



INDUSTRIAL SEWING MACHINE

MODEL

PLK-G6030WR

TECHNICAL MANUAL

SEWING MACHINE HEAD

A180E760P01

FOR SAFE USE

Before the installation, operation, and inspection for this product, read the “FOR SAFE USE” and the technical manuals carefully. Also read the other technical manuals, “Control Unit” and “Operation Panel” describing some instructions, which are not in this manual, and use the sewing machine properly.

SAFETY INDICATIONS

	DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
	CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage. Note that CAUTION level may lead to a serious consequence according to the circumstances. Always follow the instructions of both levels because they are important to personal safety.

CAUTION INDICATIONS

No.	Caution indication	Description
1		<p><u>Precaution for sewing machine operation:</u></p> <p>Indicates that removing the safety and operating the sewing machine for some other purposes with power-on are prohibited.</p> <ul style="list-style-type: none"> ● Please do not operate the sewing machine without protective equipment such as a needle guard, an eye guard, a belt cover or the others. ● Please turn off the power switch when threading, changing a needle and a bobbin, cleaning, and lubricating.
2		<p><u>Caution for fingers injury:</u></p> <p>Indicates a possibility of fingers (hands) injury in a certain condition.</p>
3		<p><u>Caution for squeezing fingers:</u></p> <p>Indicates a possibility of squeezing fingers in a certain condition.</p>

SAFETY PRECAUTIONS



To prevent from receiving an electric shock, always turn off a power switch and unplug power supply when opening a control box, and then open after ten minutes passes.



USAGE ENVIRONMENT

Please do not operate the sewing machine under the following conditions.

- (1) In the ambient temperature of 35 degrees (95°F) or more than 35 degrees, or the ambient temperature of 5 degrees or less than 5 degrees (41°F).
- (2) In the ambient temperature of 55 degrees (131°F) or more than 55 degrees, or the ambient temperature of -10 degrees or less than -10 degrees (18°F) during transportation.
- (3) In the relative humidity exceeding 85% or less than 45%.
- (4) In the open-air place or the location that receives direct sunlight.
- (5) In the place near heat sources such as heating devices.
- (6) In the atmosphere filled with dust, explosive gas, or corrosive gas.
- (7) In the place where the fluctuation in the power voltage of 10% or more than 10%, or the power voltage of -10% or less than -10% of the fixed power voltage.
- (8) In the place where the power source cannot supply enough voltage to keep the motor running.
- (9) In the place filled with strong electric noises such as high-frequency welders.

INSTALLATION

- (1) Please have some specialists, who have enough experience for the sewing machine installations, install the sewing machine.
- (2) Please have a qualified electrician perform necessary electric wiring.
- (3) Please do not operate until the sewing machine is repaired when any damage or fault is found on the sewing machine at the installation.
- (4) Please do not refurbish the sewing machine.
- (5) The sewing machine is heavy. For the safety, please make sure to install the sewing machine head by more than one person.
- (6) Please make sure to fit the safety protective equipment (the motor cover or the others) and the accessory protective equipment (the eye guard) that removed temporarily for installation.

SEWING

- (1) Please make sure to turn the power switch off before installing or replacing needles.
- (2) Please pay attention for the fingers not to be injured by the needle point.
- (3) Please make sure to turn power switch off before lubricating.
- (4) Please pay attention that oil does not get on your skin or in your eyes as it may cause an inflammation.
- (5) Please make sure to keep oil out of the reach of children who may drink oil by mistake.
- (6) Please make sure to turn the power switch off before threading a needle.
- (7) Before starting the sewing, please make sure the position and the function of the halt switch.
- (8) Please do not touch the operating parts during sewing operation.
- (9) It is very dangerous to operate the sewing machine without safety guards (eye guards, belt covers, link covers, finger guards or the others).
Please make sure to operate the sewing machine with safety guards.
- (10) Please make sure to turn the power switch off when stopping the sewing machine temporarily.

ADJUSTMENT

- (1) Please make sure to turn the power switch off before adjusting the sewing machine.
- (2) If the adjustment is required while the power switch on, do not step on the foot switch by mistake.
- (3) Please be careful not to be injured by a sharp part such as the needle and the shuttle hook point.
- (4) Please make sure to put the safety guards (eye guards, belt guards, link covers, and finger guards or the others) back on the initial position after the sewing machine adjustment.

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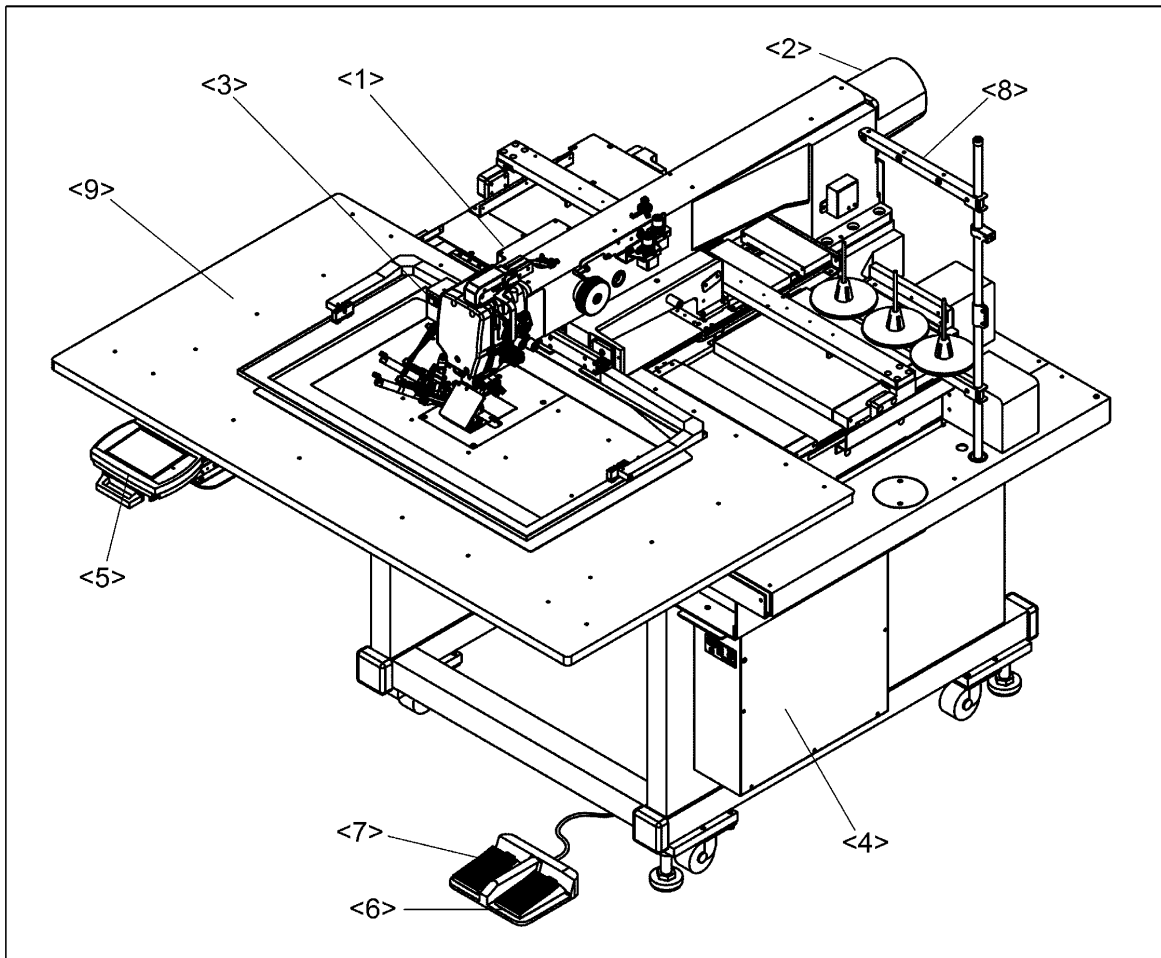
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1. STRUCTURE OF THE SEWING MACHINE

PLK-G6030WR electronic pattern sewing machine consists of the following main parts.



<1>: Sewing machine head <2>: Main shaft motor <3>: Halt switch <4>: Control box
<5>: Operation panel <6>: Work holder switch <7>: Start switch <8>: Thread stand
<9>: Sewing machine table

2. SPECIFICATIONS

Model	PLK-G6030WR
Sewing area	X-direction (left/right) 600 mm
	Y-direction (front / back) 300 mm
Maximum sewing speed	1,800rpm (Continuous feeding) 1,800rpm (Intermittent feeding)
Setting speed ^{*3}	10 speed levels in 200 rpm to 1,800 rpm
Stitch length	0.1 to 20.0 mm
Stitch type ^{*4}	Double needle lock stitch (by the needle changing method)
Maximum number of needles	20,000 per pattern
Storable sewing data item	900 patterns (internal memory)
Data memory	Internal memory, USB memory
Needle bar stroke	41.2 mm
Thread take up lever stroke	70mm
Class of needle	DPX17#18
Needle thread holder	Needle thread holder and thread catcher system
Presser foot lift ^{*1}	12 mm (as factory default setting) (Maximum 15 mm)
Presser foot stroke ^{*2}	In 4 mm to 10 mm (4 mm as factory default setting)
Hook	Large size vertical rotating hook
Bobbin case	With non racing spring
Bobbin	Large size aluminum bobbin
Thread trimmer system	Horizontal engagement with fixed knife and movable knife
Lubrication system	Manual oiling and replenishment with the oil braids from the oil tanks
Lubrication oil	Pulley SF oil
X-Y drive system	Stepping motor feedback control Timing belt drive system. Intermittent or continuous feeding
Machine dimensions (W)x(L)x(H)	1,350mm x 1,720mm x1,250mm
Weight	Total 445 Kg
Type of motor	XL-K756-20
Type of controller	PLK-G-CU-20-WR
Type of operation panel	PLK-G-PAL-2
Power	In 200V to 240V single-phrase or three-phrase The power in 110V to 120V or in 380V to 415V is compatible with power unit (option)

*1 : Presser foot lift is the height of the presser foot after the sewing has stopped.

*2 : Presser foot stroke is the up and down movement of the presser foot while sewing.

*3 : Sewing speed may be limited by the operation or sewing condition.

*4 : It cannot sewing same time by the both needles work.

3. INSTALLATION

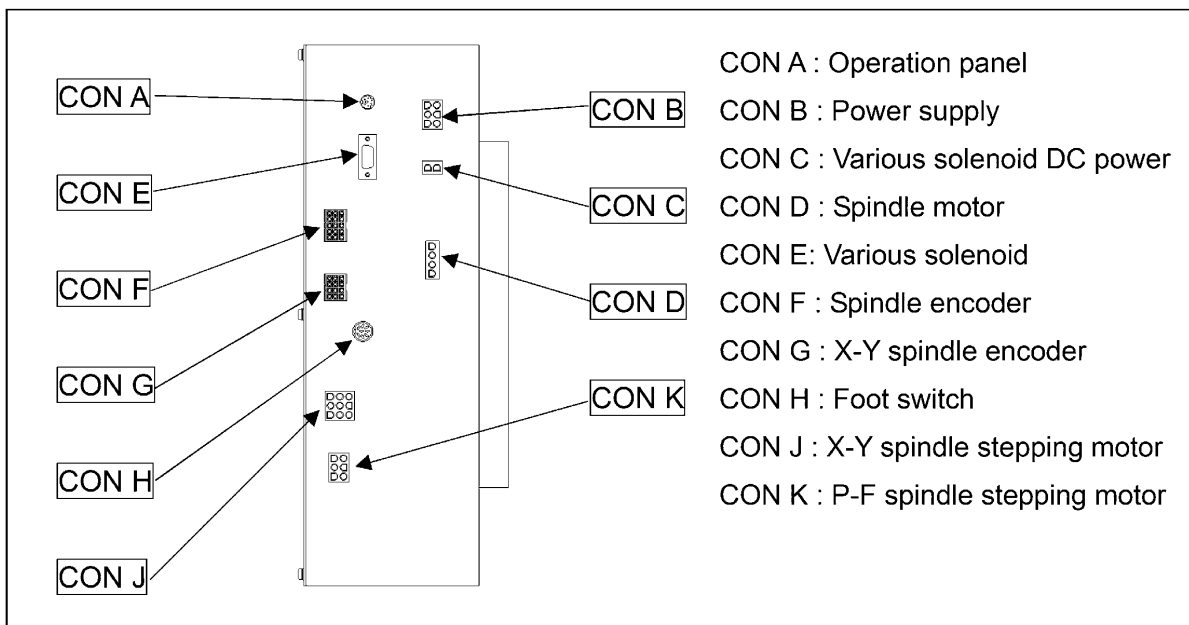


- (1) Please have some specialists, who have enough experience for the sewing machine installations, install the sewing machine.
- (2) Please have a Qualified Electrician perform necessary electric wiring.
- (3) Please do not operate until the sewing machine is repaired when any damage or fault is found on the sewing machine at the installation.
- (4) Please do not refurbish the sewing machine.

3-1. Installation of the foot switch

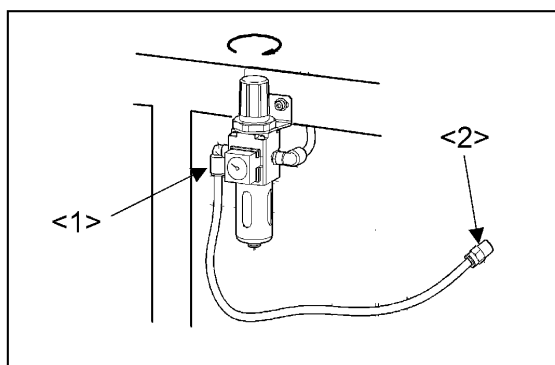
Connect the foot switch to the connector CON H.

The foot switch is enclosed in the accessory box.



3-2. Connection of the air tube

Insert the one end of the air tube (8mm Diameter) into the intake air fitting of the filter regulator (No.1) then, join the other end of the air tube with the suitable air coupling to be adopted with the air supply source provided in your factory. One of the air couplings (No.2) is enclosed in the accessory box.

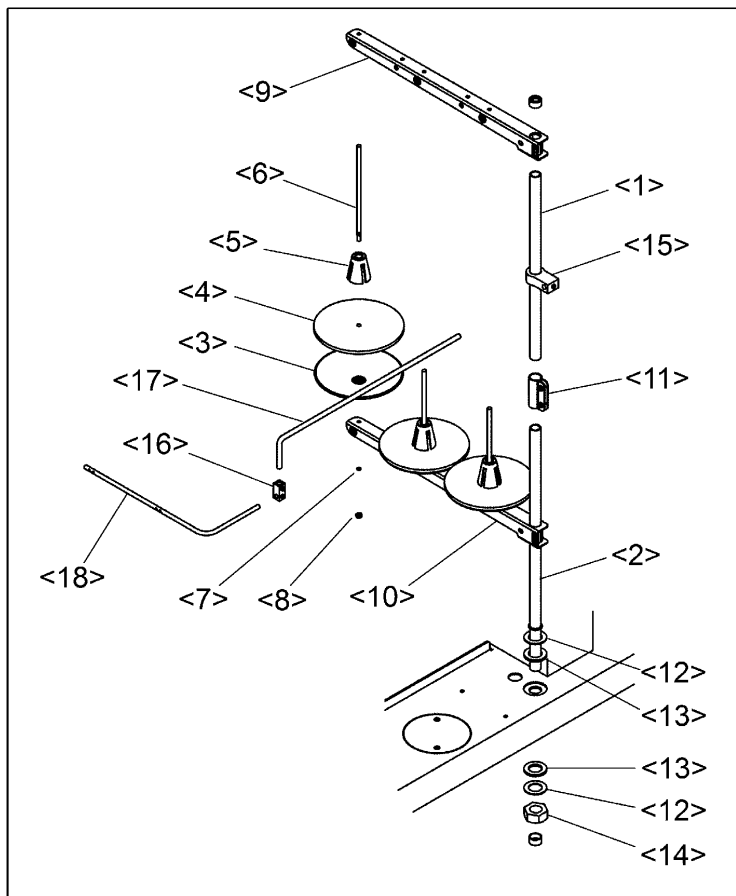


<1>: Intake air fitting

<2>: Air coupling

3-3. Installation of the thread stand

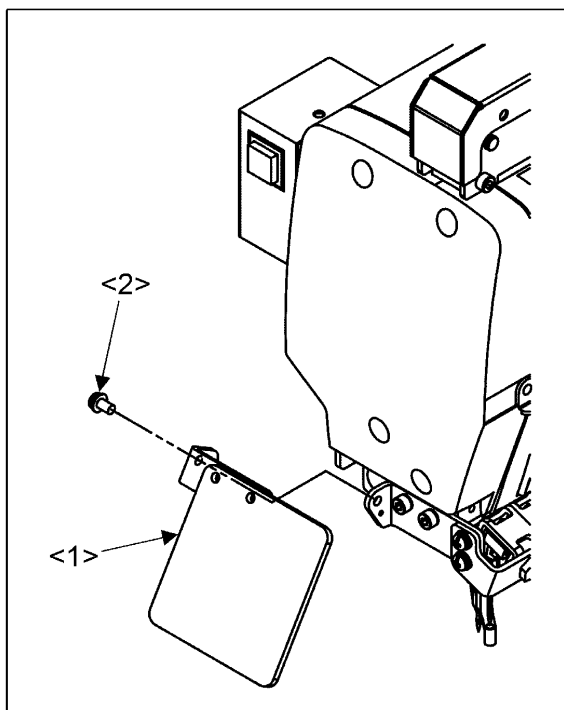
- (1) Assemble the parts of the thread stand as shown on the figure.
- (2) Fit the thread stand into the hole at the far right on the table stand with the nut (No.14) and the washer (No.12) and cushion (No.13).



- <1>: Upper column pipe
- <2>: Lower column pipe
- <3>: Spool stand base
- <4>: Spool mat
- <5>: Spool holder
- <6>: Spool shaft
- <7>: Spring washer
- <8>: Nut
- <9>: Thread hunger
- <10>: Spool holder
- <11>: Column joint
- <12>: Washer
- <13>: Cushion
- <14>: Nut
- <15>: Bracket (large)
- <16>: Bracket (small)
- <17>: Holder
- <18>: Thread guide

3-4. Installation of the eye guard

- (1) Mount the eye guard (No.1) with screw (No.2) to the flat place of the sewing machine.



- <1>: Eye guard unit
- <2>: Screw

4. LUBRICATION



CAUTION

- (1) Please make sure to turn power switch off before lubricating.
- (2) Please pay attention that oil does not get on your skin or in your eyes as it may cause an inflammation.
- (3) Please make sure to keep oil out of the reach of children who may drink oil by mistake.

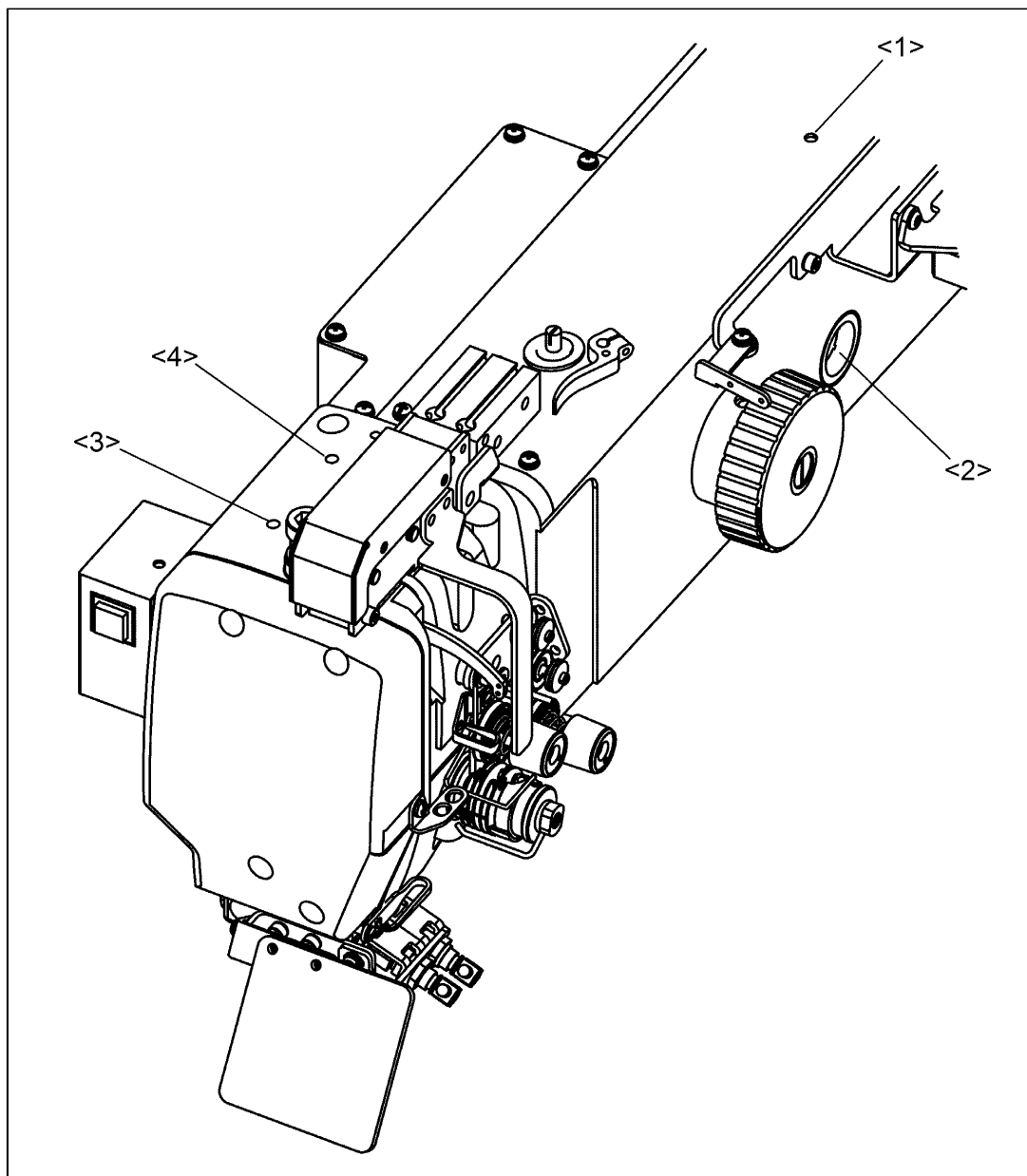
[Notice] Please make sure to lubricate when operating for the first time after the installation. Also, please make sure to check the amount of oil when the machine has not been used for a long time.

4-1. Filling the oil tank

Pour the oil through the oil hole (No.1) to the oil tank (No.2) on the machine arm.

4-2. Oiling

Put some oil to the red marked oil holes (No.3 & No.4).



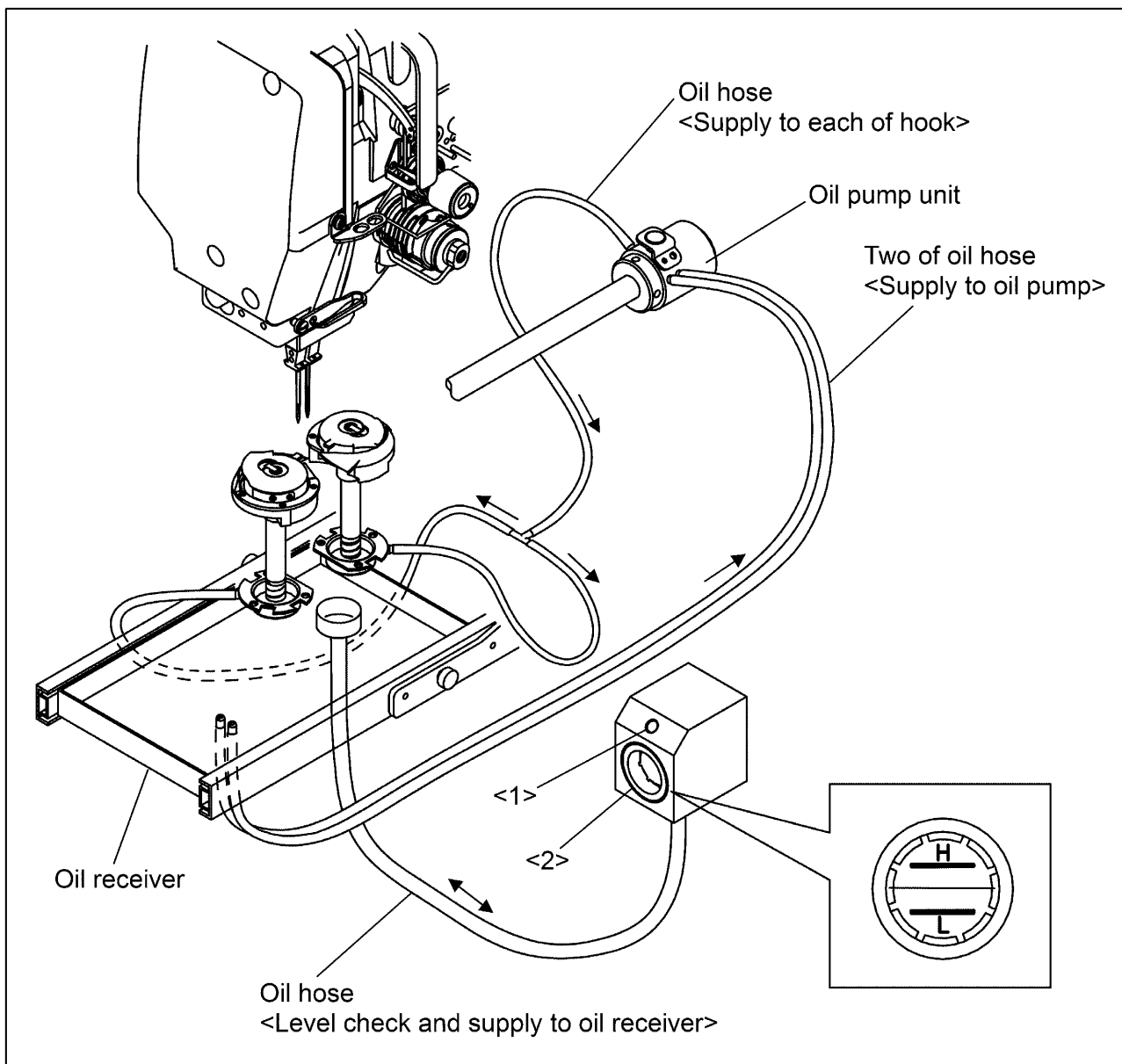
4-3. Oil lubrication mechanism for hook

Component of oil lubrication mechanism is showing in below drawing.

Check the oil amount of oil receiver by oil level gauge (No.2). When oil level is below the lower line, fill the oil to oil hole (No.1).

NOTE 1. The oil is not filled by shipment. When using machine first time, please fill the oil to oil receiver directly. In this case fill the oil slowly with checking the oil level and wait oil level become stabled. This operation has to remove the hook saddle cover and drawing the oil receiver. Please refer to the instructions in the paragraph <7-5-1 (2) and 7-23-1 (3)>.

2. When filled the oil first time, the oil hose has many air bubbles. Please get rid of air bubbles as much as possible and operate the machine at slow speed with checking the oil circulation.



5. PROPER OPERATION

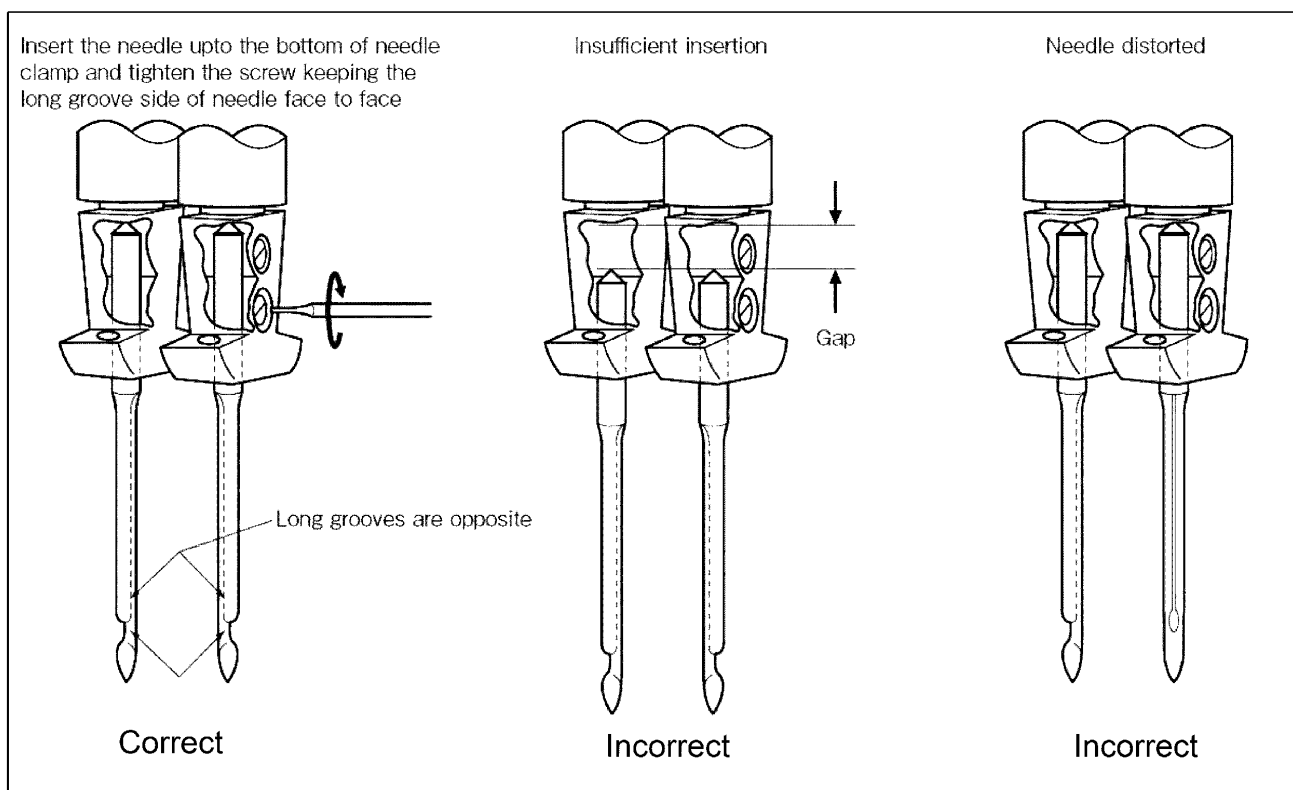
5-1. Initial setting of the control box

When using the sewing machine for the first time, the model and the language of the sewing machine in use have to be set.

Refer to the instructions in the paragraph “[6] Initial Setting of System (Model/language Setting)” in the **CONTROL UNIT** technical manual.

5-2. Installation of needles

NOTE Before installing the needles, be sure to turn off the power.

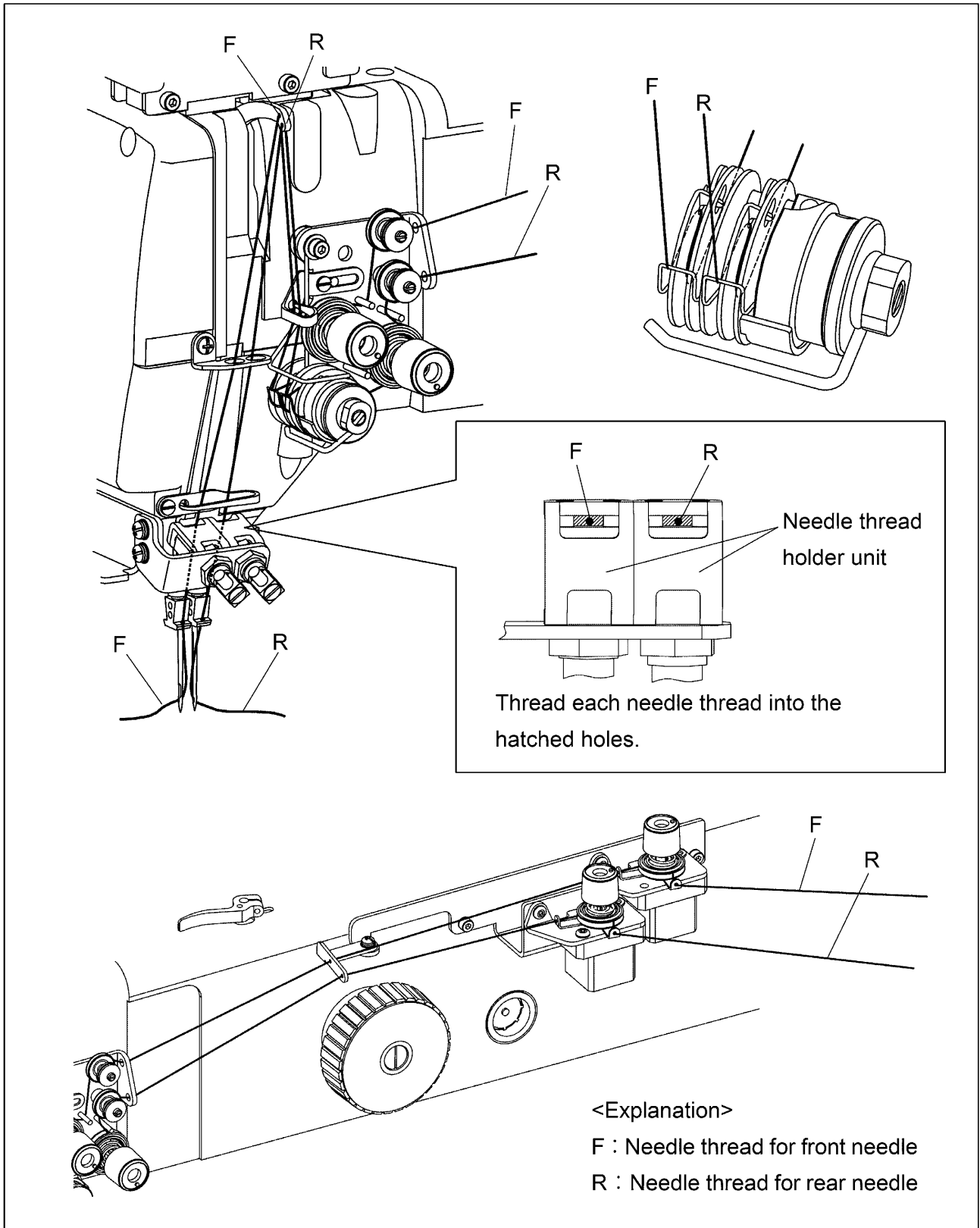


5-3. Threading the needle thread

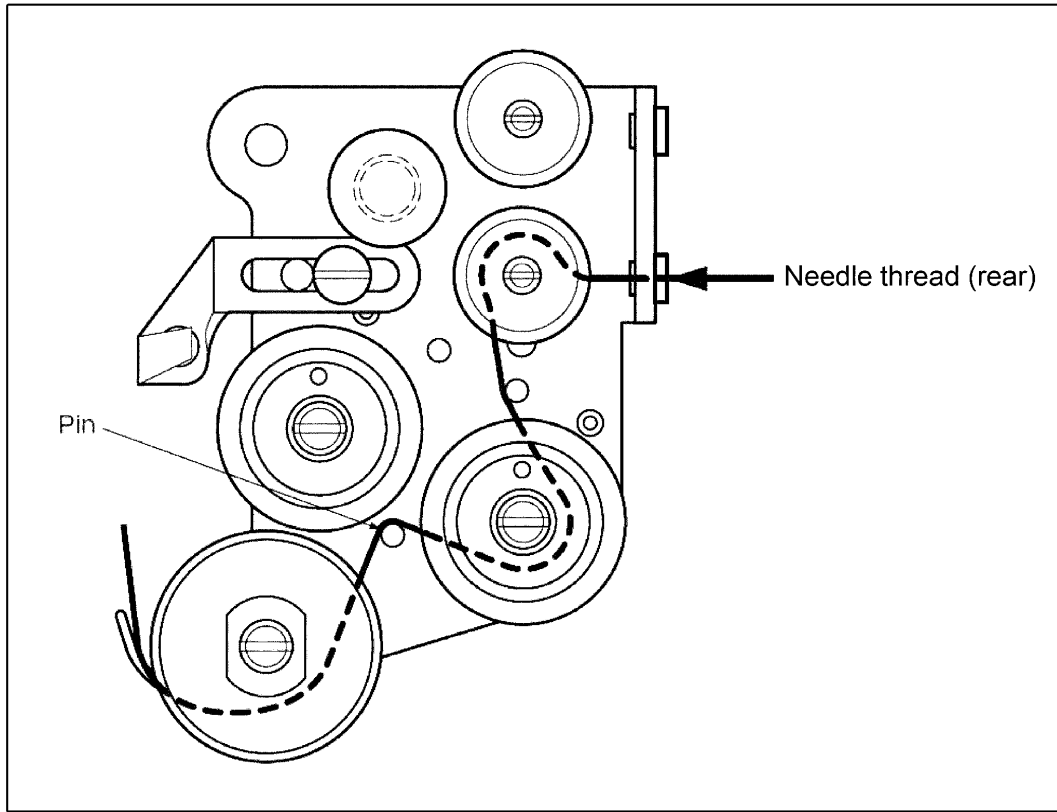


(1) Please turn the power switch off when threading a needle.

