

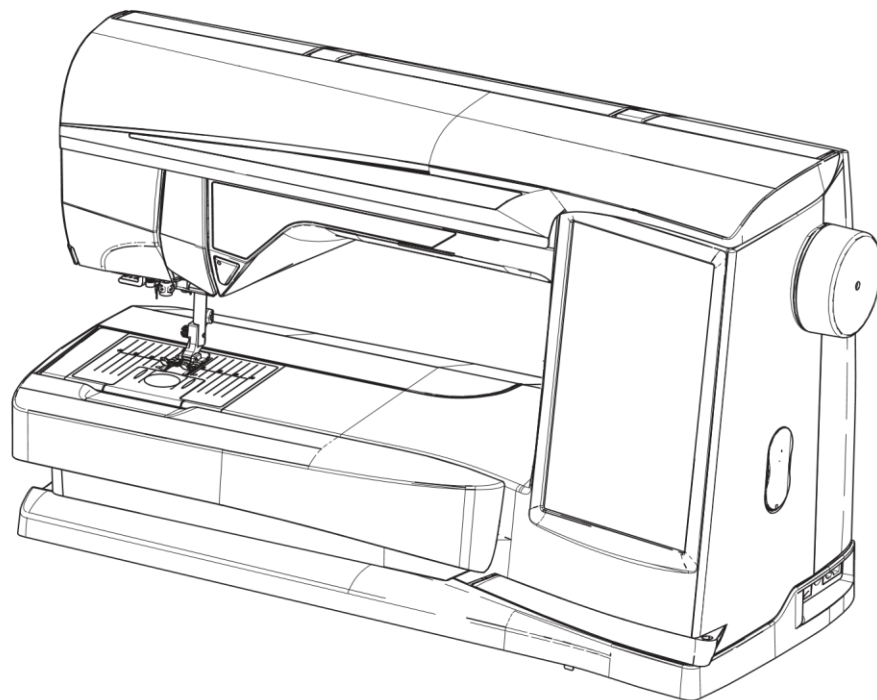
# Manualoader

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# SERVICE MANUAL



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## Directions for use

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

The manual is divided into six 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 the service program.

The third section covers removal and mounting of covers.

The fourth section covers dismantling and mounting of internal parts.

The fifth section covers the embroidery unit.

The sixth section covers fault finding.

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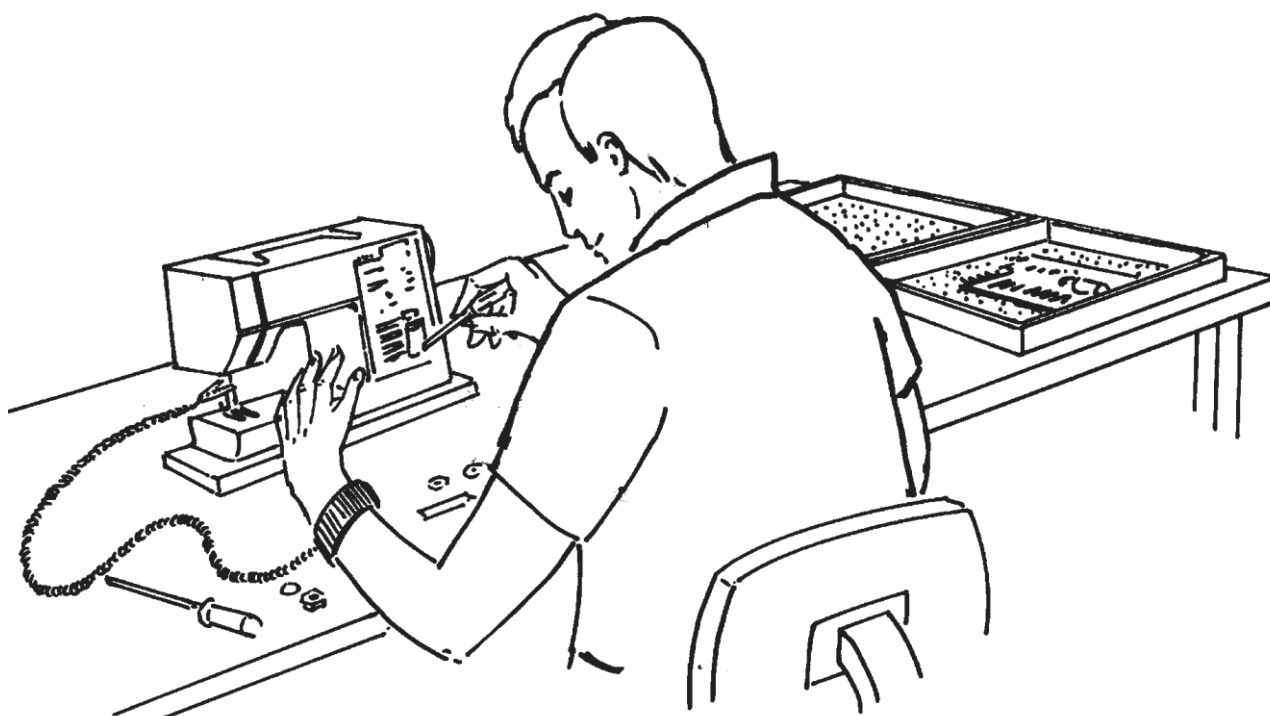
The diagrams only give indication as to where the detail or mechanism is located in the machine. For more detailed information regarding the construction, etc., refer to the diagrams in the spare parts list.

## 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). 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 and a ESD mat when servicing.



## 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.

Ref. No 63-102600-18/000 Spacer

Ref. No 61-111600-02/000 Feeler gauge 2.5 Ref. No 413 10 22 - 01 Needle clamp

3. Gauge for the feed dog lift. Ref. No 413 12 73-01

4. Gauge for the needle height. Ref. No 412 35 29-02

5. Allen key 2.5 mm

Ref. No 411 86 01-01

6. Allen key 2 mm

Ref. No 411 86 00-01

7. Allen key 1.5 mm

Ref. No 411 66 89-01

8. Allen key 4 mm

Ref. No 74-33006-27/000

8. Distance gauge 0.05-1.00 mm Ref: No. 412 38 85-01

9. Angled key Torx 6 Ref No 412 27 67-01

10. Screwdriver Torx 8

Ref. No 74-34008-41/000

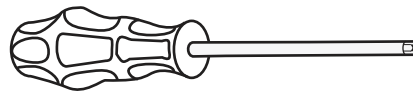
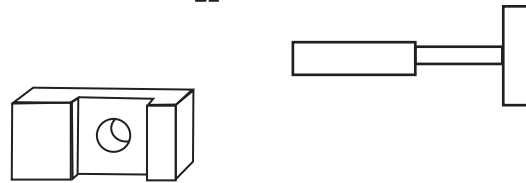
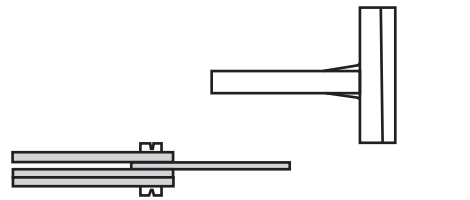
11. Screwdriver Torx 10 Ref. No 412 36 48-01

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

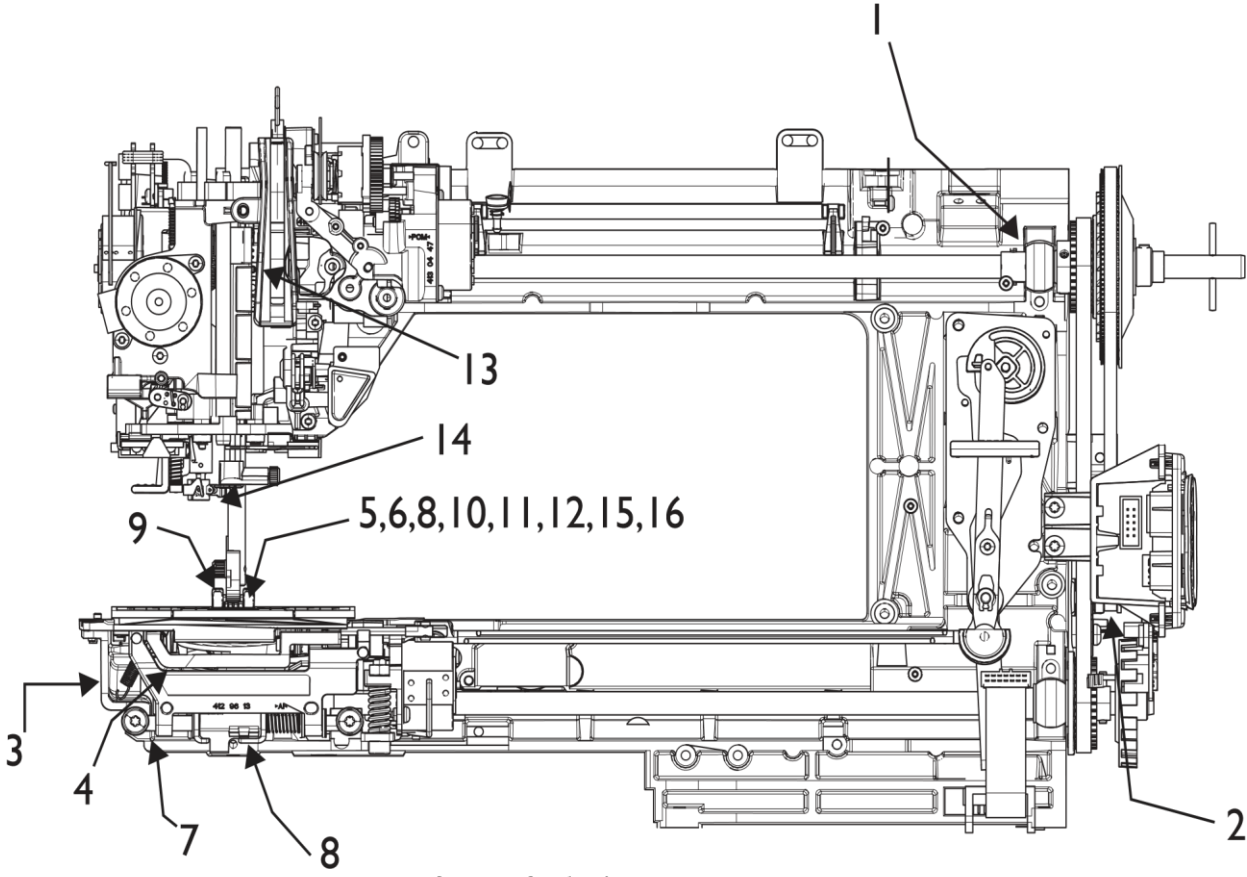
13. Screwdriver Torx 25 Ref. No 412 36 50-01

14. Service DVD Designer Diamond - European Version (for PAL TV and DVDs) Ref. No 4132380-26

15. Service DVD Designer Diamond - US/CANADA Version (for NTCS TV and DVDs) Ref. No 4132380-27



# Settings



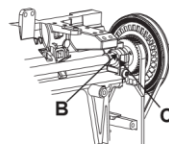
*Settings - Quick reference*



## Settings - Quick reference

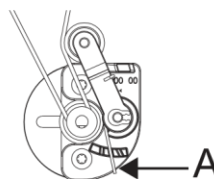
### 1. Belt tension, drive belt

The belt tension shall be adjusted by turning the eccentric bearing (B) until a firm belt tension is obtained.



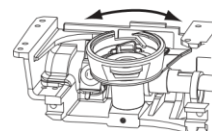
### 2. Belt tension, motor belt

The belt tension spring (A) should normally be positioned in middle slot on the belt tension device.



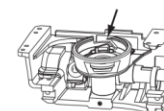
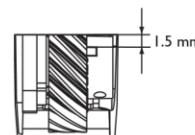
### 3. The play of the hook gear

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.



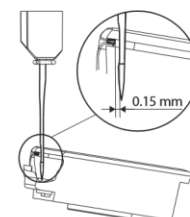
### 4. Setting the hook in relation to the feeding eccentric (after feeding).

The position of the pin (C) shall be 1.5 mm from the top of the frame opening when tip of hook is straight back.



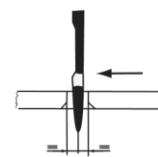
### 5. The gap between the needle and the hook.

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



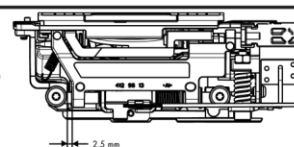
### 6. Setting the needle plate (the hook cover) in relation to the needle in the feeding direction.

The needle should, the feeding direction, descend right into the middle of the needle hole of the needle plate.



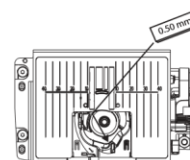
### 7. Setting the feed unit sideways

The clearance between The Feed unit and the casting, should be 2.5 mm.



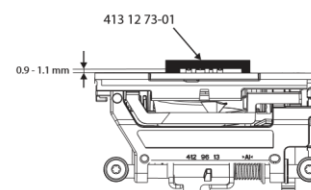
### 8. The height of the hook

The distance between the bobbin case and the case holder should be 0.5 +



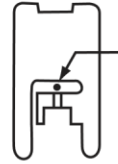
### 9. Feed dog height

When Feed dog teeth are in its highest position they should be 0.9-1.1 mm above the needle plate.



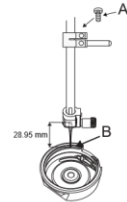
**10. Setting the needle in centre position**

The needle should always get to the centre position, when the zig zag step-motor is calibrated.



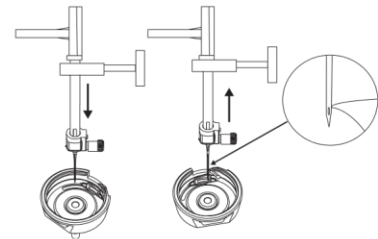
**11. The needle bar height**

When the needle bar is in its lower turning position the distance between the upper end of the needle and the surface (B) of the hook ring should be 28.95 (+ 0.2 mm).



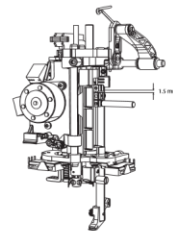
**12. The timing of the hook in relation to the needle**

When the needle is in its centre position and 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.



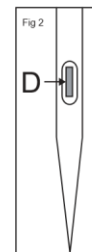
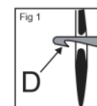
**13. Needle threader stop**

The distance between the Cross head and the needle threader stop should be 1.5 mm (+0.5 mm).



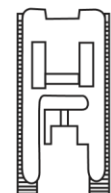
**14. Threading device**

With a new # 70 needle the threader hook should go smoothly into the needle eye.



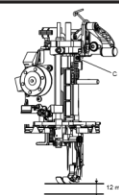
**15. Presser foot parallelism to the feed dog**

The presser foot should be parallel to the feed dog.



**16. Presser foot height to the needle plate**

When the presser foot is in its highest lifting position it shall be approx. 12 mm above the needle plate.



**17. Measure height (TP)**

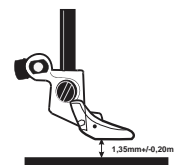
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Is used to set the electronic distance between the highest and lowest position of the presser bar. This setting should only be carried out if the setting 15. Presserfoot parallelism, 16. Presser foot height has been re-set or if the Pc-board has been changed.

**18 . Pivot height**

When the presser foot "R" is in its "Pivot" position the distance between the lower side of presser foot "R" and the needle plate should be 1.35 mm +/-0.20 mm.



**19 and 20. Stitch length balance**

The Flower stitch shall look according to illustration.



**21. Lower thread tension (thread tension of the bobbin case)**

The thread tension spring of the bobbin case shall give a resistance of 12 - 20 g when pulling the thread slowly, using normal polyester thread.

**22. HIGHER Upper thread tension - Hi Tension**

When normal stitch is selected a correct thread tension take-up should be obtained at straight stitching and zig-zag using normal cotton fabrics and polyester thread.

**23. HIGHER Upper thread tension - Extra Hi Tension**

The thread tension should be 170 grams. Use a weight (170g), attach the thread to the weight. Touch "close discs" the thread and the weight should not move.

**24. LOWER Upper thread tension - Lo Tension**

When e.g. satin or embroidery is selected a correct thread tension take-up should be obtained.

**25. Upper thread tension - Position Cut Tension**

Cut Tension menu is for setting the upper thread tension when cutting the thread.

In the service program - "Lo Tension" menu and Sub menu "Cut Tension" touch "Close Disc".

**26. Setting the thread take-up spring**

The thread take-up spring should have completed its movement when the the needle eye reaches the fabric. The check has to be carried out at straight stitching and using normal cotton fabrics and polyester thread.

**27. Pre-setting step motor for the feed dog lowering**

In Service program - Motor Control menu - Side motion/Feed dog drop sub menu, touch button "Feed Dog Drop" . The feed dog should now drop down under the stitch plate.

**28. Setting the feed dog in relation to the needle plate**

Enter service program - Motor Control - Side motion/Feed dog drop sub menu , Touch button "Left Pos". Turn the hand wheel in such a way that the step motor changes between its 2 positions. The feed dog should not at any point touch the needle plate. In the service program - Motor Control - Side motion/Feed dog drop sub menu Touch button "Right Pos" in Side motion/Feed dog drop sub menu. Turn the hand wheel in such a way that the step motor changes between its 2 positions. The feed dog should not at any point touch the needle plate.

**29. Feed Dog Lowering**

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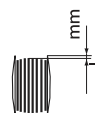
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Enter service program - Motor Control menu. Set the Needle in its highest position. In Side motion/Feed dog drop ,Touch button "Feed Dog Drop" and the feed dog should drop down.

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### 30. Disconnection when winding the bobbin

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



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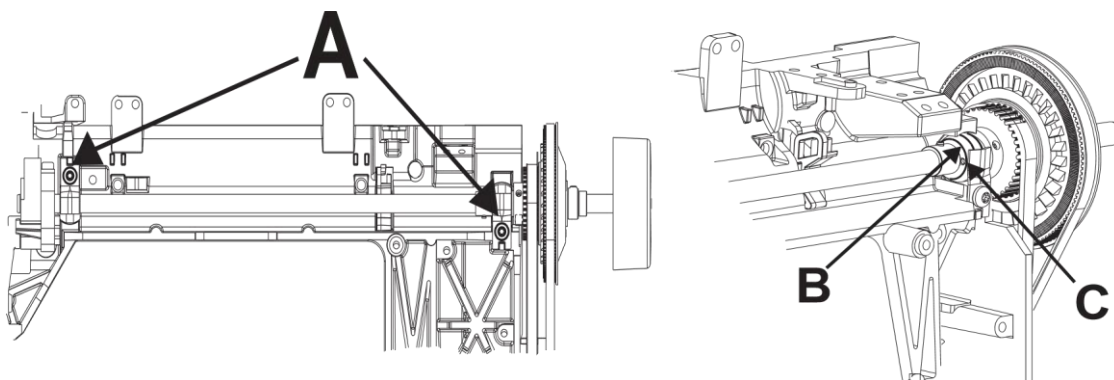
104 72 94-26

9

*Settings*

## I. Belt tension -drive belt

1. Remove rear cover and front cover.
2. Loosen the two screws (A) of the bearing clamps.
3. The belt tension can now be adjusted by turning the eccentric bearing (B) until the belt tension is firm.



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

## 2. Belt tension -motor belt

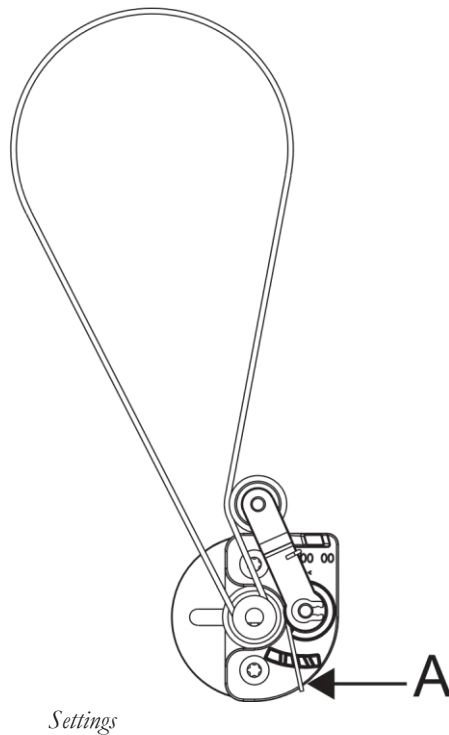
1. Remove rear cover.
2. Move the tension spring (A). The belt tension spring (A) should normally be positioned in middle slot on the belt tension device.

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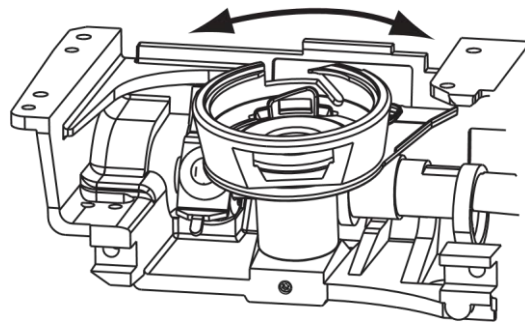


### 3. The play of the hook gear

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

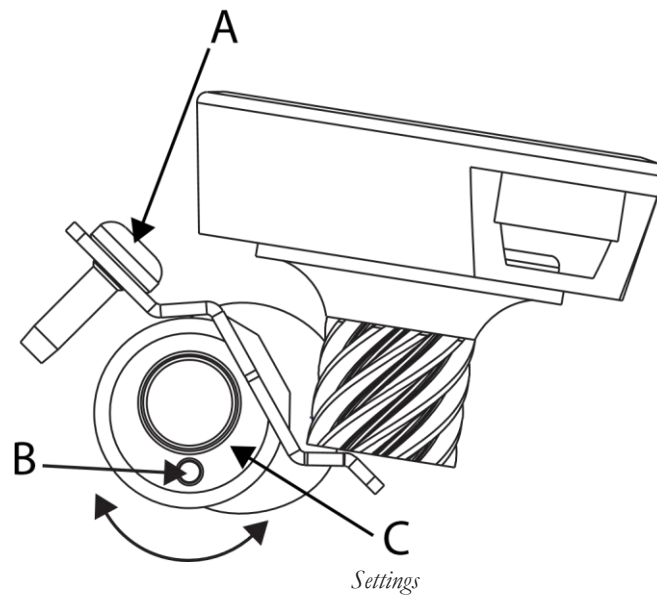
1. Rotate the hook back and forth and check the play.
  2. Do this check on at least 3 different spots during the revolution of the cog wheel.
- (Move the cog wheel using the hand wheel).



#### Adjustment

1. Remove backcover, frontcover and the hookcover.
2. Loosen, screw (A) holding the bearing clamp
3. 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.



#### 4. Setting the hook in relation to the feeding eccentric (After feeding)

##### 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 of the worm gear (C) should now be positioned according to fig. below.

**Note!** The position of the pin shall be 1.5 mm from the top of the frame opening.

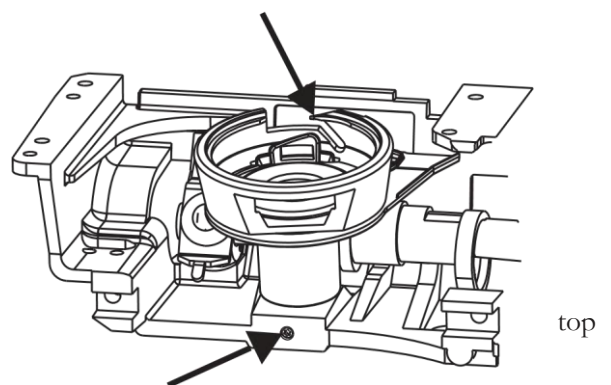
##### Alt. Check

1. When the pin of the worm gear are positioned according to the figure the tip (A) of the hook

**Note!** The position of the pin shall be 1.5 mm ! should point straight backwards. from the top of the frame opening.

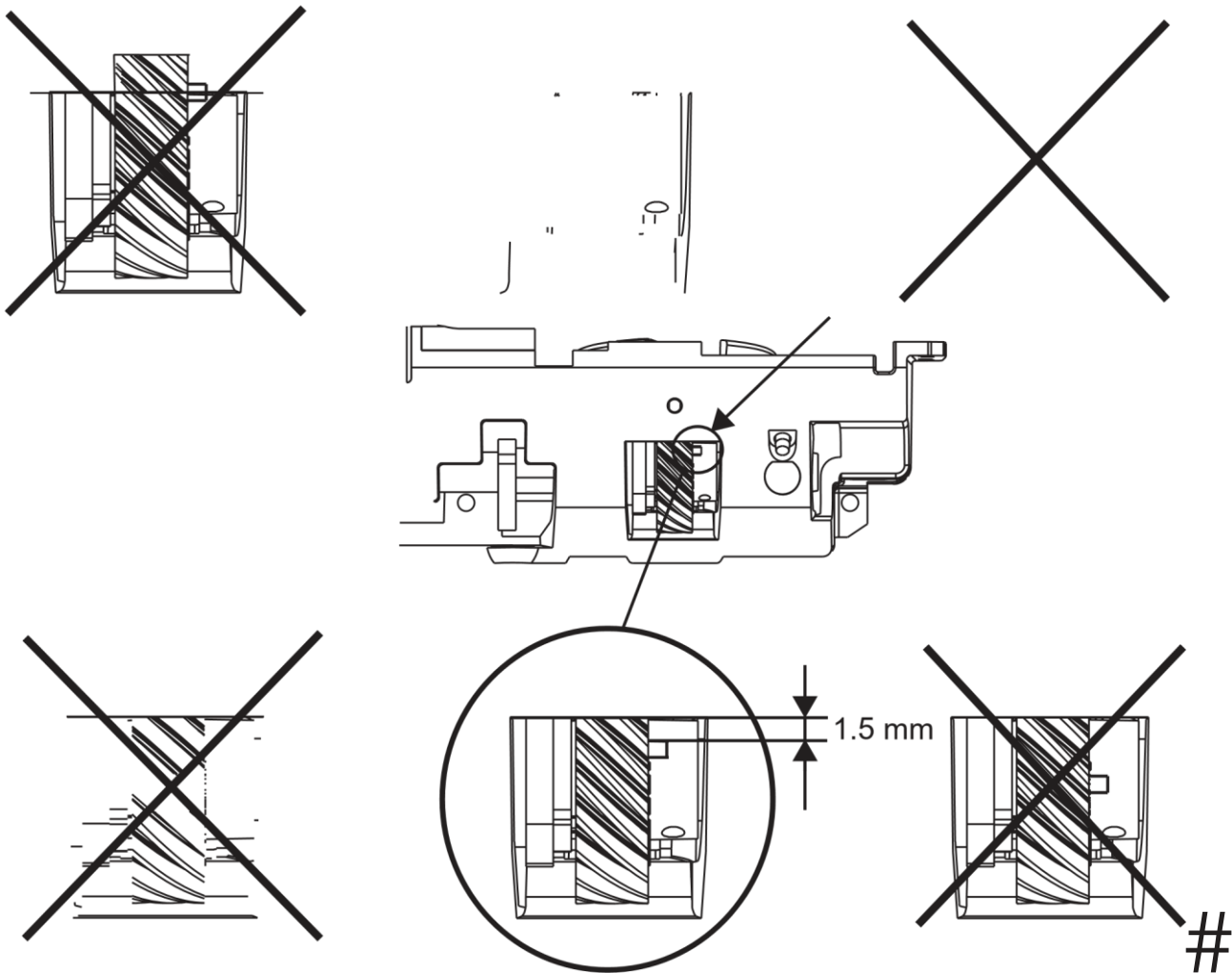
##### Adjustment

1. Remove the back cover, front cover and hook cover.
2. Loosen screw (B) and remove the hook.
3. Position the cog wheel so the pin is 1.5 mm from the of the frame opening by turning the hand wheel.
4. Mount the hook.



||

5. Mount the hook cover, back cover and front cover.



Note! The position of the pin shall be 1.5 mm from the top of the frame opening.

*Settings*

## 5. The gap between the needle and the hook

### Check

1. Set the machine on straight stitching.
2. Insert a new needle size 90 universal in the machine.
3. Rotate hand wheel until the tip of the hook arrives behind the needle.
4. 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



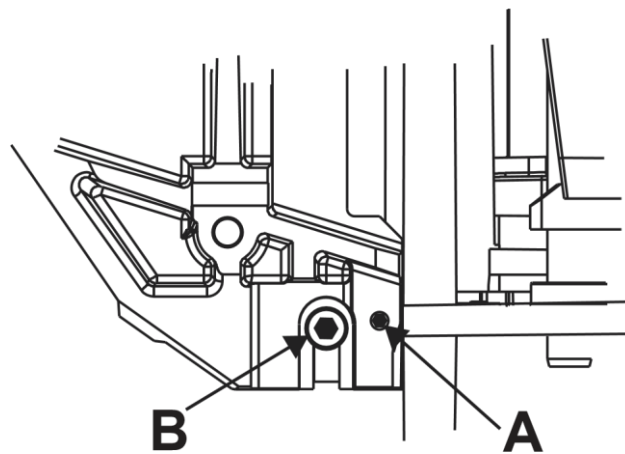
Remove the backcover.

If the gap is too large:

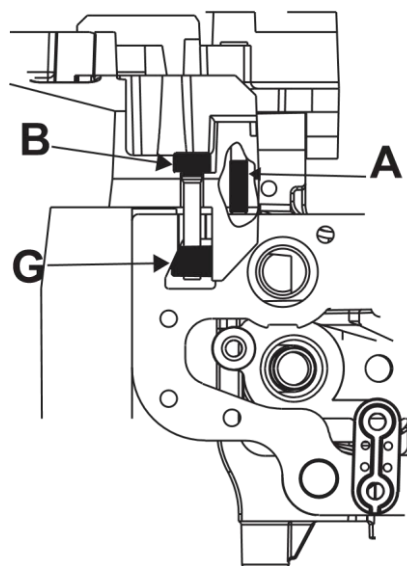
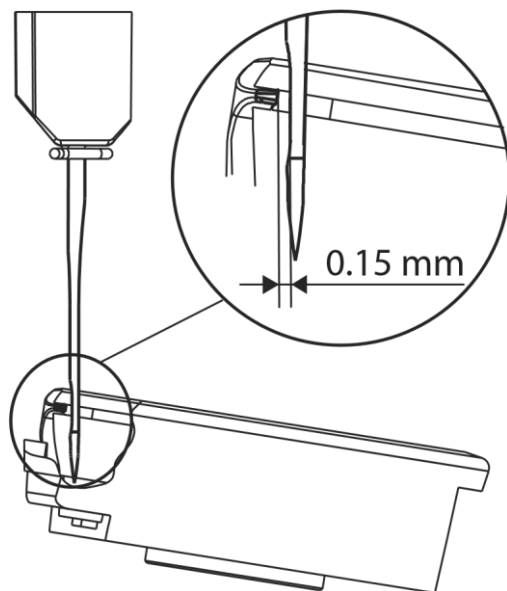
1. Loosen the screw (A).
2. Turn screw (B) clockwise until the needle touches the tip of the hook.
3. Turn screw (A) until the gap is correct.

If the gap is too small:

1. Loosen the screw (B)
2. Turn screw (A) to make the gap larger and then loosen the screw (A) again.
3. Turn screw (B) clockwise until the needle touches the tip of the hook.
4. Turn screw (A) until the gap is correct.



