



DOUBLE NEEDLE LOCKSTITCH COMPOUND-FEED INDUSTRIAL SEWING MACHINES

MODEL

LU5-5720-B0T

INSTRUCTION MANUAL

INTRODUCTION

Thank you very much for purchasing Mitsubishi industrial sewing machine.

Please read this instruction manual before operating the sewing machine. Please read also “Safety Manual”, “Instruction manual for Mitsubishi Limiservo X” and operate the sewing machine correctly and safely.

PRECAUTION BEFORE STARTING OPERATION

1 Safety Precautions

- 1 . When turning the power on, keep your hands and fingers away from the area around/ under the needle and the area around the pulley.
- 2 . The power must be turned off when the machine is not used, or when the operator leaves his/her seat.
- 3 . The power must be turned off before tilting the machine head, installing or removing the “ V” belt, adjusting the machine, or replacing parts.
- 4 . Avoid placing fingers, hairs, obstacles, etc. near the pulley, “ V” belt, bobbin winder wheel, or motor when the machine is in operation. Injury could result.
- 5 . Don’t put fingers into the thread take-up lever cover, around/under the needle, or pulley when the machine is in operation.
- 6 . If the belt cover, the finger guard, and/or the eye guard are installed, don’t operate the machine without these safety devices

2 Precaution before Starting Operation

- 1 . If the machine’s oil pan has an oil sump, never operate the machine without filling oil in it.
- 2 . If the machine is lubricated by a drop oiler, never operate the machine without lubricating.
- 3 . When a new sewing machine is operated, verify the rotational direction of the pulley with the power on.
(The pulley should rotate counterclockwise when viewed from the pulley.)
- 4 . Verify voltage and (single or three) phase indicated on the nameplate of the motor.

3 Precaution for Operating Conditions

- 1 . Avoid using the machine at abnormally high temperature (35°C or higher) or low temperature (5°C or lower). Otherwise, machine failure may result.
- 2 . Avoid using the machine in dusty conditions.
- 3 . Avoid using the machine in conditions filled with a lot of electric noises such as highfrequency welders.

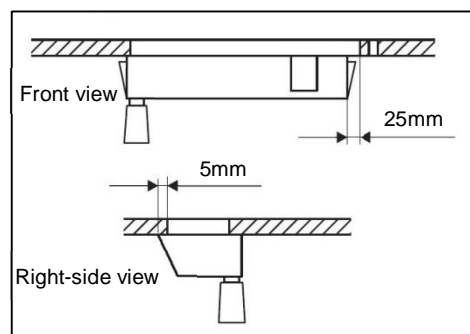
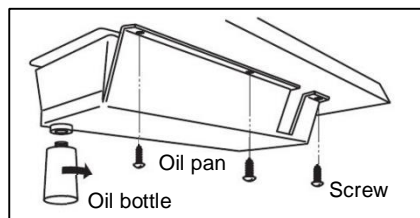
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PREPARATION FOR OPERATION

1 Installation position of the oil pan

1. Install the oil pan as shown in the figure with screws.
2. Install the oil bottle to the oil pan.



2 Connecting the electric cables of the air controller

1. Install the solenoid valve and the filter regulator assembly within the reach of the tube / cords under the table.
2. Align the piping symbols of the tubes with the regulator and solenoid valve assembly, and insert the tubes.

3 Connecting the electric cables to the control box

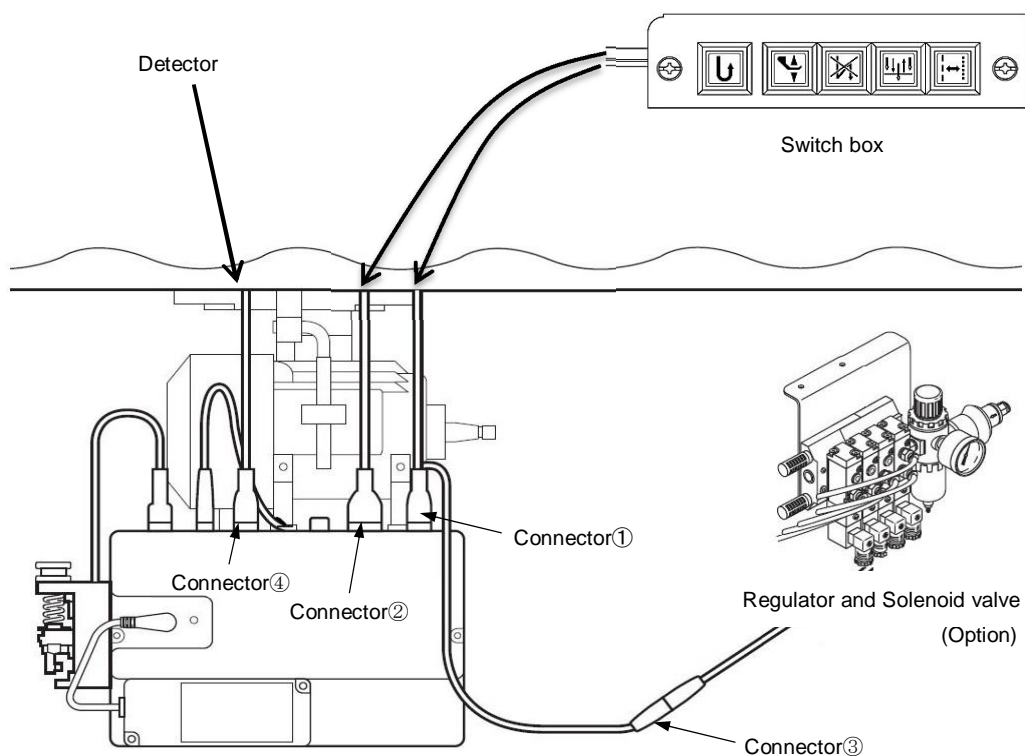
Connect the electric cables as follow in the figure.

- (1) Connect connector①② of the switch box to the control box, and connect 6-pin connector③ to the solenoid valve.

Note: Set the standard air pressure of the regulator to 0.5 MPa.

- (2) Connect connector④ of the detector to the control box.

Note: For your safety, always turn off the power switch whenever connect or disconnect connectors.

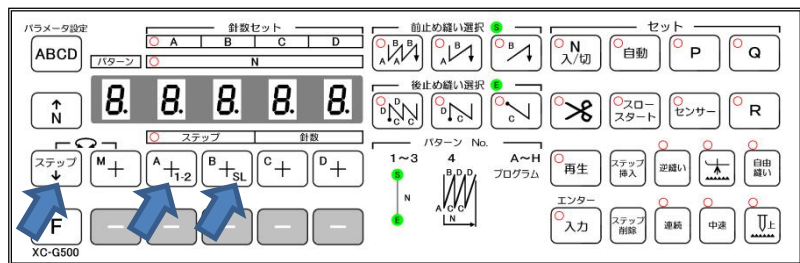


PREPARATION FOR OPERATION

4 Setting up the control box

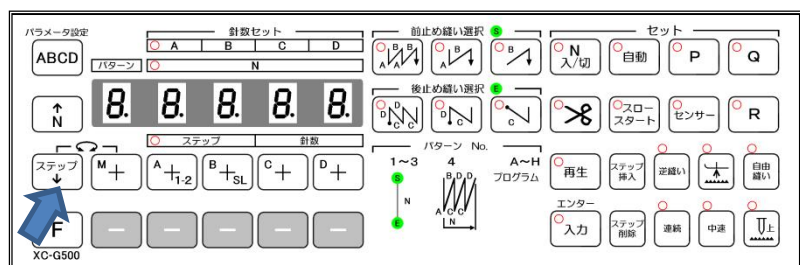
1. Set the control box to machine model LU2-4410-B1T by simple setting function

(1) Changing the mode to the program mode [1]



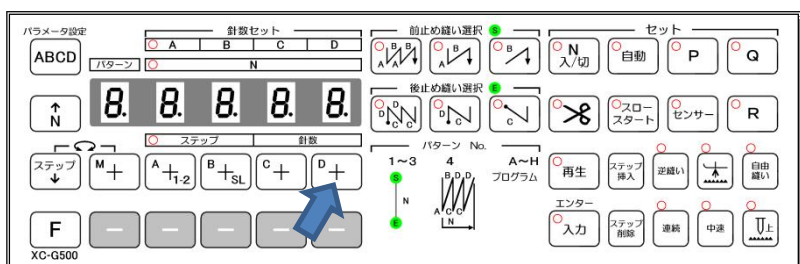
In the normal screen,
Push keys [↓] + [A] + [B] for 2 seconds or
more at the same time.

