INSTRUCTION

RX SERIES

Industrial Sewing Machines

First published : September 1991
Fourth edition : June 2004

No. 040019

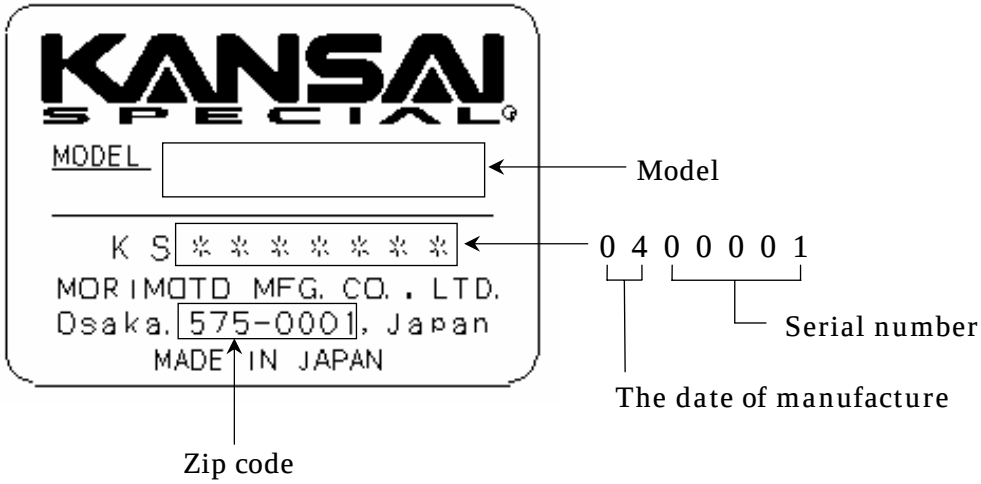
KANSAI SPECIAL®

INTRODUCTION

Thank you for your purchasing Kansai Special's RX Series.
Read and study this instruction manual carefully before beginning any of the procedures and save it for later use.

1. This instruction manual describes adjustments and maintenance procedures on this machine.
2. Before starting the machine, check to make sure the pulley cover, safety cover, etc. are secured.
3. Before adjusting, cleaning, threading the machine or replacing the needle, be sure to turn off the power.
4. Never start the machine with no oil in the reservoir.
5. Refer to the parts list as well as this instruction manual before maintenance.
   If the machine includes a thread trimmer, read and study the instruction manual for the thread trimmer carefully.
6. The contents described in this instruction manual are subject to change without notice.

Indication of serial number

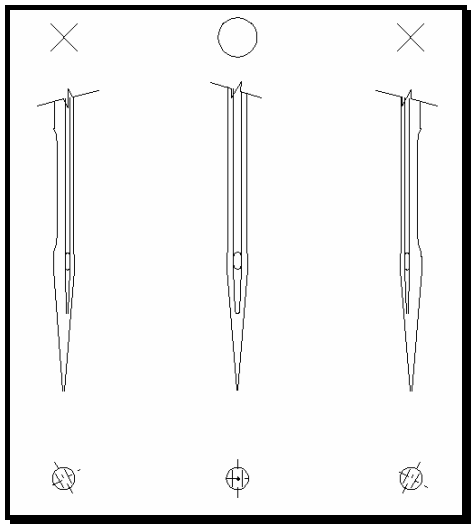


CONTENTS

【1】NEEDLES & THREADING THE MACHINE

1-1 Needles

UY128GAS of Schmetz or Organ.
Select the proper needle for the fabric and thread.



< Needles and needle size >

Schmetz	Nm65	Nm70	Nm75	Nm80	Nm90
Organ	#09	#10	#11	#12	#14

< RX9804D >

Schmetz MY×1014B	Nm65	Nm70	Nm75	Nm80
Organ SM×1014B	#09	#10	#11	#12

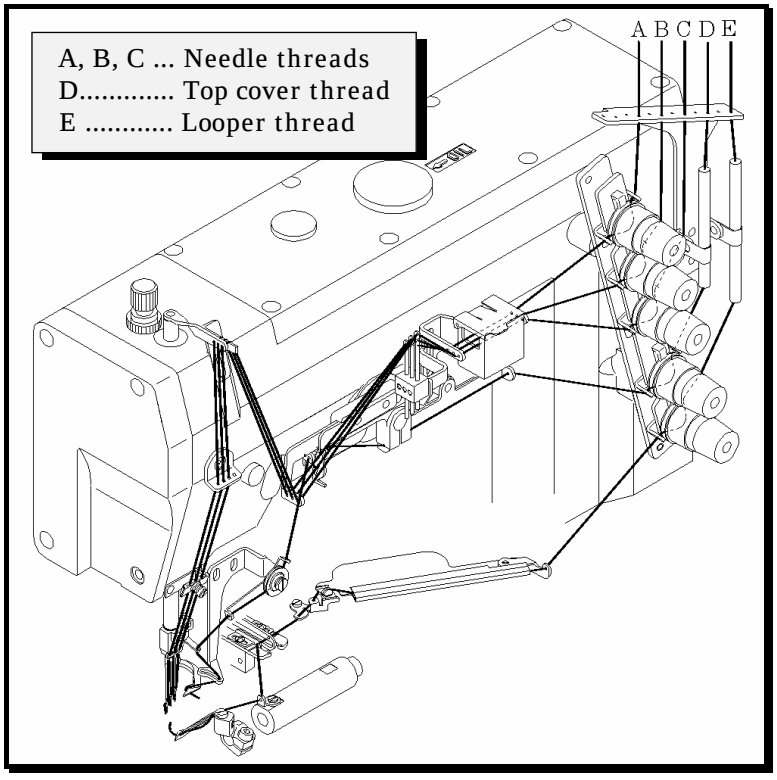
1-2 Replacing the needle

To replace the needle, check the needle carefully to see that the scarf is turned to the rear of the machine (see the illustration). Then install the needle correctly.

< Note >
Before 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.

1-3 Threading the machine

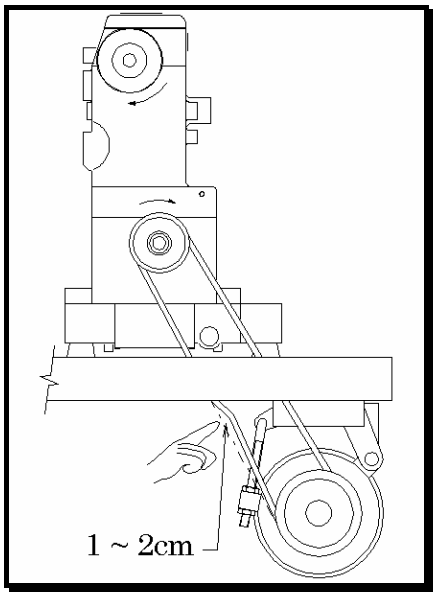
Thread the machine correctly by referring to the illustration below.
Threading the machine incorrectly may cause skip stitching, thread breakage and/or uneven stitch formation. Thread tension should be changed according to various kinds of conditions such as the thread to be used and/or the feeding amount (see Chapter 10 for "Stitch formation").



【2】MACHINE SPEED

2-1 Machine speed & direction in which the machine pulley runs

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 clockwise as the handwheel does as seen from the machine pulley.



2-2 Motor & belt

Motor : 3-phase, 2-pole, 400W clutch motor
Belt : M type V belt

Select the proper motor pulley according to the machine speed (refer to the motor pulley outer diameter on the table below). Adjust where to position the motor by pressing the finger onto the middle of the belt so that 1~2cm deflection can be achieved (see the illustration on the right).

< Machine speed >

TYPE	MAXIMUM SPEED	STANDARD SPEED
RX9703	6000SPM	5500SPM
RX9803	5500SPM	5000SPM
RX9803P	5000SPM	4500SPM
RX9804D	4000SPM	3500SPM

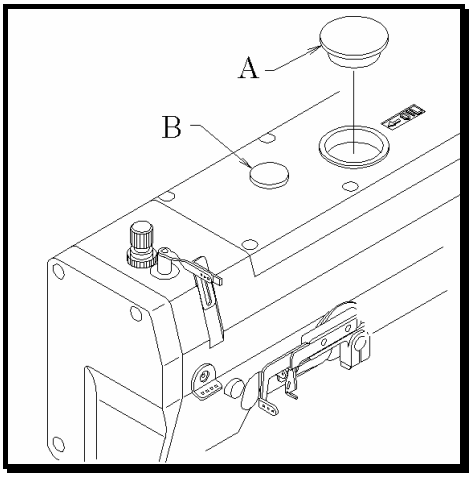
< Motor pulley selection table >

Motor pulley outer diameter (mm)	Machine speed (SPM)	
	50Hz	60Hz
80	3300	3900
90	3700	4400
100	4100	4900
110	4500	5400
120	5000	5900
130	5300	(6400)
140	5800	(6900)
150	(6200)	

【3】LUBRICATION

3-1 Oil

Use Kansai Special's genuine oil.
(Part No. 28-613 : 1000cc)



3-2 Oiling

■ To fill the machine with oil

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.

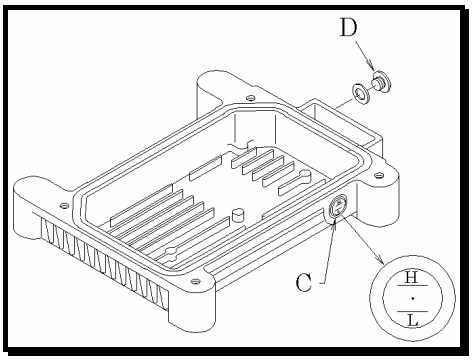
■ To check for proper oil flow

After filling the machine with oil, run the machine to check the oil is splashing to oil flow sight window B.

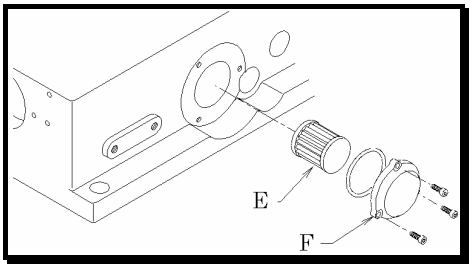
3-3 Replacing the oil and the oil element

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 3-2 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.

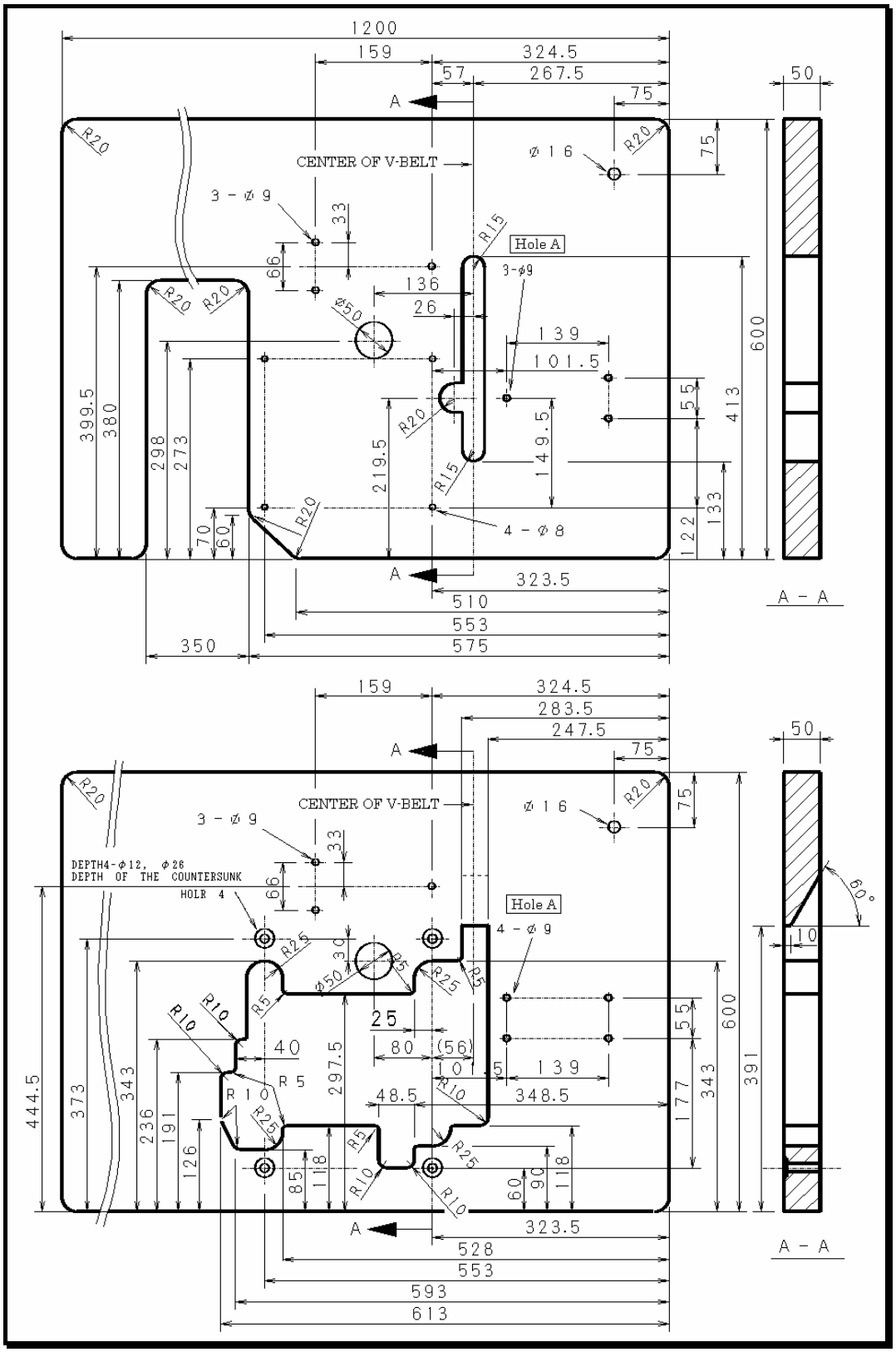


< Note >
When the oil filter cap is removed, the oil collected on the element drips. Be careful.

