PFAFF

6110, 6120
6150, 6230

Service Manual

1st Edition 1994

Service Manual

Repair instructions

Foreword

This service and repair manual is intended to assist you in carrying out all repairs to the machine quickly and accurately. Adjustments should only be made if you find the actual settings deviating from the requirements described here.

When checking or adjusting a machine, always proceed in the sequence specified.

For easier reference, every workstep is marked with a dot. Differing worksteps are marked with a circle or square.

The indications „right", „left", „top", „bottom", „front" or „rear" always refer to the upright machine with its controls facing the operator.

When assembling dismantled machines, make approximate adjustments right in the course of working. This facilitates subsequent exact adjustments. If not described otherwise, the handwheel must always be turned to the front.

Always pull out the mains plug before making repairs at live parts or in their vicinity.

An electrical safety test must be carried out after every repair, including mechanical ones.

According to the law on safe machine operation of June 24, 1958, VDE regulations apply as official rules in electrical engineering and as such are basic to electrical safety tests of technical devices.

The required electrical tests for appliances are set forth in Para. 3 of the Regulations for Repair, Modification and Testing of Used Electrical Devices (VDE 0701, edition 9.71). After every repair of electrical devices we manufacture, a test in accordance with VDE 0701 is obligatory.

Outside the Federal Republic of Germany, there are similar regulations in force which are largely identical with the requirements of VDE 0701. For repairs of electrical devices, it is therefore by all means required to consult an expert.

For correct adjustment of the machines, the following gauges and tools are required:

Needle rise gauge	00-870136-01
Needle rise clamp	00-870137-01
Spacer	63-102600-18
Adjustment gauge for bobbin case position finger	00-880133-01
Sewing foot gauge	63-114690-39
Combination spanner (wrench), 5.5 mm	43-111010-04
Torx screwdriver TX 10	07-434008-44
Torx screwdriver TX 15	07-434008-45
Torx screwdriver TX 20	07-434008-46
Torx screwdriver TX 25	07-434008-47
Torx offset screwdriver TX 15	07-434008-74
Torx offset screwdriver TX 20	07-434008-75
Circlip fitting tool 2.3 kz	07-437003-20
Circlip fitting tool 3.2 kz	07-437003-30
Circlip fitting tool 4.0 kz	07-437003-40
Circlip fitting tool 5.0 kz	07-437003-50
Circlip fitting tool 6.0 kz	07-437003-60
Circlip fitting tool 10.0 kz	07-437003-86
Spring hook	07-437006-00

Subject to alterations in design and dimension.

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

Ambient conditions:

The recommended ranges are:

Ambient temperature	– 10° to 40°C (14° to 104°F)
Air humidity	20 % to 80 %

This machine is a high-quality electro-mechanical device. It is designed for household purposes and should always be supervised when in use. Make sure that it is not subjected to:

dust, severe dampness, direct sunlight, static electricity, heat-producing objects, corrosive chemicals or liquids.

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

Treatment:

Always protect the machine against damage by hitting or dropping.

Cleaning:

Housing:

To clean the housing, use a dry, clean and soft cloth which is free of fluff. To remove any stubborn dirt, use a soft cloth with a neutral cleansing agent for plastic materials.

Please note!

Do not use any insecticides or chemical products such as petrol (gas) or thin chemicals for cleaning the housing.

Display:

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

Safety:

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

Specifications of the PFAFF machines

PFAFF 6230

Electronic free-arm utility and fancy stitch machine with 9 forwards and 9 forwards- and reverse-controlled utility stitches, stitch combinations possible.

Buttonhole unit, electronically controlled needle „up" and „down" positioning. Basting stitch unit, key with LED-indicator for half and full end speed (550 r.p.m. or 1000 r.p.m.), micro-computer motor control. High-ohm foot control (cold), needle threader, dual fabric feed.

PFAFF 6150

Free-arm utility and fancy stitch machine with 9 forwards and 9 forwards- and reverse-controlled utility stitches, stitch combinations possible. Fancy stitch unit with 6 fancy stitches, stitch combinations possible. Optional low-ohm foot control (warm) or electronic control with torque raising, needle threader, dual fabric feed.

PFAFF 6120

Free-arm utility stitch machine with 9 forwards and 9 forwards- and reverse-controlled utility stitches, stitch combinations possible. Optional low-ohm foot control (warm) or electronic control with torque raising, needle threader, dual fabric feed.

PFAFF 6110

Free-arm utilitiy stitch machine with 9 forwards stitches and 9 forwards- and reverse-controlled utility stitches, stitch combinations possible. Optional low-ohm foot control (warm) or electronic control with torque raising.

Detailed specifications of the machines

- Electronic free-arm utility and fancy stitch machine
- Directly controlled automatic utility stitch system, step-down ratio 6:1
- Three zigzag widths of 2 mm, 3.5 mm and 5 mm
- Utility stitch width: 5 mm
- Indirectly controlled automatic fancy stitch system, step-down ratio: 18:1
- Stitch length from 0 to 6 mm
- Reverse stitch length from 0 to 3 mm
- Electronically controlled take-up lever„up" (needle „up" positioning) or needle „down" position with LED display
- Key with LED for half speed (540 r.p.m.)
- Digital motor control with a max. speed of 1000 r.p.m.
- When machine is blocked, the motor is switched off automatically after 1 to 3 s by an anti-blocking device
- High-ohm foot control (cold)
- FM radio and TV-screened, approval marking: suppression degree B
- Safety-class II with GS test marking
- Main switch for motor, electronics and indicator lamps
- Glare-free built-in sewing lamp (indicator lamp) 230 V or 120 V, 15 W
- pendulum-type needle bar frame
- Transmission of drive from arm shaft to lower shaft by flat toothed belt, transmission ratio 1:1
- Automatic switchover to bobbin winding (computer-controlled)
- Power input rating: sewing at 950 r.p.m., 90 W; stationary: 40 W
- Lockstitch of types 301, 302, 303, 304, 305, 308 and all other variants obtainable by sideways needle movement or forwards and reverse-control of the machine feed

- PFAFF transverse double-rotating hook
- Link take-up lever
- Linkage-type feed regulator
- Dual feed
- Disengageable feed dog
- Needle threader
- Drive from motor to handwheel by flat toothed belt
- 60 to 1000 stitches per minute
- Sintered metal bearings
- Oil for sintered metal bearings: BP Energol HLP 46 or HLP 80 No. 28-036550-09
- Oil for sewing hook No. 91-129452-91
- Clear workspace: 175, 114, 205 mm
- Machine height: 280 mm
- Baseplate dimensions: 390, 155 mm
- Free-arm dimensions: 80, 49, 200 mm
- Housing material: aluminium alloy
- Weight of sewing head: approx. 8 kg
- Needle system 130/705 H

- Additional needle system classifications:

Twin needle	Suffix = Zwi
Wing needle	Suffix = Wing
Twin hem-stitching needle	Suffix = Zwi-Ho
Long needle eye	Suffix = N
Stretch needle	Suffix = PS
Jeans needle	Suffix = J

- Possible needle points

Small ball point	Suffix = SES
Medium ball point	Suffix = SUK
Large ball point	Suffix = SKF
Pointed cloth point	Suffix = J
Leather point, right-hand	Suffix = LR

Specifications and versions of the built-in motors for PFAFF 6230-6110

Type	UUS 400 (6230) No. 902-1040-001 Radioscreened according to EN 55014	220-240V	50/60Hz 37W Safety class II	6600 r.p.m.
Type	UUS 403 (6230) No. 902-1040-003 Radioscreened according to EN 55014	110-120V	50/60Hz 39W Safety class II	6600 r.p.m.
Type	UUS 390 (6110-6150) No. 902-1039-001 Radioscreened according to EN 55014	220-240V	50/60Hz 27W Safety class II	4500 r.p.m.
Type	UUS 393 (6110-6150) No. 902-1039-003 Radioscreened according to EN 55014	110-120V	50/60Hz 27W Safety class II	4500 r.p.m.

Dismantling the housing cover

Note: Before adjusting or repairing the machine, be sure to dismantle the housing covers according to the adjustment or repair instructions.

- Pull the mains plug out of the machine.
- Remove the needle and the presser foot shoe.
- Remove the detachable work support.
- Remove the top cover.
- Switch on the bobbin winder.
- Undo the two Torx screws of the housing insert.
- Remove the housing insert.
- Undo the four retaining screws of the baseplate.
- Turn the baseplate over.
- On class 6230 remove cover 183 of the baseplate by means of a screwdriver.
- Push catch 170 just 1 to 2 mm to the right and pull off the two-wire cable with plug 174.
- Remove the two plugs 172 and 173 from the circuit board (fig. 1).
- Press the two catches 190 together and pull the motor plug out upwards (fig. 2).
- Remove the three flat cables form the cable channel.

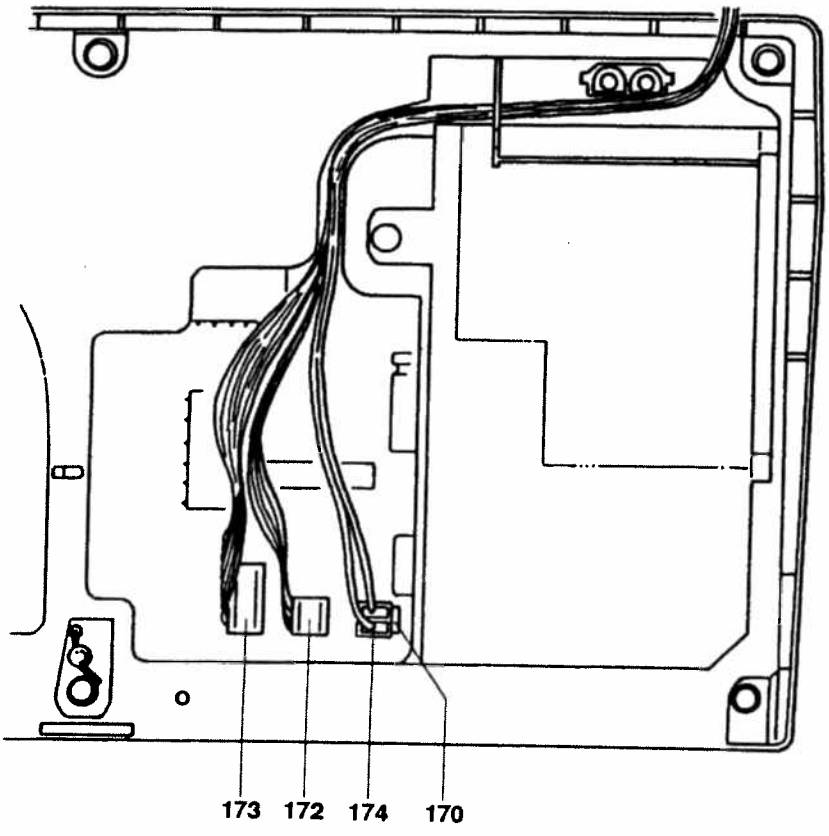


Fig. 1

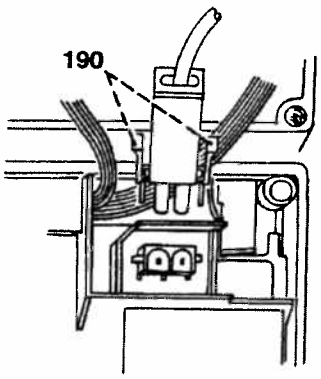
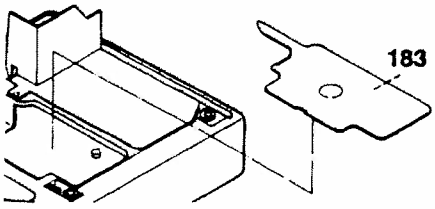


Fig. 2



- Turn out the two retaining screws 3 of the free-arm cover (fig. 3).
- Pull the left-hand side of the free-arm cover a little bit downwards and remove it towards the left.
- Remove the needle plate.
- Turn out the two retaining screws 4 of the free-arm cover (fig. 4).
- Loosen retaining screw 5 of the free-arm cover.
- Remove the free-arm cover.

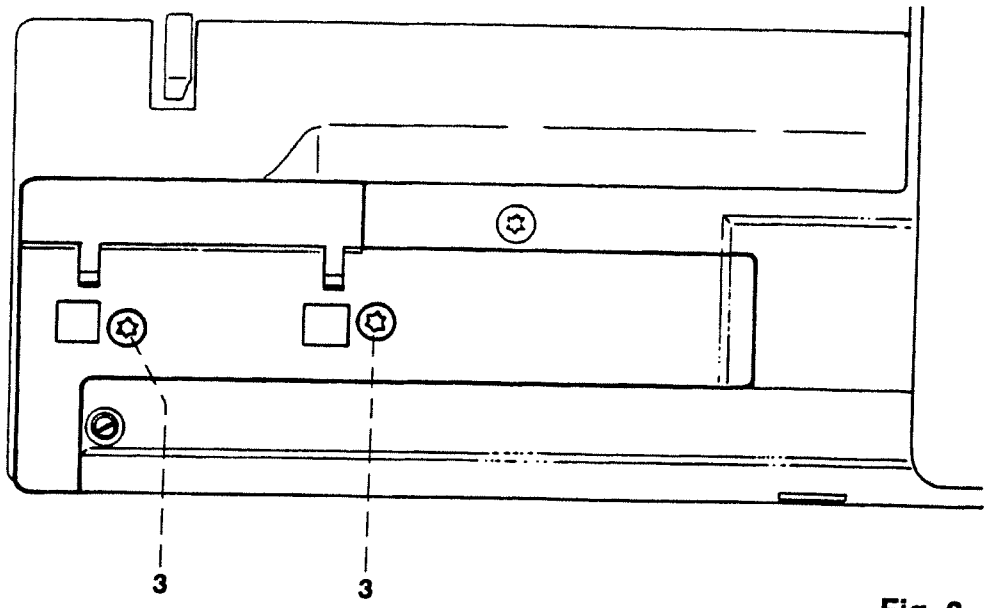


Fig. 3

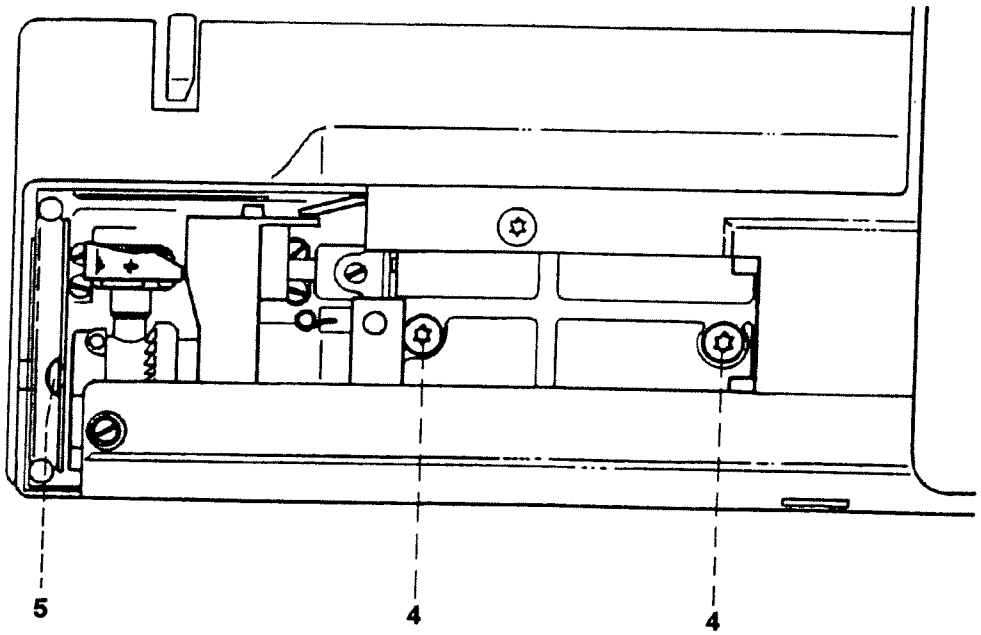


Fig. 4

- Loosen the retaining screws 6, 7, 8, and 9 of the rear housing shell (fig. 5 and 6).
- Open the catch connections on the inside of the arm by pressing with your thumb against the points indicated by the arrows (fig. 8).
- Remove the rear housing shell.
- Remove the motor cover.

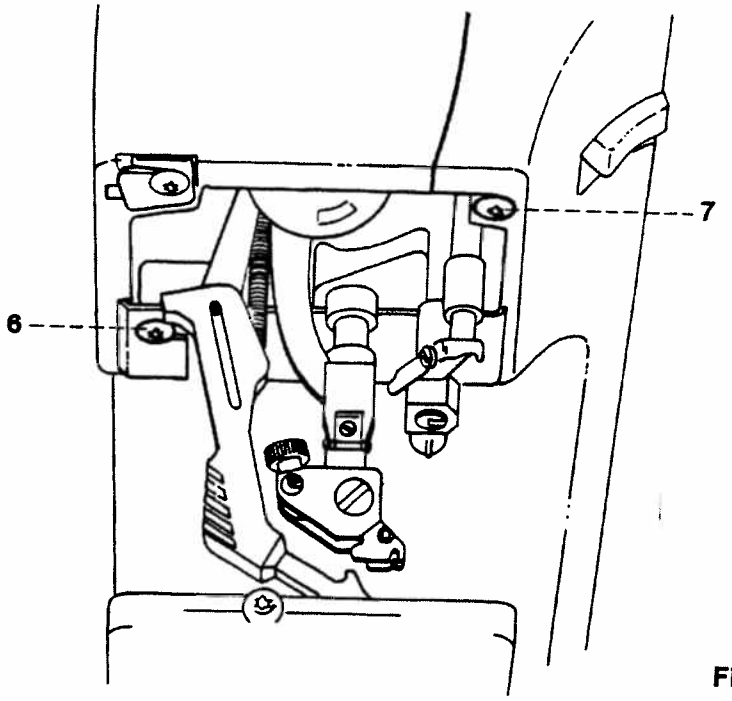


Fig. 5

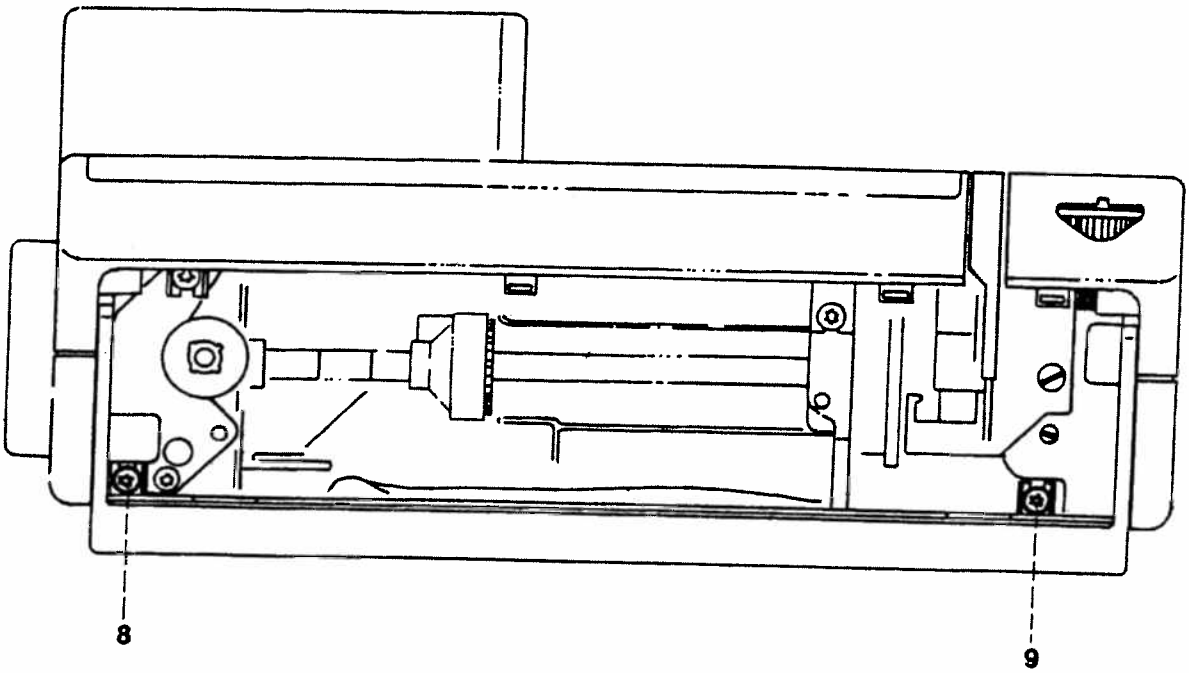


Fig. 6

- Loosen the retaining screws 10, 11, 12 and 13 on the front housing shell (fig. 7 and 8).
- Turn out retaining screws 14 and 15.

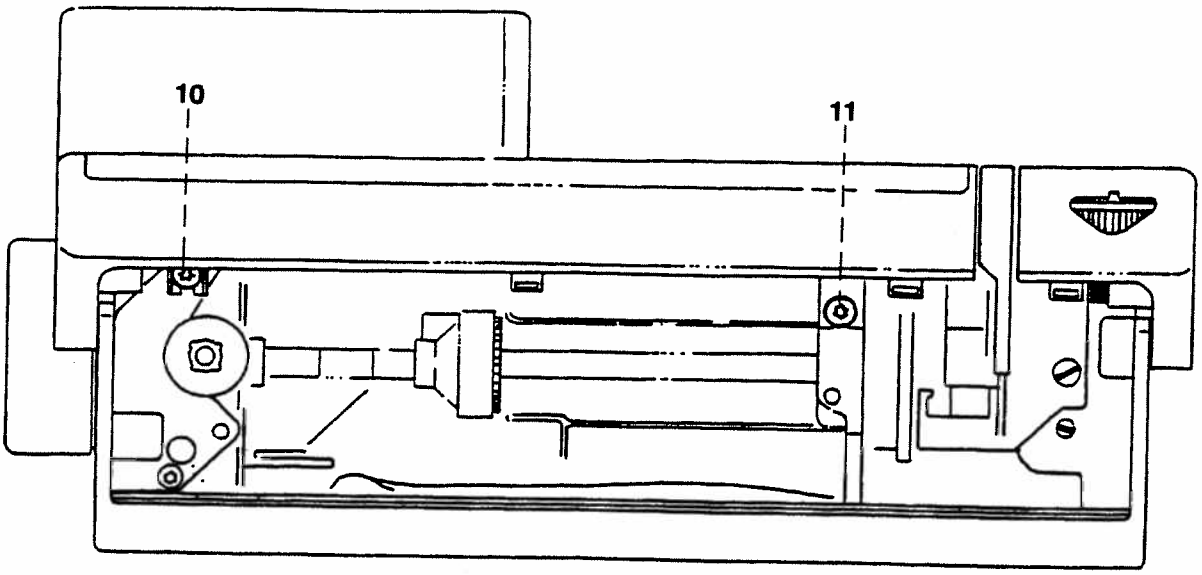


Fig. 7

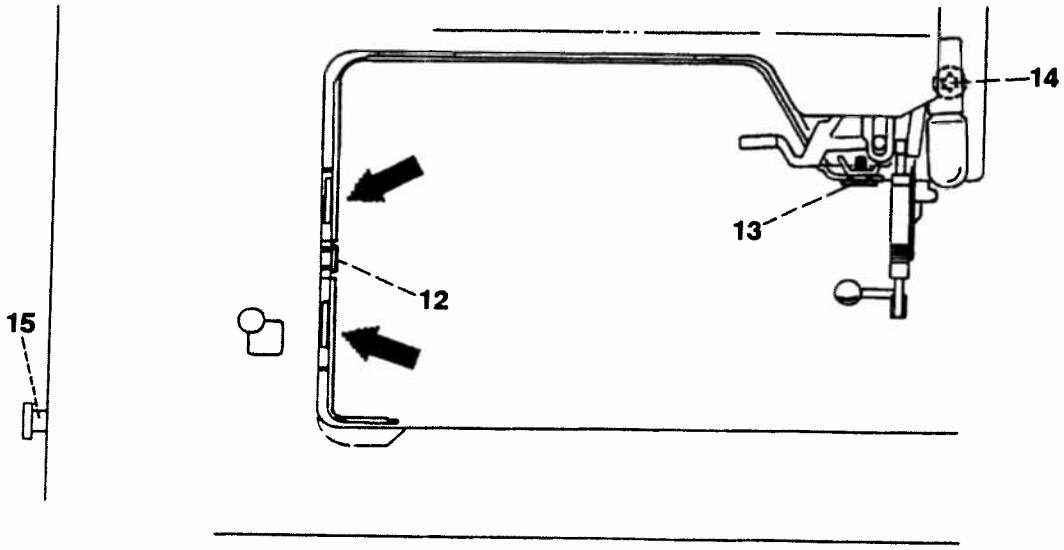


Fig. 8

- Turn out retaining screw 16 (fig. 9).
- Switch on the top key row of the utility stitch unit.
- Lift the front housing shell and pull off connection cable 17 of the circuit board and remove cable 17 from guide hook 18 (fig. 10).
- Lift the front housing shell off carefully.

The assembly must be carried out in reverse order.

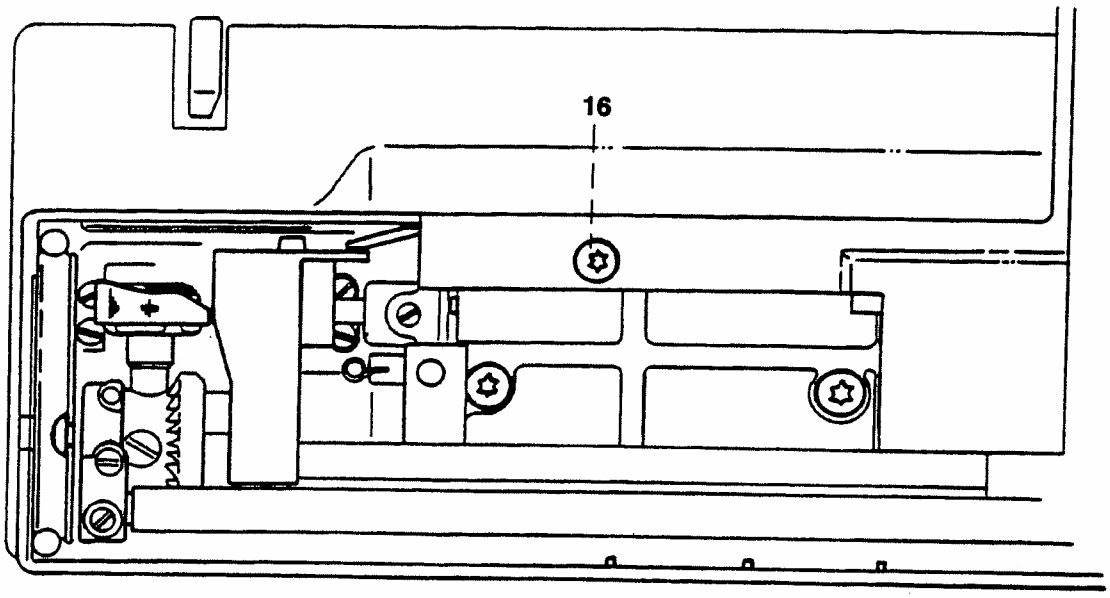


Fig. 9

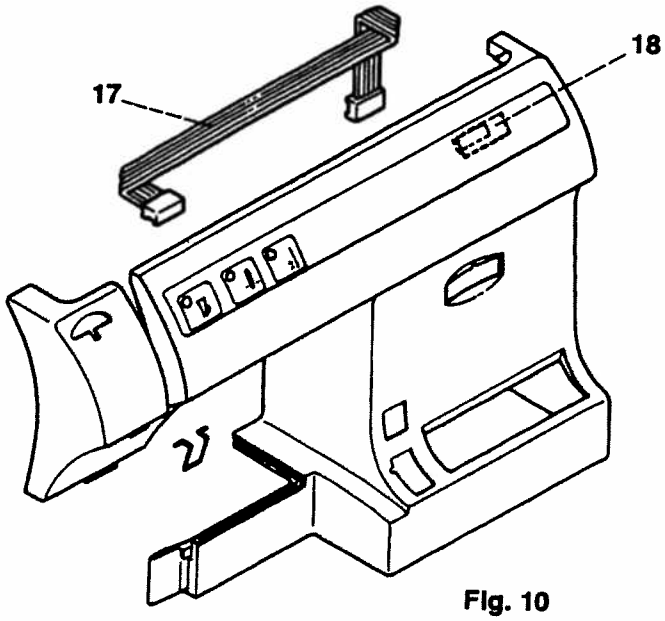


Fig. 10

Notes:

Feeding system

1. Adjustment of toothed belt tension

Requirement:

The toothed belt must be so taut that the sewing hook has no play in its direction of rotation. But it must be possible to turn the machine easily.

Adjustment:

- Loosen screw 1 (fig. 1).
- Re-position tensioning roller 2 with a screwdriver accordingly.
- Tighten screw 1.

Check:

- Check this adjustment in accordance with the requirement.
- Press lightly against the middle of the toothed belt (250 g).
  The toothed belt must move 1 to 3 mm inwards.

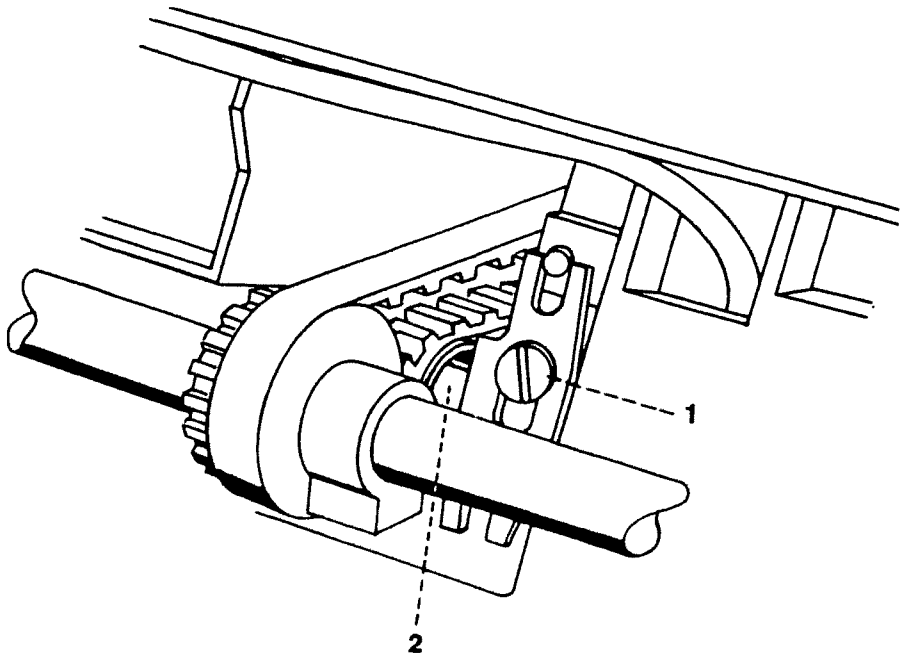


Fig. 1

2. Adjustment of feed-dog shaft in sideways direction

Requirement:

The distance of the feed dog to the left and right edges of the feed slot must be equal (fig. 2).

Check:

Verify feed dog position by visual check.

Adjustment:

- Loosen the two screws 29 and 41 (fig. 2a).
- Loosen screw 6.
- Disconnect spring 4a.
- Re-position feed-dog driving shaft 36 with the two cylindrical pins 30 and 40 sideways until the feed dog is centered in the needle plate cutout.
- Tighten screws 29 and 41 firmly.
- Push rod 5 against connecting bar 8.
- Tighten screw 6.
- Re-connect spring 4a.

Check:

The feed dog must now be centered in the needle plate cutout and the feed-dog driving shaft must neither have any play nor must it bind.

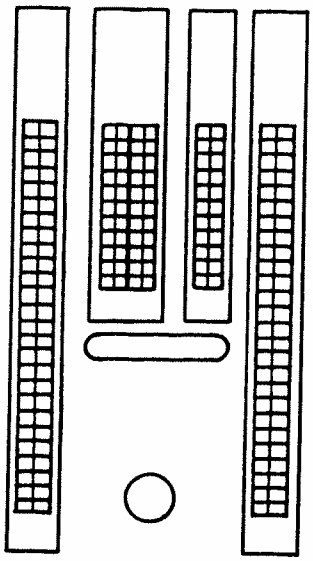


Fig. 2

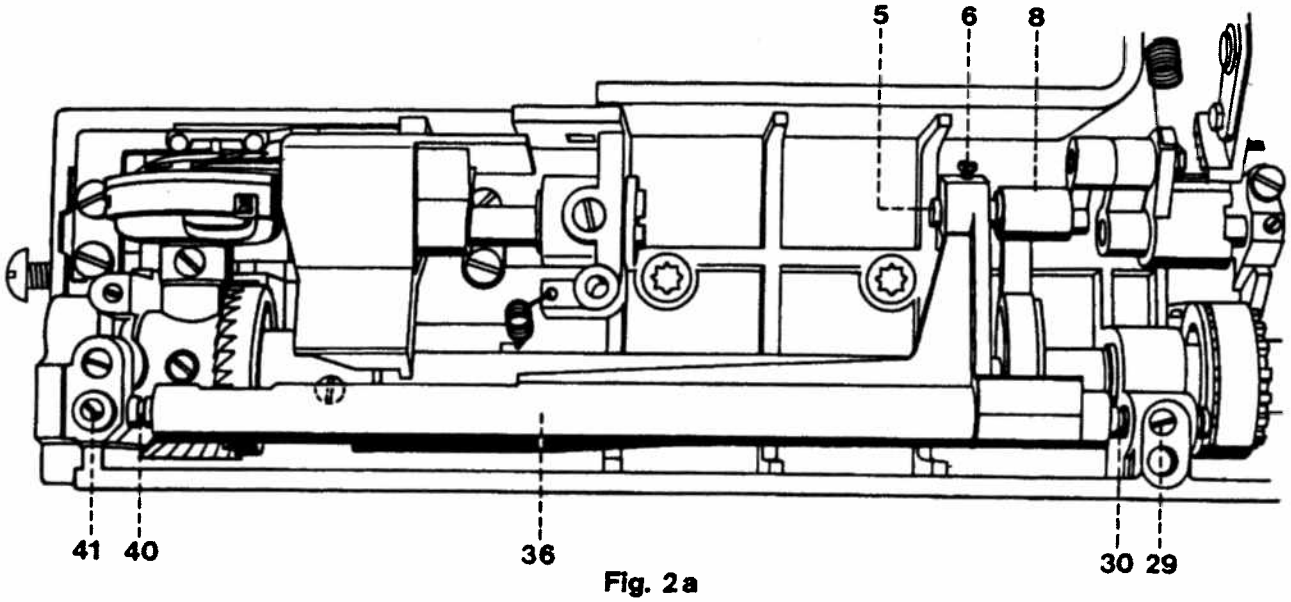


Fig. 2a

2a. Adjustment of feed-dog shaft in sideways direction on Pfaff 6120-6230

Requirement:

The distance of the feed dog to the left and right edges of the needle plate cutout must be the same.

Check:

Verify feed dog position by visual check.

Adjustment:

- Tilt the machine over backwards.
- Loosen screw 8a (fig. 2a).
- Remove pin 8c to the right.
- Loosen screw 6.
- Take out circlip 6a.
- Remove rod 5.
- Loosen screws 29 and 41.
- Re-position feed-dog driving shaft 36 with the two cylindrical pins 30 and 40 sideways until the feed dog is centered in the needle plate cutout.
- Tighten screws 29 and 41 firmly.
- Disconnect spring 4a.
- Remove the needle plate.
- Use your finger to pull the feed dog to the front and let it go again.
- The complete feed-dog driving shaft must slide lightly back.
- Loosen screw 172 (fig. 2c).
- Move the complete top feed lever to and fro.
- The top feed must move smoothly and without any difficulty (if necessary, remove cause of binding).
- Fit pin 8c with the washer located to the left of pull-rod 8b without any play (fig. 2a).
- Move the complete top feed lever to and fro.
- The top and the bottom feed must move smoothly and without any difficulty.
- Tighten screw 8a and check again for smooth movement.
- Move crank pin 173 together with pull-rod 171 until the complete top and bottom feed can be moved easily.
- Tighten screw 172 and check again for smooth movement.
- Fit rod 5.
- Insert circlip 6a.
- Push the rod against connecting bar 8.
- Tighten screw 6.
- Connect spring 4a.

Cross-check:

The feed dog must now be centered in the needle plate cutout and the complete top and bottom feed must neither have play nor must it bind.

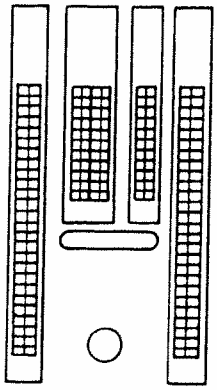


Fig. 2

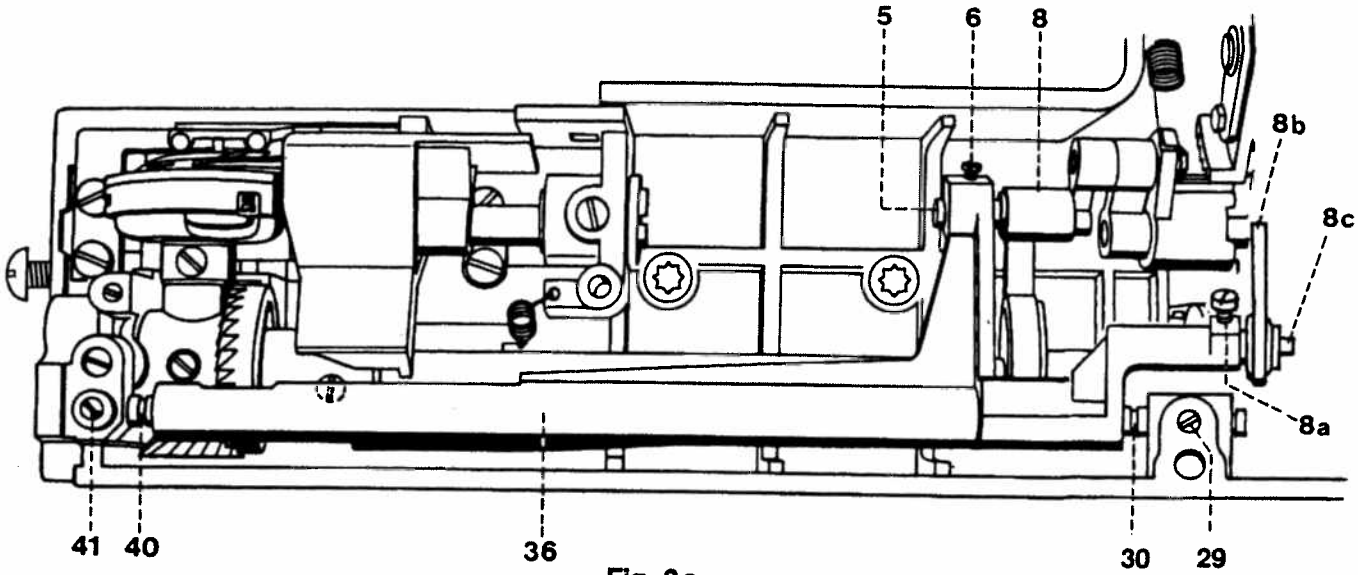


Fig. 2a

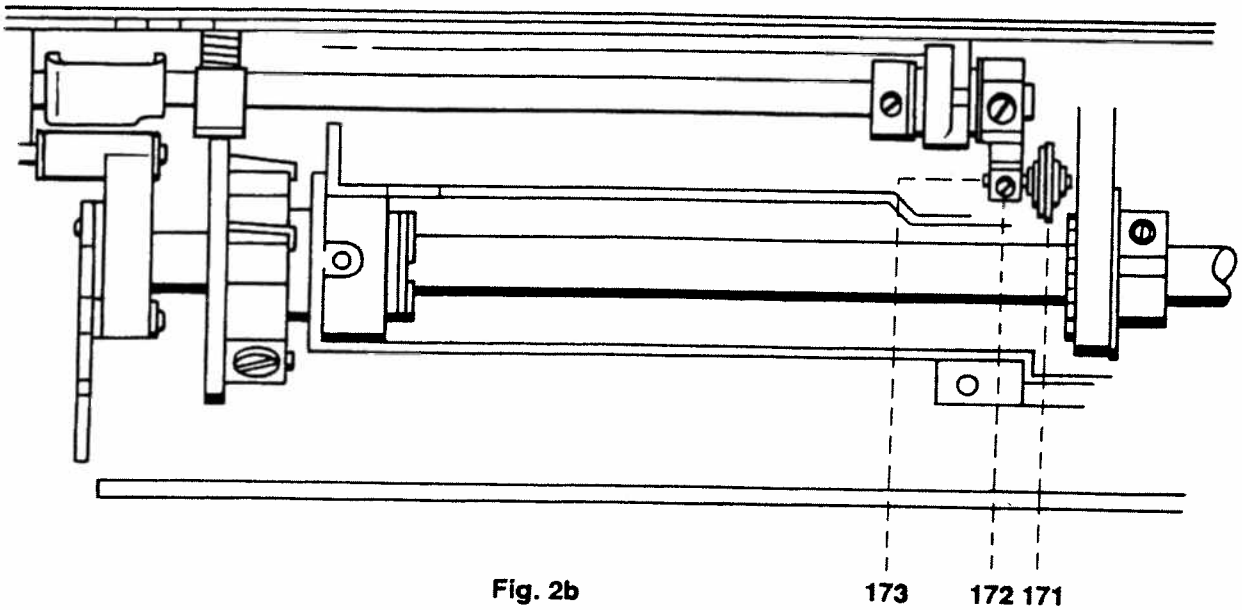


Fig. 2b

3. Adjustment of feed dog height

Requirement:

In the highest working position of the feed dog, the points of its teeth must protrude above the needle plate surface by 0.9 mm (fig. 3).

