

Gritzner

Models 1002/1004

Service Manual



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Foreword

The purpose of this service manual is to assist you in quick and correct repairing of the machines.

Adjustments should only be made if the settings deviate from the requirements described herein.

When checking or adjusting a machine, always proceed in the order of the worksteps prescribed.

For easier reference every workstep is marked with a dot.

Differing worksteps are marked with a circle or square.

The indications "left", "right", "top", "bottom", "front" and "back" always refer to the upright machine with the controls facing the operator.

When assembling dismantled machines, adjust the machine to approximately the right settings.

This facilitates the subsequent fine adjustments.

Unless otherwise specified, the handwheel must always be turned forward.

When carrying out maintenance work on live parts or in their proximity, the machine is to be separated from the power supply by unplugging the lead cord from the electrical socket.

An electrical safety test must be carried out after all repair work, even if the repair work is of a mechanical nature.

According to the German law on safe machine operation of June 24, 1958, VDE regulations are the recognized rules in the field of electrical engineering and form the basis for electrical safety tests of technical appliances.

The required electrical tests for the appliances are laid down in paragraph 4 of the regulations for repair, modification and testing of electrical appliances

(VDE 0701, edition 05.93).

It is obligatory to test our electrical appliances according to VDE 0701 following any repairs to our electrical appliances.

Outside Germany there are similar regulations in force which are largely identical with the requirements of VDE 0701.

It is therefore necessary to consult a specialist when carrying out repairs on electrical appliances.

For the proper adjustment of the machine, the following gauges and tools are required:

| | |
|-----------------------------|---------------|
| Needle rise gauge | .61-111600-02 |
| Needle rise clamp | .61-111600-35 |
| Bridge gauge | 01-066141-00 |
| 2 mm Allen key | 07-433005-30 |
| 2.5 mm Allen key | 07-433005-40 |
| Hexagon socket wrench | 99-203604-02 |
| Combination wrench 5.5 mm | 43-111010-04 |
| Combination wrench 6.0 mm | 07-433007-50 |
| Combination wrench 7.0 mm | 43-111010-05 |
| Circlip fitting tool 3.2 kz | 07-437003-30 |
| Spring hook | 07-437006-00 |

Subject to alterations in design and dimensions.

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 (50° 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.

It should be operated in such a way that it is not subjected to: dust, severe dampness, direct sunlight, static electricity, heat-producing objects, corrosive chemicals or liquids.

To permit adequate ventilation the machine must be kept unblocked and used on a firm and even surface.

Treatment

Always make sure not to damage your machine by knocking it over or dropping it.

Cleaning

Housing:

To clean the housing, use a dry, clean, soft, lint-free cloth. To remove any stubborn dirt, use a soft cloth with a neutral cleansing agent for plastic materials.

Please Note!

Never use insecticides or chemical products such as petrol (gas) or thin chemicals to clean the housing.

Display:

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

Safety:

1. The machine should be put into operation as indicated 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 visible damage,
 - its function is defective,
 - it is wet, e.g. with condensation.
4. Do not pull the lead cord 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 cannot 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 the exclusive responsibility of our qualified service staff.
7. Be sure to use only original PFAFF parts.

Automatic Mechanism

1. Adjustment of the lifting clearance between the feeler finger and the cams (class 1004)

Requirement:

When the right control knob is rotated, the lifting clearance between the feeler finger and the highest points of the cams must be 0.2-0.3 mm (fig. 1).

Check:

- Fold up the carrying handle.
- Turn out both arm cover screws and remove arm cover.
- Set control knobs as shown in fig. 1a.
- Turn the handwheel until the highest point of the zigzag cam 1 lies exactly in front of feeler finger 2.
- Turn the right control knob carefully between the straight stitch symbol and the elastic stitch symbol.
The lifting clearance between the feeler finger 2 and the highest point of cam 1 must now be 0.2-0.3 mm.

Adjustment:

- Loosen screw 3 (fig. 1 and 1a).
- To increase the lifting clearance, push lever 4 in direction "A".
- To reduce the lifting clearance, push lever 4 in direction "B".
- Tighten screw 3.

Test:

- Rotate the right control knob back and forth to test the correct lifting clearance of 0.2-0.3 mm.

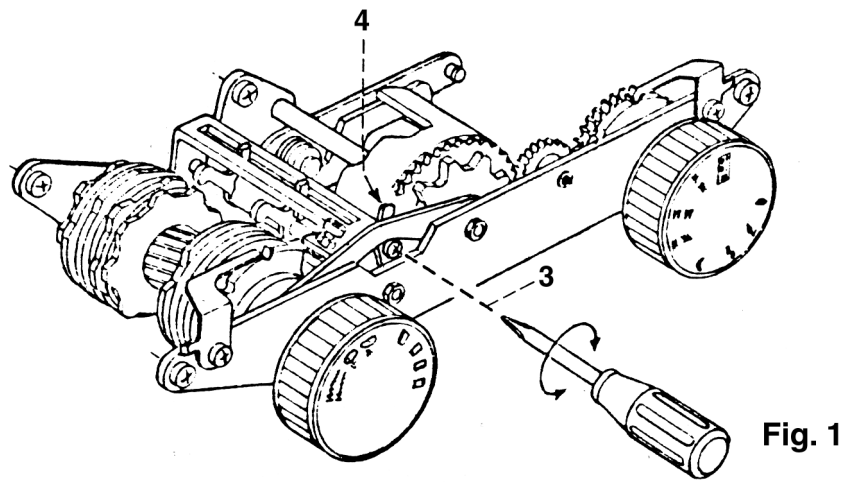


Fig. 1

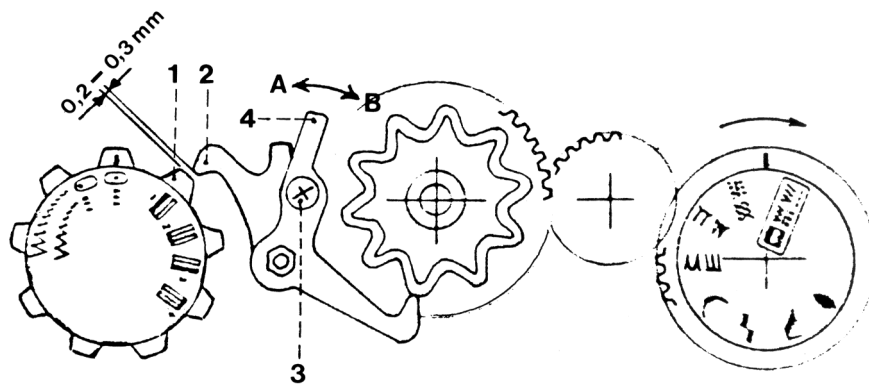


Fig. 1a

2. Adjustment of the needle zero point for the straight stitch

Requirement:

When the control knob for utility and zigzag stitches is set to "left" needle position, the machine must sew a perfectly straight stitch.

The lifting clearance between the feeler finger 2 and the highest points of the zigzag cam 1 must be 0.1-0.2 mm (fig. 2 and 2b).

Check:

- Fold up the carrying handle.
- Turn out both arm cover screws and remove arm cover.
- Set stitch control knob as shown in fig. 2.
- Run the machine slowly.
The needle bar frame should have no sideways movement.
The feeler finger 2 must not touch the highest points of the zigzag cam 1 (fig. 2b).

Adjustment:

- Turn the handwheel until the feeler finger 2 is at the highest point of the zigzag cam 1.
- Loosen nut 5 (fig. 2a and 2c).
- Turn screw 6 until it touches zigzag width cam 7 and the clearance between feeler finger 2 and the highest point of zigzag cam 1 is 0.1-0.2 mm (fig. 2b).
- Tighten nut 5 without turning screw 6 (fig. 2c).

Test:

- Run the machine slowly.
The needle bar frame is not allowed to make any sideways movement.
The lifting clearance between the feeler finger 2 and the highest point of the zigzag cam 1 must be 0.1-0.2 mm (fig. 2b)

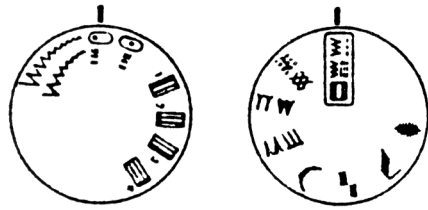


Fig. 2

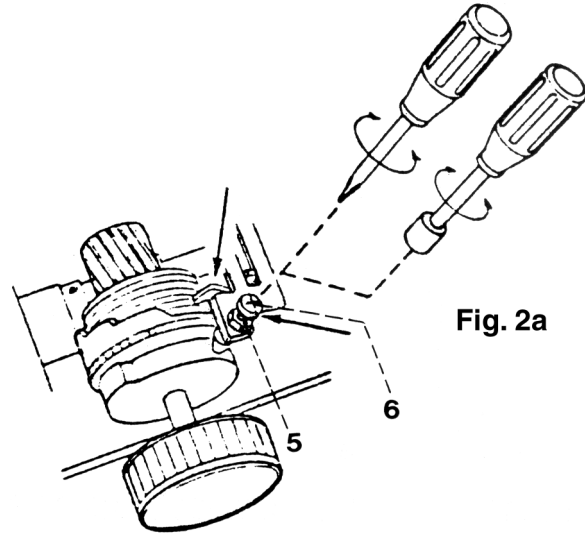


Fig. 2a

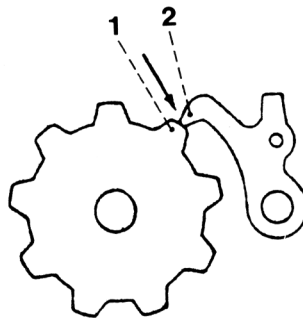


Fig. 2b

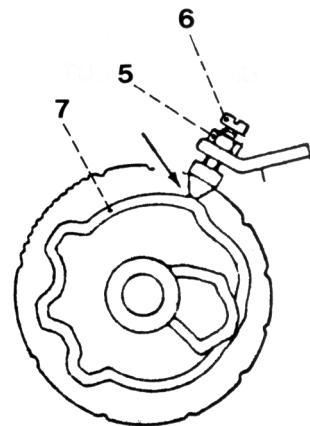


Fig. 2c

3. Adjustment of the sideways movement

Requirement:

At zigzag stitch setting the sideways movement of the needle must take place with the needle at a position higher than the maximum fabric thickness.

The needle sideways movement must begin when the needle point is leaving the needle plate.

It must be completed before the needle enters the fabric again, approx. 7 mm above the needle plate (fig. 3).

Check:

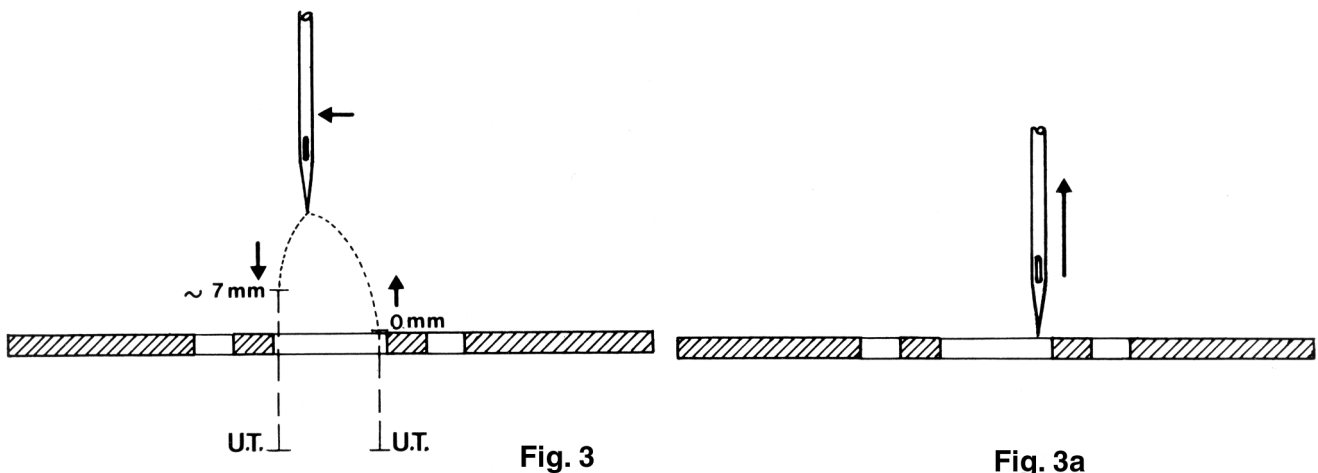
- Set stitch control knob to the widest zigzag stitch (fig. 3b).
- Remove the presser foot shoe.
- Turn the handwheel in sewing direction until the needle rises to the right and the needle point is positioned exactly on the surface of the needle plate.
- You can check the start of the sideways movement of the needle by simultaneously touching the back side of the needle bar frame and the machine head with the index finger of your left hand while turning the handwheel very slowly with your right hand.

Adjustment:

- Remove the presser foot holder completely.
- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Loosen both face cover retaining screws and remove face cover.
- Loosen screws 8 with a 2 mm Allen key (fig. 3c).
- Turn the handwheel in sewing direction until the needle rises to the right and the needle point is exactly on the surface of the needle plate (fig. 3a).
- Turn worm 9 to the front, making sure it rests on the left side of the set collar, until feeler finger 2 is exactly at the starting point of the rising cam 1 (fig. 3d).
- Tighten one of both screws 8.
- If no screw is accessible in this position, turn back both the worm 9 and the handwheel together until one of the screws is accessible.

Test:

- Test the needle sideways movement as described in the section "Check".
- Tighten screws 8 (fig. 3c).



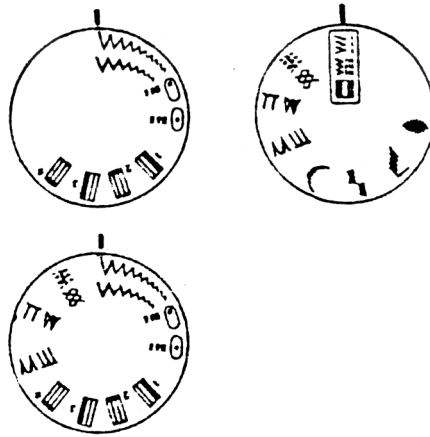


Fig. 3b

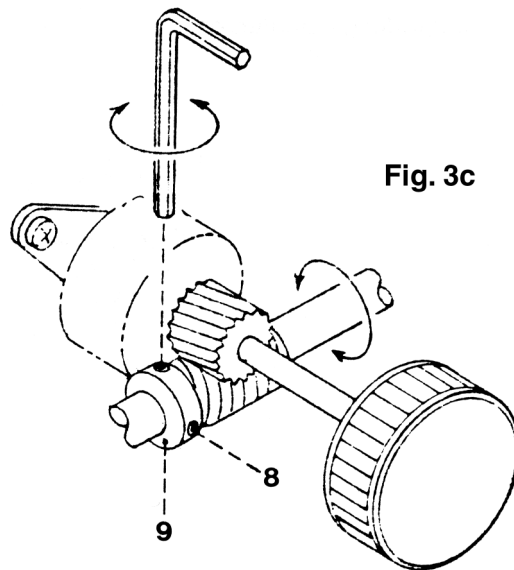


Fig. 3c

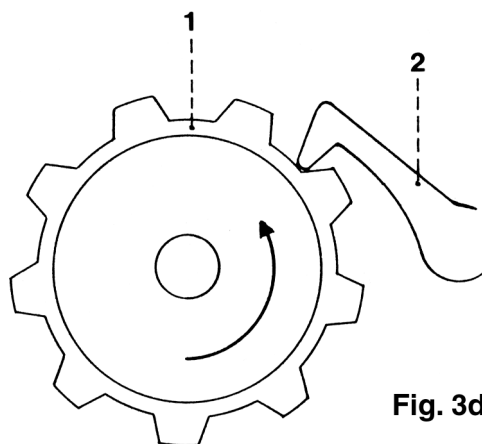


Fig. 3d

4. Adjustment of the needle entry points in the needle slot

Requirement:

The needle entry points at the widest zigzag stitch setting must be at the same distance from the left and right side of the needle plate (fig. 4b).

At the settings for straight stitch and "middle" needle position the needle must enter exactly in the center. At "left" needle position there must be a clearance of 0.3 to 0.5 mm between the needle and the left edge of the needle slot (fig. 4c).

These three needle positions must be balanced out with each other.

Check:

- Remove the presser foot shoe.
- Set the widest zigzag stitch (fig. 4).
- Turn the handwheel and check right and left clearance.
- Set straight stitch at "middle" needle position.
- Check needle entry point in the center of the needle hole slot.
- Set straight stitch at "left" needle position and check the clearance of 0.3 to 0.5 mm.

Adjustment:

- Remove the presser foot holder.
- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Loosen both face cover retaining screws and remove face cover.
- Set the widest zigzag stitch.
- Loosen screw 10 using a 7 mm wrench, until the needle bar frame stop 11 can be moved (fig. 4d).
- Loosen screw 12 slightly with a 2.5 mm Allen key (fig. 4a).
- First turn eccentric 13 to the highest position; then, continue turning until both distances are equal.
- Set straight stitch alternately at "middle" and "left" needle position, check needle entry points and adjust if necessary.
- Tighten screw 12
- Adjust needle bar frame stop 11 so that it does not strike against the needle bar frame 14 on left and right of zigzag throw nor when control knobs are turned (fig. 4d).
- Tighten screw 10.

