BERNINA
Oldtimer

Service Manual

830 Record

831..832

IMPORTANT SAFETY INSTRUCTIONS

CAUTION

Your sewing machine is designed and constructed only for HOUSEHOLD use.

Before using this sewing machine, read this manual and follow all Safety Rules and Operating Instructions.

DANGER— To reduce the risk of electric shock:

1. This sewing machine should never be left unattended when plugged in. Always unplug this sewing machine from the electric outlet immediately after using and before cleaning.
2. Always unplug before replacing a sewing machine bulb. Replace bulb with same type rated 15 Watts.
3. Do not reach for a sewing machine that has fallen into water. Unplug immediately.
4. Do not place or store this sewing machine where it can fall or be pulled into a tub or sink. Do not place or drop it into water or other liquid.

WARNING— To reduce the risk of burns, fire, electric shock, or injury to persons:

1. Do not allow this sewing machine to be used as a toy. Close attention is necessary when this sewing machine is used by or near children.
2. Use this sewing machine only for its intended use as described in this owner's manual.
   Use only attachments recommended by the manufacturer as contained in this owner's manual.
3. Never operate this sewing machine if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or dropped into water. Return this sewing machine to the nearest Sears store or service center for examination, repair, electrical or mechanical adjustment.
4. Never operate this sewing machine with any air opening blocked. Keep ventilation openings of this sewing machine and foot controller free from accumulation of lint, dust and loose cloth.
5. Never drop or insert any object into any opening.
6. Do not use outdoors.
7. Do not operate where aerosol (spray) products are being used or where oxygen is being administered.
8. To disconnect, turn all controls to the off ("○") position, then remove plug from outlet.
9. Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
10. Keep fingers away from all moving parts. Special care is required around the sewing machine needle.
11. Always use the proper needle plate. The wrong plate can cause the needle to break.
12. Do not use bent needles.
13. Do not pull or push fabric while stitching. It may deflect the needle causing it to break.
14. Switch this sewing machine off ("○") when making any adjustment in the needle area, such as threading the needle, changing the needle, threading the bobbin or changing the presser foot, and the like.
15. Always unplug this sewing machine from the electrical outlet when removing covers, lubricating, or when making any other adjustments mentioned in this owner's manual.

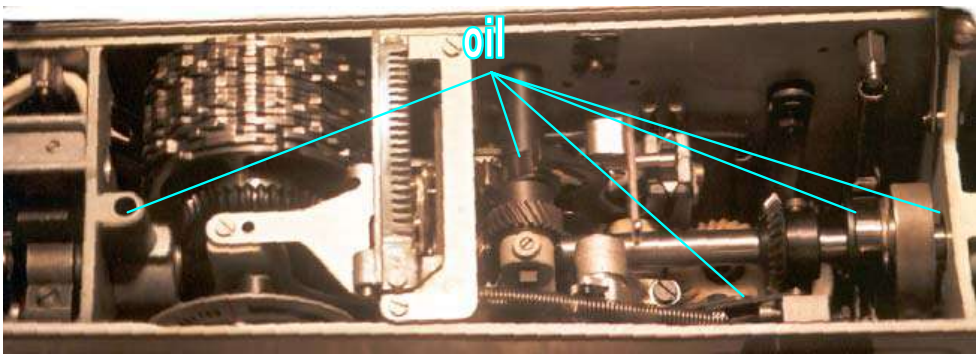
Before using your sewing machine for the first time, place a waste fabric under the presser foot and run the machine without thread for a few minutes. Wipe away any oil which may appear.

Cleaning and lubrication

The best way to remove lint from the machine is with compressed air. Blow all the lint from the machine. Remove all lint from the gears and again from the bobbin area and feed dogs.

When oiling your machine, make sure you use a good quality oiler and clear sewing machine oil.

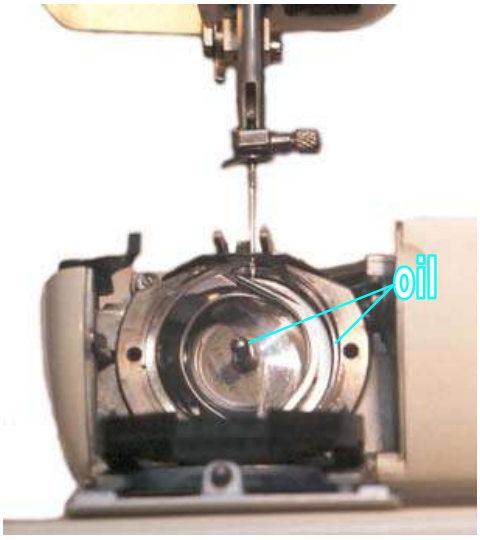
This type of oiler is good because it has an extendable spout and only lets out small drops of oil. A drop of oil is the amount of oil left on the tip of a needle if you dipped it in oil.



Oil all moving parts in the top of the machine. Make sure the parts shown are not missed. Grease the gears with light sewing machine grease.

Lubrication Continued

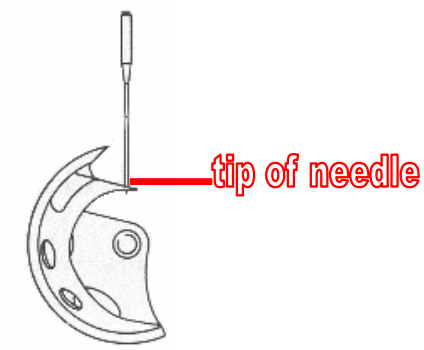
Oil all parts in the arm area.

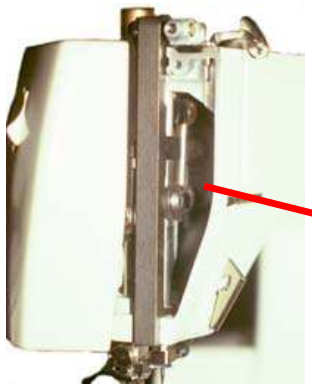


Oil the hook race and the center pin on the hook.

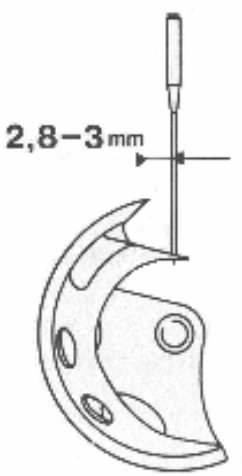
Oil all moving parts in the hook area. Do not use too much oil in this area as it will find its way onto your fabric.

Checking timings





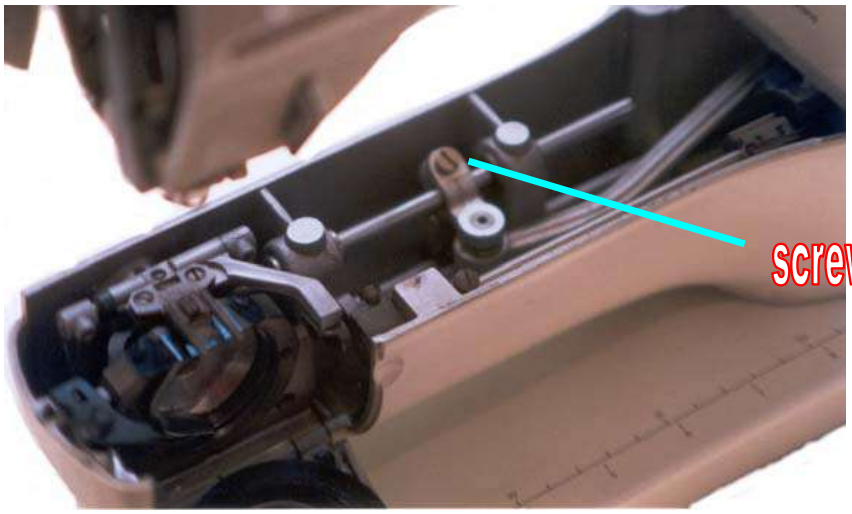
First check the needle bar height by turning the hand wheel until the needle bar is in its lowest position. The tip of the needle should meet the hook as shown. If not loosen the needle bar screw ½ turn and move the needle bar up or down to get the height. Be sure to not twist the needle bar and keep the needle clamp straight.



With the hook in the race but the race cover not closed, set the needle position to the far left. Bring the needle to its lowest position. The tip of the hook should be 2.8 – 3mm to the left of the needle.

If it is not, you will have to adjust the hook position before you can check the timing.

Hook Timing and Position Continued



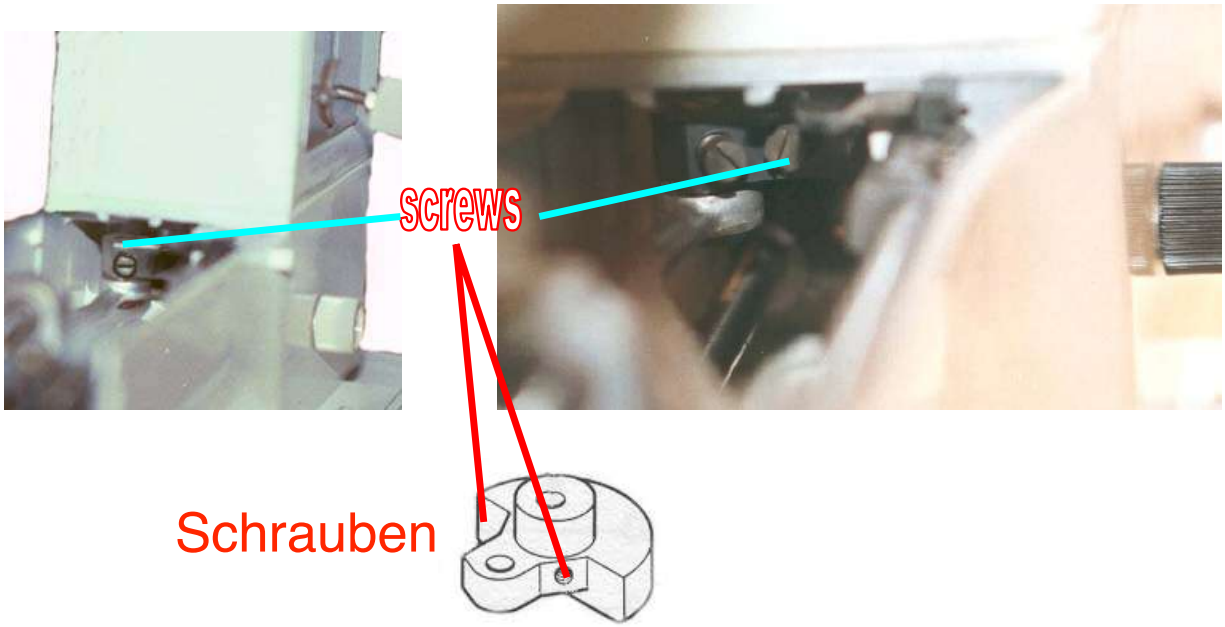
Loosen the adjusting screw ½ turn only and move the hook into position. Make sure not to force the shaft the screw is on or the machine will bind. Tighten the screw and recheck the position.

Set your machine to far right needle position. From the lowest position bring the needle up until the hook and needle meet. The tip of the hook should be just above the eye of the needle.

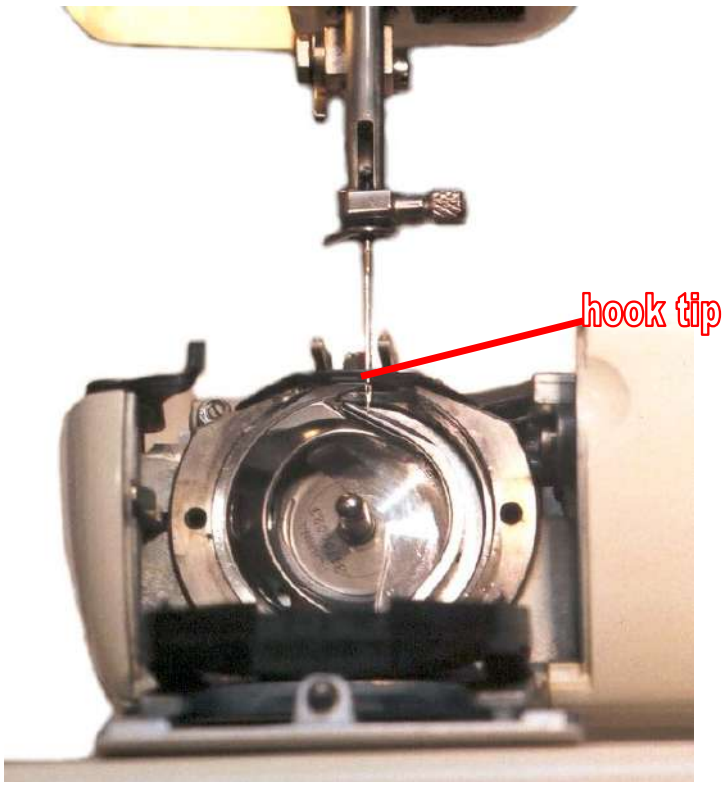
In most cases the hook timing on your machine should be fine. If not adjust the timing with the instructions on the next page.

Hook Timing Adjustment

Greifer Timing einstellen

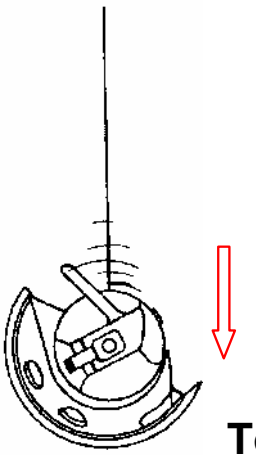


Locate and loosen the two stroke eccentric screws. Be very careful not to loosen them too much and do not let the eccentric drop down. Move the hook to the position shown. Tighten the screws and recheck the timing.



Bobbin tension

Spannung der Spulen / Spulenkapsel



To check the bobbin tension, insert a bobbin wound with medium weight thread into the bobbin case. Remove the hook from the machine. Snap the bobbin case onto the hook. Hold the hook and bobbin case by the bobbin thread and jerk the thread once or twice. The bobbin and hook should move down a bit. If the hook does not stop moving down the tension is too loose. If the hook does not move the tension is too tight.

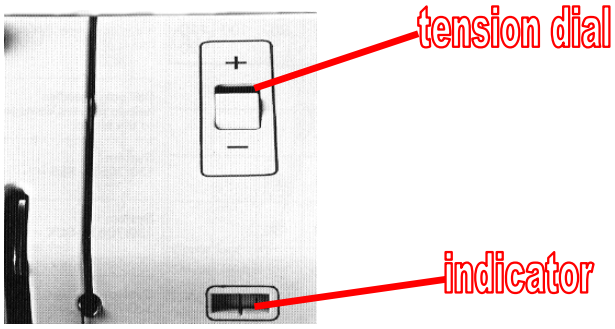
If the tension is too tight, turn the screw counterclockwise ¼ turn at a time and retest. If the tension is too loose, turn the screw clockwise ¼ turn at a time and retest.

Continue to loosen or tighten the tension screw until the hook only moves down about ½" when you jerk the thread.

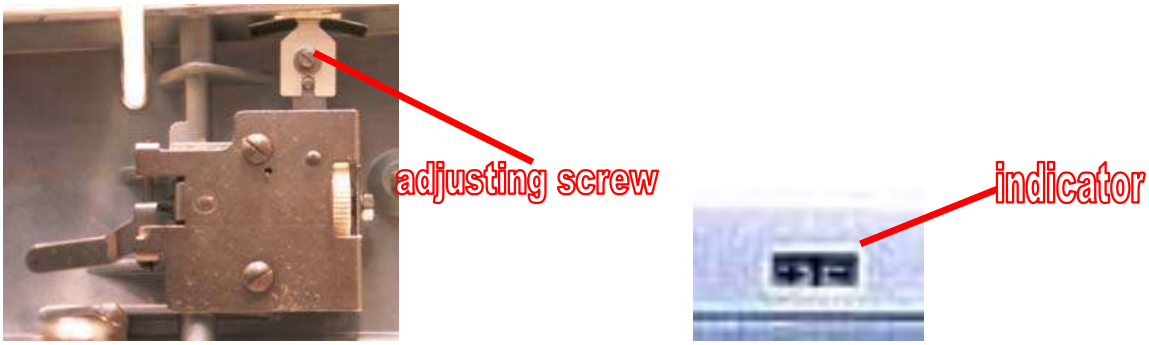
It is rare that you have to adjust your bobbin tension. Mainly if the tension spring was bent or for specialty sewing.

Top Tension

Oberfadenspannung



The top tension is controlled with the tension dial. Normal tension is when the indicator is centered. After the bobbin tension is set the tensions should balance in the center of the fabric as shown.



If adjustment is required, sew a test and turn the top tension dial until the right tension is achieved. Open the top cover and locate the adjusting screw. Loosen the screw and center the indicator. Tighten the screw and recheck the adjustment.
Your machine will sew on most fabrics without requiring tension adjustment. If you are using heavier thread or very thick fabric you may have to increase the tension.

The result you should look for in tension is for the knot to be formed in the center of the fabric.

Contents

BERNINA record model 830	Zig-zag, plain and Decorative stitch machine, 20 built-in cams and automatic buttonholer
BERNINA model 831	Zig-zag and plain stitch machine with automatic buttonholer

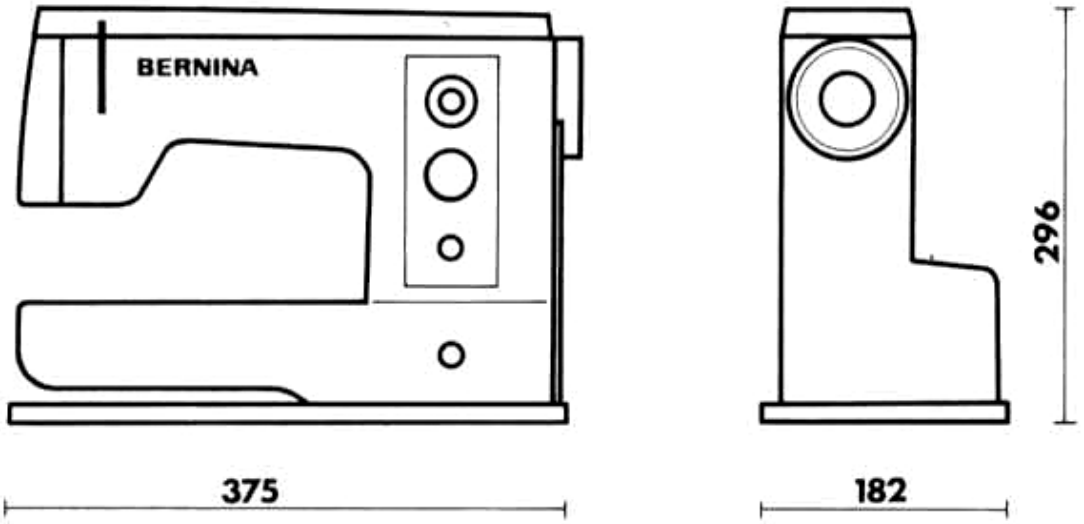


Fig.

Max. zig-zag width	4.5 mm
Stitch distribution	left—center—right
Max. forward stitch length	4 mm
Max. reverse stitch length	2 mm
Presser foot lift	6,5 mm
Passage space	110 x 200 mm
Size of baseplate	375 x 182 mm
Shuttle system	Jam free central bobbin shuttle
Bobbin capacity	75 m cotton yarn
Needle system	705 B
Needle movement	swinging needle bar
Thread feed	hinged take-up lever
Thread tension	upper thread tensioning incorporated in frame cover
Winder	self-releasing
Motor	power: 90 watts
Sewing lamp (built-in)	power: 15 watts
Number of stitches	approx. 1100 stitches/min.
Weight of machine	approx. 9.15 kg
Weight complete with carrying case	approx. 15 kg

Sewing off needle	705 B - 80
Needle deflection:	
with lifting bar suspension	3
needle plate upper edge	4.5
at shuttle tip	4.63
Needle bar lift	33.73
Loop lift: left	2.2
Shuttle travel	220° 18′ 30″
Rack travel	34.6
Lifting crank radius	17.3
Take-up lever travel	61
Presser foot lift	6.5
Darner lift	2.92
Speed:	
motor	7500 rpm
stepped pulley	2405 rpm
frame shaft	1137 rpm
Gear ratio:	
overall	6.6 : 1
motor: stop pulley	3.12 : 1
stop pulley: frame shaft	2.12 : 1
Base circumference	230 mm
Machine dimensions:	
overall length	388 mm
overall width	182 mm
height over adjusting lever	315 mm
Weight	9.15 kg

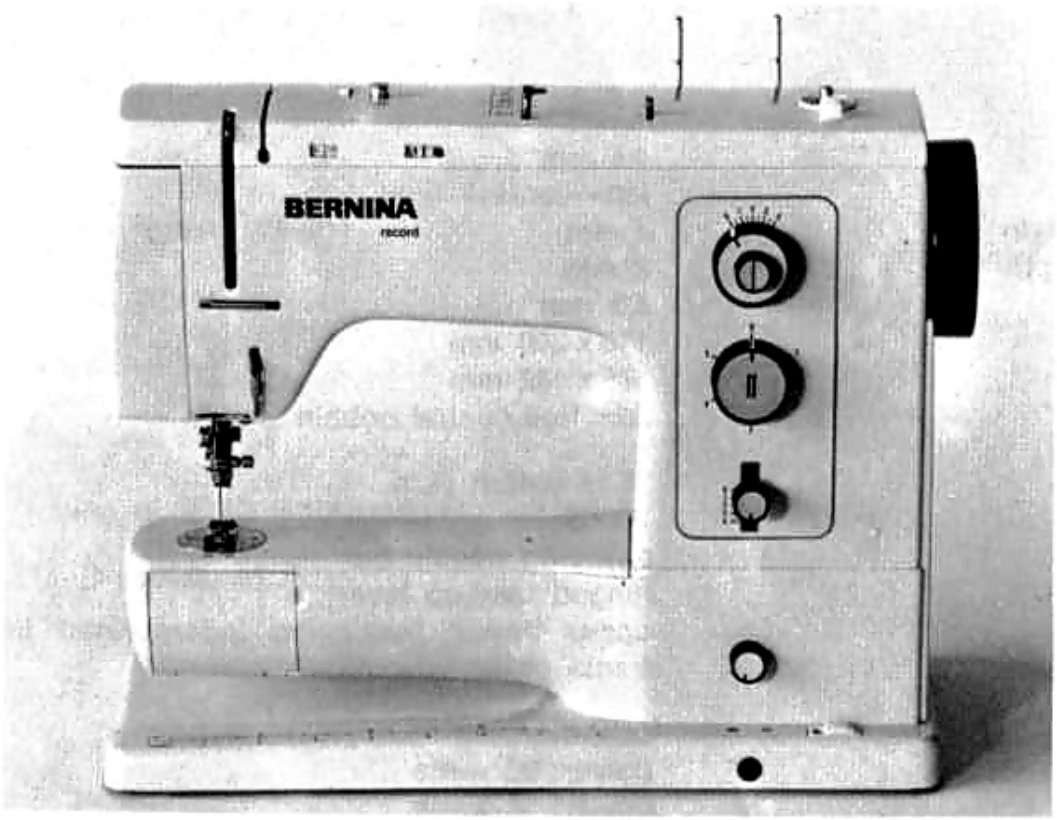


Fig. 2

These instructions are designed to help you carry out minor repairs and adjustments to the BERNINA Model 830 sewing machine.