(1) Thread the needle thread as shown on the figure.



(2) If the strong twisted thread is used and needle threads tension is strong (about 500gf or more), the right thread may be released from the thread tension disc. In this case, thread only the rear thread as shown in the figure (keep the front thread standard).



5-4. Winding the bobbin thread

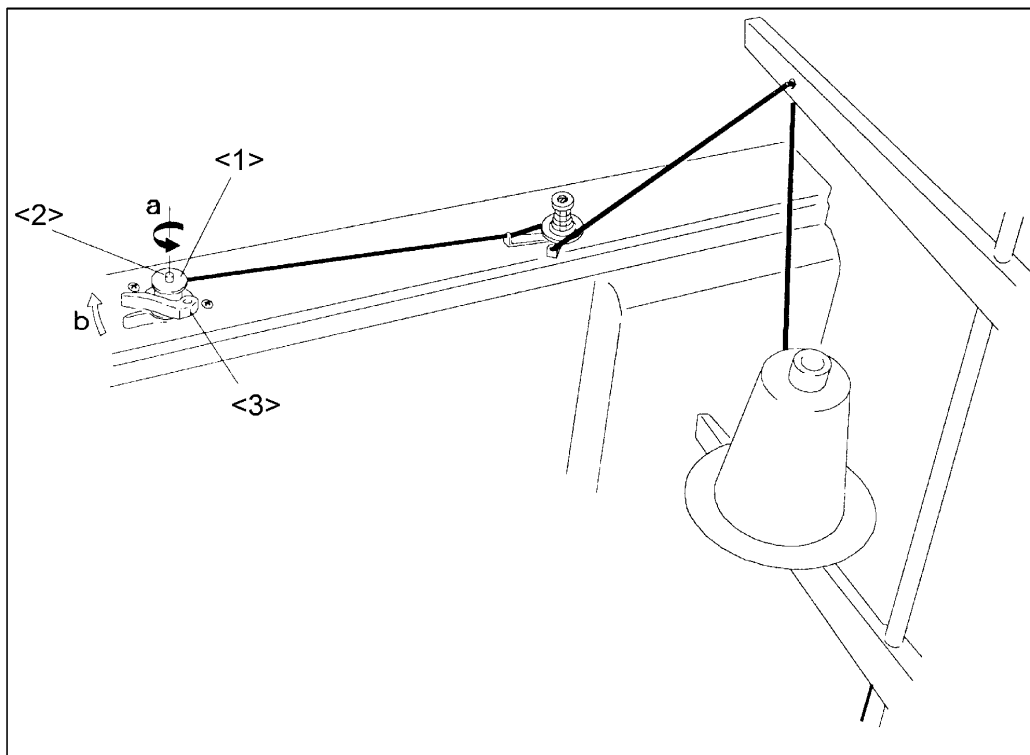


(1) Please do not touch the rotating part during winding thread. Doing so may cause injury and/or the machine failure.

[Notice] Please make sure to pull the needle thread out of the needle before winding the bobbin thread.

- (1) Route the thread as shown in the below figure then, wind the thread to the bobbin (No.1) in the direction of "a" arrow several times. Then fit the bobbin to the bobbin winder (No.2) and push in the bobbin presser arm (No.3).
- (2) With the machine in the Bobbin Wind Mode, step on the work holder foot switch first and then the start switch second so that the thread continues winding to the bobbin while the start switch is stepped on.
- (3) When the bobbin finishes winding a certain amount (80 to 90 % of the outside diameter of bobbin) of thread, the bobbin presser arm is returned to the initial position.
- (4) To wind the bobbin thread during the sewing operation, carry out the procedure (1) above then, the bobbin winding is performed automatically.

For the bobbin winding mode, refer to the instructions in the paragraph "[3] Explanations of basic screen, icons and operation "5. The Bobbin Winding screen" is explained below" in the **OPERATION PANEL** technical manual.

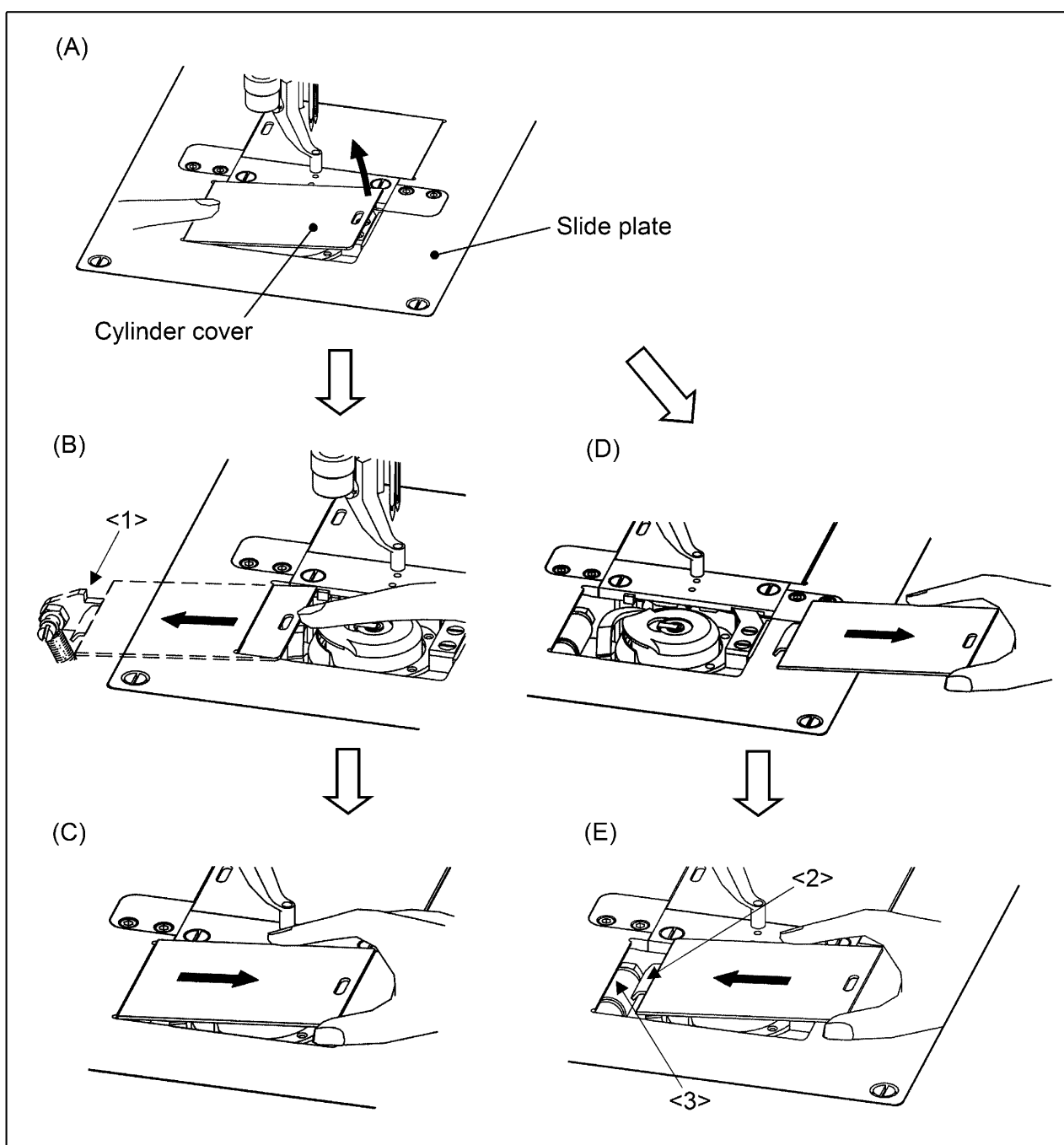


<1>: Bobbin <2>: Bobbin winder <3>: Bobbin presser arm

5-5. Opening the cylinder cover

- (1) Press the end of cylinder cover. Other end of cylinder cover is lifted. (Fig. A).
- (2) Keeping above state and push end of cylinder cover by the other hand. The cylinder cover can be inserted in the slide plate. (Fig. B) Cylinder cover is stop when it reached to the stopper (No.1).
- (3) When shut the cylinder cover drawing slowly with keeping both side of cover. Cylinder cover is closed when drawn up to its end position. (Fig. C)
- (4) The cylinder cover also can be detached from slide plate when draw out the cylinder cover from previous (Fig. A) state. (Fig. D)
- (5) When back the cylinder cover to the slide plate insert the bended end of cylinder cover (No.2) to the point (No.3) between slide plate and guide roller.

NOTE When shut the cylinder cover please make sure that cylinder cover is not lifted.



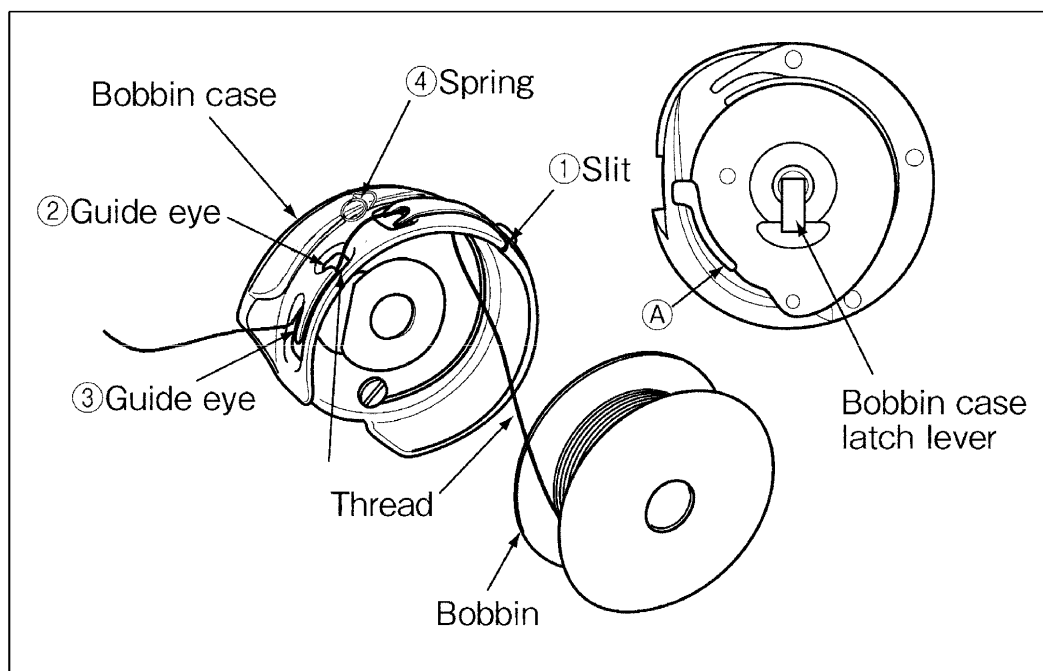
5-6. Setting the bobbins

Thread and install the bobbin case according to following figure.

- (1) Pass the bobbin thread slit (No.1) so that the thread can be unwound on the left side of the bobbin.
- (2) Pass the bobbin thread in the order from (No.1) to (No.3) in the figure.

NOTE The spring (No.4) is not used.

- (3) Match the protruded portion of the rotating hook with recessed portion (A) of the bobbin case and install the hook and the bobbin case to the rotating hook shaft.
- (4) Set the bobbin case latch lever.
- (5) Leave the thread tail on the bed.



6. SEWING




CAUTION



- (1) Before starting the sewing, please make sure the position and the function of the halt switch.
- (2) Please do not touch the operating parts during sewing operation.
- (3) It is very dangerous to operate the sewing machine without safety guards (eye guards, belt covers, link covers, finger guards or the others). Please make sure to operate the sewing machine with safety guards.
- (4) Please make sure to turn the power switch off when stopping the sewing machine temporarily.

6-1. The sewing operation

(1) Turn the power switch on.


(2) Press the home position return icon .


(3) Select a sewing data.


Press the  on the standard screen then, press the .


(4) Select a target (internal memory/USB memory) to read the data from.

The screen as default setting is set to the reading from internal memory mode.


(The mode display at the left top on the screen is .)

Press the , when switching the reading from the internal memory to the reading from USB memory mode.



(Pressing the  also can switch the target.)

Press the  to switch the page with full of data.

(5) Select a data then, set the data.

Press the target data number then, press the .

(6) Set the sewing speed.

Set the appropriate sewing speed by selecting  or . (10 selections of 0 to 9)

(7) Set the sewing material under the work holder.


(8) When the black foot switch is stepped on, the work holder goes down.

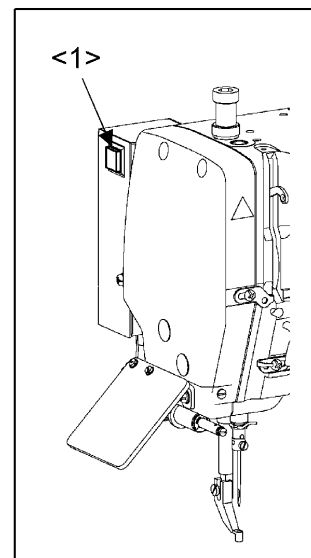
(When the sewing material has to be reset, step the black color foot switch again to make the work holder go up.)

(9) Step on the gray color start switch so that the sewing machine starts sewing,

(10) After the sewing finishes, the work holder is lifted automatically then, the sewing material is released.

6-2. Operation of the halt switch

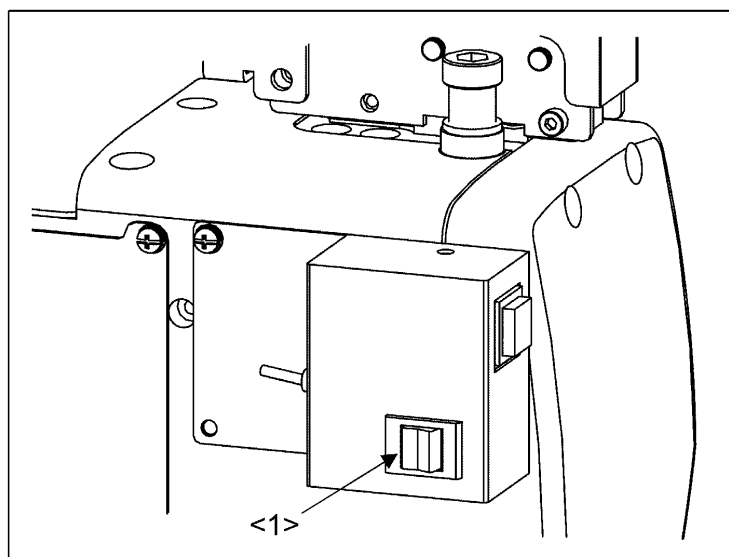
- (1) If accidents such as a thread breakage, needle breakage and others happened during the sewing, press the halt switch immediately.
The sewing machine stops instantly.
- (2) To cancel the halt state, press the halt switch again.
- (3) When continuing sewing, step on the grey foot switch to restart at the halted position. (Press the jogging in forward/reverse direction icon so that the sewing start position will move.)
- (4) To cancel sewing, press the home position return icon .



<1>: Halt switch

6-3. Operation of the needle select switch

When push the needle select switch (No.1) each time. The sewing needle is changed.



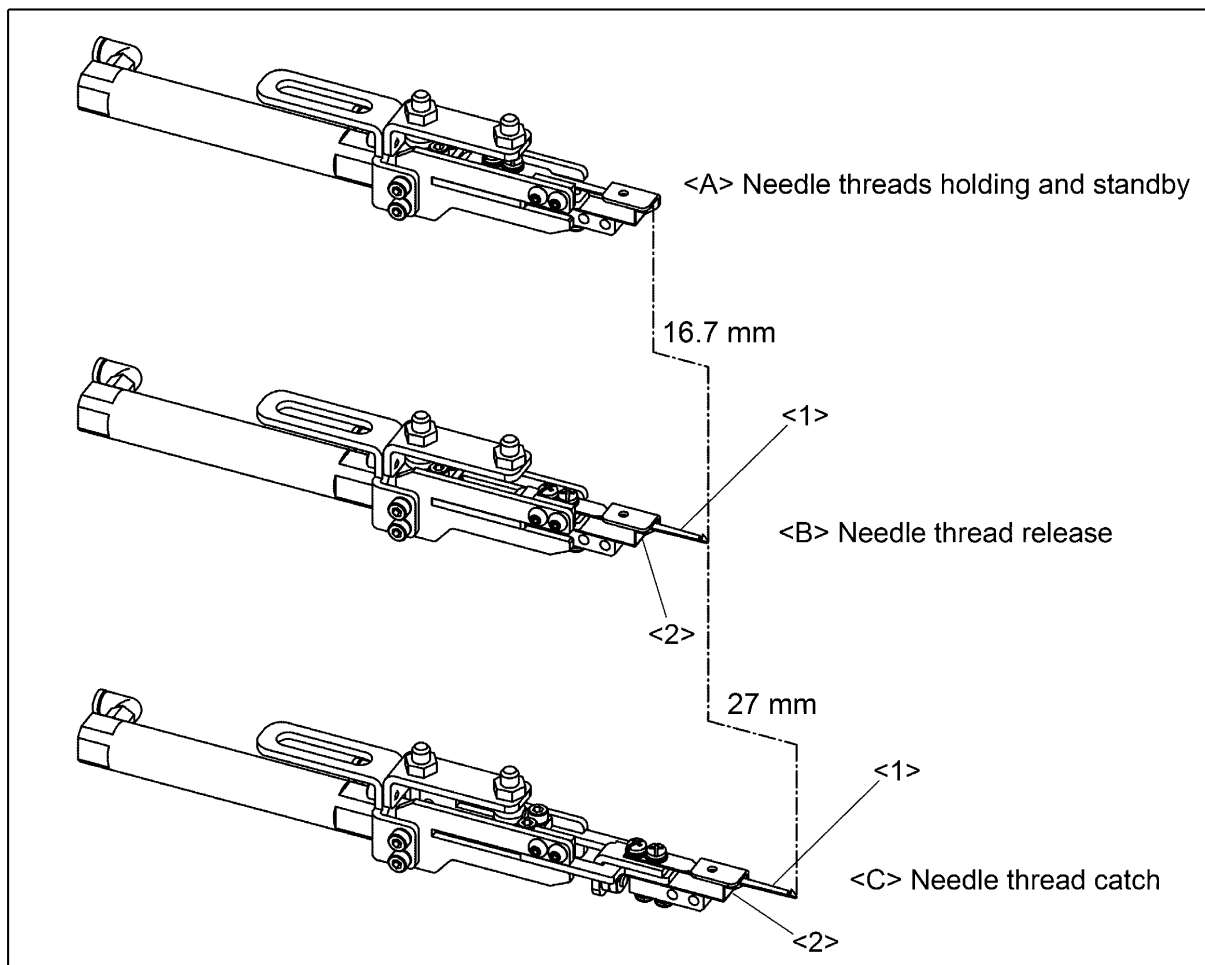
6-4. Operation of the needle thread catcher

Two sets of the needle thread catcher are equipped for both sewing needles. The needle thread catcher prevents skip sewing and thread entangling by holding the standby needle thread.

6-4-1. Function of the needle thread catcher

The needle thread catcher functions automatically when finish the thread trimming. The following is summary of the thread catcher's work.

- (1) Fig. <A> is the most retracted state of the needle thread catcher. The needle thread catcher is waiting in this state with holding the needle thread.
- (2) When start the sewing, the needle thread catcher can be release the needle thread by itself. (Fig.)
In this time the thread picker (No.1) moves little forward and drag out the needle thread from holder spring (No.2). This needle thread release function can be control the release timing arbitrarily. Please refer to the paragraph <6-4-7. Setting of the thread release timing>.
- (3) When needle thread is trimmed, the thread picker <1> moved to the state of Fig. <C>. In this state the needle thread catcher is most extended. Then the thread picker (No.1) is move immediately toward the standby position. (Fig. <A>) In this process the needle thread caught by thread picker (No.1) and then held by the holder spring (No.2).
- (4) When operate the manual thread release switch, the needle thread catcher moves into the state of fig. . Please refer to the paragraph <6-4-8. Operation of the manual thread release switch >.

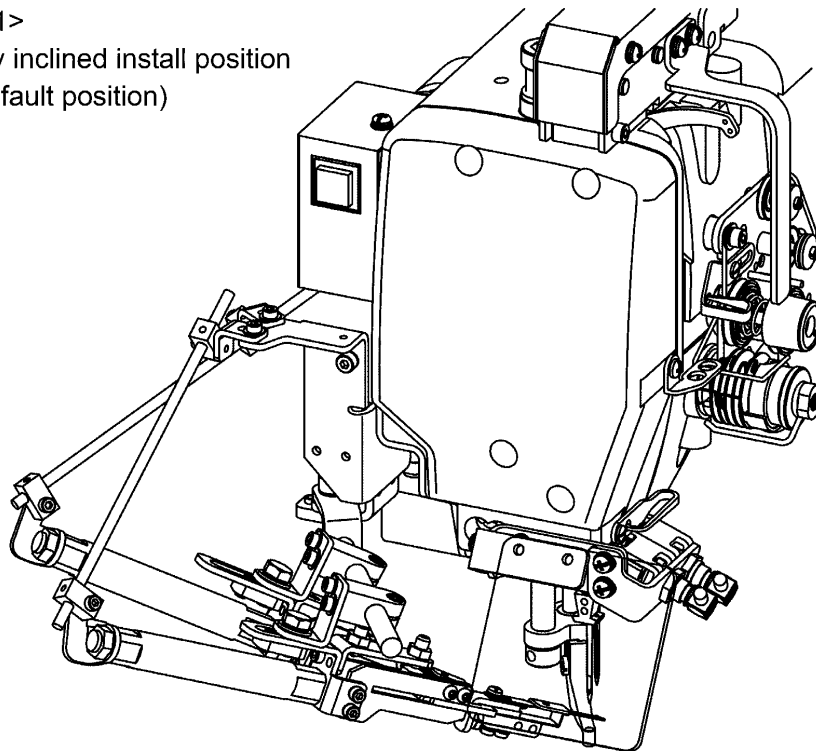


6-4-2. Installation of the needle thread catcher

The following is two examples of the needle thread catcher system installation position. Please change the needle thread catcher position according to the need. In this case please note that the needle thread catcher not to contact other needle thread catcher and needles, presser foot. When change the install position, please refer to the paragraph <6-4-5. Adjustment of the needle thread catcher >.

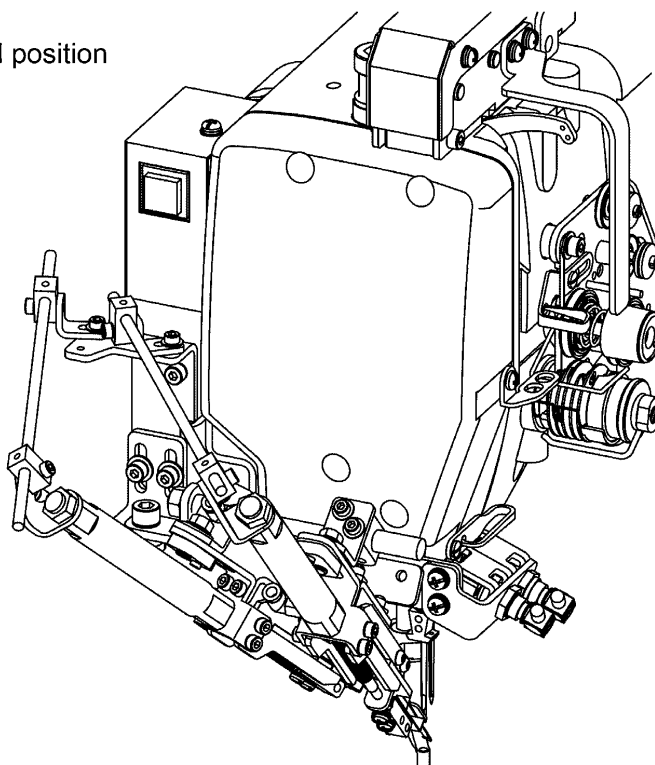
<Example.1>

Horizontally inclined install position
(Factory default position)

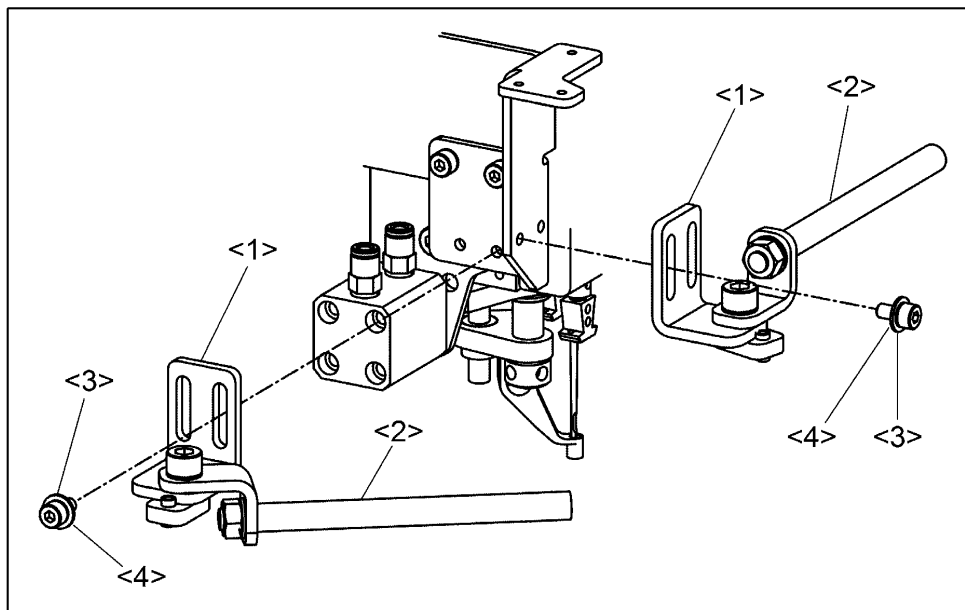


<Example.2>

Vertically inclined install position



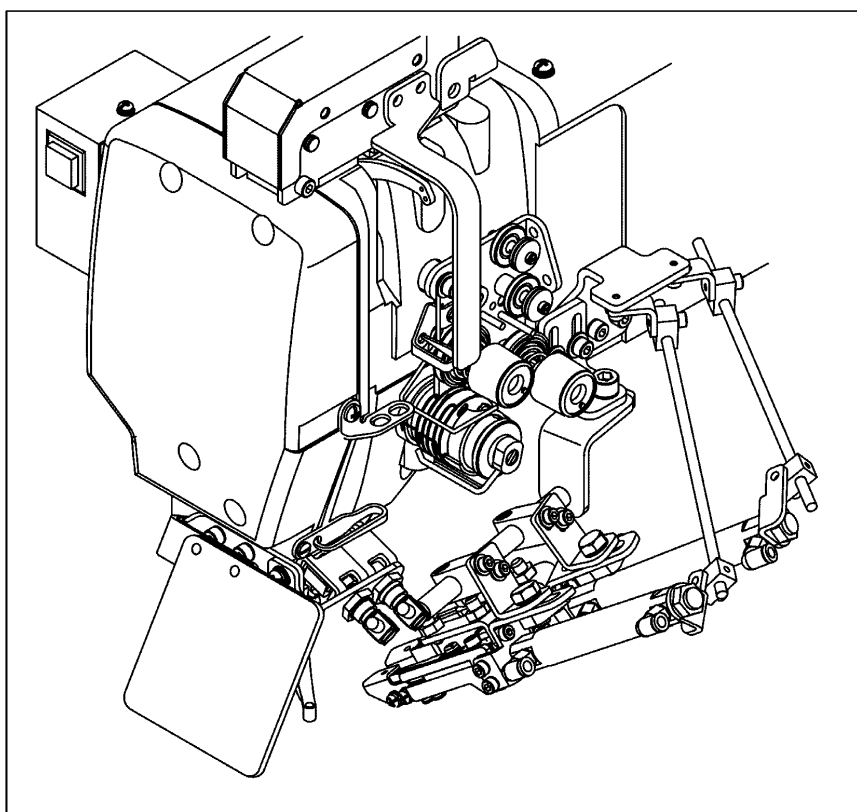
Remove the needle thread catcher supporter (No.1) by removing the each two of screws (No.3) and washer (No.4) according to following figure when change the install position. The rotating angle and vertical position of support arm (No.2) can be changed arbitrary too.



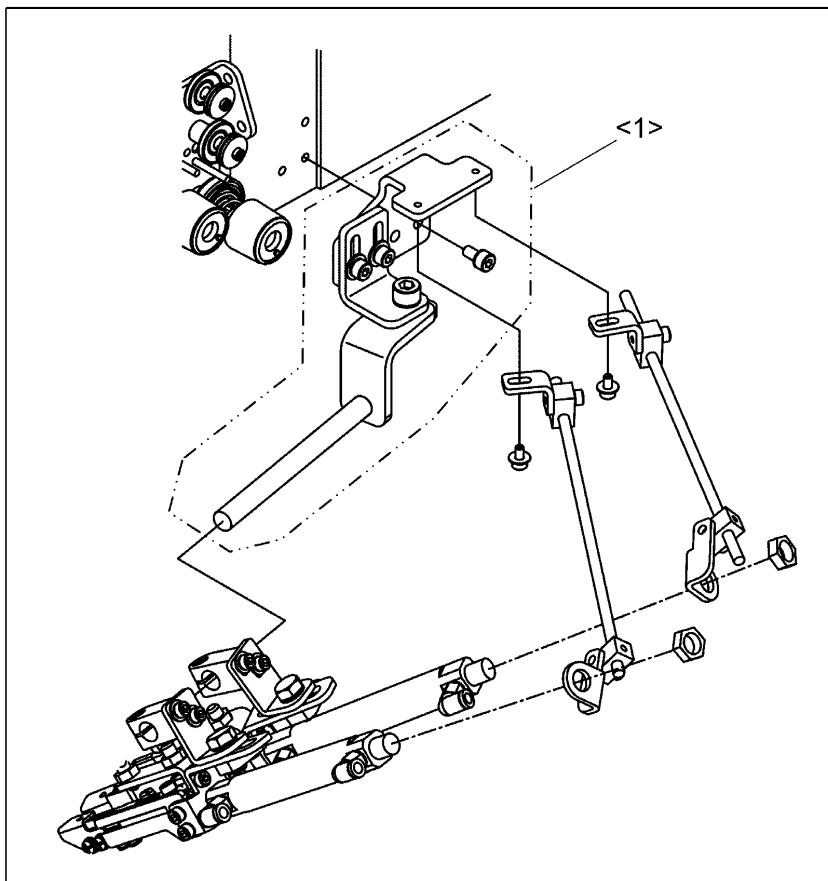
6-4-3. Installation of the needle thread catcher (adapted the optional support unit)

By using the optional support unit, the needle thread catcher is installed in right side of machine arm. For more detail, please refer to the paragraph <Option parts> in the industrial sewing machine parts catalog.

[Notice] This optional support unit is adapted to the PLK-G6030WR-C (Jig eject system specification). This option is not recommended for install the standard work holder specification because it has interference with work holder unit.

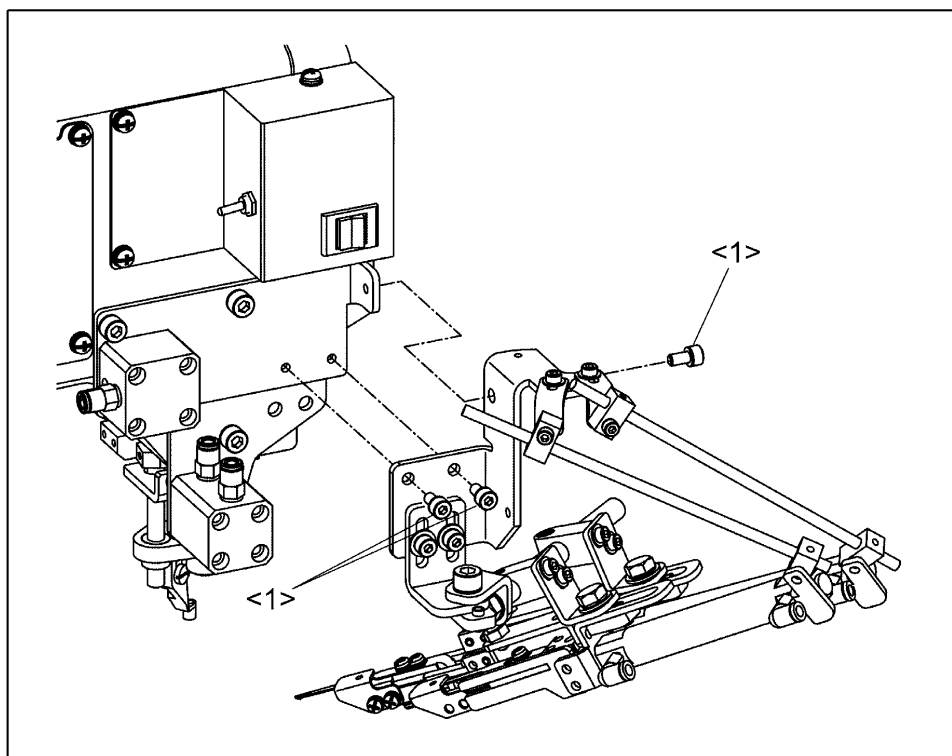


Install the support unit (No.1) with attached three screws.



