

INSTRUCTION

FSX SERIES

Industrial Sewing Machines

FSX6604S, LM, MH

First published : July 2005

No. 050054

KANSAI
SPECIAL®

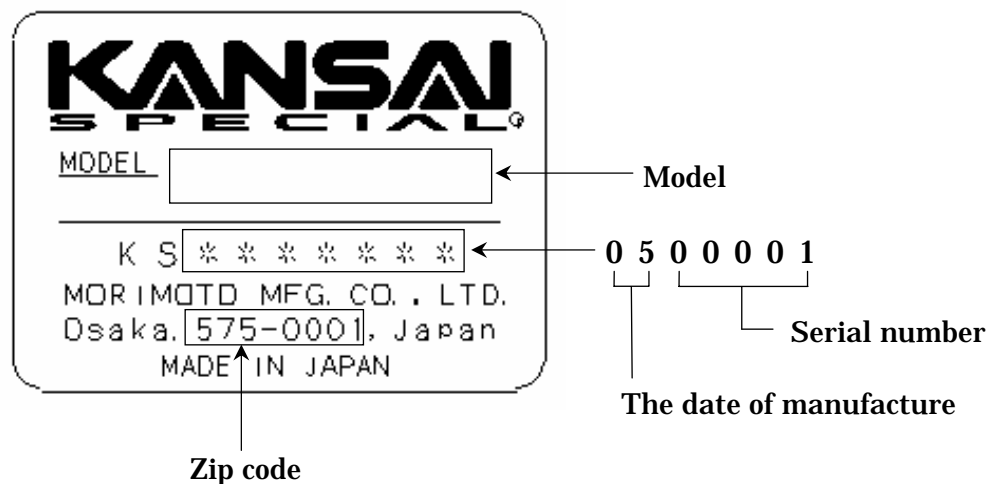
INTRODUCTION

Thank you for your purchasing Kansai Special's FSX6604 Series.

Please 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, please make sure the pulley cover, safety cover, etc. are secured.
3. Before adjusting, cleaning, threading the machine or replacing the needle, please 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



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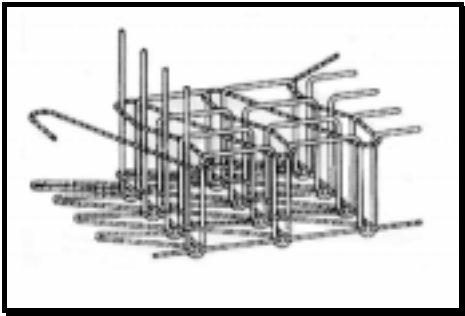
【1】 SPECIFICATION

1-1 Description

High speed feed-off-the-arm with 4 needles flat seamer

1-2 Stitch type

ISO standard 607



【2】 NEEDLES & THREADING MECHANISM

2-1 Needles

Needles····· FL × 118GCS (Organ)
 Ritana····· FLG-8 (Organ)

Please select the proper needle size according to fabric thickness and material.

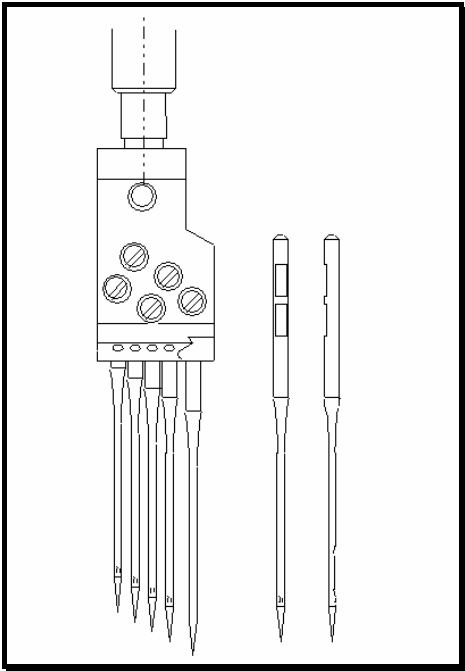
< Needles and needle size >

Japan	# 8	# 9	#10	#11	#12	#14
Germany	Nm60	Nm65	Nm70	Nm75	Nm80	Nm90

2-2 Replacing the needles

When replace the needle, the groove on needle shank is turned to front then put it into needle bar head interior. (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.

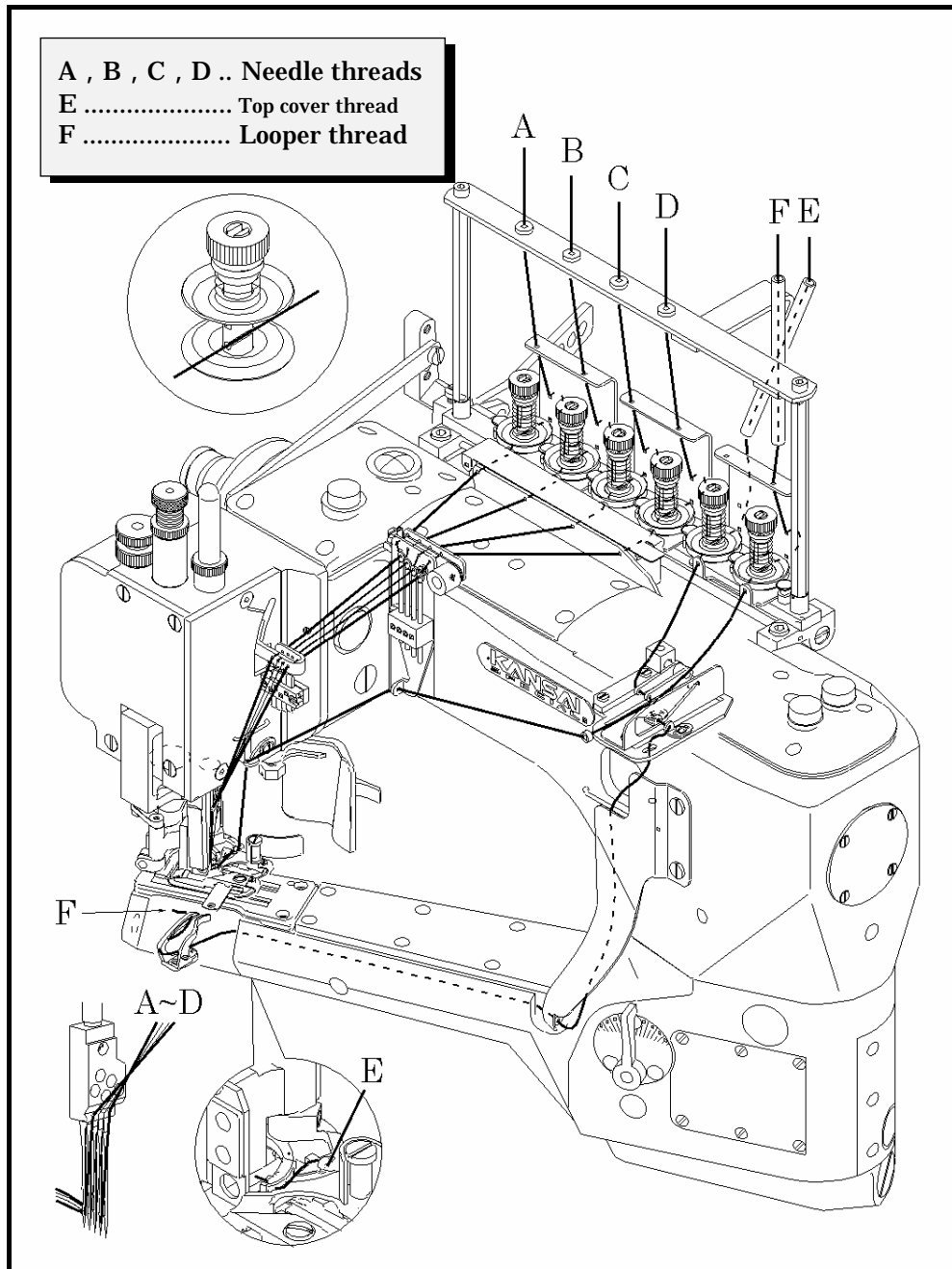


2-3 Threading

Please refer the illustration as below.

< Note >

Threading must be properly way for avoid machine broken.

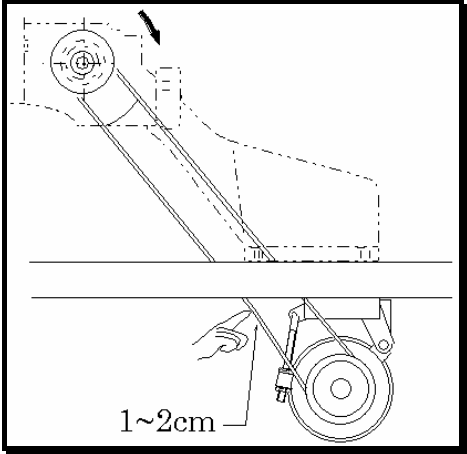


【3】 MACHINE SPEED

3-1 Machine speed & running hand-wheel direction

This machine's max speed is 4200spm. (Normally 3800spm for operation)

< Note >
For running new machine, first 200hours (1 month) must run 3500spm for long durability in the future.
For direction of hand-wheel is clockwise.



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 & OIL

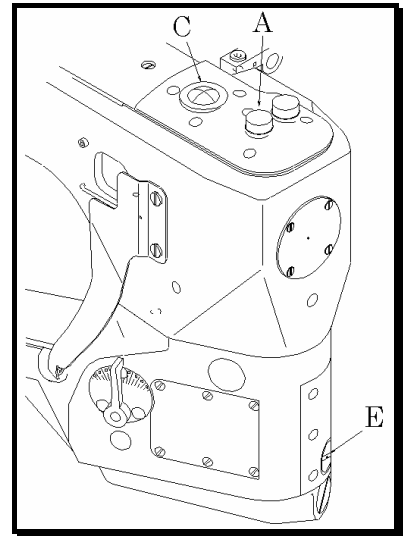
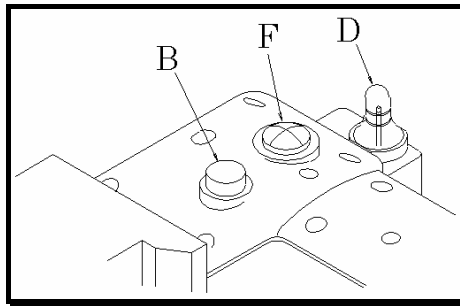
4-1 Oil

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

4-2 How to fill 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.

