

Operation Manual

GARUDAN[®]

GF-137-443 MH/L38

GF-137-448 MH/L38

GF-237-443 MH/L38

GF-237-448 MH/L38



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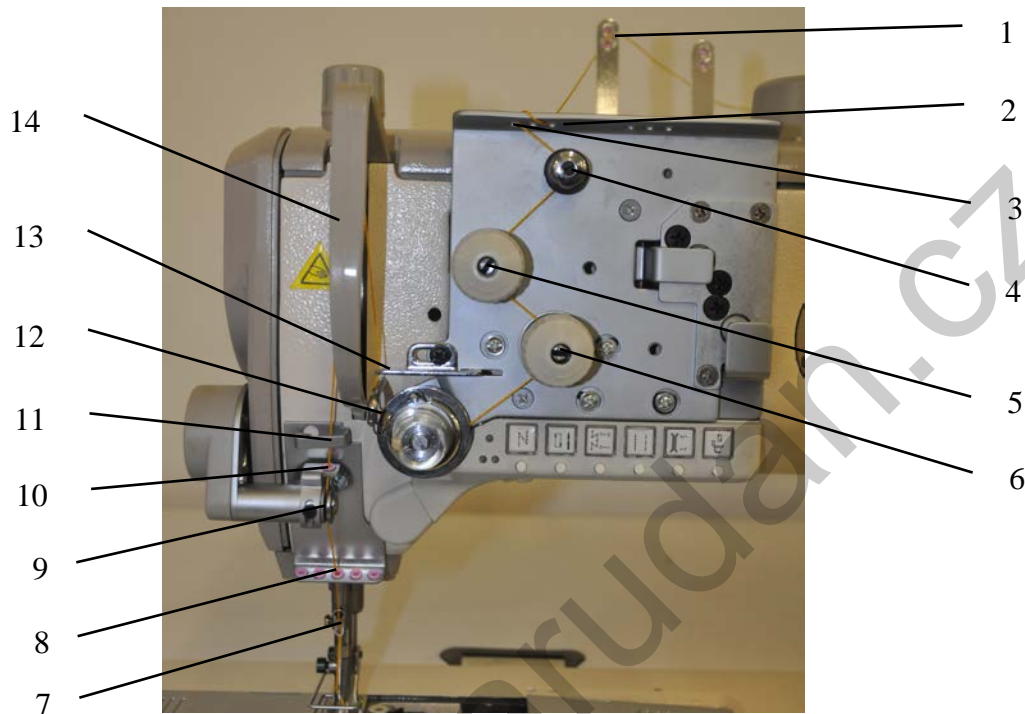
1) SPECIFICATION

Model	GF-137-443 MH/L38	GF-137-448 MH/L38	GF-237-443 MH/L38	GF-237-448 MH/L38
Usage	Medium and heavy weight materials			
Systém mazání	Automatic			
No. of needles	1	1	2	2
Thread trimming	Ne	Ano	Ne	Ano
Hook	Large diameter, vertical (bobbin diameter 32mm)			
Maximum speed	Stitch Length	Presser foot lift (mm)	Stitches/minute.	
	0-6	1	3500	
		2	3200	
		3	3000	
		4	2800	
7-12	1-9	1500		
Maximum stitch length (mm)	12			
Needle bar stroke (mm)	40			
Presser foot lift (mm)	20			
System of automatic trimming	---	Pneumatic cylinder	---	Pneumatic cylinder
Needle	DP×17#21 (#18~#23) 134-17 (Nm80~160)			
Sewing space (mm)	380 x 130			
Motor	Servo(600W) Clutch motor	Servo (750W)	Servo (600W) Clutch motor	Servo (750W)
Automatic thread trimming	---	Standard specification	---	Standard specification
Backtacking lever	Standard specification			
Automatic backtacking	---	Standard specification	---	Standard specification
Automatic presser foot lift	---	Standard specification	---	Standard specification

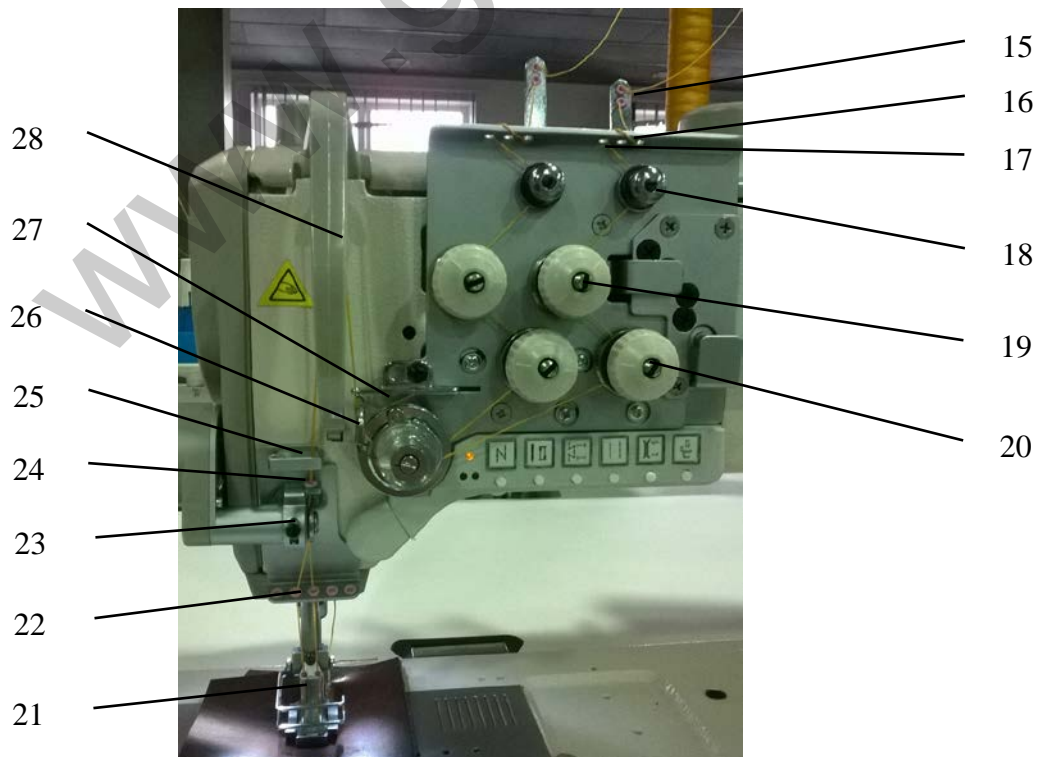
2) THREADING OF UPPER THREAD

2.1 Threading scheme

Single needle machine



Double needle machine



2.2 Threading of upper thread

- Turn off the main switch! Threading may only be performed if the sewing machine is turned off.

Threading of single needle machines

- Insert the thread cones on the stand and lead the upper thread through the unwinder arm. The arm must be in vertical position above the thread reels.
- Lead the thread through guides 1,2 and 3.
- Conduct the thread clockwise around auxiliary tensioner 4.
- Conduct the thread counter-clockwise around additional tensioner 5.
- Conduct the thread clockwise around main tensioner 6.
- Lead the thread under spring 12 a pass through thread regulator 13 up to thread take-up lever 14.
- Pass the thread through take-up lever 14, thread guides 11,10, thread holder 9 and thread guides 8 and 7.
- Insert the thread into the needle eye

Threading of double needle machines

- Insert the thread cones on the stand and lead the upper thread through the unwinder arm. The arm must be in vertical position above the thread reels.

Left needle thread (the same as for single needle machines)

- Insert the thread cones on the stand and lead the upper thread through the unwinder arm. The arm must be in vertical position above the thread reels.
- Lead the thread through guides 1,2 and 3.
- Conduct the thread clockwise around auxiliary tensioner 4.
- Conduct the thread counter-clockwise around additional tensioner 5.
- Conduct the thread clockwise around main tensioner 6.
- Lead the thread under spring 12 a pass through thread regulator 13 up to thread take-up lever 14.
- Pass the thread through take-up lever 14, thread guides 11,10, thread holder 9 and thread guides 8 and 7.
- Insert the thread into the needle eye

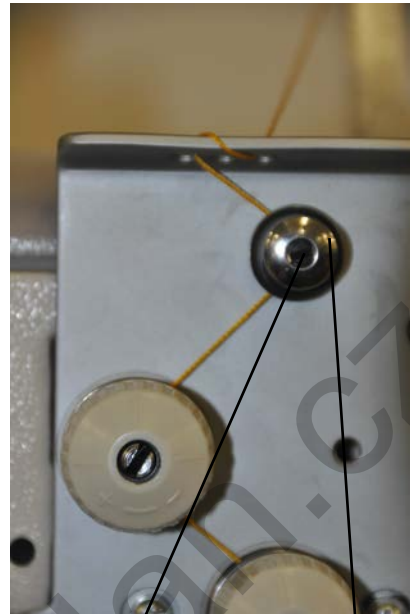
Right needle thread

- Lead the thread through guides 15,16 and 17.
- Conduct the thread clockwise around auxiliary tensioner 18.
- Conduct the thread counter-clockwise around additional tensioner 19.
- Conduct the thread clockwise around main tensioner 20.
- Lead the thread under spring 26 and pass through thread regulator 27 up to thread take-up lever 28.
- Pass the thread through take-up lever 28, thread guides 25,24, thread holder 23 and thread guides 22 and 21. Then insert the thread into the needle eye.

3) SETTING UPPER THREAD TENSION



3 2 1



5 4

	A	Correct stitch composition in the middle of the sewn material
	B	Too low tension of upper thread or Too high tension of lower thread
	C	Too high tension of upper thread or Too low tension of lower thread

Auxiliary thread tensioner

If main tensioner 2 and additional tensioner 3 are open, still, small amount of sub-tension is needed. This sub-tension is regulated by auxiliary tensioner 1. This tensioner, at the same time, controls length of the thread ends after trimming (thread ends for next stitch).

