

This concise booklet is intended to provide rapid information to the sewing machine mechanic to assist him in carrying out the most important repairs.

We assume that sewing machine mechanics are familiar with assembly and dismantling work normally encountered, for which reason such work is not dealt with in this booklet.

This booklet, therefore, contains a brief survey of the main functions and necessary adjustments, as well as hints on the elimination of faults. The values occurring in practical operation and hints on the elimination of faults have been subdivided into four main categories:

- Technical Information
- Functions
- Adjustments
- Trouble-Shooting

It is the purpose of the first two points to assist the mechanic by making him familiar with data and mechanical functions of the machine to carry out adjustments more rapidly by the following explanations and hints.

A fully mis-adjusted machine is used as basis. For this reason, when carrying out the individual adjustment, also check on the adjustments previously explained.

Sub-classes and their adjustments are given after the basis class (basic adjustments).

167
+ 2 Needle
Adler

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Technical Information

Technical equipment

Type	Flat bed sewing machine
Number of needles	Single or twin needle
Type of stitch	Double straight stitch
Type of feed	Bottom and needle feed
	Bottom / needle / top feed
Loop catcher	1 or 2 large horizontally and doubly rotating hook(s)
Take-up lever	Sliding type

Technical data

	167-3 S	-62	-62 S	-63	-63 S
stitches/min	max: 1800	2200	2200	1900	1900
max. stitch length	mm: 6	6	6	6	6
max. lift of foot	mm: 7	7	7	7	7
clearance under arm	mm: 285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm: 518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system	: 134 Lr	134	134 Lr	134	134 Lr
No.	: 110 - 140	80 - 110	80 - 110	110 - 140	110 - 140
yarn	cotton: —	60/3 - 20/3	—	—	—
	synthetic yarn: 60/3 - 30/3	120/3 - 60/3	120/3 - 60/3	60/3 - 30/3	60/3 - 30/3
	silk: 60/3 - 20/3	100/3 - 60/3	100/3 - 60/3	60/3 - 20/3	60/3 - 20/3
	linen: 60/3 - 30/3	—	—	50/3 - 30/3	50/3 - 30/3
motor speed	: 1400	1400	1400	1400	1400
motor pulley dia.	mm: 100	112	112	118	118
drive pulley dia.	mm: 80	80	80	95	95
power input	HP: 1/2	1/2	1/2	1/2	1/2
weight	kg: 38/57	38/57	38/57	38/57	38/57
needle spacing	mm: —	—	—	—	—
cutter spacing	mm: —	—	—	—	—
	-64	-64 S	-72	-72 V/1	-73
stitches/min	max: 1400	1400	2000	2000	1800
max. stitch length	mm: 6	6	4,5	4,5	6
max. lift of foot	mm: 7	7	7	7	7
clearance under arm	mm: 285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm: 518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system	: 134	134 Lr	134	134	134
No.	: 140 - 170	140 - 170	80 - 110	80 - 110	110 - 140
yarn	cotton: 20/3 - 10/3	20/3 - 10/3	60/3 - 20/3	60/3 - 20/3	—
	synthetic yarn: 20/3 - 10/3	20/3 - 10/3	120/3 - 60/3	120/3 - 60/3	60/3 - 20/3
	silk: 20/3 - 10/3	20/3 - 10/3	100/3 - 60/3	100/3 - 60/3	60/3 - 20/3
	linen: 25/3 - 18/3	25/3 - 18/3	—	—	50/3 - 30/3
motor speed	: 1400	1400	1400	1400	1400
motor pulley dia.	mm: 125	125	106	106	112
drive pulley dia.	mm: 140	140	80	80	95
power input	HP: 1/2	1/2	1/2	1/2	1/2
weight	kg: 38/57	38/57	38/57	38/57	38/57
needle spacing	mm: —	—	—	—	—
cutter spacing	mm: —	—	—	3,5 - 10	—

		73 V/1	74	203 S	262	262 Z
stitches/min	max:	1800	1400	1800	2200	2200
max. stitch length	mm:	6	6	6	6	4,5
max. lift of foot	mm:	7	7	6	7	7
clearance under arm	mm:	285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system	:	134	134	134 L ₁	134	134/35
No.	:	110 140	140 170	110 140	80 110	80 110
yarn	cotton:	60/3 20/3	20/3 10/3		60/3 20/3	60/3 20/3
	synthetic yarn:	60/3 30/3	20/3 10/3	60/3 30/3	120/3 60/3	120/3 60/3
	silk:	60/3 20/3	20/3 10/3	60/3 20/3	100/3 60/3	100/3 60/3
	linen:		25/3 15/3	50/3 30/3		
motor speed	:	1400	1400	1400	1400	1400
motor pulley dia.	mm:	95	125	100	112	125
drive pulley dia.	mm:	95	140	80	80	80
power input	HP:	1/2	1/2	1/2	1/2	1/2
weight	kg:	38/57	38/57	38/57	38/57	38/57
needle spacing	mm:			2 u. 2,5	3.68	10.16
cutter spacing	mm:	3.5 10				
		262 NH	262 NH1	263	272	272 NH
stitches/min	max:	2200	2200	2000	2000	2000
max. stitch length	mm:	6	6	6	4,5	4,5
max. lift of foot	mm:	7	7	7	7	7
clearance under arm	mm:	285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system	:	134 35	135 35	134	134	134 135
No.	:	80 110	80 110	110 140	80 110	80 110
yarn	cotton:	60/3 20/3	60/3 20/3		60/3 20/3	60/3 20/3
	synthetic yarn:	120/3 60/3	120/3 60/3	60/3 30/3	120/3 60/3	120/3 60/3
	silk:	100/3 60/3	100/3 60/3	60/3 20/3	100/3 60/3	100/3 60/3
	linen:			50/3 30/3		
motor speed	:	1400	1400	1400	1400	1400
motor pulley dia.	mm:	125	112	125	106	112
drive pulley dia.	mm:	80	80	95	80	80
power input	HP:	1/2	3/4	1/2	1/2	3/4
weight	kg:	38/57	38/57	38/57	38/57	38/57
needle spacing	mm:	4,8-14	3.68	4,8-70	3.60	4,8-14
cutter spacing	mm:	—				
		273	273 HU	372	373	2263
stitches/min	max:	1800	1800	1900	1800	1400
max. stitch length	mm:	6	6	4,5	6	6
max. lift of foot	mm:	7	7	12/25	12/25	7
clearance under arm	mm:	285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system	:	134	134 L ₁	134-35	134-35	134
No.	:	110 140	110 140	90 110	110 140	110 140
yarn	cotton:	—	—	60/3 20/3	—	Fancy thread 6 ply
	synthetic yarn:	60/3 30/3	60/3 30/3	120/3 60/3	60/3 30/3	60/3 20/3
	silk:	60/3 20/3	60/3 20/3	100/3 60/3	60/3 20/3	11/3
	linen:	50/3 30/3	50/3 30/3	—	50/3 30/3	—
motor speed	:	1400	1400	1400	1400	1400
motor pulley dia.	mm:	112	118	100	112	125
drive pulley dia.	mm:	95	95	80	95	140
power input	HP:	1/2	1/2	1/2	1/2	1/2
weight	kg:	38/57	38/57	38/57	38/57	38/57
needle spacing	mm:	4,8-20	3.25	—	—	1.6
cutter spacing	mm:					