Test:

- Carry out as described in "check".

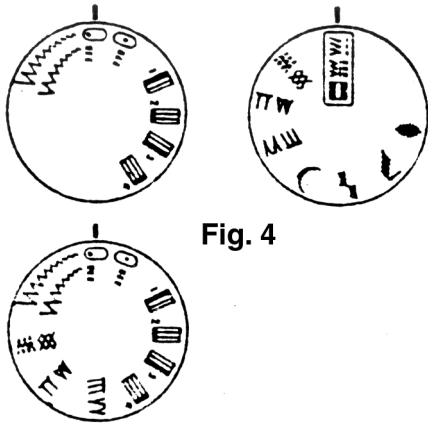


Fig. 4

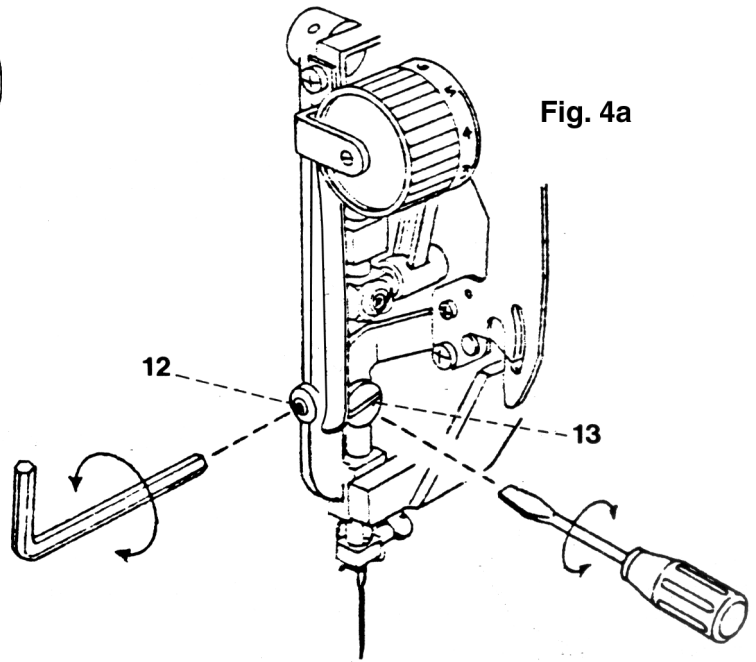


Fig. 4a

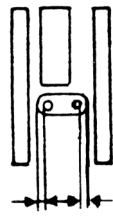


Fig. 4b

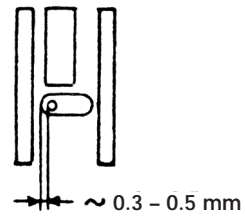


Fig. 4c

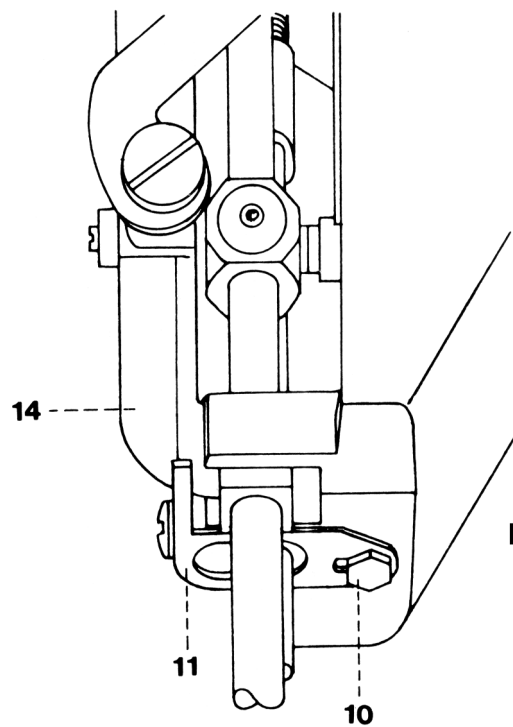


Fig. 4d

Stitch forming mechanism

5. Adjustment of the needle clearance in relation to the needle slot

Requirement:

Between the rear edge of the needle and the rear edge of the needle slot in the needle plate, there should be a clearance of 0.2 mm (fig. 5a).

Note:

For needle system 130/705 H, the needle size increases the actual size of the needle only at the front of the needle. For example, a size 100 needle will be positioned with its needle point exactly in the center of the needle slot (viewed from front to back) while the needle point of a size 80 needle will be positioned with its needle point slightly towards the rear.

Check:

- Insert a new size 100 system 130/705 H needle.
- Set control knob to straight stitch and "left" needle position (fig. 5).
- Remove the presser foot shoe.
- Turn the handwheel until the needle is at its lowest position.
The needle must now be evenly centered from front to back in the needle plate slot.

Adjustment:

- Loosen screw 15 with a 2.5 mm Allen key (fig. 5).
- Move the complete bolt 16 together with the needle bar frame 17 forward or backward until the needle is centered exactly in the needle plate slot (fig. 5b).
- Tighten screw 15.

Test:

- Carry out a visual test for the straight and zigzag stitches.

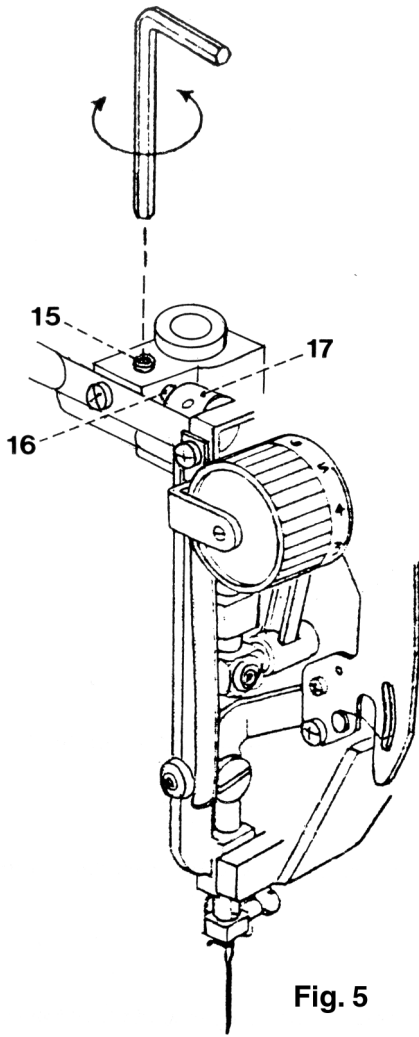


Fig. 5

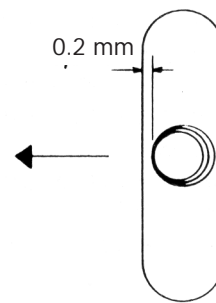
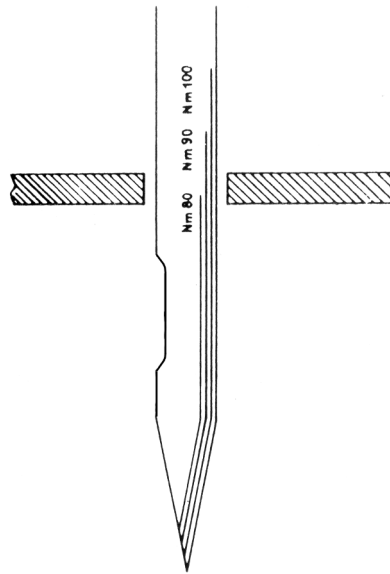


Fig. 5a

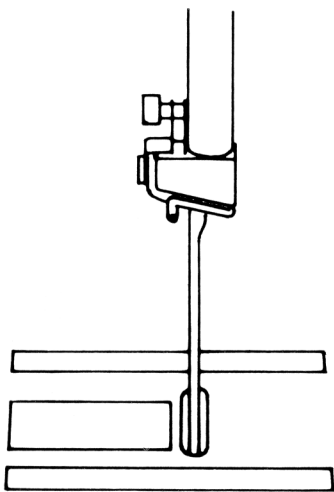


Fig. 5b

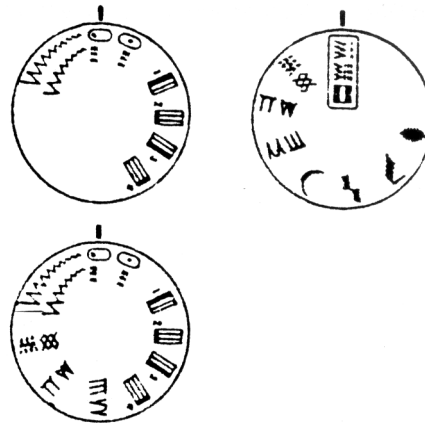


Fig. 5c

6. Adjustment of the hook-to-needle clearance

Requirement:

At the settings for straight stitch and "middle" needle position, the distance of the sewing hook point from the bottom of the scarf in the needle (130/705 H system) must be 0.05 mm to 0.1 mm (fig. 6). With the right needle swing of the widest zigzag stitch, the sewing hook point must almost touch the needle.

Check:

- Remove the presser foot completely and unscrew the needle plate.
- Remove the bobbin case.
- Insert a new size 80 system 130/705 H needle.
- Check the hook-to-needle clearance for straight and zigzag stitch.
- To do this, set control knob to the straight stitch and the widest zigzag stitch alternately.

Adjustment:

- Remove the detachable work support (accessory box) by pulling it to the left.
- Lay the machine on its back.
- Turn out the five baseplate retaining screws and remove baseplate.
- Turn out both free-arm cover retaining screws 68 (fig. 6d).
- Remove free-arm cover 19.
- Disconnect the spring of the gear housing cover.
- Turn out retaining screws of gear housing cover and remove gear housing cover 18.
- Set control knob to straight stitch and "middle" needle position (fig. 6b).
- Loosen screw 24 with a 2.5 mm Allen key (fig. 6c).
- Move the long hook shaft 25 just 0.5 mm to the right.
The gears 23 and 61 must remain engaged!
- Tighten screw 24 slightly.
- Loosen screws 20 and 22 with a 2.5 mm Allen key.
- Move the hook race 21 so that the clearance is equal to 0.05 - 0.1 mm (fig. 6).
- Set control knob to the widest zigzag stitch.
- Turn the hook race, without shifting it, until the left and right needle entry points are set at equal distances in the cutout of the thread deflector plate (fig. 6a).
- Tighten both screws 20 and 22.
- Loosen screw 24.
- Move the long hook shaft 25 to the left until there is no longer any play between the gears 23 and 61 and they move easily.
- Tighten screw 24.

Test:

- Check the hook-to-needle clearance at straight and zigzag stitch setting, and left and right needle entry points in thread deflector plate.
- Tighten both screws 20 and 22 again.
- Fit gear housing cover 18 with the retaining screws and connect the spring (fig. 6d).

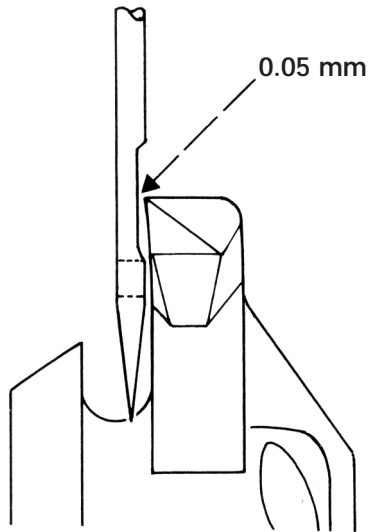


Fig. 6

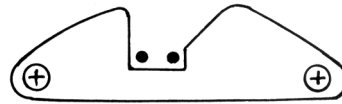


Fig. 6a

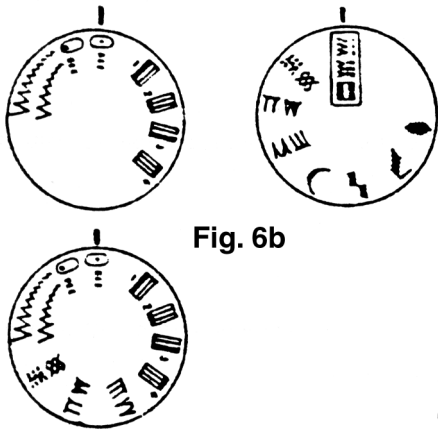


Fig. 6b

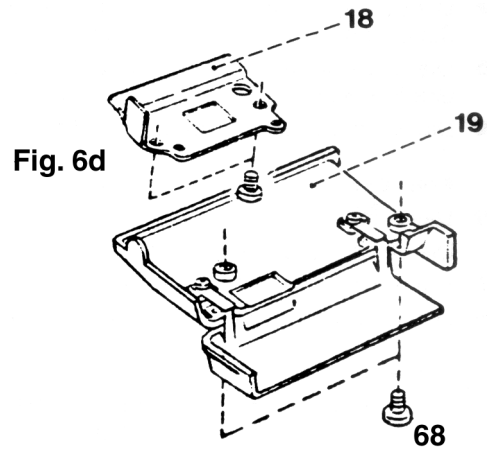


Fig. 6d

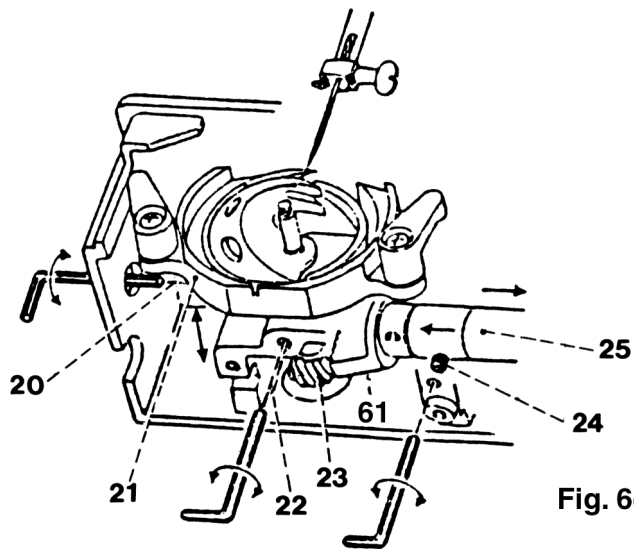


Fig. 6c

7. Adjustment of the toothed segment to the bevel gear

Note:

This adjustment is only to be carried out if it is urgently required.

Requirement:

Toothed segment 61 must not strike the gear housing when the sewing hook timing of 2.5 mm is correctly set (fig. 7).

The hook drive shaft 25 must not exhibit any play.

When the handwheel is turned, the toothed segment must not move out of mesh.

Adjustment:

- Remove the needle and the presser foot holder completely.
- Remove the detachable work support (accessory box) by pulling it to the left.
- Take out the bobbin case and the hook race cover.
- Lay the machine on its back.
- Turn out the five baseplate retaining screws and remove baseplate.
- Turn out both free-arm cover retaining screws.
- Remove free-arm cover.
- Disconnect the spring of gear housing cover.
- Turn out both retaining screws of gear housing cover and remove gear housing cover.
- Loosen screw 24 with a 2.5 mm Allen key.
- Loosen screws 27 with a 2.5 mm Allen key (fig. 7a).
- Move hook drive shaft 25 to the right until teeth are out of mesh.
- Turn hook driver until both driver points 60 are the same distance from the top (fig. 7b).
- Turn hook drive shaft 25 until center of toothed segment 61 is exactly facing bevel gear 23 (fig. 7).
- Push hook drive shaft to the left until toothed segment 61 is resting against bevel gear 23 without any play.
- Tighten screw 24

Test:

- Check that bevel gears run easily and without play.

Note:

After the sewing hook timing has been adjusted (Point 8 of this manual), check that toothed segment 61 cannot move out mesh.

