BERNINA®

Service Manual



artista 630-640

Version 4

© Fritz Gegauf Ltd.
BERNINA sewing machines
8266 Steckborn
Switzerland

Chapter 1
General information

1.1 Safety Regulations

Caution!
All electrical and electronic components operate at dangerous voltages. Remove the mains plug before making any adjustments to the machine. Wait about 30 seconds after removing the plug (capacitor discharge).

This service manual is intended to help with minor repairs and adjustments.
The instructions do not claim to be complete or comprehensive. The manual does not provide guidance for complete assembly or disassembly.

Important:
To enable the work described to be performed correctly, the sewing and embroidery computer must be in good mechanical and electrical condition (running smoothly, properly oiled and all leads connected)! When adjustments are carried out in the correct order, the sewing/embroidery computer will function without a problem.

It is important that only devices approved and distributed by BERNINA® are connected to the sewing/embroidery computer ports.

When servicing or repairing, always use genuine parts and original accessories, either those delivered with the machine or purchased afterwards.

These are the following:
- **Mains cable**
- **Foot control unit**
- **Buttonhole foot**
- **Presser foot 1**
- **Bobbin case with bobbin**
- **Other accessories**
- **BERNINA stitch length regulator (BSR) foot (if applicable).**

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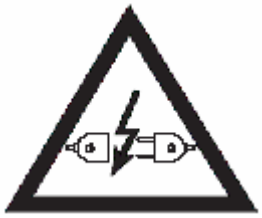
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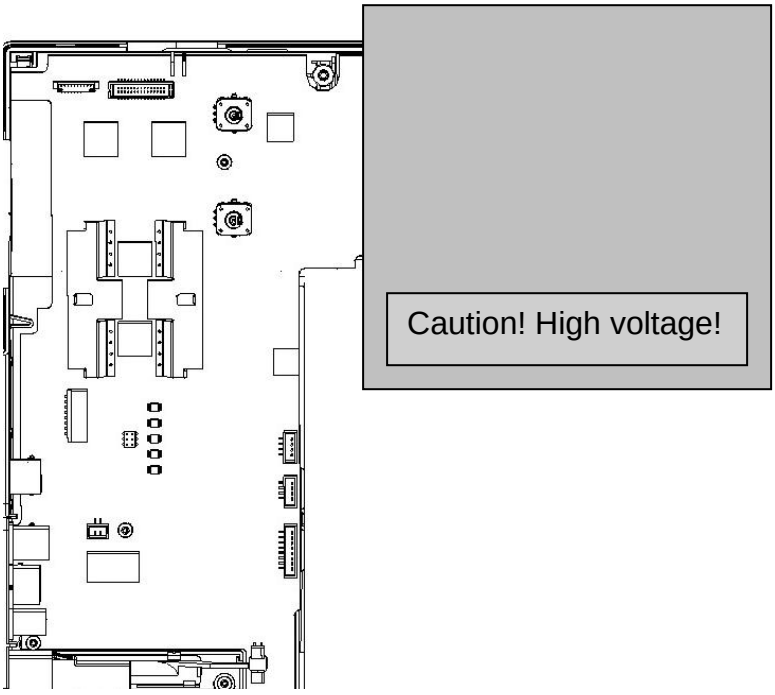
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Author: Hans Peter Horn
Layout/typesetting: Hans Peter Horn
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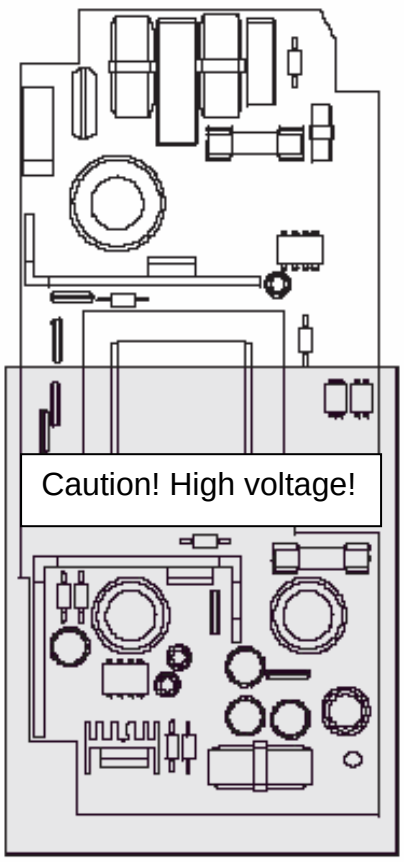
1.2 Warning: Dangerous voltage levels!

Caution!
The L-Print power circuitry, the S-Print CFL voltage supply and the mains cable all carry dangerous voltages.
For your own safety do not touch the L-Print and S-Print until about 30 seconds after the main voltage has been switched off. This is the time required for the capacitors to discharge.

Warning!
The sewing/embroidery computer may only be connected to the mains supply when the chassis covers are mounted. Work on the L-Print, S-Print and mains cable may only be carried out when the mains plug has been removed from the mains supply.







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1.4 Note on Electrostatic Discharge (ESD)



Electrostatic charges are caused by:
- a person's walking (influence) over synthetic tilled or carpeted floor
- friction between and separation of two insulating materials (triboelectricity)

If this static electricity discharges through electronic components, these may be partially or irreparably damaged. Electrostatically charged persons represent the greatest danger for components. This can be dissipated by controlled electrostatic discharge.

Protection of electrical and electronic components against electrostatic discharges

Be sure to follow these important guidelines:

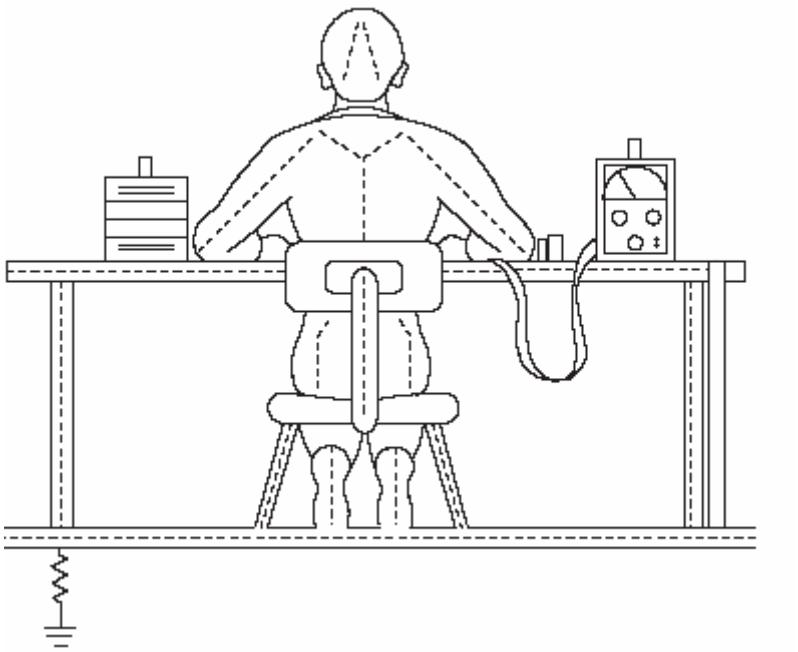
1. Always work at a stationary, ESD-compliant workstation equipped with the appropriate protective devices including conductive table and floor mat, earth connection box and earthing wristband when doing service work.
The cable of the earthing wristband must have a built-in resistance of 1 M ohm to ensure protection.

2. Always put on an earthing wristband before starting to work. Always remove any synthetic parts like plastic bags, covers etc. from your workstation.

3. Only open ESD protective packaging at your ESD-proof workstation while wearing an earthing wristband. Electronic components must be placed on conductive table mats only. Packing is carried out under the same conditions.

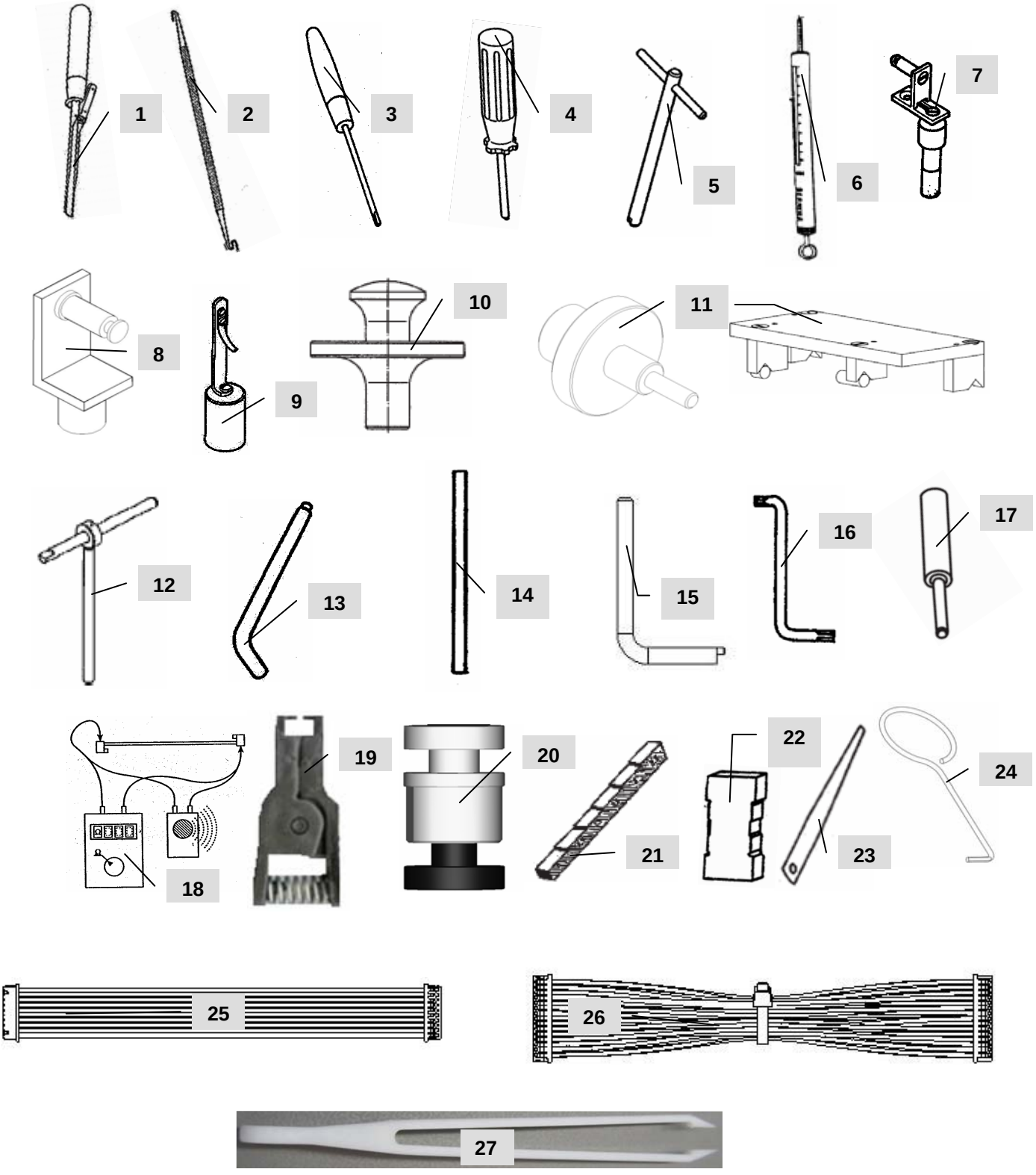
4. Only use conductive plastic/foil pouches and ESD transport boxes for dispatching electronic components – even if the components might be faulty.

5. Treat faulty PCBs the same as good ones to prevent addition harm.



1.5 Tools and gauges

Required tools and gauges (commercially available, not available from BERNINA): Multimeter, IC-Extraction tool and TORX screw driver sizes: No. 6, 8, 9, 10, 12, 15, 20, and 25.



No.	Part number	Description	No.	Part number	Description
1	398 083 030	Circlip mounting tool	**15**	031 563.50.00	Eccentric key head frame
2	398 112 030	Spring mounting tool	**16**	007 993.50.00	Angular key Torx 8
3	398 097 030	Rectifying tool bobbin case spring	**17**	030 883.50.00	Distance gauge for auto threader
4	001 361.70.00	Eccentric key	**18**	Commercially available	Digital Multimeter
5	001 357.70.00	Rectifying tool driver/hook play	**19**	Commercially available	IC-Extraction tool (EEPROM)
6	006 038.50.00	Spring balance gauge	**20**	031 939.70.00	Bobbin winder gauge
7	001 358.70.00	Lower thread tension CB	**21**	398 031 133	Presser foot height
8	006 543.70.01	Lower thread tension RH	**22**	398 024 030	Feed-dog height
9	398 080 040	Upper thread tension	**22**	398 022 030	Feeler gauge 0,3 mm
10	006 765.71.00	Hook race gauge CB	**23**	398 111 030	Feeler gauge 0,15 mm
11	032 051.70.00	Centering gauge 640 Parallel setting gauge (**Set**)	**24**	030 652.50.00	Pinning tool for Stepp motor SL
12	030 349.70.00	Pinning tool short (**Set**)	**25**	023 054.50.01	Service cable 50mm 10 pol.
12	030 430.51.00	Pinning tool	**26**	031 134.50.01	Service cable 50mm 30 pol.
13	001 356.50.00	Angular pinning tool	**27**	Commercially available	Composite Tweezers (disconnecting cables)
14	007 937.50.00	Pinning tool base shaft		031 950.70.00	BERNINA USB Stick 64MB

1.6 Where and how to use the service cables # 25 and 26

Where to use:

- In order to have the artista 630 and 640 machines under power whilst the covers have been taken off, it is necessary to use the service cables 023 054.50.01 (50mm 10 pole) and 031 134.50.01 (50mm 30 pole).

How to use:

1. Observe ESD regulations (page 6).
2. Remove the power cord
3. Remove the covers (pages XXXX). The removed covers must be placed on the ESD mat.
4. Attach the service cables very carefully (straight) to the S-Print and P-Print. The artista 630 only needs the 30 pole cable. The artista 640 needs also the 10 pole cable.
5. Attach an external CFL sewing light to the S-Print.
   Note: Without the CFL sewing attached, the screen will not have any background lighting!
6. Fit the connection cable L-Print / S-Print.
7. Place both the back and front covers together and using the snapper clips, clip together.
8. When necessary the motor cable can also be connected.
9. Connect the power cable and switch the machine on. In order to get into the service program one has to press the reverse button whilst switching on the machine.

Attention: Make sure that no cable is pinched, trapped or otherwise damaged.



Chapter 2
Description of technical details and electronics

2.1 BERNINA artista 630/640 technical specifications

Features	artista 630	artista 640
Max. stitch length forward in mm	5	5
Increment in mm	0,15	0,15
Max. stitch length reverse in mm	5	5
Stitch width in mm	5,5	9,0
Increment in mm	0,23	0,23
Data interface	USB	USB
Hook system	BERNINA CB	BERNINA RH
Needle system	130/705 H	130/705 H
Adjusting needle	130/705H TCN 80	130/705H TCN 80
Sideways motion	no	no
Feed-dog drop	yes	yes
Feed-dog drop via FHS	yes	yes
Needle positions	11	11
Stitch programs:		
Total number of buttonhole types	7	8
Buttonhole length measuring system	yes	yes
Quilting stitches	25	28
Total number of utility stitches	26	26
Total number of decorative stitches	145	189
Alphabets	4	5
Eyelets	2	2
Total number of stitch patterns	250	300
Functions:		
Automatic basic settings	yes	yes
Display of recommended optimum settings	yes	yes
Display of selected stitch	on display	on display
Clear (clr) button	yes	yes
Balance	electronically	electronically
Sideways mirroring	yes	yes
Permanent reverse sewing	yes	yes
Memory (mem)	yes	yes
Pattern end	yes	yes
Securing at pattern beginning/ending	yes	yes
Upper thread indicator	yes	yes
Lower thread indicator	no	yes
BSR – BERNINA stitch length regulator	yes	yes
Integrated threader	yes	yes
Hopper mechanism	yes	yes
Longstitch setting	no	yes
Adjustable presser-foot pressure	yes	yes
Free Hand System (FHS) presser foot lifter	yes	yes
Automatic upper thread tension	no	yes
Automatic lower thread cutter	no	yes
Operating controls		
Screen	graphic LCD	graphic LCD
Colors	256	256
Size in mm (inch)	80x60 (3.2x2.4)	80x60 (3.2x2.4)
Number of pixels	320x240	320x240

Features	artista 630	artista 640
Screen backlighting	yes/white	yes/white
Direct stitch/function selection	yes/touch screen	yes/touch screen
Stitch width bar display	yes	yes
Stitch length bar display	yes	yes
Integrated service program	yes	yes
Drive/power unit		
Universal power PCB (L-Print), 100-240 Volt	yes	yes
Power max.	100 W	100 W
Motor	DC/65W30V	DC/65W30V
Sewing speed	100-900 S.p.M	100-900 S.p.M
Embroidery stitching speed ∅	600 S.p.M	600 S.p.M
Needle stop	yes	yes
Needle stop via foot control	yes	yes
Main power switch	yes	yes
Mechanical data / housing		
Diametral capacity in mm	190x110 /215	190x110 / 215
(inch)	(7.5x4.3 / 10.2)	(7.5x4.3 / 10.2)
Overall length in mm (inch)	385 (15)	385 (15)
Overall width in mm (inch)	175 (7)	175 (7)
Overall height in mm (inch)	308 (12)	308 (12)
Sewing light	CFL	CFL
Presser foot level in mm	7,5	7,5
Weight in kg (without accessories) (lbs)	approx. 9.7 (approx. 21)	approx. 9.7 (approx. 21)

2.2 Cleaning

Remove covers and clean.
Electrostatic charging may occur during cleaning. To prevent this, use antistatic office-equipment cleaning agents.
We use and recommend BASF's SURFACE CLEAN surface cleaner
It forms a protective film against static electricity, and is suitable for both plastic and metallic surfaces.

Inside parts
Dust, lint, thread and fabric remnants can accumulate inside the machine behind the covers and may lead to malfunctions.

In the head frame area, this frequently occurs in particular in the thread take-up (joints), the main shaft (behind the balance piece) and the thread tension device.

In the base area it occurs in:

- the bobbin case,
- the feed-dog,
- the hook,
- the hook drive,
- the hook race,
- the base shaft (lift and advance eccentric),
- and in the toothed rack.

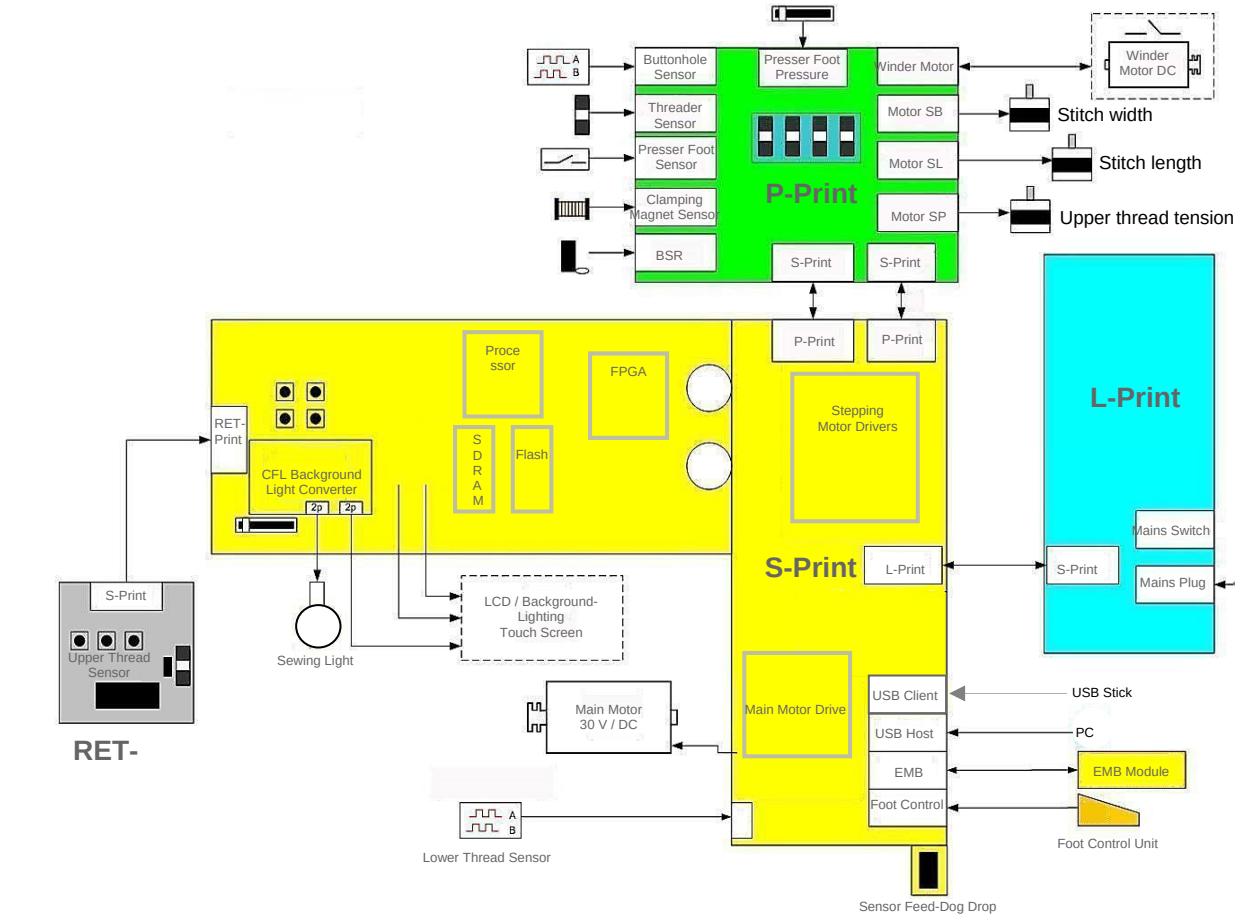


Attention!
Never use alcohol, petrol, spirits or any corrosive fluids, or abrasive pastes!

The main and base shaft belts and their tension units can also be affected by the accumulation of dust, lint, thread and fabric remnants, as well as by belt residue.

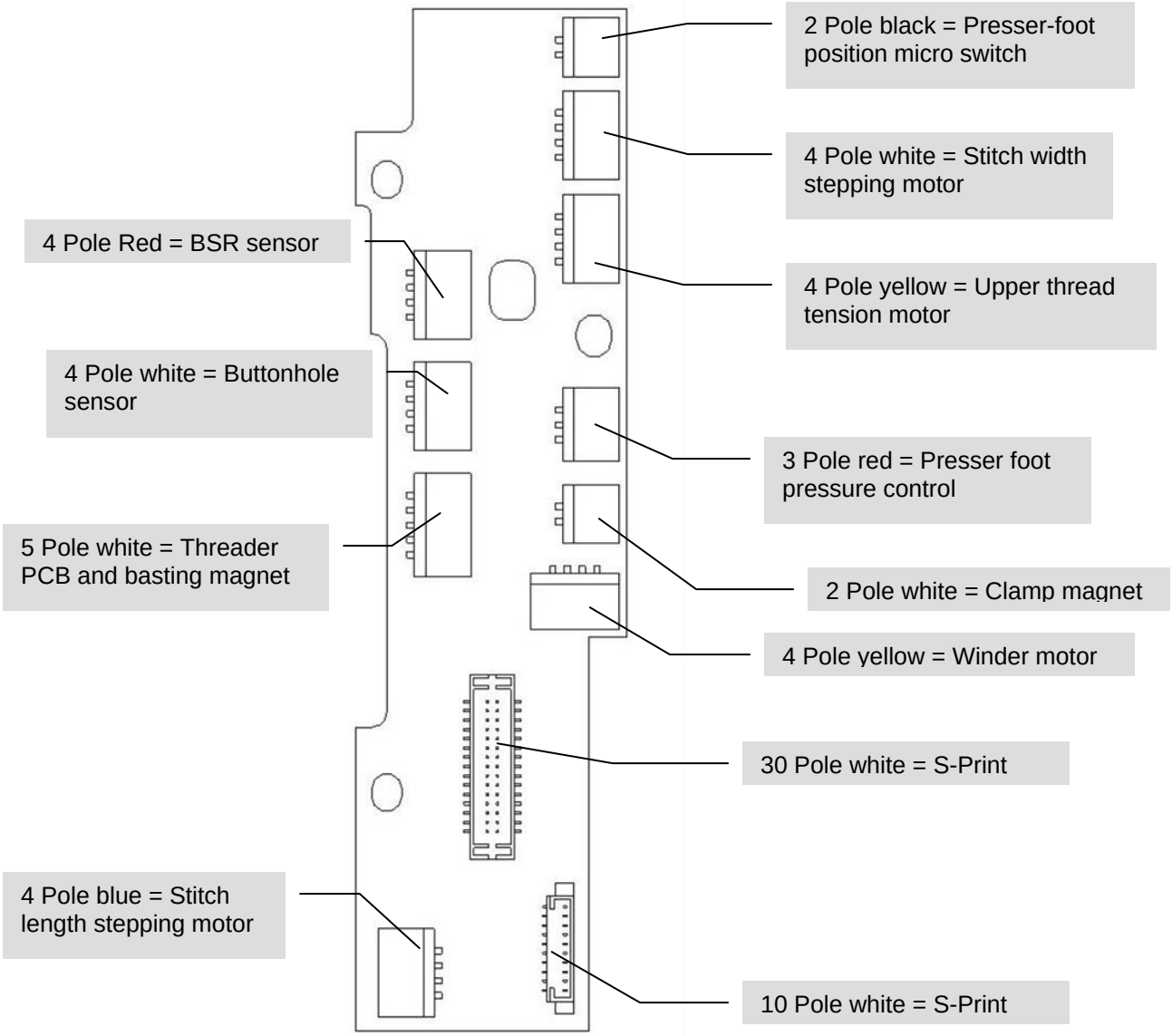
2.3 Block diagram

The electronics of the BERNINA artista 630/640 are primarily accommodated in three main modules (PCBs) – the L-Print (power PCB), the P-Print (positioning PCB) and the S-Print (control via micro-processor).



2.4 PCBs, plugs and cables

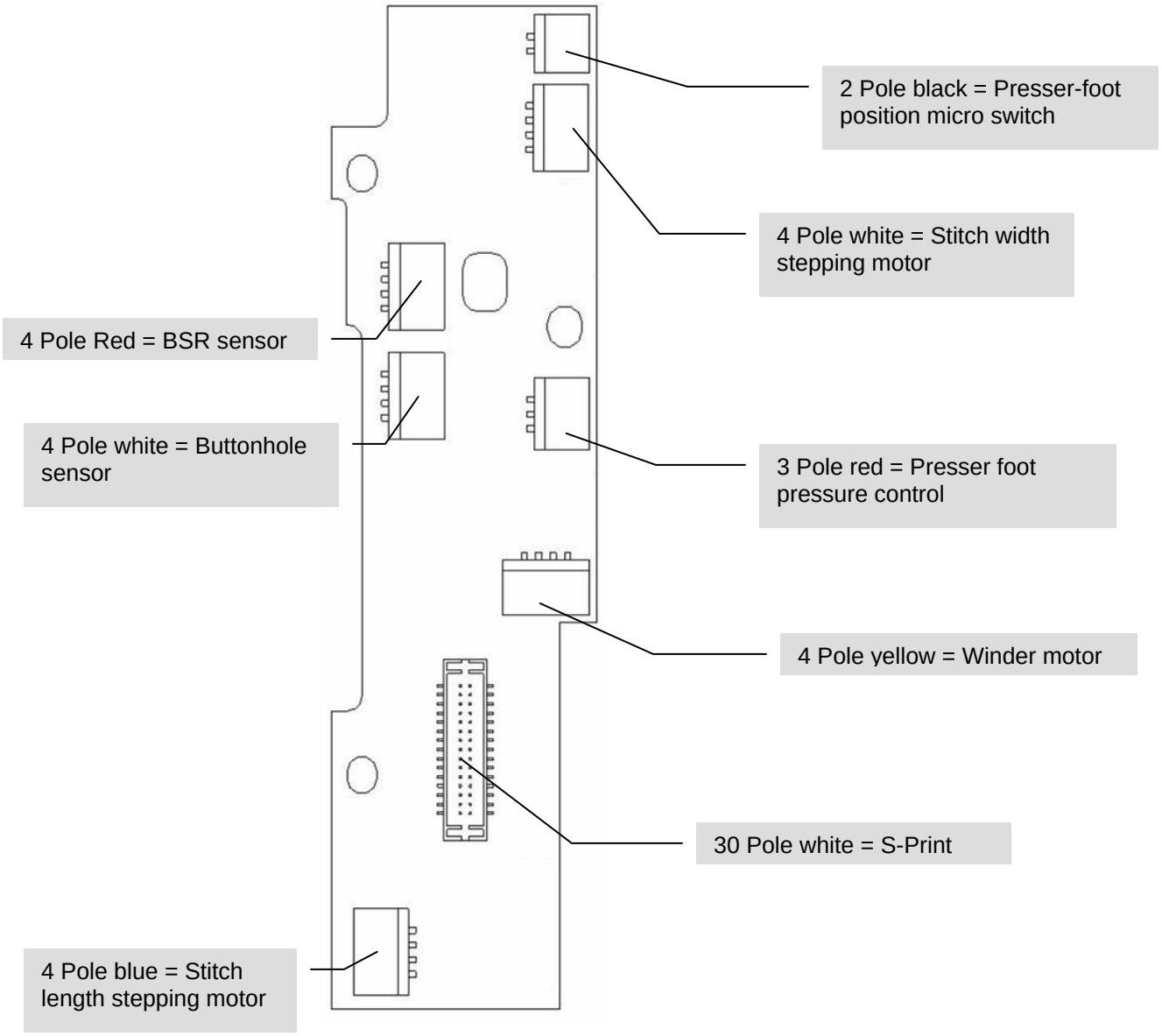
artista 640 positioning PCB





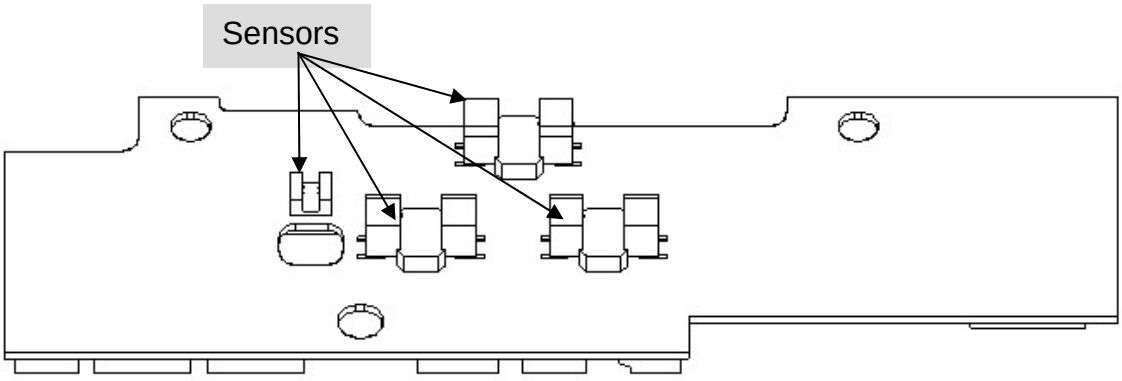
Note:
Never connect or disconnect the connecting cables when the machine is powered!

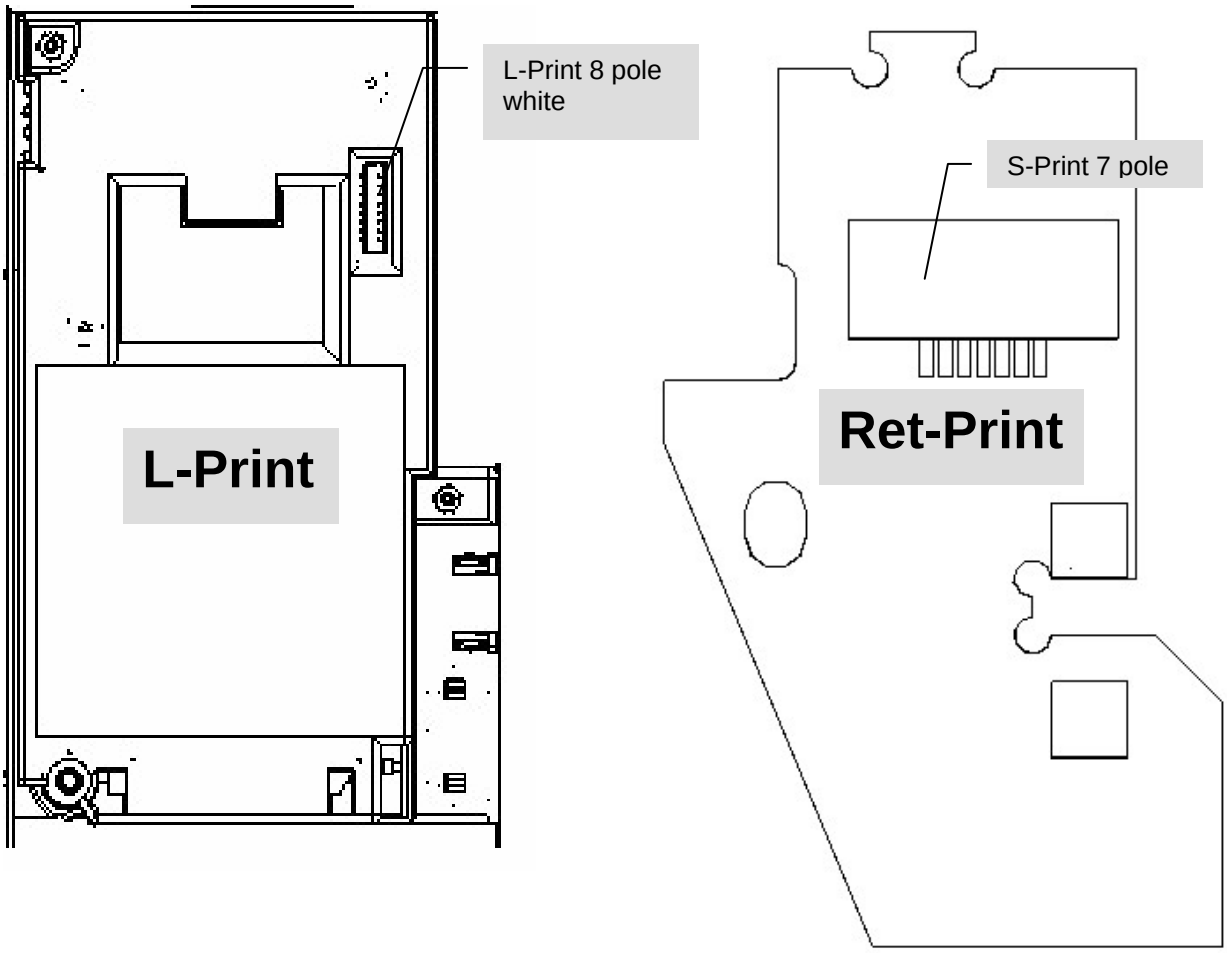
artista 630 positioning PCB



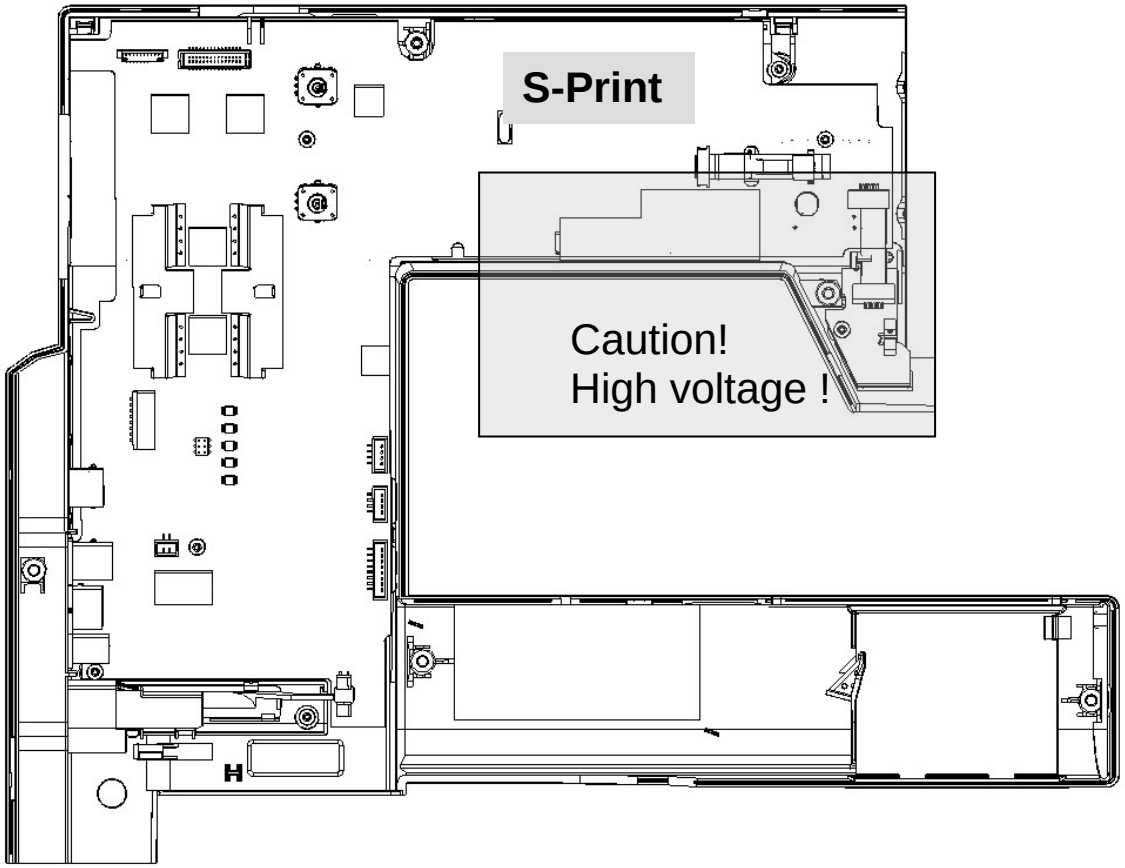
Note:
Never connect or disconnect the connecting cables when the machine is powered!

P-Print (artista 630 & 640) reverse side

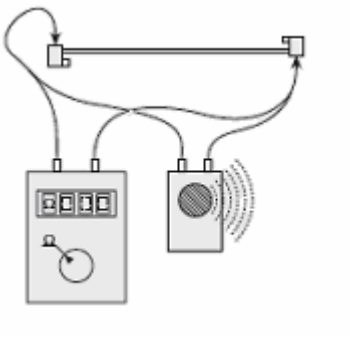




Note:
Never connect or disconnect the connecting cables when the machine is powered!



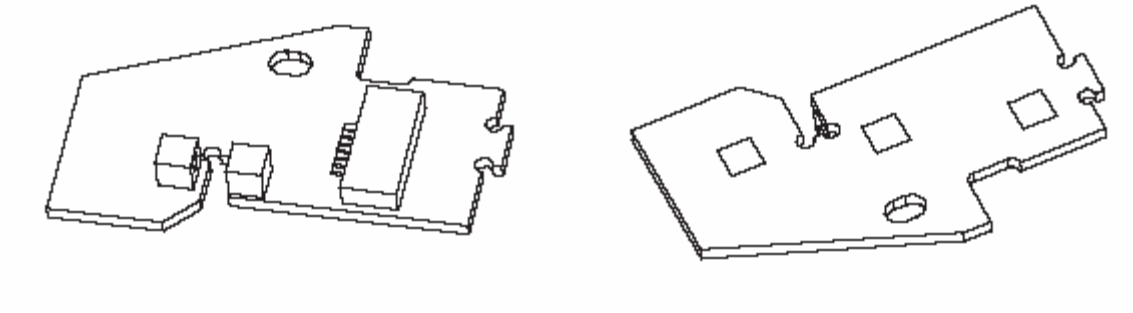
Ribbon cable function

What to Test	What to adjust	Desired status
Electrical resistance of cable	Disconnect mains plug, remove covers and unplug cables from both printed circuits	
Visual check		Check cables for damage, short circuits, and line disconnections Check plug and socket for damage, bent or loose contacts
Electronic measurement by ohmmeter or continuity tester (beeper) 	Set measuring instrument to beeper or Ohm area. Check each cable wire. This involves placing the measuring tips on the top of the connector against the metal cutters to check each wire against the other.	Each wire individually: If the wire is OK: • Ohm on the ohmmeter: beep signal on beeper. Defective wire: Ohm on Ohmmeter: no beep signal on beeper (interruption). Each wire against the other wires: If the wire is OK: Ohm on Ohmmeter: no beep signal on beeper Defective wire: • Ohm on ohmmeter; beep signal on beeper (short circuit, squashed wires)

2.5 General functions of the PCBs

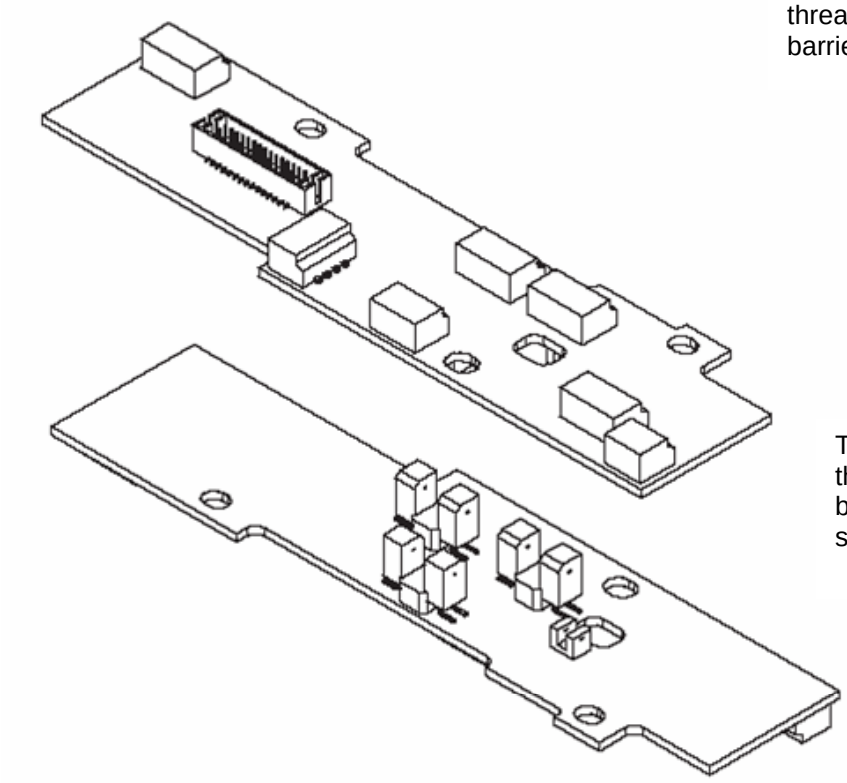
The microcomputer on the S-Print receives an analogue signal from the foot control which is converted into a digital signal and reported as a nominal value. The motor r.p.m is adjusted to the required value by comparison of the predetermined and actual values. When the foot control is released (nominal value zero) the microcomputer switches on the electrical brake. The motor is stopped very quickly in the required needle position.
On switching on the sewing/embroidery computer, the stepping motors may be in any given position. The microcomputer control memory may also have any given value. The stepping motors are moved to their pinning position by means of a command from the microcomputer to give a defined situation. This position is then registered and set to zero in the memory. This zero position then allows any stitch program to be selected and sewn.
The S-Print controls the processes between the individual stepping motors, evaluates the signals of the sensor and shows the results on the display.