**NOTE!** The setting should be performed so the needle ALWAYS is pushed away from the tip of the hook.

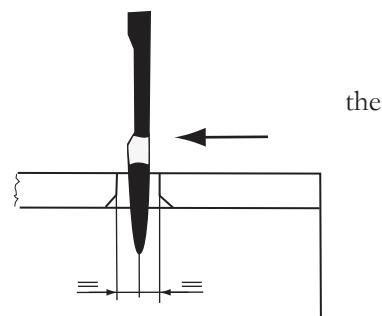


*Settings*

## 6. Setting the needle plate (the hook cover) in relation to the needle in the feeding direction.

**Check**

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

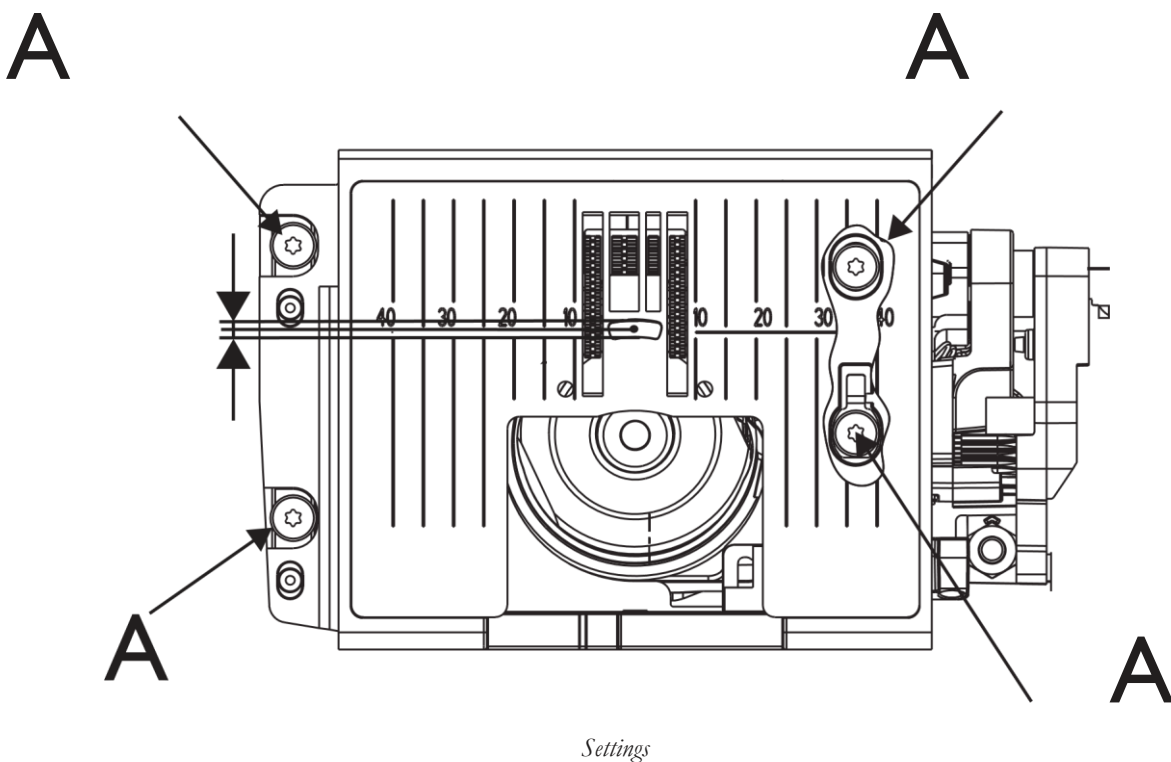


**Adjustment**

Loosen the 4 screws (A) of the hook cover and move it so that:

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- the needle sideways descends in the middle of the needle plate.



## 7. Setting the feed unit sideways

Remove back and frontcovers. **Check**

1. The clearance between the feed unit and the casting, should be 2.5 mm, as indicated.

### **Adjustment**

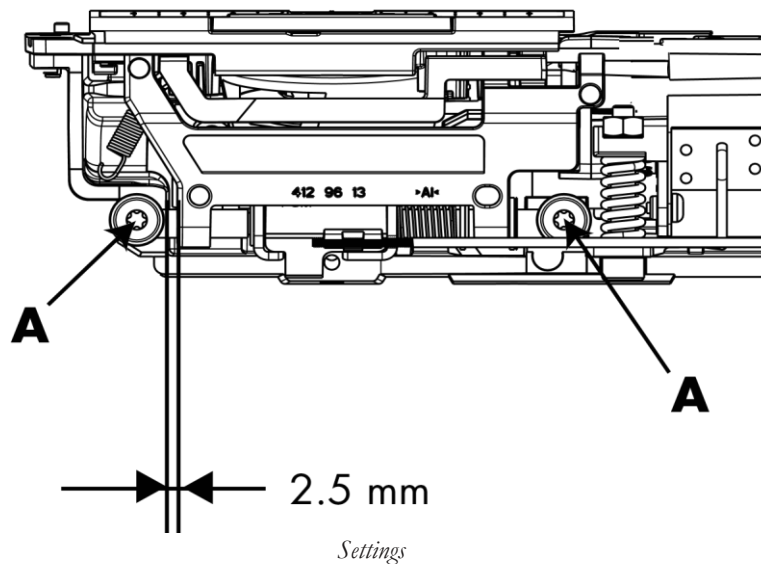
1. Disconnect the feed dog lowering rod 2. Loosen the two screws (A) of the feed unit.

3. Move the feed unit sideways until a distance of 2.5 mm is obtained according to the below figure.

4. Tighten the two screws (A).

### **Check and set**

Setting 21. Setting the feed dog in relation to the needle plate. Setting 22. Feed dog lowering.



## 8. The height of the hook

The height is checked between the bobbin case and the case holder.

### 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 position according to fig. 1.

### Adjustment

1. Remove back and frontcovers.
2. Loosen screw (A).
3. Push the bobbin case down with a finger.
4. Put a 0.6 mm feeler gauge between the bobbin case and the bobbin case holder.  
Place it where the threading arrow is located on the bobbin case holder.
5. Lift away the finger. A spring is pushing the hook upwards; make sure that it rotates up so it is positioned against the feeler gauge.
6. Tighten the screw (A).
7. Re-check the setting, now with a 0.5 feeler gauge. It shall go in, but a small resistance shall be felt.
8. Mount back and frontcovers.

**NOTE!** This setting affects: 11. The needle height  
12. The timing of the hook and the needle

Check with distance gauge 412 38 85-01.

fig. 1

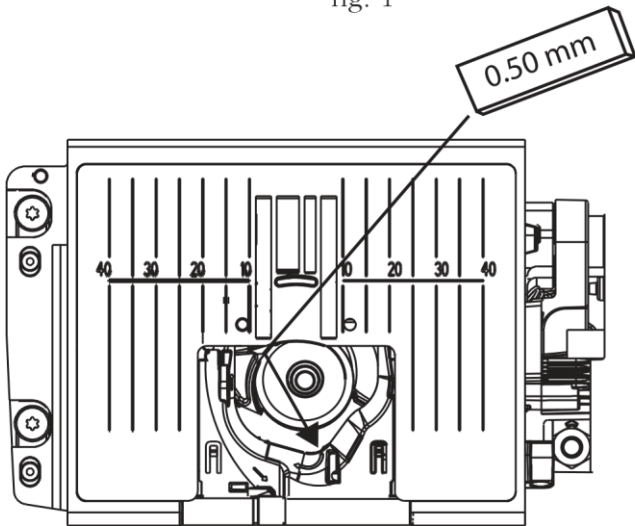
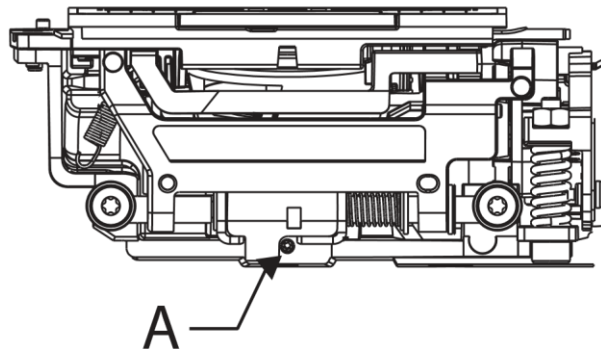


fig. 2



*Settings*

## 9. Feed dog height

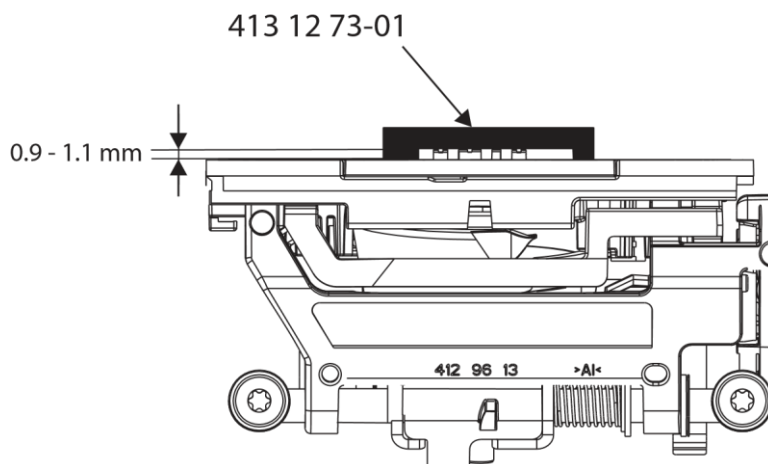
### Check

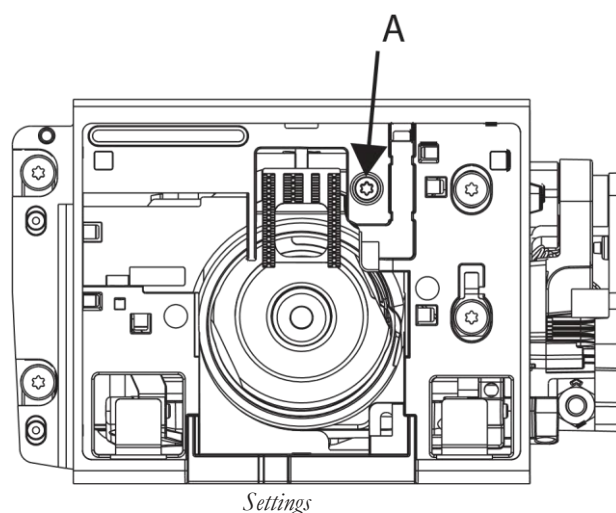
1. Bring the feed dog to its highest position.
2. The top of the feed dog should be 0.9-1.1 mm above the needle plate.

Check with setting gauge 413 12 73-01

### Adjustment

1. Bring the feed dog to its highest position.
2. Remove the needle plate.
3. Adjust with a Torx 10 the adjustment nut (A) until a correct feed dog height (0.9-1.1 mm) is obtained.  
Turn Clockwise : - it will be higher  
Turn Anti-Clockwise : - it will be lower
4. Mount the needle plate and check the height.





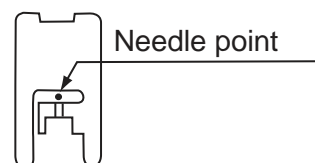
## 10. Setting the needle in centre position

### Check 1

1. Insert a new needle size 90 universal in the machine.
2. The needle should always go to its centre position, when the machine is switched on repeatedly.

### Check 2 - using service program

1. Enter the service program - Motor Controls menu.
2. Touch button "Calibrate" in Needle sub menu repeatedly - The needle should always go to its centre position in the A presser foot.



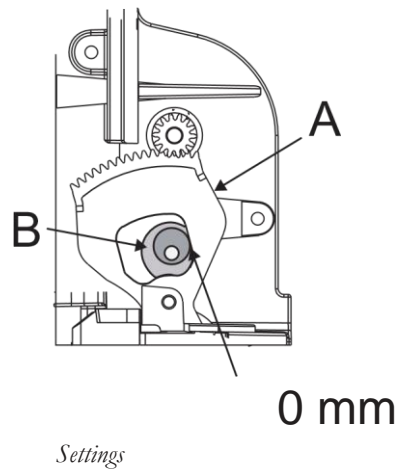
### Check the gap between the segment (A) and the calibration stop (B).

1. Enter service Program - Motor Controls menu.
2. Touch button "Calibrate" in Needle sub menu - Needle should go to its centre position in the A-presser foot.
3. Touch button "Cal Pos" in Needle sub menu - The needle shall now take its calibration position.(left of centre position)

The gap between the segment (A) and the calibration stop (B) should now be zero (0 mm).

4. Touch button "Cal Pos -1" in Needle sub menu - If the gap is ZERO (0 mm), the needle should not move in any direction.
5. Touch button "Calibrate" in Needle sub menu - Needle should go to its centre position in the A presser foot.
6. Touch button "Cal Pos" in Needle sub menu - The needle shall now take its left position.
7. Touch button "Left Pos" in Needle sub menu - If the gap is correctly set, the needle should now move one small step to the right.

NOTE! The position of the eccentric of the calibration stop (B).



## Adjustment

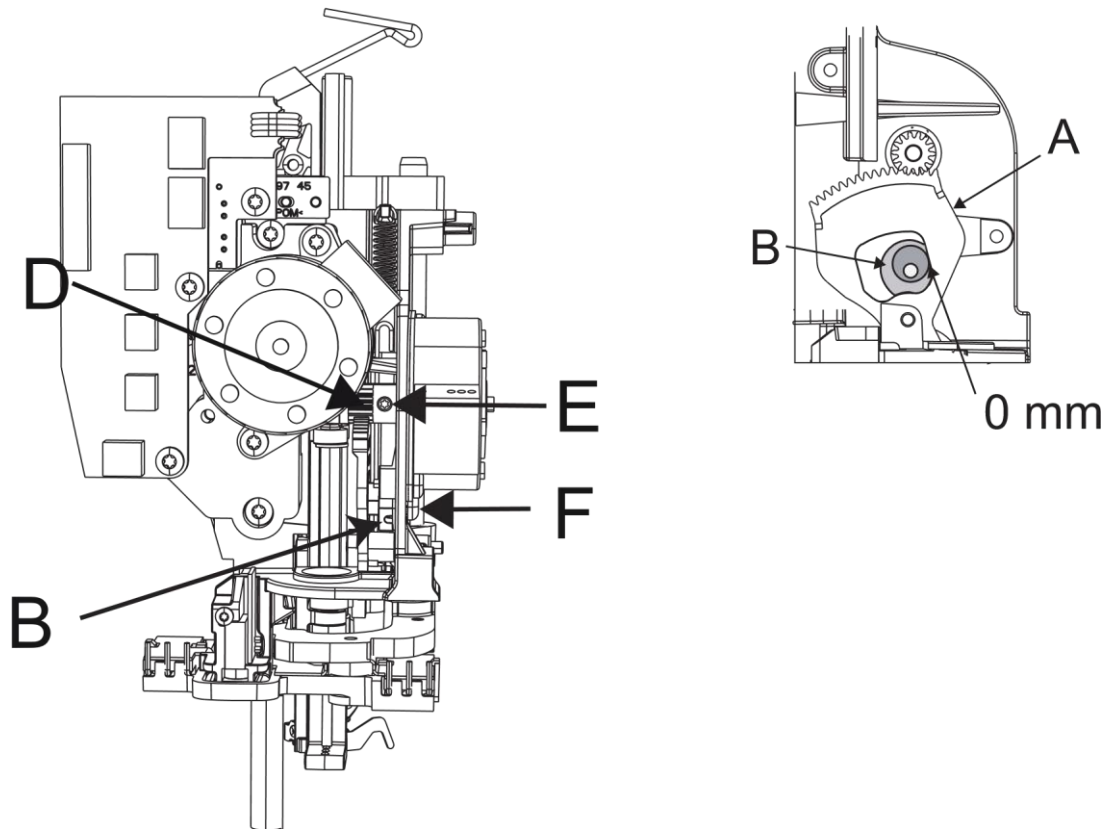
NOTE! To set the Centre position, all covers must be removed.

The front cover should be used as a service panel and should stand on the side of the machine and the cables between the front cover and pc-board must be connected.

1. Loosen screw (E) on the cog wheel (D) on the step motor shaft.
2. Enter service program - Motor Controls menu.
3. Touch button "Centre Pos" in Needle sub menu, step motor now goes to its electronic centre position.
4. Turn the cog wheel until the needle is in the centre of the A-presser foot.
5. Tighten screw (E).
6. Loosen screw (F) of the calibration stop (B).
7. Remove the A-presser foot.
8. Touch button "Cal Pos" in Needle sub menu. the step motor goes to its calibration position against the calibration stop (B).
9. Turn the calibration stop (B) until the gap between the calibration segment and the calibration stop is correct = 0 mm.
10. Tighten the screw (F).

NOTE! The position of the eccentric stop.

11. To check if the gap is 0mm, touch button "Cal Pos-1" in Needle sub menu - If the needle does NOT move in any direction, it is zero mm (0 mm) between calibration stop and cog segment.
12. Touch button "Calibrate" in Needle sub menu - Needle moves to centre position in the presser foot.
13. Touch button "Cal pos" in Needle sub menu - The needle shall now take its left position.
14. Touch button "Cal Pos-1" in Needle sub menu - If the gap is correctly set, the needle should now move one small step to the right.
15. If one of point 8 or 11 are wrong - Touch button "Calibrate" in Needle sub menu.
16. Re do from point 3.



*Settings*

## I I. The needle bar height

### Check

1. The needle shall be in its centre position, straight stitching.
2. Bring the needle bar to its lower turning position.
3. The gap between the upper end of the needle and the surface (B) of the hook ring should be 28.95 (+ 0.2 mm).

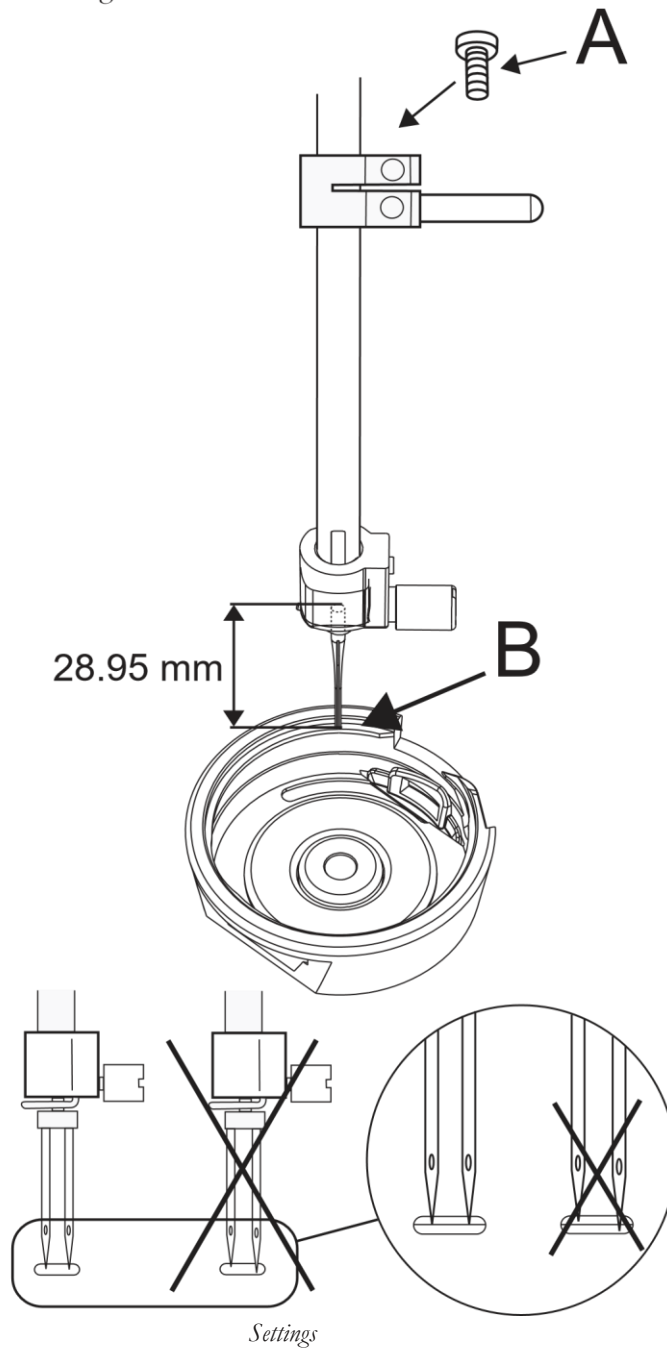
The check is executed with needle bar height gauge which is 28.95 mm long. Order nr. 412 35 29 - 02

### Adjustment

1. Bring the 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, it may

cause jump stitches when sewing with a twin needle.



## 12. The timing of the hook in relation to the needle

### Check

- Set a new needle size 90 universal into the machine.
- Remove the needle plate, bobbin case holder and the bobbin case.
- Set machine on straight stitching.
- 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!** Before any adjustment is done check that the setting "4. Setting the hook in relation to the feeding eccentric" is correct.

**Check with setting gauge, Ref. No: 63-102600-18/000 Spacer, Ref. No: 61-111600-02/000**

**Feeler gauge 2.5, Ref. No: 413 10 22-01 Needle clamp**

1. Turn the hand wheel until the needle is at its lower turning position.
2. Put the spacer onto the needle bar and push it upwards against the needle bar frame (C).



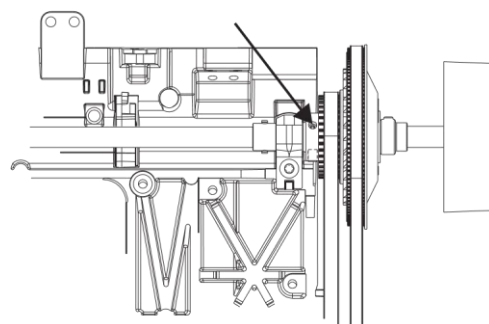
3. Take then the timing clamp and put it on the needle bar and tighten its screw lightly.
4. Take the 2.5 mm feeler gauge and put its cutout on the needle bar, above the clamp.
5. Loosen the clamp a little and push both feeler gauge and clamp upwards against the spacer.
6. Tighten the screw on the timing clamp.
7. Remove the 2.5 mm feeler gauge.
8. Turn the hand wheel, in the sewing direction, until the timing clamp stops against the spacer.
9. The tip of the hook should now be behind the centre line of the needle.

### Adjustment

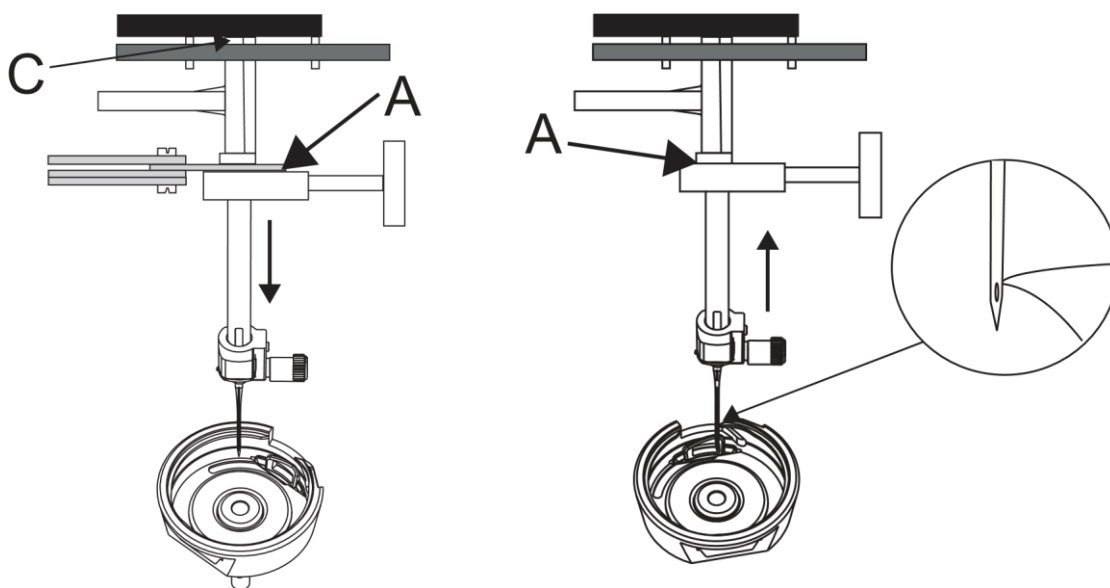
1. Remove the blank pointed screw (B) and loosen the other 2 screws in the belt wheel of the arm shaft.
2. Make sure that the feed dog is in its down stroke position.

**B**

3. Repeat checking points 1 to 8 with the setting gauges.
4. Hold the arm shaft and turn the hook until its tip arrives behind the centre line of the needle. 5. Tighten one of the black screws.
6. Make sure the screw descends into the groove of the shaft so that the belt wheel is placed correctly sideways.
7. Check.
8. Tighten all the screws.



**NOTE! Change the position of the Arrowed silver screw and the second black screw.**



*Settings*

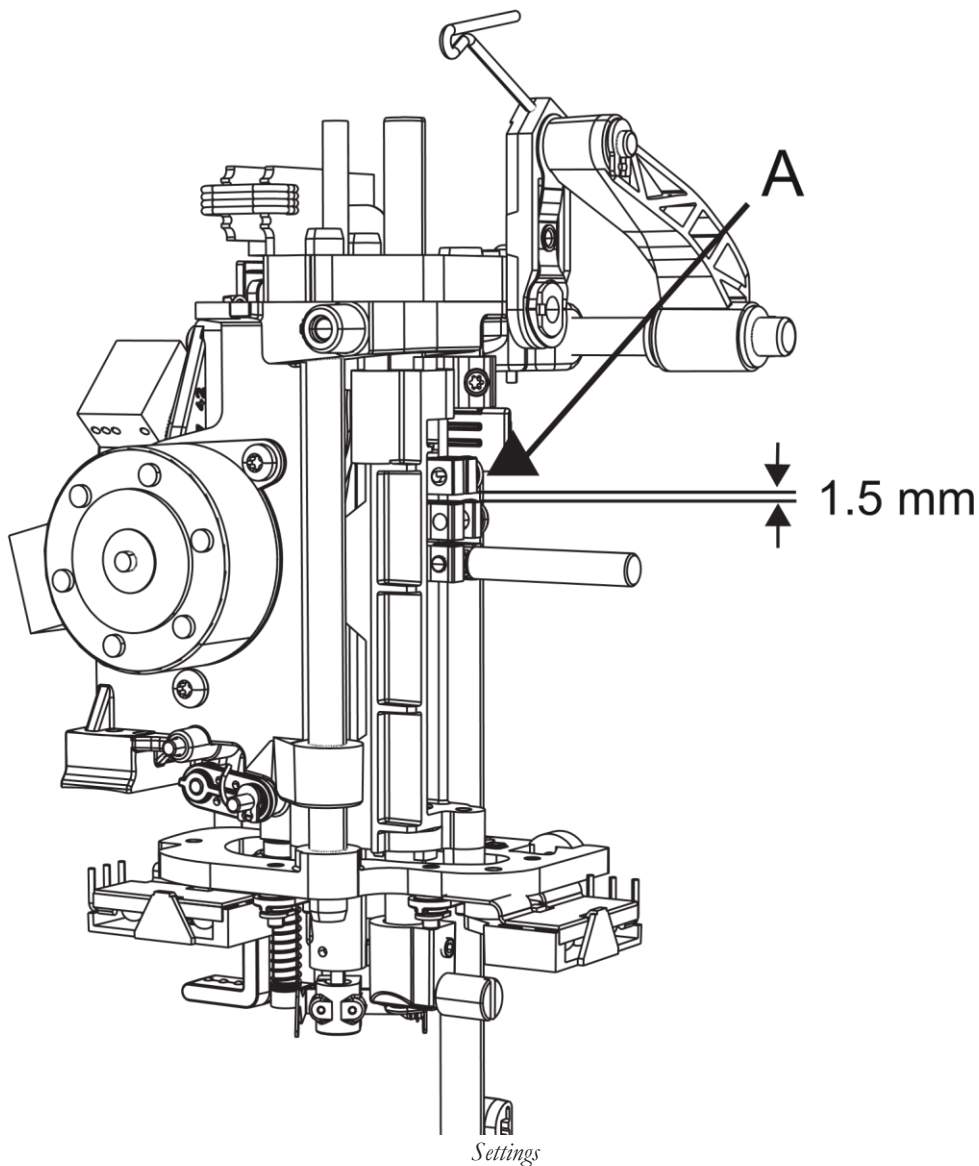
## 13. Needle threader stop

### Check

The distance between the Cross head and the needle threader stop should be 1.5 mm.

### Adjustment

1. Loosen screw (A) and move the needle threader stop until the correct measure is obtained.
2. Tighten the screw.



## 14. Threading device

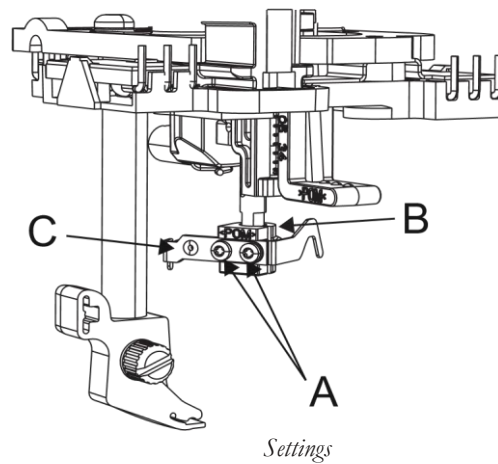
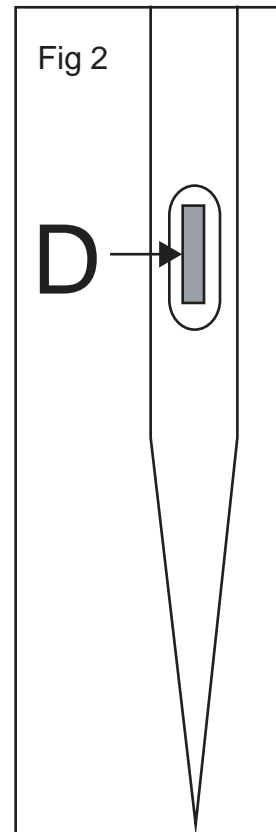
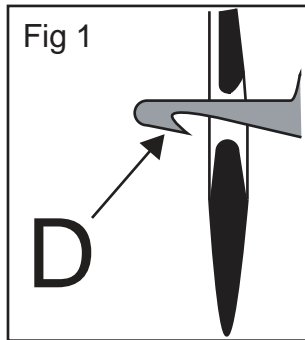
### Check

1. Insert a new # 70 needle.
2. Bring the needle bar to its highest turning position.
3. The threader hook shall go smoothly into the needles eye. See Fig 1 and Fig 2.

### Adjustment

1. Loosen the two screws (A) on the back of the threader head (B).
2. Move the white needle thread head (B) so that the threader hook (D) does not touch the needle eyes inside up or down (See fig 1)
3. Move the silver looking needle thread hook holder (C) so that the threader hook (D) does not touch the needle eyes inside sideways (See fig 2).
4. Tighten the screws.

NOTE! Both settings are adjusted at the same time



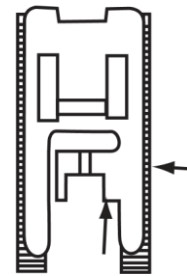
## 15. Presser foot parallelism to the feed dog

### Check

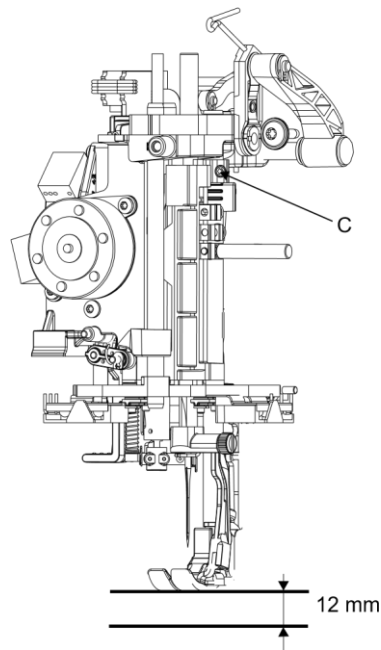
The presser foot (A) should be parallel to the feed dog (B).

### Adjustment

1. Remove the Thread tension unit. **B**
2. Loosen screw (C) and turn the presser foot until it is parallel to the feed dog.
3. Tighten the screw (C).
4. Mount the thread tension.



**A**



## 16. Presser foot height to the needle plate

### Check

When the presser bar is in its highest lifting position it shall be approx. 12 mm above the needle plate.

### Adjustment

1. Set the presser bar in its highest lifting position, by using the function button "Presser foot up".
2. Remove the Thread tension unit.
3. Loosen screw (C) and turn the presser foot until it is parallel to the feed dog groove of the needle plate and its lifting height is approx. 13 mm.
4. Tighten the screw (C).
5. Mount the thread tension unit.

**NOTE!** This setting affects:

- 15. Presser foot parallelism to the feed dog
- 17. Measure height (TP)

*Settings*

## 17. Measure height (TP)

Is for setting the electronic distance between the highest and lowest position of the presser bar. This setting should only be carried out if the setting 15. Presser foot height and parallelism to the needle plate has been changed or if the Pc-board has been replaced.

### Adjustment

1. Put on the presser foot A on the machine.
2. Enter the service Program - Motor Controls menu.
3. Lower the feed dog by touch "Feed dog drop" button in Side Motion/feed dog drop sub menu.
4. Touch button "Calibrate" in Presser Foot sub menu - The presser bar should now take its highest position.
5. Touch button "Measure Height TP" in Presser Foot sub menu - Presser bar takes its lowest position.

