



# Service Manual

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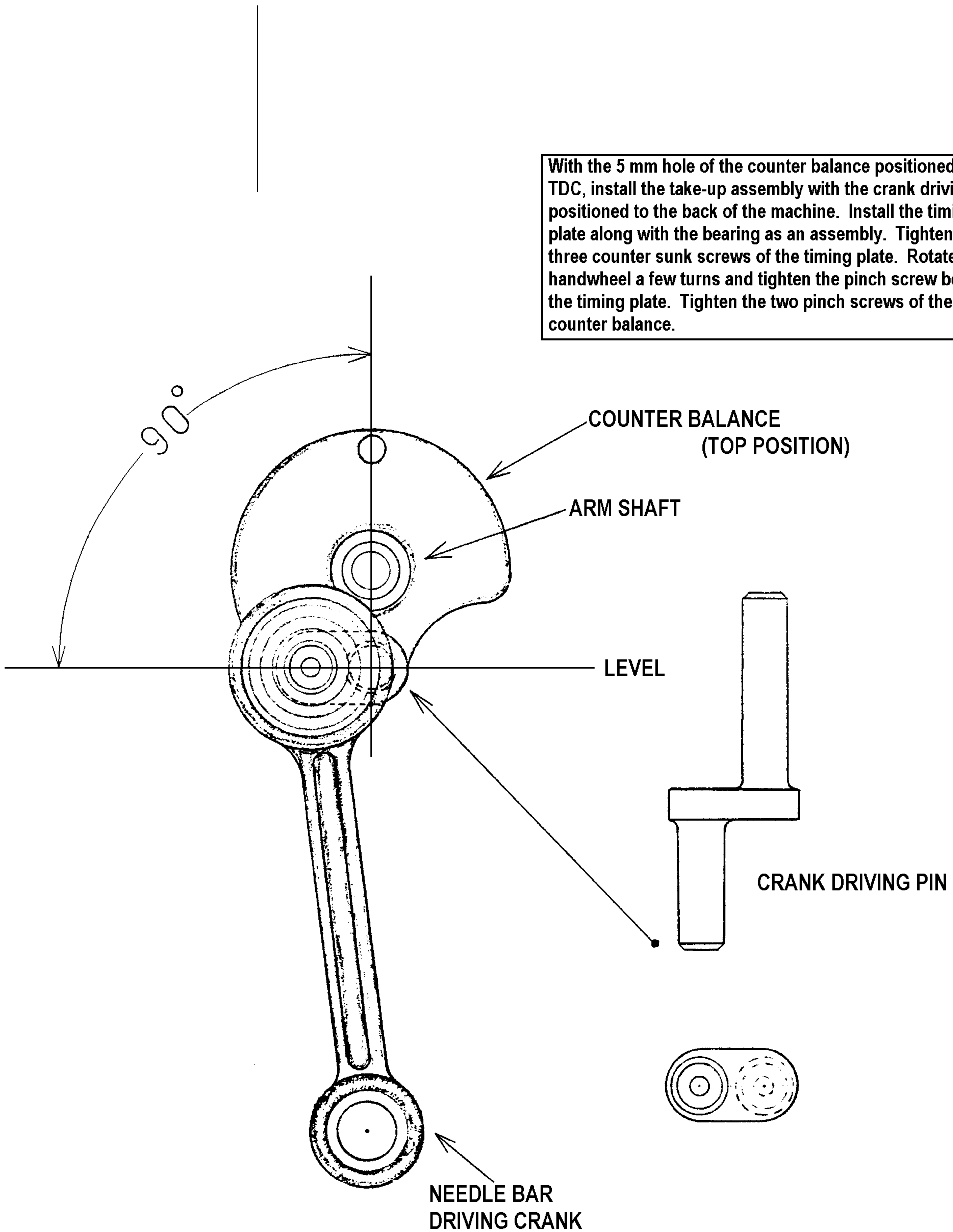
Pfaff, D 6750 Kaiserslautern, Postfach 3020/3040, Telex: 45 753



# PFAFF INDUSTRIAL OF AMERICA

3910 Green Industrial Way  
Atlanta, Georgia 30341

With the 5 mm hole of the counter balance positioned at TDC, install the take-up assembly with the crank driving pin positioned to the back of the machine. Install the timing plate along with the bearing as an assembly. Tighten the three counter sunk screws of the timing plate. Rotate the handwheel a few turns and tighten the pinch screw behind the timing plate. Tighten the two pinch screws of the counter balance.





Service manual **418, 438** applies to the following versions:

418

438

418-716/..

438-716/..

For the adjustment of automatic fancy-stitch mechanism -718/01 and thread trimmer -900/.. there are separate manuals.

### Important note

Do not use a C-clamp on the needle bar of Pfaff **418 and 438** machines as this would damage its special coating. Make sure you check the hook lubrication system (see Section 27) on machines in operation for the first time or which have been idle for a longer period (i.e. 1 or 2 months).

For shipping purposes the oil is drained from the needle vibrating eccentric housing of the Pfaff 418 and 438. It is therefore necessary to fill this housing with 100 c.c. of oil (see Section 26) before operating the machine for the first time. A sticker on the machine arm serves as a reminder.

When the machine is given a general overhaul put about **2 c.c.** of pinion grease, with a dripping point of 160°C, in the bevel-gear case of the hook. We recommend you use **Molykote-Longtherm 00**. This grease can be obtained from us under No. 280-1-120 199.

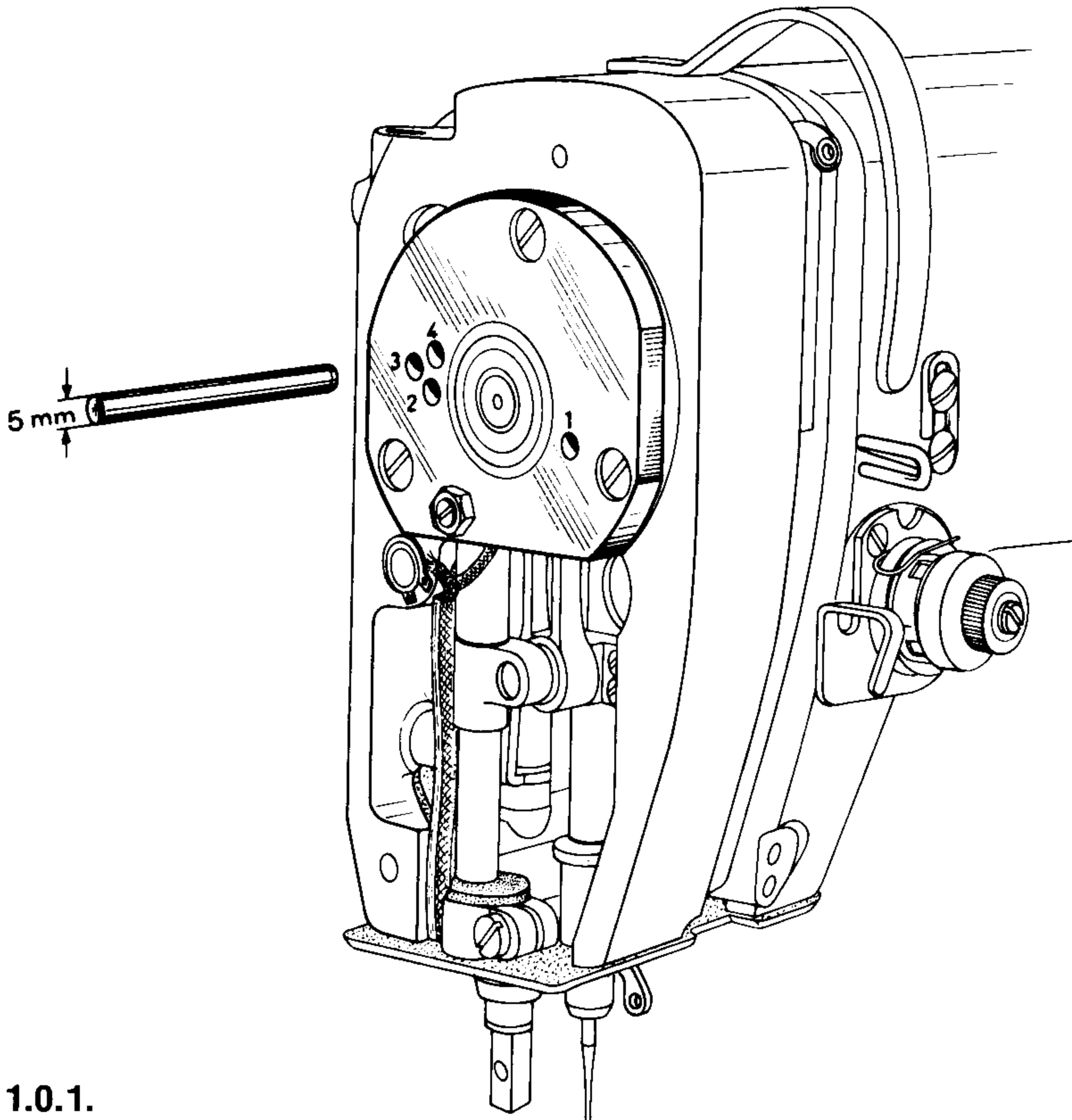
### Tools, gauges and other accessories required for adjusting the machines

- 1 set of screwdrivers with 2 to 10 mm wide blades
- 1 set of allen keys from 1.5 to 6 mm
- 1 set of wrenches with openings from 7 to 14 mm wide
- 1 wrench with 27-mm-wide opening
- 1 metal ruler
- 1 cylindrical pin (5 mm dia.), No. 13-030 341-05
- 1 feed dog gauge, No. 91-129 995-05
- 1 hook bearing bracket gauge, No. 91-129 996-05
- 1 wrapper of system 438 needles
- 2 strips of white paper
- 1 roll of adhesive tape
- Sewing thread and testing material

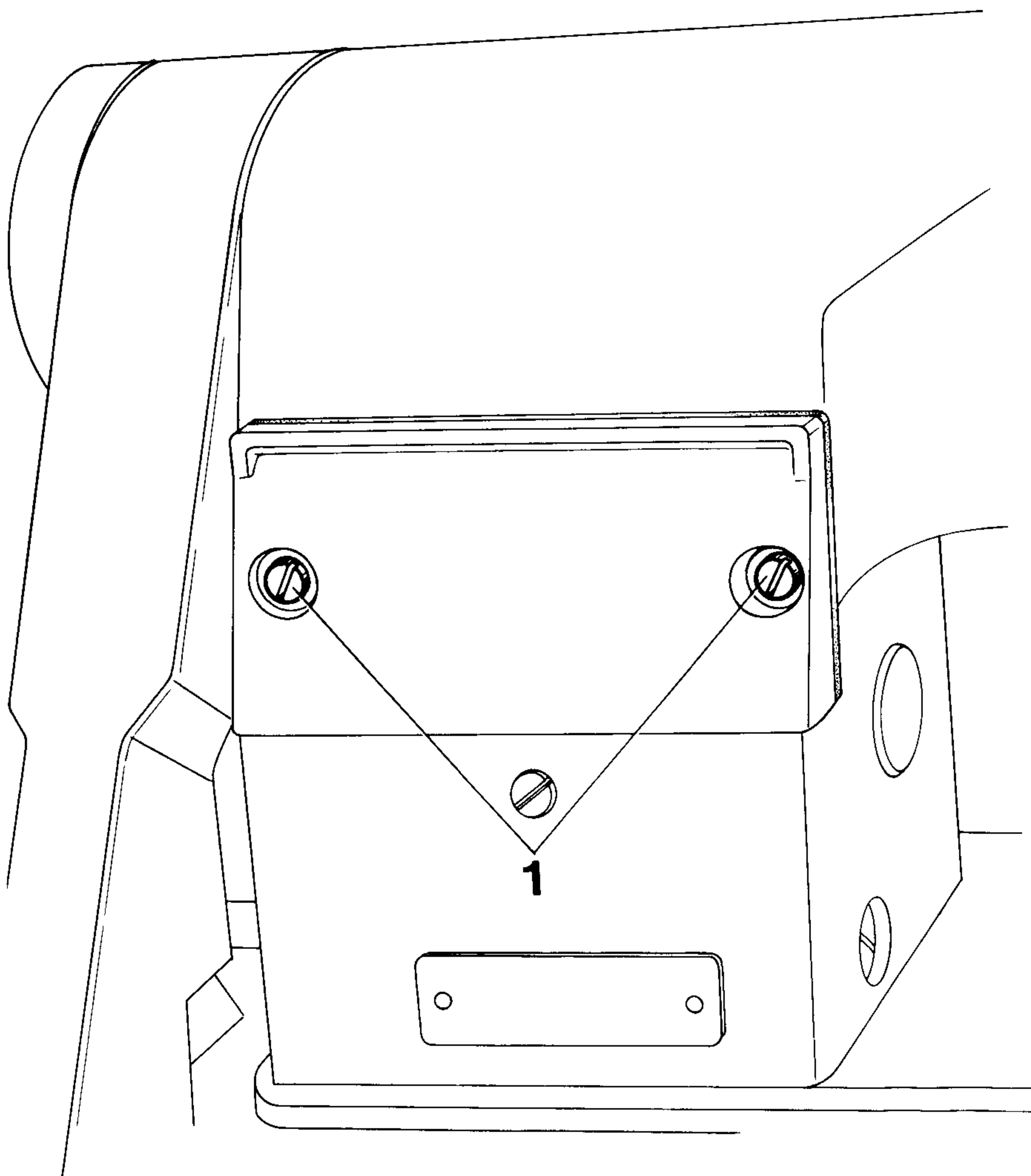
**1****Preparations for adjusting**

Note:

To allow the machine to be blocked with the needle bar at the required position the bearing plate (Fig. 1.0.1.) has four holes. After positioning the needle bar as required push the pin into the appropriate hole until it enters the recess behind the bearing plate, thus blocking the machine.

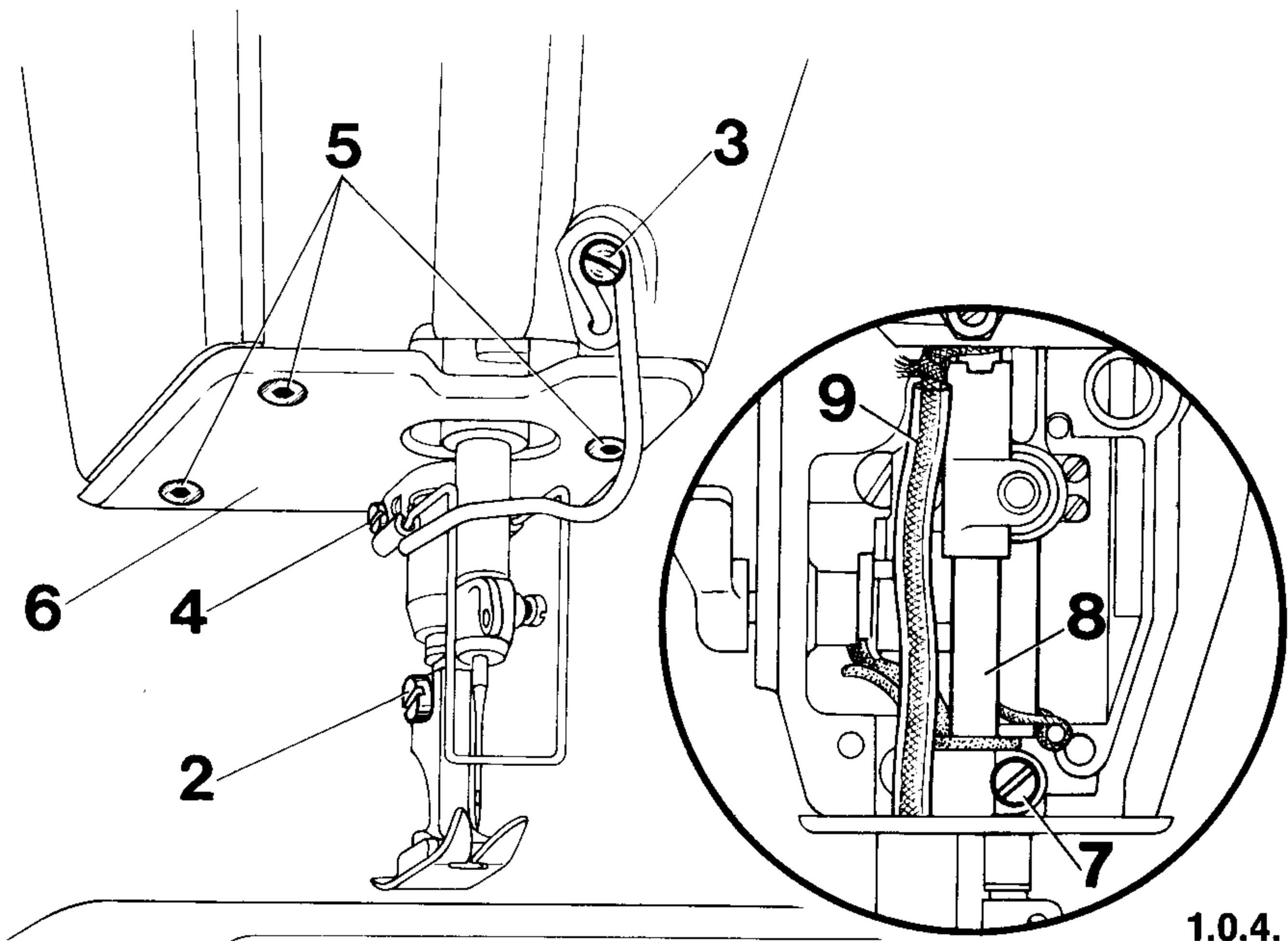
**1.0.1.**

- 1.1 Take out screws 1 from the cast iron cover and remove the cover. (Do not remove the needle bar lubricating wick from its hole in the cover sealing plate.)
- 1.2 Drain the oil from the needle vibrating eccentric housing.



**1.0.2**

- 1.3 Unscrew the two screws in the face cover and remove the cover.
- 1.4 Take out screw **2** and remove the presser foot.
- 1.5 Take out screw **3** and remove the thread guide.
- 1.6 Loosen screw **4** of the thread control and remove the latter by pulling it downwards.
- 1.7 Unscrew allen screws **5** (do not remove cover plate **6** as it is connected to oil wick **9**).
- 1.8 Loosen clamp screw **7** and pull stabilizing rod **8** down a little.
- 1.9 Remove plate **6** with oil wick **9**.
- 1.10 Insert a new needle (system 438) and push it up as far as it will go; the long groove should face the front.



**1.0.3.**

**1.0.4.**

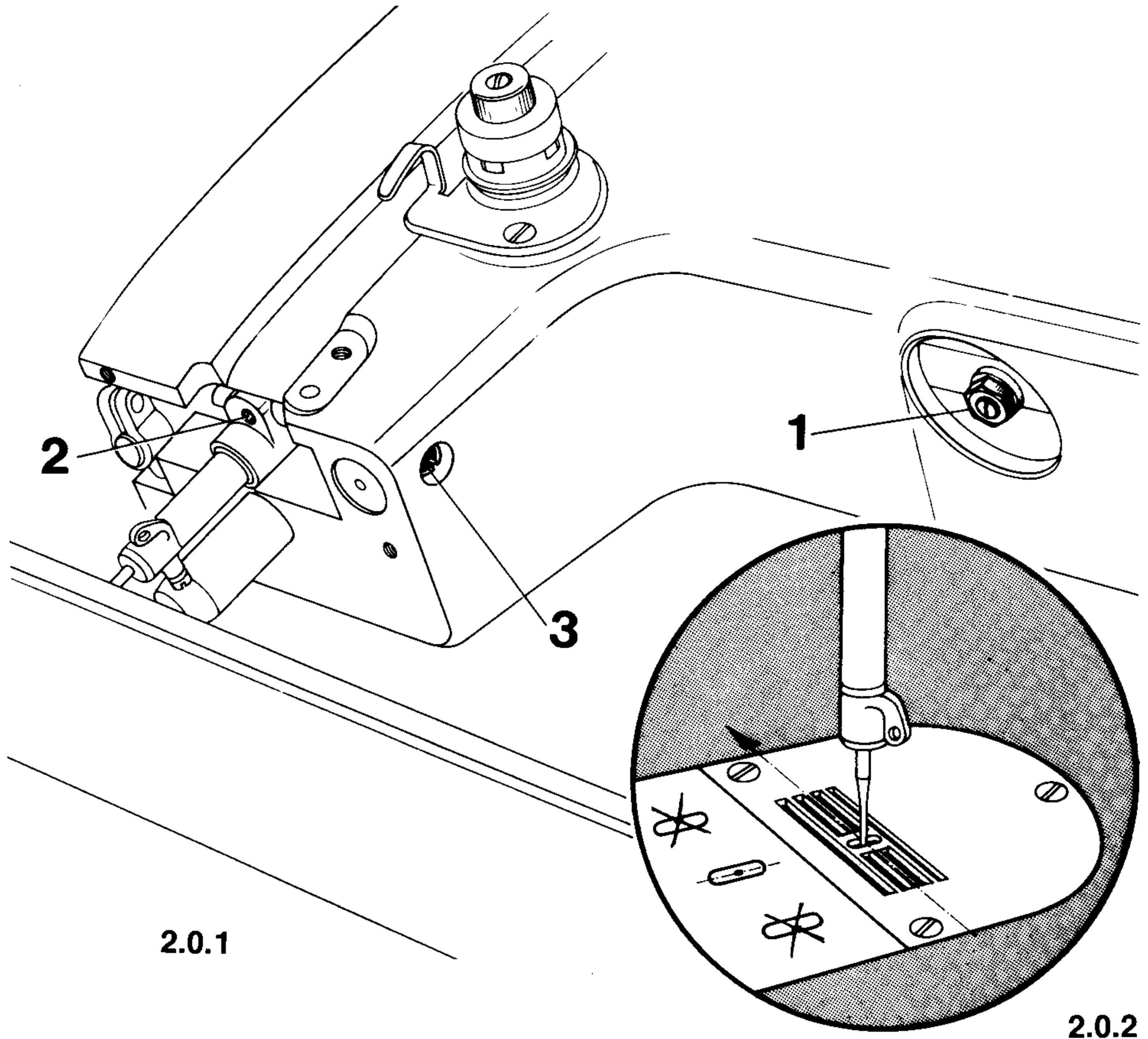


## 2

### Centring the needle in the needle hole (in sewing direction)

Correct setting:

When the stitch width is set at "0" and the needle position lever is in its central position the needle must enter the needle hole exactly in the middle (in sewing direction).



- 2.1 Set the needle position lever at "centre" and the stitch width lever at "0".
- 2.2 Remove the plastic plugs on the underside of the arm.
- 2.3 Bring the needle bar to its b.d.c.
- 2.4 Loosen jam nut 1 and allen screw 2.
- 2.5 **Turn eccentric stud 3 until the needle - as seen in sewing direction - is centred in the middle of the needle hole.**
- 2.6 In this position, tighten allen screw 2 and jam nut 1.
- 2.7 Check this adjustment (see "Correct setting").

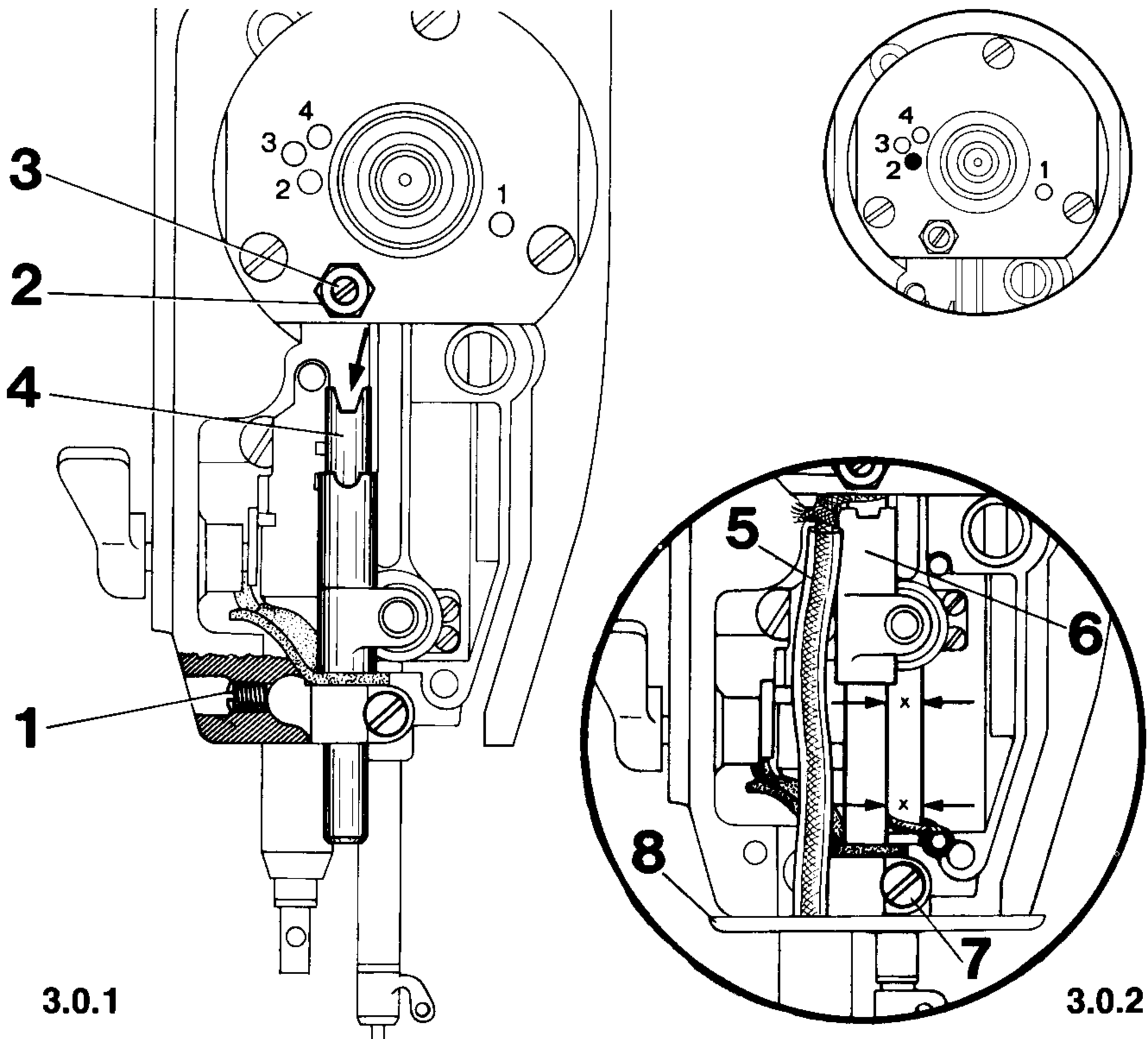
### 3 Setting the stabilizing rod parallel to the needle bar

Correct setting:

Stabilizing rod 4 must be parallel to the needle bar.