		8063	8263 NH		AE 73/E36	-BF-262
stitches/min	max	1250	1200		1400	2200
max. stitch length	mm:	12	12		6	6
max. lift of foot	mm:	7	7		7	7
clearance under arm	mm:	285 x 115	285 x 115		285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178		518 x 178	518 x 178
needle system		134	134		134-35	134KK Lr
No.		110 - 150	110 - 150		110 - 130	80 - 110
yarn	cotton:	Fency thread 6-9-ply	Fency thread 6-9-ply		60/3 - 20/3	60/3 - 20/3
	synthetic yarn:	60/3 - 30/3	—		120/3 - 60/3	120/3 - 60/3
	silk:	Lacet tape 2 mm	—		100/3 - 60/3	100/3 - 60/3
	linen:	—	—		—	—
motor speed		1400	1400		1400	1400
motor pulley dia.	mm:	106	80		95	125
drive pulley dia.	mm:	140	95		95	80
power input	HP:	1/2	3/4		1/2	3/4
weight	kg:	38/57	38/57		38/57	38/57
needle spacing	mm	—	4,8-14		—	14-20
cutter spacing	mm	—	—		—	—
		BF-272	FA-3S	FA-63	FA-63 S	FA-73
stitches/min	max.	2000	1800	1800	1800	1800
max. stitch length	mm:	4,5	6	6	6	6
max. lift of foot	mm:	7	7	7	7	7
clearance under arm	mm:	285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system		134 KK Lr	134 KK Lr	134 KK Lr	134 KK Lr	134 KK Lr
No.		80 - 110	110 - 140	110 - 140	110 - 140	110 - 140
yarn	cotton:	60/3 - 20/3	—	—	—	—
	synthetic yarn:	120/3 - 60/3	60/3 - 30/3	60/3 - 30/3	60/3 - 30/3	60/3 - 30/3
	silk:	100/3 - 60/3	60/3 - 20/3	60/3 - 20/3	60/3 - 20/3	60/3 - 20/3
	linen:	—	50/3 - 30/3	50/3 - 30/3	50/3 - 30/3	50/3 - 30/3
motor speed		1400	1400	1400	1400	1400
motor pulley dia.	mm:	112	100	100	100	125
drive pulley dia.	mm:	80	80	80	80	95
power input	HP:	3/4	3/4	3/4	3/4	3/4
weight	kg:	38/57	38/57	38/57	38/57	38/57
needle spacing	mm:	14-20	—	—	—	—
cutter spacing	mm:	—	—	—	—	—
		FA-203 S	FA-262	FA-262 NH	FA-262 NH1	FA 262 Z
stitches/min	max:	1800	2200	2200	2000	2200
max. stitch length	mm:	6	6	6	6	4
max. lift of foot	mm:	6	7	7	6	7
clearance under arm	mm	285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system		134 KK Lr	134 KK Lr	134-35	134-135	134-35
No.		110 - 140	80 - 110	80 - 110	80 - 110	80 - 110
yarn	cotton:	—	60/3 - 20/3	60/3 - 20/3	60/3 - 20/3	60/3 - 20/3
	synthetic yarn:	60/3 - 30/3	120/3 - 60/3	120/3 - 60/3	120/3 - 60/3	120/3 - 60/3
	silk:	60/3 - 20/3	100/3 - 60/3	100/3 - 60/3	100/3 - 60/3	100/3 - 60/3
	linen:	50/3 - 30/3	—	—	—	—
motor speed		1400	1400	1400	1400	1400
motor pulley dia.	mm:	100	125	125	106	125
drive pulley dia.	mm:	80	80	112	80	80
power input	HP	3/4	3/4	3/4	3/4	3/4
weight	kg:	38/57	38/57	38/57	38/57	38/57
needle spacing	mm	2 und 2,5	4,8 - 12	4,8 - 14	4,8 - 12	10 und 12
cutter spacing	mm	—	—	—	—	—

		FA 263	FA 272	FA-272 NH	FA 273	GK 373
stitches/min	max:	2000	2000	2000	1800	1800
max. stitch length	mm:	6	6	4,5	6	6
max. lift of foot	mm:	7	7	7	7	12
clearance under arm	mm:	285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178	518 x 178	518 x 178	477 x 178
needle system	:	134 KK Lr	134 KK Lr	134 35	134 KK Lr	134 135
No.	:	110 - 140	80 - 110	80 - 110	110 140	110 150
yarn	cotton:	60/3 - 30/3	60/3 - 20/3	60/3 - 20/3	-	-
	synthetic yarn:	60/3 - 30/3	120/3 - 60/3	120/3 - 60/3	60/3 30/3	60/3 30/3
	silk:	60/3 20/3	120/3 - 60/3	100/3 - 60/3	60/3 20/3	60/3 20/3
	linen:	50/3 - 30/3	-	-	50/3 30/3	50/3 30/3
motor speed	:	1400	1400	1400	1400	1400
motor pulley dia.	mm:	130	112	112	125	118
drive pulley dia.	mm:	95	80	80	95	95
power input	HP:	3/4	3/4	3/4	3/4	1/2
weight	kg:	38/57	38/57	38/57	38/57	38/57
needle spacing	mm:	4,8-12	3-12	4,8-12	4,8 12	-
cutter spacing	mm:	-	-	-	-	-
		LG-72	LG-73	LG 73 PKR/VE	LF 63	LF 263 NH
stitches/min	max:	1800	1700	1800	1400	1400
max. stitch length	mm:	4,5	6	6	9	9
max. lift of foot	mm:	7	7	7	7	7
clearance under arm	mm:	285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system	:	134 35	134 35	134	134	134 35
No.	:	80 - 110	110 140	110 - 140	110 150	134 35
yarn	cotton:	60/3 - 20/3	-	-	Fancy thread 6-9 ply	6 ply
	synthetic yarn:	120/3 - 60/3	60/3 - 30/3	60/3 - 30/3	11/3	20/3
	silk:	100/3 - 60/3	60/3 - 20/3	60/3 - 20/3	20/3	20/3
	linen:	-	50/3 30/3	50/3 - 30/3	-	-
motor speed	:	1400	1400	1400	1400	1400
motor pulley dia.	mm:	95	100	112	95	95
drive pulley dia.	mm:	80	95	95	95	95
power input	HP:	1/2	1/2	1/2	1/2	1/2
weight	kg:	38/57	38/57	38/57	38/57	38/57
needle spacing	mm:	-	-	-	-	4,8 8
cutter spacing	mm:	-	-	-	-	-
		LF-263 NH 1	LS-63	LS-263 NH	LS 263 NH 1	RE 73
stitches/min	max:	1400	1400	1400	1400	1900
max. stitch length	mm:	9	9	9	9	6
max. lift of foot	mm:	7	7	7	7	7
clearance under arm	mm:	285 x 115	285 x 115	285 x 115	285 x 115	285 x 115
bedplate size	mm:	518 x 178	518 x 178	518 x 178	518 x 178	518 x 178
needle system	:	134-35	134	134 35	134 35	134
No.	:	110 - 150	110 - 150	110 - 150	110 - 150	100 140
yarn	cotton:	Fancy thread 6-9 ply	-	Fancy thread 6-9 ply	-	-
	synthetic yarn:	60/3 - 20/3	60/3 - 20/3	60/3 - 20/3	60/3 - 20/3	60/3 30/3
	silk:	Laceth. 2 mm	Laceth. 2 mm	Laceth. 2 mm	Laceth. 2 mm	60/3 20/3
	linen:	-	-	-	-	50/3 30/3
motor speed	:	1400	1400	1400	1400	1400
motor pulley dia.	mm:	90	95	140	125	106
drive pulley dia.	mm:	95	95	140	140	80
power input	HP:	3/4	1/2	1/2	1/2	1/2
weight	kg:	38/57	38/57	38/57	38/57	38/57
needle spacing	mm:	3 - 14	-	4,8 8	3 14	-
cutter spacing	mm:	-	-	-	-	-

■ Functions, (Basic Class 167-3 S)

Needle Drive

The upward and downward movement of the needle bar is transmitted from handwheel 1 (at the end of this booklet), figure on page 301, to the armshaft 2, the crank 3, which transmits the movement to the needle bar joint 4, the clamp 5 and, consequently, to the needle bar 6.

Loop Catcher

The doubly rotating movement of the circular hook is transmitted as follows: from the handwheel 1 to the armshaft 2, the wheel 7, the tooth-shaped belt 8, the wheel 9, the short hook spindle 10, the slip clutch 11 (which eliminates blocking of the hook, e. g. by misaligned threads), the long hook spindle 12, the bevel gear 13, the bevel gear 14, the hook spindle 15, and the hook 16.

Feed

The feed movement is produced by the co-operation of two movement mechanisms:

- the feed advance and
- the feed lift.

The feed advance is effected as follows:

from handwheel 1 to the arm-shaft 2, the cam 17 (with sliding ring), the fork 18, the advance movement (stitch length) of which now depends on the position of the adjustable link 19, which affects the upward and downward movement of the hook 20, the feed crank 21 (with pin), the shaft 22, the beam 23 (with pin) and to the feed dog 24.

