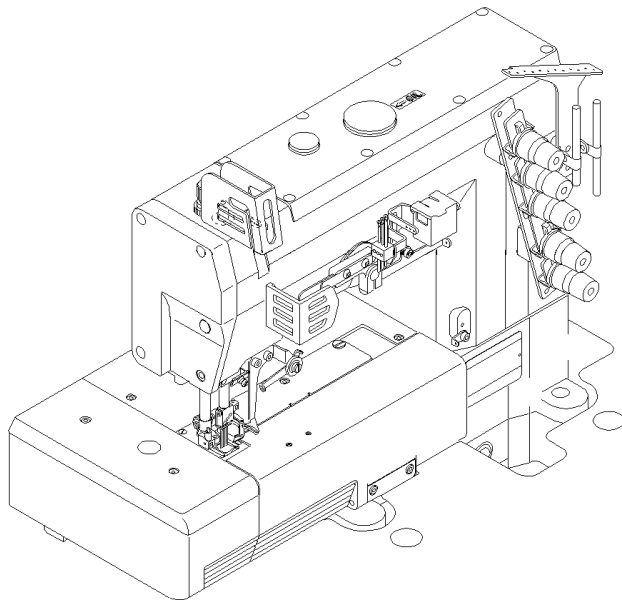


INSTRUCTION

WX *SERIES*

Industrial Sewing Machines



WX8800
WX8700
LX5801

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No. 970016

KANSAI
SPECIAL®

INTRODUCTION

Thank you for your purchasing Kansai Special's WX 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

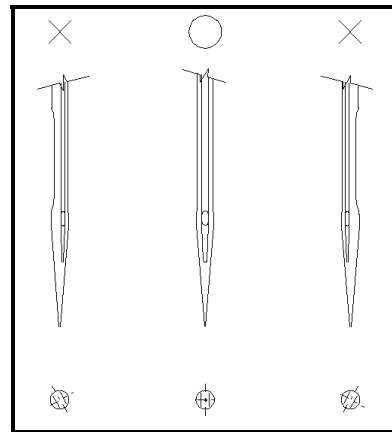
UY128GAS of Schmetz or Organ
 Select the proper needle for the fabric and thread.

< Needles and needle size >

Schmetz UY128GAS	Nm65	Nm70	Nm75	Nm80	Nm90
Organ UY128GAS	# 09	# 10	# 11	# 12	# 14

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.

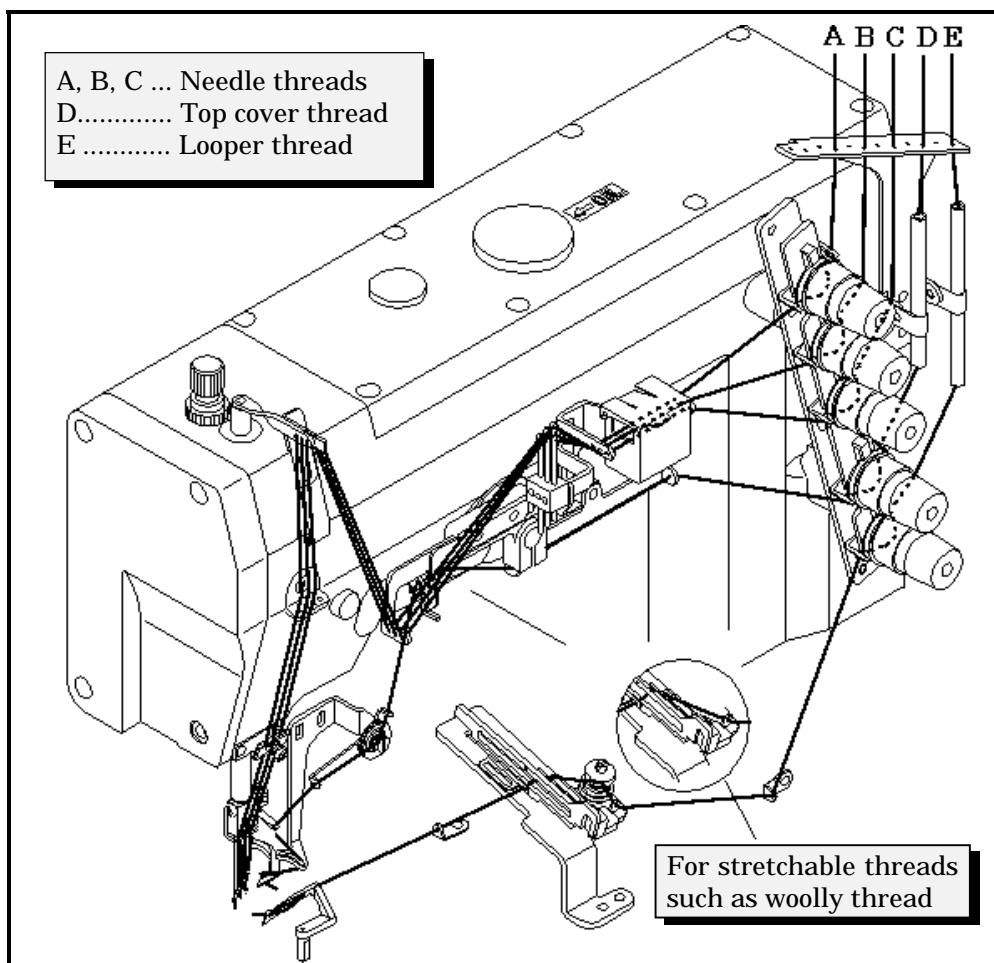


< Note >

*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.

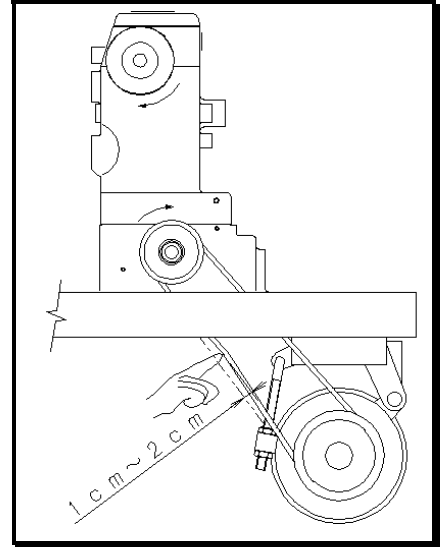


Thread tension should be changed according to various kinds of conditions such as the thread to be used and/or the feeding amount (see Chapter 10 for "Stitch formation").

【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 obtained (see the illustration on the right).

< Machine speed >

TYPE	MAXIMUM SPEED	STANDARD SPEED
WX8803	6000SPM	5500SPM
WX8803EMK	5000SPM	4500SPM
LX5801	6500SPM	6000SPM

< 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

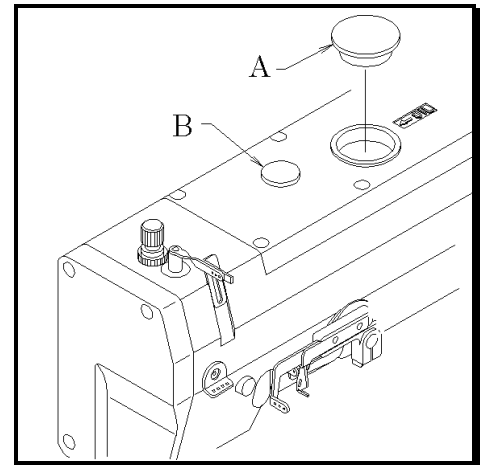
Remove rubber plug A from the oil hole.

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.