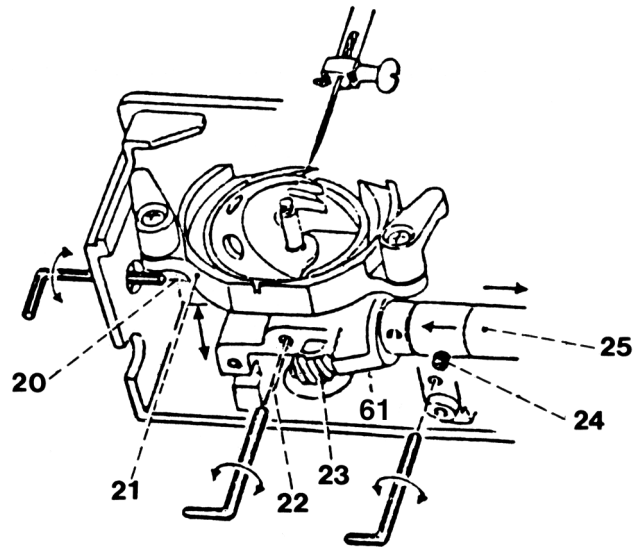


Fig. 7

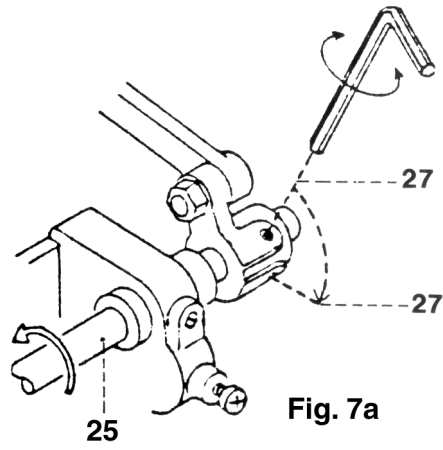


Fig. 7a

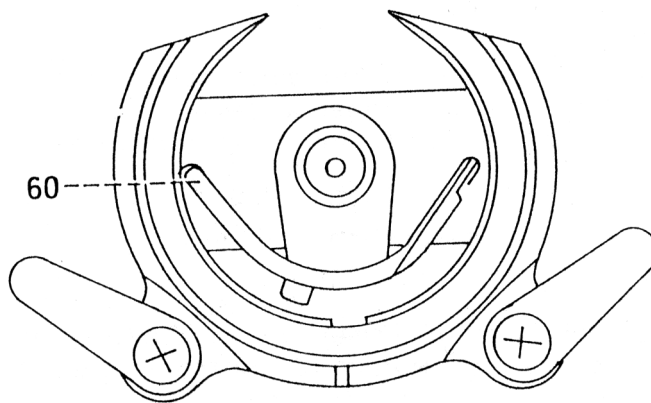


Fig. 7b

8. Adjustment of the sewing hook timing

Requirement:

At the settings for straight stitch and "middle" needle position, when the needle bar has moved from its lowest position 2.5 mm upward, the hook point must be positioned exactly on the center line behind the needle (fig. 8d).

Check:

- Remove the presser foot holder completely and the needle plate.
- Set control knob to straight stitch and "middle" needle position (fig. 8).
- Bring the needle bar to its lowest position by turning the handwheel (fig. 8c).
- Place the needle rise clamp (61-111600-35) over the needle bar and secure it lightly.
- Place the 2.5 mm feeler gauge (61-111600-02) over the needle bar with its cutout above the needle rise clamp.
- Loosen the needle rise clamp.
- Move the needle rise clamp and the 2.5 mm feeler gauge upward against the needle bar frame.
- Tighten the knurled screw of the needle rise clamp.
- Move the handwheel back and forth slightly.
If there is play on the feeler gauge, repeat the above procedure.
- Remove the 2.5 mm feeler gauge.
- Turn the handwheel in sewing direction until the needle rise clamp is resting on the needle bar frame (fig. 8d).
The needle has thus risen by 2.5 mm.
The hook point must now be positioned on the center line behind the needle.

Adjustment:

- If the adjustment is not correct, remove the needle rise clamp.
- Lay the machine on its back.
- Turn out the five baseplate retaining screws and remove baseplate (fig. 8a).
- Loosen screws 27 with a 2.5 mm Allen key (fig. 8b).
- Fit the needle rise clamp again and repeat the worksteps until the needle is once again in needle rise position (see "Check" fig. 8d)).
- Turn the long hook shaft 25 so that the hook moves forward and the hook point is on the center line behind the needle (fig. 8d).
- Tighten one of the screws 27 (fig. 8b).

Test:

- Turn the handwheel a little backward and then forward until the needle rise clamp is resting on the needle bar frame. The hook point must now be positioned on the center line behind the needle.
- Remove the needle rise clamp.
- Tighten screws 27 very tightly.

Note:

After this adjustment, the setting of the feed dog lifting eccentric (Point 13 of this manual) must be checked and adjusted if necessary.

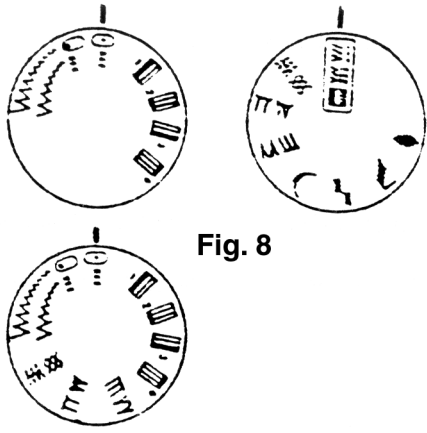


Fig. 8

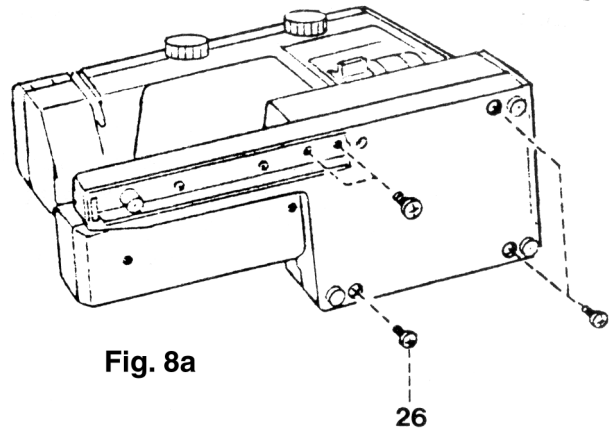


Fig. 8a

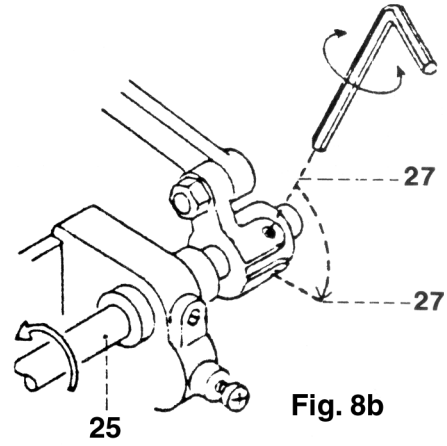


Fig. 8b

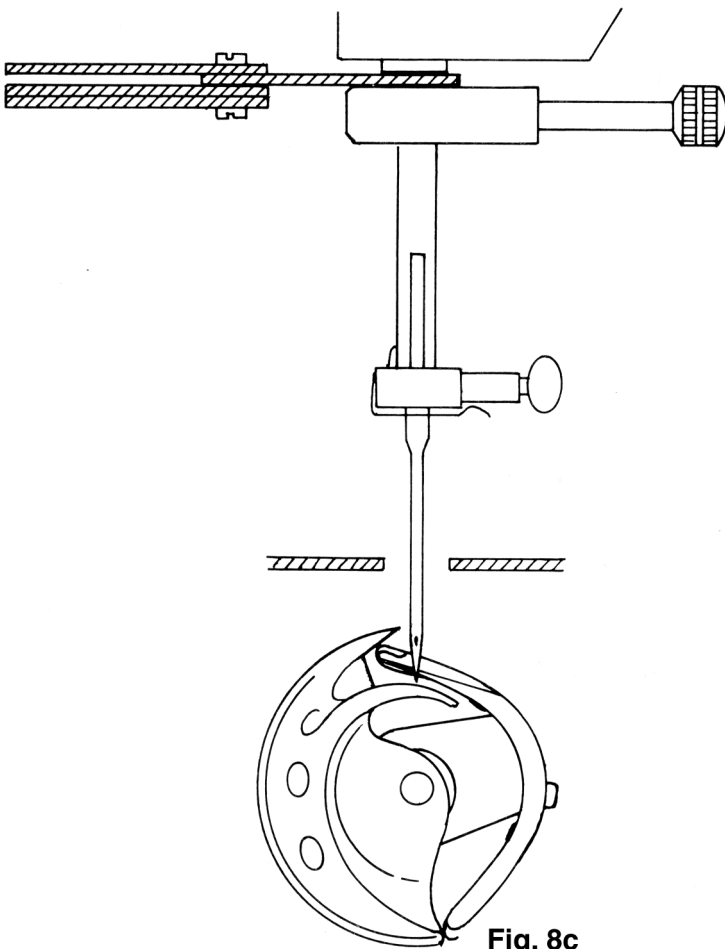


Fig. 8c

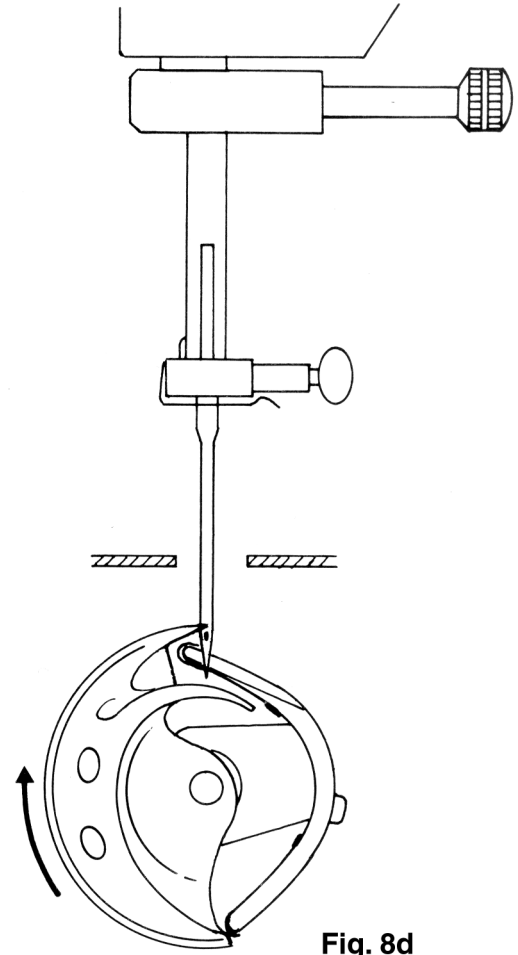


Fig. 8d

9. Adjustment of the needle bar height

Requirement:

The distance between the top edge of the needle eye and the sewing hook point must be 0.5 mm at the widest right zigzag penetration (fig. 9b).

Check:

- Remove the presser foot holder completely and the needle plate.
- Set control knob to the widest zigzag stitch (fig. 9).
- Turn the handwheel until the needle rises on right of its zigzag throw and the sewing hook point is exactly at needle center line.
- The distance between the top edge of the needle eye and the hook point must now be 0.5 mm.

Adjustment:

- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Loosen both face cover retaining screws and remove face cover.
- Loosen screw 29 with a 2.0 mm Allen key (fig. 9a).
- Move needle bar 30 upward, without twisting it, until the clearance of 0.5 mm is set.
- Tighten screw 29.

Test:

- Turn the handwheel until the needle rises on right of its zigzag throw and the sewing hook point is exactly at needle center line.
Check the clearance of 0.5 mm.
The needle holder 31 must face exactly square to the right.

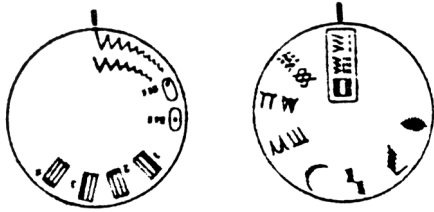


Fig. 9

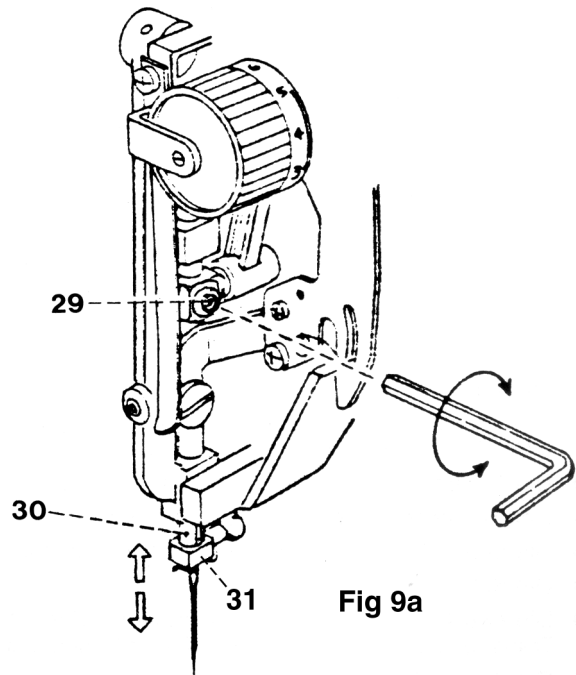


Fig 9a

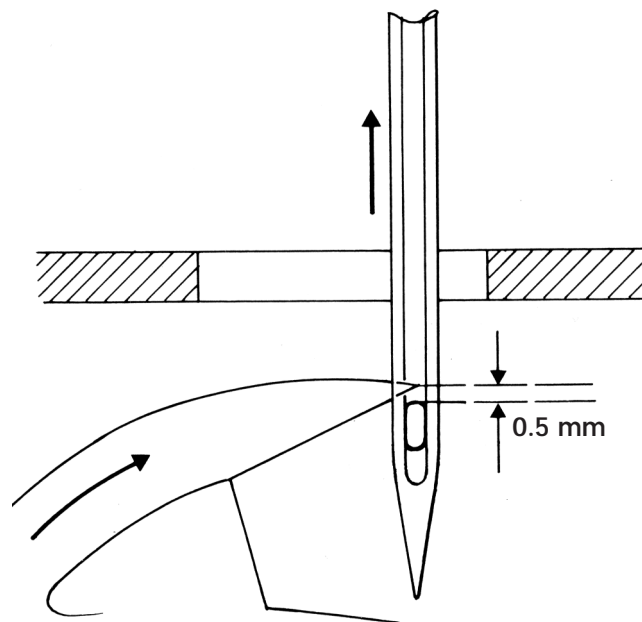


Fig. 9b

Feed mechanism

10. Adjustment of the feed dog in crosswise direction

Requirement:

The left and right clearance of the feed dog in the feed slot must be the same (fig. 10).

Check:

Check the position of the feed dog with a visual check.

Adjustment 1:

- Remove the needle plate.
- Loosen screws 32 only a little (fig. 10a).
- Move the feed dog 33 to the correct position.
- Tighten screws 32 slightly.
- Screw on the needle plate.
- Check the position of the feed dog. Reposition the feed dog if necessary.
- Remove the needle plate and tighten screws 32 securely.
- Reattach the needle plate.

Adjustment 2:

If it is not possible to move the feed dog in place, you have to adjust the feed driving shaft 36 (fig. 10b).

- Remove the detachable work support (accessory box) by pulling it to the left.
- Lay the machine on its back.
- Turn out the five baseplate retaining screws and remove baseplate.
- Turn out both free-arm cover retaining screws.
- Remove free-arm cover.
- Disconnect the spring of the gear housing cover.
- Turn out retaining screws of gear housing cover and remove gear housing cover.
- Loosen screw 35 with a 2.5 mm Allen key.
- Loosen screw 39.
- Turn both thread bolts 34 and 40 (to eliminate the play of the feed driving shaft 36) until the feed dog is centered in the feed slot.
- Tighten screws 35 and 40 securely.

Test:

The feed dog must be exactly in the center of the feed slot. The feed driving shaft must not bind nor have any play.

- Refit gear housing cover and connect the spring.
- Refit free-arm cover and baseplate.

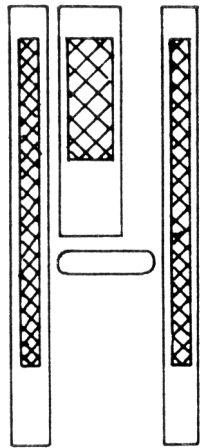


Fig. 10

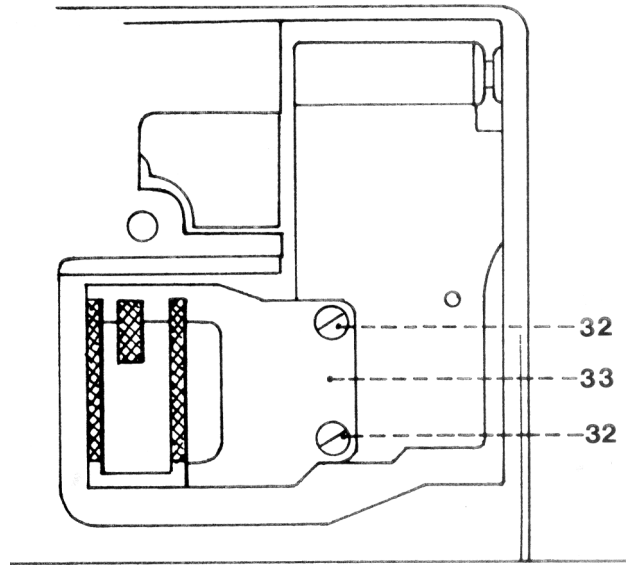


Fig. 10a

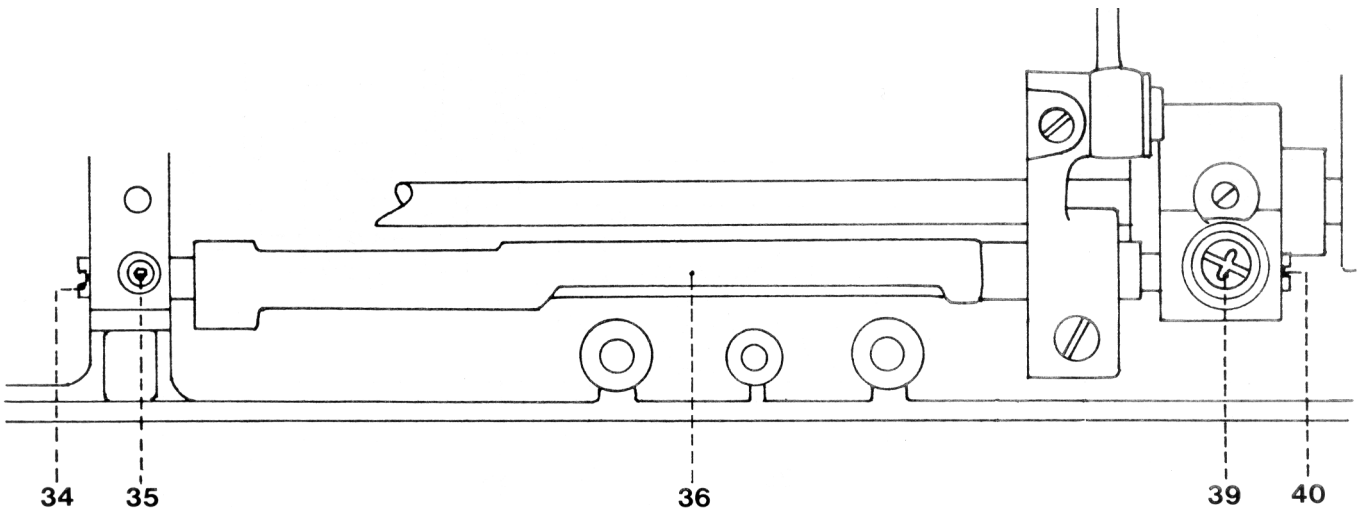


Fig. 10b

11. Adjustment of the feed dog in the feed slot in sewing direction

Requirement:

At the largest stitch length, the feeding stroke of the feed dog should begin as near as possible to the needle hole (fig. 11).