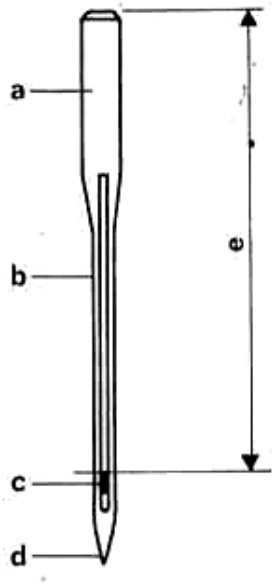
The booklet lays no claim to completeness. The instructions are not suitable for an overall mechanical assembly or dismantling procedure.

IMPORTANT: To enable the following points to be performed correctly, the sewing machine must be in **good mechanical condition** (running smoothly, properly oiled, etc.) If the sequence of adjustments is observed the machine will operate fully satisfactorily.

The needle

The needle is one of the most important sewing items. It has the task of piercing the work and of taking the upper thread to the shuttle for linking with the lower thread and of forming the loop for acceptance by the shuttle.

The loop is formed after the needle has pierced the work and has reached its lowest point. The thread is drawn tight and lies in the long groove at the front. At the rear it lies in the short groove and higher up between the needle stem and the hole pierced in the fabric. If the needle rises slightly, the so-called loop-lift, a loop is produced at the eye of the needle on the short groove side which the tip of the shuttle can enter, as a result of the friction between the work and the needle stem where the thread is retarded.



Basically, the sewing machine needle has the following features:

a) the **plunger** for securing the needle in the needle bar,

b) the **stem** with a short and a long groove for guiding the thread and forming the loop,

c) the **eye of the needle**

d) the **point of the needle**

e) the **needle length.**

BERNINA uses the «705 B» needle system without Scarf (Singer designation: 15 x 1) on all domestic machines.

Since 1947 the millimetre system has been used for needle size. Needle size «100» means a needle stem thickness of 1 mm (Needle No. 80 = 0.8 mm dia.)

The needle must be **firmly** secured with the knurled screw on the needle holder. Tighten screw by hand — do not use a screwdriver.

IMPORTANT: Always use a needle No. 80 for all adjustments unless otherwise stated.

Check the needle before every adjustment to the machine. It must **always be straight.**

The needle plate

The needle plate is used to take the material to be worked and has a longitudinal slot, the stitch hole, to allow the needle to pass. It is hardened and polished to allow upper and lower threads to slide through smoothly. In addition, it is perforated in the shape of the feed dog which feeds the material.

Needle distribution in needle plate slot

The needle must penetrate at the center of the stitch hole as seen in the direction of the material feed. (Needle No. 90).

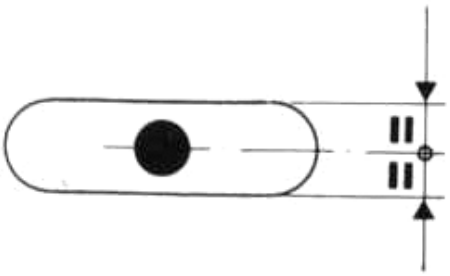


Fig. 2

If a correction has to be made the belt cover must be removed on the handwheel side (see also page 33) and three of the four frame fixing screws loosened (socket head screws with width of 5 mm). For this operation the special wrench No. 398 089 03 is required. Then press the frame to the desired position and retighten the three screws.

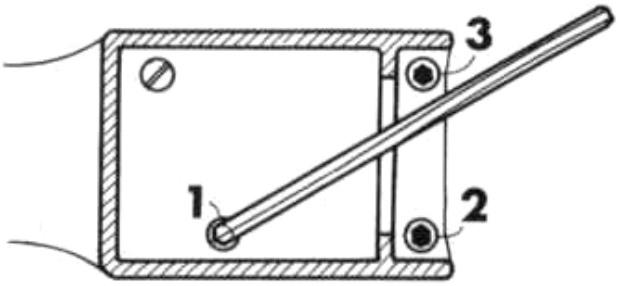


Fig. 3

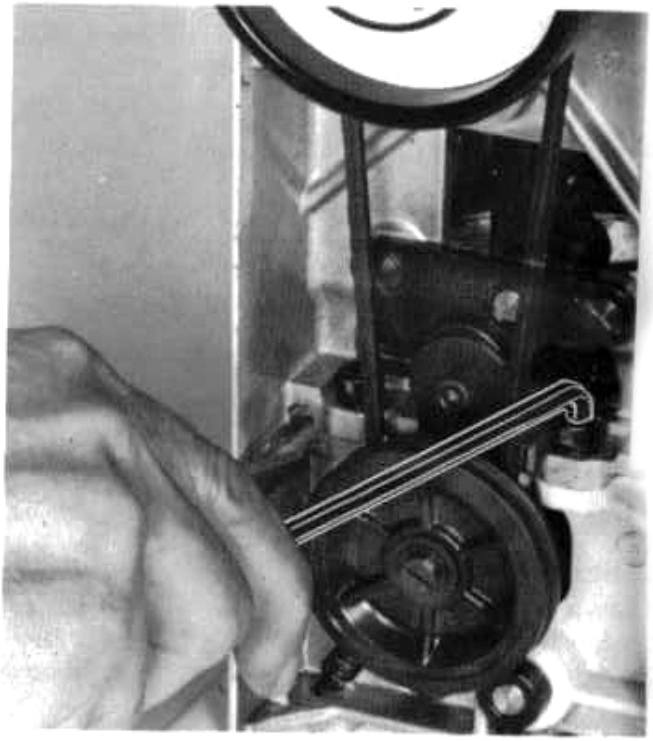


Fig. 3 a

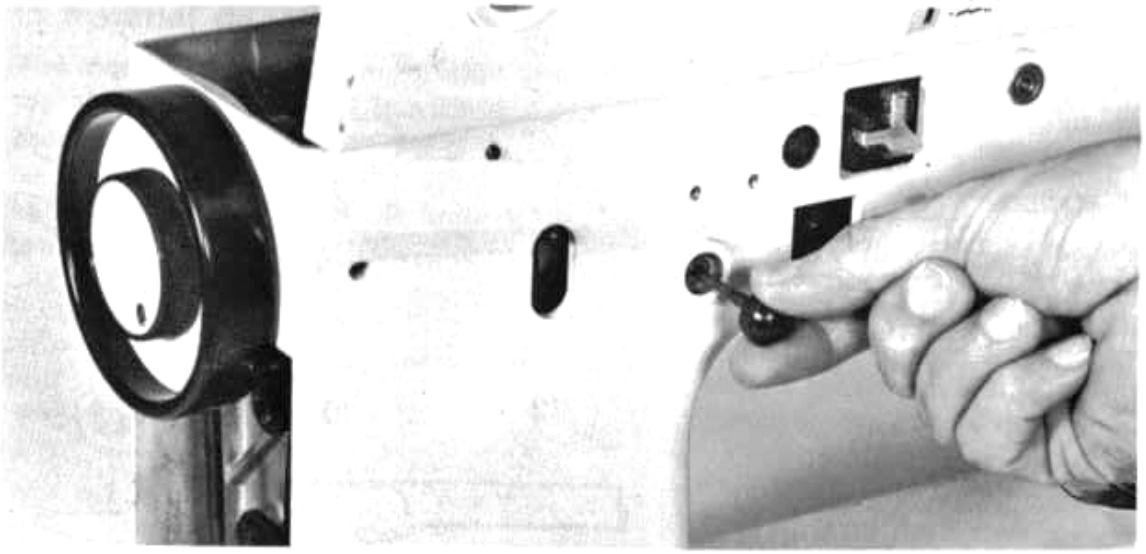


Fig. 4

Adjustment of link and stitch position

L—C—R (left—center—right)

Dismantle rear frame cover with reel holder and twin lever if necessary (from lifter). The front of the link spindle is then accessible.

Place the special tool No. 398 001 04 through the hollow link spindle while at the same time turning the L—C—R knob backwards and forwards until the conical tip of the tool engages with the hole of the link.

This ensures that the link in its normal position pivots around the center of the link spindle.

The L—C—R knob is fixed at the desired center position (zero position). In this position the black line on the front of the knob must be exactly vertical.

In the event of inaccuracy the socket head screw (9) with locknut should be loosened and the L—C—R knob set to its correct position.

Retighten socket head screw (9) and remove the tool.

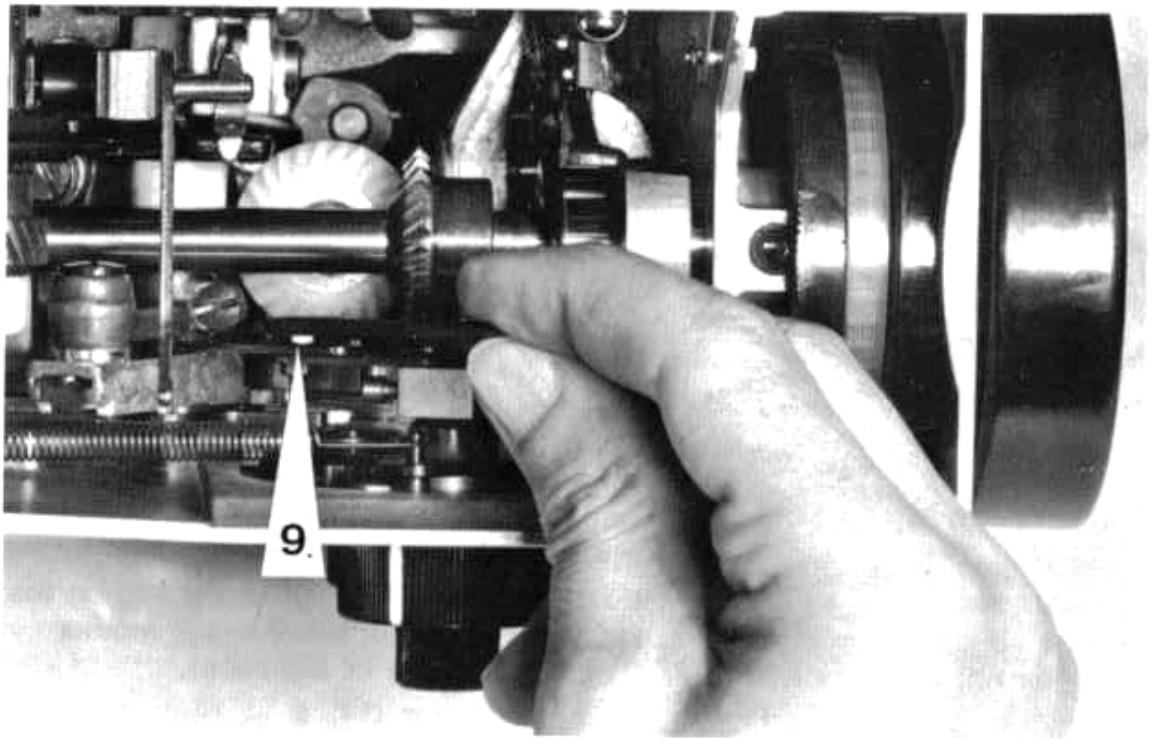


Fig. 5

Rest position of needle

Turn zig-zag knob fully to left — up to stop (position «0») Start machine. The needle swivel support must not make any lateral movement.

It must remain stationary.

If this is not the case, correction is made as follows: screw (10) with conical locknut (11) in the guide fork (12) is loosened with the aid of special spanner No. 398 035 03 (or with a screwdriver for slotted nuts). Then adjust screw (10) up or down until the swivel support, and therefore the needle, remains absolutely still while the machine is running. Retighten locknut (11).

On later models this adjustment only requires a normal screwdriver since the locknut is replaced by a helical spring under screw (13).

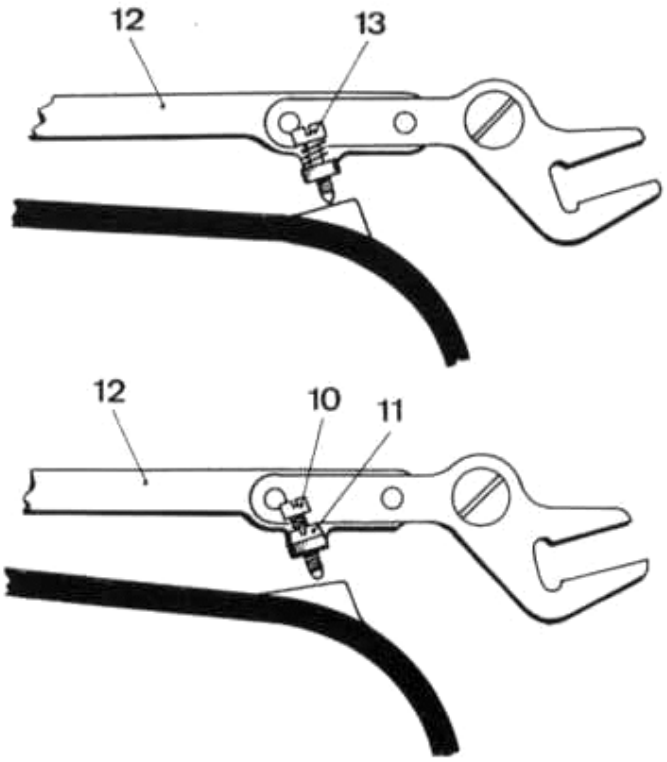


Fig. 6

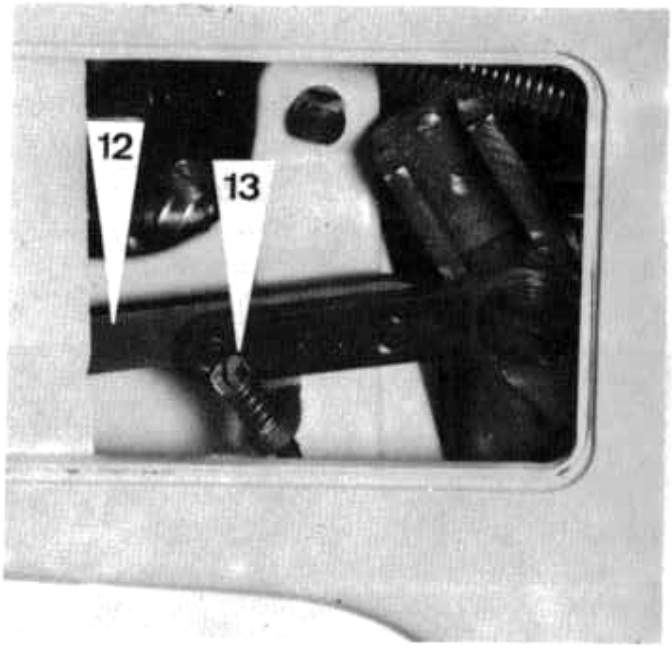


Fig. 6 a

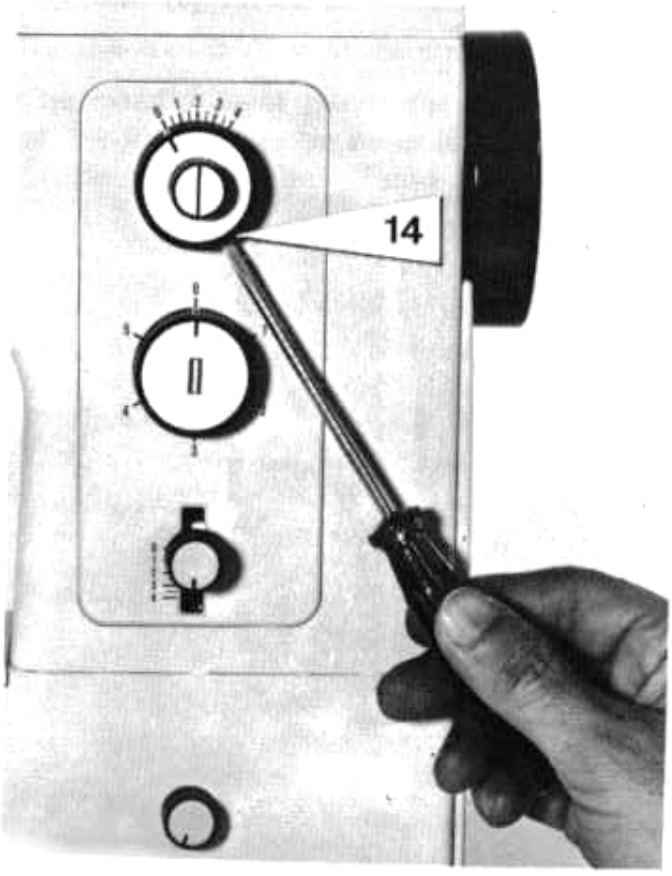


Fig. 7

When the rest position of the needle is corrected, check whether the white marking line of the zig-zag knob coincides with the «0» on the scale.

If not set exactly loosen screw (14) on the zig-zag knob and set the two marks (knob and scale) in alignment.

Retighten screw (14).

Lateral needle movement, transverse to material direction

The needle must pierce through the center of the stitch hole if the black mark on the LCR head is exactly vertical. This can easily be checked if the needle is observed while turning the LCR knob from the left to the right hand position.

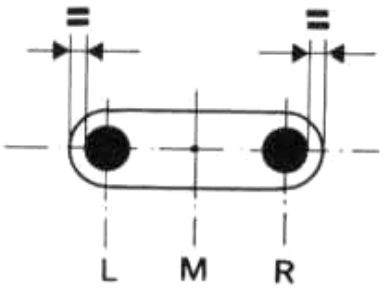


Fig. 8

The distance from the edge of the stitch hole must be the same in each case.

If not, it should be corrected as follows:

Loosen screw (15). Place special fork key No. 398 063 03 on the knurled screw head (16). This screw (16) is formed as a small eccentric. By turning slightly to the right or left the lateral position of the needle can then be brought to the desired position. Screw (15) should be retightened following this correction.

IMPORTANT! Ensure that there is no play between the connecting rod and the needle bar holder.

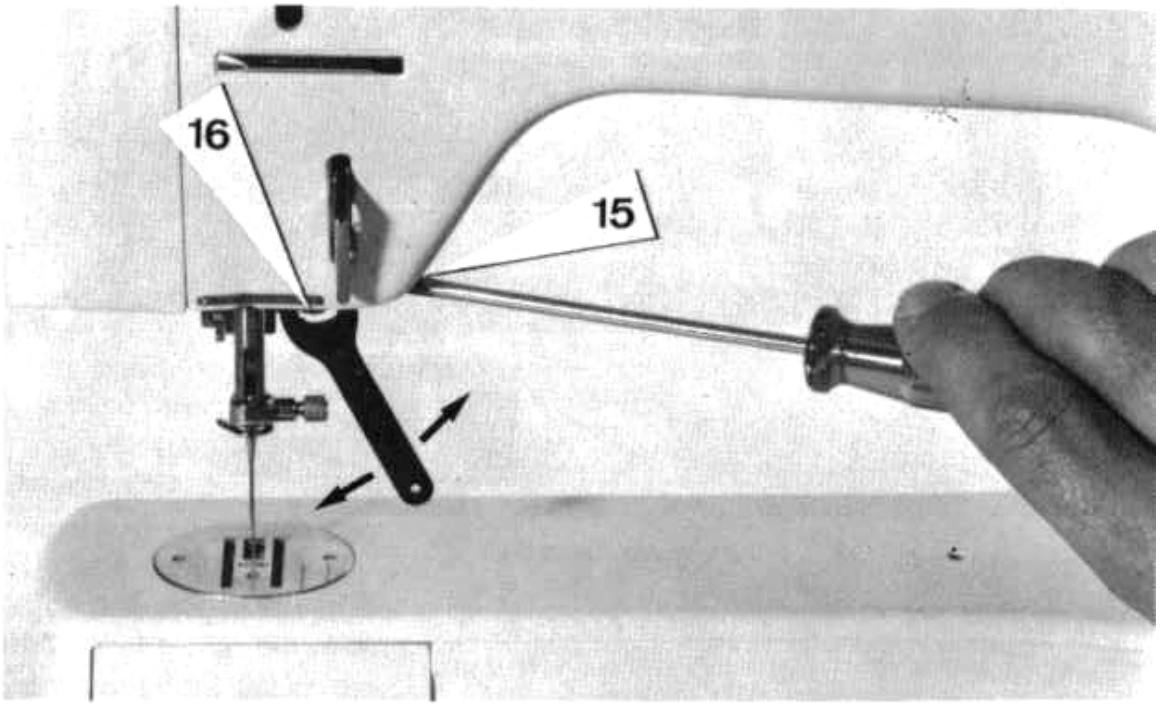


Fig. 9

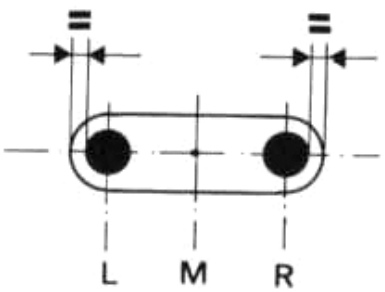


Fig. 10

Stitch position on zig-zag

Set the zig-zag knob to position 4 and observe while turning the handwheel whether the left and right hand penetration is equidistant from the edge of the stitch hole.

