# SERVICE - MANUAL


# BERNINA - MATIC
# MODEL 910

BERNINA-Matic, Model 910 Zig-zag, utility stitch sewing machine with automatic buttonholer.

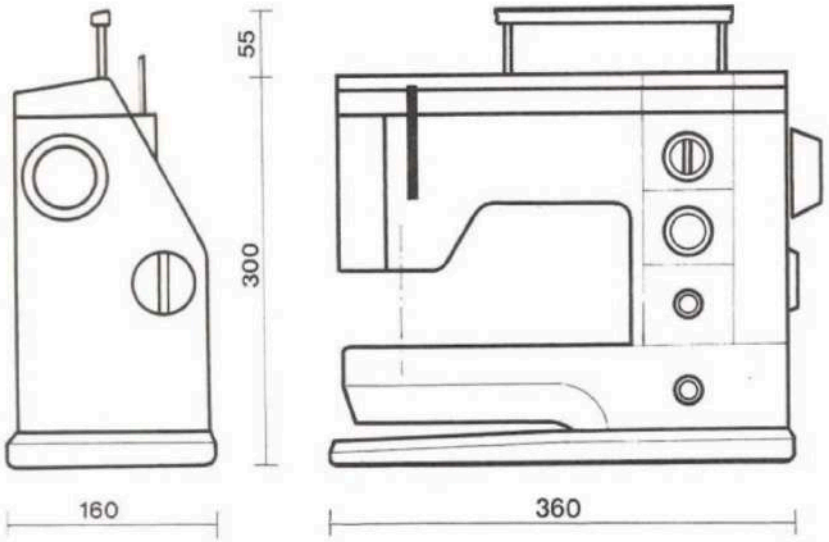
Provisional Edition 1983

**BERNINA**

Fritz Gegauf Ltd. Manufacturers of Bernina Sewing-Machines Steckborn (TG) Switzerland

## TECHNICAL DATA

| | |
|---|---|
| Max. stitch width | 4,5 mm |
| Stitch position adjustment | left – half-left – center half-right – right (L-C-R) |
| Max. forward stitch length | 4 mm |
| Max. reverse stitch length | 2 mm |
| Presser foot lift | 7,5 mm |
| Size of baseplate | 360x160 mm |
| Hook system | Central bobbin hook (CB), non-jamming |
| Bobbin capacity | 75 m cotton yarn 60/3 |
| Needle system | 130/705 H |
| Needle movement | swinging needle bar |
| Thread take-up lever | Link take-up lever |
| Thread tension | upper thread tensioning incorporated in frame cover |
| Winder | automatic machine disconnection and self-releasing |
| Motor | Power 75 W |
| Sewing light | Power 15 W |
| Number of stitches | approx. 1100 stitches/min. |
| Weight of machine | 9,5 kg |
| Weight with carrying case | 13,5 kg |
| Lamp indication | low-voltage bulb (4,5 V) |
| Multi-range switch | OFF and two speeds |
| Needle stop | mechanical (electrical) |
| Sewing-off needle | 130/705 H, Nm 80 |
| Loop lift: left | 1,6 mm |
| Hook return motion | 2,3 mm |
| Darner lift | 1,8 mm |
| Base circumference | 240 mm |
| Machine dimensions: | |
| overall length | 380 mm |
| overall width | 170 mm |
| height over reel pin | 335 mm |



# ADJUSTMENT OF MODEL 910

These adjustment instructions are intended to help you carry out minor repairs and adjustments.

The instructions lay no claim to completeness.

They are not suitable for a complete assembly or dismantling procedure.

*IMPORTANT:* To enable the work described to be performed correctly, the *sewing machine must be in good mechanical condition:* (running smoothly, properly oiled etc.).

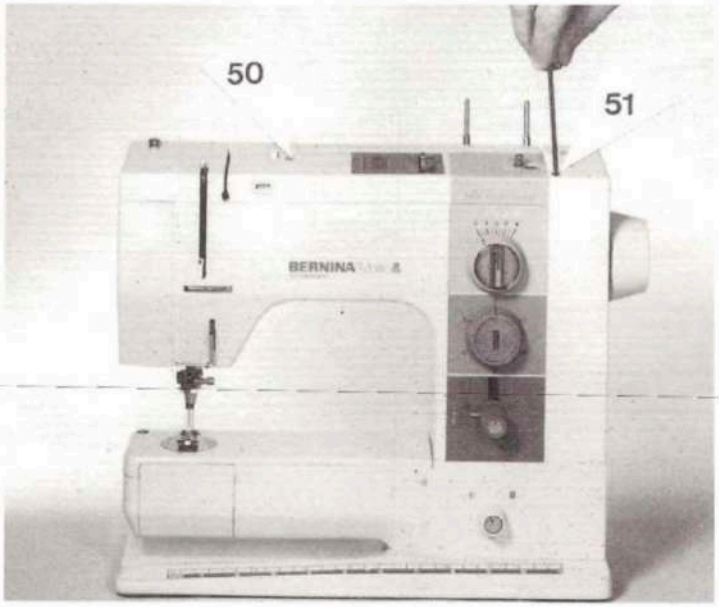
If the sequence of adjustments is observed, the machine will sew satisfactorily.

## Dismantling covers

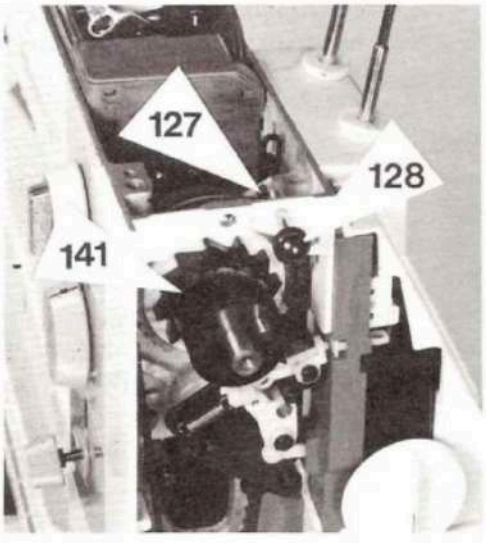
*WARNING:* The electronic components operate with dangerous voltages. The mains plug must be withdrawn before making any adjustments to the machine! Wait at least *30 seconds* afterwards (capacitor discharge).

### Dismantling top frame cover

Screws 50 and 51 secure the top frame cover. Remove both screws with screwdriver, lift off top frame cover vertically upwards until the carrying handle guide is free.

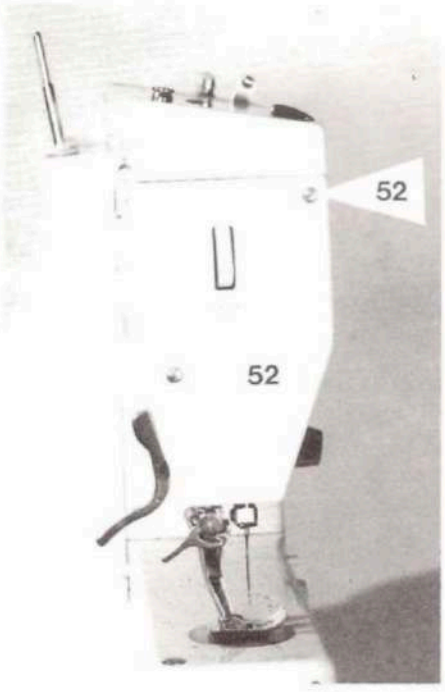


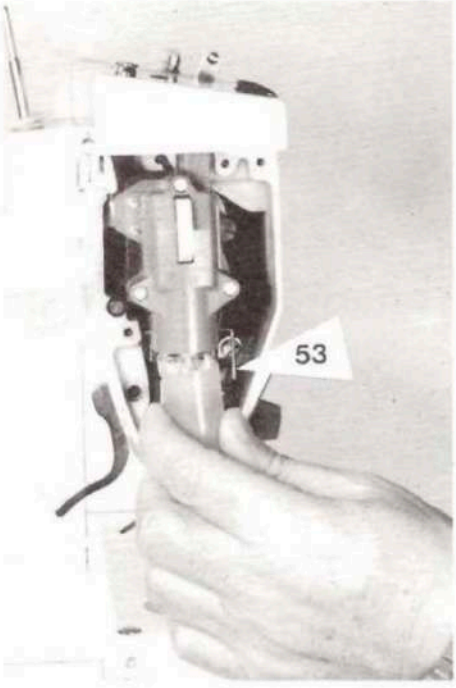
*WARNING:* When the top frame cover is removed the locking lever 127 engages with the clutch sleeve 141 and blocks the machine. The blocking lever must be released to carry out further adjustments. Therefore disengage blocking lever 127 and hold with an object.




**Removing the front cover**

Release the two fixing screws 52, which are set into the front cover.



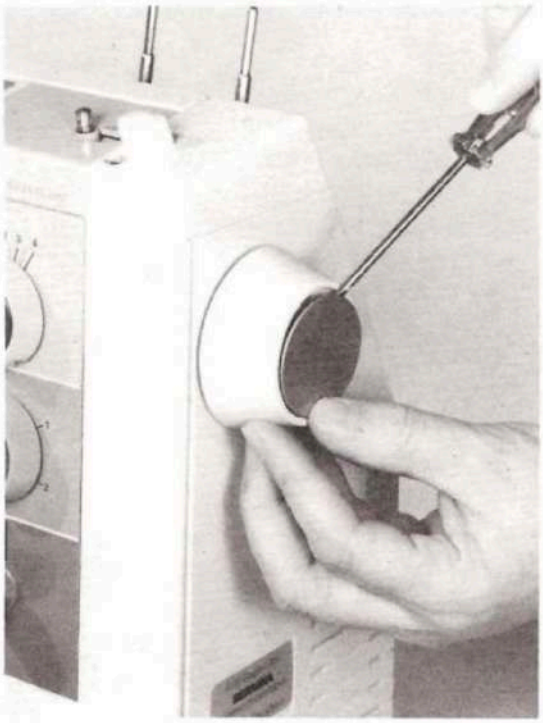



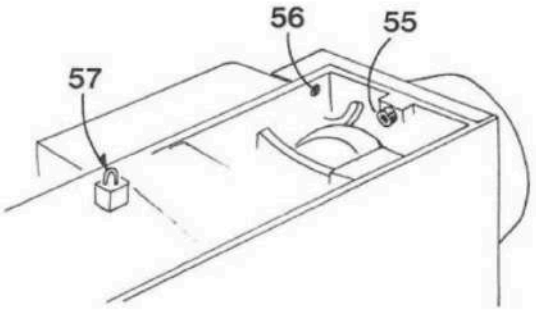

**Changing the bulb**

The lamp has a bayonet socket. A new bulb can only be fitted after folding the protective cover 53 in front of the lamp socket to the side.
(Protective cover is only for Great Britain regulations of the B.E.A.B.)

## Removing belt cover

Raise cover plate on handwheel with small screwdriver and remove.



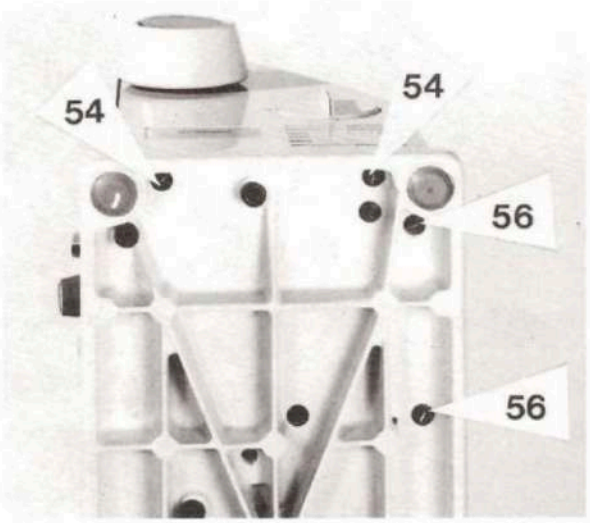



Release handwheel screw and remove handwheel.

Release cheese-head screws 54 (2 screws) and the hexagon socket screw and remove.

## Dismantling chassis cover

Remove 2 screws 56 and securing spring 57. Swing chassis cover out backwards.

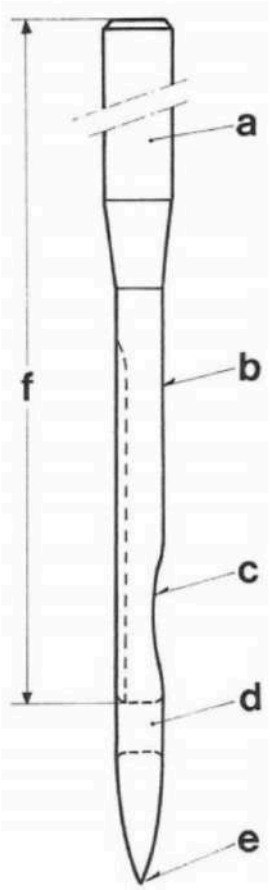



Assembly of the covers is performed in the opposite sequence.

## THE NEEDLE

The needle is one of the most important items of sewing equipment. Its function is to pierce the material and to take upper thread to the hook for linking with the lower thread and to form the loop for acceptance by the hook.

The loop is formed after the needle has pierced the work and 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 hook 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 long groove for guiding the thread and forming the loop

c) the *scarf*

d) the *eye of the needle*

e) the *point of the needle*

f) the *needle length*

BERNINA uses the *130/705 H needle system* with scarf for the model 910.

The *needle size* is measured in millimetres, e. g. needle size (Nm) «100» means: a needle shank thickness 1 mm.

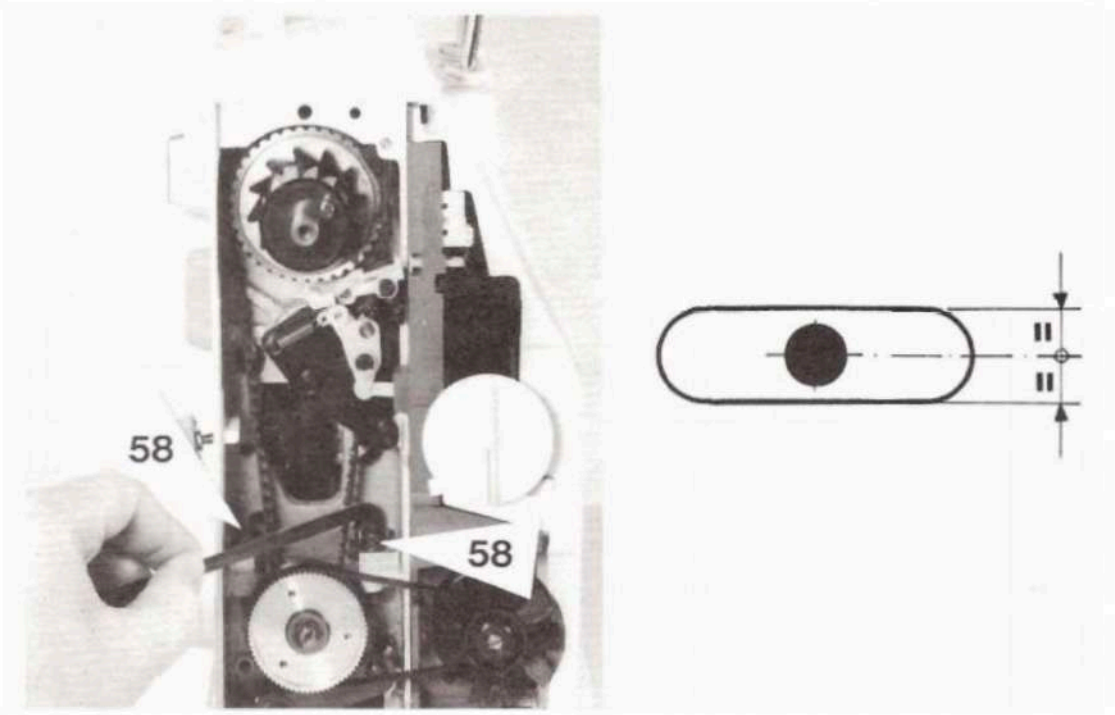
The needle must be firmly secured with the knurled screw on the needle holder. Tighthen screw with special screw-driver.

*IMPORTANT:* Always use the «Nm 80» needle for all adjustments unless otherwise stated. Check the needle before every adjustment to the machine! It must be *absolutely straight!*

## STITCH DISTRIBUTION

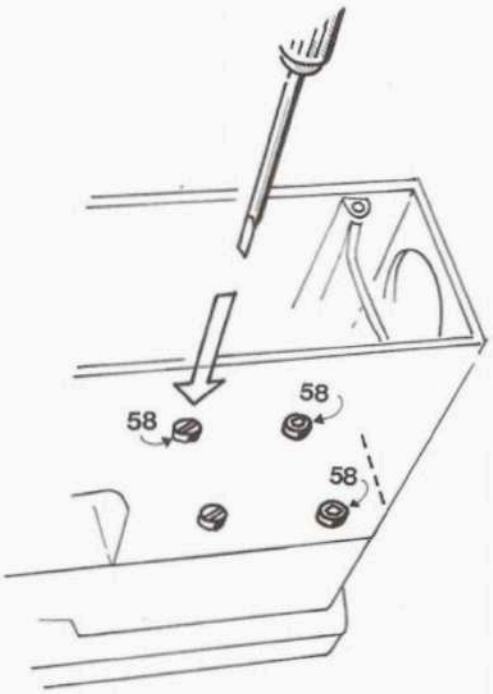
### Needle distribution in stitch hole

The needle must penetrate at the center of the stitch hole as seen in the direction of the material feed (use needle Nm 90).




