



expression 710

Service Manual

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Please note that on disposal, this product must be safely recycled in accordance with relevant National legislation relating to electrical/electronic products. If in doubt please contact your retailer for guidance.



Bitte beachten Sie, dass hinsichtlich der Entsorgung dieses Produkts, vorschriftsmäßig entsprechend der gültigen nationalen Gesetzgebung für elektrische/elektronische Produkte, recycelt werden muss. Bei Zweifel setzen Sie sich bitte mit Ihrem Fachhändler in Verbindung.



Veuillez noter qu'en cas de destruction, ce produit doit bénéficier d'un recyclage sécurisé, conforme à la législation nationale applicable aux produits électriques/électroniques. En cas de doute, veuillez contacter votre distributeur agréé.

- All casted parts within our products are marked with name of material if allowed by size.
- All molded plastic parts within our products are marked with name of material if allowed by size.

This household sewing machine is designed to comply with IEC/EN 60335-2-28 and UL1594

IMPORTANT SAFETY INSTRUCTIONS

When using an electrical appliance, basic safety precautions should always be followed, including the following:

Read all instructions before using this household Sewing machine.

DANGER – To reduce the risk of electric shock:

- A sewing machine should never be left unattended when plugged in. Always unplug this sewing machine from the electric outlet immediately after using and before cleaning.

WARNING – To reduce the risk of burns, fire, electric shock, or injury to person:

- Do not allow to be used as a toy. Close attention is necessary when this sewing machine is used by or near children or infirm persons.
- Use this sewing machine only for its intended use as described in this manual. Use only attachments recommended by the manufacturer as contained in this manual.
- Never operate this sewing machine if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or dropped into water. Return the sewing machine to the nearest authorized dealer or service center for examination, repair, electrical or mechanical adjustment.
- Never operate the sewing machine with any air openings blocked. Keep ventilation openings of the sewing machine and foot controller free from the accumulation of lint, dust, and loose cloth.
- Keep fingers away from all moving parts. Special care is required around the sewing machine needle.
- Always use the proper needle plate. The wrong plate can cause the needle to break.
- Do not use bent needles.
- Do not pull or push fabric while stitching. It may deflect the needle causing it to break.
- Switch the sewing machine off ("0") when making any adjustment in the needle area, such as threading needle, changing needle, threading bobbin, or changing presser foot, etc.
- Always unplug sewing machine from the electrical outlet when removing covers, lubricating, or when making any other user servicing adjustments mentioned in the instruction manual.
- Never drop or insert any object into any opening.
- Do not use outdoors.
- Do not operate where aerosol (spray) products are being used or where oxygen is being administered.
- To disconnect, turn all controls to the off ("0") position, then remove plug from outlet.
- Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
- Hold plug when rewinding into cord reel. Do not allow plug to whip when rewinding.
- This sewing machine is provided with double insulation. Use only identical replacement parts. See instructions for Servicing of Double-Insulated Appliances.

SAVE THESE INSTRUCTIONS

SERVICING OF DOUBLE INSULATED PRODUCTS

In a double-insulated product, two systems of insulation are provided instead of grounding. No ground means is provided on a double-insulated product, nor should a means for grounding be added to the product. Servicing of a double-insulated product requires extreme care and knowledge of the system, and should be done only by qualified service personnel. Replacement parts for a double-insulated product must be identical to those parts in the product. A double-insulated product is marked with the words 'DOUBLE INSULATION' or 'DOUBLE INSULATED'.

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. Adjustments should only be made if the settings deviate from the requirements described herein.

When checking or adjusting a machine, always proceed in the order of the worksteps prescribed.

Unless otherwise specified, the handwheel must always be turned forward.

When carrying out maintenance work on live parts or in their proximity, the machine is to be separated from the power supply by disconnecting the lead cord from the electrical socket.

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

They are as follows:

- SETTINGS
- SERVICE PROGRAM
- REMOVING THE COVERS
- FAULTFINDING

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 parts list.

ESD

ATTENTION!

It is of the outmost importance that precautions are being taken in order to avoid damage of the electronics by electro static discharges ESD. To avoid these errors, it is important to handle circuit boards in a controlled way.

Always use wrist band and ESD mat when servicing.



Technical Product specification

Notes on the sewing machine with regard to ambient conditions, treatment, cleaning and safety

Ambient conditions:

The recommended ranges are:

Ambient temperature 10° to 40°C (50° to 104°F)

Air humidity 20 % to 80 %

This machine is a high-quality electro-mechanical device. It is designed for household purposes and should always be supervised when in use.

Make sure that it is not subjected to: dust, severe dampness, direct sunlight, static electricity, heat-producing objects, corrosive chemicals or liquids.

The machine must be used on a firm and even surface which is open for ventilation purposes.

Treatment:

Always protect the machine from damage caused by hitting or dropping.

Cleaning:

Housing:

To clean the housing, use a dry, clean, soft, lint free cloth. To remove particularly persistent dirt, use a soft cloth with a neutral cleansing agent for plastic materials.

Please note!

Do not use any insecticides or chemical products such as petrol (gas) or liquid chemicals to clean the housing.

Display:

If necessary, clean display with a soft cloth moistened with a little water.

Safety:

1. The machine must be put into operation according to the indications on the specification plate.
2. Do not place any objects in the openings on the machine.
3. Do not use the sewing machine if:
 - there is visible damage,
 - Its function is defective,
 - it is wet, e.g. with condensation.
4. Do not pull the mains plug out of the socket by its cord.
5. If this appliance is used for another purpose than that intended, or if it is wrongly operated, we cannot accept any liability for any damage caused.
6. To avoid the risk of electric shock, do not open the machine. There are no parts inside the machine which the user can repair. This is solely the responsibility of our qualified service staff.
7. Be sure to use only original PFAFF parts.

Specifications of the PFAFF expression 710

- Computerized free-arm machine for utility stitches
- Electronic stitch pattern storage
- Zigzag stitch width = 0 to 9 mm with 0.125 mm needle movement resolution
- Feed length = 0 to 6 mm forwards and 0 to 6 mm reverse with 0.125 resolution.
- 37 different needle positions can be set
- Electronic feed dog drop
- Automatic presser foot lifter with pivot, high and extra high position
- Presser foot lift 8 mm
- Max. presser foot height 12 mm
- Electronically controlled and adjustable Presser Foot Pressure
- Electronically controlled needle up needle down position with LED indicator
- Thread cutter button with LED indicator
- Reverse sewing button with two LED indications (reverse or tie-off)

-
- Bobbin thread monitor
 - Digital motor control with 60 to 1050 r.p.m.
 - Several pattern-dependent reduced speeds in addition
 - When machine is blocked, an anti-blocking device switches the motor off automatically after 1 to 3 seconds
 - 100k foot control (cold) with automatic-rewind cable
 - Master switch for motor, electronics and LED's.
 - Bobbin winding possible during sewing due to separate motor
 - Pendulum-type needle bar frame
 - Transmission of drive from arm shaft to lower shaft by toothed belt, transmission ratio 1:1
 - Power consumption 1.7 – 0.8 A
 - Nominal voltage (universal) 100-240 V
 - Needle thread monitor
 - PFAFF horizontal double-rotating hook
 - Link take-up lever
 - Slide block regulator for forwards and reverse stitch lengths.
 - Dual feed original IDT
 - Drive from motor to handwheel by flat-toothed belt
 - Sintered metal bearings
 - Oil for sintered metal bearings: Anderol 500
 - Lighting: Four banks of LEDs
 - Clear workspace (D x H): 250 x 107 mm
 - Dimensions (W x H x D): 217 x 295 x 492 mm
 - Free-arm dimensions: Length 135mm , circumference 260 mm
 - Housing material: aluminum
 - Weight of sewing machine: 11 kg
 - Needle system 130/705 H

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.

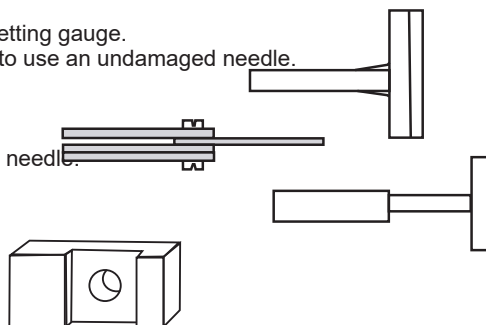
The setting ratings are adapted to needle 90. Make sure to use an undamaged needle.

2. Gauge for setting the timing of the hook in relation to the needle.

Ref. No 63-102600-18/000 Spacer

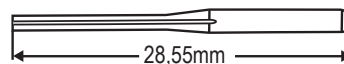
Ref. No 61-111600-02/000 Feeler gauge 2.5

Ref. No 413 10 22 - 01 Needle clamp



4. Gauge for the feed dog lift.

Ref. No 413 12 73-01



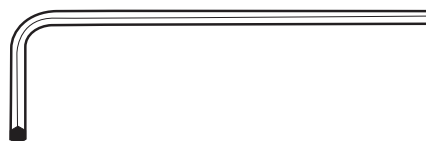
5. Gauge for the needle height.

Use a standard 90 needle shortened to 28,55 mm



6. Allen key 4 mm

Use a 4 mm allen key shortened to 13 mm



7. Allen key - Shortened 2.5

Ref. No 412 27 65-01

8. Allen key 2 mm

9. Allen key 1.5 mm



10. Distance gauge 0.05-1,00 mm

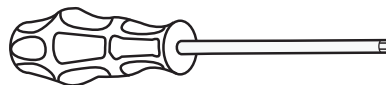
11. Angled key Torx 6

12. Screwdriver Torx 8

13. Screwdriver Torx 10

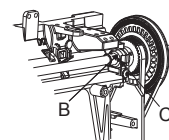
14. Screwdriver Torx 20

15. Screwdriver Torx 25



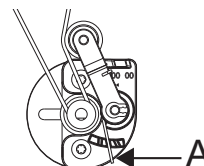
1. Belt tension - Drive belt

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



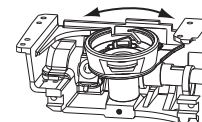
2. Belt tension - Motor belt

The belt tension spring (A) should be positioned so a correct belt tension is obtained.



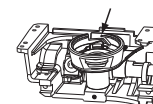
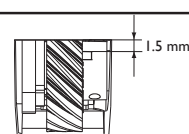
3. The play of the hook gear

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.



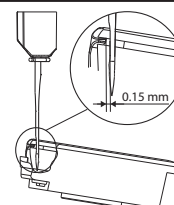
4. Setting the hook in relation to the feeding eccentric (after feeding)

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.

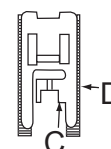


5. The gap between the needle and the hook

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

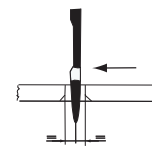


6. The Presser foot (C) should in the sideways direction be parallel on both sides (D) of the of needle plate opening for feed dog.



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

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



8. Setting the feed dog in relation to the needle plate

Sideways the feed dog should be symmetrically set in relation to the needle plate slot.

9. Feed dog lowering

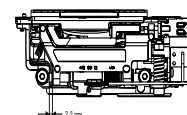
Feed dog should drop and return to up position when feed dog lever is pushed to left and right.

10. Calibration cut sensor

Set start and end position of the fetcher.

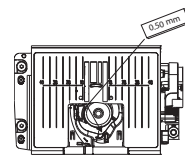
11. Setting the feed unit sideways

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



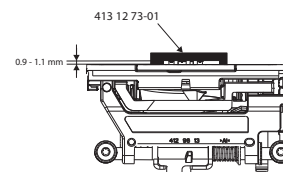
12. The height of the hook

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



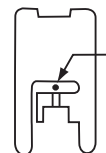
13. Feed dog height

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



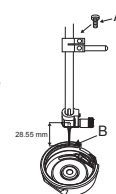
14. Setting the needle in centre position

The needle should always go to the centre position, when the main switch is turned.



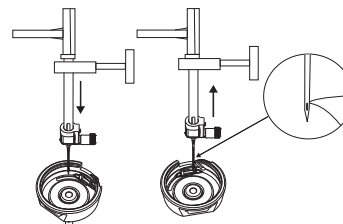
15. The needle bar height

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 28.55 (+ 0.2 mm).



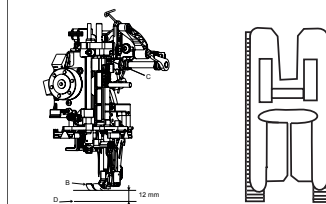
16. The timing of the hook in relation to the needle

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.



17. Presser foot height and parallelism to the needle plate

1. When the presser foot is in its highest lifting position it shall be approx. 12 mm above the needle plate.
 2. The presser foot should be parallel to the feed dog.
- Use gauge 413 14 17-01

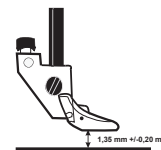


18. Needle plate position

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 **13. Presser foot height and parallelism to the needle plate** has been reset or if the Pc-board has been changed.

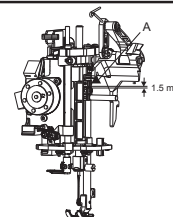
19. Pivot height

When the presser foot "#6A" 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.



20. Needle threader stop

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



21. Threading device

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



22. IDT linkage holder - height and parallelism

The distance between the linkage holder and the sewing head frame should be 16.3 mm (+/- 0.2 mm) when the presser bar is in its lowest position.

23. Adjustment of the IDT foot - height and feeding position

In Service program, Hi Tension menu, touch button Honeycomb. The machine sews a pre-programmed Honeycomb stitch (66-72 mm).

- The pre programmed stitch with the IDT disengaged should be (66-72 mm).
- The stitch with the IDT engaged should be +2 mm longer or shorter.

E.g. Without IDT = 66 mm , With IDT 64-68 mm.

24. Stitch length balance

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

25. 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.

26. Upper thread tension - Factory setting

Need special tools.

27. Upper thread tension - Low and high

A correct thread take-up should be obtained when stitching, using normal cotton fabrics and polyester thread.

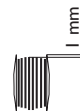
28. Setting the thread take-up spring

29. Upper thread guard sensor

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

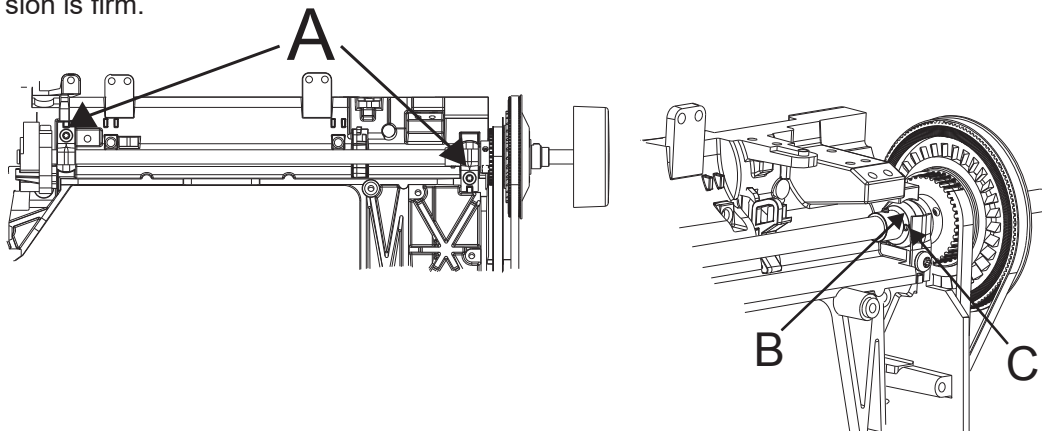
30. Disconnection when winding the bobbin

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.



1. Belt tension - Drive belt

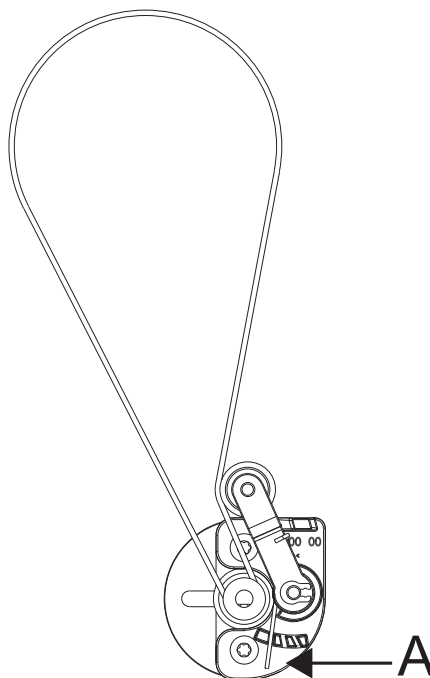
1. Remove all covers.
2. Remove the bobbin winding device.
3. Loosen the two screws (A) of the bearing clamps.
4. The belt tension can now be adjusted by turning the eccentric bearing (B) until the belt tension is firm.



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 left slot on the belt tension device.

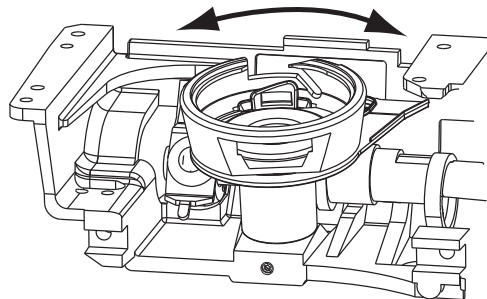


3. The play of the hook gear

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.

Check

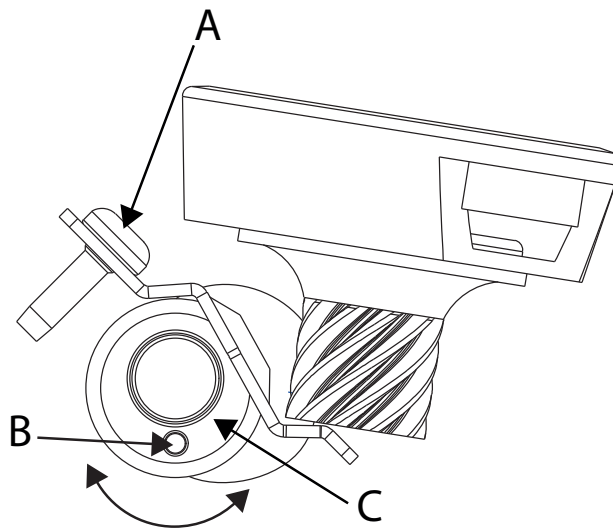
1. Rotate the hook back and forth and check the play.
2. Do this check on at least 3 different spots during the revolution of the cog wheel.
(Move the cog wheel with the hand wheel).



Adjustment

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

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



4. Setting the hook in relation to the feeding eccentric (Timing feed motion)

Check

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

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 is positioned according to fig. 1 the tip (A) of the hook should point straight backwards.

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

Adjustment

1. Remove all covers.
2. Remove the hook cover.
3. Loosen the screw (B).
4. Remove the hook.
5. Position the pin on the wormgear.
6. Mount the hook into its correct position.

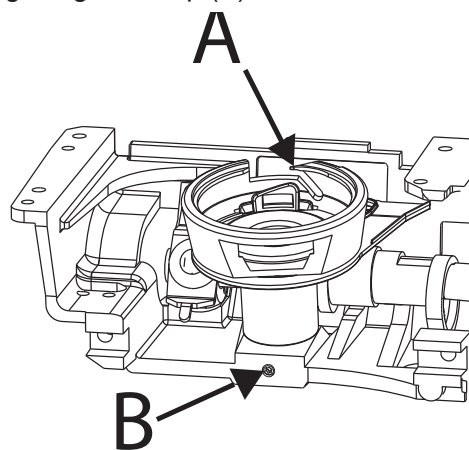
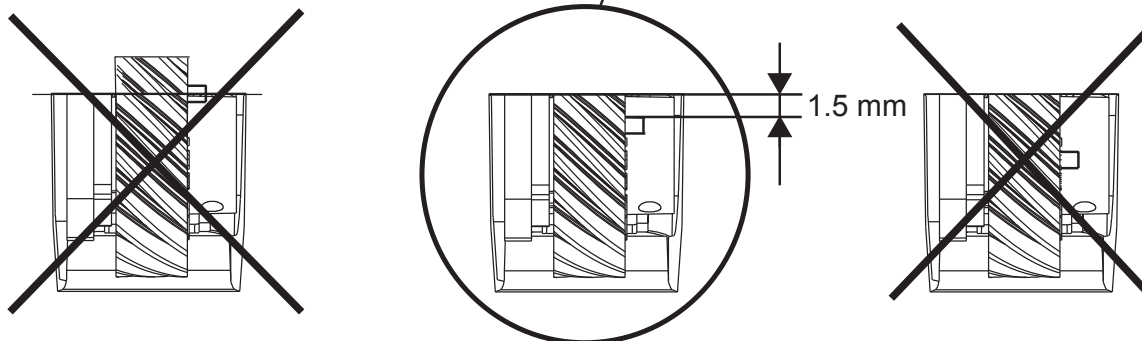
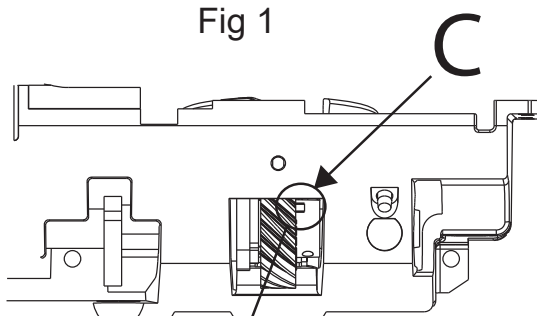


Fig 1



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

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.

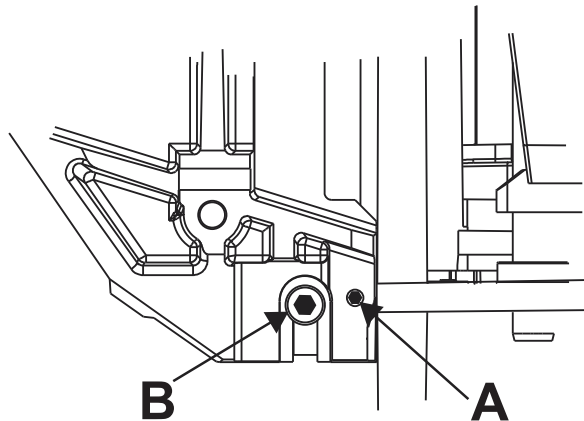
Adjustment

If the gap is too large:

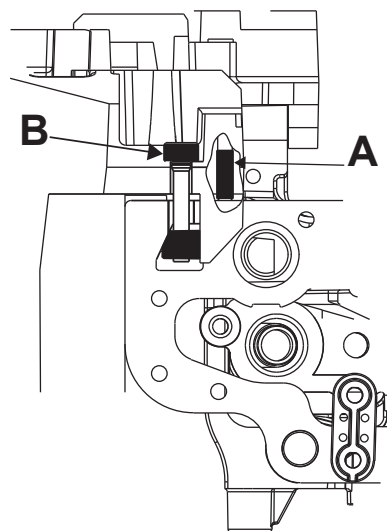
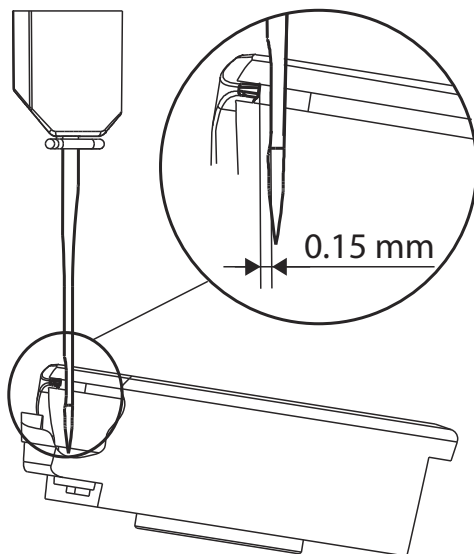
1. Loosen the screw (A).
2. Turn screw (B) clockwise until the needle touches the tip of the hook.
3. Turn screw (A) until the gap is correct

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



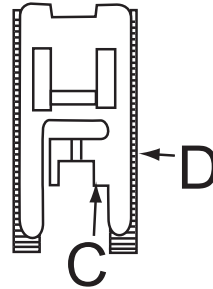
NOTE! The setting should be performed so the needle **ALWAYS** is pushed away from the tip of the hook.