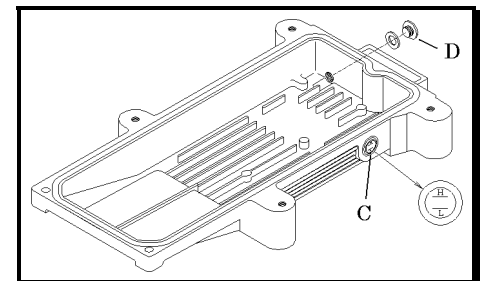


3-3 Replacing the oil and the oil element

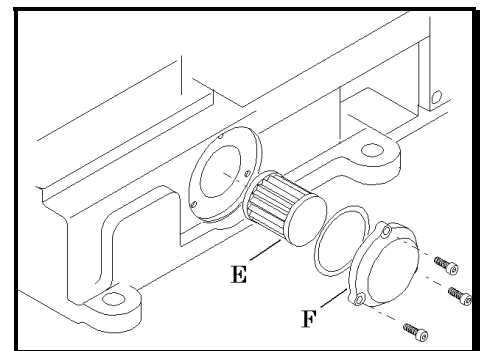
To extend machine life, be sure to replace the oil after the first 250 hours of operation.

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 >

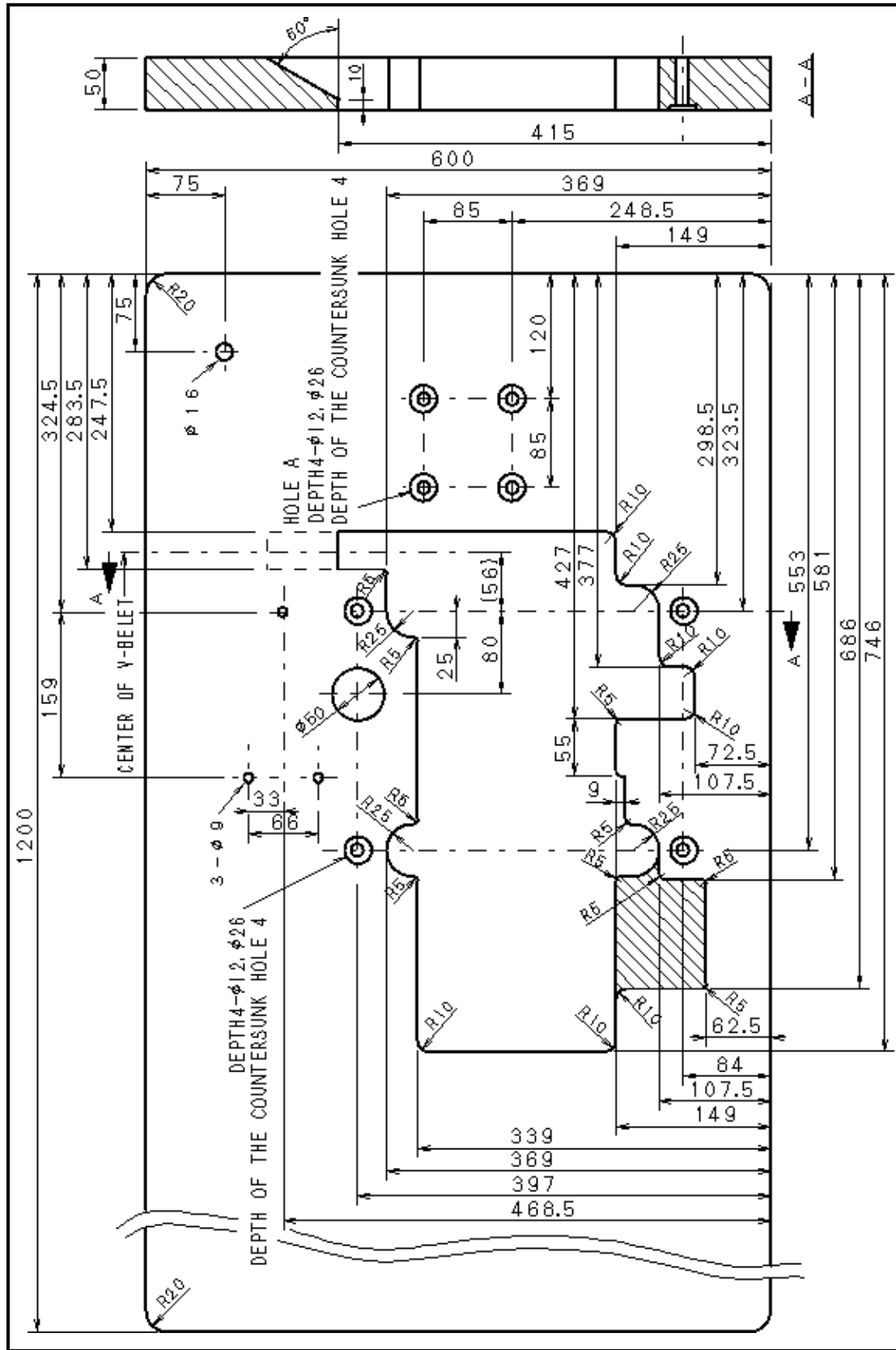
When the oil filter cap is removed, the oil collected on the element drips. Be careful.

【4】 SEWING MACHINE INSTALLATION

4-1 Cutting the machine table

Cut the diagonally shaped area for the EMK type.

