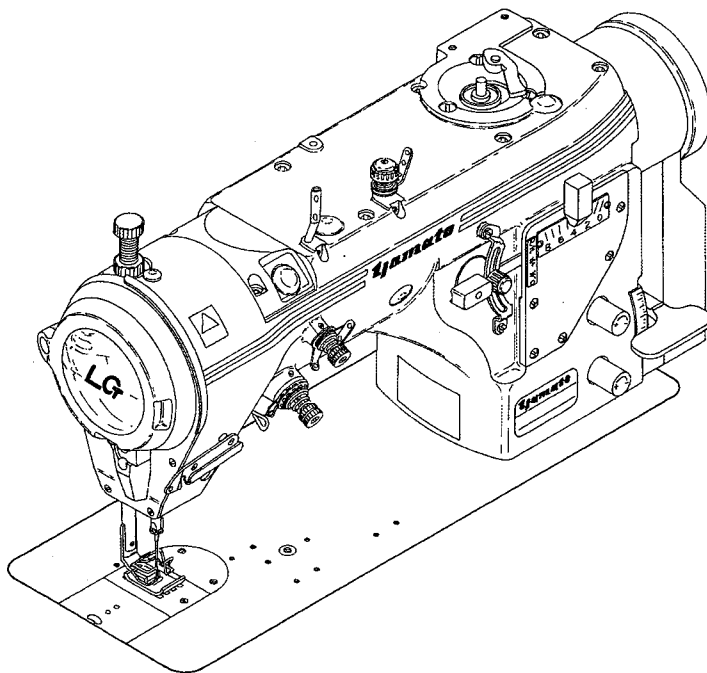


Yamato[®]

Instruction Manual

HIGH SPEED ZIGZAG LOCKSTITCH MACHINE

LG2000 CLASS



Before using the machine, please read this instruction manual thoroughly and understand the contents well.

After reading this instruction manual, please keep it in a location where it is easy to access for operators.






















YAMATO SEWING MACHINE MFG. CO., LTD.

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This instruction manual is mainly for technicians. However, the  marks are attached to the section titles that also operators should read to operate the machine properly.



Safety instructions



1. To ensure safe use

Always observe the following instructions to ensure the safe use of the industrial sewing machines and devices.

1-1 Application and purpose

The sewing machine is designed to improve productivity in the sewing industry and must not be used for other applications and purposes. Do not use this sewing machine until it can be confirmed that safety measures for the drive units have been taken.

1-2 Before use

Read all instruction manuals thoroughly before starting the use of this machine and follow them.

Also, read the instruction manual for the installed drive unit.

1-3 Working environment

DO NOT WORK IN THE FOLLOWING ENVIRONMENTS:

- Place where atmosphere temperature and humidity give a bad influence the performance of sewing machines.
- Outdoors and place where the sewing machines are exposed to sunlight directly.
- Atmosphere containing dust, corrosive gases or flammable gases.
- Place where voltage fluctuation exceeds $\pm 10\%$ of the rated voltage.
- Place where power capacity necessary for the used motor specifications cannot be secured.
- Place where strong electric or magnetic fields are generated such as near large-output high frequency transmitters or high frequency welding machines.

1-4 Unpacking and transportation

- (1) Unpack from the top.
- (2) Never hold the parts near the needle or threading parts when removing the sewing machine head from the buffer of box.
- (3) When carrying the sewing machine head, have an assistant.
- (4) Pay attention not to get excessive impact or shock when moving the sewing machine head with a pushcart.

2. Installation and preparation

2-1 Instruction and training

Operators and workers, who supervise, repair or maintain the machine head and machine unit, are required to have the adequate knowledge and operation skills to do the job safely. In order to establish such necessary conditions, it needs for the employer to plan and enforce the safety education and training to those workers.

2-2 Sewing table and motor

- (1) Prepare a machine table that has enough strength to withstand the weight of the sewing head and any reaction while operating.
- (2) Maintain a comfortable working environment with considering the lighting and the arrangement of sewing machine so that the operators can work smoothly.
- (3) When installing the control box and the related parts on the sewing machine, take care about the posture of the worker.
- (4) Install the drive unit correctly according to the instruction manual.

2-3 Wiring

- (1) Never connect the plug for power supply until assembly is finished.
- (2) Fix the connectors securely to the sewing machine head, motor, and electric apparatus.
- (3) Do not apply excessive force to the connection cords.
- (4) Connect the cords away from the driving parts.
- (5) Place the ground wire securely to the designated position on the machine head.

2-4 Before operation

- (1) Take care not to attach lubricant, silicone oil, and grease on the eyes or skin. Keep them away from children.
- (2) Be sure to fill or drop lubrication oil before operating the sewing machine. Use the Yamato SF oil as specified.
- (3) Never put your hand under the needle or near the moving parts of the machine when turning on power supply switch.



Safety instructions



- (4) When operating a new sewing machine, make sure the rotating direction of pulley agrees with the rotating-direction mark.

2-5 During operation

- (1) Be sure to operate the sewing machine with the safeguards such as belt cover, finger guard, and eye guard.
- (2) Never place the finger, hair or objects under the needle or close to the moving parts while operating the sewing machine.
- (3) Be sure to turn off the power supply switch when threading or replacing the needles.
- (4) Never place your hands close to the knives when operating the sewing machine with the trimming devices.
- (5) Be sure to turn off the power supply switch when terminating the sewing work or leaving the sewing machine.
- (6) If the sewing machine malfunctions, abnormal sound or smell something unusual while operating, be sure to turn off the power supply switch.

2-6 Removal

- (1) Turn off the power supply switch if removed or replaced any parts or during adjustment of sewing machine.
- (2) Do not pull the cord when removing the plug. Be sure to hold the plug itself.
- (3) A high voltage is applied inside the control box. Turn off the power supply switch and wait more than 5 minutes before opening the cover.

3. Maintenance, inspection, and repair

- (1) Follow the instruction manuals for maintenance, inspection, and repair.
- (2) Entrust the maintenance, inspection, and repair to specially trained personnel.
- (3) Be sure to turn off the power supply switch and make sure the sewing machine and motor completely stop before the maintenance, inspection, and repair. (IF using a clutch motor, take care that the motor keeps turning for a while even after turning off the power supply switch.)
- (4) Do not modify the sewing machine by the customer's judgment.
- (5) Be sure to use original replacement parts for repairs or maintenance.

4. Caution signs and alert pictorial markings

This instruction manual contains the following caution signs and alert pictorial markings to prevent you from injuring yourself or the sewing machine from being damaged. Please follow the instructions.

4-1 Meanings of caution signs

WARNING indicates potentially hazardous situations which, if not heeded, could result in death or serious injury to you and others.

Caution indicates hazardous situations which, if not heeded, may result in minor or moderate injury to you and others, or may result in machine damage.

NOTE is used to emphasize essential information.



Safety instructions



4-2 Alert pictorial markings



This mark indicates the warning which, if not heeded, could result in death or Serious injury.



This mark indicates the caution for high temperature.



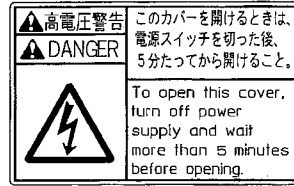
This mark indicates the warning which, if not heeded, could result in death or Serious injury.



High-voltage applies in the control box. This label indicates that electric shock may be caused.



This mark indicates the caution which, if not grounded, the machine or device could malfunction and could result in personal injury.



High-voltage applies in the control box. This label indicates that electric shock may be caused.



This label is affixed on the safeguards. Considering the operation, it is not affixed on the finger guard and eye guard. Be sure to operate with the finger guard and eye guard in position.

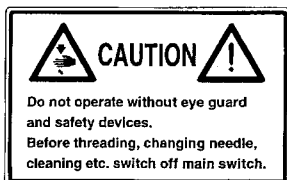


Stepping motor and solenoid may overheat if used continuously. To prevent a burn, take care not to touch.

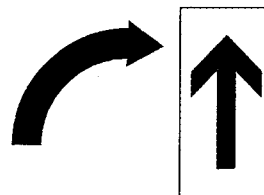


If not connected earth line, static electricity may be generated and inflict injury on person. In addition, the malfunction of electric system may cause injury to person.