Note:

The lobe of eccentric stud 3 must always point downwards.



- 3.1 Bring the needle bar to t.d.c. and insert the pin in hole "2" of the bearing plate (to block the machine).
- 3.2 Making sure that lock screw 7 is loose, loosen screw 1 (accessible from the back of the machine arm).
- 3.3 Loosen jam nut 2 and turn eccentric stud 3 so that its lobe points downwards.
- 3.4 Insert stabilizing rod 4 in the loop of oil wick 5.
- 3.5 Position stabilizing rod 4 so that the recess at its top end (see arrow in Fig. 3.0.1) touches eccentric stud 3.
- 3.6 **Hold stabilizing rod 4 firmly and turn eccentric stud 3 until stabilizing rod 4 is parallel to the needle bar (Fig. 3.0.2).**
- 3.7 In this position tighten eccentric stud 3 with nut 2.

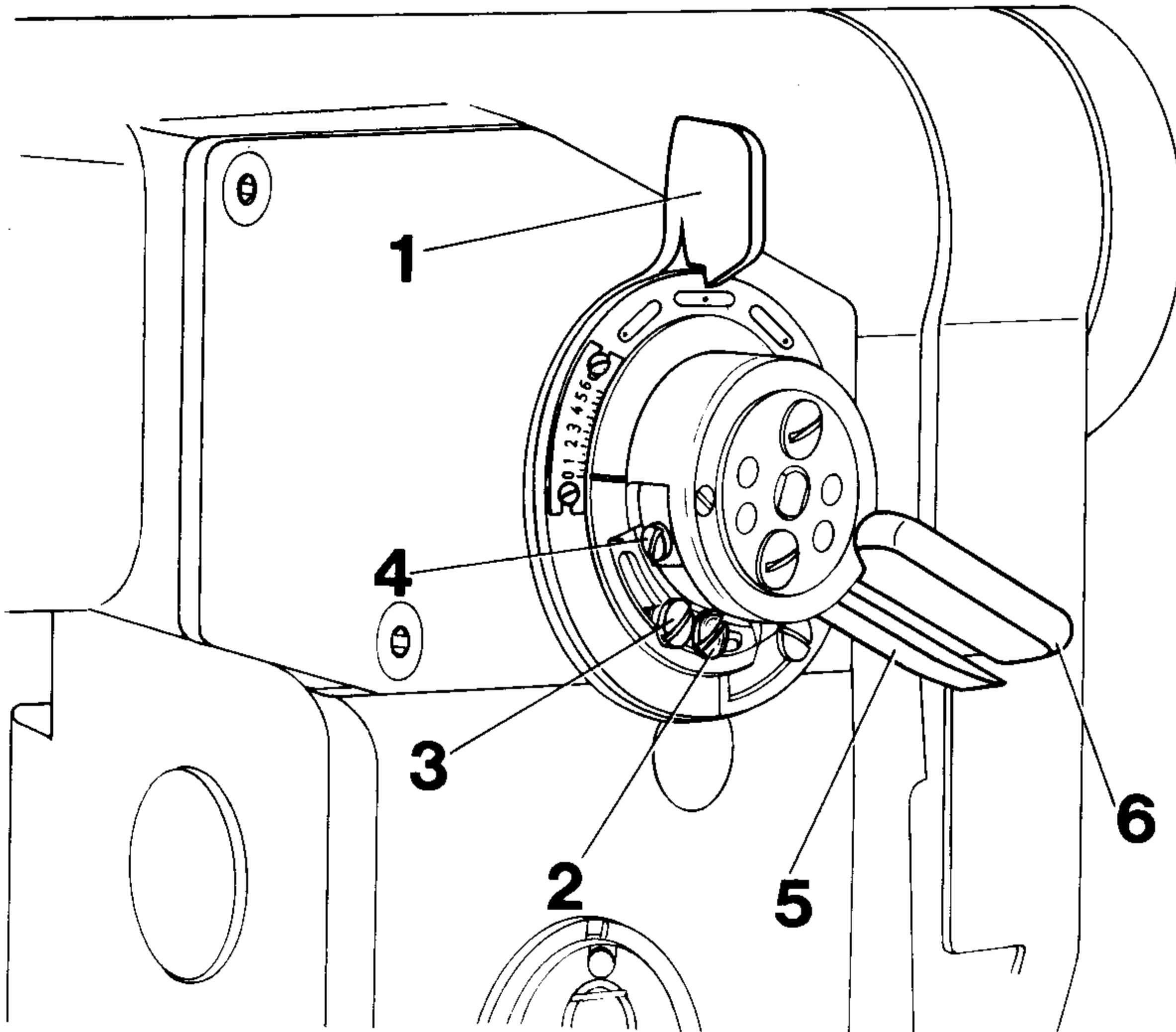
- 3.8 To check that it is parallel to the needle bar first pull stabilizing rod **4** down and then push it up again as far as it will go, making sure that guide **6** does not move to the side (if necessary turn eccentric stud **3** accordingly).
- 3.9 Making sure that stabilizing rod **4** is still in contact with eccentric stud **3** tighten clamp screw **7** securely.
- 3.10 Remove the cylindrical pin from the hole in the bearing plate.
- 3.11 Bring the needle bar to b.d.c. and tighten screw **1** which is accessible from the back of the machine arm.
- 3.12 Screw on cover plate **8**.

## 4 Stitch width control

### 4.1 Zeroing the needle for straight stitching

Correct setting:

When the stitch width control is set at "0" the needle bar must not move to the side.



#### 4.0.1

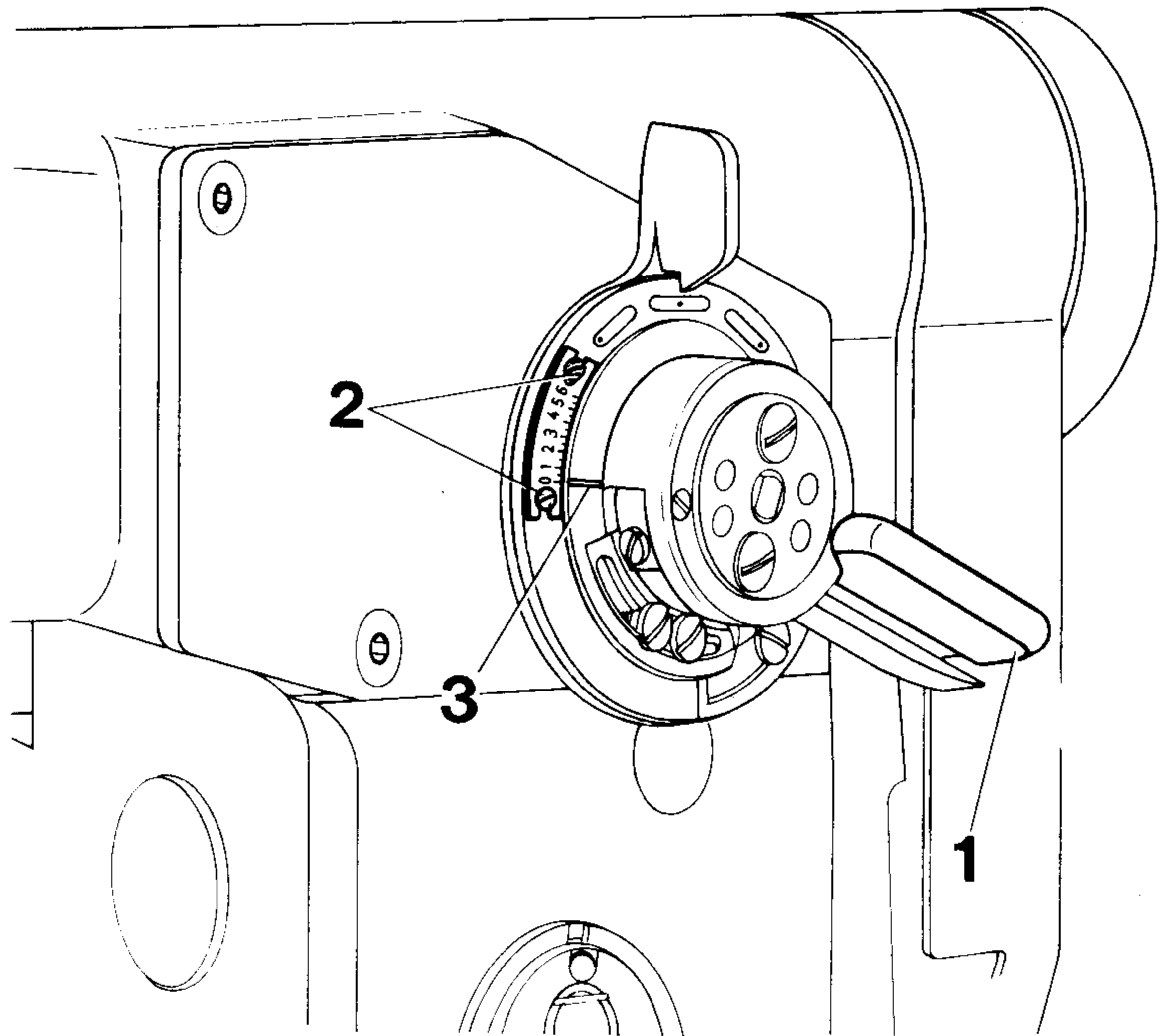
- 4.1.1 Set needle position lever **1** at its central position.
- 4.1.2 Loosen screws **2** and **3**.
- 4.1.3 Loosen clamp screw **4** and let locking lever **5** move back until its spring is relaxed.
- 4.1.4 In this position, tighten clamp screw **4**.
- 4.1.5 Move stitch width lever **6** to the right as far as it will go (i.e. towards "0").
- 4.1.6 Turn on the master switch and let the machine run slowly. **Move stitch width lever 6 to the left until the needle bar stops swinging sideways.**
- 4.1.7 In this position push screw **2** to the right as far as it will go and tighten it.
- 4.1.8 Check this adjustment (see "Correct setting").
- 4.1.9 Switch off master switch.
- 4.1.10 Screw **3** is still loose.

## 4.2

### Stitch width scale

Correct setting:

When the stitch width control is set at "0" the zero mark on the stitch width scale must be opposite mark 3 of the stitch width lever.



### 4.0.2

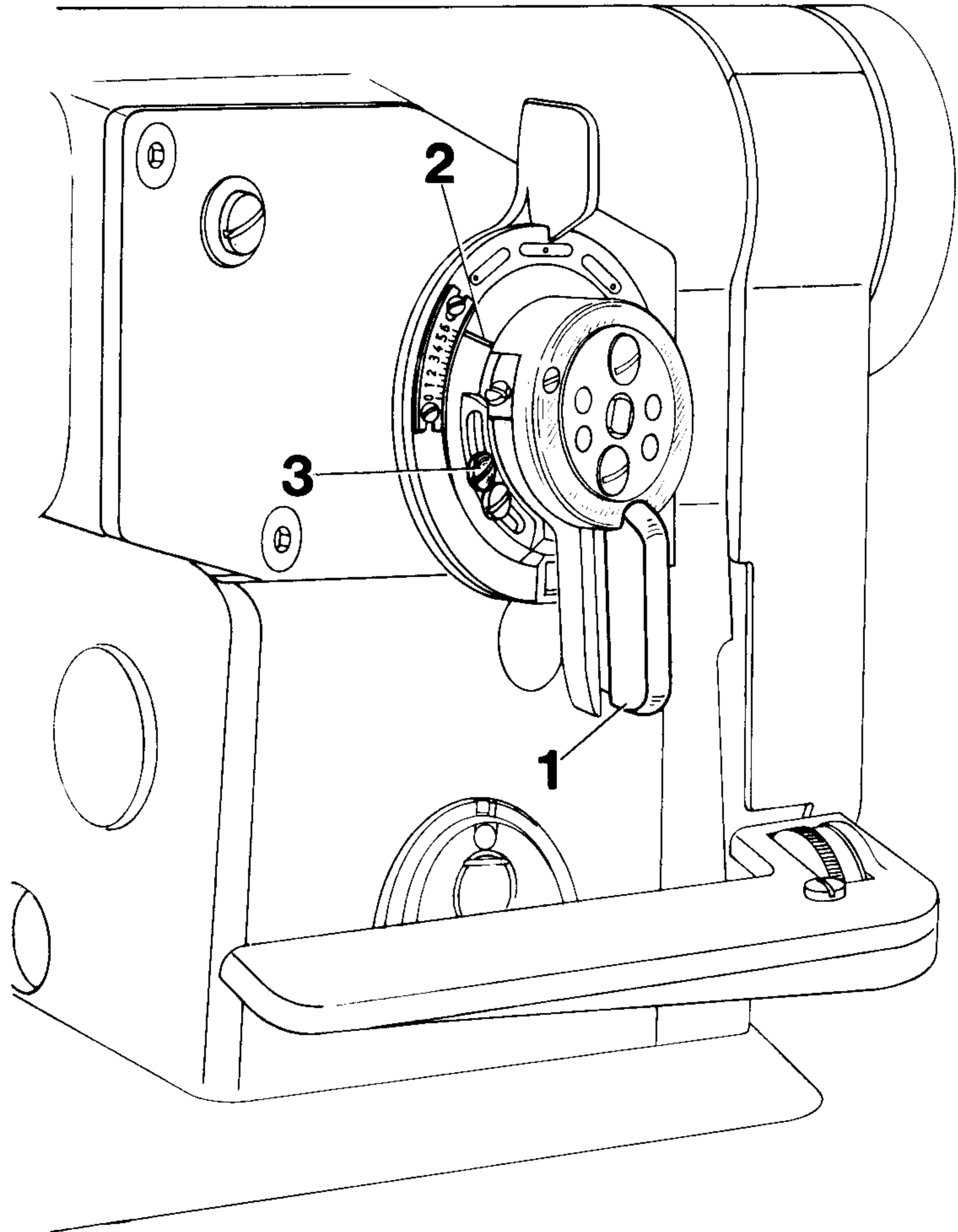
- 4.2.1 Move stitch width lever 1 to the right as far as it will go.
- 4.2.2 Loosen screws 2.
- 4.2.3 **Adjust the stitch width scale until the zero mark is opposite mark 3 of stitch width lever 1.**
- 4.2.4 In this position tighten both screws 2.
- 4.2.5 Check this adjustment (see "Correct setting").

## 4.3

### Limiting the maximum stitch width

Correct setting:

When the maximum stitch width is set, mark **2** of the stitch width lever must be opposite the maximum stitch width mark on the stitch width scale.



#### 4.0.3

4.3.1 **Move stitch width lever 1 to the left until mark 2 is opposite the maximum stitch width mark on the stitch width scale.**

4.3.2 In this position move stop screw 3 which limits the maximum stitch width upwards as far as it will go and tighten it.

Note: If for certain sewing operations the machine is equipped with a needle plate whose hole is smaller than the widest stitch width indicated on the scale, limit the stitch width according to the width of the needle hole rather than the graduation mark on the stitch width scale.

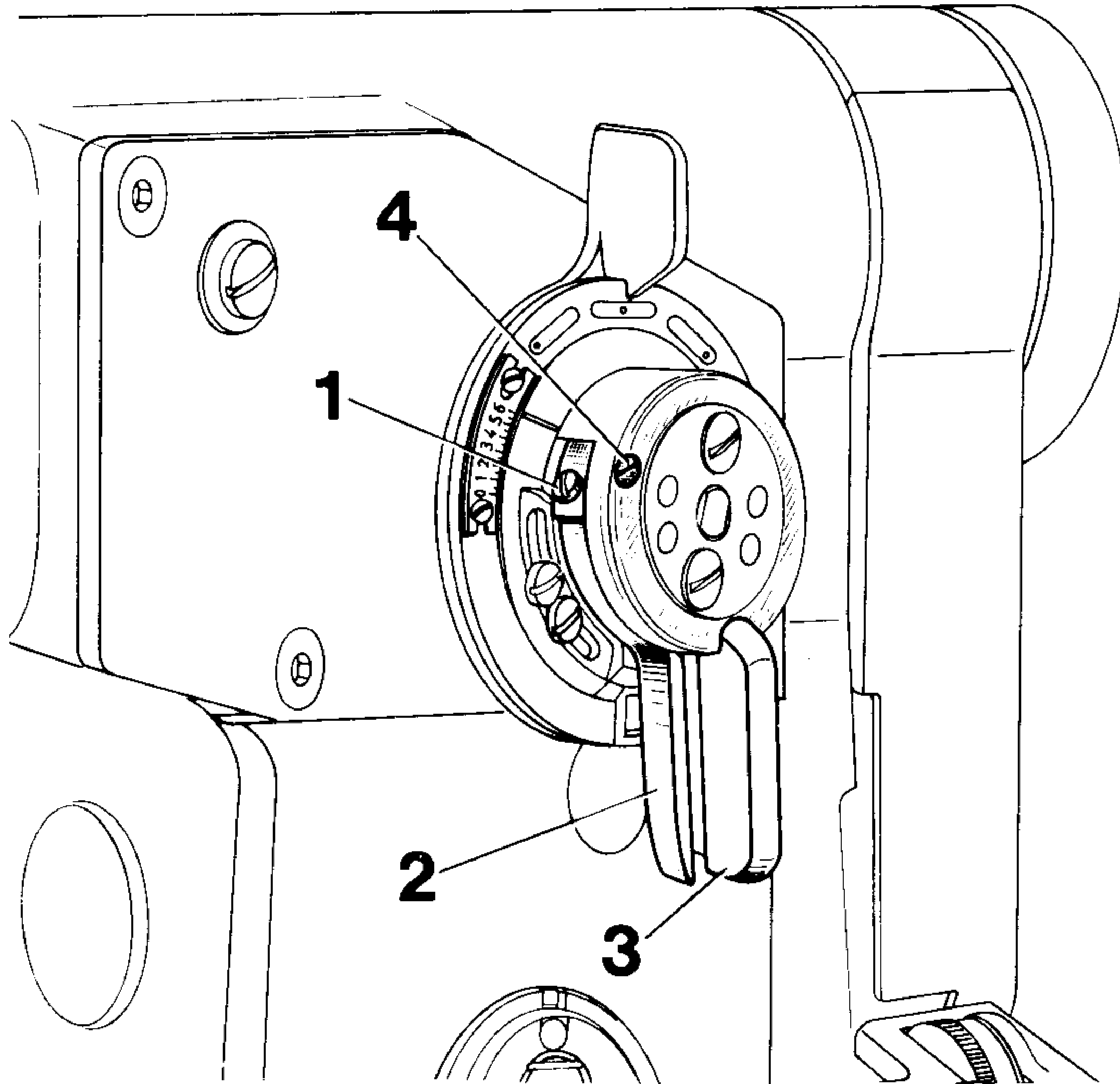
4.3.3 Check this adjustment (see "Correct setting").

4.4

**Adjusting the locking lever**

Correct setting:

The locking lever 2 must be adjusted so that stitch width lever 3 can be locked in any position.



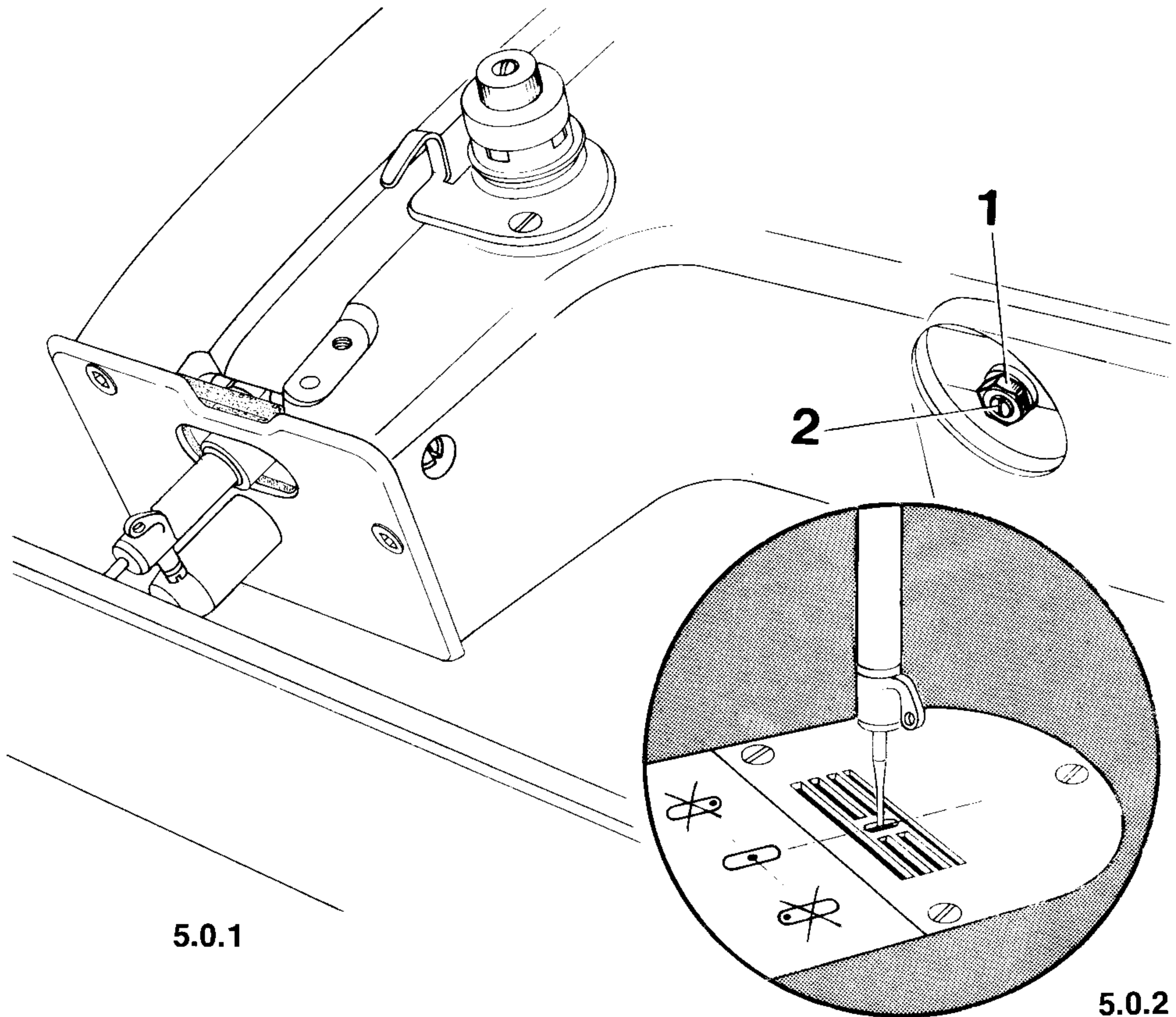
**4.0.4**

- 4.4.1 Loosen clamp screw 1 of locking lever 2, making sure that the pressure spring in the locking lever does not fall out.
- 4.4.2 **Pull locking lever 2 forward until it presses against stitch width lever 3.**
- 4.4.3 **In this position use a screwdriver to turn hinge stud 4 until the locking lever has the right amount of play and then tighten clamp screw 1 (when at rest, locking lever 2 must be more or less parallel to stitch width lever 3).**
- 4.4.4 Check this adjustment (see "Correct setting").

## 5 Adjusting the needle in the needle hole (sideways)

Correct setting:

When the stitch width lever is turned to "0" and the needle position lever is in its central position the needle should enter the needle exactly in the middle (sideways).