If a correction has to be made, the belt cover must be removed on the handwheel side and three of the four frame fixing screws released (socket head screws with key SW 5). For this operation the special key No 398 089 03 and the lock socket head key are required.

Place top frame in desired position and re-tighten the three screws.



**Setting the return motion**

Two settings may be necessary:

1. *Correction following inaccurate adjustment*

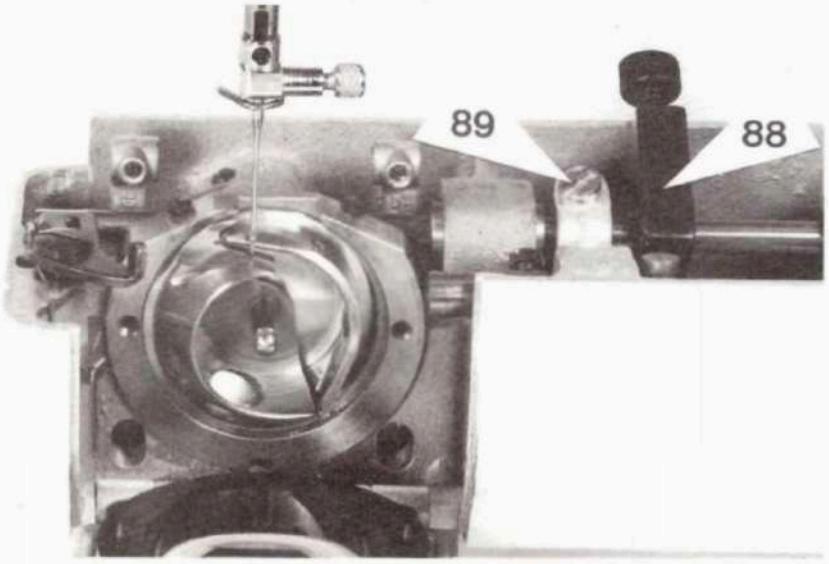
   Use a good needle Nm 80 for adjustment.

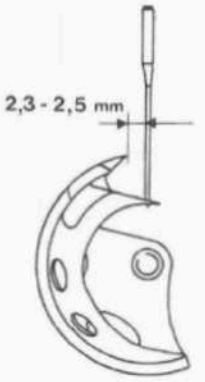
   - stitch position setting = left
   - stitch width 0

   Set rack to front dead point.

   To ensure that rack position is not altered radially when the rack is displaced, the clamping piece 88 No. 398 005 04 75 should be mounted on the rack in such a way that the screw lies on the edge of the free-arm. Loosen screw 89 of rack dog.

   Axial displacement of rack to left = greater return motion
   to right = smaller return motion




   The spacing is correct when the distance between tip of hook and left-hand edge of needle is 2.3–2.5 mm. Tighten screw 89.

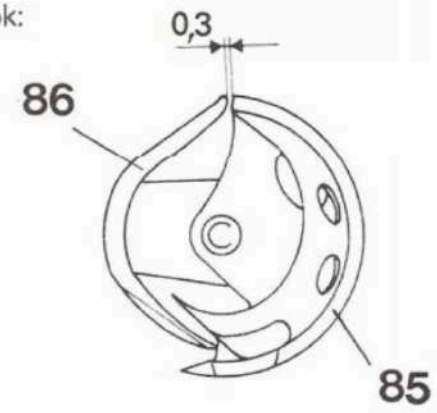
2. *Setting the return motion after dismantling the rack*

Loosen screw 89 and set rack dog to front dead point. Set rack approx. 3 mm from base wall and turn the teeth to the horizontal position (insert hook drive for this purpose). Tighten rack dog, remove hook drive again and set dog approx. centrally between the two rack bearings. Insert the hook drive in the race so that the thread outlet side (short shank) lies slightly below the left-hand bore in the hook race.

The remaining adjustment is made as described in point 1.

## ADJUSTING THE HOOK (CB-Hook = *C*entral *B*obbin hook)

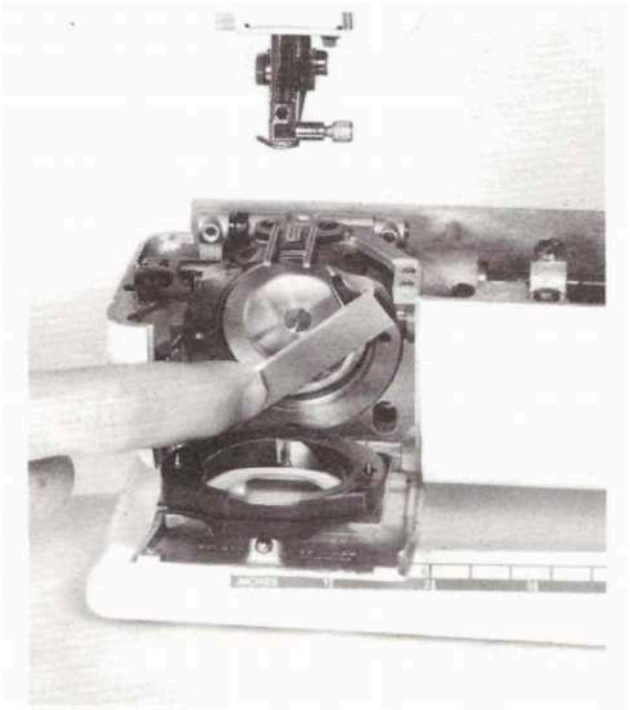
Use a straight needle without fail for adjusting the hook:

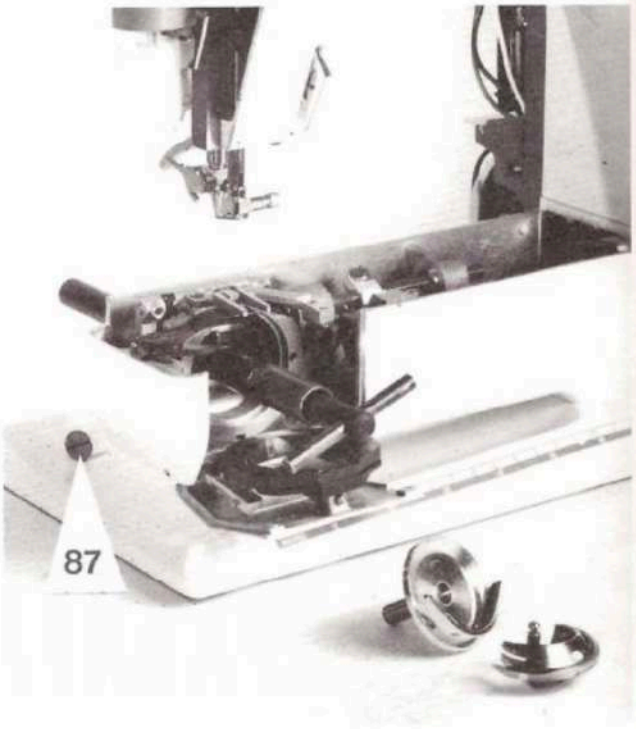



### Thread passage

There must be play of 0,3 mm between hook 85 and hook drive 86 for the thread passage. Check with gauge 398 022 03.

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






### Position of driver in hook race

The hook driver should be 0,15 mm behind the front edge of the hook race.
If a correction is necessary to hook drive-needle, the bearing bush of the hook race must be shifted. Dismantle screw 87 at the rear of the free-arm and remove the hook driver. Insert tool No. 398 049 04 from the rear of the free-arm through the hook race bore and fir the pin. Turn the tool nut against the face of the hook race until it makes contact.

The bush can be moved to the rear by turning the knob colckwise. If correction has to be made forwards, the tool should be inserted from the hinged cover side (i. e. from the front).

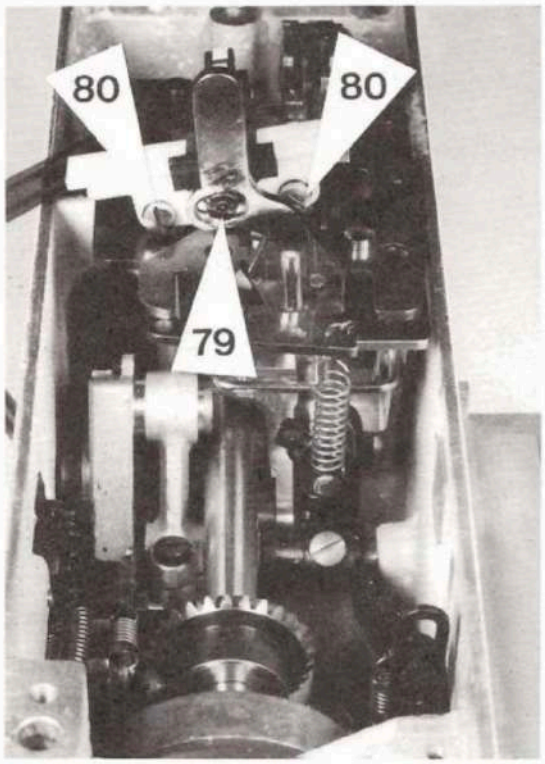
## SUPPORT WITH GUIDE RAIL AND LIGHT INDICATOR FOR STITCH SELECTION

Check:
The light indicator should stand exactly under the stitch scale. There should also be a distance of 0,2 mm between the light indicator and the lower edge of the upper frame cover.

If not, correct as follows:

1. Adjust sliding bolts
   - Loosen round nut 79 with socket spanner 398 035 030
   - Set sliding bolts to correct position
   - Tighten nut.

2. Adjust height of guide rail
   - Loosen two screws 80
   - Move guide rail to desired position and re-tighten both screws.



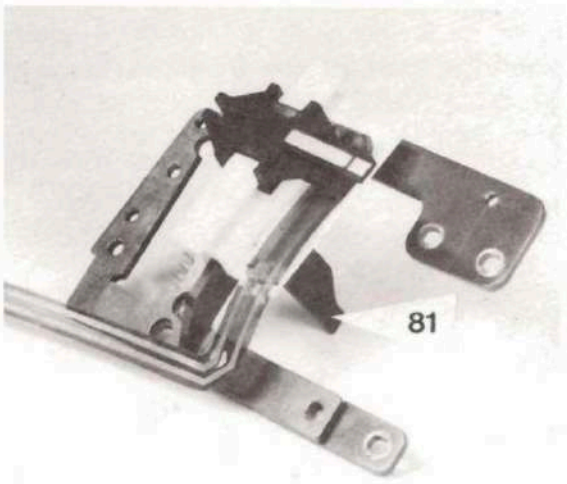

## THE TRACER SUPPORT TO POSITION 0 OF THE STITCH SELECTION SCALE

Check the support as follows:

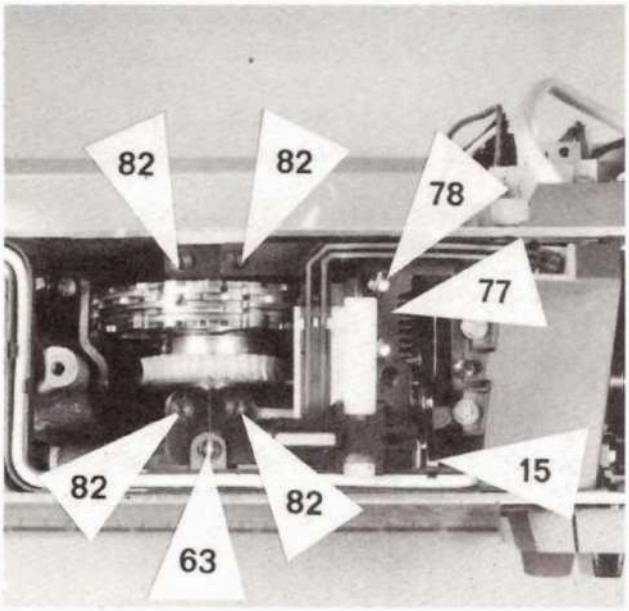
- selector lever 14 to position 0
- LCR-knob to center

If the stitch width knob is then turned from 0–4, the needle must remain stationary.

If not, correct as follows:
if the needle moves to the left when the stitch width knob is turned from 0–4, the tracer support 81 must be set left, if the needle moves right the tracer support should also be moved right.



The notched carrier must, therefore, be set so that the tracer 75 no longer contacts the control cam when moved. On the other hand, it must only be raised sufficiently for the needle still to penetrate in the stitch hole (far left).





If correction is necessary, the four screws 82 must be loosened and the notched carrier 55 moved to the desired position. Tighten the five screws.

## SETTING NOTCHED SEGMENT

The notched segment 77 holds the lever 15 in the selected position. The notches must be set laterally so that the tracer coincides with the cams.

In order to achieve this it is necessary to move the notched segment sideways, forwards or backwards depending on ther deviation.

Best check for coincidence:
set selector lever to stitch No. 4.

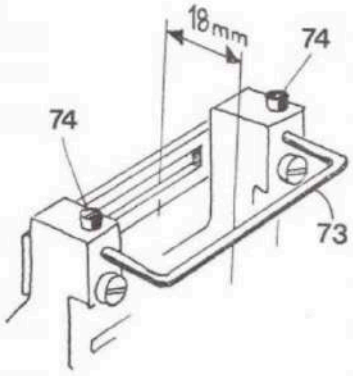
In the event of discrepancies, the two fixing screws 78 must be loosened and the notched segment 77 moved to the disired position. Tigthen screws 78.

## BASIC SETTING OF THE TRACER LIFTER STRAP

To ensure that the notched carrier has sufficient range of adjustment, the lifter strap 73 must first be set to the correct position. The distance between tracer strap and lifter strap is 18 mm (basic value).

The following procedure should be adopted:

1. Release two fixing screws 74
2. Insert distance gauge between tracer strap and lifter strap
3. Press lifter strap parallel to and against the distance gauge and tighten both screws 74.

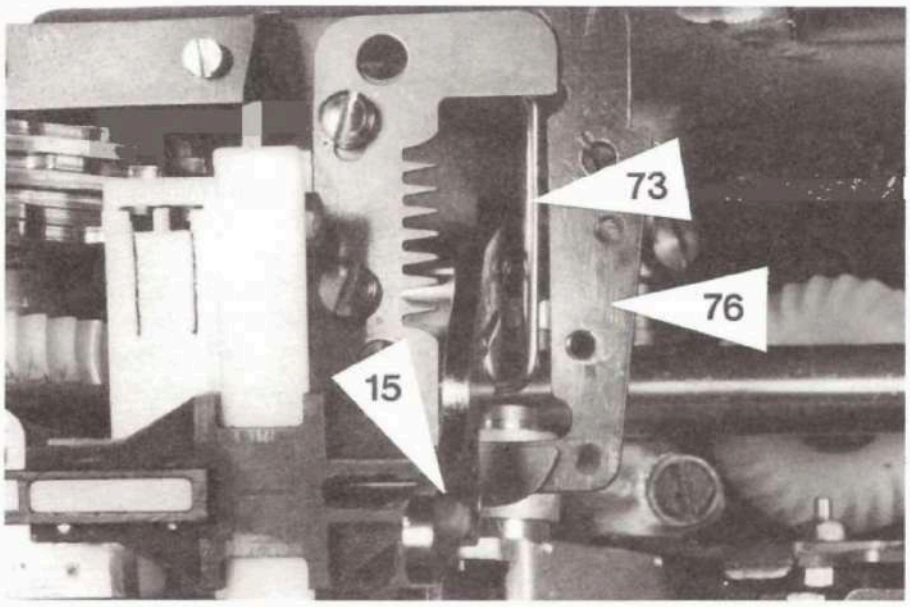



## SETTING NOTCHED CARRIER

When setting the individual practical stitches, tracer 54 is moved with selector lever 14 from one control cam to the other.

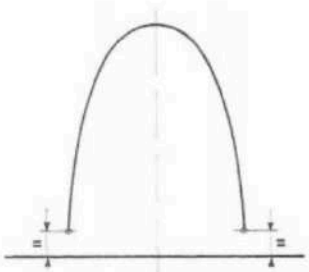
This ist performed:
a) by raising the tracer
b) by moving the selector lever

During lifting, the notched carrier limits the selector lever on the right.



## Lateral Motion of needle during zig-zag sewing

The sideways movement of the needle (parabola) must be exactly matched to the up and down motion.
It must only begin when the tip of the needle during the upwards motion is 7,5 mm above the needle plate and must be completed when the needle tip is again 7,5 mm above the needle plate during the downward motion.

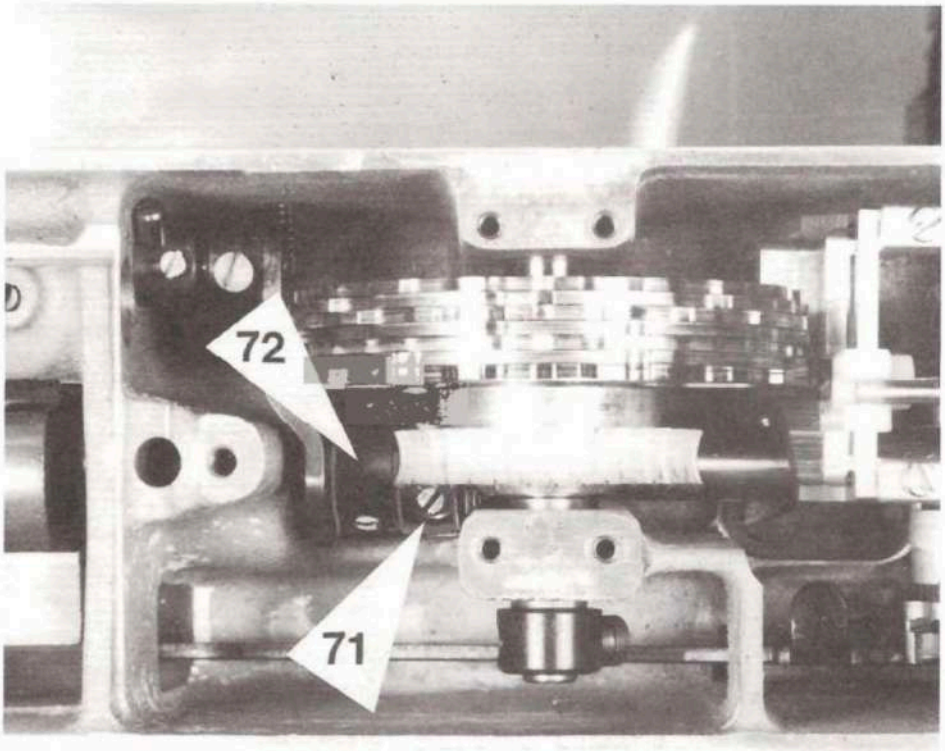


The zig-zag motion is derived from a cam (1:36).