5. Warning labels on sewing machines



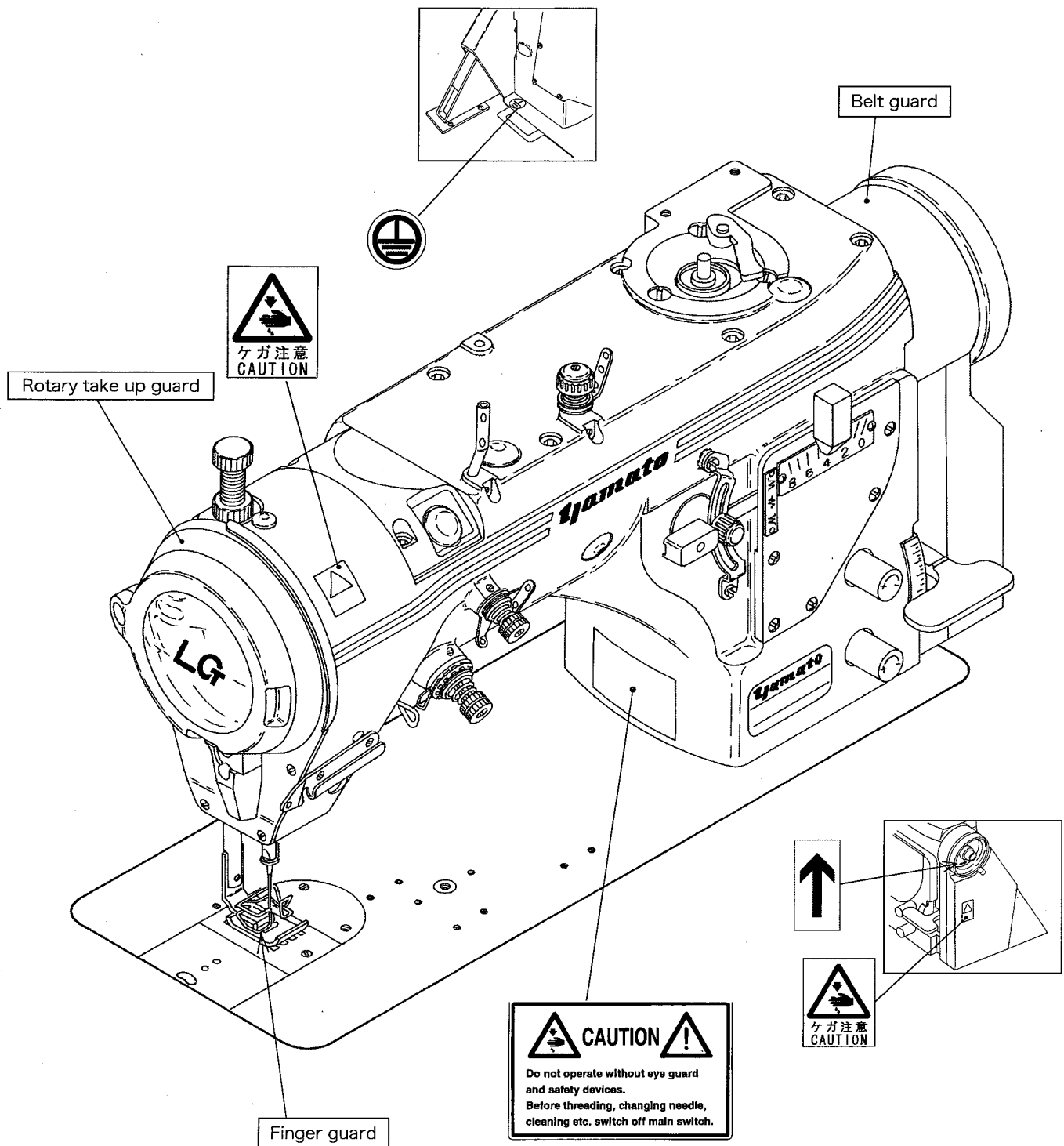
This label indicates that removal of the safeguards and works except for sewing performance while the power supply switch is on are prohibited. (For details, see the next page.)



Check the rotating direction of machine pulley agrees with 'ROTATING-DIRECTION SYMBOL'.



Safety instructions



6. Other factor which may cause injury precaution against it

Finger guard

We set up the finger guard in order to not cause your finger injury. However, it has space around it. If you insert your finger into space, you can stick your finger with the needle. Never insert your finger into space.

Rotary take up guard

We set up the rotary take up guard in order not cause your finger injury. If you put your finger near to the rotary take up, you can hit your finger with it. Never put your finger near to the rotary take up.