If this is not the case, loosen clamping screw (17) of the rocking lever (18) on which the zig-zag link is suspended and set the needle to the correct position.

IMPORTANT: Ensure when moving the rocker lever (18) that no play results between bearing and lever.

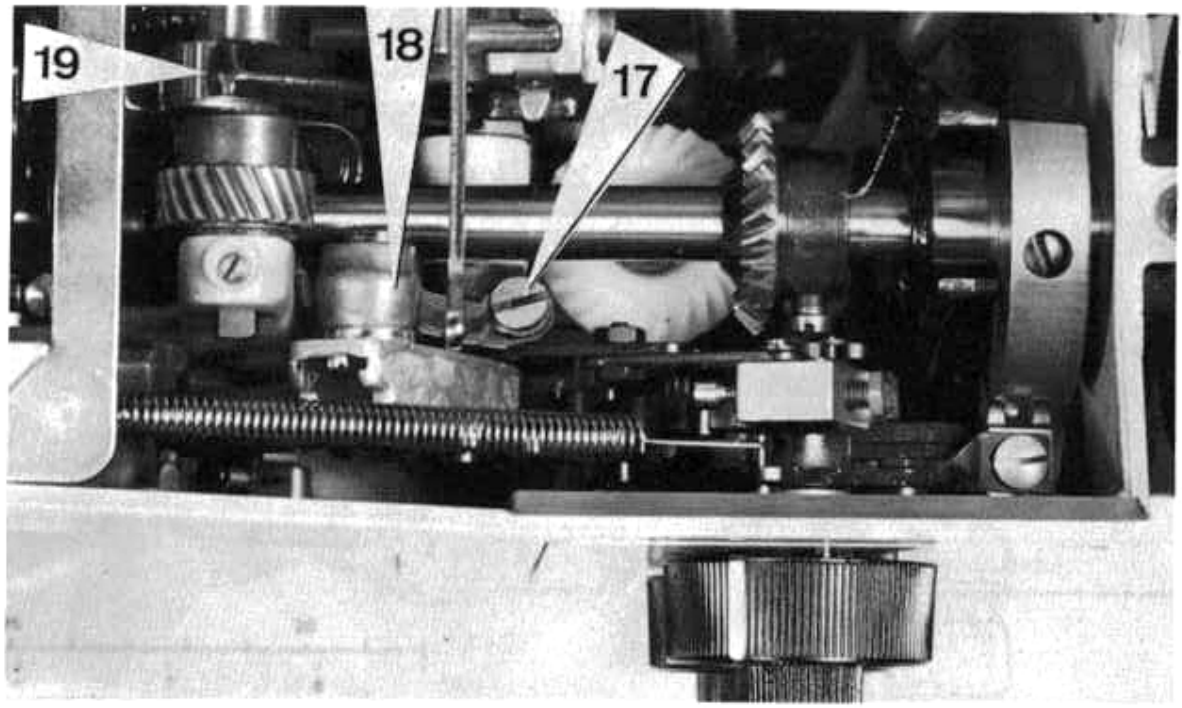


Fig. 11

Lateral motion of needle during zig-zag sewing

The lateral movement of the needle (parabola) must be exactly matched to the up and down motion. It may only begin when the needle has left the work and must cease when the needle pierces the work. The motion is derived from the zig-zag eccentric (19) running at half-speed.

Check:

Set LCR knob to center position.
Set needle to uppermost position by turning handwheel. If the zig-zag knob is then turned backwards and forwards between «0» and «4» **the needle must remain stationary.**

If not, a correction must be made.

Loosen the two screws on worm wheel (20). Then, using the screwdriver, secure the worm wheel (20) which is loose on the spindle while pressing the setting ring (21) and turning the handwheel until the correct setting is found (Fig. 12).

Tighten the two screws on the worm wheel.

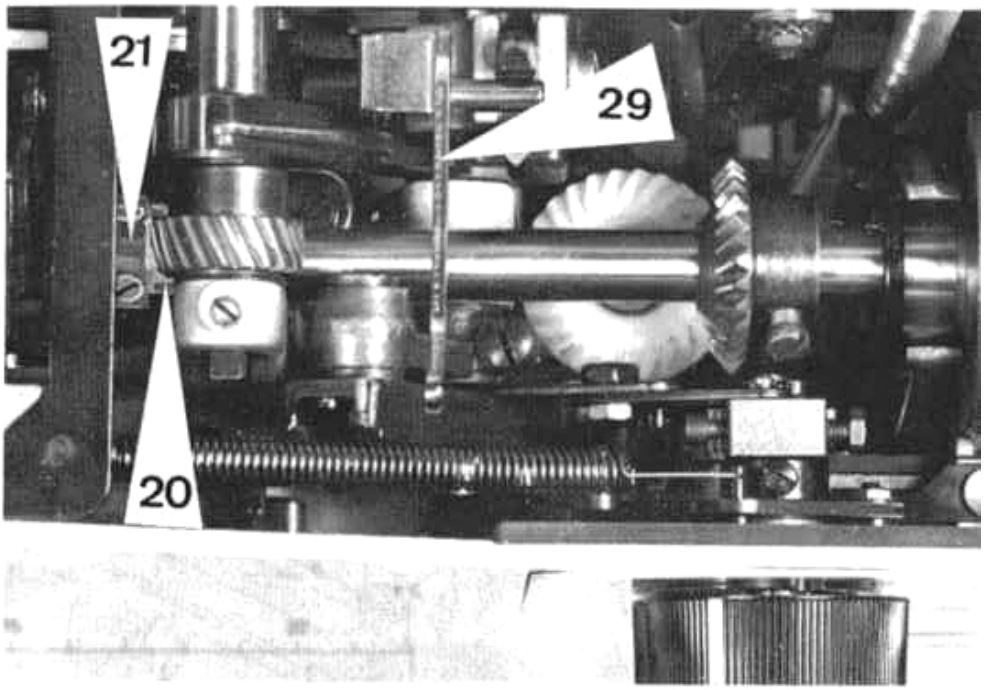


Fig. 12

Set notched carrier

When selecting the individual fancy stitch pattern the selector lever (31) with scanner (34) is moved from one fancy stitch cam to another. Displacement takes place in two movements:

1. Raising of the scanner.
2. Lateral displacement of the scanner.

The notched carrier limits the scanner adjusting lever (stitch selector lever) to the right in the frame cover slot while raising.

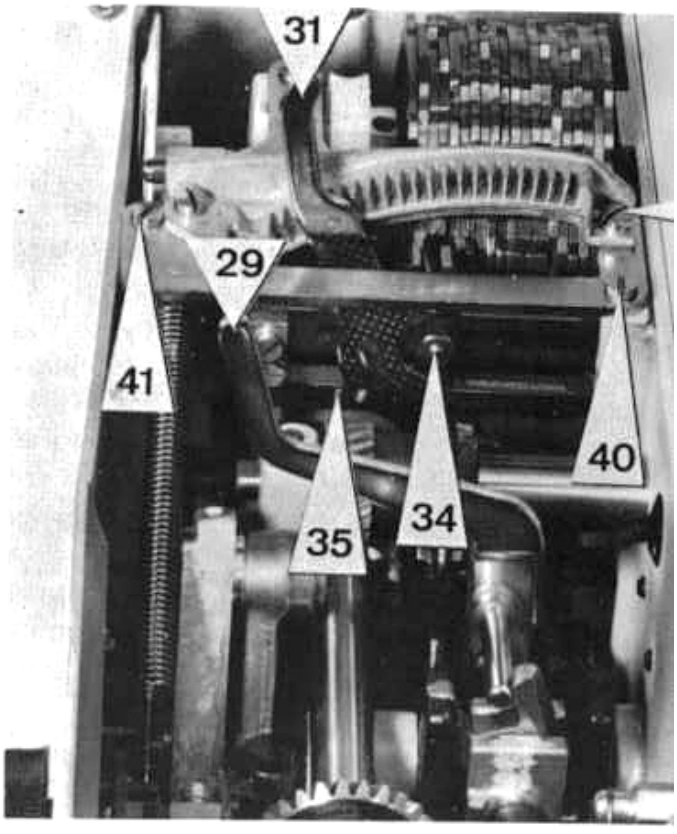
The notched carrier must be set so that there is always a spacing of approx. 1 mm between frame cover slot and lever when the scanner adjusting lever is displaced from cam 1-20.

Scanner support when no automatic stitches are being sewn.

Fig. 17

If correction is necessary, the three screws (40, 41, 42) must be loosened (see Fig. 16).

Fig. 16a



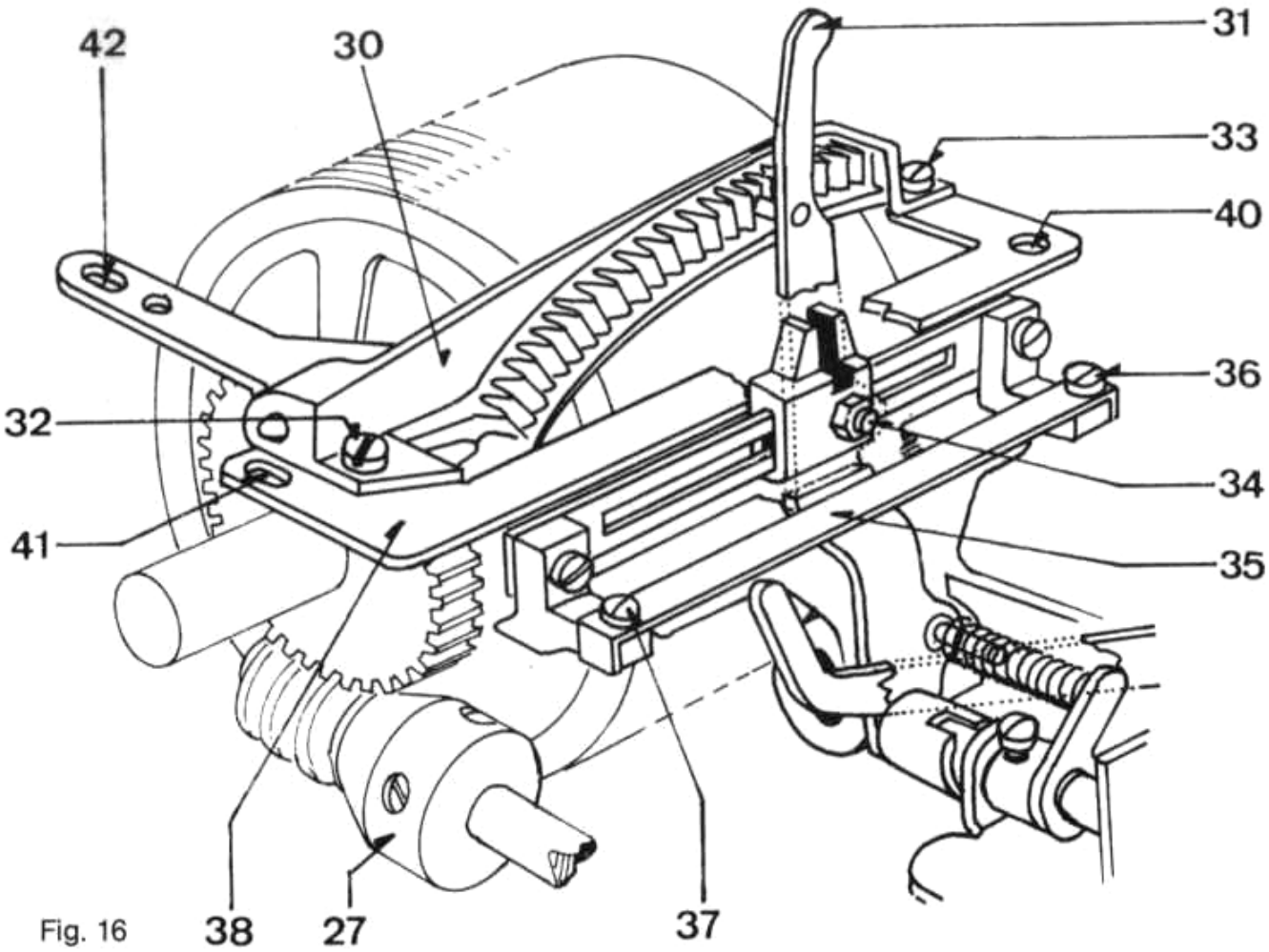


Fig. 16

Setting notched segment

The notched segment (30) is designed to hold the selector lever (31) in the selected position.

The notches must be set laterally so that they coincide with the cams and the scanner on one side and the black mark on the selector lever and the scale on the frame cover on the other.

In order to achieve this it is necessary to move the notched segment sideways, forwards or backwards (depending on deviation). Best check for coincidence: decorative stitch selector lever on No. 2 and 19. If there is a discrepancy, the two fixing screws (32 + 33) must be loosened and the notched segment (30) moved to the desired position. Retighten screws.

Stitch distribution in the needle plate with cam control (automatic)

Set decorative stitch coupling lever (29) to the rear — on scale «1-20». The zigzag or decorative stitch control is then obtained from the cam. To check the stitch distribution select decorative stitch pattern 17 and turn the handwheel until the cam-set fixing screw (25) points vertically upwards. The lateral needle displacement is greatest in this position (set zigzag knob to position 4). The lateral spacing from the stitch hole should then be the same to right and left.

If the stitch distribution has to be corrected, the procedure is as follows: dismantle frame cover with reel pins (possibly also the knee lever suspension bearing underneath). The cam control lever is in 2 parts connected by screw (26). Insert special spanner no. 398 067 03 in the existing hole next to the screw (26).

Then loosen screw (26) slightly. By turning the spanner to right or left the correct needle position can be set. Retighten screw (26).

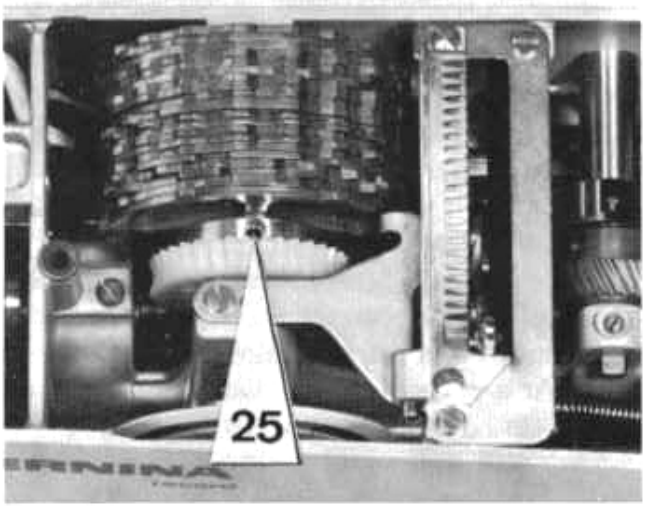


Fig. 13

Lateral motion of needle during decorative stitch sewing (automatic)

When sewing decorative stitches with cams the lateral needle swivel motion (parabola) must be exactly the same as for zigzag sewing.

Check:

LCR knob to centre position, coupling lever (29) to position «1-20», decorative stitch selector lever (31) to symbol 17.

Turn handwheel until screw (25) points vertically upwards and the needle is exactly at the uppermost position.

If then the zigzag knob is turned to-and-fro between «0» and «4» the **needle must remain stationary.**

If not, correction should be made as follows: loosen the two screws (27) on the worm wheel. Secure worm wheel whith screwdrive and turn handwheel forwards or backwards until the correct setting is found (possibly several times).

Retighten screw (27).

Ensure that there is no play between worm gear and setting coller (28).

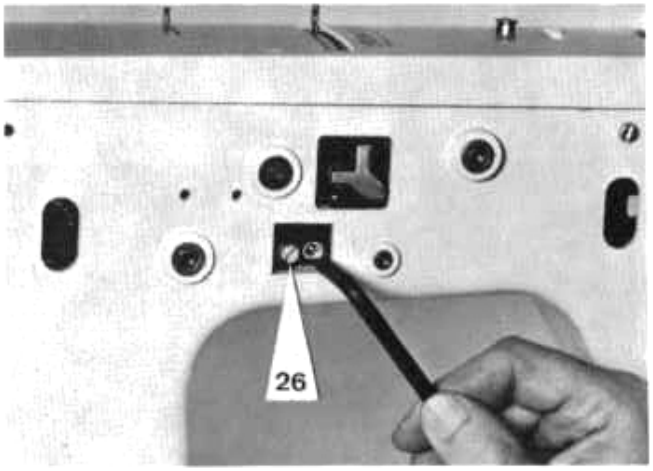


Fig. 14

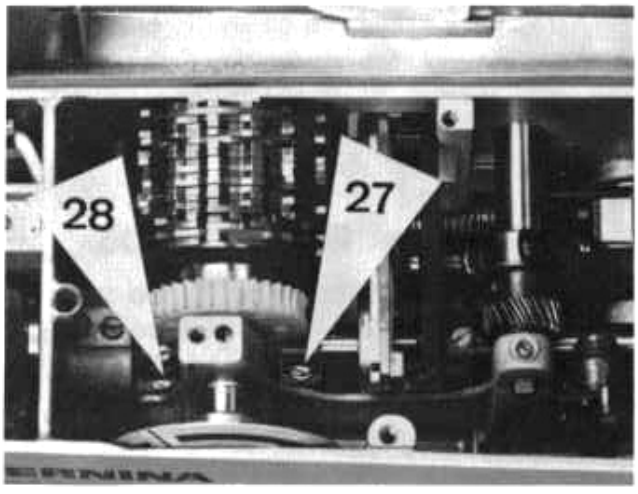


Fig. 15

IMPORTANT: When the drive wheel is turned the ratchet carrier (48) and toggle lever (45) — coupled by ratchet (46) — swing to and fro in synchronism with the zig-zag fork (47). If it happens that the zig-zag fork (47) swings in the opposite direction, the worm wheel (20) must be turned through one complete revolution (360°). For this purpose loosen the two screws on the worm wheel (20) and check again the correct stitch distribution. Ensure that there is no play between the worm wheel (20) and setting ring (21).

(Fig. 15a)

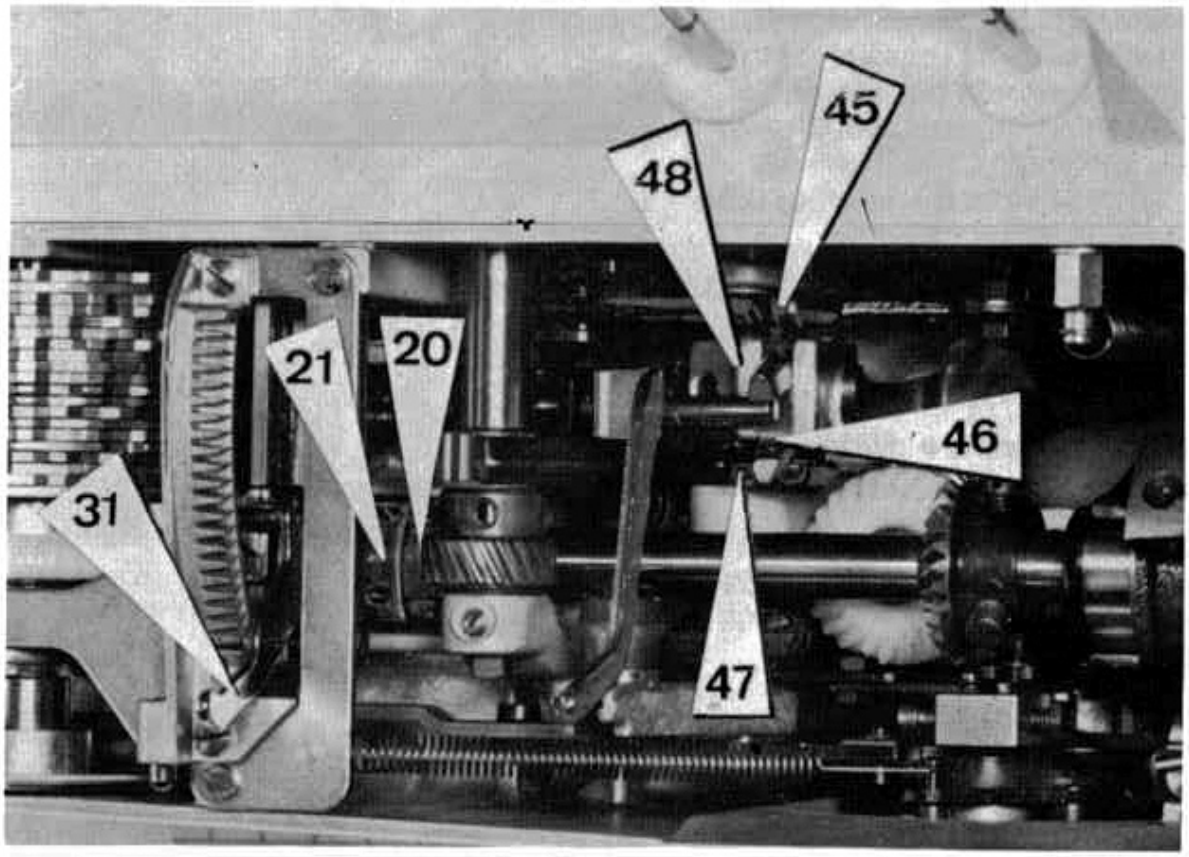


Fig. 15a

Setting scanner lifting strap 35

The scanner must firstly be raised from the cams sufficiently for it not to touch a cam when moved sideways. Secondly, the needle must on no account pierce outside the stitch hole when the scanner is raised.

If correction is necessary, the two screws (36+37) must be loosened. The lifting strap 35 can then be moved to the required position.

(See Fig. 16).

Setting decorative stitch indicator

If the red mark of the indicator no longer coincides with that on the inspection window, the following re-adjustment must be made:

Set fancy stitch selector lever (31) to stitch pattern 13. Coupling lever (2) to 1—20.