## 18. Pivot height

### Check

1. Mount presser foot "R" on to the machine.
2. Enter Service Program - Motor Controls menu.
3. Lower the feed dog by touch "Feed dog drop" button in Side Motion/feed dog drop sub menu.
4. Use the function button presserfoot down to set the presser bar to its Pivot position.
5. When the Presser bar is in its "Pivot" position the distance between the lower side of presser foot #6A and the needle plate should be 1.35 mm +/-0.20 mm.

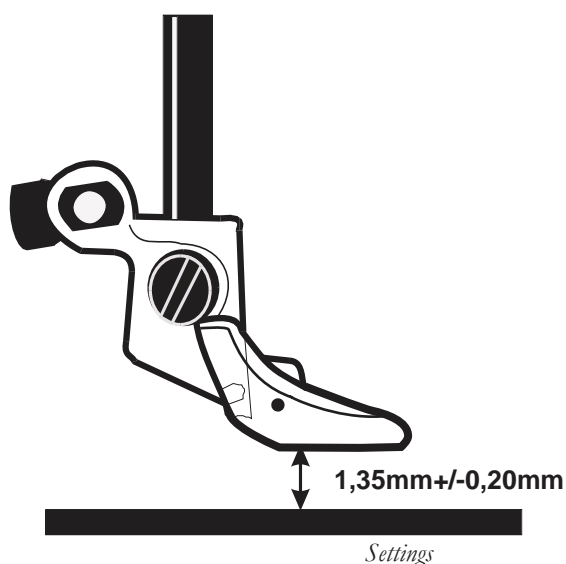
### Adjustment

1. Mount the presser foot "R" on to the machine. 2. Enter Service Program - Motor Controls menu.
3. Lower the feed dog by touch "Feed dog drop" button in Side Motion/feed dog drop sub menu.
4. Use the functions buttons to set the presser bar to its Pivot position.
5. To adjust the distance, use touch buttons + and - in Presser foot sub menu.

The adjustments can be done between -12 and +12.

The adjustment is automatically set when a key is touched, and is saved when turning off the machine.

6. Check the distance between the lower side of the presser foot R and the needle plate so that it is 1.35 mm +/- 0.20 mm.



## 19. Stitch length balance basic setting

### Check 1

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

## Check 2

1. Enter service program - Motor Controls menu
2. Insert a needle and place fabric (dual layers) under the presser foot.
3. Touch button "Zero Feed" in Feed sub menu.
4. The feed dog shall NOT move the fabrics when the foot control is pressed (0-feeding).

## Adjustment

1. Before any adjustment is carried out, ALWAYS check so that setting 20. Stitch length balance/Sidemotion balance is OK.
2. The adjustment can only be done with the feeding step motor unit removed from the machine.
3. Remove all covers, the base and the feeding step motor unit
4. Place the base with the power supply in front of the machine and connect it to the pc-board.
5. Connect the front cover to the pc-board and place it on top of the casting.
6. Loosen set screw (A).
7. Enter service program and Touch button "Cal Pos" in Feed sub menu.
8. Push the black cog segment (C) against the calibration stop (B).
9. Tighten screw (A). Mark the position of the screw (A).
10. Touch button "Calibrate" in Feed sub menu repeatedly to check that the step motor always returns to the same point.
11. Touch button "Cal Pos" in Feed sub menu. The gap between segment (C) and

calibration stop (B) should still be

Zero (0 mm) and the setting screw (A) should be lined up with the mark made in step 9.

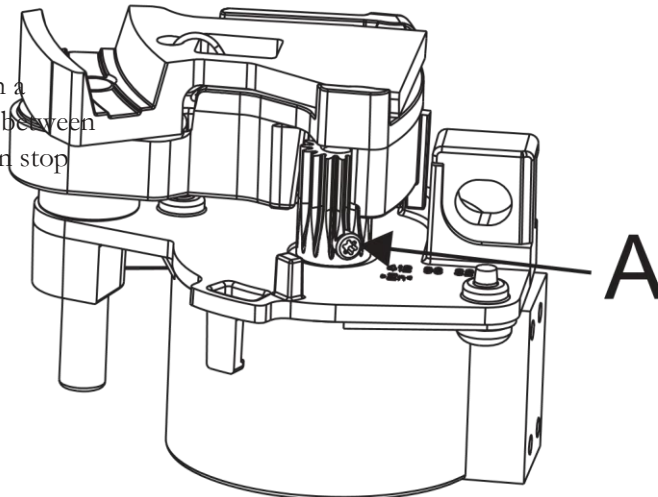
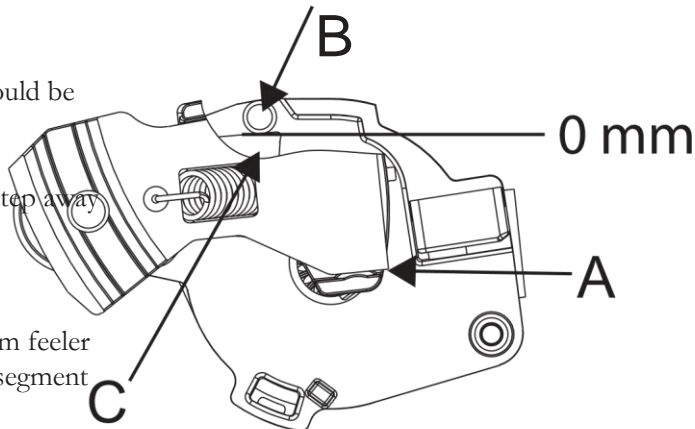
sub menu. The step motor now take one step away from the calibration stop (B).

### Check1.

Verify the setting by checking with a 0.4mm feeler gauge, it should NOT go in between the segment (C) and the calibration stop (B),

### Check 2.

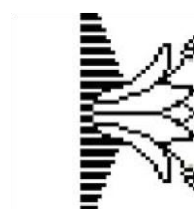
Verify the setting by checking with a 0.2mm feeler gauge, it shall go in between the segment (C) and the calibration stop (B).



## 20. Stitch length balance / Sidemotion balance

### Check

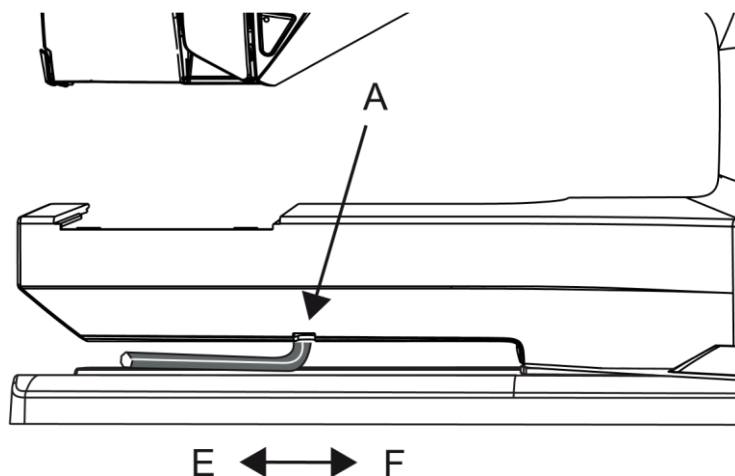
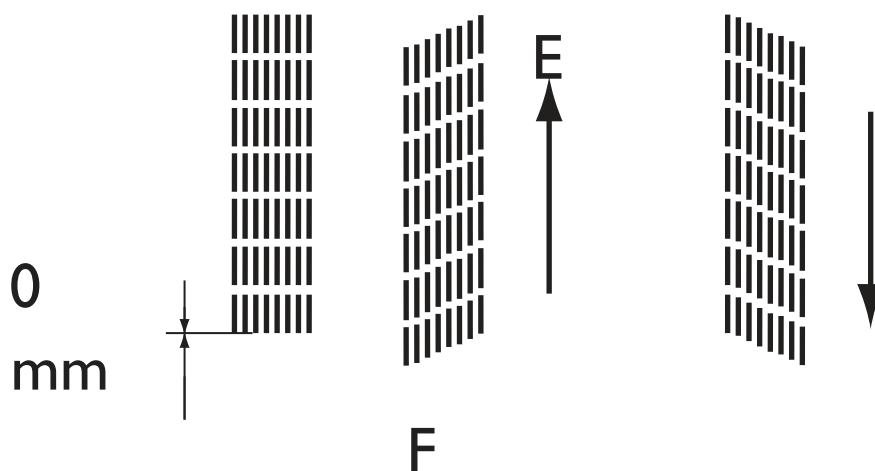
1. The "Lawn Flower" in service program - Hi Tension menu shall look according to illustration.
2. The "Flower" in service program - Hi Tension menu shall look correct.
3. Both columns of the "buttonhole" in service program - Low tension menu be of the same density.



shall

### Pre adjustment of stitch lengths

1. Choose the "Mending stitch" in service program Hi Tension menu.
2. Use Two layers of Cotton/chinos fabrics.
3. Use presser foot # 0A Foot
4. Turn screw (A) with a shortened 4 mm Allen key until the machine sews the mending stitch according to illustration 1.
  - To adjust the mending stitch in the E- direction, turn the screw (A) CLOCKWISE (E).
  - To adjust the mending stitch in the F- direction, turn the screw (A) COUNTER CLOCKWISE (F).
5. Continue to fine adjust.

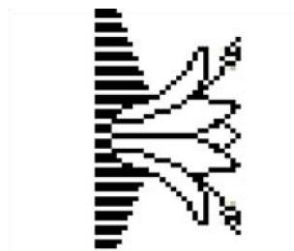


### Fine adjustment of stitch lengths balance

1. Choose "Lawn Flower" .

2. Turn screw (A) with a shortened 4 mm Allen key until the machine Flower" according to illustration.

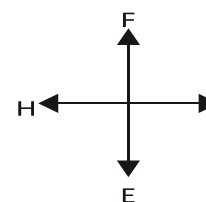
- To adjust the "Lawn Flower" in the E- direction, turn the (A) CLOCKWISE (E).
- To adjust the "Lawn Flower" in the F- direction, turn the (A) COUNTER CLOCKWISE (F).



sews "Lawn

screw

screw



### Sidemotion balance

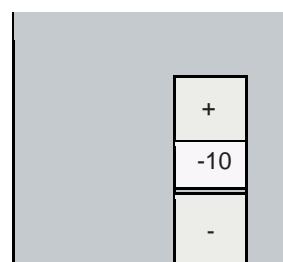
1. The adjustment of sidemotion balance is located in service program at Hi Tension menu on the lower right hand side.

"+" adjust sidemotion to the right (G).

"-" adjust sidemotion to the left (H).

### Note!

The "Lawn Flower" shall look according to illustration when the adjustment is done.



Side Motion Balance



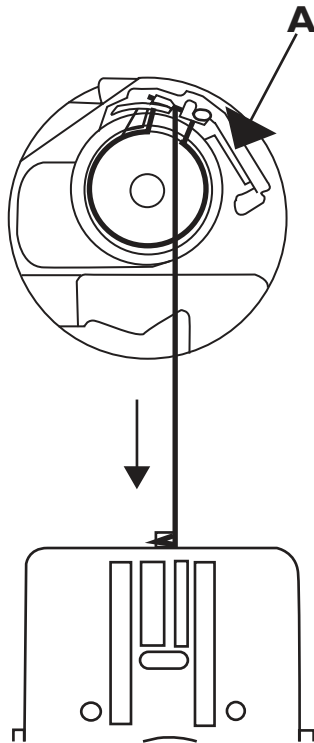
*Settings***21. Lower thread tension (thread tension of the bobbin case)****Check**

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, using normal polyester thread.

**Adjustment**

1. Turn screw (A) until the correct thread tension is obtained. Use Needle plate # 412 78 96-01 as a setting gauge.

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



## 22. Upper thread tension - Hi Tension

Hi Tension Menu is for setting the higher upper thread tension

### Check

A correct take-up should be obtained on straight stitch and zig-zag when the sewing advisor is set on woven medium.

### Comment 1

The sewing advisor adjusts the thread tension according to the selection of fabric and sewing technique.

### Comment 2

The thread tension that is set in the set menu is to be regarded as a general indication. This general indication can be raised and lowered by means of the thread tension buttons in the set menu and remains until the machine is turned off.

### Adjustment

1. Enter service program and select "Hi Tension menu"
2. To adjust the HIGHER upper thread tension e.g. on straight stitching or zig-zag sewing use the "+" or "-" button in "High Tension" sub menu.
3. "High Tension" adjustments can be done between -10 and +10 if Lo Tension is set on 0 (zero).

There are limitations in this setting e.g. if "Lo Tension" not is set to 0 (zero), the value of the Hi Tension setting can be higher or lower then -10 or +10.

The adjustment is automatically saved.

**NOTE !** Remove any loose pieces of thread or fluff from the thread tension discs before any adjustment is made.

## 23. Upper thread tension - Extra Hi Tension

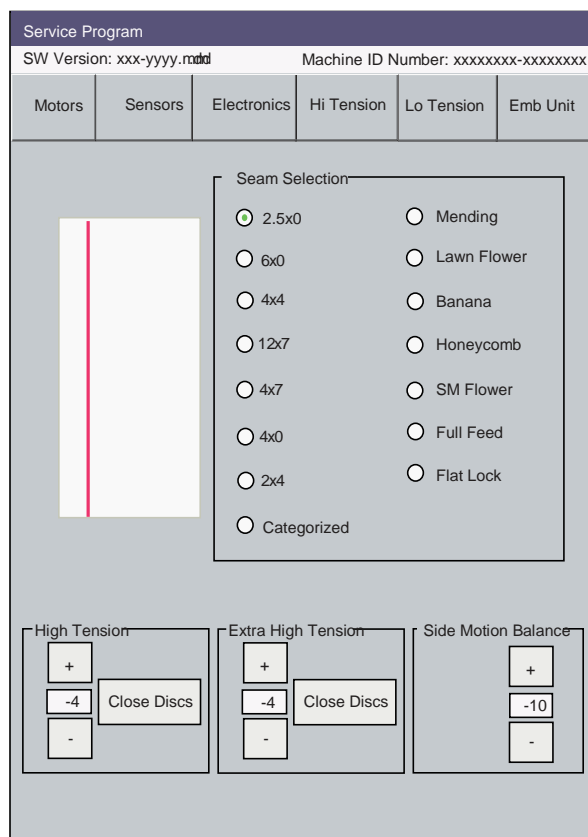
Extra Hi Tension Menu is for setting the highest upper thread tension.

### Check

The thread tension should be 170 grams. Use a weight (170g), attach the thread to the weight. Touch "close discs" the thread and the weight should not move.

### Comment 1

The sewing advisor adjusts the thread tension according to the selection of fabric and sewing technique.



## Comment 2

The thread tension that is set in the set menu is to be regarded as a general indication. This general indication can be raised and lowered by means of the thread tension buttons in the set menu and remains until the machine is turned off.

## Adjustment

1. Enter service program and select "Hi Tension menu"
2. To adjust the Extra High upper thread tension use the "+" or "-" button in "Extra High Tension" sub menu.
3. Attach the thread to a weight (170g).
4. Touch "Close Discs".
5. Decrease the tension until the weight starts to move.
6. Increase the tension until the weight stop moving.

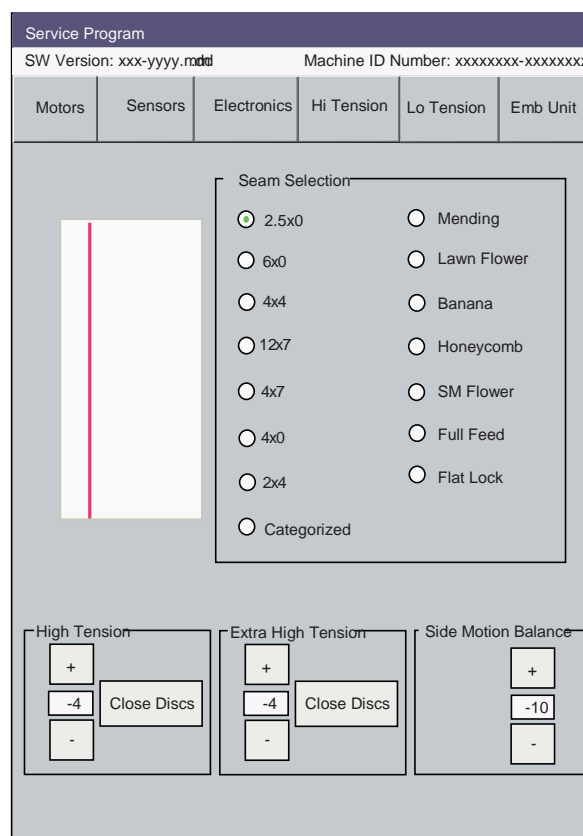
"Extra High Tension" adjustments can be done between -10 and +10 if High Tension is set on 0 (zero).

There are limitations in this setting e.g. if "High Tension" not is set to 0 (zero), the value of the Hi Tension setting can be higher or lower then -10 or +10.

The adjustment is automatically saved.

**NOTE !** Remove any loose pieces of thread or fluf from the thread tension discs before any adjustment is made.

*Settings*



## 24. Upper thread tension - Position Lo tension

Lo Tension menu is for setting the lower upper thread tension.

### Check

A correct take-up should be obtained on an embroidery stitch

Note!

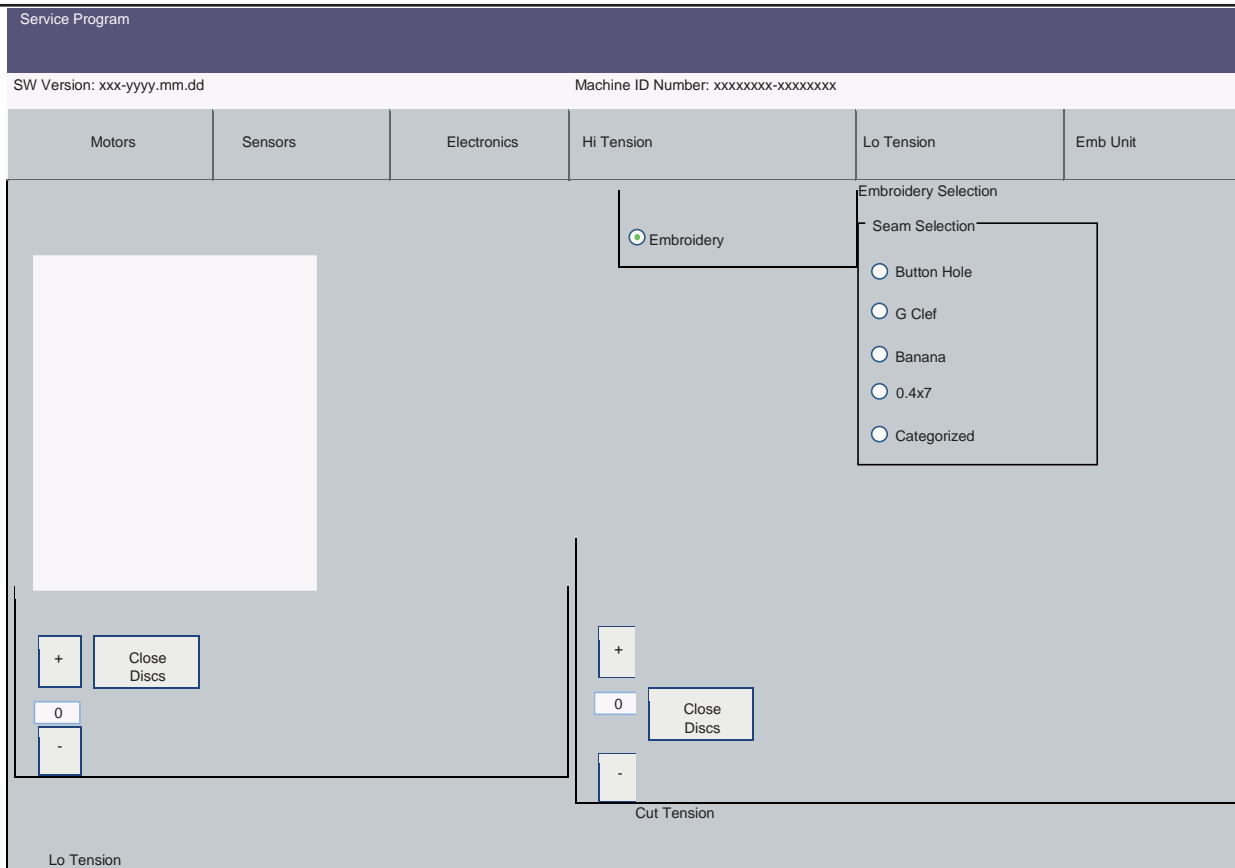
The following embroidery threads shall be used:

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

Lower thread: Thread thickness No 70 ( e.g. Sulky bobbin 100)

### Adjustment

1. Go to the service program - "Lo Tension" menu.



2. To adjust the LOWER upper thread tension for embroidery or decorative sewing, use the "+" or "-" button in "Low Tension" sub menu
3. "Low Tension" adjustments can be done between -10 and +10 if normal thread tension - "Hi Tension" is set on 0 (zero).

If "Hi Tension" is not set on 0 (zero) there are limitations in the setting. The value of the setting could be higher or lower than -10 or +10.

The adjustment is automatically saved.

NOTE ! Remove any loose pieces of thread or fluff from the thread tension discs before any adjustment is made.

*Settings*

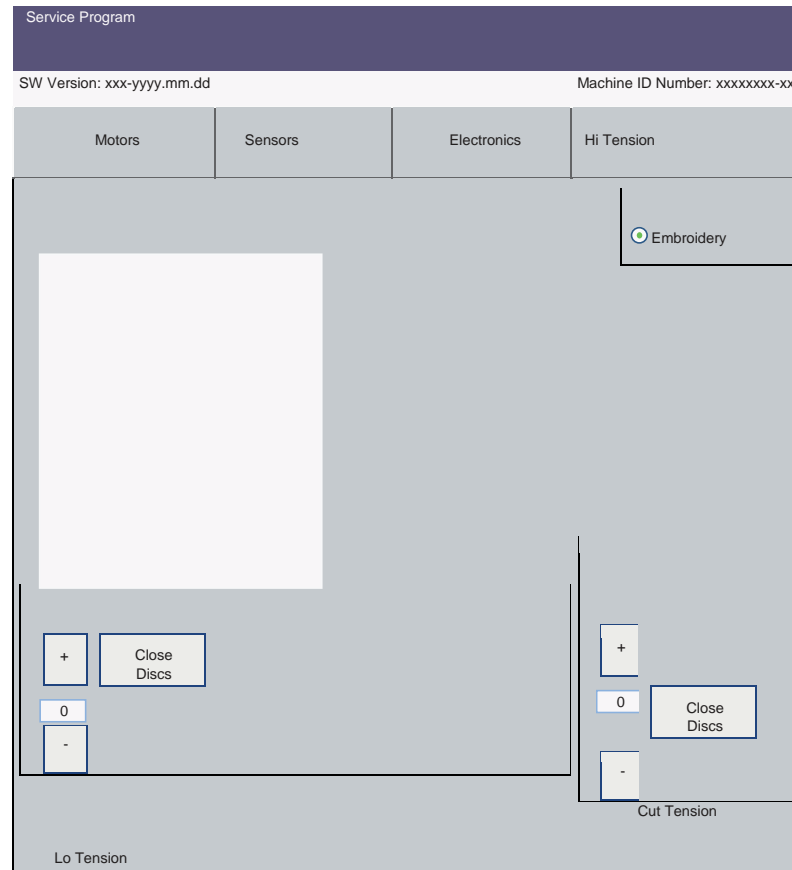
## 25. Upper thread tension - Position Cut Tension

Cut Tension menu is for setting the upper thread tension when cutting the thread. The upper thread tension discs should not be closed when slowly pulling a normal polyester thread.

**Check and Adjust**

1. Enter service program - "Lo Tension" menu
2. Pull slowly a normal polyester thread just through the upper thread tension discs.
3. In Sub menu "Cut Tension" touch "Close Disc", the thread tension discs will close.
4. Touch "+" button in Sub menu "Cut Tension" until a small resistance is obtained.
5. Then touch the "-" button one time, so that the setting is one step below of the setting where a small resistance was felt.
6. "Cut Tension" adjustments can be done between -10 and +10. The adjustment is automatically saved.

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



## **26. Setting the thread take-up spring**

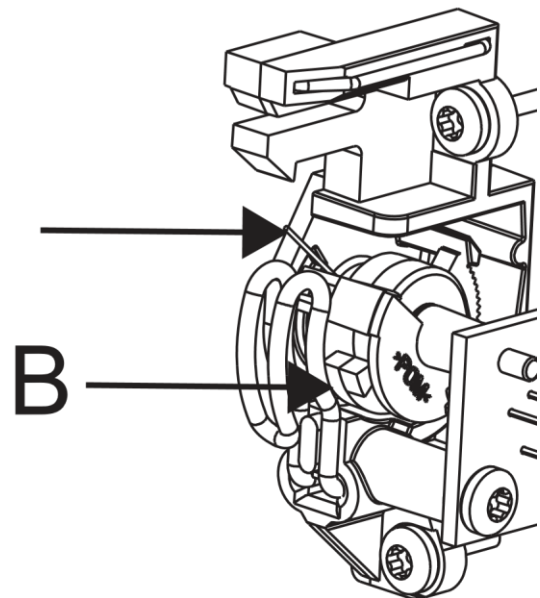
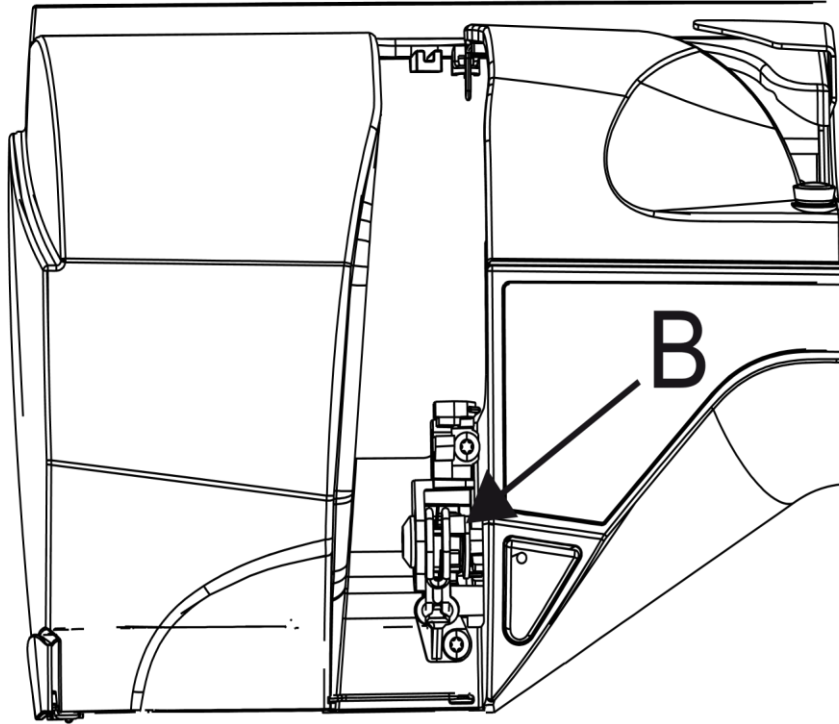
### **Check**

The thread take-up spring (A) should have completed its movement when the the needle eye reaches the fabric. The check has to be carried out at 2.5 mm straight stitching and using normal cotton fabrics and polyester thread.

### **Adjustment**

**NOTE! Before any adjustment is done check that the lower and upper thread tension is correct.**

1. Remove the thread guide on the front cover.
2. Turn the thread tension body (B) with a screw driver until a correct thread take-up is obtained.



A

*Settings*

## 27. Pre-setting of the step motor for the feed dog lowering

### Check

1. Enter Service Program - Motor controls menu.
2. Touch button "Feed Dog Drop" in Side motion/Feed dog drop sub menu. The feed dog should now drop down below the stitch plate.
3. Touch button "Calibrate" in Side motion/Feed dog drop sub menu. While turning the hand wheel the feed dog should now operate as normal.

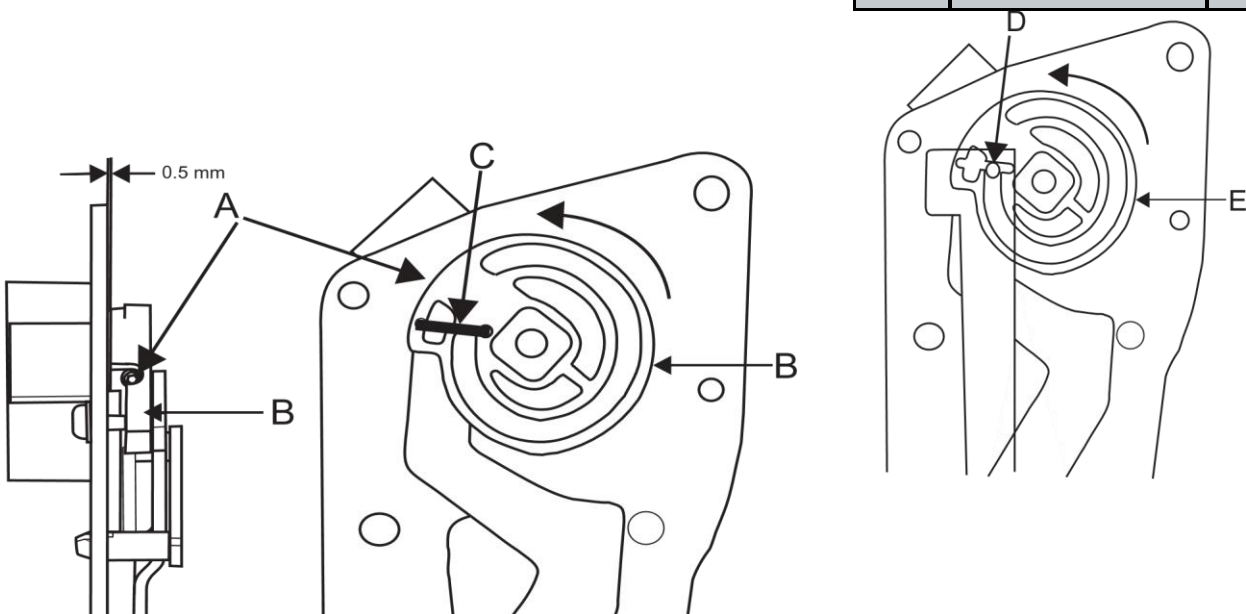
### Adjustment

1. Remove all covers, the base plate, pc-board and the side feeding step motor unit.
2. Mount the pc-board, when the side feeding unit is out.
3. Place the base with the power supply in front of the machine and connect it towards the pcboard.

4. Connect the front cover to the pc-board and place it on top of the casting.
  5. Remove the black stop rubber (C) in the curve on the side feeding unit.
  6. Connect the side feeding unit. Hold the side feeding unit in your hand.
  7. Loosen screw (A) on the Curve (B).
  8. Enter service Program - Motor controls menu.
  9. Touch button "Cal Pos" in Side motion/Feed dog drop sub menu.
  10. Place a 0.5 mm feeler gauge in between the side feeding frame and feed dog lowering curve(B). This is to avoid that the curve is against the frame.
  11. Turn the Curve (B) until the side feeding pin (D) is against the end position of the curve (E).
  12. Tighten the screw (A).
  13. Remove the feeler gauge.
  14. Touch button "Feed Dog Drop" in Side motion/Feed dog drop  
Side Motion / Feed Dog Drop sub menu. The step motor should now take the feed dog drop position.
  15. Touch button "Calibrate" in Side motion/Feed dog drop sub menu. The step motor should now take the feed dog calibration position.
- NOTE! The Calibration position is NOT the same as the setting position.
16. Turn the machine off.
  17. Turn the curve (B) by hand and check so it is smoothly-running.
  18. Mount the black stop (C).
  19. Remove the pc-board .
  20. Mount the side feeding unit and the pc-board
  21. Set the 28. Setting the feed dog in relation to the needle plate
  22. Set the 29. Feed Dog Lowering

*Settings*

Calibrate
Cal Pos (0)
Left Pos (1)
Right Pos (19)
Feed Dog Drop (40)



## 28. Setting the feed dog in relation to the needle plate

### Check

**Note!** To carry out this check the Hook Cover Cpl. must be mounted on the machine.

1. Enter service program - Motor Controls menu.
2. Touch button "Left Pos" in Side motion/Feed dog drop sub menu.  
Turn the hand wheel in such a way that the step motor changes between its two positions. The feed dog should not at any point touch the needle plate.
3. Touch button "Right Pos" in Side motion/Feed dog drop sub menu.