Check:
Set LCR-knob to center

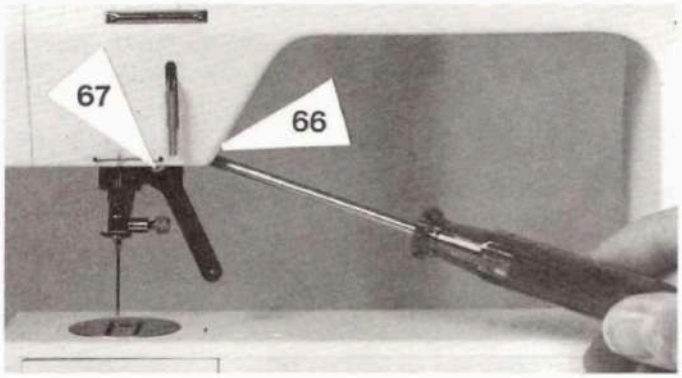
Set needle to uppermost position by turning handwheel. If the stitch width knob is turned backwards and forwards between «0» and «4», the *needle must remain stationary.* If not, a correction must be made:

Loosen the two screws on worm wheel 71. Then using the screwdriver secure the worm wheel now loose on the spindle, while pressing the setting ring 72 and turning the hand-wheel at the same time, until the correct setting is found.Tighten both screws on worm wheel.



The distance from the edge of the stitch hole must be the same in each case. If not, correct as follows: Loosen screw 66 very slightly. Place special fork wrench No. 398 063 03 on the knurled eccentric bolt 67.
By turning slightly to right of left the needle can then be brought to the desired position. Tighten screw 44.

*IMPORTANT:* Ensure that there is *no play* between take-up lever link and swivel support when the eccentric is turned!



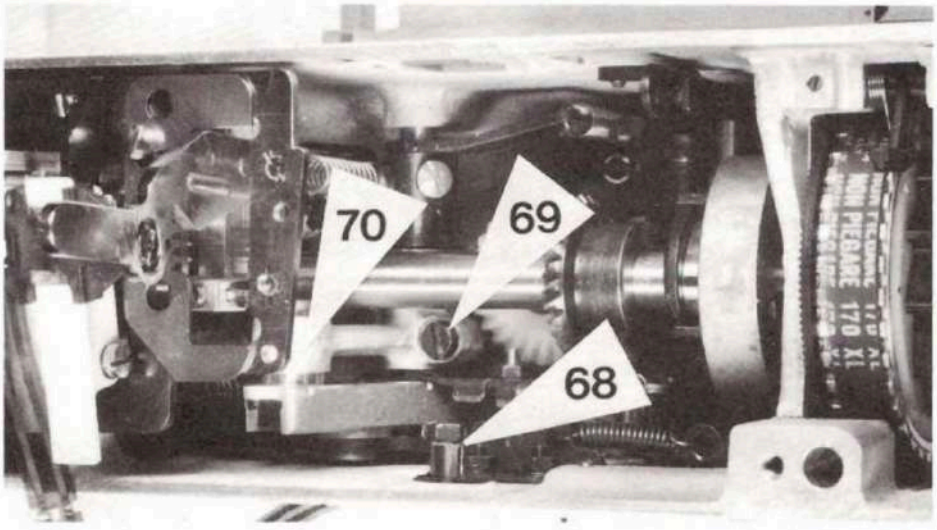

**Stitch position on zig-zag**

a) Turn stitch width knob to position 4 and check width of upper stitch (4,5 mm).
The zig-zag width is derived from the eccentric stop limit 68 for the zig-zag adjusting lever.

The stop should only be twisted to a maximum until the link block contacts the limiting screw in the link. This also prevents a tension arising between the adjusting lever and zig-zag link.

b) Now turn hand wheel and check whether left and right-hand penetration are equidistant from the edge of the stitch hole.
If this is not the case, release clamping screw 69 of the rocker arm 70 (on which the zig-zag link is suspended) and set needle to correct position. Tighten clamping screw.

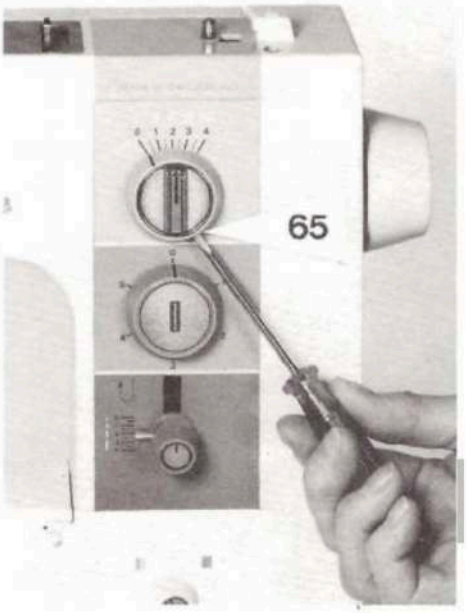
*IMPORTANT:* Ensure that *no play* exists between bearing and rocker arm 70 when the rocker arm is moved!

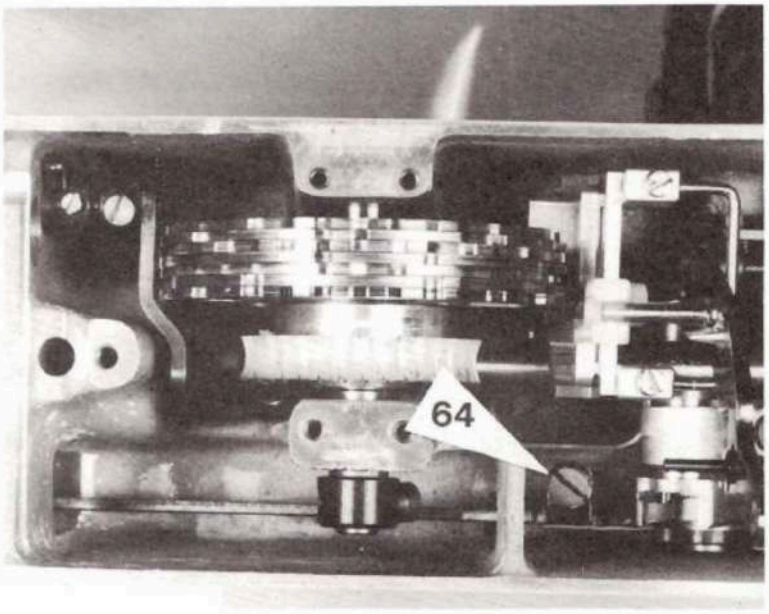


## Rest position of needle

Turn stitch width knob fully left to the stop (0 position). Start machine. The needle swivel support must not make any sideways movement.

If it does move, correction is made as follows: turn right-hand screw 64 (with helical spring) to right or left until the *needle swivel support* makes no further sideways movement.



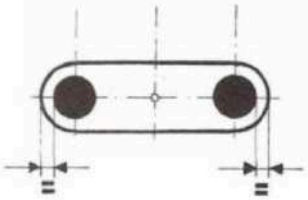

When the rest position of the needle is corrected, check whether the marking line on the stitch width knob coincides with the «0» on the scale.

If not set exactly, loosen screw 65 in the stitch width knob and set the two marks (knob and scale) in alignment. Tighten screw 65.

## Lateral needle movement

The needle must pierce through the center of the stitch hole when the mark on the LCR knob is vertical.

This can easily be checked by observing the needle while turning the LCR knob from left to right.



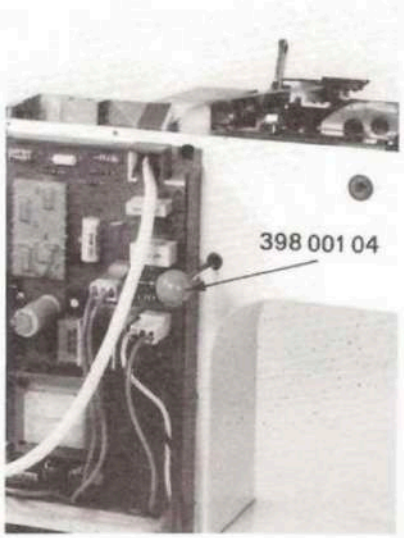
**Adjustment of link and needle position L-C-R**

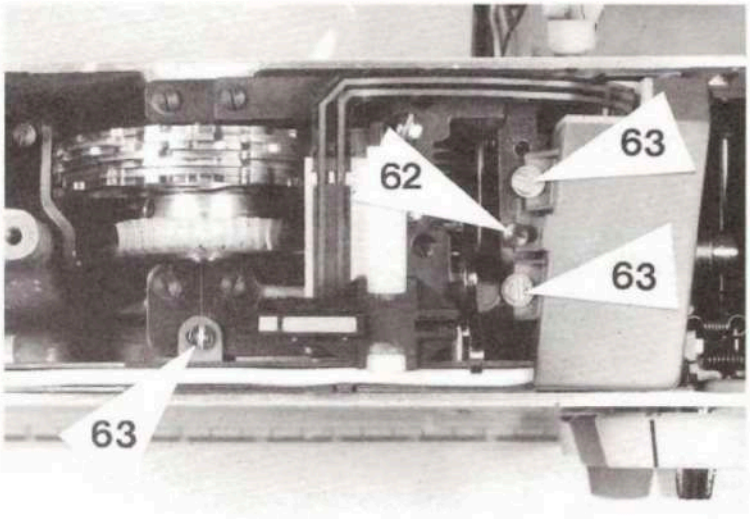
(*L*eft – half-left – *C*enter – half-right – *R*ight)

To do this the transformer must first be removed. (See dismantling transformer, page 38.

Dismantle circuit board T 910, loosen the two screws 63 and remove transformer housing.

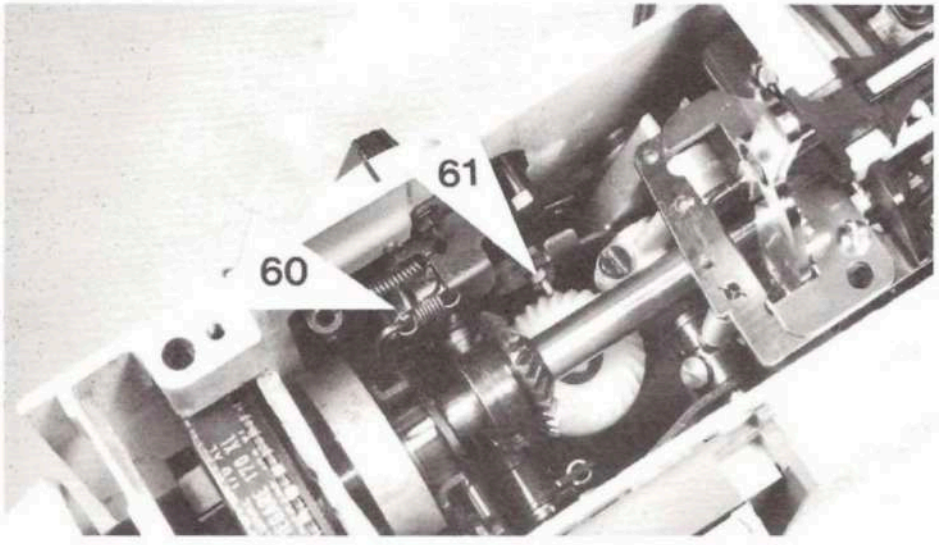
Place the special tool No. 398 001 04 through the hollow link spindle, while at the same time turning the LCR knob backwards and forwards until the conical tip of the tool enganges in the hole of the link. This ensures that the link in its normal position pivots around the center of the link spindle.




At the same time, the LCR locking lever 40 must be engaged in the center position. If not, the locknut and socket head screw 61 are released.

Set the locking lever to the prescribed position and retighten socket head screw with locknut. Remove tool.

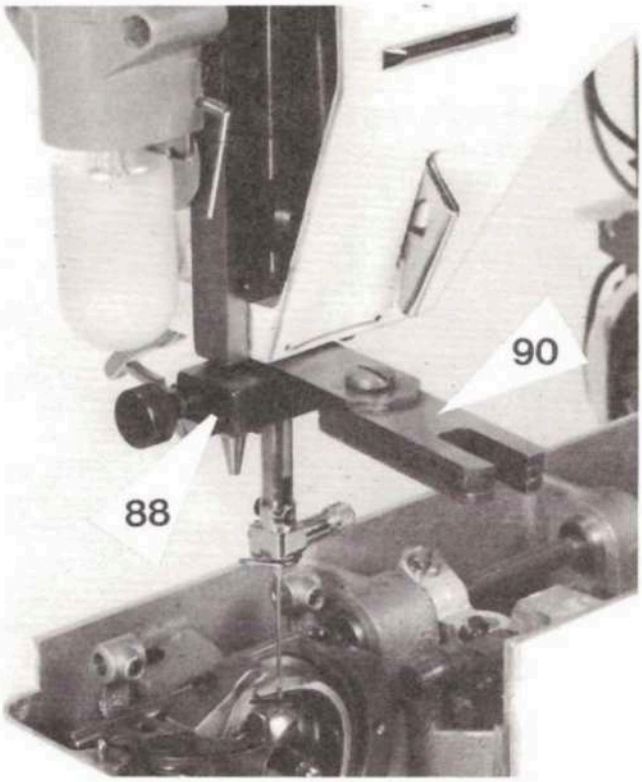


## Loop lift

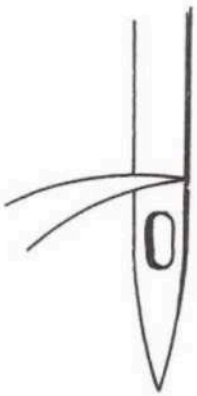
The loop lift ist the path traversed by the needle bar during the upwards motion from the lowest point until the hook tip is flush with the right-hand edge of the needle behind the needle.

Model 910: loop lift = 1.6 mm

The loop lift ist set on left-hand stitch (loop lift gauge No. 398 008 04).




Set needle bar to lowest position. Place clamping piece 88 around the needle bar. Insert loop lift gauge 90 between swivel support and clamping piece and tighten screw of clamping piece.



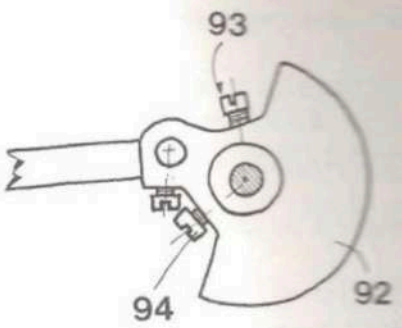
Remove gauge 90 and raise needle bar to the stop by turning the handwheel in direction of running (anti-clockwise).

In this position the hook tip must be at the same level as the right-hand edge of the needle.

If this is not the case, correct as follows:

By turning the lift crank 92 set the hook with the hook drive in such a way that the hook tip is flush with the right-hand edge of the needle. Then tighten screw 93 and check setting.

Remove clamping piece and turn lift crank until the screw 94 can be reached. Screw 94 is a pointed screw and should therefore only be tightened when the required setting is obtained.




*WARNING:* When tightening the screws 93 and 94 the lift crank must not be pushed down on the vertical spindle, in order to prevent play between crank and vertical spindle.

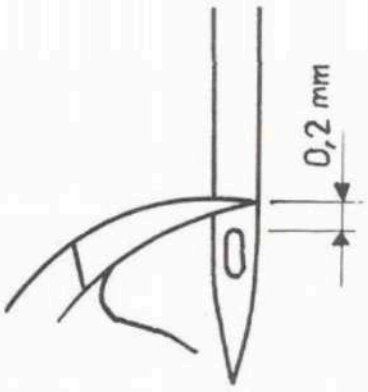
**Needle height** (Setting the needle bar)

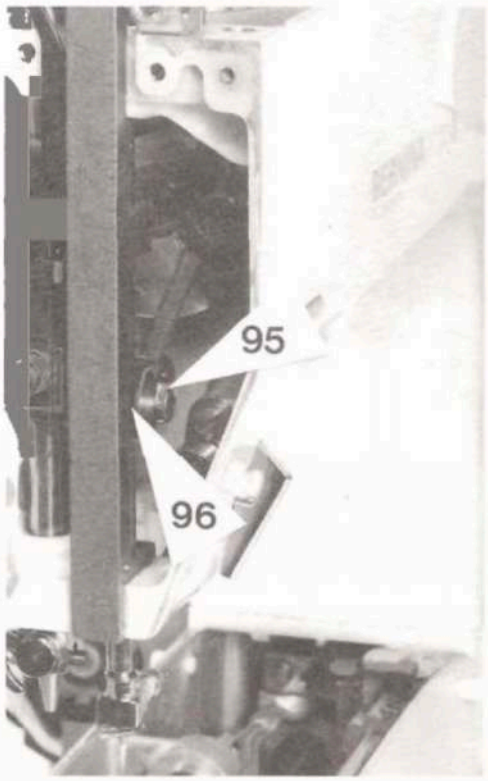
The final needle eight is determined after setting the loop lift.

