

BERNINA®



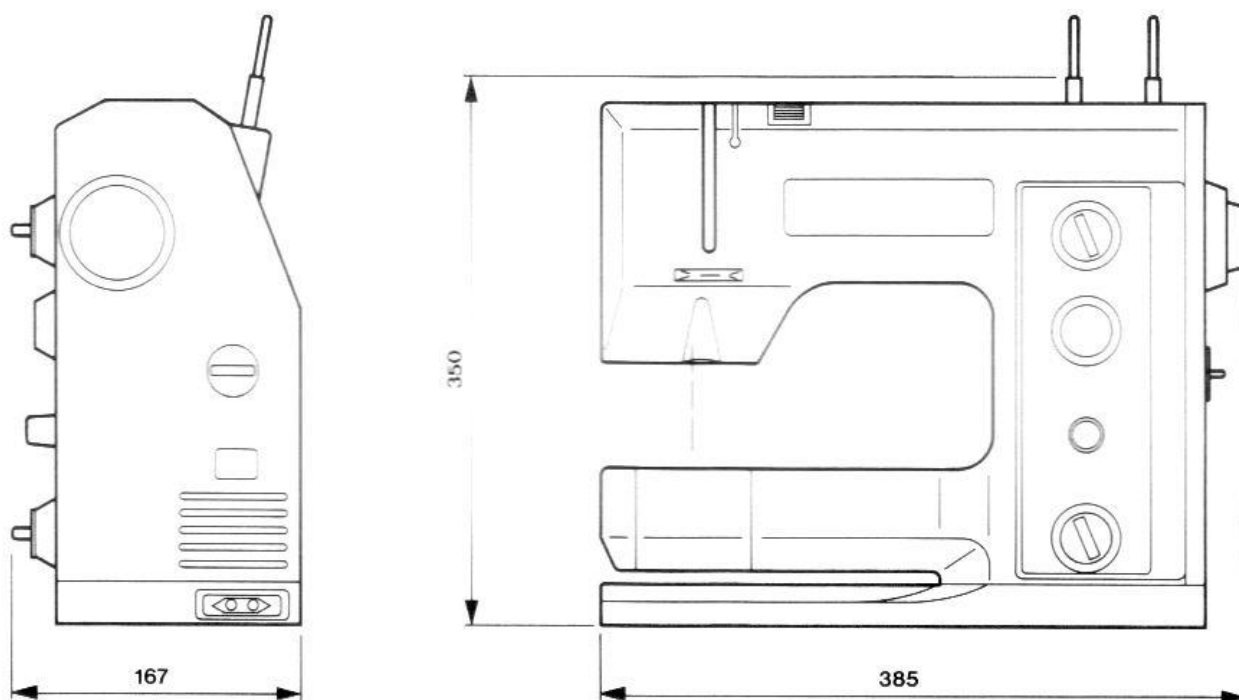
Service manual

BERNINA 1000,1004,1005,1010,1015

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FRITZ GEGAUF LTD.,
Manufactures of BERNINA Sewing-Machines
8266 Steckborn / Switzerland

(SUPPLEMENT TO SERVICE MANUAL 1030 / 1020)



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Legend × = see service manual Cl. 1030/1020

— = not for these models

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2.1 Technical data, features and functions

	1030	1020	1015	1010	1005	1004	1000
Stitch length forwards max. 5,0 mm	×	×	×	×	×	×	×
reverse max. 2,5 mm	×	×	×	×	×	×	×
Stitch width max. 5,5 mm continuous	×	×	×	×	×	×	×
Needle system 130/705 H							
Adjusting needle 130/705 H/TCN	×	×	×	×	×	×	×
Hook system BERNINA CB = Central bobbin	×	×	×	×	×	×	R
Lowest point of needle bar = 0°	×	×	×	×	×	×	×
Presser foot height = 7,5 mm	×	×	×	×	×	×	×
Darning foot min. height = 0,5 mm	×	×	×	×	×	×	×
Automatic long stitch = 10 mm 2:1	×	—	—	—	—	—	—
Working space 105 × 195 mm	×	×	×	×	×	×	×
Overall length (mm)	375	375	385	385	385	385	385
Overall width 167 mm	×	×	×	×	×	×	×
Overall height 350 mm	×	×	×	×	×	×	×
Motor D.C. / A.C.	D.C.	D.C.	A.C.	A.C.	A.C.	A.C.	A.C.
No. of stitches per min. min./max.							
120-1050 min ⁻¹	120	120	<170	<170	<170	<170	<170
Reduced min.-max. 120-600 min ⁻¹	×	×	<170/550	—	—	—	—
Sewing light: bulbs 2 × 6 V/4 W	×	×	220V/15W	220V/15W	220V/15W	220V/15W	220V/15W
Weight 9,8 kg							

R = Double rotary hook

	1030	1020	1015	1010	1005	1004	1000
Needle position 5	×	×	×	×	×	×	×
Zigzag and stitch length infinitely adjustable	×	×	×	×	×	×	×
Display of setting in window	×	×	P	P	P	P	P
Presser foot display	×	×	P	P	P	P	P
Upper needle stop (general)	×	×	—	—	—	—	—
Needle positioning up/down with foot control	×	×	—	—	—	—	—
Pattern start with mechanical pattern repeat display	×	×	—	—	—	—	—
Buttonhole 6-step	×	×	×	×	×	—	×
Automatic long stitch	×	—	—	—	—	—	—
Practical stitches without reverse feed	10	10	6	7	7	7	7
Practical stitches with reverse feed	8	8	5	6	—	—	—
Decorative stitches without reverse feed	3	1	1	1	—	—	—
Decorative stitches with reverse feed	5	3	2	2	—	—	—
Number of stitch patterns	26	22	14	16	7	7	7
Decorative stitch pattern repeat 36	×	×	×	—	—	—	—
Main switch	×	×	×	×	×	×	×
Speed reduction switch combined with main switch	×	×	F	—	—	—	—
Separate light switch	×	×	—	—	—	—	—
Combined light switch with main switch	—	—	×	×	×	×	×
Bobbin winder separate motor	×	×	—	—	—	—	—

P = Printed on panel

F = Speed reduction by 2-position switch on foot control

Principal features of individual models



Model 1010

CB-central bobbin hook
with reverse feed



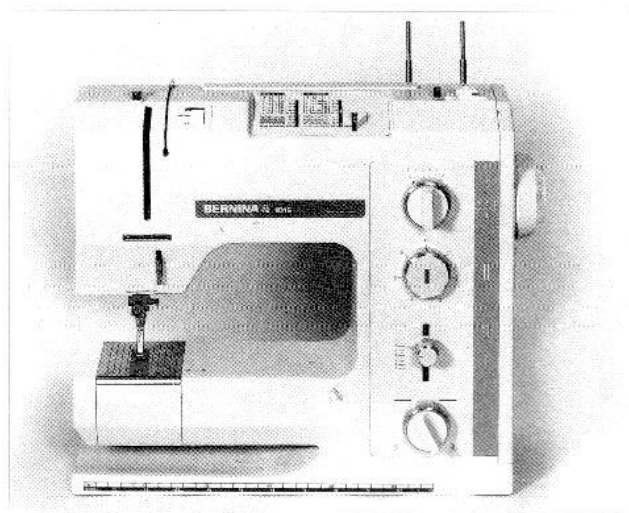
Model 1005

CB-central bobbin hook
without reverse feed

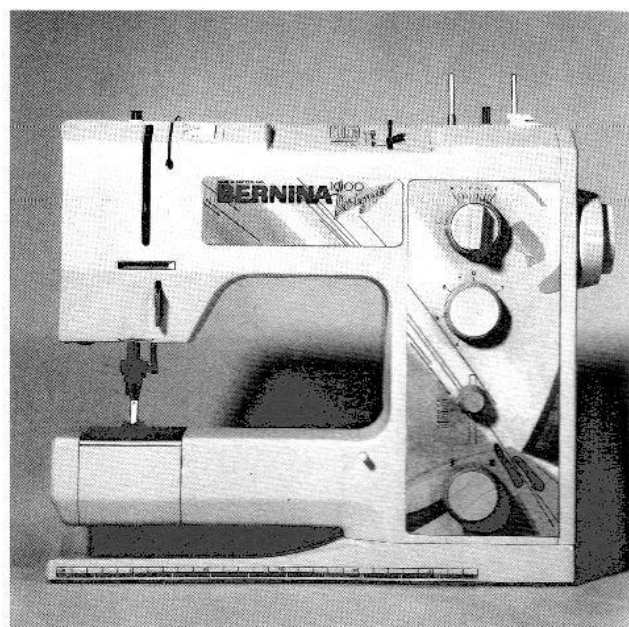


Model 1004

CB-central bobbin hook
without reverse feed and
automatic buttonholer

**Model 1015**

CB-central bobbin hook
with reverse feed

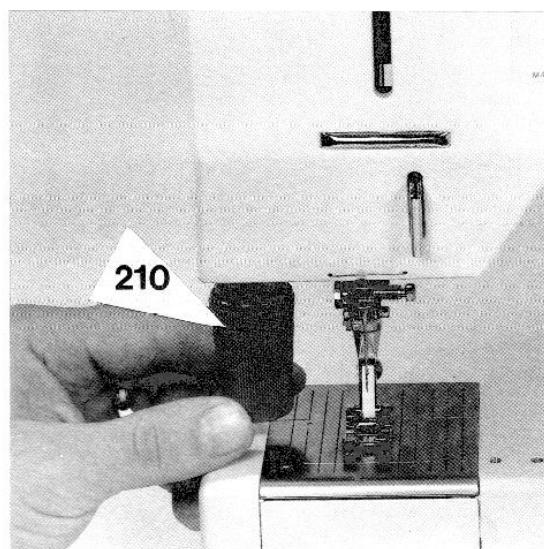
**Model 1000**

Rotary hook without
reverse feed

4.1 Changing the bulb

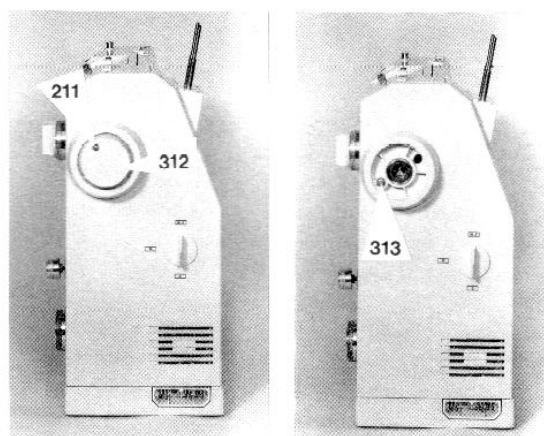
The machine is fitted with a 220V, 15W, bulb located on the left front side.

