

INSTRUCTION

DX ***SERIES***

Industrial Sewing Machines

DX9902-3U
DX9900-4U

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No. 970038

KANSAI
SPECIAL®

INTRODUCTION

Thank you for your purchasing Kansai Special's DX 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.

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【1】 NEEDLES & THREADING THE MACHINE

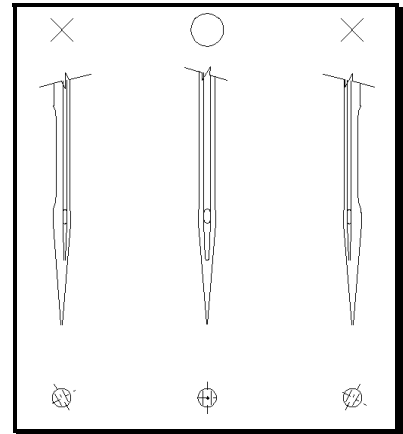
1-1 Needles

TV × 5 of Schmetz or Organ

Select the proper needle for the fabric and thread.

< Needles and needle size >

Schmetz	Nm80	Nm90	Nm100
Organ	# 12	# 14	# 16



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.

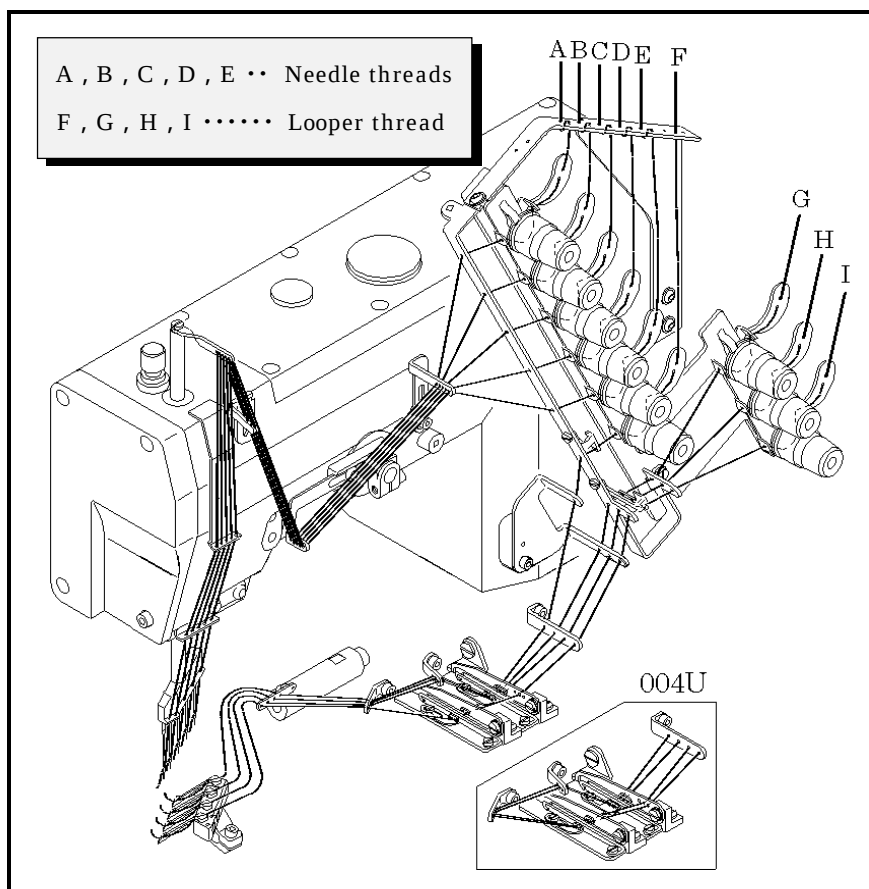
< Note >

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.

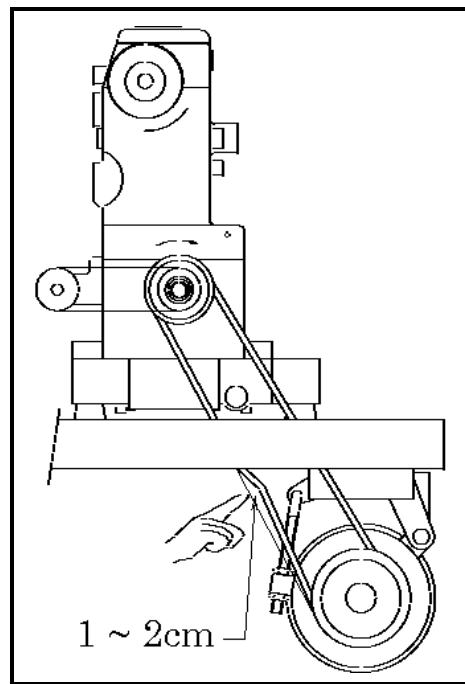
Threading the machine incorrectly may cause skip stitching, thread breakage and/or uneven stitch formation. Thread tension should be changed according to various kinds of conditions such as the thread to be used and/or the feeding amount (see Chapter 9 for "Stitch formation").



【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
DX	4500SPM	4000SPM
DX-LK	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)

【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

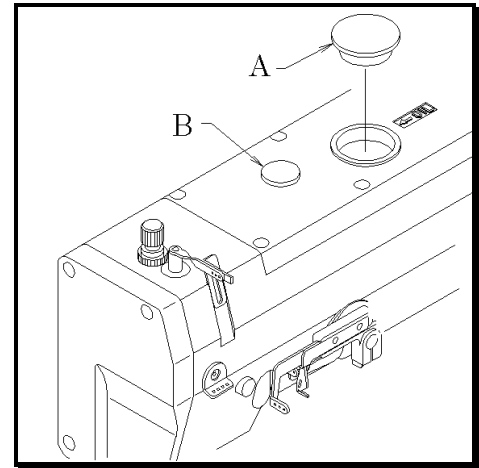
Remove rubber plug A from the oil hole.

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.

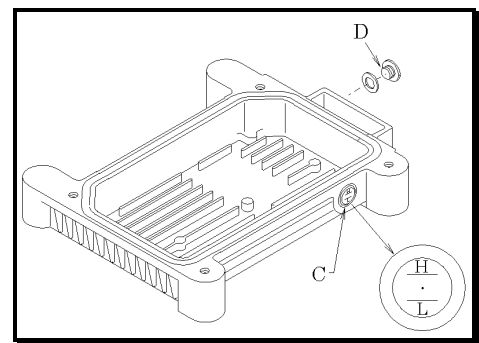


3-3 Replacing the oil and the oil element

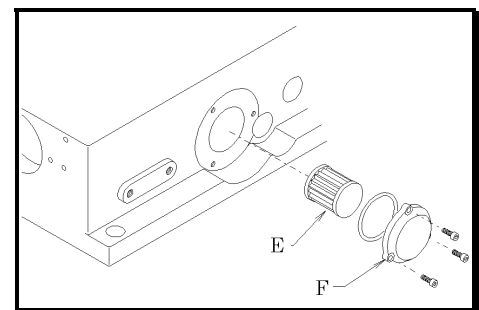
To extend machine life, be sure to replace the oil after the first 250 hours of operation.

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.

