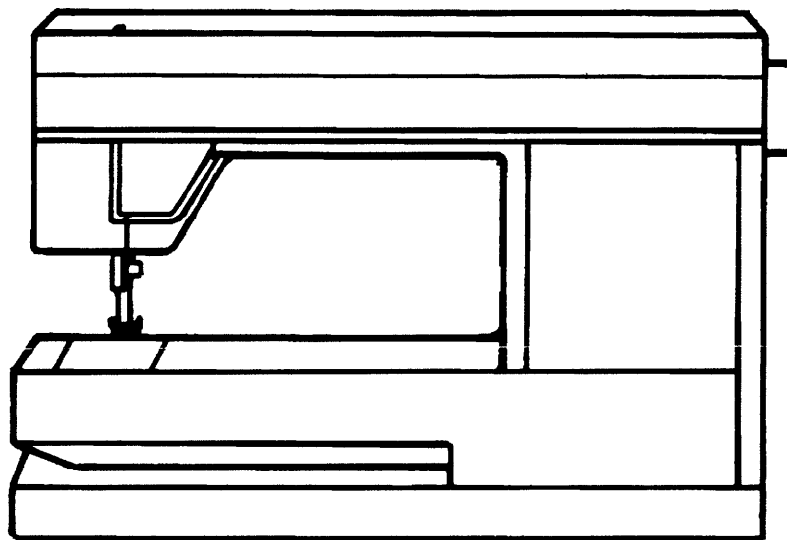


Husqvarna

VIKING

SERVICE MANUAL



600,500,400,350

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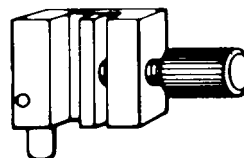
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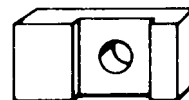
Service tools

A reasonable requirement in a domestic sewing machine is that it should be able to sew all types of fabrics used in the home. The settings made when assembling and sewing in the machines are those most suited to give the best results in the majority of fabrics and fabric combinations. In doing so, consideration has been given to the requirements of different markets. This does, however, mean that when sewing extreme fabrics, better results may be obtained in certain cases by altering the settings. It must be pointed out that these altered settings can cause poorer results on more normal fabrics. How the different standard ratings are set can be seen from the description under each setting instruction. The following list of setting gauges and service tools is intended as an instruction about the special service tools needed to servicing this machine.

1. On several different occasions the needle is used as a setting gauge.
The setting ratings are adapted to needle 90.
Make sure to use an undamaged needle.



2. Gauge for setting the timing of the hook in relation to the needle (P.16).
Ref. No 411 17 52-01.



3. Gauge for the feed dog lift (P.18).
Ref. No 411 49 93-01.

4. Gauge for the needle height (P.17).
Ref. No 412 35 29-01.

5. Adapter to check the signals of the machine to the embroidery unit.
Ref 412 42 12-01



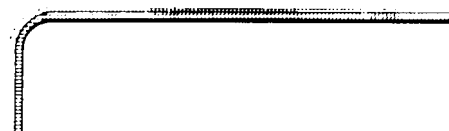
6. Fixed spanner 7 mm
Ref. No 412 22 35-01



7. Allen key 2.5 mm
Ref. No 411 86 01-01

8. Allen Key 2 mm
Ref. No 411 86 00-01

9. Allen key 1.5 mm
Ref. No 411 66 89-01



10. Distance gauge 0.05-1,00 mm
Ref: No. 412 38 85-01

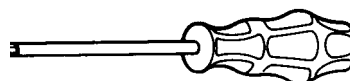


11. Angel key Torx 6
Ref No 412 27 67-01

12. Screwdriver Torx 10
Ref. No 412 36 48-01.

13. Screwdriver Torx 20
Ref. No 412 36 49-01.

14. Screwdriver Torx 25
Ref. No 412 36 50-01



Directions for use

These service instructions are intended to be used by service workshop personnel, or by salesmen who carry out servicing their own districts. They assume a thorough knowledge of the handling of precision appliances and accessibility to service tools.

The manual is divided into two sections and covers all service operations and checks which should be carried out when making a complete overhaul of a sewing machine.

The first section deals with the various settings which must be maintained to ensure that the machine functions satisfactorily.

The second section covers dismantling and mounting instructions.

The diagrams only give indication as to where the detail or mechanism is located in the machine. For more detailed information regarding the construction, etc., refer to the diagrams in the spare parts list.

ESD

ATTENTION!

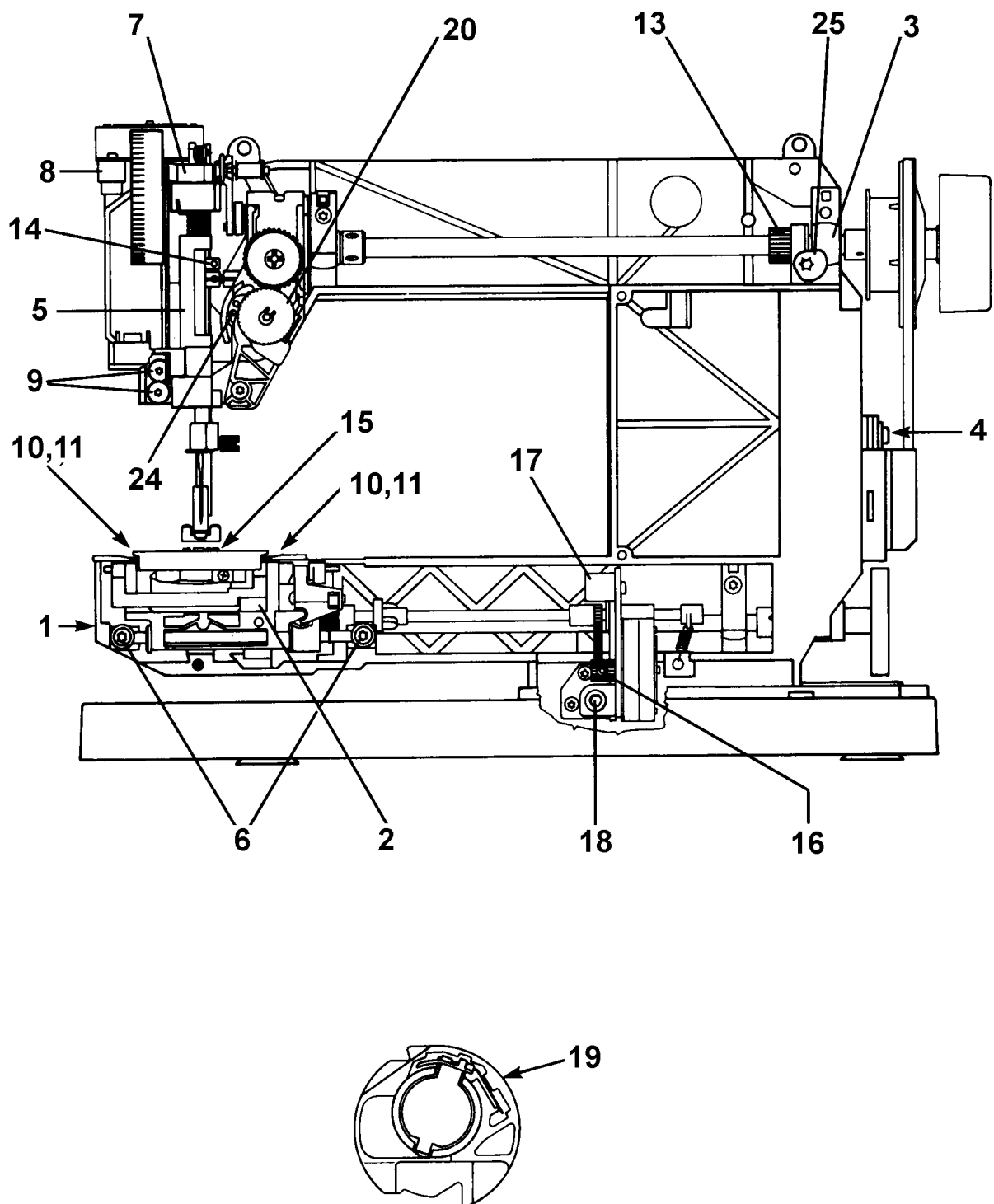
It is of the utmost importance that precautions are being taken in order to avoid damage of the electronics by electro static discharges ESD (=Electro Static Discharge). To avoid that these errors arise it is important to handle loose circuit boards in a controlled way.

Always use wrist band 412 23 02-01 when servicing.



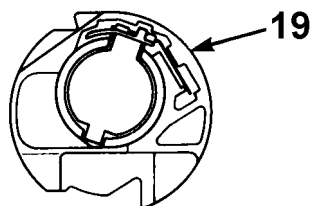
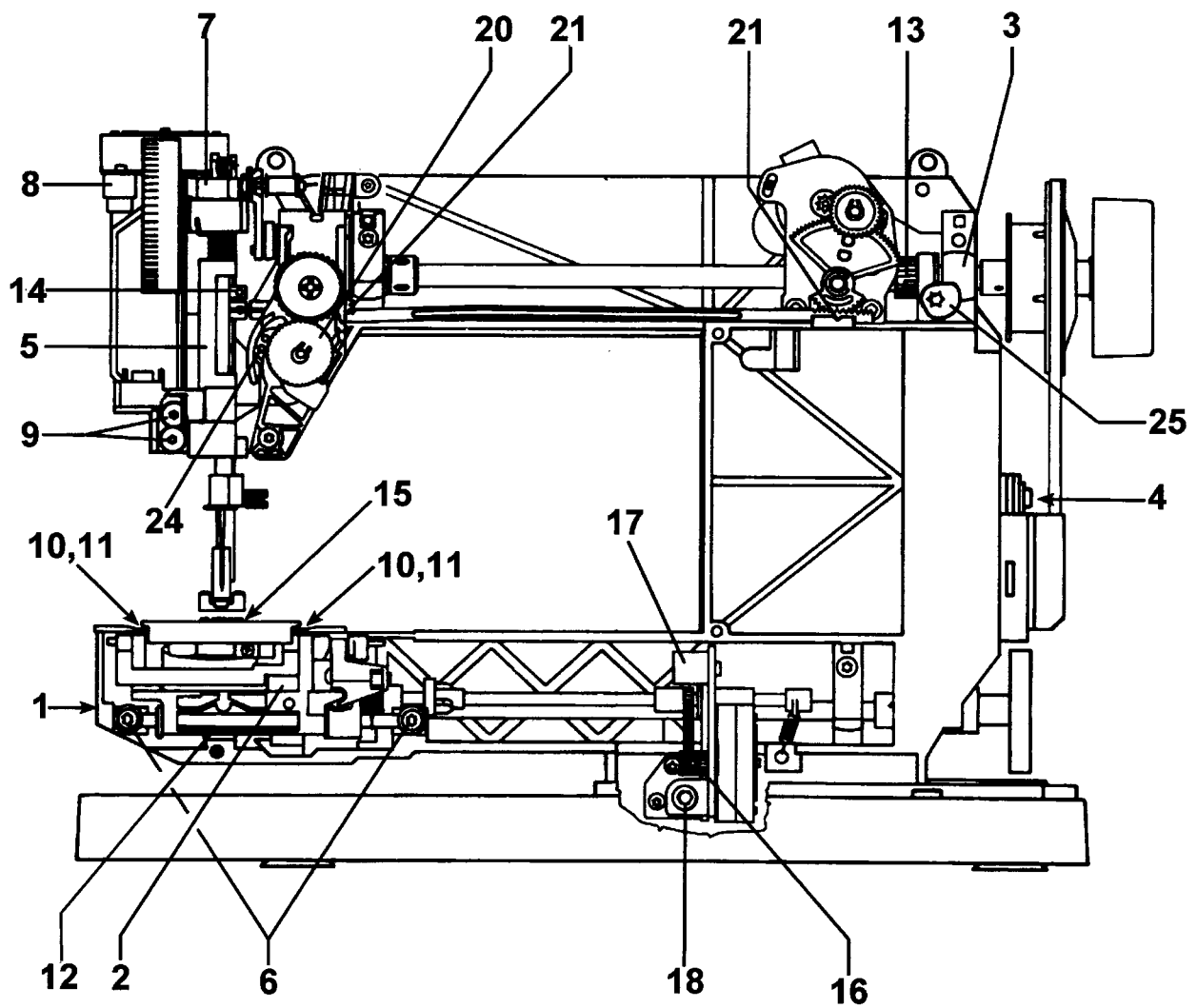
SETTINGS

- Model 350, 400 and 500 -



SETTINGS

- Model Rose -



1. The play of the hook gear

It is impossible to obtain an equally large play in one rotation of the cog wheel, but it should be as small as possible at the tightest spot during the revolution.

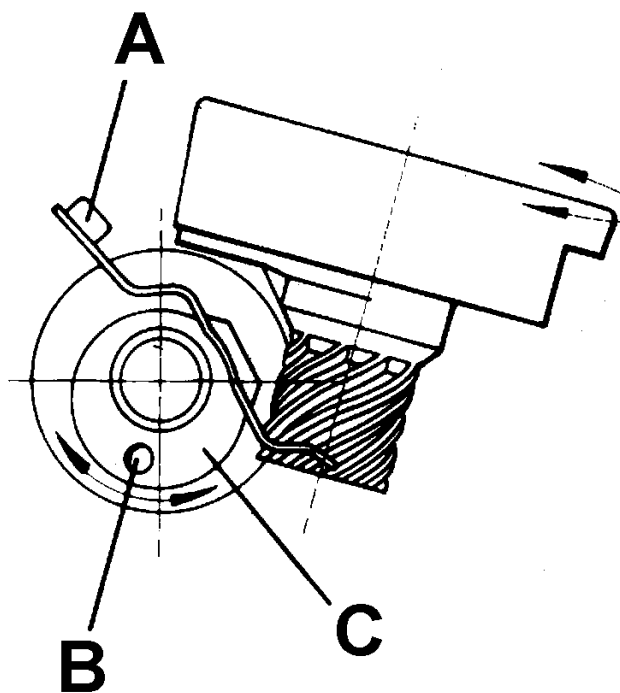
Check

1. Rotate the hook back and forth and check the play.
2. Do this check at at least 3 different spots during the revolution of the cog wheel.
(Move the cog wheel with the hand wheel).

Adjustment

1. Loosen, screw (A) in the bearing clamp
2. The play can now be adjusted by turning the eccentric bearing (C).

NOTE! The hole (B) in the bearing shall always be on the lower half.



2. Setting the hook in relation to the feeding eccentric (after feeding). Version 1 - one pin

Check

1. The needle shall be in its centre position, straight stitching.
2. Set the tip of hook (A) so is centred behind the needle, the tap of the worm gear should now be positioned according to fig. 2

Alt. Check

1. When the two taps of the worm gear are positioned according to fig. 2 the tip (A) of the hook should point straight backwards.

Adjustment

1. Loosen screw (B). Remove the hook and set it into its correct position.

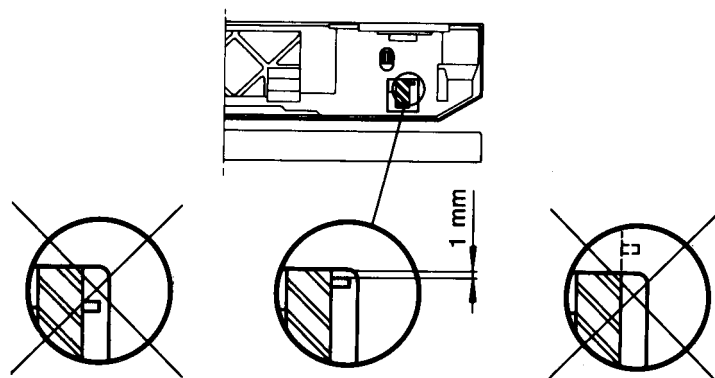
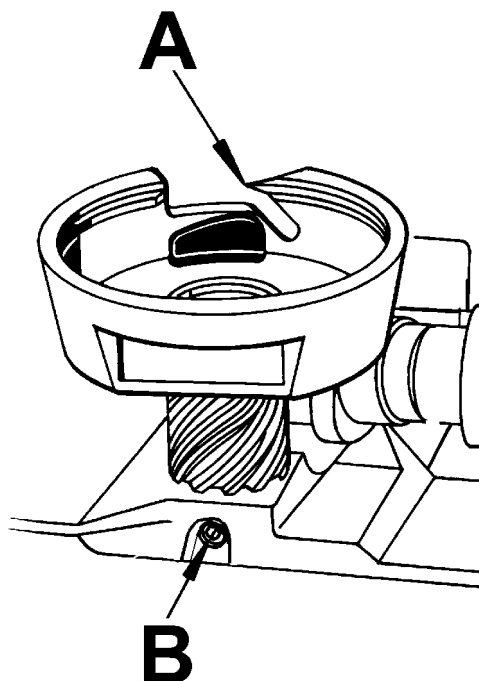


Fig 2

Note! If none or only one pin is found please clean the worm gear and look for a breaking mark.

2. Setting the hook in relation to the feeding eccentric (after feeding). Version 2 - two pins

Check

1. The needle shall be in its centre position, straight stitching.
2. Set the tip of hook (A) so is centred behind the needle, the tap of the worm gear should now be positioned according to fig. 3

Alt. Check

1. When the two taps of the worm gear are positioned according to fig. 3 the tip (A) of the hook should point straight backwards.