However, the feed dog must not strike against the front or back of the feed slot at the largest forwards and reverse stitches or any other stitch length setting.

Check:

- Select the largest stitch length.
- Turn the handwheel and simultaneously actuate the reverse sewing key several times.
- Carry out a visual check.

Adjustment:

- Lay the machine on its back.
- Turn out the five baseplate retaining screws and remove baseplate.
- Loosen screw 38 only a little (fig. 11a)
- Rotate the feed dog driving shaft 36 slightly until the feed dog position is correct.

Attention!

The clamp crank 37 with fork 41 must not be shifted laterally.

- Tighten screw 38.

Test:

- Carry out a visual check as described in "check".

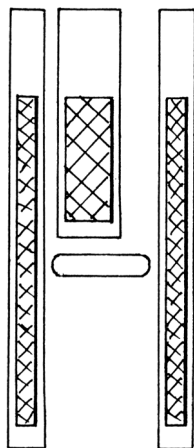


Fig. 11

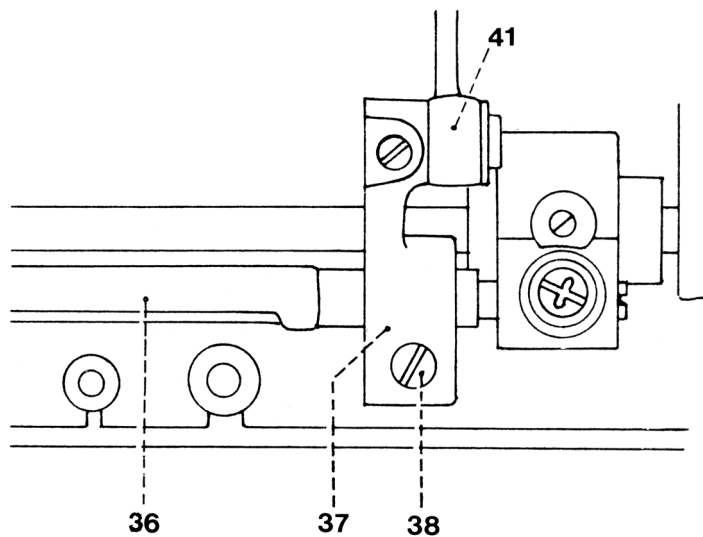


Fig. 11a

12. Adjustment of the feed dog driving eccentric

Requirement:

When the hole of the take-up lever is at its highest position, the feed dog must move farther back by 0.4 to 0.8 mm.

When screw 45 of the driving eccentric 44 is aligned with the screw 43 of the arm shaft crank 42, the above requirement is fulfilled (fig. 12).

Check:

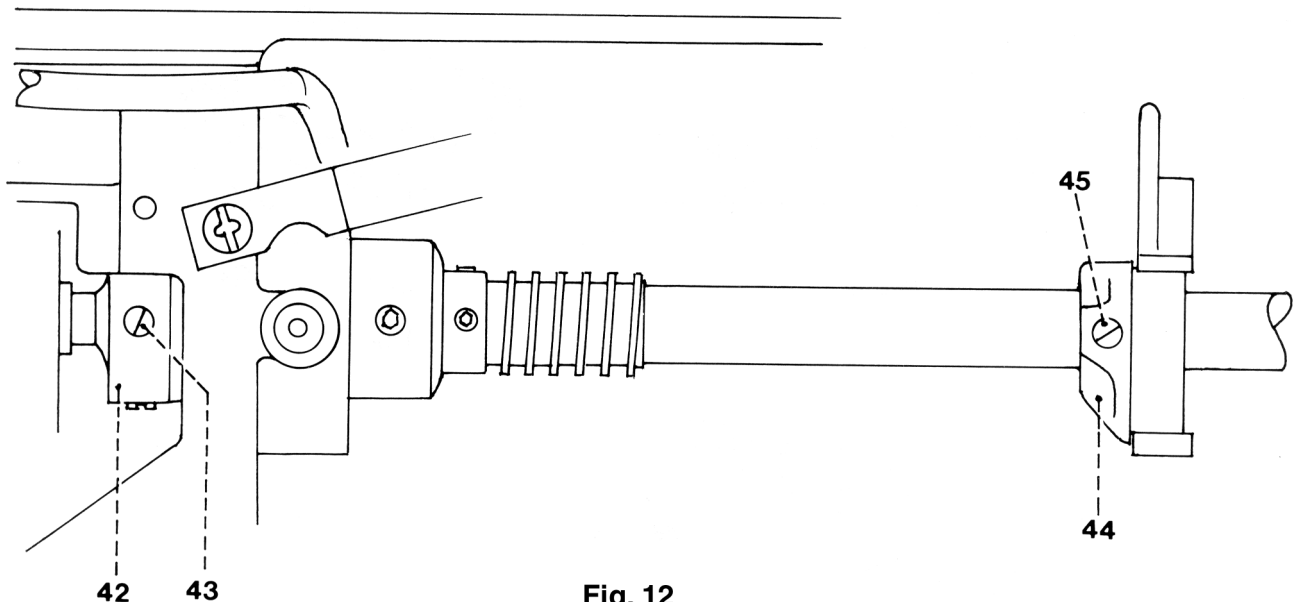
- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Carry out a visual check to make sure that screws 43 and 45 are aligned.

Adjustment:

- Loosen screw 45.
- Turn eccentric 44 until both screws 43 and 45 are aligned.
- Tighten screw 45.

Test:

- Carry out a visual check.



13. Adjustment of the feed dog lifting eccentric

Requirement:

The return movement of the feed dog underneath the needle plate in the forward direction must be completed when the rising feed dog reaches the needle plate surface.
The lowering of the feed dog must begin shortly before the end of the feed driving movement.

Check:

- Select the largest stitch length.
- Turn the handwheel and carry out a visual check.

Adjustment:

- Remove the detachable work support (accessory box) by pulling it to the left.
- Lay the machine on its back.
- Turn out the five baseplate retaining screws and remove baseplate.
- Turn out both free-arm cover retaining screws (fig. 13a).
- Remove free-arm cover 19.
- Loosen screw 46 with a 2.5 mm Allen key (fig. 13b).
- Turn the handwheel until on the needle bar, in its descending movement from the upper position, there is a clearance of 15 mm between needle holder and arm edge.
The proper clearance corresponds to the width of the zigzag presser foot shoe (fig. 13).
- Loosen eccentric 47 with a 2.5 mm Allen key.
- Turn eccentric back and forth, until the Allen key rests on the feed driving shaft 36 (fig. 13b).
- Tighten screw 46 in this position so that the long hook shaft 25 does not exhibit any play.

Test:

- Turn the handwheel and carry out a visual check.
- Refit free-arm cover and baseplate.

Note:

Since the lifting movement and the feeding movement influence each other, both must be checked and readjusted to each other if necessary.

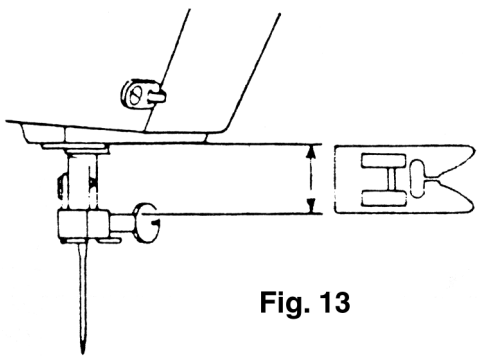


Fig. 13

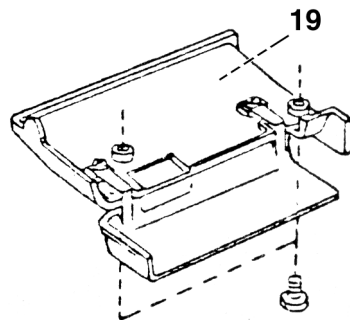


Fig. 13a

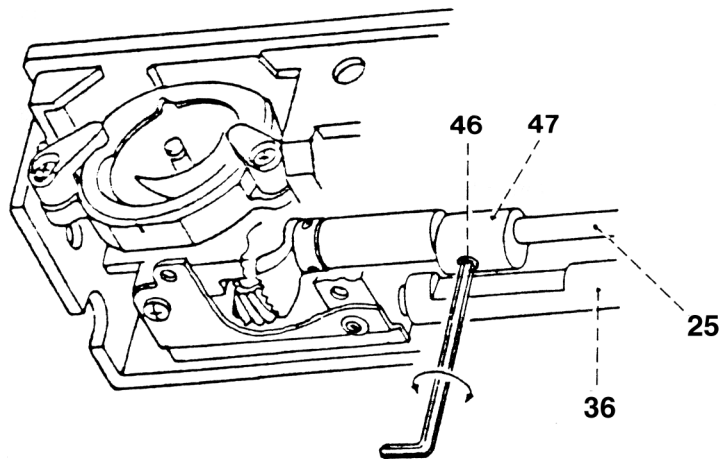


Fig. 13b

14. Adjustment of the feed dog height

Requirement:

At the highest feed dog position, the tips of the feed dog teeth must protrude above the needle plate surface by 0.9 mm (fig. 14).

Check:

- Remove the needle and the presser foot shoe.
- Select the largest stitch length.
- Turn the handwheel until the feed dog is at its highest position.
- Place bridge gauge (01-066141-00) over the feed dog on the needle plate (fig. 14).
- Carry out a visual check.
The feed dog must not touch the gauge, but must clear it by 0.1 mm.

Adjustment:

- Open the free-arm cover.
- Loosen screw 51 with a 2.0 mm Allen key (fig. 14a).
- Turn the setting eccentric 50 until the feed dog is at the correct height.
- Tighten screw 51.

Test:

- Turn the handwheel and check height of feed dog in its highest position again.

Note:

- Check the feed lifting and driving eccentric movements again (point 12 and 13 of this manual).

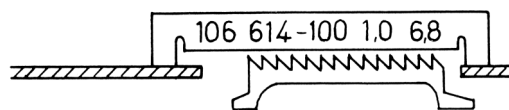


Fig. 14

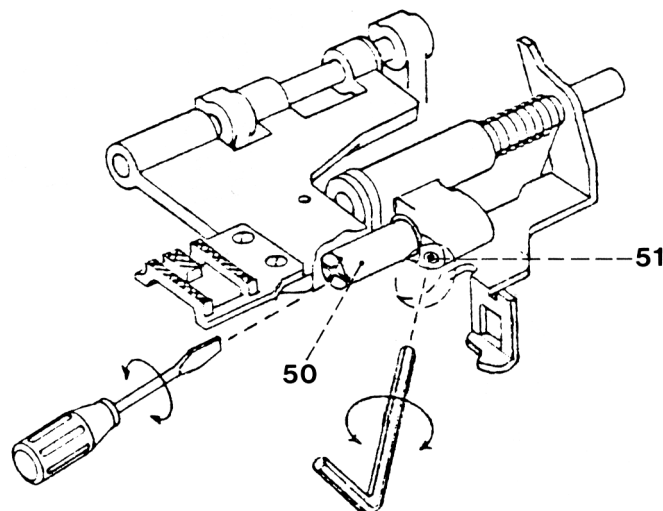


Fig. 14a

15. Adjustment of the presser bar height

Requirement:

With the presser bar lifter raised there must be a clearance of approx. 6.0 mm between the needle plate and the zigzag foot shoe (fig. 15a).

Check:

- Set control knob to straight stitch and "middle" needle position.
- Raise the presser bar lifter.
- Attach the zigzag presser foot.
- Lower the feed dog.
- Place bridge gauge (No. 01-066141-00) under the zigzag foot shoe as shown in fig. 15a.

Adjustment:

- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Loosen both face cover retaining screws and remove face cover.
- Loosen screw 52 with a 2.0 mm Allen key (fig. 15).
- Move presser bar 53 downwards until the zigzag foot shoe is resting on the bridge gauge.
- Tighten screw 52 slightly.
- Remove the bridge gauge.
- Turn the zigzag foot until it is parallel to the feed slot, and the needle slot in the presser foot is aligned with the needle plate slot.
The needle is now positioned in the center of the presser foot.
- Lift the zigzag foot.
- Tighten screw 52.

Test:

- Push bridge gauge under zigzag foot shoe as shown in fig. 15a.
- Check that height and lateral position are correct.
- Refit face cover and arm cover.

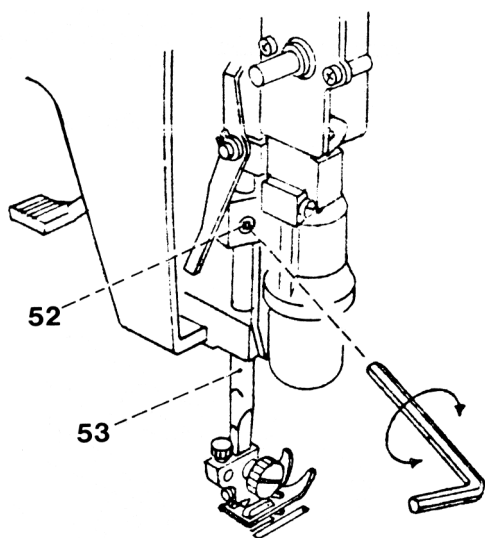


Fig. 15

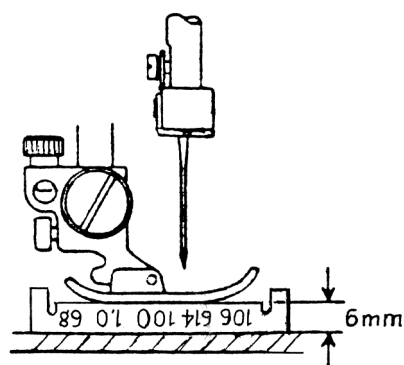


Fig. 15a

16. Adjustment of the zero point of the stitch length control

Requirement:

When the stitch length is set to "0", the fabric should not be fed.

At stitch length setting "2" the length of forward and reverse stitches must be approx. the same.

Check:

- Set the control knob to the straight stitch (fig. 16).
- Remove the needle.
- Set the stitch length to "0".
- Place a piece of fabric under the presser foot.
- Operate the machine.
The fabric should not be fed either forward or backward

Adjustment:

- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- If the fabric is fed forwards, turn screw 54 slightly in direction "A" (fig. 16a).
- If the fabric is fed backwards, turn screw 54 slightly in direction "B".

Test:

- Operate the machine and check to see that the fabric is not fed.

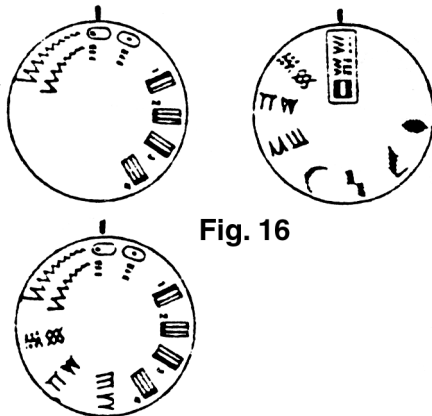


Fig. 16

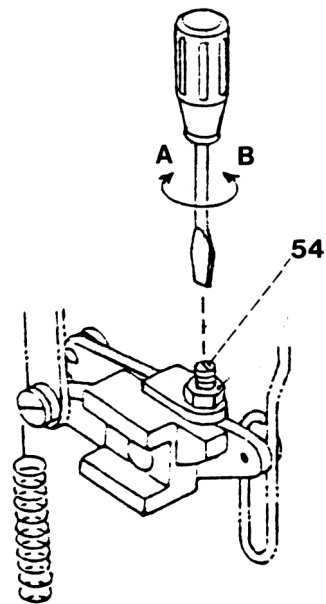


Fig. 16a

Stitching off the machine

17. Adjustment of the bobbin thread tension

Requirement:

The thread pull weight of the bobbin thread using cotton thread 50/2 should be approx. 30 to 35 g.