(2) Selection of the machine model



Setting the screen display to [410b] by
pushing keys [↓] and [↑].

(3) Changing of the simple setting



Push the key [D] for 2 seconds or more.
The model is flickered, and “CLEAR” is
displayed.
Return the normal screen by pushing the
key [D]. (Setting completion)

PREPARATION FOR OPERATION

2. Setting for LU5-5720

(1) Changing the mode to the program mode [A]

Push 2 keys [↓] + [A] for 2 seconds or more at the same time.

Function name	Setting
AC (Acceleration time simple setting)	L (240msec)

(2) Changing the mode to the program mode [C]

Push 2 keys [↓] + [C] for 2 seconds or more at the same time.

Signal name	Setting
I1 (Input signal I1)	BTL (Tacking cancel signal)
I2 (Input signal I2)	UD (Half-stitch signal)
I4 (Input signal I4)	IO2 (Instant changing alternating movement signal)
I4A (Alternate)	ON
I5 (Input signal I5)	IO5 (Changing stitch length signal)
I5A (Alternate)	ON
OA (Output signal OA)	B (Backstitch output)
OB (Output signal OB)	FU (Presser foot lifter output)
OC (Output signal OC)	OT2 (Instant changing alternating movement output)
OD (Output signal OD)	OT5 (Changing stitch length output)
O2 (Output signal O2)	OT5 (Changing stitch length L output)
O7 (Output signal O7)	OT2 (Instant changing alternating movement L output)

USAGE PRECAUTION

1 Lubrication (1)

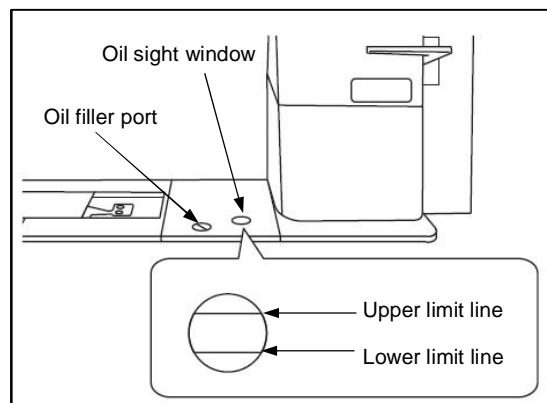
Remove the screw on the oil filter port, and lubricate until the upper limit line in oil tank.

If oil position is lower than the lower limit line, lubricate until the upper limit line in oil tank too.

Reference of the oil property :

Specific gravity (15°C) = 0.86 (g/cm³)

Viscosity (40°C) = 10.9 (mm²/s)

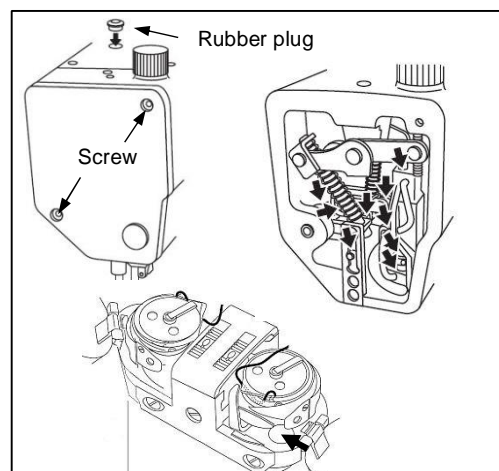


2 Lubrication (2)

Remove the rubber plug, and lubricate.

Loosen screws, remove the face plate, and lubricate a few drops of oil to the portions indicated by arrows in the right figure.

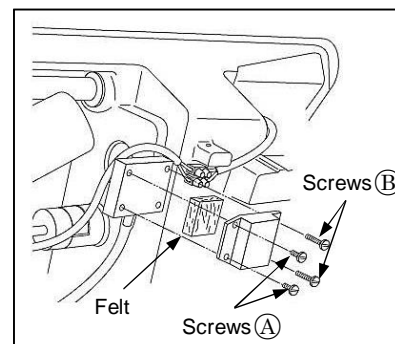
Open right and left hook covers, and lubricate a suitable amount of oil to felts.



Cleaning of filtration felt

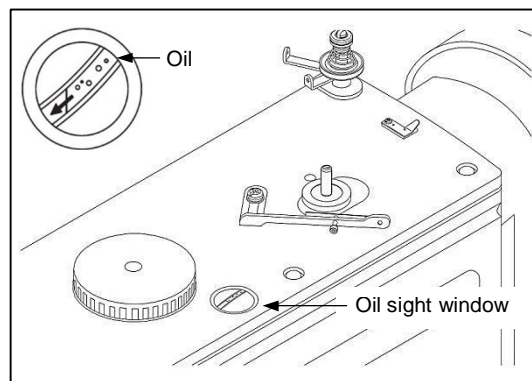
Remove screws ① and ②, and check whether there are the dust of the felt once in six months.

If there are the dust, remove the felt and clean it.



3 Checking of lubrication condition

Check lubrication condition of the sewing machine by seeing the oil sight window.

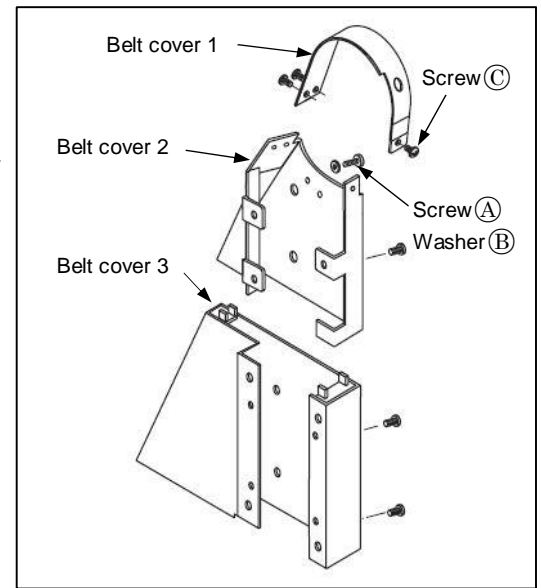


USAGE PRECAUTION

4 Installation of the belt cover

Set the belt to the pulley, and assemble in the following procedure.

