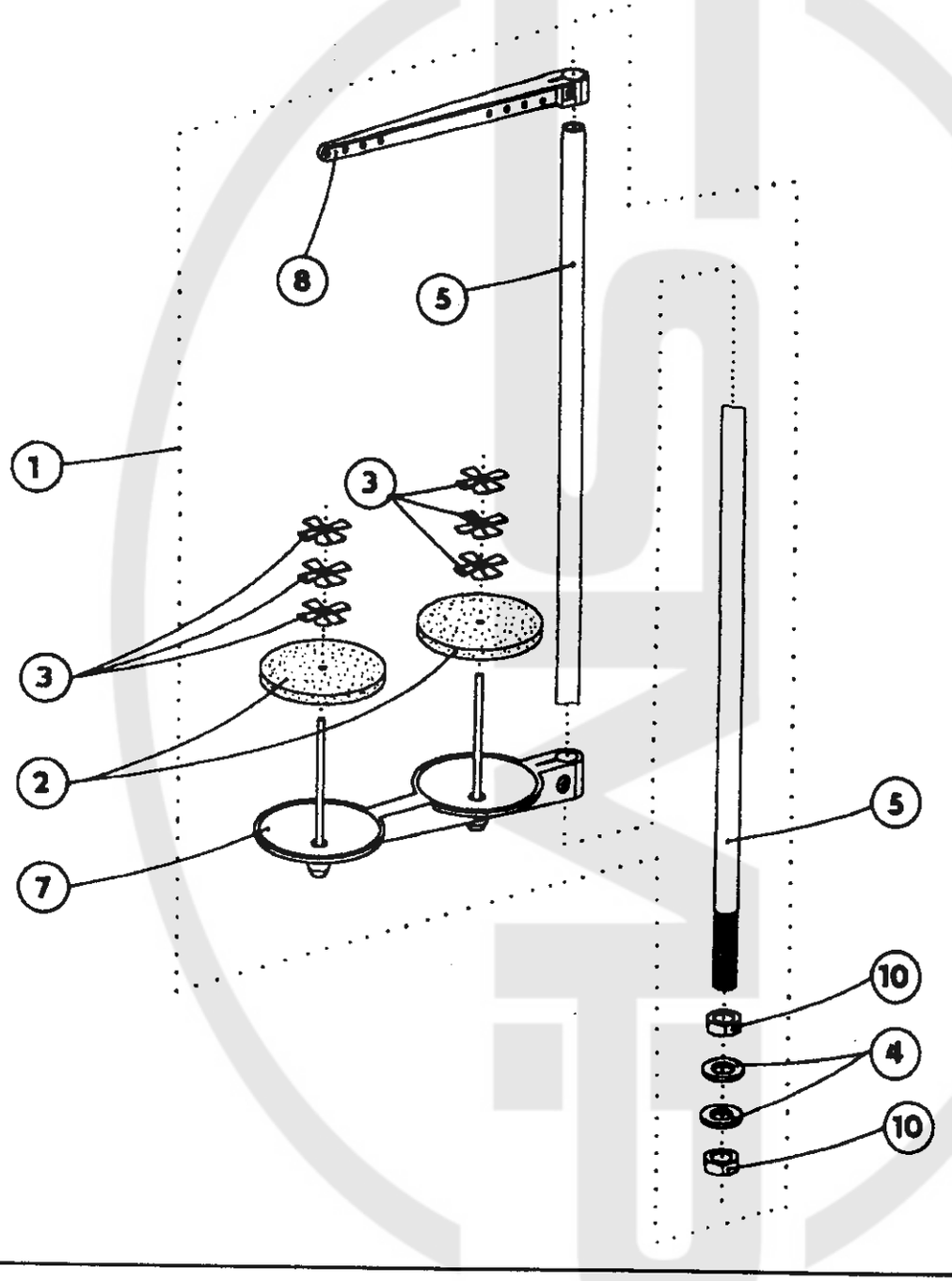


524 - 105

S980 099038 /3

1	S980	049109
2	S080	264290
3	S311	732070
4	S080	613480
5	S080	141109
6	S311	515041
7	S080	725050
8	S980	044142

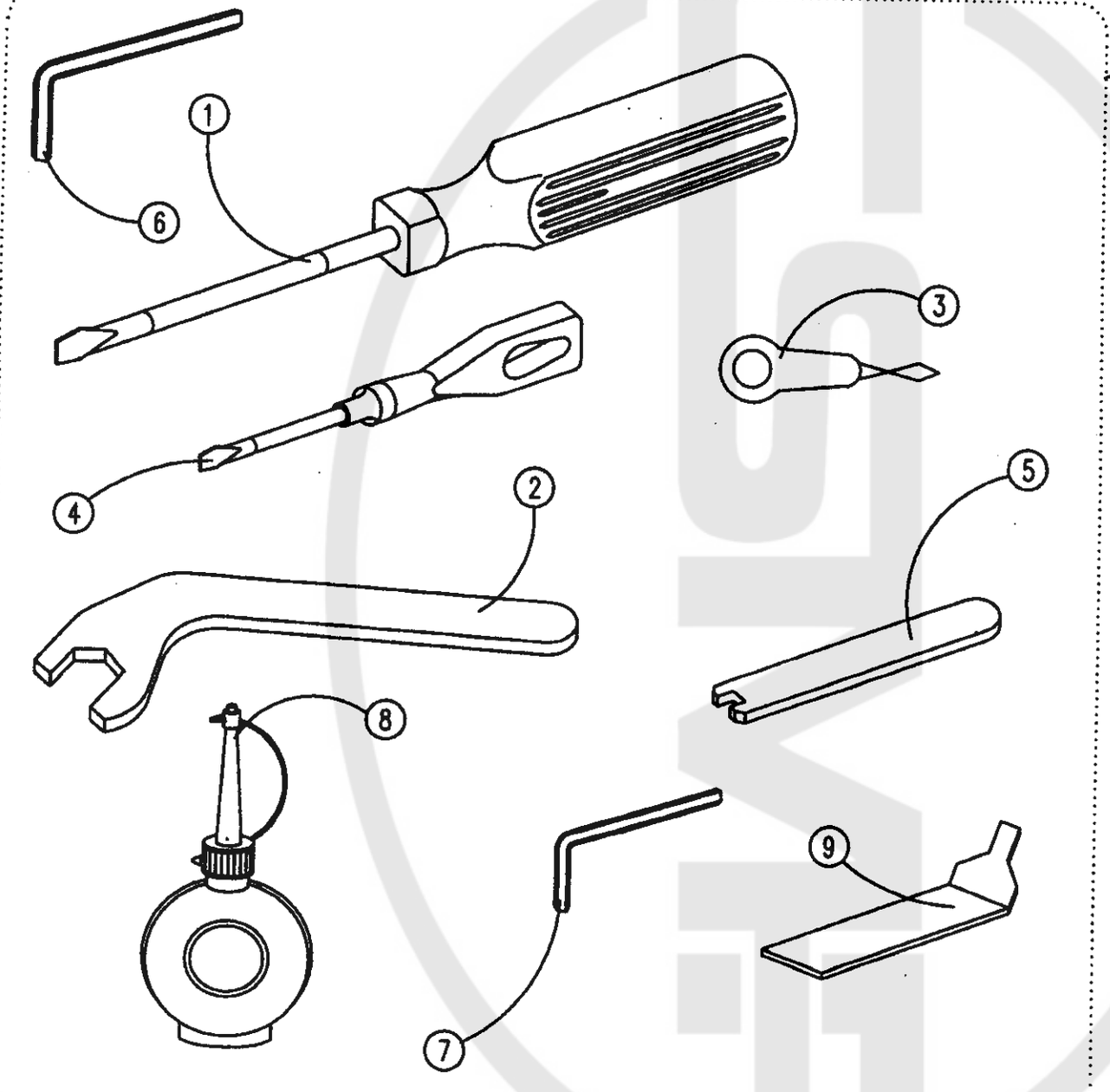
tab. 27



524 - 105

S980 099038 /4

1	S981	036163	
2	0077	110220	4 x
3	0077	110230	12 x