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



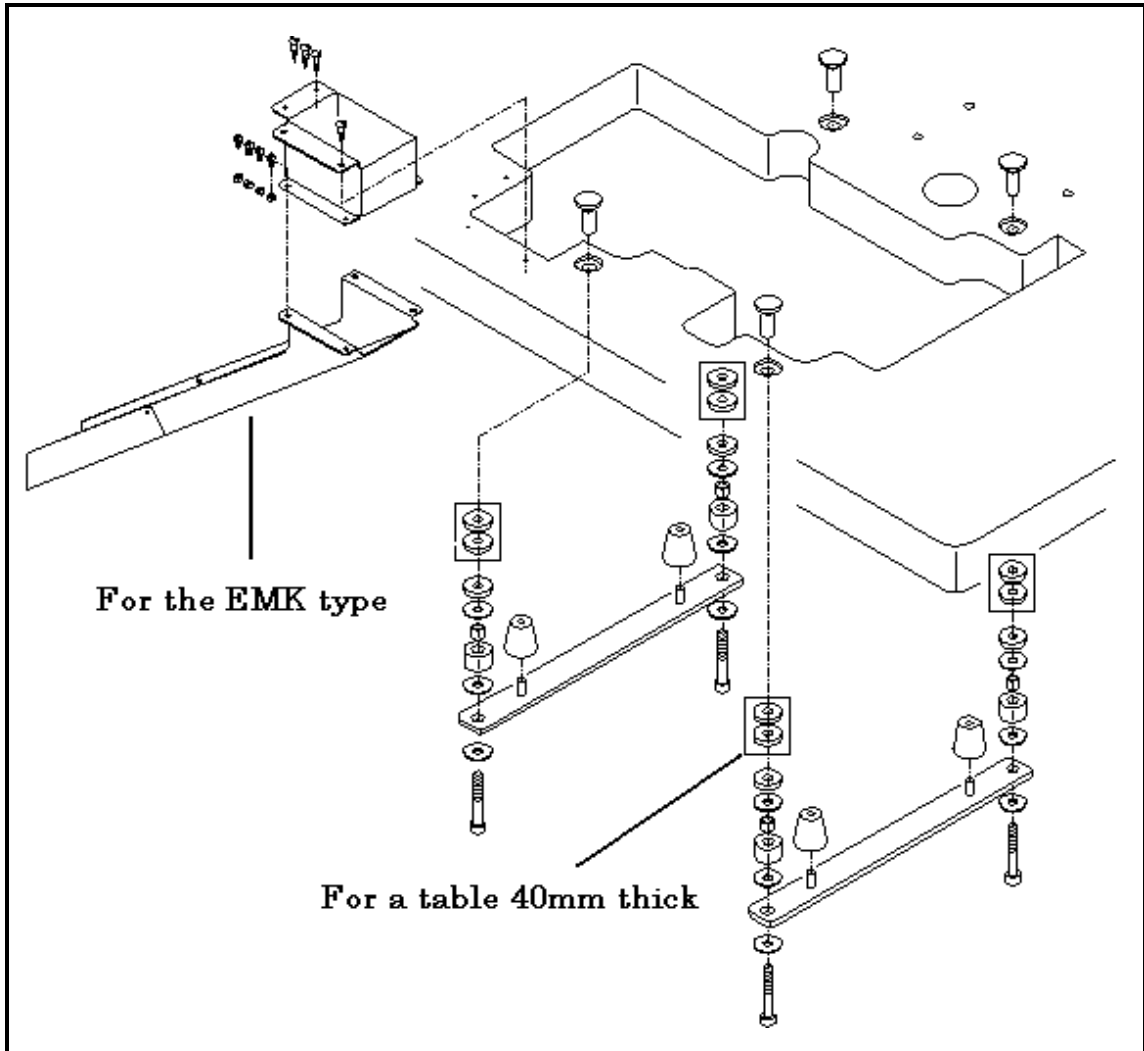
4-2 Installing the machine

Install the machine correctly by referring to the illustration below.

Secure the bolts in place with the nuts tightened against the underside of the machine table. Fit the rubber cushions onto the bolts.

Then mount the machine properly onto the rubber cushions.

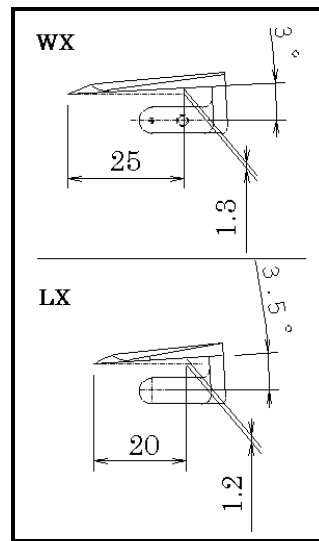
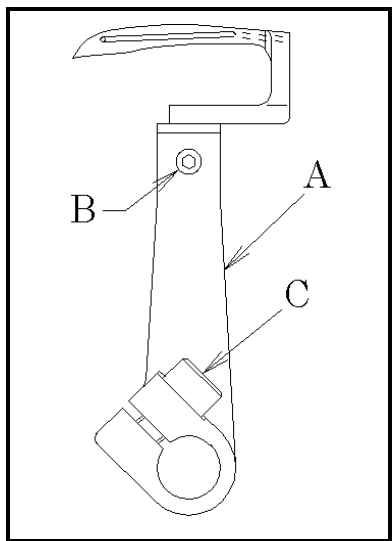
Install the chute for the EMK type (see below).



【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. WX Series Angle : 3° 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 1.3mm. LX Series Angle : 3.5° Distance at 20mm from the point of the looper between the bottom of the looper blade and the extension line from the point of the looper : Approximately 1.2mm.

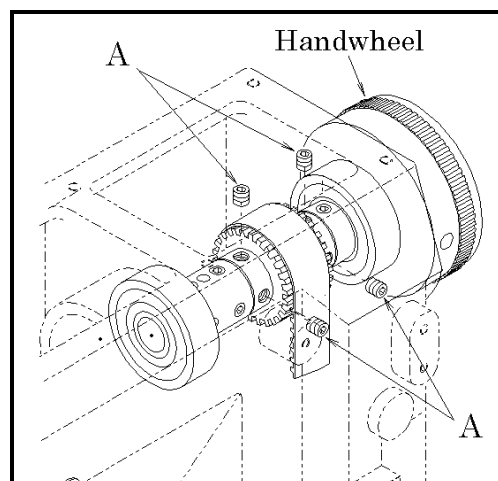
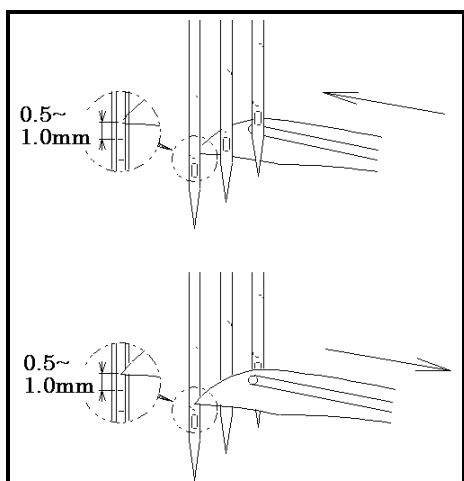


5-2 Looper left-to-right movement

The point of the looper should pass the center of the left needle and 0.5~1mm above the top of its needle's eye when the looper moves to the left or right on the front or back side of the needles (see the illustration below). Refer to 5-4 for the height of the needle.

To adjust the timing of the looper to the needles,

1. Remove the machine cover.
2. Loosen screws A on the timing pulley (upper).
3. Shift the timing pulley (upper) by turning the handwheel while holding the timing pulley (upper) by hand.



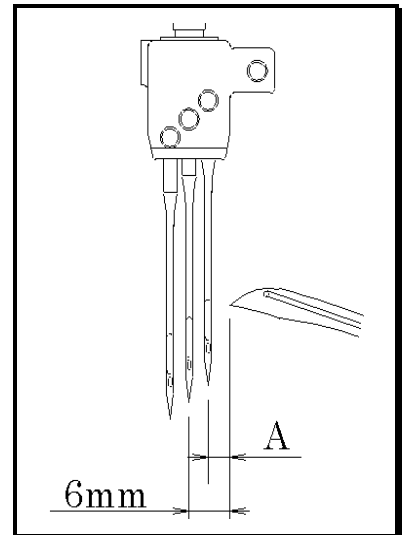
5-3 Looper setting distance

Set the looper so that the distance from the point of the looper to the center of the needle bar is 6mm when the looper is at its farthest position to the right. For 1-needle machines, this distance is 4mm. The table below shows setting distance A from the point of the looper to the center of the right needle when the needle is at the bottom of its stroke and the looper is at its farthest position to the right.

Setting distance A varies according to the needle space.

To make this adjustment, loosen screw C (see 5-1) on the looper holder.

NEEDLE SPACE (INCH)	LOOPER SETTING DISTANCE A
3.2mm (1/8)	4.4mm
4.0mm (5/32)	4mm
4.8mm (3/16)	3.6mm
5.6mm (7/32)	3.2mm
6.4mm (1/4)	2.8mm
1 Needle	4mm



5-4 Needle height

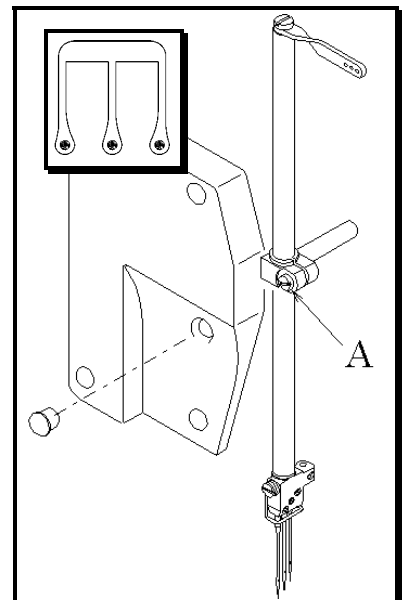
The point of the looper should be 0.5~1mm above the top of the left needle's eye on the back side of the needle when the point of the looper has reached the center of the left needle with the machine pulley turning in the operating direction (see 5-2).