【4】SEWING MACHINE INSTALLATION

4-1 Cutting the machine table

■Hole A shown below is for installing the electric presser foot lift.



4-2 Installing the machine

The RX Series is available in two kinds of installations, non-submerged and semi-submerged.

■Non-submerged installation

Install the machine correctly by referring to the illustration.

Install the bolts and nuts to the machine table.

Fit the rubber cushions onto the bolts.

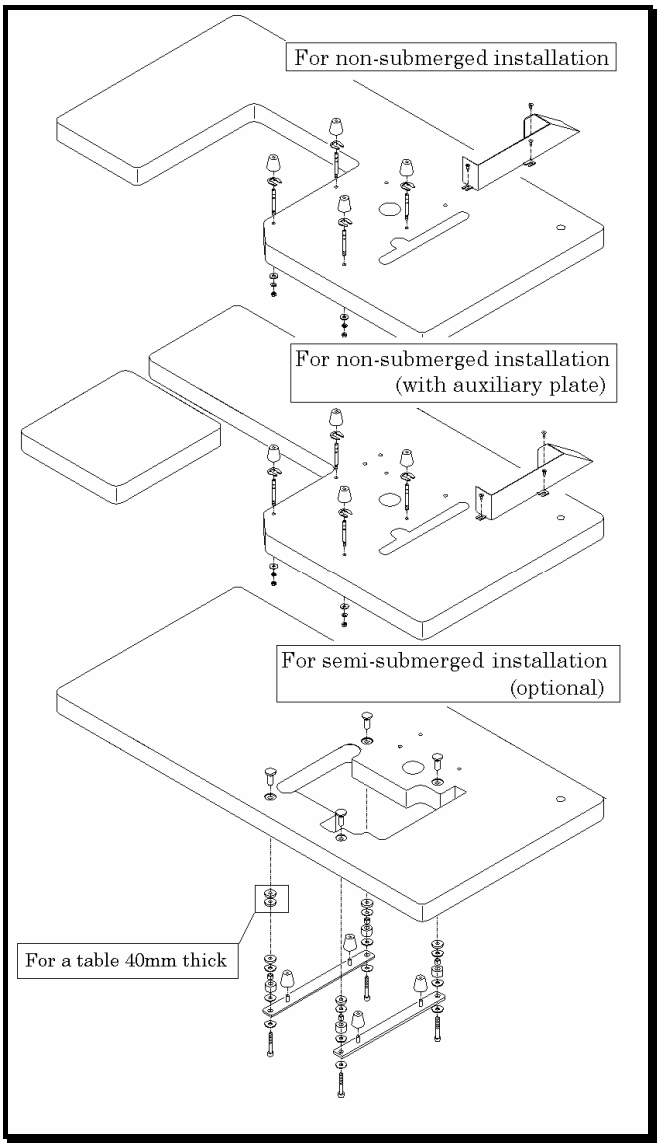
Then mount the machine properly onto the rubber cushions.

■Semi-submerged installation

Install the machine correctly by referring to the illustration.

Secure the oil reservoir installation brackets to the machine table with screws. Fit the rubber cushions onto the screws.

Then mount the machine properly onto the rubber cushions.

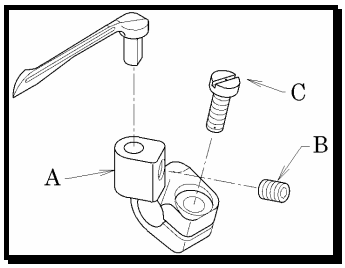


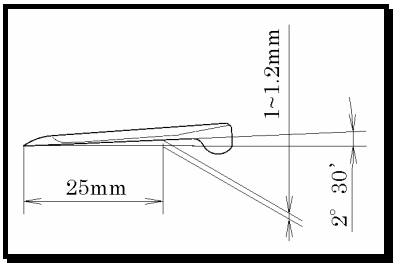
【5】TIMING OF THE LOOPER TO THE NEEDLES

5-1 Angle and height for installing the looper

To obtain the proper angle and height, insert the looper fully into looper holder A and then tighten screw B. The proper angle for the looper is 2º 30'.

Distance at 25mm from the point of the looper between the bottom of the looper blade and the extension line from the point of the looper : Approximately 1.1mm

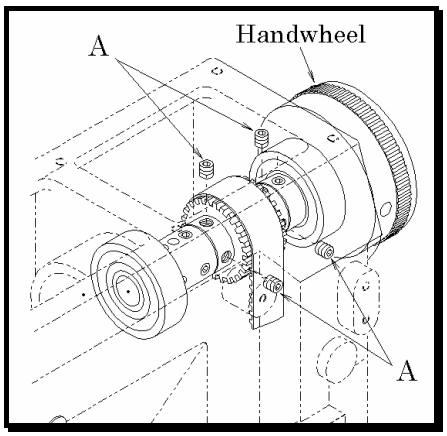


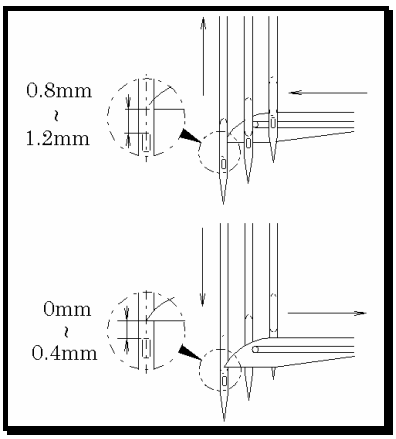


5-2 Looper left-to-right movement

The point of the looper should pass the center of the left needle and 0.8~1.2mm above the top of its needle's eye when the looper moves to left on the back side of the left needle.

On the other, the point of the looper should pass the center of the left needle and 0~0.4 mm above the top of its needle's eye when the looper moves to right on the front side of the left needle (See the illustration below). To adjust the timing of the looper to the needles, remove the machine cover, loosen screws A on the timing pulley (upper), and shift the timing pulley (upper) by turning the handwheel while holding the timing pulley (upper) by hand.



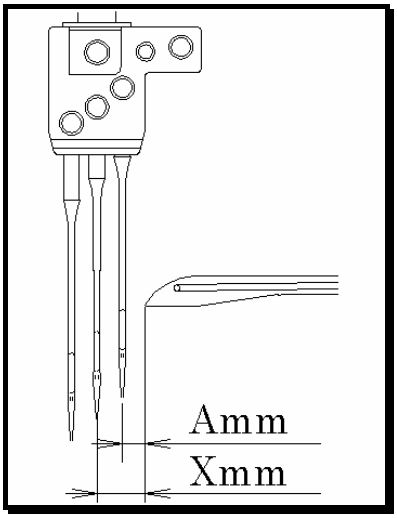


5-3 Looper setting distance

Looper setting distance is the fundamental distance from the point of the looper to the center of the needle bar when the looper is at its farthest position to the right.

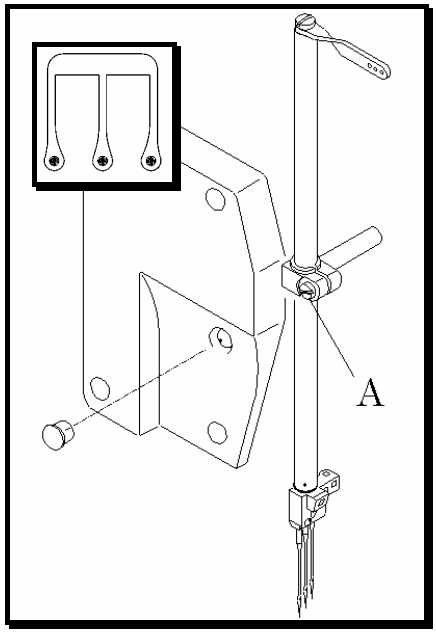
Setting distance X varies according to the needle stroke (See the table below). Also, setting distance A varies according to the needle width or gauge size for further adjustment (see 5-4).

Needle stroke	Looper setting distance (Xmm)
31mm	6.5mm
33mm	6mm



5-4 Needle height

The point of the looper should be 0.8~1.2mm above the top of the left needle's eye on the back side of the needle when the point of the looper has reached the center of the left needle with the machine pulley turning in the operating direction (see 5-2).



■To adjust the height of the needle,

1. Set the needle bar at the top of its stroke.
2. Remove the plug on the head cover.
3. Loosen screw A.
4. Move the needle bar up or down.

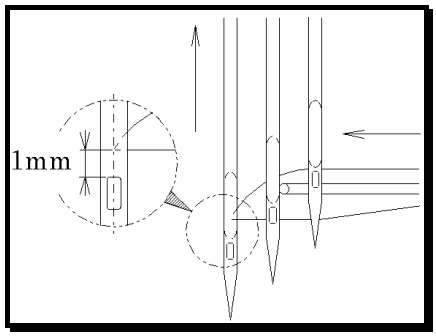
< Note >
After the above adjustment, check to make sure each needle drops into the center of each needle hole.

NEEDLE SPACE (INCH)	Needle height (mm)		LOOPER SETTING DISTANCE (Amm)	
	Without UTC	With UTC	31mm stroke	33mm stroke
3.2mm (1/8)	10.2	9.7	4.7~5.0	4.3~4.5
4.0mm (5/32)	9.8	9.3	4.3~4.6	3.9~4.1
4.8mm (3/16)	9.4	8.9	3.9~4.2	3.5~3.7
5.6mm (3/32)	9	8.5	3.5~3.8	3.1~3.3
6.4mm (1/4)	8.6	8.1	3.1~3.4	2.7~2.9

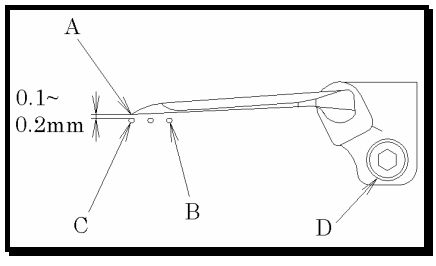
✳UTC: Under Thread Cutter

5-5 Needle/looper front-to-back relationship

The point of the looper should be 0.8~1.2mm above the top of the left needle's eye on the back side of the needle when it has reached the center of the left needle. With the point of the looper at this position, set the clearance between the left needle and the point of the looper at approximately 0.1~0.2mm.
Then the looper should barely touch the right needle.

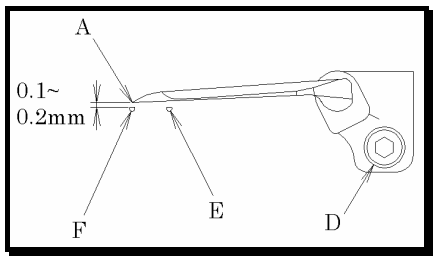


■On 3 and 4-needle machines, the clearance between point A of the looper and left needle C should be 0.1~0.2mm. To make this adjustment, loosen screw D on the looper holder first. Then adjust the needle guard (rear) so that it presses right needle B slightly to the front. With the needle guard (rear) and needle B in this position, set the clearance between the point of the looper and needle B at 0~0.05mm.



Also, set the clearance between the point of the looper and center needle at 0~0.05mm.

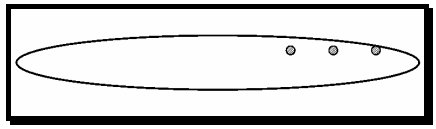
■On 2-needle machines, the clearance between point A of the looper and left needle F should be 0.1~0.2mm.
To make this adjustment, loosen screw D on the looper holder first. Then adjust the needle guard (rear) so that it presses right needle E slightly to the front.
With the needle guard (rear) and needle E in this position, set the clearance between the point of the looper and needle E at 0~0.05mm.



< Note >
When moving the looper holder front or back, be careful not to change the looper setting distance.