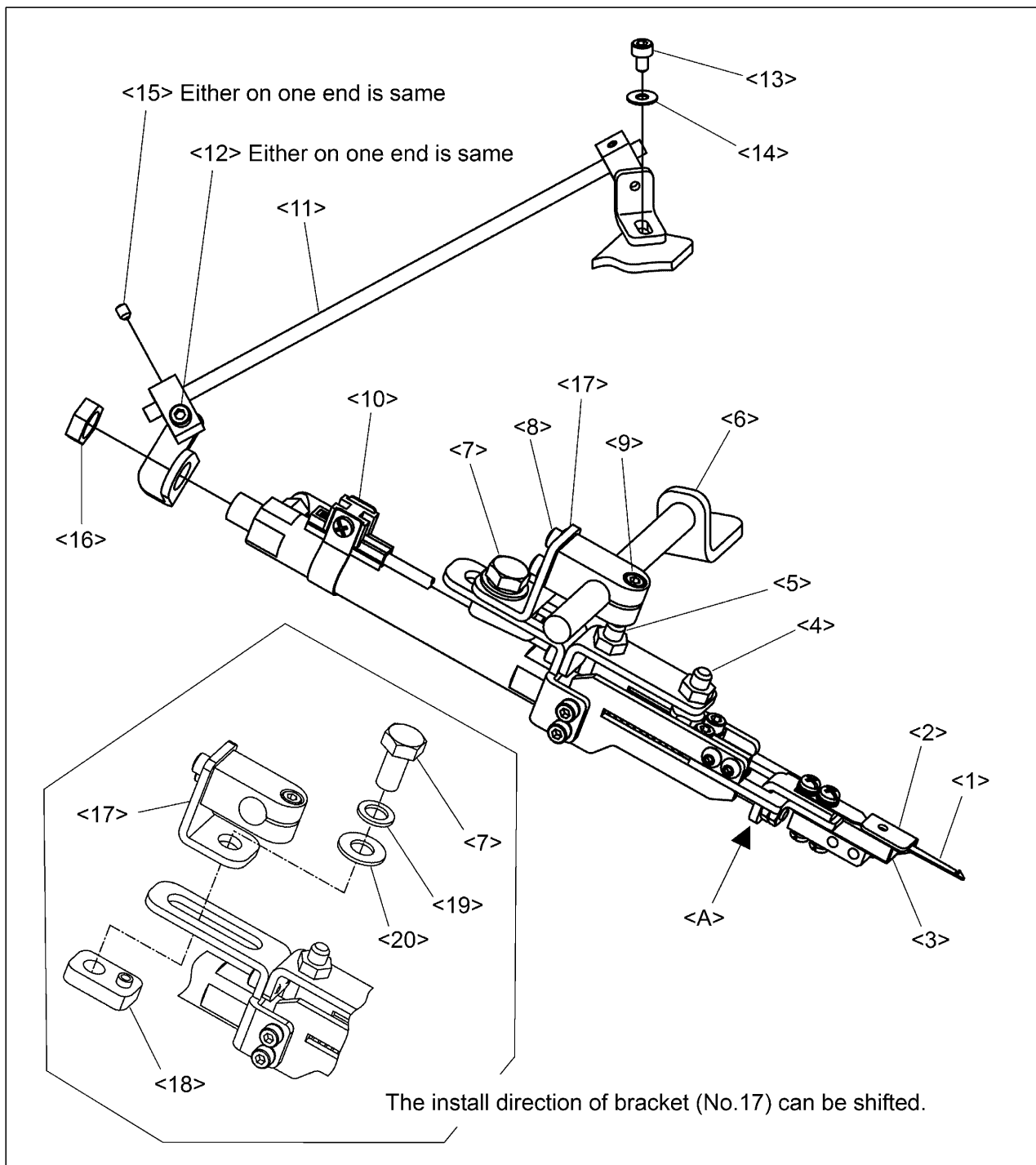
6-4-4. How to remove the needle thread catcher

By removing the three screws (No.1) the needle thread catcher unit can be detached according to the need. When install the unit, tighten three screws (No.1) little by little alternately. Please note that not to pull connecting cable and air piping strongly.



6-4-5. Adjustment of the needle thread catcher

The needle thread catcher consists following parts.



- <1>: Thread picker <2>: Holder <3>: Holder spring <4>: Ball plunger stopper (front)
- <5>: Ball plunger stopper (rear) <6>: Support arm unit <7>: Screw A <8>: Screw B
- <9>: Screw C <10>: Sensor <11>: Support bar unit <12>: Screw D
- <13>: Screw E <14>: Washer <15>: Set screw <16>: Nut <17>: Bracket
- <18>: Nut (with stopper) <19>: Spring washer <20>: Washer

Adjust the needle thread catcher position according to following description.

(1) At first, loosen all screws of the support unit. Loosen each screws of Screw A (No.7) to Screw C (No.9) which has support arm unit (No.6). Loosen each screws of Screw D (No.12) and Screw E (No.13) and Set screw (No.15), Nut (No.16) which has support bar unit (No.11).

(2) Shut off the air supply and extend fully the needle thread catcher by hand. It can be extended easily by holding <A> marked parts in above figure. The needle thread catcher has ball plunger stopper (front) (No.4) and ball plunger stopper (rear) (No.5) which works extended or retracted position. When the ball plunger stopper worked, the constant holding pressure is applied to the cylinder with click sound. This holding pressure by the ball plunger stopper is necessary for the function of thread holding and thread releasing.

NOTE All of the ball plunger stoppers release force has been adjusted about 1 kgf (10 N). The ball plunger stopper release force can be adjusted by screwing the ball plunger stoppers casing.

(3) Turn the hand pulley and stop at the thread take up lever upper position.

(4) Referring the following Fig.<A> to Fig. <C> and adjust the thread picker (No.1) position so that satisfies each condition. At first adjust the meeting position between the needle point and tip of the thread picker (No.1) according to Fig <A>. Then moving the needle thread catcher unit little forward and adjust the stop position of the thread picker (No.1) according to Fig . It is possible to change the bracket (No.17) direction when needed to adjust above. Please note that not to contact each needle thread catcher and needles or presser foot when adjust the position.

NOTE The sewing needle is lifted automatically by reverse running before function the needle thread catching. [Program mode / Needle position group / RU (ON)] The factory default setting of reverse run angle value is 20. (Function name: R8) The sewing needle is lifted about 4 mm from thread take up lever upper position. It cannot use needle thread catcher function if it does not have any space between the needle and presser foot nevertheless considering above needle lifting method.

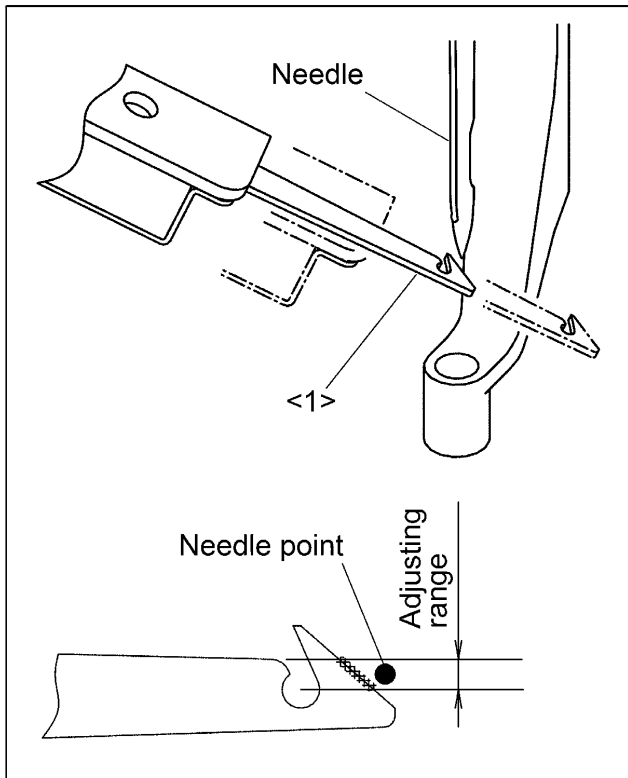
(5) Adjust the slant of to the cross-section direction of the thread picker (No.1). Adjust about be right angled between needle center line and cross-section direction of the thread picker according to Fig <C>.

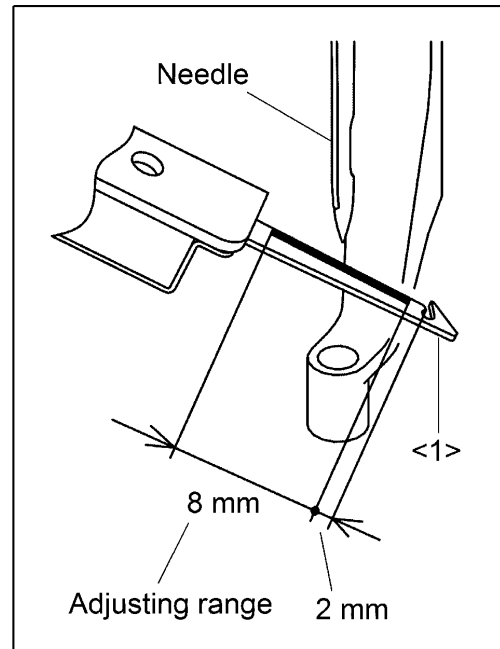
(6) When finish the adjusting tighten the Screw A (No.7) to Screw C (No.9).

(7) Confirm again the adjusting position. Retract the needle thread catcher and then fully extend it. While extending the needle thread catcher, confirm the thread picker (No.1) meeting and stopping position satisfy the condition that required in Fig <A> and Fig .

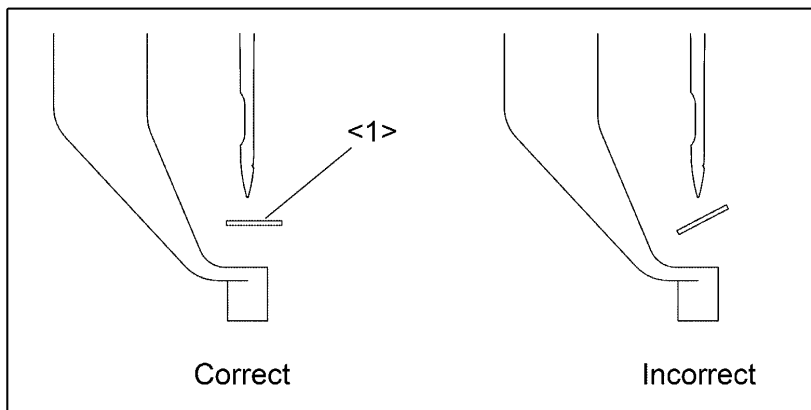
(8) After confirmation fix the support bar unit (No.11). Tighten each Screw D (No.12) and Screw E (No.13) and Set screw (No.15), Nut (No.16) alternately.

<A>





<C>



6-4-6. Adjustment of the sensor position

The sensor detection position has been adjusted when retracted the needle thread catcher.

NOTE Needle thread catcher sensor functions when adapt the step sequence file which included in "Setting table CD" in accessory box. The sensor detects an abnormality and became to a halt when needle thread catcher cannot go back the standby position due to the trimming trouble. Refer to the instructions in the paragraph "[6] Initial Setting of System (Model/language Setting)" in the **CONTROL UNIT** technical manual.

6-4-7. Setting of the thread release timing

The needle thread catcher can be controlled thread release timing since beginning to sewing. Both or either setting is valid.

(1) Press the **Program** > **Wiper** > **UTN**

UTN: Needle thread catcher release number of stitch <Default value is 0>

(2) Press the **Program** > **Wiper** > **UTU**

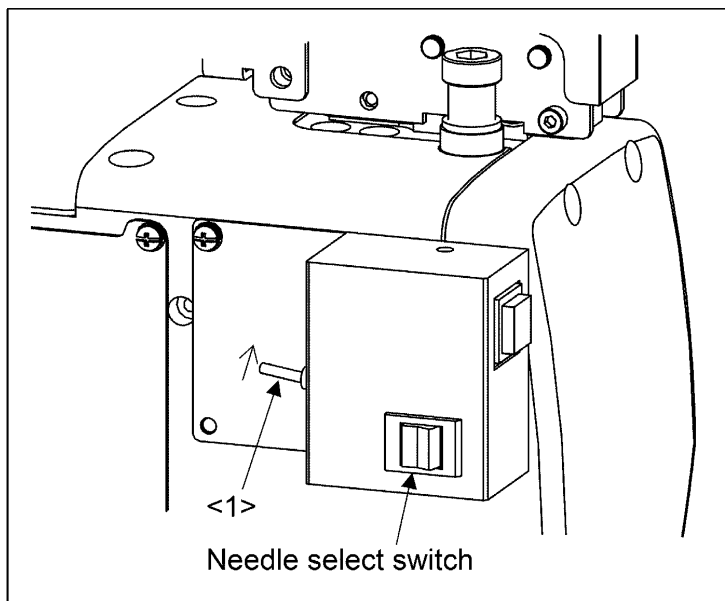
UTU: Needle thread catcher release degree (based on up position) <Default value is 0>

NOTE When change the thread release timing, the needle thread tail remains on the material surface. This function is effective for prevent the thread blocking by hook at the beginning of sewing and improve the thread nest on the back side of material.

6-4-8. Operation of the manual thread release switch

When holding needle thread by needle thread catcher manually, turn on the toggle switch (No.1). The needle thread catcher becomes thread release state. After threading the needle thread into the groove of thread picker turn on the toggle switch (No.1) again. The needle thread catcher becomes thread holding state.

NOTE The manual thread release function is valid only selected needle. Please push the needle select switch and change the active needle.



6-5. Operation of the needle thread holder.

The needle thread holder works between the take up lever and the needle.

This system functions in the case of following that,

- (1) To prevent the thread trouble among the sewing thread and not sewing thread.
- (2) To limit the supplying of needle thread from sawing start and lead the needle thread tail to under side appearance. This function controlled by program. Please refer to next paragraph.

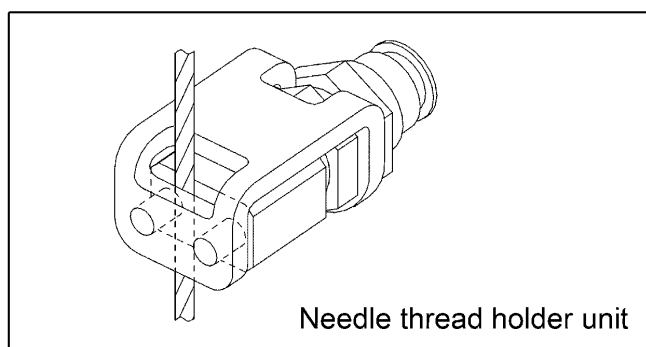
6-5-1. Setting of the thread holding timing

Needle thread holder can be controlled the thread holding timing when beginning to sewing.

(1) Press the **Program** > **Wiper** > **W1** or **W2**

W1: Needle thread holder for back side needle (FNF) output time <Default value is 1>

W2: Needle thread holder for front side needle (FNE) output time <Default value is 1>



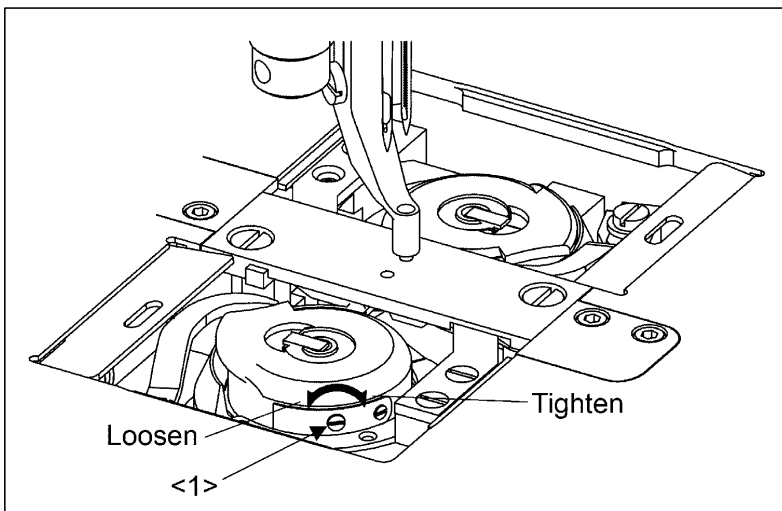
7. STANDARD ADJUSTMENT



CAUTION

- (1) Please make sure to turn the power switch off before adjusting the sewing machine.
- (2) When adjusting the sewing machine with the power switch on, please be careful not to step on the foot switch by mistake.
- (3) Please be careful not to be injured by a sharp part such as the needle and the shuttle hook point.
- (4) Please make sure to put the safety guards (eye guards, belt guards, link covers, and finger guards or the others) back on the initial position after the sewing machine adjustment.

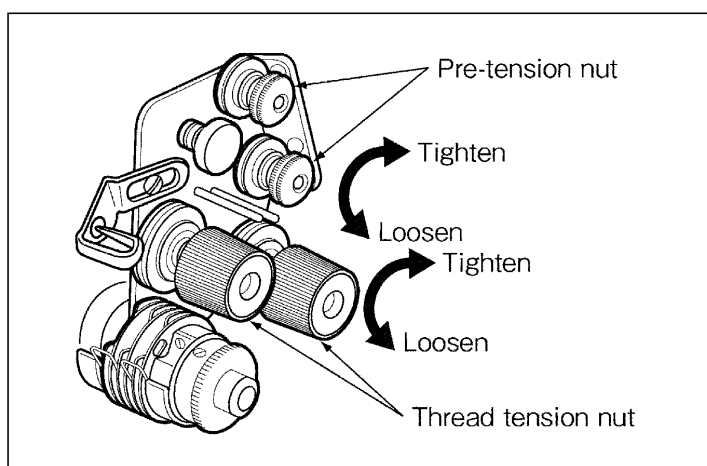
7-1. Adjustment of bobbin threads tension



<1>: Thread tension screw

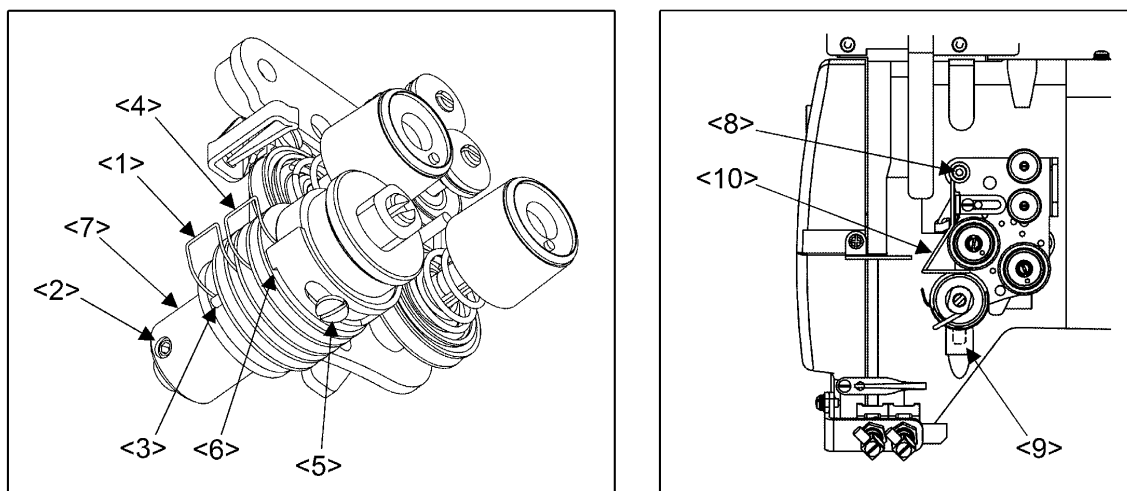
7-2. Adjustment of needle threads tension

Adjust needle threads tension by turning thread tension nuts.



7-3. Adjusting movable range of the thread take up spring

- (1) To adjust the thread take up spring for the front thread (No.1), loosen the stopper stop screw (No.2) and move the stopper (No.3). The stopper stop screw (No.2) has inside of machine arm. For this adjustment it is necessary to remove the needle thread tensioner. The needle thread tensioner can be removed when remove the screw (No.8) and loosen the screw (No.9). When removed screw (No.8) the space collar which has back side of thread tensioner and thread guide (No.10) are detached too.
- (2) To adjust the thread take up spring for the rear thread (No.4), loosen the stopper stop screw (No.5) and move the stopper (No.6).
- (3) After adjustment, back the needle thread tensioner and put the power switch on. Then confirm the tension disks are opening regularly. If it has not, check the busing (No.7) is installed in collect position.

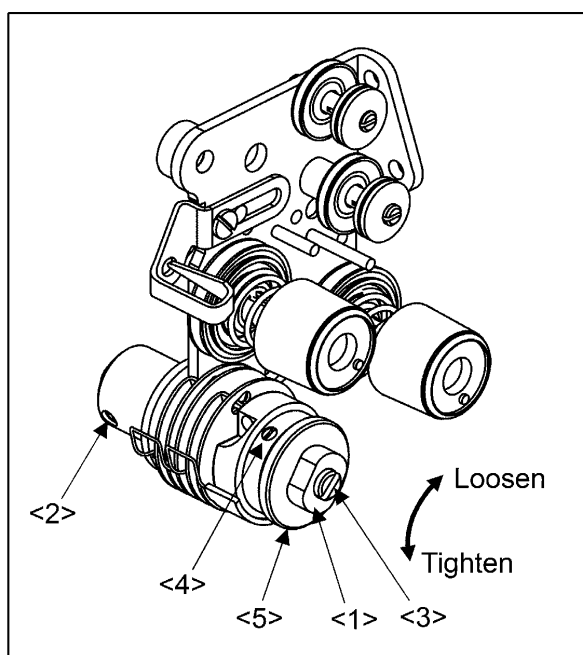


7-4. Adjusting intensity of the thread take up spring

- (1) Front thread: Remove the needle thread tensioner unit due to previous section. Loosen the lock nut (No.1), and loosen the screw (No.2). Turn the adjusting shaft (No.3). After adjustment, tighten the screw (No.2), and tighten the lock nut (No.1).

NOTE It is necessary to keep the position of the thread take up spring when loosen the screw (No.2).

- (2) Rear thread: Loosen the screw (No.4), and turn the adjusting nut (No.5). After adjustment, tighten the screw (No.4).



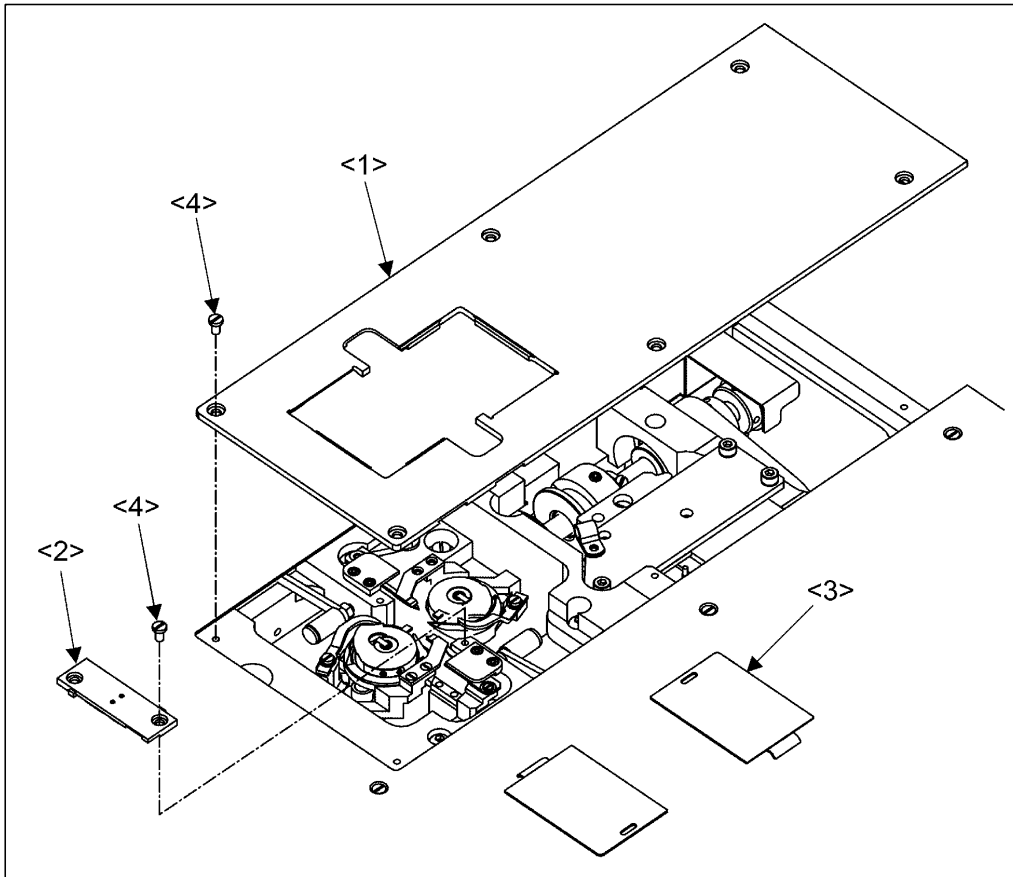
7-5. Timing between the rotating hook motion and the needle motion

Adjust front and rear timing in the same way at the same time.

NOTE If removed the presser foot, work holder and feed plate, it makes easier to adjust.

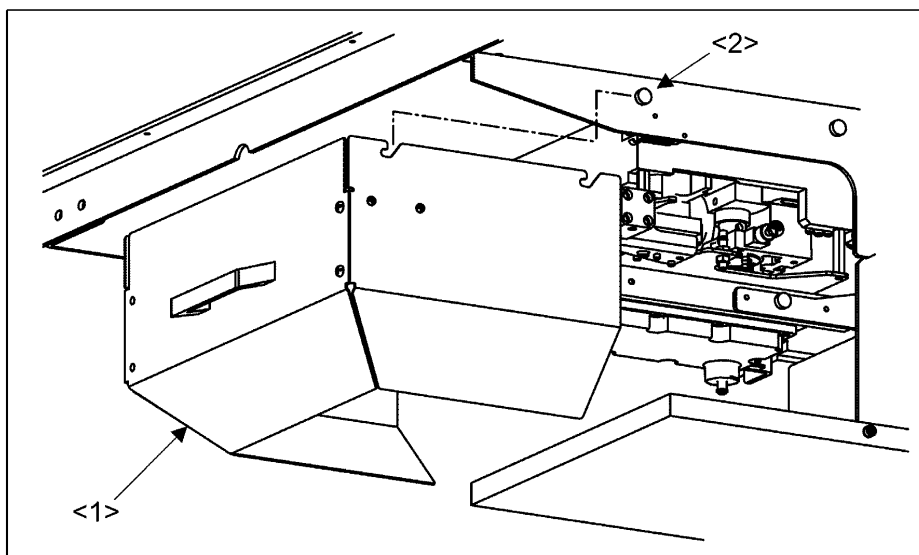
7-5-1. Adjustment of the clearance between the hook point and the needle

- (1) Remove the both cylinder cover (No.3) and screws (No.4) then remove the slide plate (No.1) and needle plate (No.2).



- (2) Loosen the left and right side of four thumb screws (No.2) and remove the hook saddle cover (No.1).
The hook saddle cover is removed when pull little toward and downward.

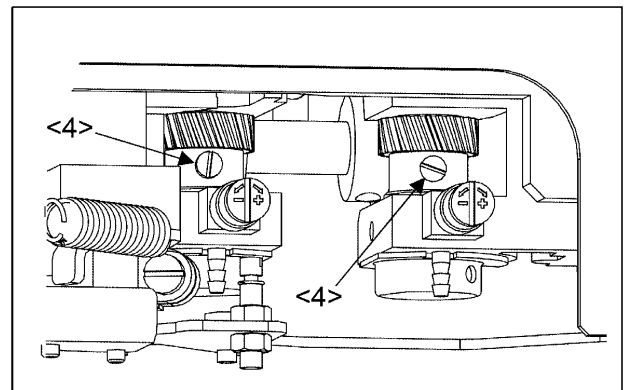
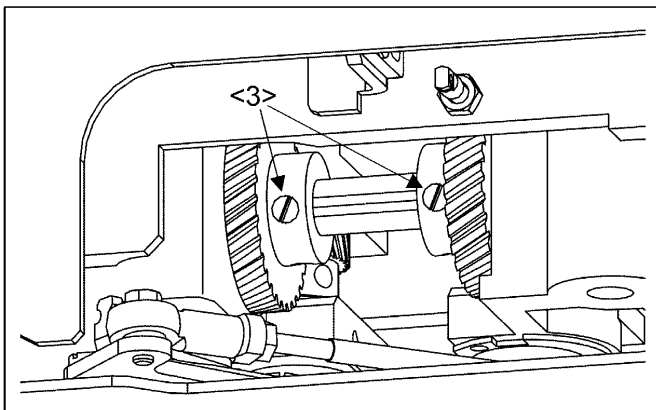
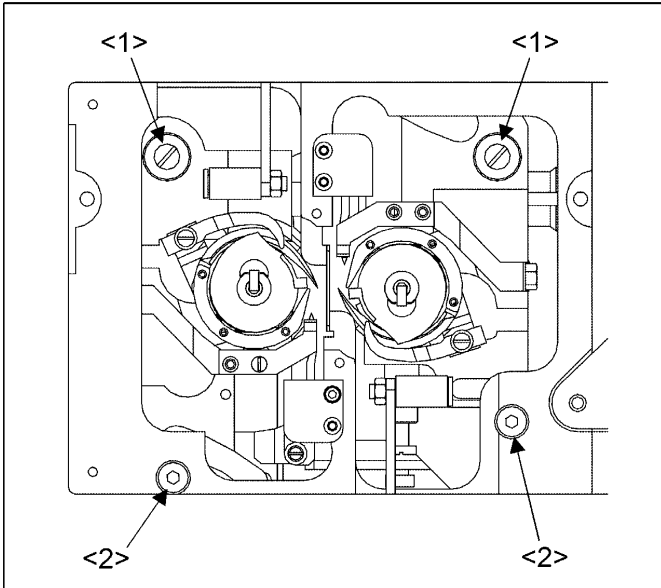
NOTE When remove the hook saddle cover (No.1) with machine power remained on, the safety switch works with displaying a message. In this case turn off the power switch.



(3) Loosen two screws of (No.1) and two screws of (No.2) from top side of slide plate.

Loosen each two of set screws of (No.3) from machine lower left side and loosen each three of set screws of (No.4) from machine lower right side.

NOTE At this time, don't loosen the set screw (No.4) too much. In this case set screw top causes interference with hook saddle body.

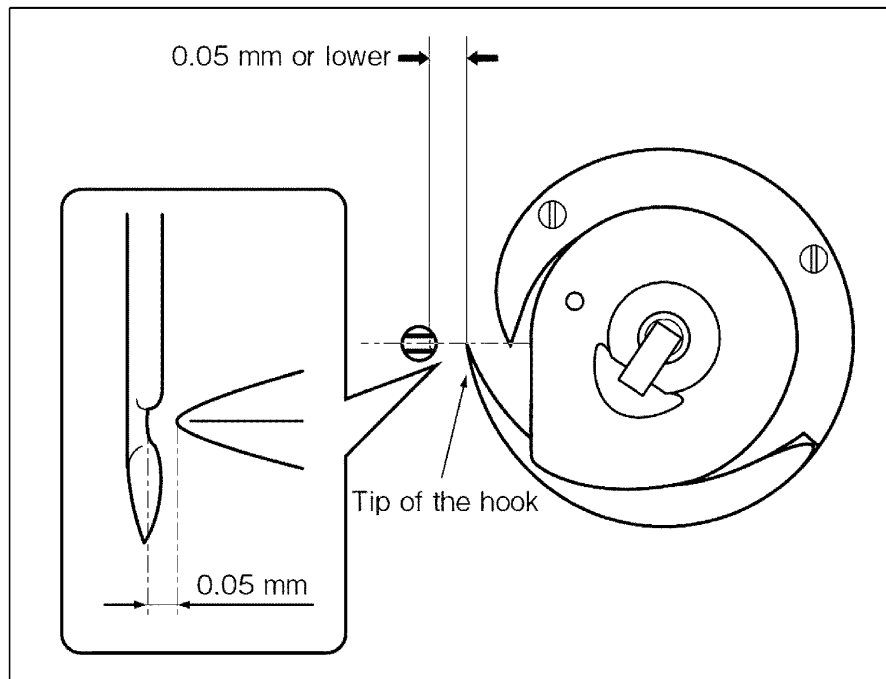


(4) Slide each hook saddle to outside.

(5) Check that the first screw of the large gear enters a notch, and set the needle bar at the lowest position.

(6) Slide the large gear to the hook saddle and mesh with the small gear. At this time, adjust it so that one of three set screws (No.4) faces upward.

- (7) Adjust the saddle hook position so that the gap between the tip of the hook and the scarf of the needle is 0.05 mm or lower.



- (8) Tighten the screws (No.1) and (No.2) alternately and check if lower shaft has not increased torque.
(9) Have a small gap between the large gear and the saddle hook, and tighten all set screws (No.3).
(10) Then adjust the hook timing. Please refer to next paragraph.

NOTE It is necessary to check if the drive arm roller which is component of trimmer system smoothly into the groove of drive plate. Please refer to the paragraph <7-23-4>.

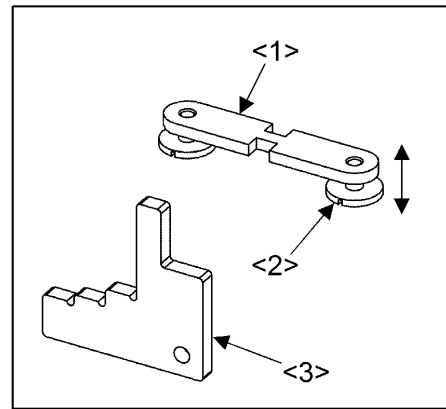
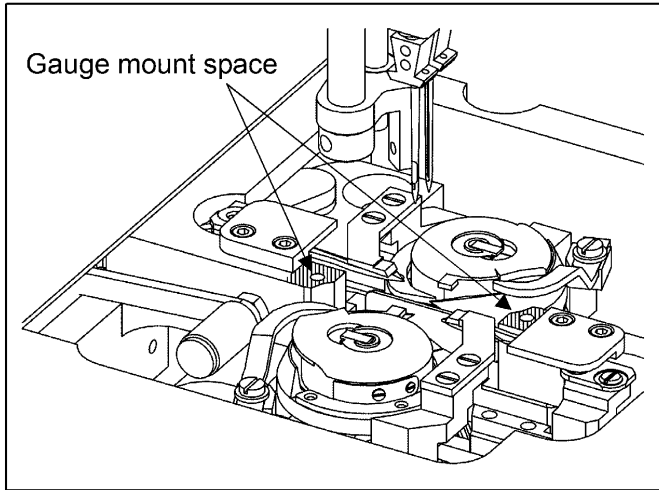
7-5-2. Adjustment of the timing between needle and hook point

- (1) When adjust the hook timing, please use the adjust gauge which included in accessory box.
Put the gauge base (No.1) to hatched area showing in (Fig. A) and check if the gauge base (No.1) is not contacted other parts. (Fig B)
(2) Move the needle bar slowly to the lowest position with attention not to contact the needle with gauge base (No. 1). Slip the bottom step ("a" marked) of gauge (No.3) between gauge base (No.1) and needle clamp. (Fig. C) Then turn the both screw (No.2) and adjust the gauge base height. The correct condition is showing in (Fig. D). Even if finished adjusting, keep the gauge (No.3) and gauge base (No.1) in this state.

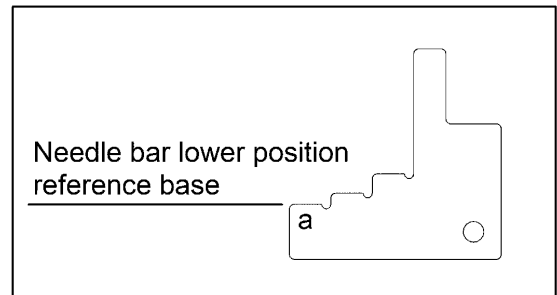
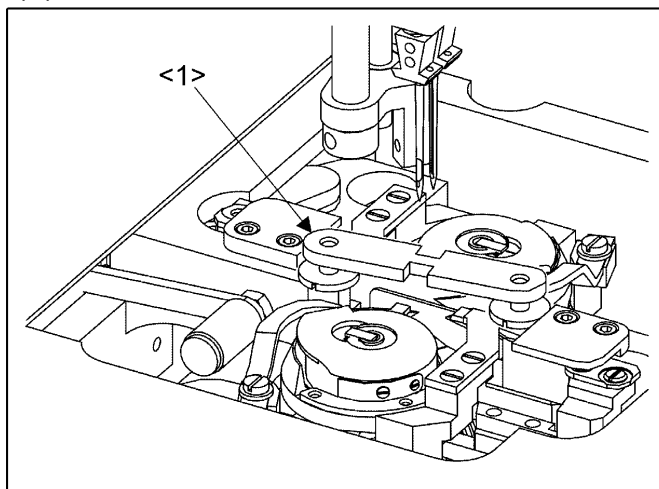
NOTE 1 When air supply off and rotate hand pulley more than one rotate to the clockwise direction, both needle bar is moving.