4	9330	000177	
5	0791	001081	
7	0791	001091	2 x
8	0791	001096	2 x
10	0995	340617	

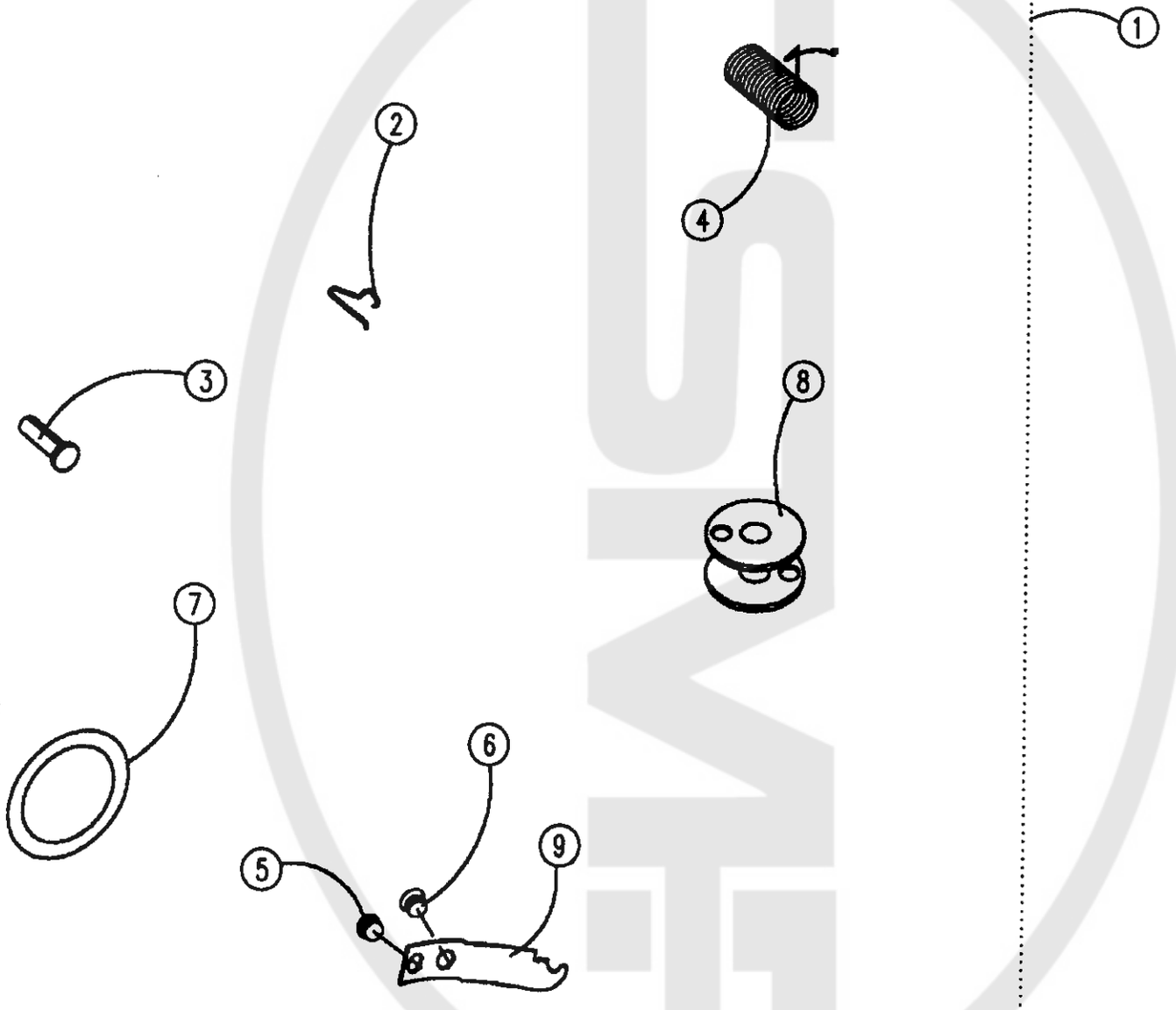


524 - 105

S980 099038 /5

1	S413	731023
2	S080	818273
3	S548	001000
4	S413	310002
5	S080	813481
6	S413	000500
7	S413	000400
8	S562	002000
9	S080	829796
10	**S980**	**092220**

