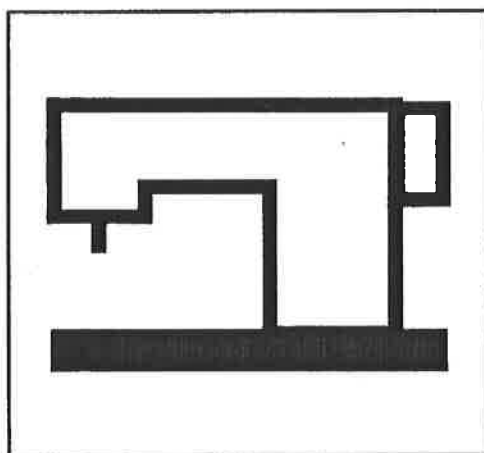


SEIKO

INSTRUCTION MANUAL SK-2B-1



SEIKO SEWING MACHINE CO., LTD



CAUTION

Installation



• Machine installation should only be carried out by a qualified technician.



• Contact your SEIKO dealer or a qualified electrician for any electrical work that may need to be done.



• Be sure to wear protective goggles when operating the sewing machine. If the machine is used without it, a broken needle gets into your eyes and injury may result.



• The sewing machine weights more than 44kgf. Two or more people should carry out the installation.



• Do not connect the power cord until installation is complete, otherwise the machine may operate if the treadle is pressed by mistake, which could result in injury.



• Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.



• All cords should be secured at least 25mm away from any moving parts. Furthermore, do not excessively bend the cords or secure them too firmly with staples, otherwise there is the danger that fire or electrical shocks could occur.



• Install the belt covers to the machine head and motor.



• If using a work table that has casters, the casters should be secured in such a way so that they cannot move.



• Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.



• Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarrhea. Keep the oil of the reach of children.

Sewing



• Operators who have received the necessary training in safe use beforehand should only use this sewing machine.



• The sewing machine should not be used for any applications other than sewing.



• Turn off the power switch at the following times, otherwise the machine may operate if the treadle is pressed by mistake, which could result injury.

1. When threading the needle
 2. When replacing the needle and bobbin
 3. When not using the machine and when leaving the machine unattended
- * When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.



• Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.



• If using a worktable that has casters, the casters should be secured in such a way so that they cannot move.



• Do not touch any of moving parts or press any objects against the machine while sewing, as this may result in personal injury or damage to the machine.



• Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.



• If an error occurs in machine or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest SEIKO dealer or a qualified technician.



• If the machine develops a problem, contact your nearest SEIKO dealer or a qualified technician.



CAUTION

Cleaning



• Turn off the power switch before carrying out cleaning, otherwise the machine may operate if the treadle is pressed by mistake, which could result in injury.

* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.



• Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.



• Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarrhea. Keep the oil out of the reach of children.

Maintenance and inspection



• A qualified technician should only carry out maintenance and inspection of the sewing machine.



• Ask your SEIKO dealer or qualified electrician to carry out any maintenance and inspection of the electrical system.



• Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is pressed by mistake, which could result in injury.

1. When carrying out inspection, adjustment and maintenance

2. When replacing consumable parts such as the rotary hook

* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait the motor stops fully before starting work.

• If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.



• Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.



• When checking the rotating hook lubrication, do not touch moving parts such as the rotating hook, needle and needle bar with your finger or paper nor push them with other objects, otherwise injury or damage to the machine may result.



• Use only the proper replacement parts as specified by SEIKO.



• If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.



• Any problems in machine operation, which result from unauthorized modifications to the machine, will not be covered by the warranty.

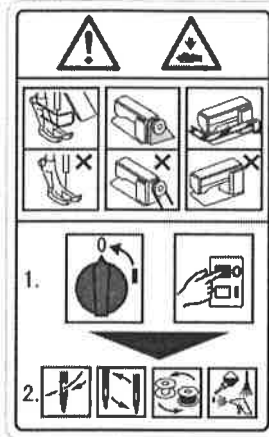
3. Warning labels

★ The following warning labels appear on the sewing machine.

Please follow the instructions on the labels at all times when using the machine.

If the labels have been removed or are difficult to read, please contact your nearest SEIKO dealer.

1



Caution
Moving parts may cause injury.

Attach all safety devices
before using the sewing
machine.

Turn off the power switch
at the following times.

- When threading the needle.
- When replacing the bobbin, needle, knife, rotary hook.
- When lubrication, cleaning, adjustment and maintenance.

2



Be sure to connect the ground.
If the ground connection is not secure,
you run a risk of receiving a serious
electric shock.

3

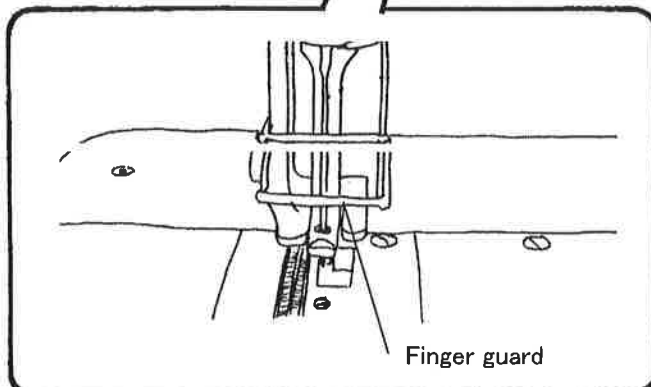
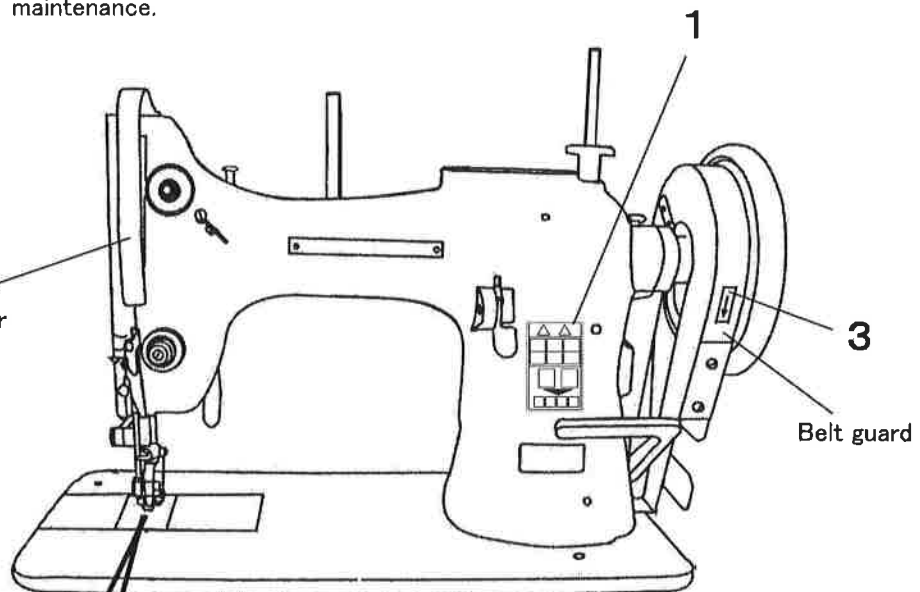


Direction of operation

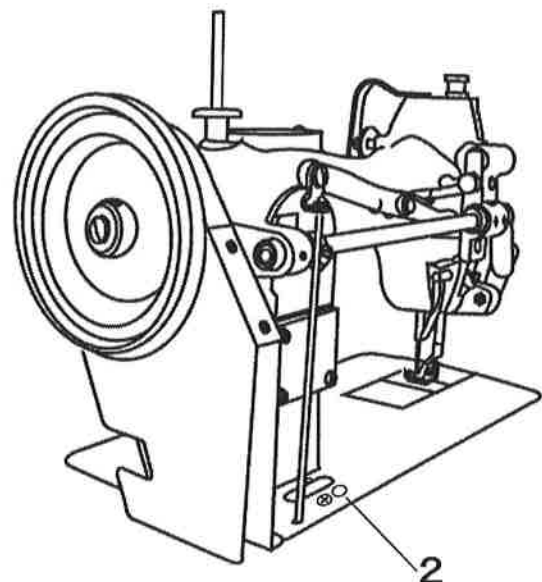
★ Safety devices

- Finger guard
- Thread take-up cover
- Belt guard, etc.

