

# INSTRUCTION

# **SX** *SERIES*

## Industrial Sewing Machines

*SX6803PD*  
*(Differential feed)*  
*SX6803P*  
*(Plain feed)*

*Second edition : January 2005*

No. 040111

**KANSAI**  
SPECIAL®

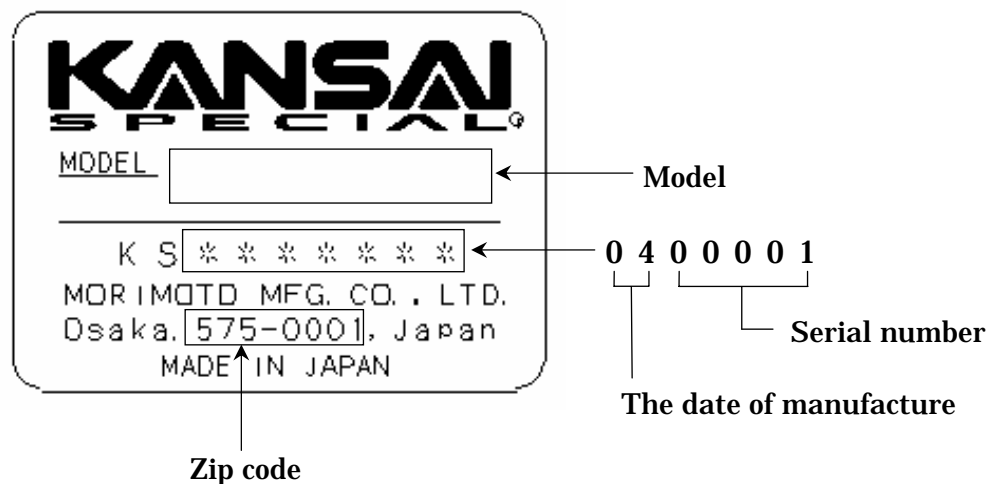
## **INTRODUCTION**

*Thank you for your purchasing Kansai Special's SX6800 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 performing preventive maintenance.
6. The contents described in this instruction manual are subject to change without notice.

### **Indication of serial number**



**SX series**

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*< Note >*

*All of adjustment categories for SX6803PD and SX6803P are same, expecting feed dog & stitch length adjustment, category No.8.*

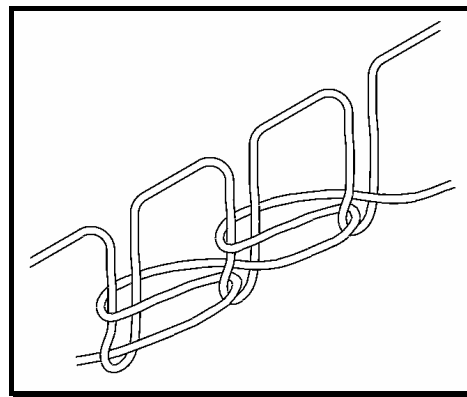
## 【1】 SPECIFICATIONS

### 1-1 Description

High speed feed-off-the-arm machines with differential feed

### 1-2 Stitch type

JIS401 double chainstitch machines



## 【2】 NEEDLES & THREADING THE MACHINE

### 2-1 Needles

TV × 3 of Schmetz or Organ

Select the proper needle for the fabric and thread.

< Needles and needle size >

Schmetz	TV × 3	Nm90	Nm100	Nm110	Nm125	Nm130	Nm140
Organ	TV × 3	# 14	# 16	# 18	# 20	# 21	# 22

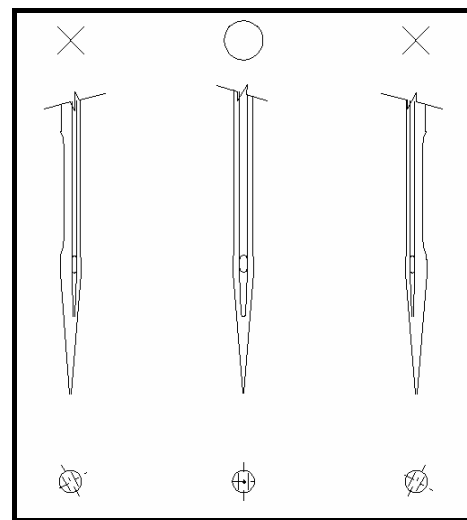
### 2-2 Replacing the needle

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

< Note >

*When replacing the needle, be sure to turn off the machine. A clutch motor continues running for a while after the machine is turned off.*

*Therefore keep on pressing the pedal until the machine stops.*



## 2-3 Threading

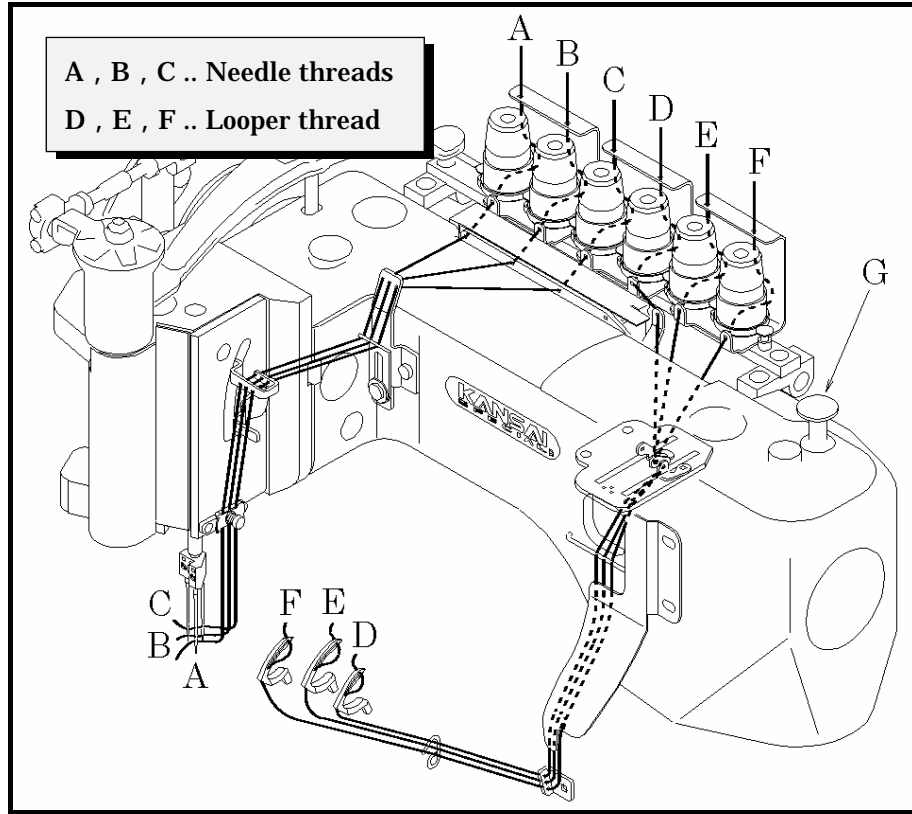
Thread the machine correctly by referring to the illustration below.

To thread the loopers, lay the looper holder down using the looper drawing device.

To lay the looper holder down

When the needle bar is at the bottom of its stroke, press push button G.

Threading is easy.



## 【3】 MACHINE SPEED

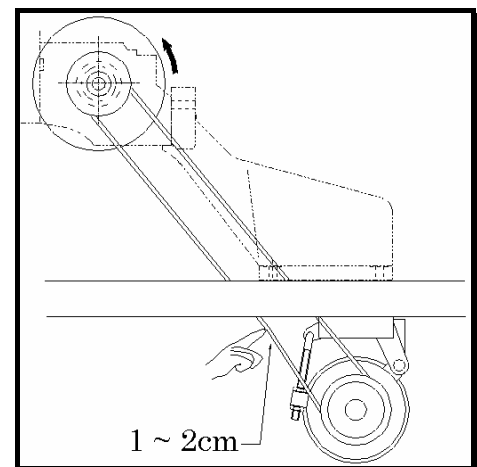
### 3-1 Machine speed & direction in which the machine pulley runs

Maximum speed : 4,500 spm (4,000 spm for normal use)

< Note >

Run the machine at 3,500 spm for the first 200 hours (approximately 1 month) for durability.

The handwheel turns counterclockwise as shown in the illustration.



### 3-2 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 in the table below.) Position the motor by pressing the finger onto the mid-point of the belt so that 1~2cm deflection can be achieved (see the illustration).