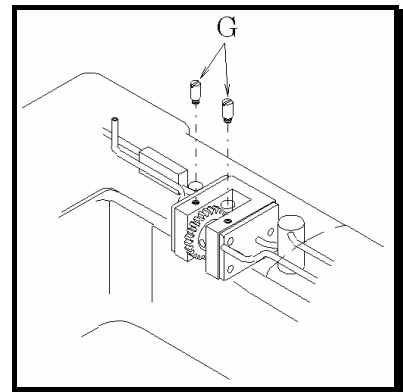


4-3 Check oil

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.

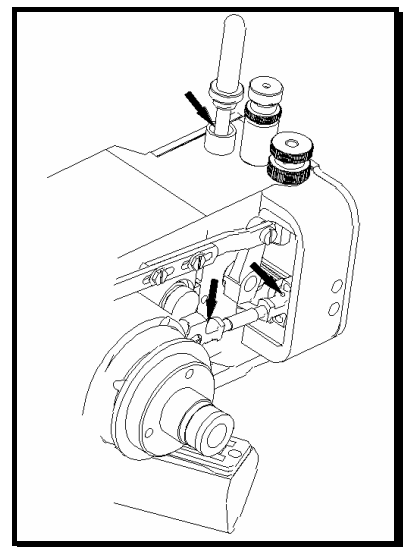
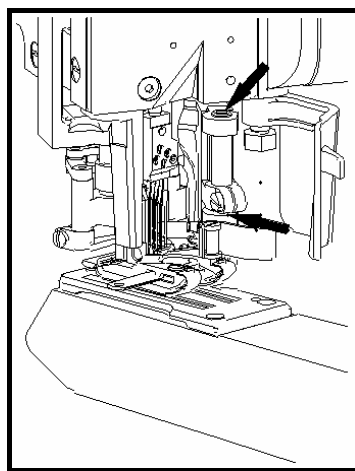
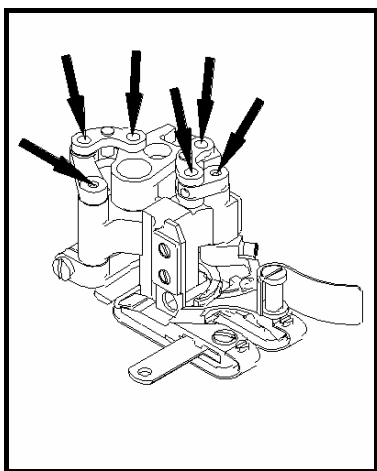
To do this, remove the two plug screw G.

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



4-4 Lubrication

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

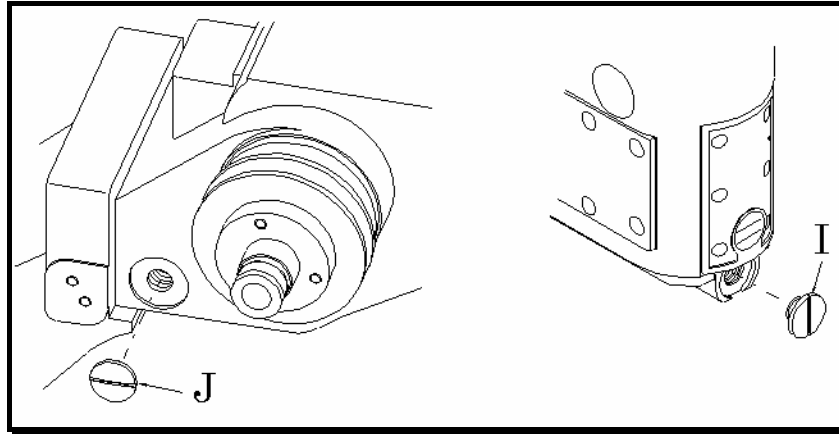


4-5 Changing oil

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.

