Manualslib.com - The Global Manuals Library

BERNINA ARISTA 165 SERVICE MANUAL



Quick Links

Adjustment of Bernina Artista
Removing Covers
Distance Needle/Hook
Needle Height
Lower Thread Tension
Diagnostic Instruction

Table of Contents

Safety regulations

Table of Contents

Adjustment of BERNINA artista

Removing covers

Tensioning the drive belts

Checking the bobbin winder unit

Checking the presser foot fixation

Checking the presser foot height

Checking the darning foot height

Distance needle/hook

Needle plate position

Needle position zig-zag

Synchronisation disc

Feed-dog position (165/170)

Feed-dog position (180/185)

Height of the feed-dog

Thread passage play (165/170)

Setting the driver (165/170)

Radial play of the driver (165/170)

Loop lift (165/170)

Loop lift (180/185)

Needle height

Bobbin case stopper (180/185)

Feed-dog Synchronisation

Basic setting of balance

Basting/long stitch device

Knee lifter unit

Lowering the lifter lever

Automatic threader (180/185)

Lower thread tension

Upper thread tension (165/170)
Upper thread tension with a weight
Upper thread tension rough tuning
Upper thread tension fine tuning
Thread regulater spring
Thread cutter
L-print 165/170/180 (old)
L-print 165-185 (new)
Diagnostic instruction
Electrostatic discharges
Exchanging the S-print/touch screen
Test program artista
Test programs
Test no.3 Stepping motor test for
Test no.7 Configuration of the sewing
Test no.11 Software version of the
Test no.13b Setting of reference point
Test no.13c X-carriage sensor test
Test no.13d Y-carriage sensor test
Test no.13e Software version display
Test no.13f Memo card
Test no.13g Free-arm Eembroidery
Test no.13a Stepping motor test
Buttonhole sensors
RET-Print
Test Buttonhole sensor
Test P-Print
Test Switch bobbin winder unit
Bobbin winder motor switch
Feed-dog drop
Foot control and needle stop change
Presser foot lowering control

Thread cutter test
Foot control functioning
Presser foot lowering check
Tests in basic position
Thread cutter key
Threader sensor
Hour counter
Stitch counter
Test Connection S-print/L-print
Embroidery module function and
Embroidery; removing covers
Belt drive of x- and y-carriages
Exchanging S-Print
Exchanging X-Carriage Stepping Motor
Removing covers
Main cable
Freearm sensor and cable
S-Print
X-Carriage Stepping Motor
X-Carriage Belt and Gear Wheels
Y-Carriage Sensor
Y-Carriage Stepping Motor
Y-Carriage Belt and Gear Wheels
Embroidery Modul - Adjustment
Set Hoop Support on Y-Profile
Other ManualsLib Projects

BERNINA®

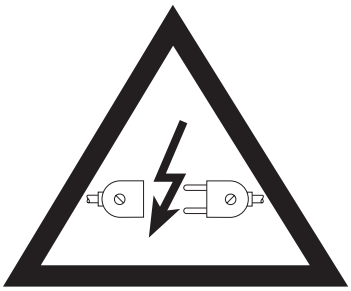


ENTWURF 3e

Service-Manual

artista 165/ 170/ 180/ 185

Safety regulations



Warning!
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 problems.

When servicing, always use original accessories and genuine BERNINA parts, either those delivered with the machine or purchased afterwards. These are the following:

Mains cable, Foot control, Buttonhole foot, Bobbin case with bobbin, other accessories

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

The Service Manual and Instructions are protected by copyright laws. These documents are delivered exclusively to the recipient. It is forbidden to copy, distribute, forward, publish or to reproduce them in any form without the explicit prior consent of Fritz Gegauf Ltd., BERNINA, Steckborn, Switzerland. It is also forbidden to record this Service Manual and Instructions on any retrieval system, or to translate it, or parts of it, into any human or computer-related language of any kind, whether electronically, mechanically, magnetically, or otherwise. Furthermore, it is prohibited to disclose the Service Manual and Instructions to third parties without the express written approval of FGAG, BERNINA, Steckborn, Switzerland.

This Manual is subject to revisions without notice. The recipient is responsible for updating the information provided by FGAG, BERNINA, Steckborn, Switzerland.

Masthead
Authors: V. Häseler / P. Kenyon
Layout: Erika Czibulya
Printing: Heer Druck AG, CH-Sulgen 2003

Contents (mechanic)

	Page
Safety regulations	1
Adjustment of BERNINA artista	3
Technical data of the Bernina artista series 165/170/180/185	3
Removing covers	5,6,7
Tensioning the drive belts	8
Checking the bobbin winder unit	9
Checking the presser foot fixation	9
Checking the presser foot height	10
Checking the darning foot height	10
Distance needle/hook	11
Needle plate position	11
Needle position zig-zag	12
Synchronisation disc	12
Feed-dog position (165/170)	13
Feed-dog position (180/185)	13
Height of the feed-dog	14
Thread passage play (165/170)	14
Setting the driver (165/170)	15
Radial play of the driver (165/170)	15
Loop lift (165/170)	16
Loop lift (180/185)	17
Needle height	18
Bobbin case stopper (180/185)	18
Feed-dog Synchronisation	19
Basic setting of balance	19
Basting/long stitch device	20
Knee lifter unit	21
Lowering the lifter lever	21
Automatic threader (180/185)	21
Lower thread tension	22
Upper thread tension (165/170)	22
Upper thread tension with a weight	23
Upper thread tension rough tuning	23
Upper thread tension fine tuning	23
Thread regulater spring	24
Thread cutter	24
Embroidery module function and troubleshooting	43
Test sample evaluation	44
Embroidery; removing covers	45
Belt drive of x- and y-carriages	46
Exchanging S-Print	46
Exchanging X-Carriage Stepping Motor	47
Exchanging X-Carriage Stepping Motor	47
Removing covers	48
Main cable	49
Freearm sensor and cable	50
S-Print	51
X-Carriage Stepping Motor	52
X-Carriage Belt and Gear Wheels	53
Y-Carriage Sensor	54
Y-Carriage Stepping Motor	55
Y-Carriage Belt and Gear Wheels	56
Embroidery Modul - Adjustment	57
Set Hoop Support on Y-Profile	57

Contents (electronic)

	Page
Description	25
Block diagram a165/170/180	26
Blockdiagram a185	27
L-print 165/170/180 (old)	28
L-print 165-185 (new)	29
S-print 165-180	30
S-print 185	30
Diagnostic instruction	31
Electrostatic discharges	31
Exchanging the S-print/touch screen	32
Test program artista	32
Test programs	33
Test no.1 Sewing-off	34
Test no. 2Forward/reverse feed equalization	34
Mechanical fine adjustment	34
Test no.3 Stepping motor test for sewing machine (balance).	35
Test no.4 Pinning position of all step ping motors	35
Test no.5 LCD/Touch-screen test	35
Test no.6 Touch screen calibration	35
Test no.7 Configuration of the sewing machine	36
Test no.8 Maximum speed equalisation in stitches/minute	36
Test no.9 Both lower and upper thread detectors	36
Test no.10 Endurance test for R+D	37
Test no.11 Software version of the sewing machine	37
Test no.12 Beeper test (acoustically)	37
Test no.13 Embroidery	37
Test no.13a Stepping motor test	37
Test no.13b Setting of reference point	38
Test no.13c X-carriage sensor test	38
Test no.13d Y-carriage sensor test	38
Test no.13e Software version display	38
Test no.13f Memo card	38
Test no.13g Free-arm Eembroidery	39
Test no.14 Demo mode	39
Test no.15 Buttonhole	39
Test no.16 Basting solenoid	39
Test no.17 Clamp magnet	39
Test no.18 Thread cutter	39
Test P-Print	40
Test Buttonhole sensor	40
RET-Print	40
Test Switch bobbin winder unit	40
Tests in basic position	41
Presser foot lowering check	41
Feed-dog drop	41
Thread cutter key	41
Threader sensor	41
Foot control and needle stop change using the foot control	41
Motor power	42
Hour counter	42
Stitch counter	42
Test Connection S-print/L-print	42

Adjustment of BERNINA artista 165/170/180/185

The service manual is intended to help with small repairs and adjustments. The instructions lay no claim to completeness. They are not suitable for a complete assembly or disassembly procedure.

Important:
To enable the work described to be performed correctly, the sewing machine must be in good mechanical and electrical condition (running smoothly, properly oiled and all plugs in position). When the adjustments are carried out in the correct order, the machine will sew perfectly.

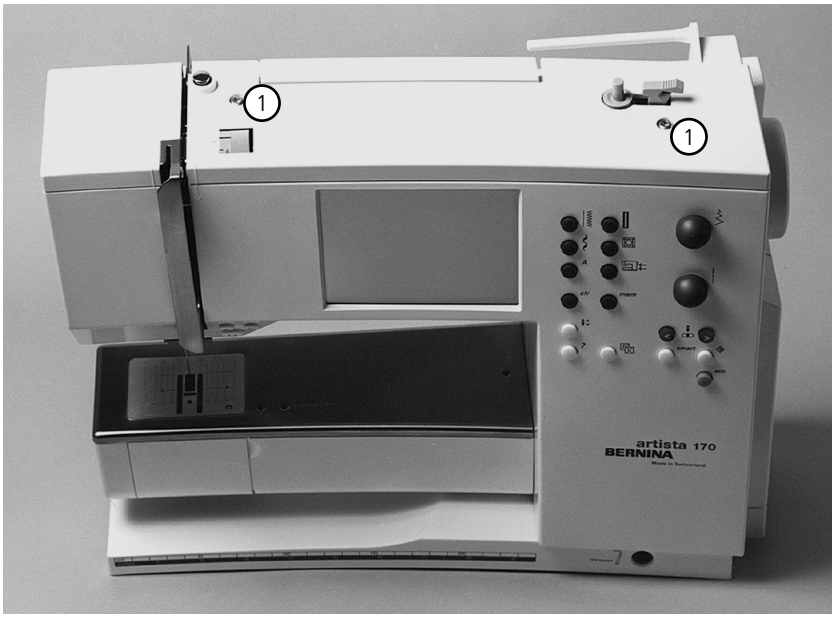
Technical data of the Bernina artista series artista 165/170/180/185

Feature (stitches)	**artista 165**	**artista 170**	**artista 180**	**artista 185**
Stitch length forwards in mm	5	5	5	5
Increment in mm	0.05	0.05	0.05	0,05
Stitch length reverse in mm	5	5	5	5
Stitch width in mm	5.5	5.5	9	9
Increment in mm	0.11	0.11	0.11- 0.18	0,11
Sideways feed	-	-	yes	Ja
Increment in mm	-	-	0.18	0,18
Sewing directions	2 (F./B.)	2 (F./B.)	16	16/4
Needle positions	11	11	11	11
Manual buttonhole (6 step)	yes	yes	yes	yes
Buttonhole/bartacks	12	12	13	13
Function: length measurement	yes	yes	yes	Ja
Quilt stitch	19	19	1	23
Darning programmes	2	2	2	2
Total practical stitches	21	21	21	26
Total decorative stitches	61	61	208	279
Alphabets/monogramme	3	3	5	4+3
Total number of stitches	180	180	376	338
Functions				
Automatic basic settings	yes	yes	yes	yes
Optimum settings displayed	yes	yes	yes	yes
Selected stitch/function display	on screen	on screen	on screen	im Display
Clear (clr) button	yes	yes	yes	yes
Balance	electronic	electronic	electronic	Elektronisch
Pattern end	yes	yes	yes	yes
Mirror image (lateral)	yes	yes	yes	yes
Permanent reverse sewing	yes	yes	yes	yes
Memory (mem)	yes	yes	yes	yes
Pemanent save	yes	yes	yes	yes
Securing pattern begin/end	yes	yes	yes	yes
Built-in needle threader	yes	yes	yes	yes
Hopper mechanism	yes	yes	yes	yes
Adjustable presser foot pressure	yes	yes	yes	yes
Lower thread control	no	no	yes	yes

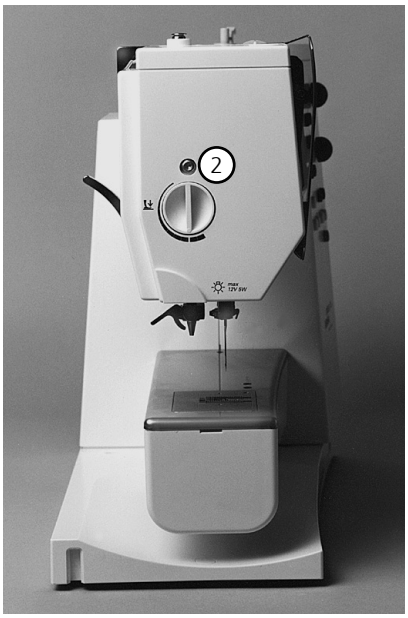
Technical data cont'd.

Operating controls:	**artista 165**	**artista 170**	**artista180**	**artista 185**
Screen	LCD	LCD	LCD	LCD (new)
Size in mm	100 x 75.5	100 x 75.5	100 x 75.5	94 x 71
Type	graphical	graphical	graphical	graphical
Number of dots	1/4VGA/320x240	1/4VGA/320x240	1/4VGA/320x240	1/4VGA/320x240
Background lighting	yes/CFL	yes/CFL	yes/CFL	yes/white
Contrast setting direct	touch screen	touch screen	touch screen	yes/Touchscreen
Direct stitch selection	yes/touch screen	yes/touch screen	yes/touch screen	Touchscreen
scroll function	yes	yes	yes	yes
Stitch width indicator beam	yes	yes	yes	yes
Stitch length indicator beam	yes	yes	yes	yes
CPS	optional	yes	yes	yes
Integrated service programs	yes	yes	yes	yes
Drive unit/power unit:				
Universal L-print 100 - 240V	yes	yes	yes	yes
Power max.	90W	90W	90W	90 W
Motor	DC/ 65 W/30V	DC/ 65 W/30V	DC/ 65 W/30V	DC/65W/30V
Sewing speed S.p.m.	120 - 900	120 - 900	120 - 900	100 - 900/min.
Embroidery	120 - 750	120 - 750	120 - 750	120 - 750
"Super Slow"	yes 70 S.p.M.	yes 70 S.p.M.	yes 70 S.p.M.	Ja 70 S.p.M.
Needle stop	up/down	up/down	up/down	up/down
Needle stop via foot control	yes	yes	yes	yes
Roll-up foot control cable	yes	yes	yes	yes
Main power switch	yes	yes	yes	yes
Construction/housing:				
Through space in mm	100 x 210	100 x 210	100 x 210	110 x 210
Overall length in mm	378	378	378	378
Overall width in mm	185	185	185	185
Overall height in mm	312	312	312	312
Sewing light voltage	12 V	12 V	12 V	12 V
Bulb	1 x 5W	1 x 5W	1 x 5W	CFL
No. of interfaces	1x	1x	1 x	1 x Service
Presser foot height in mm	7.5 mm	7.5 mm	7.5 mm	7,5 mm
Drop feed-dog	yes	yes	yes	yes
Drop feed-dog via FHS	yes	yes	yes	yes
Hook system	BERNINA CB	BERNINA CB	BERNINA rotary	BERNINA rotary
Needle system	130/705H	130/705H	130/705H	130/705 H
Adjusting needle	130/707H TCN	130/707H TCN	130/705H TCN	130/705H TCN
Weight (excl. accessories)	ca. 9.7 kg	ca. 9.7 kg	ca. 9.7 kg	ca. 9,7 kg

Removing covers



Top cover:
· Remove 2 screws (1).
· Remove top cover.



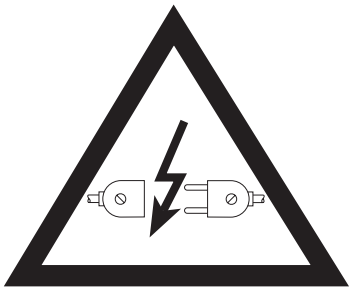
Head cover:
· Remove the screw (2).
· Remove head cover.



Removing L-print, back cover,
front cover:
· Remove L-print cover screw (4).

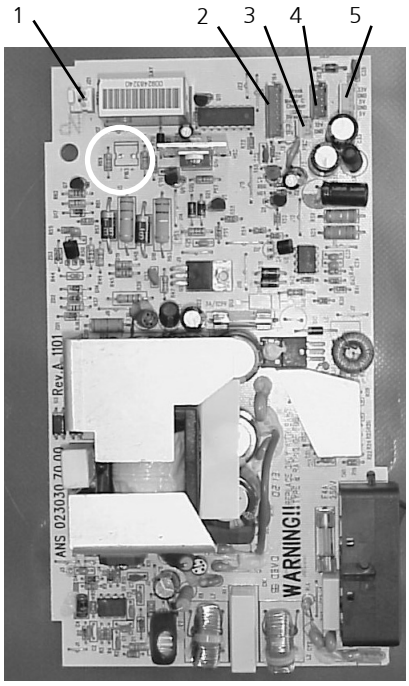
Removing covers



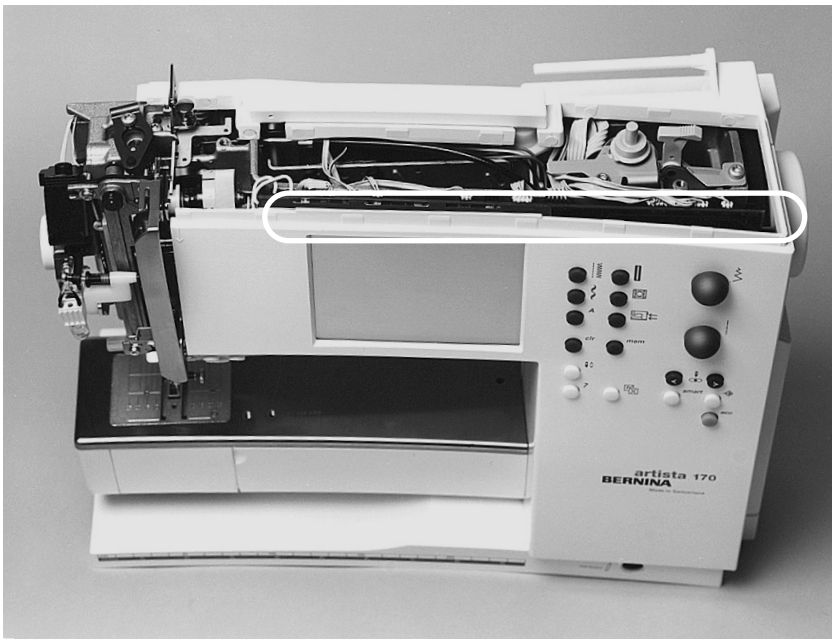


Refer to safety instructions on page 1!

· Swing out the cover and disconnect the four encircled connections P-160/161/162/163.



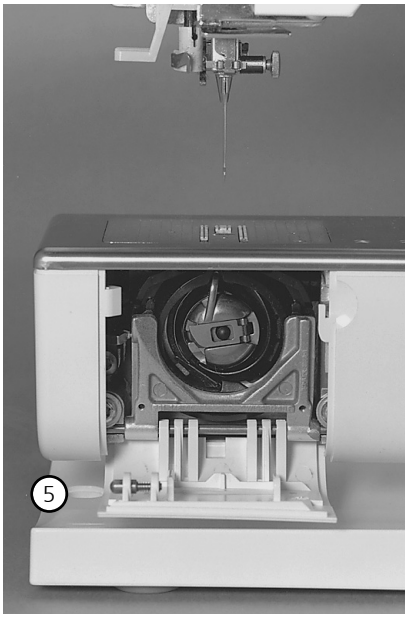
· Remove the complete L-print.
· Remove back cover.



· Disconnect the 10 encircled connections from the S-print.
· Swing out the complete front cover and disconnect the 4 connections and remove the front cover.

1)	165-185
2)	185
3+4)	165-180
5)	165-185

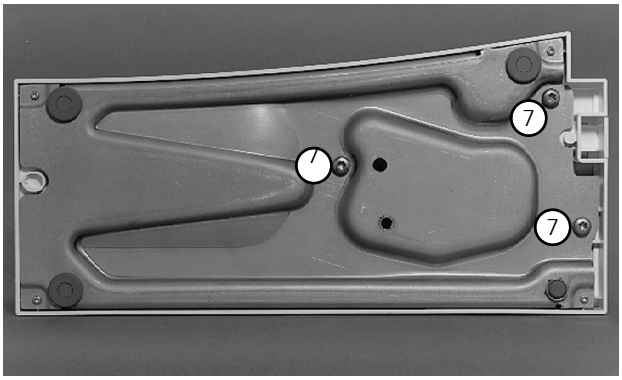
Removing covers



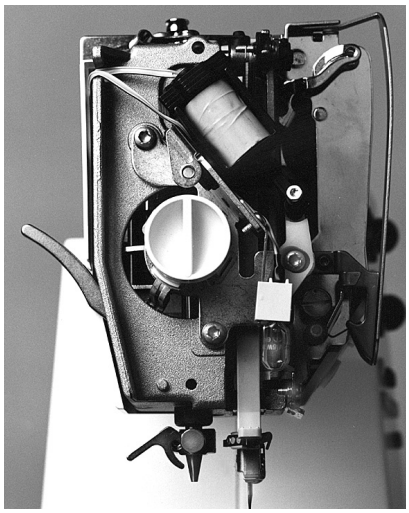
Free-arm cover:
· By snapping out remove the hinged front cover.
· Remove the cap (5).

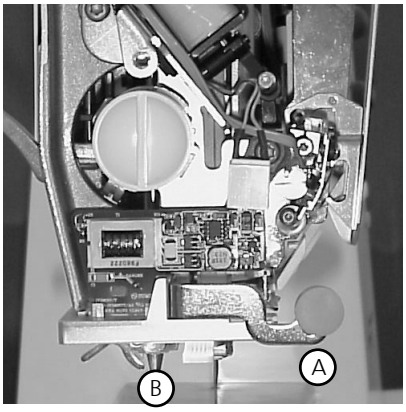


· Remove screw (6), access through the base plate.
· Slide out the free-arm cover.



Base plate:
· Remove 3 screws (7).
· Remove base plate.



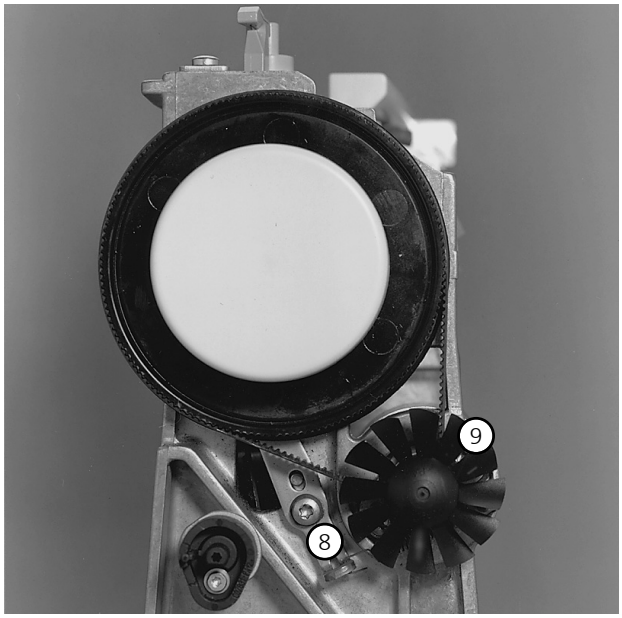


Replacing the light bulb:
There is a 12V/5W light bulb in the sewing computer, front left.

· Remove head cover.
· Pull bulb down and out (snap-on fastening).
· Insert new bulb in socket.
· Refit head cover.