The lamp is changed using a special tool (210) (lamp has a bayonet-type socket).



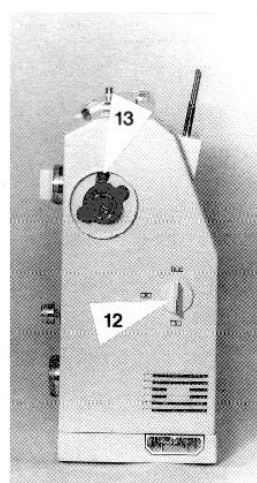
5.1 Removing belt-cover

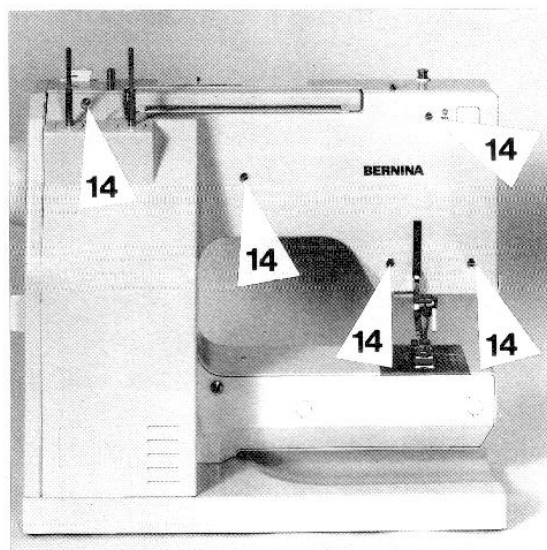
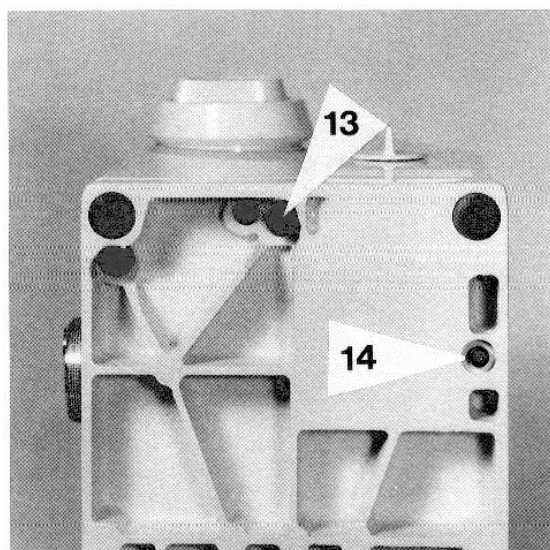
- Loosen the cross-cut screw (211) on the hand-wheel latch release by 3 turns.
 - Remove latch release screw (312).
 - Remove star-washer.
 - Remove handwheel screw (313).
 - Remove handwheel.
-
- Turn the belt pulley until the handwheel fastener comes into the belt-cover recess.
 - Remove main switch knob (12).
 - Remove screws (13) (2×),



Removing chassis cover:

- Remove the six screws (14).
- After placing the lifter-lever in the up position, remove the cover.



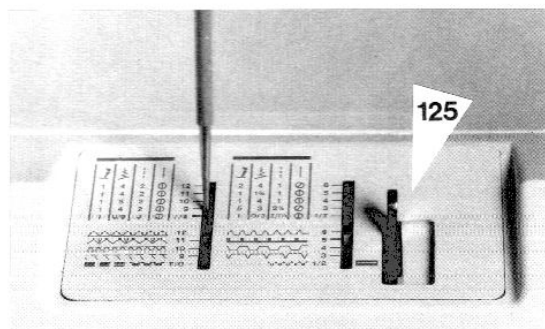


5.2 Scale plate (125), new for mod. 1030 and submodels

The scale plate (125) is now fastened to the machine frame by brackets.

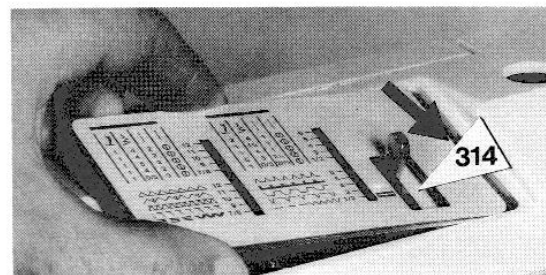
Removing scale plate

- Insert spring hook into the left-hand indicator slot.
- Pull the spring hook upwards (scale plate clicks out to the left).
- Draw the scale plate out to the left.

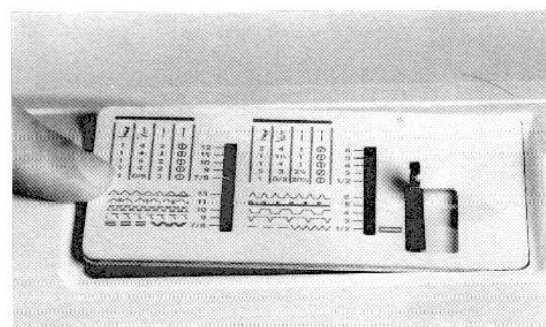


Mounting the scale plate

- Insert the scale plate (125) into the machine frame from left to right.
- Pay attention to the slider (314).



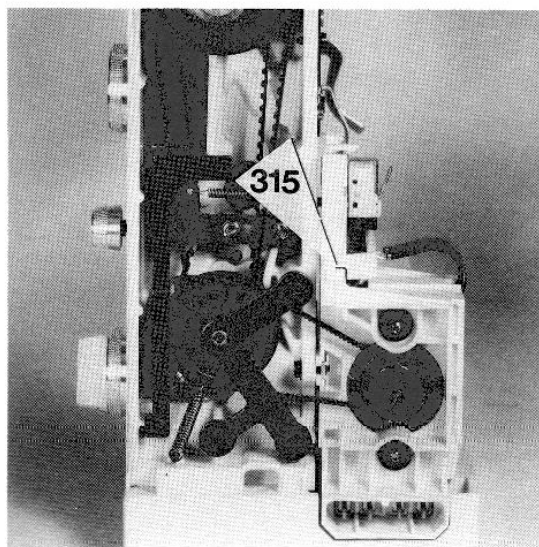
- Press the scale plate (on the left side) gently against the machine frame (scale plate clicks into position).



7.1 Dismantling motor support

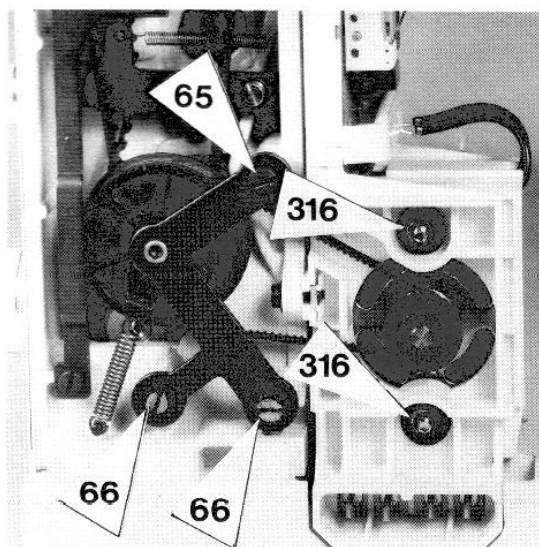
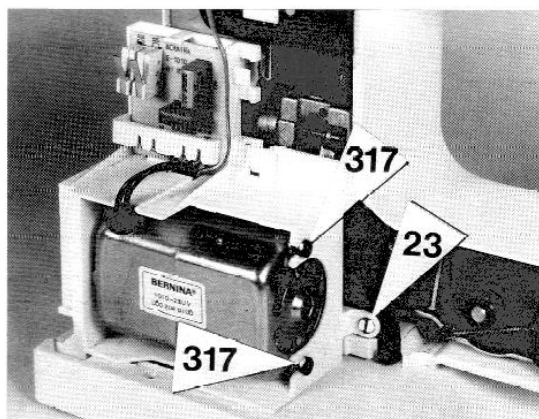
- Remove cable securing clip (35) by sliding out to the left.
- Remove connector NL.
- Remove grounding screw (only U.S.A.).
- Dismantle stepped pulley (3 screws [65/66]).
- Release the long and short drive belts.
- Remove motor support screws (23).
- Remove motor support.

To assemble reverse the procedure.



Removing the main motor:

- Unplug the mains plug!
- a) Unplug cable on print E 1010. Unplug connection MO.
- b) With a 7 mm key remove nuts (316) with washers (belt drive-side).
- c) Loosen nuts (317) on the opposite side, and remove motor.