Check:

- Remove the needle.
- Remove the sewing foot.
- Switch on the master switch.
- Set the maximum stitch length.
- Set bridge gauge 63-112120-08 over the feed dog on the needle plate. – Turn the handwheel until the feed dog is in its highest working position.
- Carry out a visual check.
  The feed dog must not be in contact with the gauge and must be at a distance of 0.1 mm.

Adjustment:

- Loosen screw 3 by just 1/8 of a turn (fig. 3a).
- Turn eccentric stud 4 until the eccentric is facing rear (basic position).
- Turn eccentric stud 4 counter-clockwise until the heigth of the feed dog is correct.
- Tighten screw 3.

Cross-check:

- Turn the handwheel and check the feed dog height in its highest working position.
- The feed-dog lowering mechanism must not bind or hit against anything when the handwheel is turned.
- Lower the feed dog and check the function.

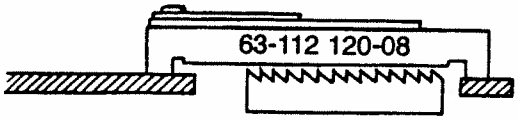


Fig. 3

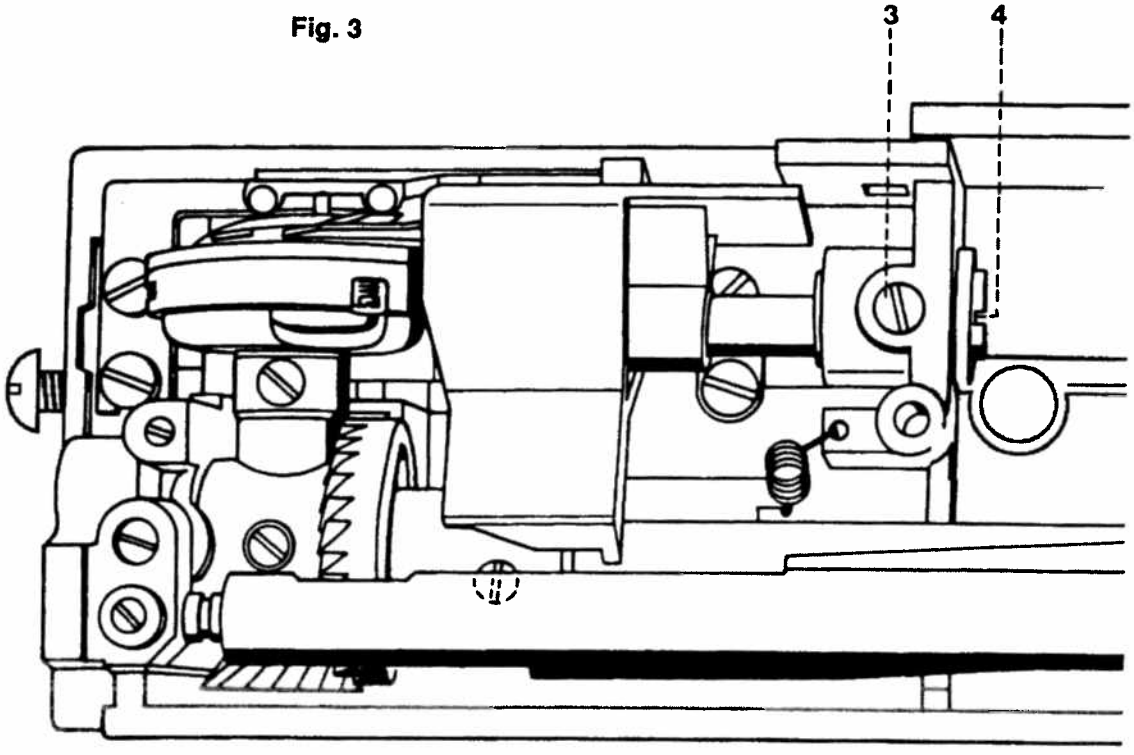


Fig. 3a

4. Adjusting the presser bar height on Pfaff 6110

Requirement:

With the presser bar lifter raised there must be a clearance of 8 mm between the needle plate and the sole of the zigzag foot.

Check:

- Raise the presser bar lifter.
- Fit the zigzag sewing foot.
- Lower the feed dog.
- Fully raise the presser bar lifter and hold it there.
- Insert sewing foot gauge No. 63-114690-39 from behind under the zigzag foot and into the cutouts of the needle plate at the same time (fig. 4).
- Lower the presser bar lifter to its normal position again. The zigzag foot must rest parallel and without play on the sewing foot gauge. However, the sewing foot gauge must not lift the zigzag foot, and the needle thread tension release 44 must be without play.

Adjustment:

- Loosen screw 47 (fig. 4a).
- Turn the zigzag foot with the presser bar lifter raised until it is parallel with the sides of the sewing foot gauge.
- Use a screwdriver to press presser bar guide 48 firmly down.
- At the same time tighten screw 47 firmly.

Cross-check:

- Press the presser bar lifter briefly upwards from its already raised position and release it again. The zigzag foot must rest parallel and without play on the sewing foot gauge. The needle thread tension release must not have any play. The presser bar lifter must be in its raised position.

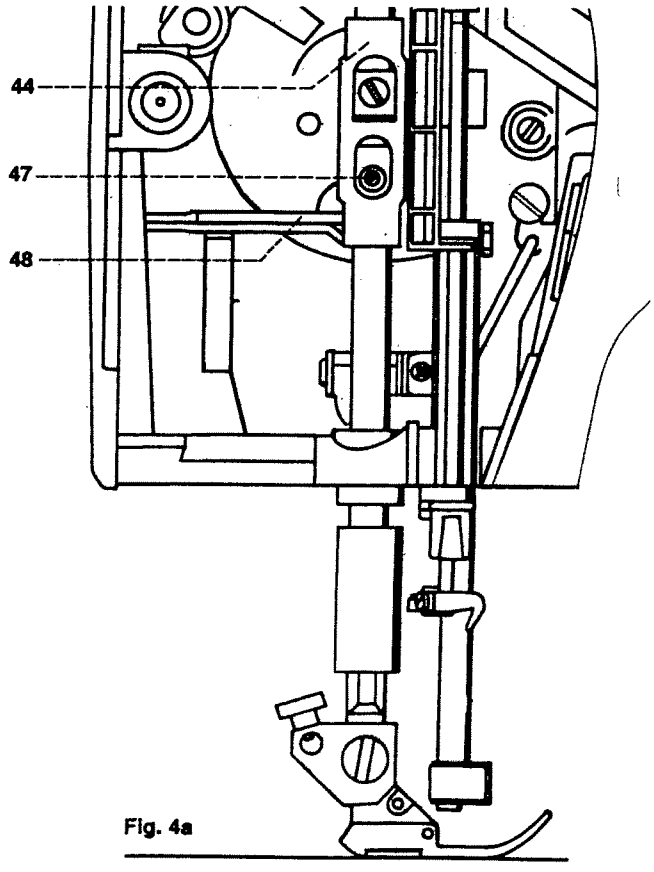


Fig. 4a

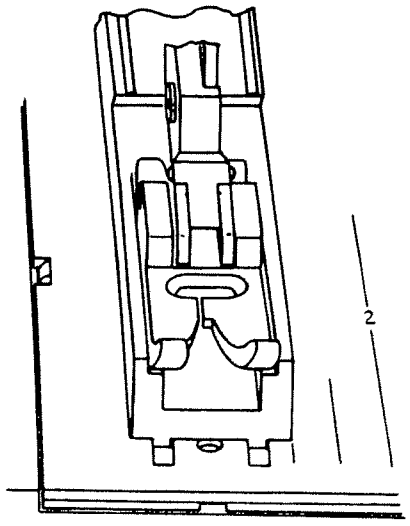


Fig. 4

4a. Adjusting the presser bar height on Pfaff 6120-6230

Requirement:

With the presser bar lifter raised there must be a clearance of 8 mm between the needle plate and the sole of the zigzag foot.

Check:

- Raise the presser bar lifter.
- Fit the zigzag sewing foot.
- Lower the feed dog.
- Fully raise the presser bar lifter and hold it there.
- Insert sewing foot gauge No. 63-114690-39 from behind under the zigzag foot and into the cutouts of the needle plate at the same time (fig. 4b).
- Lower the presser bar lifter to its normal position again. The zigzag foot must rest parallel and without play on the sewing foot gauge. However, the sewing foot gauge must not lift the zigzag foot, and the needle thread tension release must be without play

Adjustment:

- Loosen the three screws 46, 47 and 50.
- Turn the zigzag foot with the presser bar lifter raised until it is parallel with the sides of the sewing foot gauge.
- Use a screwdriver to press presser bar guide 48 firmly down.
- At the same time tighten screw 184 firmly.

Cross-check:

- Press the presser bar lifter briefly upwards from its already raised position and release it again. The zigzag foot must rest parallel and without play on the sewing foot gauge. The needle thread tension release must not have any play. The presser bar lifter must be in its raised position.

Note:

The two screws 46 and 50 are not tightened until later when the top feed foot height is set.

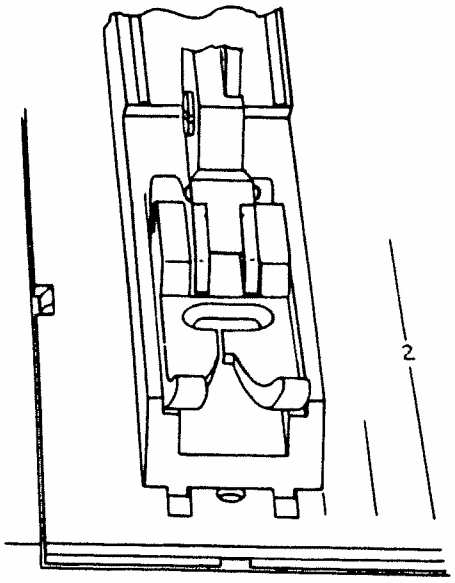


Fig. 4b

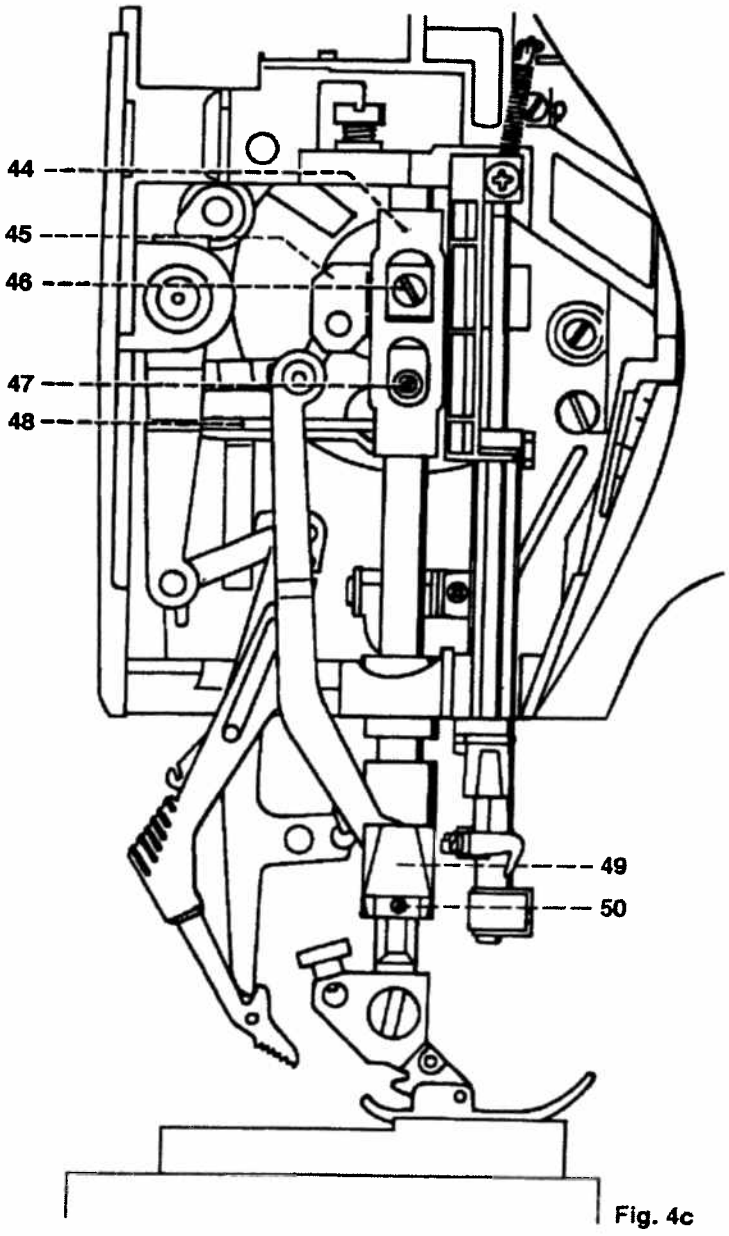


Fig. 4c

5. Adjustment of top feed foot in sewing direction

Requirement:

The front edge of the top feed foot must be between the first and second tooth point of the feed dog (fig. 5).

Check:

- Raise the presser bar lifter.
- Remove the entire sewing foot.
- Set the maximum stitch length.
- Engage the top feed.
- Turn the handwheel until the rising feed dog is flush with the surface of the needle plate.
- Lower the presser bar lifter.
- Carry out a visual check.

Adjustment:

- Loosen screw 43 (fig. 5a).
- Position the presser bar lifter so that the top feed foot is just resting on top of the feed dog.
- At the same time push the top feed foot to the front or to the rear until the front edge is inbetween the first and second tooth point of the middle tooth row.
- Lower the presser bar lifter.
- Tighten screw 43 making sure that driving shaft 42 has no play.

Cross-check:

- Cross-check as described under „Check".

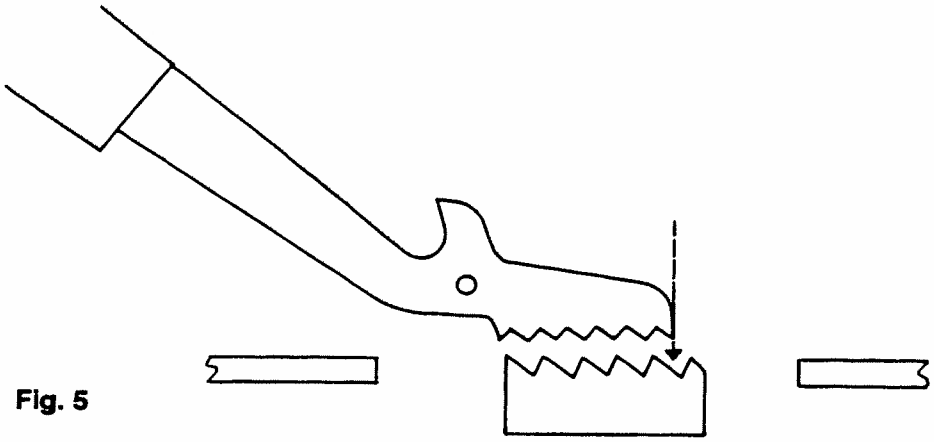


Fig. 5

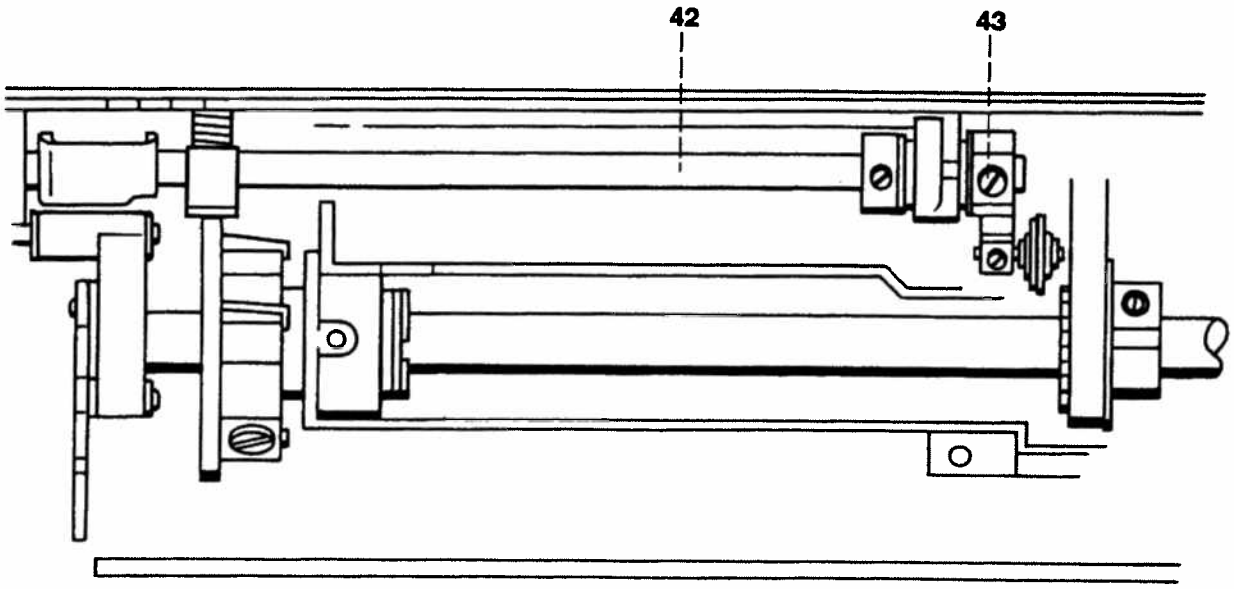


Fig. 5a

6. Adjustment of top feed foot height

Requirement:

In its highest working position the top feed foot must be 2 mm higher than the lower edge of the zigzag foot sole (fig. 6).

Note:

This adjustment must only be carried out when the height of the presser bar is set correctly!

Check:

- Raise the presser bar lifter.
- Insert the zigzag foot sole.
- Engage the top feed.
- Turn the handwheel until the needle bar is in its lowest position.
  Caution: Now the handwheel must not be turned any more!
- Lower the feed dog.
- Fully raise the presser bar lifter and hold it in this position.
- Insert sewing foot gauge No. 63-114690-35 from behind under the zigzag foot and into the cutouts of the needle plate.
- Let the presser bar lifter down again to its normal raised position.
- Press top feed foot 51 upward by about 2 mm against its spring pressure and then release it.
- Press the top feed foot lightly downward.
- Check that the top feed foot rests only lightly on the sewing foot gauge and has no play.

Adjustment:

- Loosen screws 46 and 50.
- Push counter bearing 45 lightly down until top feed foot 51 rests lightly on the sewing foot gauge.
- Tighten screw 46 in this position.

Cross-check:

Check for light resting and lack of play of the top feed foot on the sewing foot gauge as described under „Check".

Adjusting the guide piece:

- Fully raise the presser bar lifter and hold it in this position.
- Remove the sewing foot gauge.
- Let the presser bar lifter down again to its normal raised position.
- Turn the handwheel to set needle bar 53 exactly at its highest position.
- Set guide piece 49 at a clearance of 0.2 mm from cross head 52 (fig. 6a).
- Tighten screw 50.

Cross-check:

- Turn the handwheel and check the clearance of 0.2 mm.

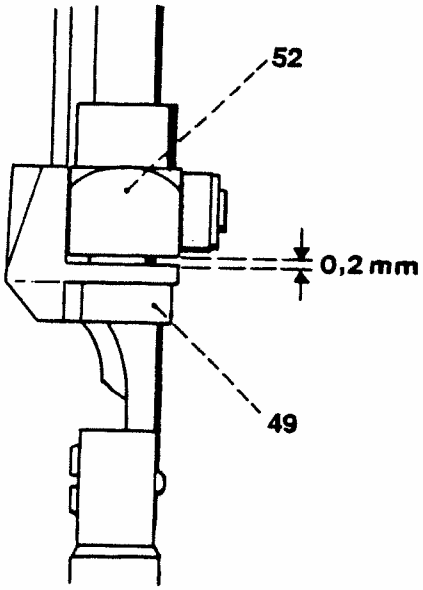


Fig. 6a

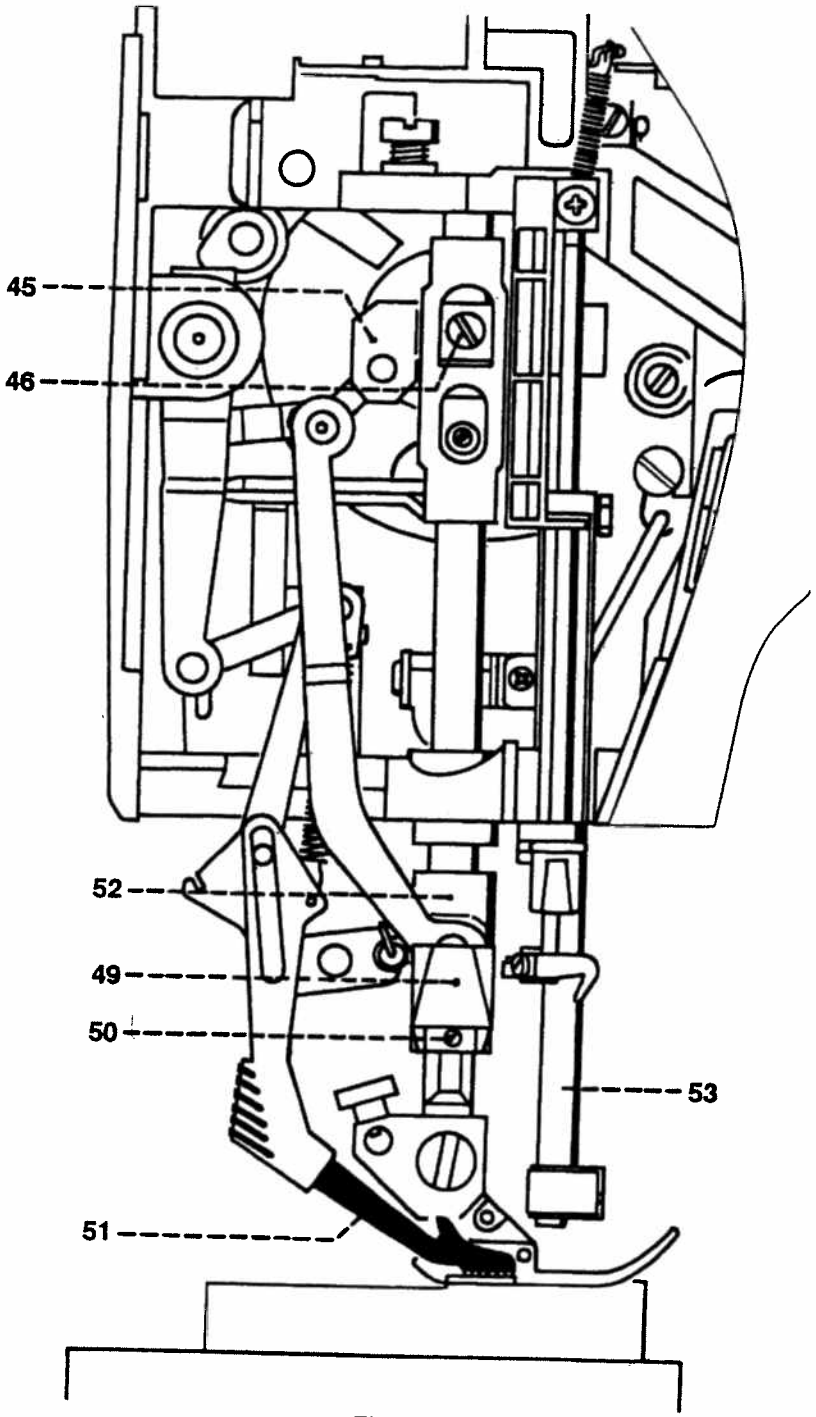


Fig. 6

7. Adjustment of feed regulator cranks

Requirement:

The feed regulator cranks must not have any play in the lengthwise direction.

Check:

Move the cranks to and fro in the sideways direction (fig. 7).

Adjustment:

- Loosen the two screws 6 and 26.
- Push driving eccentric 32 to the right against the bearing.
- Push rod 5 to the right until connecting bar 34 is in contact with edge 33 of driving eccentric 32.
- Push the circlip along with shaft 27 and tooth segment 28 along with actuating crank 10 to the left until no crank or joint has any play anymore.
- Tighten screws 6 and 26.

Cross-check:

- Set the stitch length regulation disc at „6".
- Disconnect spring 12.
- Check the joints for easy movement and lack of play.
- Connect spring 12.

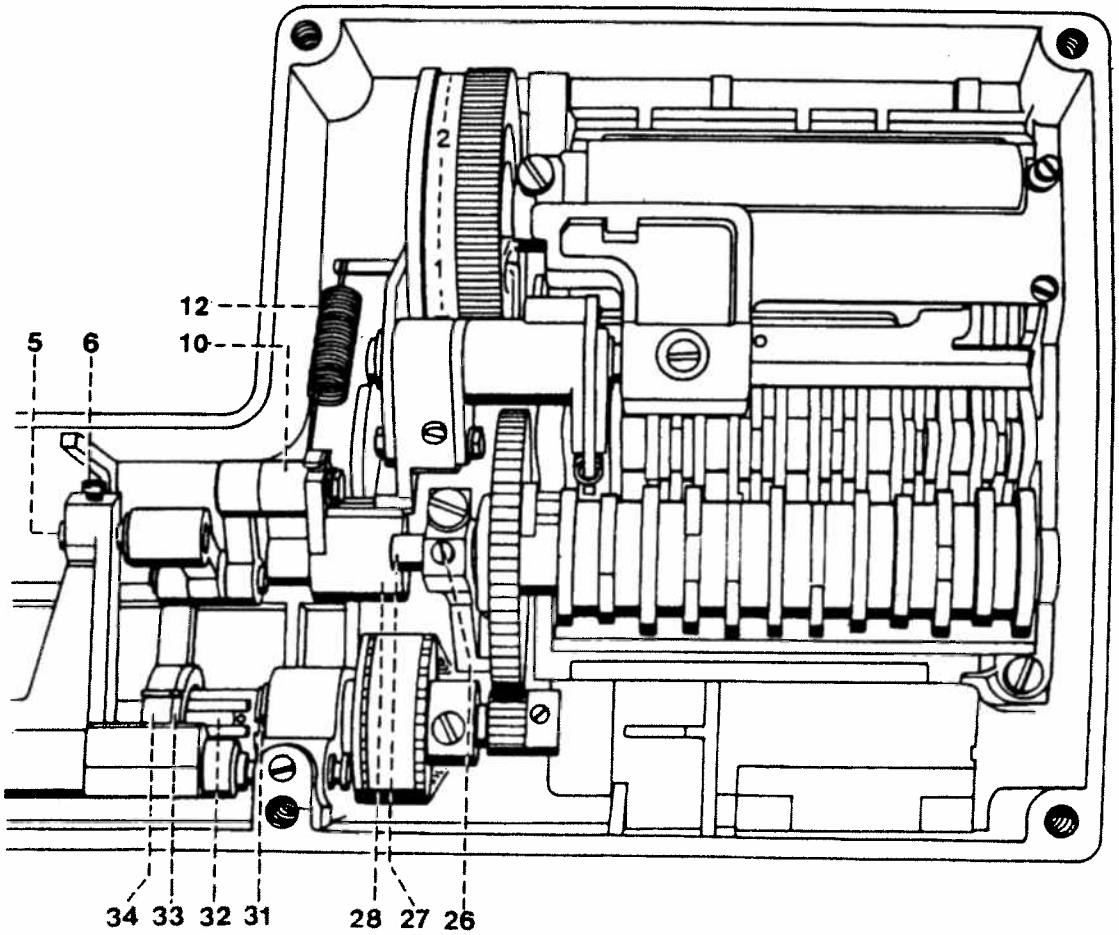


Fig. 7

8. Adjustment of feed regulator

Requirement:
When the stitch length regulation disc is set at „0“ the feed dog must only move up or down.

Check:

- Set the stitch length regulation disc at „0“.
- Place a piece of fabric under the sewing foot.
- Lower the sewing foot.
- Run the machine.
  The fabric must not be fed neither forwards nor backwards.

  Precondition 1:
  The dot markings on the tooth segments must be opposite each other (fig. 8a).

  Precondition 2:
  Eccentric 194 must be in its basic position facing upwards (fig. 8).

Adjustment:

- Loosen screw 11 with a 5.5 mm wrench.
- Re-position screw 11 until the center lines of the rods in actuating crank 10 and linkage 9 and rod 8 are level (see dot-dash line).
- Tighten screw 11.

Check:

Carry out as under „Check“.

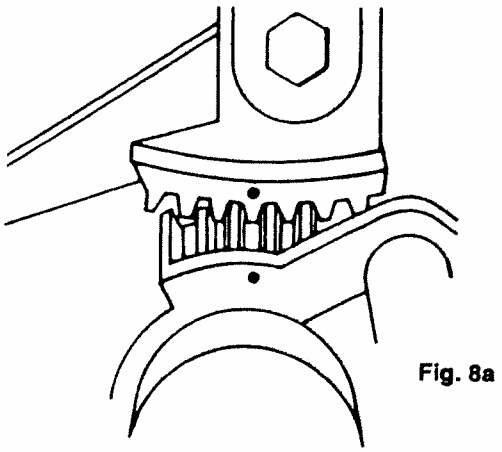


Fig. 8a

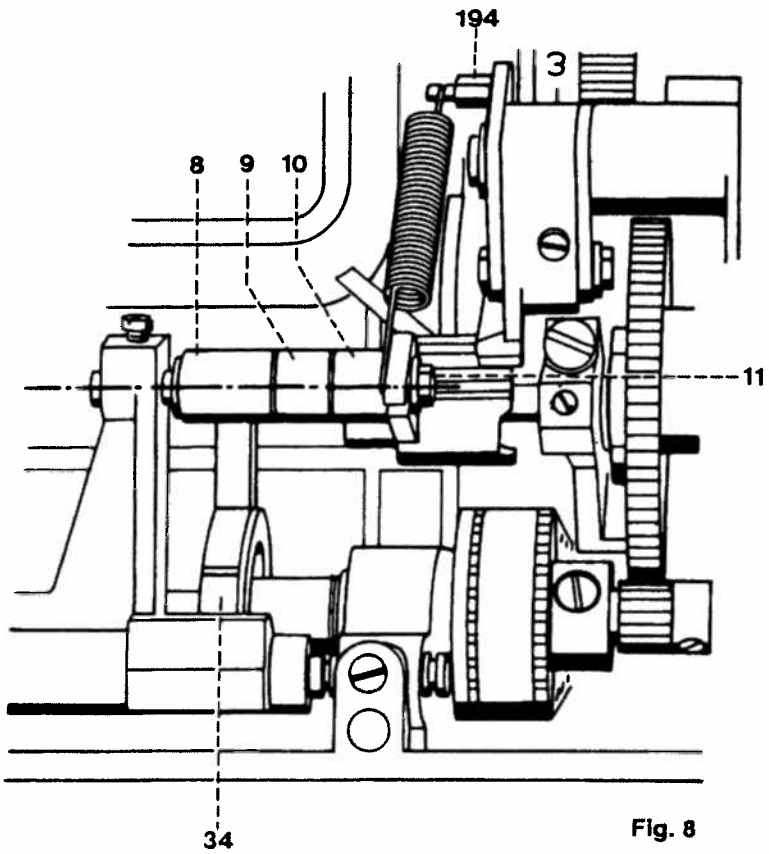


Fig. 8

9. Timing of feed motion

Operating sequence:
When the rising needle has left the fabric, the feed dog moves up above the needle plate. The risen feed dog pushes the fabric to the rear.

Shortly before the end of the feed motion the take-up lever is in its highest position (t.d.c.). At a stitch length setting of 6 mm the feed dog now pushes 0.7 mm more to the rear (after-feed movement).

After completing the feeding movement, the feed dog moves down under the needle plate surface and the needle enters the fabric.

Underneath the needle plate the feed dog moves back to its basic position.

Requirement:
When the needle bar has moved 2 mm up from its lowest position (b.d.c.), the two marks on edge 33 of feeding eccentric 32 and on connecting bar 24 must be opposite each other (fig. 9).

Check:
- Remove the needle.
- Set the needle bar at its lowest position by turning the handwheel.
- Fit the spacer (63-102 600-18) on top of the needle bar and push it upwards against the needle bar frame (fig. 9a).
- Push the needle-rise clamp (00-870 137-01) on the needle bar and tighten it lightly.
- Push the 2-mm feeler gauge (00-870 136-01) with its cutout on the needle bar above the needle-rise clamp.
- Loosen the needle-rise clamp and push the 2-mm feeler gauge upwards against the spacer.
- Tighten the milled screw of the needle-rise clamp.
- Turn the handwheel back and forth a little.
- If there is play at the feeler gauge, repeat the procedure.
- Remove the 2-mm feeler gauge.
- Turn the handwheel in the sewing direction until the needle-rise clamp is in contact with the spacer (fig. 9b).
- Tilt the machine over backwards.
  The marks on edge 33 of feeding eccentric 32 and connecting bar 34 must now face each other (fig. 9).

Adjustment:
- If the adjustment is not correct, remove the needle-rise clamp.
- Loosen the three screws 24 in the lower toothed-belt sprocket.
- Re-fit the needle-rise clamp and repeat the operation as described in „Check" until the needle bar has moved 2 mm upwards and the clamp is in contact with the spacer (fig. 9b).
- Turn the long drive shaft 35 in sewing direction until the marks on feeding eccentric 32 and on connecting bar 34 face each other (fig. 9).

Cross-check:
- Turn the handwheel back and forth again until the clamp is in contact with the spacer.
  The marks must now face each other.
- Tighten all three screws 24 very firmly.

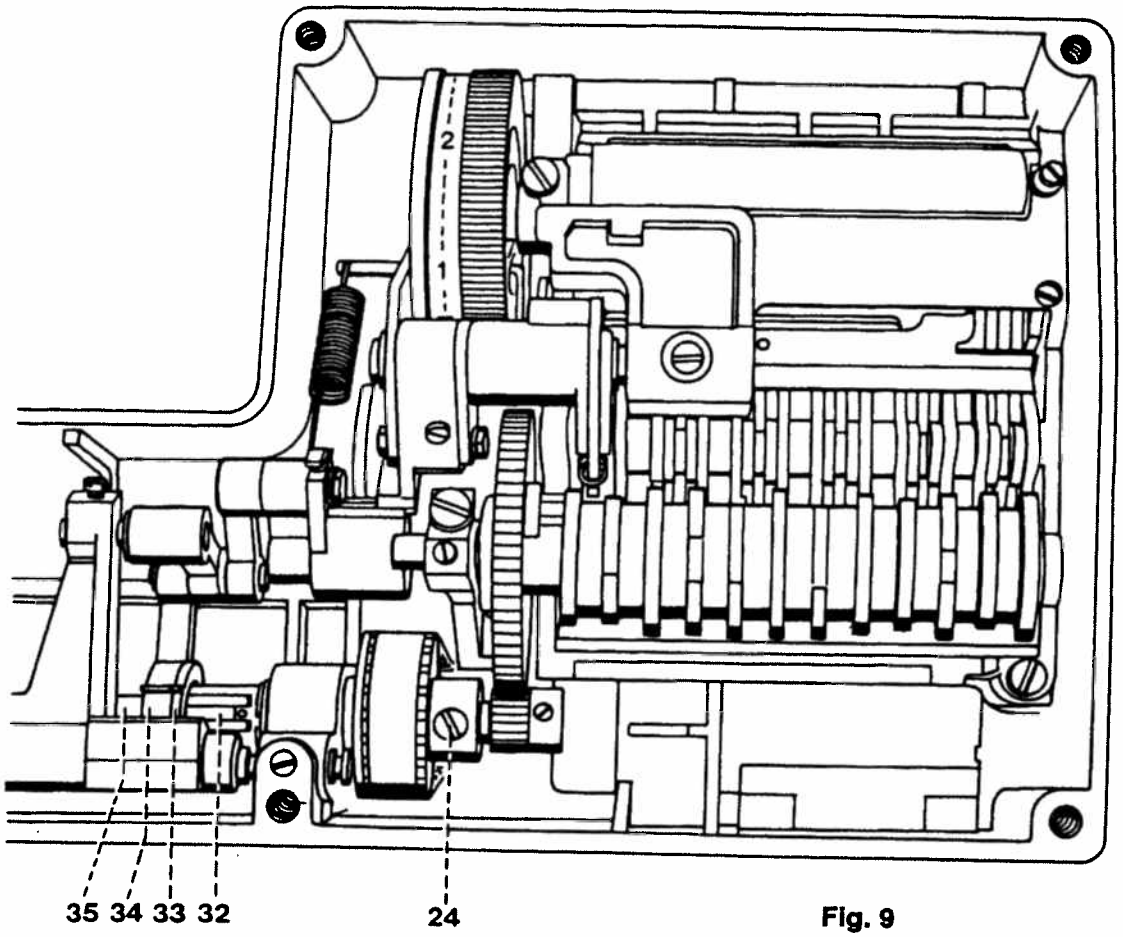


Fig. 9

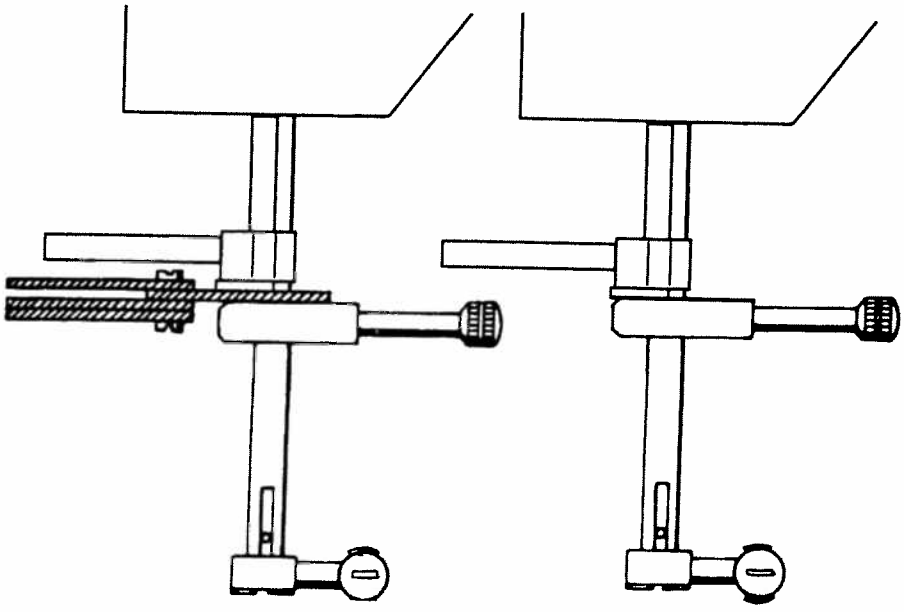


Fig. 9a

Fig. 9b

Automatic utility-stitch unit

10. Dismantling the utility stitch module

Removal:

- Loosen screw 6 (fig. 10).
- Remove circlip 7.
- Remove stud 5.
- Remove circlip 13.
- Disconnect pull-rod 14.
- Disconnect the feed regulator cranks together with connecting bar 34 to the left.
- Unscrew screws 17, 19, and 25.
- Remove the complete utility stitch module downwards.

11. Fitting the utility stitch module

Note:

Before fitting the automatic module make sure that the two dot marks on the thooth segments are exactly opposite each other (fig. 11).

