

**MITSUBISHI
INDUSTRIAL
SEWING
MACHINE**

Model

LU2-4410·4430

Classes

**Single-Needle, Double-Needle
Lockstitch
Compound-Feed
Automatic undertrimmer
Variable speed control**

Thank you for choosing Mitsubishi Industrial Sewing Machine.
Please read this instruction carefully before operating the machine.

INSTRUCTION MANUAL

A180E271P02

PREPARATION FOR OPERATION

1 Adjustment of needle bar stop position

1. Adjust of "UP" position

When the pedal is kicked down by heel, the machine stops at "UP" position. If the marks deviate larger than 3 mm, adjust as follows.

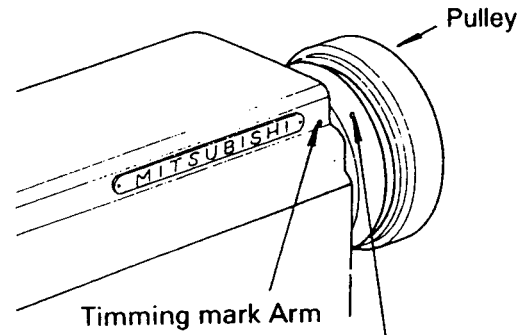
- 1. Disconnect the plug (12 pins) of cable from the machine head.
- 2. Run the machine and stop at "UP" position.
- 3. While holding the pulley, insert the "adjusting tool" in the hole (A), then remove the tool.

2. Adjust of "Down" position

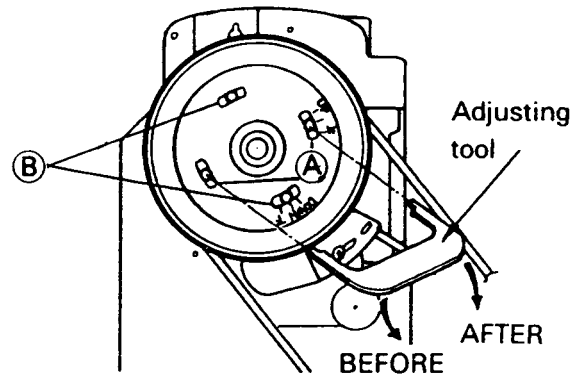
When the pedal is "Neutral" the machine stops at "Down" position. If the marks deviate large than 5 mm, adjust as follows.

- 1. Disconnect the plug (12 pins) of cable from the machine head.
- 2. Run the machine and stop at "Down" position.
- 3. While holding the pulley, insert the "adjusting tool" in the hole (B), then remove the tool.

- 3. Confirm the stop operation, then set the plug (12 pins) coming from the machine head into the receptable.



white mark	"Up" position
Black mark	"Down" position

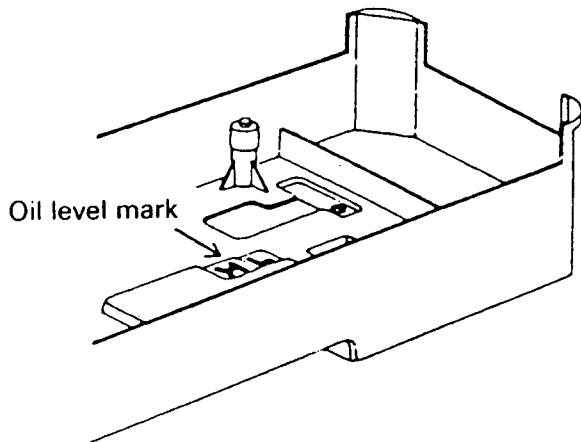


CAUTIONS ON USE

1 Oiling (1)

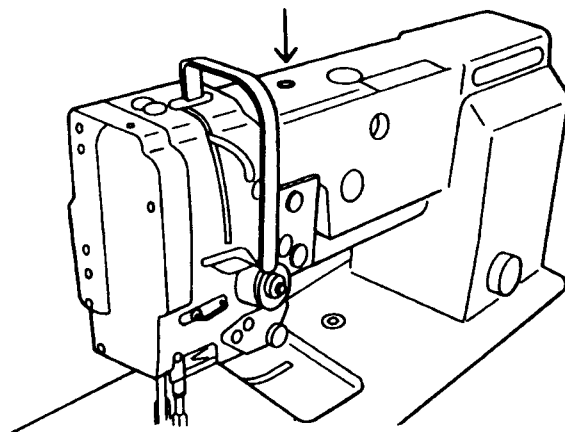
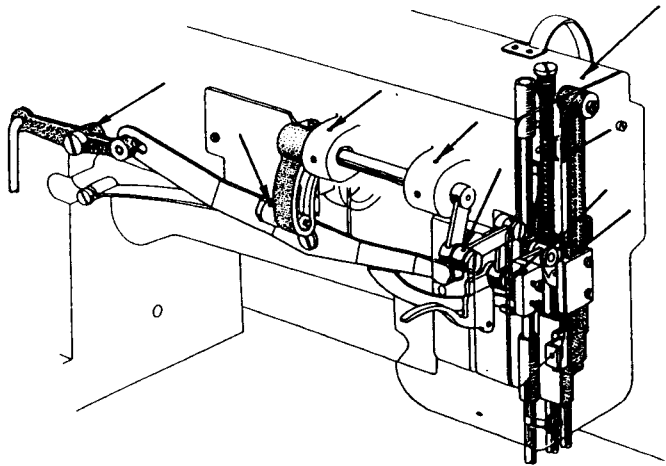
Fill the oil reservoir with oil up to "H" mark. Oil level should be periodically checked. If oil level is found below "L" level replenish oil to "H" level.

For oil, use MC70M specified by Mitsubishi.



2 Oiling (2)

When a new sewing machine is used for the first time, or sewing machine left out of use for considerably long time is used again, replenish a suitable amount of oil to the portions indicated by arrow in the below figure.



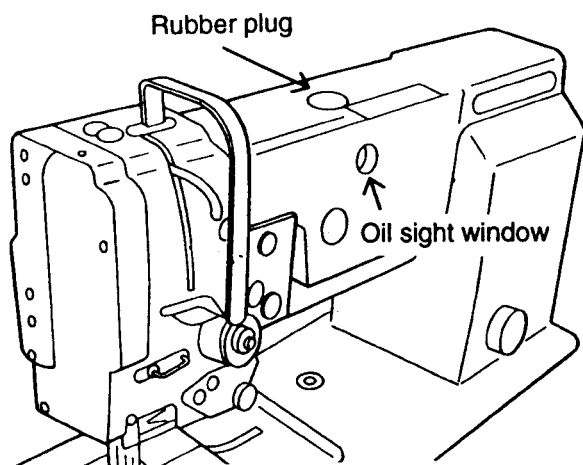
CAUTIONS ON USE

3 Oiling condition

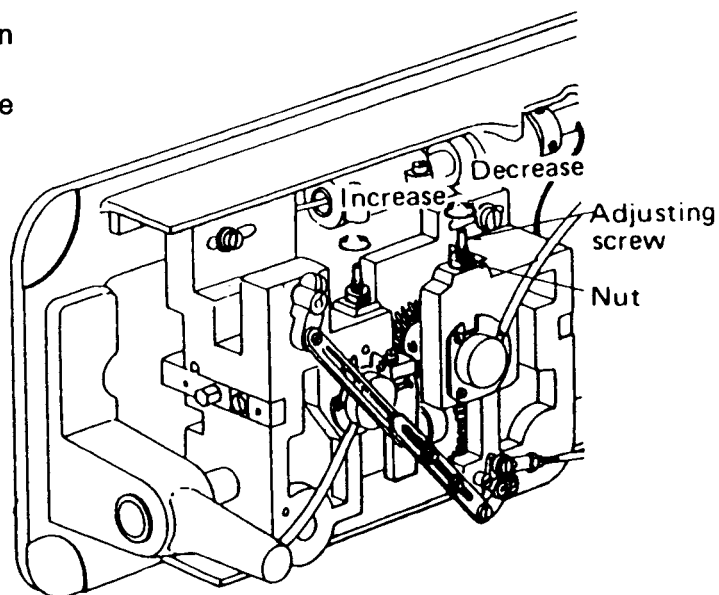
See dripping of oil through the oil sight hole to check oiling condition during operation.