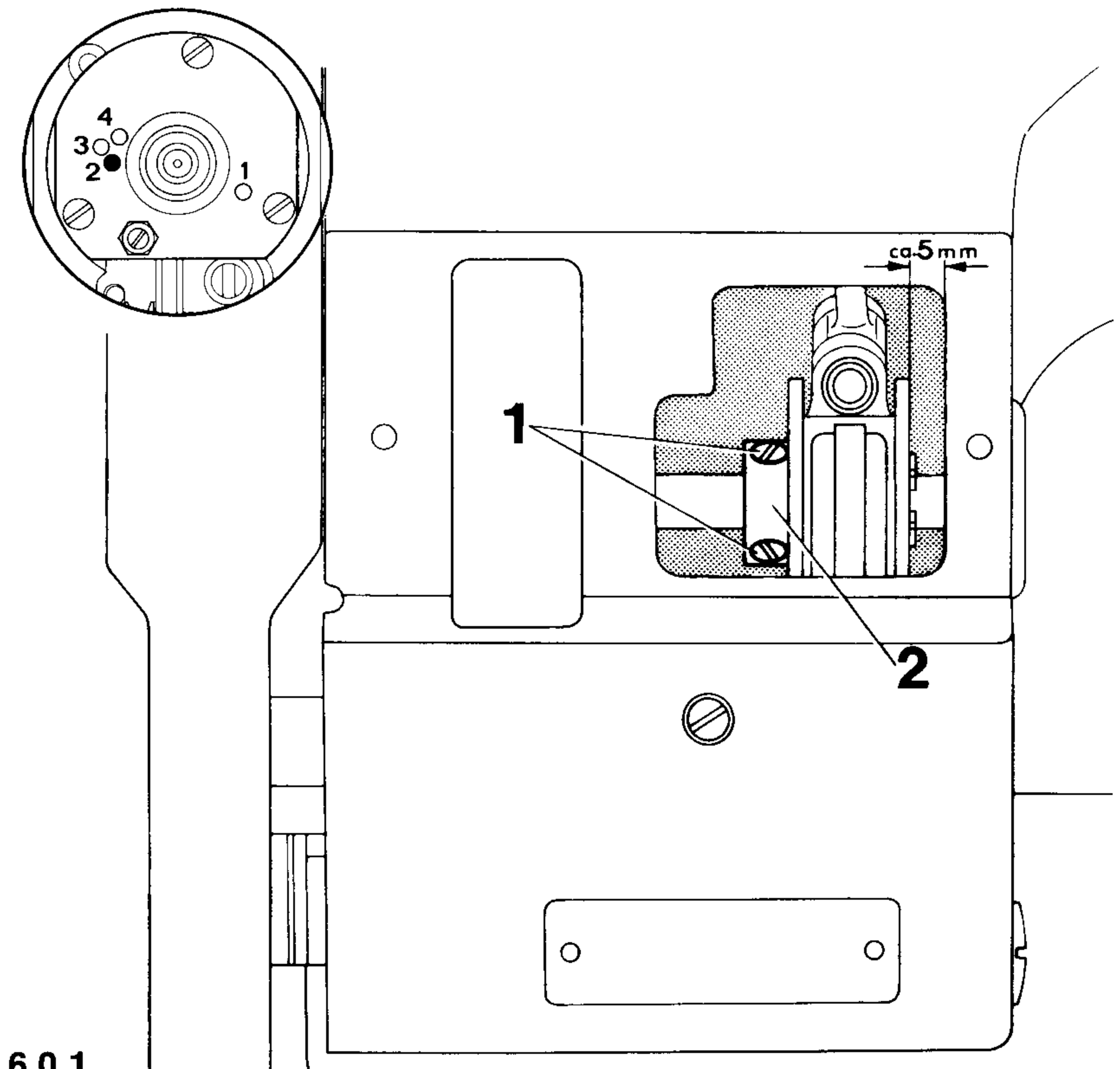


- 5.1 Turn the needle position lever to its central position and the stitch width lever to "0".
- 5.2 Bring the needle bar to b.d.c.
- 5.3 Loosen jam nut 1.
- 5.4 **Turn eccentric stud 2 until the needle is centred in the needle hole sideways.**
- 5.5 In this position tighten eccentric stud 2 with nut 1.
- 5.6 Check this adjustment (see "Correct setting").
- 5.7 Replace the plastic plugs on the underside of the arm.



Correct setting:

When the needle bar rises from the bottom position on the right of its throw to t.d.c. (pin in hole 2) it must not move to the side when the stitch width lever is moved to and fro.



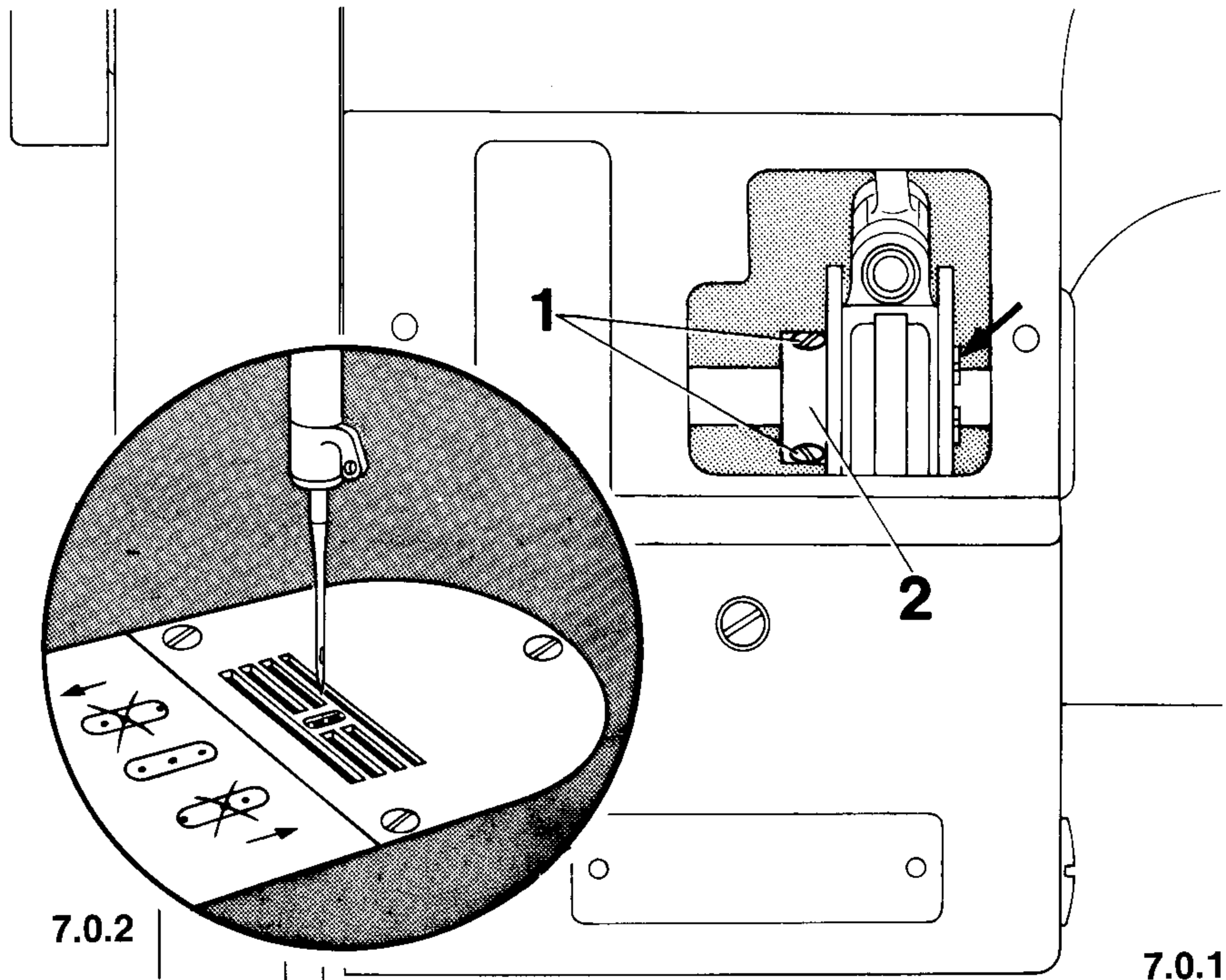
6.0.1

- 6.1 Loosen screws **1** of zigzag eccentric **2** just enough to allow the eccentric to be turned on its shaft against strong resistance.
- 6.2 Bring the needle bar from the bottom position on the right of its throw to t.d.c.
- 6.3 Insert cylindrical pin in hole "**2**" of the bearing plate (to block the machine).
- 6.4 Move eccentric **2** sideways on its shaft until there is a clearance of about 5 mm between it and the right wall of the casting. (See Fig. 6.0.1.).
- 6.5 **Turn eccentric 2 on its shaft until the needle bar stops vibrating when the stitch width lever is moved to and fro.**
- 6.6 Check this adjustment (see "Correct setting").
- 6.7 Remove cylindrical pin from hole "**2**" of the bearing plate.
- 6.8 Screws **1** are still loose.

**Needle position “left, centre, right”**

Correct setting:

When the stitch width lever is set at “0” the needle must enter the needle hole in the centre.  
When the maximum stitch width is set the right and left positions of the needle in the needle hole should be equidistant from the centre (Fig. 7.0.2).

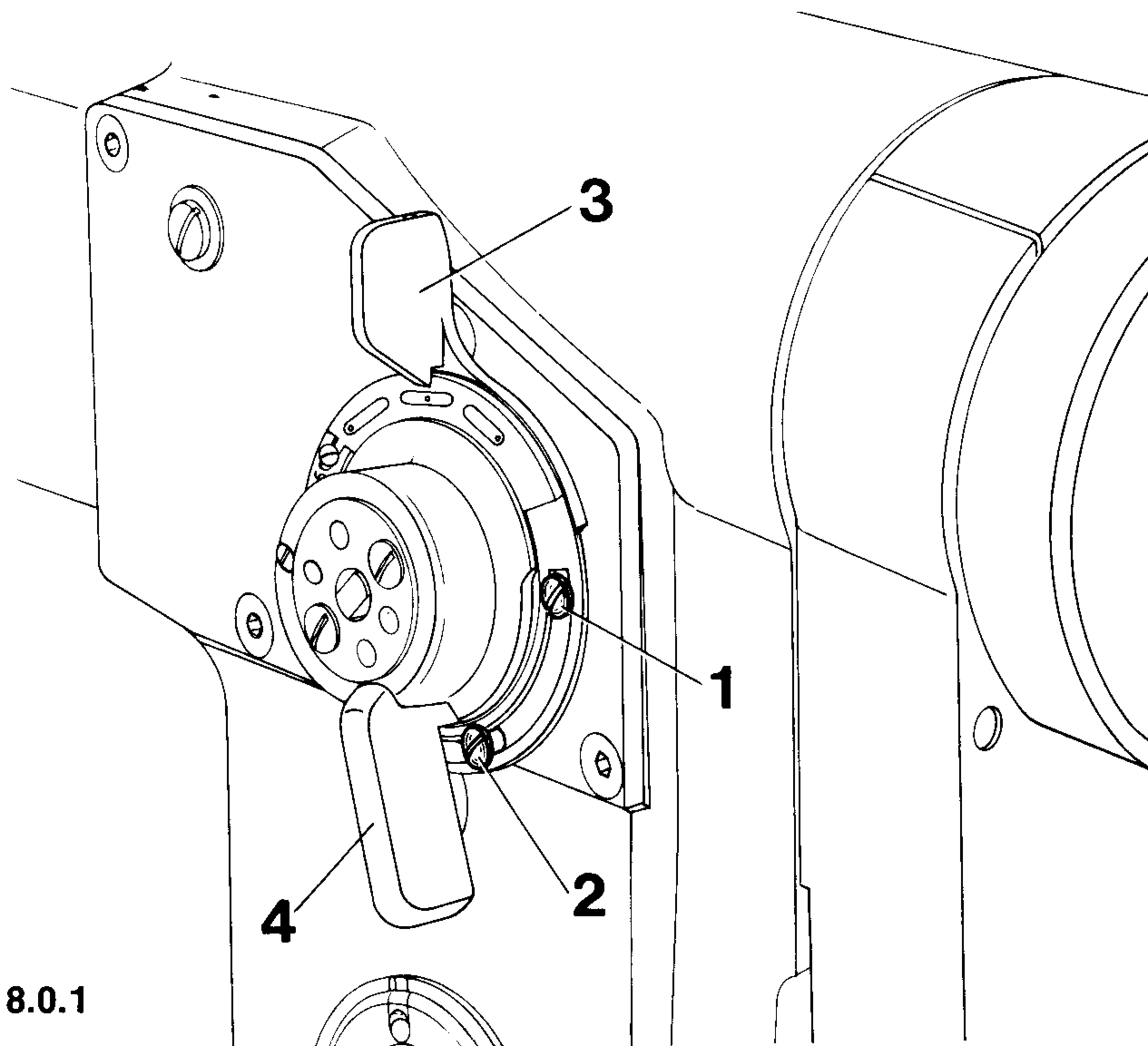


- 7.1 Turn needle position lever to its “central” position and the stitch width lever to “0”.
- 7.2 Place a piece of white paper on the needle plate and hold it in position.
- 7.3 Turn the balance wheel in its normal direction of rotation and let the needle pierce the paper.
- 7.4 Raise the needle again a little and hold the paper in position.
- 7.5 Turn the stitch width lever to the “maximum” stitch width.
- 7.6 Turn the balance wheel in its normal direction of rotation and let the needle pierce the paper again.
- 7.7 Remove the paper from under the needle and turn the balance wheel one complete turn.
- 7.8 Turn stitch width lever to “0” again.
- 7.9 Place the piece of paper under the needle again and position it so that the needle pierces the first hole exactly as before.

- 7.10 Making sure that the needle point is not in the paper, turn the stitch width lever to “maximum” and let the needle pierce the paper again.
- 7.11 **Move needle vibrating eccentric 2 in the direction in which the two outer needle punctures must be moved in order to obtain a symmetrical stitch pattern; make sure that the eccentric is not rotated in the process.**
- 7.12 In this position tighten screws 1 and push the circlip (see arrow in Fig. 7.0.1) up against the eccentric.
- 7.13 Check this adjustment (see “Correct setting”).

Correct setting:

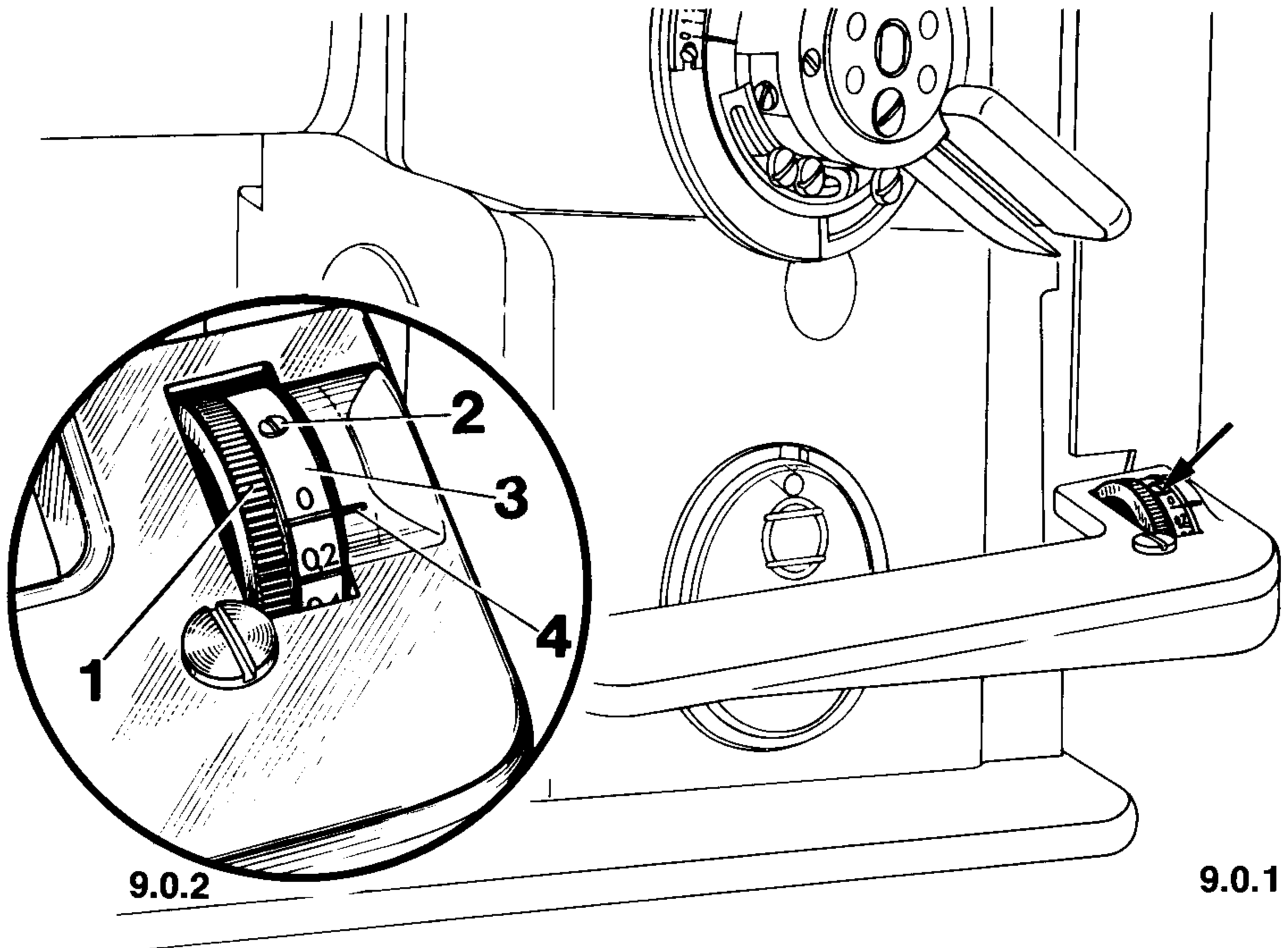
The left and right throws of the needle must be the same both at the widest stitch setting and at the left and right needle positions.



- 8.1 Loosen screws **1** and **2**.
- 8.2 Turn needle position lever **3** to its “central” position and stitch width lever **4** to the “maximum” stitch width.
- 8.3 Turn the balance wheel in its normal direction of rotation until the descending needle is positioned above the left end of the needle hole.
- 8.4 Place a piece of white paper over the needle hole and fix it in position with adhesive tape.
- 8.5 Turn the balance wheel in sewing direction until the needle pierces the paper.
- 8.6 Turn the balance wheel in the opposite direction and let the needle pierce the paper again.
- 8.7 Turn stitch width lever **4** to “0” and push needle position lever **3** to the right until the point of the needle is positioned exactly above the hole last made in the paper.
- 8.8 **In this position push screw **2** against its stop and tighten it firmly.**
- 8.9 Push needle position lever **3** to the left until the point of the needle is positioned exactly above the left hole in the paper.
- 8.10 **In this position push screw **1** against its stop and tighten it firmly.**
- 8.11 Check this adjustment (see “Correct setting”).

## Adjusting the stitch length scale ring

When the stitch length is set at "0" the "0" mark on scale ring **3** must be in line with graduation mark **4**.



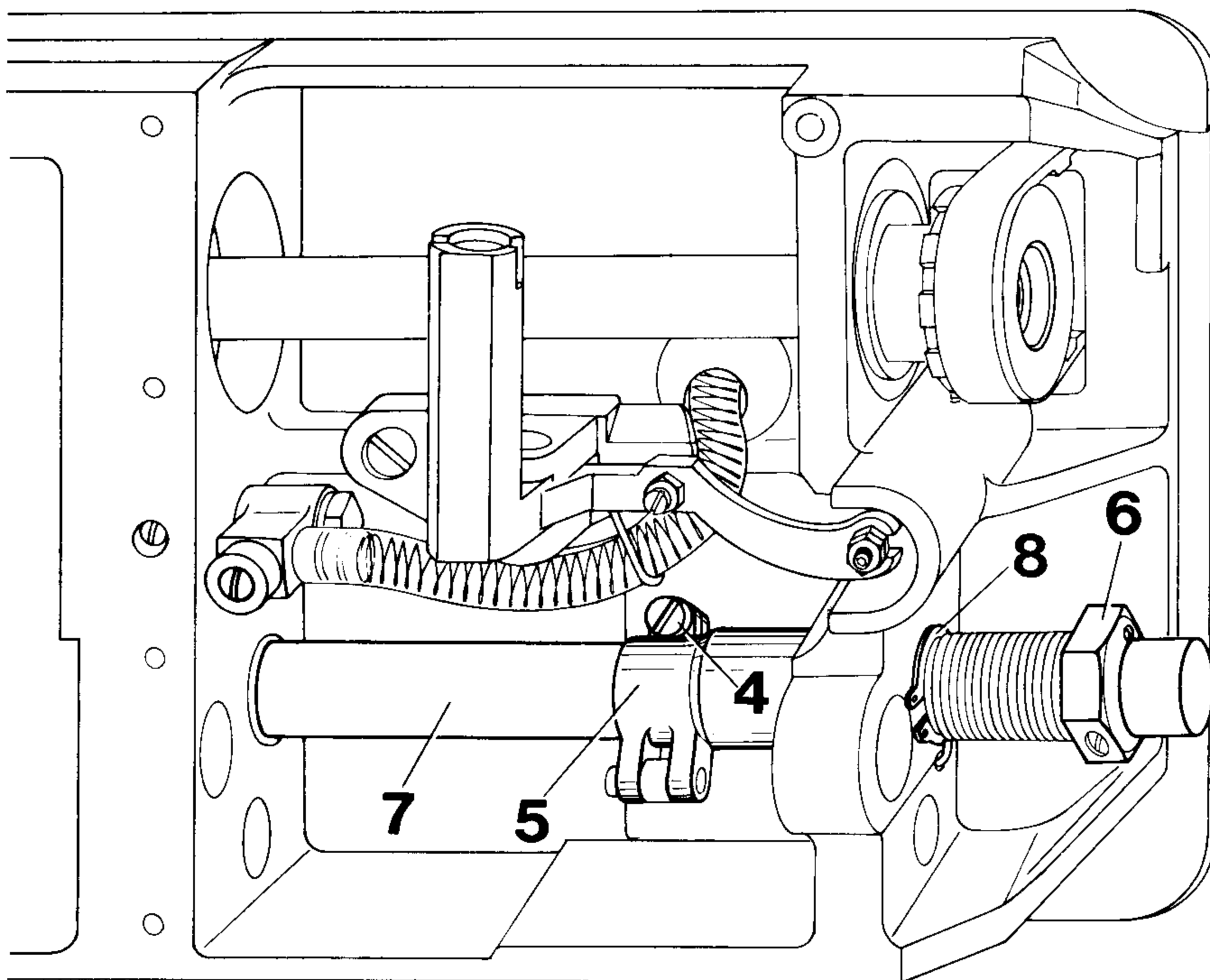
- 9.1 Turn milled wheel **1** **as far as it will go** in the direction in which the reverse-feed control moves downwards.
- 9.2 **Loosen screw 2** and turn scale ring **3** so that the figure **"0"** is in line with graduation mark **4**.
- 9.3 In this position tighten screw **2**.

## 10 Zeroing the bottom feed

Correct setting:

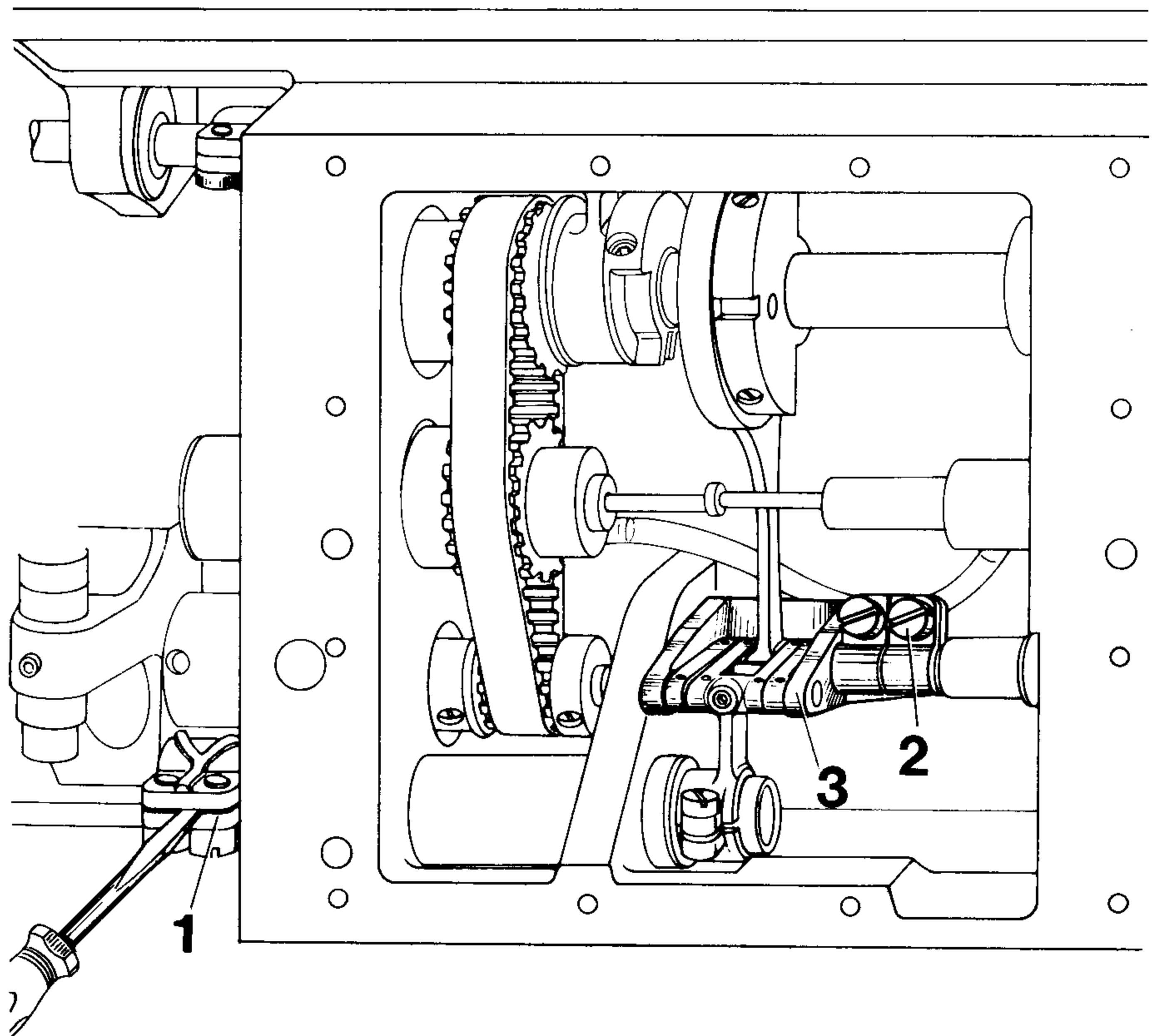
When the stitch length is set at "0" the feed dog must not move forward when the balance wheel is turned.

