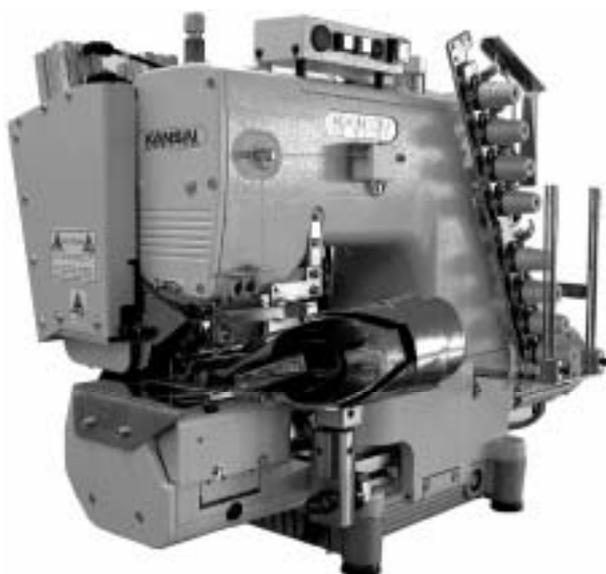


INSTRUCTION

FBX SERIES

Industrial Sewing Machines

FBX-PA-2AC



Third edition : April 2006

No. 060058

KANSAI
SPECIAL[®]

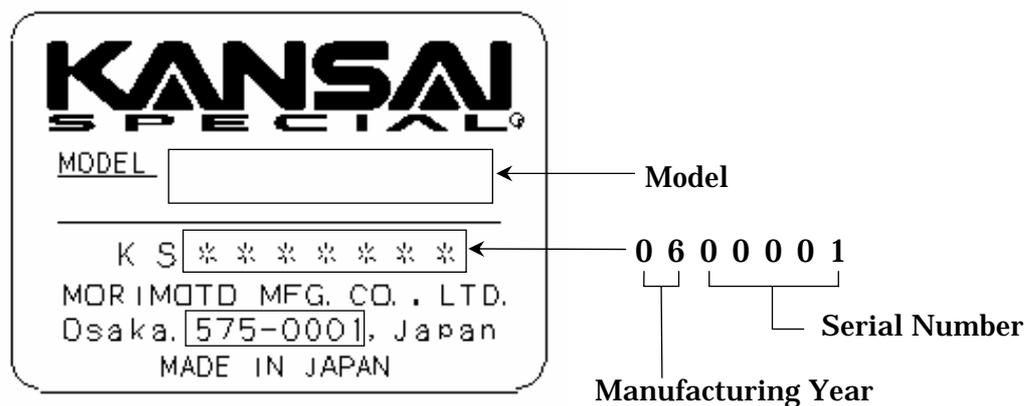
INTRODUCTION

Thank you very much for purchasing Kansai Special FBX series.

Read and study this Instruction Manual carefully before you start any of the procedure and save it for later use.

1. This Instruction Manual is for adjustments and maintenance procedures on only Kansai Special FBX machine.
2. Check if pulley cover and safety cover, etc. are all securely set before you start the machine.
3. Be sure to turn off the power in the time of adjusting, cleaning, threading the machine, and replacing needles.
4. Never start the machine without oil in the reservoir.
5. Refer to the parts list as well as Instruction Manual before preventive maintenance.
6. The contents here are subject to change without notice.

Indication of Serial Number



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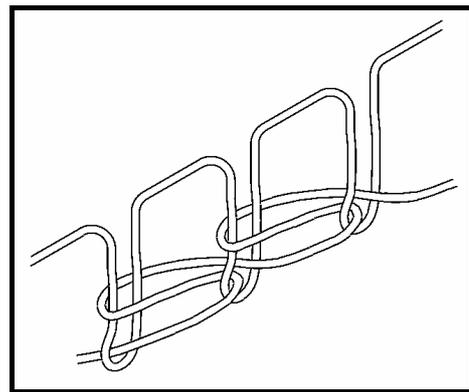
【1】 SPECIFICATIONS

1-1 Stitch Type

JIS401 double chain stitch machine

1-2 Model

Model	FBX1102PA-2WAC
No. of needle	2 needles
No. of threads	4 needle threads
	4 looper threads
Type of tension set	Mounted Type
Min. gauge width	25.4mm
Max. gauge width	38.1mm



1-3 Specification

PA-2AC is automation machine for attaching waistband only.

The machine includes the below extra features;

- Feeding pullers driven by pulse motor
- Waistband cutting knife
- Automatic skip stitch device

Motors driven by pulse motors

Both Front puller (1st puller) and Back puller (2nd puller) are driven by pulse motor, whose timing of feeding is synchronized with the one of feed dog on machine head.

Waistband cutting knife

Fabric edge of starting and ending are cut by cutting knife operated by pneumatic cylinder. Two sensors (Front and Back) are equipped on the machine, cutting knife is operated by the signal of those sensors. Machine speed is reduced to certain speed at the time of cutting process on both starting edge and ending edge.

Automatic skip stitch device

Auto skip device can be operated at the starting and ending point of waistband. It is pneumatic device operated by signal of front and back sensors as well as cutting knife.

1-4 Motor and Power

Direct motor is used for this machine. Its voltage of power supply is only AC220V.

< Specification >

Power source : AC220V

【2】 NEEDLES AND THREADING

2-1 Needles

DV × 57 of Schmetz or Organ

Select the proper needle for the fabric and thread.
(Standard #21)

< Needles and needle size >

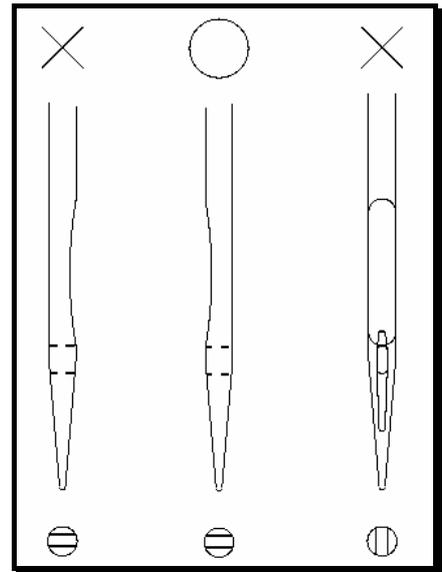
Schmetz DV × 57	Nm90~Nm200
Organ DV × 57	#14~#25

2-2 Replacing needles

When replacing the needle, check the needle carefully to see that the scarf is turned to the left of the machine (see the illustration).

< Note >

When replacing the needle, be sure to turn off the machine. A clutch motor continues running for a while after the machine is turned off. Therefore keep on pressing the pedal until the machine stops.



2-3 Threading

Thread the machine correctly by referring to pages 2 to 3.

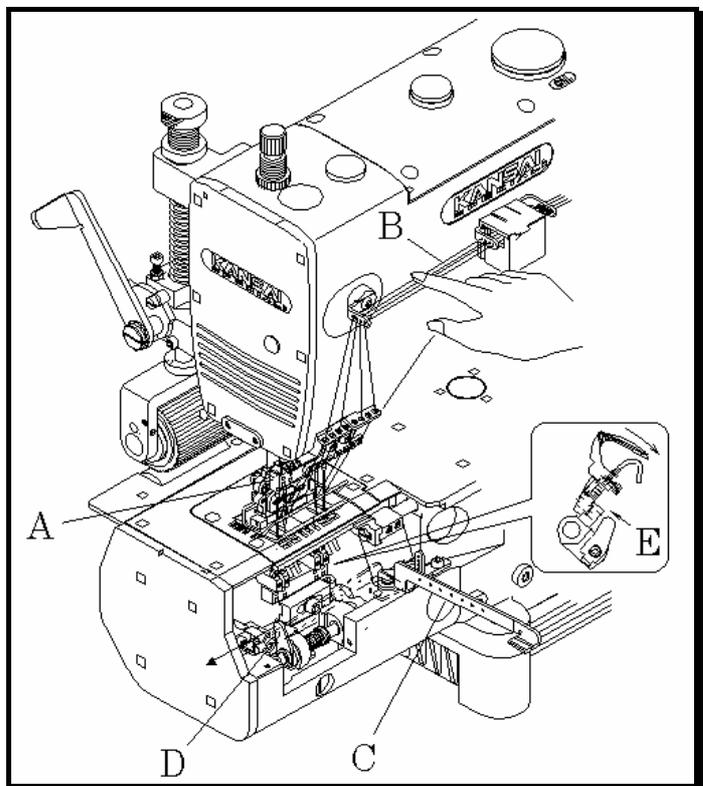
Incorrect threading may cause skip stitching, thread breakage and/or uneven stitch formation. When threading the looper, tilt the looper holder toward the front of the machine using the looper drawing bar.

To tilt the looper toward the front

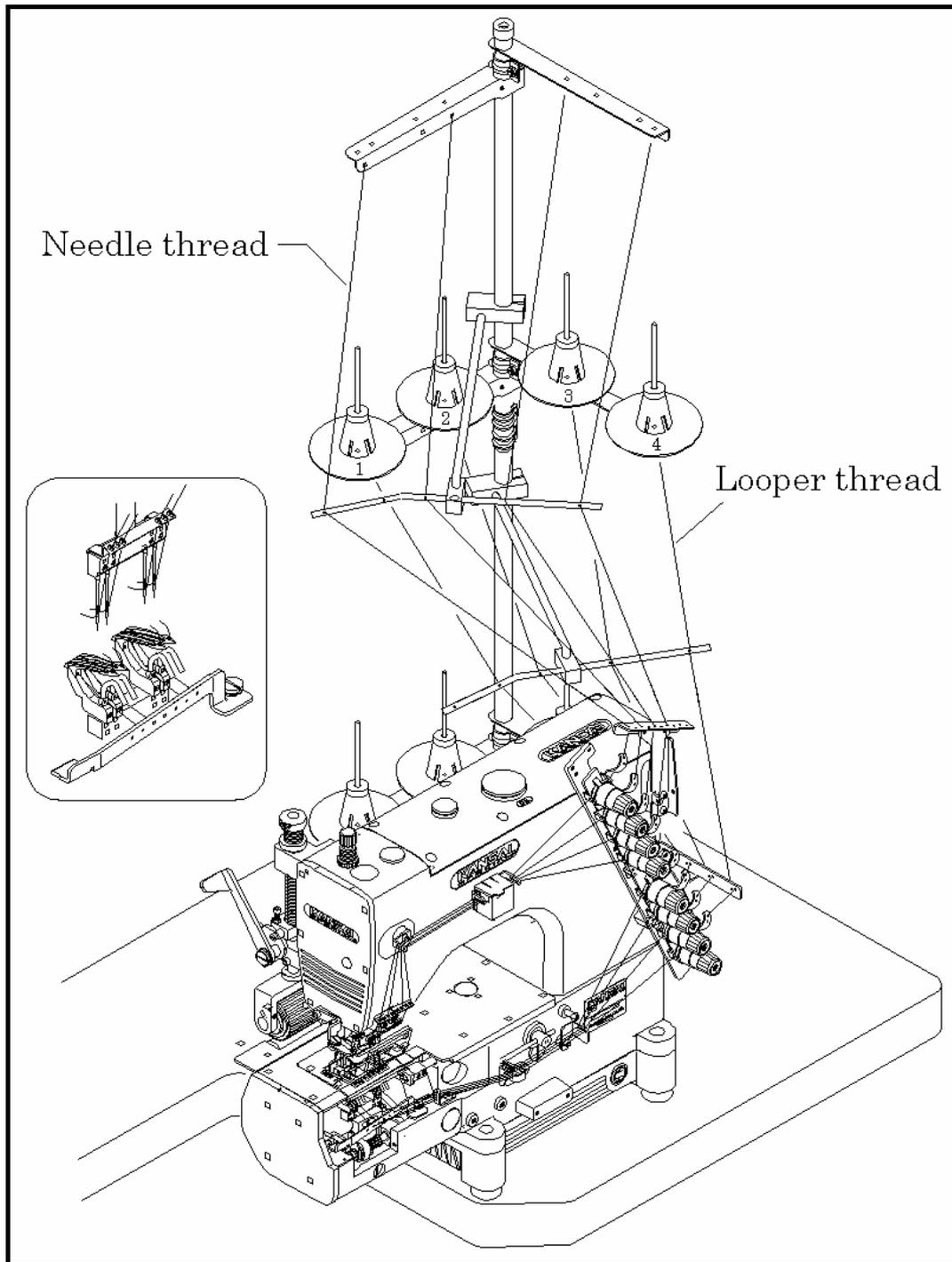
1. Bring needle bar A to the top of its stroke.
2. Pay out the needle thread from the spool by pressing a finger down on needle threads B.
3. Open looper eyelet.
4. Pull drawing lever D out to the arrow mark as shown in the illustration so that the looper holder is tilted toward the front of machine.
5. After the machine is threaded, replace the looper by pressing looper holder E into the machine until it clicks.