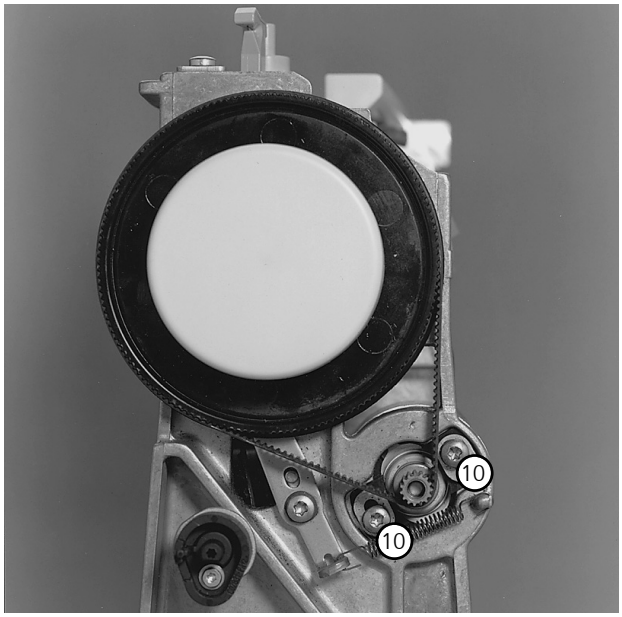
Replacing CFL light and magnifying glass holder:
See instructions in the CFL and magnifying glass holder packaging.
Points A and B may differ depending on the shipment. Older machines can be retrofitted with A and B.

Tensioning the drive belt (base shaft)



The belt tension is achieved automatically between the tension roller and the tension spring.
· Loosen the screw (8) slightly of the tension roller holder.
· Turn handwheel backwards and forwards.
· Tighten the screw (8).

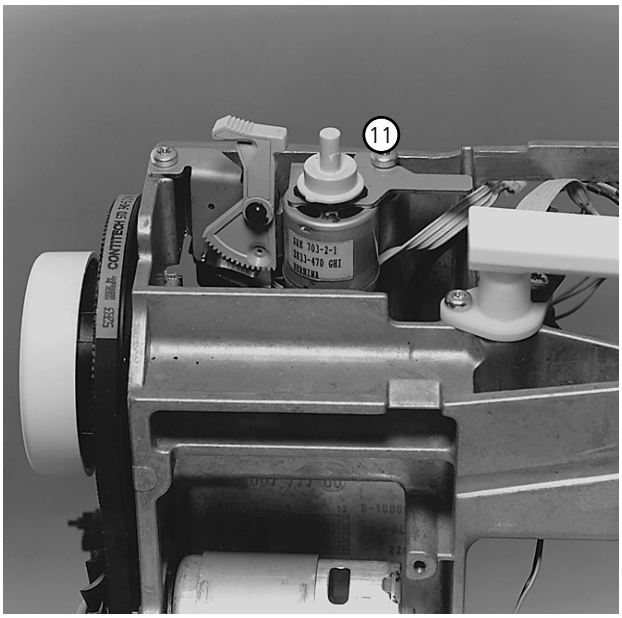
Tensioning the drive belt (motor)

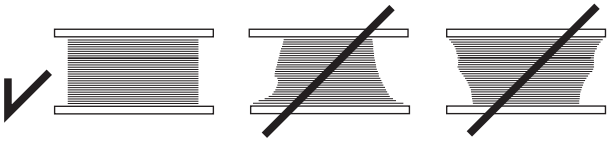


· Remove the ventilating fan (9).
· Loosen the fixing screws (10) slightly.
· Bring the motor into the desired position.
· Tighten both screws (10).

Checking the bobbin winder unit

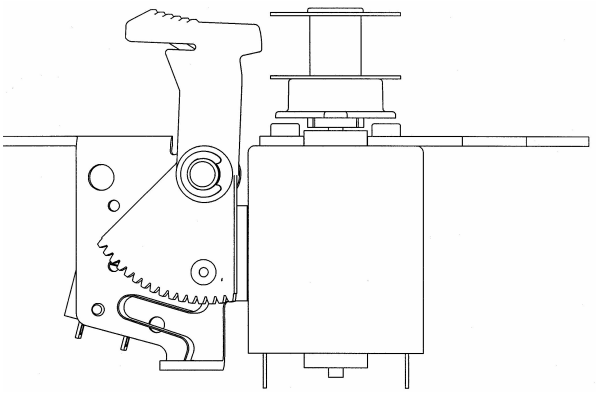
The thread should be wound evenly with pre-tension and the bobbin should be correctly filled.





Correction for one-sided winding:
· Turn the adjustment screw (11) in or out as appropriate.

Correcting the bobbin filling:
· The flip-flop spring should be in the third tooth of the release lever.



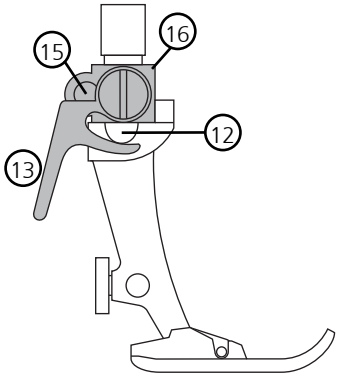
Attention!
The filling of the bobbin cannot be adjusted by moving the spring to another tooth position.

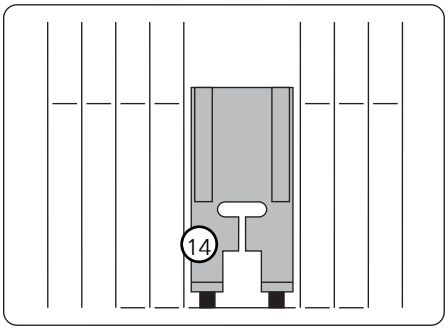
The filling of the bobbin can at the best, only be adjusted by means of rectifying the bracket basic spring position.

Checking the presser foot fixation and height

· The tension pin (12) should be one third to half way along the tension lever (13). The presser foot sole (14) must be parallel with the markings on the needle plate.

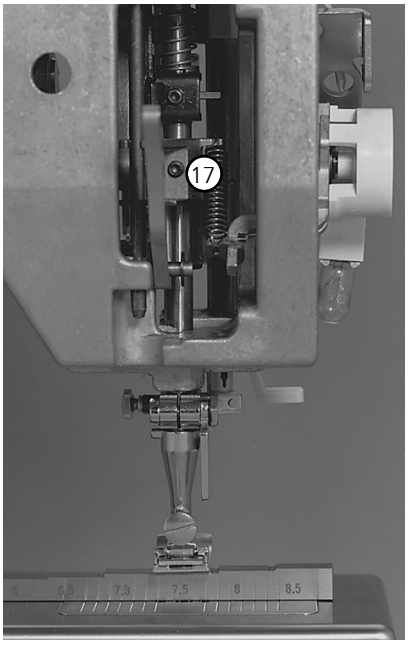
Correction:
· Loosen screw (15) on clamp (16).
· Adjust the height of clamp (16) until the correct tension position is reached.
· Align the presser foot sole with the markings on the needle plate.
· Tighten screw (15).





Checking the presser foot height

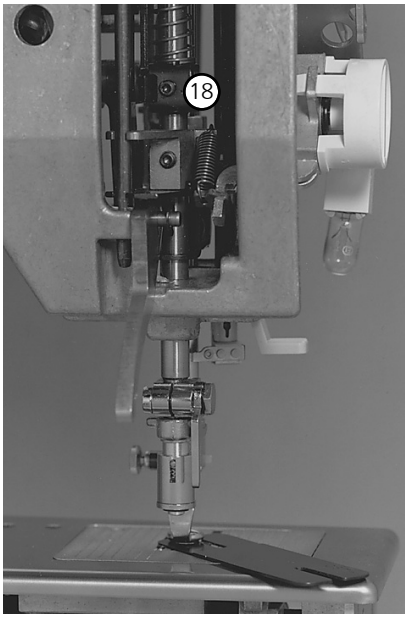
· Lower the feed-dog.
· Raise the lifter lever.
· Check the height with 7.5 mm gauge.



Correction:
· Loosen screw (17) on the presser foot bar guide.
· Place the presser foot on the gauge (7.5 mm).
Keeping it parallel to the markings.
· Press the presser foot bar down by hand.
· Tighten screw (17).

Checking the darning foot height

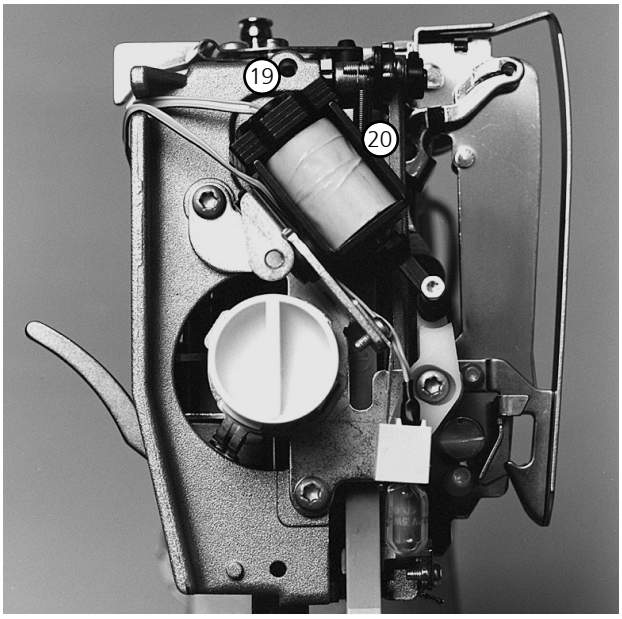
· Attach the darning foot.
· Lower the feed-dog.
· Turn the handwheel until the presser foot bar has reached its lowest position.
· Use the gauge (0.5 mm) to check the distance between the needle plate and darning foot sole.



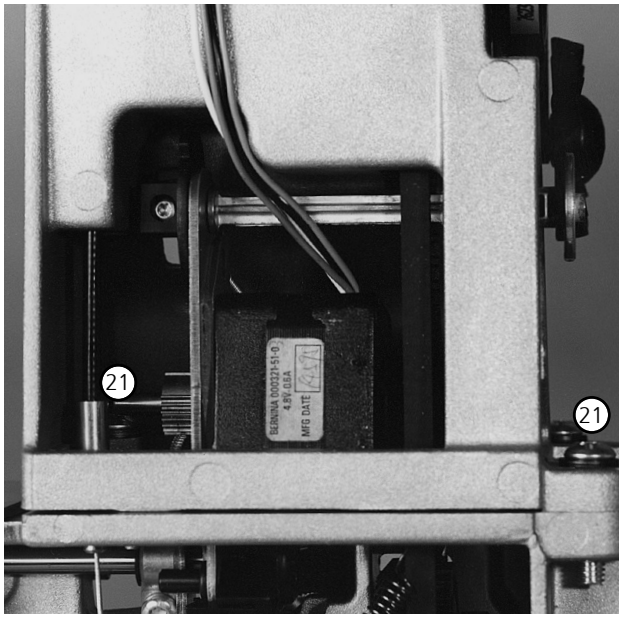
Correction:
Loosen screw (18) on the hopper machanism lever.
Place darning foot on the gauge (0.5 mm).
Tighten screw (18) (note position in regards to the cam).

Checking the needle position in the direction of feed (needle/hook distance)

· Insert no. 80 needle (checked). The lateral distance between needle and hook (in the scarf) should be 0.01 mm to 0.05 mm.



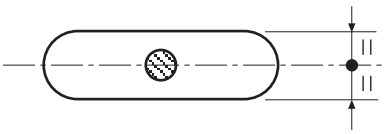
Correction (up to 0.2 mm):
· Loosen screw (19) of the pivot pin.
· Adjust the needle bar holder (20) to the prescribed position.

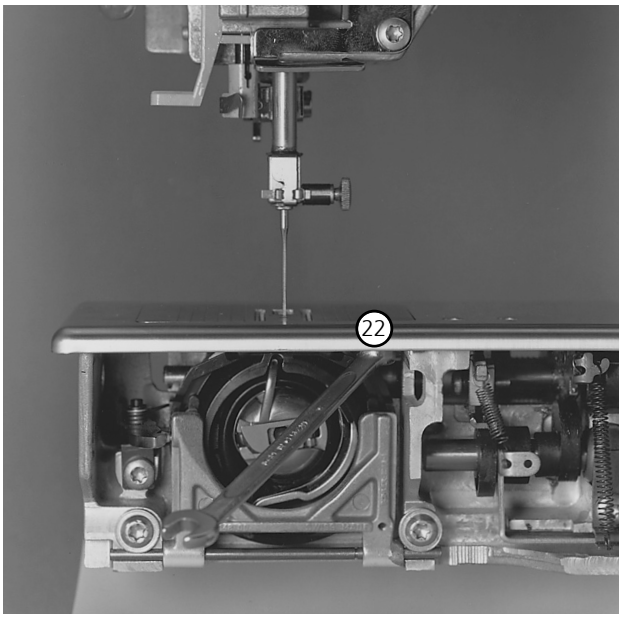


Correction (more than 0.2 mm):
· Slightly loosen 3 screws (21).
· Move the frame to the hook appropriate.
Attention! Only in the direction of the material feed. If necessary check the position of the presser foot in relation to the needle plate.
· Tighten screws (21).

Checking the needle plate position

· Insert needle Nm 90.
As seen in the direction of the material feed the needle should be in the centre of the stitch hole.

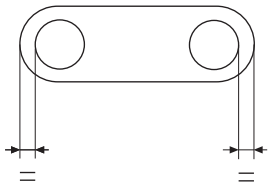


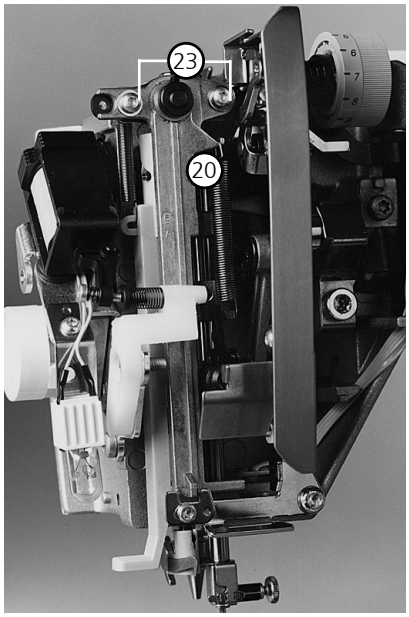


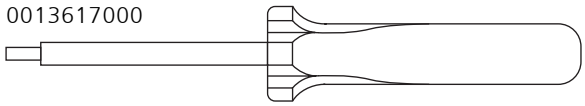
Correction:
· Loosen the nut on the locking pin (22) (under the needle plate).
· Adjust the stitch plate to the prescribed position. Tighten the nut (22) - only within the limits of the free-arm cover.

Checking the needle position of the zig-zag stitch

· Switch machine on.
· Select zig-zag.
· Set stitch width to maximum.
· Turn the handwheel and observe whether the lateral spacing from the edge of the stitch hole is the same to the left and right (This is also valid for needle position LCR).

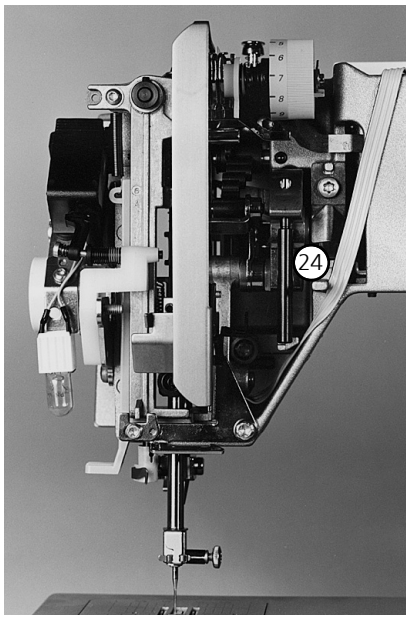




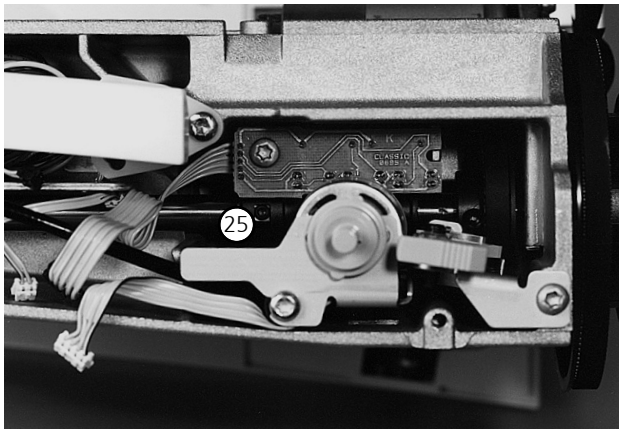


Correction:
· Slightly loosen the fixing screws (23) on the needle bar support (20).
· Using the eccentric key (0013617000) adjust the support until the prescribed needle position in the stitch hole is obtained.
· Tighten the screws (23) - zig-zag limiter should be checked.

Checking the position of the synchronization disc



Fine adjustment (e.g. as check):
· Go into basic setting of service program.
· Turn handwheel in the direction of rotation until signal no.3 is no longer active (all 3 must be inactive at the same time).
· The balance piece should now be in the pinning position.

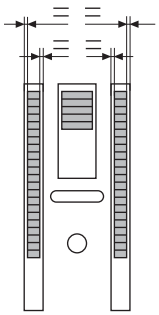


Rough adjustment (after disassembling):
· Remove the frame cover.
· Remove the head cover.
· Position the balance piece with pin (24).
· Fixation screw (25) on the synchronization disc must point vertically upwards.

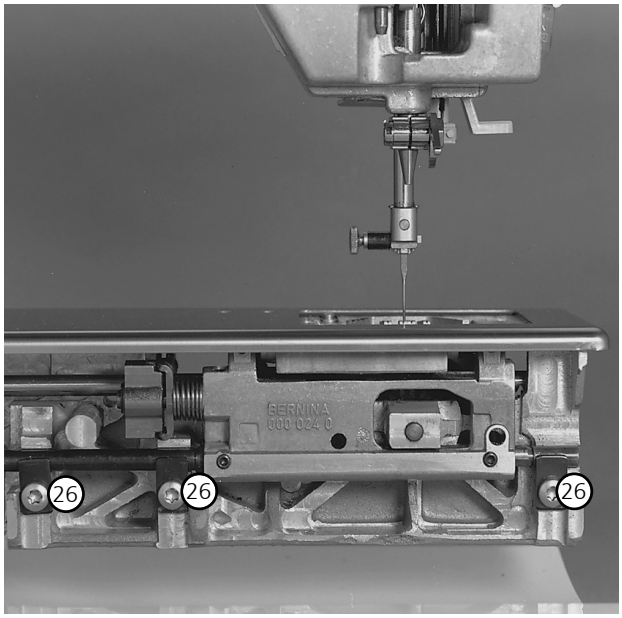
Correction:
· Loosen the screw (25).
· Pin the balance piece.
· Adjust the synchronization disc to the correct position.
· Tighten the screw (25) - max. torque 0.6 Nm.

Checking the feed-dog position in the needle plate (artista 165/170)

· The feed-dog must be equidistant to each side of the needle plate.



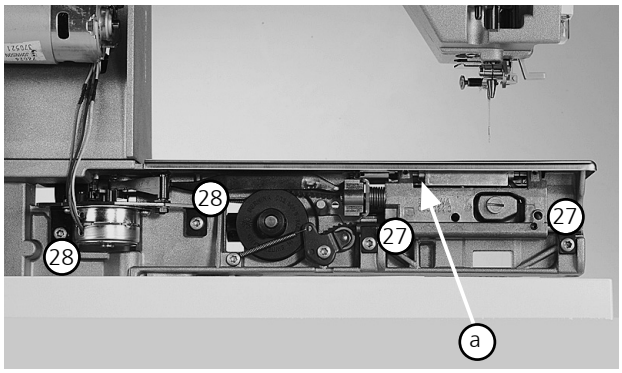
Check:
When lowering the feed-dog, it must drop by itself.



Correction:
· Loosen 3 screws (26).
· Move the pivot points sideways to the correct position.
· Tighten screws (26).

Checking the feed-dog position in the needle plate (a180/185)

· Pin the stepping motor for lateral feed.
· The feed dog must be equidistant to each side of the needle plate.



Correction:
· Pin the stepping motor.
· Loosen both screws (28).
· Center the feed-dog out.
· Retighten the two screws (28).

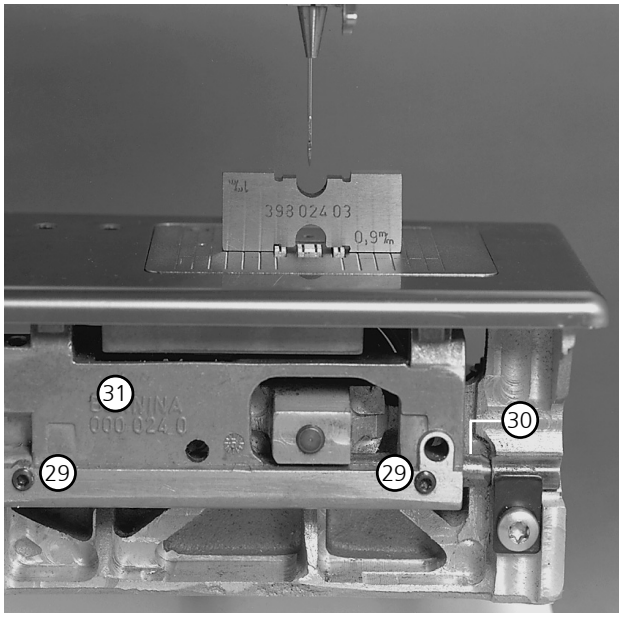
Note:
Check/set the distance of 2,4mm (a).

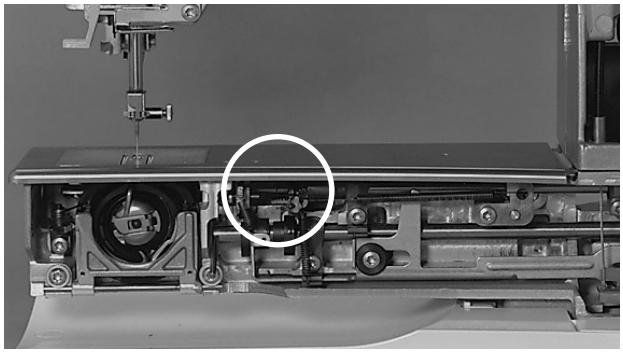
· When not correct, loosen both screws (27).
· Move the pivot points to the correct position (no play/moving freely) and retighten the screws (27).

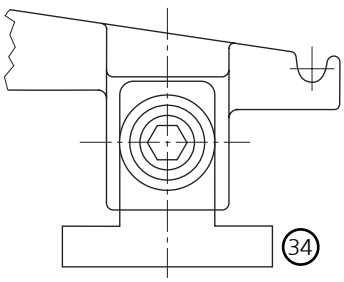
Checking the feed-dog height

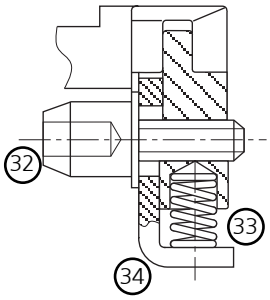
At their highest point the tips of the feed-dog teeth should be 0.05 mm higher at front than at the back.

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



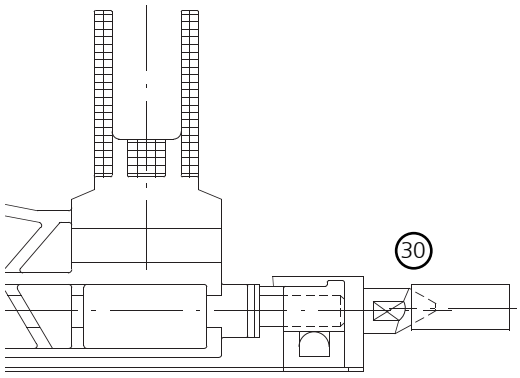






Correction: (rear of feed-dog)
· Loosen the screws (29).
· Using a 5.5 mm open end wrench, turn the excentric pin (30) until a height of 0.9 mm is reached.
· Tighten the screws (29).

Attention! The feed dog carrier (31) must lie on the circlip.

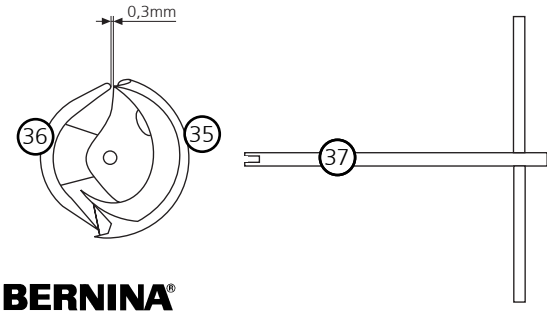


Correction: (front of feed-dog)
· Loosen the screw (32).
· The pressure spring (33) causes the adjustment plate (34) to move independently.
· Place gauge 0.9 mm in position and press down.
· Tighten the screw (32).

