

PLN-985

INSTRUCTION MANUAL

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

	DANGER : 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.
	WARNING : 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.
	CAUTION : 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>② 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>② To perform sewing work with safety cover.</p> <p>② 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 "oiling and cleaning".</p>

Electrical-shock danger label		<p>危険</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>DANGER</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 PLN-985 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 hook rotates at a high speed while the machine is in operation.
To prevent possible injury to hands, be sure to keep your hands away from the vicinity of the hook during operation. In addition, be sure to turn OFF the power to the machine when replacing the bobbin.
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.
- When tilting the machine head, tilt it after removing knee lifter hook.
- Never operate the machine before lubricating.
- For a test run, remove the bobbin and the needle thread.
- For the first month, decrease the sewing speed and run the sewing machine at a speed of 1,500 sti/min or less.
- Operate the handwheel after the machine has totally stopped.

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	PLN-985
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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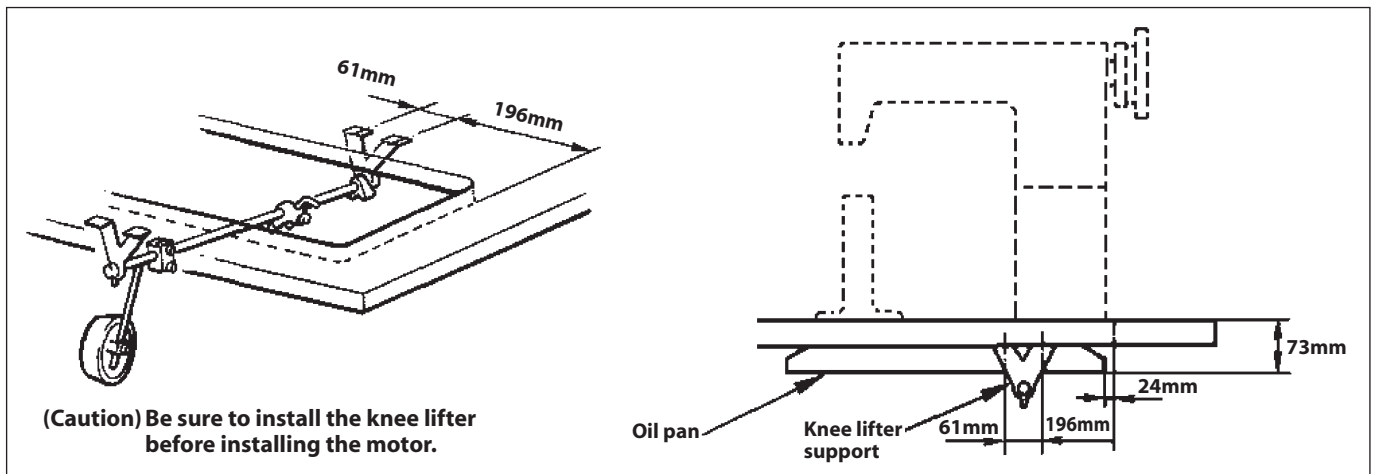
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SPECIFICATIONS

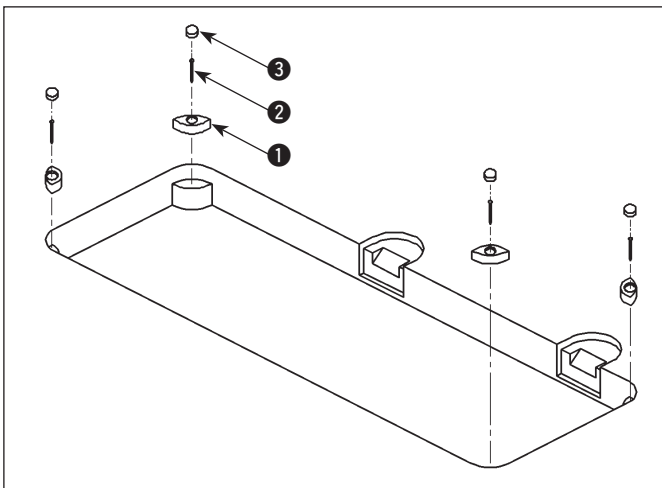
Type of sewing machine head	Post-bed, 1-needle, Needle-Feed Lockstitch Machine	Needle (standard)	SCHMETS 134, Nm100
Usage	Leathers, such as shows, etc.	Needle system	Nm100 to Nm130
Sewing speed	2,500 sti/min (max.)	Thread	#40 to #8
Stitch length	4 mm (max.)	Stitch adjuster method	Dial type
Lift of presser foot	Hand lifter : 6.5 mm, Knee lifter : 9mm	Lubrication method	Hand oiling and oil tank drop lubrication
Thread take-up lever	Slide type thread take-up lever	Motor to be used	Clutch motor (2P) 3 phase 400W
Needle bar stroke	33.4 mm	Oil to be used	JUKI New Defrix Oil No.1
Noise	- Equivalent continuous emission sound pressure level (L_{pA}) at the workstation: A-weighted value of 78.5 dB; (Includes $K_{pA} = 2.5$ dB); according to ISO 10821- C.6.2 -ISO 11204 GR2 at 2,500 sti/min.		

1. INSTALLATION

1) Mounting locations for the knee lifter and the oil pan



2) Attaching the support rubbers



Fix the support rubbers ① on the four corners of the table using nails ②.

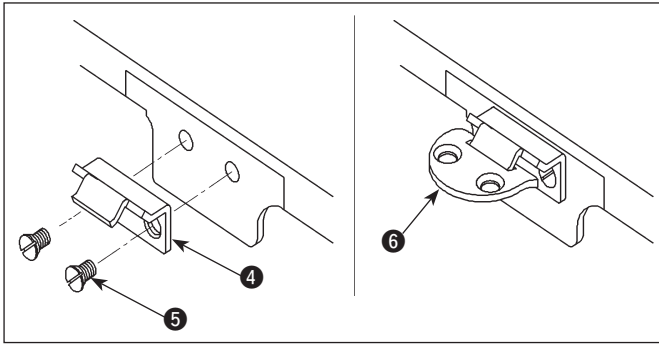
Adhere felts ③ with adhesive glue on support rubbers ①.

3) Carry the sewing machine with two persons.

(Caution) Do not hold the handwheel.

4) Do not put protruding articles such as the screwdriver and the like at the location where the sewing machine is placed.