The needle should pierce on *right-hand stitch.* After the loop lift is completed, the lower edge of the hook tip should be approx. 0.2 mm above the upper edge of the eye of the needle.

Correction:

- Loosen clamping screw 95 of needle bar carrier 96 and place needle bar in prescribed position.
- Caution: The needle bar must not become twisted! Can be checked with a double needle.
- Finally re-tighten screw 95.



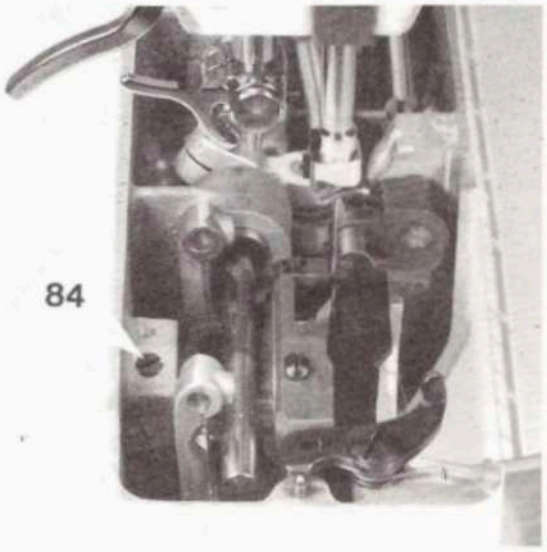
## Lateral hook adjustment

Check and adjust only with the center needle position. The lateral spacing between needle and hook should be 0.05 mm in the fluting. If this is greater, the result will be skipped stitches, if too small the tip of the hook may be damaged.

Correction: by shifting the hook race.

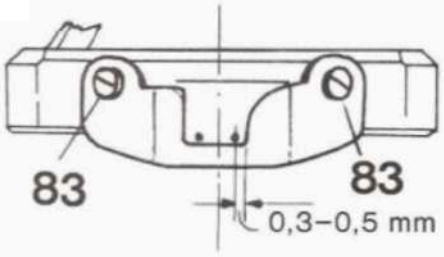
Loosen screw 84. The hook race can then be moved forwards or backwards depending on whether the needle spacing must be increased or decreased. Tighten screw 84 after setting correctly.

*WARNING:* The distance of the needle from the hook drive is exactly the same as that between needle and hook!


## Thread guide plate

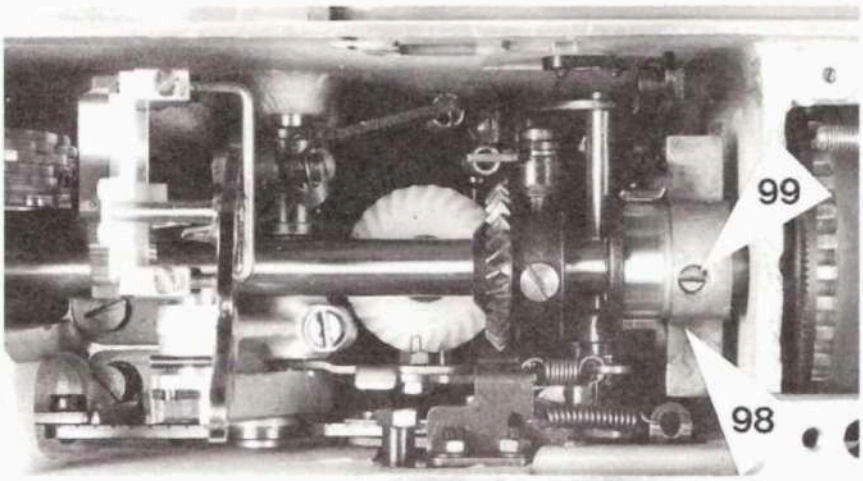
The thread guide plate ist situated above the hook race. The lateral needle spacing from the thread guide plate opening should be approx. 0.3–0.5 mm on the right-hand side for maximum zig-zag deflection. In case of discrepancies, loosen the two screws 83 an set the thread guide plate to the correct position as illustrated.



## ADJUSTING THE FEED-DOG

### Feed-dog advance

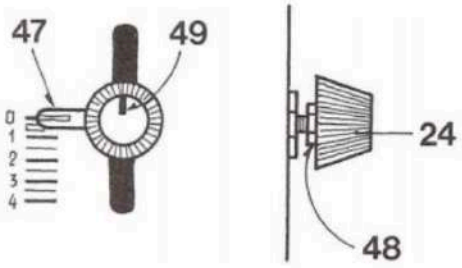
The feed-dog eccentric has only one fixing screw 66. This must be set exactly on the flat of the upper arm shaft. It must be ensured that the advance eccentric 86 is set axially so that the stitch setting fork is indeed controlled but not jammed.




### Feed-dog lift

The lift eccentric is firmly connected to the lift crank. This means: when the return motion and loop lift are set, the motion of the feed-dog is also correct.

a) *Setting the stitch length knob*




Turn stitch length knob 24 to the right to the stop. The mark on the front of knob 24 must be at the top.

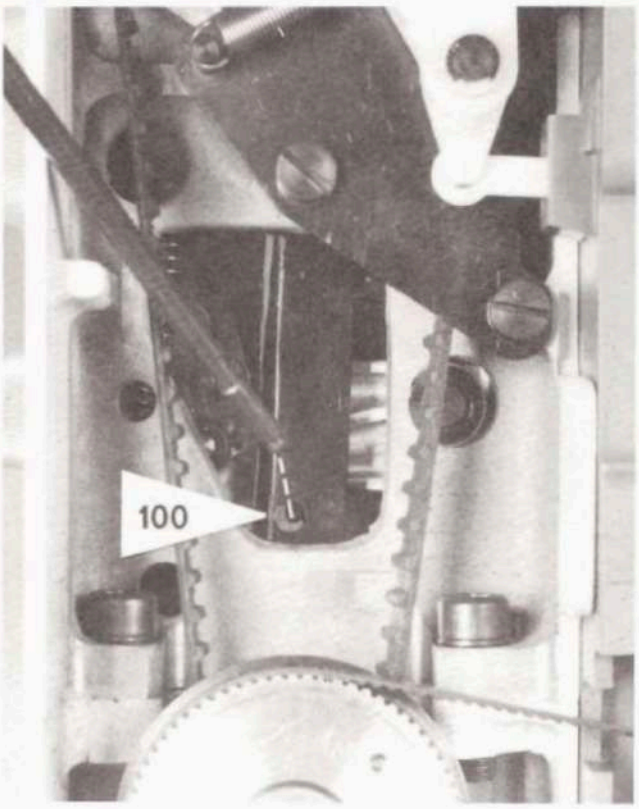
In the event of discrepancies, loosn the hex. nut 48 behind the knob and turn knob to proper position. Tighten nut 48.

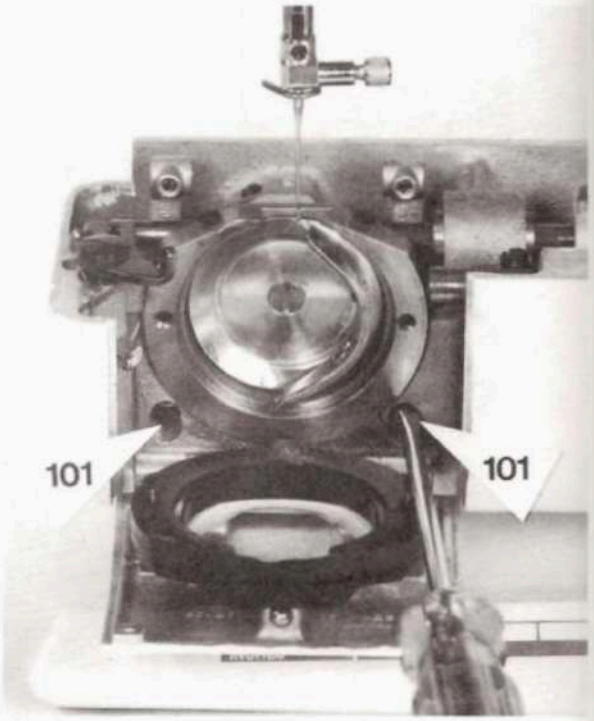
*WARNING:* The stitch length knob must not turn from the zero position.

b) *Setting the stitch length stop*

The displacement arrow must coincide with the «0» on the stitch length scale.

If correction is necessary, loosen screw 100 with tool No. 398 122 030. Then move the stitch length knob with displacement arrow (stop) so that these concide with the scale. Tighten screw 100.

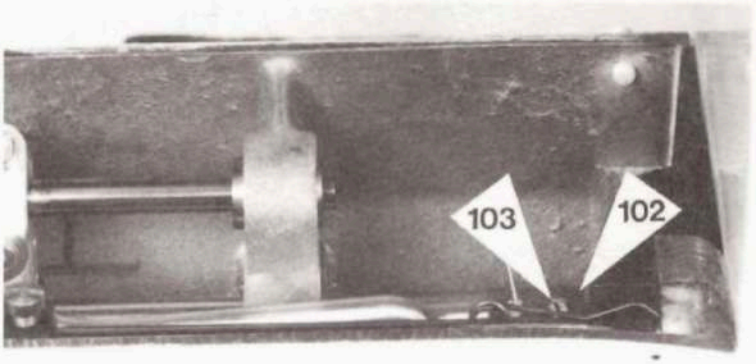



c) *Position of feed-dog in needle plate*

The feed-dog must be free to move in the needle plate. Correct as follows:

- Loosen both screws 101.
- The fed-dog can then be moved sideways and lenthwise.
- Set stitch length knob to 3, average out the feed-doog, needle plate spacing in the longitudinal direction.
- Tighten the two screws 101.

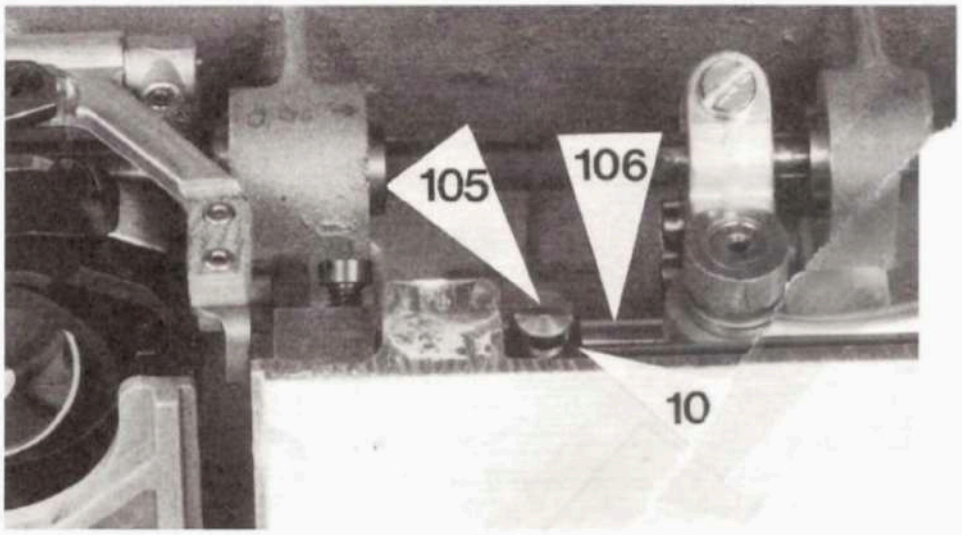


d) *Feed-dog height*

The tips of the feed-dog teeth should be 1.0 mm above the needle plate at the highest position. The correct setting should be checked with gauge 398 027 03.

Set Sewing/Darning knob to «Sewing». Place adjustment gauge with the notch on the needle plate (1.1 mm at front, 1.0 mm at rear). Set the longest stitch (4 mm). The feed-dog height can then be checked.

If correction is necessary, loosen the two screws 103 of the half-coupling 102. The latter can then be turned forwards and backwards and the feed-dog its raised or lowered. Tighten screws 103 and check lateral play of half-coupling. Fit needle plate and check the dimensions again with the setting gauge.




e) *Depth limit stop for feed-dog*

The adjusting ring 104 acts as a limit stop for the feed-dog 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.

Correction:
Set Sewing/Darning knob to «Sewing».
Then bring feed-dog to lowest position by turning the hand wheel.

The distance between the limiting screw and the base wall should now be 0.1 mm.

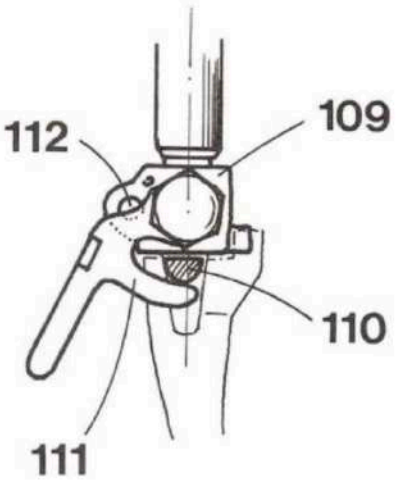
If not, loosen screw 105 and turn setting ring radially and fix in the prescribed position.

*WARNING:* axial play on feed lift shaft 106!

Also check whether the feed lifter shaft 106 can be moved freely when the Sewing/Darning knob is at «Darning».

## PRESSER FOOT BAR

a) *Adjustment of presser foot fixing*




The height of the clamp 109 should be set so that the tension cam 110 of the presser foot is approximately at the center of the clamping surface of lever 111.

Correction:
Loosen screw 112 and set clamp to the correct position.

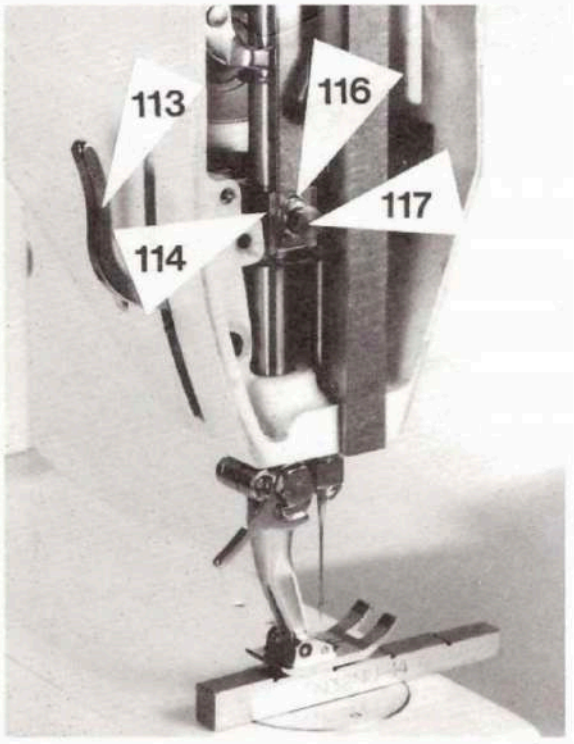
*WARNING:* The clamp 109 must *not* be twisted.

b) *Presser foot adjustment*

Lower feed-dog, raise lifter lever 113 and attach normal presser foot.

Place feller gauge No. 398 03 3 (height 7,5 mm) under the presser foot on the needle plate. In this position the material presser foot bar guide 114 must lie on the lifter lever 113.

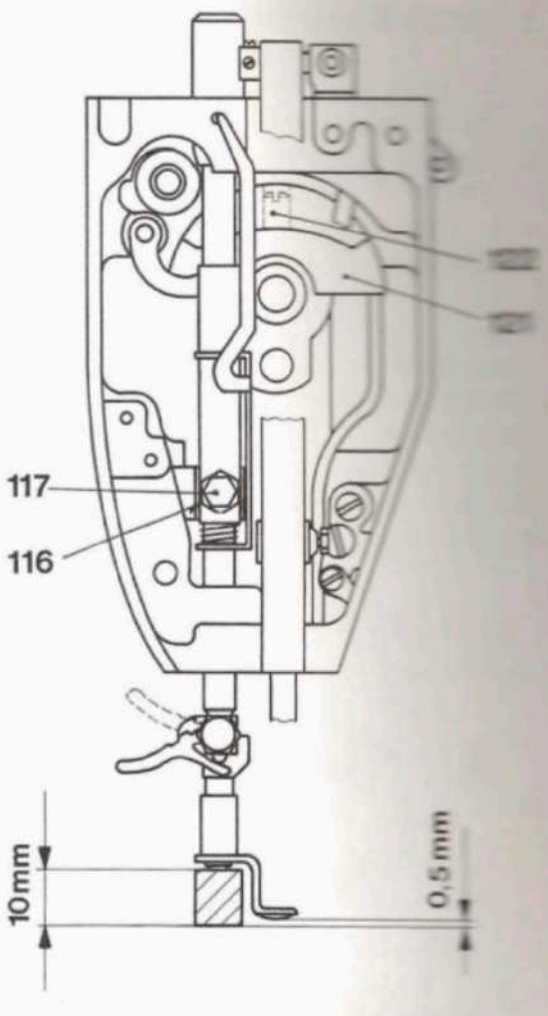
Correction:
- Loosen nut 116 and screw 117
- Move material bar guide 114 to correct position and set presser foot parallel to the needle plate slots
- Tighten screw 117.



c) *Setting the darning device*

- Remove presser foot
- Fit darning foot
- Lower feed-dog
- Place spacer (10 mm) under the darning foot shank and lower presser foot bar.
- Turn handwheel until the fixing screw of the swivel piece 121 points vertically upwards.
- Move connecting strap down until the long darning lever lies on the darning eccentric.
- Tighten nut 116.