Fitting:

- Insert the utility stitch module in the machine.
- Insert the two long screws 19 and 25 at the bottom and the shorter screw 17 at the top and tighten them lightly (fig. 10).
- Push the feed regulator cranks on the stud of actuating crank 10.
- Insert stud 5.
- Insert circlip 7.
- Push stud 5 to the right until the feed regulator cranks have no sideways play and move easily.
- Tighten screw 6.
- Connect pull-rod 14.
- Fit circlip 13.

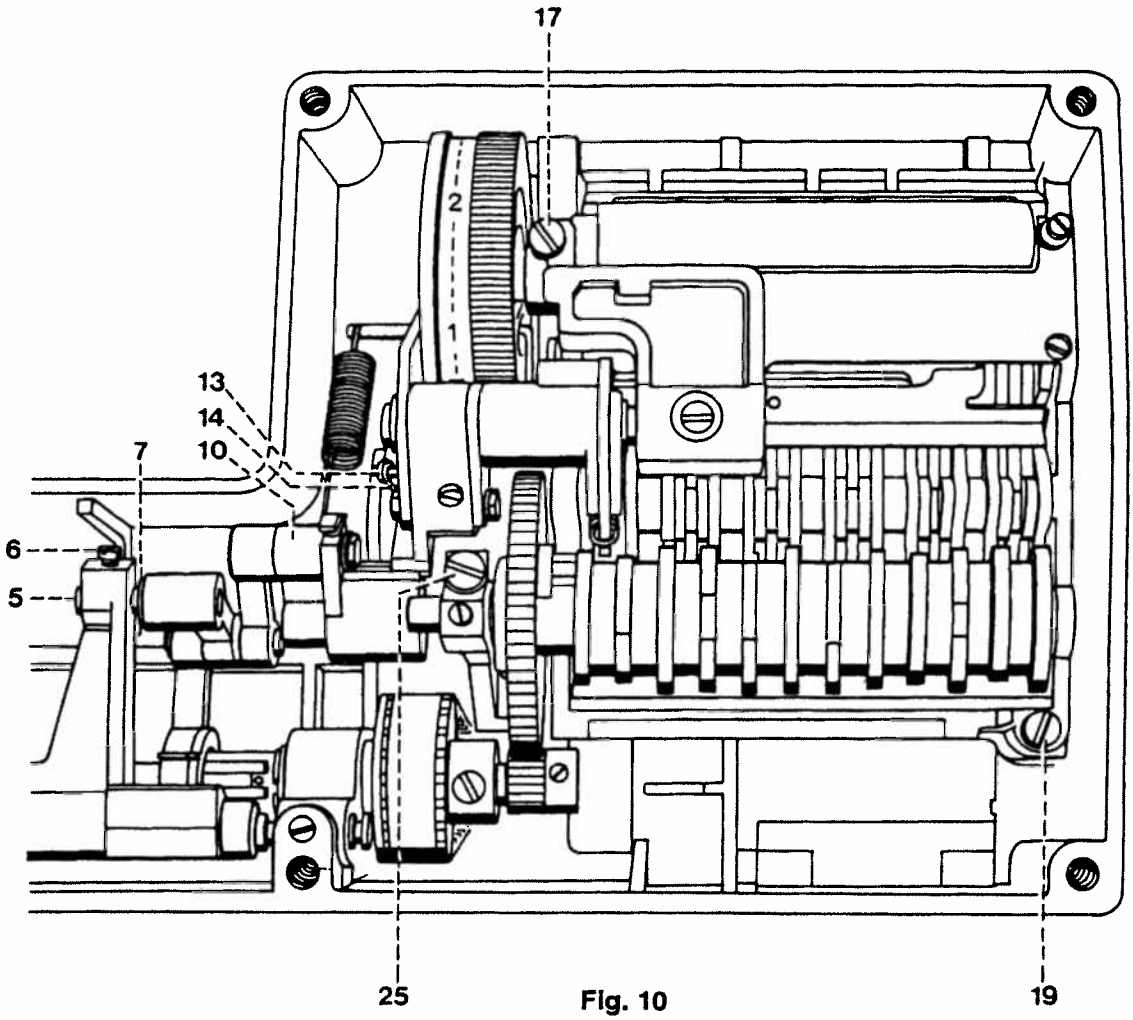


Fig. 10

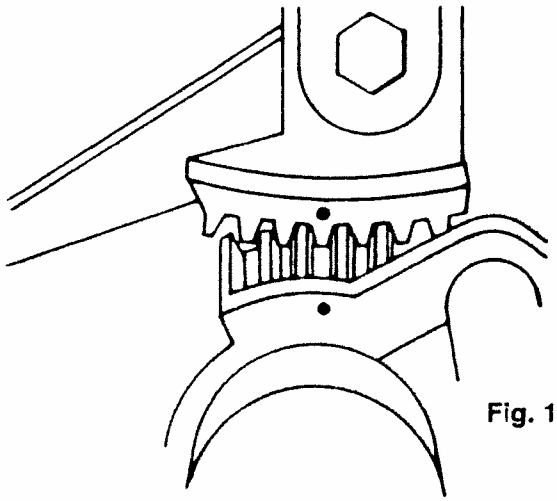


Fig. 11

12. Adjusting the gears

Requirement:

The two gears must not have any play, must not bind, and must stand parallel to each other.

Check:

- Check for free running by turning the handwheel, check for lack of play by turning the gears back and forth and carry out a visual check of the parallelity.

Adjustment:

- Having loosened the three screws 17, 19 and 25 adjust the two gears 22 and 23 so that they are parallel (fig. 12).
- Tighten the three screws.

Cross-check:

- Check as described under „Check".
- Tighten screws 17, 19 and 25 very firmly.

Note:

The feed regulator cranks must now be adjusted according to item 7 of the adjustment and repair manual.

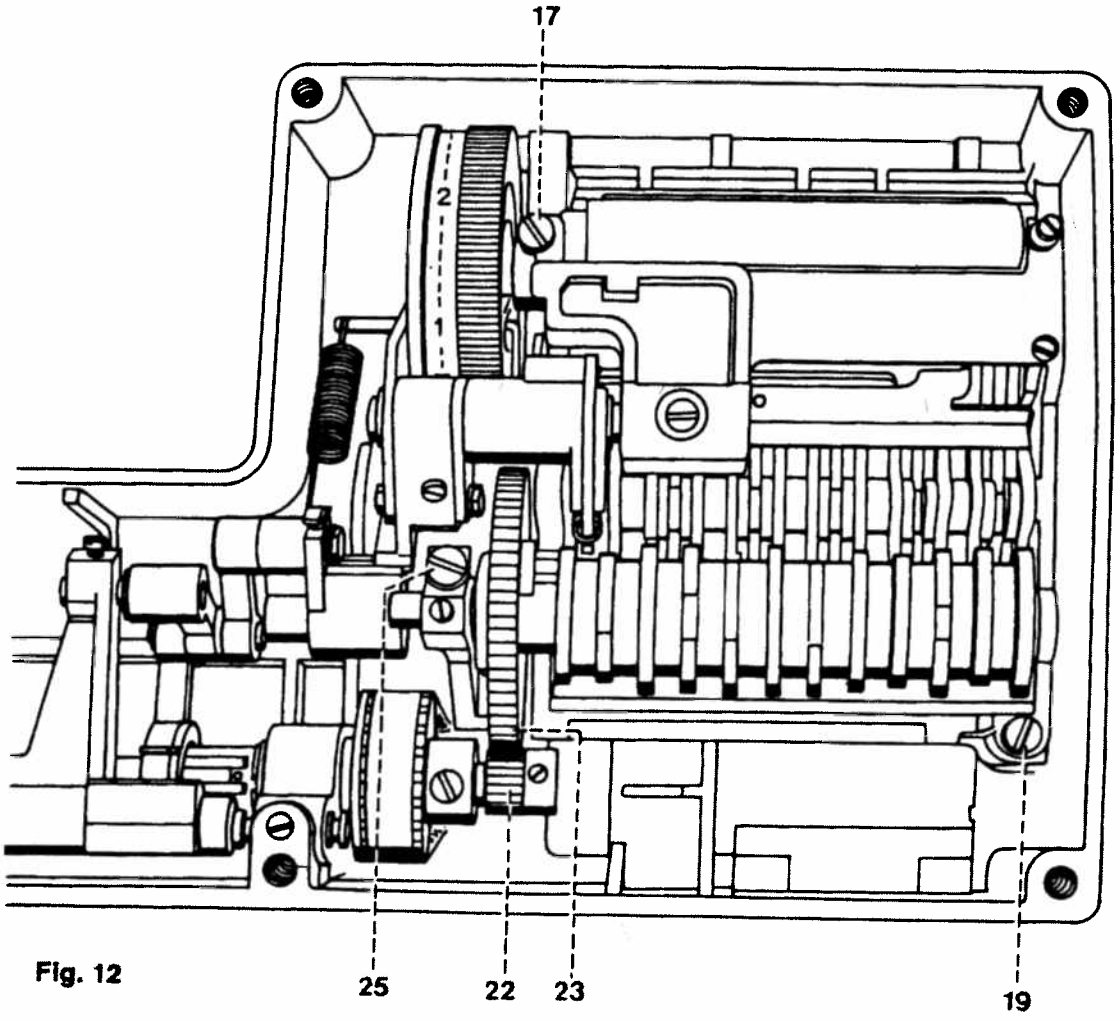


Fig. 12

13. Basic position of adjustment eccentric for the sideways needle position

Requirement:

In its basic position the adjustment eccentric must point upwards at a position 45 degrees towards the left.

Adjustment:

- Press the straight stitch key.
- Loosen screw 56 (fig. 13).
- Turn adjustment eccentric 57 upwards and 45 degrees to the left.
- Turn adjustment eccentric 57 to the left and to the right until the needle is centered in the needle hole.
- Tighten screw 56.

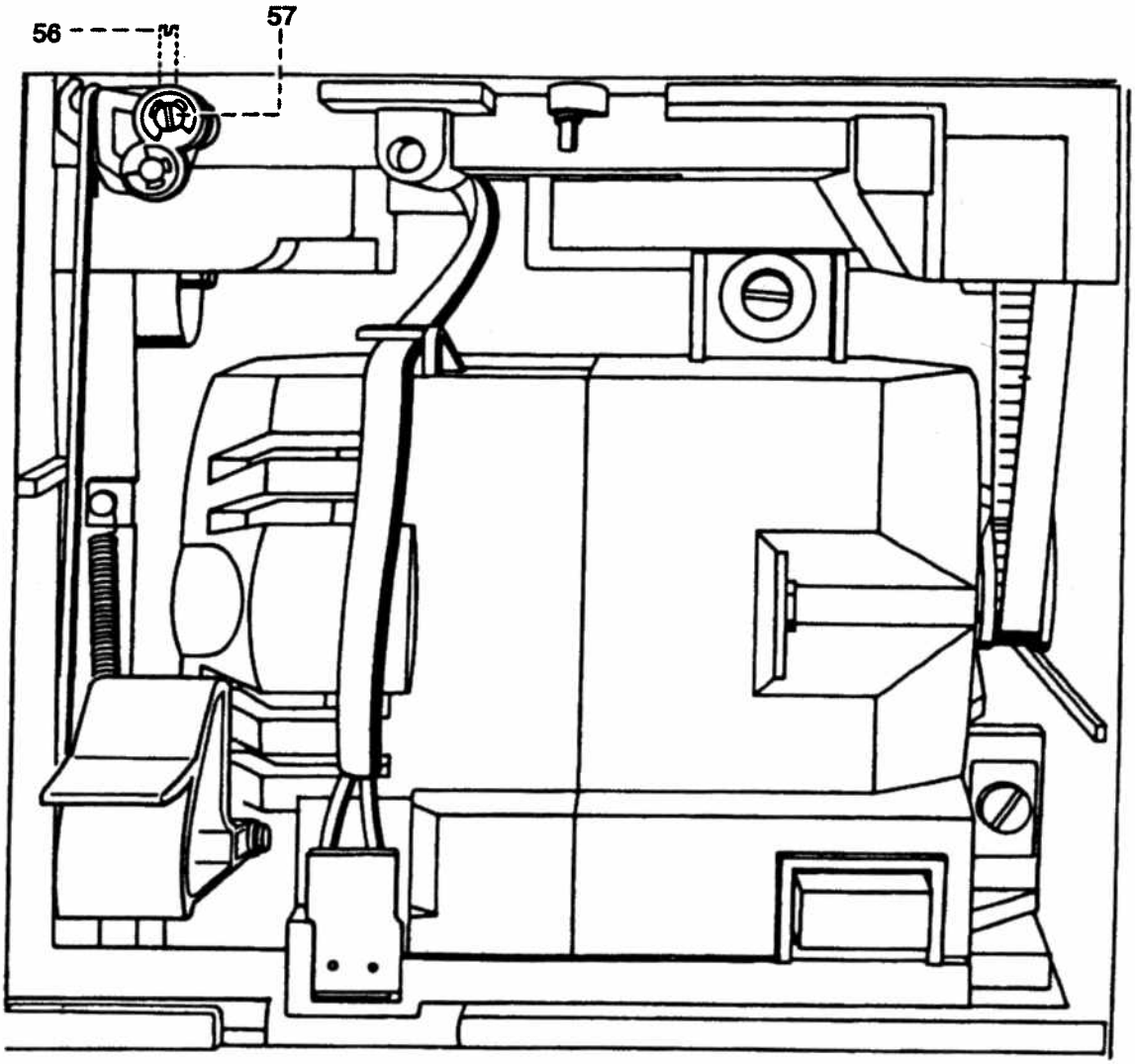


Fig. 13

14. Adjusting the sideways movement of the needle bar

Requirement:

When sewing a zigzag stitch the needle must carry out its sideways movement above the highest possible fabric thickness.

The sideways movement of the needle must start as soon as the needle point has left the needle plate.

It must be completed before the needle enters the fabric.

This is at 8 mm above the needle plate (fig. 14).

Check:

- Press the key for the widest zigzag stitch.
- Remove the sewing foot.
- Turn the handwheel in the normal direction of rotation until the point of the rising needle is at the top surface of the needle plate (fig. 14a).
- It is possible to check the beginning of the sideways needle movement by touching the needle bar frame and at the same time the sewing head with the left forefinger while turning the handwheel very slowly.

Adjustment:

- Loosen the two screws 21 (fig. 14b).
- Turn the handwheel in the normal direction of rotation until the point of the rising needle is at the top surface of the needle plate (fig. 14a).
- Turn the large gear 23 in the direction indicated by the arrow until finger 18 (fig. 14c) is exactly at the starting point of the rising cam 20.
- Hold the large gear 23 firmly so that this position cannot be lost.
- Disengage the small gear 22 to the right, turn it until you can reach one of screws 21 and then push it back fully to the left and engage it again.
- Tighten screw 21 a little.

Cross-check:

- Check the sideways movement of the needle bar as described under „Check".
- Tighten both screws 21.

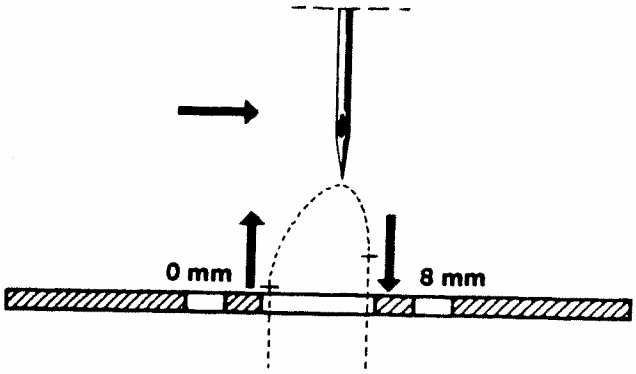


Fig. 14

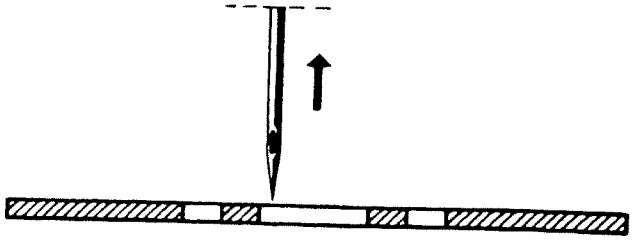


Fig. 14a

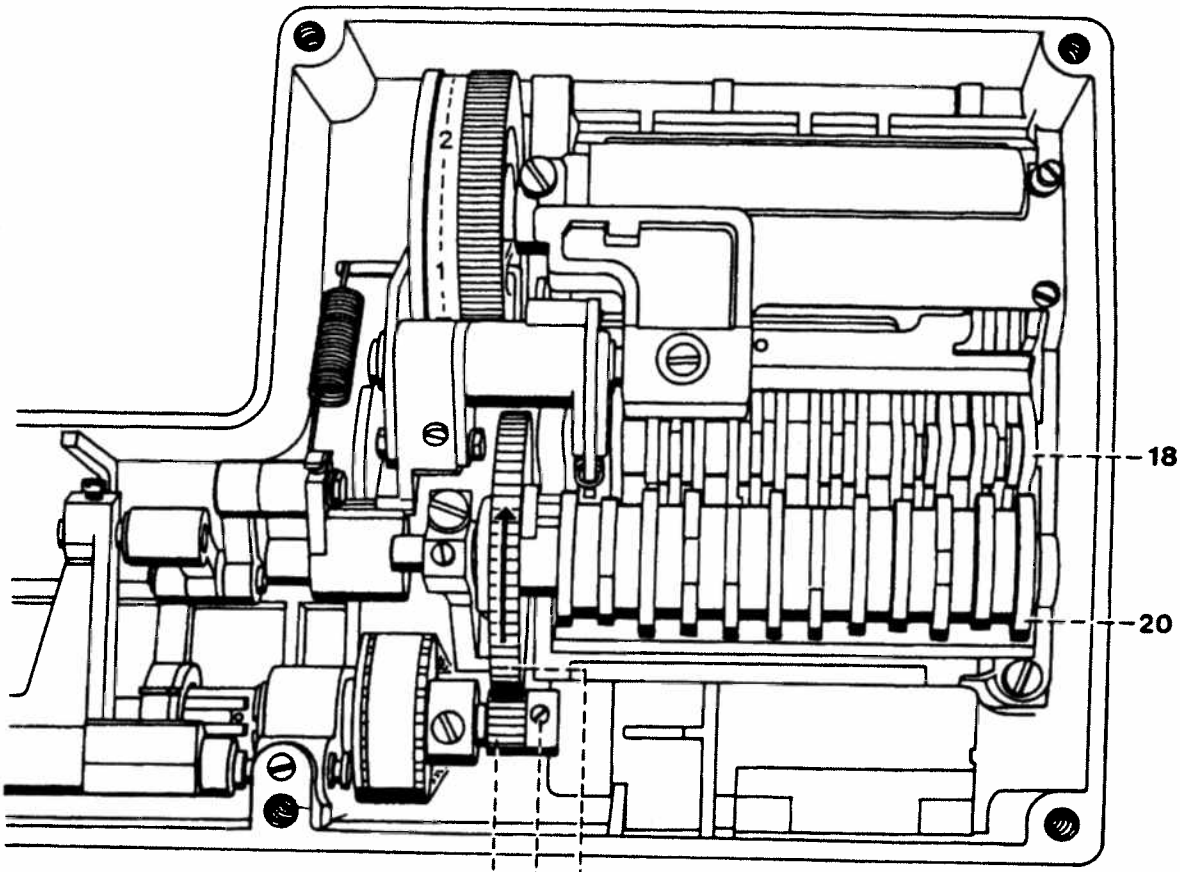


Fig. 14b

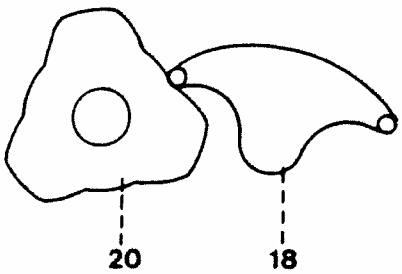


Fig. 14c

15. Adjusting the zigzag movement of the needle in the needle hole

Requirement:

The widest zigzag stitches must have the same distance to the left and right edges of the needle plate slot (fig. 15).

Check:

- Remove the sewing foot.
- Insert a new needle.
- Press the key for the widest zigzag stitch.
- Turn the handwheel and check the left and the right clearance in the slot.

Adjustment:

- Loosen screw 63 (fig. 16a) and push stop 62 to the left.
- Loosen screw 56 (fig. 15a).
- Turn the adjustment eccentric 57 until the two clearances are equal.
- Tighten screw 56.

Cross-check:

- Turn the handwheel and check the clearances.

Note:

The adjustment of stop 62 is described in section 16.

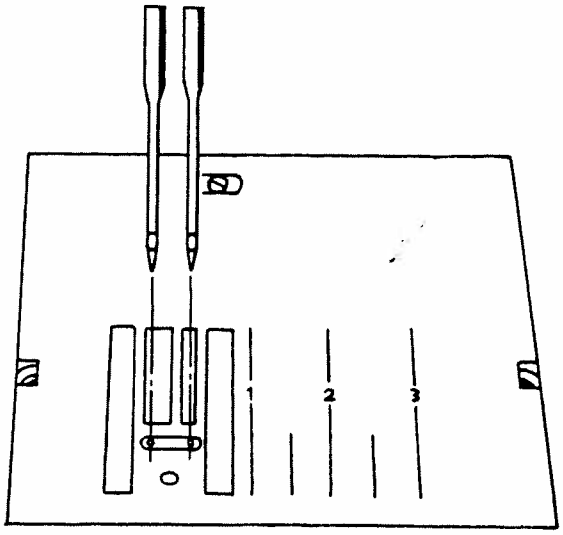


Fig. 15

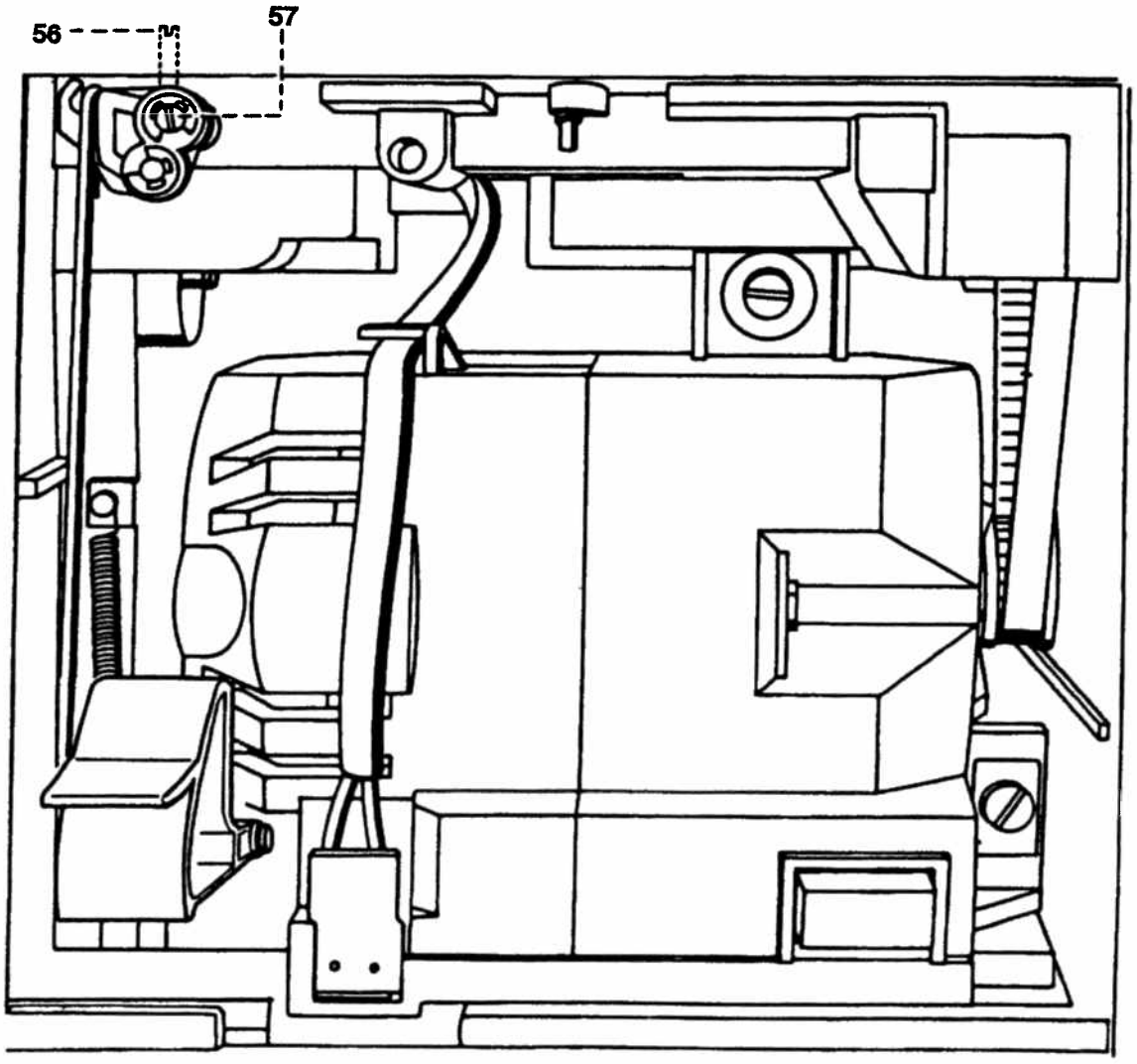


Fig. 15a

16. Adjusting the stop for the left needle position

Requirement:

When all keys are switched off the needle must be approx. 0.2 mm further left than the widest zigzag stitch.

The needle must not touch the needle plate.

Check:

- Press the key for the widest zigzag stitch.
- Turn the handwheel until the needle moves downward on the left side and is at a position of roughly 1 mm above the needle plate (fig. 16).
- Press the key for the buttonhole tack.
  Now the needle must move approx. 0.2 mm to the left.

Adjustment:

- Press the key for the widest zigzag stitch.
- Loosen screw 63 (fig. 16a).
- Move stop 62 to a position 0.2 mm from the pin.
- Tighten screw 63.

Cross-check:

- Press the key for the widest zigzag stitch and the key for the buttonhole bartack alternately and check whether the needle moves by approx. 0.2 mm without hitting the needle plate.

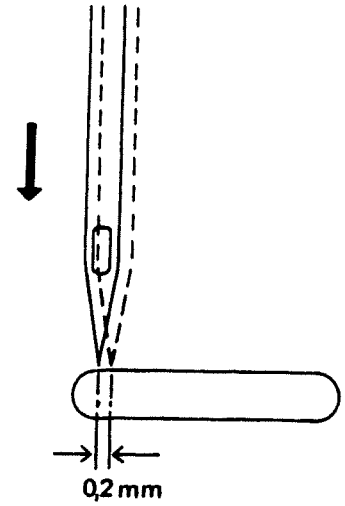


Fig. 16

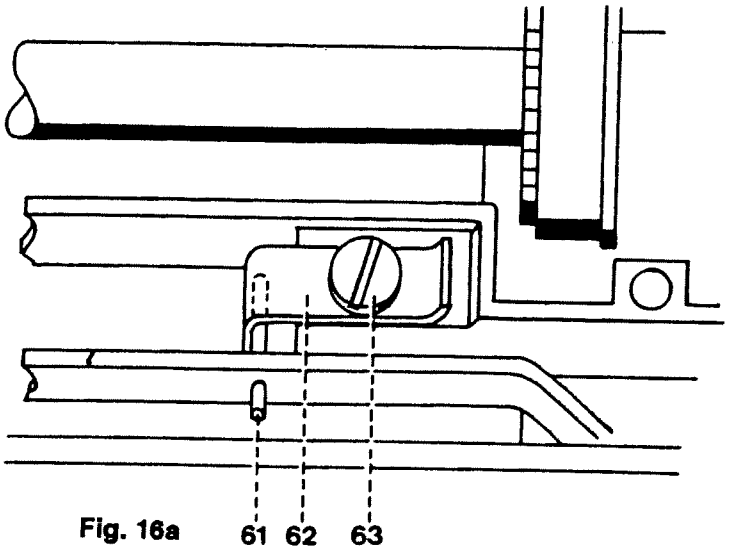


Fig. 16a

Automatic fancy stitch unit

17. Replacing the automatic module

Removal:

- Disconnect the mains plug from the machine.
- Remove the housing cover according to the adjustment and repair manual.
- Pull out light plug 60 (fig. 17a).
- Disconnect spring 200 at the top of the push-lever.
- Dismantle the reverse key 202.
- Unscrew the two screws 58 and 59 and remove the two washers.
- Remove motor sprocket 133 from toothed belt 135 and remove the motor to the front.
- Remove circlip 203 (fig. 17).
- Remove the two screws 205.
- Remove the entire automatic module downwards.

Fitting:

- Loosen the three screws 207 of worm 208.
- Move worm 206 to the left.
- Insert the module upwards and at the same time insert pin 204 in the eyelet on connecting bar 201.
- Tighten the two screws 205 just a little.
  Make sure that the module is pulled to the front and has a parallel position in the housing.
- Push circlip 203 onto pin 204.
- Insert the motor and at the same time install motor sprocket 133 in toothed belt 135 (fig. 17a).
- Insert the two screws 58 and 59 with their washers and tighten them a little.
- Adjust the toothed belt correctly and tighten up the two screws 58 and 59.
- Install reverse key 202.
- Connect spring 200 at the top of the push-lever.
- Connect light plug 60.

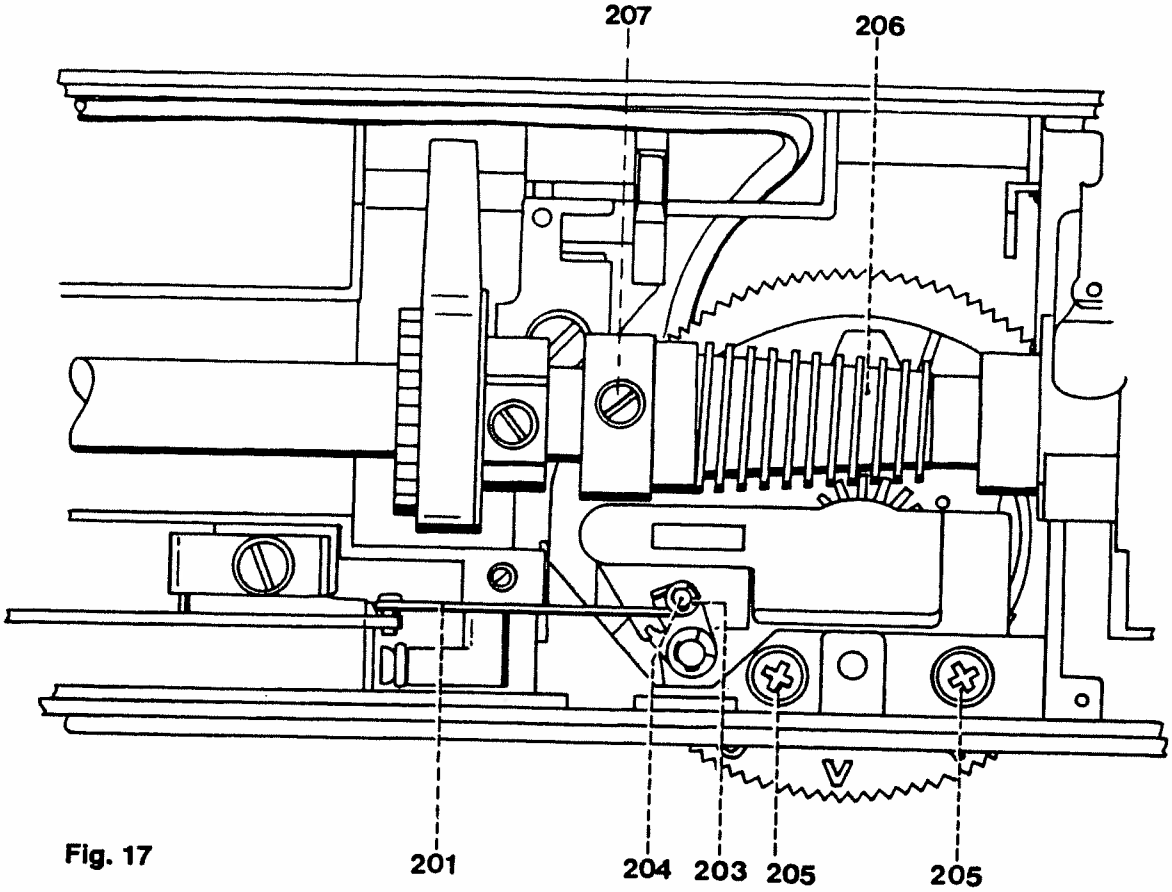


Fig. 17

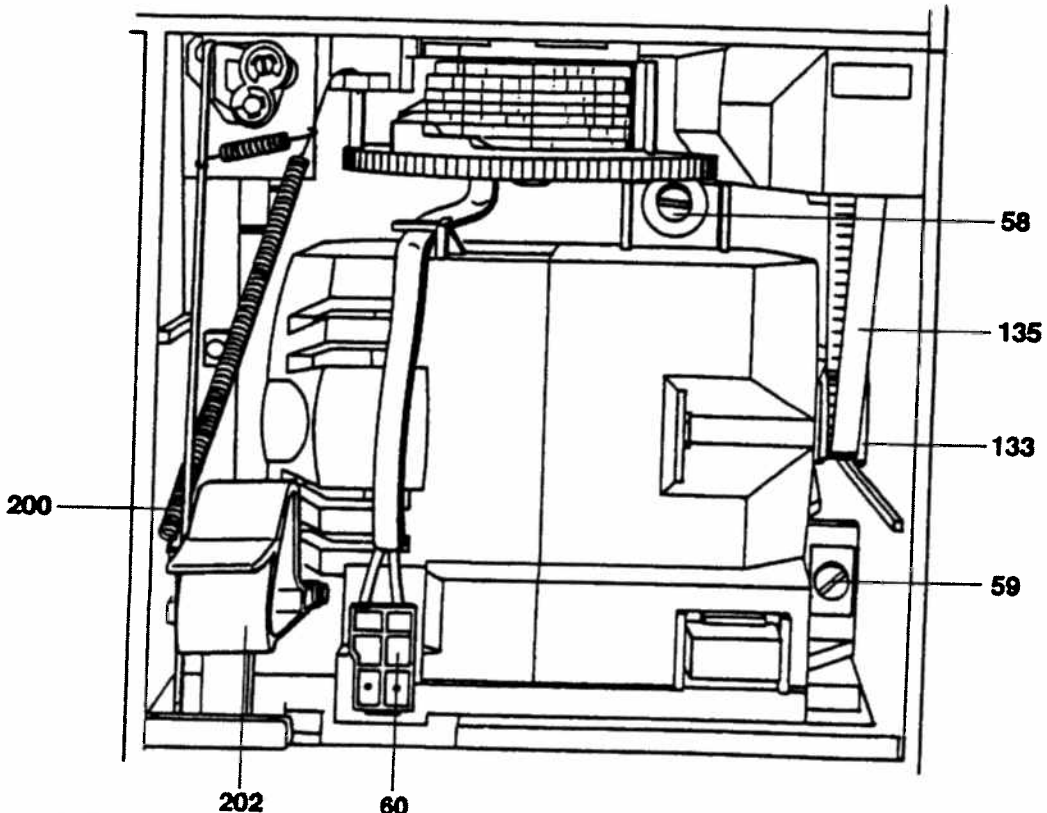


Fig. 17a

18. Adjusting the locking disc

Note:

Carry out this adjustment only if compelling reasons exist. For this adjustment the automatic module has to be dismantled.

Requirement:

With the automatic module switched off lifting pin 208 must be centered in the slot (fig. 18).

Check:

- Set regulation disc 210 at the dot mark.
- Move push-lever 209 back and forth.
- Lifting pin 208 must be exactly in the center of the slot and must not touch the left wall of the slot when moving.

Adjustment:

- Loosen screw 211 just lightly (fig. 18a).
- Turn regulation disc 210 until lifting pin 208 is exactly in the middle of the slot (fig. 18).
- Tighten screw 211 very firmly (fig. 18a).

Cross-check:

- Move push-lever 209 back and forth and check as described under „Check".

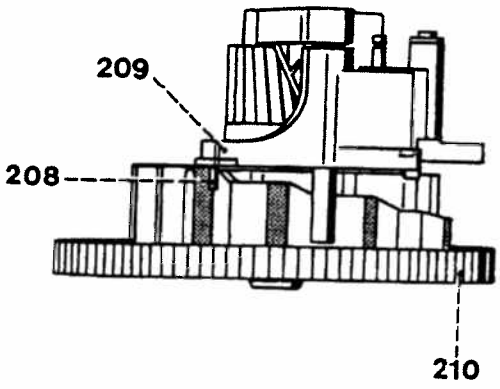


Fig. 18

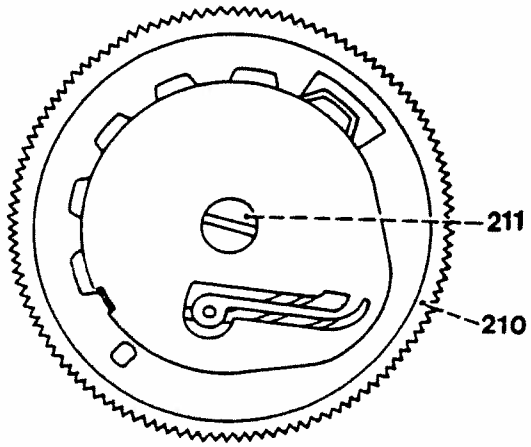


Fig. 18a

19. Adjusting the needle movement in the needle hole

Requirement:

The widest needle penetrations of the fancy patterns must have the same distance to the left as to the right needle plate slot edges (fig. 19).

Check:

- Remove the sewing foot.
- Insert a new needle.
- Switch off the automatic utility stitch unit.
- Set the regulation disc at the letter „V".
- Turn the handwheel and check the left and right distance.

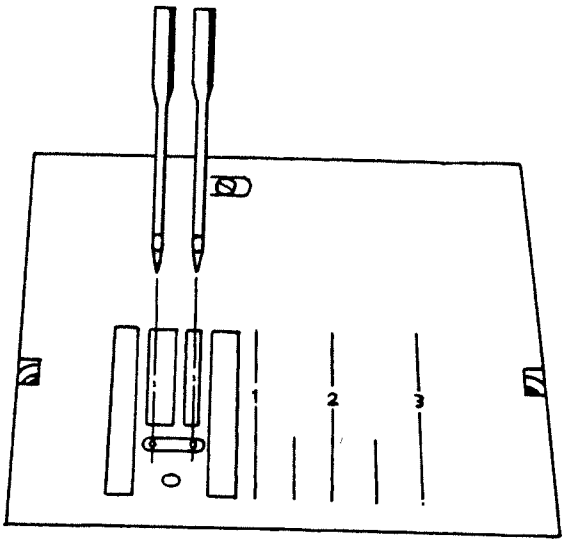


Fig. 19

Adjustment:

- Loosen the three screws 207 of worm 206 by just 1/8 of a turn (fig. 19a).
- Turn the handwheel until the needle point is at the surface of the needle plate (19b).
- Turn worm 206 towards the front until the small hole mark 212 is exactly at the carrier of the automatic module (fig. 19a).
- Loosen the two screws 205 just a little.
- Push the carrier of the automatic module to the left or to the right until the needle is centered in the needle plate slot (fig. 19c).
- Tighten the two screws 205.

Check:

- The needle must be exactly in the center of the needle plate slot.

Note:

After the sideways movement of the needle bar has been adjusted it is possible to check the left and right needle penetration.