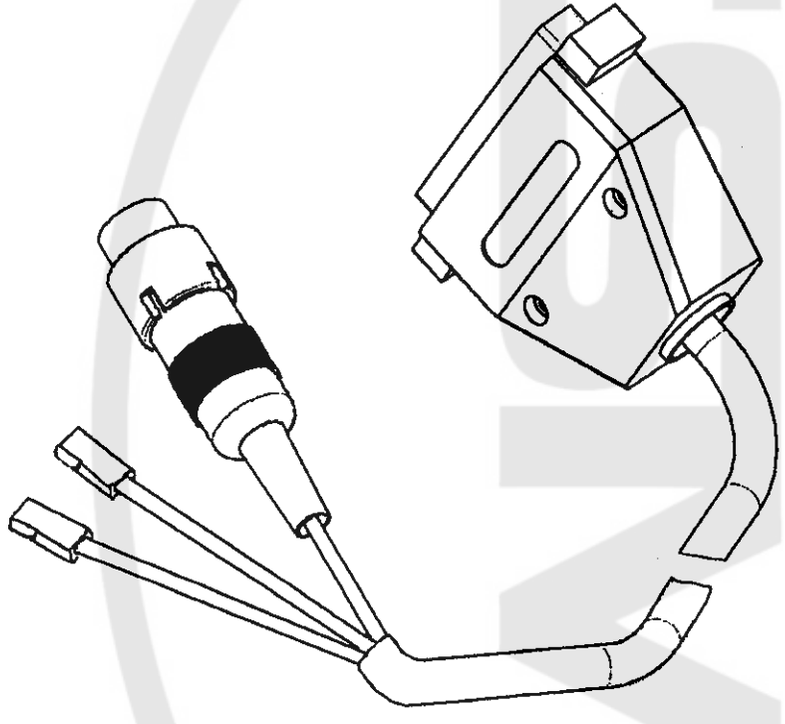
tab. 29



524 - 105

1	**S980**	**092229**	
2	S080	265037	4 x
3	S321	953200	2 x
4	S315	264294	4 x
5	S080	683063	4 x
6	S080	683053	4 x
7	S273	025410	4 x
8	S080	685051	10 x
9	S080	690029	4 x