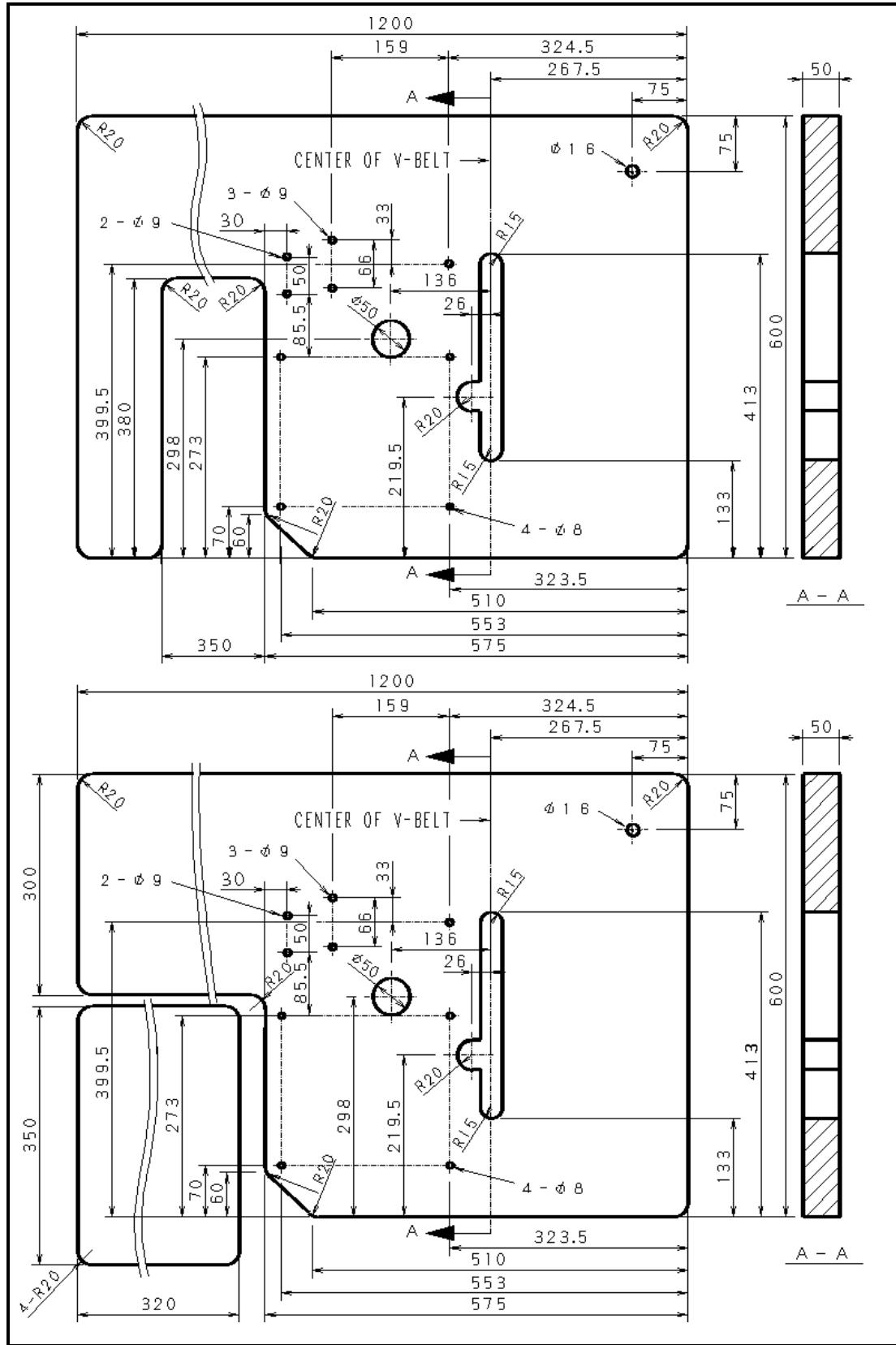


< Note >

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

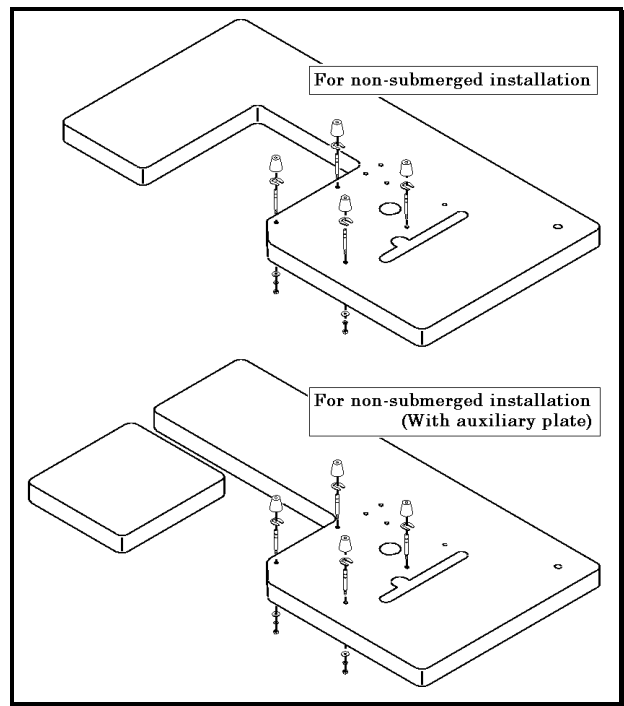
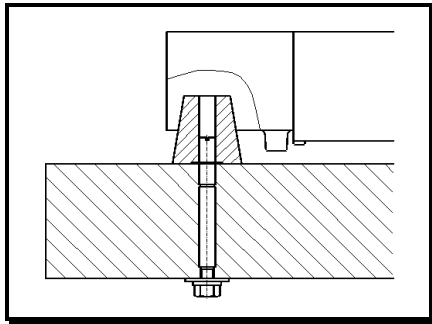


4-2 Installing the machine

■ Non-submerged installation

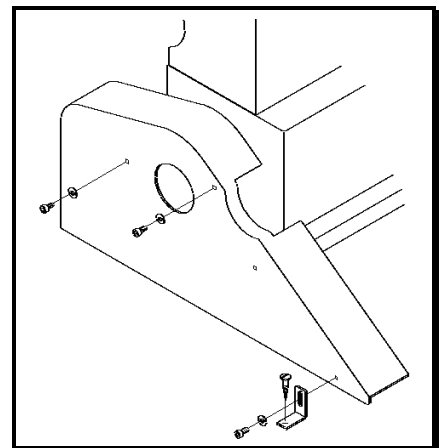
Install the machine correctly by referring to the illustration.

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.



■ Replacing the belt cover

Install the belt cover correctly by referring to the illustration.



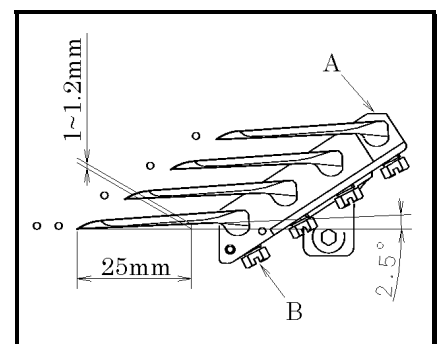
【5】TIMING OF THE LOOPER TO THE NEEDLES

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 2.5° .

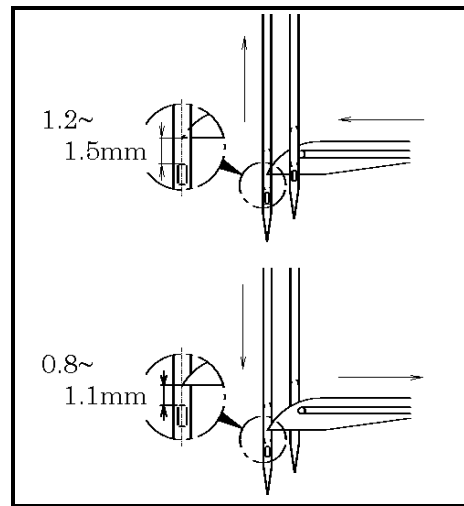
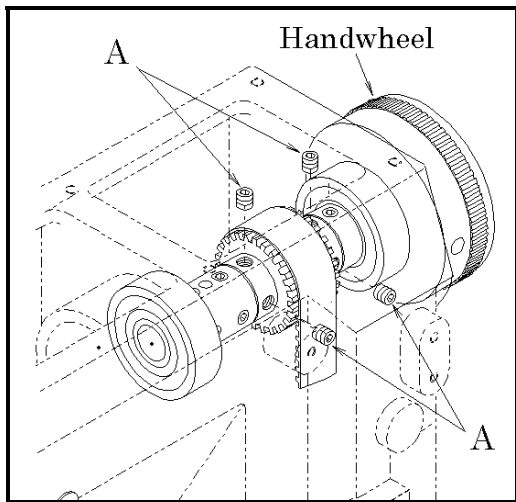
Distance at 25mm from the point of the looper between the bottom of the looper blade and the extension line from the point of the looper: Approximately 1.1mm



5-2 Looper left-to-right movement

The point of the looper should be approximately 1.2~1.5mm above the top of the left needle's eye when the looper moves to the left on the back side of the needles.

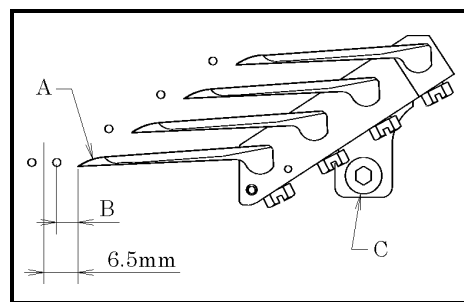
The point of the looper should be approximately 0.8~1.1mm above the top of the left needle's eye when the looper moves to the right on the front side of the needles (see the illustration below). To adjust the timing of the looper to the needles, remove the machine cover, loosen screws A on the timing 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

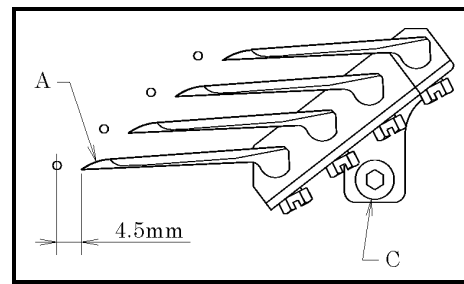
Adjustment should be made by referring to looper A. When the needle is at the bottom of its stroke with the looper at the extreme right end of its travel, setting distance B from the point of the looper to the center of the right needle varies according to the needle space (see the table below).