9.1 Checking the bobbin winding device

The thread should be wound evenly via the bobbin-winder pretensioner and the bobbin correctly filled.

Correction: for one-sided winding.

- Using the special driver tool, rectify the bobbin holder bracket up or down.

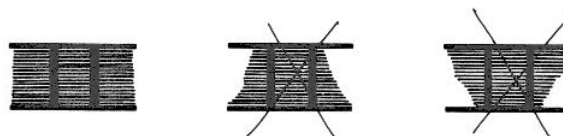
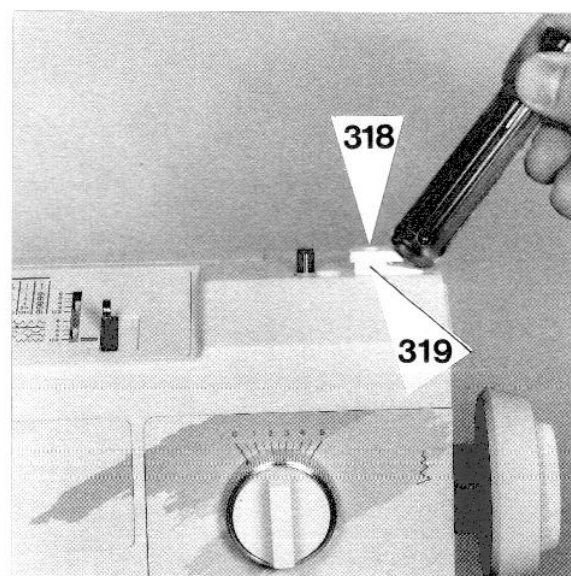
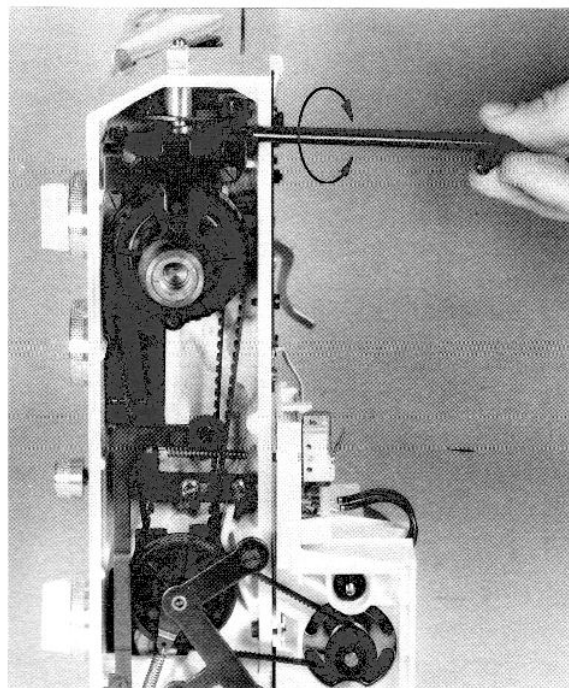
Correction: when filling the bobbin.

- Loosen the tensioner screw (318) screw slightly.
- Move the tensioner (319) right or left by tapping gently (screwdriver handle).
- Tighten tensioner screw (318).

Correction: Filling the bobbin

Bobbin insufficiently filled: move pressure piece to the right.

Bobbin too full: move pressure piece right to the left.



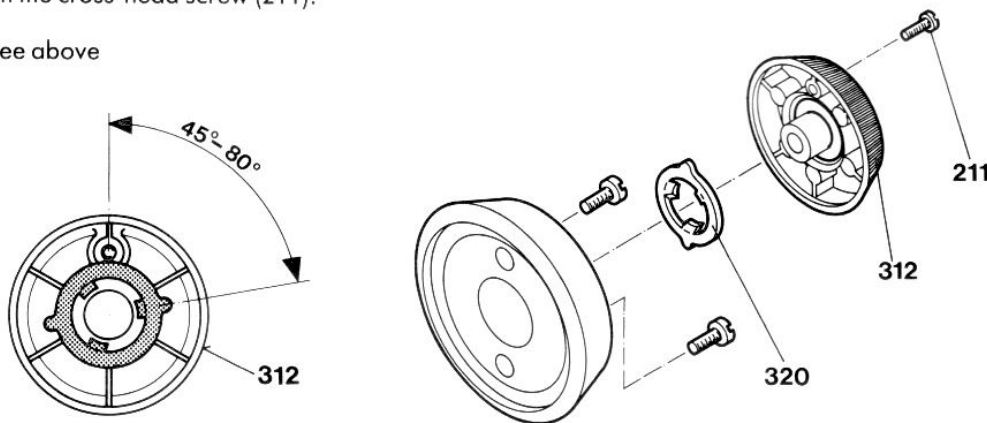
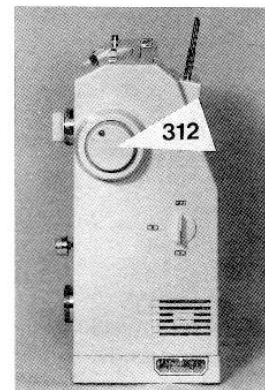
10.1 Checking the handwheel release mechanism

- Hold the handwheel.
- Turn the handwheel release screw (312) anti-clockwise until it stops, approx. 45°–80° max.
- Run the machine – only the motor and belt drive should now run, the machine should be disengaged.

Correction

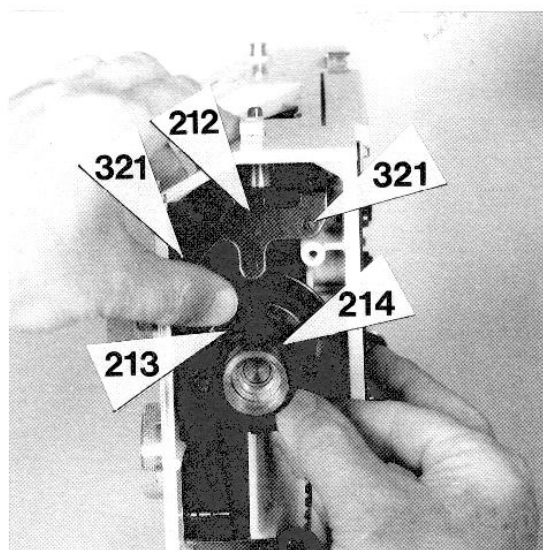
- Loosen the cross-cut screw (211) on the handwheel release by 3 turns.
- Remove the handwheel release screw (312).
- Turn the star-washer (320) one or two notches as required.
- Install the handwheel release screw (tighten).
- Tighten the cross-head screw (211).

Check: see above



10.2 Disassembling the drive flange (toothed belt wheel 36 teeth)

- Release bobbin-holder (212) (2 screws) (321). Push the 2 clips (213) outwards while pulling the drive flange (214) out.
- Remove drive flange and bobbin-holder.



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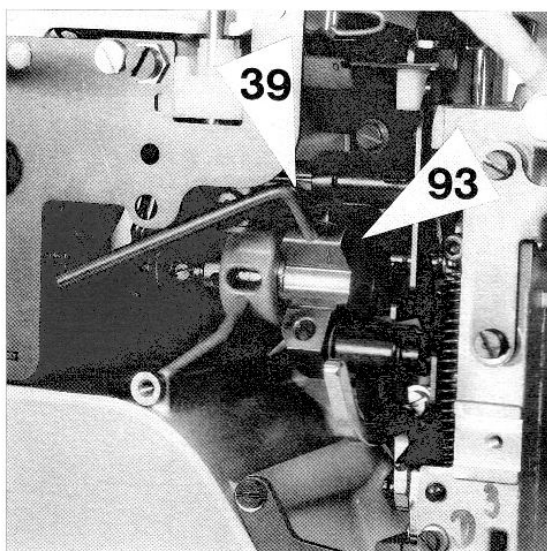
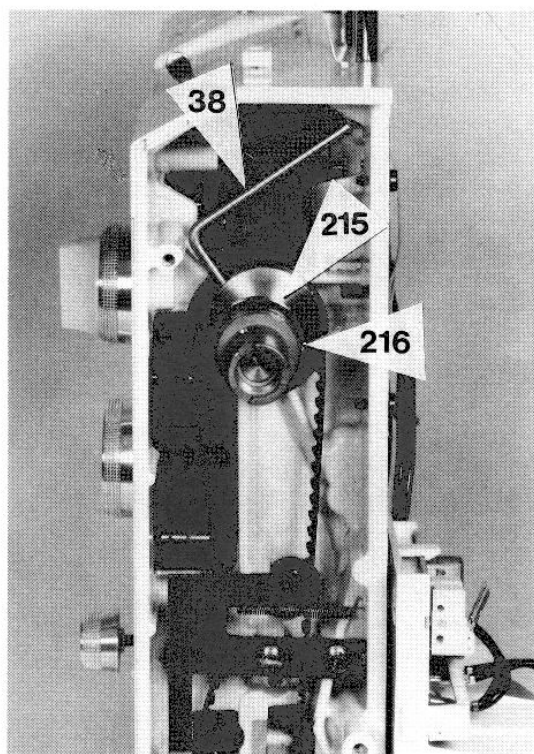
When making adjustments between the upper shaft and carrier on the Model 1015 the balance weight (215) must first be removed from the toothed belt pulley 24 teeth.

- Loosen screw (216).
- Remove balance weight (215) from flange.