1. Name of each part

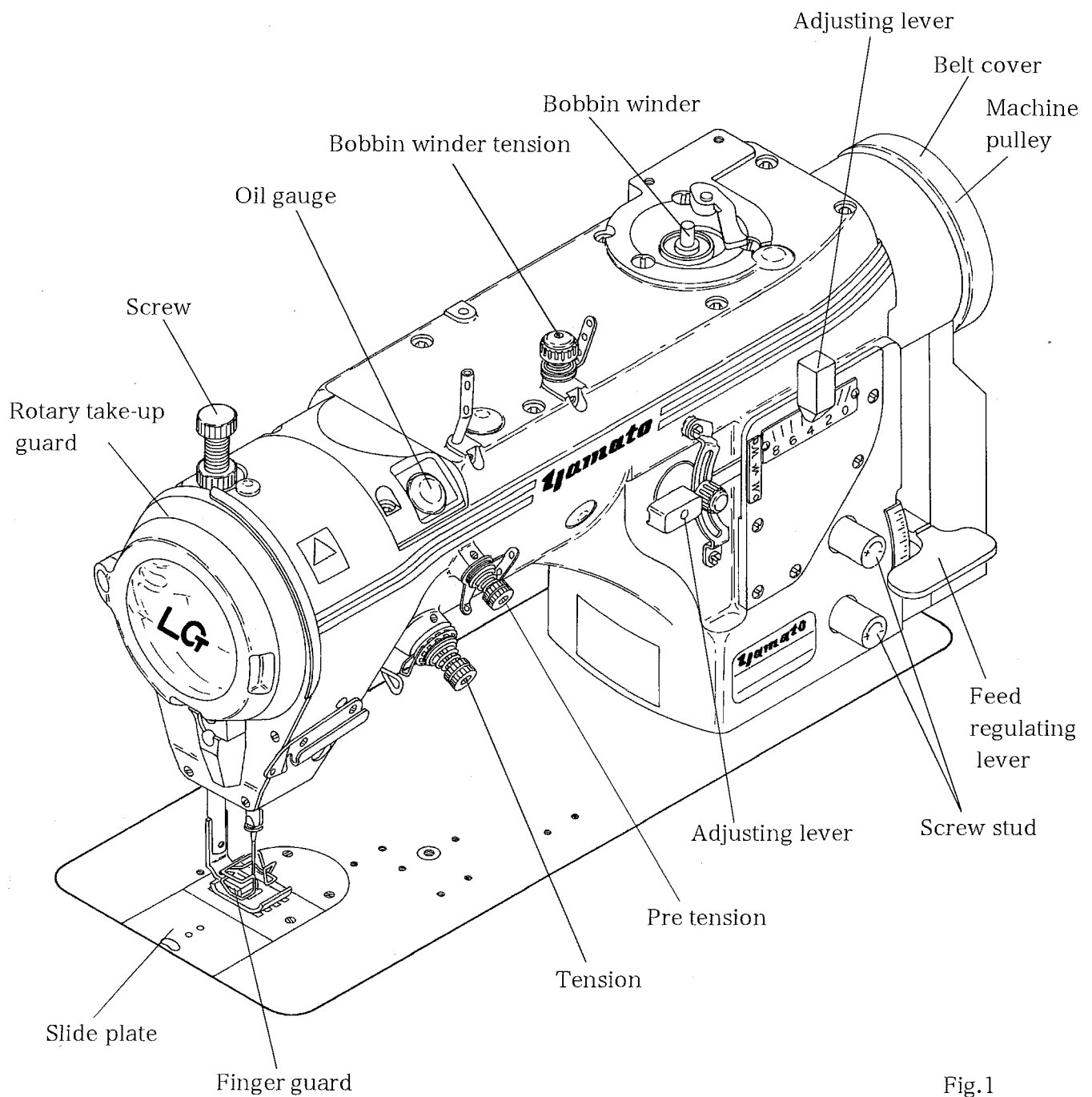


Fig.1

2. Installation

2.1 Table cutting diagram

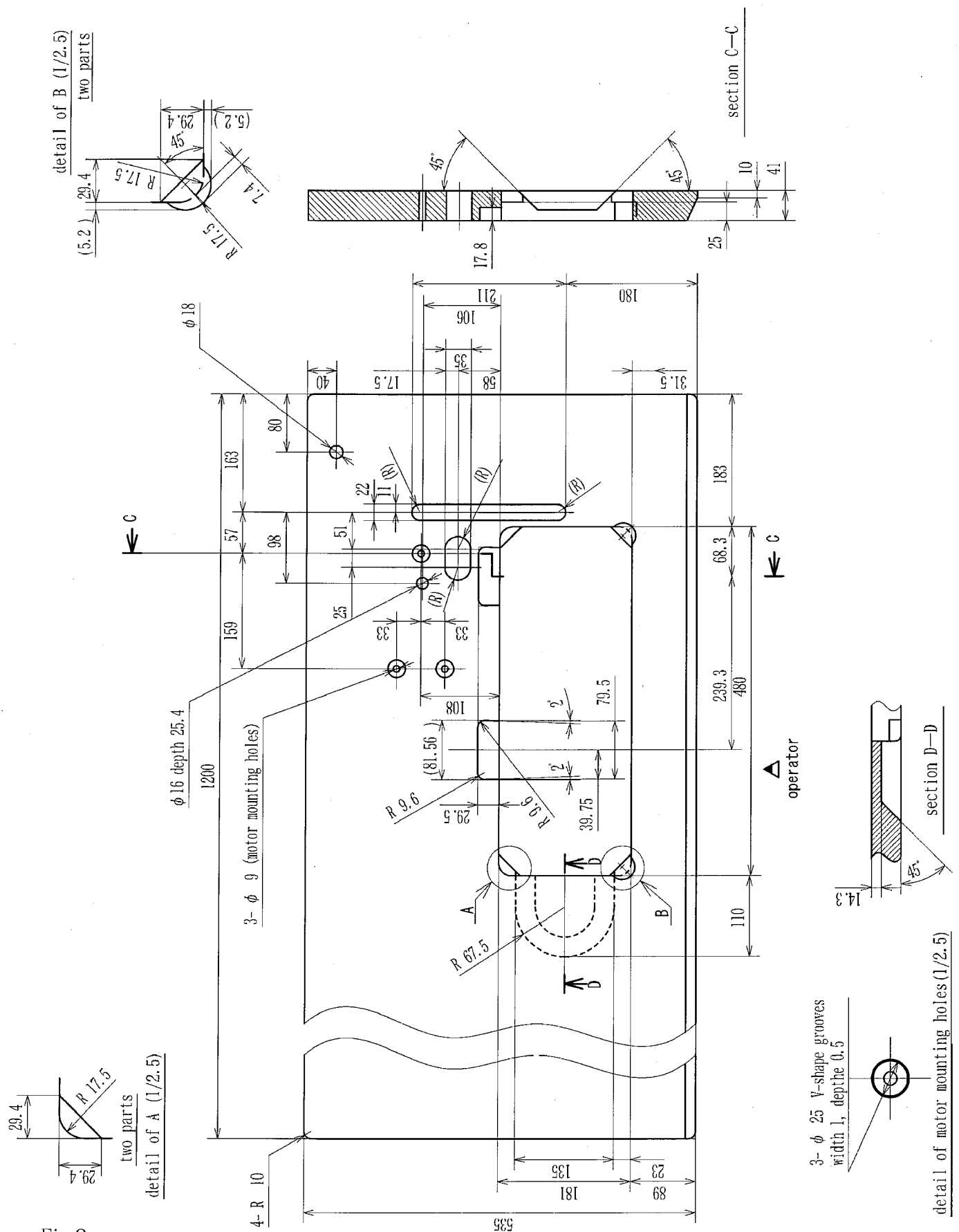


Fig.2

2.2 Oil reservoir installation

- (1) Attach the oil reservoir cushions (small)① and (large)② (two each), and fasten them with the nails ③.
- (2) Put the two cushions ④ into the table and fasten them with the nails ③.
- Mount the oil reservoir ⑤ onto the table.
- (3) Attach the cushion ⑥ and the plunger ⑦ to the oil reservoir ⑤.
- (4) Install the rest pin ⑧ in the table.

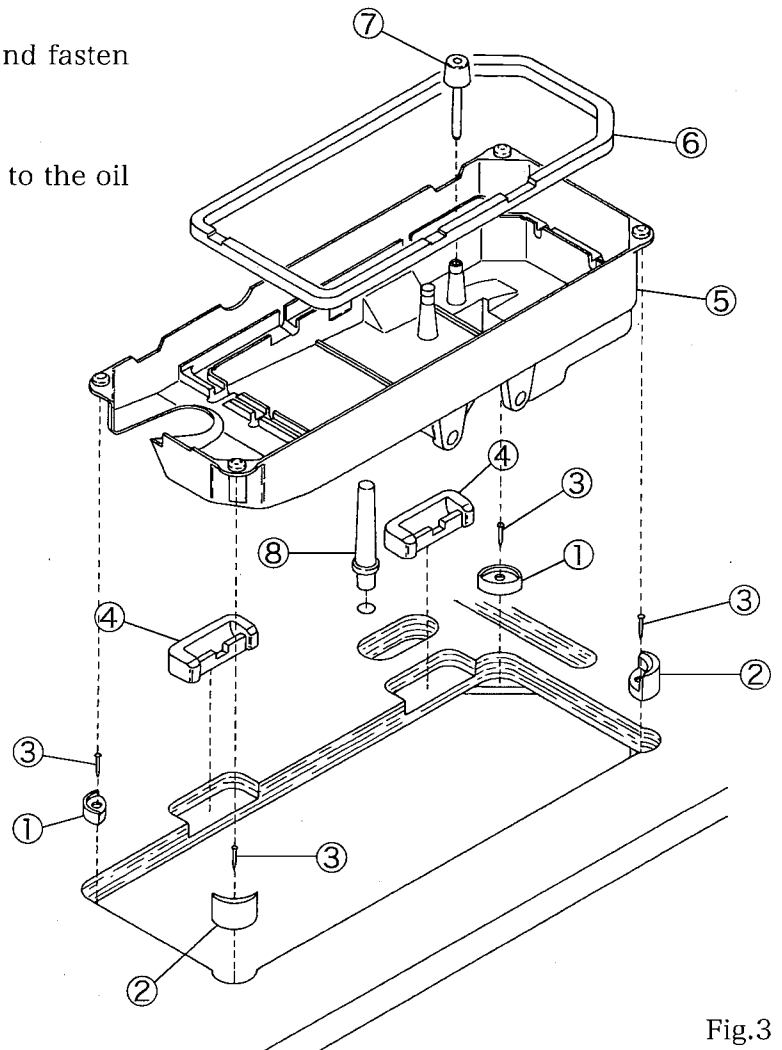


Fig.3

2.3 Sewing machine installation

- (1) Insert the machine hinge connections⑨ in the machine.
- (2) Mount the machine onto the table.
(Install the connections⑨ into the cushion④ already installed into the table.)

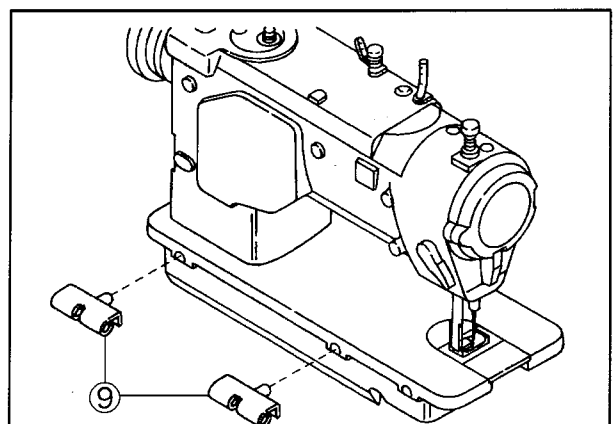


Fig.4

2.4 Bed support removal

The bed support ① is needed for transportation of a machine. It is not needed for sewing. Therefore, remove it at the installation.

- (1) Tilt the machine backward.
- (2) Loosen the screw ② and remove the bed support ①.

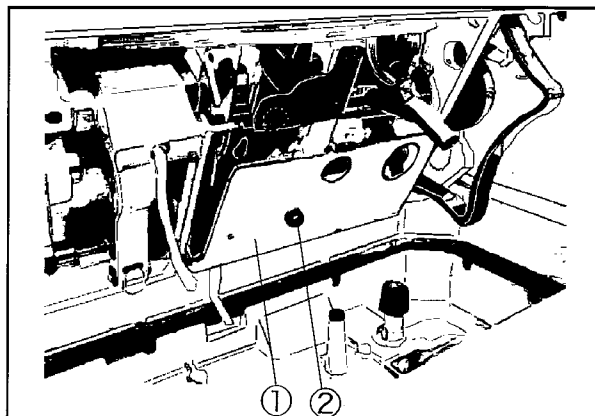


Fig.5

2.5 Motor and pulley

Regarding a motor, see the instructions for the used motor.