Adjustment is made by loosening screw C on the looper holder.



- If the needle space is different, the distance from the point of the looper to the center of the right needle should be 6.5mm on cover stitch machines. On double chainstitch machines it should be 4.5mm.

	Needle space	Looper setting distance Center of the right needle (B)
02-3U	4.8-10-10-10	4.1mm
	5.0-13-13-13	4mm
00-4U	8.5-8.5-8.5	4.5mm
	9.5-9.5-9.5	4.5mm
	6.4-6.4-6.4	4.5mm



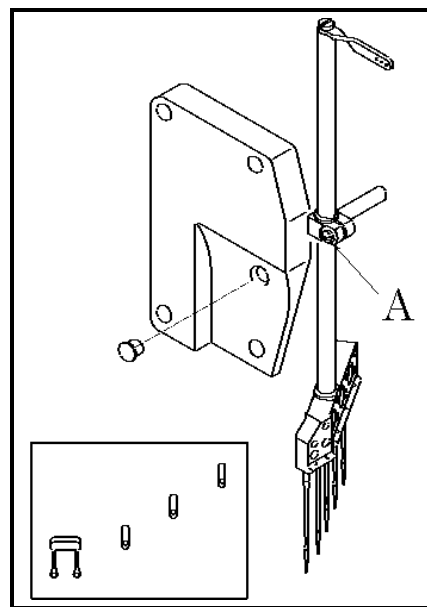
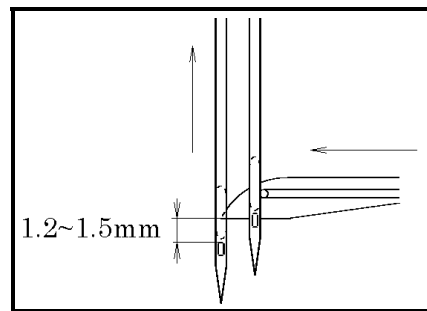
5-4 Needle height

The point of the looper should be 1.2~1.5mm 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 >

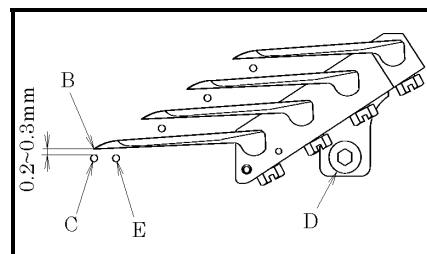
After the above adjustment, check to make sure each needle drops into the center of each needle hole.



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

■ 2-3U

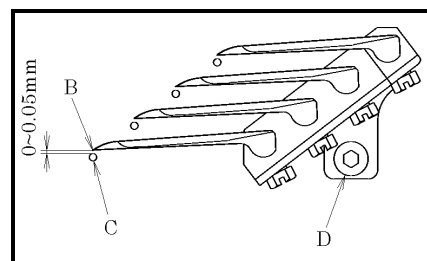
When point B of the looper reaches left needle C, there should be a clearance of 0.2~0.3mm between point B of the looper and left needle C. When point B of the looper reaches right needle E, they should slightly touch with each other. Adjustment is made by loosening screw D on the looper holder. After the above adjustments are made, the clearance between the point of the looper and right needle E should be 0~0.05mm with right needle E deflected by the needle guard (rear).



■ 004U

When point B of the looper reaches needle C, point B of the looper should slightly touch needle C.

Adjustment is made by loosening screw D on the looper holder. After the above adjustments are made, the clearance between point B of the looper and needle C should be 0~0.05mm with needle C deflected by the needle guard (rear).



<Note>

Make sure the setting distance is not changed when the looper holder is moved front or back.

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 0.2~0.3mm.

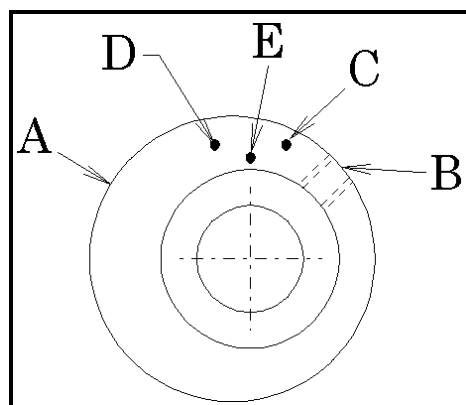
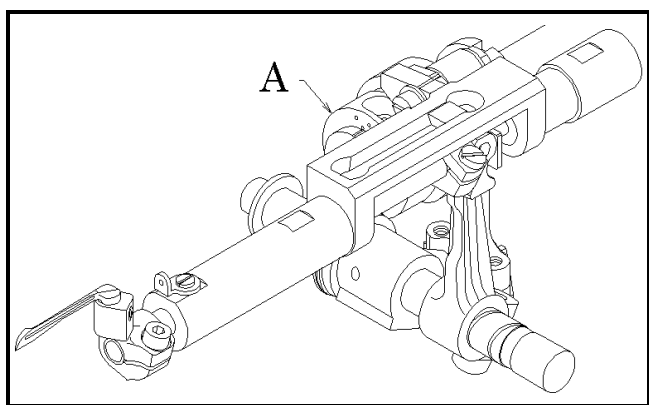


< Note >

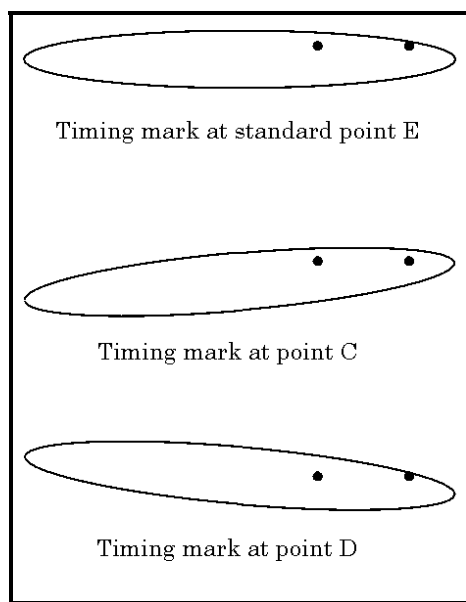
To sew under good conditions, after changing the amount of the looper front-to-back movement adjust the looper orbit by moving the timing mark slightly to C or D.

To change the looper's orbit, loosen screw B on eccentric A and shift the timing mark by moving eccentric A front or back. The timing mark is factory-set for standard.

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. The clearance when the looper moves to the right increases. Then the point of the looper touches the right needle. Skip stitching may occur when the looper moves to the right. A thread chain is not produced smoothly.
- When the timing mark is at point D, The clearance between the point of the looper and the left needle increases. Skip stitching may occur when the looper moves to the left. The needle extremely touches the back of the looper, causing needle breakage.



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 #14 (Nm90). If you use needle counts #11 (Nm75), adjust the amount as required.

Remove the inside cover.

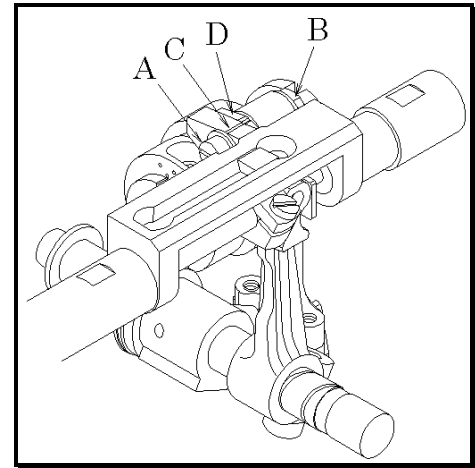
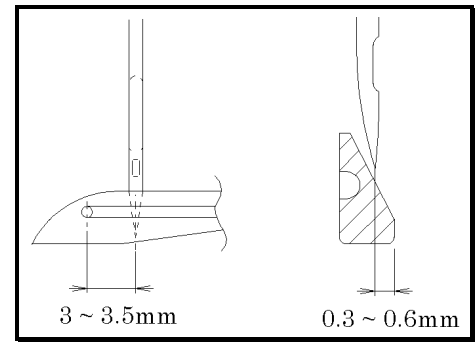
Loosen nut B while holding screw A for the looper front-to-back adjusting pin with a screwdriver.