Confirm that oil has been drained from the oil tank when the operation is stopped.

When dust, etc. accumulate in the oil tank, remove the rubber plug to clean.



4 Adjustment of oiling to rotating hook



5 Cautions for built-in type detector

(1) Since the optical type detecting element is used in the detector, prevent dust or oil from sticking to the detecting plate when the sewing machine pulley is removed for adjustment. If they have stuck, wipe them off with soft cloth carefully so that the surface is not scratched. Do not let oil permeate the clearance on the detecting plate.

(2) In case of disconnection of the position detector connector, running off of the belt or complete constraint of the machine, the power supplied to the motor is automatically turned off after pre-determined time to prevent burning of the motor. (However, in case of half-constraint and over load, the power may not be turned off.) After the failure is eliminated, the normal operation is resumed by turning off the power once then turning on again.

The same operation occurs for the detector malfunction or the line breakage.

6 Installation of belt cover

(1) Install the belt cover on the machine side for safety. Refer to the provided instruction document contained in the same package.

(2) Install the belt cover on the motor side for safety.

7 Cautions 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.

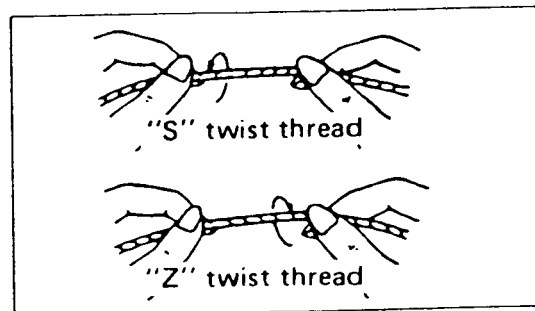
(4) Do not apply a multimeter to the control circuit for checking, otherwise voltage of multimeter might damage semiconductor components in the circuit.

OPERATION

3 Selection of 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.



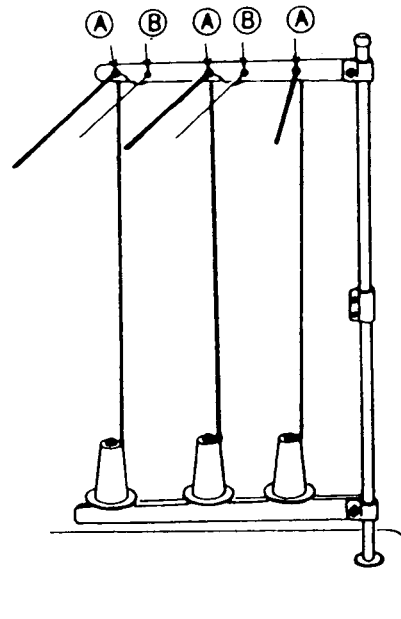
4 Threading of needle threads

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

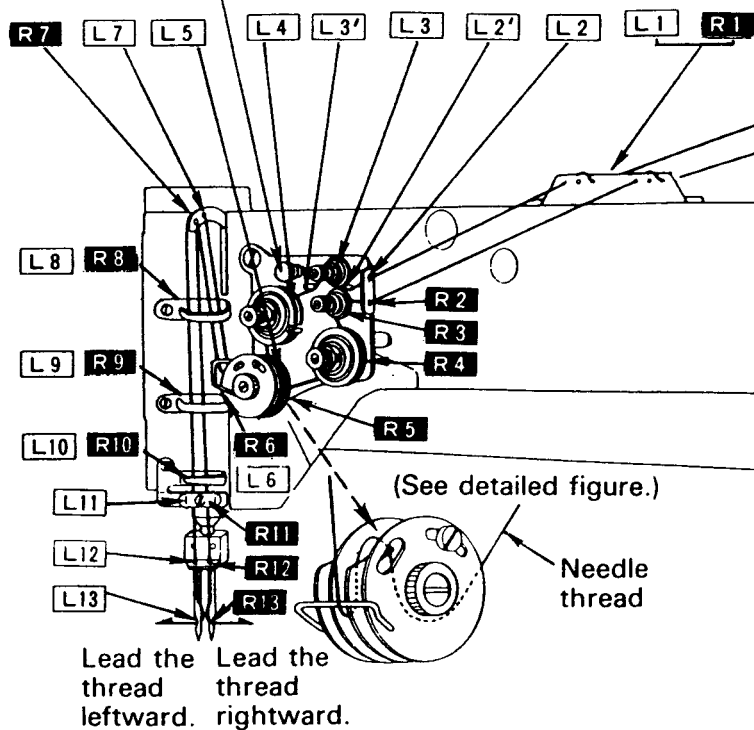
Note: When thin slippery thread (polyester thread or filament thread, for example) is used, pass the thread through thread guide (B) as well.

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

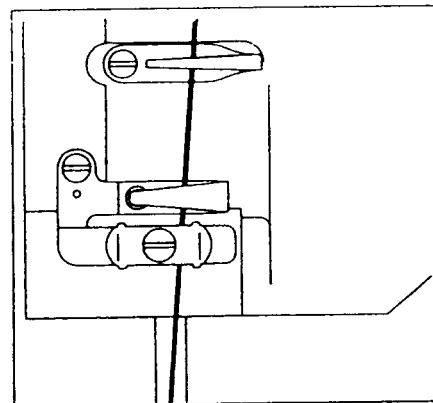
Note: Pressing the upper thread loosening button shown in the figure below opens the saucer of the upper thread tension adjuster, and the upper thread can easily pulled out.



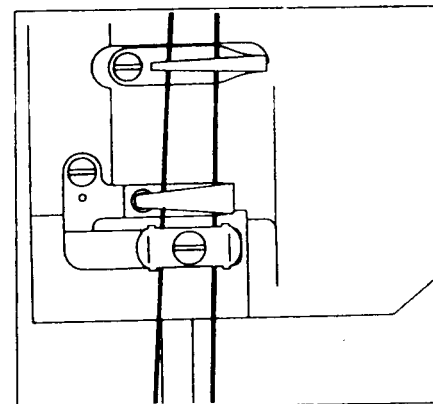
Needle thread tension releasing button



L11, R11 (Detail)
LU2-4410



LU2-4430

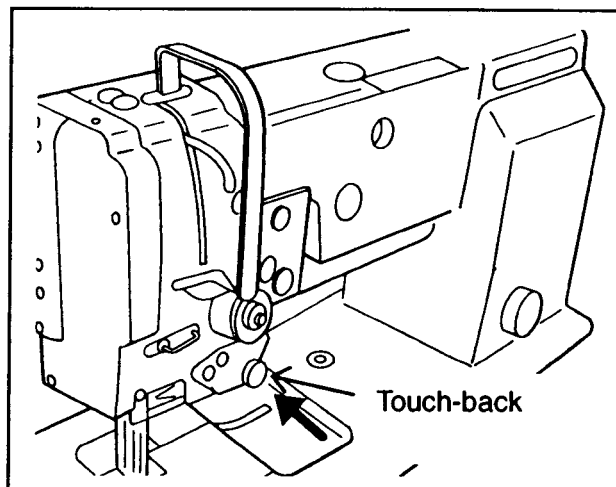
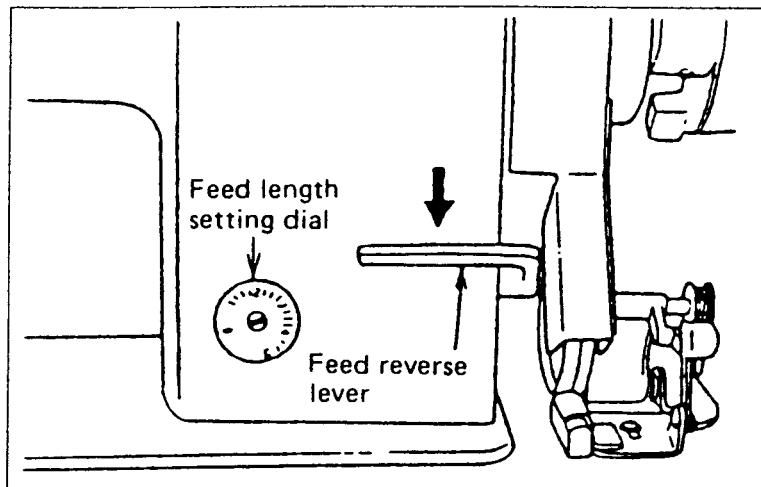


OPERATION

5 Adjustment of feed (stitch) length and stitch reversing (touch back)

Note: To make feed (stitch) length smaller, depress the feed reverse lever and set the feed length setting dial to a desired position.