Stitch width «4» (no presser foot or thread).

Make a pencil mark as guide below the notch on the inspection window of the **frame.** Raise frame cover. Start machine and observe needle motion. The exact position of the red indicator mark is reached when the needle has made the jump from the righthand side fully to the left.

Set needle with the handwheel to the left hand position so that the tip is exactly at the level of the needle plate. Loosen screw (50) on the indicator, align the red line with the guide mark on the frame. Retighten screw (50).

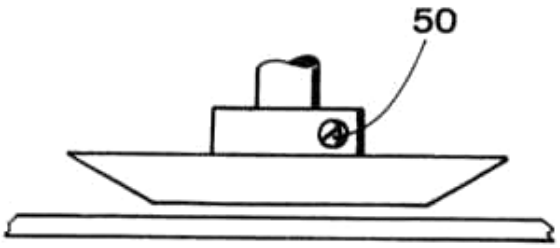


Fig. 18 c

WARNING: Note the distance between indicator disk and frame wall.

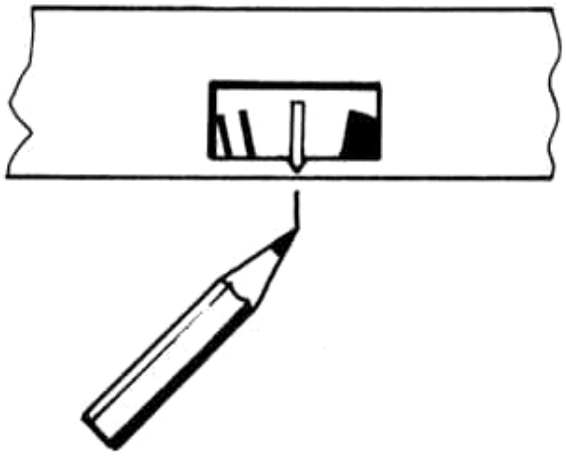


Fig. 18 a

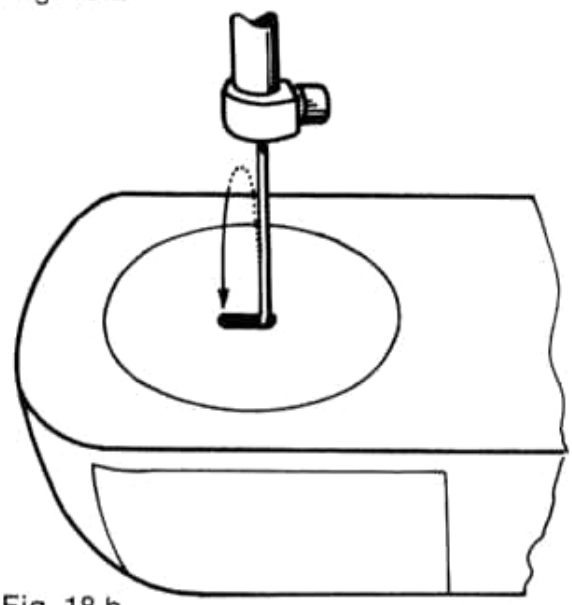


Fig. 18 b

Adjustment of CB-shuttle

(CB = central bobbin)

Use a straight needle without fail for adjusting the shuttle.

Thread passage

There must be a play of 0.3 mm between shuttle (53) and shuttle drive (54) for the thread passage. Check with gauge no. 398 022 02.

If the spacing is too large or too small, the short stem of the shuttle drive should be set with the aligning spanner no. 398 020 03 a little inwards or outwards.

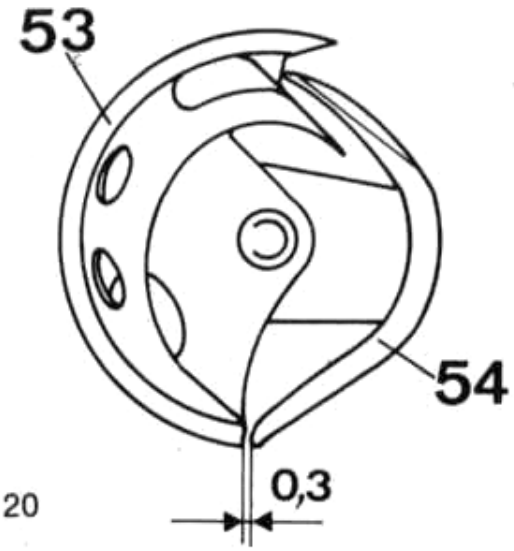


Fig. 20

Position of drive in the shuttle race

The shuttle drive must on no account project beyond the shuttle race.

If a «shuttle drive — needle» correction is necessary, the bearing bush (56) of the shuttle race must be shifted. Loosen screw (58) on the rear of the free-arm base and dismantle the shuttle drive together with pinion.

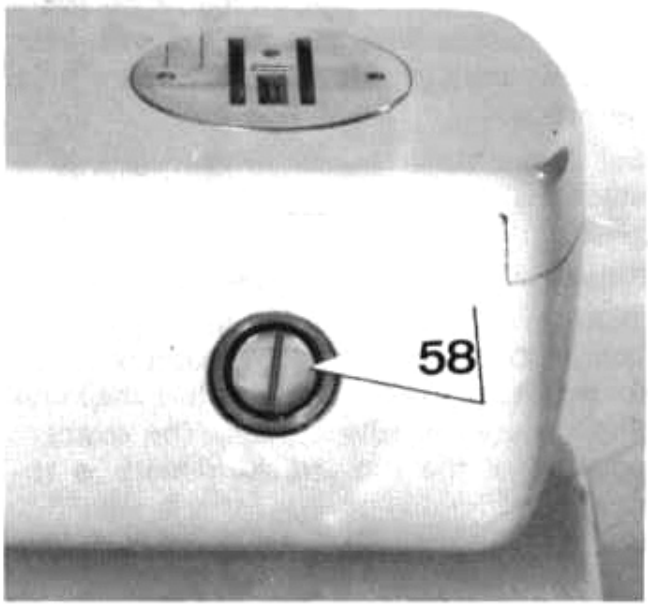


Fig. 23

Insert tool 398 049 04 from the rear of the free-arm base through the shuttle race bore and fit the pin (59). Turn the thrust nut of the tool against the hub of the shuttle race until it makes contact.

The bush (56) can be moved to the rear by turning the knob clockwise.

If correction has to be made forwards, the tool should be inserted from the hinged cover side (or from the front).

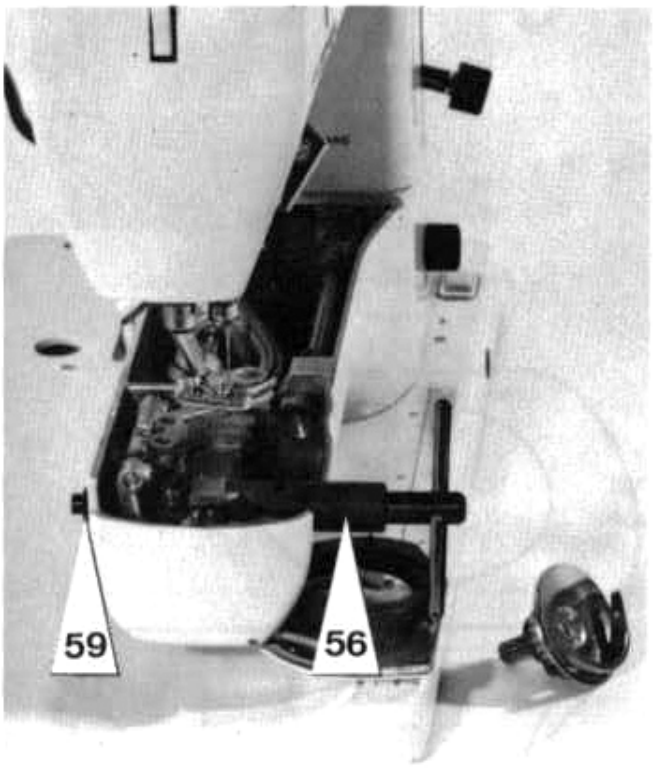


Fig. 24

Setting the return motion

Two settings may be necessary:

I. Correction owing to inaccurate adjustment:

Use a good needle, system 705 B, No. 80 for the adjustment. Set needle deflection to left-hand stitch (zig-zag to «0»). Set rack to forward dead point, loosen screw (60) from rack follower.

Axial displacement of rack to the left = wider return motion.

Axial displacement of rack to the right = narrower return motion.

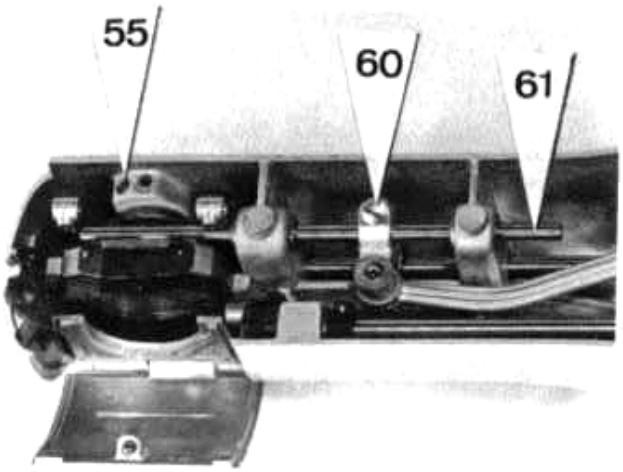


Fig. 25

The spacing is correctly set when the distance between the shuttle tip and the left-hand edge of the needle is 2,8 to 3,0 mm (gauge 398 090 03).

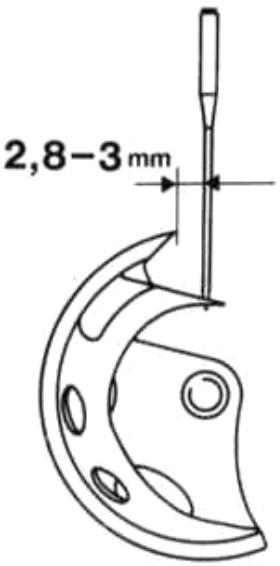


Fig. 26

Secure the toothed rack dog and check the driver for smooth running. Screw out flat headed screw (58) on the driver spindle and move the spindle.

If there is any sticking it should be eliminated by radial twisting of the toothed rack (61).

Replace screw (58) and tighten.

II. Setting the return motion after dismantling the toothed rack and when exchanging a pinned shuttle drive

Loosen toothed rack dog screw (60) and set to forward dead position. Set toothed rack approx. 3 mm from base wall and turn the teeth to the horizontal position (also insert shuttle drive). Secure rack dog, again remove shuttle drive and set approx. centrally between the two rack bearings.

Insert the shuttle drive in the race so that the thread outlet side (short shank) lies slightly below the left-hand bore in the shuttle race.

The remaining adjustment is made as described in point I.

Loop lift

The loop lift is the path traversed by the needle from its lowest point until the moment when the shuttle tip enters the thread loop.

Model 830: loop lift = 1.8 mm
(return motion 2.8 - 3.0 mm)

The loop lift is set on **left-hand stitch** with the aid of the loop gauge No. 398 008 04 (63).

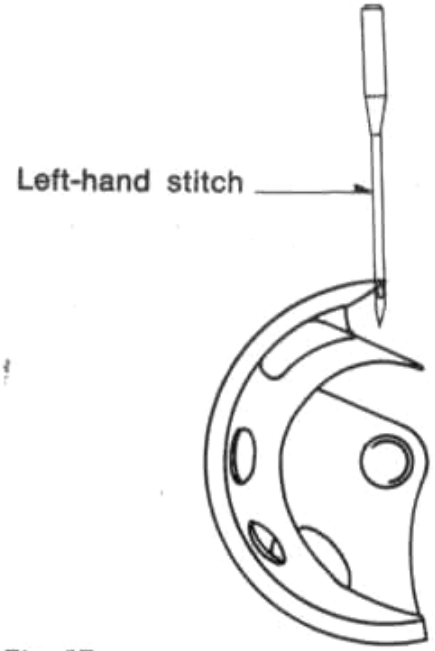


Fig. 27

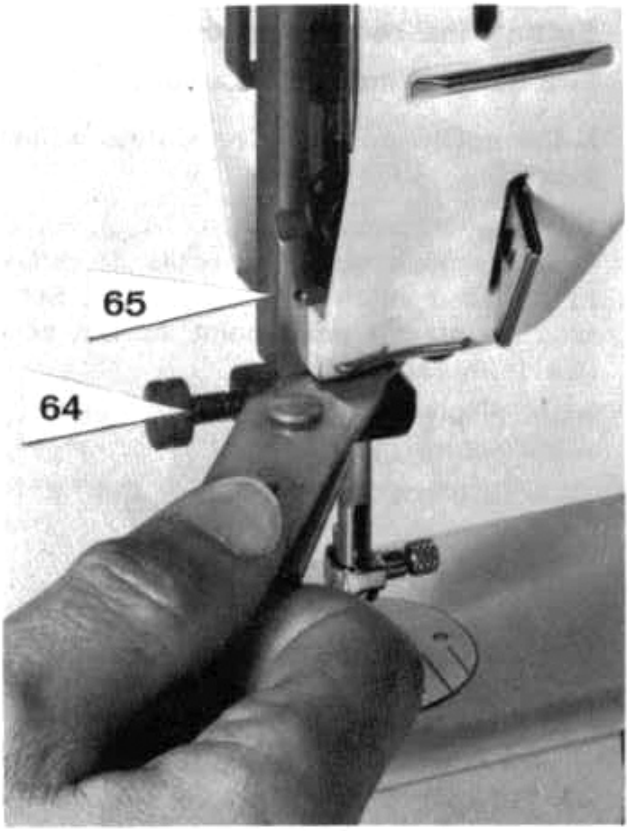


Fig. 28

Set needle bar to lowest position.

Insert loop lift gauge (1,8 mm) beneath the swivel support and raise needle bar by turning handwheel until clamping piece (64) contacts the swivel support (65) (Fig. 28).

In this position the shuttle tip must be at the same level as the right-hand edge of the needle (Fig. 27).

If correction is necessary, loosen the two screws (66, 67) on the lift crank (68). Then by turning the lift crank (68) the shuttle can be set using the shuttle drive so that the shuttle tip intercepts the right hand needle edge. Then tighten screw (66) and recheck setting. Remove clam-

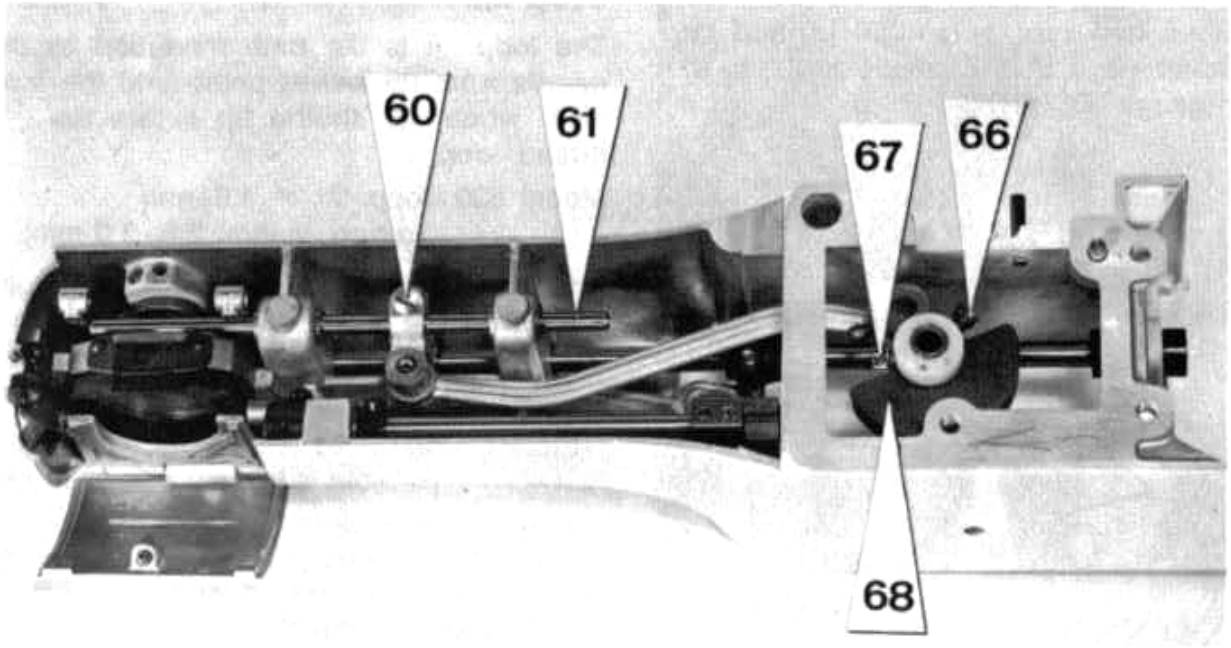


Fig. 29

ping piece and turn the lift crank until screw (67) is accessible. This is a pointec screw and should, therefore, only be tightened when the required setting is obtained. Ensure when tightening the screw that the lift crank is not pushed downwards onto the vertical spindle in order to prevent play between crank and vertical spindle.

Needle height

(adjusting needle bar)

The final needle height should be set after setting the loop lift. The needle pierces on **right-hand stitch.**

After the loop lift is completed the lower edge of the shuttle tip should intercept the upper edge of the needle eye (Fig. 30).

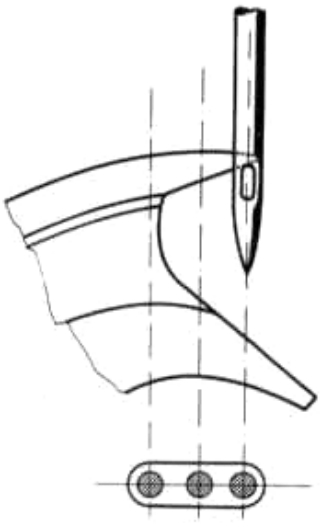


Fig. 30

To correct, loosen the clamping screw (70) of the needle bar dog (71) and set the needle with needle bar to the specified position.

C a u t i o n : The needle bar must not twist!

Possibly check with a double needle.

Finally retighten screw (70).

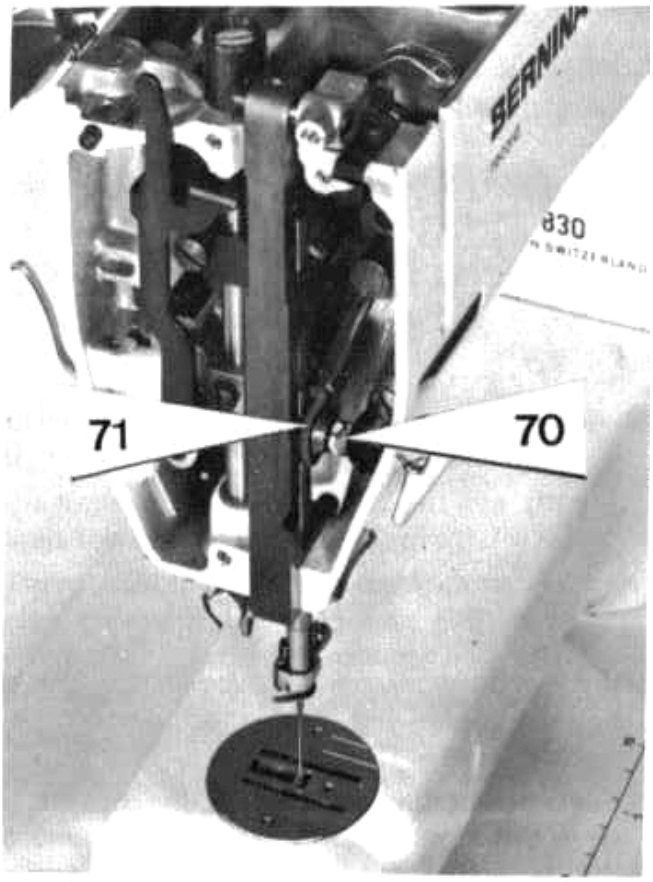


Fig. 31

Lateral shuttle adjustment

The lateral spacing betwen needle and shuttle should be 0.05 mm. If this is greater the result will be faulty stitches, if too small the tip of the shuttle can be damaged.

Correction is performed by shifting the shuttle race. Screw (55) must be loosened. The shuttle race can then be displaced forwards or backwards depending whether

Fig. 21

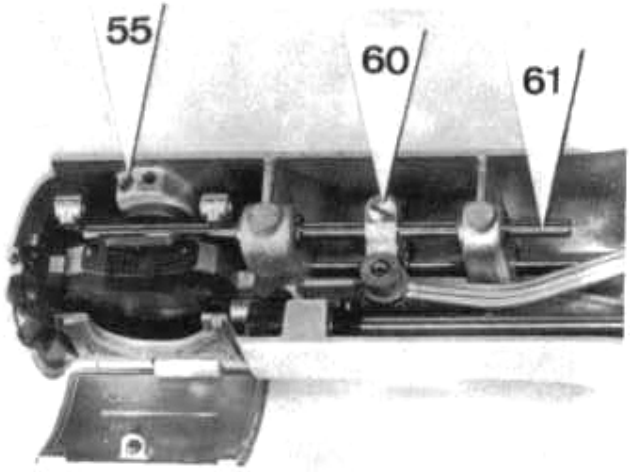


Fig. 22

the needle spacing must be made greater or less. Following proper adjustment re-tighten screw (55).

Ensure that the distance of the needle from the shuttle tip is exactly the same as that between needle and shuttle drive.

The shuttle drive must under no circumstances project beyond the shuttle race.

7. Thread guide plate

The thread guide plate is situated above the shuttle race. The lateral needle spacing from the thread guide plate opening should be approx. 0.3 - 0.5 mm on the right-hand side for maximum zigzag deflection.

In case of discrepancies loosen the two screws (52) and set the thread guide plate to the correct position as illustrated.