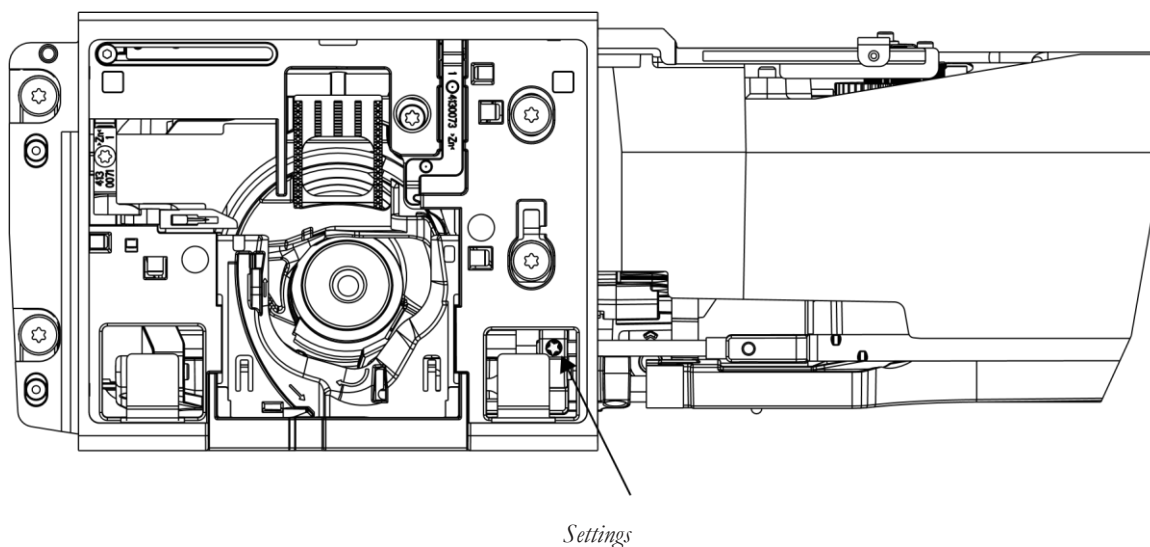
Turn the hand wheel in such a way that the step motor changes between its two positions. The feed dog should not at any point touch the needle plate.

## Adjustment

**Note!** To carry out this adjustment the Hook Cover Cpl. must be Side Motion / Feed Dog mounted.

1. Enter service program and Motor Controls menu.
2. Remove the needle plate.
3. Loosen the screw (A), located inside the hook cover.
4. Mount the needle plate.
5. Touch button "Left Pos" in Side motion/Feed dog drop sub menu.
6. Insert a 0.10 mm feeler gauge between the left side of the feed dog and the needle plate.
7. Push the feed dog to the left and against the 0.10 mm feeler gauge.
8. Carefully remove the needle plate without moving the feed dog.
9. Tighten the torx six screw (A).
10. Check the Side motion Right position.
  - Touch button "Right Pos" in Side motion/Feed dog drop sub menu. Turn the hand wheel in such a way that the step motor changes between its two positions. The feed dog should not at any point touch the needle plate.
  - Touch button "Left Pos" in Side motion/Feed dog drop sub menu. Turn the hand wheel in such a way that the step motor changes between its two positions. The feed dog should not at any point touch the needle plate.

Calibrate
Cal Pos (0)
Left Pos (1)
Right Pos (19)
Feed Dog Drop (40)



## 29. Feed Dog Lowering

### Check

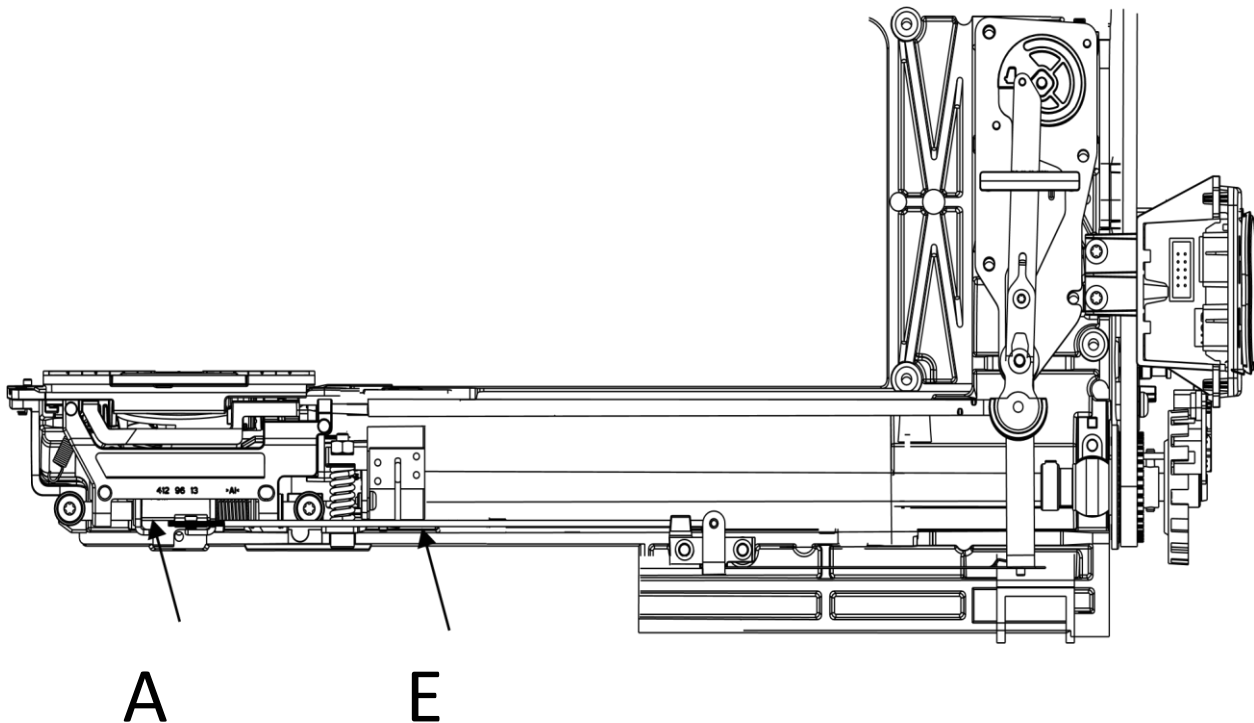
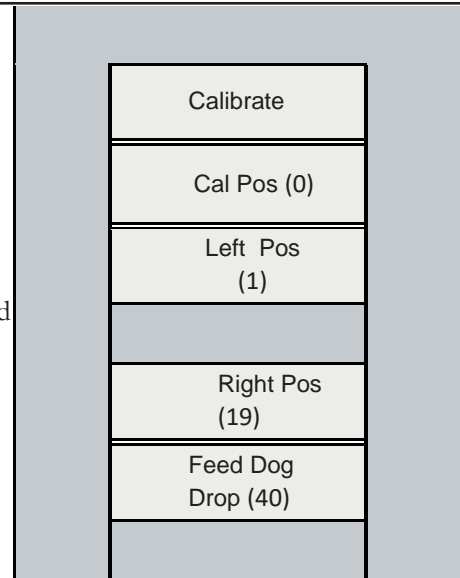
1. Enter service program - Motor Controls menu.
2. Set the needlebar in its highest position.
3. Touch button "Feed Dog Drop" in Side motion/Feed dog drop sub menu and the feed dog should drop.

Side Motion / Feed Dog Drop

## Adjust

Note! First check that setting #7 Setting the feeding unit sideways and #28 Setting the feed dog in relation to the needle plate are correctly set before continue to do this adjustment.

1. Enter Service Program - Motor Controls menu.
2. Set the needlebar in its highest position.
3. Remove the feed dog lowering rod (E) from its holder on the feed dog lowering device (A).
4. Make sure that the feed dog lowering device (A) is at its most left position and that the feed dog is in its up position.
5. Touch button "Calibrate" in Side motion/Feed dog drop sub menu.
6. Push on the feed dog lowering rod (E) on the feed dog lowering device (A).
7. Touch button "Feed Dog Drop" in Side motion/Feed dog drop sub menu, the feed dog should now drop.



*Settings*

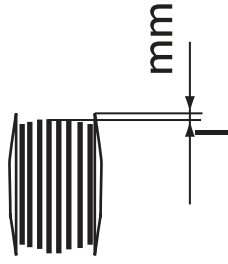
## 30. Disconnection when winding the bobbin

### Check

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

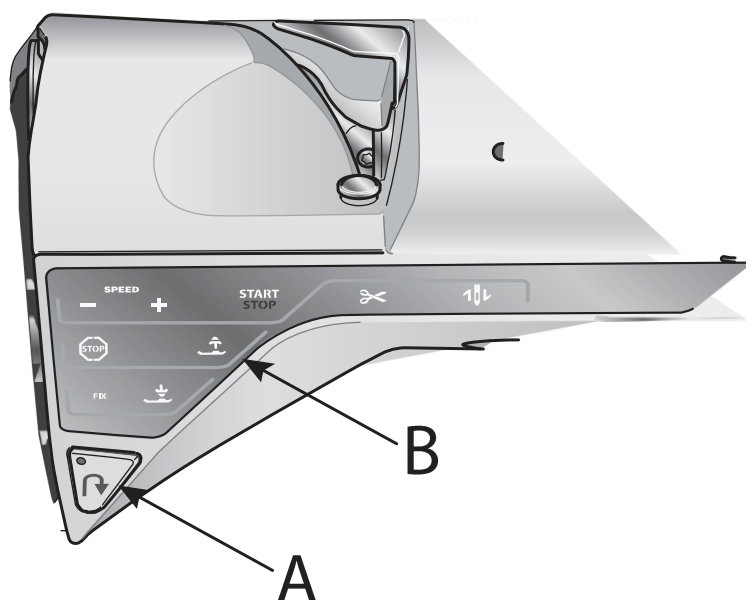
### Adjustment

1. Loosen the Screw.
2. Turn the disconnection until the correct amount of thread is obtained.
3. Tighten the screw.
4. Check by winding a bobbin.



## Service program

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



### Handling

1. Go to the service program of the machine by pressing the reverse feed button (A) and the Presser foot up (B) button while the main switch is switched on.

**Note!** Hold the buttons pressed until the Pop up “Enter Password” appears on the screen. See illustration below.

2. Enter the password to the service program.  
password combination 5031

NOTE! The password may change depending on what Firmware Build Version there is in the machine.

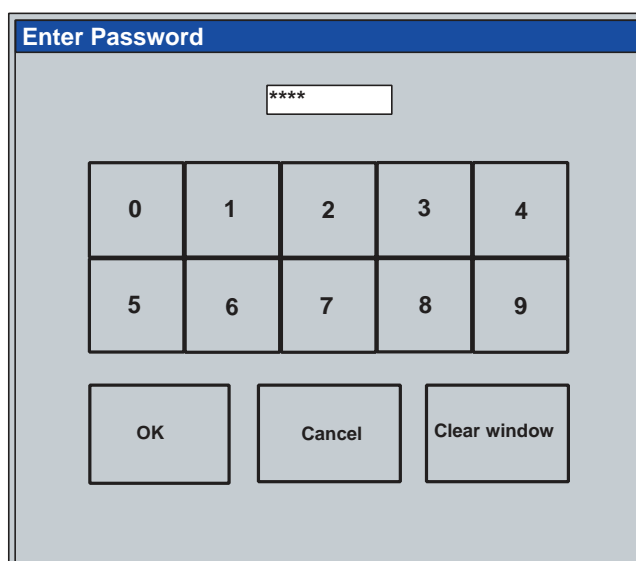
If the password will not unlock the service program, look for password updates on our Husqvarna Viking dealer site

3. Push OK to unlock the Service Program.

*Service Program*

## Functions of the service menu - Motors

This menu is to check and adjust the motors in the machine



## Needle - Menu

**Calibrate Needle** Is used for checking the movement of the zig-zag step motor and centre position of the needle in straight stitching. The zig-zag step motor calibrates and takes its Centre position. Cal Pos -1 Is used for checking the calibration stop of the zig-zag step motor.

It will attempt to take one step further to the left.

- If correct needle will not move.
- If faulty needle will take one step to the left or to the right.

**Cal Pos** Used for checking the calibration stop of the zig-zag step motor. The needlebar goes left to its calibration position.

**Left Pos** Used for checking the calibration stop of the zig-zag step motor.

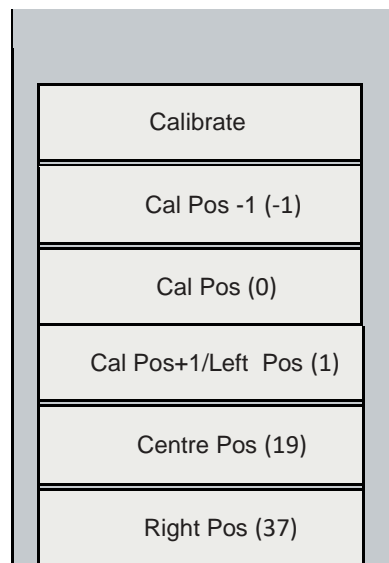
- It will attempt to take one step to the right.
- If correct needle will take one step to the right.
  - If faulty needle will not move or move to the left.

**Centre Pos** Used when setting the centre position of the needle. The needle step motor is now in its electronic centre position.

**Right Pos** Used for setting the end stop position of the step motor for the needle. The needlebar goes to its right position

### buttons are used during the following settings :

- The centre position of the needle.



These

## Side Motion - Menu

**Calibrate** The side feeding step motor calibrates and takes its right position.

**Cal Pos** The stepmotor take its calibration position for feed dog drop.

**Left Pos** Feed dog take its left position.

**Right Pos** Feed dog take its right position. **Side Motion / Feed Dog**

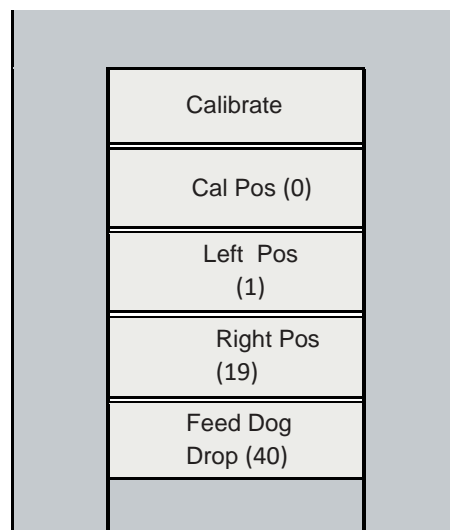
**Drop Feed dog Drop** Feed dog should drop down.

### These touch buttons are used during the following settings:

- Setting the feeding unit sideways
- Pre-setting of the step motor for the feed dog lowering
- Setting the feed dog in relation to the needle plate
- Feed dog lowering

*Service Program*

## Feed Menu



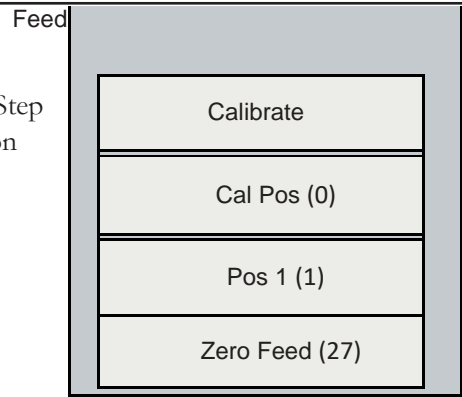
Calibrate            The stepmotor calibrates.

Cal Pos            The stepmotor takes it`s calibration position against the calibration stop. Pos 1

motor moves one step away from stop.

Zero-Feed            Is used when coarse-adjusting the stitch length balance

                          The feed dog should now stand still (0-feeding).



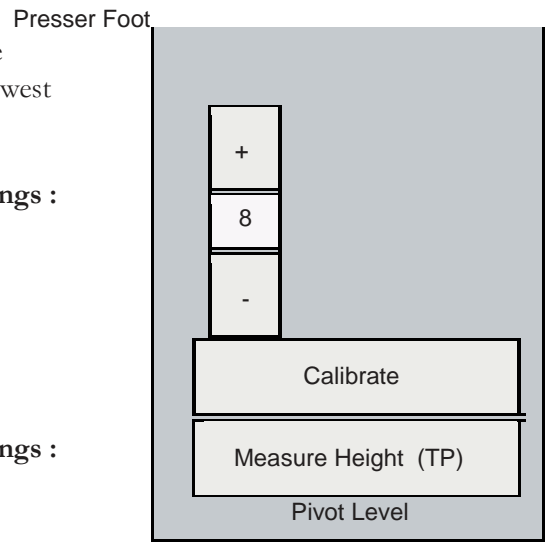
**These touch buttons are used during the following settings :**

19. Stitch length balance, basic setting

**Presser Foot Menu**

Calibrate            Presser bar takes its highest position.

Measure height (TP)    Used to set the electronic distance between the highest and lowest position of the presser bar.



**These touch buttons are used during the following settings :**

17. Measure height (TP)

Pivot level -            Decreases the Pivot height.

Pivot level +            Increases the Pivot height

**These touch buttons are used during the following settings :**

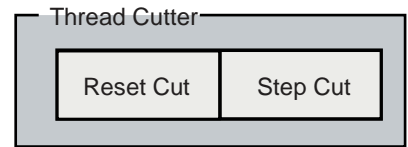
18. Pivot height

**Thread Cutter Menu**

Reset Cut            Thread cutter takes its original position.

Step                    Thread cutter moves one step at the time in the

cutting sequense.



*Service Program*

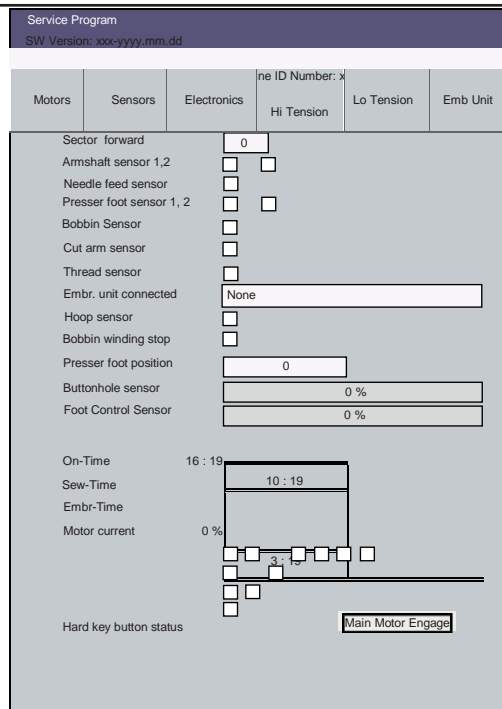
**Functions of the service menu - Sensors**

This menu is for checking the different sensors in the machine.

## Operation

Enter service program, touch Sensors menu

Note! An activated function = black



## Synchronizer Function

The synchronizer is located on the right hand side of the lower shaft.

Sector forward Check of the stop right function. in numbers (0-31).

Armshaft sensor 1 Check of the arm shafts first sensor (stop right function).

Armshaft sensor 2 Check of the arm shafts second sensor (stop right function). Needle feed sensor Check of the needle position (stop right function).

## Check

In Sector Forward square the numbers from 0 to 31 must be shown when turning the hand wheel slowly in the sewing direction.

In Armshaft sensor 1, 2 and Needle feed Sensor the squares should turn from black to white when turning the hand wheel slowly in the sewing direction.

## Presser foot sensor

Located on the back side of the sewing head.

Presserfoot sensor 1: Check of the presser foot's first sensor.

Presserfoot sensor 2: Check of the presser foot's second sensor.

## Check.

Both Presserfoot sensor 1 and 2 squares should turn from white to black when pushing the presser bar upwards.

*Service Program*

## Bobbin Sensor

Located in the Hook cover. One in the front right corner and the second on the back left corner.

## Check

1. Remove the bobbin from the bobbin case.
  2. Turn the hand wheel slowly to locate the position where the square changes from black to white.
  3. Place a full bobbin in the bobbin case and the square should be activated.
- alt Check.

Remove the bobbin and run the machine, it should now stop and indicate bobbin empty.

## Adjustment

1. Clean the areas around the bobbin sensor.

---

2. Check so the cable is correct connected to the main Pc-board.

### **Cut Arm sensor**

#### **Check**

1. Press the function button.
2. when the cutter performs its movement the cutter arm sensor will change. Note! Main Motor MUST be engaged to check this.

### **Thread Sensor**

Located at the Check spring device on the front cover

#### **Check**

1. Thread the machine up to the point at the thread take up.
2. Pull the thread, the square should change from white to black **alt. check**

Thread the machine and sew a straight stitch, cut the thread with a scissor while sewing. When the thread has ended, the machine should stop and indicate upper thread break.

### **Embroidery Unit Connected**

Check if and what embroidery unit was connected.

#### **Check**

When an embroidery unit is connected the text field should change from "None" to a text describing what type of unit that has been connected.

### **Hoop Sensor**

Located on the Embroidery unit Y-frame.

#### **Check**

See the under the section Embroidery Unit - Hoop sensor.  
*Service Program*

### **Bobbin winding stop**

Located on the top right hand side of the machine.

The bobbin winding sensor -Indicates when bobbin is fully wounded.

#### **Check**

When pushing the bobbin winding stop to the winding position the square should change from white to black.

### **Presser foot position**

Sensor located on the Sewing head.

Indictacates the position in digits .

#### **Check**

1. Touch the Presser foot up/down function button.
2. When the Presser foot does its movement up/down the digits will change. Note! Main Motor MUST be Engaged to check this.

### **Buttonhole sensor**

Located on the sensormatic buttonhole foot.

Buttonhole sensor                      Buttonhole sensor check.

#### **Check**



---

Turn the black dial on the sensormatic buttonhole foot, and the percent number should change from 0 - 100.

### Foot control Sensor

Located inside the foot control.

Foot control sensor                      Check of the foot control sensor.

### Check

Push on the foot control and the percent number should increase from 0 - 100.

### Log time

On-Time    Indicates how many hours and minutes the machine has been switched on.

Sew-Time                      Indicates how many hours and minutes the machine has been sewed on.

Embr-Time Indicates how many hours and minutes the machine has been embroidered on.

### Motor current

Motor located on the back of the frame.

### Check

Start the machine and run it, the higher the value the heavier the machine runs.

**Hard key button status** Check  
of function buttons.

### Check

Push each button and the a square should be black in the Hard key button status menu.

### Main Motor Engaged

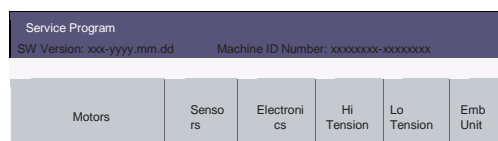
Is used to engage and disengage the motor and the functions of the hard key buttons.

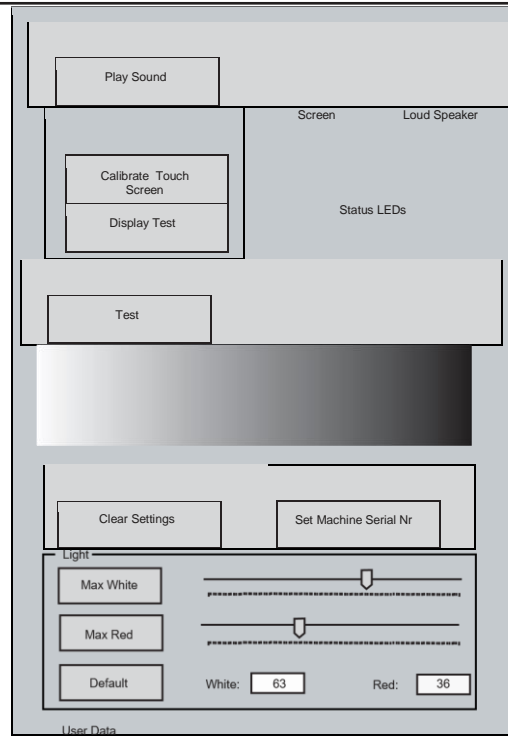
*Service Program*

## Functions of the service menu - Electronics

### Operation

Enter service program and touch Electronics menu.





### Service Menu - Screen

Calibrate touch            Is for Calibration of the touch display. screen  
 See calibrating instructions under Chapter  
 "Calibration of the touch panel"

LCD Test                    Display test.  
 A square pattern shall change between red, green and blue. After the  
 check is done the machine will automatically return the service menu  
 "Electronics" again.

### Service Menu - Light

NOTE! The LED Light in this menu is only for checking its function, not setting it.

Max White                Sets the LED light to Max white  
 Max Red                 Sets the LED light to Max red  
 Default                 Re-sets the LED light to a the last set default value

### Service Menu - User Data

Clear User settings Removes all individual settings the customer has set in the "Set Menu"

Set Serial Nr            A Menu to enter the machine serial number in to the main Pc-board.  
 For further information regarding how to change this, see chapter  
 "Enter the Serial number"

*Service Program*

## Calibration of the touch screen

How to synchronize the touch area of the touch screen with the symbols on the screen.

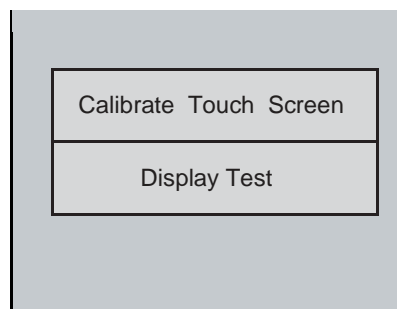
1. Enter service program of the machine.

2. Press **the needle up/down button** or enter Service Program electronics menu submenu screen, touch button "Calibrate Touch Screen" and the touch screen calibration window will

Screen bration window will

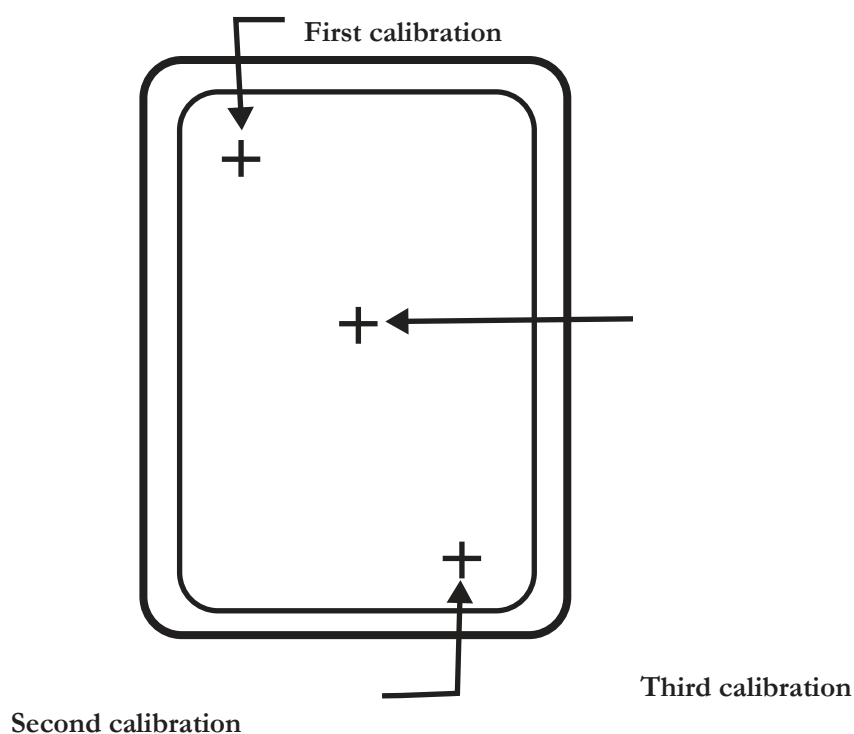
3. Touch with a stylus in the center of cross 1, indicated **First calibration mark** on the illustration.

**NOTE!** The setting occurs when the stylus is leaving the cross , NOT entering.



4. Touch with a stylus in the center of cross 2, indicated **Second calibration mark** on the illustration.

5. Touch with a stylus in the center of cross 3, indicated **Third calibration mark** on the illustration. When the third and final calibration of the touch panel is set, the machine will automatically return to where you entered service menu.



Uför kalibreringen med Stylus 412 69 34-01

**Observera!** Denna justering måste göras om touch-panelen eller kretskortet har bytts.

*Service Program*

## Enter the Serial number

**How to change the machine serial number in service program.**

If a pc-board is changed the first eight digits (A) must be re-entered into the new PC-Board to match the eight digit machine serial number (B) on the base plate sticker.

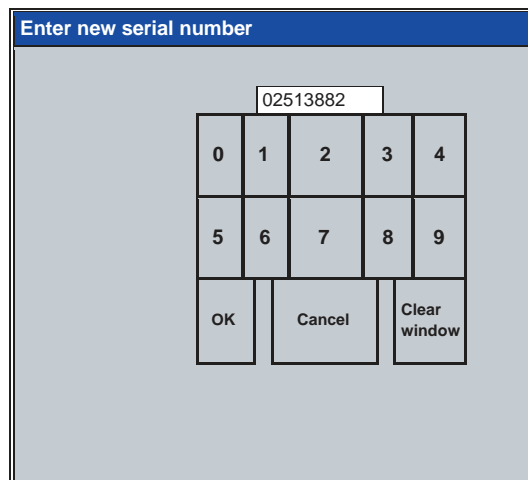
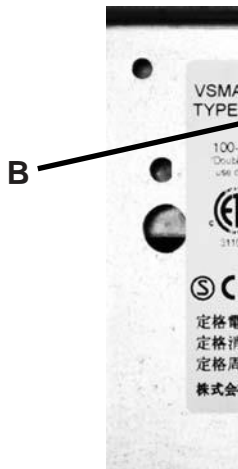
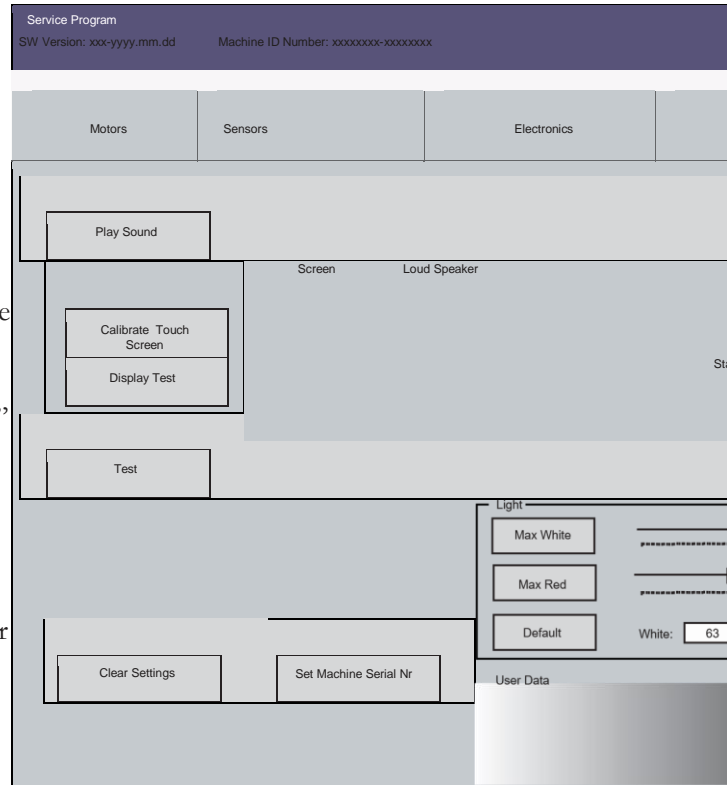
1. Enter service program of the machine.
2. Touch the Electronics menu. **A**
3. Touch the “Set Machine Serial Nr” menu. A pop-up called “Enter new serial number” will appear in the display. See Illustration below.
4. Enter the serial number of the machine by using a stylus, the eight digits are located on the machine serial number sticker on the base plate.

If any of these numbers are entered wrong, at this point, use the button “Clear Window”. All digits are then erased from the digit field.

By using the “Cancel” button it will return to the “Electronics” menu with out changing any serial number.

5. Touch on the “OK” button and the machine number will be updated in the Pc-board.

Note! To correct a wrongly entered machine number start over from point Nr 3.



6. When a Pc-board is changed, the Pc-board's card number has to be modified in the Main ID data bank, this is to avoid conflicts in the future for the end customer when e.g. downloading new firmware.
7. This is done by connecting the machine via the usb cable to a computer with internet connection running.
8. Turn on the machine leave it on for a minute and then an automatic transfer of the Machine ID Number will take place to update a database on internet.

