

# MH-486-5

# INSTRUCTION MANUAL

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**NOTE :** Read safety instructions carefully and understand them before using.  
Retain this Instruction Manual for future reference.

# TO ENSURE SAFE USE OF YOUR SEWING MACHINE








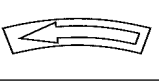


For the sewing machine, automatic machine and ancillary devices (hereinafter collectively referred to as "machine"), it is inevitable to conduct sewing work near moving parts of the machine. This means that there is always a possibility of unintentionally coming in contact with the moving parts. Operators who actually operate the machine and maintenance personnel who are involved in maintenance and repair of the machine are strongly recommended to carefully read to fully understand the following **SAFETY PRECAUTIONS** before using/maintaining the machine. The content of the **SAFETY PRECAUTIONS** includes items which are not contained in the specifications of your product.

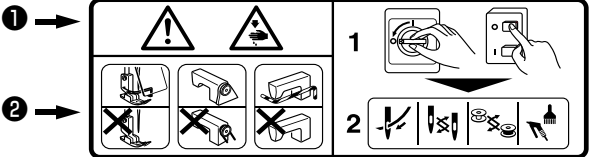


The risk indications are classified into the following three different categories to help understand the meaning of the labels. Be sure to fully understand the following description and strictly observe the instructions.

## ( I ) Explanation of risk levels

	<b>DANGER :</b> This indication is given where there is an immediate danger of death or serious injury if the person in charge or any third party mishandles the machine or does not avoid the dangerous situation when operating or maintaining the machine.
	<b>WARNING :</b> This indication is given where there is a potentiality for death or serious injury if the person in charge or any third party mishandles the machine or does not avoid the dangerous situation when operating or maintaining the machine.
	<b>CAUTION :</b> This indication is given where there is a danger of medium to minor injury if the person in charge or any third party mishandles the machine or does not avoid the dangerous situation when operating or maintaining the machine.
	Items requiring special attention.

## (II) Explanation of pictorial warning indications and warning labels

Pictorial warning indication		There is a risk of injury if contacting a moving section.	Pictorial warning indication		Be aware that holding the sewing machine during operation can hurt your hands.
		There is a risk of electrical shock if contacting a high-voltage section.			There is a risk of entanglement in the belt resulting in injury.
		There is a risk of a burn if contacting a high-temperature section.			There is a risk of injury if you touch the button carrier.
		Be aware that eye deficiency can be caused by looking directly at the laser beam.	Indication label		The correct direction is indicated.
		There is a risk of contact between your head and the sewing machine.			Connection of a earth cable is indicated.

Warning label		
	<p>① • There is the possibility that slight to serious injury or death may be caused.</p> <p>• There is the possibility that injury may be caused by touching moving part.</p> <p>② • To perform sewing work with safety guard.</p> <p>• To perform sewing work with safety cover.</p> <p>• To perform sewing work with safety protection device.</p> <p>③ • Be sure to turn the power OFF before carrying out "machine-head threading", "needle changing", "bobbin changing" or "cleaning".</p>	
Electrical-shock danger label		<p><b>危険</b></p> <p>高電圧部分に触れて、大けがをすることがある。 電源を切って、5分以上たってからカバーをはずすこと。</p>
		<p><b>DANGER</b></p> <p>Hazardous voltage will cause injury. Turn off main switch and unplug power cord and wait at least 5 minutes before opening this cover.</p>

# SAFETY PRECAUTIONS

Accident means "to cause personal injury or death or damage to property."



## DANGER

1. When it is necessary to open the control box containing electrical parts, be sure to turn the power off and wait for five minutes or more before opening the cover in order to prevent accident leading to electrical shock.



## CAUTION

### Basic precaution

1. Be sure to read the instruction manual and other explanatory documents supplied with accessories of the machine before using the machine. Carefully keep the instruction manual and the explanatory documents at hand for quick reference.
2. The content of this section includes items which are not contained in the specifications of your product.
3. Be sure to wear safety goggles to protect against accident caused by needle breakage.
4. Those who use a heart pacer have to use the machine after consultation with a medical specialist.

### Safety devices and warning labels

1. Be sure to operate the machine after verifying that safety device(s) is correctly installed in place and works normally in order to prevent accident caused by lack of the device(s).
2. If any of the safety devices is removed, be sure to replace it and verify that it works normally in order to prevent accident that can result in personal injury or death.
3. Be sure to keep the warning labels adhered on the machine clearly visible in order to prevent accident that can result in personal injury or death. If any of the labels has stained or come unstuck, be sure to change it with a new one.

### Application and modification

1. Never use the machine for any application other than its intended one and in any manner other than that prescribed in the instruction manual in order to prevent accident that can result in personal injury or death. JUKI assumes no responsibility for damages or personal injury or death resulting from the use of the machine for any application other than the intended one.
2. Never modify and alter the machine in order to prevent accident that can result in personal injury or death. JUKI assumes no responsibility for damages or personal injury or death resulting from the machine which has been modified or altered.

### Education and training

1. In order to prevent accident resulting from unfamiliarity with the machine, the machine has to be used only by the operator who has been trained/educated by the employer with respect to the machine operation and how to operate the machine with safety to acquire adequate knowledge and operation skill. To ensure the above, the employer has to establish an education/training plan for the operators and educate/train them beforehand.

### Items for which the power to the machine has to be turned off

Turning the power off: Turning the power switch off, then removing the power plug from the outlet.  
This applies to the following.

1. Be sure to immediately turn the power off if any abnormality or failure is found or in the case of power failure in order to protect against accident that can result in personal injury or death.
2. To protect against accident resulting from abrupt start of the machine, be sure to carry out the following operations after turning the power off. For the machine incorporating a clutch motor, in particular, be sure to carry out the following operations after turning the power off and verifying that the machine stops completely.
  - 2-1. For example, threading the parts such as the needle, looper, spreader etc. which have to be threaded, or changing the bobbin.
  - 2-2. For example, changing or adjusting all component parts of the machine.
  - 2-3. For example, when inspecting, repairing or cleaning the machine or leaving the machine.
3. Be sure to remove the power plug by holding the plug section instead of the cord section in order to prevent electrical-shock, earth-leakage or fire accident.
4. Be sure to turn the power off whenever the machine is left unattended between works.
5. Be sure to turn the power off in the case of power failure in order to prevent accident resulting of breakage of electrical components.

# PRECAUTIONS TO BE TAKEN IN VARIOUS OPERATION STAGES

## Transportation

1. Be sure to lift and move the machine in a safe manner taking the machine weight in consideration. Refer to the text of the instruction manual for the mass of the machine.
2. Be sure to take sufficient safety measures to prevent falling or dropping before lifting or moving the machine in order to protect against accident that can result in personal injury or death.
3. Once the machine has been unpacked, never re-pack it for transportation to protect the machine against breakage resulting from unexpected accident or dropping.

## Unpacking

1. Be sure to unpack the machine in the prescribed order in order to prevent accident that can result in personal injury or death. In the case the machine is crated, in particular, be sure to carefully check nails. The nails have to be removed.
2. Be sure to check the machine for the position of its center of gravity and take it out from the package carefully in order to prevent accident that can result in personal injury or death.

## Installation

### (I) Table and table stand

1. Be sure to use JUKI genuine table and table stand in order to prevent accident that can result in personal injury or death. If it is inevitable to use a table and table stand which are not JUKI genuine ones, select the table and table stand which are able to support the machine weight and reaction force during operation.
2. If casters are fitted to the table stand, be sure to use the casters with a locking mechanism and lock them to secure the machine during the operation, maintenance, inspection and repair in order to prevent accident that can result in personal injury or death.

### (II) Cable and wiring

1. Be sure to prevent an extra force from being applied to the cable during the use in order to prevent electrical-shock, earth-leakage or fire accident. In addition, if it is necessary to cable near the operating section such as the V-belt, be sure to provide a space of 30 mm or more between the operating section and the cable.
2. Be sure to avoid starburst connection in order to prevent electrical-shock, earth-leakage or fire accident.
3. Be sure to securely connect the connectors in order to prevent electrical-shock, earth-leakage or fire accident. In addition, be sure to remove the connector while holding its connector section.

### (III) Grounding

1. Be sure to have an electrical expert install an appropriate power plug in order to prevent accident caused by earth-leakage or dielectric strength voltage fault. In addition, be sure to connect the power plug to the grounded outlet without exceptions.
2. Be sure to ground the earth cable in order to prevent accident caused by earth leakage.

### (IV) Motor

1. Be sure to use the specified rated motor (JUKI genuine product) in order to prevent accident caused by burnout.
2. If a commercially available clutch motor is used with the machine, be sure to select one with an entanglement preventive pulley cover in order to protect against being entangled by the V-belt.

## Before operation

1. Be sure to make sure that the connectors and cables are free from damage, dropout and looseness before turning the power on in order to prevent accident resulting in personal injury or death.
2. Never put your hand into the moving sections of the machine in order to prevent accident that can result in personal injury or death.  
In addition, check to be sure that the direction of rotation of the pulley agrees with the arrow shown on pulley.
3. If the table stand with casters is used, be sure to secure the table stand by locking the casters or with adjusters, if provided, in order to protect against accident caused by abrupt start of the machine.

## During operation

1. Be sure not to put your fingers, hair or clothing close to the moving sections such as the handwheel, hand pulley and motor or place something near those sections while the machine is in operation in order to prevent accident caused by entanglement that can result in personal injury or death.
2. Be sure not to place your fingers near the surround area of the needle or inside the thread take-up lever cover when turning the power on or while the machine is in operation in order to prevent accident that can result in personal injury or death.
3. The machine runs at a high speed. Never bring your hands near the moving sections such as looper, spreader, needle bar, hook and cloth trimming knife during operation in order to protect your hands against injury. In addition, be sure to turn the power off and check to be sure that the machine completely stops before changing the thread.
4. Be careful not to allow your fingers or any other parts of your body to be caught between the machine and table when removing the machine from or replacing it on the table in order to prevent accident that can result in personal injury or death.

5. Be sure to turn the power off and check to be sure that the machine and motor completely stop before removing the belt cover and V-belt in order to prevent accident caused by abrupt start of the machine or motor.
6. If a servomotor is used with the machine, the motor does not produce noise while the machine is at rest. Be sure not to forget to turn the power off in order to prevent accident caused by abrupt start of the motor.
7. Never use the machine with the cooling opening of the motor power box shielded in order to prevent fire accident by overheat.

#### Lubrication

1. Be sure to use JUKI genuine oil and JUKI genuine grease to the parts to be lubricated.
2. If the oil adheres on your eye or body, be sure to immediately wash it off in order to prevent inflammation or irritation.
3. If the oil is swallowed unintentionally, be sure to immediately consult a medical doctor in order to prevent diarrhea or vomiting.

#### Maintenance

1. In prevention of accident caused by unfamiliarity with the machine, repair and adjustment has to be carried out by a service technician who is thoroughly familiar with the machine within the scope defined in the instruction manual. Be sure to use JUKI genuine parts when replacing any of the machine parts. JUKI assumes no responsibility for any accident caused by improper repair or adjustment or the use of any part other than JUKI genuine one.
2. In prevention of accident caused by unfamiliarity with the machine or electrical-shock accident, be sure to ask an electrical technician of your company or JUKI or distributor in your area for repair and maintenance (including wiring) of electrical components.
3. When carrying out repair or maintenance of the machine which uses air-driven parts such as an air cylinder, be sure to remove the air supply pipe to expel air remaining in the machine beforehand, in order to prevent accident caused by abrupt start of the air-driven parts.
4. Be sure to check that screws and nuts are free from looseness after completion of repair, adjustment and part replacement.
5. Be sure to periodically clean up the machine during its duration of use. Be sure to turn the power off and verify that the machine and motor stop completely before cleaning the machine in order to prevent accident caused by abrupt start of the machine or motor.
6. Be sure to turn the power off and verify that the machine and motor stop completely before carrying out maintenance, inspection or repair of the machine. (For the machine with a clutch motor, the motor will keep running for a while by inertia even after turning the power off. So, be careful.)
7. If the machine cannot be normally operated after repair or adjustment, immediately stop operation and contact JUKI or the distributor in your area for repair in order to prevent accident that can result in personal injury or death.
8. If the fuse has blown, be sure to turn the power off and eliminate the cause of blowing of the fuse and replace the blown fuse with a new one in order to prevent accident that can result in personal injury or death.
9. Be sure to periodically clean up the air vent of the fan and inspect the area around the wiring in order to prevent fire accident of the motor.