Thread take-up cover



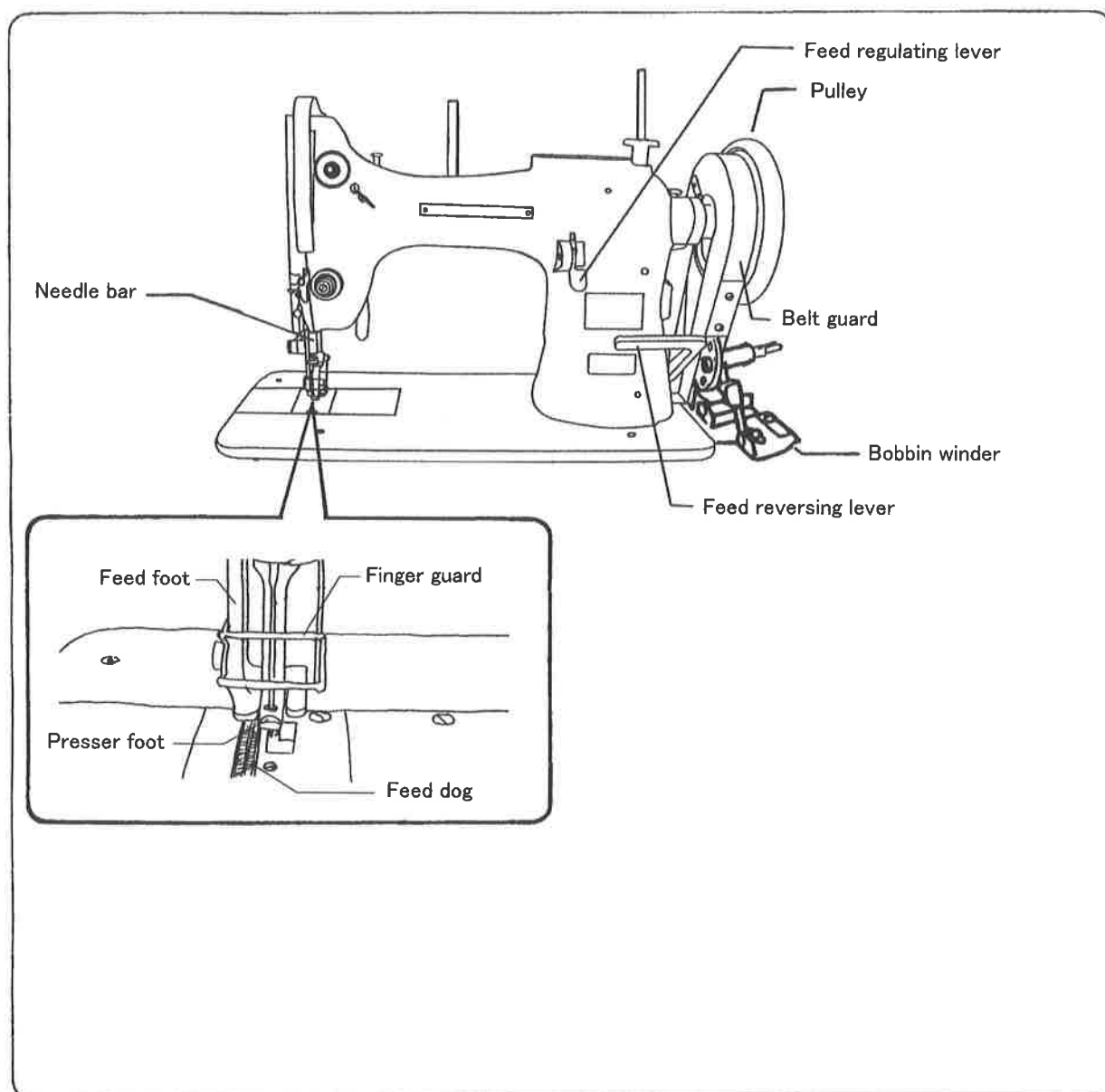
Finger guard



CONTENTS

1. MAIN PARTS NAMES	1
2. MACHINE SPECIFICATIONS	1
3. WORK TABLE AND MOTOR	2
4. INSTALLATION	3
4-1. Installing the hinge rubber cushion and the corner rubber cushion	3
4-2. Installing the oil pan	3
4-3. Installing the machine head	3
4-4. Installing the spool pin	4
4-5. Installing the pedal and chain	4
4-6. Installing the belt	5
4-7. Installing the bobbin winder	5
4-8. Installing the belt guard, the auxiliary belt guard and the belt guard auxiliary plate	6
4-9. Installing the thread stand	6
4-10. Lubrication	7
4-11. Checking the machine pulley direction	8
5. PREPARATION BEFORE SEWING	9
5-1. Installing the needle	9
5-2. Removing the bobbin case and bobbin	9
5-3. Winding the lower thread	10
5-4. Installing the bobbin case	10
5-5. Threading the upper thread	11
5-6. Adjusting the stitch length	11
6. SEWING	12
6-1. Sewing	12
6-2. Backtacking	12
7. THREAD TENSION	13
7-1. Adjusting the thread tension	13
7-2. Adjusting the presser foot pressure	13
8. STANDARD ADJUSTMENT	14
8-1. Adjusting the needle and rotating hook timing	14
8-2. Adjusting the height of the needle bar	15
8-3. Adjusting the clearance between the needle and the hook	16
8-4. Adjusting the height of the feed dog	17
8-5. Adjusting the feed dog position	17
8-6. Adjusting the needle and feed timing	18
8-7. Adjusting the thread take-up spring	18
8-8. Adjusting the upper feed amount	19
8-9. Adjusting the height of the presser foot	19
8-10. Adjusting the alternating presser foot movement amount	20
9. TROUBLESHOOTING	21 – 24

1. MAIN PARTS NAMES



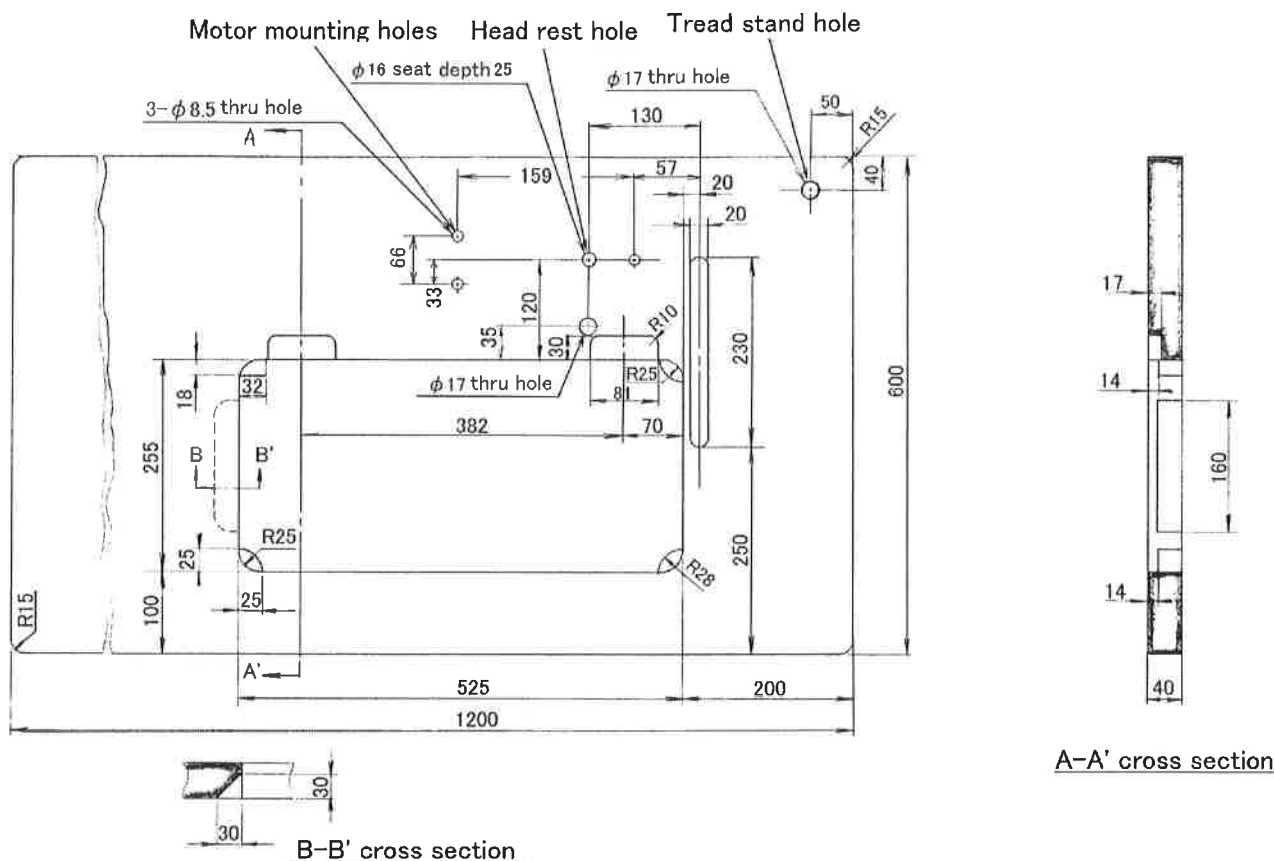
2. MACHINE SPECIFICATIONS

Applications		Harnesses, covers, safety belts, tents, sheets, gloves, buffs, etc.
Maximum sewing speed		1,200 s.p.m.
Presser foot height	Foot lifting lever	13 mm
	Pedal	14 mm
Maximum stitch length		13 mm
Feed dog height		1.4 mm
Working space		253X190 mm
Needle		DDx1 #23 - #25 (#24: standard)

3. WORK TABLE AND MOTOR

■ Work table

- When using a table made by another manufacturer, drill holes in the table as shown in the figure below.
- The top of the table should be 40mm in thickness and should be strong enough to hold the weight and withstand the vibration of sewing machine.