## Functions of the service menu - Hi Tension

To facilitate the setting of the higher upper thread tension there is an electronic adjustment in Service- mode. The Hi tension menu is for the higher upper thread tension, to check and set the stitches that is sewed with high upper thread tension e.g. straight stitch, zigzag and letters.

### Operation

Enter service program. Touch Hi tension. The machine enters menu for adjusting the high upper thread tension

### High Tension - High upper thread tension

**+ and -** - This is used for adjustment of the **HIGH** upper thread tension (normal sewing). The value is normally set between +10 and -10. The value on the display is changed gradually each time you touch the touch area. **Note! There are limitations in the setting. The value of the setting could be higher than +10 or lower than -10 .**

**Close Disc** This is used to activate the Thread disc device without lowering the presser bar.

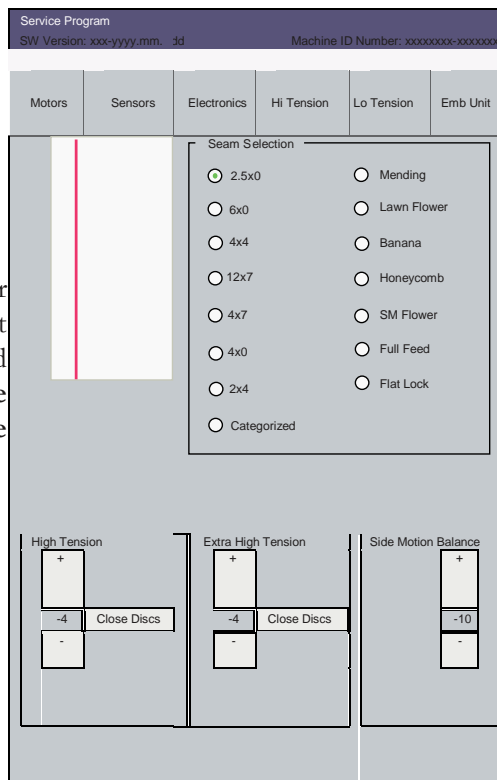
### Extra High Tension - Highest upper thread tension

This is used for adjustment of the **HIGHEST** upper thread tension (quilting). The value is normally set between +10 and -10. value on the display is changed gradually each time you touch area.

**Note! There are limitations in the setting. The value of the setting could be higher than +10 or lower than -10.**

### Seam Selection - High upper thread tension

2,5x0	The machine sews straight stitch 2,5 mm.
6x0	The machine sews straight stitch 6 mm.
4x4	The machine sews a zig zag stitch 4x4 mm.
12x7	The machine sews a zig zag stitch 12x7 mm.
4x7	The machine sews a zig zag stitch 4x7 mm.
4x0	The machine sews straight stitch 4 mm.
2x4	The machine sews a zig zag stitch 2x4 mm.
Categorized and click Ok.	Is used for choosing any of the stiches in the machine.enter the number
Mending programmed	Is used for pre set the stitch length balance. The machine now sews a pre-mending stitch.
Lawn Flower	Is used to set stitch length balance and sidemotion balance.
Banana	Is used to set stitch length balance.
Honeycomb	The machine now sews a pre-programmed Honeycomb stitch ( 66--72 mm).
SM Flower	Is used for fine-adjusting the stitch length and sidemotion balance.
Flat lock	The machine sews a Teddy Bear as a side motion stitch.
Full Feed	The machine sews a Flat lock stitch. Not used for service



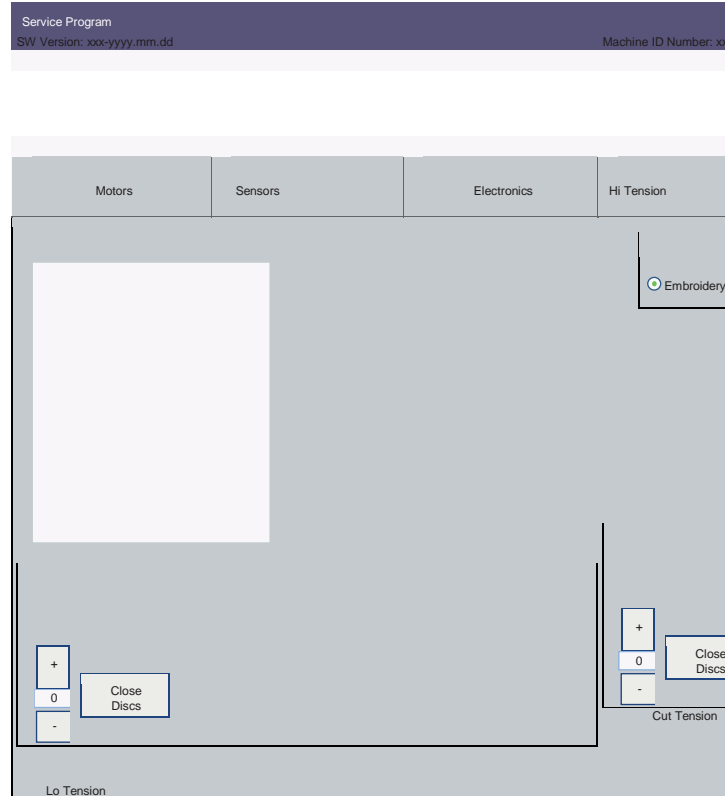
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## Functions of the service menu Lo Tension

To facilitate the setting of the Lower upper thread tension there is an electronic adjustment in the Service program.

The Lo tension menu is for the Lower upper thread tension, to check and set the stitches that is sewed with low upper thread tension e.g. Embroideries, Decorative stitches and Button holes.

### Operation



---

Get into the service program.Touch " Lo Tension". The machine will enter the menu for adjusting the lower upper thread tension.

### Lo Tension - Lower upper thread tension

+ and - Is used for adjustment of the **LOWER** upper thread tension (embroidery and decorative sewing).The value is normally set between +10 and -10.  
The value on the display is changed gradually each time you touch the touch area

**Note! There are limitations in the setting. The value of the setting could be higher than +10 or lower than -10.**

Close Disc This is to activate the Thread disc device without lower the presser bar.

### Cut Tension

+ and - Is used for adjustment of the tension that is used when the thread cutter cuts the thread.  
The value is normally set between +10 and -10.  
The value on the display is changed gradually each time you touch the touch area

Close Disc This is to activate the Thread disc device without lower the presser bar.

### Embroidery Selection

Embr The machine sews a pre-programmed Embroidery.

### Seam Section - Lower upper thread tension

Button hole The machine sews pre- programmed Button hole.

Banana Is used for fine-adjusting the stitch length balance.

G clef Is used for fine-adjusting the stitch length balance.

0,4x7 The machine sews a satin stitch.

Categorized Is used for choosing any of the stitches in the machine. Enter the number and

*Service Program*

## Functions of the service menu "Emb Unit"

### Operation

click OK.

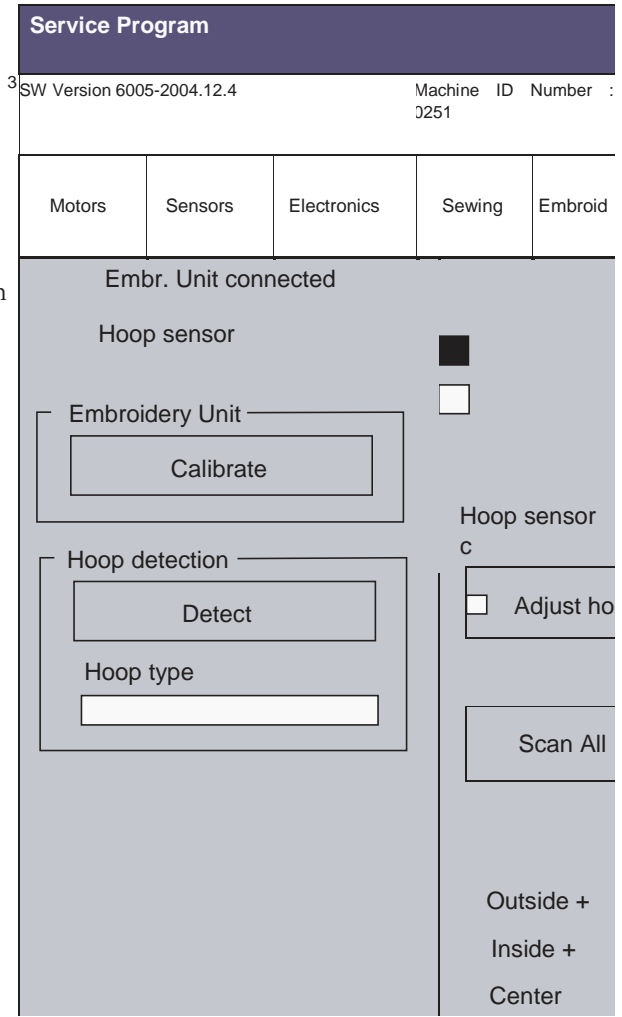
Enter service program. Touch "Emb Unit". The machine enters the menu for Hoop detection and belt tension adjustments.

**Embr. unit connected**

Tells if an embroidery unit is attached to the machine.

**Hoop sensor**

Indicates if the hoop sensor is sensing the indicator arm in its slot. The indicators are updated every 250 ms.



a o

**Embroidery unit Menu**

**Calibrate** By pressing this button an electrical calibration sequence of the embroidery unit starts.

**Park** By pressing this button, the Embroidery Unit moves to its parking position.

**Belt Tension menu**

**Check Belt X** By pressing this button, the X-step motor moves one step forward and one step backwards repeatedly. This is used for setting the belt tension.

**Check Belt Y** By pressing this button, the Y-step motor moves one step forward and one step backwards repeatedly. This is used for setting the belt tension.

**Check Belt Off** This button is used for switch off the "Check Belt" function.

**Hoop Detection menu**



---

Detect            Pressing this button activates a hoop type detection sequence.

NOTE! A hoop must be attached to the embroidery unit.

Detected Hoop type    The result of the detection is showed in the corresponding text field.

For example attaching a 150x150 hoop and pressing the “Detect” button  
will result with the text “HT\_150\_150 to appear in the text field "Detec  
Hoop Type".

ted

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## Update of the memory-Designer Diamond

The software of Designer Diamond is updatable, before updating the machine It needs to be set in update mode.

### Revision of the program

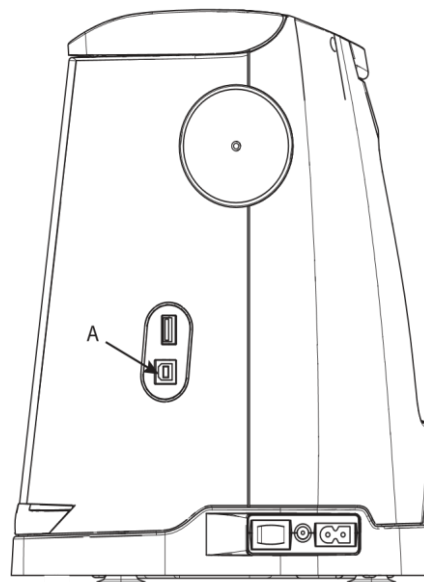
The revision of the software can be seen in the upper left corner in service program or under Info menu/personal info.

NOTE! Before a upgrade is performed, make sure that the Designer Diamond communicates with the computer in use.

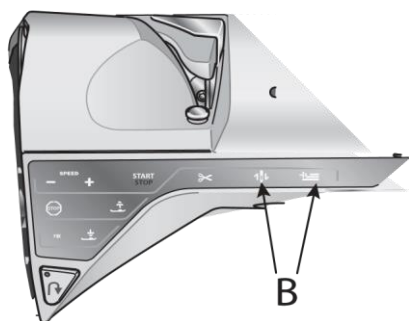
This communication file will be installed when the Designer Diamond "4D organizer software" is installed. This software comes with the Designer Diamond on a CD.

### How to update

1. Plug the USB cable that is delivered with the machine into your computer and into the lower USB port (A) of the Designer Diamond.



2. Set the Designer Diamond in “update mode” mode by pressing the marked buttons (B) simultaneously and switch on the machine.



3. Start the Software Update Designer Diamond application in the computer.
4. Activate the Software Update Designer Diamond program by pressing the “Start update” button. The transfer of the new Software will now start and memory will automatically be updated.

The

the



Note! If The Designer Diamond has a newer version installed than the update version. A pop up will appear and ask if you wish to continue. Push then button "Cancel".

NOTE! NEVER DOWNGRADE A MACHINE.

5. Wait for the Designer Diamond to finish the upgrade.



6. When the upgrade is done the Designer Diamond will restart and return to the normal mode.
7. Remove the USB cable.
8. Check the revision.

**NOTE! If the Main Pc-board is changed, the memory always has to be updated with the latest version.**

*Dismantling and mounting Covers*

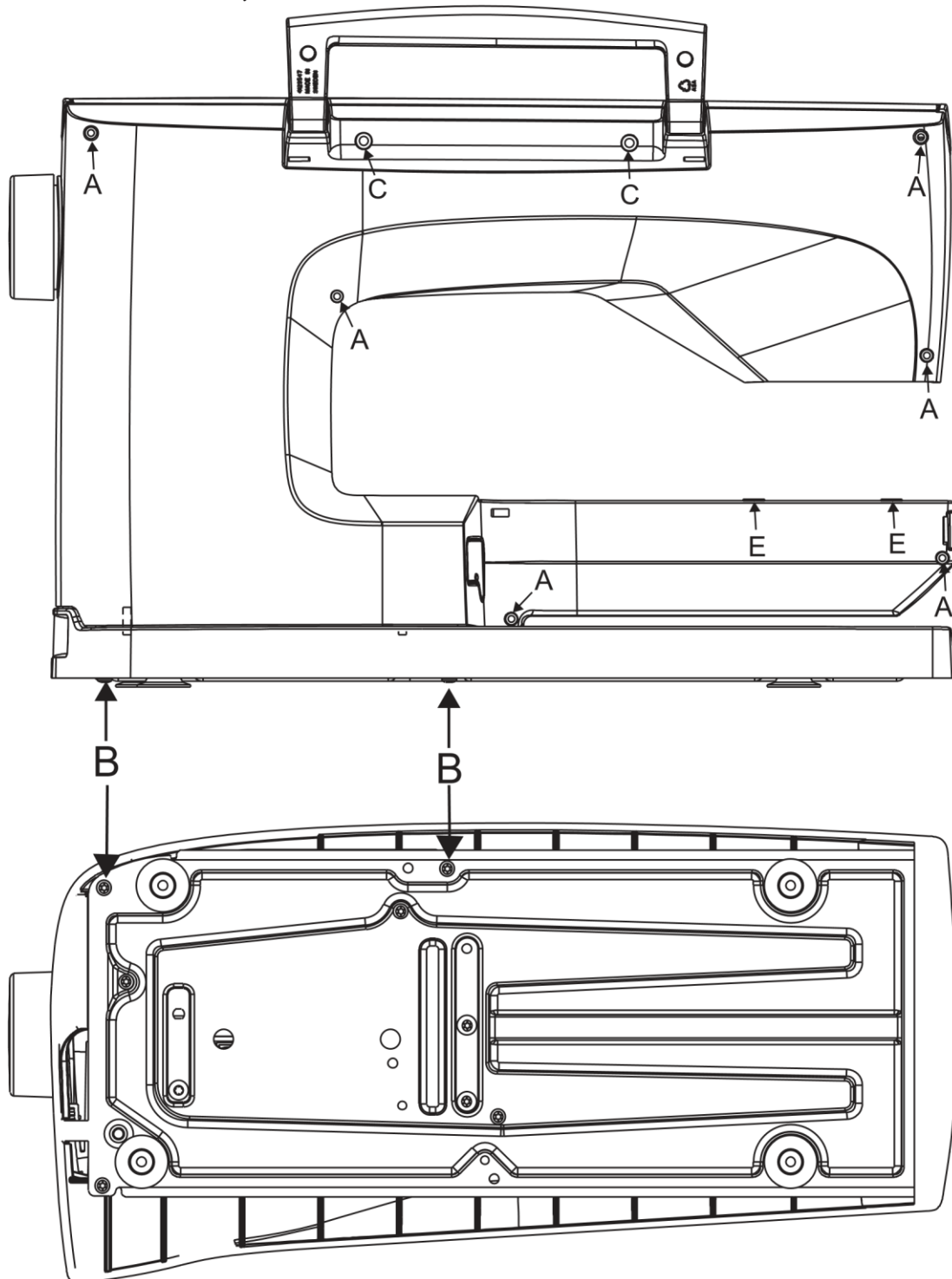
## Front Lid

1. Raise the lid up.
2. Take the left lid ending and cautiously push it away from the back covers left pin.

## Rear cover

1. Remove the six Torx 10 screws (A) on the back cover.
2. Remove the two Torx 20 screws (C), located under the handle, on the back cover.
3. Lay the machine down, front facing up, and remove the two Torx 20 screws that holds the back cover to the base plate.

4. Lift the machine up again, but DO NOT hold in the handle.
5. When removing the back cover cautiously pull the back cover out a bit at (E), Take a firm grip on the back covers left side and loosen the cover.
6. Remove the Embroidery cable from the back cover and remove the back cover.



*Dismantling and mounting Covers*

## Front cover

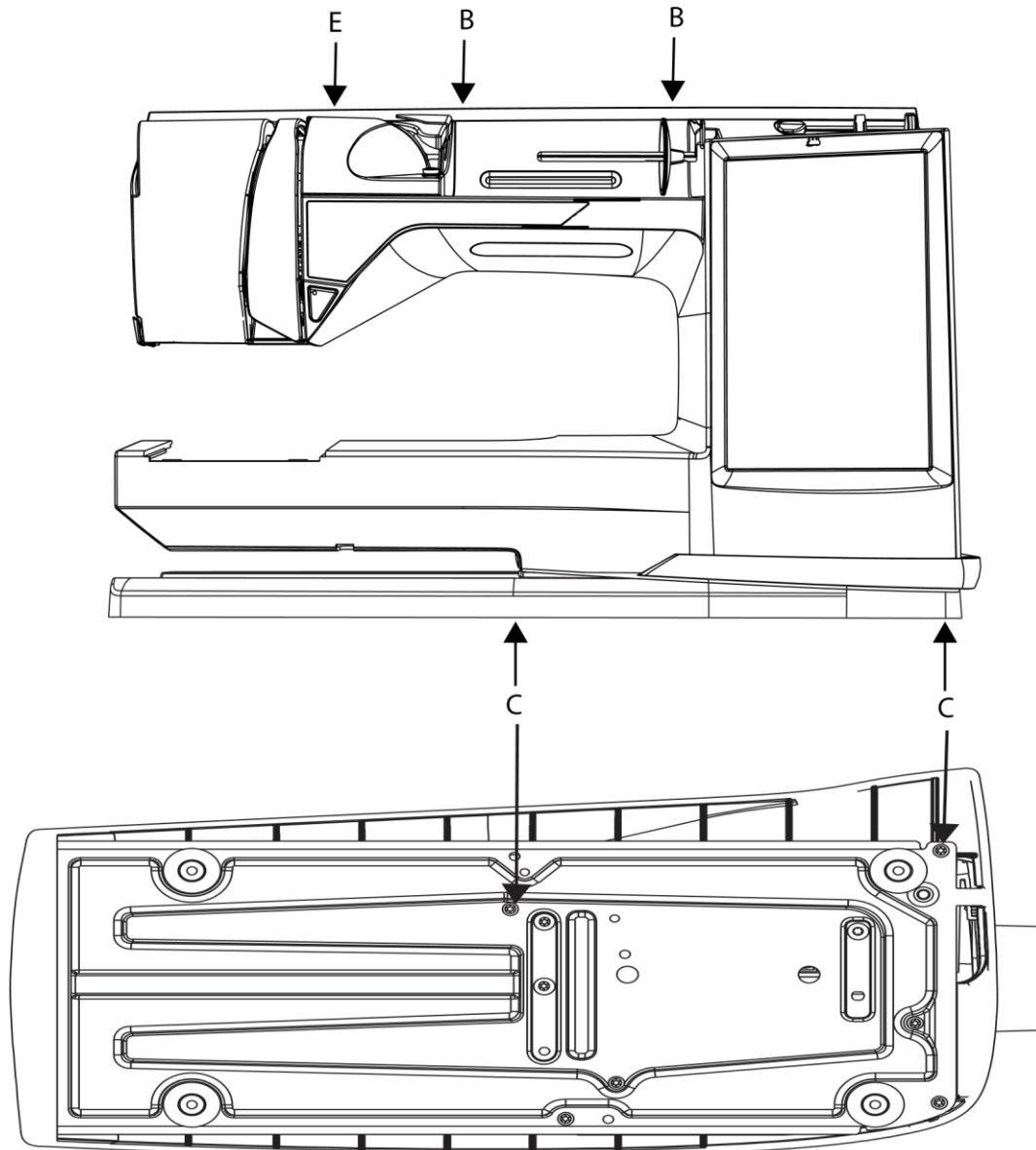
**NOTE!** Always use wrist band 412 23 02-01 and a ESD mat when removing the front cover. **Dismantling**

1. Remove the rear cover.
2. Remove the two Torx 20 screws (B) in the middle from behind.
3. Loosen the Torx 10 screw (E) beside the tension unit from behind and lift off the tension cover.
4. Lay the machine down, front facing up.
5. Remove the two screws (C) in the base plate that holds the front cover to the base plate.

6. Hold down the threading device while turning the hand wheel backwards until the needlebar is in its lowest position, so the thread take up lever and threading device is out of the way.
7. Carefully lift up the cover at the thread tension.
8. Pull away the front cover from the hand wheel and pull it straight out.
9. Remove the 6 cables of the frontcover from the circuit board.

### Mounting

Mount in reverse order.



*Dismantling and mounting Covers*

## Remove Thread tension cover

### Dismantling

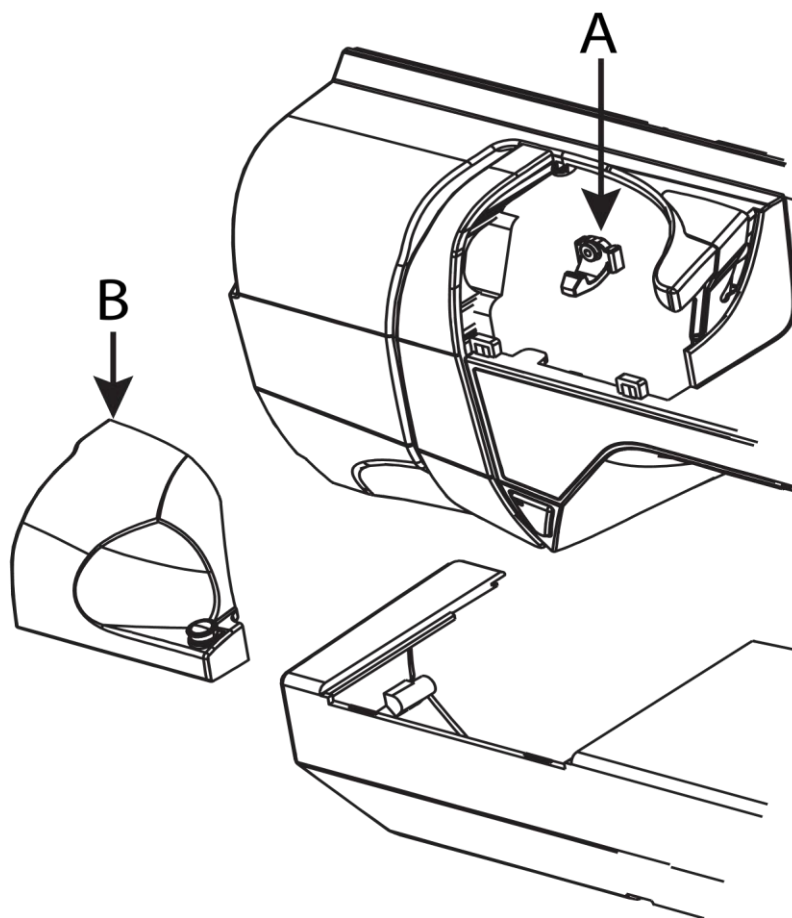
1. Remove back cover.
2. Loosen the torx 10 screw (A) from the back.
3. Remove the thread tension cover (B).

### Mounting

1. Tighten the torx 10 screw from the back (A), make sure that the hook is in its highest position.
2. Mount the thread tension cover (B).

---

3. Mount back cover.



*Dismantling and mounting*

## Internal parts of front cover - Consol, display holder

### Dismantling

1. Remove Back cover and Front cover.
2. Remove the bobbin winding stop.
3. Remove the two cables from the LCD.
4. Remove the cable from the touch screen.
5. Remove the cable from the LED light.
6. Remove the five torx 10 screws.
7. Remove the consol.

### Mounting

In reverse order.

## Internal parts of front cover - Bobbin winding motor

### Dismantling

- 
1. Remove the Back cover and Frontcover
  2. Remove the Consol
  3. Remove the bobbin winder spindle.
  4. Remove the two torx 10 screws.
  5. Remove the motor.

### **Mounting**

In reverse order.

## **Internal parts of front cover - Bobbin winding sensor**

### **Dismantling**

1. Remove the Back cover and Frontcover
2. Remove the Consol
3. Remove the torx 6 screw.
4. Remove the sensor.

### **Mounting**

In reverse order.

*Dismantling and mounting*

## **Internal parts of front cover - LCD screen**

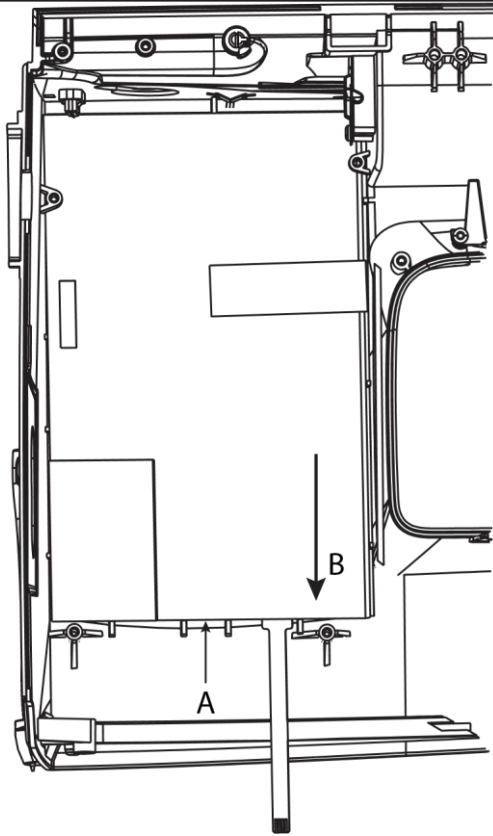
### **Dismantling**

1. Remove the Back cover and Frontcover.
2. Remove the Consol.
3. Remove the LCD screen by lifting the bottom facing side (A) and pull it in direction (B).

**NOTE!** DO NOT TOUCH the screen on the LCD!

### **Mounting**

In reverse order.



*Dismantling and mounting*

## **Internal parts of front cover - Touch screen**

### **Dismantling**

1. Remove the Back cover and Frontcover.
2. Remove the Consol.
3. Remove the LCD screen.
4. Remove the Touch screen.

**NOTE!** DO NOT TOUCH the screen on the LCD and the backside of the touch screen!

### **Mounting**

In reverse order.

## **Internal parts of front cover - Check spring unit**

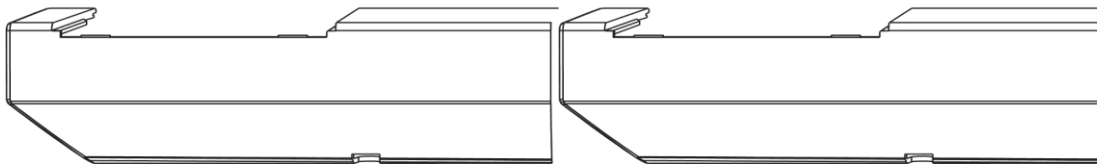
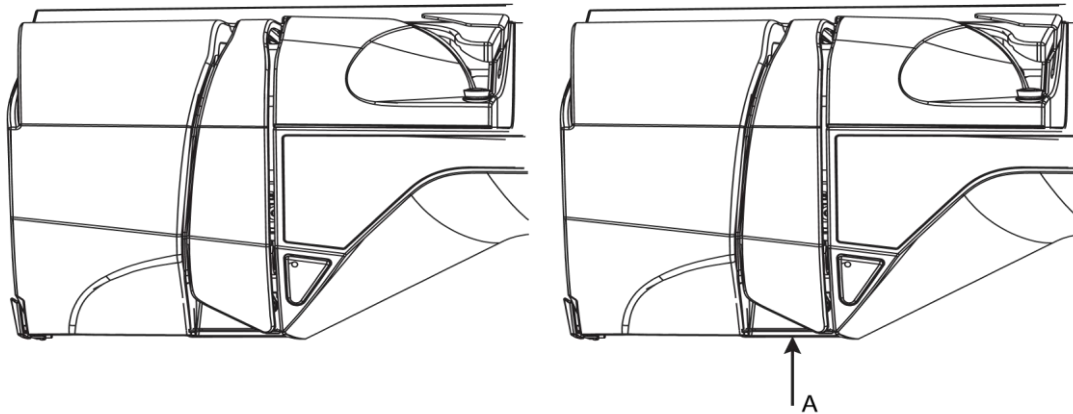
### **Dismantling**

1. Remove the the thread guide by pulling at (A).
2. Remove the two torx 10 screws (B).
3. Lift out the checkspring unit.
4. Remove the torx 10 screw holding the sensor board and remove the sensor board.
5. Remove the check spring unit.

### **Mounting**



## Internal parts of front cover - Reverse button

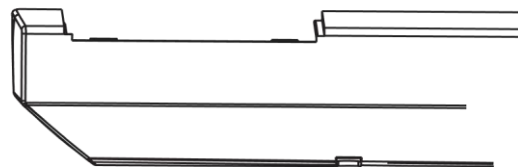
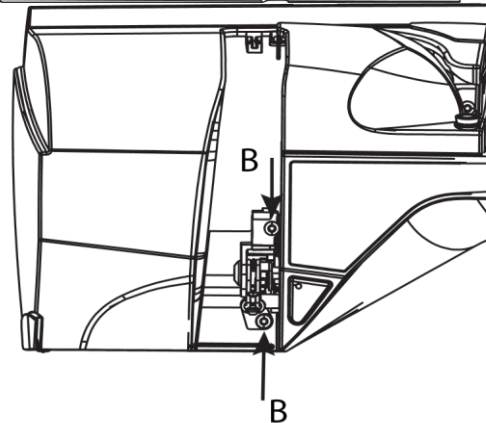


### Dismantling

1. Remove the back cover and front cover
2. Remove the check spring unit.
3. Remove the reverse button boards cable from the connecting board.
3. Remove the torx 10 screw holding the reverse button board and remove the board.
4. Lift out the reverse button from the front cover.

### Mounting

In reverse order.



## Internal parts of front cover - Keyboard

### Dismantling

1. Remove back cover and front cover
2. Remove the three Torx 10 screws for the cable guide for the LED lamp and connector board.
3. Remove the cable guide.
4. Loosen the locking of the keyboard tail on the connector board. Pull out the tail. Don't remove the other cables on the connector board.
5. Put the LED lamp and the connector board to the side.
6. Remove the heat shield sticker and carefully loosen the keyboard tail from the double side tape.
7. Use a small screwdriver to carefully lift the keyboard at the right hand side corner. Make sure that the keyboard tail follows. Then pull the rest of the keyboard by your fingers.

**Note!** In order to avoid scratches on the front cover you could wrap some plastic tape on the screwdriver, or use a flat plastic tool instead of a screw driver.

---

## Mounting

1. Fold the keyboard tail before mount it in the front cover.

**Note!** In order to get a proper folding you could place the new keyboard on a clean table (front side down) and tilt it 90 degrees (with the upside of the keyboard against the table).

2. Remove the sticker protection on the backside of the keyboard.

3. Attach the keyboard to the front cover. Start by fully insert the keyboard tail and attach the right hand side of the keyboard. Then carefully place the remaining part.

4. Mount the LED light, LED window and connector board. Connect the keyboard tail and lock it. **Note!** Make sure that you mount the keyboard tail straight and fully into the connector before you lock it.

5. Mount the heat protection sticker.

6. Mount the cable guide for the LED lamp and connector board with three Torx 10 screws. Make sure that you don't squeeze/damage any cables.