< Note >

The looper pops out of the machine as soon as lever D is pulled, so do not bring your fingers close to the looper.



FBX-PA-2AC type



【3】 SEWING SPEED

3-1 Sewing speed and motor direction

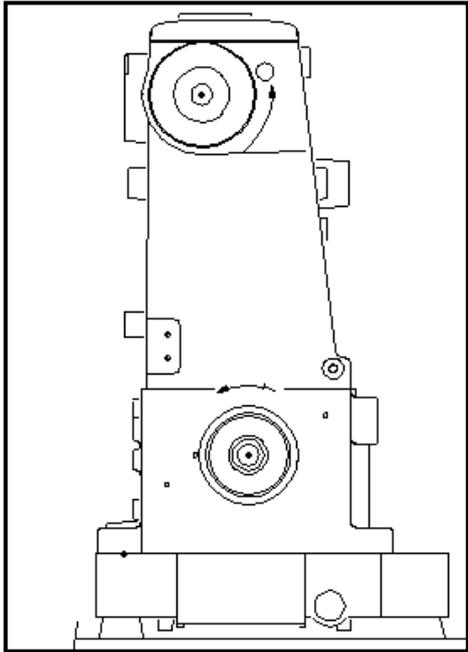
Refer to the table below for maximum and standard speeds of the Series.

To extend machine life, run the machine approximately 15~20% below the maximum speed for the first 200 hours of operation (approx. 1 month). Then run the machine at the standard speed.

The machine pulley turns counterclockwise as seen from the end of the machine pulley.

< Machine speed >

Model	Maximum speed	Standard speed
FBX-PA-2AC	4,000rpm	3,500rpm



【4】 LUBRICATION

4-1 Oil

Use Kansai Special's genuine oil.
(Part No. 28-613:1,000cc)

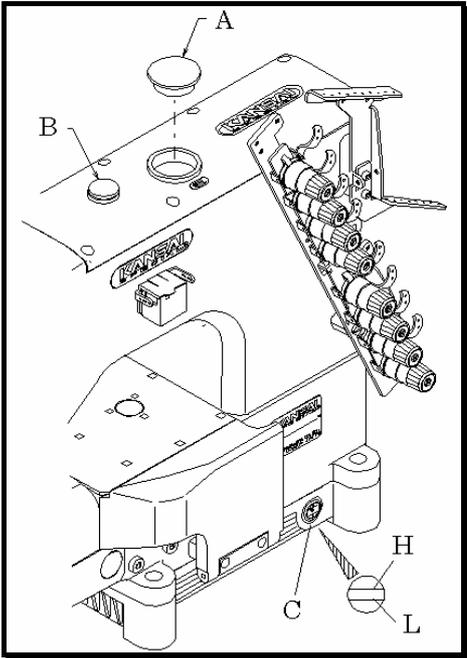
4-2 Lubrication

Remove rubber plug A from the oil hole.

Fill the machine with oil until the oil level is at the top line (see H in the illustration) on oil gauge C.

After the first lubrication, add oil so that the oil level will be between H and L.

After filling the machine with oil, run the machine to check the oil is splashing onto oil pot A.

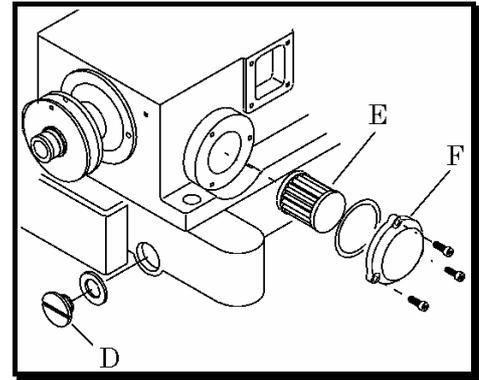


4-3 Replacing oil and oil element

To extend machine life, be sure to replace the oil after the first 250 hours of operation.

To replace the oil, follow the procedures below.

1. Remove the V belt from the motor pulley and then remove the machine from the table.
2. Remove screw D and then drain the oil.
Be careful not to stain V belt with the oil.
3. After draining the oil, be sure to tighten screw D.
4. Fill the machine with oil by referring to 4-2 shown above.



If element E is contaminated, proper oiling may not be performed.

Clean the filter element every six months.

If just a little or no oil flows out from the nozzle with the proper amount of oil in the machine, check the element. To do so, remove oil filter cap F.

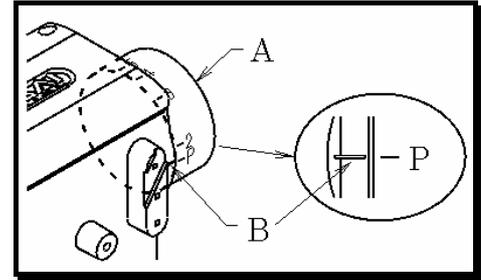
Replace the element if necessary.

< Note >

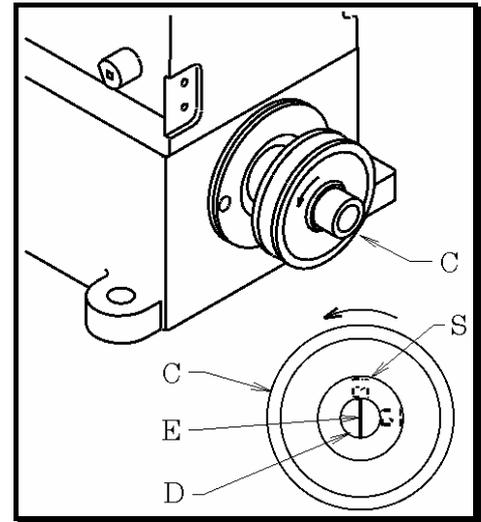
Be careful to oil dropping when oil filter cap is removed. Oil may come out from oil element.

【5】TIMING AND ADJUSTMENT BETWEEN UPPER AND LOWER SHAFT

Turn the hand pulley and align mark B on the hand wheel mark P. The needle bar position would be at the top of its stroke.



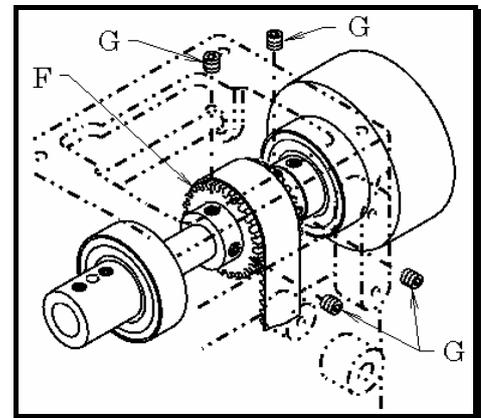
In this case, the line E marked on the lower shaft D should be vertical. And make sure if the first screw S of the turning direction is above the V-belt pulley C or not.



If not, loosen screw G (4pcs) on the timing pulley F of the upper shaft to be adjusted to the above-mentioned position. Make sure of tightening screw G (4pcs) again after adjustment.

< Note >

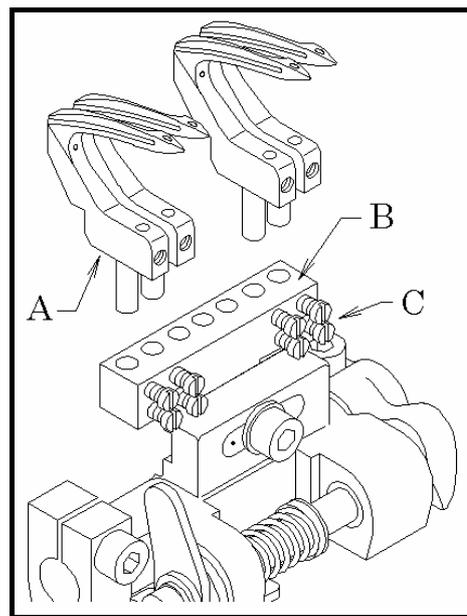
Before adjusting machine, be sure to turn off the motor.



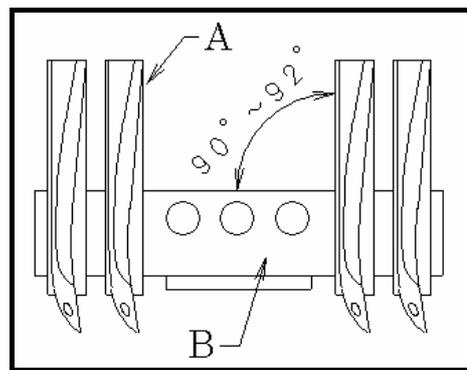
【6】TIMING OF LOOPER AND NEEDLE

6-1 Looper angle and looper holder bracket

Insert the looper into the looper holder until the bottom A of the looper touches to the looper rocker B. Then tighten screw C.

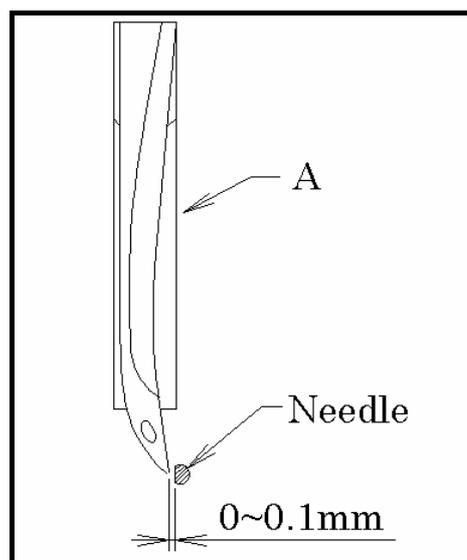


As shown in the illustration, the angle between the looper rocker B and the looper A is 90~92 degrees.