#### Operating environment

1. Be sure to use the machine under the environment which is not affected by strong noise source (electromagnetic waves) such as a high-frequency welder in order to prevent accident caused by malfunction of the machine.
2. Never operate the machine in any place where the voltage fluctuates by more than "rated voltage  $\pm 10\%$ " in order to prevent accident caused by malfunction of the machine.
3. Be sure to verify that the air-driven device such as an air cylinder operates at the specified air pressure before using it in order to prevent accident caused by malfunction of the machine.
4. To use the machine with safety, be sure to use it under the environment which satisfies the following conditions:
 

Ambient temperature during operation	5°C to 35°C
Relative humidity during operation	35 % to 85 %
5. Dew condensation can occur if bringing the machine suddenly from a cold environment to a warm one. So, be sure to turn the power on after having waited for a sufficient period of time until there is no sign of water droplet in order to prevent accident caused by breakage or malfunction of the electrical components.
6. Be sure to stop operation when lightning flashes for the sake of safety and remove the power plug in order to prevent accident caused by breakage or malfunction of the electrical components.
7. Depending on the radio wave signal condition, the machine may generate noise in the TV or radio. If this occurs, use the TV or radio with kept well away from the machine.
8. In order to ensure the work environment, local laws and regulations in the country where the sewing machine is installed shall be followed.  
In the case the noise control is necessary, an ear protector or other protective gear should be worn according to the applicable laws and regulations.
9. Disposal of products and packages and treatment of used lubricating oil should be carried out properly according to the relevant laws of the country in which the sewing machine is used.

## **Precautions to be taken so as to use the MH-486-5 more safely**



1. Keep your hands away from needle when you turn ON the power switch or while the machine is in operation.
2. Do not put your fingers into the thread take-up cover while the machine is operating.
3. Turn OFF the power switch when tilting the machine head, or removing the belt cover or the V belts.
4. During operation, be careful not to allow your or any other person's head, hands or clothes to come close to the handwheel and thread take-up lever. Also, do not place anything close to them.
5. Do not operate your machine with the belt cover and finger guard removed.
6. When tilting the machine head, be sure to confirm that the head support bar is properly attached to your machine head, and be careful not to allow your fingers or the like to be pinched in the machine head.



1. To ensure safety, never operate the machine with the ground wire for the power supply removed.
2. When inserting/removing the power plug, the power switch has to be turned OFF in advance.
3. In time of thunder and lightening, stop your work and disconnect the power plug from the receptacle so as to ensure safety.
4. If the machine is suddenly moved from a cold place to a warm place, dew condensation may be observed. In this case, turn ON the power to the machine after you have confirmed that there is no danger of water drops in the machine.
5. To prevent fires, periodically draw out the power plug from the plug socket and clean the root of the pins and the space between pins.
6. The loopers oscillate at a high speed during operation.  
Be sure to keep your hands away from the vicinity of the loopers to protect hands from possible injury during operation. Turn the power OFF before threading the machine head.
7. To avoid possible accidents due to abrupt start of the machine, be sure to turn OFF the power to the machine.
8. Be careful of handling this product so as not to pour water or oil, shock by dropping, and the like since this product is a precision instrument.
9. When tilting or returning the sewing machine to the home position, hold the upper side of the machine head with both hands and perform the work quietly so that fingers or the like are not caught in the machine.

## BEFORE OPERATION



### CAUTION :

Check the following so as to prevent maloperation of and damage to the machine.

- Before you put the machine into operation for the first time after the set-up, clean it thoroughly . Remove all dust gathering during transportation and oil it well.
- Confirm that voltage has been correctly set.  
Confirm that the power plug has been properly connected to the power supply.
- Never use the machine in the state where the voltage type is different from the designated one.
- The direction of normal rotation of the machine is counterclockwise as observed from the pulley side.  
Take care not to allow the machine to rotate in the reverse direction.
- Never run the sewing machine before filling the oil pan with oil.
- Be sure to remove thread from the machine head and loopers before starting a trial run.
- For the first month, decrease the sewing speed and run the sewing machine at a speed of 4,000 sti/min or less.
- When you carry the sewing machine, keep hands away from the detector located behind the handwheel.
- Operate the handwheel after the machine has totally stopped.



### CAUTION :

Note that safety devices such as “belt cover”, “finger guard”, etc. may be omitted from the illustrations in this Instruction Manual for easy explanation.

When operating the machine, be sure not to remove these safety devices.

## DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY

We hereby declare that the sewing machine (sewing head) described below ;

1. Must not be put into service until the machinery to which it is incorporated has been declared in conformity with the provisions of the Directive 2006/42/EC, and
2. Conforms to the essential requirements of the Directive 2006/42/EC, described in the technical documentation, and
3. To be prepared with the above technical documentation compiled in accordance with part B of Annex VII, and
4. Also to conform to the RoHS Directive 2011/65/EU
5. Relevant information on which should be transmitted in response to a reasoned request by the national authorities, by the electronic method or other according to the request.

Model	MH-380 Series, MH-480 Series
Description	Industrial Sewing Machine
Function	make stitches and sew

Applied harmonized standards, in particular :  
EN ISO12100, EN ISO10821, EN 50581

Manufacturer :  
JUKI CORPORATION  
2-11-1, Tsurumaki, Tama-shi, Tokyo, Japan



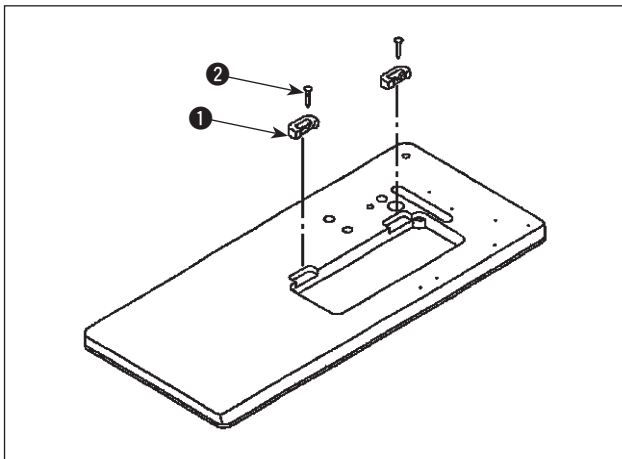
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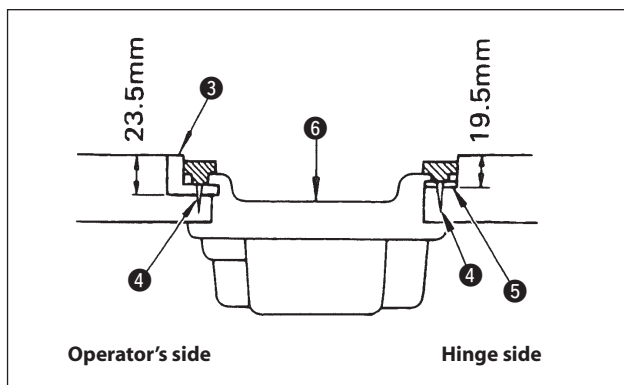
## SPECIFICATIONS

Model	MH-486-5
Sewing type	1-needle, double chainstitch, differential-feed, bottom and variable top feed machine
Sewing speed	Max. 4,500 sti/min
Stitch length	1 to 5 mm
Lift of presser foot	Hand lifter lever : 5.5 mm, Knee lifter : 7 mm
Top feed amount	0 to 7 mm
Stroke of needle bar	33 mm
Needle	Schmets 149 × 7 Nm 70 to Nm 130 (Standard : Nm 80)
Stitch length adjustment method	Dial type
Safety stitch	Condensation stitch/reverse-feed stitch (by feed lever)
Looper mechanism	Inclined crank type
Looper stroke	21.5 mm
Lubrication system	Fully automatic lubrication
Oil	JUKI New Defrix Oil No.1
Noise	- Equivalent continuous emission sound pressure level ( $L_{pA}$ ) at the workstation: A-weighted value of 83.5 dB; (Includes $K_{pA} = 2.5$ dB); according to ISO 10821- C.6.2 -ISO 11204 GR2 at 4,500 sti/min. - Sound power level ( $L_{WA}$ ): A-weighted value of 90.5 dB; (Includes $K_{WA} = 2.5$ dB); according to ISO 10821- C.6.2 -ISO 3744 GR2 at 4,500 sti/min.

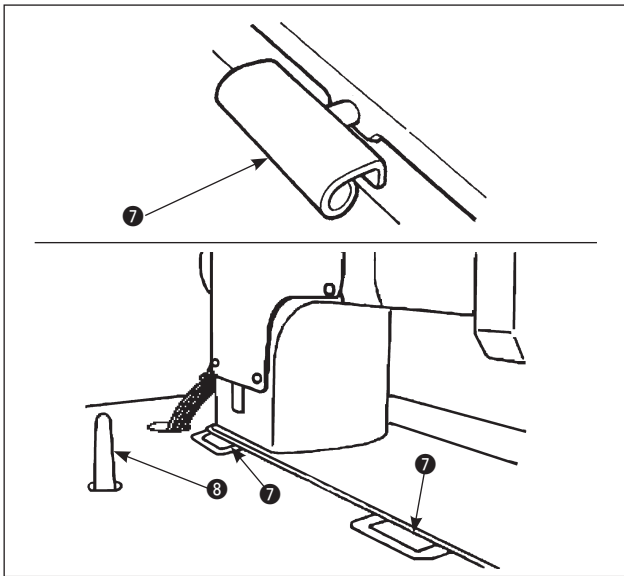
## 1. INSTALLATION



- 1) Carry the sewing machine with two persons.  
**(Caution) Do not hold the handwheel.**
- 2) Do not put protruding articles such as the screwdriver and the like at the location where the sewing machine is placed.
- 3) Attaching the hinge seats and the support rubbers of the machine head  
Fix the hinge seats ① supplied with the machine on the table using nails ②.



- 4) Attaching the oil pan  
Install oil pan ⑥ in such a way that it is supported at four corners of the groove in the table.  
At two corners on the operator's side, attach rubber cushion ③ to a protruding portion of the table by means of nails ④. At two corners on the hinge side, attach two head-rest cushions ⑤ by means of nails ④. Then place oil pan ⑥ on the cushions.



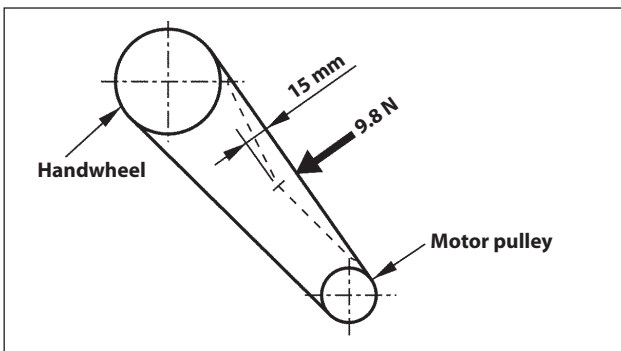
- 5) Fit hinge **7** into the opening in the machine bed, and fit the machine head to table rubber hinge before placing the machine head on rubber seats on the four corners.
- 6) Securely attach head support rod **8** to the table until it goes no further.

## 2. ADJUSTING THE BELT TENSION



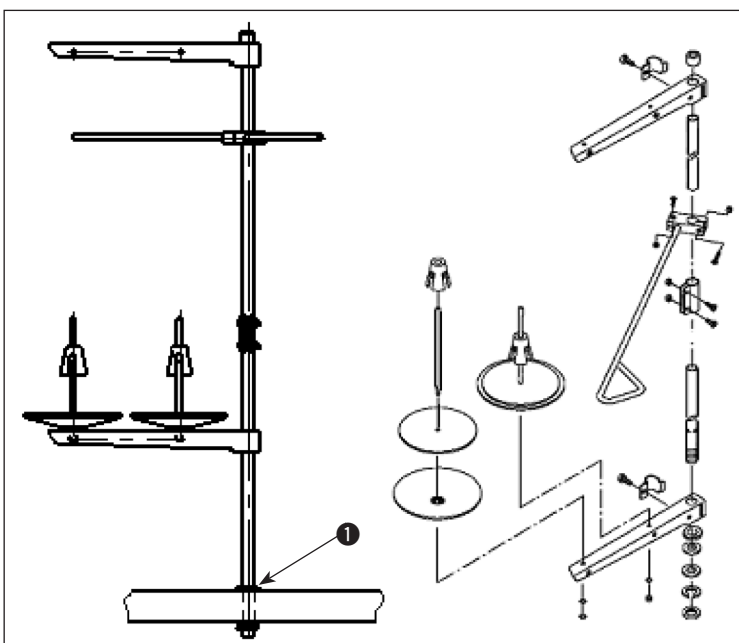
### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



Adjust the belt tension with the height of the motor so that the belt sags 15 mm when the center of V belt is applied with a 9.8 N load.