The feed dog lift is effected as follows:

From the handwheel 1 to the armshaft 2, the wheel 7, the tooth-shaped belt 8, the wheel 9, the short shaft 10, the slip clutch 11, the long shaft 12, the lifting cam 25, the tierod 26 (with screw), the crank 27, the lifting spindle 28, the crank 29 (with pin and sliding block), the feed dog beam 23 and, consequently, to the feed dog 24.

■ Adjustments (Basic Class 167-3 S)

Before making any adjustments, ensure that all screws of the movement mechanism are firmly tightened (and correctly seated on their appropriate surface or notch).

Checking Needle Entry

1. Insert needle system 134 Lr No. 90.
2. Turn handwheel (towards the operator) until the needle enters into the needle hole. The entry of the needle should be exactly in the centre of the needle hole. Fig. 1, page 302.

Correct, if necessary, by:

- slackening the oscillating screw;
- displacing the oscillating rocker;
- tightening the screw.

Hook adjustment (loop lift, needle clearance)

Required adjusting gauge: loop lift gauge 29 (1,75 mm)
 part No. 981 15 000 8
 clamp 30
 part No. 981 15 000 2

1. Set stitch length to "0".
2. With a newly inserted needle plate properly polish the needle hole.
3. Insert hook (in case of new hook) or unscrew bevel gear housing and slacken bevel gear screws 31 (with old hook). Fig. 2.
4. Turn handwheel until the needle bar reaches its lowest position. This position permits no needle clearance between needle clearance between needle channel and hook point. Fig. 3.
Correct as follows:
5. Slacken screws 32 and 33.
6. Adjust bearing block 34 accordingly.
7. Tighten screws 32 and 33.

Afterwards please remember to check the engagement between the bevel gears 35 and 36. Fig. 4.

8. Place loop lift gauge 29 on to clamp 30 and move both together upward along the needle bar as far as the loop lift gauge will go.

9. Secure clamp 30 by means of screw 37. Fig. 1, page 303.
10. Withdraw loop lift gauge.
11. Rotate handwheel until the clamp abuts against the top.
12. Rotate bevel gear 35 in mesh with bevel gear 36 until the hook point is at the needle centre. Fig. 2.
13. Unscrew clamp 30 and tighten bevel gear setscrews 31. Make sure, however, that the two bevel gears 35 and 36 are properly enmeshed (without moving too sluggishly or having too much clearance).
14. Where a new needle plate has to be inserted, thoroughly polish all edges of the groove 38. Fig. 3.
15. There should be a clearance of approx. 1.5 mm between the throat plate groove 38 and the holding lug 39, i. e. the thickest thread gauge to be used should be able to pass through smoothly. However, the groove 38 must still properly retain the hook against twisting.

Adjusting the needle guard

1. Rotate the handwheel until the hook point is at the centre of the needle.
2. In this position the hook point must not entrain the needle slightly forced against it. The hook plate 40 should protect the needle against being "entrained".
Correct as follows:
3. Carefully bend the hook plate 40. Fig. 4.

Bobbin case lifter adjustment

The thread clearance indicated on page 303, fig. 3, has the disadvantage that, owing to the hook movement, the holding lug always contacts one edge of the groove 38 and thus impedes the thread movement. In order to obtain the necessary clearance all the same, the bobbin case lifter should withdraw the bobbin case retaining lug 39, in order to allow for a smooth passage of the corresponding thread width being used.

Correct as follows:

1. Slacken screw 41. Fig. 1, page 304.
2. Rotate lifter ring 42:
 - backwards = increased lift (thread passage)
 - forwards = reduced lift (thread passage)
3. Tighten screw 41.

Needle bar height adjustment

1. Slacken screw 43. Fig. 2.
2. Shift needle bar 44 so that the centre of the needle channel will coincide with the hook point 45. Fig. 4.
3. Tighten screw 43.

Presser bar height adjustment

Required adjusting gauge: dimension block 46 (7 mm)
part No. 981 13 000 5

1. Raise lifter lever 47. Fig. 3.
2. Attach hinged foot.
3. Place dimension block 46 underneath hinged foot on to throat plate.
4. Slacken screw 48.
5. Lower presser bar 49 down to the dimension block 46.
6. Tighten screw 48.

Adjustment of feed dog follow-up movement

1. Set the stitch regulator lever to maximum forward stitch length.
2. Rotate the handwheel until the take-up lever has reached the top position.
3. In this position rotate the handwheel.
Now the feed dog has to move along for one further tooth before lowering underneath the needle plate.
(This applies to a normally toothed feed dog).
Fig. 1, page 305.
Correct as follows:
4. Slacken screws 50. Fig. 2.
5. Rotate cam 51 accordingly.
6. Tighten screws 50.

Feed dog height adjustment

1. Rotate handwheel until the feed dog reaches its highest position.
2. In this position the feed dog should be above the throat plate by the height of one tooth. Fig. 3.
Correct as follows:
3. Slacken screw 52. Fig. 4.
4. Rotate crank 53:
upward = feed dog height increases
downward = feed dog height decreases.
5. Tighten screw 52.

Feed dog lift adjustment

Please note that with the following adjustment you will not obtain the feed dog lift movement shown in Fig. 1, page 306, but the one shown in Fig. 2.

The lift movement shown in Fig. 2 is required in order to make sure that the stitch length selected will actually be carried out by the feed dog above the throat plate.

1. Rotate the handwheel until the needle enters the needle hole, i. e. the feed dog should have completed the follow-up movement as indicated on page E 12.
2. In this position the feed dog should drop vertically underneath the throat plate as the handwheel continues to rotate. Similarly, the feed dog should vertically emerge from the throat plate again as the return movement is completed. Please note that the vertical lift movement can merely approximately be obtained by the circular cam.

Correct as follows:

3. Slacken screws 54. Fig. 3.
4. Rotate cam 55.

It is advisable to retain the cam by means of a tool (screwdriver) and to have the adjustment carried out by rotating the handwheel.

5. Tighten screws 54.

Checking feed dog position

In order to obtain the feed on the entire toothed surface of the feed dog, the following checks should be carried out:

1. Rotate the handwheel until the feed dog reaches its highest position.
2. Place the necessary test ruler 226 (part No. 981 16 000 1) long-side and crosswise on the feed dog teeth.
3. Check spacing 56. This should be completely horizontal with the upper edge of the throat plate. Fig. 4.
4. For possible correction tool the feed dog clamping surface 57 at the beam.

Roller foot adjustment

1. The hinged foot should be in parallel with the edge of the throat plate. Fig. 1, page 307.

Correct as follows:

2. Slacken screw 58. Fig. 2.
3. Rotate the hinged foot retainers 59 and 60.
4. Tighten screw 58.
5. The hinged foot base 61 should be in parallel with the top edge of the throat plate.

Correct by bending the hinged foot arm 62 accordingly.

6. Between the lefthand edge of the needle and the edge of the hinged foot there should be an clearance of abt. 0,1–0,2 mm. Fig. 3.

Correct by bending the hinged foot arm 62 accordingly.

7. Rotate the handwheel until the needle enters the needle hole.

Take-up spring adjustment

1. Slacken screw 63. Fig. 4.
2. Adjust spring pad 64 so that the bottom edge is abt. 1,5 mm above the tension centre.
3. Tighten screw 63.
4. This adjustment applies to standard thread only.
Extremely thick or thin threads (sewing material) require a different adjustment.