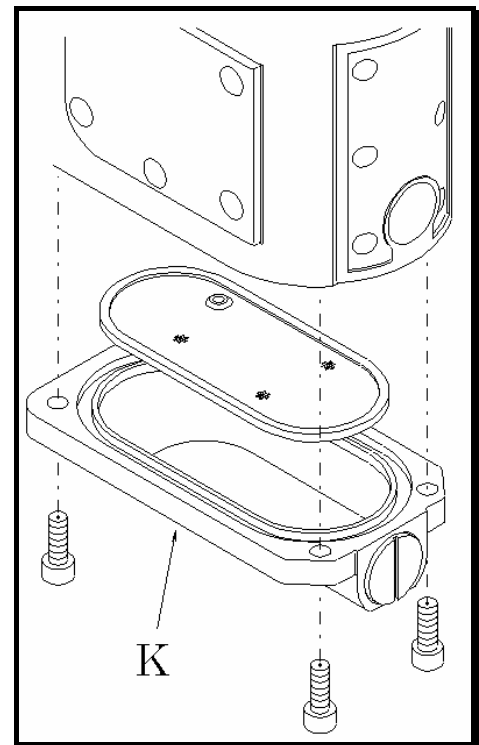
< Note >

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

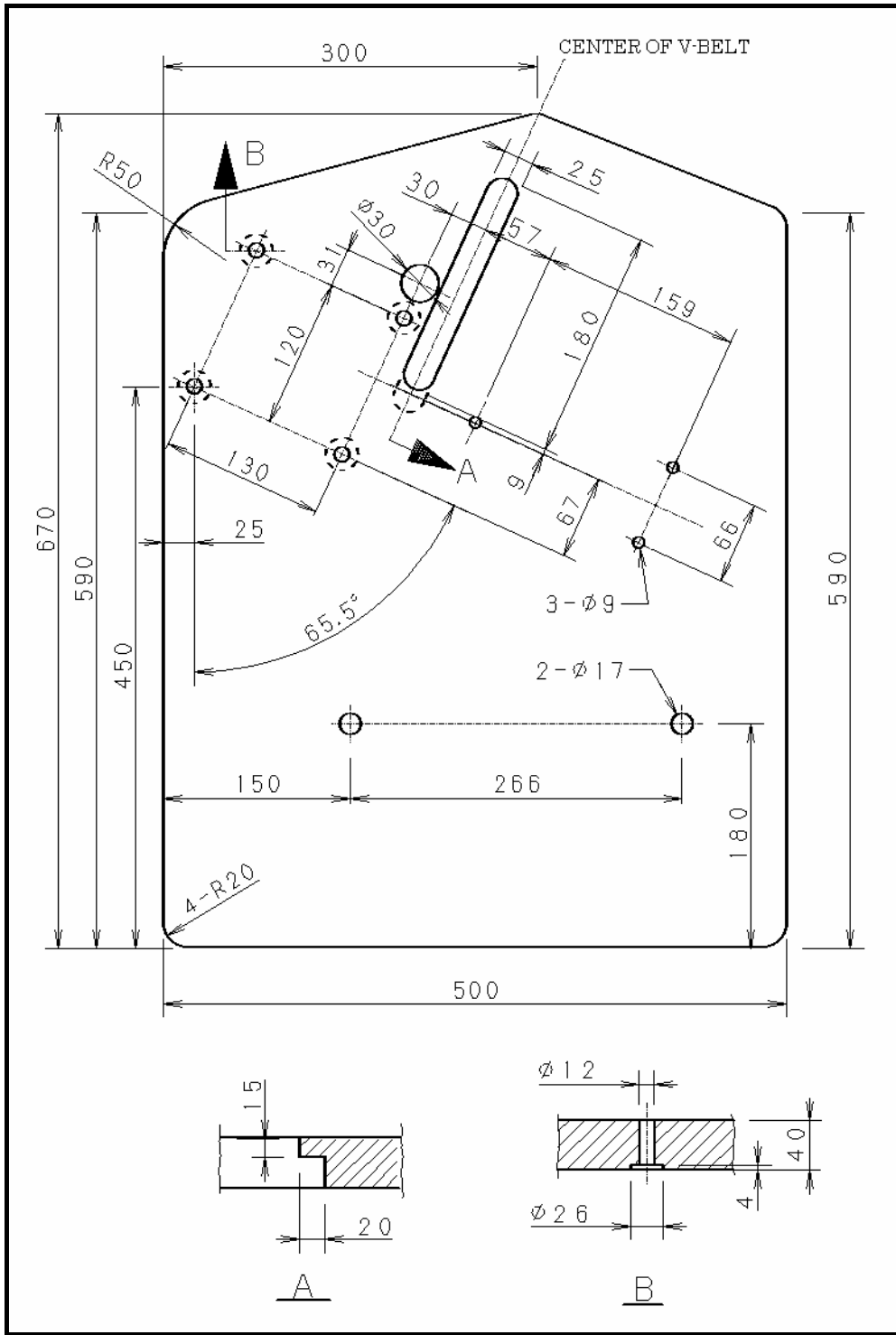


4-6 Cleaning the filter

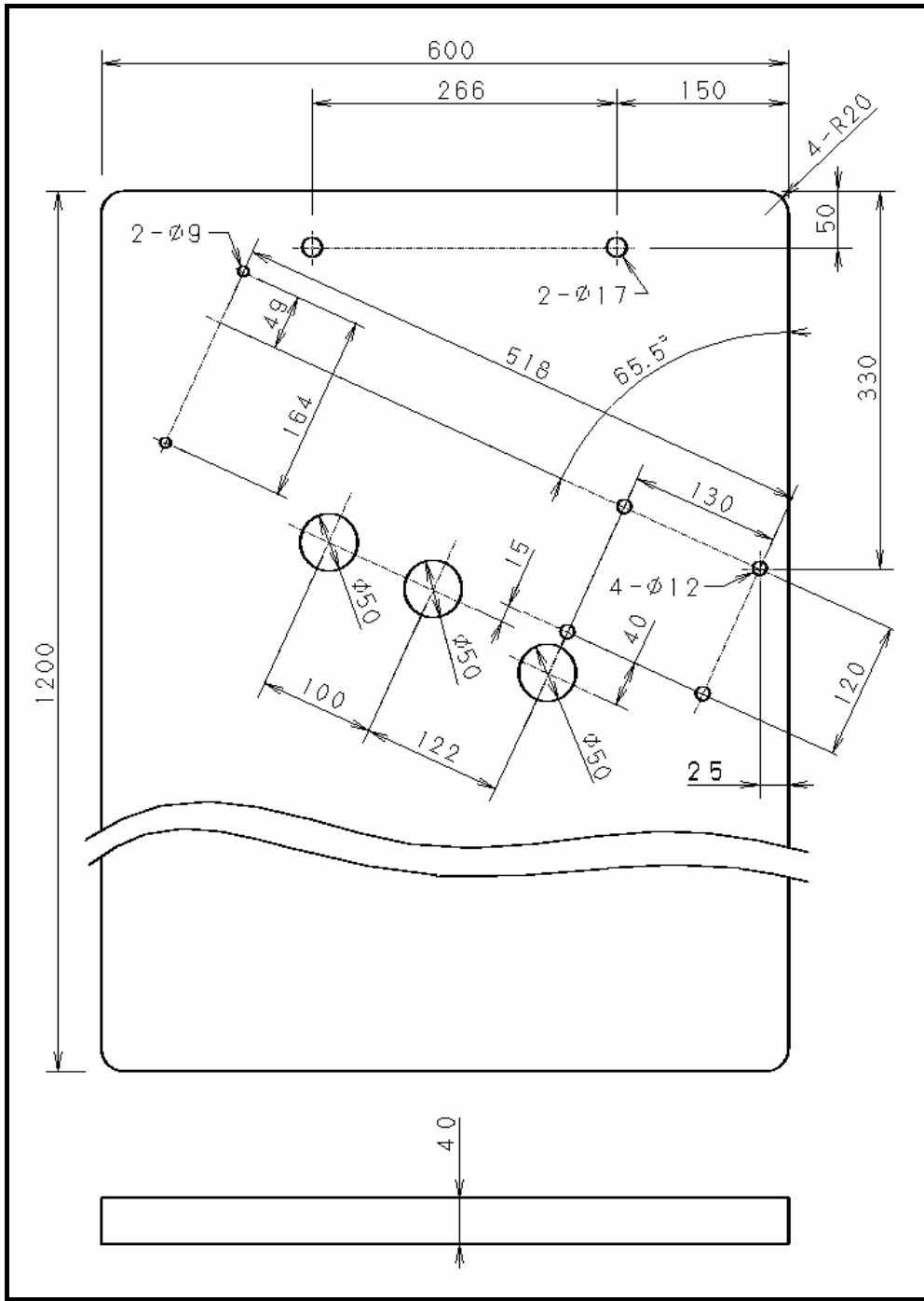
Before replacing the oil, remove reservoir K and clean the cylinder, inside of the reservoir and filter element.

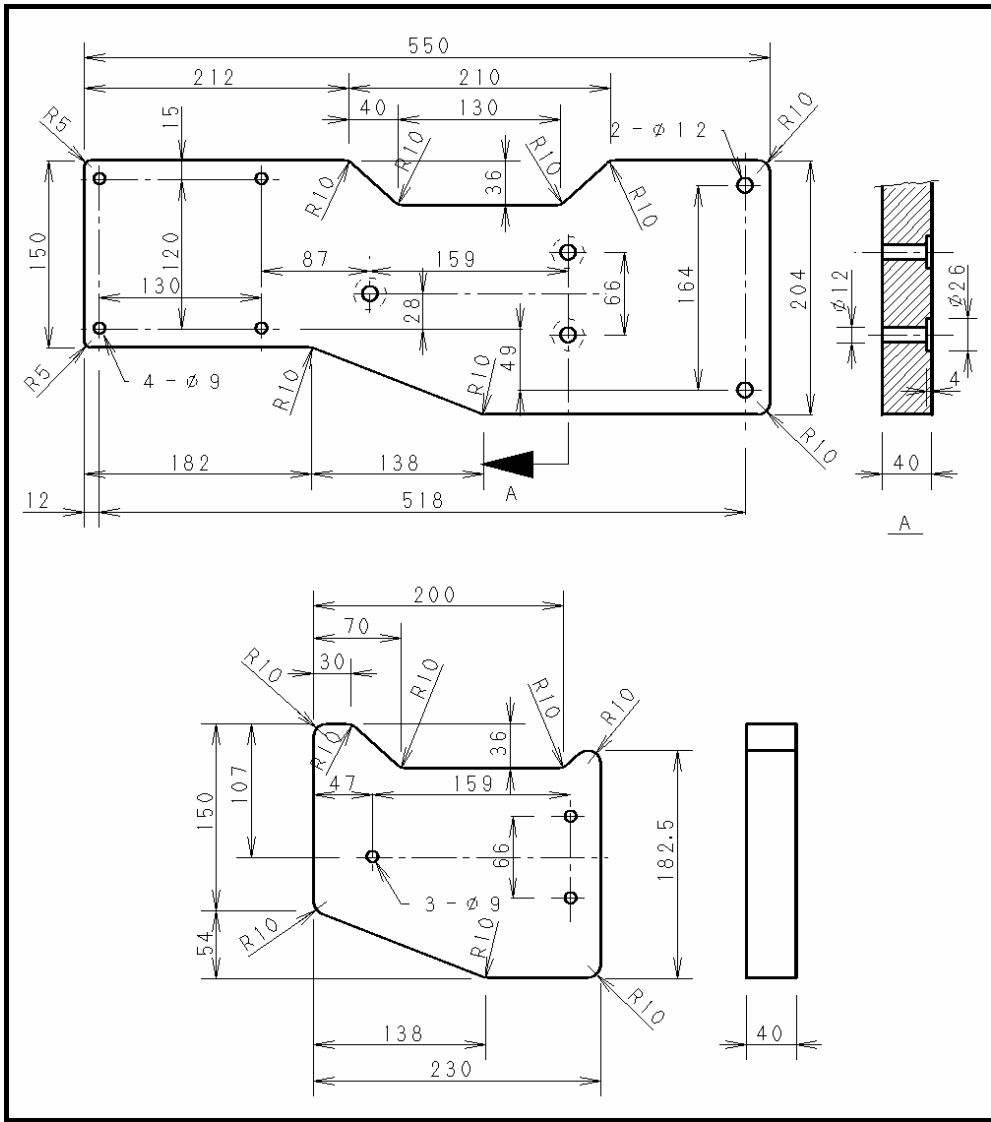


Type B (clutch motor)



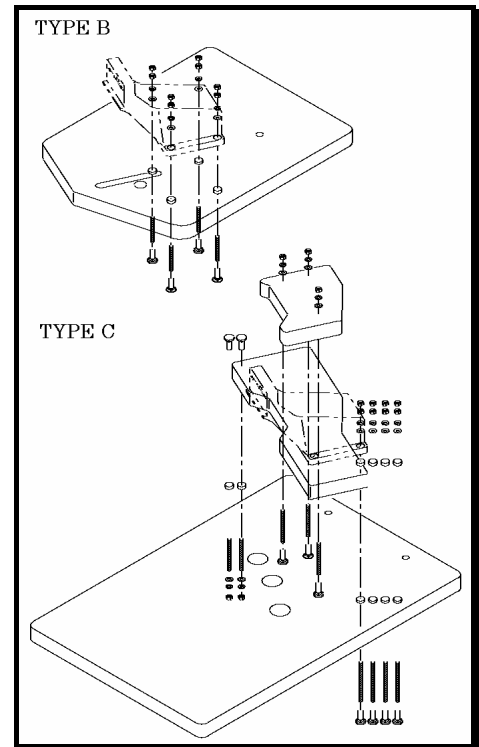
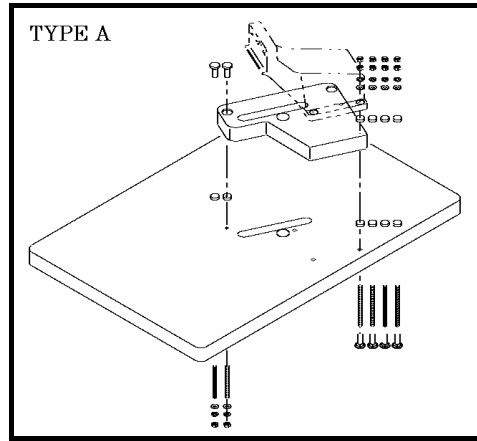
Type C (servo motor)





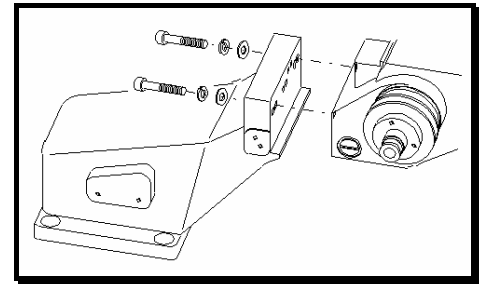
5-2 Installing the mount base

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



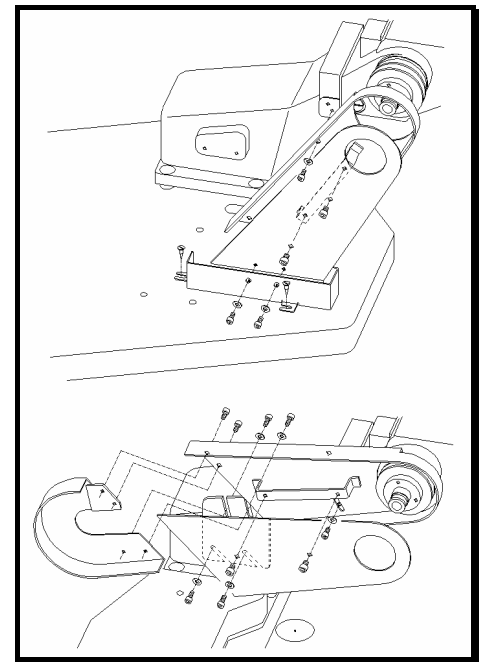
5-3 Installing the machine

Install the machine correctly by referring to the illustration right.