## 3. ATTACHING THE THREAD STAND



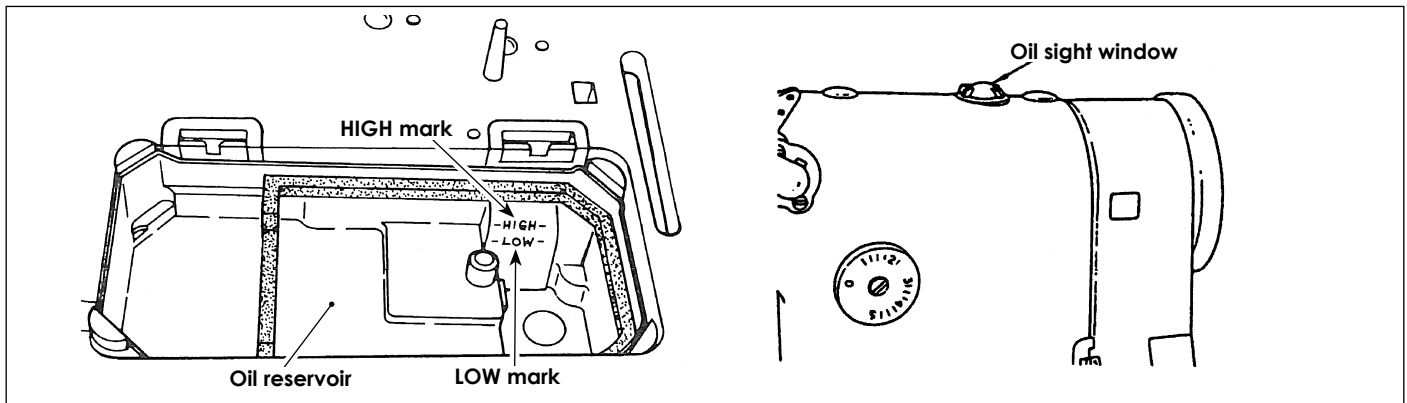
Assemble the thread stand, set it up on the machine table using the installation hole in the table and tighten nut **1** gently.

## 4. LUBRICATION



### WARNING :

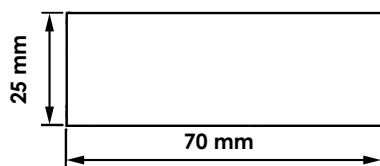
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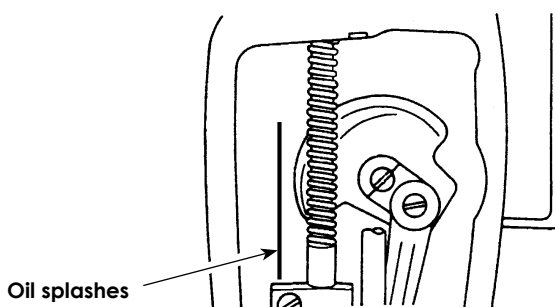
1. Before operation, fill the oil reservoir with JUKI New Defrix Oil No.1 up to the HIGH mark.
2. Whenever the oil level drops to the LOW mark, add more oil.
3. When the sewing machine is run after the oil reservoir has been filled, oil can be seen splashing on the oil sight window. However, the amount of oil splash has no relation to the amount of oil in the reservoir so there is no need to worry.
4. When the oil has become dirty, replace it with fresh oil. Unscrew the oil plug from the oil reservoir when draining.
5. When using a new sewing machine or one that has not been used for a long time let it idle for about ten minutes at 3,000 to 3,500 sti/min to run it in.

- (Caution)**
1. Verify that the lubricating oil is properly circulating by watching it through the oil sight window.
  2. Remove any fibrous dust from the oil pump filter screen and the oil reservoir.
  3. When the lubrication oil has become dirty, drain it through the oil drain screw cap and fill it with new JUKI New Defrix Oil No.1.
  4. Verify that the oil level is above "LOW" mark.
  5. Clean up the oil reservoir magnet with a cloth.

### ① Amount of oil (oil splashes) confi rmation paper

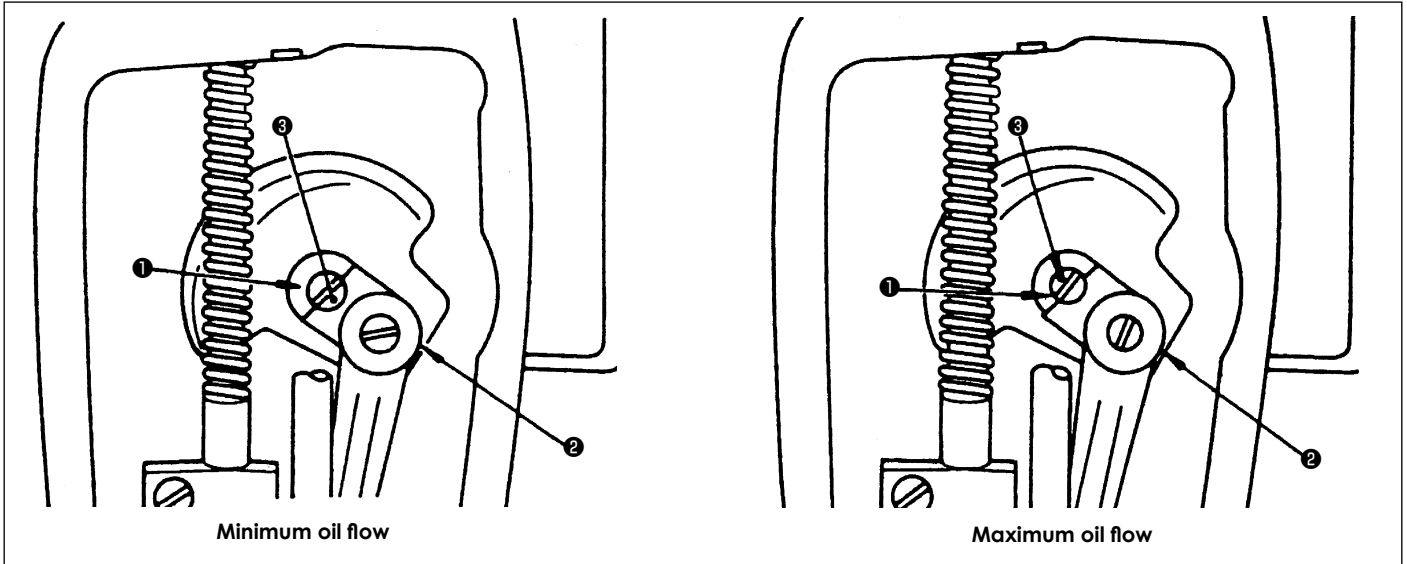


### ② Position to confi rm the amount of oil (oil splashes)



### Confi rmation of the amount of oil supplied to the face plate parts

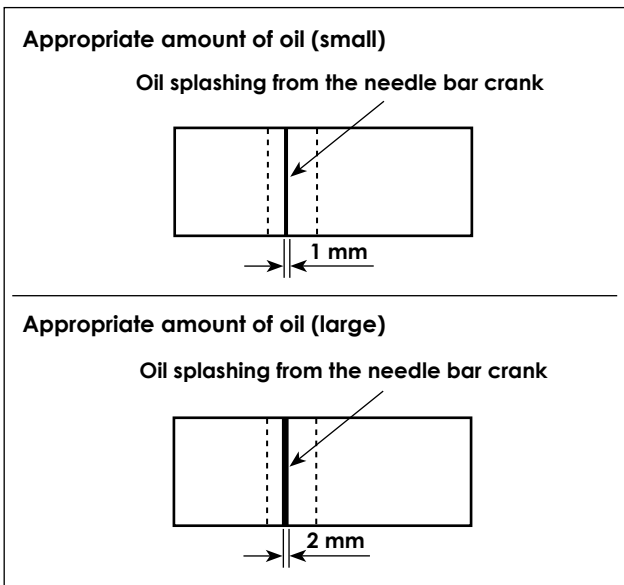
1. If the machine has not been sufficiently warmed up for operation, make the machine run idle for approximately three minutes. (Moderate intermittent operation)
2. Place the amount of oil (oil spots) confi rmation paper under the hook immediately after the machine stops running.
3. Confi rm the height of the oil surface in the oil reservoir is within the range between "HIGH" and "LOW".
4. Confi rmation of the amount of oil should be completed in fi ve seconds. (Check the period of time with a watch.)



**Adjustment of oil amount for the face plate components.**

Amount of lubricating oil supplied to the face plate components such as needle bar crank ② is adjustable by turning adjusting pin ① : bring the dot mark ③ engraved on the adjusting pin close to needle bar crank ② to minimize or farthest from the needle bar crank ② to maximize the amount of oil.

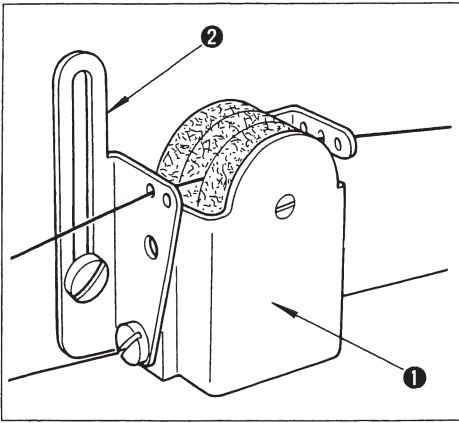
**(Caution)** The oil amount does not change immediately after adjustment, so have this in mind when adjusting the oil amount.



**Sample showing the appropriate amount of oil supplied to the face plate parts**

1. The state given in the figure shows the appropriate amount of oil (oil splashes). It is necessary to finely adjust the amount of oil in accordance with the sewing processes. However, do not excessively increase/decrease the amount of oil in the hook. (If the amount of oil is too small, the face plate parts will be hot or seize. If the amount of oil is too much, the sewing product may be stained with oil.)
2. Adjust the amount of oil in the hook so that the oil amount (oil splashes) should not change while checking the oil amount three times (on the three sheets of paper).

## 5. ATTACHING THE SILICON OIL LUBRICATING UNIT



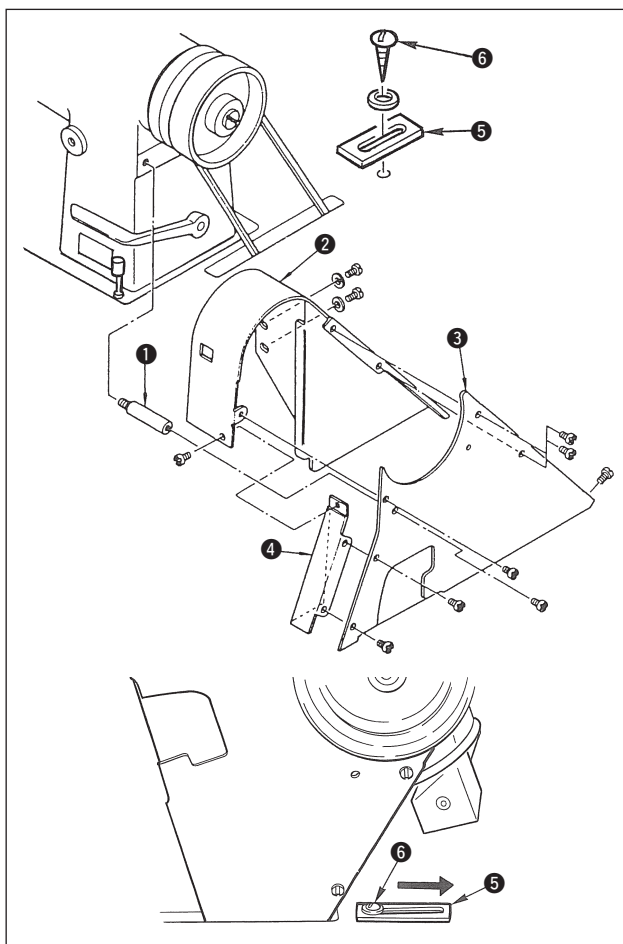
A silicon oil lubricating unit ① is available on an extra order. Separately place an order with us if necessary. Install the silicon oil lubricating unit to intermediate thread guide ② as illustrated.

## 6. ATTACHING THE BELT COVER



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



1. Insert belt cover support ① into the tapped hole in the machine arm.
2. Temporarily fix belt cover ② on the machine head with screws.
3. Slightly tilting the machine head, put rid ③ of the belt cover inside the outer pulley and fix rid ③ with four screws.
4. Fix rid ③ on support ①.
5. Loosen the screws in the belt cover, and adjust the position of belt cover ② properly. Then securely tighten the screws in the belt cover.
6. Fix bobbin winder cover ④ with three screws.
7. Fix belt cover auxiliary plate ⑤ as illustrated in the figure.

**(Caution)** 1. When tilting the machine, loosen wooden screw ⑥ in belt cover auxiliary plate ⑤ and move the auxiliary plate in the direction of the arrow to such an extent that it does not come in contact with the belt cover as shown in the figure.