Motor pulley outer diameter	Machine speed	
	50Hz	60Hz
75 mm		3500SPM
85 mm		4000SPM
90 mm	3500SPM	
95 mm		4500SPM
100 mm	4000SPM	
110 mm	4500SPM	

## 【4】 LUBRICATION

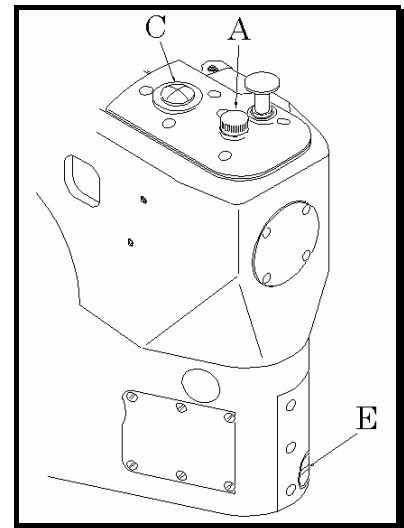
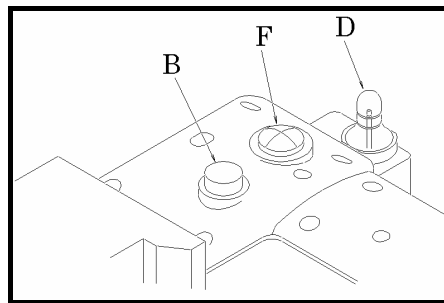
### 4-1 Oil

Use Kansai Special's genuine oil. (Part No.28-617)

### 4-2 To fill the machine with oil

Remove screw A and B from the oil hole.

Fill the machine with oil until the oil level reaches the top line on oil gauge E and D. Maintain the oil level between the lines of the gauges. After filling the machine with oil, run the machine to check the oil is splashing to oil flow sight window C and F.

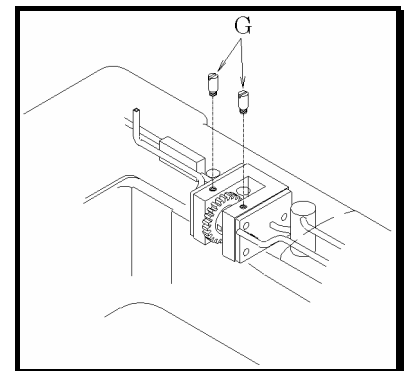


### 4-3 To check for proper oil flow

When starting a new machine after filling the reservoirs, or when beginning to operate a machine that has been idle for some time, it may be necessary to prime the pump.

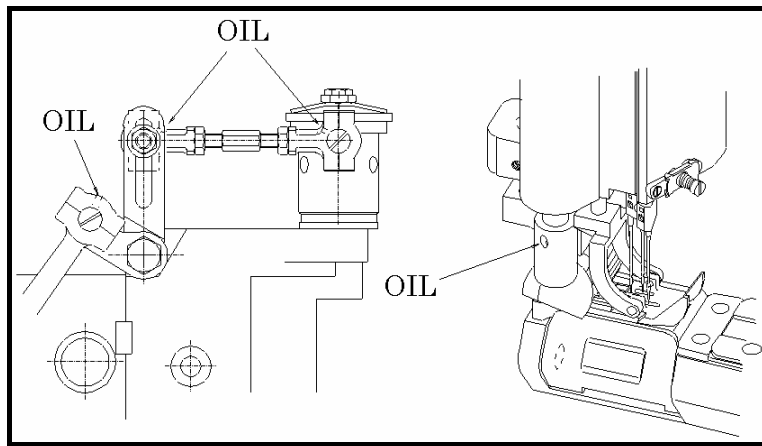
To do this, remove the two plug screw G.

Apply oil from an oil can to these holes and operate machine until bubbling can be observed at the windows.



#### 4-4 Putting a small amount of oil

Put a small amount of oil onto the positions shown in the illustration.

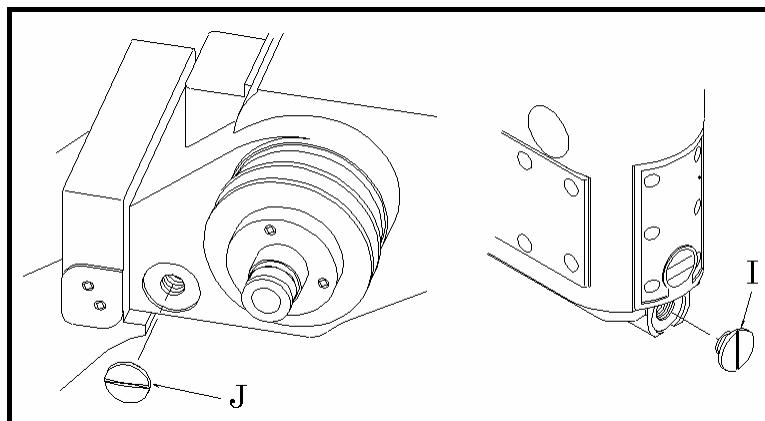


#### 4-5 Replacing the oil

To extend machine life, replace the entire oil after the first 200 hours of operation. Thereafter replace the oil every 6 months. To drain the oil, remove screw I and J.

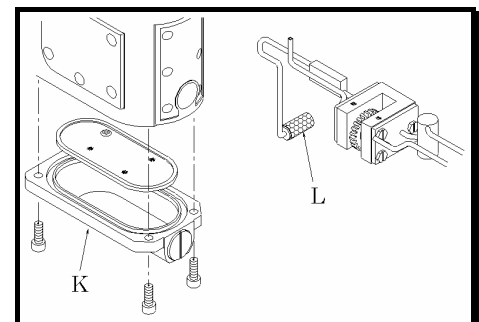
< Note >

*Contaminated oil may shorten machine life. Replace the oil as early as possible.*