Adjustment

1. Loosen screw (B). Remove the hook and set it into its correct position.

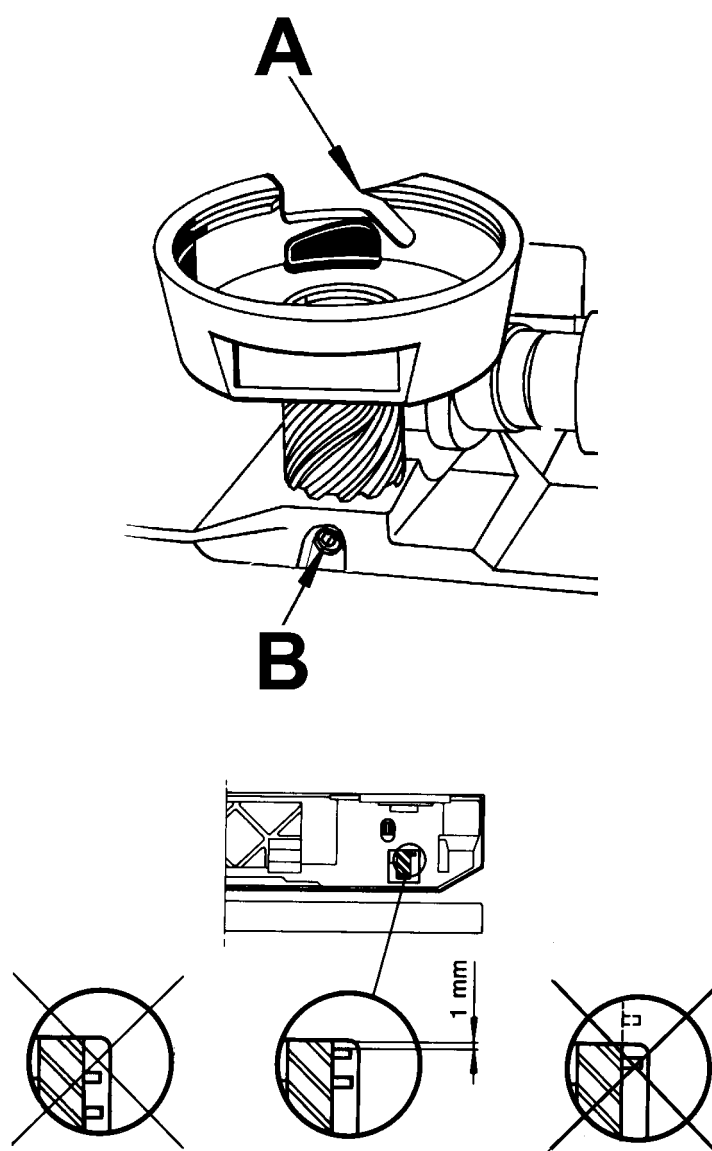


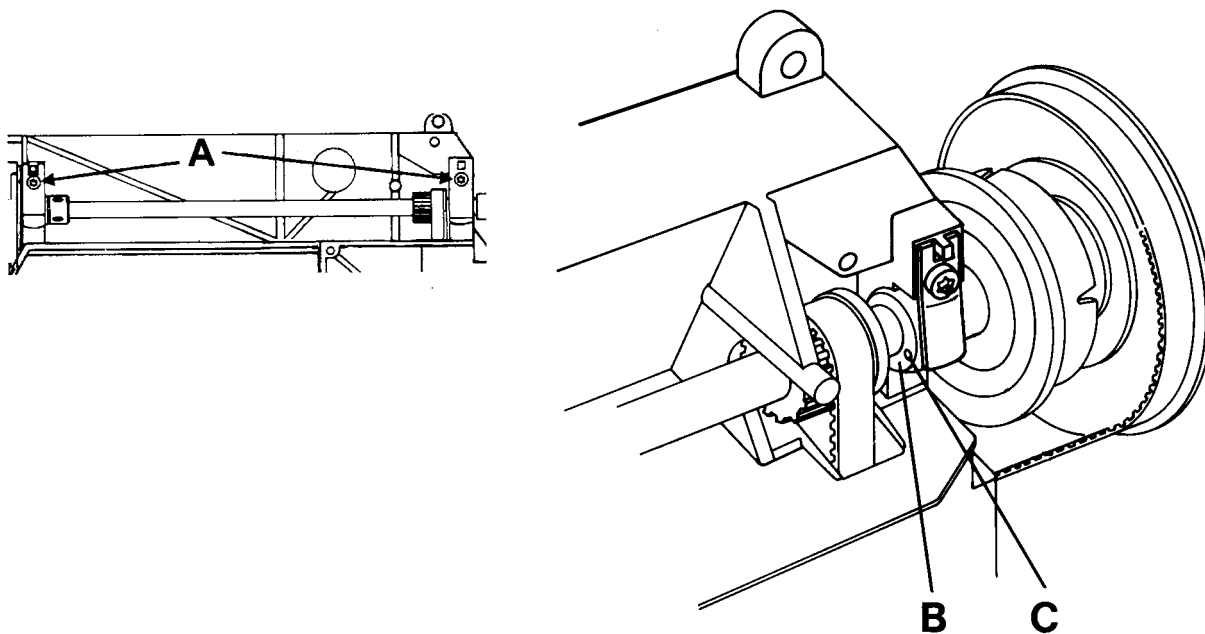
Fig 3

Note! If none or only one pin is found please clean the worm gear and look for a breaking mark.

3. Belt tension, arm/lower shaft belt

1. Dismount rear cover and front cover
2. Loosen the screw in the bobbin winding device and remove it.
3. Loosen the two screws (A) of the bearing clamp.
4. The belt tension can now be adjusted by turning bearing (B) which is eccentric.

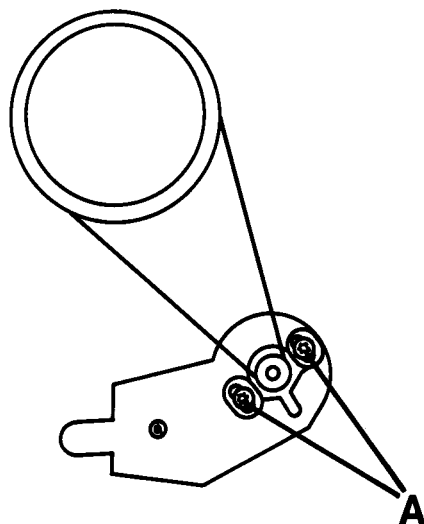
NOTE! The hole (C) should always be on the front half.



4. Belt tension, motor belt

1. Dismount rear cover.
2. Loosen the 2 screws (A) and adjust the belt tension by displacing the motor.

NOTE! Adjustment of the arm/lower shaft belt affects this adjustment.



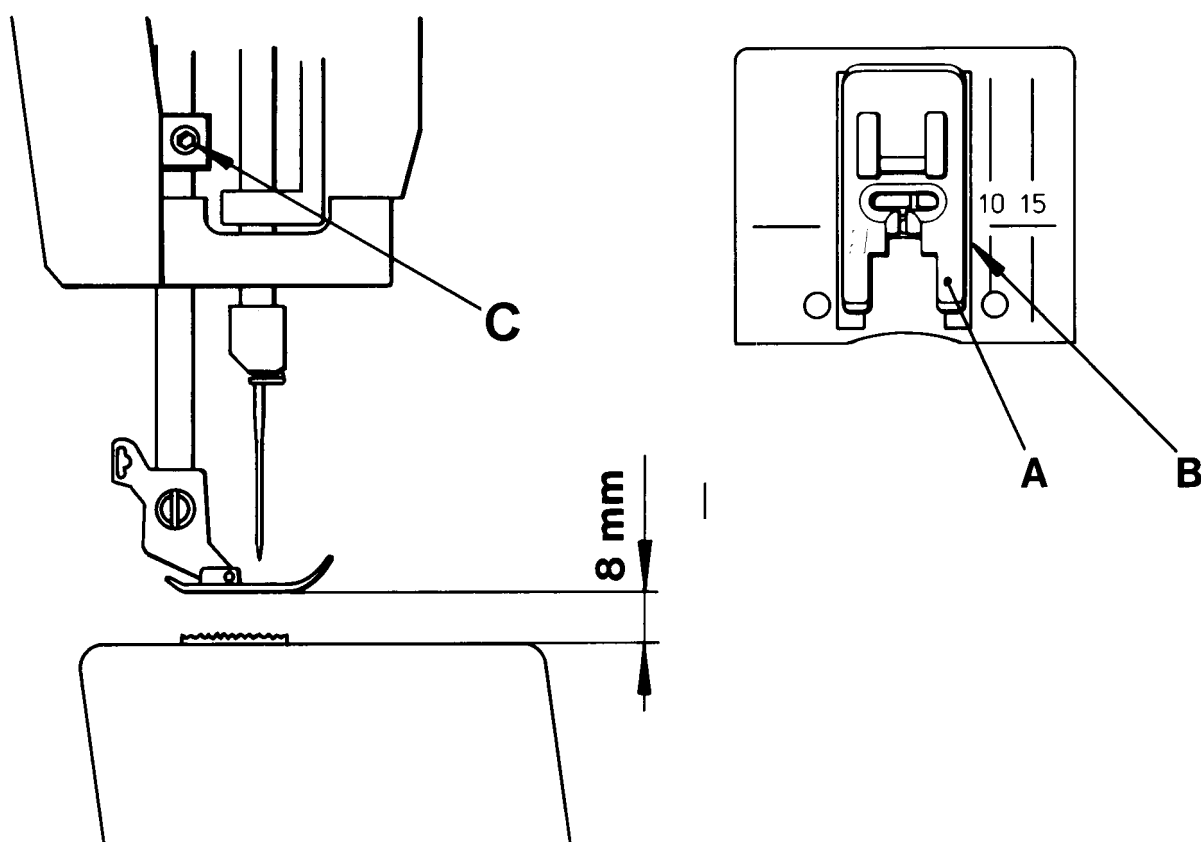
5. Presser foot height and parallelism to the stitch plate

Check

The presser foot (A) shall be parallel to the feed dog groove (B) and in its lifted position it shall be approx. 8 mm above the stitch plate.

Adjustment

1. Loosen screw (C) and turn the presser foot until it is parallel to the feed dog groove of the stitch plate and move it until its lifting height is approx. 8 mm.
2. Tighten the screw.



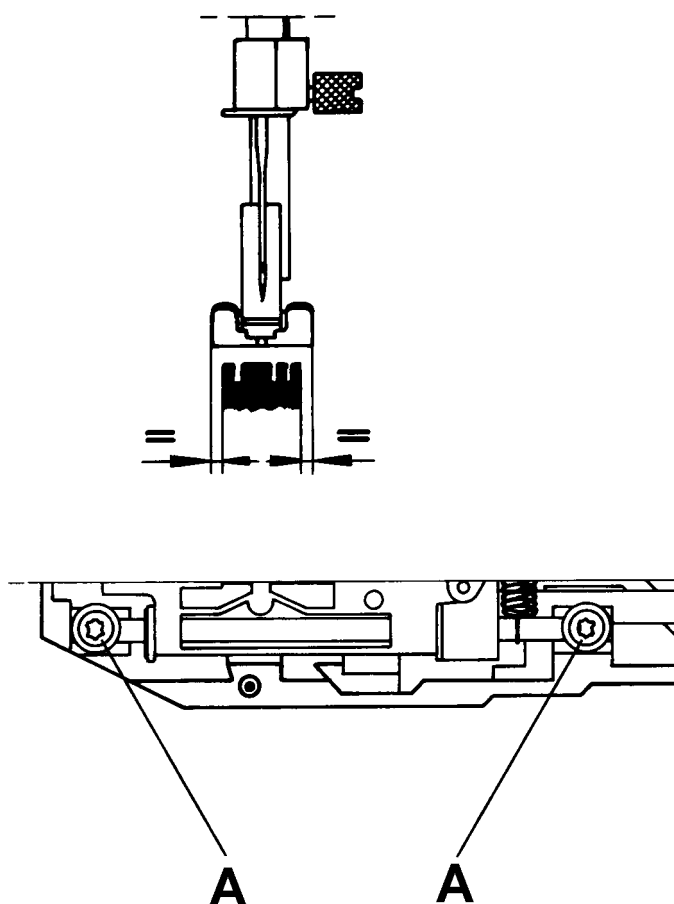
6. Setting the feed dog in relation to the presser foot

Check

1. Sideways the hook should be symmetrically set in relation to the presser foot.

Adjustment

1. Loosen the 2 screws (A) in the feeding device.
2. Move the feeding device sideways until the feed dog is right below the presser foot.
3. Tighten the screws.



7. The centre position of the needle

8. Pre-setting the step motor of the needle

Check

1. Insert a new needle 90 in the machine.
2. When the machine is set for straight stitching centre position, the needle should sideways descend into the centre of the needle hole of the presser foot.

Check

1. Get into the service mode of the machine by pressing the reverse feed button and minus (-) stitch length while the mains switch is turned on.

2. Turn the hand wheel until the needle arrives at its upper turning position.

600,500,400 - Press key nr. 7.

Freesia, Lisa, Angelica, Victoria - Press key nr. 6.

The needle should now descend sideways into the needle hole of the presser foot.

3. **600,500,400** - Press key nr. 8.

Freesia, Lisa, Angelica, Victoria - Press key nr. 7.

The gap between the segment (A) and the calibration stop (B) should now be $(0.2 \pm 0.3 \text{ mm})$.

Note! The position on the eccentric.

Adjustment

1. Get into the service mode of the machine by pressing the reverse feed button and minus (-) stitch length while the mains switch is turned on.

2. Turn the hand wheel until the needle arrives at its upper turning position.

600,500,400 - Press key nr. 3.

Freesia, Lisa, Angelica, Victoria - Press key nr. 2.

Loosen screw (D) in the cog wheel (E) on the step motor shaft.

Turn the cog wheel until the needle is in the centre of the presser foot.

3. **600,500,400** - Press key nr. 4.

Freesia, Lisa, Angelica, Victoria - Press key nr. 3.

Loosen screw (C) in the calibration stop (B) and turn it until the gap is correct $(0.2 \pm 0.3 \text{ mm})$.

4. The eccentricity of the stop should point obliquely backwards to the left.

Check by pressing

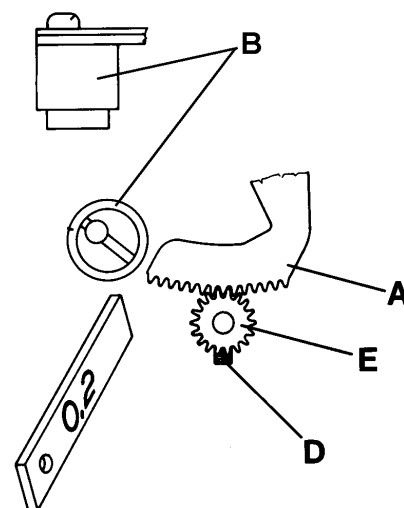
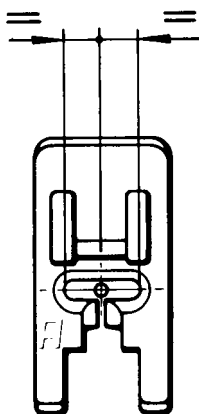
600,500,400 - key nr. 8.

Freesia, Lisa, Angelica, Victoria - key nr. 7. several times.

The motor should now run smoothly and the gap should remain 0.2 mm.

Check with

distance gauge 412 38 85-01.



9. The gap between the needle and the hook

Check

1. Set stitch selector for straight stitching.
2. Insert a new needle 90 in the machine.
3. Rotate hand wheel until the point of the hook arrives behind the needle.

Check the gap by pressing a small screw driver against the needle.

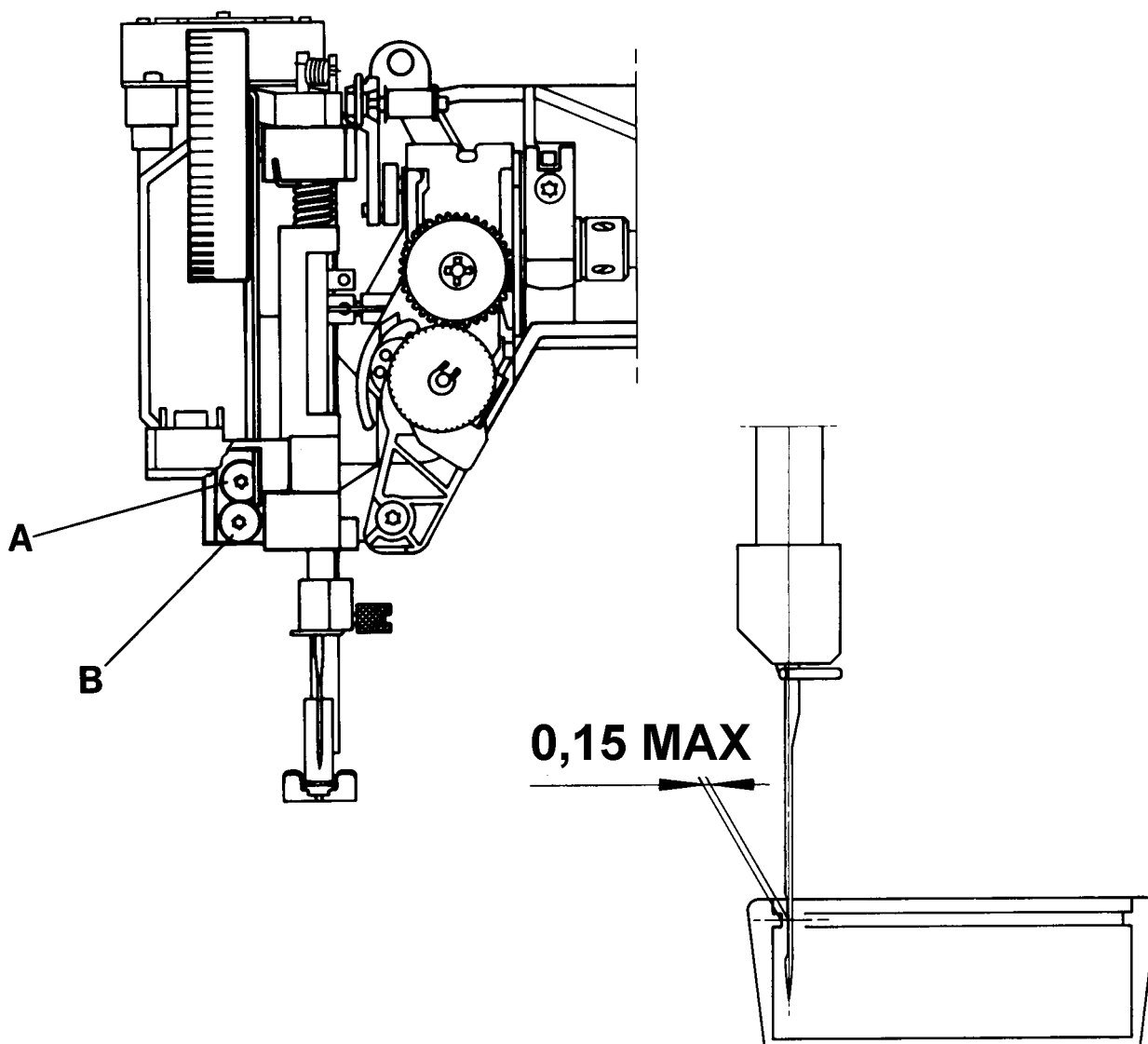
The gap should be as small as possible, but max 0.15 mm.

Adjustment

1. If the gap is too large:
Turn screw (A) clockwise and tighten with screw (B).
2. If the gap is too small:
Loosen the screws (B) and (A) and make the gap larger.
Then turn screw (A) clockwise and tighten with screw (B).

NOTE! Always tighten with screw (B).

Check!



10. Setting the stitch plate (the hook cover) in relation to the needle in the feeding direction.

Check

1. Insert a new needle 90 in the machine.
2. In the feeding direction the needle should descend right into the middle of the needle hole of the stitch plate.