Check:

- When the threaded bobbin case is hanging on its thread, it must not be caused to slip downwards by its own weight.
- It must drop stepwise, however, on sharp upward movements of the hand.
- There must not be any thread fragments under the tension spring.
- The tension spring must rest evenly on the bobbin case.

Adjustment:

- Loosen the screw slightly and then turn it again, tightening the screw until you feel resistance when pulling the thread (fig. 17).

Test:

- Carry out as described in "check".

Note:

When the bobbin thread tension is adjusted correctly, all other adjustments to the tension should be carried out only on the needle thread tension.

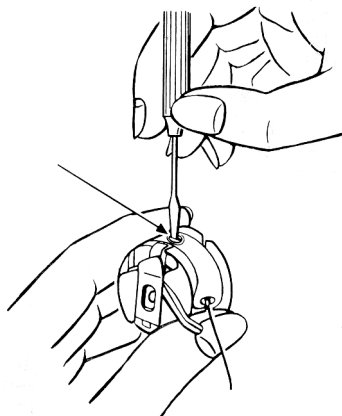


Fig. 17

18. Adjustment of the needle thread tension

Requirement:

Within the adjusting range from 3 to 5, the interlacing of the needle thread and the bobbin thread (using cotton thread) must take place approximately in the middle of the fabric at straight and zigzag stitch setting.

Check:

- Set the needle thread tension to "5". Sew with straight and zigzag stitches with stitch length at "2".

Adjustment:

- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Loosen both face cover retaining screws and remove face cover.
- Turn out Phillips screw 56 (fig. 18).
- Turn out screw 57.
- Take out leaf spring 58 and connecting strap 59.
- Refit leaf spring 58 with screw 57.
- Pull out nut retention 60 and remove graduated knob 61.
- Turn gear 62 slightly to the left.
- Set control knob to the widest zigzag stitch setting.
- Sew while turning the gear 62 in small increments to the right, until the interlacing is in the middle of the fabric.
- Slide on the graduated knob 61 so that the number "5" is aligned with the mark.
- Fit retention 60 in the groove of the tension bolt 63.
- Turn out screw 57 and take out leaf spring 58.
- Fit connecting strap 59 onto the tension bolt 63 and tighten Phillips screw 56 slightly.
- Tighten Phillips screw 56 securely.

Test:

- Re-fit face cover and arm cover.
- Set the graduated knob to "5".
- Sew and check the interlacing.
- Fasten leaf spring 58 with screw 57.

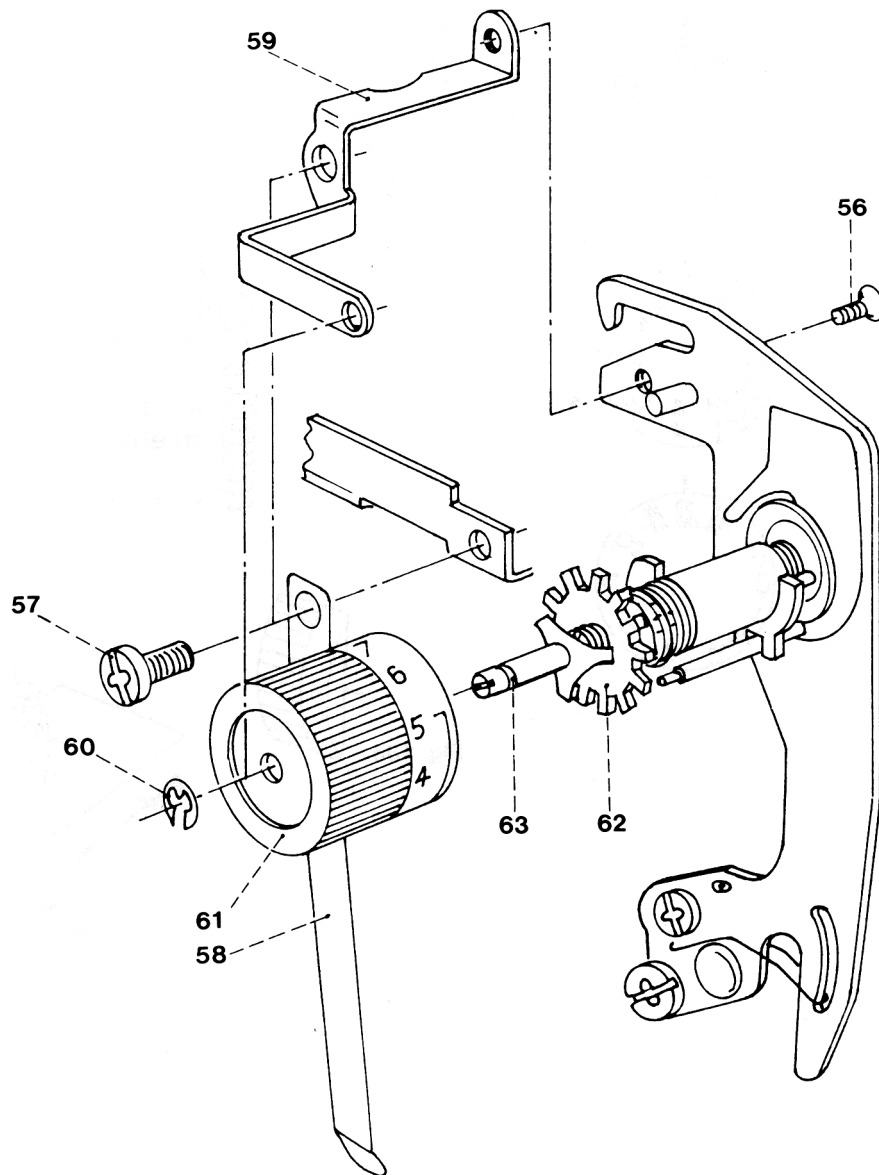


Fig. 18

19. Adjustment of the feed dog standstill point in a buttonhole bartack

Requirement:

The bartack must be sewn on the spot with no feeding motion.

Check:

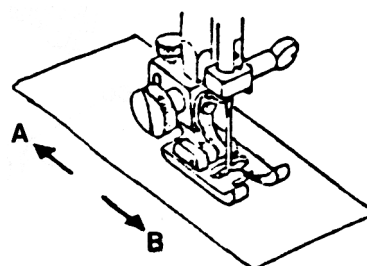
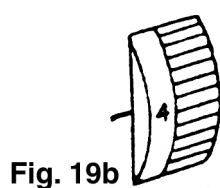
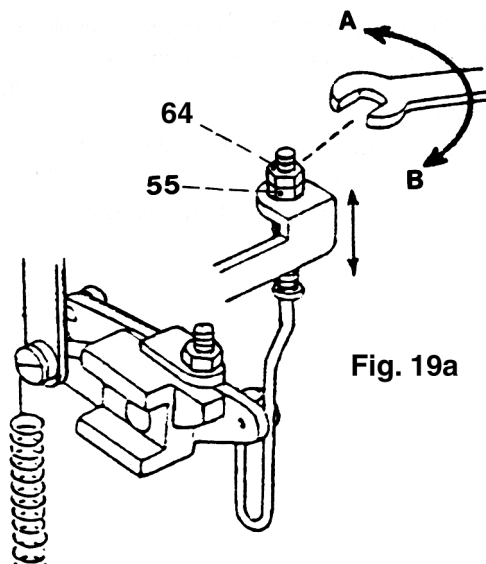
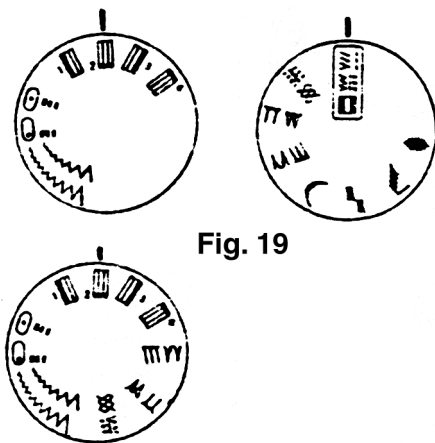
- Set the control knob to the "bartack" symbol No. 2 (fig. 19).
- Set stitch length to "4" (fig. 19b).
- Place a piece of fabric under the buttonhole foot.
- Operate the machine and check the feed standstill function.

Adjustment:

- Loosen upper nut 64 with a 5.5 mm socket wrench (fig. 19a).
- If the fabric is fed forward in direction "A", (fig. 19a) bottom nut 55 must be turned slightly in direction "A".
- If the fabric is fed backward in direction "B", bottom nut 55 must be turned slightly in direction "B".
- If the fabric is not fed at all, tighten upper nut 64 without turning bottom nut 55.

Test:

- Operate the machine and check the feed standstill function again.



20. Adjustment of equal stitch length for left and right buttonhole seams

Requirement:

The stitch length of the left buttonhole seam (sewn forward) and of the right buttonhole seam (sewn backward) must be the same (fig. 20).

Check:

- Attach the buttonhole foot.
- Set control knob to "buttonhole seam" symbol No. 1 (fig. 20c).
- Set stitch length to 0.5 in buttonhole range (fig. 20d).
- Sew the left buttonhole seam.
- Change setting to right "buttonhole seam" symbol No. 3.
- Sew the right buttonhole seam.
- The stitch length must be the same.

Adjustment:

- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- If left seam has longer stitch length than right one (fig. 20a), turn screw 54 slightly in direction "A" (fig. 20e).
- If left seam has shorter stitch length than right one (fig. 20b), turn screw 54 slightly in direction "B".

Test:

- Set stitch length somewhat shorter.
- Sew a buttonhole.
- Compare the stitch lengths of both buttonhole seams.

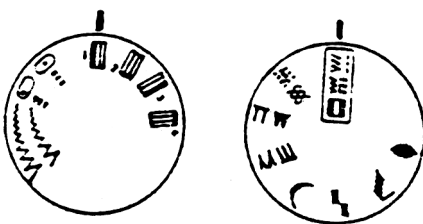


Fig. 20c

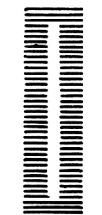
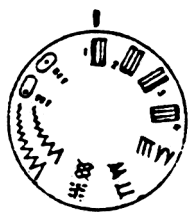


Fig. 20

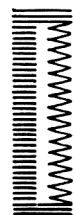


Fig. 20b



Fig. 20b

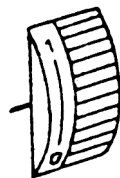


Fig. 20d

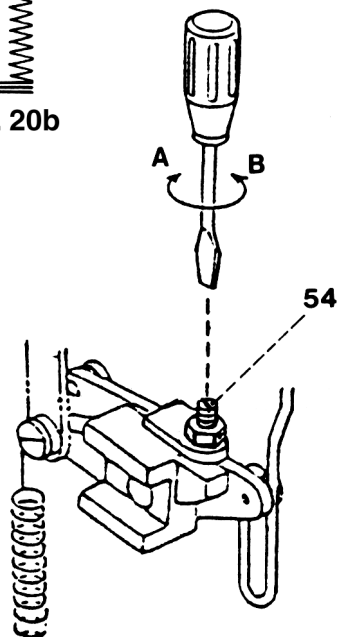


Fig. 20e

21. Adjustment of equal stitch length for forward/reverse-controlled utility stitches

Requirement:

The needle perforations for the honeycomb stitch and the stretch triple straight stitch must always take place in the same penetration holes for forward and reverse feed (fig. 21).

Check:

- Set left knob to the widest zigzag stitch setting (fig. 21a).
- Set right knob to the honeycomb stitch.
- Set stitch length to "SS" (fig. 21b).
- Sew the honeycomb stitch.

Adjustment:

- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Loosen nut 66 with a 5.5 mm socket wrench (fig. 21c).
- Turn screw 67 approx. one turn left in direction "B".
The stitch length of the honeycomb stitch should now be a bit too long.
- Turn screw 67 stepwise, by about 1/8 of a turn each, in direction "A".
- Sew honeycomb stitches each time and check needle perforations.
- Continue adjusting screw 67 until the needle enters the same perforations.
- Tighten nut 66 without turning screw 67.

Test:

- Sew the honeycomb stitch and the stretch triple straight stitch and check whether the needle always enters the same perforations.



Fig. 21

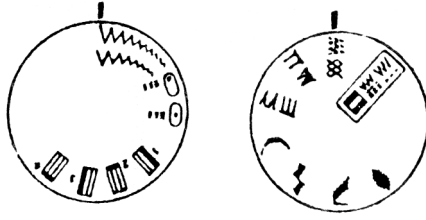


Fig. 21a

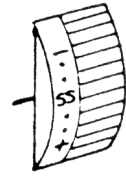


Fig. 21b

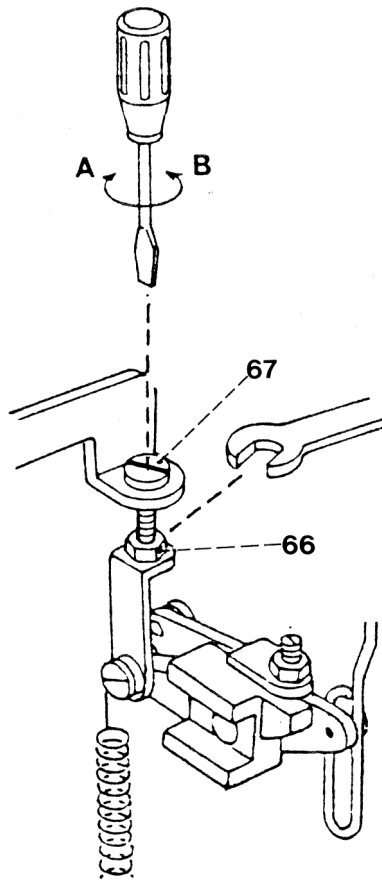


Fig. 21c

22. Making up a sewing sample

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

This sewing sample should contain the most important stitch patterns available on the repaired machine.

If the customer has special requirements, these should also be included in the sewing sample.

The following is an example of a sewing sample (fig. 22).

The stitch types listed are not available on all models. Sew only the stitch types available on the specific repaired machine model.

Stitch type:

1. straight stitch
2. zigzag stitch
3. stretch triple straight stitch
4. honeycomb stitch
5. fancy stitch
6. buttonhole

Stitch length:

- 2
2
SS
SS
0.3 - 0.5
0.3 - 0.5

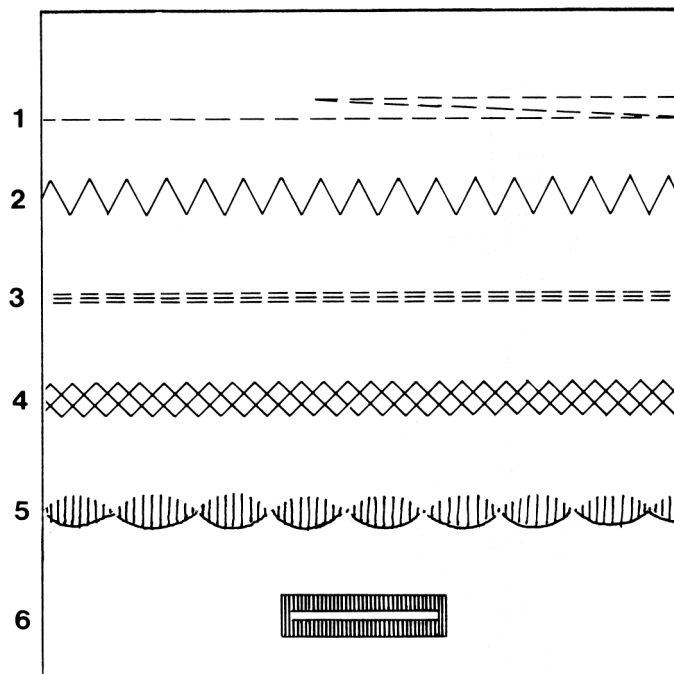


Fig. 22

Repair Instructions

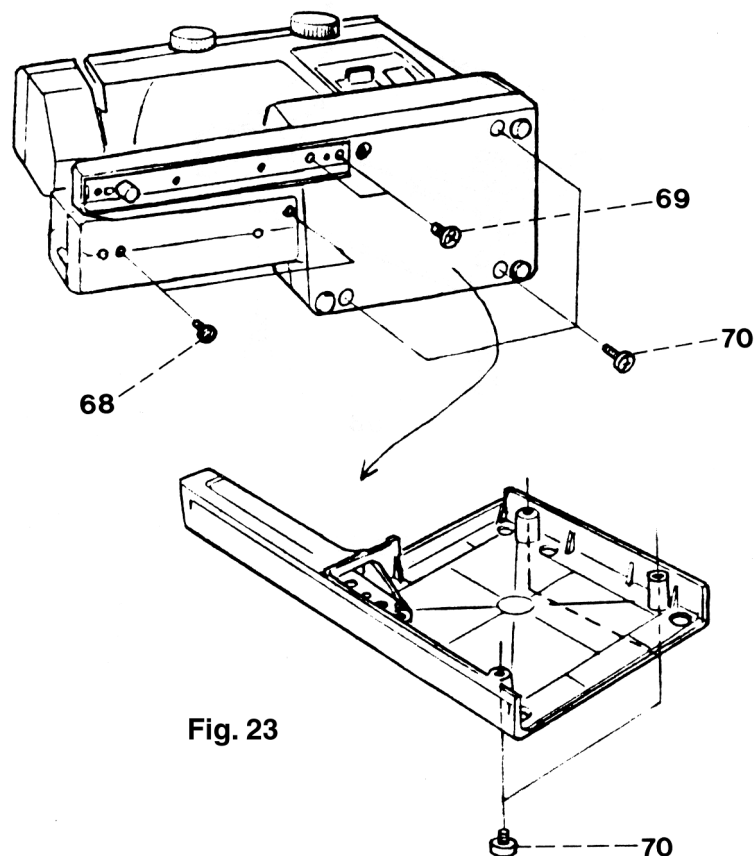
23. Changing the baseplate

Removal:

- Remove the detachable work support (accessory box) by pulling it to the left.
- Lay the machine with its back on the table (fig. 23).
- Turn out both screws 69.
- Turn out the three screws 70 and remove the baseplate.