10.1 Adjustment with **closed** gearcase.



### 10.0.1

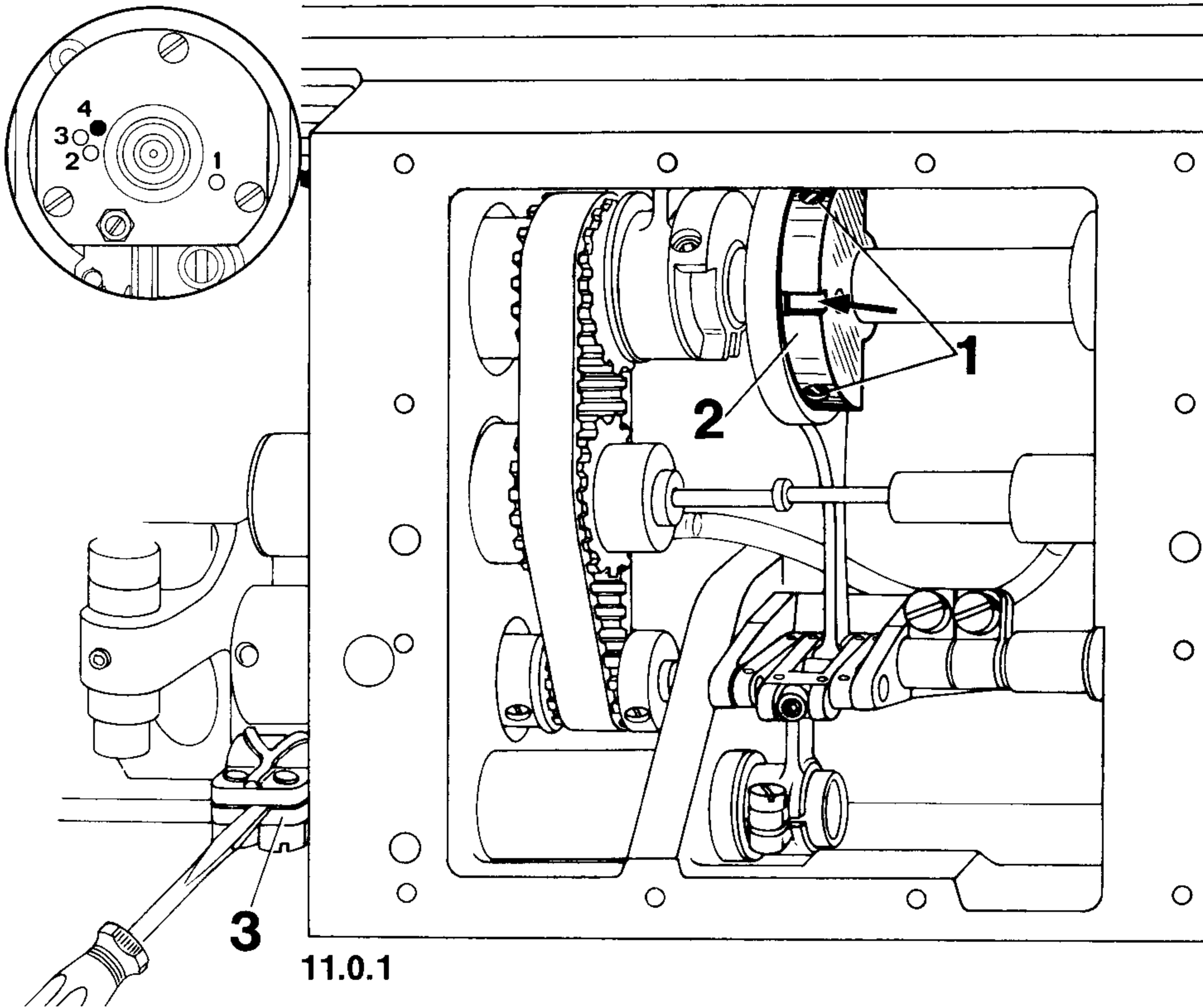
- 10.1.1 Loosen clamp screw 4 of actuating crank 5.
- 10.1.2 Place a 27-mm wrench on hexagon torsion nut 6 and thus hold actuating shaft 7 firmly in position.
- 10.1.3 **Keep rotating the balance wheel and turn the wrench on the torsion nut until the feed dog stops moving forward.**
- 10.1.4 Hold the wrench in this position and, making sure the actuating crank 3 and circlip 6 are against the casting, tighten clamp screw 2.
- 10.1.5 Check this adjustment (see "Correct setting").

**10.0.2**

- 10.2.1 Remove the gearcase cover on the underside of the machine (collect any oil which runs out of the gearcase).
- 10.2.2 Set stitch length at "0".
- 10.2.3 To make it easier to see when the feed dog is motionless insert a screwdriver in the slot of feed rock shaft crank 1.
- 10.2.4 Loosen clamp screw 2 just enough to allow crank 3 to be turned on its shaft against resistance.
- 10.2.5 **Turn the balance wheel and at the same time turn feed shaft crank 3 until the screwdriver and thus the feed dog is completely motionless.**
- 10.2.6 In this position tighten clamp screw 2.
- 10.2.7 Check this adjustment (see "Correct setting").

Correct setting:

When the machine is set for its longest stitch and the needle bar is positioned **1 mm beyond its t.d.c.** (pin in hole **4**) the feed dog must not move when the reverse-feed control is operated.



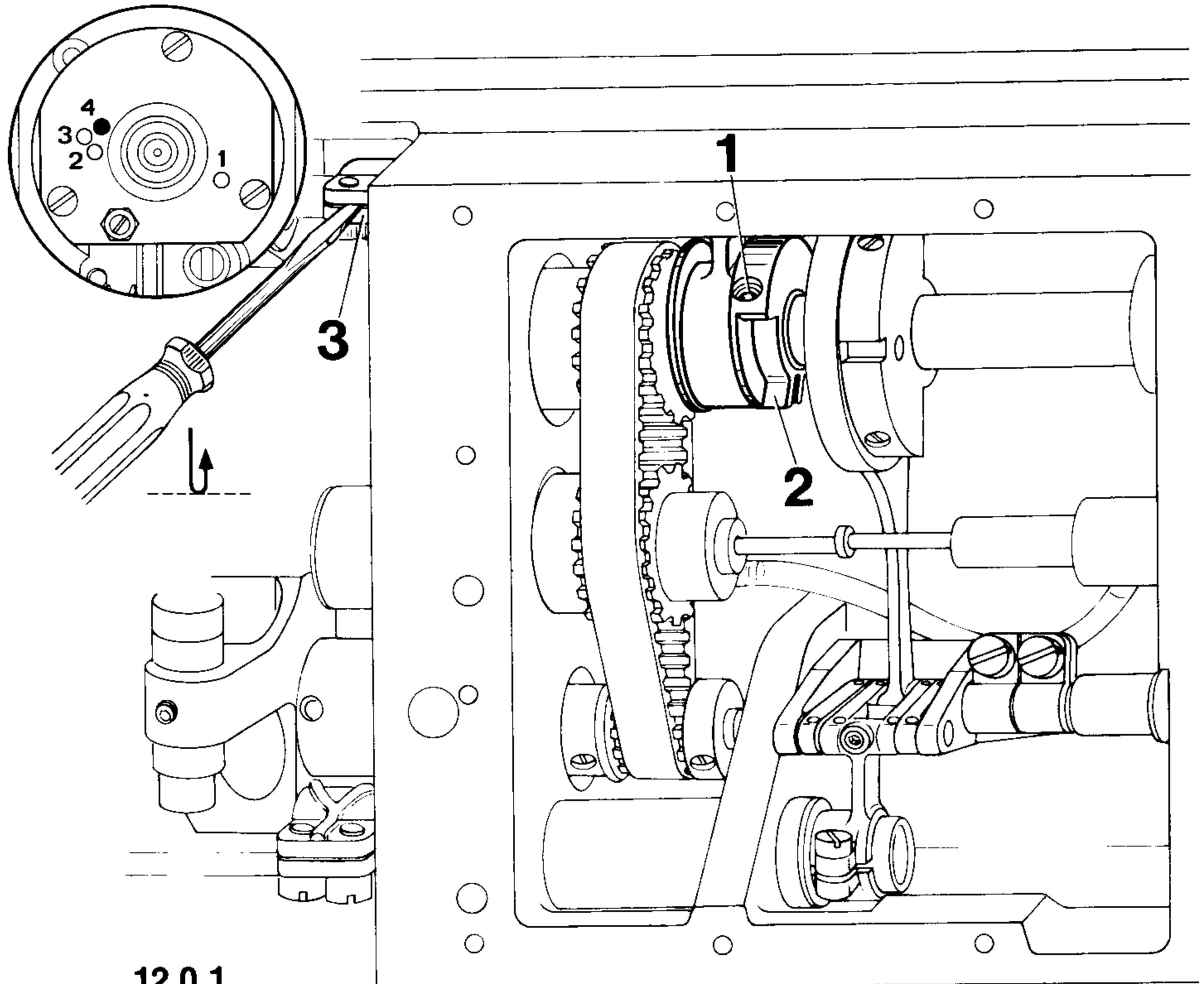
11.0.1

- 11.1 Turn the shaft to make screws **1** of feed driving eccentric **2** accessible and loosen them just enough for the eccentric to be turned against strong resistance.
- 11.2 Turn the balance wheel until the needle bar is positioned 1 mm beyond its t.d.c.
- 11.3 Insert the cylindrical pin in hole **4** of the bearing plate (to block the machine).
- 11.4 Set the machine for its longest stitch.
- 11.5 **Move the reverse-feed control up and down and turn feed driving eccentric **2** until the notch on the eccentric is visible and the screwdriver in feed rock shaft crank **3** is completely motionless.**
- 11.6 In this position, making sure that the feed driving eccentric is not moved along the shaft, tighten one of the screws **1**.
- 11.7 Remove the cylindrical pin from the hole of the bearing plate.
- 11.8 Tighten the other screw **1**.
- 11.9 Check this adjustment (see "Correct setting").
- 11.10 Remove the screwdriver from feed rock shaft crank **3**.



Correct setting:

When the stitch length is set at "0" and the needle bar is positioned **1.0 mm beyond its t.d.c.** (pin in hole **4**) the feed dog **3** must be at its t.d.c. (Fig. 12.0.1)

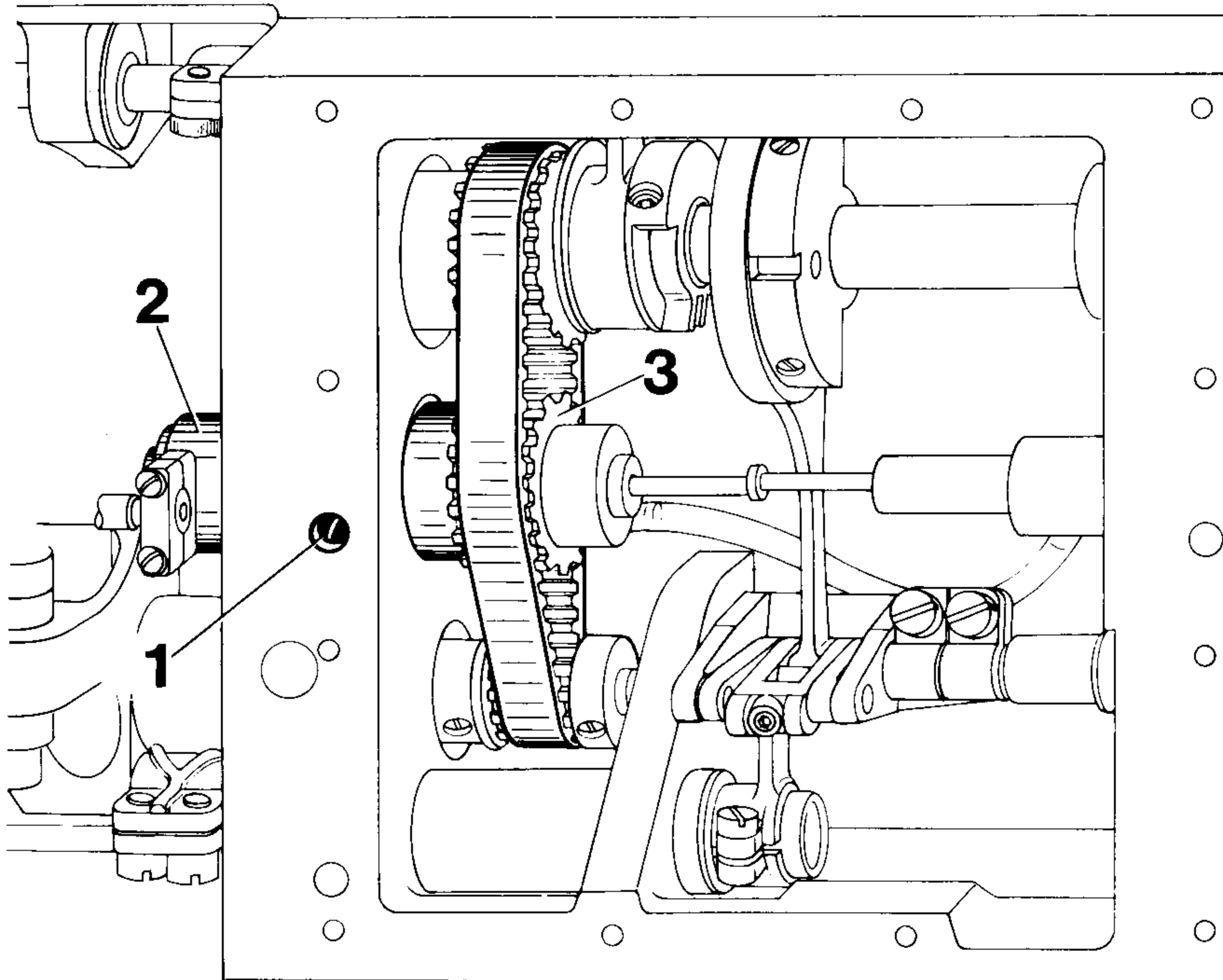


**12.0.1**

- 12.1 Set the stitch length at "0".
- 12.2 Loosen screws **1** in feed lifting eccentric **2**.
- 12.3 Turn the balance wheel until the needle bar is positioned **1.0 mm beyond its t.d.c.**
- 12.4 Insert the cylindrical pin in hole "**4**" of the bearing plate (to block the machine).
- 12.5 To make it easier to recognise the b.d.c. position insert a screwdriver in the slot of lifting crank **3**.
- 12.6 **Turn feed lifting eccentric **2** on its shaft until the screwdriver in feed lifting shaft crank **3** is at its b.d.c.** (see arrow in Fig. 12.0.1).
- 12.7 In this position, making sure that feed lifting eccentric **2** does not move along the shaft, tighten the accessible screw **1**.
- 12.8 Remove the cylindrical pin from the hole of the bearing plate.
- 12.9 Tighten the second screw **1**.
- 12.10 Check this adjustment (see "Correct setting").

Correct  
setting:

The driving belt must be tensioned so that the gears have no backlash, but the machine does not bind.

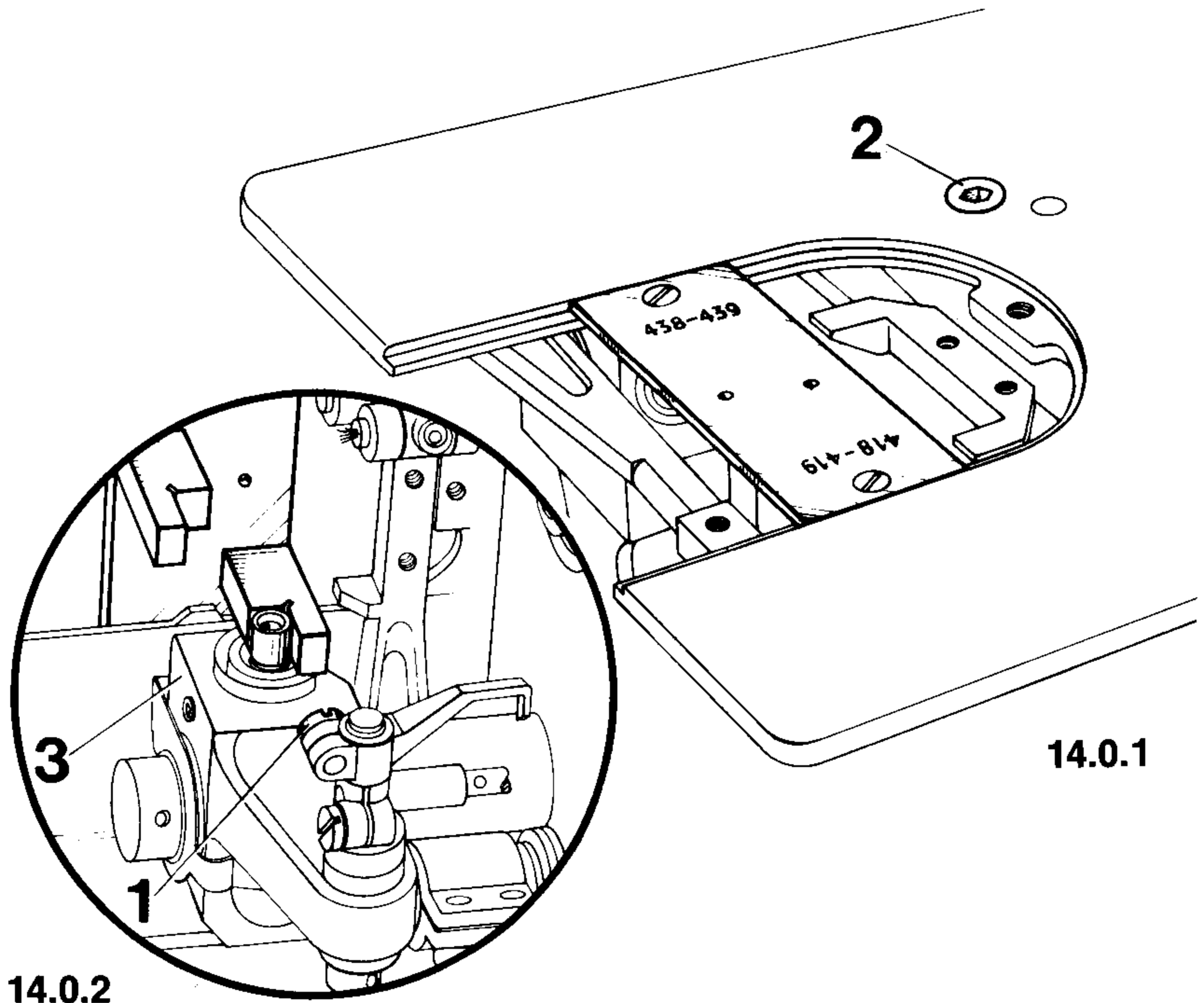


### 13.0.1

- 13.1 Loosen screw 1.
- 13.2 Move eccentric bushing 2 until the driving belt is positioned in the middle of the bobbin case opener driving gear 3.
- 13.3 **Making sure that eccentric bushing 2 is not moved, tension the driving belt by turning the eccentric bushing so that the gears have no backlash but the machine does not bind.**
- 13.4 In this position tighten screw 1.
- 13.5 Check this adjustment (see "Correct setting").

Correct setting:

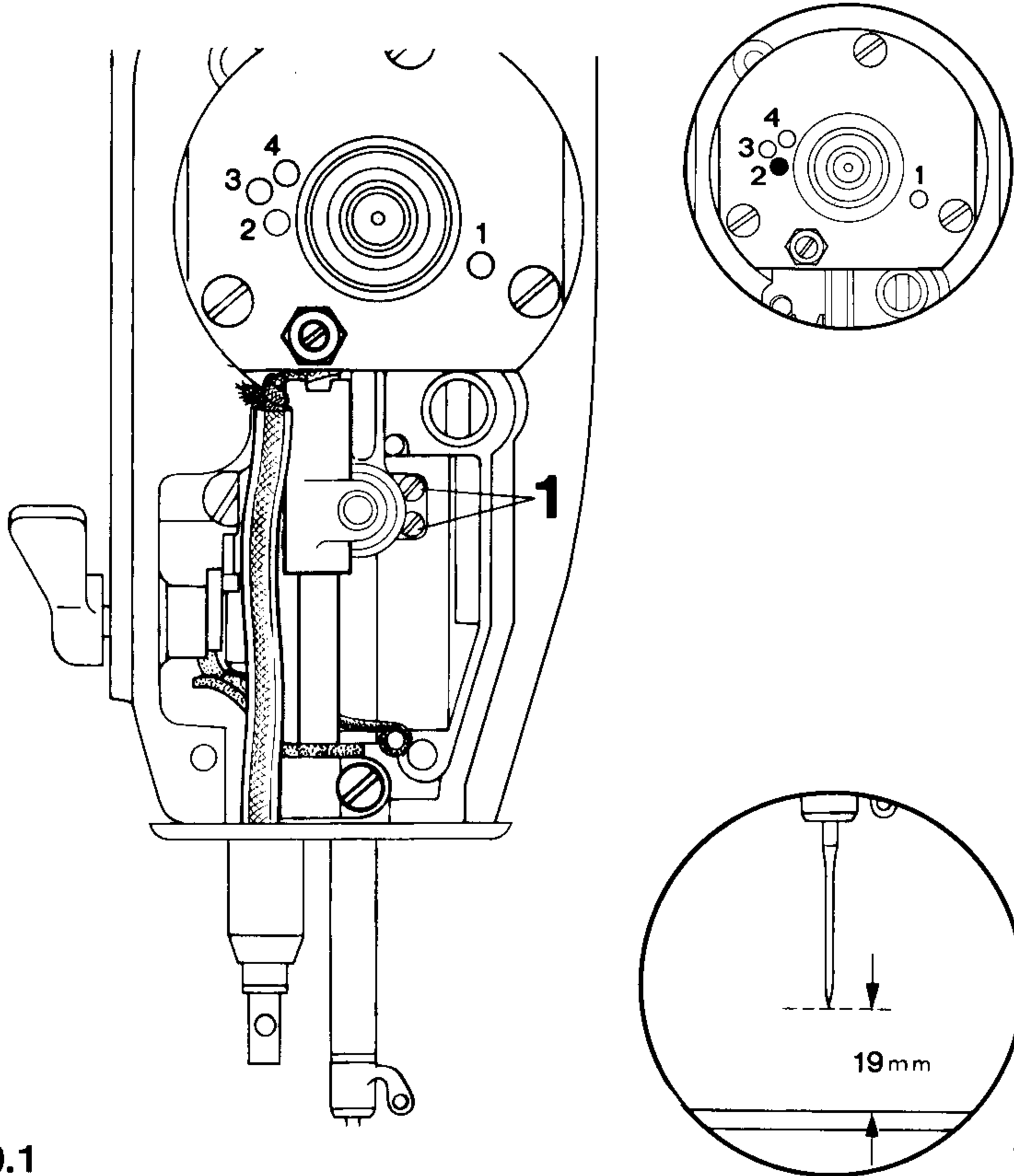
The hook shaft must contact both the vertical and horizontal surfaces of the hook bearing bracket gauge.



- 14.1 Remove bed slide, needle plate, feed dog and bobbin case position finger.
- 14.2 Loosen clamp screw **1** and swing the bobbin case opener to the right.
- 14.3 Loosen the two hook set screws and remove the sewing hook from its shaft.
- 14.4 Loosen allen screw **2** on the bedplate and release the taper key of hook bearing bracket **3** underneath this screw by tapping the head of the allen screw lightly with a hammer.
- 14.5 Screw on the hook bearing bracket gauge so that on Cl. 438 and 418 machines numbers **438-439** and **418-419** respectively can be read from the front (Fig. 14.0.1).
- 14.6 **By turning and moving hook bearing bracket 3 bring the hook shaft into contact with both the vertical and horizontal surfaces of the hook bearing bracket gauge.**
- 14.7 In this position tighten allen screw **2**.
- 14.8 Unscrew and remove the hook bearing bracket gauge.

Correct  
setting:

When the needle bar is at t.d.c. (pin in hole "2") there must be clearance of **19 mm** between needle point and needle plate.



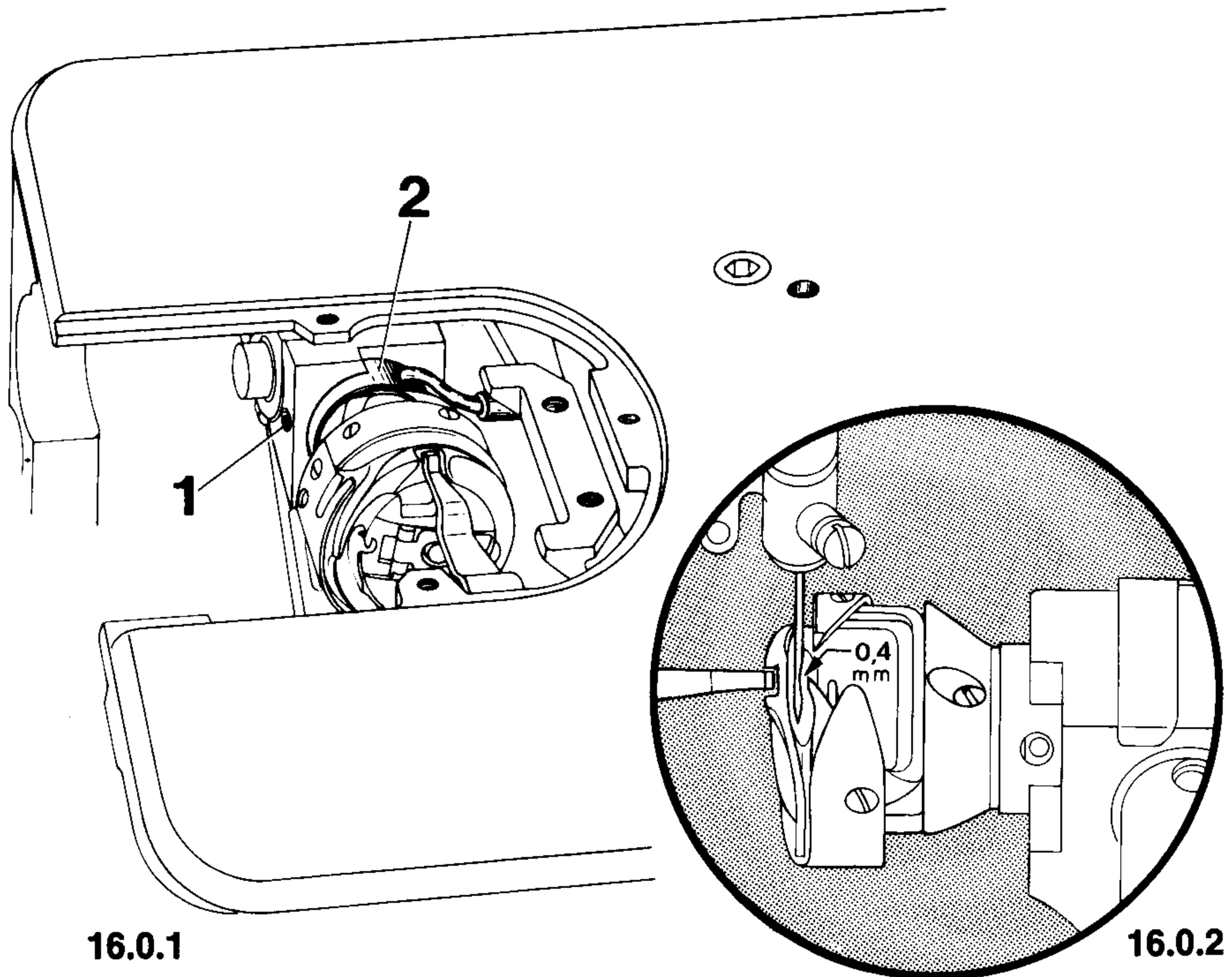
15.0.1

15.0.2

- 15.1 Bring the needle bar to t.d.c. and insert the cylindrical pin in hole "2" of the bearing plate.
- 15.2 Place the needle plate in the needle plate cutout.
- 15.3 Loosen screws 1 in the needle bar connecting stud.
- 15.4 **Adjust the needle bar vertically - without turning it - until there is a clearance of 19 mm between needle point and needle plate.**
- 15.5 In this position tighten screws 1.
- 15.6 Remove the needle plate again.