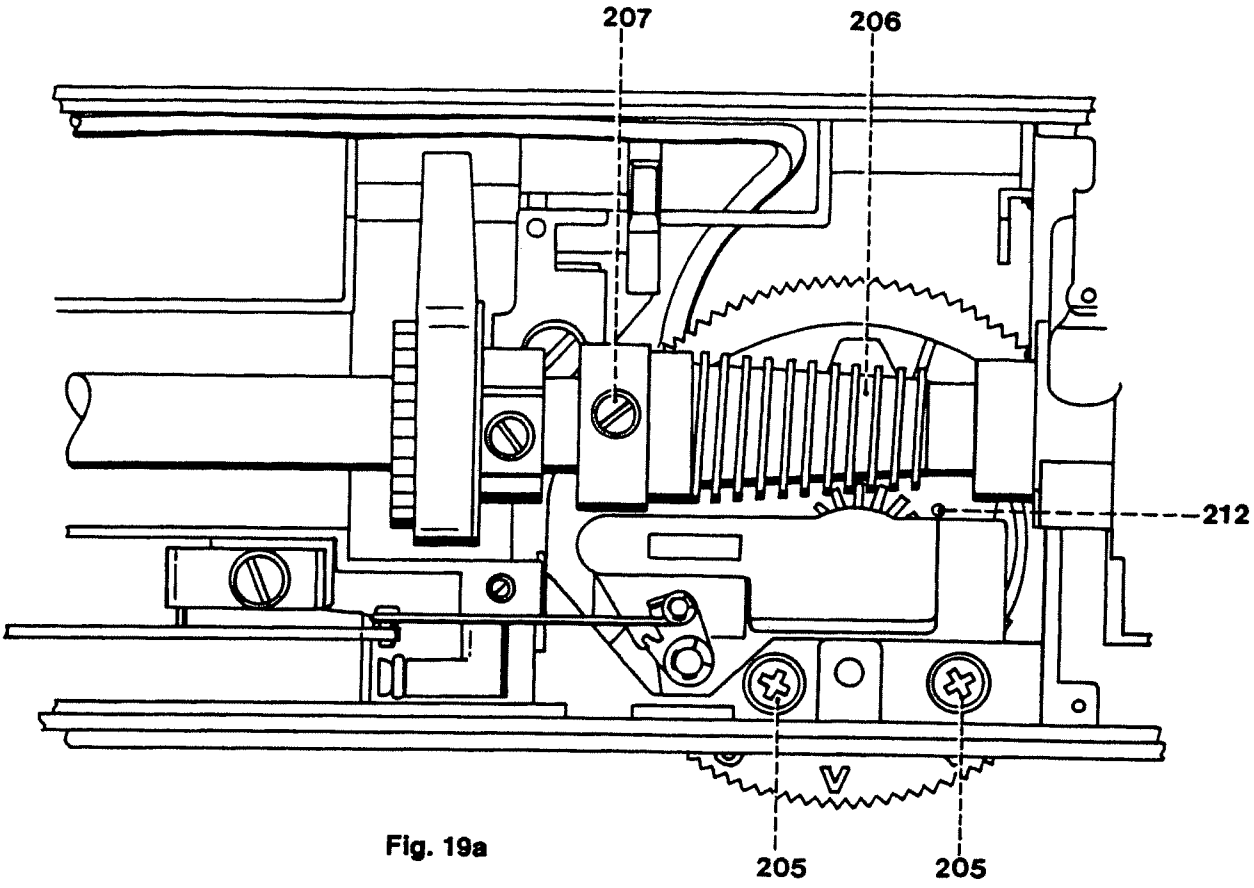


Fig. 19a

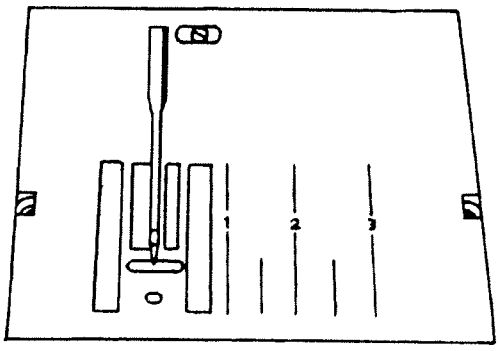


Fig. 19b

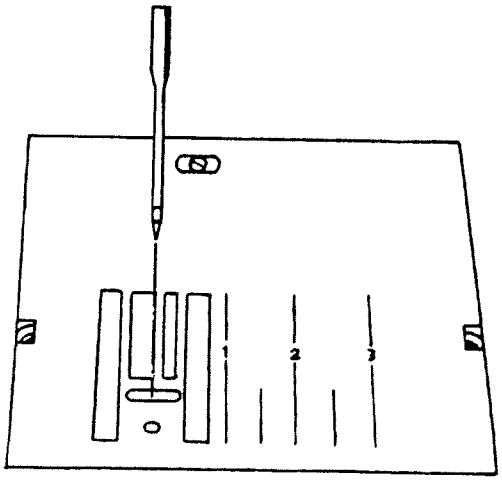


Fig. 19c

20. Adjusting the sideways movement of the needle bar for the automatic fancy stitch unit

Requirement:

The sideways movement of the needle must be carried out above the highest possible fabric thickness.

The sideways movement of the needle must start as soon as the needle point has left the needle plate.

It must be completed before the needle enters the fabric again.

This is roughly at a position of 8 mm above the needle plate (fig. 20).

The pulses for the sideways movement of the needle, which are generated by the automatic utility stitch unit and the automatic fancy stitch unit, must have the same direction.

Check:

- Unscrew the baseplate.
- Set regulation disc 210 at the dot mark.
- Turn the handwheel until rib 213 is in the position indicated in fig. 20a.
- Turn the handwheel a little until the needle point rising on the left-hand side is at the top surface of the needle plate (fig. 20b).
- Press the key for the widest zigzag stitch of the automatic utility stitch system.
- Turn the handwheel just a little to check the start of the sideways movement of the needle.
- Set the needle at the top surface of the needle plate again.
- Switch off the the zigzag stitch of the automatic utility stitch system.
- Set regulation disc 210 at the letter „V" (fig. 20c).
- Turn the handwheel just a little to check the start of the sideways movement of the needle.

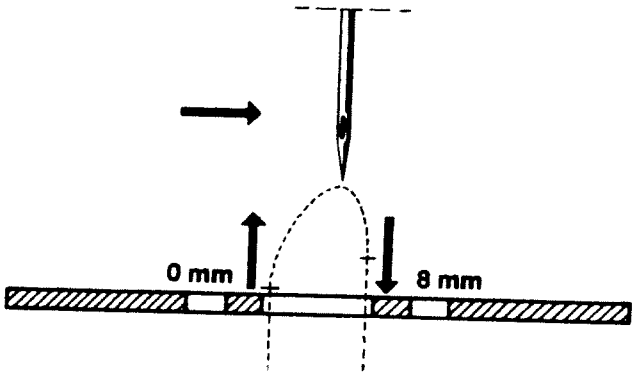


Fig. 20

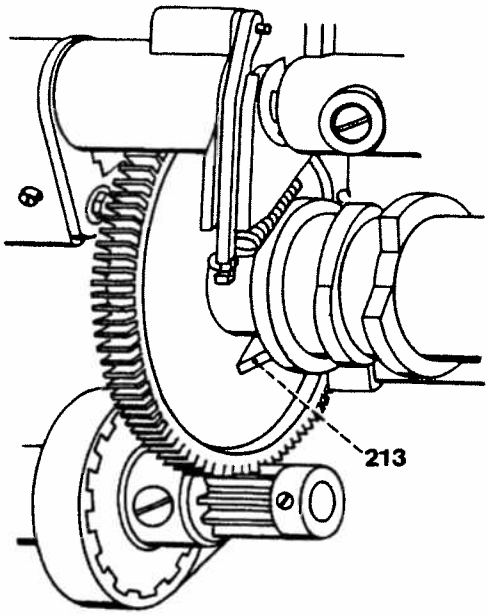


Fig. 20a

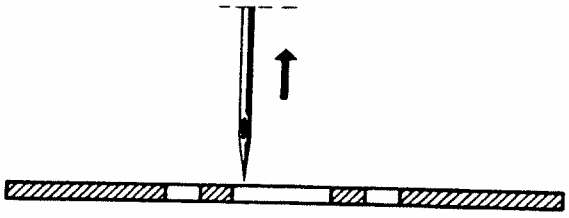


Fig. 20b

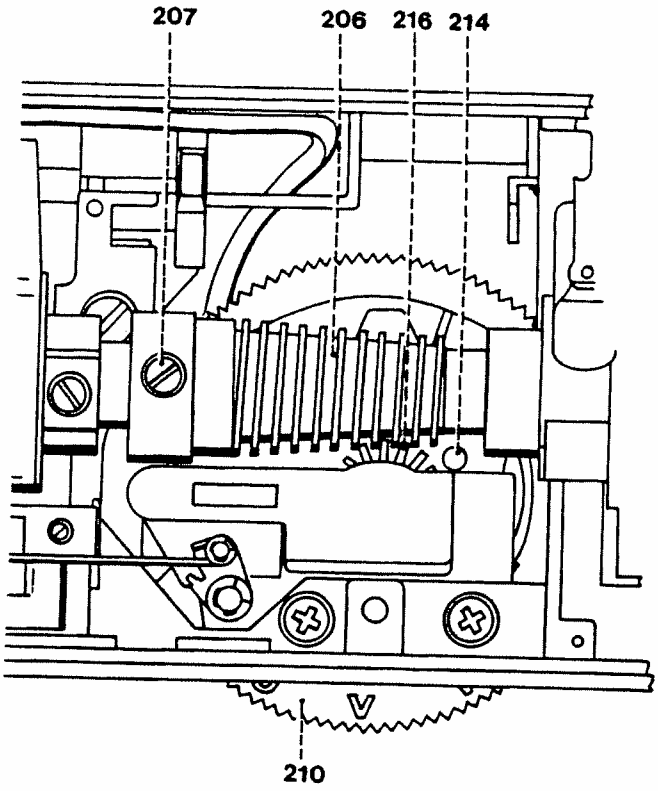


Fig. 20c

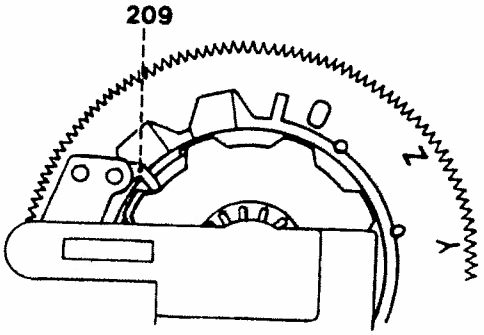


Fig. 20d

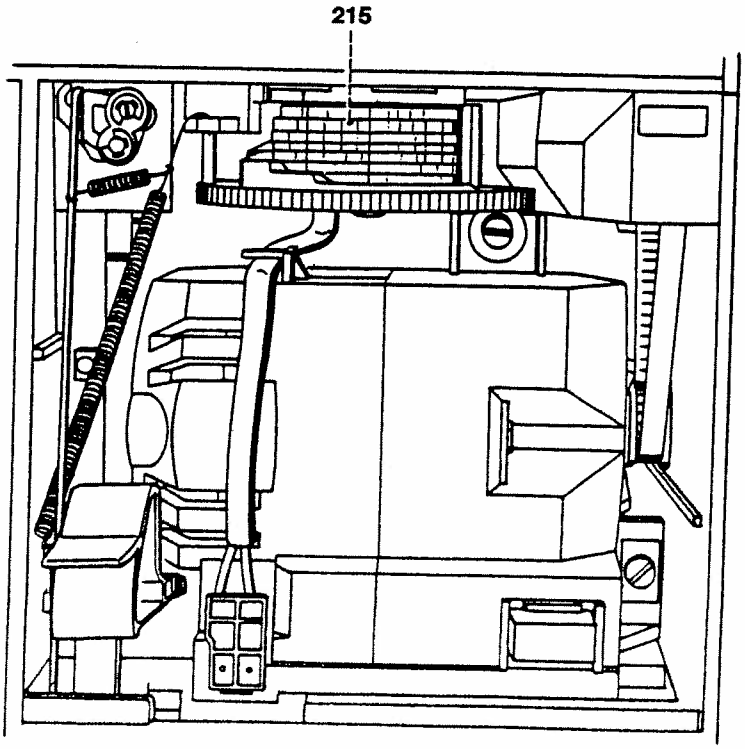


Fig. 20e

Adjustment:

- Set regulation disc 210 at the dot mark.
- Loosen the three screws 207 of worm 206 by just 1/8 of a turn.
- Turn the handwheel until rib 213 is in the position indicated in fig. 20a.
- Press the key for the widest zigzag stitch of the automatic utility stitch system.
- Turn the handwheel until the needle point rising on the left-hand side is at the top surface of the needle plate (fig. 20b).
  Now the handwheel must not be turned any more.
- Switch off the zigzag stitch of the automatic utility stitch system.
- Set the regulation disc at the letter „V" (fig. 20c).
- Turn worm 210 to the front until the large dot mark 214 is in the position indicated in fig. 20c.
- Keep on turning worm 206 slowly until finger 209 is at the rising cam and the needle starts moving to the right (fig. 20d).
- Hold the stack of cams 215 securely from the front taking care not to distort it (fig. 20e).
- Turn worm 206 backwards until a little binding can be felt thus making sure that worm 206 and worm gear 216 have no play (fig. 20c).
- Tighten one of screws 207.

Cross-check:

- Carry out a check as described under „Check".
- Tighten the two screws 207.

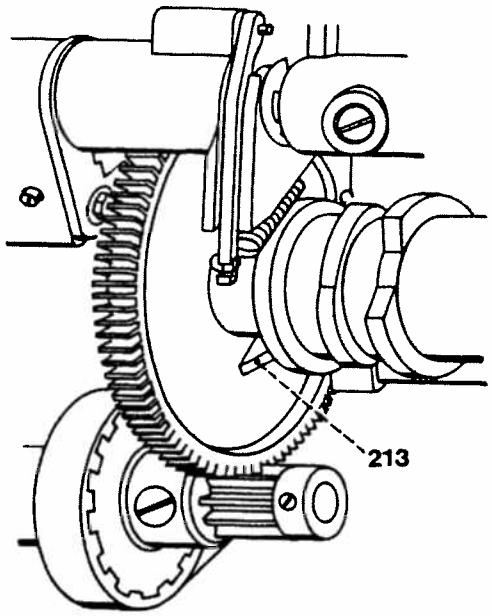


Fig. 20a

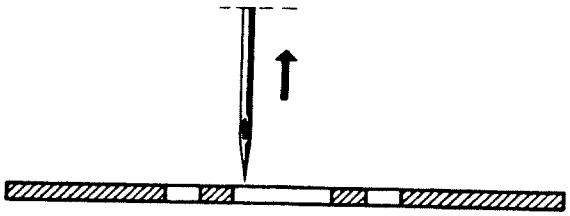


Fig. 20b

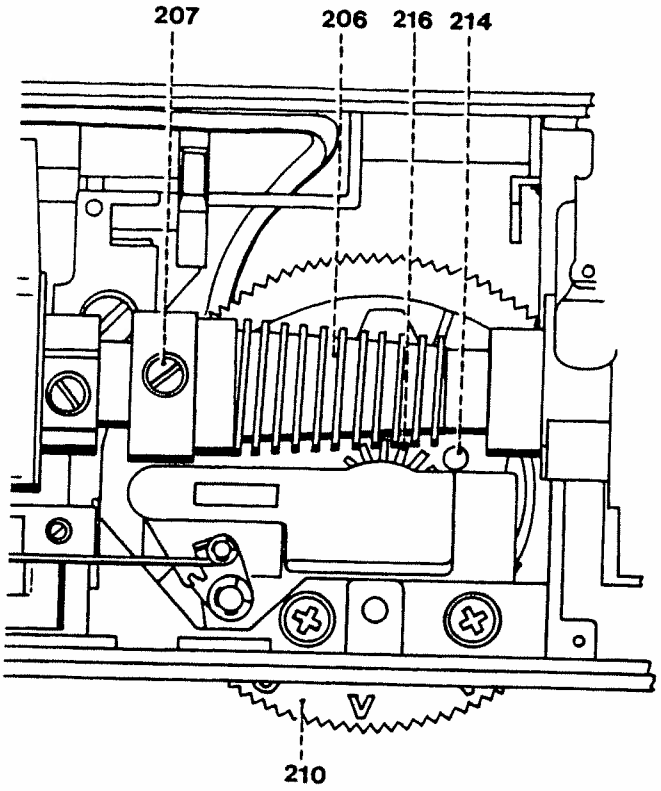


Fig. 20c

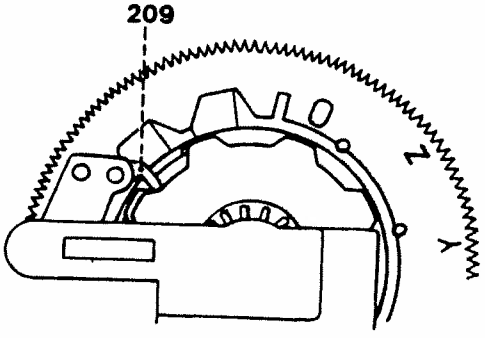


Fig. 20d

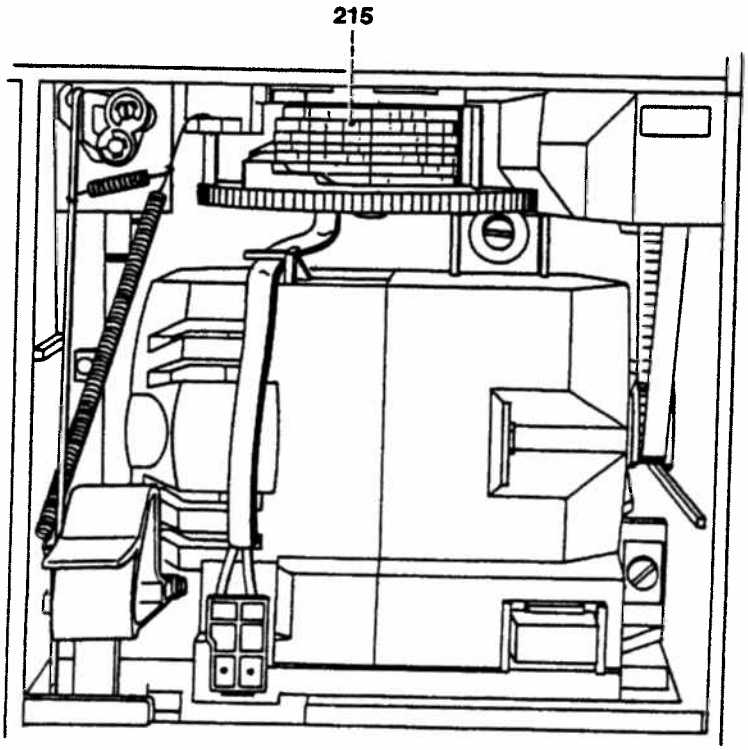


Fig. 20e

Stitch forming parts

Foreword:

The sewing hook adjustment consists basically of the three following adjustments:

Needle rise
Needle bar height
Hook-to-needle clearance

Needle rise:

The needle rise is the movement by which the needle must rise from its lowest position until a thread loop has formed on the side of the needle on which the scarf is located.

Needle bar height:

The needle bar heigth must be set in such a way that the sewing hook point can easily enter the thread loop above the needle eye at straight stitch and zigzag stitch settings.

Hook-to-needle clearance:

The distance of the sewing hook point from the needle must be as small as possible, so that the sewing hook point does not miss the thread loop.

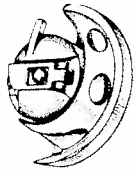
The sequence of sewing hook adjustments is as follows:

1. Hook-to-needle clearance
2. Bevel gear setting
3. Needle rise
4. Needle bar height

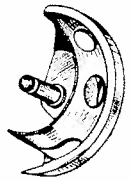
Shuttles and sewing hook types in lockstitch sewing machines

Oscillating CB hook and beak shuttle

CB shuttle complete



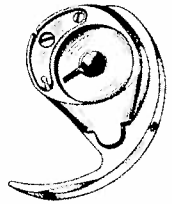
Shuttle body



Bobbin case

Bobbin

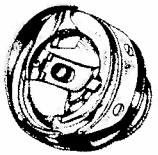
Beak shuttle complete



Bobbin

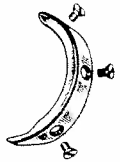
Horizontal rotary hook

Hook complete



Hook body

Hook gib



Bobbin case base

Bobbin case cap

Bobbin

Large horizontal rotary hook

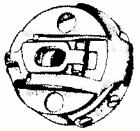
Hook complete

Hook body

Hook gib and needle guard

Bobbin case base

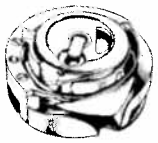
Bobbin case cap



Bobbin

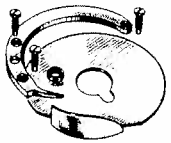
Vertical rotary hook

Hook complete



Hook body

Hook gib and needle guard



Bobbin case base

Bobbin case cap

Bobbin

21. Position of needle in needle hole in sewing direction

Requirement:

There must be a clearance of 0.2 mm between the back edge of the needle shank and the back edge of the needle hole in the needle plate (fig. 21).

Note:

Since system 130/705 H needles increase in size at the needle front side only, the point of an Nm 100 needle is positioned exactly in the middle of the needle hole (as seen in feeding direction), while the point of an Nm 80 needle is positioned slightly closer to the back edge of the hole.

Check:

- Insert a new needle of sysem 130/705 H in size Nm 100.
- Press the key for straight stitch.
- Engage the zigzag foot.
- Lower the zigzag foot.
- Turn the handwheel until the needle is in its lowest position.
  The needle must now have the same distance to the front and rear edges of the needle hole in the foot and the needle plate.

Adjustment in relation to the sewing foot:

- Loosen screw 54 (fig. 21a).
- Move pin 53 together with collar and needle bar frame 52 to the front or the rear until the needle is exactly in the middle of the needle hole in the sewing foot.
- Tighten screw 54.

Check:

- Turn the handwheel and raise the needle.
- Place a piece of paper underneath the sewing foot and lower the foot.
- Turn the handwheel and bring the needle to its lowest position.
- Its distance from the front and rear edges of the needle hole in the foot must be equal.

Important:

The needle bar frame must move easily and without binding. If this is not the case any binding must be removed.

Adjusting the needle plate:

- Turn the handwheel and bring the needle to its top position.
- Remove the zigzag foot.
- Turn the handwheel and bring the needle to its lowest position.
- Turn adjustment eccentric 55 until the distance from the front and rear edges of the needle hole is equal (fig. 21b).

Cross-check:

- Carry out a visual check at straight stitch and zigzag stitch settings.

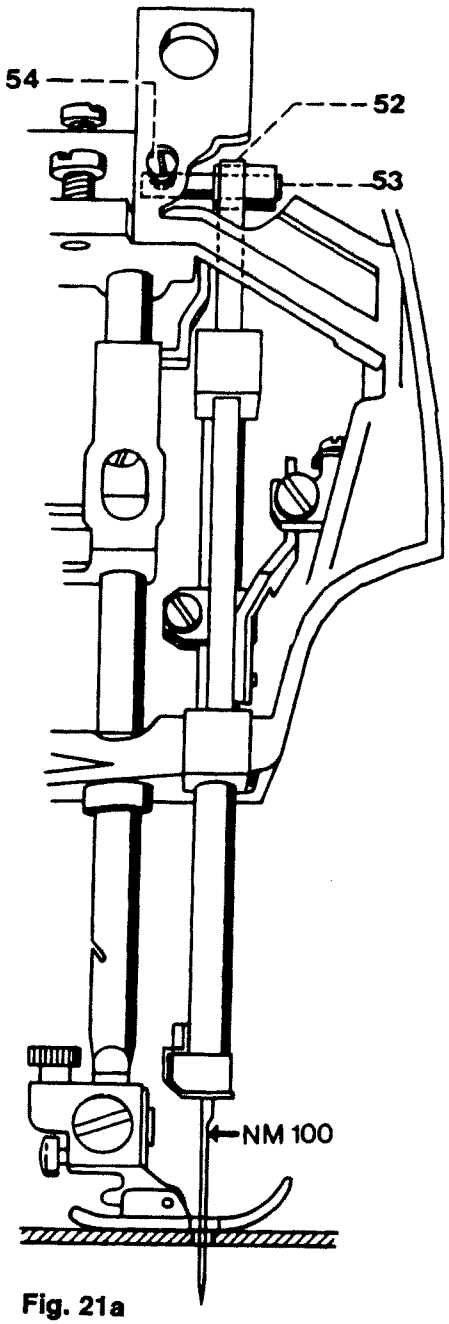


Fig. 21a

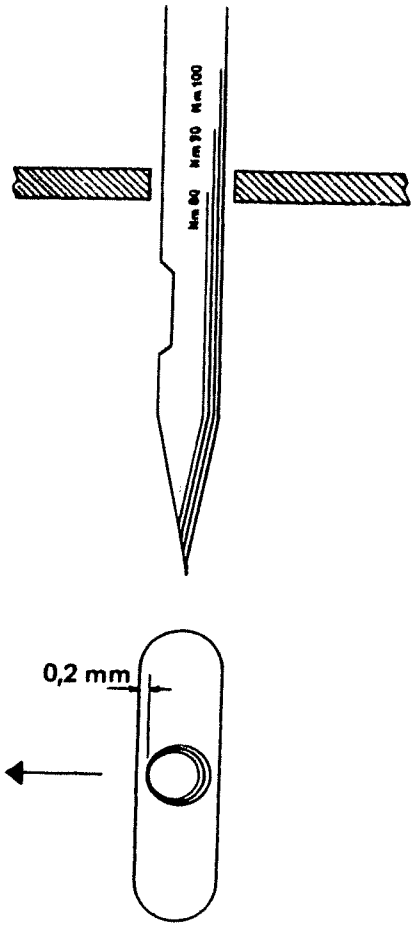


Fig. 21

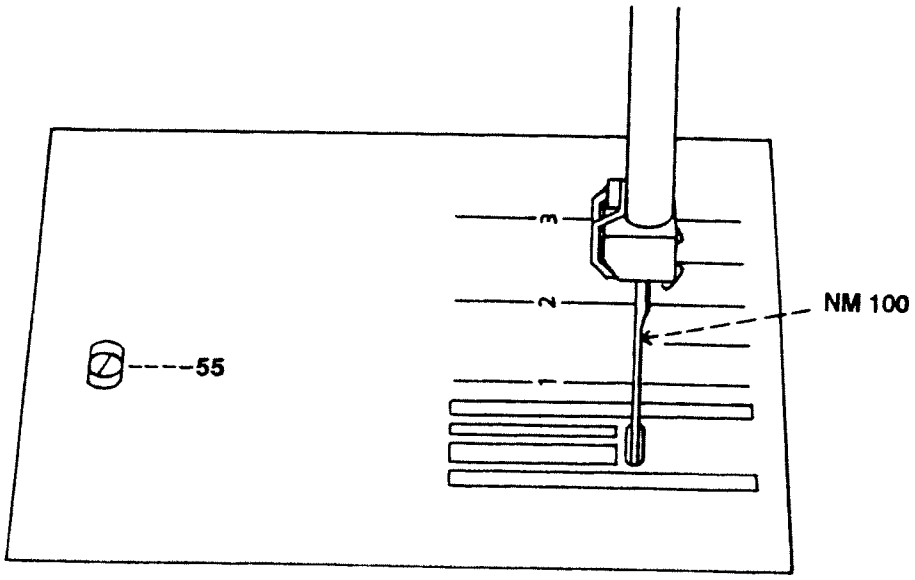


Fig. 21b

22. Adjustment of hook-to-needle clearance

Requirement:

At the straight stitch setting the distance of the sewing hook point from the bottom of the scarf in the needle must be 0.05 mm (see fig. 22). In the widest zigzag stitch, the sewing hook point must almost touch the needle.

Check:

- Remove the needle.
- Remove the sewing foot and the needle plate.
- Remove the bobbin case.
- Unscrew the bobbin case position finger.
- Remove the hook gib with bobbin case base by unscrewing the three screws.
- Insert a new needle of system 130/705 in size Nm 80.
- Press the key for straight stitch.
- Turn the handwheel until the hook point is exactly at the center line of the needle.
- Check the distance between hook point and needle scarf.
- Check the axial play of hook 44 in relation to hook bushing 46.

Adjustment:

- If the hook shaft has axial play, loosen the two screws 42 (fig. 22a).
- Press bevel gear 38 with shaft to the front and sewing hook 44 to the rear.
- Tighten the two screws 42.
- Loosen screw 37 in the lifting eccentric by 2 to 3 turns.
- Loosen screw 39 just a little.
- Turn handwheel and hook until the hook point is opposite the center line of the needle scarf.
- Shift the sewing hook complete with hook shaft bush 46 until the distance of the hook point to the bottom of the scarf in the needle is 0.05 mm.
- Tighten screw 39 on the narrow surface of the hook shaft bush.

Note:

The large surface of the hook shaft bush must face right.

Cross-check:

- Check for free movement of the hook shaft.
- Again check the clearance between the hook point and the bottom of the needle scarf.

22a. Adjustment of bevel gears

Requirement:

The bevel gears must move easily and without play.

Adjustment:

- Push bevel gear with lifting eccentric to the left until it is in contact with bevel gear 38 and has no play.
- Tighten screw 37 on the surface of the drive shaft.

Check:

- As described under „Requirement".

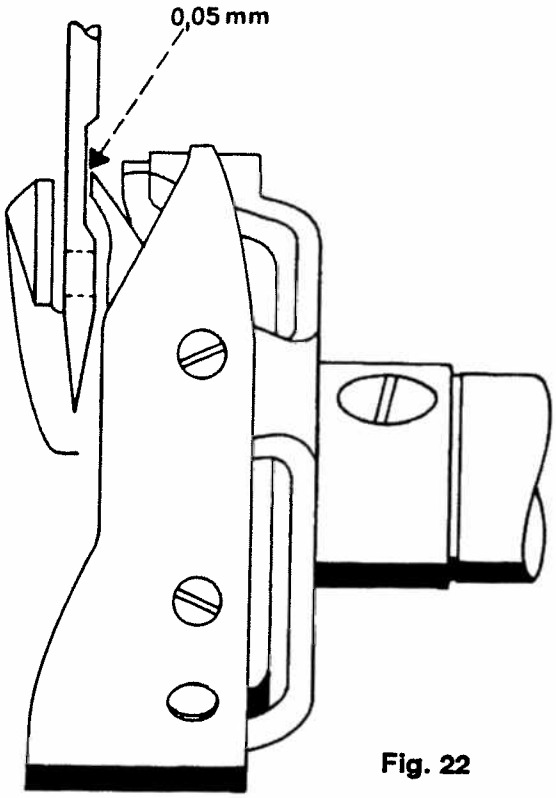


Fig. 22

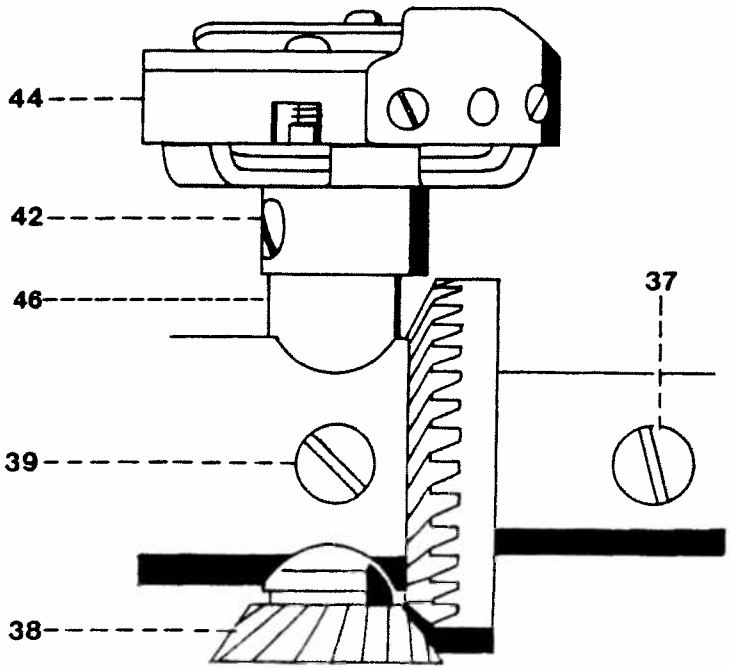


Fig. 22a

23. Hook timing

Requirement:

When the needle bar has moved 2.2 mm upwards from its lowest position, with the machine set for straight stitch and center needle position, the sewing hook point must be exactly opposite the center line of the needle (fig. 23).

Check:

- Remove sewing foot and needle plate.
- Select stitch pattern „00" for straight stitch.
- Bring the needle bar to its lowest position by turning the handwheel.
- Set the spacer (63-102 600-18) on top of the needle bar and push it upwards against the needle bar frame (fig. 23a).
- Push the needle-rise clamp (00-870 137-01) on the needle bar and tighten it lightly.
- Push the 2.2 mm feeler gauge (00-870 136-01) with its cutout on the needle bar above the needle-rise clamp.
- Loosen the needle-rise clamp and push the 2.2 mm feeler gauge upwards against the spacer.
- Tighten the milled screw on the needle-rise clamp.
- Turn the handwheel backwards and forwards a little.
- If there is any play on the feeler gauge, repeat this procedure.
- Remove the 2.2 mm feeler gauge.
- Turn the handwheel in sewing direction until the needle rise clamp is in contact with the spacer. By this means the needle has moved upwards by 2.2 mm to the needle rise position. The hook point must now be exactly behind the center line of the needle (fig. 23).

Adjustment:

- If the setting is not correct, remove the needle-rise clamp.
- Loosen the two screws 42 (fig. 23b).
- Re-fit the needle-rise clamp and repeat the operation as described under „Check", until the needle bar has moved 2.2 mm upwards and the needle-rise clamp is in contact with the spacer.
- Turn the hook until the hook point is exactly behind the center line of the needle.
- Press sewing hook 44 and bevel gear 38 together so that there is no play between them, and tighten one screw 42.

Check:

- Turn the handwheel a little backwards and then forwards until the needle-rise clamp is in contact with the spacer (fig. 23). The hook point must be exactly behind the center line of the needle.
- Remove the needle-rise clamp.
- Verify that the hook shaft has no axial play.
- Tighten the two screws 42 very firmly.

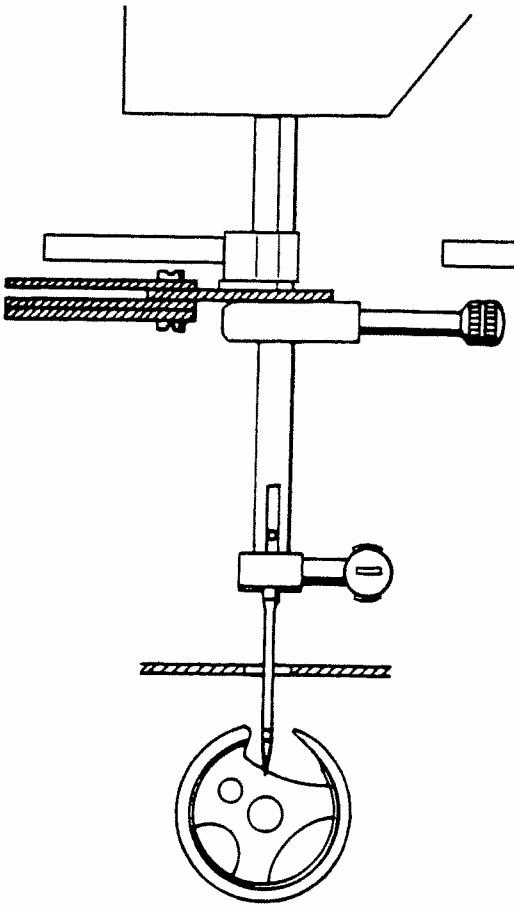


Fig. 23a

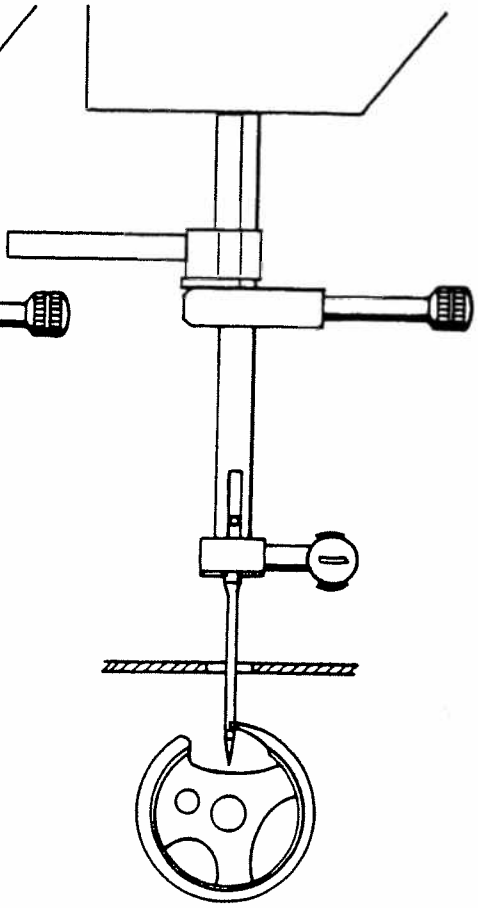


Fig. 23

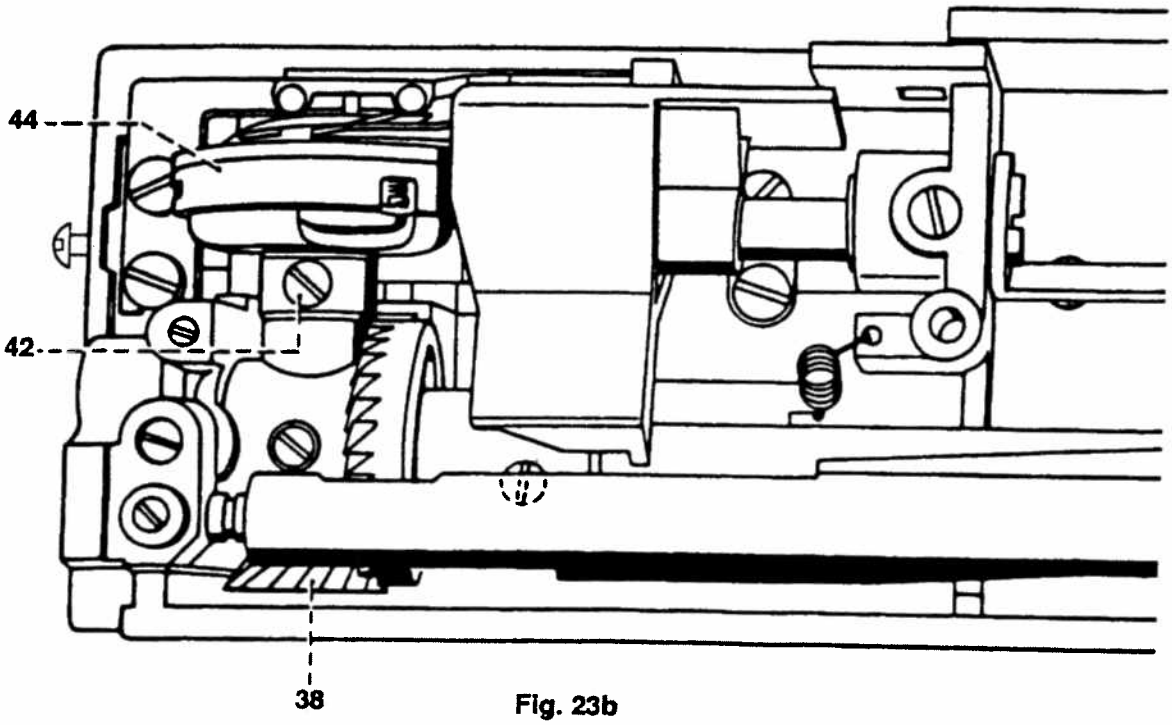


Fig. 23b

24. Adjustment of needle bar height

This machine has a transverse double-rotating hook.

On the right zigzag penetration, the sewing hook reaches the needle a little earlier and at the left penetration a little later than at the center penetration.

Therefore the hook point position at the right-hand zigzag penetration is a little higher above the needle eye than at the left-hand zigzag penetration (fig. 24).

Requirement:

The distance between the top edge of the needle eye and the lower edge of the sewing hook point must be 0.5 mm at the widest left zigzag penetration (fig. 24a).

Check:

- Press the key for the widest zigzag stitch.
- Turn the handwheel until the needle rises at the left zigzag stitch and the sewing hook point is exactly behind the center line of the needle.
  The distance between the top edge of the needle eye and the lower edge of the hook point must be 0.5 mm.

Adjustment:

- Loosen screw 51 just a little (fig. 24b).
- Shift needle bar 50 in height, without twisting it, until the clearance of 0.5 mm is set.
- Tighten screw 51 securely.

Cross-check:

- Check the clearance of 0.5 mm.
  The needle holder must face exactly square to the right.