- (1) Remove screwⒶ and washerⒷ on the pulley side.
- (2) Temporary tighten the belt cover 2 with screwⒶ and washerⒷ.
At this time, be careful not to fix the belt cover 2 because it will not be difficult to install the belt cover 3.
- (3) Fix the belt cover 3 with the screwⒶ and washerⒷ.
- (4) Tighten screwⒶ of the belt cover 2.
- (5) Fix the belt cover 1 and 2 with screwⒸ



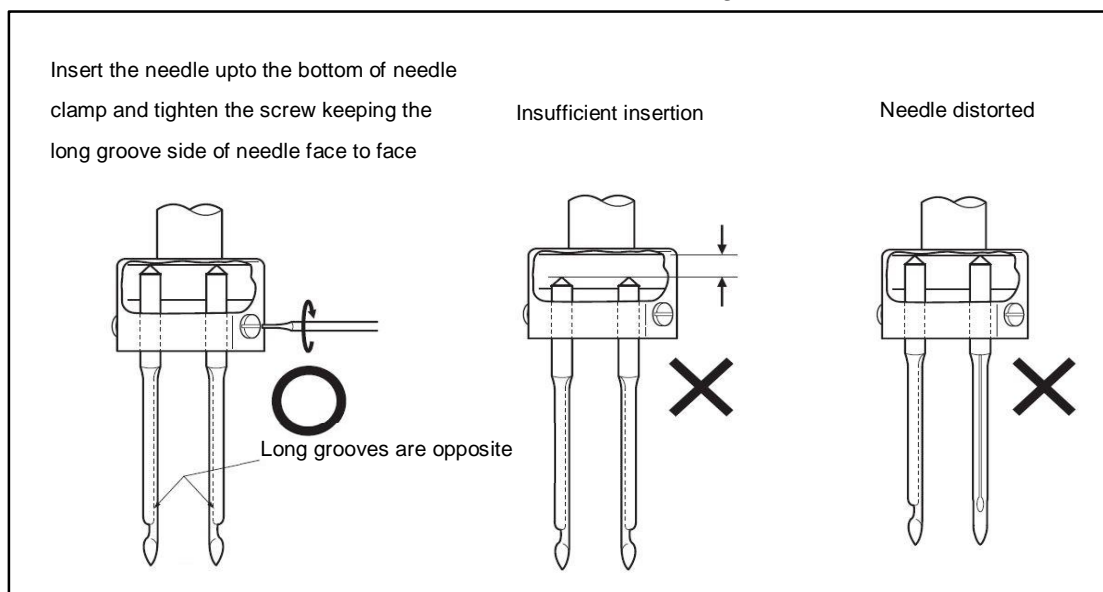
5 Precaution on operation

- (1) When the power is turned on or off, keep foot away from the pedal.
- (2) It should be noted that the brake may not work when the power is interrupted or power failure occurs during sewing machine operation.
- (3) Since dust in the control box might cause malfunction or control troubles, be sure to keep the control box cover close during operation.
- (4) Do not apply a multimeter to the control circuit for checking, otherwise voltage of multimeter might damage semiconductor components in the circuit.

HOW TO USE

1 Installation of needles

Note: Before installing the needles, be sure to turn off the power.



2 Winding of the bobbin thread

Note:

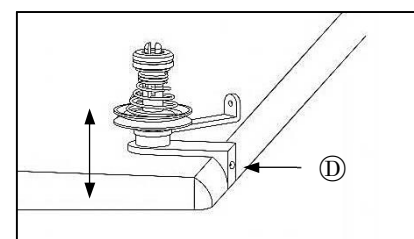
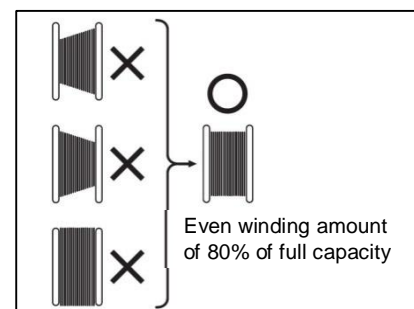
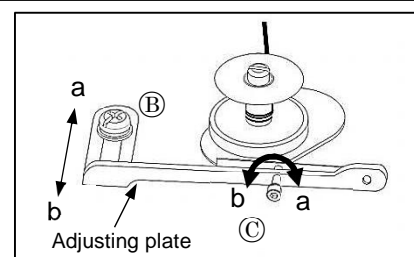
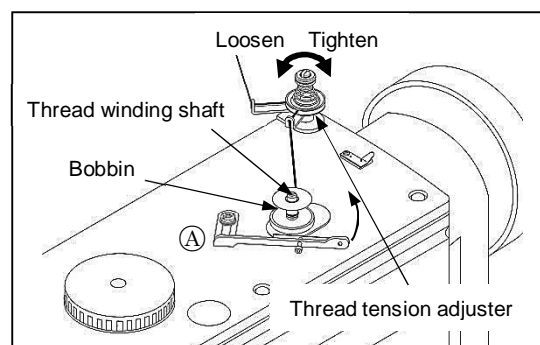
- (1) Be careful not to touch a rotary part while bobbin thread is wound. Because it may cause injury or failure.
- (2) When bobbin thread is wound, keep the presser foot lifted.

Winding of the bobbin thread

- (1) Put the bobbin into the thread winding shaft.
- (2) Pass the thread as shown in the figure, wind the thread to the bobbin clockwise several times, and wind the thread from the thread tension adjuster to the bobbin counterclockwise several times.
- (3) Adjust tension of wound thread by turning the thread tension adjuster nut.
- (4) Push lever **A** and operate the sewing machine.
- (5) When the bobbin finishes winding a certain amount (80% of the outside diameter of bobbin) of thread, the bobbin presser arm is returned to the initial position.

Adjustment amount of wound thread

- (1) Loosen screw **B** and adjust amount of wound thread by moving the adjusting plate.
 - a: decrease b: increase
- (2) It is possible to adjust amount of wound thread by turning screw **C** too.
 - a: decrease b: increase
- (3) If the thread is wound unevenly, loosen screw **D** and adjust height of the thread tension adjuster.



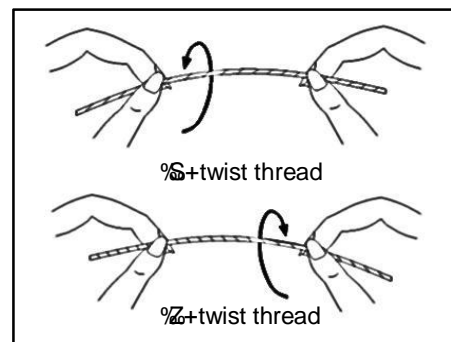
HOW TO USE

3 Selection of the thread

It is recommended to use “S” twist thread in the left needle (viewed from front), and “Z” twist thread in the right needle.

When discriminate use of needle threads is impossible, use “Z” twist thread in both the needles.

For bobbin thread, “S” twist thread as well as “Z” twist thread can be used.