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

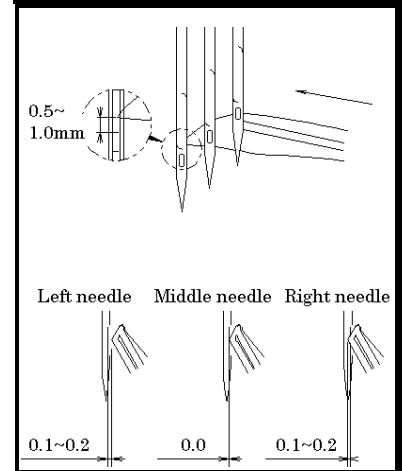
The point of the looper is 0.5~1mm above the top of the left needle's eye on the back side of the needle when it has reached the center of the left needle. With the point of the looper at this position, set the clearance between the left needle and the point of the looper at approximately 0.2mm.

Then the looper should barely touch the right needle (approximately 0.2mm). On 3-needle machines, the clearance between the point of the looper and the middle needle should be 0mm. To make the above adjustment,

1. Loosen screw C (see 5-1).
2. Move the looper holder front or back.

< 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 0.2mm.

< Note >

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

To change the looper's orbit,

1. Loosen screw B on eccentric A.
2. 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 the standard position.

The 3 o'clock end of the orbit is at a slightly up position.

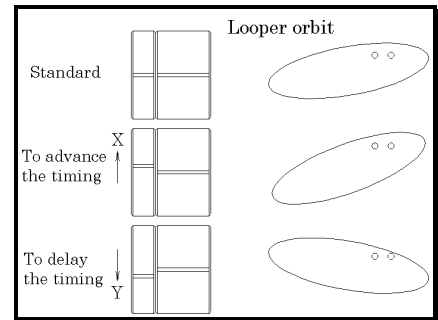
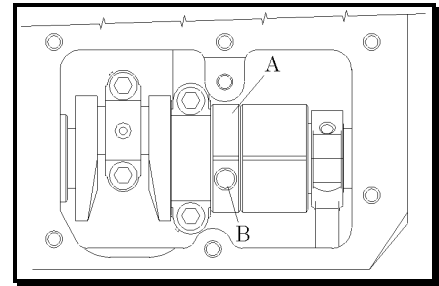
To advance the timing of the looper to the needle

Shift the timing mark to X. Skip stitching may occur when the looper moves to the right. A thread chain is not produced smoothly.

To delay the timing of the looper to the needle Shift the timing mark to Y.

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 0.05 -0.1mm. The clearance between the point of the right needle and the back side of the looper should be 0.2~0.3mm. The amount of the looper front-to-back movement is factory-set properly for needle counts 9~11.

If you use needle counts 12~14, adjust the amount as required (see below).

1. Remove rear bed cover A.
2. Loosen the nut on the looper front-to-back rod pin.

To decrease the amount, move the rod pin to X.

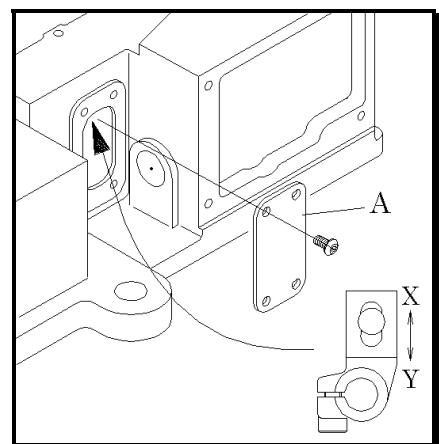
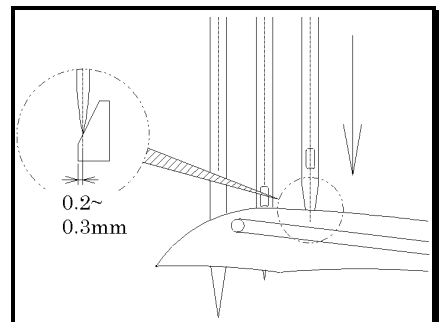
To increase the amount, move the rod pin to Y.

The amount range is from 2.3 to 3.1mm.

The amount is factory-set at 2.7 to 2.8mm.

Adjust according to the needle count.

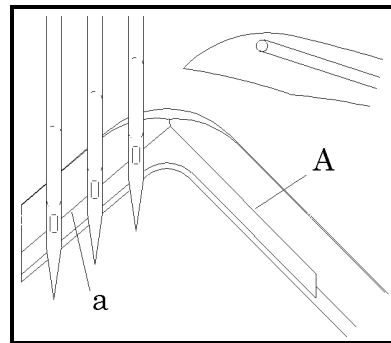
If the amount is excessively decreased, the needle will rub against the back of the looper, causing needle breakage. If the amount is excessively increased, the clearance between the needle and the back of the looper will increase and then skip stitching may occur when the looper moves to the left.



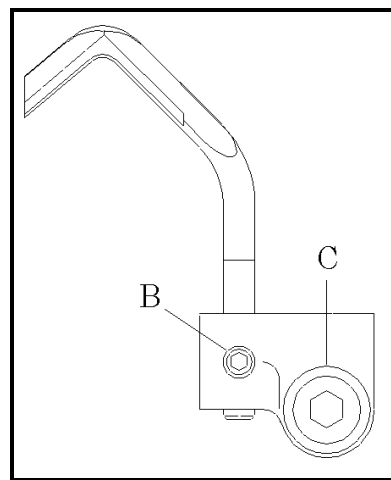
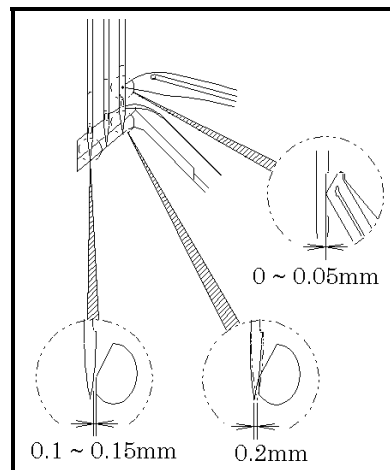
【6】 FRONT AND REAR NEEDLE GUARDS

6-1 Position of the needle guard (rear)

Align line (a) on needle guard (rear) A with the center of the right needle hole when the needle guard (rear) is at the bottom of the stroke. When point of the looper passes the back side of the needles, the needle guard (rear) should push the right needle slightly toward the front and the clearance between the point of the looper and the left needle should be approximately 0.2mm.



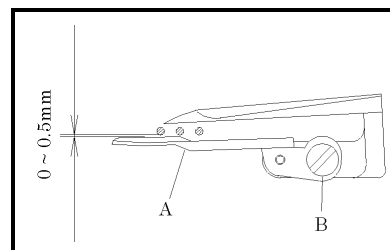
Set the clearance between the right needle and the point of the looper at 0~0.05mm when the point of the looper has reached the center of the right needle from the extreme right end of its travel. When the point of the looper has reached the center of the left needle, make sure the left needle does not touch the looper by pressing the left needle backward. Then turn the needle guard (rear) with screw B to set the clearance between the needle guard (rear) and the needle at 0.1~0.15mm. Adjust the needle guard (rear) front to back with screw C.



6-2 Position of the needle guard (front)

Set the clearance between the needles and needle guard (front) A when the point of the looper has reached the center of the right and left needles at 0~0.05mm.

To make this adjustment, loosen screw B.