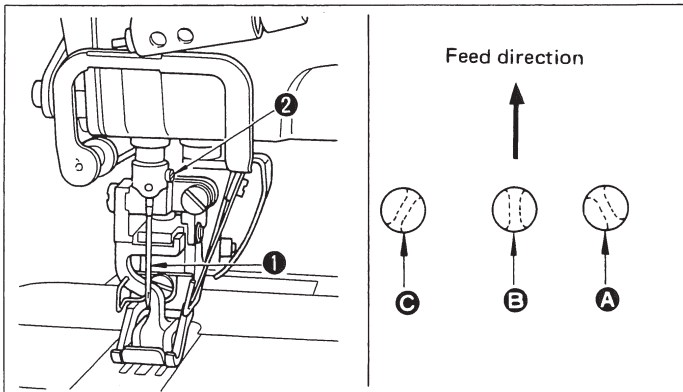
2. After you have raised the machine, return belt cover auxiliary plate ⑤ to the previous position.

## 7. ATTACHING THE NEEDLE



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



Use a Schmetz 149×7 needle.

Different needle counts are applicable. However, select an appropriate one according to the thickness of thread and the type of material to be used. (Nm 70 to Nm 130)

- 1) Turn the handwheel to bring the needle bar to the highest position of its stroke.
- 2) Loosen needle clamp screw ②. Hold needle ① so that its scarf faces toward the feeding direction of material.
- 3) Insert needle ① fully into the needle clamp hole until it comes in contact with the deep end.
- 4) Firmly tighten needle clamp screw ②.

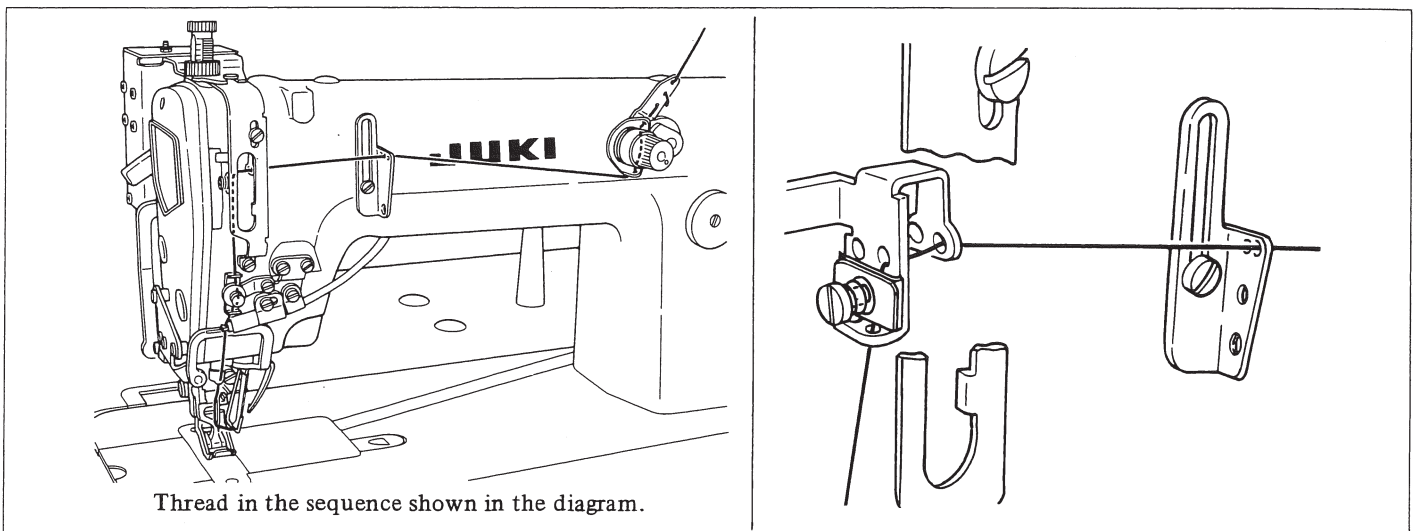
Attach the needle so that its eyelet faces toward ① for filament thread, or ② for cotton thread so as to prevent stitch skipping of needle thread.

## 8. THREADING THE MACHINE HEAD



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.

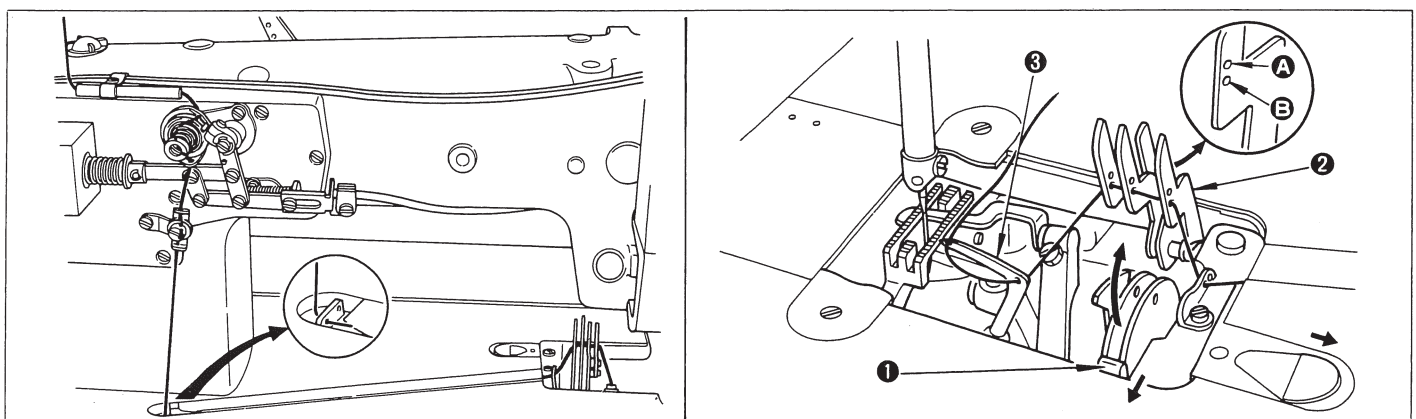


## 9. THREADING THE LOOPERS



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



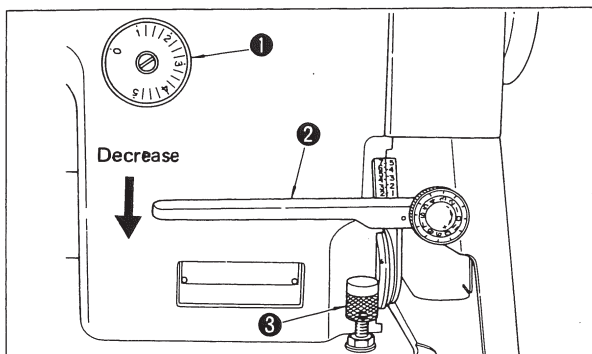
1. Passing the looper thread in the order illustrated, pull leaf spring ① toward you, and looper thread guide ② will rise.
2. Properly use thread holes ① and ② in the looper thread guide. Pass the thread through hole ① for less looper thread tension, stretchy thread, use hole ② for general stitch tightness.
3. Use the tweezers supplied with the machine when passing the thread through looper ③ .

## 10. ADJUSTING THE STITCH LENGTH



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



Turn feed regulator dial **1** counterclockwise or clockwise and align the desired number with the pin protruding from the arm.

The numbers on the dial indicate millimeters. When reducing the indication turn the feed regulator dial while depressing reverse feed control lever **2**.

### ★ Reverse stitching

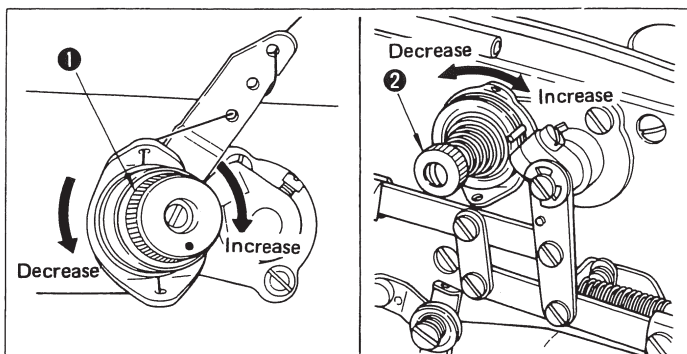
1. Depress reverse feed control lever **2**.
2. Reverse stitching is possible while the lever is depressed.
3. When the lever is released, the sewing direction will return to normal.

### ★ Lever stopper

1. When lever stopper **3** is set in a high position, a small reverse feed stitch length will result.
  2. When feed lever **2** is depressed after setting the lever stopper in a higher position, the forward feed stitch length will be reduced.
- Perform the above adjustment for sewing start or for stopping stitch at sewing end.

**(Caution)** This function is not applicable to thread trimming in the case of reverse feed stitching.

## 11. THREAD TENSION



### ★ Adjusting the needle thread tension

When needle thread tension nut **1** is turned clockwise the tension of the needle thread increases.

When it is turned counterclockwise the tension decreases.

### ★ Adjusting the looper thread tension

When looper thread tension nut **2** is turned clockwise the tension of the looper thread increases.

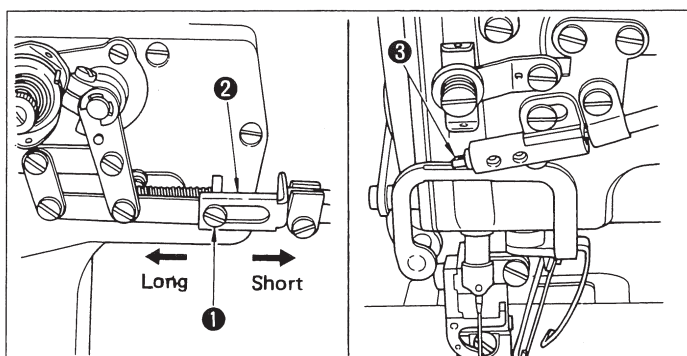
When it is turned counterclockwise the tension decreases.

## 12. ADJUSTING THE REMAINING LENGTH OF TRIMMED THREAD



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



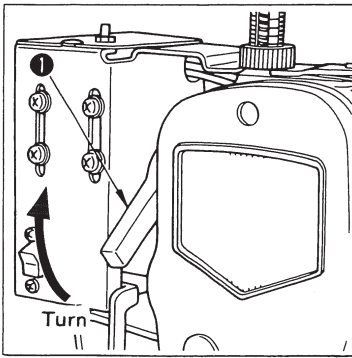
The length of the thread remaining on the needle after thread trimming significantly affects the occurrence of stitch skipping at the beginning of sewing.

Loosen setscrew **1** and move wire drawing link **2** of the needle thread draw-out solenoid to the left to increase the thread take-up amount of draw-out pin **3**. This increases the length of thread remaining at the bottom of the needle eyelet. On the contrary, moving the link to the right decreases it.

Reduce the length of thread remaining on the needle after thread trimming when using elastic thread such as Tetoron thread and nylon thread.

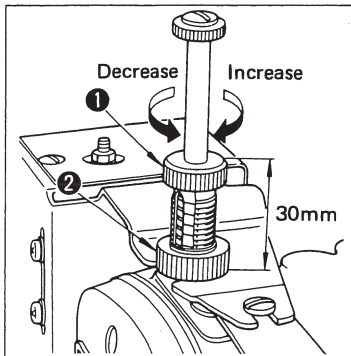


### 13. HAND LIFTER



In order to stop the presser foot in the raised position, turn hand lifter ① clockwise. The presser foot will stop after rising about 5.5 mm. It can be lowered to its original position by lowering the hand lifter. When using the knee lifter, the presser foot will rise about 7 mm.

### 14. ADJUSTING PRESSURE OF THE PRESSER FOOT



When nut ② is loosened and presser spring regulator ① is turned clockwise the pressure increases. When it is turned counterclockwise the pressure decreases.

Tighten nut ② after adjustment.