Adjustments, Sub-Classes 167-62; -62 S; -63; -63 S; -64; -64 S

1. Check screw seats as per page E 9.
2. **Check needle entry**
Required adjusting gauge: distance gauge 30
(measure side 13,5 mm)
part No. 981 12 000 8
 1. Insert needle system and width according to indications stated on pages E 4—E 7.
 2. Set stitch regulating lever to "0".
 3. Slacken screw 31. Fig. 2, page 308.
 4. Pull needle bar 32 so far ahead to the right until distance gauge 30 fits properly in between.
 5. Tighten screw 31. Fig. 2.
 6. Now the needle should enter at the centre of the feed dog stitch hole. Fig. 3.
If not, the feed dog can still be somewhat readjusted.
3. Adjust hook as per pages E 9—E 10.
3. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11.
8. Adjust feed dog height as per page E 12.
9. **Adjust needle and bottom feed (advance).**
 1. Set stitch regulating lever to longest stitch.
Rotate handwheel until the needle enters the feed dog stitch hole with needle eye.
 2. Rotate handwheel further. Now the feed dog should start feeding (simultaneously with the needle). However, as soon as the needle (with needle eye) will leave the stitch hole again, feeding should be terminated.
Correct as follows:
 3. Slacken screws 57. Fig. 4, page 308.
 4. Turn cam 17 accordingly.
 5. Tighten screws 57.

10. **Adjust feed dog lift**

1. Rotate handwheel until the needle point has the height of the throat plate top edge.
2. Keep on rotating the handwheel. Now the feed dog should leave the throat plate and start feeding with the needle. When the feed movement is terminated the feed dog is to lower again underneath the throat plate. Fig. 1, page 309.

Correct as follows:

3. Slacken screws 55, fig. 2.
 4. Turn cam 56 accordingly.
 5. Tighten screws 55.
11. Check feed dog position as per page E 13.
12. Adjust hinged foot as per page E 14 (applies to 167-62 S; -63 S; -64 S only).
13. Adjust take-up spring as per page E 14.

Adjustments, Sub-Classes 167-72; -73; -74

1. These sub-classes have a high upper feed foot lift and no feed dog lift. Fig. 1, page 310.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 15; but using spacer gauge having a 5 mm side between presser foot bar and upper feed foot bar.
4. Adjust hook as per pages E 9 – E 10.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11.
9. Adjust feed dog height as per page E 12, however, the feed dog tooth top edge must be flush with the throat plate top edge.
10. Adjust needle and bottom feed (advance) as per pages E 15–E 16.
11. **Adjust top feed foot movement in relation to bottom and needle feed movements**
 1. The top feed foot should carry out the same feed movement as the needle or the feed dog. Fig. 2.
Correct as follows:
 2. Slacken screws 67. Fig. 3, page 310.
 3. Rotate cam 68 so that the freedom of movement as mentioned under item 1 is obtained.
 4. Tighten screw 67.
12. **Adjust top feed foot lift**
 1. The setting height depends on the thickness of the material to be sewn.
 2. Slacken screw 69. Fig. 3.
 3. Adjust pin 70:
upward = increased top feed foot lift,
downward = reduced top feed foot lift.
 4. Tighten screw 69.
13. Check feed dog position as per page E 13.
14. Adjust take-up spring as per page E 14.

Adjustments, Sub-Classes 167-72/V1; -73/V1

1. Hints on feed dog lift as per page E 17.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 17.
4. Adjust hook as per pages E 9—E 10.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11.
9. Adjust feed dog height as per page E 17.
10. Adjust needle and bottom feed (advance) as per pages E 15—E 16.
11. Adjust top feed foot movement in relation to bottom and needle feed movements as per page E 17.
12. Adjust top feed lift as per page E 17.
13. Check feed dog position as per page E 13.
14. Adjust take-up spring as per page E 14.
15. **Adjust top knife in relation to bottom knife**
 1. Slacken screw 71. Fig. 1, page 311.
 2. Place the knife block 72 (complete with knife) to the left against the bottom knife 73.
 3. Tighten screws 71.
 4. Place the sewing thread between the two knives and carry out a cutting test front and rear on the knife blade.
 5. If the knife fails to cut in front, adjust by means of screw 74. If the knife fails to cut at the rear, adjust the knife block.
 6. Make sure that the knife in its lowest position makes contact with the front edge only, thus having somewhat clearance in the rear. Fig. 2.
16. **Knife height adjustment**
 1. Depress button 75 until it clicks into position. Fig. 3, page 311.
 2. Slacken wing screw 76 and push pin 77 into its extreme righthand position. Tighten the wing screw.

3. Rotate handwheel until the top knife has reached its lowest position. In this position the edge 78 should be approx. 0,5 mm below the bottom knife edge 100. Fig. 1, page 312.

Correct as follows:

4. Slacken screw 79, Fig. 3.
5. Displace bar 80 accordingly.
6. Tighten screws 79.

17. Adjust cutting movement in relation to feed movement

1. Turn handwheel until feed movement is completed.
2. At this point of time the upper knife 81 must start the cutting movement. Fig. 2, page 312.

Correct as follows:

3. Slacken screw 83. Fig. 4.
4. Remove cap 84.
5. Slacken screws 85.
6. Rotate cam 86 accordingly.
7. Tighten screws 85, put on cap 84 and secure by means of screws 83.

Adjustments, Sub-Class 167-203 S

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 9, but both needle holes.
3. **Hook adjustment (loop lift, needle clearance)**
 1. Proceed as indicated on pages E 9—E 10, however,
 2. in order to be able to adjust the lefthand hook in relation to the needle, proceed as follows:
 3. Slacken screws 95 and 96. Sif. 1, page 313.
 4. Adjust hook accordingly by rotating the bevel gear 97 (observe tooth clearance).
 5. Tighten screws 95 and 96.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11.
8. Adjust feed dog follow-up movement as per page E 12.
9. Adjust feed dog height as per page E 12.
10. Adjust feed dog lift as per page E 13.
11. Adjust feed dog position as per page E 13.
12. Adjust roller foot as per page E 14.
13. **Adjust holding down unit**
 1. Lower lifter lever until roller foot has contact.
 2. In this position the holding down unit 119 should be above the roller foot base 120. Fig. 2, page 313.
Correct as follows:
 3. Slacken screw 121. Fig. 3.
 4. Remove presser bar 122 accordingly.
 5. Tighten screw 121.
14. Adjust take-up spring as per page E 14.

Adjustments, Sub-Classes 167-262; -263; -2263

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes (needle system and needle width as indicated on pages E 4–E 7).
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, however, double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) and feed dog lift as per pages E 15–E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.

Adjustments, Sub-Class 167 - 262 Z

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, but both needle holes (needle system and needle width as indicated on pages E 4–E 7).
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, however, insert double needle presser foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as well as feed dog lift as per pages E 15–E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.

12. Adjust knife height

1. Depress button 158 until it clicks into position. Fig. 2, page 314.
2. Slacken wing screw 159 and push pin 160 into extreme righthand position.
Tighten wing screw 159.
3. Rotate handwheel until the top knife has reached its lowest position.
In this position the edge 161 should be approx. 0,5 mm below the bottom knife edge 162. Fig. 1.

Correct as follows:

4. Slacken screws 163. Fig. 2, page 314.
5. Displace bar 164 accordingly.
6. Tighten screws 163.

13. Adjust cutting movement in relation to feed movement

1. Rotate handweheel until feed dog starts feeding.
2. At this instant half of the cutting edge of the upper knife 165 should be above the lower knife 166. Fig. 1, page 314.

Correct as follows:

3. Slacken screws 167. Fig. 2.
4. Remove cap 168.
5. Slacken screws 169.
6. Rotate cam 170 accordingly.
7. Tighten screws 169, put on cap 168 and tighten with screws 167. Thereby the upper knife should carry out the upward movement.

Correct as mentioned under items 3—6.

Adjustments, Sub-Class 167-262 NH

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes (needle system and needle width as indicated on pages E 4–E 7).
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, however, use double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as well as feed dog lift as per pages E 15–E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.

Adjustments, Sub-Class 167-262 NH 1

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes (needle system and needle width as indicated on pages E 4–E 7).
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. **Adjust needle height**
 1. Unscrew screw 171, fig. on page 315.
 2. Screw the needle clamp 172 on the thread pin 173 until the centre of the needle channel stands on the hook point height 45. Fig. 4, page 304.
 3. Tighten again screw 171.
 4. Please note:
The safety mechanism 174 (fig. on page 315) prevents the cross-head 175 from being pushed down too far and the upper balls from jumping out by mistake while the needle bar wing is being dismantled and the needle bar disconnected.
7. Adjust presser bar height as per page E 11, but use double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as well as feed dog lift as per pages E 15–E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.