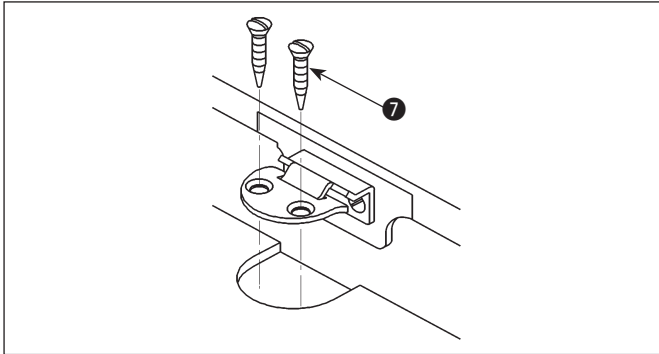
5) Attaching the hinge arm



Install hinge arms **4** to the front and rear (at one location each) of the sewing machine head with screws **5**. Hook hinge seats **6** on hinge arms **4**.

(When hooking hinge seats **6** on the hinge arms **4**, face the counter sunk plane of the hinge seats **6** upward.

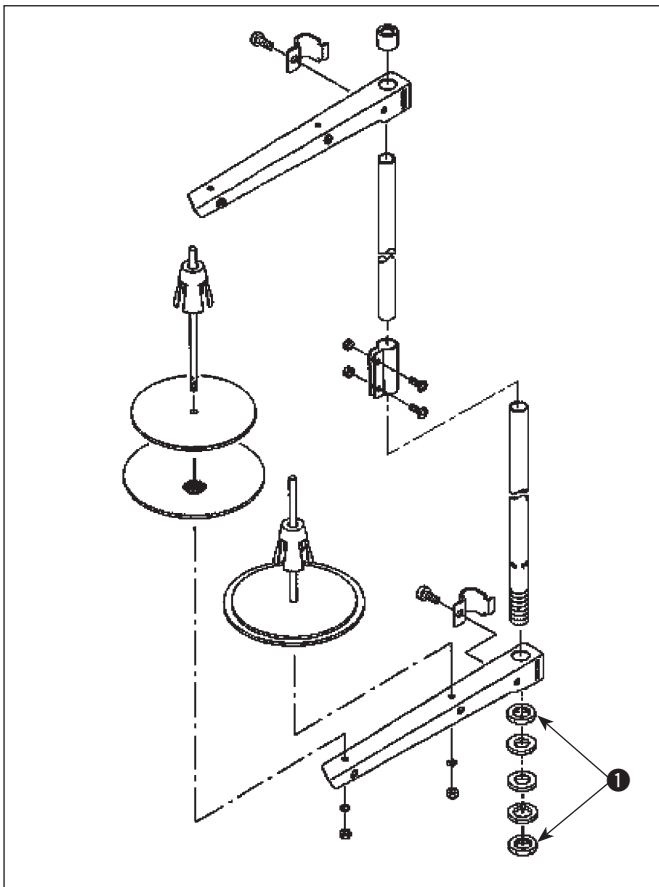
6) Installation of the machine



Put the sewing machine head on the table with the sewing machine head and hinge seats **6** aligned.

Fix hinge seats **6** with wood screws **7** supplied with the unit.

2. INSTALLING THE THREAD STAND



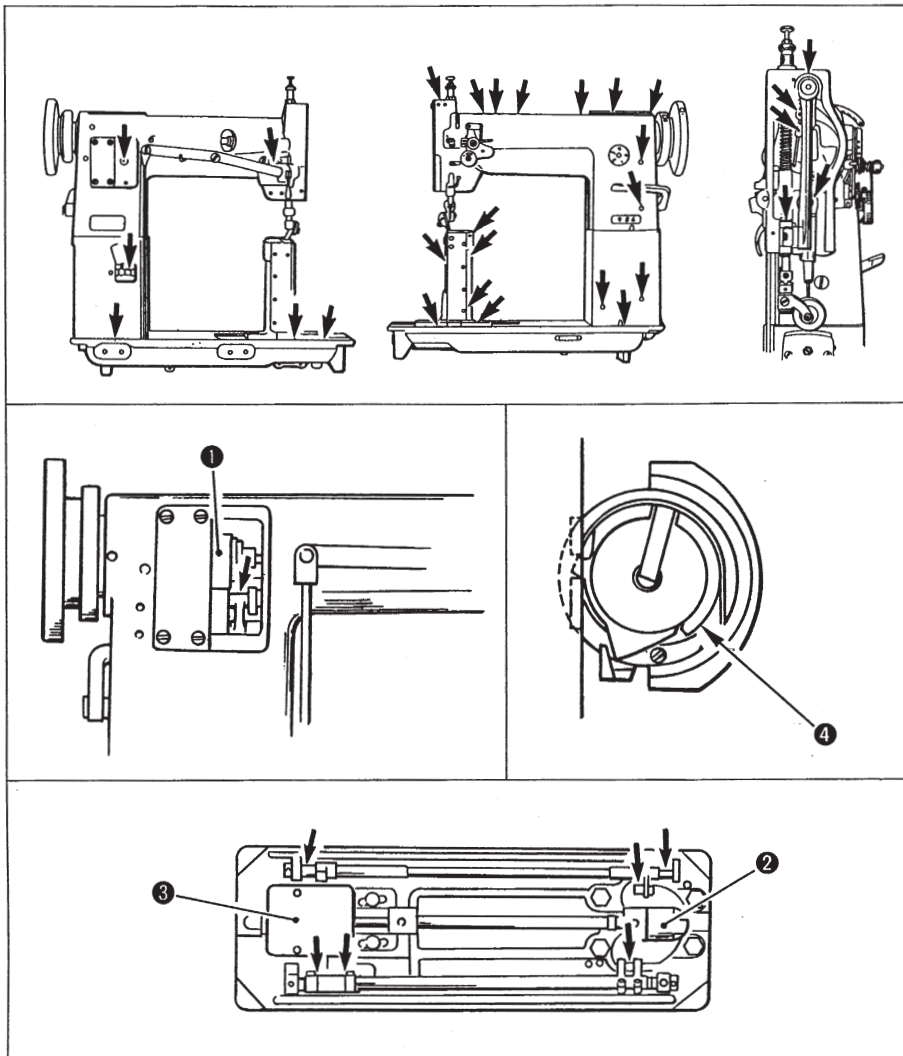
Assemble the thread stand, set it up on the machine table using the installation hole in the table and tighten nut **1** gently.

3. LUBRICATION



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.