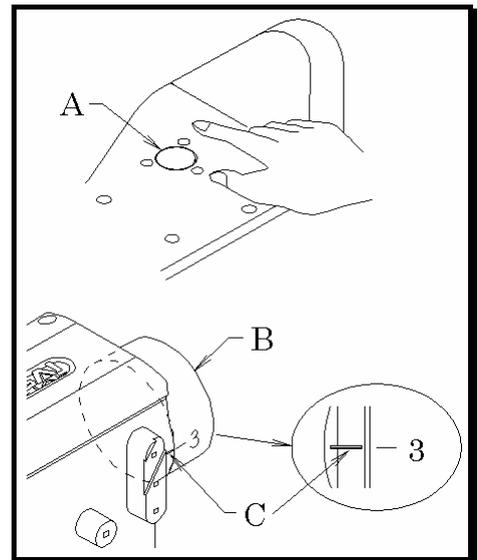
The clearance between the looper and the needle when the point of looper passes the scarf of the needle should be 0~0.1mm. (Adjust by the screw C)

*< Note >
Before adjusting machine, be sure to turn off the motor.*

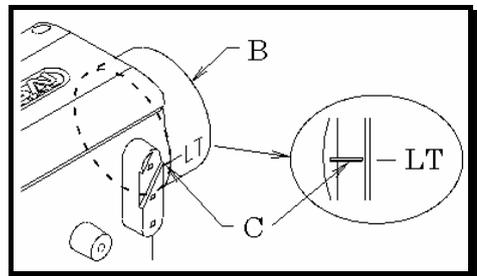


6-2 Timing of looper and needle

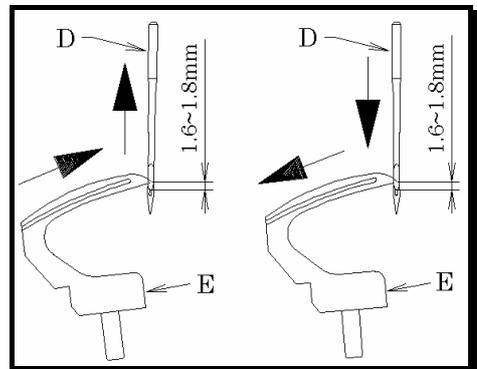
Turn the hand pulley B pressing push button A lightly until the push button touches an inside parts and clicks. And align mark C with the scale no.3 on the hand pulley B. (Refer to 10-4 stitch length adjustment on page no.14.)



Detach your hand from the push button A. Then turn the hand pulley B and align mark C with the scale LT on the hand pulley B.

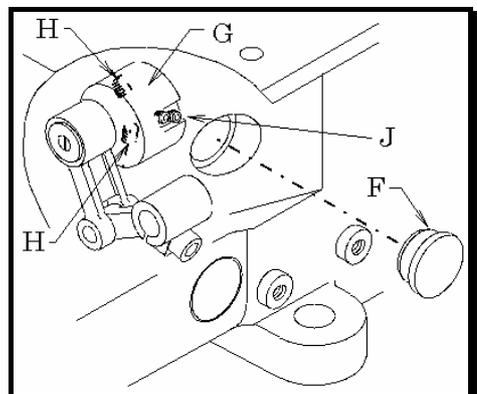


In this case, turn the hand pulley and check that the point of looper is 1.6~1.8mm above the needle eye when the point of looper, moving both to the right and to the left, reach to the center of the needle.



In the beginning, the stitch length would be adjusted to scale no.3. If you need to change it, procedures are as follows. Remove the rubber plug F and loosen screw H (2pcs) in the looper eccentric G to adjust appropriate timing.

Make sure tighten screws H again one by one.

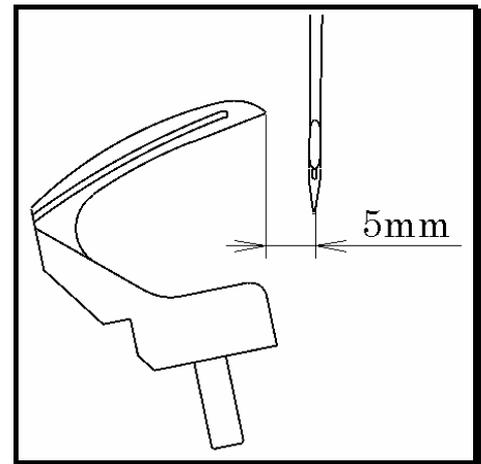


< Note >

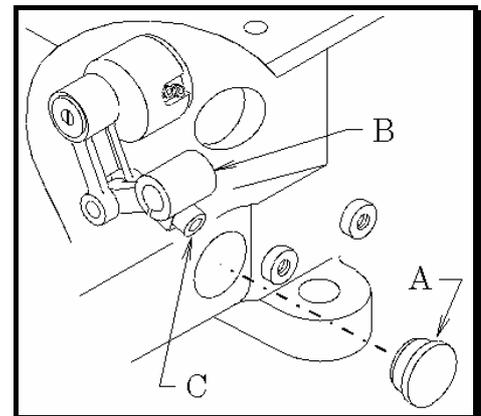
Before adjusting machine, be sure to turn off the motor.

6-3 Looper gauge

When the needle bar is at the bottom of its stroke, there should be a distance of approximately 5mm from the point of the looper to the center of the needle.

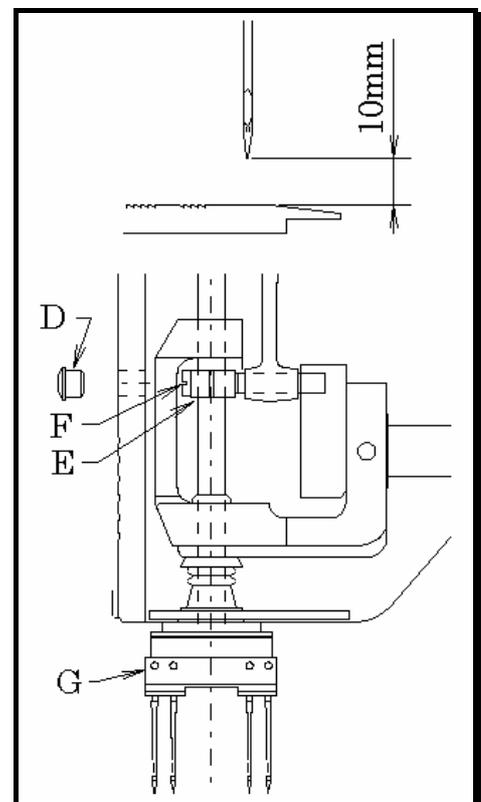


The adjustment for the looper setting distance is made by removing plug A and loosening screw C for the lever B. After adjusting, tighten screw C.



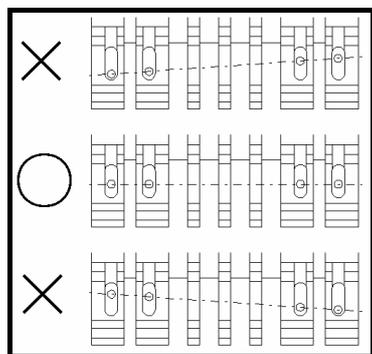
6-4 Needle height

When the needle bar is at the top of its stroke, there should be a distance of approximately 10mm from the top surface of the needle plate to point of the needle. Adjustment is made by loosening screw F of the needle bar bracket E after removing plug D. After the adjustment is made, check to make sure each needle drops correctly into the center of each needle drop hole.



< Note >

Before adjusting machine, be sure to turn off the motor.



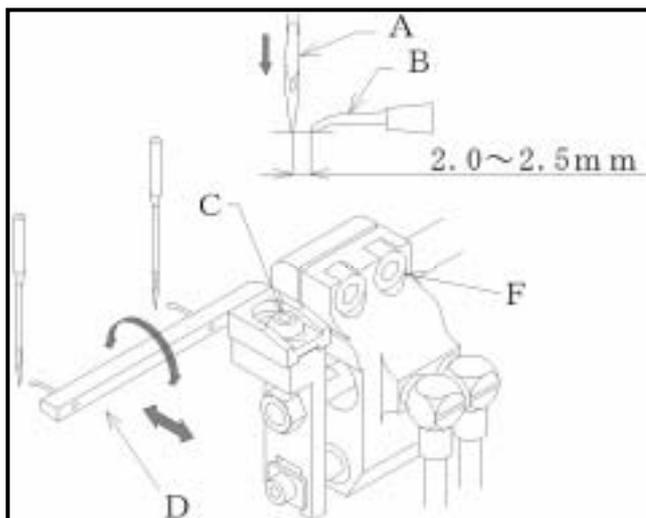
【7】 RETAINER LOOPER

7-1 Front-Back position

Clearance from retainer looper to tip of needle will be 2.0~2.5mm when tip of needle A is on same level as retainer looper D as right drawing shows.

It can be adjusted by loosening screw C to shift retainer looper D to front or back.

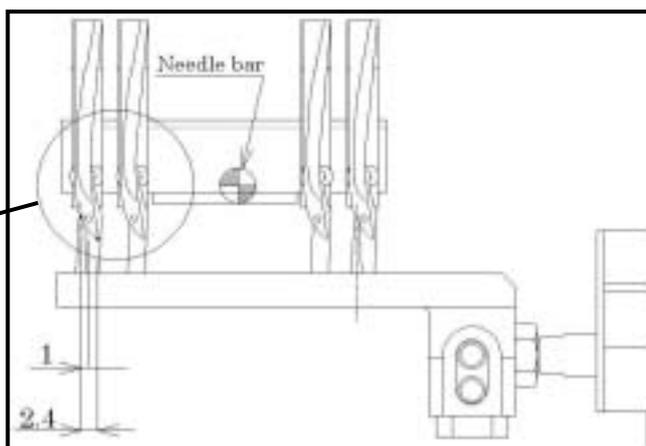
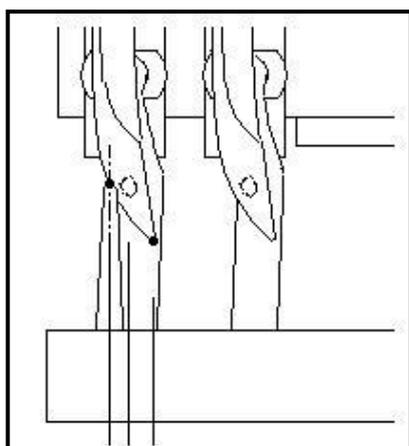
- * Readjustment is necessary when stitch length is largely changed as the clearance is also changed related to stitch length.