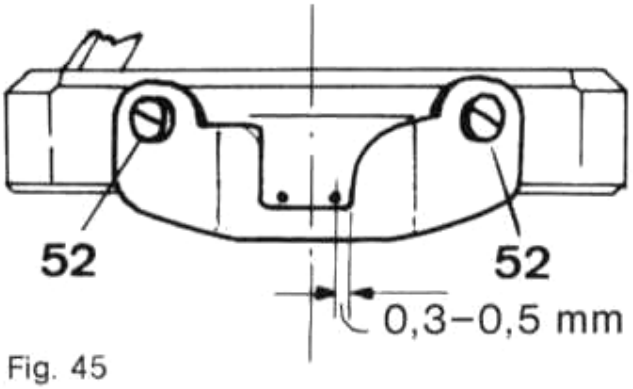


Fig. 45

Material feed

Feed dog in the needle plate

The feed dog (toothed section) must be able to move in the feed dog slot without any sticking.

Even with maximum stitch length there should be sufficient space at front and rear in the needle plate.

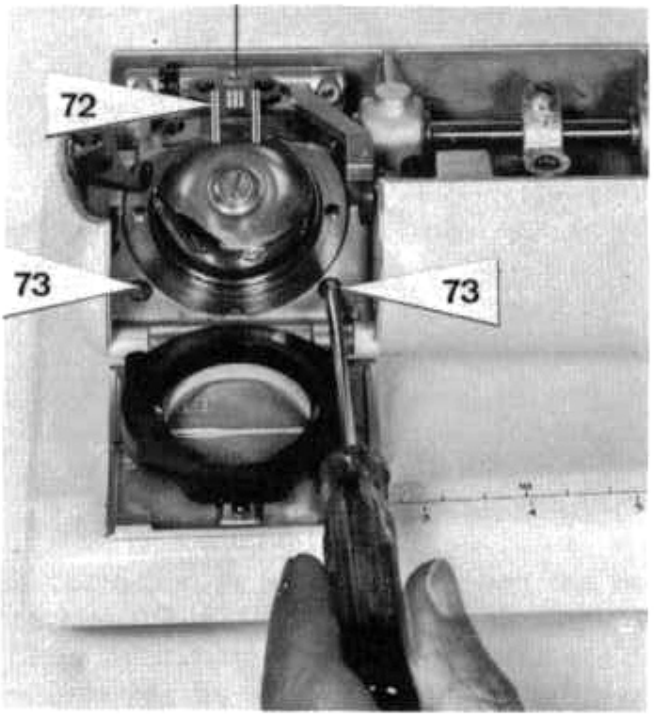


Fig. 32

If the feed dog (72) has to be reset, the two screws (73) must be loosened.

The feed dog can then be shifted in the longitudinal direction and laterally.

Retighten screw (73).

Check with the feed dog lowering knob whether the feed dog can be raised and lowered without sticking.

Height of drop feed control

The tips of the feed dog teeth should project 1.0—1.1 mm over the upper edge of the plate at the highest position.

Check correct setting with gauge 398 027 030.

Turn drop feed lowering knob to «sewing» position.

Place adjustment gauge with the existing notch on the needle plate (1.1 mm at front, 1.0 mm at rear).

Set the longest stitch.

The required drop feed height can then be checked.

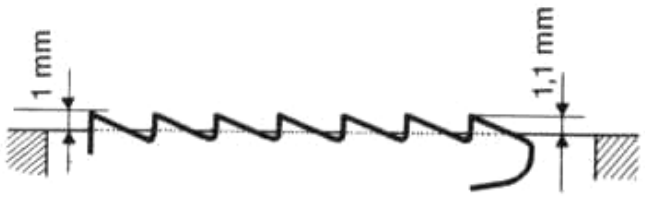


Fig. 33

If correction is necessary, loosen the two screws (75) of the half coupling (74). The latter can then be turned forwards and backwards and the drop feed is raised or lowered. Retighten screws (75) and place cover plate in position.

Check the distances again with the setting gauge 398 027 030.

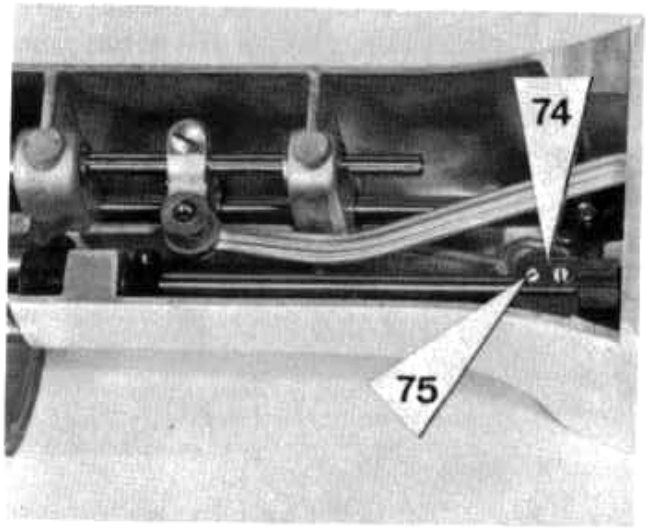


Fig. 34

Depth limit stop for drop feed

The adjusting ring (76) acts as a limit stop for the drop feed at its lowest position.

The lowest point of the feed dog should be limited so that it cannot touch the thread guide plate under any circumstances.

Set drop feed lowering knob to «sewing» (couple).

Bring the drop feed to its lowest position by turning the handwheel.

Disengage drop feed, i. e. set the drop feed lowering knob to «darning».

There should then still be approx. 0.2 mm play before the setting ring (76) with stop limits the downward motion.

Loosen screw (77) if necessary and fix setting ring (76) with stop in the prescribed position. Ensure when re-setting that no axial play exists.

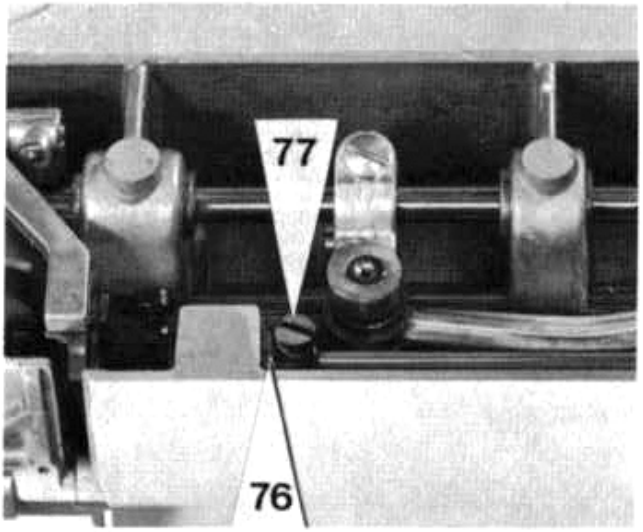


Fig. 35

b) Presser foot adjustment

Lower feed dog, raise lifter lever (86) and attach normal presser foot. Place feeler gauge 398 031 13 (height 6.5 mm) under the presser foot on the needle plate. In this position (spacing 6.5 mm) the material bar guide (84) must lie on the lifter lever (86). If correction is necessary, loosen screw (85) and set the material bar guide to the required position.

Finally check whether the presser foot sole runs parallel to the needle plate slot.

c) Setting the darning device

Remove presser foot and attach darning foot. Lower feed dog. Placer spacer (10 mm) under the darning foot and lower the presser foot bar. Turn handwheel and set the swivel piece (88) so that the screw (89) points vertically upwards.

Then the presser foot bar dog (90) above the presser foot bar guide is released This is moved downwards until it lies on the darning lever.

Retighten screw (91) ensuring that the presser foot bar dog does not twist.

When set correctly the distance between darning foot sole and needle plate is 0.5 mm.

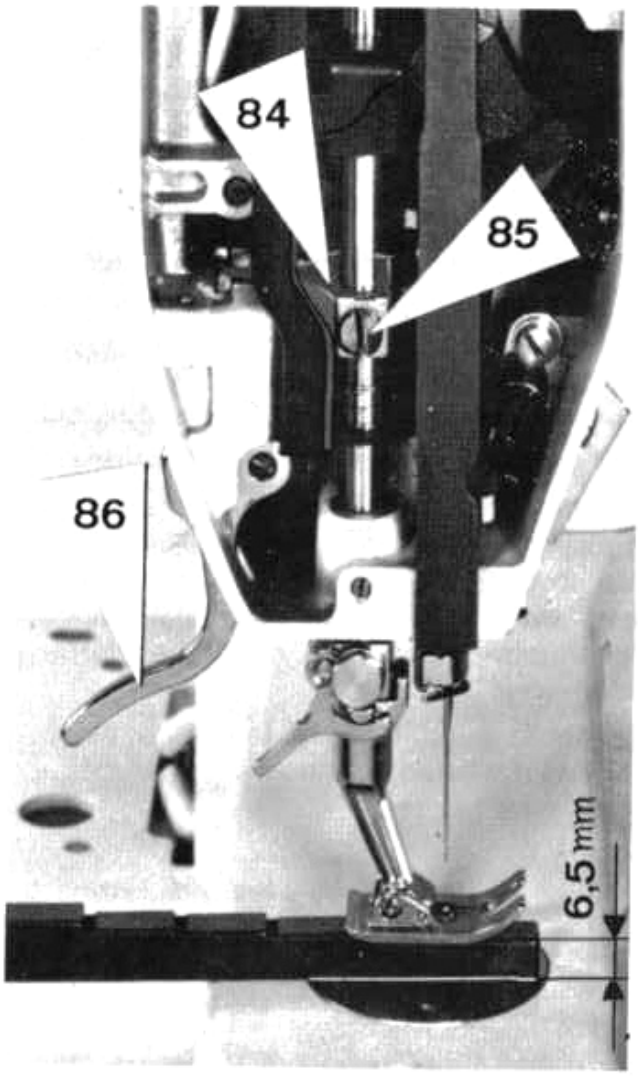


Fig. 39

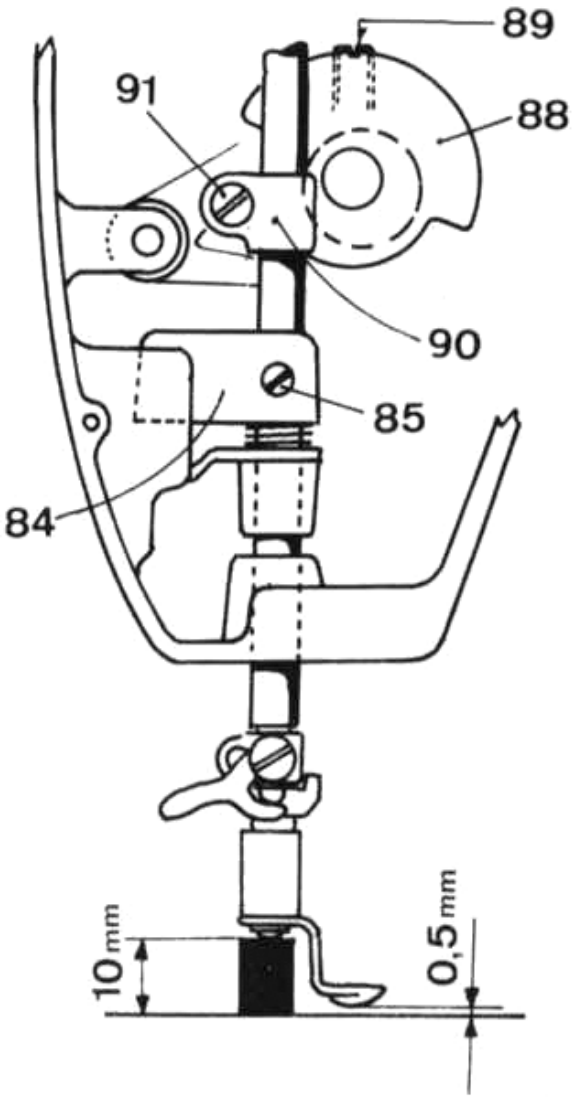


Fig. 40

Adjustment of automatic buttonholer Models 830/831

(old version)

First make the following two adjustments:

Turn buttonhole knob to position «0».
Rotate stitch length adjusting knob (101) up to stop.

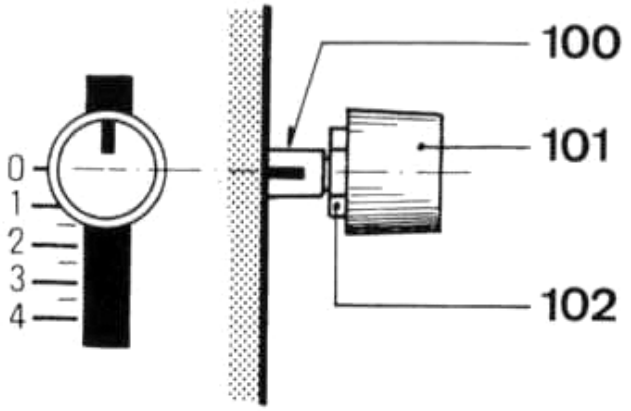


Fig. 41

a) Position of stitch length adjustment knob

The black mark on the front of the knob (101) must point vertically upwards. In the event of discrepancy the hex. nut (102) behind the knob should be loosened and the knob turned to the prescribed position.

Warning: the stitch length adjusting screw must not turn out of the zero position.

b) Zero position of stitch length stop

The mark on the pointer bush (100) must coincide with the figure «0» on the stitch length scale. In the event of discrepancy the hex. nut (103) on the gearing carrier must be loosened (remove belt cover). The stitch length adjustment knob with pointer bush can then be made to coincide with the figure «0» on the scale. Retighten screw (103).

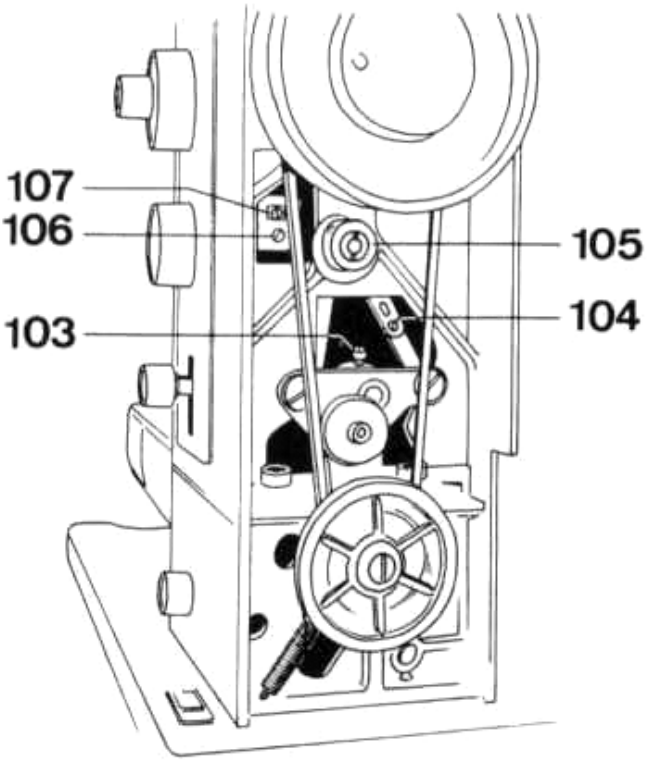


Fig. 42

c) Zero position of stitch setting link

Turn stitch length adjustment knob (101) half a revolution, i. e. the mark must point **vertically downwards.**

Fit needle system 705 B. The needle must be neither bent nor blunt.

Sewing-in material: raw cotton cretonne, 2-ply, place under buttonhole foot (without thread). The sewing speed should be chosen so that at low motor speed (changeover switch at min.) the starter is pressed right down.

3 complete rotations of the fancy stitch indicator should produce a length of 33—37 mm.

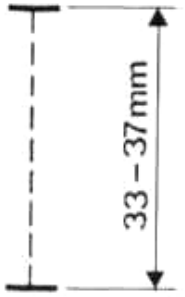


Fig. 43

If the length is not within this range, the link must be adjusted as follows:

Loosen screw (104) slightly for the strap connection adjustment lever-link. Then with the machine running (material remains beneath foot) the link is adjusted by turning the setting ring (105) to the specified feed.

Warning: Secure setting ring until the machine no longer runs. After tightening the strap screw (104) it is necessary to carry out the check with the 3 indicator revolutions again.

2. Setting the bar tack

Turn buttonhole knob (101) to position «2». The material feed for the bar tack stitch should be ZERO with a **minimum feed in the reverse stitch direction** considered tolerable.

If material is still fed, adjustment is made from the drive side (remove belt cover).

Slightly loosen lower clamping screw (106) on the plastic plate. Turn eccentric screw (107) until there is no more feed. Retighten clamping screw (106).

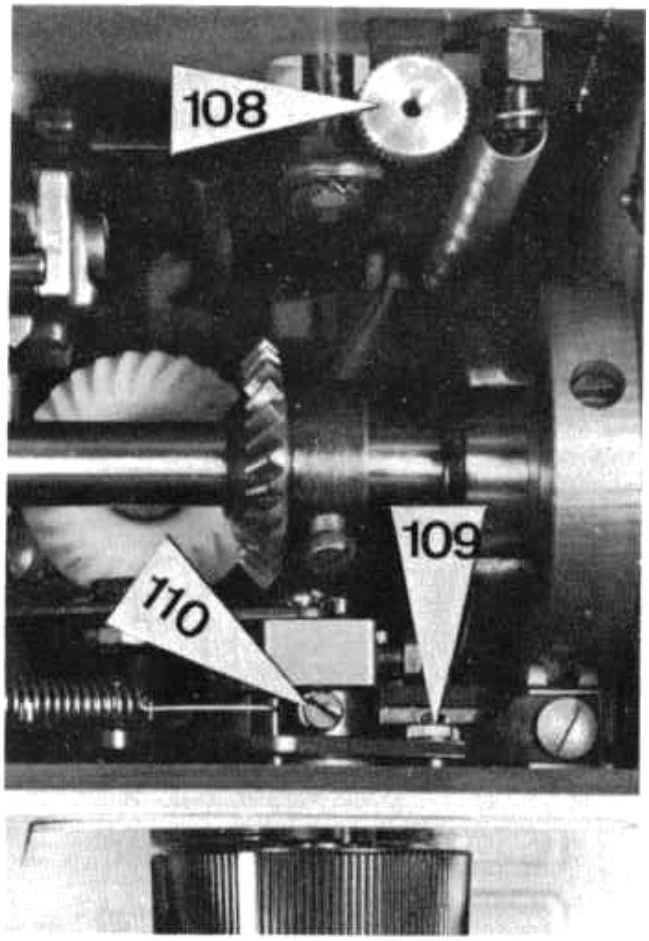


Fig. 44

3. Setting the forward bead

Turn buttonhole knob to position «1».

Sewing-in thread: No. 60, 2-ply, left-hand twist or No. 30/3 right-hand twist.

Sewing-in material: raw cotton cretonne, 2-ply.

Buttonhole-foot.

Bobbin case thread in auxiliary tension.

Adjust satin stitch spacing with stitch length adjustment knob (101) so that the stitches lie side by side.

4. Setting the reverse bead

The satin stitch spacing must be made the same as the forward bead. Regulation is made with the knurled nut (108) (open frame cover). If the bead has to be made tighter the buttonhole knob should first be set to position «4». The spacing is made **closer** by turning the knurled nut (108) to the **right,** i. e. the stitch becomes shorter. Reset buttonhole selector knob to position «3» and check the spacing. If the bead is too close the material feed can be **increased** by turning the knurled nut (108) to the **left,** i. e. the stitch becomes longer.

5. Stitch check of bar tack and bead width

Theoretical sizes:

Bar tack width	4.27 mm
Bead width	1.91 mm
Cut gap	0.45 mm
	(Bead-bead spacing)

If the distance (cut gap) between the beads is too great or too small it should be corrected as follows:

Loosen the hex. nut (109) on the adjustment lever (112). The segment (111) behind the adjustment lever (112) can then be moved (with socket wrench No. 398 084 03). If the segment is moved **downwards** the bead becomes narrower, i. e. the **cutting gap wider.**

If the segment is moved **upwards** the bead becomes wider, i. e. the **cutting gap narrower.**

Following adjustment the position of the zig-zag knob should be checked (marker line must coincide with the figure «0» on the scale). Loosen screw (110) if necessary and set knob to correct position.

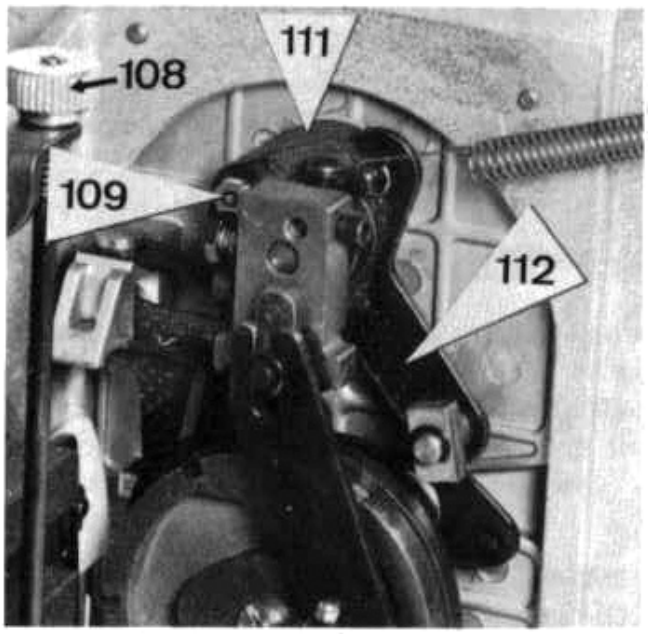


Fig. 45

Clamping knurled nut (108)

To prevent subsequent rotation of the knurled nut (108) after setting at the factory it is secured with a grub screw.

Grub screw M 3 x 3 (No. 200 014 43) is screwed into the existing tapped hole of screw (108) and tightened.

This can also be fitted if necessary on machines not so fitted.