Attention! Check again after retightening the screw.

Checking the thread passage play (artista 165/170)

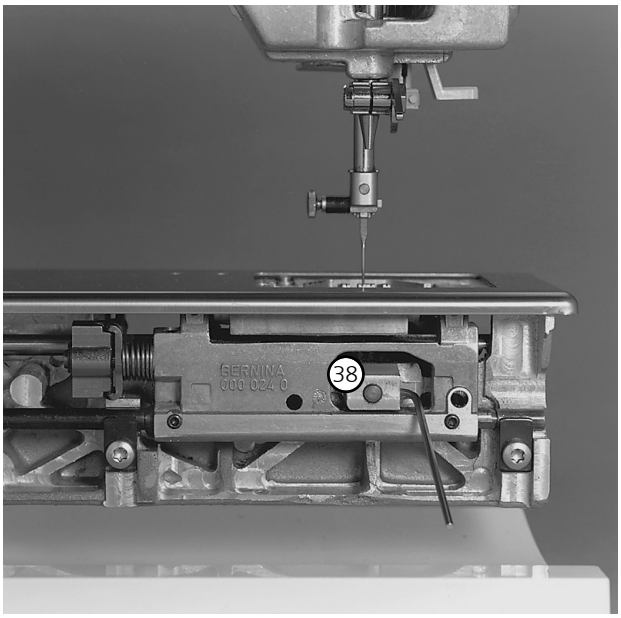
· There must be 0.3 mm play between the hook (35) and the hook driver (36). Check with a feeler gauge.



Correction:
· If the distance is too large or too small, adjust the short arm of the driver with the adjustment key (37).

Checking the position of the driver in the hook race (artista 165/170)

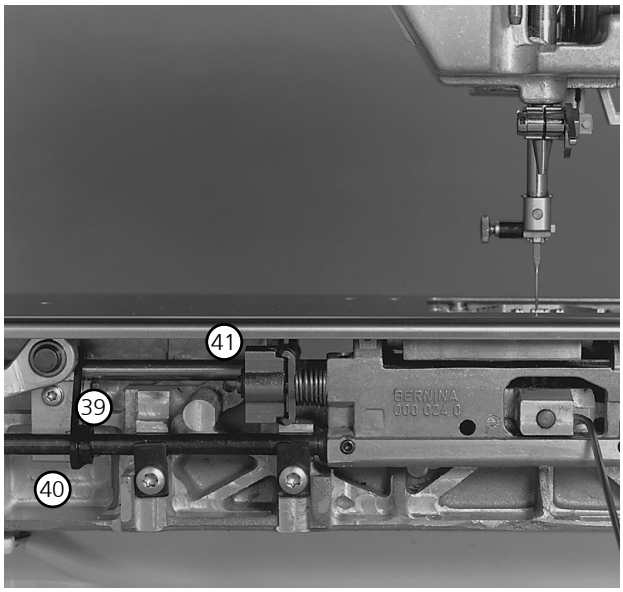
· The hook driver (36) should be 0.1 - 0.15 mm behind the front edge of the hook race.



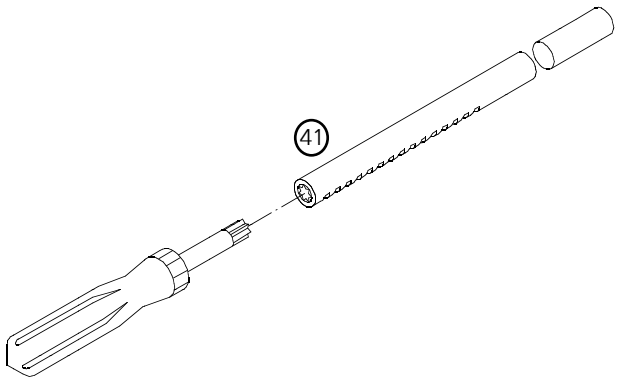
Correction:
· Loosen the screw (38) of the driver shaft.
· Push the complete driver to the prescribed position.
· Tighten the screw (pay attention to the flat).

Checking the radial play of the driver (only artista 165/170)

· Check the play between the rack (41) and the pinion by moving the hook driver (36) in a radial motion.
· The driver (36) should not have any radial play.

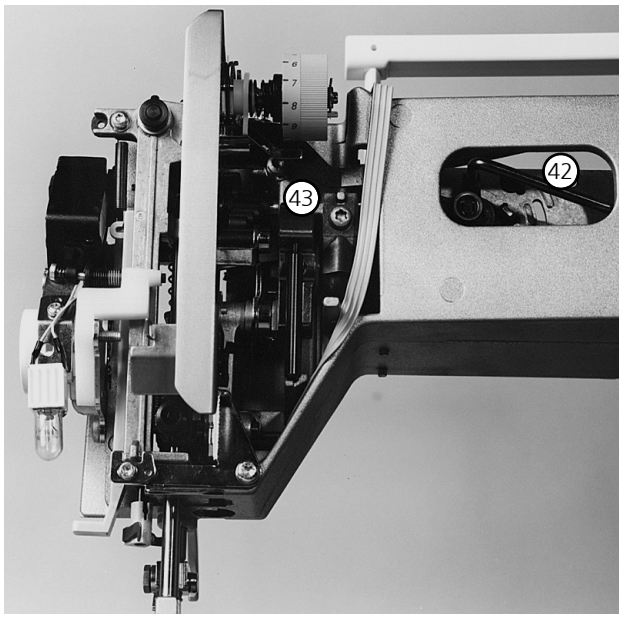


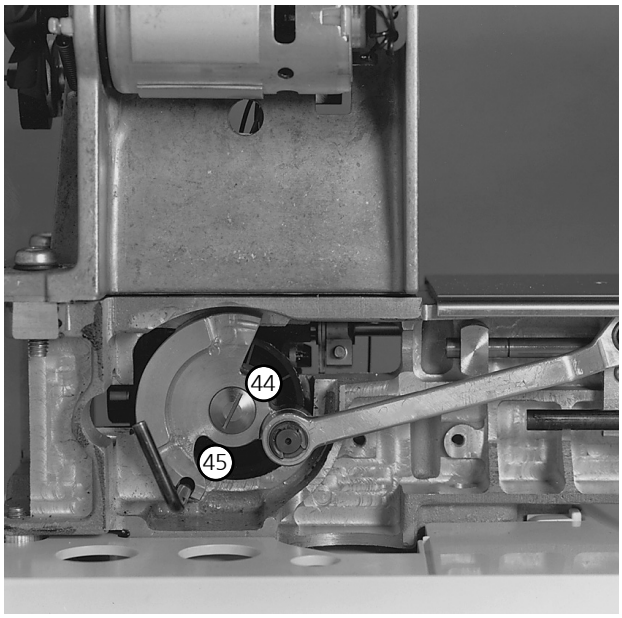
Correction:
· Loosen the screw (39) on the rack driver clamping piece (40).
· With the help of a Torx screwdriver, eliminate the play by turning the rack (41) in a radial motion.

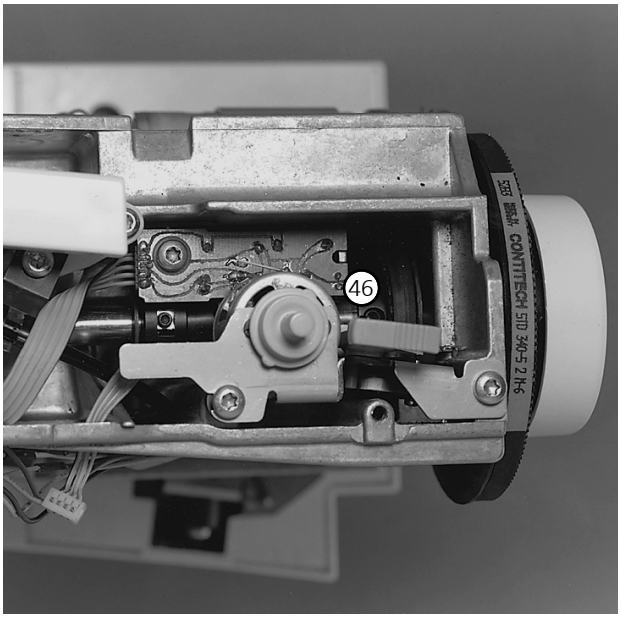


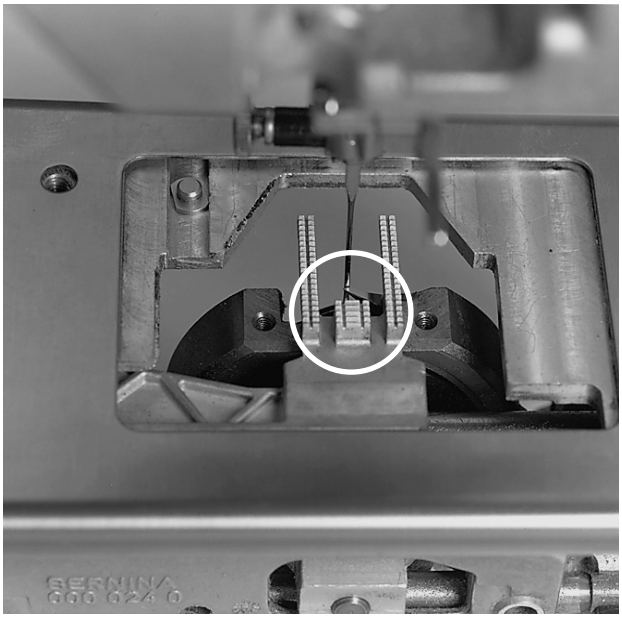
Checking the hook adjust. loop lift/synchronization (artista 165/170)

· Remove the needle plate
· Pin the stepping motor (42) needle position center.
· Pin the balance piece (43) of the needle drive(5.5 mm pin) and turn the handweel until the stop position is reached.
· Hook drive crank (44) must now be pinned with pin (45).
Note: The feed-dog settings should be correct first.







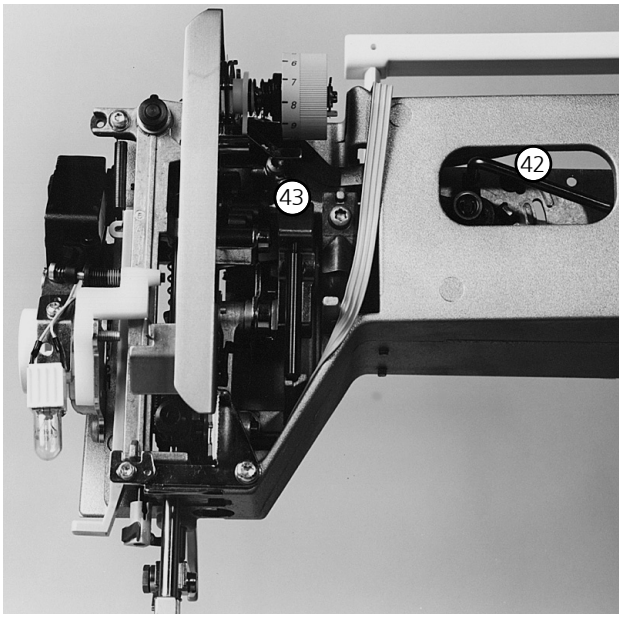


Correction hook drive crank:
· Loosen the second screw (46) in direction of rotation of the drive belt flange.
· Loosen the first screw in direction of rotation. Now turn the drive belt flange, until the hook drive crank can be pinned.

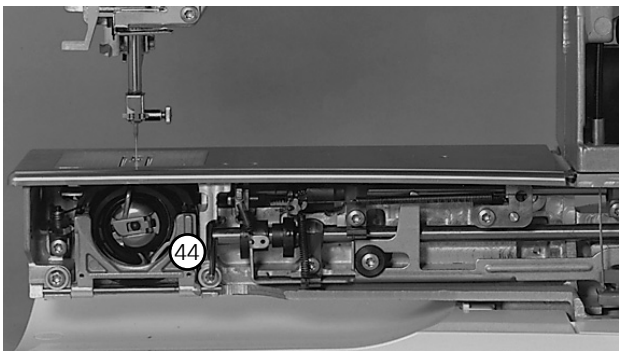
Position of hook in relation to the needle:
· Pin the balance piece, stepping motor zig-zag and the hook drive crank.
· The hook point must now be flush with the right hand edge of the needle (see encircled part of diagramme).

Correction:
· Pin the balance piece, stepping motor zig-zag and the hook drive crank.
· Loosen screw (39) on the rack clamping piece (40).
· The rack (41) can be moved until the hook is flush with the right hand edge of the needle.
· Tighten screw (39).

Checking the hook adjustment loop lift /synchronization (a180/185)

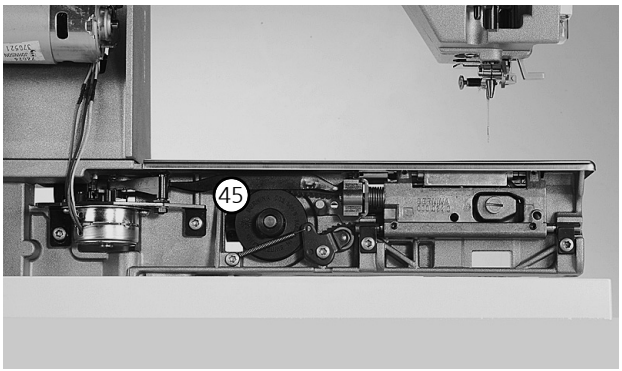


- Remove the needle plate
- Pin the stepping motor (needle position centre)
- Pin the balance piece (43) of the needle drive (5.5mm pin) and turn the handweel until the stop position is reached.
- Pin the base shaft (44) 3mm pin, feed dog must be in its lowest position.
- In this position the hook must now be flush with the left hand edge of the needle.



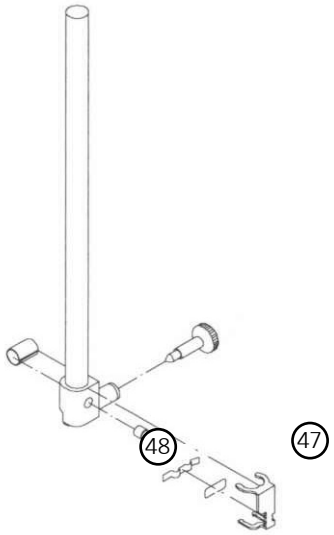
Attention!
The gears shoudn't have any undue play and must be running smoothly.

Note:
As the first screw in direction of rotation must be horizontal to the front of the machine, it might be necessary to go out of mesh with the gear.



Correction :
- Loosen the second screw in direction of rotation of the bevel gear (45).
- Pin the stepping motor/balance piece/base shaft.
- Loosen the first screw in direction of rotation and rotate the bevel gear until the correct position of the hook is achieved.

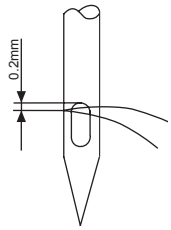
Checking the needle height



· Set needle position (artista 165/170) to the right (artista 180/185 to the left).
· Position the hook tip flush with the right-hand edge of the needle (artista 180/185 left hand of the needle).
· The lower edge of the hook tip should now be 0,2 mm above/below the needle eye.

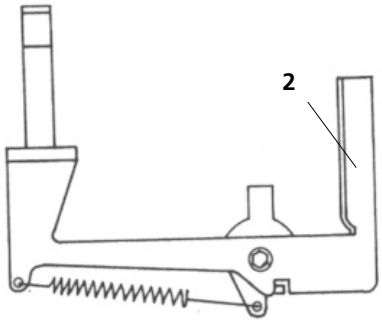
Correction:
· Remove the thread guide clip (47) on the needle clamp.
By means of exchanging the needle stop pin (48), the needle height can be accordingly adjusted.

008 211 5000 = 1.50 mm dia.
008 211 5001 = 1.85 mm dia.
008 211 5002 = 2.20 mm dia.
008 211 5003 = 2.55 mm dia.
008 211 5004 = 2.90 mm dia.



ex. aritsta 180/185

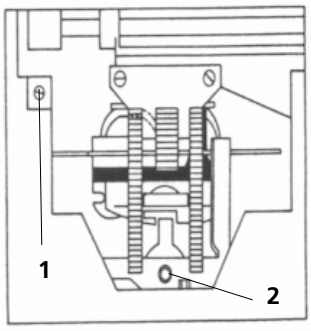
Checking the bobbin case stopper position (artista 180/185)



The setting of the bobbin case retainer bracket is very important for the functioning of the thread cutter and the tension relationship top and bottom. To this end when a retainer bracket has been exchanged, a test must be made of the thread cutter, using the zig-zag stitch.

Check:
Top edge of bobbin case retainer nose must be flush with maximum radius of bobbin case carrier (fig. 1).
There must be a clearance of 0.3mm between retainer and carrier (fig2)

Correction:
Loosen screw (1)
If necessary, move bobbin case retainer (2) axially and radially
Tighten screw (1)

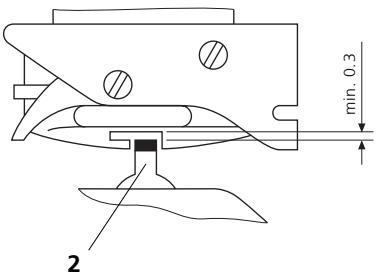


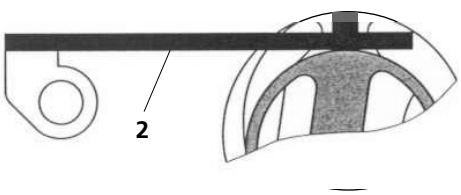
Note:
When the needle is centered, the left edge of the needle groove must be flush with the left bobbin case retainer edge.

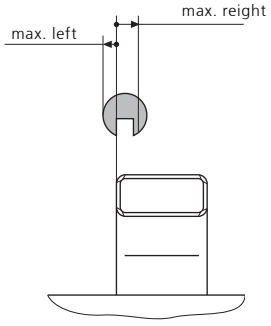
Final check:
To check the cutting using zig-zag 9mm:
This test should be done by using a relatively thick thread.

Possibility:	Zig-Zag 9mm:	Cutter:	Retainer:
1	ok	ok	ok
2	ok	incorrect	move upwards
3	Loops underneath	ok	move down
4	loops underneath	incorrect	move down and check cutting blade

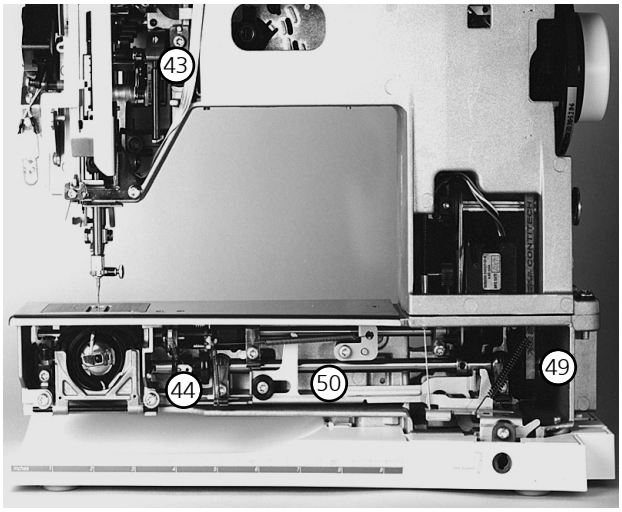
moving down => 0,2mm - 0,3mm
moving upwards => 0,2mm - 0,3mm







Checking the feed-dog sychronization (feed-dog lift and advance)

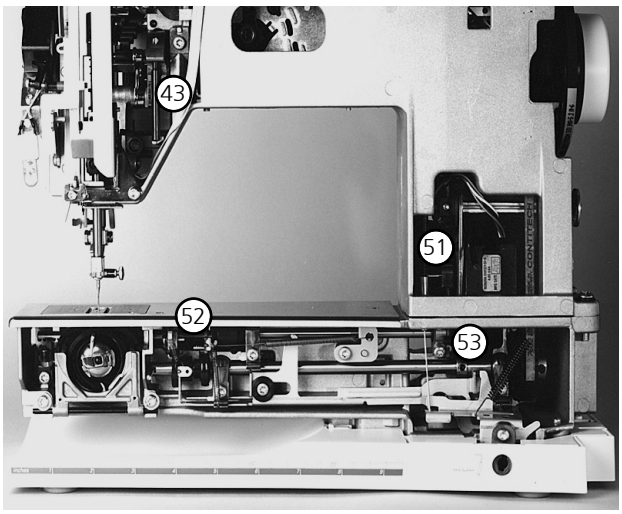


· Pin the balance piece (43).
· The base shaft (50) can now be pinned with pin (44). At the same time the feed-dog must be in the lowest position.

Correction:
· Loosen the second screw in direction of rotation of the bevel gear (49).
· Pin the balance piece and the hook drive crank.
· Loosen the first screw in direction of rotation of the bevel gear. The base shaft (50) can now be turned until it can be pinned.

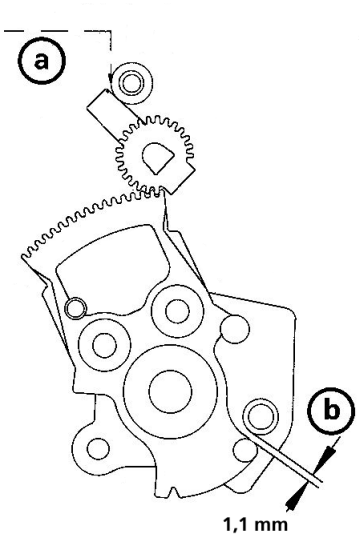
Attention! artista 180/185 must be set before the hook settings.

Checking the basic position of balance

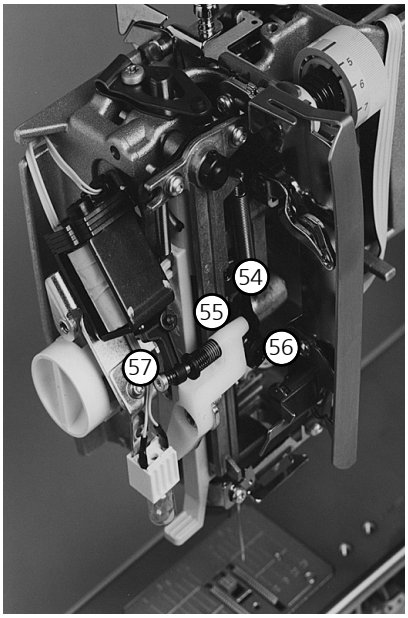


· Pin the balance piece (43).
· Pin the balance adjustment cam (51). In this position the stitch lenght crank (52) can now be pinned.

Correction:
· Loosen the screw of the clamping piece (53).
· Turn the crank (52) into its pinning position.
· The toothed segment must now be against the stop (a), at the same time on the opposite side, a distance of 1,1 mm must be at hand between the toothed segment and the stop pin (b) see sketch.
· Tighten the screw of the clamping piece (53).



Basting and automatic long stitch unit



Checking the needle bar guide - test one of service program, straight stitch:

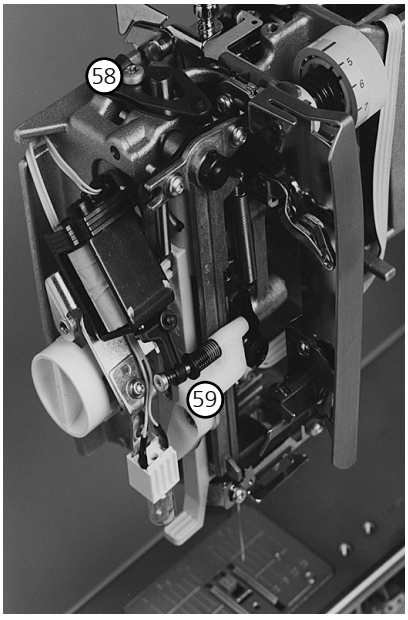
· Turn the handwheel until the needle bar reaches its lowest position.
· Uncouple the needle bar by hand.
· By turning the needle bar to the right and left establish the amount of guide play, and whether by means of bringing the needle bar down check that the coupling pin can latch in smoothly.