7-2 Left-Right position

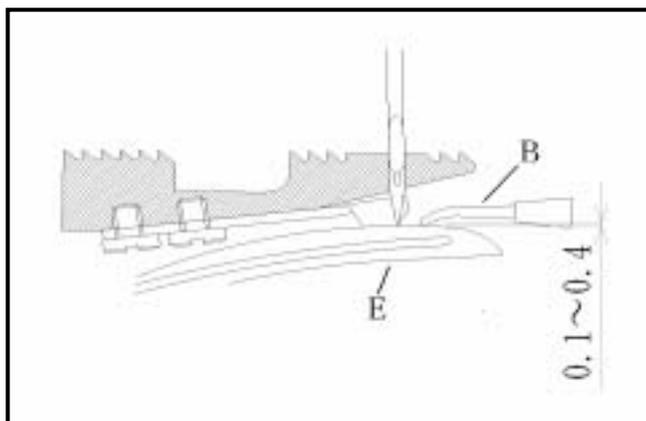
Clearance between tip of looper and tip of retainer looper will be 2.4mm when retainer looper comes to the position as the right drawing shows.

Pull the cylinder (5mm stroke) to left side by hand manually to adjust the above.



7-3 Height of retainer looper

Height is adjusted by moving cylinder manually. As the right drawing shows, clearance of standard adjustment between tip of retainer B and upper surface of looper E is 0.1~0.4mm when tip of retainer B comes closest to upper surface of looper E. Loose screw F (top drawing) to adjust.



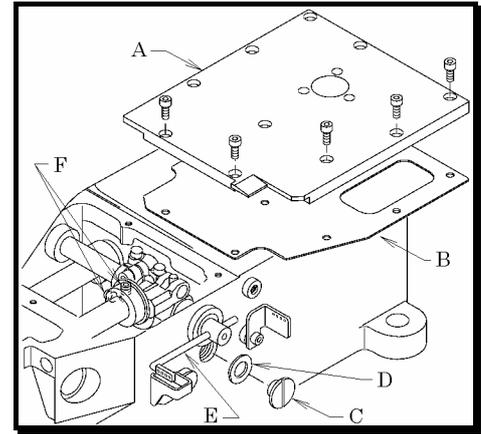
< Note >

Before adjusting machine, be sure to turn off the motor.

7-4 Timing against needle

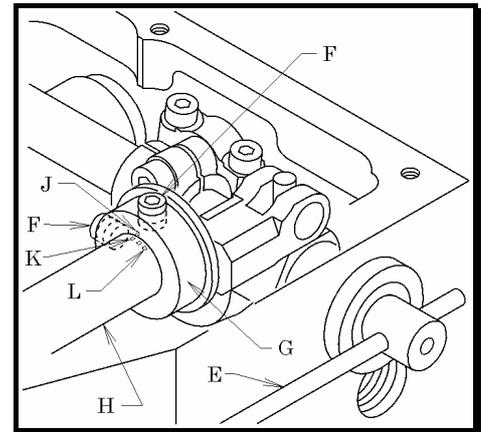
Firstly detach front cover A and gasket B, and also Screw C and oil seal D.

Loose two screws F on retainer looper eccentric G then timing can be adjusted by the eccentric standard. Adjustment is that the marking dot J on the eccentric G is aligned with the dot K on lower shaft H.



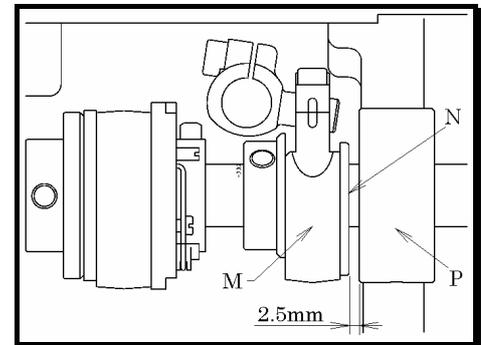
Timing of retainer looper and looper thread take-up will be faster when it is adjusted to the marking dot L on front side of lower shaft.

On the other hand, timing of retainer looper and looper thread take-up will be relatively slower when it is adjusted to the marking dot K.



Fasten two screws F on retainer looper eccentric G after adjustment. Make sure that there should be the gap 2.5mm between lower shaft bush P and end-plate N.

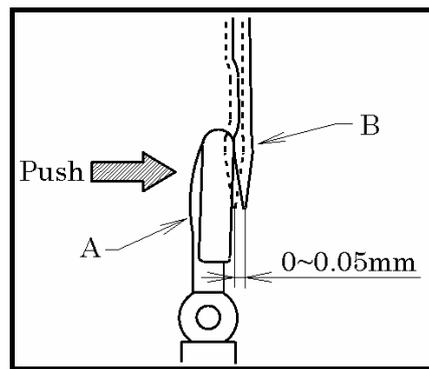
* After this adjustment, recheck front-back position, left-right position, and height of retainer looper. (Refer to last page)



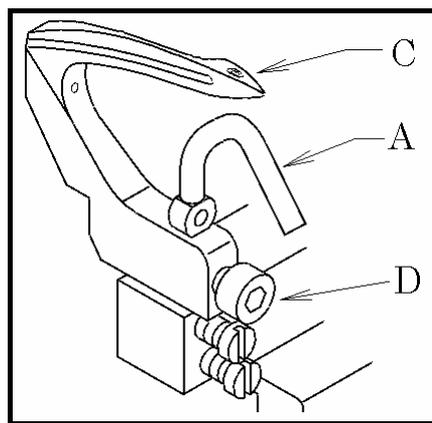
< Note >
Before adjusting machine, be sure to turn off the motor.

【8】 CLEARANCE BETWEEN NEEDLE AND NEEDLE GUARD

Adjustment should be made by pushing of the needle guard A to the needle B at 0~0.05mm.

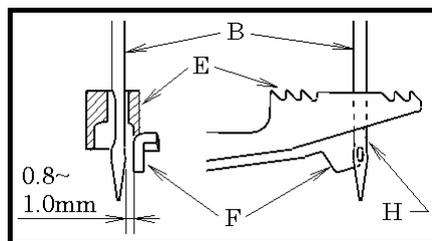


Adjusting by turning of the needle guard A after loosening of the screw D.

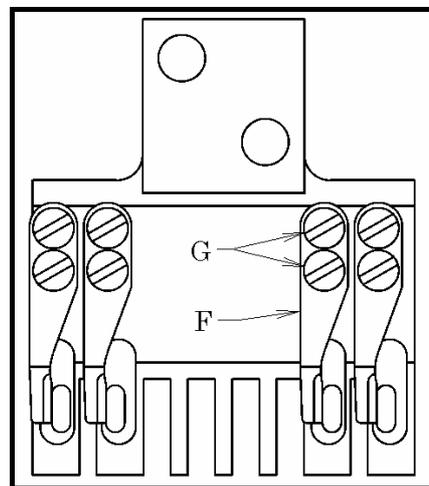


【9】 THREAD RECEIVER

The clearance of left-right direction between the needle B and the thread receiver F of the feed dog E is 0.8~1.0mm. At front-back direction, when the needle B is positioned into the feed dog as fig. by turning of hand pulley, the top edge of the thread receiver F should be aligned to the right side line H of the needle.



Adjusting by loosening of the screw G for the thread receiver F



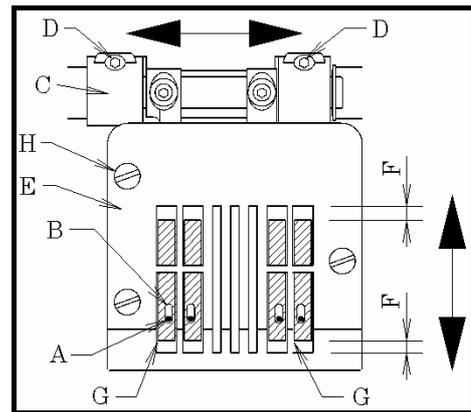
【10】 FEED DOG AND STITCH LENGTH

10-1 Left-Right position of feed dog

Make sure each needles A drops into the center of the needle drop hole B of the feed dog J.

Adjusting at left and right by loosening of the screw D (2 pieces) of the feed rocker C.

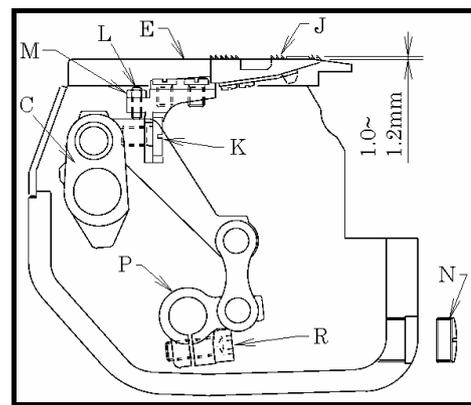
At the same time, adjusting by loosening of the screw H (3 pieces) of the needle plate E, in order to be equal between each clearance G and also to be parallel between the feed dog and the feed grooves of the needle plate E.



10-2 Front-Back position of feed dog

When the feed dog is positioned at both the front dead point and the back dead point by turning of hand pulley, each clearance F at the front and the back between the feed dog and the feed grooves of the Needle plate E is to be equal.

Adjusting at front and back by loosening of the screw D (2 pieces) of the feed rocker C.

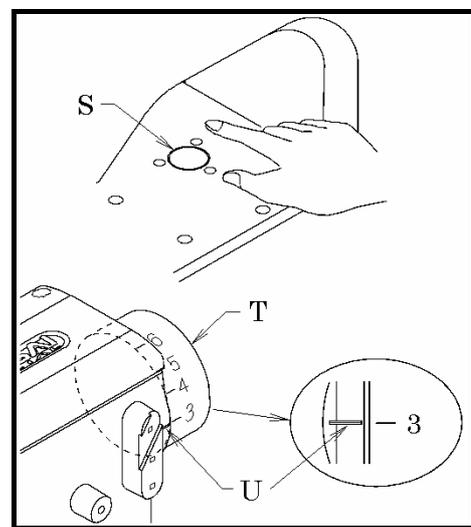


10-3 Height of feed dog

When the feed dog is at the upper dead point, the feed dog J is to be parallel with the top surface of the needle plate E. Its height is 1.0~1.2mm.

Adjusting by loosening of nut M and adjusting screw L of the feed dog J and also the screw K.

After adjusting by up and down of the feed dog J, fasten the screw K. Then, fix the adjusting screw L up by the nut M after slight-touching it to the feed rocker. Tilt adjustment is to be done by loosening of the screw R of the feed up-down lever P after removing of the screw N.



10-4 Stitch length

The stitch length can be adjusted from 2.1 up to 6.4mm without step.

The following table shows the stitch length with the number of stitches within 1" (25.4mm) and 30mm.

Pulley position	stitch length (mm)	No. of stitches	
		within 1"	within 30mm
2	2.1	12	14
3	3.0	8.5	10
4	4.0	6.2	7.5
5	5.0	5.0	6.0
6	6.0	4.2	5.0
L	6.4	4.0	4.5

How to change the stitch length (Fig. : Refer to previous page.)

1. Press push button S lightly with the left hand until the end of push button S touches an inside part.
2. With pressing push button S lightly, turn the hand pulley T by the right hand, until the push button S goes further into the depth.
3. Press the push button S strongly again.
With keeping of this press, turn the hand pulley T in order to meet the number of pulley position to the mark U which can be selected as required.
4. After selecting of the desired stitch length, release the left hand.
5. The machine is adjusted the number 3 of pulley position.
In case of happening the defect after big-changing of the stitch length, adjust again for [6] timing of the looper to the needle, [7] timing of the retainer looper and the looper.