Fig. 24

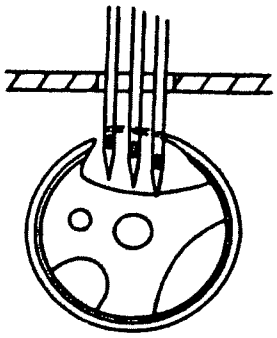


Fig. 24a

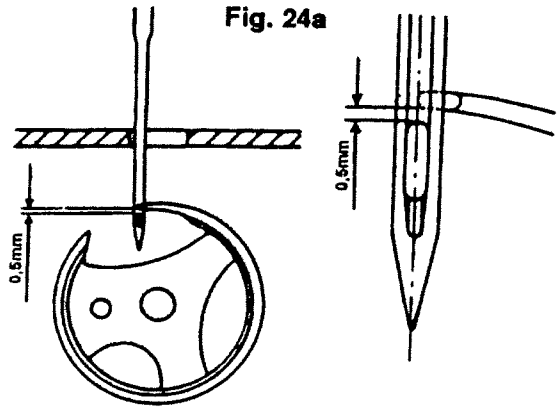
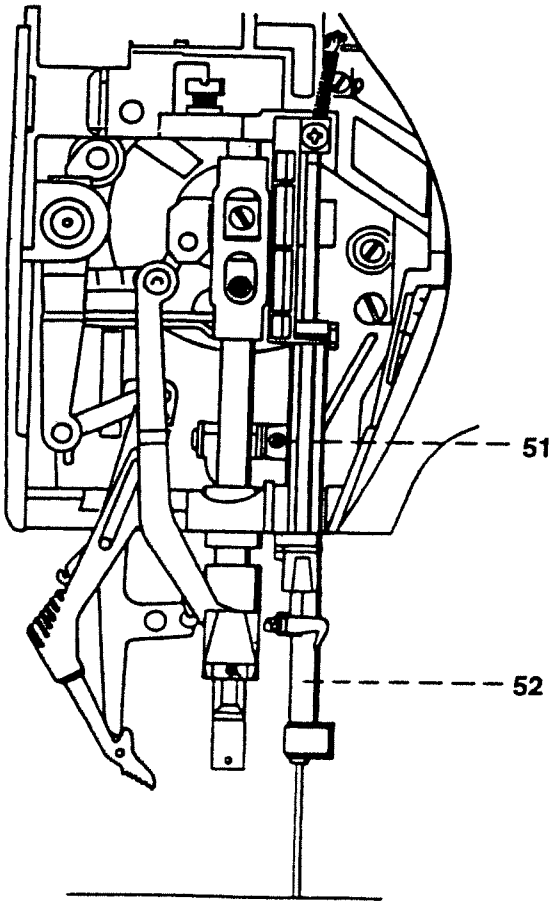


Fig. 24b



25. Adjustment of bobbin case position finger

Requirement:

The clearance between the position finger and the bottom of the groove in the bobbin case base must be 0.7 mm.

Check:

- It must be possible to insert the clearance gauge 00-880133-01 with ease but without play between the position finger and the bottom of the groove in the bobbin case base (fig. 25).

Adjustment:

- Loosen the two screws 43.
- Insert the clearance gauge.
- Press bobbin case positioning finger 45 against the clearance gauge at an angle of 90 degrees.
- Tighten the two screws 43.

Cross-check:

- Carry out as described under „Check".

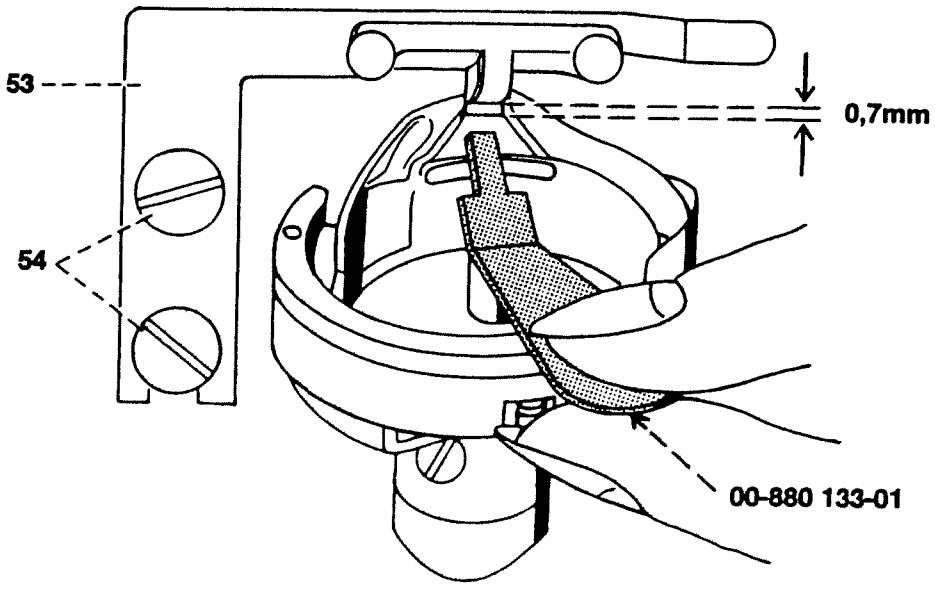


Fig. 25

26. Adjustment of synchronizer on Pfaff 6230

Note:

The synchronizer must be adjusted only after the sewing hook timing has been set (section 23) correctly.

Check:

- Insert the mains plug.
- Switch on the master switch.
- Engage the handwheel.
- Switch off all keys of the automatic systems (utility stitch as well as fancy stitch).
- Briefly operate the foot control.
  Check the take-up lever position (fig. 26).

Adjustment:

- Unscrew the four screws of the baseplate.
- Place the baseplate aside but leave all connections together.
- Press key „needle down".
- Briefly operate the foot control.
  Check the position of the hook point in relation to the needle (fig. 26a).
- Hold the handwheel in position.
- At the same time turn (slide) hexagonal pin 86 by means of a 5.5-mm hexagon wrench (hexagon spanner) just a little.
- Briefly operate the foot control.
  Check the position of the hook point in relation to the needle (fig. 26a).
  In case position is not correct:
- Loosen fixing collar screw 85 (fig. 26b).
- Briefly operate the foot control.
  Check the position of the hook point in relation to the needle (fig. 26a).
- Repeat the synchronizer adjustment until the take-up lever „up" position and the needle „down" position are adjusted according to fig. 26 and fig. 26a.
- Tighten screw 85.

Cross-check:

- Carry out as described under „Check".

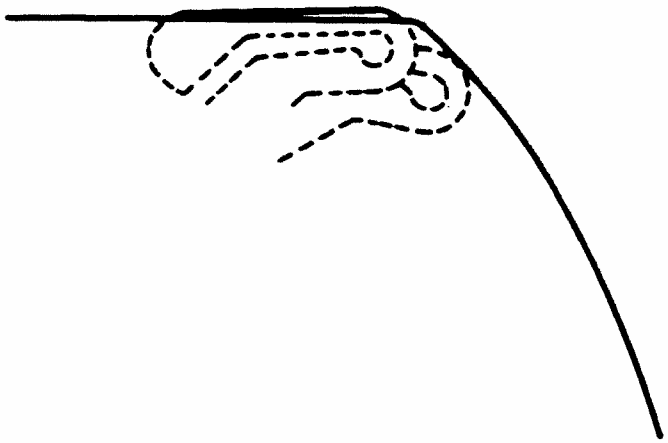


Fig. 26

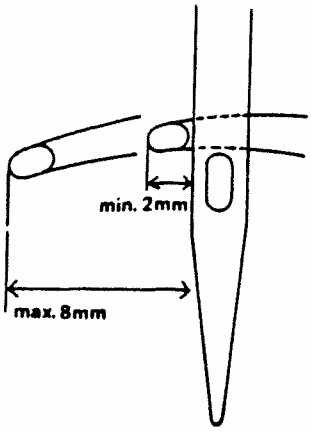


Fig. 26a

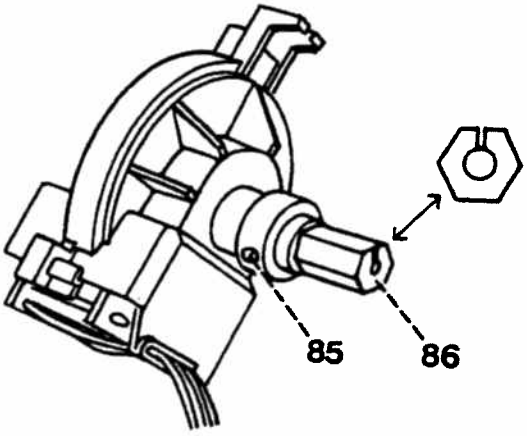


Fig. 26b

Stitching off

27. Adjustment of needle threader

Requirement:

With the threader key pushed fully down, prong 69 must pass through in the center between the top and bottom edge of the needle eye of a needle of size Nm 70 (fig. 27). The prong must have equal distance to the side edges of the needle eye.

Check:

- Insert a new needle, system 130/705 H, size Nm 70.
- Set the machine at top needle position by briefly pressing the foot control.
  On machines without needle „up" positioning turn the handwheel until the needle bar is in its top position.
- Push threader 68 fully down and swing it to the front.
- Carry out a visual check.

Height adjustment:

- Disconnect pull-spring 61 at the top (fig. 27c).
- Press threader bar mounting 63 down and hold it in this position.
- Loosen Philips screw 62 by just 1/4 of a turn.
- Push threader bar 65 upward or downward until prong 69 is the same distance from the top and bottom edge of the needle eye (fig. 27).
- Tighten screw 62 in this position.

Cross-check 1:

- Use button 68 to move the threader prong to the rear and to the front again.
  Carry out a visual check of the prong height.

Lateral adjustment:

- Use button 68 to turn threader prong 69 to the front into the needle eye.
- Loosen screw 67 by just 1/8 of a turn (fig. 27a).
- Move the prong bracket 66 laterally until prong 69 is precisely centered in the needle eye.
- Tighten the screw.

Cross-check 2:

- Use button 68 to move the threader prong backwards and to the front again.
  Carry out a visual check of the lateral position of the prong.
- Turn pull-spring 61 by two full turns counter-clockwise and engage it in hook 60 so that the spring is positioned towards the left. (fig 27c).
  This ensures that the threader is swung automatically backwards.
- Actuate the threader button, and perform a visual and functional check.

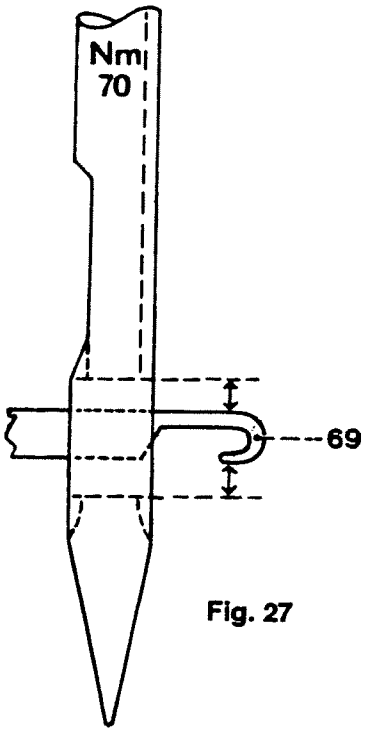


Fig. 27

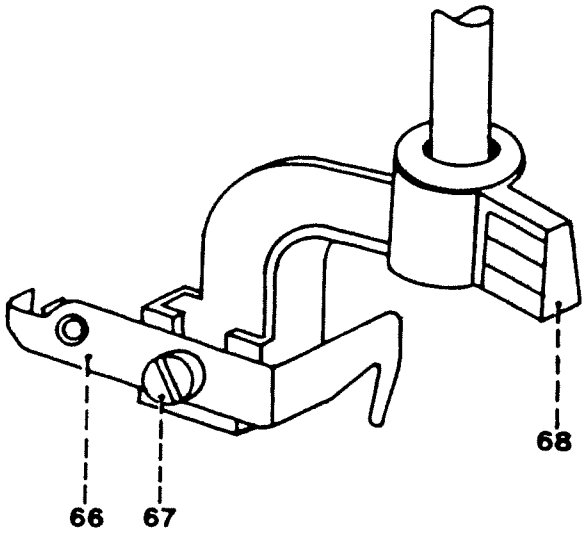


Fig. 27a

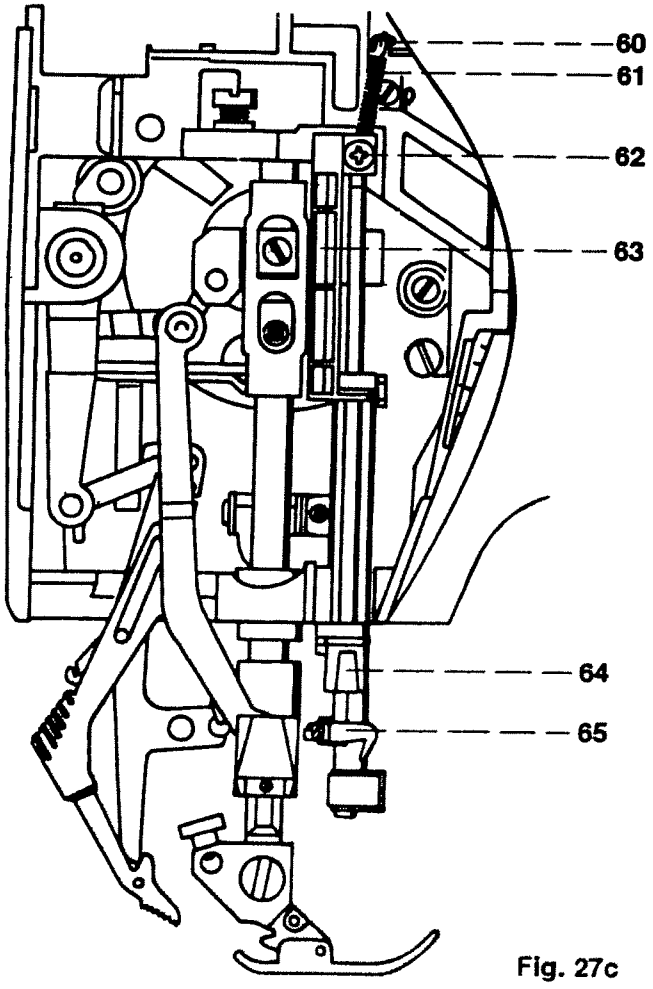


Fig. 27c

28. Adjustment of bobbin winder stop

Requirement:
The bobbin winder must stop when the thread has reached a level of 1 mm below the bobbin rim.

Check:

- Wind a bobbin and check that the winder stops as desired.

Adjustment:

- Loosen screw 66 (fig. 28).
- Position stop 67 to the left for less thread and to the right for more thread.
- Tighten screw 66.

Cross-check:

Wind a bobbin and check that the winder stops as required.

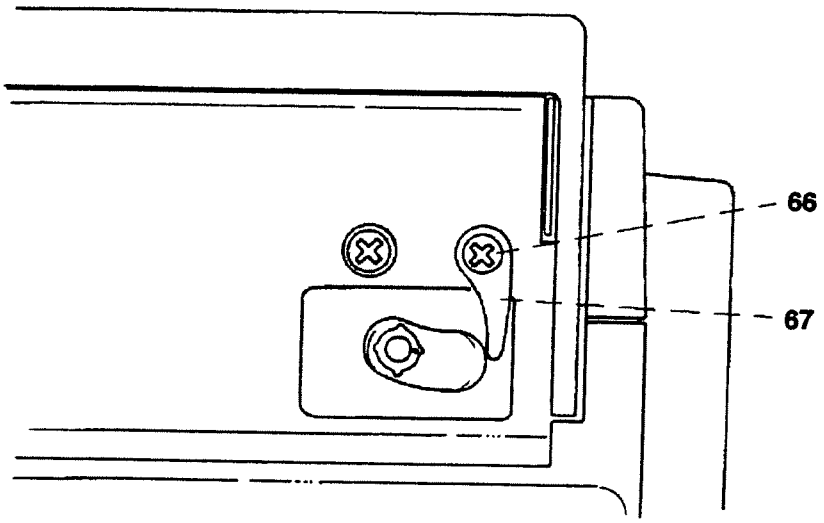


Fig. 28

29. Adjustment of bobbin thread tension

Requirement:

The force required for pulling cotton thread 50/2 or synthetic fibre thread 100/3 off the bobbin must be approximately 20 to 25 g.

Check:

- When a threaded bobbin case hangs on its thread, it must not slide downwards by its own weight.
- Upon sharp upward movements of the hand, the thread must run off gradually (fig. 29).
- There must not be any thread waste under the tension spring.
- The tension spring must rest evenly and parallel on the bobbin case.

Adjustment:

Loosen the knurled screw a little and turn it in again until a resistance is felt when the thread is pulled off.

Check:

- Carry out as described under „Check"

Note:

- Once the bobbin thread tension has been set correctly, tension adjustments must be made only at the needle thread tension.

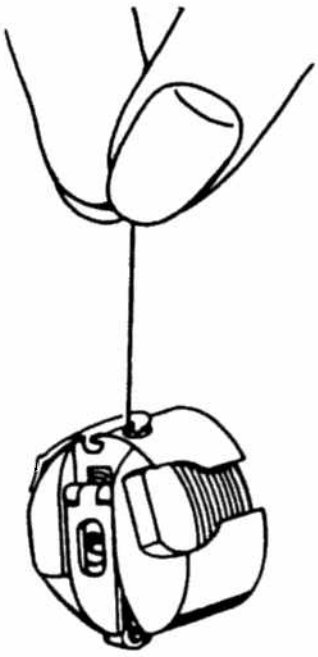


Fig. 29

30. Adjustment of needle thread tension

Requirement:

Within the adjusting range from 3 to 5, the interlacing of the needle thread and the bottom thread with cotton thread 50/2 or synthetic fibre thread 100/3 must take place approximately in the middle of the fabric in straight and zigzag stitch setting (fig. 30).

Check:

- Set the needle thread tension at „5".
- Press the key for the widest zigzag stitch.
- Set the stitch length at „2.0".
- Place a piece of fabric under the zigzag foot and sew.
- Press the key for straight stitch.
- Set the stitch length at „2.5".
- Sew with straight stitch.

Adjustment:

- First turn milled nut 68 fully to the left (fig. 30b).
- Press the key for the widest zigzag stitch.
- Set the stitch length at „2.0".
- Sew with zigzag stitch.
- At the same time turn the milled nut gradually in clockwise direction, until the knot is formed in the center of the fabric (fig. 30a).

Cross-check:

- Sew with straight stitch and zigzag stitch as described under „Check".

Fig. 30

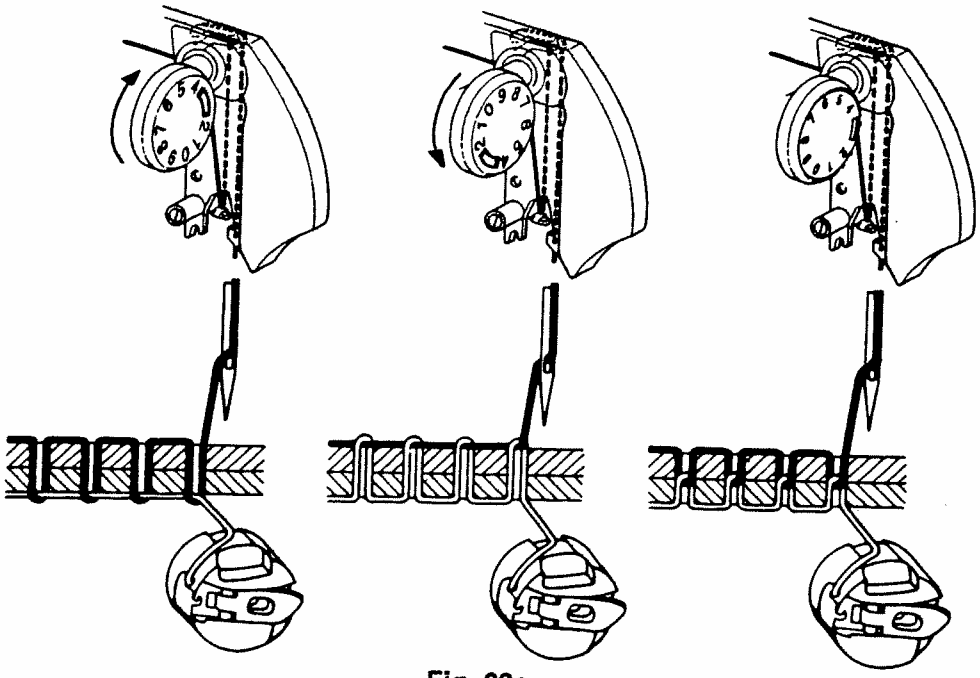


Fig. 30a

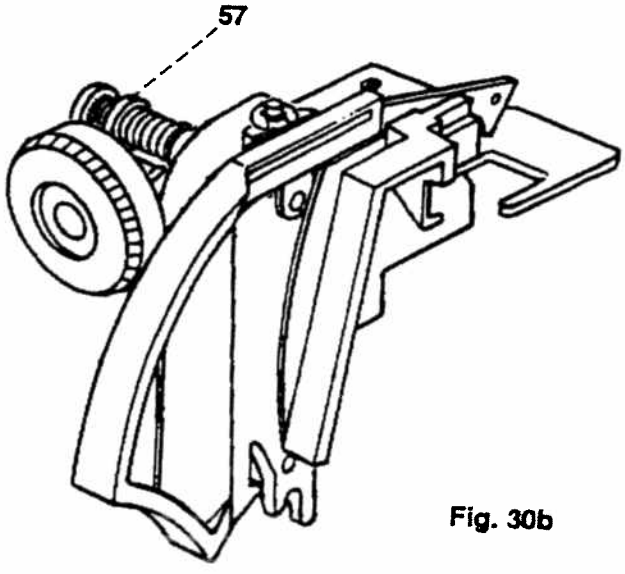


Fig. 30b

31. Adjustment of thread check spring stroke

The thread check spring prevents the descending needle from piercing the slack needle thread. The needle thread is slackened by the descending take-up lever.

Requirement:

Thread check spring 71 must keep the needle thread taut at least until the needle point enters the fabric (fig. 31).

The thread check spring must release the needle thread as soon as the lower edge of the needle eye enters the fabric.

Check:

- Press the key for straight stitch.
- Set the stitch length at „6.0".
- Place two plies of linen fabric under the sewing foot.
- Sew a few stitches.
- Turn the handwheel and determine the end of the thread check spring stroke.
  Correct slackening of the needle thread takes place when it enters the needle eye not tautly but in a loose curve.

Adjustment:

- Loosen screw 69.
- Turn thread check spring stop sleeve 70 until thread check spring 60 is in the correct position.
- Tighten screw 69.

Cross-check:

- Sew a few stitches and check as described under „Check".

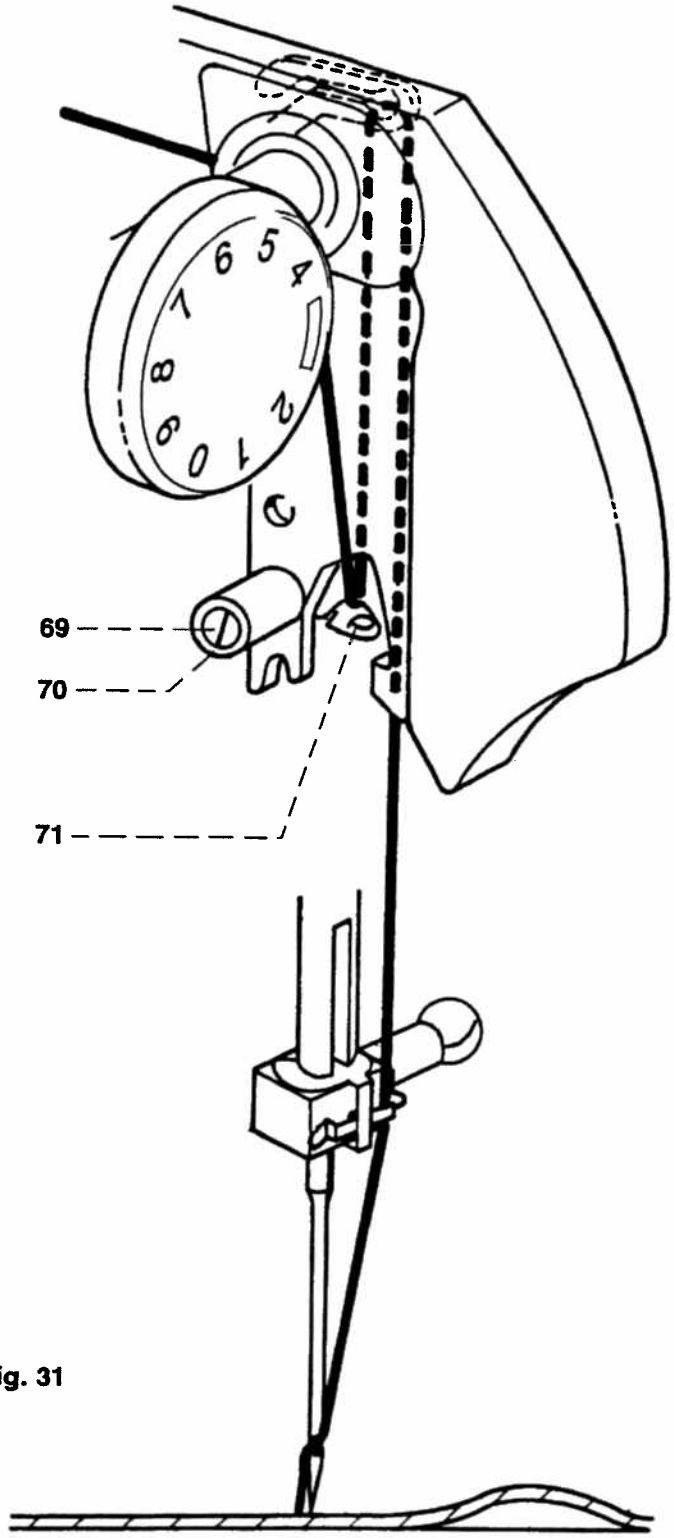


Fig. 31

32. Adjustment of equal stitch length for the left and right buttonhole seam

Requirement:

The stitch lengths of the left and right buttonhole seam must be equal (fig. 32).

Note:

Normally the stitch lengths of the buttonhole seams are equal in length when the stitch length control has been zeroed correctly (section 8 of the Adjustment and Repair Manual).

Check:

- Sew a buttonhole with gimp thread and compair the two stitch lengths.

Adjustment:

- If the stitch length on the right buttonhole seam is longer than the left one (fig. 32a), turn the adjustment eccentric a little to the rear (direction „A", fig. 32c).
- If the stitch length on the left buttonhole seam is longer than the right one (fig. 32b), turn the adjustment eccentric a little to the front (direction „B", fig. 32c).

Cross-check:

- Sew a buttonhole with gimp thread and check the stitch length.

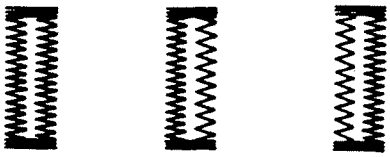


Fig. 32 Fig. 32a Fig. 32b

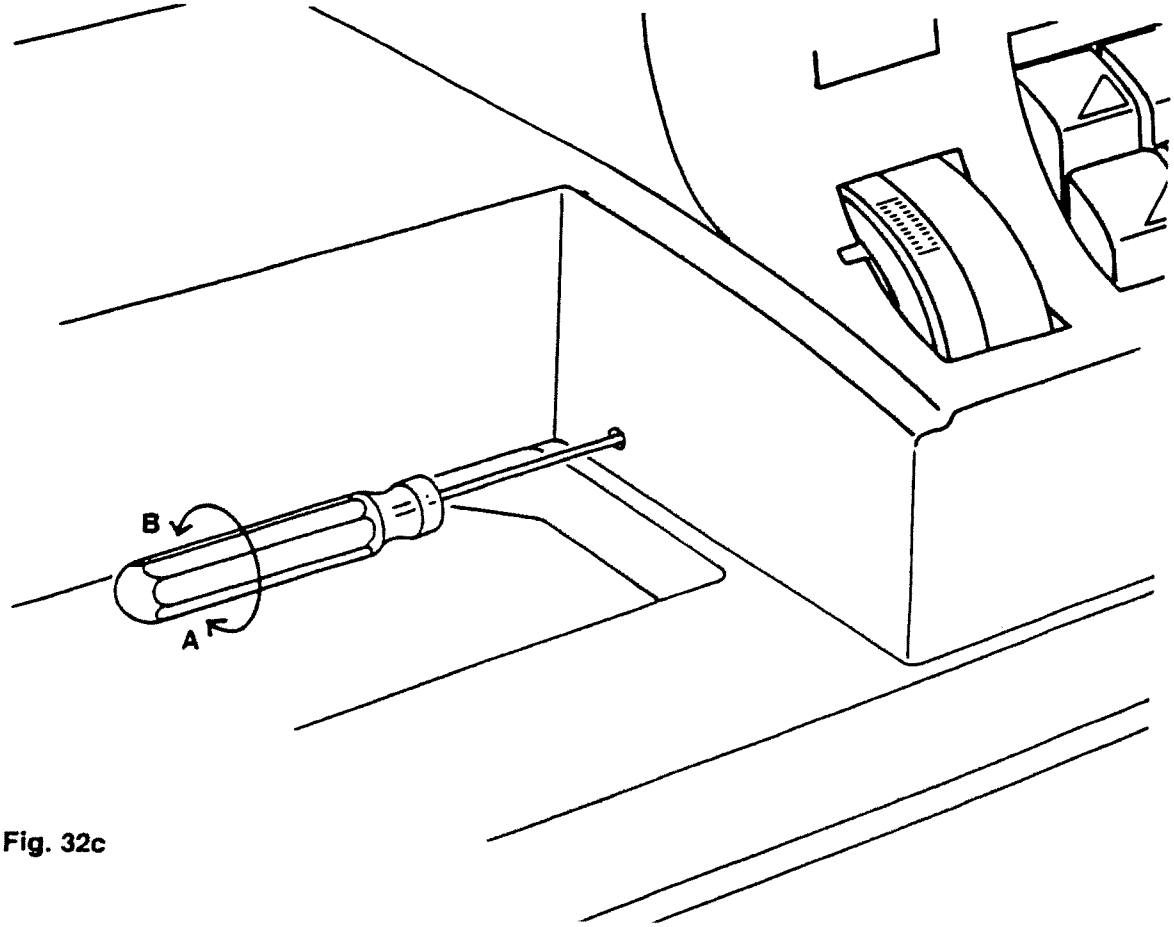


Fig. 32c

33. Adjustment of equal forward and reverse stitch length for utility stitches

Requirement:
With the honeycomb stitch selected, the needle must penetrate always the same holes when sewing forwards and reverse (fig. 33).

Check:
- Set the adjusting dial for the stitch length against the stop next to the symbol for the triple stitch.
- Press the key for the honeycomb stitch.
- Install the sewing foot sole.
- Place two plies of linen underneath the sewing foot.
- Sew the honeycomb stitch.

Adjustment:
- Loosen the hexagonal screw 16 with a 5.5 mm wrench (spanner) by just 1/8 of a turn (fig. 33a).
- Loosen screw 15 by approximately 2 turns.
- Tighten screw 16 just a little.
- Sew the honeycomb stitch.
  The stitch length of the honeycomb stitch must now be a little too long.
- Loosen screw 16.
- Turn screw 15 in a little.
- Tighten screw 16 lightly.
- Sew the honeycomb stitch and check the penetrations.
- Keep on repeating the adjustments on screw 15 and screw 16 step by step until the needle enters always the same holes.
- Tighten screw 16.

Cross-check:
- Sew the honeycomb stitch and the triple stretch straight stitch and check whether the needle actually enters always the same holes.

Fig. 33

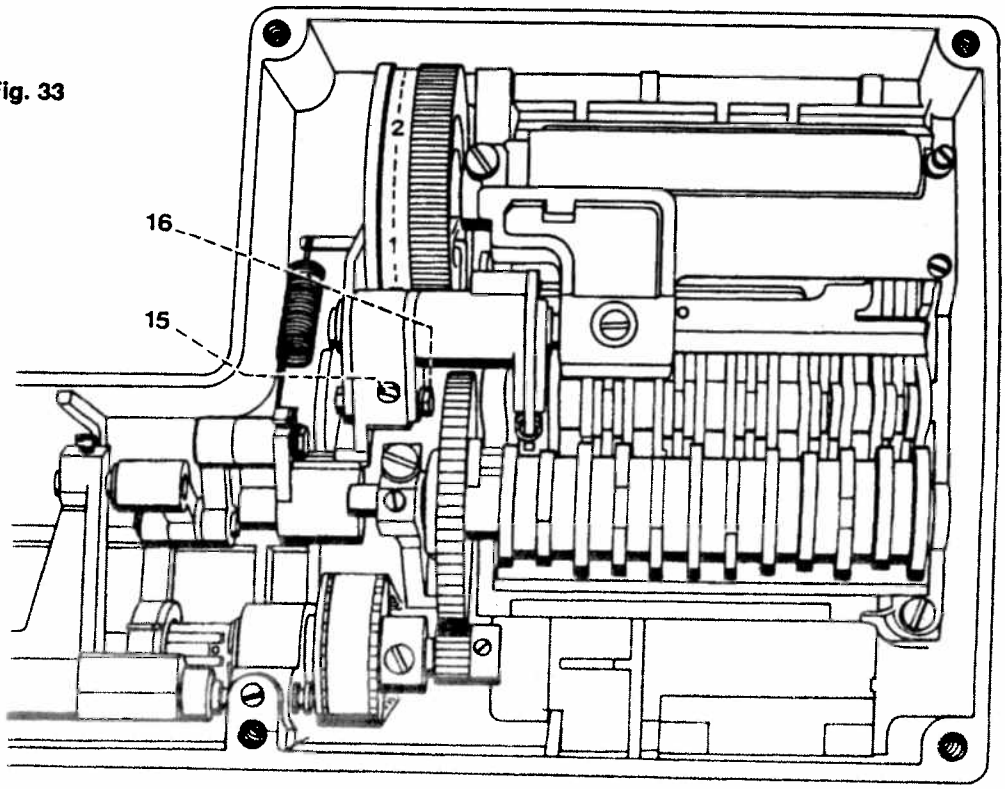


Fig. 33a

34. Making up a sewing sample

When all sewing checks are completed and the machine sews perfectly, a sewing sample is to be made.

This sewing sample should contain the most important stitch patterns which can be sewn on a repaired machine (fig. 34).

If the customer has special requirements, these should appear on a separate sewing sample.

The following is a sewing sample made on the PFAFF 6230

Stitch pattern	Stitch length	Sewing foot no.
1 Straight stitch	2.5	Zigzag foot „0“
2 Zigzag stitch	2.0	Zigzag foot „0“
3 Elastic fancy stitch	1.0	Zigzag foot „0“
4 Honeycomb stitch	III	Zigzag foot „0“
5 Triple stretch straight stitch	III	Zigzag foot „0“
6 Triple stretch zigzag stitch	III	Zigzag foot „0“
7 Fancy stitch „V“	approx. 0.3	Zigzag foot „1“
8 Lingerie buttonhole	approx. 0.3	Buttonhole foot „5“

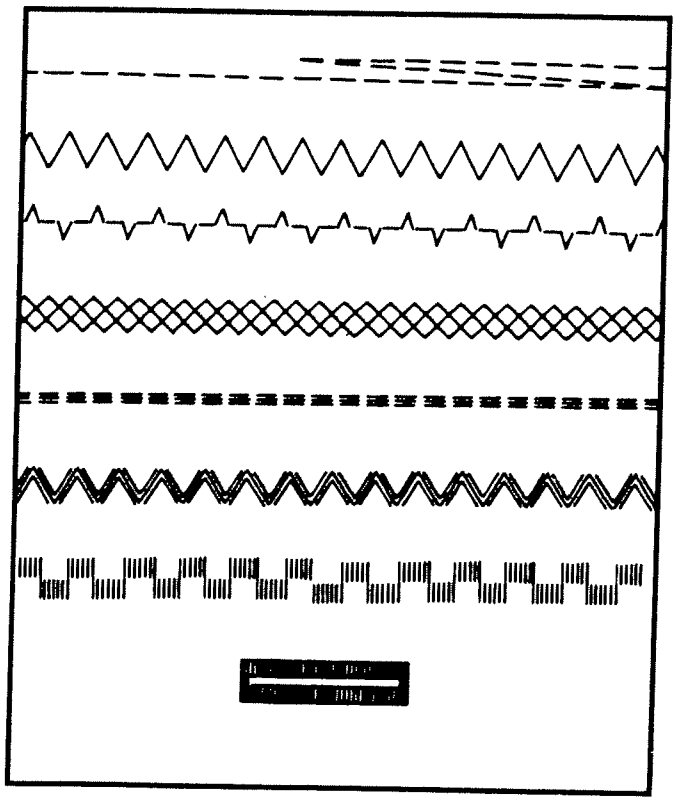


Fig. 34

Repair Instructions

35. Dismantling and assembling the needle thread tension

Removal:

- Remove the needle thread tension.
- Press the two plastic noses 86 together and remove tension dial 87 (fig. 35).
- Remove spring disc 88.
- Turn milled nut 89 out of guide 90.
- Remove guide 90.
- Remove milled nut 89 and pressure-spring 91.
- Pull out or knock out cemented stud 92 complete with pressure piece 93 and the three tension discs 94, 95 and 96.

Fitting:

- Insert tension stud 92 with the three tension discs and the pressure piece.
- Cement the tension stud into the mounting plate with Onmivit-Rapid.
- Push pressure-spring 91 and milled nut 89 onto tension stud 92.
- Insert guide 90 with its right side and fully screw in milled nut 89.
- Push on tension dial 87 making sure that the guide nose is in contact with the outer surface of the curve.
- Install the needle thread tension.
- Set the needle thread tension according to section 3.

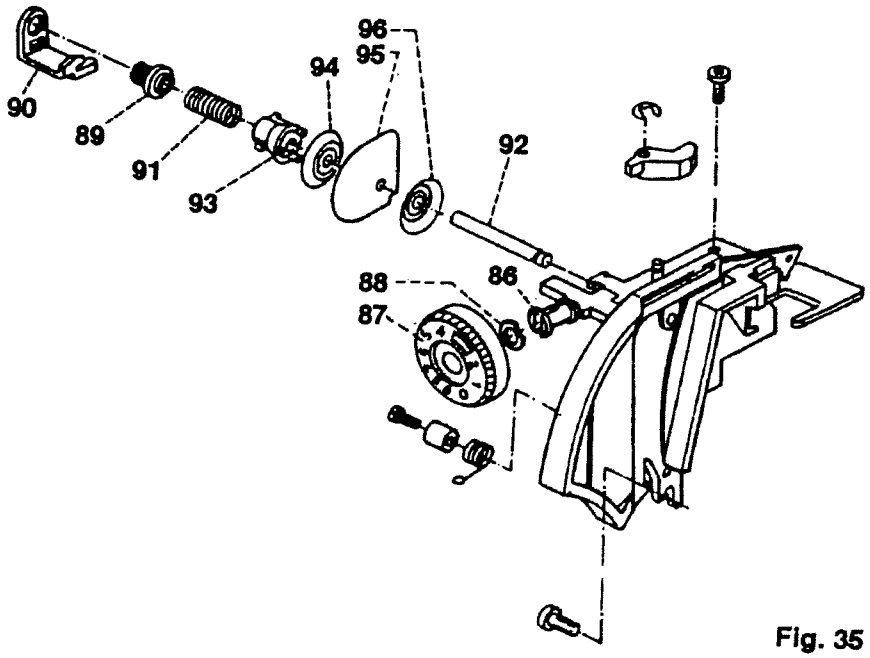


Fig. 35

36. Changing the pressure spring in the handwheel release

Removing the handwheel release

- Use clearance gauge 00-880 133-01 to remove plastic cap 119 (fig. 36).
- Remove metal screw 107.
- Pull out handwheel release disc 110 and take out pawl 111, clutch piece 113 and pressure spring 114.

Fitting the handwheel release

- Turn handwheel 115 and clutch disc 116 until the hole in the handwheel and the cutout in the clutch disc are facing downwards (fig. 36a).
- Place pressure spring 114 onto the handwheel boss so that its rear side fits into the guide groove (fig. 36b).
- First place clutch piece 113 onto the handwheel boss, then press it towards the back. The pressure spring is thus placed vertical and the clutch piece is positioned as shown in fig. 36c.
- Push the pin of pawl 111 into the hole in such a way that it is positioned as shown in fig. 36d.
- Push handwheel release disc 110 with its square mark 118 facing up into the handwheel (fig. 36e).
- In order to be able to lock into the catch, handwheel release disc 110 must be turned counter-clockwise by approx. 5 mm.
- Fit metal screw 107 with washer 108.
- Hold handwheel 115 in position and turn release disc 110 in sewing direction until you hear it snap in place.
- Fit the plastic cap.
- Check the handwheel release by engaging and disengaging it.