RET-Print (return)



The RET-Print accommodates three buttons and the upper thread indicator light barrier.

P-Print



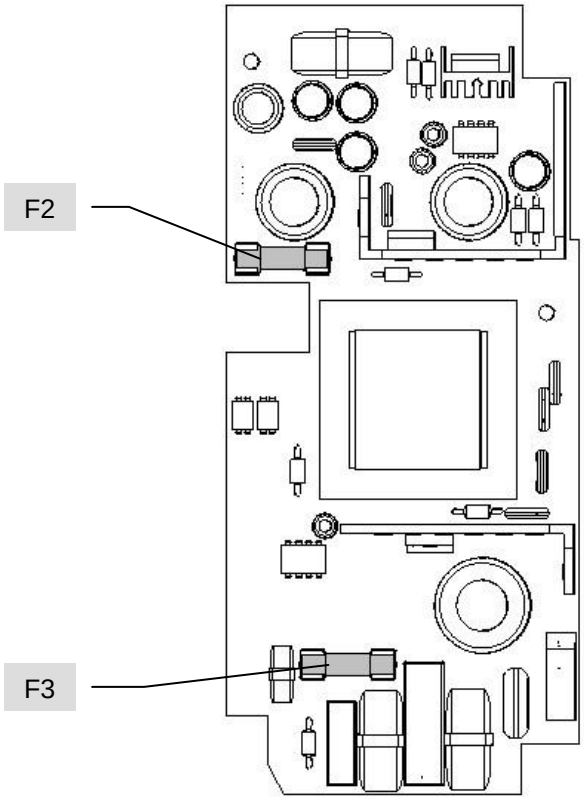
The P-Print accommodates the synchronizing disc light barriers, and the motor and sensor connections.

Universal L-Print (power)

The power PCB (L-Print) is installed in the cover at the back of the sewing machine.
The circuit components of the L-Print producethe following direct current voltages:

- 5 V/DC for the logics on the S-Print
- 12 V/DC for the sewing light
- 30 V/DC for the main motor, winder motor and stepping motors
- 16 V/DC for the motor control on the S-Print

In the event of malfunction, the F2 (T-3, 15A secondary) /F3 (F-4A primary) fuses protect components against overload. If a fuse blows, this is always for a reason. The cause must be identified and removed. An **original replacement fuse** of the correct rating must be used. It is essential to test the functions on replacing the fuse.
The L-Print and S-Print are connected via an 8-pin ribbon cable.



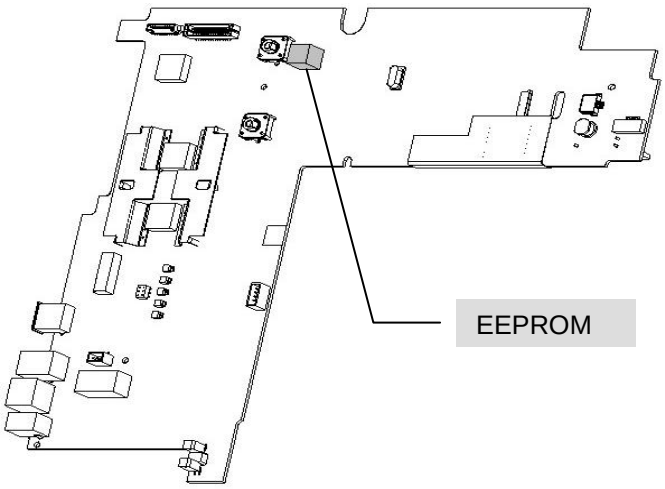
Fuse F 2 T- 3,15 A Item no. 031 999.50.00
Fuse F 3 F- 4 A Item no. 031 999.50.01

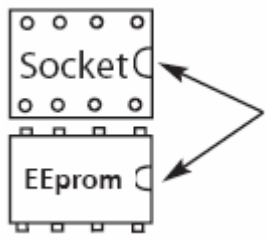
S-Print

The S-Print is manufactured according to S.M.D. (Surface Mounted Device) technology.
S.M.D. components facilitate very compact circuitry.
S.M.D. printed circuits cannot be repaired with conventional tools!



The sewing computer data is saved on an EEPROM on the S-Print.
If the S-Print needs to be replaced, that EEPROM must be moved to the new S-Print.





EEPROM markings must match.

Chapter 3
Functional check and diagnostic instructions

3.1 Functional check

A correct functional check must be carried out in order to make an error diagnosis.

1) Visual check:
Spool holder
Thread guiding parts
Needle in general, and needle position
Stitch plate
Feed-dog
Bobbin case
Hook, thread guide plate, bobbin case Retainer
Hook driver

2) Functional check:
Functioning of FHS presser foot lifter
Functioning of feed-dog drop
Functioning of presser foot pressure setting
Removal of bobbin case
Functioning of automatic (artista 640) and manual thread cutter
Connecting machine with original cable and foot control
LCD screen with backlighting
Functioning of sewing light
Functioning of left and right needle position
Functioning of stitch length and stitch width
Functioning of CLR button
Functioning of winder motor
Test-run the machine and listen for unusual noises and noise level
Inspect main-, foot-control- and ribbon cables for loose contacts and electrical resistance.
Drive check of stepping motors.
Inspect USB, embroidery module, PC and foot control interfaces for connection capabilities.
Note machine's operating hours, firmware version and balance values in service program.

3) Mechanical checks:
Remove all covers.
Cleaning of mechanical parts
Check bevel gears for wear and tear
Checking of:
Main shaft play
Base shaft play
Thread take-up lever
Needle bar support
Feed-dog
Functioning of bobbin case hinge
Functioning of upper and lower thread tension.
Lubricate the machine.

4) Sewing checks:
Sewing-off using the following:
Functioning of the Quick reverse button (securing stitches)
Straight stitch
Zigzag stitch
Honeycomb stitch
Automatic buttonhole stitch
Automatic darning
Embroidery module (if there is one) using the test embroidery design
BSR foot (if available)

3.2 Diagnostic instructions

Powering the stepping motors

- In order to allow the stepping motors to operate correctly, it is essential that they are returned to their "zero" position after each restart of the sewing computer or change of function. In order to adjust this "zero" position, the stepping motors must be powered (under current). Replacement motors should be adjusted before they are fitted into the machine. To achieve this, the motor must be connected to the P-Print at the appropriate plug, which in turn must be connected to the S-Print, and the S-Print to the power supply. Plug in the power cable, then select pinning positions in the service program (SP 4e). This program powers the stepping motors to their correct current values. The motors can then be adjusted according to the servicing instructions of the service manual.

Saving the data before carrying out any servicing or repair work

- Customer and machine data must be recorded on a BERNINA USB data stick before starting servicing or repair work. This is to avoid loss of data when replacing PCBs or updating the firmware, and for use when comparing with the factory settings. The machine data is saved on a replaceable EEPROM (Electrically Erasable Programmable Read-Only Memory) on the S-Print. This EEPROM can only be exchanged with a special tool and in an ESD environmental workplace (see page 6).

3.3 Sewing-off (a-640 must be sewn-off with the head cover fitted (light will affect the threader sensor)

- Sewing-off is a way of checking whether the adjustments made have had the desired effect, and that the machine is functioning correctly.
- The following stitches should be checked in sequence using the appropriate criteria.

1)
Straight stitch
Is the thread regulator spring being moved correctly?
Is the row of stitching straight?
Is the thread feed regular?

2)
Zigzag (default values)
Is the stitch formation symmetrical?
Is the thread feed regular?
Is the fabric free from puckering?

3)
Satin stitch
Is the stitch formation symmetrical?
Is the thread feed regular?
Is the fabric free from puckering?

4)
Running stitch
Is the stitch formation symmetrical?
Is the thread feed regular on both sides?
Is the fabric free from puckering?

5)
Balance using “9” & “Leaf” pattern
Is the stitch formation symmetrical?
The stitched outline in the '9' and the leaf must correctly meet up.

6)
Any other stitch (e. g. Honeycomb stitch)
Is the stitch formation symmetrical?
Is the thread feed regular?
Is the fabric free from puckering?

7)
Buttonhole
Standard buttonhole:
Is the stitch formation symmetrical?
Are the beads of equal length?
Is the feed correct?
Automatic buttonhole:
Is the stitch formation symmetrical?
Are the beads of equal length?
Is the feed correct?
Keyhole buttonhole:
Is the stitch formation symmetrical?
Are the beads of equal length?
Is the feed correct?
Is the stitch formation of the eyelet part symmetrical?

8)
Sew-off samples for the customer
At the end of the service, a sample is prepared for the customer so that they can see how the machine sews after the service or repair.
This sample should contain the following stitches:
- Straight stitch
- Zigzag stitch
- Running stitch
- Reverse-fed stitch
- Buttonhole

Should the customer have complained about any specific stitch, these should also be sewn on another piece of fabric and included.
The sample for the customer must be the technician’s business card!

9)
BSR foot
Functioning
Even stitching in X/Y directions

10)
Embroidery module
• Test embroidery design or customer-specific designs if necessary.

3.4 External cleaning

Caution!
Never use alcohol, petrol, spirits or any other corrosive fluids, or abrasive pastes!
Electrostatic charging may occur during cleaning. To prevent this, use antistatic office-equipment cleaning agents.
We use and recommend “BASF’s SURFACE CLEAN” cleaner It forms a protective film against static charging, and is suitable for plastic and metallic surfaces.

Chapter 4
Replacing Assemblies

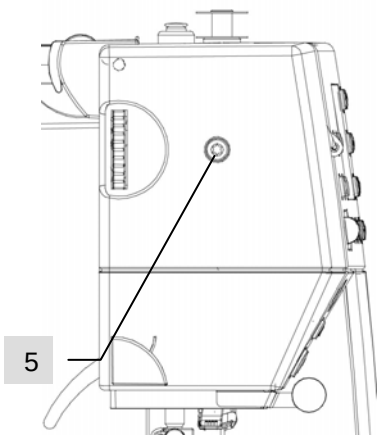
4.1 Removing covers

Before making adjustments, the covers must be removed in the following order:

Head cover:

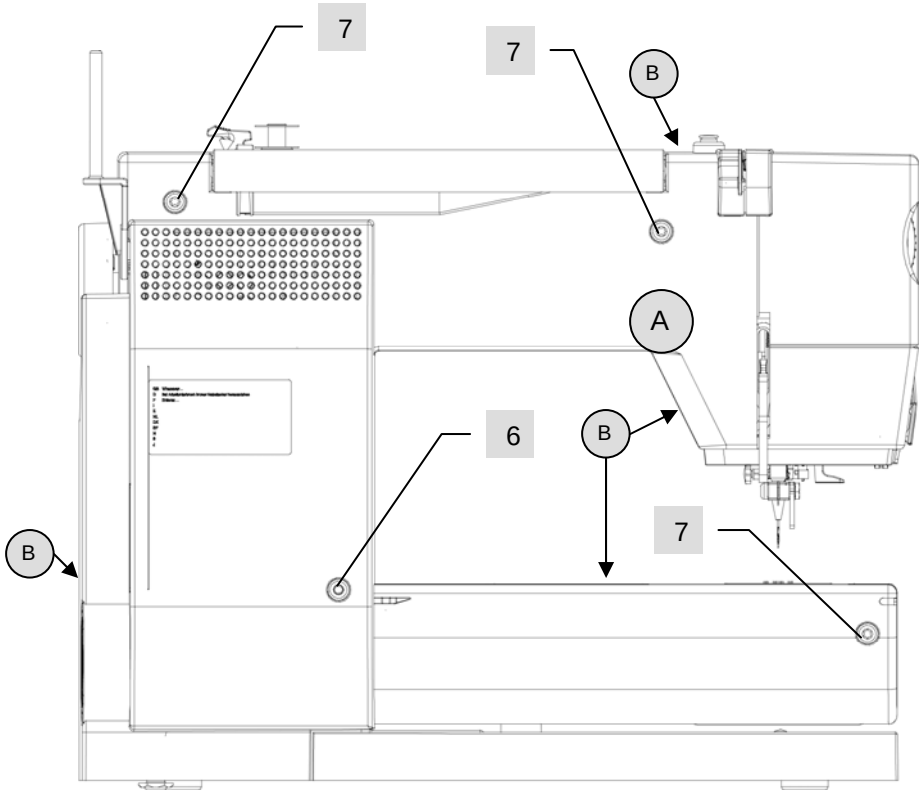
1. Remove screw (**5**).
2. Remove head cover.

Attention! The a-640 must have the head cover refitted when sewing-off.



Rear cover:

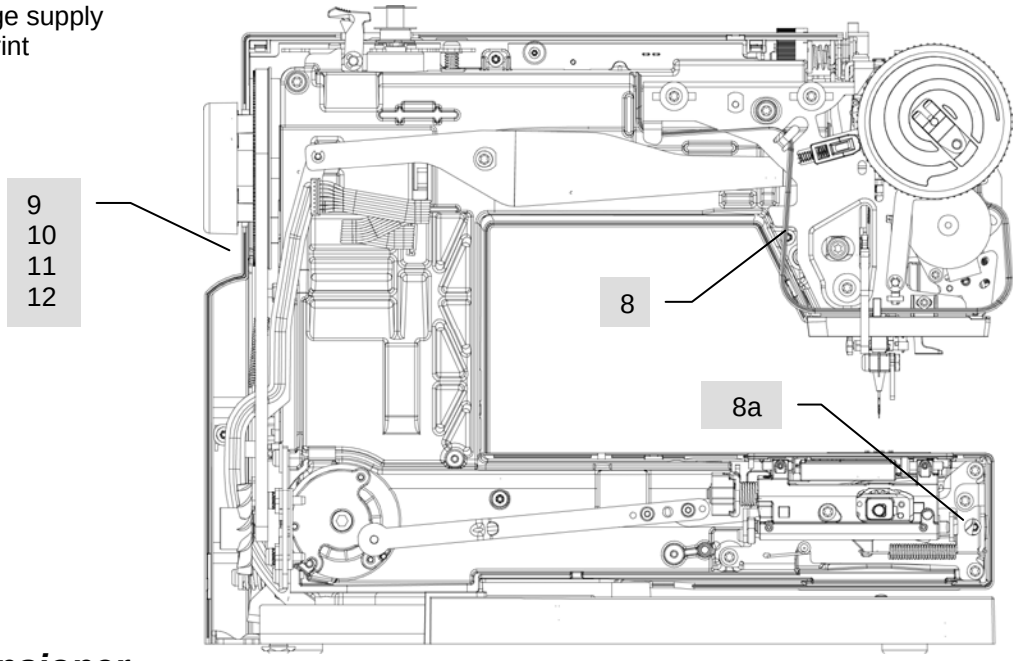
1. Remove screw (**6**).
2. Remove screws (**7**) (3 screws). Remove L-Print cable.
3. Remove rear cover.
4. The covers are linked with clips at the points (**B**). Slightly press against the points to 'de-clip' them.



Note:
Be sure not to squash the CFL and buttonhole sensor cables in the head area (**A**) when refitting the covers.

Front cover:

1. Remove hook cover.
2. Remove screws (**8)** (5 screws).
3. Feed-dog drop button must be in sewing position.
4. Turn hand wheel until screw (**8a**) is accessible (hook drive crank at rear stop).
5. Lift cover over upper thread tension adjusting disc and pull out.
6. Disconnect connectors (**9-12**).
   (**9**) main motor / S-Print
   (**10**) S-Print voltage supply
   (**11**) P-Print / S-Print
   (**12**) CFL / S-Print



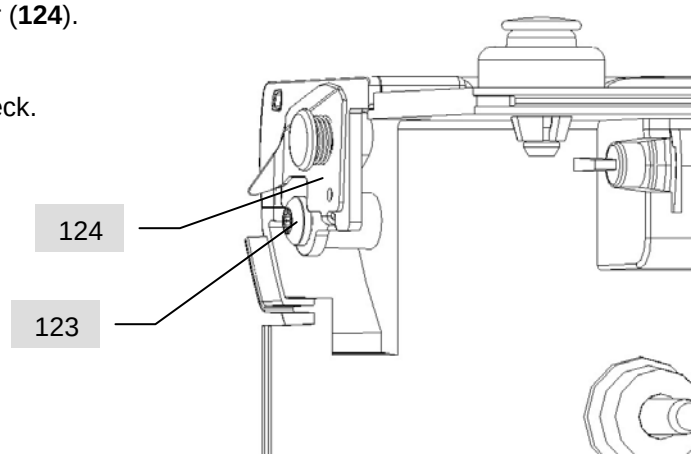
4.2 Thread pre-tensioner

Disassembly:

1. Remove rear cover.
2. Remove screw (**123**).
3. Remove thread pre-tensioner (**124**) and replace.

Assembly:

1. Refit thread pre-tensioner (**124**).
2. Refit screw (**123**).
3. Refit cover.
4. Carry out a functional check.
5. Sew-off



4.3 Vertical spool pin

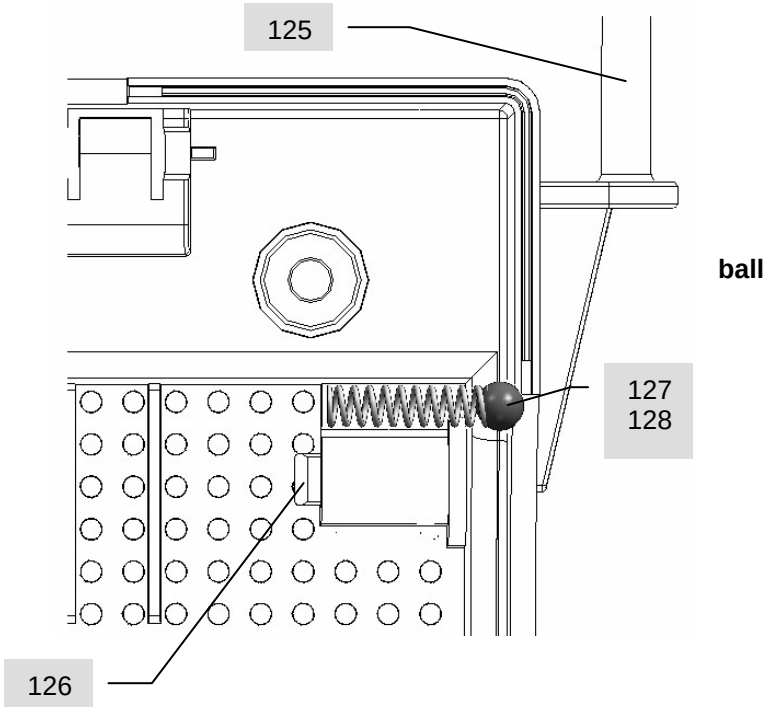
Disassembly:

1. Remove rear cover.
2. Remove L-Print cover (see **p. 27**).
3. Push spool pin (**125**) to the back.
4. Pinch clip (**126**) and pull spool pin (**125**) out to the right. Replace.

Important: Don't lose spring (127) and ball (128)!

Assembly:

1. Move spool pin (**125**) to the right in the guide until clip (**126**) engages.
2. **Important: Don't forget to refit spring (127) and ball (128)!**
3. Refit L-Print cover.
4. Refit cover. Carry out a functional check.
5. Sew-off



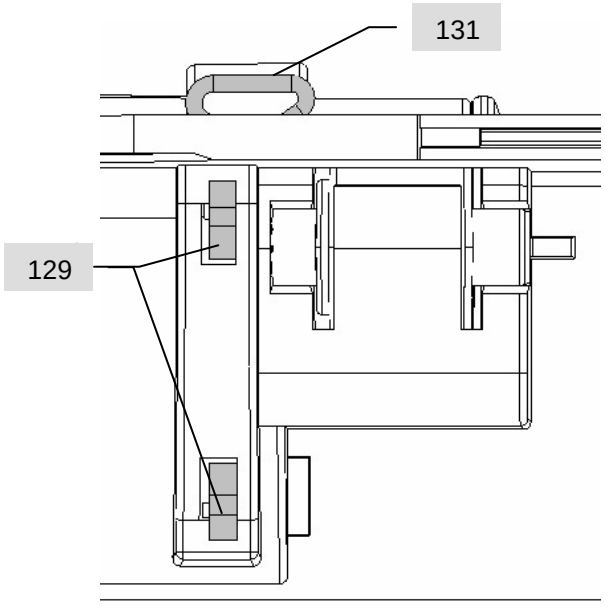
4.4 Horizontal spool pin and rear thread-guide eyelet

Disassembly:

1. Remove rear cover.
2. Pinch clip (**129**) and pull spool pin out to the back. Replace.
3. Replace thread-guide eyelet (**131**).

Assembly:

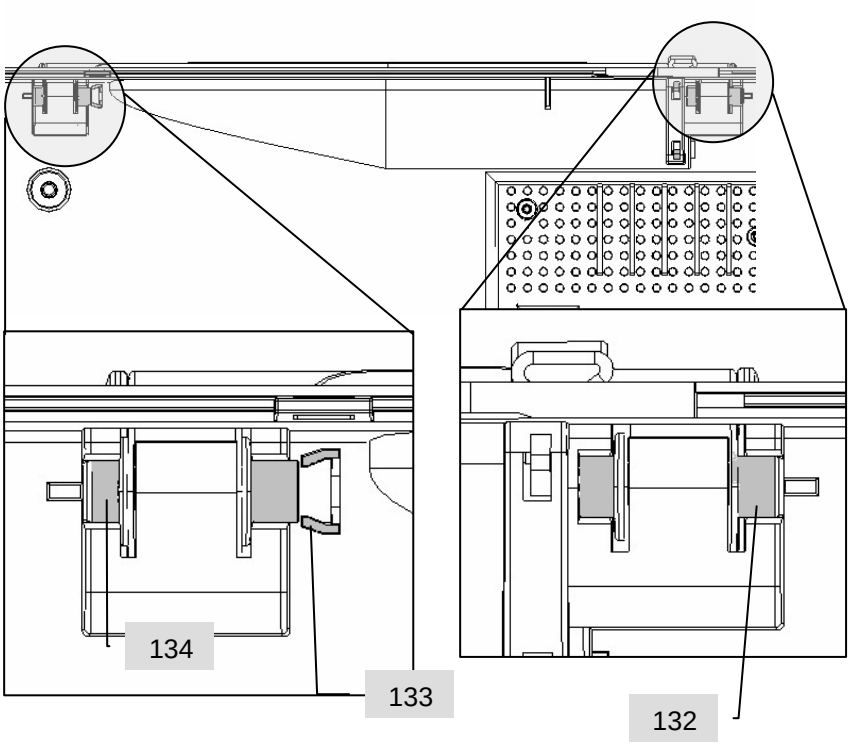
1. Position thread-guide eyelet (**131**).
2. Move spool pin forwards in the guide until clip (**129**) engages.
3. Refit cover.
4. Carry out a functional check.
5. Sew-off



4.5 Carrying handle

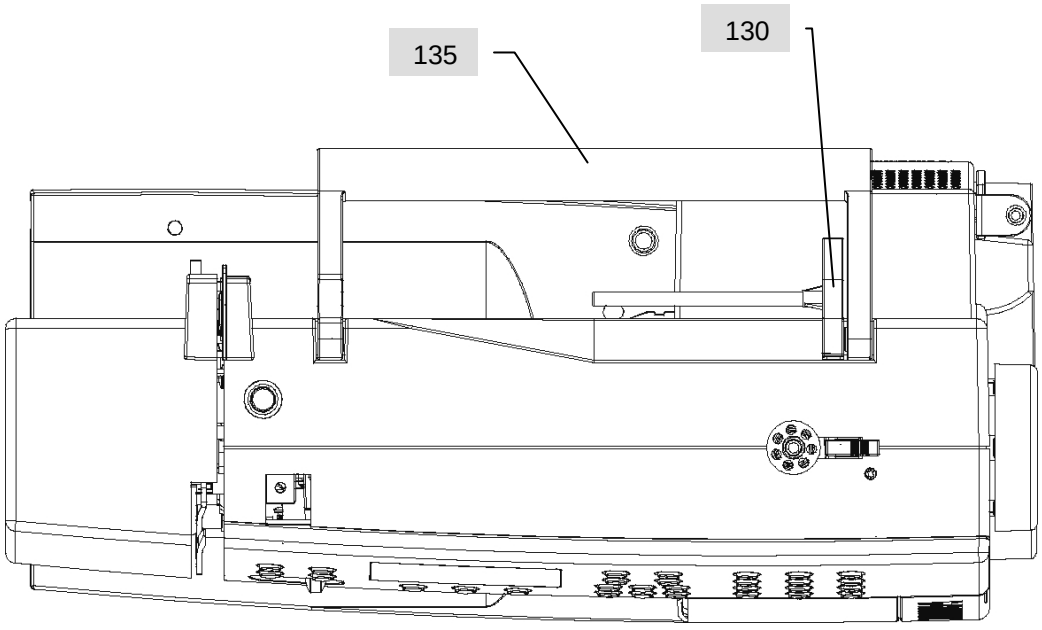
Disassembly:

1. Remove rear cover.
2. Remove spool pin (**130**) **see p. 21**.
3. Push pin (**132**) out to the left and remove.
4. Carefully prise lock (**133**) apart using a screwdriver. Push pin (**134**) out to the right and remove.
5. Remove handle (**135**) and replace.



Assembly:

1. Insert handle (**135**).
2. Slide pin (**134**) in from the right until it engages.
3. From the left move pin (**132**) to the stop.
4. Refit spool pin (**130**) and thread-guide eyelet (**131**).
5. Refit cover.
6. Carry out a functional check.
7. Sew-off



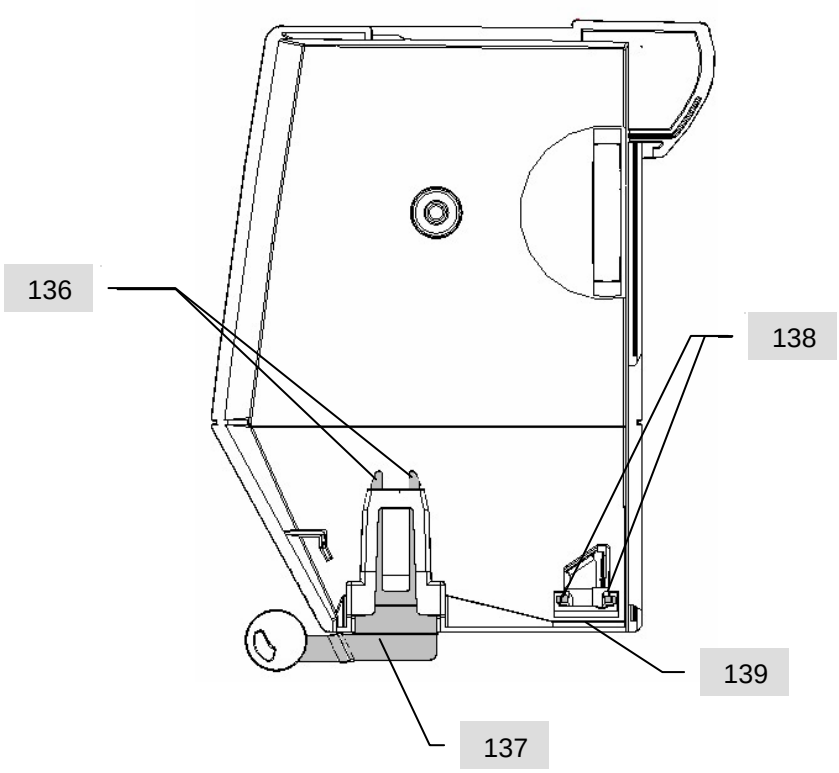
4.6 Magnifying-glass holder and thread cutter

Disassembly:

1. Remove head cover.
2. Pinch clip (**136**) and pull magnifying-glass holder (**137**) downwards and out. Replace.
3. Pinch clip (**138**) and pull thread cutter (**139**) downwards and out. Replace.

Assembly:

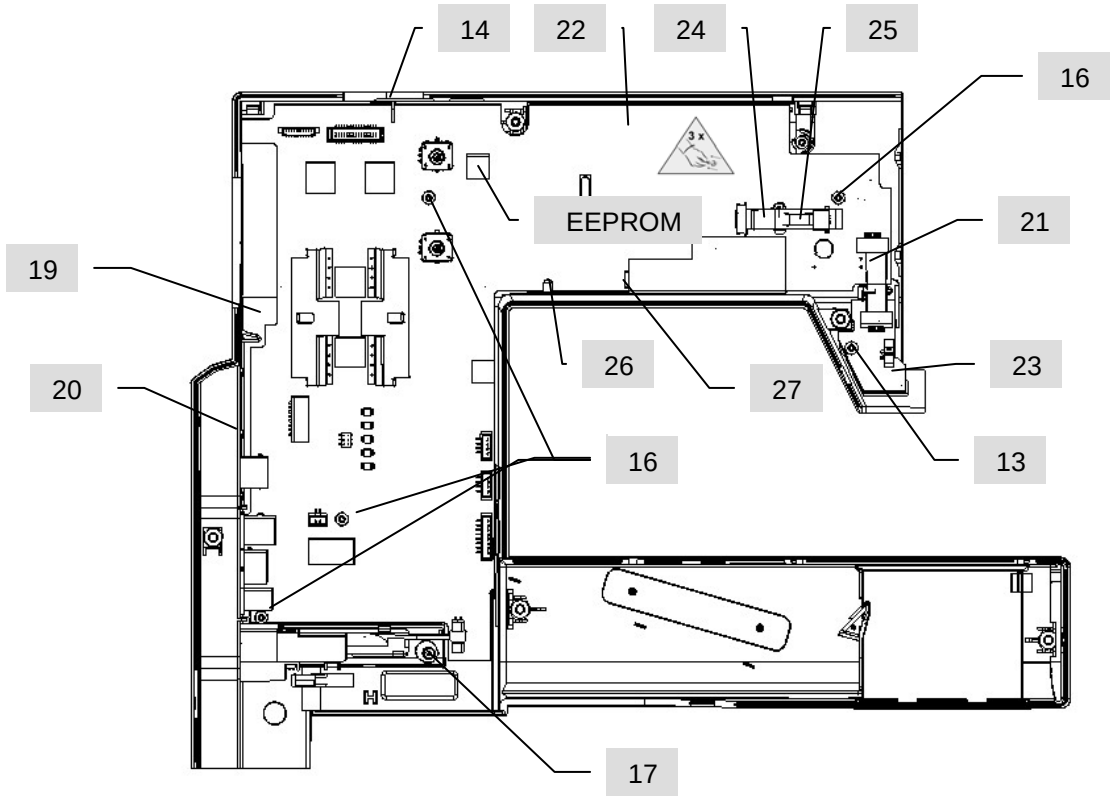
1. Move thread cutter (**139**) upwards in the guide until clip (**138**) engages.
2. Move magnifying-glass holder (**137**) upwards in the guide until clip (**136**) engages.
3. Refit head cover.
4. Carry out a functional check.
5. Sew-off

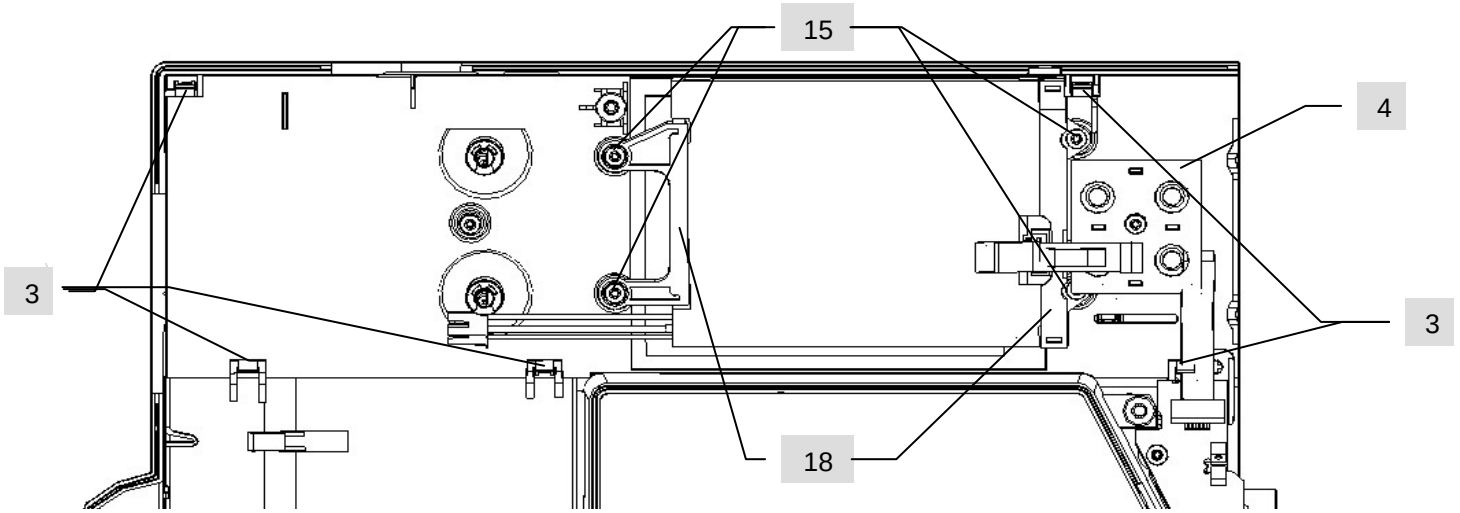


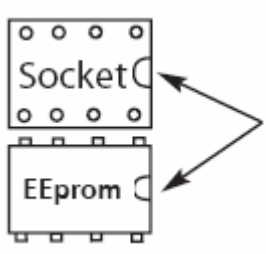
4.7 S-Print, keypads, front panel, RET-Print, touch screen, display and side cover (plugs)

Disassembly:

1. Remove covers.
2. Pull adjusting button off speed regulator.
3. Remove screw (**17**).
4. Press clip (**19**) down and remove side cover (**20**) to the left.
5. The artista 640 requires disconnection of lower thread indicator cable.
6. Carefully slide down the locking clip to disconnect and remove the cables (**21**) from S-Print (**22**) and RET-Print (**23**).
7. Remove screw (**13**) from RET-Print.
8. Remove RET-Print (**23**).
9. Carefully slide down the locking clip to disconnect the ribbon cable (**25**) from the touch screen.
10. Carefully slide down the locking clip to disconnect the ribbon cable (**24**) from the LCD.
11. Disconnect LCD backlighting plug (**27**). **Note:** Pull only on the plug, and not the LCD lighting cable, because the CFL tube may break.
12. Remove screws (**16**) – 4 screws.
13. To remove, lift S-Print (**22**) from beneath and pull out from under pin (**14**).
14. Guide plug (**27**) out through opening (**26**).
15. Use the special tool (IC extractor) to remove EEPROM from old S-Print. Transfer it directly to new S-Print. NOTE: Take care to place EEPROM in the correct position and avoid bending the contacts.
16. Remove screws (**15**) – 4 screws – from bridges (**18**). Remove LCD and touch screen. Replace (p. 24)
17. Remove keypad (**4**).
18. Remove the five front cover clips (**3**), remove the front panel and replace.







Markings must match!

Assembly:
S-Print, keypad, front panel, RET-Print, touch screen, LCD and side cover (plugs)

1. Slide front panel (**4**) into guides until front panel clips (**3**) engage.
2. Insert touch screen into opening – check for dirt before.
3. Insert LCD. Position bridges (**18**) and fasten with screws (**15**).
4. Insert keypad (**4**) – contacts must not be dirty or oily!
5. Insert S-Print (**22**) and LCD backlighting cable (**27**) into opening (**26**). Carefully draw ribbon cables (**24 and 25**) through the opening.
6. Make sure to insert the shaft faces of the stitch width and stitch length adjusting knobs into the respective SW/SL potentiometer openings on the S-Print.
7. Tighten screws (**16**) to fasten S-Print.
8. Reconnect cables (**21, 24, 25, 27**) and lower thread indicator on artista 640. Make sure that the ribbon cables sits correctly, and **carefully close** the locking clip.
9. Refit front cover. Feed-dog switch must be active (in the sewing mode).
10. It is essential to calibrate the maximum speed, the balance and the buttonhole in the service program before these values can be saved on the S-Print.
11. Carry out a functional check.
12. Sew-off

Important: Is the EEPROM in place?

4.8 P-Print

Disassembly:

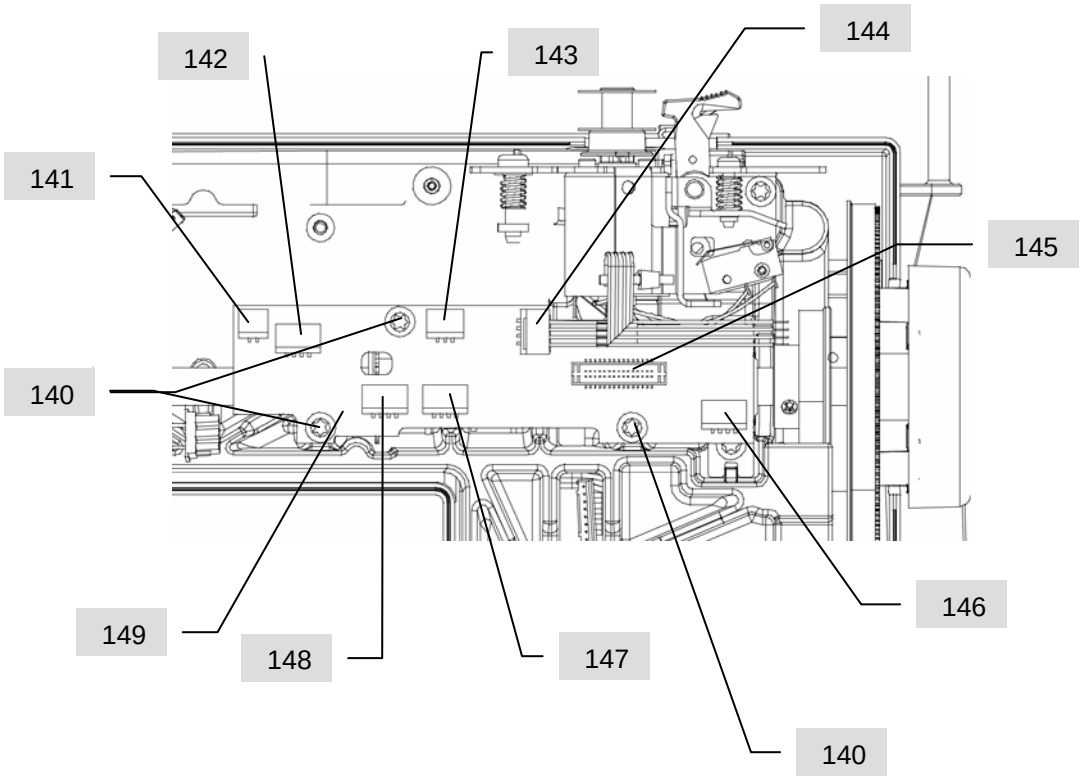
1. Remove covers.
2. Disconnect plugs (**141-148**).
3. Remove screws (**140**).
4. Remove P-Print (**149**) and replace.

Assembly:

1. Insert P-Print (**149**).
2. Refit screws (**140**).
3. Required lateral position of the P-Print (can be seen in the PCB's cut-out) => disc must lie centred in the light barrier.
4. Reconnect plugs (**141-148**).
5. Refit covers.
6. Carry out a functional check.
7. Sew-off

Connectors:

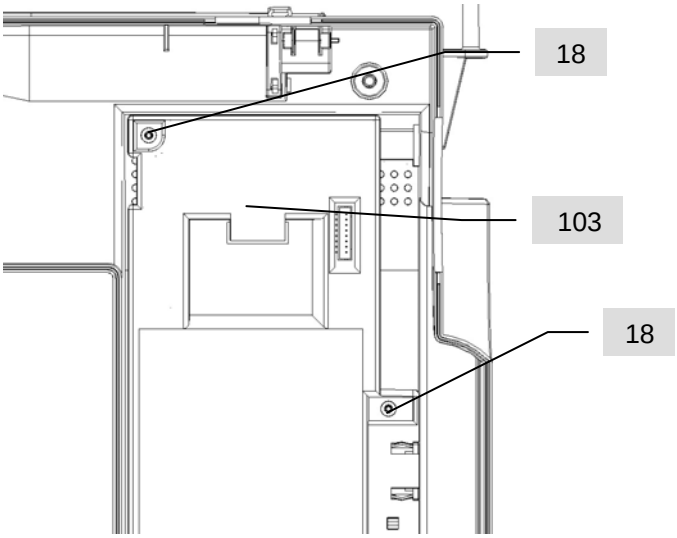
141 => presser foot lifter sensor **142** => stitch width stepping motor **143** => presser foot pressure sensor **144** => winder motor
145 => S-Print **146** (2 connectors on artista 640's S-Print) => stitch length stepping motor
147 => buttonhole foot sensor **148** => BSR sensor



4.9 L-Print

Disassembly:

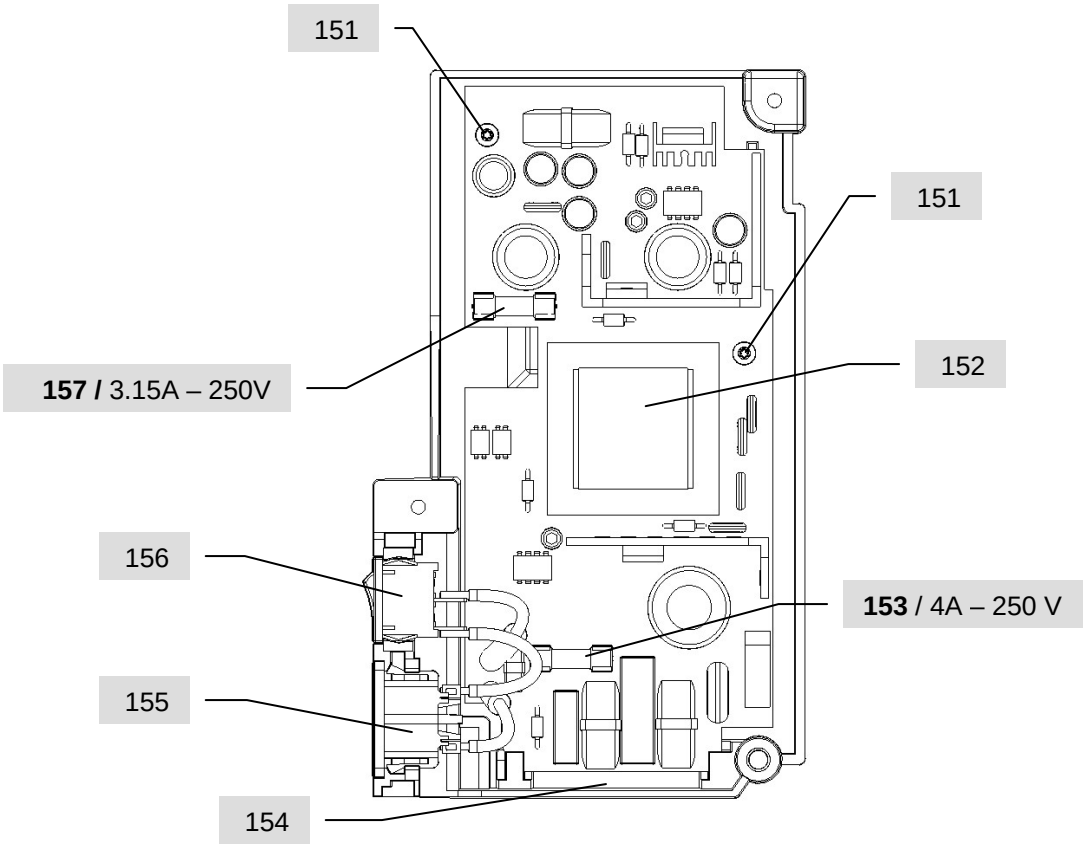
1. Remove rear cover.
2. Remove screws (**18**).
3. Remove L-Print cover (**103**).
4. Check the primary (**157**) F2 (3.15A 250V) and secondary (**153**) F3 (4A - 250V) fuses. Replace if necessary.
5. Disengage switch (**156**) and socket (**155**).
6. Remove screws (**151**).
7. Lift L-Print (**152**) from top and pull out of guide (**154**).
8. Replace L-Print (**152**).