Toe down the pedal, then the motor pulley moves to the left. At this moment, the centers of the motor pulley and machine pulley should be aligned. This is the proper installation position for a clutch motor.

Note: Table 1 shows the rough relations between motor pulleys' outside diameters and rotating speeds of a machine when 3-phase, 2-pole, 400 W (1/2 HP) clutch motors are used.

⚠ CAUTION

Use only those motor pulleys applicable to this machine.

If not, the machine can over the speed limit and be damaged.

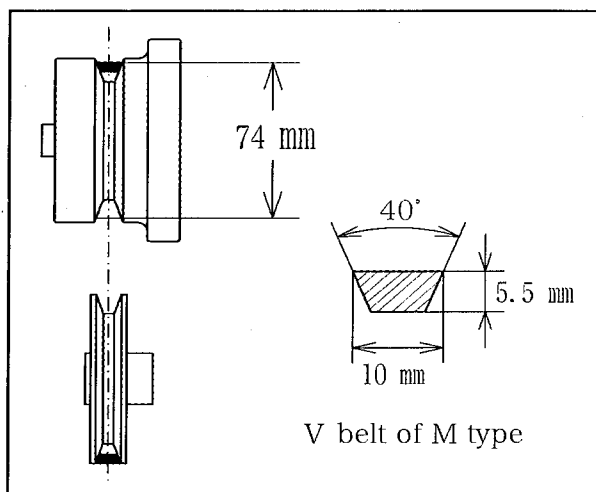


Fig.6

Outside diameter (mm)	Sewing speed (rpm)	
	5 0 H z	6 0 H z
75		3450
80		3700
85		3900
90	3450	4100
95	3650	4350
100	3850	4600
105	4050	4800
110	4250	
115	4400	
120	4600	
125	4800	
130	5000	

Table 1

2.6 Belt hanging

WARNING

Before starting the work, ALWAYS turn the power switch OFF and check that the motor has already stopped.

Use the V belt of the M type.

- (1) Hang the belt ① on the machine pulley ②.
- (2) Tilt the machine ③ backward and hang the belt ① on the motor pulley ④.
- (3) Raise the machine ③ upright.
- (4) Adjust the belt tension so that the belt ① has 10 - 20 mm slack when its center is pushed with 10 N (1.02 kgf).
- (5) After hanging, fasten the belt ① with the nut ⑤ securely.

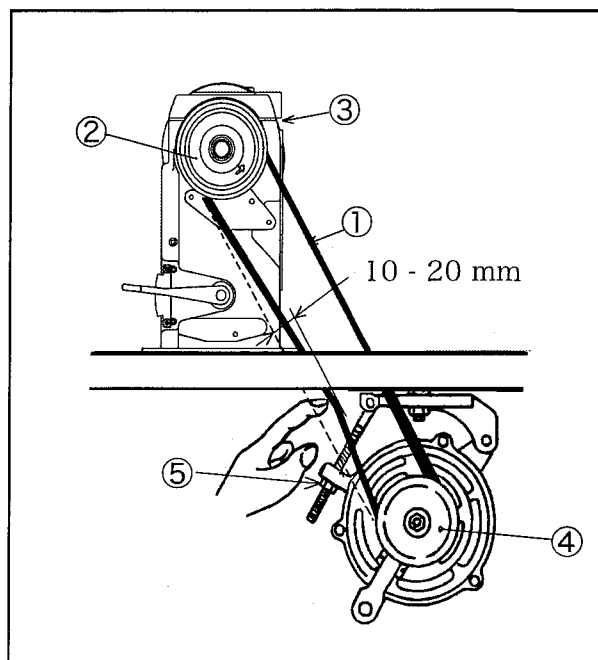


Fig.7

2.7 Belt guard installation

WARNING

Turn the power switch OFF.

When raising the machine upright, use the both hands.

Be careful not to crush the hands between the machine and the table.

To prevent injuries, use the belt guard during operation.

- (1) Install the belt guard ⑥ and ⑦ with the screws ⑧ and ⑨ to the machine body ③.
- (2) Install the belt guard ⑩ with the wood screw ⑫ so that it does not hit the belt guards ⑥ and ⑦ and the V belt is pressed to the belt support ⑪ when the machine is tilted backward.

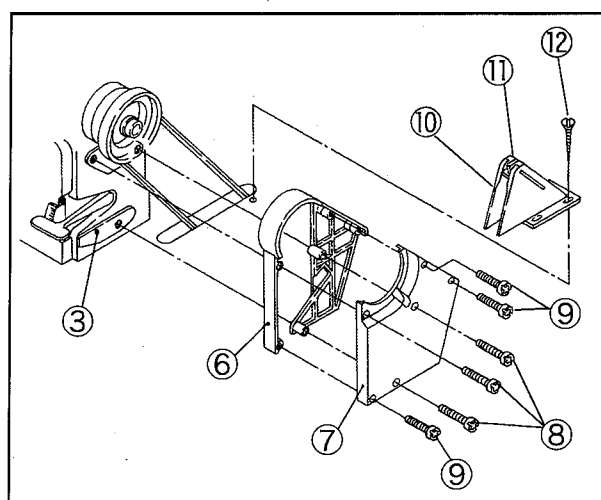


Fig.8

3. Sewing speed and rotating direction

This machine's maximum sewing speed is 5,000 rpm (during intermittent operation).

Run the new machine about 4,000 rpm during the first 200 hours (for about one month) so that it can offer a long service life in a good condition.

The rotating direction of the machine pulley ① and the motor pulley ② is counterclockwise as shown in Fig. 9.

⚠ CAUTION

If the machine pulley reverses, oil cannot be supplied properly and the machine can be damaged.

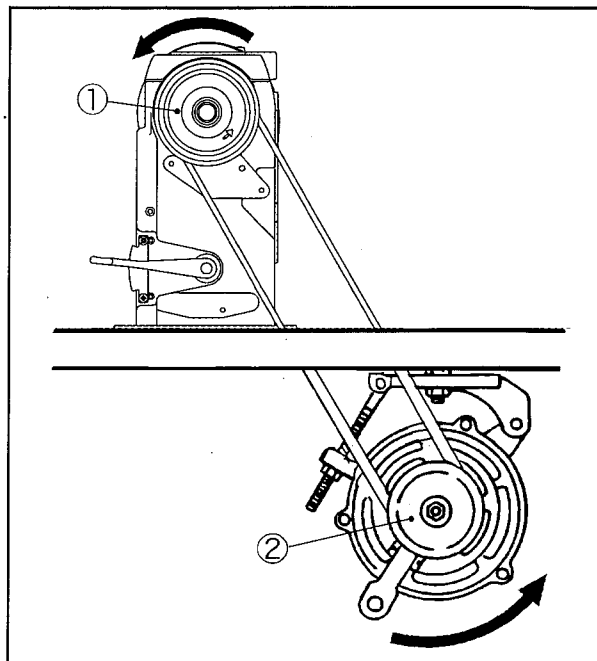


Fig.9

4. Lubricating oil

⚠ WARNING

Turn the power switch OFF.

When raising the machine upright, use the both hand.

Be careful not to crush the hands between the machine and the table.

4.1 Fitting oil

Use Yamato SF Oil 28 for lubricating oil.

⚠ CAUTION

Never add additives to lubricating oil. If added, it can cause deterioration of oil and damage the machine.

4.2 Lubrication

- ◇ Tilt the machine backward and fill the oil to the “HIGH” mark on the oil reservoir shown in Fig.10.

When using a new machine, before lubrication

- ◇ attach the accessory oil filter ② to the mouth ③ of the oil pump.
- ◇ Check that the accessory plunger ④ is already installed into the oil reservoir ①.
- ◇ Rotate the machine and check that oil is splashed onto the oil sight window ⑤ as shown in Fig.11.
If this splashing is unstable, stop the machine, clean the oil filter, and check the oil amount in the oil reservoir. If needed, supply oil.
- ◇ Check the oil amount in the oil reservoir at least twice a month so that the oil surface does not become lower than the ADD OIL mark.