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 >

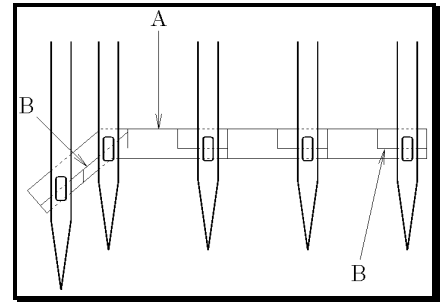
If you change the amount of the looper front-to-back movement, the clearance between the point of the left needle and the back side of the looper when the looper moves to the right from the extreme left end of its travel should be 0.3~0.6mm.

【6】 ADJUSTING THE NEEDLE GUARDS (FRONT AND REAR)

6-1 Position of the needle guard (rear) (2-3U)

■ Height of the needle guard (rear)

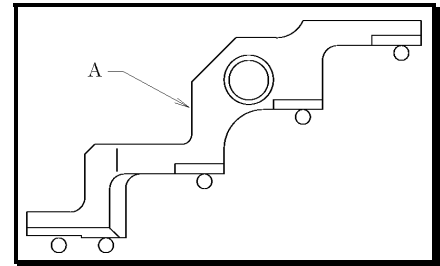
When the needle is at the bottom of its stroke, line B on needle guard (rear) A should be aligned with the center of the needle's eye.



■ Front-to-back position of the needle guard (rear)

When the point of the looper has reached the center of the right needle, adjust the needle guard (rear) so that there is a clearance of 0~0.05mm between the needle and the looper. The same adjustment should be made on other double chainstitch machines.

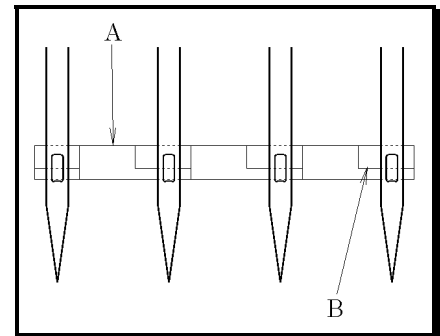
These adjustments are made by loosening screws C and D. The clearance between the left needle and the needle guard (rear) should be approximately 0.2mm.



6-2 Position of the needle guard (rear) (004U)

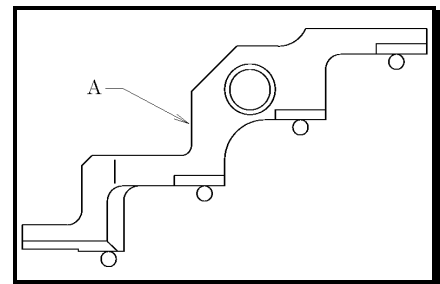
■ Height of the needle guard (rear)

When the needle is at the bottom of its stroke, line B on needle guard (rear) A should be aligned with the center of the needle's eye.



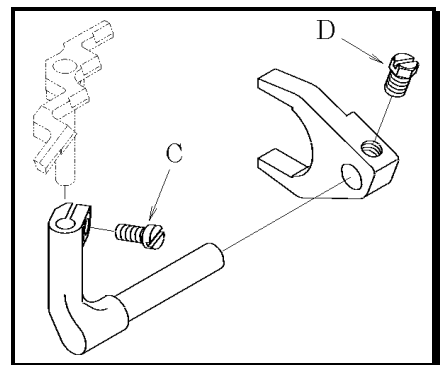
■ Front-to-back position of the needle guard (rear)

When the point of the looper has reached the center of the needle, adjust the needle guard (rear) so that there is a clearance of 0~0.05mm between the needle and the looper.



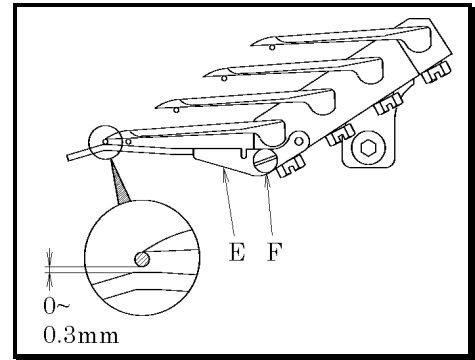
< Note >

Adjustments is made by loosening screws C and D.



6-3 Position of the needle guard (front) (2-3U)

When the point of the looper has reached the center of the left needle, there should be a clearance of 0~0.03mm between the left needle and needle guard (front) E. Adjustment is made by loosening screw F.

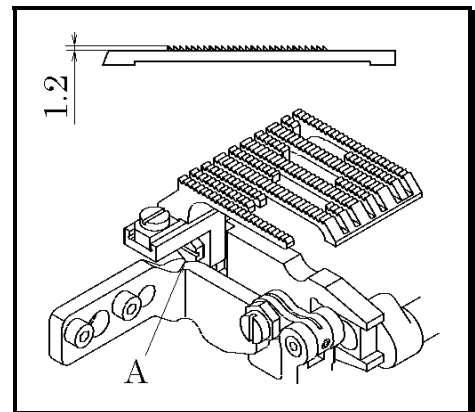


【7】FEED DOGS & STITCH LENGTH

7-1 Feed dog height & tilt

■ Height

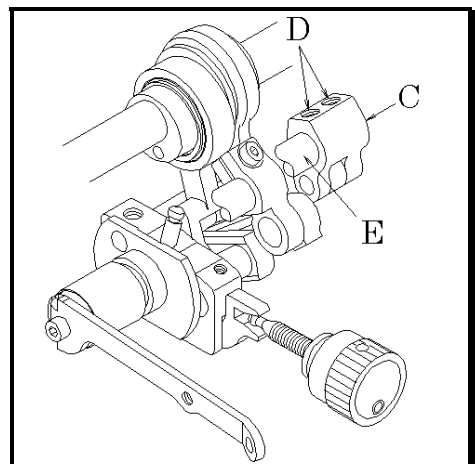
When the feed dog is at the top of this stroke, the feed dog teeth should be parallel with and 1.0~1.2mm above the top surface of the needle plate. To make this adjustment, loosen screw A and move the feed dog up or down.



■ Tilt

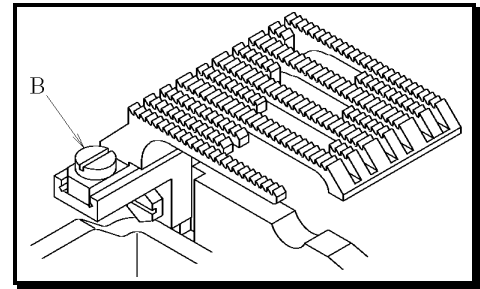
When the feed dog is at the top of this stroke, the feed dog should be parallel with the top surface of the needle plate. To make this adjustment, loosen screws D and move shaft E.

If the fabric to be used is thick and soft, install the feed dogs slightly higher than standard to feed the fabric smoothly.



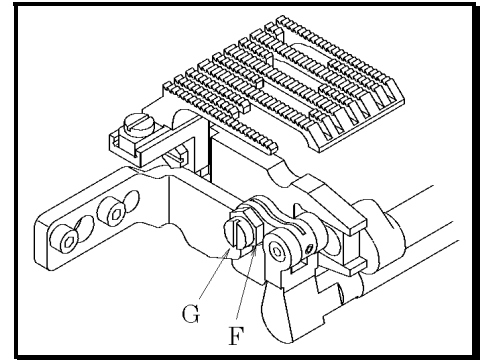
7-2 Feed dog left-to-right position

The feed dog should be centered left to right.
Adjustment is made by loosening screw B.



7-3 Feed dog front-to-back position

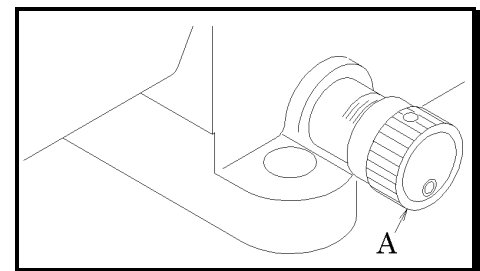
The feed dog should be centered front to back.
The feed dog should not touch the needle plate.
Fine adjustment is made by tightening screw G and turning front-to-back adjusting eccentric F



7-4 Stitch length

The stitch length is adjustable from 1.4 to 4.5mm.
The following table shows the number of stitches within 1 inch (25.4mm) according to the stitch length.

Stitch length (mm)	No. of stitches (within 1")
4.5	5.5
4.0	6.5
3.0	8
2.0	12
1.0	18

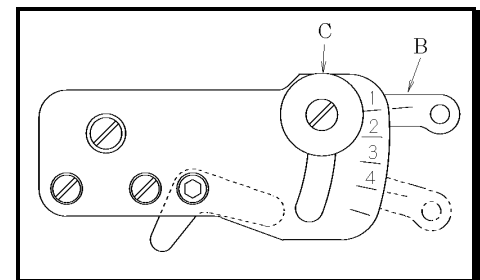


■ To change the stitch length

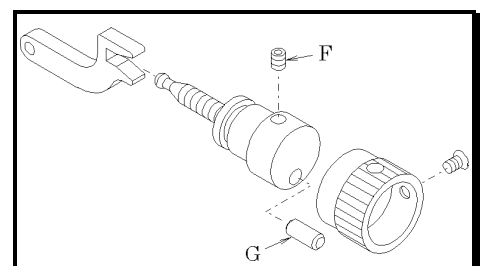
Turn adjusting knob A or position lever B as required. The readings show the stitch length.