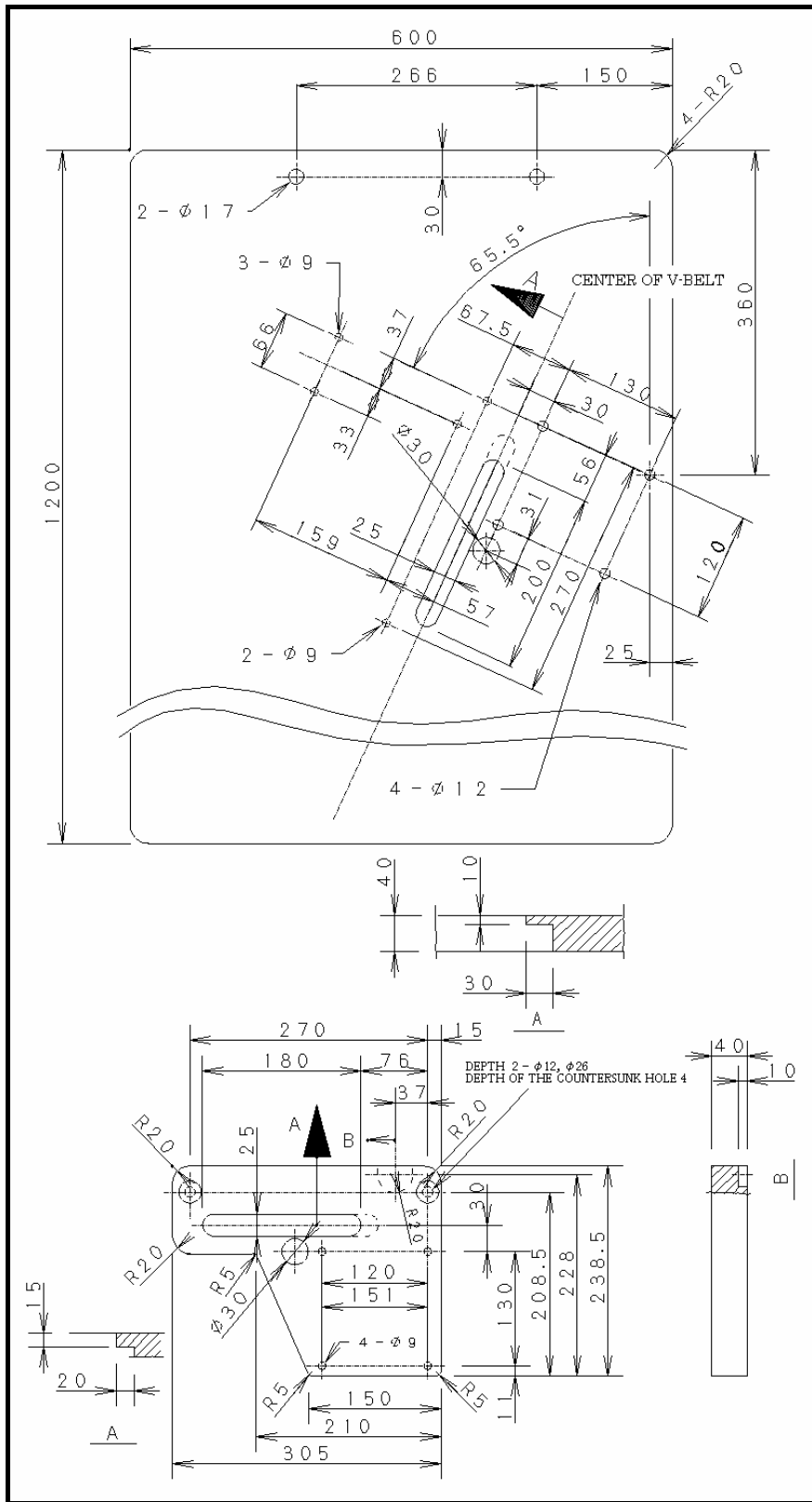
#### 4-6 Cleaning the filter element

Before replacing the oil, remove reservoir K and clean the cylinder, inside of the reservoir and filter element. Also remove the oil pump and clean the filter element L. If these parts are contaminated, proper oiling may not be performed.