- Touch-back button . . . Direction of stitching can be reversed by depressing this button. Stitching goes on in reversed direction while the button is held down, and returns to forward direction when the button is released.

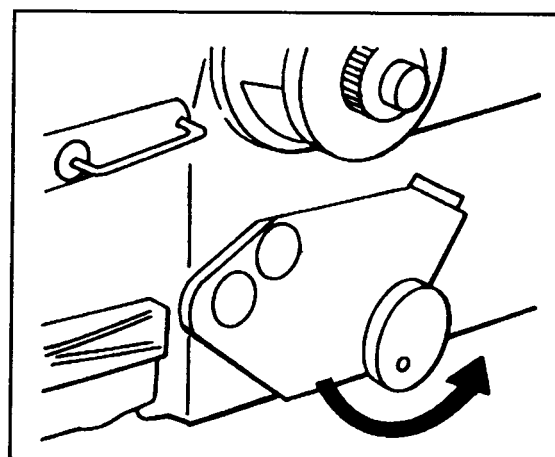
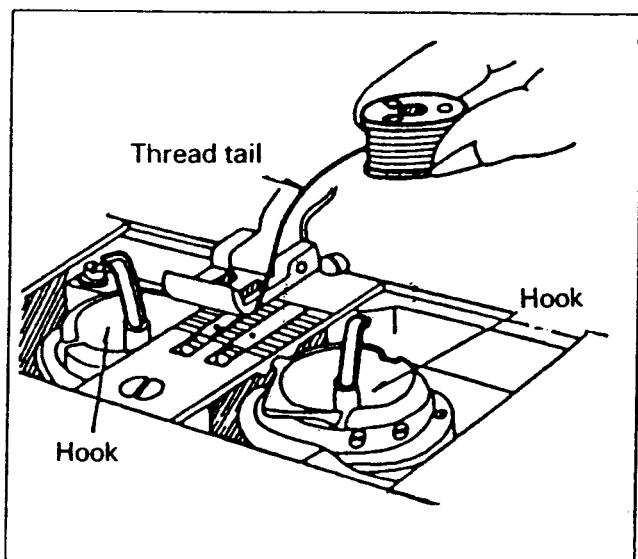


6 Setting of bobbin

- (1) Pull out 5 cm thread tail from the bobbin.
- (2) Hold the bobbin so that the bobbin thread is wound in right direction and put it into the hook.

In the case that the push button is turned to the arrow direction by 180°, no backward stitching occurs even when the push button is depressed.

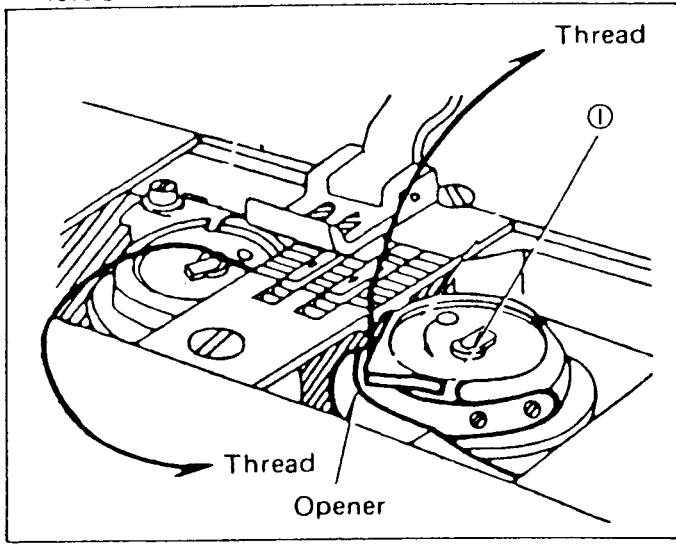
Use this function to avoid the malfunction such as unnecessary reverse stitching in the case that the fabric comes in contact with the touch switch during sewing.



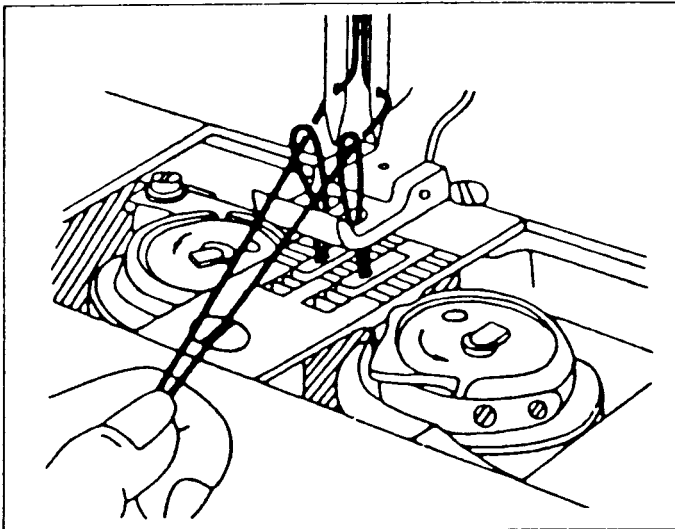
OPERATION

7 Threading of bobbin threads

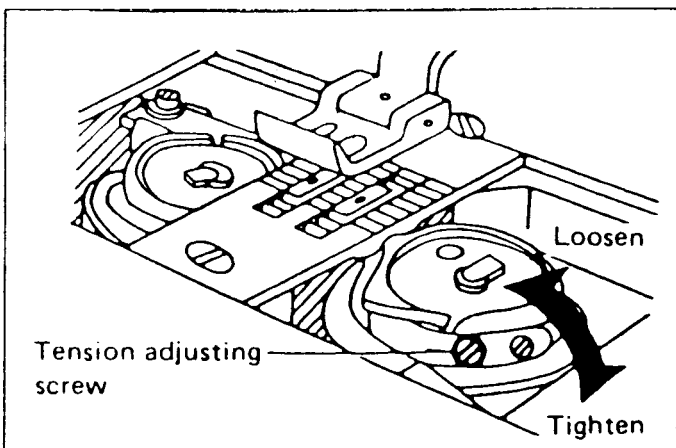
(1) Put the hook into the bobbin case and press down the latch ①. The thread end should be left on the bed.