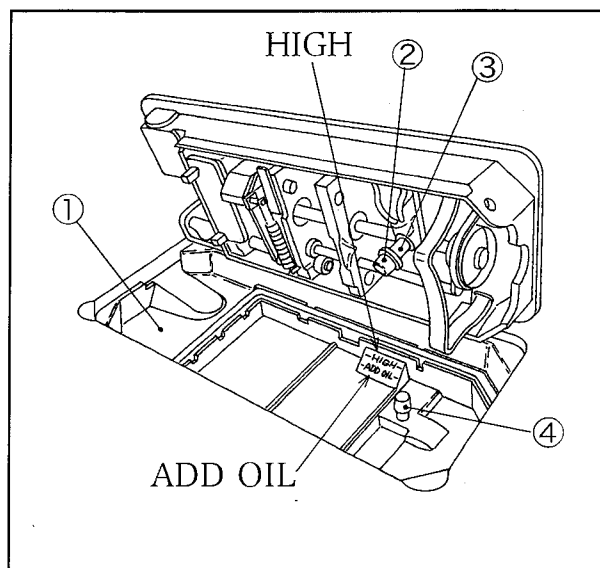


Fig.10

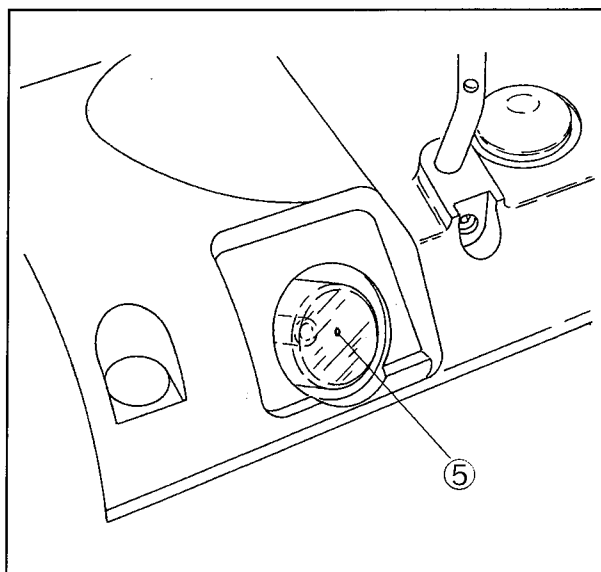


Fig.11

4.3 Hook lubrication

WARNING

Turn the power switch OFF.

When raising the machine upright, use the both hand.

Be careful not to crush the hands between the machine and the table.

Remove the oil remaining in the hook by running the machine without a material and threads for one minute. Then, attach a paper to the lower part of the hook and run the machine for 15 seconds to check the oil amount.

To adjust the oil amount to the hook,

(1) tilt the machine backward.

(2) Turn the adjusting valve① in Fig.12.

- To increase the amount, turn the screw clockwise.
- To decrease the amount, turn the valve① counterclockwise.
(To maximize the amount, turn the valve① counterclockwise five times from the closed position.)

NOTE

When the above-mentioned maximum oil amount is not enough,

(1) loosen the nut② in Fig.13.

(2) Turn the adjusting screw③ to the arrow direction A. (At shipment, the distance is set to 10 mm.)

Then, the amount increases.

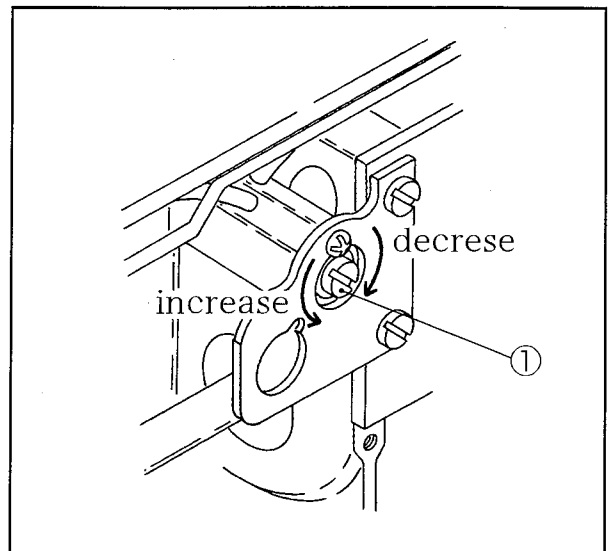


Fig.12

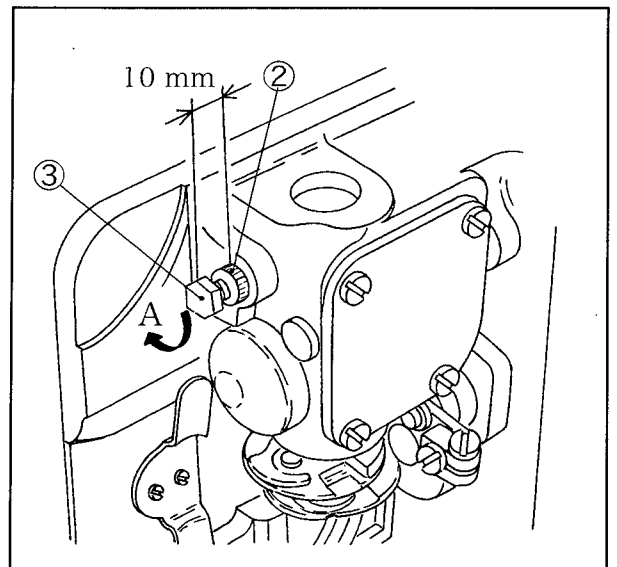


Fig.13

5. Proper operation

5.1 Fitting needle



Use SG × 1963 needle.

This type of needle has multiple sizes. Choose one that fits for threads and materials.

When a needle size is proper, a thread pass the needle eye easily and does not break while sewing.

A bent needle can cause skip stitches.

A crush or burr at a needle point can cause skip stitches or damage materials.

Needle sizes Table 2

Application		Light-weight	Medium-weight
Thread sizes	Metric No.	100-120	60-100
	Cotton No.	60-80	30-60
Needle sizes	JIS	#8-#10	#12
	Metric	60-70	80-100

5.2 Needle installation



WARNING

Before starting the work, ALWAYS turn the power switch OFF and check that the motor has already stopped.

- (1) Turn the machine pulley frontward by hand and raise the needle bar ① to the highest position.
- (2) Loosen the screw ②.
- (3) Remove the old needle.
- (4) Insert a new needle into the installation hole as far as it will go. Be sure that the needles long groove comes front. (Fig.15)
- (5) Tighten the screw ② securely.

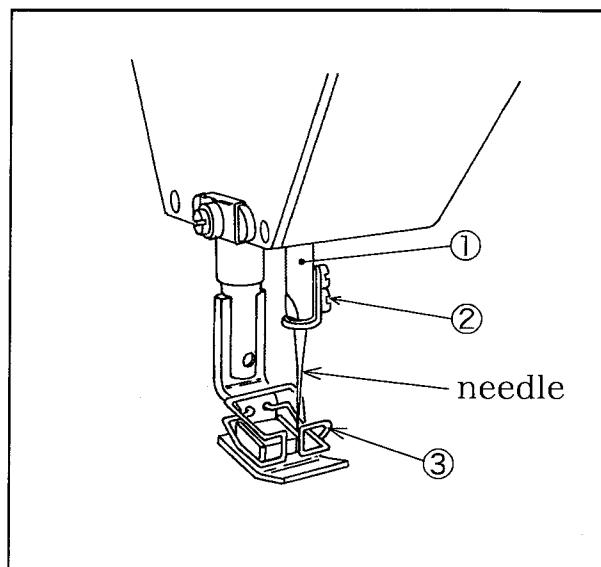


Fig.14



WARNING

When operating the machine, be sure that the finger guard ③ is installed.

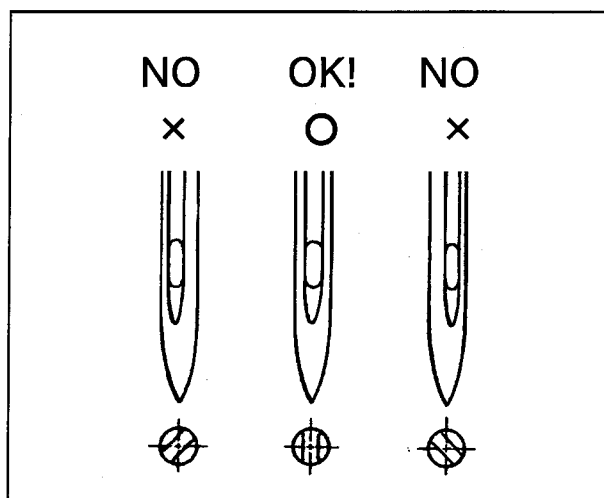


Fig.15

5.3 Bobbin winding



To wind a under thread around the bobbin, use the bobbin winder in Fig.16.