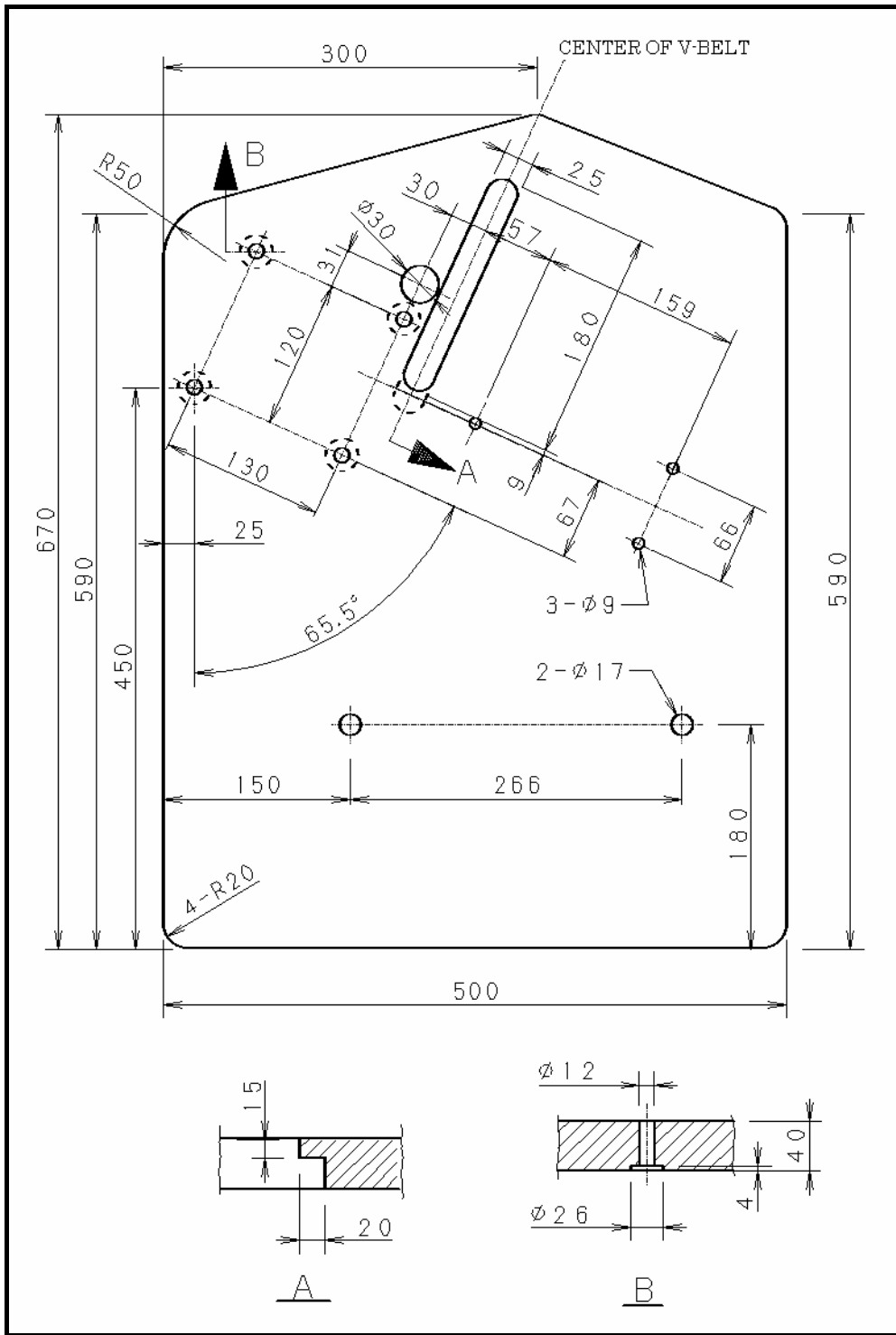
# 【5】 SEWING MACHINE INSTALLATION

## 5-1 Cutting the machine table Type A (clutch motor)

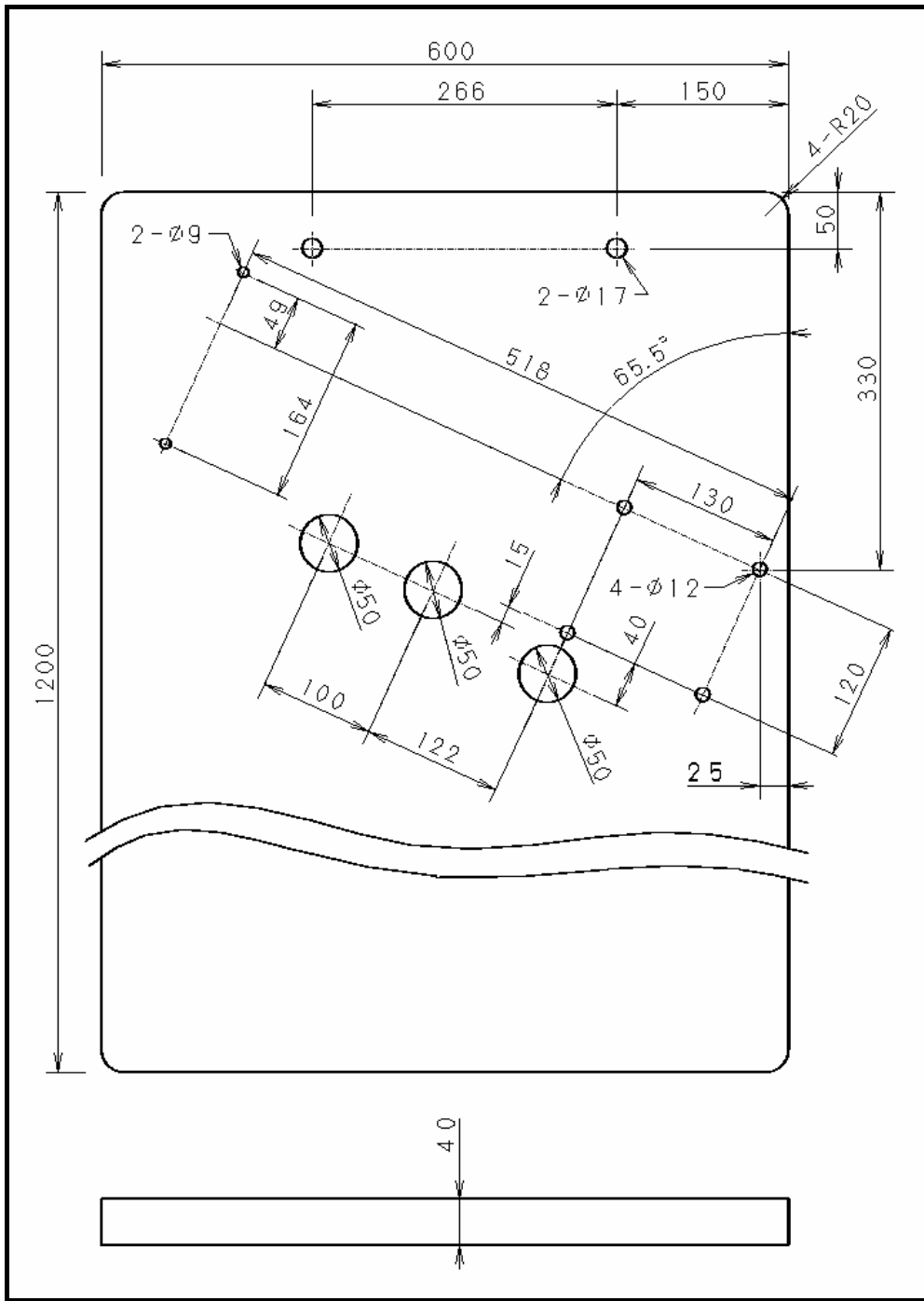


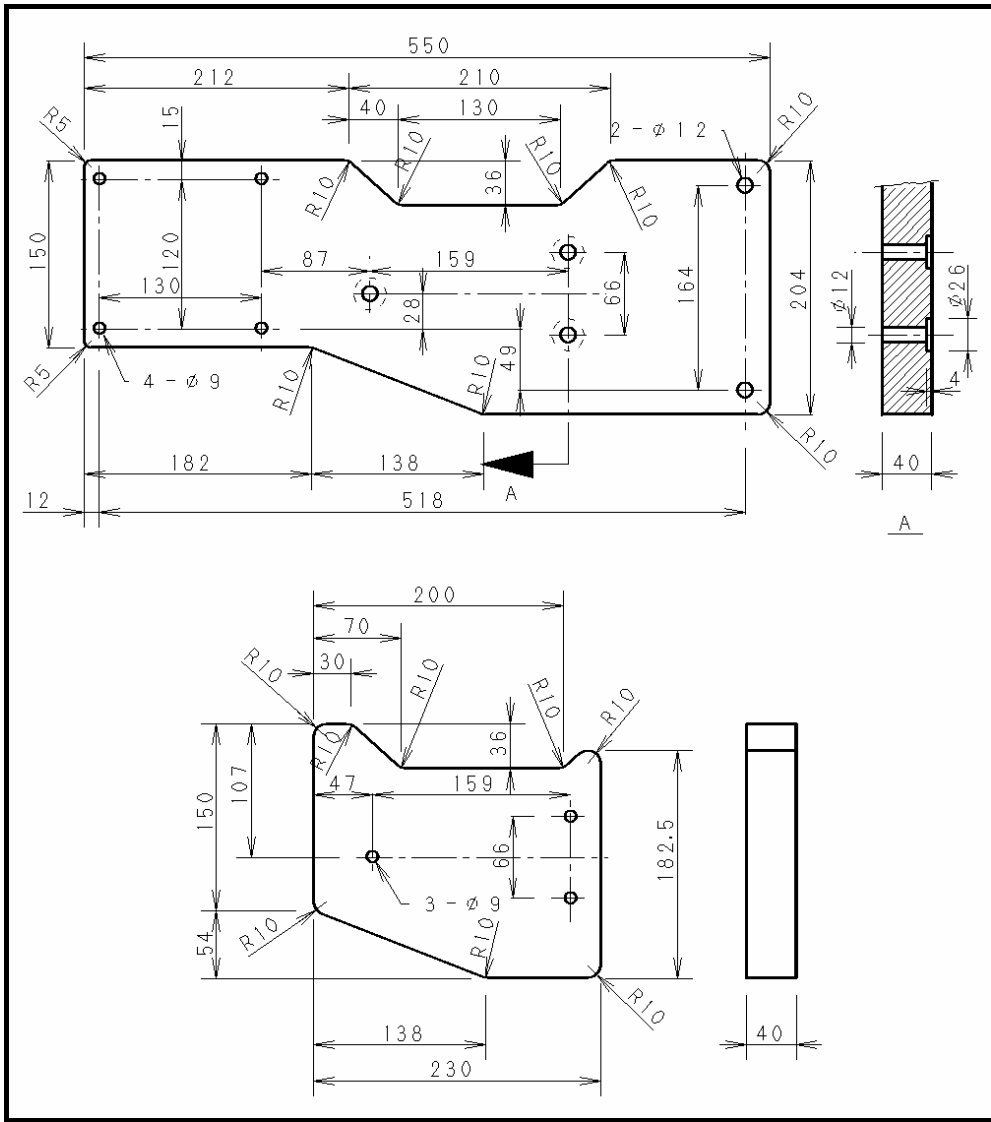


Type B (clutch motor)



Type C (servo motor)

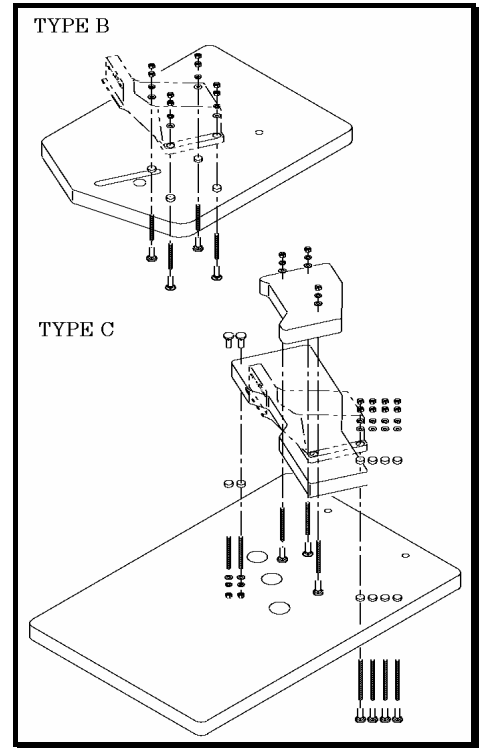
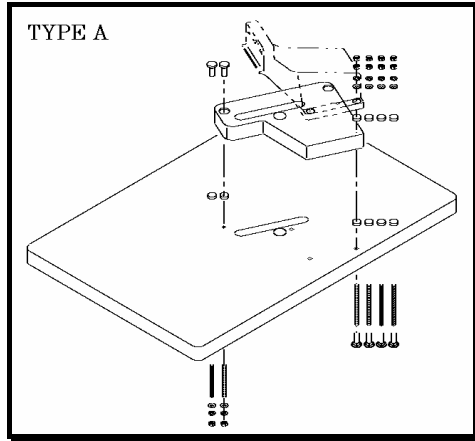




### 5-2 Installing the mount base

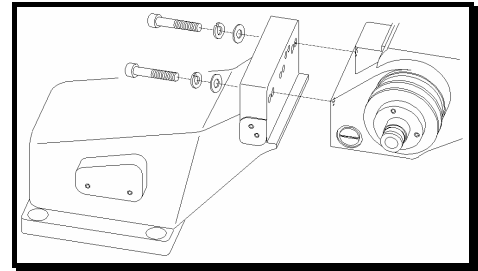
Refer to the Parts list page 25~30,60~65.

Install the mount base correctly by referring to the illustration right.



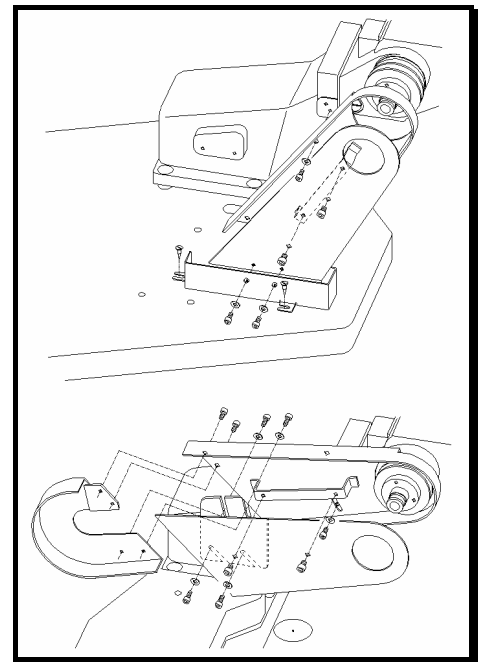
### 5-3 Installing the machine

Install the machine correctly by referring to the illustration right.



### 5-4 Installing the pulley cover

Install the pulley cover correctly by referring to the illustration right.



## 【6】 TIMING OF THE LOOPERS TO THE NEEDLES

Timing of the looper to the needle is factory-set properly. However, when disassembling the needle bar mechanism, looper mechanism or using a new part, this timing should be readjusted. Refer to the following procedures.