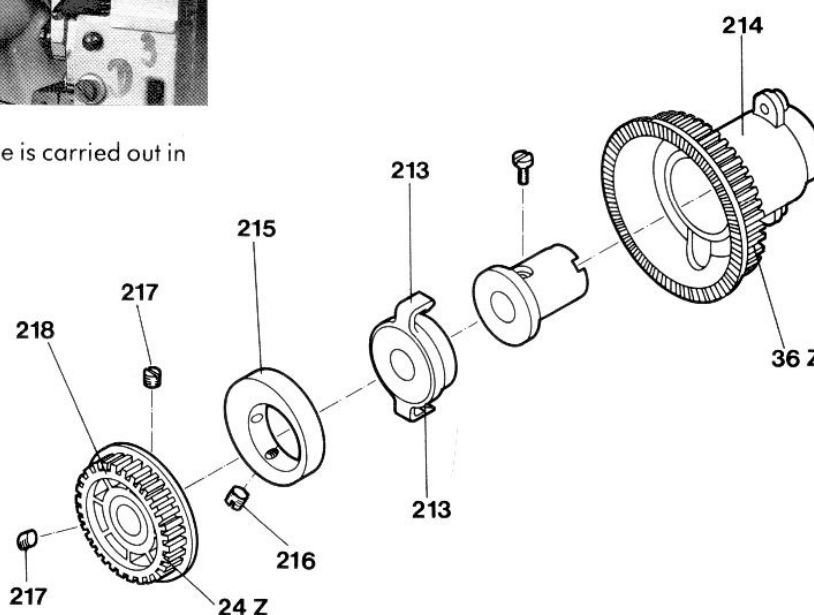
Cl. 1015/1010/1005/1004

Installing the balance weight.

- Pin the balance piece (93) of the needle drive with 4 mm pin and turn the upper shaft in the direction of rotation as far as the stop (39).
- Pin the balance weight with a 4 mm socket key (38) and turn in the direction of rotation until the stop is reached.
- Tighten the screw (216).



The assembly of the drive flange is carried out in the reverse order.



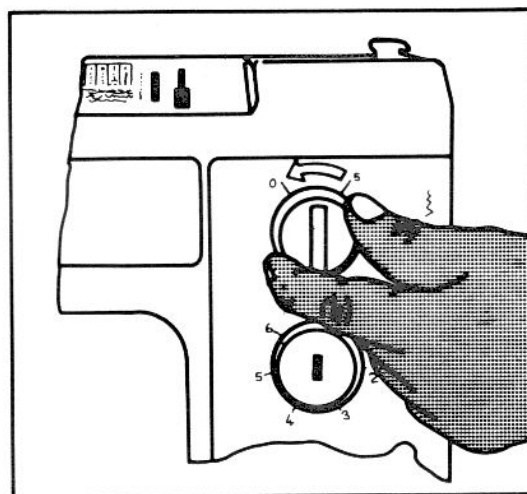
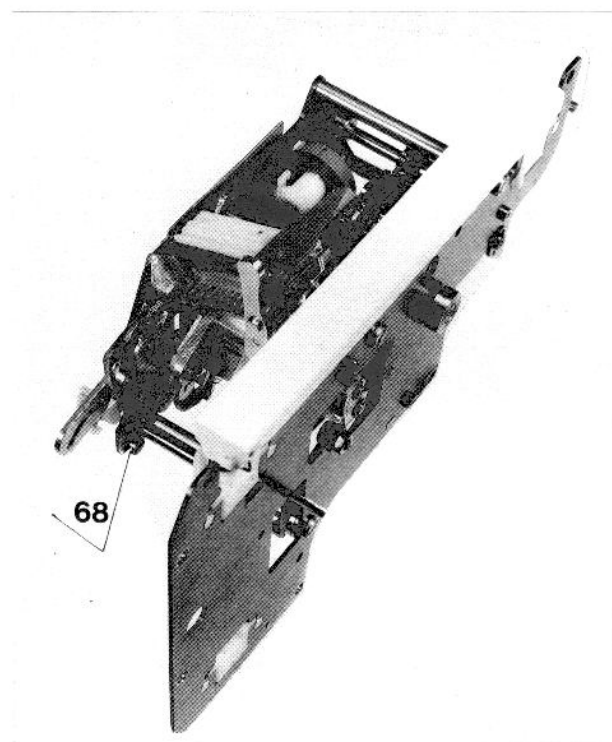
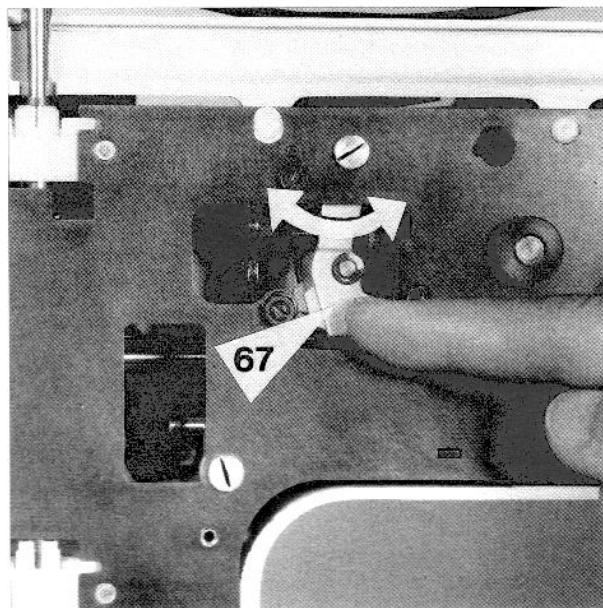
20.1 Rest position of needle

Checking the rest position of needle

- Set the L.C.R. knob to the centre position.
- Set the stitch width knob to 0 (straight stitch).
- By turning the handwheel set the tracer to the lowest position (set needle above stitch plate).
- Move the cam operating lever (67) quickly to and fro by hand. The needle should not make any sideways motion.

Correction

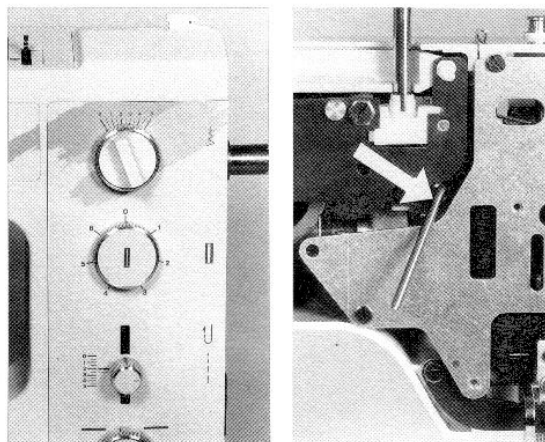
- Loosen screw (68).
- Turn the stitch width knob to maximum (5 mm).
- Tighten screw (68) slightly.
- Turn the stitch width knob towards zero and at the same time move the cam operating lever (67) to and fro by hand. The needle should not make any sideways motion.
- Tighten screw (68).



26.1 Checking the hook adjustment—loop lift

(First check chapter 31.1 feed timing)

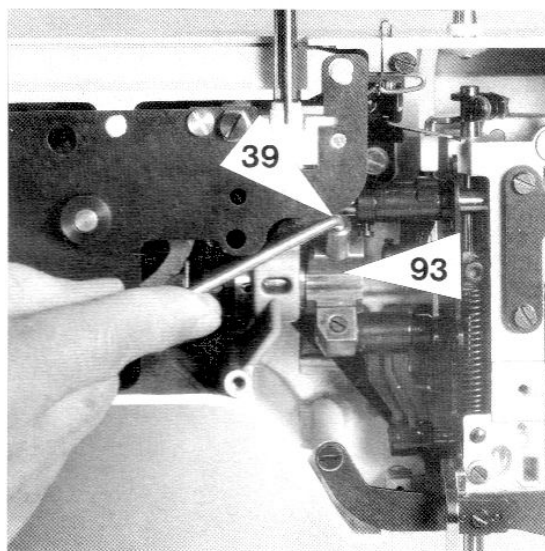
- Set the L.C.R. knob to the left.
- Remove the stitch plate.
- Pin the balance piece (93) of the needle drive and turn the handwheel until stop 39 is reached. (Note: use insert 10 mm dia) 006 380 50 00.
- The hook tip must now be flush with the left side of the needle.



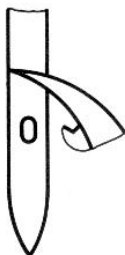
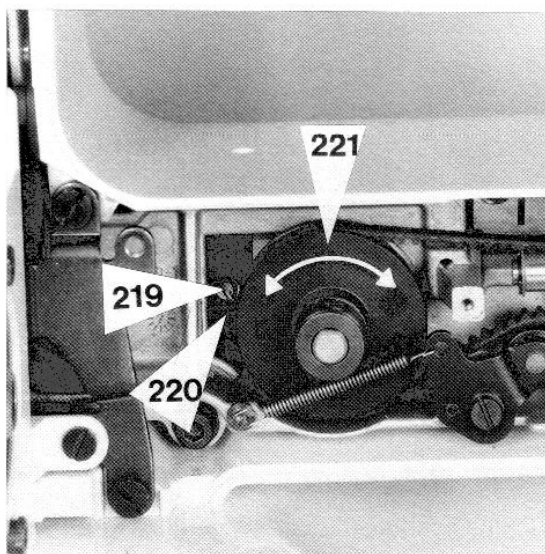
Correction

- Loosen the 2 screws (219) on the bevel gear (220) by at least 2 turns (pull the bevel gear to the left out of mesh.).
- Set the L.C.R. knob the left.
- Pin the balance piece (93) of the needle drive and turn with the handwheel until stop (39) is reached.