Correct  
setting:

When the hook is in contact with the oil distributor ring there must be a clearance of **0.4 mm** between the hook point and the middle of the clearance cut of the needle (Fig. 16.0.2)



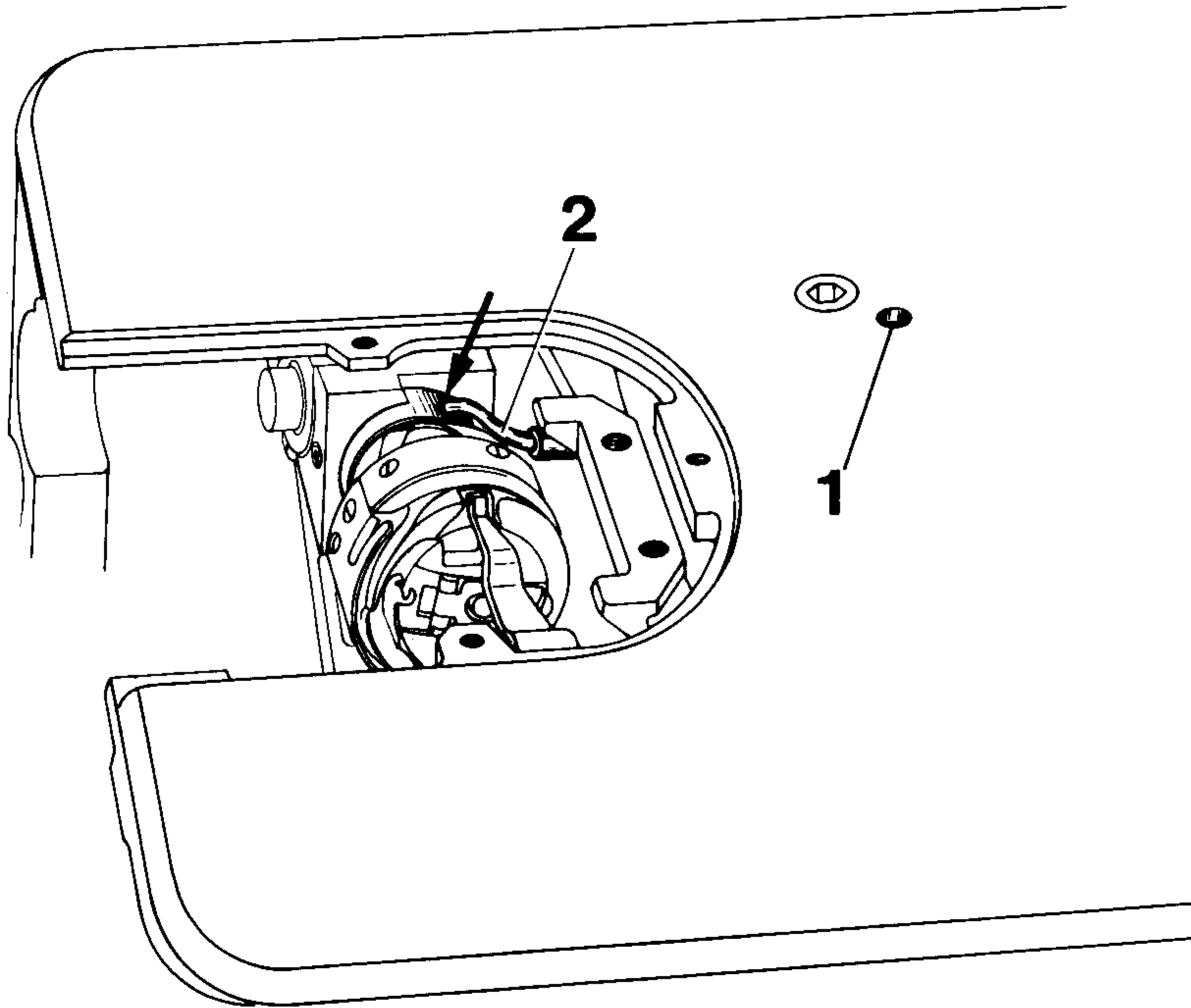
- 16.1 Set the stitch width lever at "0" and the needle position lever at its central position.
- 16.2 Place the sewing hook on the hook shaft.
- 16.3 Bring the needle bar to a position **2 mm** beyond b.d.c. but make sure the needle does not strike the sewing hook.
- 16.4 Loosen screw **1** of oil distributor ring **2**.
- 16.5 **Making sure that the hook is up against the oil distributor ring, move the oil distributor ring and the hook until there is a clearance of 0.4 mm between the hook point and the middle of the clearance cut of the needle (Fig. 16.0.2)**
- 16.6 In this position tighten screw **1**.
- 16.7 Check this adjustment (see "Correct setting").

17

## Inserting the oil tube in the oil distributor ring

Correct  
setting:

Oil tube **2** must be in the hole of the oil distributor ring (see arrow in Fig. 17.0.1).



**17.0.1**

17.1 Loosen allen screw **1**.

17.2 **Place oil tube 2 in the hole of the oil distributor ring** (see arrow in Fig. 17.0.1).

17.3 Tighten allen screw **1**.

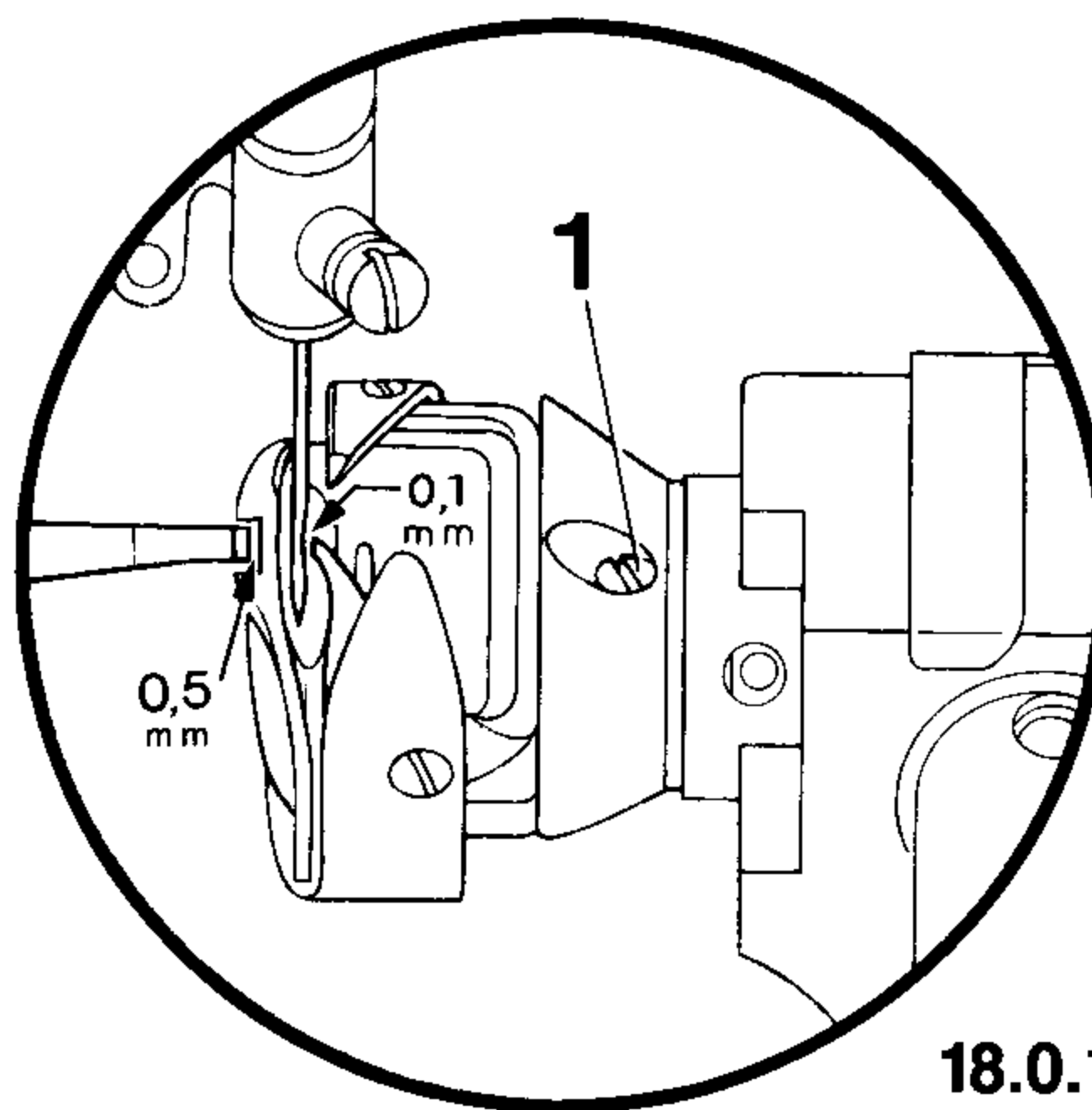
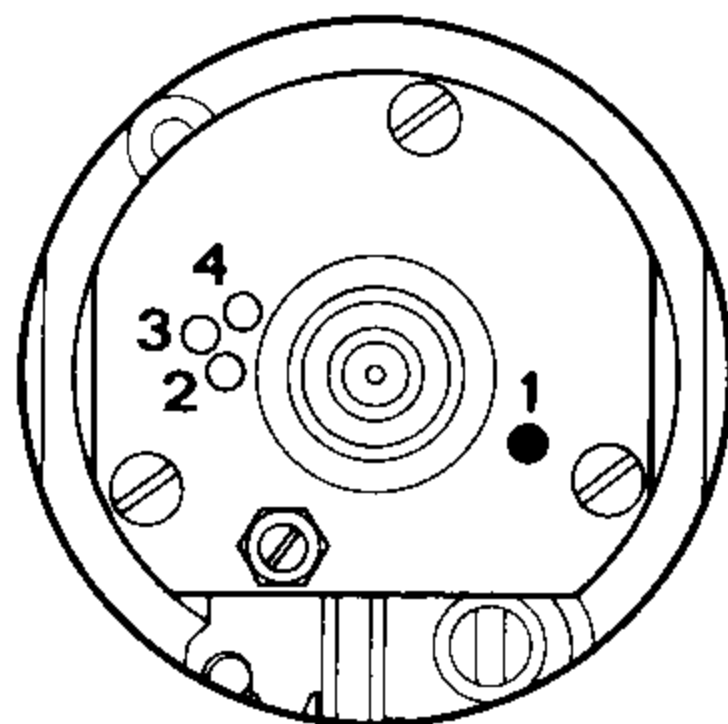
## 18

**Hook timing, hook-to needle clearance and bobbin case position finger**

Correct setting:

With the needle position lever in its central position, the stitch width lever at "0" and the needle bar at a position **2 mm** beyond b.d.c. (pin in hole "1") the hook point must be exactly opposite the centre line of the needle. Also, in this position, there should be a clearance of abt. **0.1 mm** between hook point and needle.

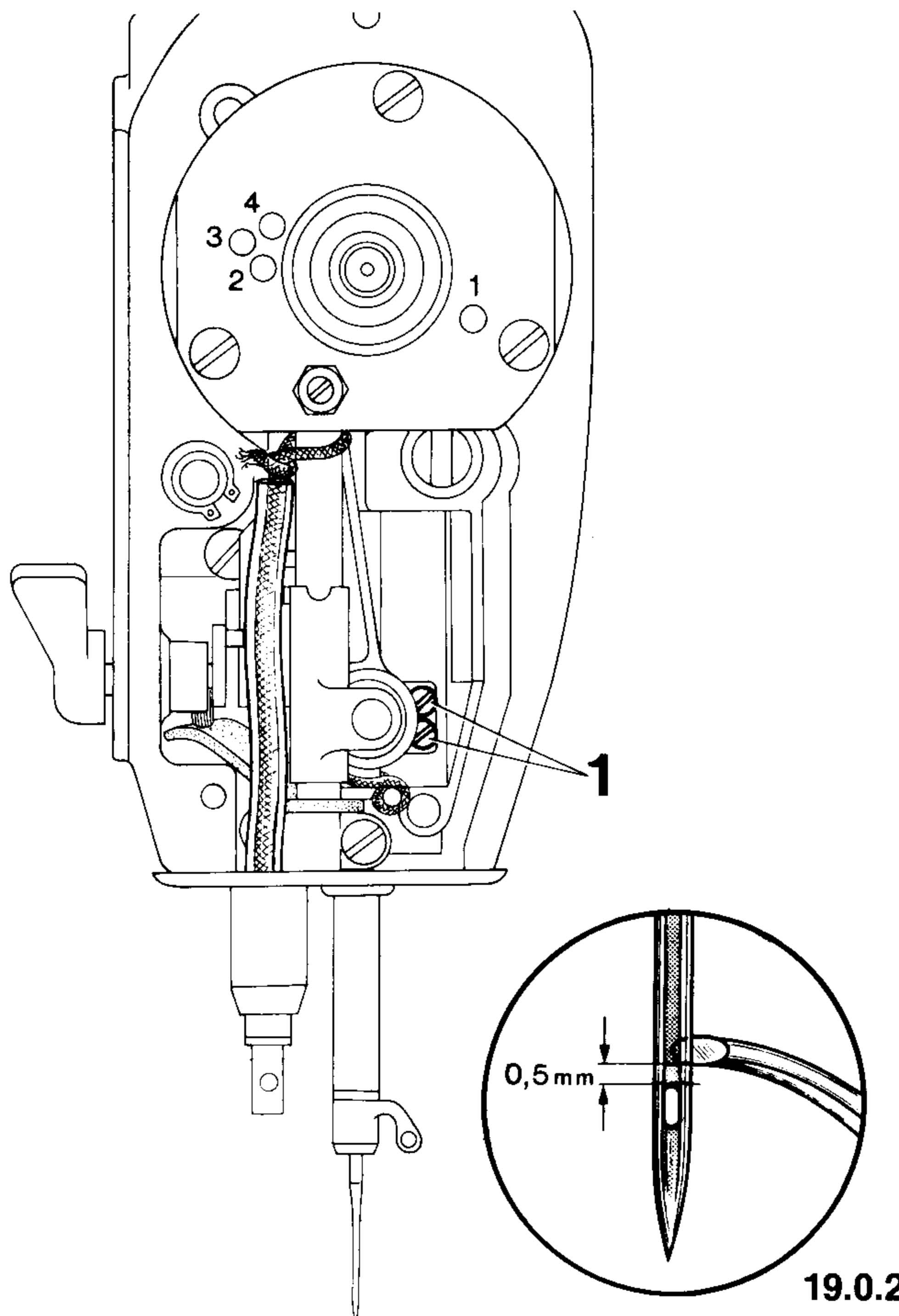
- 18.1 Bring the needle bar to a position **2.0 mm beyond b.d.c.**, making sure that the needle does not strike the sewing hook. Block the machine in this position by inserting the pin in hole "1" of the bearing plate.
- 18.2 Set the stitch width lever at "0" and the needle position lever at its central position.
- 18.3 Turn the sewing hook on its shaft until its point is opposite the centre line of the needle.
- 18.4. **Adjust the hook laterally, however without turning it, until there is a clearance of 0.1 mm between its point and the needle.**
- 18.5 In this position, tighten the accessible hook set screw 1.
- 18.6 **Screw on the bobbin case position finger so that it is positioned in the slot of the bobbin case base and that there is a clearance of 0.5 mm between its front edge and the bobbin case base.**
- 18.7 Pull the pin out of the hole in the bearing plate and tighten the second hook set screw 1.
- 18.8 Check this adjustment (see "Correct setting").



18.0.1

Correct setting:

With the stitch width lever at "0", the needle position lever at its left position and the hook point positioned exactly opposite the needle, the bottom edge of the hook point must be positioned **0.5 mm** above the top of the needle eye.



19.0.1

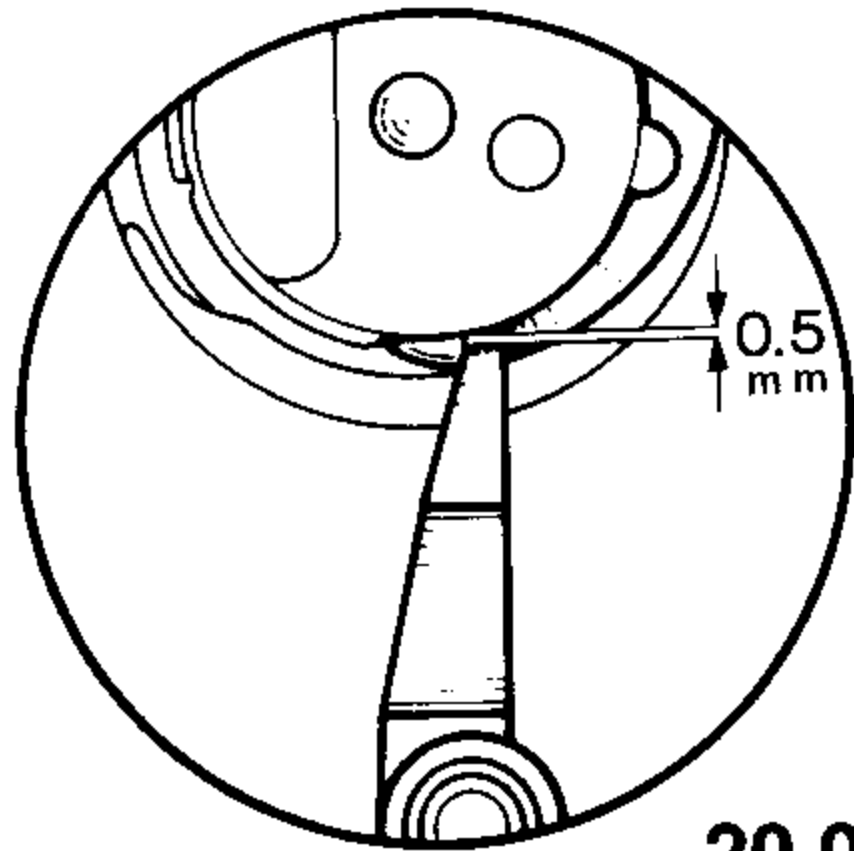
19.0.2

- 19.1 Set the stitch width lever at "0" and the needle position lever to its left position.
- 19.2 Turn the balance wheel until the hook point is exactly opposite the needle.
- 19.3 Loosen both clamp screws 1 of the needle bar connecting stud.
- 19.4 **Push the needle bar up or down until the hook point is positioned 0.5 mm above the top of the needle eye.**
- 19.5 In this position, tighten both screws 1, making sure that the needle bar has not been turned.

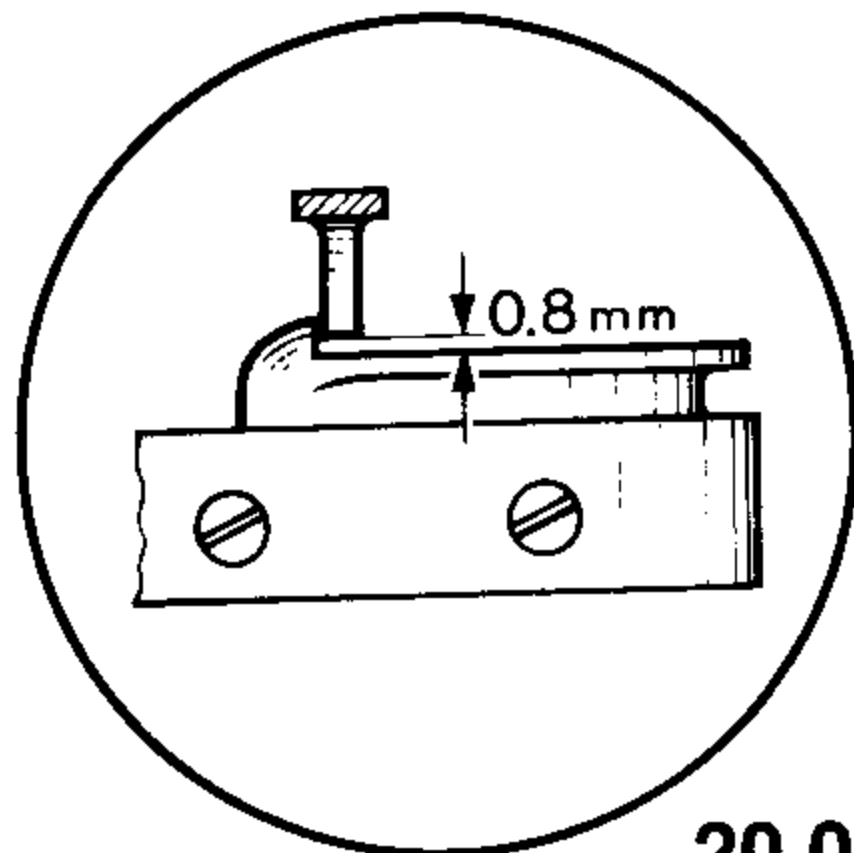


Correct setting:

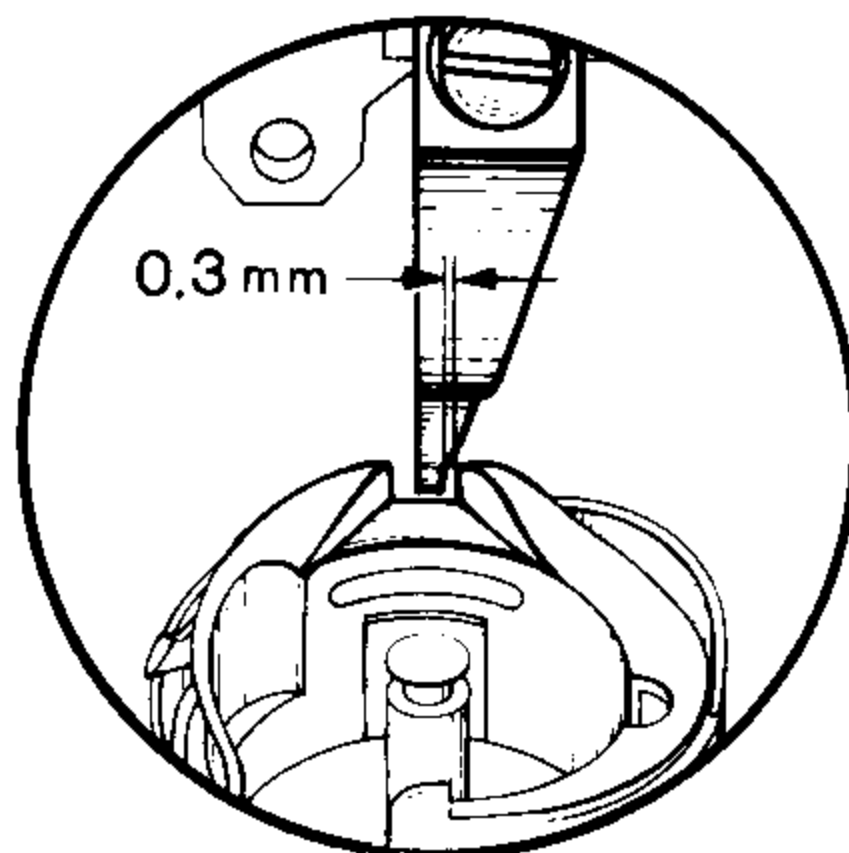
There must be a clearance of abt. **0.8 mm** between bobbin case opener finger and bobbin case base (Fig.20.0.3). Furthermore, there must be a clearance of **abt. 0.5 mm** between the top of the bobbin case position finger and the inner edge of the bobbin case base (Fig.20.0.2). And, finally, there should be a clearance of abt. **0.3 mm** between the right side of the bobbin case slot and the bobbin case position finger when the bobbin case opener is at its left point of reversal (Fig.20.0.4).