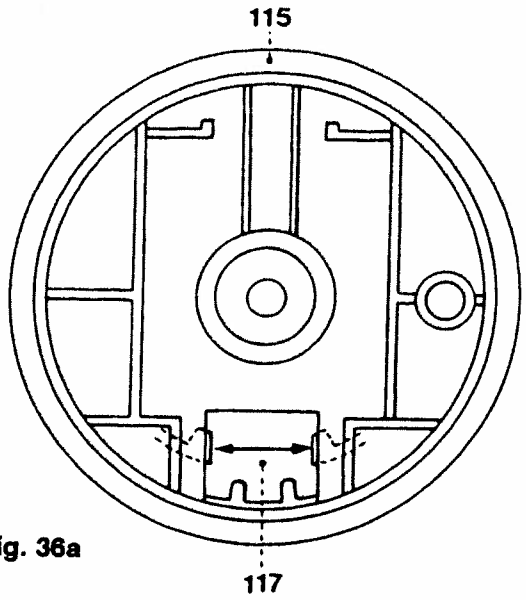


Fig. 36a

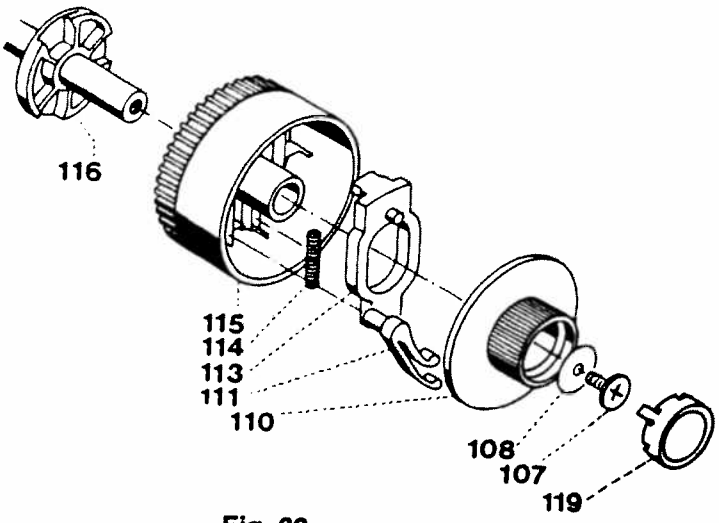


Fig. 36

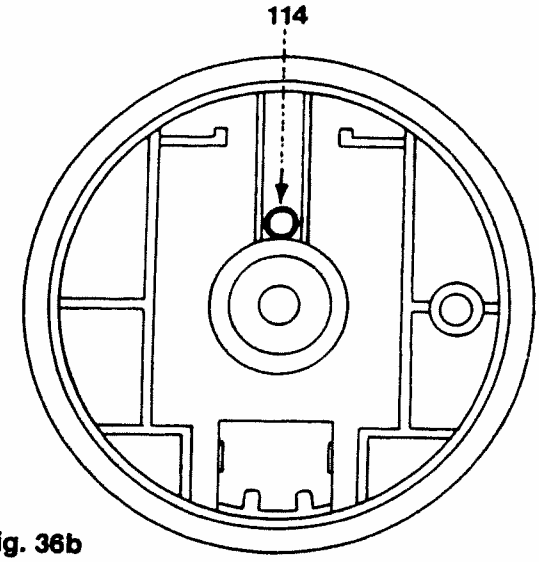


Fig. 36b

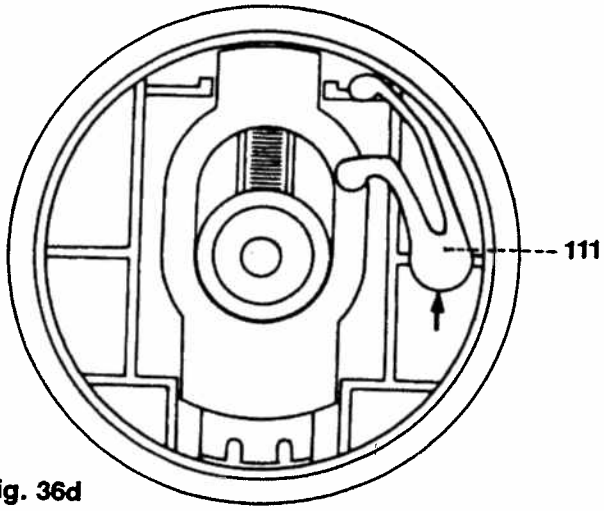


Fig. 36d

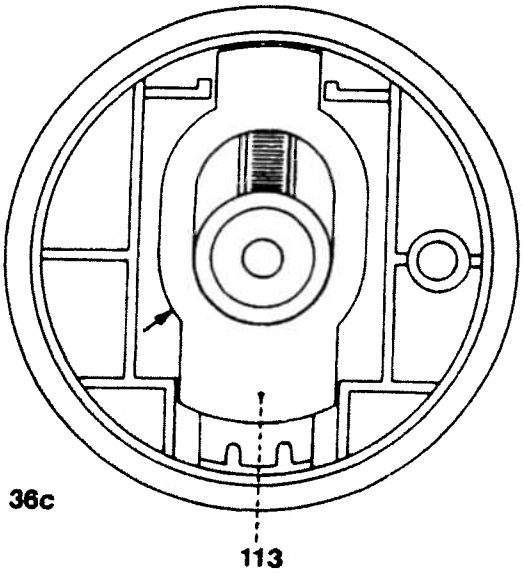


Fig. 36c

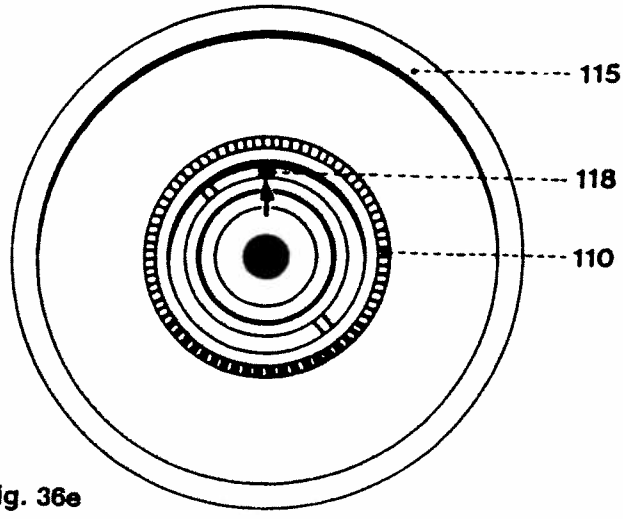


Fig. 36e

37. Dismantling and assembling the sewing hook

Removal:

- Remove the needle.
- Unscrew the sewing foot.
- Remove the bobbin case.
- Unscrew the bobbin case position finger.
- Take out the three screws with springs from behind (fig. 37).
- Remove the bobbin case base with sewing hook gib (fig. 37a).
- Turn the sewing hook gib to the left or to the right out of the bobbin case base (fig. 37b).
- Clean the sewing hook, the bobbin case base and the hook gib.

Fitting:

- Turn the handwheel until the opening of the sewing hook faces to the left (fig. 37c).
- Turn the sewing hook gib to the left into the bobbin case base (fig. 37d).
- Insert the bobbin case base complete with sewing hook gib into the sewing hook (37e).
- Fasten the sewing hook gib from behind with three screws with springs (fig. 37).
- Screw on and adjust the bobbin case position finger.

38. Cleaning and oiling the machine

Note:

The machine is equipped with sintered bearings and parts and is therefore maintenance-free for the user.

Only the sewing hook should be lubricated once in a while with normal sewing machine oil.

After repair work, the mechanic should oil the machine with BP Energol HLP 46 or HLP 80 and the sewing hook with normal sewing machine oil.

Sintered bearings or parts must not be cleaned with gasoline, paraffin, kerosene, thinners, trichlorethylene etc.

Dirty or clogged sintered bearings or parts may only be cleaned mechanically by brushing them off.

They are then oiled with BP Energol HLP 46 or HLP 80.

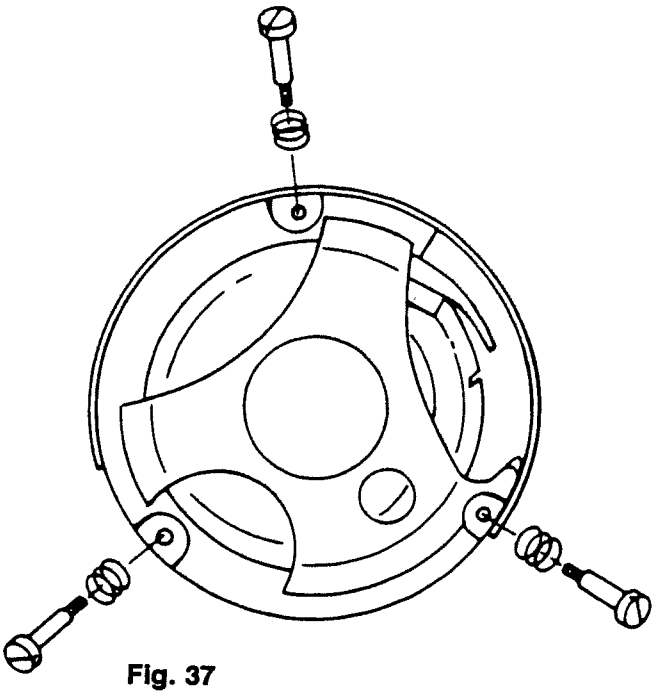


Fig. 37

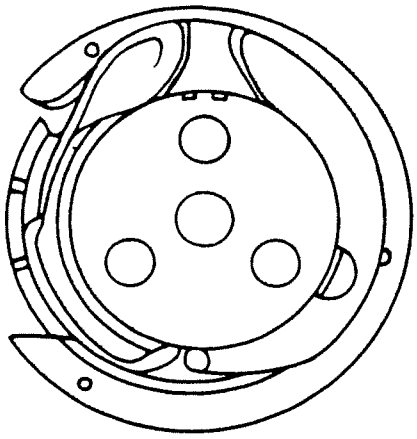


Fig. 37a

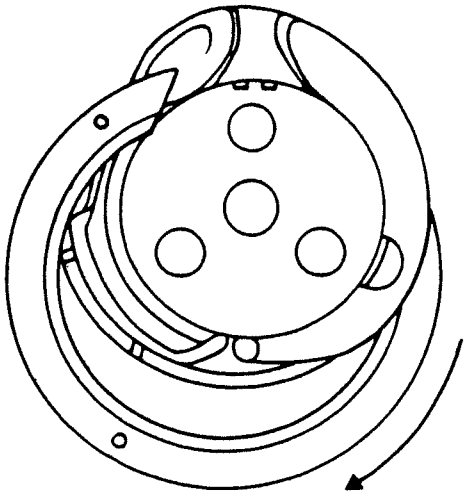


Fig. 37b

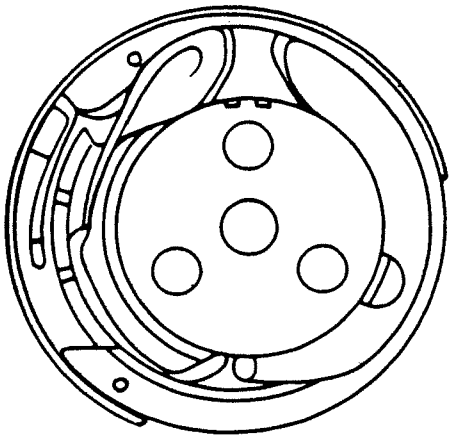


Fig. 37c

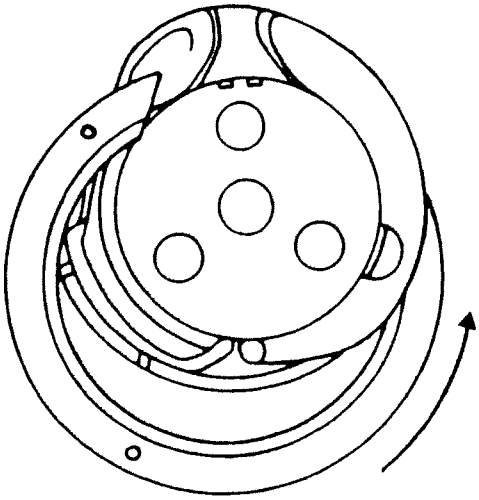


Fig. 37d

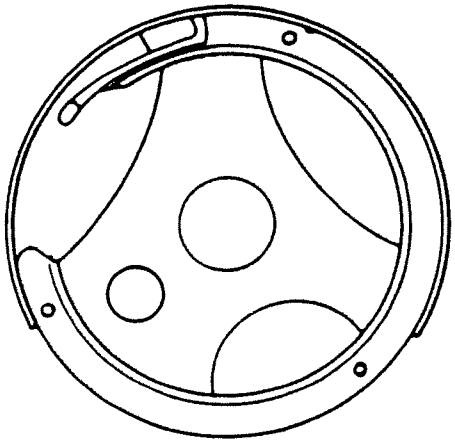


Fig. 37e

39. Changing the toothed belt

Removal:

- Pull the mains plug out of the machine.
- Remove the needle and the sewing foot sole.
- Remove the detachable work support.
- Remove the top cover.
- Switch on the bobbin winder.
- Unscrew the two Torx screws of the housing insert.
- Remove the housing insert.
- Unscrew the four retaining screws of the baseplate.
- Turn the baseplate upside down.
- On class 6230 use a screwdriver to remove the baseplate cover.
- Press catch 170 just 1 to 2 mm to the right and pull out plug 174 with the two-connection cable.
- Remove plugs 172 and 173 from the circuit board (fig. 39).
- Press the two catches 190 of the motor plug together and pull it out upwards (fig. 39a).
- Remove the three flat cables out of the cable channel.
- Place the baseplate aside.
- Loosen fixing collar screw 85 of the synchronizer (fig. 39b).
- Remove the synchronizer to the right from the shaft.
- Loosen screw 164 in arm shaft crank 106 (fig. 39c).
- Loosen screw 1 of tensioning roller 2.
- Unscrew screw 165.
- Remove circlip 132 off the arm shaft.
- Pull arm shaft 76 to the right and release toothed belts 77 and 78.
- Loosen the three screws 17, 19 and 25 of the automatic utility-stitch unit.
- Loosen the two screws 21 and remove gear 22 to the right.
- Move the automatic utility-stitch unit a little to the front and remove toothed belt 77 between the large gear 23 and the shaft end.

Fitting:

- Insert new toothed belt 77 and insert it between the large gear and the shaft end. Install it on the lower toothed belt 80.
- Tighten the three screws 17, 19 and 25 of the automatic utility-stitch unit.
- Pull toothed belt 77 upwards.
- Insert arm shaft 76 to the left through toothed belt 77 into the left bearing and in arm shaft crank 106.
- Fit circlip 132 on the arm shaft.
- Remove lengthwise play in the arm shaft and tighten screw 164 in the arm shaft crank.
- Push toothed belt 77 onto upper sprocket 79.
- Insert and tighten screw 165 in the upper sprocket.
- Adjust the tensioning roller according to section 1.
- Place motor belt 78 on the handwheel.
- Push the small gear 22 onto the shaft and tighten screws 21 just lightly.
- Adjust the gears according to section 12.
- Push the synchronizer onto the shaft (fig. 39b).
  Check that the housing rib is between both guide clamps.

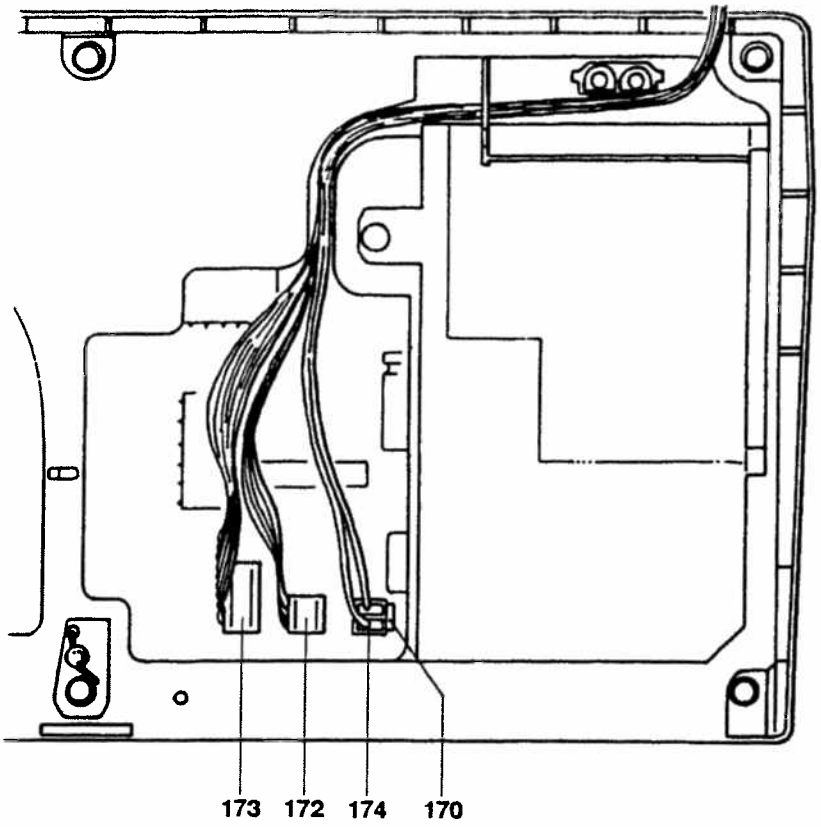


Fig. 39

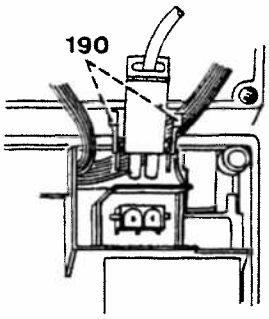


Fig. 39a

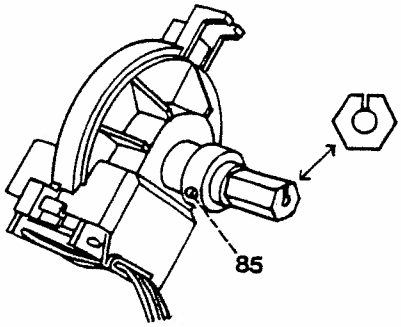


Fig. 39b

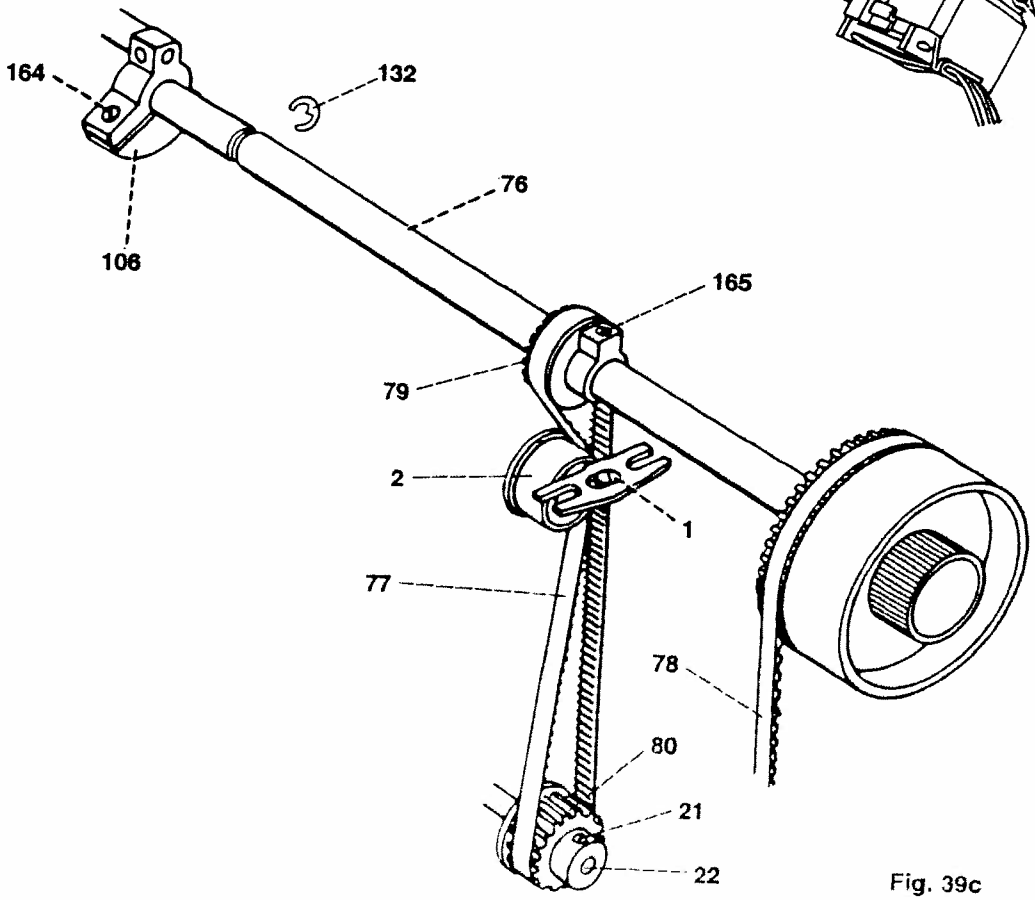


Fig. 39c

Adjusting the arm shaft crank

- Press the key for straight stitch.
- Loosen screw 164 in arm shaft crank 106 just enough to allow the arm shaft crank to be turned on its shaft (fig. 39c).
- Raise the needle bar and insert the needle.
- Hold arm shaft crank 106 with your left hand.
- Turn the handwheel with your right hand until the feed dog is at the bottom and the sewing hook point is centered between the feed dog rows.
- Now hold the handwheel while at the same time turning arm shaft crank 106 until the needle bar is in its lowest position.
- Fit spacer 63-102600-18 on the needle bar.
- Push needle-rise clamp 00-870137-01 on the needle bar and tighten it just a little (fig. 39e).
- Push the 2.2-mm feeler gauge 00-870136-01 with its cutout on the needle bar above the needle-rise clamp.
- Push the needle-rise clamp and the 2.2-mm feeler gauge up against the spacer.
- Tighten the milled screw of the needle-rise clamp.
- If there is play at the feeler gauge, repeat this procedure.
- Remove the 2.2-mm feeler gauge.
- Hold the handwheel and turn arm shaft crank 106 in sewing direction until the needle-rise clamp is in contact with the spacer.
- The sewing hook point must now be exactly opposite the center line of the rear side of the needle.
- If this is not the case, turn simultaneously handwheel and arm shaft crank 106 until the sewing hook is exactly opposite the center line of the rear side of the needle with the clamp resting against the spacer.
- Remove the needle-rise clamp.
- Tighten screw 164 in arm shaft crank 106 in such a way that arm shaft 76 has no play and the needle rise is correct.
- To this end re-attach the needle-rise clamp and check.
- Fit the needle plate.
- Adjust sideways movement of needle bar according to section 14.
- Set synchronizer according to section 26.
- Set baseplate complete against the machine.
- Place the three flat cables in the cable channel (fig. 39a).
- Connect the motor plug to the motor socket (both catches 190 must engage).
- On class 6230 fit the cover of the control board.
- Fold the baseplate against the machine and fasten it with the four screws.
- Insert the housing insert and fasten it with the two screws.
- Then the following items have to be checked and adjusted on the machine:
- Section 29 – Adjustment of bobbin thread tension
- Section 30 – Adjustment of needle thread tension
- Section 31 – Adjustment of thread check spring stroke
- Section 33 – Adjustment of equal forward and reverse stitch length for utility stitches
- Use testing appliance ABB Metrawatt 5013 to carry out an electrical safety test according to VDE 0701.

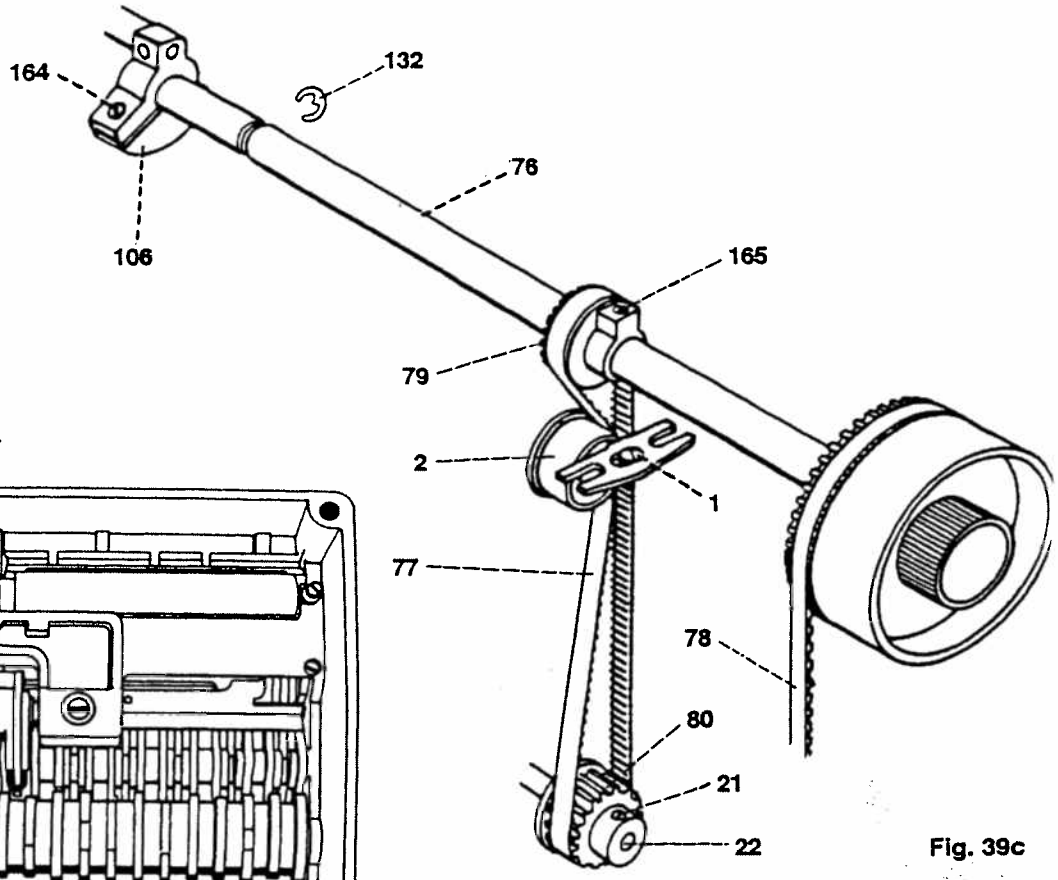


Fig. 39c

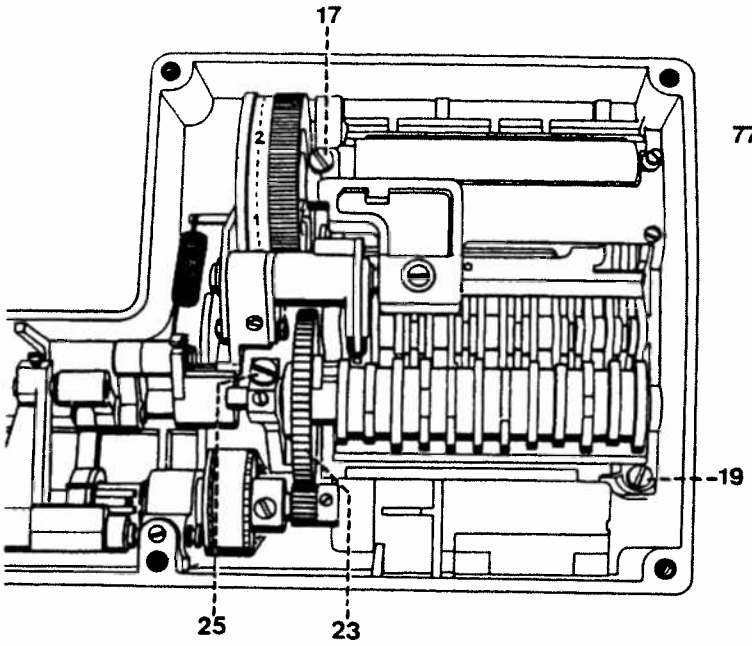


Fig. 39d

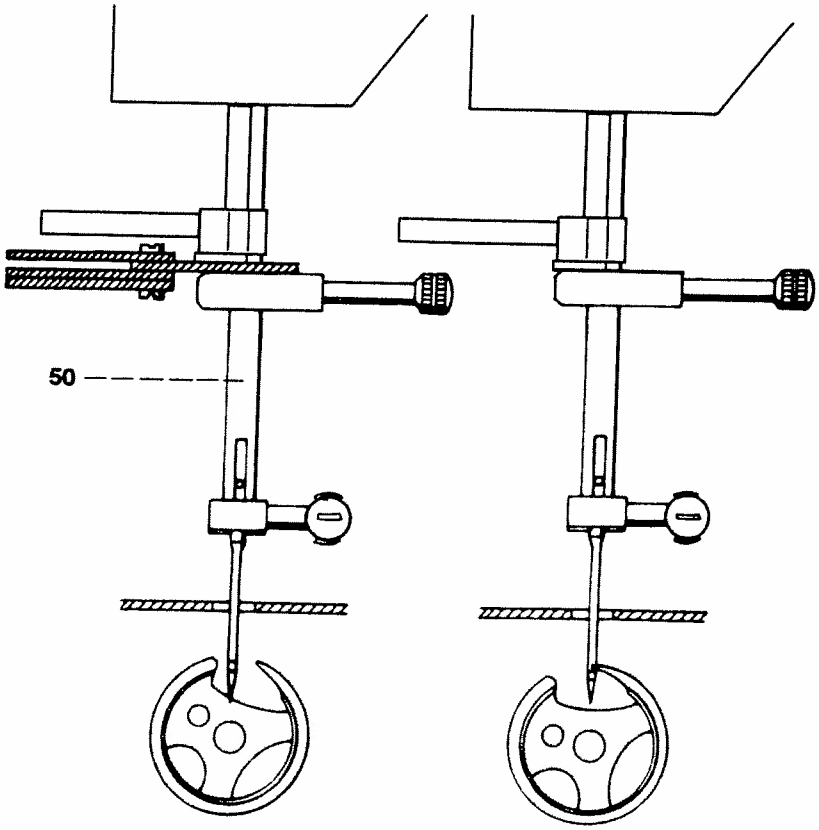


Fig. 39e

40. Changing the bevel gears

Note:

Always change bevel gears in pairs.

Removal:

- Remove housing cover according to adjustment and repair instructions.
- Loosen fixing collar screw 85 of the synchronizer (fig. 40).
- Remove the synchronizer to the right from the shaft.
- Loosen the two screws 21 on the small gear 22 (fig. 40a).
- Remove the small gear 22 to the right from hook driving shaft 35.
- Disconnect pull-spring 4a (fig. 40b).
- Loosen screw 3.
- Remove the feed-dog lowering mechanism.
- Set the adjusting dial of the stitch length control at „6".
- Loosen screw 6.
- Remove washer 6a.
- Remove stud 5.
- Unscrew both screws 43 of bobbin case position finger 45.
- Place bobbin case position finger 45 and the leaf spring aside.
- Loosen the two screws 42 at the sewing hook.
- Remove the complete sewing hook 44 to the top.
- Remove the complete connecting bar 34 from actuating crank 19 (fig. 40b).
- Push the connecting bar 34 as far to the left as it will go.
- Push driving eccentric 33 to the left.
- Knock out hollow pin 58 (fig. 40a).
- Use a screwdriver to remove the circlip.
- Push the plastic washer a little to the left.
- Unscrew screw 37 of the lifting eccentric (fig. 40c).
- Loosen the three screws 24 of the lower belt sprocket (fig. 40a).
- Push hook driving shaft 35 fully to the right.
- Remove screw 41a at the sewing hook bearing and push the latter fully to the left (fig. 40b).
- Turn the sewing hook bearing a little and remove the small hook driving shaft along with the small bevel gear 38.
- Unscrew screw 39 at the sewing hook bearing and remove hook shaft bushing 46 (fig. 40c).
- Remove the large bevel gear with the lifting eccentric from the hook bearing.

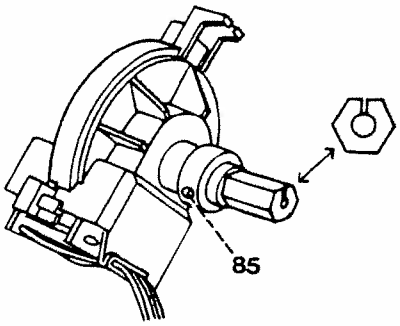


Fig. 40

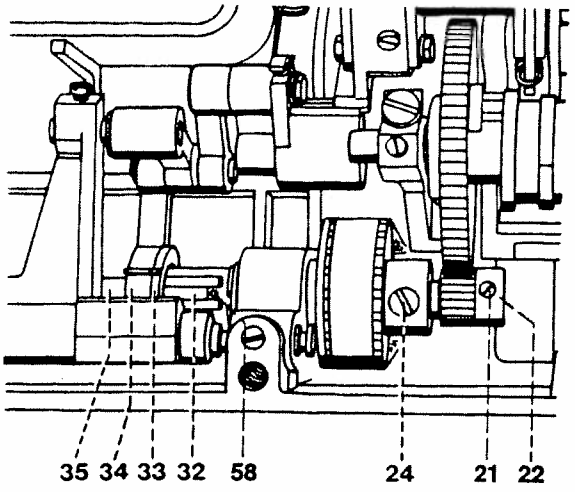


Fig. 40a

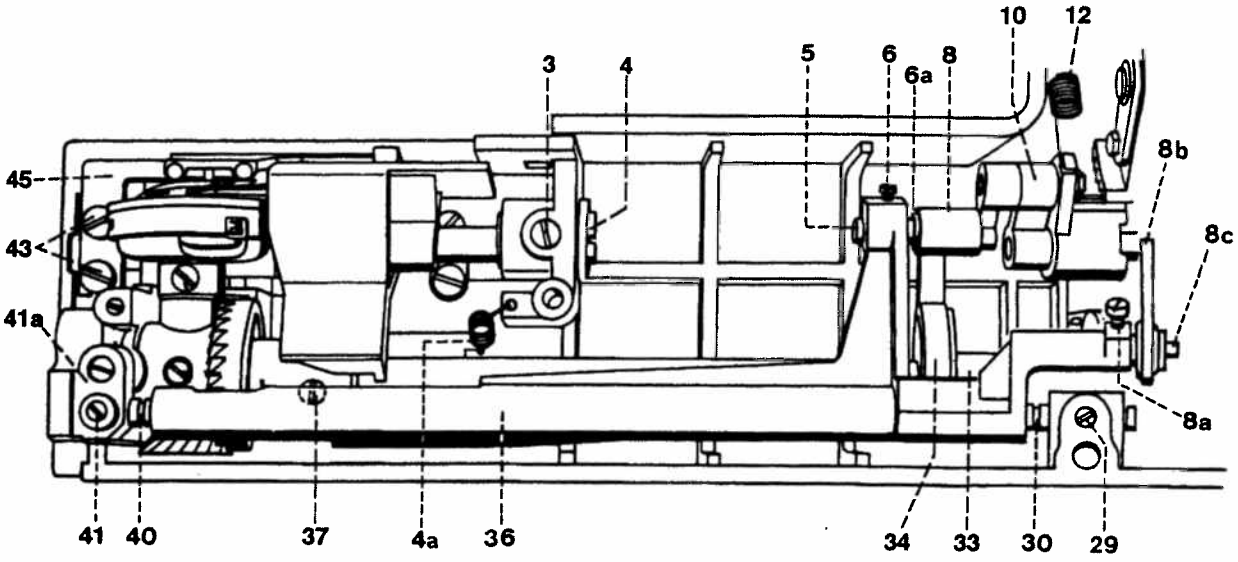


Fig. 40b

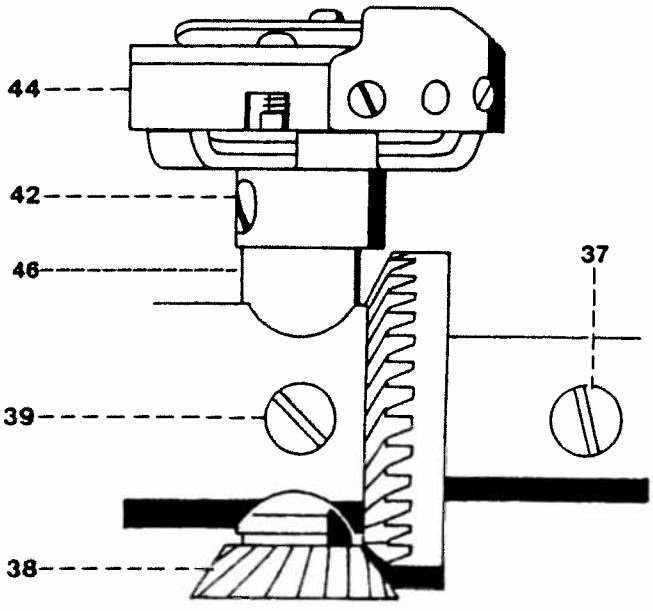


Fig. 40c

Fitting:

- Set the new bevel gear with the lifting eccentric onto the sewing hook bearing.
- Insert hook shaft bushing 46 and tighten screw 39 lightly (fig. 40c).
- Insert the small hook driving shaft with the small bevel gear 38 and the two plastic washers.

Note:
The large surface of hook shaft bushing 46 must face the right.

- Insert screw 41a and fasten the hook bearing (fig. 40b).
- Insert sewing hook 44 and tighten one of screws 42 (fig. 40c).
- Push the hook driving shaft 35 to the left.
- Insert screw 37 into the large bevel gear and set it onto the surface of the hook driving shaft.
- Push the plastic washer to the right against the bearing.
- Fit the circlip making sure that the plastic washer is between bearing and circlip.
- Pull hook driving shaft 35 to the right as far as it will go and use one of screws 24 of the toothed belt sprocket to remove any lengthwise play in the shaft (fig. 40a).
- Insert and knock in hollow pin 58.
- Push driving eccentric 33 to the right.

Note:
Hollow pin 58 must always be visible on driving eccentric 33 on the opposite side of screw 37 in the lifting eccentric.

- Place connecting bar 34 complete onto actuating crank 10 (fig. 40b).
- Insert stud 5.
- Insert washer 6a.
- Adjust feed regulator cranks in accordance with Section 7.
- Fit the feed-dog lowering mechanism.
- Connect pull-spring 4a.
- Push the small gear 22 onto hook shaft 35.
- Push the synchronizer onto the shaft.
  Make sure that the housing rip is inbetween the two guide clamps.
  Now the following adjustments must be carried out.
- Section 3 Adjustment of feed dog height
- Section 9 Timing of feed motion
- Section 22 Adjustment of hook-to-needle clearance
- Section 22a Adjustment of bevel gears
- Section 23 Hook timing
- Section 24 Adjustment of needle bar height
- Section 25 Adjustment of bobbin case position finger
- Section 26 Adjusting the synchronizer
- Section 27 Adjustment of needle threader
- Section 29 Adjustment of bobbin thread tension
- Section 30 Adjustment of needle thread tension
- Section 33 Adjustment of equal forward and reverse stitch length for utility stitches
- Section 34 Making up a sewing sample
- Use testing appliance ABB Metrawatt M 5013 to carry out an electrical safety test according to VDE 0701.