★ Before operating the machine

Be sure to supply an appropriate amount of oil to the arrowed sections before operating the machine.
(Be sure to supply oil additionally to the race surface ④ of the hook.)

★ Refilling grease

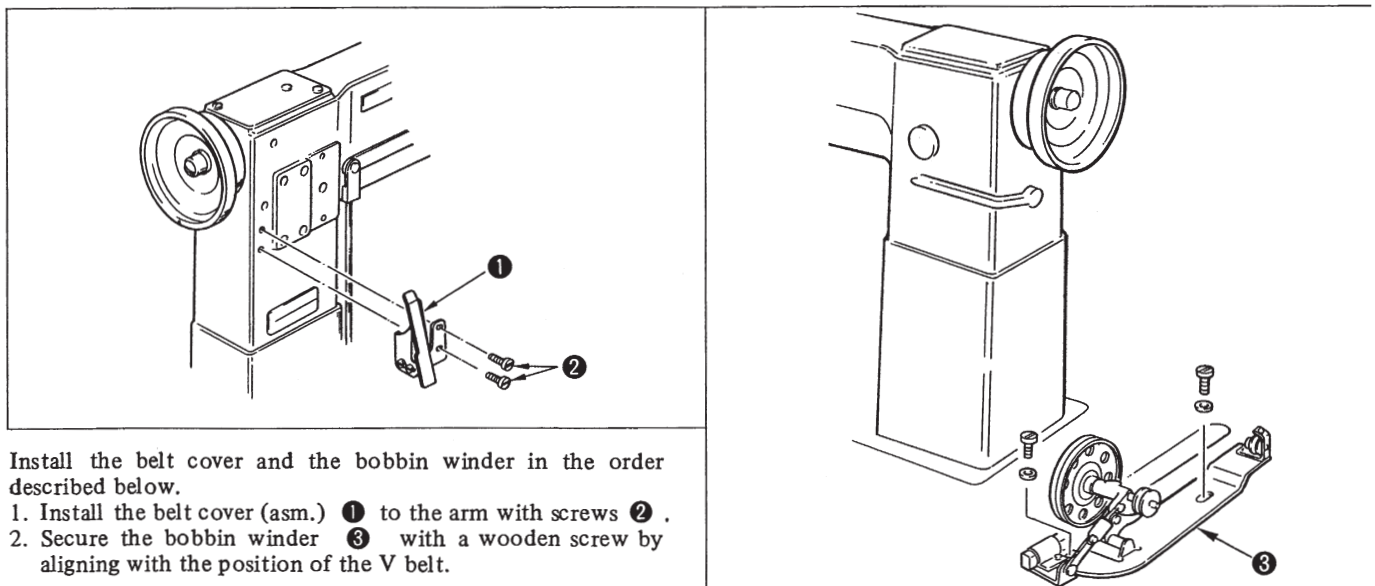
Refill grease once a year by removing screws for upper gear case ①, lower gear case ②, and hook gear case ③.
(Daido Yushi EP-3 grease is used.)

4. INSTALLING THE BELT COVER AND THE BOBBIN WINDER



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.



Install the belt cover and the bobbin winder in the order described below.

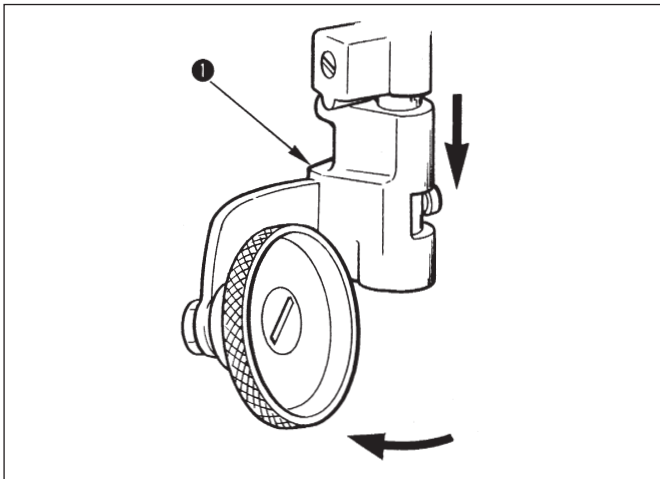
1. Install the belt cover (asm.) ① to the arm with screws ②.
2. Secure the bobbin winder ③ with a wooden screw by aligning with the position of the V belt.

5. OPENING/CLOSING THE ROLLER PRESSER FOOT



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.



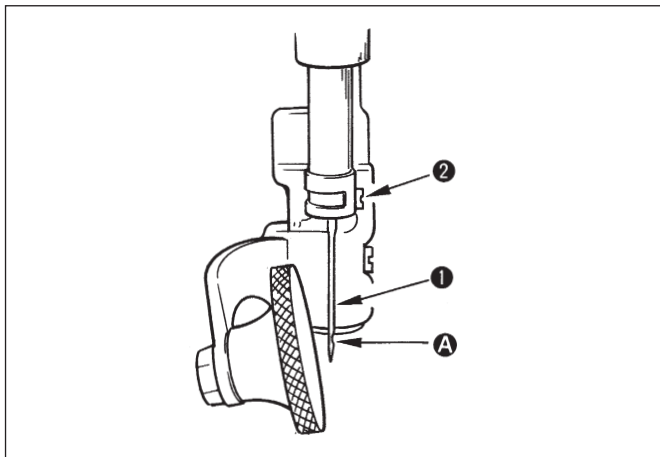
1. To open the roller presser foot, first raise the hand lifter. Now push down roller presser foot base ①, and turn the roller presser foot counterclockwise until it will go no further.
2. To close the roller presser foot, turn the roller presser foot clockwise so that it returns to its predetermined position.

6. INSTALLING THE NEEDLE



WARNING :

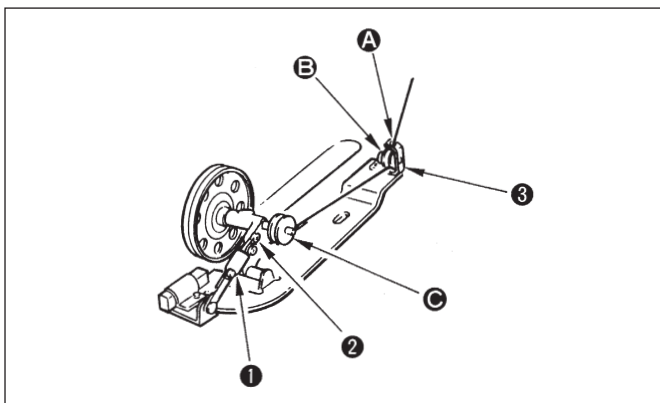
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



The standard needle is a SCHMETS 134, Nm100.