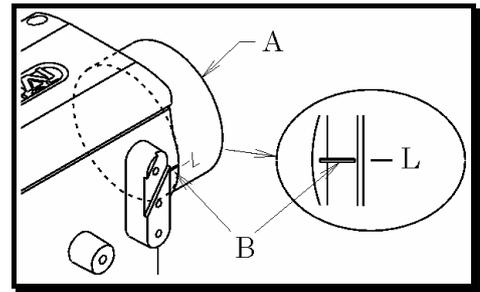
< Note >

Before adjusting machine, be sure to turn off the motor.

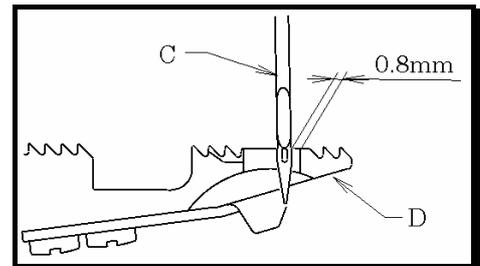
【11】 NEEDLE FEED

11-1 Front-Back position of needle

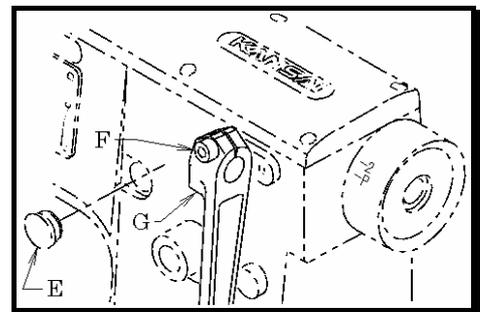
With reference to 10-4. Adjusting of stitch length, align the number L of pulley position to the mark B. Then, the stitch length is maximum.



When the needle C is going down from the top dead point by turning of hand pulley A, align the top end of needle hole of the needle C to the top surface of the feed dog D. The clearance between the needle and the needle drop hole of the feed dog D should be approx. 0.8mm as fig.



Remove the rubber plug E of the machine. Adjust the needle clamp with the moving to front and back after loosening of the screw F of the needle swing lever arm G.



11-2 Amount of needle feed movement

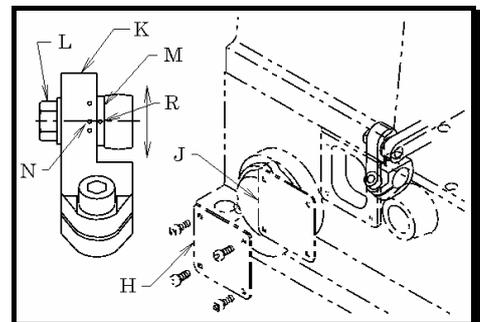
The center mark N of the needle swing lever K should be aligned to the mark R of the needle swing lever pin M as fig. It is a standard setting.

With this setting, the movement amount of the needle is synchronized with the movement amount of the feed. When adjusting of the movement amount of the needle, remove the cover H and the gasket J at the back side of the bed.

Adjust by moving up and down of the needle swing lever pin M after loosening of the nut L.

The needle feeding amount is increased when moving up.

The needle feeding amount is decreased when moving down.



< Note >

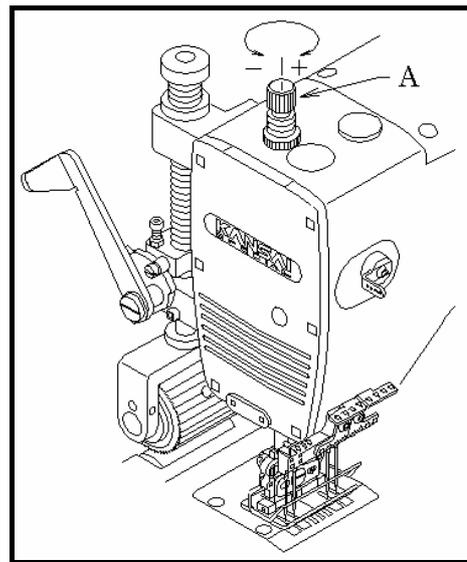
Before adjusting machine, be sure to turn off the motor.

【12】 PRESSER FOOT

12-1 Pressure of presser foot

The presser foot pressure should be as light as possible, yet be sufficient to feed the fabric and produce uniform stitches.

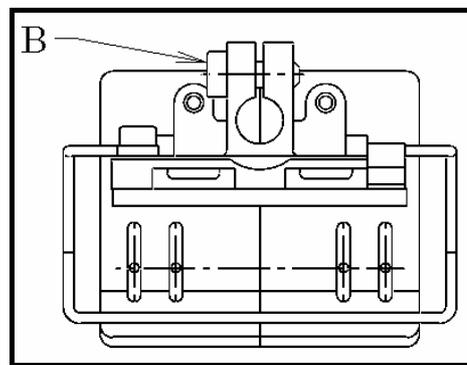
To increase the presser foot pressure, turn the adjusting knob clockwise.



12-2 Position of presser foot

Fit the presser foot onto the presser bar so that the needle can drop correctly to the center of the needle drop hole on the presser foot.

Adjustment is made by loosening screw B.

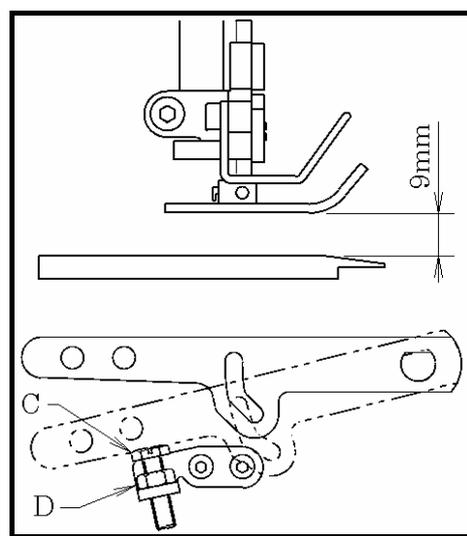


12-3 Foot lift

Position stopper C with the presser foot approximately 9mm above the top surface of the needle plate and then tighten nut D.

< Note >

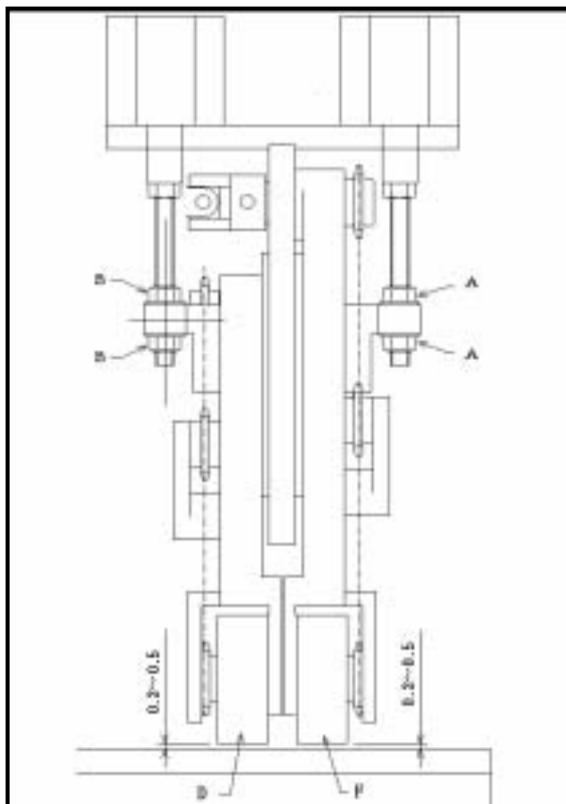
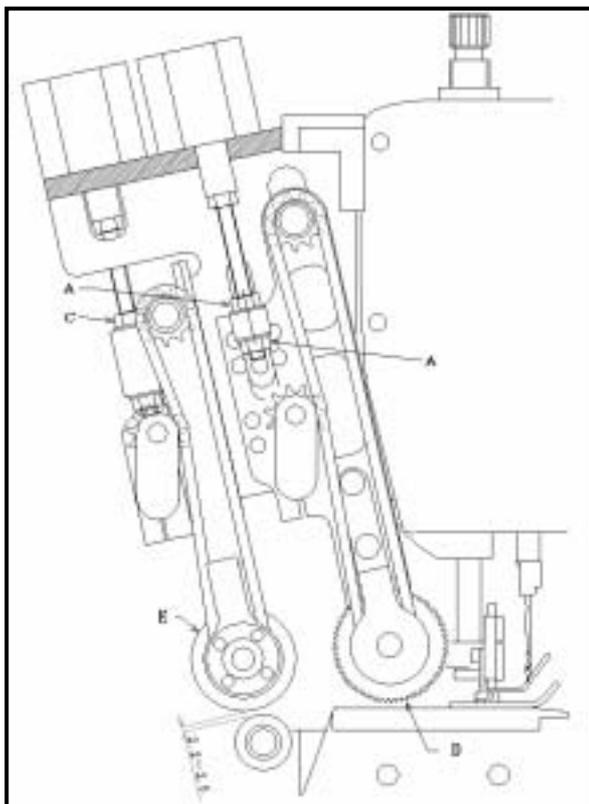
Before adjusting machine, be sure to turn off the motor.



【13】 REAR PULLER

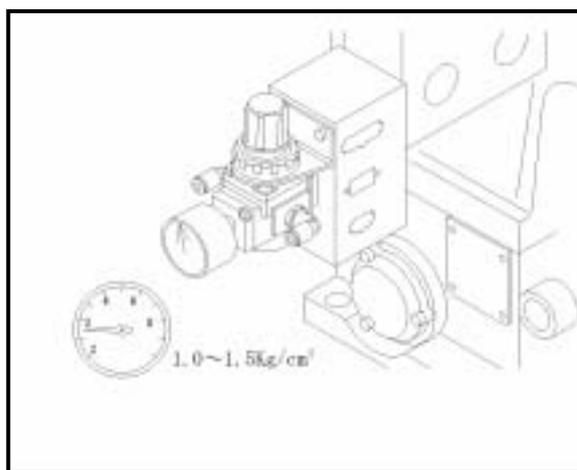
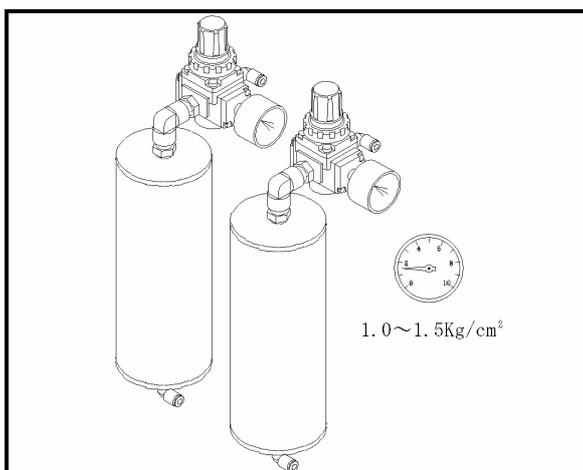
13-1 Height of rear puller

Adjust the height of first puller D (left) and F (right) to make the gap 0.2~0.5mm to the surface of needle plate. Also make the gap 2.2~2.5mm between second puller E and lower puller as left below drawing shows. The above settings are adjusted by bolts A, B and C on the below drawings.