5-4 Installing the Pulley (hand-wheel) cover

Install the pulley (hand-wheel) cover correctly by referring to the illustration right.



【6】TIMING OF THE LOOPERS & NEEDLES

6-1 Installing the needle clamp

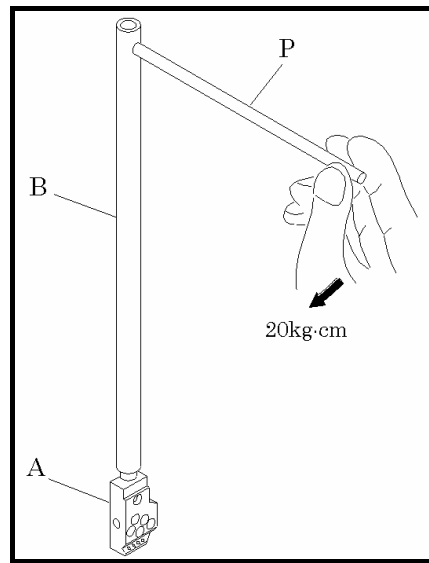
Needle-clamp "A" put in to needle-bar "B".
(Less than 20kg·cm torque to be tighten)

< Note >

Do not more than 20kg·cm torque to tight in case of expand outside diameter of bottom part that disable the needle bar.

Supplementation: If it uses another part "torque bar-P 16-6612 (optional)", it is suitable to tight.

Installation: The torque bar P put in to top of needle bar hole and tight until torque bar beginning to bend.



6-2 Adjusting needle bar high

When needles are at highest position, from needle point (4th from left) to surface of needle plate distance size (H), please adjust it as table showed.

Needle width	Size (H)
R: 5.2mm	13.49mm
S: 6.0mm	12.7mm

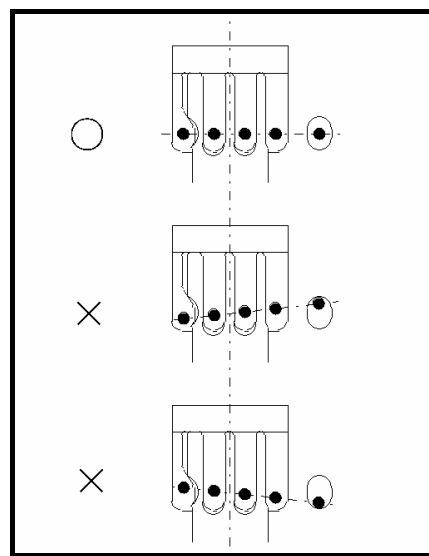
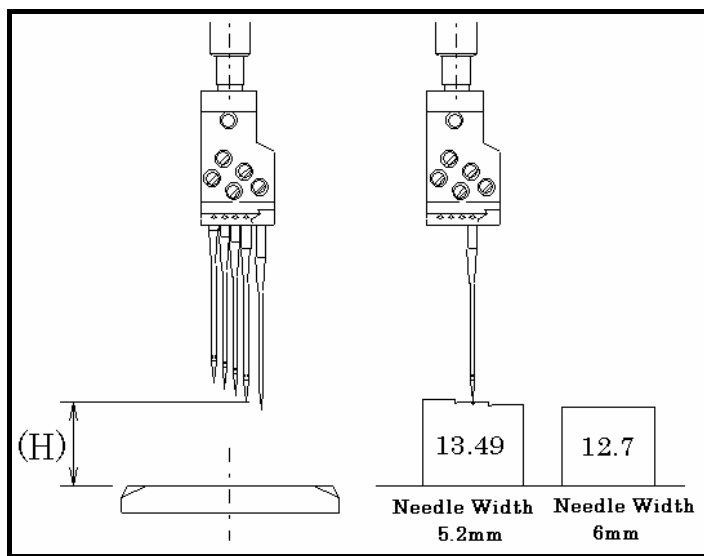
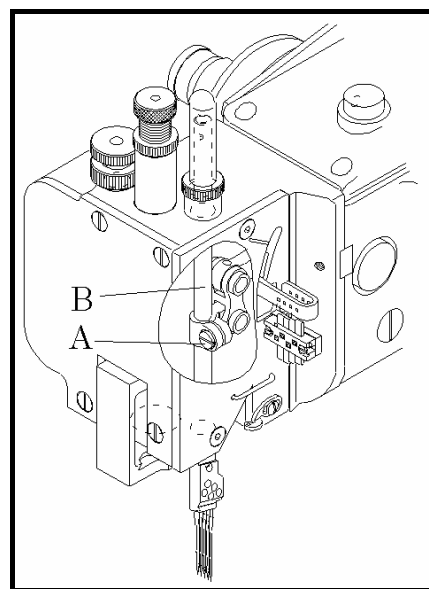
For adjusting the needle bar, loose screw A and needle bar B can be adjustable by moving up & down. Before the adjustment, please check needle drop position should be parallel against needle plate.

Refer to illustration. (optional gauge height)

Needle width R: 16-6601

Needle width S: 16-6602

It is easy to adjust by using these.



6-3 Adjusting looper back & front stroke

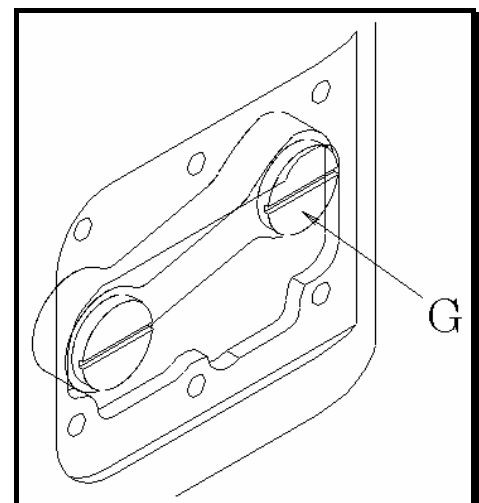
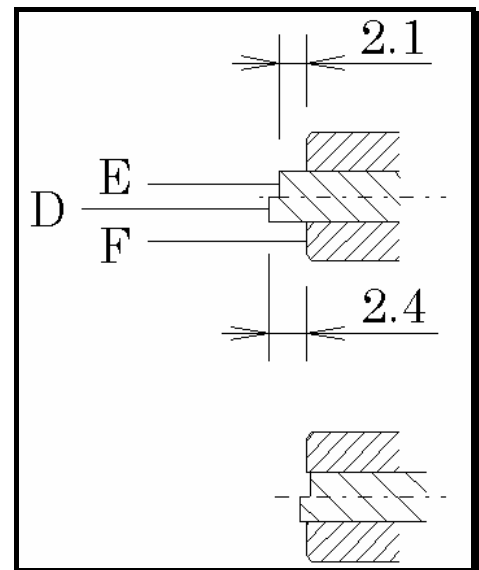
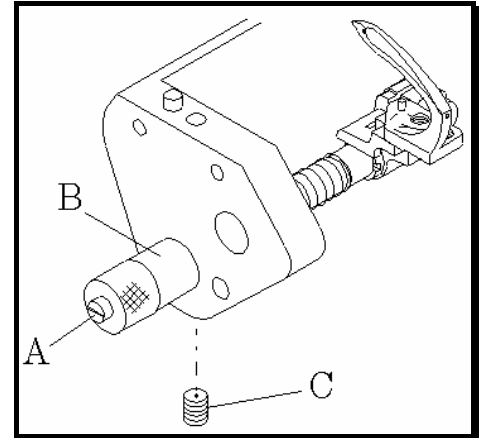
Adjust looper stroke 2.1mm~2.4mm.

Optional to using special gauge (16-6603), easy to adjust it.

If you do not have special gauge, use micrometer or use depth micrometer-scale.

How to adjust

1. Set looper axis to the end.
2. Insert special gauge into cylinder-bed top hole (see illustration), then plunger A fully extended by axis (bearing) B push to front and tighten with screw C.
3. Set the looper axis foremost position with turning the hand-wheel clockwise.
4. For checking the back & forth stroke by plunger point.
D and F surface point suited, as 2.4mm.
E and F surface point suited, as 2.1mm.
F surface is between D and E surface, then confirmed.
5. For adjustment, take off the cylinder-cover then loose the screw G.
Put up the G decrees the back & forth stroke.
Put down the G increase the back & forth stroke.

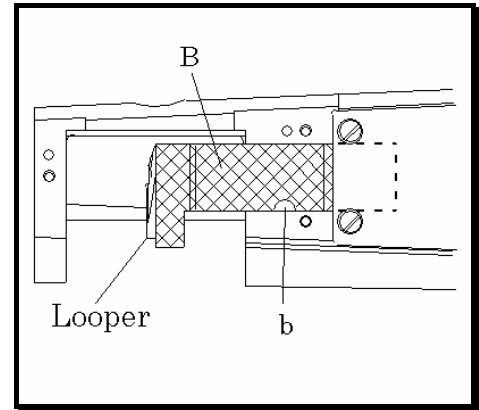
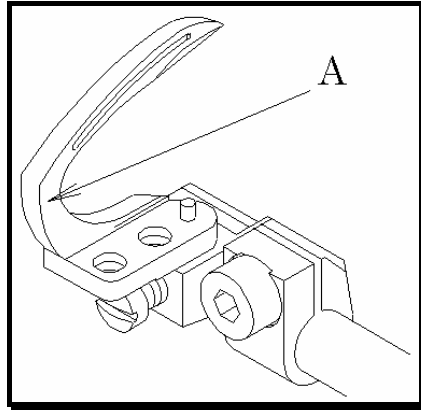


6-4 Degree of installing the looper

As for looper angle, looper's A surface is right-angled face to the looper axis.

(Optional) It is easy to adjust by using the looper angle gauge B (16-6604)

As for using it, as shown in figure: Gauge B put in the entering ditch of cylinder feed rocker, put driver in tapered tool the ditch of screw b at same time apply it to looper. If looper parallel to edge of gauge without gap, get collect angle.