NOTE 2 It is not required which needle bar applying when using the gauge (No.3).

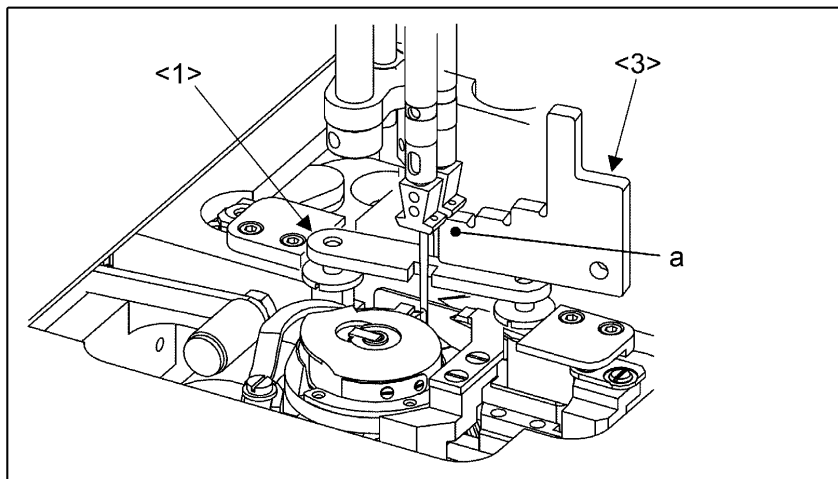
(A)



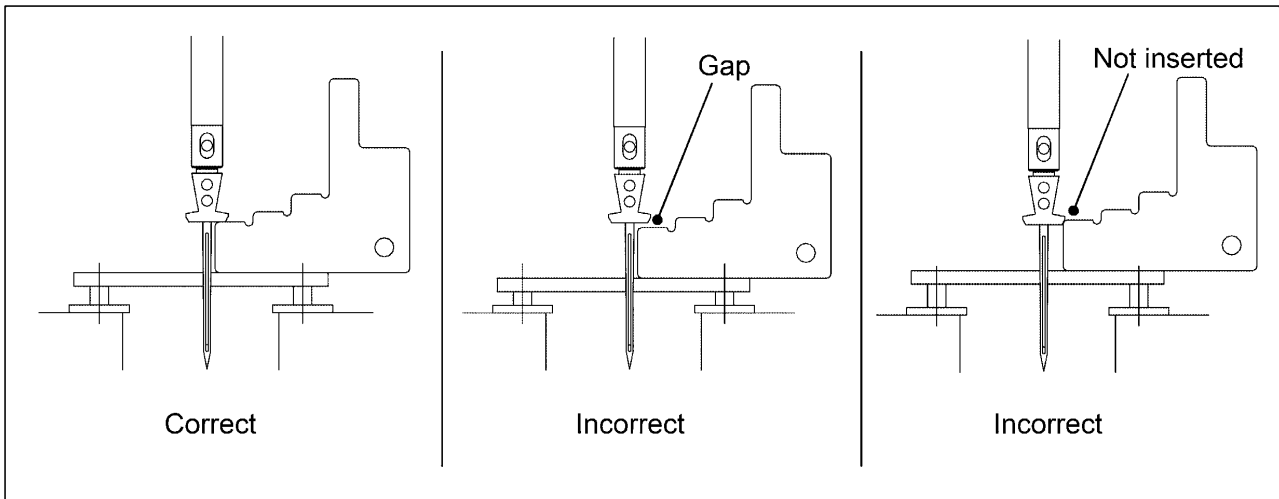
(B)



(C)



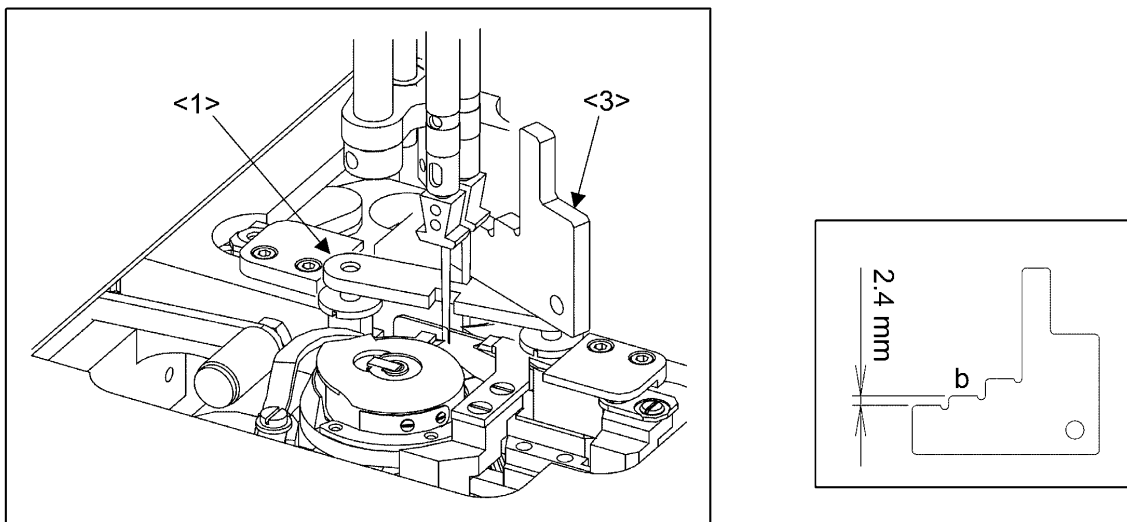
(D)



(3) Lift the needle bar slowly with turning the hand pulley and slip the step ("b" marked) of gauge (No. 3) between gauge base (No. 1) and needle clamp. (Fig. E) At this time needle bar has lifted 2.4 mm from the lowest position. Then adjust the tip of the hook position so that it is in the center of the needle.

NOTE The hand pulley should rotate clockwise when viewed from the pulley.

(E)



(4) While checking that the tip of the hook is in the center of the needle, and tighten set screws (No.4).

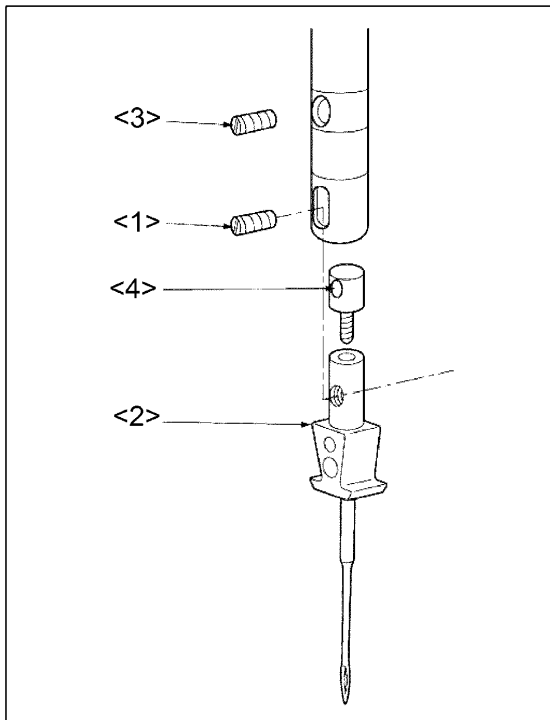
NOTE Tighten each screw (No.4) little by little and check if lower shaft has not increased torque. See the previous paragraph <7-5 (3)>.

(5) Return the removed parts according to previous paragraph <7-5-1>.

7-6. Adjustment of the needle up and down position

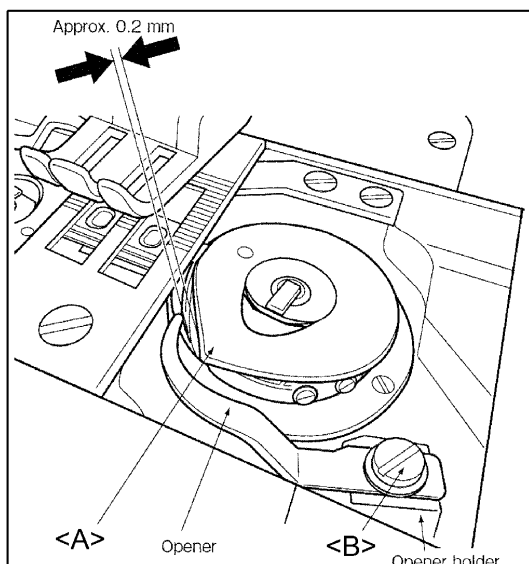
When the needle is lifted 2.4 mm (use adjust gauge due to the previous section) from the lowest position, adjust the needle position so that the gap between the top of needle eye and the tip of the hook is 1.0 to 2.0 mm.

- (1) Remove the set screw (No.1).
- (2) Rotate one turn the needle clamp (No.2) and adjust the needle position. At this time do not remove the set screw (No.3).
- (3) Return the needle clamp (No.2) to the position before adjusting and fully tighten the set screw (No.1).



7-7. Relationship between the rotating hook motion and the opener motion

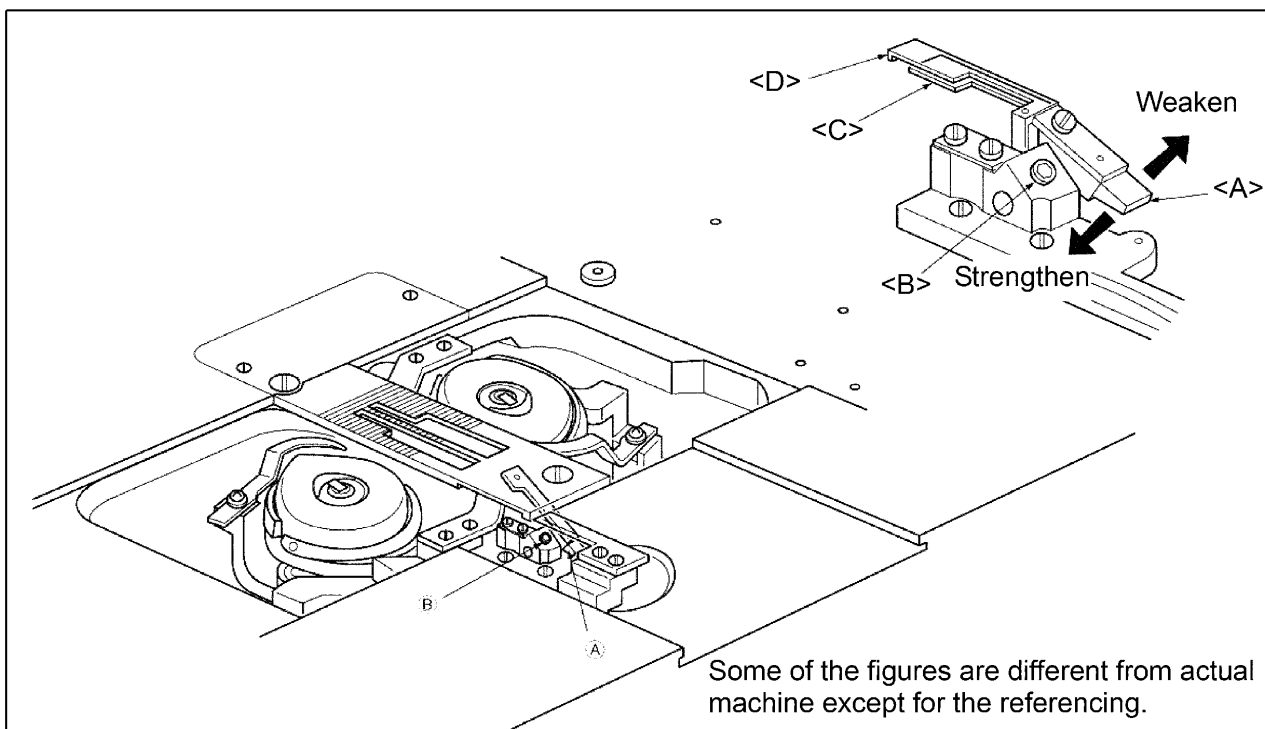
- (1) Turn the pulley by your hand and stop it at the position where the opener holder is located most remotely from the throat plate.
- (2) Check that the gap between the lug (A) and the opener is approximately 0.2 mm.
- (3) If the gap is too large or small, loosen the opener holder screw (B) and adjust position of the opener.



Some of the figures are different from actual machine except for the referencing.

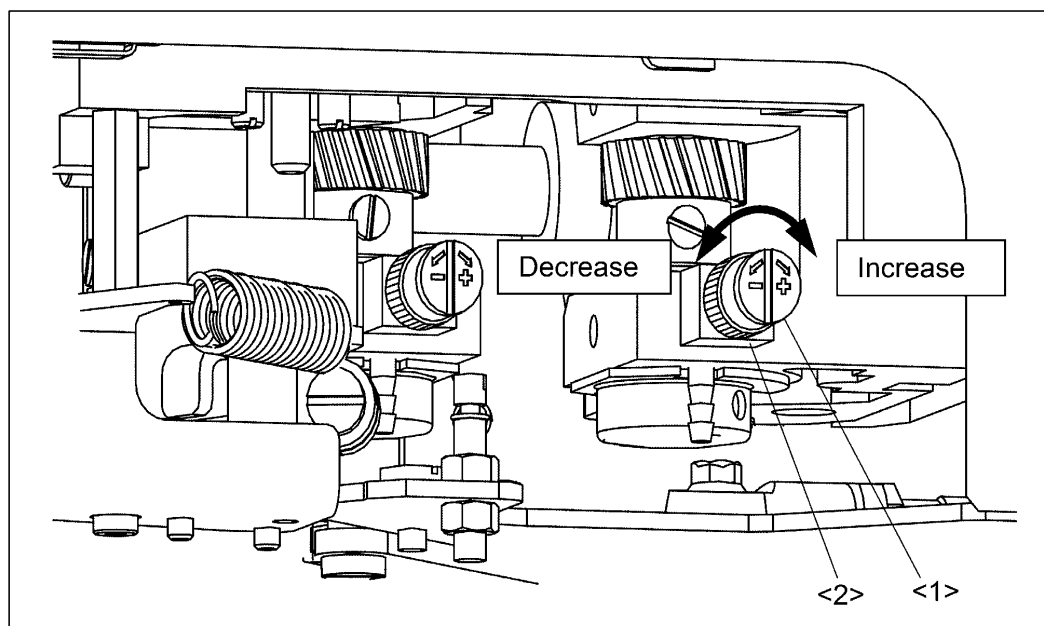
7-8. Adjustment of the holding pressure of the bobbin thread

- (1) Loosen the set screw (B) for clamping the adjuster (A). (By using the socket wrench 1.5 in accessories.)
- (2) When the adjuster (A) is moved upward, the holding pressure becomes weak. On the other hand, when the adjuster (A) is moved downward, the holding pressure becomes strong.
- (3) Set the adjuster (A) to the position where it can be gotten an adequate holding pressure of the bobbin thread. (At this time, the leaf spring (C) should be located in directly below the leaf spring (D).)
- (4) Tighten the set screw (B).



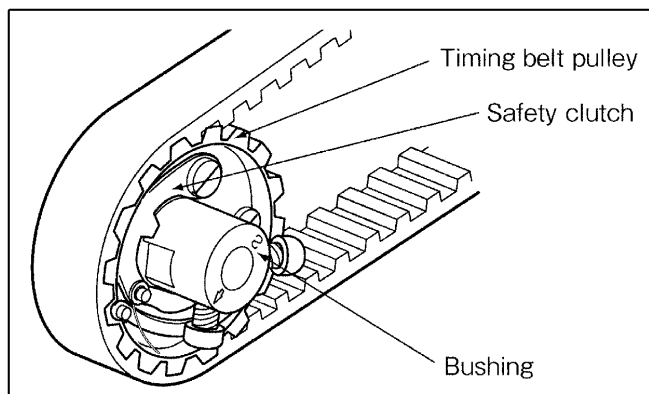
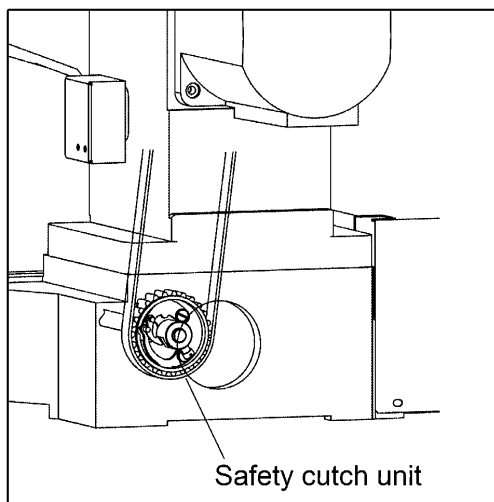
7-9. Adjustment of the lubrication for the rotating hook

- (1) Open the hook saddle cover.
- (2) When adjust the oil flow loosen the nut (No.2) and turn the adjusting screw (No.1).
- (3) After finish the adjustment, tighten the nut (No.2).



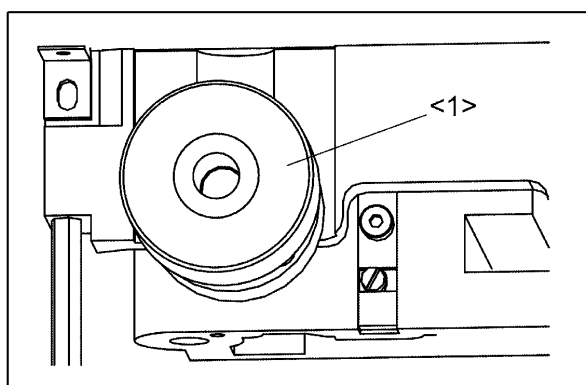
7-10. Safety clutch

A safety clutch is installed to prevent the hook or timing belt damage if the thread is caught in the hook when the machine is loaded abnormally during operation.



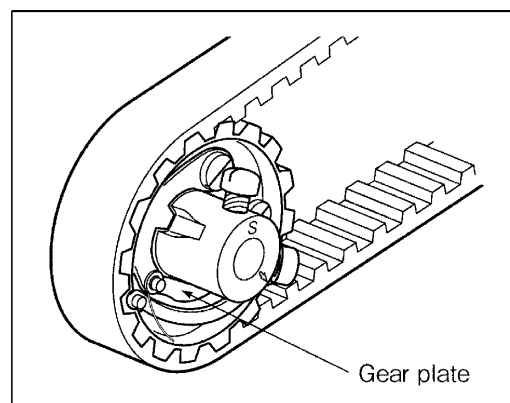
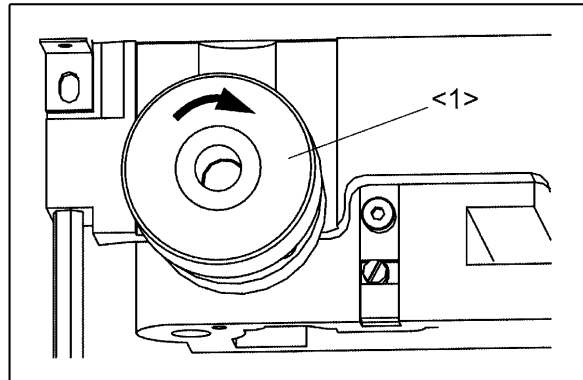
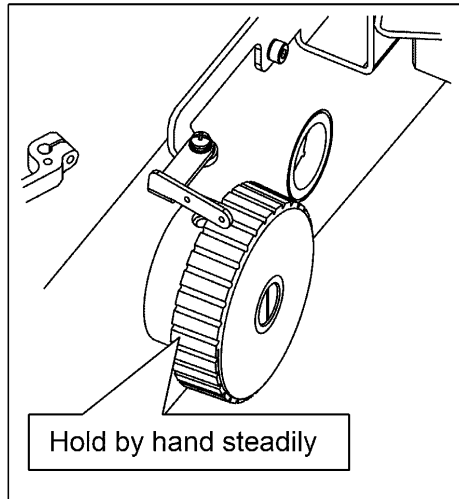
7-10-1. Function of the safety clutch

- (1) When the safety clutch functions, the timing belt pulley will be freed, and the lower shaft rotation will stop. The upper shaft only will rotate. Stop the operation of the machine.
- (2) Completely remove the thread, etc. caught in the hook.
- (3) Remove the hook saddle cover and turn the hand pulley (No.1) which has lower shaft by hand, and check whether the lower shaft rotates lightly and properly, then install the clutch device as before.



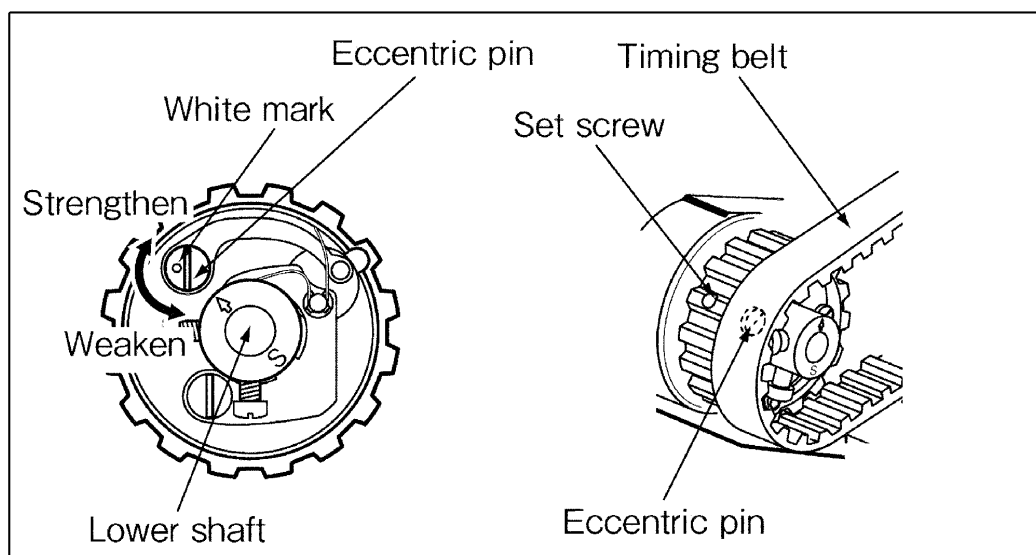
7-10-2. How to set safety clutch

- (1) While keep holding the hand pulley which has machine arm, turn the lower hand pulley (No.1) in arrow direction (clockwise rotate) slowly.
- (2) The pulley will be stopped by the gear plate, but turn the pulley more firmly.
- (3) The clutch device will be set as shown in the figure.




7-10-3. Force applied to the safety clutch

- (1) The force applied to the safety clutch is the smallest when the white mark of the eccentric pin faces the center of the lower shaft. The force proportionally increases as the white mark faces the outside.
- (2) To adjust the force, slide the timing belt, loosen the set screw, and turn the eccentric pin.
- (3) After adjusting, fully tighten the set screw.




7-11. Adjustment of the thread take up lever upper position

(1) Remove the both of needle and needle plate then prepare the adjust jig according to previous section <7-5-2>.

(2) Turn the power switch on and press the home position return icon .


(3) Press the **Program** > **Needle position** > **RU**

RU: Reverse needle lifting operation after thread trimming function (Default is ON. For prevent the needle thread catcher contact to needle.)


(4) Select the **OF** on the screen, and press the .

(5) Press the **Program** > **Home position** > **NNU**

NNU: Home positioning prohibition when needle is not the UP position (Default is ON. For prevent the needles contact to pressor foot when changing the needle.)

(6) Select the **OF** on the screen, and press the .

(7) Turn the hand pulley more than one rotation in the direction of the arrow.

(8) Press the home position return icon .

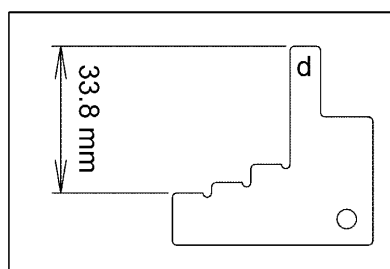
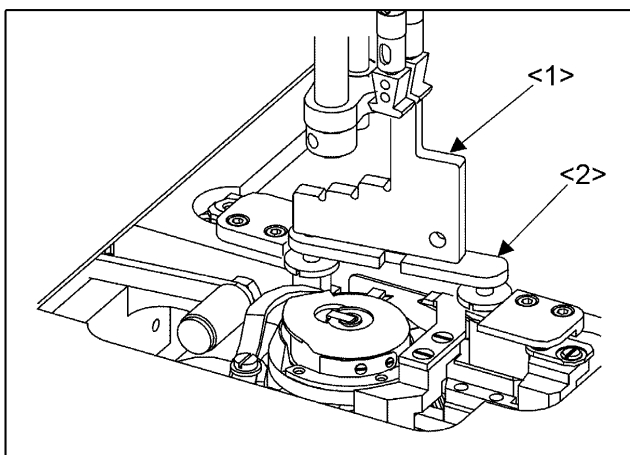
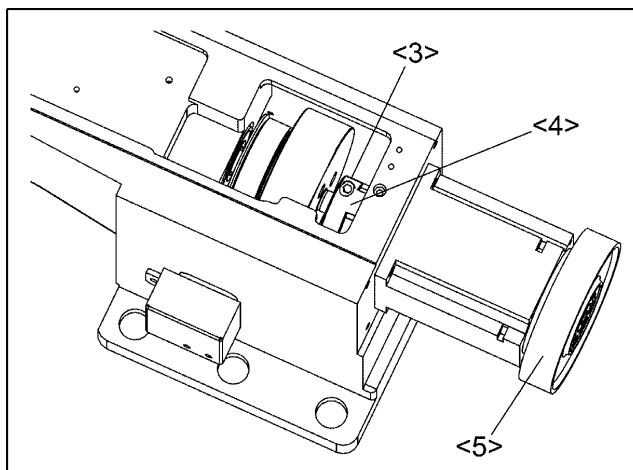
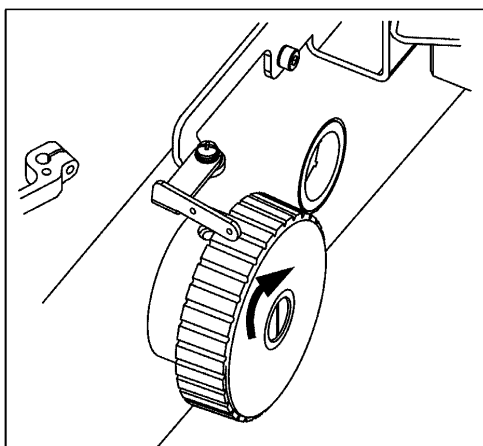
(9) Slip the step ("d" marked in figure) of gauge (No.1) between gauge base (No.2) and needle clamp. At this time needle bar is lifted 33.8 mm from the lower position.

(10) Check if the gauge installed smoothly and without any gap.

(11) If it does not, Remove the top cover and loosen the screw (No.3) of motor coupling (No.4) and change the rotating angle of the motor coupling (No.4) a little with turning the motor pulley (No.5).

(12) After tighten the screw repeat and check above (7) to (10).

(13) After adjustment restore the setting to original program.



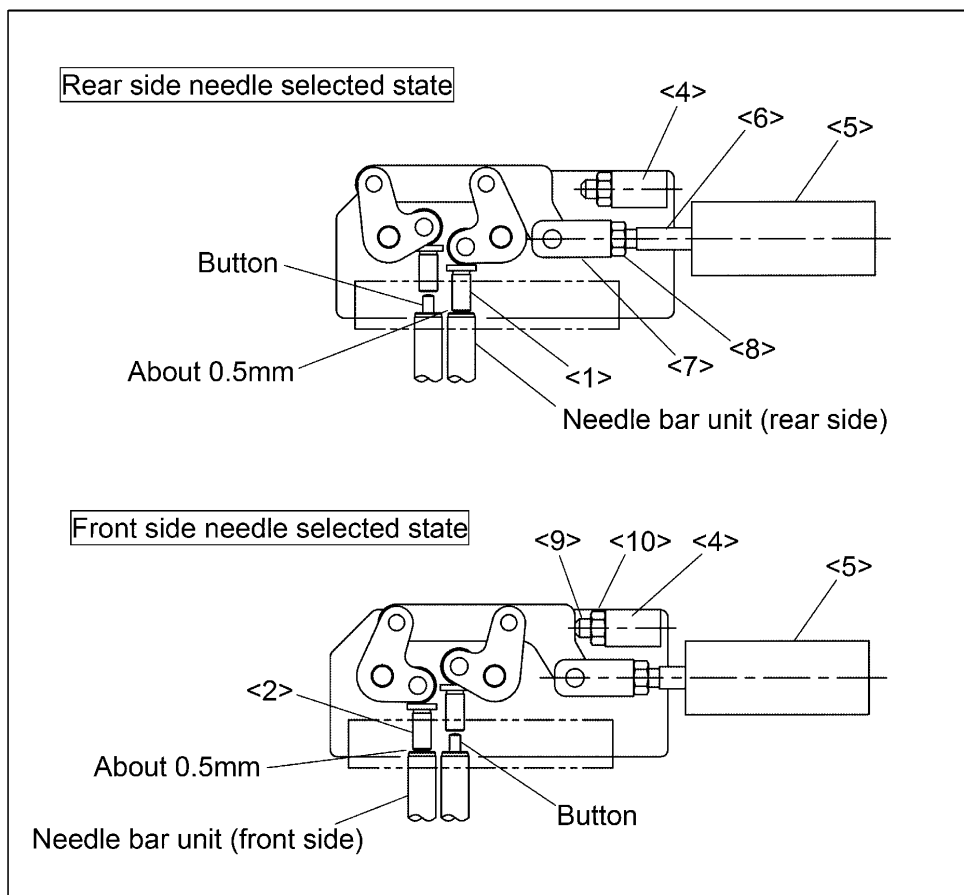
7-12. Adjustment of the needle selecting system

The needle selecting system can change the needle while keep pushing the push pin which has top of the each needle bar at needle bar upper position. This system works alternately pushing above push pin. If it has any fail of this needle changing function, it is necessary adjust the needle selecting system. When adjust it, shut off the air pressure and turn off the power switch.

(1) At first, adjust the rear needle side position of the push pin (No.1). Remove the four screws which has stopper unit (No.4). To keeping the needle bar upper position, adjust the gap of the push pin about 0.5 mm from top of the needle bar when the air cylinder (No.5) thrusts. When adjust the push pin (No.1) position. Loosen the Nut (No.8) and adjust the knuckle pin (No.7) position with turning the cylinder rod (No.6). When finish the adjustment, tighten the Nut (No.8).

(2) Then, adjust the front needle side position of the push pin (No.2). Install the stopper unit (No.4) and adjust the gap of the push pin about 0.5 mm from top of the needle bar when the air cylinder (No.5) pulled back. When adjust the push pin (No.2) position. Loosen the Nut (No.10) and adjust the stopper screw (No.9) position. When finish the adjustment, tighten the Nut (No.10).

NOTE If cannot adjust the push pin position as required above, please adjust the vertical install position of the needle selecting system. Please refer to the next paragraph <7-13>.



7-13. How to remove the needle selecting system

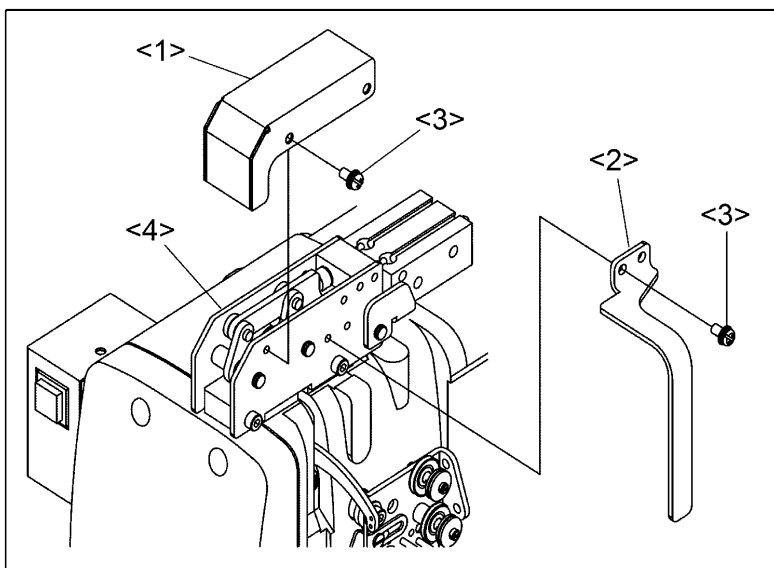
When remove the needle bar unit for the purpose of adjustment or maintenance, it is necessary to remove the needle selecting system (No.4) according to following procedures.

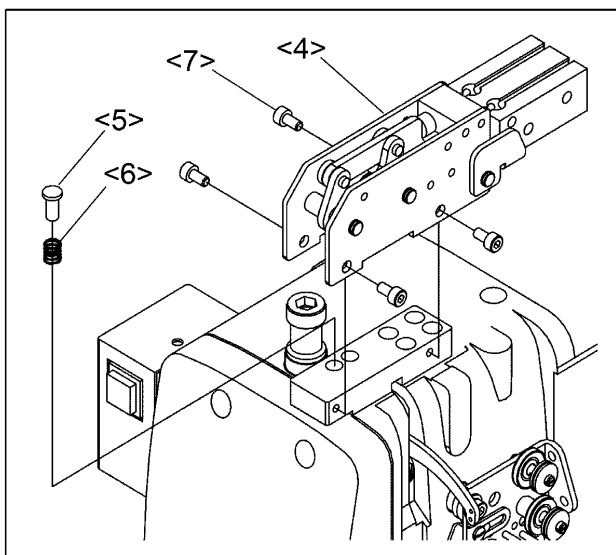
- (1) Remove the each two of screws (No.3) and remove the cover (No.1) and take up lever cover (No.2). (Fig. A)
- (2) Remove the four screws (No.7) and lift the needle selecting system up. At this time, remove the each two of push pin (No.5) and spring (No.6). There are small parts, so that it is necessary to note to lose. (Fig. B)
- (3) Remove the hour screws (No.9) and remove the base block (No.8). (Fig. C)
- (4) With reverse method, the needle selecting system is installed.
- (5) After installation, check the needle selecting system movement with no air supplying. If it has abnormal movement, check if the needle selecting system (No.4) is slanted.

NOTE After finish the installation please confirm the contents of previous paragraph <7-12>.

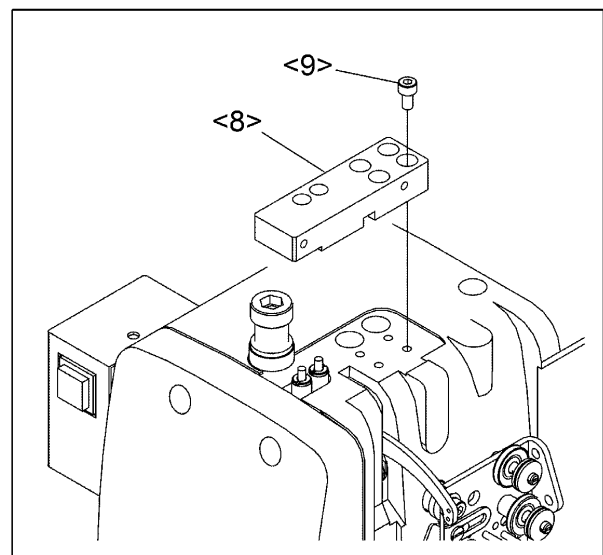
If it does not satisfy the required conditions loosen the four screws (No.7) again and adjust the vertical install position of the needle selecting system (No.4).