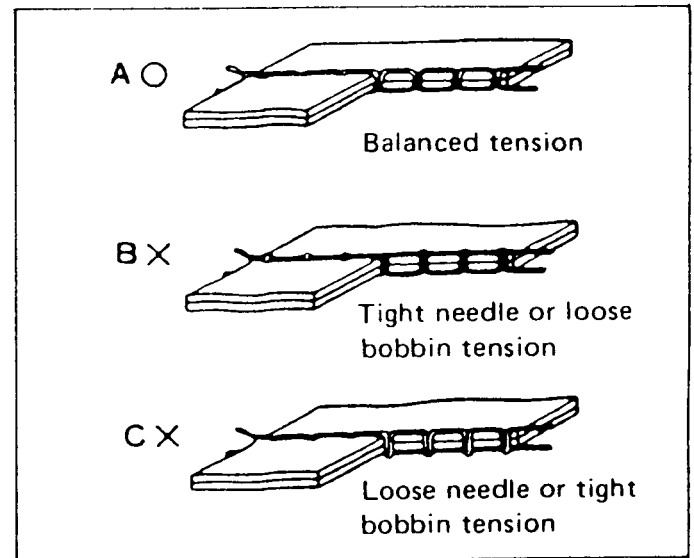
(2) While holding the two needle threads by left hand, rotate the handwheel one turn by right hand. By pulling up the needle threads, as shown in the figure, the bobbin threads will be lifted. Each combination of bobbin thread and needle thread should be aligned and led backward.



8 Tension adjustment of bobbin threads



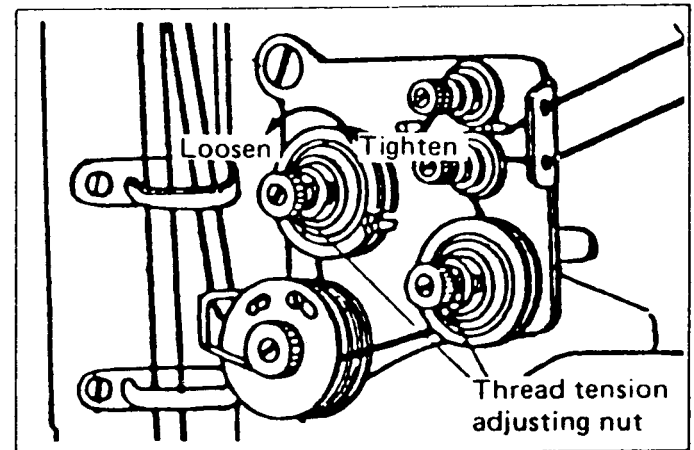
9 Balance of thread tension



10 Needle thread tension

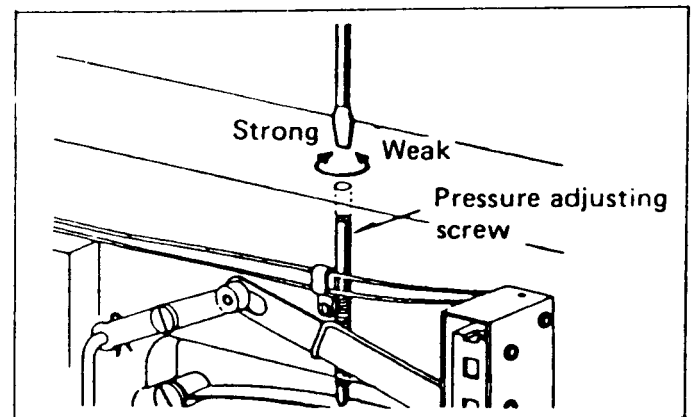
- Needle thread tension should be adjusted in reference to bobbin thread tension.
- To adjust needle thread tension, turn each tension adjusting nut.

Needle thread tension can be also adjusted for special fabric and thread by changing intensity and movable range of slack thread adjusting spring.



11 Adjustment of presser foot pressure

Pressure to fabric(s) can be adjusted by turning the pressure adjusting screw.

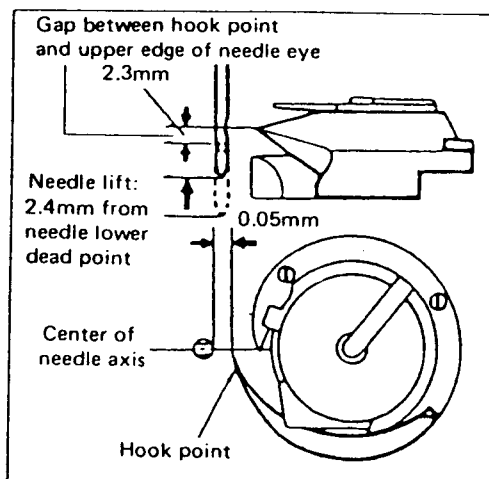


OPERATION

12 Timing between rotating hook motion and needle motion

- (1) Set feed length (stitch length) to "6" on the feed setting dial.
- (2) When needle is lifted 2.4mm from the lower dead point, as shown in Figure, the following positional relationship should be maintained.

- The upper edge of needle eye should be 2.3mm below the hook point.
- The hook point should be located at the center of needle axis.
- Gap between the hook point and the side face of needle should be 0.05mm.



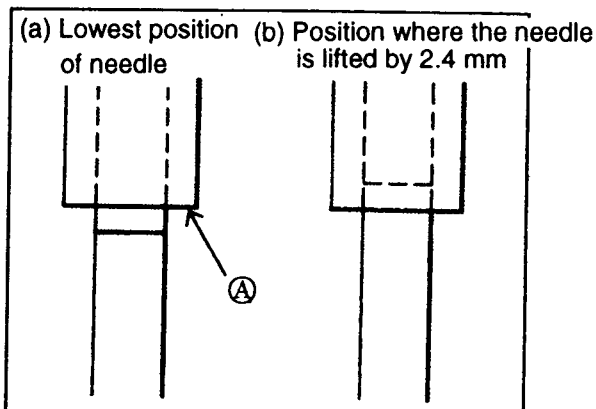
The timing mark (reference line) is marked on the needle as a standard of adjustment.

(a) Lowest position of needle

At this position the needle support lower end surface (A) comes almost same level with the upper reference line on the needle.

(b) Position where the needle is lifted by 2.4 mm

At this position the needle support lower end surface (A) comes almost same level with the lower reference line on the needle.



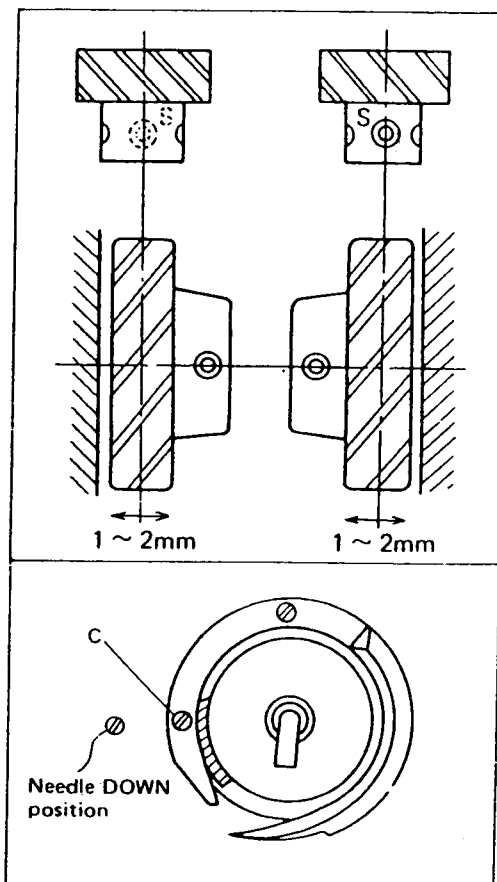
- (3) Needle/rotating hook position can be adjusted as follows.

(For easy adjustment, it is recommended that the presser foot, throat plate and feed dog assemblies are removed.)

• Positioning of hook point

- (1) When the needle is at DOWN position, the smaller crossed herical gears on the right side and left side should be engaged with the larger wheel so that the "S" screw of the former gear comes on the front side, and that of the latter gear on the reverse side.
- (2) Tighten each "S" screw, where is punched for set screw, on the hook shaft.
- (3) Approximate position of hook
"C" screw of hook should be found close to the needle when the needle is at DOWN position.

- * To finely adjust timing between the needle motion and hook motion, loosen the set screw of larger gear wheel and move the gear wheel in its axial direction within a range from 1mm to 2mm.