11. The sideways setting of the stitch plate (the hook cover) in relation to the feed dog.

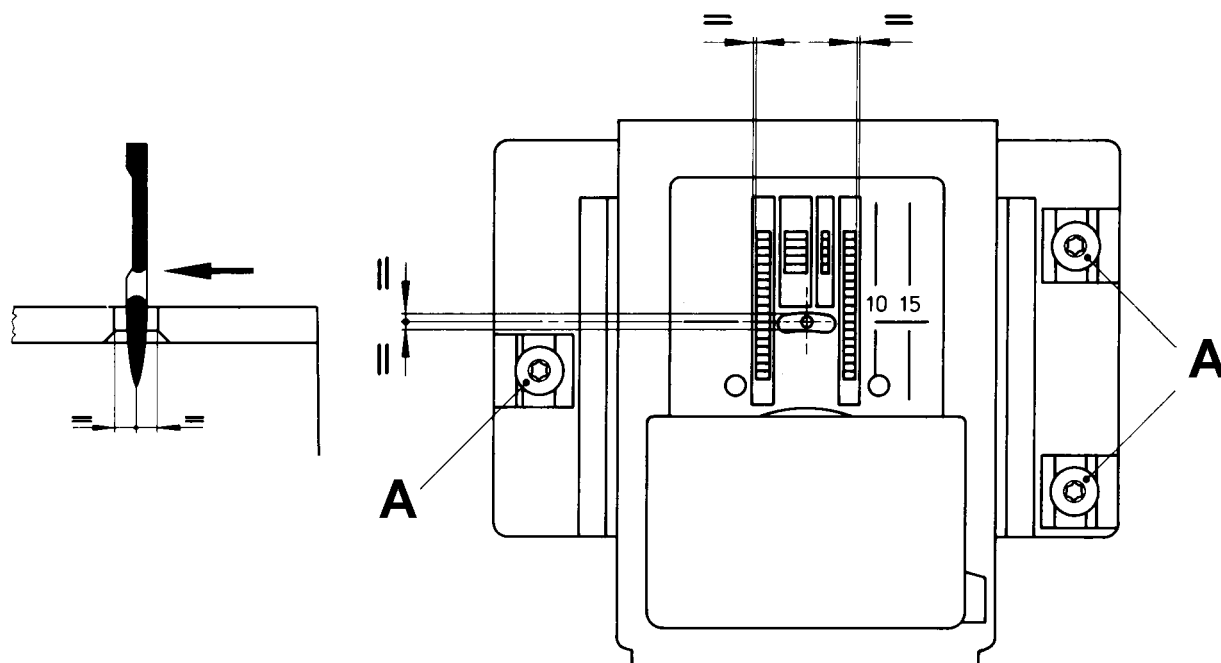
Check

The feed dog must not touch the stitch plate at any point.

Adjustment

Loosen the 3 screws (A) of the hook cover and move it so that:

- the needle sideways descends in the middle of the stitch plate.
- the feed dog does not touch the stitch plate.



12. The height of the hook

Is checked between the bobbin case and the case holder - only Rose

Check

The distance between the bobbin case and the case holder should be $0.5^{+0.1}_{-0.05}$ mm.

The check is carried out at the tightest spot between the bobbin case and the case holder. Check at the marked positions according to fig. 1.

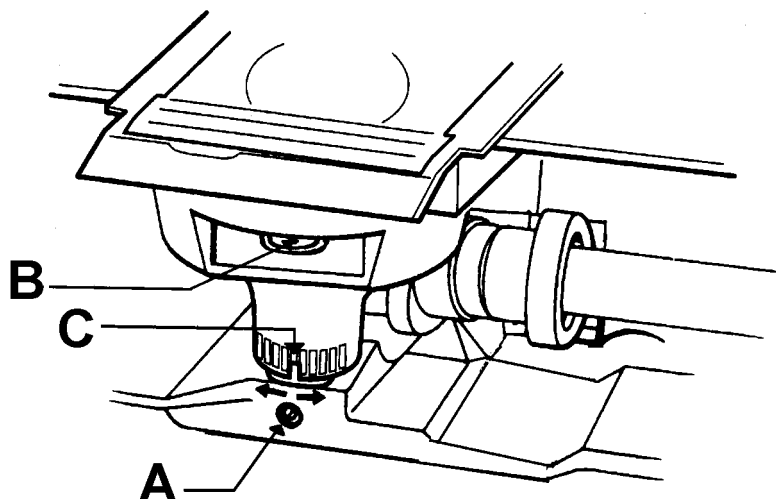
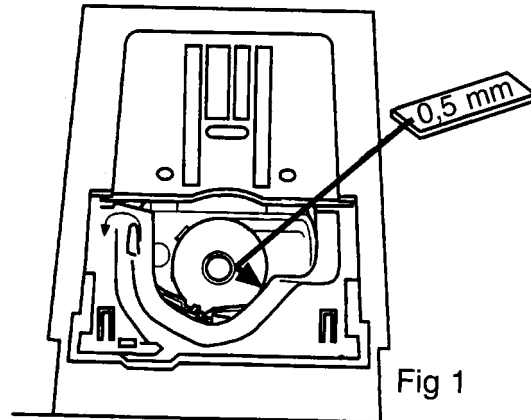
Adjustment

1. Loosen screw (A).
2. The gap between the hook and its cover can now be adjusted by turning the stud (C) right or left.
 - To the right, the gap becomes larger.
 - To the left, the gap becomes smaller.
3. Push down the hook shaft (B) and tighten screw (A).

N.B.: This setting affects:

1. The play of the hook gear.
13. The timing of the hook and the needle
14. The needle height

Check with distance gauge 412 38 85-01.



13. The timing of the hook in relation to the needle

Check

1. Set a new needle 90 into the machine
2. Dismount the stitch plate and the bobbin case.
3. Set machine on straight stitching.
4. As the needle is moving upwards, the tip of the hook should pass behind the centre of the needle, when the needle is 2.5 mm above its lower turning position.

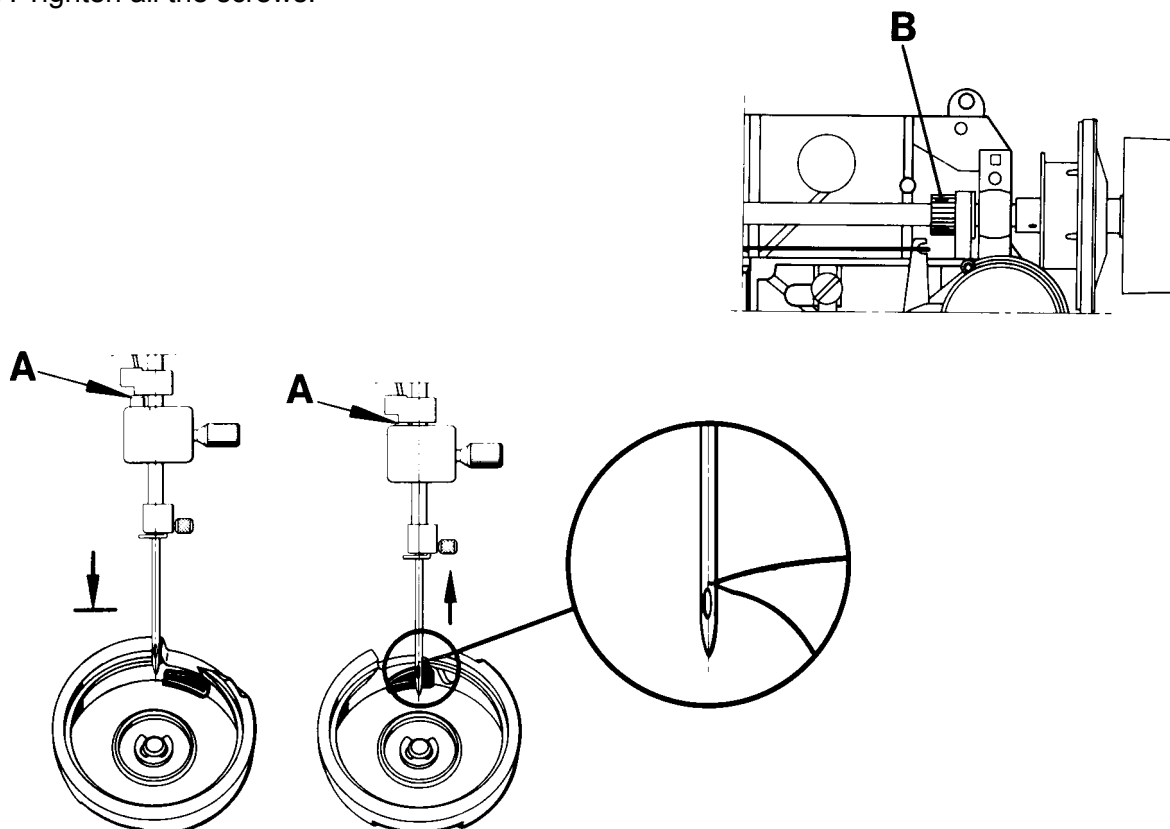
NOTE! The feeding eccentric should be straight backwards.

Check with setting gauge 411 17 52-01.

1. Turn the handwheel until the needle is at its lower turning position.
2. Place the setting gauge on the needle bar so that the springloaded stud (A) just touches the needle bar frame and tighten the screw.
3. Move the needle upwards with the handwheel until the springloaded stud (A) rests against its stop in the setting gauge.
4. The tip of the hook should now be behind the centre line of the needle.

Adjustment

1. Remove the blank pointed screw (B) and loosen the other 2 screws in the belt wheel of the arm shaft.
2. Repeat checking points 1, 2 and 3.
3. Hold the arm shaft and turn the hook until its tip arrives behind the centre line of the needle.
4. Tighten one of the black screws.
5. Make sure the screw descends into the groove of the shaft so that the belt wheel is placed correctly sideways.
6. Check.
7. Tighten all the screws.



14. The needle height

Check

1. Bring needle into its lower turning position.
2. The gap between the upper end of the needle and the surface (B) of the hook ring should be 29.15 ± 0.2 mm.

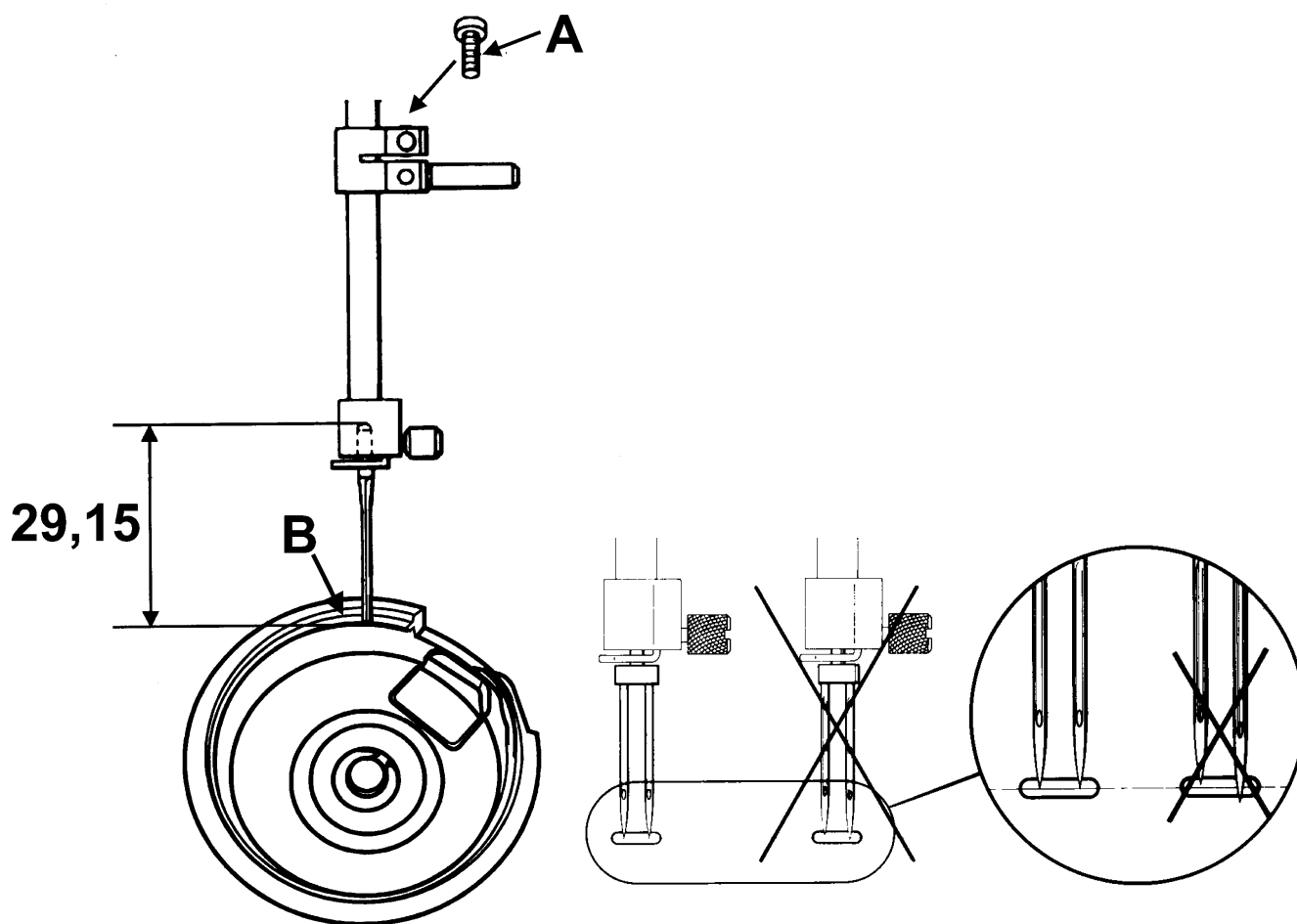
The check is executed with a polished needle 90 which is 29.15 mm long.

Order nr. 412 35 29 - 01

Adjustment

1. Bring needle to its lower turning position.
2. Loosen screw (A) and move the needle bar until the correct measure is obtained.
3. Tighten the screw.

NOTE! Check by means of a twin needle that the needle bar is not twisted. May cause jump stitches when sewing with a twin needle.



15. Feed dog height

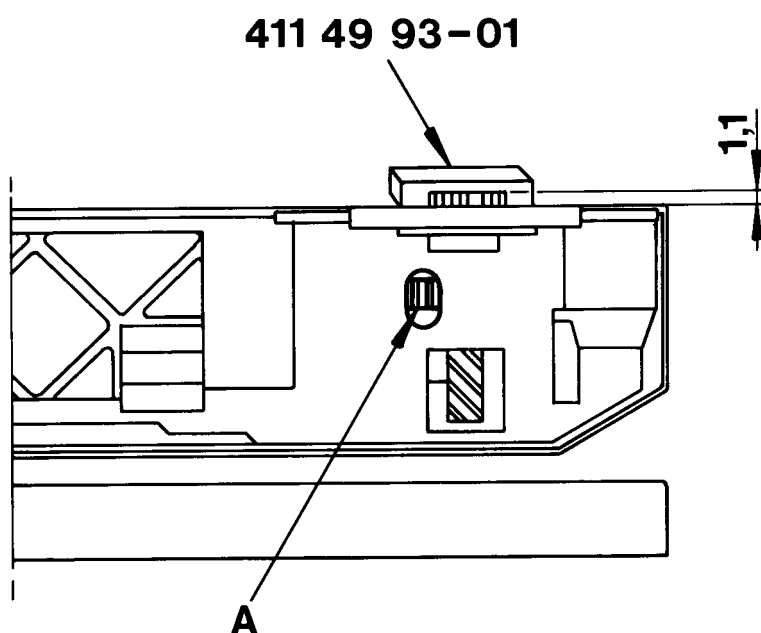
Check

1. Bring feed dog to its highest position.
2. The top of the feed dog should be 0.9-1.1 mm above the stitch plate.

Check with setting gauge 411 49 93-01

Adjustment

1. Bring feed dog to its highest position.
2. Adjust with a screw driver the adjustment nut (A) until a correct feed dog height (0.9-1.1 mm) is obtained.



16. Stitch length balance basic setting

Check

Get into the service mode of the machine by pressing the reverse feed button and minus (-) stitch length while the mains switch is turned on.

600,500,400 - Press key nr. 5.

Freesia,Lisa, Angelica, Victoria - Press key nr. 4.

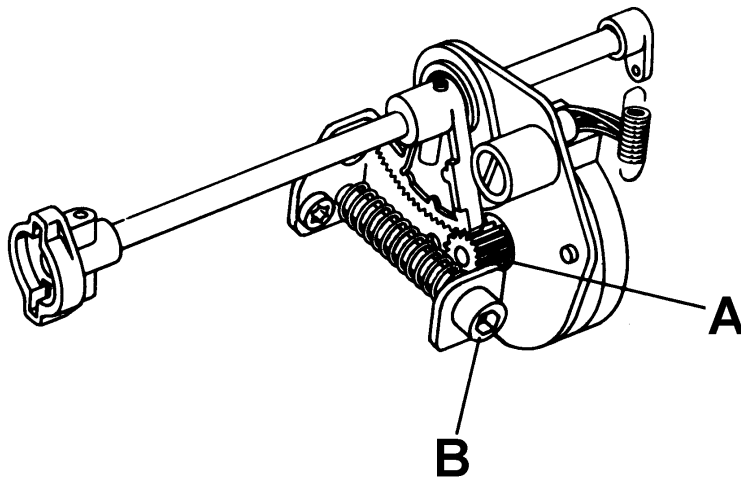
the feed dog shall now stand still when the foot control is pressed (0-feeding).

Adjustment

Loosen the screw (A) of the cog wheel and turn it until the feed dog comes to a stand-still when the foot control is pressed.

Note! If a basic setting has to be carried out.

Check that set screw (B) can be adjusted both ways.



17. Pre-setting the step motor of the feed dog

Check 1

Set the needle in its lower turning position.

The feed dog should after turning the mains switch several times on and off always reach such a position that 2.5 mm straight stitching will be obtained.

Check 2

Get into the service mode of the machine by pressing the reverse feed button and minus (-) stitch length while the mains switch is turned on.

Turn the hand wheel until the needle arrives at its lower turning position.

600,500,400 - Press key nr. 8.

Freesia,Lisa, Angelica, Victoria - Press key nr. 7.

The gap between the segment (A) and the calibration stop (B) should now be $(0.2 \pm 0.3 \text{ mm})$.

Adjustment

600,500,400 - Press key nr. 6.

Freesia,Lisa, Angelica, Victoria - Press key nr. 5.

Loosen screw (C).