6. Setting the needle plate (the hook cover) sideways

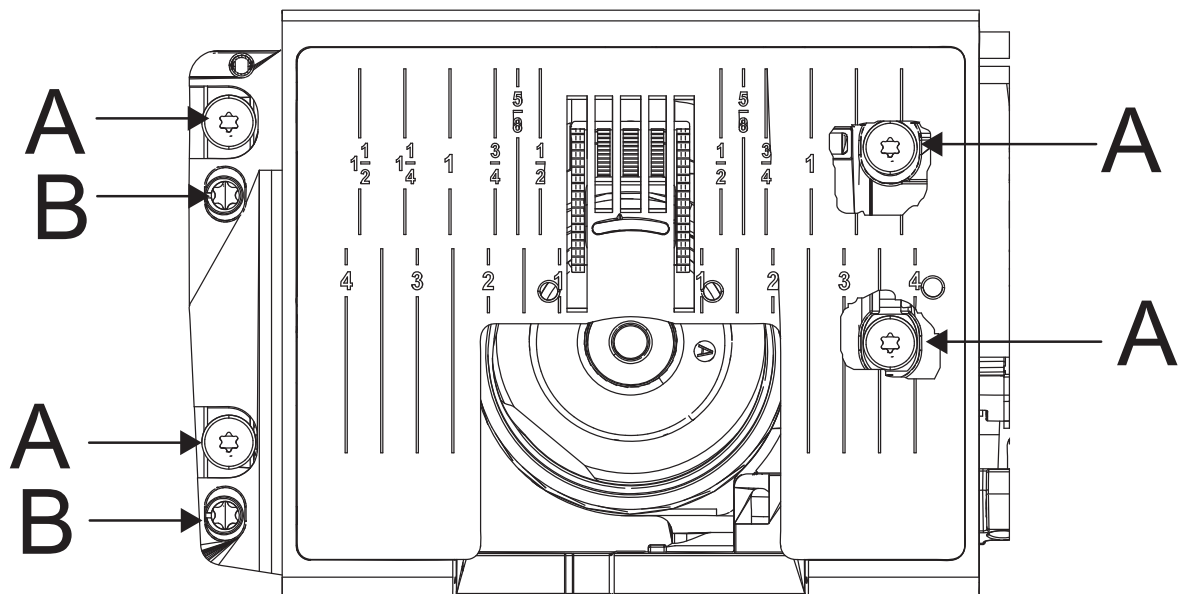
Check

1. Insert a #0A-foot (C) the machine.
2. The Presser foot (C) should in the sideways direction be parallel on both sides (D) of the of needle plate opening for feed dog.



Adjustment

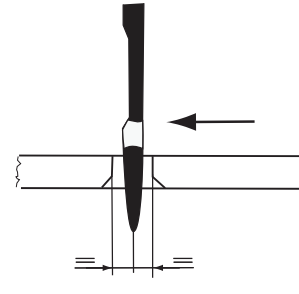
1. Remove all covers
2. Loosen the 4 screws (A) of the hook cover
3. Turn the two black setting pins (B) so the foot should be parallel on both sides of the feed dog opening on the needle plate.
4. Check the setting needleplate in relation to needle in feed direction.



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

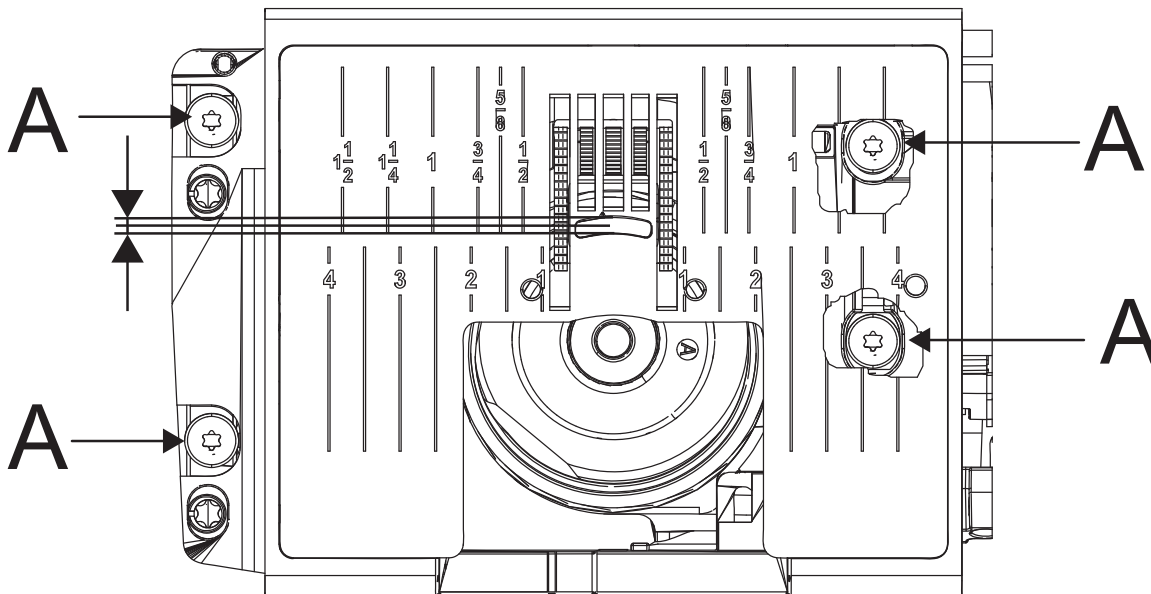
Check

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



Adjustment

1. Loosen the 4 screws (A) of the hook cover and move it so that:
 - the needle sideways descends in the middle of the needle plate.
2. Tighten the 4 screws (A) and check the setting needle plate sideways



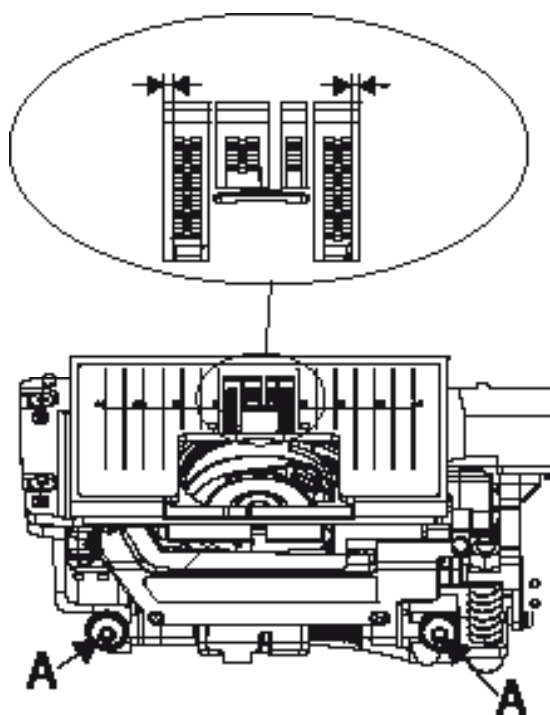
8. Setting the feed dog in relation to the needle plate

Check

1. Sideways the feed dog should be symmetrically set in relation to the needle plate slot.

Adjustment

1. Loosen the 2 screws (A) of the feeding unit.
2. Move the feeding unit sideways until the feed dog teeth is centered in the needle plate slot.
3. Tighten the screws (A).



9. Feed Dog Lowering

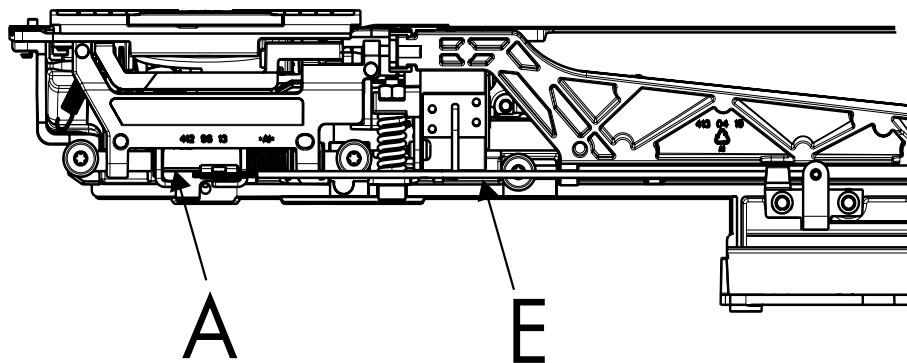
Check

1. Set the needlebar in its highest position.
2. Push the feed dog drop lever to the left and the feed dog should drop.

Adjust

Note! First check that setting #7 Setting the feeding unit sideways are correctly set before continue to do this adjustment.

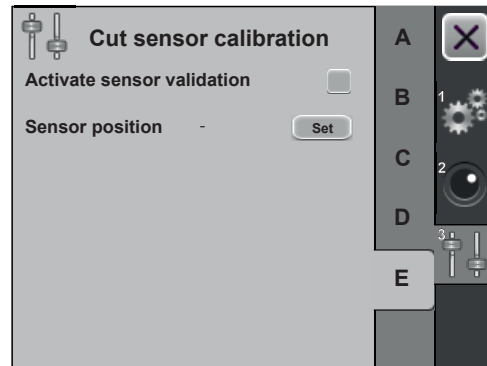
1. Remove all covers
2. Set the needlebar in its highest position.
3. Remove the feed dog lowering rod (E) from its holder on the feed dog lowering device (A).
4. Make sure that the feed dog lowering device (A) is at its most left position and that the feed dog is in its up position.
5. Push the feed dog drop lever (B) to its most right position.
6. Mount the feed dog lowering rod (E) by push it on the feed dog lowering device (A).
7. Push the feed dog drop lever to the left and the feed dog should drop.



10. Cut sensor calibration

Calibrate

1. Enter the service Program - 3. Adjust menu - F. Cut sensor calibration
2. Touch the set button to start calibration.
3. Follow the instruction in the menu.
 1. *Remove stitch plate*
 2. *Clean from lint*
 3. *Push the fetcher to its most left position*
 4. *Verify that there is no room between fetcher and wall.*
 5. *Touch OK to perform calibration*
4. If calibration has been successful there should appear a sensor position value between 50-80, if the value is out of range touch set +button to recalibrate.



11. Setting the feed unit sideways

Check

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

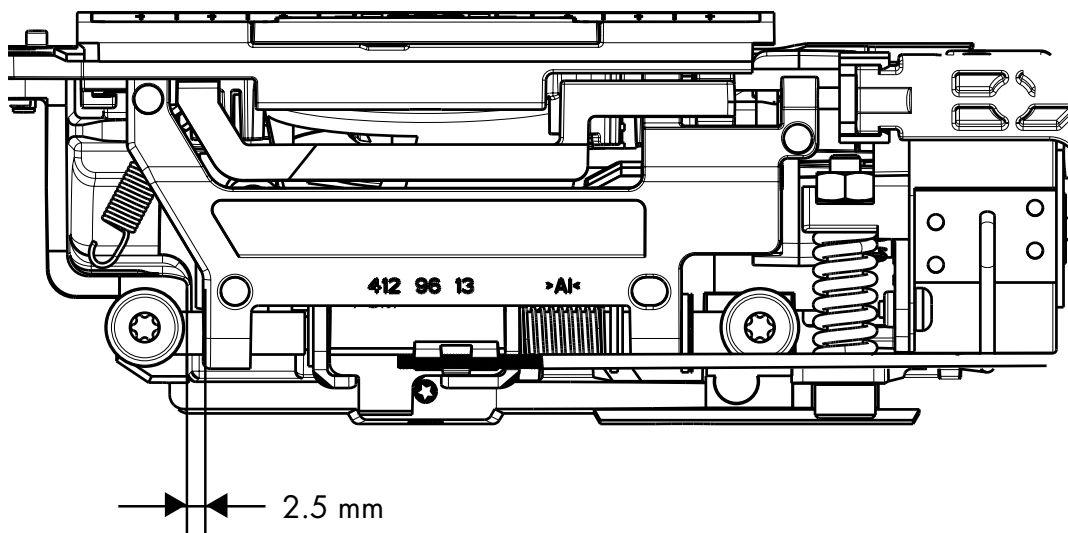
Adjustment

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 20. Setting the feed dog in relation to the needle plate.

Setting 21. Feed dog lowering.



12. The height of the hook

The front cover must be mounted when the hook height is checked.

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

Check

The distance between the bobbin case and the bobbin 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 bobbin case holder.

Check at the marked position according to fig. 1.

Adjustment

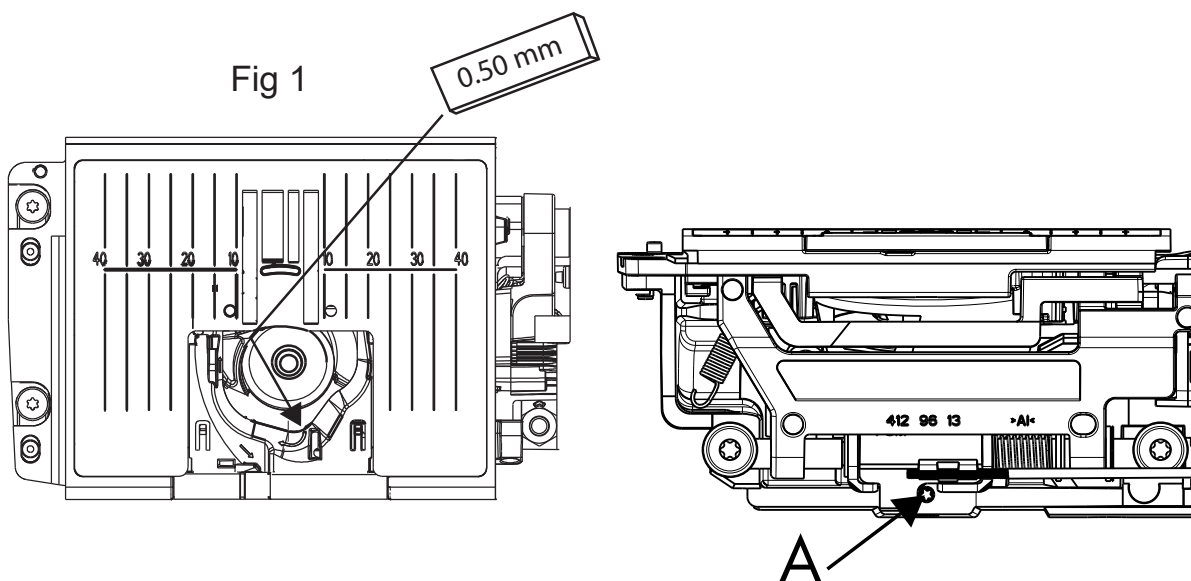
NOTE! All covers need to be removed before an adjustment can be carried out.

1. Loosen the screw (A).
2. Push the bobbin case down with a finger.
3. 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.
4. Remove the finger. A spring is pushing the hook upwards, make sure that it rotates up so it is positioned against the feeler gauge.
5. Tighten the screw (A).
6. Re-check the setting, now with a 0.5 feeler gauge. It shall go in, but a small resistance shall be felt.

NOTE! This setting affects:

11. The needle bar height
12. The timing of the hook in relation to the needle

Check with distance gauge.



13. Feed dog height

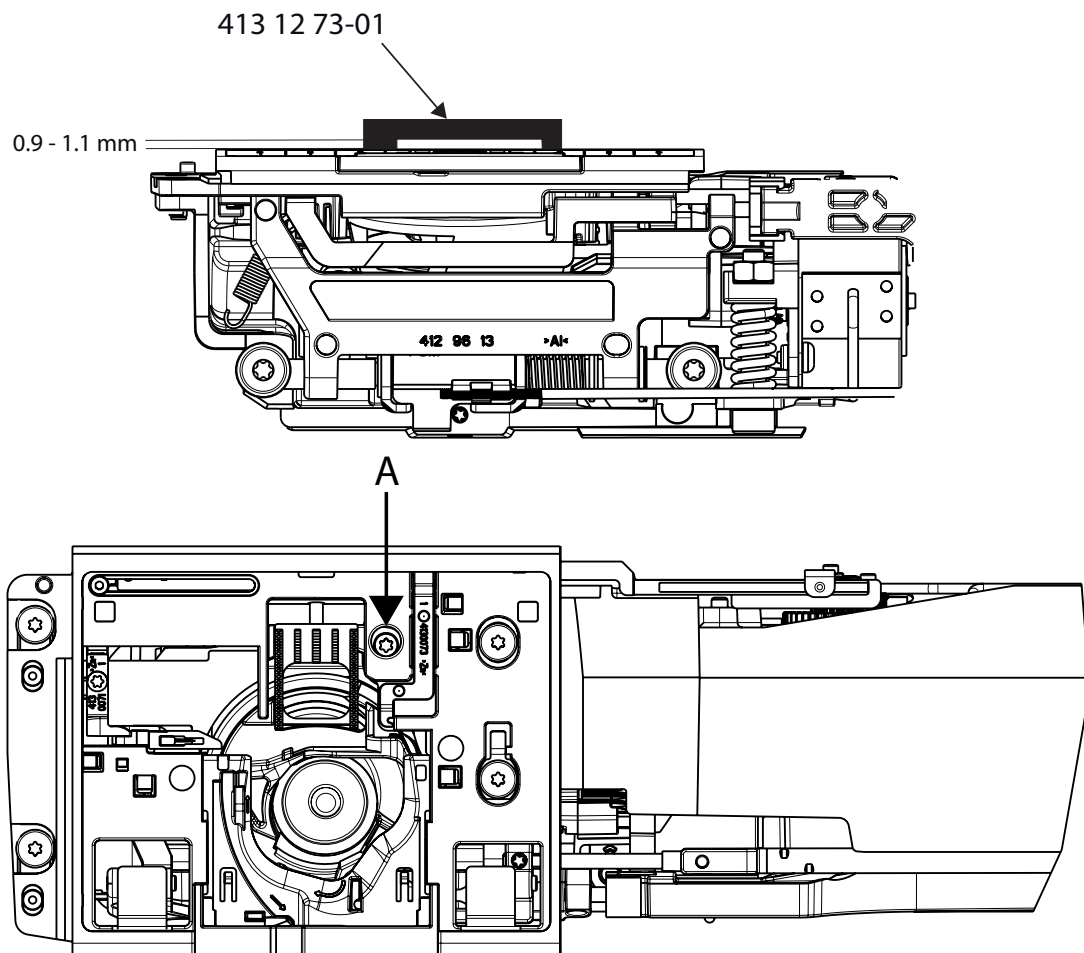
Check

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 by turning the torx screw (A) until a correct feed dog height (0.9-1.1 mm) is obtained.
Turn clockwise : - it will be higher
Turn counter clockwise : - it will be lower
4. Mount the needle plate and check the feed dog height.



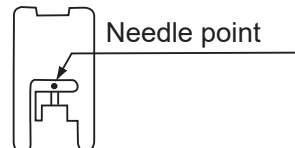
14. Setting the needle in centre position

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.

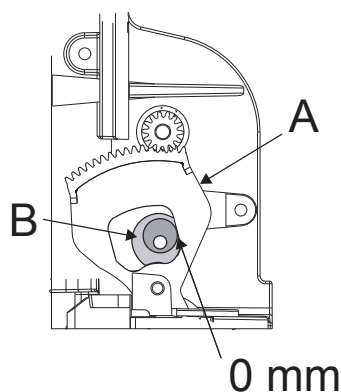
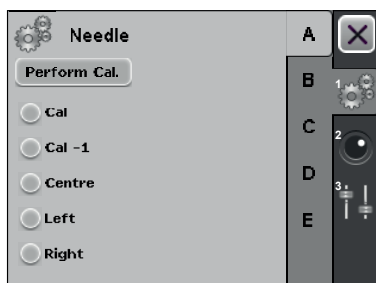
Check 2 - using service program

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



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

1. Enter service Program - **1. Set menu - A. Needle menu.**
2. Touch button **"Perform Cal."** in **Needle menu** - Needle should go to its centre position in the #OA-presser foot.
3. Touch button **"Cal"** in **Needle 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 -1"** in **Needle menu** - If the gap is ZERO (0 mm), the needle should not move in any direction.
5. Touch button **"Centre"** in **Needle menu** - Needle should go to its centre position in the #0A presser foot.



6. Touch button **"Right"** in **Needle menu** - The needle shall now take its left position.
7. Touch button **"Left"** in **Needle 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).

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

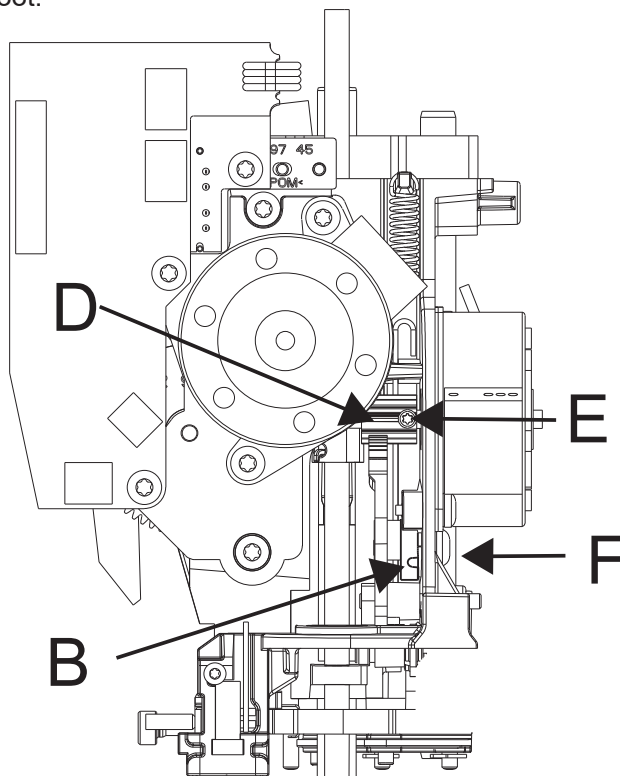
The front cover should be used as a service panel and should stand on the side of the machine and the cables between the front cover and pc-board must be connected.

Adjustment

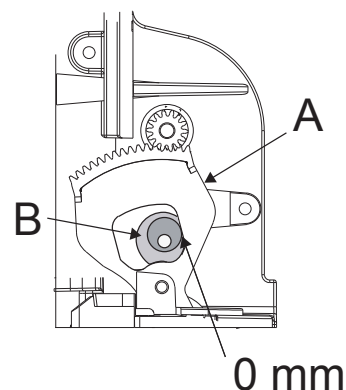
1. Loosen screw (E) on the cog wheel (D) on the step motor shaft.
2. Enter service program - **1. Set menu - A. Needle menu.**
3. Touch button **"Centre"** in **Needle menu**, step motor now goes to its electronic centre position.
4. Turn the cog wheel until the needle is in the centre of the #OA-presser foot.
5. Tighten screw (E).
6. Loosen screw (F) of the calibration stop (B).
7. Remove the OA-presser foot.
8. Touch button **"Perform Cal."** in **Needle 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 (A) 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 0 mm, touch button **"Cal -1"** in **Needle menu** - If the needle does NOT move in any direction, it is zero mm (0 mm) between calibration stop (B) and calibration segment (A).
12. Touch button **"Centre"** in **Needle menu** - Needle moves to centre position in the presser foot.



13. Touch button **"Right"** in **Needle menu** - The needle shall now take its left position.
14. Touch button **"Cal -1"** in **Needle 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 **"Perform Cal."** in **Needle menu**.
16. Redo from point 3.



15. The needle bar height

Check

1. Bring the needlebar into its lower turning position.
2. The gap between the upper end of the needle and the surface (B) of the hook ring should be 28.55 (+ 0.05 mm).