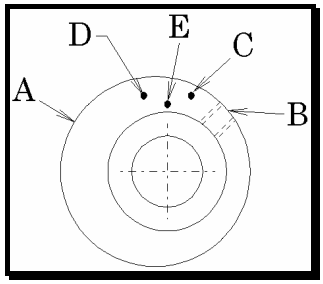
5-6 Changing the looper orbit

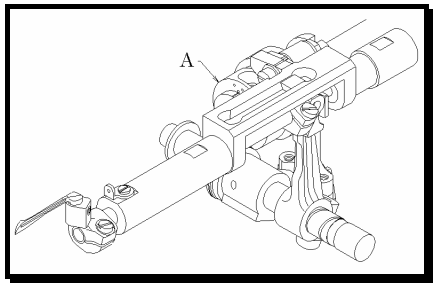
When the looper moves around the needles, the point of the looper on 2-needle and 3-needle machines barely touches the right needle and the clearance between the point of the looper and the left needle is approximately 0.1~0.2 mm.



< Note >
To sew under good conditions, after changing the amount of the looper front-to-back movement adjust the looper orbit by moving the timing mark slightly to C or D.

■To change the looper's orbit, loosen screw B on eccentric A and shift the timing mark by moving eccentric A front or back. Do not change the orbit extremely.

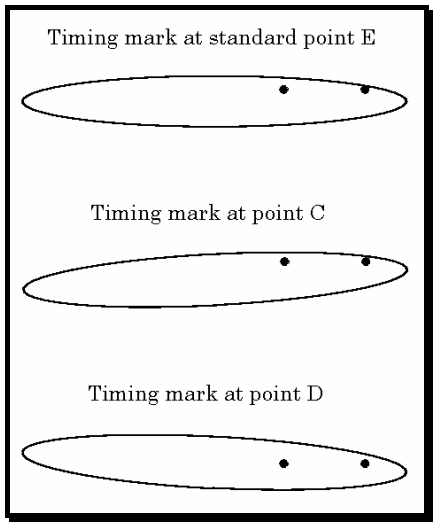




■The timing mark is at point E : standard

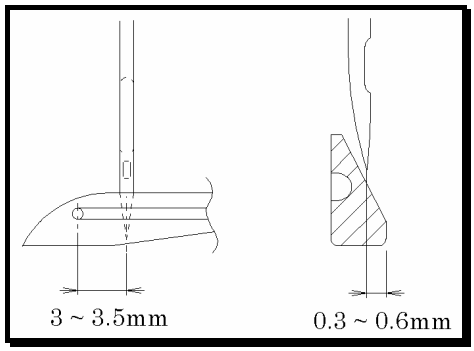
■When the timing mark is at point C, The clearance between the point of the looper and the left needle when the looper moves to the left decreases.

■When the timing mark is at point D, The clearance between the point of the looper and the left needle increases.



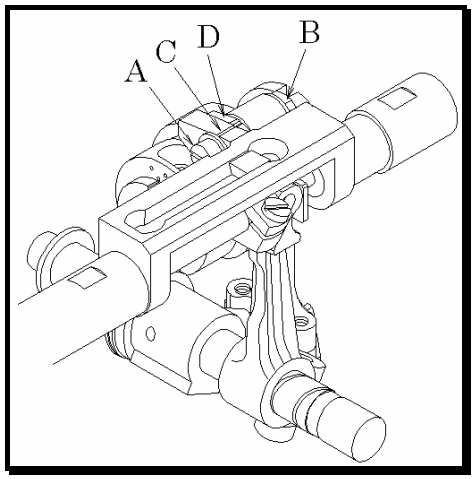
5-7 Changing the amount of the looper front-to-back movement

The clearance between the point of the left needle and the back side of the looper when the looper moves to the right from the extreme left end of its travel should be 0.3~0.6mm (The needle is pressed to the back). The distance between the point of the left needle and the center of the looper's eye on the back side of the looper should be 3~3.5mm.



The amount of the looper front-to-back movement is factory-set properly for needle count #11 (Nm75).
If you use needle counts Nm80~90, adjust the amount as required.

Remove the inside cover.
Loosen nut B while holding screw A for the looper front-to-back adjusting pin with a screwdriver.
Then move the front-to-back rod front or back.
To increase the amount, move alignment mark D on the front-to-back rod to the front from mark C on the looper bar guide. To decrease the amount, move mark D to the back. Adjust according to the needle count.

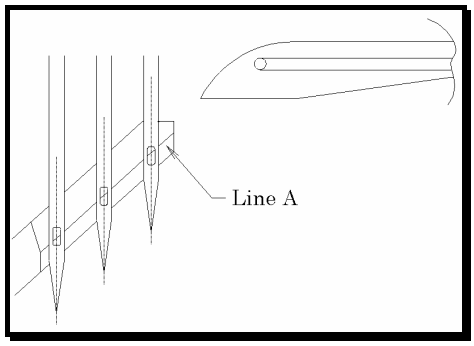


< Note >
If you change the amount of the looper front-to-back movement, the clearance between the point of the left needle and the back side of the looper when the looper moves to the right from the extreme left end of its travel should be 0.3~0.6mm.

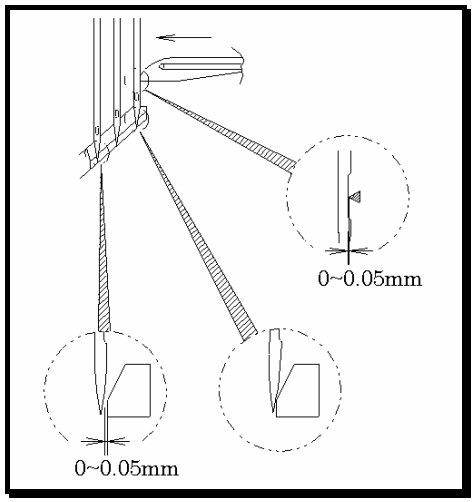
【6】FRONT AND REAR NEEDLE GUARDS

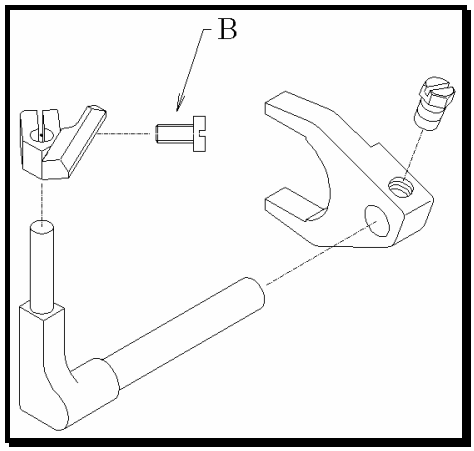
6-1 Position of the needle guard (rear)

Align line A with the center of needle's hole when the needle is at the bottom of the stroke.
Loosen screw B and adjust the height of the needle guard (rear).

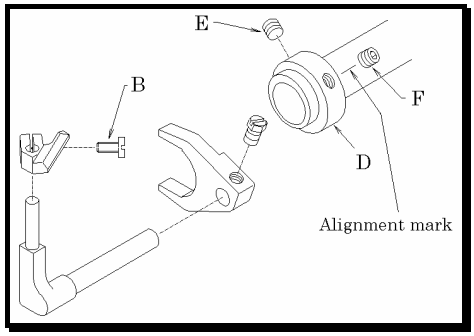


When the point of the looper has reached the center of the right needle, the clearance between the needle and the looper should be 0~0.05mm.
Loosen screw B and move the needle guard (rear) slightly to the front.
Then the clearance between the left needle and the needle guard (rear) should be 0~0.05mm.
Loosen screw B to make this adjustment. All the above adjustments are made by screw B.
Therefore after these adjustments, check to make sure the relationship between the needle guard (rear), left and right needles is correct.





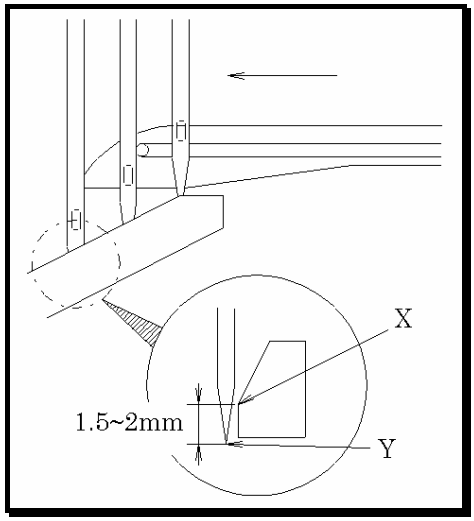
■To readjust the timing of the needle guard (rear) movement, loosen screws E and F and move eccentric D. Align the alignment mark on the shaft with the center of screw F which turns afterward in the operating direction.



6-2 Position of the needle guard (front)

When looper has reached at the center of left needle. The position of needle guard (front)'s height should be 1.5~2mm from the tip of left needle Y to the line of needle guard X.

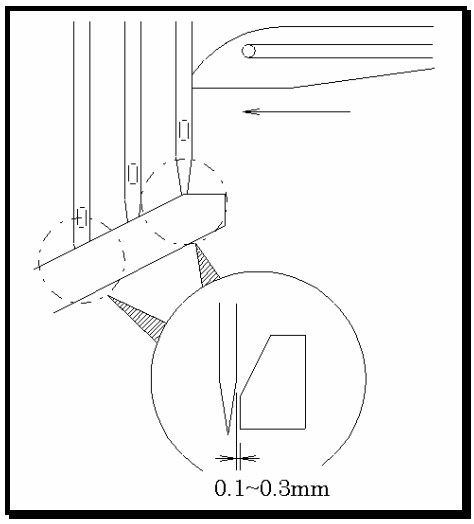
To adjust the height of needle guard (front), loosen screw A and set the above distance.

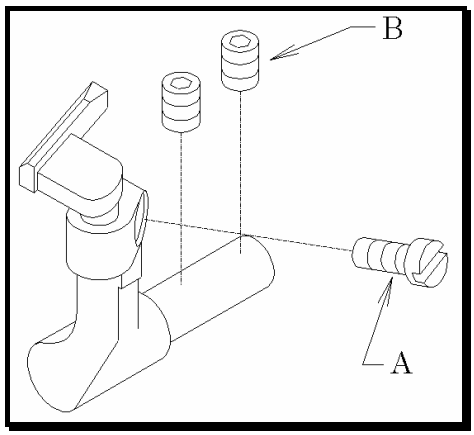


When looper has reached at the center of right needle. The clearance between the needle guard and each needles should be 0.1~0.3mm.

To adjust the needle guard (front) front to back, loosen screws A and B.

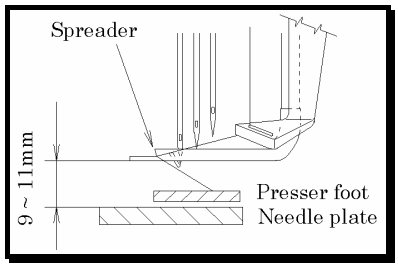
< Note >
Retighten the screws while checking there is no left-to-right shake on the needle guard (front).





【7】SPREADER

7-1 Position of the spreader



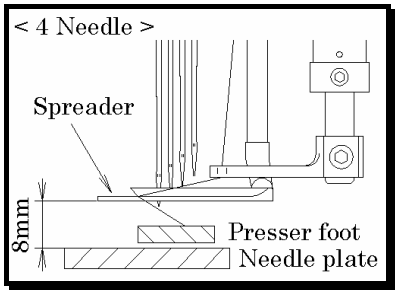
■Height

The distance from the top surface of the needle plate to the bottom surface of the spreader should be 9~11mm.

■Left-to-right position

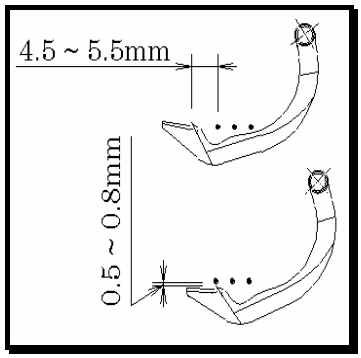
When the spreader is at the extreme left end of its travel, the distance from the center of the left needle to the point of the thread carrying notch should be 4.5~5.5mm.

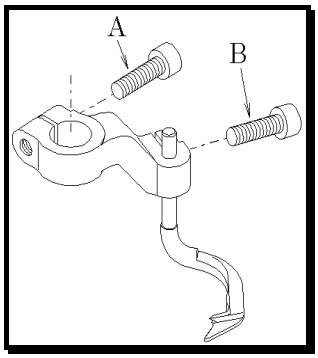
When the spreader passes the left needle, the clearance between the point of the thread carrying notch and the left needle should be 0.5~0.8mm. To make the above adjustment, loosen screws A and B.

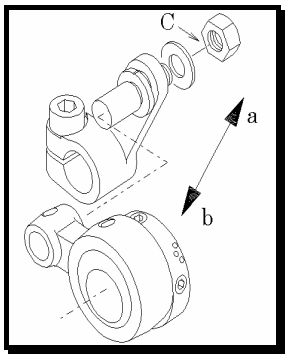


■Adjust the amount of the spreader movement according to the number of spreader threads and/or the fabric weight.

To make this adjustment, remove the arm top cover, loosen nut C and then move the adjusting lever pin in direction (a) or (b). To decrease the amount, move the pin in the direction of (a). To increase the amount, move the pin in the direction of (b).