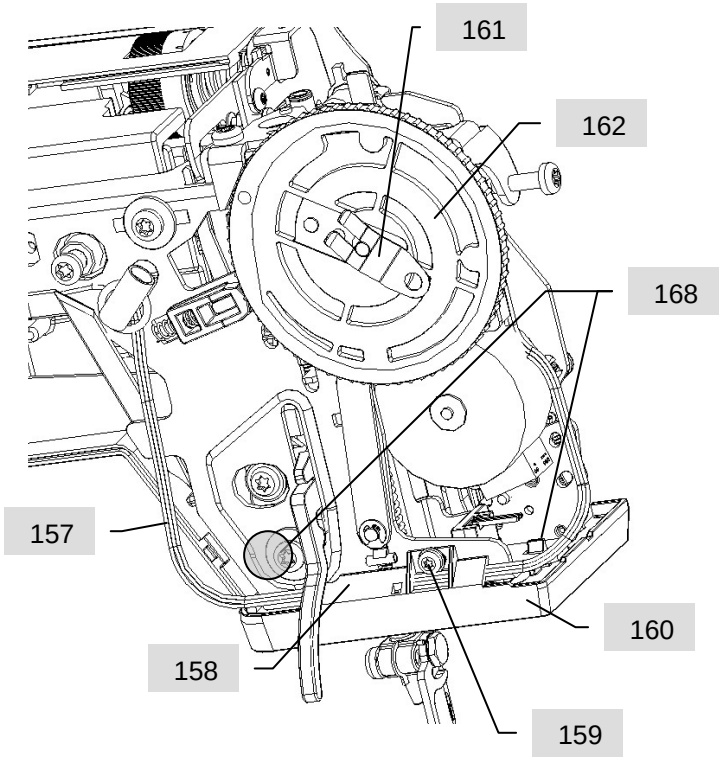
Assembly:

1. Refit L-Print (**152**) and screws (**151**) - they are shorter than screws (**18**).
2. Re-engage switch (**156**) and socket (**155**).
3. Refit L-Print cover (**103**).
4. Refit screws (**18**) and covers.
5. Calibrate speed.
6. Carry out a functional check.
7. Sew-off

Fuse F 2 T- 3,15 A
Item number
031 999.50.00
Fuse F 3 F- 4 A
Item number
031 999.50.01



4.10 CFL



Disassembly:

1. Remove covers.
2. Remove screw (**159**).
3. Disengage CFL (**160**) from **both** fastening clips (**168**). Replace.

Note:
The presser foot bar must be down!
Do not bend CFL tube!

Assembly:

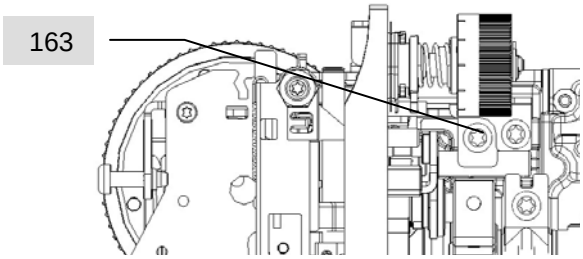
1. Refit CFL light (**160**).
2. Place cable (**157**) into guide (**158**). Important: Be sure not to squash the cables.
3. Refit CFL – the two clips must engage.
4. Refit screws (**159**) including washers.
5. Refit covers.
6. Carry out a functional check.
7. Sew-off.

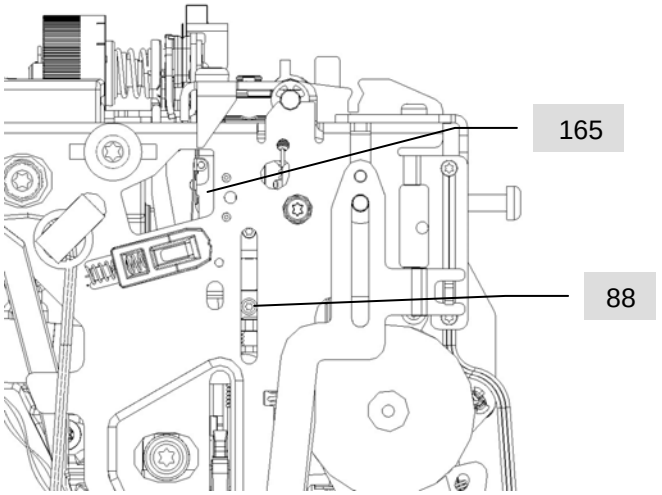
Note:
If a fault in the CFL light or the screens background lighting occurs, then because of safety regulations the high voltage power is switched off.
If the screen is not lighting, check the CFL first!

4.11 Presser foot lifter sensor (micro switch)

Disassembly:

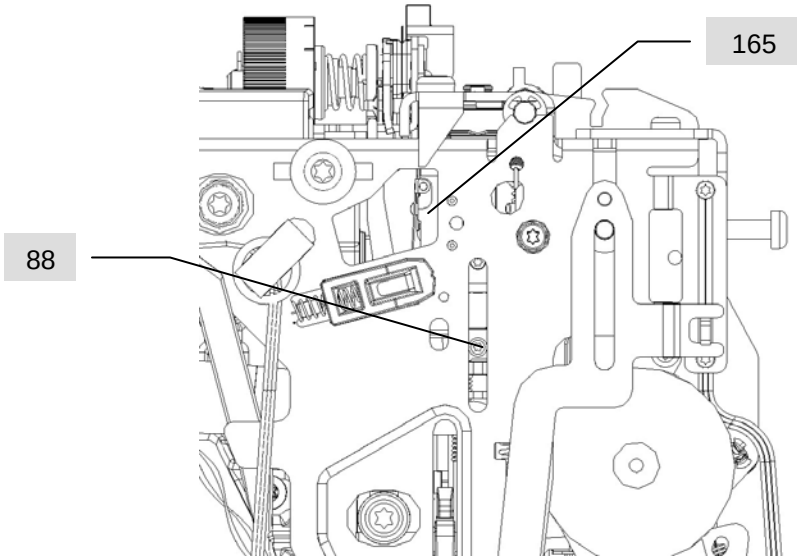
1. Remove covers.
2. Remove adjusting wheel lock (**161**).
3. Remove carefully the adjusting wheel (**162**) so that the spring loaded pressure lever remains in place.
4. Remove upper thread tension (**p. 40/41**).
5. Disconnect plug (**141**) from P-Print (**149**), see **page 26**, and unthread cable from guide.
6. Loosen link shaft screw (**163**), then remove, including clamp.
7. Use thread take-up lever to swing link shaft down.
8. Loosen screw (**88**), then swing hopper mechanism lever downwards to front.
9. Remove the 2 screws (**165**) from micro switch and holder.
10. Slide micro switch including cable out to front.

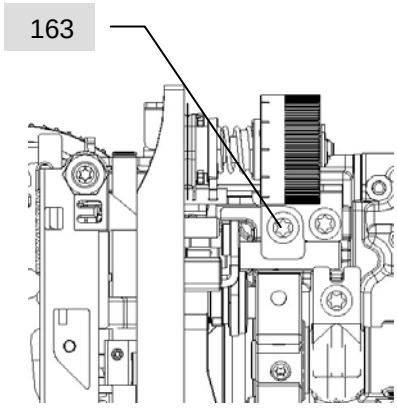




Assembly:

1. Refit micro switch (**165**). Fitting position => the bores of the switch must be placed accurately to the lugs in the head frame. If the switch is at an angle when the screw is tightened, the switch may be damaged.
2. Draw cables through rear opening and place into cable guides.
3. Connect plug (**141**) to P-Print (**149**).
4. Turn hopper mechanism lever into position, then tighten screw (**88**) slightly.
5. Use thread-take up lever to swing link shaft up. Then refit clamp with screw (**163**). To clear the thread take-up's play, push link shaft slightly to the right.
6. Refit upper thread tension (**p. 40/41**).
7. Set darning foot height. (**p. 46**)
8. Refit adjusting wheel (**162**) and safety stop (**161**). Make sure the pressure lever fits into the spring, into the potentiometer and the guide of the adjusting wheel.
9. Refit covers.
10. Carry out a functional check
11. Sewing-off.

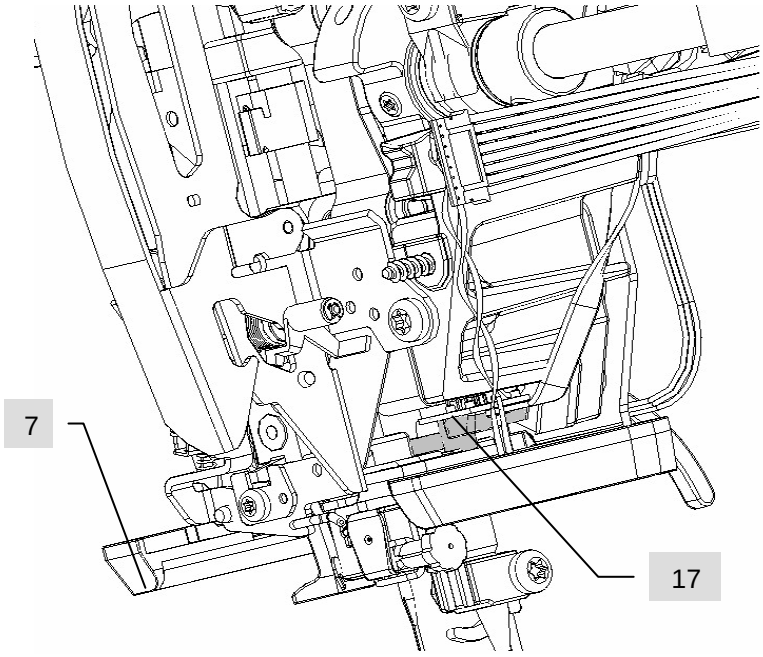




4.12 Buttonhole sensor PCB

Disassembly:

1. Remove covers.
2. Remove CFL (**7**), (**p. 28**).
3. Remove thread tensioner (**p. 40/41**).
4. **Carefully lift buttonhole sensor (17)** using a screwdriver on the clip of the presser foot bar guide bearing.
5. Turn sensor to front and pull out.
6. Replace sensor.



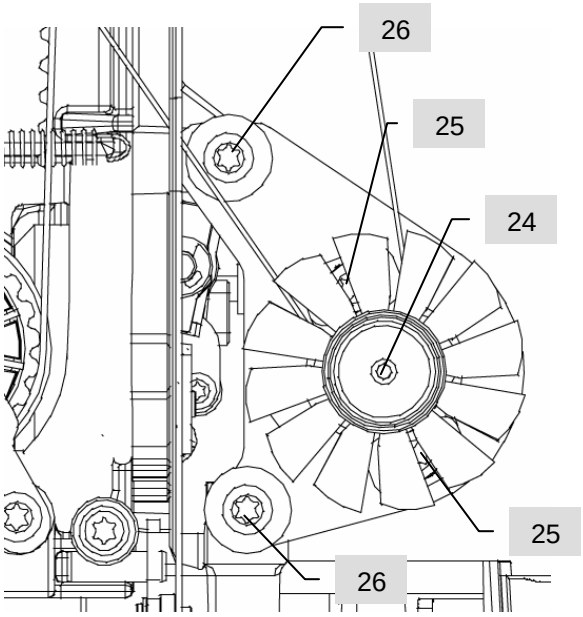
Assembly:

1. Guide new sensor into the bore and place in position.
2. Carefully press clip onto presser foot bar guide bearing until it engages.
3. Refit thread tensioner (**p. 40/41**).
4. Place ribbon cable in such way that it does not touch moving parts.
5. Refit CFL light (**7**).
6. Refit covers.
7. Calibrate buttonhole (**p. 91**).
8. Carry out a functional check.
9. Sewing-off.

4.13 Main motor (complete unit only)

Disassembly:

1. Remove covers.
2. Pull motor connection cable out from guide channel (remove clip).
3. Remove ventilator fan (**24**) which is press fitted onto motor shaft.
4. Remove the two securing screws (**25**).
5. Remove the motor.



Assembly:

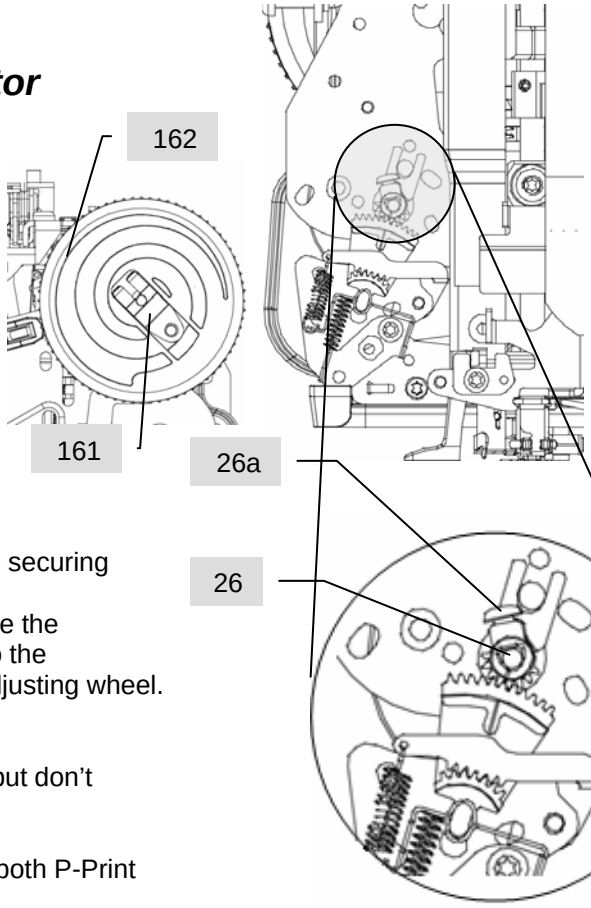
1. Fit new motor and fasten with the two securing screws (**25**).
2. Adjust belt tension. Check for ease of movement.(**26**)
3. Refit ventilator fan.
4. Thread motor connection cable into guide channel (fasten clip).
5. Refit covers.
6. Calibrate speed – Service Program test 4f (**p. 84**).
7. Carry out a functional check.
8. Sew-off.

Attention!
Position the ferrite insulator to face outwards, in order that the cable cannot come into contact with any other moving parts. The cable must be held with the clip as taut as possible in order that it cannot come into contact with the hook drive crank

4.14 Stitch width stepping motor

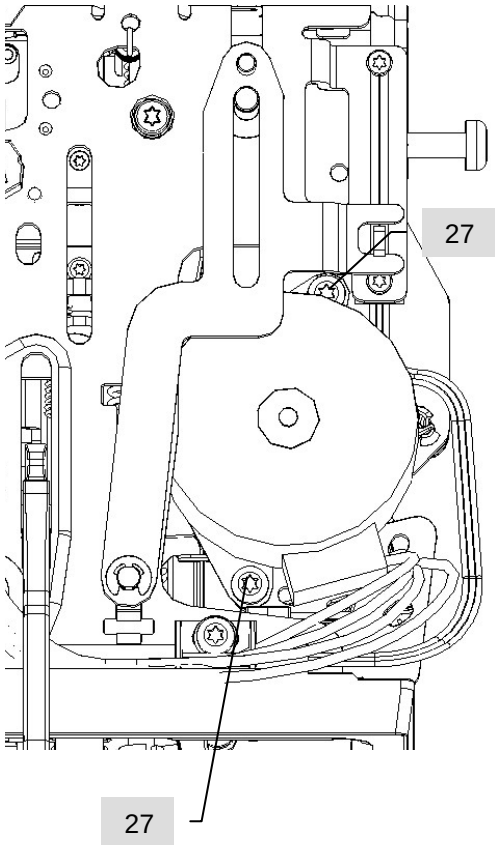
Disassembly:

1. Remove covers.
2. Loosen screws (**26a**).
3. Remove adjusting wheel lock (**161**).
4. Remove carefully the adjusting wheel (**162**) so that the spring loaded pressure lever remains in place.
5. Remove pinion (**26**).
6. Remove CFL (**p. 28**).
7. Remove the two securing screws (**27**).
8. Replace stepping motor.



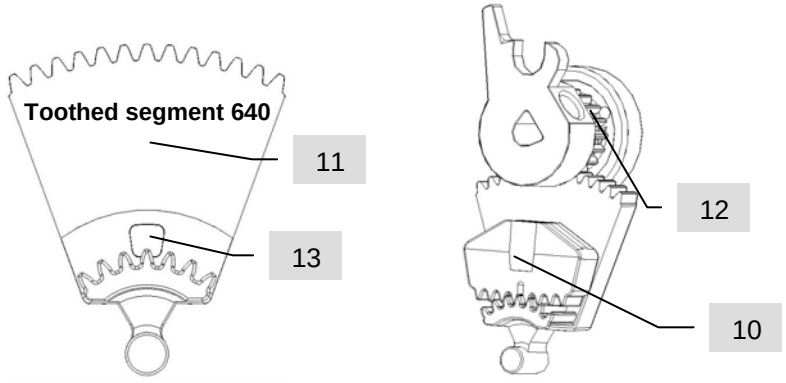
Assembly:

1. Fit new motor and fasten with the two securing screws.
2. Refit adjusting wheel (**162**). Make sure the pressure lever fits into the spring, into the potentiometer and the guide of the adjusting wheel.
3. Refit adjusting wheel lock (**161**).
4. Refit CFL (**p. 28**).
5. Fit pinion in toothed segment centre but don't fasten it yet.
6. Reconnect motor. Refit front cover.
7. Attach front cover connect S-Print to both P-Print and L-Print.
8. Connect mains plug.
9. Start machine in service program mode.
10. Select pinning positions in SP test 4e (**p. 83**).
11. Pinion distance to metal plate is 0.5 mm.
12. Pin pinion and secure.
13. Set needle position (**p.47**).
14. Refit covers.
15. Calibrate buttonhole in SP test 5c (**p. 91**).
16. Carry out a functional check.
17. Sew-off.



Note: artista 640

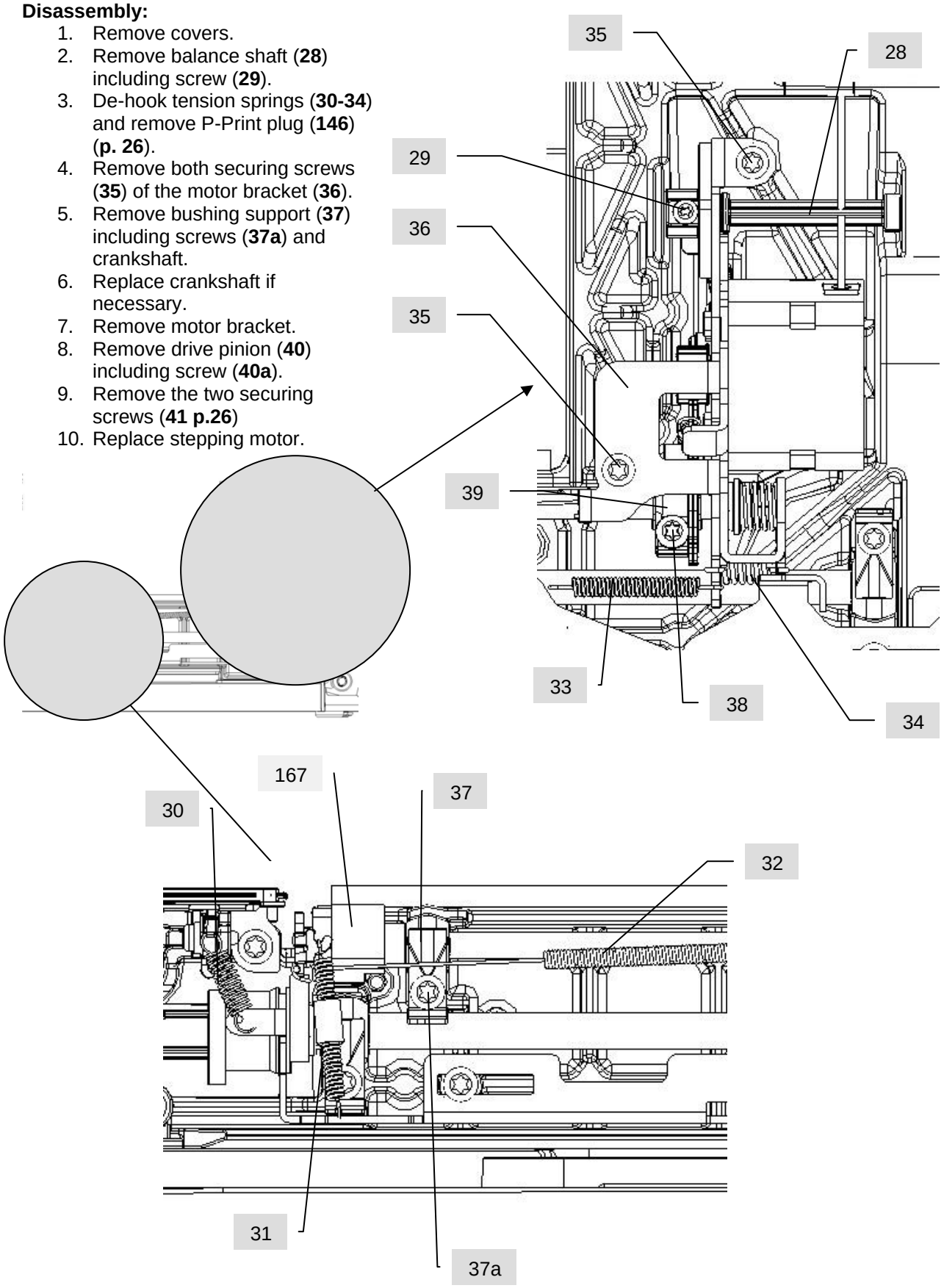
The toothed segment (**11**) must be placed in center of pinion (**12**) The driving toothed segment (**10**) must be positioned in toothed segment center (**11**). It can be seen through the cut-out (**13**).



4.15 Stepping motor, stitch length and crankshaft

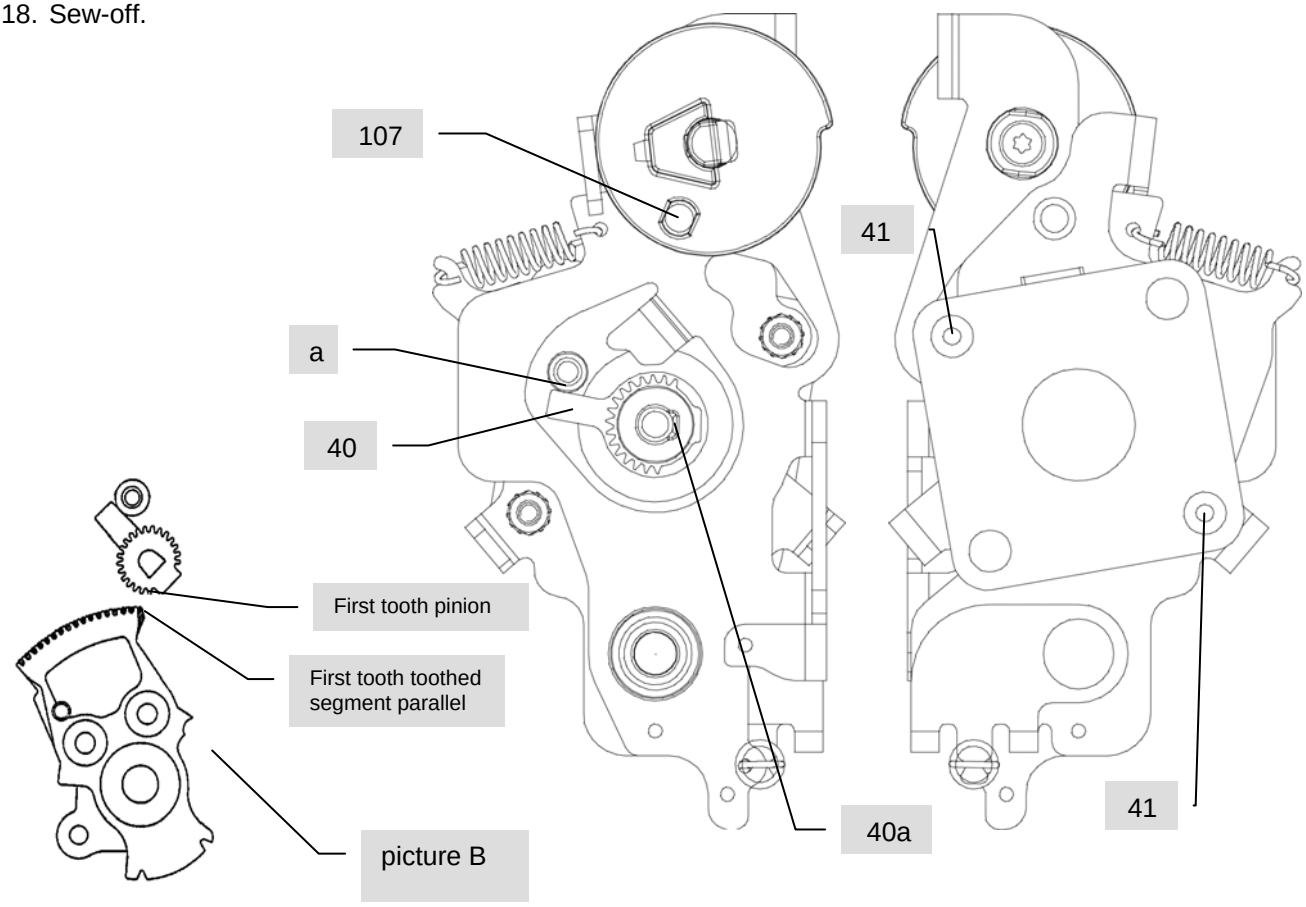
Disassembly:

1. Remove covers.
2. Remove balance shaft (**28**) including screw (**29**).
3. De-hook tension springs (**30-34**) and remove P-Print plug (**146**) (**p. 26**).
4. Remove both securing screws (**35**) of the motor bracket (**36**).
5. Remove bushing support (**37**) including screws (**37a**) and crankshaft.
6. Replace crankshaft if necessary.
7. Remove motor bracket.
8. Remove drive pinion (**40**) including screw (**40a**).
9. Remove the two securing screws (**41 p.26**)
10. Replace stepping motor.



Assembly:

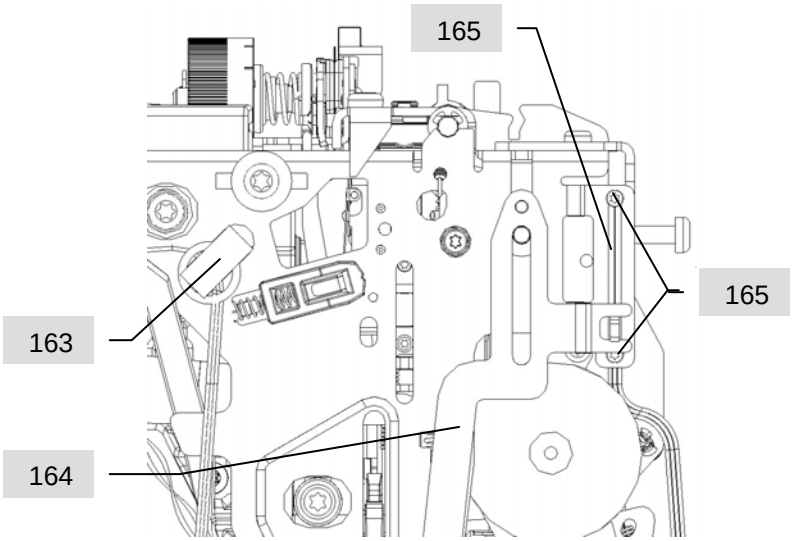
1. Fit new stepping motor and fasten with the two securing screws.
2. Power stepping motor: First connect stepping motor to P-Print then S-Print to power unit, only then connect mains cable to power supply. Select pinning positions in service program (SP test 4e, **p. 83**)
3. Place drive pinion at axial distance of 0.5 mm to metal plate.
4. Lift rubber sleeve (**a**) up, and place gauge of 0.5 mm distance to metal plate.
5. Move drive pinion (**40**) to stop position and tighten screw (**40a**).
6. Switch machine off, remove 0.5 mm gauge, and refit rubber sleeve (**a**).
7. Slide crankshaft into spherical bearing, place toothed segment parallel (**picture B**), then place it against stepping motor stop.
8. Slide stitch length transmission (crankshaft and motor bracket together) into the machine and fasten with two screws (**35**).
9. Secure crankshaft with bushing support (**37**).
10. Re-hook tension springs (**30-34**).
11. Check if toothed segment and pinion are correctly positioned.
12. Refit balance shaft (**28**).
13. Pin crank (**167**) and balance cam (**107**), loosen screw (**38**), push toothed segment against stop and retighten screw (**38**).
14. Refit covers.
15. Calibrate speed – Service Program test 4f (**p. 84**).
16. Fine-adjust balance (**SP 5b, p. 88**).
17. Carry out a functional check.
18. Sew-off.



4.16 Presser foot pressure sensor

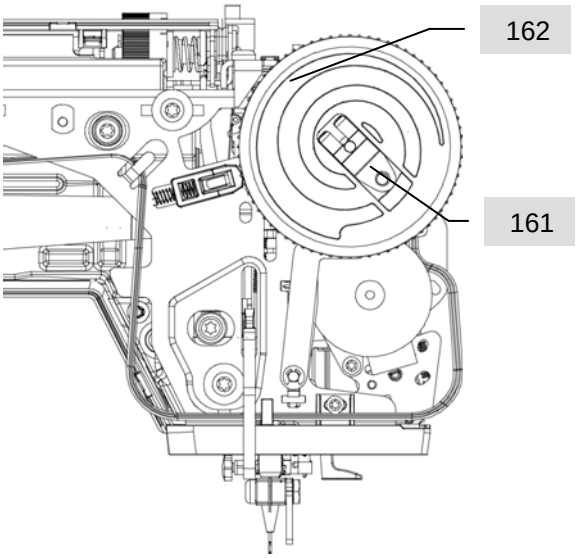
Disassembly

1. Remove covers.
2. Remove adjusting wheel lock (**161**).
3. Remove carefully the adjusting wheel (**162**) so that the spring loaded pressure lever remains in place.
4. Remove metal guide (**164**).
5. Remove plug (**143**) from P-print (**149**) and remove cable (**163**) from cable guide.
6. Loosen screws (**165**).
7. Replace pressure sensor potentiometer (**166**).



Assembly:

1. Replace pressure sensor potentiometer (**166**).
2. Refit screw (**165**).
3. Place cable (**163**) correctly in guide.
4. Reconnect plug (**143**).
5. Refit metal guide (**164**).
6. Refit adjusting wheel (**162**). Make sure the pressure lever fits into the spring, into the potentiometer and the guide of the adjusting wheel.
7. Refit adjusting wheel lock (**161**).
8. Refit covers.
9. Carry out a functional check (test 5e, **p. 91**).
10. Sew-off.



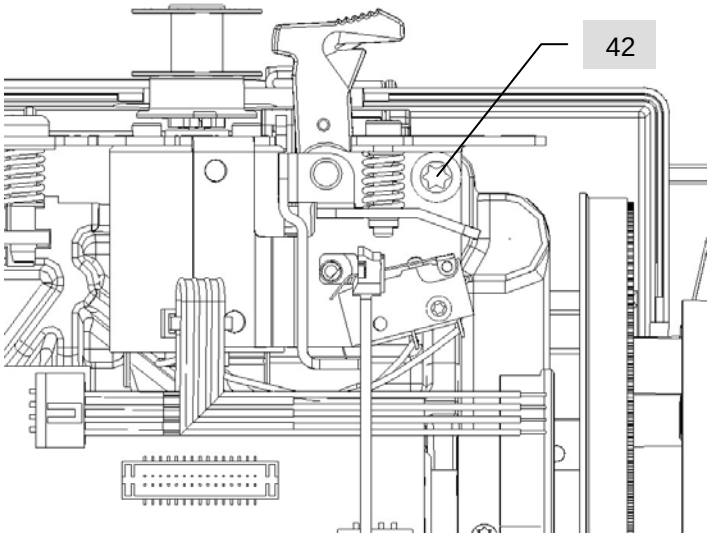
4.17 Winder motor

Disassembly:

1. Remove covers.
2. Disconnect plug (**144**) from P-Print (**p. 26**).
3. Remove securing screw (**42**).
4. Replace winder motor.

Assembly:

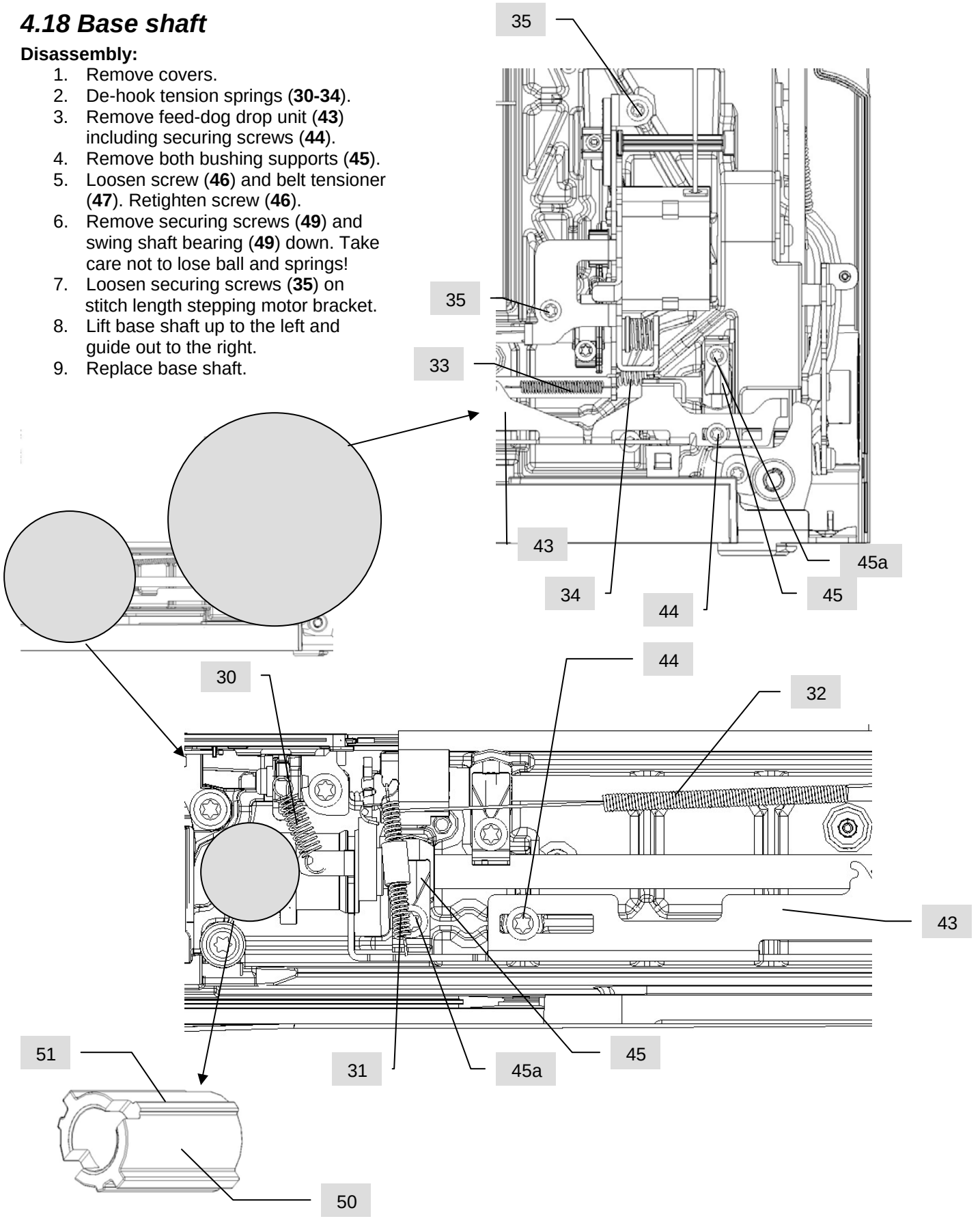
1. Fit new winder motor and fasten with the securing screw.
2. Reconnect P-Print plug (**144**) (**p. 26**).
3. Refit covers.
4. Test winder functioning (tests 3h and 4k,. **p.77 / 86**)
5. Adjust winder function.



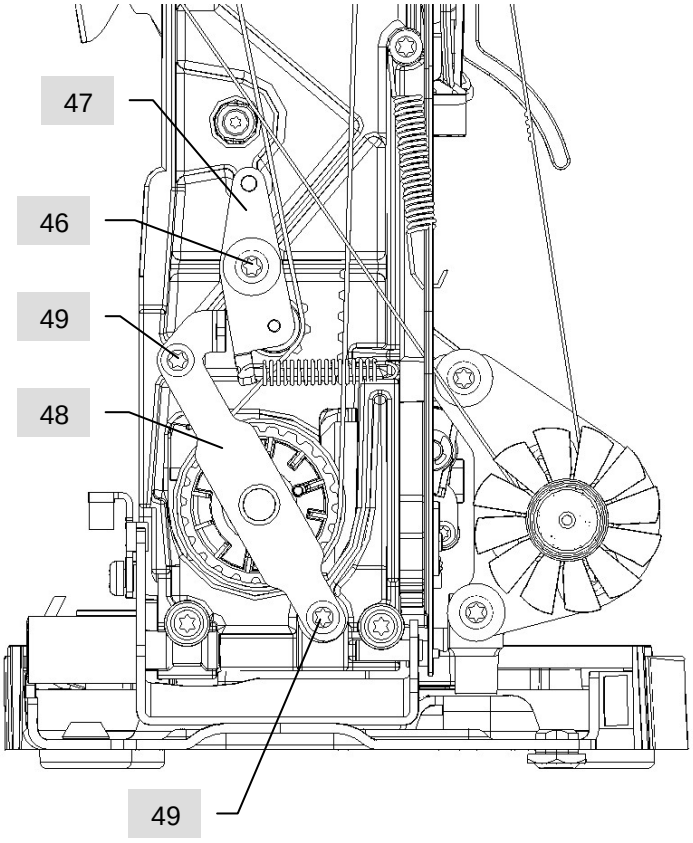
4.18 Base shaft

Disassembly:

1. Remove covers.
2. De-hook tension springs (**30-34**).
3. Remove feed-dog drop unit (**43**) including securing screws (**44**).
4. Remove both bushing supports (**45**).
5. Loosen screw (**46**) and belt tensioner (**47**). Retighten screw (**46**).
6. Remove securing screws (**49**) and swing shaft bearing (**49**) down. Take care not to lose ball and springs!
7. Loosen securing screws (**35**) on stitch length stepping motor bracket.
8. Lift base shaft up to the left and guide out to the right.
9. Replace base shaft.



Assembly:



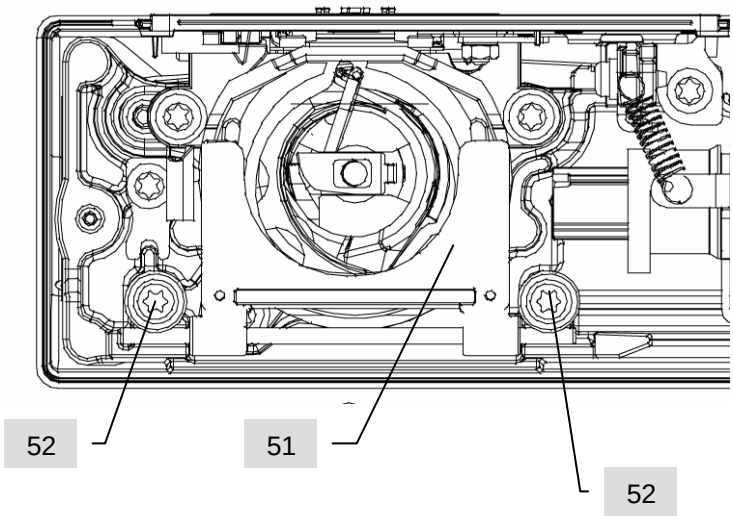
1. Pin needle drive balance piece and hook drive crank – artista 630 requires removal of motor in addition to this.
2. Slide new base shaft in pinning position and in mesh with the hook drive crank gear.
   Caution! Edge (**51**) at pinning position (**50**) must be to the front (**see picture 2 on page 49**).
   Note: At the same time the feed-dog is at the lowest position.
3. Secure the bushing supports (**45**).
4. Tighten screws (**35**) to fasten stitch length stepping motor.
5. Place drive belt on bevel gear and tighten belt tensioner (**47**) with tension spring. Tighten screw (**46**).
6. Refit shaft bearing (**48**) and adjust to a 0.1-0.3 mm springing by tightening screw (**49**).
7. Remove pinning gauges.
8. Refit feed-dog drop unit and tighten securing screws (**44**).
9. Re-hook tension springs (**30-34**).
10. Adjust hook (synchronization), (**p. 50 -**).
11. Refit main motor and tighten belt.
12. Refit ventilator fan.
13. Refit covers.
14. Check position of synchronizing disc (SP test 3n, **p. 79**).
15. Calibrate speed (SP test 4f, **p. 84**).
16. Carry out a functional check. Sew-off.