The bobbin winder shaft ① rotates to the arrow direction A while winding.

- (1) Run a thread as shown in Fig.16. Then, wind a thread around the bobbin ② several times.
- (2) Insert the bobbin ② into the bottom of the bobbin winder shaft ①.
- (3) Move the lever ③ to the arrow direction B.
(At this moment, the preparation for bobbin winding is completed.)
- (4) To start winding, toe down the pedal.
- (5) When winding is finished, the winder stops automatically.
- (6) Stop the machine.
- (7) Remove the bobbin and cut a thread.

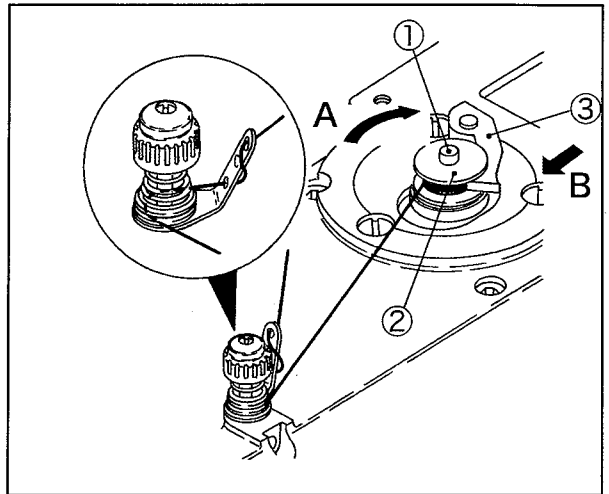


Fig.16

5.4 Threading



5.4.1 Upper thread threading



WARNING

Before starting the work, ALWAYS turn the power switch OFF and check that the motor has already stopped.

When operating the machine, be sure that the cover ① is closed. (See Fig.17.)

WARNING

Be careful not to be injured with the thread cutter ② shown in Fig.17.

Before threading the upper thread, check that the thread does not wind the rotary take-up ③.

To thread the upper thread, see Fig.17.

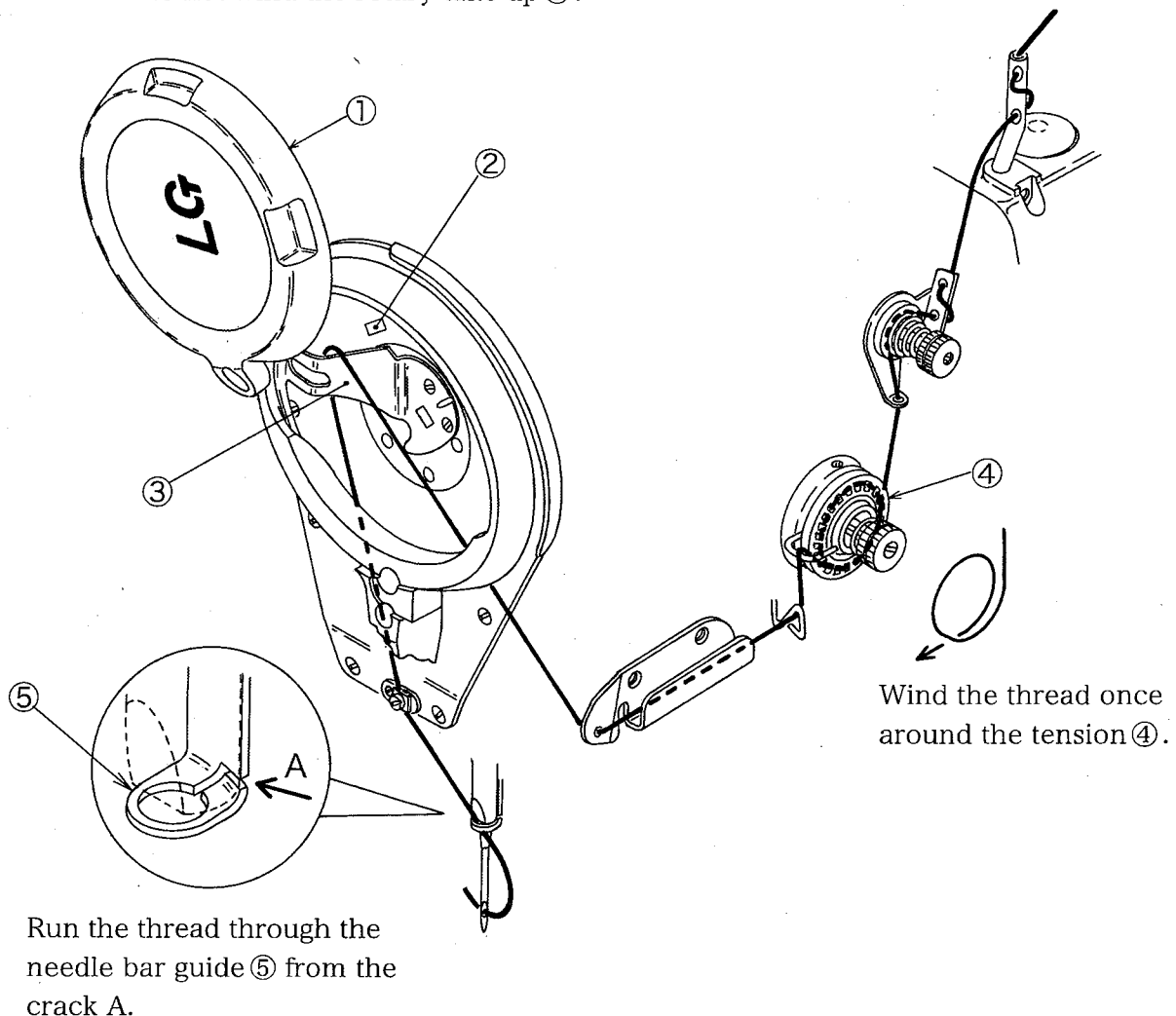


Fig.17

5. Proper operation

5.4.2 Under thread threading



5.4.2.1 Bobbin case removal and installation



WARNING

Before starting the work, ALWAYS turn the power switch OFF and check that the motor has already stopped.

When operating the machine, be sure that the left side of the stitch plate ① (the slide plate) is closed.

Removal

Lift up the knob ② in Fig.18 and take out the bobbin case from the hook ③.

Installation

Lift up the knob ② in Fig.18 and install the bobbin case into the hook ③ by holding the knob ②.

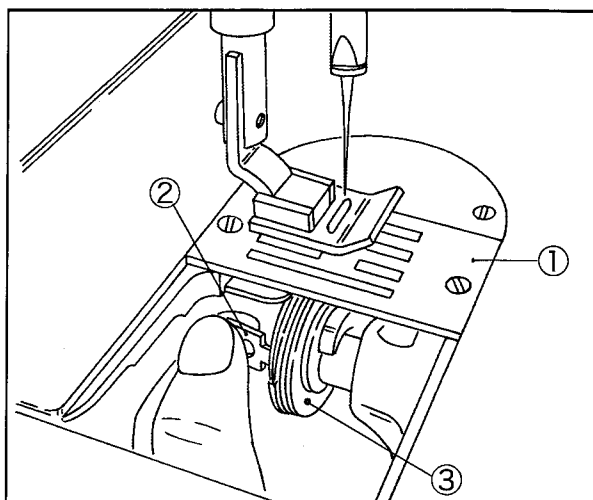


Fig.18

5.4.2.2 Bobbin case threading



- (1) Pull out the thread ⑤ from the bobbin ④.
- (2) Put the bobbin ④ into the bobbin case ⑥ as shown in Fig.19.
- (3) Insert the thread that is pulled off in Step(1) into the crack ⑦ on the bobbin case ⑥ and pass it under the tension spring ⑧.
- (4) Insert the thread into the crack ⑨.
- (5) Pull out the thread through the hole A or B.
(See Fig.20.)

A : For lightweight materials

B : For medium-weight materials

- (6) Install the bobbin case ⑥ into the machine.
(See 5.4.2.1.)
- (7) Rotate the machine pulley by hand and pull up the thread to the stitch plate surface.