< Note >

When turning adjusting knob A or positioning lever B, loosen screw C. Since this machine has a single feeding system, differential feed is unavailable. To change the stitch length, be sure to turn off the power.



- On the DX Series, the feeding amount can be changed mechanically up to 4.5mm. To achieve a feeding amount of 4.5mm, loosen screw F on the adjusting knob and release the stop position by moving stop pin G. Adjust while checking the front or back clearance so that the needle plate will not touch the feed dog.

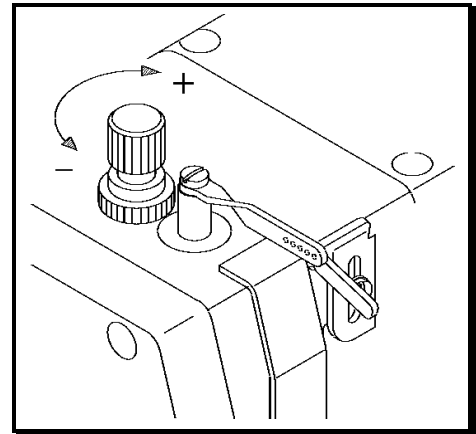


【8】PRESSER FOOT

8-1 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.



8-2 Position of the presser foot & foot lift

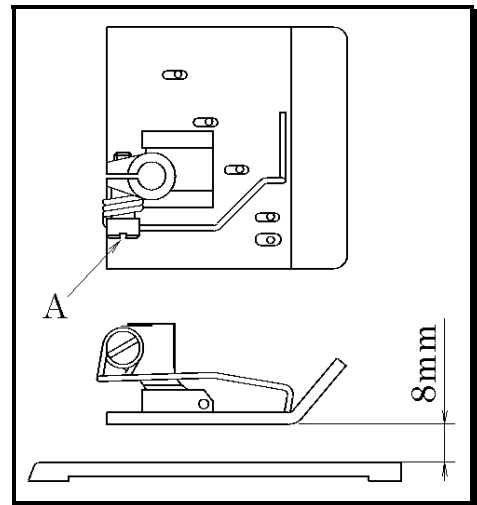
Fit the presser foot onto the presser bar so that the needle can drop correctly to the center of the presser foot needle drop hole.

■ 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.

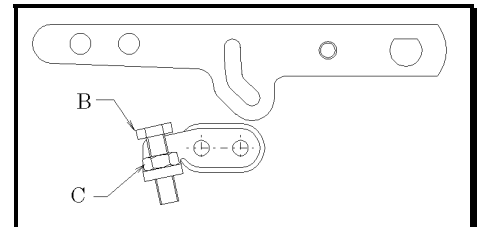
■ Foot lift

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.



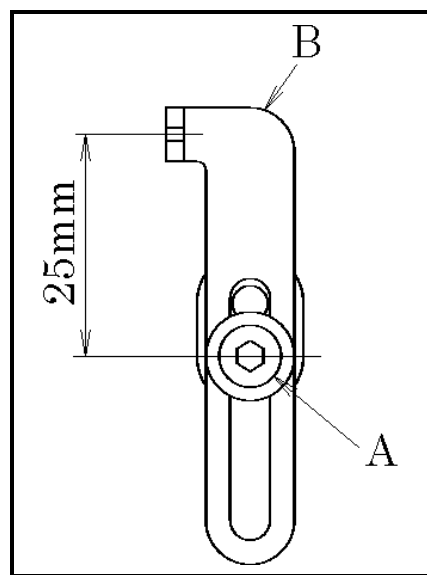
【9】 STITCH FORMATION

9-1 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 25mm (see the illustration).

Adjust the height of the thread guides by loosening screws A and moving thread eyelet B 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.

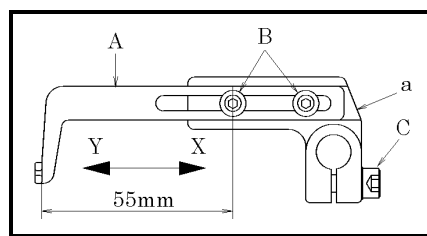


9-2 Position of the thread guide on the needle thread take-up

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 screw B to the thread guide of needle thread take-up A should be 55mm.

To make this adjustment, loosen screws B and C.

To tighten the needle thread, move needle thread take-up to Y. To loosen the needle thread, move needle thread take-up to X.



9-3 Timing of the needle thread take-up

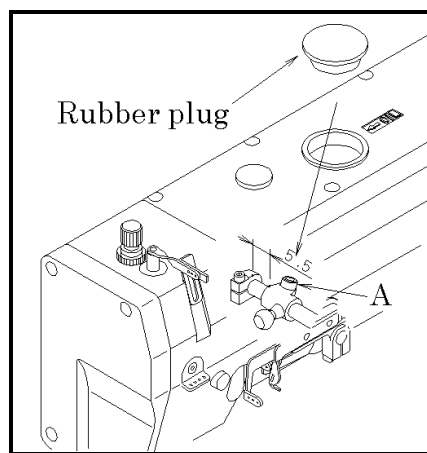
The timing of the needle thread take-up in relation to the up-and-down movement of the needles can be adjusted. This timing is factory-set to synchronize with the up-and-down movement of the needle bar.

< 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.



9-4 Position of the thread support

When the needle bar is at the bottom of its stroke, the top surface of needle thread support B should be level with the centers of the eyes on needle bar thread eyelet A, and A should be parallel with B.

Height adjustment of needle thread support B is made by loosening screw C and moving needle thread support B up or down. Moving it up tightens the needle thread.

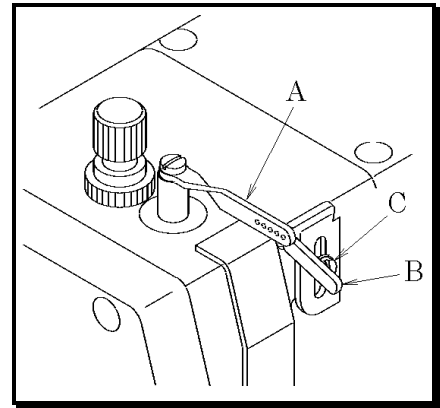
Moving it down loosens the needle thread.

- For cotton threads (less stretchable)

Set the top surface of the needle thread support 2.0mm below the centers of the eyes on needle bar thread eyelet A or do not use the needle thread support. (Loosen screw C and lower the needle thread support.)

- For woolly threads (stretchable)

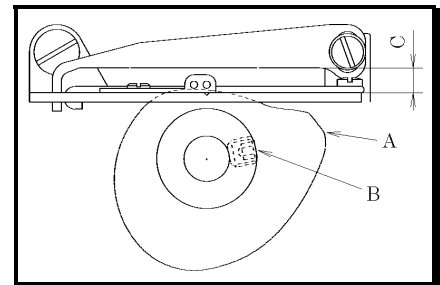
Set the needle thread support as high as possible.



9-5 Adjusting the looper thread take-up

When the point of the left needle has reached approximately half of the looper blade from the top of its stroke, the looper thread should be removed from the highest point A on the looper thread take-up.

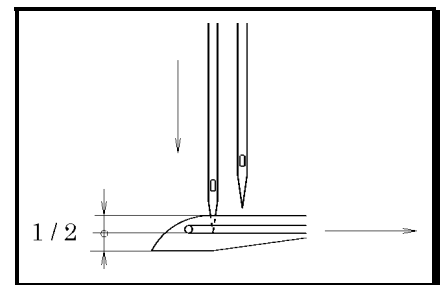
Adjustment is made by loosening screw B.



9-6 Adjusting the amount of the looper thread to be supplied

To increase the amount, increase clearance C.

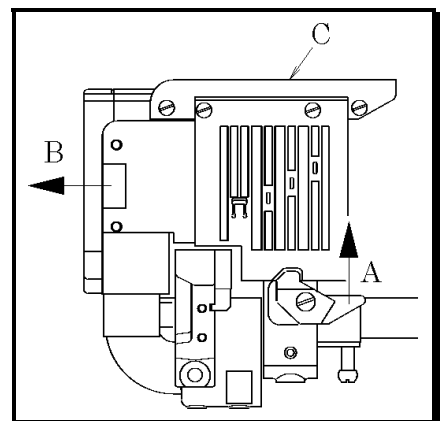
To decrease the amount, decrease clearance C.