Note:
The bevel gear is pressed onto the base shaft.

4.19 artista 630 hook race ring

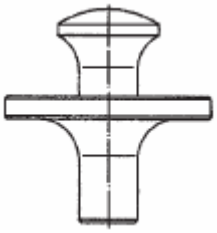
Disassembly:

1. Remove covers.
2. Remove stitch plate including stitch plate frame.
3. Remove securing screws (**52**) and hook race cover (**51**).
4. Remove screw (**53**) and hook drive (**53a**).
5. Remove the 3 screws (**55**) and hook race (**54**).
6. Remove thread guide and thread positioning plate (**56**).
7. Replace hook race ring.



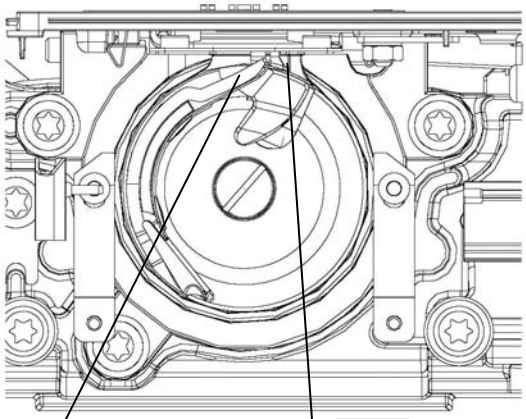
Assembly:

1. Refit thread guide and thread positioning plate onto new hook race ring.
2. Use hook race gauge (006765.71.00) to fit hook race ring. Don't tighten the screws yet.
3. Set stitch length crank manually to shortest stitch length (to stop position).
4. Set needle bar to highest position.
5. Position CB centering gauge in hook race ring.
6. Place V-notched paralleling gauge on feed-dog shaft (**14 and 15 on p. 38**) and hook race ring (**16 and 17 on p. 38**).
7. Slightly press paralleling gauge against the four supporting points. Check position of centering gauge.
8. Retighten screws (12). Check the position again after tightening the screws!
9. Slide hinge pin for hook cover back in. Tighten screws (52).
10. Set toothed rack to the left (needle bar must be at the same time in its highest position.
11. Slightly lift toothed rack.
12. Fit driver and washer as follows:
    Make sure to align the driver arm (58) at its pivoting point with the thread guide (57) (they must be approx. in line).



CB hook centering gauge 006765.71.00

13. Retighten screw (53).
14. Refit hook race cover.
15. Check feed-dog lateral position.
16. Refit covers.
17. Calibrate speed.
18. Carry out a functional check.
19. Sew-off.



Note:
Supporting points of gauges and positions see pictures on page 37.

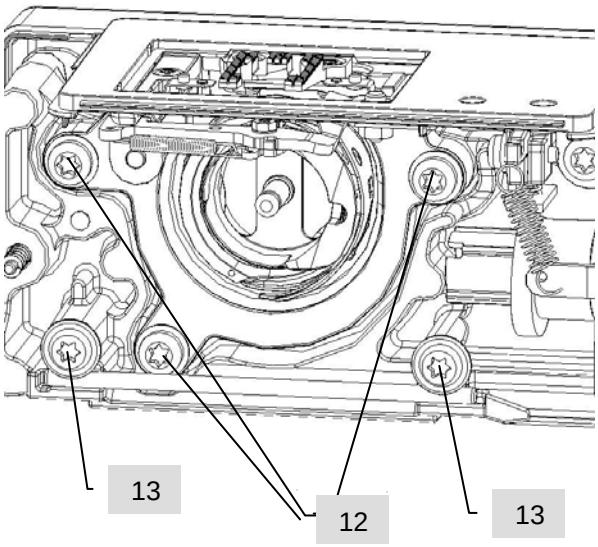
4.20 artista 640 stitch plate holder

Disassembly:

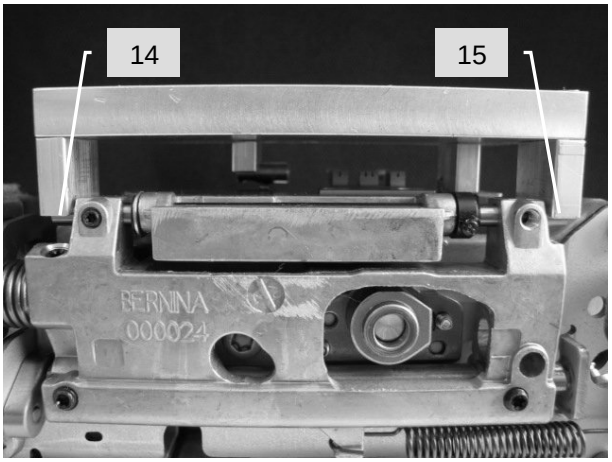
1. Remove covers.
2. Remove rotary hook (**see p. 39**).
3. Loosen screws (**13**) so that the hinge pin can be slided out to the left.
4. Remove the 3 screws (**12**) and stitch plate holder.

Assembly:

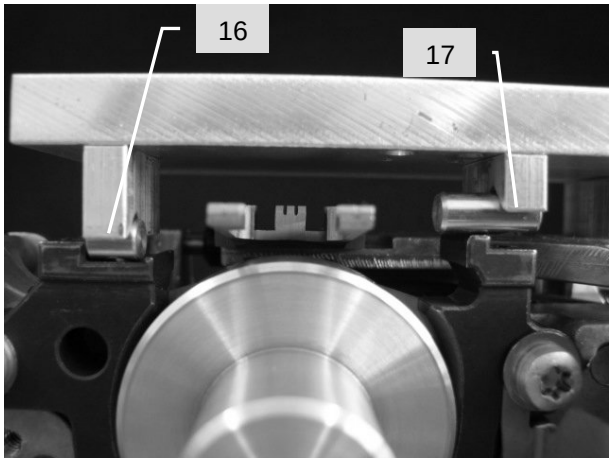
1. Slide stitch plate holder back in and attach screws (**12**). Stitch plate holder must still be movable.
2. Set stitch length crank manually to shortest stitch length (to stop).
3. Set needle bar to highest position.
4. Position centering gauge in stitch plate holder.
5. Place V-notched paralleling gauge on feed-dog shaft (**14 and 15**) and stitch plate holder (**16 and 17**).
6. Slightly press paralleling gauge against the four supporting points. Check position of centering gauge.
7. Retighten screws (**12**). Check the position again after tightening the screws.
8. Slide hinge pin back in. Tighten screws (**13**).
9. Slide hook back in.
10. Set belt tension.
11. Fit and set bobbin case retainer.
12. Adjust hook.
13. Check feed-dog lateral position.
14. Refit covers.
15. Carry out a functional check.
16. Sew-off



Rear view



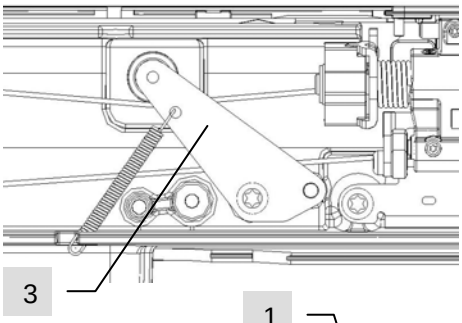
Front view



4.21 Rotary hook (RH), cutting blade and hook drive belt in artista 640

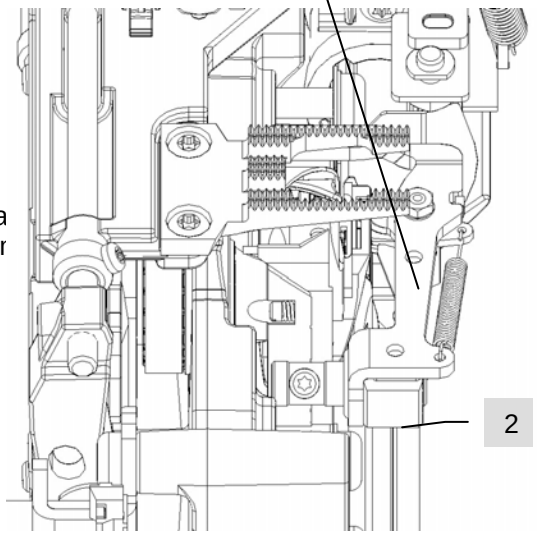
Disassembly:

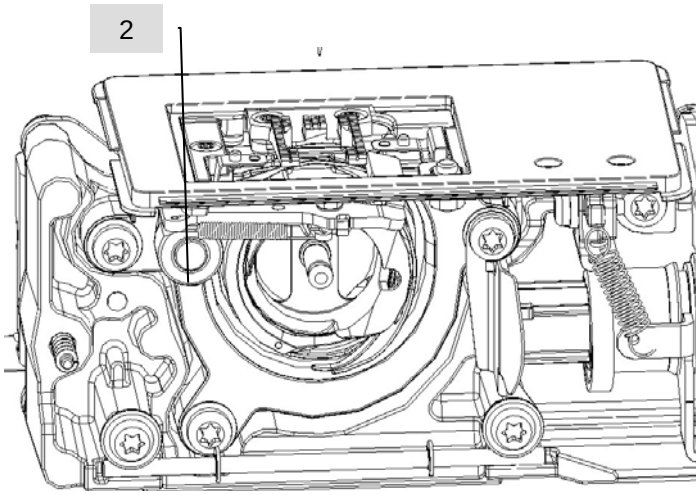
1. Remove back cover.
2. Remove stitch plate.
3. Loosen screw (**2**) and bobbin case retainer (**1**).
4. Remove belt tension screw (**3**).
5. Remove tensioner, disassemble, then clean and oil idler pulley shaft.
6. Remove flat headed screw (**7**).
7. Pull hook out to the front.
8. Slide drive belt out and remove.
9. Remove two cutting blade screws.
10. Replace cutting blade.
11. Check hook for smooth operation, clean and lubricate,
12. Remove any burr from hook tip, hook body and retainer

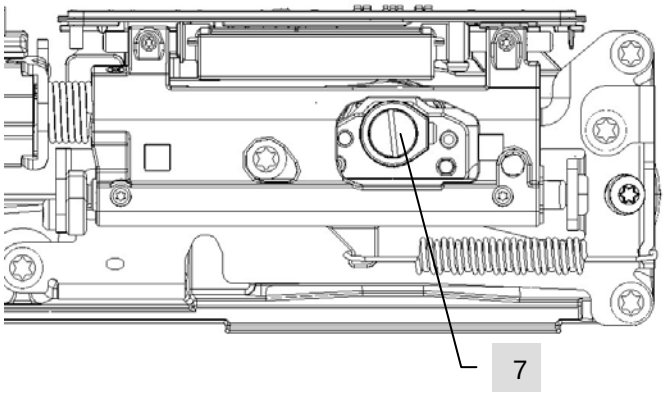


Assembly:

1. Position new cutting blade and tighten the two screws.
2. Slide drive belt in.
3. Slide hook into drive belt from the front, and tighten flat hea
4. Refit belt tensioner and tighten drive belt (is tightened autor screw (**3**) and check ease of run.
5. Refit and set bobbin case retainer (**p. 49**).
6. Check hook setting. Adjust if necessary (**p. 52 -**).
7. Refit covers.
8. Carry out a functional check.
9. Sew-off.



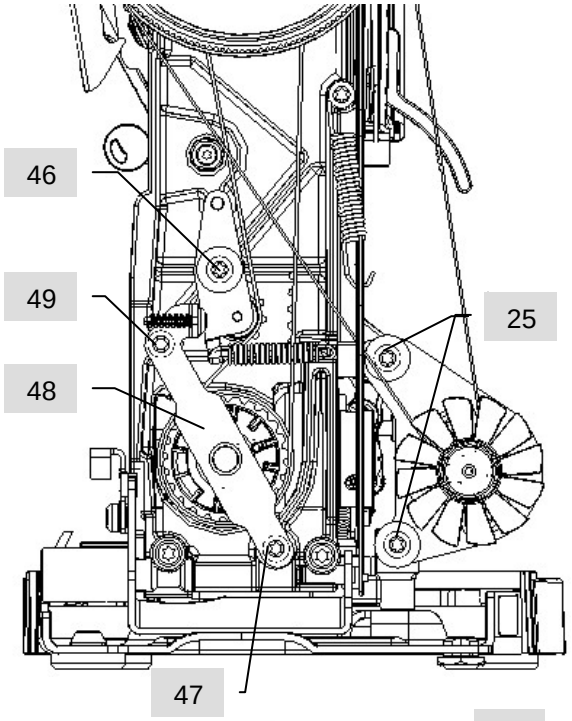




4.22 Drive belt (synchronization of main and base shaft)

Disassembly

1. Remove covers.
2. Loosen the two motor bracket screws (**25**) and pull drive belt off hand wheel.
3. Remove screw (**46**) and belt tensioner (remove tensioner, clean and oil idler pulley shaft).
4. Remove shaft bearing (**48**) screw (**49**). Swing shaft bearing down, taking care not to move the bevel gear out of mesh.
5. Slide belt tensioner out down, and remove it from the top over the hand wheel.



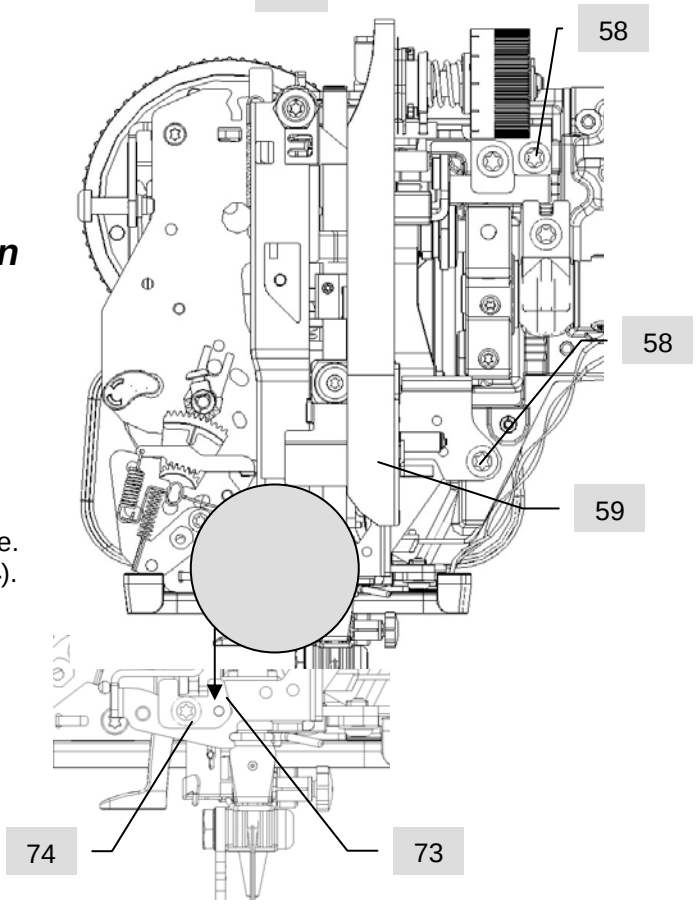
Assembly:

1. Pin balance piece and base shaft. Cylinder flute (edge) must face front (see **p. 50 CB and 52 RH**)
2. Fit new drive belt and belt tensioning pulley (note the pinning positions.)
3. Refit the shaft bearing bracket (**48**) – 0.1-0.3 mm play between bearing shaft and bracket. Adjust with screw (**47**)
4. Tension drive belt – turn hand wheel back by a half rotation, tighten screw (**49**).
5. Adjust synchronisation, (**p. 50 CB and 52 RH**).
6. Refit main motor (**p. 30**).
7. Refit covers.
8. Calibrate speed – Service Program test 4f (**p. 84**).
9. Carry out a functional check.
10. Sew-off.

4.23 artista 630 upper thread tension

Disassembly:

1. Remove covers.
2. Remove securing screws (**58**).
3. Replace thread tensioner (**59**).



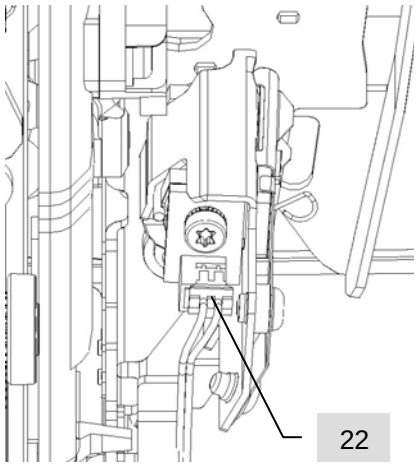
Assembly:

1. Fit new thread tensioner and tighten securing screws (**58**).
2. Note the position of the thread tension release.
3. Set the stitch width limiter (**73**) with screw (**74**).
4. Refit rear and front covers.
5. Set thread tension (**p. 63-**).
6. Adjust thread regulator spring (**p. 65**):
7. Check thread tension release mechanism. (**p. 61**)
8. Sew-off.

4.24 artista 640 upper thread tension

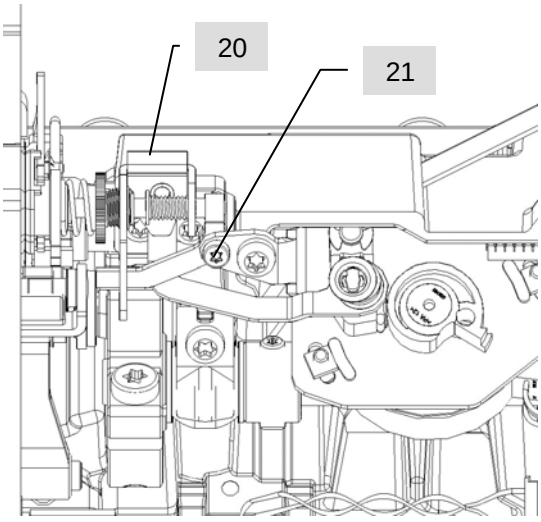
Disassembly:

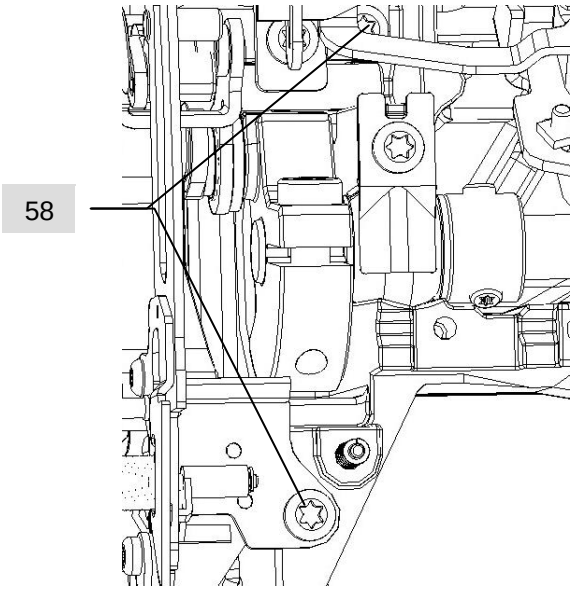
1. Remove covers.
2. Disconnect thread clamp magnet (**22**)
3. Remove link clip (**20**).
4. Remove screw (**21**).
5. Remove the two securing screws (**58**).
6. Remove thread tension unit.



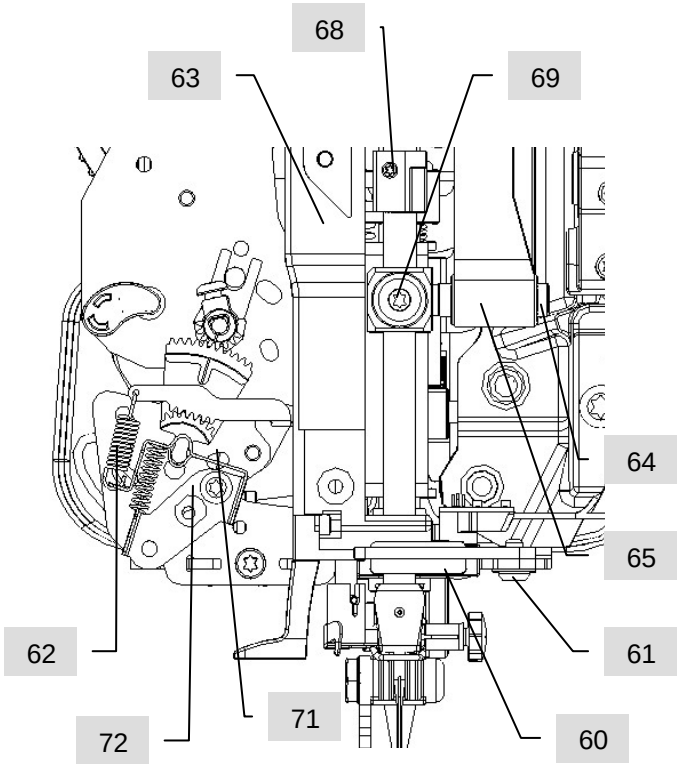
Assembly:

1. Fit new thread tension unit and tighten securing screws (**58**) and (**21**).
2. Refit link clip (**20**).
3. Note the position of the thread tension release.
4. Set the stitch width limiter (**73**) with screw (**74**).
5. Reconnect thread clamp magnet plug.
6. Refit rear and front covers.
7. Set thread tensioner (**p. 63-64**).
8. Set regulator spring (**p. 65**):
9. Check thread tension release mechanism. (**p. 61**)
10. Sew-off.





4.25 Thread take-up lever, thread take-up lever crank, needle bar and link piece

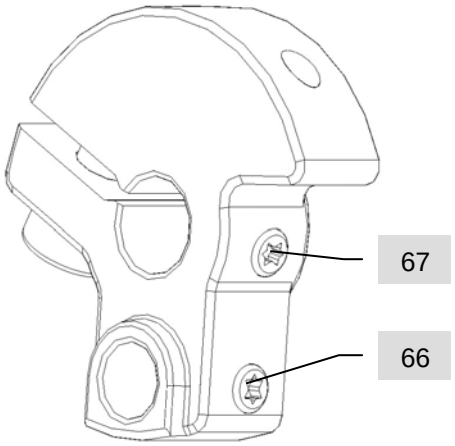


Disassembly:

1. Remove covers.
2. Remove CFL light (**p. 28**).
3. Remove upper thread tension unit (**p.40-41**).
4. Loosen securing screw (**61**) and remove angular adjusting piece (**60**).
5. De-hook zigzag segment tension spring (**62**).
6. Pull needle bar support (**63**) forward at the bottom to pull thread take-up crank (**64**) out from the crank guide piece (**65**) on the left. (Don't lose the needle bar support cam!)
7. Loosen screws (**68**) and (**69**) and pull needle bar down out of the needle bar support.
8. With artista 640, loosen screw (**68**), disengage needle bar and pull down out of the needle bar support.
9. Loosen balance piece (**67**) screw (**66**). Pull crank out from the balance piece from the left (Don't lose the washer!)
10. Pull thread take-up lever out from link piece out from the right.
11. The link piece can be replaced by loosening the screw and sliding it off the shaft.
12. Replace thread take-up lever, link piece, needle bar and/or crank.

Assembly:

1. Refit link piece.
2. Put thread take-up into link piece.
3. Put crank into thread take-up and washer into balance piece.
4. Put thread take-up crank into crank guide piece (**65**).
5. Slide needle bar back into needle bar support. Tighten screws (**68**) and (**69**) provisionally.
6. With artista 640, slide needle bar into needle bar support, and engage basting clutch into needle bar. Tighten screw (**68**) slightly.
7. Insert needle bar support cam, push needle bar support back in, insert zigzag segment in gear center. Re-hook tension spring and set the thread take-up unit with the angular adjusting piece free of play.
8. Refit upper thread tension unit.
9. With artista 640, set basting magnet (**p. 62**).
10. Refit CFL light, making sure that the cables are placed correctly.
11. Refit covers.
12. Set needle position.
13. Set needle height (**p. 55**) and threader position. Tighten screws (**66**) and (**67**).
14. Calibrate speed. (SP test 4f, **p. 84**).
15. Carry out a functional check.
16. Sew-off.



Chapter 5
Adjustments

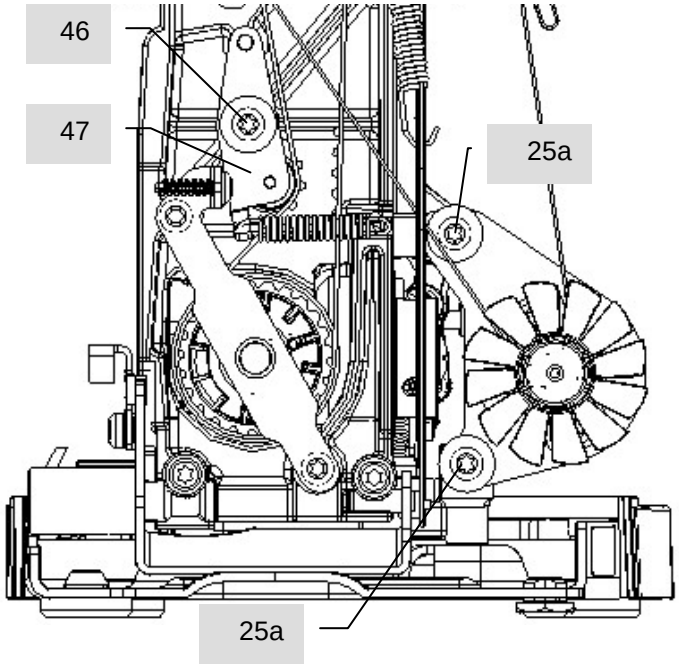
Important:
To enable the work described to be performed correctly, the sewing / embroidery computer must be in good mechanical and electrical condition (running smoothly, properly lubricated and all leads connected)! When adjustments are carried out in the correct order, the sewing / embroidery computer will function without a problem.
Important:
Always use a size «Nm 80» needle when adjusting and setting the machine, unless otherwise specified. Always check the needle before carrying out adjustments on the sewing/embroidery computer! It must be absolutely straight **(130/705 H TCN)**.
When servicing, always use genuine BERNINA parts and accessories, either the ones supplied with the machine or purchased afterwards. These are the following: Mains cable, foot control, buttonhole foot, bobbin case with bobbin, BSR foot (if applicable) and other accessories.

5.1 Tensioning the drive belt

- Slightly loosen the securing screws (**25a**).
- Position the motor as required. Retighten both screws.

Tensioning:

- The drive belt is correctly tensioned when there is about 5mm play at half height of the belt when pushing against it slightly.
- Check for ease of movement.

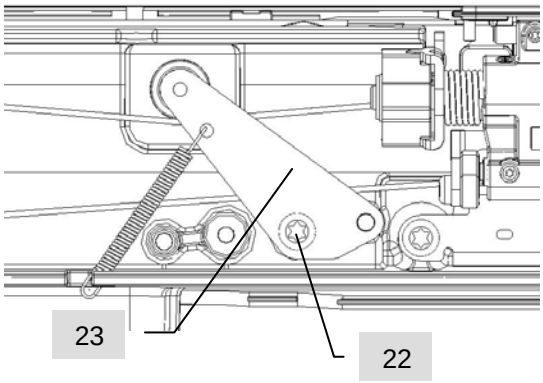


5.2 Tensioning the base shaft belt

- The belt is automatically tensioned by the belt tensioner and tension spring.
- Slightly loosen screw (**46**) of the idler pulley (**47**).
- Turn hand wheel back by half rotation.
- Retighten screw (**46**).

5.3 artista 640 hook drive belt tension

- The belt is automatically tensioned by the belt tensioner and tension spring.
- Slightly loosen screw (**22**) of the idler pulley (**23**).
- Turn handwheel forward and backward.
- Retighten screw (**22**)



5.4 Bobbin winder

Standard:

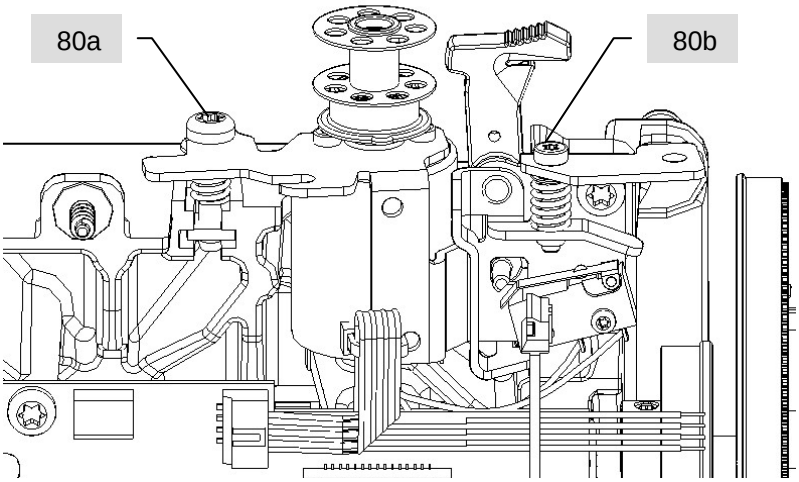
- The thread should be evenly wound with the pre-tension unit, and the bobbin should be correctly filled.

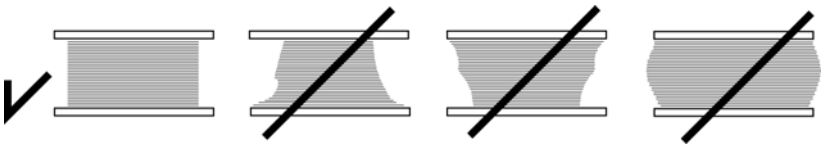
Correcting uneven filling:

- Turn screw (**80a**) in or out as appropriate.

Correcting the bobbin filling:

- Turn screw (**80b**) in or out as appropriate.





Note:

- Use the bobbin adjustment gauge as described below to check the filling level. Item # 031 939 7000.

1. Fit the gauge over the bobbin winder spindle.
2. Turn the gauge until the flat on the gauge is exactly opposite to the switch lever of the winder device.
3. Activate the switch lever as you would do when bobbin winding.
4. The switch lever must now contact the flat on the gauge.
5. When the gauge is now rotated, the switch lever must disengage.
6. If this is not the case then a correction can be made by turning the screw # **80b**.

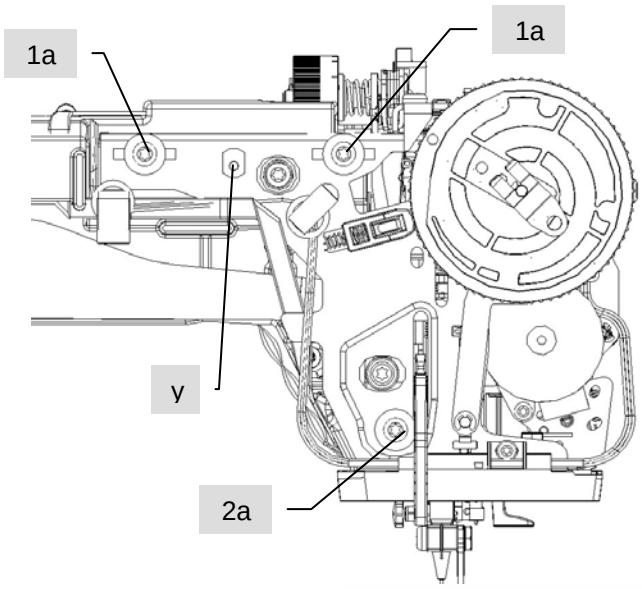
5.5 Position of the head frame plate

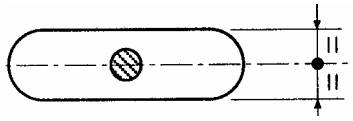
Standard:

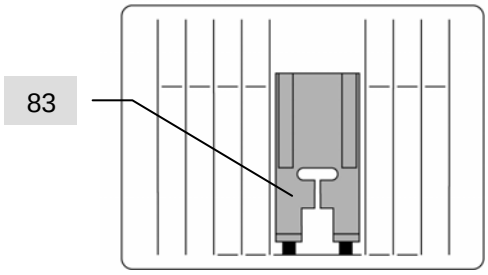
- Presser foot must be in the center of the stitch plate.
- A size 100 needle must be in the center of the stitch hole in the needle plate.

Correction:

- Attach presser foot no. 1
- Loosen screws (**1a slightly**) and (**2a**). Reposition head frame plate (using eccentric key 031 563.50.00 at point **Y**) in such way that the presser foot is centered in the stitch plate.
- Tighten screw (**1a**).
- Remove presser foot and insert a size 90 needle.
- Turn screw (**2a**) in or out to center the needle in the stitch hole of the needle plate.







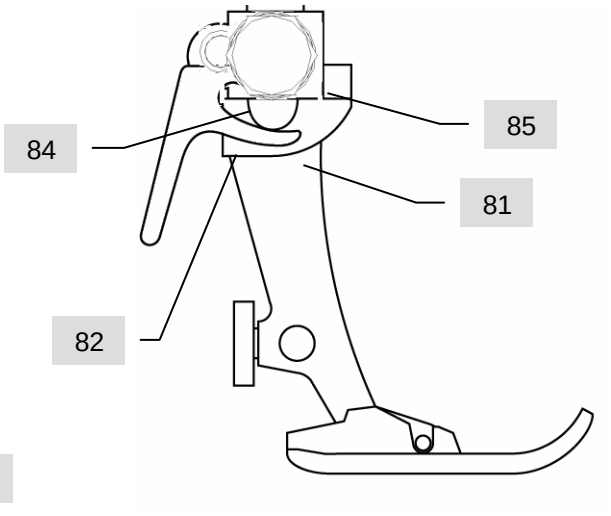
5.6 Presser foot fixation

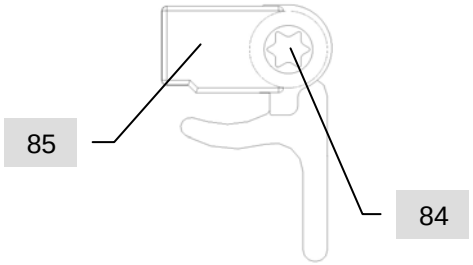
Standard:

- Using a new presser foot, the tension pin (**81**) should be positioned one third to halfway along tension lever (**82**). The presser foot sole (**83**) should be positioned parallel to the markings on the stitch plate.

Correction:

- Loosen screw (**84**) on clamp (**85**).
- Adjust clamp (85 in height) until correct tension position is reached (1/3 along the tensioning lever).
- Align the presser foot sole (**83**) with the markings on the stitch plate.
- Tighten screw (**84**).

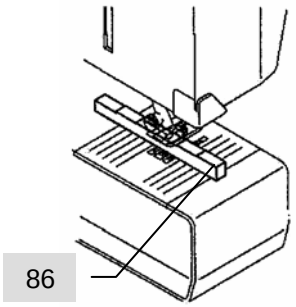




5.7 Presser foot height

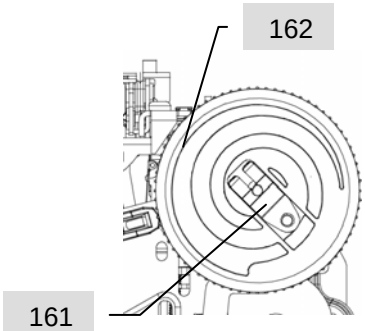
Standard:

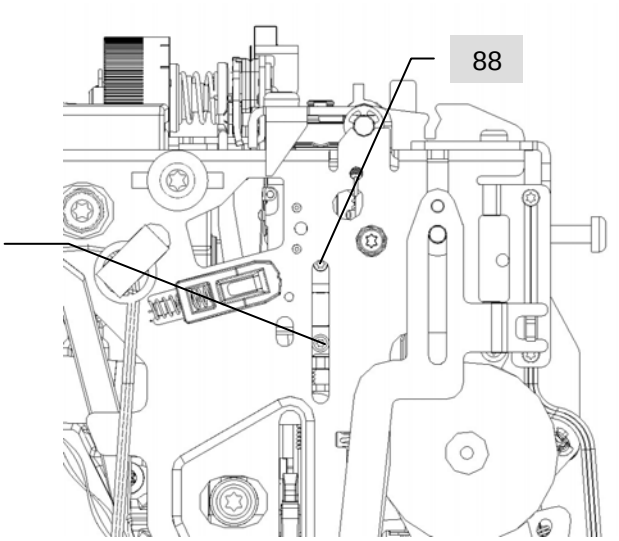
- Drop feed-dog. Attach presser foot no. 1
- Raise presser foot lifter lever.
- Use 7.5mm presser-foot height gauge (**86**) to check height.



Correction

- Remove adjusting wheel lock (**161**).
- Remove carefully the adjusting wheel (**162**) so that the spring loaded pressure lever remains in place.
- Raise lifter lever.
- Loosen presser-foot bar guide screw (**64**).
- Place presser foot on gauge (**86**), keeping it parallel to markings on stitch plate.
- Press presser-foot bar down by hand.
- Retighten screw (**64**).
- Refit adjusting wheel (**162**). Make sure the pressure lever fits into the spring, into the potentiometer and the guide of the adjusting wheel.
- Refit adjusting wheel lock (**161**). Check functioning.

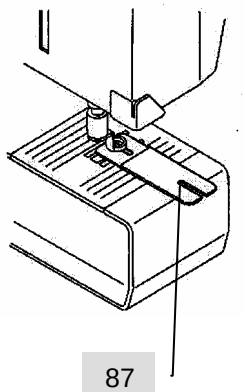




5.8 Darning foot height

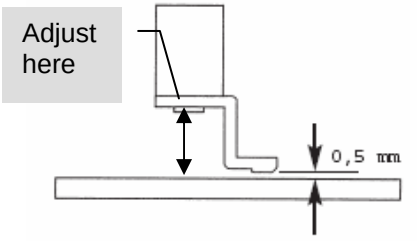
Standard:

- Attach darning foot no. 9 or drop-shaped foot no. 26.
- Drop feed-dog.
- Turn the handwheel until the presser-foot bar reaches its lowest position.
- Use gauge (**87**) to check distance (0.5 mm) between stitch plate and darning foot sole.



Correction:

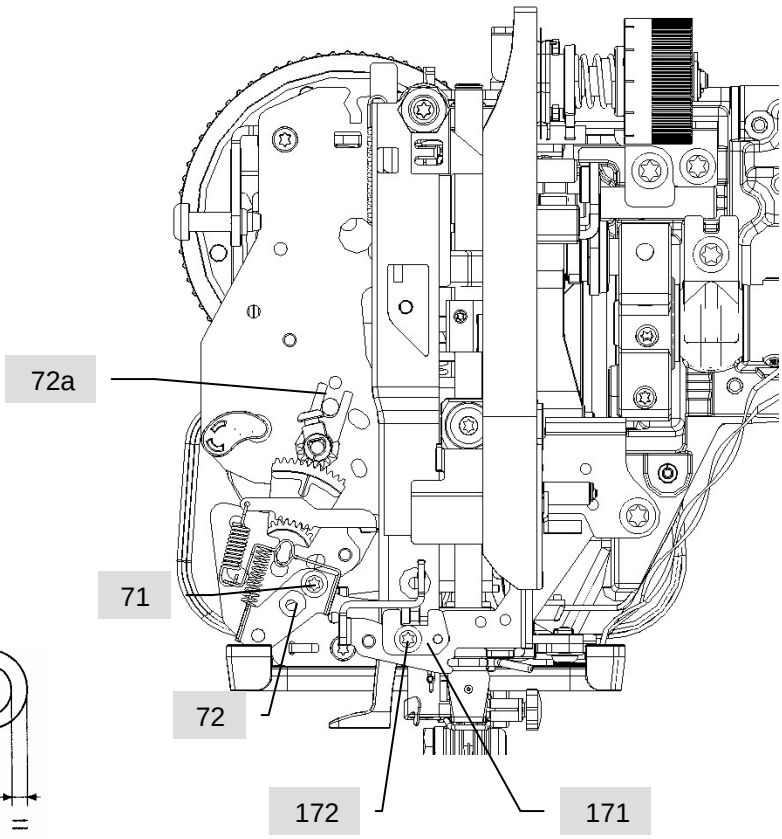
- Remove adjusting wheel lock (**161**).
- Remove carefully the adjusting wheel (**162**) so that the spring loaded pressure lever remains in place.
- Pin loop lift position on balance piece (darning foot at lowest position).
- Loosen screw (**88**) on hopper mechanism lever.
- Move presser foot bar up or down, as appropriate to correct the level.
- Create the distance of 0.5mm by lifting up the presser foot as shown
- Use gauge (**87**) to check correct level.
- Tighten screw (**88**) (note cam position).
- Refit adjusting wheel (**162**). Make sure the pressure lever fits into the spring, into the potentiometer and the guide of the adjusting wheel.
- Refit adjusting wheel lock (**161**). Check functioning.



5.9 Straight stitch needle position (needle distribution)

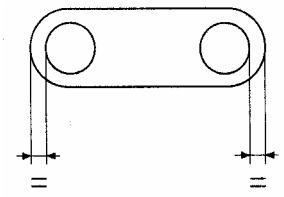
Standard:

- In service program basic setting, select test 4e (**p. 83**).
- Stitch width stepping motor must be in pinning position (**72a**). If necessary, adjust this first.
- Switch machine off ("0").
- Pin stitch width stepping motor.
- The needle must be in the center of the stitch plate.



Check:

- Set maximum stitch width.
- The needle mustn't touch the right or left side of the stitch plate.
- **Note:** It is necessary to use a 9mm sensor presser foot for the 9mm stitch width on the artista 640.



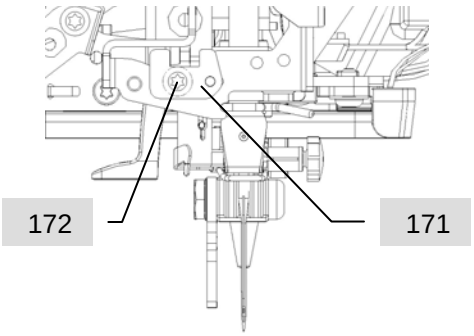
Correction:

- Slightly loosen securing screw (**71**).
- Use eccentric key (001361.70.00) in cut-out (**72**) to adjust needle bar support until the prescribed needle position in the stitch plate is reached.
- Retighten screw (**71**).

5.10 Stitch width limiter

Standard:

- Power machine. Set to maximum stitch width. Needle bar support
- in needle position left and right must be equally distributed in the limiter (**171**).
- It is necessary to use a 9mm sensor presser foot for the 9mm stitch width on the artista 640.