The check is executed with a gauge which is 28.55 mm long.

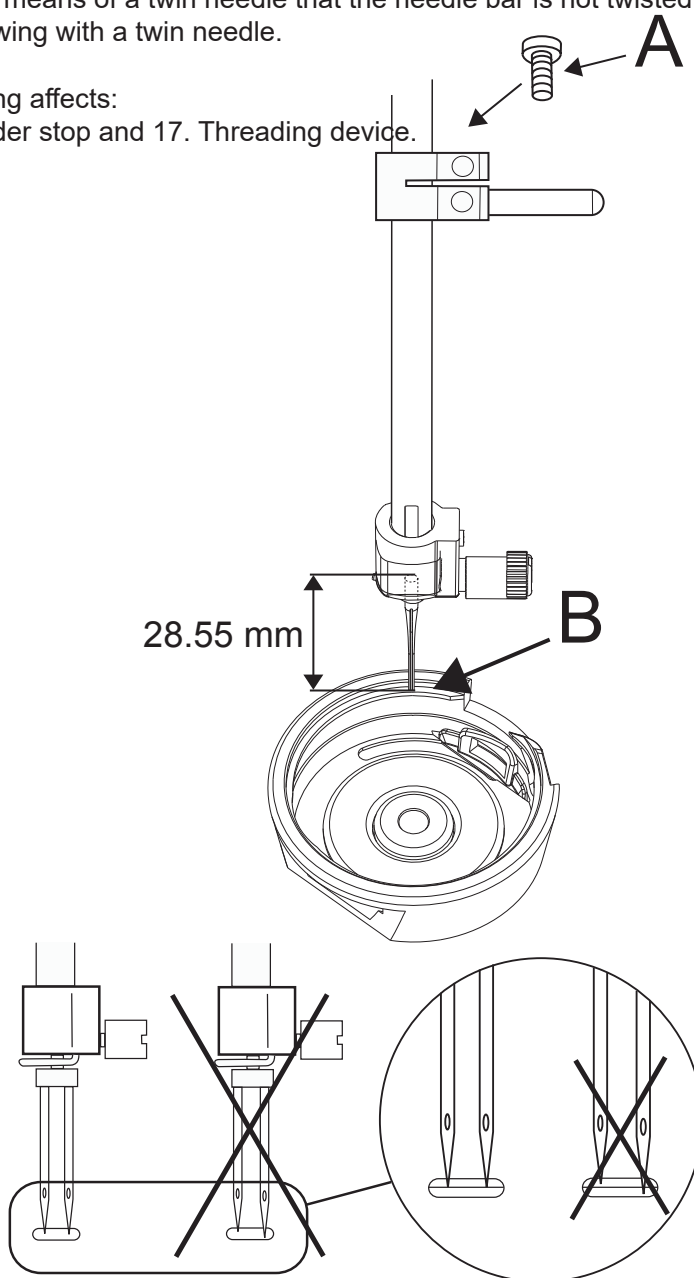
Adjustment

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

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.

NOTE! This setting affects:

16. Needle threader stop and 17. Threading device.



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

Check

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

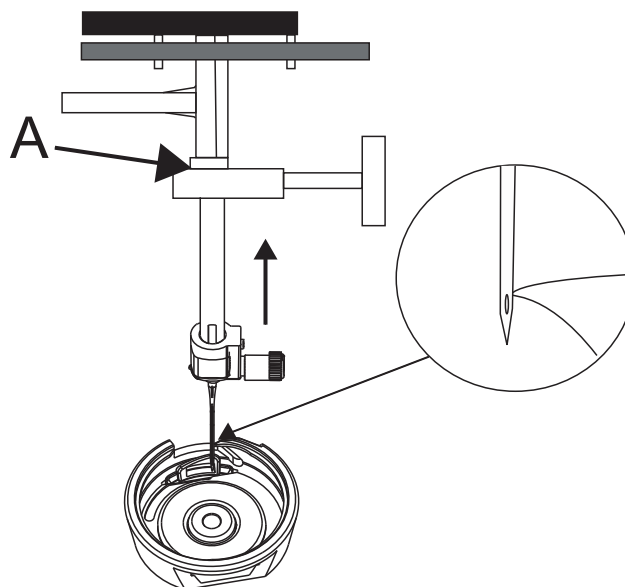
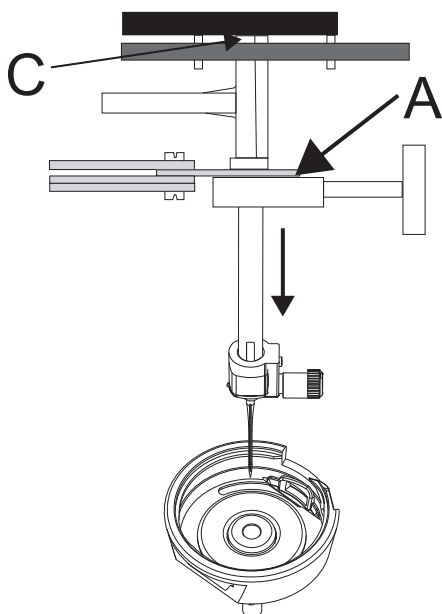
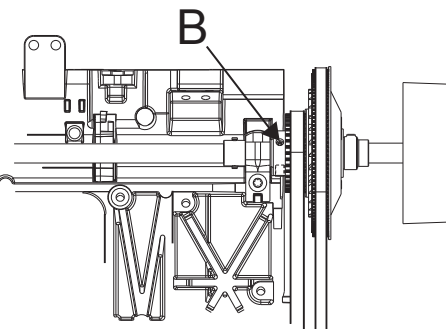
NOTE! Before any adjustment is done check that the setting "4. Setting the hook in relation to the feeding eccentric" is correct.

Check with setting gauge

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



17. Presser foot height and parallelism to the needle plate

Check

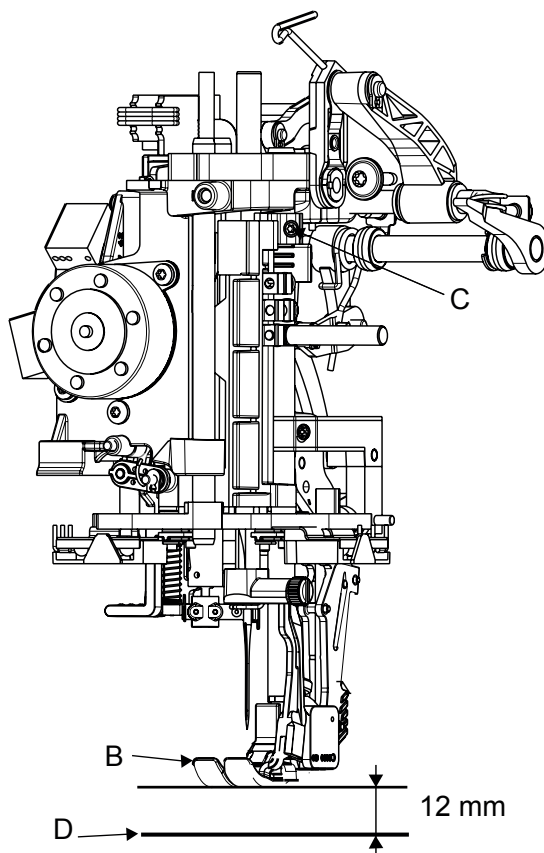
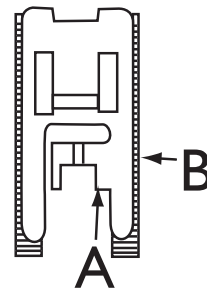
When the presser foot (B) is in its highest lifting position it shall be approx. 12 mm above the needle plate (D) and in its down position the presser foot (A) should be parallel to the feed dog (B).

Adjustment

1. Remove the thread tension unit.
2. Use the function button presserfoot up to set the presser bar to its highest position.
3. Loosen screw (C).
4. Insert gauge 413 14 17-01 from behind under the presser foot #OA and into the cutouts of the needle plate.
5. Push the presser bar against the gauge.
6. Tighten the screw (C).
7. Mount the thread tension unit.
8. Enter service program and perform setting "14. Needle plate position".

NOTE! This setting affects:

18. IDT linkage holder - height and parallelism.

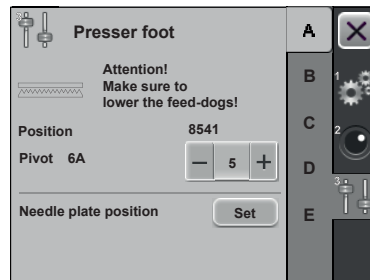


18. Needle plate position

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 **13. 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 #OA on the machine.
2. Enter the service Program - **3. Adjust menu - A. Presser foot menu.**
3. Lower the feed dog by touch **"Feed dog drop"** button in **Side Motion** menu.
4. Touch button **"Calibrate"** in **Presser Foot** menu - The presser bar should now take its highest position.
5. Touch button **"Needle plate position"** in **Presser Foot** menu - Presser bar takes its lowest position.



19. Pivot height

Check

1. Mount presser foot "6A" on to the machine.
2. Enter Service Program - **3. Adjust menu - A. Presser foot menu.**
3. Lower the feed dog.
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.

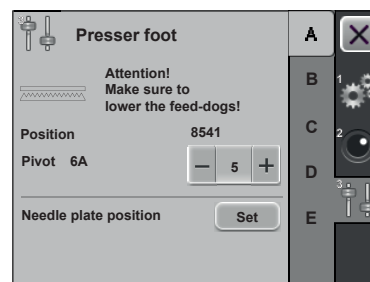
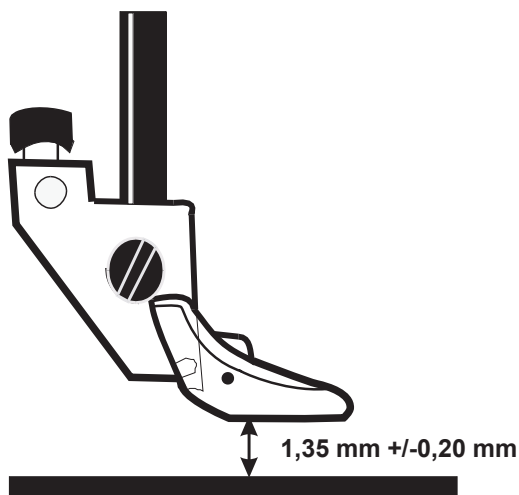
Adjustment

1. Mount the presser foot "6A" on to the machine.
2. Enter Service Program - **3. Adjust menu - A. Presser foot menu.**
3. Lower the feed dog.
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 menu.**

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

The adjustment is automatically set when either the + or - button in **Presser foot menu** is touched, and is saved when turning off the machine.

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



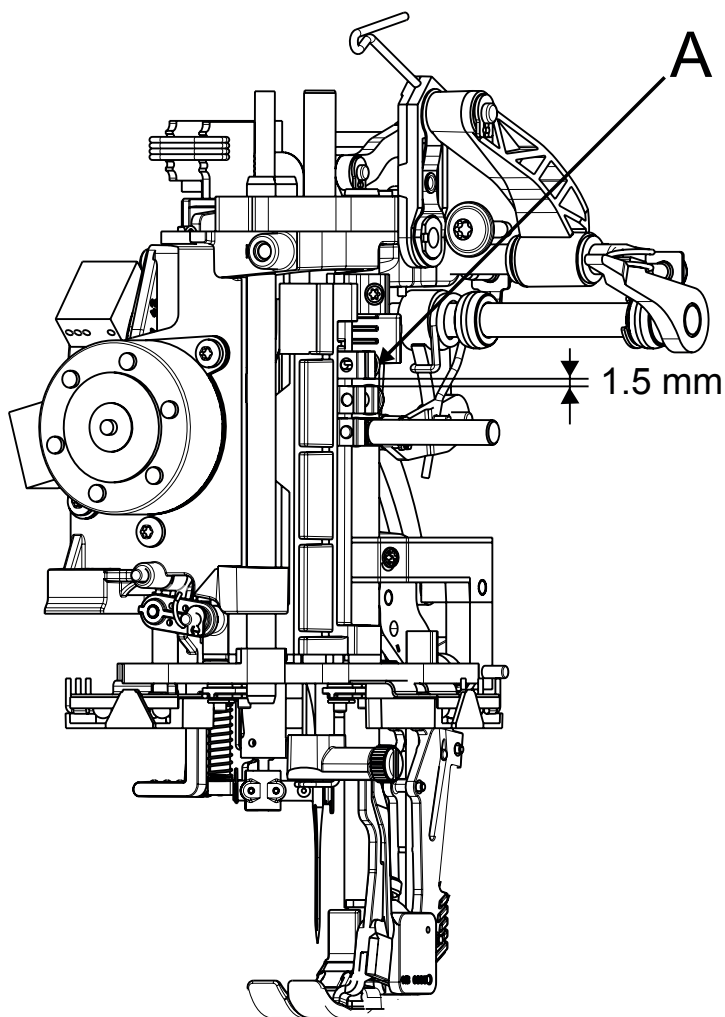
20. Needle threader stop

Check

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

Adjustment

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



21. Threading device

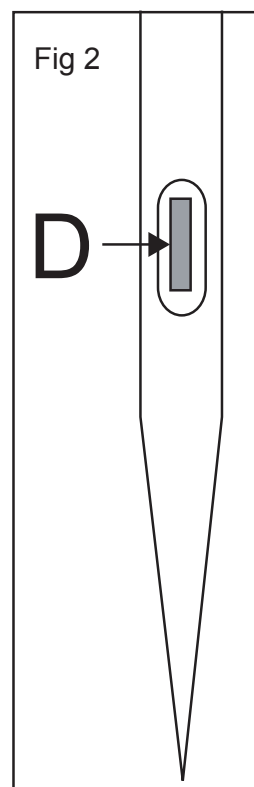
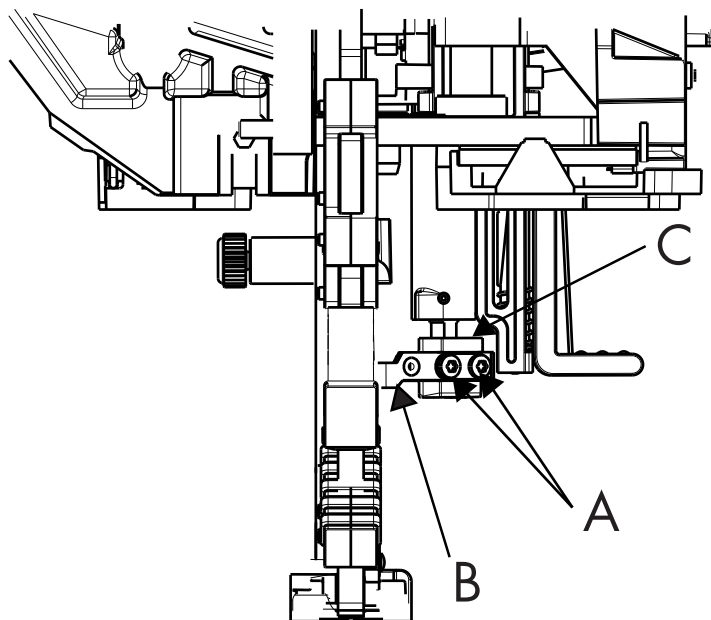
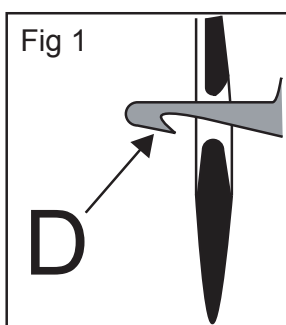
Check

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

Adjustment

1. Loosen the two screws (A) on the back of the threader head (C).
2. Move the white needle thread head (C) so that the threader hook (D) does not touch the inside of the needle eye (see fig1).
3. Move the needle thread hook holder (B) so that the threader hook (D) does not touch the inside of the needle eye (sideways see fig 2).
4. Tighten the screws (A). Always tighten the left screw first.

NOTE! Both settings are adjusted at the same time.



22. IDT linkage holder - Height and parallelism

Check

The distance between the linkage holder and the lower sewing head frame should be 16.3 mm (+/- 0.2 mm) when the presser bar is in its lowest position.

NOTE!

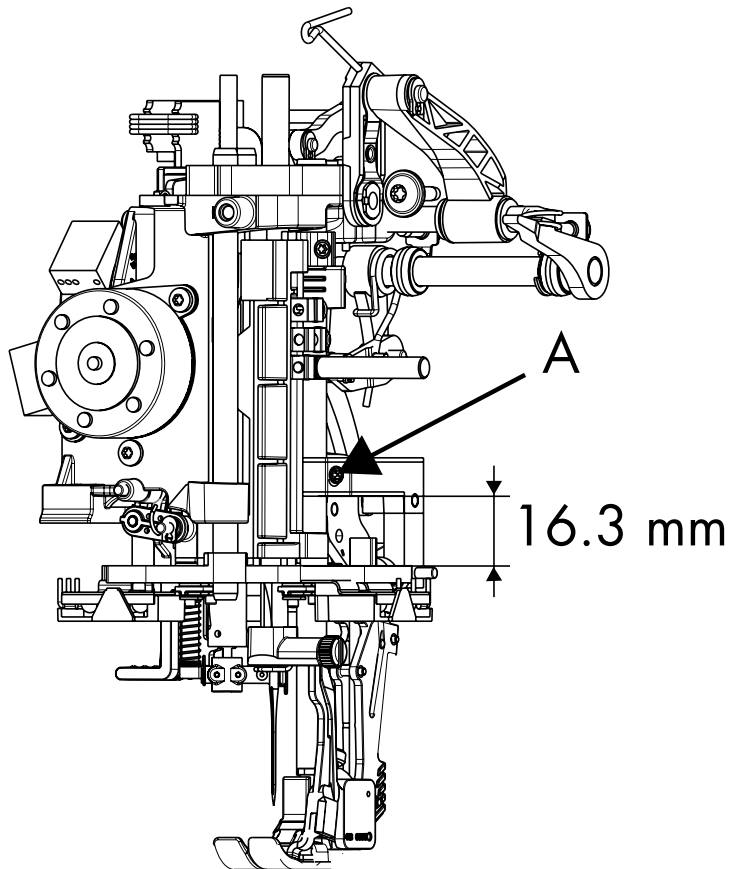
The adjustment can only be carried out when the machine is switched on in service program and the feeddog is dropped.

Adjustment

1. Loosen screw (A) to move the linkage holder.
2. Insert gauge 63-102600-18/000 Spacer inbetween the linkage holder and the lower sewing head frame.
3. Press them the linkage holder downwards against the gauge to reduce any play.
4. Tighten screw (A).

NOTE!

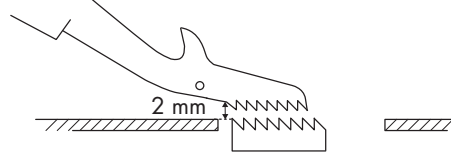
This setting affects setting "19. Adjustment of the IDT foot height and feeding position".



23. Adjustment of the IDT foot - height and feeding position

Check of the height

1. Put on the presser foot #0A.
2. Engage the IDT.
3. Turn on the machine and set it to stitch length 6 mm. Turn the hand wheel one full turn.
4. Lower the presser bar with the functions button presserfoot down.
5. Turn the hand wheel until the IDT foot is in its highest position.
6. The height distance between needle plate and IDT should be min. 2 mm (see illustration).



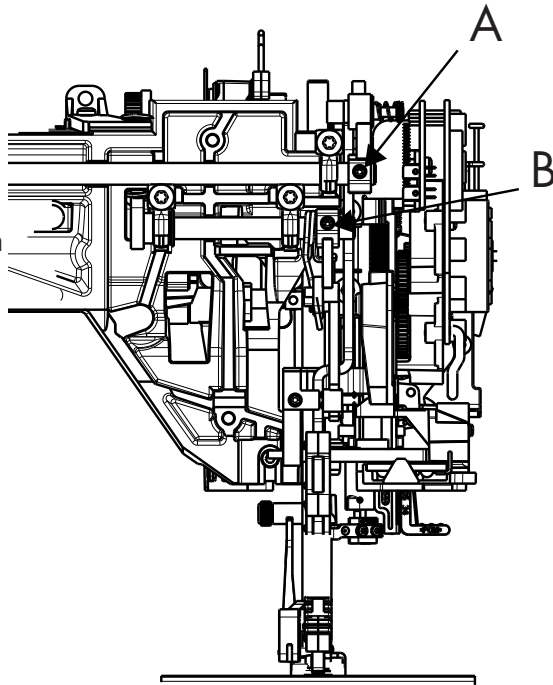
Check of feeding direction

1. Turn on the machine and set it to stitch lengths 6 mm. Turn the hand wheel one full turn.
2. Turn the handwheel in sewing direction until the rising feed dog teeth is flush with the needle plate surface.
3. Remove the presser foot #0A.
3. Lower the presser bar with the function button presserfoot down.
4. The front edge of the IDT foot must be between the second and the third tooth of the centre row of the feed dog.

Adjustment

NOTE! both adjustments must be carried out at the same time

1. All covers must be removed except the front cover.
 2. Put on the presser foot #0A.
 3. Engage the IDT.
 4. Remove the cable holder on the back.
 5. Turn on the machine and set it to stitch lengths 6 mm.
 6. Turn the hand wheel one full turn, and then set the needle bar to its upper turning position.
 7. Lower the feed dog.
 8. Put on the IDT setting tool 413 14 17-01. Make sure the rails are inside the needle plate slot and in its most rear position.
 9. Lower the presser bar, use the function button, so presser foot #0A is in the IDT gauge slot.
 10. Loosen up the two set screws (A) and (B) of the IDT on the back of the machine.
 11. Make sure the edge of the IDT foot is against the setting gauge then tighten the set screw (A).
 12. Push the metal part of height linkage to its most upper position without lifting the IDT foot, make sure there is no play between the two height linkage parts then tighten the set screw (B).
 13. Enter Service Program - **2. Sensor menu - C. IDT menu.**
 14. Touch button Honeycomb. The machine now sews a pre-programmed Honeycomb stitch (66-72 mm).
 - The pre preprogrammed stitch with the IDT disengaged should be (66--72 mm).
 - The stitch with the IDT engaged should be +-2 mm longer or shorter.
- E.g. Without IDT = 66 mm, With IDT 64-68 mm.



24. 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 - **1. Set menu - B. Fabric feeder menu.**
2. Insert a needle and place fabric (dual layers) under the presser foot.
3. Touch button **"Zero Feed"** in **Feed menu.**
4. The feed dog shall NOT move the fabrics when the foot control is pressed (0-feeding).

Adjustment

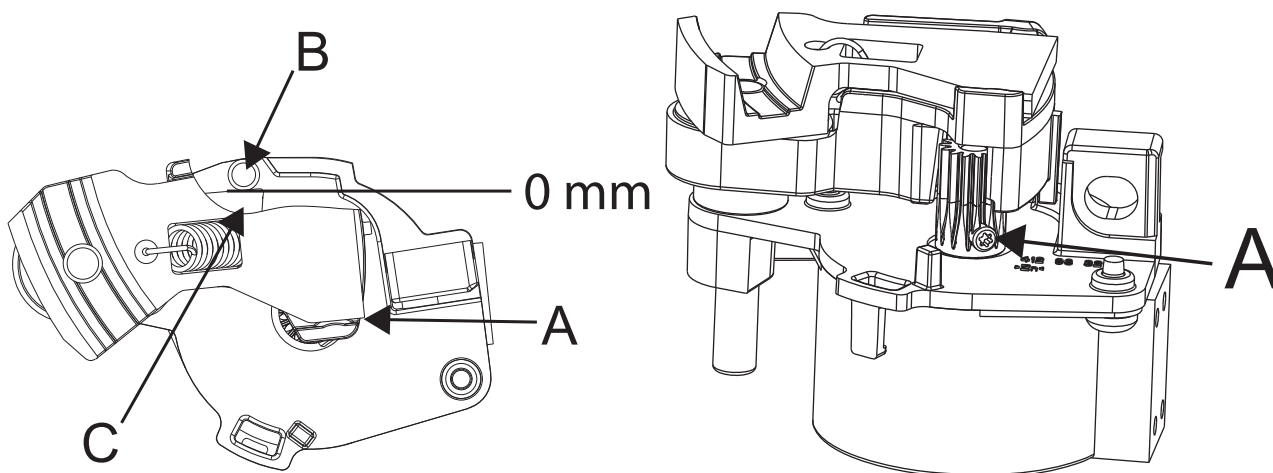
1. Before any adjustment is carried out, ALWAYS check so that settings 22. Stitch length balance and 23. Sidemotion balance is OK.
 2. The adjustment can only be done with the feeding step motor unit removed from the machine.
 3. Remove all covers, the base and the feeding step motor unit.
 4. Place 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"** in **Fabric feeder 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 **"Perform Cal."** in **Fabric feeder menu** repeatedly to check that the step motor always returns to the same point.
 11. Touch button **"Cal"** in **Fabric feeder 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.
12. Touch button **"1"** in **Fabric feeder menu.** The step motor now take one step away from the calibration stop (B).