9-7 Removing the needle plate

To thread the looper and/or adjust the looper, the needle plate can be removed with the needle plate mounting base.

1. Remove the presser foot.
2. Open side cover B.
3. Press the tongue of needle plate stopper A toward the back side of the machine.
4. Raise the needle plate slightly together with needle plate mounting base C.
5. Remove the needle plate by shifting it backward.



【10】 ADJUSTING THE KNIFE DEVICE

10-1 Adjusting the cutting width

Loosen screw D on the lower knife holder. Adjust the cutting width as required by moving the upper and lower knife holders simultaneously to the left or right. Then tighten screw D.

< Note >

Torque screw D to 10 to 15Kgf. cm. Do not tighten it excessively.

Put a small amount of oil to oil holes E and F occasionally.

10-2 Disassembling/reassembling the lower knife

■ To disassemble the lower knife

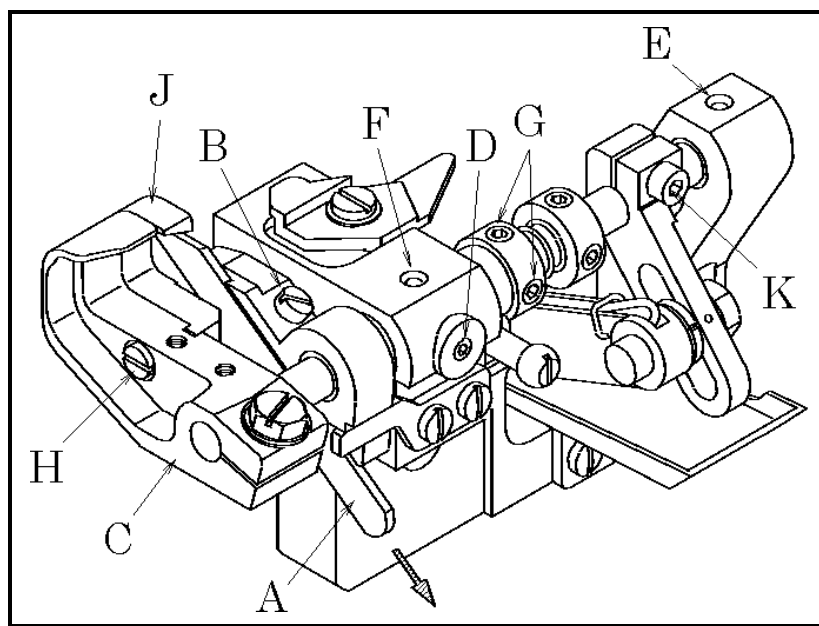
1. Open the front cover.
2. Loosen screws G on the collar (left).
3. Press upper knife holder C to the left to create clearance between the upper and lower knives.
4. Tighten screws G temporarily.
5. Loosen screw B that secures the lower knife. Then pull lower knife A down.

■ To reassemble the lower knife

1. Set the cutting edge of lower knife A flush with the top surface of the needle plate. Then tighten screw B.
2. Loosen screws G on the collar (left) that was tightened temporarily. (The upper lower knives are overlapped by the spring pressure.)
3. Place a thread between the upper and lower knives. Check for the cutting action by turning the machine pulley by hand.
4. Bring the upper knife to the top of its stroke. Tighten screws G on the collar (left).
5. Check for the cutting action again.

10-3 Disassembling/reassembling the upper knife

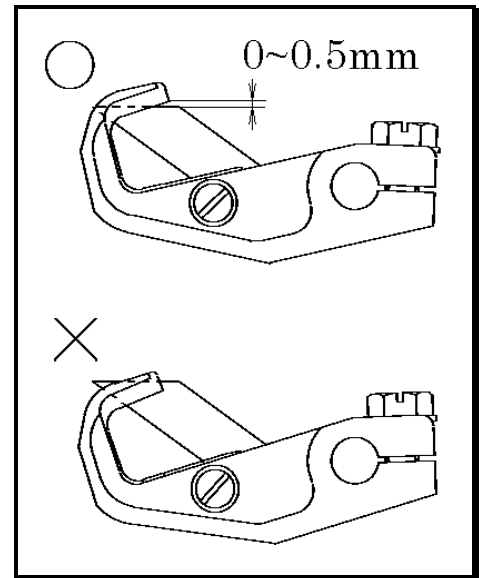
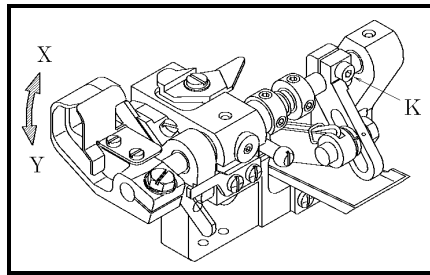
1. Loosen screw K on the upper knife lever. Turn upper knife holder C slightly upward. Tighten screw K temporarily with screw H for the upper knife in sight.
2. Loosen screw H for the upper knife. Remove upper knife J.
3. Install upper knife J with screw H with upper knife J fit onto the key groove on upper



knife holder C.

10-4 Overlap of the upper and lower knives

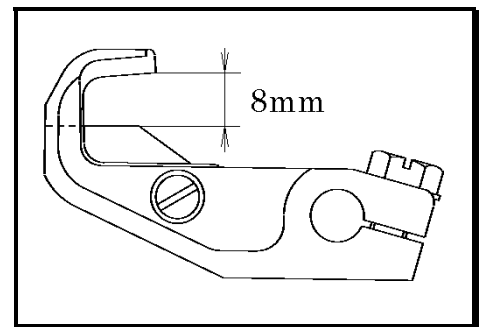
When upper knife J is at the bottom of its stroke, adjust the overlap of the upper and lower knives as shown in the illustration. To increase the overlap, loosen screw K on the upper knife lever and move the upper knife in the direction of arrow X. To decrease the overlap, move the upper knife in the direction of arrow Y. When the correct overlap is achieved, tighten screw K.



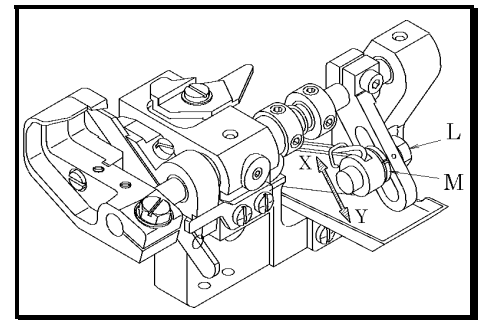
10-5 Adjusting the stroke of the upper knife

Set the stroke of the upper knife at approximately 8mm. To change the stroke, loosen nut L on the upper knife adjusting lever pin.

- To decrease the stroke, move lever pin M in the direction of Y.
- To increase the stroke, move lever pin M in the direction of X.

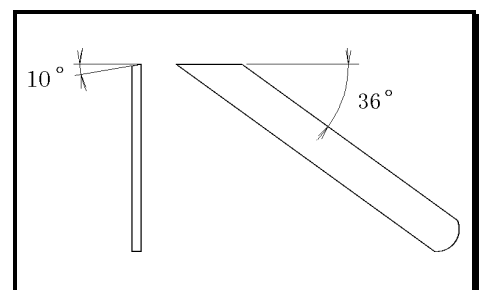


After the adjustment, tighten nut L securely. Adjustment of the stroke will change the overlap of the upper and lower knives. Be sure to achieve the correct overlap by referring to 10-4.



10-6 Resharpener the knives

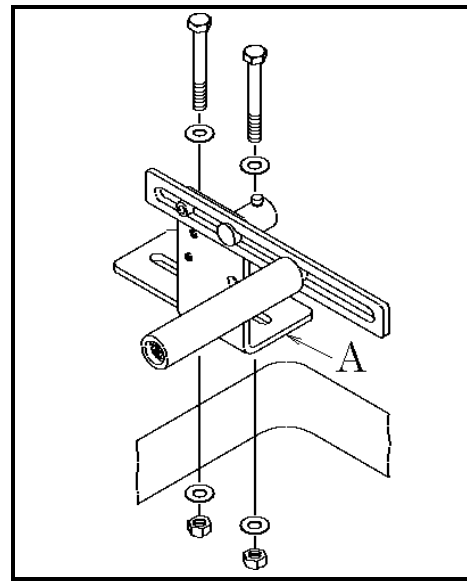
Since the upper knife is made of a superalloy, there is no need to sharpen it about one year. If cutting does not occur, sharpen the lower knife.