7. Mount front cover and back cover

*Dismantling and mounting*

## Base Plate

**FOR SAFTEY REASONS ALWAYS DISCONNECT THE POWER CORD FROM THE MACHINE BEFORE REMOVING THE POWER SUPPLY.**

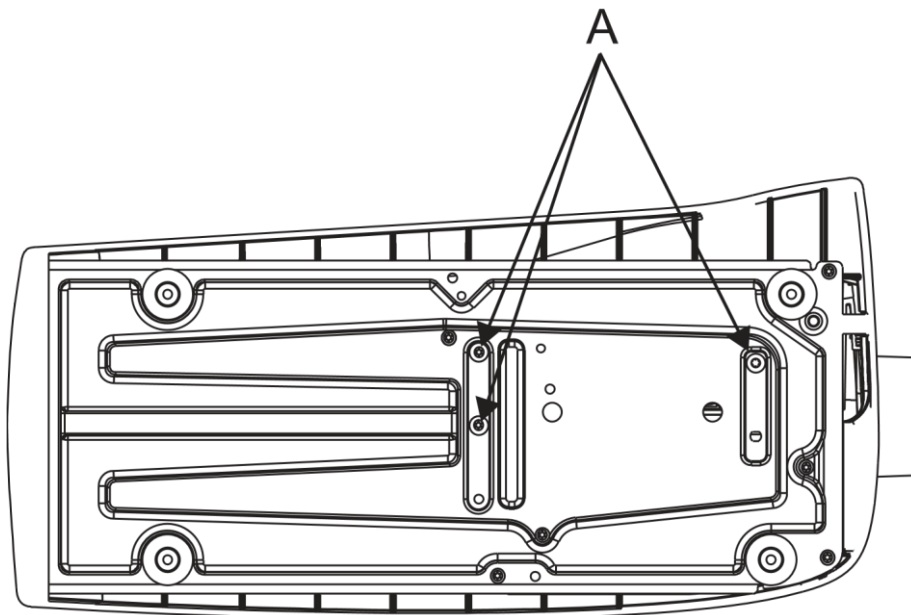
### Dismantling

1. Remove the back cover. 2. Remove the front cover.

3. Remove the 3 screws (A) for the base plate.

### Mounting

In reverse order.



*Dismantling and mounting*

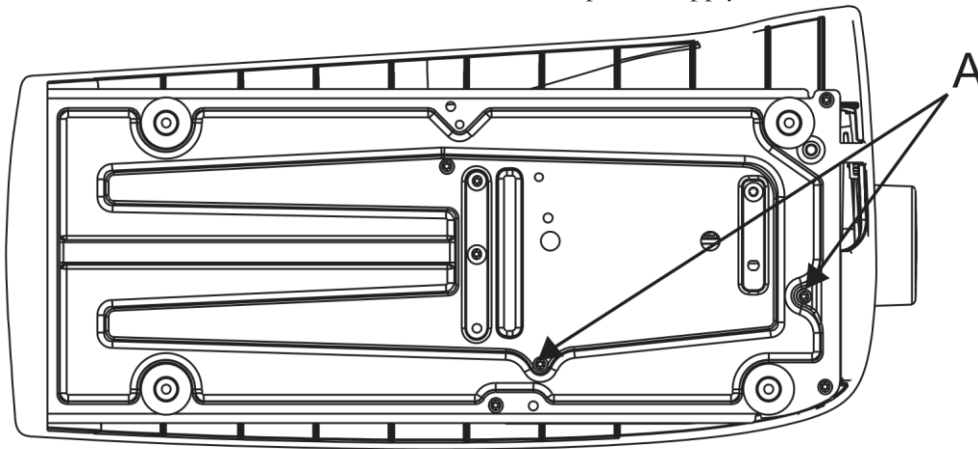
## Power supply

**FOR SAFTEY REASONS ALWAYS DISCONNECT THE POWER CORD FROM THE MACHINE BEFORE REMOVING THE POWER SUPPLY.**

---

## Dismantling

1. Remove rear cover.
2. Loosen the two screws (A) of the powersupply from below in the base plate.
3. Push the power supply to the right so that the main switch part is exposed from the base plate and lift it upwards.
4. Disconnect the cable to the circuit board from the power supply.



## Checking the powersupply

Connect the powercord to the powersupply.

Measure the voltage and resistance between the contact pins.

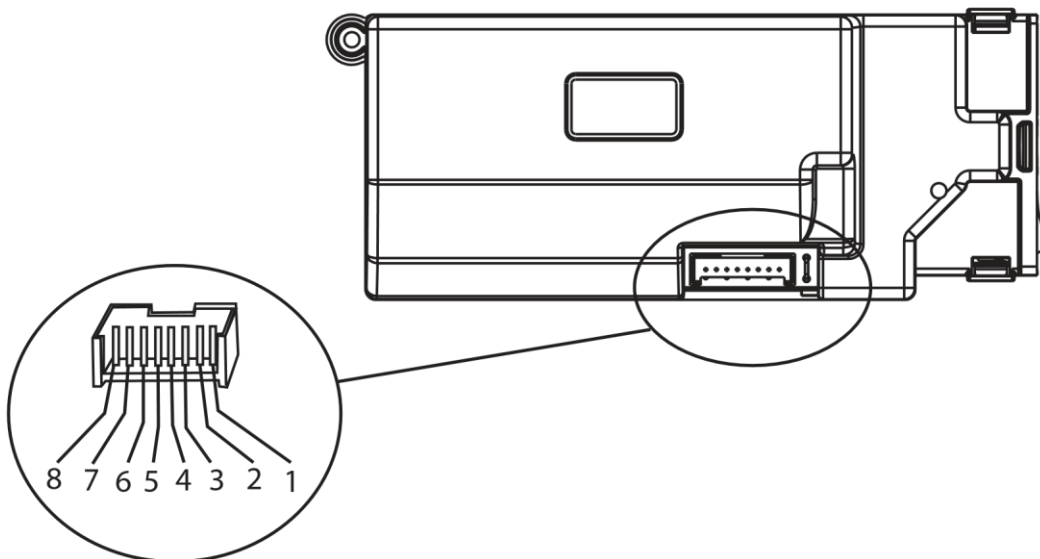
1-2 should be approx. 0-100 k Ohm Foot control connected.

3 should be 6.5 - 7.5 V DC.

4 should be approx. 3.3 V DC.

5-6 are ground.

7-8 should be approx. 24 Volt DC Lamp, computer.



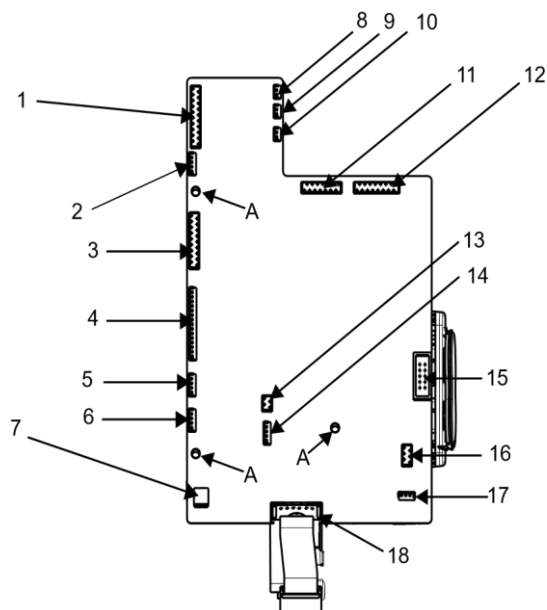
*Dismantling and mounting*

## Circuit board - Circuit diagram

**FOR SAFETY REASONS ALWAYS DISCONNECT THE POWER CORD FROM THE MACHINE BEFORE REMOVING THE CIRCUIT BOARD AND MAKE SURE TO USE WRIST BAND AND ESD MAT.**

**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). To avoid that these errors arise it is important to handle loose circuit boards in a controlled way.



**Dismantling** 1. Remove rear covers.

2. Remove front cover.

3. Disconnect the cables from the circuit board according to below:

- |  |                                     |
|--|-------------------------------------|
| (1) Connecting board (Red).                          | (10) Speaker (Yellow).              |
| (2) Thread tension unit (Blue).                      | (11) Display - frontcover(Red). (3) |
| The sewing head (Red).                               | (12) Display - frontcover(Red).     |
| (4) Embroidery unit cable (White).                   | (13) Bobbin thread sensor(White).   |
| (5) Feed unit stepmotor (White).                     | (14) Thread cutter stepmotor(white) |
| (6) Side motion/Feeddogg lowering stepmotor (White). | (15) USB card (Black).              |
| (7) Motor (Black).                                   | (16) Stop right card (Red).         |
| (8) Bobbin winder motor (Black).                     | (17) Thread cutter                  |
| sensor(White).                                       |                                     |
| (9) Bobbin winder sensor (White).                    | (18) Power supply (Grey).           |

4. Remove the 3 screws (A) holding the circuit board.

5. Lift away the board from the machine, and ALWAYS hold the PC board by the edges.

6. Place the PC board in a ESD Bag.

**Note! If the Main PC board is changed you need to set:**

**Update to latest software version.**

**The sewing heads pivot position.**

**Measure hight (TP).**

**The upper thread tension. (CUT, LO, HI, and EXTRA HIGH tension).**

**Side motion balance.**

**Machine serial number.**

**Connect the machine via a computer to the internet so its ID number is reset in**

*Dismantling and mounting*

## Tension unit

### Dismantling

1. Remove rear cover and front cover.

2. Place the needle bar in its lowest position using the hand wheel.

3. Remove the cable from PC-board and its fastening points.

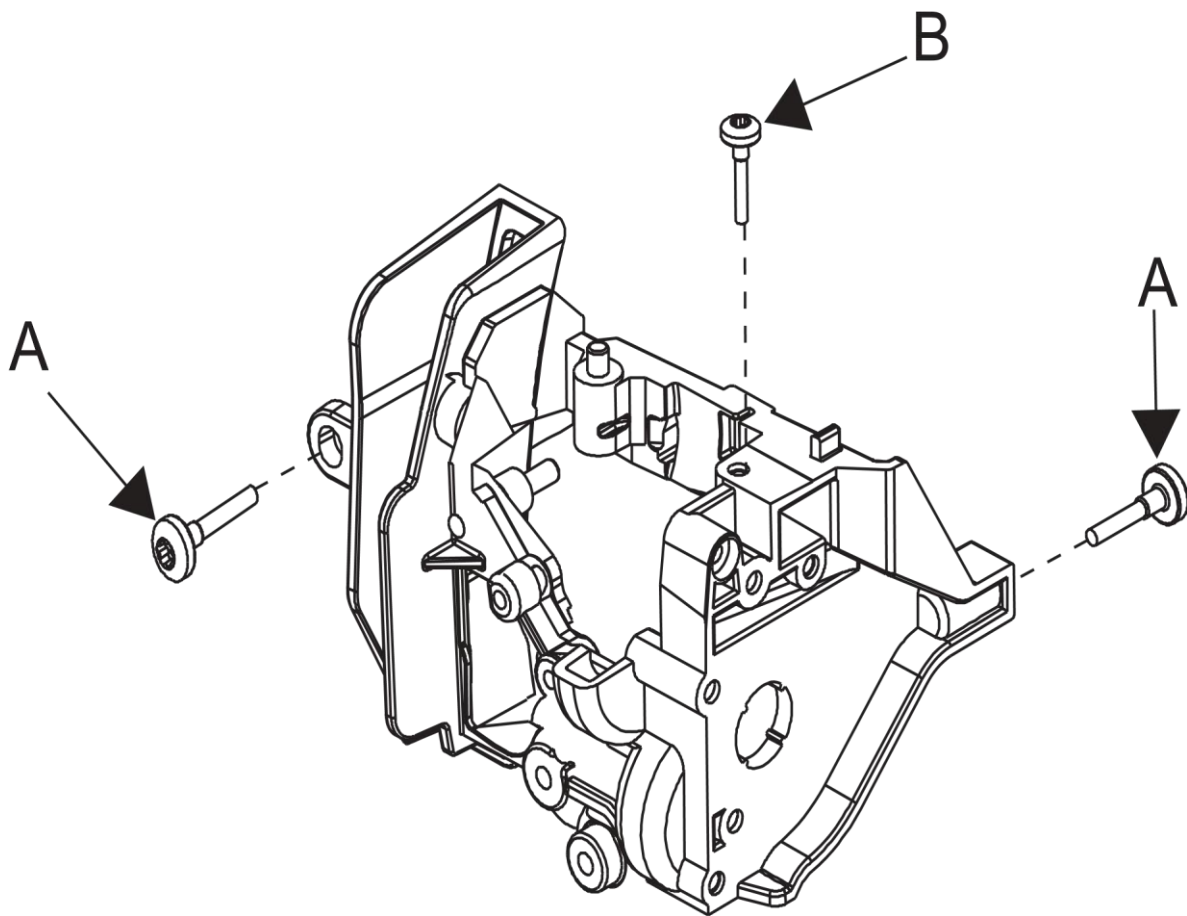
4. Remove two torx 20 screws, one from the front and one from the back (A).

5. Remove one torx 10 screw, from the top (B).

- 
6. Remove the tension unit.

### Mounting

1. Mount one torx 10 screw, from the top (B).
2. Mount two torx 20 screws, one from the front and one from the back (A).
3. Mount the cable to the PCboard and to its fastening points.
4. Mount front cover and rear cover.



*Dismantling and mounting*

## Tension unit - Replacement of the tension discs

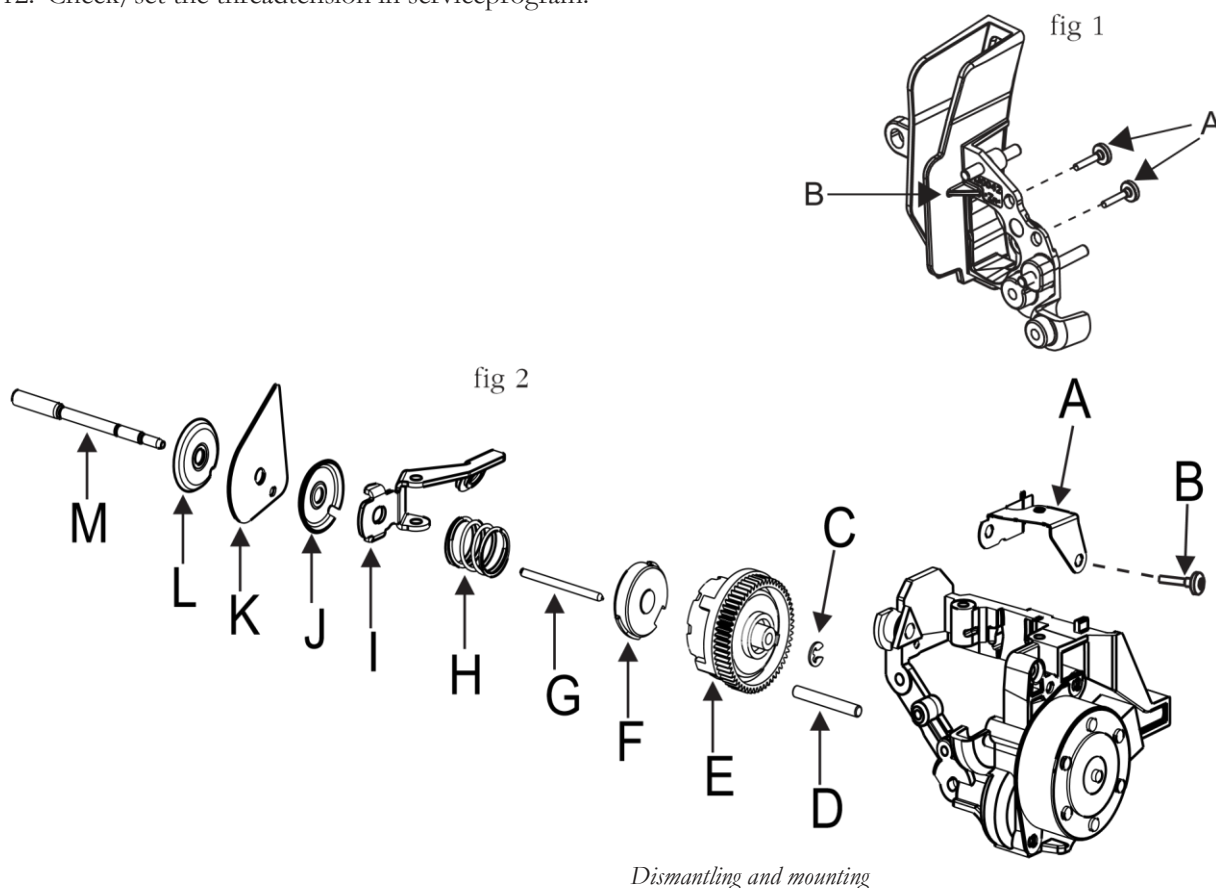
### Dismantling

1. Remove back cover and front cover.
2. Remove tension unit.
3. Remove the two torx 10 screws (A) and remove the protection shield (B) (fig 1).
4. Remove the C-clip (C) on the tension shaft (M) (fig 2).
5. Remove torx 10 screw (B) and loosen the tension wheel spring (A).
6. Put the tension unit on a stand with the discs down.
7. Knock the shaft (M) out, use a pindriving tool max 2mm wide.
8. Remove the shaft (M).
9. Lift off the tension wheel spring (A).
10. Remove the spring housing (E) with the nut (F) and its spring (H).

11. Remove the two discs (J, L).
12. Remove the tension shaft (G) and the last disc (K) by knocking the tension shaft out.
13. Remove the calibrationstop pin (D).

### Mounting

1. Put the tension unit on e.g. a bench with the stepmotor facing the bench.
2. Push the tension shaft (G) thru its hole on the housing and mount the center disk (K) and spring housing.
3. Push the calibrationstop pin in (D), until its flush with the outside of the housing.
4. Mount the two disks with the cut out on the tension shaft.
5. Align the discs and springhousing center holes and push the shaft (M) thru them.
6. Mount the tension wheel spring (A) then push the shaft all the way in.
7. Mount torx 10 screw (B) holding the tension wheel spring (A).
8. Mount the c-clip (C) on the shaft.
9. Mount the protection shield (B) with its two torx 10 screws (A) (Pic 1).
10. Mount the tension unit.
11. Mount the front cover and rear cover.
12. Check/set the threadtension in serviceprogram.



## Tension unit - Replacement of the Stepmotor

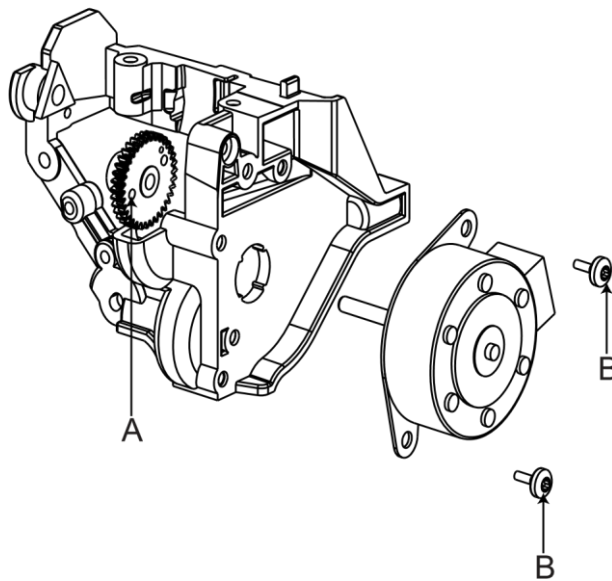
### Dismantling

1. Remove back cover and front cover.
2. Remove the cable from its fastening points and the PC-board.
3. Lock the springloaded cog wheel (A) by putting a needle through its hole.
4. Remove the two torx 10 screws (B).
5. Remove the Stepmotor.

### Mounting

1. Mount the stepmotor.

2. Mount the two torx 10 screws (B).
3. Remove the needle from the springloaded cog wheel (A).
4. Mount the cable to the PC-board and its fastening points.
5. Mount the front cover and back cover.
6. Check/Set upper threadtension in serviceprogram.

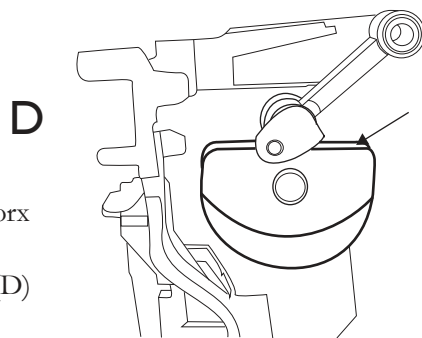


*Dismantling and mounting*

## Sewing head

### Dismantling

1. Remove rear cover and front cover.
2. Remove the thread tension unit.
3. Remove the presser foot holder and needle.
4. Disconnect the cable from the PC-board.
5. Loosen the 2.5 mm Allen key screw (B) and remove both the wedge (G) and the screw(B) by pushing them down.
6. Set the thread take up lever in its lowest position and remove Torx 20 screw (C) that holds the sewing head on the front.
7. Turn the hand wheel so the Arm shafts counter weight flat side(D) is on top.
8. Lift up the sewing head from the sewing machine arm.
9. Unhook the sewing head from the stud (E) of the thread takeup lever, then lift the sewing head up and unhook the connecting rod (F).



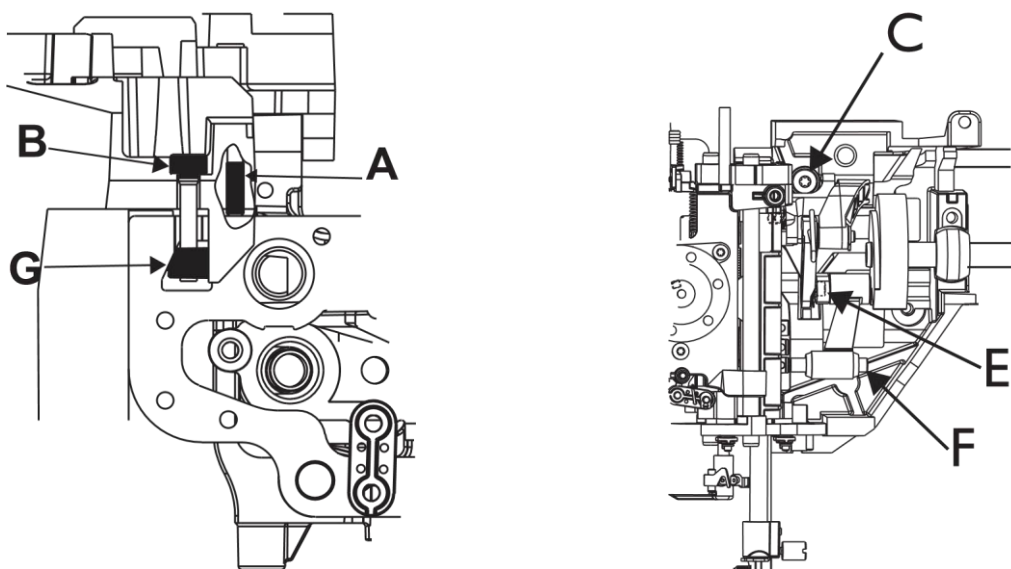
### Mounting

1. Turn the hand wheel so the Arm shafts counter weight flat side (D) is on the top.
2. Connect the Crossheads tab to the Arm shafts link hole (F),
3. Connect the stud (E) of the thread take-up lever.

4. Place sewing head in the machine and hold it while turning the hand wheel, by hand, until the needle bar is in its lower position.
5. Enter the Torx 20 screw (C) and tighten it firmly.
6. Mount the wedge (G) and the screw (B) together in the slot between the sewing head and the casting.
7. Tighten the 2.5 mm Allen key screw (B).
8. Connect the cable, from the Main PC board to the board on the left side of the Sewing head.
9. Mount the thread tension unit.

**Set thereafter:**

5. The gap between the needle and the hook.



*Dismantling and mounting*

## Step motor of the needle

### Dismantling

NOTE! The sewing head should be in the machine when changing the step motor of the needle.

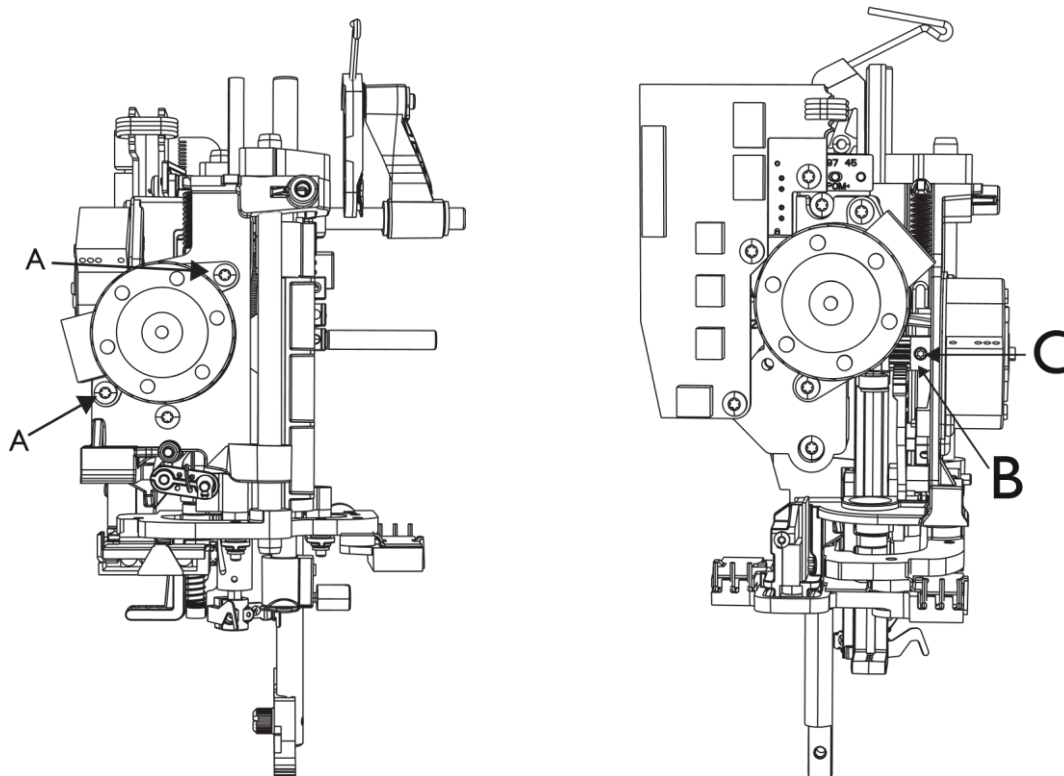
1. Remove rear cover and the front cover.
2. Disconnect the step motor cable from the sewing heads connecting board.
3. Remove the step motor by removing the 2 screws (A).

### Mounting

1. Mount an A-foot and a new 90 needle.
2. The needle should now be manually set against the A-foot, by hand, to its centre position.
3. On the step motor, position the cogwheel (B) so that the screw (C) is pointing to the left side of the sewing head, when mounted.
4. Mount the step motor; make sure the needle remains in its centre position against the A-foot.
5. Enter the screws (A) and tighten them.
6. Connect the step motor cable to the sewing heads connecting board.
7. Loosen the screw (C) on the Step motors cogwheel (B).
8. Connect the front cover to the PC Board.
9. Enter the service program.
10. Turn the screw (C) on the cogwheel (B) until the needle is in its centre position of the Presser foot A and the screw (C) is still pointing out to the left of the sewing head.



- 
11. Tighten the Screw (C).
  12. Calibrate the step motor – Press Key 1 in menu 1 of the service program repeatedly, the needle must always be in its centre position of the Presser foot A.



*Dismantling and mounting*

## Step motor of the Presser bar

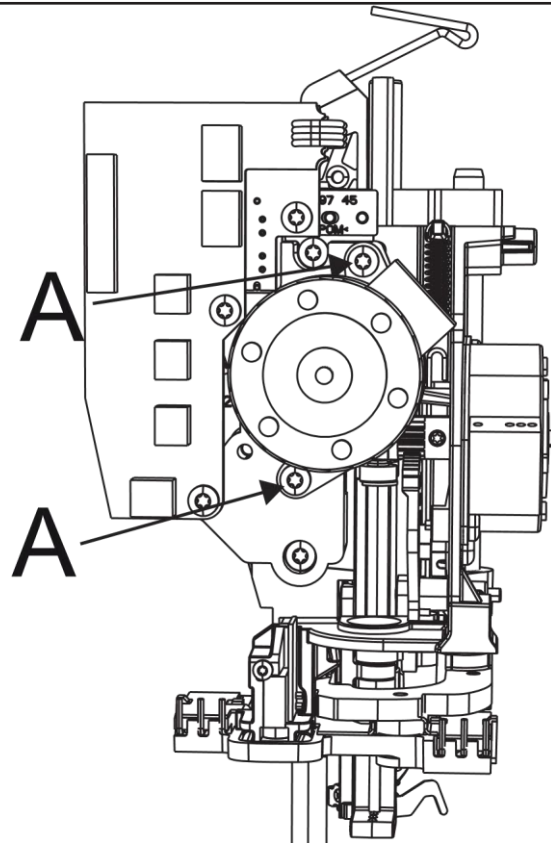
### Dismantling

NOTE! The sewing head can be in the machine when changing the step motor of the presser bar.

1. Remove rear cover and front cover.
2. Disconnect the step motor cable from the sewing heads connecting board.
3. Remove the step motor by removing the 2 screws (A).

### Mounting

1. Connect the step motor cable to the sewing heads connecting board.
2. Mount the step motor and tighten the screws (A).
3. Turn on the machine



*Dismantling and mounting*

## Presser bar bushing

### Dismantling

NOTE! The sewing head must be removed from the machine when replacing the bushing of the presser bar.

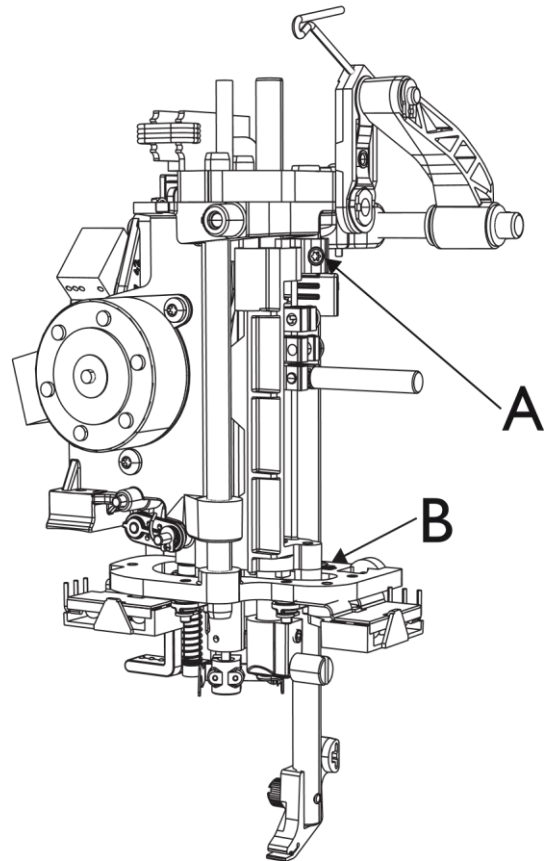
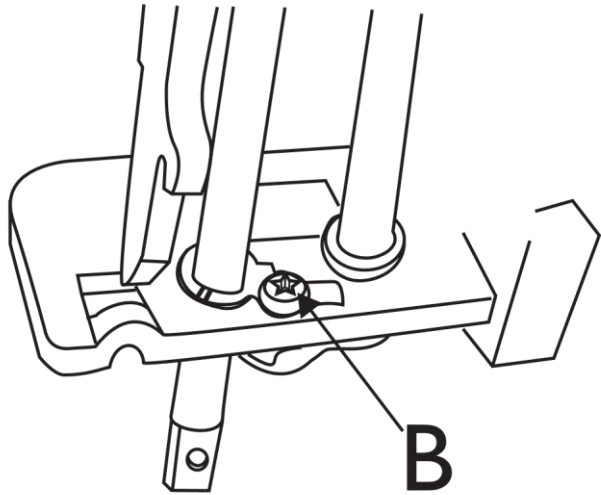
1. Remove the rear cover and the front cover.
2. Remove the tension unit.
3. Remove the sewing head from the machine.
4. Remove the presser foot holder.
5. Loosen up the 2 mm Allen key screw (A) on the presser bar holder and pull the shaft up a bit and tighten the screw VERY lightly, not to make any extra marks on the presser bar.
6. Take an angled Torx 10 screw driver and just loosen up the screw (B). Do not remove the screw and clamp.
7. Push away the bushing clamp to the right and remove the bushing.