Correction:
· Place needle bar to its highest position.
· Loosen the needle bar guide (54).
· Engage needle bar in coupling pin.
· Middle out any play from the needle bar in the coupling pin.
· Tighten the screw of the needle bar guide.
· Check the function of decoupling.

Note:
Check the vertical position of the needle bar guide in conjuction with the automatic threader!
The vertical position of the guide piece is automatically achieved when setting the automatic threader.

Checking the basic position of the release pin:
· Position needle to the left.
· Activate the automatic long stitch unit.
· Turn the handwheel until the release pin (55) is to the left (not activated).
· There should now be a distance of 0,3mm between the release pin and the left hand edge of the latch (56).

Correction:
· By turning set screw (57) clockwise or anti-clockwise the release pin can be moved into its correct position.
. Check for correct operation.



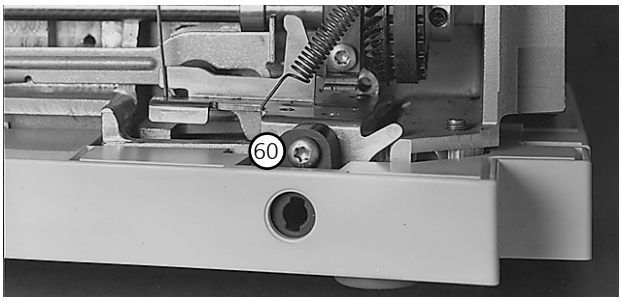
Checking the instant of decoupling:
· Position needle to the left.
· Activate the long stitch unit.
· The needle bar should now decouple approx. 12 degrees before reaching its highest position.

Correction:
· By turning set screw (58) anti clockwise by approx. one revolution, bring the puffer higher than its normal position.
· Loosen screw (59) of the release pin bracket. Move the bracket accordingly, to release earlier or later.

Checking the puffer position:
· Position the needle to the right.
· Activate the long stitch unit.
· Whilst the machine is running, turn set screw (58) slowly in a clockwise direction until the puffer moves the needle bar into its engaging position.

Basic adjustment to the knee lifter lever

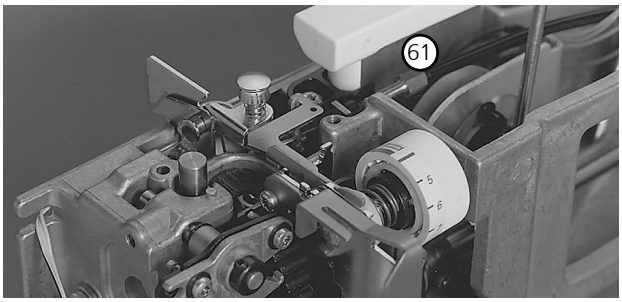
The end of the knee lifter should be vertical under the right edge of the LCD.



Correction:
· Loosen the screw (60) of the feed-dog drop unit.
· Insert knee lifter lever.
· Adjust the lifter to the convenient position.
· Tighten the screw (60).

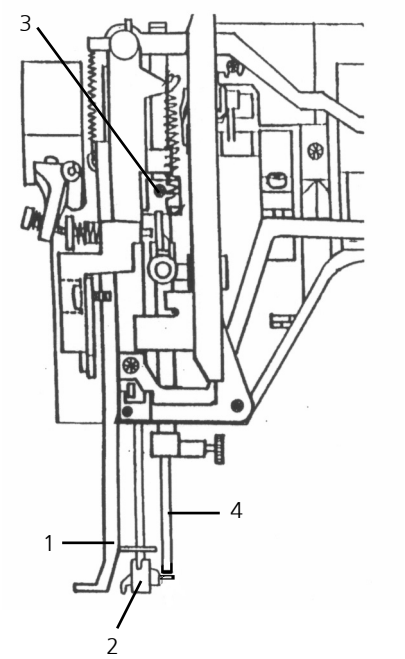
Checking the release of the lifter lever

· Place the lifter lever in ist highest position.
· Turn the upper tension dial to no.10.
· When the knee lifter is actuated, the lifter lever must drop down.



Correction:
· Turn the adjustment nut (61) until the lever drops down.
· Check tension release mechanism.

Automatic threader artista 180/185



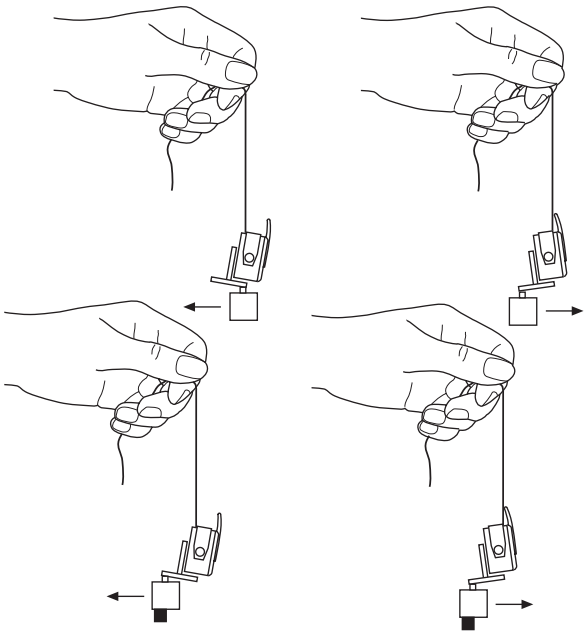
Check:
Remove needle
Place in its place the gauge 030883.50.00
Place needle bar to its upper dead center
Push threader (1) downward until threader head (2) turns in under the gauge.

Correction:
Loosen the adjusting screw (3) of the position clamp. The threader head can be properly adjusted by moving it up or down. Retighten the adjusting screw (3) of the position clamp.

Important: Don't twist the needle bar, check basting device.

Lower thread tension (artista 165/170)

For testing use synthetic thread (BW Ne 60/2 bzw. NM 43.1/2) Mettler white, left twist. The lower thread tension is checked with the moveable setting weight no. 001 358 7000. The bobbin case is placed in the weight gauge just as in the hook.



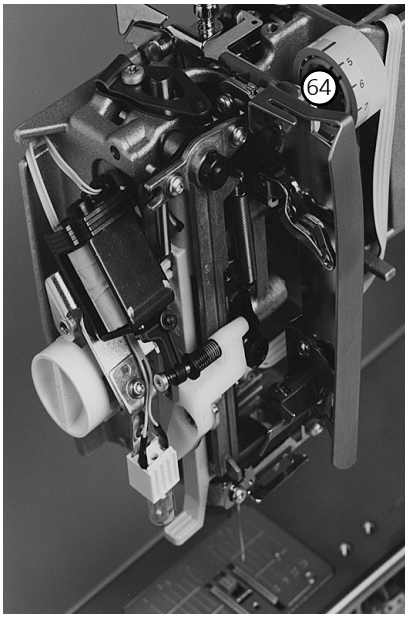
Checking:
Hold the free end of the thread and suspend the bobbin case with the setting weight (without any additional weight). The bobbin case must not move downwards. After attaching an additional weight (5 g) the thread should move downwards (speed 1m/24 sec). If you test using the thread in every new machine (synthetic Nm100), the 3 g weight from the cl.1630 must be used.
Regulation of the lower thread tension is made with the bobbin case adjusting screw and a small screwdriver.

Anti-clockwise = weaker
Clockwise = stronger

Lower thread tesion (artista 180/185):
Gauge 006 543 7001 should be used.
The method is exactly as desribed above.

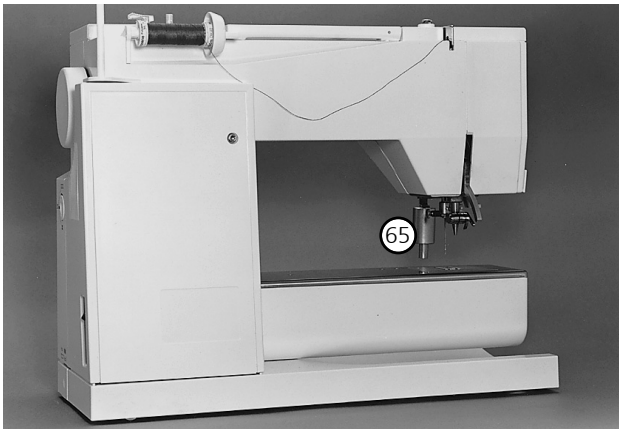
Basic adjustment of the upper thread tension (artista 165/170)

· Test thread (BW Ne 60/2 bzw. NM 43.1/2) Mettler white.
· Check the tension of the bobbin case (see above).
· Line up the red mark on the adjusting dial with the mark on the top cover.
· Sew-off using the running stitch (the knotting should be the same on top as underneath).

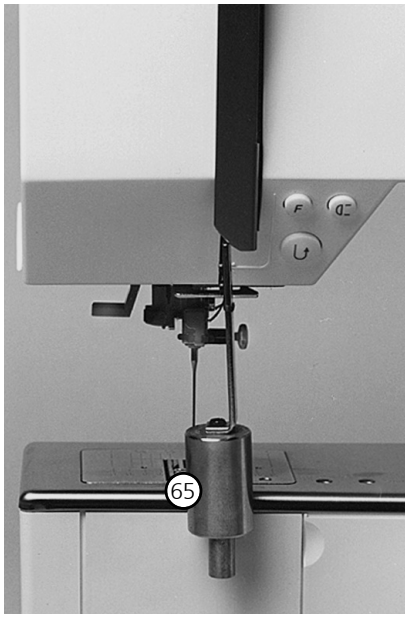


Correction:
· Turn the adjusting dial accordingly (the running stitch is of the correct tension)
· Press the locking lever (64) down (the dial is now free).
· Turn the dial until the red mark is lined up with the mark on the top cover.
· The locking lever (64) can now be locked with the tensi on dial accordingly.

Adjustment of upper thread tension with a weight

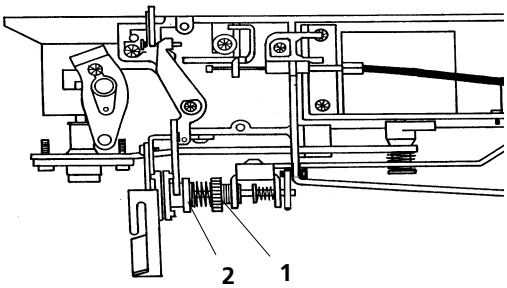


· Test thread (BW Ne 60/2 bzw. NM 43.1/2) Mettler white.
· Thread the machine including the take-up lever.
· Bring the take-up lever/needle bar to the highest position.
· Lower the presser foot.
· Turn the tension adjustment dial until the red mark is in line with the mark on the top cover.
· Using the weight (65) 93 g (85 g + 8 g).
· Draw off approx. 30 cm of thread from the bobbin.
· Thread tension weight of 85 g must not move down.
· Attach the extra magnetical weight of 8 g. The weight must now move down slowly.



Correction:
See correction basic adjustment.

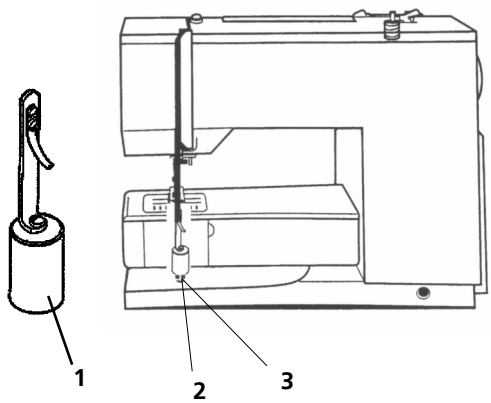
Upper thread tension rough tuning (artista 180/185)



Check:
Between the Adjustment dial (1) and the pressure piece (2) there must be a distance of 7.5mm to 7.8mm at hand.

Correction:
Turn adjusting dial (1) as appropriate.

Upper thread tension fine tuning, using a weight (artista 180/185)



Attention:
Check that customers havent altered from basic settings.

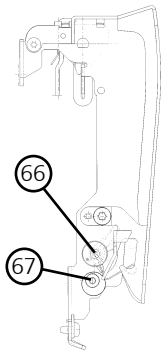
Check:
Use Thread (BW Ne 60/2 eg. NM 43 ½) Mettler white for testing.

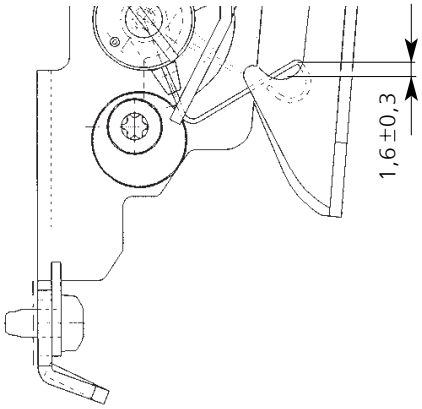
Thread machine including take-up lever.
Take-up lever must be in the highest positions.
Lower presser foot. Stepping motor thread tension must be pinned.
Use 93g upper-thread tension weight (85g + 8g).
Unwind about 30cm thread from the spool.
The 85g thread tension weight must not move.
Add 8g additional weight. Now the thread should unwind very slowly.

Correction:
See "Basic setting corrections".

1 => Tension weight	(398 080 040) 85g
2 => Tolerance weight	(398 171 030) 5g (magnet)
3 => Tolerance weight	(398 172 030) 3g (magnet)

Thread regulator spring (also used for upper thread control)





Checking the tension:
· 12-15 g (use BERNINA Tension spring 006 038 5000)

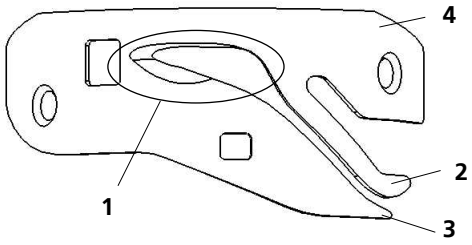
Checking position:
· The spring should rest fully on the stop piece. At the same time a distance of 1,6 mm (1/16 inch) should be measured between the spring and the cover (sketch).

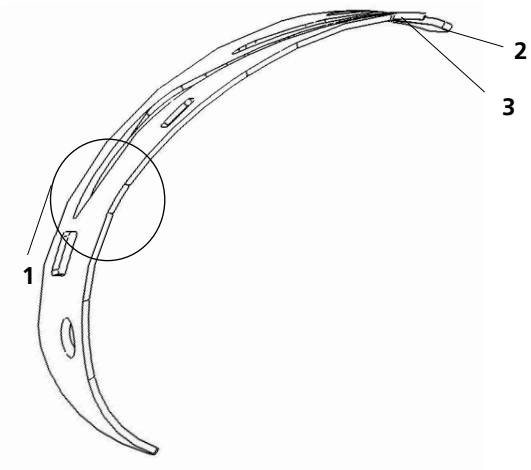
Correction tension:
· By turning screw (66) clockwise or anti-clockwise, the tension will become more or less.

Correction position:
· Slightly loosen screw (67).
· By means of turning the excentric stop, bring the spring to the required distance of 1,6 mm (1/16 inch).

Upper thread control:
· Go into the basic menu of the service programs and select test no. 9.
· By means of a thread lift the regulator spring up. The stitch length indication will move up at the same time.
If the spring is working correctly then the indication will be between 0 and 4 1/2.

Thread cutter artista185





Check:
Check thread cutter for deformities. If there is no clean thread cut, i. e. the ends are fraying, the cutter is not sharp enough.

Correction:
In both cases the cutting blade (4) needs replacing.

Check:
If the upper thread is drawn through the needle eye after cutting, check the thread cutter clamp magnet function in service program 4n (page 35) check the position (parallel) of the thread clamping plate in respect to the holder.

Correction:
In both cases the clamp magnet needs replacing.

Check/Correction:
If the lower thread gets trapped or is not cut, the hook angle position needs checking. Check thread cutter, loop lift and P-print including synchronizing disk.
The position of the thread tension support bracket is correct if the shaft is in the bore.
First locate support bracket with bore into shaft, then secure. Check thread tension.

Description of the electronics

The electronics of the BERNINA artista are basically contained in two modules (printed circuits), namely on the power L-print and the S-print (see block diagram).

Power L-print
The power L-print is mounted at the rear of the sewing machine. The circuits have the following functions:

Motor control
The motor control for the main motor operates with low safety voltages. The main motor is a 30 volt DC motor, the speed of which is controlled by a pulse width modulation. The regulating circuit is integrated at the control side (S-print). All circuits for the motor control work with low safety voltages.

Power supply
The following voltages are supplied:
· 5 V for the logic on the S-print
· 12 V for the sewing light
· 30/33 V for the drive motor, bobbin winder motor and stepping motors.

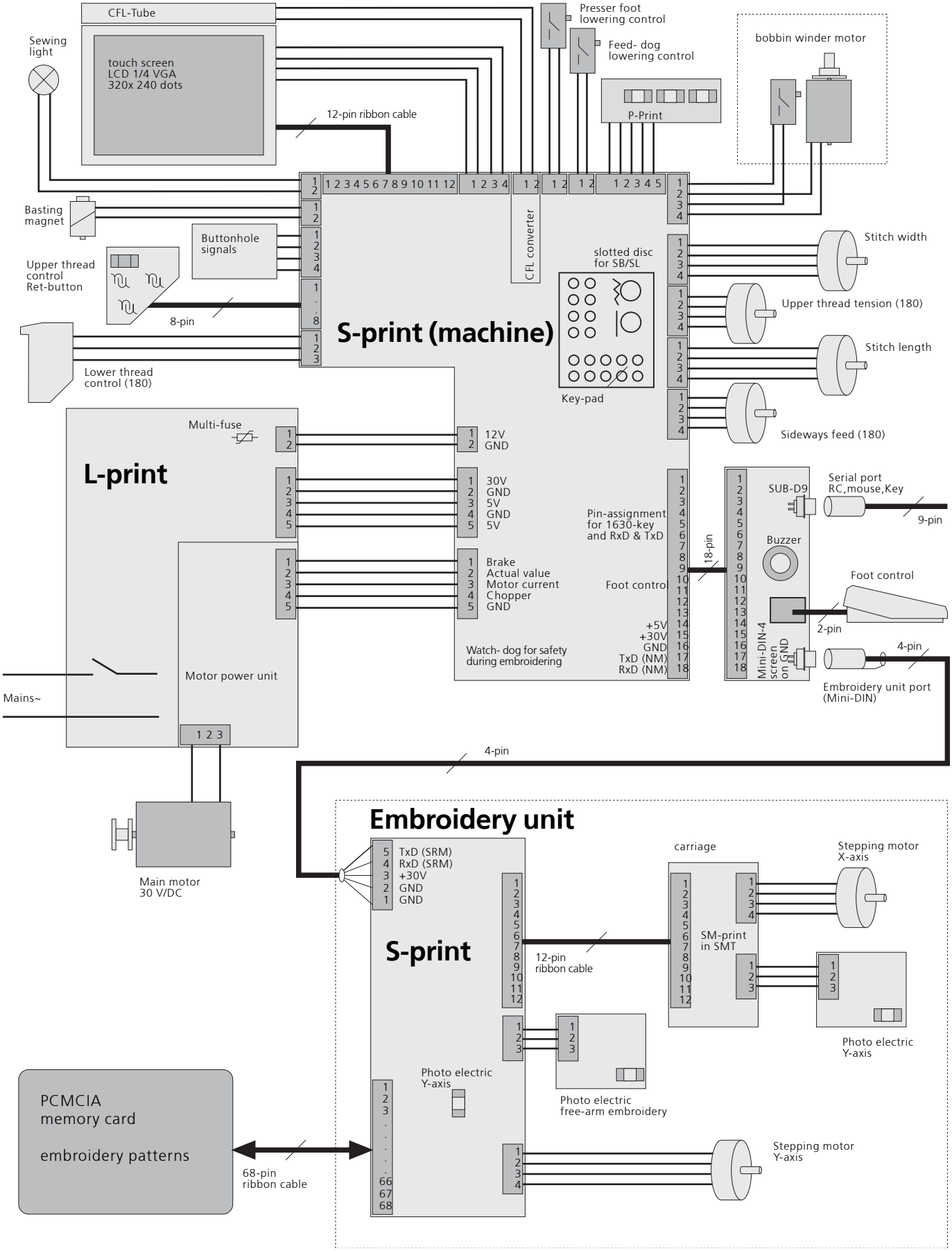
In case of malfunction, a T-3A fuse protects the parts against overload. If a fuse blows, only an original replacement with the correct ratings must be used.

S-print
The S-print is assembled with the latest SMD (Surface Mounted Unit) technology. SMD components allow a very compact type of circuitry.
SMD prints cannot be repaired with conventional tools!

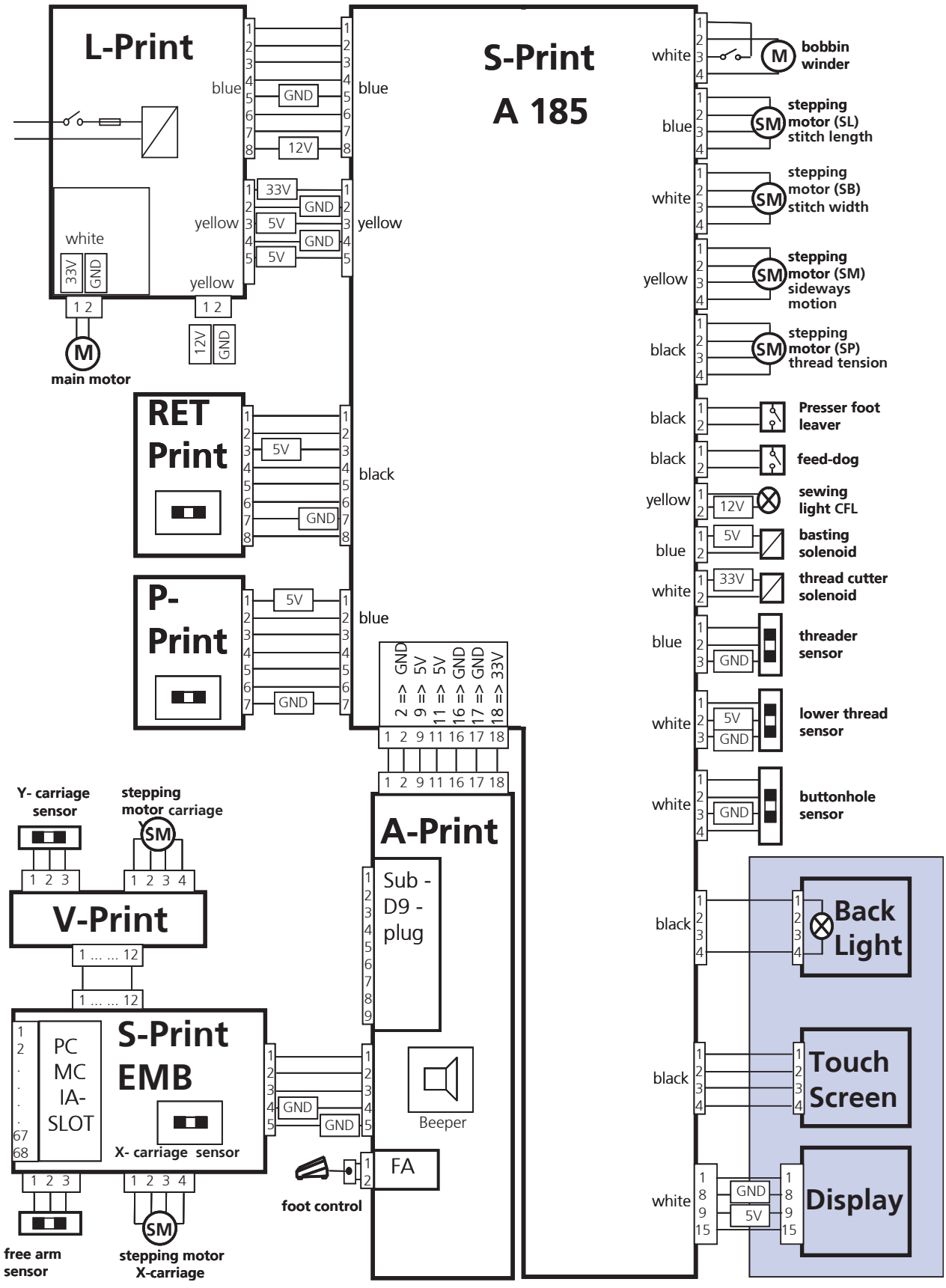
The micro-computer on the S-print receives an analogue signal from the foot control which is converted into a digital signal and given as a nominal value.
When the foot control is released (nominal value zero) the micro-computer switches on the electric brake.
The motor is stopped very quickly in the required needle position. The signal exchange between the S-print and the L-print is carried by means of a 5-pole cable (165-180).