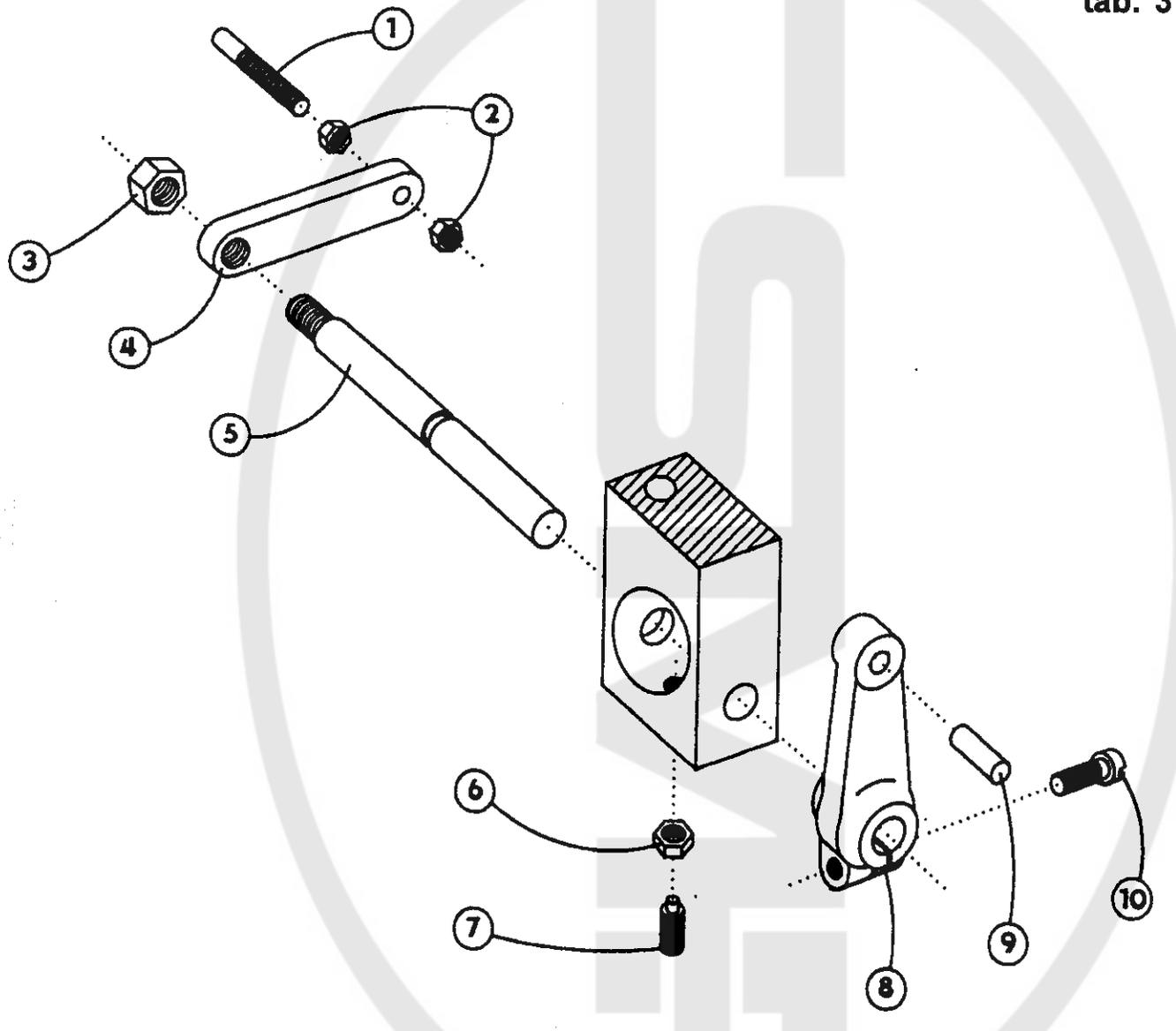
tab. 30



524 - 105

S980 094051

tab. 31



524 - 105

S791 995068

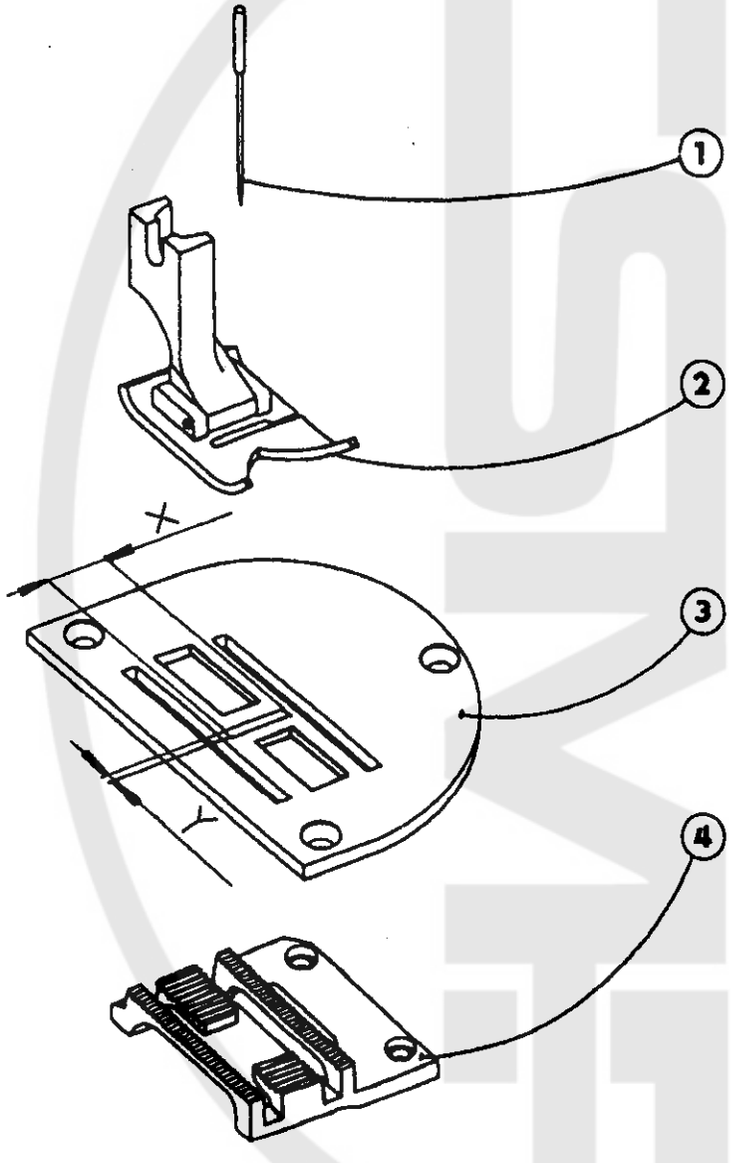
1	S080	316038
2	S080	161143
3	S080	161159
4	S080	632019
5	S080	342096
6	S080	161140
7	S080	111097
8	S080	613480
9	S311	515035
10	S080	120230

Šicí vybavení
Sewing equipment

524

Obchodní označení / Ordering No.	Pro podtřídu/Použití / For subclass/Use	Stehová deska / Throat plate: Rozměr jehelního otvoru/Stitch hole size	Stehová deska/Throat plate	Zásuvná deska levá/Slide, left	Zásuvná deska pravá/Slide, right	Hlavní podavač / Main feed dog: Rozměr jehelního otvoru/Stitch hole size	Pilové ozubení/Serrated	Pilové ozubení šikmé/Serrated, oblique	Křížové ozubení/Cross toothed	Oboustranné ozubení/Roof-shaped	Patka / Foot: Kloubová kompenzační/Compensating hinged	Kloubová s drážkou pro nit zepředu/ Hinged with front thread slit	Kloubová s drážkou pro nit z boku Hinged with side thread slit	Kolečková/Roller presser		Jehelník/Needle holder	Systém jehly/Needle system	
525 E 032	-101 -105 lehký materiál; 4řádkový podavač - rozteč zubů 1 mm tl. jehly 80-110 Nm; max. šířka klik. stehu -10 mm max. délka klik. stehu -5 mm light weight material; 4-lined feed dog with 1 mm needle size 80-110 Nm; max. throw width 10 mm max. stitch length 5 mm	1,5 x 11,6	S080 811641				S080 651504						S980 031603				134/110	