4 Threading of needle threads

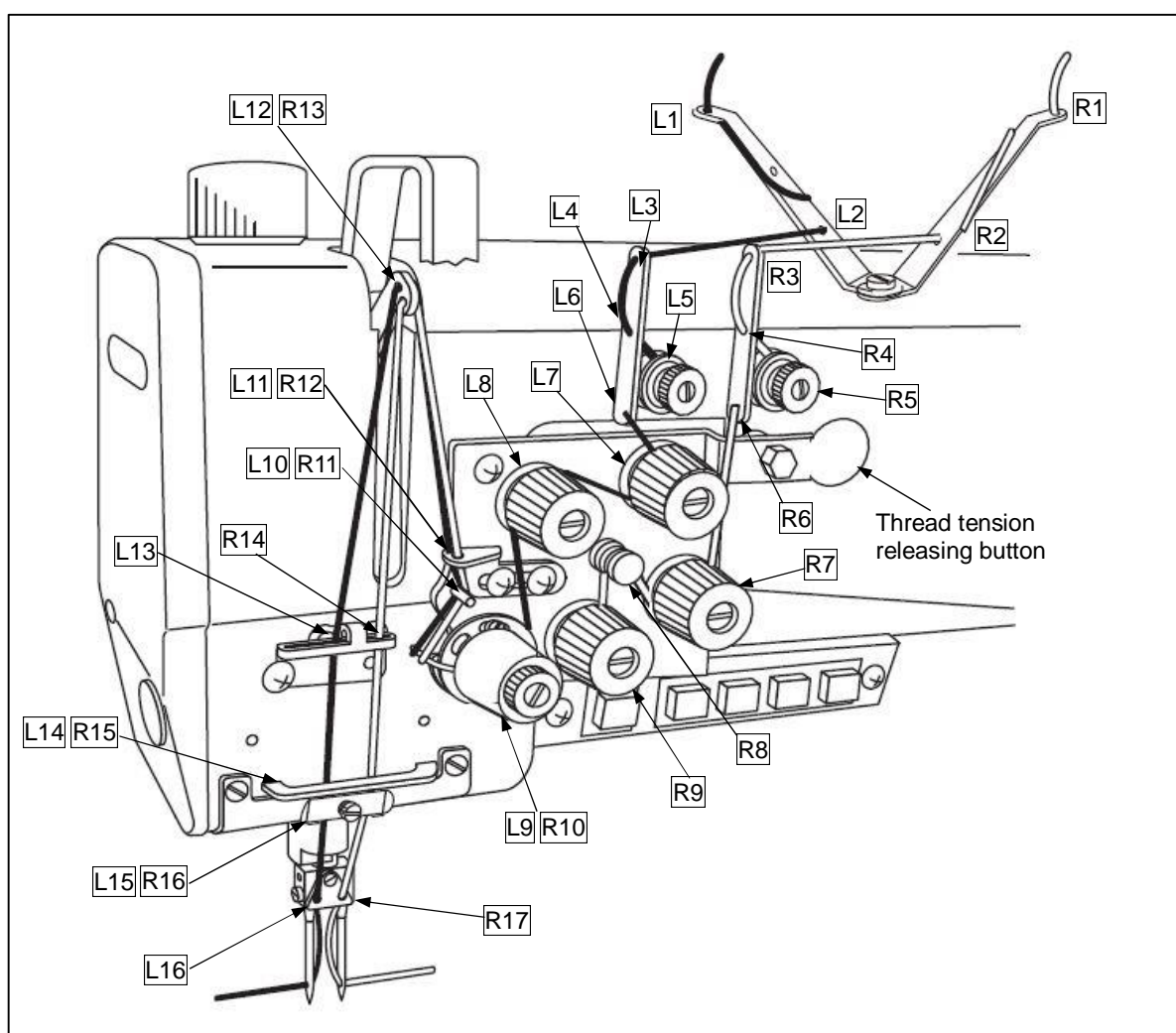
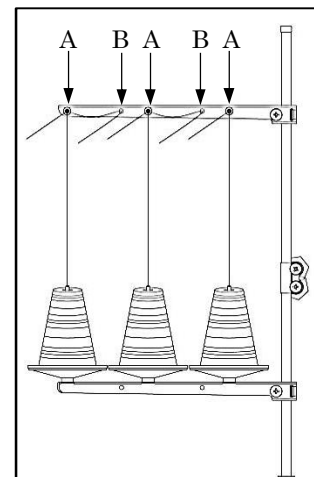
1. Pass each needle thread through thread guide (A).

Note: When thin slippery thread (polyester thread or filament thread, etc.) is used,

Pass the thread through thread guide (B) as well.

2. With the thread take-up lever located at the upper most position, pass each needle thread in the order shown in the following figure.

Note: Pushing the needle thread tension releasing button shown in the figure below opens the saucer of the needle thread tension adjuster, and the needle thread can easily pulled out.




HOW TO USE

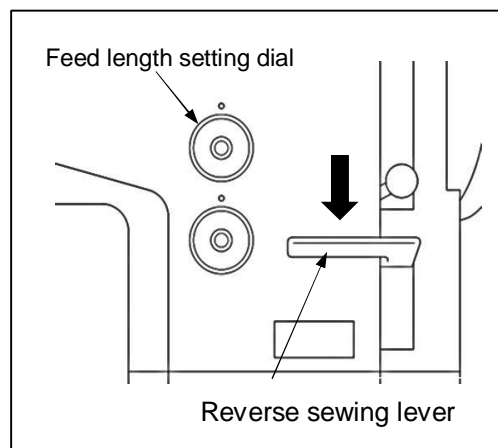
5 Adjustment of the needle thread guide

Adjust the needle thread guide of the needle thread tension adjuster according to the fabric, the thread, and sewing condition.

Needle thread guide position	Center	Left side	Right side
Fabric	Standard	Heavy	Light
Needle thread supply	Standard	More	Less

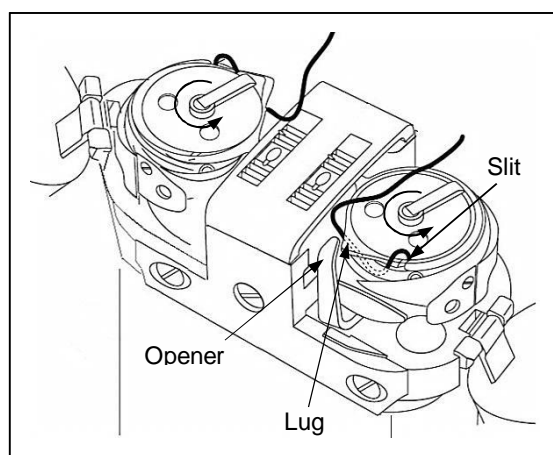
6 Adjustment of feed (stitch) length and backstitch

- Adjustment of feed (stitch) length ··· Adjust feed length by turning over feed length setting dial.
- Backstitch ··· Direction of stitching can be reversed while depressing the reverse sewing lever or pushing the touch back switch. 



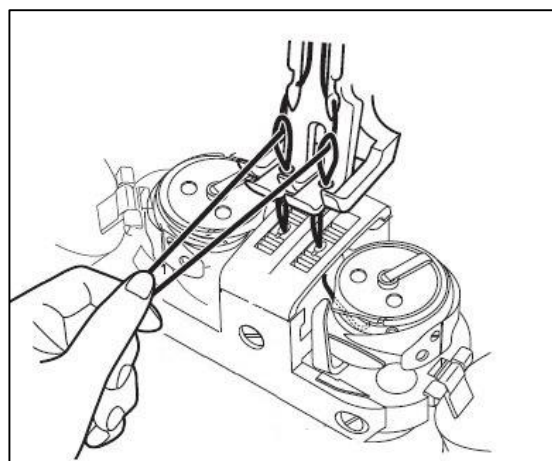
7 Setting of bobbins and threading of bobbin threads

- (1) Pull out 5cm thread tail from bobbins.
- (2) Put bobbins into hooks so that bobbins turn counterclockwise when threads are pulled.
- (3) Put bobbin threads into the slit, pass under the lug, and extend it above the bed.



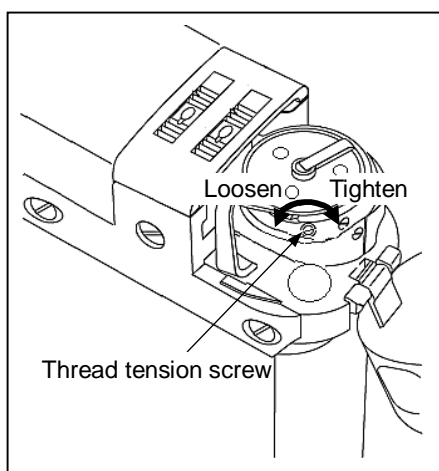
8 Pulling up bobbin threads

While holding two needle threads with your left hand, turn the pulley one rotation with your right hand. The bobbin threads will come up when needle threads are lifted up as shown in the figure. Needle threads and bobbin threads should be aligned and led backward together.