Check1.

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

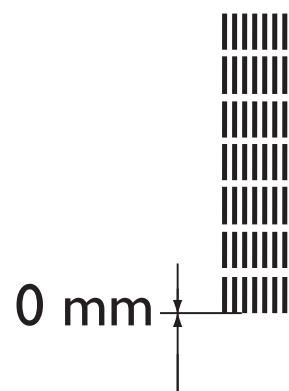
Check 2.

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



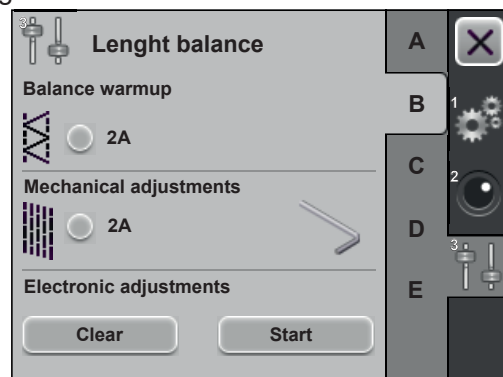
Check

1. Enter the service program and **3. Adjust menu - B. Lenght balance menu.**
2. Choose the "Mechanical adjustment" stitch.
3. The machine should NOT be threaded.
4. Use presser foot #2A Foot.
5. Use one layer of stabilizer (medium size).
6. Sew the machine - starting point must be min. 25 mm from the edges of the Stabilizer (top, left and right side) and the mending stitch should come out as a square. See illustration.

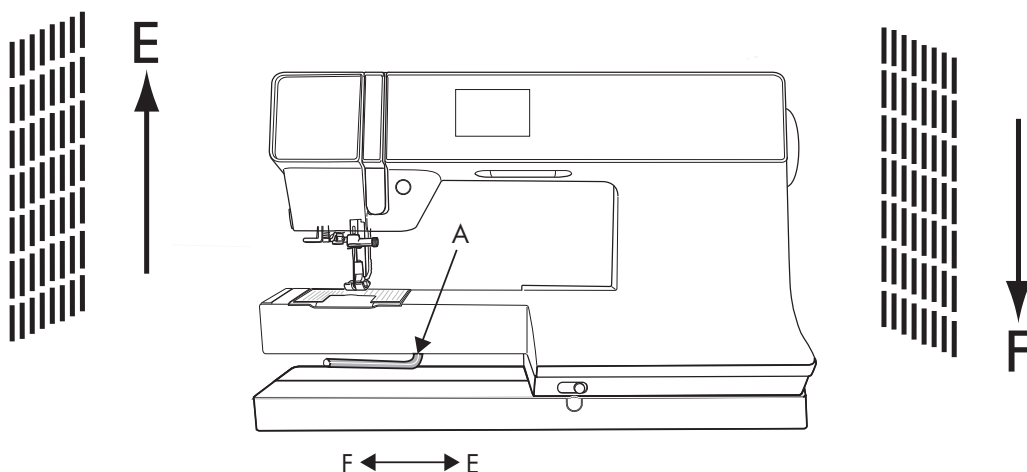


Fine adjustment of stitch lengths balance

1. Choose the "Mechanical adjustment" stitch In service program **3.**

**Adjust menu - B. Lenght balance menu.**

2. The machine should NOT be thread.
 3. Use one layer of stabilizer (medium size).
 4. Use presser foot #2A Foot.
 5. Sew the machine - starting point must be mini. 25 mm from the edges of the Stabilizer (top, left and right side).
 6. Turn screw (A) with a shortened 4 mm Allen key until the machine sews the mending stitch that is squared.
- illustration 1.
- To adjust the mending stitch in the E- direction, turn the screw (A) CLOCKWISE (B).
 - To adjust the mending stitch in the F- direction, turn the screw (A) COUNTER CLOCKWISE (C).



7. When the mending is set correctly in the balance menu continue with Electronic balance.
8. Thread up the machine with regular #30 polyester thread.
- 9 Use one layer of chinolins and one layer of medium tear away stabilizer.

Electronic balance Pattern 1 (72)

A. Sew Balance pattern 1 forward, when finished measure the lengths (D), (the 7 mm width portion of the z-z stitch).

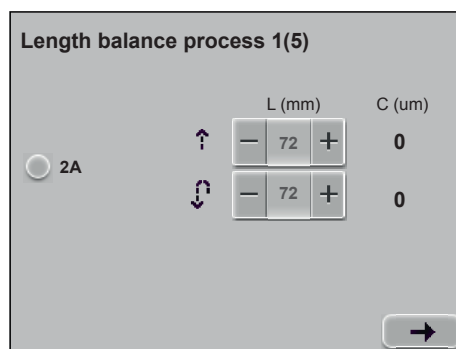
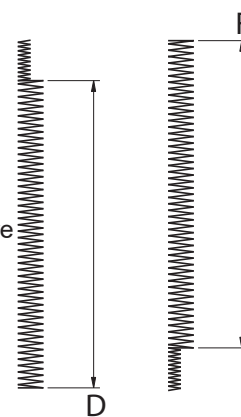
Adjust the value to represent actual lengths from the measurement in the square (E), use the + or – button to step up or down, each step is 1 mm.

B. Sew balance pattern 1 reverse.

Activate the reverse sewing by using the reverse button in the functions menu and sew Balance pattern 1 reverse. When finished measure its lengths (F).

Adjust the value to represent the actual lengths from the measurement in the square (G), use the + or – button to step up or down, each step is 1 mm.

NOTE! The machine sews a couple of small z-z stitches on the left side first, when finished measure its lengths. Measurement is done only on the 7 mm z-z.



Balance Pattern 2 (144 mm)

A. Sew a balance pattern 2 forward, when finished measure its lengths (H).

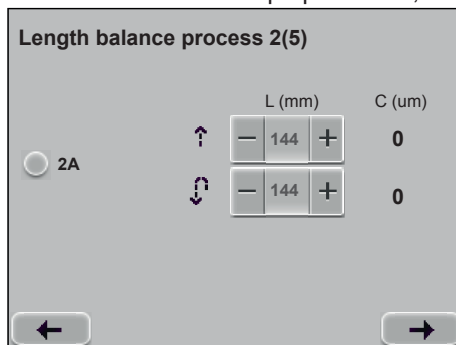
Adjust the value to represent the actual lengths from the measurement in the square (I), use the + or – button to step up or down, each step is 1 mm.

NOTE! The machine sews a couple of stitches on the left side first and the measurement is between when it's goes to the centre and ends when its goes back to the left side again.

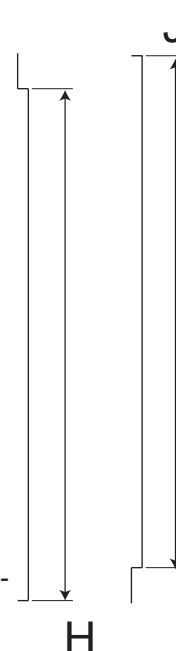
B. Sew balance pattern 2 reverse.

Activate the reverse sewing by using the reverse button in the functions menu and sew Balance pattern 2 reverse. When finished measure its lengths (J).

Adjust the value to represent the actual lengths from the measurement in the square (K), use the + or – button to step up or down, each step is 1 mm.



NOTE! The machine sews a couple of stitches on the left side first and the measurement is between when it's goes to the centre and ends when its goes back to the left side again.



Pattern Balance 3 (144 mm)

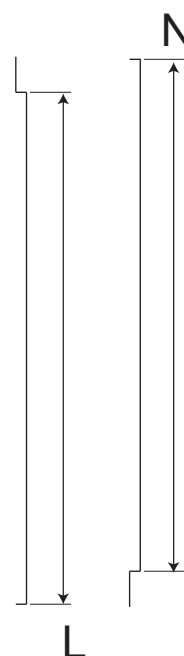
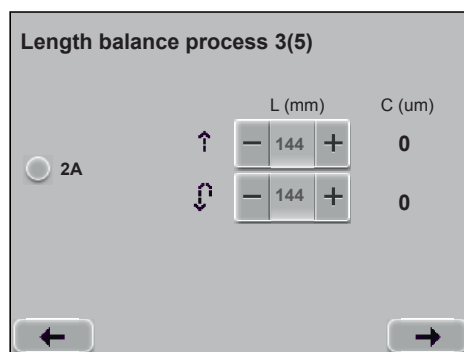
A. Sew a balance pattern 3 forward, when finished measure its lengths (L).
Adjust the value to represent the actual lengths from the measurement in the square (M), use the + or – button to step up or down, each step is 1 mm.

NOTE! The machine sews a couple of stitches on the left side first and the Measurement is between when it goes to the centre and ends when it goes back to the left side again.

B. Sew balance pattern 3 reverse.

Activate the reverse sewing by using the reverse button in the functions menu and sew Balance pattern 3 reverse. When finished measure its lengths (N).
Adjust the value to represent the actual lengths from the measurement in the square (O), use the + or – button to step up or down, each step is 1 mm.

NOTE! The machine sews a couple of stitches on the left side first and the Measurement is between when it goes to the centre and ends when it goes back to the left side again.



Pattern Balance 4 (144 mm)

1. Sew a balance pattern 4 forward, when finished measure its lengths (P).

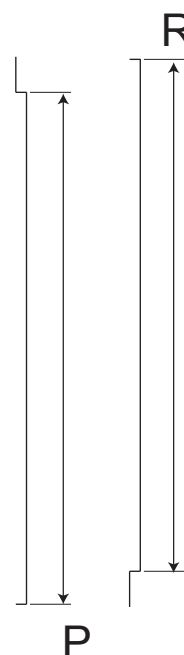
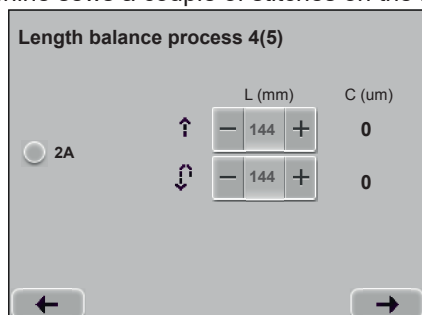
Adjust the value to represent the actual lengths from the measurement in the square (Q), use the + or – button to step up or down, each step is 1 mm.

NOTE! The machine sews a couple of stitches on the left side first and the Measurement is between when it goes to the centre and ends when it goes back to the left side again.

2. Sew balance pattern 4 reverse.

Activate the reverse sewing by using the reverse button in the functions menu and sew Balance pattern 4 reverse. When finished measure its lengths (R).
Adjust the value to represent the actual lengths from the measurement in the square (S), use the + or – button to step up or down, each step is 1 mm.

NOTE! The machine sews a couple of stitches on the left side first and the Measurement is between when it goes to the centre and ends when it goes back to the left side again.



surement is between when it goes to the centre and ends when it goes back to

the left side again.

Balance Pattern 5 (144 mm)

1. Sew a balance pattern 5 forward, when finished measure its lengths (T).

Adjust the value to represent the actual lengths from the measurement in the square (U), use the + or – button to step up or down, each step is 1 mm.

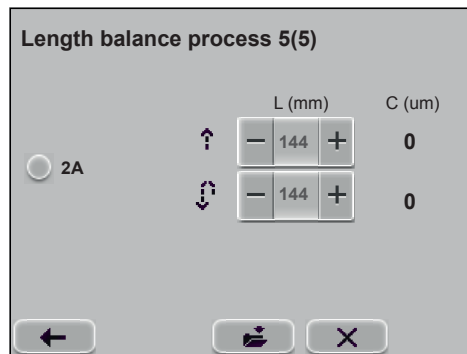
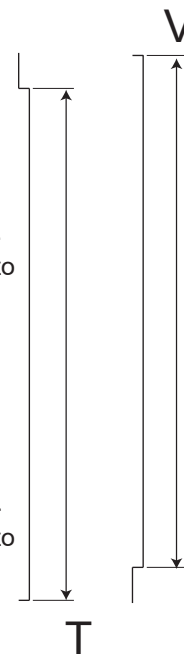
NOTE! The machine sews a couple of stitches on the left side first and the Measurement is between when it's goes to the centre and ends when its goes back to the left side again.

2. Sew balance pattern 5 reverse.

Activate the reverse sewing by using the reverse button in the functions menu and sew Balance pattern 5 reverse. When finished measure its lengths (V).

Adjust the value to represent the actual lengths from the measurement in the square (X), use the + or – button to step up or down, each step is 1 mm.

NOTE! The machine sews a couple of stitches on the left side first and the Measurement is between when it's goes to the centre and ends when its goes back to the left side again.



Activate the balance setting

Push button "save settings" and accept the change, the computer in the machine has now recalculated the lengths.

Caution: if you push the button "clear settings" (X) all values are wiped out!

A recommendation if the values in the "c-(um)" column differs (not on "0"), do not change these before you have the mending stitch set.

If the values all are on "0", the machine has not been set in the balance menu yet!

(e.g. after you change PC board).

NOTE! The mending stitch in the balance menu is NOT compensated through the settings done with the balance patterns 1-5.

The mending stitch in the "Sew test" menu is compensated with the values in the "balance menu".

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

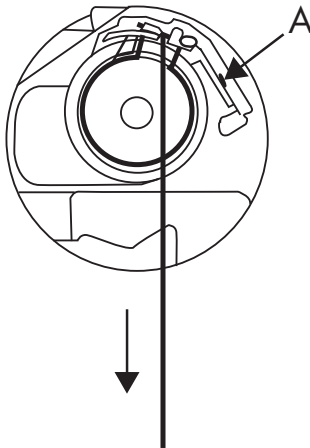
Check

1. Insert a full bobbin into the bobbin case, use normal polyester thread.
2. The thread tension spring of the bobbin case shall give a resistance of 19 - 21 g when pulling the thread slowly, using normal polyester thread.

Adjustment

1. Insert a full bobbin into the bobbin case, use normal polyester thread.
2. Pull the thread slowly and turn screw (A) until the correct thread tension is obtained.

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



26.Upper Thread tension - Factory setting

NOTE! Factory settings - Mechanical adjustment shall always be checked or set before adjusting the Tension low and high software setting.

Factory setting Start -1 and Extra high shall only be made if the PC-board or mechanical parts in the tension unit has been replaced.

Thread tension -"factory setting" Mechanical adjustment

Check

A correct thread balance should be obtained on satin stitch 0.7x7 mm.

Adjust Mechanical adjustment.

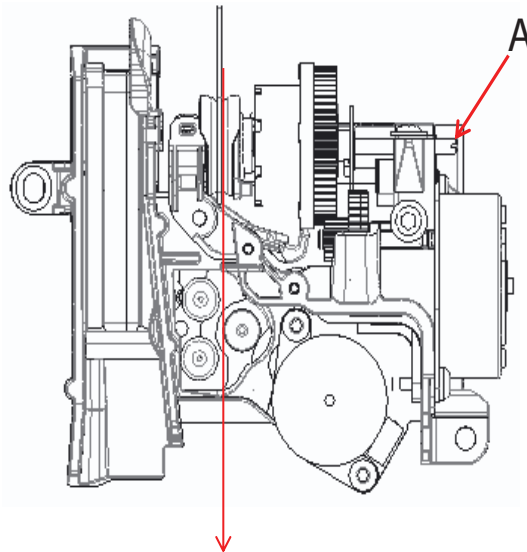
1. Enter service program **3 Adjust menu - C. Tension.**

1. Touch "Factory" button to enter the Factory Tension menu.

2. Activate Mechanical adjustment by touching "Set" button.

3. Put a normal polyester thread so it just go thow the upper thread tension discs.

4. Pull the normal polyester thread and turn the screw (A) located on the tension unit until it is 50 gram (+-2g). Use a tension gauge to verify the grams.



"Tension Start 1" of the Factory setting menu is for setting the Zero (0) tension of the machine.

Check and Adjustment

1. Enter service program - **3. Adjust menu - C. Tension menu.**

2. Open the "FACTORY TENSION" menu by click on the "Factory".

3. Put a normal polyester thread so it just goes through the upper thread tension discs.

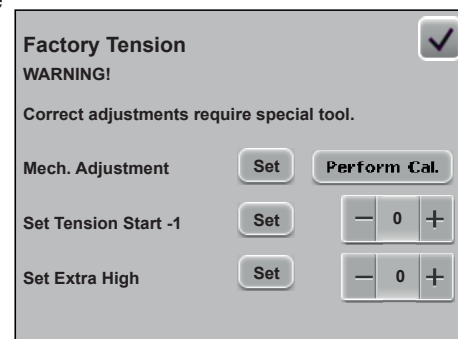
5. In Sub menu "Tension Start 1" touch "Set low", The presser foot will go down to its pivot position and the thread tension discs will close.

4. Pull slowly the normal polyester thread.

5. Touch " + " button in menu "Tension Start 1" 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. "Tension Start 1" adjustments can be done between -10 and +10. The adjustment is automatically saved.



"Extra high" of the Factory setting menu located as a menu in Tension menu is for setting the highest upper thread tension of the machine.

Check

The thread tension should be 150 grams. Use a weight (150g), attach the thread to the weight. Touch "Extra high" button and the thread and the weight should not move.

Adjustment

1. Enter service program - **3. Adjust menu - C. Tension menu.**
2. Open the "FACTORY TENSION" menu by click on the square (A) that say "Locked".
3. Put a normal polyester thread so it just goes through the upper thread tension discs.
5. In menu "Extra High" touch "Set Extra high", the thread tension discs will close.
6. Attach the thread to a weight (150g).
5. Decrease the tension until the weight starts to move.
Use the " - " button in "Extra High Tension" menu.
6. Increase the tension until the weight stop moving.
Use the " + " button in "Extra High Tension" menu.

There are limitations in this setting e.g. if "Sew Tension" not is set to 0 (zero), the value of the Extra high

Tension setting can be higher or lower then -10 or +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.

27. Upper thread tension - Low and high

Low and High Tension in the tensions menu is for setting the low and high upper thread tension at normal sewing

Low Tension

Check

A correct thread balance should be obtained on an Satin stitch 0.7x7 mm.

NOTE!

The following threads shall be used:

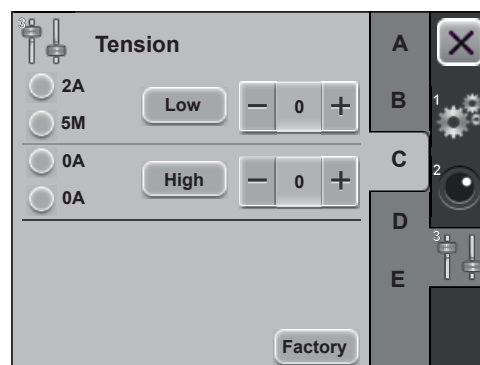
Upper and lower thread : Normal polyester thread.

Adjustment

1. Go to the service program - **3. Adjust menu - D. Tension menu**, activate sewing tension menu "LOW" and stitch 1.
2. Sew a an Satin stitch 0.7x7 mm with presser foot #2A.
3. To adjust the "Low" upper thread tension for e.g. decorative sewing, use the "+" or " - " button in "Set Low" menu.
4. Sewing Tension"Low" adjustments can be done between -10 and +10 if Sewing tension "High" is set on 0 (zero).

If "High Tension" is not set on 0 (zero) there are limitations in the setting.

The value of the setting could be higher or lower then -10 or +10.



The adjustment is automatically saved.

High Tension

Check

A correct thread balance should be obtained on an straight stitch 4x4mm.

Adjustment

1. Go to the service program - **3. Adjust menu - D. Tension menu**, activate sewing tension menu HIGH and stitch 1.
2. When sewing Stich 1 in High menu, the zig-zag stitch 4x4 mm, use presser foot #OA.
3. To adjust the "High" Sewing thread tension use the "+" or " - " button in "Set High" menu to adjust the High sewing tension.
4. Sewing Tension "High" adjustments can be done between -10 and +10 if Sewing tension "Low" is set on 0 (zero).

If "Low Tension" is not set on 0 (zero) there are limitations in the setting.

The value of the setting could 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.

28. Setting the thread take-up spring

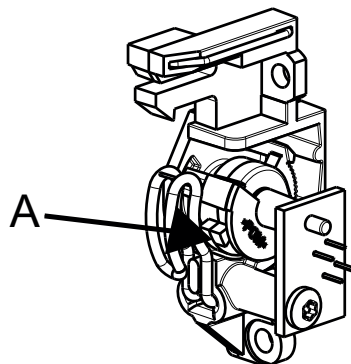
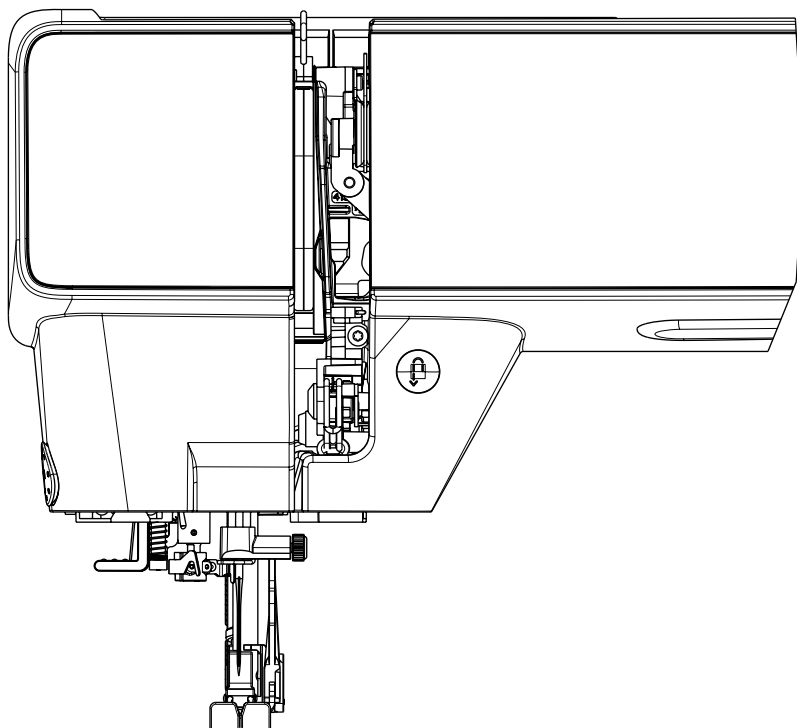
Check

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

Adjustment

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

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



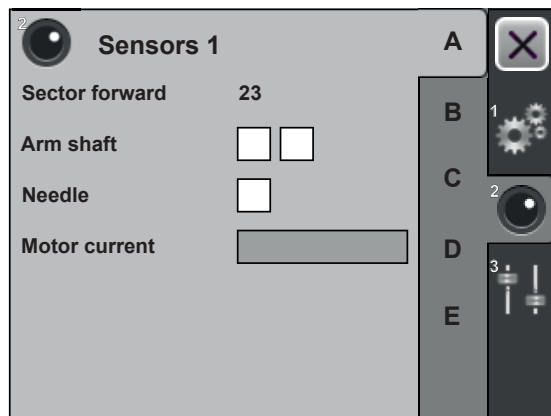
29. Upper thread guard sensor

Check

Enter service program.