When the sewing machine is switched on the stepping motors are in any given position. There can also be any given value in the memory of the micro-computer.
So that a defined basis is achieved, the stepping motors are positioned by means of a signal from the micro computer. This position is then registered and set at zero in the memory of the micro-computer. It is then possible to select and sew any given stitch from this zero position.

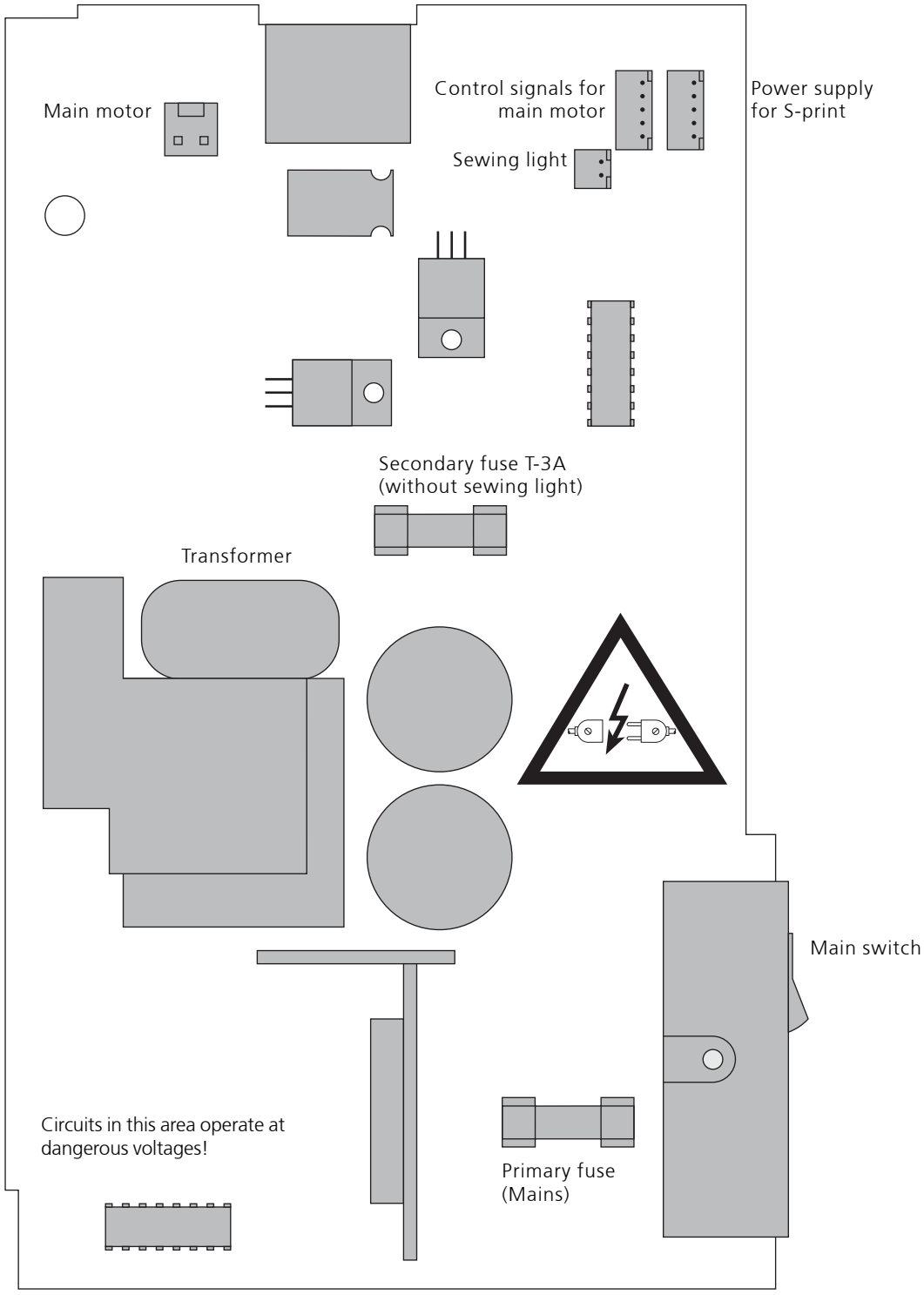
Block diagram artista 165/170/180 with embroidery unit



BERNINA®

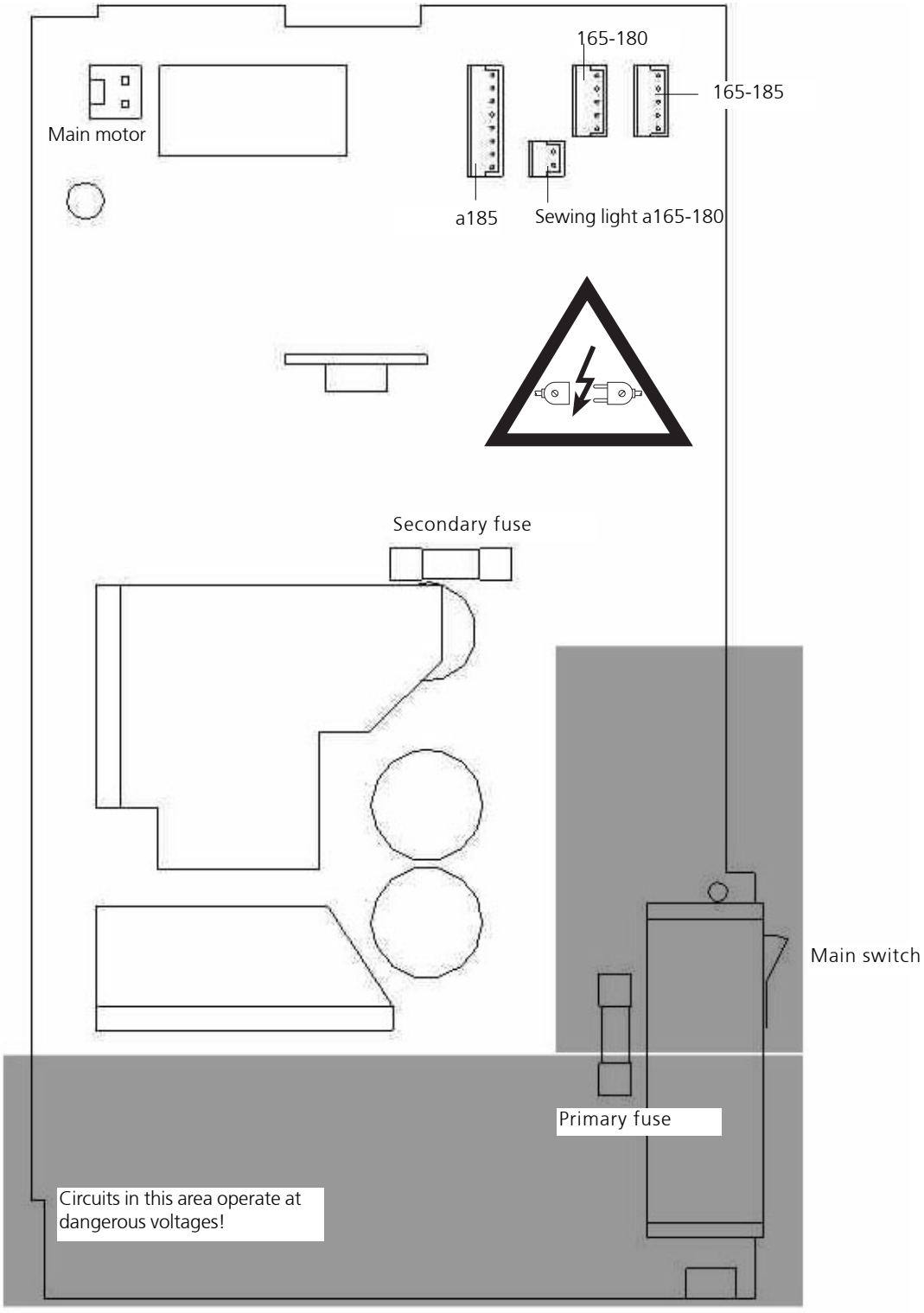

L-Print
S-Print
A 185
RET
Print
P-
Print
A-Print
V-Print
S-Print
EMB
PC
MC
IA-
SLOT
Sub -
D9 -
plug
Beeper
FA
foot control
main motor
bobbin
winder
stepping
motor (SL)
stitch length
stepping
motor (SB)
stitch width
stepping
motor (SM)
sideways
motion
stepping
motor (SP)
thread tension
Presser foot
leaver
feed-dog
sewing
light CFL
basting
solenoid
thread cutter
solenoid
threader
sensor
lower thread
sensor
buttonhole
sensor
Back
Light
Touch
Screen
Display
Y- carriage
sensor
stepping
motor carriage
X- carriage sensor
free arm
sensor
stepping motor
X-carriage
white
blue
yellow
black
GND
5V
12V
33V

L-print artista 165 / 170 / 180 (old)

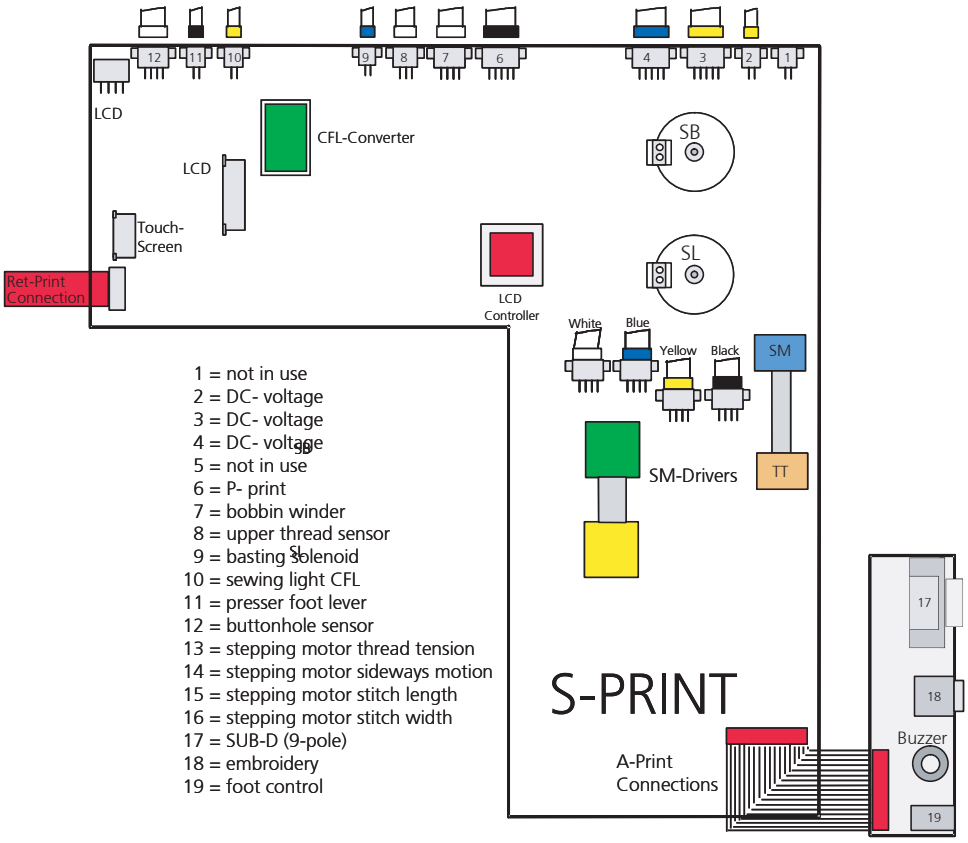


BERNINA®

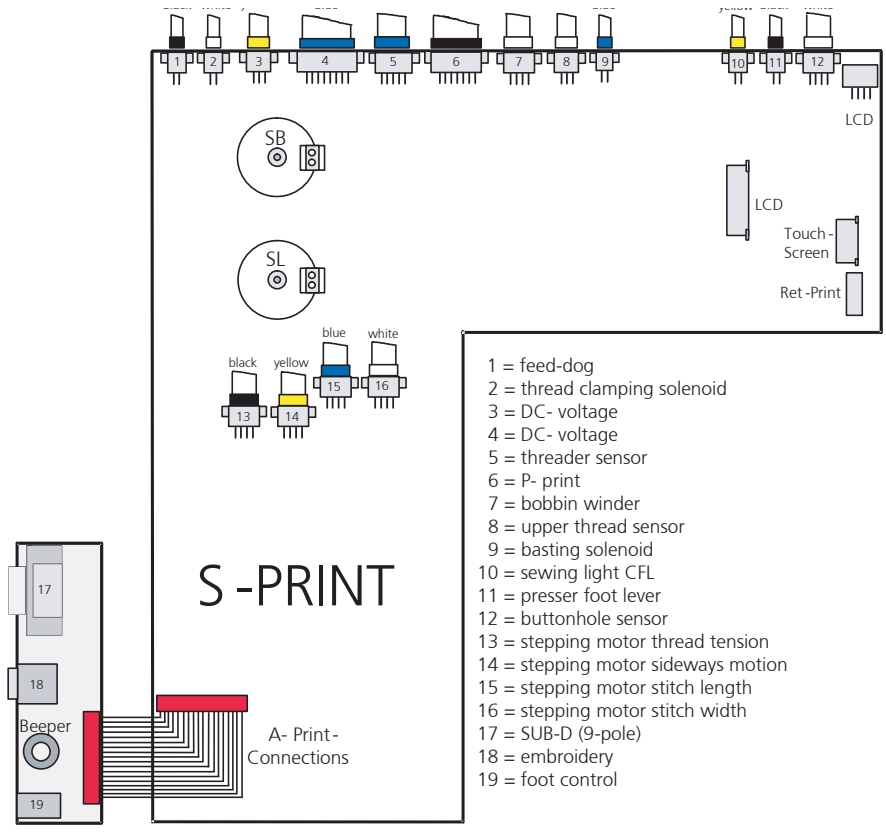
L-Print artista 165-185 (new)



S-print artista 165-185



S-Print artista 185

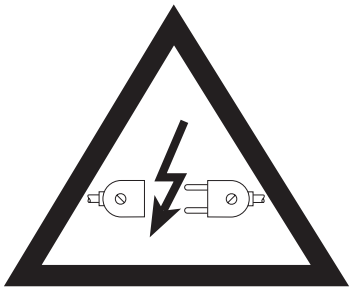


Diagnostic instructions

Warning: Dangerous voltage levels !
Mains voltage (refer to L-print page 27)

The switch part of the L-print and mains cable carry dangerous voltages.

For your own safety do not touch the L-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 machine may only be connected to the mains supply when the L-print cover is mounted.

Work may only be carried out on the L-print and mains cable when the mains plug has been withdrawn from the mains supply.

Refer to safety instuctions on page 1!

Protection of electrical components against electrostatic discharges

If two insulation materials (e.g. shoe sole and floor) rub together there can be a build-up of static electricity. Should this be discharged through electronic components these can be seriously damaged.

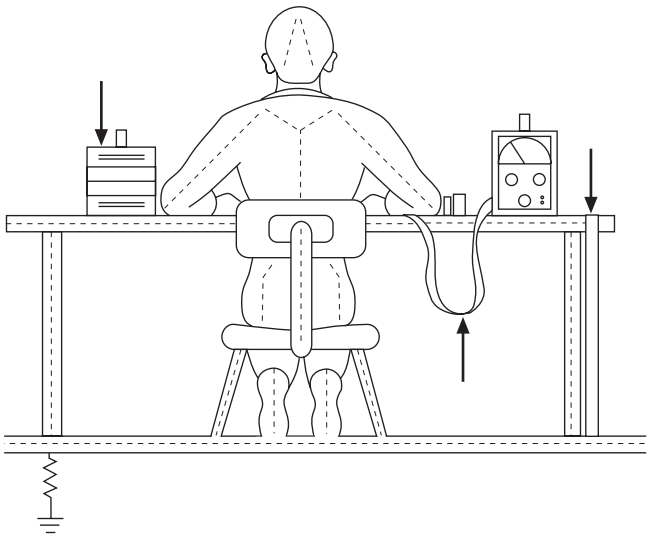
One of the most effective measures to conduct these charges away is earthing.

1. A bench suitable for working with components in today's electronic industry has a surface that does not allow the build-up of static electricity.

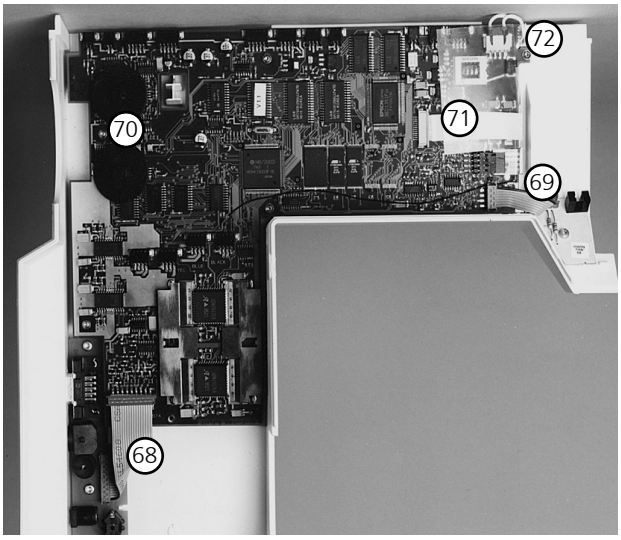
   On the one hand the surface should be conductive so that charges are conducted away but on the other hand it should have enough resistance to prevent short-circuiting and earthing of parts laid out on the bench.

2. By wearing a wristband that is connected to the bench surface, static electricity can be conducted away from the person. For safety reasons a resistance of approx. 1 M ohm has to be connected in series with the conduc - tive wristband.

3. Electronic parts may only be dispatched in their original packaging.



Replacing the S-print/touch screen



· Remove the top cover.
· Remove the cable connections on the S-print.
· Remove the front cover (see pages 5 and 6).
· Disconnect the 18-pole ribbon cable connection (68) of the foot control/interface/Embroidery unit.
· Disconnect the 8-pole ribbon cable connection (69) of the RET-print .
· Remove both the stitch length and stitch width increment dials (70).
· Disconnect the 12-pole ribbon cable connection (71) of the LCD.
· Disconnect the 2-pole connection (72) of the LCD.
· Remove the seven TORX screws.
· Disconnect the 4-pole ribbon connection of the touch-screen.
· Replace the S-print, and if necessary the touch screen/LCD.

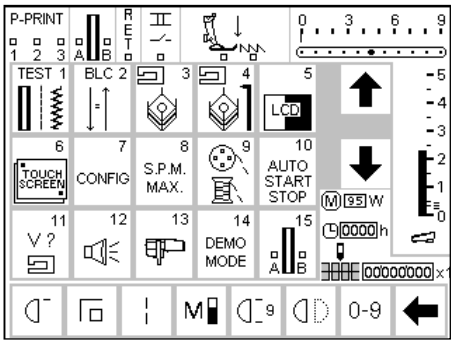
Please note!
The window of the control panel must be clean before assembly. This can be achieved by using a dry, fluff-free cloth, possibly using compressed air to blow-off.
Test no.5 of the service program should be checked

Attention:
Never use alcohol, petrol, spirits, or any other acid type of liquid.

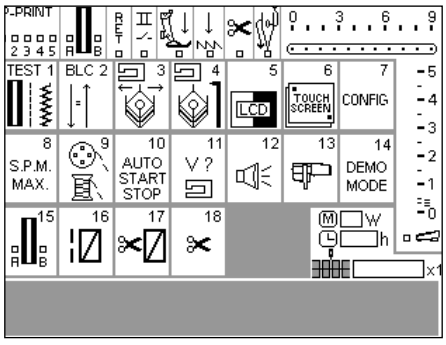
Test program artista

Starting the test programs:
· Attention! Turn the machine off.
· When switching the machine on, press at the same time the clr-button (the clr-button must be kept pressed until the machine goes into service program)

The machine is now in the basic menu of the service program and any one of the 1-18 individual test programs, along with 15 sensor checks can be carried out.



old



new

By pressing the clr-button the machine can at any given time be brought into the basic menu of the service program.

Termination of the test program:
· Switch machine off.
· Switch machine on in the normal manner.
· The sewing machine can now be operated normally.

Test programs

What is to be tested:

		Page
1.	Sewing-off	34
2.	Forward/reverse feed equalization	34
3.	Stepping motor test for sewing machine (balance).	35
4.	Pinning position of all stepping motors	35
5.	LCD/Touch-screen test	35
6.	Touch screen calibration	35
7.	Configuration of the sewing machine	36
8.	Maximum speed equalisation in stitches/minute	36
9.	Both lower and upper thread detectors	36
10.	Endurance test for R+D (used only at the factory)	37
11.	Software version of the sewing machine	37
12.	Beeper test (acoustically)	37
13.	Embroidery (brings you in the sub-menu for embroidery unit)	37
	13a. Stepping motor test (embroidery module only)	37
	13b. Setting of reference point (embroidery module only).	38
	13c. X-carriage sensor test	38
	13d. Y-carriage sensor test	38
	13e. Software version display (embroidery module only)	38
	13f. Memo card	38
	13g. Free-arm Eembroidery	39
14.	Demo mode (machine scrolls through a demo)	39
15.	Buttonhole	39
16.	Basting solenoid	39
17.	Clamp magnet	39
18.	Thread cutter	39

Tests in basic position

	Page
The following sensor signals can also be checked:	
Position indicator/P-print	40
Buttonhole sensors	40
RET-print	40
Bobbin winder motor switch	40
Presser foot lowering control	41
Feed-dog drop	41
Thread cutter test	41
Threader sensor	41
Foot control functioning	41
	41
The following data is always displayed on the screen:	
Motor power in Watts	42
Hour counter	42
Stitch counter	42

Test no. 1 (sewing-off)

What is to be tested	What to adjust	Normal condition
Sewing-off Stitch length, width and L.C.R. Buttonhole/Sensors	 Select service program no.1. Note: The Buttonhole bead length are set automatically.	The machine can now be sewn off. L.C.R., straight stitch, stitch length and width can be adjusted. The Buttonhole sensors can be checked for correct function and the buttonhole sew-off.

Test no. 2 Electronic forward/reverse feed equalisation

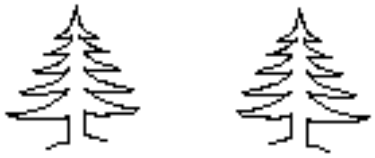
What is to be tested	What to adjust	Normal condition
Forward and reverse feed equalisation	 Select service program no. 2. In this program the stitch pattern "9"(double stitch length) is active. artista 180 has the "pine tree" as a pattern. The center picture is a correct duplication of the pattern. The patterns to the left and right, depict the tree as a distorted pattern. The balance can be altered by pressing either the arrow to the left or right accordingly. The increments available are 0, 4, 8, 12, and 16. The neutral position is therefore 8.	The stitch pattern "pine tree" resp. "9" must be closed.

Mechanical fine adjustment



If the stitch formation is not absolutely closed after electronic compensation, a fine adjustment can be made to the balance regulating shaft, which can be achieved through the opening (73).

Procedure:
· By means of a torx-key, turn the balance regulating shaft as required.



· Turn clockwise · Turn anticlockwise

Test no. 3 Stepping motors and S-print

What is to be tested	What to adjust	Normal condition
All stepping motors/S-print	 Select service program no. 3.	All step motors rotate back and forth.

If a step motor does not rotate then the fault can lie either with the step motor or the S-print. The faulty components can be identified by swapping the connections of the step motors eg. stitch width with stitch length.

Warning! Disconnect the machine from the electricity supply.