### 6-1 To adjust the timing

1. Remove the needle, needle plate, presser foot, feed dog and auxiliary feed dog and feeding roller.
2. Remove the front looper. Then install test bar A (diameter : 3.97). Tighten screw B.
3. With the looper holder at the extreme right end of its travel, position test bar A so that it is normal to the throat plate. Adjustment is made by loosening screw C and positioning the looper holder again.
4. Bring test bar A to the extreme left end of its travel. Then install the needle plate.
5. Turn the machine pulley counterclockwise slowly until the test bar touches slightly the needle plate.
6. Fit timing gauge D onto the underside of the machine head. Then secure it on the needle bar.
7. Turn the machine pulley clockwise slowly until timing gauge D touches the machine head or test bar A touches the needle plate.

Clearance between timing gauge D and the machine head or test bar A and the needle plate should be within 0.1mm. If it is, the timing will be correctly achieved. If it is more than 0.1mm, follow the procedures below.

8. Remove the cover of the crank chamber and packing. Loosen screws F of joint collar E. If timing gauge D touches the machine head before test bar A touches the needle plate while the machine pulley is turned slowly clockwise, the looper timing is fast. Therefore fix the crankshaft and turn main shaft G clockwise.

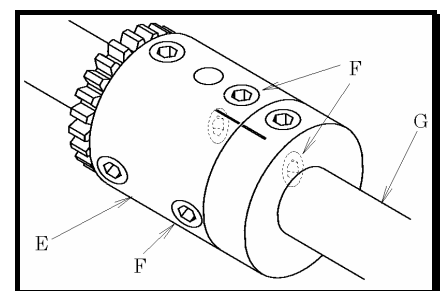
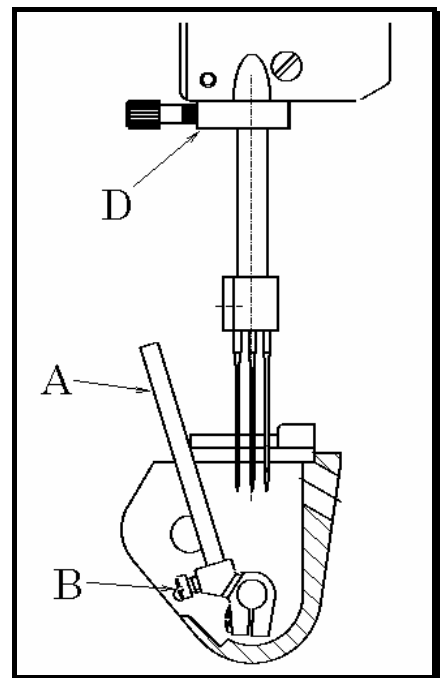
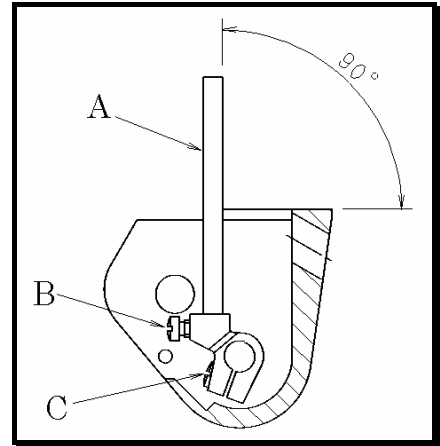
If test bar A touches the needle plate and there is a clearance between timing gauge D and the machine head, the looper timing is slow.

Turn main shaft G counterclockwise.

Every time joint collar E is readjusted, perform 6, 7 and 8 procedures repeatedly.

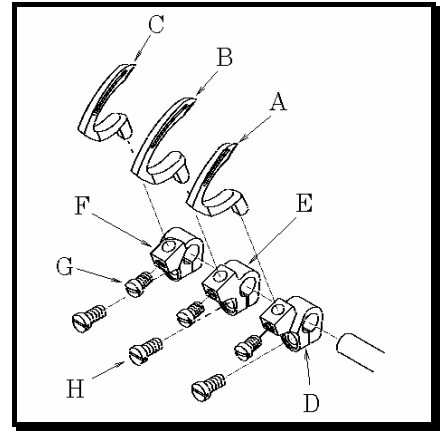
To do so, tighten any one of screws F temporarily.

After the adjustment has been achieved, tighten screws F securely. Then make sure the correct timing is obtained by referring to the above procedures.



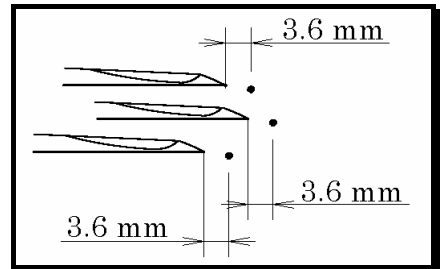
### 6-2 Angle and height for installing the loopers

Insert loopers A, B and C fully into looper holders D, E and F. Tighten screws G. Height and an angle of  $3^\circ$  are achieved.



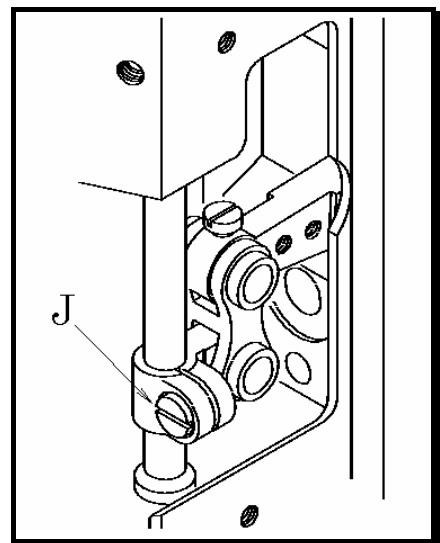
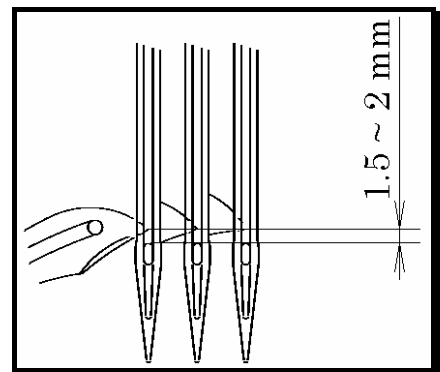
### 6-3 Looper setting distance

With the loopers at the extreme left end of their travel, there should be a distance of approximately 3.6mm from each center of the needles to each point of the loopers. Adjustment is made by loosening screws H.



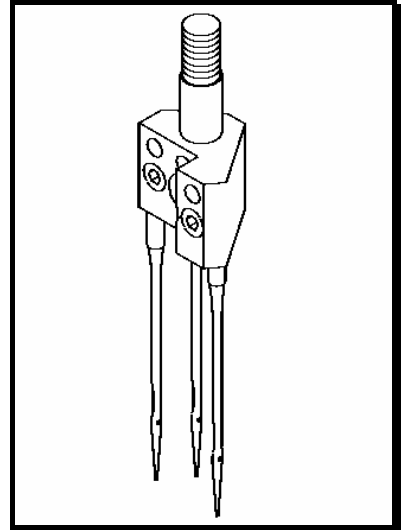
### 6-4 Needle height

When each point of the loopers passing behind the needles has reached each center of the needles, there should be a distance of 1.5~2.0mm from each point of the loopers to each top of the needles' eyes. Adjustment is made by loosening screw J of the needle bar clamp and moving the needle bar up or down as required.



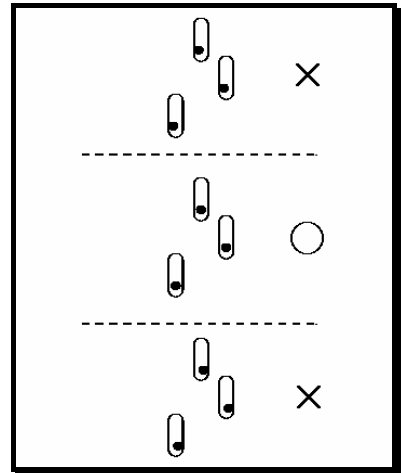
### 6-5 Installing the needle holder

Torque the needle holder into the needle bar to 20kgf·cm.



### 6-6 Relationship between the needles and needle plate

When the height of the needle bar is adjusted, check to see if each needle is centered in its needle drop hole.