<A>





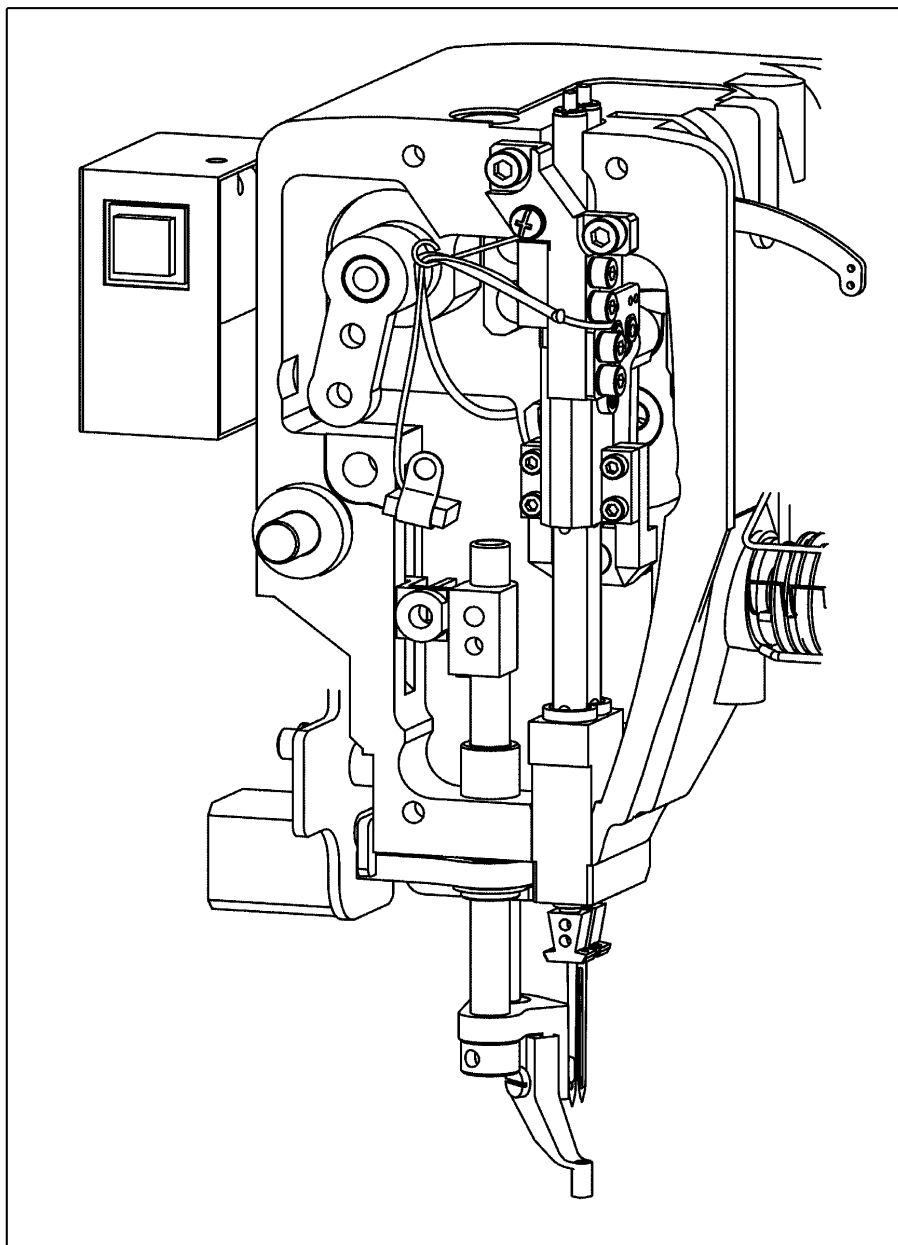
<C>



7-14. How to remove the needle bar unit

According to following procedures the needle bar unit can be removed, for the purpose of adjustment or maintenance.

- (1) For preparations in advance, remove the face cover, presser foot system component parts (except the parts for oiling) and needle selecting device as in the below figure.

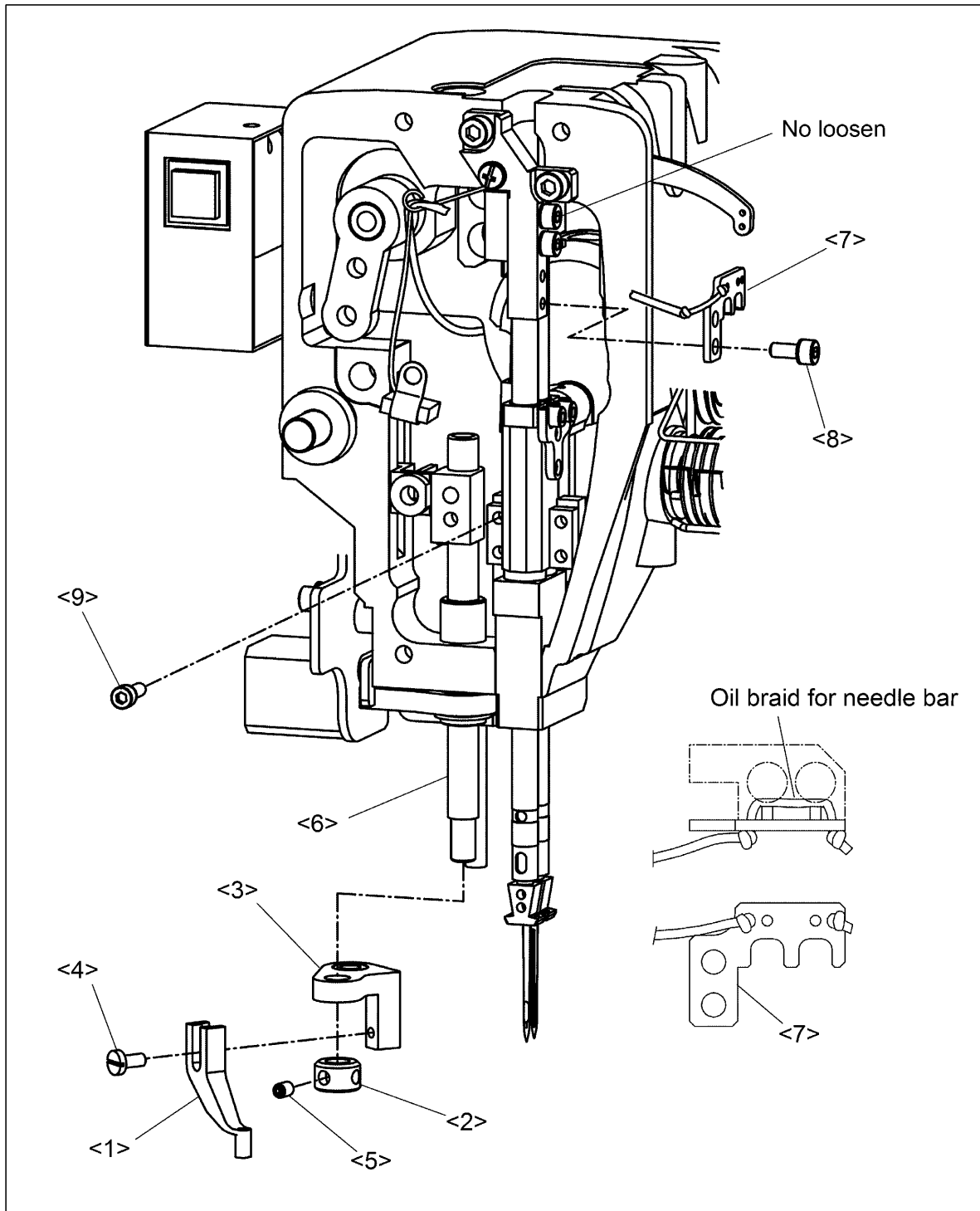


(2) Remove or loosen the screw (No.4) and remove the pressor foot (No.1). Then loosen the two screws of (No.5) and pull the set collar (No.2). The pressor foot block (No.3) is out from the pressor bar (No.6).

(3) Remove the two of screws (No.8) and remove the guide plate (No.7). This parts has oil piping for the needle bars, therefore not to pulling it stronger. When back the guide plate (No.7), please confirm if the oil braid has installed like as following figure.

NOTE Do not loosen two screws above of the screws (No.8).

(4) Remove the four screws (No.9). The needle bar unit is disconnected with upper shaft crank.

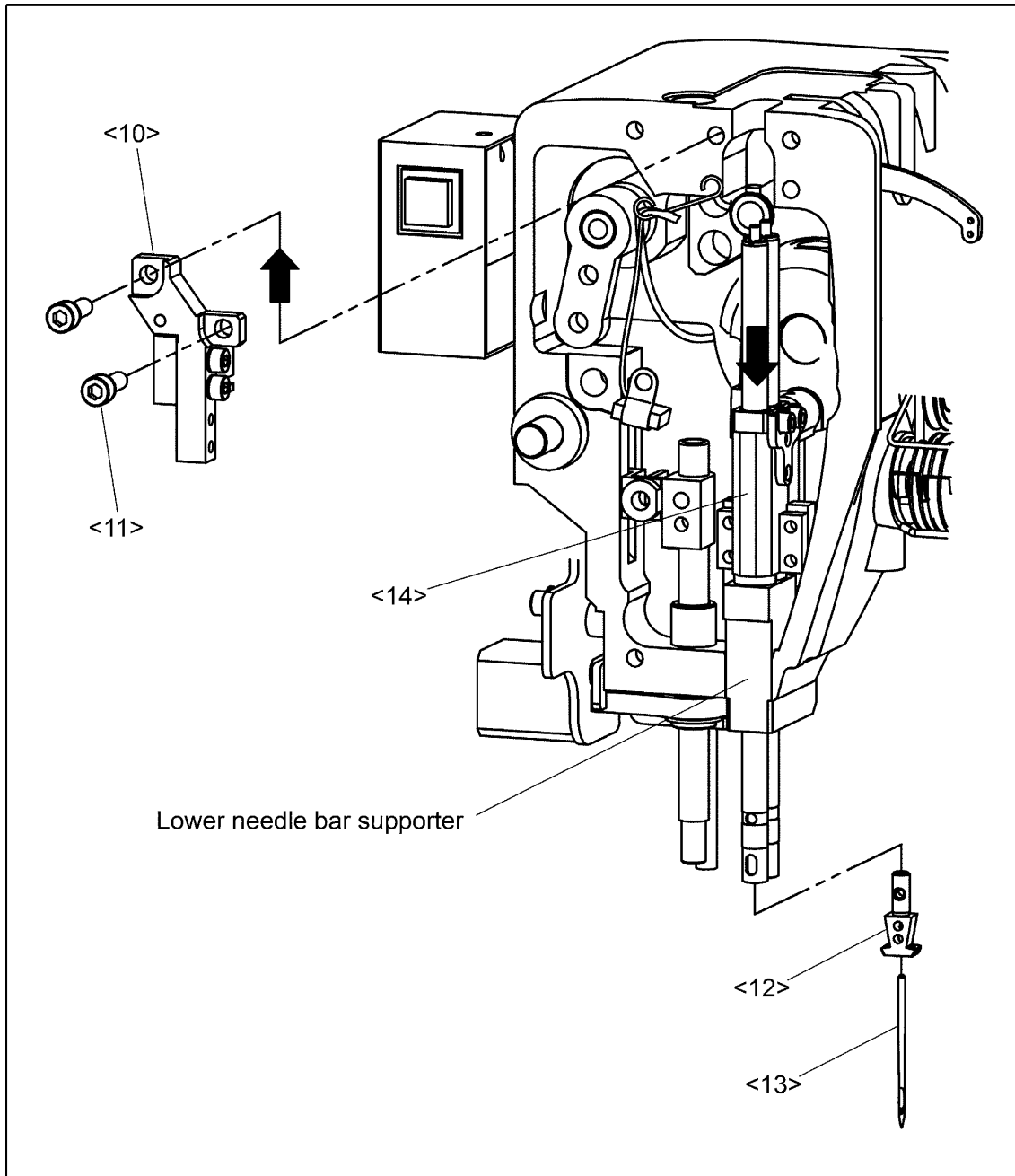


(5) Set down the needle bar holder (No.14) to lower position.

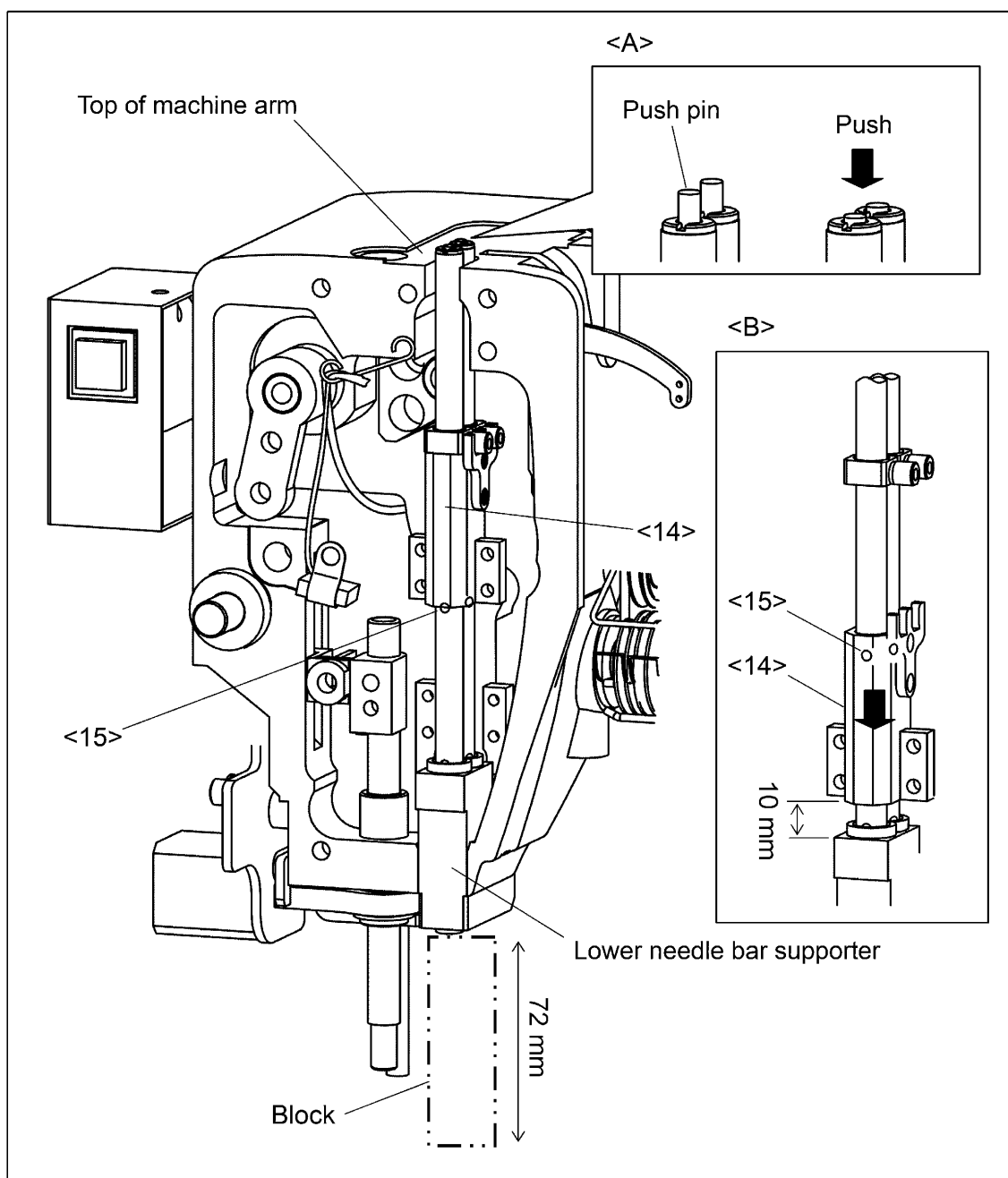
(6) Remove the two screws (No.11) and lift the needle bar supporter (No.10) at its point. And then pull forward, the needle bar supporter (No.10) is removed.

NOTE Lower needle bar supporter is bonded to machine arm with anaerobic adhesive firmly. Don not removes it unless the circumstances are exceptional.

(7) Remove the both two of needles (No.13) and needle clamps (No.12). Refer to the section <7-6>.



- (8) Lift the needle bar unit (No.14) to the point of the machine top so that push pin which has needle bar is appeared.
- (9) Keep holding the bottom of needle bar at the bottom of lower needle bar supporter. Instead of above, it is also possible to put the something hard block which height is about 72 mm on the needle plate. This block is not included in accessory box.
- (10) Push the both push pin as following figure (A). At this time keeping on the pushing and down the needle bar holder (No.14) to the position of following figure (B). In this time the steel ball (No.15) goes inside of the needle bar holder (No.14).



(11) Loosen the screws (No.16) with hexagonal wrench "1/16" inch which has inside of the needle bar guide (No.17) then, down the both needle bar guide (No.17) toward needle bar holder (No.14). In this time remove the each two of the stopper (No.18). There are small parts, so that it is necessary to note to lose.

NOTE The hexagonal wrench "1/16" inch is not included in accessory box.

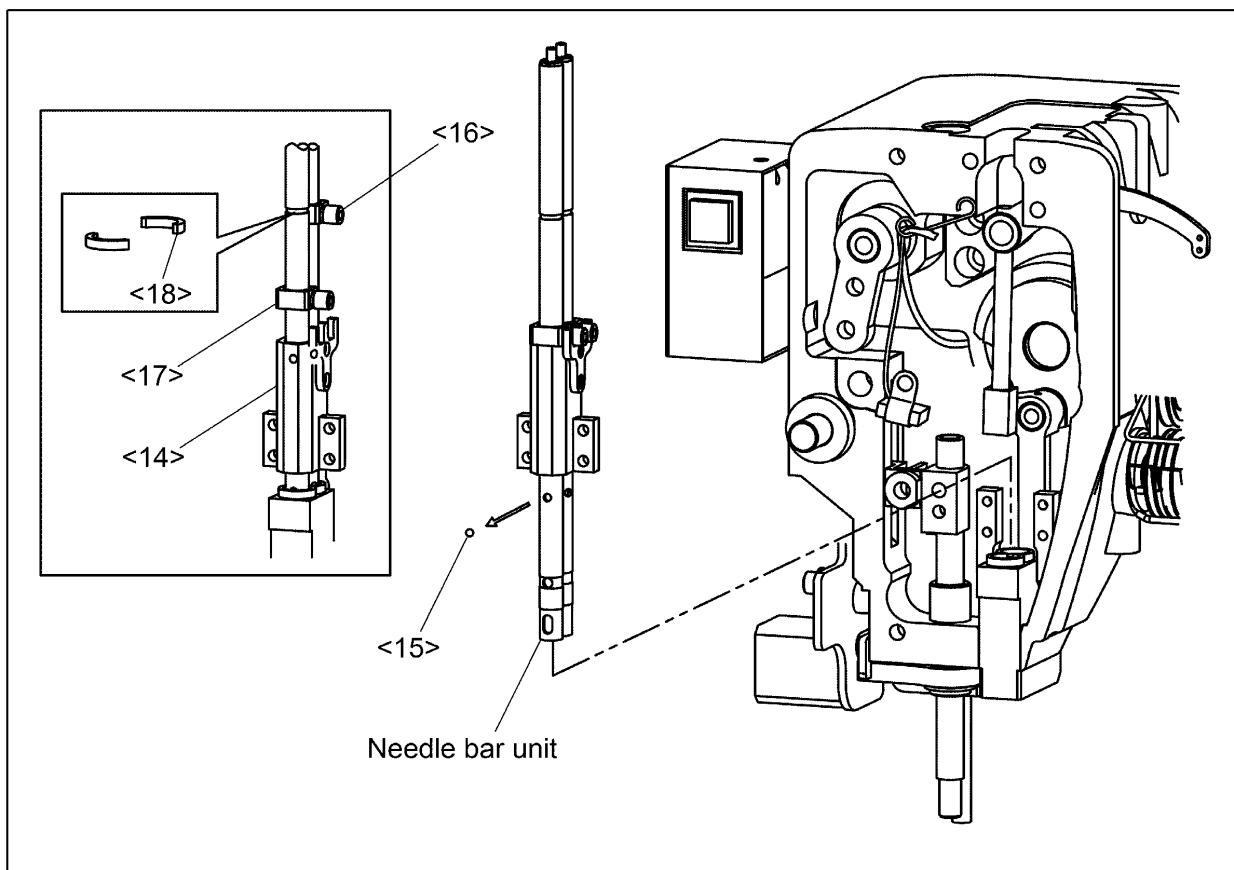
(12) Lift the needle bar unit and remove it. The six pieces of still ball (No.15) should drop out from needle bar unit.

There are small parts, so that it is necessary to note to lose.

NOTE1 These operations accompanied by small parts removing therefore prepare some spare parts in advance of the operation which are (No.15 and No.18).

NOTE2 For the prevention of the miss assembling, do not disassemble the needle bar unit by customer side.

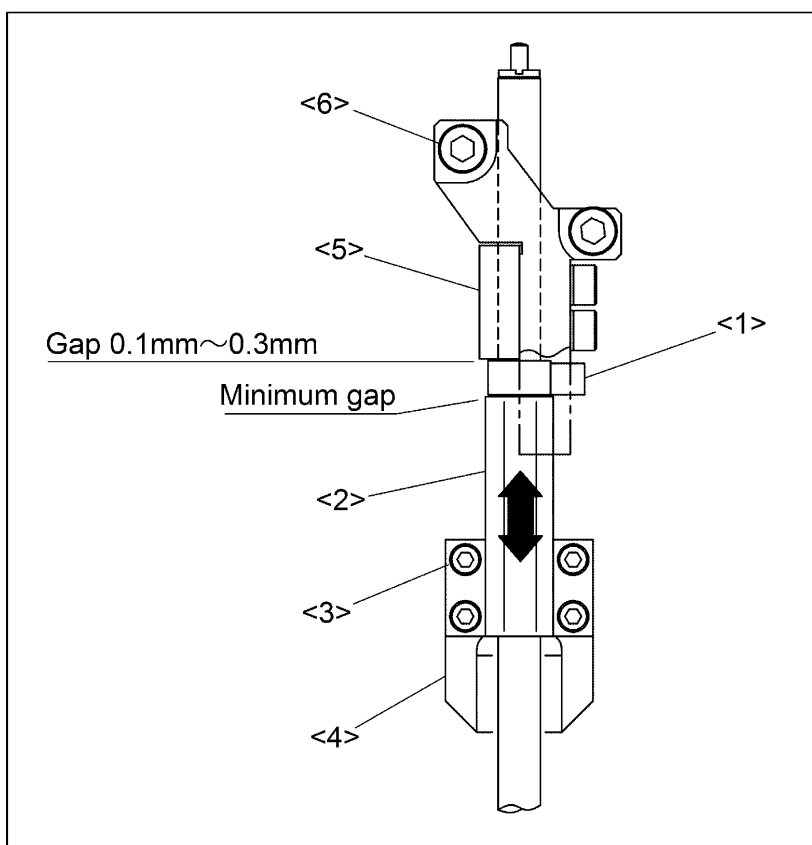
(13) With reverse method, the needle bar unit is installed. And then make an adjustment according to the next section.



7-15. Adjustment of the fixing position of the needle bar holder

The needle bar guide (No.1) and needle bar holder (No.2) is closely contacted in sewing state. The standby needle side, needle bar holder (No.2) is moving with needle bar but needle bar guide (No.1) is staying at the needle bar upper position. It is necessary to make a little gap between the needle bar guide (No.1) and needle bar holder (No.2) for above standby needle side. If contact hardly, the machine arm vibration may increase. On the other hand it may have needle changing trouble when the gap is big. At the same time, make an adjustment to the needle bar supporter (No.5) position. If the gap between needle bar supporter (No.5) and needle bar guide (No.1) is big, needle changing trouble occurs.

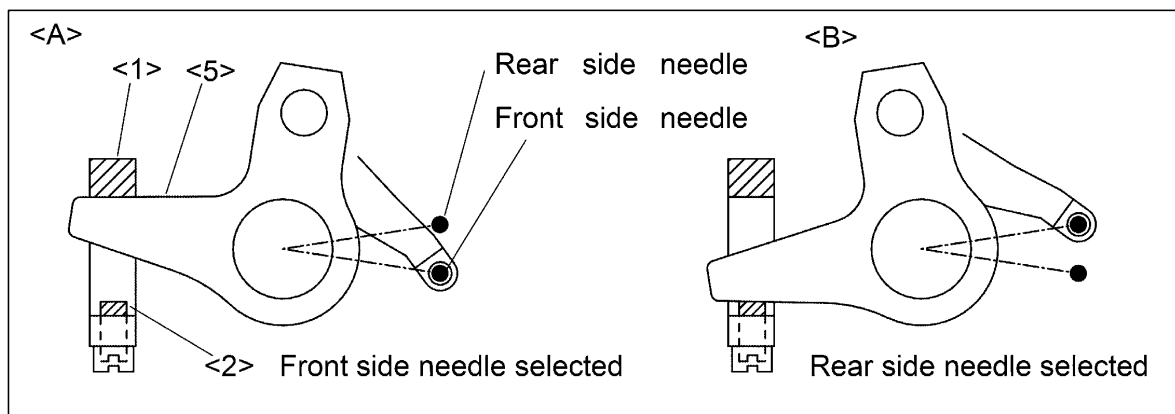
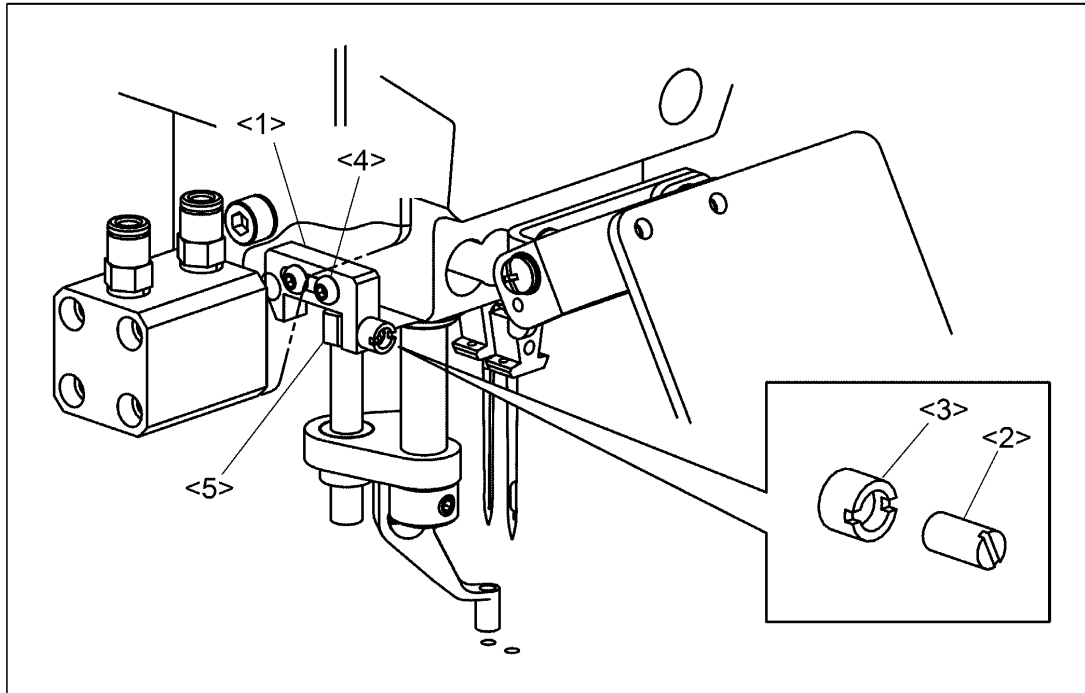
- (1) Loosen four screws of (No.3) and adjust the position of needle bar holder (No.2) relation to connecting arm (No.4) and confirm the gap between needle bar guide (No.1) and needle bar holder (No.2) is minimum (no contact). The target measurement is about 0.05 mm to 0.1 mm.
- (2) After adjustment tighten the four screws (No.3) firmly.
- (3) Loosen two screws of (No.6) and adjust the position of needle bar supporter (No.5). It is necessary to adjust the gap between needle bar supporter (No.5) and needle bar guide (No.1) within 0.1 mm to 0.3 mm.
- (4) Tighten the two screws of (No.6) little by little and make sure if the needle bar moving smoothly. After adjustment tighten the two screws of (No.6) firmly.



7-16. Adjustment of the presser foot turning position

Adjust the presser foot hole and needle like as coaxially when presser foot turning system worked.

- (1) At first adjust the front side turning position. Loosen the two screws (No.4) and move the stopper unit (No.1) to front or backward little by little then adjust the shifting lever (No.5) stop position. (Fig. A).
- (2) After tighten the two screws (No.4), loosen lock nut (No.3) and turn the stop screw (No.2) adjust the rear side turning position. After adjusting the position, tighten the lock nut (No.3). (Fig. B)

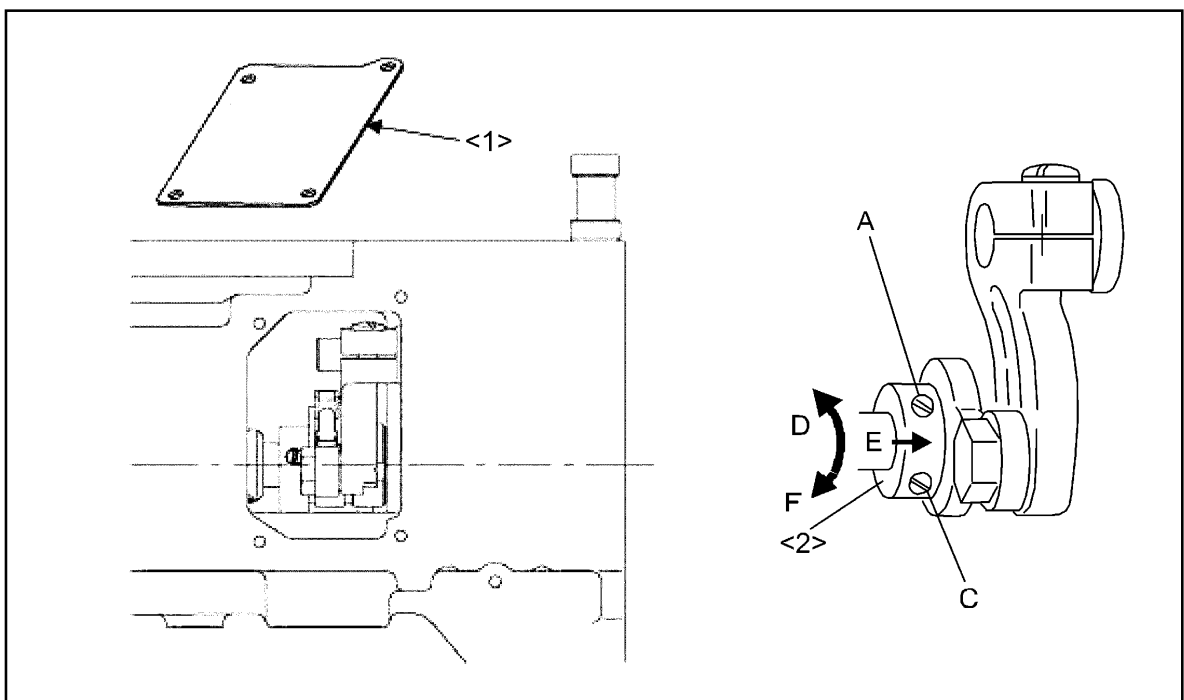


7-17. Adjustment of the presser foot timing

NOTE The presser foot up and down movement during the sewing synchronizes with the needle up and down movement. With changing this synchronized timing to the sewing materials, the skip stitches can be prevented or the seam tightness can be improved.

For example, the delay of the presser foot timing against the needle movement prevents the skip stitches especially to the thin materials, and the advance of the presser foot timing can improve the seam tightness especially to the thick materials.

- (1) Remove the cover (No.1).
- (2) Loosen the set screw "C" of the eccentric cam (No.2).
- (3) Turn the sewing machine pulley by hand and stop the needle bar at the lowest position. At this stage, the set screw "A" of the eccentric cam (No.2) is positioned right beside the center line of the upper shaft. This is the standard position for the eccentric cam (No.2).
- (4) Loosen the set screw "A" of the eccentric cam (No.2).
- (5) If turn the eccentric cam (No.2) to the arrow direction "D", the presser foot timing is advanced, and turn the eccentric cam (No.2) to the arrow direction "F", the presser foot timing is delayed.
- (6) After the adjustment, tighten the set screw "A" and "C" in turn with slightly pushing the eccentric cam (No.2) to the arrow direction "E".
- (7) Put the cover (No.1) back on the original location.