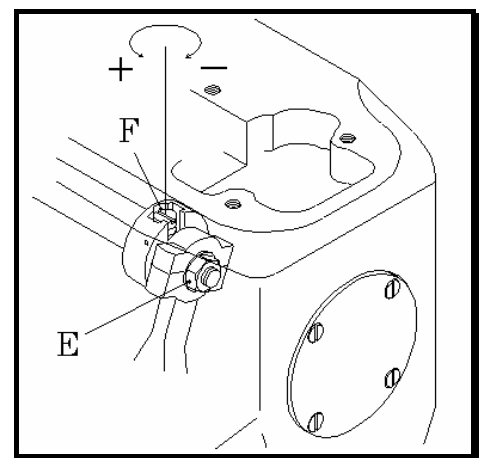
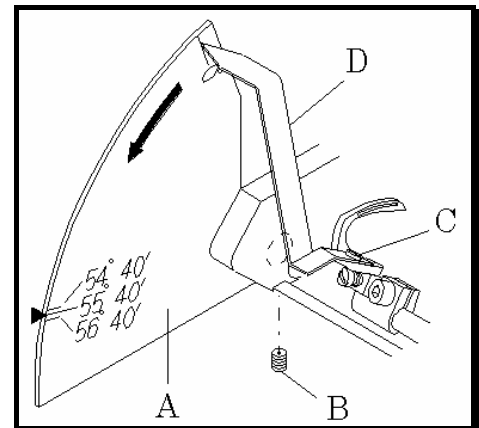


6-5 Adjustment of looper right & left amount of stroke

To be suitable looper right & left amount of stroke is looper axis in $54^{\circ} 40'$ ~ $56^{\circ} 40'$.

For adjustment, use the (optional) looper right & left gauge set (16-6605) part as shown in figure.

1. The dial plate A put into the hole of cylinder-bed edge of point then tighten with screw B as temporary.
2. To use the spare looper's screw C, install the pointer D as shown figure. Put pointer D's edge of point as possible as close to dial plate A.
3. When the looper reach to extreme of right position by turning the hand-wheel, dial plate A's 0° position match to the pointer D's edge point then tighten by screw B.
4. When the looper reach to extreme of left position by turning the hand-wheel, it is right position if pointer points $54^{\circ} 40'$ ~ $56^{\circ} 40'$ on dial plate. If it doesn't point between these degrees, go to next following instruction.
5. Both cover of top arm and end arm should be take off, then loose the nut E and adjust by screw F (turning the screw left & right). Screw F turn to right, stroke will decrees. Screw F turn to left, stroke will increase. Please go back to begin with 6-5 1. after tighten the nut E.



< Note >

After this adjustment, it is important to check the needle and looper timing (6-6).

6-6 Needles & loopers timing (relationship)

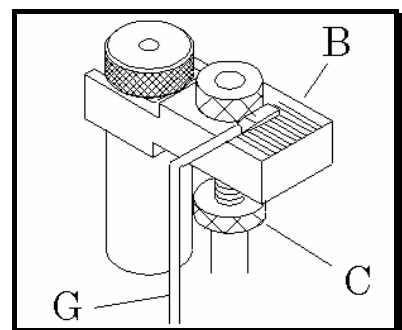
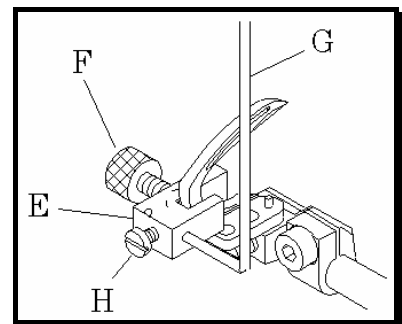
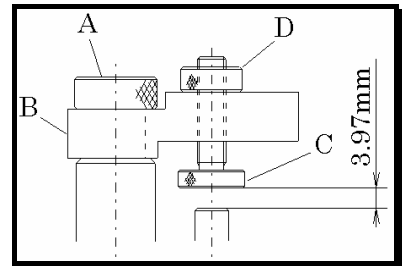
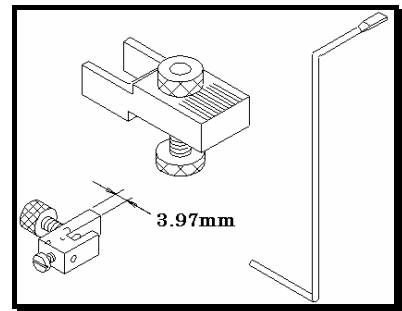
When needle bar position is extremely bottom point, looper has already begun towards to needle, however, in this position, needle bar & looper does not synchronized.

When needle bar rose at 3.97mm point from bottom position, at this point needle bar & looper are synchronized.

For exactly check the timing, by using the gauge set (16-6611) which is an option.

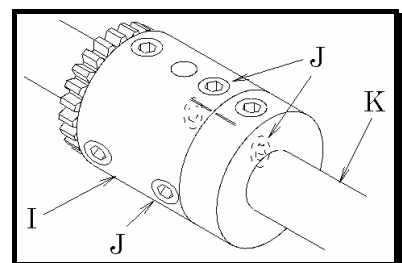
Timing gauge and adjustment procedure

1. Needle bar set to extreme bottom position
2. Loosing adjustment screw A, then timing-block B insert. As shown on figure screw C comes to right top of needle bar by block B tighten with screw A.
3. As shown in figure, turning screw C to make space 3.97mm between needle bar top point by tighten with nut D. Used thickness looper-cramp E's arm position (Long).
4. By turning hand-wheel slowly to right, needle bar top apply to screw C.
5. Tighten looper-cramp E by looper screw F, gauge-rod G install to looper-cramp by screw H then gauge-rod point fixed close to center of timing-block B dial scale.
6. By turning hand-wheel slowly to left, needle bar top apply to screw C, look at gauge G point indicated on dial. If gauge point indicated on dial which same as procedure 5, then it is correct. If it isn't synchronized, go to next following procedure. 7.
7. Taking off the crank-room, cover and packing then loosening joint-color screw (3 places). Turning hand-wheel to the right, needle bar top apply to screw C, if gauge-rod top point comes near to the right at clockwise, looper timing is early and reverse (to the left) main shaft against to crank-shaft. If the situation opposite (Looper timing is slow as gauge-rod near to the left, please do as opposite, main-shaft turned to right.)



< Note >

For adjusting Joint-color I, repeating procedure 5. , 6. However one of screw J tightens as temporary for convenience. After finishing adjustment, tight all 3 screw J then re-check the timing following by 1. ~ 6. procedure.



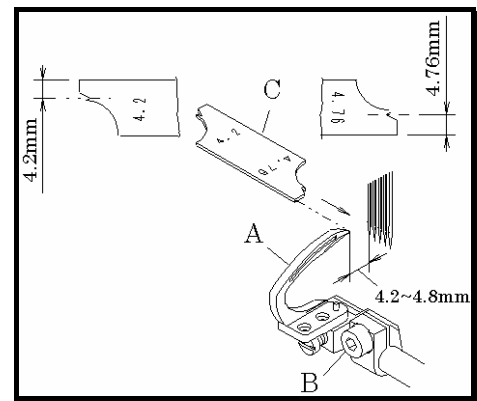
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6-7 Looper setting distance (amount of pull stroke)

When the looper A is at the extreme left point, from left center of needle to the looper point distance should be 4.2mm~4.8mm as standard.

For adjustment, loosening screw B.

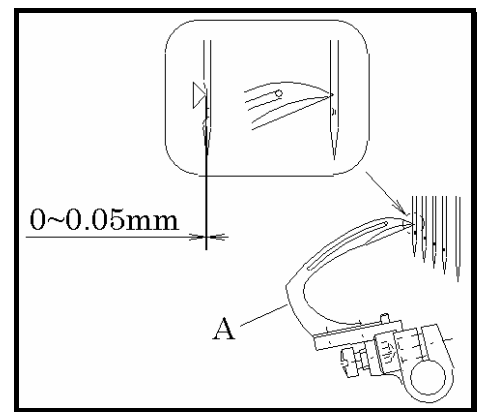
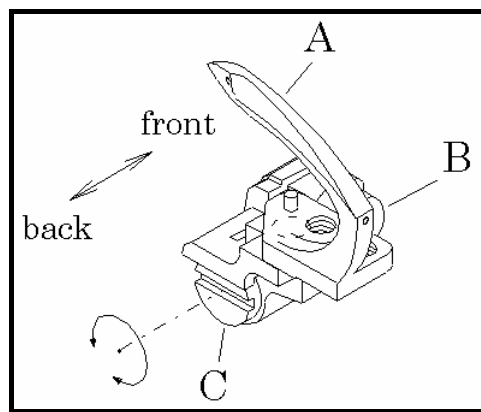
It is easy to check the distance by using looper pull-gauge (another sale) C (16-6609).



6-8 Adjusting looper back & forth position

When the looper A move from extreme left point to the right, the looper A should pass behind the needle, but when looper A point reach to center of left needle (among of needles), looper A and left needle should have distance 0mm~0.05mm without touched.

For adjustment, loosening screw B, then turning screw C to move looper holder back & forth. After adjustment, check the amount of looper front-to-back stroke then tight the screw B.



【7】 ADJUSTING THE NEEDLE GUARD

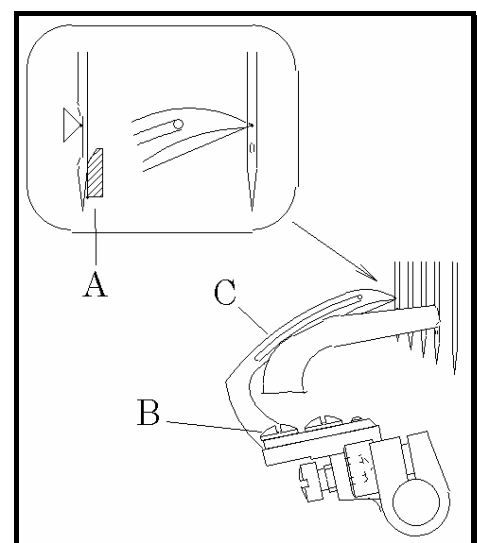
7-1 Auxiliary looper adjustment

When the looper C point reach to center of left needle, to effecting auxiliary looper A to adjust between needle and looper's gap at 0mm.

For adjustment, loosening screw B.