Note: So that the bevel gear can be pulled sufficiently out of the mesh, the feed-dog should not be lowered.



- Turn the hook drive pulley (221) until the hook tip is flush with the left-hand side of the needle.
- Slide the bevel gear to the right into the hook drive gear (set without play).
- Tighten screw (219).



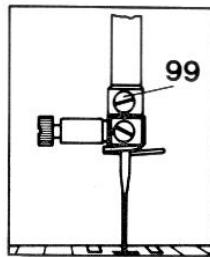
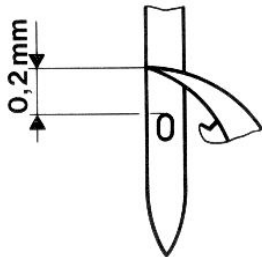
27.1 Checking the needle height

- Position the needle to the left.
- Position the hook tip flush with the left-hand side of the needle.
- The lower edge of the hook tip should now be 0,2 mm above the upper edge of the needle eye.

Correction: The stop-screw (99) must be replaced when necessary.

Part.No.

006 361 50 04	screw ø	2,85 mm
006 361 50 03		2,50 mm
006 361 50 02		2,15 mm
006 361 50 01		1,80 mm
006 361 50 00		1,45 mm



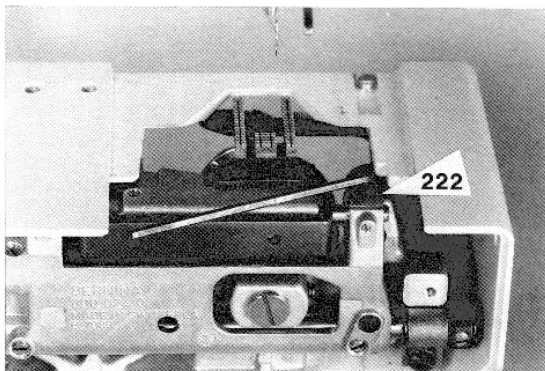
29.1 Checking bobbin case stopper position

min. 0,3 mm clearance normally flush with the cut-out upper edge of bobbin stopper nose flush with max. bobbin carrier radius.

See illustration

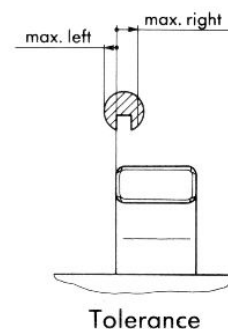
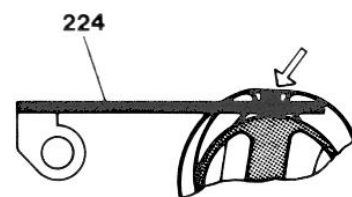
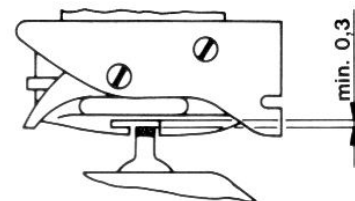
Correction

- Loosen Allen screw (222).
- Move the bobbin stopper (224) axially and radially as required.
- Tighten Allen screw (222).



Note

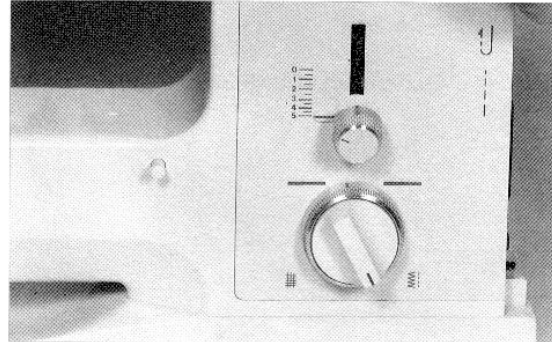
With the needle in the centre position, the left edge of the bobbin stopper should be in line with the left side of the needle groove. See sketch for tolerance.



31.1 Feed synchronisation (green zone)

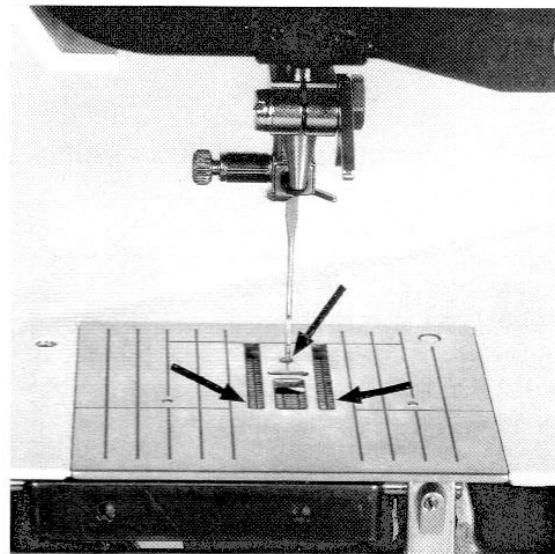
Checking

- Set stitch length to max. 5 mm
- Turn the upper shaft in the direction of rotation until the rear teeth of the feed-dog are flush with the upper edge of the stitch plate. The needle tip (No. 80) should also be flush with the surface of the stitch plate.



Correction

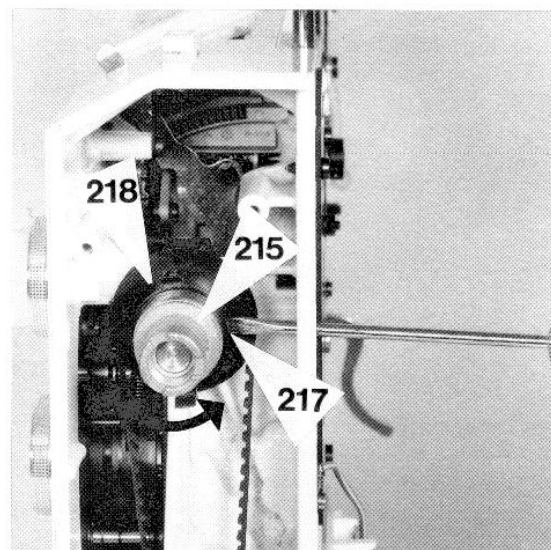
- Remove handwheel release screw and hand-wheel (Section 10.1).
- Release the carrier from the bobbin-winder (2 screws).
- Loosen the drive flange (push the 2 clips outwards [see Section 10.2]).
- Remove bobbin-winder and drive flange.
- Check belt tensioner. Section 18.
- Loosen the second screw (217) (in direction of rotation) in the belt pulley 24 teeth (218).
- Loosen the first screw (217) in belt pulley 24 teeth (218).
- Turn the upper shaft forwards and backwards slightly until the needle tip is flush with the upper surface of the stitch plate.
- By means of turning the belt pulley (218). Set the rear teeth of the feed-dog (when moving downwards) flush with the upper surface of the stitch plate.
- Tighten screws (217).



Top inspect: see checking.

Note

The distance between the belt pulley 24 teeth (218) and the frame shaft rear bearing must be at least 1 mm. When the setting has been achieved section 26.1 (loop-lift) should be checked.

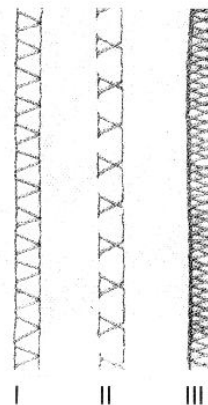


43.1 Checking the forward and reverse feed equalization / double overlock

Adjustments are performed exactly as for Model 1030.

Double overlock is used instead of honeycomb stitch.

- I = correct
- II = to long
- III = to short

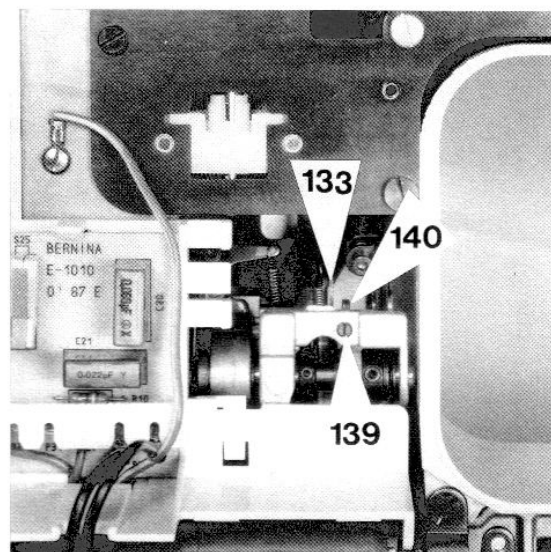


44.1 Tracer position with reverse feed off

- Assemble handwheel flange (with long belt), stepped pulley short belt and motor (Section 10.1, 10.2, 7.1).
 - Connect foot control unit.
 - Set feed switch knob to «green».
 - Let machine run.
 - By placing a finger on the crank (133) check that the tracer of the feed-dog crank (133) contacts the feed-dog cam.
- The tracer-cam clearance must be approx. 0–0,05 mm.

Correction

- Using the adjusting screw (139) adjust the change-over lever (140) until the correct tracer clearance is achieved.



Picture shows U.S.A. execution (with earth cable).

54.1 Lower thread tension Cl. 1000

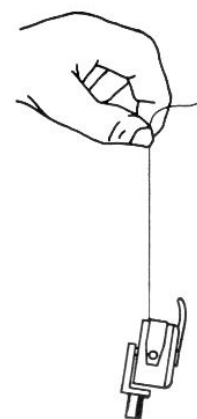
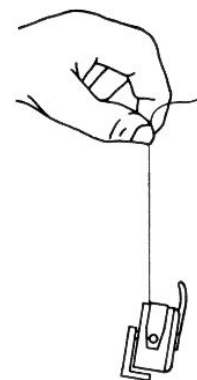
For testing use synthetic thread No. 100/3 ply, white, left twist. This thread is contained in the bobbin case of every new machine. The lower thread tension is checked with the movable setting weight No. 006 543 7000. The bobbin case is placed in the weight gauge just as in the hook.