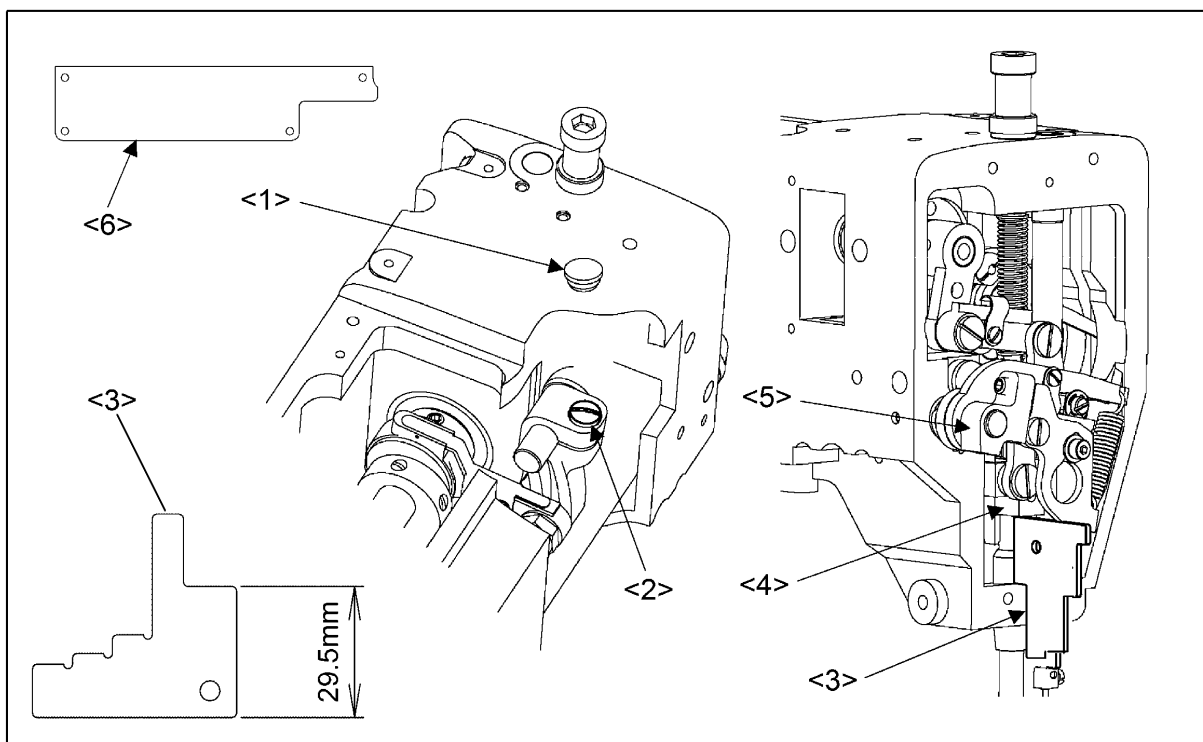


<1>:Cover <2>:Eccentric cam



7-18. Adjustment of the presser foot lift

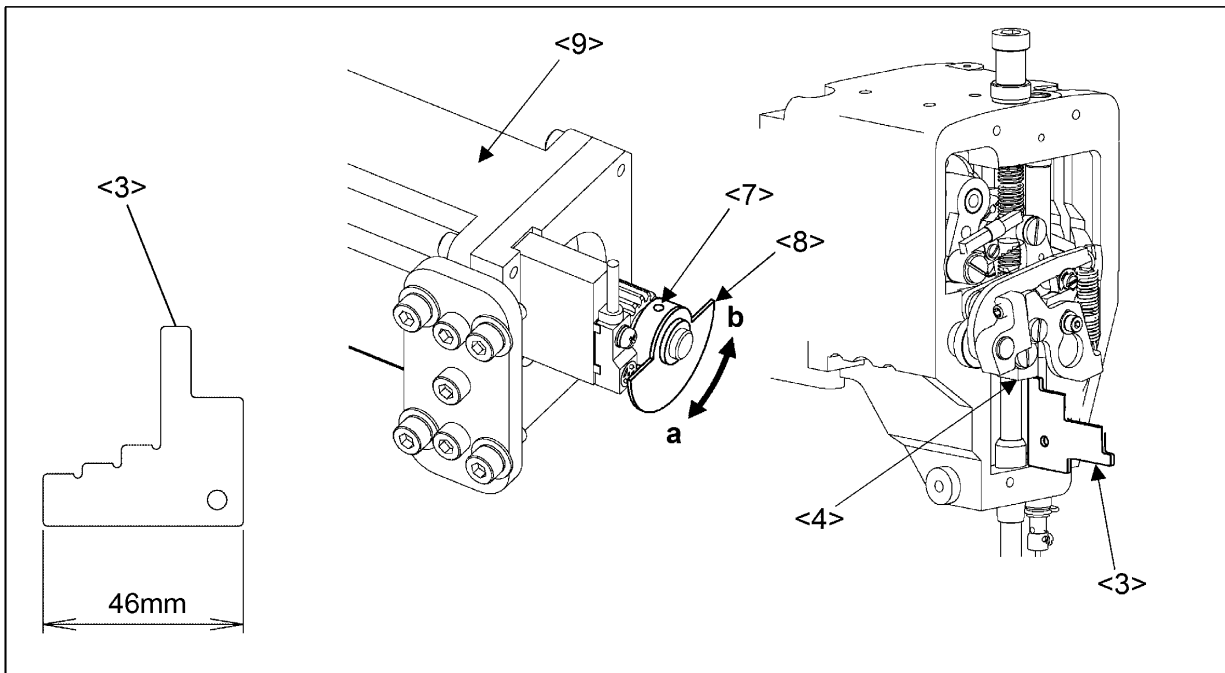
The presser foot lift can be returned factory default setting at 15mm as the procedure shown below. Also, if the presser foot does not move after changing the presser foot correction value and the stroke, carry out the procedure below.

- (1) Remove the face cover, the rubber plug (No.1), and the PF motor cover (No.6).
- (2) Keep the thread take-up lever at the highest position then, loosen the arm set screw (No.2).
- (3) Slide the 29.5mm part on the gauge (No.3) in between the presser bar holder (No.4) and the arm.
- (4) Push down the presser foot lifting lever (No.5) then, tighten the arm set screw (No.2).



<1>: Rubber plug <2>: Arm set screw <3>: Gauge <4>: Presser bar holder
<5>: Presser foot lifting lever <6>: PF motor cover


- (5) Turn the power switch on then, press the home position return icon .
 - (6) Check the clearance between the presser bar holder (No.4) and the arm with the 46mm part on the gauge (No.3). Refer to the next figure.
 - (7) If the clearance is less than 46mm, loosen the detector plate set screw (No.7) on the presser foot drive motor (No.9) and adjust the notch part of detector plate (No.8).
*If it is more than 46mm, turn the detector plate to the direction "a".
*If it is less than 46mm, turn the detector plate to the direction "b".
 - (8) Remove the gauge then, press the home position return icon  and make sure the clearance is 46mm.
- [Notice] If it is not 46mm, carry out the same procedure (7) and (8) again.
- (9) Put the face cover, the rubber plug (No.1), and the PF motor cover (No.6) back on the original location.

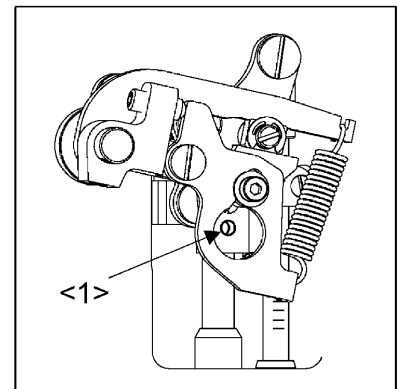


<3>: Gauge <4>: Presser foot bar holder <7>: Detector plate set screw
 <8>: Detector plate <9>: Presser foot drive motor

7-19. Adjustment of the presser foot height position

The height of presser foot can be returned factory default setting as the procedure shown below.

- (1) Turn the power switch on, and set the correction value at 0. (*1)
 For details, refer to the instructions in the paragraph "[8] Controlling the Presser Foot" in the **OPERATION PANEL** technical manual.
- (2) Press the  on the standard screen and lower the presser foot.
- (3) Turn the hand pulley and place the needle bar at the lowest position.
- (4) Loosen the presser foot bar set screw (No.1) and adjust the clearance between the presser foot and slide plate to be 0mm and then, tighten the screw (No.1).
- (5) The correction value is set at 3 as the factory default.



<1>: Presser foot bar set screw

*1: When changing the correction value at 0, an error message;

" M-096: OVER LIMIT OF PRESSER FOOT STROKE " may show up. This happens when the presser foot stroke is already set to the sewing data and by changing the correction value, the stroke in sewing data becomes 0mm or less. In that case, make new sewing data without the presser foot stroke or read out a sewing data that the stroke does not become 0mm or less.

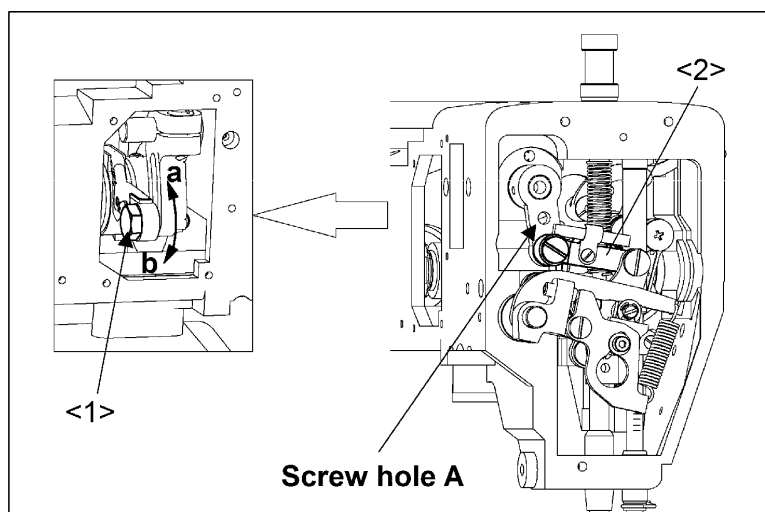
7-20. Adjustment of the presser foot position

The presser foot lift during the sewing can be adjusted from 0 to 8mm. For details, refer to the instructions in the paragraph "[8] Controlling the Presser Foot" in the **OPERATION PANEL** technical manual.

[Notice] When using the long cylinder type of the presser foot, the correction value and the stroke are restricted.

7-21. Adjustment of the presser foot walk during the sewing

- (1) The presser foot walk during the sewing can be adjusted with the walk at zero or the walk of 2 to 10mm. The walk at zero requires the exclusive parts (Option). Please feel free to contact the sewing machine stores.
- (2) When turning the set position of the shoulder bolt (No.1) to the direction "a", the presser foot walk becomes bigger, and when turning the set position to the direction "b", the presser foot walk becomes smaller.
- (3) To adjust the walk in 2 to 4mm, connect the link (No.2) with the screw hole A and adjust with the method (2) described above.
- (4) To adjust the walk in 4 to 10mm, connect the link (No.2) shown on the figure and adjust the method (2) described above.



<1>: Shoulder bolt

<2>: Link

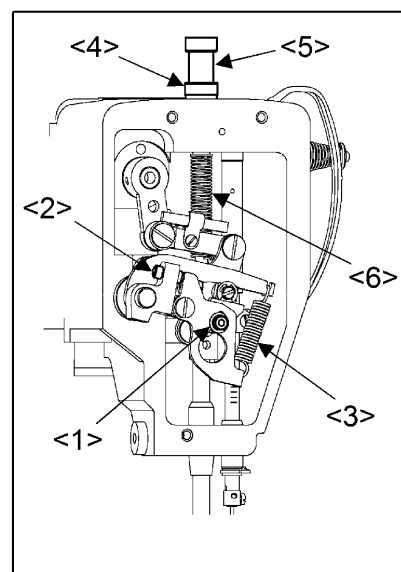
7-22. Adjustment of the presser foot spring pressure

The presser foot spring pressure can be changed with the following two methods.

- (1) To increase the spring pressure, remove the face cover and loosen the bolt (No.1) then, adjust the spring A (No.3) pressure with the adjust screw (No.2). After the adjustment, tighten the bolt (No.1).
- (2) To fine-tune the spring pressure, loosen the nut (No.4) then, turn the thumb screw (No.5) to adjust the spring B (No.6) pressure.

* If tighten the adjust screw (No.2) spring A (No.3) pressure can be increase.

* If tighten the thumb screw (No.5) spring B (No.6) pressure can be increase.



<1>: Bolt <2>: Adjust screw <3>: Spring A

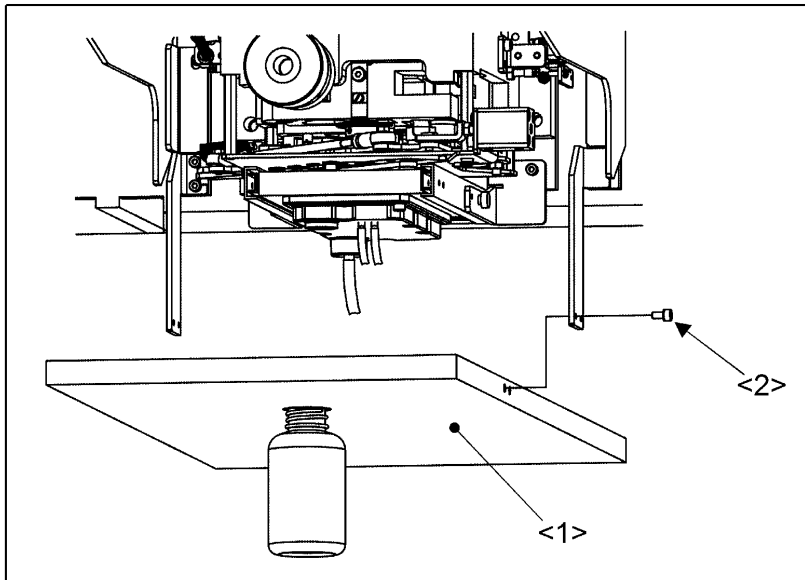
<4>: Nut <5>: Thumb screw <6>: Spring B

7-23. Adjustment of the thread trimmer

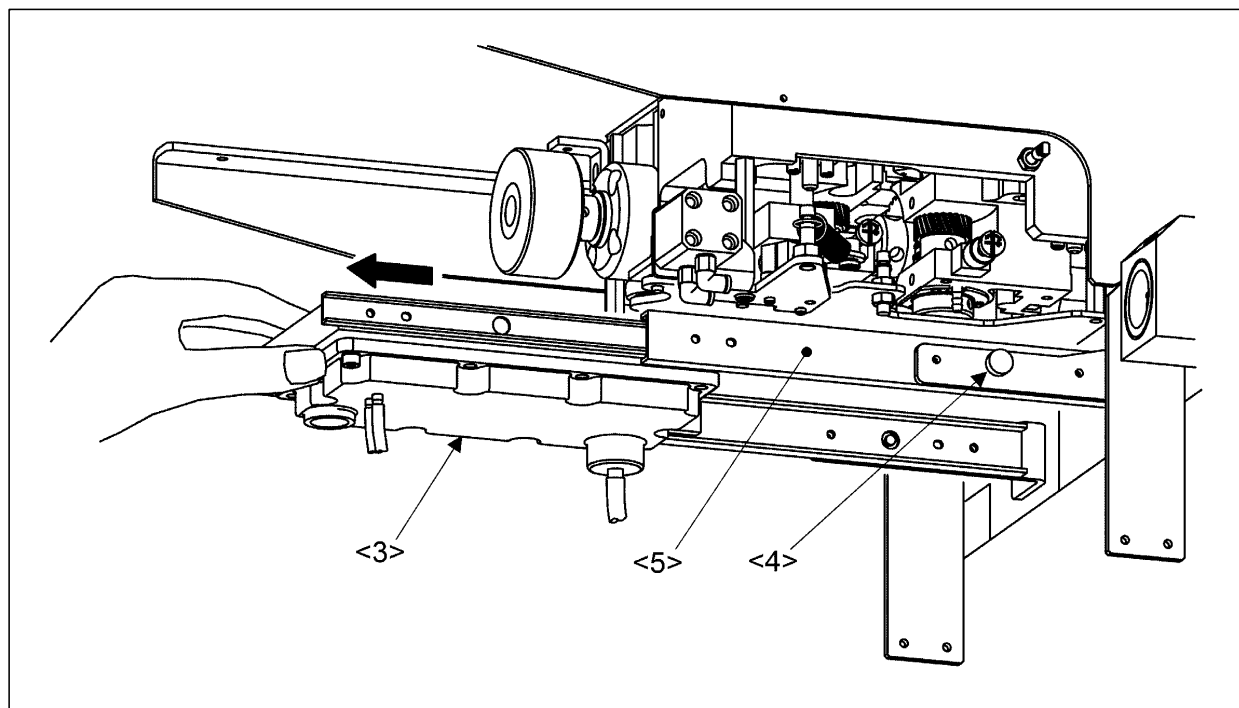
7-23-1. How to remove the thread trimmer selecting mechanism

If remove the thread trimmer selecting mechanism for maintenance, it can be removed by following procedures.

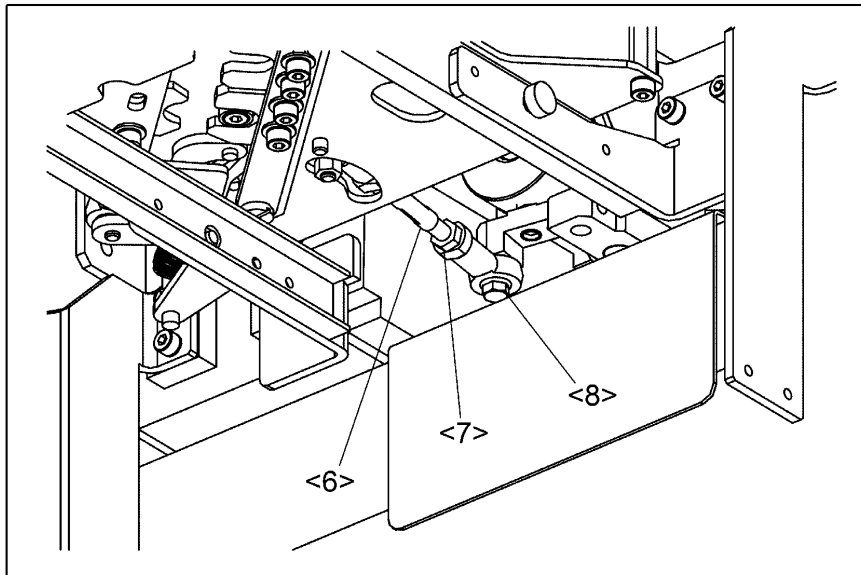
- (1) Remove the saddle hook cover according to previous section.
- (2) Remove the four screws (No.2) and remove the oil cover (No.1).



- (3) Loosen fully the left and right side of each two hand screws (No.4) and draw slowly the oil receiver (No.3) to the end stop of the slide rail (No.5).

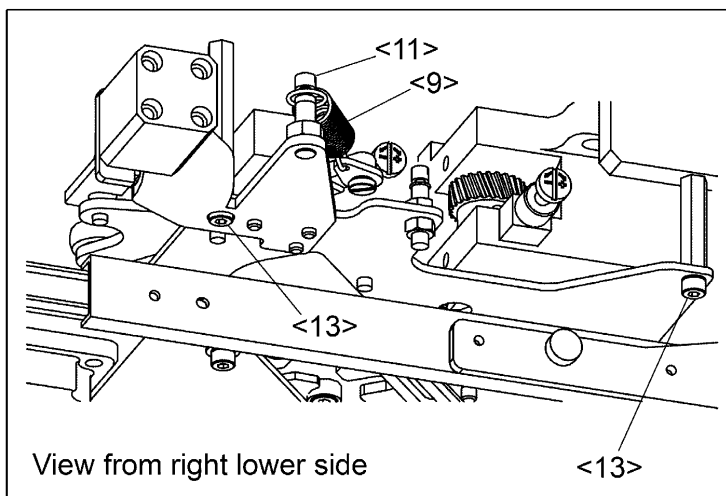


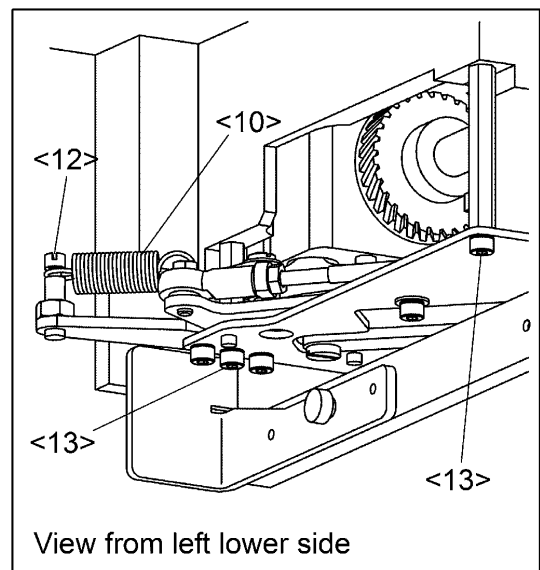
(4) Loosen two nuts (No.7) which have both side of the connecting rod (No.6) and disconnect with cam follower crank unit (No.8). When loosen the nut (No.7) please note that each one of the nuts (No.7) is left-handed screw.



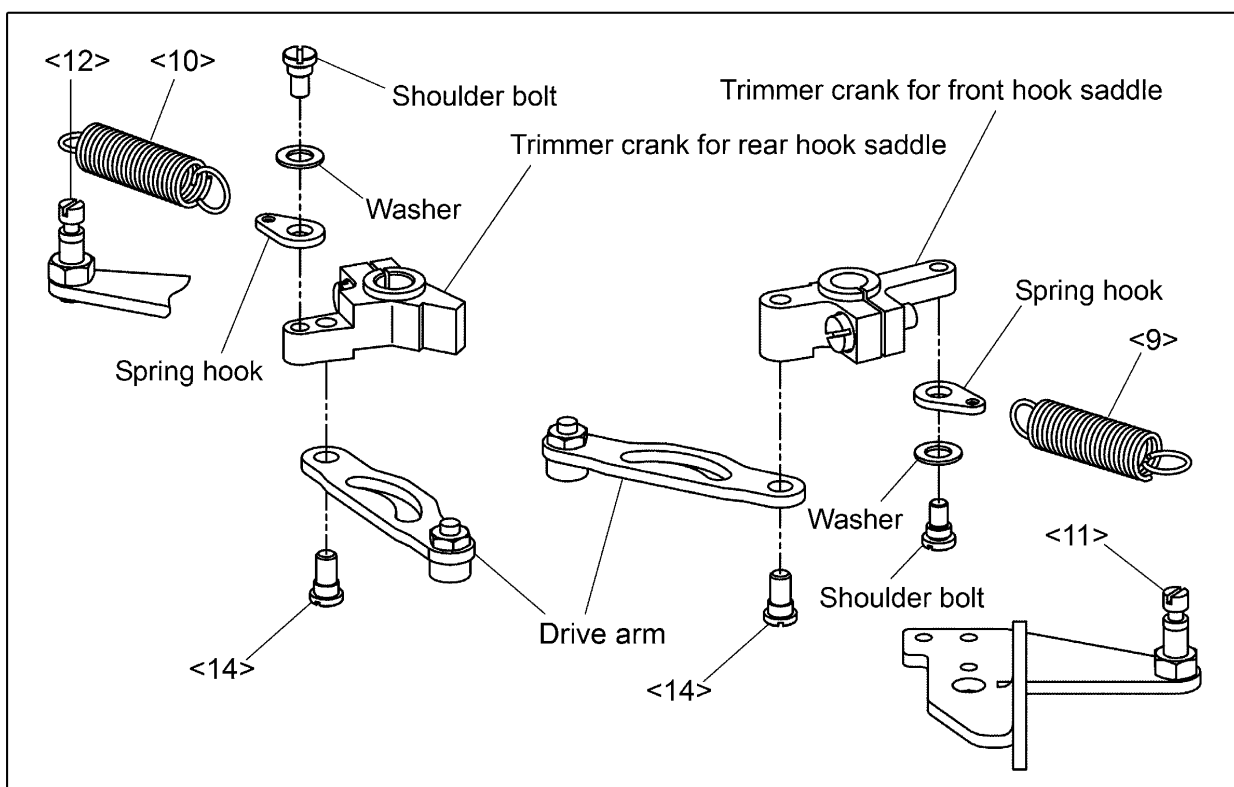
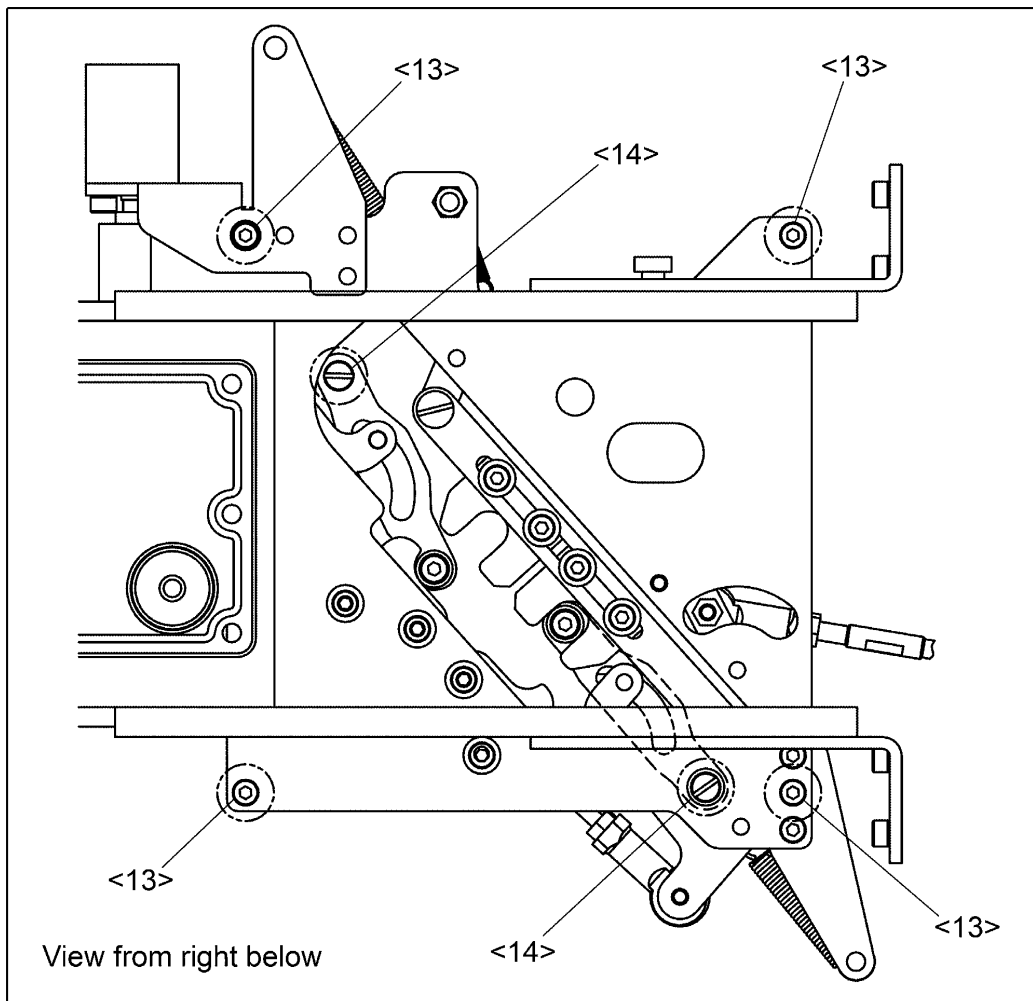
(5) Remove the return spring (No.9) and (No.10) from spring post (No.11) and (No.12).

<A>

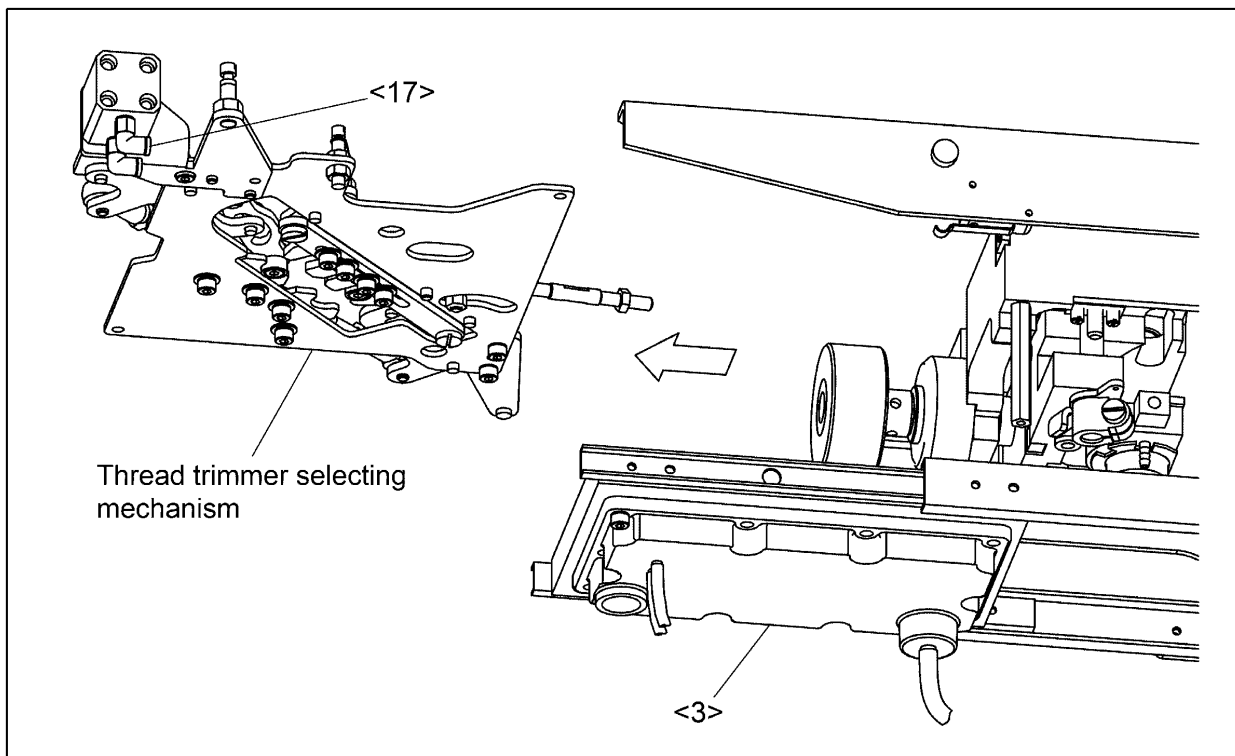




(6) Remove the four screws of (No.13) and two screws of (No.14). The screws (No.13) also indicated (Fig. A) and (Fig. B) in previous paragraph. The removed two screws of (No.14) and return spring (No.9) and (No.10) can be assembled referring below figure.



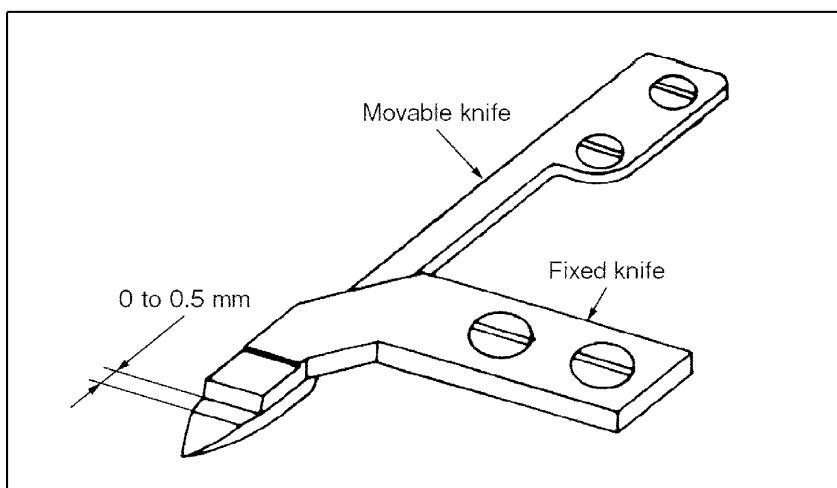
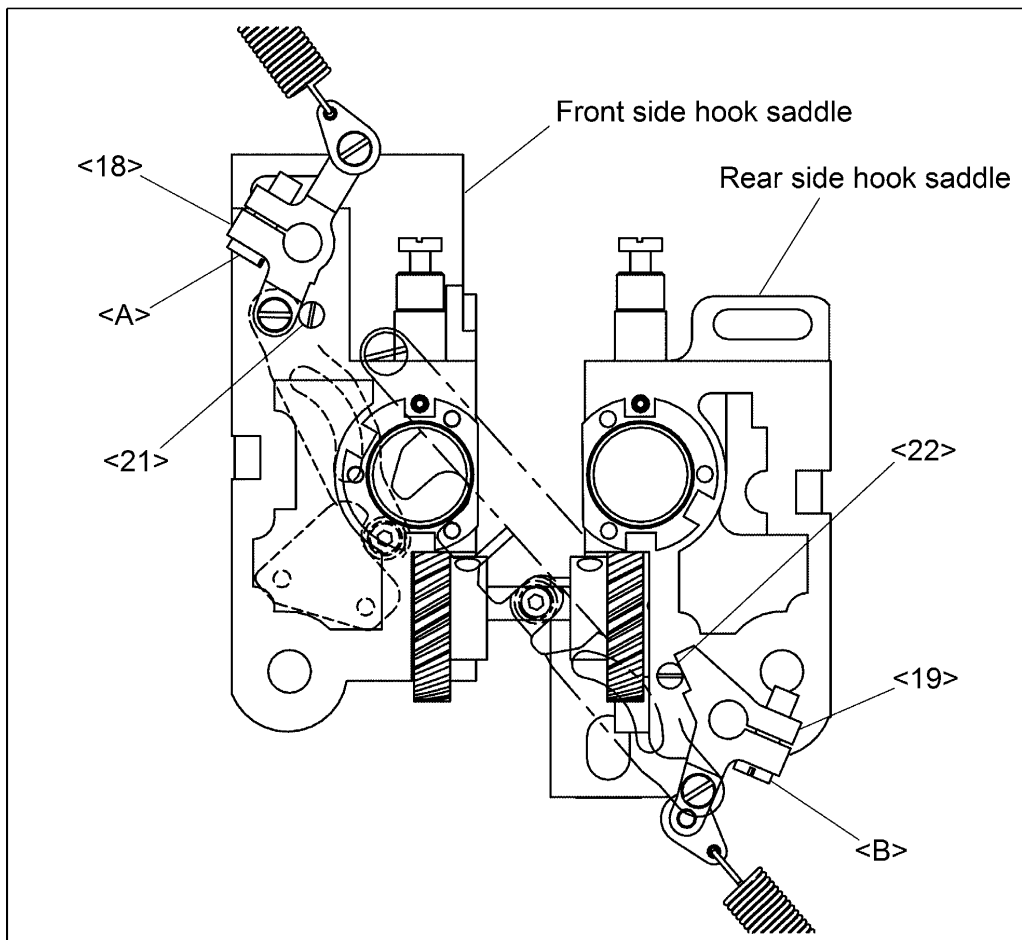
- (7) Remove two air pipes from air fitting (No.17) and move forward the thread trimmer selecting mechanism carefully between the hook saddle and oil receiver (No.3).



- (8) By reverse method, the thread trimmer selecting mechanism can be installed. And then make some adjustment according to the next section.

7-23-2. Installation of the movable knife

- (1) Loosen bolt (A) and (B) of trimmer cranks (No.18) and (No.19).
- (2) Adjust so that the tip slant portion of the movable knife protrudes 0 to 0.5 mm from the fixed knife, as shown in the figure.
- (3) Contact thread trimmer cranks (No.18) and (No.19) to stopper pins (No.21) and (No.22). At this condition tighten bolts (A) and (B) with confirming if the each trimmer cranks (No.18) and (No.19) are contact (no gap) with hook saddle.

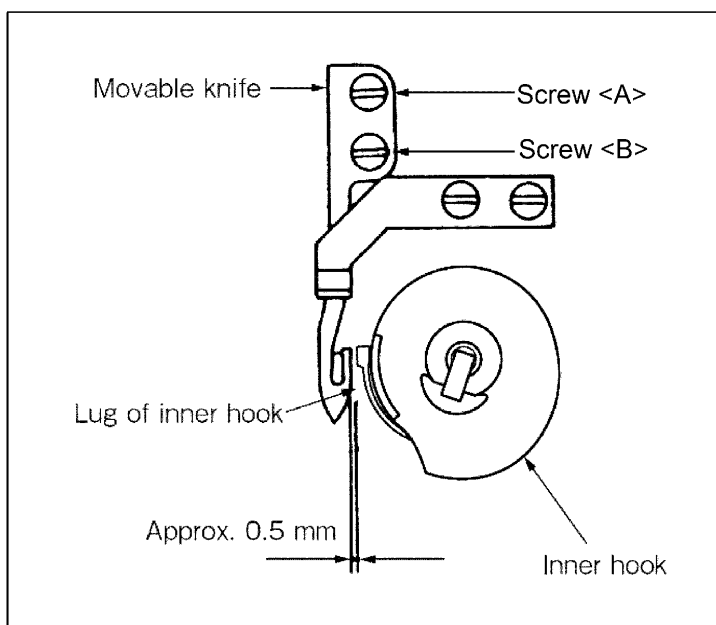


7-23-3. Gap between the movable knife and the lug of inner hook

(1) Move the each trimmer cranks (No.18) and (No.19) by hand which showing in following section and stop it at the position where the movable knife move to the position as shown in the figure.

NOTE When thread trimmer selecting mechanism has installed, trimmer cranks (No.18) and (No.19) can't move same time. Refer to next section change the trimmer crank alternately.

(2) Turn the inner hook and adjust so that the gap between the movable knife and the lug of inner hook is about 0.5 mm. Screws (A) and (B) should be loosened for this adjustment.



7-23-4. Adjustment of driving arm unit position on thread trimmer selecting mechanism

(1) a) Shut off the air pressure supplying. and make sure if each two of thread trimmer crank contacts each stopper pin. Please refer to previous paragraph <7-23-2>.