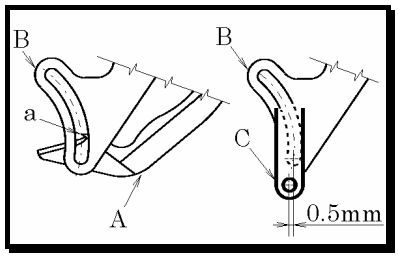




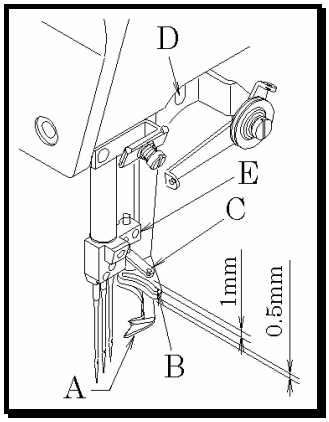


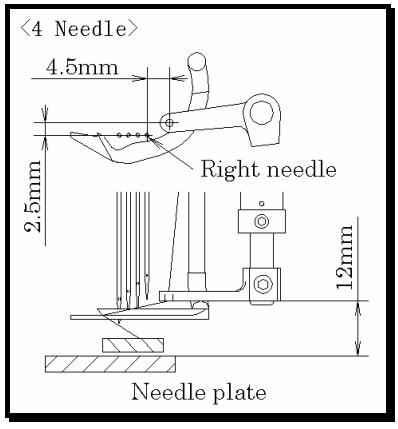
7-2 Position of the spreader thread guide

The clearance between spreader thread guide B and spreader A should be 0.5~0.8mm. When the spreader is at the extreme right end of its travel, point (a) of the spreader thread carrying notch should be aligned with the centerline of the slot of spreader thread guide B.



When the needle bar is at the bottom of its stroke, the clearance between the spreader thread guide and spreader thread guide C should be 1mm and the eyelet of spreader thread guide C should be approximately 0.5mm left to the center line of the slot of spreader thread guide B. To make this adjustment, loosen two screws D and screw E and move each thread guide up or down, left or right, or front or back as required.





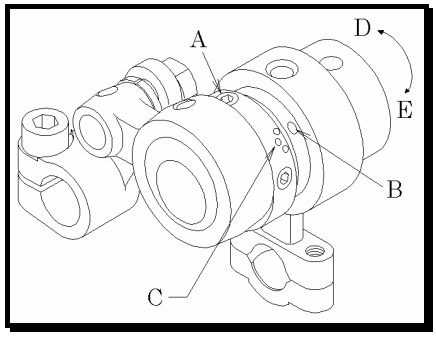
7-3 Timing of the spreader

The timing of the spreader is factory-set by referring to the previous procedure (see 7-2).

Adjust according to the thread to be used or other conditions. To make this adjustment, remove the top arm cover and loosen two screws for looper eccentric A on the upper shaft. Then shift alignment mark C front or back while referring to alignment mark B.

To advance the timing of the spreader to the needle, shift mark C in the direction of D.

To delay the timing of the spreader to the needle, shift mark C in the direction of E.



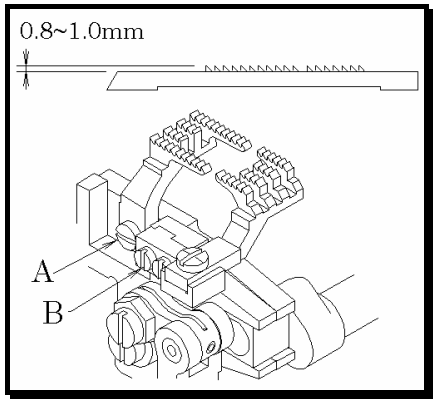
【8】FEED DOGS & STITCH LENGTH

8-1 Feed dog height & tilt

■Height

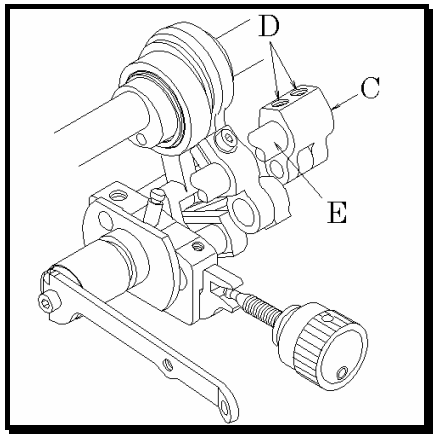
When the feed dogs are at the top of their stroke, the feed dog teeth should be parallel with and 0.8~1.0mm above the top surface of the needle plate.

To make this adjustment, loosen screws A and B and move the main (back) and differential (front) feed dogs up or down.



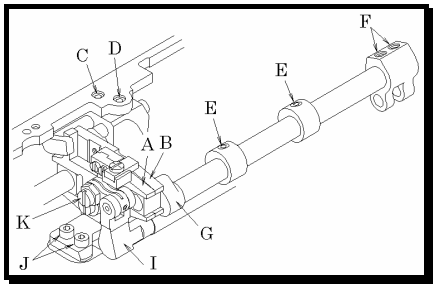
■Tilt

When the feed dogs are at their top of their stroke, the feed dogs should be parallel with the top surface of the needle plate. To make this adjustment, loosen screws D and move shaft E. If the fabric to be used is thick and soft, install the feed dogs slightly higher than standard to feed the fabric smoothly.



8-2 Left-to-right position of the feed dogs

Position feed bars A and B so that the main (back) and differential (front) feed dogs are centered left to right in the needle plate. Adjust by screws and feed dog guides (see C, D, E, F, J and I in the illustration).



< Note >
After the adjustment, remove screw K and check to make sure the differential (front) feed bar moves slightly front to back.

8-3 Front-to-back position of the feed dogs

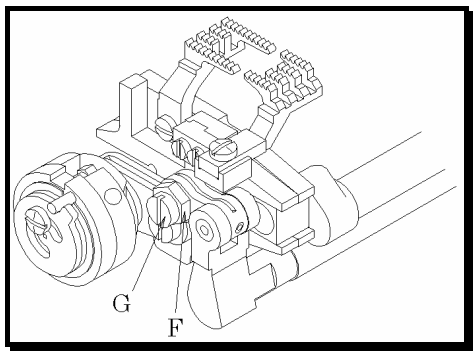
■Maximum feed dog movement

< Amount of the front feed: 4.0mm >

< Amount of the back feed: 3.6mm >

Center the feed dogs in the needle plate so that they do not touch the needle plate.

To make a fine front-to-back adjustment on the differential (front) feed dog, tighten screw G on front-to-back adjusting eccentric F and turn the eccentric.

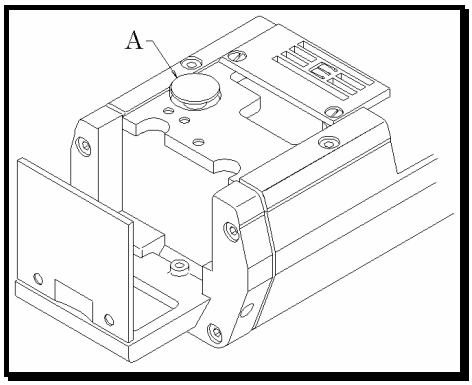


8-4 Stitch length

The stitch length is adjustable from 1.4~3.6mm.

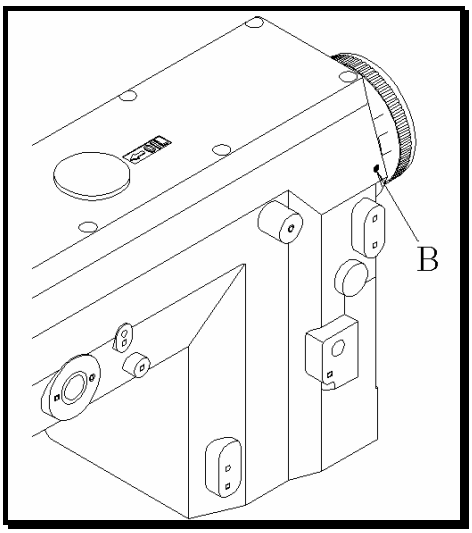
The following table shows the number of stitches within 1 inch (25.4mm) or 30mm according to the stitch length.

Stitch length (mm)	No. of stitches (within 1")	No. of stitches (within 30mm)
3.6	7.0	8.0
2.4	10.5	12.5
1.4	18.0	21.0



■To adjust the stitch length

1. Press push button A lightly until its end touches the inside part and clicks.
2. Turn handwheel by hand while pressing the push button lightly until the push button goes further into the depth.
3. Then press down the push button strongly again while turning handwheel as required.
4. Align the desired stitch length with alignment mark B and release the push button.

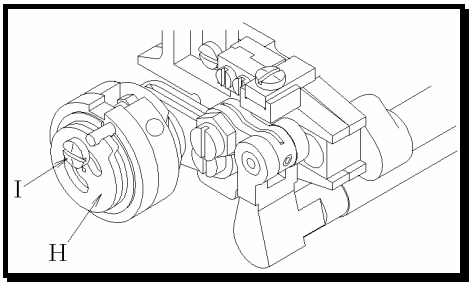


■Max. feeding amount for the RX Series: 4.5mm

To obtain a max. feeding amount of 4.5mm, loosen screw I on stopper H to release stopper H.

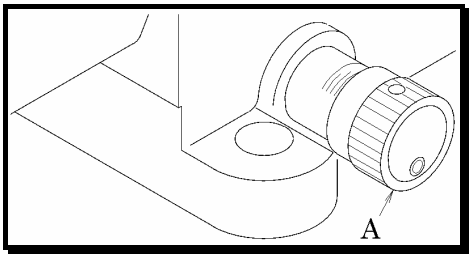
Adjust while check to make sure the feed dogs do not touch the needle plate.

< Note >
Before adjusting the stitch length, be sure to turn off the power.



8-5 Differential feed

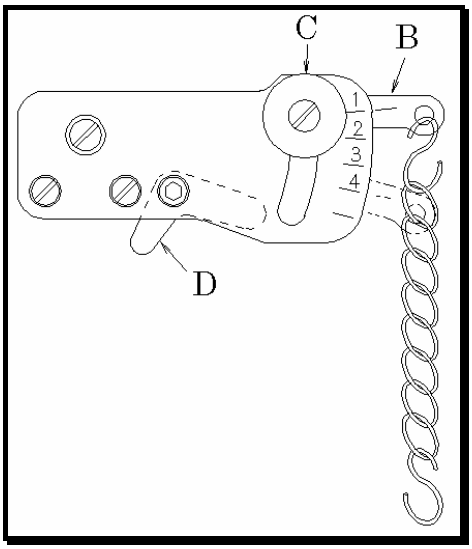
The RX Series is equipped with independently driven main (back) and differential (front) feed dogs.
Adjust the feeding amount of the differential (front) feed dog by positioning differential feed adjusting lever B or turning adjusting knob A.
The normal and reverse differential feeds can be obtained as required.



■Feeding amount of the differential (front) feed dog
The readings indicate the feeding amount of the differential (front) feed dog. Loosen nut C.
Set differential (front) feed adjusting lever B as required at 1.0~4.0mm or adjust by turning adjusting knob A.

■If you use differential feed lever, secure lever B as required with nut C within the range from the reading which differential feed lever B read when knob A is turned to stopper D.

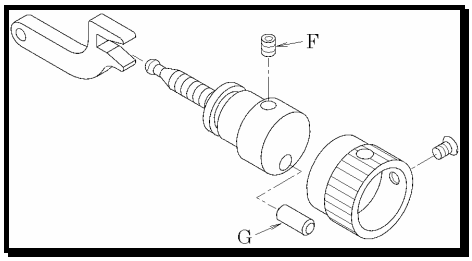
■If you change the feeding amount of the differential feed dog during sewing, connect a chain to differential feed lever B.



Each of the front (differential) and back (main) feed dog drives independently.
Therefore if you change the feeding amount of the back (main) feed dog (stitch length), the differential feed ratio will be changed.
Readjust the differential feed ratio.

< Differential feed ratio >

Stitch length (mm)	Max. normal diff. Feed	Max. reverse diff. Feed
3.6	1:1.1	1:0.3
2.5	1:1.6	1:0.4
2.0	1:2	1:0.5
1.4	1:2.9	1:0.7



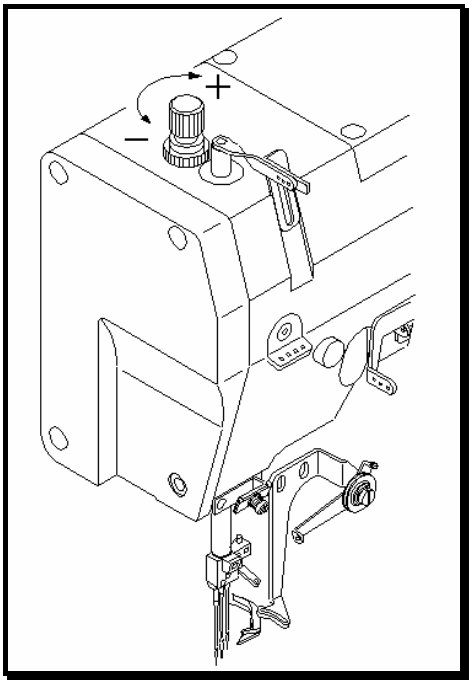
■On the RX Series the feeding amount can be changed mechanically up to 4.5mm.
To obtain 4.5mm, loosen screw F and move stop pin G to release the stopping position.
If you change to the maximum feeding amount, adjust the feed dogs front to back while checking to make sure the feed dogs do not touch the needle plate.