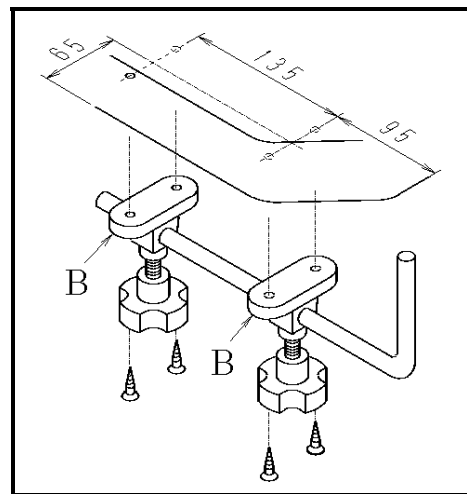
【11】 ADJUSTING THE ROLLERS AND THE GUIDES

11-1 Installing the rollers

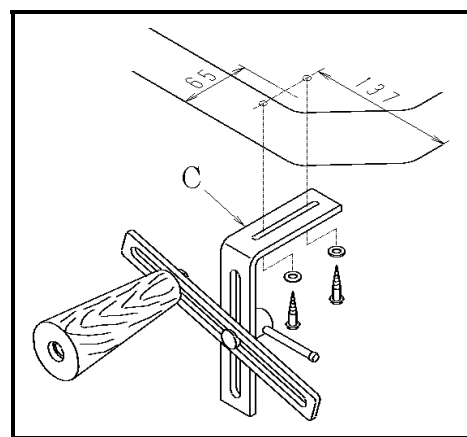
- Install tension roller bracket A as shown in the illustration.



- Install roller brackets B properly on the underside of the table.



- Install tension bracket C on the underside of the table (see the illustration).

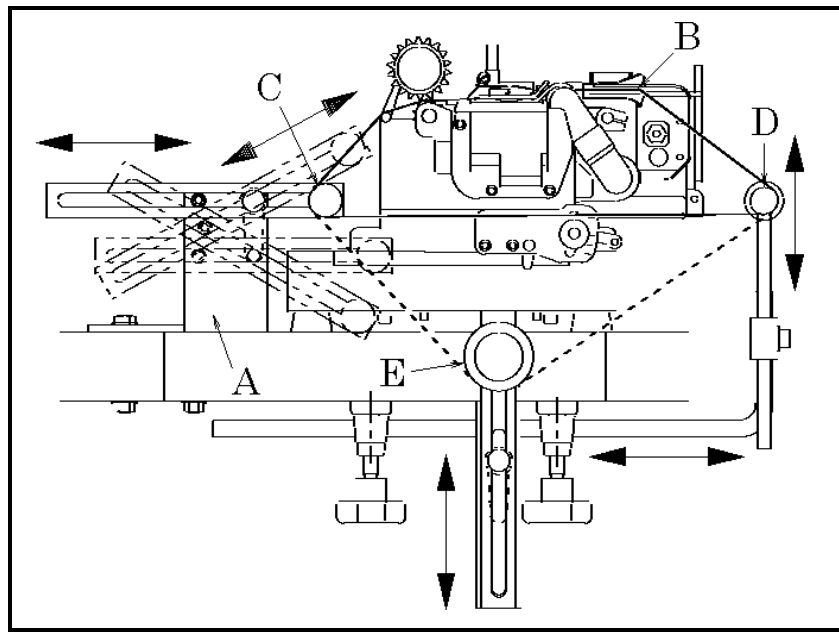


11-2 Sewing

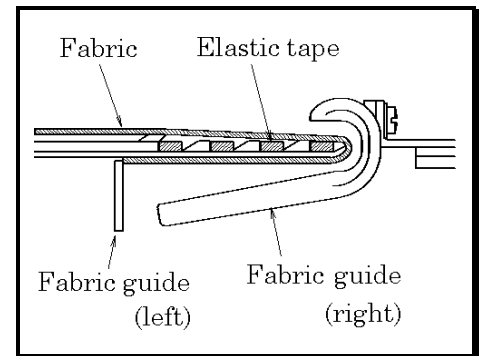
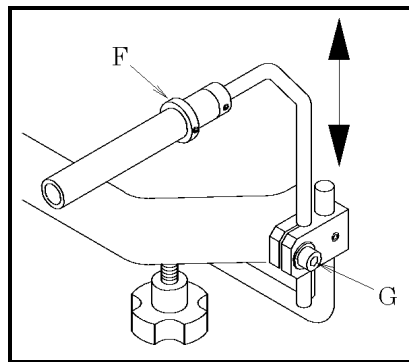
1. Raise the presser foot. Place elastic tape on guide B and tension roller (upper) D.
2. Position the fabric on the elastic tape and along the fabric guide (right).
Raise the presser foot. Turn the fabric in the operating direction by hand.
The hem is formed by the fabric guide (right). Keep on performing this operation until the fabric end touches the fabric guide (left). Then lower the presser foot.
3. Place the fabric on the tension roller. Start sewing with the fabric end protruded sufficiently to the right so that the hem can be formed. Feed the fabric evenly by holding it lightly by hand. Do not form the hem forcibly by hand.
Otherwise the fabric tension may be changed, causing trouble.
4. When the start of sewing comes close to guide B, press the knee switch. The fabric is removed from the tape guard and the guide. Then keep on sewing while checking the fabric is fed neatly and the start of sewing is aligned with the end of sewing.

11-3 Adjusting the rollers

- Position tension roller (upper) C and front roller D by spreading the body on both rollers. Tension roller (upper) C can be moved front or back easily by loosening the lever. In addition, it can be mounted on the lower part of holder A. If the size of the body is large, use tension roller (lower) E.



- Adjust elastic guide (front) F of the front roller left to right according to the right edge of flat elastic tape. Move the front roller up or down and turn it clockwise or counterclockwise as required by loosening screw G.

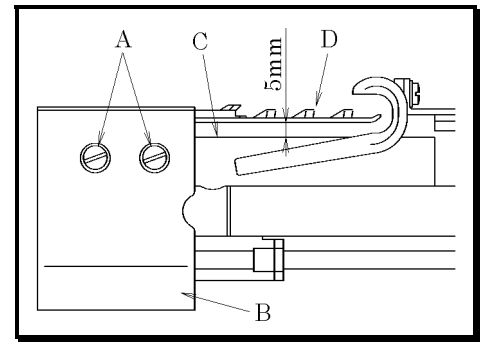


11-4 Adjusting the guides

■ Height adjustment

Clearance between elastic tape guard D and needle plate mounting plate C is factory set at approximately 5.0mm.

Adjust the clearance according to the fabric to be used. Adjustment is made by loosening screws A and moving guide holder (upper) up or down as required.

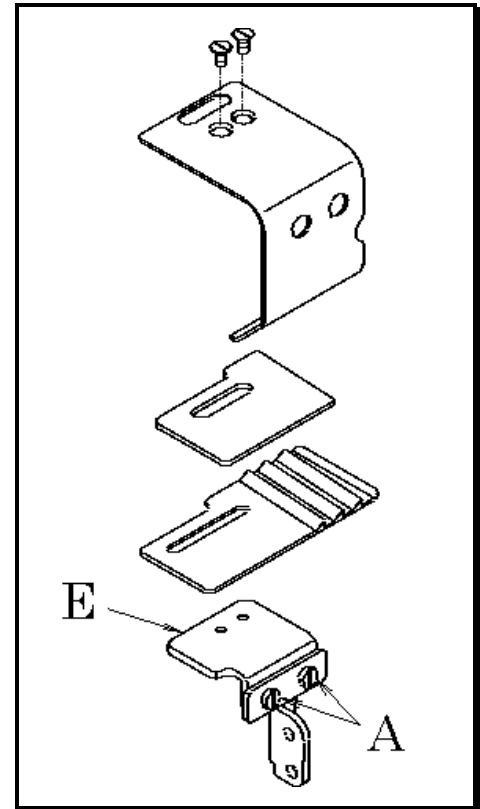
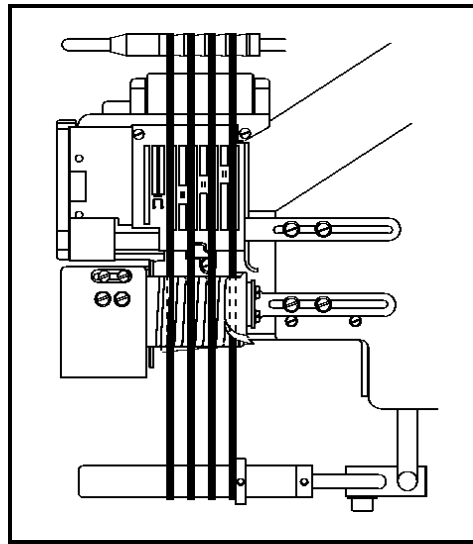


■ Adjusting elastic tape left to right

Loosen screws A.