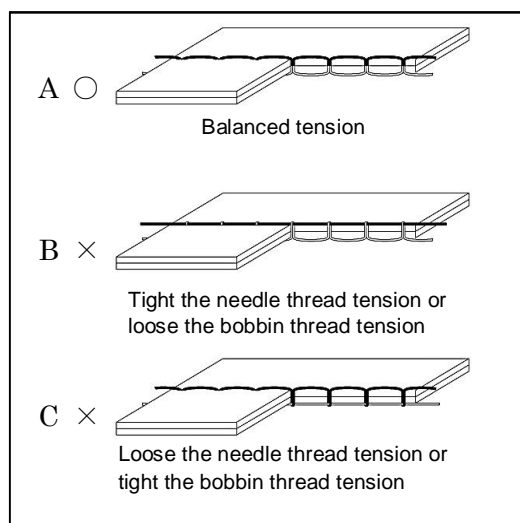


HOW TO USE

9 Adjustment of bobbin threads tension



10 Balance of threads tension



11 Adjustment of needle threads tension

- Needle threads tension should be adjusted on the basis of bobbin threads tension.
- Adjust needle threads tension by turning thread tension nuts.

Needle threads tension can be also adjusted by changing intensity and movable range of the thread take-up spring in case of sewing the special fabric and thread.

1. Adjusting movable range of the thread take up spring

To adjust the thread take up spring① for the left thread, loosen screwⒶ and move the stopper①.

To adjust the thread take up spring② for the right thread, loosen screwⒷ and move the stopper②.

2. Adjusting intensity of the thread take up spring

Loosen screwⒷ, remove the stopper②, and loosen the fixed nut.

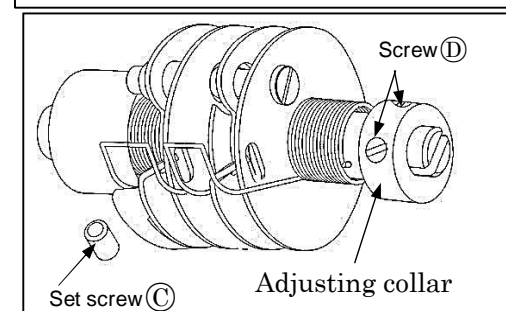
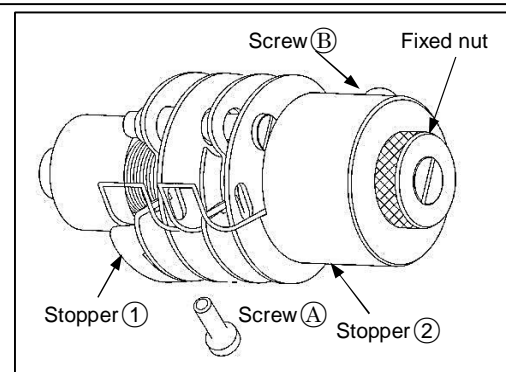
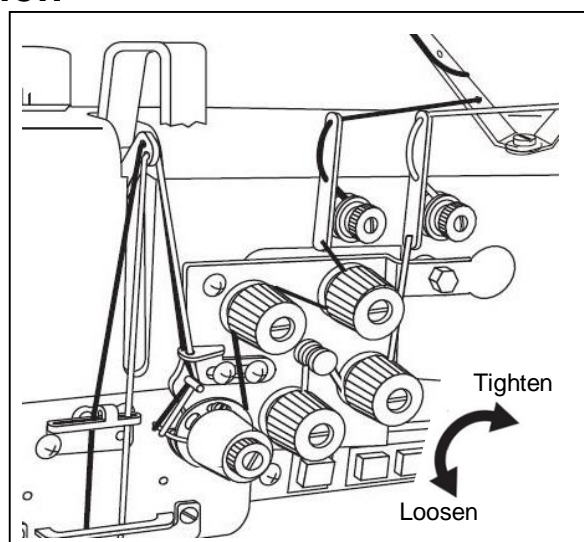
Left thread:

Loosen set screwⒸ fixing the adjusting shaft, and adjust by turning the adjusting shaft. Fix the adjusting shaft by tightening set screwⒸ.

Right thread:

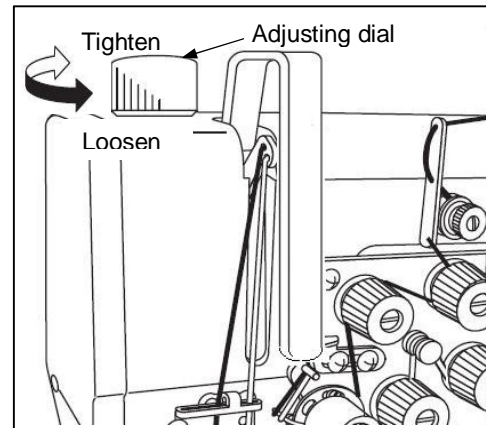
Loosen screwsⒹ, and adjust by turning the adjusting collar. Fix the collar by tightening screwsⒹ.

After adjusting, tighten the fixed nut, and install stopper② with screwⒷ.



12 Adjustment of the presser foot pressure

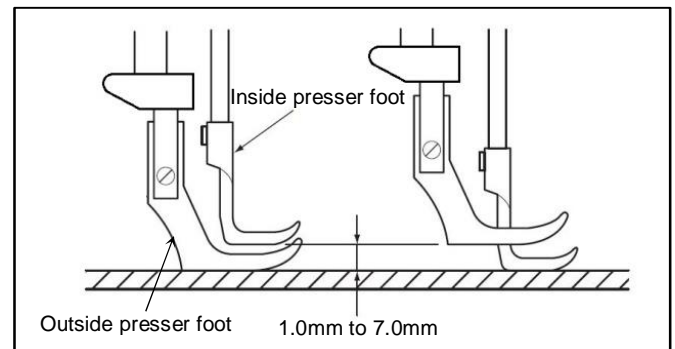
Adjust the presser foot pressure by turning the adjusting dial.



13 Adjustment of the outside presser foot and inside presser foot

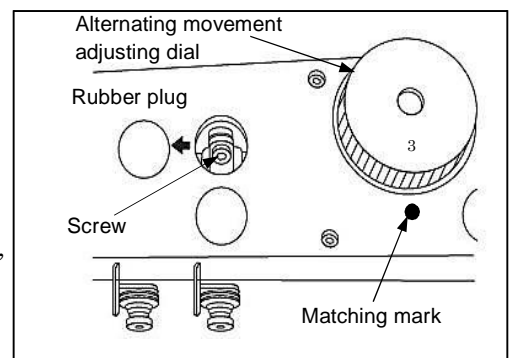
1. Adjustment of alternating movement

- (1) The alternating movement on the outside presser foot and inside presser foot can be adjusted by using the turning dial located on the top cover.
- (2) Face the desired number printed on the dial to the matching mark located on the top cover.
- (3) The number printed on the dial represents the possible protrusion of the outside presser foot and inside presser foot from the throat plate when the alternating movements on these are evenly set.
- (4) If the alternating movements are evenly set, they can be readjusted up to 1.0 to 7.0 mm.



2. How to equalize balance between the alternating movement on the outside presser foot and inside presser foot

- (1) Remove the rubber plug on the top cover.
- (2) Set the alternating movement to "3" on the adjusting dial.
- (3) Loosen the screw.
- (4) Turn the pulley and stop it at the position where Tip of needles, inside presser foot, outside presser foot, and feed dog come to top face of the throat plate, and tighten screw.