Turn the eccentric calibration stop (B) until the gap between segment (A) and the calibration stop (B) is $0.2 \pm 0.3 \text{ mm}$.

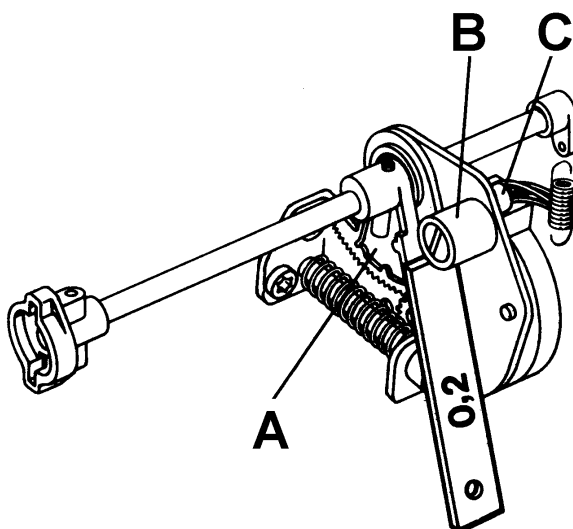
Check by pressing

600,500,400 - key nr. 8.

Freesia,Lisa, Angelica, Victoria - key nr. 7. several times.

The motor should now run smoothly and the gap should remain 0.2 mm.

Check with distance gauge 412 38 85-01.



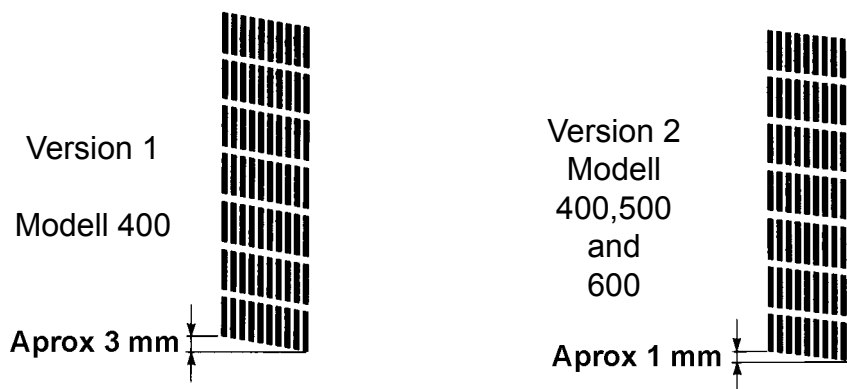
18. Stitch length balance

Check

- A Both columns of the buttonhole shall be of the same density.
- B The machine shall sew a motif according to the symbol.
- C The darning stitch shall look according to ill.

Use the service program - button n 18

Note! When controlling or adjusting the stitch length balance the buttonhole balance shall be zeroed (see below).



Fine adjustment

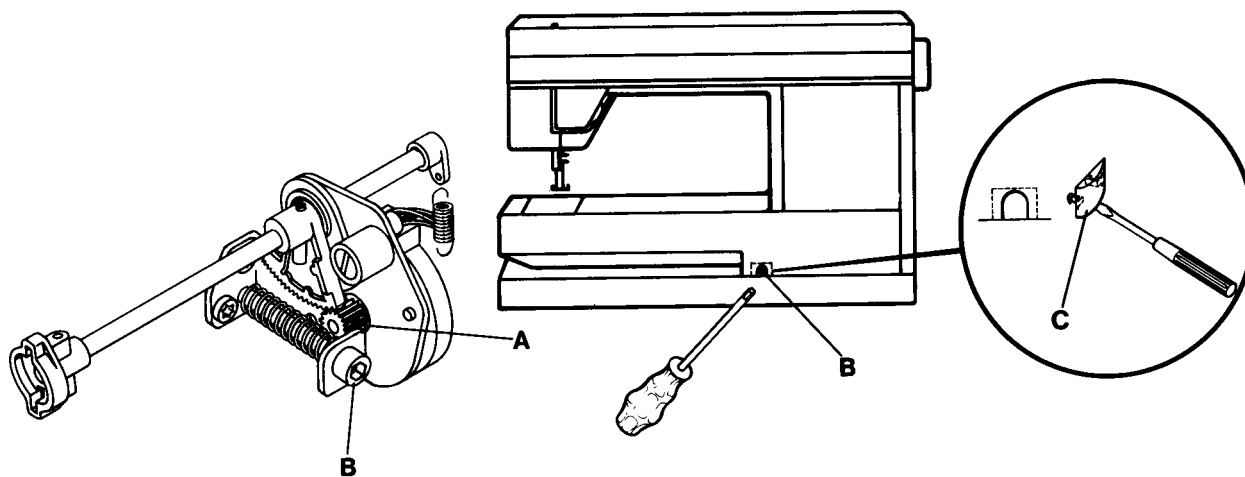
600,500,400 - Press key nr. 18.

Freesia,Lisa, Angelica, Victoria - Press key nr.17.

Turn screw (B) until the machine sews mending stitch acc. to ill.

This adjustment may be done without dismantling the covers (see ill.).

Snap away cover (C) by bending in its lower edge by means of a screw driver.



Buttonhole balance Concerns model Rose, 500, 350 and 400 version 2.

Can be carried out on any of the buttonholes.

Press <= and => simultaneously until the text BAL flashes in the left part of the display (model Rose and 500) or until the flashing of the length figures (model 400 and 350).

Instead of the stitch length a balance value is shown:

If you want a denser left column press stitch length key (+).

If you want a less dense left column press (-).

The balance can be set between -5 and +5. The balance value in the display changes in steps each time you press.

The machine always remembers the most recently set balance value.

19. Lower thread tension (thread tension of the bobbin case)

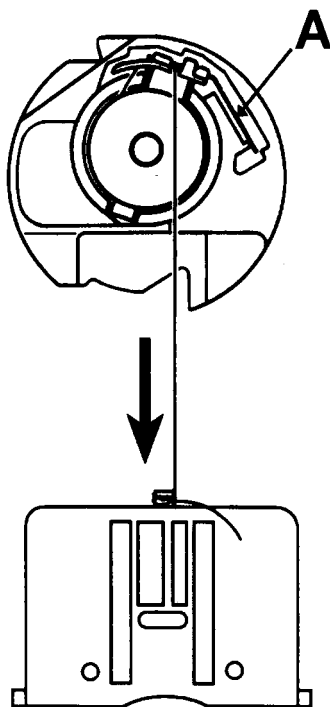
Check

1. Insert a full bobbin into the bobbin case.
2. The thread tension spring of the bobbin case shall give a resistance of 12 - 20 g when pulling the thread slowly.

Adjustment

1. Turn screw (A) until the correct thread tension is obtained.

NOTE ! Before any adjustment is made remove any loose pieces of thread or fluff from the thread tension discs



20. Upper thread tension

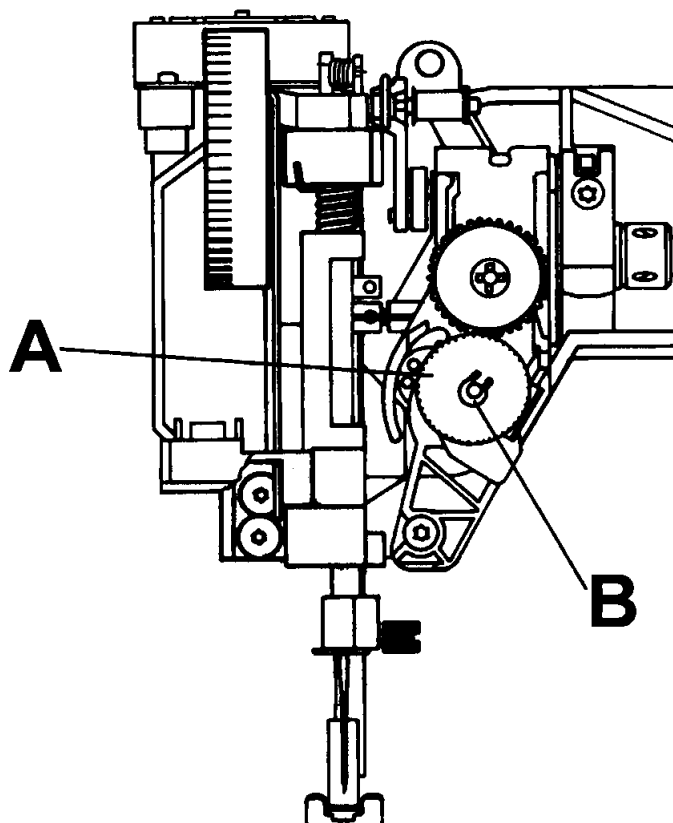
Check

A correct take-up should be obtained at straight stitching and zig-zag in cotton, when the thread tension dial is set within the marked area.

Adjustment

1. Run the machine and turn the thread tension dial (A) until a correct take-up is obtained.
2. Loosen locking washer (B).
3. Remove the thread tension dial (A) and put it back on the shaft with its white field right in front of the index.

NOTE ! Before any adjustment is made remove any loose pieces of thread or fluff from the thread tension discs



21. Upper thread tension - only Rose, Iris

Check - Thread tension - Normal position

A correct thread take-up should be obtained at straight stitching and zig-zag in cotton when the thread tension dial is set within the marked area.

Fine adjustment -1

Switch on the machine.

1. Press the embroidery key (↵) and the thread tension key (+) simultaneously. Instead of a stitch number TT is shown on the display, and instead of the stitch length a setting value.

The value can be set between +6 and -6. The value on the display is changed gradually each time you press the key.

The machine will always remember the most recently set value.

2. Sew and press the (+) or the (-) of the *stitch length key* until a correct take-up is obtained.

If you wish a harder thread tension press the *stitch length key* (+).

If you wish a softer thread tension press the *stitch length key* (-).

3. To save, press any key, but not the stitch length key.

NOTE ! Before any adjustment is made remove any loose pieces of thread or fluff from the thread tension discs

Fine adjustment -2

This adjustment is a complement to the electronic adjustment (TT) and (TC).

The adjustment can be made in 5 steps (± 2 steps).

The maximum adjustment is ± 20 gram. Each step is ± 10 gram.

This adjustment can be done without dismounting the covers se fig 2

1. Reset the electronic adjustments, both TT and TC to zero (0).

2. Sew the machine on straight stitching and Zig-zag

3. Adjust the thread tension by turning the calibration stop (A)
one-step clockwise the thread tension will be lower (- 10 gram).

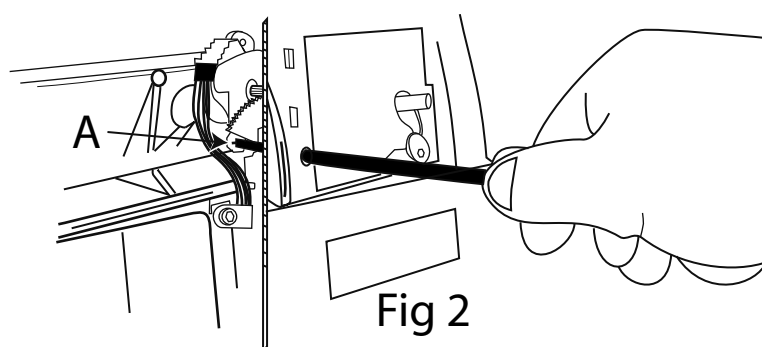
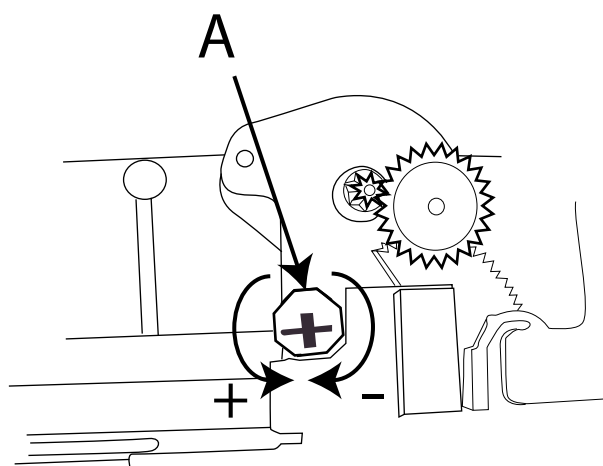
or one step anti-clockwise the thread tension will be higher (+10 gram) .

4. Restart the machine , so the stepmotor recalibrates to the new setting.

5. Test sew straight stitching and Zig-zag and the embroidery stitch no 9 - card 1.

If necessary adjust thread tension-Embroidery position (TC).

6. Check the setting of the thread take-up spring



21. Upper thread tension cont. - only Rose, Iris

Coarse adjustment

If a correct take-up is not obtained with the fine adjustments.

Switch on the machine. Press embroidery key (↓) and the thread tension key (+) simultaneously and zero the fine adjustment.

To save, press any key, but not the stitch length key.

1. Dismount the rack from the stepmotor and the thread tension unit.

See dismounting instruction below.

2. Sew the machine and turn the thread tension dial (A) until a correct take-up is obtained.
3. Loosen locking washer (B).
4. Remove the thread tension dial (A) and put it back on the shaft inbetween 4 and 5 in front of the index.
5. Mounting according to instruction below.

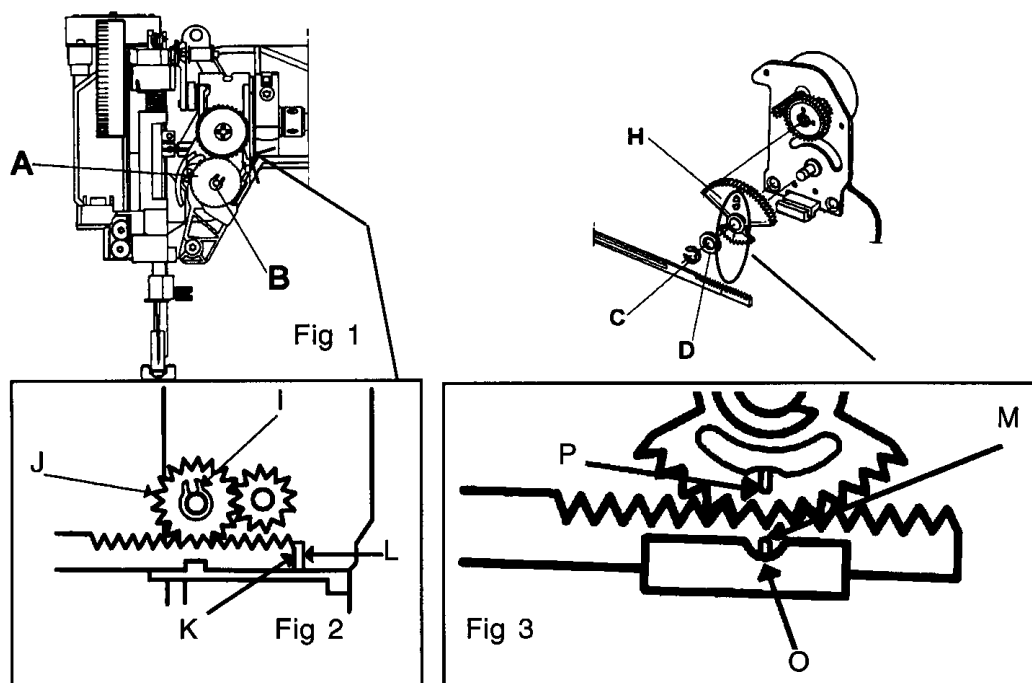
Dismounting instructions

1. Loosen the screws of the circuit board and partley remove it.
2. Remove C-washer (C), washer (D) and cog segment (H).
3. Loosen the screws of the thread tension unit and partley remove it.
4. Loosen the locking washer (I).
5. Remove the cogwheel (J).

Mounting instruction

1. Place the edge of the rack (K) right above the index mark (L) of the thread tension casing according to fig 3.
2. Mount the cogwheel (J) and the locking washer (I).
3. Mount the thread tension unit.
4. Place the index mark (M) of the rack right in front of the index mark (O) of the step motor.
5. Place the index mark (P) of the cog segment right in front of the index mark (M) of the rack.
6. Mount washer (D) and C-washer (C).
7. Mount the circuit board.

NOTE ! Before any adjustment is made remove any loose pieces of thread or fluff from the thread tension discs



22. Upper thread tension - embroidery position - Only Rose, Iris

Check sewing

A correct thread take-up will be obtained at embroidery stitch no 9 and with the thread tension dial set on embroidery position.

The following embroidery thread is to be used:

Upper thread: Thread thickness no 40 (e.g. Sulky no 40)

Lower thread: Thread thickness no 70 (e.g. Sulky bobbin)



Fine adjustment

Switch on the machine.

Press the embroidery key arrow (↓) down and the thread tension key (-) simultaneously. Instead of a stitch number TC is shown on the display and instead of the stitch length a setting value.

The value can be set between +6 and -6. the value on the display is changed gradually each time you press the key.

The machine will always remember the most recently set value.

Sew and press the (+) or the (-) of the *stitch length key* until a correct take-up is obtained.

If you wish a harder thread tension press the *stitch length key* (+).

If you wish a softer thread tension press the *stitch length key* (-).

To save, press any key, but not the stitch length key.

NOTE ! Before any adjustment is made remove any loose pieces of thread or fluff from the thread tension discs

23. Upper thread guard - only for Rose, Iris

Check

If the upper thread is running out or breaks the machine should stop.

This is done by means of a photo diode (A) on the thread take-up casing which reads the movement on screen (B) which moves at the same time as the thread take-up spring.

The machine must be threaded before activating the thread guard.

Upper thread guard check.

Check according to service program key No 23.

A figure is shown in the right corner of the display.