Refitting

- Fit the baseplate properly under the machine.
- Insert and tighten the five screws.



24. Changing the free-arm cover

Removal:

- Remove the detachable work support (accessory box) by pulling it to the left.
- Lay the machine with its back on the table (fig. 23).
- Turn out both screws 69.
- Turn out the tree screws 70 and remove the baseplate.
- Turn out both screws 68 (fig. 24).
- Remove the free-arm cover.

Refitting:

- Fit the free-arm cover onto the free-arm properly.
- Insert and tighten both screws 68.
- Fit the baseplate under the machine properly.
- Insert and tighten the five screws.

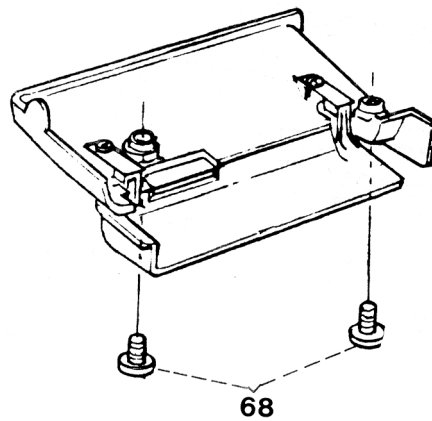


Fig. 24

25. Changing the arm cover

Removal:

- Fold up the carrying handle (fig. 25).
- Turn out both screws 71.
- Remove arm cover by lifting it upwards.

Refitting:

- With the carrying handle in upright position, fit arm cover to the machine checking the position of the thread tensioners and making sure that the arm cover closes without play.
- Insert and tighten both screws 71.

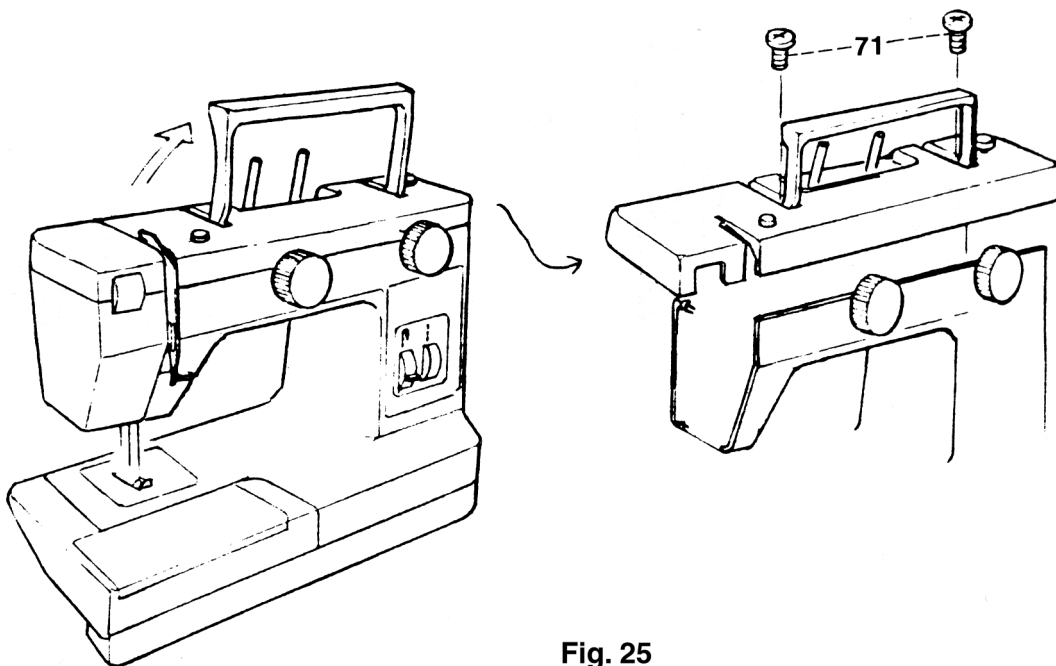


Fig. 25

26. Changing the face cover

Removal:

- Fold up the carrying handle.
- Turn out both screws 71.
- Remove arm cover by lifting it upwards.
- Loosens both screws 72 by approx. 2 turns (fig. 26).
- Remove face cover 73.

Refitting:

- Insert face cover with the hole from behind over the main switch and both guides under the screw heads.
- Fit face cover 73 exactly into its guide (fig. 26a).
- Tighten both screws 72.
- With the carrying handle in upright position, fit arm cover to the machine checking the position of the thread tensioners and making sure that the arm cover closes without play.
- Insert and tighten both screws 71.

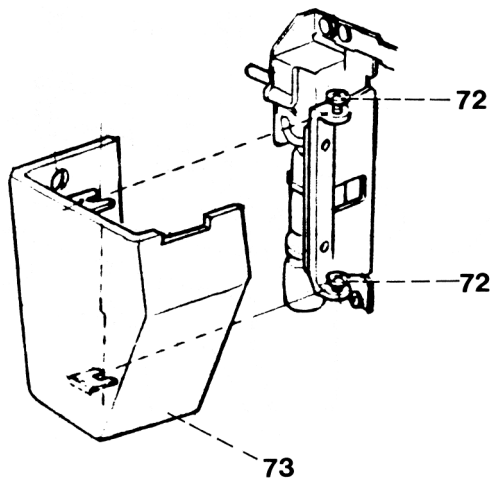


Fig. 26

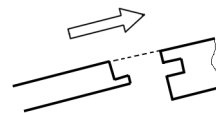


Fig. 26a

27. Changing the stand cover

Removal:

- Fold up the carrying handle.
- Turn out both screws 71.
- Remove arm cover by lifting it upwards.
- Turn out screw 87 (fig. 27).
- Remove stand cover 74.

Refitting:

- Insert stand cover rib 75 in the baseplate and push stand cover onto the machine housing.
- Insert and tighten screw 87.
- With the carrying handle in upright position, fit arm cover to the machine checking the position of the thread tensioners and making sure that the arm cover closes without play.
- Insert and tighten both screws 71.

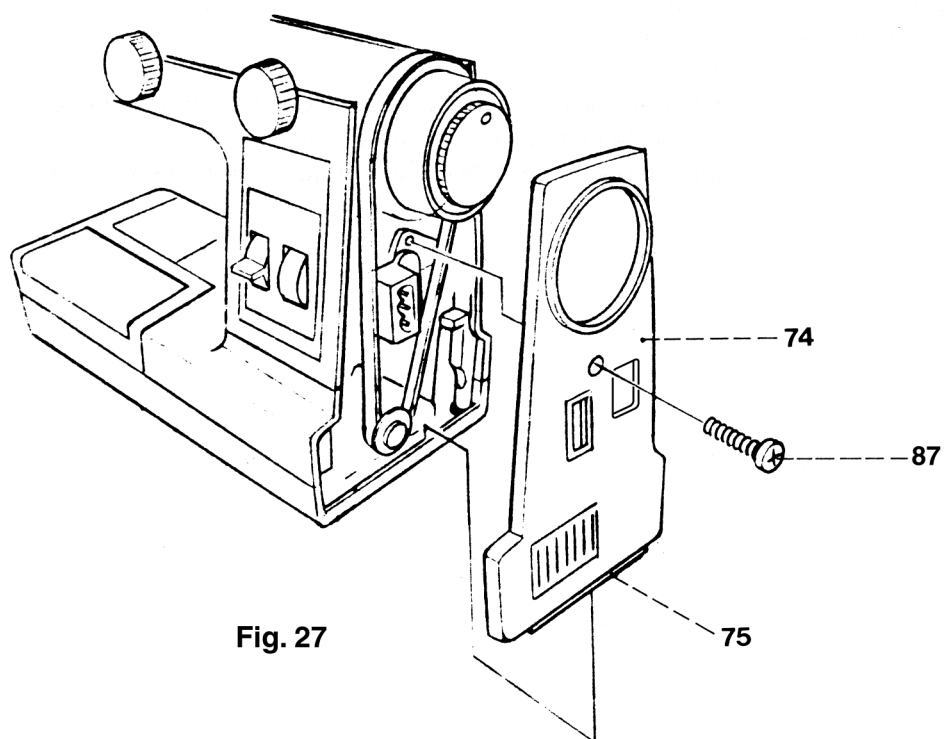


Fig. 27

28. Changing the motor

Removal:

- Disconnect the plug from the electrical outlet.
- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Turn out stand cover retaining screw and remove stand cover.
- Remove the detachable work support (accessory box) by pulling it to the left.
- Lay the machine on its back.
- Turn out the five baseplate retaining screws and remove baseplate.
- Remove toothed belt 86 (fig. 28).
- Turn out both Phillips screws 82 of the motor bracket.
- Turn out both Phillips screws 76 of the plug 77.
- Remove plug cover 78 (fig. 28a).
- Turn out both Phillips screws 84 of the main switch (fig. 28).
- Remove the motor bracket.
- Pull out the main switch assembly a little to the front.
- Turn out both Phillips screws 83.
- Slide the main switch somewhat to the side.
- Turn out nuts 79 and 80 with a 5.5 mm socket wrench (fig. 28a).
- Disconnect both motor lead eyelets on plug and on main switch.
- Turn out both Phillips screws 81 (fig. 28).
- Pull out the motor cable from the cable clip and remove the motor assembly.

Refitting:

- Pull the motor cable through the cable clip and through the main switch plug (replace the cable clip if necessary).
- Pull the blue motor cable through the protecting sleeve.
- Push both lead eyelets onto the threaded studs and fasten them using nuts 79 and 80 (fig. 28a).
- Fit and fasten the main switch cover with Phillips screws 83.
- Fasten the main switch assembly onto the motor bracket using both Phillips screws 84.
- Fit the motor assembly and fasten it with both Phillips screws 81 (fig. 28).
- Bring the machine in an upright position.
- Insert plug 77. At the same time fit plug cover 78 properly.
- Insert and tighten both Phillips screws 76.
- Fasten the motor bracket onto the housing using both Phillips screws 82.
- Mount toothed belt 86.
- Loosen both screws 85.
- Adjust the tension of the toothed belt and tighten both screws 85 securely.
- Refit stand cover, baseplate and arm cover.
- Carry out an electrical safety test in accordance with VDE 0701 using testing appliance ABB Metrawatt 5013.

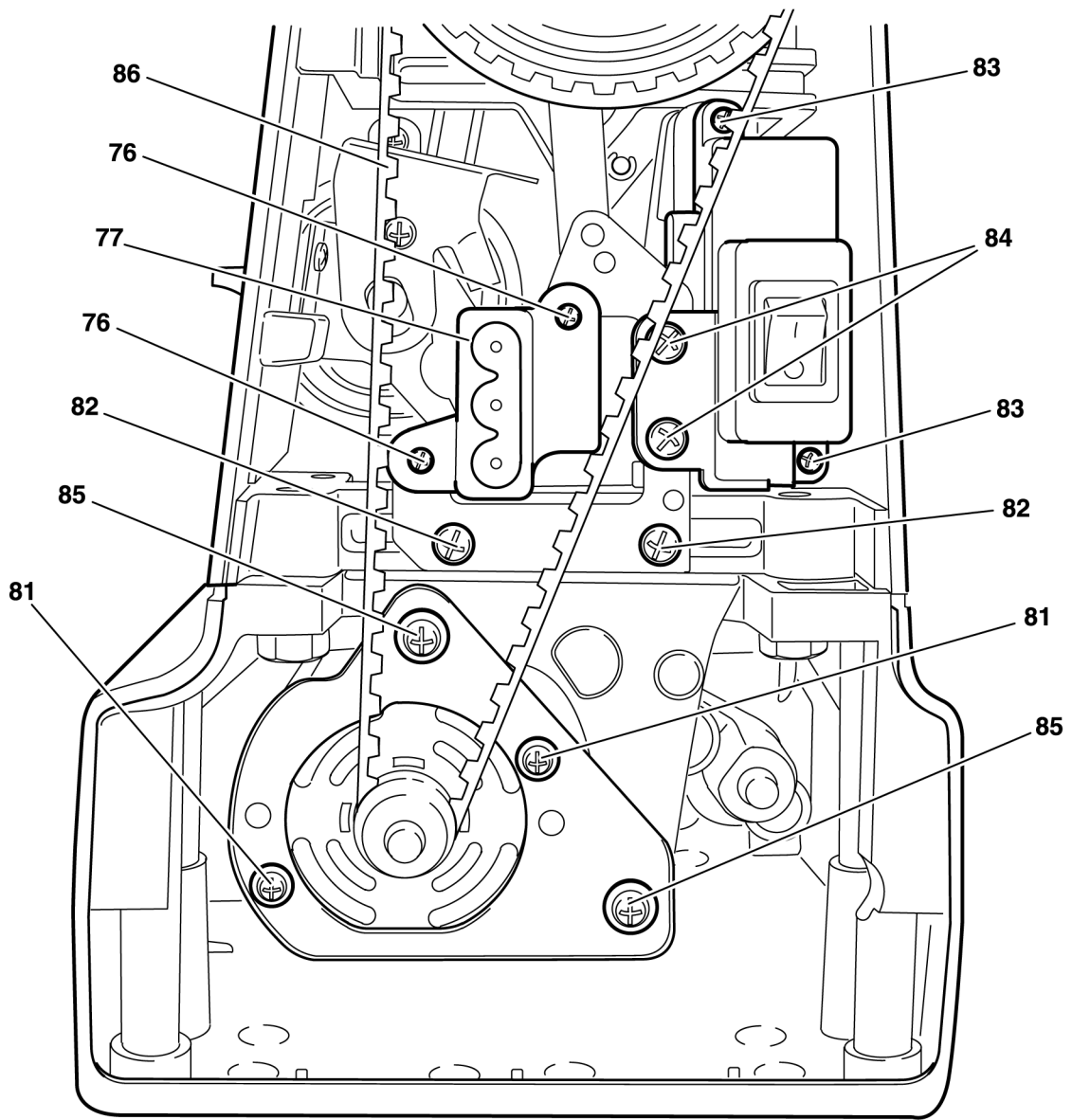


Fig. 28

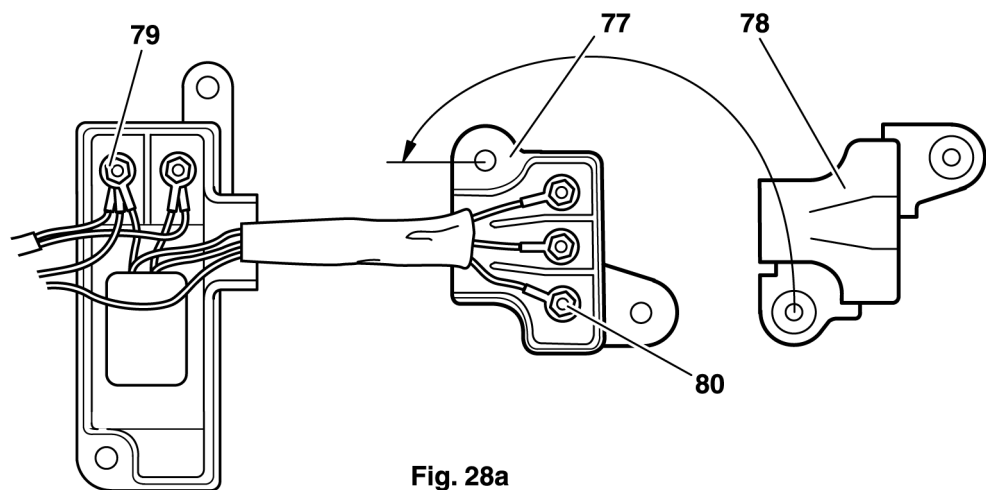


Fig. 28a

29. Changing the stitch length control

Removal:

- Disconnect the plug from the electrical outlet.
- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Turn out both stand cover retaining screws and remove stand cover.
- Loosen both face cover retaining screws and remove face cover.
- Remove the detachable work support (accessory box) by pulling it to the left.
- Take out screw 88 with washer 89 (fig. 29).
- Remove cover plate 90.
- Turn out both lock washers 91 (fig. 29a).
- Turn out Phillips screw 92 (fig. 29b).
- Remove stitch length control plate 93 with spring 94.
- Disconnect spring 95 (fig. 29a).
- Turn out both Phillips screws 96 (fig. 29b).
- Detach the connecting rods of the stitch length control from the guide pins of the slide way.
- Remove the stitch length control 97.