【7】 SPREADER

7-1 Position of the spreader

Height

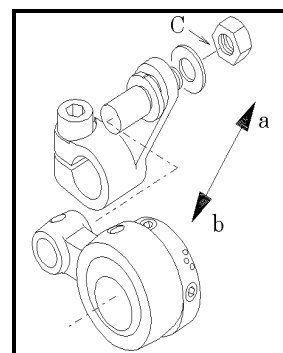
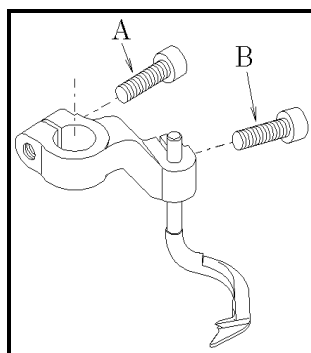
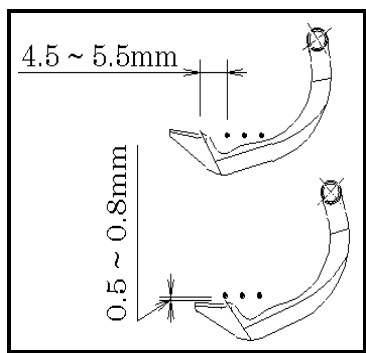
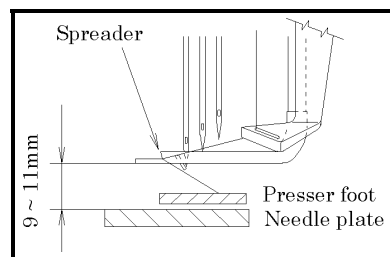
The distance between the top surface of the needle plate and the bottom surface of the spreader should be 9~11mm.

Left-to-right position:

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

When the spreader passes the left needle, the distance 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



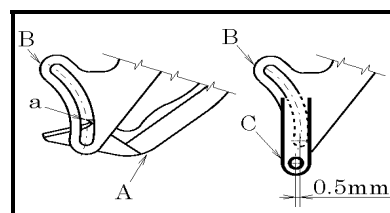
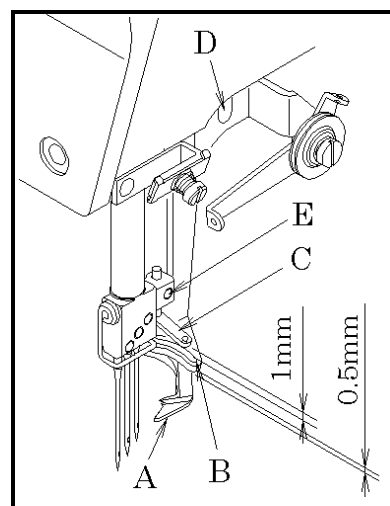
in the direction of (b).

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 center line 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 the above 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.



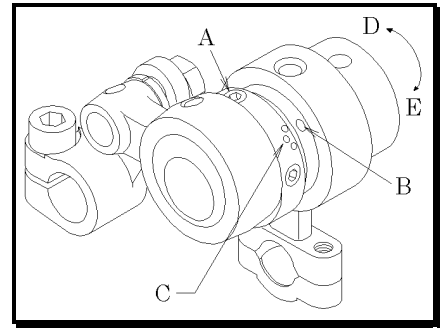
7-3 Timing of the spreader

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,

1. Remove the top arm cover.
2. Loosen two screws for looper eccentric A on the upper shaft.
3. 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.

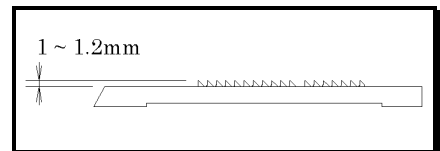
【8】 FEED DOGS & STITCH LENGTH

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 1.0~1.2mm above the top surface of the needle plate.

To make this adjustment, loosen screw A and move the main and differential feed dogs up or down.

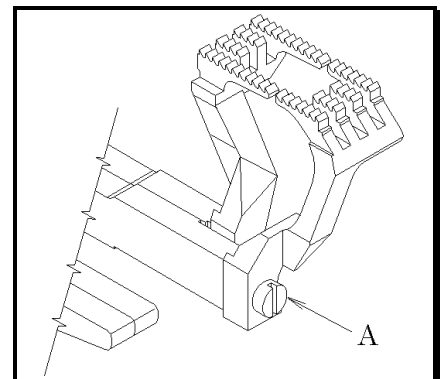


Tilt

Remove the cover from the rear side of the bed.

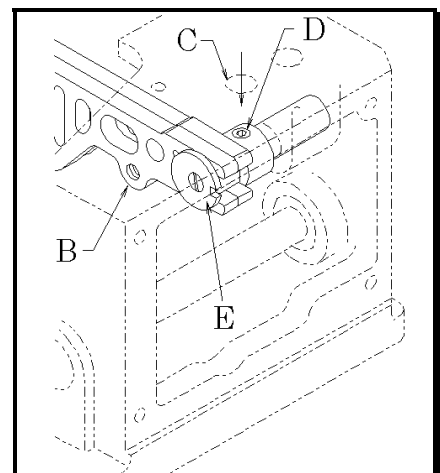
Loosen screw D from hole C with a 2.5mm hex. Wrench.

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. Adjust by turning eccentric pin E with a screwdriver.



< Note >

When turning the eccentric pin, tighten screw D with the pin slightly touching feed bar B while checking that the shaft is not shifted to the left.



8-2 Stitch length

The stitch length is adjustable from 1.4 to 3.6mm as follows

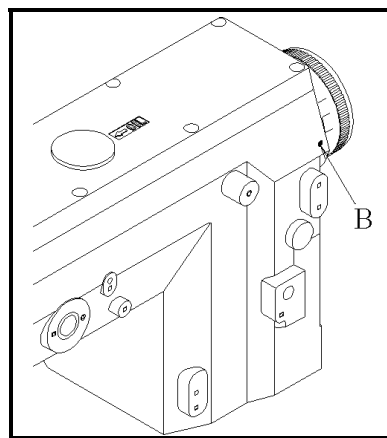
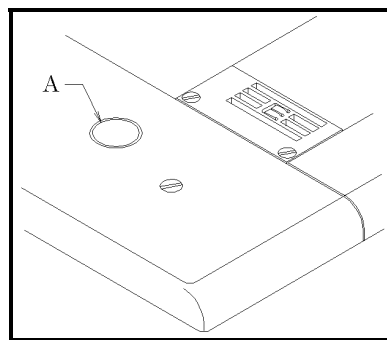
Stitch length(mm)	No. of stitches (within 1")	No. of stitches (within 30mm)
3.6	7.0	8.0
2.4	10.5	12.5
1.4	18.0	21.0

To adjust the stitch length

1. Press push button A lightly until its end touches the inside part and clicks.
2. Turn the 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. Adjust the stitch length as required by turning the handwheel.
4. Align the required stitch length with alignment mark B. Then release the push button.

< Note >

To adjust the stitch length, be sure to turn off the power first.



8-3 Differential feed

Normal differential feed (to gather the fabric)

To make this adjustment, loosen nut A, move lever B up or down and tighten nut A at the required position.

To obtain a feed ratio of 1:1, align lever B with reading C.

To obtain the normal differential feed, raise lever B above reading C. To obtain a feed ratio of 1:2, set lever B at 2.

Reverse differential feed (to stretch seam the fabric)

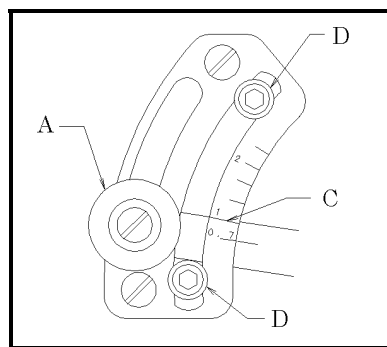
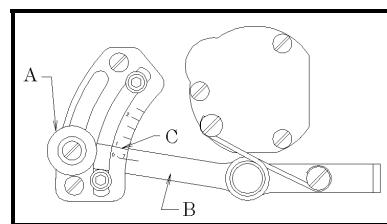
To obtain the reverse differential feed, lower lever B below reading C. To obtain a feed ratio of 1:0.7, set lever B at 0.7. To adjust the differential feed ratio during sewing Connect a chain, etc. to the lever. Set the upper and lower limits with two stoppers (D). To adjust the differential feed ratio during sewing, move lever B up or down within this range and then set lever B at the required position. The differential feed ratio varies according to the stitch length. See the table below.