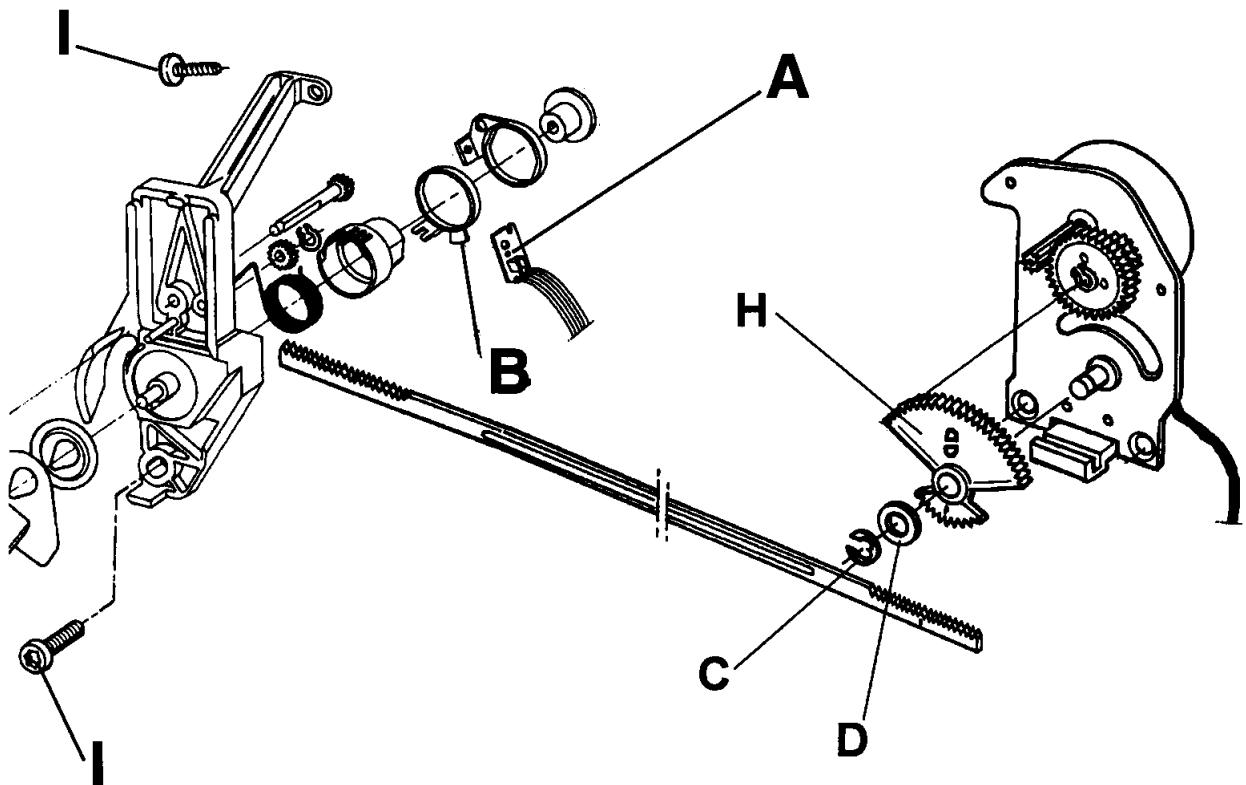
If it switches between 2 different positions ("0" and "1") while moving the thread take-up spring up or down, the function is correct.

Dismounting

To be able to dismount the upper thread guard you have to:

1. Loosen the contact from the step motor of the thread tension in the circuit board.
2. Loosen the screws of the circuit board and partly remove it.
3. Remove C-washer (C), washer (D) and the cog segment (H).
4. Loosen the contact of the upper thread guard in the circuit board.
5. Loosen the screws (I) before loosening the thread tension unit.

NOTE ! The setting of the thread take-up spring affects the function of the upper thread guard.



24. Setting the thread take-up spring

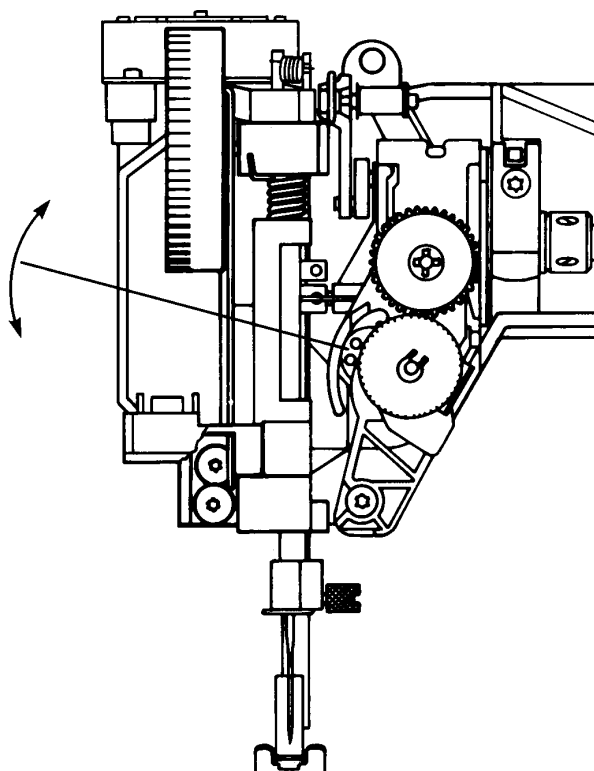
Check

The thread take-up spring should have completed its movement when the tip of the needle reaches the fabric but not the needle eye. The check has to be carried out in straight stitching in cotton.

Adjustment

Turn the thread tension body with a screw driver until a correct thread take-up is obtained.

NOTE ! On Rose and Iris the setting of the thread take-up spring affects the function of the upper thread guard.



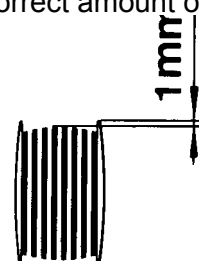
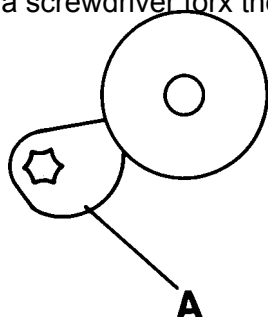
25. Disconnection when winding the lower thread

Check

When winding up the lower thread onto the bobbin the machine should stop when there is a minimum of 1 mm between the edge of the bobbin and the thread.

Adjustment

Turn by means of a screwdriver torx the disconnection (A) until the correct amount of thread is obtained.



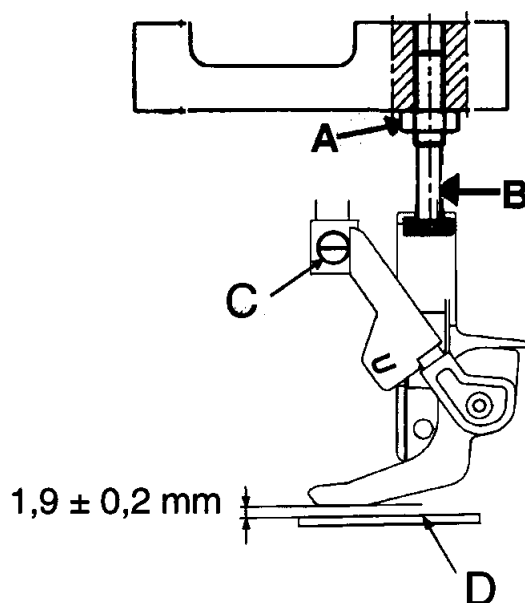
26.The height of the embroidery foot - Only Rose,Iris

Check

1. Embroidery foot U in its lowest position.
2. Needle bar in it's highest position and the needle clamp screw (C) against the embroidery foot (according to ill).
3. The distance between the embroidery foot U and and the stitch plate (D) should be $1,9 \pm 0,2$ mm (see ill.).

Adjustment

1. Loose the nut (A).
2. Turn the screw (B) untill the distance between the embroidery foot U and and the stitch plate (B) is $1,9 \pm 0,2$ mm (see ill.)
3. Tighten the nut.



Service program - 600,500,400 series

In order to facilitate the checking and setting of the different functions of the machine there is a service program.

Handling

Get into the service mode of the machine by pressing **the reverse feed button** and **minus (-) stitch length** while the mains switch is turned on.

This is indicated when the code letter is shown (=key 1).

To enter the service program of

the Husqvarna 400 use the foil keyboard 412 36 51-01

the Husqvarna 500 use the foil keyboard 412 40 02-01

the Husqvarna 535,530 use the foil keyboard 412 53 20-02

the Husqvarna 545,540 use the foil keyboard 412 53 14-04

the Husqvarna 555,550 use the foil keyboard 412 53 14-03

the Husqvarna 535,530 use the foil keyboard 412 53 20-02

the Husqvarna 605,600 use the foil keyboard 412 45 27-02

Functions of the service program

- | | |
|--------------|--|
| Key 1 | The two symbols to the right show the code letter of the program memory, of the circuit board. |
| Key 2 | Display test where all symbols light up on the display. |
| Key 3 | Is used for the centre position of the needle in straight stitching.
The step motor of the needle is now in its centre position.
Setting nr. 7. |
| Key 4 | Is used when pre-setting the step motor of the needle.
The step motor now takes its calibration position.
Setting nr. 8 |
| Key 5 | Is used when coarse-adjusting the stitch length balance.
The feed dog should now stand still (0-feeding).
Setting nr. 16 |
| Key 6 | Is used when pre-setting the feeding step motor.
The step motor now takes its calibration position.
Setting nr. 17 . |
| Key 7 | Is used for checking the centre position of the needle in straight stitching. Setting nr. 7 |
| Key 8 | Is used for checking the:
- Pre-setting of the step motor of the needle.
The needle height. Setting nr. 8
- Pre-setting of the feeding step motor.
Feed dog below the stitch plate. Setting nr. 17 |

Key 9	Check that the arm shaft sensor (stop right function) works. The latter looks after when the step motors have to be reset, it reads the speed and the stop right functions. The function is correct if numbers 0-3 are shown in the right part of the display, while the handwheel is turned around slowly.
Key 18	Is used when fine-adjusting the stitch length balance. Setting nr. 18 The machine now sews stitch nr. 29 with a pre-programmed length.
Key 20	The machine sews signs B,P,R,S.
Key 23	Control of the upper thread guard. A figure is shown in the right corner of the display. If it changes between 2 different positions ("0" and "1") while moving the thread take-up spring up or down the function is correct.
Key 26	Is used to check the sideways movement of the embroidery unit.
Key 27	Is used to check the movement of the embroidery unit in the feeding direction.
Key 28	Is used together with the adapter (412 41 12-01) to make sure that the control signals of the machine to the embroidery unit are correct.
Key 29	Indicates which memory card is in the machine (e.g. 1) and which program code the memory card has (e.g. 5).

Note! Not mentioned keys are not used on service or have no function.

Electronic button hole balance

Rose, 500, 350 and 400 version 2.

Can be carried out on any of the buttonholes.

Press <= and => simultaneously until the text BAL flashes in the left part of the display (model Rose and 500) or until the flashing of the length figures (model 400 and 350).

Instead of the stitch length a balance value is shown:

If you want a denser left column press stitch length key (+).

If you want a less dense left column press (-).

The balance can be set between -5 and +5. The balance value in the display changes in steps each time you press.

The machine always remembers the most recently set balance value.

Service program

- Freesia 425/415 -Lisa -Angelica -Victoria

In order to facilitate the checking and setting of the different functions of the machine there is a service program

Handling

Get into the service program of the machine by pressing **the reverse feed button** and **the minus (-) stitch lenght button** as the main switch is switched on.

The display will now show the service menu.

To select the differernt service functions in the service menu

the stitch selector buttons (-) and (+) should be used.

With the left buttons - it will go between the tens.

With the right buttons - it will go between 1-9.

The number of the selected stitch is displayed to the right of the Infodisplay

Note! Every time the (+) key is pressed it will step up one step to the next figure or if the (-) key is pressed it will step down one step to the next figure.

To enter the service program of

the Freesia 415 use the foil keyboard 412 60 55-01

the Freesia 425 use the foil keyboard 412 60 58-01

the Lisa use the foil keyboard 412 65 60-01

the Angelica use the foil keyboard 412 6974-01

the Victoria use the foil keyboard 412 7362-01.

Functions of the service program

Key 0 The two symbols to the right show the code letter of the program memory, of the circuit board.

Key 1 Display test where all symbols light up on the display.

Key 2 Is used for the centre position of the needle in straight stitching. The step motor of the needle is now in its centre position. Setting nr. 7.

Key 3 Is used when pre-setting the step motor of the needle. The step motor now takes its calibration position. Setting nr. 8 .

Key 4 Is used when coarse-adjusting the stitch length balance. The feed dog should now stand still (0-feeding). Setting nr. 16.

Key 5 Is used when pre-setting the feeding step motor. The step motor now takes its calibration position. Setting nr. 17.

Key 6 Is used for checking the centre position of the needle in straight stitching. Setting nr 7

-
-
- Key 7** Is used for checking the:
- Pre-setting of the step motor of the needle.
The needle height. Setting nr 8.
 - Pre-setting of the feeding step motor.
Feed dog below the stitch plate. Setting nr. 17
- Key 8** Check that the arm shaft sensor (stop right function) works.
The latter looks after when the step motors have to be reset,
it reads the speed and the stop right functions.
The function is correct if numbers **0-3** are shown in the right
part of the display, while the handwheel is turned around slowly.
- Key 17** Is used when fine-adjusting the stitch length balance.
Setting nr. 18

Electronic button hole balance

Freesia 425/415,Angelica. Victoria

It is not possible to do any electronic button hole balance on the Freesia 425/415,the Angelica.
and the Victoria

Electronic button hole balance

Lisa

Electronic button hole balance should NOT be carried out on a Lisa.

If a electronic buttonhole balance is made - on a Lisa - it will influence the stich legths balance
on all stiches. The setting of the electronic button hole balance MUST BE -3

Check of the setting of the Electronic button hole balance

Enter Electronic button hole balance menu - by choose any buttonhole and then push the
arrows

In this menu the setting MUST BE -3. This value should NOT be re-set in any way.

NOTE! If the PC board is changed on a Lisa the setting must to be set to -3 before any
stich lenght balance is set.

Setting the country code- Rose.

Keep the CLR-key pressed until the main switch is put on.

Select a new country code with the right or left arrow.

The machine will always remember the most recently set country code.

Codes:

00	gives	figures as colour code
01	gives	Swedish as colour code
06	gives	Danish as colour code
11	gives	Finnish as colour code
21	gives	Norwegian as colour code
26	gives	English as colour code
31	gives	French as colour code
36	gives	Dutch as colour code
41	gives	Italian as colour code
46	gives	Spanish as colour code
51	gives	German as colour code
60	gives	Portuguese as colour code
81	gives	Croatian as colour code
82	gives	Polish as colour code
90	gives	Czech as colour code

Upper thread tension - Rose , Iris

To facilitate the setting of the upper thread tension there is an electronic adjustment in the normal function position.

Operation

Switch on the main switch. Then select one of the following combinations.

Emboidery key (↓) arrow down and (+) thread tension key plus.

Is used at fine adjustment of the upper thread tension at normal position .

Instead of a stitch number TT is shown on the display and instead of the stitch length a setting value.

Setting no 21 (page 24).

Emboidery key (↓)arrow down and (-) thread tension key minus.

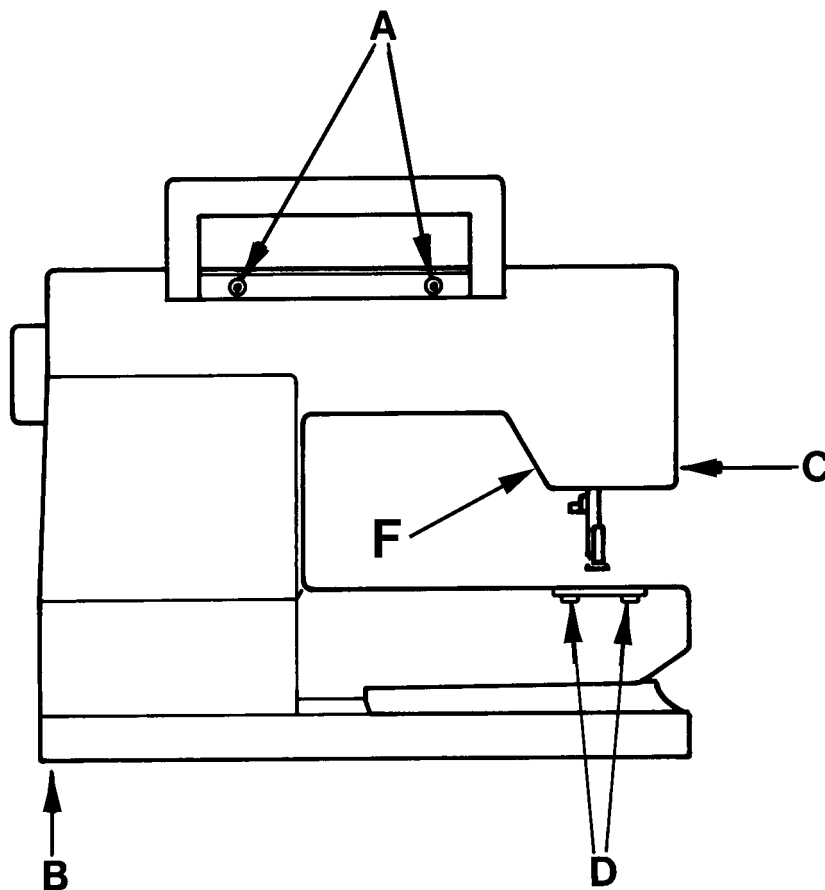
Is used at fine adjustment of the upper thread tension at embroidery position .

Instead of a stitch number TC is shown on the display and instead of the stitch length a setting value.

Setting no 22 (page 26)

Rear cover - 350, 400 and 500

1. Loosen the two screws (A) under the handle, screw (B) in the rear corner of the base plate and screw (C) at the thread knife of the sewing head.
2. Cautiously bend by means of a screwdriver the 2 recesses under the stitch plate in order to expose the hook.
Expose the hooks (D) and (F) and remove rear cover.

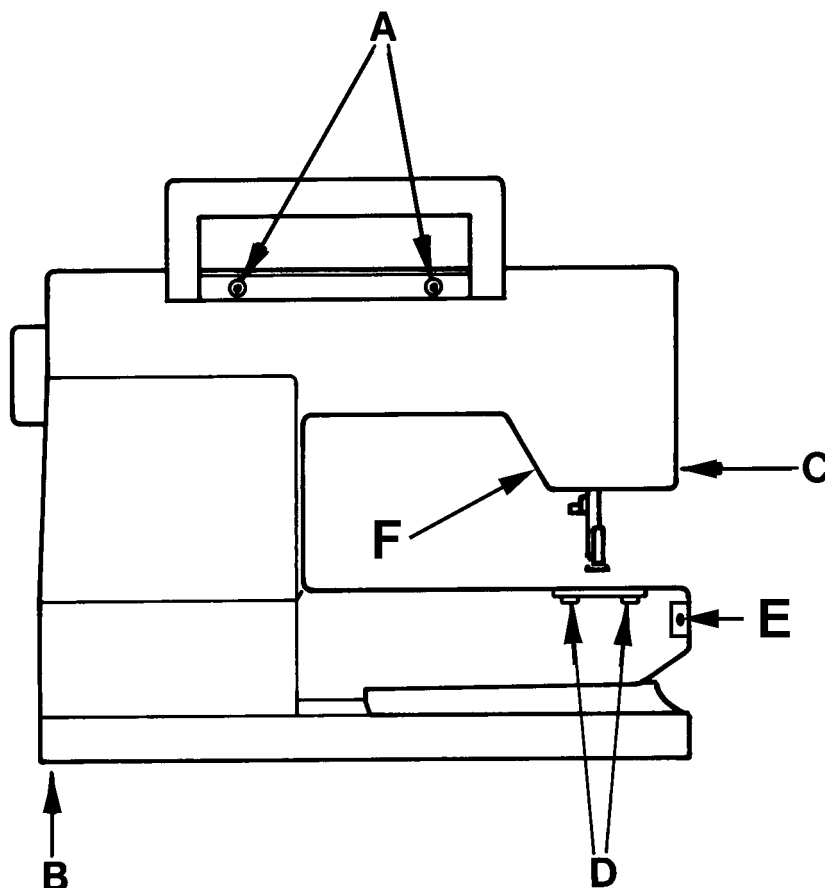


Upper rear cover - Lily, Rose

Loosen the two screws (A) under the handle, screw (B) in the rear corner of the base plate and screw (C) at the thread knife of the sewing head. Expose hook (F) and remove the rear cover.