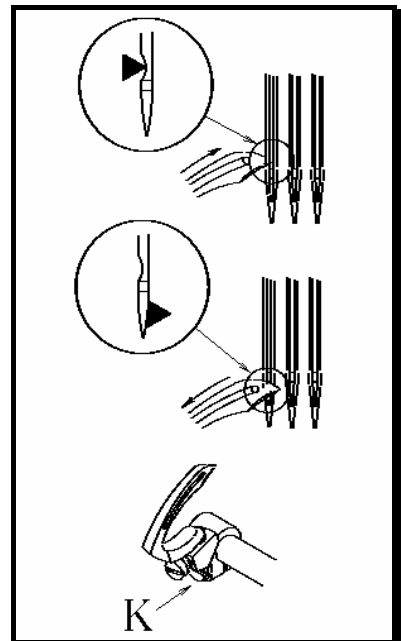


### 6-7 Needles/loopers front-to-back relationship

The looper passes behind the needle when it moves from the extreme left end of its travel to the right.

When the point of the looper has reached the center of the needle, the looper should be as close to the needle as possible with no contact between the looper and the needle. Adjustment is made by loosening screw K on the looper holder. When the looper moves to the left from the extreme right end of its travel while the needle is descending to the back of the looper blade, check to see if the needle touches slightly the back side of the looper.

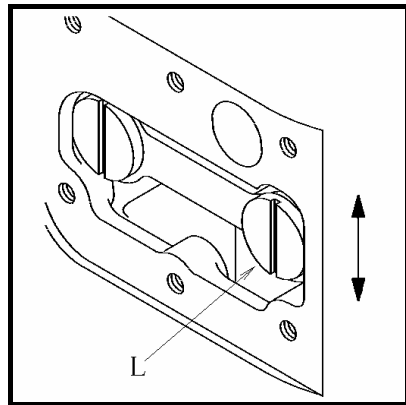
If the needle is bent by the looper or there is a clearance between the needle and the looper, adjust the amount of looper front-to-back movement by referring to the below.



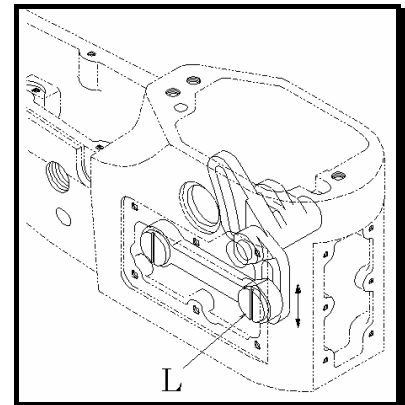
### 6-8 Adjusting the amount of looper front-to-back movement

Remove the side cover of the cylinder. Loosen screw L (see the illustration) on the looper avoiding rod. Move the looper avoiding rod up or down as required.

Raising the rod decreases the amount. Lowering the rod increases the amount.



< SX6803PD >



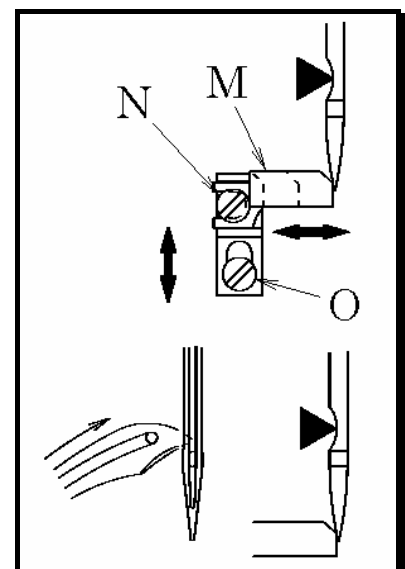
< SX6803P >

### 【7】 ADJUSTING THE NEEDLE GUARD

When the looper moves to the right from the extreme left end of its travel, the looper passes behind the needle.

When the point of the looper has reached the centerline of the needle, the needle should be 0~0.5mm deflected by needle guard M. Adjustment is made by loosening screw N. The needle guard should be installed as low as possible. In addition, the needle must touch the needle guard surface until the point of the looper passing behind the needle reaches the right side of the needle.

Adjustment is made by loosening screw O.



< Note >

*Since the needle guard is installed on the feed dog bracket, the relationship between the needle and the needle guard varies according to the stitch length. Therefore readjust the needle guard if the stitch length is changed.*



## 【8】 ADJUSTING THE FEED DOGS & STITCH LENGTH

### *SX6803PD (Differential feed)*

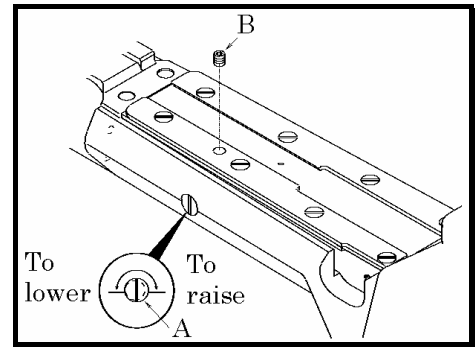
#### 8-1 To install and adjust the feed dogs

**Position of the feed rocker arm eccentric pin**

Eccentric pin A which is located at the middle of the cylinder is used for a fine height adjustment on the main and differential feed dogs.

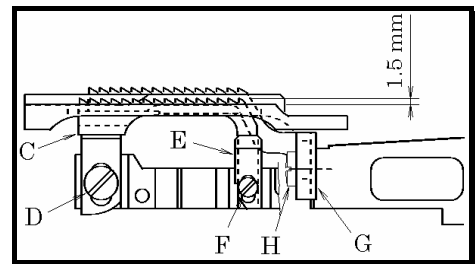
Before installing the main and differential feed dogs, set the groove on the eccentric pin in a vertical position and then fasten the eccentric pin with screw B. The above adjustment should be made in order to raise the main and differential feed dogs simultaneously (the extreme rear ends of these feed dogs must be 2.5mm raised).

Assemble eccentric pin A so that the feed dogs can be raised by turning eccentric pin A clockwise.



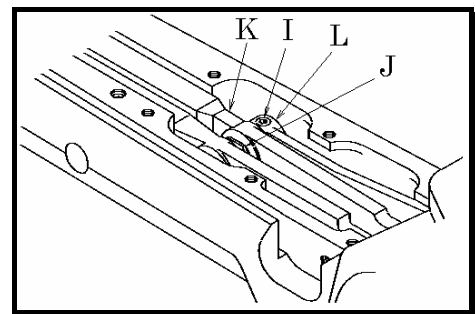
**To assemble the feed dogs**

1. Install feed dog C with screw D.
2. Fit feed dog support E onto feed dog C and tighten screw F.
3. Fit differential feed dog G slightly onto feed dog C and tighten screw H.
4. Check to see if the machine pulley turns easily with differential feed effective.



**Feed dog height**

When the main feed dog is in its highest position, the first tooth from the front should be 1.5mm above the needle plate. Adjustment is made by loosening screws D, F and H.



**Position of the feed rocker arm**

If the feed dogs touch the slots of the needle plate at the front or back, adjust the position of the feed rocker arm. Adjustment is made by loosening screw I, turning eccentric pin J and moving feed rocker arm K front or back as required.

To turn eccentric pin J, tap the V groove on the brim of the pin with a tapered tool.

After this adjustment, secure feed rocker arm K and feed link L with screw I while checking there is no play on these parts.

## 8-2 Stitch length

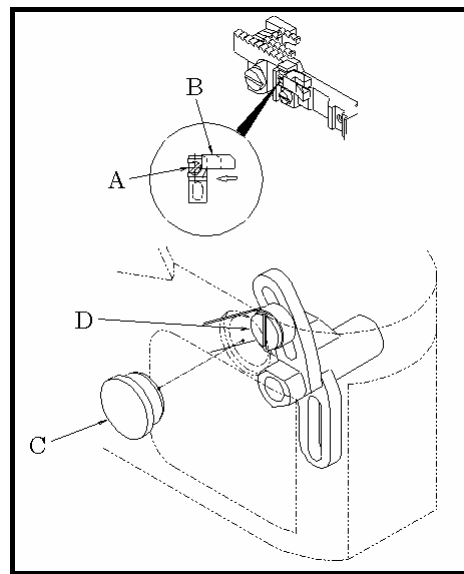
Adjustable from 2.1mm to 4.2mm with no steps.

The number of stitches per inch (25.4mm) is as follows.

Stitch length	Number of stitches per inch
4.2mm	6
3.6mm	7
3.2mm	8
2.8mm	9
2.5mm	10
2.3mm	11
2.1mm	12

To change the stitch length

1. Loosen screw A on the needle guard.  
Move needle guard B to the extreme rear end of the machine.  
Then tighten screw A temporarily.
2. Remove rubber plug C.
3. Loosen screw D. To increase the stitch length, move screw D upward. To decrease the stitch length, move screw D downward.
4. When the required stitch length is achieved, tighten screw D securely and then replace rubber plug C.
5. Adjust needle guard B and tighten screw A (refer to "Adjusting the needle guard" on page 11).