< Differential feed ratio >

Stitch length (mm)	Max. normal diff. feed	Max. reverse diff. feed
3.6	1:1.2	1:0.7
2.5	1:1.6	1:0.7
2.0	1:1.8	1:0.7
1.4	1:2.0	1:0.7

< Note >

To use the machine with the normal differential feed, check to make sure the feed dogs do not touch the needle plate.

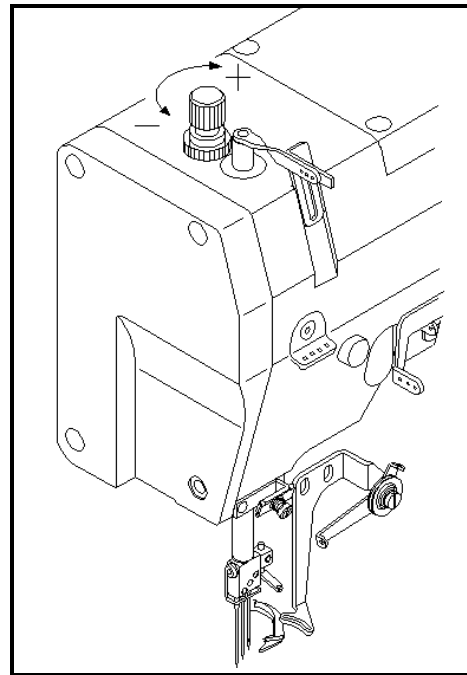


【9】 PRESSER FOOT

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.

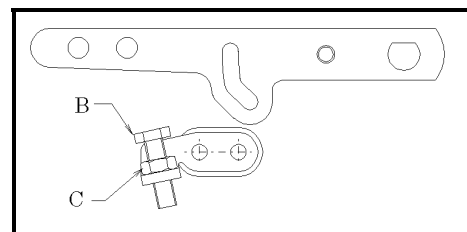
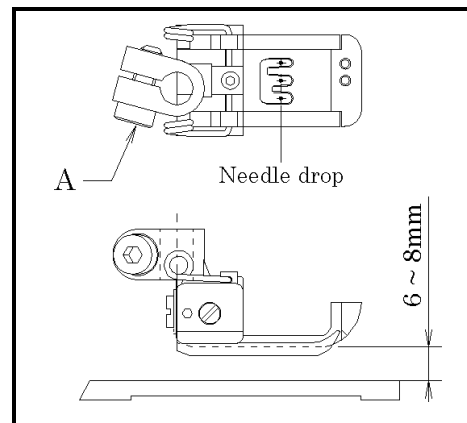
Position of the presser foot

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.



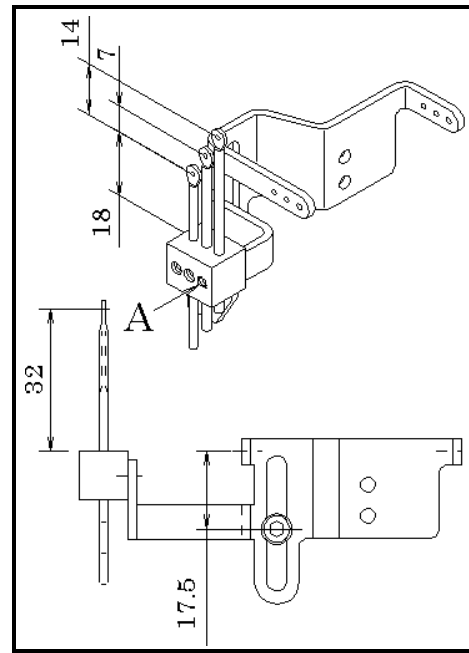
【10】 STITCH FORMATION

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.



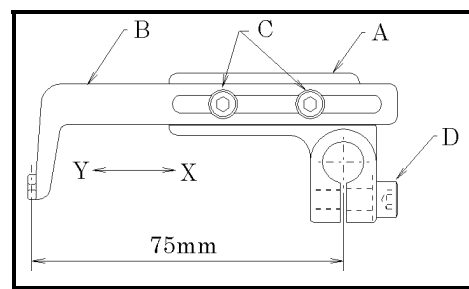
10-2 Position of the thread guide on the needle thread take-up

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.



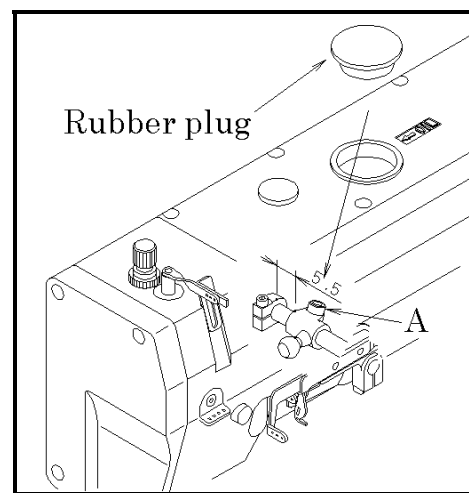
10-3 Timing of the needle thread take-up

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.

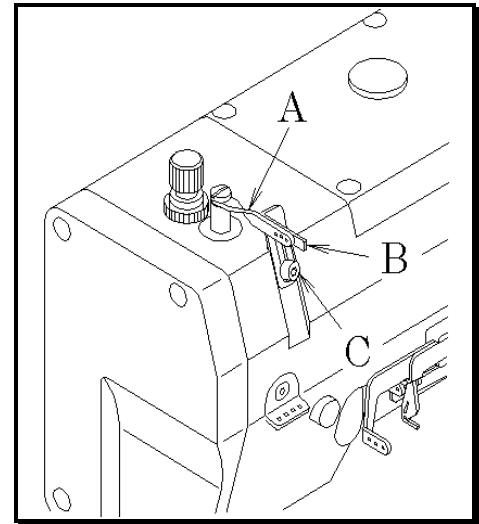
To loosen the needle thread, move down B.

For cotton threads (non-stretchable threads)

Bring the needle thread guard 2.0mm below the standard, or remove it. 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

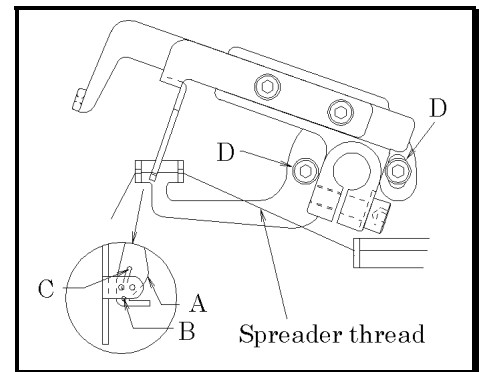
When the needle bar is at the top of its stroke, thread any one of parts A, B and C on the spreader thread take-up with the spreader thread.

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.

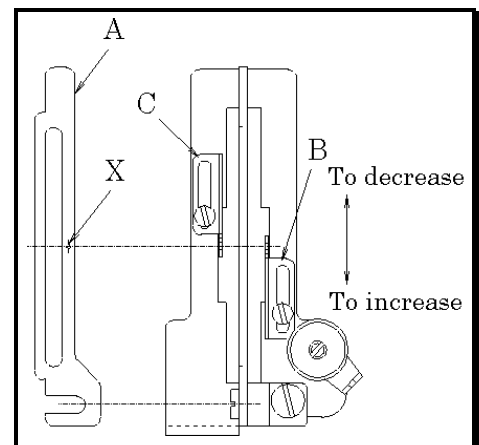


10-6 Position of the thread guide of the looper thread take-up

The eyelets on thread guides B and C should be aligned with mark X on thread guide A.