【9】PRESSER FOOT

9-1 Presser foot pressure

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.

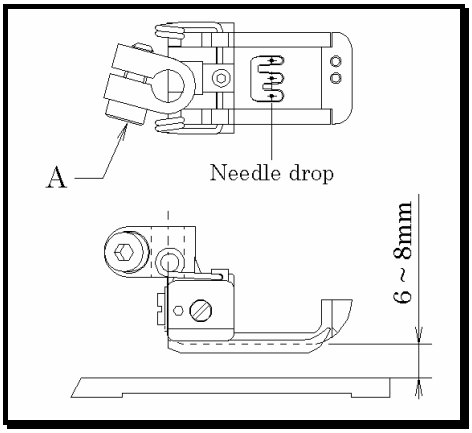


9-2 Position of the presser foot & foot lift

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

■Position of the presser foot

Loosen screw A. Adjust by moving the presser foot left or right while checking to make sure the needle drops correctly to the center of the presser foot needle drop hole.

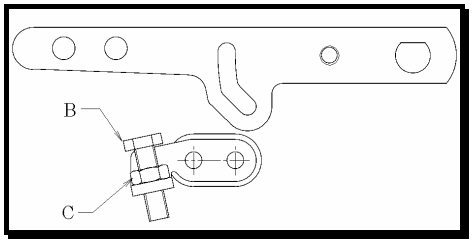


■Foot lift

For machines with the spreader, the presser foot should be 6mm above the top surface of the needle plate. Check to make sure presser foot does not touch the spreader with the presser foot in the above position. For machines without the spreader, the presser foot should be 8mm above the top surface of the needle plate.

Set stopper B at the required position.

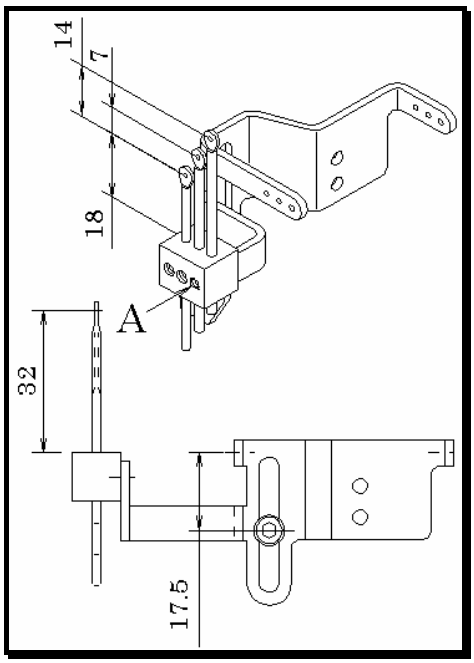
Fasten the presser foot lift lever with nut C so that the lever cannot be lowered.



【10】STITCH FORMATION

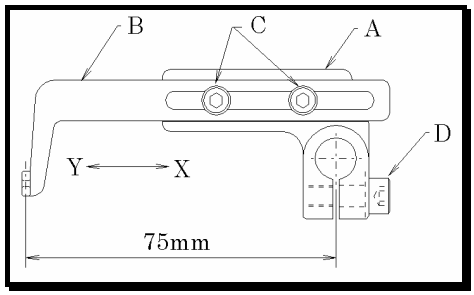
10-1 Position of the needle thread guides

The distance from the center of the eyelet of the needle thread guide to that of the set screw should be approximately 17.5mm (see the illustration).
Adjust the height of the thread guides by loosening screws A and moving each thread guide up or down (refer to the distances shown in the illustration).
If the stitch formation cannot be changed extremely by adjusting the height of the thread guides because of the thread to be used, unravel the thread after test sewing and adjust the height of the thread guides while checking the tension of the needle thread.



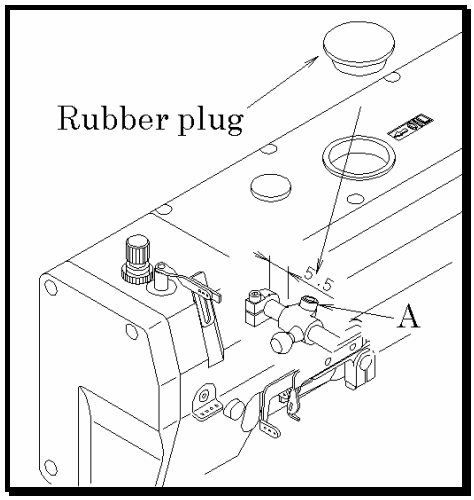
10-2 Position of the thread guide on the needle thread take-up

When the needle bar is at the bottom of its stroke, needle thread take-up bracket A should be level and the distance from the center of the shaft to the thread guide of needle thread take-up B should be 75mm. To make this adjustment, loosen screws C and D. To tighten the needle thread, move needle thread take-up to Y. To loosen the needle thread, move needle thread take-up to X.



10-3 Timing of the needle thread take-up

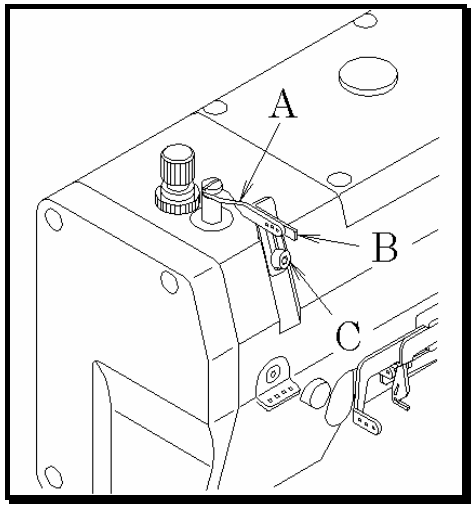
The timing of the needle thread take-up in relation to the up-and-down movement of the needles can be adjusted. This timing is factory-set to synchronize with the up-and-down movement of the needle bar.



< Note >
The rod ball is factory-set at 5.5mm from the rear end of the shaft. To make the needle thread loop small, move the rod ball to the front. To make the needle thread loop large, move the rod ball to the back. Remove the rubber top plug. Loosen the screw of (A) with a 5mm wrench. Then move the rod ball to the front or back.

10-4 Position of the needle thread guard

When the needle bar is at the bottom of its stroke, the center of the eyelet of thread guide A should be level with the top surface of needle thread guard B. In addition, A should be parallel with B.
To adjust the height of needle thread guard B, loosen screw C and move needle thread guard B up or down. To tighten the needle thread, move up B. To loosen the needle thread, move down B.

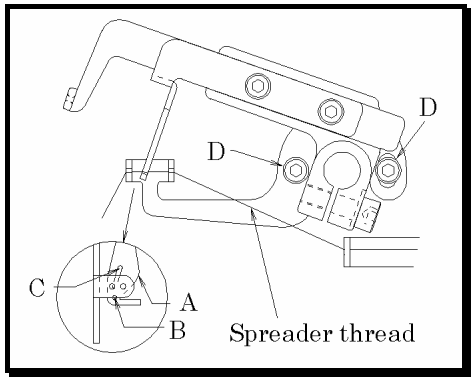


■For cotton threads (non-stretchable threads)
Bring the needle thread guard 2.0mm below the standard, or do not use the needle thread guard.
Loosen screw C and move down the needle thread guard.

■For woolly threads (stretchable threads)
Raise the needle thread guard as high as possible.

10-5 Position of the thread guide of the spreader thread take-up

When the needle bar is at the top of its stroke, thread any one of parts A, B and C on the spreader thread take-up with spreader thread.

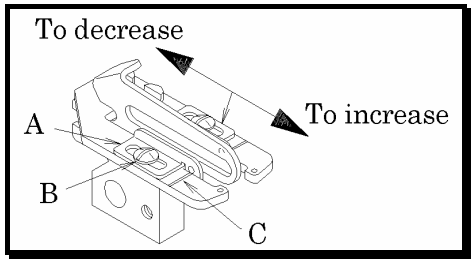


■For woolly threads: Thread B or C.

■For cotton threads or spun threads
Thread A and adjust the spreader thread take-up according to the thread or fabric to be used.
Adjust by moving up or down the spreader thread take-up with screws D.

10-6 Position of the thread guide of the looper thread take-up

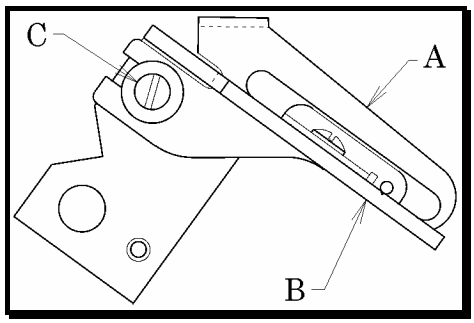
Position thread guide A according to the amount of looper thread supplied by the looper thread take-up.
To do so, loosen screw B and move the eyelet of thread guide A to the front or back while referring to alignment mark C on the bracket.



■To increase the amount of looper thread
Move the eyelet of A to the front.

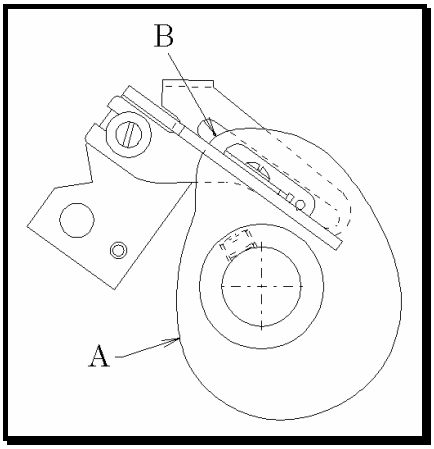
■To decrease the amount of looper thread
Move the eyelet of A to the back.

■To adjust the height of thread guide A
Loosen screw C and adjust thread guide A so that the bottom surface of the slot will be flush with the top surface of plate B.

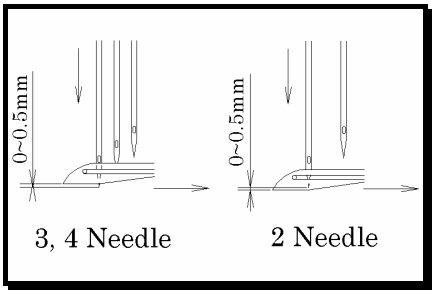


10-7 Position of the looper thread take-up

When the point of the left needle descending to the back side of the looper has reached 0~0.5mm above the bottom surface of the looper blade while the looper is moving to the right from the extreme left end of its travel, the looper thread should be removed properly from position B on the looper thread take-up.



■Position of the point of the left needle when the looper thread is removed from point B on the looper thread take-up. On 3,4-needle machines the point of the left needle is slightly below the bottom surface of the looper blade. On 2-needle machines the point of the left needle is slightly above the bottom surface of the looper blade.



【11】ADJUSTING THE ALK AND PLK

11-1 Specifications of the ALK and PLK

1. Needle bar stroke ·····33mm
2. Upper knife stroke ·····4.5mm
3. Hem width ·····12.7~25.4mm ALK (with an auxiliary presser foot)
4. Elastic width ·····10~30mm PLK (with an auxiliary presser foot)
5. With rear puller ·····No. of threads on the upper puller : 28 (PLK)

11-2 Adjusting the PLK for inserting elastic into waists of tubular goods

1. To install each elastic tension roller
   a. Secure rear roller bracket A with bolt B and nut C onto the top surface of the machine table.
   b. Install front roller installation bracket E on the underside of the machine table (refer to the distances from table ends X and Y shown below).
   c. Install lower taper roller bracket D on the underside of the machine table (refer to the distance from table end Y shown below).
2. To sew the fabric
   a. Raise the presser foot and position elastic tape T as shown below.
   b. Cover elastic tape T with the fabric positioned along lower elastic guide (U). Rotate the fabric in the operating direction. The fabric is folded along lower elastic guide (U) and right fabric guide (V). Go on until the fabric edge reaches left fabric guide (W). Then lower the presser foot.