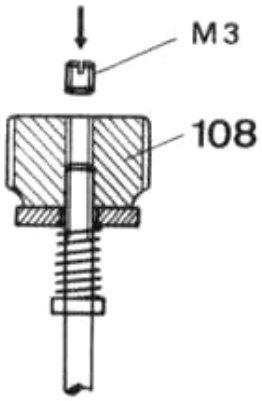


Fig. 46

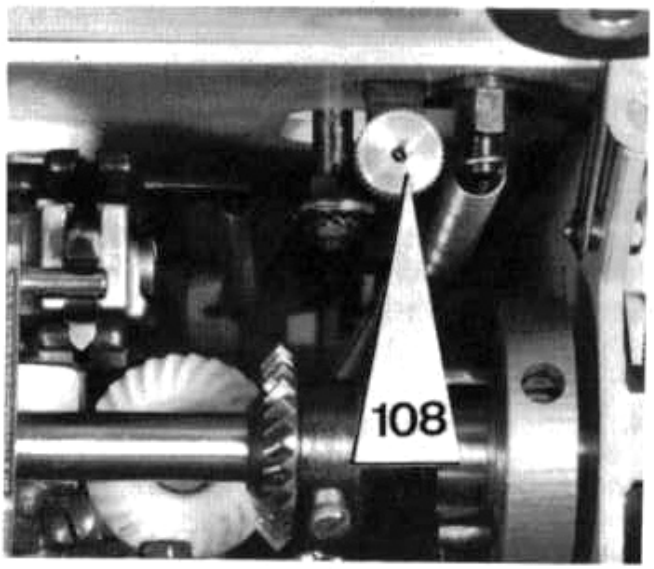


Fig. 47

Adjustment of automatic buttonholer
(new version)

All model 830 machines and variants **without** regulating screw (108) are provided with a new, fixed stitch length stop.

The following setting instructions for the automatic buttonholer apply to these machines.

Turn buttonhole knob to position «0».

Screw in stitch length adjustment knob (101) to the stop.

a) Position of stitch length adjustment knob

The black mark on the front of the knob (101) must point vertically upwards. In the event of discrepancy the hex. nut (102) behind the knob must be loosened and the knob turned to the specified position.

Warning: the stitch length adjustment screw must not turn from the zero position.

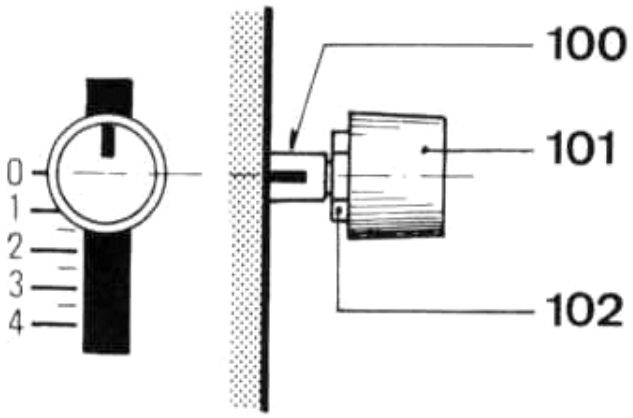


Fig. 48

b) Zero position of stitch stop

The mark on the pointer bush (100) must coincide with the figure «0» on the stitch length scale. In the event of discrepancy the hex. nut (103) on the gearing carrier must be loosened (remove belt cover).

The stitch length adjustment knob with pointer bush can then be made to coincide with the figure «0» on the scale. Retighten screw (103).

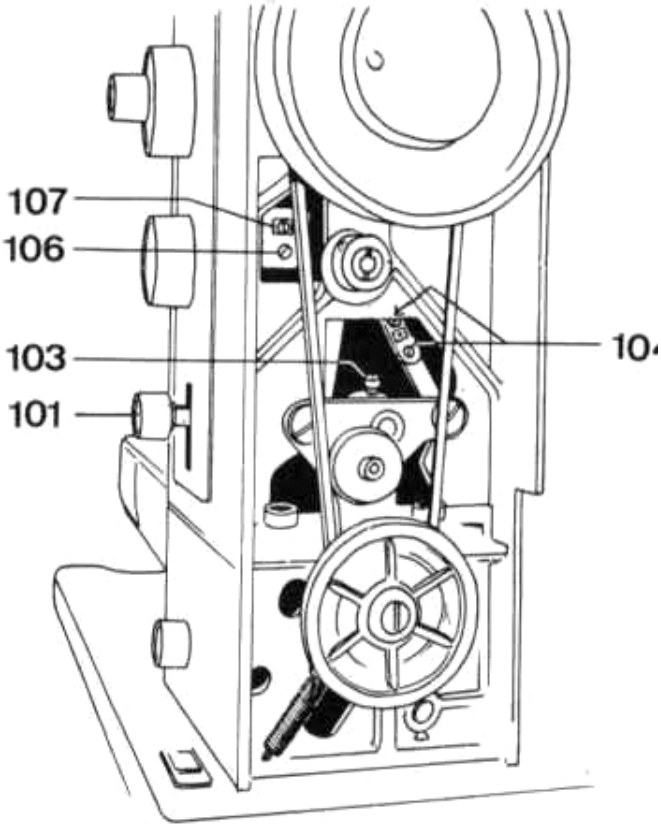


Fig. 49

1. Setting bar tack spacing

Turn stitch length adjustment knob (101) half a rotation, i. e. the mark must point vertically downwards.

Turn buttonhole knob to position «2».

The material feed for the bar tack width should be ZERO.

If the material is still fed, adjustment must be made from the drive side (remove belt cover). Slightly loosen lower clamping screw (106) on the plastic plate. Turn eccentric screw (107) until there is no more feed. Retighten clamping screw (106).

2. Zero position of stitch setting link

Sewing forward bead:

buttonhole knob to pos. 1
indicator disk 2 complete revolutions

Sewing reverse bead:

buttonhole knob to pos. 3
indicator disk 2 complete revolutions

Measure:

difference in length between forward and reverse beads.

Both beads should be same length with a tolerance of 1 mm less for the reverse bead.

If the difference in length is outside this tolerance the zero position of the link must be regulated.

a) loosen both screws (104) of the strap connector;

b) the link can be adjusted by shortening or lengthening the strap using eccentric key 398 091 03.

If the reverse bead is shorter than the forward bead the two strap connectors must be relatively displaced, i. e. the axial distance from link to stitch setting screw must be shortened.

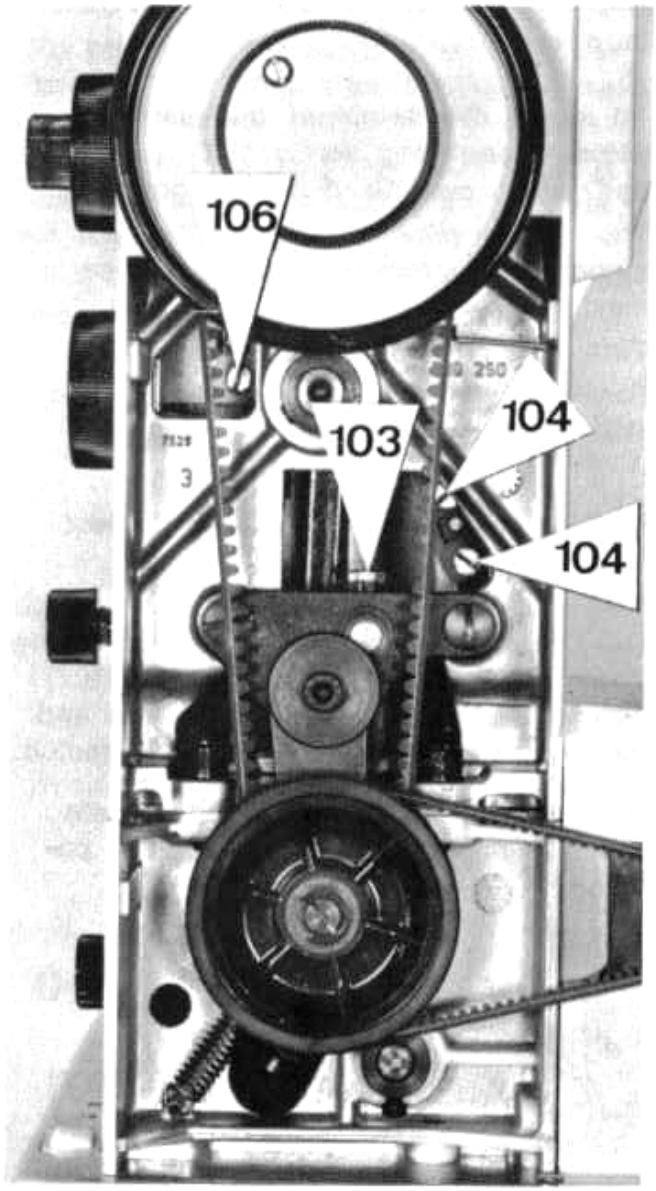


Fig. 50

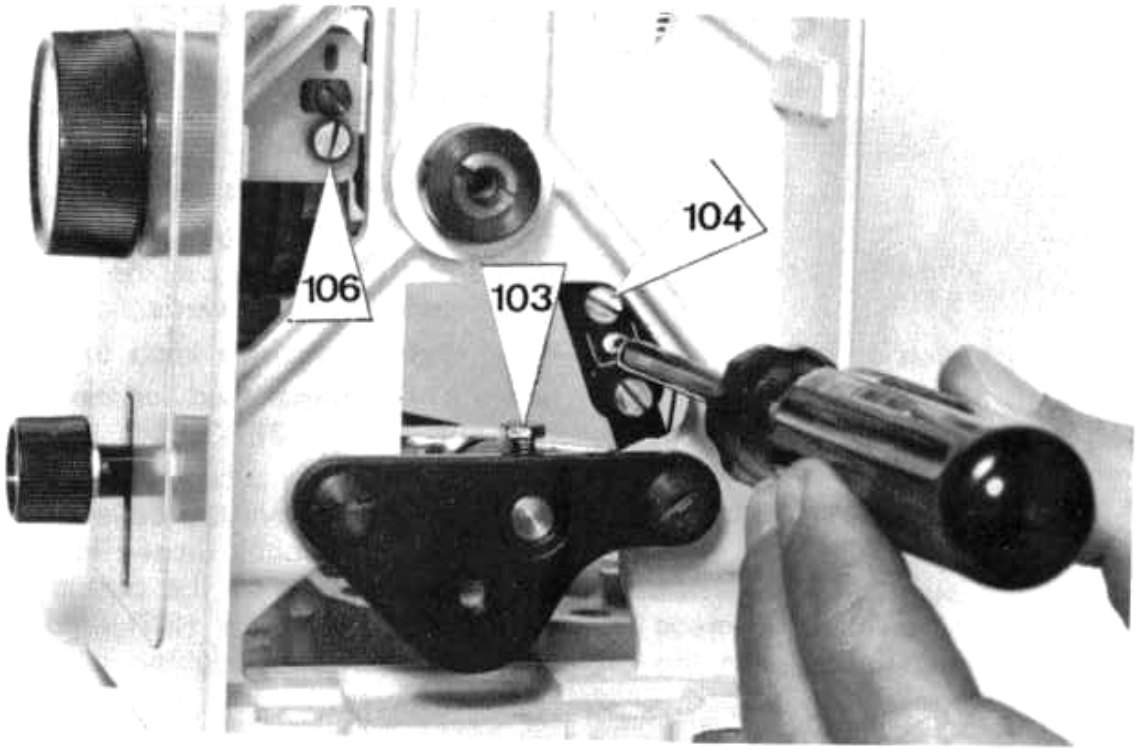
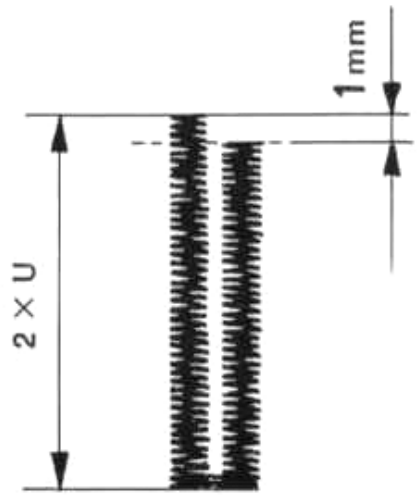


Fig. 51

Fig. 52



2 x U 2 revolutions of the indicator disk

If the reverse bead is longer than the forward bead the two strap connectors must be moved apart, i. e. the axial spacing of link and stitch setting screw must be lengthened.

Warning: 1 mm difference in the bead length requires a correction of only 1/100 mm at the link, i. e. only a very small turn must be made with the eccentric key.

We recommend the following for the adjustment described:

Use sewing thread No. 60, 3-ply, left twist or sewing thread No. 30, 3-ply, right-hand twist;

bobbin thread on additional tension;

needle system 705 B (neither blunt not bent).

4. Stitch check of bar tack and bead width

Theoretical figures:

Bar tack width	4.27 mm
Bead width	1.91 mm
Cutting gap	0.45 mm (bead-bead spacing)

If the spacing (cutting gap) between the beads is too great or too wide, correction should be made as follows:

loosen the hex. nut (109) on the adjustment lever (112). The segment (111) behind the adjustment lever (112) can then be moved. (with socket wrench No. 398 084 03).

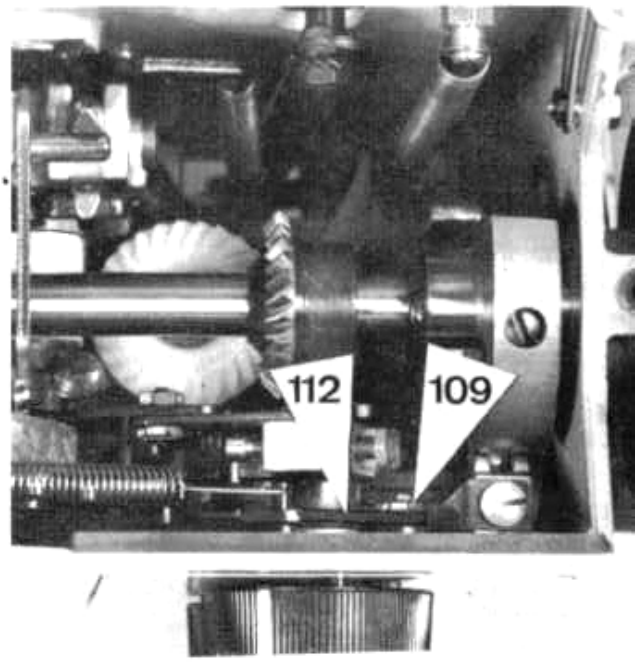


Fig. 5

If the segment is shifted **downwards** the bead becomes **narrower,** i. e. the cutting gap is wider.

If the segment is moved **upwards** the bead becomes **wider,** i. e. the cutting gap is narrower.

Following adjustment the position of the zig-zag knob should be checked (marking line must coincide with the figure «0» on the scale). Loosen screw (14) if necessary and set knob to correct position (see page 6).

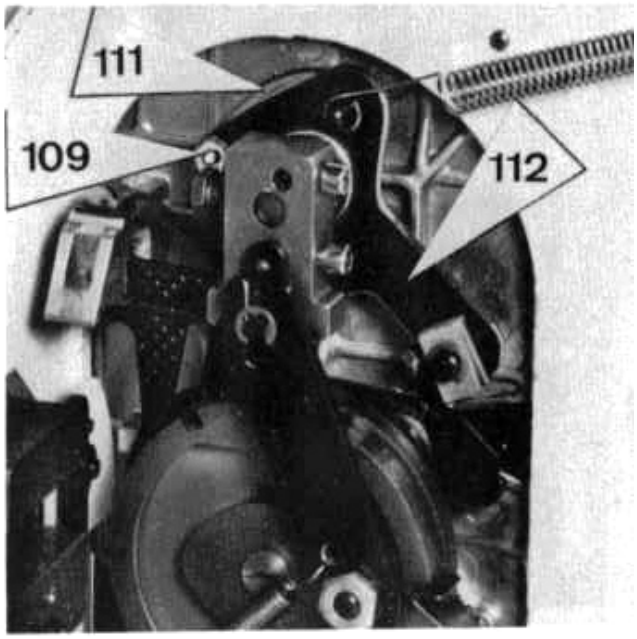


Fig. 5

Assembly and dismantling of rear*) frame cover

The 3 circlips can be removed with a normal screwdriver.

It is best to release the fixing pins slightly with the screwdriver before removing the circ lips. They can then be removed far more easily (one revolution of the screwdriver is sufficient).

A special tool is an advantage for mounting the locking rings. This tool has a holding device with which the ring can be inserted over the securing pin of the cover without difficulty.

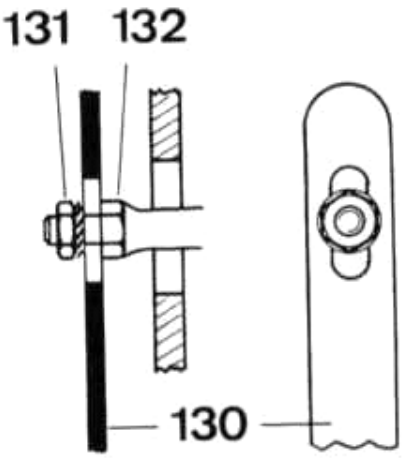
(Tool No. 398 083 03).

Fig. 55

Adaptation of lifter lever

Hold the threaded pin (132) with a socket wrench and loosen nut (131). The lifter can then be optimally adapted to the operator by moving the connector bar (130) up or down. Retighten hex. nut (131).

Fig. 56



*) Addendum: On later machines the above mentioned circlip is replaced by a securing spring (no special tool required).

Upper thread tension

Check and adjust the upper thread tension with the setting weight No. 398 080 040 for model 830.

The bobbin case yarn contained in a brand new machine should be used as test yarn.

The bobbin with sewing thread No. 60, 3-ply, white, left-twist, is placed on the front reel pin and threaded as far as the take-up lever in its highest position.

Warning: lay the thread to the right of the intermediate disc.

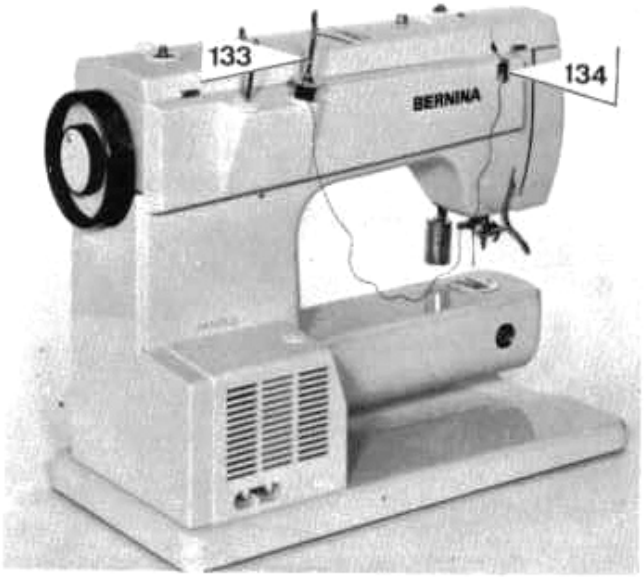


Fig. 58

Approx. 30 cm thread is drawn off the bobbin so that when checking the take-off speed the thread hangs **loosely** between reel pin (113) and diverting eye (134).

The weight is then suspended on the thread and the speed of take-off noted.

The thread is correctly tensioned when the weight draws the thread **very slowly.**

The permissible take-off speed is 30 ± 10 secs. for a length of 55 mm (length of take-up lever slot, see Fig. 59).

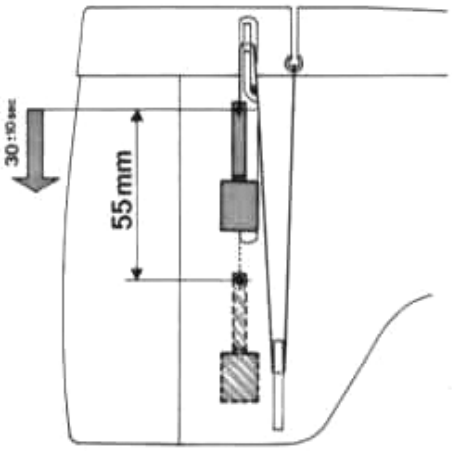


Fig. 59

If the thread tension is set inaccurately, correction should be made as follows:

1. Turn the thread tension nut towards the scale window (reduction of tension) until the weight moves well. The thread between reel pin and diverting eye must be slack.
2. Turn the thread tension nut away from the scale window until the take-off speed reaches the value specified above of 55 mm in 30 ± 10 secs.
3. Adjust the thread tension scale to the mark on the frame cover.

   The scale must be as close as possible to the wall but must not touch it.

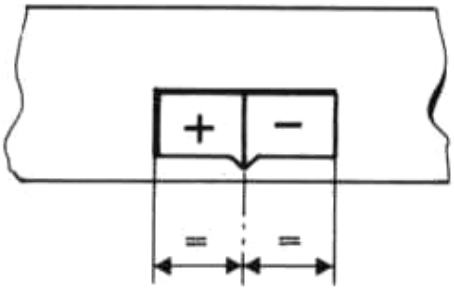


Fig. 60

Check of lower thread tension

Metrosene:	mercerised thread 100 / 3	(Ne 60 / 3)	or
Darning thread:	mercerised thread 120 / 2	(Ne 70 / 2)	or
	mercerised thread 100 / 2	(Ne 60 / 2)	

Regularity check

Check whether the thread can be moved to-and-fro perfectly freely as it leaves below the bobbin case spring.

Fig. 62 Bobbin case spring must be on top without fail.

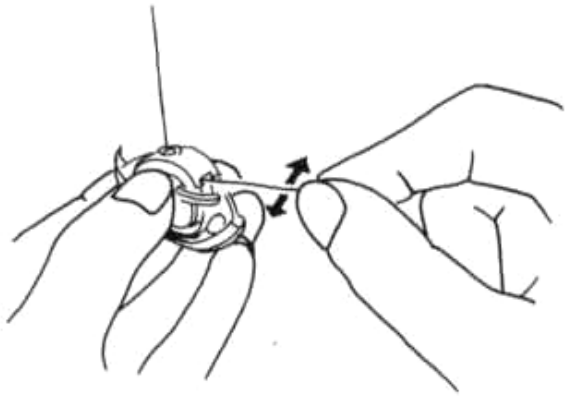


Fig. 62

Tension check

The shuttle must be used as a weight to check the tension.