■ Motor



CAUTION



• All cords which are connected to the motor should be secured at least 25 mm away from any moving parts. Furthermore, do not excessively bend the cords or secure them too firmly with staples, otherwise there is the danger that fire or electric shocks could occur.



• Install the correct belt guard which corresponds to the motor being used.

<Motor>

- Select the correct motor from those listed in the table.
- Refer to the instruction manual for the motor for details on installing and using the motor.

Power	Motor
Single-phase	4-pole, 400 W motor
Three-phase	4-pole, 400 W motor

<Motor pulley and V-belt>

- Select the correct motor pulley and V-belt by referring to the table to suit the power frequency of your area.

Sewing speed	Frequency	Motor pulley	V-belt
1,200 s.p.m.	50 Hz	ϕ 90	52 inches
	60 Hz	ϕ 75	53 inches

4. INSTALLATION



CAUTION



• A qualified technician should only install the sewing machine.



• Ask your SEIKO dealer or a qualified electrician for any electrical work that may need to be done



• The sewing machine weighs more than 44kgf. Two or more people should carry out the installation.



• Do not connect the power cord until installation is complete, otherwise the machine will operate if the treadle is pressed by mistake, which could result in injury.

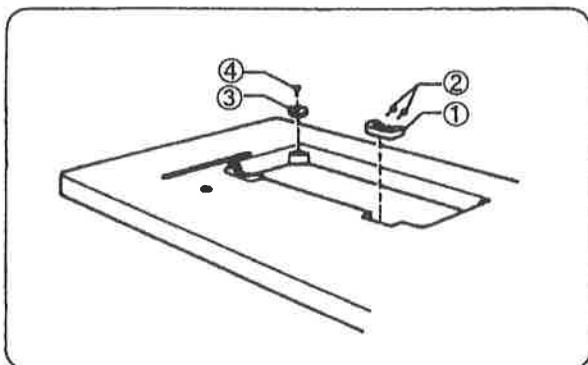


• Be sure to connect the ground. If the ground connection is not secure, serious electric shocks will result.



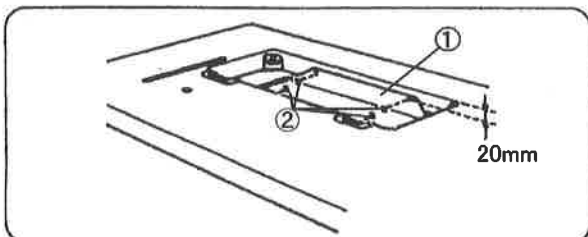
• Install the belt guard to the machine head.

4-1. Installing the hinge rubber cushion and the corner rubber cushion



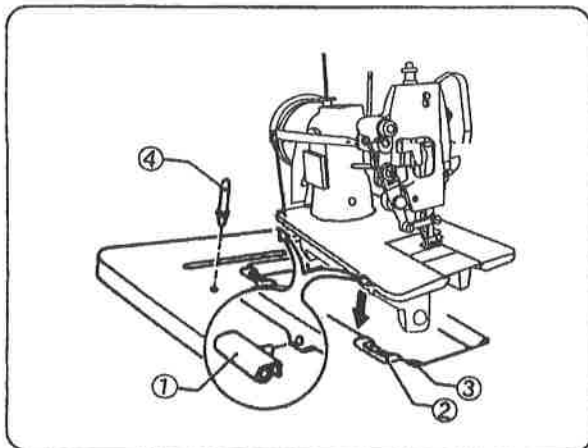
1. Install the hinge rubber cushion① on the table with the two nails②. (Two places)
2. Install the corner rubber cushion③ at the corner of the table with a nail. (Four corners)

4-2. Installing the oil pan



1. Fit the oil pan into the opening in the table, and secure it with 4 nails.

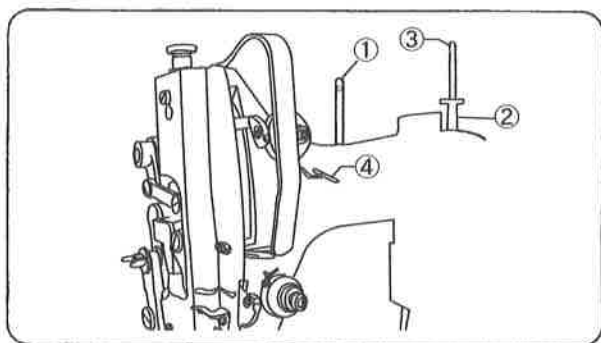
4-3. Installing the machine head



1. Insert the two hinge connections① into the holes in the machine bed.
2. Fit the hinge connection① to the hinge rubber cushion② and then place the machine head onto the corner rubber cushion③.
3. Tap the head rest④(option) into the table hole.

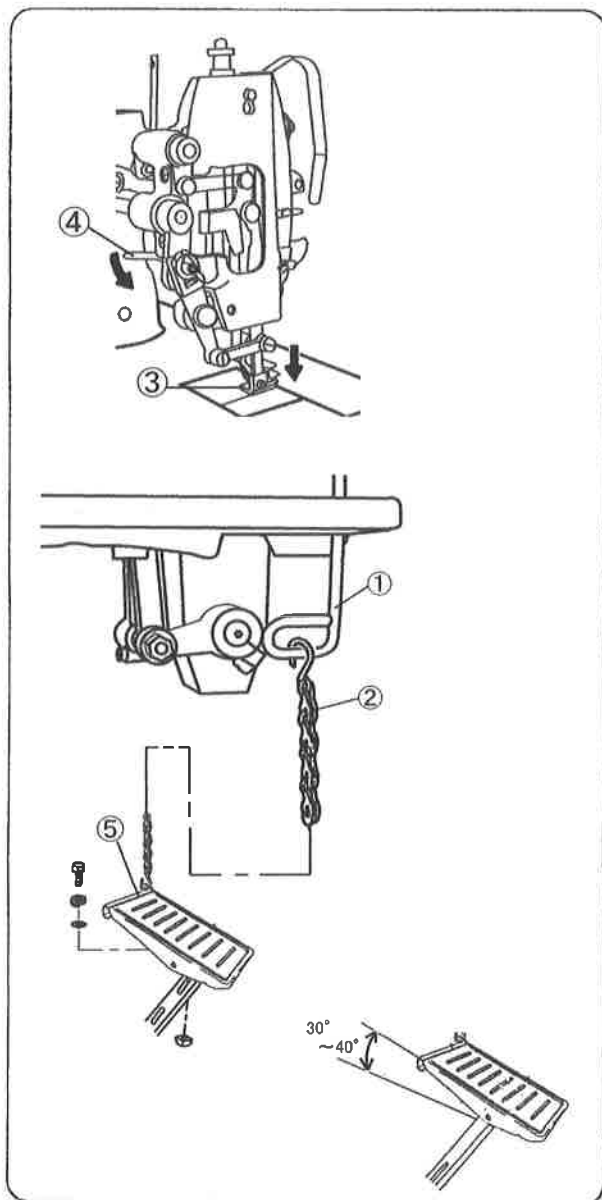
NOTE: Tap the head rest securely into the table hole. If the head rest is not pushed in as far as it will go, the machine head will not be sufficiently stable when it is tilted back.

4-4. Installing the spool pin



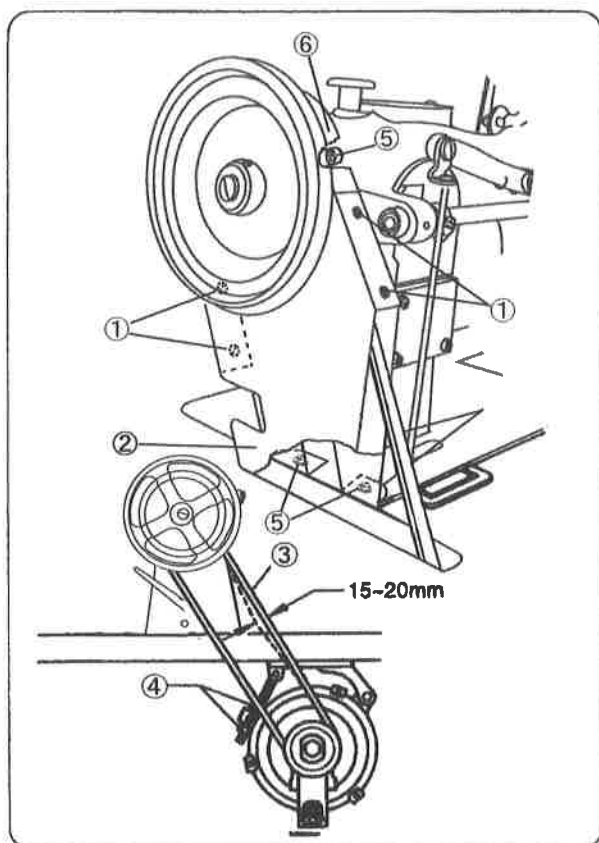
1. Insert the arm spool pin① to the hole and fix it while the threading hole of the arm spool pin① direct to the upper thread guide④.
2. Insert the arm spool pin bushing② to the hole and fix it, and then insert the arm spool pin③. At that time, the threading hole should be directed to the arm spool pin①