- Basic setting:
Turn the plate 4, until its front side is in level with the pin 5.
- Short threads ends for start of sewing:
Turn the plate 4 clockwise.
- Longer threads ends for start of sewing:
Turn the plate 4 counter-clockwise.

Main tensioner

It is necessary to set minimum tension on main tensioner 2. Crossing of threads should occur in the middle of the sewn material.

Too high thread tension can cause unwanted deformation of thin materials or thread breakage.

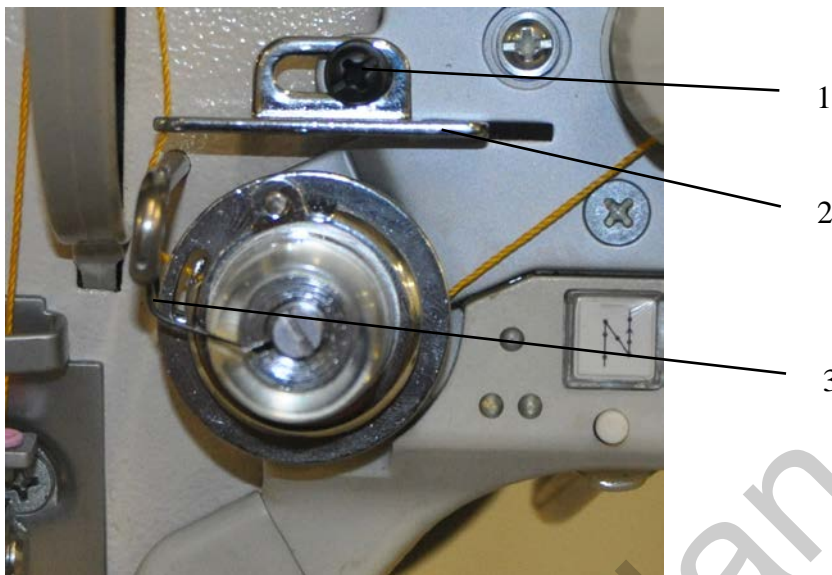
- Set the main tensioner 2 in order to reach constant stitch composition.
To increase the tension – turn the wheel clockwise
To lower the tension – turn the wheel counter-clockwise

Additional tensioner

Additional tensioner 3 is used for quick change of upper thread tension, for example in heightened points of seams.

- Set additional tensioner 3 lower than main tensioner 2.

4) SETTING THREAD REGULATOR



Turn off main switch. The thread regulator may only be adjusted with the sewing machine switched off.

The thread regulator controls the quantity of thread required for stitch formation. The thread regulator must be precisely adjusted for an optimum result.

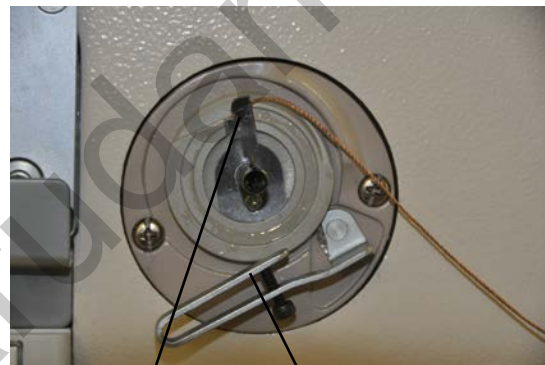
With correct setting the needle-thread loop must slide with low tension over the thickest point of the hook.

- Loosen screw 1.
- Adjust position of the thread regulator 2.
 - Thread regulator to the left = more thread
 - Thread regulator to the right = less thread
- Tighten screw 1.

Adjustment information:

If the maximum quantity of thread is required, the thread-tensioning spring 3 must be pulled upwards about 0,5mm from its lower limit position. This is the case, when the needle-thread loop passes the maximum hook diameter.

5) WINDING OF HOOK THREAD



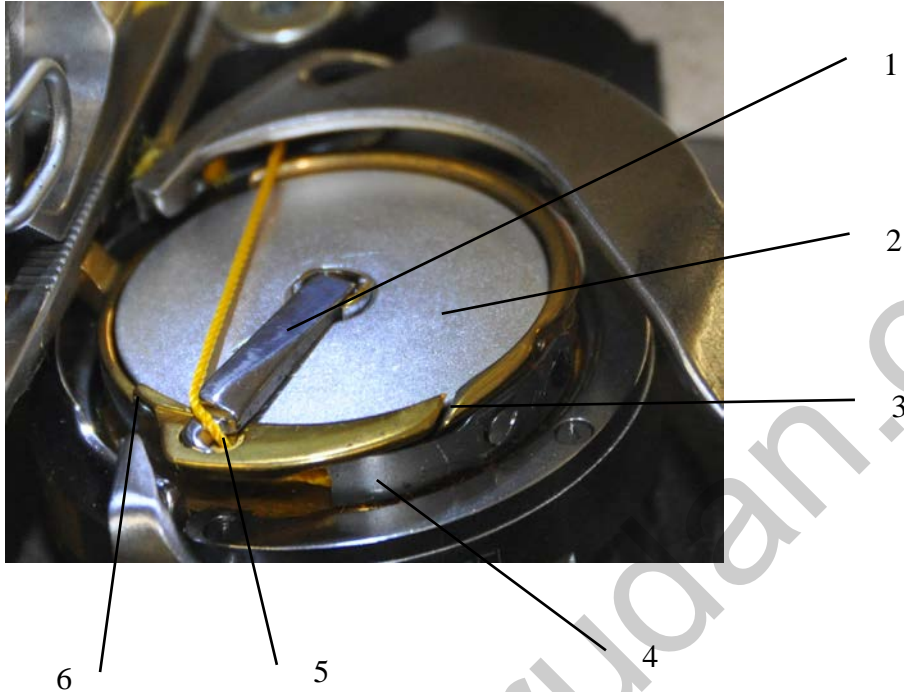
- Put the thread cone on the thread stand and conduct the thread through the unwinder arm.
- Pass the thread through thread guide 1 and tensioner 2.
- Pull the thread beginning behind the tear-off knife 3 and tear it off.
- Insert the empty bobbin on the winder.
- Press the winder lever 4 against the bobbin.
- Start sewing.

Winder level will stop the process of winding when the bobbin is full.

The winder always stops when the knife 3 is in the upper position like indicated on the right picture.

- Take out the full bobbin, pull the thread behind the knife 3 and tear off.
- Insert new empty bobbin and press the winder lever 4 against the bobbin.
- If the thread is not supposed to be wound, it is necessary to fix the presser foot in the upper position and adjust the presser foot lift for the minimum value, otherwise breakage can occur.

6) EXCHANGE OF HOOK THREAD BOBBIN



Turn off the main switch. Hook thread bobbin may only be replaced if the machine is turned off.

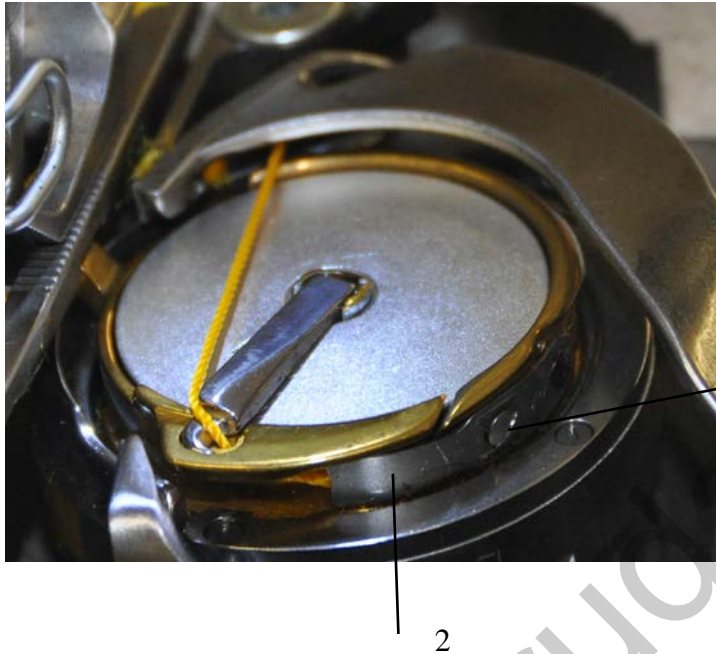
Taking out the empty bobbin

- Raise the flap 1 and take out the empty bobbin.

Inserting the full bobbin

- Insert the bobbin 2 in a way that it moves in counter-clockwise direction against the hook when unwinding the thread.
- Conduct the lower thread through the slot 3 and pass it underneath the spring 4.
- Pull the thread through the slot 6 and continue pulling until it stands out about 3cm.
- Close the flap 1 and pull the thread through the flap guide 5.

7) SETTING HOOK THREAD TENSION

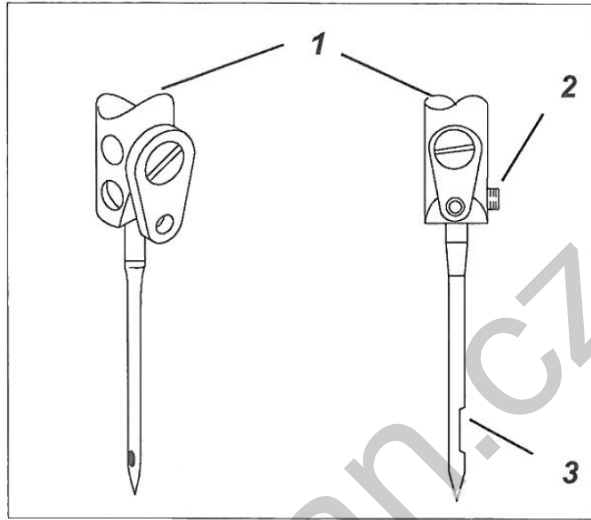


Turn off the main switch. Lower thread tension may only be adjusted only if the machine is switched off.