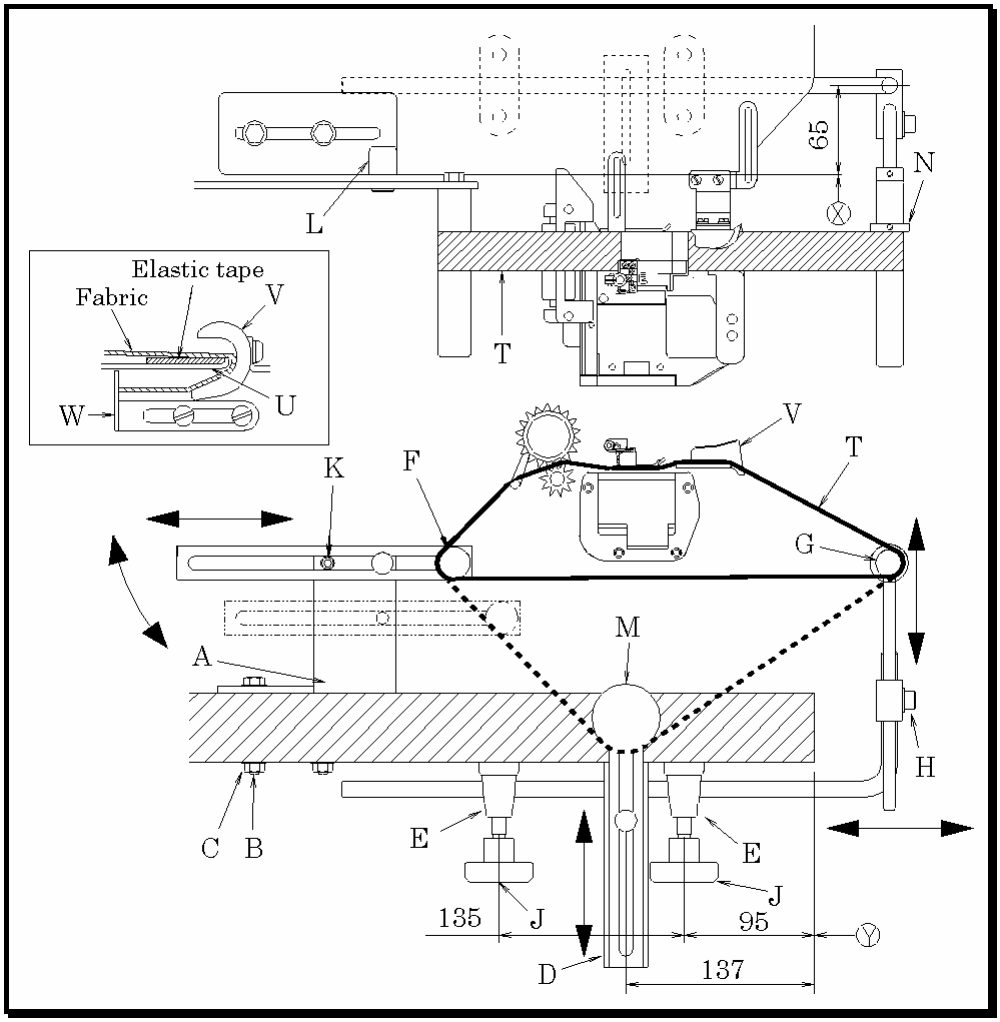
c. Place the fabric on rear roller F and protrude the fabric edge sufficiently to the right to form a hem. Hold the fabric lightly by hand so that the fabric will not move to the left or right. Do not form a hem forcibly during sewing.
It may cause trouble due to the change of tension on the fabric.

d. When the start of sewing comes close to lower elastic guide (U) and right fabric guide (V), stop sewing and then press the knee switch under the machine table.
The whole elastic guide moves to the left.
Remove the fabric from lower elastic guide (U) and right fabric guide (V).
Sew the fabric while checking to see if the fabric edge is uniform and/or seams at the start of sewing match those at the end of sewing.

3. To adjust each elastic tension roller

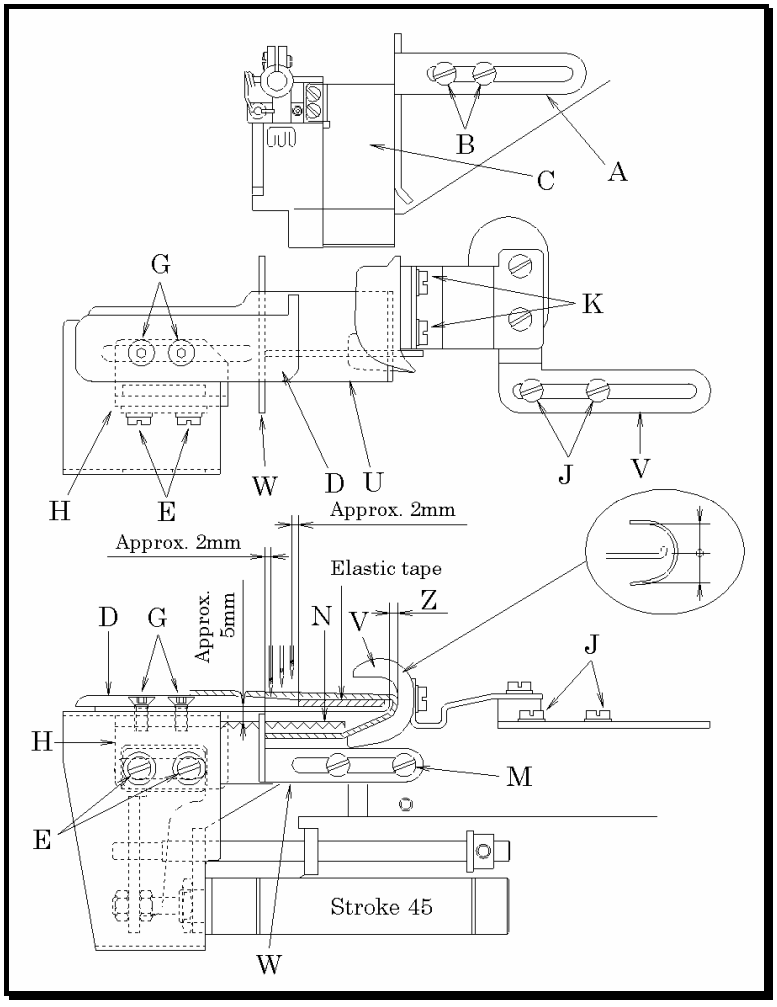
a. Position rear roller F and front roller G according to the size of the fabric which is spread properly. Loosen lever L and adjust rear roller F front to back.
The rear roller can be lowered on bracket A by changing the position of screw K.
In addition, the rear roller can be adjusted front to back and tilted forward or backward with lever L (see below). If the fabric is large, adjust by moving up or down lower taper roller M. Lower taper roller M can be adjusted up and down easily by loosening the lever.

b. Adjust elastic guide N for front roller G left to right by positioning elastic guide N correctly along to the right side of the elastic tape.
Loosen screw H and adjust the height and direction of the front roller.
Loosen knob J and adjust the front roller front to back.



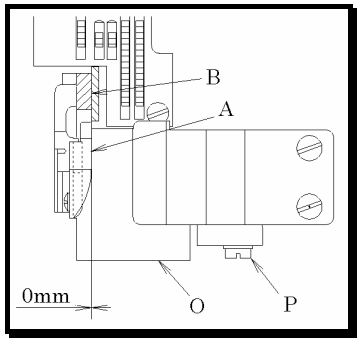
11-3 Adjusting each holder

1. To adjust the height of the lower elastic guide
   The clearance between lower elastic guide U and top surface N of the needle plate is factory-set at approximately 5mm. Adjust this clearance according to the fabric to be used. Loosen screw E and move elastic guide bracket H up or down as required.
2. To adjust elastic tape left to right
   Loosen screws E. Adjust upper elastic guide D left to right so that the clearance between the left edge of elastic tape and the right needle is approximately 2mm.
3. To adjust the elastic width
   Loosen screws G and adjust lower elastic guide U left to right according to the elastic width.
4. To adjust the hem width
   Adjust fabric guide (right) V and rear fabric guide (right) A.
   Loosen screws J and B. Adjust V and A left to right according the hem width.
   To adjust fabric guide (right) V up and down, loosen screws K and position lower elastic guide U so that it is approximately centered in the fabric guide (right).
   Adjust clearance Z between fabric guide (right) V and lower elastic guide U according to the fabric. Loosen screws J and adjust fabric guide (right) V left to right.
   If the hem width is smaller than the width of fabric pressing plate C, file or grind the right edge of C.
5. To adjust the width of the fabric edge to be cut
   Loosen screws M. Adjust fabric guide (left) W left to right so that the clearance between the raw edge of the fabric and the left needle is approximately 2mm.



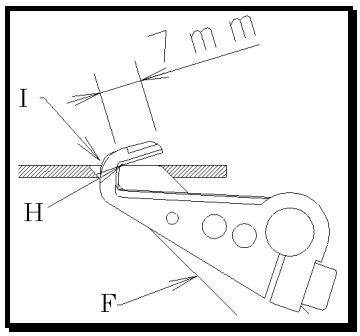
11-4 Adjusting the hem guide (ALK)

Between A line and B line of the side of upper knife should be make same line. To adjustment of hem guide, loosen screw P on the guide O.



11-5 Adjusting the fabric trimmer positioned to the left of the needle

1. To adjust the width of the fabric edge to be cut
   Loosen screw A and adjust by moving upper knife holder D and lower knife holder W simultaneously left to right as required. Then tighten screw A.



< Note >

Add a small amount of oil from oil holes P and Q periodically.

2. To remove/install the lower knife

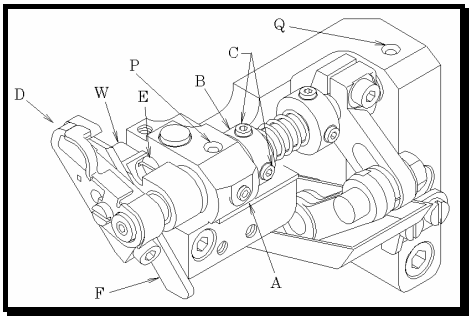
< To remove the lower knife >

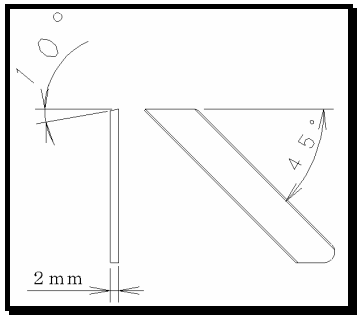
a. Open the front and side covers.
b. Loosen screw C on collar (left) B.
c. Press upper knife holder D to the left to create the clearance between the upper and lower knives.
d. Tighten screws C on collar (left) B temporarily.
e. Loosen screw E on lower knife holder W and remove the lower knife.

< To install the lower knife >

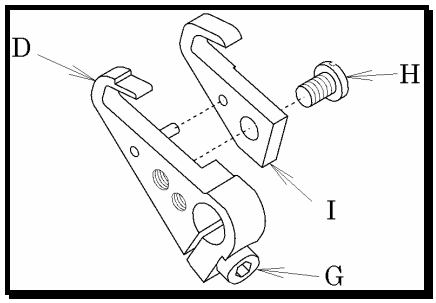
a. Align the cutting edge of lower knife F with the top surface of the needle plate. Then tighten screw E.
b. Loosen screw C on collar (left) B temporarily.
c. The upper knife turns to the right with spring pressure to mate with the lower knife.
d. Place a thread between the upper and lower knives and check for the proper cutting action by turning the machine pulley by hand.
e. The distance between the point of upper knife and the point H of the cutting edge of lower knife F should be 7mm and tighten screw C on the collar B.
f. Recheck for the proper cutting action of the upper and lower knives.

3. To resharpen the lower knife
   When the upper and lower knives become dull, resharpen the lower knife.
   Reserve new upper and lower knives for replacement.





4. To remove/install the upper knife



< To remove the upper knife >

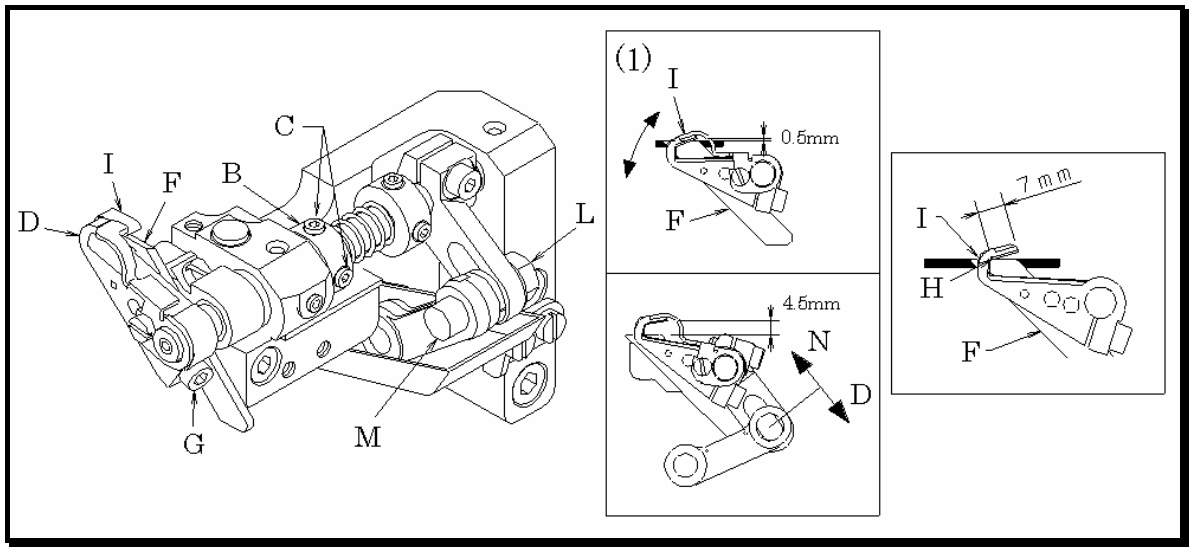
a. Loosen screw G and remove the upper knife bracket D.
b. Loosen screw H and remove the upper knife I.