Test no. 4 Pinning position of all stepping motors

What is to be tested	What to adjust	Normal condition
Pinning position of the stepping motors	 Select service program no. 4.	All the stepping motors are activated to there stepping position.

Test no. 5 LCD touch screen

What is to be tested	What to adjust	Normal condition
The LCD (liquid crystal display)	 Select service program no. 5. Touch the screen again and the screen will change to a white screen.	The screen will change colour to black. If any single dots on the screen are defective, these will appear as white areas. This test (as well as the first one) can be used to check for particles of dirt or fluff after for example an exchange has been made.

Note:
If any fields are defective then the LCD as a Complete unit must be exchanged.

Test no. 6 LCD touch screen calibration

What is to be tested	What is to be tested	What is to be tested
Calibration of the LCD with the touch-screen	 Select service program no. 6. Both dots must now be pressed.	The screen will colour white and two largr dots will appear at the upper left and lower right hand corners. The LCD is now calibrated to the touch-screen.

Note:
If an exchange of either the LCD or the touch-screen has been carried out, it can happen that when the machine is switched on the screen will not react. In this case proceed as follows:

· Switch the machine off.
· Whilst switching the machine on, press at the same time the two needle position buttons and keep them pressed until two dots appear on the screeen.
· The two dots can now be touched, wereby afterwards you will automatically go into the basic menu of service-programmes.

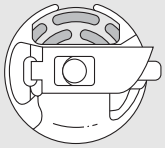
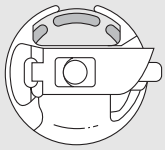
Test no. 7 Configuration of the machine

What is to be tested	What to adjust	Normal condition
Configuration of the machine Caution! Select only the configuration that is intended for the sewing computer.	 Select test no. 7. Select either artista 165/170/180 or 185 whichever the case might be and push the CLR button. After the Configuration the Artista has to be switched off. After switching the machine on it will be newly configured	The screen will automatically go into a submenu The display shows a clock during the config time. After selection, the machine will return to the basic menu of the service program.

Test no. 8 Maximum speed equalisation

What is to be tested	What to adjust	Normal condition
Maximum speed equalisation (s.p.m. stitch/minute) The speed is set automatically.	 Select service program no. 8. Press foot control until "OK" appears on the screen.	The maximum speed appears on the screen. Used for example after disassembly/assembly operation to compensate the machine's software. If for some reason (a bind in the machine) the machine doesn't reach its normal speed, then an "F" (fault) will appear.

Test no. 9 Upper/lower thread detector

What is to be tested	What to adjust	Normal condition
Lower thread control	 Select Service program no. 9. Mount empty bobbin as shown in sketch below. 	The stitch width scale is active. Remark: = < same or less than = > same or more than
Repair instructions: If the normal conditions cannot be achieved, then the print must be replaced.	Select field "bobbin". Press clr button. Mount empty bobbin as show in sketch below.  Select field "bobbin"	On the stitch width scale a value of = < 0,5 appears. On the stitch width scale a value of = > 4 appears.

What is to be tested	What to adjust	Normal condition
The upper thread detector	Select service program no. 9. Place a thread around the take up spring and lift the thread using the full stroke of the take-up spring.	The stitch length scale is active. The stitch length scale will move in accordance with the movement of the spring. A reading of between 0 and over 4 1/2 will be registered.

Test no. 10 Auto start/stop

What is to be tested	What to adjust	Normal condition
Endurance test for R+D	 Select service program no. 10.	After pressing the foot control unit, the machine will run on an on/off basis.

Note: This test is only for our internal factory use!

Test no. 11 Software version of the machine

What is to be tested	What to adjust	Normal condition
Software version	 Select service program no. 11.	A second screen will appear with a sewing machine and a number. The number is the version number. This can be used if and when updates are made to the software of the machine, to identify which software the machine has.

Test no. 12 The beeper acoustics

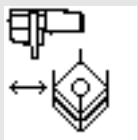
What is to be tested	What to adjust	Normal condition
Beeper acoustics for presser foot lowering	 Select the service program no. 12 (continue pressing).	The beeper can now be heard.

Test no. 13 Basic menu for embroidery unit

What is to be tested	What to adjust	Normal condition
The embroidery unit	 Select service program no. 13.	After selection another submenu will appear. Note: By pressing clr, you will always return to the basic service menu for the sewing machine.

Submenu test for the embroidery unit:

Test no. 13a for the stepping motors of the embroidery unit

What is to be tested	What to adjust	Normal condition
Stepping motors of the embroidery unit	Select the stepping motor test. 	The stepping motors of the embroidery unit will now begin to move to and fro. After pressing clr, you will automatically return to the basic program of the embroidery test.

Test no. 13b Setting the reference point for the embroidery frame

What is to be tested	What to adjust	Normal condition
Reference point of the embroidery unit.	Select the reference point test (With standard frame and template). 	After selection a further submenu will appear. By selecting any of the arrows, the frame can now be placed into its reference point. By pressing esc the position will be memorized, and you will automatically return to the basic service menu for the embroidery unit.

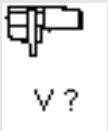
Test no. 13c Testing the sensor function of the X-carriage

What is to be tested	What to adjust	Normal condition
Sensor X-carriage	Select the sensor test “X”. 	Above the test field a sensor field X will be activated. By pressing clr you will automatically return to the basic menu for the embroidery unit.

Test no. 13d Testing the sensor function of the Y-carriage

What is to be tested	What to adjust	Normal condition
Sensor Y-carriage	Select the sensor test “Y”. 	Same as described above, but in the Y-direction. By pressing clr you will automatically return to the basic menu for the embroidery unit.

Test no. 13e Software version of the embroidery unit

What is to be tested	What to adjust	Normal condition
Software version of the embroidery unit	Select the version test >V<. 	After selection a submenu will appear depicting an embroidery frame and showing the respective software version.

Test no. 13f Memory card test

What is to be tested	What to adjust	Normal condition
Memory card	Place a memory card in the embroidery attachment.	The sensor fields “MEM CARD” will be active. Either the OK or the “F” (Fault).

Test no. 13g Free-arm embroidery

What is to be tested	What to adjust	Normal condition
Sensor for free-arm embroidery.	Attach the free-arm embroidery unit to the machine.	The sensor field "FA" (free-arm) will be active, showing that the unit has been attached.

Test no. 14 Demo mode

What is to be tested	What to adjust	Normal condition
A demonstration for say a window display can be called up.	 Select service program no. 14.	Select service program no. 14. After selection a submenu will appear. Select the field "on" and a demonstration will automatically be scrolled. The demo elements are: · Basic menu of practical stitches. · Basic menu of decorative stitches. · Basic menu of the alphabet. By pressing "off" the program will be stopped, with "ok" you will return to the basic menu for the embroidery unit.

Test no. 15 Buttonhole calibration

What is to be tested	What to adjust	Normal condition
Automatic buttonhole	 Select test no.15. Buttonhole sensors. Raise feed-dog. Mount the buttonhole foot. Lower the presser foot. Mount the buttonhole filter.	The feed-dog will move to and fro, until the buttonhole sensors have been calibrated.

Test no. 16 Basting solenoid (165-185)

What to test:	What to adjust:	Normal condition:
Basting solenoid	 Select service program no. 16	The basting solenoid attracts and then releases again when the key on the touch screen is released.

Test no. 17 Clamp magnet (only artista 185)

What to test:	What to adjust:	Normal condition:
Normal thread cutter sequence	 Select service program no. 17	The clamp magnet attracts and then releases again when key 17 on the touch screen is released.

Test no. 18 Thread cutter (only artista 185)

What to test:	What to adjust:	Normal condition:
Normal thread cutter sequence.	 Select service program no. 18 - "ALMOST" (FAST) appears under the scissors symbol. Press the "Cutter" key to start.	Travelling through all positions of the cutting sequence in real time. Upper and lower thread are cut.

Test for the P-print

What to test:	What to adjust:	Normal condition
P-print and position of synchronizing disk.	 Select basic service program position. Use hand wheel to move needle bar to upper dead center (position 1). Continue to turn wheel, and compare with list.	Points 4 and 5, and degree display - displayed under P-print - change in 5° steps. See following list for points 1, 2, and 3, and appropriate degree number:

●=> on ○ => off X => not defined

Position:	Degree	Point 1	Point 2	Point 3	Point 4	Point 5
1	280°	○	○	●	X	X
2	25°	○	○	○	X	X
3	40°	○	●	○	X	X
4	95°	○	●	●	X	X
5	110°	●	●	●	X	X
6	125°	●	●	○	X	X
7	210°	●	○	○	X	X
8	250°	●	○	●	X	X

Buttonhole sensor test

What to test:	What to adjust:	Normal condition
Buttonhole sensor	 Select basic service program position. Insert buttonhole foot 3a. Move buttonhole foot slide back and forth.	Points A and B next to buttonhole sensor symbol flash.

Testing the RET-print (reverse button)

What is to be tested	What to adjust	Normal condition
RET-print	 Using the basic menu of the service program, press the reverse button.	The sensor fields "RET" and foot control will become active.

Repair instructions:
If only the RET-sensor is not active, then the RET-print must be exchanged.
If only the foot control sensor is not active, then the S-print must be exchanged.
If both sensors are not active, then the fault could be in either the RET or the S-print.

Testing the switch of the bobbin winder unit

What is to be tested	What to adjust	Normal condition
Winder motor switch	 Basic menu of service program. Switch on motor.	Sensor "bobbin switch" is active in the display.

Presser foot lowering check

What to test:	What to adjust:	Normal condition:
Sensor field (lowering of the presser foot).	 Raise presser foot. Lower presser foot.	Presser foot sensor field is activated. Presser foot sensor field remains deactivated.

Repair advice:
If the sensor field remains deactivated, replace limit switch.

Feed-dog drop artista185

What to test:	What to adjust:	Normal condition:
Feed-dog drop	 Select basic service program position. Actuate feed-dog drop.	Points under feed-dog symbol light up.

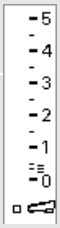
Thread cutter key artista185

What to test:	What to adjust:	Normal condition:
Thread cutter key	 Select basic service program position. Actuate thread cutter key	Points under thread cutter symbol light up.

Threader sensor artista185

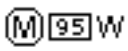
What to test:	What to adjust:	Normal condition:
Threader sensor	 Select basic service program position. Actuate threader.	Points under threader symbol light up.

Foot control and needle stop change using the foot control

What to test:	What to adjust:	Normal condition:
Foot control	Basic service program position: 	The foot control function is displayed on the stitch length bar display. Additionally, the foot control field is activated.
Needle stop change using the foot control.	Select basic service program position. Install foot control and press at the back. 	Stitch length bar display increases to 0.9 Points under foot control symbol light up

Further information displayd

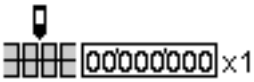
· Motor power given in Watts



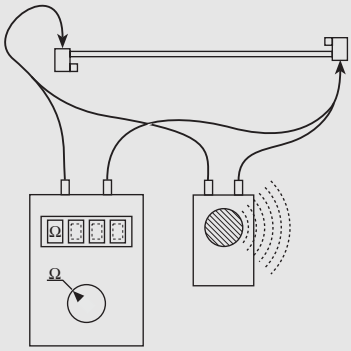
· Time sewn on the machine given in hours (up to 9999).



· The number of stitches sewn by the machine (up to 99'999'999).



Test for the cable connection S-print to L-print

What is to be tested	What to adjust	Normal condition
	Disconnect mains plug. a) Disconnect plugs from Prints b) Check on the upper side of the plugs with a circuit tester or ohmmeter, that each wire is continuous. c) Test every wire as described in picture b.	High pitched tone cable OK. Ohmmeter shows a small resistance cable OK. Important: If there is no high pitched tone, or the display of the ohmmeter blinks, or shows infinite resistance, then the cord is defective.

Embroidery module function and troubleshooting (a165-185)

Function

When sewing the loose fabric is moved by the feed dog. When embroidering the material hooped into the embroidery hoop is moved. The embroidery hoop itself is put into motion by the X and Y-carriages and moved to the right position. The needle movement is reduced to up and down. The position of the needle penetration is attained by the control of the X and Y-carriage motors.
Before the embroidery process, the motif in the artista can be worked upon (sizing, rotating, etc.) and it will be transformed into the customer's design. For the embroidery process itself the artista supplies the data to the embroidery module, and the S-Print transforms it for the stepping motors of the X and Y-carriage. The embroidery module returns data (sensors and carriage positions) to the artista, which are used for the stitch calculation.

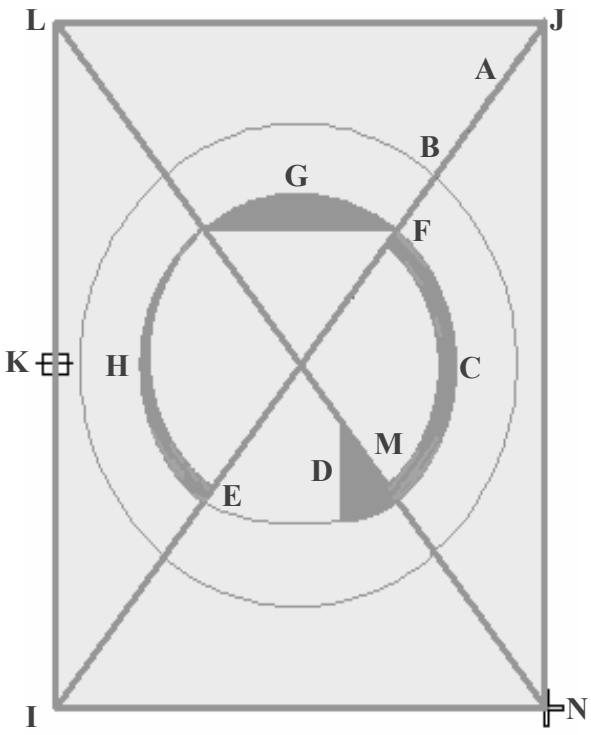
Fault Search

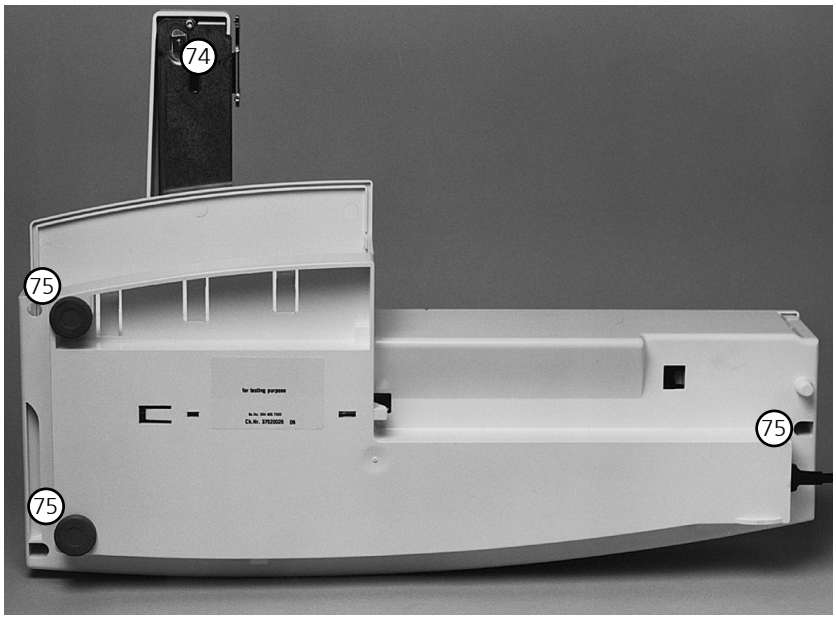
Inconsistant embroidery results or a not correctly functioning motifs can have more than one reason. Three basic areas of fault sources are possible:

1) The hardware	machine, embroidery module or embroidery hoop
2) The motif	the design of the motif with start and finish, jump stitches, type of stitches, format, etc.
3) The user:	fabric, thread, stabilizer top / bottom the way the fabric is hooped, etc.

When searching for faults in the embroidery module, it is required that the sewing computer works faultless, the fabric is hooped properly and the correct thread and correct needle are used. When searching for faults it is useful to download and embroider the specially developed test motif from the PC card (order No. 030 028.50.00) in the service program area 6 test i. Areas, normal condition and possible faults are listed in the following table, to recognize the fault easier. If the test motif is embroidered faultlessly, the fault has to be found in either 2) the motif or 3) the user.

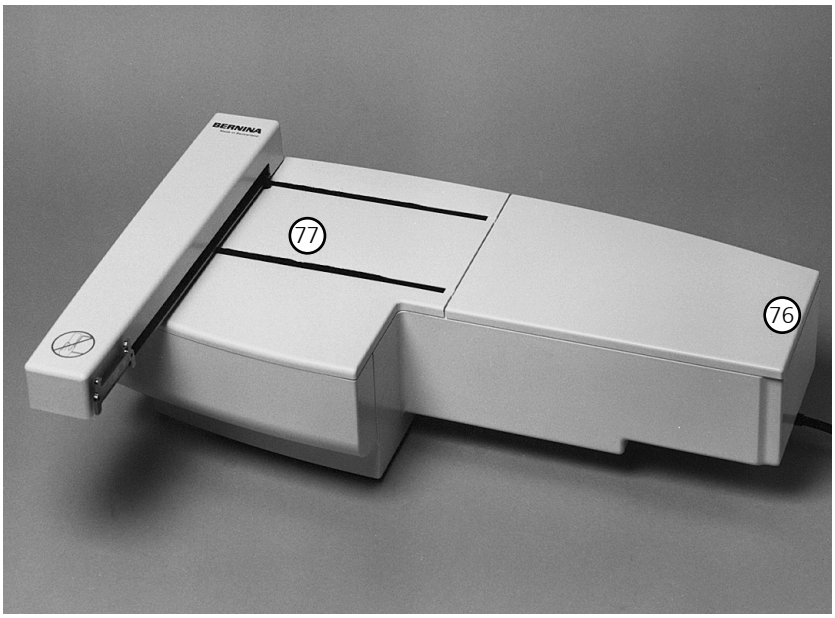
Point / Area	Normal Condition	Possible Faults
A	The two sewn lines must lie on top of one another Belt tension too tight/loose	Reference point has not been adjusted. Speed of the sewing computer is too high.
B Circle	The circle must close at point B	Binding in the X and Y-carriages. Belt ten sion too tight/loose
C Satin Stitch	The stitches must lie next to each other	Binding in the gearing caused by dirt or pieces of thread. Belt tension too tight/loose
D Fill Pattern	The stitch density (Y-direction) must be evenly spread	Binding in the Y direction (carriage or gearing)
E	Must finish in line with the first diagonal stitches or gearing)	Binding in the Y resp. X-direction (carriage
F	Must be parallel with the first diagonal stitches or gearing)	Binding in the Y resp. X-direction (carriage
G Fill Pattern	The stitch density (X-direction) must be evenly spread	Binding in the X-direction (carriage or gearing)
H Satin Stitch	The stitches must lie next to each other	Binding in the gearing caused by dirt or pieces of thread
I	Must line up with the corner stitches or gearing)	Binding in the Y resp. X-direction (carriage
J	Must line up with the corner stitches or gearing)	Binding in the Y resp. X-direction (carriage
K	One line of stitches must be apparent. (Caution: because at the start of the pattern no securing stitches are made, it is not necessary that the two points meet one another OR: ...that point K lines up with the starting point	Binding in the Y resp. X-direction (carriage or gearing) Fabric not properly hooped. Mark hoop contours with a pencil
L	Must line up with the corner stitches gearing)	Binding in the Y-direction (carriage or
M	Must meet up with the fill stitches (point D) or gearing)	Binding in the Y resp. X-direction (carriage
N	Must line up with the corner stitches or gearing)	Binding in the Y resp. X-direction (carriage





Note:
First of all remove the accessory box!

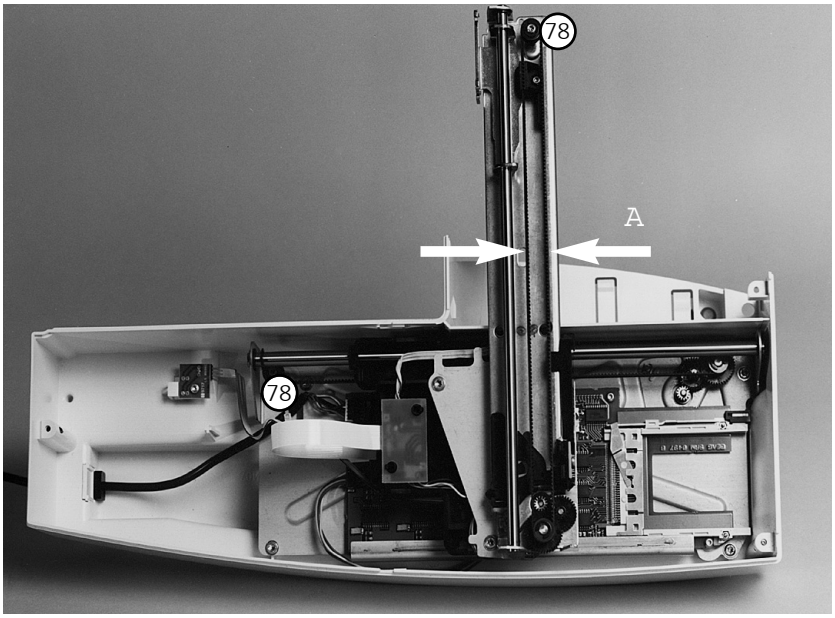
Y-carriage cover:
· Remove screw (74).
· Remove the Y-carriage cover.



Top right side cover (without slots):
· Remove three screws (75).
· From the right hand side lift the cover (76) approx. 45° and remove.

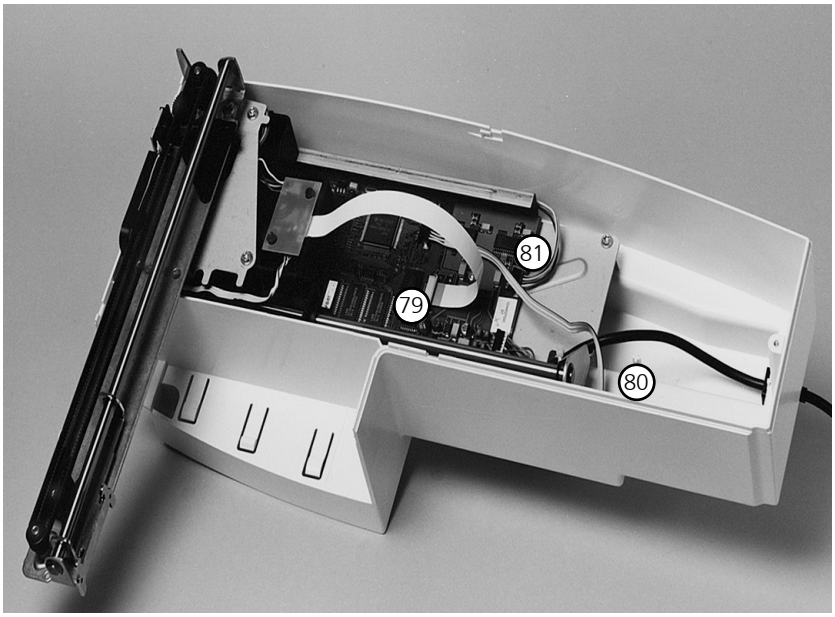
Top left side cover (with slots):
· Slide the X-carriage as far to the right as possible.
· From the left hand side, lift the cover (77) as far up as necessary so that the two lugs for the screws are clearing the frame, and slide out.

Tensioning the belt drive of both X and Y-carriages



- Loosen securing screw (78) of the toothed gear.
- Move the pulley in the necessary position, until the correct tension is achieved.
  Correct tension is achieved when pressure is put on both sides of the belt (in the middle) and both sides just meet in the center (see arrows A).