As illustrated, the shuttle with bobbin case is suspended from the lower thread to check the tension.

When the hand is lightly jerked, the shuttle and bobbin case should move slowly downwards.

They must stop moving immediately, however, when the movement of the hand ceases.

Regulation

Regulation is performed on the bobbin case spring screw with the aid of a small screwdriver.

turning to left = weaker
turning to right = stronger

Upper thread tension

Adapt the upper thread tension to that of the lower thread set as described above.

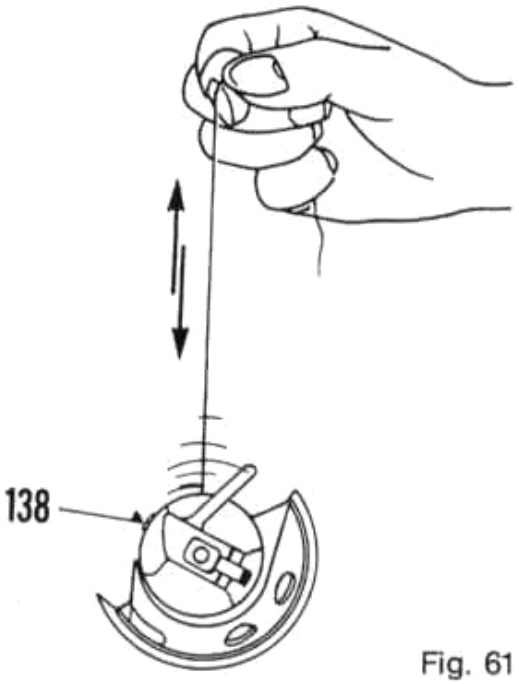


Fig. 61

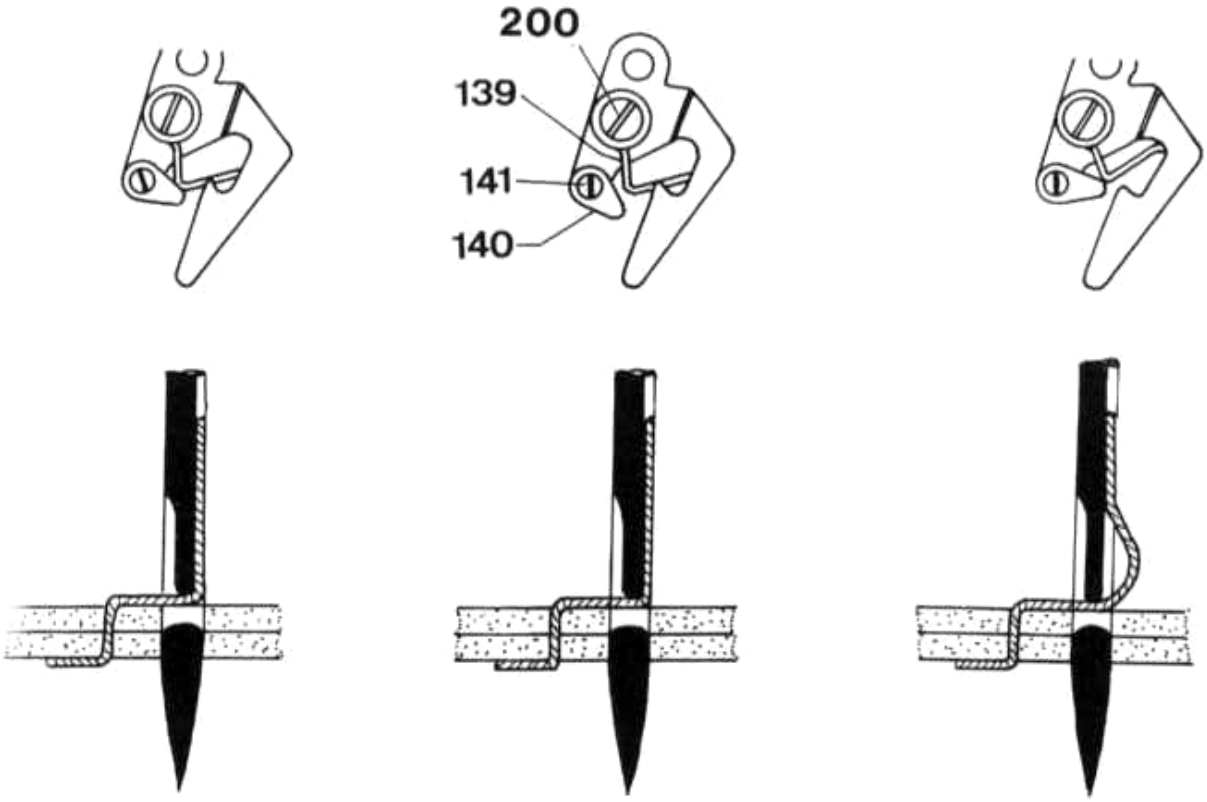


Fig. 63

a)
correct

b)
wrong

stop (140)
too low

c)
wrong

stop (140)
too high

Setting the thread regulator

The thread regulator spring (139) should lie on the limiter (140) at the instant when the eye of the needle enters the work. The stop (140) can be set to the correct position by turning screw (200) (Fig. 63).

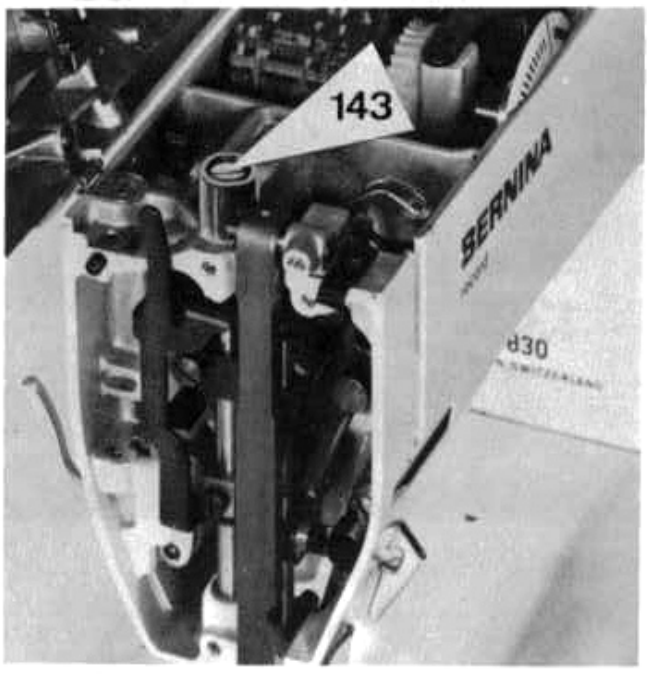
The tension of the regulator spring (139) is also important. This must neither be too loose nor too tight. The correct setting is obtained when the spring (139) takes off the thread with the necessary «liveliness». The tension can be made stronger or weaker by turning screw (141) to left or right.

Fig. 64

Regulation of foot pressure.

If necessary the presser foot pressure can be regulated with screw (143).

Factory setting = 1200 grms.



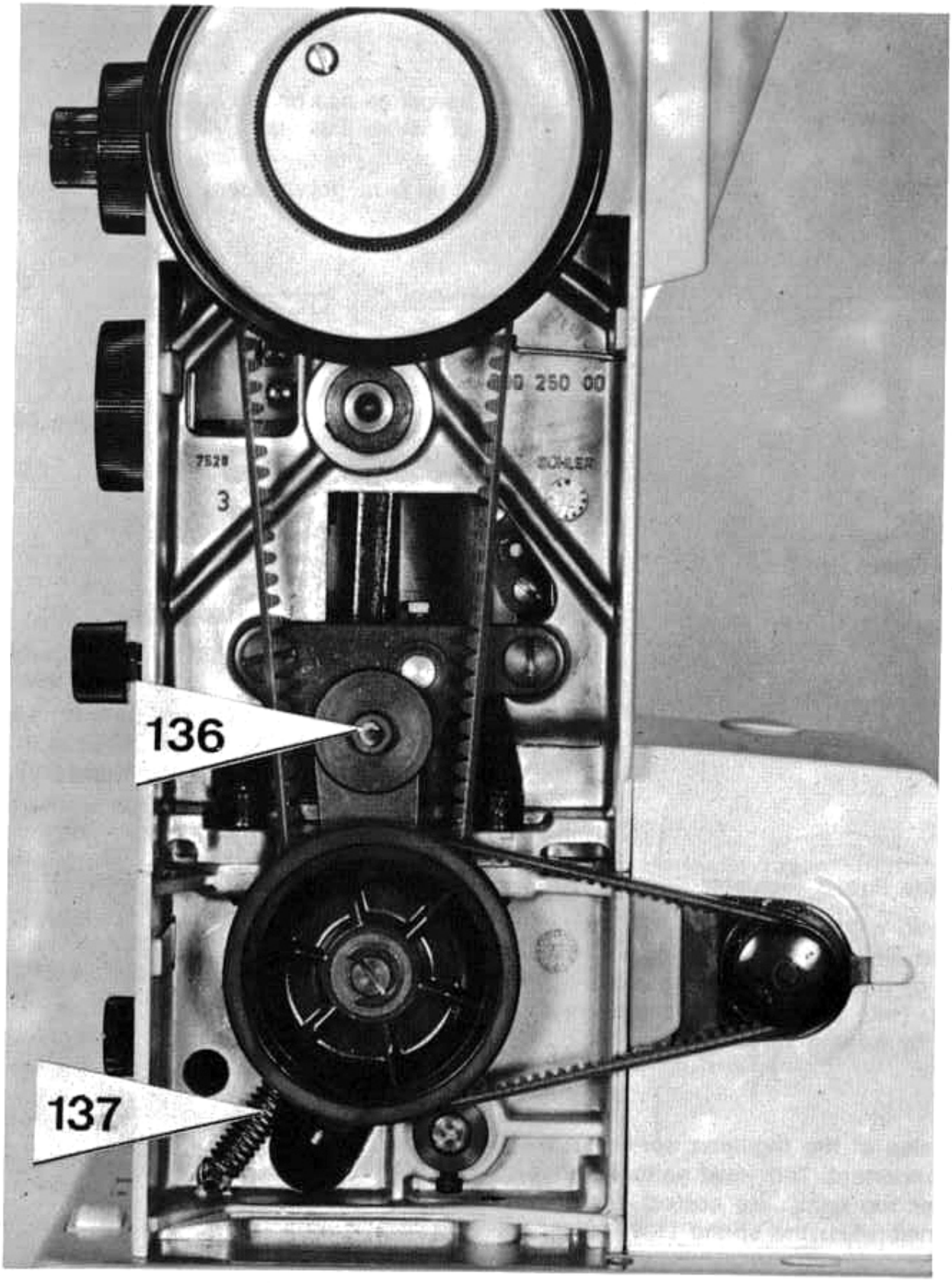


Fig. 65

Model 830 drive

Exhaustive tests have been carried out with various V-belts to improve the power transmission from motor to machine. The best result was obtained with the new, inside-teeth, POLYURETHANE V-belts.

Model 830 from serial number: 12 02 55 01
Model 831 from serial number: 12 07 73 51
Model 832 from serial number: 11 08 45 01

The belt section of the new, long, polyurethane V-belt is 6 x 4 mm (part no. 305 201 130).

Long polyurethane V-belts of 5 x 3 mm section (part no. 305 201 080) are available from September 1972 as replacements for rubber V-belts (5 x 3 mm) on model 830 machines.

The short V-belt (motor-step pulley) have the same section and are fully interchangeable within the same model.

Re-tensioning the driving belt

Remove screw (135) and belt cover.

Loosen screw (136) slightly with socket spanner. Turn handwheel back and forth Retighten screw (136).

The spring (137) draws the gearing into the correct position and thus produces the prescribed belt tension.

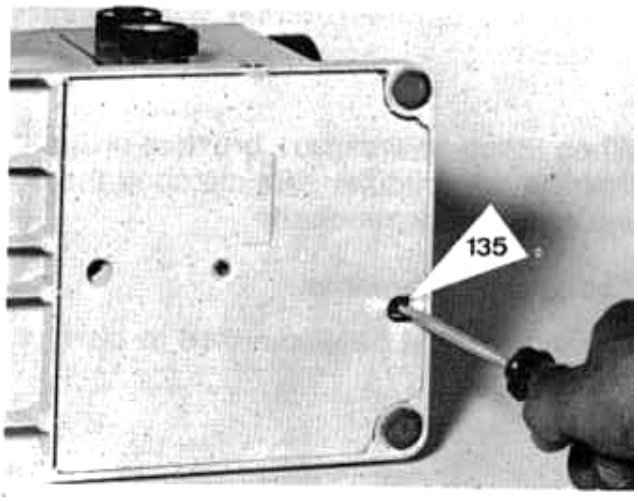


Fig. 66

Summary of former and new parts numbers for:

	former V-belt	polyurethane V-belt
	Model 830 + vars.	Model 830 + vars.
V-belt, long	305 201 030 section 5 x 3	305 201 130 section 6 x 4
V-belt, short	305 188 030 section 5 x 3	305 188 031 section 5 x 3
V-belt, long, for replacement delivery		305 201 080 section 5 x 3

Electrical fittings

Motor input model 830 (and variants): 90 W.
Sewing lamp: 15 W.

Important:

The machine must be disconnected from the supply by withdrawing the plug from the socket before carrying out repairs or servicing.

When fitting new carbon brushes ensure that the semicircular side matches the curvature of the commutator.

Changing the brushes

The motor must be dismantled to change the brushes.

Conversion of machines with resistance regulator (carbon pile) to electronic sewing speed regulator

Release motor housing with motor from baseplate. Remove cover from motor housing. Rewire to Fig. 68.

1. Take out entire changeover switch (150) and diode in baseplate with cable (151). The resulting hole in the baseplate by the changeover switch must be filled with a plastic insert No. 302 225 031.
2. Motor cable (154) from plug contact 5 to contact 4.
3. White capacitor cable (153) from plug contact 1 to 5.
4. Resistor (152) to contacts 1 and 5. Re-assemble motor and housing.

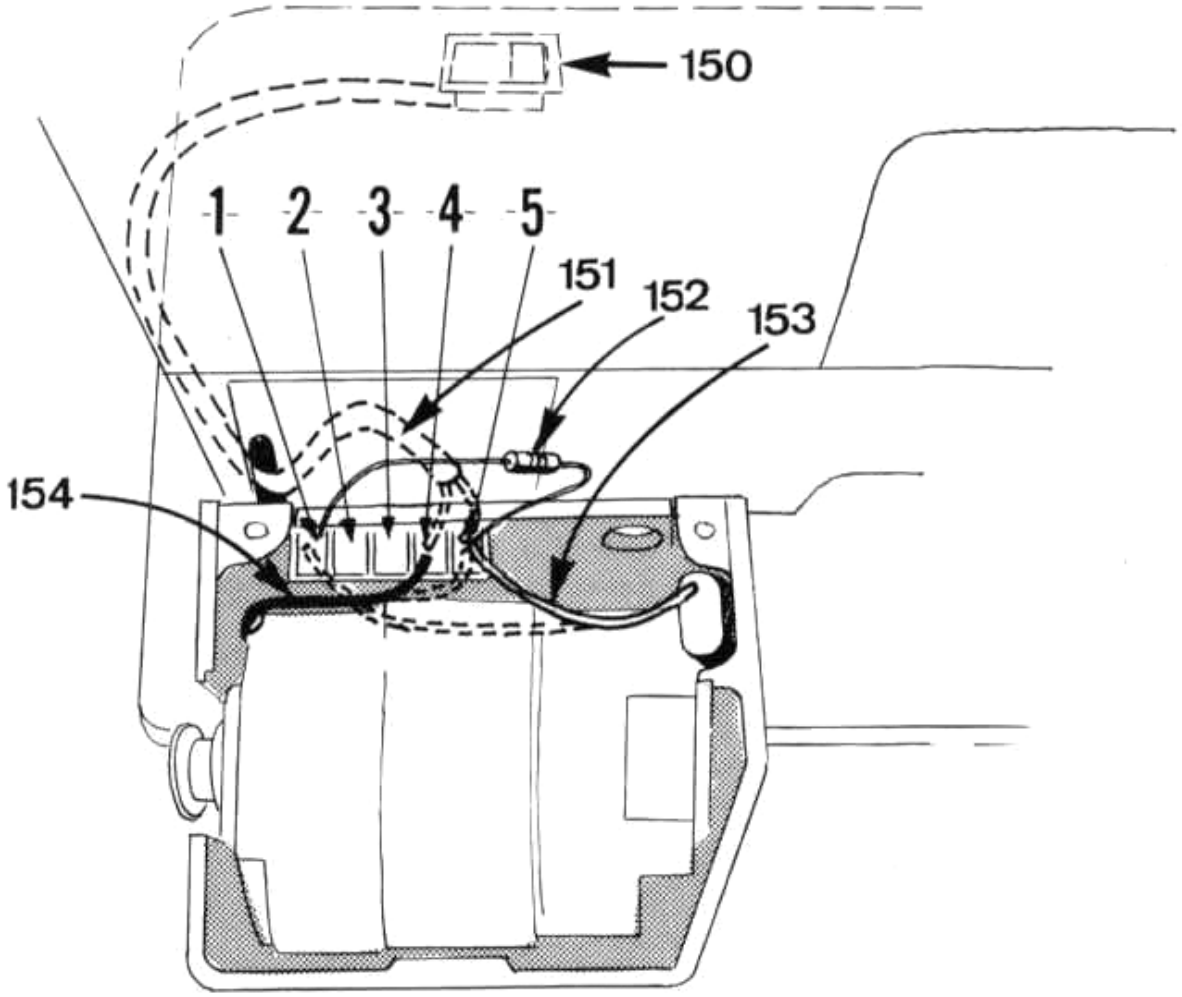


Fig. 6

Electronic sewing speed regulator (foot starter)

Connect machine and regulator to mains supply. Press regulator treadle lightly until the supply is fed to the machine (motor hums). The moment of switching on can be heard when the starter switch closes.

If the motor does not then begin to rotate slowly or fails to start at all, the following procedure must be adopted:

Adjust the trimmer inside the regulator case with the small screwdriver.

The motor can be made to start by carefully turning to the right.

Ensure the needle motion is even, it must not be jerky.

(The motor runs really smoothly at about 150—180 stitches/min.).

Fig. 6

If the motor runs too fast when switched on, the trimmer must be turned to the left with the screwdriver until the correct speed is attained.

This adjustment adapts the regulator to the machine.

We would point out that when ordering an electronic regulator the associated cable and the required resistor No. 335 046 04 are supplied at the same time. The existing connecting cable (mains-carbon pile starter machine) can no longer be used.

Principle of electronic speed regulation:

The normal carbon pile or resistance starter is not a regulator but only a controller. These starters only vary the speed-power demand is not compensated. Hence the speed varies with increasing or decreasing power demand if the starter position is not changed.

Electronic starters can either incorporate a simple control or the far more complicated regulator. The latter automatically regulates a set speed even though the load changes.

Our new electronic foot starter is a regulator, i. e. it automatically regulates the power demand of the moter for a set number of stitches or even for stitch-by-stitch sewing, so that the machine always runs evenly regardless of the power demand. The degree of regulation offered in the lower speed range is also significantly «finer» than with the previous starter.

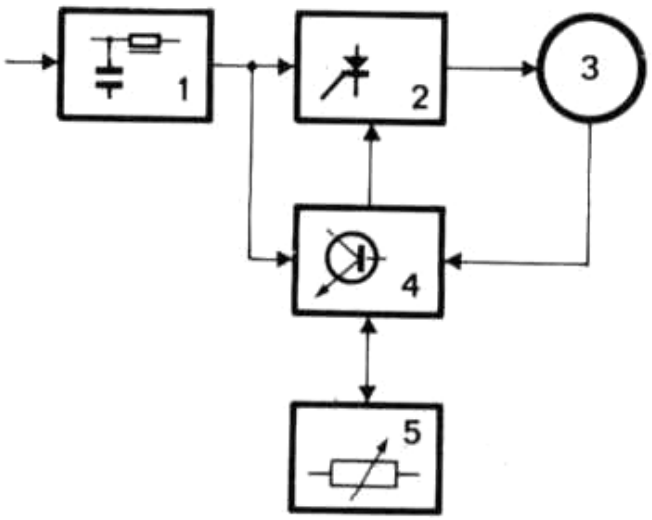


Fig. 70

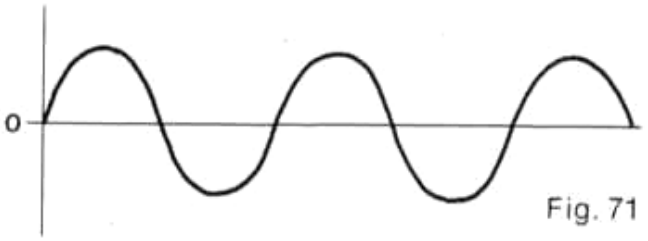


Fig. 71

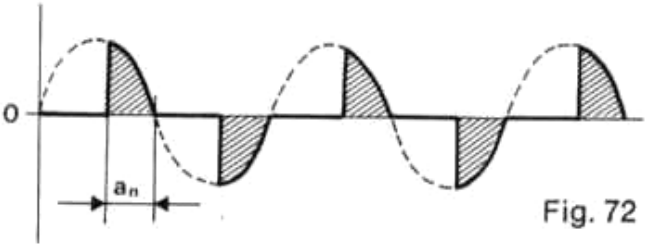


Fig. 72

Block schematic diagram of electronic regulator

1. Suppressor
2. Triac power circuit
3. Motor
4. Phase control
5. Foot starter.

The motor speed «n» is set with the foot starter. The motor receives a certain fraction «a_n» of each half-wave of current from the electronic unit depending on the starter setting.

As the load increases the motor issues an immediate «command» to the electronic unit for regulation to ensure that the set speed does not fall. The fraction «a_n» is increased by an additional amount «b_n» to keep the set speed practically constant.