4-5. Installing the pedal and chain



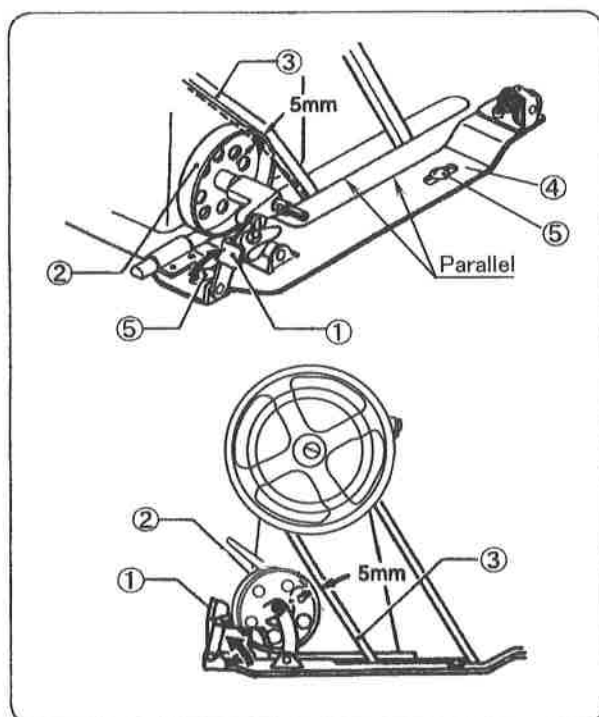
1. Lower the feed foot③ by foot lifting lever④.
2. Connect the chain② with the foot lifter lifting lever connecting rod① and the pedal⑤ as shown in the illustration at left.
3. Adjust the length of the chain so that the angle between the pedal and floor is to be 30° - 40°.

4-6. Installing the belt



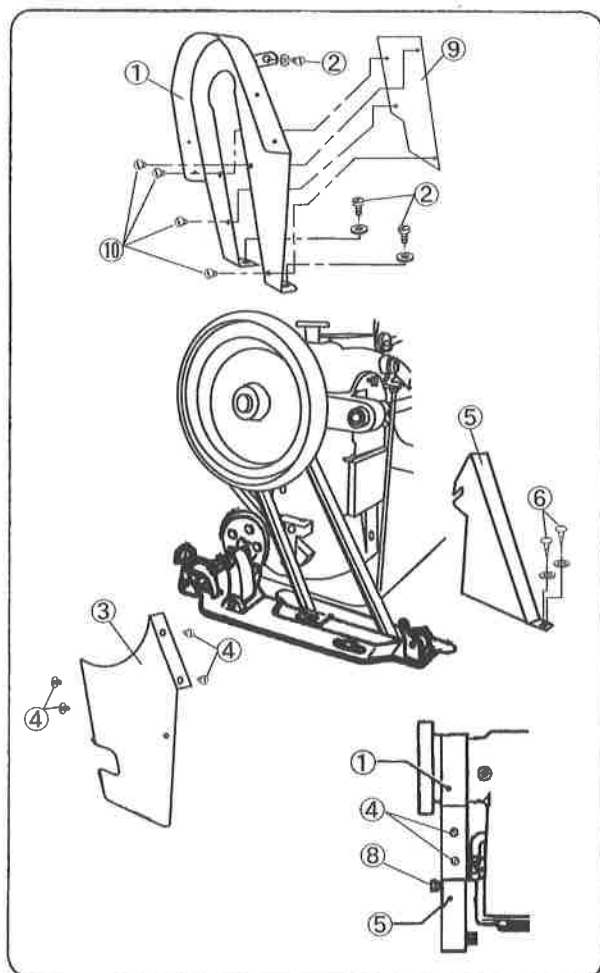
1. Remove the screws①(4pcs.) and the belt guard side cover②.
2. Remove the screws⑤(3pcs.), and remove the belt guard⑥ from upper side.
3. Tilt back the machine head, and then place the belt③ onto the motor pulley and the machine pulley.
4. Turn the nut④ to adjust so that there is 15 – 20mm of deflection in the V-belt③ when it is pressed at the midway point with a force of 9.8N(1kgf).

4-7. Installing the bobbin winder



1. Push down the bobbin set lever① as far as it will go.
2. Place the bobbin winder pulley② so that it pushes the belt③ by approximately 5mm, and then place the bobbin winder④ so that it is parallel with the belt hole in the work table.
3. Install the bobbin winder④ to the work table with the two screws⑤(2pcs.).
4. Pull the bobbin set lever① back and check that there is approximately 5mm of clearance between the bobbin winder pulley② and the belt③.

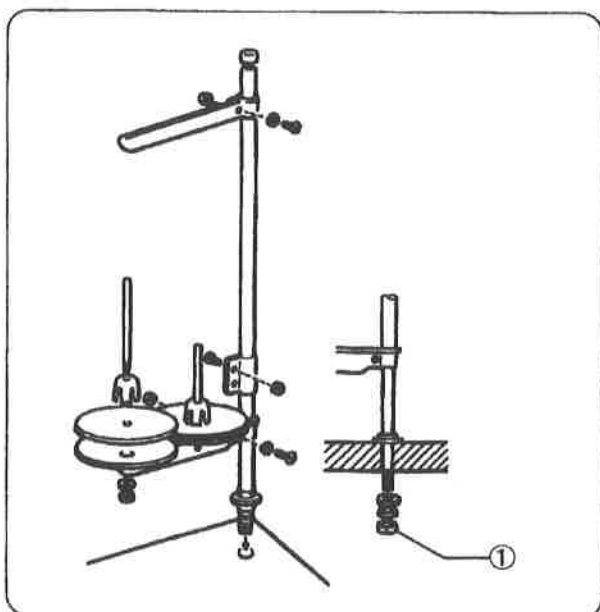
4-8. Installing the belt guard, the auxiliary belt guard and the belt guard auxiliary plate



Please note that the auxiliary belt guard(5) and the belt guard auxiliary plate(9) is optional equipment. If unnecessary, you don't need to do adjustment of fig. No.2 and No.4.

1. Install the belt guard(1) from a top of the machine head and fix it with the screws(2)(3pcs.).
2. Install the belt guard auxiliary plate(9) from the reverse side of belt guard(1) and fix it with the screws(10)(4pcs.)
3. Tilt back the machine head, and then install the belt guard side cover(3) from down side of machine pulley and fix it with the screws(4)(4pcs.)
*Please fix so that the belt guard side cover(3) covers belt guard(1)
4. Fix the auxiliary belt guard(5) and the belt guard(1) with the wood screws(6)(2pcs.) and the screw(8) so that there is no gap between them.

4-9. Installing the thread stand



1. Assemble the thread stand as shown in the illustration, and then install it to the work table.
*Tighten the nut(1) securely so that the thread stand does not move.