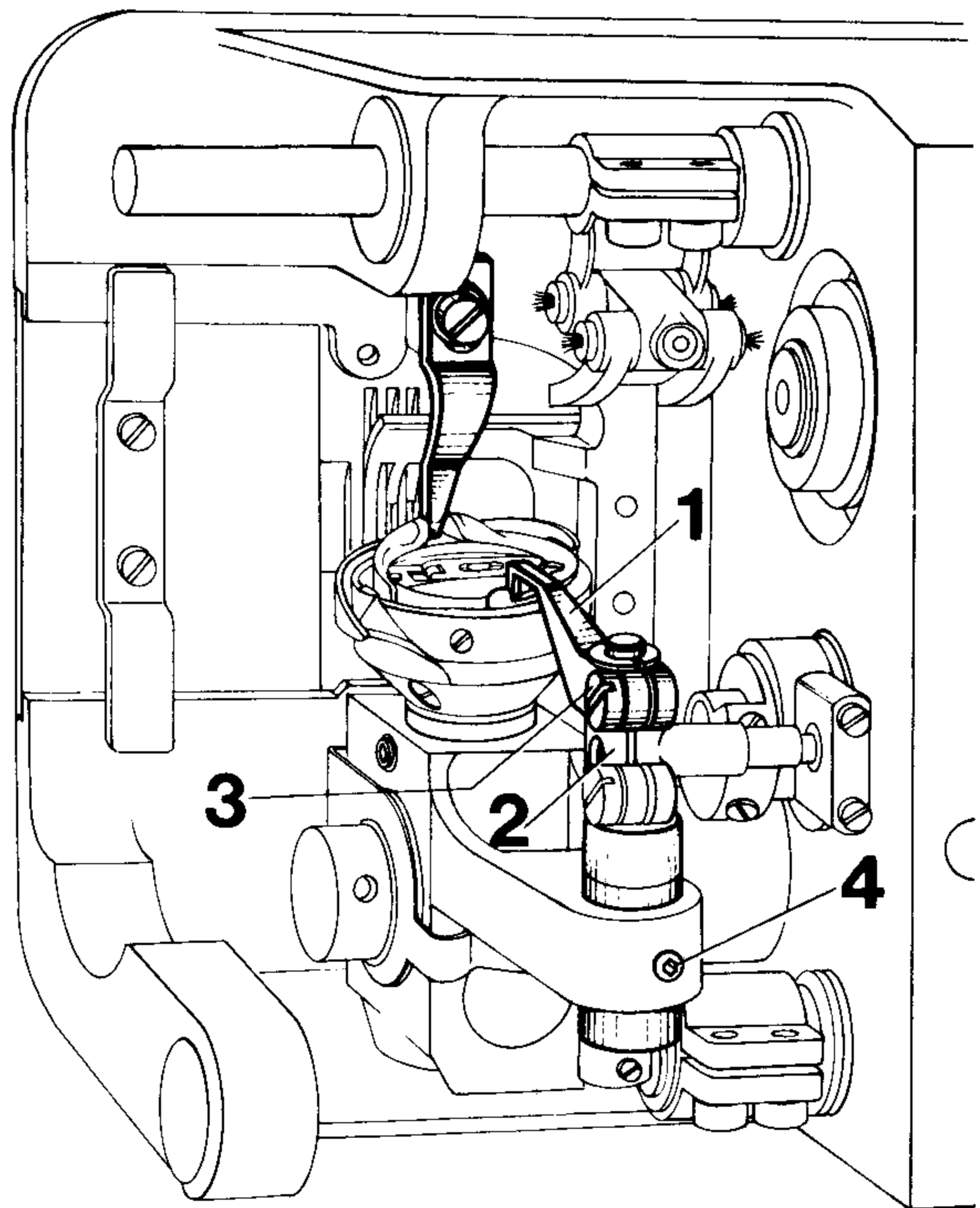
20.0.2



20.0.3



20.0.4



20.0.1

20.1.1

Turn bobbin case opener finger **1** so that it contacts the right side of the bobbin case slot.

20.1.2

Push the opener finger against clamp crank **2** located underneath and tighten clamp screw **3** just sufficiently to allow the opener finger to be turned on its shaft against resistance.

20.1.3

Loosen allen screw **4** of the eccentric bobbin case opener bushing.

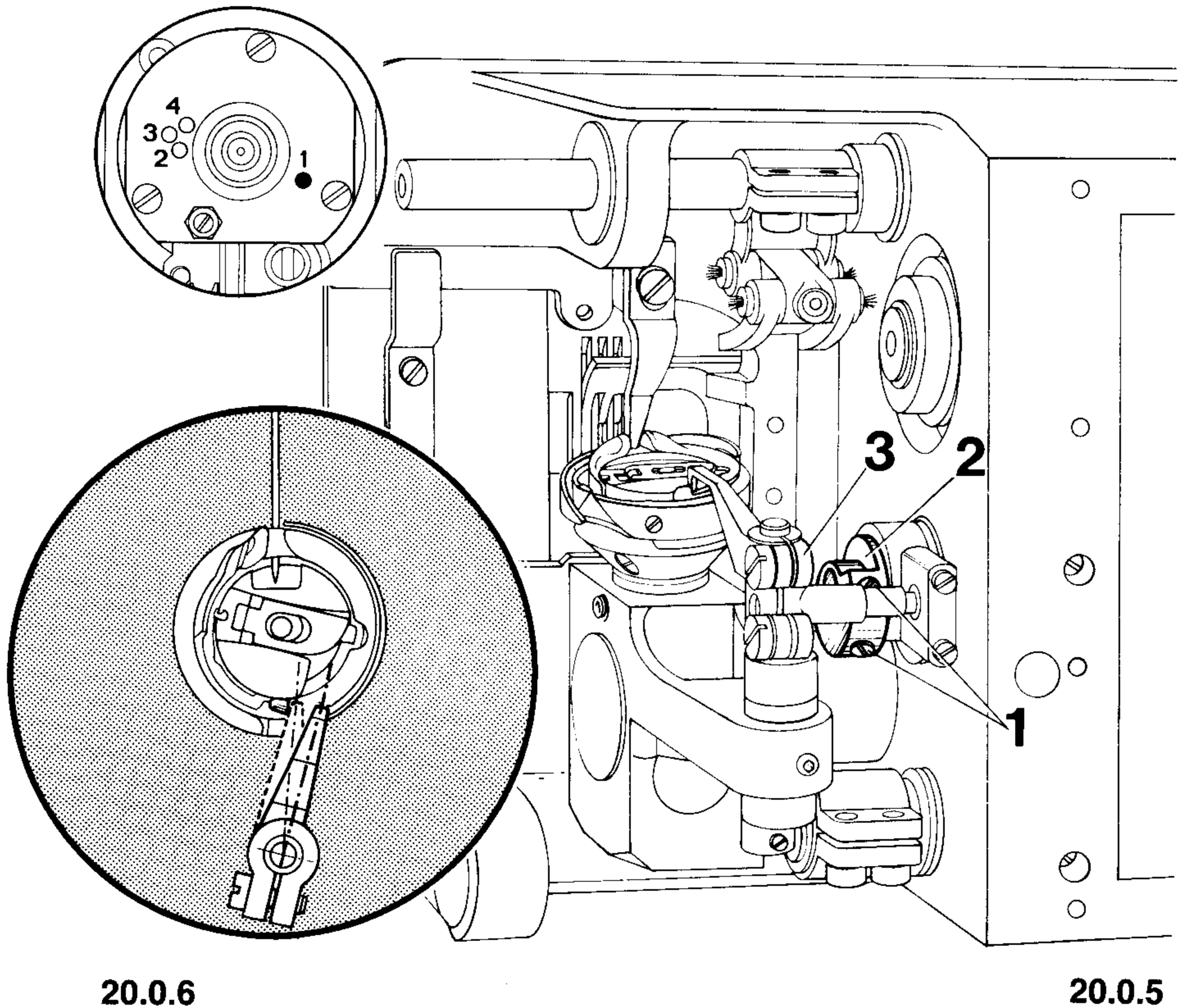
- 20.1.4 **Turn the eccentric bushing until there is clearance of abt. 0.5 mm between the top of the bobbin case opener finger and the inner edge of the bobbin case base (Fig. 20.0.2).**
- 20.1.5 **Adjust the bushing endwise without turning it until there is a clearance of abt. 0.8 mm between bobbin case opener finger and the edge of the bobbin case base (Fig. 20.0.3).**
- 20.1.6 In this position, tighten allen screw **4**.
- 20.1.7 Turn the balance wheel to bring the bobbin case opener to its left point of reversal.
- 20.1.8 **Turn the opener finger on its shaft, making sure it still contacts the bobbin case base, until there is a clearance of abt. 0.3 mm between the right side of the bobbin case slot and the bobbin case position finger (Fig. 20.0.4)**
- 20.1.9 In this position tighten clamp screw **3**, making sure the bobbin case opener still contacts clamp crank **2** underneath.
- 20.1.10 Check this adjustment (see "Correct setting").

## 20.2

### Timing the bobbin case opener

Correct setting:

When the needle bar is at a position **2.0 mm beyond b.d.c.** (pin in hole "1") the opener finger must be at its right point of reversal (Fig. 20.0.6.)



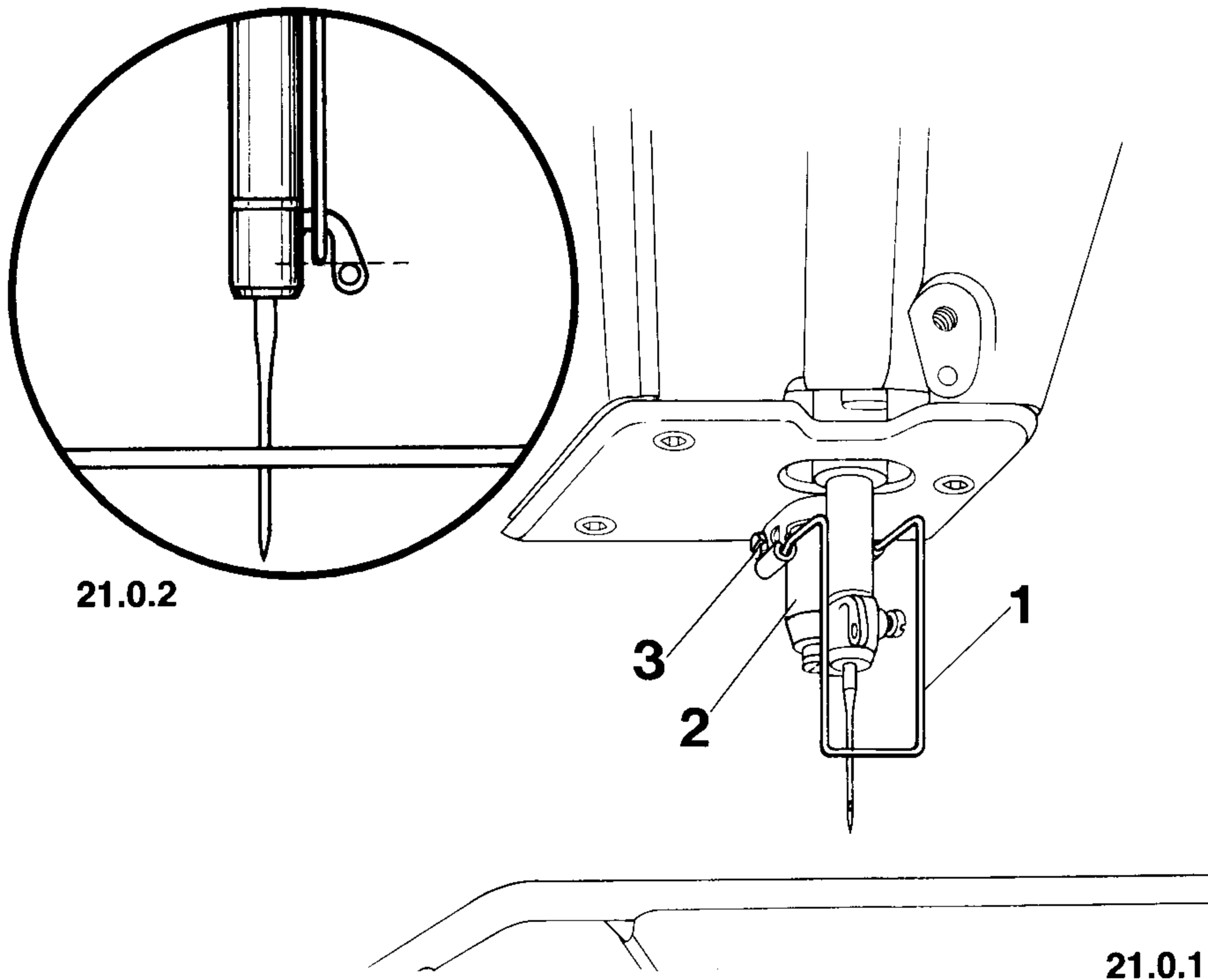
20.0.6

20.0.5

- 20.2.1 Loosen the three screws **1** of bobbin case opener eccentric **2**.
- 20.2.2 Tighten the central screw **1** just sufficiently to allow eccentric **2** to be turned on its shaft against resistance.
- 20.2.3 Bring the needle bar to a position **2.0 mm beyond b.d.c.** and, in this position, insert the pin in hole "1" (to block the machine).
- 20.2.4 To facilitate determining the exact point of reversal insert a small screwdriver in the slot of the clamp of opener finger **3**.
- 20.2.5 **Turn opener eccentric **2** until opener finger **3** is at its right point of reversal (Fig. 20.0.6)**
- 20.2.6 Pull the pin out of the hole in the bearing plate.
- 20.2.7 Tighten the central screw **1** first, then the two outer screws **1**.
- 20.2.8 Pull the screwdriver out of the clamp slot of the bobbin case opener and check this adjustment (see "Correct setting").

Correct  
setting:

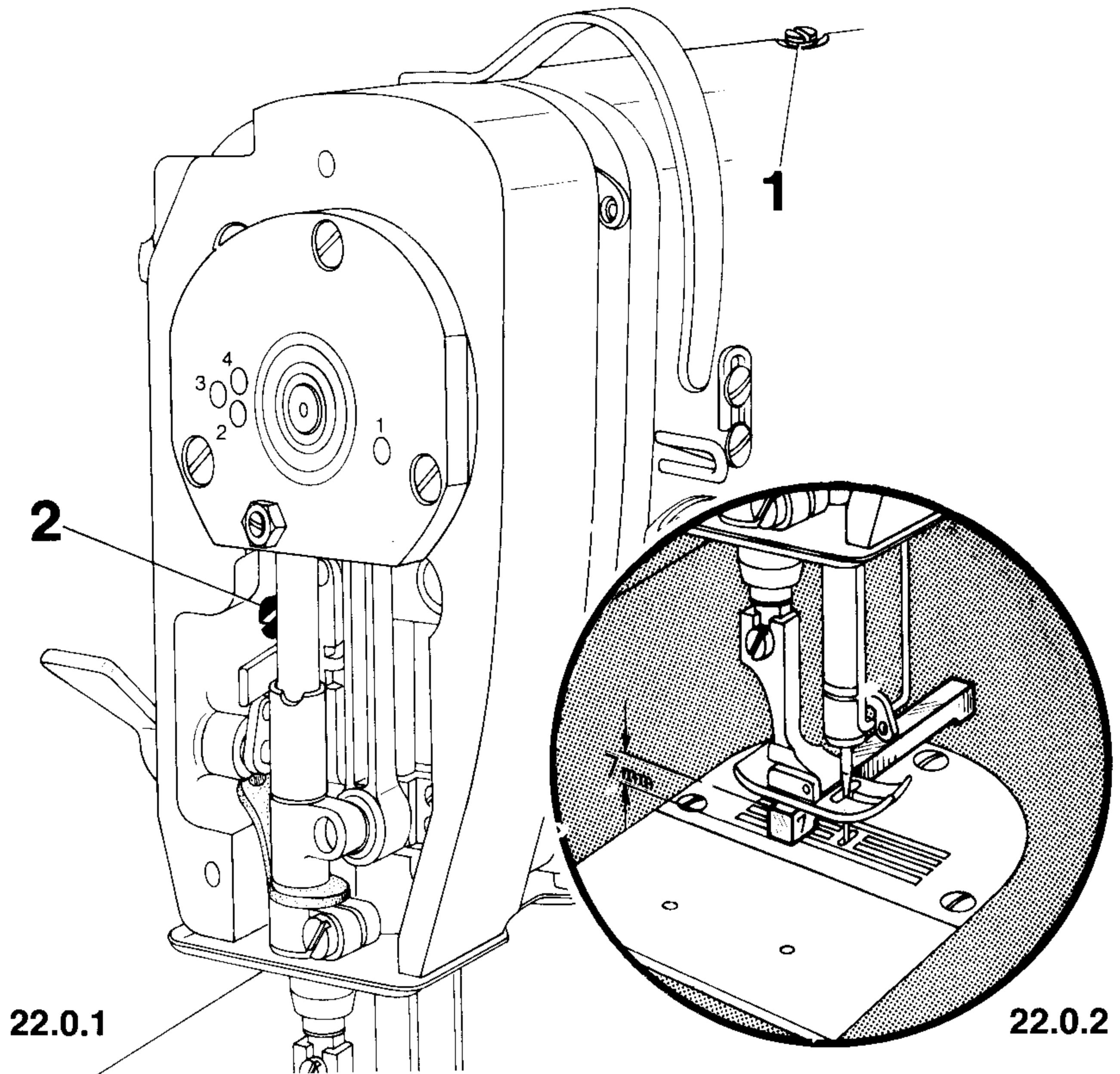
When the needle bar is at b.d.c. the bottom edge of the slack thread control wire must be in line with the top edge of the hole in the thread guide (Fig. 21.0.2).



- 21.1 Push slack thread control wire 1 on bushing 2 and hold it in position.
- 21.2 Bring the needle bar to b.d.c.
- 21.3 **Adjust the position of slack thread control wire 1 so that its bottom edge is in line with the top edge on the hole in the thread guide, and make sure it is set parallel to the bedplate.**
- 21.4 In this position tighten screw 3.
- 21.5 Check this adjustment (see "Correct setting").

Correct setting:

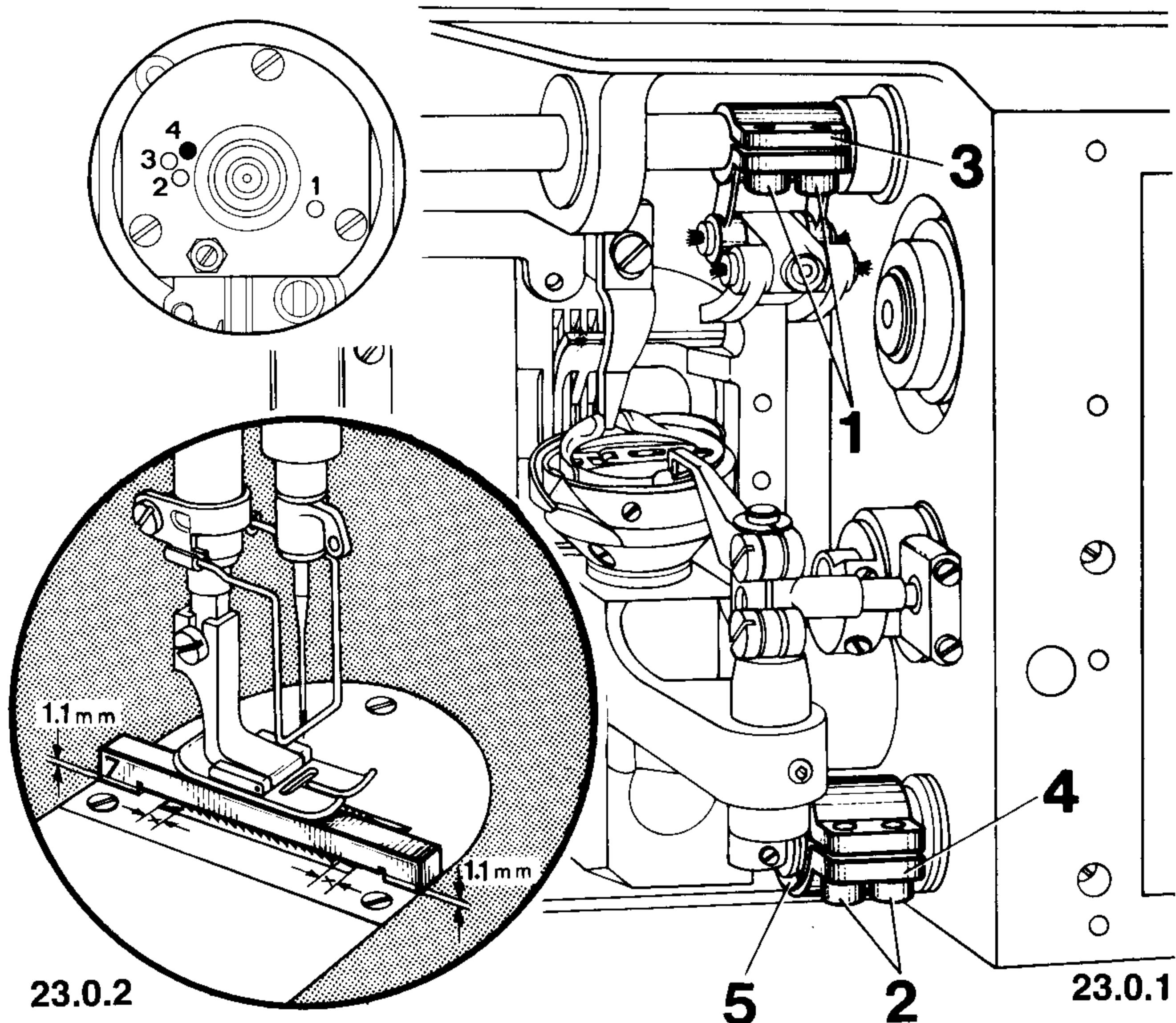
When the presser bar lifter is raised there must be a clearance of 7 mm between presser foot and needle plate.



- 22.1 Screw on feed dog, needle plate and bed slide.
- 22.2 Making sure that the stitch width lever is at "0" and the needle position lever is in its central position, raise the presser bar lifter.
- 22.3 Replace the presser foot and lower it onto the needle plate by means of the presser bar lifter.
- 22.4 Reduce the pressure of the presser bar by turning out regulating screw 1 until the presser foot is pressed against the needle plate only slightly.
- 22.5 Push the 7-mm-thick part of the gauge under the presser foot from behind so that it is under the hinge of the presser foot.
- 22.6 Loosen clamp screw 2 of the lifting bracket and raise the presser bar lifter.
- 22.7 Turn the balance wheel until the needle is down in the needle hole of the presser foot.
- 22.8 **Adjust the position of the presser foot so that the needle is centred exactly in the hole of the presser foot.**
- 22.9 **In this position push the lifting bracket down as far as it will go and tighten clamp screw 2.**
- 22.10 Check this adjustment (see "Correct setting").

Correct setting:

With the stitch set at "0" and the needle bar at a position **1.0 mm beyond t.d.c.** (pin in hole "4") the feed dog must be centred in its slots and contact the gauge throughout its entire length (Fig. 23.0.3).



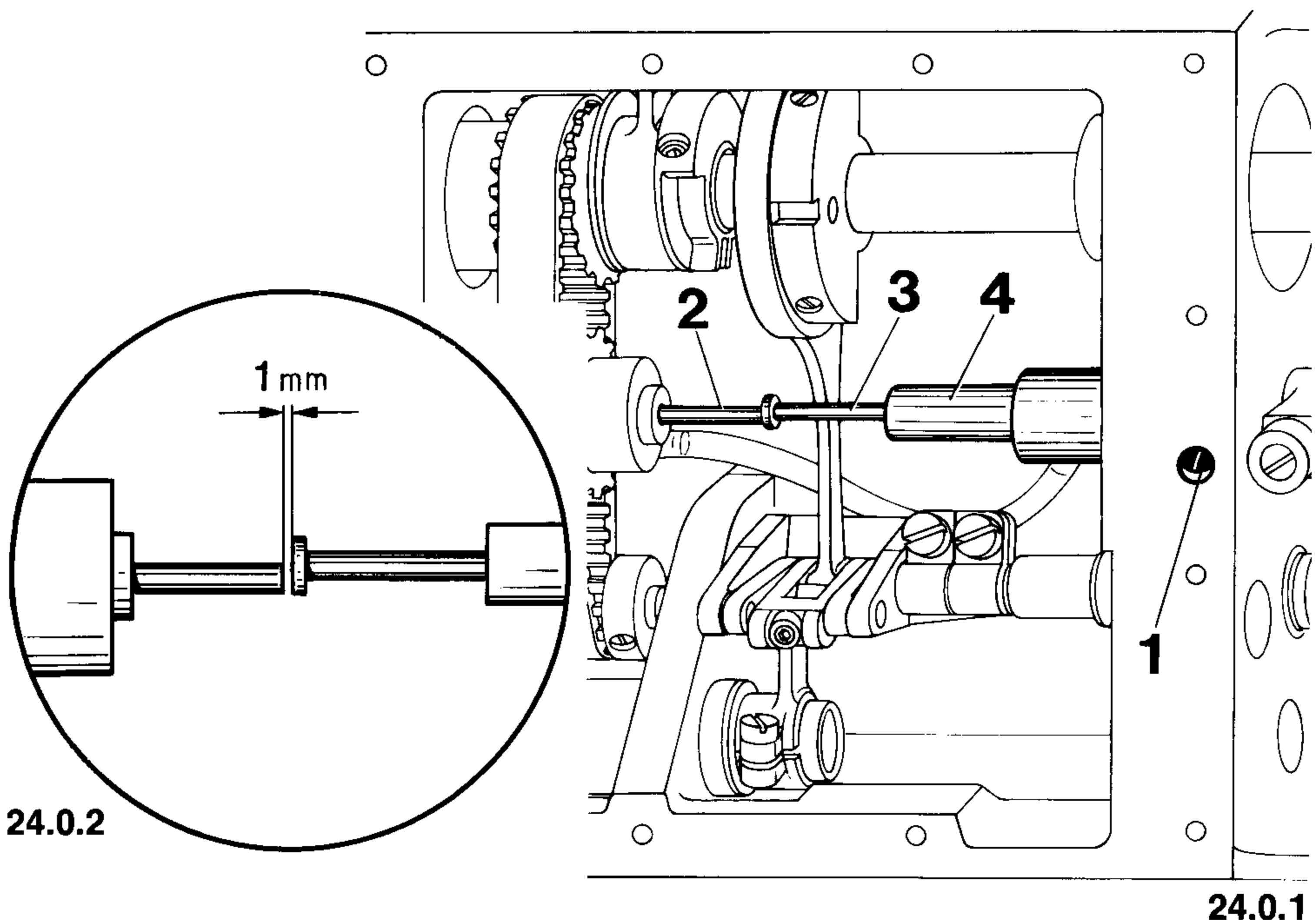
- 23.1 Bring the needle bar to a position **1.0 mm beyond t.d.c.** and insert the pin in hole "4" of the bearing plate (to block the machine).
- 23.2 Loosen clamp screws 1 and 2.
- 23.3 Place the gauge under the presser foot so that its recess faces downwards and its front edge is flush with the edge of the needle plate.
- 23.4 Lower the presser bar lifter to rest the presser foot on the gauge.
- 23.5 Push the feed bar upwards, centre the feed dog in the needle plate slots and hold it in this position.
- 23.6 Turn feed lifting crank 3 until the feed dog contacts the gauge and tighten clamp screw 1 just lightly.
- 23.7 **Turn eccentric bushing 5 under feed rock shaft crank 4 until the feed dog is in contact with the gauge throughout its entire length and tighten clamp screw 2 lightly too.**
- 23.8 Tighten clamp screws 1 and 2, making sure the feed dog is still in contact with the gauge throughout its entire length.
- 23.9 Raise the presser foot lifter, remove the gauge from under the presser foot and pull the pin out of the hole in the bearing plate.
- 23.10 Check this adjustment (see "Correct setting").