### Mounting

1. Take the presser bar bushing and place it in the sewing head.
2. Push back the bushing holder so it is on top of the bushing and tighten the Torx 10 screw (B) lightly. Make sure the clamp is positioned correct on top of the bushing and in the bushing positioning on the lower side.
3. Remove the 2 mm Allen key screw (A) of the presser bar holder.
4. Push down the presser bar and make sure it goes smoothly up and down.
5. Tighten the Torx 10 screw (B) firmly. Re-check again so the presser bar goes smoothly up and down.
6. To pre set the presser bar, look on the shaft for a previous double mark from the screw (A), locate it and place it inside the screw hole for screw (A).
7. Re-enter the screw (A) and tighten it.
8. Mount the sewing head in the machine

**Set thereafter:**

- 15. Presser foot parallelism to the feed dog
- 16. Presser bar height to needle plate



*Dismantling and mounting*

## Needle bar bushing

### Dismantling

NOTE! The sewing head must be removed of the machine when replacing the bushing of the needle bar.

1. Remove the rear covers and the front cover.
2. Remove the tension unit.
3. Remove the sewing head from the machine.
4. Remove the presser foot holder.
5. Loosen the screw (A) on cross head and the screw (B) that holds the needle thread stop.
6. Pull the needle bar down a bit and remove the needle thread stop (C) and the cross head (D).
7. To remove the needle bar bushing, push the needle bar a little side to side so the bearing holder snap loose.
8. Remove bushing and holder from the needle bar.

### Mounting

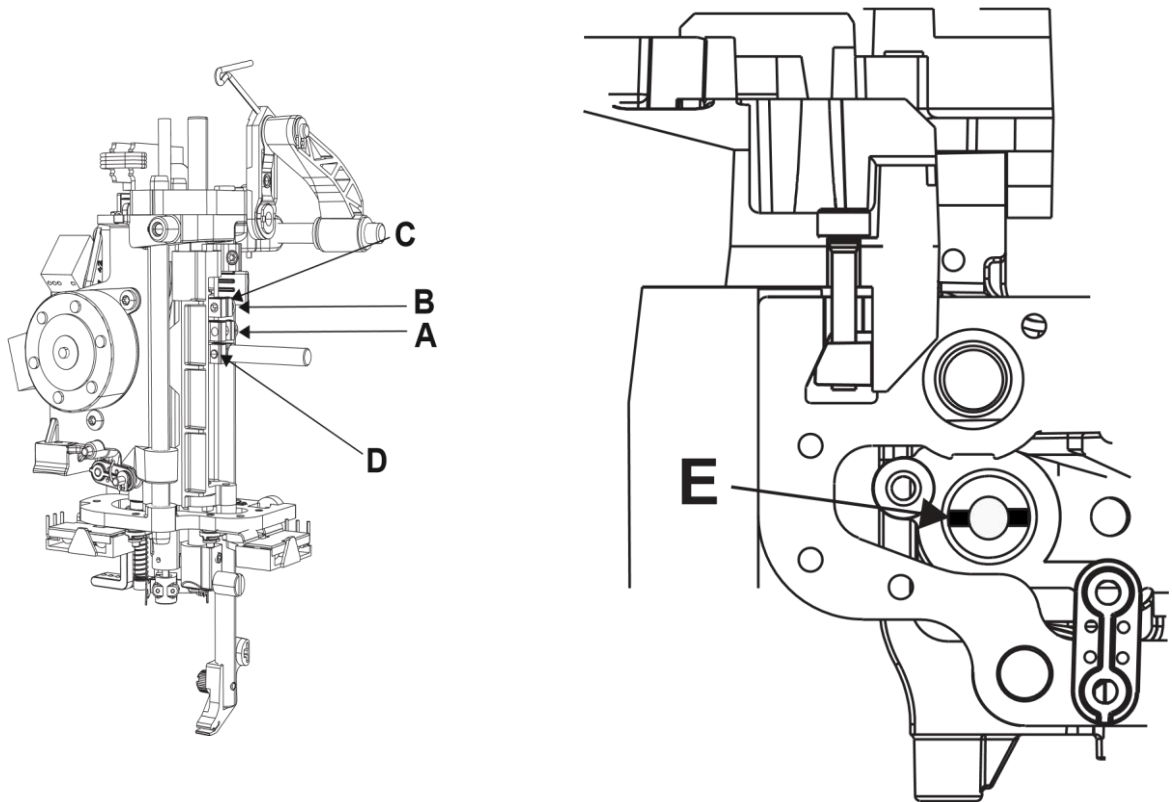
1. Place the bushing holder on the bushing
  2. Mount the bushing holder and the bushing on the needle bar - with the bushing on top.
  3. Mount the needle bar and push it all the way in.
  4. Use a small screw driver to snap-in the bushing holder.
- The bushing holder has 2 tabs (E) they should be positioned side to side when looking at the sewing head from the front.
5. Pull down the needle bar a bit and mount the cross head and the needle threader stop.
  6. Pre position both cross head and needle threader stop and tighten the screw just lightly.
  7. Mount the sewing head in the machine.

### Check/Set thereafter:

8. The height of the hook.
11. Needle bar height.

---

13. Needle threader stop.



*Dismantling and mounting*

## Sewing head re-building

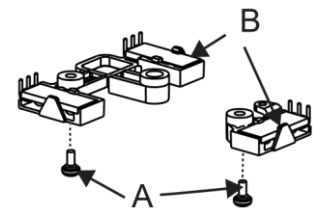
Remove the sewing head from the machine. See detailed instruction in this manual.

Disconnect all LED Cables from the connecting card.

Remove the 2 torx 10 screws (A) that holds the LED lights.

Remove both LED lights (B).

Disconnect the Zigzag and the presser bar step motor cables from the connecting card.



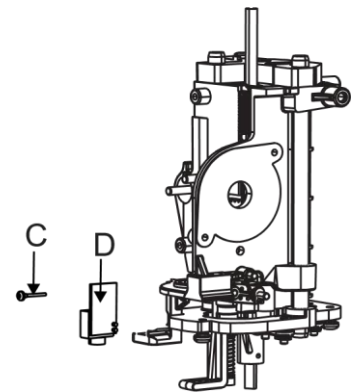
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Disconnect the buttonhole sensor cable.

Remove the torx 6 screw (C) that holds the button hole sensor.

Remove the button hole sensor (D)

Mount the button hole sensor (D) on the replacement sewing head. Turn in the torx 6 screw (C) on the replacement sewing head.



---

Remove the 2 torx 10 (E) that holds the presser bar unit.

Remove the presser bar unit (F).

It includes Step motor and connecting card

Remove the large presser bar cog wheel (G).

Remove the small presser bar cog wheel (H).

Remove the pin (I) that the small presser bar cog wheel was placed on.

Loosen up the screw that holds the p-bar shield (J).

Remove the p-bar shield (J).

Remove the utter C-clip (K) that holds the Thread take-up.

---

---

Remove the Thread take-up (L).

Note! The flat washer and the wave washer located on the thread take up shaft.

Loosen up the Presser bar torx 8 set screw (M).

Remove the presser bar (R).

Un-hook the presser bar spring (N) from the presser bar connecting lever pin.

Remove the presser bar connecting bracket (O).

Place the spring on the presser bar connecting bracket (P) and mount it on the replacement sewing head.

Hook it on to the presser bar levers pin (N).

Remove the presser bar torx 8 set screw (M).

Mount the presser bar (R) in the replacement sewing head.

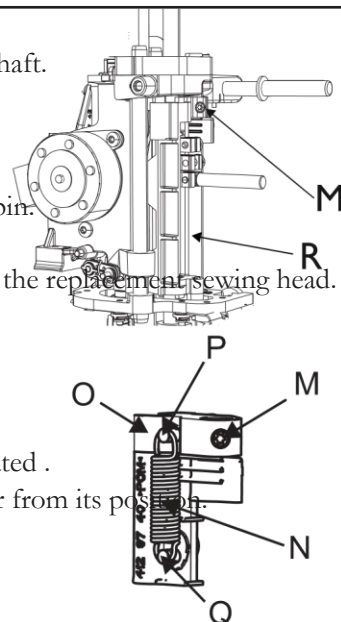
Look for the mark from the presser bar set screw.

Place the mark inside the hole where the presser bar set screw (M) was located .

Mount the presser bar torx 8 set screw (M), without moving the presser bar from its position.

Check so the presser bar is moving up and down freely.

*Dismantling and mounting*



Remove the 2 torx 10 screws (S) that hold the Zigzag step motor.

Remove the Zigzag step motor (T).

Remove the Zigzag calibration stop torx 10 screw (U).

Remove the Zigzag calibration stop.

Place the Zigzag calibration stop (V) in the replacement sewing head.

The eccentricity of the calibration stop (V) should be on the top, see illustration.

Hold the calibration stop (V) with a finger and mount the torx 10 screw (U).

---

Mount the pin (I) where the small presser bar cog wheel was placed on.

Place the small presser bar cog wheel (H) inside the presser bar unit. Smaller part of the cog wheel to the top. See illustration.

Place the larger presser bar cog wheel (G) on the larger presser bar cog wheels pin (I). Note! This pin may be missing, look for it then inside the old sewing head.

The 2 cog wheels (G and H) should now be connected with the presser bar step motor (J).

Take the presser bar unit (F) and place it on the replacement sewing head. Connect the Large cog wheel to the presser bar lever. The small cog wheel should be on the pin (I).

Make sure the sewing head and presser bar unit are together. Mount the 2 torx 10 screws (E).

Mount the presser bar sensors shield (J). It should be inside

Pull the needle bar to its down position.

make note of the distance between the needle bars top and the frame (AA), see illustration.

Loosen up the cross heads torx 10 screw (Y).  
Loosen up the needle thread stop torx 10 screw (Z).  
Tighten the torx 20 screw.  
Remove the Needle bar by pull it down.

Take the replacement sewing head and mount the needle bar Just push it up a bit.

Mount the cross head and the needle threader stop. Pre-set it with the cross head against the base and the top of needle bar has a small distance to top of frame, see (AA) Illustration.

Tighten cross head screw (Y)

Before tighten the needle thread screw (Z) make a 1.5 mm distance between it and the cross head.

#### *Dismantling and mounting*

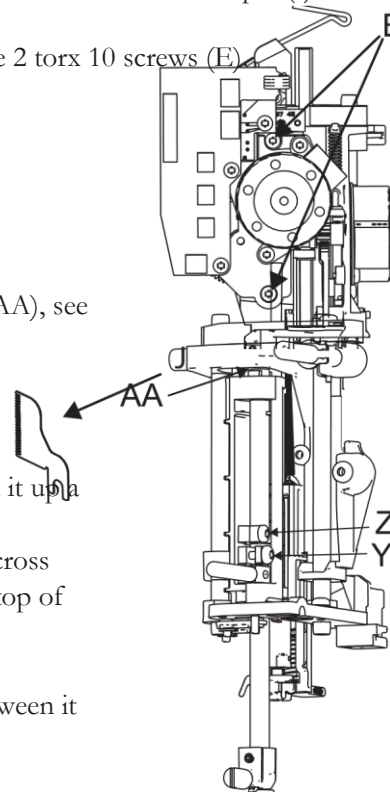
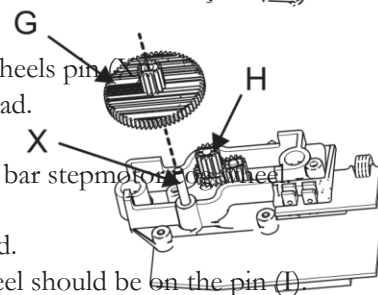
Mount the presser foot holder and the A-presser foot.

Put in a new # 90 needle.

Set the needle in the centre position against the A-presser foot, by hand.

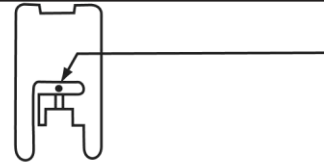
Take the zigzag step motor.

Mount it on the sewing head with it's cogwheels setting screw (BB) is pointing to the left from the side of the sewing head, see illustration.

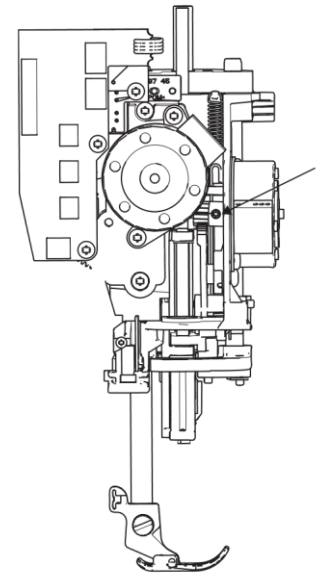


Make sure the needle remains in its centre position against **BB** the A-foot.

Mount the both screws for the zigzag step motor.



Mount the both LED light's (B). Fasten them with screws (A) Connect all the cables.



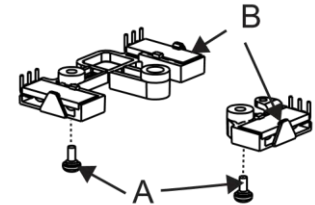
Mount the C-clip that position the Thread take up. Measure the distance on the old sewing head. See illustration.

Mount a straight metal washer on the inside.

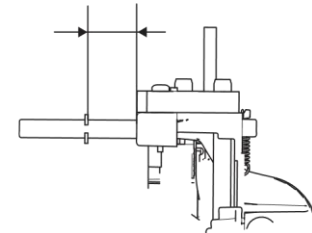
Mount the Thread take up.

Mount a metal wave washer.

Remove the C-clip from the Old sewing head and mount it on the replacement sewing head. Make sure it is no play but that it moves freely. NOTE! When the thread tension is mounted look so the thread take up is in the centre of the thread take up screen.



Mount the sewing head on the machine. See detailed instruction in this manual.



### Set thereafter.

5. The gap between the needle and the hook.
8. The height of the hook.
11. Needle bar height.
13. Needle threader stop.
15. Presser foot parallelism to the feed dog
16. Presser bar height to needle plate
17. Measure height (TP)
10. Setting the needle in centre position
14. Threading device

*Dismantling and mounting*

## Arm shaft.

**FOR SAFTEY REASONS ALWAYS DISCONNECT THE POWER CORD FROM THE MACHINE BEFORE REMOVING THE CIRCUIT BOARD AND MAKE SURE TO USE WRIST BAND AND ESD MAT.**

### Dismantling

1. Remove the rear cover and the front cover.
2. Remove the tension unit.
3. Remove the PC Board.
4. Un-hook the motor belt from the arm shaft.
5. Remove the two screws (A) and the clamps.

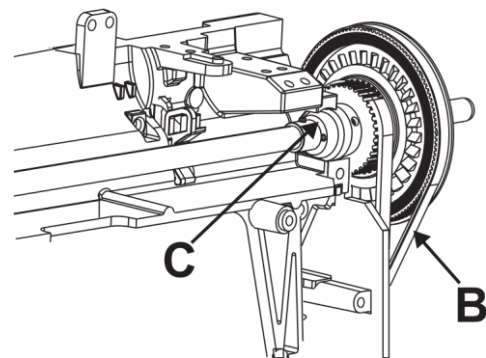
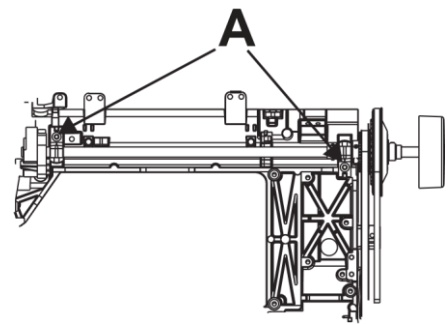
6. Push the eccentric bearing up wards, to loosen up the drive belt tension.
7. Lift out the Arm shaft a bit and then pull it towards the right, through the drive belt and at the same time disconnect the thread take up and the cross head.

### Mounting

1. Make sure the rubber inserts are positioned at the bearing holders on the casting.
2. Enter the arm shaft through the drive belt
3. Connect the sewing heads crossheads tab to the Arm shafts link hole,4. Connect the sewing heads the thread take-up lever to the arm shafts stud.
5. Place the drive belt on the arm shafts cog wheel.
6. Place the arm shafts bearings into the bearing holders on the casting.**NOTE! Make sure the eccentric bearings hole is facing the front.**
7. Fold up the rubber of the inserts and place the clamps on top.
8. Enter the screws (A).
9. Disconnect the upper and lower shaft by loosen the three screws on the arm shafts cog wheel.
10. Hook on the Motor belt.

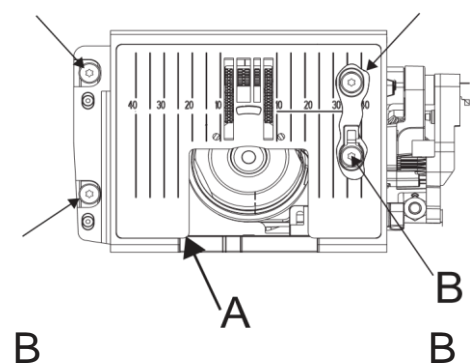
### Set thereafter.

1. Belt tension -drive belt
12. Timing of the hook in relation to the needle.



*Dismantling and mounting*

### Hook cover



### complete

#### Dismantling

1. Remove the rear cover and the front cover.
2. Remove the powersupply.



3. Remove the screw (C). Remove and cut the ziptie.
4. Remove the bobbin sensor cable from the PC-board

and its fasteningpoints.

**B**

5. Raise the presser bar to its highest position.
6. Remove the needle.
7. Remove the presser foot holder.
8. Remove the bobbin window.
9. Remove the needle plate by placing a screw driver at (A) and snap it off.
10. Remove the bobbin basket holder and the bobbin basket.
11. Remove the four screws (B) on the hook cover.
12. Remove the hook cover. Pull/roll the bar (E) out from the thread cutter step motor unit.

### Mounting

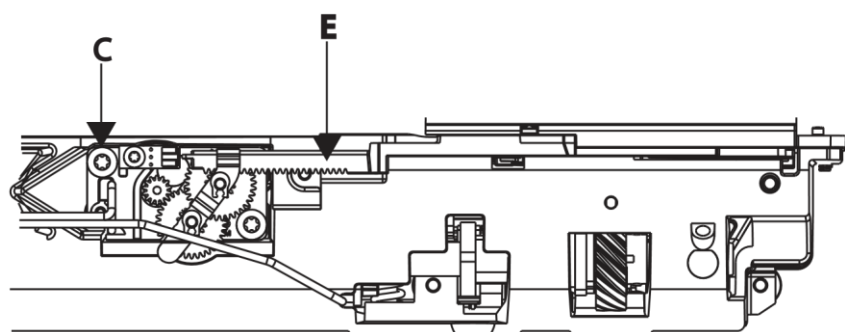
1. Push/roll the bar (E) into its position in the thread cutter step motor unit.
2. On the left side of the castings free arm is it two black setting pins, place the hook cover openings on top of these.
3. Mount all four Torx 10 screws that hold the hook cover in position but do not tighten them at this point. The hook cover must be movable back to front.

Note! The ESD washer should be positioned on the right hand front side.

4. Mount the bobbin basket, bobbin basket holder and the needle plate.
5. Insert the new size 90 needle in the machine.
6. Put the A-foot on the machine and centre the needle by the hand.
7. Remove the A-Foot.
8. Turn the hand wheel so that the needle eye is just above the needle plate.
9. Set the hook cover in relation to the needle in feeding direction. Move the hook cover until the needle is in the centre position looking from the side.
10. Tighten the two screws on the left hand side first. Always hold the cover with one hand, when tightening the first screw.
11. Turn the hand wheel so the needle is in its upper turning position and then remove the needle plate.
12. Tighten the two screws on the right hand side.
13. Mount the Needle plate.
14. Turn the hand wheel so that the needle enters the needle hole in the needle plate and recheck the setting - The needle should now still be in centre position looking from the side.
15. Mount the cable and attach it to the PC-board and its fastening points.
16. Mount a new ziptie.
17. Mount the screw (C).

### Set thereafter

The height of the hook.

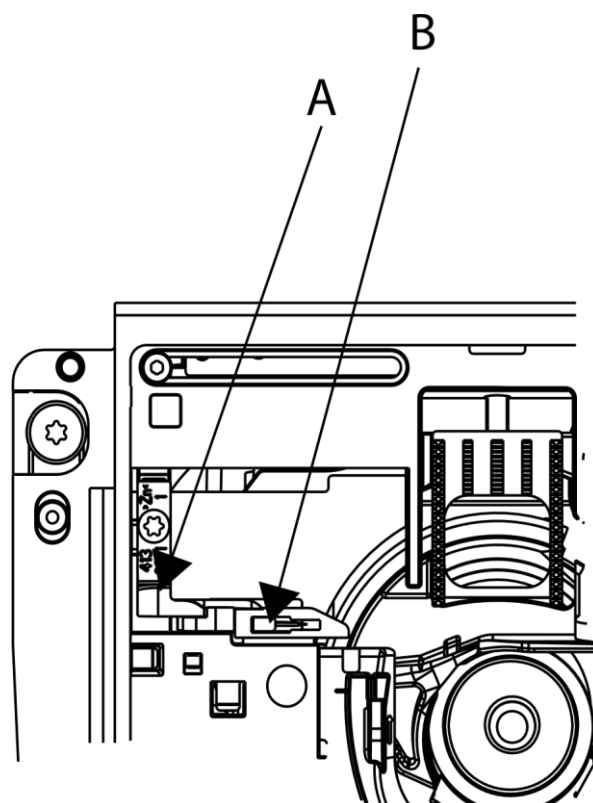


*Dismantling and mounting*

## Replace thread cutter knife

1. Remove needle plate.
2. Enter the serviceprogram Motors menu.
3. In submenu Thread Cutter press Step Cut.
4. Turn the knife holder (B) to straight up position and remove the knife holder by pulling it towards the back of the machine.

5. Remove the knife by pulling it straight out from the holder.
6. Mount the new knife by pushing it into the knife holder.
7. Mount the knife holder in the hook cover and place it in position so the knife edge is facing towards the needle.
8. Press Reset Cut.
9. Mount the needle plate.



*Dismantling and mounting*

## Hook complete

### Dismantling

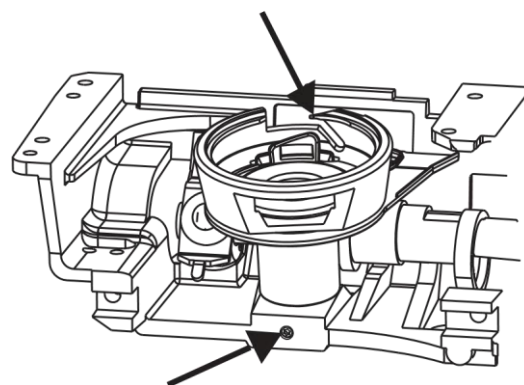
1. Remove rear cover and front cover.
  2. Remove the hook cover.
  3. Loosen the 2mm Allen screw (B)
  4. Rotate the hook upwards a bit, then grip the dust cover, tilt the hook towards the feed dog and remove both parts out of the machine.
1. Turn the hand wheel so the setting pin on the

worm **!** **Mounting**

gear is positioned according to figure.

2. Place the spring on the hook shaft and then place the dust cover on the shaft.
3. Lift the feed dog to gain access and slide the dust cover and the hook into place.

NOTE! On the dust covers back there is a pin, this must be placed in position before the hook shaft is positioned, then drop the dustcover.



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4. Place the hook so the tip (A) points straight backwards. 5. Check that the spring pushes the hook upwards.



Press the hook down and tighten screw (B).

6. Mount the hook cover.

**Set thereafter:**

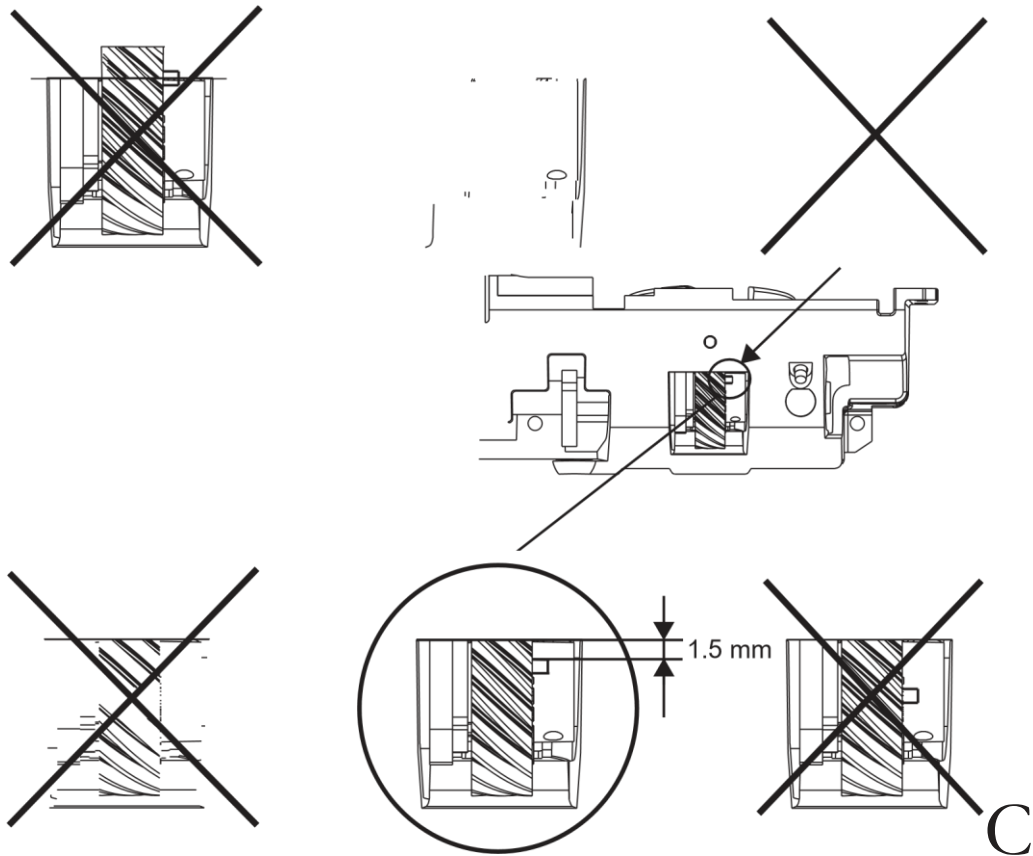
Play of the hook gear.

Gap between the needle and the hook.

The setting of the needle plate (hook cover) in relation to the needle in the feeding direction. The height of the hook.

Needle height.

Timing of the hook in relation to the needle.



*Dismantling and mounting*

## Feeding unit step motor

### Dismantling

1. Remove the rear cover and the front cover.
  2. Remove the base plate.
  3. Remove the hook cover
  4. Disconnect the Step motor cable from the PC Board and bring it out to the back side.
  5. For easier mounting later, take the measurement between the upper part of step motor frame (A) and the casting(B), and make a note of the height. The height may differ from machine to machine.
  6. Use a 4mm Allen Key to remove the feed adjusting screw (C).
  7. Remove the nut and the spring.
  8. Push down the step motor against the casting.
  9. Remove the Torx 20 screw (D) on the back side of the step motor.
- NOTE! This screw (D) is a left hand threaded Torx 20 screw, to REMOVE it turn the screw driver CLOCKWISE.
10. Un-hook the feed dog carrier spring (E), located on the castings left side.
  11. Push the feed unit to its most forward position.
  12. Remove the feed dog step motor unit by lifting it to the right and then up.

---

## Mounting

NOTE! Always check or set the step motors feeding position (Basic length balance setting) before mounting it.

1. Take the step motor and enter the cable through the casting.
2. The concave shaped guide block follower should go on the guide block and the guide blocks flat side must face the lower side of the machine.
3. Before mounting the Feeding Step motor check or set "Pre-setting of the feed unit step motor".
4. Mount the step motor and connect the guide block and guide follower first then push the motor more to the left and position the shaft in the casting.
5. Take the left hand threaded Torx 20 screw (D), tighten the screw firmly.

NOTE! turn the screw driver ANTI CLOCKWISE.

6. Hook on the feed dog carrier spring (E).
7. Push up the step motor.
8. Put in the spring then the screw and the nut on top.
9. Take the 4 mm Allen key and turn in the screw (C).
10. Check the distance between the upper part of step motor frame (A) and the casting (B). It should be the same as before loosening the screw. Continue until it matches.
11. Mount the cable in the cable groove and then into the clip, push it in the castings opening to the front and connect it to the pc board.
12. Mount hook cover

13. Mount base plate A D

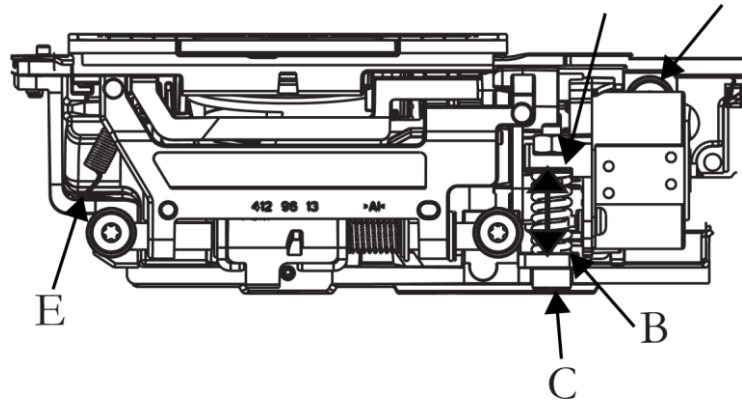
NOTE! Use ESD mat and wrist band.

## Settings to do

Setting the hook cover.

Stitch length balance, fine adjustment.

*Dismantling and  
mounting*



## Feeding unit

### Dismantling

1. Remove rear and front covers.
2. Remove the hook cover.
3. Remove the hook complete.
4. Remove the baseplate.
5. Remove the feeding step motor.
6. Remove the two screws (B).
7. Un-hook the spring from the casting, located on the left side of the feed unit.
8. Lift out the complete feeding unit.

### Mounting

1. Set feeding eccentric straight backwards.
2. Insert feeding unit and tighten the two screws (B) lightly.
3. Mount the feeding step motor and base plate.
4. Mount and set hook and hook cover.
5. Mount the presser foot holder and the presser foot.
6. Set the feed unit side ways (setting No 7) and tighten screws (B).

**The below have to be checked or set, either during or after the parts are mounted.**

Setting of the hook in relation to the feeding eccentric.

Play of the hook gear.

Gap between the needle and the hook.

---

The setting of the stitch plate (hook cover) in relation to the needle in the feeding direction. Setting the feed dog in relation to the needle plate.

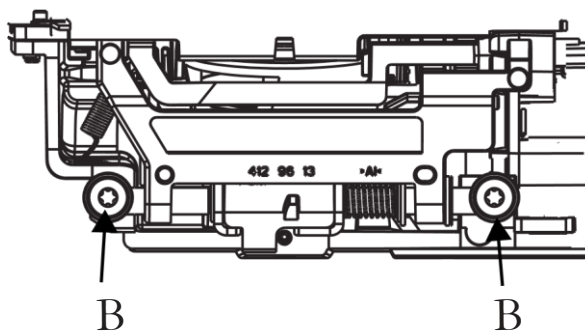
Feed dog height.

Needle height.

Timing of the hook in relation to the needle.

Stitch length balance, basic setting.

Stitch length balance, fine adjustment.



*Dismantling and mounting*

## The side feeding mechanism complete

### Dismounting

1. Remove all covers.
2. Remove the pc-board.
3. Disconnect the bar (C) from the side feeding mechanism by removing the screw (A) and the clip (B).
4. Disconnect and remove the Feed dog lowering rod (D).
5. Remove the two Torx 20 screws (E) and remove the Linkage connection (F).
7. Remove the linkage (G) by moving it to the front and un-hook it from the side feeding.
8. Remove the 4 screws (H) and remove the side feeding mechanism.

### Mount

1. Mount the Side Feeding Mechanism.
2. Connect the draw bar (C) from the side feeding mechanism with the screw (A) and the clip (B).
3. Mount the linkage (G) and connect it to the linkage connection (F).
4. Mount linkage connection (F) and the two Torx 20 screws.
5. Mount the pc-board.
6. Mount the Feed dog lowering rod (D).