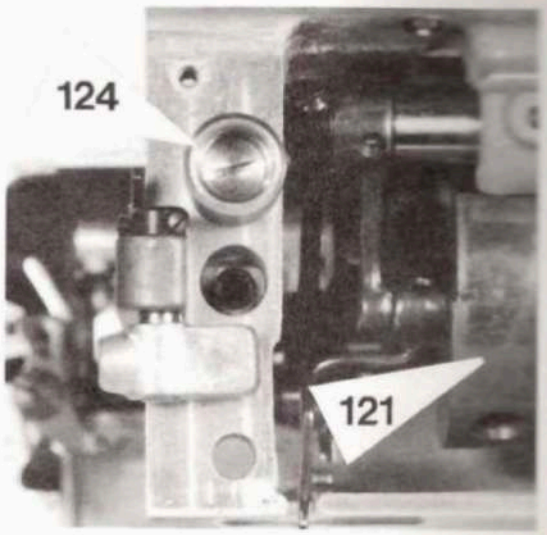
When set correctly the distance between the darning foot sole and the needle plate is 0,5 mm.




d) *Regulating the presser foot pressure*

The presser foot pressure can be regulated with screw 124.

Factory setting = 1200 grams at lowest presser foot position on thin material (single-ply cretonne).

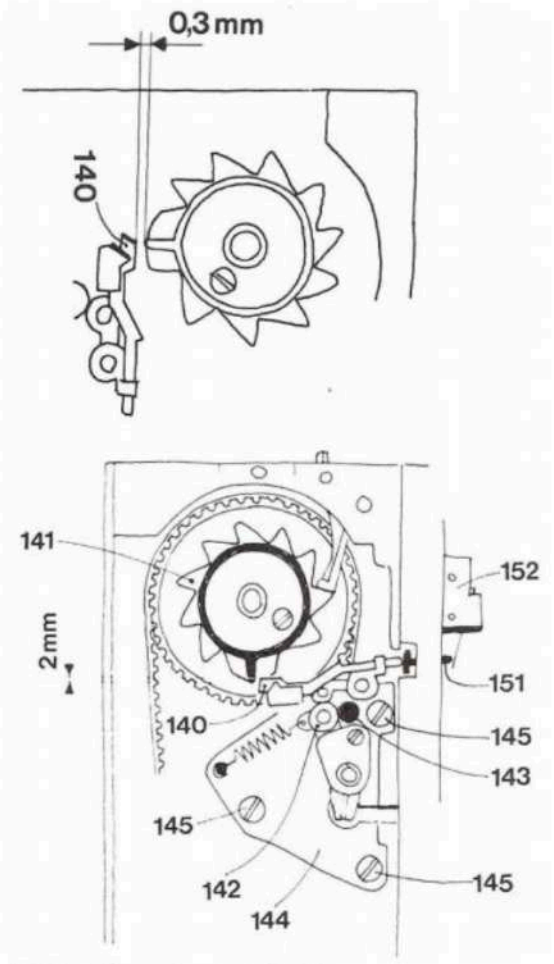


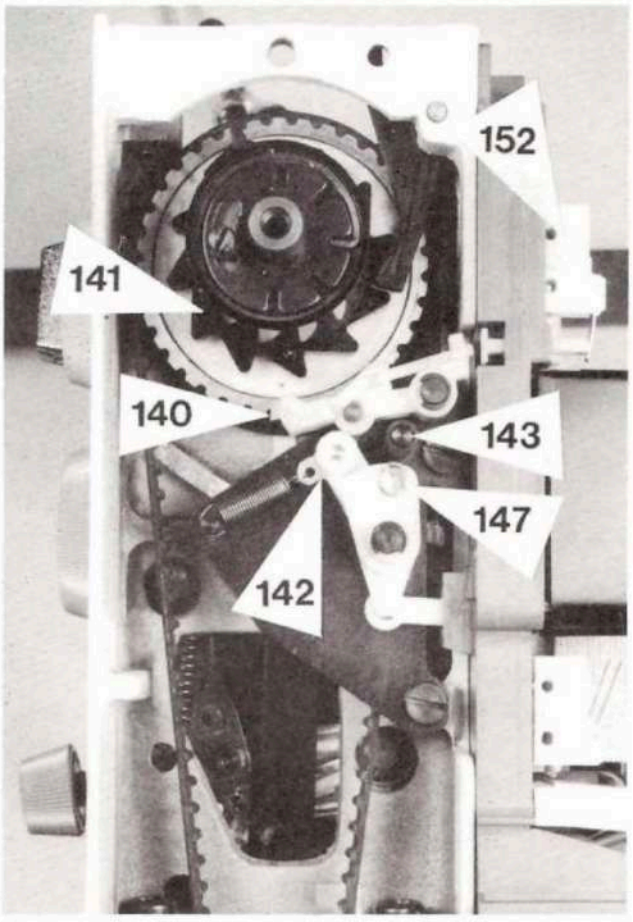
## NEEDLE STOP DEVICE

When the machine ist stopped, the needle bar and take-up lever are moved automatically to the upper position.

### 1. Setting the bearing plate

In the working position the latch 140 should engage approx. 2.0 mm in the stop of the clutch sleeve 141. Press toggle lever 142 on stop 143. Turn stop spindle in direction of rotation until the coupling sleeve is against the latch. If correction is necessary, the bearing plate 144 must be moved as required. Loosen the three fixing screws 145, set bearing plate to prescribed position and tighten screws 145. When the magnet has released the hinged armature, the latch 140 should be approx. 0.3 mm below the stop of the coupling sleeve 141.




### 2. Setting the latch lift

When the hinged armature 146 of the magnet is closed, the toggle lever 142 should reach the stop 143. (Check with a 0.1 mm gauge or a strip of paper in between).

When the magnet has released the hinged armature, the latch 140 should be approx. 0.3 mm below the stop of the coupling sleeve 141.

Thread Nr. 100, 3-ply, left-twist, or
Darning thread No. 100, 3-ply, right-twist.

Thread bobbin case thread in extra tension.

**e) Checking the width of bar tack and bead**

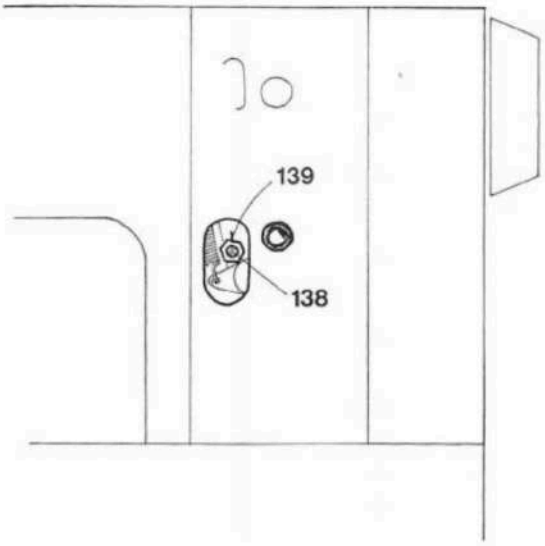
Theoretical sizes: bar tack width = 4.27 mm
bead with = 1,91 mm
cut gap = 0,45 mm

Correcting cut gap:

Cut gap and bead width *cannot* be adjusted independently.

- Buttonhole knob to 1
- Dismantle knob and scale plate of buttonhole device
- Loosen lock-nut 139 on zig-zag changeover lever
- Set cut gap and bead width by turning eccentric bolt 138
- Tighten lock-nut 139.

After adjustment check the position of the stitch width knob (mark must be at 0). Loosen screw if necessary and move knob to correct position.



**d) Setting forward and reverse beads**

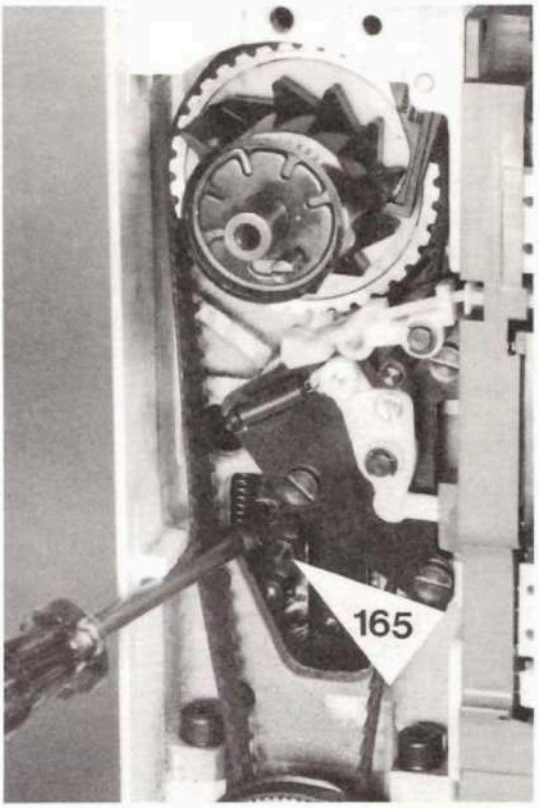
(Zero position of the stitch setting link)

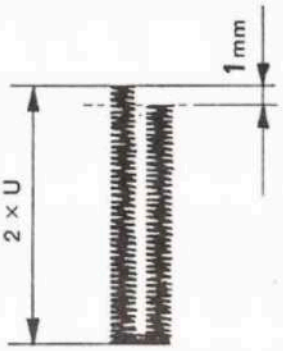
Sewing forward bead: buttonhole knob to «1»
Cam set two full turns (sew 72 stitches).

Sewing reverse bead: buttonhole knob to 3
Cam set two full turns
(sew 72 stitches).

Check: Measure difference in length between forward and reverse beads.

Both beads should be the same length, although it is permissible for the reverse bead to be 1 mm shorter. If the difference in length is more than 1 mm, the position of the link mus be adjusted.




*WARNING:* 1 mm difference in bead length requires a correction of only 1/100 mm to the link. Only a very slight turn may be made with the eccentric key.

Correction:
- Loosen nut 165 with socket wrench SW 5,5 mm
- The link position can be adjusted by shortening or lengthening the strap with eccentric key No. 398 091 03.

If the *reverse bead is shorter* than the forward bead, the two connecting straps must be *pushed together,* i. e. the axial distance between link and stitch setting screw should be shortened.

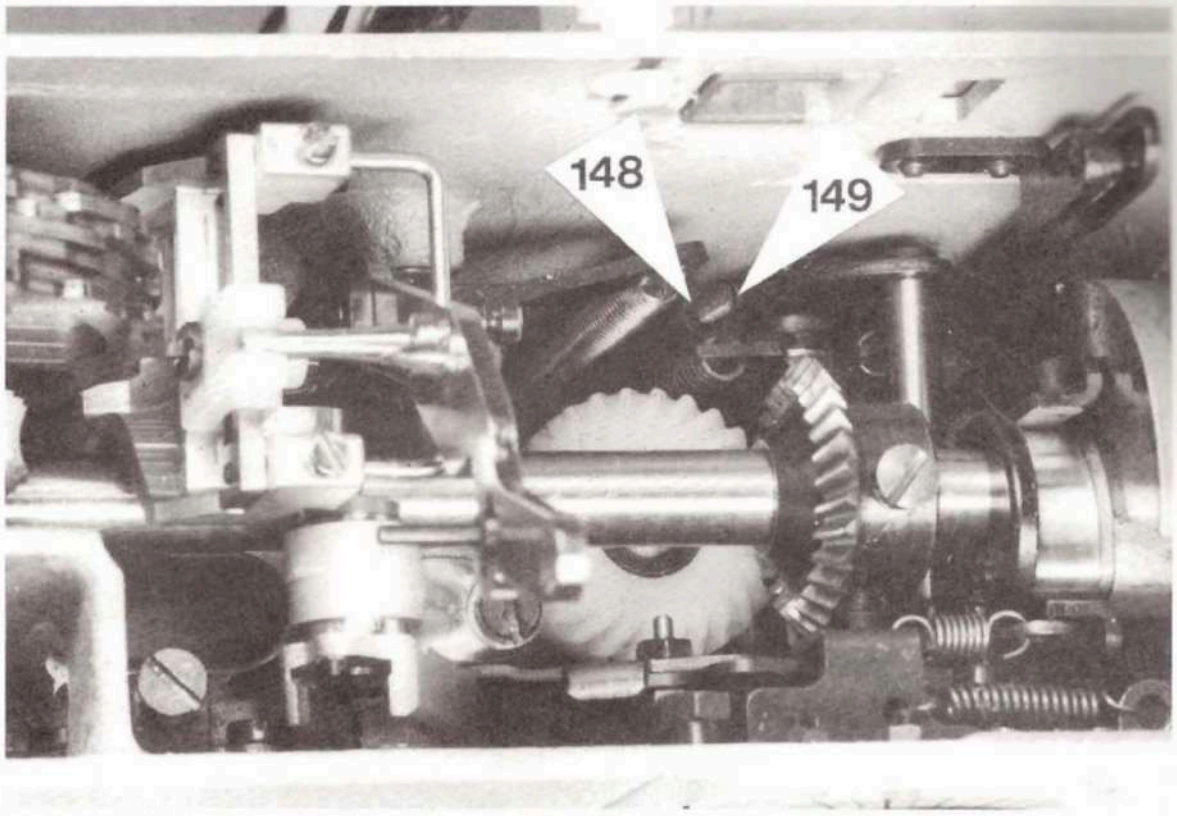
If the reverse bead is longer than the forward bead, the two connecting straps should be pushed away from each other, i. e. the axial distance between link and stitch setting screw should be lengthened.

- Tighten nut 165
- Sew buttonhole again and check

### c) Setting the bar tack density

The material feed must be zero when sewing the bar tack. A minimum feed in the direction of reverse stitch is permissible.

Correction:
- Remove belt cover
- Set buttonhole knob 20 to 2
- Open stitch length knob 24 half a revolution from the zero position. The mark on the front of the knob is now underneath.
- The correct position is set by turning the adjusting screw 149 to the right or left.
- Tighten lock-nut 148
- Check bar tack density again with position 4 (buttonhole).



## ADJUSTMENT OF AUTOMATIC BUTTONHOLER

*WARNING:* Needle should be neither blunt or bent!

Set buttonhole knob to 0
Turn-in stitch length knob 21 to the stop.

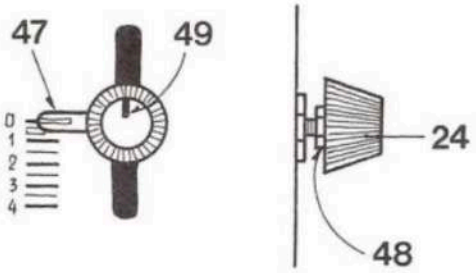
### a) Position of stitch length knob 24

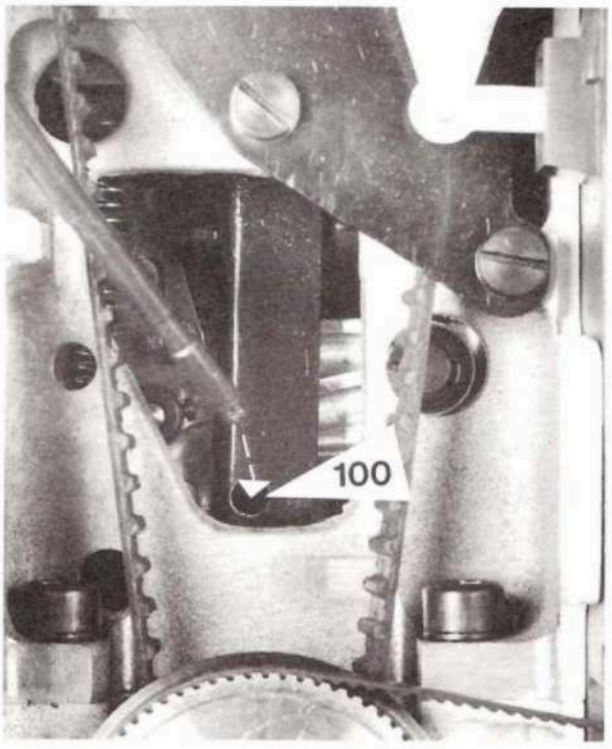
The mark on the front of the knob 24 must be at the top. In the event of discrepancy, loosen hex. nut 48 behind the knob and turn knob to correct position.

*WARNING:* Spacing between sliding arrow and nut must be at least 2 mm. The stitch length knob must not turn out of the zero position.

### b) Setting stitch length stop

Loosen hexagonal socket screw 100 with tool No. 398 122 030. The stitch length knob 24 with sliding arrow (stop) can then be moved so that the sliding arrow coincides with the scale. Tighten screw 100.

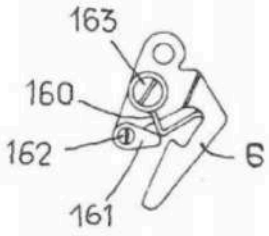


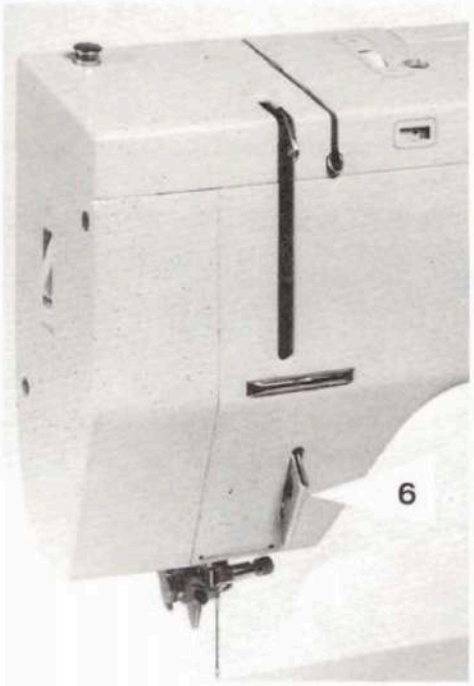



## SETTING THE THREAD REGULATOR

The thread regulator spring 160 must contact the limiter 161 when the eye of the needle (downward motion) is flush with the needle plate.