4-10. Lubrication

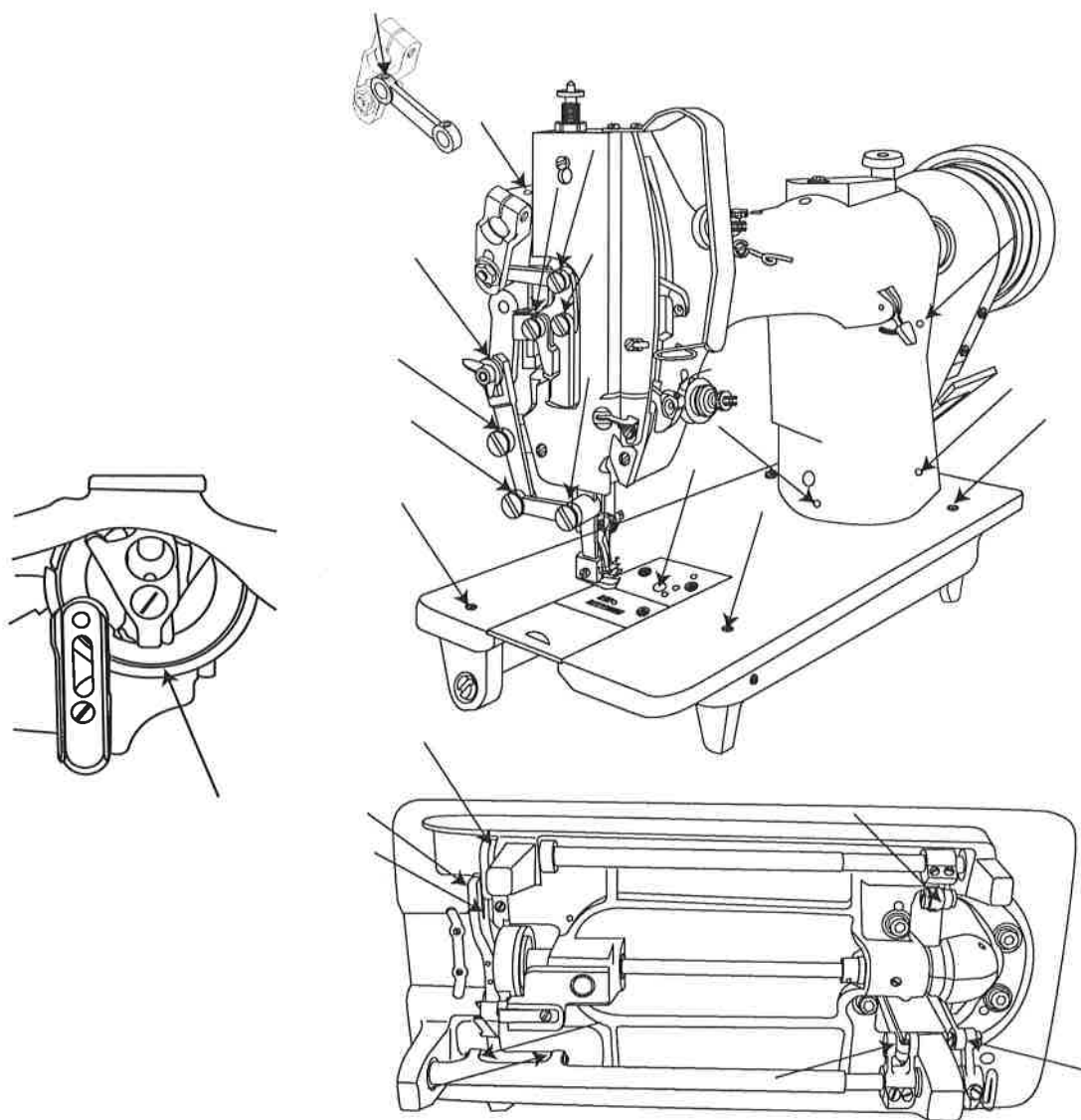


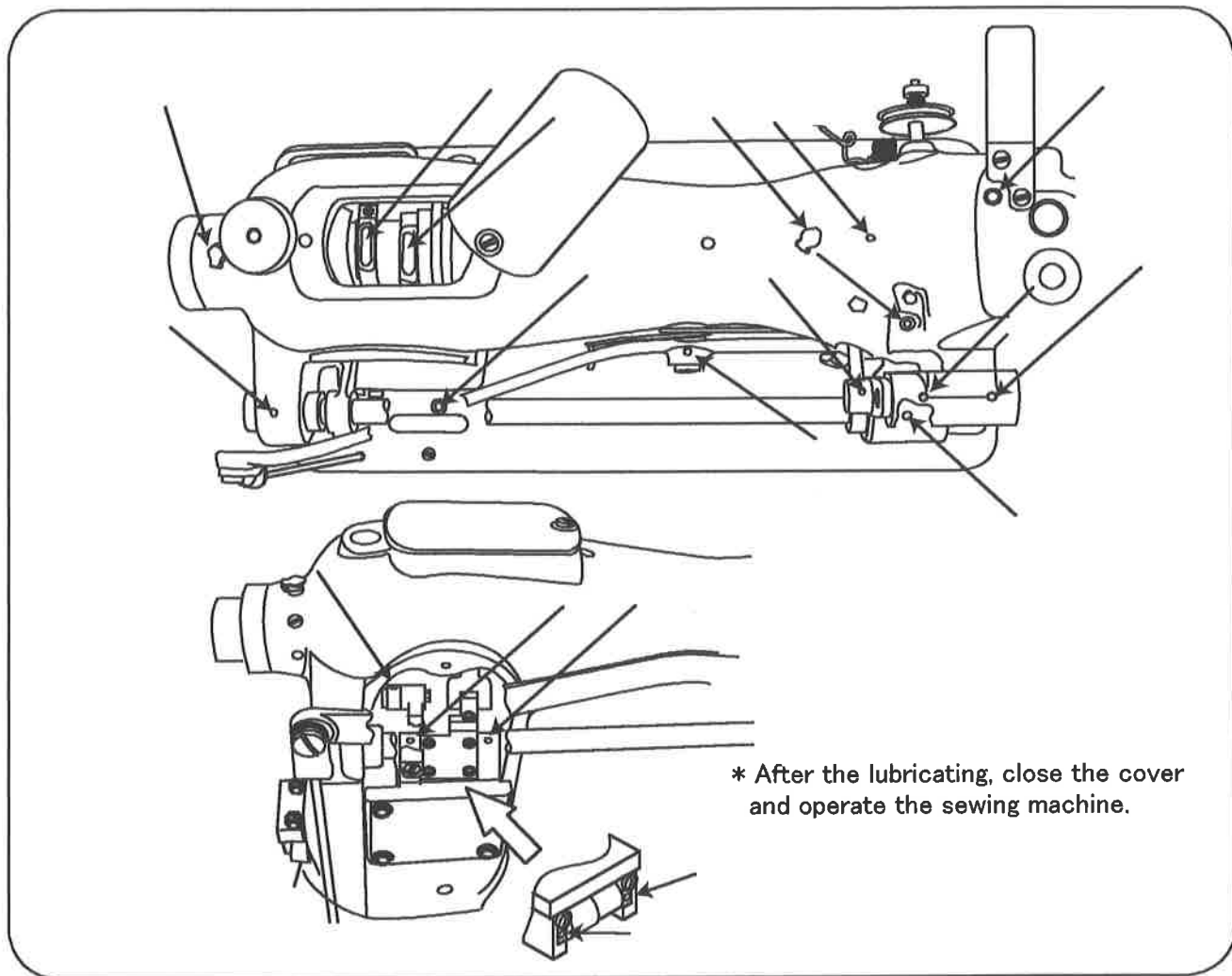
CAUTION



- Do not connect the power cord until lubrication has been completed, otherwise the machine may operate if the treadle is pressed by mistake, which could result in injury.
- Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarrhea.
- Keep the oil out the reach of children.

- The sewing machine should always be lubricated and the oil supply replenished before it is used for the first time, and also after long periods of non-use.
- Use only the lubricating oil.
- Add 1-2 drops of oil in the places indicated by the arrows.
- Add oil other sliding parts also, while being careful to avoid oil leaks.
- Oiling must be done at least twice daily continuous use.





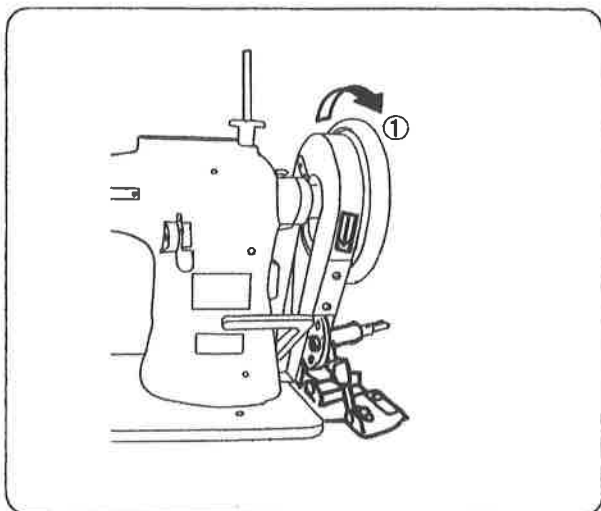
4-11. Checking the machine pulley direction



CAUTION



• Do not touch any of the moving parts or place any objects against the machine while sewing, as this may result in personal injury or damage to the machine.



1. Insert the power cord plug into the wall outlet, and then turn on the power switch.
 2. Depress the treadle and check that the direction of the machine pulley matches the direction of the arrow ①.
- * If the direction of rotation is reversed, change the direction of rotation to the correct direction while referring to the instruction manual for the motor.

5. PREPARATION BEFORE SEWING

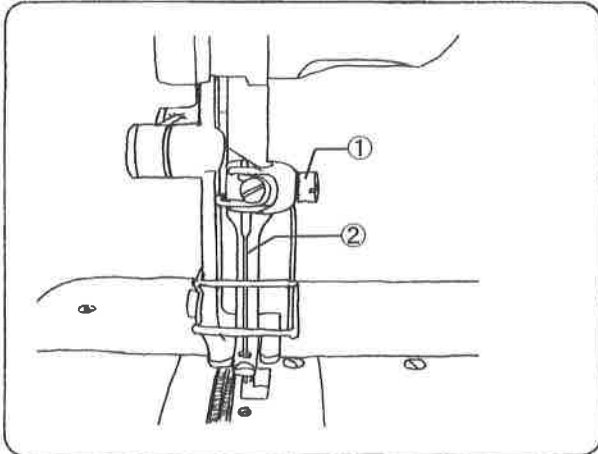
5-1. Installing the needle



CAUTION



• Turn off the power switch before installing the needle. The motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work. The machine may operate if the treadle is pressed by mistake, which could result in injury.