12. Disassembly of a needle bar

Dismantling

1. Move switch lever 176 into "medium position". Fig. 1, page 315.
2. Unscrew screw 177, remove switch lock 178.
3. After loosening the screws remove guide angle 179.
4. Unscrew the screws 180.
Withdraw to the left bearing plate 181 (with bearing bolt), needle bar oscillating shaft 182, block 183 (with guide (bolt)). Please note point 6, item 4 on page E 23.
5. Remove guide bar 184 by unscrewing 185.
6. Disconnect the needle bar to be dismantled in the following way:
Put block 183 above the needle bar in question and push cross head 175 upward until the three lower balls 186 audibly click into position.
7. Push down cross head 175 by approx. half of the needle bar lift.
8. Unscrew safety screw 187, loosen set screw 188 and take out the copper pressure piece from underneath.
9. Remove the safety halves 190 lying in the ring groove and getting visible when pushing down the clamping ring 189.
10. Couple the needle bar again by displacing block 183 in central position.
11. Slowly move cross head 175 upward on the needle bar until the three upper coupling balls will come forward. Please note that the balls are under spring pressure.
12. Withdraw the needle bar downward from the oscillating shaft 182. Take into account that the 3 lower balls will drop out of the ball holes of the needle bar.

Taking apart

1. Unscrew the screw 171 and remove the needle clamp 172.
2. Unscrew the screw 191 and take out spring counter bearing 173.
3. Remove all parts which are located inside the needle bar from underneath.

13. Assembly of a needle bar

Fitting together

1. Tighten locking screw 192 which might possibly have loosened.
2. Previously mount the parts of the lower coupling bar 193 so that a spacing of 30,5 mm will be observed.

3. Coupling bars with springs:

194 = 22 mm length

195 = 18,5 mm length

196 = 12 mm length

to be inserted into the needle bar according to succession of the illustration.

(Large start of coupling bar 197 — Fig. on page 315 — points upward).

4. Mount and screw spring counter bearing 173.

5. Depress several times upper coupling bar 197 and thereby check whether the rods in the needle bar can easily be moved.

Installation

1. Lead needle bar from below into the needle bar oscillating shaft.

2. Place cross head 175 and clamping ring 189 on to the needle bar. (The thin wall of the clamping ring should point to the inside towards the other needle bar).

3. Displace the needle bar vertically so that the lower ball holes will be exactly underneath the needle bar bearing.

4. Insert three balls into the lower ball holes and slide the needle bar upwards until the balls will disappear.

5. Insert three balls into the upper ball holes, retain the needle bar, press the upper coupling bar 197 into the needle bar and push cross head 175 upon the upper balls.

Make sure that:

the needle bar will not be displaced any further, as otherwise the balls being under spring pressure might jump out.

6. Move the clamping ring 189 underneath the ring groove which is located in the needle bar.

7. Insert the safety halves 190 into the ring groove and slide the clamping ring over it until it contacts.

8. Press cross head 175 upwards against the clamping ring 189 until it reaches the stop. Thus the needle bar is connected with the cross head 175.

9. Insert needle clamp 172 and tighten it.

10. Distort the needle bar in such a way that the front faces of both needle clamps will form a mutual plain.
11. Fasten clamping ring 189 and make sure that the rounding of the copper pressure piece will properly contact the needle bar.
Secure set screw 188 by safety screw 187.
Both clamping rings 89 with their round starts should be led in the guide fork 198.
12. Fix guide bar 184 to the needle bar oscillating shaft.
13. Install block 183 (with guide pin), needle bar oscillating shaft 182 and bearing plate 181 (with bearing pin) as illustrated on page 315.
14. Tighten or mount switch lock 178 with screw 177.

Adjustments, Sub-Classes 167-272; -273; -272 NH

1. Observe hints on feed dog lift as per page E 17.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 9, but on both needle holes.
4. Adjust hook as per pages E 20—E 21.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11, but double needle presser foot instead of roller foot.
9. Adjust feed dog height as per page E 12, but the feed dog tooth top edge must be flush with the throat plate top edge.
10. Adjust needle and bottom feed (advance) as per pages E 15—E 16.
11. Adjust upper feed foot movement in relation to bottom and needle feed movements as per page E 17.
12. Adjust upper feed foot lift as per page E 17.
13. Check feed dog position as per page E 13.
14. Adjust take-up spring as per page E 14..

Adjustments, Sub-Class 167-273 HU

1. This sub-class has a standard upper feed foot lift and a low feed dog lift. Fig. 3, page 316.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 9, but both needle holes.
4. Adjust hook as per pages E 20—E 21.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11, but double needle presser foot instead of roller foot.
9. Adjust feed dog height as per page E 12, but the feed dog must be set with half tooth height above the throat plate top edge.
10. Adjust needle feed and bottom feed (advance) as per pages E 15—E 16.
11. Adjust upper feed foot movement in relation to bottom and needle feed movement as per page E 17.
12. Adjust upper feed foot lift as per page E 17.
13. Check feed dog position as per page E 13.
14. Adjust take-up spring as per page E 14.

Adjustments, Sub-Classes 167-372; -373; GK-373

1. This sub-class has a high upper feed foot lift and a low feed dog lift.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 9 (needle system and needle Width as indicated on pages E 4—E 7).
4. Adjust hook as per pages E 9—E 10.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11.
9. Adjust feed dog height as per page E 17, but the feed dog tooth upper edge must be flush with the throat plate upper edge.
10. Adjust needle and bottom feed (advance) as per pages E 15—E 16.
11. Adjust top feed foot movement in relation to bottom and needle feed movements as per page E 17.
12. Adjust upper feed foot lift as per page E 17.
13. Check feed dog position as per page E 13.
14. Adjust take-up spring as per page E 14.

Adjustments, Sub-Class 167 - 8063

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 9 (needle system and needle width as indicated on pages E 4—E 7).
3. Adjust feed dog height as per page E 11.
4. **Adjusting needle feed and bottom feed (advance)**
 1. Set stitch regulator to longest stitch (12 mm).
Turn handwheel so that the eye of the needle is about to enter the stitch hole in the feed dog.
 2. Continue turning handwheel and make sure that the feed dog starts forward movement simultaneously with the needle. As soon as the eye of the needle comes out of the Stitch hole again, the feed movement must be completed.
Correct as follows:
 3. Slacken screw 98. Fig. 1, page 316.
 4. Rotate cam 99 as required.
 5. Tighten screw 98 (advance now set).
 6. Slacken screw 100. Fig. 2, page 316.
 7. Set needle bar or needle to centre of feed dog needle hole.
 8. Tighten screw 100.
5. Adjust feed dog stroke as per page E 16.
6. Adjust hook as per pages E 9—E 10, but set stitch length to 8 mm beforehand.
7. Adjust needle guard as per page E 10.
8. Adjust bobbin case lifter as per page E 11.
9. Adjust needle bar height as per page E 11.
10. Adjust presser bar height as per page E 11.
11. Check feed dog position as per page E 13.
12. Adjust take-up spring as per page E 14.

Adjustments, Sub-Class 167 - 8263 NH

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, but both needle holes. (Needle system and needle width as indicated on pages E 4—E 7.)
3. Adjust hook as per page E 20, but set stitch length to 8 mm beforehand.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, but double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as well as feed dog stroke as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.

Adjustments, Sub-Class 167-AE 73/E 36

1. Observe hints on feed as per page E 17.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 17.
(Needle system and needle width as indicated on pages E 4—E 7.)
4. Adjust hook as per pages E 9—E 10.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11.
9. Adjust feed dog height as per page E 17.
10. Adjust needle and bottom feed (advance) as per pages E 15—E 16.
11. Adjust upper feed foot movement in relation to bottom and needle feed movements as per page E 17.
12. Adjust upper feed foot lift as per page E 17.
13. Check feed dog position as per page E 13.
14. Adjust take-up spring as per page E 14.
- 15. Adjust upper knife in relation to bottom knife**
 1. Slacken screws 87 (on both sides). Fig. 1, page 317.
 2. Adjust knife holder 88 in relation to bottom knife.
 3. Tighten screws 87.
 4. Upper knife must be in rightangular position to bottom knife. Correct as follows:
 5. Set cutting device (knife) in lowest position.
 6. Slacken screw 89.
 7. Turn knife (set rightangularly) and move close to bottom knife.
 8. Make sure that the knife in its lowest position makes contact with the front edge only, thus having somewhat clearance in the rear. Fig. 2.
Correct as follows:
 9. File pressure plate 90 one-sidedly.
- 16. Adjust cutting movement in relation to feed movement**
 1. Turn handwheel until the knife is in its lowest position.
In this position the feed dog should have completed the feed movement. Correct as follows:
 2. Slacken screws 91. Fig. 3, page 317.
 3. Remove cap 92.
 4. Slacken screws 93.
 5. Displace cam 94 accordingly.
 6. Tighten screws 93. Put on cap 92 and tighten with screws 91.