1. Turn the handwheel to allow the needle bar to go up to its top position.
2. Loosen screws ② and place needle ① with its recess A facing directly sideways.
3. Insert the needle fully into the needle hole until it will go no further.
4. Firmly tighten screws ②.

7. WINDING BOBBIN THREAD



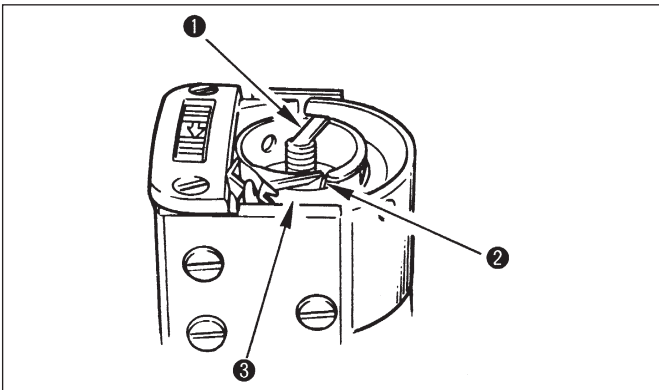
1. Pass the thread through A, B, and C, in that order, and wind the thread onto the bobbin four or five turns.
2. Push down the bobbin winder trip latch ①, allowing the bobbin winder to touch the belt.
3. Adjust the amount of thread wound by the adjuster screw ② so that the thread can be wound round approximately eight-tenths of the bobbin.
To increase the amount, turn the adjuster screw clockwise, and to decrease, turn it counterclockwise.
4. If the thread is wound unevenly, move the bobbin winder thread tension stud bracket ③ to the left and right and adjust so that the thread can be wound evenly.
5. When predetermined amount of the bobbin thread has been wound round the bobbin, the bobbin winder trip latch will be disengaged the bobbin winder will stop automatically.

8. THREADING BOBBIN 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.



★ Taking out the bobbin

To take out the bobbin, pull out the bed slide and raise the claw of the bobbin case holder ① with a finger.

★ How to thread bobbin thread

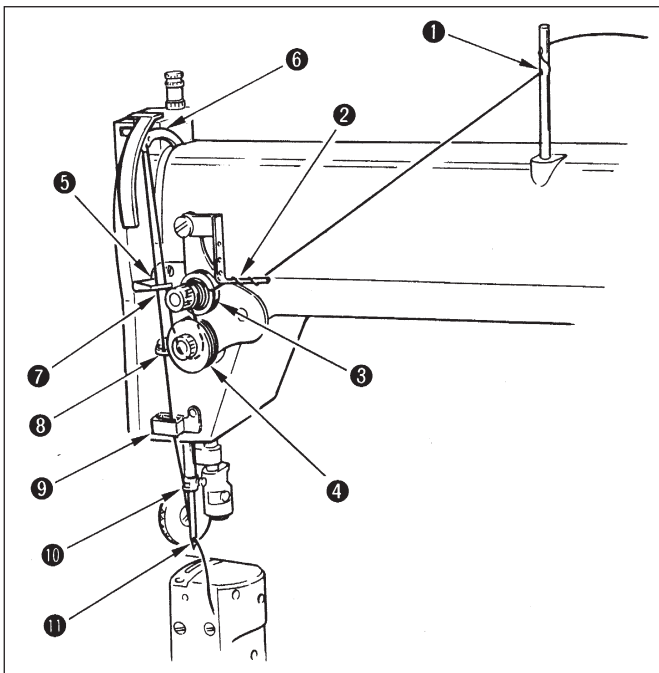
1. Put the bobbin into the hook and pull out the thread end approximately 5 cm and push down the claw of the bobbin case holder ① .
2. Pass the already pulled out thread end through the slot ② in the bobbin case holder. Then pull the thread to pass it under the tension spring ③ .
3. Close the bed slide.

9. HOW TO THREAD A NEEDLE



WARNING :

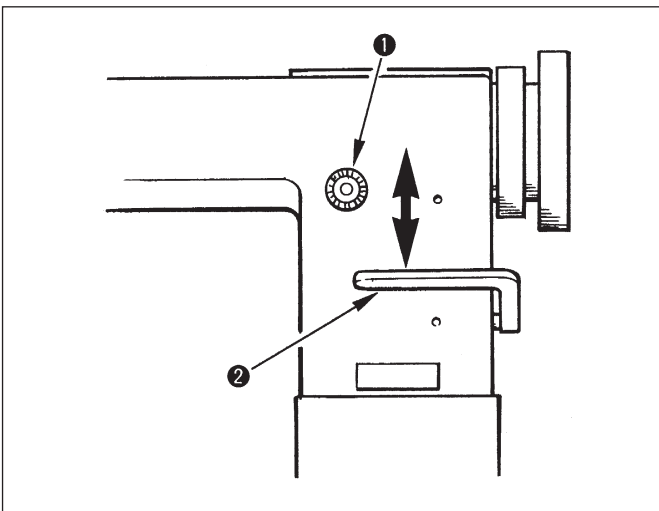
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



Thread a needle in the order illustrated in the figure.

(The thread take-up lever has two holes in it. Thread the lower hole.)

10. ADJUSTING THE STITCH LENGTH

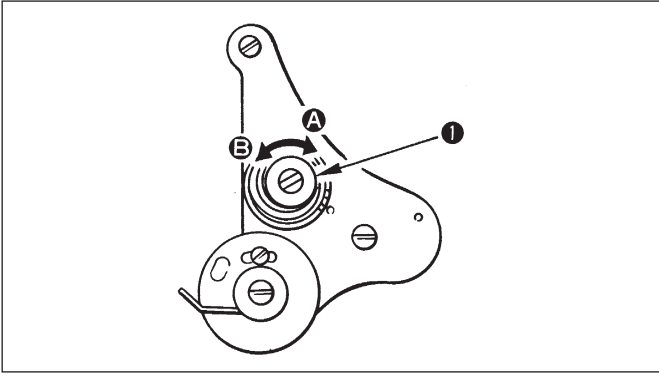


Turn feed adjusting dial ① counterclockwise (or clockwise) so that your desired figure on the dial comes to the top position and is aligned with the pin.