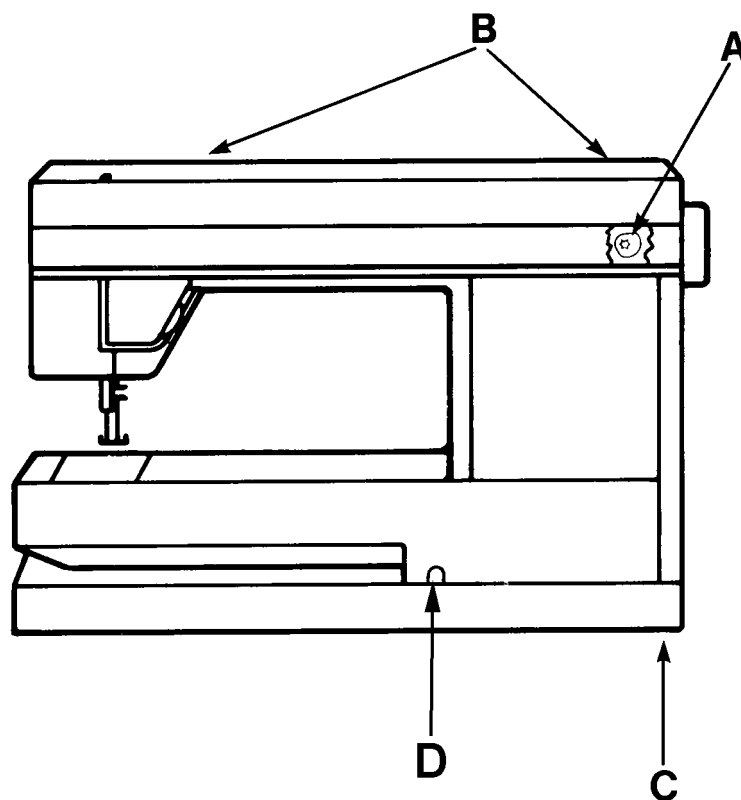
Lower rear cover - Lily, Rose

1. Loosen screw (E).
2. Cautiously bend with a screwdriver in the two sockets (D) under the stitch plate in order to expose the hook and remove the lower rear cover.



Front cover

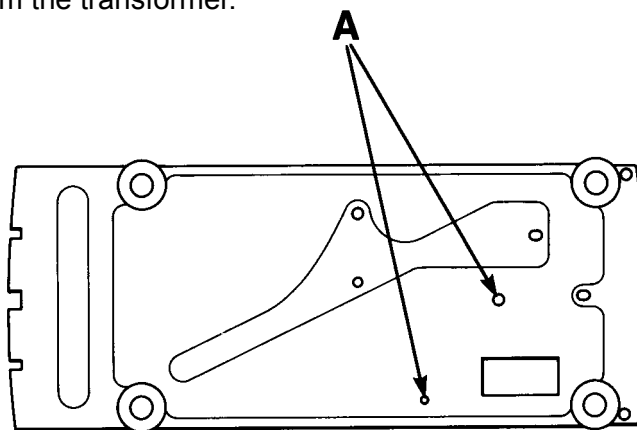
1. Dismount rear cover .
2. Loosen the button for the off-switch, winding, by pulling it straight out.
3. Loosen the two screws (B) from behind and screw (C) in the front corner of the base plate.
4. Snap off cover (D) by bending its lower edge by means of a screwdriver.
5. Carefully bend away the front cover from the hand wheel and pull it straight out.
6. Loosen the band cable of the foil keyboard from the circuit board by pulling the outer covering of the white switch outwards.



Transformer

Dismounting

1. Dismount rear cover (page 33-34).
2. Loosen the two screws (A) of the transformer from below in the base plate.
3. Push the transformer to the right so that the mains switch part is exposed from the base plate and lift it upwards.
4. Unhook the cable to the circuit boards from the transformer.



Checking the transformer

Connect the transformer to mains.

Measure the tension and resistance between the contact pins.

1-3 shall be approx. 13 Volt AC Lamp, computer.

4/5-6/7 shall be approx. 28 Volt AC Step motor, drive motor.

2-8 shall be approx. 100-0 k Ohm Foot control connected

Fuses

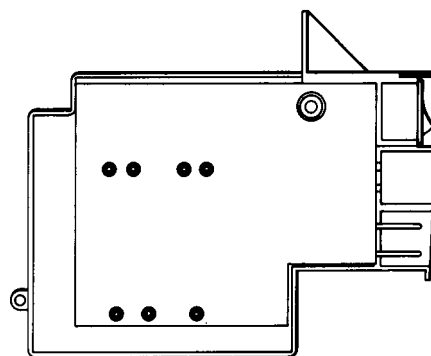
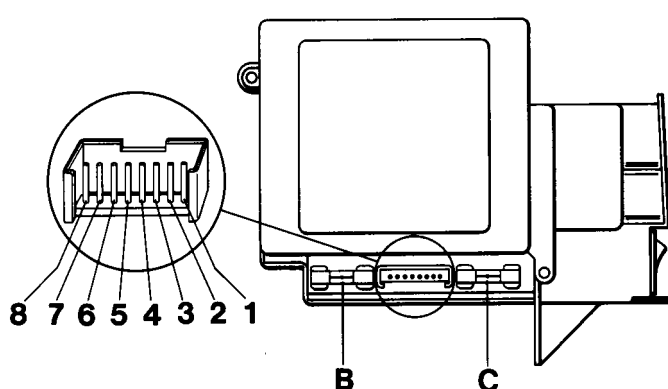
On the circuit board of the transformer there are two fuses.

They can be exchanged without disassemble the transformer.

Fuse (B): for 120 V machines 3.5 A/250 V

for 220 V machines 6.3 A/250 V

Fuse (C): 2 A/250 V



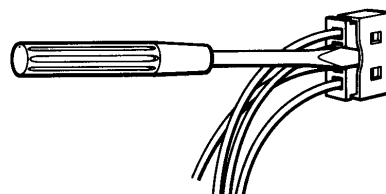
Dismounting the transformer and the circuit board

1. Remove the lower part of the transformer casing.
2. Remove the soldering from the 7 connections of the transformer to the circuit board.
3. Remove the circuit board.

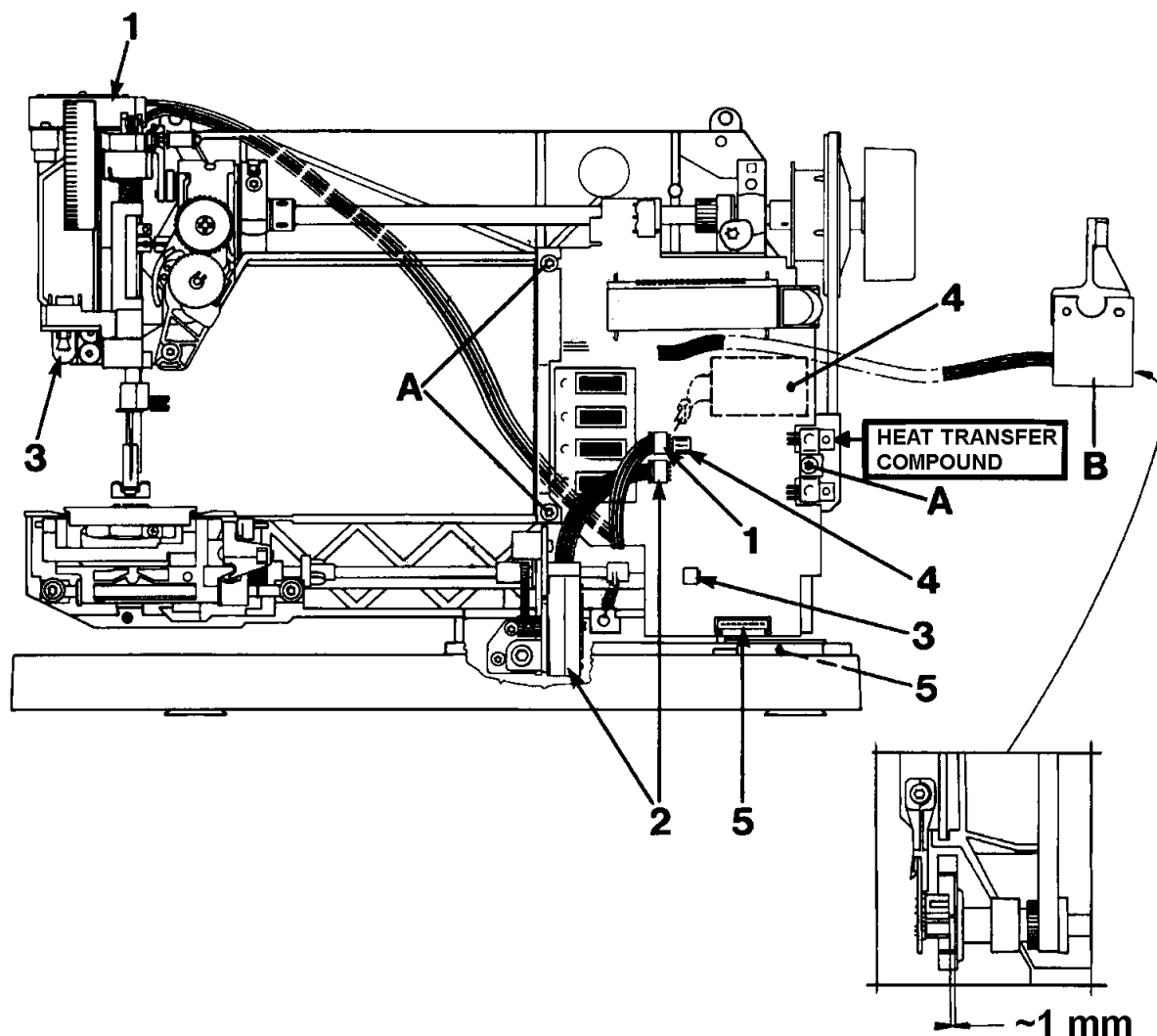
Circuit board - Circuit diagram - for models 350, 400 and 500 -

Dismounting

1. Dismount rear cover (see page 33-34).
2. Dismount front cover (see page 35).
3. Loosen the 3 screws (A) holding the circuit board and the cooling plates and lift out the board from the machine.
4. Cautiously snap the circuit board (B) of the arm shaft sensor off its support by bending its lower end outwards and thereafter pulling it downwards.
5. Loosen the cables from the circuit board according to below:
 - (1) The step motor of the needle.
 - (2) The step motor of the feeding unit.
 - (3) Lamp.
 - (4) Motor "mounted from the rear", red cable down.
 - (5) Transformer
 - (6) Buttonhole counter

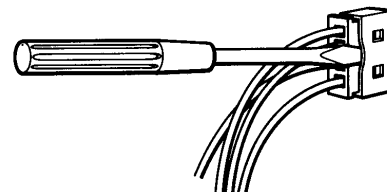


- Note!** 1. Contacts (1), (2) and (3) can be loosened by cautiously bending away the outer covering with a thin screwdriver.
2. Check that the lower shaft sensor is mounted at a distance of approx. 1 mm from the screen, lower shaft sensor (see ill.)

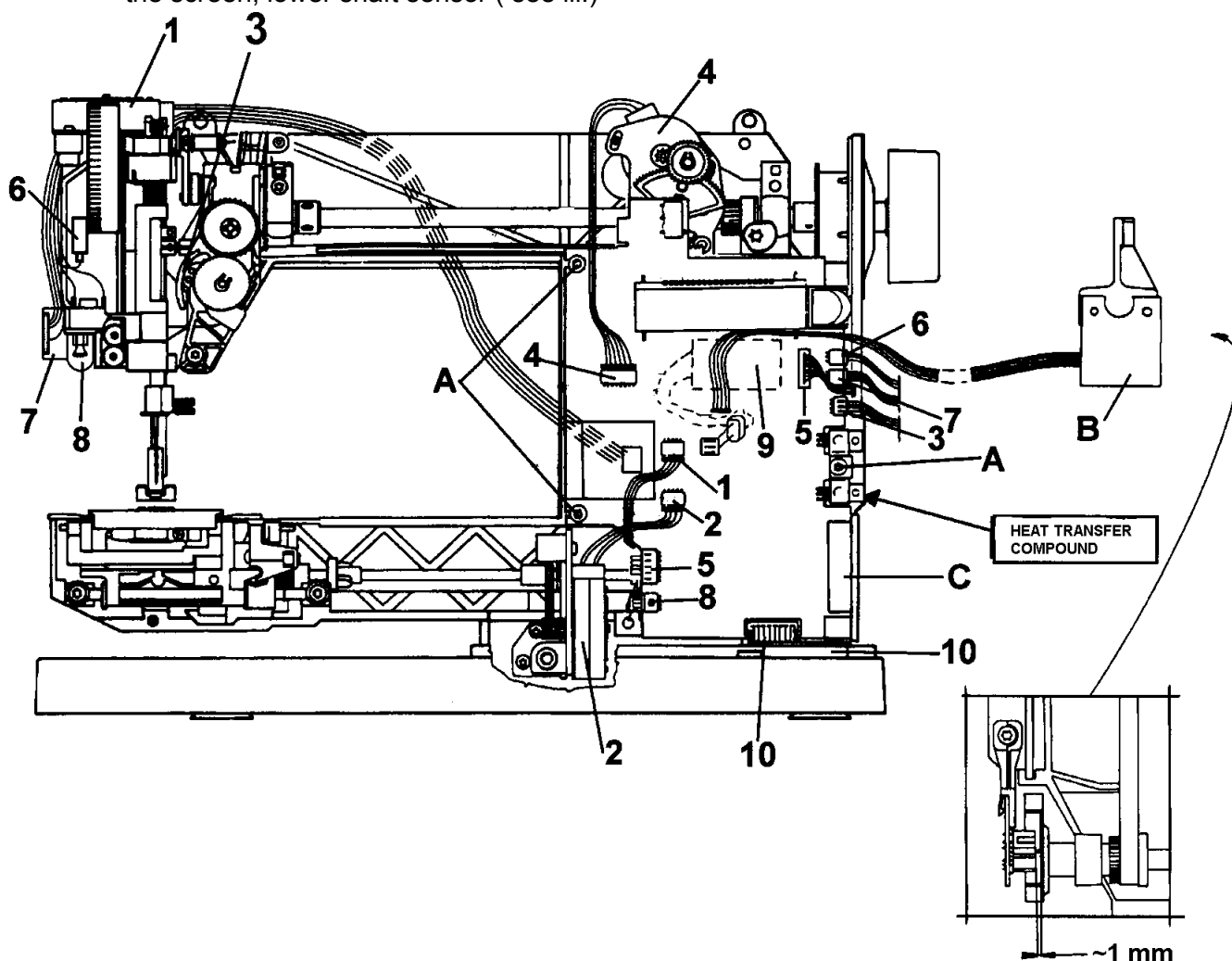


Circuit board - Circuit diagram- for model Rose - Dismounting

1. Dismount rear cover (see page 33-34).
2. Dismount front cover (see page 35).
3. Loosen the 3 screws (A) holding the circuit board and the cooling plates and lift out the board from the machine.
4. Cautiously snap the circuit board (B) of the arm shaft sensor off its support by bending its lower end outwards and thereafter pulling it downwards.
5. Loosen the cables from the circuit board according to below:
 - (1) The step motor of the needle.
 - (2) The step motor of the feeding unit.
 - (3) The thread guard
 - (4) The step motor of the thread tension
 - (5) XY-connection (2)
 - (6) Microswitch
 - (7) Buttonhole counter
 - (8) Lamp.
 - (9) Motor "mounted from the rear", red cable down.
 - (10) Transformer
6. Cautiously snap the guide for the memory card (C) and the metal sheet of the circuit board.



Note! 1. Contacts (1), (2), (3), (5) and (6) can be loosened by cautiously bending away the outer covering with a thin screwdriver.
 2. Check that the lower shaft sensor is mounted at a distance of approx. 1 mm from the screen, lower shaft sensor (see ill.)



Sewing head

Dismounting

1. Dismount rear cover and front cover .
2. Loosen screws (A) and (B).
3. Remove the step motor of the needle.
4. Remove screws (C) and (D).
5. Unhook the sewing head from the sewing machine arm.
6. Unhook the sewing head from the stud (E) of the thread take-up lever and the connecting rod (F).
7. Loosen the lamp cable from the circuit board.

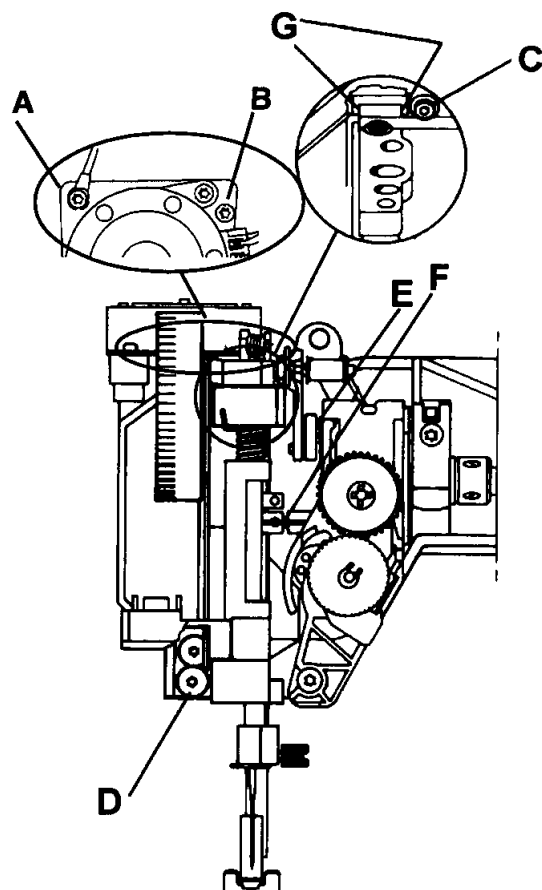
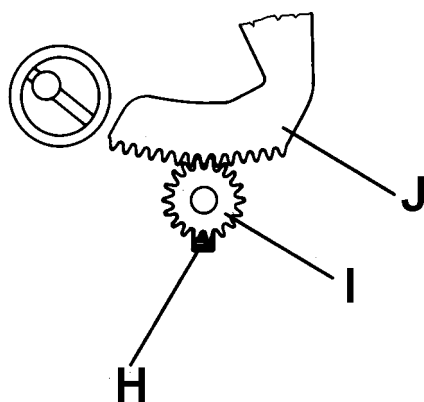
Mounting

1. Hook on the sewing head to the connecting rod (F) and the stud (E) of the thread take-up lever.
2. Place sewing head with its upper part into its guide (G).
3. Make sure that the presser foot lever is hooked on its lever arm.
4. The screw (H) on the cog wheel (I) should now be positioned opposite cog segment (J) when it is centred.
5. Tighten screws (C) and (D).
6. Mount the step motor of the needle. Tighten screws (A) and (B).
Under screw (A) the earth cable is mounted.
7. Mount the lamp cable in the circuit board.