Adjustments, Sub-Class 167 FA-3 S

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 9 (needly system as indicated on pages E 4–E 7).
3. Adjust hook (loop lift, needle clearance) as per pages E 9–E 10.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11.
8. Adjust feed dog follow-up movement as per page E 12.
9. Adjust feed dog height as per page E 12.
10. Adjust roller foot as per page E 14.
11. Adjust take-up spring as per page E 14.

12. Adjust thread cutting device

General information

The thread cutting device (FA) is an additional unit for automatic pulling through of the needle thread and for cutting of the bobbin and needle thread underneath the sewing material.

Thus the magnet 3, Fig. 1, page 318, being excited by the impulse of the synchronizator (grinding ring 28, fig. 2) pulls the roll 6 via lever 5 (Fig. 1) into the control cam 7 while the needle moves upward. The thread pulling knife 22 (Fig. 3) swivels back. At the beginning of the cutting procedure the impulse of magnet 3 (Fig. 1) regarding the position of the roll 6 in relation to cam 7 is cancelled by the insulation area 27 (Fig. 2).

In this case cam 7 controls mechanically the thread pulling knife 22 (Fig. 3) via roll 6.

The illustrations 3 and 4 on page 319 are showing the two phases of thread cutting.

Fig. 3 = standard position, threads are cut.

Fig. 4 = beginning and development of thread pulling.

Adjustment of control cam

1. Turn off main switch. Tilt back the sewing machine.
2. Rotate handwheel (towards the operator) until thread lever has reached its highest position.
3. Slacken screw 8 (Fig. 1, page 318) and adjust cam 7 so that roll 6 will have contact abt. 2 – 3 mm behind the running out of the control cam. Make sure that the control cam 7 will contact the distance bush 9 free from play. Fig. 1.

Adjustment of roll

1. Roll 6 should contact easily moving the extreme outer face of the control cam 7. Fig. 1, page 319.
2. Slacken screws 11 (Fig. 1, page 318) and put stop sheet 10 with stop 12 at lever 5.
3. If roll 6 contacts the control cam inside face (Fig. 2) the pole armature should limit the stroke while magnet 3 is excited.
Correct as follows:
Slacken screws 4 (Fig. 1, page 318) and turn on the magnet for stroke limitation.

Adjustment of thread pulling knife

1. The thread pulling knife 22 (Fig. 3, page 319) should swivel in the passage centre 41 of the hook.
Correct as follows:
2. Slacken screws 23 and prepare thread pulling knife 22.
3. The "vertical clearance" of 0,2 mm between passage 41 and thread pulling knife 22 can be corrected by rebending the thread pulling knife.

Adjustment of counter knife

1. Slacken screws 19 and prepare knife holder 18 (with counter knife 20) in relation to thread pulling knife.
2. Make sure that
the cutting edge of the counter knife 20 will touch the thread pulling knife only after 1/3 of overlapping. Fig. 4.
The counter knife 20 is easily diverted during cutting. Make sure that the thread pulling knife will not strike against the counter knife.
3. New counter knives should better contact the rear stop of the knife holder 18 in order to save further adjustments if the cutting edge might need regrinding.
4. Slacken screw 16 (Fig. 5) and determine the thread pulling knife swivel range by displacing support 17 in the block 15.
5. Make sure that the thread pulling knife 22 will run completely underneath the counter knives when cutting. Fig. 3.

Adjustment of clamping spring

1. Slacken screws 25 (Fig. 3, page 319) and fix clamping spring 24 in relation to thread pulling knife. Tighten screws 25.
2. The clamping spring 24 should slightly clamp the bobbin thread end while the thread pulling knife 22 is cutting.

Adjustment of pull rod

1. The change of extreme needle widths requires an axial displacement of the hook bearing 42 (Fig. 5, page 319), so that the pull rod 13 will have to be readjusted as follows:
2. Slacken counter nuts 14a and 14b (Fig. 1, page 318 and Fig. 5, page 319).
14a = lefthand thread,
14b = righthand thread.
3. Displace pull rod eyes.

Adjustment of thread tension release

1. While treadling the pedal back into "0" position (Fig. 3, page 320) when thread cutting is initiated, the magnet at the arm head is simultaneously excited for thread tensioning release.
2. Therefore the adjustment of the thread tension release is carried out at the stroke bar of the armature.

Adjustment of control micro switch

1. When depressing the pedal front part into "U" position (Fig. 3) the stop 38 (Fig. 2) is pressed against the motor switch. Adjust the necessary "play" as follows:
2. Rotate set screw 39 so that the micro switch will audibly click into position when coupling shortly before the handwheel is "carried along".

Adjustment of synchronizator

1. The position of the synchronizator to the machine is marked ex works. Fig. 1, marking 35 and 36. Therefore, carry out a new adjustment as follows:
2. Make sure that the safety clutch has clicked into position at the handwheel.
3. Fig. 4 will give you a survey on the position of the contact ways in relation to the insulating faces of the grinding rings.
Pointed area = insulating face,
hatched area = contact face.

4. The meaning of the grinding rings in Fig. 4, page 318, is the following:
 28 = cutting
 29 = current supply
 30 = thread lever top position, 2nd position
 32 = lowest position of needle, 1st position.
5. Rotate handwheel (towards the operator) until roll 6 stands in the centre of the lowest point of control cam 7. Fig. 1 and 2, page 319.
6. Carbon brush has to stand at the beginning of insulating face 27 of grinding ring 28 (Fig. 1 and 2, page 320). Thus the excited magnet is cancelled.
 Correct as follows:
 Slacken screws 26 (Fig. 1, page 320) and rotate the grinding ring body accordingly.
7. Slacken screw 34.
8. Rotate handwheel until the hook point – when having seized the thread loop – will be abt. 10 mm behind the needle.
9. Rotate grinding ring 32, so that carbon brush will contact the beginning of the insulating face 33. Now the lowest position of the needle is set or determined in the 1st position.
10. Slightly tighten screw 34.
11. Rotate handwheel until thread lever has reached its highest position.
 Slacken screw 34 and rotate grinding ring 30.
 Make sure that the grinding ring 32 will not distort. The carbon brush stands at the beginning of insulating face 31.
 Now the highest position of the thread lever is set or determined in the 2nd position.
12. Tighten screw 34.
13. Let sewing machine shortly run several times, stop and check, whether the described and set positions are correct.

General hints for maintenance and repair

1. Regrind counter knife with oil stone.
2. In case of functional disorder of control cam check whether roll 6 (Fig. 1, page 318) contacts control cam 7 with ease of movement.

3. The additional control illustrated in Fig. 1, page 321 comprises a fuse 40 = 0,8 A inert for 220 volts according to DIN 41571.
Termin: G — safety fuse T 0,8 A.
Part No. 997 50 260 0.