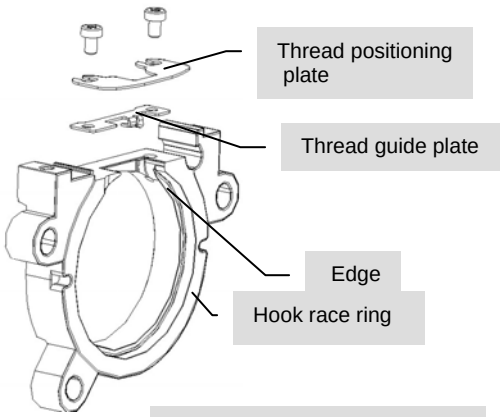
Correction:

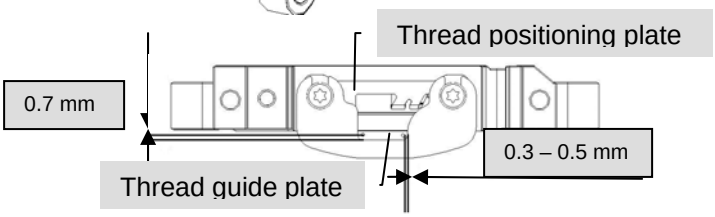
- Loosen screw (**172**) and move stop (**171**) as appropriate to avoid that the needle bar support touches the limiter (**171**).
- The needle bar support must not hit the stitch plate in either position, left or right.
- Retighten screw (**172**).

5.11 Thread guide plate plate adjustment on artista 630

Standard: the thread guide plate must lie at a distance of 0.3mm to 0.5mm from right needle penetration point, and at a distance of 0.7mm from hook race ring.
The finger guide of the thread positioning plate must lie flush against hook race ring.

Correction:
Align thread guide plate and thread positioning plate in such a way that the distances are within the mentioned tolerances.
Attention: The thread positioning plate must be pushed to the rear (against hook race ring), when tightening the screws!



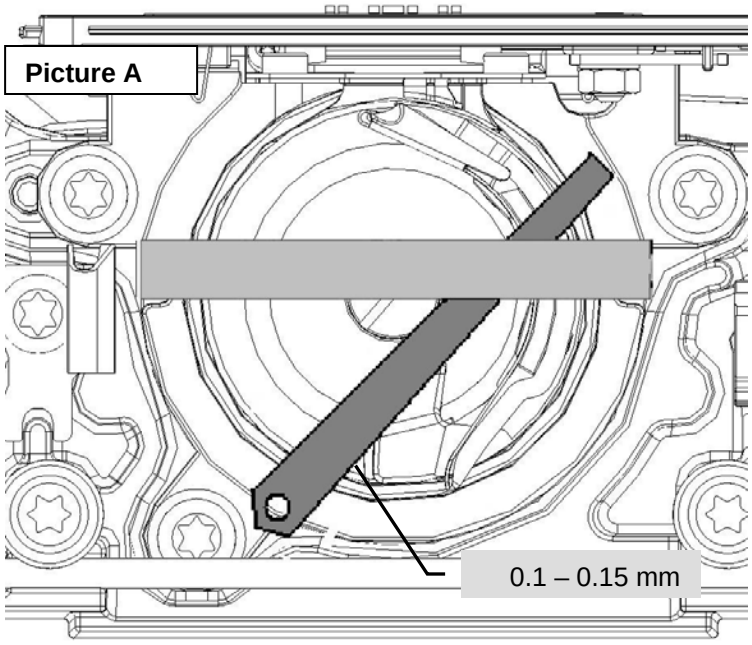


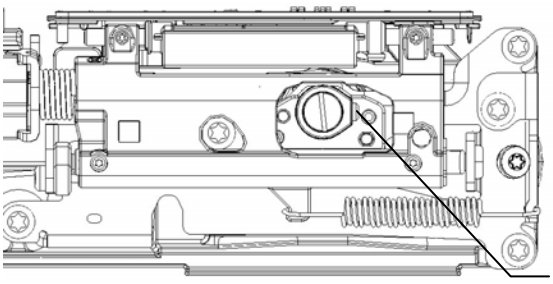
5.12 Position of driver in hook race of artista 630

Basic position of driver:
see **page 37**

Standard:
The hook driver should be 0.1–0.15mm behind the front edge of the hook race.
See picture (**A**) for measuring method

Correction:
Loosen driver shaft screw (**169**).
Move complete driver into prescribed position.
Retighten screw (**169**).

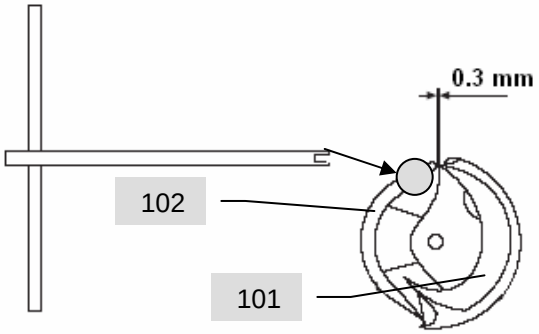




5.13 Thread passage on artista 630

Standard:
The play between hook (**101**) and hook drive (**102**) must be 0.3mm.
Use 0.3mm gauge (item no. 398 022 030) to check.

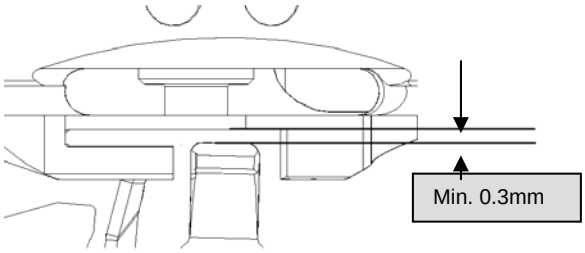
Correction:
If the distance is too wide or too small, adjust the short driver arm with the hook rectifying tool 001357.70.00.



5.14 Bobbin case retainer position on artista 640

- Proper adjustment of the bobbin case retainer is crucial for the correct functioning of the thread cutter and (**Picture 1)** the stitch formation of the thread.
- Therefore it is essential to check the individual zigzag stitches and the thread cutter for proper functioning on replacing the bobbin case retainer or the hook.

Picture 1



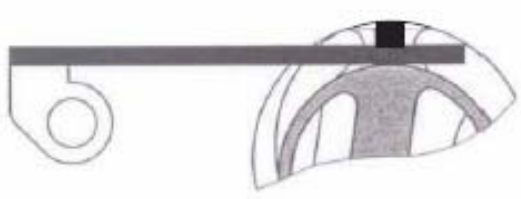
Standard:

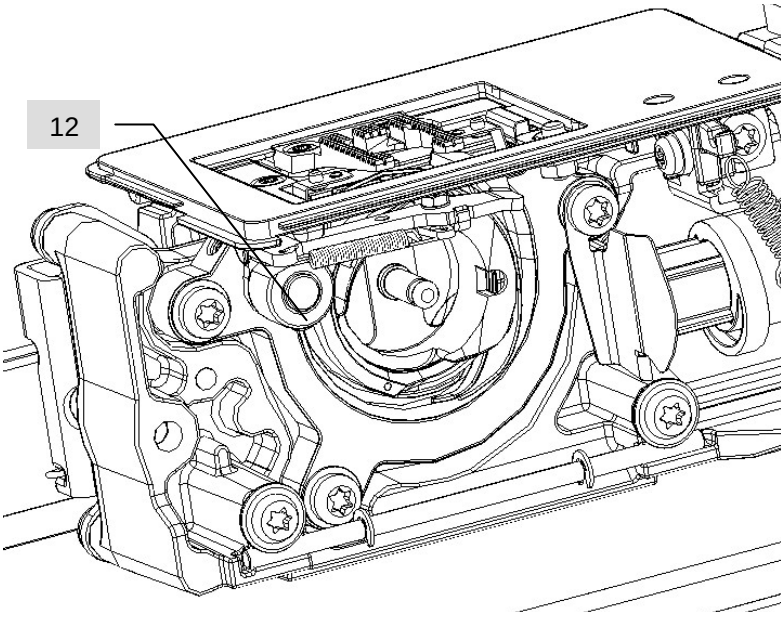
- Distance of 0.3mm from bobbin case carrier (thread passage play). (**picture 1)**.
- Top edge of bobbin case retainer nose must be flush with maximum radius of bobbin case carrier. (**picture 2**)

Correction:

- Remove stitch plate.
- Loosen securing screw (**12**)
- If necessary, move bobbin case stop axially and radially. Retighten securing screw (**12**).

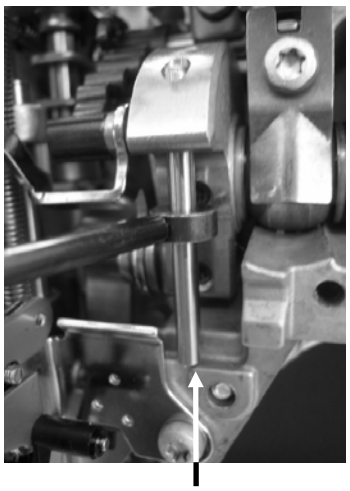
Picture 2



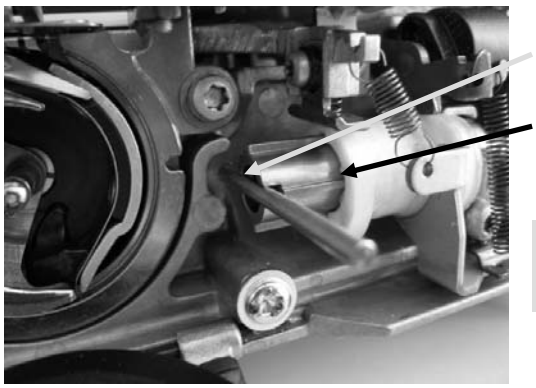


5.15 artista 630 CB hook, synchronization, feed and needle drive

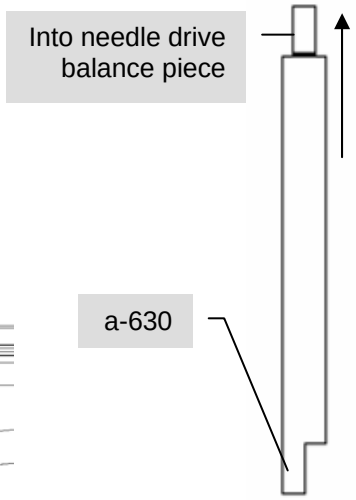
Standard:
Remove covers. Use pinning tool 030 349.70.00 to pin needle drive balance piece and tool 007 937.50.00 to pin base shaft. The hook drive crank must be able to be pinned in this position.

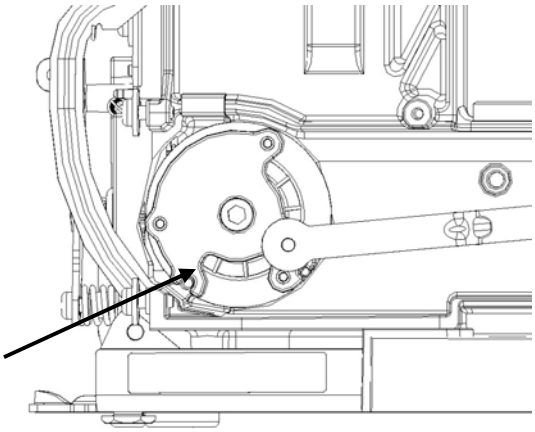


Needle drive balance piece pinning position. It must be against the frame.
Attention: *New gauge* 030 430.51.00



Base shaft pinning position. Pinning gauge 007 937.50.00 Cylinder flute must face front.



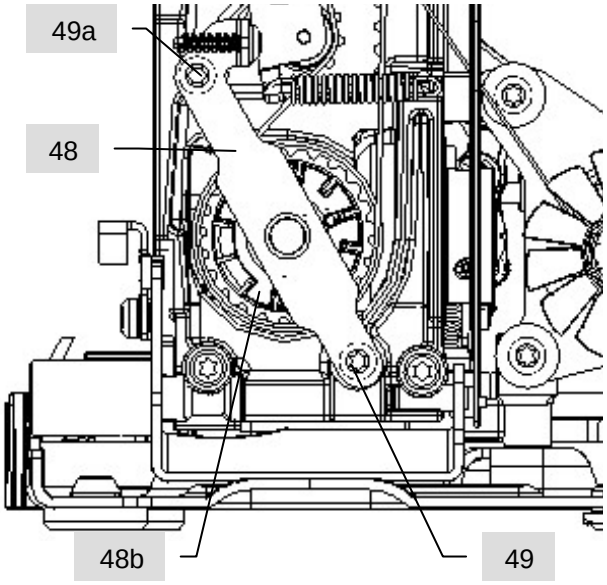


Hook drive crank pinning position

1st correction:
Pinning positions of base shaft and hook drive crank

- Remove the pin from the needle drive piece
- Remove screw (**49a**).
- Loosen screw (**49**).
- Swing ball bearing plate(**48**) down and remove ball.
- Pull out the drive gear (**shaft 48b**) so far as to be out of mesh.
- Pin hook drive crank.
- Push the drive gear (base shaft) back into mesh in such a way that the shaft can be pinned.
- Important: Cylinder flute (edge) must face front.
- Refit ball bearing (**48**) and screw (**49a**). Use screw (**49**) to adjust a springing movement of 0.1-0.3mm.

Important! Turn the hand wheel 1 revolution and test in 4 different positions.

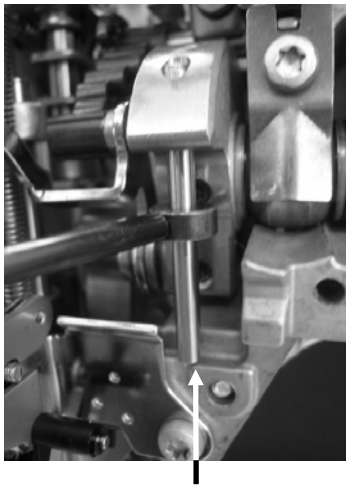


Note:
Drive gear and lift/advance eccentric are pressed onto the base shaft.

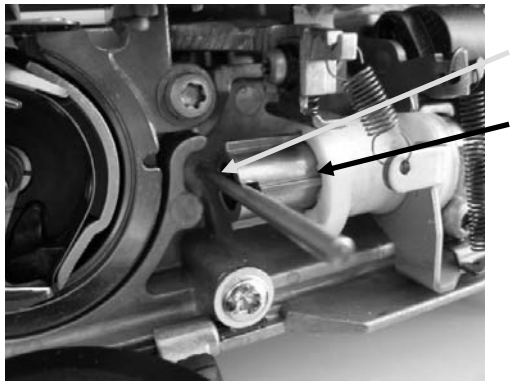
2nd correction:
Pinning position of base shaft and needle drive balance piece.

Correction:

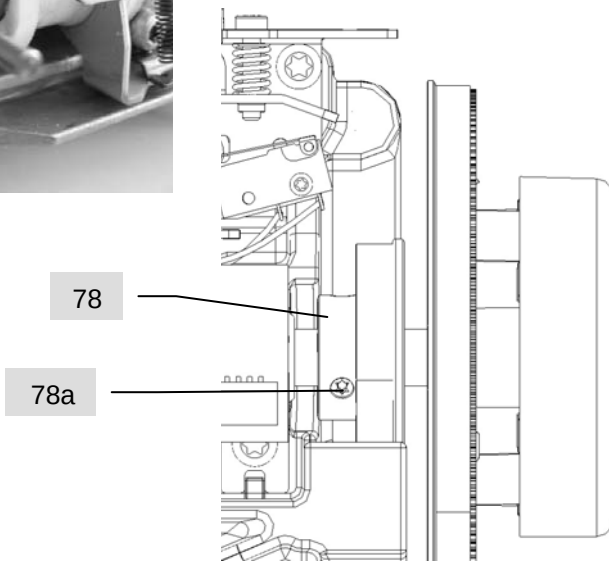
- Remove covers.
- Loosen two screws (**78a**) on the drive belt flange (**78**).
- Pin needle drive balance piece.
- Rotate base shaft until it can be pinned.
  Base shaft Cylinder flute must face front.
- Tighten the two screws (**78**).



Needle drive balance piece pinning position. It must be against the frame.
Attention: *New gauge* 030 430.51.00



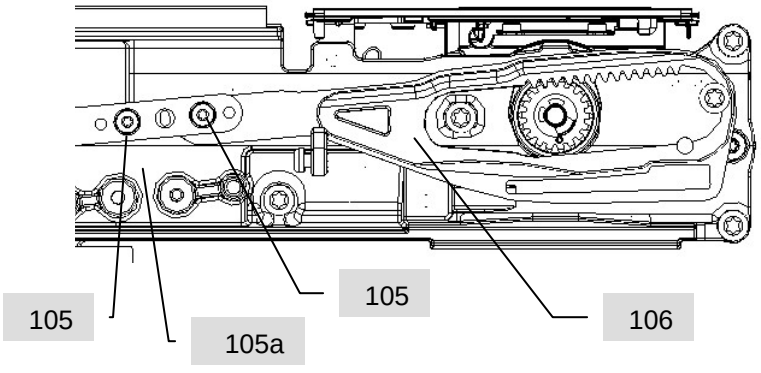
Base shaft pinning position. Pinning gauge 007 937.50.00 Cylinder flute must face front.

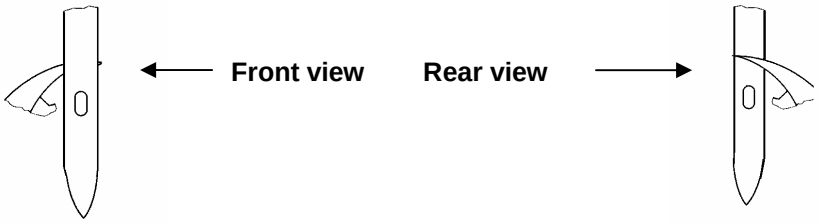


3rd correction:
Needle / hook point fine-adjustment

First check 2nd corrections – pinning positions of base shaft and hook drive crank.

- Remove covers.
- Pin needle drive balance piece and stitch width stepping motor in center needle position.
- Loosen two screws (**105**) on toothed rack guide piece (**106**).
- Use eccentric key (001361.70.00) to adjust toothed rack until hook point is flush with right needle edge (front view).
- Retighten screws (**105**).
- Refit covers.
- Carry out a functional check.
- Sewing-off





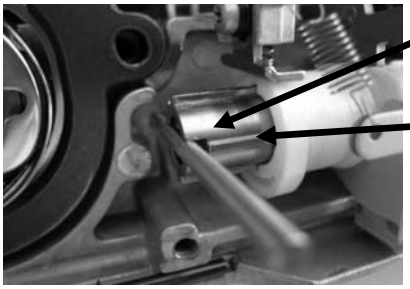
Note:

- The drive belt tension (synchronization) must be set before adjusting the loop lift.

5.16 artista 640 RH hook, synchronization, feed and needle drive

Standard:
Remove covers. Use pinning tool 030 349.70.00 to pin needle drive balance piece. Then use tool 007 937.50.00 to pin base shaft. The base shaft must be able to be pinned in this position.



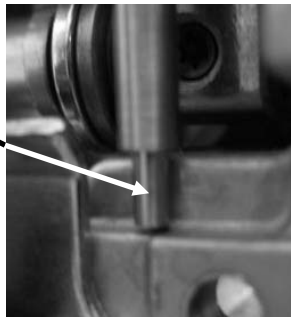


Base shaft pinning position. Pinning gauge 007 937.50.00
Cylinder flute must face front.

Into the needle drive balance piece

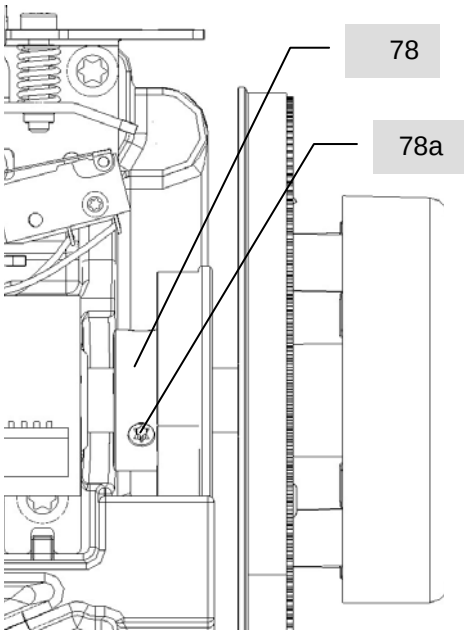
a-640

Needle drive balance piece pinning position. **The cylindrical end of the new pinning gauge 030 430.51.00. must be against the frame.**



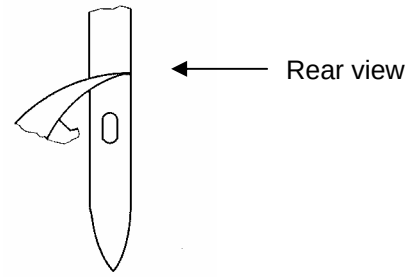
1st Correction*:*
Base shaft / needle drive balance piece pinning position.

- Loosen two screws (**78a**) on drive belt flange (**78**).
- Pin needle drive balance piece.
- Rotate base shaft until it can be pinned.
  Base shaft cylinder cam (flute) must face the front.
- Tighten the two screws (**78**).



Standard:
Needle / hook tip pinning position

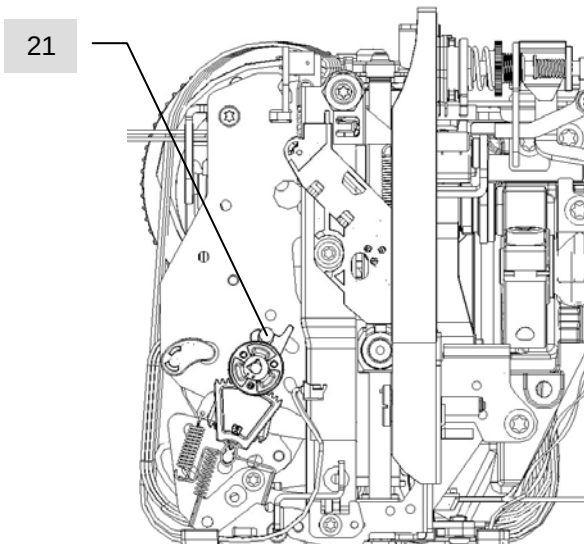
- Remove covers.
- Pin needle drive balance piece (**pinning tool 030430.51.00**), stitch width stepping motor and base shaft **(needle position center).**
- With rear view, the hook tip must be flush with the right hand
- needle edge.

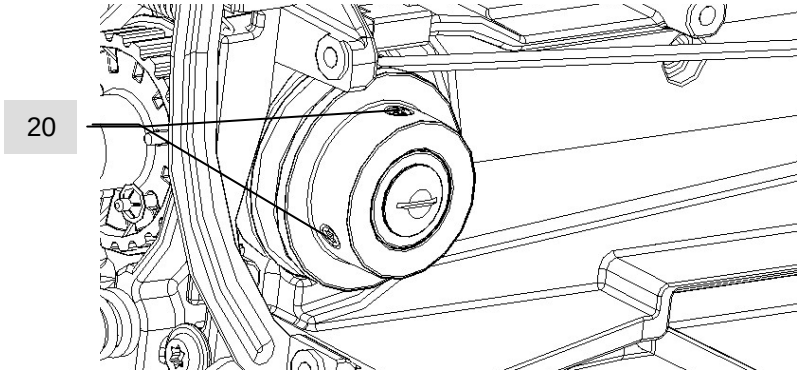


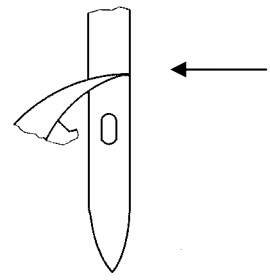
Rear view

2nd Correction:
Needle/hook point fine-adjustment

- Remove covers.
- Remove stitch plate.
- Loosen the two hook drive belt flange screws (**20**).
- Pin stitch width stepping motor (**21**) **(center needle position)**.
- Pin needle drive balance piece (pinning tool 030349.70.00).
- Turn hook via drive belt flange until hook tip is flush with right hand needle edge (rear view).
- Retighten the two hook drive belt flange screws (**20**).
- Refit stitch plate.
- Refit covers.
- Carry out a functional check.
- Sew-off.

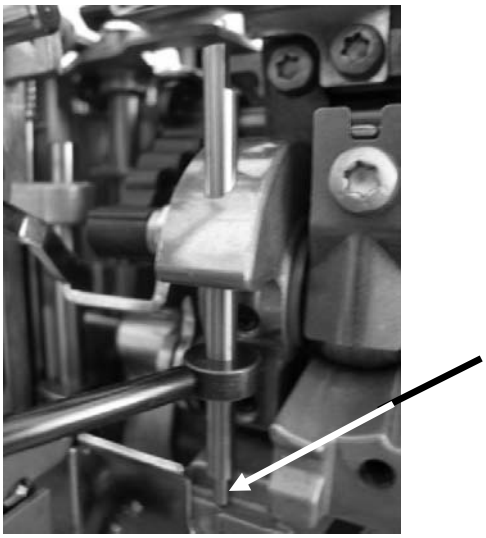




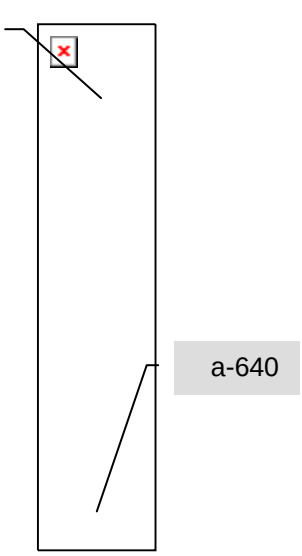


Note:

- The drive belt tension must be set before adjusting the loop lift.



Needle drive balance piece pinning position. **The cylindrical end of the new pinning gauge 030 430.51.00. must be against the frame.**



5.17 Needle/hook distance

Standard:

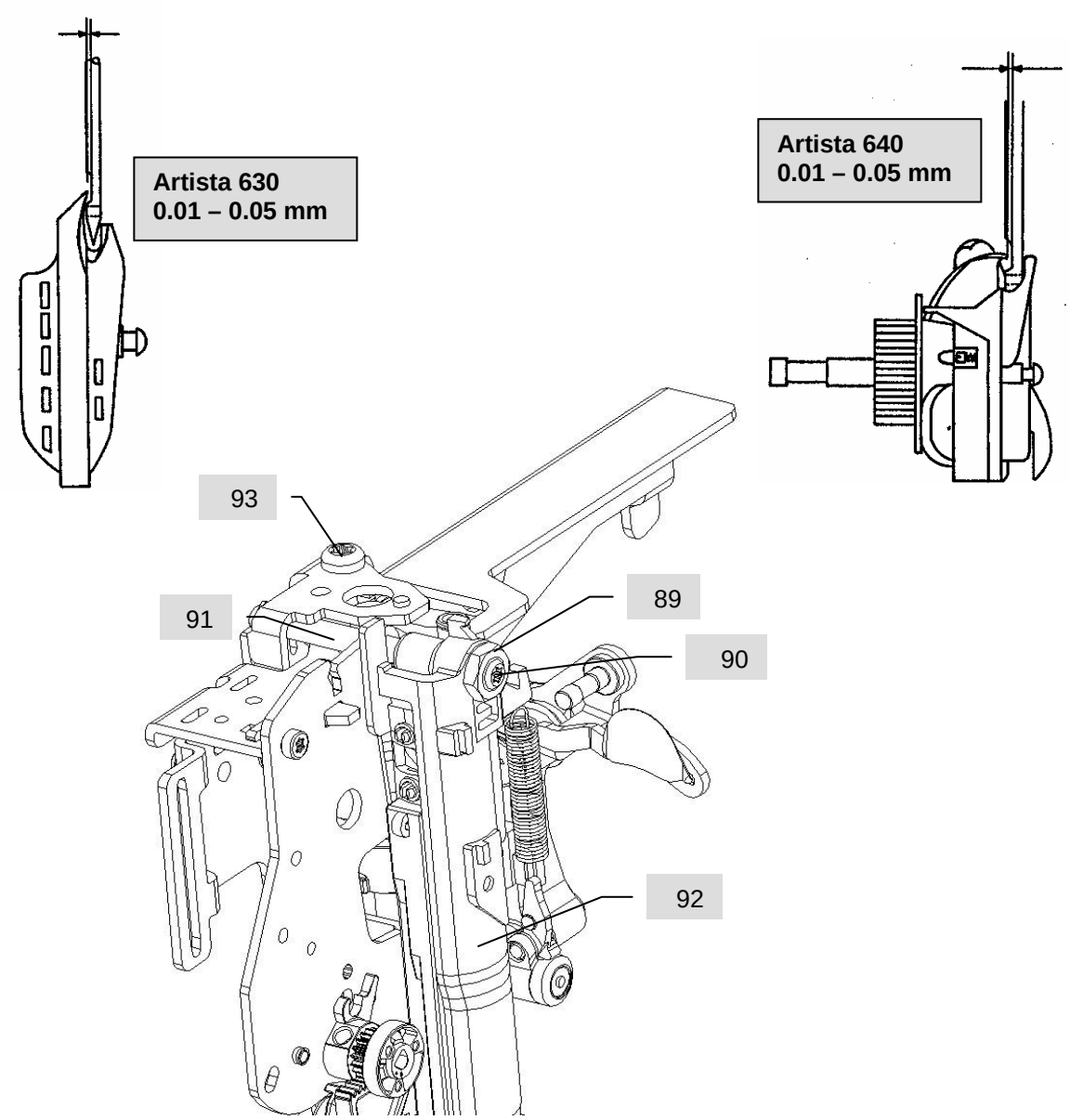
- **Remove stitch plate**. Warning! This must be done, before loosen screw (**93**)
- Insert needle (type 130/705 H TCN 80).
- The lateral distance between needle and hook (in the scarf) should be 0.01 mm to 0.05 mm.

Correction:

- Rough adjustment (if necessary): Slightly loosen screw (**93**) and move pivot pin (**91**) as appropriate.
- Retighten screw (**93**).
- Fine adjustment: Loosen nut (**89**). Using screw (**90**) move needle bar support (**92**) into its correct position.
- Tighten nut (**89**).

Note:

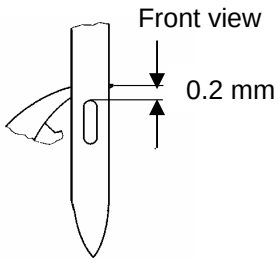
- **Check for correct needle movement in stitch plate (p. 45).**
- **There is no fine-adjustment on the first artista 630 models – they can only be adjusted using screw (93) and pivot pin (91).**

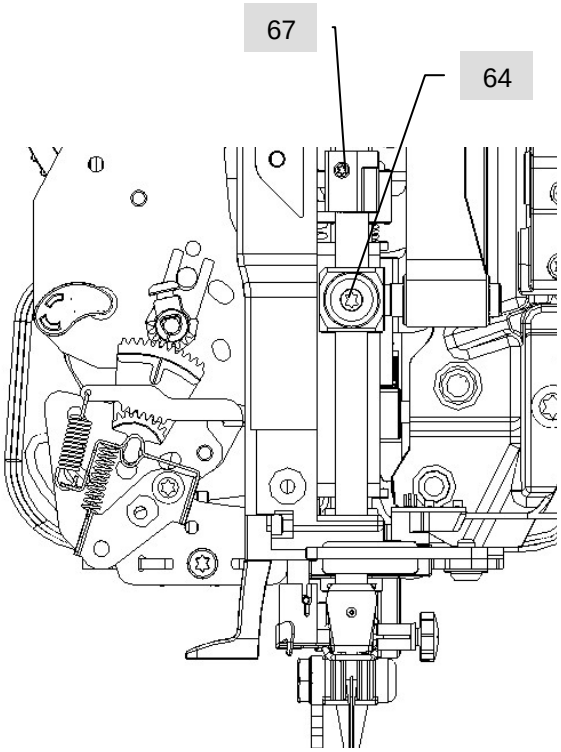


5.18 artista 630 needle height

Standard:

- Set needle to right needle position.
- Set hook tip flush with right hand needle edge
- needle on its upwards movement).
- From a front view, the lower edge of the hook tip should be 0.2mm above the top edge of the needle eye.





Correction:

- Loosen needle bar clamp screw (**64**).
- Move needle bar to prescribed position.
- Retighten screw (**64**).

Attention:

- The needle bar must not turn.
- Use twin needles to check if necessary.

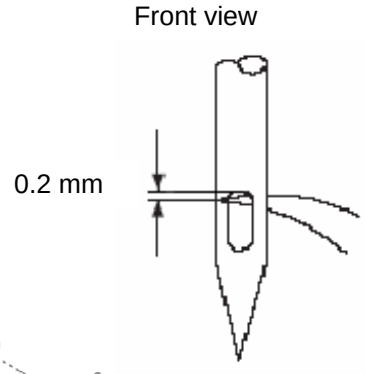
Note:

- Check threader position (**p. 56**).

5.19 artista 640 needle height

Standard:

- Attach 9mm presser foot and set needle to left position.Position hook tip flush with the left edge of the needle (needle must be in its upwards movement).
- From a front view, the point of the hook tip should be 0.2mm below the upper edge of the needle eye.

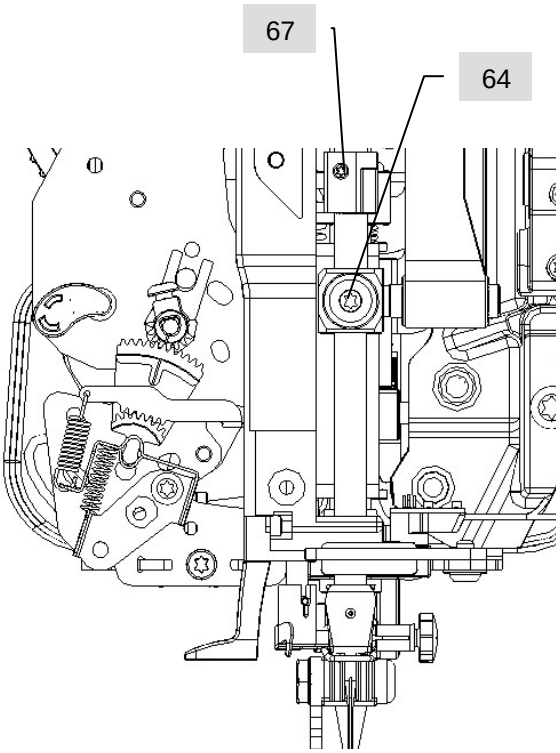


Correction:

- Remove needle, thread guide clamp and thread guide.
- It may be necessary to replace the stop pin.

008211 5000 = ø 1.50mm
008211 5001 = ø 1.85mm
008211 5002 = ø 2.20mm
008211 5003 = ø 2.55mm
008211 5004 = ø 2.90mm

5.20 Threader



Standard:

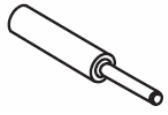
- Remove needle and attach the threader gauge (030883.50.00) in its place.
- Set needle to upper dead centre.
- Push threader downward until threader head turns in flush under the gauge.

Correction:

- Loosen screw (**67**) on the guide piece.
- The threader head can be properly adjusted by moving it up or down, as appropriate.
- Retighten guide piece screw (**67**).

Important: Don't turn needle bar.
Check basting device by model 640.

Threader gauge 030883.50.00



5.21 Feed-dog position in stitch plate

Standard:

The feed-dog must be equidistant from each side of the stitch plate.

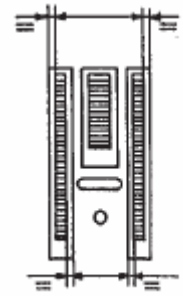
Correction:

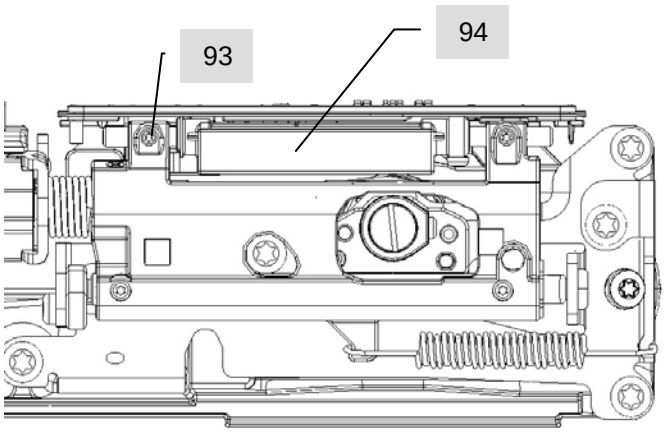
- Loosen screw (**93**).
- Move feed-dog carrier shaft (**94**) sideways into the required position.
- Retighten screws (**93**).

Check:

- When the feed dog is lowered, it must drop freely.(Sewing to darning)
- When switched from darning to sewing and the hand wheel is turned the feed dog must jump up

equidistant

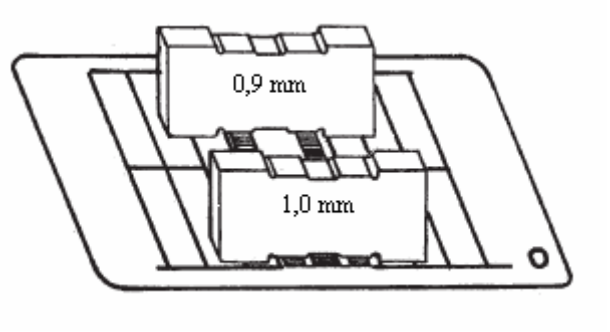




5.22 Feed-dog height

Standard:

- In the feed-dog's highest position, the peaks of the feed-dog teeth must be at least 0.05 mm higher at the front than at the back.
- Feed-dog height (0.9-1.0mm).

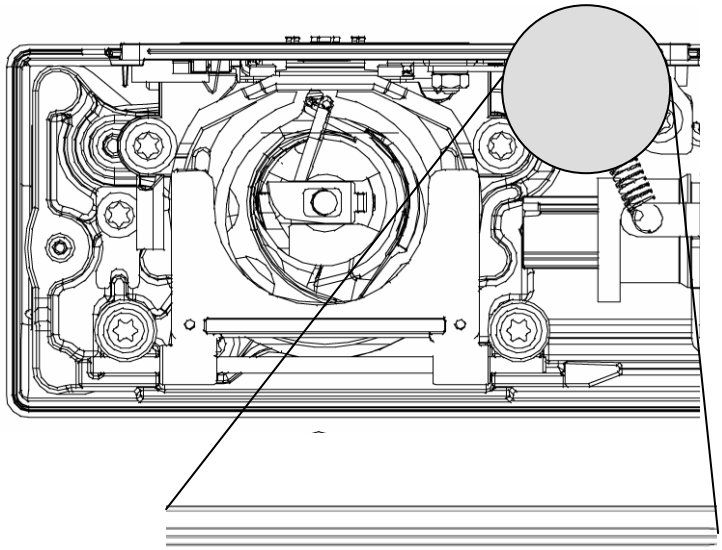


Example:

- front 0.95 mm, back 0.90 mm
- front 1.00 mm, back 0.90 mm
- front 1.00 mm, back 0.95 mm

Correction of front feed-dog section

- Loosen screw (**95**).
- The pressure spring (**96**) causes the adjustment plate (**97**) to move up independently.
- Position 1.0 mm gauge and press down.
- Retighten screw (**95**).

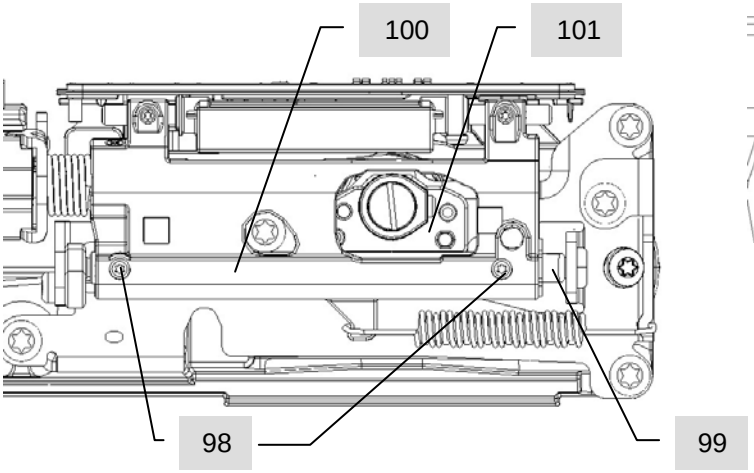


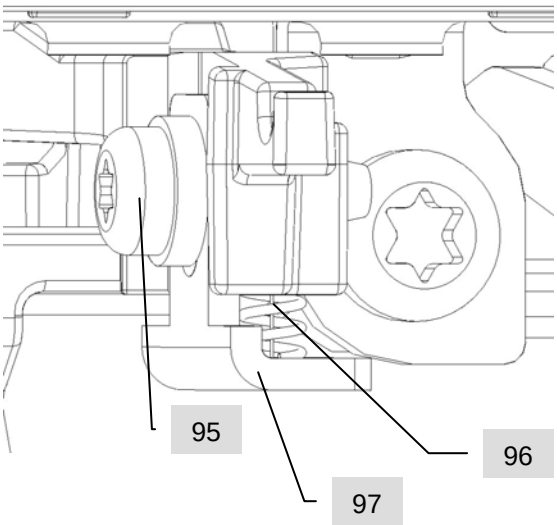
Important:
Check again after tightening the screw!

Correction of rear feed-dog section:

- Slightly loosen screws (**98**). Use a 5.5 mm open-end wrench to turn the eccentric pin (**99**) until it reaches 0.9 mm level.
- Tighten screws (**98**).

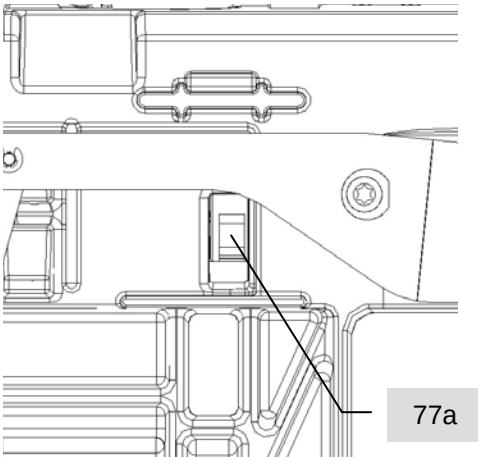
Important:
Feed-dog carrier (100) must lie flush against circlip on the right side. Eccentricity must face outward! Face inward would touch the Support sheet (101).





5.23 Position of synchronizing disc (rough-adjustment)

Attention:
Don't over tighten the screw of the composite synchronizing disc.



Standard:

- Mechanical check:
- Pin needle drive balance piece.
- The positioning disc screw (**77a**) should be in a horizontal position and point to the back (visible through rear opening in housing).

Correction:

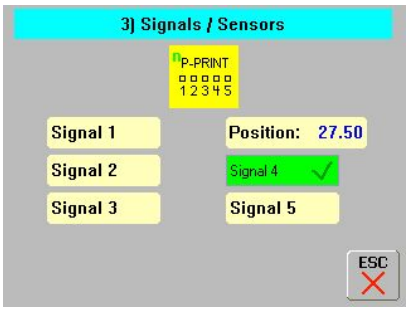
- Presetting:
- Loosen screw (**77a**).
- Pin balance piece.
- Turn synchronizing disc in such way that screw (**77a**) points horizontally to the back (visible through rear housing opening) and lies against the circlip.
- Retighten screw (**77a**) carefully.