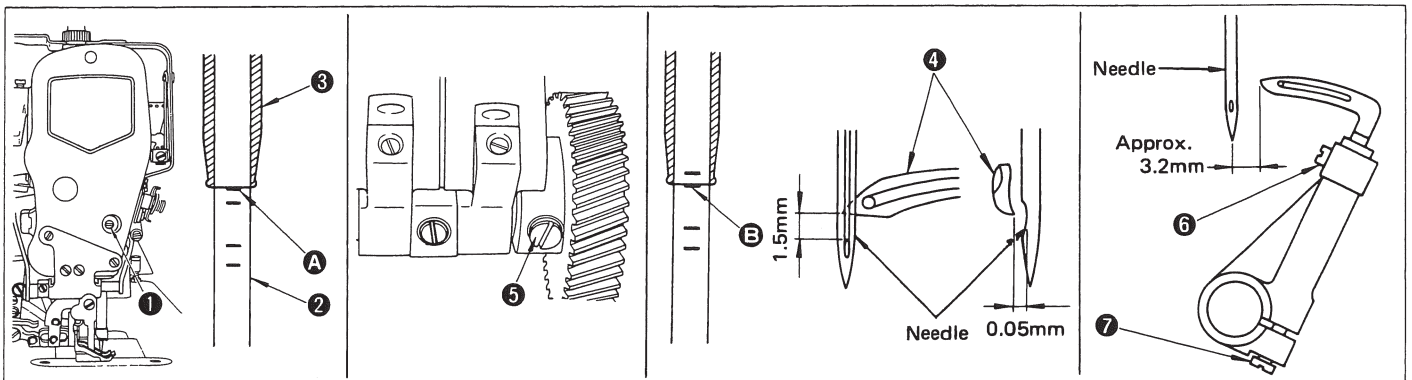
In the case of general fabrics the standard height of the pressure adjusting screw is 30 mm (6 kg).

### 15. NEEDLE-TO-LOOPER RELATION



**WARNING :**

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



**Adjust the needle and the looper as described below:**

1. Turn the handwheel to bring the needle bar to the lowest position of its stroke. Loosen needle bar connection setscrew ①.

**(Determining the needle bar height)**

2. Align first (uppermost) marker line A on needle bar ② with the bottom end face of needle bar lower bushing ③. Tighten needle bar connection setscrew ①.

**(Determining the looper position)**

3. Loosen gear setscrew ⑤ to adjust so that looper ④ reaches its back end when the needle bar is at the lower point of its stroke.

4. Carry out adjustment so that the blade point of looper ④ aligns with the center of the needle, so that the former is spaced 1.5 mm from the upper end of needle eyelet and so that a clearance of 0.05 mm is provided between the looper and the needle when second marker line B on needle bar ② is aligned with the bottom end of needle bar lower bushing ③.

5. Loosen looper setscrew ⑥ and looper clamping screw ⑦ and carry out the adjustment.

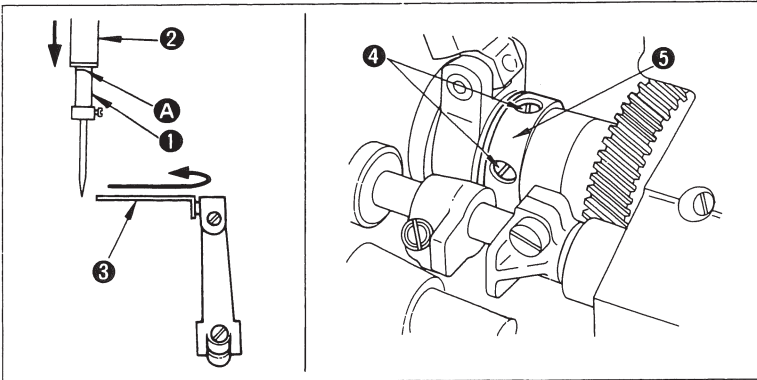
6. Check to be sure that a distance of approximately 3.2 mm is provided between the center of the needle and the blade point of the looper when the looper reaches its back end.

## 16. THREAD SPREADER



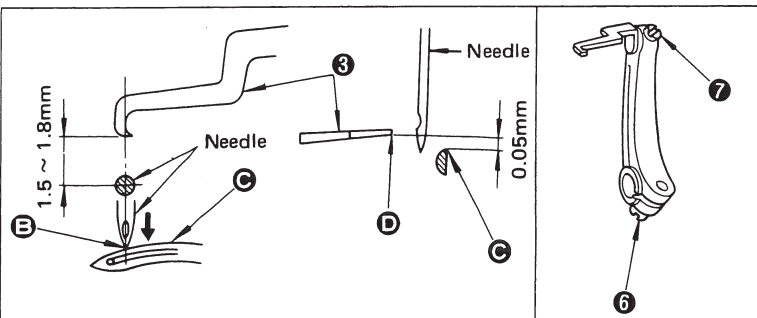
### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



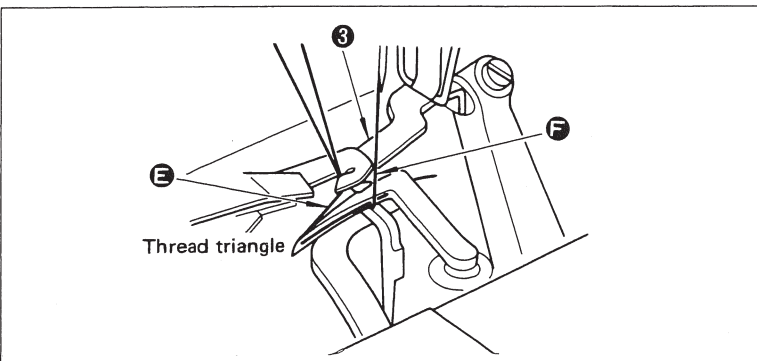
### ★ Adjustment of the timing of the thread spreader to the needle

Loosen setscrew ④ and make adjustment by thread spreader eccentric ⑤ so that thread spreader ③ reaches the rightmost position when fourth mark ① (the fourth from the top) on needle bar ① is flush with the bottom end surface of lower needle bar bushing ② as the needle bar goes down.



### ★ Positioning the thread spreader

1. Loosen screw ⑥ to make adjustment so that the inside extension line of thread spreader ③ coincides with the center of the needle with a distance of 1.5 to 1.8 mm provided between the end of the thread spreader and the center of the needle when the needle bar is lowered until needle point ① meets the top ② of the looper.
2. The loosen screw ⑦ and make adjustment to provide a 0.05 mm clearance between bottom ④ of the thread spreader and top ③ of the looper.



### ★ Thread spreading

Check the following in the forward and reverse feed stitchings, and make correction if necessary.

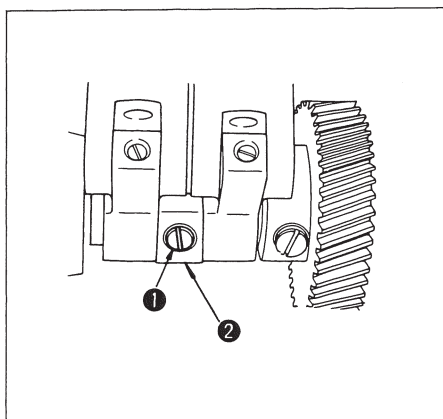
1. When thread spreader ③ returns, the end of the thread spreader should securely hold looper thread ① and only one side of needle thread ② looper until the needle points enters the thread triangle.
2. The thread spreader should release the threads as soon as the needle point enters the thread triangle.

## 17. MATCHING THE MOTION OF THE NEEDLE GUARDS WITH THE LOOP GUIDE



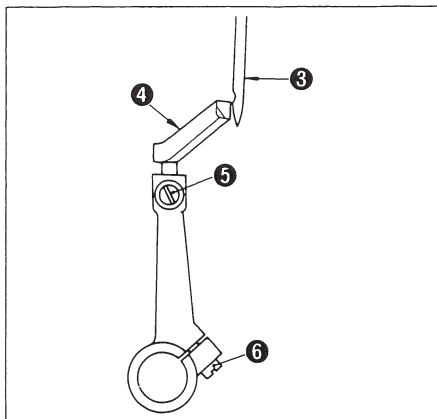
### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



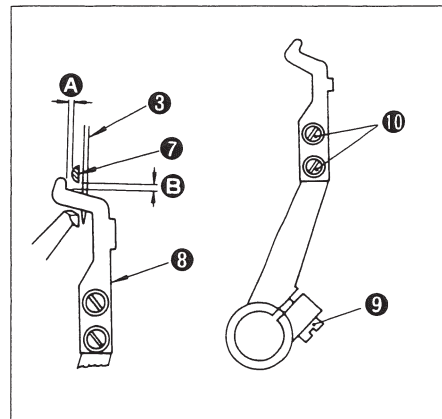
### ★ Timing of the needle guard

The timing of the needle guard is set by fixing needle guard cam 2 after aligning setscrew 1 with the flat part.



### ★ Positioning the needle guard

Perform adjustment to make the point of needle 3 lightly touch needle guard 4 when the looper coincides with the center of the needle. The needle guard should desirably be set high as far as it does not break needle thread loops. The perform the adjustment, loosen setscrews 5 and 6 .



### ★ Positioning the loop guide

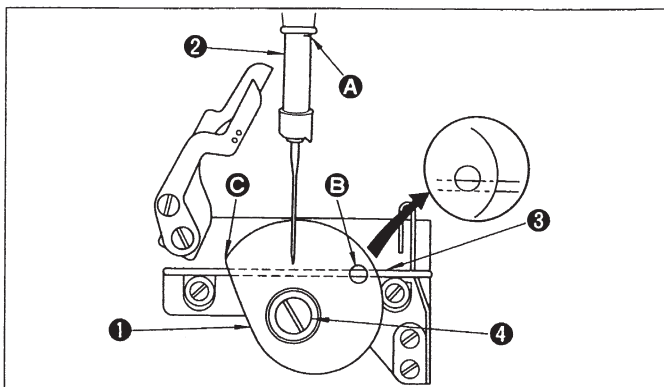
Perform adjustment so that clearance A between loop guide 8 and the looper becomes 0.2 to 0.5 mm and clearance B becomes approx. 0.5 to 1 mm when looper 7 coincides with the center of needle 3 . Loosen setscrew 9 to adjust clearance A , and loosen setscrew 10 to adjust clearance B .

## 18. POSITION OF THE LOOPER THREAD TAKE-UP



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.

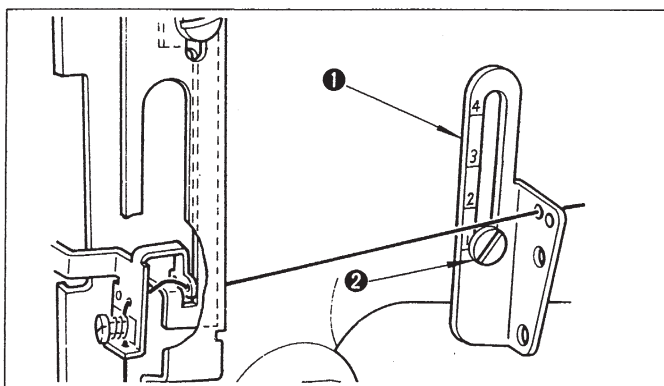


Loosen setscrew 4. Adjust the position of looper thread cam 1 so that wire 3 is visible through guide hole B when third marker line A (third from the top) of the needle bar 2 aligns with the bottom end face of the needle bar lower bushing.

After the adjustment, verify the following.

1. When the looper thread moves off tip C of the looper thread cam, the needle tip fully enters the looper thread triangle.
2. In the case puckering is particularly concerned, the bottom face of the wire aligns with the bottom end of guide hole B slightly earlier than the normal timing.

## 19. POSITION OF THE FRAME THREAD EYELET



The thread tension changes by moving intermediate thread guide 1 up and down.

The thread tension is increased by moving the intermediate thread guide upward, or decreased by moving it downward.

In general, adjust the position of setscrew 2 referring to the table below.

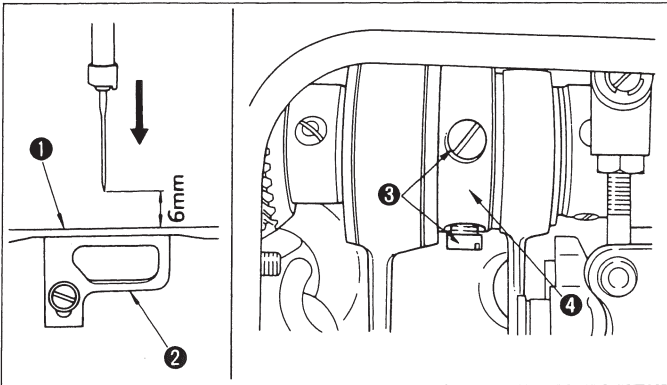
Thread used		Scale on the intermediate thread guide
Cotton thread	#80 to #50	2 to 3
	#30 to #20	3 to 4
Synthetic thread	#80 to #50	1 to 2
	#30 to #20	2 to 3

## 20. ADJUSTING THE FEED TIMING



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



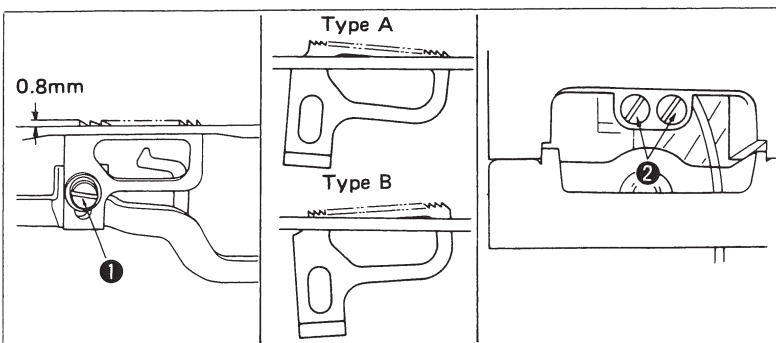
Loosening setscrew ③, perform adjustment by moving feed rocker cam ④ to make feed dog ② fully go down from the throat plate surface when the needle point reaches a point of 6 mm above the surface of throat plate ①.