Adjustments, Sub-Classes 167 FA-63; FA-63 S

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15.
3. Adjust hook as per pages E 9—E 10.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed as per page E 15.
10. Adjust feed dog stroke as per page E 16.
11. Check feed dog position as per page E 13.
12. Adjust roller foot as per page E 14. (Only 167 FA-63 S).
13. Adjust take-up spring as per page E 14.
14. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Class 167 FA-73

1. Observe hints as per page E 9.
2. Check screw seats as per page E 15.
3. Check needle entry as per page E 15.
4. Adjust hook as per pages E 9—E 10.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11.
9. Adjust feed dog height as per page E 17.
10. Adjust needle and bottom feed as per pages E 15—E 16.
11. Adjust upper feed foot movement in relation to bottom and needle feed movements as per page E 17.
12. Adjust upper feed foot lift as per page E 17.
13. Check feed dog position as per page E 17.
14. Adjust take-up spring as per page E 17.
15. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Class 167 FA-203 S

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 9, however, both needle holes.
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11.
8. Adjust feed dog follow up movement as per page E 12.
9. Adjust feed dog height as per page E 12.
10. Adjust feed dog lift as per page E 13.
11. Adjust feed dog position as per page E 13.
12. Adjust roller foot as per page E 14.
13. Adjust holding down unit as per page E 20.
14. Adjust take-up spring as per page E 20.
15. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Classes 167 FA-262; FA 263; BF-262

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes. (Needle system and needle width as indicated on pages E 4—E 7).
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, however, double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed as well as feed dog lift as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust thread take-up spring as per page E 14.
12. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Class 167 FA-262 NH

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes (needle system and needle width as indicated on pages E 4—E 7).
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, however, double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed as well as feed dog lift as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.
12. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Class 167 FA-262 NH 1

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes. Needle system and needle width as per pages E 4—E 7.
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle height as per page E 23.
7. Adjust presser bar height as per page E 11, however, double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed as well as feed dog lift as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.
12. Dismantling of needle bar as per page E 24.
13. Assembly of needle bar as per pages E 24—E 25.
14. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Class 167 FA-262 Z

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes. Needle system and needle width as indicated on pages E 4—E 7.
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, however, double needle presser foot to be used.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as well as feed dog lift as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.
12. Adjust knife height as per pages E 21—E 22.
13. Adjust cutting movement in relation to feed movement as per page E 22.
14. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Class 167 FA-272; FA 273; BF-272

1. Observe hints on feed dog lift as per page E 17.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 9, however, both needle holes.
4. Adjust hook as per pages E 20—E 21.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11, but double needle presser foot instead of roller foot.
9. Adjust feed dog height as per page E 12, however, the feed dog tooth top edge must be flush with the throat plate top Edge.
10. Adjust needle and bottom feed (advance) as per pages E 15--E 16.
11. Adjust upper feed foot movement in relation to bottom and needle feed movements as per page E 17.
12. Adjust upper feed foot lift as per page E 17.
13. Check feed dog position as per pages E 13.
14. Adjust take-up spring as per page E 14.
15. Adjust thread cutting device as per page E 33—E 36.

Adjustments, Sub-Class 167 FA-272 NH

1. Observe hints on feed dog lift as per page E 17.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 9, but both needle holes.
4. Adjust hook as per pages E 20—E 21.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11, however, double needle presser foot instead of roller foot.
9. Adjust feed dog height as per page E 12, however, the feed dog tooth top edge must be flush with the throat plate top edge.
10. Adjust needle and bottom feed (advance) as per pages E 15—E 16.
11. Adjust upper feed foot movement in relation to bottom and needle feed movements as per page E 17.
12. Adjust upper feed foot lift as per page E 17.
13. Check feed dog position as per page E 13.
14. Adjust take-up spring as per page E 14.
15. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Classes 167LG-72; LG-73; LG-73 PKR/VE

1. Observe hints on feed dog lift as per page E 17.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 17, needly system and needle width as indicated on pages E 4—E 7.
4. Adjust hook as per pages E 9—E 10, however, the hook is to the left of the needle in this case. For this reason the hook illustrations shown for this sub-class should be looked at inversely.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11.
9. Adjust feed dog height as per page E 12.
10. Adjust needle and bottom feed (advance) as per pages E 15—E 16.
11. Adjust upper feed foot movement in relation to bottom and needle feed movements as per page E 17.
12. Adjust upper feed foot lift as per page E 17.
13. Check feed dog position as per page E 13.
14. Adjust take-up spring as per page E 14.

Adjustments, Sub-Class 167 LF-63

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15.
3. Adjust hook as per pages E 9—E 10.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed as per page E 15.
10. Adjust feed dog lift as per page E 16.
11. Check feed dog position as per page E 13.
12. Adjust take-up spring as per page E 14.
13. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Class 167 LF-263 NH

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, but both needle holes. Needle system and needle width as indicated on pages E 4—E 7.
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, but use double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed as well as feed dog lift as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.
12. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, Sub-Class 167 LF-263 NH 1

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, but both needle holes. Needle system and needle width as indicated on pages E 4—E 7.
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle height as per page E 23.
7. Adjust presser bar height as per page E 11, but use double needle presser foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as well as feed dog lift as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.
12. Dismantling of needle bar as per page E 24.
13. Assembly of needle bar as per page E 24.
14. Adjust thread cutting device as per pages E 33—E 36.

Adjustments, sub-Class 167 LS-63

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15.
3. Adjust hook as per pages E 9—E 10.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as per page E 15.
10. Adjust feed dog lift as per page E 16.
11. Check feed dog position as per page E 13.
12. Adjust take-up spring as per page E 14.

Adjustments, Sub-Class 167 LS-263 NH

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes (needle system and needle width as per pages E 4—E 7).
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle bar height as per page E 11.
7. Adjust presser bar height as per page E 11, however, use double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as well as feed dog lift as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.

Adjustments, Sub-Class 167 LS-263 NH 1

1. Check screw seats as per page E 9.
2. Check needle entry as per page E 15, however, both needle holes. Needle system and needle width as indicated on pages E 4—E 7.
3. Adjust hook as per page E 20.
4. Adjust needle guard as per page E 10.
5. Adjust bobbin case lifter as per page E 11.
6. Adjust needle height as per page E 23.
7. Adjust presser bar height as per page 11, but use double needle presser foot instead of roller foot.
8. Adjust feed dog height as per page E 12.
9. Adjust needle and bottom feed (advance) as well as feed dog lift as per pages E 15—E 16.
10. Check feed dog position as per page E 13.
11. Adjust take-up spring as per page E 14.
12. Dismantling of a needle bar as per page E 24.
13. Assembly of a needle bar as per page E 24.

Adjustments, Sub-Class 167 RE-73

1. This sub-class has a high upper feed foot lift and a feed dog lift.
2. Check screw seats as per page E 9.
3. Check needle entry as per page E 15, however, use distance gauge with 5 mm spacing between presser bar and upper feed foot bar.
4. Adjust hook as per pages E 9—E 10.
5. Adjust needle guard as per page E 10.
6. Adjust bobbin case lifter as per page E 11.
7. Adjust needle bar height as per page E 11.
8. Adjust presser bar height as per page E 11.
9. Adjust feed dog height as per page E 12, but the feed dog tooth top edge must be flush with the throat plate top edge.

10. **Adjust needle and bottom feed (advance and return movement)**
 1. Set stitch regulating lever to longest stitch. Rotate handwheel until the needle with needle eye enters into the feed dog needle hole.
 2. Continue rotating handwheel. The feed dog should now start to move into the opposite direction of the needle feed, i. e. the needle moves in sewing direction (off the operator), the feed dog moves opposite to the sewing direction (towards the operator). Fig. 2, page 321.
Correct as follows:
 3. Slacken screws 1. Fig. 1.
 4. Rotate cam 2 until the feed dog is in extreme rear position when starting to move.
 5. Tighten screws 1.
11. **Adjust top feed foot movement in relation to needle and bottom feed movements**
 1. The top feed foot should carry out the same feed movement as the needle (not as the feed dog).
Fig. 2, page 321.
 2. Slacken screws 67, fig. 3, page 310.
 3. Rotate cam 68 in such a way that the movement as indicated above under item 1 will start.
 4. Tighten screws 67.
12. Adjust top feed foot lift as per page E 17.
13. Adjust feed dog lift as per page E 13.
14. Check feed dog position as per page E 13.
15. Adjust take-up spring as per page E 14.
16. **Adjust scale wheel**
 1. Set stitch length according to operator's guide to "0" (no feed) and check whether at zero position the feed dog will actually carry out no movement.
Correct as follows:
 2. Rotate handwheel until the depressed button 3 will click into groove 4. Fig. 1, page 321.
 3. Slacken screws 5.
 4. Rotate scale 6 until the number "0" can be seen in the inspection glass 7.
 5. Tighten screws 5.