Fine-adjustment:

What to adjust:

- Loosen synchronizing disc screw (**77a**).
- Pin balance piece (loop lift position).
- Turn synchronizing disc until light signal 3 turns off and light signal 4 turns on (27.5°).
- Retighten screw (**77a**) carefully.

Service Program test 3n (**p.77**)

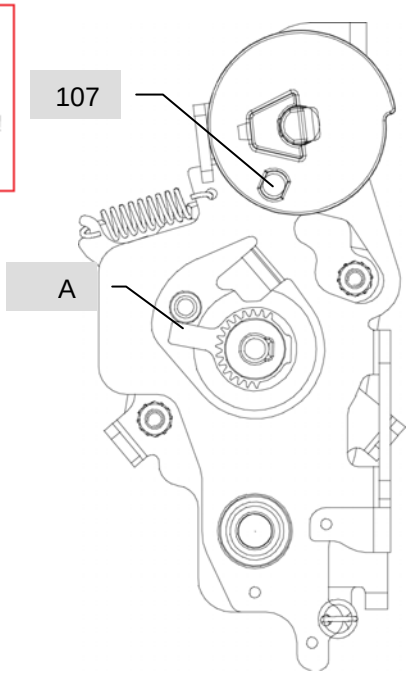


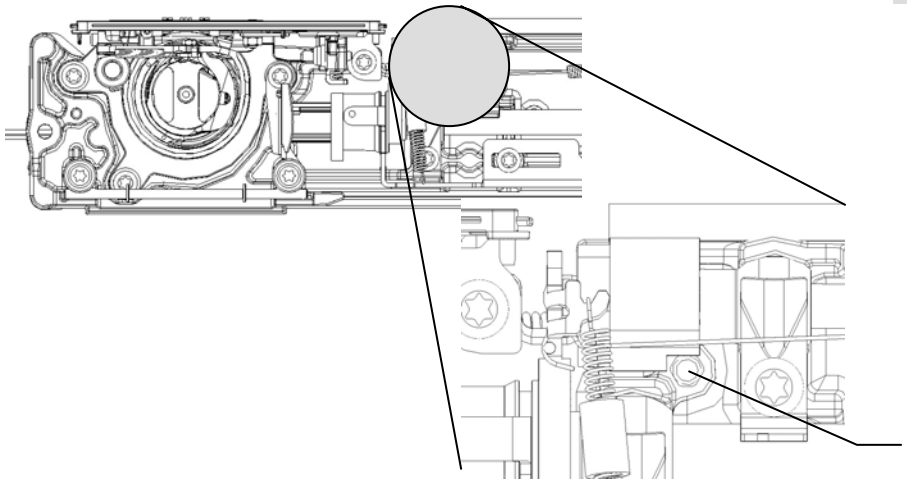
5.24 Basic balance setting

Standard:

- Remove covers.
- Pin balance adjusting cam (**107**) (pin from hand wheel side).
- Drive gear must be set against stop (**A**). The first tooth of the drive gear must lie against first tooth of the toothed segment.
- The stitch length crank (**108**) should now be in pinning position.

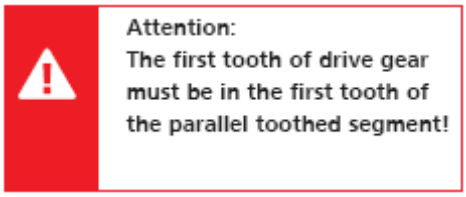
Attention:
The first tooth of drive gear must be in the first tooth of the parallel toothed segment!

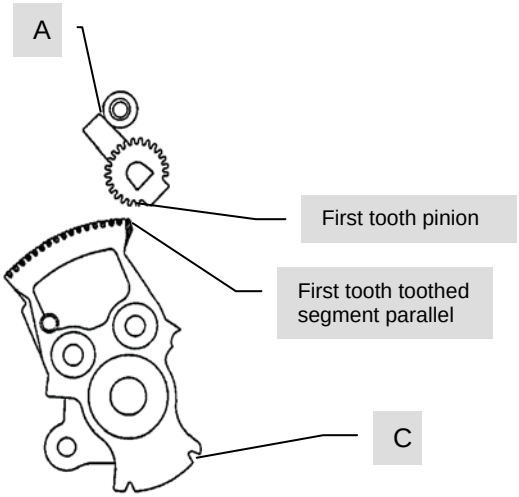


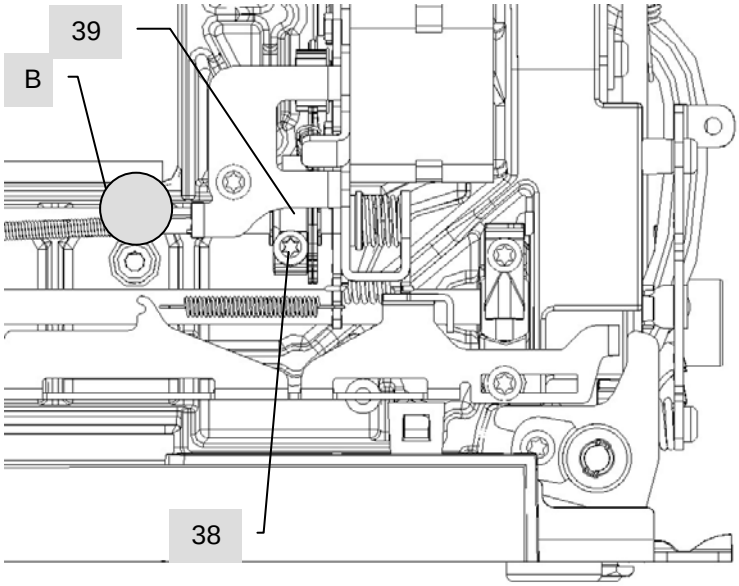


Correction:

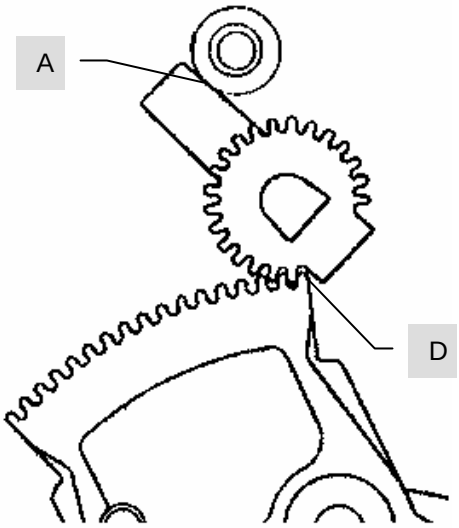
- Loosen securing screw (**38**) of the clamping piece (**39**).
- Turn crank (**108**) into pinning position and pin.
- Pin balance adjustment cam (**107**).
- Turn toothed segment and gear drive against stop (**A**) and hold firmly while tightening screw (**38**).







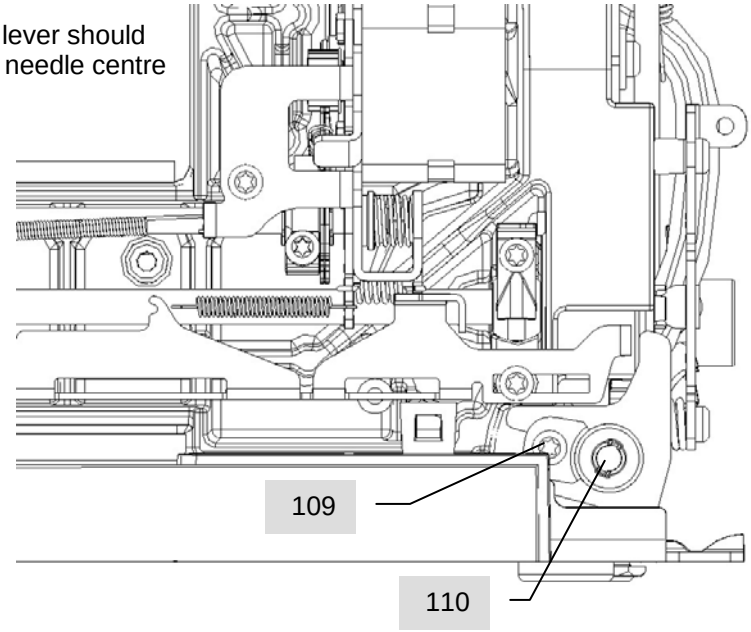
- Use a screwdriver to slightly press crank shaft down at point (**B**) until toothed segment slides of mesh.
- At the same time, use a screwdriver to set the toothed segment parallel at point (**C**) and insert first tooth of toothed segment into first tooth of the drive gear (**D**).
- Check basic balance setting.



5.25 Basic presser foot lifter setting (Free Hand System (FHS))

Standard:

- The end of the knee-activated lifter lever should be approx. 160mm / 6inch from the needle centre position (horizontally).



Correction:

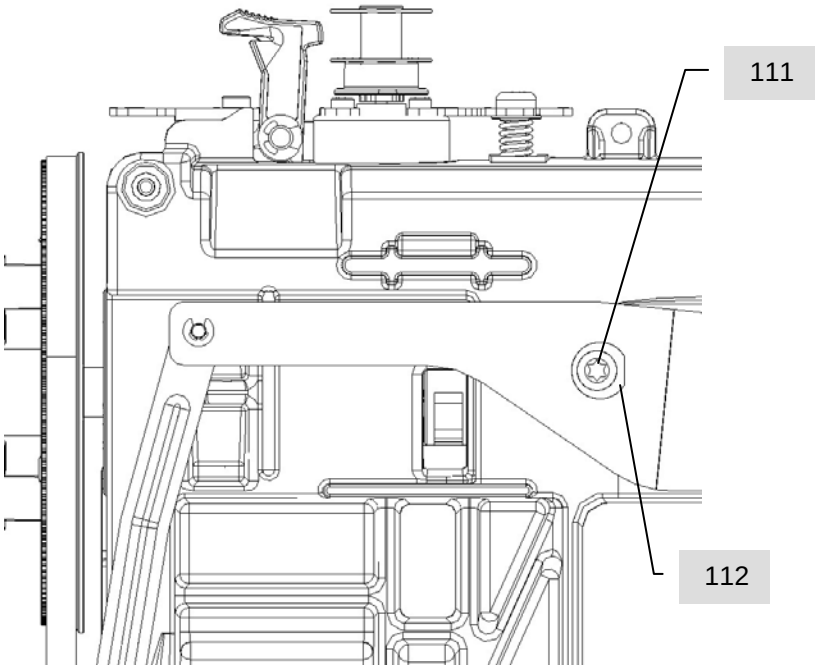
- Fit lifter lever into bore (**110**).
- Loosen screw (**109**).
- Position knee-lifter lever in the appropriate place.
- Retighten screw (**109**).

Checking correct position:

- Place presser foot lifter lever up.
- Set upper thread tension to 10.
- Model 640 manually rotate the top tension stepping motor cam counter clock wise to the highest setting.
- When the lifter is actuated, the presser foot lifter lever must drop.

Correcting the position:

- Loosen screw (**111**) and turn adjustment eccenter (**112**) until the lifter lever releases (drops).
- Retighten screw (**111**).
- Check tension release mechanism. Correct if necessary (release lever must be free).



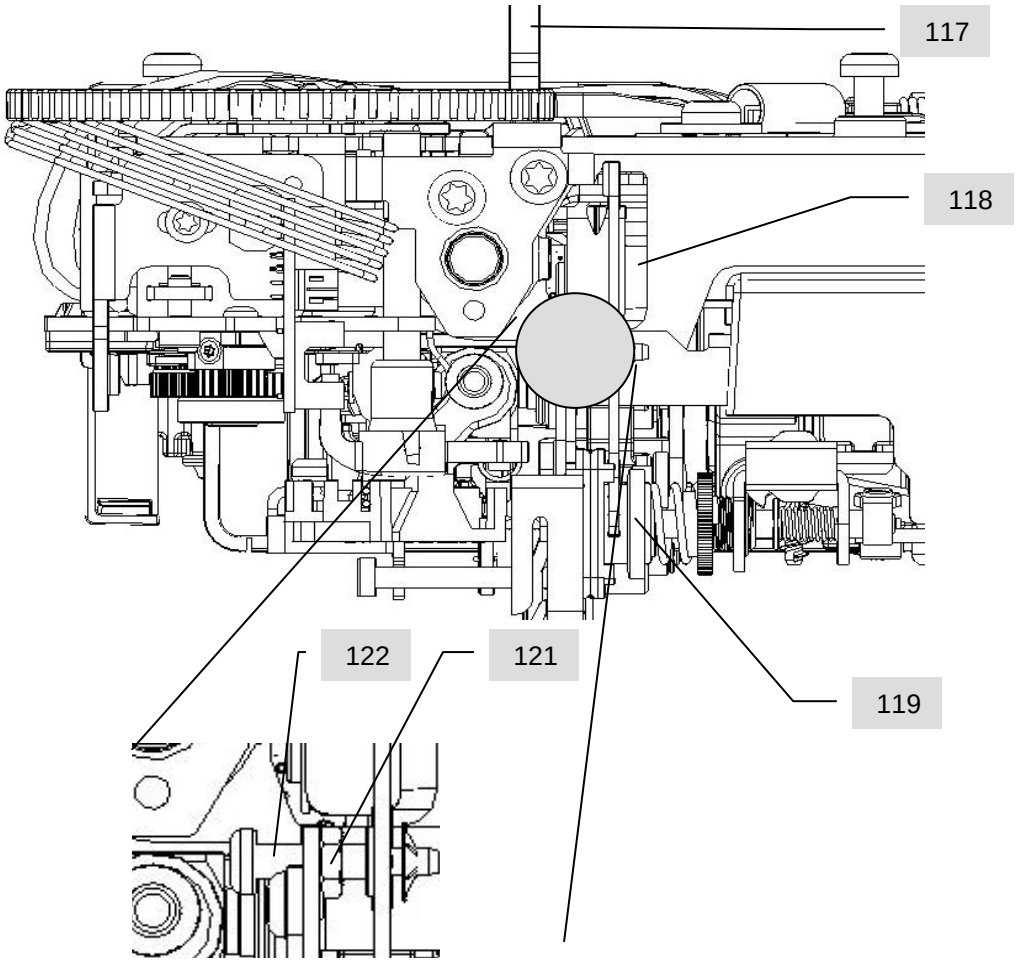
5.26 Thread tension release

Standard:

- Lower presser foot lifter lever (**117**).
- The release lever (**118**) must not touch the pressure piece (**119**) – neither at 0 position of adjusting wheel nor at position 10. (With artista 640, turn the cam of the upper thread tension stepping motor from minimum to maximum).
- Set lifter lever (**117**) up, and upper thread tension adjusting wheel (artista 630) to position 10.
- The distance between the tension discs must be at least 0.3 mm.

Correction:

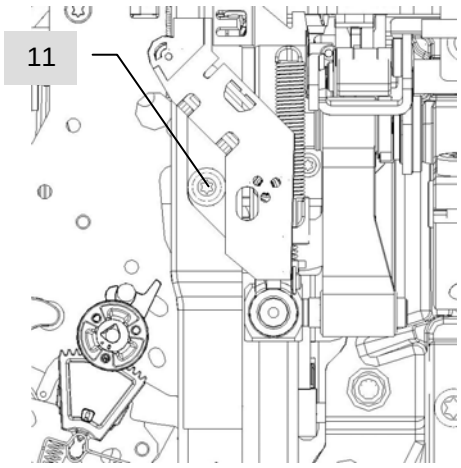
- Raise presser foot lifter lever (**117**).
- Turn adjusting wheel to position 10 (with artista 640, turn the cam of upper thread stepping motor to maximum).
- Loosen lock nut (**121**).
- Adjust adjusting screw (**122**) to set pressure piece distance to at least 0.3 mm.
- Tighten lock nut (**121**).



5.27 Basting and long stitch device artista 640

Standard:

- Checking the needle bar guide.
- Disengage the needle bar manually.
- Rotate left and right to check play and if clutch pin engages easily.

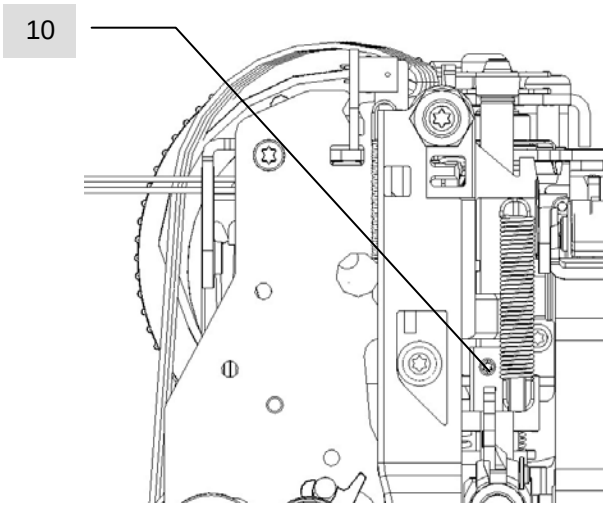


Correction:

- Remove basting magnet (remove screw (**11**)).
- Set needle bar to top dead center.
- Loosen needle bar clamp screw (**10**)
- Engage needle bar in clutch pin.
- Center the clutch pin in the needle bar hole.
- Retighten screw on needle bar guide.
- Check threader adjustment (**p. 56**)
- Refit basting magnet and secure with screw (**11**).

Note:
Check needle bar guide to threader position. Adjustment is made by the threader.

Checking the timing of disengagement



Standard:

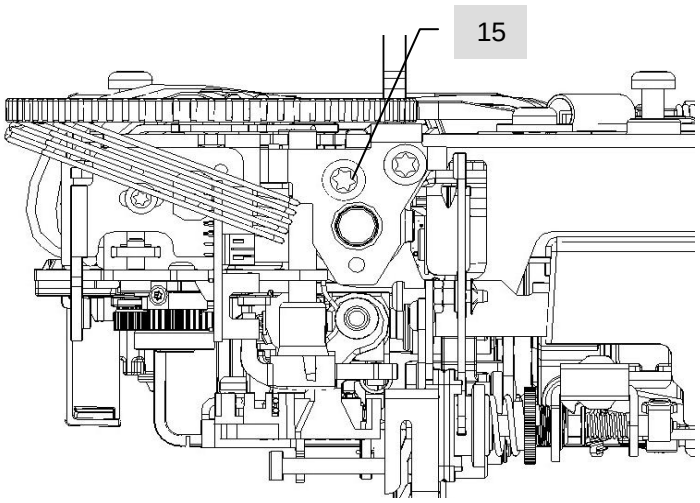
- Start machine and select long stitch function.
- Needle bar should be disengaged – approx. 1-2mm before reaching the upper dead center.

Correction:

- Turn buffer adjusting screw (**15**) out by about one rotation.
- Loosen securing screw (**11**) from long stitch magnet housing and move housing up or down as appropriate.

Adjusting the buffer position:

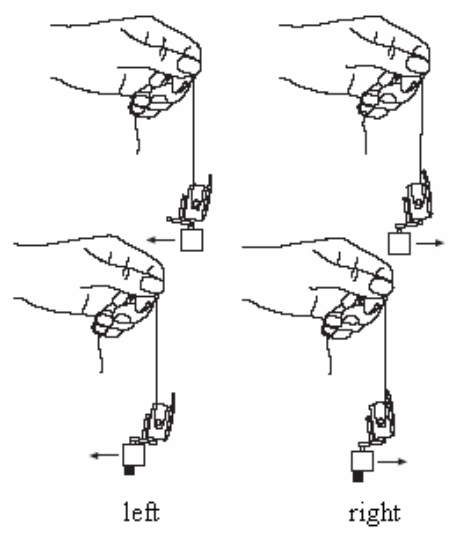
- Turn buffer screw (**15**) out until needle bar cannot engage again.(counter clock wise).
- Disengage the needle bar manually
- Set needle position to the right.
- Run machine at medium speed (r.p.m.)
- Turn buffer adjusting screw (**15**) slowly back in, until needle bar engages.(clock wise)
- After the engaging of the needle bar, turn screw (**15**) by a quarter rotation. (clock wise).
- Carry out functionality check to see if needle bar disengages with maximum speed and in the left and right needle positions.



5.28 artista 630 CB hook lower thread tension (basic setting)

Standard:

- Use Mettler no. 60/2 Nm 43.1/2 white thread.
- Use no. **001 538 70.00** gauge to adjust lower thread tension. The bobbin case is inserted into the weight gauge in exactly the same way as into the hook.
- Hold free end of thread firmly and let the bobbin case and setting weight (without additional weight) hang free.
- The bobbin case must **not** move downwards.
- After attaching an additional weight (5 g, no. 398 117 030) the thread should unwind fast (unwinding speed: 1m in 2-4 sec.). If you test with darning thread, the unwinding speed is 1m/25 sec.



Correction:

- Use a small screwdriver to adjust the lower thread tension by turning the bobbin case spring screw as appropriate.

Note:

- Turn screw counterclockwise (to left) to slacken
- Turn screw clockwise (to right) to tighten.

artista 640 RH hook lower thread tension (basic setting)

Standard:

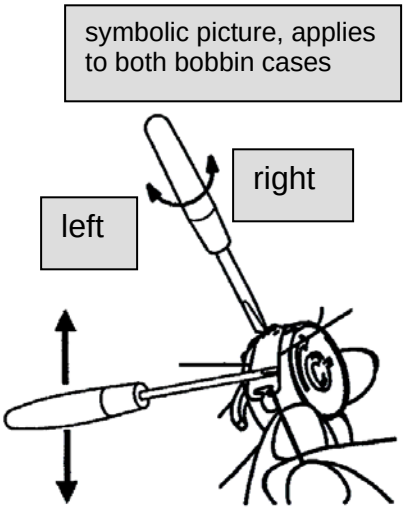
- Use Mettler no. 60/2 Nm 43.1/2 white thread.
- Use no. **006 543 70.01** gauge to adjust lower thread tension.
- The bobbin case is inserted into the weight gauge in exactly the sar

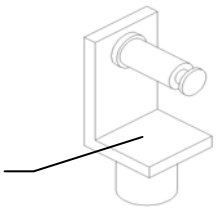
Check:

- Hold free end of thread firmly and let the bobbin case and setting w hang free.
- The bobbin case must **not** move downwards.
- After attaching an additional weight (3 g, no. 398 142 030) the threa speed: 1 m in 2-4 sec.).If you test with darning thread, the unwindin 25 sec.
- Use a small screwdriver to adjust the lower thread tension by turnin appropriate.

Note:

- Turn screw counterclockwise (to left) to slacken
- Turn screw clockwise (to right) to tighten.



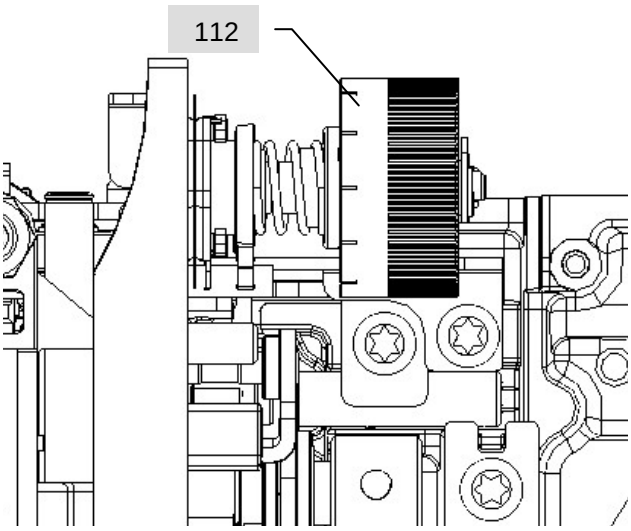


006 543 7001
640 RH hook gauge

5.29 artista 630 upper thread tension (basic setting)

Standard:

- Use Mettler white thread (cotton Ne60/2 Nm 43.1/2) for testing. Thread machine up to and including thread take-up lever (incl. rear thread guide).
- Turn adjusting wheel until the red bar mark is in line with the mark on the housing.
- Take-up lever must be in a position that it is farthermost away from the front cover (approx. needle highest position).
- Lower presser foot and unwind about 30cm thread from the spool.
- The 85g thread tension weight (398 080 040) must not move.
- Add 8g (5g + 3g) additional weight. Now the thread should unwind very slowly.



Correction:

- Turn adjusting wheel as appropriate.
- Hold clamp lever (**112**) pressed down (adjusting wheel is now unlocked).
- Turn adjusting wheel until the red bar mark is in line with the mark on the housing. Be careful ONLY turn the dial
- Engage clamp lever (**112**) as appropriate.
- Sewing-off (**p. 18**).

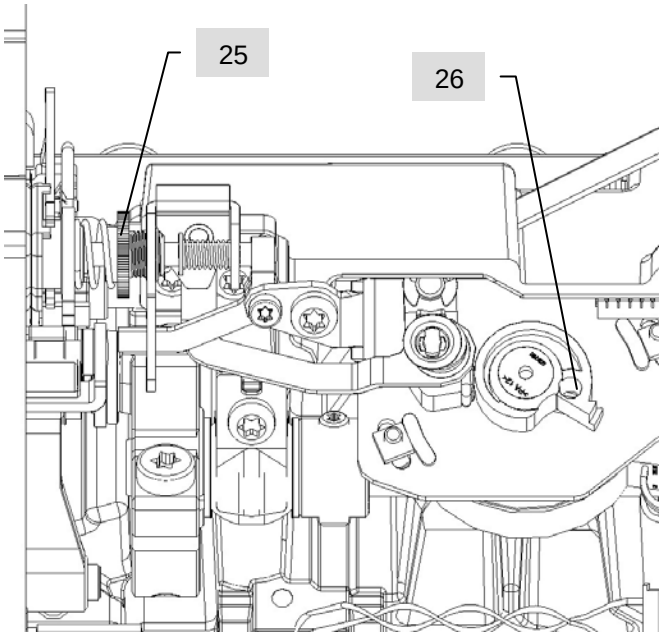


398 080 040

5.30 artista 640 upper thread tension (basic setting)

Standard:

- Reset the electronic upper thread tension (**service program 5f and 5i**)
- Use Mettler white thread (cotton Ne60/2 Nm 43.1/2) for testing. Thread machine up to and including thread take-up lever.
- Take-up lever must be in a position that it is farthermost away from the front cover.
- Lower presser foot. Pin upper thread stepping motor (**26**).
- Unwind about 30cm thread from the spool.
- Attach upper thread tension weight (398 080 040) to thread end.
- The 85g (5g + 3g) weight must not move.
- Add 8g additional weight. Now the thread should unwind very slowly.



Correction:

- Adjust adjusting wheel (**25**) appropriately.
- Sewing-off (**p. 18**).

85g thread tension weight (398.080.040)
5g tolerance weight (398 117 030)
3g tolerance weight (398 142 030)

5.31 Thread regulator spring

Tension standard:

- Thread an approx. 30cm long thread into thread regulator.
- Attach the two thread ends to the BERNINA balance spring gauge (006 038 5000). (same as checking the top tension)
- Slowly pull the gauge down.
- The check spring must start to move when the value is between 12-15g.

Note:
Check if the gauge is set to zero (calibrated).

Correction of tension:

- Turn screw (**113**) to left or right to tighten or slacken tension.

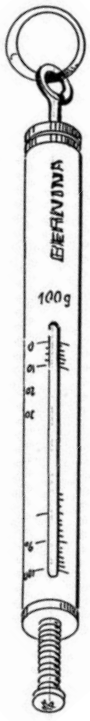
Checking correct position:

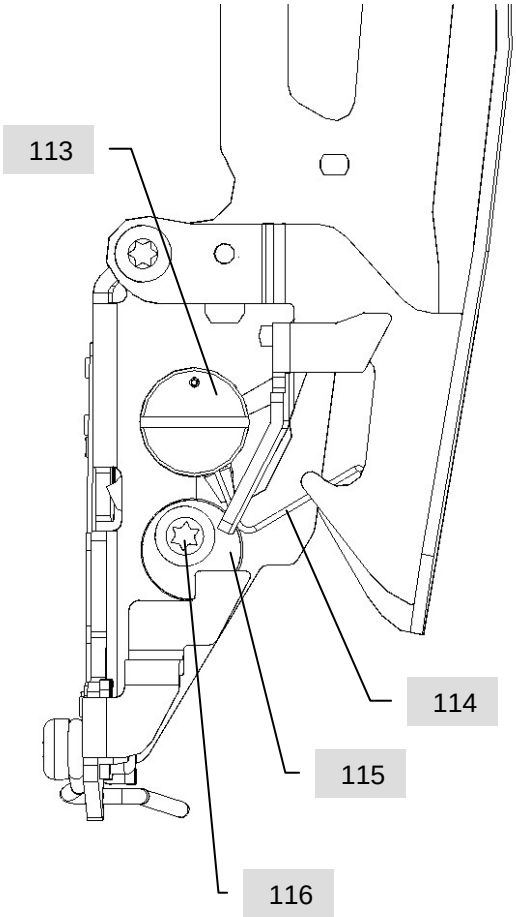
- The thread regulator spring (**114**) must lie on the limiter piece (**115**).
- There must be a distance of 1.6mm (+/-0.3mm) between spring and cover at the same time (see drawing).

Correcting the position:

- Slightly loosen securing screw (**116**). Adjust eccentric as appropriate until it serves as a support for the spring and with a distance of 1.6 mm
- Retighten securing screw (**116**).

Spring balance gauge 006 038.50.00





Chapter 6
Service Program

6.1 Starting the test program

Entering:

- Switch machine off ("0").
- Keep Ret-button pressed, and switch machine on.
- The sewing/embroidery computer moves the stepping motors to the "zero" position (brief motor noise).
- The machine is now in the basic position for servicing - first level.

Alternative access:

- If the touch-screen is calibrated in such way that no selection can be made on the screen, or the basic screen settings are misadjusted in such way that nothing can be seen anymore, an alternative access is provided. Access is achieved by simultaneously pressing the needle position keys and switching on the device.
- Contrast is adjusted by turning the stitch width knob.
- Brightness is adjusted by turning the stitch length knob.
- Touch cross symbols on touch screen for calibration.
- After calibration of touch-screen, the user-sewing program can be directly accessed.

Exiting the test program:

- Switch sewing/embroidery computer off.
- Wait about 20 seconds before switching sewing/embroidery computer on again.
- The s/e computer can now be used normally.

Basic position:
Menus 1 to 6 are selected in the service program basic setting.

1 = Service information

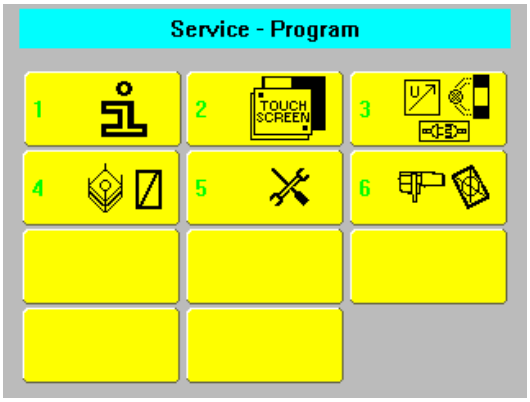
2 = Screen

3 = Signals and sensors

4 = Basic functions

5 = Settings and interfaces

6 = Embroidery module



Menus:

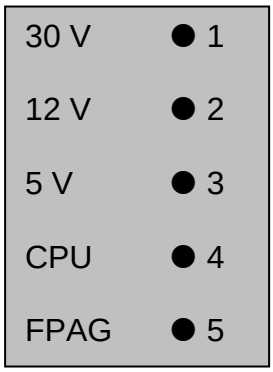
- The various tests – menus 1 to 6 – are selected in the service program basic setting.
- Press ESC to return to basic setting.

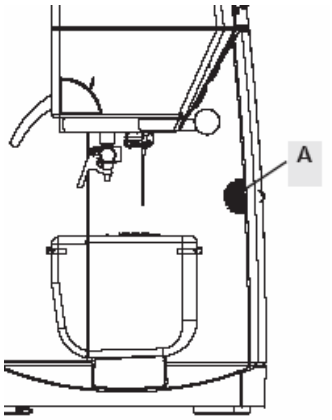
Tests:

- The testing level contains the active part of the program.
- Press ESC to return to respective menu without saving.
- Press OK to return to respective menu with saving.

Operating voltages functional test:

- The voltages on the S-Print are displayed by means of LED under the service cover.
- To access these, press the front of the cover at point (**A**) and swing the service cover (**B**) forward.





Meaning and functions of LEDs

What to test:	**LED1 / 30V**	**LED2 / 12V**	**LED3 / 5V**
Desired status:	Lit	Lit	Lit
Actual status:	Not lit	Not lit	Not lit
Repair note:	Check the wiring for deformation, tears or breaks. Replace if necessary. Check the connectors for deformations. Replace if necessary. Check L-Print functioning. Replace if necessary. Replace S-Print	Check the wiring for deformation, tears or breaks. Replace if necessary. Check the connectors for deformations. Replace if necessary. Check L-Print functioning. Replace if necessary. Replace S-Print	Check the wiring for deformation, tears or breaks. Replace if necessary. Check the connectors for deformations. Replace if necessary. Check L-Print functioning. Replace if necessary. Replace S-Print

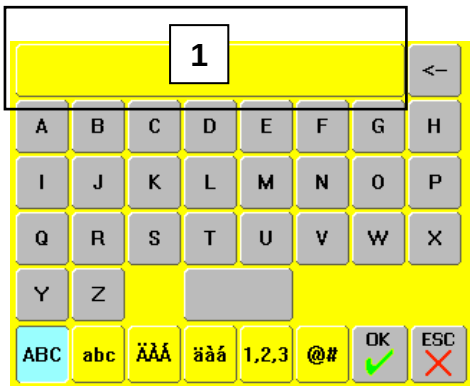
What to test:	**LED 4 CPU** Central processing unit	**LED 5 FPGA** Field programmable gate array
Desired status:	**lit = O.k., Processor is working**	**flashing = O.k., Firmware is saved/loaded**
Actual status:	**not lit = processor does not work**	**does not flash = firmware is not loaded or recognized**
Repair note:	Check LED 1-3 Replace L-Print Replace S-Print	Update. Reload machine firmware. Replace S-Print Replace L-Print

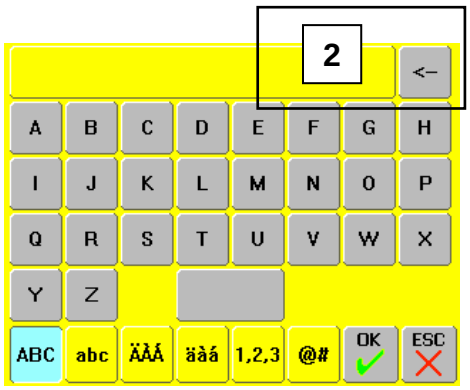
6.2 Virtual keyboard

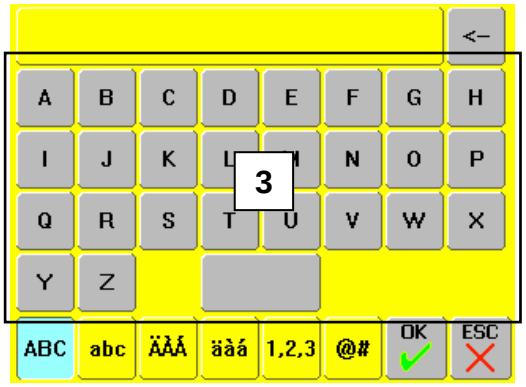
- Tests a, b, f, h and i in menu 1, and test a in menu 6 require data entering.
- Data can be entered using the four data entering fields in the virtual keyboard.

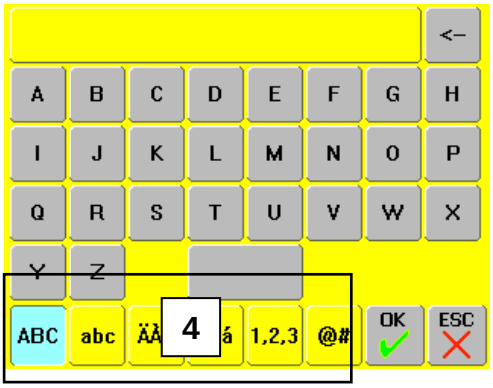
The virtual keyboard data fields are:

1) Data display field (to completely delete, press it)
2) CLR field (<--) (to individually delete, press it)
3) Data entering field (letters, numbers and symbols depending on display)
4) How to select the data entering field modes: (a: Capital letters and symbols,
   b: Low-case letters and numbers,
   c: Special characters 1,
   d: Special characters 2)

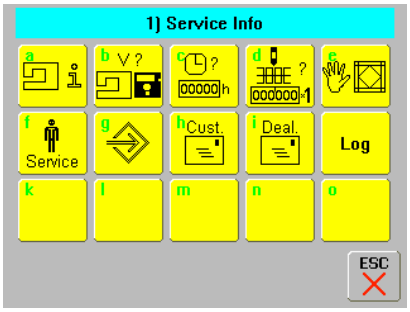








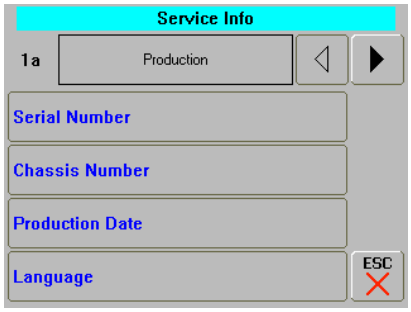
6.3 Menu 1 – Service information



- The tests are selected here by pressing the appropriate button.
- Information on configuration, sewing/embroidery computer status and user and dealer data.
- Data is displayed by the page with the page reference in green.
- Explanations of data and how to change and save data are given below.

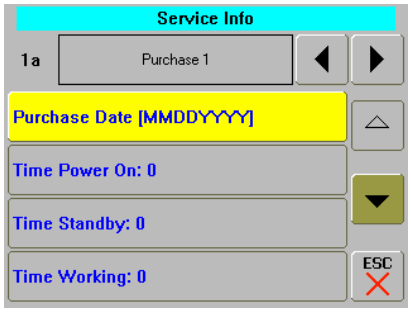
1a Sewing/embroidery computer basic data:

What to test:



- Serial Nummer
- Chassis Nummer
- Production Date
- Language

- Use the right scroll arrow ▶ to find the purchase data entering fields.



- Purchchase Date, = Date of the purchase
- Time Power: On, = Total number of operating hours (powered)
- Time Standby, = Total number of inactive operating hours (powered)
- Time Working, = Total number of active operating hours (main shaft turning)
- Time Embroidery, = Number of embroidering hours
- Time BSR, = Sewing time using BSR (BERNINA Stitch Regulator)
- Stitch Working, = Total number of stitches made
- Stitch Sewing, = Total number of stitches sewn
- Stitch Embroidery = Total number of stitches embroidered
- Stitch BSR. = Total number of stitches made using BSR

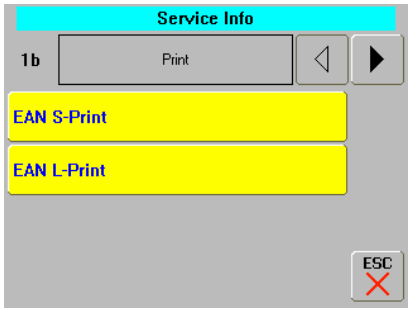
Note:

- There are 5 pages for 5 users.
- Each user's operating times can be established separately. This requires that the purchase date is entered with each change of user.
- Operating and stitching times are then automatically updated by the system.

1b Sewing/embroidery computer soft- and firmware data:

What to test:

- S-Print EAN code
- L-Print EAN code

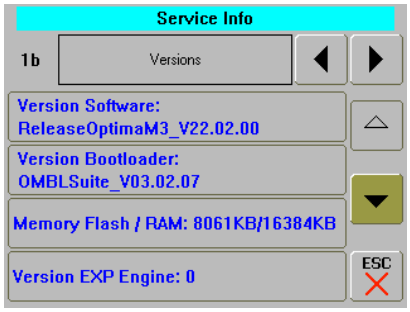


Note:

- EAN = European Article Number
- The number must be checked and re-entered if deviating when replacing S- and L-Prints.
- Use the right scrolling arrow ▶ to go to the next pages.
- Information on version and technical data is given there.

What to test:

- Software version:
- Bootloader version:
- Memory flash / RAM:
- EXP engine version:
- BSR application version:
- EMB BIOS version:



Note:

- Updating see **p. 99**.

What to test:

- Technical information data.



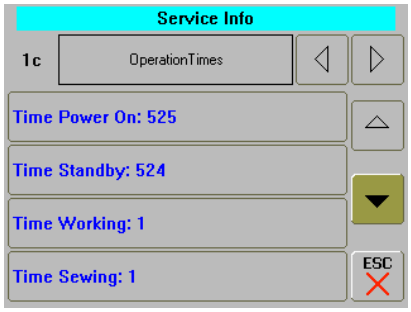
Note:

- Technical data can be entered there in the page, using the virtual keyboard.
- The entered data gives the technician information on already made improvements.

1c Sewing/embroidery computer operating time data

What to test:

- Time Power On:
- Time Standby:
- Time Working:
- Time Sewing:
- Time Embroidery:
- Time BSR:



Note:

- Total number of operating hours of each category in the sewing and embroidery system.

1d Sewing/embroidery computer stitch counter data:

What to test:

- Stitch Working, = Total number of stitches
- Stitch Sewing, = Total number of stitches sewn
- Stitch Embroidery = Total number of stitches embroidered

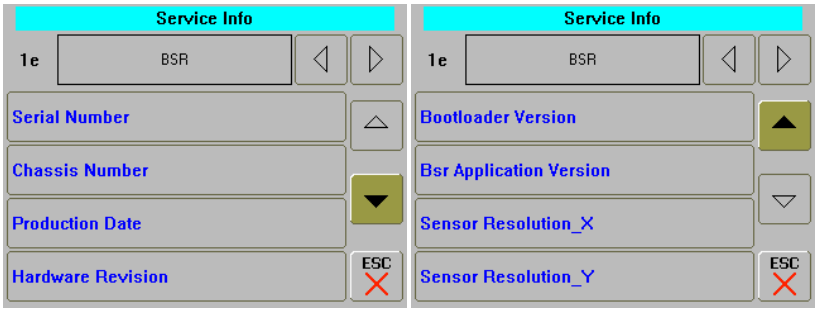
Note:

- Total number of stitches of each category in the sewing/embroidery system.

1e BSR (BERNINA Stitch Regulator) data:

What to test:

- Serial Number:
- Chassis Number:
- Production Date:
- Hardware Revision:
- Bootloader Version:
- BSR Application Version:
- Sensor Resolution_X:
- Sensor Resolution_Y:



Repairing note:

- Updating see **p. 100**.