★ Reverse stitching

1. Push down feed lever ② .
2. Reverse stitching can be done while the feed lever is being pushed down.
3. By removing the hand from the lever, the machine will carry out normal stitching.

11. THE NEEDLE THREAD TENSION



★ Adjusting the needle thread tension

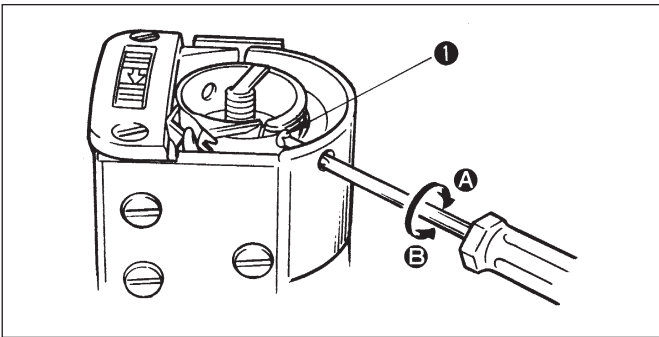
As you turn nut ① clockwise (in direction A), the needle thread tension will increase. As you turn nut ① counterclockwise (in direction B), the tension will decrease.

12. THE BOBBIN THREAD TENSION



WARNING:

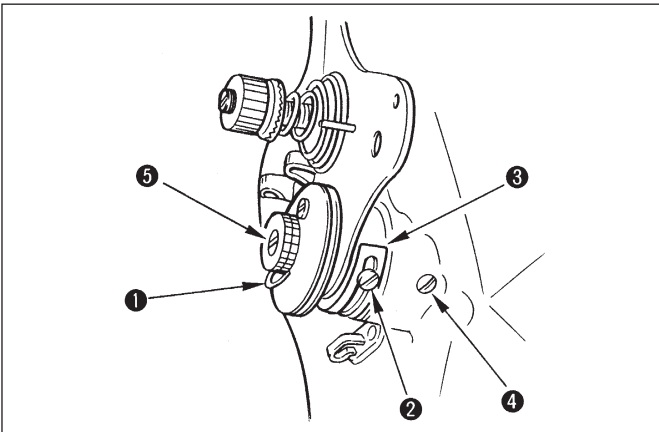
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



★ Adjusting the bobbin thread tension

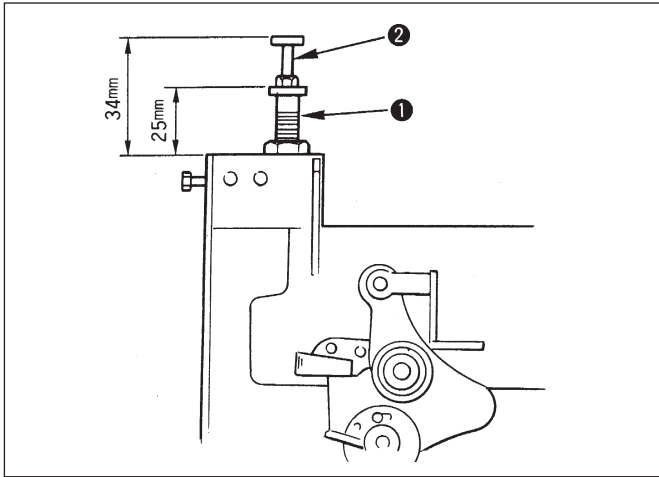
As you turn tension adjust screw ② clockwise (in direction A), the bobbin thread tension will increase. As you turn screw ② counterclockwise (in direction B), the bobbin thread tension will decrease.

13. THE THREAD TAKE-UP SPRING



1. The standard stroke of the thread take-up spring ① is 8 to 10 mm. To adjust the stroke, loosen screw ② and move the stopper ③ to the counterclockwise and clockwise direction.
2. To increase the stroke, move the stopper to the right, and to decrease, move it to the left.
3. The standard tension is 40 to 50 g.
4. To change the tension, loosen the thread take-up spring screw ④ and insert a screwdriver in the groove of tension post ⑤. To increase the tension, turn it counterclockwise, and to decrease, turn it clockwise.

14. ADJUSTING THE PRESSER FOOT PRESSURE



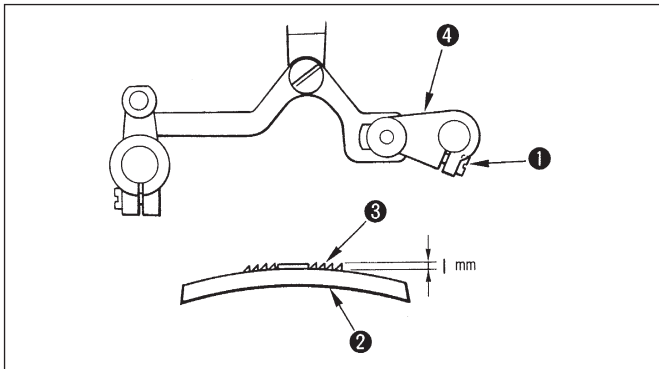
1. As you turn the presser spring regulator A ① and presser spring regulator B ② clockwise, the presser foot pressure will increase. As you turn presser spring regulator A and B counterclockwise, the presser foot pressure will decrease.
2. The standard value for presser spring regulator A ① is 25 mm, and for presser spring regulator B ②, 34 mm.
3. Use a minimum amount of required presser foot pressure.

15. THE HEIGHT OF 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.



The amount of feed dog ③ advancing from throat plate ② has been adjusted to 1 mm. To adjust the height of the feed dog when replacing the feed dog or according to the sewing condition:

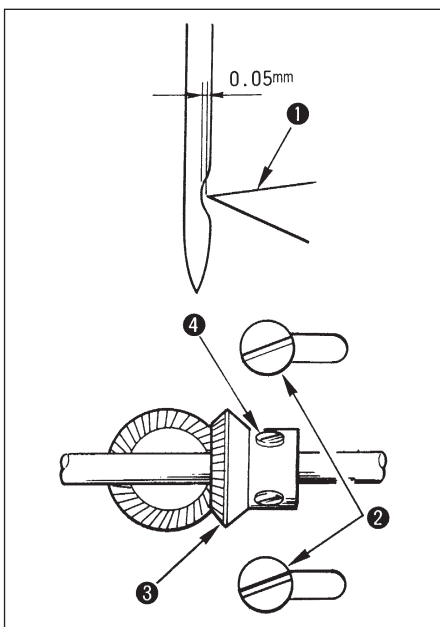
1. Adjust the height of the feed dog to the highest position.
2. Tilt the machine head and remove the bevel gear case of the hook.
3. Loosen screw ① and adjust the height of the feed dog as required by moving the rear crank ④ .