Select **2. Sensor menu - A. Sensors 1 menu.**

The function of the upper thread guard sensor is indicated by a square next to "spring sensor". Check that the square alternates between filled and not filled when moving the thread take-up spring.



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

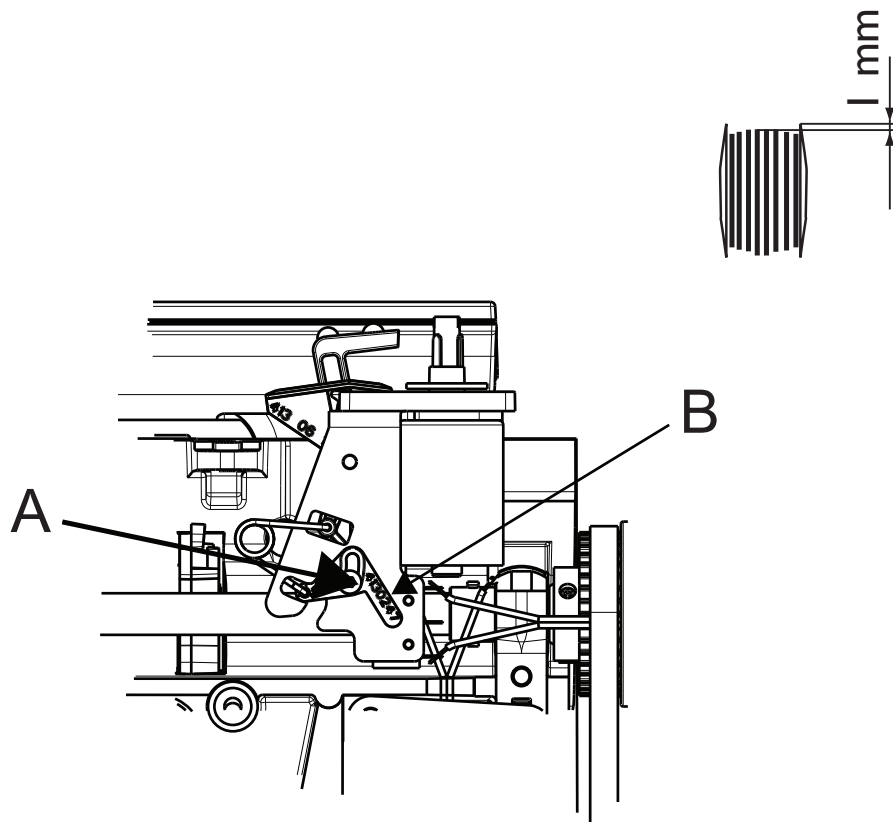
30. Disconnection when winding the bobbin

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.

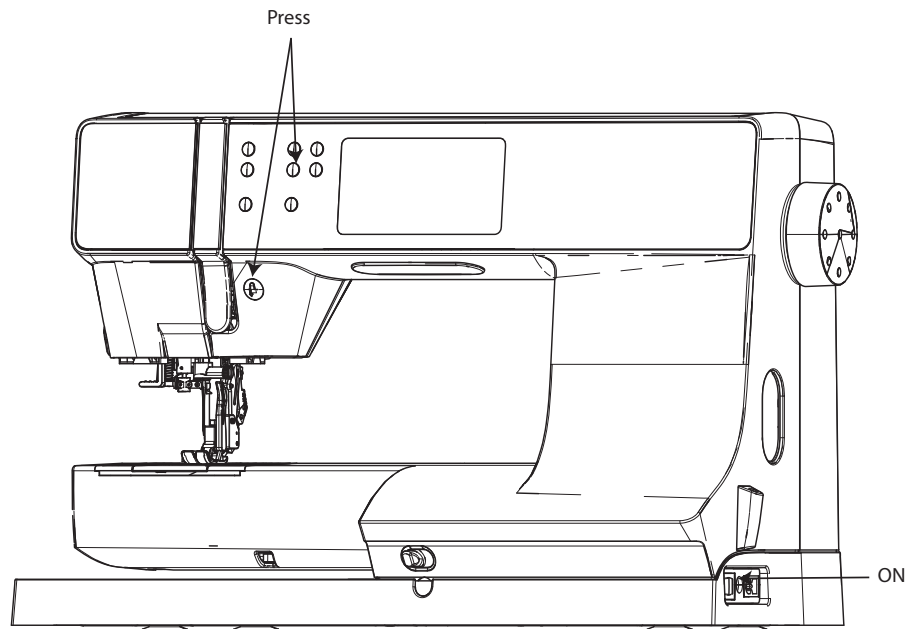
Adjustment

1. Loosen the Screw (A).
2. Move the disconnection lever (B) until the correct amount of thread is obtained.
3. Tighten the screw (A).
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.

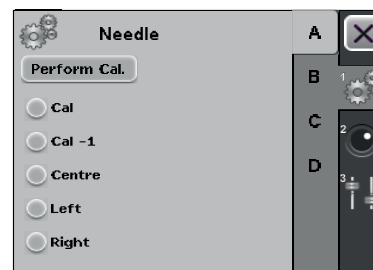


Handling

1. Go to the service program of the machine by pressing **the reverse feed button** and **the Fix button** while **the main switch** is switched on.

NOTE! Hold the buttons pressed until the service menu 1. Set menu - A. Needle menu appears on the screen.

Functions of the service program



1. Set menu - A. Needle menu

Toucharea

Perform Cal.	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	Used for checking the calibration stop of the zig-zag step motor. The cog segment of the needle step motor now takes its right calibration position.
Cal -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.
Centre	Used when setting the centre position of the needle. The cog segment of the needle step motor is now in its centre position.
Left	Used for checking the calibration stop of the zig-zag step motor. It will attempt to take one step to the more. - If correct needle will take one step to the right. - If faulty needle will not move or move to the left.
Right	Used for setting the end stop position of the step motor for the needle. The cog segment of the needle step motor now takes its left position.

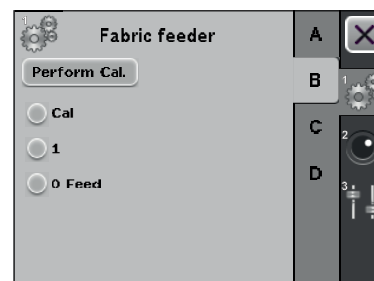
1. Set menu - B. Fabric feeder menu

Toucharea

Perform Cal.	The stepmotor calibrates.
Cal	The stepmotor takes it's calibration position against the calibration stop.
1	Step motor moves one step away from calibration stop.
0 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 :

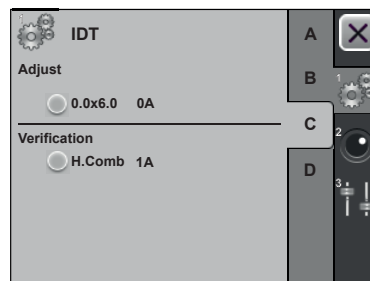
22. Stitch length balance.



1. Set menu - C. IDT menu

Toucharea

Adjust Selects a 6mm straight stitch.
Verification Selects a honey comb stitch.

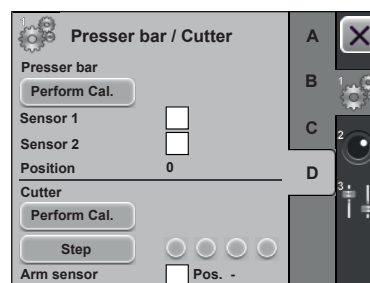


1. Set menu - D. Presser bar / Cutter menu

Toucharea

Perform Cal. Presser bar takes its highest position.
Sensor 1 Check of the presser foot's first sensor.
Sensor 2 Check of the presser foot's second sensor.
Position Indicates the presser bar position in digits

Cutter
Perform Cal. Thread cutter calibrates.
Step Thread cutter moves one step at the time in the cutting sequence.
Arm sensor Check of the cutter arm sensor.



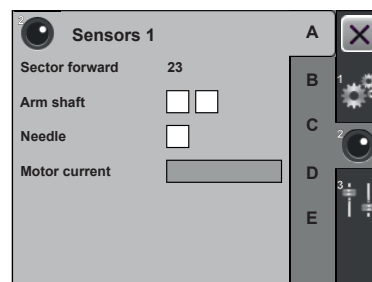
NOTE! An activated function =
Green

2. Sensor menu - A. Sensors 1 menu

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	Check of the armshaft's first sensor (stop right function).
	Check of the armshaft's second sensor (stop right function).
Needle	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 the squares should turn from black to white when turning the hand wheel slowly in the sewing direction.

2. Sensor menu - B. Sensors 2 menu

Buttonhole Located on the sensormatic buttonhole foot. Buttonhole sensor check.

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

Foot control 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.

Winding The bobbin winding sensor -Indicates when bobbin is fully wound.
Bobbin Located in the Hook cover. One in the front right corner and the second on the back left corner. Check of lower thread guard indicator.

Check

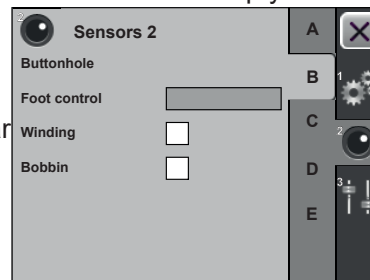
1. Remove the bobbin from the bobbin case.
2. Turn the hand wheel slowly to locate the position where the square changes from black to white.
3. Place a full bobbin in the bobbin case and the square should be activated.

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 that the cable is correct connected to the main Pc-board

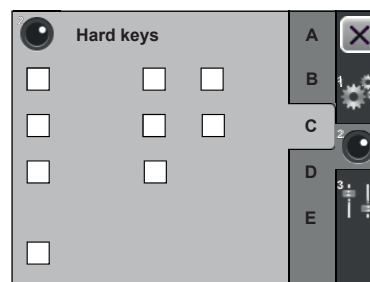


2. Sensor menu - C. Hard keys menu

Check of function buttons.

Check

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



2. Sensor menu - D. Electronics menu

Touch area

Touch cal.

Is for calibration of the touch display.

Display
check is

A square pattern shall change between red, green and blue. After the

done the machine will automatically return the service menu "Electro-

again.

Sound

The machine tests the speaker and a beep sound is played.

Status LEDs

The hardkey button LED's is uplighted.

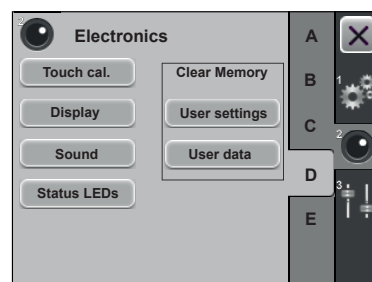
Clear Memory

User settings
Menu".

Removes all individual settings the customer has set in the "Set

User data

Removes all files saved by the customer.



2. Sensor menu - E. Timers & info menu

Toucharea

SW version

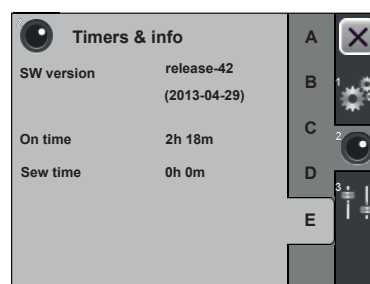
Log time

On-Time
ched on.

Indicates how many hours and minutes the machine has been swit-

Sew-Time
on.

Indicates how many hours and minutes the machine has been sewed



3. Adjust menu - A. Presser foot menu

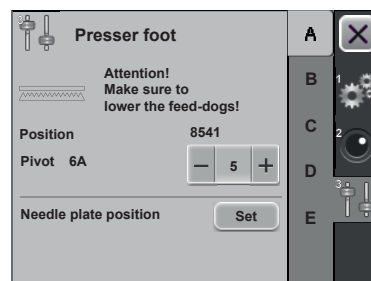
Toucharea

These touch buttons are used during the following settings :

Position	Indictacates the presser foot position in digits.
Pivot -	Decreases the Pivot height.
Pivot +	Increases the Pivot height.
Needle plate position	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 :

14. Needle plate position and 15. Pivot height.



3. Adjust menu - B. Lenght balance menu

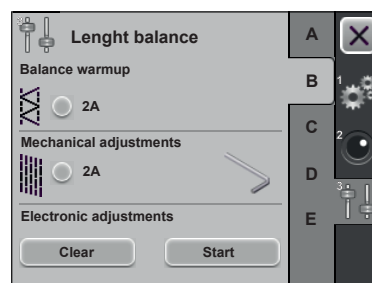
Toucharea

These touch buttons are used during the following settings :

Balance warmup	Used for warm up machine prior to setting feed balance.
Mechanical adjustments	Used for setting feed balance.

Electronic adjustments

Clear	Electronic feed balance adjustments is cleared out from machine memory.
Start	To enter the Electronic adjustments sub menus.



3. Adjust menu - C. Tension menu

NOTE! There are limitations in the setting. The difference between the settings(Low and High) could not be more than 10.

Sew tension Low

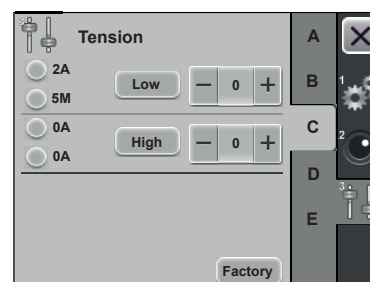
+ and - Is used for adjustment of the **LOW** thread tension (decorative sewing).
The value on the display is changed gradually each time you touch the toucharea.

Seam Selection - Low

Stitch 1 The machine sews a satin stitch.
Stitch 2 The machine sews a buttonhole.

Sew tension High

+ and - Is used for adjustment of the HIGH upper thread tension (normal sewing).
The value on the display is changed gradually each time you touch the toucharea.



Seam Selection - High upper thread tension

Stitch 1 The machine sews a zigzag stitch.
Stitch 2 The machine sews a straight stitch.

Factory tension Check

NOTE! Factory tension requires a tension gauge to verify the settings.

Mechanical adjustment

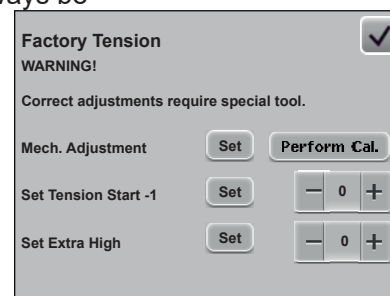
Is used to mechanically set the low tension and shall always be checked or set before setting low and high software settings.

Tension start -1

Is used to set the starting point for thread tension.

Extra high

Is used to set the highest thread tension point of the machine.



3. Adjust menu - D. Sew test menu

NOTE! The number 0A, 1A, 2A and 8 is referring to which presserfoot that should be used.

0.0x2.5 0A : The machine sews Straight stitch 2,5 mm.

0.0x6.0 0A : The machine sews Straight stitch 6 mm.

4.0x4.0 0A : The machine sews Zig-zag 4x4 mm.

9.0x12. 0A : The machine sews Zig-zag 9x12 mm.

9.0x0.8 2A : The machine sews Satin 9x0.8 mm.

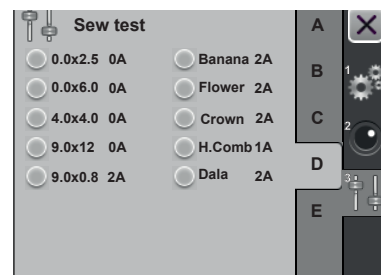
Banana 2A : The machine sews Banana motif.

Flower 2A : The machine sews Flower motif.

Crown 2A : The machine sews Crown motif.

H.Comb 1A : The machine sews Honey comb motif.

Dala 2A : The machine sews Dala motif.



3. Adjust Meny - E. Cut sensor calibration

Cut sensor calibration set the start and end position of the fetcher.

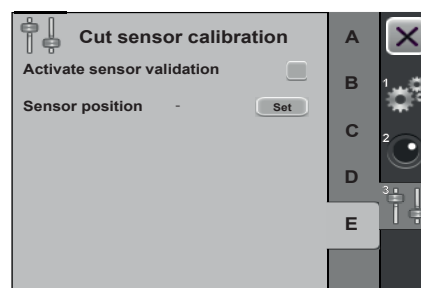
Toucharea

Activate sensor validation

Used to activate and deactivate cut sensor validation.

Set

Used to calibrate the cut sensor.



Update of the memory - expression 710

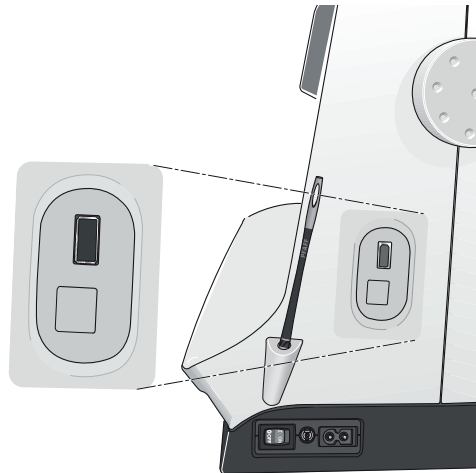
The software of uilt expression 710 is updatable, before updating the machine It needs to be set in update mode.

Revision of the program

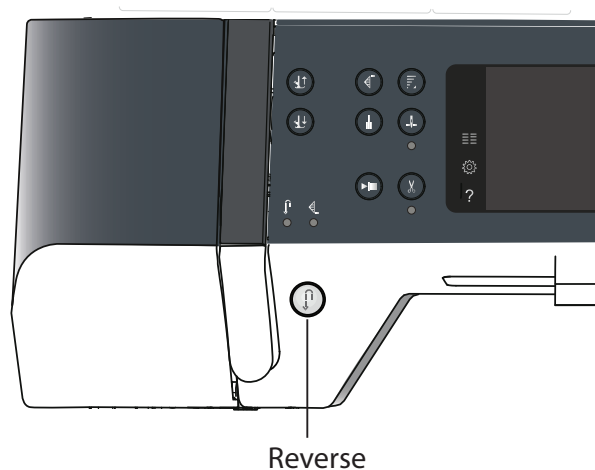
The revision of the software can be seen in service program 2. Sensor, E or under Info menu/personal info.

How to update your machine

1. Go to SVPs Service Portal on warranty.svpworldwide.com and find your sewing machine. Here you will find updates available for your machine.
2. Download and unzip the update software to an USB stick.
3. Check so that the file name is "firmware_update.clo"
4. Make sure that your machine is turned off. Connect the USB stick loaded with the new software version to the USB port on your machine.



4. While pressing and holding the reverse button, turn your machine on.



5. The update starts automatically and you can release the reverse button then the process bar appears.

NOTE! It take up to one minute before the process bar appears and you can release the reverse button.

NOTE! If the expression 710 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.

6. When the update is complete the machine will restart automatically. Check the software version number in the settings menu.

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

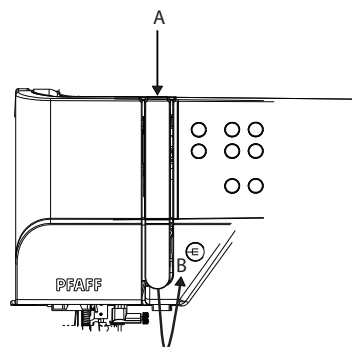
Removing the covers

NOTE:

Before adjusting or repairing the machine, make sure to:
 Disconnect the machine's main plug.
 Remove needle and presser foot.
 Remove detachable work support.

Lid cover

1. Lift up the handle.
2. From the back side of the machine, flex the Top cover lid upwards, in the middle. Flex it just enough so the pin on the top cover lid left or right side is out of the top cover holder and then remove the lid.

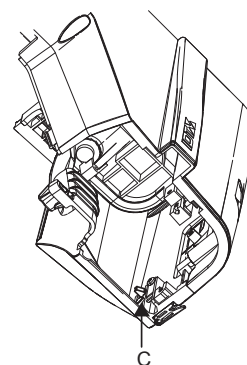
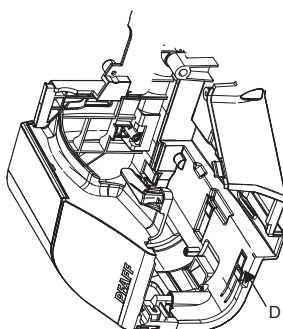
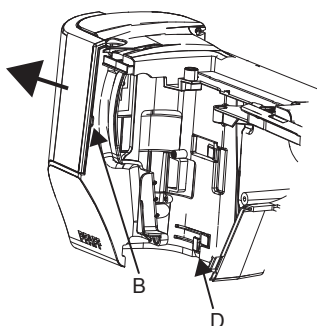
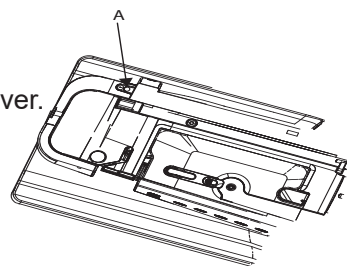


Thread Tension cover

Remove the cover by push it down from top (A) at and then carefully unhook the cover by then swing it straight up and out (B).

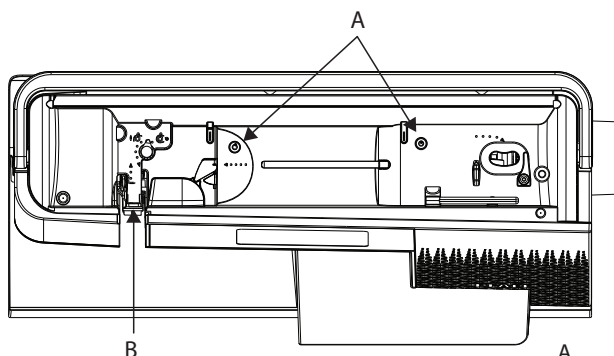
Decorative sewing head cover

1. Remove the Torx 10 screw A from top of sewing head cover.
2. Unhook Clip B located on outside at front.
2. Unhook clip C located on inside front side.
3. Unhook Clip D located on inside backside.
4. Remove the Decorative Sewing head cover straight to the left.



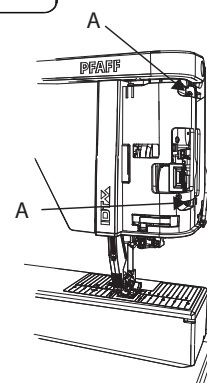
Top cover

1. Remove the two Torx 20 screws of top cover (A).
2. Lift the top cover upwards at the tension cover area B to remove the top cover.



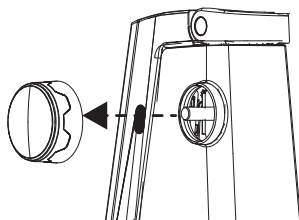
Front sewing head cover

1. Remove the two screws A from back side.
2. Remove the front sewing head cover .

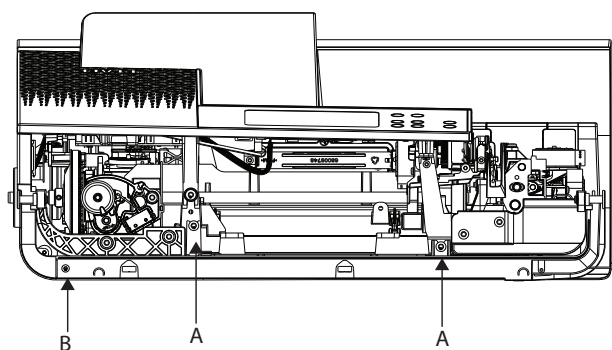


Rear cover and Motor cover

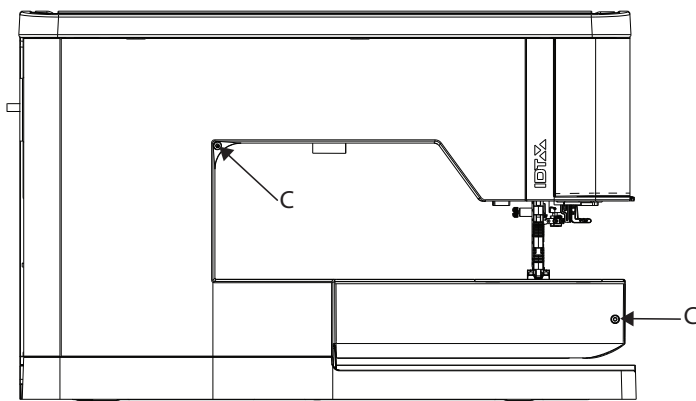
1. Remove the Hand wheel.