OPERATION

13 Adjustment of feed dog height

Height of feed dog and pressure of presser foot should be adjusted for individual fabric(s) with the following cautions:

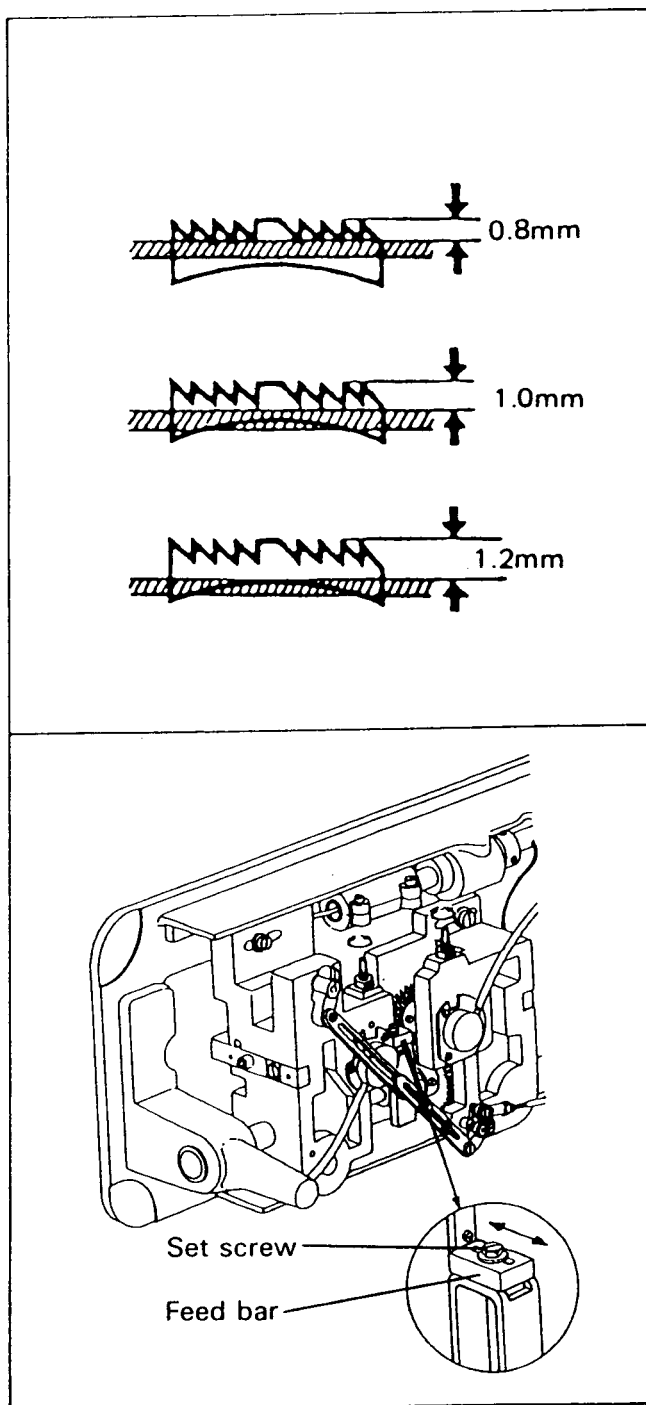
- ◆ Fabric will be damaged if the feed dog extends too high, or pressure of presser foot is too large.
- ◆ Even stitch length cannot be assured if the feed dog is too low or pressure of presser foot is too small.
- ◆ Feed dog height should be measured at the point where the needle is at the top position.

For light fabrics . . . Approx. 0.8mm from throat plate
For usual fabrics . . . Approx. 1.0mm from throat plate
For heavy fabrics . . . Approx. 1.2mm from throat plate

Adjustment procedure

- (1) Lean the machine head backward.
- (2) Turn the handwheel by hand and stop when the feed dog rises to the maximum height.
- (3) Loosen the feed bar set screw.
- (4) Vertically move the feed bar (in the direction indicated by arrow in the figure) to adjust it to adequate height.
- (5) After the adjustment, tighten the feed bar set screw.

The feed dog height is factory-adjusted to 1.2 mm.

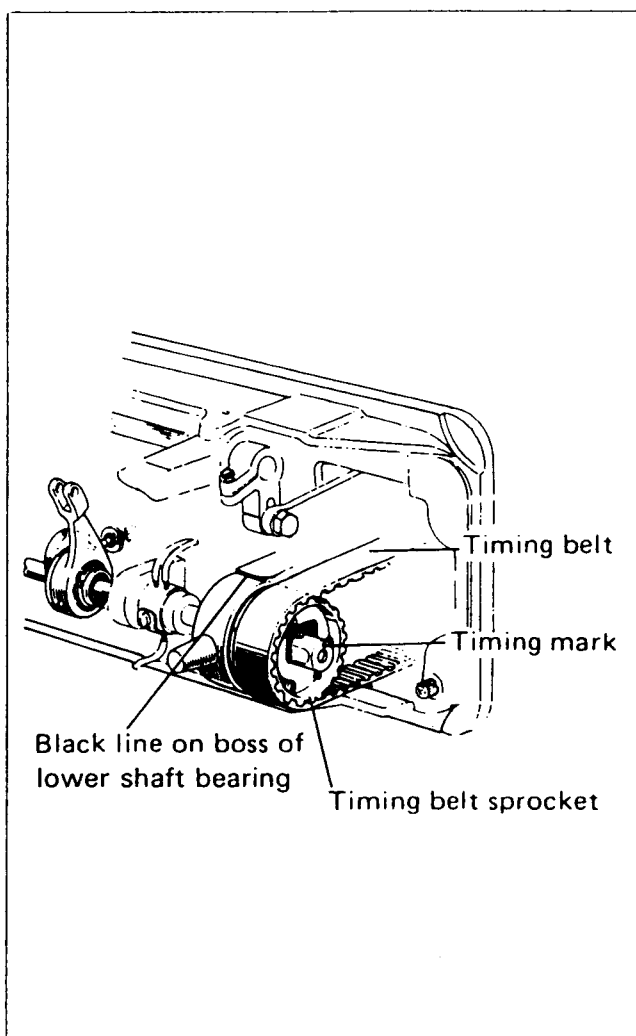


OPERATION

14 Relationship between rotating hook motion and take-up lever motion

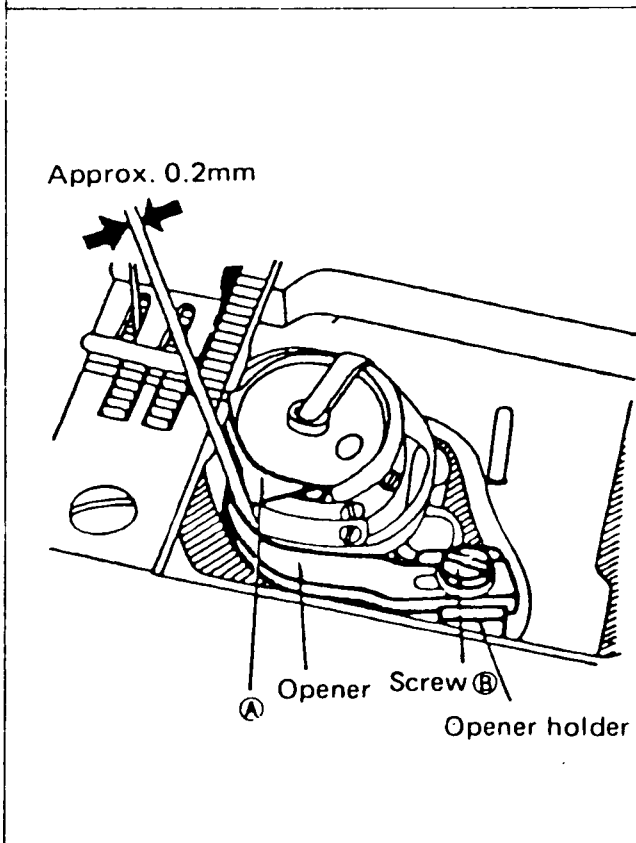
When the timing belt (toothed belt) was removed for its replacement, for example, the relationship between rotating hook motion and take-up lever motion should be adjusted as follows:

- (1) Turn the balance wheel and stop when the take-up lever is lifted to its upper dead point.
- (2) Lean the machine head backward and make sure the arrow (timing mark) put on the timing belt is in line with the black line on the boss of lower shaft bearing.
- (3) If the timing mark is not in line with the black line, remove the timing belt and install it again to adjust.