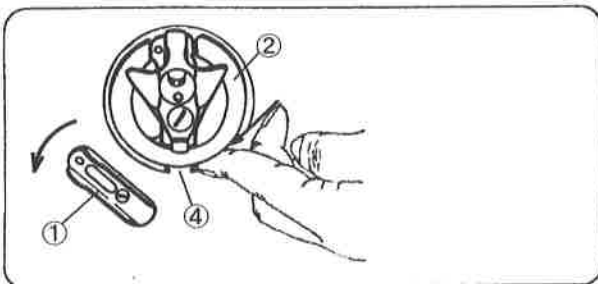


1. Turn the machine pulley toward you to move the needle bar to its highest position.
2. Loosen the screw①.
3. Holding the needle② with its long groove facing left, insert all the way into the needle bar.
4. Tighten the screw①.

5-2. Removing the bobbin case and the bobbin

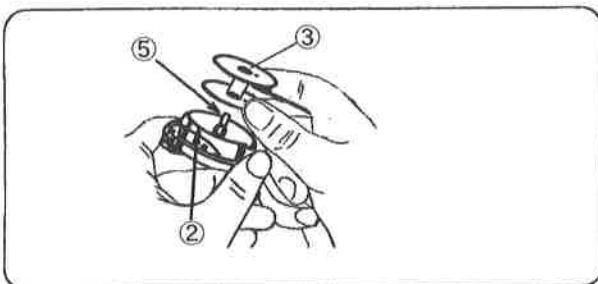


• Turn off the power supply before installing the bobbin case. The motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work. The machine may operate if the treadle is pressed by mistake, which could result in injury.



■ Removing the bobbin case

1. Open the slide plate to left direction.
 2. Turn the machine pulley until the needle comes above the throat plate.
 3. Pull down the bobbin case retainer① to left side, and then remove the bobbin case② while pushing it up.
- *It will be easy to remove the bobbin case②, when the groove of the rotating hook④ is positioned as shown in the illustration at left.



■ Removing the bobbin

1. Lift up the latch⑤ of the bobbin case②, and then remove the bobbin③.

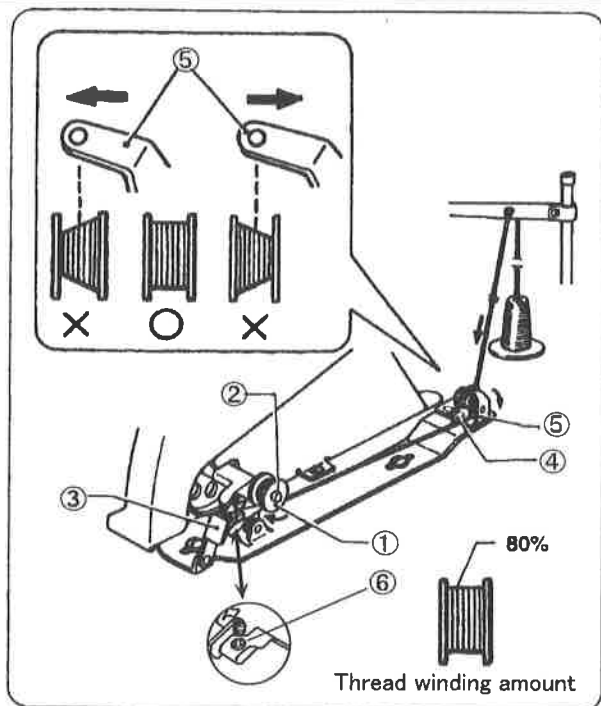
5-3. Winding the lower thread



CAUTION



• Do not touch any of the moving parts or place any objects against the machine while winding the lower thread, as this may result in personal injury or damage to the machine.



1. Turn on the power switch.
 2. Place the bobbin① onto the bobbin winder shaft②.
 3. Wind the thread several times around the bobbin① in the direction indicated by the arrow.
 4. Push down the bobbin set lever③.
 5. Raise the presser foot with the foot lifting lever.
 6. Depress the treadle. Lower thread winding will then start.
 7. Once winding of the lower thread is completed, the bobbin set lever③ will return automatically.
- * If the thread cannot be wound on evenly, loosen the screw④ and move the bobbin winder bracket⑤ to the side where there is less thread.
- ** Turn the adjustment screw⑥ to adjust the bobbin winding amount.
- To increase the winding amount: Tighten the screw
 - To decrease the winding amount: Loosen the screw

Note: The amount of thread wound onto the bobbin should be a maximum of 80% of the bobbin capacity.

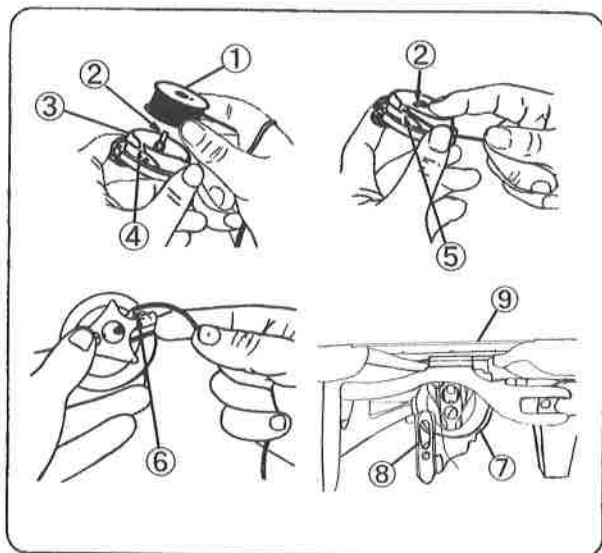
5-4. Installing the bobbin case



CAUTION



• Turn off the power supply before installing the bobbin case. The motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work. The machine may operate if the treadle is pressed by mistake, which could result in injury.



1. Lift up the latch② of bobbin case③, and place the bobbin① onto the bobbin case③ so that the thread winding direction is counter-clockwise as shown in the illustration.
2. Pass the lower thread through the groove④ of the bobbin case③.
3. Pass it along the inside of the tension spring⑤, and pass it through the hole⑥. Then lay the latch② of the bobbin case. Pull the lower thread until there is a length of approx. 5cm of thread.
4. Place the bobbin case③ onto the rotating hook⑦, turning the hole⑥ upwards, and then pull up the bobbin case retainer⑧ and close the slide plate⑨.

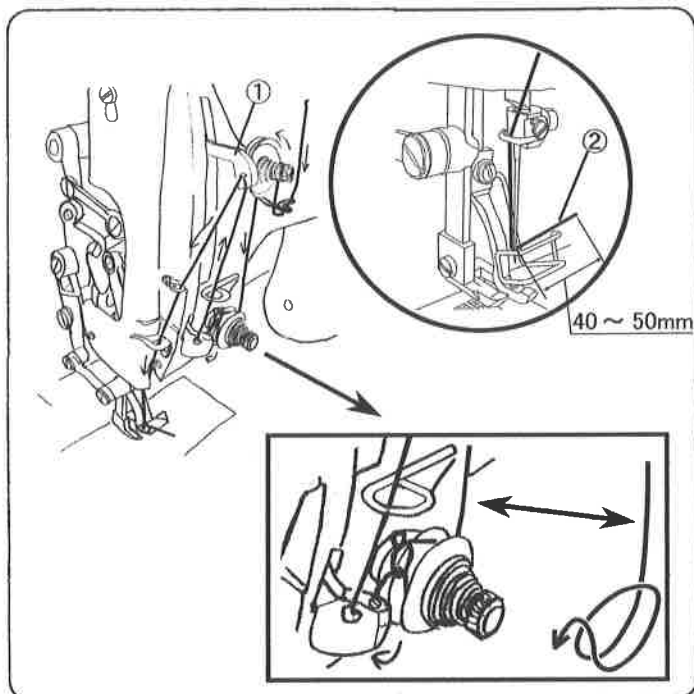
5-5. Threading the upper thread



CAUTION

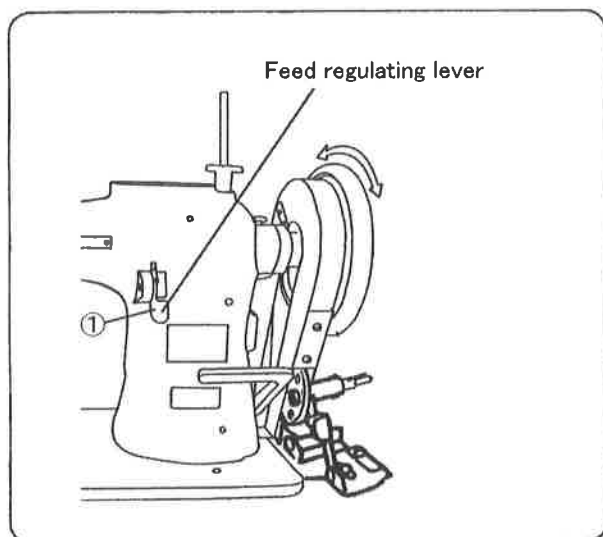


• Turn off the power supply before threading the upper thread. The motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work. The machine may operate if the treadle is pressed by mistake, which could result in injury.