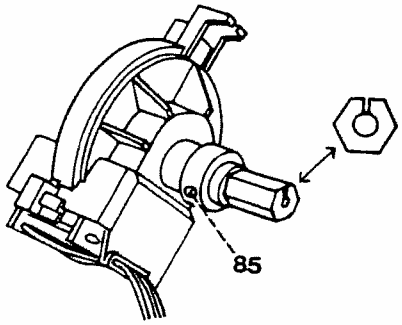


Fig. 40

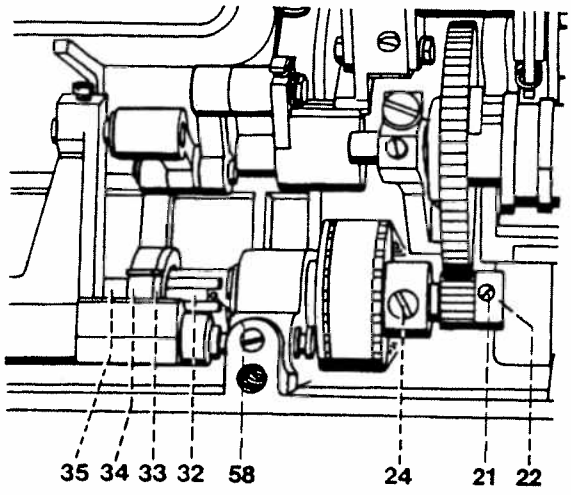


Fig. 40a

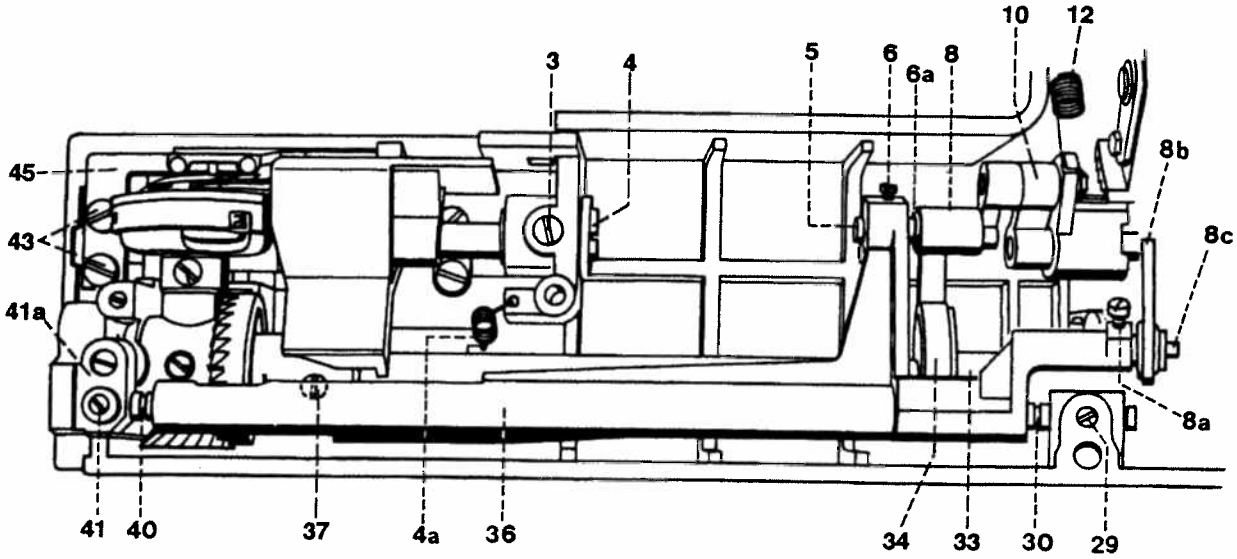


Fig. 40b

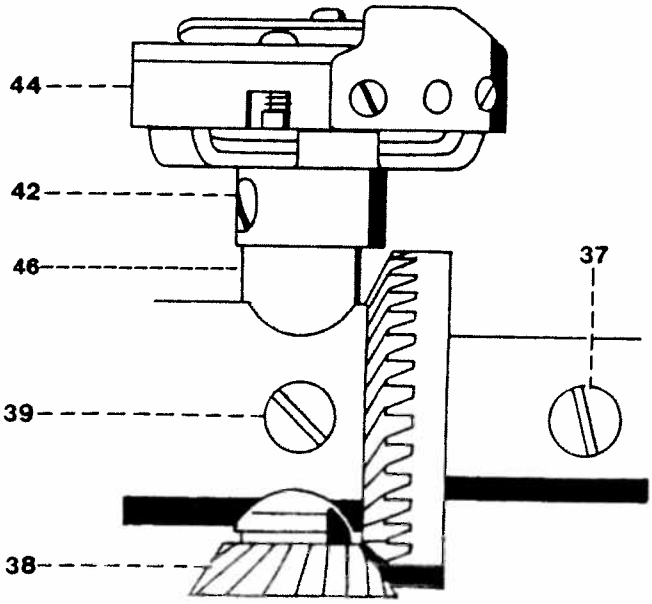


Fig. 40c

41. Changing the motor

Note:
The motor is only exchanged as a complete unit.

Removal:
- Remove mains plug from mains socket.
- Remove the detachable work support.
- Remove the housing cover according to Adjustment and Repair Instructions.
- Unscrew the right-hand motor retaining screw 59 (fig. 41).
- Disconnect light plug 60.
- Unscrew the second motor retaining screw 58.
- Lift motor sprocket 133 out of toothed belt 135 and remove the motor to the front.

Fitting:
- Before refitting the motor, the leakage current must be measured (see section 57 of the adjustment and repair instructions).
- Insert the motor and place motor sprocket 133 in toothed belt 135 (fig. 41).
- Install the sewing lamp wire at the motor and attach plug 60.
- Insert and slightly tighten top motor retaining screw 58.
- Insert and slightly tighten right motor retaining screw 59.
- Tauten toothed belt 135 and tighten the two screws.
- Fit the housing cover according to the Adjustment and Repair Instructions.
- Connect the mains plug and run the machine for testing purposes.
- Use testing appliance Metrawatt 5013 to perform an electrical safety test according to VDE 0701.

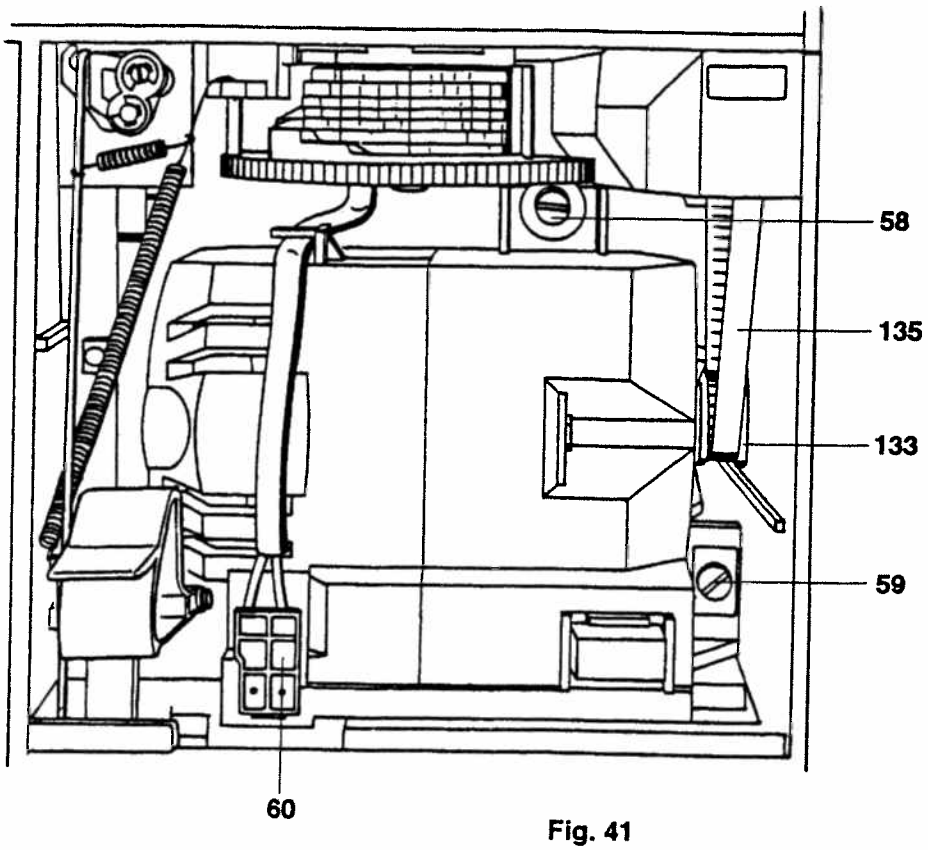


Fig. 41

42. Changing the motor circuit board on motor types UUS 400 and UUS 403

Note:
The circuit board is exchanged complete.

Removal:
- Remove the motor according to section 41 of the adjustment and repair instructions.
- Raise the two locking tabs 125 only a little and remove cover 124 (fig. 42).
- Unscrew the two groove nuts 122.
- Pull the motor apart and remove end shield 123.
- Unsolder the four cables 130.
- Raise the plastic guide of contact pins 131 by about 3 mm.
- Raise circuit board 132 at the side of the master switch and remove it.

Fitting:
- Insert new circuit board 132 with contact pins 131, then install it at the side of the master switch.
- Solder the four cables at points 130.
- Push on end shield 123 and secure it with the two groove nuts 122.
- Push cover 124 onto one side and allow it to engage on the other.
- Measure the stray current according to section 57.
- Fit the motor according to section 41.
- Use testing appliance ABB Metrawatt M 5013 to perform an electrical safety test according to VDE 0701.

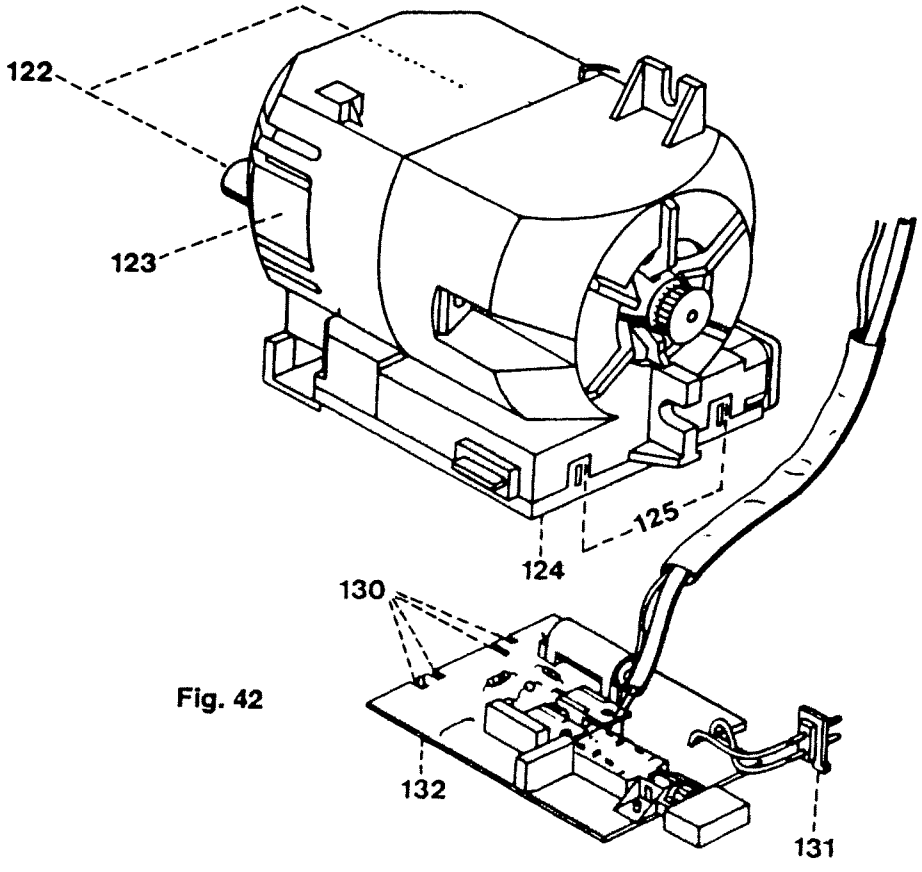


Fig. 42

43. Changing the motor circuit board on motor types UUS 390 and UUS 393

Note:

The capacitor and the master switch are always exchanged complete with the circuit board.

Removal:

- Remove the motor according to section 41 of the adjustment and repair instructions.
- Raise the two locking tabs 125 only a little and remove cover 124 (fig. 43).
- Unsolder the two cables at points 130.
- Unscrew the three screws 127.
- Remove circuit board 126.

Fitting:

- Solder the two cables at points 130 of the new circuit board.
- Insert circuit board 126.
- Screw the three screws 127 into contact pins 129 and tighten them.
- Push cover 124 onto one side and allow it to engage on the other.
- Measure the stray current according to section 57 of the Adjustment and Repair Instructions.
- Fit the motor according to section 41.
- Use testing appliance ABB Metrawatt M 5013 to perform an electrical safety test according to VDE 0701.

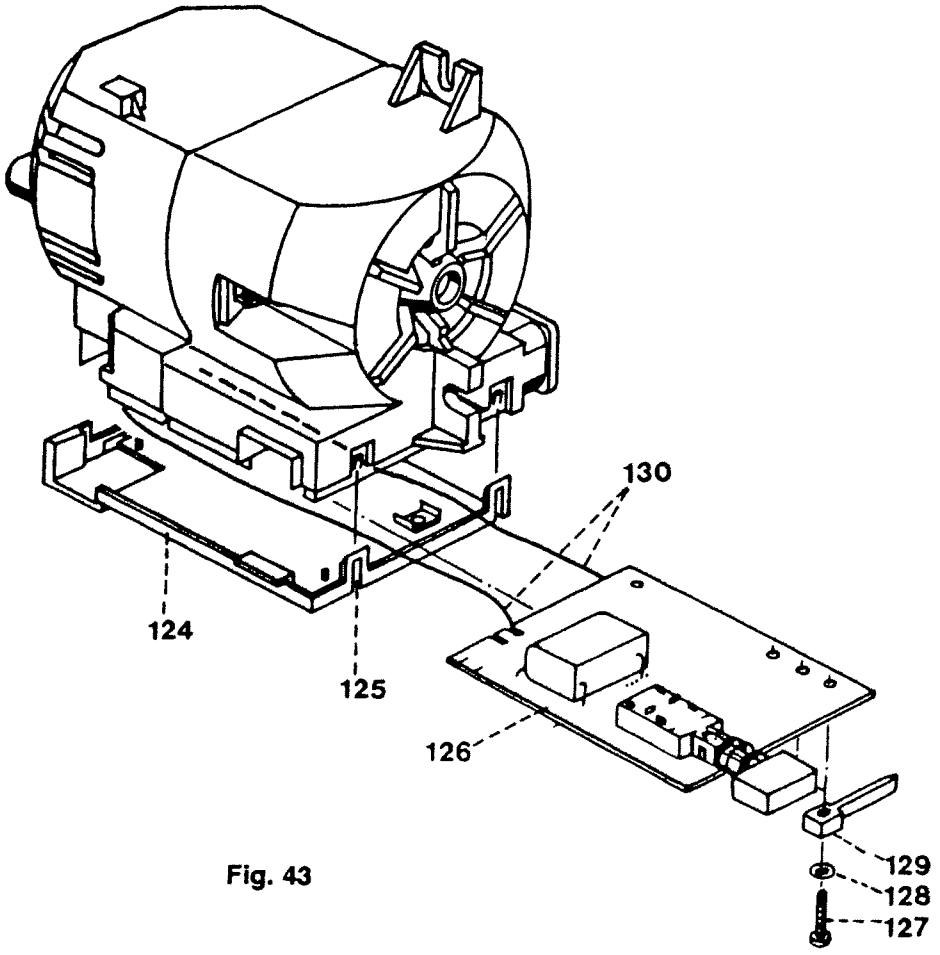


Fig. 43

44. Changing the carbon brushes on Pfaff 6110-6230

Removal:

- Remove the motor in accordance with Section 41 of the Adjustment and Repair Instructions.
- Raise the two locking tabs 125 only a little and remove cover 124 (fig. 44).
- Turn out the two groove nuts 122.
- Pull the motor apart and remove end shield 123.
- Disconnect the torsion springs and remove carbon brushes 121.
- Clean the collector and the motor.

Fitting:

- Insert the two new carbon brushes and connect the torsion springs.
- Push on end shield 123 again.
- Insert the two groove nuts and tighten them.
- Push on cover 124 on one side and allow it to engage on the other.
- Measure leakage current acoording to Section 57 of the Adjustment and Repair Instructions.
- Fit the motor according to Section 41.
- Use testing appliance ABB Metrawatt M 5013 to carry out an electrical safety test according to VDE 0701.

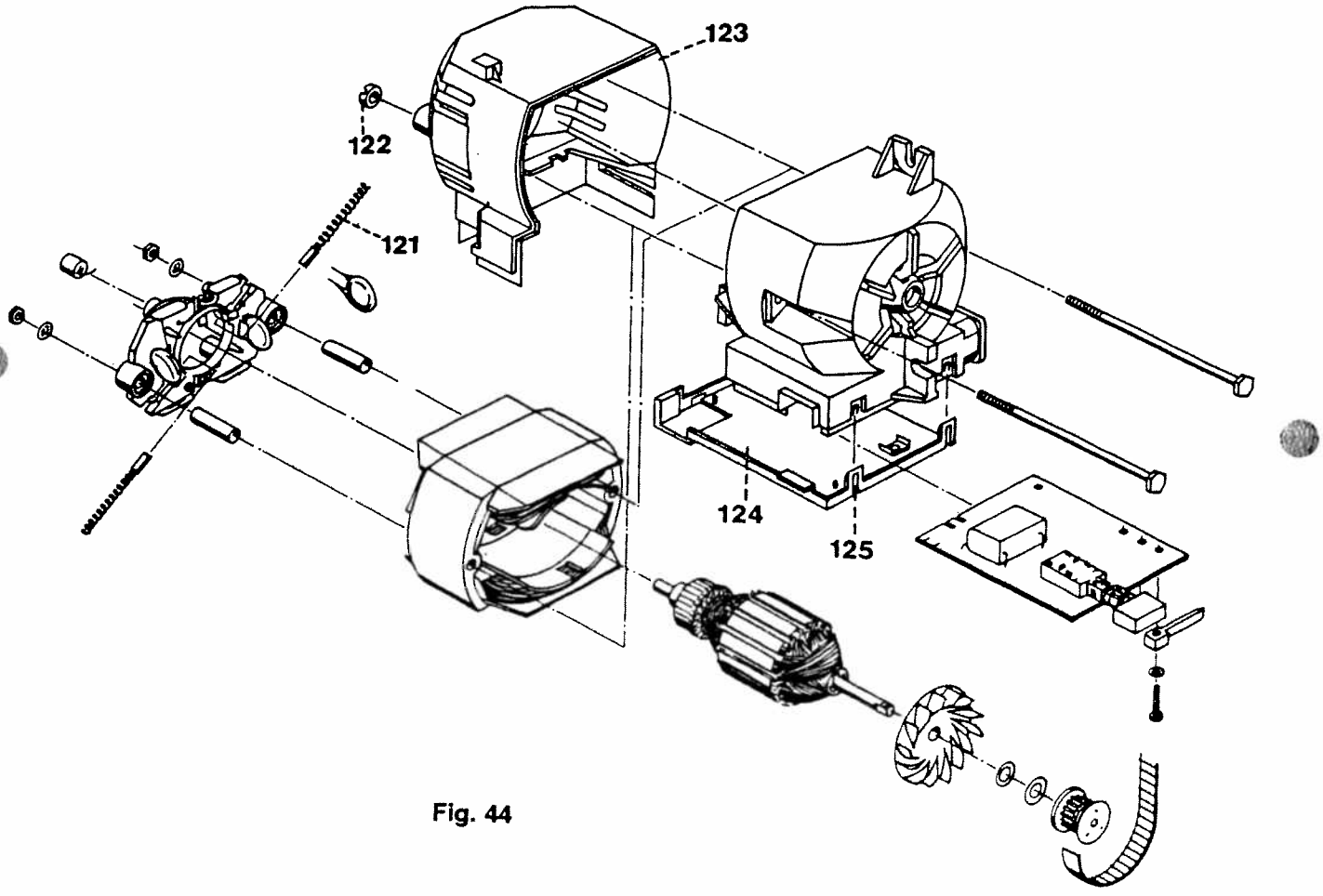


Fig. 44

45. Changing the motor pinion

Note:
The motor pinion is only removed when a rotor is exchanged.

Removal:
- Remove the motor according to section 41 of the Adjustment and Repair Instructions.
- Insert two screwdrivers of the same width between pinion 133 and the motor bearing (fig. 45).
- Turn the screwdrivers in opposite directions, thus prizing pinion 133 off the shaft.

Note:
The old pinion is no longer usable.

Fitting:
- Support the rotor shaft at the opposite end and push on the new motor pinion.
- Measure the stray current according to Section 57 of the Adjustment and Repair Instructions.
- Fit and glue on outer disc 134.
- Install the motor according to section 41.
- Use testing appliance ABB Metrawatt M 5013 to perform an electrical safety test according to VDE 0701.

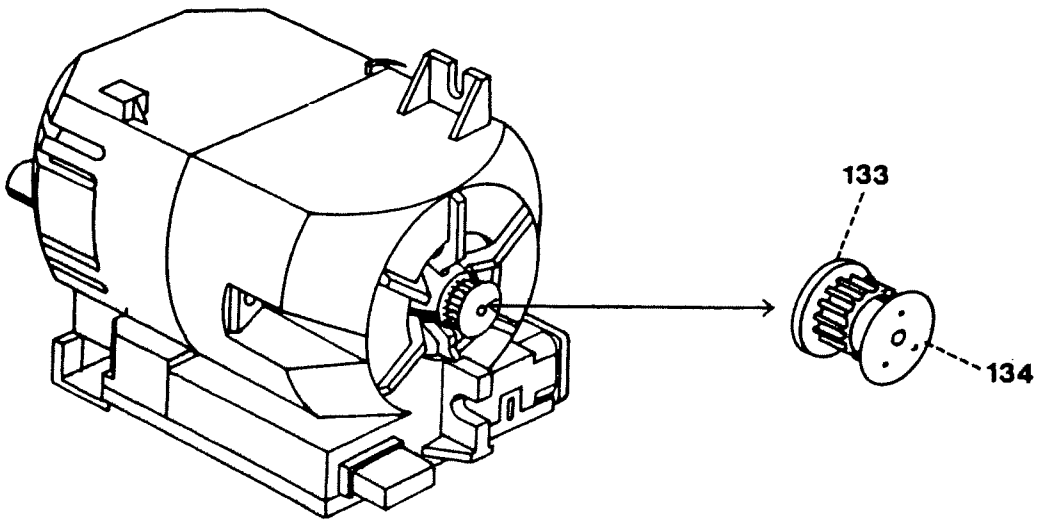


Fig. 45

46. Changing the motor toothed belt

Removal:

- Remove the mains plug from the machine.
- Remove the housing cover according to the Adjustment and Repair Instructions.
- Unscrew the two screws 58 and 59 of the motor (fig. 46).
- Disengage the handwheel.
- Turn out handwheel screw 134 (fig. 46a).
- Remove the complete handwheel.
- Remove the toothed belt.

Fitting:

- Insert the new toothed belt 135 and press it up until there is enough space for the handwheel (fig. 46).
- Insert handwheel and place the toothed belt correctly onto the handwheel pinion.
- Insert handwheel screw 134 and tighten it only with medium force.
- Fit the toothed belt onto motor pinion 133.
- Fasten the motor with screws 58 and 59 adjusting the belt tension at the same time.
- Fit the housing cover according to the Adjustment and Repair Instructions.
- Use testing appliance ABB Metrawatt M 5013 to carry out an electrical safety test according to VDE 0701.

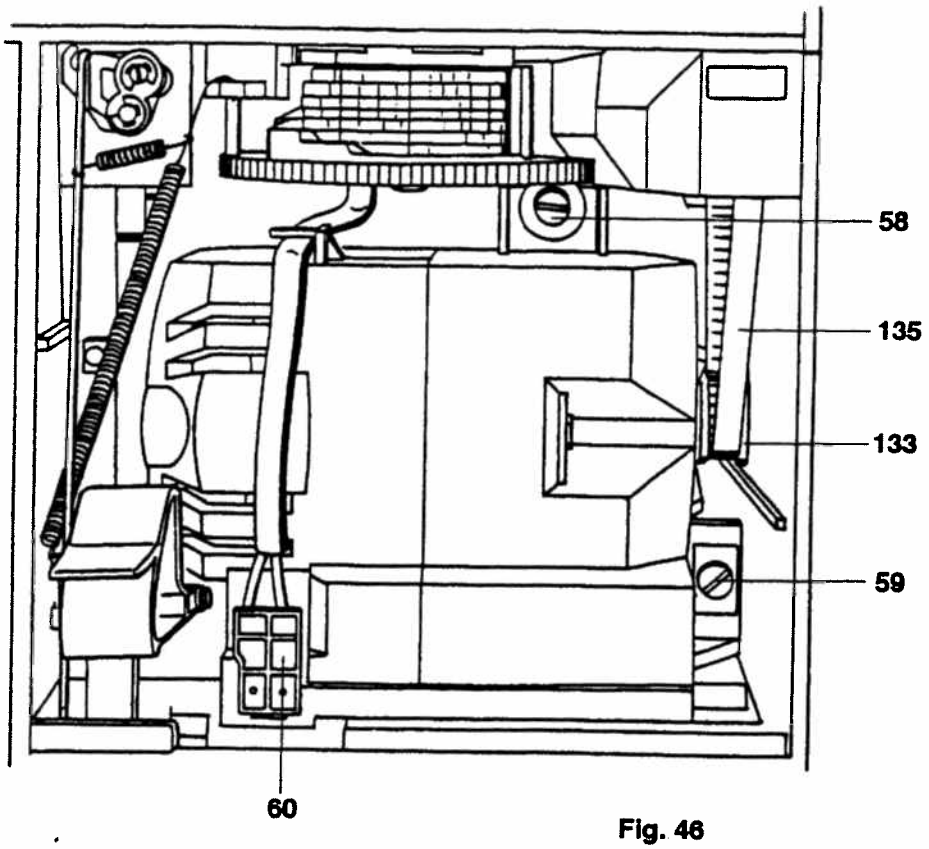


Fig. 46

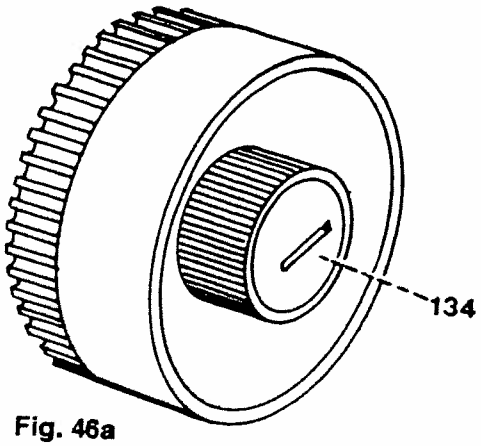


Fig. 46a

47. Changing the cable in the foot control

Removal:

- Raise rubber strip 167 and pull it out with its three feet (fig. 47).
- Pull out the two plugs 165.
- Unscrew the four Philips screws 168.
- Remove housing cover 166.
- Remove the rectangular pedal 169 with guide 170 and take out contact spring 179.
- Disconnect the right pressure spring 178.
- Disconnect the right cable 177 with the contact eyelet (fig. 47a).
- Press out or pull out cemented resistor track 172 (20 KΩ potentiometer) upwards with a screwdriver or a pair of pliers.
- Remove cable 176.

Fitting:

- Insert cable 176 into the housing.
- Insert the soldered resistor track 172 fully downwards into the guide and secure it with some adhesive.
- Push the soldered contact eyelet 177 onto the right guide pin.
- Place both cables in the respective guide grooves.
- Place contact spring 179 on the guide pin in the larger right section of pedal 169.
- Push pressure spring 178 onto the same guide pin.
- Turn pedal 169 around and push the right spring 178 on the right guide pin of the housing and the left spring 171 on the left guide pin in pedal 169.
- First press the pedal a little to the right and then downwards in such a way that contact spring 179 is on the right-hand side of resistor track 172 and is not bent.
- Press the pedal further down, as far as it will go; at the same time insert guide 170 in its two open bearings.
- Hold pedal 169 in this position; at the same time replace housing cover 166 and press it firmly on the housing (fig. 47).
- Insert and tighten the four Philips screws.
- Insert rubber strip 167 and the two plugs 165.
- Carry out a performance test.
- Use testing appliance Metrawatt M 5013 to carry out an electrical safety test according to VDE 0701.

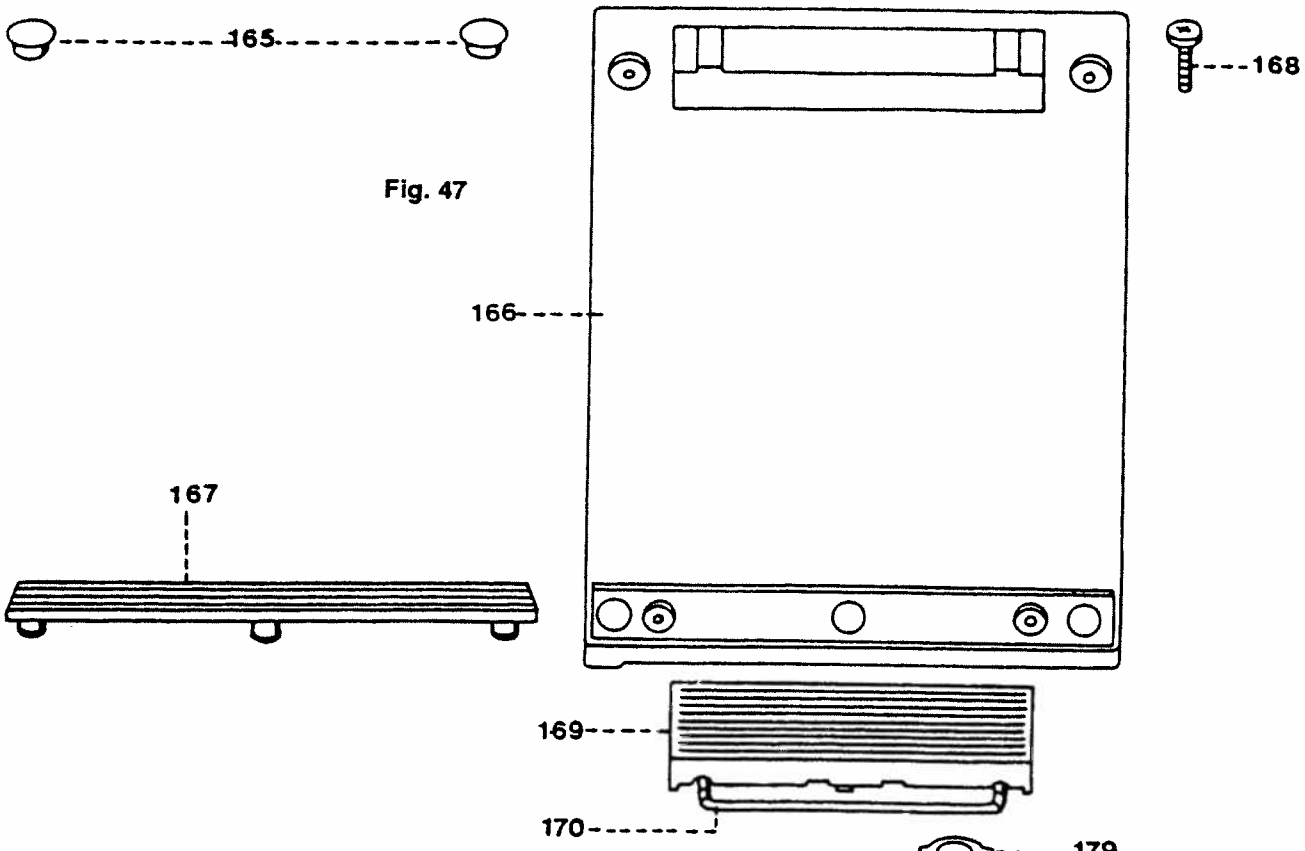


Fig. 47

Fig. 47a

48. Changing the circuit board in foot control AE 010

Removal:

- Turn the foot control so that it rests on pedal 179.
- Insert a screwdriver with a wide blade on the side opposite the cables (fig. 48).
- Turn the screwdriver while removing pedal 179 upwards.
- Carefully disconnect cables 187 from the circuit board (fig. 48a).
- Remove pressure piece 178 and spring 177.
- Unscrew the two Philips screws 180.
- Remove the complete circuit board.

Fitting:

- Insert the complete new circuit board making sure that the switch fits into the guide of the pre-selection slide.
- Insert the two Philips screws 180 and tighten them.
- Turn the potentiometer counter-clockwise until the crank journal is at the top.
- In this position insert spring 177 and pressure piece 178.
- Connect cable 187 to the circuit board.
- Fit pedal 179.
- Use a screwdriver with a wide blade to press the pedal a little aside and insert it downwards.
- Perform a function check.
- Use testing appliance ABB Metrawatt M 5013 to carry out an electrical safety test according to VDE 0701.

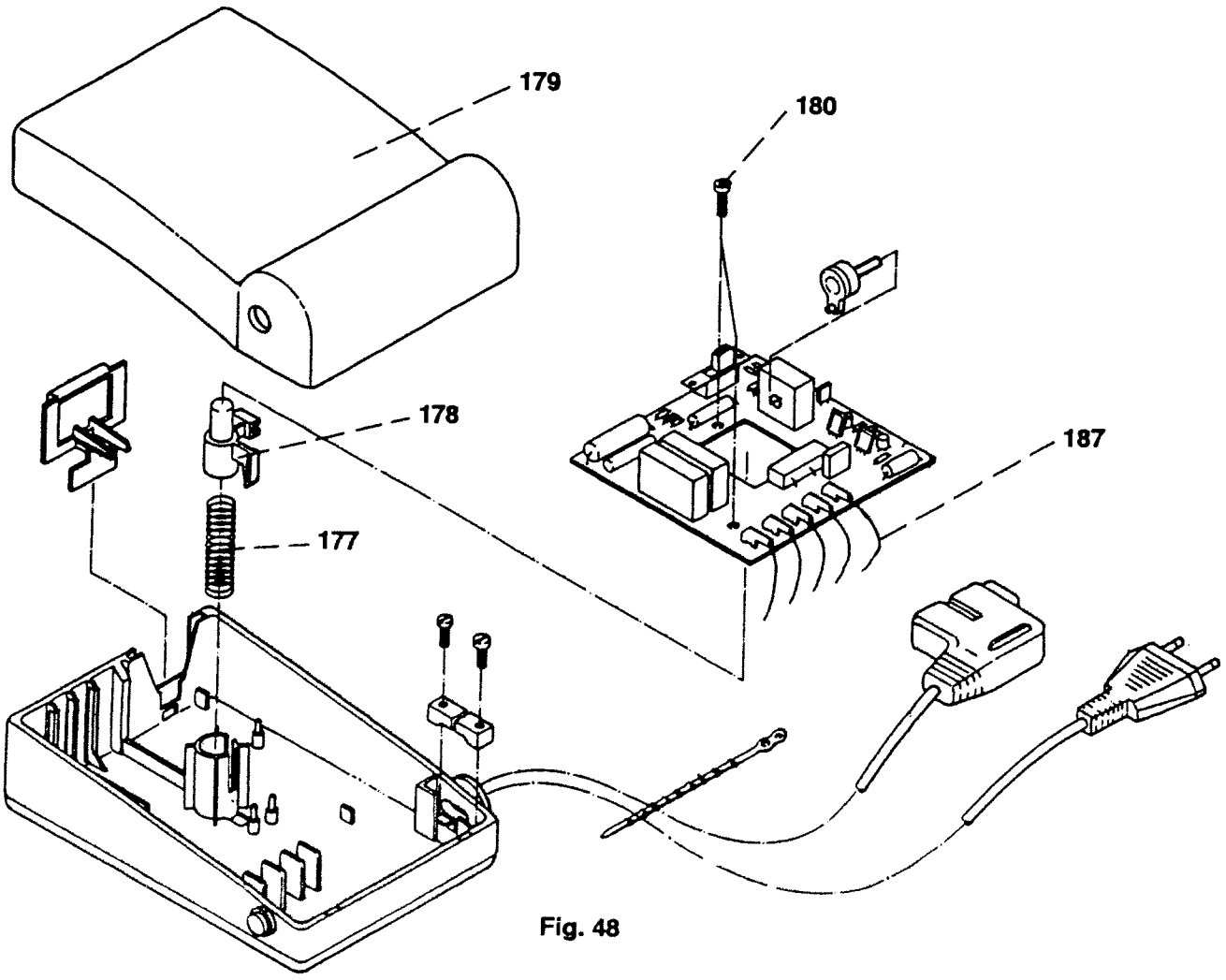


Fig. 48

49. Changing the mains connection in foot control AE 010

Note:

When changing connections it is compulsory to use the original PFAFF connection cables.

Removal:

- Turn the foot control so that it rests on pedal 179.
- Insert a screwdriver with a wide blade on the side opposite the cables (fig. 49).
- Turn the screwdriver while removing pedal 179 upwards.
- Carefully disconnect cables 187 from the circuit board (fig. 49a).
- Loosen screw 173 or screw 174.
- Remove stress relief 175.
- Remove the mains connection cable or the machine cable.

Fitting:

- Insert the new cable 187 through the hole.
- Insert stress relief 175 and fasten it with screw 173 or 174.
- Connect the cables 187 of the mains connection cable or the machine cable.
- Fit pedal 179.
- Use a screwdriver with a wide blade to press the pedal a little aside and insert it downwards.
- Perform a function check.
- Use testing appliance ABB Metrawatt M 5013 to carry out an electrical safety test according to VDE 0701.

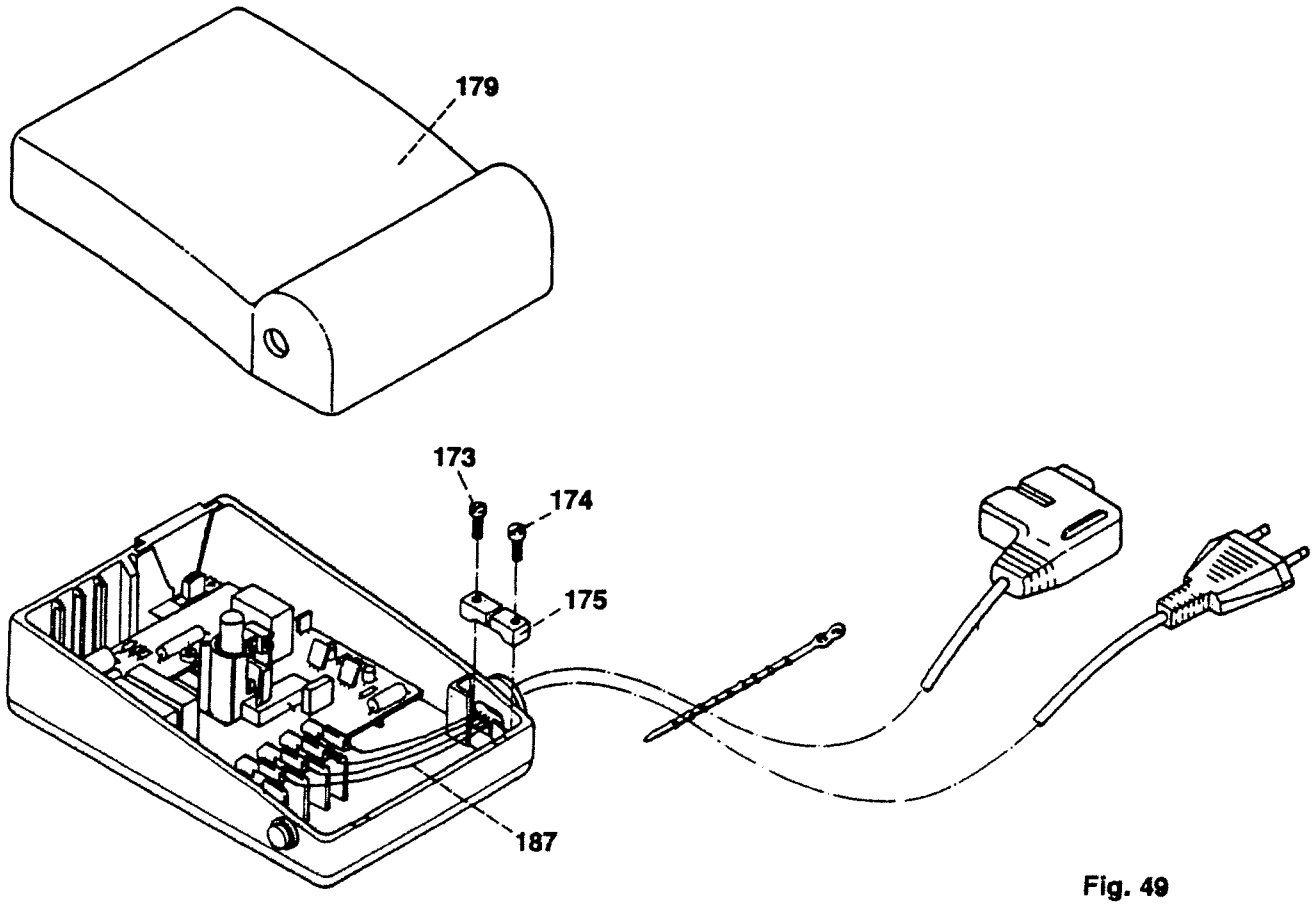


Fig. 49

50. Changing the electronic circuit board on PFAFF 6230

Note:

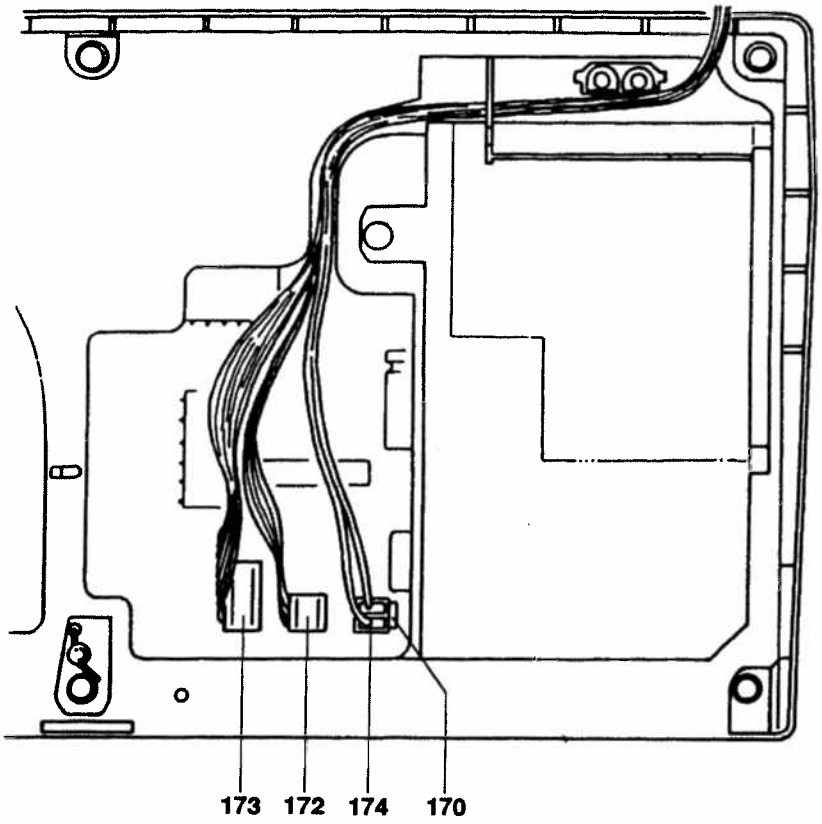
The electronic circuit board is only exchanged as a complete unit.