15 Relationship between hook motion and opener motion

- (1) Turn the balance wheel by hand and stop when the opener holder is located most remotely from the throat plate.
- (2) Make sure gap between the bobbin case holder (A) and the opener is approximately 0.2mm.
- (3) If the gap is too large or small, loosen the opener holder set screw (A) and adjust position of the opener.

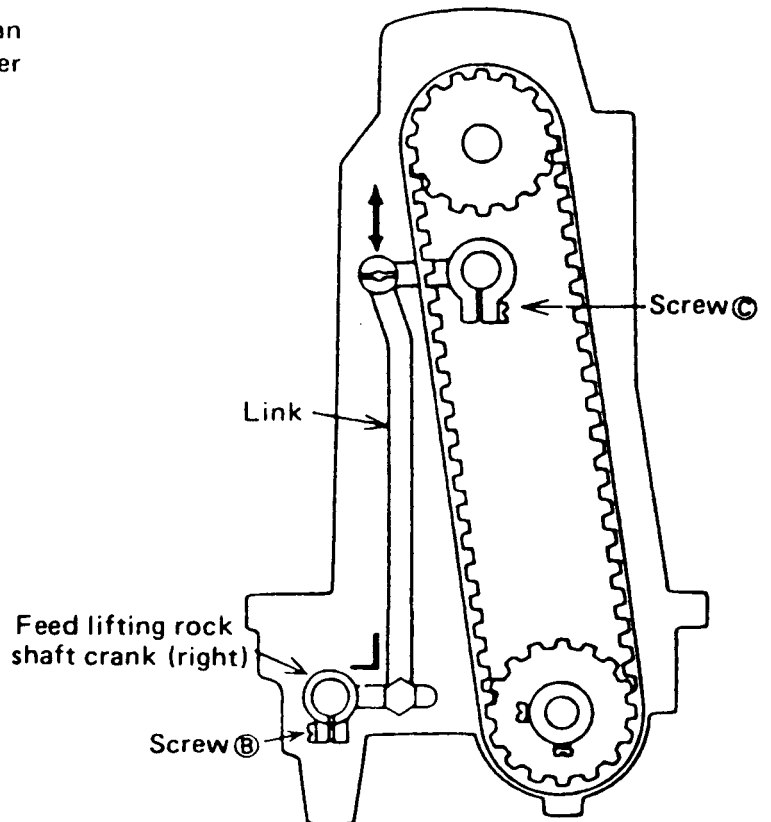
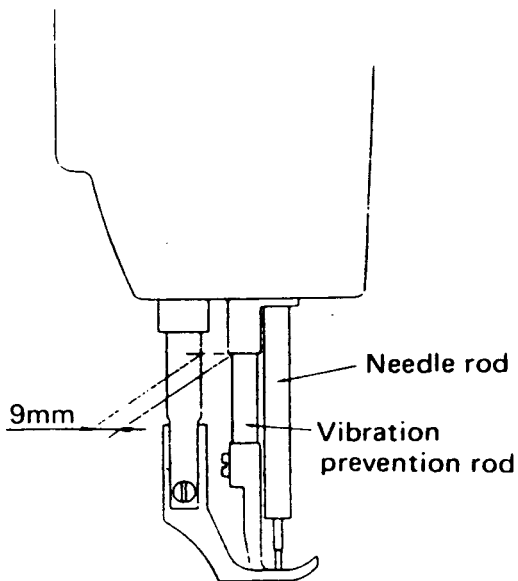
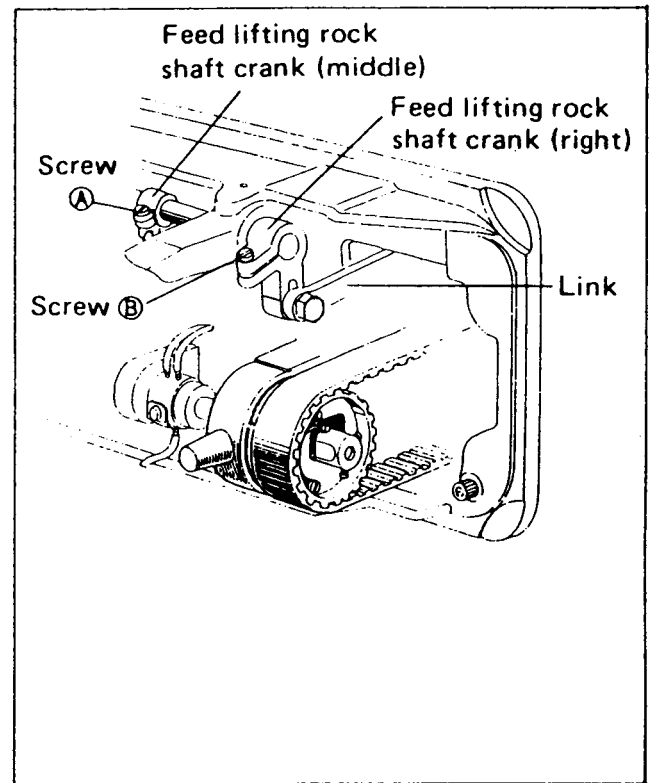


OPERATION

16 Relationship between needle motion and feed dog motion

- (1) Set feed length to "0" on the feed setting dial.
- (2) Lean the machine head backward.
- (3) Loosen the feed lifting rock shaft crank set screws (A) and (B) .
- (4) Set the needle at the lowest position.
- (5) Adjust the distance between presser rod and vibration prevention rod to 9mm and temporarily tighten the feed lifting rock shaft crank set screws (A) and (B) .
- (6) Check that the right feed lifting rock shaft crank is connected with the link at right angle, as shown in Figure.
- (7) If the connection is not at right angle, remove the back cover, loosen screw (C) and move the right link to connect the right feed lifting rock shaft with the link at right angle.
- (8) After the completion of adjustment, fully tighten the screws (A) , (B) and (C) .

At this time make certain that needle can enter the feed dog needle hole at the center of the hole.



OPERATION

17 SAFETY CLUTCH DEVICE:

Safety clutch device is installed to prevent the hook and cog belt from damage in case the thread is caught into the hook when the machine is loaded abnormally during operation.

1) FUNCTION OF SAFETY CLUTCH.