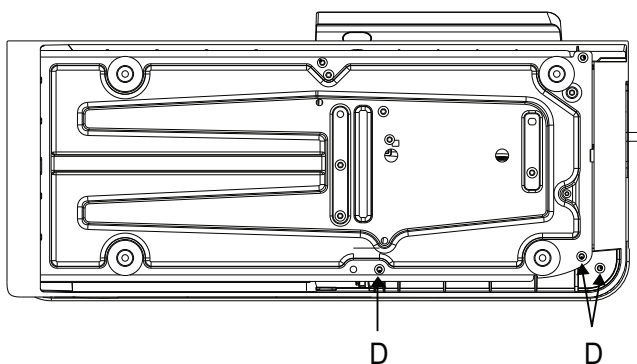
Remove the two screws A and the screw B located under the handle.



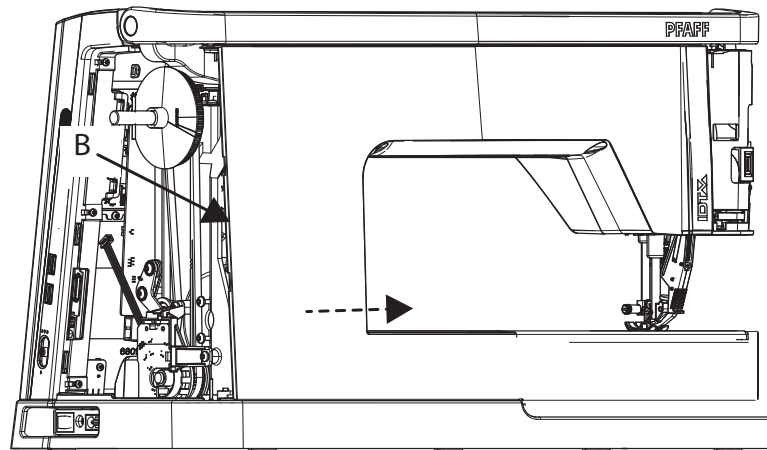
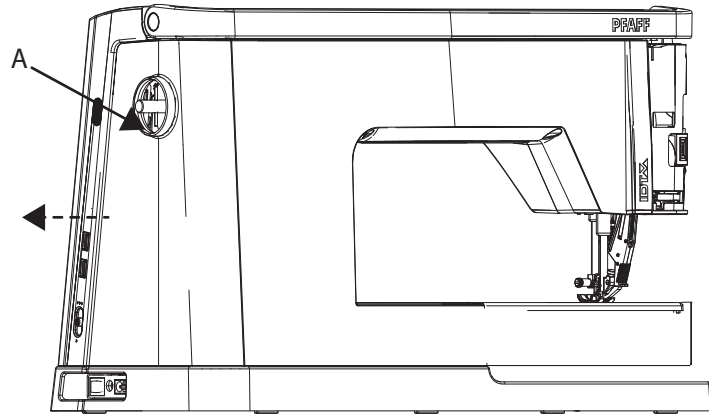
2. Remove the screw two screws on the rear cover C.



4. Lay the machine down, front facing up, and remove the three screws D.



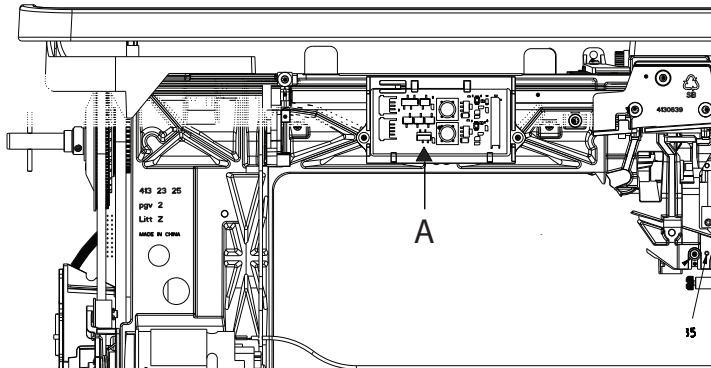
4. Lift the machine up again.
5. Remove the motor cover by first take a firm grip at (A) and cautiously pull the cover out to the left.
and then remove the back cover by cautiously pull the back cover at (B) , out a bit to remove the cover



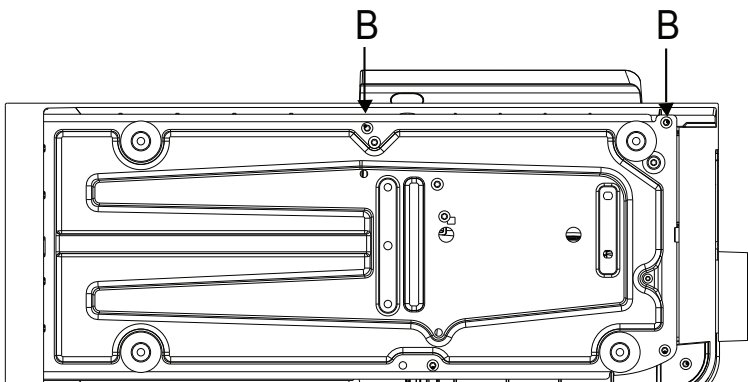
Front cover

NOTE! Always use wrist band and a ESD mat when removing the front cover.

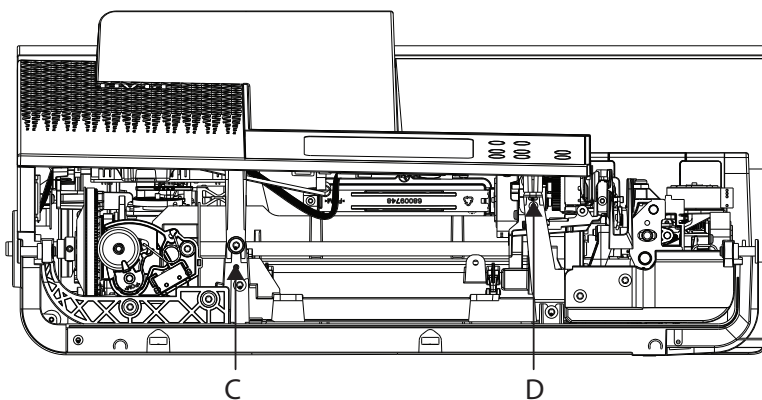
1. Disconnect the cable for LED front cover A located on the connector board at the back of the machine.



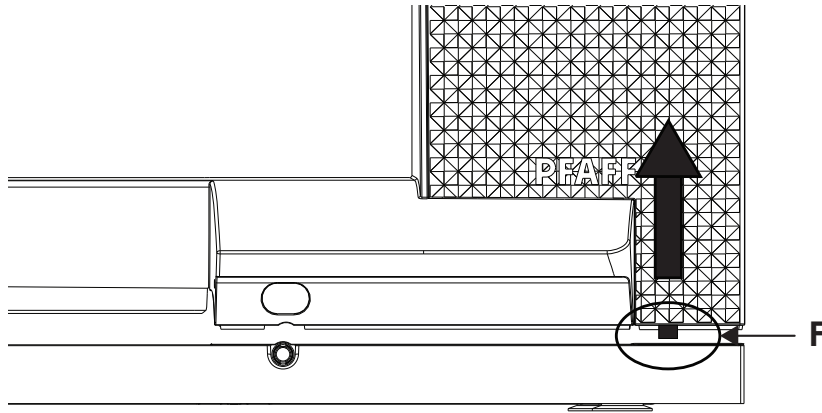
2. Lay the machine down, front facing up. Remove the two screws B.



3. Remove the two screws C and D



4. Lift the machine up again.
5. Remove the front cover by cautiously lift it up so the guide F will pass over the edge of the bottom cover then pull the front cover straight out.



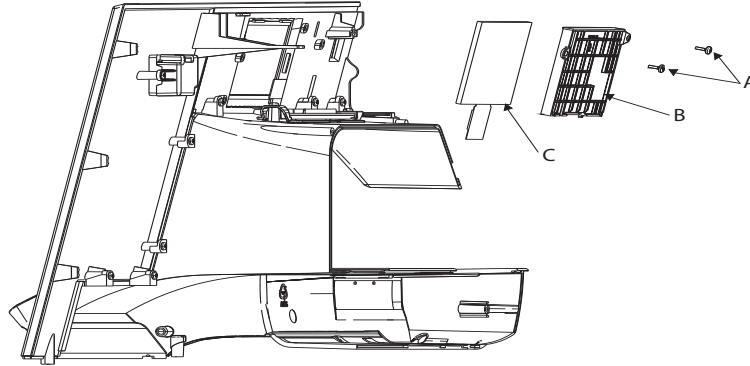
6. Disconnect the cable from the USB board and the cable from the Base board.
- Note!** Notice how the cables are connected before disconnect, they have to be connected in the same way.

Display

1. Remove all covers.
2. Remove the application board.
3. Remove the two Torx 10 screws A.
4. Lift out the frame B and the display C from the front cover.

Mounting

Mount in reverse order.



Touch panel and keyboard

NOTE! Touch panel and keyboard have to be changed as a unit.

1. Remove all covers.
2. Remove the application board.
3. Remove the display
4. Remove the touch panel and the key board.

Mounting

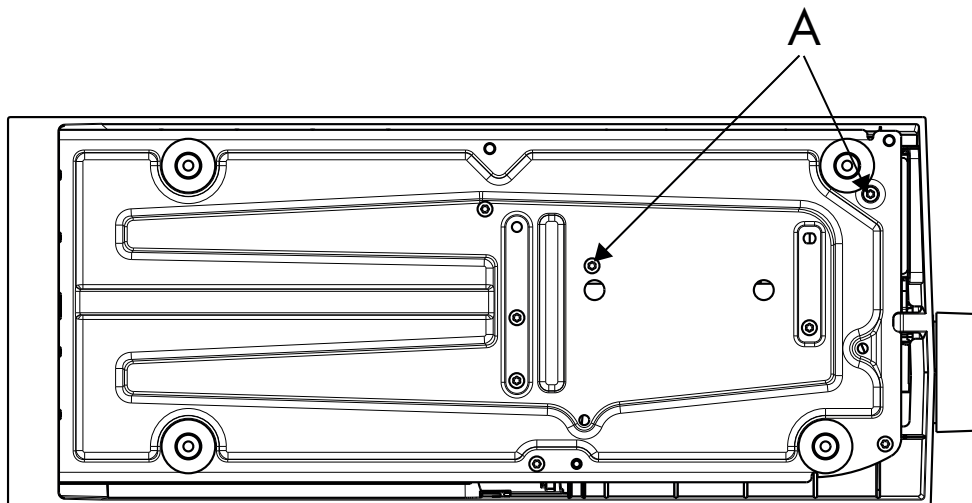
Mount in reverse order.

Power supply

FOR SAFETY REASONS ALWAYS DISCONNECT THE MAIN POWER CORD FROM THE MACHINE BEFORE REMOVING THE POWER SUPPLY.

Dismantling

1. When removing the Power Supply; please remove all the covers first.
2. Disconnect the power supply cable from the Pc-board.
3. Then Lay the machine down, front facing up.
4. Remove the two Torx 20 screws (A). When removing the last screw hold the Power Supply with one hand.
5. Push the Power supply to the left and remove the Power Supply.



Mounting

1. When mounting the Power Supply. Push the Power Supply into position.
2. Mount the first Torx 20 screw (A), still holding the Power Supply with one hand this is to make mounting easier.
3. Mount the second Torx 20 screw (A), use one hand to fixate the Power Supply to its position.
4. Connect the power supply cable to the Pc-board.
5. Mount the covers.

Checking the powersupply

Connect the main power cord to the powersupply and switch it on.

Measure the voltage and resistance between the contact pins.

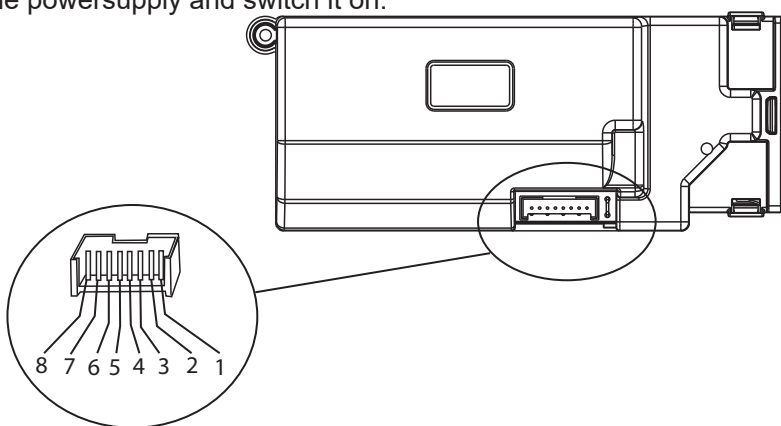
1-2 should be approx. 0 - 100k Ohm, when the foot control is pressed.

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.



Base board - Circuit diagram

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

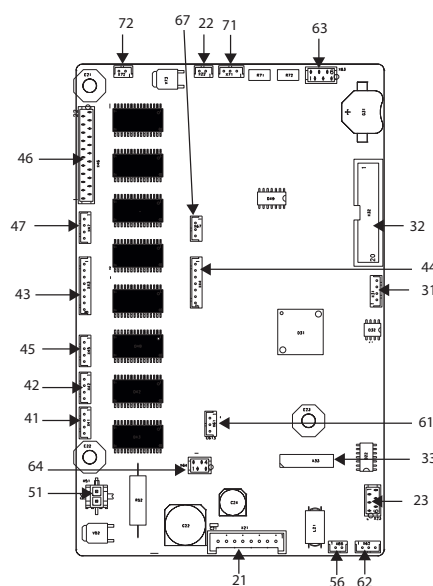
ATTENTION!

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 ESD damages, it is important to handle circuit boards in a controlled way.

Dismantling

1. Remove all covers.
2. Remove the 3 screws (A) and the screw (B) holding the circuit board.
3. Loosen the cables from the circuit board according to below:

- (21) Power supply unit - Black
- (22) Bobbin winding sensor - White
- (23) Synchronizer card - Red
- (31) NOT IN USE -White
- (32) NOT IN USE - Black
- (33) Front Cover connection - Black
- (41) Side feed motor - Yellow
- (42) Feed unit motor - White
- (43) NOT IN USE -White
- (44) NOT IN USE- Blue
- (45) Thread cutter motor - White
- (46) Sewing head unit - Red
- (47) Thread tension motor - Blue
- (51) Motor - Black
- (56) NOT IN USE- Black
- (61) Thread cutter sensor - White
- (62) NOT IN USE - Black
- (63) NOT IN USE -Red
- (64) Bobbin sensor - Red
- (67) NOT IN USE - White
- (71) NOT IN USE - White
- (72) NOT IN USE - Black



5. Lift away the board from the machine, ALWAYS hold the pc-board by the edges.
6. Place the pc-board in a ESD Bag.

NOTE! If the Main Pc-board is replaced:

1. The Firmware must ALWAYS be updated to the latest version.
2. The Touch panel must be calibrated.
3. The Sewing heads Pivot height must be set.
4. The Sewing heads "Needle plate position" must be set.
5. The Upper thread tension .
Set first the Factory the "Extra High Tension" and "Start tension 1". Then "High tension" and "Low tension".
6. The Machine serial number must be set.

Application board - Circuit diagram

ALWAYS MAKE SURE TO USE WRIST BAND AND ESD MAT WHEN REMOVING THE APPLICATION BOARD.

ATTENTION!

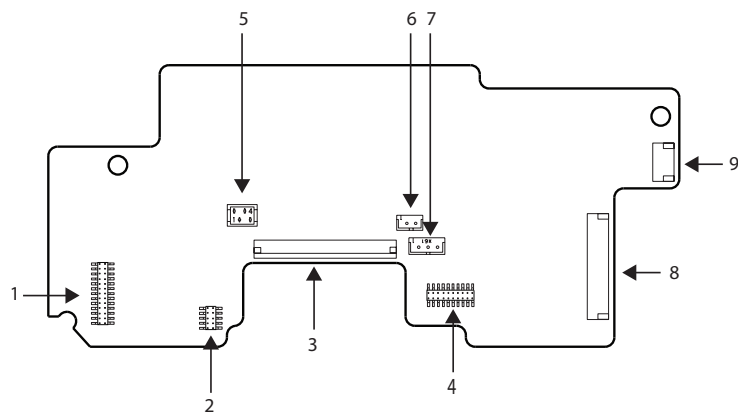
It is of the utmost importance that precautions are being taken in order to avoid damage of the electronics by electro static discharges ESD. To avoid ESD damages, it is important to handle circuit boards in a controlled way.

Dismantling

1 Remove the 2 screws holding the application board.

2. Loosen the cables from the application board according to below:

- (1) Base board- Black
- (2) USB board - Black
- (3) Display - White
- (4) NOT IN USE -Black
- (5) Reverse button - Red
- (6) Loud speaker- White
- (7) NOT IN USE - White
- (8) Key board -Brown
- (9) Touch panel - Brown



3 Lift away the application-board from the machine, ALWAYS hold the application-board by the edges.

4. Place the application-board in a ESD Bag.

NOTE! If the Application board is replaced

1. The application board are delivered without software:and must always be updated with the latest software version.

2. The Touch panel must be calibrated.

3. The Sewing heads Pivot height must be set.

4. The Sewing heads "Needle plate position" must be set.

5. The cut ut sensor must be calibrated.

5. The Upper thread tension must be set.

Set first the Factory "Extra High Tension" and"Start tension 1". Then "High tension"and "Low tension".

Base Plate

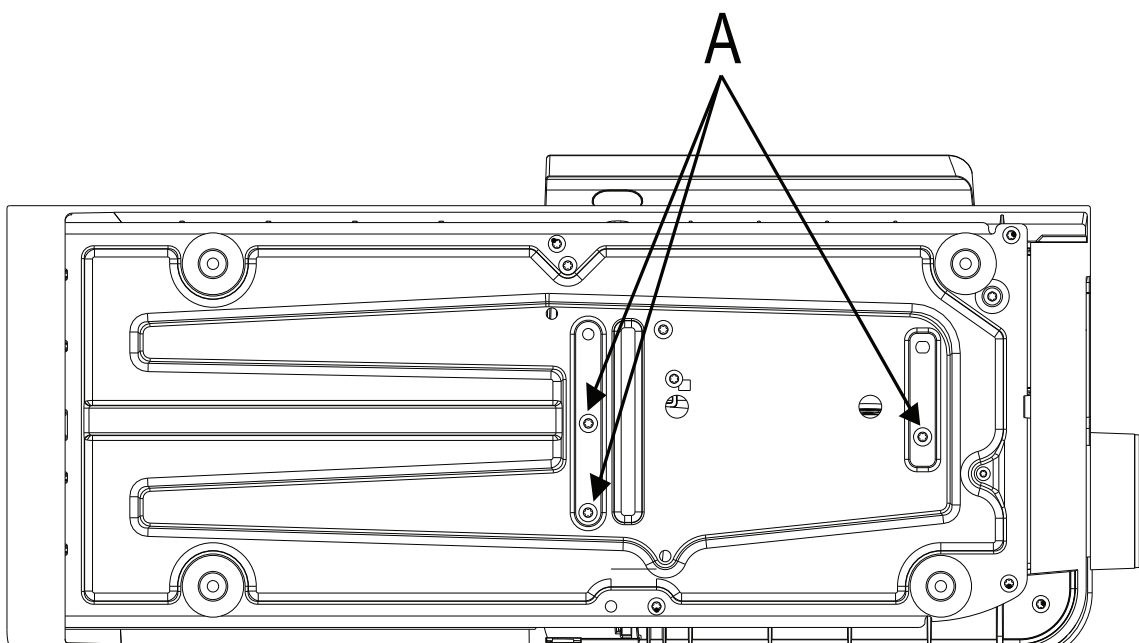
FOR SAFETY REASONS ALWAYS DISCONNECT THE MAIN POWER CORD FROM THE MACHINE BEFORE REMOVING THE POWER SUPPLY.

Dismantling

1. Remove all the covers.
2. Disconnect the Power supply cable from the Pc-board.
3. Remove the 3 screws (A) for the Base plate.
4. Remove the base plate.

Mounting:

In reverse order



Tension unit

Dismantling

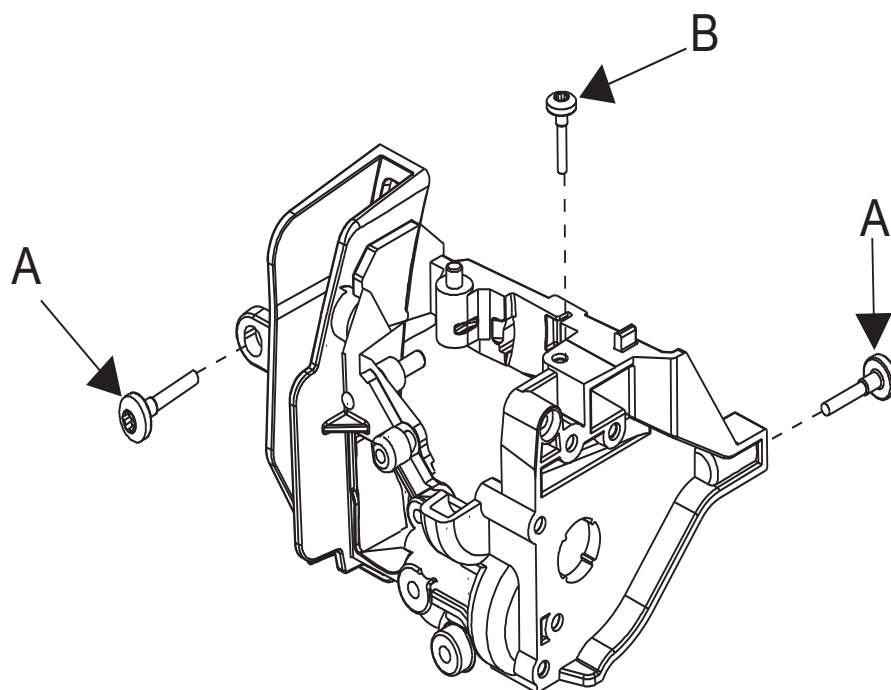
1. Remove all covers.
2. Place the needle bar in its lowest turning position using the hand wheel.
3. Remove the Tension unit cable (blue) from Pc-board and its fastening points.
4. Remove two Torx 20 screws one from the front and one from the back (A)
5. Remove one Torx 10 screw from the top (B).
6. Remove the tension unit.

Mounting

1. Mount one Torx 10 screw from the top (B).
2. Mount two Torx 20 one from the front and one from the back (A).
3. Mount the cable to PCboard and to its fastening points.
4. Mount all the covers.

Set thereafter:

26. Upper thread tension - Factory , Extra high tension
26. Upper thread tension - Factory , Start tension 1
27. Upper thread tension - Low Tension
27. Upper thread tension - High Tension.