## 8-3 Adjusting the differential feed

To adjust the differential feed, turn differential feed adjusting outside lever A clockwise or counterclockwise. If lever A is aligned with the mid-point between readings "4" and "5", the movement amount of the main feed dog will be equal to that of the differential feed dog.

Then the differential feed will not become effective.

Normal differential feed (for gathering effect)

Move lever A toward reading "+".

The maximum differential feed ratio is 1:1.3 with lever A at reading "9".

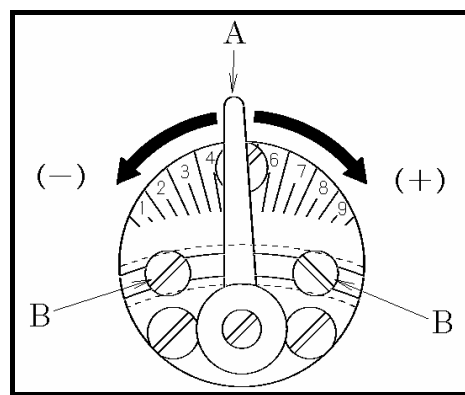
Reverse differential feed (for stretching effect)

Move lever A toward reading "-".

The maximum reverse differential feed ratio is 1:0.7 with lever A at reading "1".

If the top ply is left at the end of sewing, move lever A toward reading "+".

If the bottom ply is left at the end of sewing, move lever A toward reading "-".



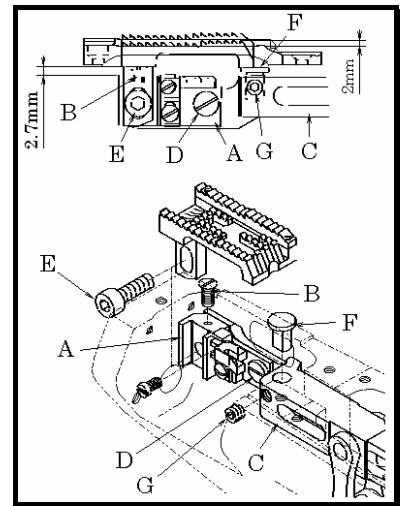
< Note >

Screws B are used to fix the lever or to regulate an adjustable range of differential feed ratio.

## ***SX6803P (Plain feed)***

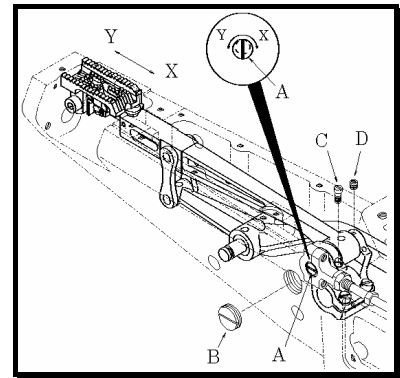
### **8-4 Feed dog height**

1. The top of the screw B should be 2.7mm above the top of feed dog bracket A, and setting the feed dog.
2. Install those parts on the feed bar C with screw D and E.
3. When the main feed dog is in its highest position, the first tooth from the front should be 2mm above the needle plate. Then tighten screw D and E.
4. Stopper pin F is touched under the feed dog and tighten screw G.



### **8-5 Feed dog front-to-back**

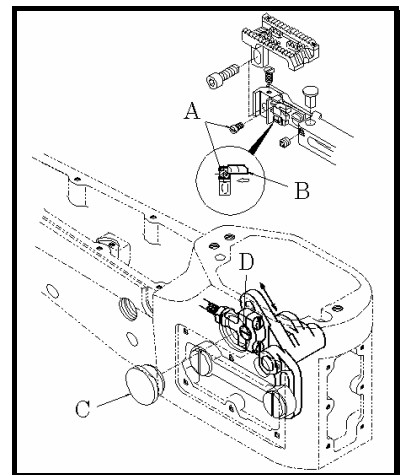
The feed dog should be centered front to back.  
The feed dog should not touch the needle plate.  
Fine adjustment is made by tightening screw C, D and turning front to back adjusting eccentric pin A.



### **8-6 Stitch length**

Adjustable from 2.1mm to 4.2mm with no steps.  
The number of stitches per inch (25.4mm) is as follows.

Stitch length	Number of stitches per inch
4.2mm	6
3.6mm	7
3.2mm	8
2.8mm	9
2.5mm	10
2.3mm	11
2.1mm	12



To change the stitch length

1. Loosen screw A on the needle guard.  
Move needle guard B to the extreme rear end of the machine.  
Then tighten screw A temporarily.
2. Remove rubber plug C.
3. Loosen screw D. To increase the stitch length, move screw D upward.  
To decrease the stitch length, move screw D downward.
4. When the required stitch length is achieved, tighten screw D securely and then replace rubber plug C.
5. Adjust needle guard B and tighten screw A (refer to "Adjusting the needle guard" on page 13).

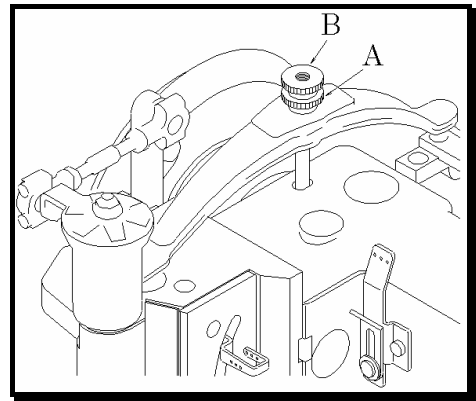
## 【9】 ADJUSTING THE PRESSER FOOT

### 9-1 Presser foot pressure

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

If the pressure is too light, the fabric may not be fed evenly or skip stitching and/or uneven stitching may occur. Adjustment is made by loosening screw A and turning adjusting screw B.

To increase the pressure, turn adjusting screw B clockwise. To decrease the pressure, turn adjusting screw B counterclockwise.



### 9-2 Disassembling and reassembling the presser foot

To disassemble the presser foot

Move the presser bar all the way to the up position by pressing the presser foot lift pedal.

Loosen screw A.

To reassemble the presser foot

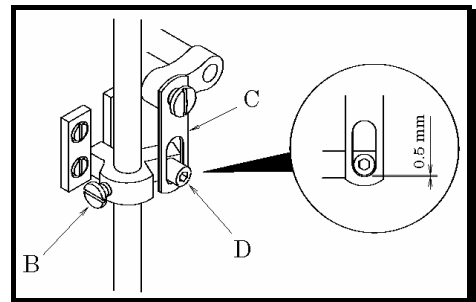
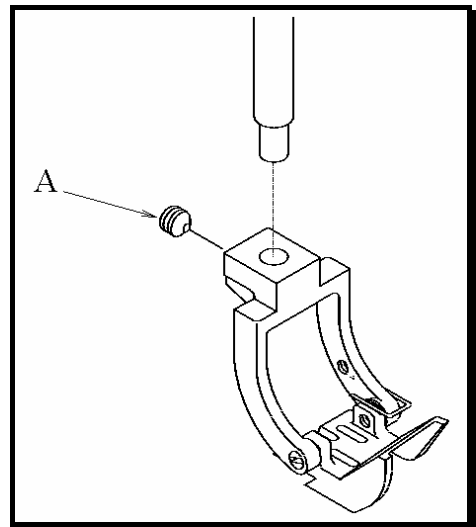
Move the presser bar all the way to the up position by pressing the presser foot lift pedal.

Install the presser foot with screw A.

Make sure the presser foot is replaced onto the flat spot of the presser bar. The needles should drop into the centers of the needle drop holes on the presser foot. To make this adjustment, loosen screw B of the presser bar clamp and turn the presser bar.

To adjust the presser bar clamp

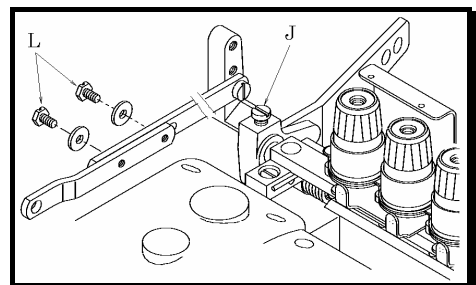
Loosen screw B of the presser bar clamp with the presser foot tightly rested on the top surface of the needle plate. Clearance between presser foot link C and screw D should be approximately 0.5mm.