Removal:

- Disconnect the mains plug from the machine.
- Remove the needle and the sewing foot sole.
- Remove the detachable work support.
- Unscrew the four retaining screws of the baseplate.
- Turn the baseplate upside down.
- Remove cover 183 of the baseplate.
- Press catch 170 by just 1 to 2 mm to the right and disconnect plug 174 with the two-connection cable (fig. 50).
- Remove the two plugs 172 and 173 from the circuit board.
- Press the two catches 190 of the motor plug together and pull the motor plug off upwards (fig. 50a).
- Remove the three flat cables from the cable channel.
- Put the complete baseplate aside.
- Turn the baseplate upside down.
- Unscrew the five Torx screws out of the plastic cover.
- Remove the torsion spring with the plastic bush.
- Remove the plastic cover.
- Unscrew the six Torx screws 193 of the circuit board and remove the circuit board (fig. 50b).

Fitting:

- Insert the new circuit board and fasten it with the six Torx screws 193.
- Fit the plastic cover.
- Insert the torsion spring with the plastic bush.
- Insert the five Torx screws of the plastic cover and fasten the cover.
- Set the complete baseplate against the machine.
- Place the three flat cables in the cable channel.
- Connect the motor plug to the motor socket (both catches must engage) (fig. 50a).
- Connect the two plugs 172 and 173 to the board (fig. 50).
  Also connect plug 174 with the two-connection cable.
- Fit cover 183 of the baseplate.
- Fold the baseplate against the machine and fasten it with the four Torx screws.
- Connect the mains plug.
- Check every function.
- Use testing appliance ABB Metrawatt M 5013 to carry out an electrical safety test according to VDE 0701.



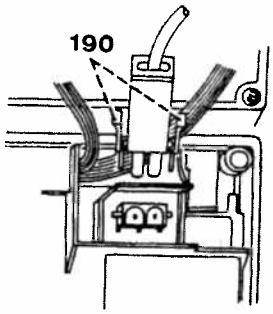


Fig. 50a

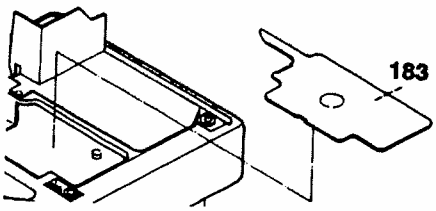


Fig. 50

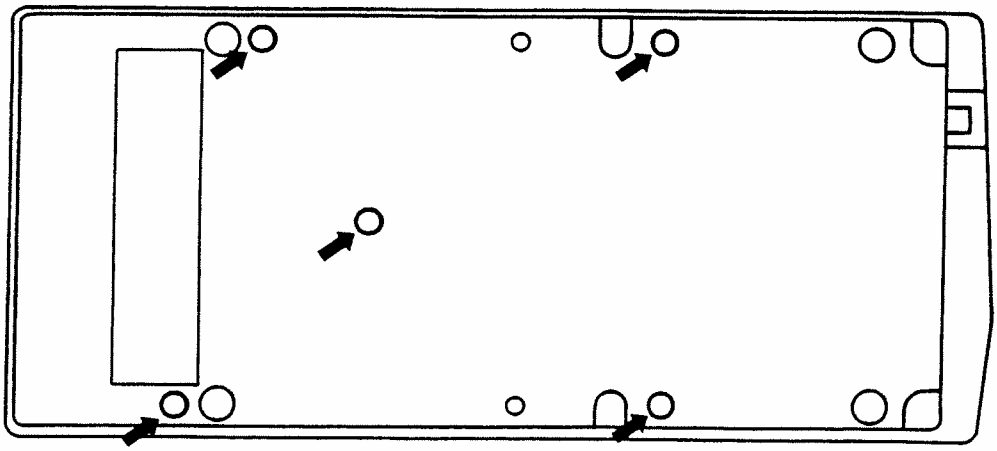


Fig. 50b

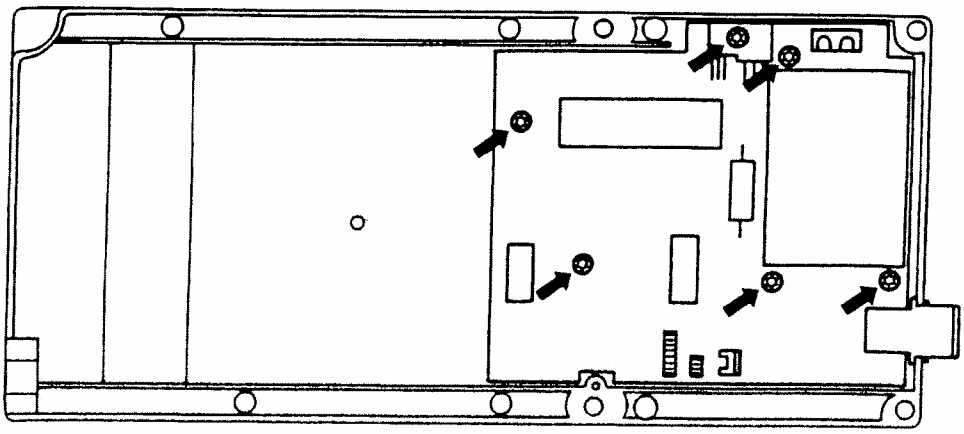


Fig. 50c

51. Changing the synchronizer on PFAFF 6230

Removal:

- Remove mains plug from mains socket.
- Remove needle and sewing foot sole.
- Remove the detachable work support.
- Unscrew the four retaining screws of the baseplate.
- Turn the baseplate upside down.
- Remove baseplate cover 183 (fig. 51).
- Press catch 170 by just 1 to 2 mm to the right and disconnect plug 174 with the two-connection cable.
- Open the two cable clips 119 at catch 120 and remove the two-connection cable from cable clip 119.
- Loosen fixing collar screw 85 of synchronizer 84 (fig. 51a).
- Turn the handwheel until the needle bar is in its highest position.
- Push synchronizer 84 to the right until it is in contact with the stack of cams.
- Keep on turning the handwheel forwards while removing the synchronizer.

Fitting:

- Insert new synchronizer 84. Make sure that the housing rib is between both guide clamps 155 (fig. 51a).
- Turn the handwheel until it is possible to push the synchronizer fully to the left so that it is in contact with the small gear.
- Remove the needle plate.
- Insert a new needle of system 130/705 H, size Nm 80.
- Adjust the synchronizer according to Section 26 of the Adjustment and Repair Instructions.
- Place the two-connection cable with plug 174 into the cable channel and fit the two cable clips.
- Fit the baseplate cover 183 (fig. 51).
- Fold the baseplate against the machine and fasten it with the four Torx screws.
- Connect the mains plug.
- Check every function.
- Use testing appliance ABB Metrawatt M 5013 to carry out an electrical safety test according to VDE 0701.

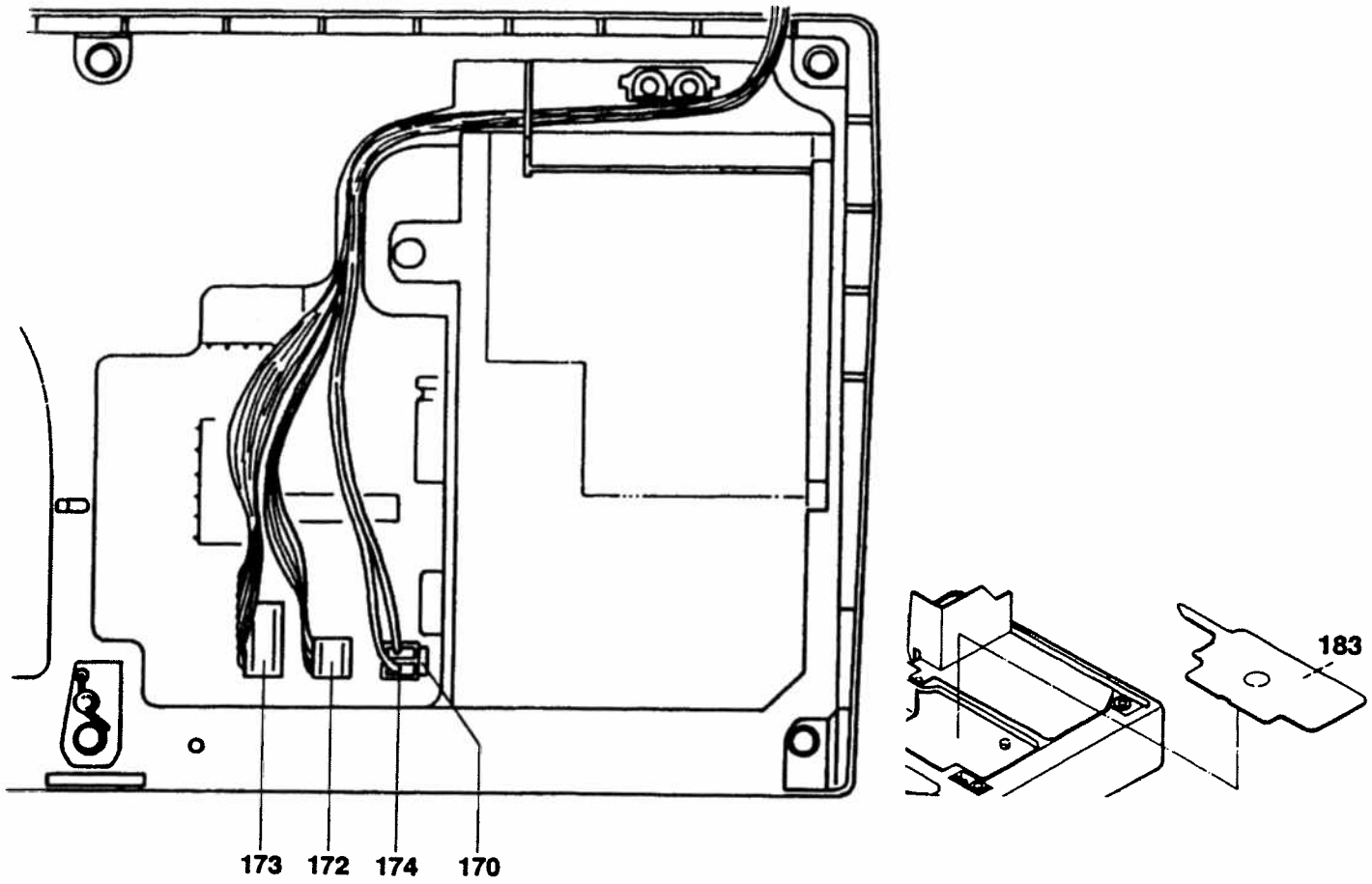


Fig. 51

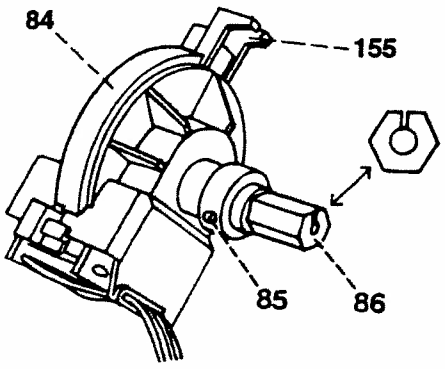


Fig. 51a

52. Foreword to the self-test

The self-test provides the mechanic with a simple and quick means of checking the machine.

Sequential faults are not detected.

Faults are only detected if the machine is mechanically in order.

If the fault cannot be detected, the fault-finding chart must be used.

The self-test is carried out sequentially; changing the test sequence is not possible. However, the program can be stopped any time by switching the machine off.

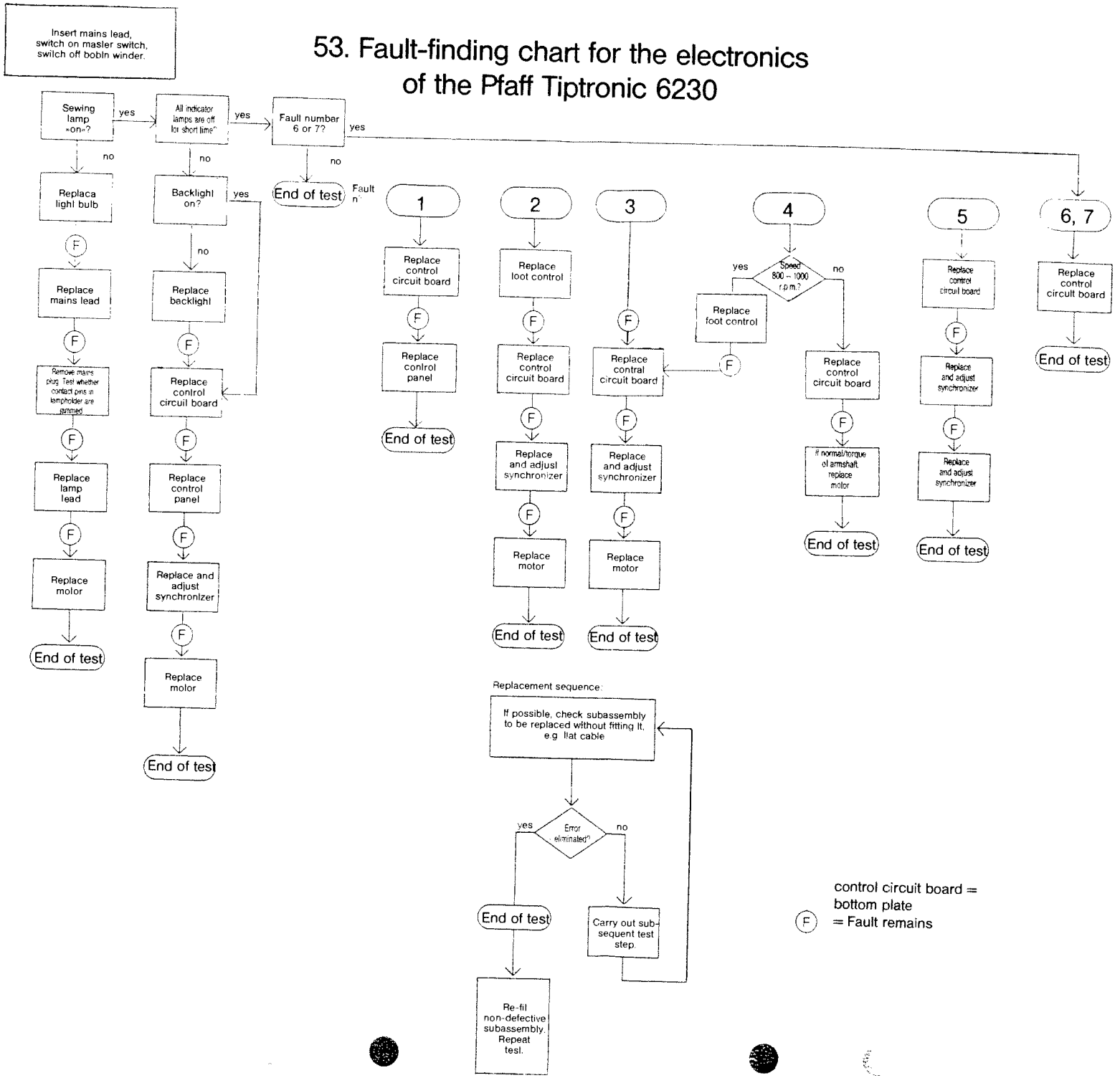
If a fault occurs, the test is interrupted.

Generally, in case of an error the number on the replacement list is indicated in binary code by the three LEDs. Advice on further action is given in this list.

In some test steps an additional visual check must be carried out.

In some cases the operator has to carry out actions at the machine within a certain time span (see column „Remarks"), as otherwise the test program will consider a fault (time-out). The test should then be repeated for reasons of safety.

53. Fault-finding chart for the electronics of the Pfaff Tiptronic 6230



54. Fault table for the electrical parts of 6250

Fault	1st replacement part	2nd replacement pt.	3rd replacement pt.	4th replacement pt.	5th replacement pt.
Machine is switched on but does not run when foot control is operated	Fuse FF2A Mains lead	Foot control	Circuit board (baseplate)	Main switch with motor circuit bord Motor	
Machine runs continuosly on its own after a brief switch-on time	Foot control	Control circuit board (baseplate)			
LED display on head panel does not light up	Control panel on sewing head Flat cable	Circuit board (baseplate)			
Machine starts runnig at full speed, then stops	Exchange synchronizer, then adjust it	Circuit board (baseplate)			
Take-up lever "up" and needle "down" position	Adjust synchronizer	Exchange synchronizer	(baseplate)		
Speed regulation (slower or faster)	Foot control	Circuit board (baseplate)	Synchronizer		
Half or full speed on key ("sew slow")	Head control panel Flat cable	Circuit board (baseplate)			
Light module off	Light module	Head control panel	Baseplate		

Safety test

55. Electrical safety test

According to the German law of safe machine operation of 24-6-86, the VDE-regulations are regarded as the official rules in electronics and are the basis for the regulations for testing electrical safety of technical devices.

The required electrical tests are established in the regulations for repair, modification and testing of used electrical appliances (VDE 0701 issue 10.86) par. 4.

We are obliged to perform a test in accordance with VDE 0701 on every electrical appliance after repair.

In other European countries there are similar regulations in force which are largely identical with the requirements of the 0701.

56. Electrical safety test with ABB Metrawatt M 5013

I) Mains voltage test: Volt = V

- For all following tests insert plug of ABB Metrawatt M 5013 in the grounded mains socket.
- Set knob for measuring range at „250 V" (fig. 56). If there is mains voltage, the LCD display shows the respective value (230 V +/- 10%).
- Touch contact field, which is located a bit to the right just below the knob for the measuring range, with your finger, thus checking the ground lead of the mains. Signal lamp „PE" just above the contact field will light up only in case the ground lead is out of order.
- Insert plug of sewing machine into the mains socket of ABB Metrawatt M 5013.
- Run the machine.
- Meter reading: 230 V +/- 10%
- Measuring appliance M 5013 can only be used with mains voltages from 207 V to 253 V (230 V +/- 10%).

II) Appliance current test: Ampere = A

- Plug of sewing machine remains in mains socket.
- Set knob for the measuring range at 16 A (fig. 56a).
- Run the machine.
- Meter reading: 0.5 A maximum.

III) Insulation resistance: M Ohm = M

- Insert plug of sewing machine in tester socket.
- Use clamp to attach test lead of testing appliance M 5013 to presser bar.
- Set knob for measuring range at „20 M Ohm" (fig. 56b).
- Meter reading: minimum 2 M Ohm
- With meter readings higher than 20 M Ohm, appliance M 5013 displays the figure 1! In these cases, the remark „Insulation resistance higher than 20 M Ohm" must be recorded in the testing certificate.

IV) Simulated leakage current: Milliampere = mA

- Sewing machine plug remains in tester socket.
- Use clamp to attach test lead of testing appliance M 5013 to presser bar.
- Set knob for measuring range at „20 mA" (fig. 56c).
- Meter reading: 0.50 mA maximum.

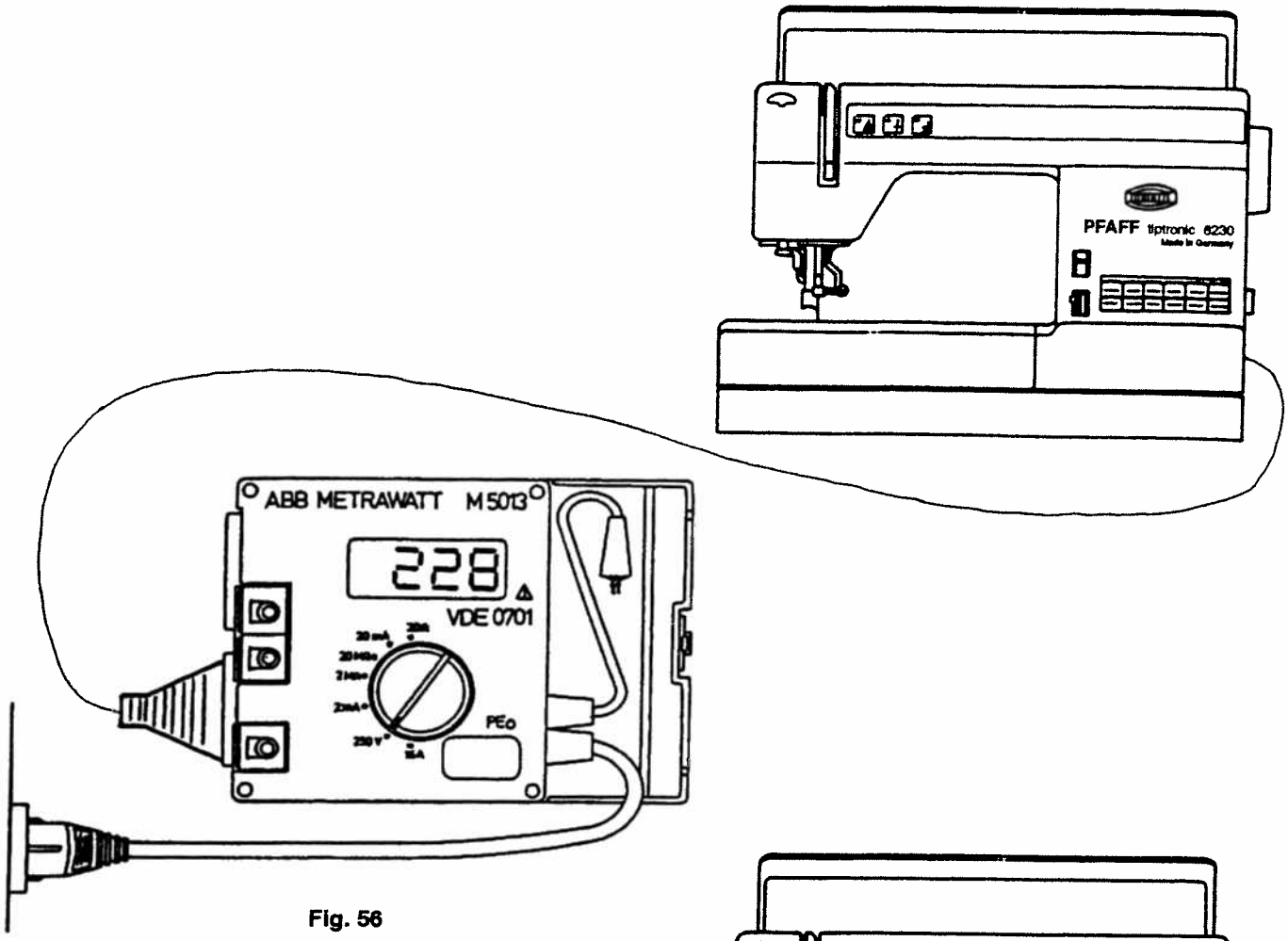


Fig. 56

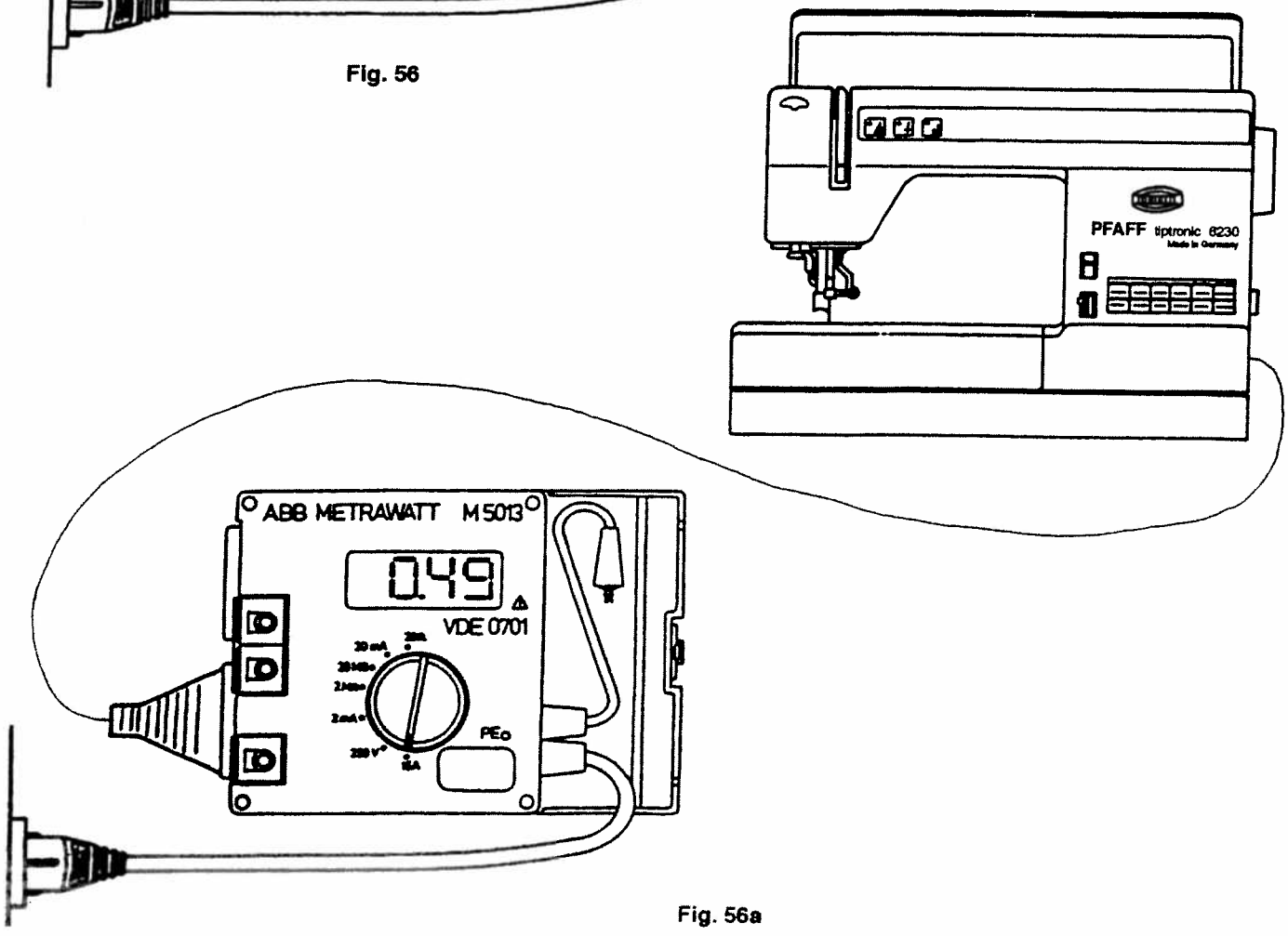


Fig. 56a

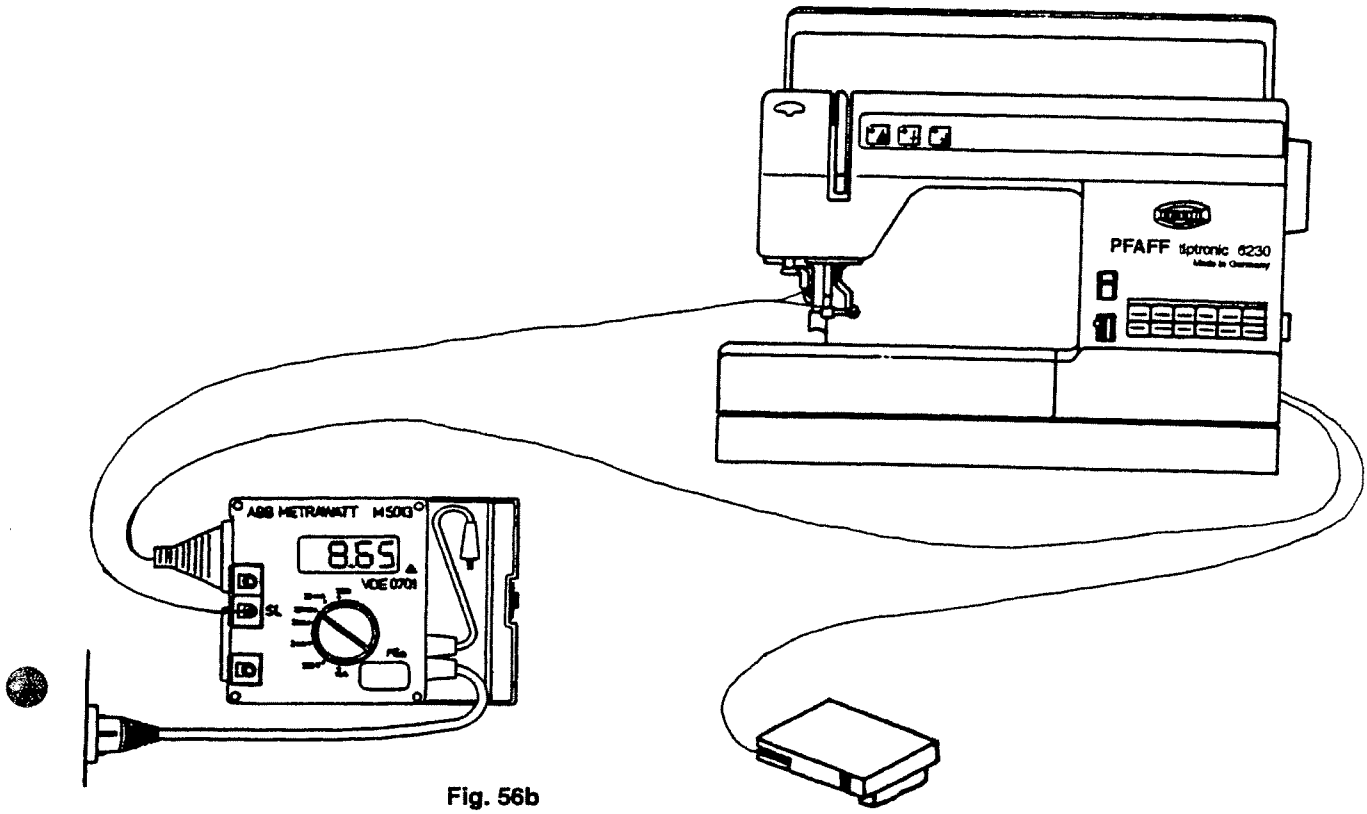


Fig. 56b

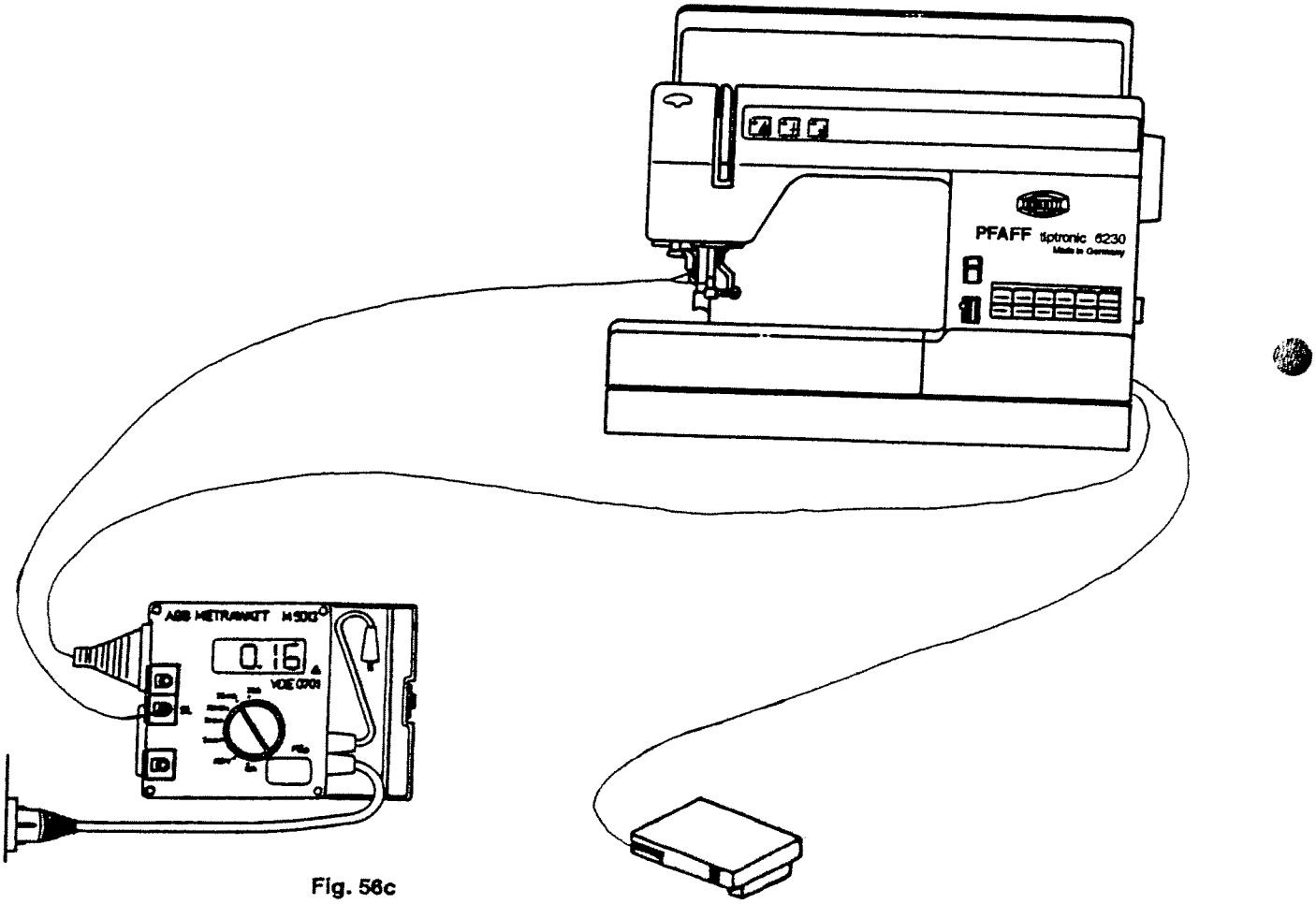


Fig. 56c

57. Simulated leakage current measurements of complete motors with ABB Metrawatt M 5013

V) Simulated leakage current measurements of complete motors

- When exchanging complete motors or motor parts (windings, rotors or capacitors), the complete motor must be measured for leakage current before fitting in the machine.
- Set knob for measuring range at „20 mA" (fig. 57).
- Screw on nut (part No. 92-320 068-05) at the motor.
- Push auxiliary angle plug (part No. 29-924 800-04) onto the motor plug.
- Attach the two test leads as shown in fig. 57.
- Meter reading: maximum 0.75 mA.

58. Measures required in case of inadmissible test values

As to I) If one of the 4 test functions is a failure, the ground mains socket is defective. Inform the landlord.

As to II) If the current consumption deviates considerably from the indicated value, although the machine does not bind, the motor is defective and must be exchanged or repaired.

As to III) If the insulation resistance drops below the required value, the defective components must be found by systematic checking and must be repaired or replaced.

As to IV) Here, the components with inadmissably high leakage current must also be found by systematic checking and must be repaired.

As to V) Send the motor to the factory.

76227 Karlsruhe, 4 May, 1994
PH/HTS

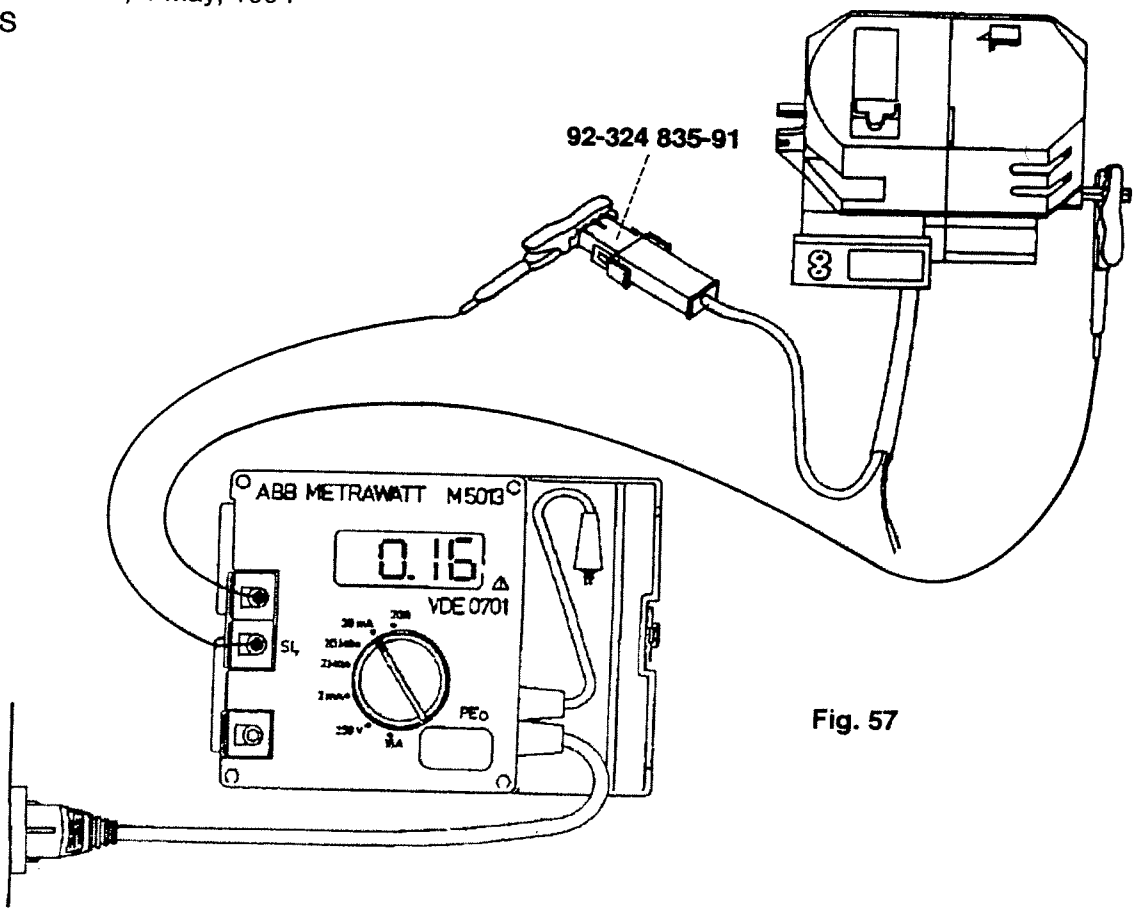


Fig. 57

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