< To install the upper knife >

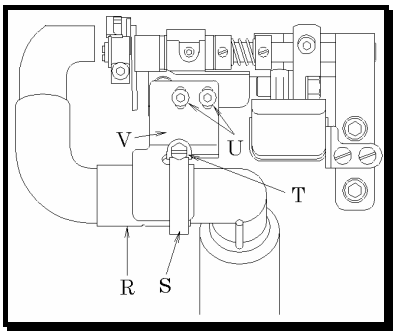
a. Install the upper knife I and tighten screw H.
b. Install the upper knife bracket D and tighten screw G temporarily.
c. When the upper knife I is at the bottom of its stroke, adjust the overlap of upper knife I and lower knife F by referring to the illustration on the below (1).
And tighten screw G
d. To increase overlap, loosen screw C on collar B the overlap are pressure by the spring.
e. Place a thread between the upper and lower knives and check for the proper cutting action by turning the machine pulley by hand.
f. The distance between the point of upper knife and the point H of the cutting edge of lower knife F should be 7mm and tighten screw C on the collar B.
g. Place a thread between the upper and lower knives and check for proper cutting action by turning the machine pulley by hand again.

5. To adjust the stroke of the upper knife
To decrease of upper knife's stroke. Loosen nut L, and the upper knife lever pin M should be move to downward. And tighten nut L.
To increase of upper knife's stroke. Loosen nut L, and the upper knife lever pin M should be move to upward. And tighten nut L.

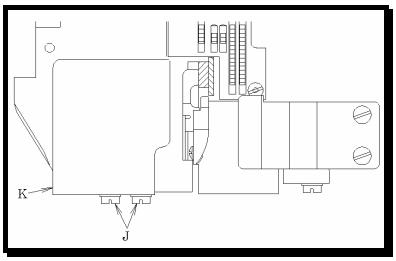
< Note >
When the stroke was changed, the overlap 05mm between upper and lower knives needs to re-adjust at the above mention of c to g. Factory adjustment.
The stroke of upper knife is adjusted by 4.5mm, which is minimum of it (The upper knife lever pin M is the point of bottom). For gaud of upper and lower knives, the distance between the point of upper knife I and the point H of the cutting edge of lower knife F should be 7mm then tighten screw C on the collar B.



6. To adjust the sucking pipe
Loosen screws U on bracket V and adjust sucking pipe R up and down.
Loosen screw T on band S and adjust sucking pipe R front to back and left to right. Install sucking pipe R properly.



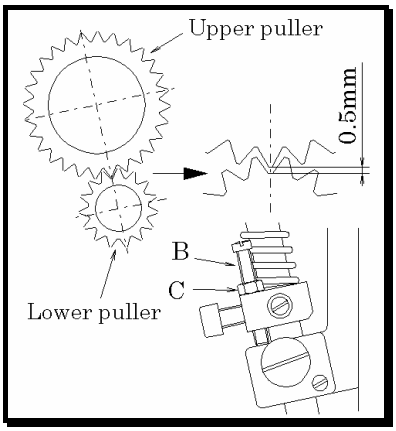
7. To adjust the support cover
When the position of vacuum pipe was changed, also, the position of support cover K should be change by loosen screw J.



【12】ADJUSTING THE REAR PULLER

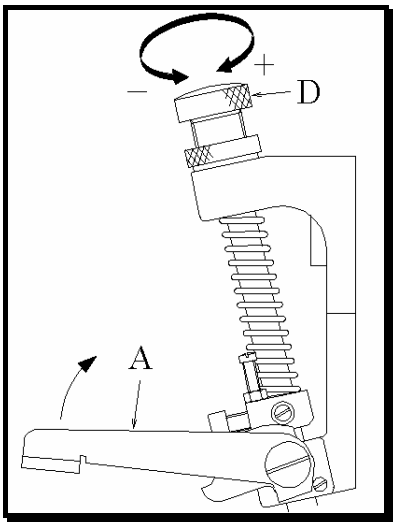
12-1 Position of the hand lever and the stopper

To position or remove the fabric, raise hand lever A.
With the hand lever lowered, adjust stopper B so that the clearance between the upper and lower pullers is 0.5mm.
Then tighten nut C.



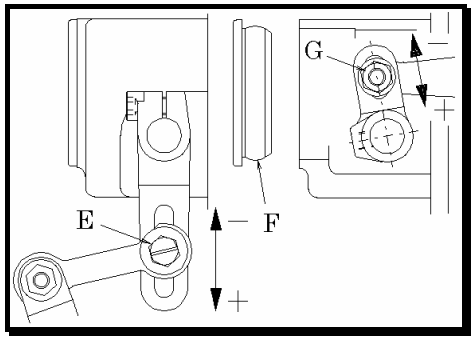
12-2 To adjust the puller pressure

The puller pressure should be as light as possible, yet be sufficient to feed the fabric smoothly.
To increase the pressure, turn adjusting knob D clockwise.
To decrease the pressure, turn adjusting knob D counterclockwise.



12-3 To adjust the feeding amount of the rear puller

The feeding amount of the rear puller should be the same as that of the feed dog. Loosen nut E.
To decrease the amount, move upward.
To increase the amount, move downward.
If the proper feeding amount is still not obtained after the above adjustment, remove rubber plug F and loosen screw G with a hex. wrench.
To decrease the amount, move upward.
To increase the amount, move downward.



【13】ADJUSTING THE PHK

13-1 Adjusting the roller

■Adjustment for elastic band's tension the parts B in fig (1) (roller bracket) should be fit with the bottom surface of table correctly with referring to dimensions in fig (1), (2).

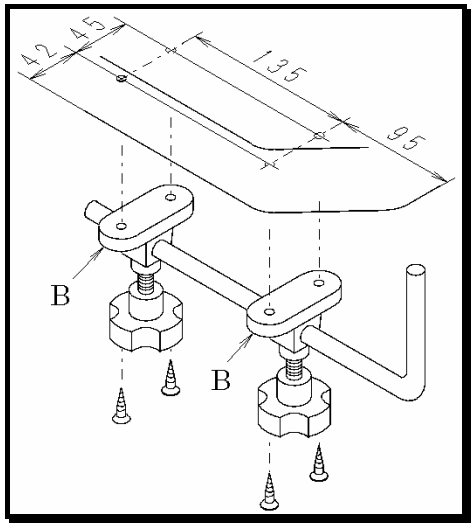


Fig 1

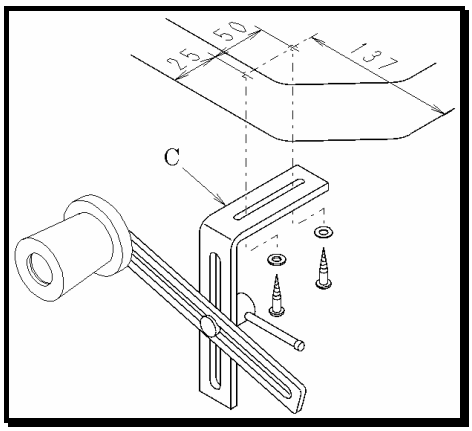
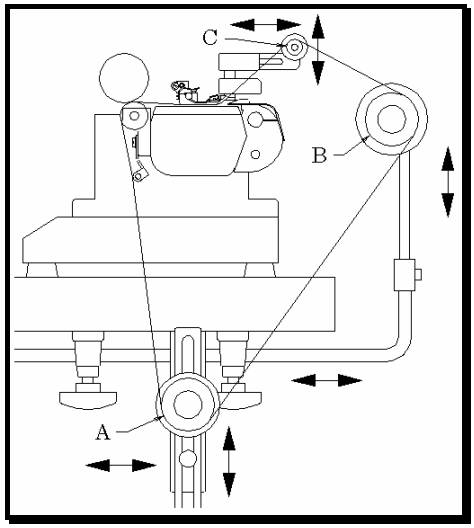
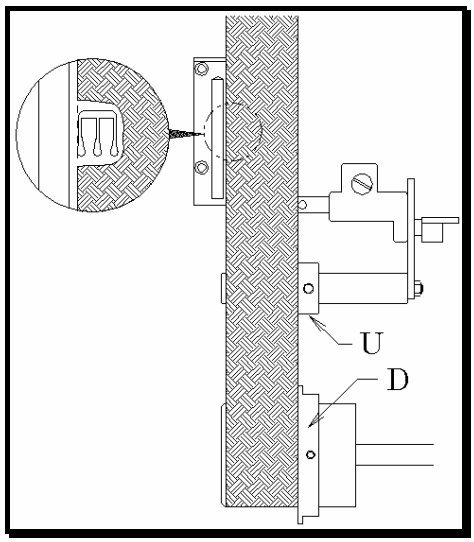


Fig 2

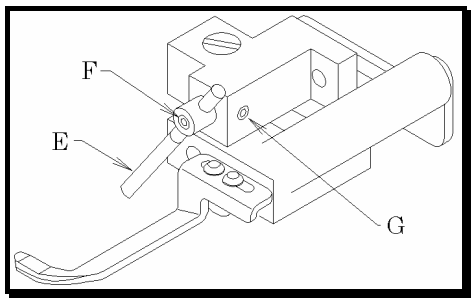
■Rollers A, B, C are adjustable with finished waist size so that rollers adjust the proper position for elastic band's size.



■In order to locate the elastic band by moving properly (L-R direction).
Adjust by the elastic slast collar D on the front roller B, the elastic guide collar U on the front roller C, and the elastic guide pole E on the upper side of the ruler plate. 25~45cm widths of the elastic band can be used.

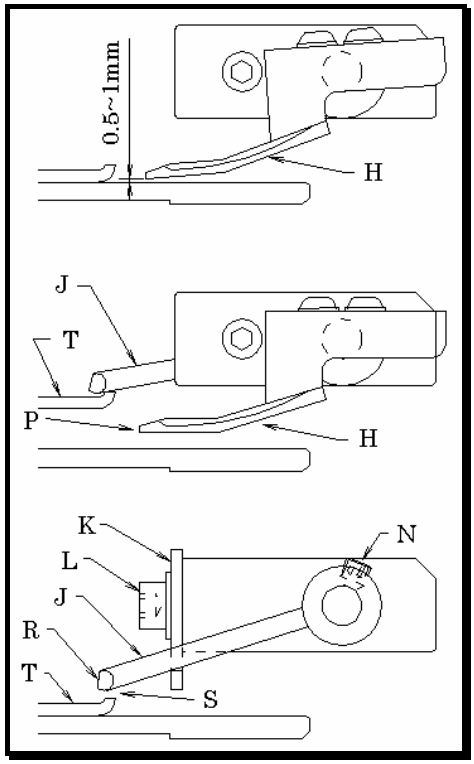


< Note >
By adjusting screw F and G, locate elastic guide pole E along with the right edge of the elastic band, and make the pole E to presser foot as near as possible with out touch.

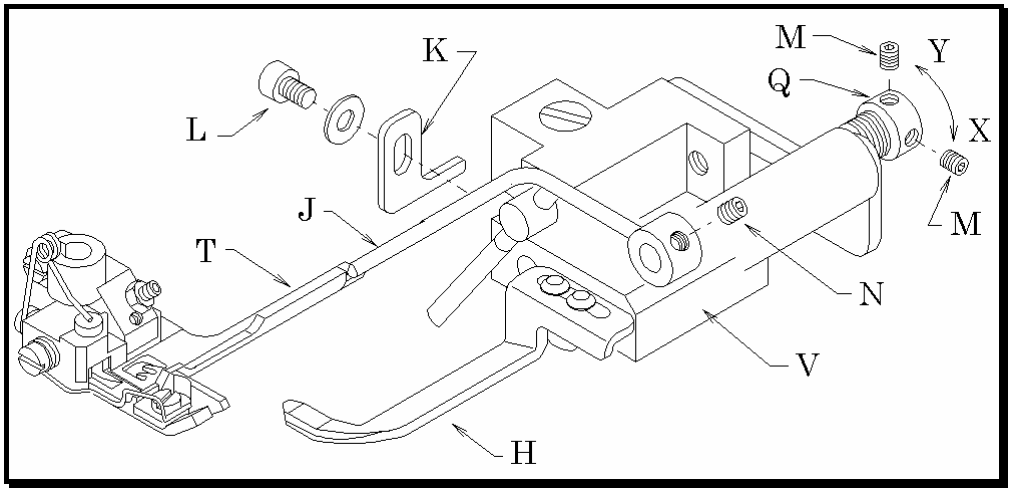


13-2 Adjusting the cloth presser

1. Spring pressure of the cloth presser can be adjusted by loosing screw M on the collar Q. Turning the collar to the direction of arrow X can strengthen spring presser, and turning the collar to the direction of arrow Y can weaken it.
2. Make the distance of 0.5~1.0mm between the edge P of the cloth presser H and needle plate when presser foot descends as shown in the figure. Locate the edge P of the cloth presser H at the middle point between needle plate and presser foot.
3. Make the gap S between the presser foot T and the edge R of the guide bar J by loosing screw N on the guide bar J and screw L on the stopper K. Tighten the screw N and L after this adjustment.