13-2 Puller pressure

Pressure of pullers should be lowest so far as it feeds fabric smoothly.
Adjust pressure of regulator at between 1.0kg/cm and 1.5kg/cm.



13-3 Feeding amount of rear puller

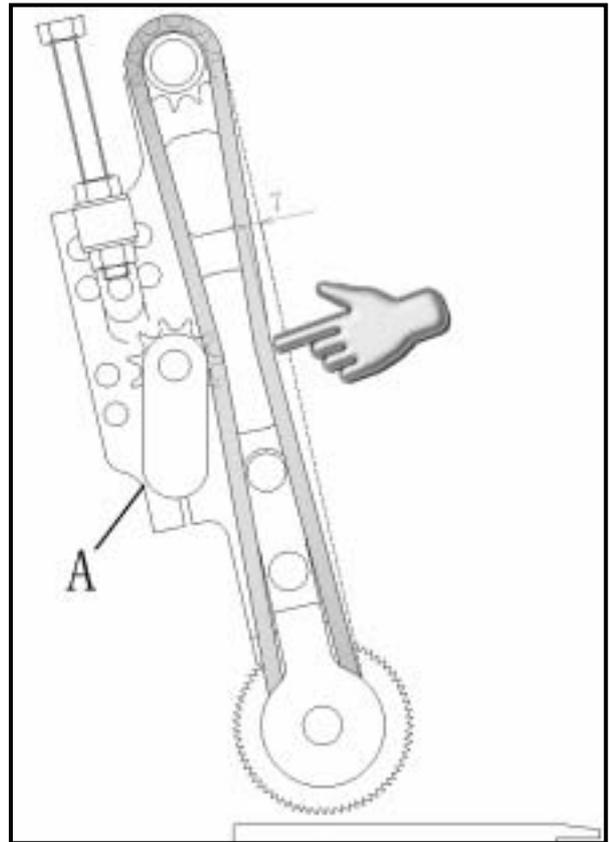
Refer to 19. Programming

13-4 Tension of puller chain

Push the middle of chains by finger to bend 7mm by loosening gear A.

This adjustment is applicable to all the chains on pullers A, B and C.

It may cause motor to rotate unevenly if the chains are tense, bending amount is less than 7mm.



【14】 STITCH FORMATION

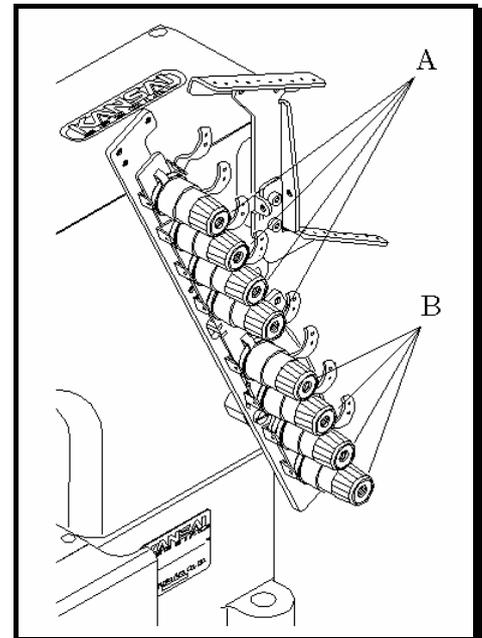
14-1 Thread tension adjustment

Thread tension varies according to sewing conditions such as the fabric, thread and stitch length to be used. Tension on the needle thread can be adjusted with nuts A.

Tension on the looper thread can be adjusted with nuts B. To increase the tension, turn the nuts clockwise.

< Note >

The tension should be as light as possible, yet be sufficient to produce uniform stitches.

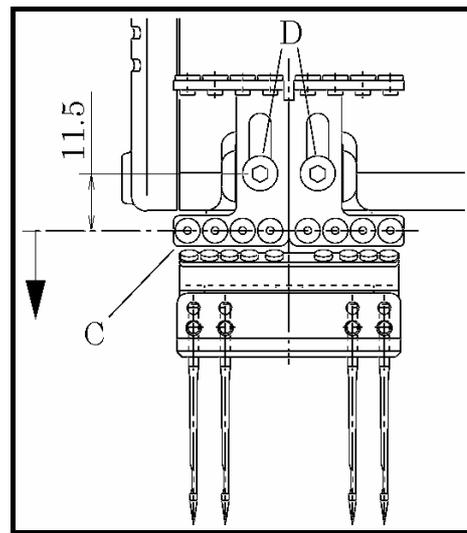


14-2 Position of needle thread eyelet

The position of the needle thread eyelet C should be adjusted about approx. 11.5mm from the center of the screw D.

< Note >

*To loose the needle thread, adjust the needle thread eyelet C to UP. To tight the needle thread, adjust the needle thread eyelet C to DOWN.
Depending upon the kind of THREAD or FABRIC.*

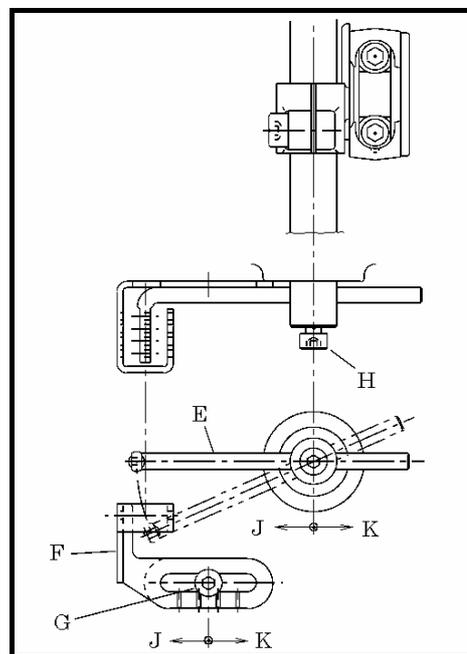


14-3 Position of looper thread take-up eyelet

1. The looper thread eyelet F is to be fastened by the screw G at the center of its long-hole.
2. The looper take-up bar E is to be fastened by the screw H at the center passing position of the looper thread eyelet F.

< Note >

To loose the looper thread, move to the direction J for both of the looper thread eyelet F and the looper take-up bar E. To tight the looper thread, move to the direction K for both of the looper thread eyelet F and the looper take-up bar E.

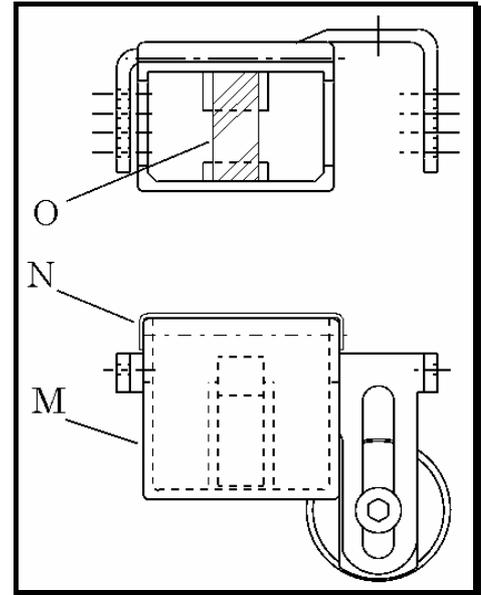


14-4 Silicon Tank

The silicon oil prevents the thread-breakage, the skip stitching and the heating of the needle top when using the synthetic and fiber material for the thread and the fabric. Use the silicon oil.

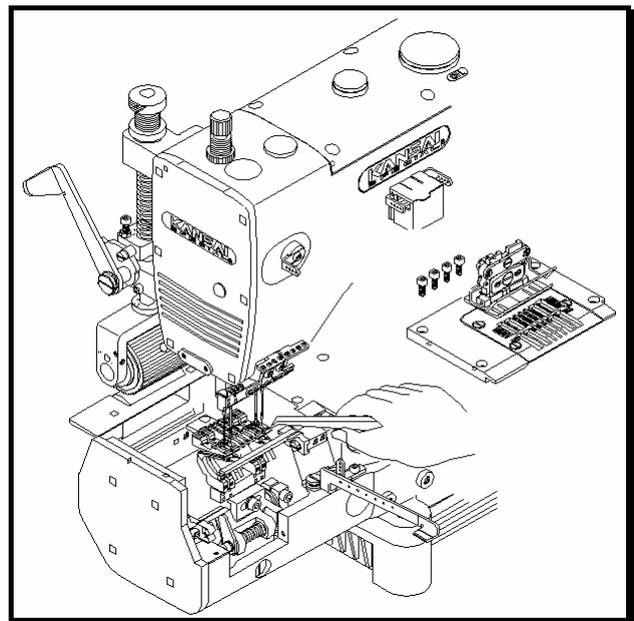
< Note >

Remove the felt *O* when no-using of the silicon tank *M*. Check the volume of the silicon oil regularly after opening of the cap *N*. If shortage, supply the silicon oil properly.



【15】CLEANING MACHINE

At the end of everyday, remove the presser foot and the needle plate and then clean the slots of the needle plate and the area around the feed dogs.



【16】 WAISTBAND CUTTER

16-1 Position and pressure

Adjusting position

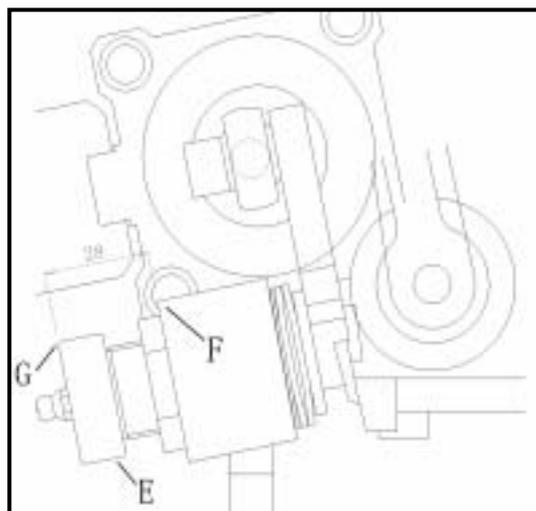
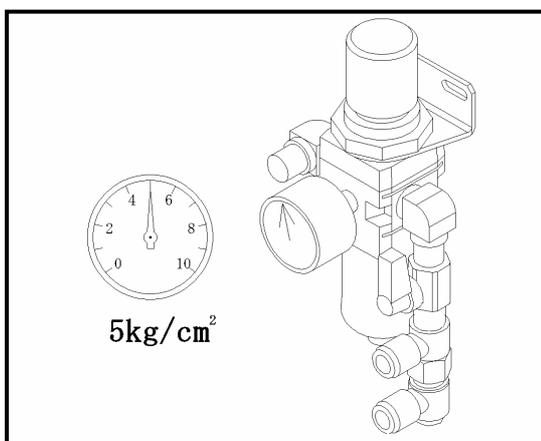
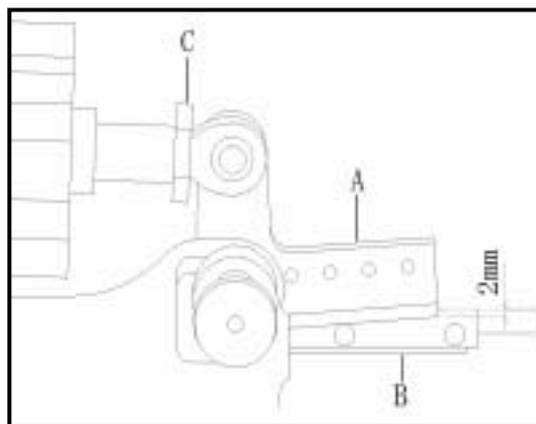
Adjust cutting edge of upper knife A to 2mm lower than surface of stationary knife B.