Correct setting:

There should be a clearance of **1.0 mm** between actuating rod **2** of the centrifugal governor and push rod **3** of the oil check valve (Fig. 24.0.2).

Note:

If the machine has been in operation for a longer time, it is recommended to fill the gearcase with abt. 130 c.c. of Pfaff sewing machine oil No. 280-1-120 144 having a viscosity of  $15.0 \text{ mm}^2/\text{s}$  at  $50^\circ \text{C}$  and a density of  $0.865 \text{ kg}/\text{dm}^3$  before the gearcase cover is closed. The two oil pads, which are available under Nos. 91-168 383-05 and 91-168 384-05, should be replaced too.



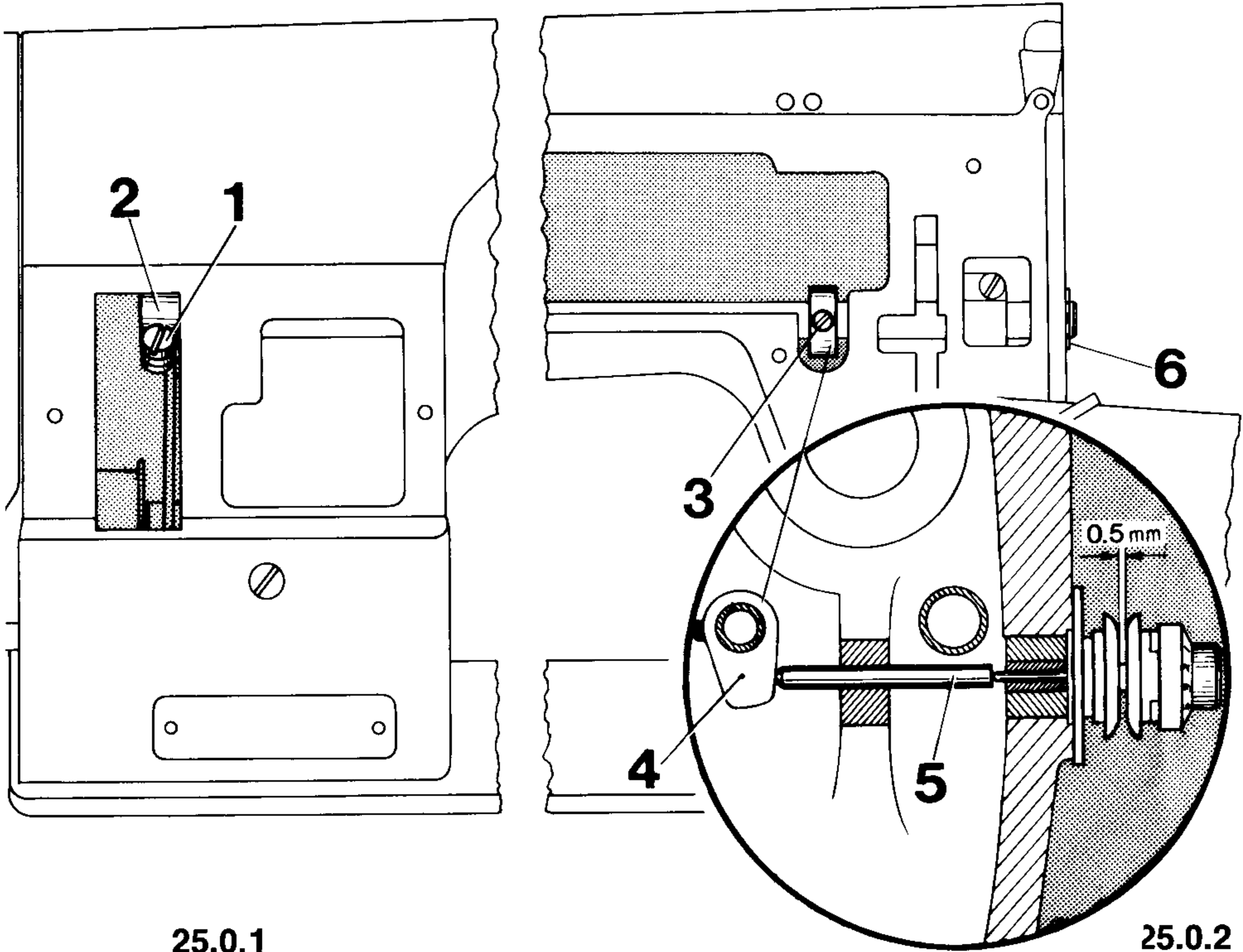
- 24.1 Loosen screw **1** of the oil check valve.
- 24.2 Push actuating rod **2** to the left as far as it will go.
- 24.3 Press push rod **3** into oil check valve **4** until a resistance is felt.
- 24.4 **Reposition oil check valve 4 until there is a clearance of 1.0 mm between actuating rod 2 and push rod 3 (Fig. 24.0.2).**
- 24.5 In this position tighten screw **1**.
- 24.6 Place the oil pad in the gearcase so that the vertical fin in the gearcase is positioned in its smallest cutout.
- 24.7 Clean the gasket face on the gearcase and the gasket of the gearcase cover.
- 24.8 Replace the gearcase cover and tighten in screws crosswise.
- 24.9 Check this adjustment (see "Correct setting").

**Tension release mechanism**

(This adjustment procedure does **not** apply to machines equipped with subcl. -900 thread trimmer.)

Correct setting:

When the presser bar lifter is raised both tension discs should be at least **0.5 mm** apart (Fig. 25.0.2).



25.0.1

25.0.2

- 25.1 Take out the four screws of the arm rear cover and swing the cover out to the right.  
 25.2 Lower the presser foot onto the needle plate by means of the presser bar lifter.  
 25.3 Loosen clamp screw **1** of lifting lever crank **2** and push the connecting rod down as far as it will go.  
 25.4 Bring the needle bar to **b.d.c.**  
 25.5 Raise the presser foot and place the feed dog gauge under the foot with its recess up.  
 25.6 Lower the presser foot into the recess of the gauge.  
 25.7 Loosen screw **3** of tension release cam **4**.



- 25.8 **Adjust tension release cam 4 on its shaft so that it is positioned exactly opposite tension release pin 5.**
- 25.9 Swing up the presser bar lifter until a resistance is felt.
- 25.10 **In this position, push tension release cam 4 up against tension release pin 5 and tighten screw 3.**
- 25.11 Remove the feed dog gauge from under the presser foot and lower the presser foot onto the needle plate again.
- 25.12 Tighten clamp screw 1, making sure that retaining ring 6 on the lifting shaft is still in contact with the face side of the machine and crank 2 contacts the casting.
- 25.13 Check this adjustment (see "Correct setting").
- 25.14 Screw on the face cover.
- 25.15 The arm rear cover remains swung out.

## 26 Lubrication of zigzag eccentric

26.1 Fill the zigzag eccentric housing with abt. 100 c.c. of oil.

Note:

Only use Pfaff sewing machine oil having a viscosity of 15.0 mm<sup>2</sup>/s at 50° C and a density of 0.865 kg/dm<sup>3</sup> (No. 280-1-120 144).

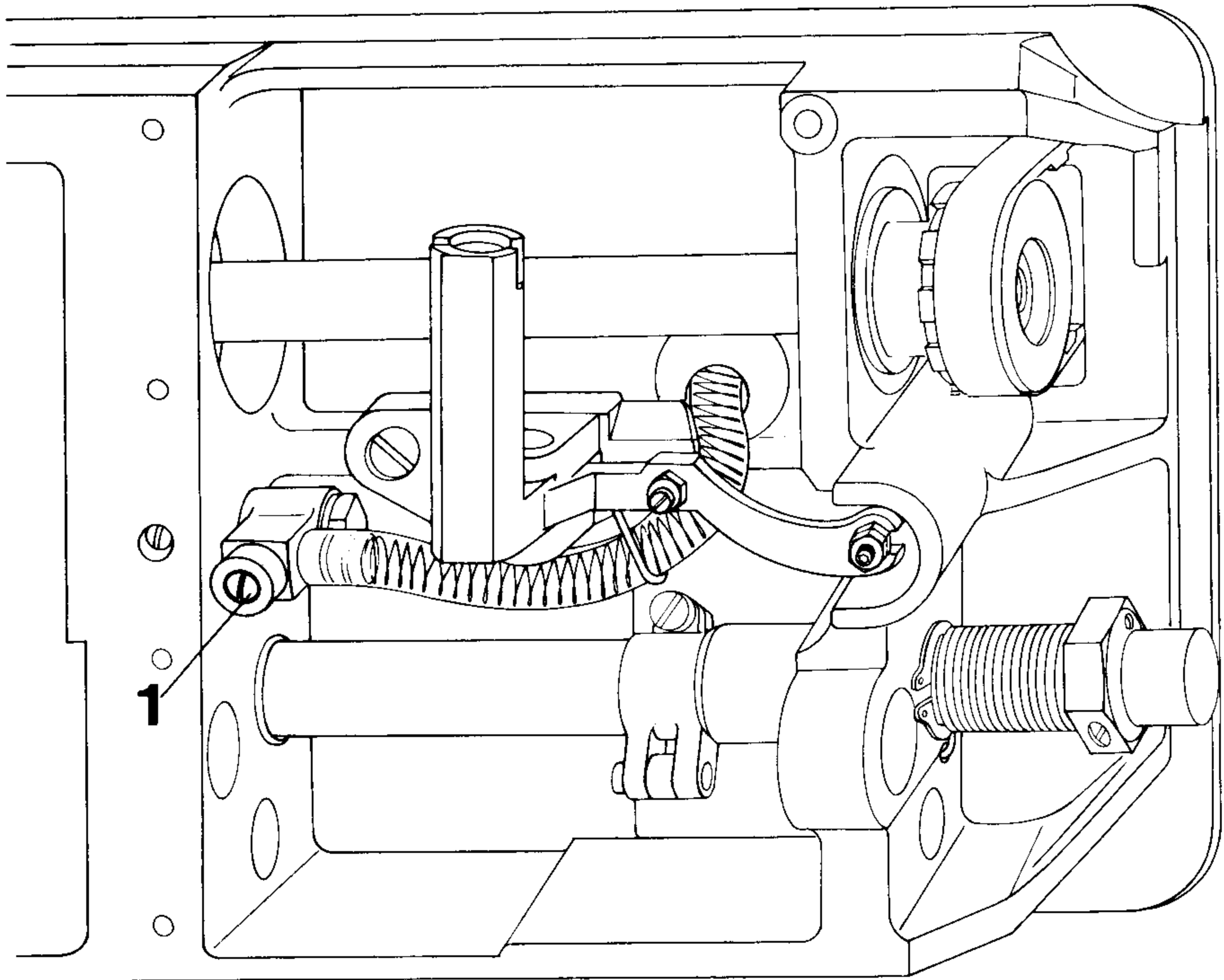
When the oil is replenished later the excess oil flows through an overflow duct from the hook oil reservoir to the zigzag eccentric housing, thus filling the latter. Keep topping up oil until the oil level is in line with the upper mark in the small circle of the oil reservoir.

26.2 Clean the gasket face on the cover of the zigzag eccentric housing and the gasket of this cover.

26.3 Screw on the cover, making sure that the needle bar lubricating wick is still positioned in the hole of the sealer plate.

Correct setting:

After the machine has run at full speed for about ten seconds, a fine trace of oil should appear on a piece of paper placed over the needle plate cutout above the hook raceway.

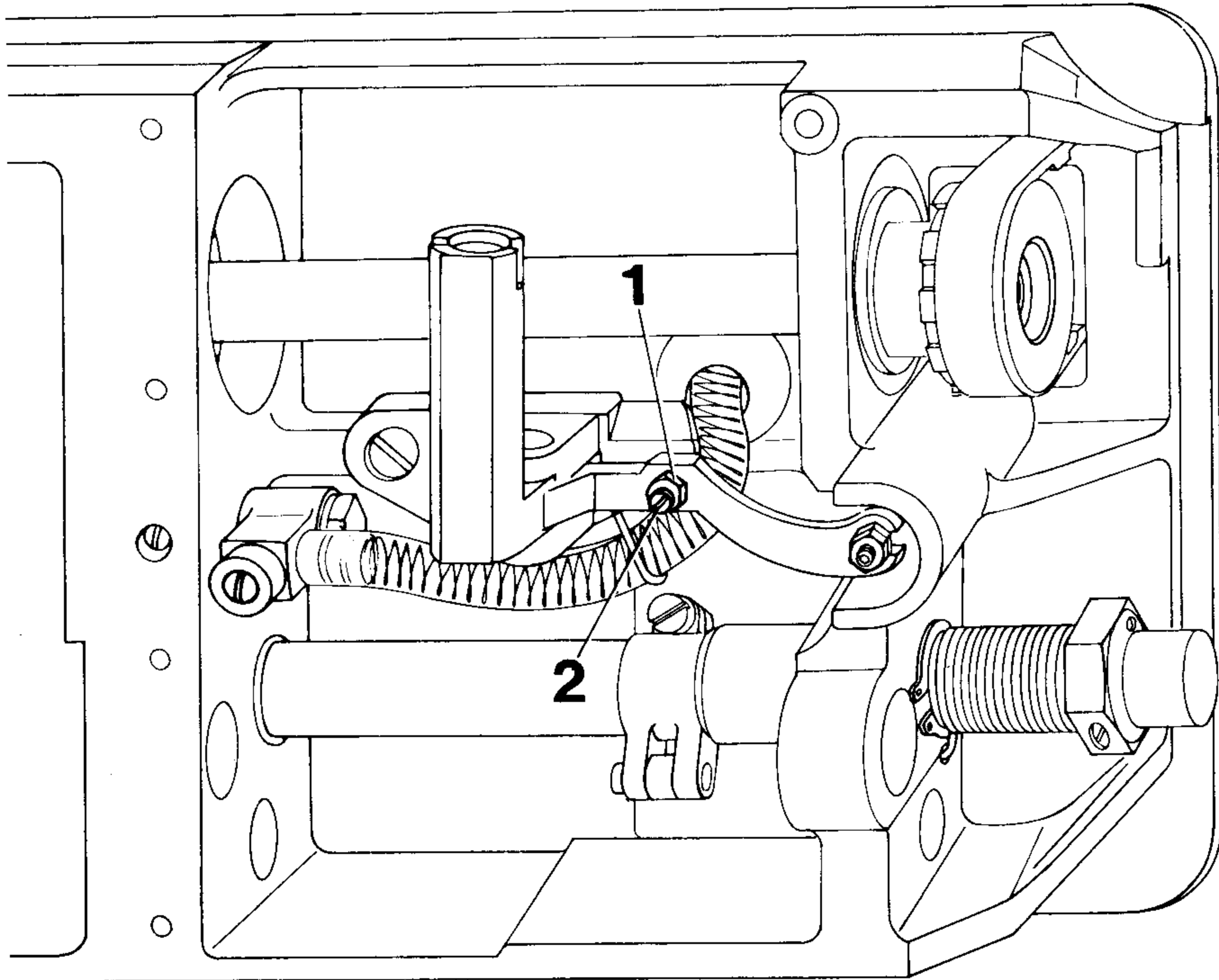


### 27.0.1

- 27.1 Check the oil level and, if necessary, top up the reservoir with oil with a viscosity of  $15.0 \text{ mm}^2/\text{s}$  at  $50^\circ \text{C}$  and a density of  $0.865 \text{ kg}/\text{dm}^3$  until the oil level is in line with the upper mark. We recommend Pfaff sewing machine oil No. 280-1-120 144.
- 27.2 Turn in regulating screw **1** of the oil check valve as far as it will go, and then back about half a turn.
- 27.3 Switch on the machine and run it for about one minute.
- 27.4 Remove needle plate and feed dog and take the needle out of the needle bar.
- 27.5 Place a piece of white paper over the needle plate cutout and hold it there.
- 27.6 Let the machine run about ten seconds. Then check to see if a fine trace of oil has appeared on the paper opposite the hook raceway.
- 27.7 **If too much oil is emitted, turn regulating screw 1 in a little; or if too little oil is emitted turn it out somewhat.**
- 27.8 Check this adjustment (see "Correct setting").
- 27.9 Replace and screw on feed dog and needle plate.
- 27.10 Replace the needle in the needle bar.

Correct  
setting:

When the knee lever is fully operated, the presser foot must be lifted from the needle plate by a little more than **7.0 mm** and the presser bar lifter must drop by its own weight.

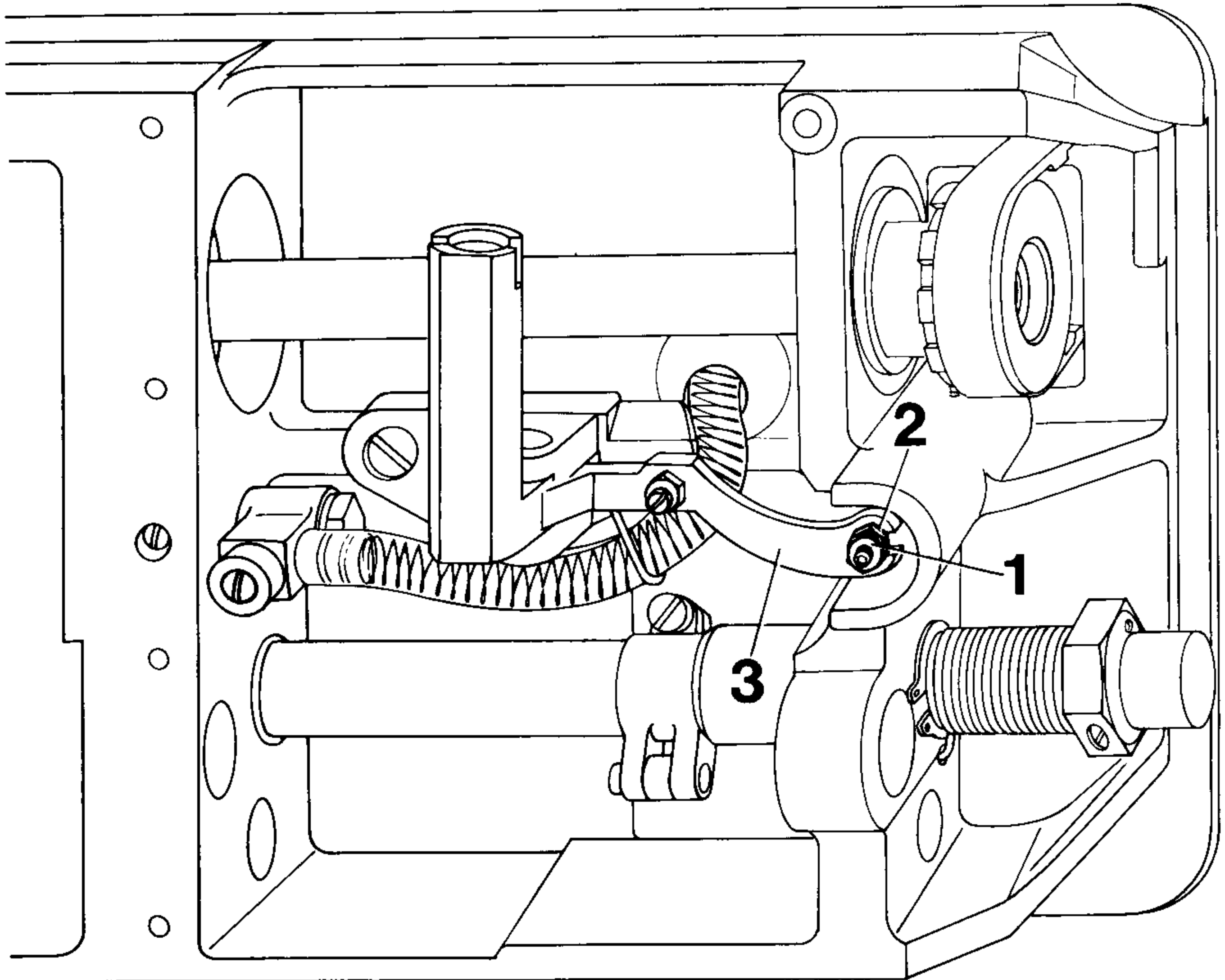


### 28.0.1

- 28.1 Place the feed dog gauge under the presser foot so that its recess faces the needle plate.
- 28.2 Lower the presser foot onto the feed dog gauge.
- 28.3 Loosen locknut **1** and turn stop screw **2** out a few turns.
- 28.4 **Move the knee lever to the right until a noticeable resistance is felt; however the presser foot must not be lifted off the gauge.**
- 28.5 **Hold the knee lever at this position and turn stop screw 2 in as far as it will go, then back out by one turn, and lock it in place with locknut 1.**
- 28.6 Remove the feed dog gauge from under the presser foot.
- 28.7 Check this adjustment (see "Correct setting").

Correct  
setting:

There must be a noticeable amount of play between nut 2 and forked connection 3 when the knee lever is operated just lightly.



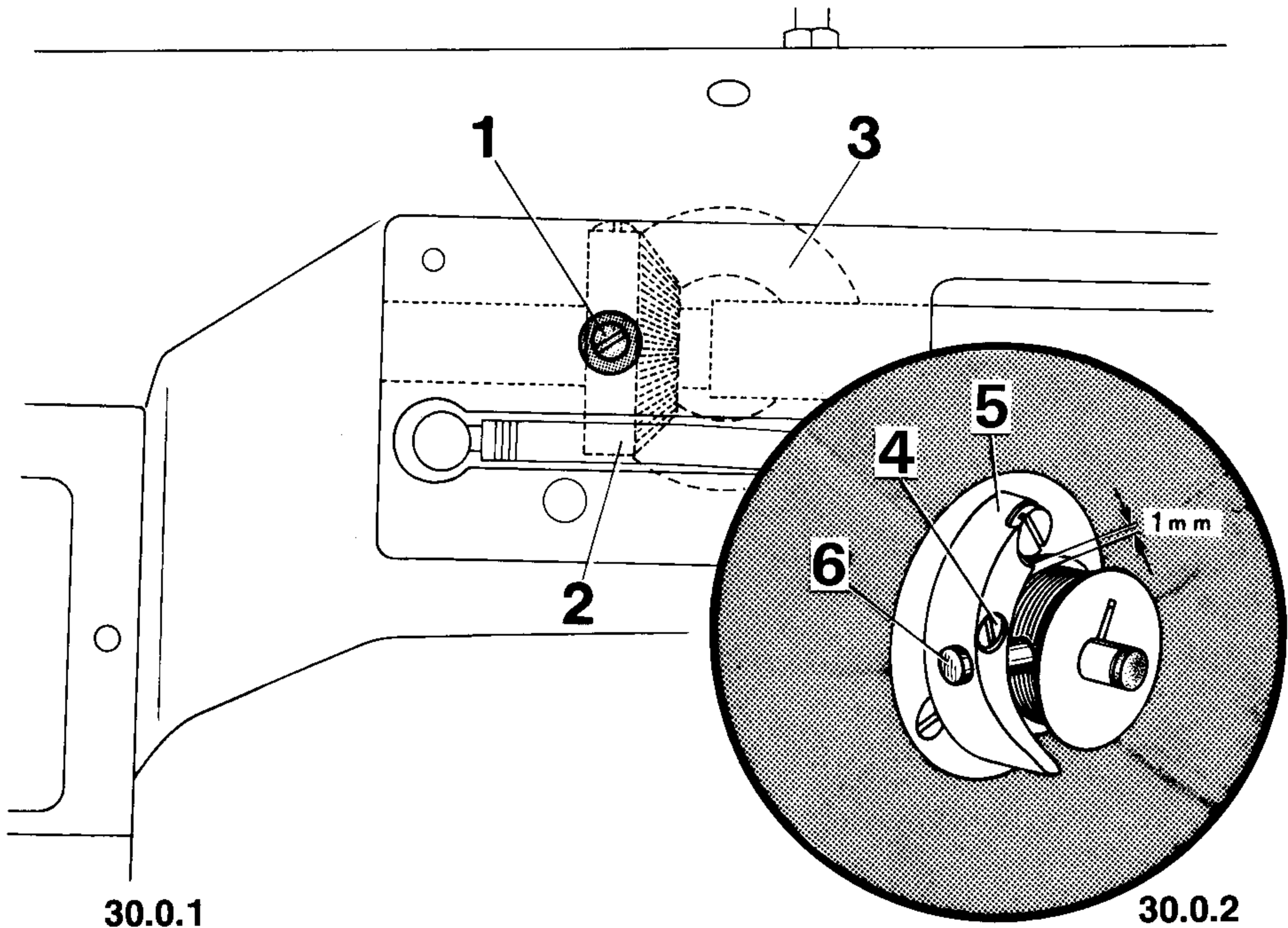
### 29.0.1

- 29.1 Loosen locknut 1 of nut 2.  
 29.2 **Turn in nut 2 until there is a noticeable amount of play between it and forked connection 3 when the knee lever is operated just lightly.**  
 29.3 Lock nut 2 in place by tightening locknut 1.  
 29.4 Check this adjustment (see "Correct setting").