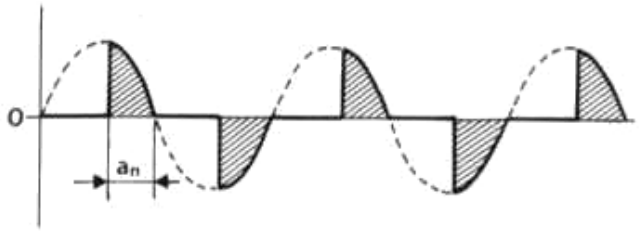


Fig. 73

Motor voltage on **no load**
speed = n

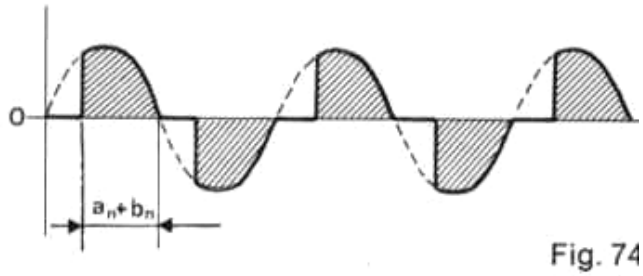


Fig. 74

Motor voltage **on load**
speed = n

Schematic diagram (electronics)

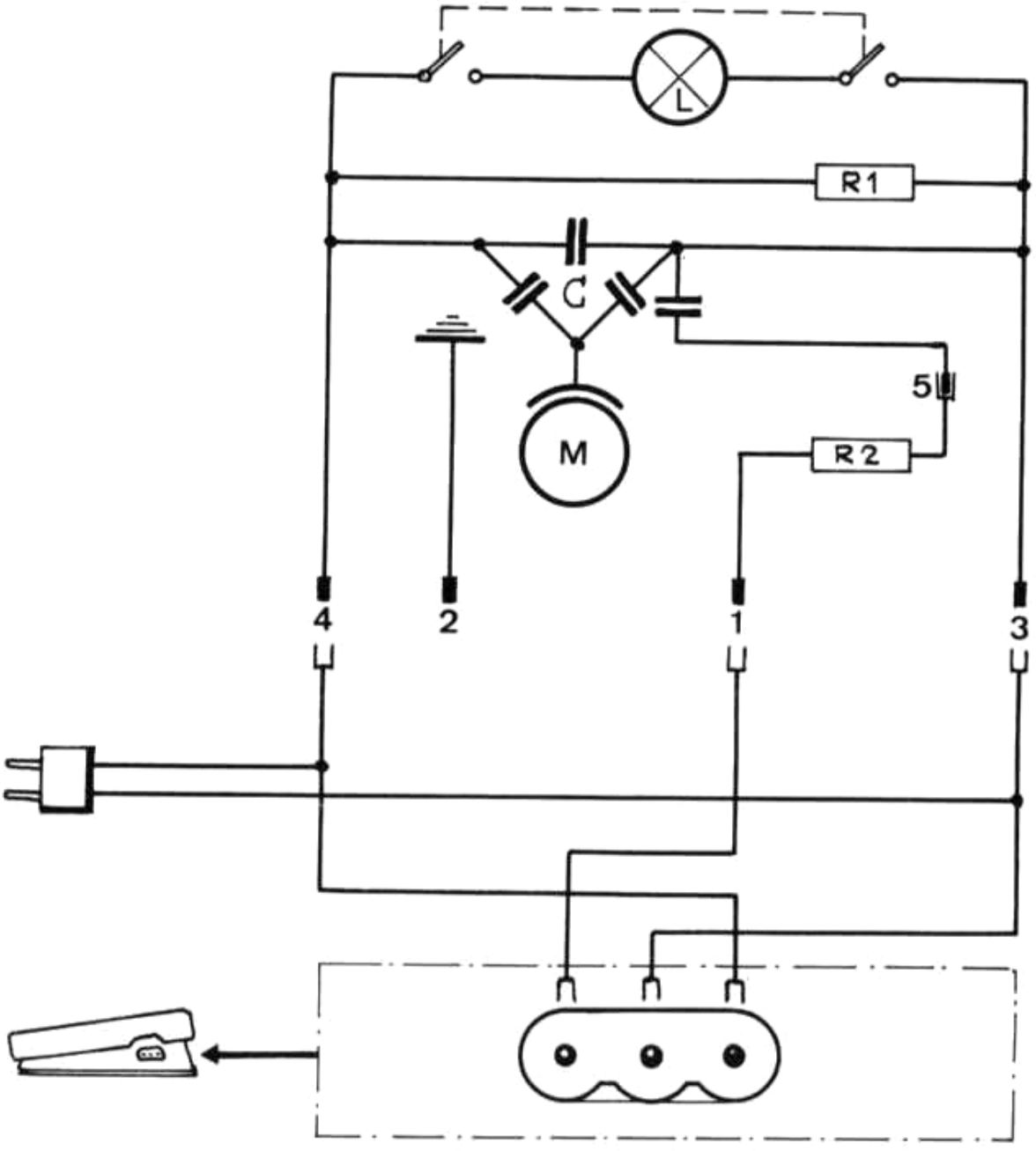


Fig. 75

Appendix

Incorporation of the new stitch length adjustment lever No. 313 257 24.

A) Dismantling the old stitch length adjustment lever:

Dismantle belt cover.

Unhook spring (1). Loosen hex. screw (2) and withdraw LCR knob (3). Set zig-zag knob (4) to position 4 and take away LCR stopping lever (5).

Set zig-zag knob (4) to position 0 and loosen screw (6). Remove knob (4).

Turn buttonhole knob (7) to position 5 and loosen screw (8). Remove knob (7).

Screw right out stitch length adjustment knob (9).

Loosen the two scale fixing screws (10) and remove scale.

Loosen the four countersunk screws (11) and withdraw the complete bearing plate.

Unhook spring (12) and screw off knurled nut (13).

Remove spring (14).

Parts 13, 14, 15 and 16 are **no longer** required.

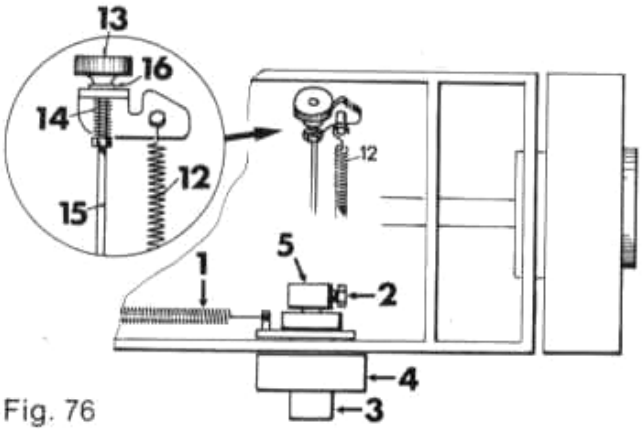
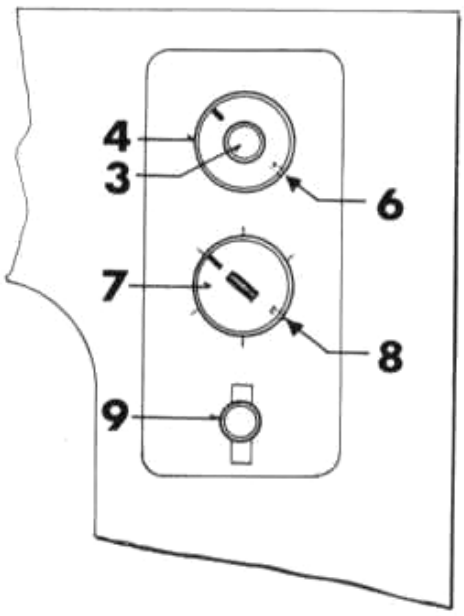


Fig. 76



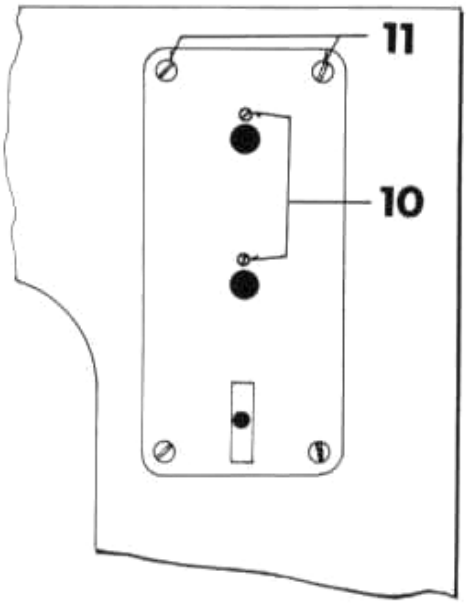


Fig. 77

Loosen the two screws (17) on setting ring (18) and remove setting ring.

Loosen screw (20) with washer (21) and dismantle the entire gearing with tension spring (22).

Screw off hex. screw (23) and the two setscrews (25) with washers. Remove carrier (24).

Unfasten strap (30) and withdraw the old stitch length adjustment lever (this is no longer required).

Warning: Later machines have a washer beneath the strap (30). This washer must be refitted when assembling the new stitch length lever.

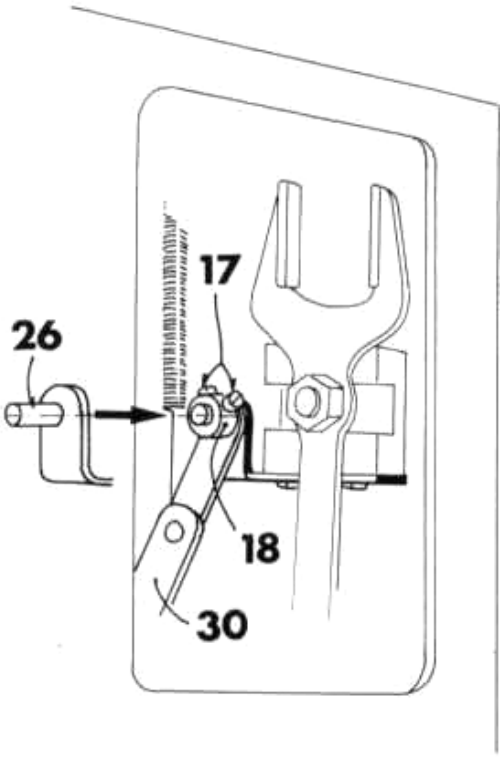


Fig. 79

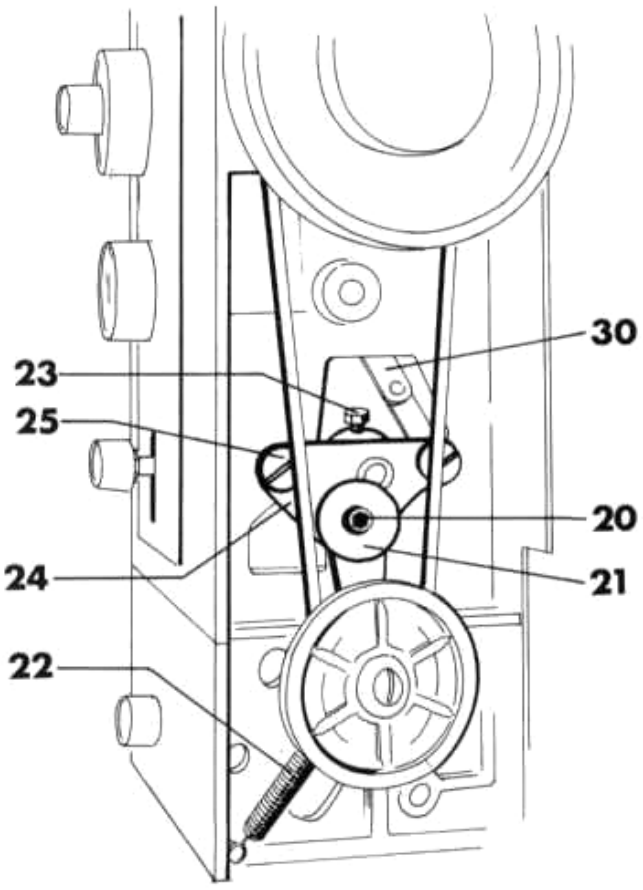


Fig. 78

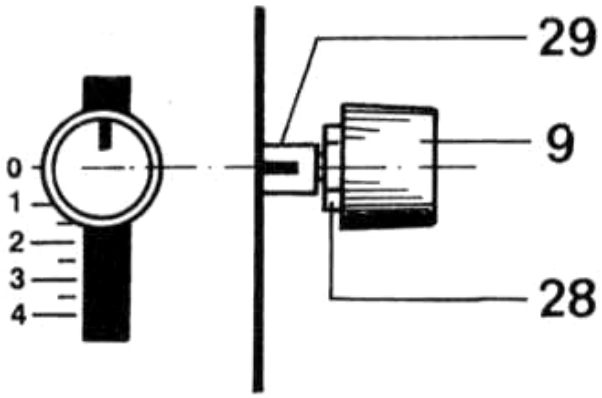


Fig. 80

B) Fitting new stitch length adjustment lever:

Introduce stitch length adjustment lever 313 257 24 with new connecting strap from the front and attach strap (30) in spindle (26).

Mount carrier (24) and tighten screw (25).

Place setting ring (18) on spindle (26) and secure with screw (17).

CHECK: The connecting strap (30) by setting ring (18) must not stick during the to-and-fro motion of the stitch length adjustment lever.

Remove black operating knob (9) and nut (28) on new stitch length adjustment lever. Do not remove pointer bush (29).

Then position dismantled bearing plate and secure with the four screws (11).

WARNING: The slide ring on the change-over lever must be inserted in the guide fork.

Attach scale plate and secure with the two screws (10). Set stitch length adjustment lever with pointer bush to position 0 and check whether pointer bush (29) is at the center of the scale plate. Tighten screw (23).

Screw in nut (28) until it just contacts the pointer bush (29) (bush must have no axial play).

Screw in operating knob (9) up to nut (28), then turn back until the mark on the knob points vertically upwards. Then lock knob (9) with nut (28).

Fit buttonhole knob (7). (Ensure that screw (8) lies on the spindle surface).

Set buttonhole knob to position 0.

Screw out stitch length adjustment lever (9) far enough so that the to-and -fro motion can be observed (stitch length 4). The stitch length adjustment mechanism must run easily and must **not** stick.

If it does, the stitch length adjustment knob, buttonhole knob, scale plate and bearing plate have to be dismantled again. Then set connecting strap (30) until the stitch length adjustment lever moves easily.

Re-assemble bearing plate, scale and knob (9).

Fit zig-zag knob (4).

Introduce slide ring from LCR stop piece (5) in zig-zag link and attach connecting strap to buttonhole device.

Place LCR knob (3) in existing hole.

Position LCR stop piece (5) free from play and tighten screw (2).
(Warning: bring screw to surface).

Then set LCR knob to «center» position.

Guide fork to lowest point.

Zig-zag knob to position 0 and tighten screw (6) on knob. Re-attach tension spring (1) and spring (12).

Re-adjust the buttonhole following mounting of drive and belt cover (see page 25).

Fault avoidance

1. Basic principles

In the great majority of cases faults can be attributed to improper handling of the machine. Should other causes be suspected, however, the machine must be examined as to whether:

a) The needle is properly fitted. The long groove must always be at the front from where the machine is threaded,

b) The right needle size is being used, needle No. 70 for fine darning work and No. 80 or 90 for other sewing work.

c) The machine is properly clean. Remove free-arm cover plate and clean away all sewing dust, clean feed dog with brush,

d) The shuttle race is properly clean,

e) The shuttle race is lubricated with a few drops of oil,

f) There are no remnants of material between the thread tensioning discs,

g) There are no remnants of material stuck underneath the bobbin case tensioning spring,

h) The machine can be turned easily with the handwheel.

2. Thread breakage at the upper thread can be caused by the following:

a) Use of poor quality, badly polished needles. Needles should always be bought from the BERNINA dealer,

b) Needle wrongly fitted. Long groove must be at front,

c) The needle is blunt or bent

d) The relationship of thread thickness to needle is not correct,

e) The tension of the upper thread is too great,

f) Poor yarn or yarn with knots. Yarn has dried during long storage. It should never be stored in heated rooms,

g) The needle plate hole has been struck by the needle and must be re-polished,

h) The shuttle tip is damaged.

3. Lower thread breakage

can be caused by the following:

a) The lower thread tension is too great,

b) The lower thread is badly wound,

c) The bobbin is crushed and jammed in the case,

d) The needle plate hole has been struck by the needle and must be re-polished.

4. Missing stitches

can be caused as follows:

a) Use of wrong needle. Use only needle system 705,

b) Needle is bent.

The following wrong adjustment on the machine can be the cause of missing stitches:

1. Lateral spacing between needle and shuttle is not right. It must be 0.05 mm (see page 14).

2. Loop lift and return motion are not correct (see page 16).

3. The needle bar height is not correctly set (see page 17).

In general: always use perfect needles and first-class thread. Also ensure that the needle size matches the thread thickness.

a) The needle fixing screw is not tightened sufficiently,

b) The upper thread tension is too great,

c) The work is drawn out at front from under the presser foot which bends the needle. It should only be drawn out at the rear beneath the presser foot sole,

d) Needle size and fabric thickness are not properly matched.
Very often needles which are too thin are used with thick yarn which causes the needle to bend,

e) Use of cheap yarn, unevenly twisted or knotted,

f) The work should not be drawn too strongly to the rear during sewing.

6. Seam faults

a) Poor, uneven seams are produced:

1. When there are remnants of thread between the thread tension discs,
2. There are remnants of thread under the bobbin case tension spring,
3. The bobbin is crushed and jams in the bobbin case,
4. The sewing yarn is of uneven thickness,
5. The shuttle is not lubricated.

b) When sewing Tricot it should be noted that:

1. Tricot should always be basted with darning thread, not with basting thread,
2. Use perfect needles, size 70 or 80.

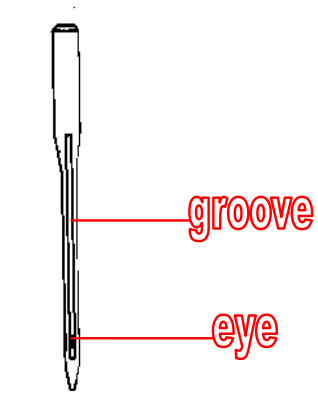
When sewing with new, synthetic threads it can occur that the normal needle plate must be exchanged for a special needle plate. The BERNINA Sewing Machine Factory is willing to lend you every assistance in solving your particular sewing problem.

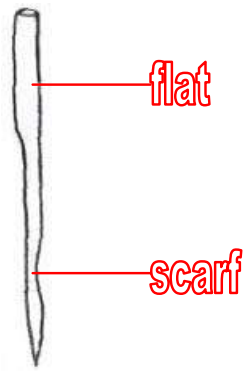
SEWING MACHINE TROUBLESHOOTING GUIDE

In most cases poor sewing results and breakdowns are caused by three main factors:

1. The condition of the needle.
2. Threading and the quality of thread being used.
3. Mechanical breakdown or damaged parts.

The condition of the needle is the most common problem. Bent or damaged needles will cause many different sewing problems. The way the needle is inserted into the needle clamp is also very important.





On most machines you install the needle so the flat is to the back of the machine. Side load machines (bobbin case is inserted on the left side of the machine) the flat is to the right. On some older Singer machines the flat is to the left. The needle should be inserted flat to the back on your machine.

Thread quality and the type of thread being used can be a problem. Always use good quality thread and try to avoid thread that is old or knotted. When ever possible use the same thread in the top and bobbin tensions. Thread the machine as shown in your manual and make sure the thread is between the tension discs.

If you start with a new needle (inserted properly) and the machine is threaded as per instructions, sewing problems may be mechanical breakdown or damaged parts.

For best results your machine should be serviced before every large project. This will increase the life of your machine and give you problem free results when sewing.

Here is a checklist we have put together for your type of machine. If you have problems while you are sewing run through the list to correct the problem.

POOR STITCH QUALITY

1. The needle is incorrectly inserted. Check that the flat of the needle is to the back of your machine.
2. The needle is blunt or bent. Your needle should be changed before each large project or if it hits the needle plate or hook. A damaged needle can also snag most fabrics.
3. The tension is not correct. The top tension of your machine should be set to the red or centerline for regular sewing. Make sure the thread is between the tension discs. Make sure the pressure foot is up when threading your machine. (this will release the tension discs) Check for lint or thread caught in the discs.
4. Type of thread being used can cause problems. Always use good quality thread. When using heavy thread in the top you will have to use a larger needle. The groove in the needle must fit the thread.

UPPER THREAD BREAKS

1. Check that the needle is inserted correctly and not damaged. Check size of needle for thread.
2. Check your threading. There should be free movement of the thread from spool to needle.
3. Make sure the top tension is not too tight.
4. Check the needle plate for damage.
5. Check the hook for damage.

LOWER THREAD BREAKS

1. Make sure the bobbin is inserted correctly and the right bobbin for your machine is being used. Generic bobbins should not be used in your machine.
2. Check that the thread is in the bobbin tension and the tension is not too tight. Also check for thread or lint caught in the tension spring.
3. Make sure the bobbin is evenly wound.
4. Check the needle plate for damage.

BOBBIN THREAD NOT BEING BROUGHT UP

1. Check that the needle is inserted correctly.
2. Check threading of the machine. If the take-up lever is not threaded properly the thread will not come up.
3. Hook timing may be out. The hook must pick up the thread from the scarf of the needle. 

STITCH LENGTH VARIES OR WILL NOT FEED

1. Check that your feed dogs are coming up above the needle plate.
2. Check the pressure foot pressure. There must be some pressure on the foot to feed the fabric. Your machine has an automatic pressure adjustment and should be ok.
3. Check for lint caught in the feed dogs.
4. Is the pressure foot tight on the pressure bar? Make sure the foot is pushed up all the way and tight.
5. If all points check out the feed timing may be off.

SKIPPING STITCHES

1. Check your threading.
2. Check for needle damage or type of needle being used.
3. Check your hook/needle timing.