### 9-3 Presser foot lift

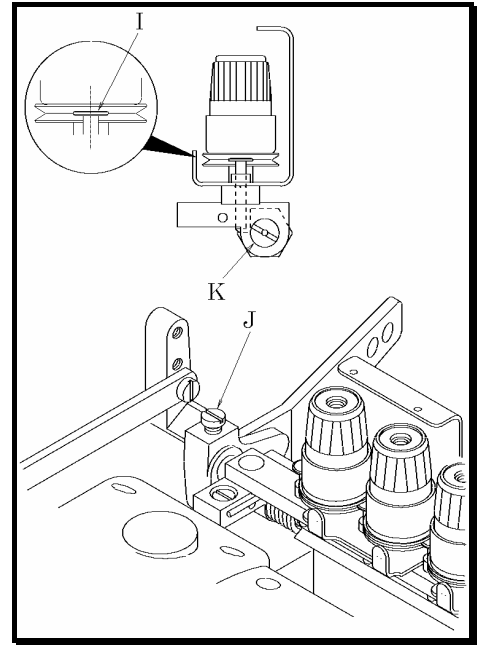
With the presser foot tightly rested on the top surface of the needle plate (the presser foot lift pedal is not pressed), there should be a clearance of approximately 0.5mm between presser foot link C and screw D of the presser bar clamp.

To make this adjustment, adjust screw J on the presser foot lift lever or screws L.



#### 9-4 Adjusting the thread releaser shaft

When the presser foot lift pedal is not pressed, the upper part of thread releaser pin I should be positioned between the top and bottom thread tension disks. To make this adjustment, loosen screw J of the presser foot lift lever (Large) and turn thread releaser shaft K as required with a screwdriver.



### 【10】 ADJUSTING THE FEED ROLLER

#### 10-1 Adjusting the movement amount of the feed roller

Loosen screw C.

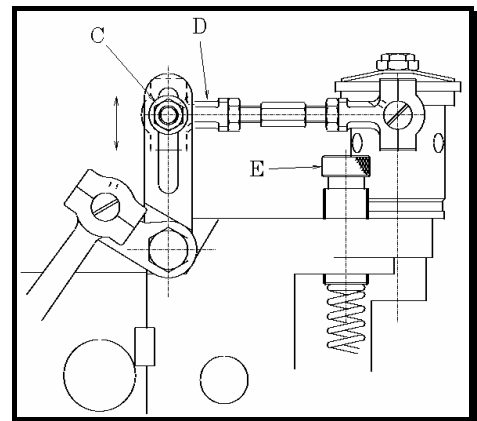
Move feed roller lever rod D up or down as required.

To increase the movement amount, move rod D upward. To decrease the movement amount, move rod D downward.

#### 10-2 Feed roller pressure

The pressure should be sufficient to feed the fabric uniformly. To increase the pressure, turn adjusting screw E clockwise.

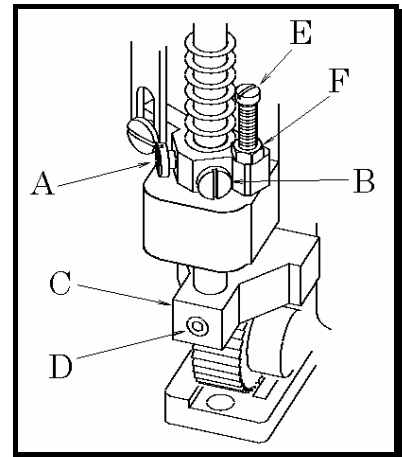
To decrease the pressure, turn adjusting screw E counterclockwise.



### 10-3 Disassembling, reassembling and adjusting the feed roller

To disassemble the feed roller

1. Remove screw A on the feed roller presser bar clamp. Loosen screw B.
2. Loosen screw D on feed roller bracket C.
3. Raise the feed roller presser bar as required. Remove feed roller bracket C.



To reassemble and adjust the feed roller

1. Insert the feed roller presser bar into the feed roller presser spring, feed roller presser bar clamp and then feed roller bracket.
2. Replace screw A of the feed roller presser bar clamp. Tighten screw A until it contacts the flat spot on the feed roller presser bar. Tighten screw B.
3. Create a clearance of approximately 0.1mm between the feed roller and the needle plate with screw E of the feed roller presser bar clamp touching the surface of the casting on the machine head. Then tighten screw D. If the feed roller contacts the needle plate when the machine runs with no fabric, the feed roller will be worn out. This clearance (0.1mm) prevents the feed roller from being worn out.

Interlock between the feed roller and the presser foot

Pressing the presser foot lift pedal raises simultaneously the presser foot and the feed roller. The feed roller is factory-set to be raised shortly after the presser foot is raised.

Adjust the timing at which the presser foot and the feed roller are raised according to sewing conditions. Refer to the procedures below.

1. Loosen screw D to release the feed roller.
2. Loosen nut F. Turn adjusting screw E clockwise or counterclockwise as required. To advance the timing at which the feed roller is raised, turn adjusting screw E counterclockwise. To delay the timing at which the feed roller is raised, turn adjusting screw E clockwise.
3. Lock adjusting screw E with nut E.
4. Create a clearance of 0.1mm between the feed roller and the needle plate. Tighten screw D.

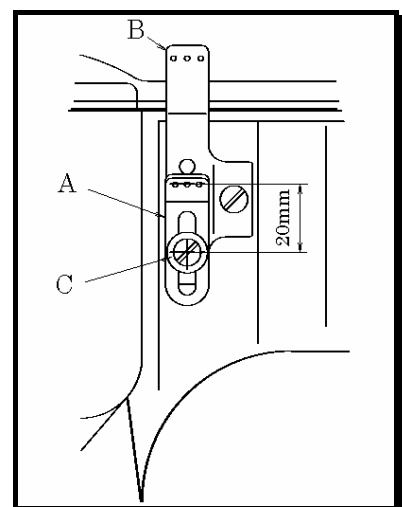
## 【11】 ADJUSTING THE STITCH FORMATION

### 11-1 Needle thread tension

Secure needle thread eyelet (left) A in the slot on the lower part of needle thread eyelet (right) B.

There should be a distance of 20mm from the center of screw C to the eyes on needle thread eyelet (left) A.

To tighten the needle thread, move needle thread eyelet (left) A downwards.

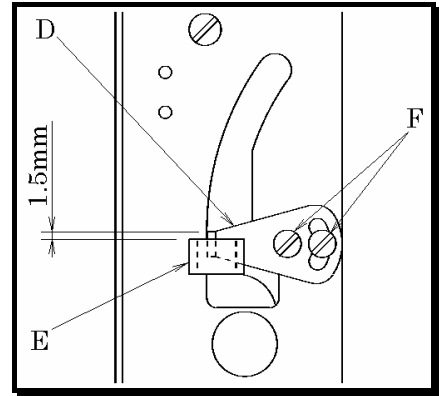


### Needle thread guard

Needle thread guard D adjusts the needle thread tension after the looper has withdrawn from the needle thread loop and the shape of the needle thread loop which the looper enters. When the needle bar is at the bottom of its stroke, needle thread guard D should be 1.5mm above the top end of needle bar lever eyelet E. Moving needle thread guard D upwards increases the size of the needle thread loop.

Moving needle thread guard D downwards decreases the size of the needle thread loop.

Adjustment is made by loosening screws F.



### 11-2 Looper thread tension

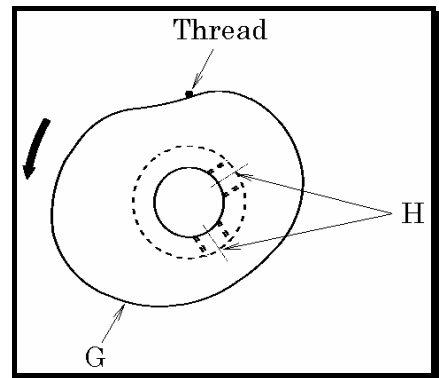
The illustration of the looper thread take-up cam is as seen from the front (operator's side).

When the looper starts moving to the left from the extreme right end of its travel, looper thread take-up cam G should begin to cast off the looper thread.

Adjustment is made by loosening screws H.

To increase the amount of looper thread to be supplied, advance the timing at which the looper thread take-up cam starts casting off the looper thread for the looper.

When adjusting looper thread take-up cam G, be careful not to move it front or back.



## 【12】CLEANING THE MACHINE

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