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 grammes) the thread should move downwards (speed 1 m/2–4 sec.). If you test with darning thread the speed should be 1 m/25 sec. Regulation of the lower thread tension is made with the bobbin case adjusting screw and a small screwdriver.

Turning left = weaker

Turning right = stronger



55.1 Basic adjustment of the upper thread tension (See service-manual cl. 1030 section 55 for illustration)

Checking

- Use synthetic thread No. 100/3 ply above and below.
- Test bobbin case with prescribed weight.
- Line up the red mark on the adjusting dial with the mark on the housing.
- Trial run.

Correction

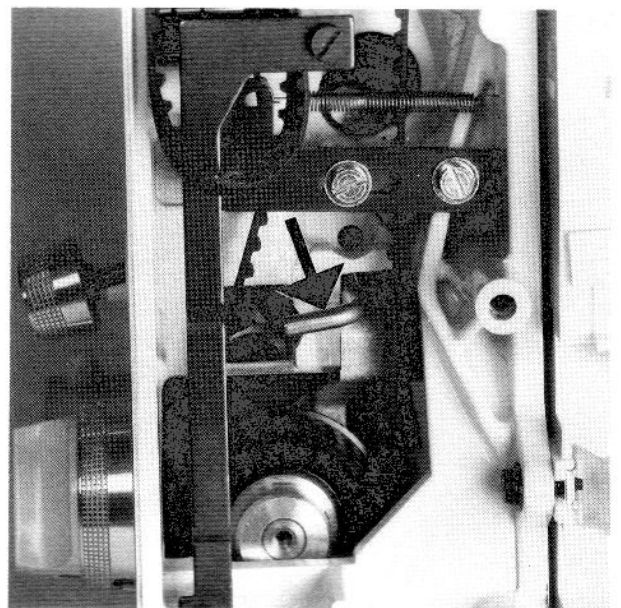
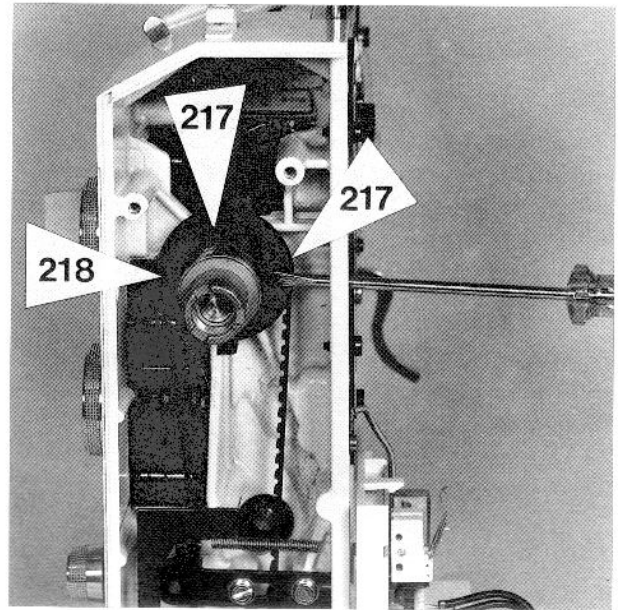
- By turning the thread tensioning spindle (168) the basic adjustment can be made.
- Using 2,5 mm allen key (shortened) through the thread take-up lever slit, turn thread tensioning spindle (168) accordingly.
- (Turn anti-clockwise for less, turn clockwise for more tension.)

Adjustment of the upper thread tension with a weight

- Test thread 120/2 ply.
- Thread machine up including thread take-up lever.
- Position the thread take-up lever with needle bar at its highest point.
- Lower presser foot.
- Line up the red mark on the adjusting dial with the mark on the housing.
- Attach the upper thread tension weight of 90 gr. (85 + 5 grammes).
- Draw approx. 30 cm of thread off the bobbin.
- The thread tension weight should hang and not move.
- Only when an additional weight of 5 grammes is attached should the thread be drawn very slowly.

63.1 Mounting the carrier

1. Loosen two screws (217) of the toothed pulley 24 teeth (218), remove belt from pulley.
2. Insert the complete carrier (fit belt only to carrier bevel gear).
3. Screw in three Allen screws (59) on the carrier (53).
4. Provisionally install the stitch length adjustment knob, feed switch knob, and feed-dog drop feed knob (set stitch length to max.).
5. Install stitch plate.
6. Make height and lateral adjustments to feed-dog (section 16 + 17).
7. Turn the toothed pulley (carrier bevel gear) in the direction of rotation, until the rear feed-dog teeth are flush with the surface of the stitch-plate.
8. Place the belt on the toothed pulley (main shaft) being carefull that the first screw in the direction of rotation is placed in a horizontal position to the rear.
9. Tension belt for synchronisation (section 18).
10. Turn the main shaft until the point of the needle is flush with the stitch plate (downwards motion).
11. Tighten screws (217).
Attention: Between toothed pulley and main shaft bearing there must be a play of 1 mm.

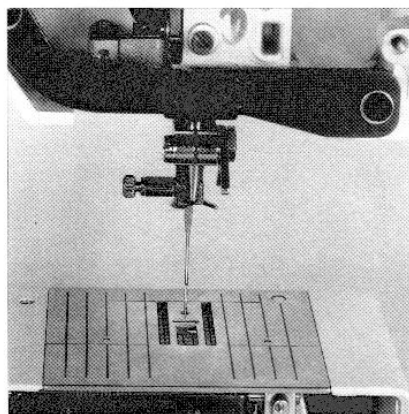


Check

- Turn the main shaft in the direction of rotation until the rear teeth of the feed-dog are flush with the stitch plate. The needle point should now be flush with the stitch plate surface.

Correction: Section 31.1.

12. Install the rigidity plate (183) (section 62).
13. Hook timing and loop lift (section 26.1).
14. Further checks see sections 39, 40, 42, 45, 46).



64.1 Using the special gauge for basic carrier adjustment (001 364 70 00)

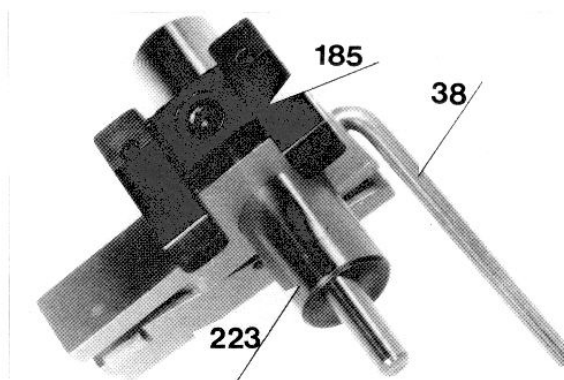
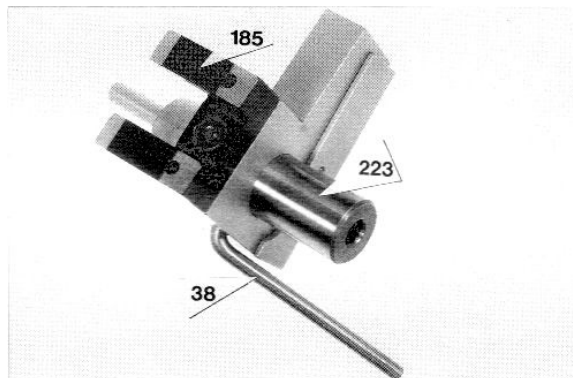
The gauge (185) has been redesigned to permit its use on machine types having CB = and rotary hooks.

New: double pin (233).

1. With hole for the drive shaft (as previously).
 2. Eccentric pins for the hook bearing (new).
- The double pin (223) is positioned laterally with a 4 mm dowel (38).

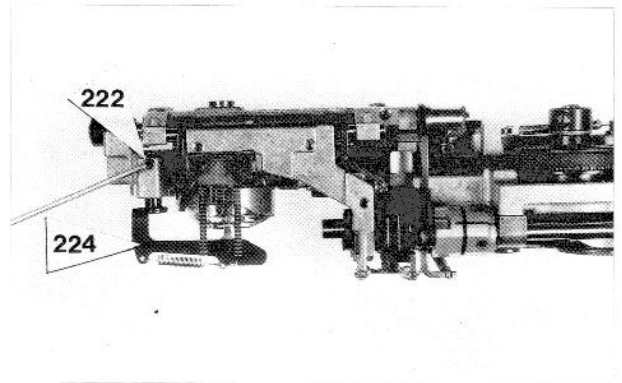
Setting as in section 64.

1. Feed mechanism operating position (all models with reverse feed).
2. Lateral position of the feed-dog (all models).
3. Feed-dog height (all models).
4. Feed-dog lift and advance according to hook movement (hook drive) (all models with CB-hook).