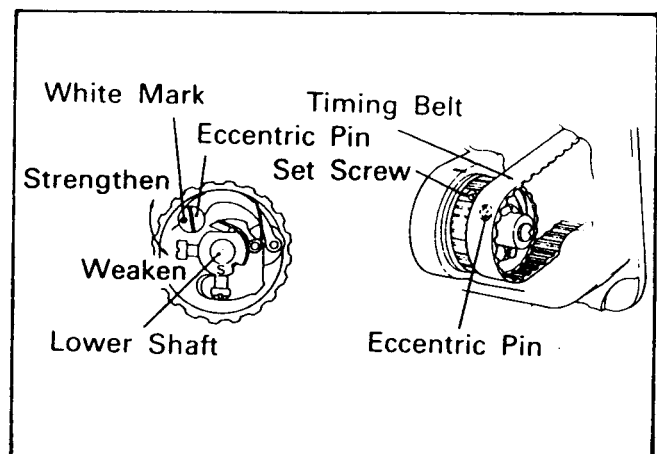
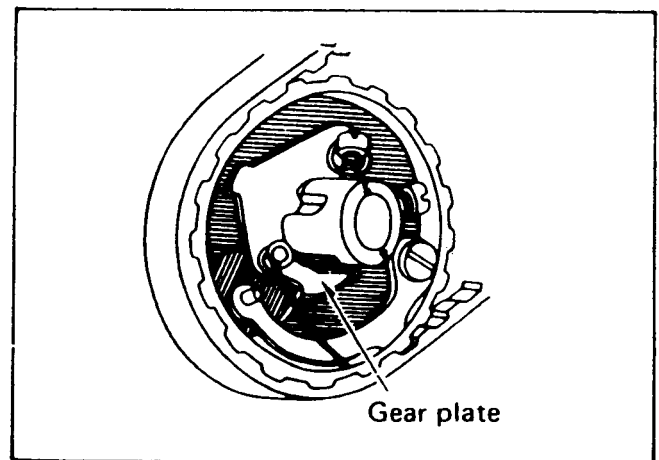
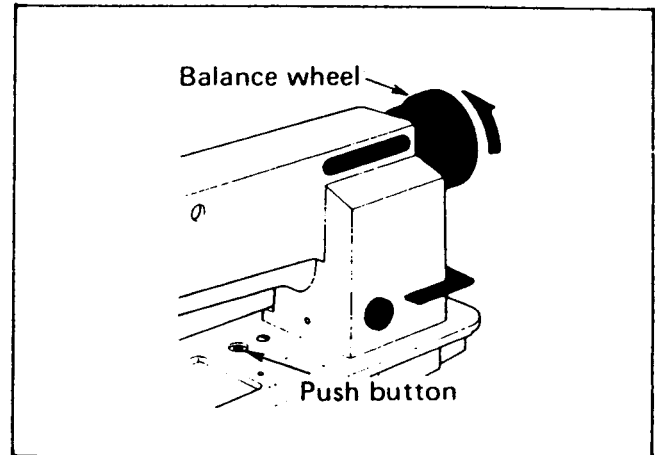
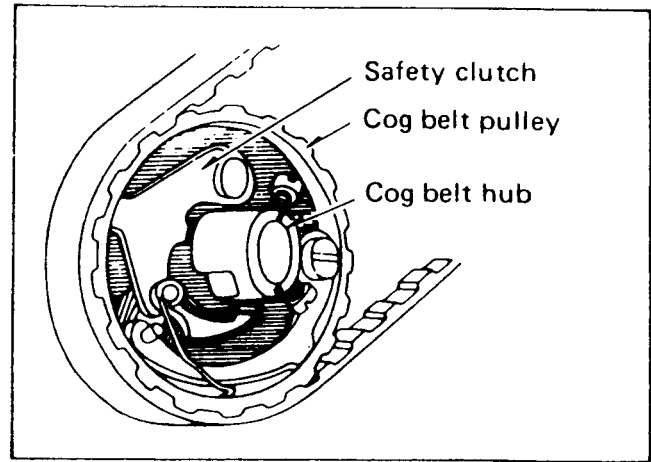
- 1) When the safety clutch acts, the cog belt pulley will be unloaded, then the rotation of hook shaft will stop. The arm shaft only will rotate. Stop the operation of machine.
- 2) Clean the thread thoroughly which is caught into the hook.
- 3) Turn the cog belt hub by hand, and check whether the hook shaft rotates lightly and properly, place the clutch device as follows.

2) HOW TO SET THE SAFETY CLUTCH.

- 1) While pressing down the push button on the opposite side of bed by left hand, turn the balance wheel slowly by right hand away from you as shown in the figure.
- 2) The balance wheel will stop by the gear plate, but turn the balance wheel more firmly.
- 3) Release the push button.
- 4) As shown in the Figure, the safety clutch device is set.

3) FORCE APPLIED TO THE SAFETY CLUTCH.

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



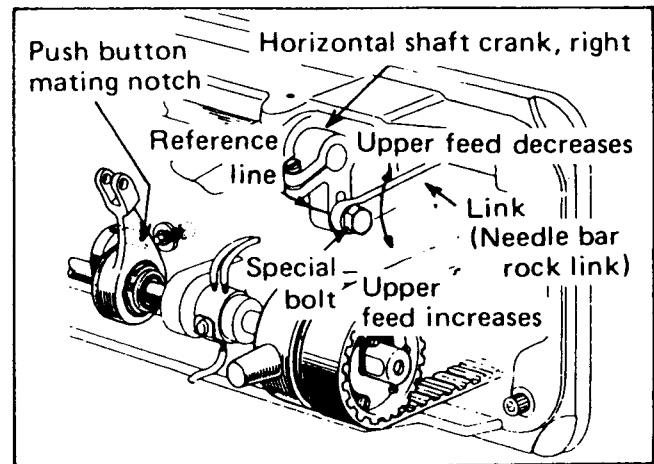
OPERATION

18 UPPER FEED ADJUSTMENT (NEEDLE SIDE)

If the uneven feeding occurs according to the fabric, adjust the long hole of the horizontal feed shaft crank (right) to adjust the upper feed length.

(How to adjust)

- 1) Loosen the special bolt.
- 2) Move the special bolt upward to decrease upper feed.
- 3) Move the special bolt downward to increase the upper feed. The upper feed and the lower feed theoretically becomes equal at the reference line on the horizontal feed shaft crank.
- 4) Securely tighten the special bolt after adjustment.

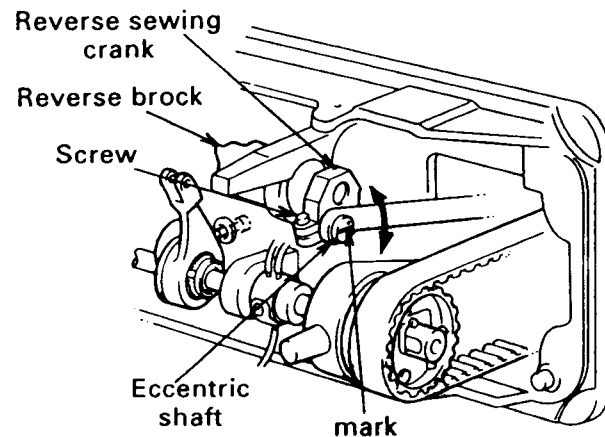


19 Adjustment of forward / backward stitch length

Forward / backward stitch length can be adjusted by moving the eccentric shaft shown in the figure, as follows :

- (1) Loosen screw of reverse sewing crank.
- (2) To increase forward stitch length, turn the eccentric shaft clock-wise.
To increase backward stitch length, turn the eccentric shaft counter clock-wise.

NOTE : please adjust the forward / backward length in the range where the mark point of the eccentric shaft is facing to the reverse block side as shown on the figure.

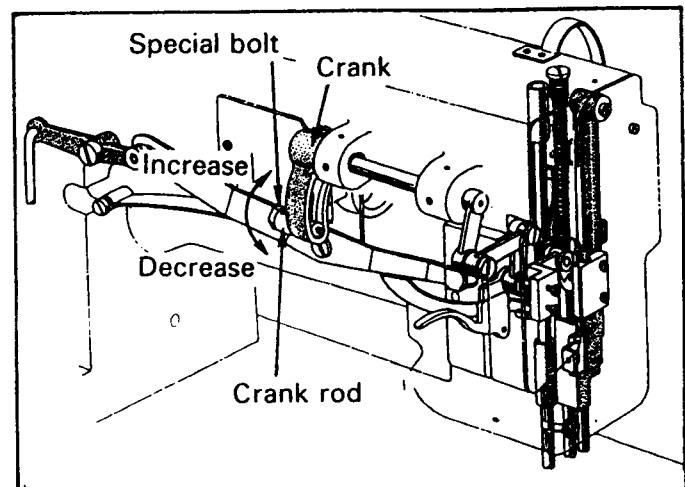


20 Adjustment of outside and inside presser foot

1. Outside presser foot and inside presser vertical stroke adjustment

Adjustment

- 1) Loosen the special bolt.
 - 2) The vertical strokes of the presser feet become maximum when the crank rod is moved upward and set.
 - 3) The vertical strokes become minimum when the nut is moved downward and set.
 - 4) After the adjustment, fully tighten the special bolt.
- The vertical strokes of the presser feet can be adjusted within a range from 6 mm to 2 mm



OPERATION

2. Amount of alternative up and down movement

A good feed condition is attained when the amount of alternative up and down movement is changed between the outside presser foot and the inside presser foot depending on the kind of fabric.