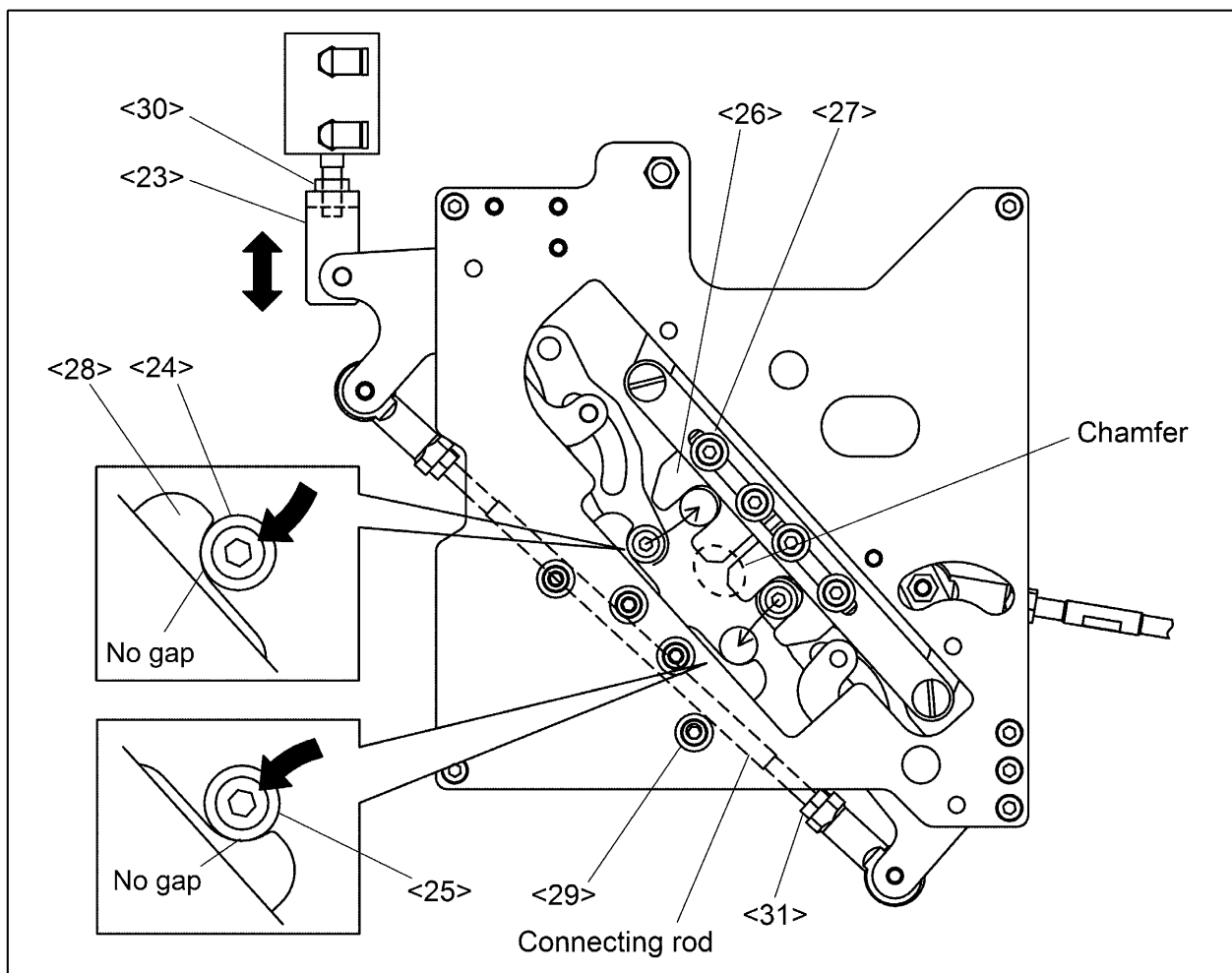
b) Move the clevis rod (No.23) back and forth, and confirm the driving arm roller (No.24) and (No.25) alternately move into the each drive plate groove (No.26) smoothly. If it does not, loosen each two screws (No.27) and adjust the driving plate (No.26) position.

NOTE Drive plate (No.26) is necessary to install as indicated in figure that each smaller chamfer of drive plate match the side.

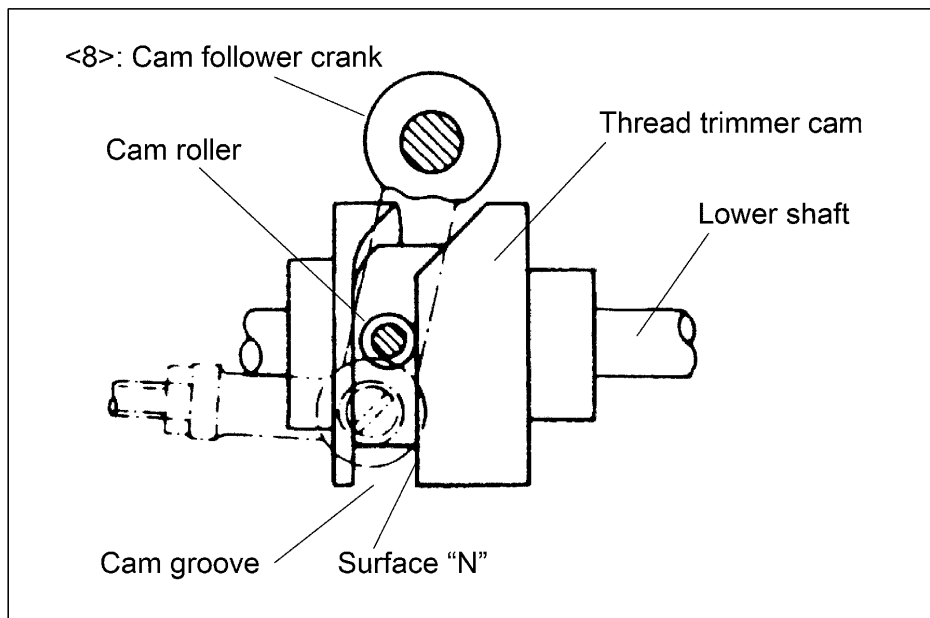
c) Adjust the roller stopper (No.28) position so that hold the arc motion moving of the drive arm roller (No.24) and (No.25). Loosen each two screws (No.29) and adjust according to following figure that not have any gap in roller moving direction.

d) Adjust the drive roller position in the groove of drive plate (No.26). The drive roller is necessary to fully in the slotted groove of drive plate but not connect the slotted groove end. If it does not satisfy this condition, loosen nut (No.30) and change the distance between clevis rod (No.23) and air cylinder body. The drive roller (No.24) position is changed. When adjust the drive roller (No.25) position loosen both end of connecting rod nuts (No.31) and change the length of connecting rod. (One of nut is left handed-screw) In other hand, it is necessary to check if the air cylinder moves within its range. If it does not, either one of the drive roller (No.24) or (No.25) can't stop by roller stopper (No.28). In this case, distance of clevis rod (No.23) and air cylinder body is not correct.

e) When finish the adjustment please check previous paragraph <7-23-2> again.



- (2) Turn the hand pulley and stop it at the position where the needle comes to the lowest.
- (3) Loosen both two of nuts (No.7). <Refer to previous section 7-23-1 (4)>
- (4) Push the cam follower crank (No.8) and adjust the connecting rod (No.6) so that the cam roller can smoothly enter the thread trimmer cam groove. <Refer to previous section 7-23-1 (4)>
- (5) Adjustment of the cam groove and the cam roller
- a) Put the cam roller into the thread trimmer cam groove by pushing the cam follower crank (No.8).
 - b) Turn the connecting rod (No.6), and adjust the gap between the cam roller and the surface "N" of the cam groove as small as possible, and tighten both two of nuts (No.7).
 - c) Push the cam follower crank (No.8) again and check that the cam roller enters the thread trimmer cam groove smoothly.
 - d) Check again if the thread trimmer cranks (No.18) and (No.19) contacts with stopper pins (No.21) and (No.22).



7-23-5. Adjustment of thread trimmer cam timing

(1) Remove the slide plate and needle plate and prepare the adjust jig according to previous section.

<7-5-2>

(2) Depress the cam follower crank (No.8) by hand and put the cam roller into the groove of thread trimmer cam at needle bar lower position.

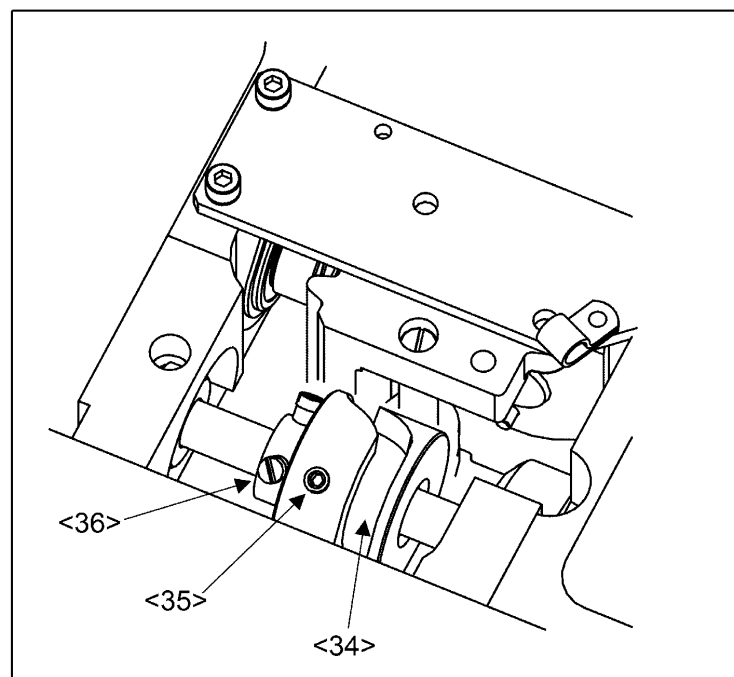
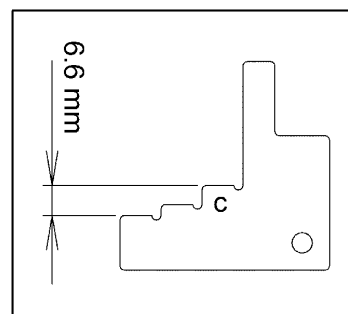
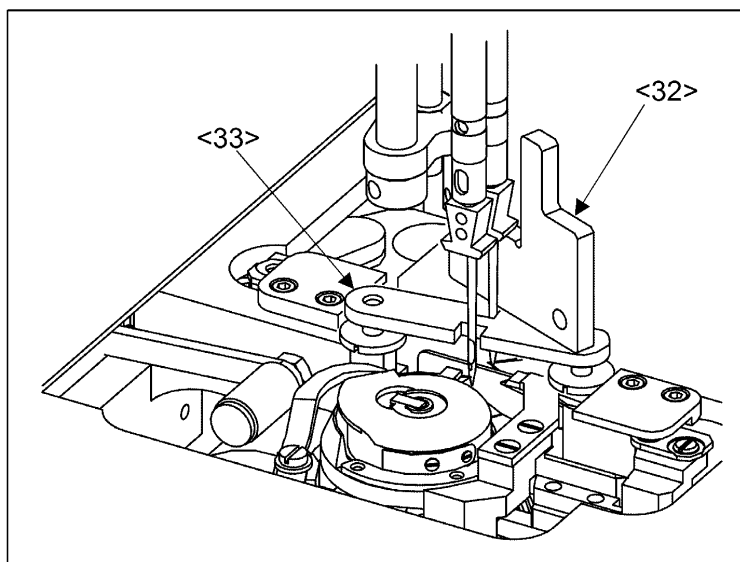
(3) Turn the hand pulley and stop when the movable knife starts moving.

(4) Slip the step ("c" marked) of gauge (No.32) between gauge base (No.33) and needle clamp. At this time needle bar is lifted 6.6 mm from the lower position.

(5) Make sure that the gauge (No.32) smoothly inserted without any gap between the gauge base (No.33) and needle clamp. If it does not, loosen two thread trimmer cam clamp screws (No.35) and change rotating position of the trimmer cam with placing the thread trimmer cam (No.34) on the end face of the bushing (No.36) (making the gap between each part zero).

(6) After adjusting repeat and check above (2) to (5).

NOTE The hand pulley should rotate clockwise when viewed from the pulley.

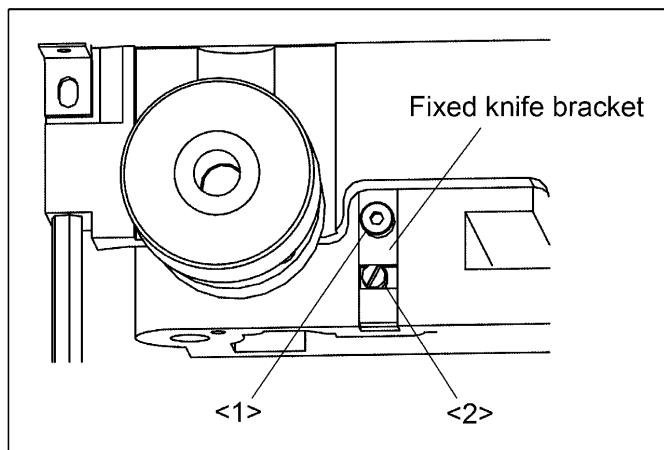


7-24. Adjustment of meshing pressure between the movable knife and the fixed knife for front side

- (1) Loosen the fixed knife bracket clamp bolt (No.1).
- (2) Adjust meshing pressure by turning the up and down adjusting screw (No.2), and tighten the bolt (No.1).

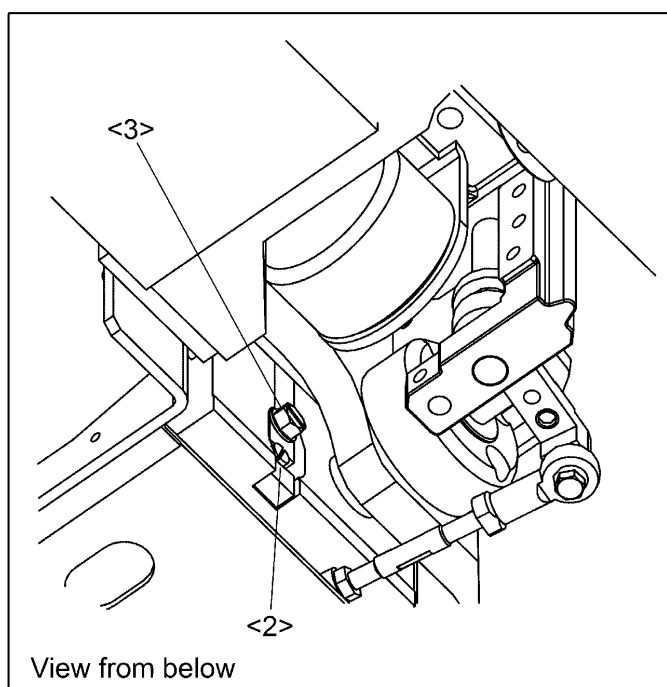
NOTE Since overpressure causes a large torque on the thread trimmer mechanism and trimming failure, adjust so that the thread can be trimmed with the minimum pressure.

- (3) Move the movable knife and check that the thread can be sharply trimmed.



7-25. Adjustment of meshing pressure between the movable knife and the fixed knife for rear side

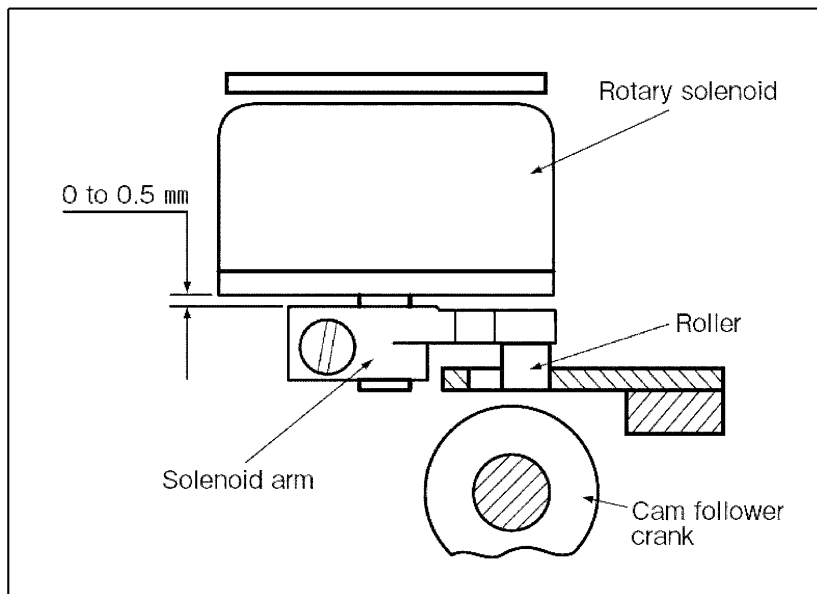
- (1) When operate rear side of fixed knife bracket clamp bolt (No.3), remove the oil pan and loosen by hexagonal wrench.
- (2) When operate the up and down adjusting screw (No.2), use the flat-blade screwdriver with short elbow. This screwdriver is not included in accessory box.
- (3) Adjusting procedure is same as previous section.



7-26. Installation of the solenoid arm

(1) Install the rotary solenoid so that the gap between the rotary solenoid and the solenoid arm is about 0 to 0.5 mm.

NOTE If the gap is too large, the roller and the cam follower crank interfere while rotating movement of the solenoid, which causes malfunction and result in failure of the thread trimmer device.



7-27. Adjustment of the work holder pressure



CAUTION

★If the secondary side air pressure is set too high, trouble such as operation faults may occur. Always set the pressure to within 0.4Mpa.

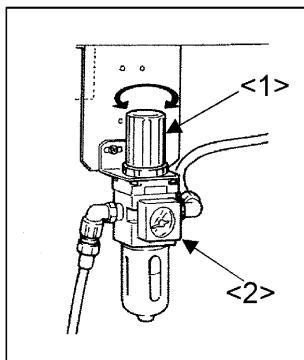
(1) The work holder pressure is provided from an air source.

Lift and turn the air regulator's adjustment knob (No.1) located under the table to adjust the air pressure.

(2) If turn the adjusting knob (No.1) to the clockwise, the air pressure is increased and the work holder pressure is also increased simultaneously.

(3) If turn the adjusting knob (No.1) to counter clockwise, the air pressure is decreased and the work holder pressure is also decreased simultaneously.

(4) 0.4Mpa (4kgf/cm²) is the standard air pressure as a normal sewing operation.



<1> : Adjusting knob

<2> : Air regulator

7-28. Adjustment of the bobbin winder

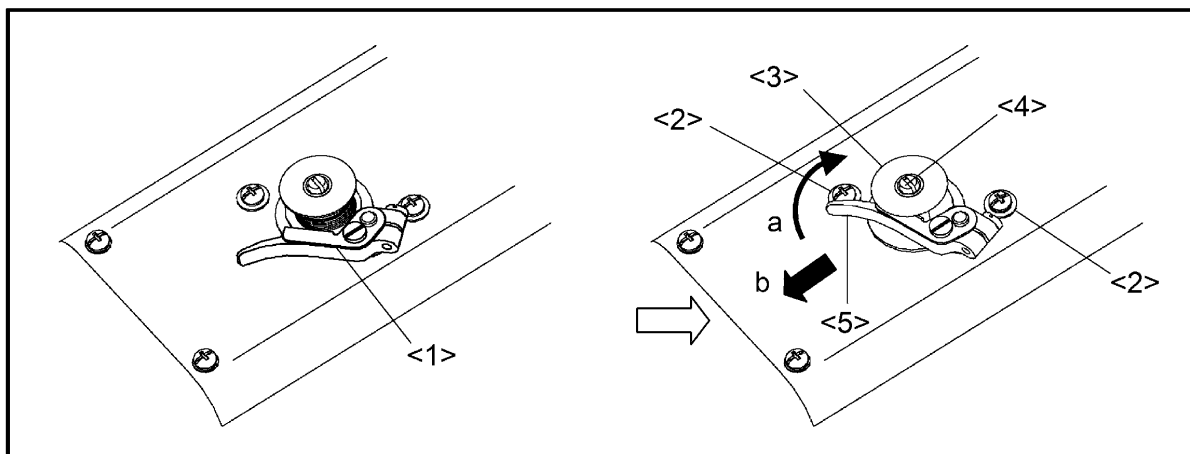
(1) Adjustment of the winding volume

Adjust the amount of the winding thread with the subsidiary arm (No.1).

The winding volume is adjusted 80% of the full volume when the sewing machine is shipped from the factory.

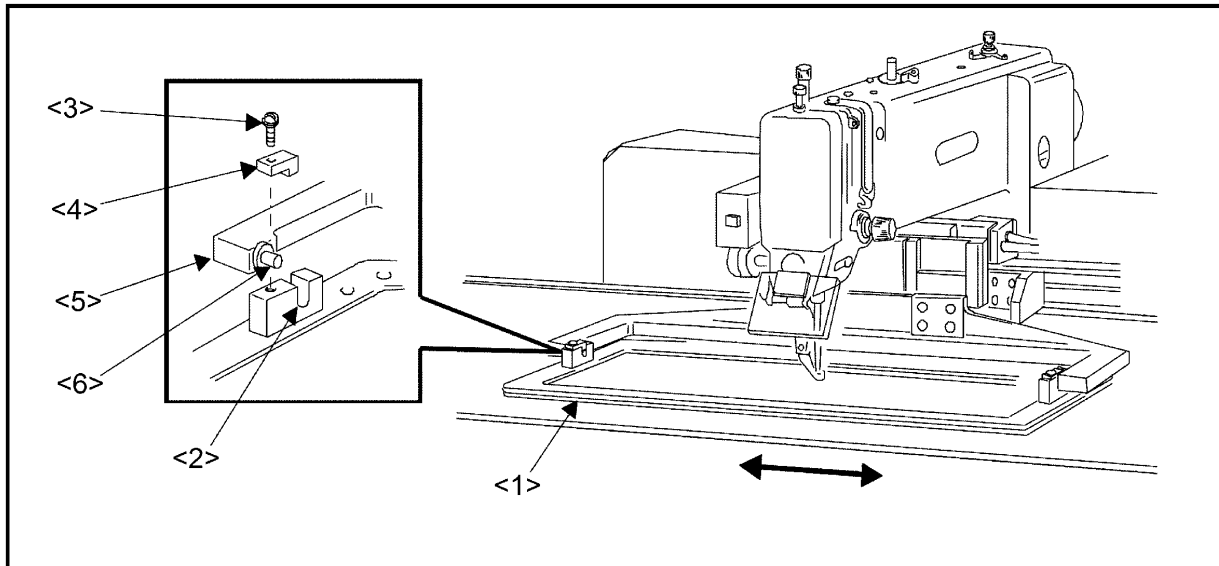
(2) Adjustment of the proper position of the bobbin winder

Firstly, loosen the set screws (No.2) of the bobbin winder and put the empty bobbin (No.3) on the rotating shaft (No.4) then, push the adjusting lever (No.5) to the arrow direction "a". Secondary, move the whole bobbin winder to the arrow direction "b" and stop it at the position where the empty bobbin is rotated then, tighten the set screws (No.2) of the bobbin winder. This is the proper position of the bobbin winder.



7-29. Changing the work holder



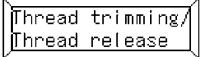




- (1) Before changing the work holder (No.1), remove the holder block (No.4) that is secured with the screw (No.3). It will come off by pressing the work holder (No.1) down from the area engaged with the pin (No.6) of the work holder arm (No.5).
- (2) Prepare another work holder and securely engaged its U shaped ditch (No.2) with the pin (No.6) of the work holder arm (No.5). At this time, make sure that there is no play in the \longleftrightarrow arrow direction.



<1>: Work holder <2>: U shaped ditch <3>: Screw <4>:Holder block
 <5>: Work holder arm <6>:Pin

7-30. Adjustment of the opening time of the needle thread tension release disks

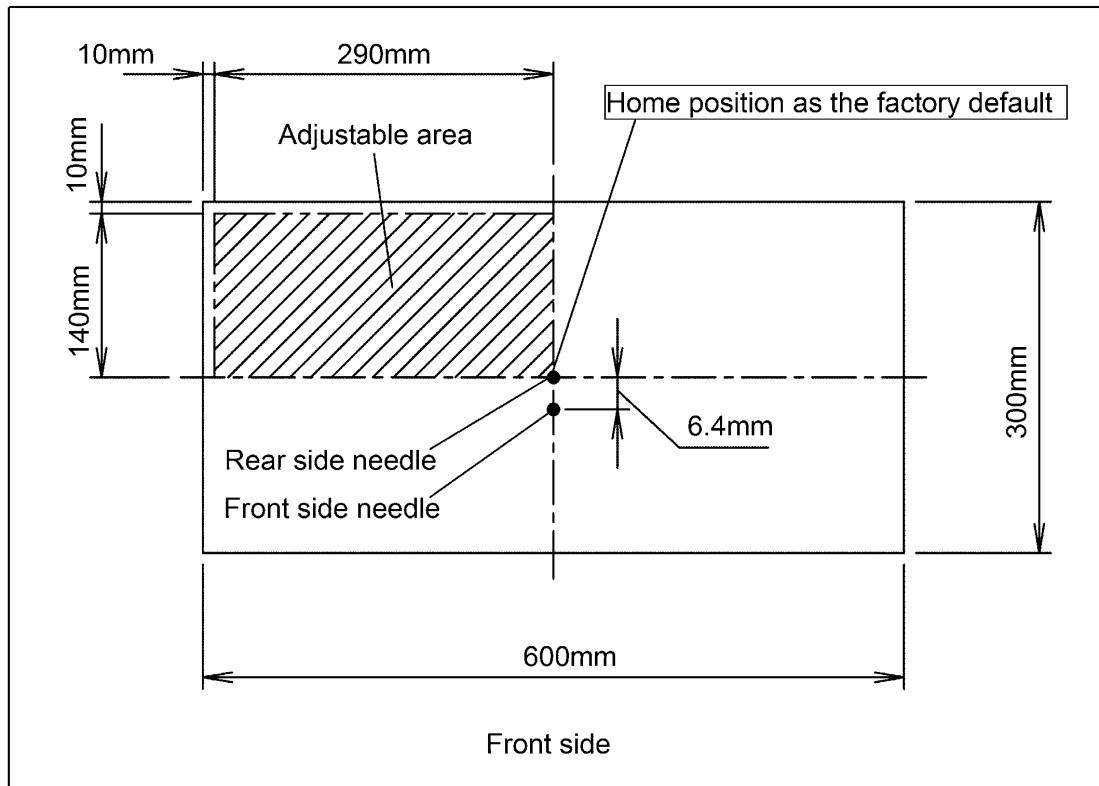
When the presser foot rises, the thread tension disks are open for a given length of time and close. The default setting is set at one-minute intervals. To change the set value, carry out the procedure shown below.

- (1) Turn the power switch on.
 - (2) Press the  on the standard screen to open the MENU mode.
 - (3) Press the  >  >  [Setting for tension release outputs time length at presser] in order.
 - (4) Current set value is “60 sec”.
 - (5) Change the value from 0 to 10000 then press the  .
- If change the value to “0” the thread tension disks closed when the presser foot rises.
- (6) Press the  >  . Changing set value has been completed.


7-31. Adjustment of the mechanical home position

The mechanical home position is fixed at the center of the sewing area when the sewing machine is shipped from the factory. However, it can be moved within the area covered with diagonal lines.



NOTE The mechanical home position adjusted based on the rear side needle.



(1) After canceling the sewing area limit, change the mechanical home position.

(2) Press the  on the standard screen to open the MENU mode.


(3) Press the  >  >  [Cancellation of sewing area limit] in order.

(4) Select the  on the [Cancellation of sewing area limit] screen, and press the .


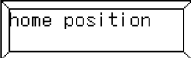

(5) Press  → press  to return the standard screen.

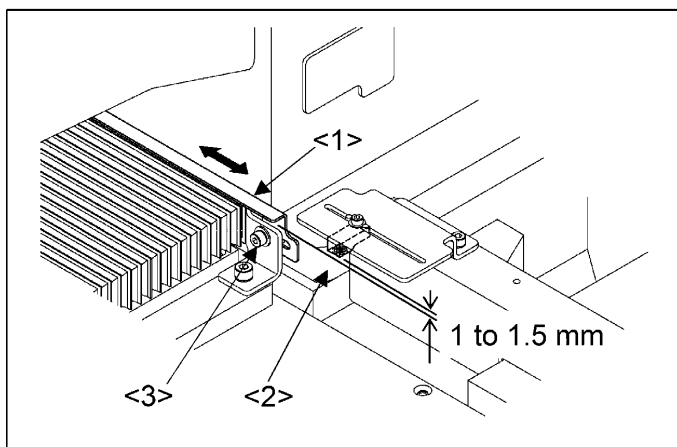
7-32. Adjustment of the detector position

7-32-1. Adjustment of the X direction

- (1) Turn the power switch off.
- (2) The mechanical home position of the X direction is the position where the detector (No.2) can detect the edge of the detector plate X (No.1).
- (3) For the adjustment of the X direction mechanical home position, loosen the detector plate set screws (No.3) at the left and right side then, move the detector plate X in the arrow direction as shown on the figure. Set the clearance between the detector plate X and the detector within the range of 1.0 to 1.5mm.
- (4) Turn the power switch on. Press the home position return icon , and check the mechanical home position.
- (5) If the mechanical home position is not the desired position, carry out the same procedure (3) and (4) again. In that case, turn the power switch off each time.


[Notice] The machine has a function that the motor memorizes the home position at the first home position returning operation after the switch is turned on. Therefore, from the second home position returning, it does not use the home position return sensor. Make sure to turn the power switch off to change the mechanical home position.

To use the sensor from the send returning, press  >  >  [Home returning method since the second time returning] on the standard screen and set it ON.

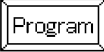
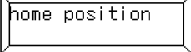



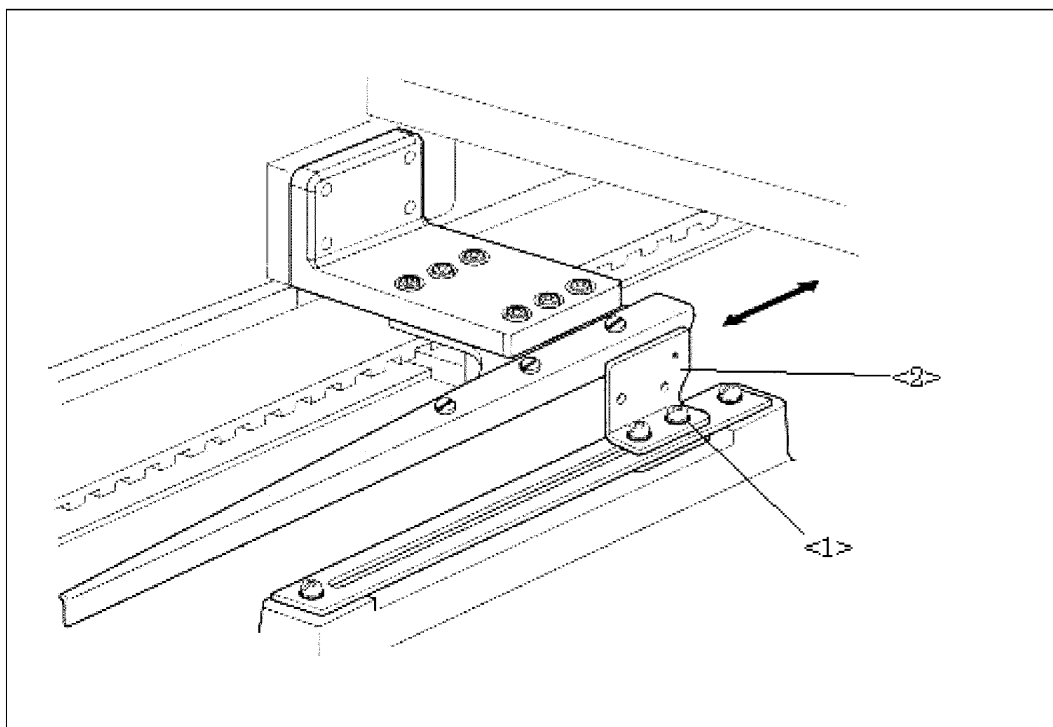
- <1>: Detector plate X
- <2>: Detector
- <3>: Detector plate set screw

7-32-2. Adjustment of the Y direction

- (1) Turn the power switch off.
- (2) Remove the covers and shutters on the top of the sewing machine bed.
- (3) For the adjustment of the Y direction mechanical home position, loosen the detector set screw (No.1) then, move the detector (No.2) to the arrow direction as shown on the figure.
- (4) Turn the power switch on. Press the home position return icon , and check the mechanical home position.
- (5) If the mechanical home position is not the desired position, carry out the same procedure (3) and (4) again. In that case, turn the power switch off each time.

[Notice] The machine has a function that the motor memorizes the home position at the first home position returning operation after the switch is turned on. Therefore, from the second home position returning, it does not use the home position return sensor. Make sure to turn the power switch off to change the mechanical home position.

To use the sensor from the send returning, press  >  >  [Home returning method since the second time returning] on the standard screen and set it ON.



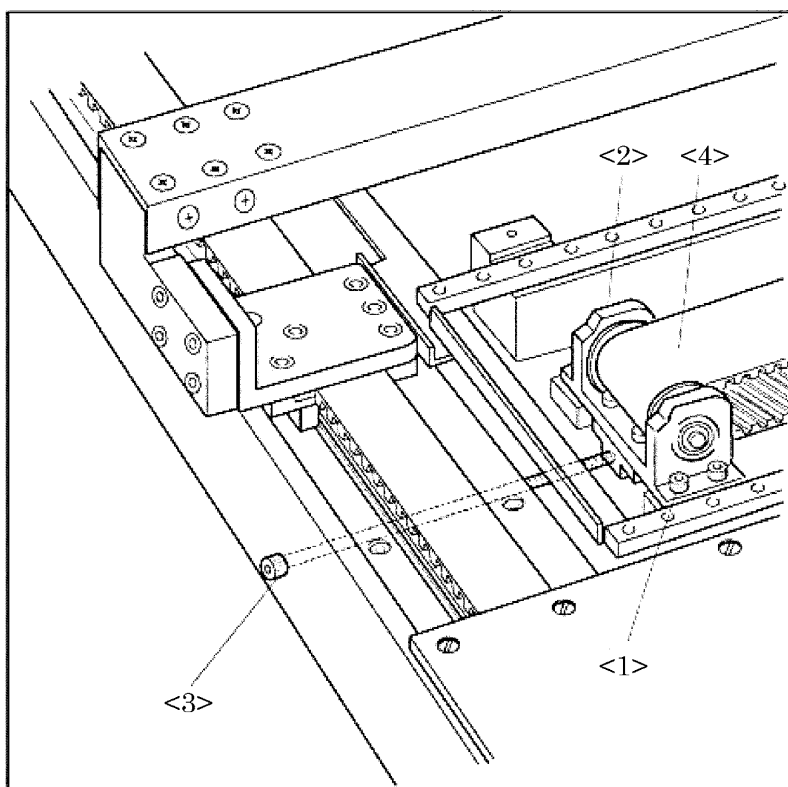
<1>: Set screw <2>:Detector bracket

7-33. Adjustment of the X-Y timing belt tension

NOTE The proper condition of the X-Y timing belt tension is standing that they will not be got any yield even it is slightly pushed by hand.

7-33-1. Adjustment of the X timing belt tension

- (1) Remove the covers and shutters on the top of the sewing machine bed.
- (2) Loosen the set screws (No.1) (4 pieces) of the bracket (No.2).
- (3) If tighten the tension adjust screw (No.3), the X timing belt (No.4) tension will be increased.
- (4) After the adjustment, securely tighten the set screw (No.1) of the bracket (No.2) and put the covers and shutters on the original locations.