Sewing head

Dismantling

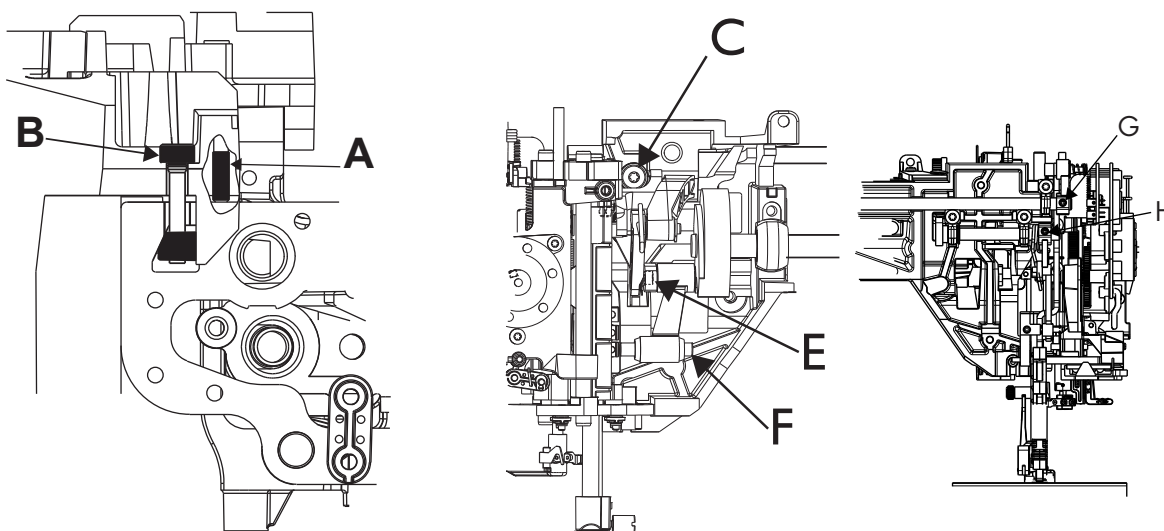
1. Remove all covers.
2. Remove the tension unit.
3. Remove the presser foot holder and the needle.
4. Disconnect the Power cable from the sewing heads connector board.
5. Disconnect the cable from the right LED light.
6. Remove the cable protection on the back of the machine.
7. Loosen the 2.5 mm Allen key screw (B) and remove both the wedge (D) and the screw (B) by pushing them downwards.
8. Loosen up the Torx 8 screw (G) of the lower lever that connects IDT to the sewing head.
9. Loosen up the Torx 8 screw (H) of the upper connection of the IDT to the sewing head.
10. Set the thread take up lever in its lowest position and remove Torx 20 screw (C) that holds the sewing
11. Lift up the sewing head a little from the sewing machine casting.
12. Unhook the sewing head from the stud (E) of the thread take-up lever, then lift the sewing head up and unhook the connecting rod (F).
13. Push both the upper and lower IDT connecting levers to the left, to remove them from there shafts and then lift the sewing head out of the machine.

Mounting

1. Connect the Crosshead tab to the Arm shafts link (F).
2. Connect both the upper and lower IDT levers.
3. Connect the stud (E) of the thread take-up lever.
4. Mount the Torx 20 screw (C) and tighten it firmly.
5. Mount the wedge (D) and the screw (B) together in the slot between the sewing head and the casting.
6. Tighten the 2.5 mm Allen key screw (B).
7. Mount the cable protection on the back of the machine.
8. Connect the right LED cable.
9. Connect the sewing head power cable cable from the Main Pc-board to the sewing head connector board on the left side of the Sewing head.
10. Mount the tension unit.

Set thereafter:

5. The gap between the needle and the hook.
19. Adjustment of the IDT foot - height and feeding position.



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.

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 screws (E) that holds the presser bar unit.

Remove the presser bar unit (F).

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 (H) 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.

To remove the presser bar (R).

Loosen up the Presser bars torx 8 set screw (M) and the IDT connecting bracket Torx 8 screw (A).

Remove the presser bar.

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

Remove the presser bar connecting bracket (O).

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

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

Mount the presser bar (R) in the replacement sewing head; Push it up just a little bit.

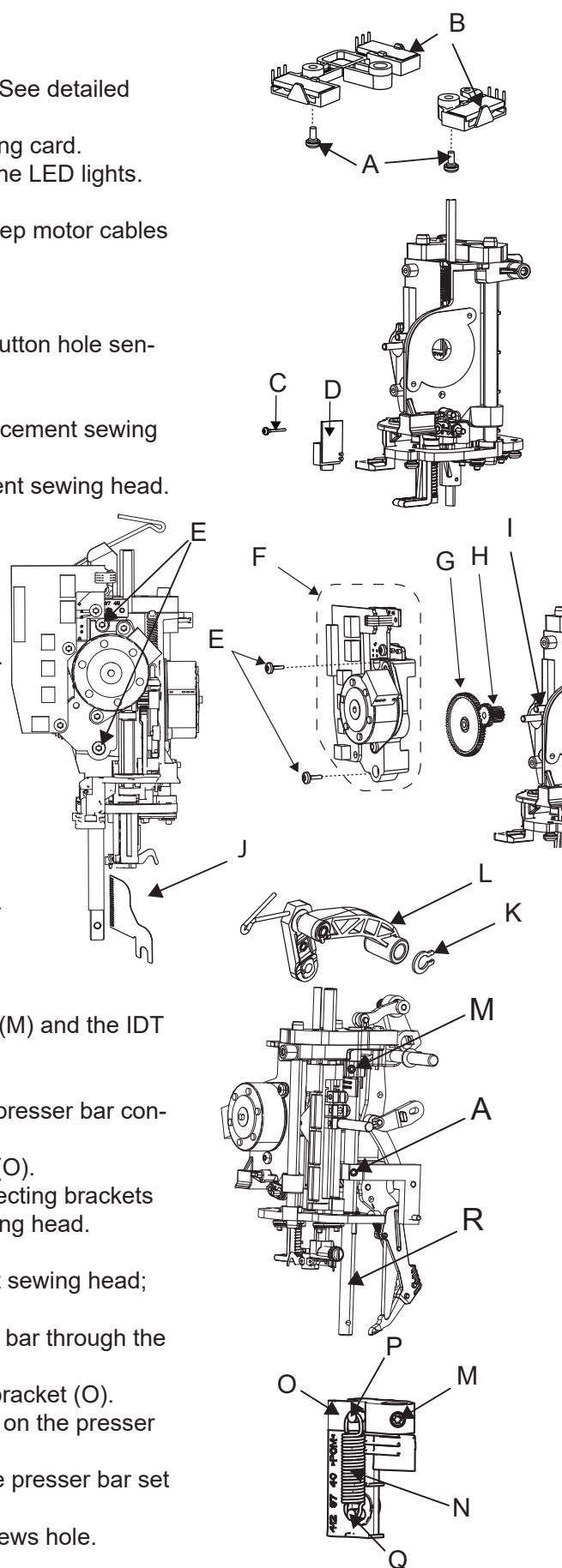
Put on The IDT Unit and push up the presser bar through the IDT connecting bracket.

Push the trough the presser bar connecting bracket (O).

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

Look for the mark on the presser bar from the presser bar set screw.

Place the mark inside the presser bar set screws hole.

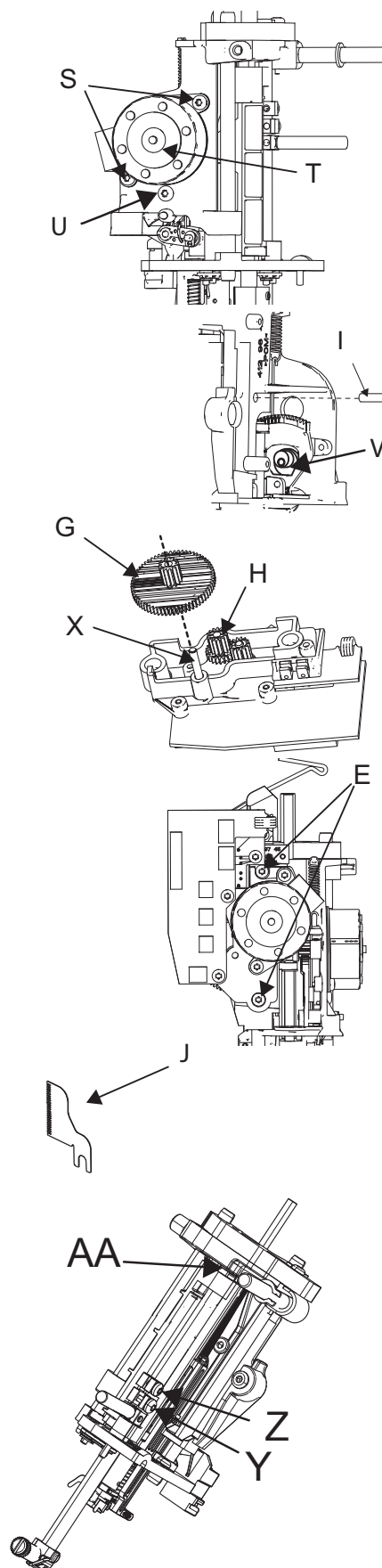


Mount the presser bar torx 8 set screw (M), without moving the presser bar from its position.
 Remove the presser bar torx 8 set screw (A) on the IDT connecting bracket.
 Look for the mark on the presser bar from the IDT connecting bracket.
 Place the mark inside the IDT connecting bracket screws hole.
 Mount the IDT torx 8 set screw (A), without moving the presser bar from its position.
 Check so the presser bar is moving up and down freely.

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 (V).
 Place the Zigzag calibration stop (V) in the replacement sewing head.
 The eccentricity should be on the top.
 Hold the calibration stop 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.
 Place the larger presser bar cog wheel (G) on the larger presser bar cog wheels pin (X).
NOTE! This pin may be missing, look for it then inside the old sewing head.
 The 3 cog wheels should now be connected.
 Take the presser bar unit (F) and place it on the replacement sewing head.
 Connect the Large cog wheel (G) to the presser bar lever (O).
 The small cog wheel should be on the pin.
 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 the sensor.
 Tighten the torx 20 screw.

Pull the needle bar to its down position.
 Make note of the distance between the needle bars top and the frame (AA),
 Loosen up the cross heads torx 10 screw (Y).
 Loosen up the needle thread stop torx 10 screw (Z).
 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 needle threader stop and the cross head.

Mount the presser foot holder and the presser foot.

Put in a new # 90 needle.

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

Take the zigzag step motor (T).

Mount it on the sewing head with the cogwheels setting screw (BB) in the middle when looking from the side of the sewing head, see illustration.

The needle should still be in its center position against the presser foot

Mount the both screws for the zigzag step motor (S).

Mount the both LED light's (B).

Fasten them with screws (A)

Connect all the cables.

Mount inner the C-clip that holds the Thread take up in position. 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.

5. The gap between the needle and the hook

8. The height of the hook

10. Setting the needle in centre position

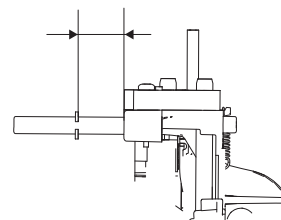
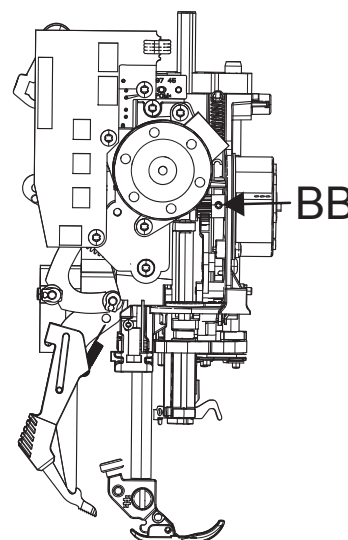
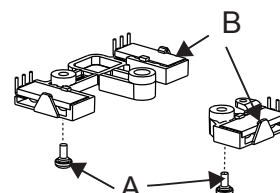
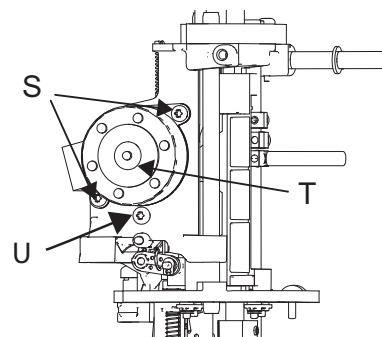
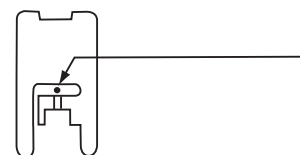
11. Needle bar height

13. Presser foot height and parallelism to the needle plate

16. Needle threader stop

17. Threading device

18. IDT linkage holder - Height and parallelism



Step motor of the needle (Zig-Zag)

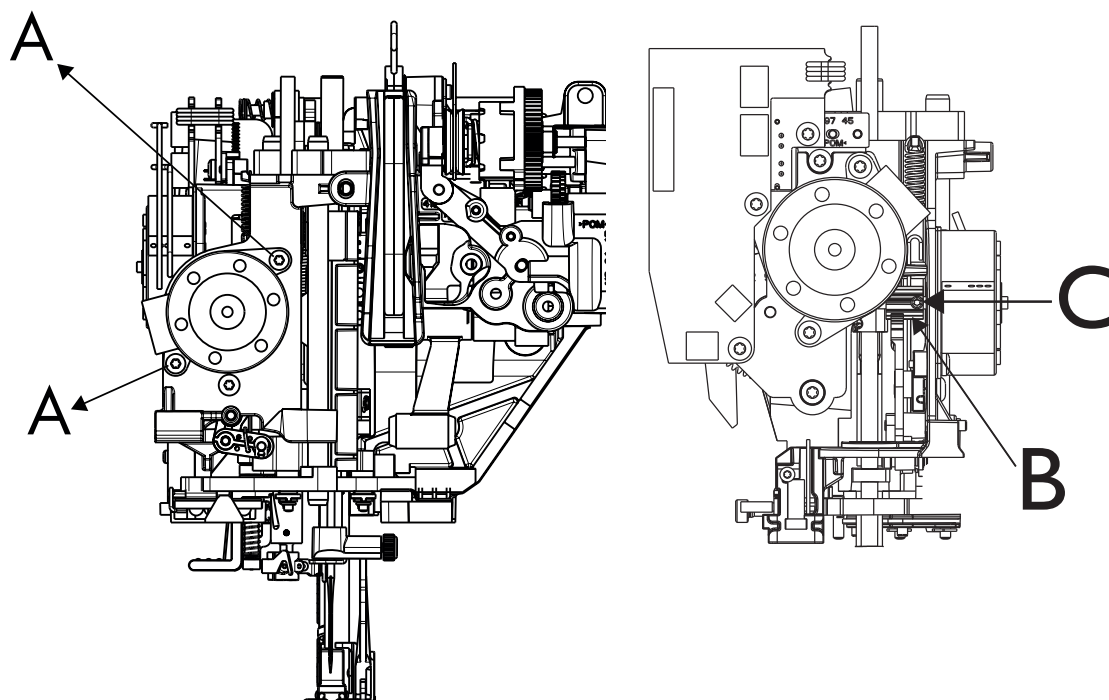
Dismantling

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

1. Remove lid cover, top cove and face 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 #0A-foot and a new 90 needle.
2. The needle should now be manually set against the #0A-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 #0A-foot.
5. Enter the screw (A) and tighten.
5. Connect the step motor cable to the sewing heads connecting board.
6. Loosen the screw (C) on the cogwheel (B).
7. Enter the service program.
8. Turn the screw (C) on the cogwheel (B) until the needle is in its centre position of the Presser foot #0A and the screw (C) is still pointing out to the left of the sewing head.
10. Tighten screw C).
11. Calibrate the step motor – Press calibrate in needle submenu repeatedly, the needle shall always be in its centre position of the Presser foot #0A.



Step motor of the Presser bar

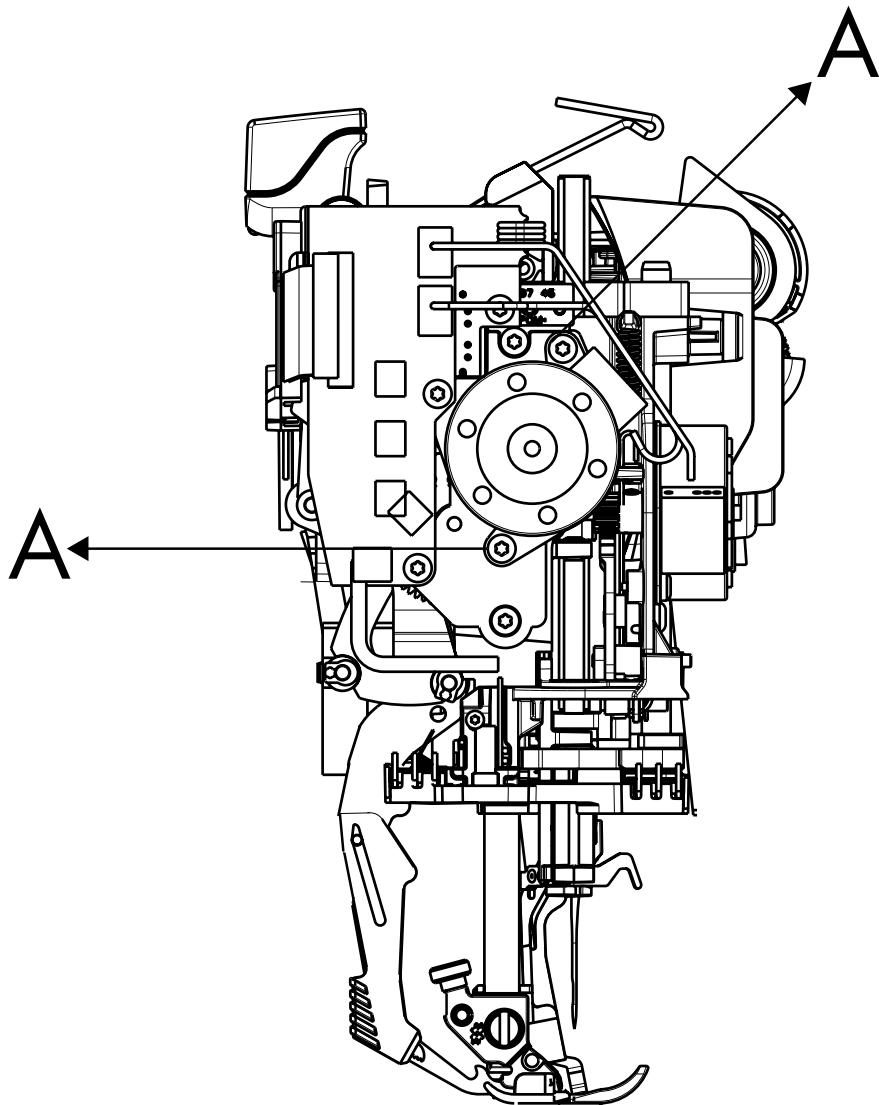
Dismantling

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

1. Remove the lid, top cover and face cover.
2. Disconnect the step motor cable from the sewing heads connecting board.
3. Remove the step motor by removing the two screws (A).

Mounting

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



Presser bar bushing

Dismantling

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

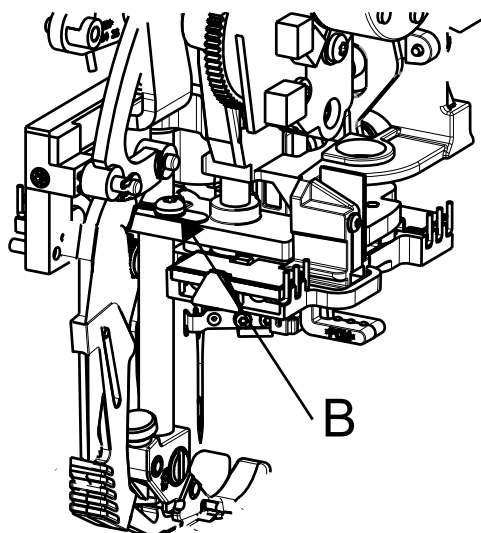
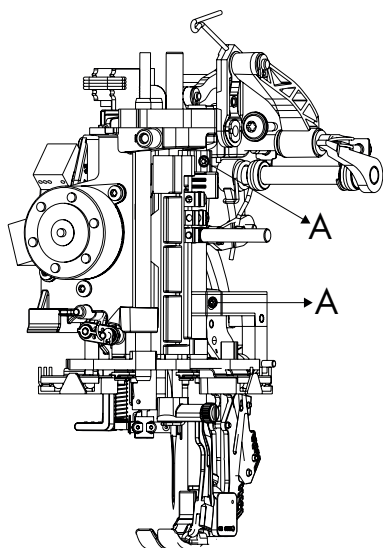
1. Remove all covers.
2. Remove the thread tension unit.
3. Remove the sewing head from the machine.
4. Remove the presser foot holder.
5. Loosen up the two torx 8 screws (A) and pull the shaft up a bit and tighten the screws VERY lightly, not to make any extra marks on the presser bar.
6. Take an angled 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's on top of 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. Open up the two torx 8 screws (A).
4. Push down the presser bar and make sure it goes smooth up and down.
5. Tighten then 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, remove the two torx 8 screws (A). On the shaft it should be a previous mark from the screws, locate them and place them inside the screw hole for screw (A).
7. Re-enter the screw and tighten it.
8. Mount the sewing head in the machine.

Set thereafter:

5. The gap between the needle and the hook.
13. Presser foot height and parallelism to the needle plate.
14. Needle plate position.
18. IDT linkage holder - Height and parallelism.



Needle bar bushing

Dismantling

1. Remove all covers.
2. Remove the Thread tension unit.
3. Remove the sewing head from the machine.
4. Remove the presser foot holder.
5. Loosen the screws (A,B).
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, pulling the needle bar a side to side so the bearing holder un-snap.
8. Remove the needle bar, bushing and bushing holder.
9. Remove bushing and holder from the needle bar.

Mounting

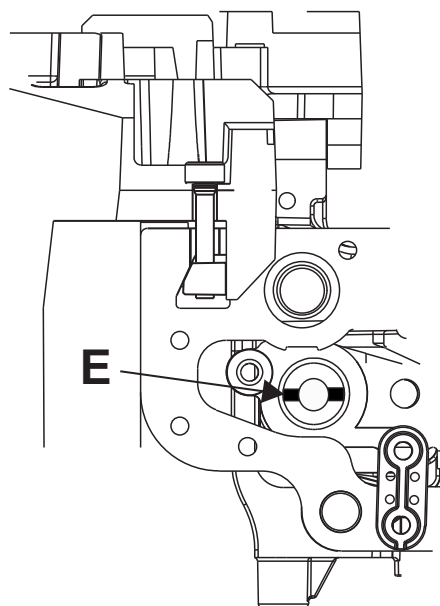
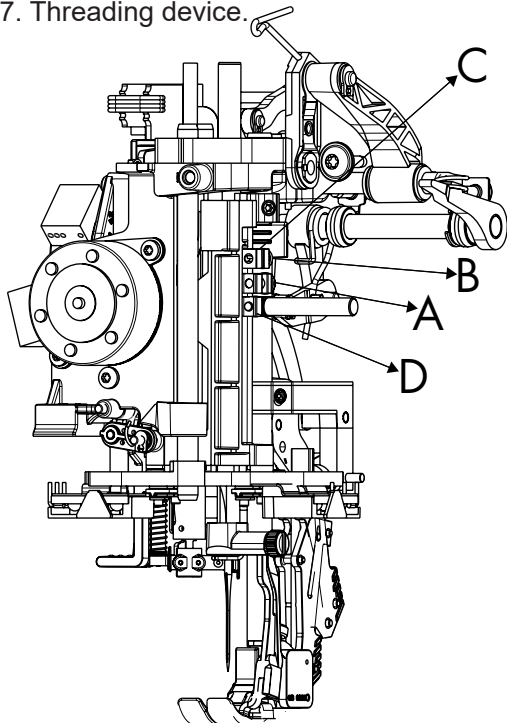
1. Place the bushing holder on the bushing.
 2. Mount the bushing holder and the bushing on the needle bar - with bushing on top.
 3. Push the needle bar all the way in.
 4. Use a small screw driver to snap-in the bushing holder.
- The bushing holder has two tabs (E) they should be positioned side to 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 needler thread stop.
 6. Pre position both cross head and needle thread stop and tighten the screw just lightly.
 7. Mount the sewing head in the machine.