16. THE NEEDLE-TO-HOOK BLADE POINT RELATIONSHIP



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.



To prevent skipped stitches or broken needle thread, the closest possible distance from the hook blade point ① to the needle is desirable. When a 2-needle machine is used, changing the needle gauge or gauge setting requires adjustment of the needle-to-hook blade point distance.

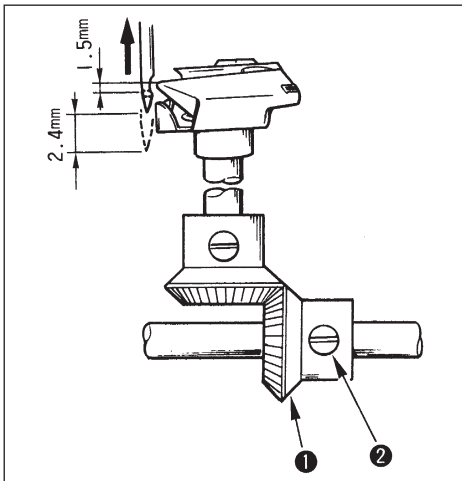
1. Loosen the hook saddle cover screws both on front and rear sides.
2. Tilt the machine head away from you.
3. Remove the bevel gear case of the hook.
4. Turn the handwheel, and when the needle center is aligned with the hook blade point ① , stop turning the handwheel.
5. Loosen screw ④ and screw ② for bevel gear ③ .
6. Adjust the clearance between the hook blade point and the needle side face to 0.05 mm by moving the hook saddle to the left and right.
7. Securely tighten screws ② and screws ④ .
8. Install the hook bevel gear case.
9. Raise up the machine head and tighten the hook saddle cover.

17. ADJUSTING THE NEEDLE BAR HEIGHT AND TIMING FOR ALIGNING THE NEEDLE AND THE HOOK BLADE POINT



WARNING :

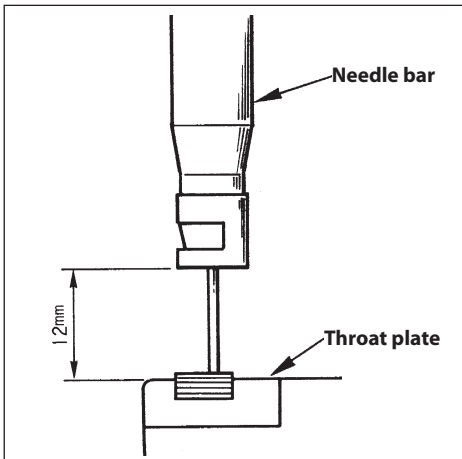
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



- For the standard timing between the needle and the blade point of the hook, the blade point of the hook should be aligned with the center of the needle and also should be brought to the position which is 1.5 mm above the upper end of the needle eyelet when the needle ascends 2.4 mm from its lowest position.
- Adjusting the needle bar and the hook
Raise the needle bar from its lowest position by 2.4 mm, and loosen screw ② in bevel gear ① of the hook driving shaft. Now adjust the position of the hook with regard to the position of the needle bar by turning the hook by hand.
- The position of the needle bar
Loosen the needle bar connecting stud clamping screw, and properly position the needle bar by moving it up and down.

(Caution) The standard for the needle bar bottom point is as follows:

- The distance from the lower end of the needle bar to the upper face of the throat plate is 12 mm.

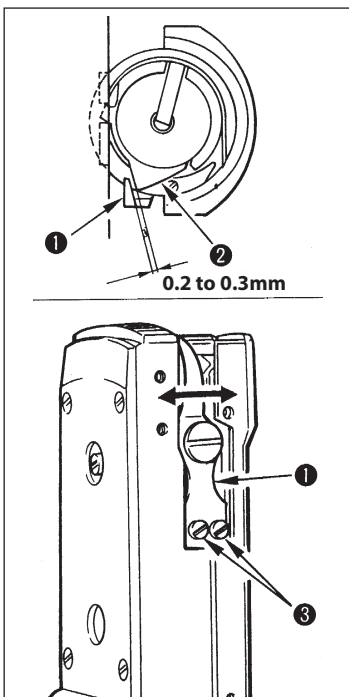


18. ADJUSTING THE BOBBIN CASE OPENING LEVER



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.



Turn the handwheel in the normal direction to bring bobbin case opening lever ① to its back end position. At this time, press bobbin case stopper ④ toward you. Under this condition, adjust the clearance between the triangle section of bobbin case holder ② and bobbin case opening lever ① to 0.2 to 0.3 mm.

★ How to adjust

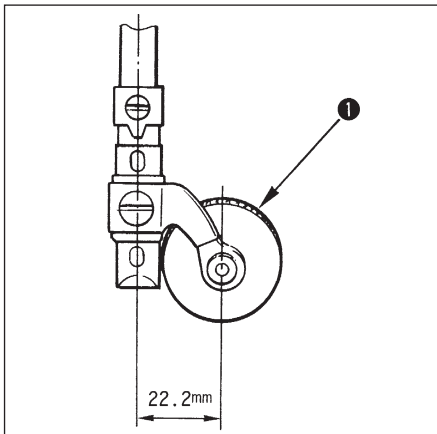
Remove the hook saddle cover and screw ③. Then adjust the clearance by moving bobbin case opening lever ① to the left and right.

19. THE FRONT/REAR POSITION OF THE ROLLER PRESSER FOOT



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.