3. How to change balance between the alternating movement on the outside presser foot and inside presser foot

- (1) Remove the rubber plug on the top cover.
- (2) Set the alternating movement to "3" on the adjusting dial.
- (3) •To increase the rise of inside presser foot, and decrease the rise of the outside presser foot.
 - ① Turn the pulley until the outside presser foot is slightly raised from the throat plate.
 - ② Loosen the screw, and tighten screw again after checking that the outside presser foot is fallen to top face of the throat plate.

HOW TO USE

- ③ This completes the adjustment, i.e., the protrusion of the outside foot has been decreased by a set distance. And, the vertical motion of the inside presser foot has been increased by that same distance.
- To increase the rise of outside presser foot, and decrease the rise of the inside presser foot.
 - ① Turn the pulley until the inside presser foot is slightly raised from the throat plate.
 - ② Loosen the screw, and tighten screw again after checking that the inside presser foot is fallen to top face of the throat plate.
 - ③ This completes the adjustment, i.e., the protrusion of the inside foot has been decreased by a set distance. And, the vertical motion of the outside presser foot has been increased by that same distance.

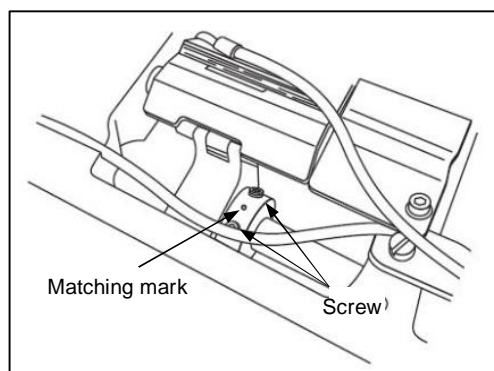
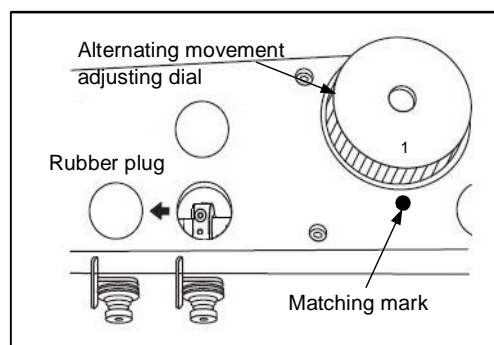
14 Timing of the presser foot

Remove the rubber plug, and turn the pulley and stop it at the position where the thread take-up lever comes to the highest. The position where the mark of cam faces to the top is standard.

Adjustment of timing

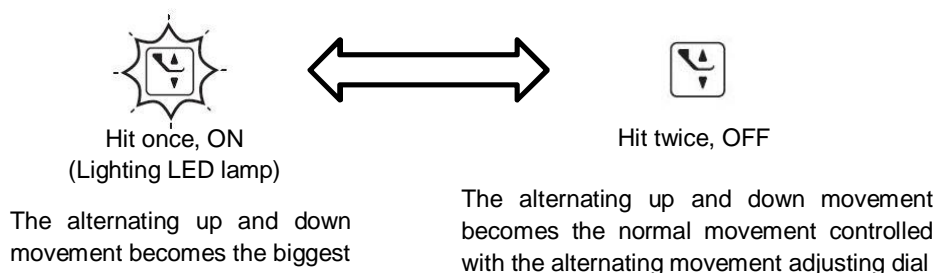
Note: If it is difficult to adjust the cam, set the alternating movement to "1" on the adjusting dial, and remove the top cover.

- (1) Remove the rubber plug.
- (2) Loosen screws.
- (3) Turn the pulley and stop it at the position where the thread take-up lever comes to the highest.
- (4) Adjust by turning the cam.
- (5) Tighten the screws and install the rubber plug.



15 Instant alternating switch

During the sewing operation, if a sewing material has a step, hit the instant alternating switch, then the alternating up and down movement instantly becomes the biggest to get over the step.



Even if it is switch-on state when the machine power is turned off, the alternating up and down movement becomes the movement shown on the adjusting dial when the machine power is turned on next time.

HOW TO USE

16 Reverse sewing cancel switch

Reverse sewing set up by control box (G500) can be canceled only one time.

Push the switch before sewing, then reverse sewing before and after sewing is canceled.

Note: When the switch is pushed, the LED lamp is not lighted.

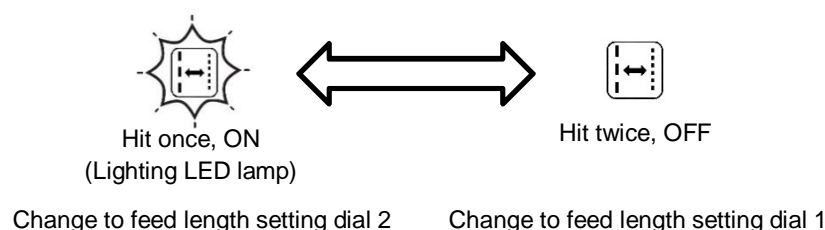
17 Half-stitch sewing switch

The half-stitch sewing can be worked by pushing the switch.

18 Changing feed length switch

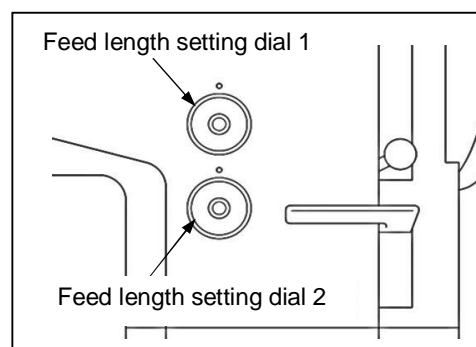
If you want to change the feed length in the middle of sewing, hit the changing feed length switch.

The feed length can be changed without changing the feed length setting dial



Under normal conditions, the feed length is the length shown on the feed length setting dial 1.

Even if the feed length is the length shown on dial 2 when the machine power is turned off, the feed length becomes the length shown on dial 1 when the machine power is turned on next time. The feed length shown on dial 2 cannot be longer than the feed length shown on dial 1.

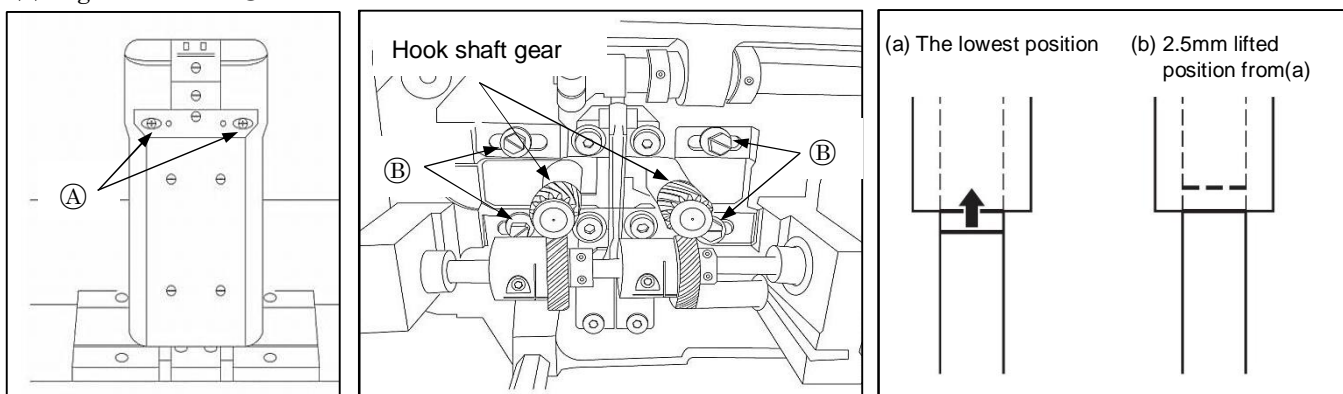


19 Timing between the rotating hook motion and the needle motion

1. Adjustment of the gap between the hook and the needle

Note: If you remove the presser foot, the throat plate, the hook saddle cover, it makes easier to adjust.