Thereafter set:

7. Centre position of the needle on straight stitching
8. Pre-setting the step motor of the needle
9. Gap between the needle and the hook
14. Needle height
18. Stitch length balance

Note! The screw (H) mustn't descend into the cog segment (J) on a complete zig-zag movement.



The step motor of the needle

Dismounting

1. Dismount rear cover.
2. Dismount front cover.
3. Loosen screws (A) which hold the mounting plate of the step motor in the arm.
4. Loosen the circuit board from the sewing machine arm and remove the contact in the circuit board.

Mounting

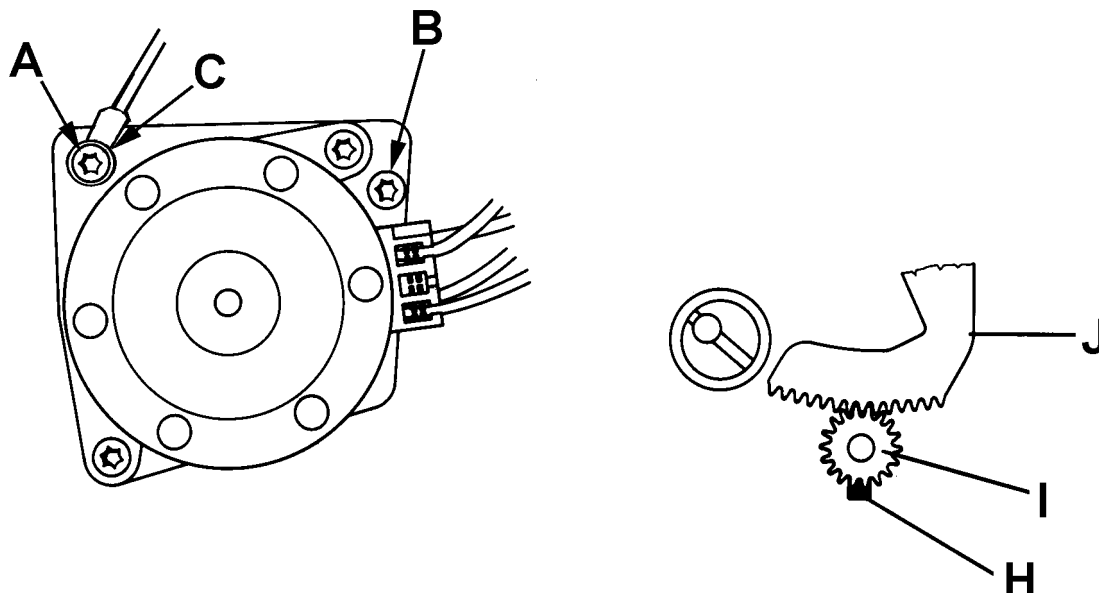
1. Thread the cable through the two holes in the sewing machine arm and attach the contact to the circuit board.
2. Mount the step motor and the screws (A) and (B).
N.B. The earth cable (C) shall be mounted under the screw (A).
3. Mount the circuit board without squeezing the cables.
4. Place the needle by means of the cog segment (J) sideways right into the presser foot. Make sure that the screw (H) of the cog wheel (I) of the step motor is straight opposite the cog segment (J).

Note! The screw mustn't descend into the cog segment on a complete zig-zag movement.

5. Position the step motor and tighten the screws.

Thereafter set:

7. The centre position of the needle on straight stitching
8. The pre-setting of the step motor of the sewing head.



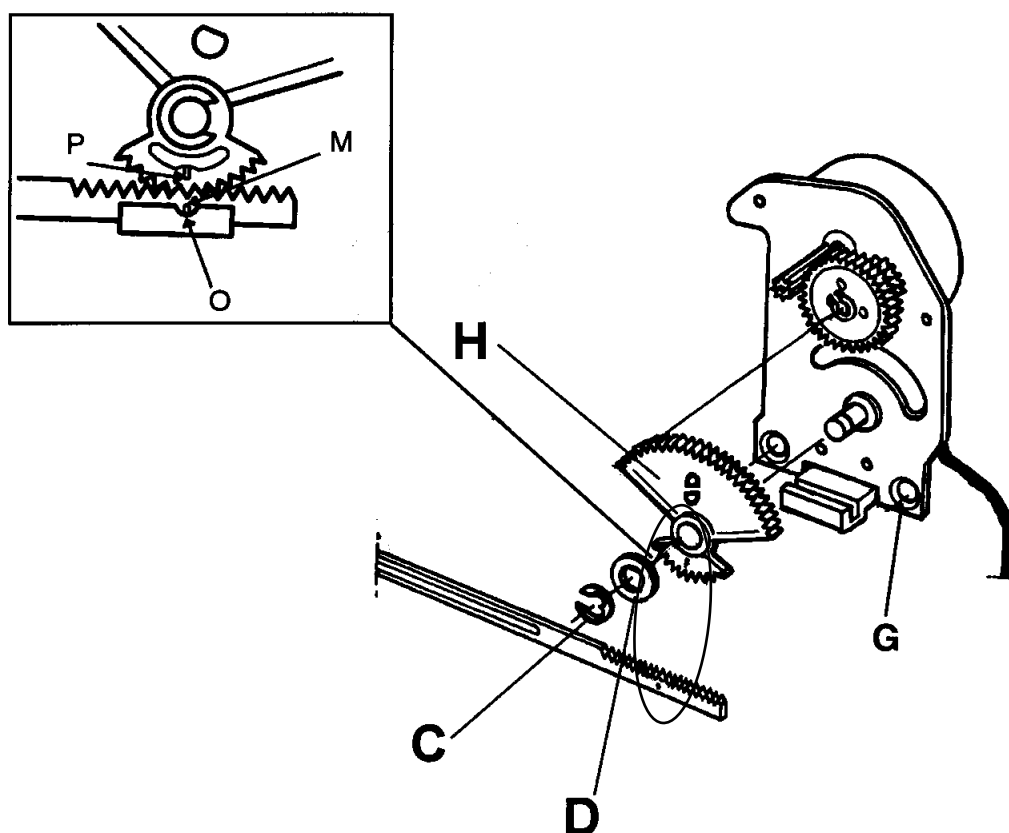
The step motor of the thread tension - for Rose -

Dismounting

1. Dismount rear cover and front cover.
2. Dismount the bobbin device.
3. Loosen the contact of the step motor of the thread tension on the circuit board.
4. Loosen the 3 screws holding the circuit board and bend it down.
5. Remove C-washer (C), washer (D) and the cog segment (H).
6. Loosen the screws (G). Remove the step motor.

Mounting

1. Position the step motor compl.
2. Position the index mark (M) of the rack right opposite the index mark (O) of the step motor.
3. Position the index mark (P) of the cog segment right opposite the index mark (IM) of the rack.
4. Mount washer (D) and C-washer (C).
5. Mount the circuit board without squeezing the cables.
6. Mount the bobbin device.



The step motor of the feeding unit

Dismounting

1. Dismount rear cover and front cover.
2. Unhook spring (A) at the end of the segment shaft.
3. Loosen the screws (B) of the step motor frame, expose the connection (C) between the segment shaft of the step motor and the feeding unit by pushing the shaft to the right.
4. Lift the step motor compl. out of the machine and remove its contact from the circuit board.

Mounting

1. Position the step motor compl.
2. Connect the connection (C) between the segment shaft of the step motor and the feeding unit.

Note! Location of the guide (see Fig 1). Do not turn 180 degrees wrong!.

3. Tighten screws (B) and connect contact to the circuit board.

Thereafter set:

16. Stitch length balance, basic setting
17. Pre-setting the step motor of the feed dog
18. Stitch length balance, fine adjustment

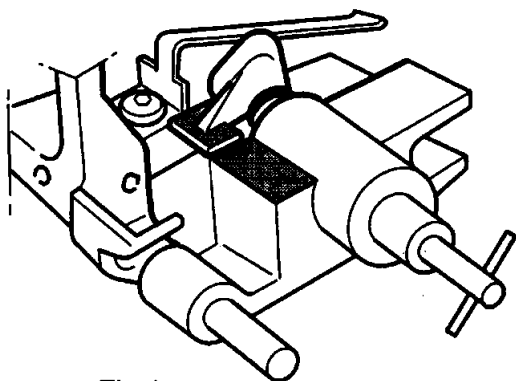
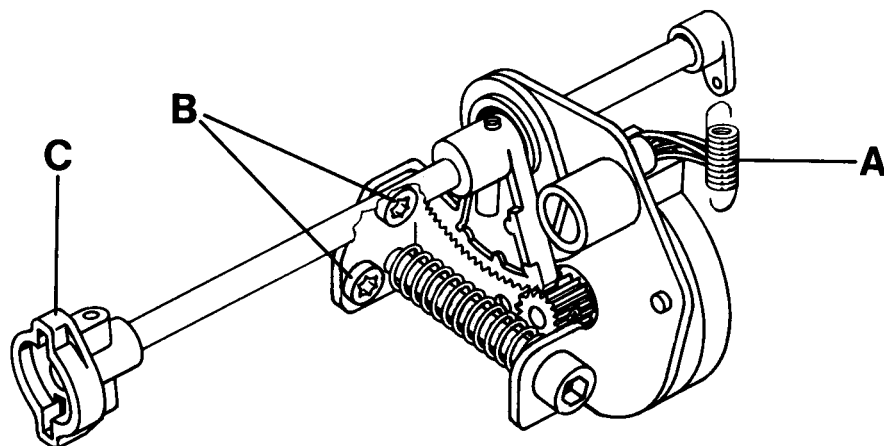


Fig 1



Feeding unit

Dismounting

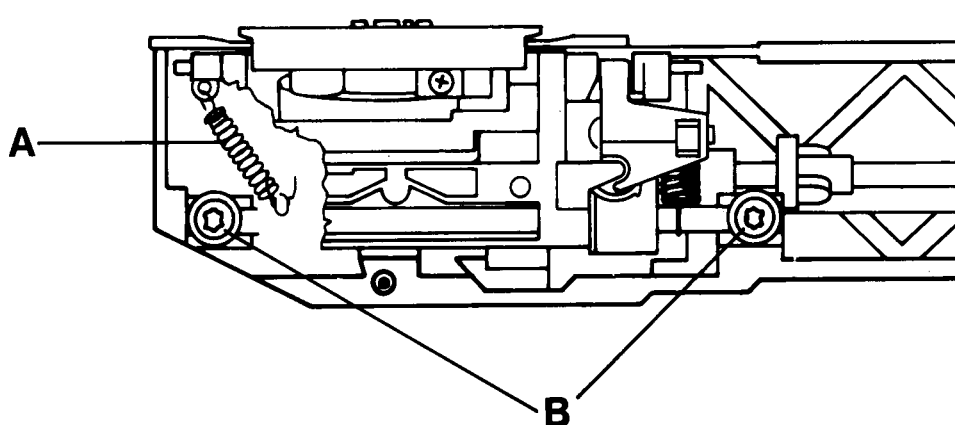
1. Dismount rear cover and front cover.
2. Unscrew the 3 screws of the hook cover and remove it.
3. Unscrew the needle and the presser foot holder and set the feeding eccentric straight backwards.
4. Dismount the feeding step motor .
5. Unhook spring (A) and unscrew screws (B).
6. Lift out the complete feeding unit.

Mounting

1. Set feeding eccentric straight backwards.
2. Insert feeding unit.
3. Tighten screws (B).
4. Mount feeding step motor.
5. Mount hook cover, presser foot holder and needle.

Thereafter adjust:

6. The setting of the feed dog in relation to the presser foot
10. The setting of the stitch plate (hook cover) in relation to the needle in the feeding direction
11. The sideways setting of the stitch plate (hook cover) in relation to the feed dog
15. Feed dog height
16. Stitch length balance, basic setting
17. Pre-setting the step motor of the feed dog
18. Stitch length balance, fine adjustment



Hook compl.

Dismounting

1. Dismount rear cove and front cover .
2. Dismount the feeding step motor.
3. Dismount the feeding unit.
4. Loosen screw (A) and lift hook compl. (B).

Mounting

1. Turn the hand wheel until the highest part (C) of the eccentric points backwards and is within the recess (D) in the arm, and the gap between the feeding eccentric and the arm is 6 mm (see ill.).
2. Position washer, adjustment stud and dust shield onto the arm. With the adjustment stud forward.
3. Place the hook so that its tip (E) points straight backwards.
4. Press the hook shaft downwards so that it is without play and tighten screw (A).
5. Mount the feeding unit .

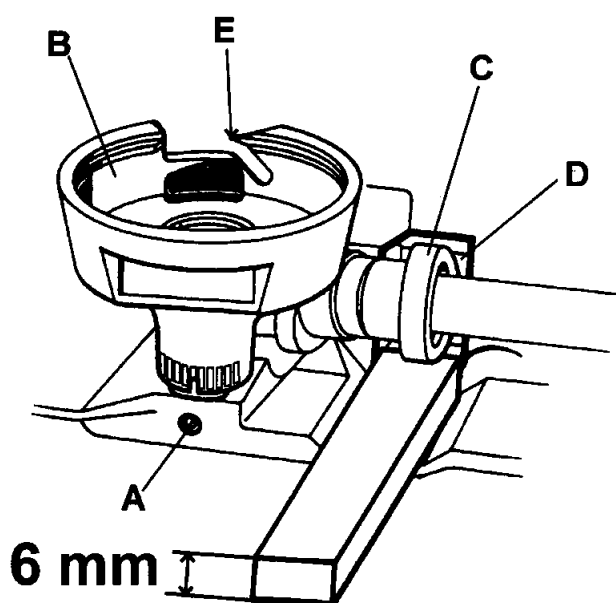
Thereafter set:

2. Setting of the hook in relation to the feeding eccentric.
1. Play of the hook gear.
6. Setting of the feed dog in relation to the presser foot.
9. Gap between the needle and the hook.
13. Timing of the hook in relation to the needle.
14. Needle height.
10. The setting of the stitch plate (hook cover) in relation to the needle in the feeding direction.
11. The sideways setting of the stitch plate (hook cover) in relation to the feed dog.
12. The hook height.
15. Feed dog height.
18. Stitch length balance.

The hook can be dismounted without removing the feeding step motor and the feeding unit.

Dismount covers, hook cover, presser foot holder, needle and bobbin basket. Loosen the locking screw of the hook shaft, lift the hook shaft. Lift the feed dog (long stitch length).

Note! The position of the hook in relation to the lower shaft mustn't be changed.



Bobbin winding device

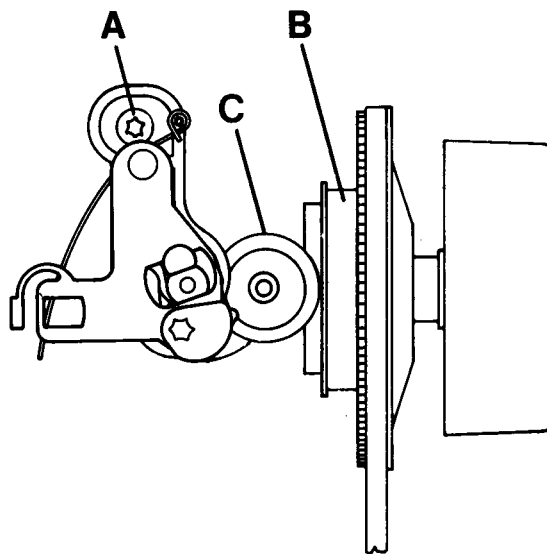
Needle- and feeding movement shall be disengaged when the "bobbin shaft with its rubber ring" is pushed against the ring (B), and is engaged when it is pushed back.

Dismounting

1. Dismount front cover and rear cover.
2. Loosen screw (A).

Mounting

1. Keep the bobbin device in extended position.
2. Push ring (B) against the hand wheel.
3. Push the rubber ring (C) of the bobbin device against ring (B).
4. Tighten the screw.
5. Check.



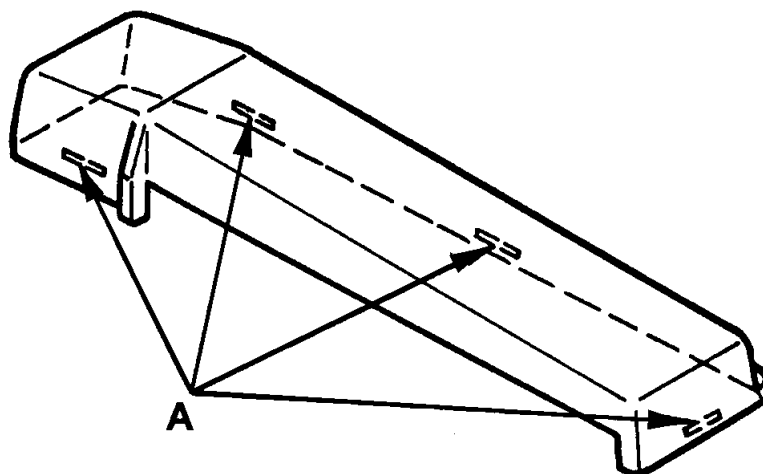
Cover Y-slide

Dismounting

Cautiously bend the cover so that the 4 snaps (A) are exposed and lift the cover upwards.

Mounting

Place the cover over the plate and press the snaps.