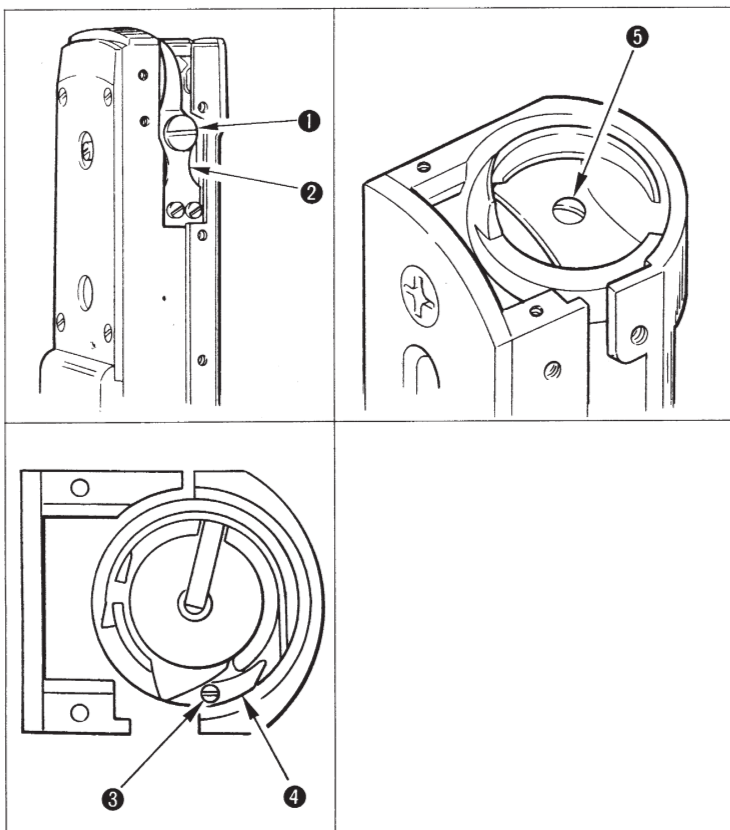
Adjust the distance between the presser bar center and the roller presser foot center to 22.2 mm. ①

20. INSTALLING OR REMOVING THE HOOK



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 hook pinches thread or the hook is to be replaced with a new one while the machine is being used, remove the hook in the order described below.

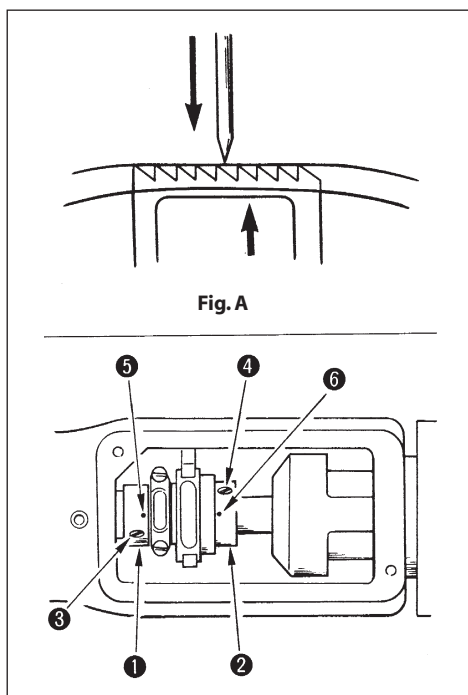
1. Remove the bed slide and pull out the bobbin.
2. Turn the handwheel by hand, and when the thread take-up lever comes down to its bottom position, stop turning the handwheel.
3. Remove the throat plate and the hook saddle cover located this side.
4. Remove hinge screw ① and take out bobbin case opening lever ②.
5. Remove screw ③ and take out bobbin case holder ④.
6. The hook can be removed by turning it slowly to the clockwise while raising it up by holding the shaft of the bobbin case holder.
7. Remove screw ⑤ and pull out the hook.

● How to install the hook

1. Install in the reverse order of removal.
2. Be sure to install the hook in the correct direction. Install it in the same direction as when it was removed.
3. To install the throat plate, align the projection of the bobbin case holder in the direction of the stopper of the throat plate. Then tighten the screw for the throat plate after ensuring a precise fit.

21. THE NEEDLE-TO-FEED DOG RELATIONSHIP

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 desired relationship between the needle and the feed dog is that the feed dog and the tip of the needle are aligned with each other on the throat plate surface, when the feeding amount is maximized. (Provided that the height of the feed dog is 1 mm.)
- How to adjust
 1. Loosen screw ③ in feed driving shaft cam. Adjust to the relation illustrated in Fig. A by turning feed driving shaft cam ① by hand.
 2. Loosen screw ④ in feed rocker shaft cam ②, and adjust so that marker dot ⑤ engraved on feed driving shaft cam ① is aligned with marker dot ⑥ engraved on feed rocker shaft cam ②.

22. MOTOR PULLEY AND SEWING SPEED

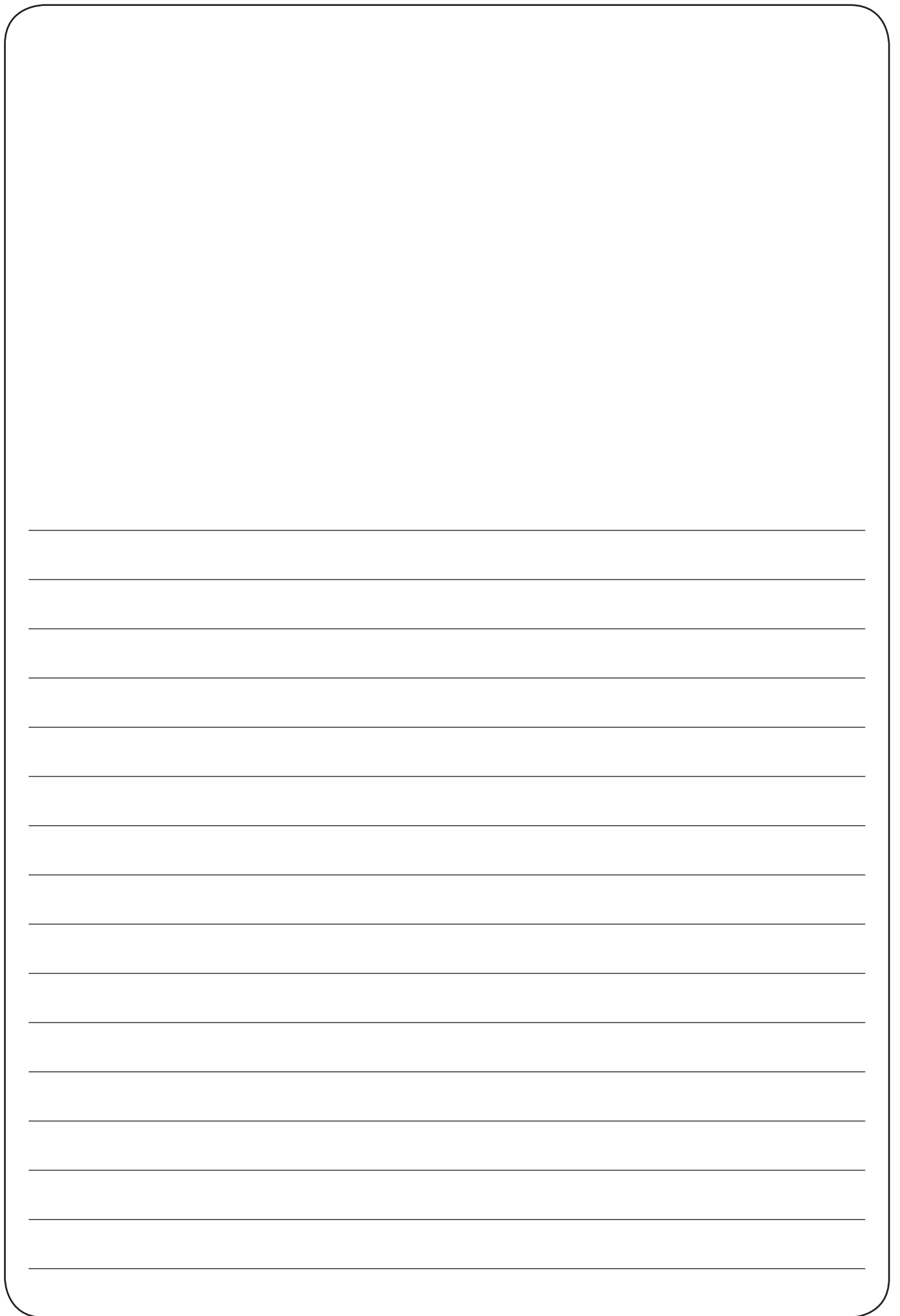
- 1) Use an M type V belt.
- 2) The following table shows the relationship among the motor pulley and the sewing speed.