525 E 033	-101 - standard -105 lehký materiál; 3řádkový podavač-rozteč zubů 1,8 mm tl. jehly 80-110 Nm; max. šířka klik. stehu - 10 mm max. délka klik. stehu - 5 mm light weight material; 3-lined feed dog with 1.8 mm needle size 80-110 Nm; max. throw width 10 mm max. stitch length 5 mm	1,5 x 11,8	S080 811637					S080 651336					S980 031603				134/110	
525 E 034	-101 -105 - standard lehký materiál; 3řádkový podavač-rozteč zubů 1,8 mm tl. jehly 80-110 Nm; max. šířka klik. stehu - 10 mm max. délka klik. stehu - 5 mm light weight material; 3-lined feed dog with 1.8 mm needle size 80-110 Nm; max. throw width 10 mm max. stitch length 5 mm	1,8 x 11,8	S080 811557					S080 651336					S980 031603				134/110	
525 E 075	-101 -105 střední materiál; 4řádkový podavač-rozteč zubů 1,5 mm tl. jehly 80-110 Nm; max. šířka klik. stehu - 10 mm max. délka klik. stehu - 5 mm medium weight material; 4-lined feed dog with 1.5 mm needle size 80-110 Nm; max. throw width 10 mm max. stitch length 5 mm	1,5 x 11,6	S080 811699				S080 651472						S980 031603				134/110	

tab. 32



524 - 105

525 E 033

S791 124033 35

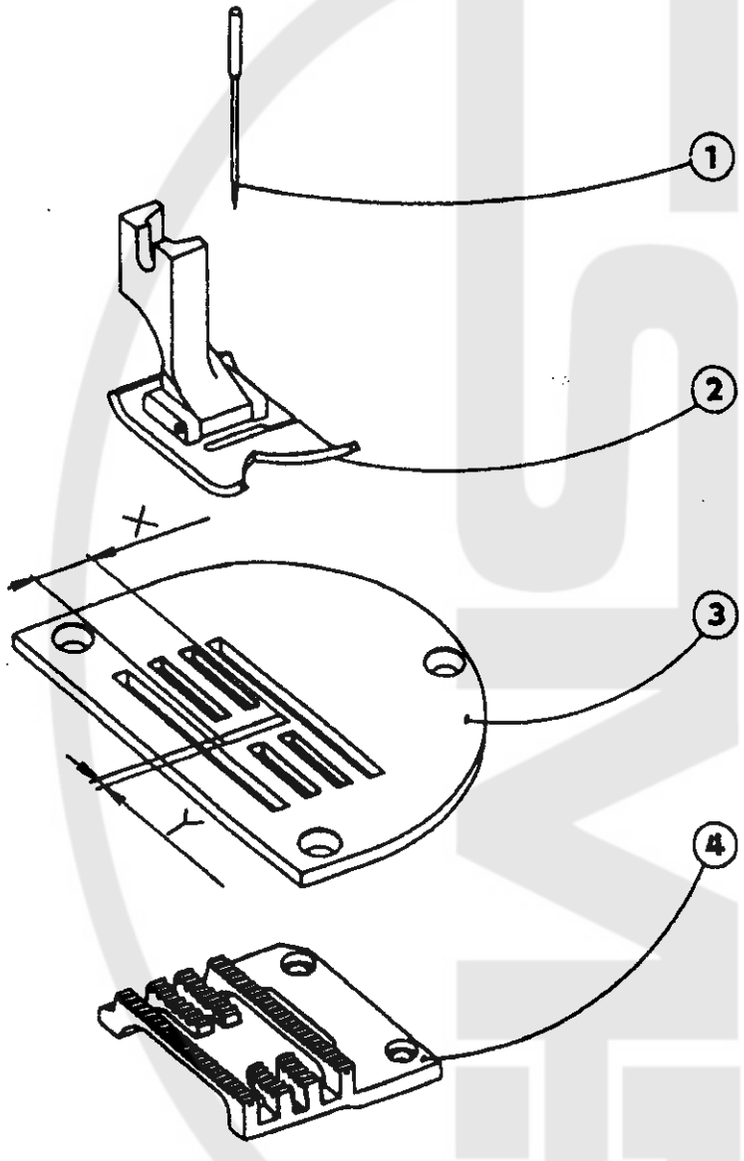
1 134 No. 110 - 11 x
2 S980 031603
3 S080 811637
4 S080 651336
X = 11,8 mm Y = 1,5 mm