Adjustment of tension spring 2

- Set the tension spring 2 by the regulating screw 1.
Increase the tension = turn screw 1 clockwise
Decrease the tension = turn screw 1 counter-clockwise

8) CHANGING THE NEEDLE IN 1-NEEDLE MACHINES



2 1

Turn off the main switch. Needle may only be changed if the machine is switched off.

- Turn the handwheel until the needle bar reached its upper end position
- Loosen screw 2
- Take out needle from the needle bar 1.
- Insert the new needle properly into the needle bar hole, aligning it so that the needle groove 3 points to the hook.
- Tighten screw 2.

If needle with a different size is inserted, distance between hook and needle must be adjusted, otherwise following faults can occur:

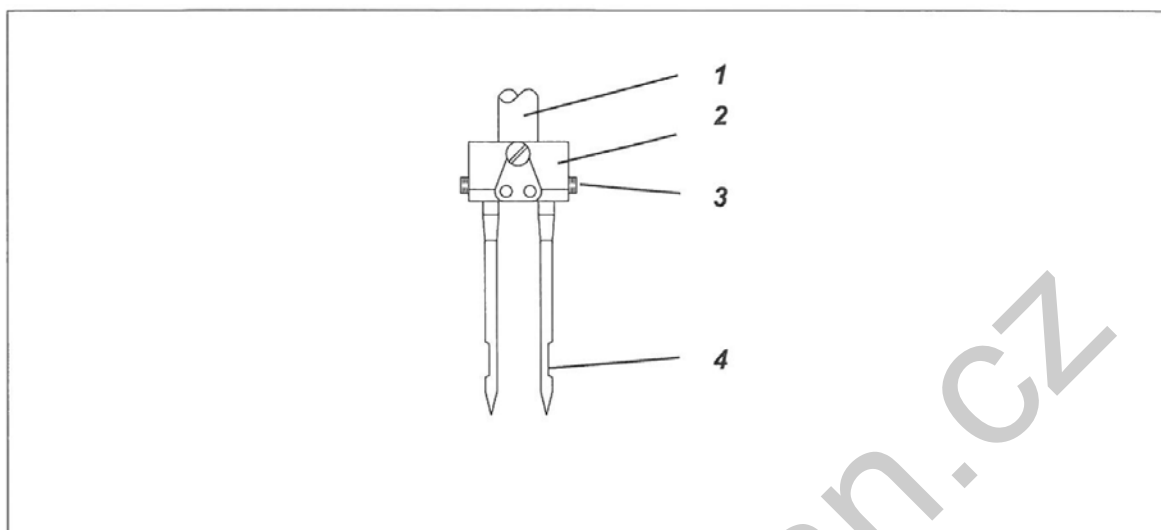
If thinner needle is used:

- Missing stitches
- Thread damage

If thicker needle is used:

- Damage of hook tip
- Damage of needle

9) CHANGING THE NEEDLE IN 2-NEEDLE MACHINES



Turn off the main switch. Needle may only be changed if the machine is switched off.

- Turn the handwhell until the needle bar 1 reached its upper end position
- Loosen screw 3
- Take out needle from the needle bar holder 2.
- Insert the new needle properly into the needle bar hole 2, aligning it so that from view of operator the right needle groove 4 points to the right and left needle groove to the left (see picture above).
- Tighten screw 3.

If needle with a different size is inserted, distance between hook and needle must be adjusted, otherwise following faults can occur:

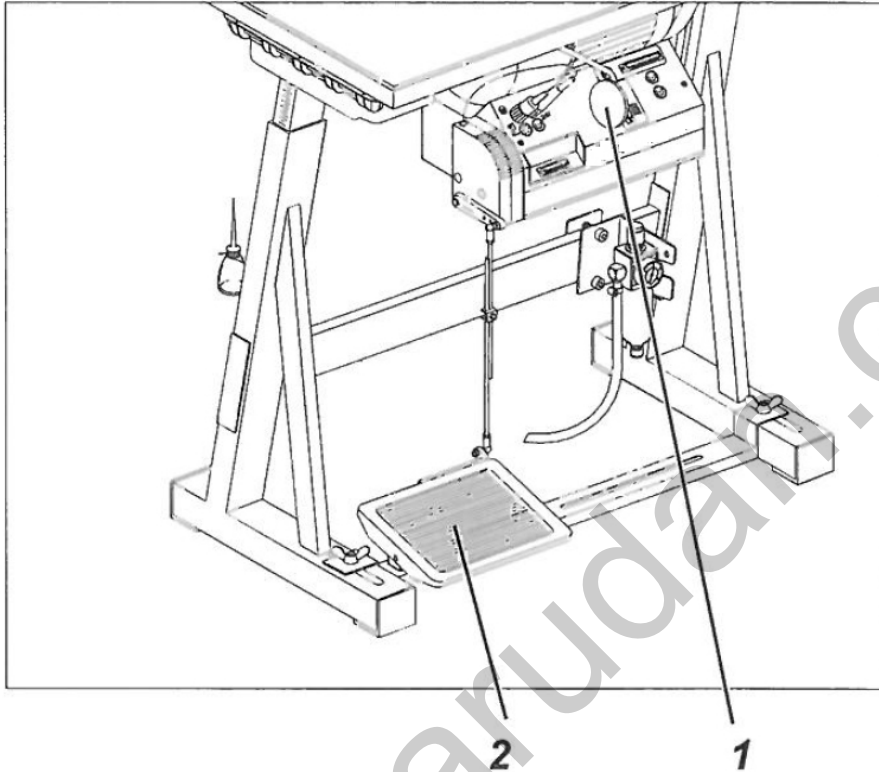
If thinner needle is used:

- Missing stitches
- Thread damage

If thicker needle is used:

- Damage of hook tip
- Damage of needles

10) LIFTING OF PRESSER FEET



Presser feet can be lifted electro-pneumatically by actuating the pedal 2 or by pressing knee lever 1.

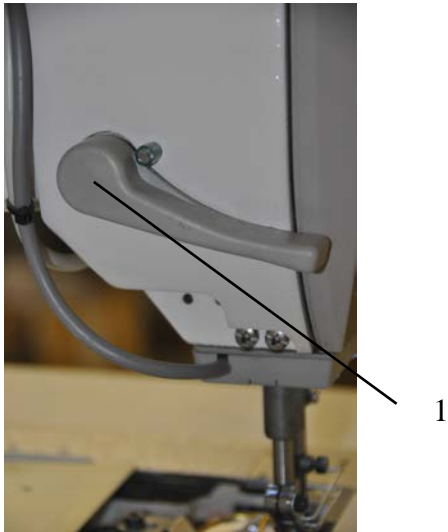
Mechanic lifting of presser feet (knee lever)

- In order to move material, correcting its position, press the knee lever to the right. Presser feet will remain lifted all the time when knee lever 1 is pressed.

Electropneumatic lifting of presser feet (pedal)

- Press the pedal 2 halfway back.
The presser feet will remain lifted with the machine at a halt.
- Press the pedal 2 all the way back.
The thread trimmer will be actuated and presser feet will be lifted.

11) LOCKING THE PRESSER FEET IN THE UPPER POSITION



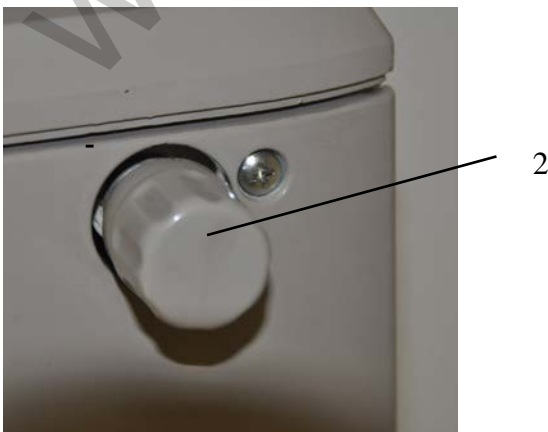
- Turn the lever 1 downwards. The presser feet are locked in their utmost upper position.
 - Turn the lever 1 upwards. The presser feet are released.
- Or
- Lift the presser feet pneumatically by the foot pedal or mechanically by the knee lever. The lever 1 will turn back to its initial position.

12) SETTING THE PRESSER FOOT PRESSURE

Required pressure of presser foot can be adjusted by the regulating knob 2.

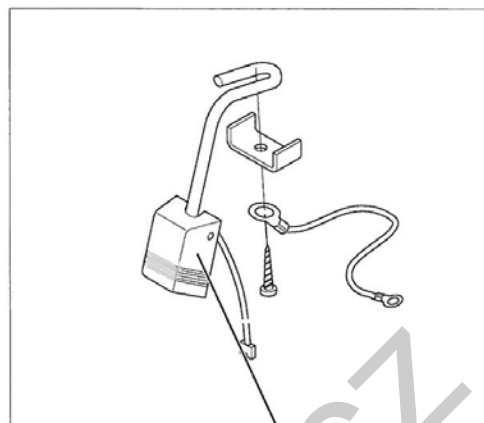
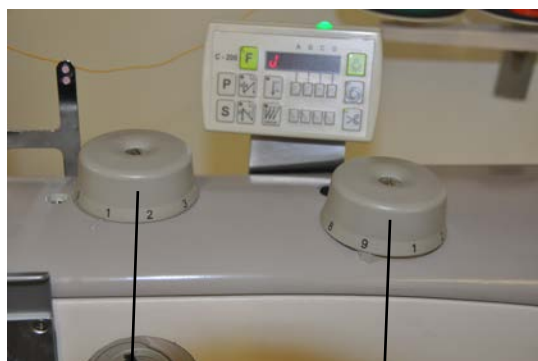
Note that the sewn material must not be loose.