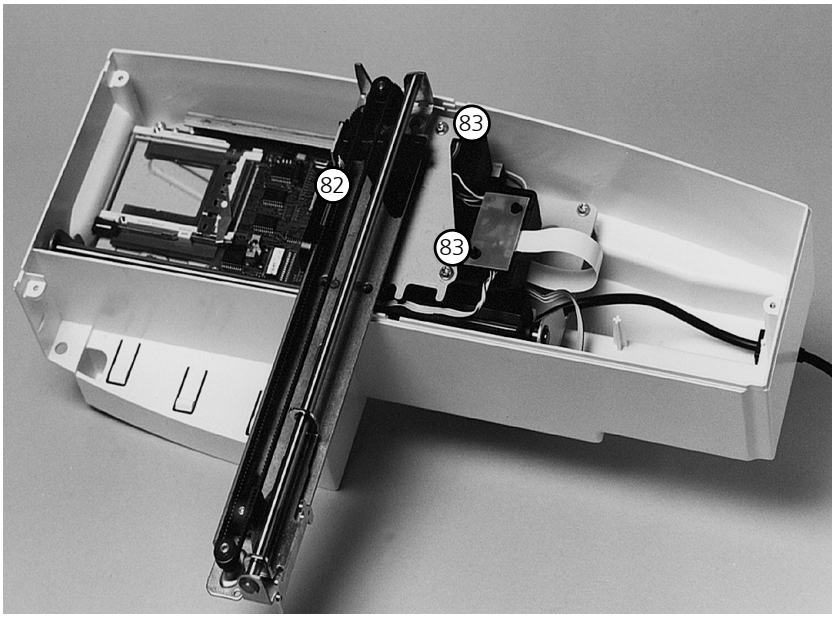
Exchanging the S-print of the embroidery unit a165-180



- Remove both top covers (see chapter "removing covers" page 45).
- Disconnect the three cables (79), (80) and (81).
- Move the X-carriage as necessary to remove the three securing screws.
- Move the carriage to its extreme position to the left.
- Remove the print to the right making sure that the memory card unit is clear of the sensor detector bracket of the X-carrige.
- Refit an exchange print in the opposite manner.

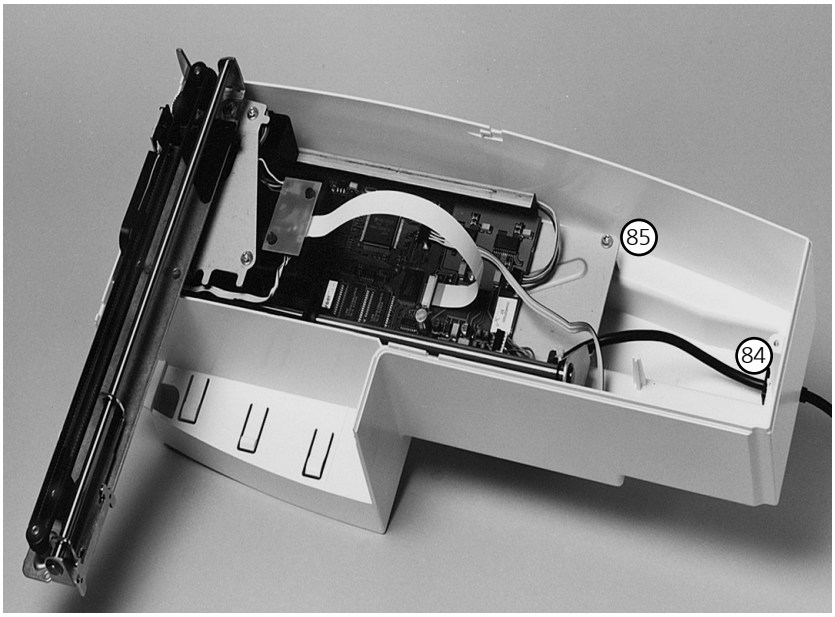
Note:
When a new/exchange print has been fitted, it is necessary to update to the latest version.

Exchanging the Y-carriage stepper motor



- Remove all three covers (see p. 45 removing covers).
- Remove the Y-carriage sensor bracket (82), this is just clipped on.
- Remove the three screws (83) and remove the Y-carriage as a complete unit.
- Remove the two screws and the stepper motor.
- Replace the stepper motor being careful that no undue play occurs between the gears.
- Replace the Y-carriage unit.
- Replace the sensor bracket, being careful of its exact position.
- Connect to sewing machine and make a test (no.13 Stepping motors).
- Replace all covers.

Exchanging the X-carriage stepper motor a165-180



- Remove all three covers (see page 45 removing covers).
- Disconnect the three connections.
- Remove the cable retaining bracket (84).
- Remove four screws (85). The whole unit can now be removed from the housing.
- Remove the two screws and the stepper motor.
- Replace the stepper motor, being careful that no undue play occurs between the gears.
- Replace the whole unit and secure with the three screws.
- Replace the cable retaining bracket, making sure that it is fixed firmly into place.
- Connect to sewing machine and make a test (Test no.13 Stepping motors)
- Replace all covers.

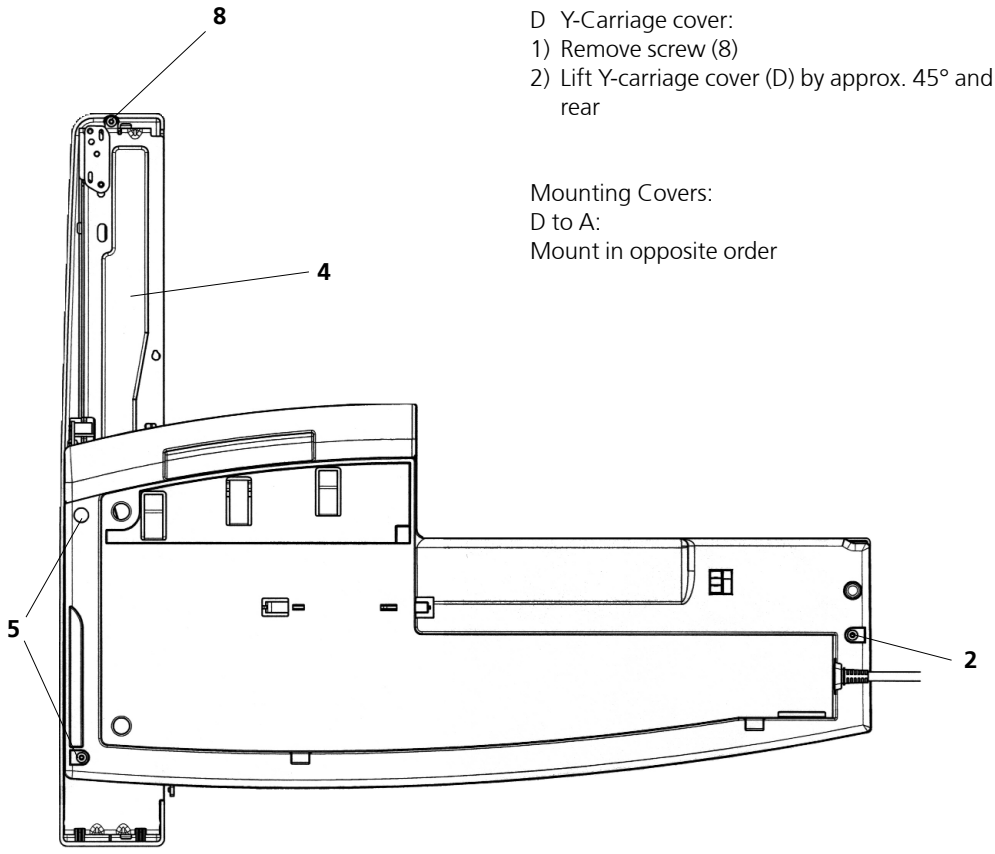
A Accessory box:
1) Pull out accessory box (A)

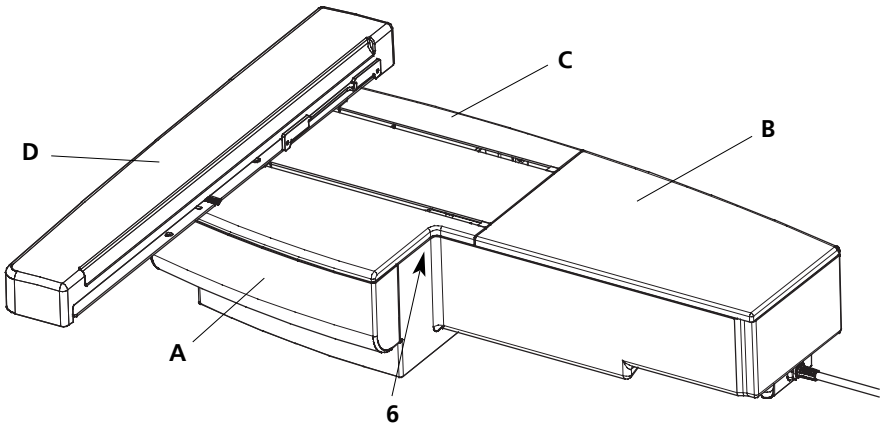
B Right cover:
1) Remove screw (2)
2) Lift right cover (B) by approx. 45° and slide to the right

C Left cover:
1) Move X carriage (4) the width of two to three fingers to the right
2) Remove both screws (5)
3) Place a guard template (to avoid scratching the surface) under Y-carriage (4)
4) Release from clip (6)
5) Raise left cover (C) as much as necessary (screw moulds must be free) and slide to the left

D Y-Carriage cover:
1) Remove screw (8)
2) Lift Y-carriage cover (D) by approx. 45° and slide to the rear

Mounting Covers:
D to A:
Mount in opposite order

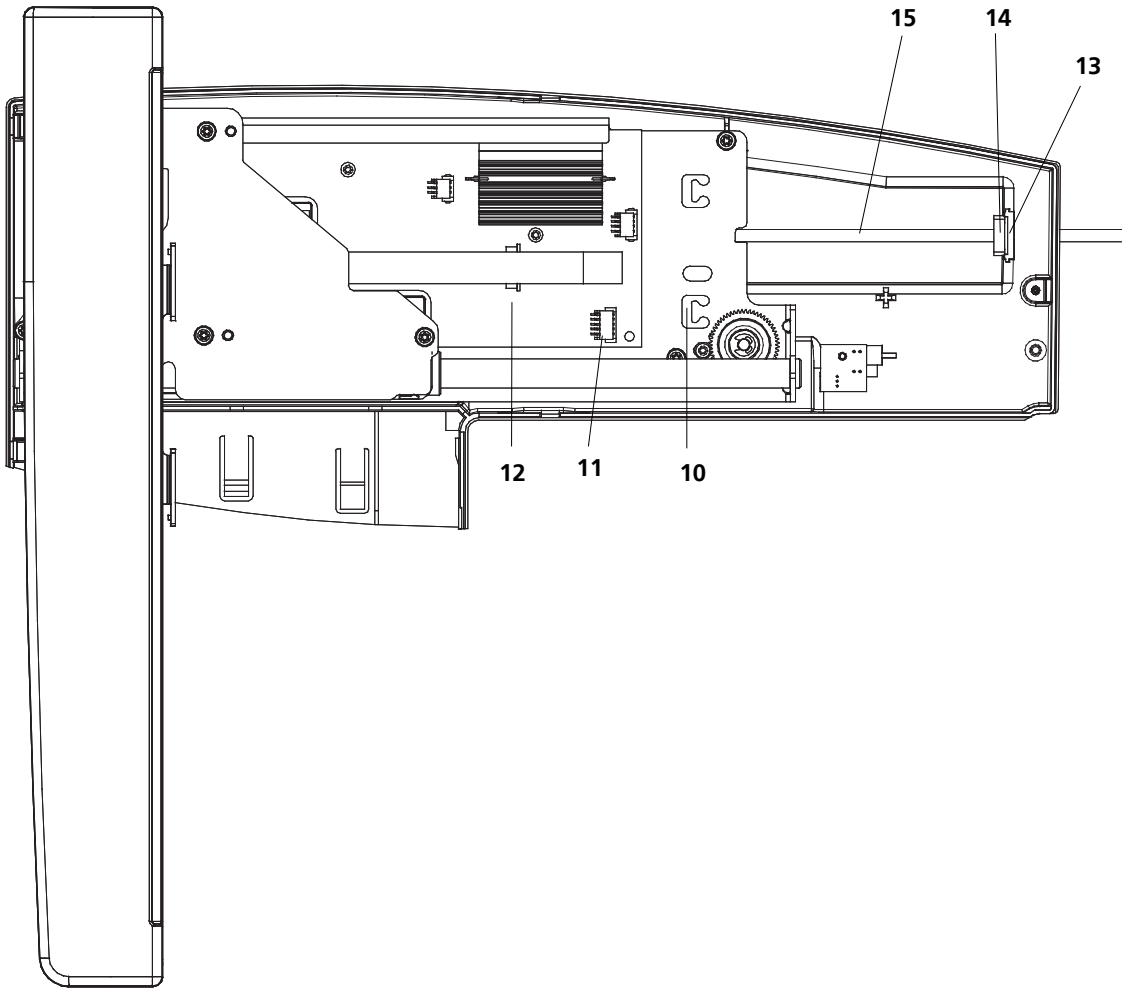




Main Cable a185

Disassembly:
1)Remove covers B and C
2) Remove cable tie (10)
3) Disconnect connection (11) from S-Print (12)
4) Press retaining plate (13) slightly inward until the clip is free, then slide upward
5) Slide strain relief (14) upwards
6) Remove main cable (15)

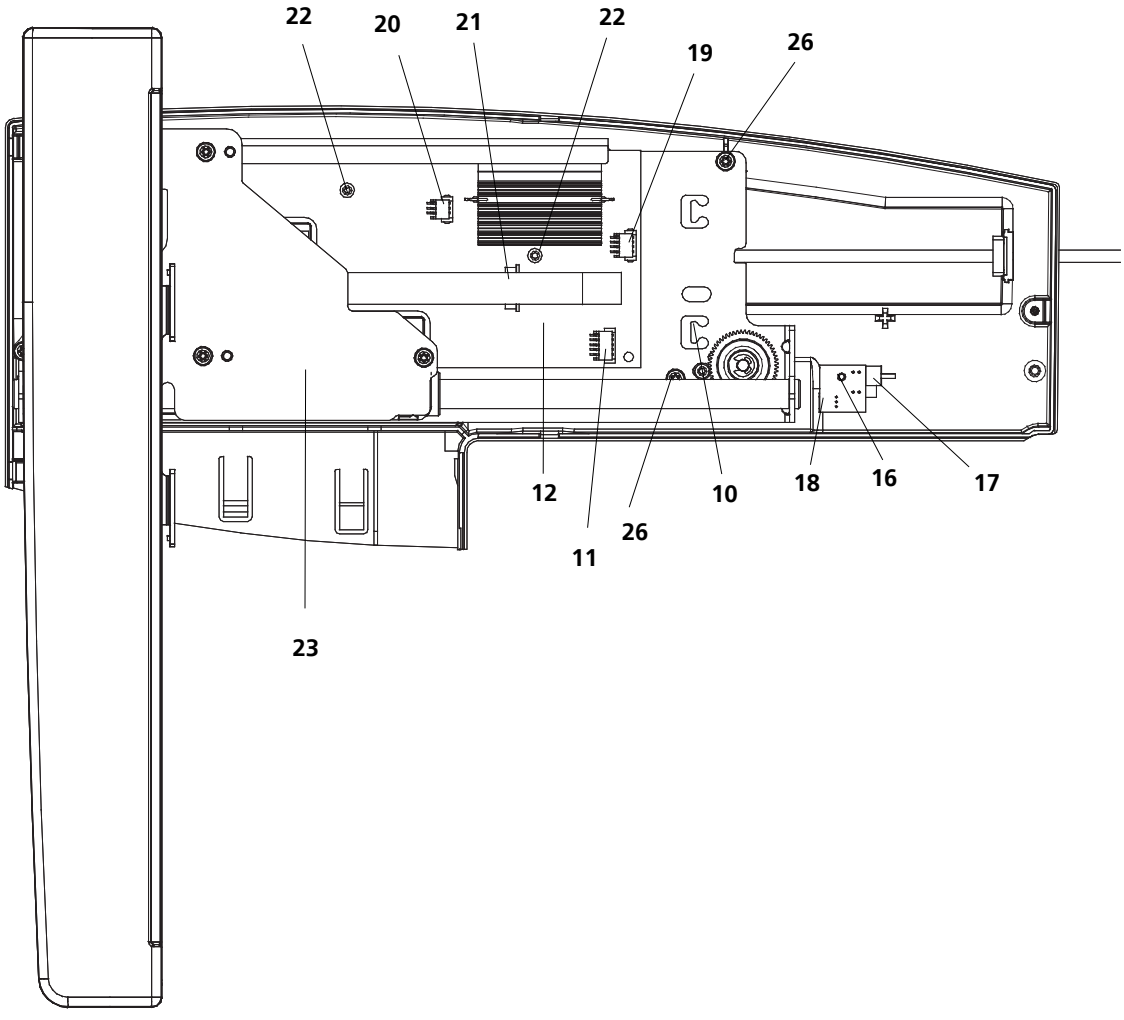
Assembly:
1) Replace main cable (15)
2) Push down strain relief (14)
3) Slide retaining plate back (13)
4) Reconnect S- Print (12) connection (11)
5) Attach cable tie (10)
6) Reattach covers B and C
7) Attach embroidery module to the sewing computer
8) Check all functions in service program 6
9) Download and embroider the test sample in the ser vice program 6i
10) Compare embroidery results with the table (page 44)



50 Free Arm Sensor and cable a185

Disassembly:
1) Remove covers B and C
2) Remove screw (16) and lift free arm sensor (18)
3) Disconnect connection (17) from free arm sensor (18)
4) Remove free arm sensor (18)
5) Disconnect connection (10) from S-Print (12)
6) Remove cable

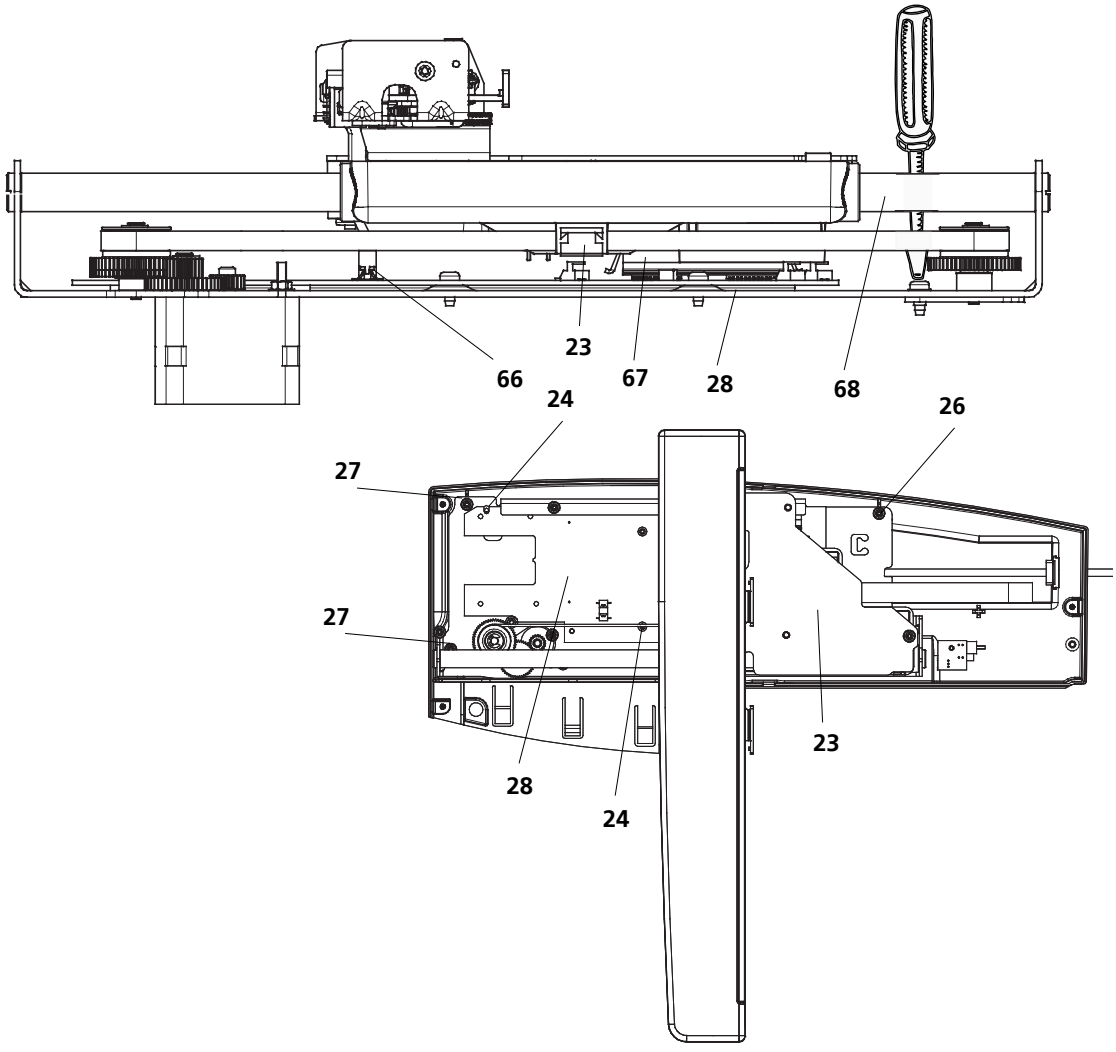
Assembly:
1) Reconnect connections (10) with S-Print (12)
2) Reconnect connections (17) with free arm sensor (18)
3) Position free arm sensor (18) and secure with screw (16)
4) Attach covers B and C
5) Attach embroidery module to sewing machine
6) Test free arm sensor in the service program 6b
7) Download and embroider the test sample in the ser ice program 6i
8) Compare embroidery results with the table (page 44)



See also page 50 for labelled illustration - free arm sensor and cable

Disassembly:
1) Remove covers A to C.
2) Remove cable tie (10).
3) Disconnect plugs (11, 19, 20, 21) from S-print (12).
4) Remove screws (22, 26).
5) Move X-carriage (23) to right buffer.
6) Remove screws (24, 27).
Caution: Don't lose the u-disks under the print at the screws (24).
7) Remove base metal sheet (28).
8) Move X-carriage (23) 3 cm short of left buffer.
9) Move S-print to the right, stopping just short of the cog-wheels.
10) Pull S-print forward on the right between base metal sheet (28) and carriage (68).
11) Lift belt slightly to stop the S-print from getting caught on the heat sink, then pull S-print out completely.
Caution: At the same time, ensure that the light barrier (66) does not get caught on the belt holder (23) or the light barrier lug (67).

Assembly:
1) Move X-carriage (23) 3 cm short of left buffer.
2) Slide S-print (12) back in on the left between base metal sheet (28) and carriage (68) so that the light barrier (66) does not get caught on the belt holder (23) or the light barrier lug (67).
3) Lift belt slightly to stop the S-print from getting caught on the heat sink, then slide S-print in completely on the right.
4) Refit base metal sheet (28) in cover.
5) Move X-carriage (23) to right buffer.
6) Fasten S-print with screws (24).
Caution: Don't forget the u-disks under the print at the screws (24).
7) Fasten base metal sheet (28) with screws (27).
8) Move X-carriage (23) to left buffer.
9) Fasten S-print with screw (22).
10) Fasten base metal sheet (28) with screws (26).
11) Reconnect plugs (11, 19, 20, 21) to S-print (12).
12) Refit cable tie (10).
13) Refit C to A covers.
14) Attach and connect embroidery module to sewing computer.
15) Check functioning in service program no. 6.
16) Open test samples in service program no. 6i, and embroider them.
17) Compare embroidery results with table on page 44.