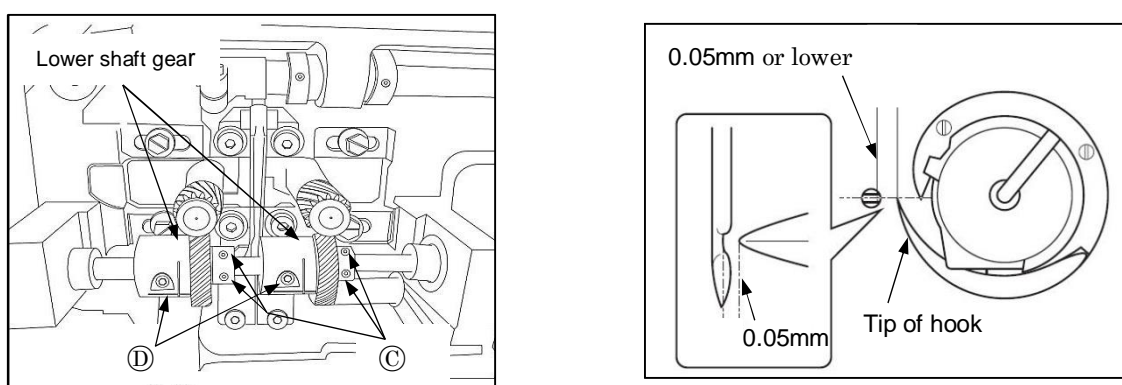
- (1) Set feed length to 6mm.
- (2) Loosen screwsⒶ (both of in front and back), lean the machine head backward, and loosen screwsⒷ
- (3) Lift the needle bar 2.5mm from the lowest position. Refer to timing marks shown in the figure.
- (4) Slide the hook saddle right and left and adjust so that the gap between the tip of the hook and the scarf of the needle is 0.05 mm or lower.
- (5) Tighten screwsⒷ.



2. Timing between the tip of rotating hook motion and the needle motion

- (1) Loosen screwsⒸ and Ⓓ.
- (2) Turn the collar so that center of the lower shaft gear and center of the hook shaft gear are matching, and tighten screwsⒸ.
- (3) Make the lower shaft gear touch to the collar.
- (4) Tighten screwsⒹ so that the tip of the hook come to the scarf of the needle.

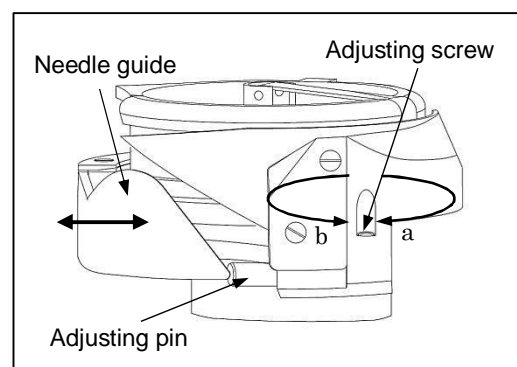
At this time, provide backlash between the hook shaft gear and the lower shaft gear.



3. Adjustment of the position of the needle guide

Adjust the needle guide position so that it comes lightly in contact with the needle.

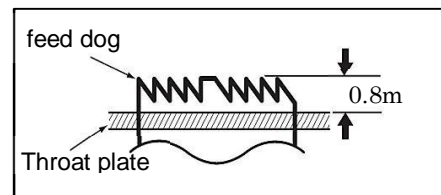
- a : needle guide is opened outward
- b : needle guide is closed inward



20 Adjustment of the feed dog height

The feed dog height and the presser foot pressure must be adjusted according to the fabric. If you want to change the presser foot pressure, please check [12] Adjustment presser foot pressure.

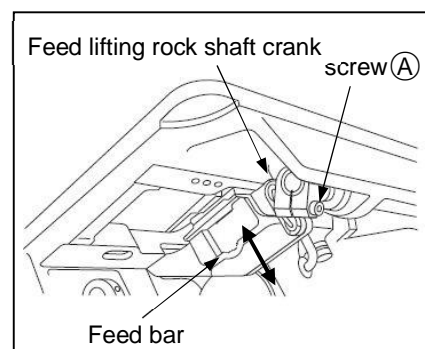
- ◆ The fabric will be damaged if the feed dog extends too high, or if the presser foot pressure is too large.
- ◆ An even stitch length cannot be assured if the feed dog is too low, or if the presser foot pressure is too small.
- ◆ The feed dog height is the position where the needle is at the top position.



Adjustment of the feed dog height

- (1) Lean the machine head backward.
- (2) Turn the pulley by hand and stop it at the position where the feed dog rises to the maximum height.
- (3) Loosen screw ④.
- (4) Adjust the feed dog height by moving feed bar vertically.
- (5) Tighten screw ④.

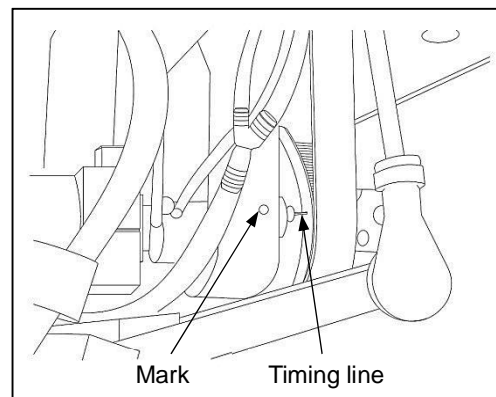
The feed dog height is standard-adjusted to 0.8 mm



21 Relationship between the rotating hook motion and the thread take-up lever motion

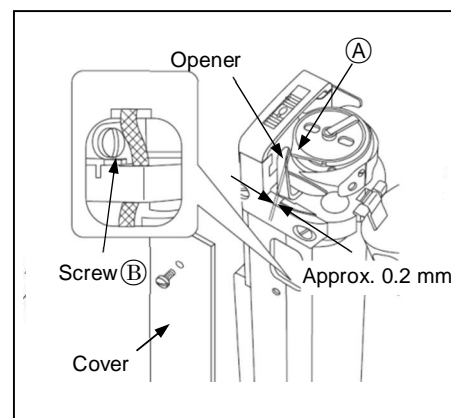
When the timing belt is removed for replacement, etc., the relationship between the rotating hook motion and the thread take-up lever motion should be adjusted as follows:

- (1) Turn the pulley and stop it at the position where the thread take-up lever comes to the highest.
- (2) Lean the machine head backward and check that the line (timing line) put on the timing belt gear is aligned with the mark on the boss of lower shaft bearing.
- (3) If the timing line is not in line with the mark, remove the timing belt and install it again to adjust.



22 Relationship between the rotating hook motion and the opener motion

- (1) Turn the pulley and stop it at the position where the opener holder is located most remotely from the throat plate.
- (2) Check that the gap between the lug ① and the opener is approximately 0.2 mm.
- (3) If the gap is too large or small, remove the cover and loosen the opener holder screw ② and adjust position of the opener.