Check:

8. The height of the hook.

Set thereafter:

11. The needle bar height.
12. The timing of the hook in relation to the needle.
16. Needle threader stop.
17. Threading device.



Arm shaft.

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

Dismantling

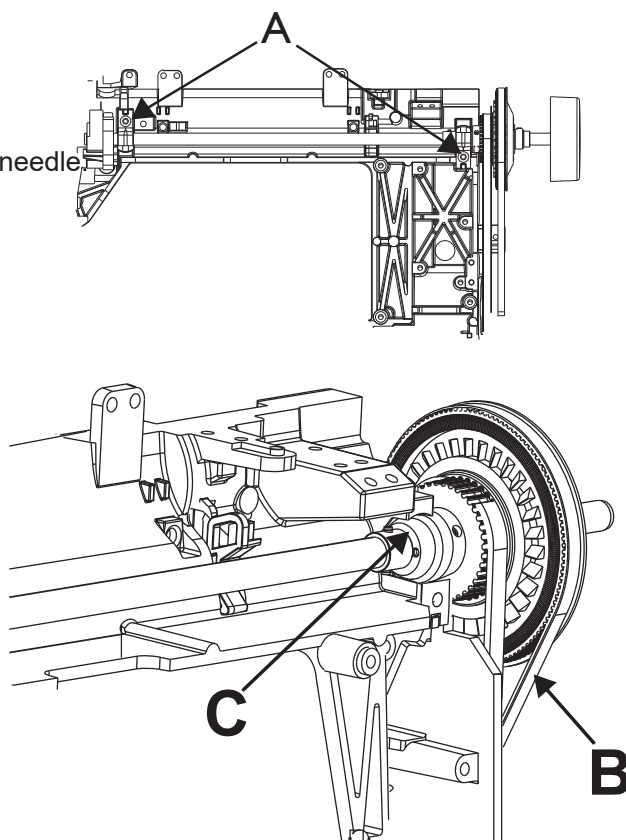
1. Remove all covers.
2. Remove the Tension unit.
3. Remove the bobbin winder.
4. Remove the Pc-board.
5. Un-hook the motor belt from the arm shaft.
6. Remove the two screws (A) and the clamps.
7. Push the eccentric bearing upwards, to loosen up the belt tension.
8. Lift out the Arm shaft a bit and then pull it towards 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 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 in the casting.
- NOTE! Make sure the eccentric bearing's hole is in the front.**
7. Fold up the rubber of the inserts and place the clamps on top.
8. Mount the two 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.

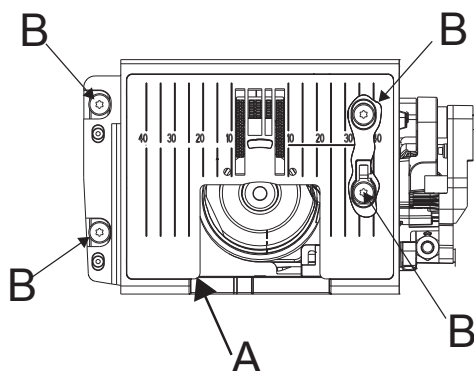
1. Belt tension - Drive belt.
12. The timing of the hook in relation to the needle.



Hook cover compl.

Dismantling

1. Remove all covers.
2. Remove the powersupply.
3. Remove the screw (C). Remove and cut the ziptie.
4. Remove the cable bobbin sensor from the PC-board and its fasteningpoints.
5. Raise the presser bar to its highest position.
6. Remove the needle.
7. Remove the presser foot holder.
8. Remove the needle plate by placing a screw driver at (A) and snap it off.
9. Remove the bobbin window.
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 the bar (E) out from the cutter step motor unit.



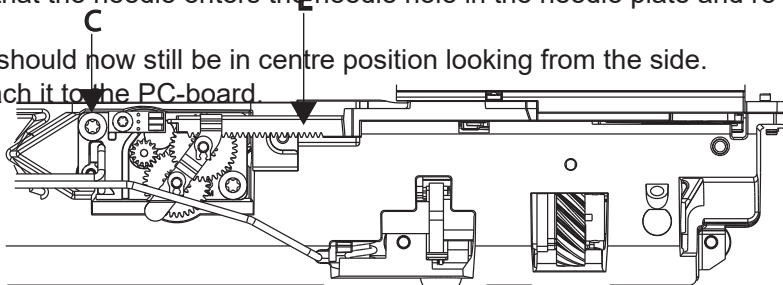
Mounting

1. Push the bar (E) into its position in the 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! On the right hand front should side should the ESD washer be positioned.

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.
The needle must be in centre position looking from the side and move the hook cover until the needle is in the centre position.
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 re-check 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.
16. Mount a new ziptie.
17. Mount the screw (C).

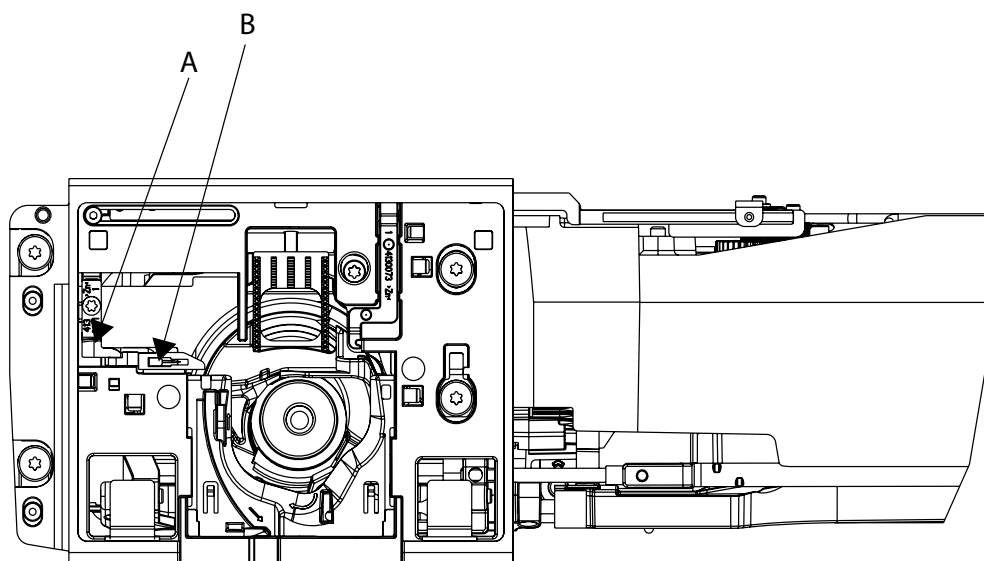


Set thereafter

8. The height of the hook.

Replace thread cutter knife

1. Remove needle plate.
2. Enter service program.
3. In Motors menu and "thread cutter" sub menu touch "Step cut" once. The cutter goes to its thread knife change position.
4. Turn the knife holder (B) to a straight up position. Then remove the knife holder by pushing it towards the back of the machine.
5. Remove the knife from holder by pulling it straight out, use a nose pliers as an aid.
6. Mount the new knife by pushing it into the knife holder, use nose pliers as an aid.
7. Mount the knife holder in the hook cover and place it in position so the knife edge is facing towards the needle.
8. Touch the thread cutter sub menu button "Reset Cut", thread cutter returns to its starting point.
9. Mount needle plate.



Thread cutting unit

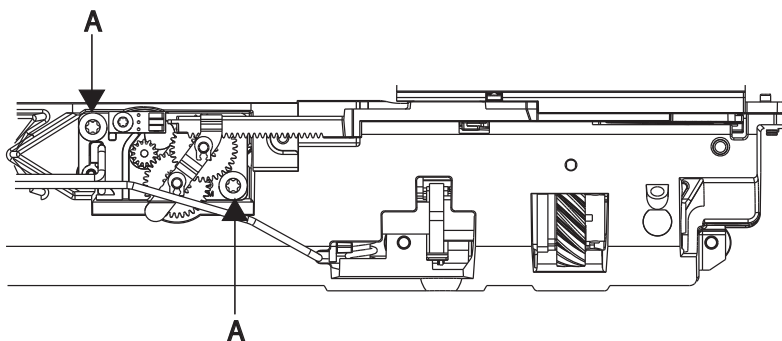
Dismantling

1. Remove all covers.
2. Remove the Power supply.
3. Remove cables: Thread cut, Bobbin sensor and Cut sensor from the PC-board, and release them from their fastening points.
4. Remove hook cover.
5. Remove two torx 20 screws (A) holding the stepper motor.
6. Take out the unit.

Mounting

1. Mount the unit.
2. Mount the two torx 20 screws (A).
3. Reattach the cables to the fastening points.
4. Attach the cables to the Pc-board
5. Mount the Power supply.
5. Mount all covers.

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



Hook compl.

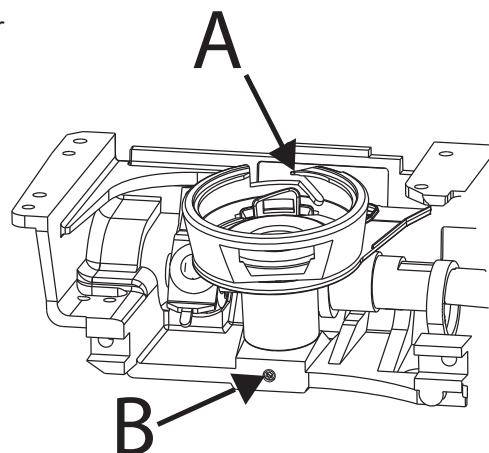
Dismantling

1. Remove all covers.
 2. Remove the hook cover.
 3. Loosen the 2mm Allen screw (B) and lift out the hook complete together with the dust cover.
- NOTE!** The hook can be dismantled. without removing the feeding unit.

Mounting

1. Turn the hand wheel so the setting pin of worm gear is positioned according to fig 1.
2. Place the spring on the hook shaft and then place the dust cover on the shaft.
3. Place the dust cover straight backwards and the hook tip to the left.
4. Lift the feed dog to gain access and slide the dust cover and the hook into place.

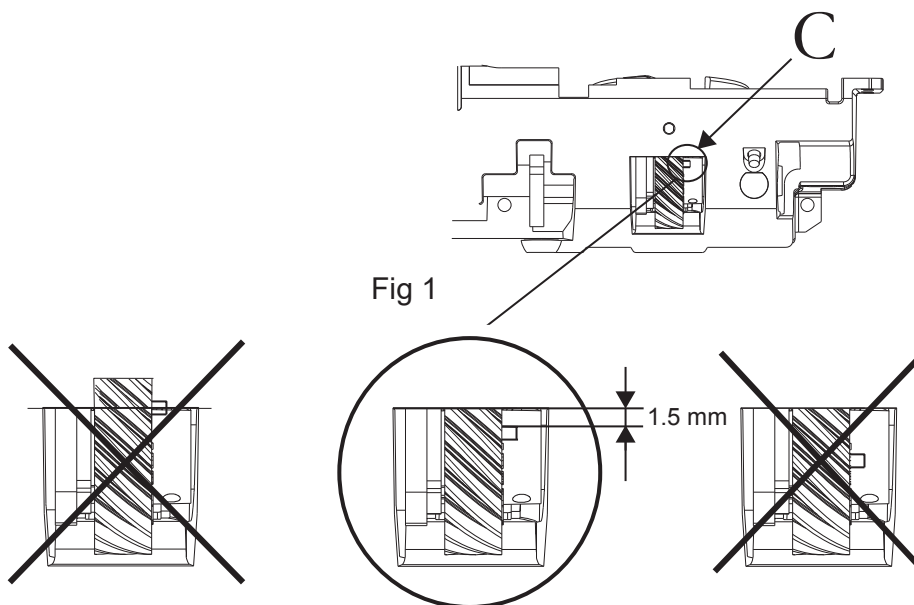
- NOTE!** On the dust covers back is a pin, this must be placed in position before the hook shaft is positioned.
5. Press down the hook shaft, the hook will rotate clockwise to the correct position with the tip (A) pointing straight backwards.
 6. Check that the spring pushes the hook upwards. Press the hook down and tighten screw (B).
 7. Mount the hook cover.



Set there after:

3. The play of the hook gear.
5. The gap between the needle and the hook.
6. Setting the needle plate (the hook cover) in relation to the needle in the feeding direction.
8. The height of the hook.
9. Feed dog height.
11. The needle bar height.
12. The timing of the hook in relation to the needle.

Fig 1



Feeding unit step motor

Dismantling

1. Remove all covers.
 3. Remove the Main Pc-board
 4. Remove the base plate.
 5. Remove the Feed dog lowering linkage.
 6. Remove the Holder from the IDT linkage
 7. Remove the two Torx 20 screws that hold the lower IDT linkage.
 8. Remove the lower IDT linkage.
 9. Bring the Step motor cable out to the back side.
 10. For easier mounting later, measure the distance between the upper part of step motor frame (A) and the casting (B), make a note of the distance .
- NOTE!** This may differ from machine to machine.
11. Use a Allen Key 4 mm to remove the feed adjusting screw (C).
 12. Remove the nut and the spring.
 13. Push down the step motor against the casting.
 14. Remove the **reverse threaded** Torx 20 screw on the back side of the step motor.
 15. Un-hook the feed dog carrier spring.
 16. Push the feed unit to its most front position.
 17. Remove the feed dog step motor unit by lifting it a little to the right and then out.

Mounting

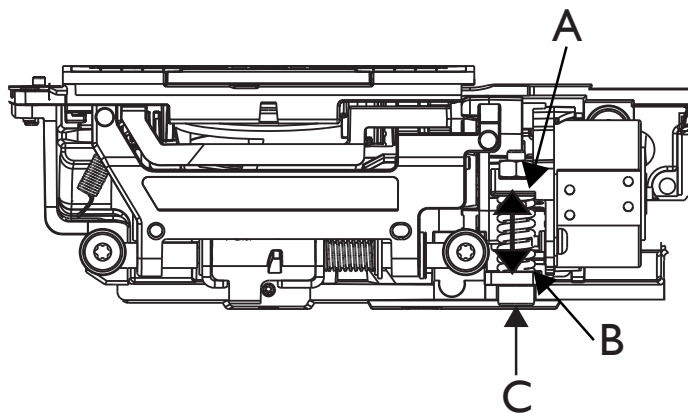
NOTE! Always check or set the step motors zero feeding position before mounting it.

1. Take the cable from the step motor and enter it through the casting.
2. The concave shaped guide block follower should go on to the guide block and the flat side of the guide block should be facing towards the lower side of the machine.
3. Before mounting the Feeding Step motor check or set " Stitch length balance, basic setting"
4. Enter the step motor and connect the guide block and guide block follower.
5. Mount the **reverse threaded** Torx 20 screw, tighten the screw firmly
6. Mount the feed dog carrier spring.
7. Push up the step motor.
8. Place the spring then the 4mm adjusting screw and the nut on top.
9. Turn the 4mm adjusting screw to obtain the distance as previously measured.
10. Mount the step motor cable into the cable guides on the backside, then bring it through the opening in the casting and connect it to the pc-board.

NOTE! Use ESD mat and wrist band.

Set there after

21. Feed Dog lowering.
22. Stitch length balance.



Feeding unit

Dismantling

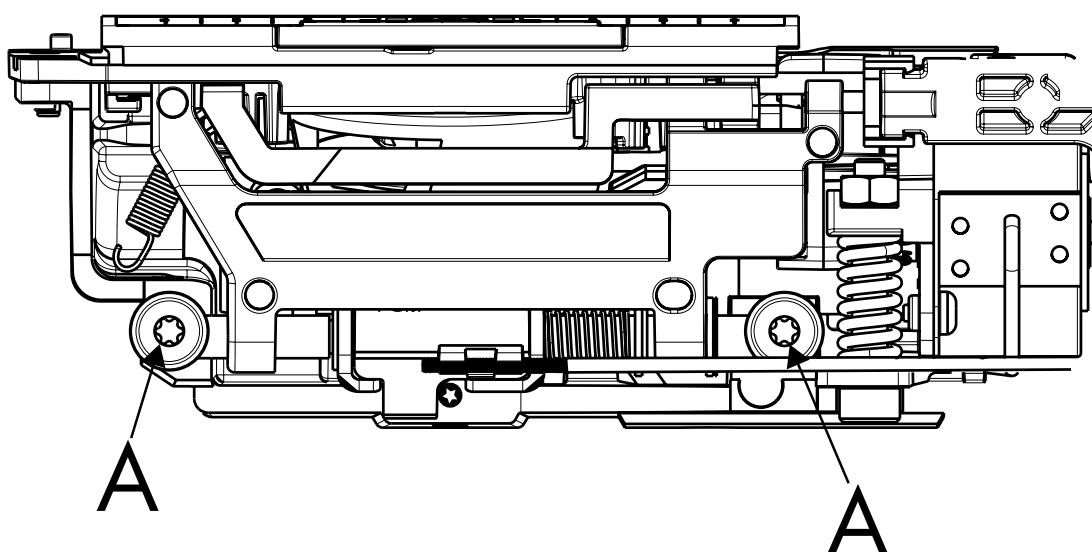
1. Remove all covers.
2. Remove the hook cover.
3. Remove the hook complete.
4. Remove the Feed step motor
5. Remove the feed dog lowering rod.
6. Remove the two screws (A)
7. Lift out the complete feed unit.

Mounting

1. Set feeding eccentric straight backwards.
2. Insert the feed unit and tighten the two screws (B) lightly.
3. Mount the Feeding step motor and base plate.
4. Mount hook and hook cover.
5. Mount the presser foot and the presser foot holder.
6. Set the feed unit side ways and tighten screws (B).

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

3. The play of the hook gear.
4. Setting of the hook in relation to the feeding eccentric (timing feed motion)
5. The gap between the needle and the hook.
6. Setting of the needle plate (hook cover) in relation to the needle in the feeding direction.
7. Setting the feed unit sideways
8. The height of the hook.
9. Feed dog height
11. Needle bar height.
12. The timing of the hook in relation to the needle.
22. Stitch length balance



The side feeding mechanism complete

Dismounting

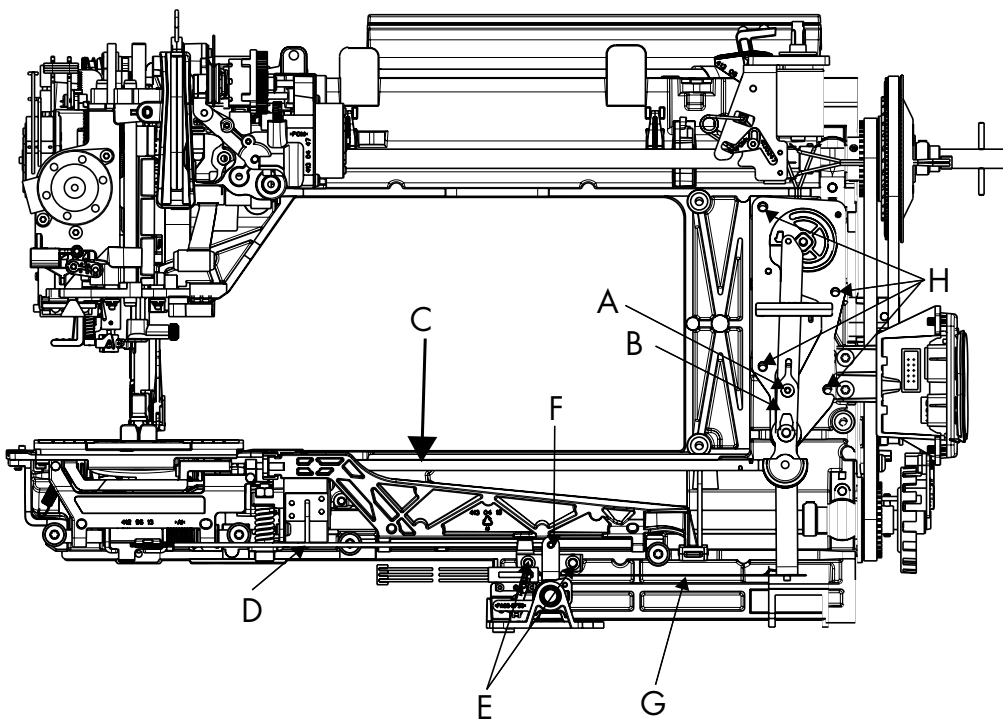
1. Remove all covers.
2. Remove the pc-board.
3. Disconnect the bar (C) from the side feeding mechanism by removing the screw (A) and the clip (B).
4. Disconnect and remove the Feed dog lowering rod (D).
5. Remove the two Torx 20 screws (E) and remove the Linkage connection (F).
7. Remove the linkage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

20. Setting the feed dog in relation to the needle plate.
21. Feed Dog Lowering.
22. Stitch length balance
23. 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 the base plate.
3. Remove the feed step motor unit
4. Remove the feed unit.
5. Remove the Main Pc-board.
6. Remove the feed dog drop unit.
7. Remove the Synchronizer card holder.
8. Remove the Synchronizer wheel 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 upper IDT shaft in position.
11. Remove the two screws and the clamps that holds the lower shaft in position.
12. Push up the IDT linkage and 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 exocentric bearing's hole is on the lower half.
3. Place the clamps on the bearings and tighten the two Torx 20 screws.
4. Mount the upper IDT shaft.
5. Push on the main belt on the lower shafts cog wheel.
6. Mount the Synchronizer wheel, it should be snapped on to the long sided pin on the lower shaft.
7. Mount the Synchronizer card holder.
8. Mount the feed dog drop unit.
9. Mount the Main Pc-board.
10. Mount the feed unit.
11. Mount the feed step motor unit - Always check the setting "24. Pre-setting the feed unit step motor" before mounting the feed step motor unit.
12. Mount the base plate.

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

1. Belt tension - Drive belt
3. The play of the hook gear.
4. Setting of the hook in relation to the feeding eccentric (timing feed motion).
5. The gap between the needle and the hook.
6. Setting the needle plate (hook cover) in relation to the needle in the feeding direction.
7. Setting the feed unit sideways
8. The height of the hook.
9. Feed dog height
11. The needle bar height.
12. The timing of the hook in relation to the needle.
22. Stitch length balance

Bobbin winding device

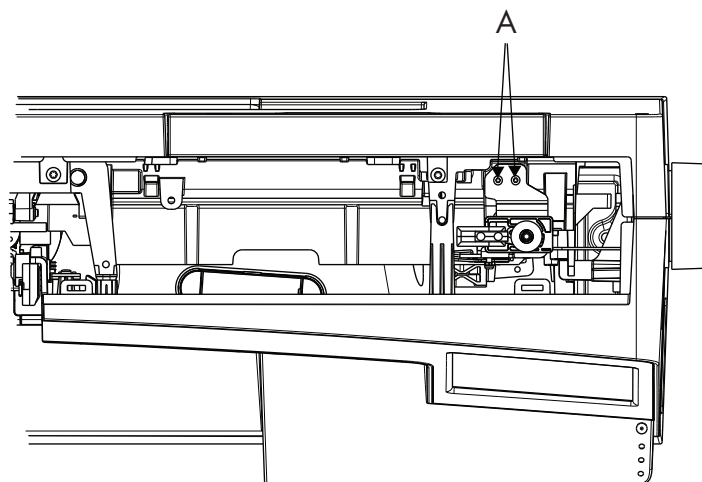
Needle- and feeding movement should be disengaged when the bobbin winding stop shaft is pushed to its winding position.

Dismantling

1. Remove all covers.
2. Disconnect the two cables from the Main Pc-board.
3. Remove the two Torx 10 (A) screws that holds the bobbin winding device and then remove it.
4. Remove the bobbin winding spindel, use a flat screw driver as an aid.
5. Remove the two Torx 10 (A) screws of the motor.
6. Remove the motor.

Mounting

In reverse order.



Fault finding diagram expression 710

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 zig-zag 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 screen

Still 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 screen

Still 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 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 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 expression 710

1. Make sure that the USB cable is properly connected to both the expression 710 and your computer.
2. Try with another USB cable.
3. Re-install the hardware driver to the xpression 710 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.