1f Sewing/Embroidery computer servicing data:

What to test:

- Lubricate Stitches: = Time for cleaning/oiling (appears at 180'000 stitches).
- Reset Lubricate Stitches: = Resetting cleaning/oiling time count
- Service Stitches: =Time for servicing (appears at 2'000'000 stitches)
- Reset Service Stitches: = Resetting servicing time count



Cleaning interval

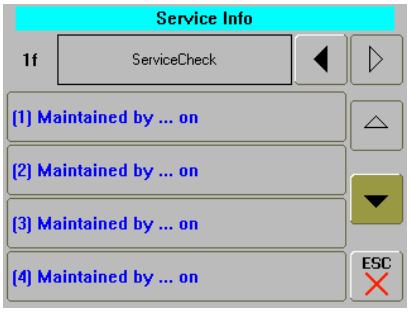
- The stitch counter (up-counter) triggers a reminder at 180'000 stitches (Clean and oil the sewing/embroidery system, please).
  Important:
- Remember to always reset the up-counter (cleaning interval) after servicing or repairing.

Servicing interval

- The up-counter triggers a reminder to the user at 2'000'000 stitches (Take your sewing/embroidery system to your BERNINA dealer for servicing, please).
  Important:
- Remember to always reset the up-counter (cleaning interval) after servicing or repairing.

Use the right scrolling arrow ▶ to go to the next page. Service and repair data entering.
There are 5 entry fields available.

- The sixth entry overwrites the first entry.
- Maintained by…on = Entered by … on (date)



Note:

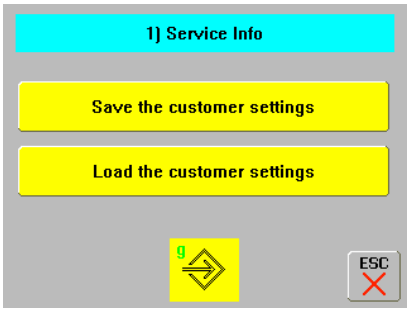
- When resetting the servicing stitches the virtual keyboard opens. Repairing data must be entered first now. Otherwise the stitch counter is not set to zero.

1g Saving of customer data

What to test:

- When replacing the S-Print, it is essential to save the customer's data first.
- For this, a BERNINA USB memory stick is used.

- Save the Customer settings = Saving of customer data on a BERNINA USB memory stick.
- Load the Customer Settings = Loading of customer data to the sewing/embroidery system.



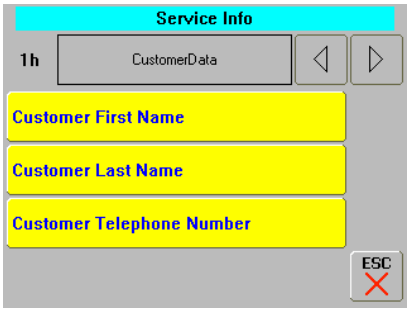
Note:

- Connect BERNINA USB memory stick and select required field. Remove the stick after saving of data has been confirmed.

1h Customer data:

What to test:

- Customer First Name: = Customer's first name.
- Customer Last Name: = Customer's last name.
- Customer Telephone Number: = Customer's phone number.



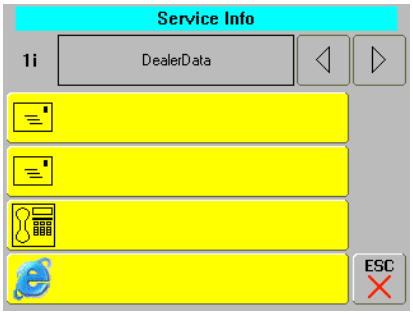
Note:

- The virtual keyboard opens on selecting a field.

1i Dealer data:

What to test:

- Dealer Store Name 1: = Name of the store (1st Store)
- Dealer Store Name 2: = Name of the store (2nd Store)
- Dealer Telephone Number: = Dealer's phone number.
- Dealer Internet Address: = Dealer's internet address



Note:

- The virtual keyboard opens on selecting a field. Customer data can now be entered.
- Dealer data can also be read and entered in .txt format from BERNINA USB memory stick.



1j Log file

What to test:

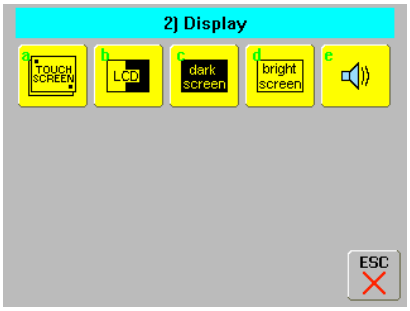
- External saving of internal processes on a BERNINA USB memory stick.

Note:

- If software problems occur, the read processes (log files) must be sent to the respective importer/distributor by email.



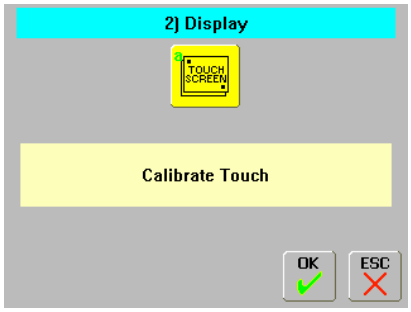
6.4 Menu 2 – screen and beeper



- The tests are selected here by pressing the appropriate button.
- Information on screen, touch screen and beeper.
- Data is displayed by the page with the page reference in green.
- Explanations of data and how to change and save data are given below.



2a Touch screen calibration:



What to test:

- To calibrate the touch screen, use a stylo to touch the three crosses as required.
- Press OK to confirm and to return to menu 2.

Note:

- If the touch screen's calibration is misadjusted in such way that the function can no longer be selected in the service or setup program, an alternative access is provided.

Alternative access: < >

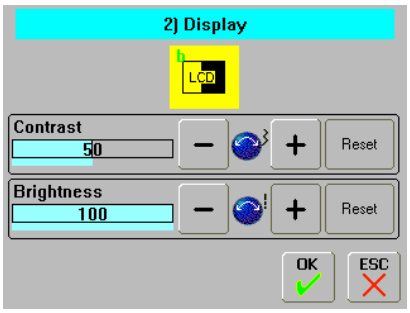
- If the touch screen is calibrated in such way that no selection can be made on the screen, or the basic screen settings are misadjusted in such way that nothing can be seen anymore, an alternative access is provided. Access is achieved by simultaneously pressing the needle position keys and switching on the device.
- Contrast is adjusted by turning the stitch width knob.
- Brightness is adjusted by turning the stitch length knob.
- Touch cross symbols on touch screen for calibration.
- After calibration of touch screen, the user sewing program can be directly accessed.

Repairing note:

- Check touch screen connecting cable for correct S-Print connection.
- Check connecting cable for deformation, tears or breaks. Replace if necessary.
- Replace touch screen.
- Replace S-Print.

2b LCD (screen):

What to test:



- Use '+' and '-' keys or stitch width adjusting knob to adjust contrast.
- Use '+' and '-' keys or stitch length adjusting knob to adjust brightness.
- Press 'Reset' to return to default.
- Press OK to save the values and to return to menu 2.
- Press ESC to return to menu 2 without saving.

Repairing note:

- Check LCD connecting cable for correct S-Print connection.
- Check connecting cable for deformation, tears or breaks. Replace if necessary.
- Replace touch screen.
- Replace S-Print.

Note:
If a fault in the CFL light or the screens background lighting occurs, then because of safety regulations the high voltage power is switched off.
If the screen is not lighting, check the CFL first!

2c Blank black LCD (screen):



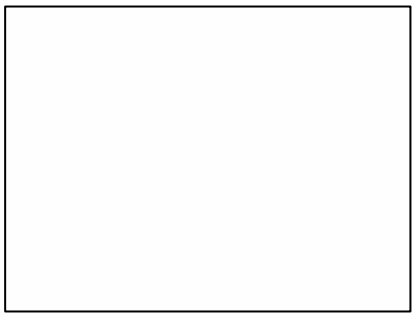
What to test:

- Blank screen (black) to find any pixel errors.
- Touch the touch screen at any place to return to menu 2.

Repairing note:

- Replace LCD if pixel errors occur.

2d Blank white LCD (screen):



What to test:

- White blank screen to find dirt or stains.
- Touch the touch screen at any place to return to menu 2.

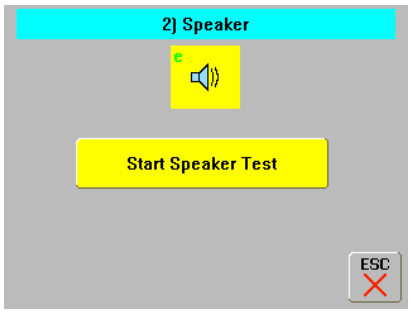
Repairing note:

- Clean LCD and touch screen.

Attention:

Do not use any abrasive or corrosive cleaning agents.

2e Speaker test:



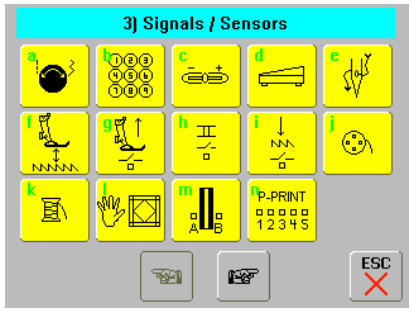
What to test:

- Speaker test.
- Press ‘Start Speaker Test’ to switch beep sound on and off.

Repairing note:

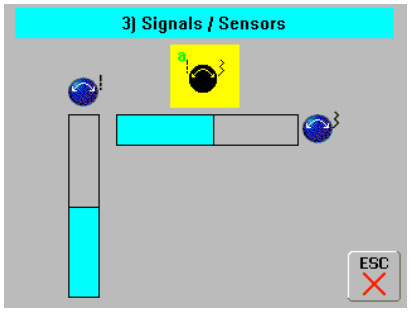
- If there is no beep sound, replace S-Print.

6.5 Menu 3 – Signals and sensors



- The tests are selected here by pressing the appropriate button.
- Information on sensors and signals.
- Data is displayed by the page with the page reference in green.
- Explanations of data and how to change and save data are given below.

3a Stitch width and stitch length adjusting knobs functions



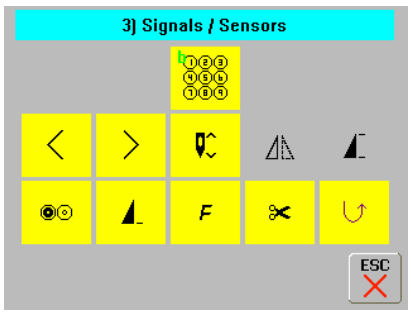
What to test:

- The respective bar remains lit as long as the related adjusting knob is used.

Repairing note:

- Check mechanical adjusting knob/S-Print connection.
- If no signals occur, replace the S-Print.

3b Functioning of keyboard:



What to test:

- On pressing the keys, the respective symbol lights up.

Repairing note:

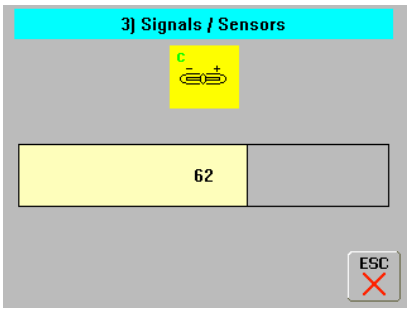
- If no signals occur, replace the S-Print or RET-Print.

3c Start/stop unit (SSU) slide control:



What to test:

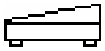
- The position of the slide control is displayed on the bar.



Repairing note:

- If no signal occurs, replace the S-Print.

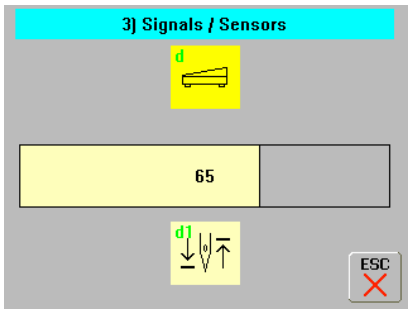
3d & 3d1 Foot control:



What to test:

- Activate foot control to display the foot control setting on the bar display.
- When using the heel kick function on the foot control, symbol D 1 lights up.





Repairing note:

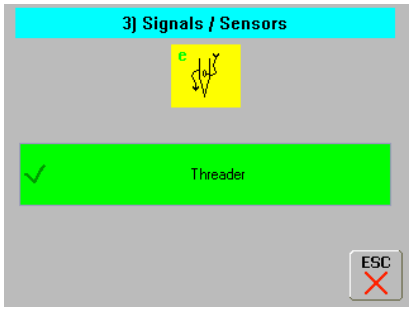
- Check the foot control cable for deformation, loose contacts, tears or breaks. Replace if necessary.
- Check foot control ceramic plate and coal carrier functioning. Replace if necessary.
- Replace S-Print.

3e Threader sensor:



What to test:

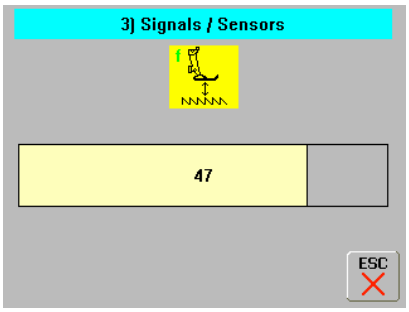
- As long as the threader is actuated, the bar graph remains active.



Repairing note:

- Check the sensor cable for deformation, loose contacts, tears or breaks. Replace if necessary.
- Replace threader sensor

3f Presser foot pressure sensor:



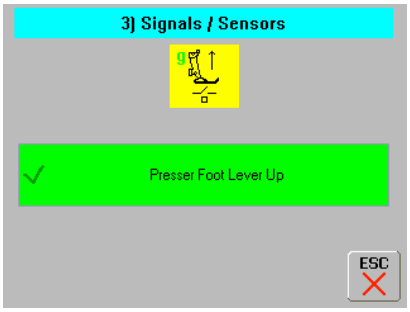
What to test:

- The position of the presser foot pressure sensor is displayed in the bar. (Default value is 47)

Repairing note:

- Check the threader print connector for deformations. Replace if necessary.
- Check the presser foot pressure cable for deformations, tears or breaks. Replace if necessary.
- Check the mechanical parts of the pressure foot pressure control. Adjust if necessary.
- Check presser foot pressure regulator functioning. Replace if necessary.
- Check P-Print and S-Print connectors for deformations. Replace if necessary.
- Check P-Print and S-Print cables for deformations, tears or breaks. Replace if necessary.
- Check P-Print functioning and replace if necessary. Replace threader print and/or S-Print.

3g Presser foot lifter micro switch:



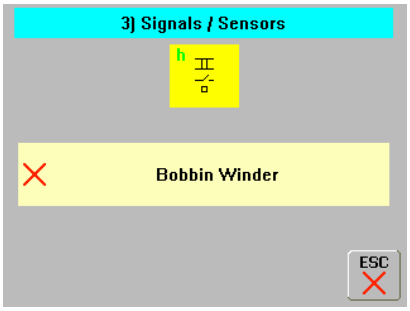
What to test:

- Raising the presser foot activates the micro switch, and the bar display lights up in green.

Repairing note:

- Check the cable for resistance, deformations, tears or breaks. Replace if necessary.
- Check functioning using an Ohm meter. Check micro switch position. Replace if necessary.
- Replace S-Print.

3h Winder motor micro switch:



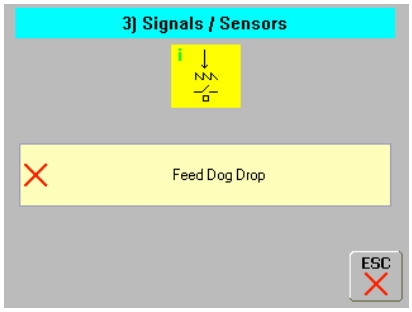
What to test:

- Switching on the winder activates the micro switch, and the bar display lights up in green.

Repairing note:

- Check the cable for resistance, deformations, tears or breaks. Replace if necessary.
- Check functioning using an Ohm meter. Check micro switch position. Replace if necessary.
- Replace S-Print.

3i Feed-dog drop light barrier:



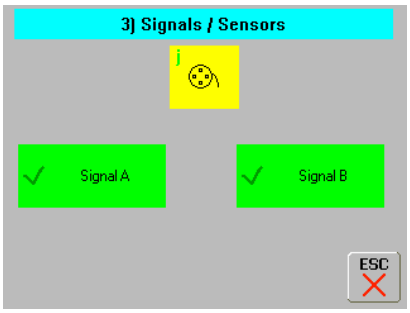
What to test:

- Switching on the feed-dog drop activates the light barrier, and the bar display lights up in green.

Repairing note:

- Remove base plate. Check light barrier for dirt. Clean if necessary.
- Check feed-dog mechanical functioning. Adjust if necessary.
- Replace S-Print.

3j artista 640 lower thread indicator:



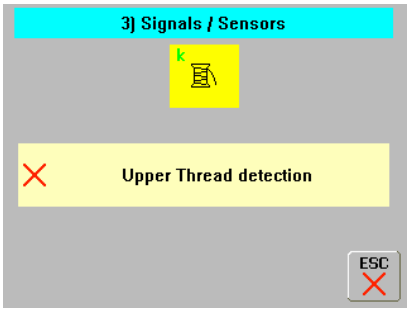
What to test:

- Insert filled bobbin and bobbin case. Close lid.
- Pulling the lower thread lights up the respective signal field.

Repairing note:

- Check lower thread indicator clamping and position in the lid.
- Check the cable for resistance, deformations, tears or breaks. Replace if necessary.
- Check connectors.
- Replace lower thread indicator.
- Replace S-Print.

3k Upper thread indicator:



What to test:

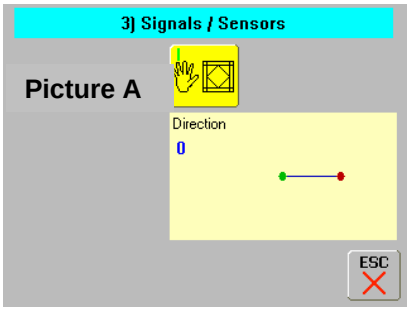
- From below insert thread loop into thread tensioner up to the thread regulator spring. Move thread regulator spring with thread loop up and down.
- The bar display lights up in green if the sensor is active.

Repairing note:

- Check settings of thread regulator spring mechanics. Adjust if necessary.
- Check light barrier for dust or dirt. Clean if necessary.
- Check if thread regulator spring is broken, dehooked or bent. Replace thread tensioner if necessary.
- Check RET-Print and S-Print connectors for deformations. Replace if necessary.
- Check RET-Print and S-Print cables for deformations, tears or breaks. Replace if necessary.
- Check RET-Print functioning. Replace if necessary.
- Replace S-Print.

3l BERNINA Stitch Regulator (BSR) foot:

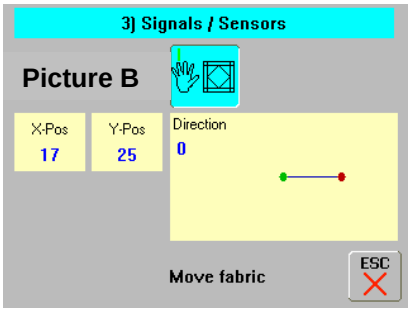
What to test:



- Attach BSR foot.
- Press 'l' icon (picture A) to start test.
- Place fabric under the presser foot and move it in different directions.
- The movements are then displayed in picture B.
- The X- and Y-position values are displayed in mm in picture B.

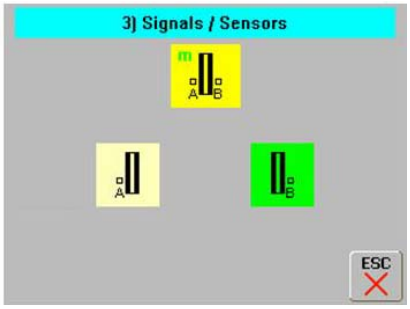
Repairing note:

- Check BSR foot sensor for dirt. Clean or replace if necessary.
- Check BSR connector.
- Update BSR foot.



3m Buttonhole signals A & B

What to test:

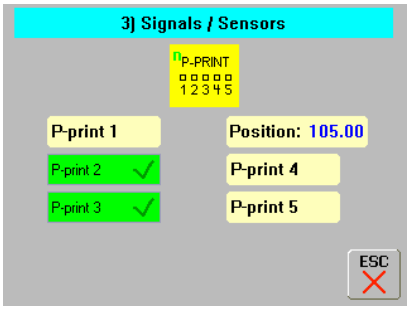


- Attach automatic buttonhole foot no. 3A. Move slide back and forth.
- Icon A or B lights up depending on the respective active signal.

Repairing note:

- Check mechanical parts of buttonhole foot for ease of movement. Replace if necessary.
- Check buttonhole lens for dirt. Clean or replace if necessary.
- Check sensor for dirt. Clean or replace if necessary.
- Check the sensor connector for deformations. Replace if necessary.
- Check the sensor cable for deformation, tears or breaks. Replace if necessary.
- Check P-Print and S-Print connectors for deformations. Replace if necessary.
- Check P-Print and S-Print cables for deformations, tears or breaks. Replace if necessary.
- Check P-Print functioning. Replace if necessary.
- Replace S-Print

3n Positioning PCB (P-Print):



What to test:

- Set needle bar to lower dead center = 0°.
- The bar display of the signals 3, 4 and 5 lights up in green.
- Turn hand wheel and compare these positions and signals with the chart.

Note:

- Lower dead center of needle bar equals 0°.
- Upper dead center of needle bar equals 180°.

P-Print 1			✓
P-Print 2		✓	✓
P-Print 3	✓		✓
P-Print 4	✓		
P-Print 5	✓		
Position Degree(s) °	0 °	45 °	115 °

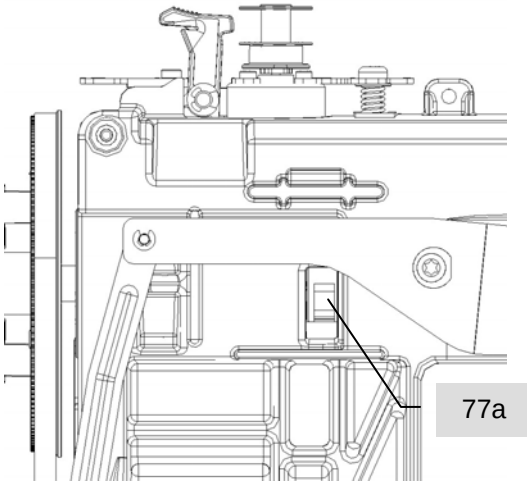
Repairing note:

- Clean P-Print light barriers.
- Check the cable for deformation, tears or breaks. Replace if necessary.
- Replace P-Print.
- Replace S-Print.

Note:

- Press ESC.
- Use the hand symbol ☞ to go to the next page.
- That is where the interface tests are displayed.

3n Mechanical fine-adjusting of P-Print:

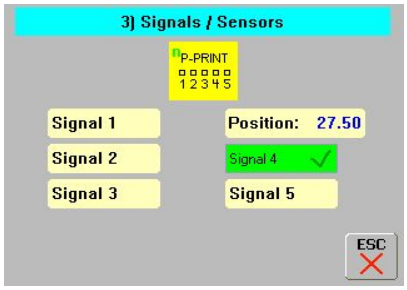


What to test:

- Balance piece in pinning position (loop lift).
- Select test 3n in service program.
- Signal 3 just stopped to light.
- Signal 4 starts to light.

What to adjust:

- Rough-adjusting of synchronizing disc (**p. 58**).
- Remove synchronizing disc screw (**77a**).
- Pin balance piece (loop lift).
- Turn synchronizing disc until light signal 3 stops and light signal 4 lightens up (27.5°).
- Tighten screw (**77a**).

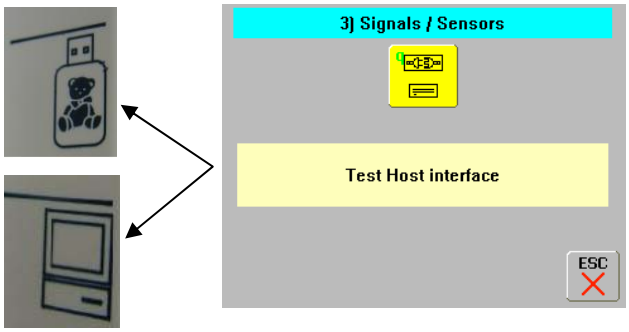


Note:

- Press ESC.
- Use the hand symbol ☞ to go to the next page.
- That is where the interface tests are displayed.



3q USB host interface:

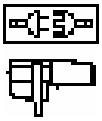


What to test:

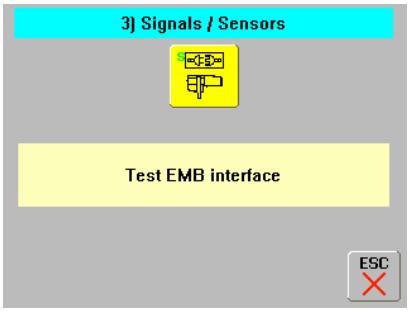
- Use an USB cable and connect the host and the client plug and press the ‘q’ icon to start the test.
- *Test successful!* appears if o.k.
- *Test failed!* appears if an error occurred.

Repairing note:

- Check USB cable (by connecting another peripheral).
- Replace S-Print.



3s EMB interface:

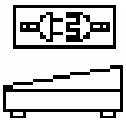


What to test:

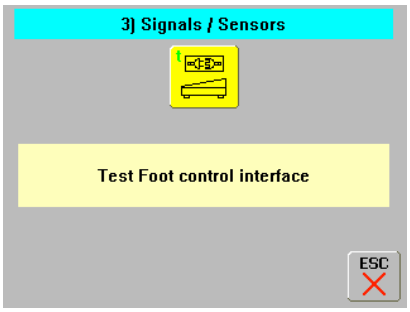
- Attach embroidery module and press ‘s’ icon to start the test.
- *Test successful!* appears if o.k.
- *Test failed!* appears if an error occurred.

Repairing note:

- Use Ohm meter to check EMB cable for resistance.
- Replace EMB cable.
- Replace embroidery module S-Print.
- Replace S-Print.



3t Foot control interface:

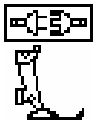


What to test:

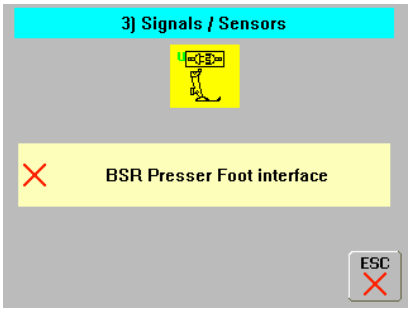
- Connect a foot control and press the ‘t’ icon to start the test.
- *Test successful* appears if o.k.
- *Test failed!* appears if an error occurred.

Repairing note:

- Use Ohm meter to check foot control cable for resistance.
- Replace foot control cable.
- Replace foot control coal pins, coal carriers and ceramic resistance plate.
- Replace S-Print.



3u BSR foot interface:

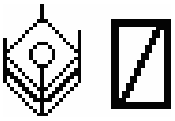


What to test:

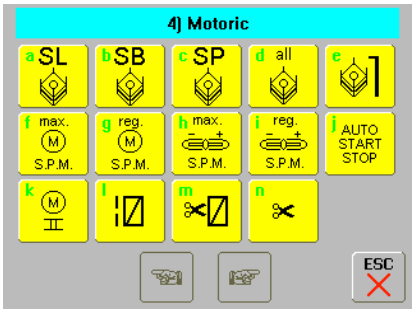
- Attach BSR foot and press ‘u’ icon to start the test.
- The bar is displayed in green if o.k.

Repairing note:

- Replace BSR foot.
- Replace S-Print.



6.6 Menu 4 – Motor functions

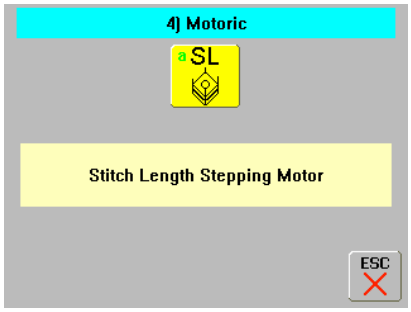


- The tests are selected here by pressing the appropriate button.
- Testing and adjusting of main and stepping motors, magnets, thread indicators, winder motor, and thread cutter operation.
- The tests are displayed by the page with the page reference in green.
- Explanations of tests and how to change and save tests are given below.

SL



4a Stitch length stepping motor:



What to test:

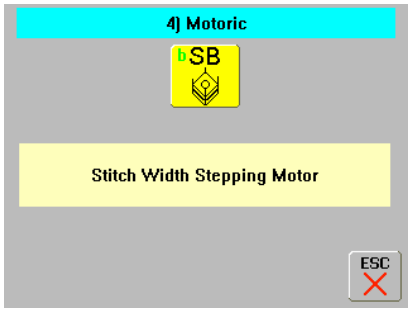
- Press icon to start and stop test.
- The stitch length stepping motor moves left to right and right to left, and the feed-dog moves forth and back.
- *Test done!* appears.
- *Test failed!* appears if an error occurred.
- Press ESC to exit the test.

Repairing note:

- If a stepping motor does not spin, the failure might be with the stepping motor or the S-Print. Swap the connections to find the defective PCB.
  Attention: Not when machine is powered. Disconnect machine from mains supply.
- If the error still occurs, check P-Print functioning and replace if necessary.

SB

4b Stitch width stepping motor:



What to test:

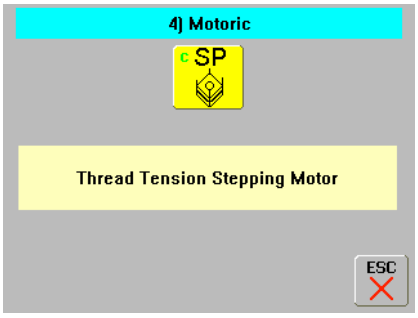
- Press icon to start and stop test.
- The stitch width stepping motor moves back and forth, the needle bar to left and right.
- *Test done!* appears.
- *Test failed!* appears if an error occurred.
- Press ESC to exit the test.

Repairing note:

- If a stepping motor does not spin, the failure might be with the stepping motor or the S-Print. Swap the connections to find the defective PCB.
  Attention: Not when machine is powered. Disconnect machine from mains supply.
- If the error still occurs, check P-Print functioning and replace if necessary.

SP

4c artista 640 upper thread tension stepping motor:



What to test:

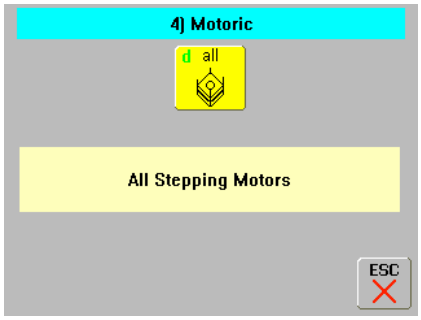
- Press icon to start and stop test.
- The upper thread tension stepping motor moves back and forth.
- *Test done!* appears.
- *Test failed!* appears if an error occurred.
- Press ESC to exit the test.

Repairing note:

- If a stepping motor does not spin, the failure might be with the stepping motor or the S-Print. Swap the connections to find the defective PCB.
  Attention: Not when machine is powered. Disconnect machine from mains supply.

all

4d All stepping motors:



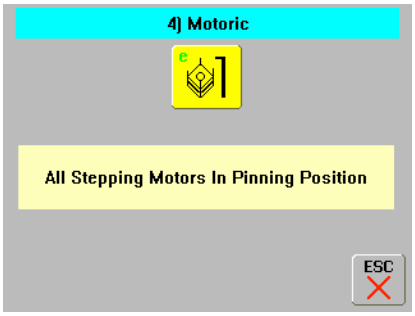
What to test:

- Press icon to start and stop test.
- All the stepping motors move back and forth.
  Test done! appears.
- *Test failed!* appears if an error occurred.
- Press ESC to exit the test.

Repairing note:

- If a stepping motor does not spin, the failure might be with the stepping motor or the S-Print. Swap the connections to find the defective PCB.
  Attention: Not when machine is powered. Disconnect machine from mains supply.

4e Pinning positions of all stepping motors:



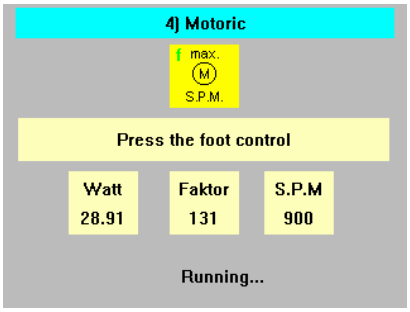
What to test:

- Press icon to start and stop test.
- The stepping motors move into their zero positions (pinning positions).
- Use 4mm pinning tool to check the pinning positions.
- *Test done!* appears.
- *Test failed!* appears if an error occurred.
- Press ESC to exit the test.

Repairing note:

- For replacing refer to respective stepping motor.

4f Stitches per minute (SPM) calibration:



Important:
Before a machine can be calibrated, it is first of all necessary that the machine has reached its running temperature. To achieve the temperature the machine must have reached room temperature and should then be run at a middle speed (without thread) for 5 minutes.

What to test:

- Connect foot control and actuate. Keep pressed until machine stops on own accord.
- *Test done!* appears.
- *Test failed!* appears if an error occurred.

Note:

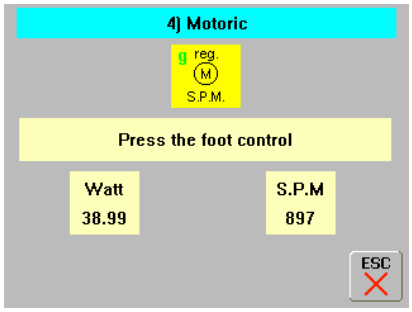
- Power in Watt is displayed in the left field.
  The average value on CB machines (a-630) is 41 Watts, but mustn't be higher than 45 Watts.
  The average value on RH machines (a-640) is 38 Watts, but mustn't be higher than 42 Watts.
- The S.P.M. adjustment factor is displayed in the middle field.
- The number of stitches per minute (SPM) is displayed in the right field.

Repairing note:

- The Wattage (max. 43W) gives an indication on the smoothness of the machine. The higher the value the stiffer the driving and vice versa.
- Ensure smooth running of the machine – mechanical ease of movement. Check drive belt tensions. Check main and base shaft bearing, needle bar belt tensioner, thread take-up crank and hook system for ease of movement.
- Check the cables for deformation, tears or breaks. Replace if necessary.
- Replace L-Print.
- Replace drive motor.
- Replace P-Print.



4g Standard SPM (stitches per minute) speed:



What to test:

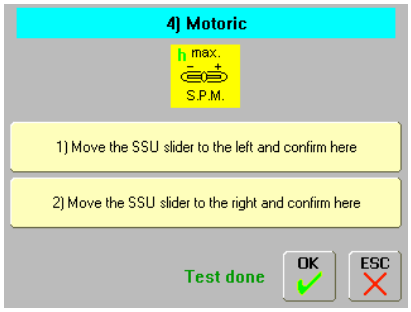
- Connect foot control and actuate. The main motor runs speed-dependant. The standard speed is displayed.

Note:

- Power in Watt is displayed in the left field.
- The number of stitches per minute (SPM) is displayed in the right field.



4h Calibrating the SSU (Start/stop unit):

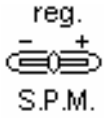


What to test:

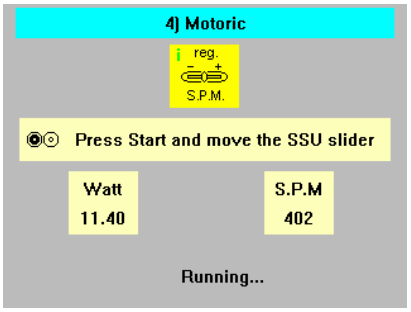
- Set SSU slide control to left and actuate bar 1. The bar appears in blue for a short period.
- Set SSU slide control to right and actuate bar 2. The bar appears in blue for a moment.
- If o.k., *Test done* appears.
- If failed, *Test failed!* appears.
- Press OK to confirm test.

Note:

- Make sure that the SSU slide control is moved completely against the stop on the right and left position.



4i Standard SSU speed:



What to test:

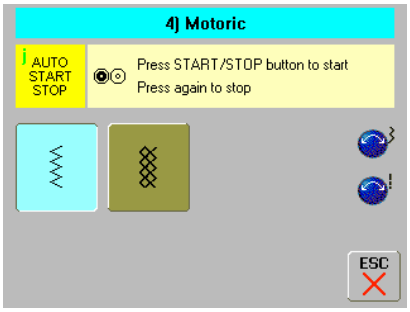
- Press Start/Stop button. The motor r.p.m changes depending on the SSU slide control position.
- The Watt value is displayed in the left field, and the stitches per minute (SPM) in the right field.

Repairing note:

- Replace S-Print.

Note:
Controlling the machine using the Start/Stop button works only if the foot control is not connected.

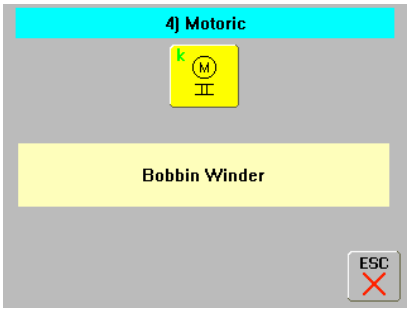
4j Automatic start/stop:



What to test:

- Press Start/Stop button. Machine runs at full speed.
- The zigzag and honeycomb stitches are available.
- Stitch length, stitch width and needle position can be changed.
- The machine runs and stops for about 7.5 seconds respectively.

4k Winder motor:



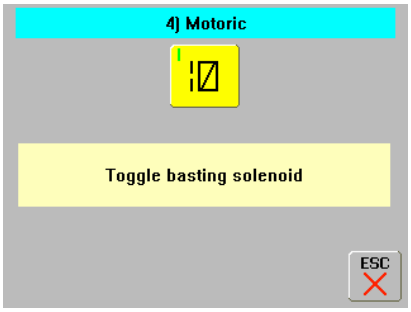
What to test:

- Press icon 4 to switch the winder motor on and off.
- If o.k., *Test done* appears.
- If failed, *Test failed!* appears.

Repairing note:

-
- Replace winder motor.
- Replace P-Print.
- Replace S-Print.

4l Basting magnet: artista 640



What to test:

- The basting magnet moves back and forth on pressing icon 4l.
- Press icon 4l again to end the test.
- If o.k., *Test done* appears.
- If failed, *Test failed!* appears.

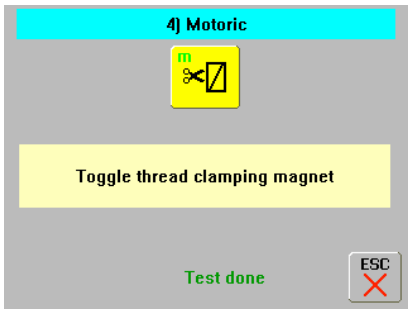
Repairing note:

- Check the cable for deformation, tears or breaks. Replace if necessary.
- Replace basting magnet.
- Replace P-Print.
- Replace S-Print.

4m Thread cutter clamping magnet: artista 640

What to test:

- The thread cutter clamping magnet toggles on pressing icon 4m.
- Press icon 4m again to end the test.
- If o.k., *Test done* appears.
- If failed, *Test failed!* appears.



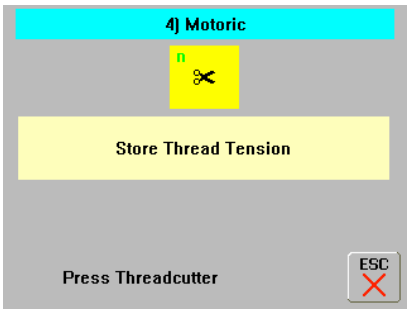
Repairing note:

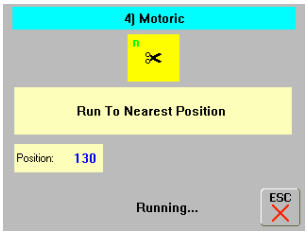
- Check the cable for deformation, tears or breaks. Replace if necessary.
- Replace basting magnet.
- Replace P-Print.
- Replace S-Print.

4n Thread cutting process: artista 640

What to test:

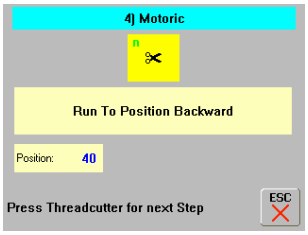
- Each pressing of the thread cutter button triggers the individual processes (10 working steps).

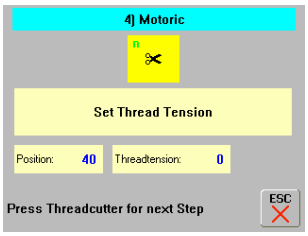


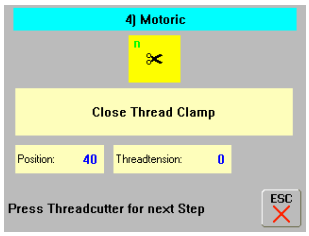


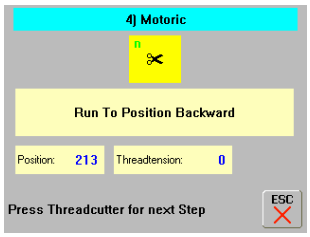


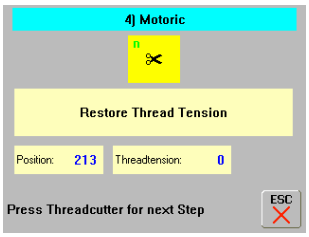


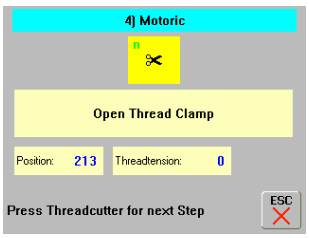


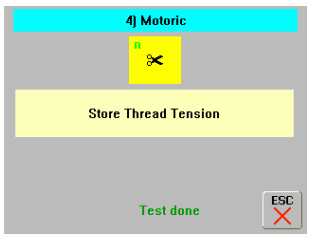










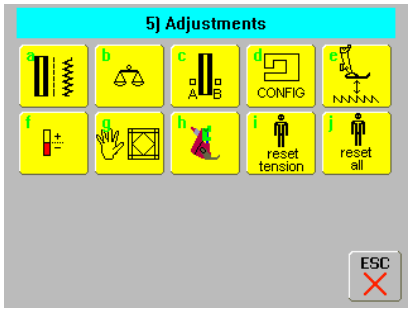


Step	Position (degree)	Motion	Movement / Action
1	130°	Run to Nearest Position	Starting position
2	213°	Run to Position Forward	Turns forward
3	125°	Run to Position Forward	Turns forward
4	40°	Run to Position Backward	Turns backward
5	40°	Set Thread Tension	Thread tension activated
6	40°	Close Thread Clamp	Thread clamp activated
7	213°	Run to Position Backward	Turns backward
8	213°	Restor Thread Tension	Thread tension deactivated
9	213°	Open Thread Clamp	Thread clamp deactivated
10		Store Thread Tension	Thread tension activated

Repairing note:

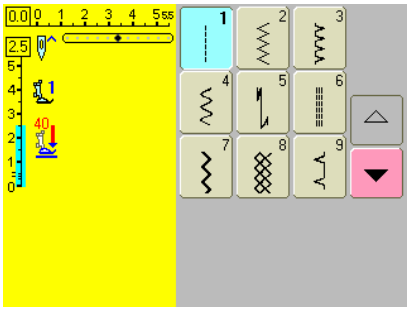
- Check cutting edge of thread cutting blade. If blunt, replace thread cutting blade (**p. 39**).
- Check position of synchronizing disc – see test 3n (**p. 79**).
- Replace P-Print.
- Replace S-Print.