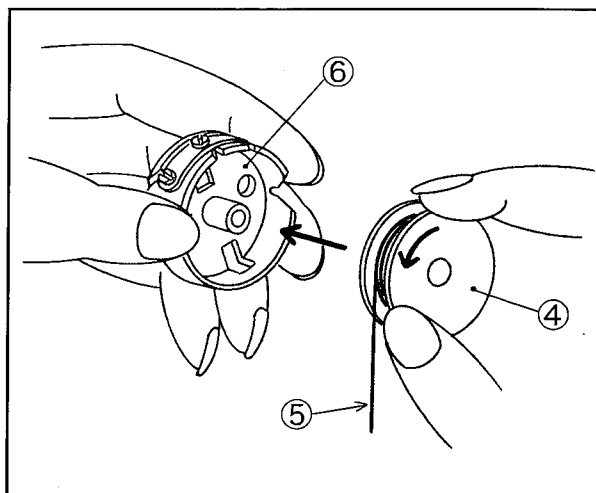


Fig.19

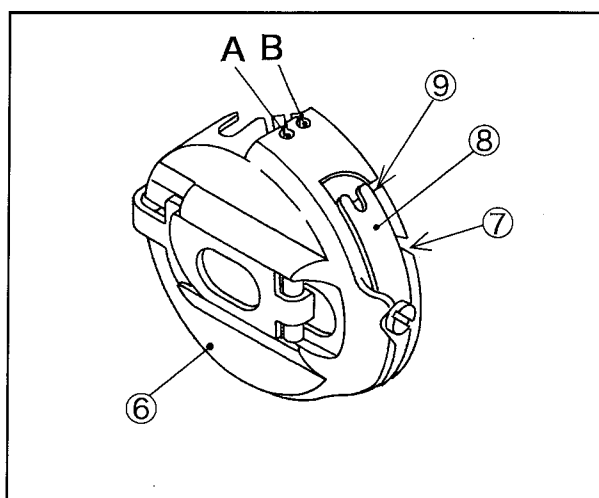


Fig.20

5.5 Upper thread tension



To adjust the upper thread tension, turn the nut ① in Fig.21.

- To increase the tension, turn the nut ① clockwise.
- To decrease the tension, turn the nut ① counterclockwise.

At shipment, the spring ② with a low pressure is installed in the machine.

When sewing heavy-weight materials or operating the machine at high speeds (3,500 rpm or more), it is recommended to change the spring ② to the one in the accessories.

To change the spring ②, remove the nut ①.

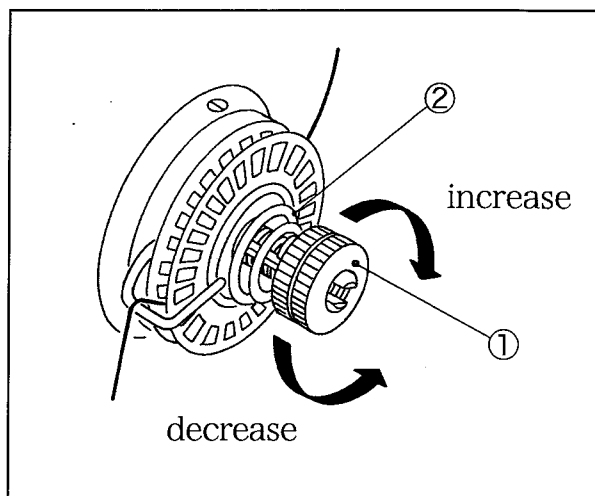


Fig.21

5.6 Presser foot pressure adjustment



To adjust the presser foot pressure, loosen the nut ③ and turn the adjusting screw ④ in Fig.22.

- To increase the pressure, turn the nut ③ clockwise.
- To decrease the pressure, turn the nut ③ counterclockwise.

At shipment, the spring ② with a low pressure is installed.

When operating the machine at high speeds (3,500 rpm or more), change the spring to the one in the accessories.

To change the spring, remove the adjusting screw ④.

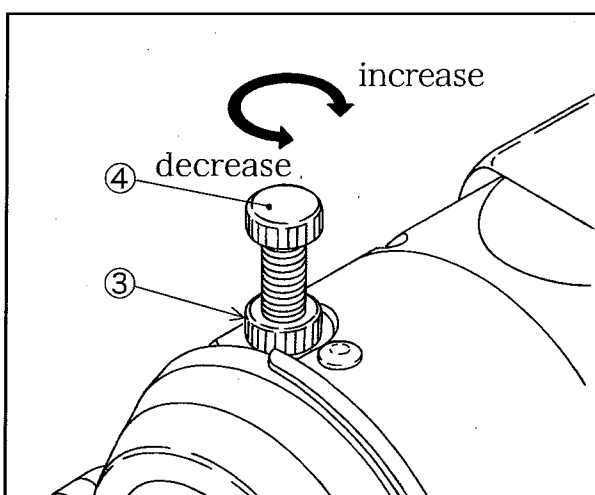


Fig.22

5.7 Stitch length adjustment



To adjust the stitch length at normal feed, turn the adjusting screw ⑤ in Fig.23.

- To shorten the stitch length, turn the screw ⑤ clockwise.
- To lengthen the stitch length, turn the screw ⑤ counterclockwise.

To adjust the stitch length at reverse feed, turn the adjusting screw ⑥ in Fig.23.

- To shorten the stitch length, turn the screw ⑥ clockwise.
- To lengthen the stitch length, turn the screw ⑥ counterclockwise.

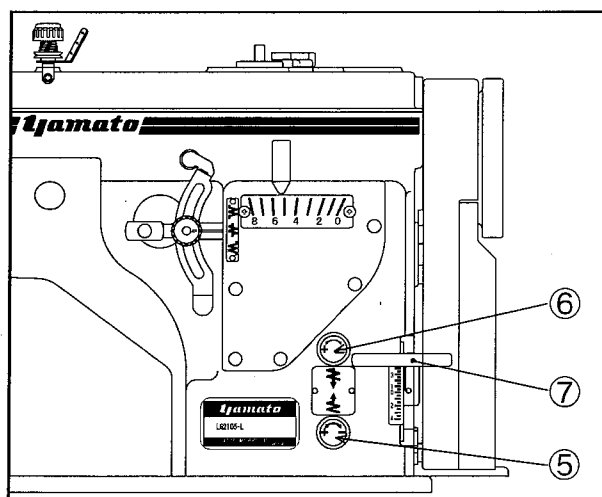


Fig.23

Reverse feed

To operate the machine at reverse feed, keep pushing the feed regulating lever ⑦.

When releasing the lever ⑦, the machine returns to the normal feed.

5. Proper operation

5. 8 Needle position choice



To change the needle position, loosen the knob ① and move the lever ②. The adjustable range is from the center needle position to the left needle position or from the center needle position to the right needle position.

- A Left needle position
- B Center needle position
- C Right needle position

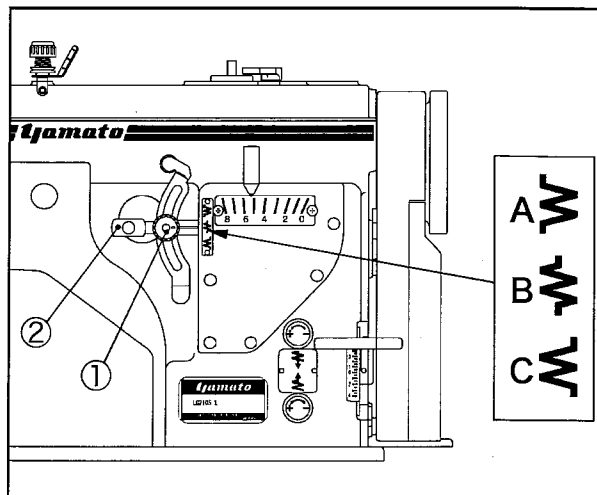


Fig.24

5. 9 Stitch width adjustment



To adjust the stitch width, move the lever ③ in Fig.25.

- LG2125 0 - 5 mm
- LG2105/135 0 - 8 mm

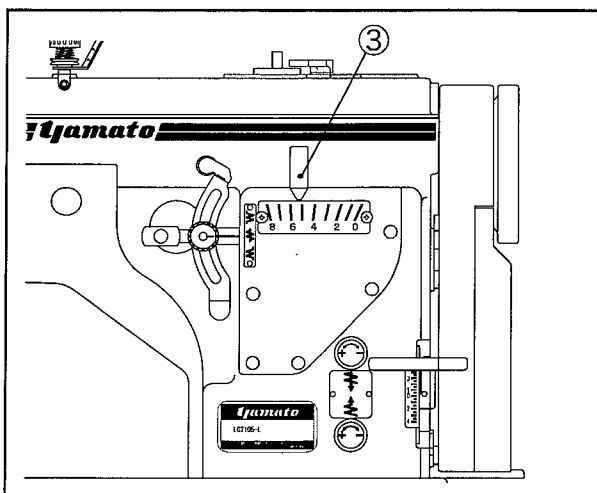


Fig.25

5. 1 0 Cleaning of machine



WARNING

Turn the power switch OFF.