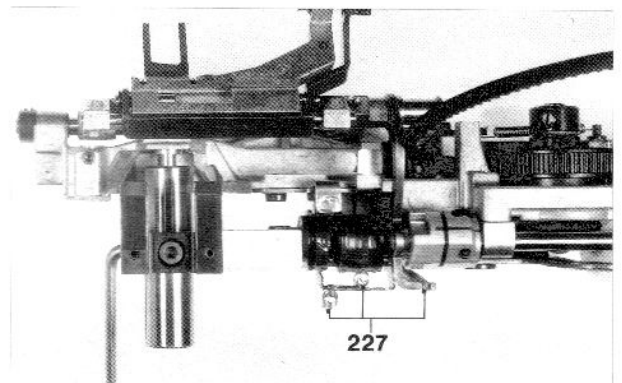


With Cl. 1000

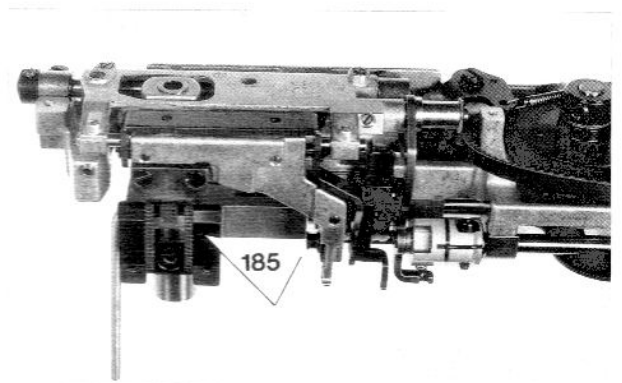
- Loosen screw (222) on bobbin case stopper.
- Remove bobbin case stopper (224).
- Loosen screw (225) on belt tensioner (hook drive).
- Slacken belt, tighten screw (225) slightly.
- Remove screw (226) on hook shaft.
- Remove hook.
- Place the drive belt to the right.



- Remove spring (227) from the feed-dog support.
- Feed-dog carrier and support can now be placed to the rear.

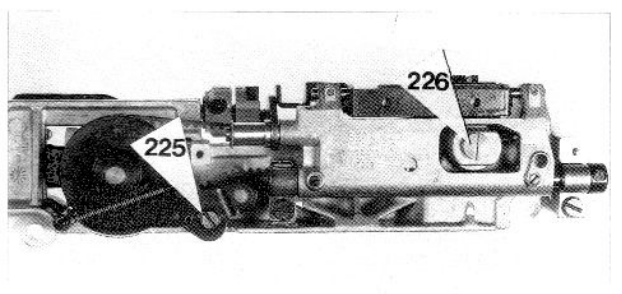


- The gauge (185) can now be fitted. Further settings see section 64 + 65.



67.1 Hook drive (Loop lift can only be adjusted in the machine.)

- Mount the hook (push the hook drive belt on to the pinion).
- Tighten the screw (226) on the hook shaft.
- Mount the bobbin case stopper (224) (see illustration for position section 29.1).
- Tension the hook drive belt.
- Tighten screw (225).



Electrical and electronic section

Model:	1015	1010	1005	1004	1000
73 Electrical and electronic Section					
73.0 Print L/R 1030/1020, 220V	×	×	×	×	×
73.1 Print L/R 1030/1020, 110V	—	—	—	—	—
73.2 Block diagram	×	×	×	×	×
73.3 Adjustment of foot control	×	×	×	×	×
74.0 Guide for Trouble-shooting					
Important warning	×	×	×	×	×
74.1 Instruction for replacement of foot control print	×	×	×	×	×
Test	×	×	×	×	×

73 Electrical and electronic section

Note: All electrical and electronic components operate at dangerous voltages.

Description

The electronic control system for Models 1004/1000/1005/1010/1015 is incorporated in the foot control. The machine itself contains only a small print with filter capacitors and switches for the motor and sewing light.

Main Motor:

This is an AC-motor with speed regulation through phase control. The electronic regulation provides practically constant speed independent of load.

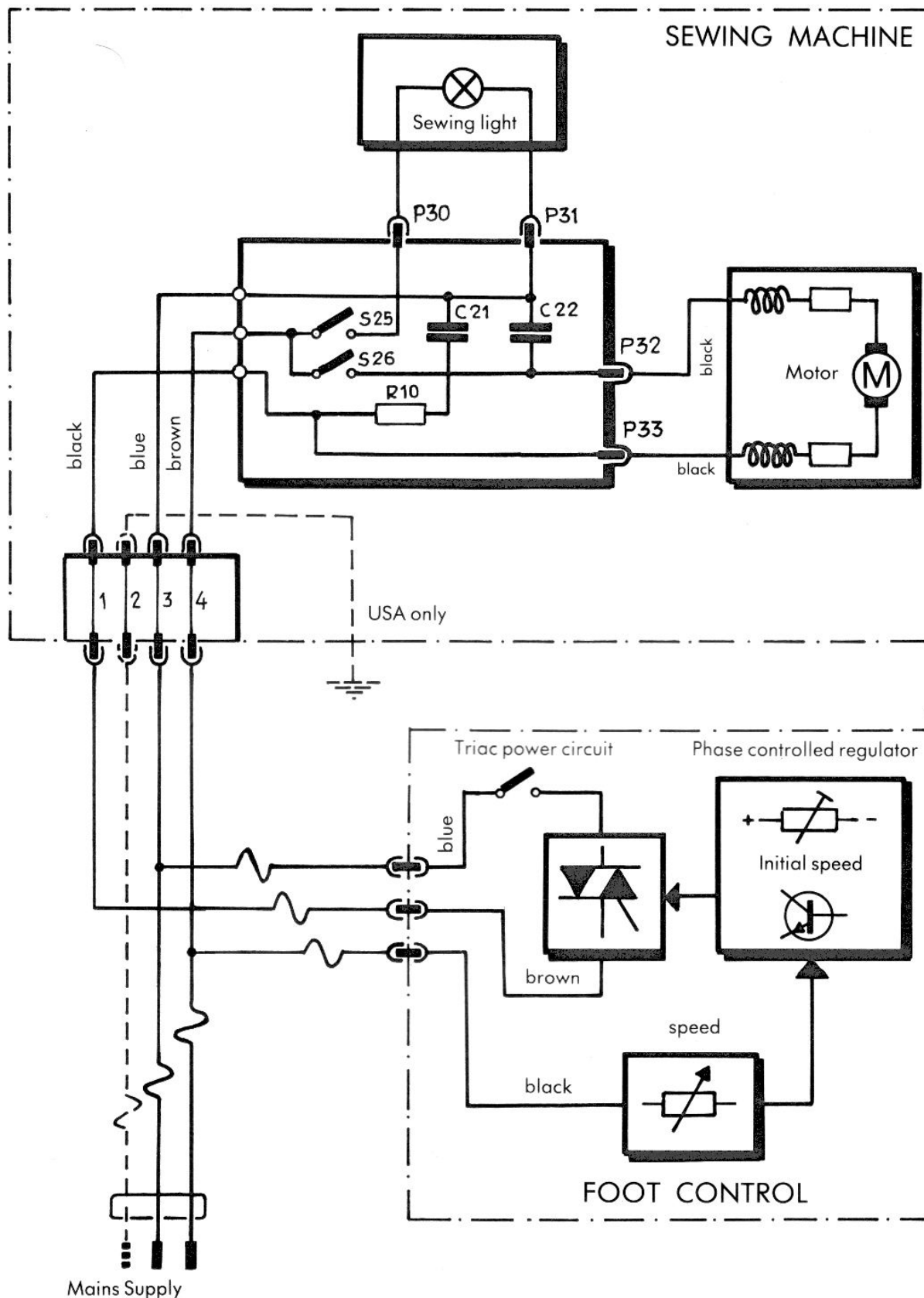
Sewing light

Supplied at mains voltage, 15 Watt (bayonet type).

Bobbin winder

A separate bobbin winder motor is not fitted. Driven by the main motor after switching on. The winder speed can be regulated with the foot-control.

73.2 Block diagram Models 1015/1010/1005/1004/1000



73.3 Adjustment of foot control (minimum speed)

Connect machine and foot control unit to mains power supply. Press the control foot-plate lightly until voltage is applied to the machine (motor hums). The switch-on point can be heard as the switch in the control clicks on.

If the motor does not rotate slowly, or if it remains still, perform the following adjustments: Adjust the trimmer inside the control housing using the small screwdriver.

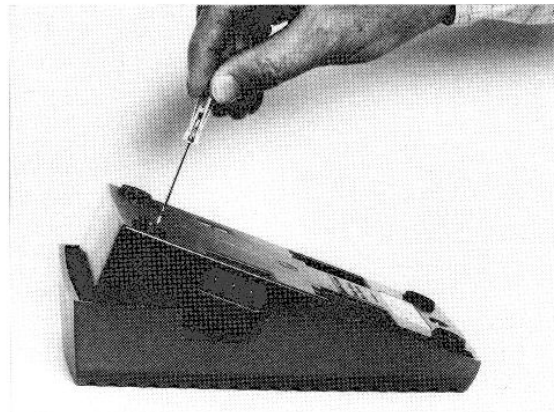
By turning carefully clockwise the motor will start to turn.

Take care that needle movement is smooth – it must not jerk.

(The motor rotates smoothly at approx. 150–180 stitches/min.).

If the motor rotates too quickly when switched on, turn the trimmer in the opposite direction, anti-clockwise, until the correct speed is attained.

The control is then correctly adjusted for the machine.



74.0 Guide for trouble-shooting

Note: All electrical and electronic components operate at dangerous voltages.

Repair procedure

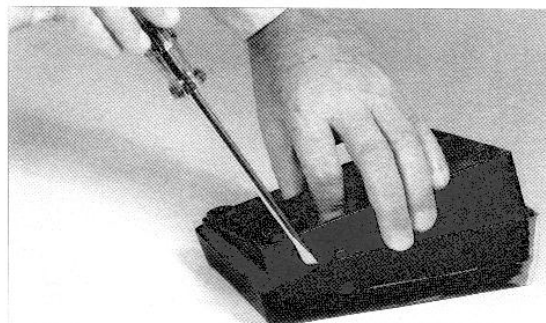
Because of the single module construction of the print, it is better to change the entire print when a fault occurs.