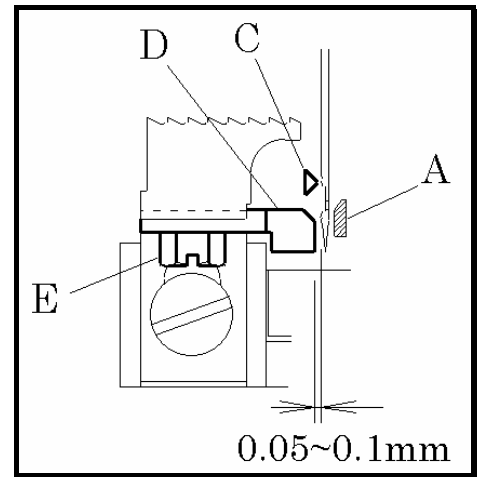
< Note >

Turning hand-wheel to the clockwise, when looper C travel from left to right, check the needle does not swing to right due to looper C point touch the back of needles. (Looper C should not be pushing the needle)



7-2 Adjusting needle guard

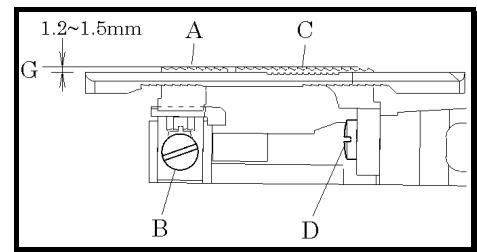
When needle guard D extremely approach to left needle, as loosening screw E to adjust the between left needle and needle guard set the gap at 0.05mm~0.1mm.



【8】 ADJUSTMENT OF FEED DOG

8-1 Adjusting feed dog height

When feed dog extremely raise to top, line G set to 1.2mm~1.5mm as shown figure, from main feed dog A and differential feed C's point connect to line G. For adjustment, loosening screw B and D then move feed dog A and C.



8-2 Adjusting differential feed ratio

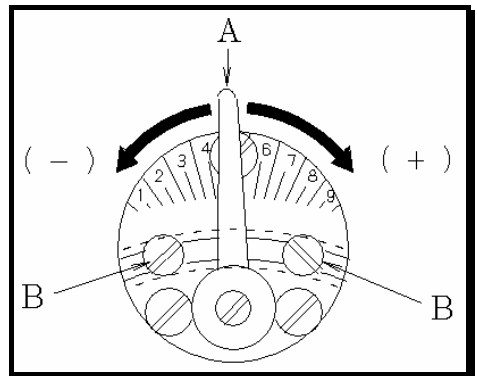
To adjusting differential feed, move lever left-to-right. When lever is between dial "4" and "5", differential feed comparison ratio is 1:1, differential is ineffective.

Normal differential feed (for gathering effect)

When lever A move to (+) direction, it is positive differential effect. The maximum ratio 1:1.5 is when lever A at dial "9".

Reverse differential feed (for stretching effect)

When lever A move to (-) direction, it is negative differential effect. The maximum ratio 1:0.7 is when lever A at dial "1".



< Note >

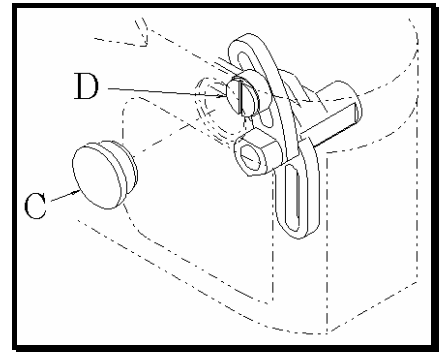
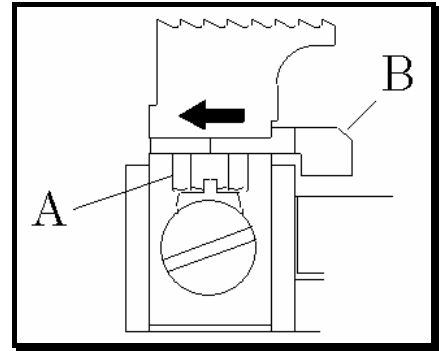
Screw B is for regulate the differential feed ratio or fixed level to be used.

8-3 Adjusting the stitch length

It can be adjustable stitch length 1.6mm~2.5mm with no stage.

To change the stitching length

1. Loosen screw A, needle guard move to extreme rear end then tight temporary.
if it is necessary to change short stitch length, this task do not need it.
2. Remove rubber plug C
3. Loosen screw D to adjust stitch length.
To move screw D upward then length increase.
To move screw D downward then length decrease.
4. When stitch length has decided, tighten screw D securely and then replace the rubber plug C.
5. Adjusting needle guard B and tighten screw A (refer to "7-2" adjusting needle guard).



As shown on figure (sheet): the number of stitches per inch(25.4mm).

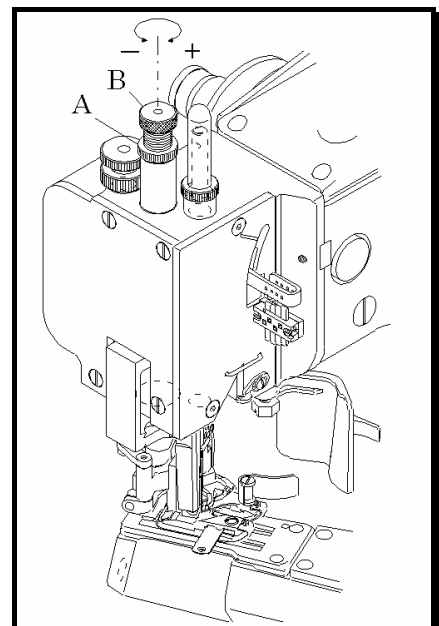
Stitch length (mm)	Number of stitches per inch
2.5	10
2.3	11
2.1	12
1.9	13
1.8	14
1.7	15
1.6	16

【9】 ADJUSTING THE PRESSER FOOT

9-1 Adjusting presser foot

The presser foot pressure can obtain as feed works accurately and it uses as much as possible within the steady stitch length by light pressure.

Loosen nut A, turning screw B to the right, pressure will increase and turning to the left, pressure will decrease.



9-2 Adjusting presser foot up & down position

To presser foot float a little, it will have several effect as below.

Prevention of stitch blocking

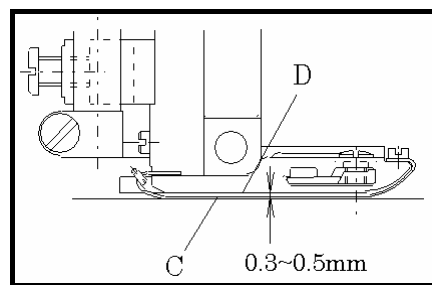
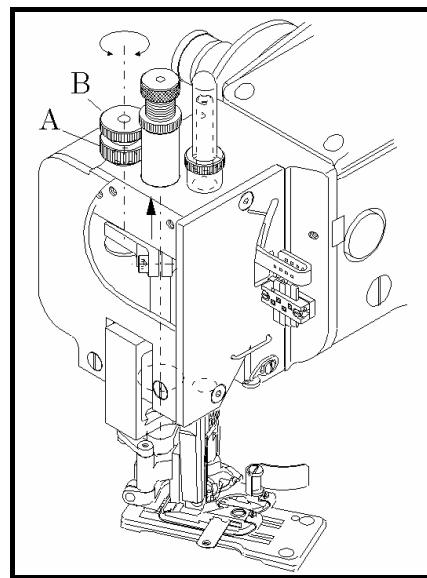
Prevention of feeding scratches

Improvement of presser shoes endurance

Decrease the vibration and noise

Possible to micro-adjustment for piled up fabric

1. Set needle to extreme bottom position.
2. Loosen nut A and screw B turn to left then put up the presser foot.
3. Adjust presser shoes and presser bottom face gap at 0.3mm~0.5mm.
4. Tighten the nut A.



【10】 ADJUSTING SPREADER (HOOK) & CARRIER

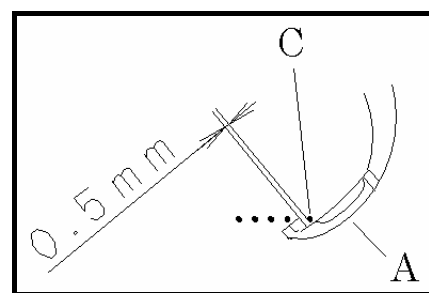
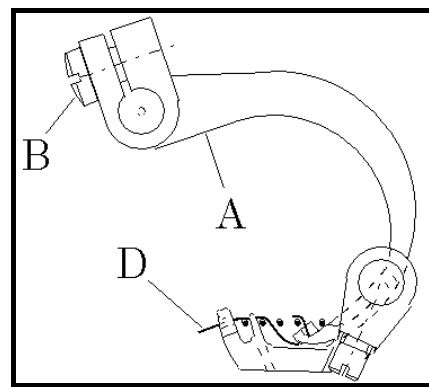
10-1 Adjusting spreader (hook)

Please set the hook A to extreme right position.

Loosen screw B to adjust hook A & retainer needle gap at 0.5mm (standard position).

When stitching adjustment, hook toward to left, check the decoration thread D into under the hook.

If it can not into under the hook, then loosen the screw B and adjust hook to left.



10-2 Adjusting the carrier

When carrier E extremely approach to first needle, loosen screw F to adjust that set the distance at 1mm from carrier point G to center of first needle.

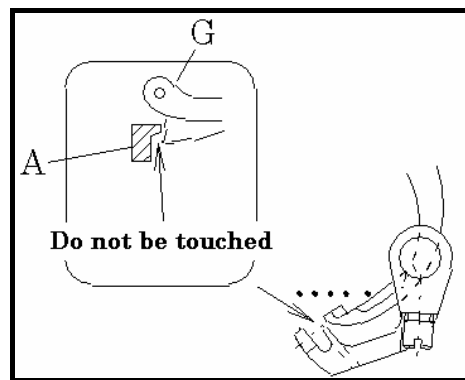
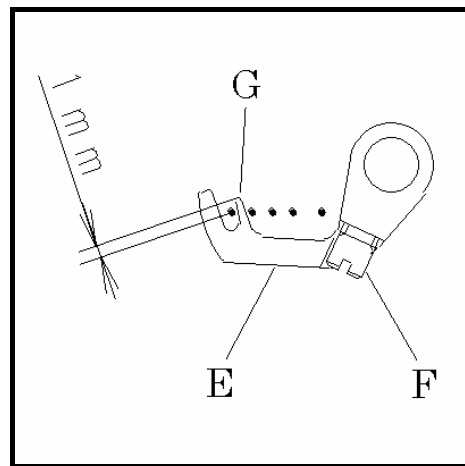
As adjusting stitch, when carrier extremely approaches to first needle, check the decoration thread through behind the 1st and 2nd needles.