The stop 161 can be set by turning screw 162.




The tension of the regulator spring 160 is also important. It is correct when the needle thread is held tight by spring 160 during the downward motion of the take-up lever.

The tension can be increased of decreased by turning screw 163 to left or right.

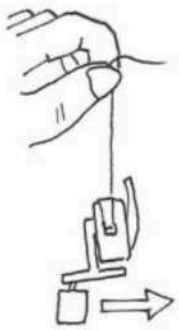
## LOWER THREAD TENSION

For testing use thread No. 60, 3-ply, white, left-twist. This thread is contained in the bobbin case of every new machine.

The lower thread tension is checked with the movable setting weight No. 398 118 040.

The bobbin case is placed in the weight gauge just as in the hook.

Check:
Hold the free end of the thread and suspend the bobbin case with setting wieght +5 g. The bobbin case must not now move downwards.

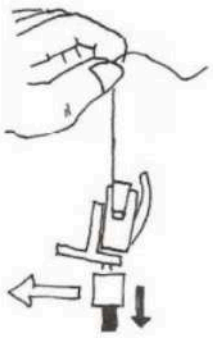


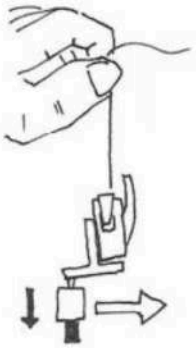
The thread may only slowly move downwards after attaching the 5 g additional weight.

Regulation of the lower thread tension is performed with the bobbin case spring screw using the small screwdriver.

Turning left = weaker
Turning right = stronger

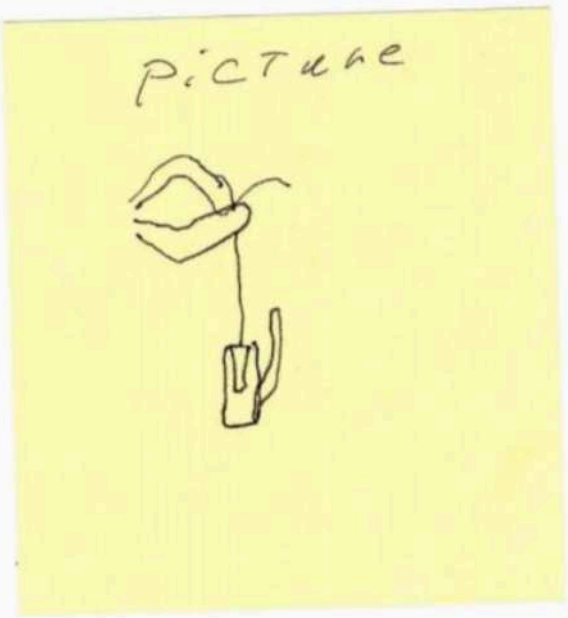
The tension set should be checked with the weight on the left and right.





*Note:* When checking with darning thread No. 100/2 use only *one* additional weight.

The upper thread tension must be adapted to the lower thread tension.

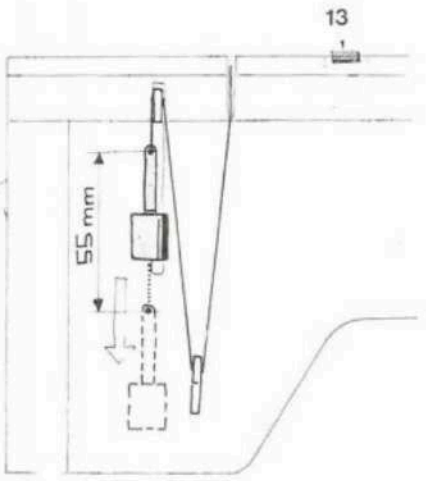


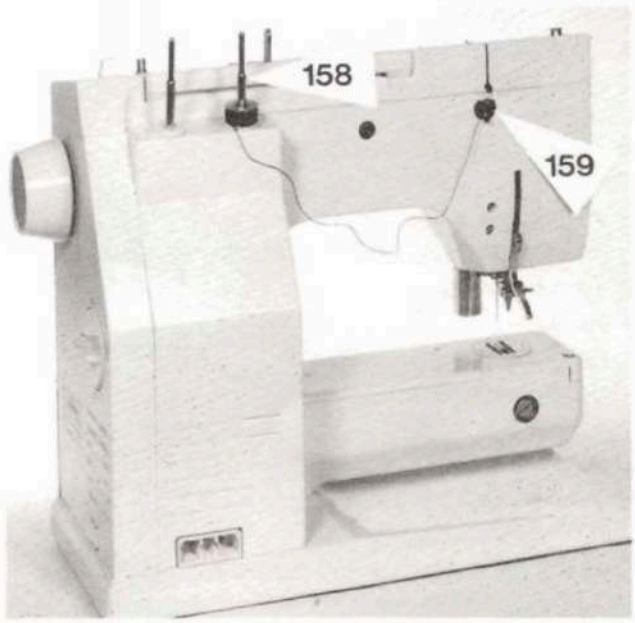
## UPPER THREAD TENSION

Check and adjust the upper thread tension with the setting weight No. 398 080 04.

- Thread No. 60, 3-ply, white, left-twist
  (This thread is in the bobbin case of every new machine).
- Place bobbin on the front reel pin
- Set take-up lever to uppermost position and thread as far as take-up lever.

*WARNING:* Lay thread to the right of the thread tension disc.




Draw approx. 30 cm thread off the bobbin so that the thread hangs *loosely* between reel pin 158 and diverting eye 159. Suspend weight from the thread and note the speed of take-off.

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

The permissible take-off speed is 55 mm in 30 seconds = length of take-up lever slot, se sketch.

Correction:

1. Reduce the tension by turning the regulating screw for the thread tension towards –, until the weight moves well. The thread between reel pin and diverting eye must be slack.

2. Increase the tension by turning the regulating screw towards + until the take-off speed reaches 55 mm in 30 seconds.

3. Adjust the thread tension indication corresponding to the marking on the frame cover. The scale must be as close as possible to the wall, but must not touch it.

## 4. Positioning the needle

The stop position of the needle is first set roughly by attaching spring 153 in the setting ring 154 (5 stages) = center position. It is then set exactly using shank screw 155.

The following points should first be noted and checked:

- fit handwheel
- LCR knob to center
- attach darning foot
- Lifter lever down
- Belt tension

Check:
Allow machine to run and then stop from full speed. Place lifter lever up. The tip of the needle should now be flush with the lower edge of the darning foot sole. The take-up lever is now in the upper position.

Remark: The sewing speed immediately before the automatic stop switches off has an influence on the stop position of the needle and thread take-up lever.

If the prescribed needle stop position is approximately reached, the setting ring 154 can be turned to any position after loosening shank screw 155 until the final needle stop position is reached. Tighten shank screw 155 firmly. If by turning the setting ring the prescribed positions of needle and take-up lever are not yet reached, correct as follows:

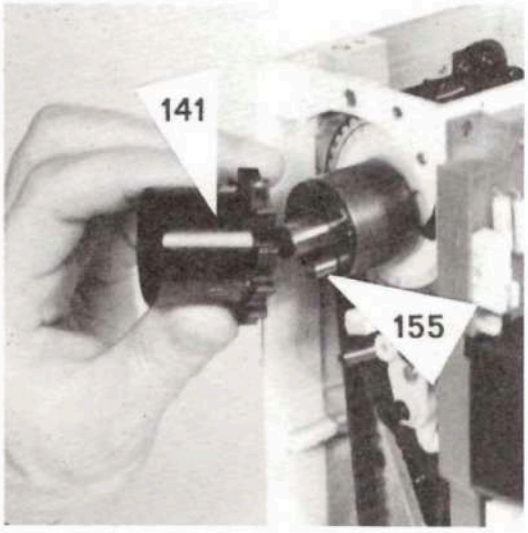
- Remove sleeve 141
- Alter position of spring in setting ring 154
- Re-fit sleeve 141.

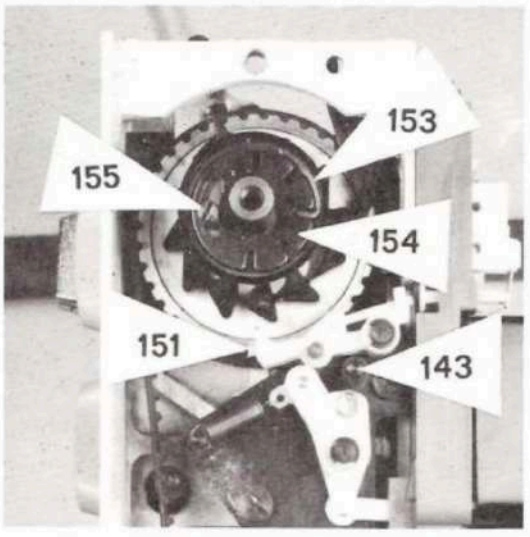
Then repeat stop test, if necessary repeating fine adjustment.

Finally check the needle stop position at various speeds.

*WARNING:* The needle stop test must only be carried out with the *handwheel fitted.*

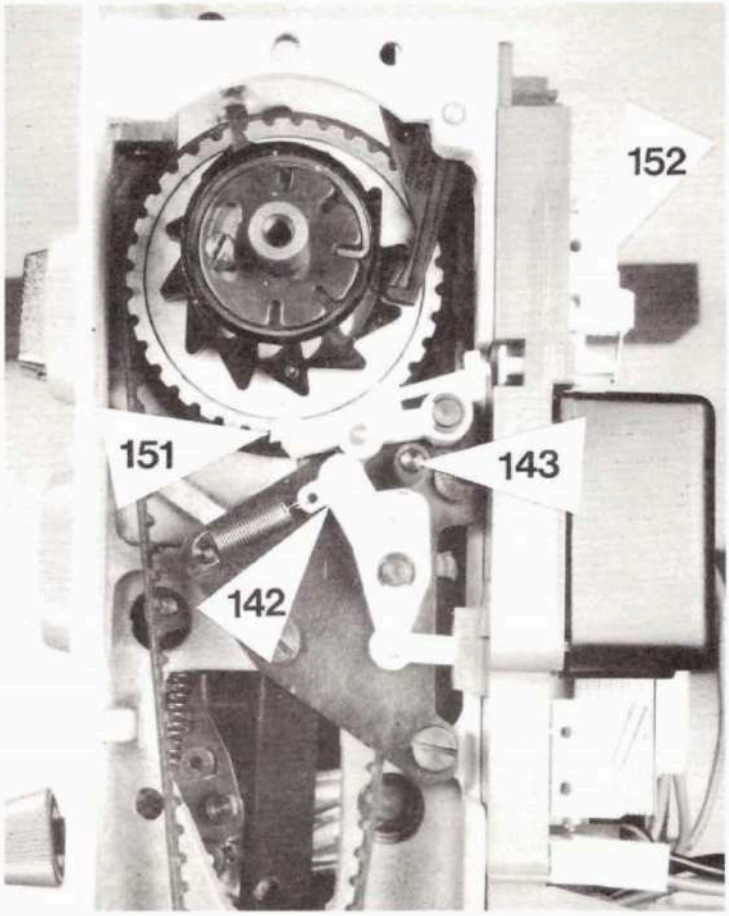
Otherwise the clutch spring could become detached and get damaged.



Correction:
Loosen connecting screw 147. Move toggle lever 142 to right or left as required. Tighten screw.

Re-check distance from toggle lever to stop.




### 3. Switch operation

Check or adjust as follows:
Press toggle lever 142 to stop 143 and move disconnecting bar 151 to the right, until it is flush with the latch.

In this position switch 152 must have been operated.

*WARNING:* Spacing between switch lever and switch housing 0.1–1 mm!
Otherwise adjust switch lever (bend).

## BOBBIN WINDING DEVICE

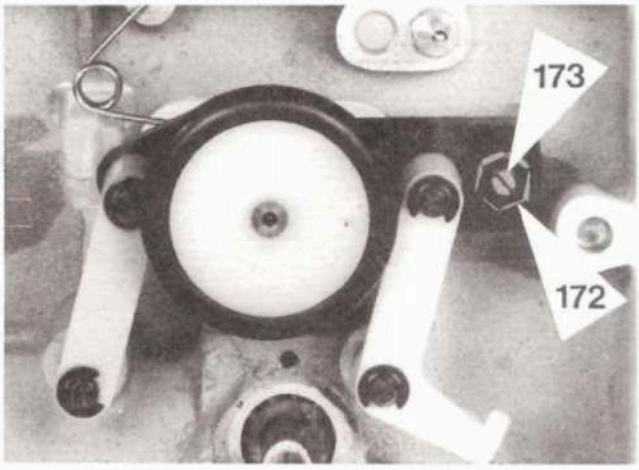
The thread should be wound evenly with pre-tension and the bobbin should be correctly filled.

The thread feed to the winder can be corrected by setting the pre-tension higher or lower.

### 1. One-sided winding

Correction to pre-tensioner:

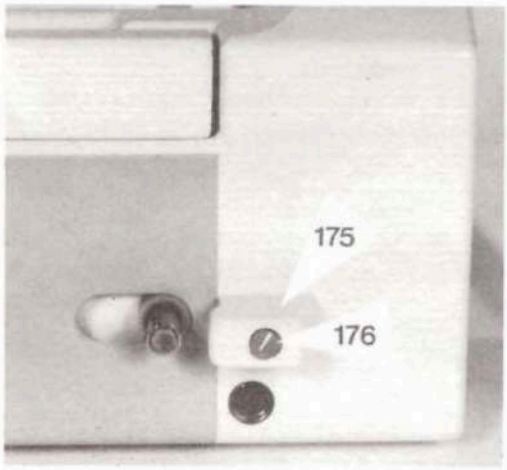
- Loosen lock-nut 172
- Turn tension bolt right and left until the thread is wound on evenly
- Tighten lock-nut 172
  The bobbin axis can also be corrected by adjusting the bearing plate.
- Loosen lock-nut 172
- Adjust screw 173 as required
- Tighten lock-nut 172.



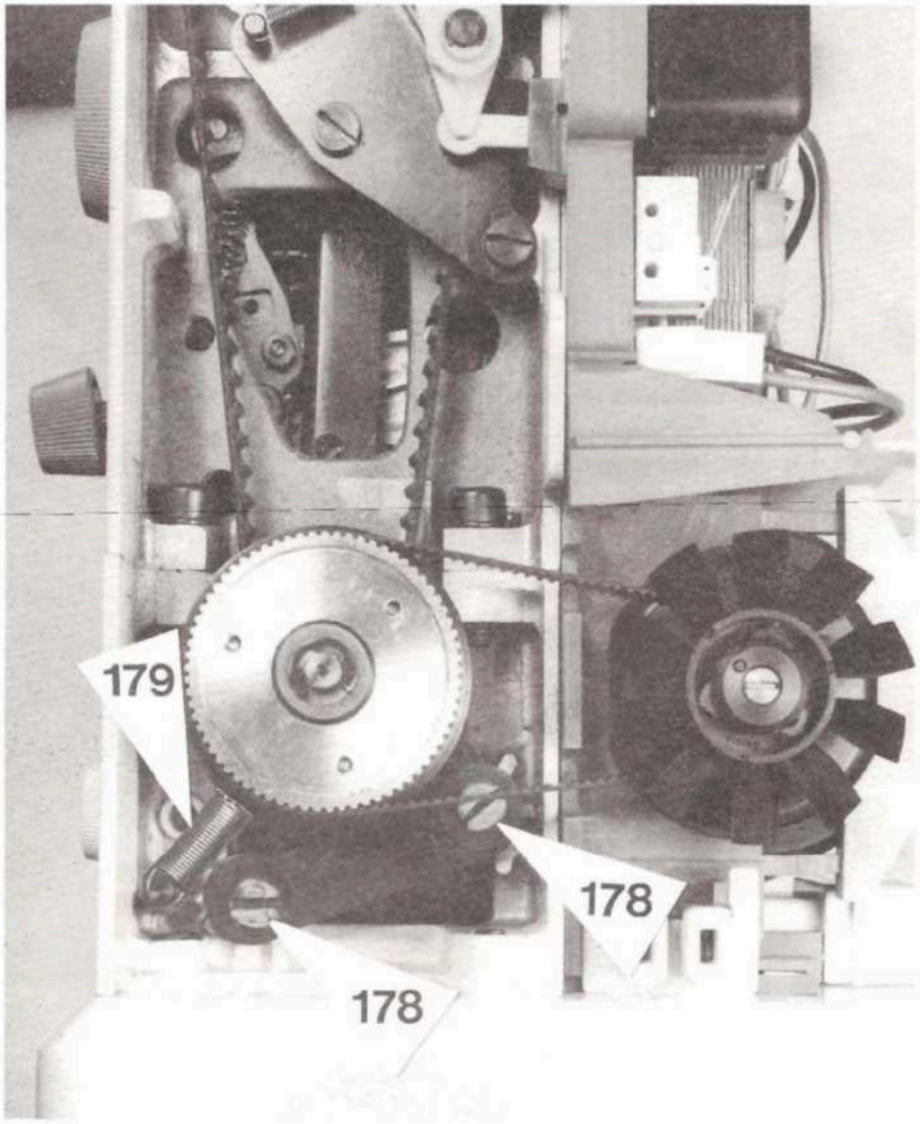

### 2. Filling the bobbin:

The amount of thread on the bobbin is set by moving the thrust piece.