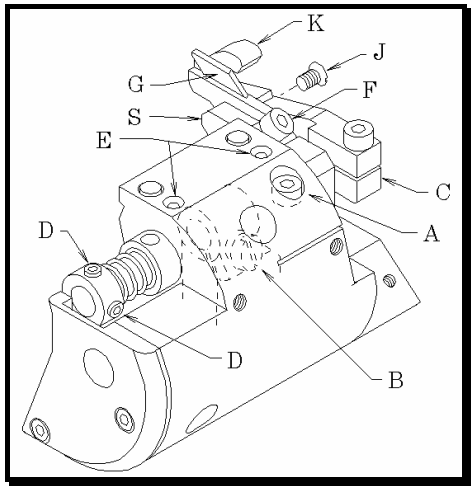


< Note >
Guide bar Attachment table V has a hole to fill oil. Insert some oil from it periodically.



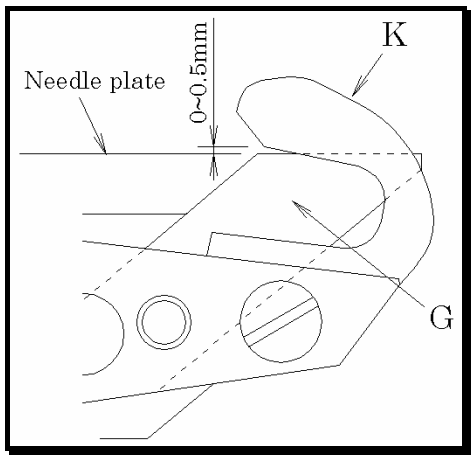
13-3 Adjusting the knife apparatus

1. Adjusting the width of knife (Adjusting the cutting point of clothe)
   a. Detach cloth guide.
   b. Locate lower knife table S properly by loosening screw A on the lower knife table S and screw B on the upper knife drive lever.
   c. Tighten screw A on the lower knife table an screw B on the upper knife drive lever.



< Note >
Do not tighten the screw A on the lower knife too much.

   d. Make sure whether you can move the upper knife table C to the right against spring pressure. If you cannot move it, loosen the screw B on the upper knife drive lever and move the upper knife table C to the right.
   e. Increase spring pressure properly by loosening screw D on collar ((left).



< Note >
Insert some oil from a hole E periodically.

2. How to detach/attach the lower knife

<Detaching the lower knife>
   a. Detach the cloth guide.
   b. Loosen screw F on the lower knife table S.
   c. Remove lower knife G downward by making a gap between the upper knife K and the lower knife G, while pulling the upper knife table C to the right.

<Attaching the lower knife>
   a. Tighten screw F while locating the edge of the lower knife G on the surface of the needle plate.
   b. Make sure the sharpness of the upper and lower knives by putting a thread between them and rotating a pulley manually.

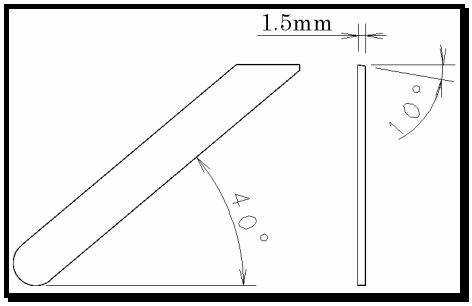
3. How to detach/attach the upper knife.

<Detaching the upper knife>
   a. Temporally tighten screw B at which you can see the screw J on the upper knife, while loosening.
   b. Detach the upper knife by loosening screw J on the upper knife K.

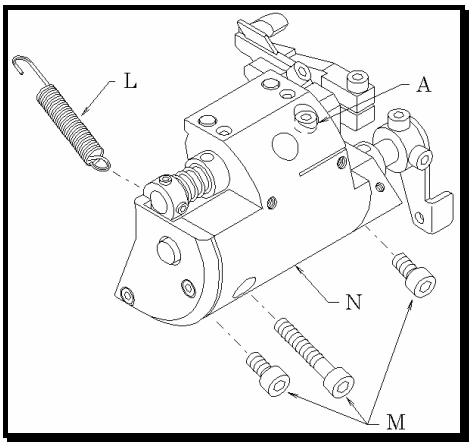
<Attaching the upper knife>
   a. Tighten screw J while attaching the upper knife K to the upper knife table C.
   b. Make sure the sharpness of the upper and lower knives by putting a thread between them and rotating a pulley manually.

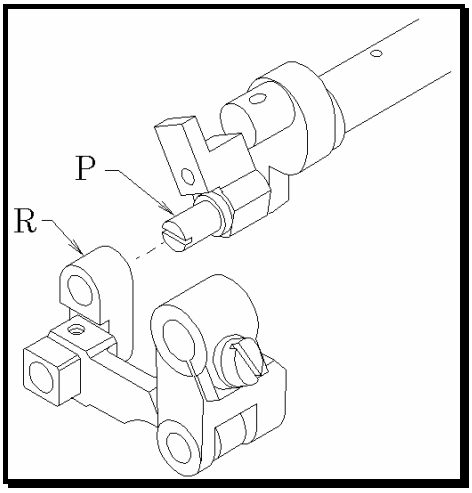
4. Adjusting the contact of the upper and the lower knives.
   Adjust the contact of the upper knife K and the lower knife G by loosening the screw B on the upper knife drive lever as shown on the figure when the upper knife K descends to its lowest point. Tighten the screw B after this adjustment.

5. How to grind knives.
   Not necessary to grind the upper knife for about a year due to cemented carbide.
   Grind the lower knife if you find blunt for the period.



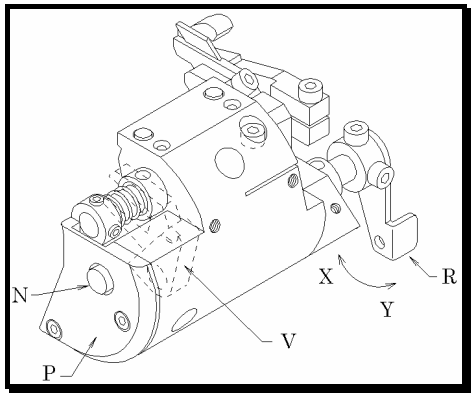
6. How to detach the right knife table.
   a. Open the side cover and detach upper knife adjust spring L.
   b. Remove 3 screws M on the right knife table N.
   c. Move the needle bar to the upper death point by rotating puller manually.
   d. Detach the right knife table from its bed. You can loosen screw A on the lower knife table if you cannot do so.
   e. Detach the link R from drive pin P attaching the edge of the up-down feeding axis.



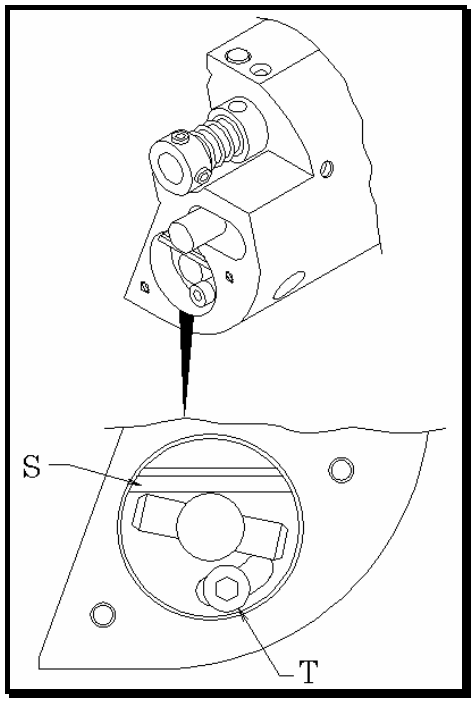


13-4 Adjusting the mechanism of knife drops

1. In case you function the mechanism of knife drops.
   a. Descent the upper knife and stop its movement by rotating the drop lever R to the direction of arrow X.
   b. You can lock the movement of the upper knife by pressing the drop lever R to the last and pressing the push bottom N to the point at which the bottom reaches the upper knife adjust lever V.
   c. Pull the drop lever R to the direction Y slightly until the edge of the push bottom N touches the upper knife adjust lever V.
      You can lock the movement of the upper knife after this.
   d. In order to unlock it, push the drop lever R to the direction of Y.
      Push bottom N will be away from the upper knife adjust lever V.
      At this stage, you can unlock the drop of the upper knife by pulling the drop lever R to the direction of Y.



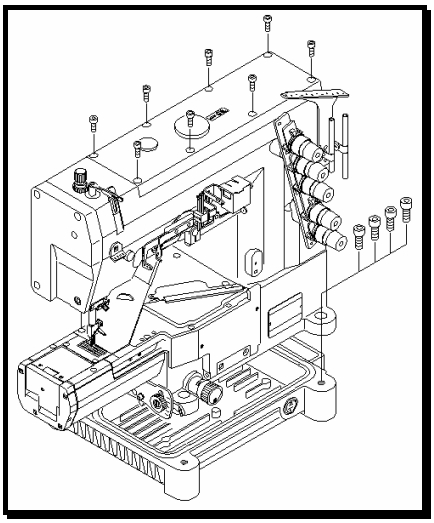
2. Adjusting the mechanism of knife drops.
   a. Detach the side cover P.
   b. Adjust by above-mentioned guidance (13.4:1-a, b) by loosening screw T on the adjust lever stopper S.
      Be careful not to change the contact of the knives this procedure.
   c. Tighten the screw T after this adjustment.



【14】Replacing the timing belt

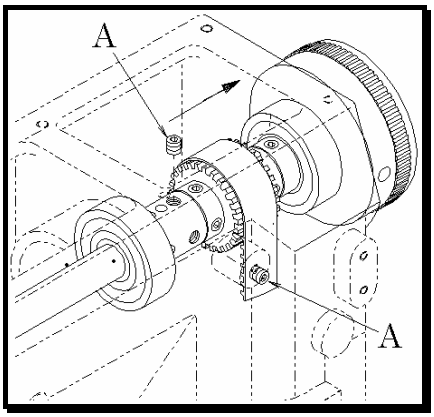
14-1 Marks on the timing belts

The X Series is available in timing belts of [A], [B] and [C] according to the distance between the upper and lower shafts. [A] indicates the longest timing belt.



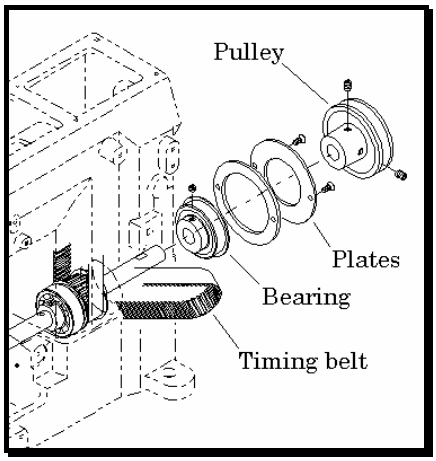
14-2 To remove the timing belt

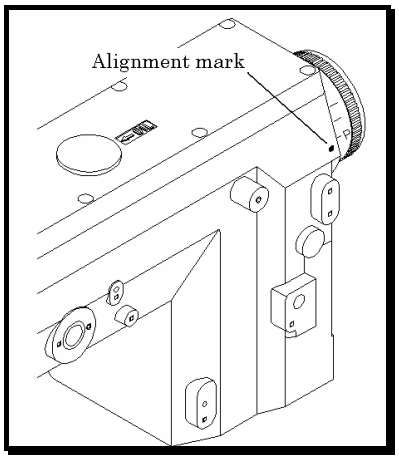
1. Loosen the eight arm cover set screws and the four oil reservoir set screws (see the illustration).
   Remove each part.
2. Loosen two screws A. Remove the handwheel to the right while turning it slowly (see the illustration).
3. Remove the pulley, plates and bearing in sequence by referring to the illustration.
   Then remove the timing belt from the hole for the bearing.



14-3 To place the timing belt

1. Install the timing belt, bearing, plates, pulley and cover by performing the reverse procedure of 13-2 (3).
2. Position the bearing so that the point of the screw is fitted correctly into the positioning hole on the lower shaft. Then tighten the screw to secure the bearing.
3. Move the looper to the extreme right end of its travel by turning the machine pulley. Bring the needle bar down to the bottom of its stroke by hand.
4. Then place the belt onto the timing pulley on the upper shaft. Tighten two screws A.
5. Bring the needle bar up to the top of its stroke by turning the machine pulley. Check to make sure mark "P" on the handwheel is aligned with alignment mark "O" on the bed.
6. To make a fine adjustment for the timing of the needle and looper, refer to 5-2.





【15】CLEANING THE MACHINE

At the end of each day, remove the needle plate and clean the slots of the needle plate and the area around the feed dogs.