1. Turn the machine pulley and raise the thread take-up lever① before threading the upper thread. This will make threading easier and it will prevent the thread from coming out at the sewing start. Leave a 40 to 50mm thread leader.

5-6. Adjusting the stitch length



1. While pushing the feed regulating lever① downward, turn the machine pulley slowly forward so that the feed regulating lever① enters the groove in the feed eccentric. Then while pushing the feed regulating lever①, turn the machine pulley to forward or backward to adjust its position.
 - To increase the stitch length, turn the machine pulley forward.
 - To decrease the stitch length, turn the machine pulley backward.

6. SEWING



CAUTION



• Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.



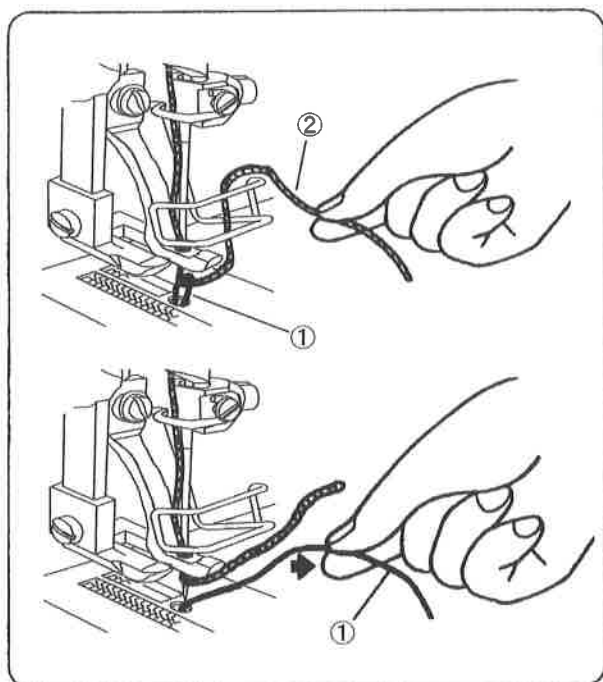
• Turn off the power switch at the following times. The motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work. The machine may operate if the treadle is pressed by mistake, which could result in injury.

1. When threading the needle
2. When replacing the needle and bobbin
3. When not using the machine and when leaving the machine unattended



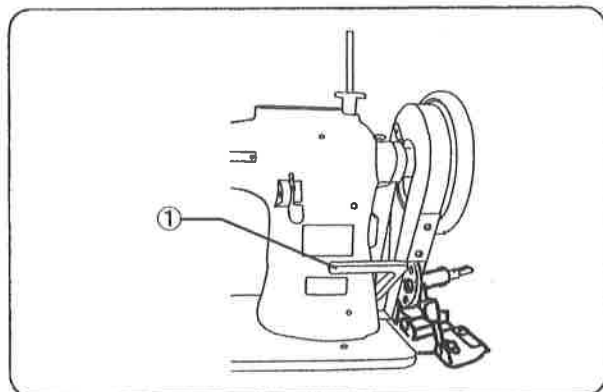
• Do not touch any of the moving parts or place any objects against the machine while sewing, as this may result in personal injury or damage to the machine.

6-1. Sewing



1. While holding the upper thread② with your fingers, turn the machine pulley by hand toward you until the lower thread① comes out onto the throat plate.
2. Pull the lower thread toward① you and check that it pulls to smoothly.
3. Turn on the power switch.
4. Depress the treadle to start sewing.

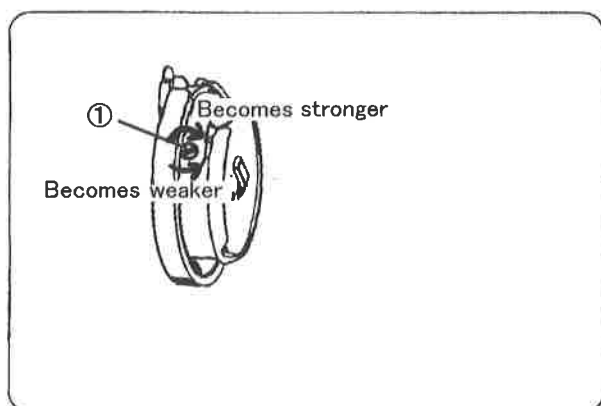
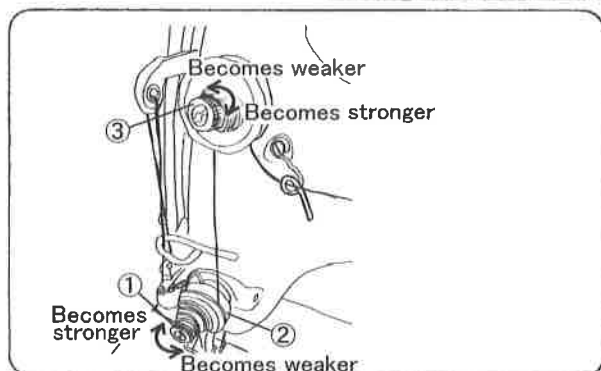
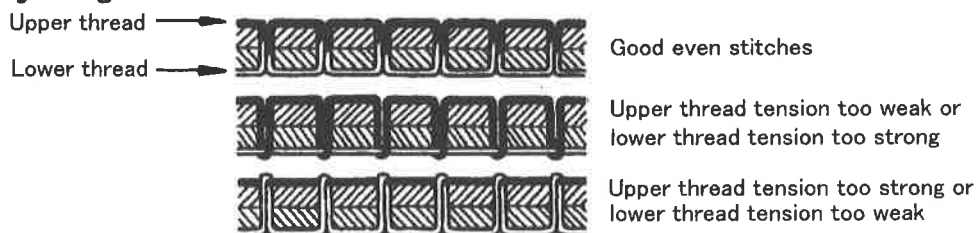
6-2. Backtacking



1. When the feed reversing lever① is pushed, the material feed direction will be reversed, and when it is returned to its original position, the feed direction will change back to normal.

7. THREAD TENSION

7-1. Adjusting the thread tension



■ Upper thread tension

1. The tension of the upper thread is adjusted using lower tension thumb nut① (There are two tension thumb nut of upper and lower). To increase the tension of the upper thread, turn the tension thumb nut① clockwise. To decrease tension, turn the tension thumb nut① counter-clockwise.
2. If the tension of lower tension disc② is weak, turn the upper tension thumb nut③ slightly clockwise and turn the lower tension thumb nut① counter-clockwise so that the upper thread is threading without deflection.

■ Lower thread tension



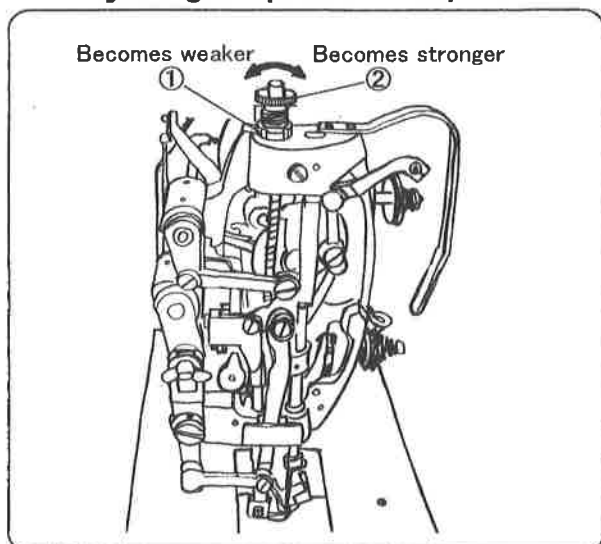
CAUTION



• Turn off the power supply before removing or inserting the bobbin case. The motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work. The machine may operate if the treadle is pressed by mistake, which could result in injury.

1. The tension of the lower thread is adjusted by turning the screw①.
 - To increase the tension of the lower thread, turn the screw① clockwise.
 - To decrease the tension of the lower thread, turn the screw① counter-clockwise.

7-2. Adjusting the presser foot pressure



1. Loosen the nut①.
2. Adjust the presser foot pressure weakly as much as possible so that the presser foot can properly hold down material by turning the screw②.
 - To increase, turn the screw② clockwise.
 - To decrease, turn the screw② counter-clockwise.
3. After the adjustment, tighten the nut① securely.

9. TROUBLESHOOTING




- Please check the following points before calling for repairs or service.
- If the following suggestions do not solve the problem, turn off the machine power supply and contact your nearest SEIKO dealer.