Correction:
- Remove screw cover on the thrust piece.
- Loosen screw 176 slightly
- Move pressure piece right or left as needed
- Tighten screw 176.




## DRIVE




Toothed belts are used to transmit the motor power to the machine.

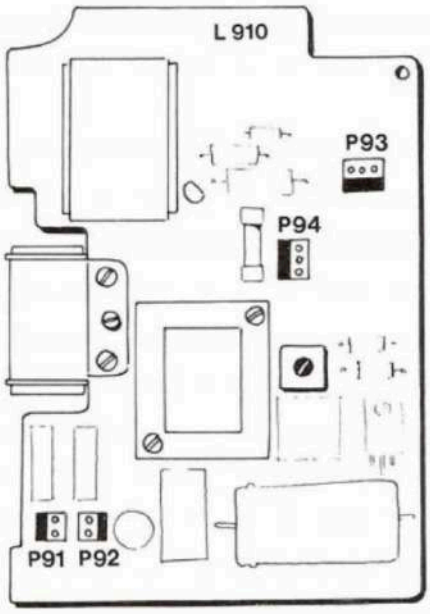
No. 305 326 030 toothed belt long, size 7,9x431,8 mm
No. 305 327 030 totthed belt short, size 5,5x243,8 mm

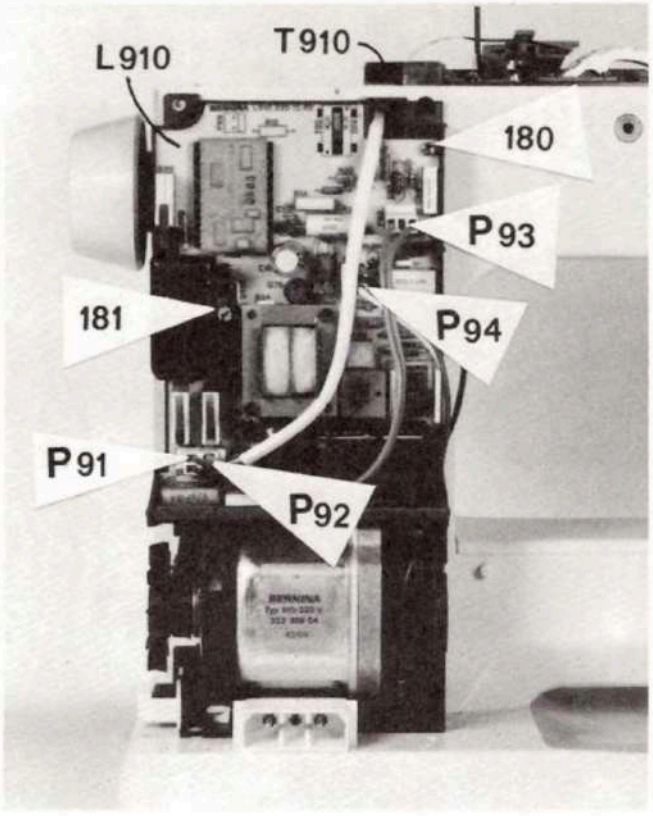
The combination of d. c. motor and toothed belt reduces the noise of the drive to a minimum.

*Re-tensioning the toothed belt*

Loosen screws 178. Turn handwheel backwards and forwards several times, tighten both screws.

Spring 179 draws the gearing into the correct position and thus produces the belt tension.



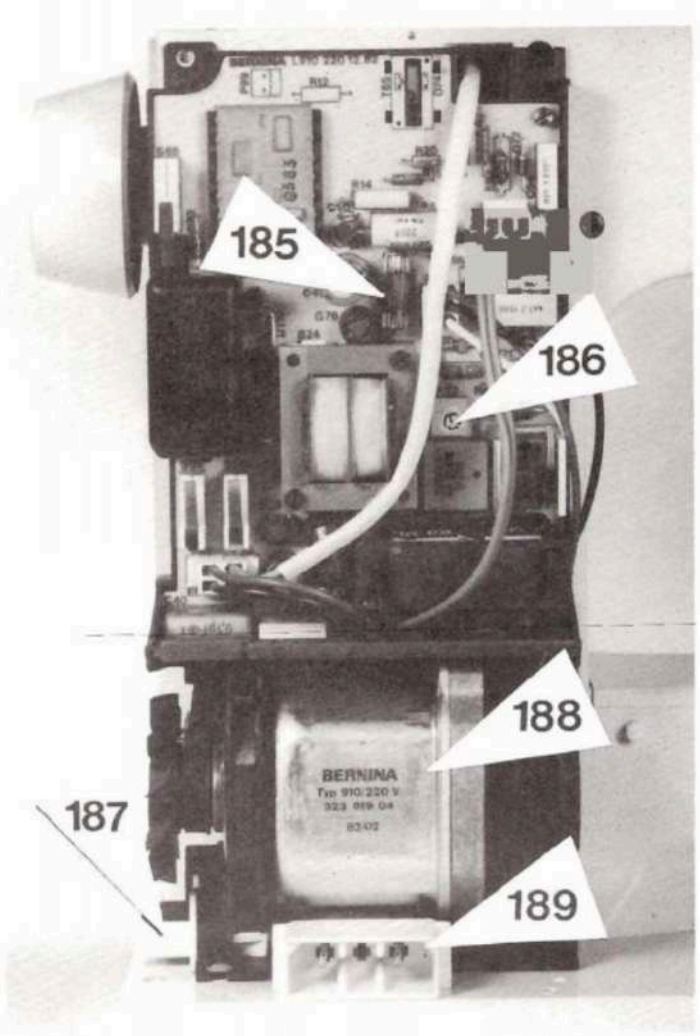




*Construction of electronic system*

Printed circuit board L 910 = power circuit
Printed circuit board T 910 = transformer circuit

*Exchanging the printed circuit boards PCB L 910*

- Dismantle belt cover, chassis cover and handwheel
- Withdraw plug connectors P 91 to P 94
- Loosen fixing screws for L 910 including magnet cover cap
- Tilt printed circuit board L 910 and lift out.




195 = fine-wire fuse
196 = potentiometer A
197 = potentiometer B
198 = foot control unit connection
199 = motor
200 = mains cable socket

Insert printed circuit board combination and attach needle stop lever in hinged armature of the magnet.

Magnet cover cap and secure. Tighten fixing screws 193 on L 910.

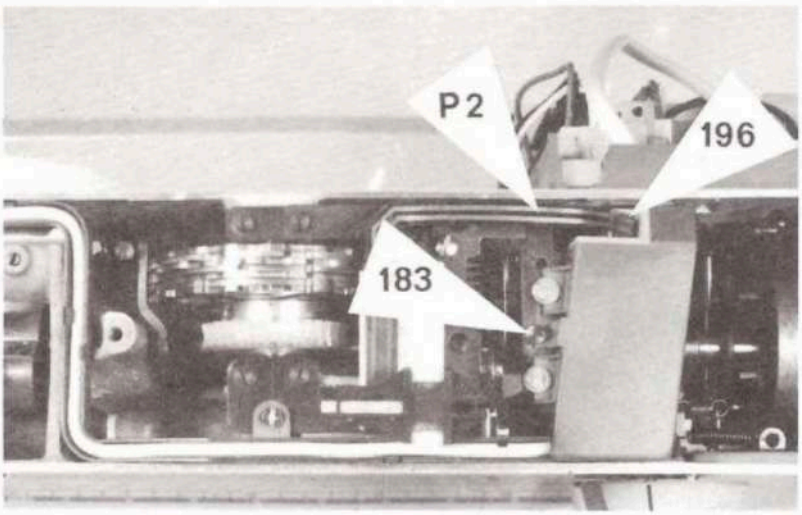
Provide plug connectors as follows:

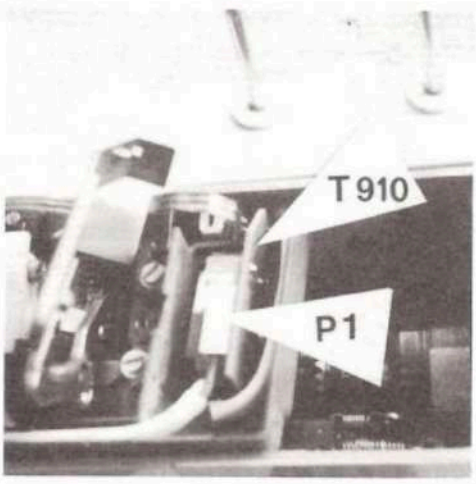
- Plug in P 94 (3-pin) with snap connector to the left
- Plug in P 93 (3-pin) with snap connector to the right
- Insert printed circuit board T 910 in P 92 (2-pin) with snap connector to the right.
- Connect mains supply to P 91 (2-pin). Snap connector to the left.
- Fit chassis cover and hand wheel *before* the function check.

Check:
- speed
- needle stop function
- LED indication
- sewing light.

*PCB T910*

- Remove top frame cover
- Remove belt cover and chassis cover
- Withdraw plug connection P 2 (flexi-switch) on transformer
- Unscrew transformer housing cover, open and remove
- Withdraw plug connection P 92 on L 910
- Withdraw plug connection P 1 on L 910
- Withdraw printed circuit board combination T 910 from the guide
- Fit new PCB T 910 in opposite sequence.

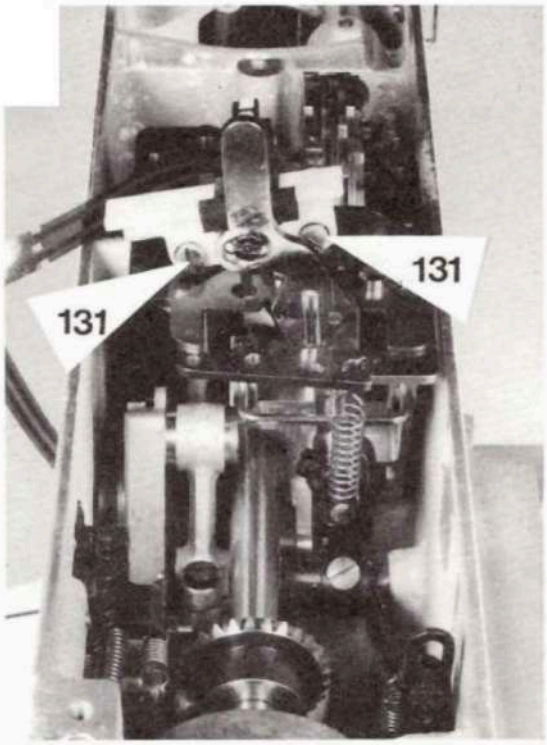


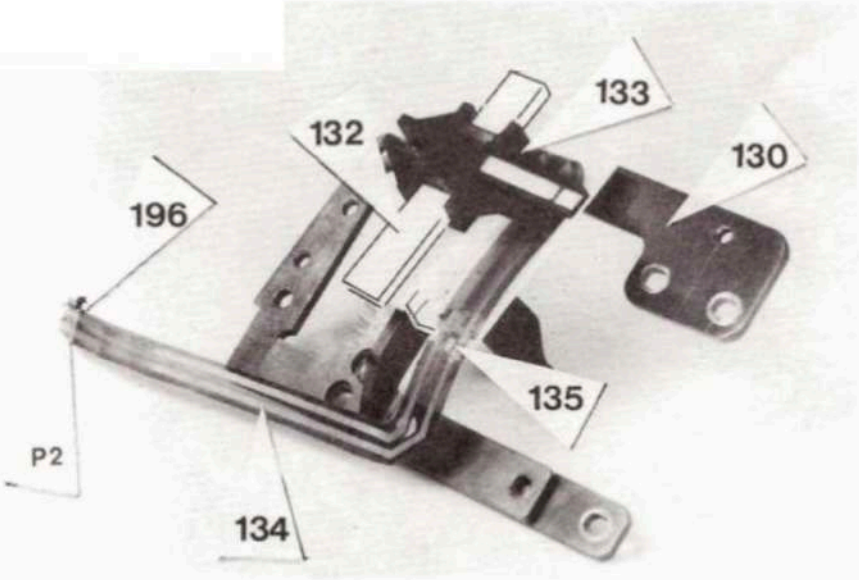



*Bulb with flexi-print*

(Stitch formation light)

- Remove top frame cover
- Withdraw plug connection P 2 (Flexi-switch 10) on transformer.
  *Grip plug with pincers, do not pull on Flexi-cable 10!*
- Loosen screws 14 and remove carrier 13 with guide rail 11 on «Schieber».
- Unhook Flexi-cable from latch 15 and bring safety-cover with Flexi-Cable from guide rail.
- Fit new safety-cover with Flexi-cable in opposite sequence.
- When fitting carrier 13 bring in bolt of stitch selection lever 16 into the slot of the bulb safety-cover.

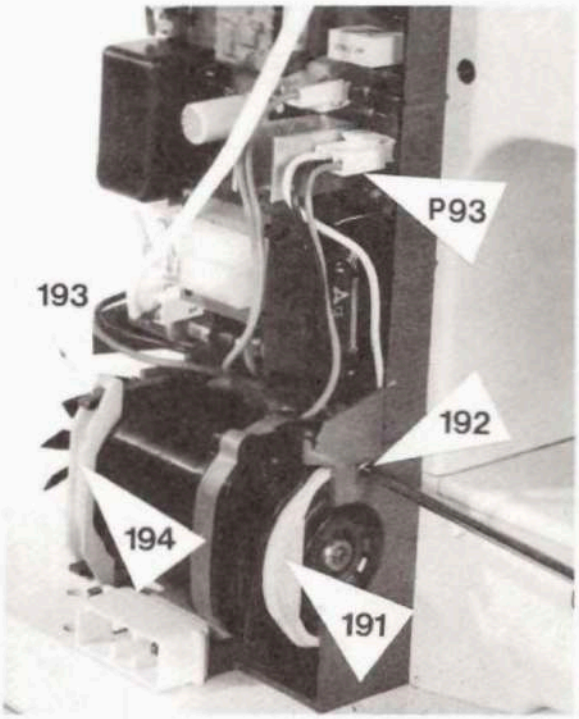


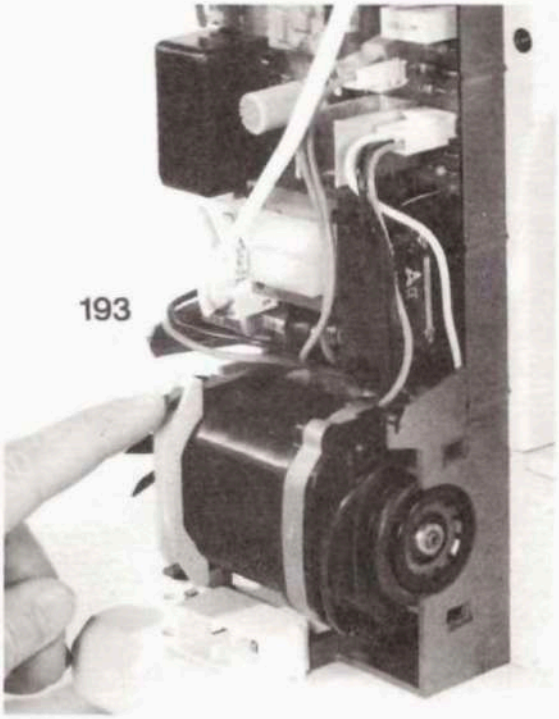




134 = Flexi-print
132 = Guide rail
133 = Safety-cover with bulb
130 = Carrier
131 = Screws for carrier fixing
135 = Latch for securing Flexi-print

## DISMANTLING THE MOTOR

- Remove belt cover and chassis cover
- Withdraw plug connection P 94
- Slacken toothed belt by loosening the two fixing screws 178 for the stepped pulley bearing plate

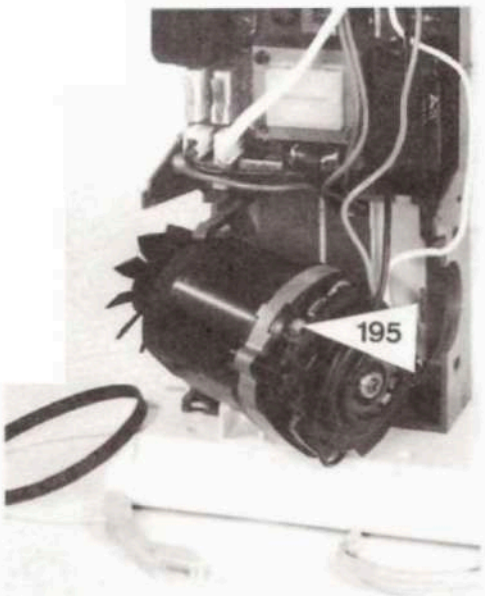



- Insert screw driver in slot 192 and press snap to clamp 191 upwards, remove clamp
- Press upper snap lightly and remove clamp
- Turn motor slightly clockwise (as sen from pulley side) and lift out.

## CHANGING THE BRUSHES

- Bend up brush strap
- Remove brushes (residual length 4 mm)
- Fit new bushes (No. 323 784 03)
- Close brush sleeve
- Refit motor in opposit sequence



## ELECTRICAL ADJUSTMENTS TO PRINTED CIRCUIT BOARD (PCB)

The printed circuit board is adjusted by the manufacturer and the potentiometer is secured with shellac to prevent its movement.