If it can not through behind the needle, carrier E push little bit to the rear direction. (Carrier E and first needle should not be touched)

If decorated thread get through behind the 3rd needle, put back carrier E to front.

< Note >

When hook A and carrier E extremely approached, do not be touched.



【11】 ADJUSTING THE STITCH FORMATION

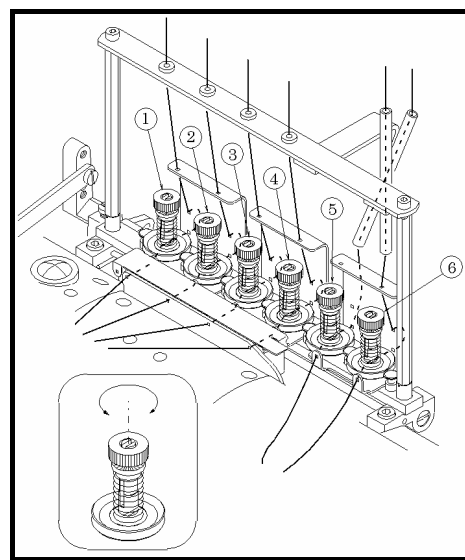
11-1 Adjusting thread tension

Thread tension change according to fabric material, kind of thread, stitch thickness, stitching length, and condition of usage.

Please adjust the thread tension nut ~ condition of usage.

- ~ Needle thread
(Right needle, Left needle)
- ~ Decoration thread
- ~ Looper thread

To turning the tension clockwise, thread is tighten.
To turning the tension reverse-clockwise, thread is loosen.



11-2 Adjusting needle tension

Adjustment of upper thread guard

There are 4 upper thread guards per 4 needles thread; each needle thread can be adjustable.

1. Set needle bar arm thread road A extremely bottom position.
2. Needle bar arm thread road at the center of eyelets F, set the upper thread-guard B upper point.
3. Upper-thread-guard C raise 3.2mm against the B.
4. Upper-thread-guard D raise 1.6mm against the B
5. Upper-thread-guard E same height as B or raise 0.8mm.
6. Above all adjustment loosen screw G and after finished adjustment tighten the screw again.

< Note >

Each upper-thread-guard top should be horizontal.

Above size is standard position. please adjust appropriately as move upper-thread-guard up & down to become needle thread loop size according to actual stitching.

- To move the upper-thread-guard to up, needle thread loop become bigger.
- To move the upper-thread-guard to down, needle thread loop become smaller.

Adjusting the needle-thread-road (As shown figure)

1. Needle-thread-road H's height match to eyelet M.
2. Needle-thread-road I is lower than H for 5mm.
3. Needle-thread-road J is lower than H for 9mm.
4. Needle-thread road K is lower than H for 15mm.

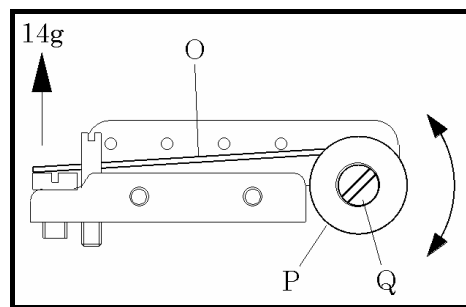
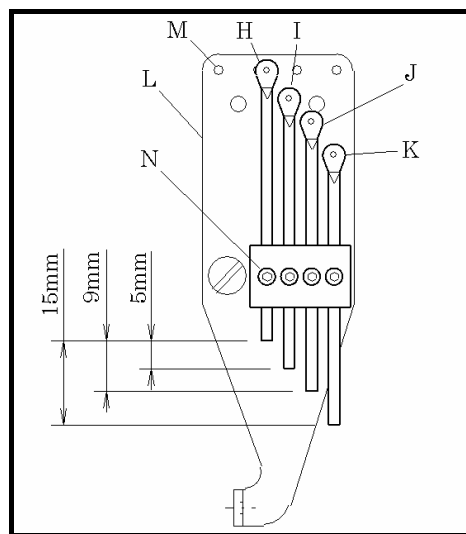
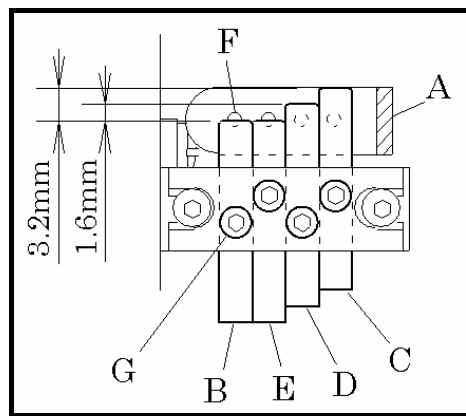
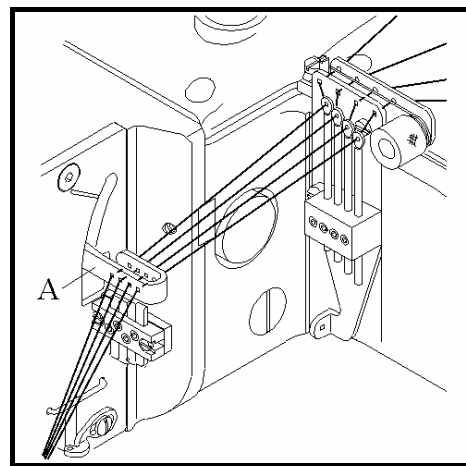
Needle thread's thread tension adjust by loosen each screw N.

- To move needle-thread-road to upward, needle thread is loosen.
- To move needle-thread-road to downward, needle thread is tighten.

Adjusting needle thread road spring

When you remove the fabric from the presser while sewing it, turn the hand-wheel to reverse clockwise. At this time, need thread road spring O should act as not to make the loop forward of the needle.

Needle thread road spring O's pressure is 14g as standard. For adjusting it, loosen screw Q and turn the spring holder P.



11-3 Adjusting looper-thread-tension

The right illustration is looper-thread take-up-cam as seen from the front.

Lower-thread-control thread guide positioning
Lower-thread-control thread guide A's right edge match to lower-thread-control plate B's right edge to install.

Timing of lower-thread tension

When needle bar come 2.8mm down from extreme high position, lower-thread tension D "a" match that looper-thread should be able to through (as shown figure) as standard.

For adjusting this, loosen screw E.

- If timing is faster, increase amount of looper-thread filature.
- If timing is slower, decrease amount of looper-thread filature.

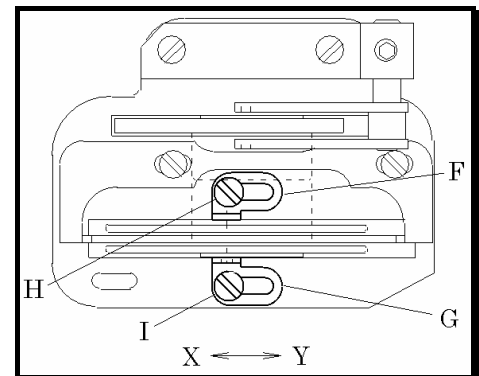
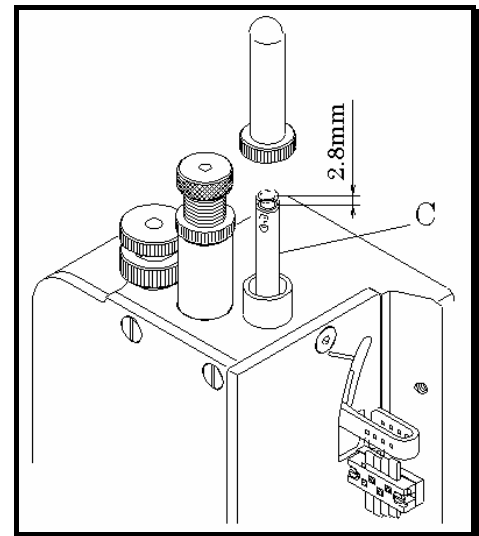
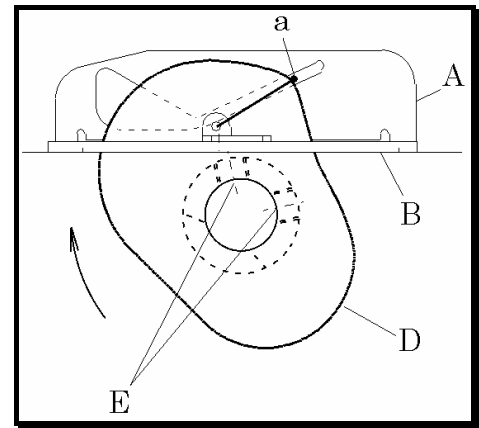
< Note >

For adjusting lower-thread-tension D, not to change the positioning as boss edge side apply to decoration boss edge side.

Adjusting lower-thread-control, plate-thread-road

Plate-thread-road F, G is positioning the extremely right edge as standard. For adjustment, loosen screw H, I to move right-to-left.

- To move X direction, lower-thread amount increase
- To move Y direction, lower-thread amount decrease



11-4 Adjusting decoration-thread tension

The right illustration is decoration-thread tension as seen from front.

Position of lower-thread-control guide

Center of lower-thread-control guide A hole and plate B gap at 4.4mm are standard.

For adjusting, loosen screw C and guide A move up & down.