At the same time, pressure must not be higher than required.



- Increase of pressure = turn the knob 2 clockwise
- Decrease of pressure = turn the knob 2 counterclockwise

13) SETTING THE PRESSER FOOT STROKE



2

1

3

Sewing machines GF-137/237-series are always equipped with 2 dials for setting the presser foot stroke.

Left dial 2 controls standard presser foot stroke in the range of 1 to 9mm.

Right dial 1 controls increased presser foot stroke in the range of 1 to 9mm.

- Turn the dials 1 and 2 (value 1-9)
 - 1 = minimum presser foot stroke
 - 9 = maximum presser foot stroke

Presser foot stroke and number of stitches are interdependent.

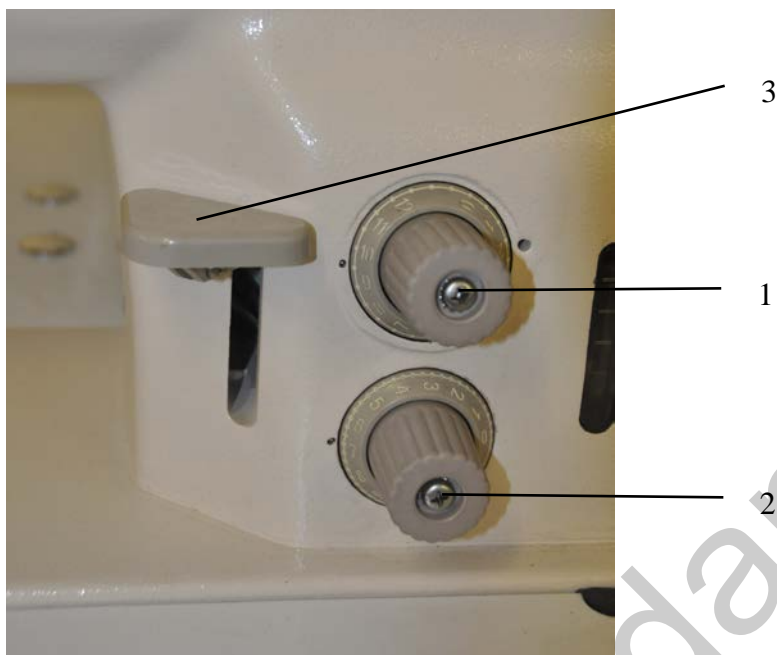
The potentiometer is mechanically connected with the dials and the control unit can thus recognize the set presser foot stroke, limiting the sewing speed (number of stitches) automatically.

The machine is equipped with the system of quick electropneumatic setting of presser foot stroke.

When cross seams or heightened/reinforced points of material are sewn, increased secondary presser foot stroke (dial 1) can be activated by pressing the knee lever 3.

Note – standard presser foot stroke set by the dial 2 must not have higher value than increased presser foot stroke set by dial 1.

14) SETTING THE STITCH LENGTH



Sewing machines GF-137/237-series are always equipped with 2 knobs for setting the stitch length. This enables operator to sew with 2 different lengths of stitch which can be activated via special key (see following chapter)

Stitch length can be set by knobs 1 and 2 on the machine arm.

- Upper knob 1 sets longer stitch length
Position 1 = minimum stitch length
Position 12 = maximum stitch length
- Lower knob 2 sets shorter stitch length
Position 1 = minimum stitch length
Position 12 = maximum stitch length

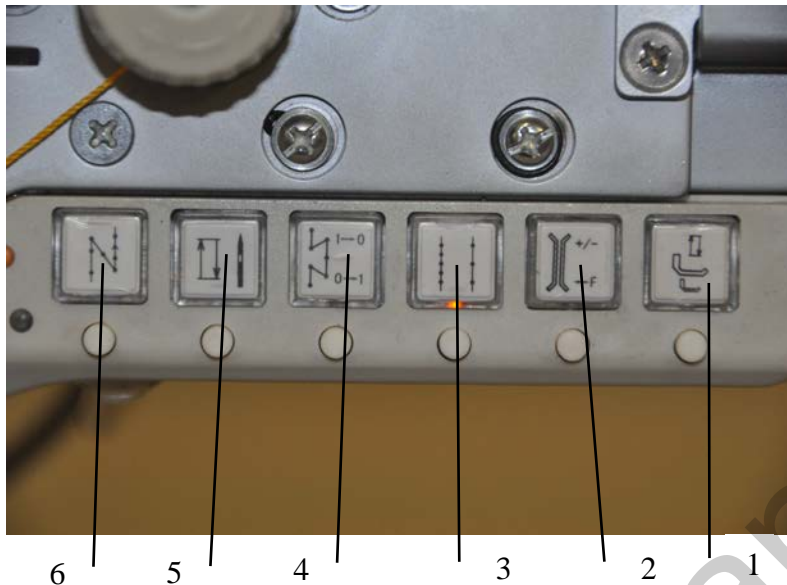
Stitch lengths for sewing forward and backwards are identical.

- For manual bartacking press the lever 3 downwards. Machine will start to sew backwards all the time when the lever 3 is pressed.

Note: For easy setting the knob 2 (see following chapter) should always set the initial stitch length which remains unchanged.

Note.: The stitch length set by lower knob 2 must not have higher value than the stitch length set by the upper knob 1.

15) KEY PANEL ON THE MACHINE ARM

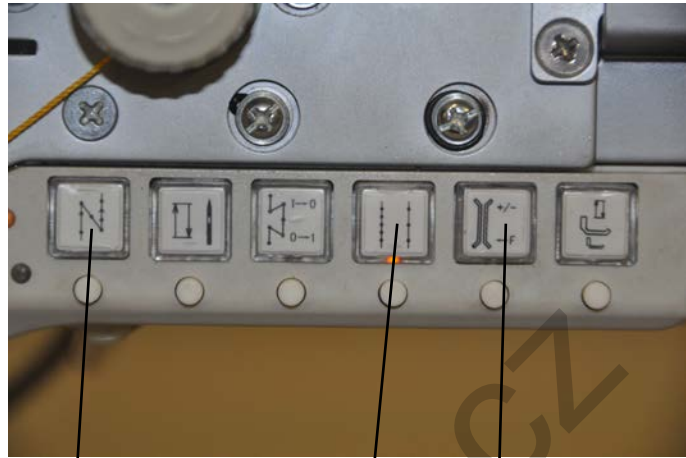


Key	Function
1	Quick presser foot stroke adjustment Light is on = maximum presser foot stroke Light is off = minimum presser foot stroke
2	Additional thread tension Light is on = additional thread tension is activated Light is off = additional thread tension is turned off
3	Second stitch length Light is on: Longer stitch length (upper knob) is activated Light is off: Shorter stitch length (lower knob) is activated
4	Activating or suppressing the initial or final bartack If the initial and final bartacks are switched on, by pressing the key the following bartack will be switched off. If the initial and final bartacks are switched off, by pressing the key the following bartack will be switched on.
5	Setting upper and lower position of needle. 1 = Needle in upper position 2 = Needle in upper/lower position 3 = Single stitch 4 = Single stitch with second stitch length/shorter stitch 5 = Needle in upper position, when outside position 2
6	Manual backwards sewing. The machine sews backwards as long as the key is pressed.

16) SEWING



4



3

2

1

Operation steps and sewing functions:

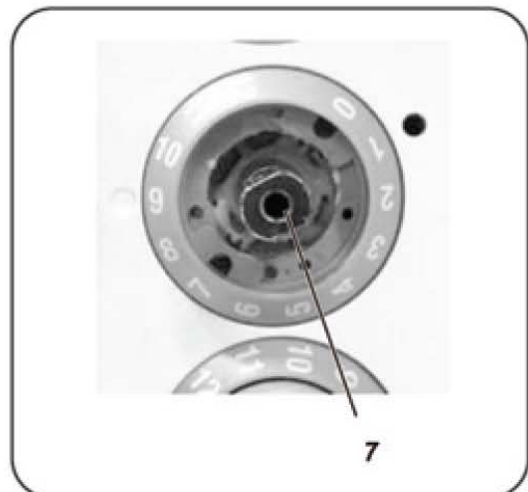
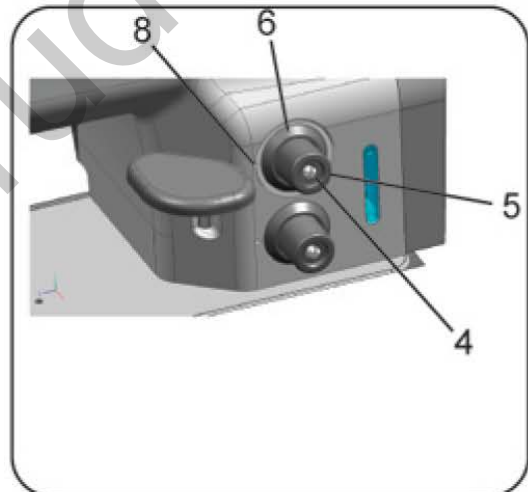
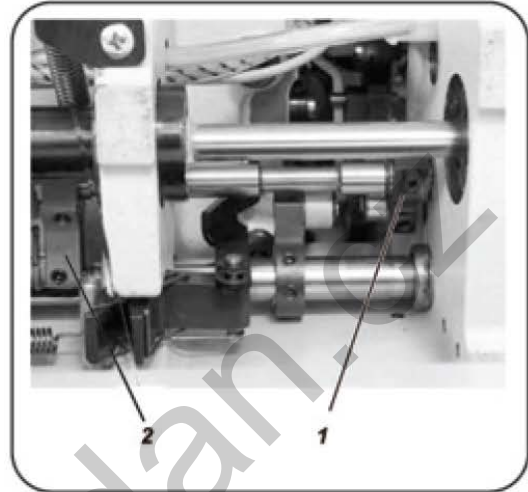
Sewing operation	Operation / Instructions
<p>Before start of sewing:</p> <p>Initial position</p> <p>Place the sewn material at the beginning of seam</p>	<p>Pedal at stop position Sewing machine at a halt Needle is up Presser feet are down</p> <p>Press the pedal halfway back Lift the presser feet Place the sewn material under the needles</p>
<p>Sewing</p>	<p>Press the pedal forward and keep it pressed. The machine continues to sew at speed controlled by the pedal.</p>
<p>In the middle of the sewing:</p> <p>Stop sewing operation</p> <p>Continue sewing operation</p>	<p>Release the pedal (stop position) The machine stops in the 1st position (needle is down). Presser feet are down</p> <p>Press the pedal forward. The machine continues to sew at speed controlled by the pedal.</p>