## 21. ATTACHING THE FEED DOG



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



By loosening screw ②, the tilt of the feed dog can be adjusted to type A (effective for reducing puckering) or type B in addition the standard tilt.

The maximum projection of the feed dog is 0.8 mm. Use screw ① to make adjustment.

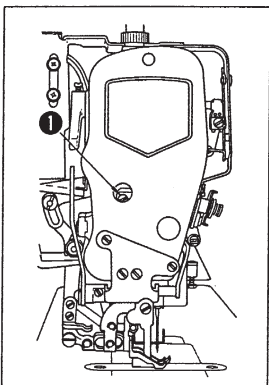
**(Caution)** When the tilt of the feed dog has been adjusted the height of the feed dog will be disturbed. So, check the height of the feed dog whenever the tilt has been adjusted. Be careful not to set the front of the feed dog too high, otherwise the looper thread may be scratched. (Type B)

## 22. ADJUSTING THE PRESSER BAR HEIGHT



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



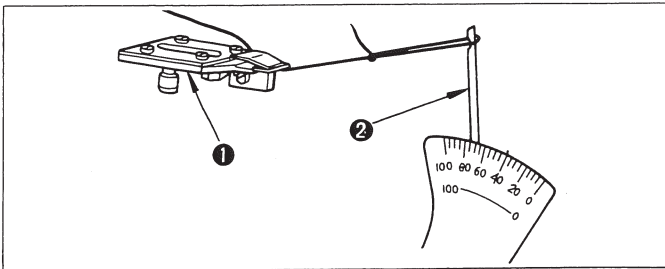
Change the presser bar height or presser foot angle after loosening needle bar connecting setscrew ①. After adjustment, tighten the setscrew firmly.

## 23. THREAD TRIMMER



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.

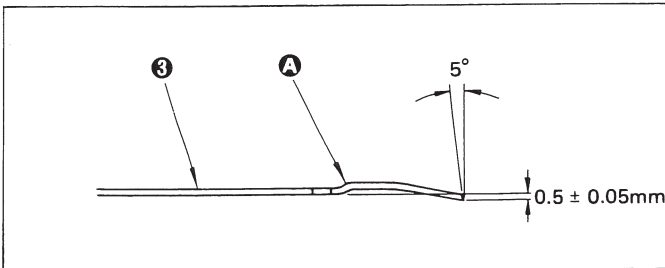


### ★ Looper thread clamping pressure

The clamping pressure of the looper thread clamping spring stays constant regardless of the type of thread used, and therefore requires no adjustment for any type of thread.

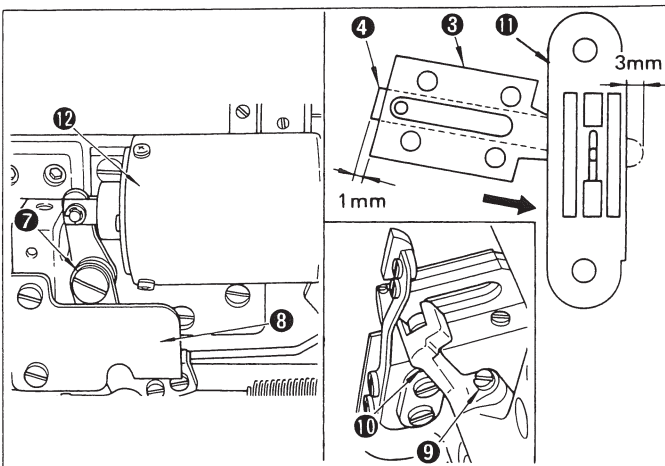
★ If looper thread clamping failures occur, replace whole moving knife mounting plate ① .

The proper clamping pressure is such that the thread drawing tension ② is 70 to 100 g when cotton thread of #60 is clamped and drawn out.



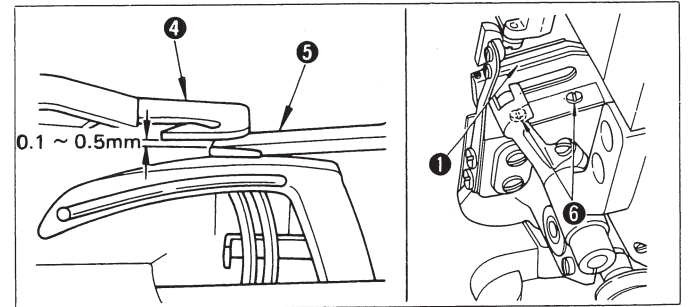
### ★ Resharpener the counter knife

Correct portion A to  $0.5 \pm 0.05$  mm when resharpener counter knife ③ .



### ★ Stroke of the moving knife

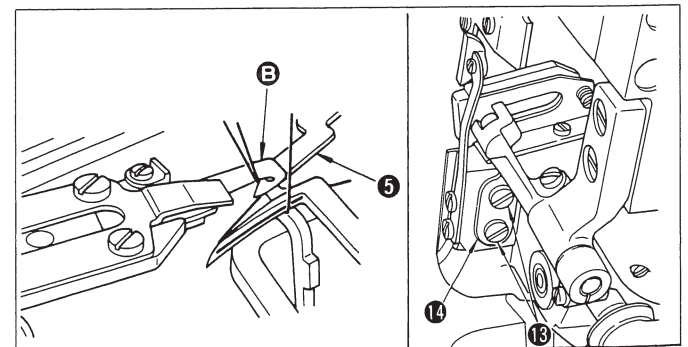
Loosening screw ⑨ , perform adjustment by knife driving fork ⑩ so that the rear end of moving knife ④ projects 1 mm from counter knife ③ with thread trimmer lever ⑦ in contact with stopper ⑧ . Then adjust the position of solenoid ⑫ to make moving knife ④ stop at 3 mm from throat plate ⑪ when it is moved to its farthest point.



### ★ Height of the moving knife mounting plate

Allow a clearance of 0.1 to 0.5 mm as shown above so as to prevent the end of the moving knife from touching thread spreader ⑤ when moving knife ④ advances.

To make the adjustment, loosen screw ⑥ and move up or down moving knife mounting plate ① .



### ★ Longitudinal travel of the moving knife

Perform adjustment to make hook ⑬ securely catch only two threads held by thread spreader ⑤ and return when the moving knife goes back.

To make the above adjustment, loosen setscrew ⑬ and move mounting plate installing base ⑭ .

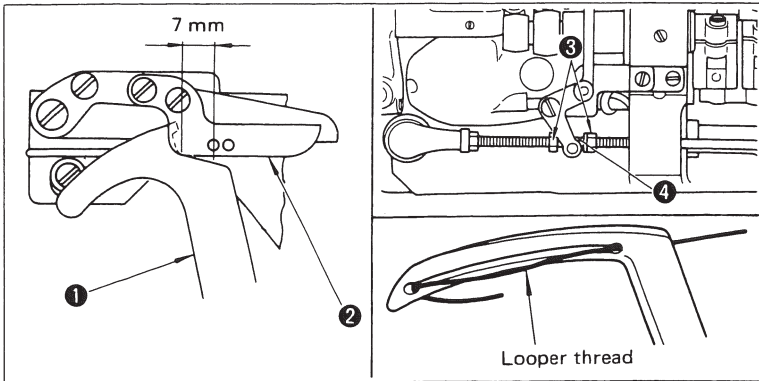
Adjust the longitudinal travel of the moving knife, the stitch length of 5 mm.

## 24. ADJUSTING THE DRAW-OUT AMOUNT OF THE LOOPER THREAD



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



The standard amount of looper thread is drawn out when looper thread draw-out lever ① is spaced 3 mm from the thread path hole in cam thread guide ② immediately before the thread trimmer is actuated. Loosen nut ③ and make adjustment by moving cam thread tension release slide block ④ to the right or left.

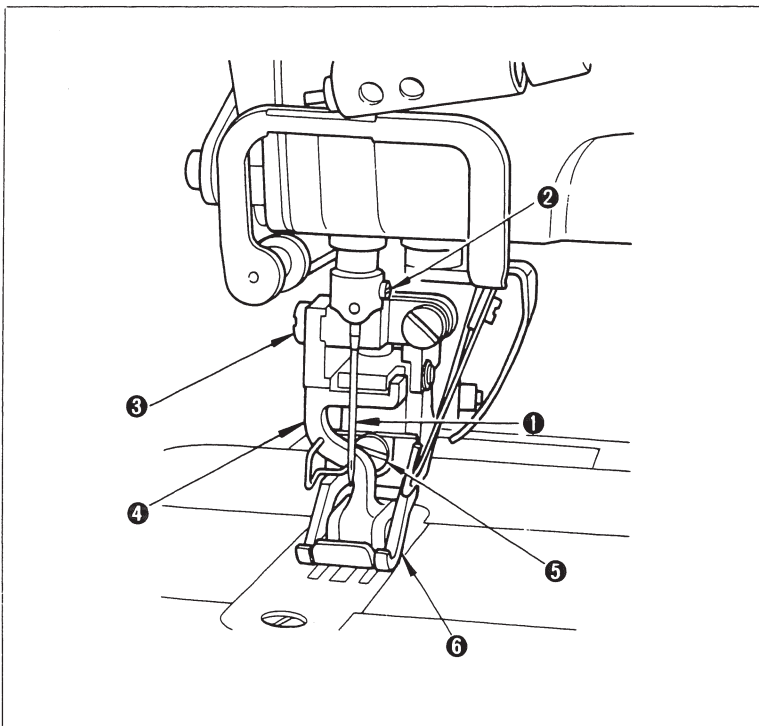
For certain types of needle, the looper thread may slip off the looper. In such a case, make adjustment so that a longer thread is drawn out.

## 25. REPLACEMENT OF GAUGE PARTS



### WARNING :

To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



### (How to remove gauge parts)

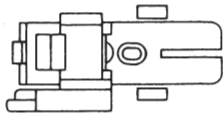
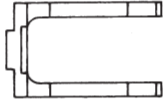
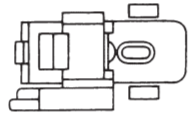
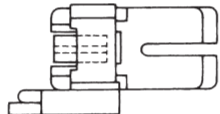
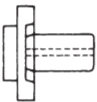
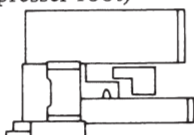
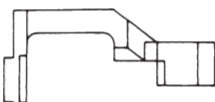
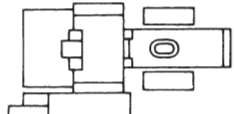
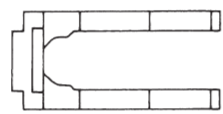
1. Loosen needle clamp screw ① to remove needle ② .
2. Remove setscrew ③ of the presser foot and remove presser foot ④ .  
(The presser foot can be easily removed by lifting walking foot ⑥ .)
3. Remove setscrew ⑤ of the walking foot to remove walking foot ⑥ .

### (How to install the gauge parts)


Install the gauge parts by reversing the above procedure.