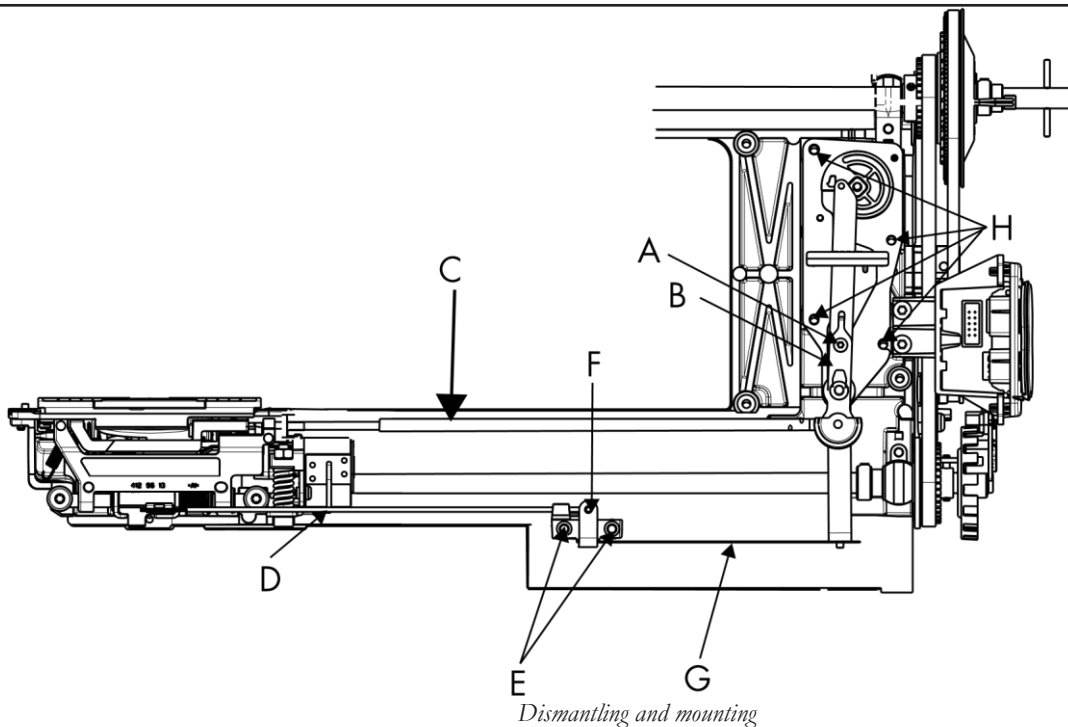
### Set thereafter.

Setting the feeding mechanism sideways.

Setting the feed dog in relation to the needle plate.

Feed Dog Lowering.

Stitch length balance / Sidemotion balance.



## Lower Shaft

**FOR SAFETY REASONS ALWAYS DISCONNECT THE POWER CORD FROM THE MACHINE BEFORE REMOVING THE CIRCUIT BOARD AND MAKE SURE TO USE WRIST BAND AND ESD MAT.**

### Dismantling

1. Remove rear cover and front cover.
2. Remove hook cover and Hook.
3. Remove the base plate.
4. Remove the feed dog step motor unit
5. Remove the feed dog unit.
6. Remove the Main PC board.
7. Remove the Synchronizer card holder.
8. Remove the Synchronizer screen from the lower shaft.
9. Push the drive belt of the lower shafts cog wheel.
10. Remove the two screws and the clamps that hold the lower shaft in position.
11. Lift up the lower shaft a bit and remove it towards right of the machine.

### Mounting

1. Before mounting the lower shaft make sure to open up the screws on the arm shafts cog wheel.
2. Place the lower shaft in the machine; make sure the excentric bearings hole is on the lower half.
3. Place the clamps on the bearings and tighten with the two Torx 20 screws.
4. Push on the main belt on the lower shafts cog wheel.
5. Mount the Synchronizer wheel, it should be snapped on to the long sided pin on the lower shaft.
6. Mount the Synchronizer card holder.
7. Mount the Main PC board.
8. Mount the feed dog unit.
9. Mount the feed dog step motor unit - Always check the setting "19. Pre-setting the feed unit step motor" before mounting the feed dog step motor unit.
10. Mount the base plate.
11. Mount the Hook and Hook cover.

---

**The below have to be checked or set, either during or after the parts are mounted.**

Setting of the hook in relation to the feeding eccentric.

Play of the hook gear.

Gap between the needle and the hook.

The setting of the needle plate (hook cover) in relation to the needle in the feeding direction. Setting the feed dog side ways to the needle plate.

Feed dog height.

Needlebar height.

Timing of the hook in relation to the needle.

Stitch length balance, basic setting.

Stitch length balance, fine adjustment.

*Dismantling and mounting*

## Threadcutting unit

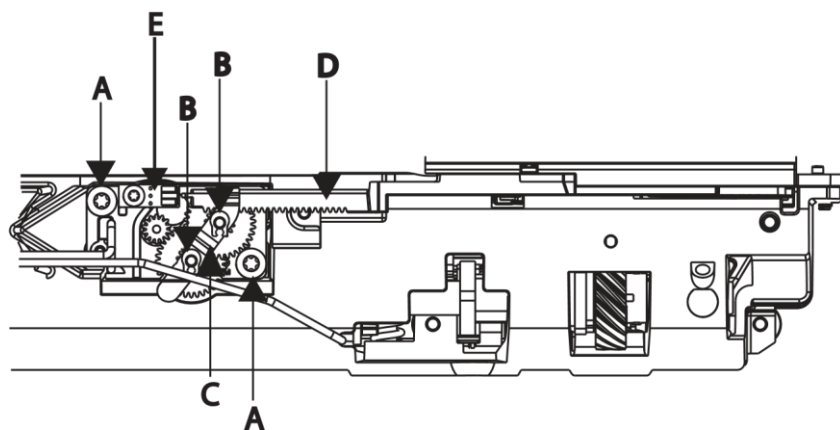
### Dismantling

1. Remove rear cover.
2. Remove front cover.
3. Remove power supply.
4. Remove cables: Thread cut, Bobbin sensor and Cut sensor from the PC-board, and release them from their fastening points.
5. Remove the two torx 20 screws (A) holding the stepper motor.
6. Take out the unit, "roll" it off from the arm (D).

### Mounting

1. Mount the unit, "roll" it on to the arm (D).
2. Mount the two torx 20 screws.
3. Reattach the cables to their fastening points and to the PC-board.
4. Mount power supply.
5. Mount front cover.
6. Mount rear cover.

**NOTE!** If you have adjusted/replaced the threadcutting sensor (E) make sure that the arm (D) runs freely through the sensor (E).



*Embroidery unit*



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# EMBROIDERY UNIT

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## Cover Y-slide

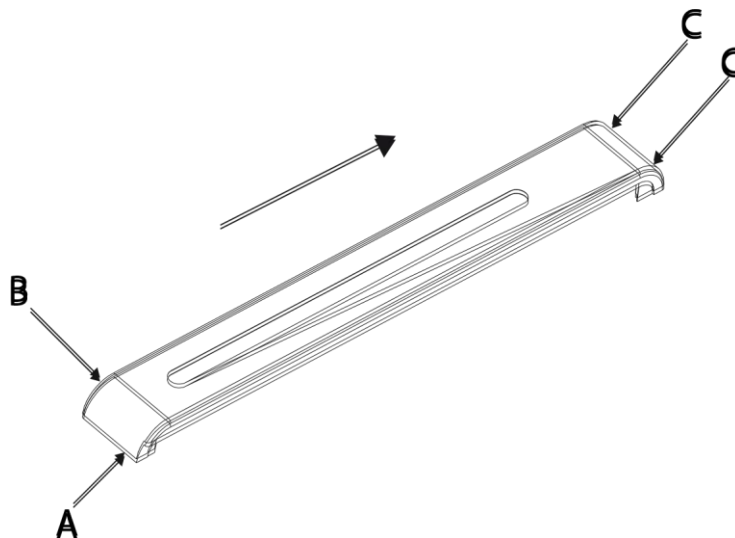
NOTE! When doing the below steps, turn the embroidery unit upside down so that the snaps are visual.

### Dismounting

1. Flex the cover to release the snap (A).
2. Push the cover gently towards the right to release the snap (B)
3. Push the cover in the direction of the arrow to release the last two snaps (C).

### Mounting

Place the cover over the plate and press the snaps.

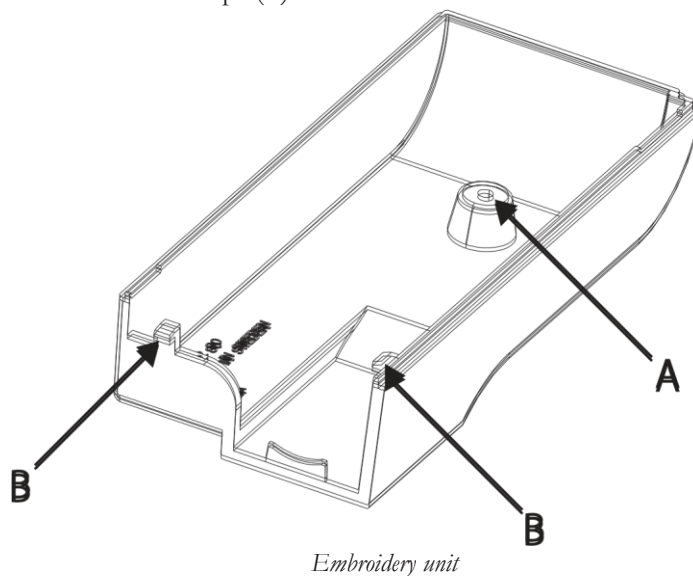


## Step motor cover

### Dismounting

Position the Y-slide in its most left position.

Remove the screw (A), release the two snaps (B) and then remove the cover.



## Upper covers

**Dismantling the upper cover** Remove the cover Y- slide.

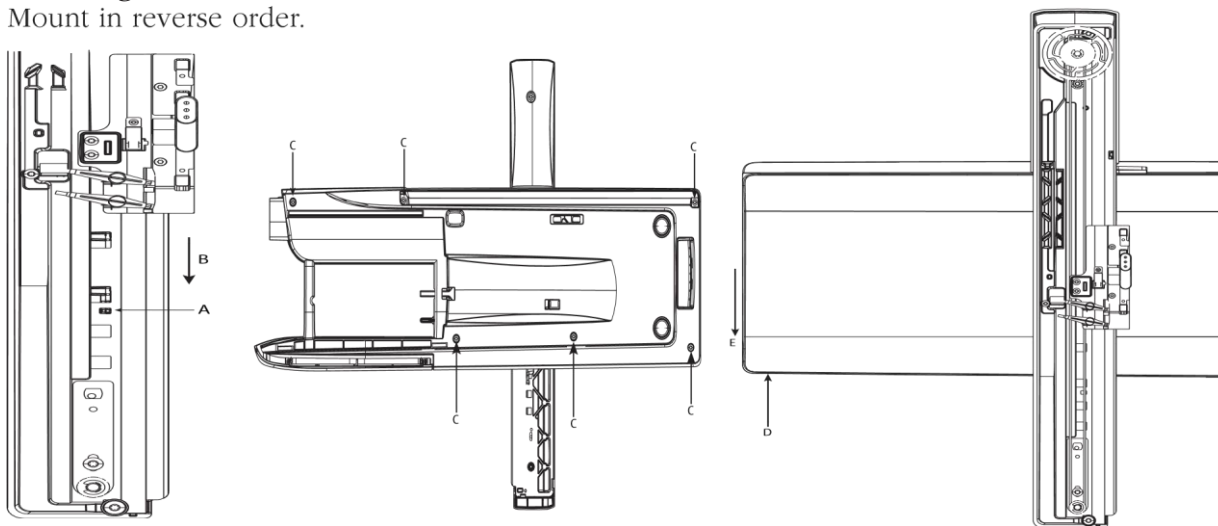
Remove the support arm by pushing down on (A) and sliding it in direction(B).

Remove the 6 torx 20 screws (C) from underneath.

Lift the Y-arm and lift the cover in its left corner(D) and slide it in direction (E) to remove it.

### Mounting

Mount in reverse order.



## Lower cover

### Dismantling

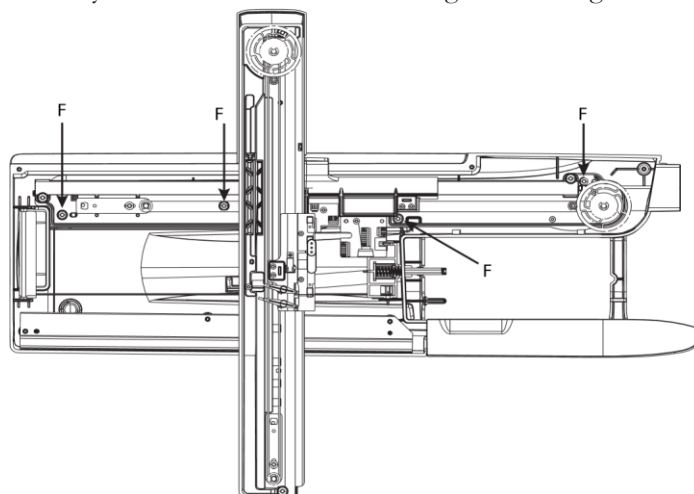
Remove the 4 screws (F) and the two embroidery cable connectors from the large connecting board.

Lift out the embroidery unit

### Mounting

Mounting in reverse order.

*Embroidery unit*



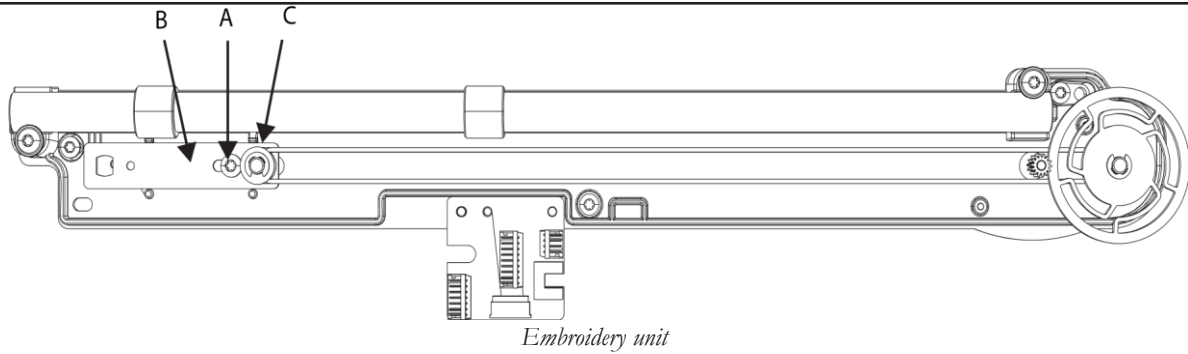
## Belt tension, Embroidery unit - X- unit

### Check

The belt should just slightly move when pressing the button Check Belt X in the Service Program menu Emb Unit.

### Adjustment

1. Adjust by touching the button Check Belt X in Service Program menu Emb Unit so that the step motor starts to move and loosen the screw (A) for the belt tension adjustment.
2. Move the plate (B) until the belt just stops to move(look in the area where C is pointing to determine when it stops), slightly release the tension and tighten screw (A), the belt should now move just slightly.
3. Press Check Belt Off to stop the step motor movement.



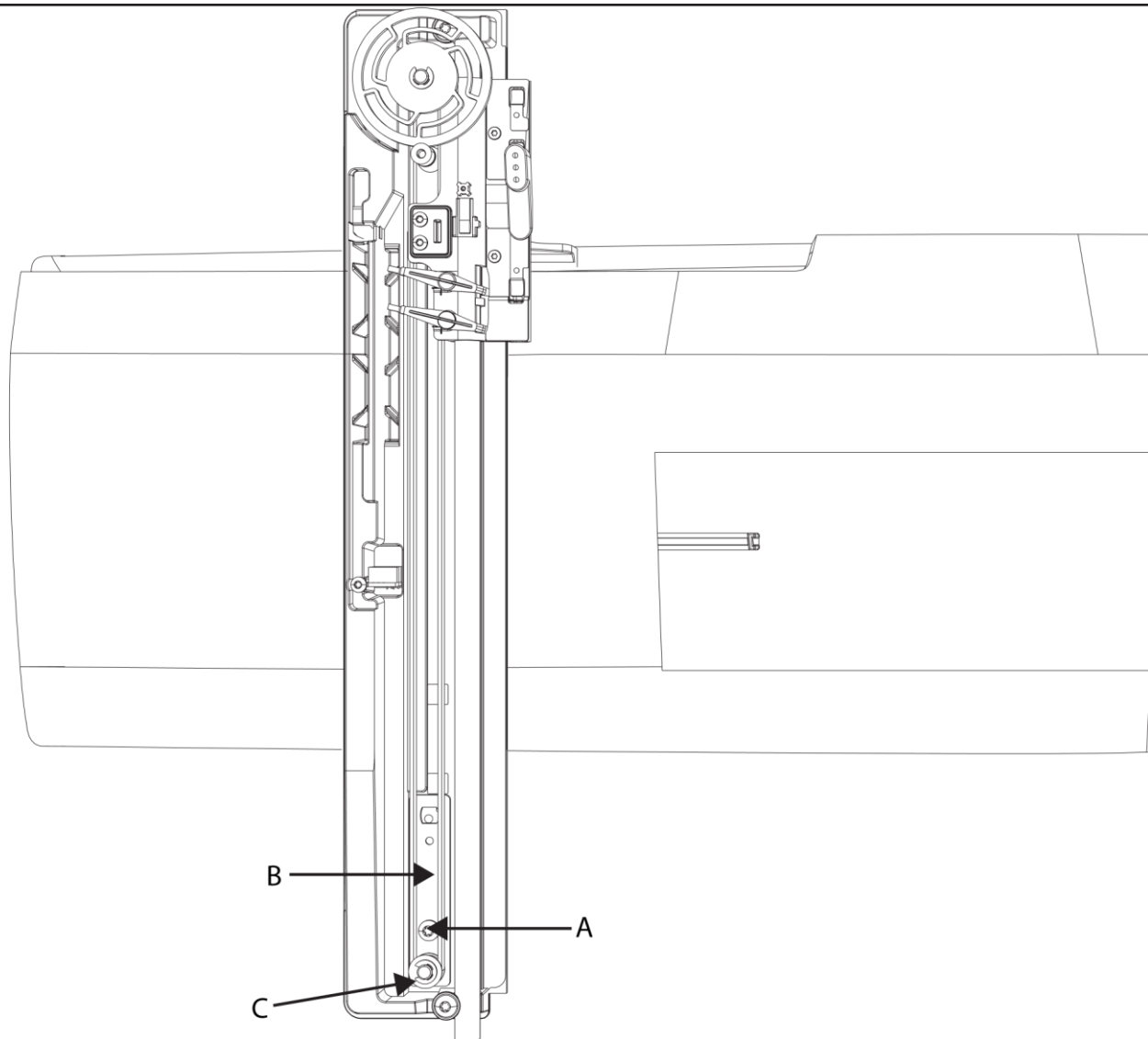
## Belt tension, Embroidery unit - Y-unit

### Check

The belt should just slightly move when pressing the button Check Belt Y in the Service Program menu Emb Unit.

### Adjustment

1. Adjust by touching the button Check Belt Y in the Service Program menu Emb Unit so that the step motor starts to move and loosen the screw (A) for the belt tension adjustment.
2. Move the plate (B) until the belt just stops to move (look in the area where C is pointing to determine when it stops), slightly release the tension and tighten screw (A), the belt should now move just slightly.
3. Press Check Belt Off to stop the step motor movement.



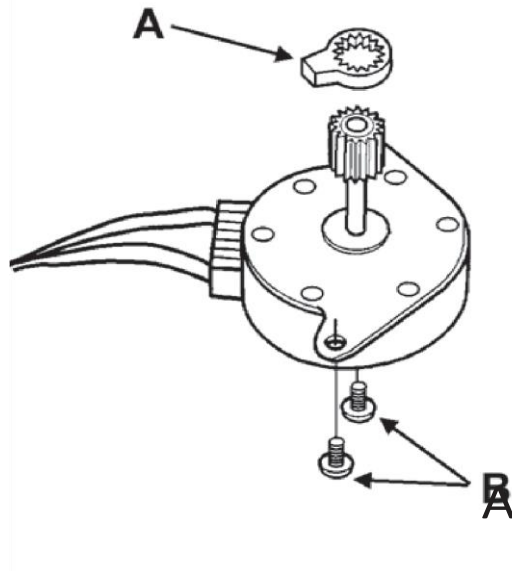
*Embroidery unit*

## **Step motor, Embroidery unit - Y-unit**

**Dismantling** Remove the Y-slide cover.  
Remove the step motor cover.  
Remove the upper cover.  
Remove the cable from the connection board.  
Remove the step motor by removing the 2 screws (A).

**Mounting in reverse order.**

**Set thereafter**  
The Y-Belt tension



## Step motor, Embroidery unit - X-unit

**Dismantling** Remove the upper cover.  
 Remove the lower cover.  
 Remove the step motor cable.  
 Remove the step motor by removing the 2 screws (A).

**Mounting in reverse order.**

### Set thereafter

The X Belt tension

*Embroidery unit*

## Hoop holder Embroidery unit - Y-unit

### Remove

Remove the two screws (A) that holds the belt holder.  
 Remove the belt holder (B).  
 Loosen the two screws (C) that holds the shaft in place. Remove the shaft and slide off the Hoop holder unit.

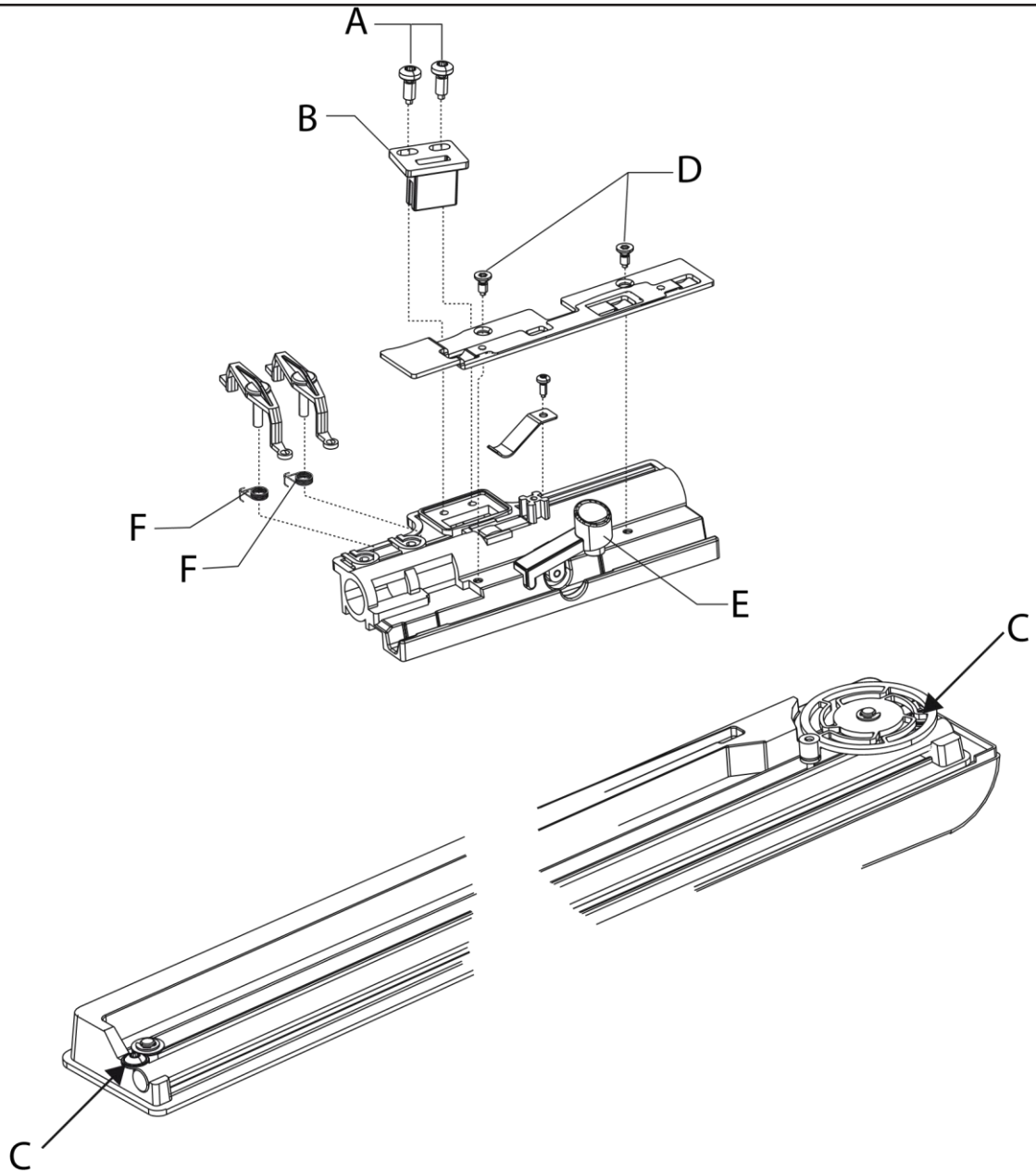
### Dismantling

Remove the two screws (D).  
 Push down the button (E) and remove the plate, spring and cap.  
 To remove a hoop sensor arm, snap off the spring (F) and lift it upwards.

### Mounting

Mount in reverse order.

**Note! The button (D) can not be replaced.**



## **Fault finding diagram Designer Diamond**

**The machine does not work when the foot control is pressed, but works when pushing the start button.**

1. Check that the contact of the cord device of the cord is correctly pushed into the potentiometer.
2. Check by means of a new foot control (potentiometer, cord device).
3. Try a new transformer.

**The machine does not start when either foot control or start button is pressed.**

1. Check that the bobbin stop sensor is not activated.
2. Try a new motor.
3. Try a new circuit board.

**The machine races when switched on or started.**

1. Check that the start button does not stay pressed.
2. If the machine only races when the foot control is connected then check the foot control.
3. Try a new circuit board.

**The zigzag movement of the machine does not work correctly.**

1. Check that the twin needle isn't activated.
2. Check in the Service Program - Sensor menu that the sector forward is working, should read from 0-31. If error
  - check first that the cable between sensor board and Main Pc-board is correctly inserted and not damaged.
  - Check the synchronizing screen is not damaged. If damaged replace screenStill error, replace sensor board.
3. Check that the cable connection of the step motor to the circuit board is correctly inserted and not damaged
4. Check the signals of the circuit board to the step motor.  
If step motor is working – replace circuit board.  
If step motor is not working - replace sewing head, complete or step motor.

**The feeding movement of the machine does not work correctly.**

1. Check that the twin needle isn't activated.
2. Check in the Service Program - Sensor menu that the sector forward is working, should read from 0-31. If error
  - check first that the cable between sensor board and Main Pc-board is correctly inserted and not damaged.
  - Check the synchronizing/stop right screen is not damaged. If damaged replace screenStill error, replace sensor board.
3. Check that the cable connection of the step motor to the circuit board is correctly inserted and not damaged
4. Check the signals of the circuit board to the step motor. If step motor is working – replace circuit board.  
If step motor is not working – replace step motor

**The stitch length balance of the machine is not correct.**

- (Buttonholes, pattern stitches, letters) 1. Always use correct presser foot.
2. Check the feed dog height
  3. Check the pre-setting of the feeding step motor
  4. Check that there is no friction in the feeding mechanism.
  5. Adjust the stitch length balance.

**The thread tension does not work.**

1. Check the cable connections between step motor and circuit board are correctly inserted and not damaged.
2. Try a new step motor.
3. Try a new circuit board.

**The machine does not alarm when the lower thread ends.**

Before doing any service, clean both diodes of the lower thread sensor and remove all fluff and grease.

1. Check the lower thread sensor in the service program by rotating the hand wheel slowly
2. Check that cables to the circuit board are correctly inserted and not damaged.
3. Try a new lower thread sensor cable
4. Try a new circuit board.

**The thread cutter is not working** If the step motor is not working:

1. Check that the button is working.
2. Check that cables to the circuit board are correctly inserted and not damaged.
3. Try a new circuit board
4. Try a new step motor.

If the step motor is working but it is not cutting the thread:

1. Check that the thread cutter knife is positioned correctly.
2. Make sure the fetcher is moving correctly.
3. Replace the knife.

**The machine does not stop when the upper thread is finished or breaks.**

Check the upper thread sensor in the service menu.

If OK:

1. Check the setting of the thread take-up spring and the thread tension.
2. Check the screens between the photo-diode of the upper thread guard so that it's running smooth.

If not OK:

1. Check that the cable to the upper thread guard sensor board is correctly inserted and not damaged.
2. Try a new upper thread guard.
3. Try a new circuit board.

**The machine stops and indicates that the upper thread is broken.**

Check the upper thread sensor in the service menu.

If not OK:

1. Check that the sensor arm is correctly assembled on the spring
2. Check the setting of the thread take-up spring and the thread tension.
3. Check the screens between the photo-diode of the upper thread guard so that it's running smooth.

If OK:

1. Check that the cable to the upper thread guard sensor board is correctly inserted and not damaged.
2. Try a new upper thread guard sensor board.
- Try a new circuit board.

**The presser foot lifting function does not work.**

Check in service program that the presser foot sensors are working.

If OK:

1. Check if there is contact between the buttons and the push button board.
2. Check that the cable from the step motor is correctly inserted and not damaged.

If not OK:

1. Secure that the presser bar runs freely.
2. Try a new sewing head slave board.
3. Try a new circuit board.



**The buttonhole sensor does not work.**

1. Make sure that the contact of the buttonhole sensor is correctly inserted; check its function by using the service program and sensor menu.
2. Try a new buttonhole sensor and check its function by using the service program, sensor menu.
3. Check the cable from the contact of the buttonhole sensor to the slave board and the circuit board are correctly inserted and not damaged.
4. Try a new sewing head slave board.
5. Try a new circuit board.

**The side motion of the machine does not work at all.**

1. Check the connection of the side feeding mechanism.
3. Check that the cable connection between the step motor and the circuit board is correctly inserted and not damaged.
4. Try a new step motor.
5. Try a new circuit board.

**The machine sews straight stitching only backwards.**

If this occurs during service, check that the motor does not run in reverse.

1. Try a new circuit board.

**The embroidery unit does not feed in all directions.**

1. Check the belt tension.
2. Check that all cables of the embroidery unit are correctly connected and not damaged.
3. Try with a new step motor.
4. Try with a new main pc-board.

**The embroidery unit does not work at all.**

1. Check that all cables in the embroidery unit are correctly connected and not damaged.
2. Check that the locking mechanism goes into the sensor on the slave board in the embroidery unit. This function is verified in the Service program/Sensors-Embr. Unit connected.

If a proper function still not is obtained, replace in this order:

1. Slave board inside the embroidery unit.
2. Main pc-board.

**The embroidery unit does not sew the pattern correctly** 1. Check that there is no sluggishness or play in the embroidery unit.

2. Check the belt tension of the embroidery unit.
3. Check so that the machine raises the presser foot to the correct height.
4. Check the thread tension of the machine.

**The machine does not recognize the 240x150, 100x100 hoop but a 150x360 embroidery hoop.**

1. Check the belt tension.
2. Check the hoop sensor in the Service program, Sensors-Hoop sensor
3. Try a new sensor.

**The hard key buttons does not function properly**

1. Check their function in Service program/Sensors-Hard key button status.
2. Check that the cable to the Hard key buttons is properly connected and not damaged.
3. Clean the surface of the Hard key button pc-board as well as the Hard key buttons.

If a proper function still not is obtained, replace in this order:

1. Hard key buttons.
2. Hard key button pc-board.
3. Cable.
4. Main pc-board.

**USB Device -No connection with the Designer Diamond.**

1. Make sure that the USB cable is properly connected to both the Designer Diamond and your computer.
2. Try with another USB cable.
3. Re-install the hardware driver to the Designer Diamond that comes with the machine onto your computer.
4. Secure that the cable connected between the main pc-board and the USB board is properly connected and not damaged.

If a proper function still not is obtained, replace in this order:

1. USB board.
2. Main pc-board.

**Bobbin winding motor - No function**

1. Secure that the cable from the motor is properly attached to the main pc-board and not damaged.

If a proper function still not is obtained, replace in this order:

1. Replace the bobbin winding motor.
2. Replace the main pc-board.

Motor does not run on full speed:

1. Replace the bobbin winding motor.
2. Replace the main pc-board.

**Motor continues to wind even though the bobbin is full.**

1. Check the function of the micro switch in Service program/Sensors-Bobbin winding stop, if this function fails.

Replace

1. Micro switch.

**Speaker - No function at all 1.**

Replace the speaker.

2. Replace the main pc-board.