The setting is adjusted by rotating cylinder shaft after loosening nut C.

Adjusting pressure

Adjust the distance 28mm from the face of upper Cutter bracket D to the surface of adjusting screw G as right drawing shows.

Check the pressure if 6 layers of denim fabrics can be securely cut. If not, increase the pressure by adjusting screw E.



< Note >

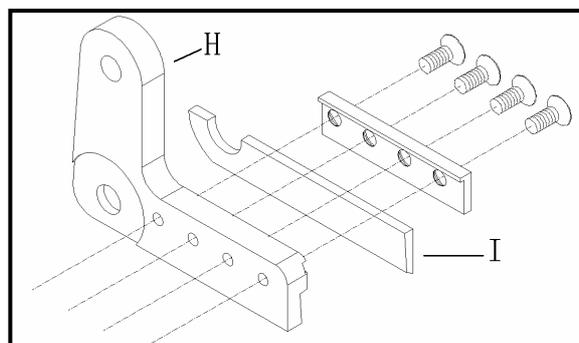
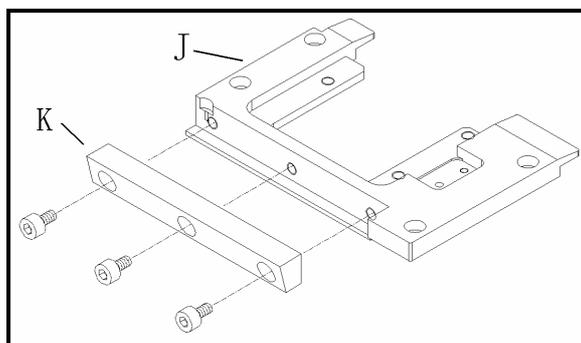
Be sure pressure of regulator should be less than 5kg/cm.

16-2 Speed

Refer to 19. Programming

16-3 Replacing cutter

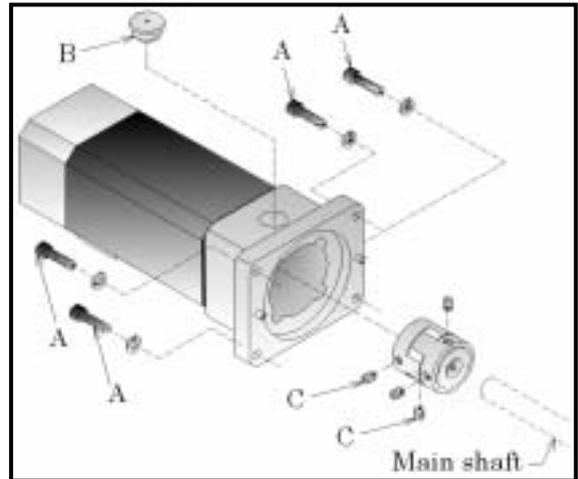
To replace upper cutter I by detaching upper cutter bracket H and four screws for fixing plate. Stationary knife can be replaced by removing it from needle plate bracket J.



【17】 DIRECT MOTOR

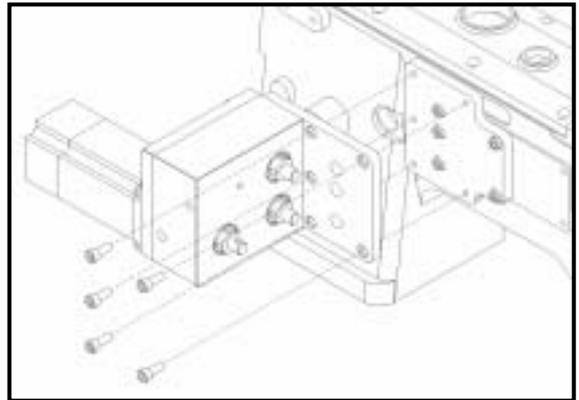
17-1 Direct Motor

Firstly take out the cap B and loosen screws C. Direct motor can be removed by loosening four screws A.



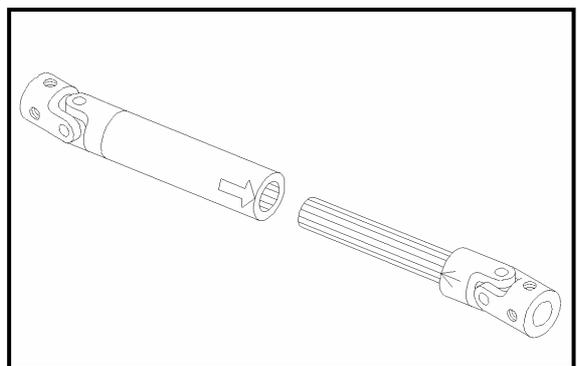
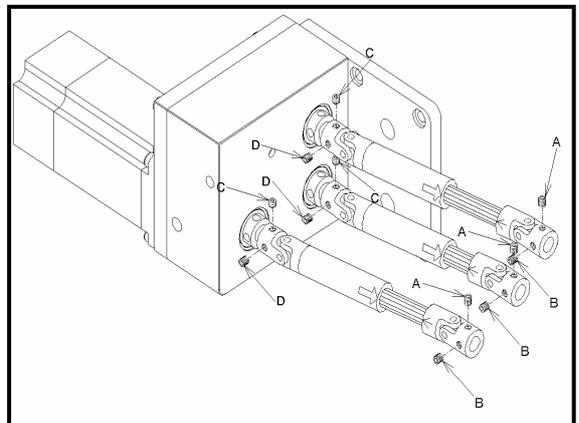
17-2 Gear Box

Gear box can be easily removed by detaching five screws as right drawing shows.



17-3 Universal Joint

Match arrow markings on both shafts to attach.

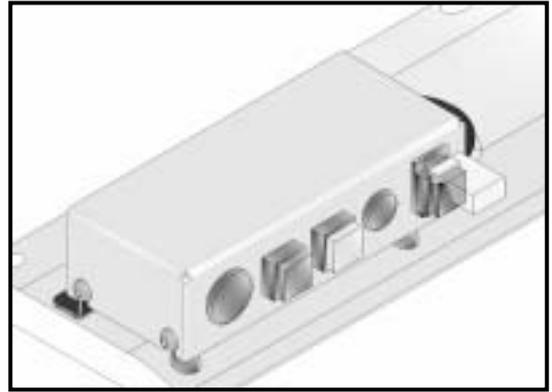


【18】 SWITCH BOX

18-1 Switch Box

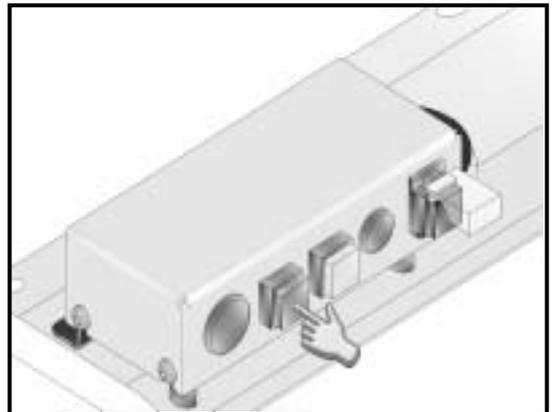
Operation of switch

Switch box is located on the top cover of machine.



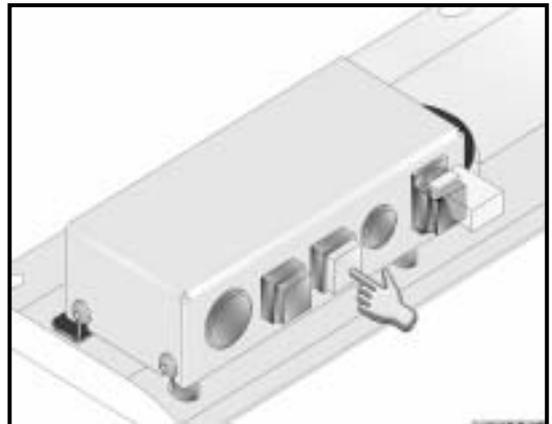
Automatic Operation Switch (Red)

1. Switch box is operated after turning on power.
2. Push red switch on left side and hold it at one second. Light will be turned on, which means the machine is on automatic mode. Sensors, auto skip stitch and waistband cutter are automatically operated.
3. Push red switch and hold it at one second again to stop automatic mode.



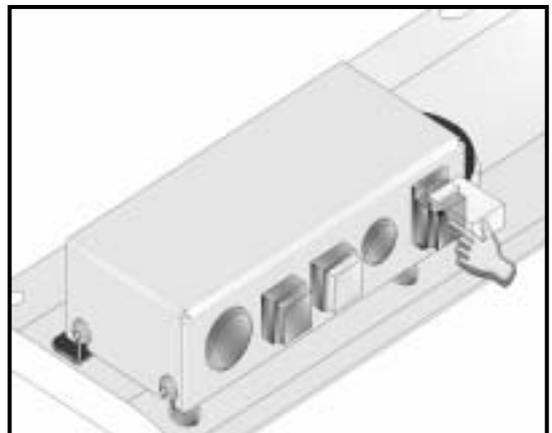
Spreader Switch (Yellow)

1. Manual mode or automatic mode, push this button to adjust spreader whenever you need. Spreader is located on skip position while yellow light is on. The machine will not work while the light is on, nor waistband cutter works even if pedal is stepped on.
2. Push yellow switch to release.



Manual cutter switch (Blue)

Waistband cutter can be manually operated by pushing blue switch on right side when the machine is not running.