To increase the amount of the looper thread supplied by the looper thread take-up, loosen screws of thread guides B and C and move the thread guides to the front. To decrease it, move the thread guides to the back. Adjust according to the thread and stitch length to be used.

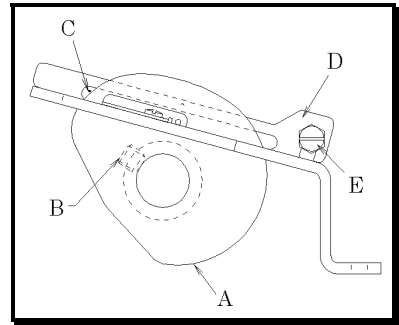
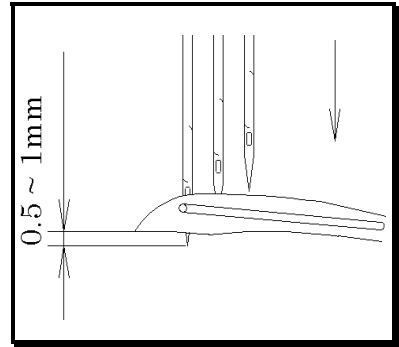
For woolly threads, move thread guides B and C to the front. Do not thread the tension disk.



10-7 Position of the looper thread take-up

Thread guide D should be at the center of the groove of looper thread take-up A. When the point of the left needle has reached 0.5~1mm above the bottom surface of the looper blade while the looper is moving from the extreme left end of its travel, the looper thread should be removed from position C on the looper thread take-up.

To make this adjustment, loosen screw B and adjust the looper thread take-up. To adjust the height of thread guide D, loosen screw E and then align the bottom of the slot of thread guide D with the top surface of the bracket.



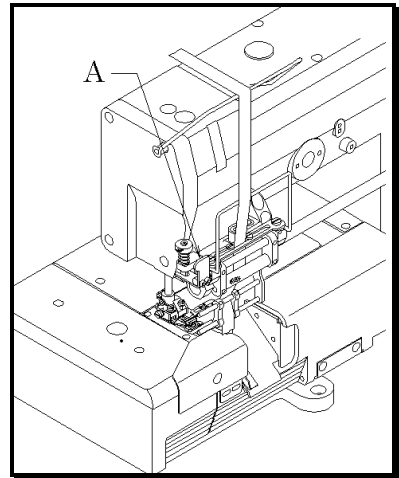
【11】EMK ELASTIC FEEDER

11-1 To insert the lace/elastic

Insert the lace/elastic correctly by referring to the illustration. The rollers are opened by pressing rubber adjusting lever A.

11-2 Lace/elastic guide on the presser foot

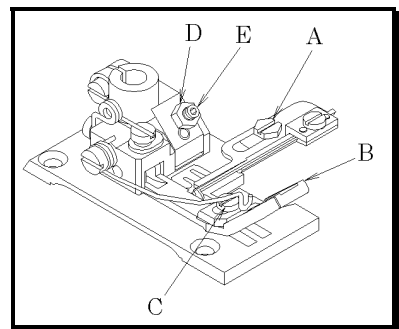
Loosen screw A. Adjust the position of the tape guide according to the needle space and/or width of the tape. Adjust the position of upper knife guide B according to the hem width cut by the knife. Install upper knife guide B by tightening screw C while checking upper knife guide B does not touch the knife.



11-3 Adjusting the front of the presser foot

Adjust the front of the presser foot according to the type of fabric and/or elastic to be used.

To sew heavy weight elastic onto the fabric, raise the front of the presser foot. This reduces resistance and feeds the fabric smoothly. Loosen nut D and turn screw E as required.

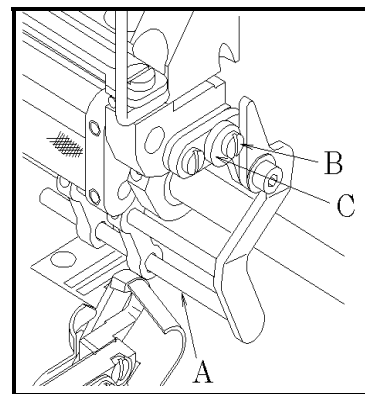


11-4 To install the tape guide

Install tape guide shaft A as close to the needle as possible, but the machine must sew the fabric smoothly.

To adjust the tape guide, loosen screw B and turn eccentric collar C clockwise or counterclockwise.

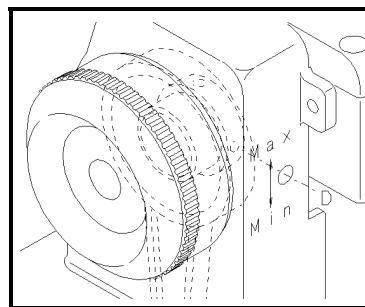
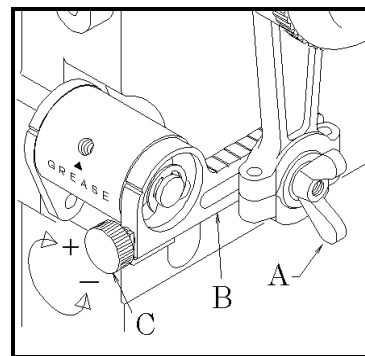
The eccentric collar serves as a stopper, so install the eccentric collar properly so that it does not touch the needle holder and spreader thread guide, etc.



11-5 Feeding amount of the lace/elastic

To adjust the feeding amount of the lace / elastic, loosen wing nut A and turn adjusting screw C while checking the readings on lever B. To increase the amount, turn screw C clockwise. To decrease the amount, turn screw C counterclockwise. Adjustable from 0.9 to 2.3mm. Adjust according to the fabric and/or elastic to be used. Adjust the pressure of the elastic feed small roller (see 11-6) simultaneously.

To increase the amount a little more, loosen two eccentric set screws from hole D. Turn the handwheel all the way to MAX with the wrench inserted until the handwheel stops and then tighten the set screws. This increases the adjustable range from 1.4 to 3.6mm.

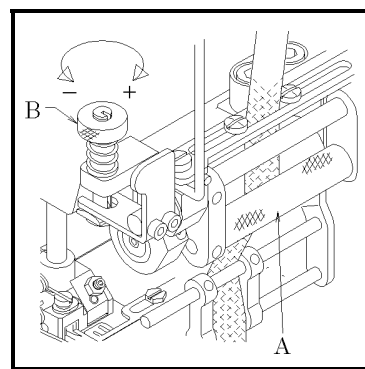


11-6 Pressure of the elastic feed small roller

To adjust the pressure of small roller A, loosen adjusting nut B as required. To increase the pressure, turn clockwise.

To decrease the pressure, turn counterclockwise.

Adjust the pressure according to the elastic to be used.



< Note >

Decrease the pressure for stretchable lace elastic.

Increase the pressure for non-stretchable lace elastic.

11-7 Checking the performance of the elastic feeder

If the elastic feeder does not work well, it will not feed elastic uniformly, causing various kinds of trouble such as burned elastic, jammed elastic, needle breakage, uneven sewing. Check the following.