Correct setting:

When the bobbin winder is engaged, the winder spindle must be driven reliably; when the bobbin winder is disengaged, however, friction wheel 3 must not contact drive wheel 2.

The bobbin winder must stop automatically when the thread wound on the bobbin has reached a point abt. 1 mm below its rim (Fig 30.0.2).



- 30.1 Raise the presser bar lifter and engage the bobbin winder.
- 30.2 Loosen both screws 1 in drive wheel 2.
- 30.3 **Set drive wheel 2 so close to friction wheel 3 that the bobbin winder spindle will be driven reliably when the bobbin winder is engaged, but that friction wheel 3 will not be driven by drive wheel 2 when the bobbin winder is disengaged.**
- 30.4 Tighten both screws 1.
- 30.5 Place a bobbin on the winder spindle, thread the machine for bobbin winding, engage the bobbin winder and start the machine.
- 30.6 Loosen screw 4 of stop latch 5.
- 30.7 **If the bobbin is too full, push regulating stud 6 toward the right, if the bobbin is not full enough, push it toward the left.**
- 30.8 After the adjustment, tighten screw 4.
- Note: If the thread piles up on one side of the bobbin, adjust the thread guide on the machine arm accordingly.
- 30.9 Check this adjustment (see "Correct setting").
- 30.10 Finally, replace the arm rear cover with the four screws

31

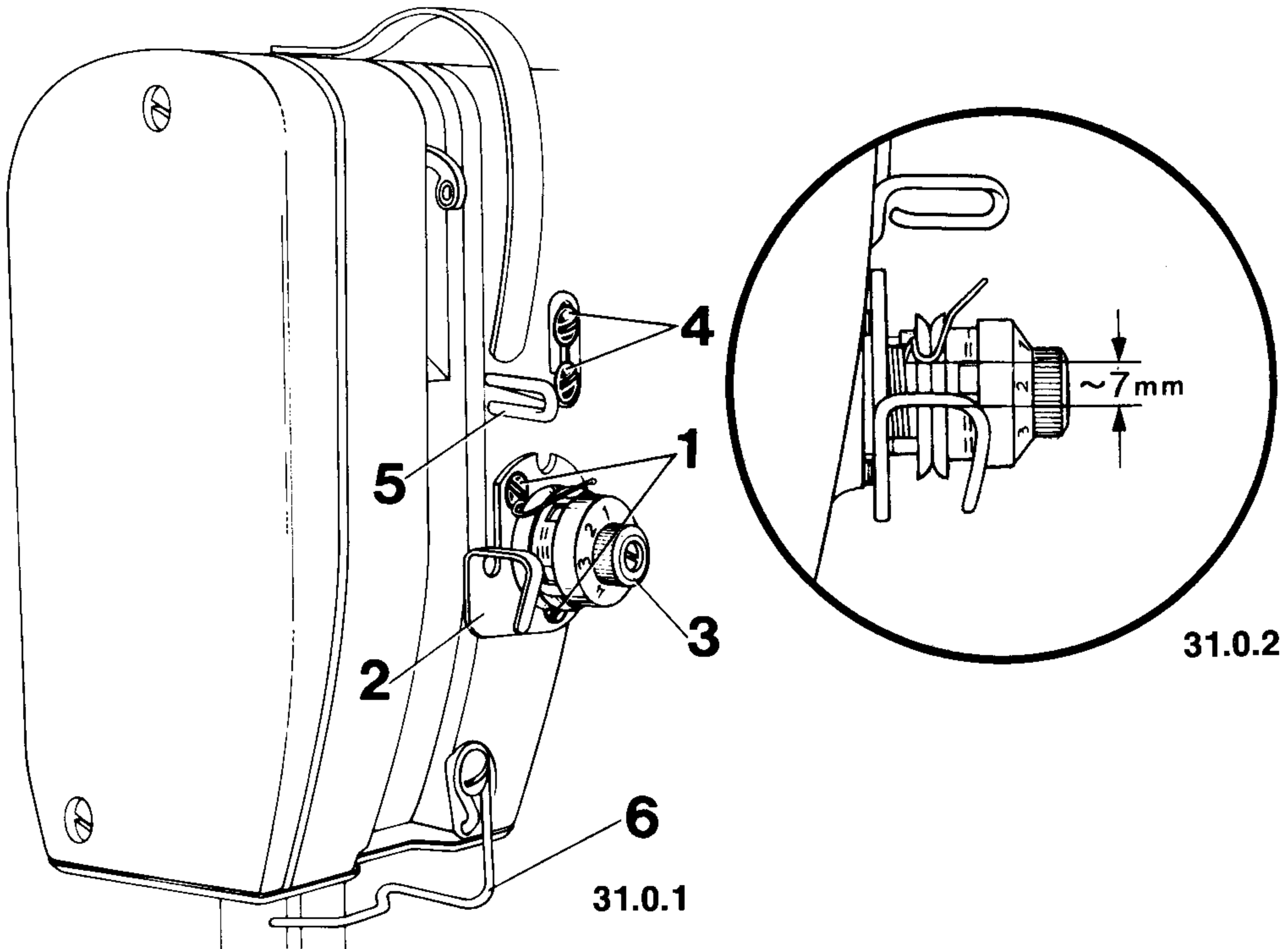
**Thread check spring and thread regulator**

Correct setting:

The stroke of the thread check spring must be completed when the point of the needle reaches the material (abt. 7.0 mm stroke).

Note:

Special sewing operations may make it necessary to choose a longer or shorter stroke.



- 31.1 Loosen both screws 1 of thread tension plate 2 just sufficiently to allow the tension barrel to be turned in this plate.
- 31.2 **Turn tension barrel 3 until the stroke of the thread check spring amounts to abt. 7.0 mm**
- 31.3 In this position, tighten both screws 1 of thread tension plate 2 evenly.
- 31.4 Check this adjustment (see "Correct setting").
- 31.5 Loosen both screws 4 of thread regulator 5.
- 31.6 **Push the thread regulator up as far as it will go.**
- 31.7 In this position, tighten both screws 4. (The position of the thread regulator is dependent on the type of thread and material used and should be adjusted according to the appearance of the seam).
- 31.8 Screw on thread guide 6.

**32 Presser foot pressure**

- 32.1 Thread the machine, place a piece of fabric under the presser foot and lower the presser foot onto it.
- 32.2 Turn in regulating screw 1 (Fig. 21.0.1) until proper feeding of the material is ensured even at top speed.

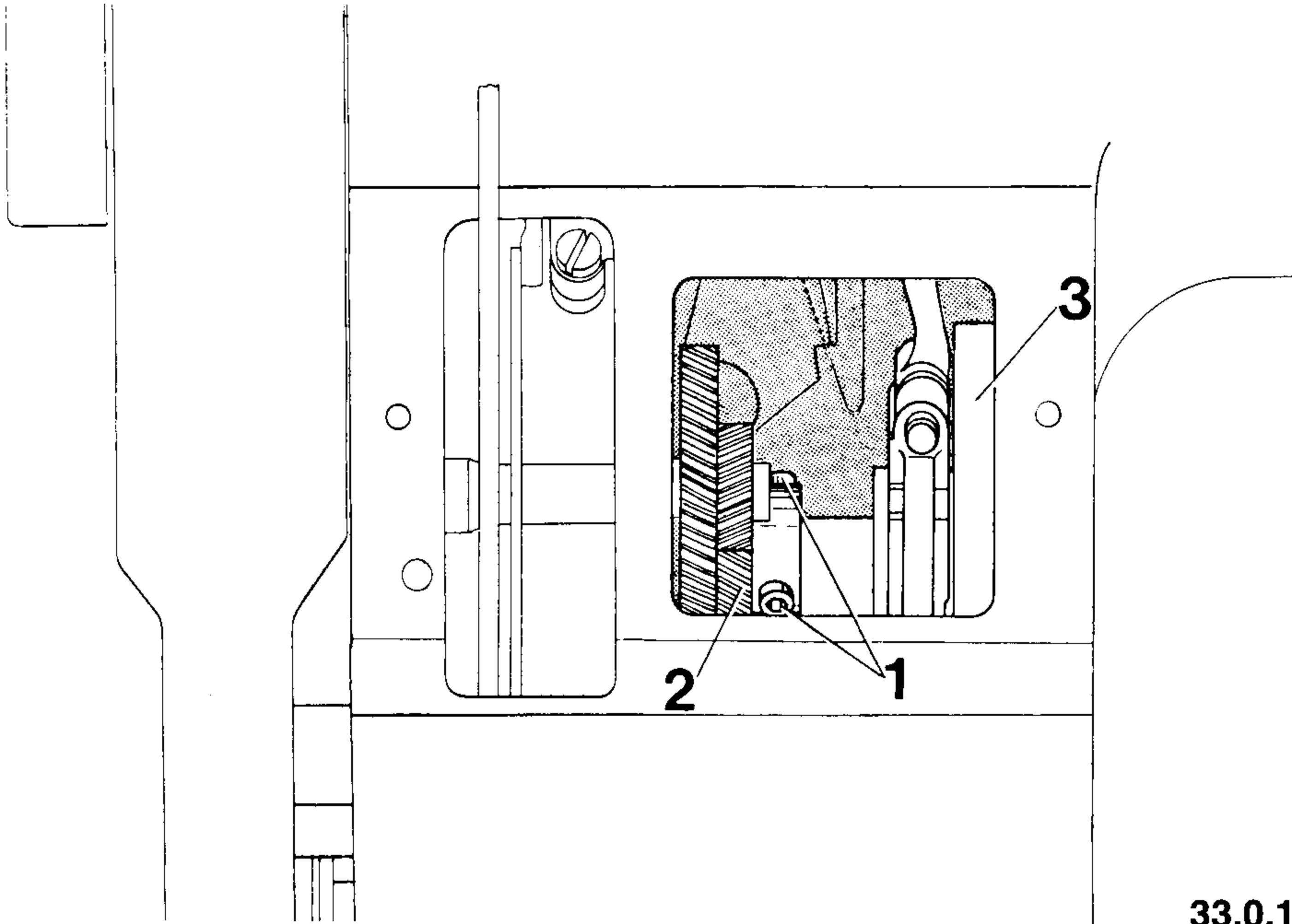
## Annex for machines equipped with zigzag control -716/..

33

### Needle vibration

Correct setting:

The sideways motion of the needle bar should cease when the needle enters the material. (Check with the machine set at its widest zigzag stitch.)



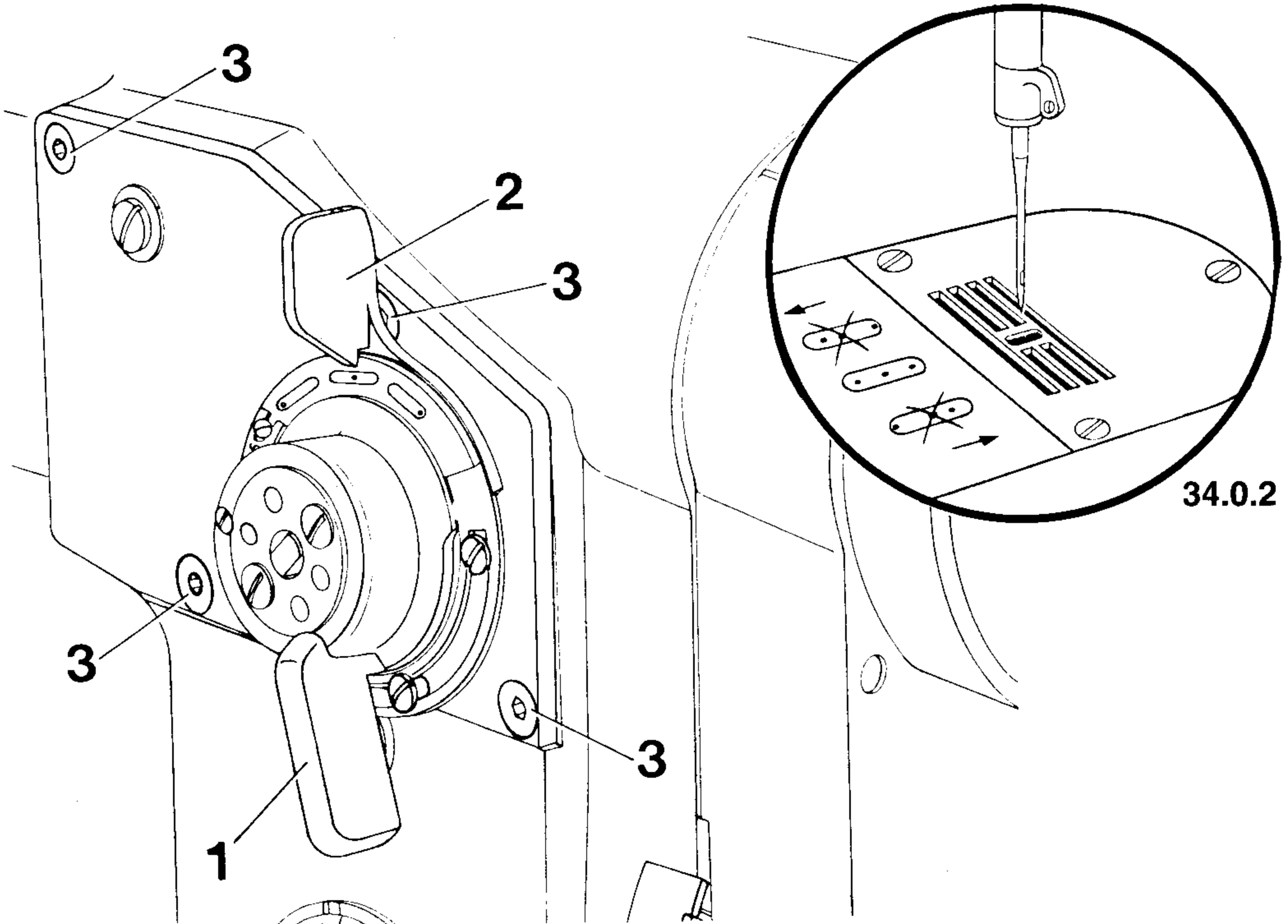
33.0.1

- 33.1 Unscrew the cast-iron cover of the needle vibrating cam housing, making sure you do not pull the needle bar lubricating wick out of its hole in the cover sealing plate.
- 33.2 Set the stitch width lever at the widest zigzag stitch.
- 33.3 Loosen the two screws 1 of gear 2.
- 33.4 Turn needle vibration cam 3 so that the needle bar has completed its sideways motion when the needle enters the material.
- 33.5 In this position, tighten the two gear set screws 1, making sure gear 2 contacts the left inner wall and needle vibrating cam 3 the right inner wall so that they have no end play.
- 33.6 Check this adjustment (see "Correct setting").



Correct  
setting:

With the machine set at its widest zigzag stitch, the right and left needle punctures should be equidistant from the central needle puncture (Fig. 34.0.2).



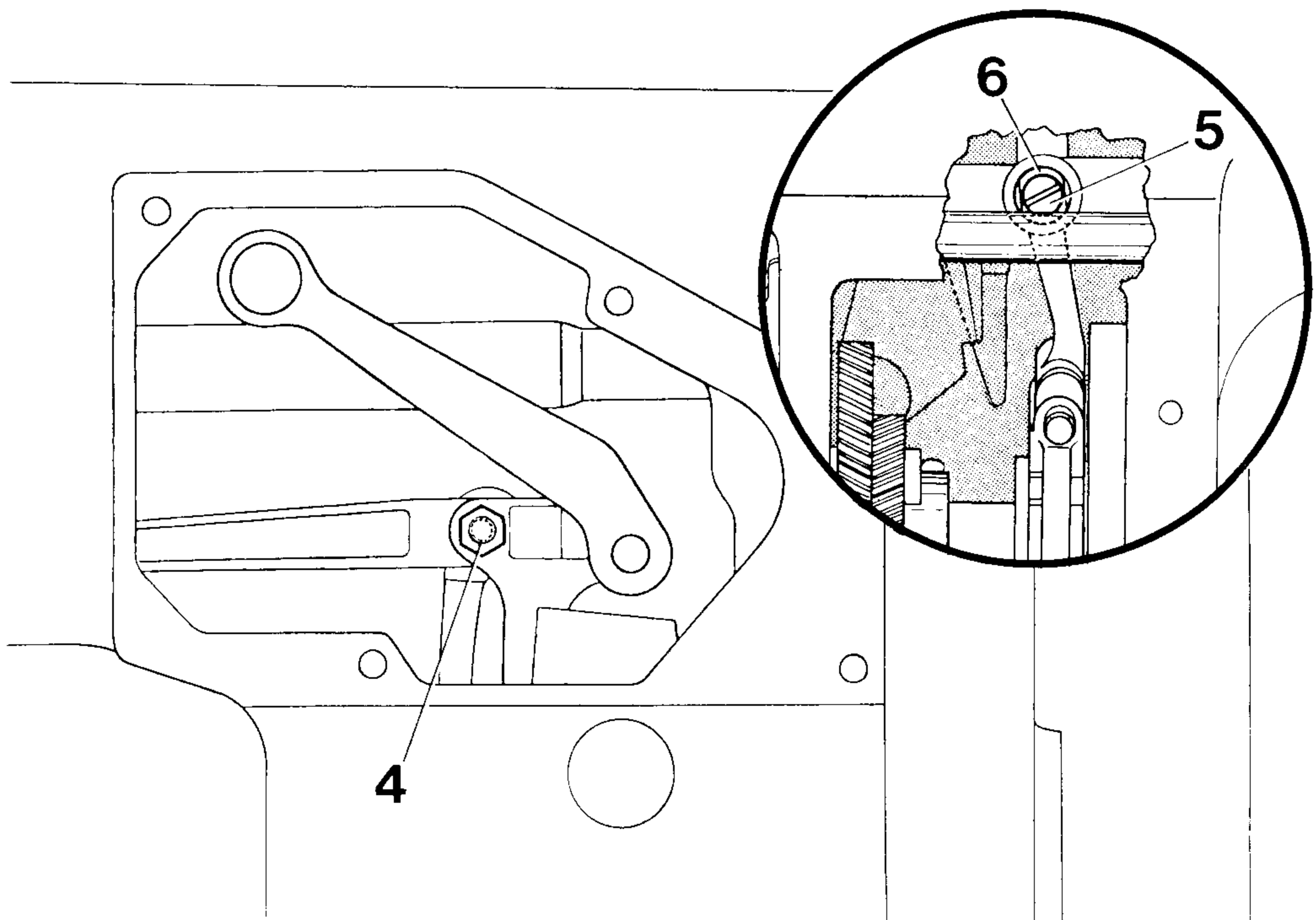
34.0.1

34.0.2

- 34.1 Move stitch width lever 1 (Fig. 34.0.1) to the widest zigzag stitch.
- 34.2 Place a piece of white paper on the needle plate and hold it there.
- 34.3 Turn the balance wheel in its normal direction of rotation and let the needle stitch all stitches of a complete pattern.
- 34.4 Hold the paper fast and turn the balance wheel until the point of the ascending needle is positioned a little above the paper.
- 34.5 Set needle position lever 2 at "center" and stitch width lever 1 at "0".
- 34.6 Turn the balance wheel in its normal direction of rotation until the needle point again pierces the paper. This needle puncture should be centered between the two outer punctures (Fig. 34.0.2)
- 34.7 If it is not, take out the four allen screws 3 of the stitch width regulator plate (Fig. 34.0.1) and remove the plate by pulling it forward.

- 34.8 Loosen locknut **4** (Fig. 34.0.3).
- 34.9 Replace the stitch width regulator plate and secure it in position with two screws only.
- 34.10 Loosen screw **5** (Fig. 34.0.4).
- 34.11 Turn eccentric bushing **6** until a symmetrical stitch pattern as described under "Correct setting" is obtained.
- 34.12 Tighten screw **5**.
- 34.13 Again unscrew the stitch width regulator plate.
- 34.14 Tighten locknut **4** while retaining screw **5** with a screwdriver.
- 34.15 Clean the stitch width regulator plate and the surface contacting the machine arm casting, apply sealing compound and screw the plate down.
- 34.16 Check this adjustment (see "Correct setting").

**34.0.4.**



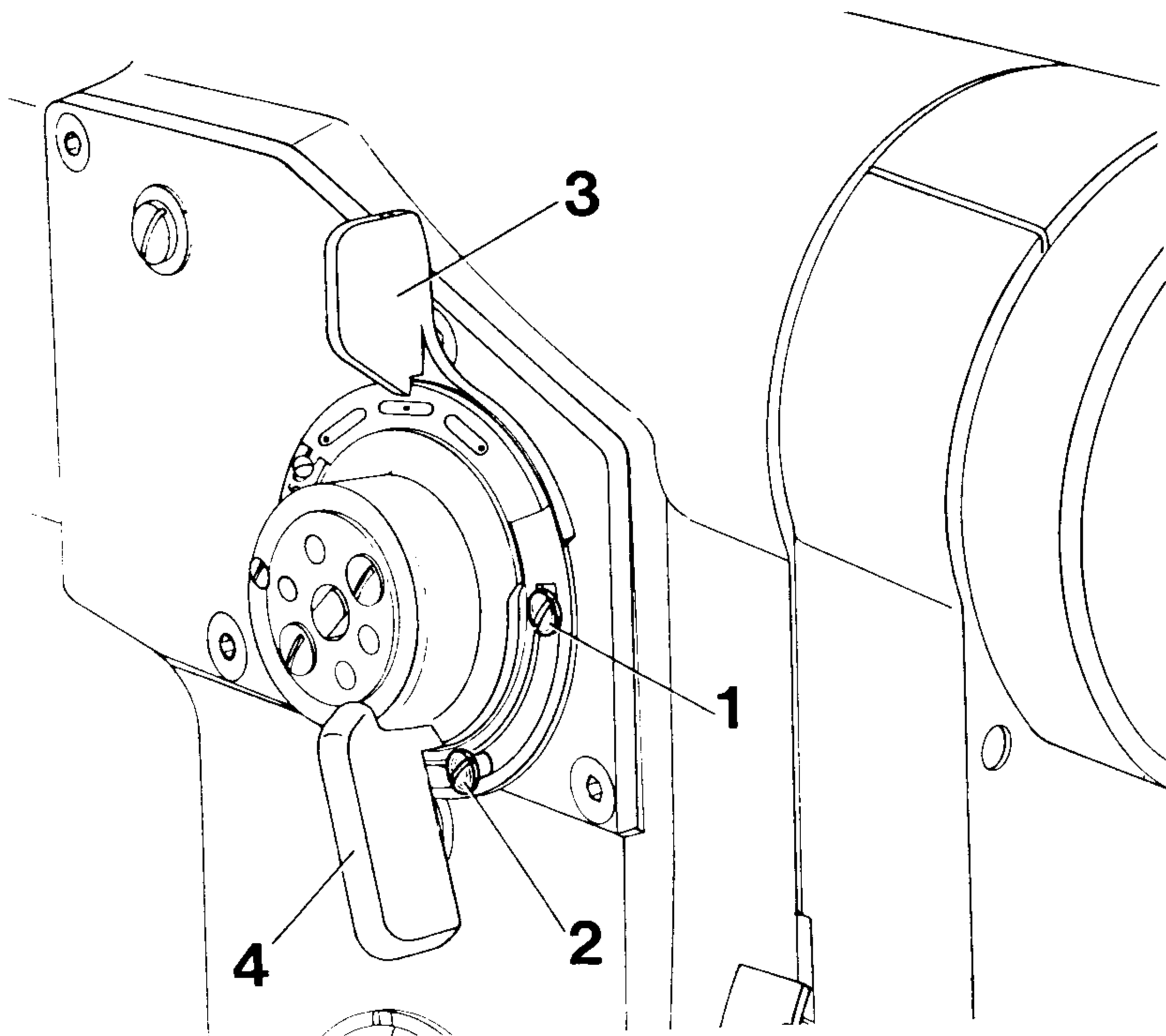
**34.0.3**

**35 Needle position lever**

**35.1 Fixing the left needle position**

Correct setting:

The straight-stitch punctures in the left needle position should coincide with the left needle puncture made at maximum stitch width.



**35.0.1**

- 35.1.1 Loosen needle position limiting screws **1** and **2**.
- 35.1.2 Set needle position lever **3** at "center" and stitch width lever **4** at the widest zigzag stitch.
- 35.1.3 Turn the balance wheel in its normal direction of rotation until the needle is at the extreme left of its throw and at bottom dead center.
- 35.1.4 Move needle position lever **3** gradually toward the left while constantly actuating stitch width lever **4** until the needle does not move any more.
- 35.1.5 In this position, push stop screw **1** up as far as it will go and tighten it securely. Leave stop screw **2** to loose however.

35.2 Fixing the **right** needle position

Correct setting:

The straight-stitch puncture in the right needle position should coincide with the right needle puncture made at maximum stitch width.

- 35.2.1 Set needle position lever **3** at "center" and stitch width lever **4** at the widest zigzag stitch.
- 35.2.2 **Turn the balance wheel in its normal direction of rotation until the needle is at the extreme right of its throw and at bottom dead center.**
- 35.2.3 Move needle position lever **3** gradually toward the right while constantly actuating stitch width lever **4** until the needle does not move any more.
- 35.2.4 In this position, push stop screw **2** to the left as far as it will go and tighten it securely.
- 35.2.5 Check this adjustment (see "Correct setting").

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