Refitting:

- Refit the stitch length control 97 in such a way that both connecting rods engage in the guide pins of the slide way.
- Reinsert both Phillips screws 96 and loosely attach the stitch length control.
- Refit both lock washers 91 (fig. 29a).
- Connect spring 95.
- Refit stitch length control plate 93 with spring 94 (fig. 29b)
- Tighten Phillips screws 92 and both Phillips screws 96.
- Refit cover plate 90 (fig. 29) and tighten it with washer 89 and screw 88.
- Carry out a function check.
- Carry out an electrical safety test in accordance with VDE 0701 using testing appliance ABB Metrawatt 5013.

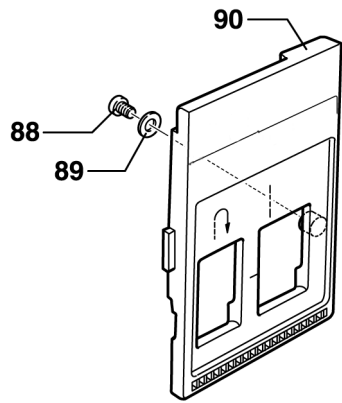


Fig. 29

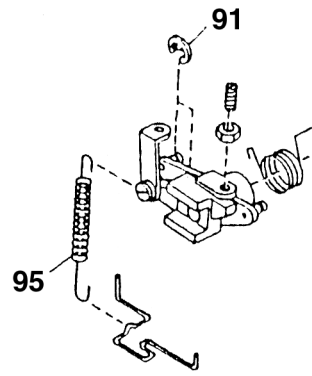


Fig. 29a

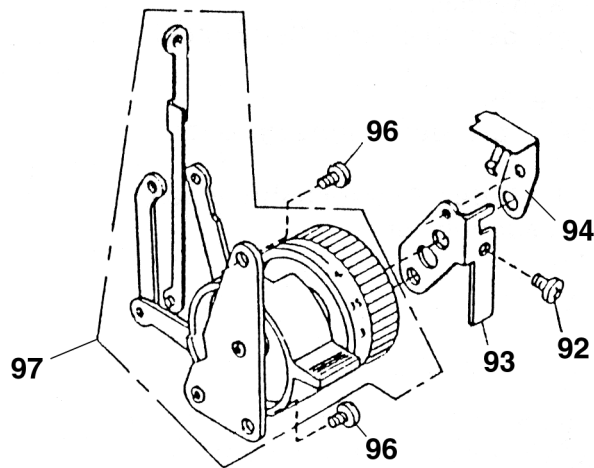


Fig. 29b

30. Changing the hook race assembly

Removal:

- Disconnect the plug from the electrical outlet.
- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Turn out both stand cover retaining screws and remove stand cover.
- Loosen both face cover retaining screws and remove face cover.
- Remove the detachable work support (accessory box) by pulling it to the left.
- Lay the machine on its back.
- Turn out the five baseplate retaining screws and remove baseplate.
- Turn out both free-arm cover retaining screws.
- Remove free-arm cover.
- Turn out both needle plate retaining screws and remove needle plate.
- Disconnect pull spring on gear housing cover 18 (fig. 30).
- Take out both retaining screws 68 of gear housing cover and remove gear housing cover.
- Loosen both Allen screws 27 on the hook shaft crank.
- Loosen screw 24 on hook shaft bush 28.
- Move hook shaft 25 to the right, until toothed segment 61 is out of mesh.
- Loosen hook race screws 20 and 22 and remove the hook race assembly to the top.

Refitting:

- Refit the hook race assembly.

Note:

The hook race must now be adjusted in the following order:
Adjustment of the hook clearance to the needle and to the thread puller plate.
Adjustment of the toothed segment to the bevel gear.

- Then adjust the hook as described in the service manual.
- Carry out an electrical safety test in accordance with VDE 0701 using testing appliance ABB Metrawatt 5013.

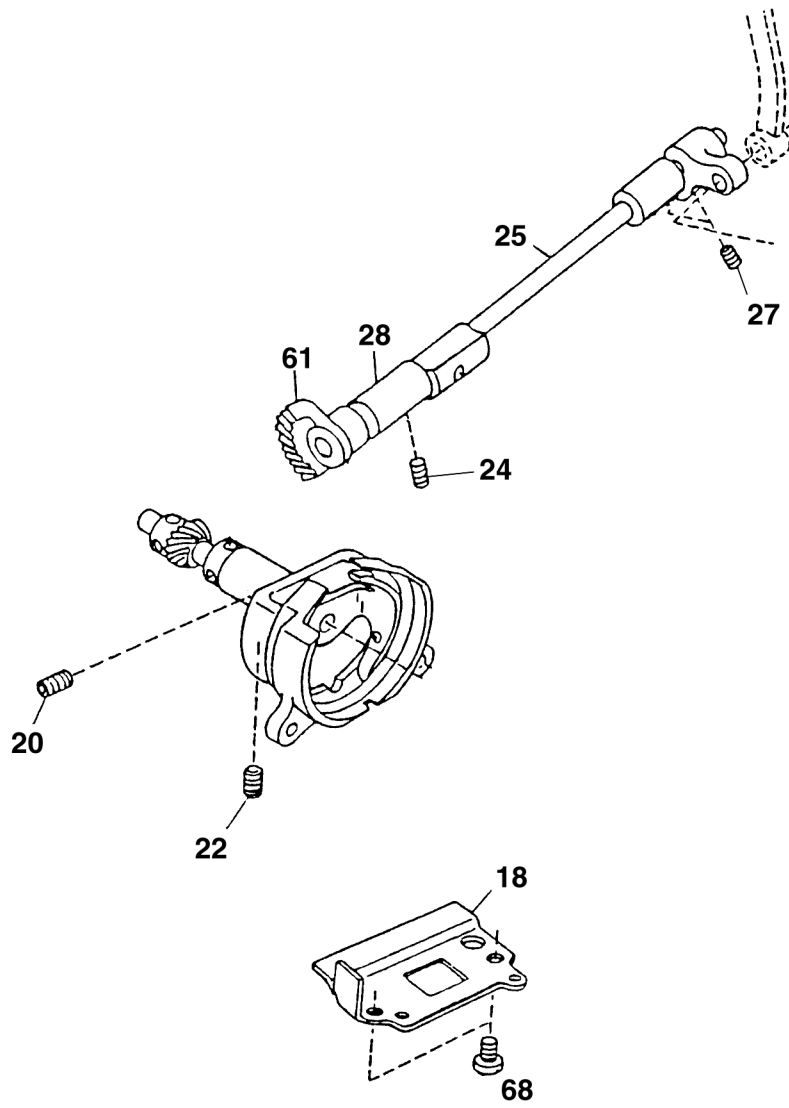


Fig. 30

31. Changing the automatic mechanism

Removal:

- Disconnect the plug from the electrical outlet.
- Fold up the carrying handle.
- Turn out both arm cover retaining screws and remove arm cover.
- Turn out both stand cover retaining screws and remove stand cover.
- Loosen both face cover retaining screws and remove face cover.
- Turn out both Phillips screws of bobbin winder and remove bobbin winder.
- Take out lock washer 99 (fig. 31).
- Detach the connecting rod to the stitch length control by moving it to the front.
- Loosen lock nut 66 (fig. 31b) using a 5.5 mm socket wrench.
- Turn out adjusting screw 67.
- Loosen top nut 64 (fig. 31a) using a 5.5 mm socket wrench and turn out the nut.
- Take out bottom nut 55 with washer.
- Set zigzag control knob 100 (fig. 31) to the buttonhole seam "1" and loosen the 2 mm Allan screw.
- Turn zigzag control knob and set it to the buttonhole seam "4". Loosen the second Allan screw.
- Take out zigzag control knob 100 by moving it to the front.
- Turn out the four retaining screws 101.
- Remove the entire automatic mechanism by moving it to the right and to the top.

Refitting:

- Refit the entire automatic mechanism. Observe the following points:
 - The guide pin of the automatic mechanism must be fitted into the connecting rod.
 - The feed reversing bar must be positioned in the tie rod of the connecting member (fig. 31a).
 - The adjusting screw 67 of the reversing bar must be positioned in the connector (fig. 31b).
- Insert the four retaining screws 101 (fig. 31).
- Hook the connecting rod of the stitch length control.
- Insert lock washer 99.
 - Now adjust the play between worm and worm gear as follows:
- Loosen the four retaining screws 101 slightly.
- Lift the automatic mechanism or lower it somewhat, to eliminate any play between worm and worm gear.
- Tighten the four retaining screws 101.
- Fit the washer and both nuts 55 and 64 (fig. 31a) onto the tie rod.
- Turn lock and adjusting cam as much as possible to the left, until the lock spring engages.
- Fit zigzag control knob 100 (with buttonhole seam "4") on top and tighten the Allan screw (fig. 31).
- Turn zigzag control knob and tighten the second Allan screw.
- Adjust the automatic mechanism as described in the service manual.
- Carry out an electrical safety test in accordance with VDE 0701 using testing appliance ABB Metrawatt 5013.

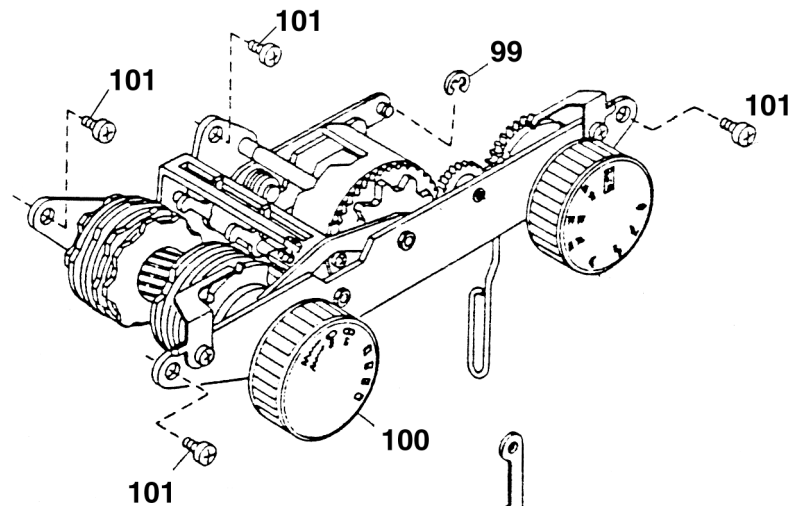


Fig. 31

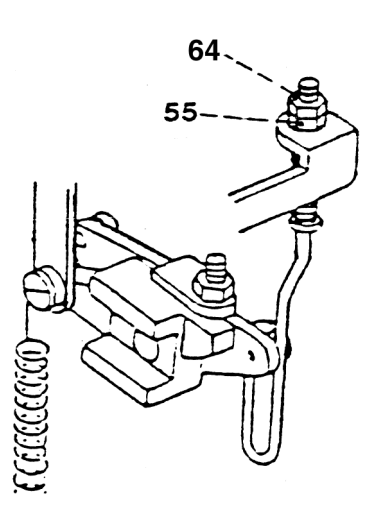
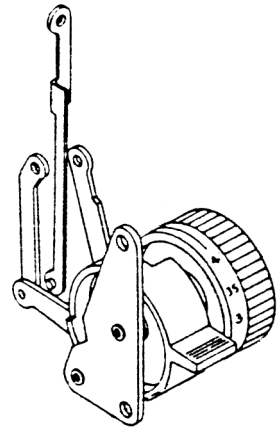


Fig. 31a

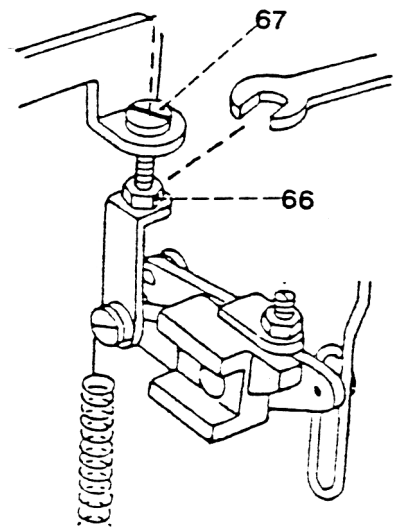


Fig. 31b

Safety test

32. Electrical safety test

According to the German law on safe machine operation of June 24, 1986, VDE regulations are the recognized rules in the field of electrical engineering and form the basis for electrical safety tests of technical appliances.

The required electrical tests for the appliances are laid down in paragraph 4 of the regulations for repair, modification and testing of electrical appliances (VDE 0701, edition 10.86).

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

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

33. Electrical safety test with ABB Metrawatt M 5013

I) Main power voltage test: Volt = V

- For all following tests insert plug of ABB Metrawatt M 5013 into a grounded electrical outlet.
- Set the testing range switch at **"250 V"** (fig. 33).
If there is main power voltage, the LCD shows the respective value (230 V +/- 10%).
- The contact field is located a bit to the right just below the knob for the measuring range.
Touch this field with your finger to check the ground lead of the electrical outlet.
Signal lamp **"PE"** just above the contact field will light up if the ground lead is out of order.
- Insert plug of sewing machine into the main power connection of ABB Metrawatt M 5013.
- Operate the machine.
- Meter reading: **230 V +/- 10%**
- Measuring appliance M 5013 can only be used with main power voltages from 207 V to 253 V (230 V +/- 10%).

II) Appliance current test: Ampere = A

- Leave sewing machine plug in mains socket.
- Set testing range switch at **16 A** (fig. 34).
- Operate the machine.
- Meter reading: **0.5 A maximum.**

III) Insulation resistance: M Ohm = M

- Insert plug of sewing machine in tester connection.
- Use clamp to attach test lead of testing appliance M 5013 to presser bar.
- Set testing range switch at **"20 M Ohm"** (fig. 35).
- 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 test: Milliampere = mA

- Leave sewing machine plug in tester connection.
- Use clamp to attach test lead of testing appliance M 5013 to presser bar.
- Set testing range switch at **"20 mA"** (fig. 36).
- Meter reading: **maximum 0.50 mA.**