Position each elastic tape so that it cannot touch each needle (see the illustration).

Adjustment is made by loosening screws A from the hole on guide holder (upper) cover B and moving the guide holder (upper) to the left or right as required.

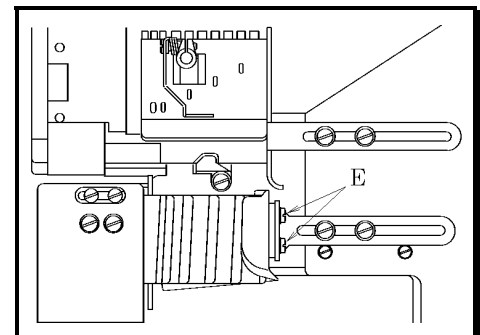
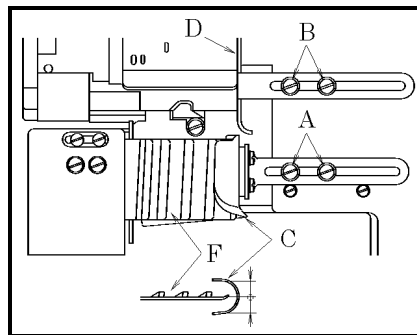


■ Adjusting the hem width

Loosen screws A and B. Position fabric guide (right) C and fabric guide (front) D according to the hem width. Adjustment is made by moving C and D to the left or right as required.

Loosen screws E and adjust the height of the fabric guide (right).

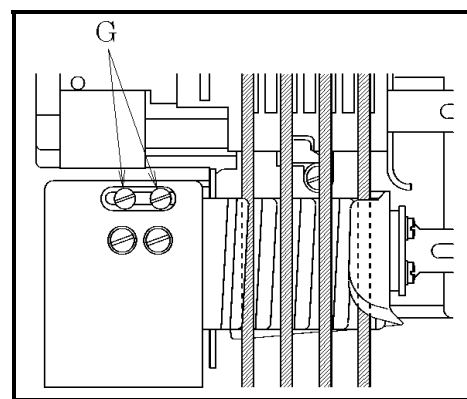
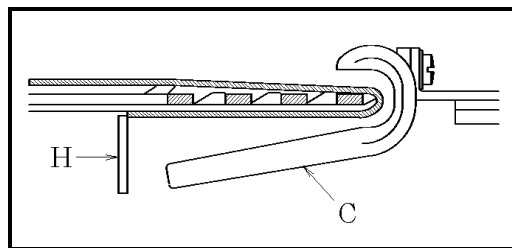
Elastic tape guard F should be centered in fabric guide (right) C.



Move fabric guide (right) C slightly to the right according to the thickness of the fabric.

■ Adjusting the cutting width

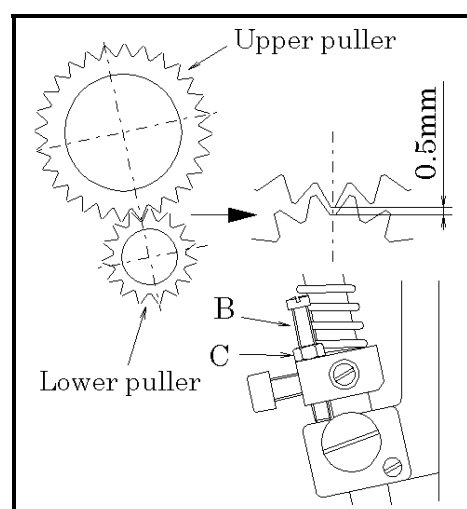
Adjust the cutting width by loosening screws G and moving fabric guide (left) H to the left or right as required.



【12】 ADJUSTING THE REAR PULLER

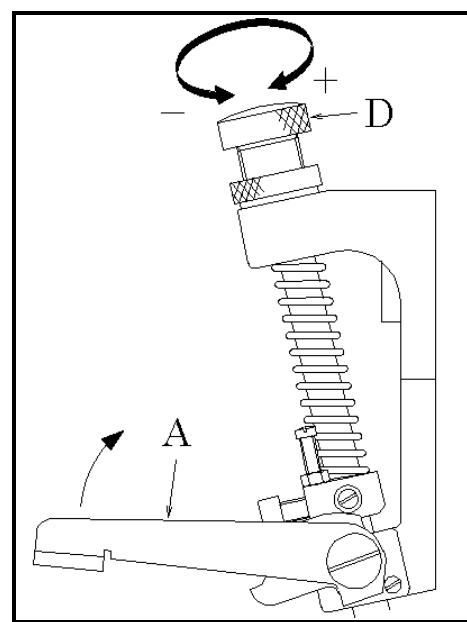
12-1 Position of the hand lever and the stopper

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.

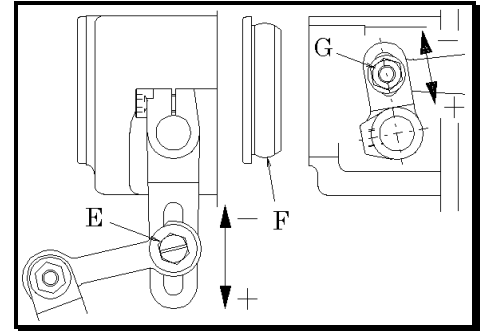
To decrease the amount, move upward.

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, turn counterclockwise.

To increase the amount, turn clockwise.

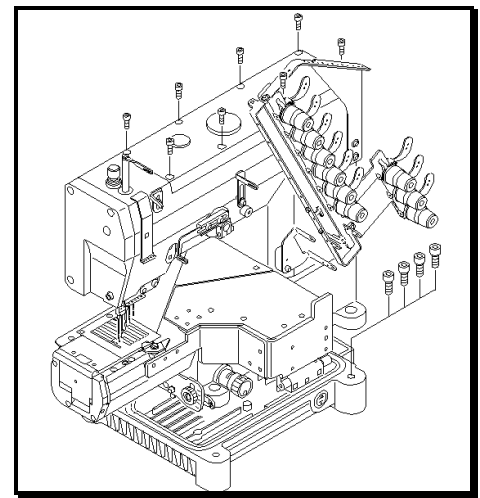


【13】 REPLACING THE TIMING BELT

13-1 Marks on the timing belts

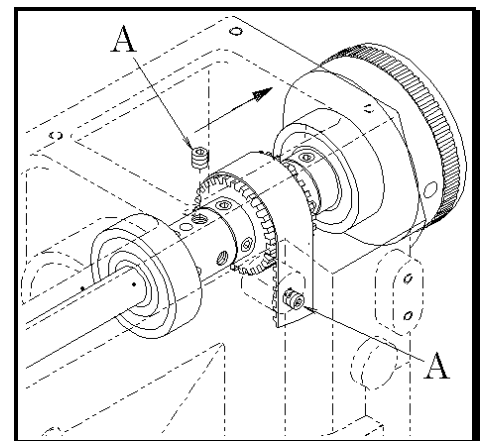
The X Series is available in timing belts of [A], [B] and [C] according to the distance between the upper and lower shafts.

[A] indicates the longest timing belt.



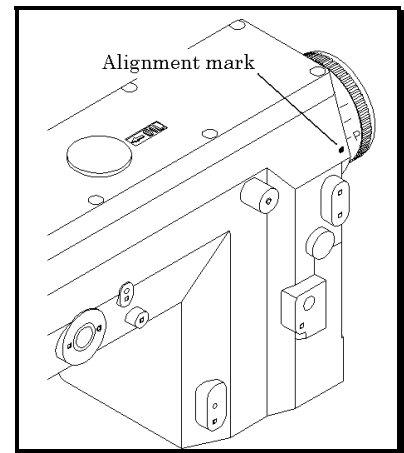
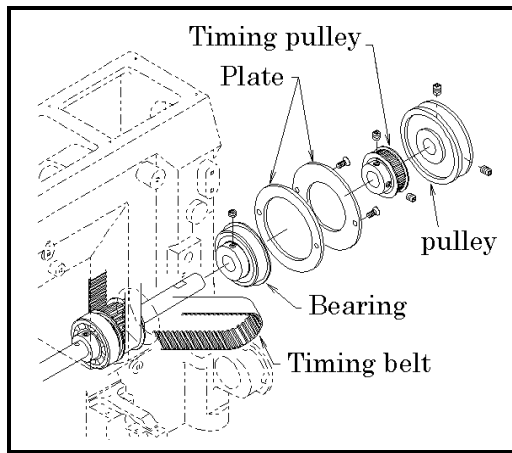
13-2 To remove the timing belt

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, timing pulley, plates and bearing in sequence by referring to the illustration.
Then remove the timing belt from the hole for the bearing.



13-3 To place the timing belt

1. Install the timing belt, bearing, plates, timing pulley, 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.



【14】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.