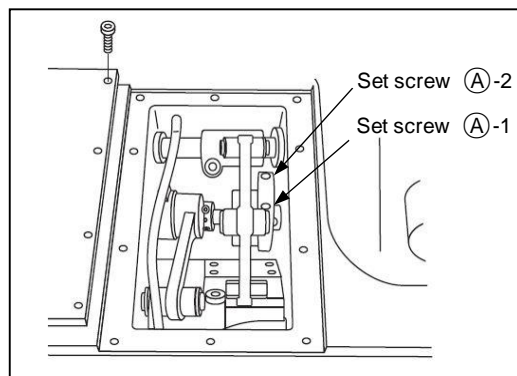


23 Relationship between the needle motion and feed dog motion

1. Adjustment in horizontal direction

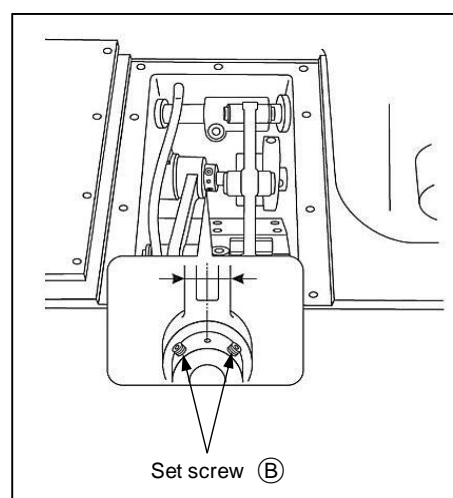
- (1) Set the stitch length to “9” on the feed length setting dial.
- (2) Remove the plate on the bed.
- (3) Loosen set screw ①-2.
- (4) Turn the pulley and stop it at the position where the needle and the feed dog cannot be moved by moving the reverse sewing lever.
- (5) Loosen set screw ①-1 and turn the cam slowly.
- (6) Tighten set screws ① after turning the cam.

Note: Check that the needle and the feed dog cannot be moved by moving the reverse sewing lever after tightening screw ①.



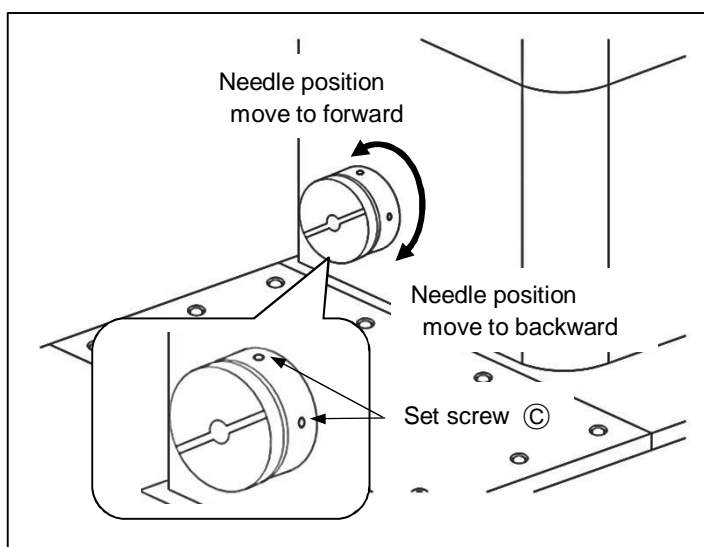
2. Adjustment in vertical direction

- (1) Set the stitch length to “0” on the feed length setting dial.
- (2) Loosen the set screws ②.
- (3) Turn the pulley and stop it at the position where the needle bar comes to the lowest.
- (4) Turn the cam and match its mark position to center of the crank rod. At this time, the feed dog protrude 0.8 mm from top face of the throat plate.
- (5) Tighten set screws ②.
- (6) Install the plate on the bed.



3. Adjustment of holes position of the feed dog and needles position

- (1) Set the stitch length to “0” on the feed length setting dial.
- (2) Turn the pulley and stop it at the position where the needle bar comes to the lowest.
- (3) Loosen set screws ③ and adjust by turning the eccentric pin.
- (4) After adjusting, tighten set screws ③.

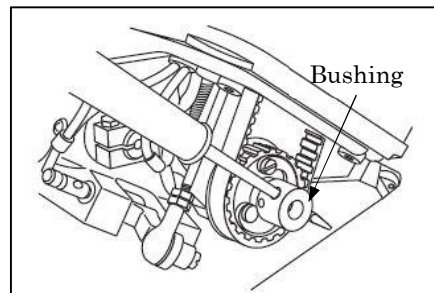


24 Safety clutch

- A safety clutch is installed to prevent the hook or timing belt damage if the thread is caught in the hook when the machine is loaded abnormally during operation.

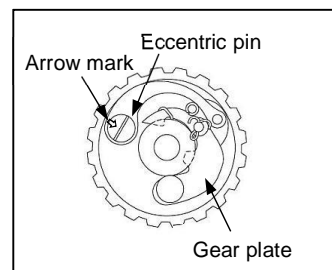
1. Function of the safety clutch

- (1) When the safety clutch functions, the timing belt pulley will be freed, and the lower shaft rotation will stop. The upper shaft only will rotate. Stop the operation of the machine.
- (2) Completely remove the thread, etc. caught in the hook.
- (3) Turn the bushing by hand, and check whether the lower shaft rotates lightly and properly, then install the clutch device as before.



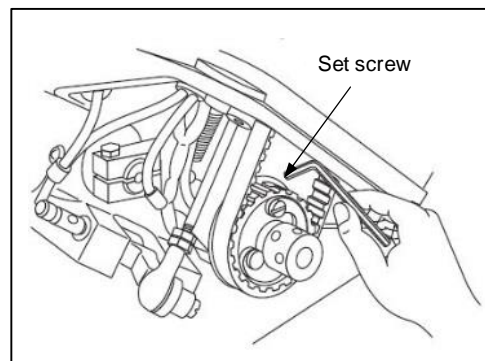
2. How to set safety clutch

- (1) Insert the screw driver in a hole of the bushing and fix it.
- (2) Turn the pulley slowly with your hand away from you.
- (3) The pulley will be stopped by the gear plate, but turn the pulley more firmly.
- (4) Check that the gear plate is in the groove of the bushing.



3. How to set safety clutch

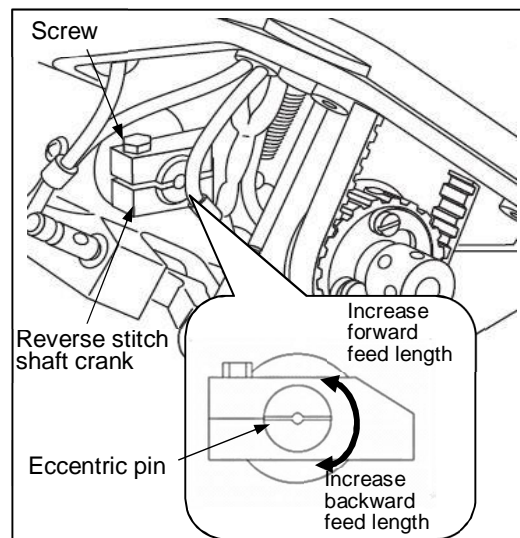
- (1) The force applied to the safety clutch is the smallest when the arrow mark of the eccentric pin faces the center of the lower shaft. The force proportionally increases as the arrow mark faces the outside.
- (2) To adjust the force, slide the timing belt, loosen the set screw, and turn the eccentric pin.
- (3) After adjusting, fully tighten the set screw.



25 Adjustment of forward / backward feed length

The forward/backward feed length can be adjusted by moving the eccentric pin as shown in the figure.

- (1) Loosen the reverse stitch shaft crank screw.
- (2) To increase forward stitch length, turn the eccentric pin counterclockwise.
To increase backward stitch length, turn the eccentric pin clockwise.
- (3) Tighten the reverse stitch shaft crank screw.



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