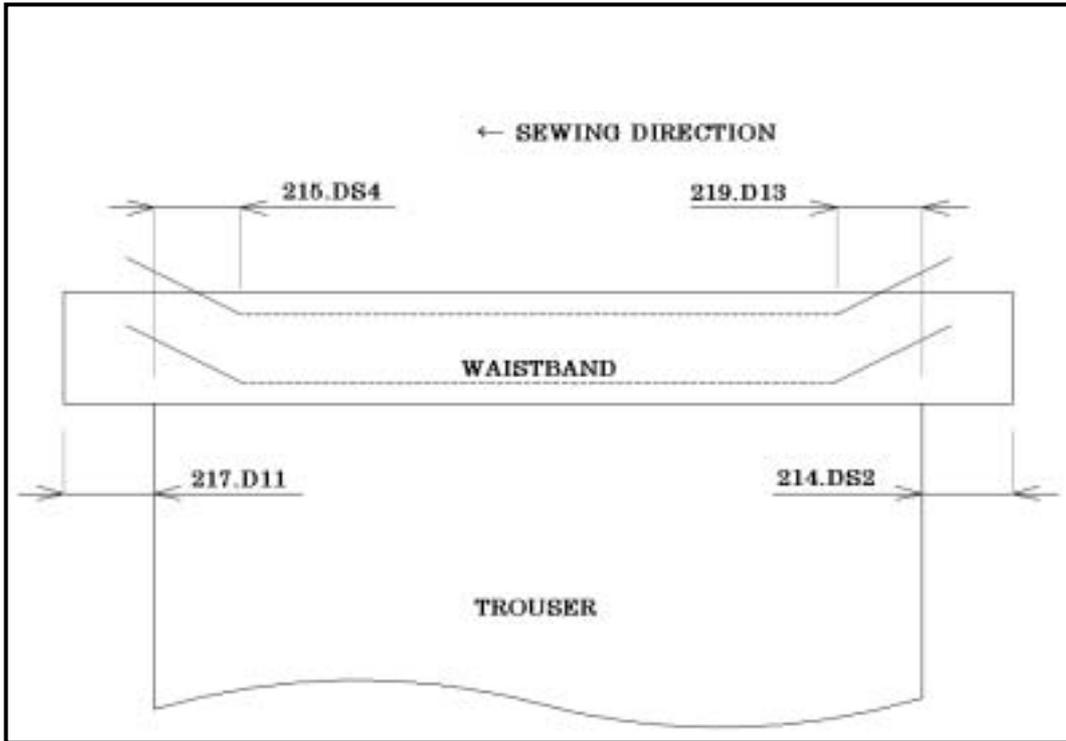
< Note >

*Take great care when cutter is operated.
Be careful not to touch the cutter during operation.*

【19】 PROGRAMMING

19-1 Parameter of each parts

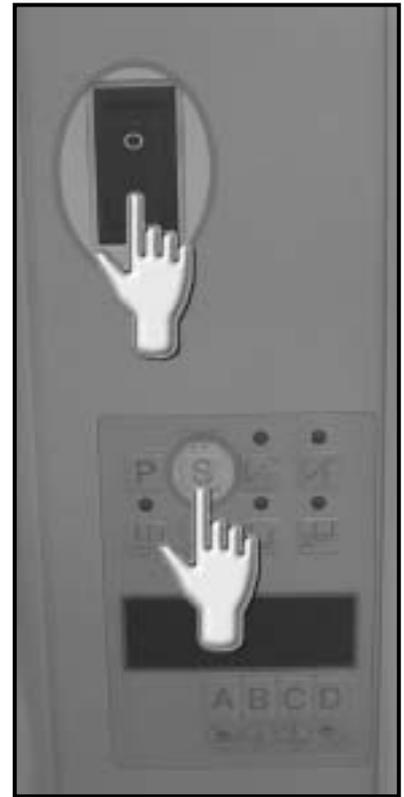
Cutting distance of waistband knife, lengths of skip stitch, etc. can be changed by the settings of each parameters.



19-2 Setting of parameter

Preparation

Firstly make sure that power supply is securely switched off. Turn on power with keeping pressing "S" button on control box. Then the display shows as below.



When power is turned off



When power is turned on

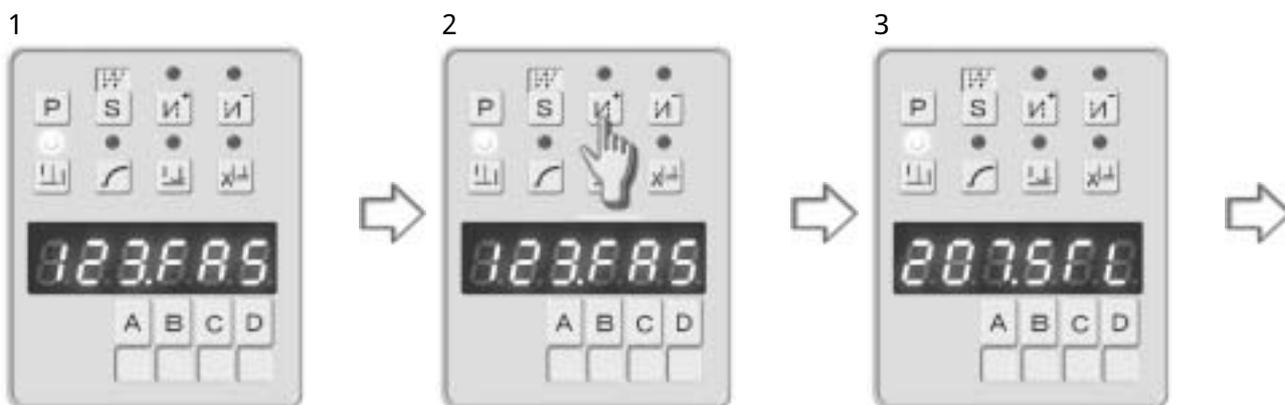


When power is turned on with "S" button

< Note >

*Do not change the setting of parameter 047.MAC.
The machine may not work properly.*

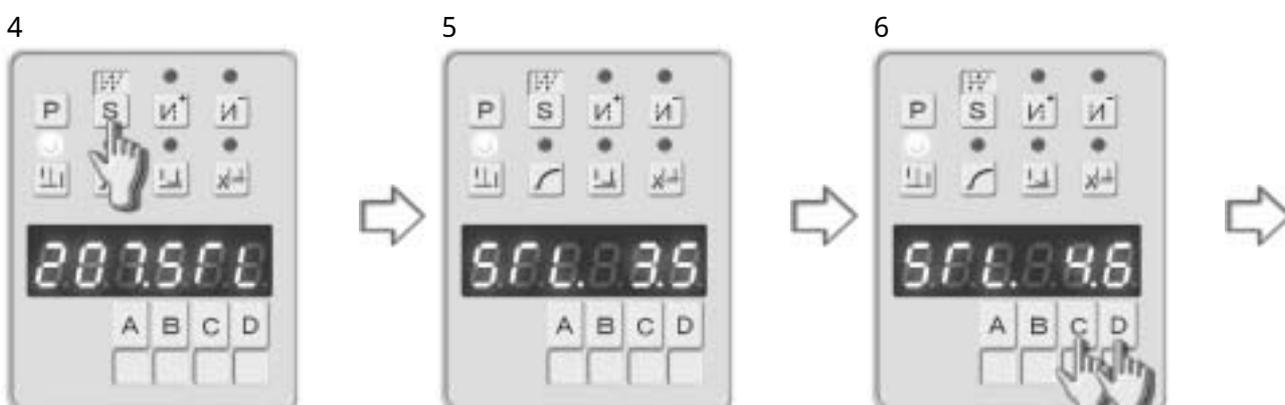
EXAMPLE --- change the setting of stitch length by puller



Firstly turn on power with pressing "S" button

Press and hold the key until display shows 207

Display shows 207 (207.STL)



Press "S" button. Date will appear on display

3.5 on display means that stitch length is 3.5mm

Change parameter into 4.6 by "C" and "D" button



Press "S" button to save the setting

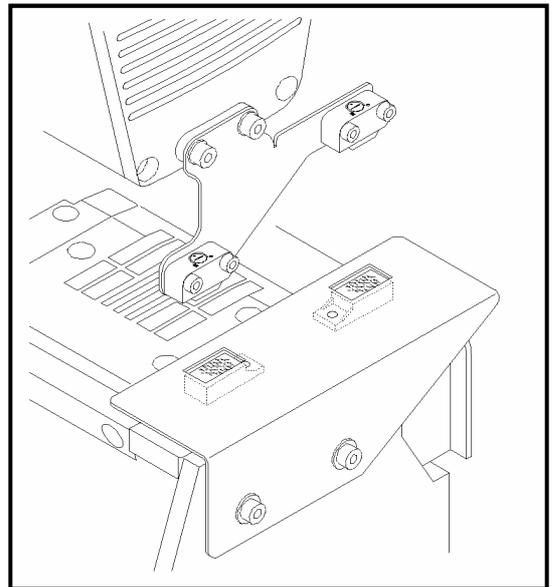
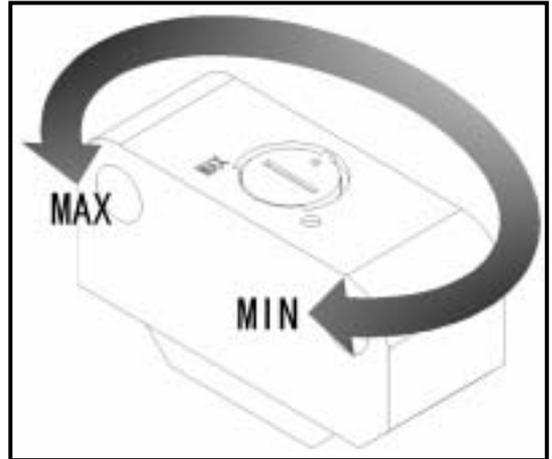
Back to sewing operation mode

19-3 Parameter List

Parameter	Detail	Unit	Max	Min	Default
179.PUA	Needle stop position after heeling back				
183.PUB	Needle stop position during sewing stop				
181.PDA	Timing of starting puller				
207.STL	Puller stitch length	mm	5.5	0.5	3.5
214.DS2	Final Cut Exceeded length of waistband at the end of operation This function is controlled by the sensor located under side protection cover beside presser foot	Cm	18.0	0.0	2.0
216.DS6	Timing of second puller activation from Initial Cut Second puller is on top position after Initial Cut. This function is adjusted to prevent fabric to get stuck on the puller, and prevent second puller to hook the beginning side of waistband tape accidentally.	Cm	18.0	0.0	10.0
215.DS4	Initial Skip Stitch Length of skip stitch on the beginning side of waistband. This function is controlled by the sensor on the folder. <Caution> For constant length of skip stitch, it is very important that operators always start sewing from same point under presser foot.	Cm	18.0	0.0	2.0
217.D11	Initial Cut Exceeded length of waistband at the beginning of operation. <Caution> Sewing speed is limited until initial cut ends. Maximum sewing speed can be applied only after initial cut.	Cm	5.0	0.0	2.0
219.D13	Final Skip Stitch Length of skip stitch at the finishing side of waistband. This function is controlled by the sensor on the folder.	Cm	4.0	0.0	2.0
222.PUM	Position Control of back (second) puller Control position of puller depending on sewing condition. 1. Back puller moves up and down automatically. 2. Back puller is always on bottom position.		2	1	1
187.WS	Sewing speed from Final Cut to Initial Cut	Rpm	4800	400	1200
97.TK3	Operating time of waistband cutter	ms	990	10	50 ~ 40
201.FNK	Needle cooling function 0 : Needle cooler starts when the pedal in ON. 1 : Needle cooler starts depending on sewing speed (parameter 199.nnk) 2 : Under edge trimmer		2	0	0

【20】 SENSITIVITY OF BEAM SENSOR

Make sure that green light is ON when the power is ON. Also check if orange light is ON when fabric is set. If not, adjust sensitivity of beam sensor by turning the dial counter clockwise as the right drawing shows.



【21】 LAYOUT OF AIR PIPES