<p>Sewing of backtack in the middle of sewing</p>	<p>Press the lever of the stitch regulator 4 downwards. The machine sews in backwards direction (backtack) as long as the stitch regulator lever is pressed. Required speed is controlled by the pedal.</p> <p>Or</p> <p>Press the key 3.</p>
<p>Sewing over cross seam. (Maximum presser foot stroke)</p>	<p>Maximum presser foot stroke is activated. Speed is limited to 1500 spm</p> <p>Operation modes of maximum presser foot stroke:</p> <p>Press the knee switch to activate the maximum presser foot stroke</p> <p>Press the knee switch again to deactivate maximum presser foot stroke</p>
<p>Sewing with 2nd stitch length during sewing (maximum stitch length)</p>	<p>Press key 2</p>
<p>Increase of thread tension during sewing</p>	<p>Press key 1</p>
<p>At the end of sewing: Take out the sewn material</p>	<p>Press the pedal all the way backwards and keep is pressed.</p> <p>End bartack will be sewn (if activated). Thread will be trimmed. The machine will stop in the 2nd position. Needle is up. Presser feet are up.</p> <p>Take out the sewn material</p>

17) ADJUSTMENT OF FEEDING

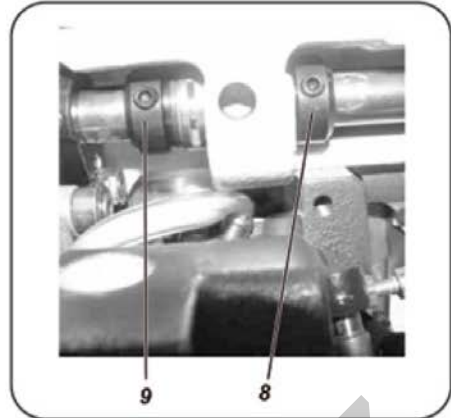
17.1 Feed position

- Turn the handwheel (5) and make the number "0" on the dial (6) to aim at the mark (8). At this time the feed system is in the state of stillness. In case of error, it is possible to make following adjustments:
 - Loosen the screw (1,4). Take off the hand knob (5). Turn the top pole to the bottom with tools.
 - Adjust the angle of the feed transfer to reach the stillness.



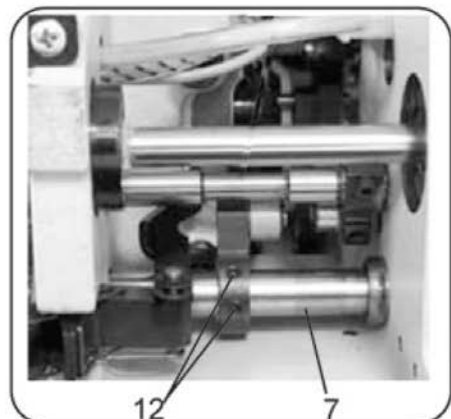
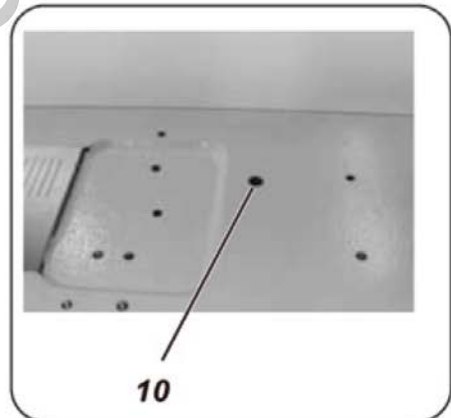
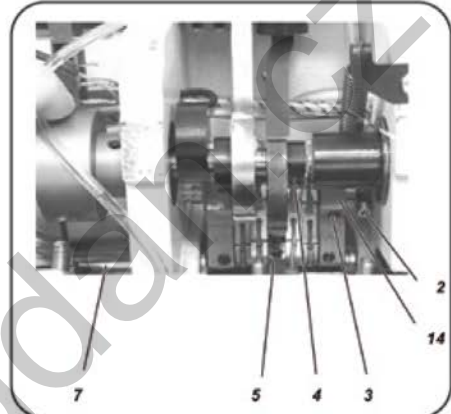
Note: Before finishing the above movement, first turn the hand knob (3) to make the number "0" on the dial aim at the mark (10) and assure the screw (11) is fastened on the plane of shaft (12)

17.2 Setting position of feed dog



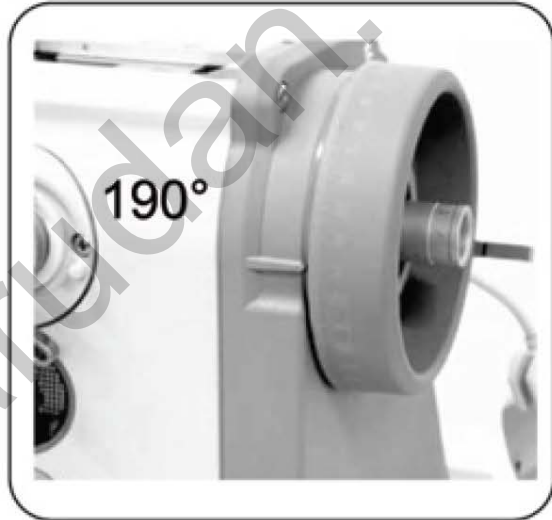
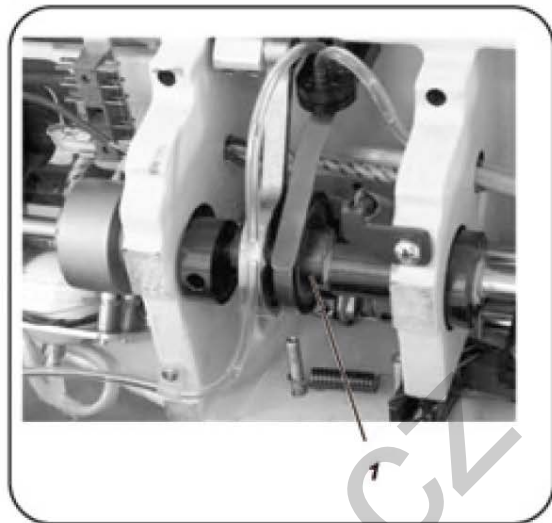
Adjust the position of feed dog in the needle plate groove

- Loosen the screws (5),(8),(9),(12), move the shaft of feed left and right to keep the feed dog in the centre of needle plate groove (add the picture of needle plate and the feed dog), then tighten the screw (8),(9),(12).
- Adjust the position of feed transfer (14) to the feed shaft (7), loosen screw (2),(3),(4),(5),(10) to keep feed transfer locate in the center of feed shaft (7) groove, then tighten the screws (2),(4),(5),(10)

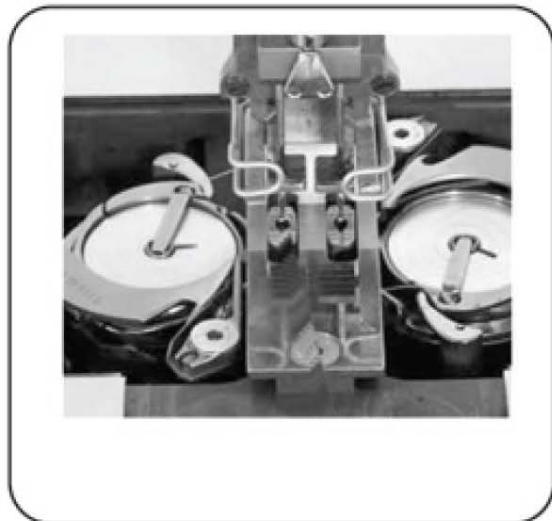


17.3 Adjustment of feed

- Turn the hand wheel to 190°, press the hand knob of bartacking, no movement of feed shaft. If it moves, loosen the screw (1), change the angles till no movement, then tighten screw (1)

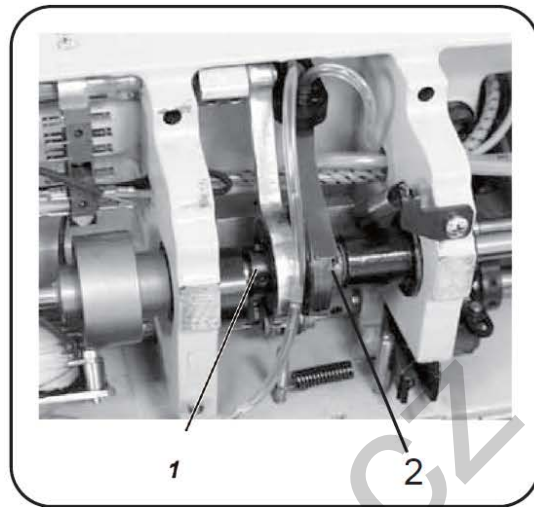


- Adjust position of feed in the needle plate, keep the front and back clearance between the feed and plate.