74.1 Instruction for print replacement in foot controller

The follow instructions show how the control housing is disassembled and reassembled when the print is replaced.

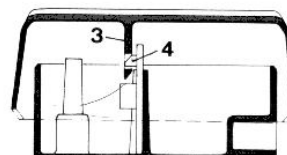
Disassembly

Insert the screwdriver (8 mm blade) between the housing and the footplate, then twist. The footplate is pushed to the side and can then be pulled off the pivots.

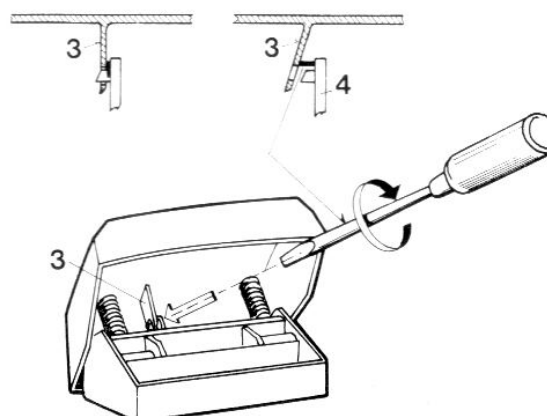


Footplate removal

The sketch shows the connection between the footplate (3) and the control housing/slider (4). This connection must be released before the footplate can be taken off.

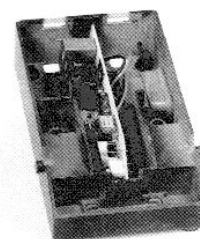
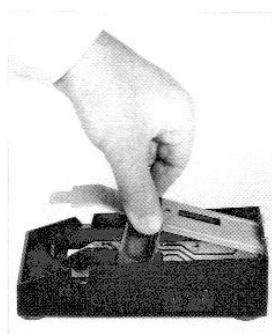


Insert a screwdriver (8 mm blade) between the connection (3) and slider (4) and twist (see diagram). The connection notch (3) is thus pushed to the side – the footplate can be removed.



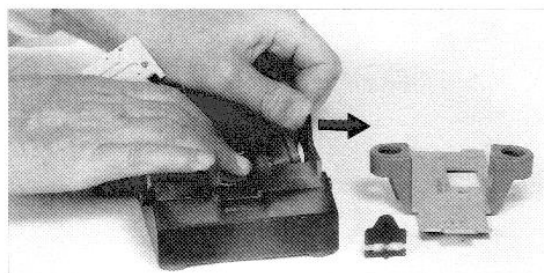
Hold the cover by the recesses for the springs and carefully draw upwards until the clips are free.

The print is now clear and can be carefully drawn upwards out of the housing.



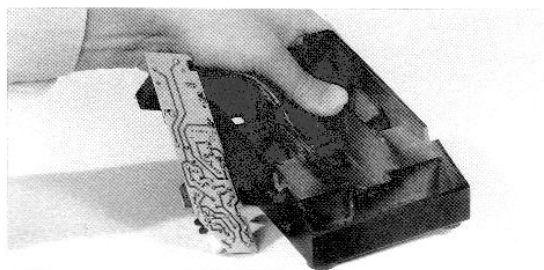
Take care that the two carbon pins of the slider are not damaged.

Take the slider out of the guide by pulling upwards. Press downwards hard on the connector while pressing the casing wall outwards until the connector clicks out.



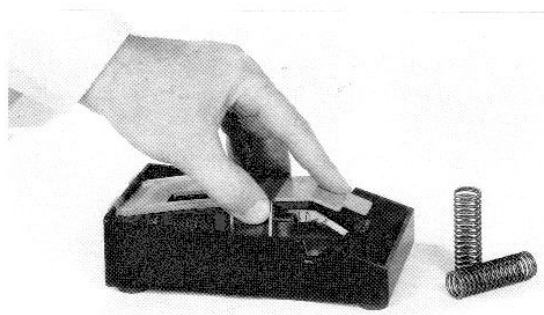
Assembly

Insert the lower edge of the connector into the housing recess. The connector clicks in when pressed hard towards the hard wall.

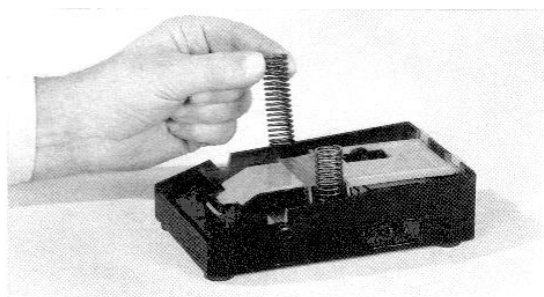


Insert the slider into the guide and hold when half-way in. Carefully slide, the print in taking care that the two carbon pins are not damaged. Also take care that the connector cables lay in the print recess provided, and not pinched.

Insert the cover into the housing and, by lightly bending them, push the clips into the housing slots.



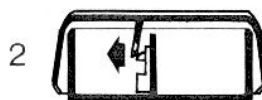
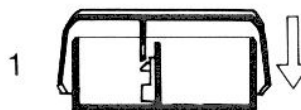
Mount the springs in the housing (lightly grease).



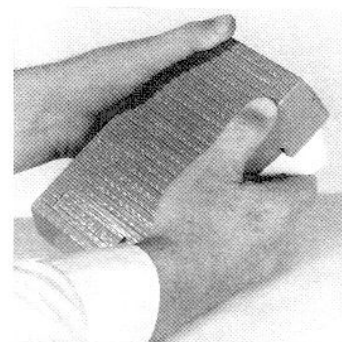
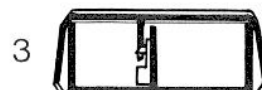
Lay the foot-plate on the housing. Take care that the springs completely enclose the guide pins. Press the footplate and housing together using both hands at the pivoting point.



Take care that the 2 pivot pins click into the borings provided. The footplate-slider connection is re-established by pressing them together hard.

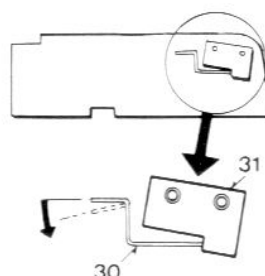


Operate the footplate by hand a few times. The soft clicking of the print switch should be audible.

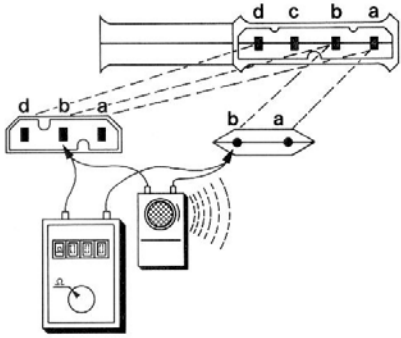


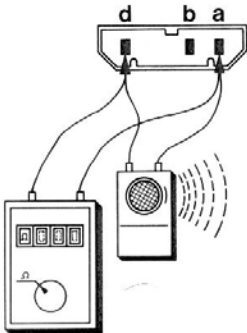
Final check

The print switch (31) must operate before the footplate reaches the mechanically-set final position. If this is not so, the print switch arm (30) must be carefully adapted by bending it with pliers. The rotary potentiometer on the base of the control housing must be adjustable over the entire speed range.



Symptom	Possible fault in	Repair instructions
Sewing light does not light up Main drive motor does not operate	<ul style="list-style-type: none"> – No power supply – Power cable 	<ul style="list-style-type: none"> – Test ①
Sewing light operates Main drive motor does not operate	<ul style="list-style-type: none"> – Foot control connection – Main motor – Electronic print in foot control 	<ul style="list-style-type: none"> – Test ① – Test ② – Replace electronic print* – Replace foot control
Main drive motor does not operate at top speed	<ul style="list-style-type: none"> – Electronics in foot control 	<ul style="list-style-type: none"> – Replace electronic print* – Replace foot control
Main drive motor speed cannot be controlled and runs at top speed	<ul style="list-style-type: none"> – Electronics in foot control 	<ul style="list-style-type: none"> – Replace electronic print* – Replace foot control
Main drive motor operates Sewing light does not light up	<ul style="list-style-type: none"> – Bulb burnt out 	<ul style="list-style-type: none"> – Replace bulb <p>*see instruction for foot control disassembly.</p>

What is to be tested	What to adjust	Desired condition
<p>Connection cables Mains – sewing machine – foot control</p>	<ul style="list-style-type: none"> – Take out mains plug a) Disconnect plug to sewing machine and to foot control. b) Test wires a, b and d with a continuity tester or ohmmeter. 	 <ul style="list-style-type: none"> – High pitched tone, cable ok – Ohmmeter indicates low resistance, cable ok
<p>Note: If there is no high pitched tone, or the ohmmeter display wavers or shows infinite resistance, then cable is defective.</p>		
<p>Test 1</p>		

What is checked	What do adjust	Desired condition
Main motor	<ul style="list-style-type: none"> – Take out mains plug a) Switch on main switch of sewing machine (sewing light off) b) Check motor winding with continuity tester or ohmmeter 	<p>Plug to sewing machine</p>  <ul style="list-style-type: none"> – Buzzer, motor electrically ok – Ohmmeter indicates for 220 V motor approx. 120 Ω 110 V motor approx. 30 Ω 240 V motor approx. 140 Ω Motor electrically ok
<p>Note If there is no high pitched tone, or ohmmeter display differs from the values given above, motor is defective. Replace motor, or carbon brushes if required.</p>		
Test 2		