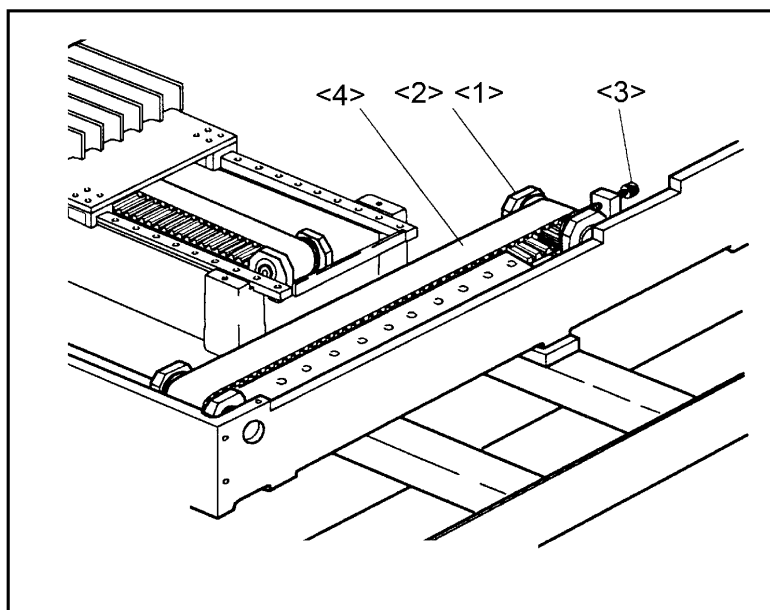


<1>: Set screw <2>:Pulley bracket <3>:Adjust screw <4>:Timing belt

7-33-2. Adjustment of the Y timing belt tension

- (1) Remove the covers and shutters on the top of the sewing machine bed.
- (2) Loosen set screws (No.2) of the brackets (No.1). (It's located right and left side)
- (3) Tighten the adjust screw (No.3) of right and left side, the Y timing belt (No.4) tension will be increased.
- (4) After the adjustment, tighten the set screws (No.2) securely.

NOTE Distinct difference of the tension between the right and left timing belt will be possible to cause undesirable moving of X-Y table. Please adjust the tension of both side timing belt to be same.



<1>: Pulley bracket <2>: Set screw <3>: Adjust screw <4>: Timing belt

8. MAINTENANCE



CAUTION

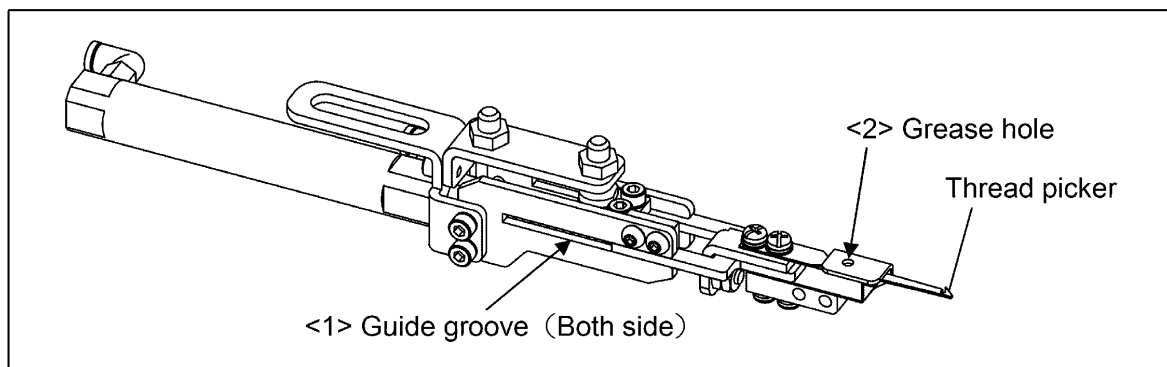
- (1) Please make sure to turn the power switch off before cleaning the sewing machine.
- (2) Please pay attention to that staining your skin or eyes with oil may cause an inflammation.

8-1. Maintenance of needle thread catcher unit

- (1) To keep in good working conditions, please put some grease in both guide grooves <1> and grease hole <2>. Please wipe off the old grease when put the new grease.

<Recommended grease: Molybdenum disulfide grease>

- (2) When the thread picker is damaged, please change it new one or check if it has any scratch. If the thread picker has any scratch, the thread release function is not work normally.



8-2. Maintenance of pressor foot selecting system

- (1) To keep in good working conditions, please put some grease at moving range of shift bar (No.1).

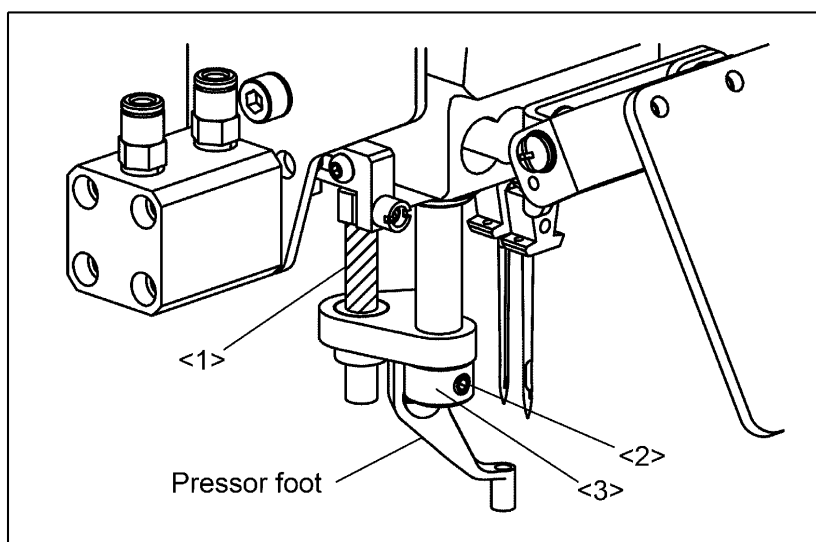
Please wipe off the old grease when put the new grease.

<Recommended grease is contain a thickener which is lithium soap >

- (2) Check if it is not any gap about pressor foot.

If gap increased please loosen two screws (No.2) of stop ring (No.3) and lift the stop ring (No.3) so that gap being decreased then tighten the screws (No.2).

NOTE When the pressor foot has collide with clamp or needle, Please check above described.

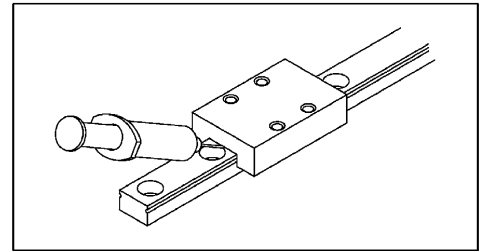


8-3. Cleaning

(1) Remove the dust and the thread waste sticking regularly especially below points.

- a) Threading parts or the hooks area.
- b) Thread trimmer selecting mechanism.
- c) In side of the oil receiver.
- d) Pressor foot turning mechanism.

(2) The dust or the like sticking the X-Y slide guide absorbs lubrication oil on the rails and significantly lowers the slide guide running life.



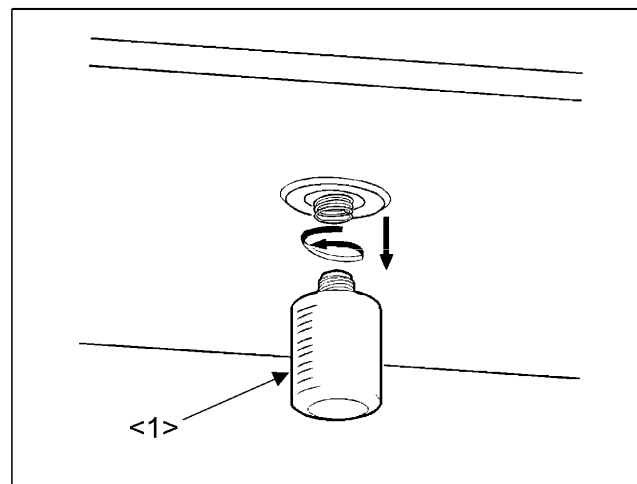
Clean the slide guide regularly and also pour some grease.

Recommended grease: Multemp PS2 (Produced by *Kyodo Yushi Co. Ltd*)

(Lithium grease 2)

8-4. Disposing of oil waste

If the waste oil pan is full filled in the oil bottle (No.1), remove the oil bottle then dispose of the waste oil.



<1>:Oil bottle

9. TROUBLESHOOTING



CAUTION

(1) Please make sure to turn the power switch off before adjusting the sewing machine.

(2) If the adjustment is required while the power switch on, do not step on the foot switch by mistake.

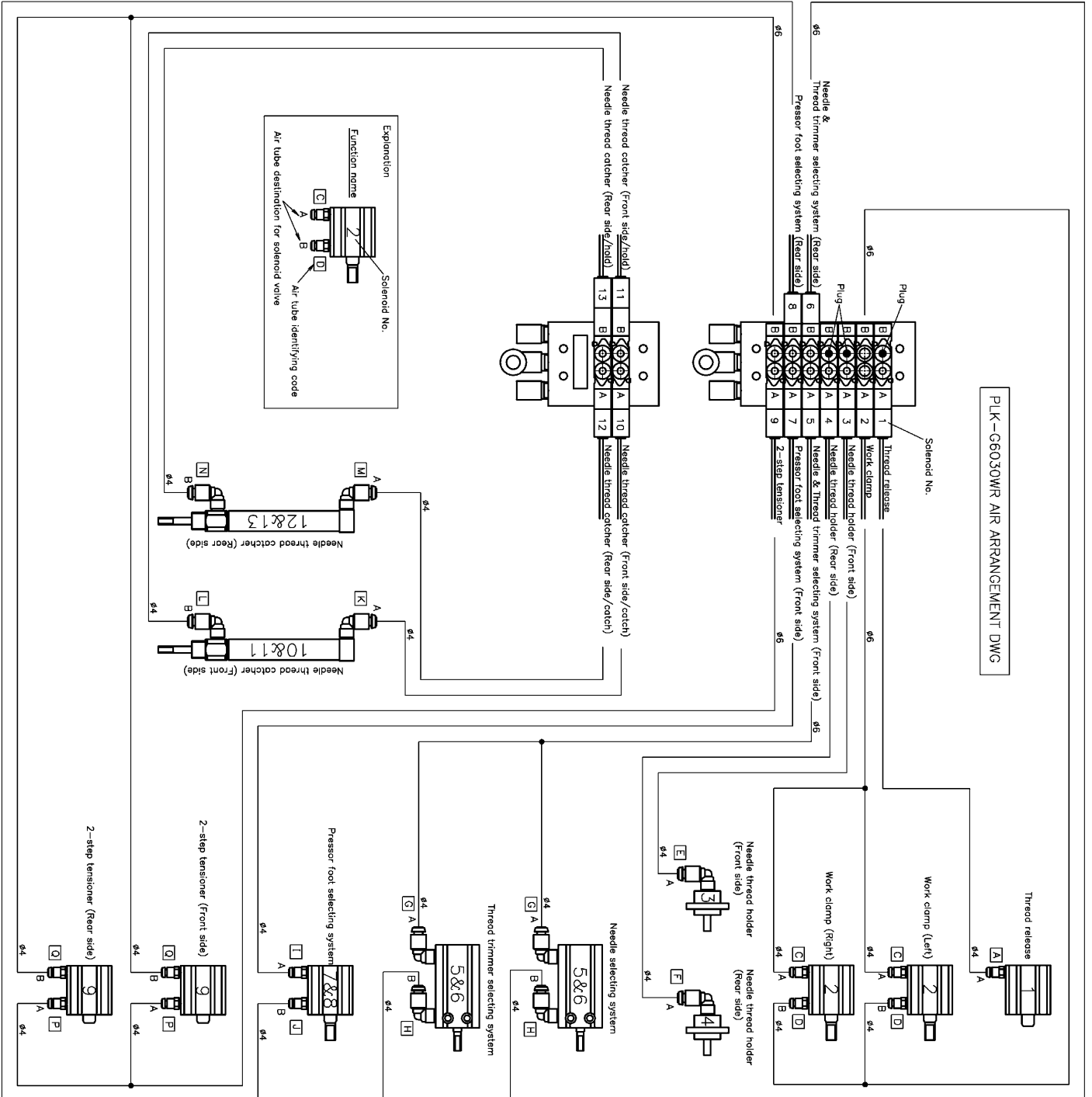
Condition	Cause	Corrective action	Reference
Needle thread is broken.	Needle thread tension is too tight.	Adjust thread tension.	7-2
	Strength of thread take up spring is inappropriate.	Adjust thread take up spring.	7-4
	Parts on needle plate, hook, thread guide, and presser foot touching thread are damaged.	Buff parts or change parts.	-
	The needle size is smaller than the thread size.	Change the needle size to suitable size.	5-2
	Thread melts with heat.	Slow down the sewing speed	6-1
		Use needle cooler.	-
Bobbin thread is broken.	Bobbin thread tension is too tight.	Adjust thread tension.	7-1
	Parts on needle plate and presser foot touching thread are damaged.	Buff parts or change parts.	-
	Bobbin case size is smaller than the thread size.	Change the thread size to suitable size.	
Needle thread is pulled from needle hole when starting sewing.	Needle thread catcher function is off.	Use the needle thread catcher function.	Operation panel section
	Thread take up spring tension is too much.	Adjust thread take up spring tension.	7-4
Needle thread tail is too long.	Needle thread release timing is late.	Change the needle thread release timing faster or using needle thread holder.	6-4-7 6-5-1

Frequent skip stitching happens.	Clearance between needle and rotating hook is too big.	Adjust clearance between needle and rotating hook properly.	7-5
	Timing of needle and rotating hook is not proper.	Adjust position of needle and rotating hook properly.	7-5
	Needle is bent.	Change needle.	5-2
	Needle is at wrong position.	Fix position properly.	5-2
	Presser foot position is not proper.	Adjust presser foot position.	7-20
	Presser foot up and down timing is not proper.	Adjust presser foot up and down properly.	7-17
Trimming is not functioned.	Fixed knife is dull.	Sharpen fixed knife or change fixed knife.	-
	Movable knife is at wrong position.	Adjust position of movable knife properly.	7-23-2
	Skip stitching happens in trimming.	Refer to the condition "Frequent skip stitching happens".	-
	Trimming setting is off.	Turn trimming setting on.	Operation panel section
Needle thread is pulled from needle hole after trimming	Thread release timing is not proper.	Adjust the thread release timing.	Operation panel section
	Thread tension disc is not open enough.	Adjust the thread tensioner position.	7-3
	Threading way of the needle thread is not proper.	Thread the needle thread properly.	5-3
	Pre-tensioner spring is too tight.	Adjust the intensity of the pre-tensioner spring.	7-2
Stitch forming is loose.	Needle thread tension is too loose.	Adjust needle thread tension.	7-2
	Bobbin thread tension is too loose.	Adjust bobbin thread tension.	7-1
	Strength of thread take up spring is inadequate.	Adjust strength of thread take up spring.	7-4
	Presser foot position is not proper.	Adjust presser foot position properly.	7-18, 7-19, 7-20
	Presser foot up and down timing is not proper.	Adjust presser foot up and down properly.	7-17
	Sewing material is not holding enough.	Hold the sewing material not to moving.	-

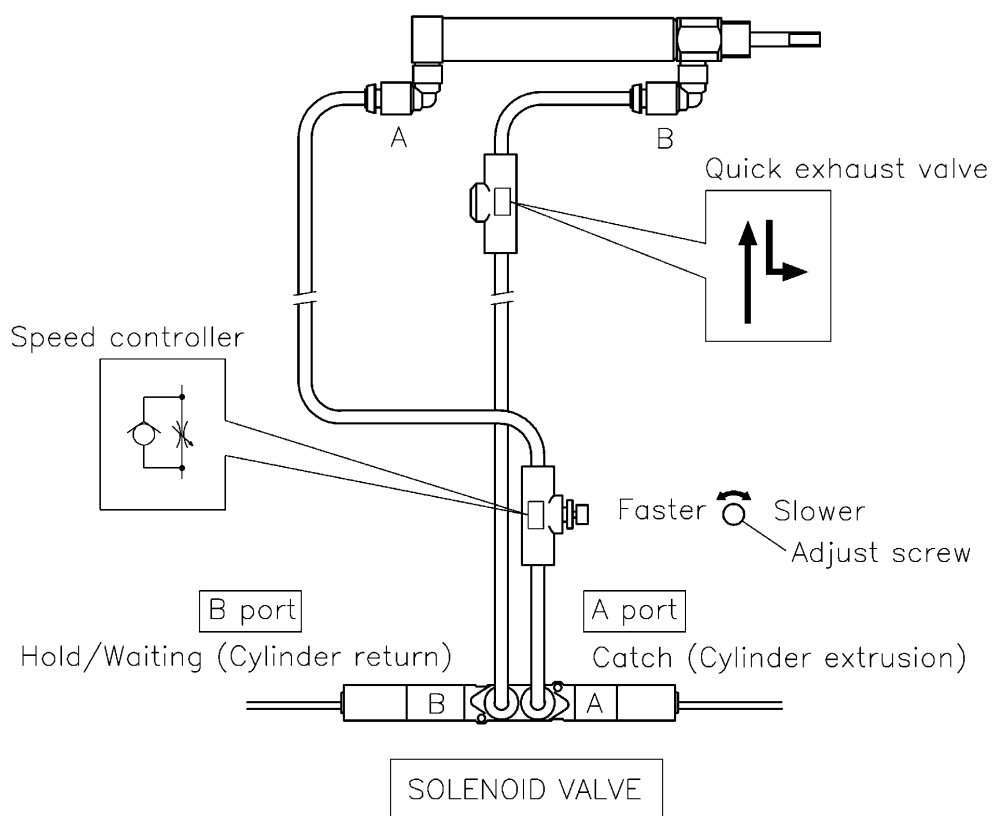
Work holder does not fall.	Foot switch is broken.	Change foot switch.	-
	Work holder presser is not strong enough.	Increase work holder presser.	7-27
	Work holder switch is out of order.	Change it new work holder switch.	-
Needle thread catcher system does not work or cannot holding the thread	Needle thread catcher contacts needle or presser foot.	Needle bar reverse lifting function is OFF.	6-4-5
	Slow in acting.	Put some grease.	8-1
	Needle thread catcher position is incorrect.	Adjust the needle thread catcher position properly.	6-4-5
	Needle thread catcher function is not proper.	Adjust the intensity of ball plunger stopper.	6-4-5
	Needle thread catcher setting is turned off.	Turn needle thread catcher setting on.	Operation panel section
	Air presser is not enough.	Increase air presser.	7-27
	Needle thread is not trimming.	Refer to the condition "Trimming is not functioned".	-
	Needle thread is pulled from needle hole after trimming.	Refer to the condition "Needle thread is pulled from needle hole after trimming".	-
Pressor foot turning system does not work or presser foot movement is not proper	The parts are broken or bending by collision.	Change the new parts.	-
	The parts are largely loosened.	Confirm the assembling conditions.	8-2
	Pressor foot contacts with needle.	Adjust the pressor foot turning position.	7-16
	Air presser is not enough.	Increase air presser.	7-27
The needle changing function is not work	Adjustment of the needle selecting system is not correct.	Adjust the needle selecting system properly.	7-12
	Needle bar unit is consumed.	Change the needle bar unit by new one.	7-14
	Adjustment of the needle bar holder position is not correct.	Adjust the needle bar holder position properly.	7-15
	Air presser is not enough.	Increase air presser.	7-27

Sewing pattern is changed.	Sewing material is not pressed properly.	Adjust work holder pressure.	7-27
	Sewing material in work clamp slips.	Put slip stopper on presser plate.	-
	Sewing material is too heavy.	Slow down sewing speed.	6-1
	X-Y timing belt tension is loose.	Adjust X-Y belt tension properly.	7-33
Returned home position is changed.	Ambient temperature is out of use range.	Use sewing machine in ambient temperature in 5 degrees to 35 degrees.	-
	Clearance between detector and detecting subject is too wide.	Adjust clearance in 1 to 1.5mm.	7-32

PLK-C6030WR AIR ARRANGEMENT DWG



Needle THREAD CATCHER AIR ARRANGEMENT DWG



NOTE

1. Please connect the quick exhaust valve according to above drawing.
2. Please connect the speed controller according to above drawing.
Cylinder returning speed can be controlled when adjust the speed controller.
3. Decreasing the cylinder extrusion speed is discouraged. In this case thread release function is slow to react.

OUTPUT

INPUT

I CON10 5195-02BU(MOLEX)

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
1	Black	5194TL	O1	T	Trimmer	SOL
2	Red	5194TL	24V			

L CON12 5196-02BU(MOLEX)

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
1	Black	5194TL	O3	L	Thread release	SOL1
2	Red	5194TL	24V			

FU CON13 5197-02(MOLEX)

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
1	Black	5194TL	O4	OF1	Work clamp	SOL2
2	Red	5194TL	24V			

ES CON6 171822-4(AAMP)

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
1	White	170204-1	GND	STP	Halt switch	Halt switch
2	Green	170204-1	12V			
3	Red	170204-1		SSW		
4	Black	170204-1	O6			

CONM CONM 770107-1(AAMP)

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
1	Black	770147-1	O8	FN6	Front needle select	SOL5
2	Red	770147-1	24V			
3	Black	770147-1	O9	FN7	Rear needle select	SOL6
4	Black	770147-1	O4	FN8	Pressor hoot front select	SOL7
5	Red	770147-1	24V	FN7	Rear needle select	SOL6
6	Black	770147-1	O8	FN9	Pressor hoot rear select	SOL8
7	Red	770147-1	24V	FN8	Pressor hoot front select	SOL7
8	Red	770147-1	24V	FN9	Pressor hoot rear select	SOL8
9	Red	770147-1	24V	FN9	Pressor hoot rear select	SOL8
10	Black	770147-1	OC	FN9	Upper thread holder front	SOL3
11	Red	770147-1	24V	FNF	Upper thread holder Rear	SOL4
12	Black	770147-1	OE			
13	Black	770147-1	OD	FN1	Two stage tensioner	SOL9
14	Red	770147-1	24V			
15	--	--	OF	--	--	--

S6 CON7 171822-3(AAMP)

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
1	Brown	170204-1	12V			
2	Black	170204-1	I3	L_9	Needle selecting sensor	SEN1
3	Blue	170204-1	GND			

CONL CONL 770102-1(AAMP)

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
1	Black	770147-1	I8	IFA	Manual needle select switch	SW1
2	Red	770147-1	GND	WC	Manual thread release switch	SW2
3	White	770147-1	I9	WC	Manual thread release switch	SW2
4	White	770147-1	IA	HFS	Hook saddle cover opening detector	SW3
5	Green	770147-1	GND	WC	Manual thread release switch	SW2
6	--	(770147-1)	IB	--	--	--
7	--	--	IC	--	--	--
8	Black	770147-1	GND	HES	Hook saddle cover opening detector	SW3
9	--	--	ID	--	--	--
10	--	--	IE	--	--	--
11	--	(770147-1)	GND	--	--	--
12	--	--	IF	--	--	--

F5W CON9 2-171822-3(AAMP)

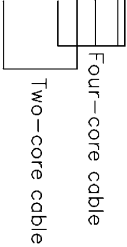
Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
1	Brown	170204-1	12V			
2	Black	170204-1	I7	L_A	Pressor hoot select sensor	SEN2
3	Blue	170204-1	GND			

TE2 TE2 Expanded I/O port

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
C1	--	Terminal	G	--	--	--
C2	Yellow	INS-S0-JANSI 1.25-31A	II	--	Upper thread catcher for front sensor	SEN3
C3	White	INS-S0-JANSI 1.25-31A	II	--	Upper thread catcher for rear sensor	SEN4
C4	--	--	IJ	--	--	--
C5	--	--	IK	--	--	--
C6	--	--	IL	--	--	--
C7	--	--	IM	--	--	--
C8	--	--	IN	--	--	--
C9	--	--	IO	--	--	--
C10	--	--	IP	--	--	--
D1	--	--	DA1	--	--	--
D2	Black	--	DA2	--	--	--
D3	Black	--	GND	--	Upper thread catcher for front sensor	SEN3
D4	Green	--	GND	--	Upper thread catcher for rear sensor	SEN4
D5	--	--	GND	--	--	--
D6	--	--	GND	--	--	--
D7	--	--	GND	--	--	--
D8	--	--	GND	--	--	--
D9	--	--	IO	--	--	--
D10	--	--	IR	--	--	--

TE1 TE1 Expanded I/O port

Pin No.	Wire lead color	Terminal	Signal	Function	Function name	Destination
A1	Black	INS-S0-JANSI 1.25-31A	OG	FNA	Upper thread catcher for front extrusion	SOL10
A2	Black	INS-S0-JANSI 1.25-31A	OH	FNB	Upper thread catcher for front pull	SOL11
A3	Black	INS-S0-JANSI 1.25-31A	OJ	FNC	Upper thread catcher for rear extrusion	SOL12
A4	Black	INS-S0-JANSI 1.25-31A	OJ	FND	Upper thread catcher for rear pull	SOL13
A5	--	--	OK	--	--	--
A6	--	--	OL	--	--	--
A7	--	--	OM	--	--	--
A8	--	--	ON	--	--	--
A9	--	--	OO	--	--	--
A10	--	--	OP	--	--	--
B1	Red	INS-S0-JANSI 1.25-31A	24V	FNA	Upper thread catcher for front extrusion	SOL10
B2	Red	INS-S0-JANSI 1.25-31A	24V	FNB	Upper thread catcher for front pull	SOL11
B3	Red	INS-S0-JANSI 1.25-31A	24V	FNC	Upper thread catcher for rear extrusion	SOL12
B4	Red	INS-S0-JANSI 1.25-31A	24V	FND	Upper thread catcher for rear pull	SOL13
B5	Red	INS-S0-JANSI 1.25-31A	24V	--	Upper thread catcher for front sensor	SEN3
B6	Brown	INS-S0-JANSI 1.25-31A	24V	--	Upper thread catcher for rear sensor	SEN4
B7	--	--	24V	--	--	--
B8	--	--	24V	--	--	--
B9	--	--	OQ	--	--	--
B10	--	--	OR	--	--	--



TECHNICAL MANUAL

Pneumatic 2-Step Tensioner

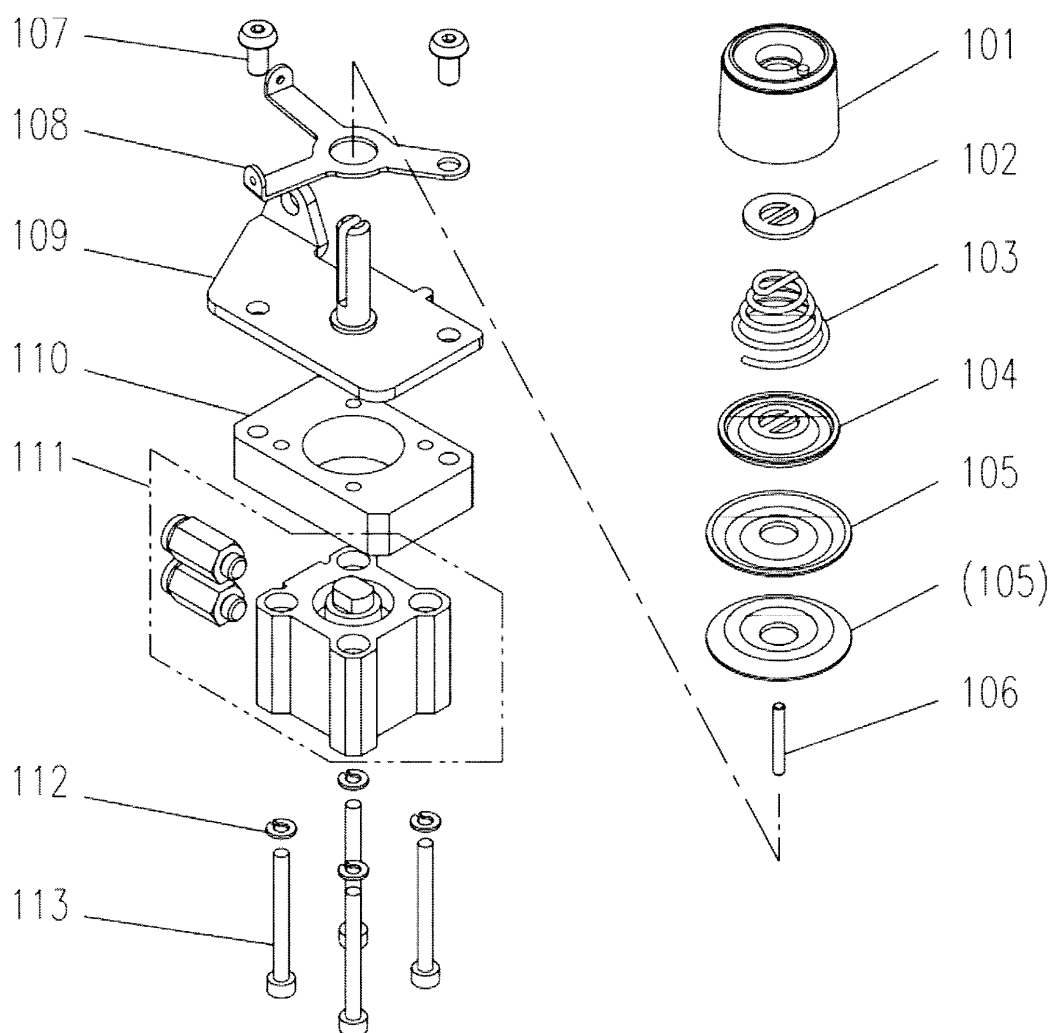
1. Features

It allows you to load in two stages the tension of the upper thread. Differences in the thread tension, caused by changes in the stitching direction or thickness, are eliminated.

2. Specifications

Cylinder stroke		: 5mm
Control power supply		: DC24V
Drive source air pressure	Primary side	: 0.5 MPa (5 kgf/cm ²) or more
	Secondary side	: 0.4 MPa (4 kgf/cm ²)

3. Pneumatic 2-step tensioner mechanism



3.1 Pneumatic 2-step tensioner mechanism (Parts list)

Fig No.	部品コード Parts No.	品名	Description	数量 Amt. Req.
101	M91610046	ツマミネジ	Thumb nut	1
102	MT60A0802	マワリ止め	Thumb nut revolution stopper	1
103	MN52A1245	エンスイバネ	Thread tension spring	1
104	MH40A0556	チョウシザラオサエ	Disc retaining plate	1
105	MF10A0555	チョウシザラ	Thread tension discs	2
106	M90235060	ピン	Pin	1
107	M94036021	ロッククアナツキホルト M4X10	Screw M4X10	2
108	MH10W0181	イトアンナイ	Thread guide	1
109	ME10T0175	チョウセツキトリツケイタ	Bracket	1
110	ME10T0476	スペーサ	Spacer	1
111	ME10T0434	ウスカシリンダ	Air cylinder	1
112	M90307053	ハネサガネ 3	Washer 3	4
113	M93008021	ロッククアナツキホルト M3X30	Screw M3X30	4

4. Operation



CAUTION

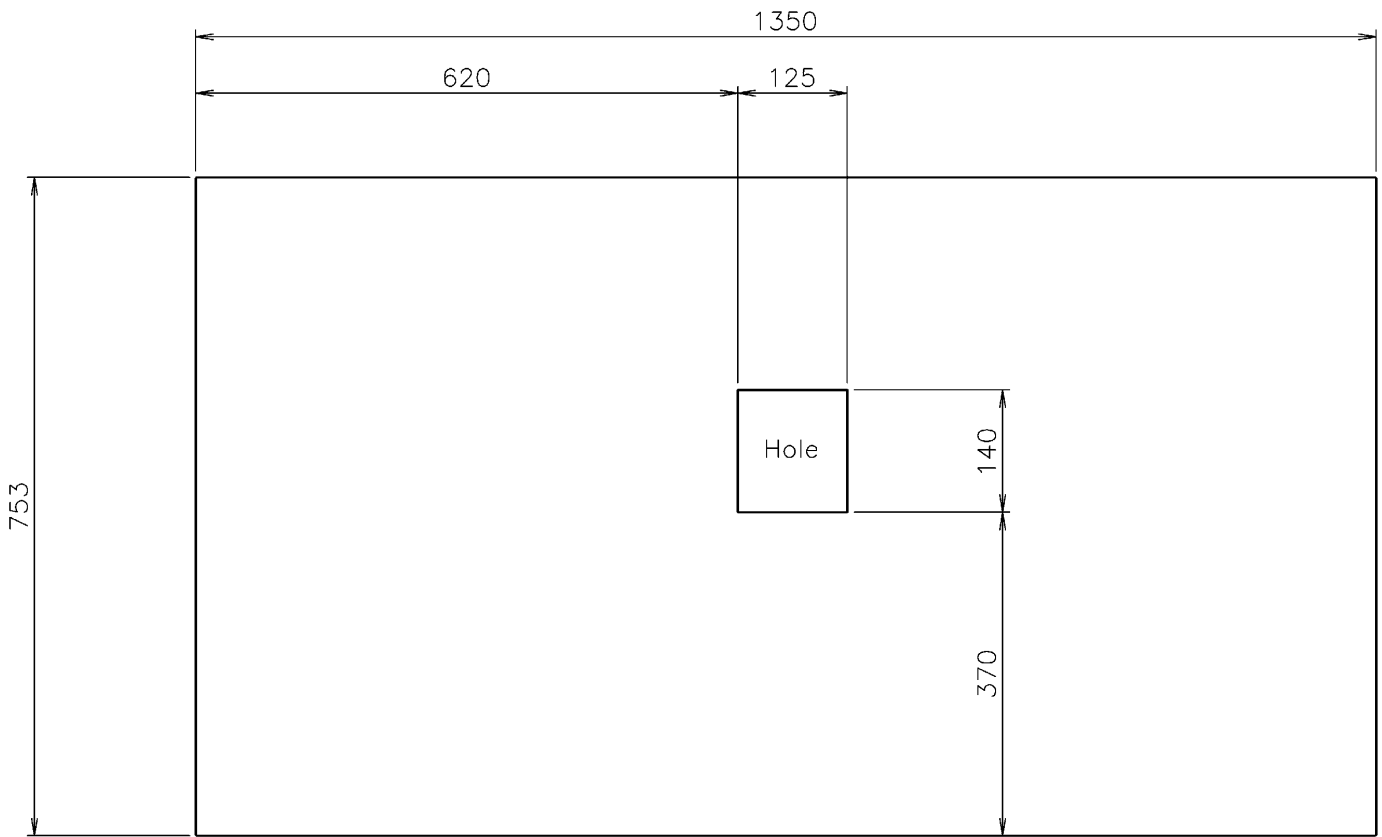
Assembly of this device is completed, please check your work once again.

Because there is a case to unexpected behavior, please away from the sewing machine when the power is turned on and the air pressure.

- (1) Pull up on the handle of the filter regulator, adjust to 0.4MPa(4kgf/cm²) air pressure by turning in a clockwise direction.
- (2) Pneumatic 2-Step Tensioner will work with to input code "FUN1" in the pattern.

For details, refer to the clause of the technical manual "Operation Panel".

PREPARING THE PROTECTIVE SHEET



NOTE The protective sheet is included with sewing machine, however this is not have any opening for maintenance or bobbin change. Please refer to above sample drawing and make a hole by customer side.

MEMO

A large rectangular area with a solid border, containing numerous horizontal dashed lines for writing.

MEMO

A large rectangular area with a solid border, containing numerous horizontal dashed lines for writing.

MITSUBISHI ELECTRIC CORPORATION

Printed in Japan

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