525 E 034

S791 124034 35

1 134 No. 110 - 11 x
2 S980 031603
3 S080 811557
4 S080 651336
X = 11,8 mm Y = 1,8 mm

tab. 33



524 - 105

525 E 032

S791 124032 35

1	134 No. 110 - 11 x	
2	S980	031603
3	S080	811641
4	S080	651504

X = 11,6 mm Y = 1,5 mm

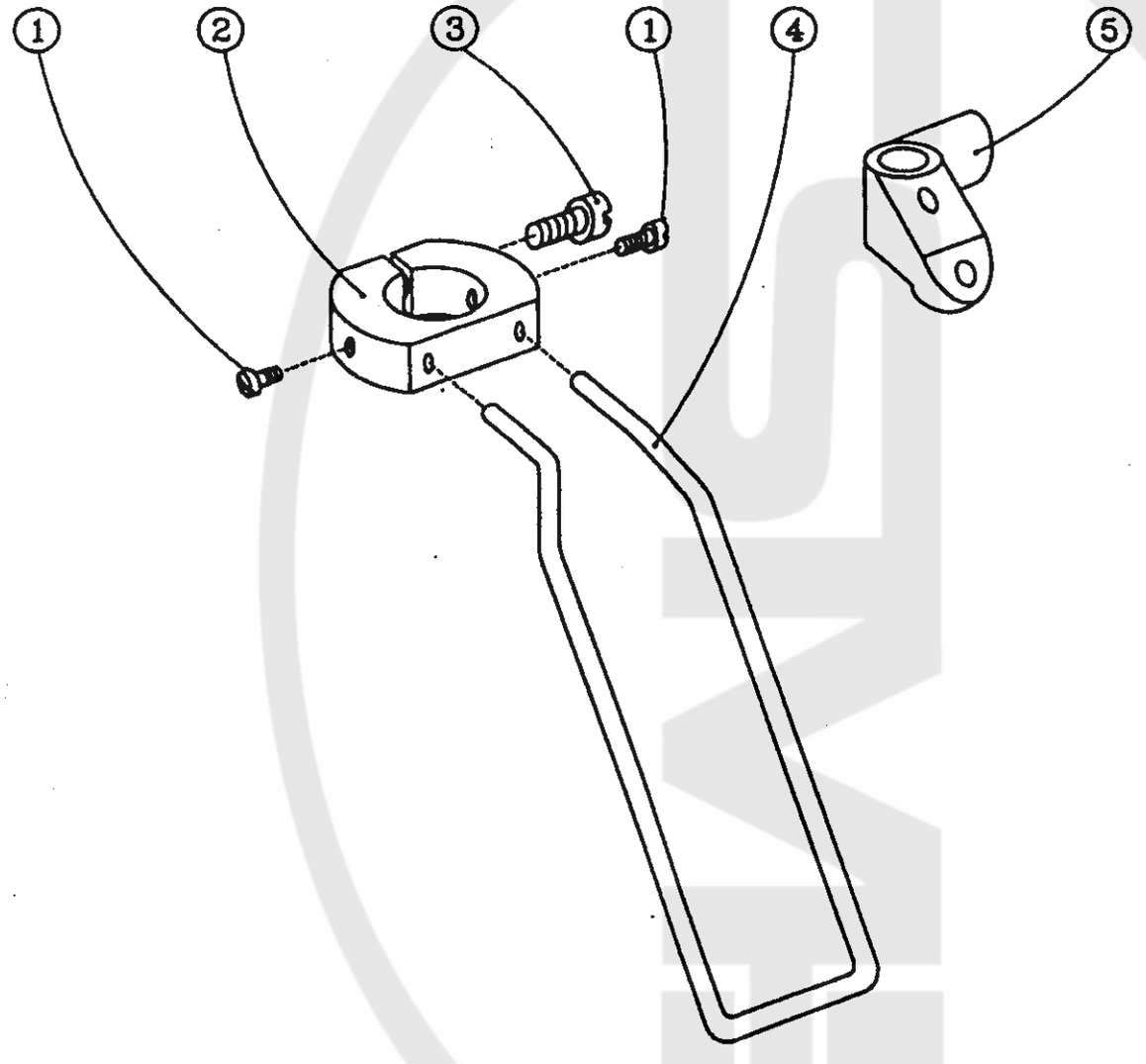
525 E 075

S791 124075 35

1	134 No. 110 - 11 x	
2	S980	031603
3	S080	811699
4	S080	651472

X = 11,6 mm Y = 1,5 mm

tab. 34



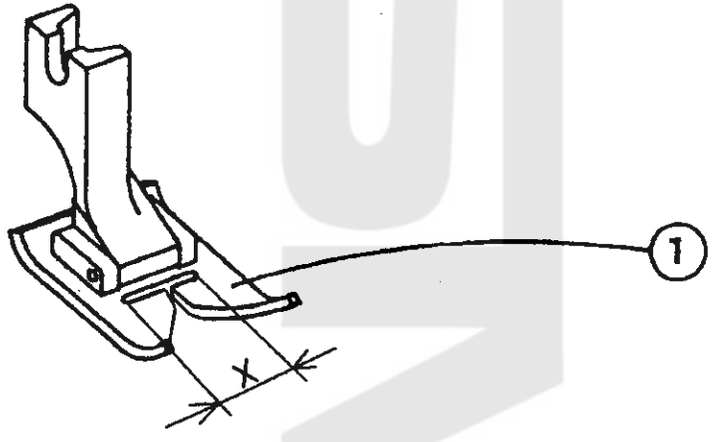
524 - 105

527 N 001

S791 149001

1	S080	120 037
2	S080	646 136
3	S080	120 225
4	S080	271 441
5	S080	627 037