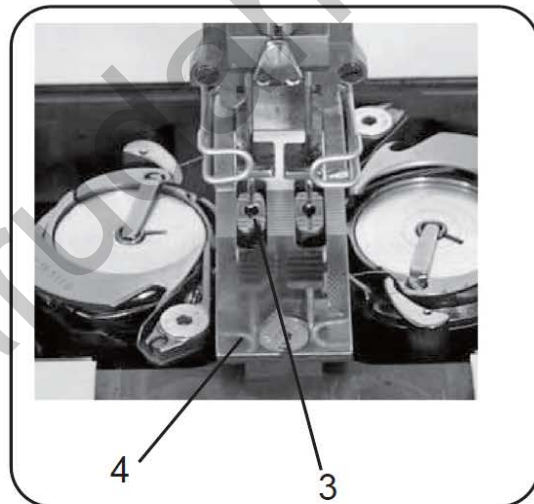


17.4 Adjustment of feed dog

- Adjust upper and lower position of feed dog, loosen screw (1), to be in the line with the pin (2), then tighten screw (1).

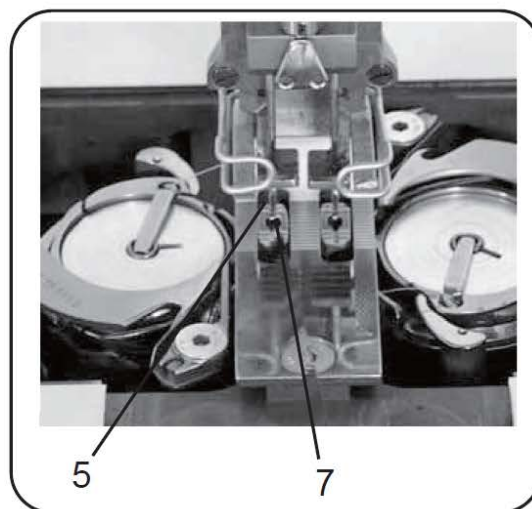
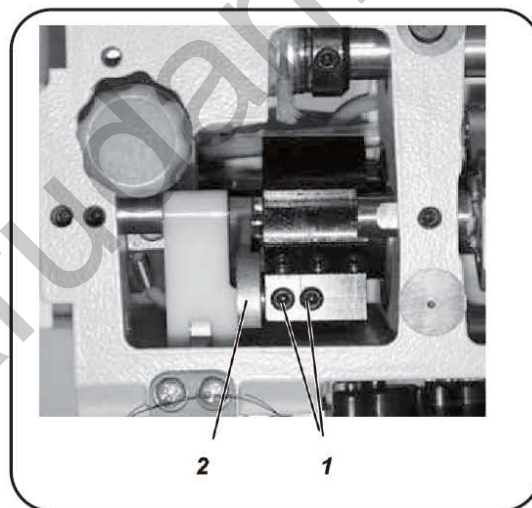
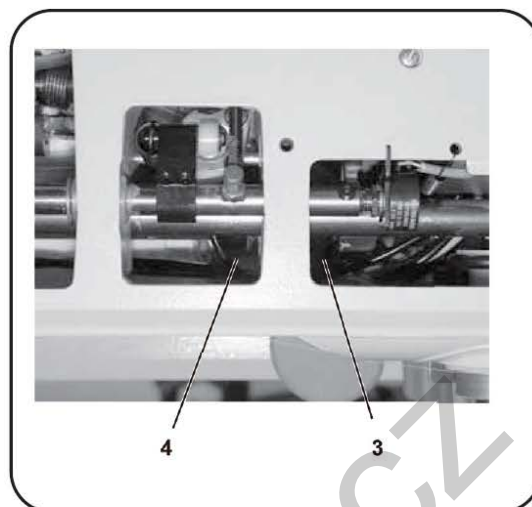


- Adjustment of feed dog (3) height against the needle plate (4). Turn the main shaft to 190°, loosen the screw (1), adjust the feed dog (3) to be 0,5mm higher than the needle plate (4),tighten the screw (1).



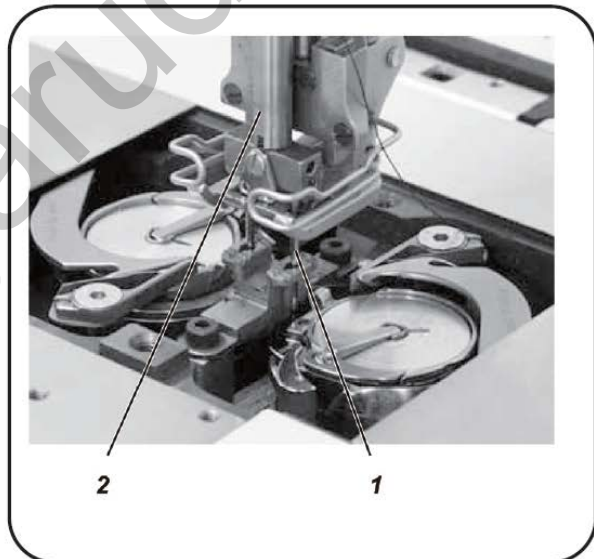
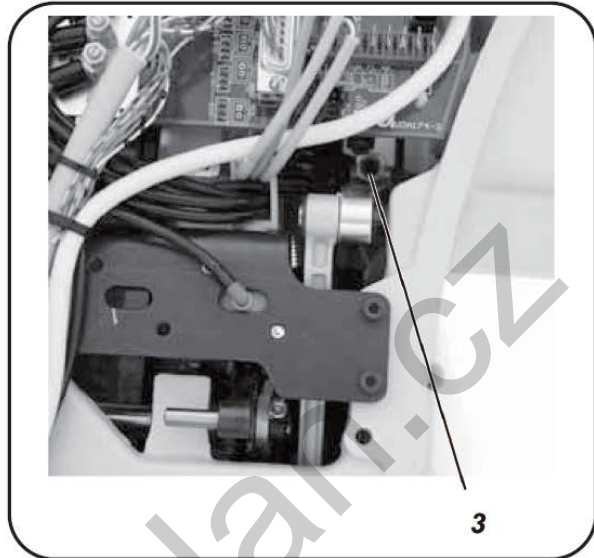
17.5 Position between needle and feed dog

- Loosen the screws (3) and (4) to make the needle aim at the centre of feed dog. Then tighten the screws (3) and (4).
- Loosen the screw (1) to keep the crank rod in the proper position, then tighten the screw (1).



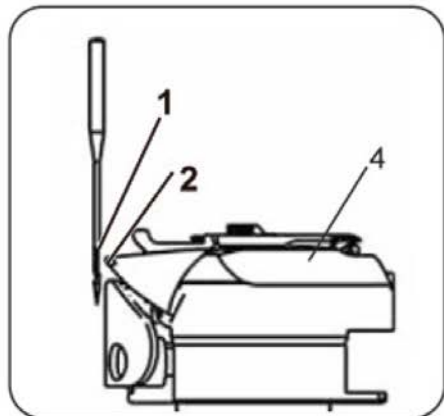
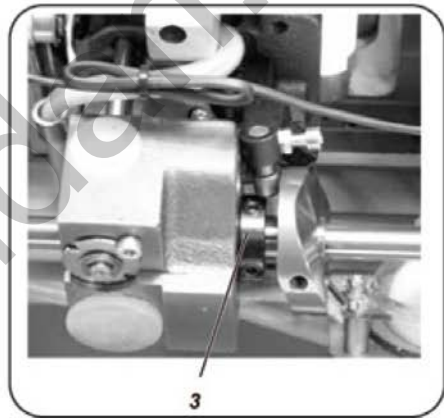
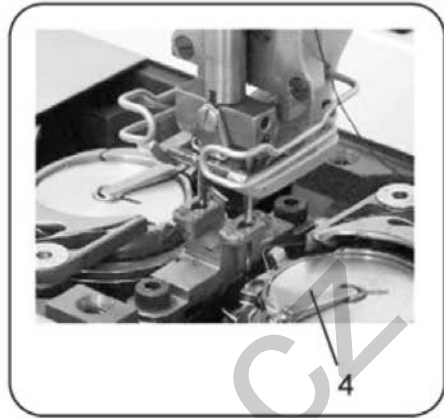
17.6 Front and back position of needle

- For correction of front/back position of needle loosen the screw (3) and move the needle bar (2) to keep the needle in the center of feed dog, then tighten the screw (3).



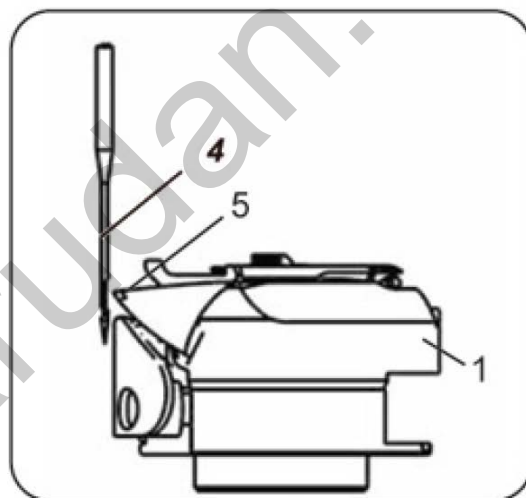
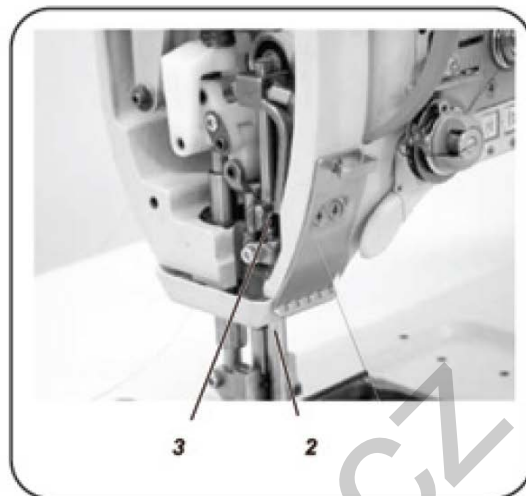
17.7 Adjustment of the looper time

- Set the stroke of the feed dog to "0" on the dial
- Move the handwheel to 203°
- Turn the large hook (4) to have its top part in the center of needle, then tighten the screw (3).