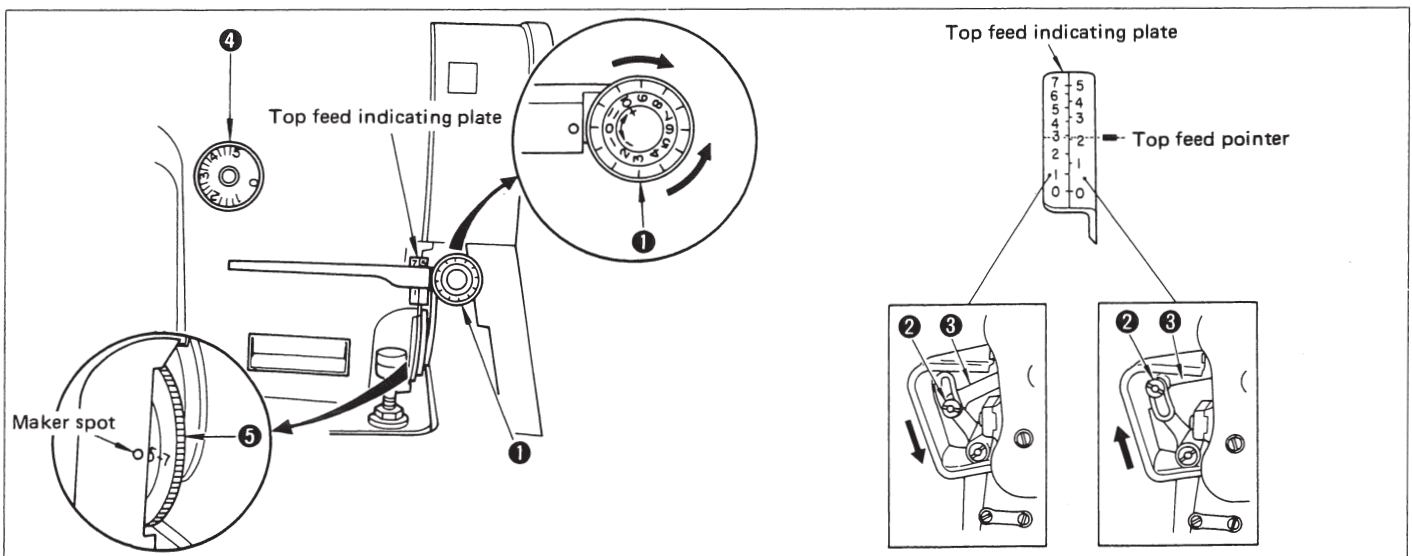
★ After installing the gauge parts, check the height of the feed dog.

## 26. GAUGE PARTS

Gauge type	Application	Presser foot (at the walking foot position)	Walking foot
Standard	Straight stitching of long workpieces	(Hinging presser foot)  B15244860B0	(Rake-in type)  B3026487000
B	Prevention of uneven material feed, and curve stitching	(Hinging presser foot)  B1524486BB0	
D	Sharp curve stitching of light-weight material	(Hinging presser foot)  B1524486DB0	(Pull-in type)  B3026487D00
M	Hem stitching of men's trousers	(Hinging presser foot)  B1524486MBA	(Rake-in type)  B3026490M00
S	Mixed type of rake-in type and pull-in type. Effectively used for prevention of puckering	(Hinging presser foot)  B1524486SB0	(Needle-side type)  B3026487S00

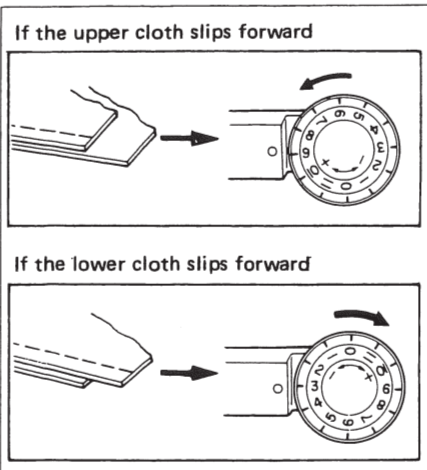
## 27. ADJUSTING THE TOP FEED AMOUNT

 **WARNING:**  
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.

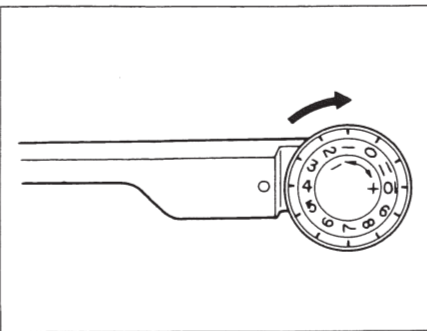


- Turning top feed adjusting dial ① clockwise increases the top feed amount, and vice versa.
  - When nut ② is loosened, and top feed connecting rod ③ is fixed at the upper end, the top feed can be adjusted up to 5 mm.
  - When top feed connecting rod ③ is fixed at the lower end, the top feed can be adjusted up to 7 mm.
- ★ If the bottom feed amount is changed by feed adjusting dial ④, the top feed amount will be automatically changed in the same proportion.
- (Caution)** If the partial shirring device (PF-3) is not used, align 5 and 7 on partial shirring dial ⑤ with the marker spot. If a top feed amount set is too large, slippage between materials and the top feed dog may result with consequent scratches on the materials.

## 28. CORRECTING THE CLOTH SLIPPAGE



1. If the lower cloth is longer than the upper cloth at the sewing end, turn the top feed adjusting dial counter clockwise ("-" direction).
2. If the upper cloth is longer than the lower cloth at the sewing end, turn the top feed adjusting dial clockwise ("+" direction).

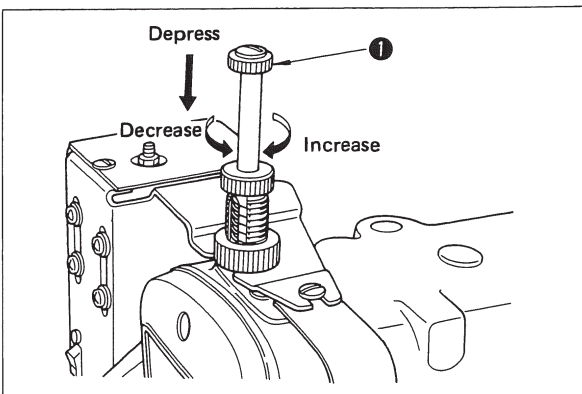


### ★ Shirring

To perform shirring, use a B-type (rake-in type) gauge, and set the top feed amount at a large value by turning the top feed adjusting dial clockwise (toward "+" direction).

**(Caution)** When the top feed amount is set to 4 mm or more, operate the machine at 3,500 sti/min or less.

## 29. ADJUSTING THE PRESSURE OF THE WALKING FOOT



Depress adjusting screw ①, when turned clockwise, the pressure of the walking foot increases, and when turned counterclockwise, the pressure decreases.

The standard pressure (4.5 to 5 kg) is obtained by loosening the fully tightened adjusting screw about 6 turns.

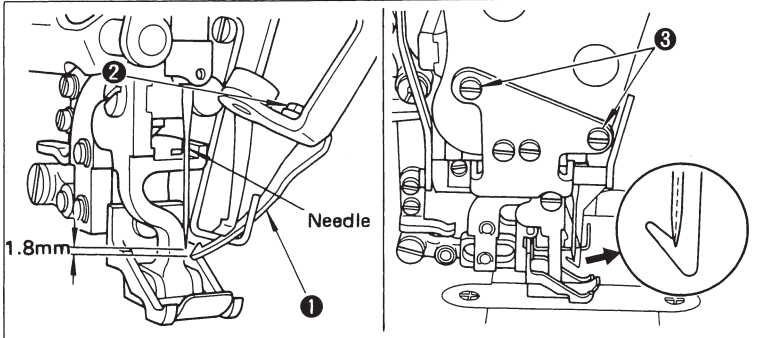
The graduation of the adjusting screw provide standard values suitable for individual materials when turning in adjusting screw ①.

**(Caution)** Take care not to excessively increase the walking foot pressure or set the presser foot pressure, otherwise the presser foot will float, leading the insufficient feed power.



### 30. WIPER

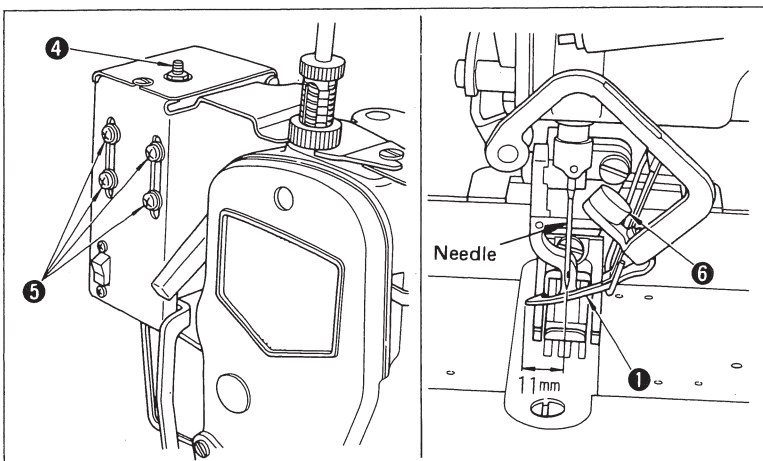
**WARNING :**  
 To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



**★ Position of the wiper with respect to the needle**

Make adjustment by screw 2 to vertically provide a 1.8 mm clearance between the needle point and wiper 1, and also perform adjustment by screw 3 to make the needle center align with the inside ridge line of the wiper longitudinally.

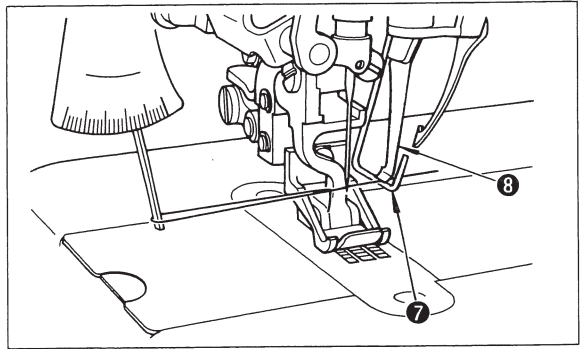
**(Caution)** Do not operate the wiper with the presser foot up.



**★ Front end position of the wiper**

Using setscrew 5, adjust the front end position of the wiper so that the end of wiper 1 is spaced 11 mm from the needle center when magnet plunger 4 is fully pushed up.

★ After adjustment, check that the wiper does not hit the needle, or that cushion 6 of the wiper arm comes in contact with the arm bottom when the wiper returns.



**★ Adjustment of the needle thread clamp**

Needle thread clamp 7 clamps the needle thread swept away by the wiper to prepare for the subsequent stitching start.

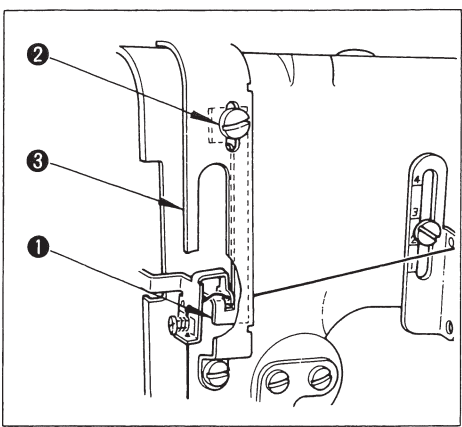
Adjust the pressure of needle thread clamp spring 8 so that a tension of 30 to 40 g is obtained when a cotton thread of #60 is drawn out.

The spring pressure is constant for any type of thread used.

**(Caution)** Ensure to make needle thread clamp 7 come in contact evenly with needle thread clamp spring 8.

### 31. POSITION OF THE THREAD TAKE-UP LEVER

**WARNING :**  
 To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



When the feed of chain-off thread is unsmooth or when a stretchy thread is used, adjust thread take-up lever 1 to make it pull the thread at the moment the needle bar reaches the lowest point of its stroke.

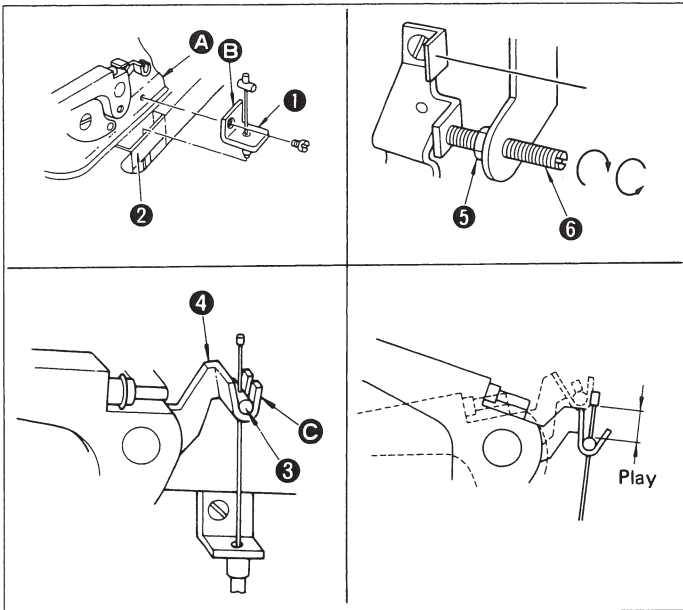
To perform the above adjustment, loosen setscrew 2, and move the thread take-up lever within the slot in thread take-up cover 3.