- Move guide A to downward, decoration-thread filature increase
- Move guide A to upward, decoration-thread filature decrease

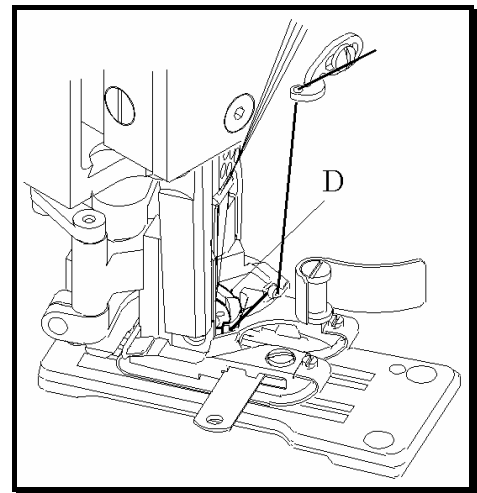
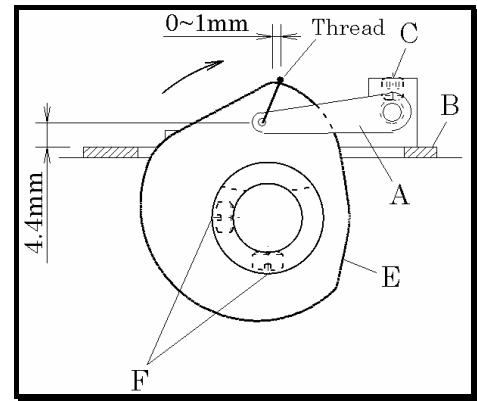
Timing of decoration tension

Decoration-thread hold distance 0~1mm from decoration thread tension E's extreme height point when thread synchronized hangs hook D.

For adjustment, loosen screw F.

< Note >

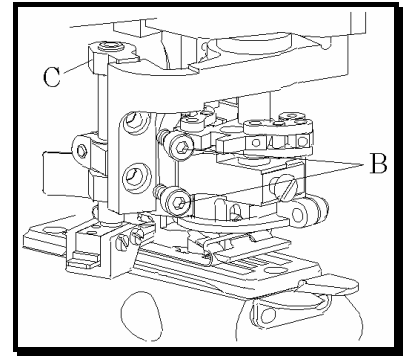
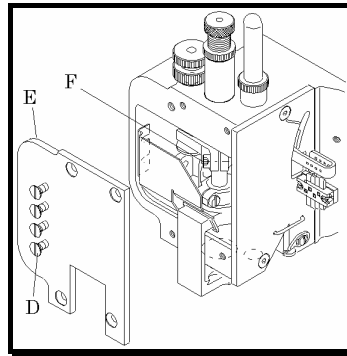
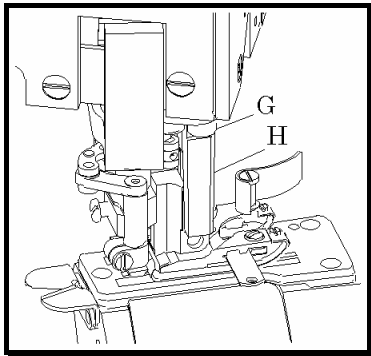
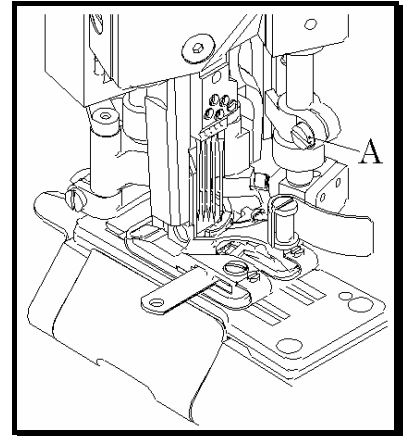
To adjusting the decoration-thread tension, not to change the positioning as boss edge side apply to decoration boss edge side.



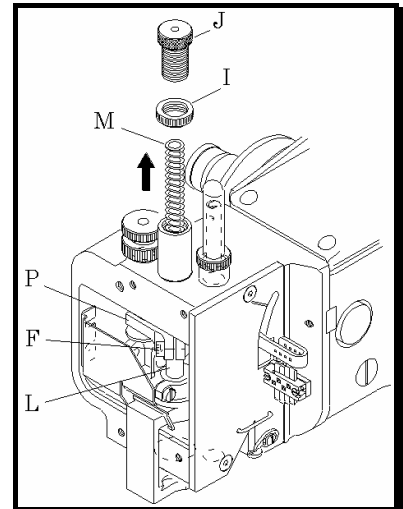
【12】 REPLACING THE PRESSER FOOT

Removing presser foot

1. Loosen screw A
2. Loosen screw B, then remove the upper-knife-holder including knife.
3. Loosen screw D then remove the cover E
4. Loosen screw F
5. Loosen screw G then remove guide H



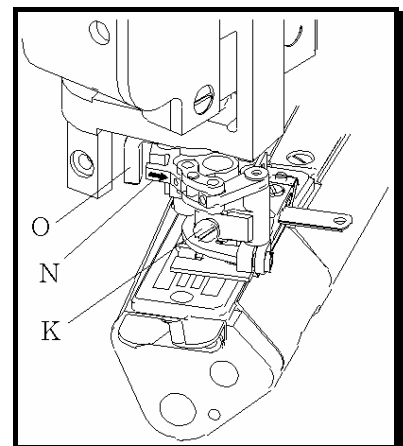
6. Loosen nut I then remove screw J
7. Loosen screw K
8. Turning hand-wheel, set the needle extreme top and remove from presser foot as far as presser bar L and spring M lift up together.
9. Presser-carrier segment N remove from decoration drive sleeve O then presser-set remove to back



Installing presser foot

Referring to figure, install from opposite procedure 9. ~ 1.

- When presser-foot install, decoration drive sleeve's lever O set to carrier hook N and paralleled.
- When guide H install, presser foot should not be shaken horizontally and for moving upward & downward as lightly.
- When upper-knife holder (including knife) install, refer (13"replacing the knife").
- When needle is extremely bottom position and it stick needle plate, lightly push the presser foot bar-guide P at same time tighten the screw F.



【13】 ADJUSTING & REMOVING THE KNIFE

To removing the knife

Upper knife: Loosen screw C and D then remove upper-knife A

Under knife: Loosen screw E and remove the under knife B

To installing the knife

Under knife: Under knife B is installed tighten by screw E

Upper knife: Upper knife A is installed tighten by screw D

To adjusting knife

Under-knife standard position is; When under knife B's head point "a" set to center of 2nd needle.

For adjustment, please do so according to fabric material.

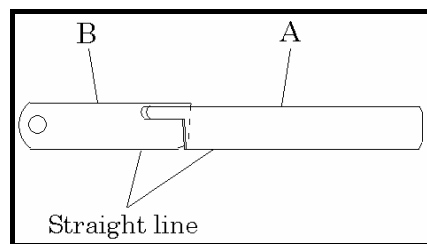
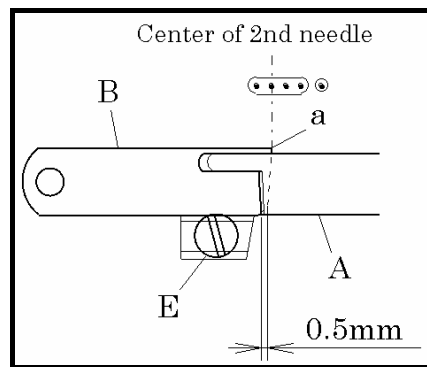
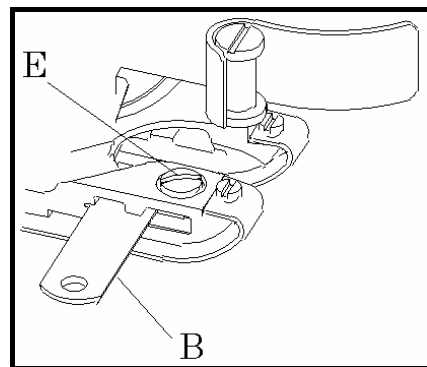
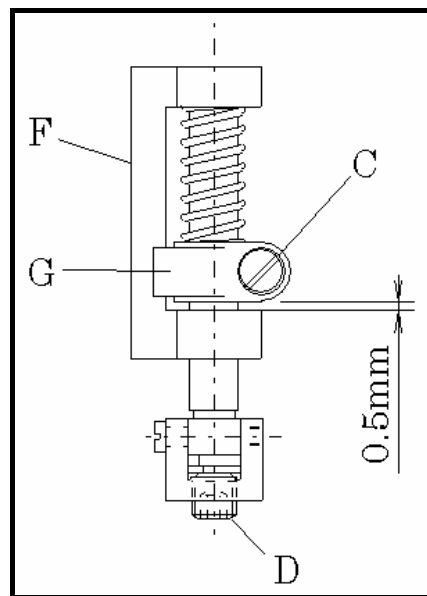
Upper knife position is; When upper knife A is at extremely left side position, set the position.

Under knife B and upper knife A engagement gap at 0.5mm.

Upper knife pressure is; needle position is at extremely bottom and presser foot stick with needle plate, moreover, upper knife stick to under knife then upper knife holder F axis guard and upper knife guide G gap at 0.5mm as a standard. (As shown figure)

< Note >

When fixed the upper knife guide G, upper knife should not be touch to presser foot and upper knife A and under knife B's front side should be matched.

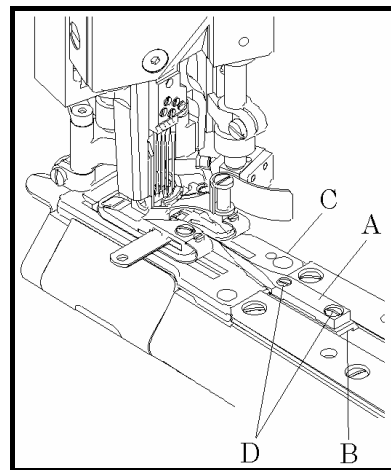


【14】 TO USING THE FABRIC GUIDE

Standard left-right position should be fabric guide A positioned center of needles.

Standard front-back position should be fabric guide plate B touched needle plate C.

Please adjust left-right position depending on feeding condition and left & right fabric swamped condition.
For adjustment, loosen screw D.
And according to fabric thickness, adjust the front-back position toward to front lightly.



FSX6604LM	FSX6604MH	Castom made part
Part No. XG-336	Part No. XG-335	Part No. XG-300