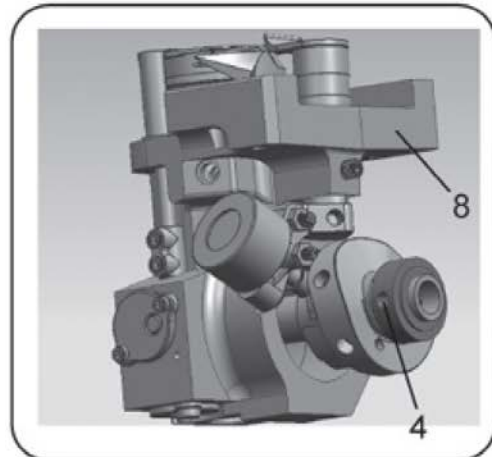
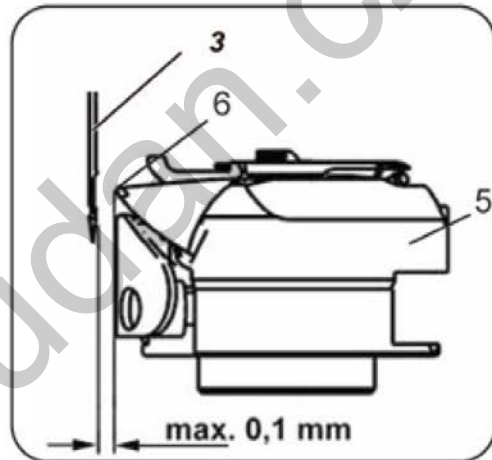
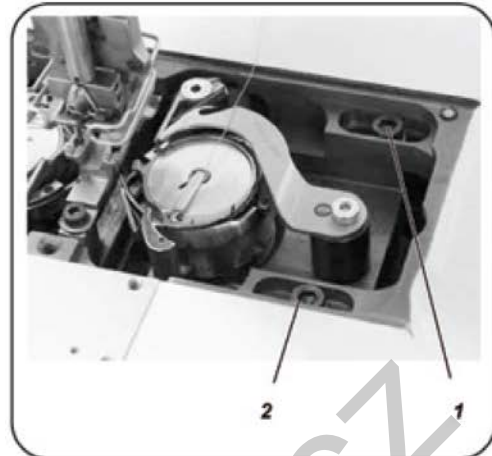
17.8 Needle position

- Loosen the screw (3) and move the needle bar (2) to keep the space between the top side of needle (4) hole and the tip of the hook at 1,5-2mm.



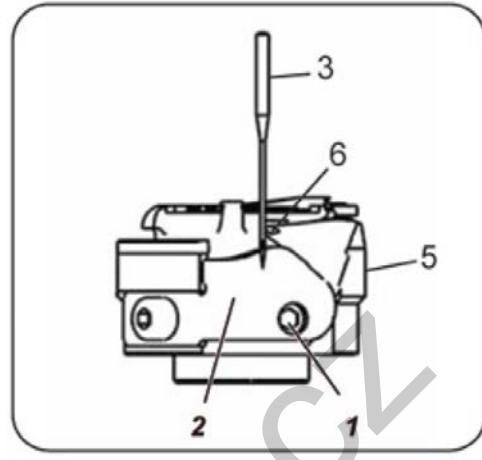
17.9 Position between needle and hook

- Loosen screws (1),(2) and (4) and move the hook frame (8) to keep the distance between the tip of the hook (5) and the flat of needle concave at 0,05-0,1mm, then tighten the screws(1),(2) and (4).
- Note: Before tightening the screw (4) make sure the hand wheel is at 203 degree and the tip of the hook is against the center of the needle.



18) SETTING OF NEEDLE GUARD

- Make sure that there is clearance between needle guard and needle(3), then adjust the gap between the needle concave (3) and the tip (6) of the hook (5) to be at 0,05-0,1mm. Make the needle guard approach the needle through the screw (1).

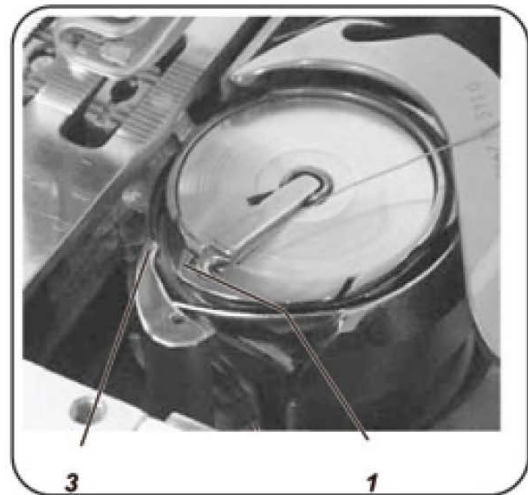
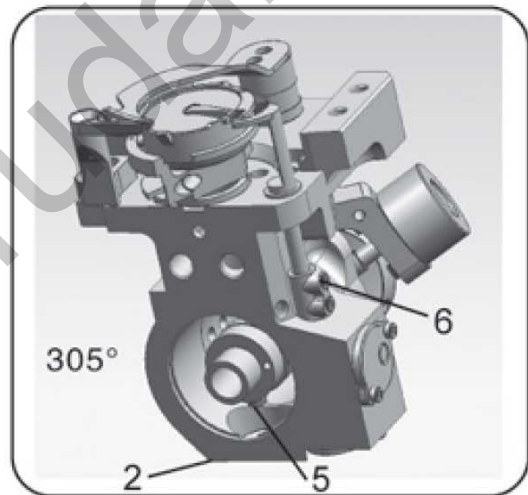
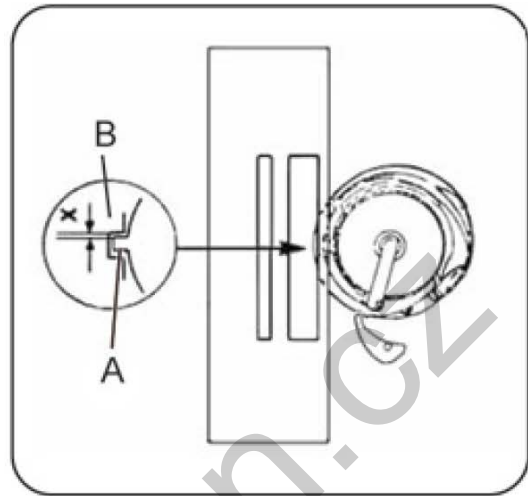


19) SETTING OF INNER HOOK

- The efficiency of the unsealing inner hook (1) can supply a smooth wire tunnel, otherwise it can cause noise and thread breakage.

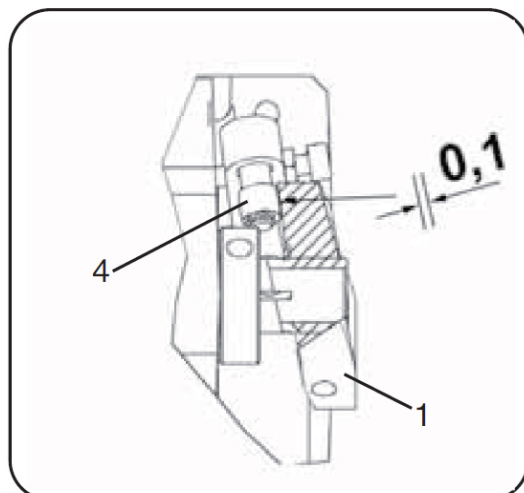
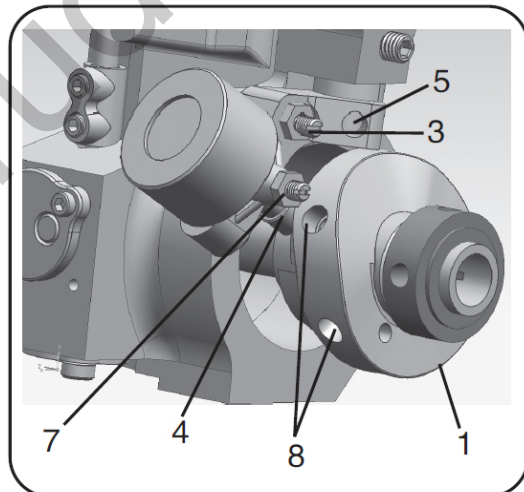
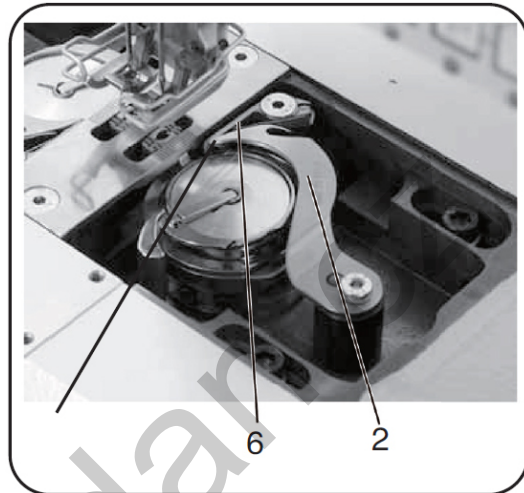


- Turn the hand wheel to 305 degree, tighten the screw (5) with wrench (4) plumbing the bottom side (2).
- Loosen the screw (6), turn the unsealing in the inner hook to the proper position, check position: when the main shaft is in 280 degree, the clearance between the hook "A" and hook "B" is enough for the thread dimension to go through. When it comes to 330 degree, the space between unsealing inner hook (3) and bulge (1) is enough for thread to go through.