6.7 Menu 5 – Adjustments



- The tests are selected by pressing the appropriate button.
- Testing and adjusting of balance, buttonhole, configuration, presser foot pressure, BSR foot, thread tension. Carrying out of resets.
- The tests are displayed by the page with the page reference in green.
- Explanations of tests and how to change and save tests are given below.

5a Sewing-off (customer's view):

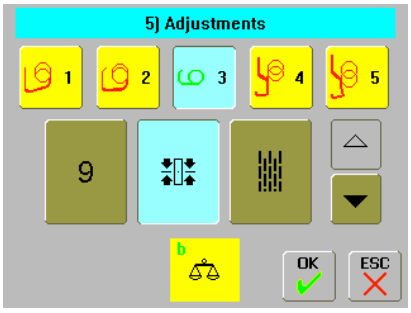


What to test:

- Press icon 5a to open the sewing program in customer's view.
- The machine can be sewn off using different stitch patterns.
- Press CLR to return to service program.

5b Electronic balance calibration:

What to test:



- Zero feed
- Use a double-layered cotton piece for the sewing-off, place it under the presser foot and start machine. The fabric must not move now.

What to adjust:

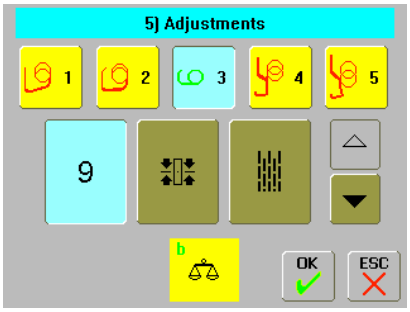
- Use icons 1-5 to set zero feed to lowest forward and reverse feed.
- The default value is 3.
- Press OK to save the value. This brings you back to menu 5.
- Press ESC to return to menu 5 without saving.

Repairing note:

- Make sure that the basic mechanical settings are correct. (**p. 58**)

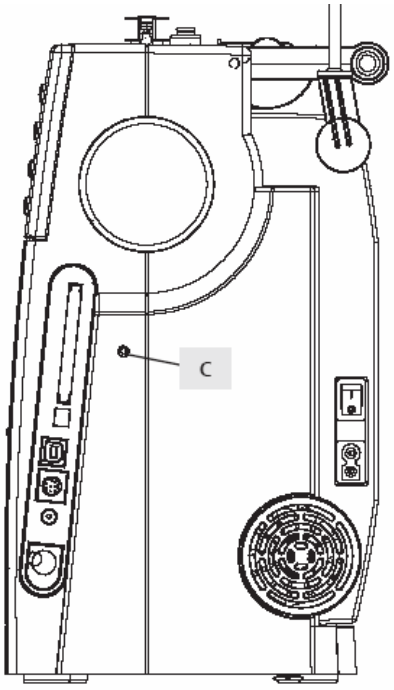
5b Mechanical balance fine-adjusting:

What to test:



- The number “9“ pattern.
- Thread machine, place two-layered sewing-off cotton under the presser foot and start machine.
- The “9” pattern must now be stitched in such way that the ends meet.

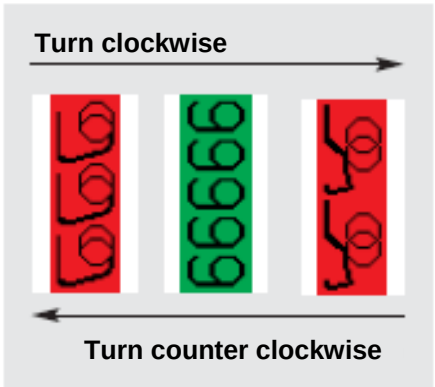
What to adjust:



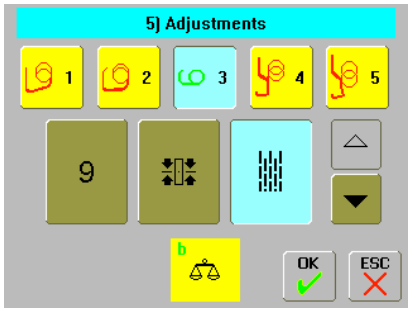
- Fine-adjusting.
- Turn balance shaft C in such way that the “9” is sewn correctly, i. e. ends of stitching lines meet exactly.

Repairing note:

- Make sure that the basic mechanical settings are correct. (**p. 58**)
- Use the icons 1-5 to increase or decrease the balance value by one unit respectively.



5b Mechanical balance fine-adjusting:



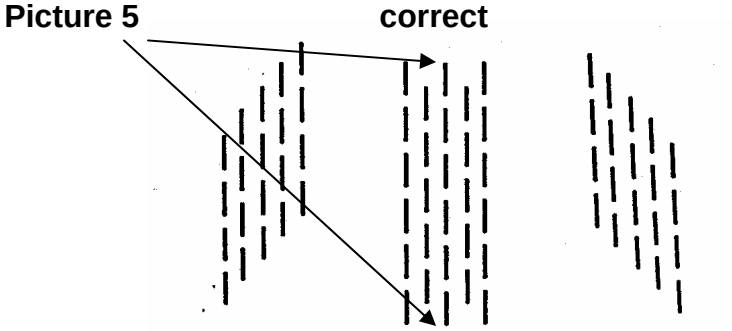
What to test:

- The (stitch counter) darning program.
- Thread machine, place two-layered sewing-off cotton under the presser foot and start machine.
- The stitch formation must form a virtual straight top and bottom line. Picture 5

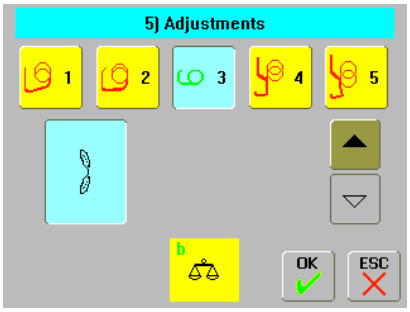
Repairing note:

- Make sure that the basic mechanical settings are correct. (**p. 58**)
- Use the icons 1-5 to increase or decrease the balance value by one unit respectively.
- Turn balance shaft C in such way that the “9” is sewn correctly, i. e. stitching line ends meet exactly.

Picture 5 **correct**



5b Electronic balance fine-adjusting:



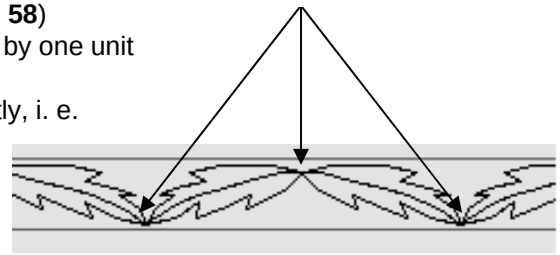
What to test:

- The “leaf“ pattern.
- Thread machine, place two-layered sewing-off cotton under the presser foot and start machine.
- The leaf pattern outline must be stitched in such way that the stitching line ends meet exactly.
- The needle penetration points at the pattern beginning and ending must match. Picture 4

Repairing note:

- Make sure that the basic mechanical settings are correct. (**p. 58**)
- Use the icons 1-5 to increase or decrease the balance value by one unit respectively.
- Turn balance shaft C in such way that the “9” is sewn correctly, i. e. stitching line ends meet exactly.

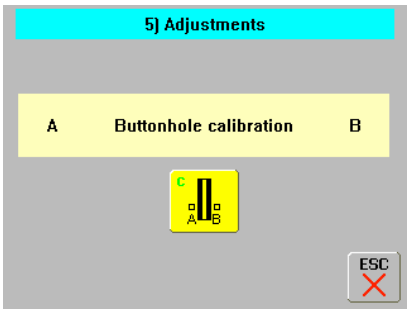
Pict. 4

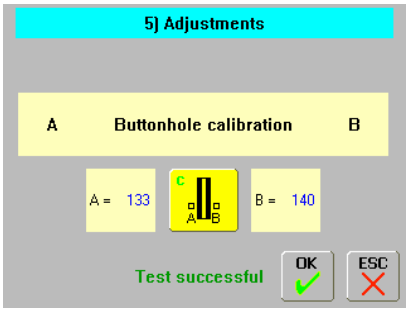


5c Buttonhole calibration:



The adjusting filter is no longer needed!



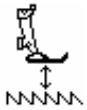


What to test:

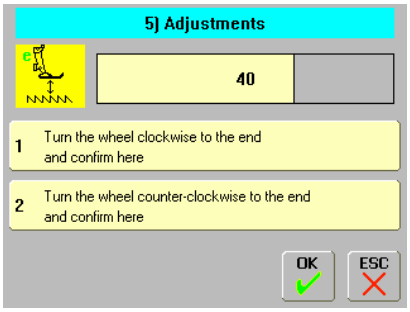
- Buttonhole calibration.
- Attach automatic buttonhole foot 3A. Set feed-dog to sewing mode.
- Lower presser foot.
- To make the feed-dog move sufficiently, the needle bar must be set to max. 1 cm below upper needle stop.
- Press icon c to start the test.
- The buttonhole device toggles. Signals A and B are recorded.
- If the calibration was successful, *Test successful* appears.
- The calibrated signals A and B must be in the range of 125 (+/-50).
- If failed, *Test failed!* appears.
- Press OK to save the value.
  This brings you back to menu 5.
- Press ESC to return to menu 5 without saving.

Repairing note:

- Balance fine-adjusting see test 5b in service program.
- Check mechanical parts of automatic buttonhole foot (smooth sliding of slide, motion of signaller prism).
- Replace automatic buttonhole foot.
- Test sensors A and B in service program 3.
- Replace S-Print and/or buttonhole sensor PCB.



5e Presser foot pressure sensor calibration (end stops):



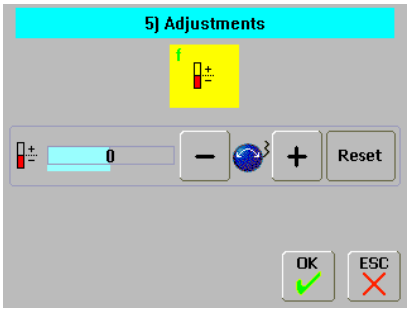
What to adjust:

- Turn presser foot pressure adjusting wheel clockwise to minimum stop.
- Press icon 1 (*Turn the wheel clockwise to the end and confirm here*).
- Turn presser foot pressure adjusting wheel counter-clockwise to maximum stop.
- Press icon 2 (*Turn the wheel counter-clockwise to the end and confirm here*).
- Press OK to save the value. This brings you back to menu 5.
- Press ESC to return to menu 5 without saving.

Repairing note:

- Check sensor (presser foot pressure slide control), cable and plug. Replace if necessary.
- Check mechanical transmission from adjusting wheel to sensor.
- Replace S-Print and/or P-Print.

5f Electronic upper thread tension: artista 640



What to test:

- Electronic default of upper thread tension.
- The default value 85 + 8 g equals the value 0.

What to adjust:

- Use the stitch width knob and/or “+” and “-“ icons to adjust the default value.
- Press Reset to return to default.
- Press OK to save the value. This brings you back to menu 5.
- Press ESC to return to menu 5 without saving.

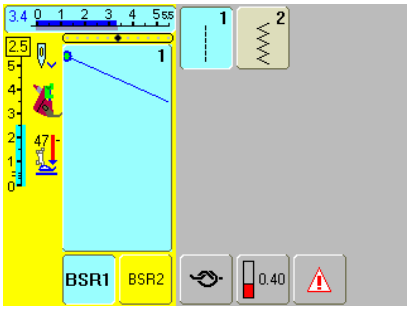
Repairing note:

- The mechanical default value of the upper thread tension must be correctly set (**p. 64**).

Note:

- The advantage of the electronic upper thread tension lies in the fact that it can be adjusted without removing the covers.

5g BERNINA Stitch Regulator (BSR) foot sewing program:



What to test:

- BSR foot sewing-off in customer’s view.

What to adjust:

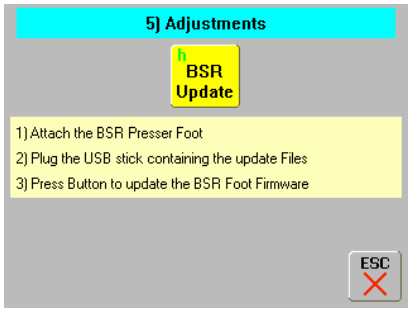
- Attach and connect BSR foot.
- Drop feed-dog, thread machine, and place fabric under foot.
- Press Start/Stop button. Move fabric in different directions.
- Press CLR to return to service program.

Repairing note:

- Check BSR foot sensor for dirt. Clean or replace if necessary.
- Check BSR connector.



5h BSR foot update:

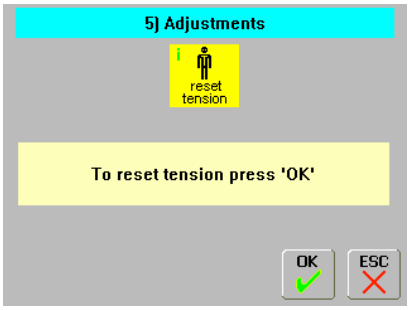


What to adjust:

- Attach BSR foot.
- Connect BERNINA USB data stick containing latest update file.
- Press icon h to start updating process.
- Follow the instructions on the screen.



5i Resetting artista 640 upper thread tension to default

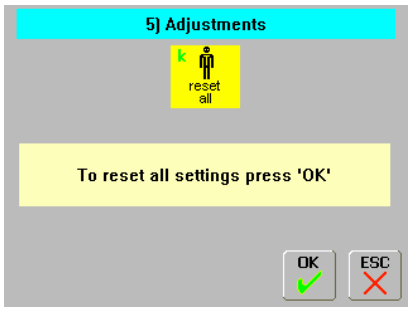


What to adjust:

- Press OK icon to reset to electronic upper thread tension default.
- *Do you really want to reset?* appears before final confirmation.
- Press OK icon again to reset to default. This brings you back to menu 5.



5j Resetting to factory settings (Reset All):



What to adjust:

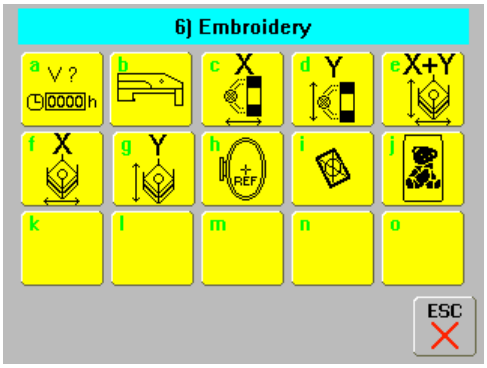
- Press OK icon to reset to factory settings.
- *Do you really want to reset?* appears before final confirmation.
- Press OK icon again to reset to default. This brings you back to menu 5.



Note:

- It is essential to save the customer's data on a BERNINA USB data stick before resetting to factory settings!
- See data saving in service program, test 1g.

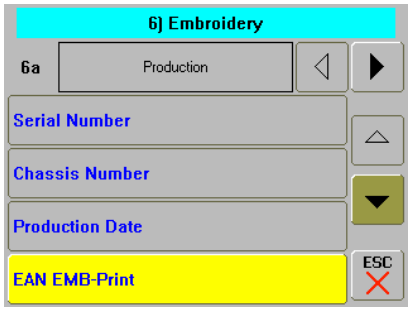
6.8 Menu 6 – Embroidery module (EMB)



- The tests are selected by pressing the appropriate button.
- The EMB test menu contains information on the configuration and the state of the embroidery module. It also contains tests for the individual components.
- Data, saving, and changing are explained below.

6a Embroidery module basic data:

What to test:

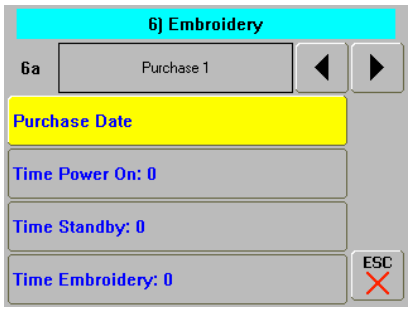


- Production dates.
- Serial Number. Is entered by the production. It can not be changed.
- Chassis number. Is entered by the production. It can not be changed.
- Production date. Is entered by the production. It can not be changed.
- EAN code. Is entered by the production. It can be changed using the virtual keyboard after replacing the EMB PCB.
- EMB BIOS version. Displays the installed BIOS version on the machine.

Repairing note:

- EMB updating.

Use the right scrolling arrow ▶ to go to the purchase, operating hours and stitching times data entry fields.



- Purchase Date, = Date of sale/purchase
- Time Power: On, = Total hours under power
- Time Standby, = Total hours under power but without activity
- Time Embroidery, = Stitching time in embroidery mode

Note:

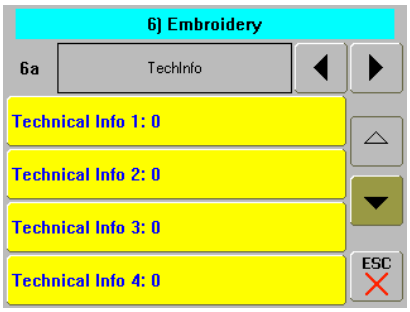
- There are 5 pages for 5 users.
- Each user's operating times can be established separately. This requires that the purchase date is entered with each change of user. Operating and stitching times are then automatically updated by the system.

Use the right scrolling arrow ▶ to go to the technical data entering fields.

What to test:

Technical information data entry.

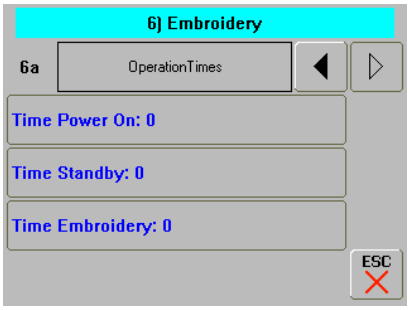
- Technical data can be entered here in this page, using the virtual keyboard.
- The entered data give the technician information on already made improvements.



Use the right scrolling arrow ▶ to go to the total hours and stitch count information.

What to test:

- Total hours and stitch count in EMB
- Time Power: On, = Total hours under power
- Time Standby, = Total hours under power but without activity
- Time Embroidery, = Stitching time in embroidery mode

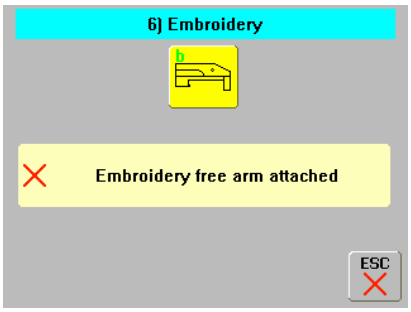




6b Free-arm adapter sensor:

What to test:

- Attach free-arm adapter and embroidery module.
- Press icon b. The bar appears in green after recognition of the sensor. *Test Successful!* appears.
- *Test failed!* appears if an error occurred.

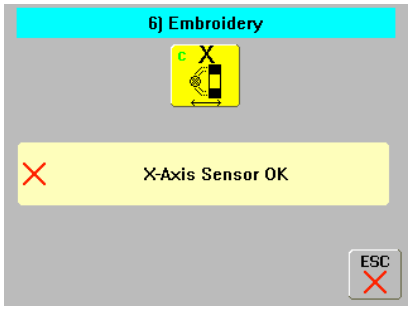


Repairing note:

- Ensure that the free-arm adapter and EMB are in the correct positions.
- Check connecting cables. Replace if necessary.
- Check EMB PCB and S-Print. Replace if necessary.
- Replace sensor.



6c X-axis sensor:

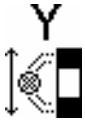


What to test:

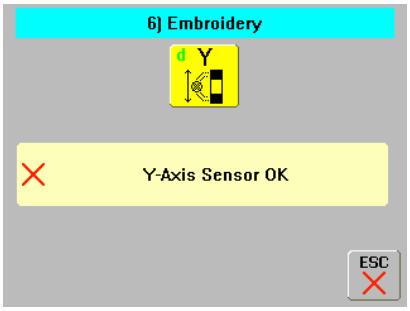
- Attach embroidery module and hoop.
- Press icon b. The bar appears in green after recognition of the sensor. *Test Successful!* appears.
- *Test failed!* appears if an error occurred.

Repairing note:

- Replace EMB S-Print.



6d Y-axis sensor:

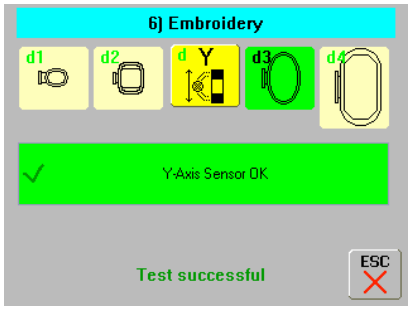


What to test:

- Attach embroidery module and hoop.
- Press icon b. The bar appears in green after recognition of the sensor. *Test Successful* appears.
- *Test failed!* appears if an error occurred.

Note:

- The type of the attached hoop is displayed after successful recognition.



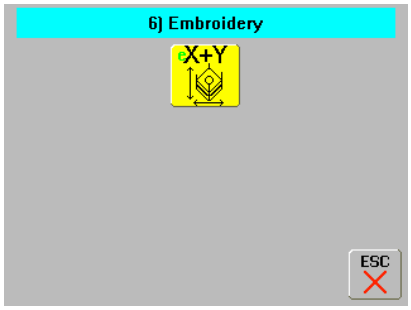
Repairing note:

- Replace Y-sensor.
- Replace EMB S-Print.

6e X- and Y-movement of stepping motors:

What to test:

- Attach embroidery module.
- Press icon e. The X- and Y-stepping motors move back and forth.
- Press icon e again to stop the test.
- *Test successful* appears if o.k.
- *Test failed!* appears if an error occured.



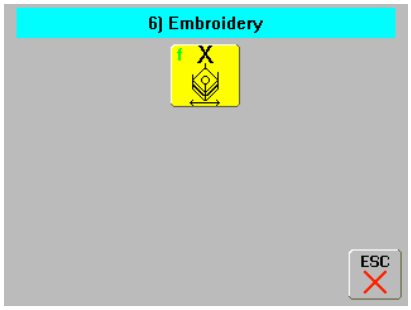
Repairing note:

- Replace the X- or Y-stepping motor.
- Replace EMB S-Print.

6f Movement of stepping motor X:

What to test:

- Attach embroidery module.
- Press icon f. The stepping motor X moves back and forth. Press icon f again to stop the test.
- *Test successful* appears if o.k.
- *Test failed!* appears if an error occurred.



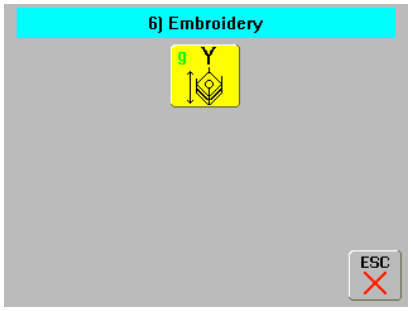
Repairing note:

- Check X drive belt tension.
- Check if drive pinion of stepping motor X is free of threads.
- Replace stepping motor X.
- Replace EMB S-Print.

6g Movement of stepping motor Y:

What to test:

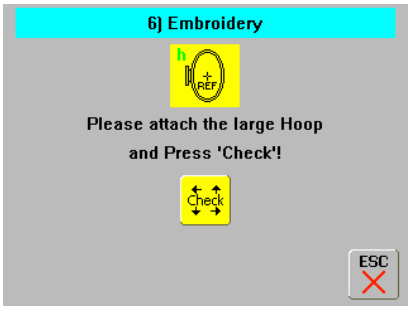
- Attach embroidery module.
- Press icon g. The stepping motor Y moves back and forth.
- Press icon g again to stop the test.
- *Test successful* appears if o.k.
- *Test failed!* appears if an error occurrred.



Repairing note:

- Check Y drive belt tension.
- Check if drive pinion of stepping motor Y is free of threads.
- Replace stepping motor Y.
- Replace EMB S-Print.

6h Hoop reference position:

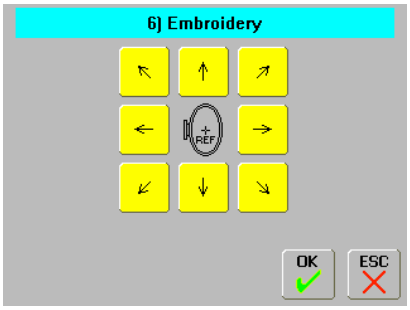


What to test:

- Hoop center reference point.
- Attach embroidery module and hoop.
- Place template (item 030 576.50.01 red) in hoop.
- Press “check“ icon. EMB moves to reference point.



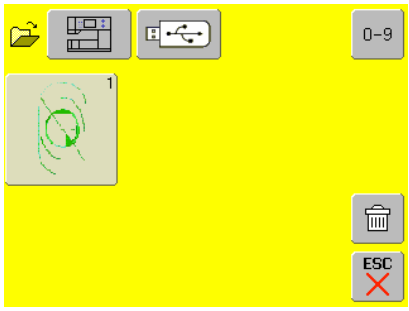
- Use the arrow keys to correct/adjust the center position.
- Press OK to save the value and to return to menu 6.
- Press ESC to return to menu 6 without saving.



Repairing note:

- Check tests 6c to 6g.
- Check X and Y drive belt tension.
- Check if drive pinion of stepping motors is free of threads.

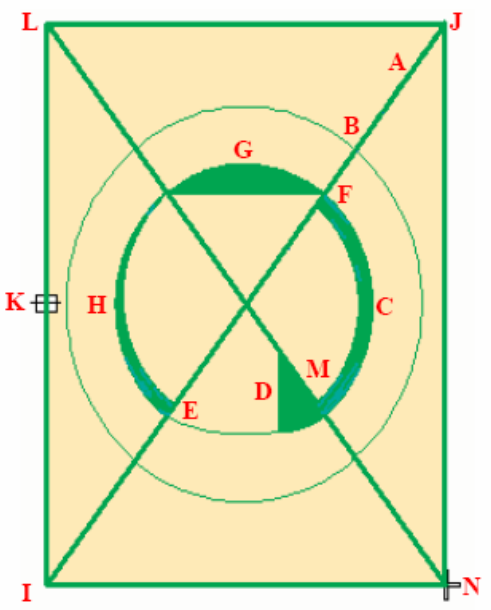
6i Embroidering using the test design:



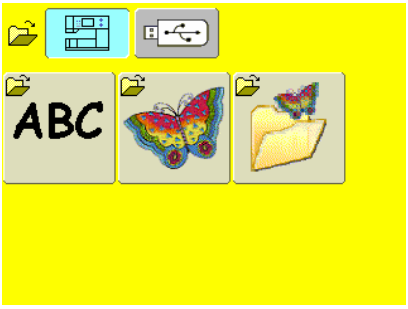
What to test:

- Hoop sew-off cotton and stabilizer.
- Attach embroidery module and hoop.
- Select test design.
- Stitch test design. Check it.
- Press CLR to return to menu 6.
- For test design assessment see **p. 98**.

Test design assessment		
Point/Area	**Desired status:**	**Possible cause:**
A	The two stitching lines must be on top of each other.	Reference point not adjusted. Speed too high, belt tension too weak/strong.
B Circle	Circle must close at point B.	X- and Y-axis stiff-driving. Belt tension too weak/strong.
C Satin stitching	The stitches must lie densely together.	Stiff-driving caused by threads, fluff, etc. in the drive. Belt tension too weak/strong.
D Fill Stitch	Stitch density (Y-direction) must be even.	Y-axis stiff-driving (slide or drive).
E	Must match first diagonal row.	Y- or X-axis stiff-driving (slide or drive).
F	Must be parallel to first diagonal row.	Y- or X-axis stiff-driving (slide or drive).
G Fill Stitch	Stitch density (Y-direction) must be even.	Y-axis stiff-driving (slide or drive).
H Satin stitch	The stitches must lie against each other.	Stiff-driving caused by dirt in the drive (probably thread remnants)
I	Must match corner row.	Y- or X-axis stiff-driving (slide or drive).
J	Must match corner row.	Y- or X-axis stiff-driving (slide or drive).
K	The stitching line must be seen. Note: Since there are no securing stitches at the beginning, it may well be that point K does not match the starting point.	Y- or X-axis stiff-driving (slide or drive). Fabric hooped incorrectly. Mark hoop outline with pencil.
L	Corner point must match.	Y-axis stiff-driving (slide or drive).
M	Must match fill (point D).	Y- or X-axis stiff-driving (slide or drive).
N	Corner point must match.	Y- or X-axis stiff-driving (slide or drive).



6j Customer's embroidery view:



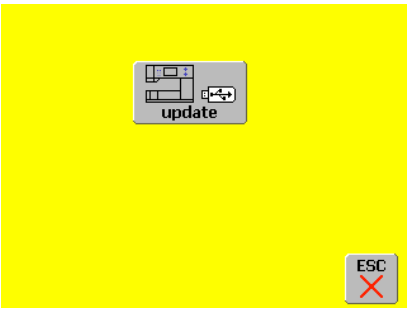
What to test:

- Use test j to go to customer's embroidery view.
- Press Clear to return to service basic program.

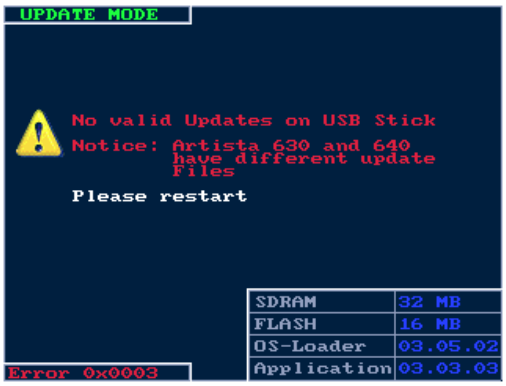
Chapter 7
Updating

7.1 Updating of sewing/embroidery computer

Note:
The artista models 630 and 640 do not have the same firmware (FW). FW files for 630 and 640 can, however, be stored on the same BERNINA USB data stick.

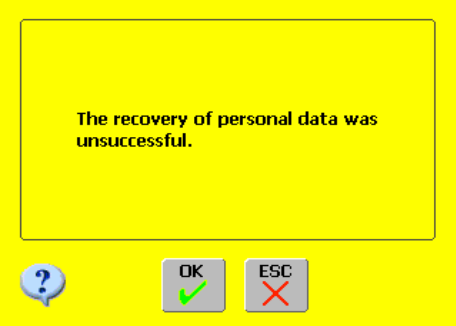


1. Connect BERNINA USB data stick including all FW files.
2. Switch machine on (power on).
3. Select setup by pressing "update".
4. The "update" screen appears. Press "update" icon to start the update.
5. Update files are checked, data and settings saved to the USB data stick and a reset triggered. The update is carried out after resetting. The sewing/embroidery computer automatically starts with the new application in update mode.
6. The settings and data that were saved on the USB data stick are sent back to the sewing/embroidery computer. The application changes to normal mode.
7. The new version is now installed on the sewing/embroidery computer. It is ready for normal use.
8. If the update can not be started or in the event of problems occurring while updating, one of the error messages below may appear:



Update files incomplete.

All required files must be copied to the BERNINA USB data stick. The stick must be correctly connected to the sewing/embroidery computer.



Saved settings / personal data is missing.

Connect BERNINA USB data stick containing
the update data to sewing computer and try again.



Update error message

Updating of new application failed. Check data on USB data stick and try again.
Try alternative access (**p. 103**).

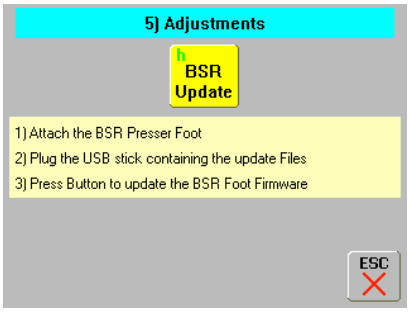
Note:
In the event of error messages during updating, see also user manual on pages 106 and 107.

7.2 BSR update

Service program 5h (**p. 93**).



5h BSR foot update:



What to adjust:

- Attach BSR foot.
- Connect BERNINA USB data stick containing latest update file.
- Press icon h to start updating process.
- Follow the instructions on the screen.

7.3 Update – alternative access

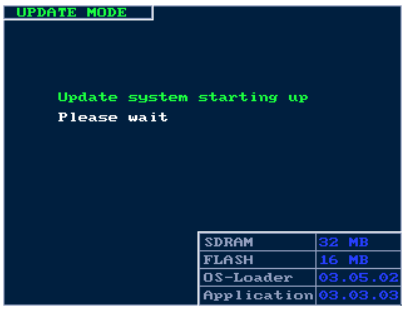
Note:
If the update can not be carried out in setup, or if the sewing/embroidery computer fails to reboot, an alternative access is provided.



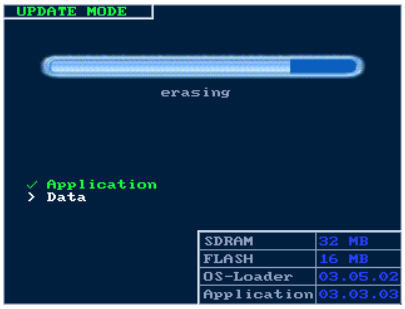
Loss of data:
If the sewing/embroidery system fails to reboot (e.g. due to not recognizing the firmware), the data saved by the customer can not be stored any more. However, the machine-related data in EEPROM (e.g. hours and stitch counter) remain saved.



1. Connect BERNINA USB data stick containing update data. Select test 1g (*save the customer settings*) in the service program. The data is read to the USB data stick.
2. Switch sewing/embroidery computer off.
3. Keep the needle positioning and pattern end keys pressed at the same time and switch sewing/embroidery computer on.
4. The application checks the update files on the USB data stick.
5. Before proceeding you are asked whether the data is saved. If yes, start process by pressing the two needle positioning keys simultaneously. If the machine data has not been saved yet, stop the updating process by switching off the sewing/embroidery computer. Return to point one.
6. After updating, the sewing/embroidery computer starts in normal mode.







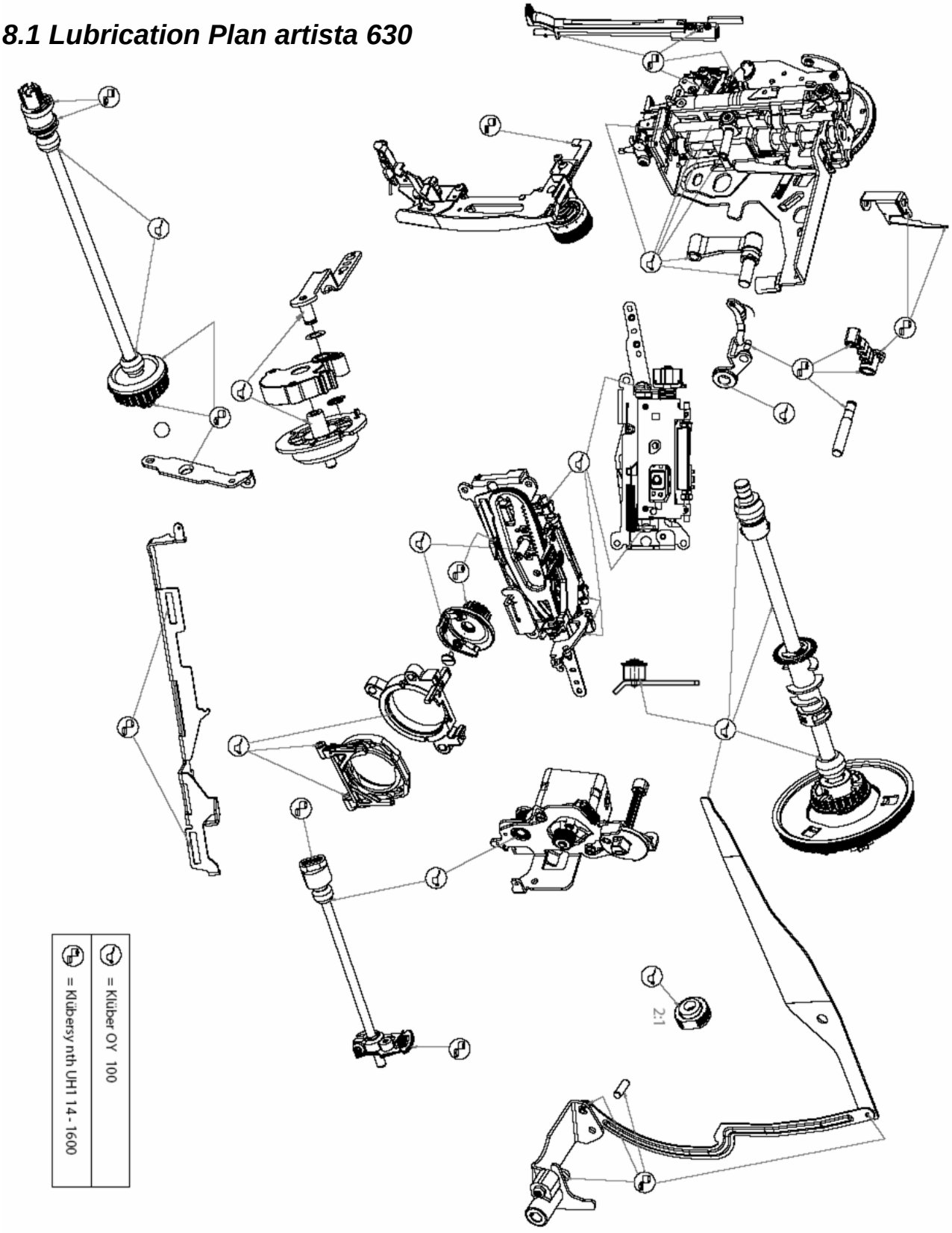


The tests below must be carried out/checked in the service program.

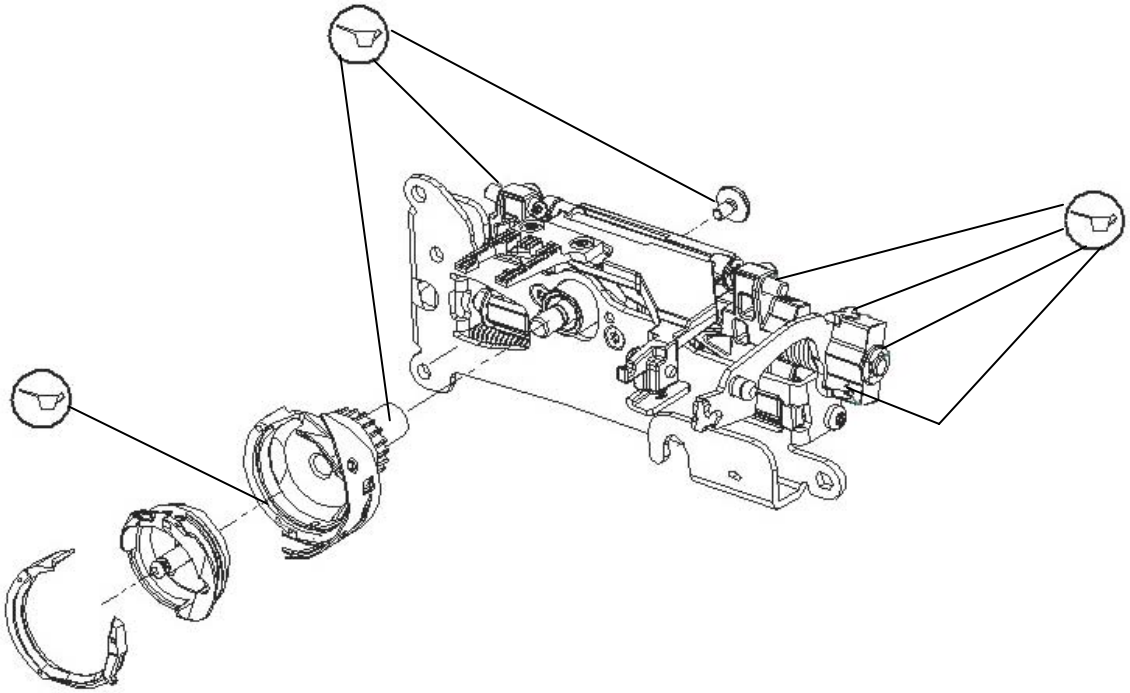
- Test 1b to check firmware version.
- Test 4f to calibrate speed.
- Test 2a to calibrate touch screen.
- Test 5c to calibrate buttonhole.
- Test 5b to check balance
  (balance default setting, see **p. 58**, fine-adjusting, see **p. 89**).
- Test 4h to calibrate Start/Stop unit (SSU).

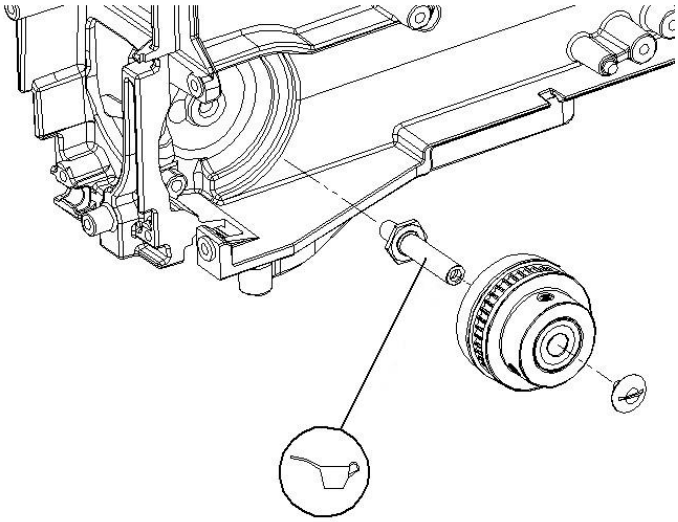
8. Chapter
Lubrication Plan

8.1 Lubrication Plan artista 630



8.2 Lubrication Plan artista 640 supplementary to artista 630





= Klüber OY 100	
= Klübersy nth UH1 14 - 1600	