tab. 35



524 - 105

525 E 016
S791 151016

1 S980 031586

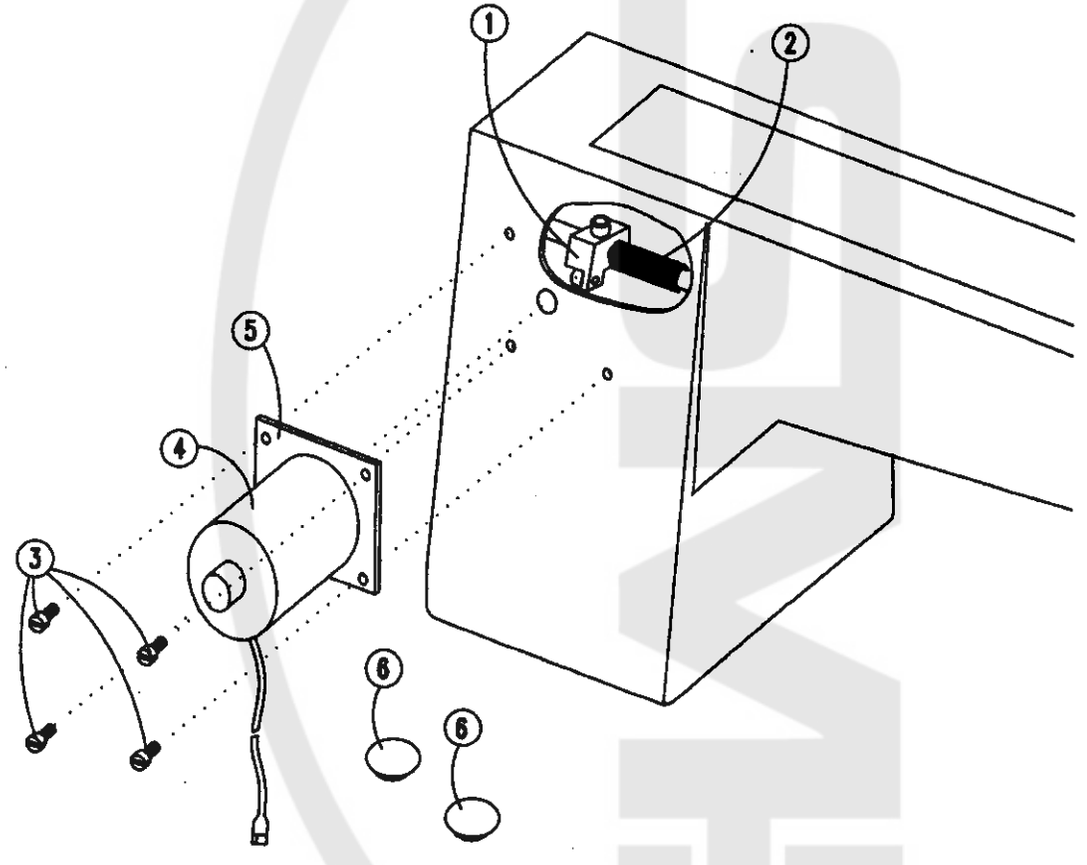
X = 6 mm

525 E 017
S791 151017

1 S980 031652

X = 10 mm

tab. 36

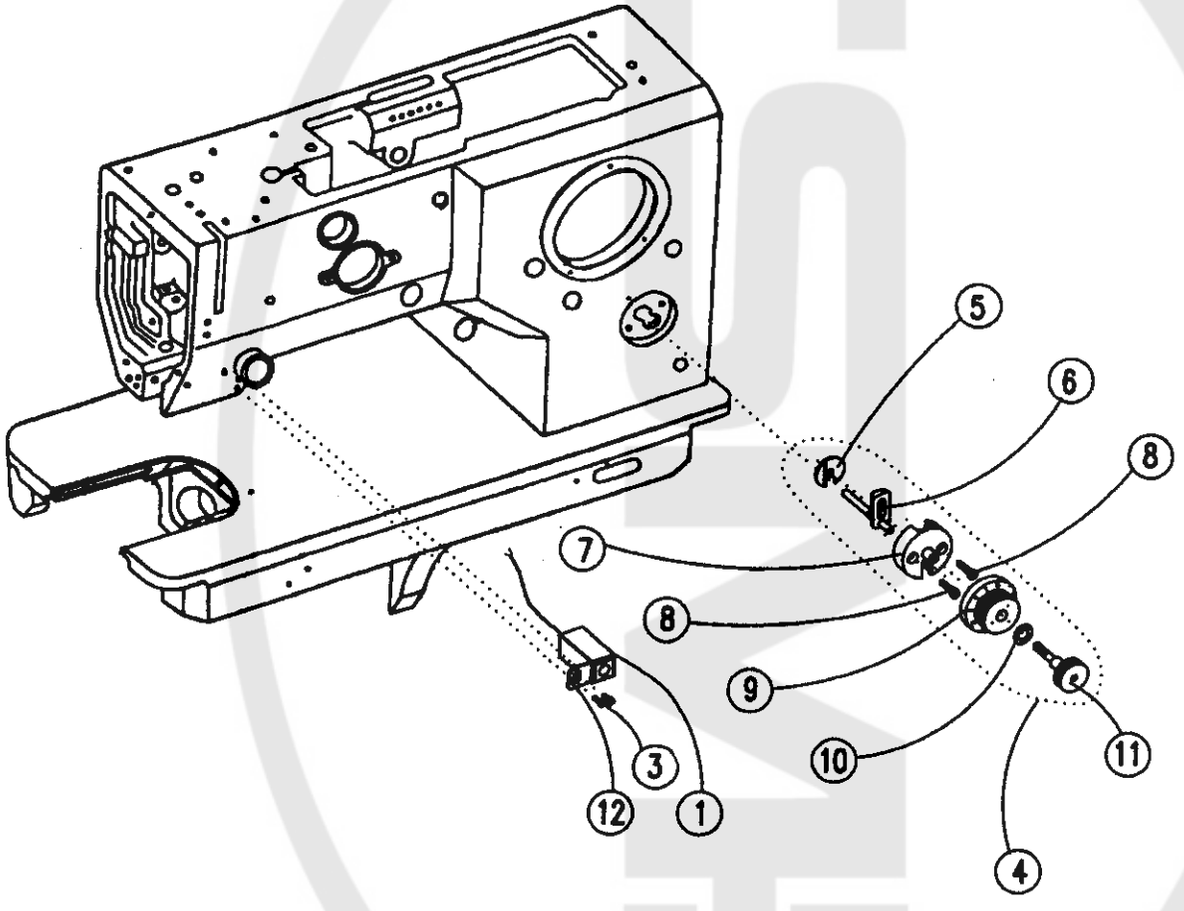


524 - 105

S791 995153

1	S980	060208
2	S080	260610
3	S080	120354
4	S981	094041
5	S080	831699
6	S321	000000

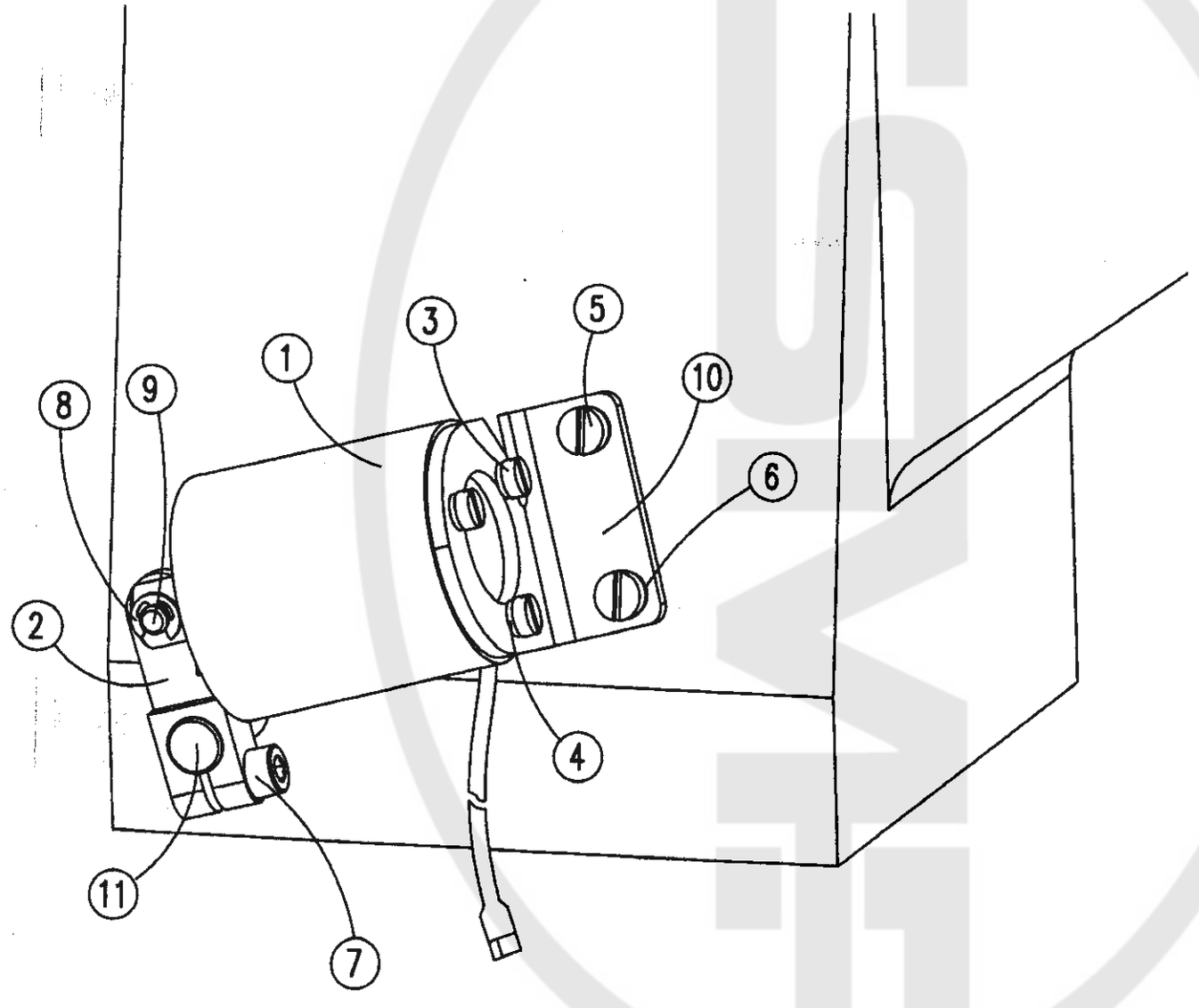
tab. 37



524 - 105

1	**S980 094057**	
1	**S980 094060**	
	S791 995154 /1	
3	S080	132153
4	S980	044895
5	S080	441550
6	S980	043369
7	S080	441475
8	S080	120219
9	S980	233053
10	S080	190483
11	S080	342270
12	S980	035914