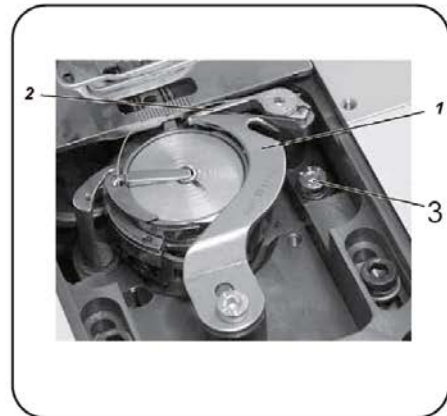
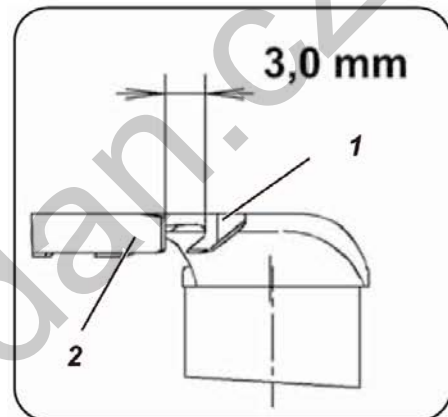
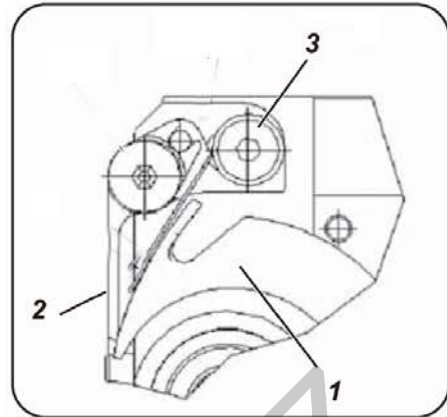
20) ADJUSTMENT OF TRIMMING

- Set the hand wheel to 65 degree, the cam drives the movable knife to the end position. Tighten the screw (8).
Loosen the screw (3) and adjust the clearance between cam and shaft at 0,1 mm.
Loosen screw (7) and adjust position of shaft (4) to flew freely, but it cant flex when its sewing normally.



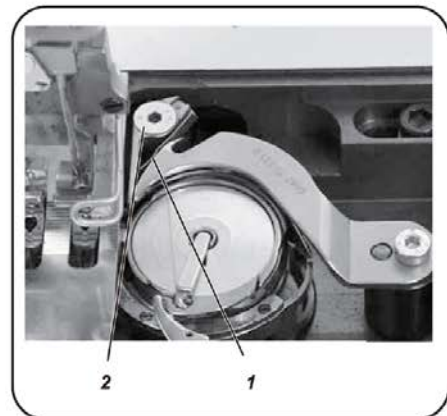
21) ADJUSTMENT OF KNIFE POSITION

- For adjustment of knife position loosen the screw (3), keep movable knife (1) and fixed knife (2) combine tightly at the distance of 3 mm, then tighten screw (3).



22) SETTING TENSION OF GRIPPING SPRING

- Loosen screw (2) and move the gripping spring (1) and make it combine with movable knife tightly to achieve the best gripping tension.



23) MAINTENANCE

Cleaning work

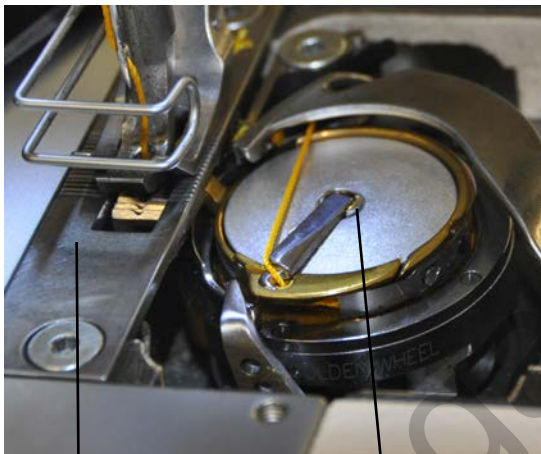
Turn off the main switch. Cleaning can only be carried out if the machine is turned off.

The maintenance work must be carried out in accordance with the intervals defined in charts (see column operation period).

When using materials which produce a lot of sewing dust, it is possible to use even shorter periods of maintenance.

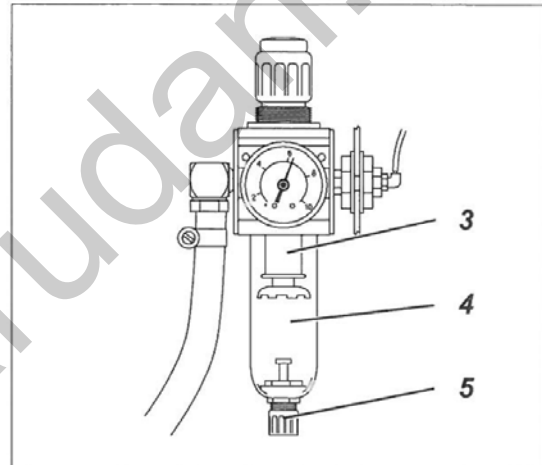
Clean machine protects the machine from damage and technical problems.

Always turn off the main switch before leaning the machine head!



2

1



3

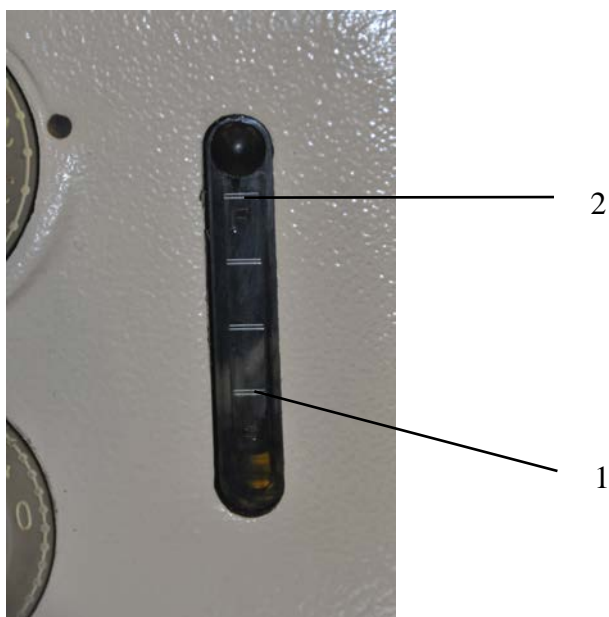
4

5

Maintenance work	Description	Operation period
<p>Machine head</p> <p>Remove sewing dust and thread remains (e.g. by compressed air gun)</p>	<p>Areas which need special attention:</p> <ul style="list-style-type: none"> - Lower part of needle plate (2) - Area around the hook (1) - Bobbin case - Thread trimming mechanism - Area around needle <p>Attention: Hold the air gun the way the sewing dust does not fall into the oil tank.</p>	8

<p>Servomotor</p> <p>Clean the motor fan sieve (e.g. by compressed air gun)</p>	<p>Remove sewing dust and thread remains from the openings.</p>	<p>8</p>
<p>Driving unit</p> <p>Clean the motor fan sieve (e.g. by compressed air gun)</p> <p>Check the tension of V-belt</p>	<p>Remove sewing dust and thread remains from the openings.</p> <p>If pressed by finger in the middle, the V-belt must bend down by approximately 10mm.</p>	<p>8</p> <p>160</p>
<p>Pneumatic system</p> <p>Check level of water in the pressure regulator.</p> <p>Clean filter insert.</p> <p>Check if the system is well sealed.</p>	<p>Level of water must not rise as far as the level of filter 3. Drain water by turning the screw 5 under pressure from water separator 4.</p> <p>Filter insert 3 separates dirt from condensed water.</p> <ul style="list-style-type: none"> - Turn off supply of compressed air. - Screw out the screw 5. <p>Pneumatic system of machine must be without pressure.</p> <ul style="list-style-type: none"> - Screw out water separator 4. - Screw out filter insert 3. Flush dirty filter case and filter insert with gasoline (not by solvent) and dry. - Assemble the unit again. 	<p>40</p> <p>500</p> <p>500</p>

24) LUBRICATION BY OIL



For lubrication of the machine use only oil recommended by manufacturer/supplier or oil with the following specification:

- Viscosity at 40°C = 10mm/s
- Flash point = 150°C

Maintenance work	Description	Operation period
Lubrication of head	<p>Machine head is equipped with wick feed oil central lubrication system. Bearings are lubricated by oil from the oil tank.</p> <p>Level of oil must be maintained above the mark of minimum oil level 1 on the oil tank.</p> <p>Fill the oil to the tank up to the mark of maximum oil level 2.</p>	8

Attention: danger of injury!

Oil can cause skin rashes.

Try to avoid contact with skin. After contact of oil with skin, rinse the affected place properly.

Manipulation and disposal of mineral oils is subjected to valid legislation. Used oil should be handed over to authorized waste center. Be careful not to spill the oil.

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