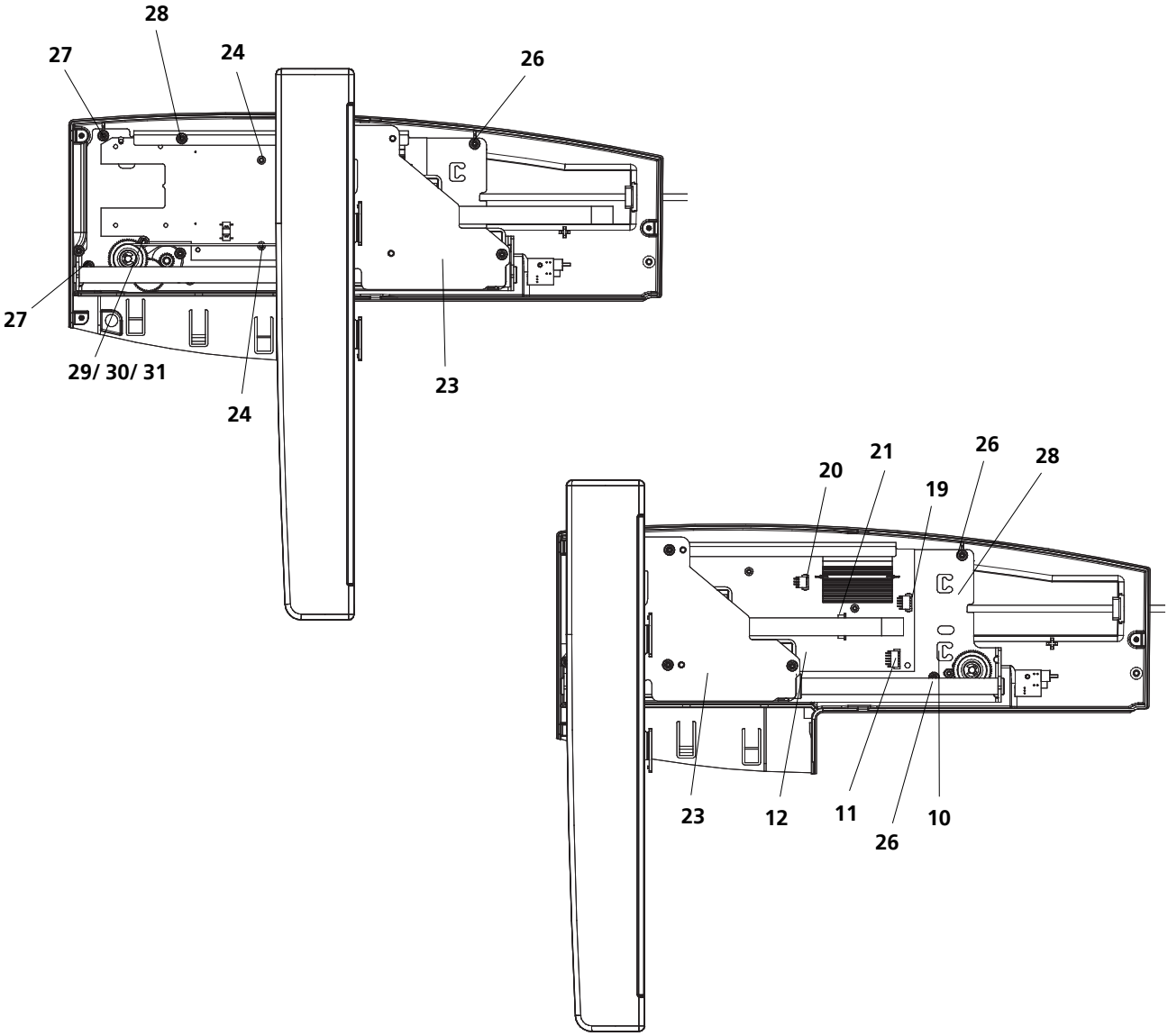


X-Carriage Stepping Motor

Pictures are same for X-Carriage belt and gear

Disassembly:
1) Remove covers A to C
2) Remove cable tie (10)
3) Disconnect connection (11, 19, 20, 21) from S- Print (12)
4) Remove screws (26)
5) Bring X-carriage (23) to its extreme position right
6) Remove screws (27)
7) Remove base plate (28)
8) Remove nuts (29) along with toothed (30) and normal washer (31)
9) Remove stepping motor (32)

Assembly:
1) Position stepping motor (32) and nuts (29) tighten along with toothed (30) and normal washer (31)
2) Check ease of run.
   Caution! Gear wheel of the motor has to be set without play!
3) Position base plate (28) and fasten with screws (27, 26)
4) Reconnect connections (11, 19, 20, 21) with S- Print (12)
5) Attach cable tie (10)
6) Reattach covers C to A
7) Attach embroidery module to the sewing computer
8) Check functions in service program 6
9) Download and embroider the test sample in the service program 6i
10) Compare embroidery results with the table (page 44)

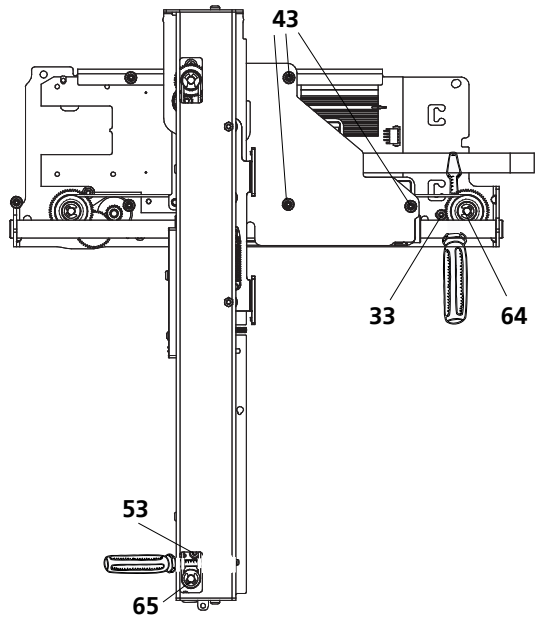


X-Carriage Belt and Gear Wheels

Pictures are same for X-Carriage stepping motor

Disassembly:

1) Remove covers A to D
2) Remove cable tie (10) (page 90)
3) Disconnect connection (11, 19, 20, 21) from S- Print (12) (page 90)
4) Remove screws (26) (page 90)
5) Bring X-carriage (23) to its extreme position right (page 90)
6) Remove screws (27) (page 90)
7) Remove base plate (28) (page 90)
8) Loosen belt tension with screw (33)
9) Remove screws (34)
10) Remove carrier support (35) including X-carriage
11) Remove clip (36)
12) Remove belt (37)
13) Remove required circlip (38a, b, c)
14) Remove required gear wheel (39a, b, c). When exchan ging the gear between motor and belt, always remove the belt gear first.



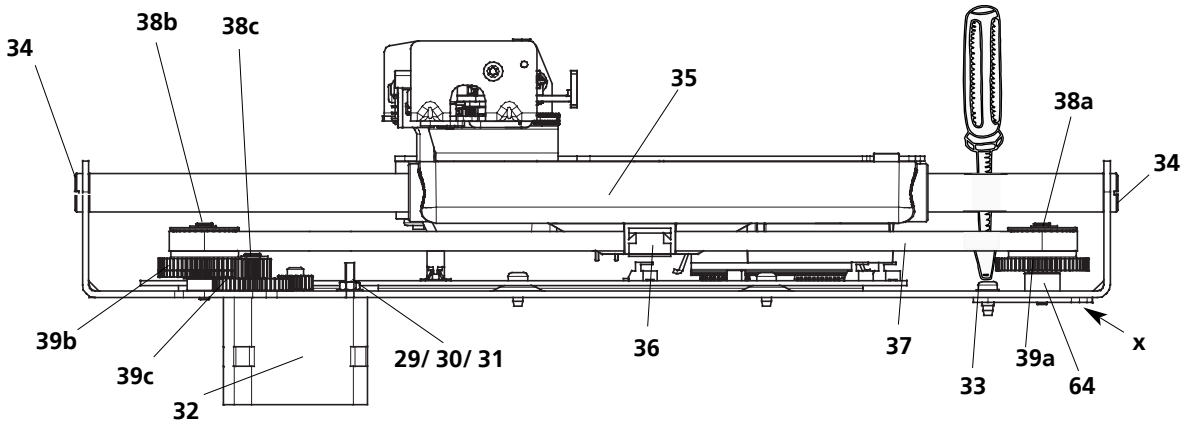
Assembly:

1) Position gear wheel (39a, b, c) and secure with circlip (38a, b, c)
   The left belt gear wheel (39b) consists of three parts. When assembling put the spring with the nose into the cutout of the upper part first. Then position the lower part so that also this nose engages into the cutout of the lower part. Turn upper and lower part against each other and put on the spindle this way. When positioning into the intermediate gear wheel make sure that there is no space between upper and lower part and that the tension between upper and lower part is always at hand.
2) Check for ease of run.
   Caution! Gear wheels have to be set without play! Loosen stepping motor, set it and tighten it again if necessary.
3) Position belt (37) so that it does not brush against the guide pulley
4) Attach clip (36)
5) Position carrier support (35) including X-carriage and secure with screws (34). Make sure that the belt runs in front of the guide
6) Put belt on the gear wheels 39a and 39b
7) Set belt tension 2kg (20 N) : Hook a tension spring gauge into the aperture (X) and tighten screw (33)

Alternative method:

   The complete X and Y carriage including S-print weighs exactly 2kg, therefore this can be used as a weight. Place a screwdriver under the gear wheel spindle (64) (see sketch) and let the whole unit pendle on the screwdriver and at the same time secure screw (33).

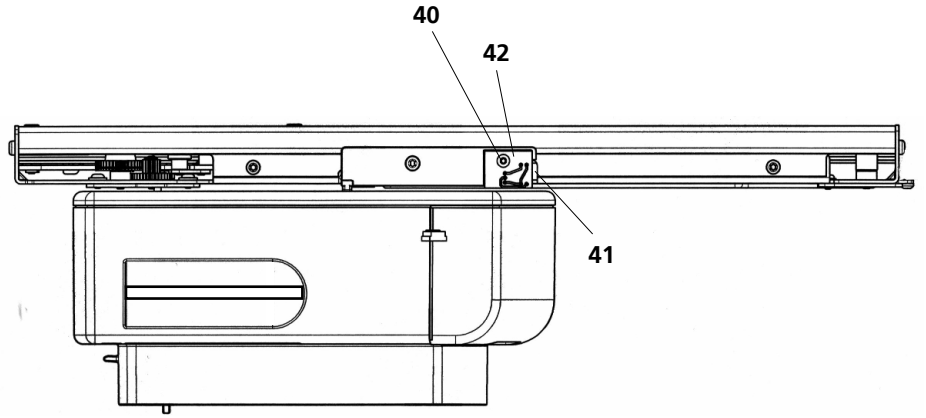
8) Position base plate (28) and fasten with screws (27, 26) page 90)
9) Reconnect connections (11, 19, 20, 21) with S- Print (12)
10) Attach cable tie (10)
11) Reattach covers A and D
12) Attach embroidery module to the sewing computer
13) Check all functions in service program 6
14) Download and embroider the test sample in the service program 6i
15) Compare embroidery results with the table (page 44)



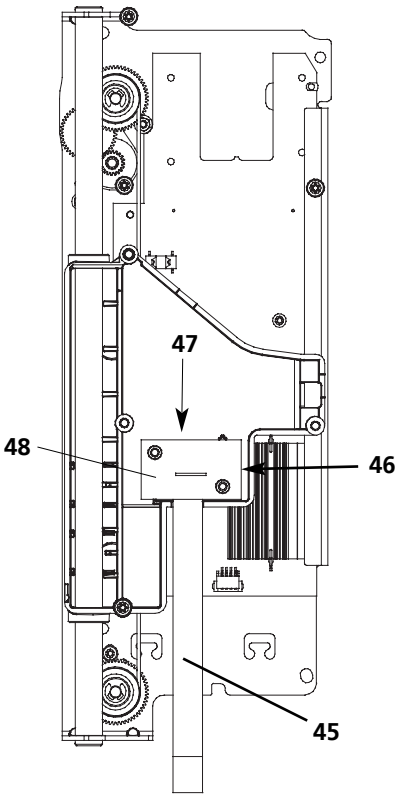
Y-Carriage Sensor a185

Disassembly:
1) Remove cover D
2) Remove screw (40)
3) Disconnect connections (41)
4) Remove sensor (42)

Assembly:
1) Connect sensor (42), position and secure with screw (40)
2) Reattach cover D
3) Attach embroidery module to the sewing computer
4) Check all functions in service program 6
5) Download and embroider the test sample in the service program 6i
6) Compare embroidery results with the table (page 44)



Y-Carriage Stepping Motor a185

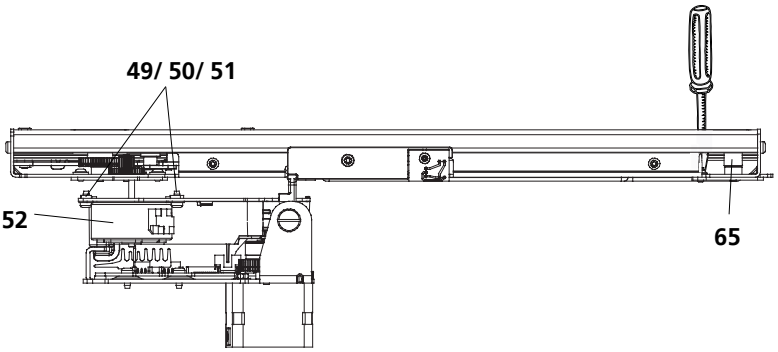


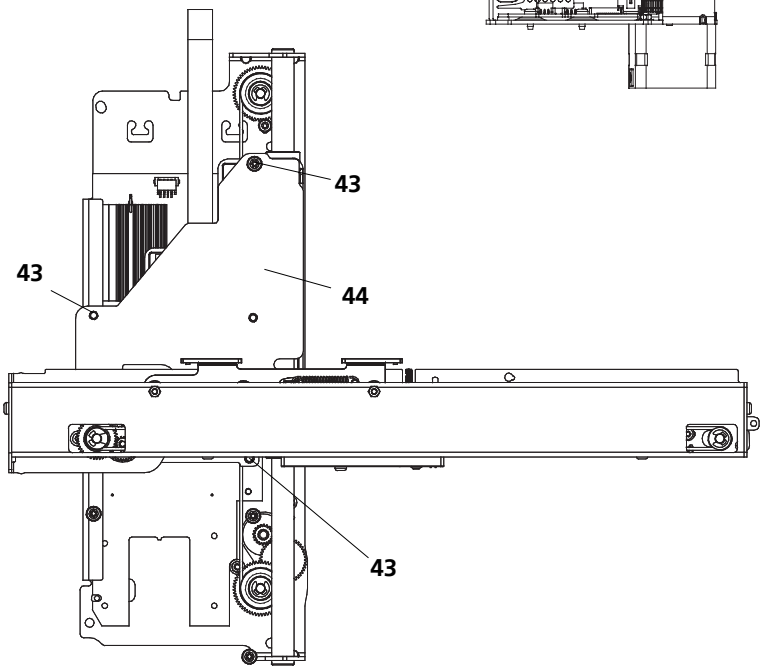
Disassembly:

1) Remove covers A to D
2) Remove screws (43)
3) Remove carrier support (44)
4) Loosen V- Print (48) and disconnect connection (45, 46, 47)
5) Remove nuts (49) along with toothed (50) and normal washer (51)
6) Remove stepping motor (52)

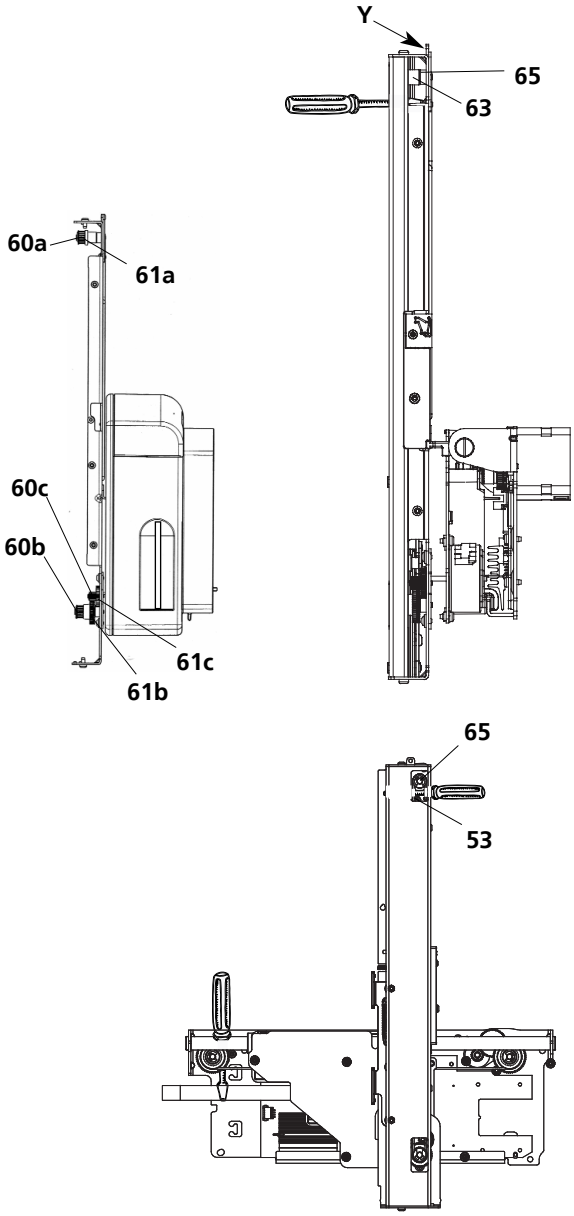
Assembly:

1) Position stepping motor (52) and secure with nuts (49) along with toothed (50) and normal washer (51)
2) Check ease of run. Caution! Gear wheel of the stepping motor has to be set without play!
3) Reconnect V-Print connections (45, 46, 47) and position V-Print (48)
4) Position carrier support (44) and fasten with screws (43)
5) Check whether the cables are not pinched
6) Reattach covers D to A
7) Attach embroidery module to the sewing computer
8) Check all functions in service program 6
9) Download and embroider the test sample in the service program 6i
10) Compare embroidery results with the table (page 85)





Y-Carriage Belts and Gear Wheels



Disassembly:

1) Remove covers D
2) Loosen belt tension with screw (53)
3) Remove screws (54, 55)
4) Remove Y- Profile (56)
5) Slide out hoop support (57) (page 95)
6) Remove clip (58) (page 95)
7) Remove belt (59) (page 95)
8) Remove required circlip (60a, b, c)
9) Remove required gear wheel (61a, b, c).When exchanging the gear between motor and belt, always remove the belt gear first.

Assembly:

1) Position gear wheel (61a, b, c) and secure with circlip (60a, b, c)
   The rear belt gear wheel consists of three parts. When assembling put the spring with the nose into the cutout of the upper part first. Then position the lower part so that also this nose engages into the cutout of the lower part. Turn upper and lower part against each other and put on the spindle this way. When positioning into the intermediate gear wheel make sure that there is no space between upper and lower part and that the tension between upper and lower part is always at hand.
2) Check for ease of run. **Caution! Gear wheels have to be set without any play! Loosen stepping motor, set it and tighten it again if necessary.**
3) Position belt (59) (page 95)
4) Attach clip (58) (page 95)
5) Slide in hoop support (57) (page 95)
6) Put belt on the gear wheels
7) Fasten Y- Profile(56) with screws (54, 55).
   Caution! The profile must lie on the guide lugs!
8) Set belt tension 2kg: Hook a tension spring gauge into the aperture (Y) and tighten screw (53) refit cover D

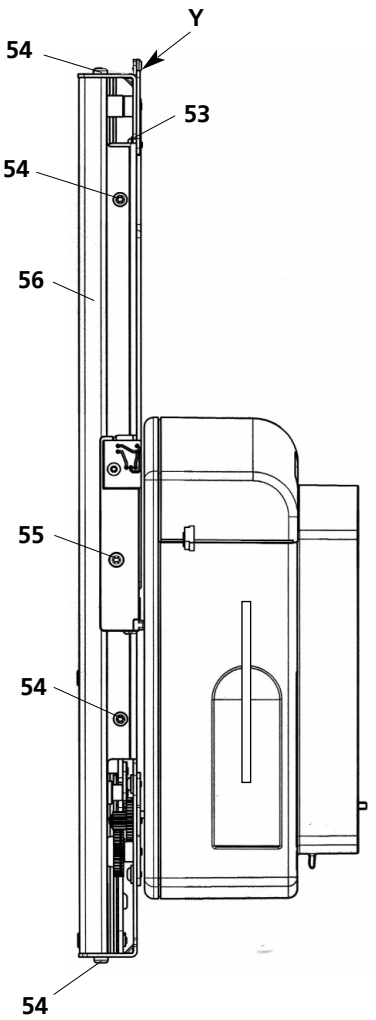
Alternative method:

The complete X and Y carriage including S-print weighs exactly 2kg, therefore this can be used as a weight.
Remove all covers A to D:
Remove screws (26, 27) and remove the complete X and Y carriage (page 90).
Place a screwdriver under the gear wheel spindle (65) (see sketch) and let the whole unit pendle on the screwdriver and at the same time secure screw (53). Replace the complete X and Y-carriage and secure with screws (26 & 27) (page 90). Refit all covers A to C.

9) Reattach cover D
10) Attach embroidery module to the sewing computer
11) Check all functions in service program 6
12) Download and embroider the test sample in the service program 6i
13) Compare embroidery results with the table (page 85)

Set Hoop Support on Y-Profile

Pictures are same for X-Carriage belt and gear page 56



Check:

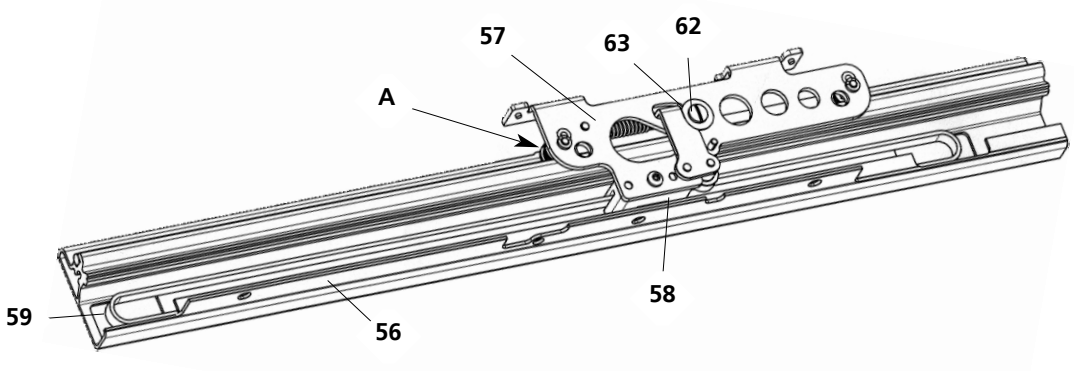
1) Over the total length of the guide there must be the same amount of play on the carriage guide rollers.
2) When there is too little play the carriage cannot run freely, but intermittently and even become jammed.
3) When there is too much play the carriage can tilt, run intermittently, jam, or even jump out of the guide

Correction:

1) Remove covers D
2) Loosen belt tension with screw (53)
3) Remove screws (54, 55)
4) Remove Y- Profile (56)
5) Loosen screw (62)
6) Set play (A) => 0.15mm (0.1 to 0.2mm) with the Excentric disk (63) and tighten screw (62) again. **Caution!! The washer should lie on the uppermost position of the tension plate, at the same time be careful that the play doesn't alter when securing.**
7) Put belt on the gear wheels
8) Fasten Y- Profile (56) with screws (54, 55). **Caution! The profile must lie on the guide lugs!**
9) Set belt tension 2kg: Hook a tension spring gauge into the aperture (Y) and tighten screw (53) refit cover D

Alternative method: The complete X and Y carriage including S-print weighs exactly 2kg, therefore this can be used as a weight. Remove covers A to C:
Remove screws (26, 27) and remove the complete X and Y carriage.
Place a screwdriver under the gear wheel spindle (65) (see sketch) and let the whole unit pendle on the screwdriver and at the same time secure screw (53) (page 94).
Replace the complete X and Y-carriage and secure with screws (26, 27) (page 90). Refit covers C to A.

10) Reattach cover D
11) Attach embroidery module to the sewing computer
12) Check all functions in service program 6
13) Download and embroider the test sample in the service program
14) Compare embroidery results with the table (page 44)



BERNINA®

© Copyright 2003 by Fritz Gegauf Ltd., Steckborn

03/08 EN 008 903 51 04

Other ManualsLib Projects

 www.manualslib.com

 www.manualslib.de

 www.manualslib.es

 www.manualslib.fr

 www.manualslib.nl

 www.manualslib.mx

 www.manualslib.tech 30+ Languages