Model	Sewing speed	Effective diameter of handwheel	Number of poles	Frequency	Rotational speed of motor	Effective diameter of motor pulley
PLN-985	2,500 sti/min	φ 95.3 mm	2	50 Hz	2,840 rpm	φ 80
				60 Hz	3,400 rpm	φ 70

(Caution) The effective diameter of the motor pulley is obtained by subtracting 5 mm from the outside diameter.

23. TROUBLES IN SEWING AND CORRECTIVE MEASURES

Problem	Cause	Corrective measures
<p>1. Thread often breaks (Thread often frays or fruzzles.)</p> <p>(A 2 to 3 cm needle thread is left on the wrong side of the cloth.)</p>	<ol style="list-style-type: none"> ① Thread path, needle point, hook blade point, bobbin case resting groove on the throat plate have scratches. ② The needle thread is excessively tight. ③ The end gap of the bobbin case opening lever is excessively large. ④ The needle and the hook blade point interfere. ⑤ The needle thread is not properly tightened. ⑥ The thread take-up spring is too tight and the amount of movement is too small. ⑦ The timing of the needle and the hook is too early or too slow. 	<ul style="list-style-type: none"> ○ Remove scratches in the hook blade point by smoothing with a paper file. Finish the bobbin case resting groove of the throat plate with buff. ○ Adjust the needle thread tension. ○ Decrease the end gap. Refer to "18. ADJUSTING THE BOBBIN CASE OPENING LEVER." ○ Refer to "16. THE NEEDLE-TO-HOOK BLADE POINT RELATIONSHIP." ○ Adjust the needle thread tension. ○ Decrease the tension of the thread take-up spring and increase the amount of movement. ○ Refer to "17. ADJUSTING THE NEEDLE BAR HEIGHT AND TIMING FOR ALIGNING THE NEEDLE AND THE HOOK BLADE POINT."
<p>2. Stitches are frequently skipped</p>	<ol style="list-style-type: none"> ① The needle-to-hook blade point clearance is excessive. ② The timing of the needle and the hook is too early or too slow. ③ The presser foot pressure is insufficient. ④ The distance from the upper end of the needle eyelet to the blade point of the hook is not proper. ⑤ The needle is improperly selected. 	<ul style="list-style-type: none"> ○ Refer to "16. THE NEEDLE-TO-HOOK BLADE POINT RELATIONSHIP." ○ Refer to "17. ADJUSTING THE NEEDLE BAR HEIGHT AND TIMING FOR ALIGNING THE NEEDLE AND THE HOOK BLADE POINT." ○ Tighten the presser adjuster screw. ○ Refer to "16. THE NEEDLE-TO-HOOK BLADE POINT RELATIONSHIP." ○ Replace the needle with a one-count lower needle.
<p>3. Faulty thread tension</p>	<ol style="list-style-type: none"> ① Bobbin thread is not in the tension spring of the bobbin case. ② The thread path is not finished properly. ③ The bobbin will not slide smoothly. ④ The end gap of the bobbin case opening lever is excessive. ⑤ The bobbin thread is not tightened properly. ⑥ The bobbin thread is wound too tightly. 	<ul style="list-style-type: none"> ○ Properly pass the bobbin thread through the bobbin case. ○ Smooth the surface with a fine paper file or finish the surface with a buff. ○ Replace the bobbin or replace the hook. ○ Refer to "18. ADJUSTING THE BOBBIN CASE OPENING LEVER." ○ Adjust the bobbin thread tension. ○ Decrease the bobbin thread winding tension.



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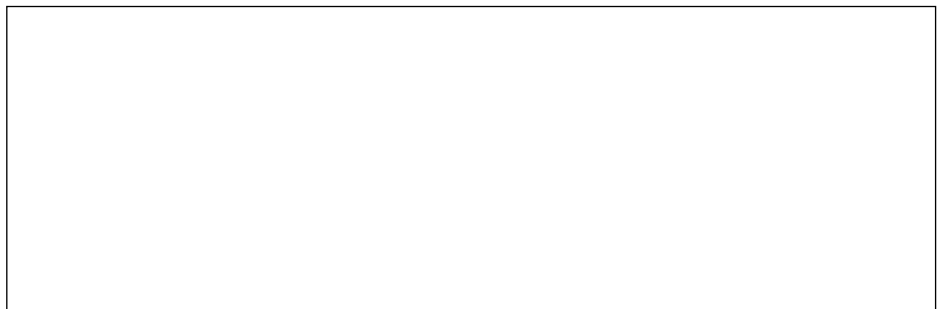
2-11-1, TSURUMAKI, TAMA-SHI,

TOKYO, 206-8551, JAPAN

PHONE : (81)42-357-2371

FAX : (81)42-357-2380

<http://www.juki.com>



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