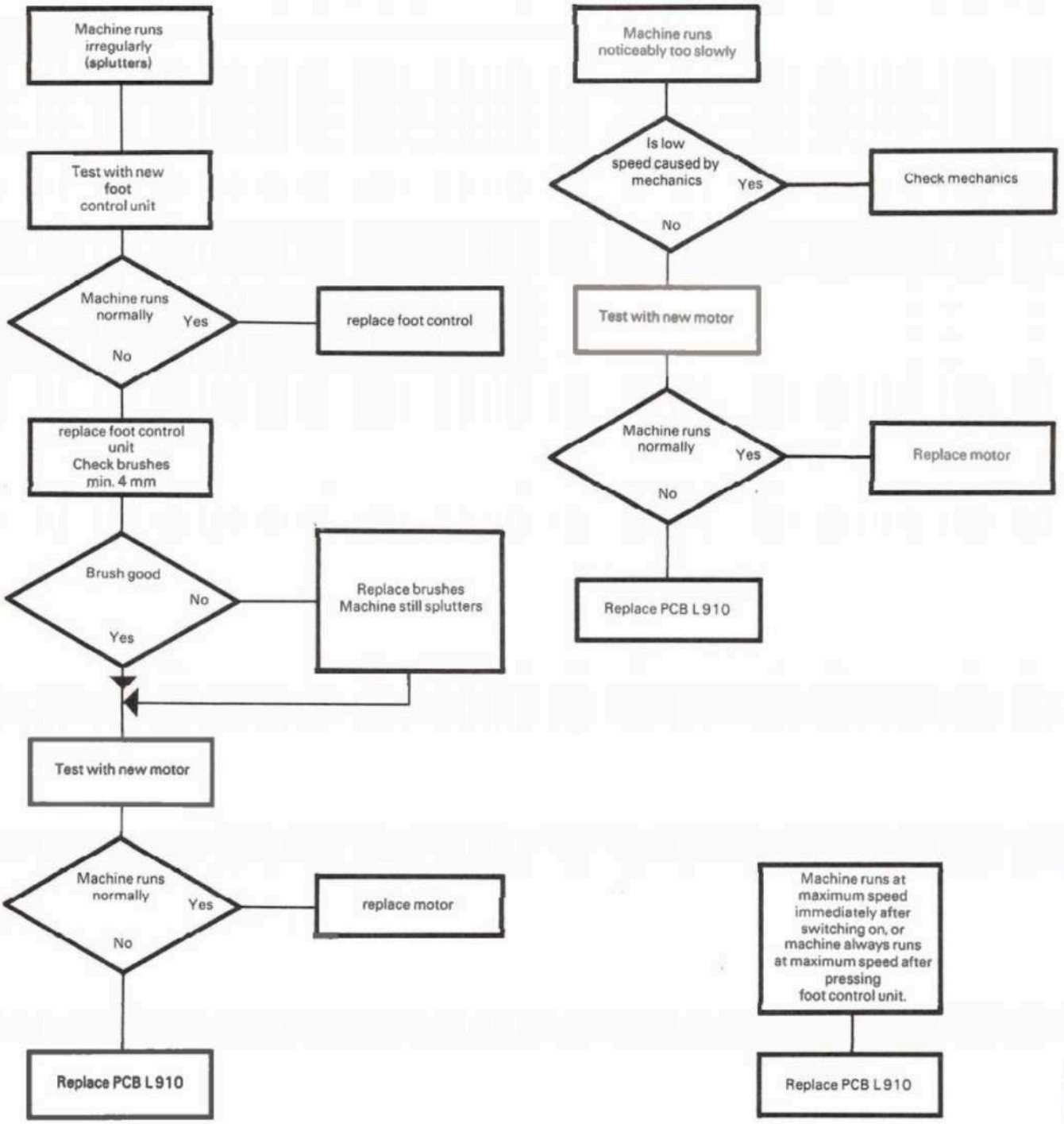
In the normal way, no speed adjustment is required following exchange of PCB L 910.

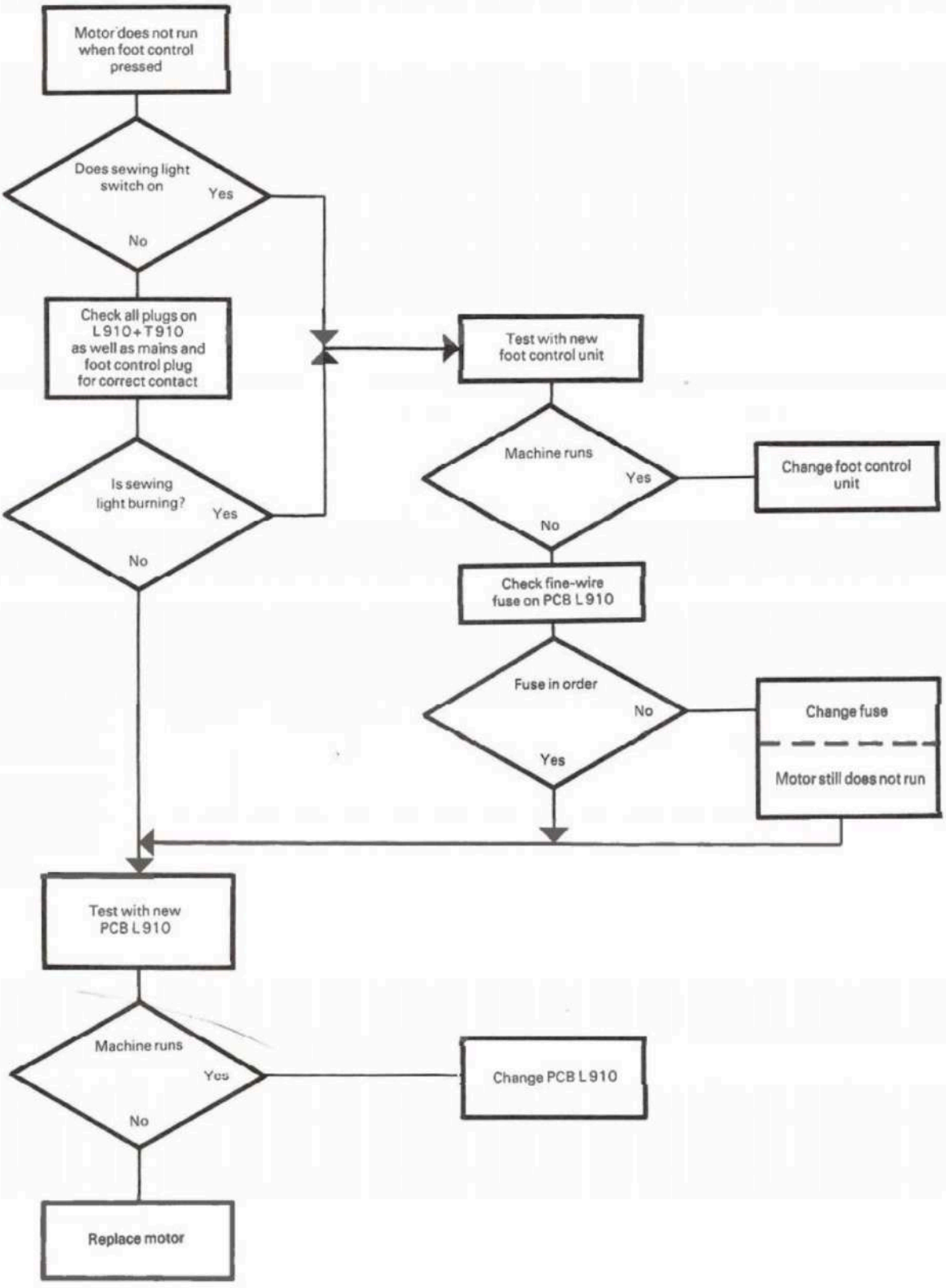
If suitable equipment is available for measuring the speed, the procedure is as follows:

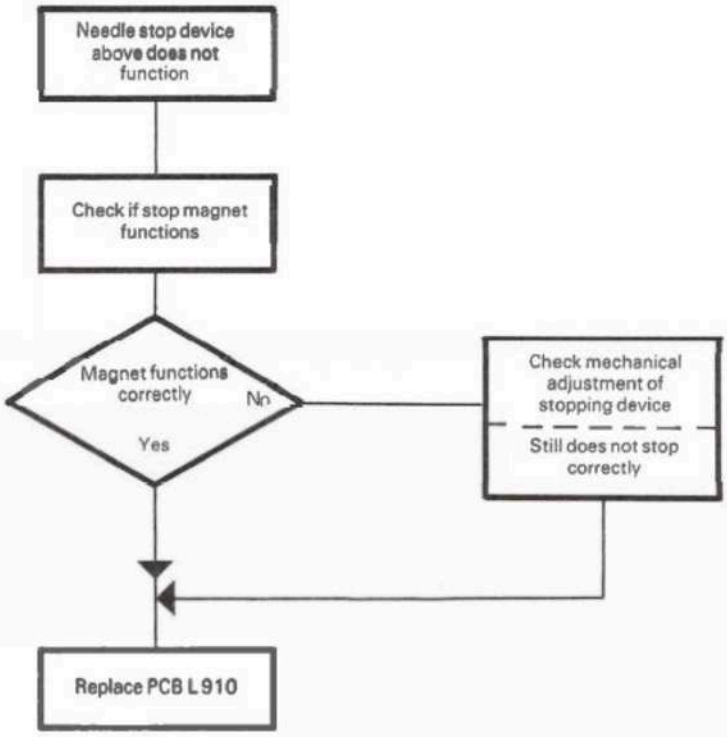
- Remove belt cover and chassis cover
- Fit special cover and handwheel
- Connect foot control unit and mains plug
- Switch on machine and main switch to
- Press foot control right down
- Setting the upper speed: potentiometer A on PCB L 910, point of measurement e. g. handwheel, n = 1050 rpm
- Main switch to
- Speed control:
  Foot control presset right down, n = 600 rpm
- Secure all potentiometers with shellac to prevent turning.

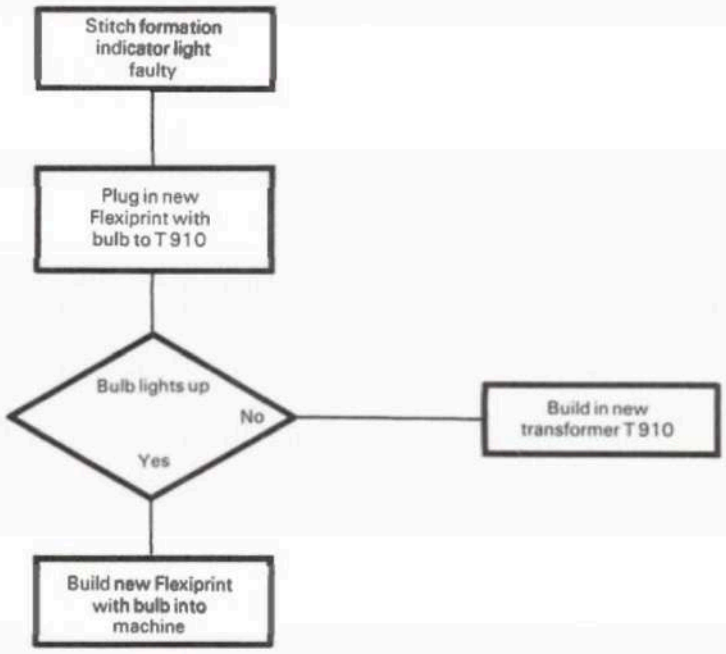
# CHECKING UP ON ELECTRONIC FAULTS

- Connect machine to mains
- Connect foot control unit
- Start machine




Motor does not run when foot control pressed
Does sewing light switch on
Yes
No
Check all plugs on L910+T910 as well as mains and foot control plug for correct contact
Is sewing light burning?
Yes
No
Test with new foot control unit
Machine runs
Yes
No
Change foot control unit
Check fine-wire fuse on PCB L910
Fuse in order
No
Yes
Change fuse
Motor still does not run
Test with new PCB L910
Machine runs
Yes
No
Change PCB L910
Replace motor


Needle stop device above does not function
Check if stop magnet functions
Magnet functions correctly
No
Yes
Check mechanical adjustment of stopping device
Still does not stop correctly
Replace PCB L 910


Stitch formation indicator light faulty
Plug in new Flexiprint with bulb to T 910
Bulb lights up
No
Yes
Build in new transformer T 910
Build new Flexiprint with bulb into machine

Technik Technic Technique

# Bernina Information

Gegenstand
Subject
Sujet

THREAD GUIDE / HOOK RACE

No.: 85

To improve quality on all machines with CB-hook, the thread guide in the vicinity of the hook race, and the hook race itself will be modified. The modification will come into effect as from the beginning of 1989.

The new hook race no. 003 084.50.00 has been broadened by 1 mm; and the two tapped holes for securing the thread guide plate have been moved 1 mm to the rear. At the same time the thread guide for the upper thread loop has been ommited. (This can be used to distinguish between old and new hook races.) This also means that old and new races are not interchangeable.

The upper thread guide is now achieved by a new type of thread guide, no. 003 163.50.00 which is secured to the hook race.
The thread guide plate has also been modified and has the new number 006 633.50.00.
Both thread guides are secured together by the same screws to the hook race (see sketch).

Because of this modification only the whole carrier is exchangeable. It must be noted that because of assembly technics, both thread guides are not assembled to the hook race. When ordering spare carriers (complete) one must also order thread guides no. 003 163.50.00 and 006 633.50.00 as sepearte articles at the same time.

We would appreciate your attention on this point.

Yours faithfully

FRITZ GEGAUF LIMITED

H. Bolier i.V. P. Kenyon

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TECHNICAL INFORMATION

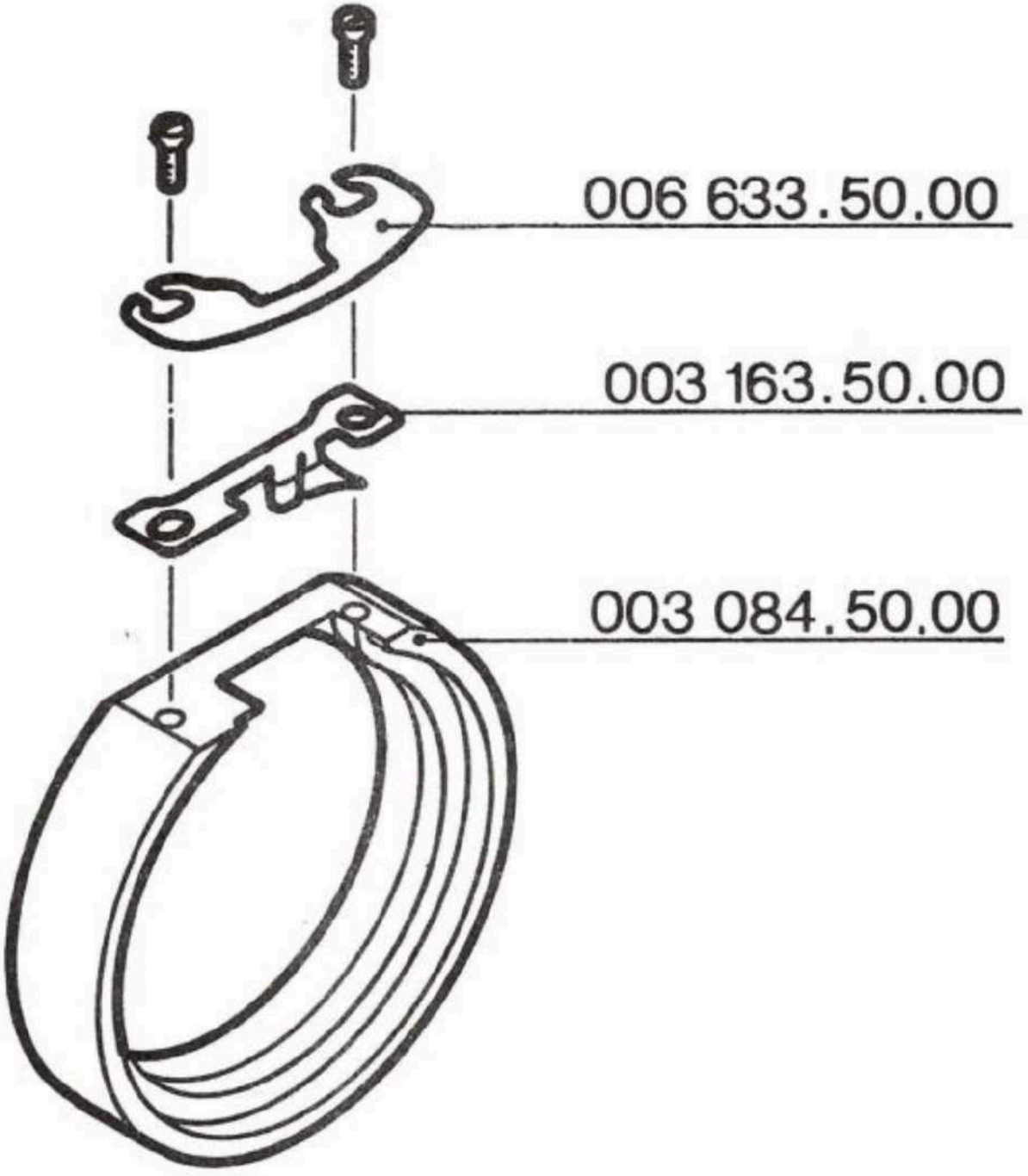
V tech 6

3/6/87

Service Information for 900, 1000, 1100, 1400 Series

Change of hook timing adjustment!

The hook timing has been increased by 0.2mm to 2.2mm. Be sure to use a new Nm 80 needle as before.


006 633.50.00
003 163.50.00
003 084.50.00