## 32. PARTIAL SHIRRING DEVICE (PF-3)



### WARNING :

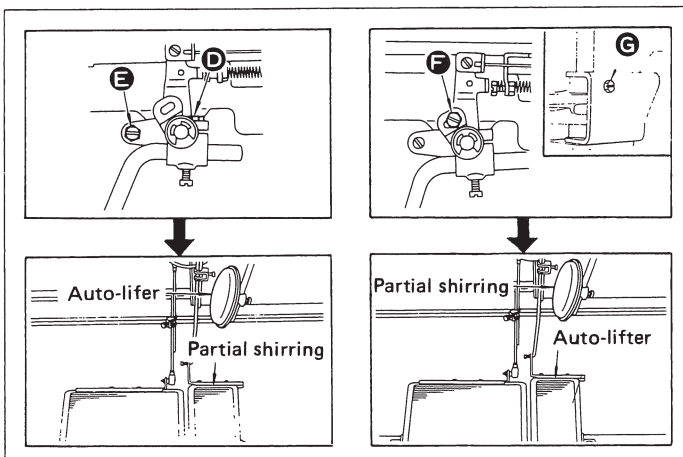
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



### ★ Adjusting and installing the device to the machine head

1. Pass the end of wire ① between wire tube guide ② and the oil reservoir onto the table top.
2. Set the machine head.
3. Fix wire ① by a screw with surface ⑤ pressed against surface ④ at the rear of the arm.
4. Place wire roller ③ onto hooked end ② of top feed adjusting plate ④.
5. When stopper ⑥ is turned clockwise after loosening nut ⑤, the play of the knee presser decreases, and vice versa.
6. Perform adjustment of the play of the knee presser so that it is eliminated when the feed lever is set for reverse feed stitching with a 3 mm bottom feed and 3 mm top feed.

**(Caution) Note that top reverse feed can not be engaged at the time of reverse feed stitching if no play is provided.**



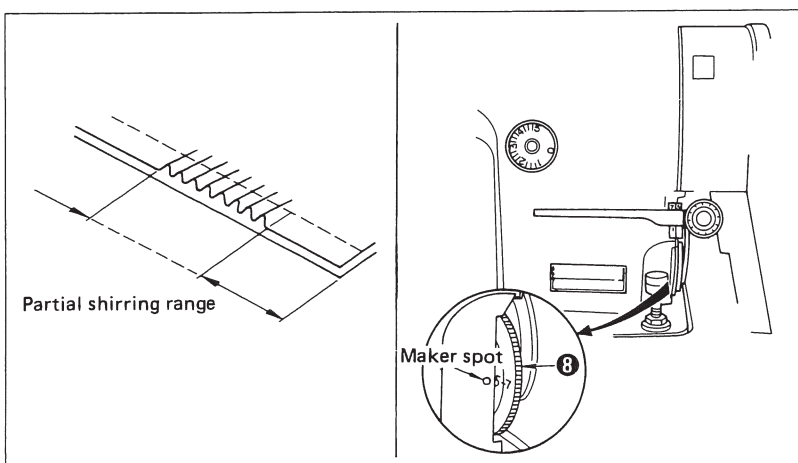
### ★ Operation

For PF-3, change in the shirring operation system (knee presser controlled system ↔ pedal-controlled system) requires only the change of position of two screws.

1. Attach screws to ④ and ⑤ .  
Pedal (small) → Partial shirring  
Knee presser → Auto-lifter
2. Attach screws to ⑥ and ⑦ .  
Pedal (small) → Auto-lifter  
Knee presser → Partial shirring

\* When performing partial shirring, replace the gauge set with a B-type (rake-in) gauge set.

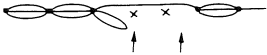


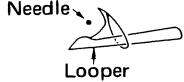
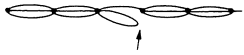
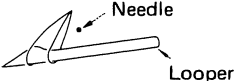
**(Note) The operating system 2 described above is recommended because the knee presser becomes less smooth in the operating system 1.**



### ★ How to use

1. Depress the pedal when a position from which shirring is required is reached, and shirring will be engaged.
2. As soon as the pedal is released, shirring will be disengaged.
3. Partial shirring dial ⑧ can be used to adjust the shirring amount.
4. The inner graduations on dial ⑧ are used when the top feed rod shaft nut has been set at the upper end, and the outer graduations are used when the nut has been set at the lower end of the top feed rod shaft.
5. The shirring amount increases with increasing numbers of graduations with the maximum shirring amount at 7.

### 33. TROUBLES AND CORRECTIVE MEASURES

Trouble	Cause	Corrective measures
1. Thread breakage	<p>① The thread quality is inferior.</p> <p>② The thread is too thick for the needle.</p> <p>③ The thread melts and breaks due to the heat generated on the needle.</p> <p>④ The thread tension is too high.</p> <p>⑤ Scratches on the thread paths, including the needle, looper, throat plate, needle guard and loop guide.</p> <p>⑥ Double hooking</p>	<ul style="list-style-type: none"> <li>○ Use a thread of good quality.</li> <li>○ Replace the needle or thread with a proper one.</li> <li>○ Use silicon oil.</li> <li>○ Reduce the sewing speed.</li> <li>○ Loosen the thread tension nut.</li> <li>○ Smooth out the scratches using an oilstone or buff.</li> <li>○ Make the thread take-up lever more effective.</li> </ul>
2. Stitch skipping	<p>① Needle thread stitches are skipped.</p>  <p>*Two stitch breaks. (This stitch skipping occurs when the looper fails to catch the needle thread.)</p>  <p>② Looper thread stitches are skipped.</p>  <p>*One stitch breaks. (This occurs when the needle fails to enter a thread triangle.)</p>  <p>③ Needle thread stitches are skipped.</p>  <p>*Loop linkage is incomplete. (This trouble occurs when the needle thread is deflected excessively to the left.)</p>  <p>④ In case of chemical fiber thread</p> <p>⑤ In case of synthetic fiber thread</p>	<ul style="list-style-type: none"> <li>○ Check the amount of the thread caught by the looper.</li> <li>○ Check the clearance between the looper and the needle.</li> <li>○ Check the timing of the needle and the looper.</li> <li>○ Make the thread take-up lever more effective, depending on the thread.</li> <li>○ Check the needle for proper installation.</li> <li>○ Check the timing and position of the needle guard.</li> <li>○ Check for proper threading.</li> <li>○ Check the amount of the thread caught by the looper.</li> <li>○ Check the clearance between the looper and the needle.</li> <li>○ Check the timing of the looper thread take-up.</li> <li>○ Correct the position of the thread spreader hook.</li> <li>○ Slightly increase the looper thread tension.</li> <li>○ Check for proper threading.</li> <li>○ Check the amount of the thread caught by the looper.</li> <li>○ Check the clearance between the looper and the needle.</li> <li>○ Check whether the timing of the thread spreader and the position of the hook are correct or not.</li> <li>○ Reduce the sewing speed.</li> <li>○ Use silicon oil.</li> <li>○ Use a needle for chemical fiber thread.</li> <li>○ Reduce the amount of thread caught by the looper.</li> <li>○ Reduce the sewing speed.</li> <li>○ Use silicon oil.</li> </ul>
3. Stitch skipping at switch start	<p>① The thread spreader has been improperly positioned.</p> <p>② Excessive amount of looper thread is drawn out.</p>	<ul style="list-style-type: none"> <li>○ Check the vertical clearance.</li> <li>○ Check the position of the thread spreader laterally and longitudinally.</li> <li>○ Limit concealed stitching to within one stitch.</li> <li>○ Reduce the amount of looper thread to be drawn out.</li> </ul>

Trouble	Cause	Corrective measures
4. Improper stitch tightness	<ul style="list-style-type: none"> <li>① The needle thread tension is too low.</li> <li>② The looper thread tension is too high.</li> <li>③ The looper thread take-up draws out inadequate amount of looper thread.</li> <li>④ The needle is too thick for the thread.</li> <li>⑤ The position of the intermediate thread guide is not correct.</li> <li>⑥ The position of the thread take-up lever is not correct.</li> <li>⑦ The throat plate is not appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>○ Tighten the needle thread tension nut.</li> <li>○ Loosen the looper thread tension nut.</li> <li>○ Pass the looper thread through another hole in the looper thread take-up thread guide.</li> <li>○ Change the needle.</li> <li>○ Lower the intermediate thread guide.</li> <li>○ Raise the thread take-up lever.</li> <li>○ Replace it with one having a larger needle hole (Part No. B113481H00)</li> </ul>
5. Needle breakage	<ul style="list-style-type: none"> <li>① The needle has been bent.</li> <li>② The timing between the needle and the feed dog is not correct.</li> <li>③ The presser foot has been installed properly.</li> <li>④ The timing and position of the needle guard are not correct.</li> <li>⑤ The needle thread tension is too high.</li> <li>⑥ The count of the thread used is not appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>○ Replace the needle</li> <li>○ Check the timing and correct it.</li> <li>○ Install the presser foot so that the presser foot hole is located at the center of the needle.</li> <li>○ Check the timing and position of the needle guard.</li> <li>○ Loosen the needle thread tension nut.</li> <li>○ Replace the thread with one suited to the quality and thickness of the material.</li> </ul>
6. Puckering	<ul style="list-style-type: none"> <li>① The thread tensions are too high.</li> <li>② The timing of the looper thread take-up is not correct.</li> <li>③ The thread paths are not smooth enough.</li> <li>④ The pressure of the presser foot is not high enough.</li> <li>⑤ The needle is not appropriate.</li> <li>⑥ The throat plate is not suited to the application.</li> </ul>	<ul style="list-style-type: none"> <li>○ Reduce the thread tensions, especially of the looper thread.</li> <li>○ Hasten the timing.</li> <li>○ Smooth out the thread paths using a thick thread of #8.</li> <li>○ Tighten the adjusting screw.</li> <li>○ Replace it with a thinner one.</li> <li>○ Replace it with one for light-weight material (Part No. B1103481B00).</li> </ul>
7. Uneven material feed	<ul style="list-style-type: none"> <li>① The pressure of the presser foot is not correct.</li> </ul>	<ul style="list-style-type: none"> <li>○ Reduce the pressure of the presser foot.</li> </ul>
8. The needle thread slips off the needle.	<ul style="list-style-type: none"> <li>① The needle thread clamping power is weak.</li> <li>② The needle thread gets entangled somewhere.</li> <li>③ The moving knife has been positioned improperly.</li> </ul>	<ul style="list-style-type: none"> <li>○ Loosen the leaf spring screw and correct the thread clamping power.</li> <li>○ Change the position of the intermediate thread guide of the thread stand.</li> <li>○ Correctly position the moving knife.</li> </ul>
9. The looper thread slips off the looper	<ul style="list-style-type: none"> <li>① Inadequate amount of looper thread is drawn out.</li> <li>② The looper has been improperly threaded.</li> <li>③ The returning position of the moving knife is not correct.</li> </ul>	<ul style="list-style-type: none"> <li>○ Increase the amount of the looper thread to be drawn out.</li> <li>○ Correctly thread the looper.</li> <li>○ Correct the returning position of the moving knife.</li> </ul>
10. The needle thread is not trimmed.	<ul style="list-style-type: none"> <li>① Chain-off thread stitches are skipped.</li> </ul>	<ul style="list-style-type: none"> <li>○ Make correction so that chain-off thread is formed properly. (Refer to 13. Inferior chain-off thread.)</li> </ul>
11. The looper thread is not trimmed.	<ul style="list-style-type: none"> <li>① The moving knife has been improperly positioned.</li> </ul>	<ul style="list-style-type: none"> <li>○ Correct the position of the moving knife.</li> </ul>
12. Failure to clamp the needle thread.	<ul style="list-style-type: none"> <li>① The wiper has been improperly positioned.</li> </ul>	<ul style="list-style-type: none"> <li>○ Correct the position of the wiper.</li> </ul>
13. Inferior chain-off thread.	<ul style="list-style-type: none"> <li>① The needle thread tension is not high enough.</li> </ul>	<ul style="list-style-type: none"> <li>○ Increase the needle thread tension.</li> <li>○ Set the intermediate thread guide in the highest position.</li> <li>○ Make the thread take-up lever slightly more effective.</li> </ul>

Trouble	Cause	Corrective measures
14. Seams sewn frequently open.	<ul style="list-style-type: none"> <li>① If the needle thread tension is not high enough.</li> <li>② If the looper thread tension is not high enough.</li> <li>③ If the stitch length is too great.</li> </ul>	<ul style="list-style-type: none"> <li>○ Tighten the needle thread tension adjustment nut.</li> <li>○ Tighten the looper thread tension adjustment nut.</li> <li>○ Decrease the stitch length. When the needle thread tension or looper thread tension has been increased, make the thread take-up lever inoperative for Tetoron thread.</li> </ul>
15. Stitch skipping occurs when sewing in 5 mm stitch length.	<ul style="list-style-type: none"> <li>① Excessive looper thread is supplied to the looper thread cam.</li> </ul>	<ul style="list-style-type: none"> <li>○ Make the thread take-up lever work about 1 mm.</li> <li>○ Increase the looper thread tension.</li> <li>○ Pass the thread through thread eyelet <b>B</b> in the vam thread guide.</li> </ul>