Cover upper part

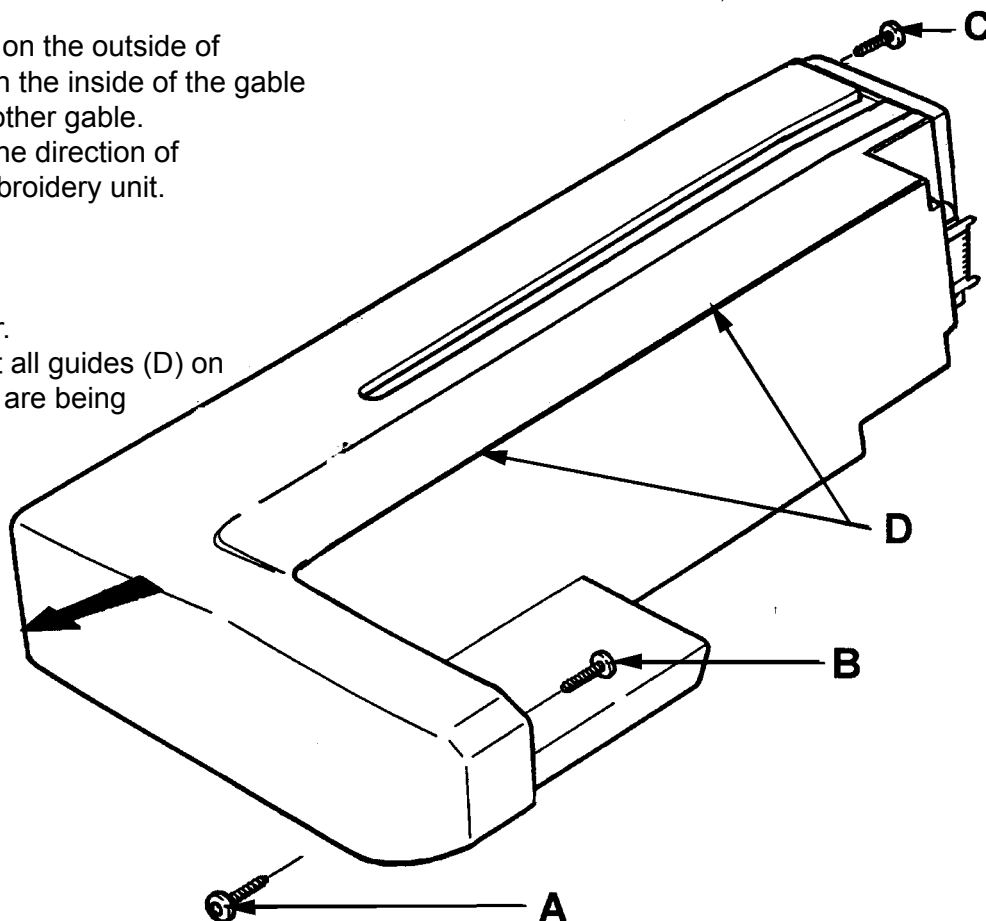
Dismounting

Loosen the screw (A) on the outside of the gable, screw (B) on the inside of the gable and screw (C) on the other gable. Remove the cover in the direction of the arrow from the embroidery unit.

Mounting

Mount in reverse order.

NOTE! Make sure that all guides (D) on the inside of the cover are being put correctly.



Cover lower part

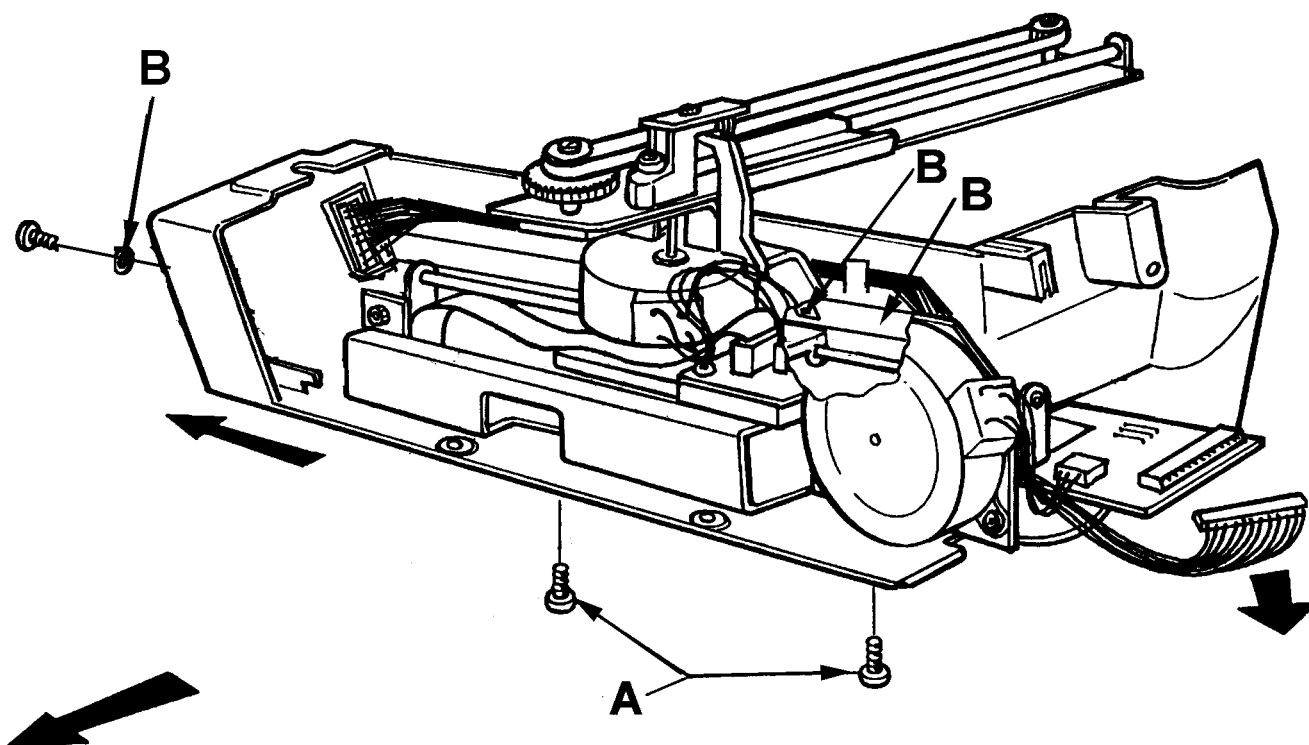
Dismounting

Loosen the 2 screws (A) on the underneath of the cover.
Cautiously pull away the cover from the embroidery unit in order not to damage the circuit board and the cables.
Loosen the cable from the circuit board.

Mounting

Insert the embroidery unit into the cover.
Connect the cord to the circuit board.
Tighten the screws.

NOTE! Check that the 3 earthings (B) for ESD (electro static discharge) are correctly positioned.



Y-unit

Belt tension

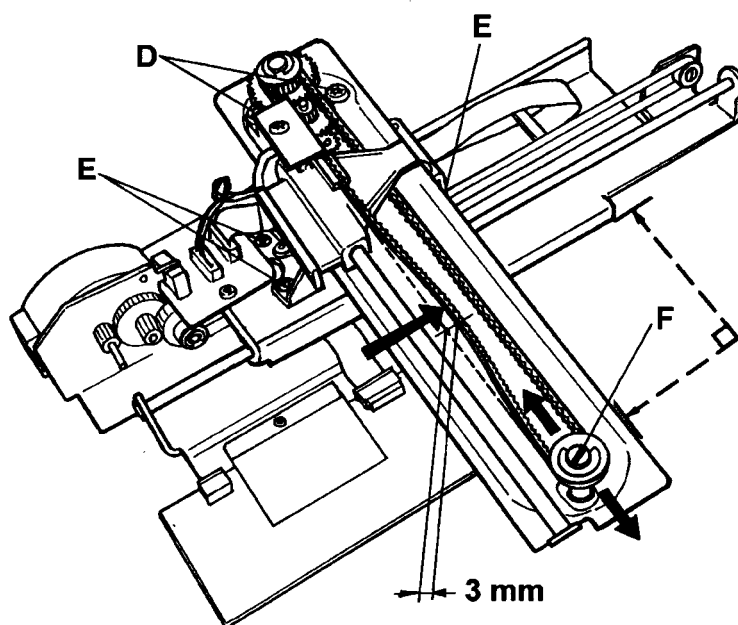
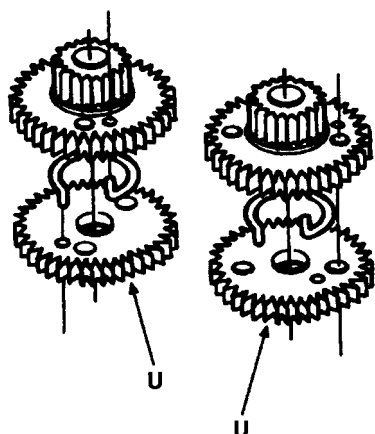
The belt shall be adjusted in such a way that, when the Y-slide is in its end position, it should be possible to push in the belt approx. 3 mm with a force of 0,2 kg

Adjust by loosening screw (A) and moving the belt wheel until a good belt tension is obtained.

Right angle between X- and Y-unit

The Y-unit shall be mounted at right angles to the X-unit.

Adjust screws (E), alternatively (D).



Wheel gear

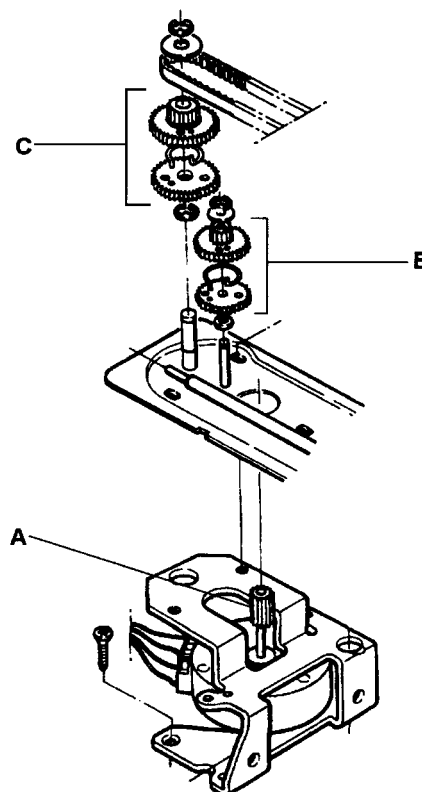
The wheel gear consists of a fixed cog wheel (A) on the step motor shaft, a split intermediate gear with a spring between (B), and a split cog wheel with a spring between on the belt wheel (C).

There shall be some play between the cog wheels which will be absorbed by the spring pressing apart the two cog wheel halves.

When mounting the play may be set by only mounting one half of the cog intermediate gear, loosening the screws (D) and pushing the cog wheels away from each other. Thereafter mount the split cog wheels.

The spring between the cog wheel parts shall be mounted with its ends in the small holes, and the cog wheel parts shall be bent apart so that 2 of the large holes come to face each other.

NOTE! The flat cog wheels are marked with a U which shall be turned away from the other cog wheel part.

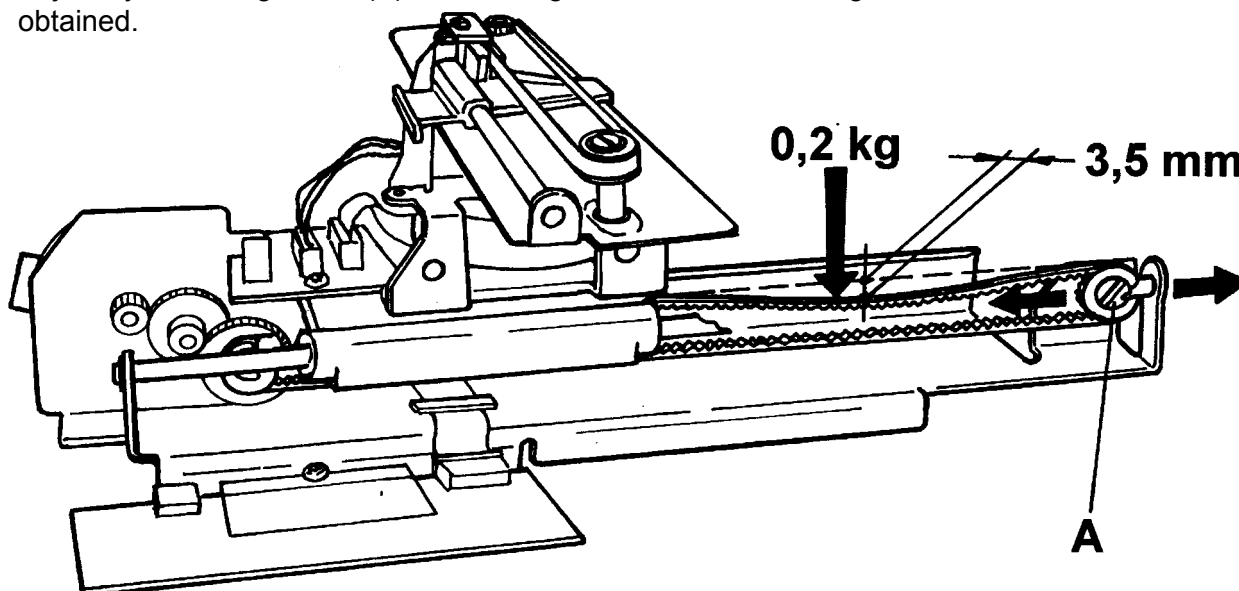


X-unit

Belt tension

The belt shall be adjusted in such a way that, when the Y-slide is in its end position, it should be possible to push in the belt approx. 3,5 mm with a force of 0,2 kg.

Adjust by loosening screw (A) and moving the belt wheel until a good belt tension is obtained.



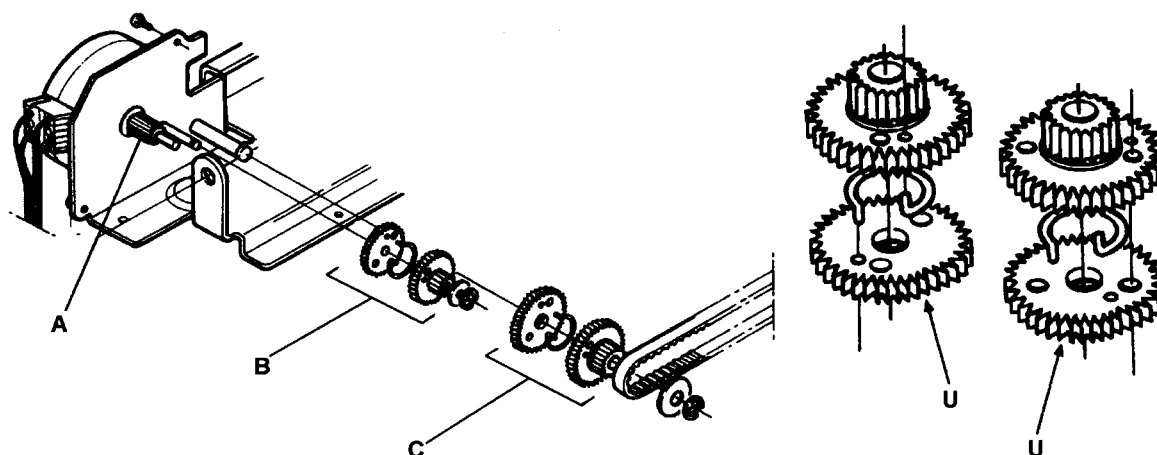
Wheel gear

The wheel gear consists of a fixed cog wheel (A) on the step motor shaft, a split intermediate gear with a spring between (B), and a split cog wheel with a spring between on the belt wheel (C).

There shall be some play between the cog wheels that will be absorbed by the spring pressing apart the two cog wheel halves.

When mounting the spring between the cog wheel parts shall be mounted with its ends in the small holes, and the cog wheel parts shall be bent apart so that 2 of the large holes come to face each other.

NOTE! The flat cog wheels are marked with a U which shall be turned away from the other cog wheel part.



Fault finding diagram - Rose Embroidery

The machine cannot read the memory card.

1. Try another memory card. If the machine reads this one, the memory card was defective.
2. If the machine does not read the second memory card. Change the circuit board of the machine.

The embroidery unit only feeds in the feeding direction of the machine.

1. Check key 28 and the adapter in the socket of the machine for the embroidery unit according to the service program.
If ER is shown. A. Check the cables of the machine.
B. Replace the circuit board of the machine.
2. If OK is indicated the machine is OK and the fault is in the embroidery unit.
3. Check all the cables and cable connections of the embroidery unit.
4. Check key 26 according to the service program. If there is no sideways movement, replace the circuit board of the embroidery unit.

The embroidery unit only feeds sideways.

1. Check key 28 and the adapter in the socket of the machine for the embroidery unit according to the service program.
If ER is shown. A. Check the cables of the machine.
B. Replace the circuit board of the machine.
2. If OK is indicated the machine is OK and the fault is in the embroidery unit.
3. Check all the cables and cable connections of the embroidery unit.
4. Connect the embroidery unit and check key 27 according to the service program. If there is no movement in the feeding direction, replace the circuit board of the embroidery unit.

The embroidery unit does not feed at all.

1. Check key 28 and the adapter in the socket of the machine for the embroidery unit according to the service program.
If ER is shown. A. Check the cables of the machine.
B. Replace the circuit board of the machine.
2. If OK is indicated and the diodes do not emit light. Replace the circuitboard of the machine.
3. If OK is indicated and the diodes of the adapter emit light, the machine is OK and the fault lies in the embroidery unit.
4. Check all the cables and cable connections of the embroidery unit.
4. Connect the embroidery unit and check key 26 and 27 according to the service program. If there is no movement at all, replace the circuit board of the embroidery unit.

The machine does not stop when the upper thread runs out or breaks.

1. Check key 23 according to the service program.

A number is shown in the right corner of the display. If it switches between 2 different positions ("0" and "1") while moving the thread take-up spring up or down, the function is correct.

If the result is OK.

Check the setting of the thread take-up spring and the thread tension.

If the result is not OK according to the service program.

2. Check the screen between the photo diode of the upper thread guard and its easy running.

3. Check the cables to the upper thread guard.

4. Try a new upper thread guard.

5. Replace the circuit board.

The embroidery unit does not sew the design correctly.

1. Check the movements of the embroidery unit by means of the keys 26 and 27 service program.

2. Sew stitch no 9 of the cassette 1.

If this stitch is not OK.

3. Make sure there is no sluggish running or play of the embroidery unit.

4. Check all the cables and cable connections of the embroidery unit.

5. Check the belt tensions of the embroidery unit.

6. Check the thread tension of the machine.

7. Check if there is a dissonance at the final position of the embroidery unit when switching it on.

If that is the case try a new circuit board (containing photo diodes) in the embroidery unit.