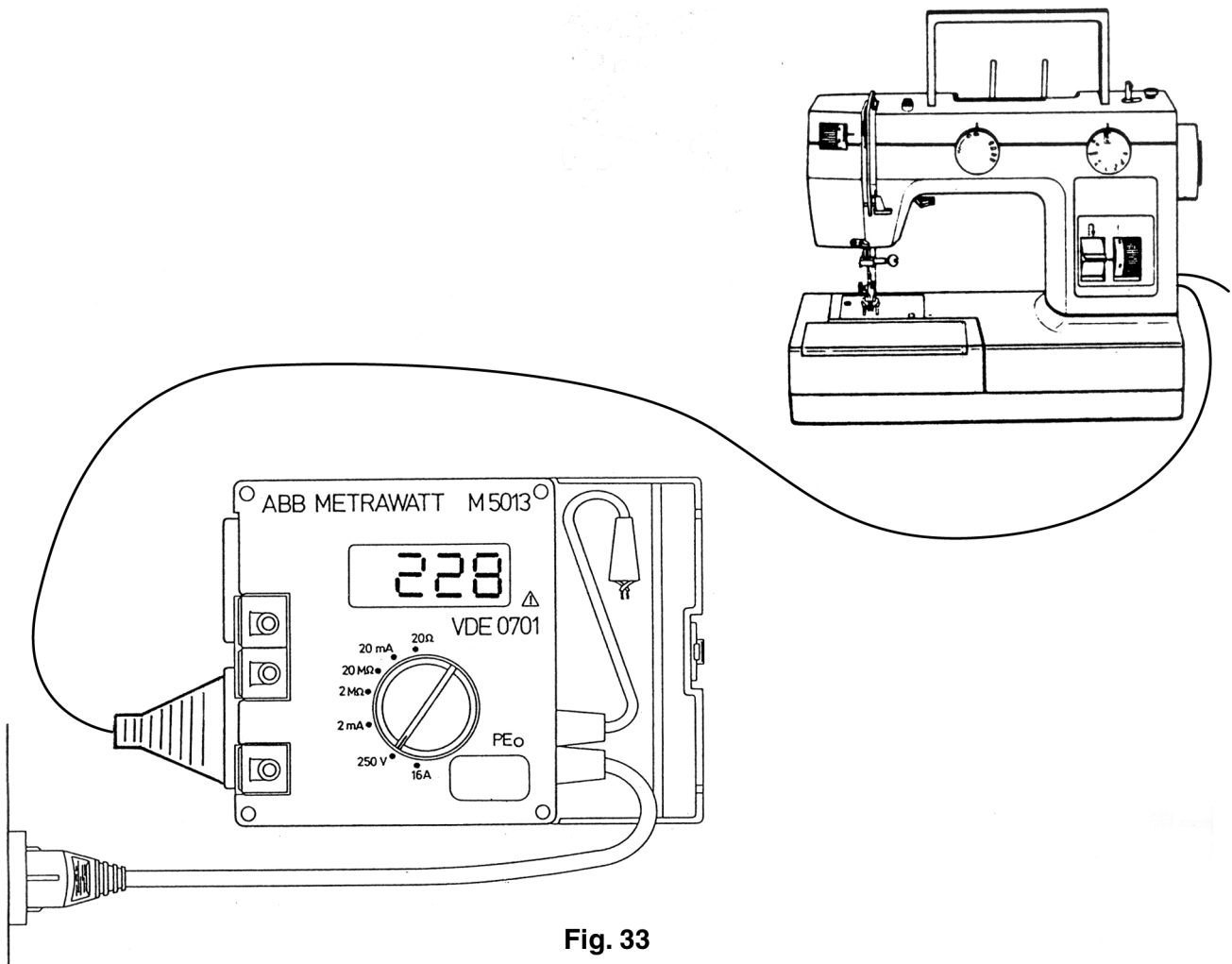


Fig. 33

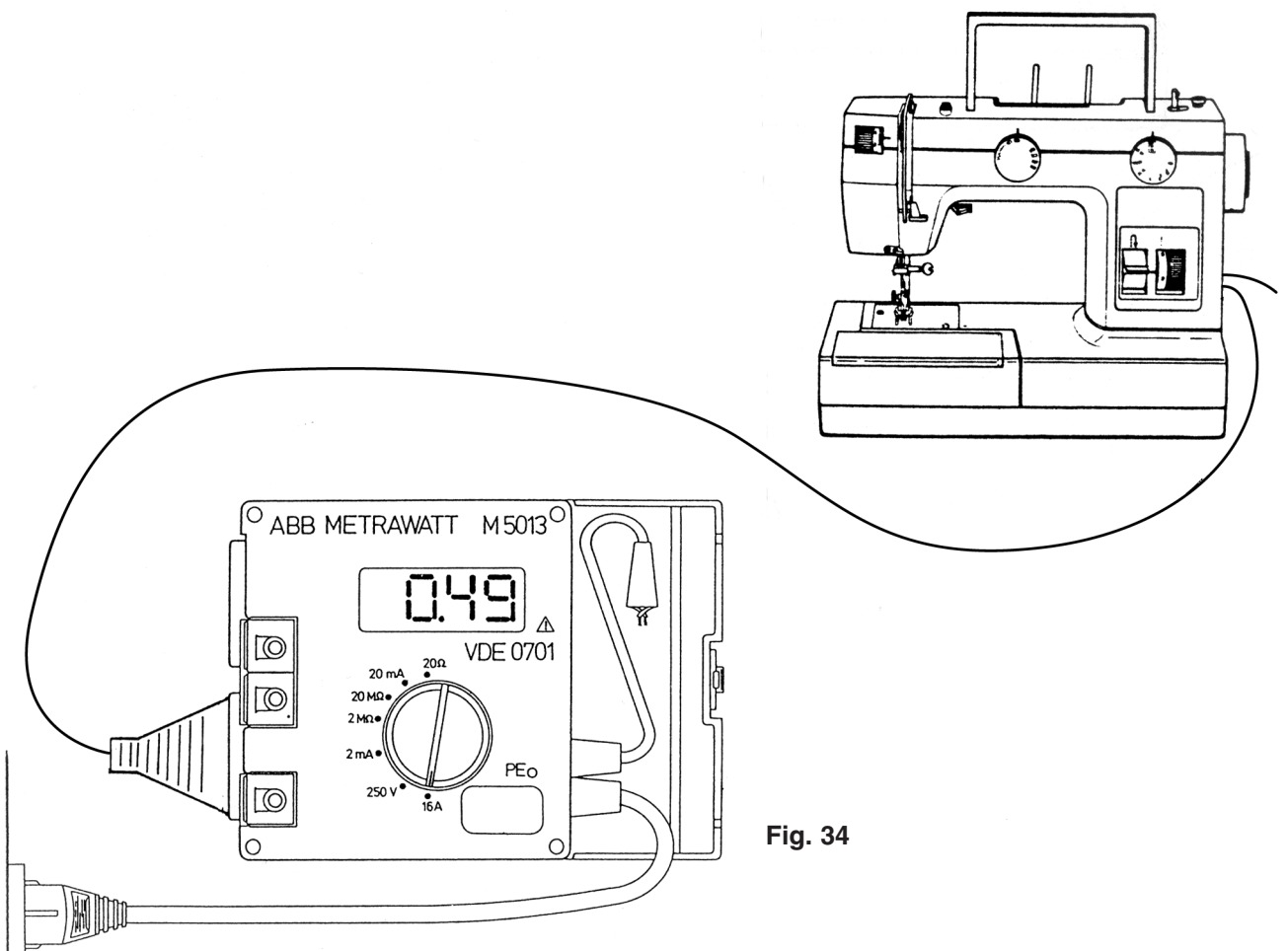


Fig. 34

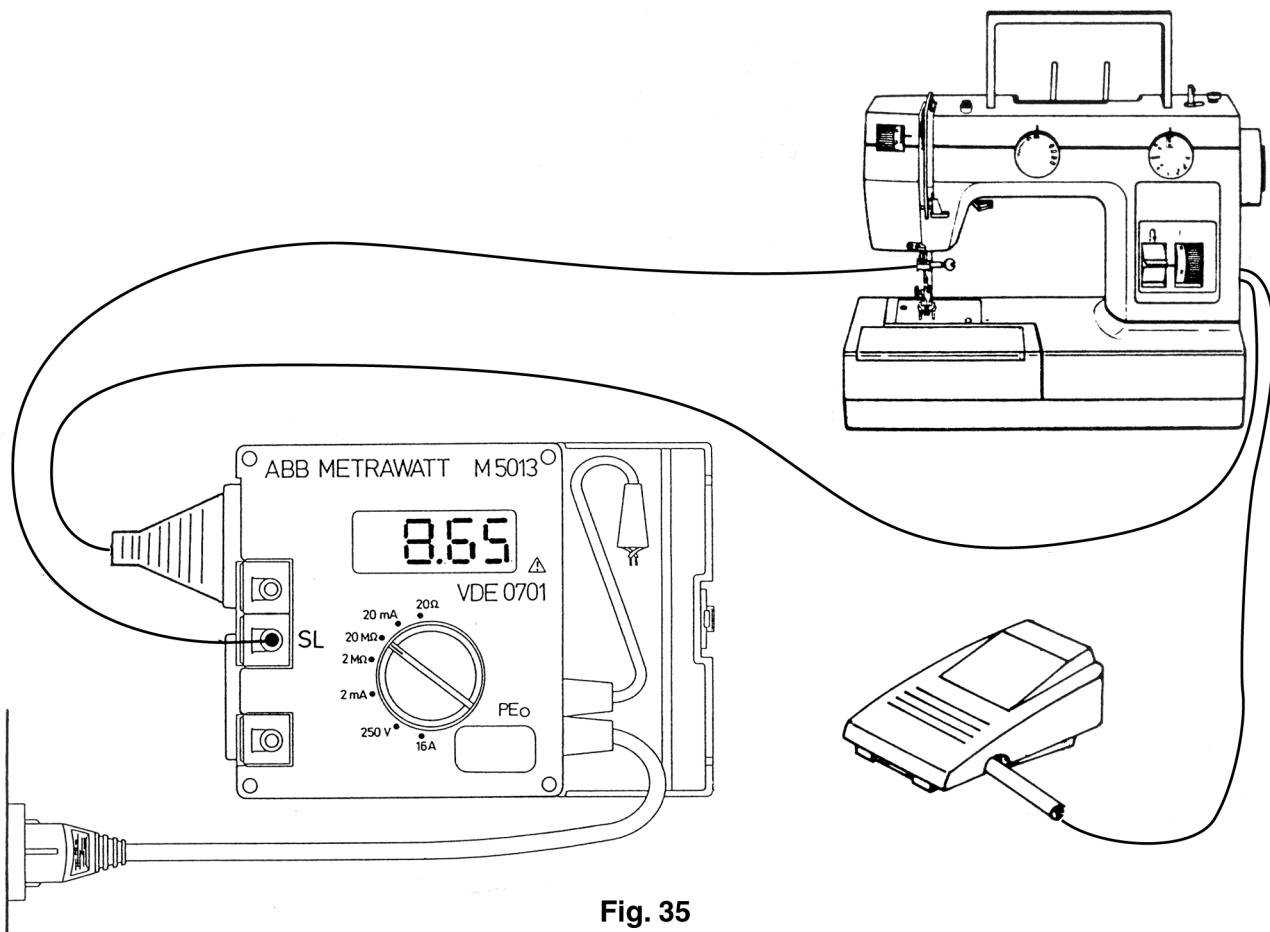


Fig. 35

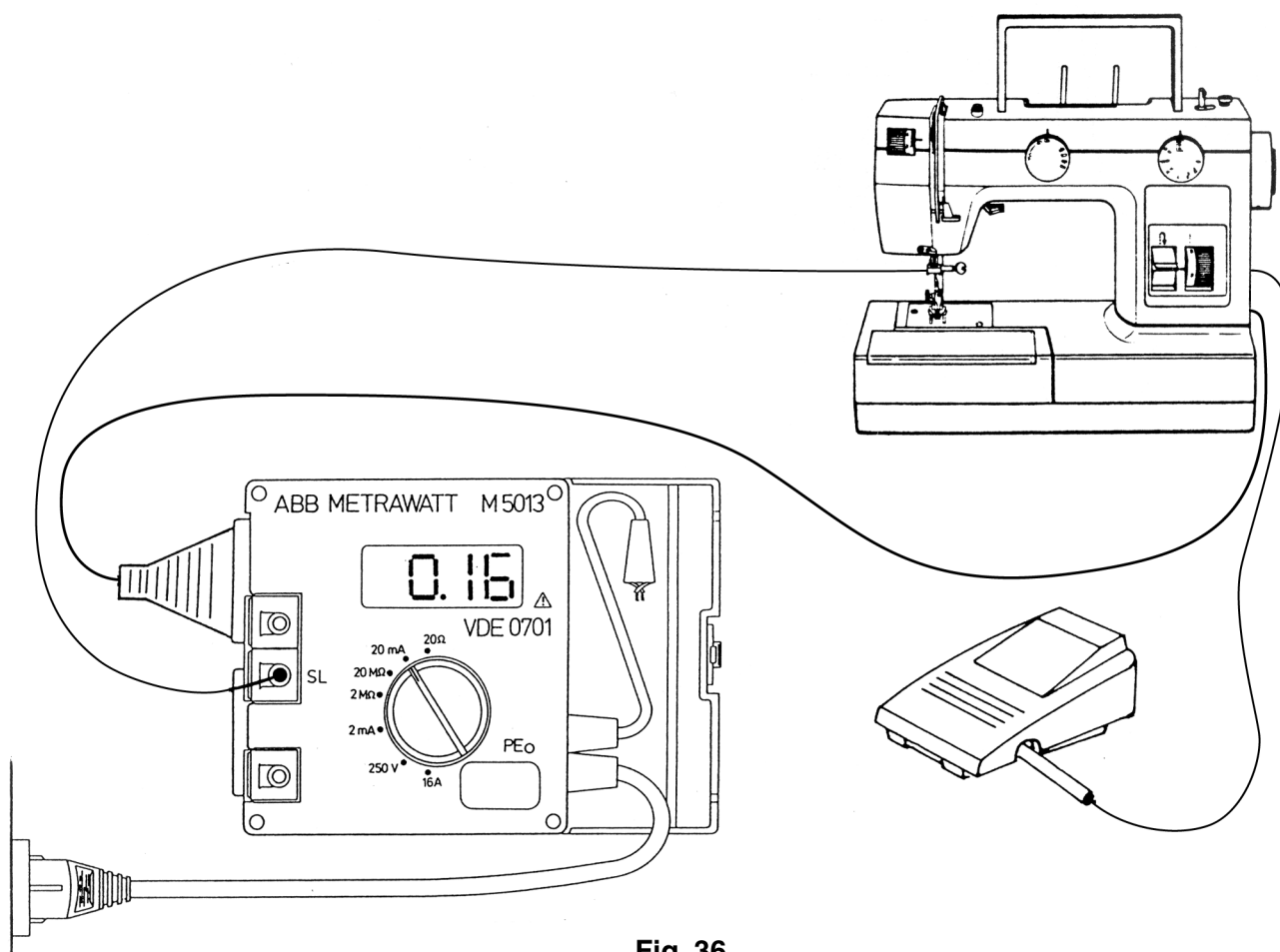


Fig. 36

34. Simulated leakage current tests on motor assemblies with ABB Metrawatt 5013

V) Simulated leakage current tests on motor assemblies

- When replacing the whole motor or motor parts respectively (field, armature or capacitor), the simulated leakage current of the motor must be tested before the motor is reinstalled.
- Set the testing range switch at "20 mA" (fig. 37).
- Connect both probe leads to the shaft and wire eyelets.
- Meter reading: 0.75 mA maximum

35. Measures required in case of incorrect readings

- re I:** If one of the 4 test functions is a failure, the grounded electrical outlet is defective. Take necessary steps to repair the electrical outlet.
- re II:** If the current consumption deviates considerably from the indicated value, even though the machine does not bind, the motor is defective and must be exchanged or repaired.
- re 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.
- re IV:** The components with inadmissably high leakage current must also be found by systematic checking and must be repaired.
- re V:** Return the motor to the factory.

PFAFF GmbH
76227 Karlsruhe, April 2002
PFAFF/HTS

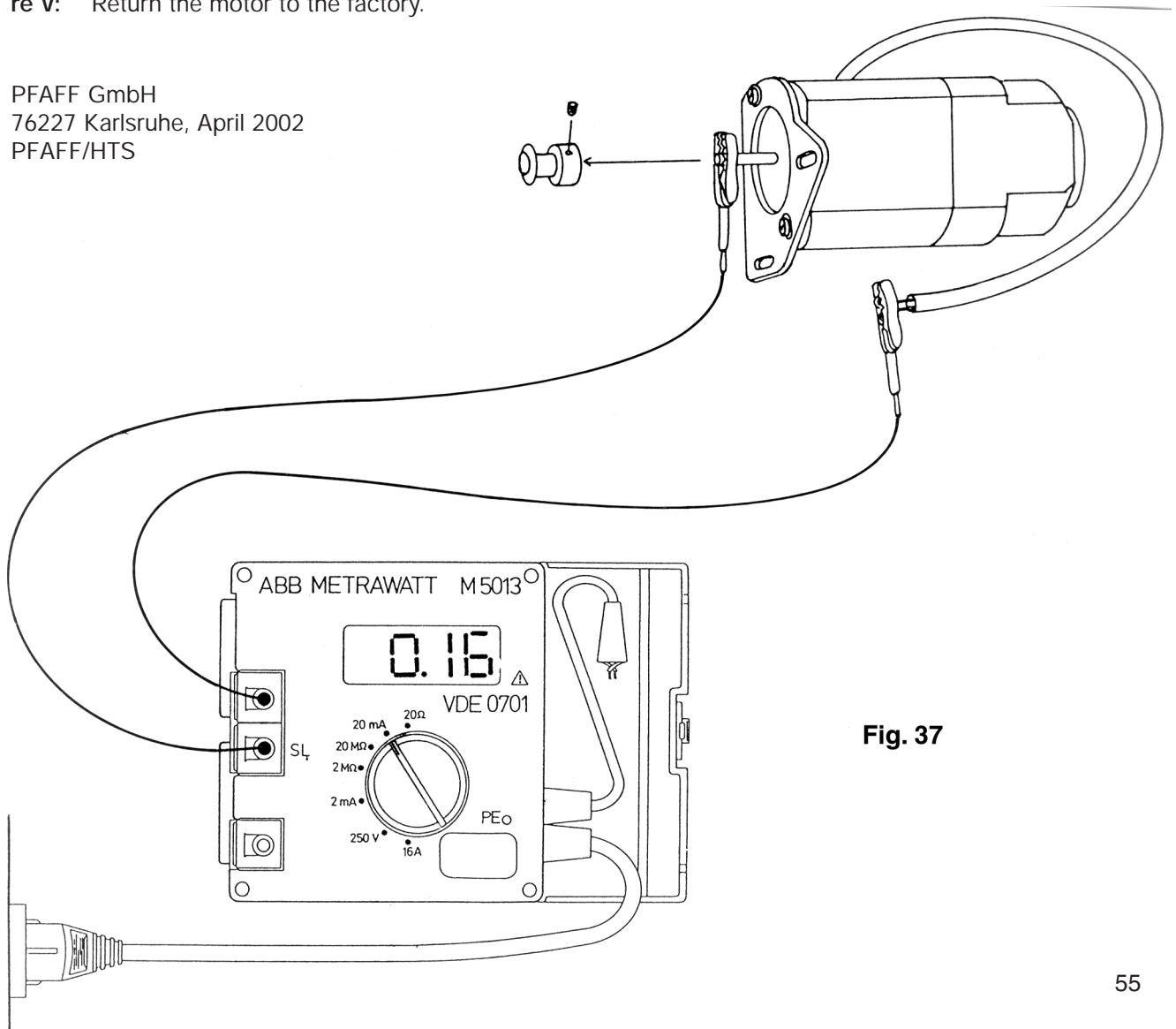


Fig. 37

Notes:

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