tab. 38

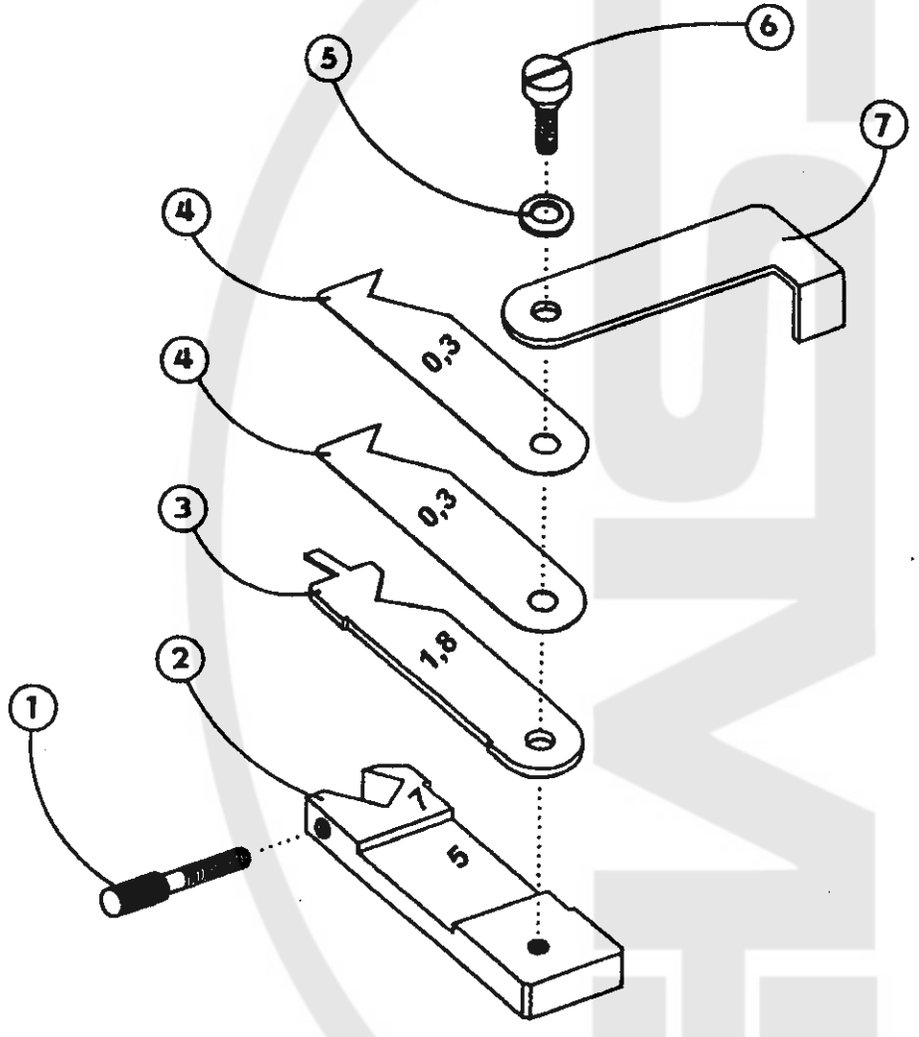


524 - 105

S791 995154 /2

1	S980	094047
2	S080	613594
3	S080	120331
4	S080	191135
5	S080	120354
6	S080	191136
7	S080	120364
8	S311	732040
9	S080	314231
10	S080	826396
11	S080	342342

tab. 39



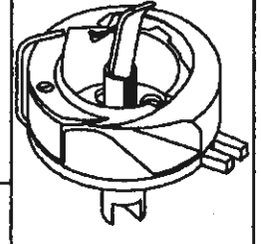
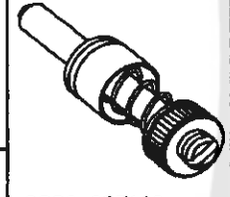
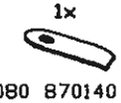
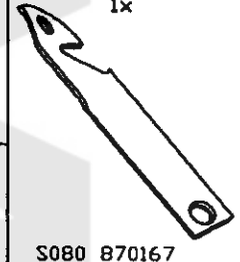
524 - 105

Z001

S791947001

1	S080	133112
2	S080	646148
3	S080	814365
4	S080	814364
5	S080	192061
6	S080	131404
7	S080	831412

tab. 40

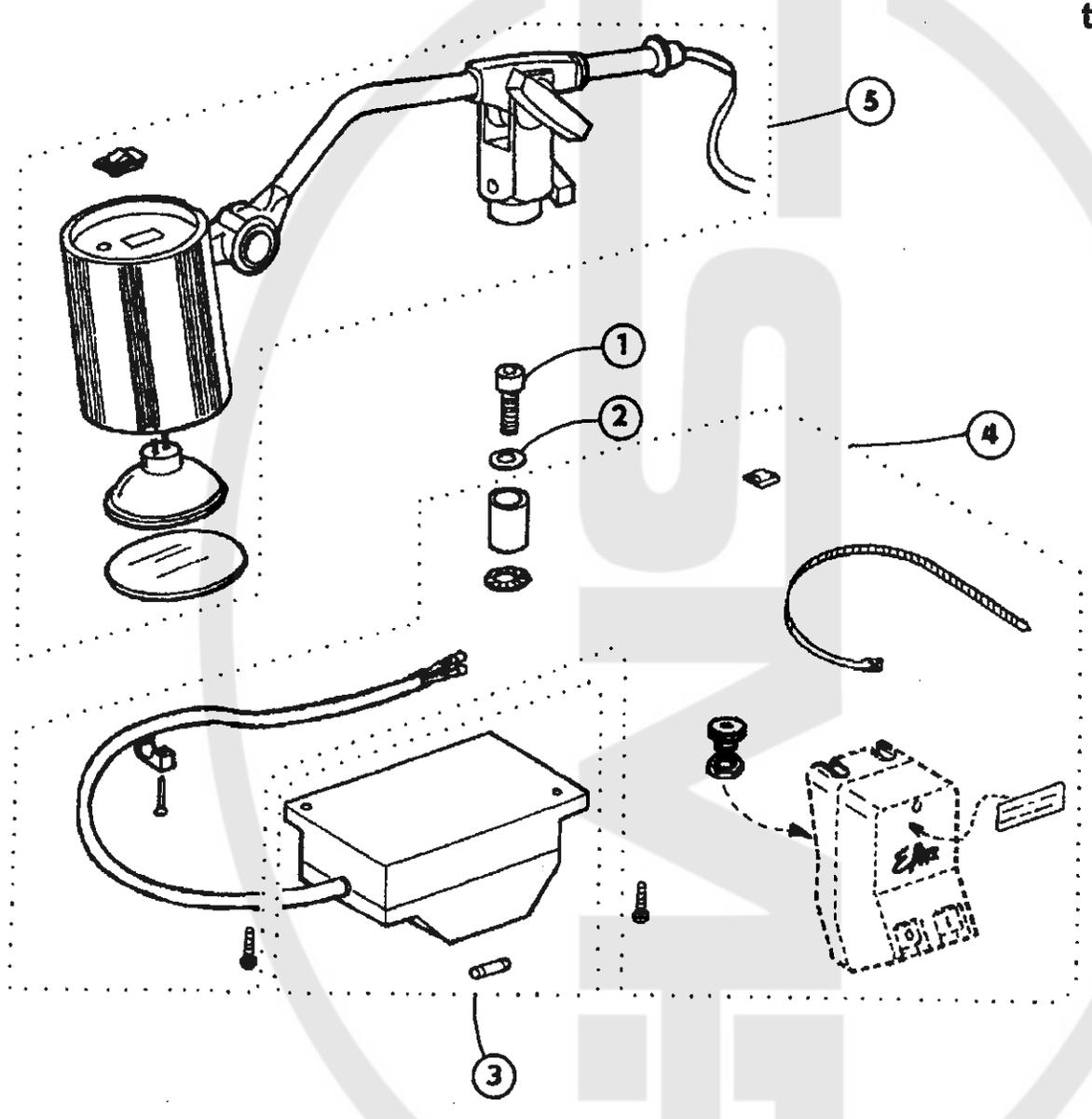
3x S080 120239	3x S080 141088	5x S080 683063	5x S080 683053	3x S080 135029	3x S080 132216
5x S080 123117	3x S080 265037	1x S080 627170	5x S080 112013	3x S080 124050	3x S080 136082
3x S080 690029	5x S315 264294	1x  S980 008250	1x S980 025245	3x S273 025410	1x  S980 025160
3x S080 122029	1x S080 264281	1x  S080 870140		1x  S080 870167	

524 - 105

524 Z 518

S741 610518 40

tab. 41



524 - 105

Z 012

S794 222012

1	S080	120692
2	S080	190346
3	0798	500088
4	0907	487519
5	9822	510001