When raising the machine upright, use the both hand.

Be careful not to crush the hands between the machine and the table.

- ◇ Clean the hook and its surroundings once a day in normal use and several times a day in intensive use.
- ◇ Clean the machine from dust and lint at a quitting time every day.
- ◇ Clean the grooves of the stitch plate, and the feed dog and its surroundings once a week.

6. Machine adjustments

6.1 Bobbin winder adjustment



- ◇ To adjust the winding amount, loosen the screw ② on the lever ① and move the lever ①.
- ◇ To adjust the thread tension at winding, turn the nut ③.
 - To increase the tension, turn the nut ③ clockwise.
 - To decrease the tension, turn the nut ③ counterclockwise.
- ◇ To wind a thread evenly around the bobbin, loosen the adjusting screw ④ and move the bobbin winder tension ⑤ up or down.

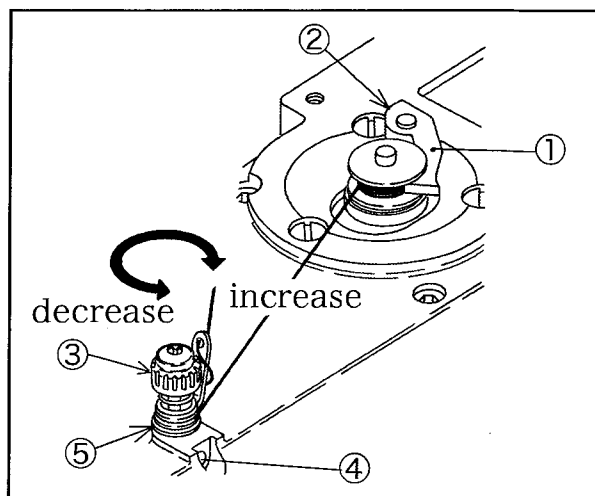


Fig.26

6.2 Take-up spring adjustment



- ◇ To adjust the pressure of the take-up spring ⑥, insert a screw driver into the tension stud ⑦ in Fig.27 and turn it.
 - To increase the pressure, turn the stud ⑦ clockwise.
 - To decrease the pressure, turn the stud ⑦ counterclockwise.
- ◇ To adjust the moving range of the take-up spring ⑥, loosen the screw ⑧ in Fig.27 and turn the whole body of the tension.

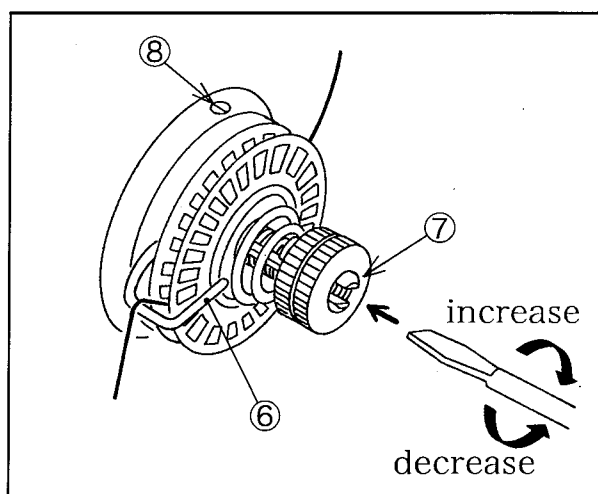


Fig.27

6.3 Pre tension adjustment



To prevent a *slippage of an upper thread on the tension ⑨ in Fig.28, turn the nut ⑩ and adjust the thread tension.

- To increase the tension, turn the nut ⑩ clockwise.
- To decrease the tension, turn the nut ⑩ counterclockwise.

* Slippage

"Slippage" indicates that the tension disk ⑪ in the tension cannot follow running of a thread and stops rotating.

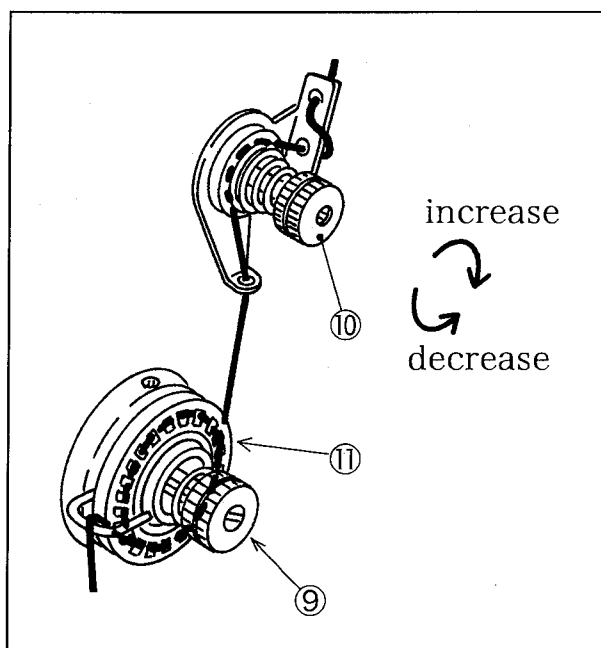


Fig.28

6.4 Under thread tension



To adjust the under thread tension, turn the screw ② in the bobbin case ① in Fig.29.

- To increase the tension, turn the screw ② clockwise.
- To decrease the tension, turn the screw ② counterclockwise.

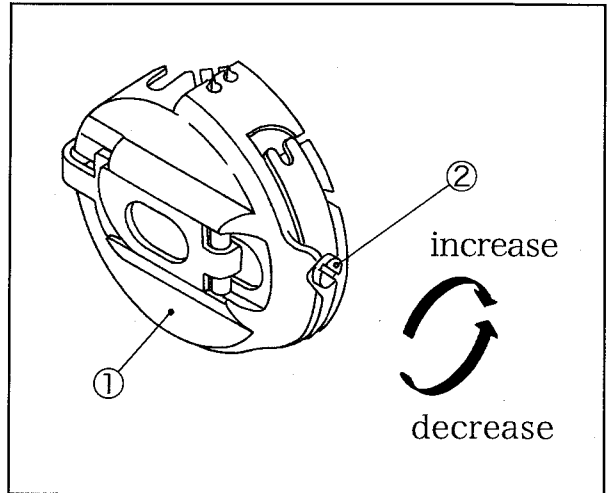




Fig.29

7. Specifications

Model	LG2105-LW	LG2105-MW	LG2125-LW	LG2125-MW	LG2135-LW	LG2135-MW
Description	 304 Plain zig-zag				 321 3-step zig-zag	
Feed System	Drop feed					
Application	Lightweight	Medium-weight	Lightweight	Medium-weight	Lightweight	Medium-weight
Maximum Sewing Speed*	5,000 rpm					
Maximum Needle Bight	8.0 mm		5.0 mm		8.0 mm	
Stitch Length	1.3mm	5.1mm	2.0mm	4.2mm	1.3mm	2.5mm
Needle Vibration Mechanism	Fixed cam type					
Needle Stroke	33.4 mm					
Presser Foot Lift By Hand)	6.2 mm					
Presser Foot Lift By Knee)	7.5 mm					
Needle Lift (At Zero Bite)	3 mm					
Needle System	S G × 1963 #8~12(LG21XX-LW : #10 LG21XX-MW : #12)					
Machine Pulley	Pulley's diameter 74mm (significant diameter for V-belt)					
Lubrication	Totally automatic lubrication by screw pump (The hook lubrication system has an adjusting valve.)					
Oil Circulation	By plunger pump					
Lubrication Oil	YAMATO SF OIL No.28					
Workspace Width	280 mm					
Workspace Height	120 mm					
Bed Dimension	477×178 mm					
Weight	About 38 kg (head only)					
Applied Motor	Clutch motor (3-phase 2-pole 550W or 1-phase 2-pole 550W)					

* The maximum sewing speed of the machine changes according to kinds of materials, threads, and sewing application.

Note: Under the standard shipping condition, the presser bar spring with a medium pressure is installed. Change the spring to the one with a high pressure in the accessories when operating the machine at high speeds.

Specifications are subject to change without notice.



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