Trouble Shooting

Faults may be due to numerous causes. For this reason we have compiled here the most frequent causes and provided hints for their elimination. In all cases, however, it is necessary to check the machine for correct settings. (See items "Adjustments".) In most cases this will eliminate the faults.

1. Thread breakage

1. Thread channels jagged:
Check all thread guiding paths and polish them.
Check for correct thread run according to operating instructions.
2. Faulty threading:
Check thread run according to operating instructions.
3. Blunt, crooked or wrong needle:
Insert new needle as per pages E 4—E 7.
4. Needle too high:
Adjust needle bar height according to page E 11.
5. Needle too low:
Insert needle as far as it will go.
6. Wrong relationship between needle and yarn:
Observe instructions on pages E 4—E 7. Only use proprietary yarn in the specified thickness and twist. Do not use any yarn which has been stored for too long under dry conditions.
7. Needle threaded from wrong side:
Always thread needle from the long-groove side.
8. Needle hole nicked:
Lightly trim edges, polish needle hole. If necessary, fit new throat plate or feed dog.
9. Needle hole too small or excessively thick needle thread:
Insert throat plate or feed dog with larger hole or re-machine needle hole. Use needle thread according to instructions on pages E 4—E 7. Observe relationship between needle and yarn.
10. Hook badly worn. Sharp edges:
Fit new hook and adjust according to pages E 9—E 10.

11. Screws of bobbin case tension spring too high, thread catches:
Tighten screws sufficiently. If this creates an excessive tension, slightly bend the tension spring.
12. Thread clearance between bobbin case support and hook inadequate:
Adjust according to instructions on pages E 9—E 10.
The clearance should be sufficient enough to ensure that the thickest thread gauge to be used will pass through smoothly.
13. Hook catches needle thread loop too late or too early:
Adjust hook or loop lift according to pages E 9—E 10.
14. Excessive tension:
Adjust tension according to material to be sewn.
15. Knotty or brittle thread:
Only use proprietary yarn in the specified thickness and twist.
16. Hook and bobbin case nicked, rusty or broken:
Use new parts or repolish existing parts.
17. Too much loose thread as the needle enters:
Needle pierces loose thread:
Adjust take-up spring according to page E 14.
18. Thread clearance insufficient between hook-bottom and bobbin case bottom section, the needle thread loop catches (dirt or fluff):
Clean hook or, if necessary, replace the hook.
19. Excessive bobbin thread tension:
Adjust tension according to operating instructions.

2. Needle breakage

1. Wrong hook setting:
Adjust hook according to instructions on pages E 9–E 10.
2. The needle is bent and seized by the hook point:
Insert new needle according to pages E 4–E 7.
3. Needle too thin for needle hole or material:
Use needle system and gauge according to pages E 4–E 7.
When using thick needles, fit throat plate having a larger needle hole. For thick or hard material use thicker needle or a needle having a cutter point.
4. Needle guard:
The needle should enter in such a manner that it is pressed away by the hook plate and cannot be seized by the hook point.
5. Wrong needle / yarn ratio:
Observe instructions given on pages E 4–E 7.
6. Knotty or uneven yarn:
Only use proprietary yarns in the specified thickness and twist. Do not use yarn which has been stored too long under dry conditions.
7. Needle breaks on entering the material, or the needle feed is incorrect in relation to the bottom feed:
Adjust as per page E 15.
8. Bobbin case incorrectly fitted:
Press in bobbin case until it engages with an audible click.
9. Hook point entrains needle:
Observe needle guard and needle clearance instructions as per pages E 10–E 11.
10. Throat plate incorrectly screwed on:
Screw in (two) throat plate setscrews and then tighten.
Check the countersink of the screw holes and screw heads.
11. The material is pushed or pulled during sewing operation and the needle settles:
Guide material lightly. Check needle feed in relation to bottom movement.
12. Feed dog too high. It entrains the material again during return movement:
Adjust feed dog height as per page E 12.

13. Feed dog pushes too early or too late:
Adjust according to page E 12.
14. Hook worn:
Fit new hook.
15. Needle drops out while sewing. Setscrew fails to clamp the needle satisfactorily:
Check setscrew and, if necessary, replace.
16. Needle bar badly worn:
Fit new needle bar.
17. Excessive thread tension, needle bends and settles:
Set correct tension according to the material to be sewn.
18. Needle settles on roller presser roller:
Set roller presser roller distance according to page E 14.

3. Skipped stitches

1. Needle wrong, bent or incorrectly fitted:
Fit new needle, for needle system and gauge refer to pages E 4—E 7. For correct fitting see operating instructions.
2. Wrong threading:
Observe thread run according to operating instructions.
3. Faulty thread take-up:
Adjust take-up spring according to page E 14.
4. Wrong hook setting:
Observe correct setting according to pages E 9—E 10.
5. Incorrect needle/yarn ratio:
Use needle system, number and gauge as per pages E 4—E 7.
6. Hook point damaged:
Machine hook point, polish or fit new hook.
7. Needle hole too large. Material is drawn in:
Use throat plate or feed dog having a smaller needle hole.
8. Needle too low:
Fit needle according to operating instructions.

9. Needle too high:
Adjust needle bar height as per page E 11.
10. Poor seam quality:
Only use proprietary yarns in the specified gauges.
11. Insufficient presser foot pressure:
Adjust presser foot pressure according to operating instructions.
12. Thread "twirls". Irregular loop formation. Thread too sharply twisted:
Only use proprietary yarn having the indicated gauge and twist.
13. Thread is of uneven strength and brittle:
Do not use any yarn which has been stored too long and in dry conditions. Only use proprietary yarn having the indicated gauge and twist.
14. Right-hand twisted thread:
Only use left-hand twisted thread.
15. Hook catches thread loop too early or too late:
Adjust loop lift as per pages E 9—E 10.
16. Insufficient or excessive thread tension:
Adjust tension to suit material to be sewn.
17. Needle too far from hook point:
Adjust clearance between needle and hook point as per pages E 9—E 10.

4. Uneven seam (stitch pattern, irregular stitches)

1. In this respect faults may be caused in the same manner as indicated under "Thread breakage" and "Skipped stitches".
2. Looping of thread above or below the material:
Adjust needle and bobbin thread tension according to operating instructions.
3. Poor or knotty yarn:
Only use proprietary yarn. For gauge and twist refer to pages E 4—E 7.
4. Hook has run out of oil. Bobbin case canting:
Observe oil details according to operating instructions. Fix new hook. Adjust as per pages E 9—E 10.

5. Faulty threading:
Observe the winding up, inserting, and threading according to operating instructions.
6. Tensioning discs dirty, fouled or sticky:
Clean components and, if necessary, repolish. All parts should be freely movable.
7. Thread guiding components rusty or rough:
Remove rust and repolish.
8. Thread take-up incorrect:
Adjust take-up spring according to page E 14.
(Adjust spring tension according to the thickness of the material to be sewn.)
9. Needle too high or too low:
Fit needle according to operating instructions or adjust needle bar height as per page E 11.
10. Thread fails to pass smoothly over hook:
Repolish all thread contact points properly.
11. Feed dog setting wrong:
Set feed dog figures according to page E 12.
12. Fouled hook. Hook prevented from rotating evenly:
Clean hook, observe setting.
13. Machine sews in a curve:
Check feed dog position according to page E 13.
Check roller presser setting (direction of movement) according to page E 14.
14. Bobbin irregularly wound, wrongly inserted or threaded:
Rewind, insert and thread according to operating instructions.
15. Machine fails to sew across seams and holes:
Wrong presser foot pressure setting. Adjust feed dog height according to page E 12. Set presser foot pressure according to thickness of material as per operating instructions.
16. Feed dog teeth ruffle the material:
Only use feed dog having teeth as supplied by the factory.
For thin and light-weight materials use a feed dog having finer teeth. Coarse-toothed feed dogs should be used only for appropriate work.
Observe setting of needle feed in relation to bottom feed.
17. Irregularly wound bobbin thread:
When winding up, make sure that the threads lie adjacent to one another.











