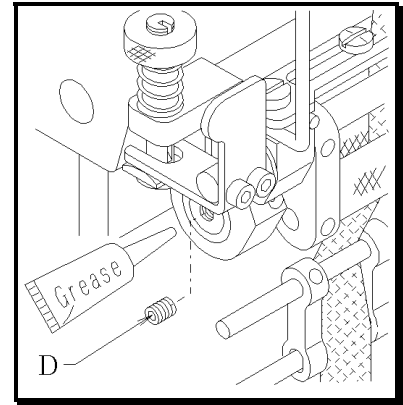
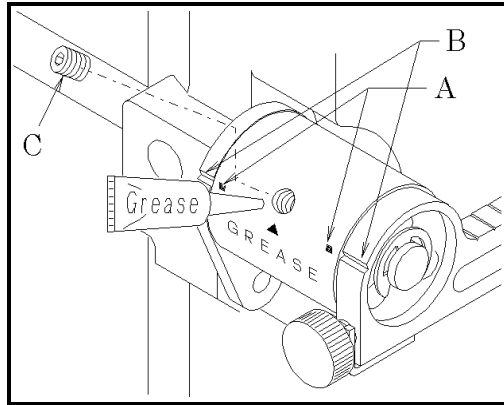
1. Adjust small roller A so that it can turn easily.
If it does not, the tape cannot be fed neatly.
2. The roller link and its shaft should move smoothly.
3. The small roller spring pressure should be as light as possible, yet be sufficient to follow the roller speed.

11-8 Oiling each part

The clutch has been greased at the factory. Add grease before it runs out.

Turn the handwheel to align mark A on the housing with mark B on the lever.

Remove screw C of the oil hole and then supply grease. Remove screw D and grease the bearing.



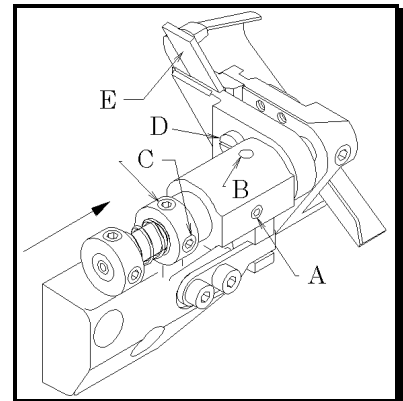
【12】EMK FRONT KNIFE DEVICE

12-1 Adjusting and oiling the lower knife holder

Loosen screw A to change the position of the lower knife holder. The upper and lower knife holders can be adjusted left to right simultaneously. When changing the distance from the right needle to the fabric edge, adjust the lower knife holder.

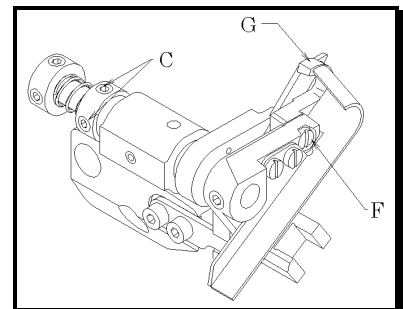
< Note >

Add a small amount of oil to oil hole B periodically.



12-2 Replacing the lower knife

1. Loosen screw C on the collar. Move the shaft to the right to provide clearance up and down.
2. Tighten screw C on the right collar temporarily.
3. Loosen screw D.
Remove lower knife E downward.
4. Align the blade of new lower knife E with the top surface of the needle plate. Tighten screw D.
5. The upper and lower knives are overlapped by loosening screw C on the collar.
6. Place a thread between the knives and check for the proper cutting action by turning the handwheel by hand. Tighten screw C.
7. Check for the proper cutting action again.

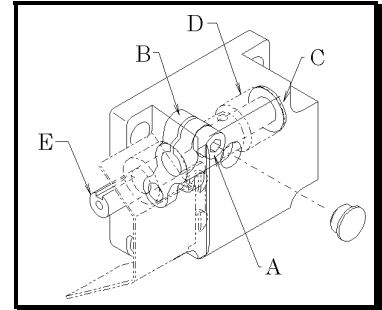
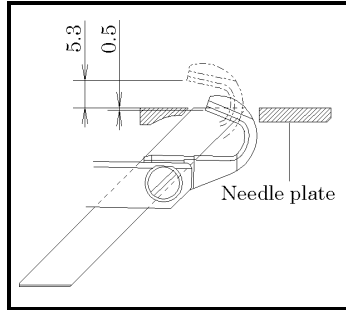


12-3 Replacing the upper knife

1. Create clearance up and down between the upper and lower knives (see 12-2 1).
2. Loosen screw F and remove upper knife G.
3. Secure a new knife and then check for the proper cutting action (see 12-2 6).

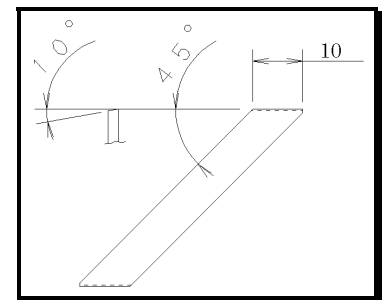
12-4 Overlap of the upper and lower knives

When the upper knife is at the bottom of its travel, there should be approximately 0.5mm overlap of the upper and lower knives. To make this adjustment, loosen screw A on the upper knife shaft lever. Then the upper knife and upper knife holder can be moved up and down simultaneously. Tighten screw A when 0.5mm overlap of the upper and lower knives is obtained. Secure bushing D with upper knife shaft lever B and washer C so that there is no left-to-right shake on upper knife shaft E. Then tighten screw A.



12-5 To sharpen the knife

The upper knife is made of an extra hard alloy. When the knives become dull, sharpen the lower knife first (see the illustration). If cutting is still not performed properly, replace the upper knife.



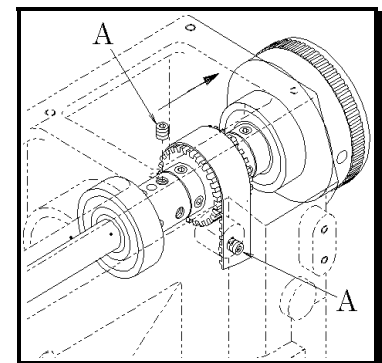
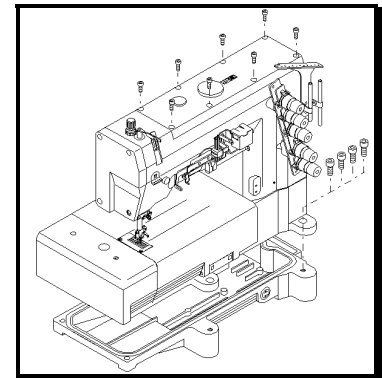
【13】 REPLACING THE TIMING BELT

13-1 Marks on the timing belts

There are three kinds of timing belts [A], [B] and [C] for the X Series according to the distance between the upper and lower shafts. [A] indicates the longest timing belt.

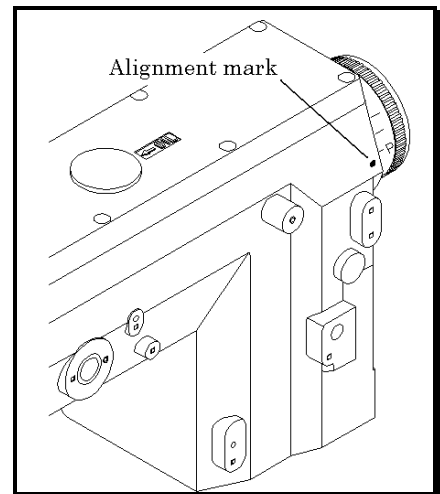
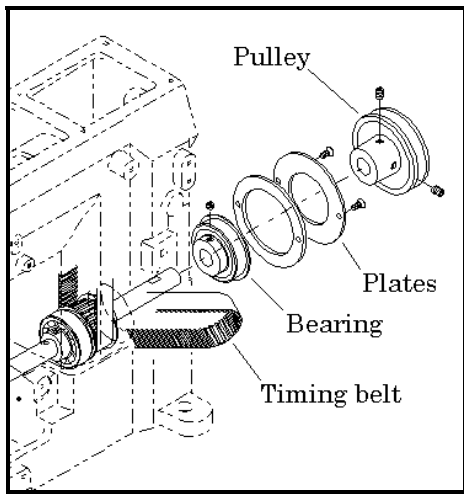
13-2 To remove the timing belt

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, plates and bearing in sequence by referring to the illustration below. 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 space collar, 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 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 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.