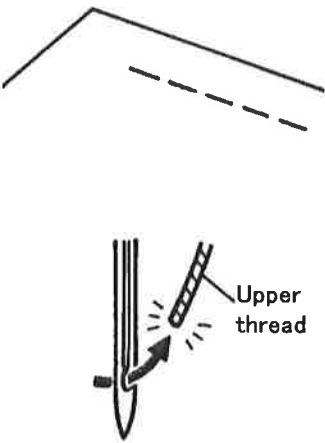


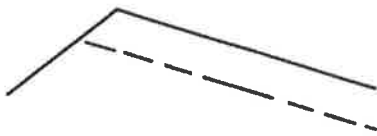
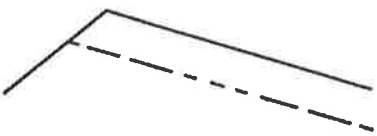
CAUTION

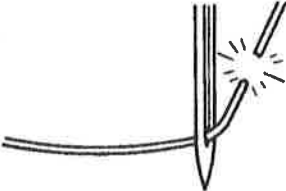


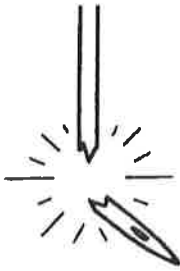
- Turn off the power switch and disconnect the power cord before carrying out troubleshooting, otherwise the machine will operate if the treadle is pressed by mistake, which could result in injury.
- * When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

Problem	Possible cause	Page
1. Upper thread is not tight. 	<ul style="list-style-type: none"> • Is the upper thread tension too weak, or is the lower thread tension too strong? Adjust the upper thread tension or lower thread tension. • Is the thread tension spring too weak? Adjust the tension of thread tension spring. • Is the operating range for the thread take-up spring too small? Increase the operating range for the thread take-up spring. • Is the clearance between the bobbin case and the bobbin case retainer correct? Adjust the position of the bobbin case retainer. 	13 18 18 16
2. Lower thread is not tight. 	<ul style="list-style-type: none"> • Is the lower thread tension too weak, or is the upper thread tension too strong? Adjust the lower thread tension or upper thread tension. 	13
3. Loops appear in seam 	<ul style="list-style-type: none"> • Is the tip of the needle burred? If the tip of the needle is burred, replace the needle. • Is the needle hole facing in the correct direction? If the direction of the hole is incorrect, install the needle correctly. • Is the needle too thin for the thread? Replace with a needle that is one rank thicker. • Is the upper thread tension too weak? Adjust the upper thread tension. • Is the thread tension spring too weak? Adjust the tension of the thread tension spring. • Is the operating range for the thread take-up spring too small? Increase the operating range for the thread take-up spring. • Is the thread path not smooth enough? Use a file with a fine grain or sandpaper to polish smooth the thread path. • Is there too much thread wound onto the bobbin? The bobbin-winding amount should not be more than 80%. • Is the bobbin-winding tension too strong or too weak? Wind the thread onto the bobbin at an appropriate tension. 	9 9 9 13 18 18 - 10 -

Problem	Possible cause	Page
	<ul style="list-style-type: none"> •Is the bobbin turning smoothly? Pull out the lower thread to check the turning of the bobbin, and replace the bobbin if necessary. 	—
	<ul style="list-style-type: none"> •Is the bobbin case tension spring defective? Replace the rotating hook. 	—
	<ul style="list-style-type: none"> •Is the rotating hook scratched? Replace the rotating hook. 	—
	<ul style="list-style-type: none"> •Is the feed dog height correct? Adjust the feed dog height so that it is 1.4mm when the feed dog is at its highest position. 	17
	<ul style="list-style-type: none"> •Is the needle and feed timing correct? Adjust the needle and feed timing. 	18
	<ul style="list-style-type: none"> •Is the needle and rotating hook timing correct? After adjusting the needle bar height, adjust the needle and rotating hook timing. 	14–15
	<ul style="list-style-type: none"> •Is the clearance between the bobbin case and the bobbin case retainer correct? Adjust the position of the bobbin case retainer. 	16
<p>4. Skipped stitches at sewing start Thread unraveling at sewing start</p> 	<ul style="list-style-type: none"> •Is the feed dog height correct? Adjust the feed dog height so that it is 1.4mm when the feed dog is at its highest position. 	17
	<ul style="list-style-type: none"> •Are the thread take-up spring tensions too strong? Reduce the tension of the thread take-up springs. 	18
	<ul style="list-style-type: none"> •Is the operating range for the thread take-up spring too large? Decrease the operating range for the thread take-up spring. 	18
	<ul style="list-style-type: none"> •Is the presser foot pressure too weak? Adjust the presser foot pressure. 	13
	<ul style="list-style-type: none"> •Is the needle too wide? Try using a needle with a count that is one lower than the current needle. 	9
	<ul style="list-style-type: none"> •Is the thread take-up lever at its highest position at the sewing start? Set the thread take-up lever to its highest position at the sewing start. 	11
	<ul style="list-style-type: none"> •Is the length of the upper thread trailing from the needle hole too short? Pull about 40–50mm of thread the needle hole at the sewing start. 	11

Problem	Possible cause	Page
5. Skipped stitches occur while sewing 	<ul style="list-style-type: none"> •Is the needle tip bent? Is the needle tip blunt? If the needle tip is bent or broken, replace the needle. 	9
	<ul style="list-style-type: none"> •Is the needle properly installed? If it is incorrect, install the needle correctly. 	9
	<ul style="list-style-type: none"> •Is the needle too thin or too thick for the thread? Replace with a needle that is suitable for the thread. 	9
	<ul style="list-style-type: none"> •Is the machine properly threaded? If it is incorrect, thread the thread correctly. 	11
	<ul style="list-style-type: none"> •Is the presser foot pressure too weak? Adjust the presser foot pressure. 	13
	<ul style="list-style-type: none"> •Is the rotary hook tip broken or worn? Sharpen the rotating hook tip or replace the rotary hook. 	—
	<ul style="list-style-type: none"> •Is the height of the needle bar correct? Adjust the height of the needle bar. 	15
6. Uneven seam 	<ul style="list-style-type: none"> •Is the needle and feed timing correct? Adjust the needle and feed timing. 	18
	<ul style="list-style-type: none"> •Is the feed dog height correct? Adjust the feed dog height so that it is 1.4mm when the feed dog is at its highest position. 	17
	<ul style="list-style-type: none"> •Is the presser foot pressure too weak? Adjust the presser foot pressure. 	13

Problem	Possible cause	Page
7. Upper thread breaks 	<ul style="list-style-type: none"> •Is the needle bent or is the needle tip broken? Replace the needle if it is bent or broken 	9
	<ul style="list-style-type: none"> •Is the needle scratched? Replace the needle. 	9
	<ul style="list-style-type: none"> •Is the needle properly installed? If it is incorrect, install the needle correctly. 	9
	<ul style="list-style-type: none"> •Is the needle too thin or too thick for the thread? Replace with a needle that is suitable for the thread. 	9
	<ul style="list-style-type: none"> •Is the upper thread tension too strong or too weak? Adjust the upper thread tension. 	13
	<ul style="list-style-type: none"> •Is the tension of the thread take-up spring too strong or too weak? Adjust the tension of the thread take-up spring. 	18
	<ul style="list-style-type: none"> •Is the operating range for the thread take-up spring too large or too small? Decrease or increase the operating range for the thread take-up spring. 	18
	<ul style="list-style-type: none"> •Is the thread path not smooth enough? Use a file with a fine grain or sandpaper to polish smooth the thread path. 	—
	<ul style="list-style-type: none"> •Is the rotating hook tip broken or worn? Sharpen the rotating hook tip or replace the rotating hook. 	—
	<ul style="list-style-type: none"> •Is the rotating hook thread path damaged? Smooth the rotating hook thread path or replace the rotating hook. 	—
	<ul style="list-style-type: none"> •Is the clearance between the bobbin case and the bobbin case retainer correct? Adjust the position of the bobbin case retainer. 	16
	<ul style="list-style-type: none"> •Has the needle been pushed in fully during installation? Install the needle correctly. 	9
	<ul style="list-style-type: none"> •Is the height of the needle bar too low? Adjust the height of the needle bar. 	15
	<ul style="list-style-type: none"> •Is the needle and rotating hook timing correct? After adjusting the needle bar height, adjust the needle and rotating hook timing. 	14–15
	<ul style="list-style-type: none"> •Is the sewing speed too fast, causing the thread to break due to heat? Reduce the sewing machine speed. 	—
	<ul style="list-style-type: none"> •Is the material feeding correctly at sections where the thickness changes? Increase the foot pressure. 	13

Problem	Possible cause	Page
8. Needle breaks 	<ul style="list-style-type: none"> •Is the material being pushed or pulled with excessive force during sewing? •Is the needle properly installed? If it is incorrect, install the needle correctly. •Is the needle bent, or is the needle tip broken? Replace the needle. •Is the needle and feed timing correct? Adjust the needle and feed timing. •Is the needle and rotating hook timing correct? After adjusting the needle bar height, adjust the needle and rotating hook timing. 	 — 9 9 18 14, 15
<div> Caution <ul style="list-style-type: none"> •It is extremely dangerous to leave any pieces of broken needle sticking in the material. If the needle breaks, search for all pieces until the whole of the needle is found again. •Furthermore, we recommend that through steps be taken to account for such needles to comply with product liability regulations. </div>		

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