Example) Reducing the amount of up and down movement for the outside presser foot and increasing that of the inside presser foot may be effective for stitching the slippery fabric.

How to adjust

- 1) Turn the pulley and stop it at the position where the thread take-up comes to the lowest position.
- 2) Lower the presser bar lifter.
- 3) Loosen the screw ① on the upper up and down feed arm.
- 4) Moving the arm ② to the left, then amount of up and down movement of the inside presser foot increases and the amount of up and down movement of the outside presser foot decreases.
- 5) To the contrary, moving the arm to the right, the amount of up and down movement of the inside presser decreases and the amount of up and down movement of outside presser increases.
- 6) Tighten the screw ① firmly after adjustment.
 - The amount of up and down movement of inside presser foot is factory-adjusted to 3 mm and that of outside presser foot to 4.2 mm.

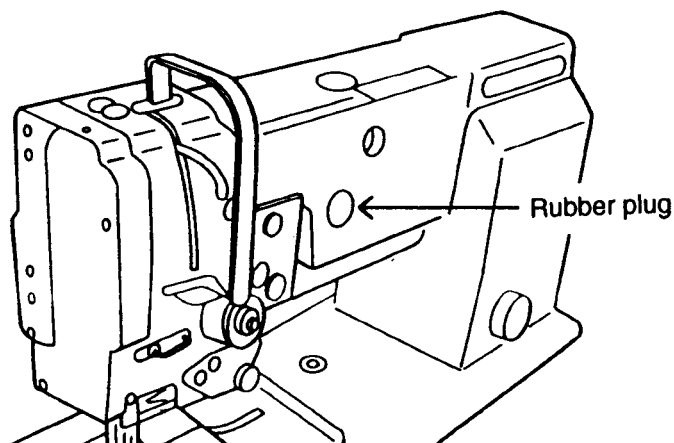
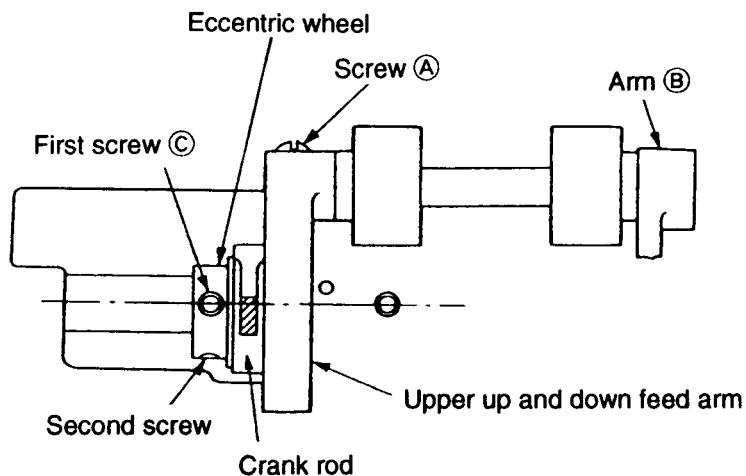
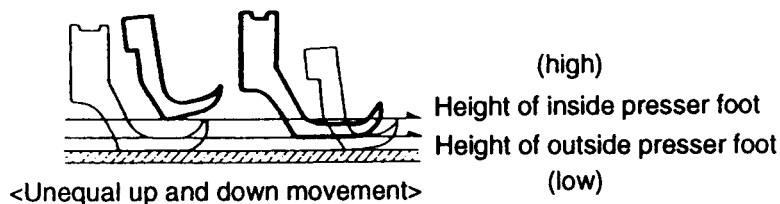
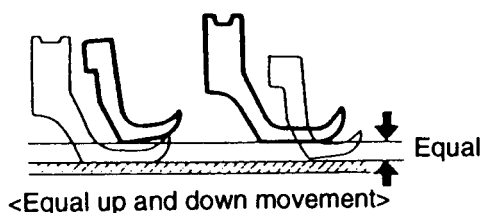
How to install the eccentric cam

- (1) Make the thread take-up at the lowest position by turning the pulley with hand.
- (2) In this condition, tighten the first screw ③ of eccentric cam so that it is positioned just side as shown in the figure.

Fine adjustment of eccentric cam

Remove the rubber plug located at the front face of the arm.

The fine adjustment of eccentric cam can be performed through this hole.

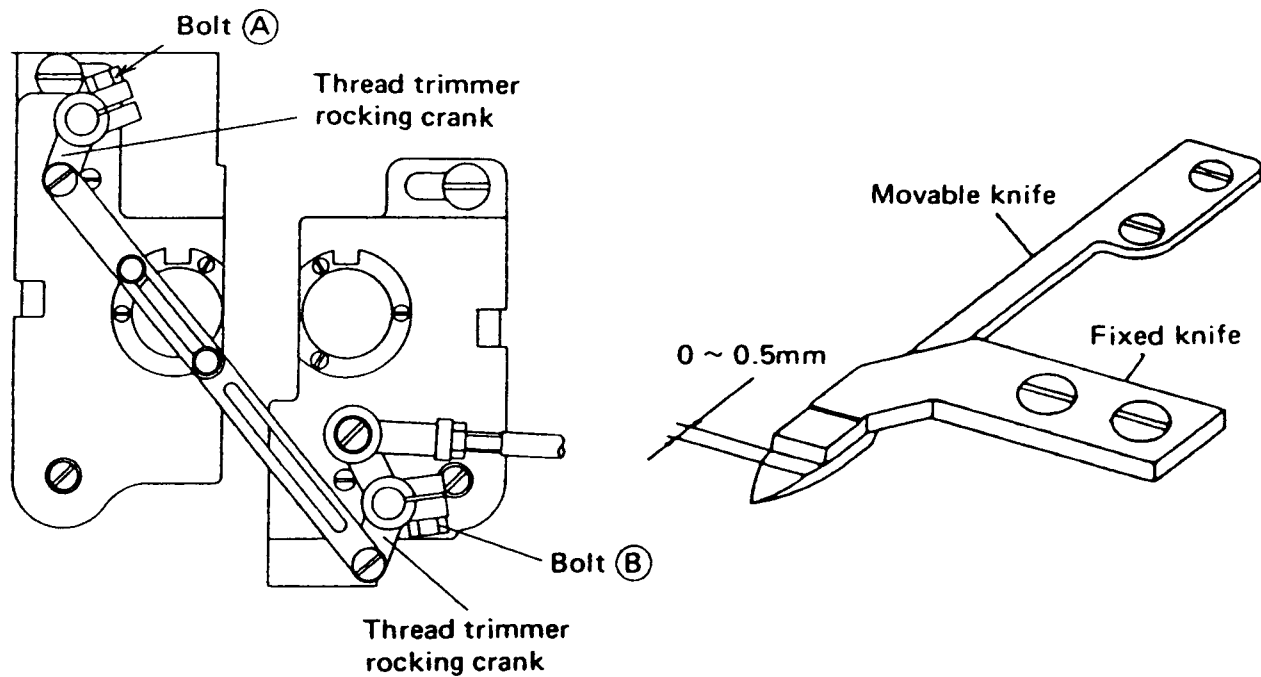


OPERATION

21 Installation of movable knife

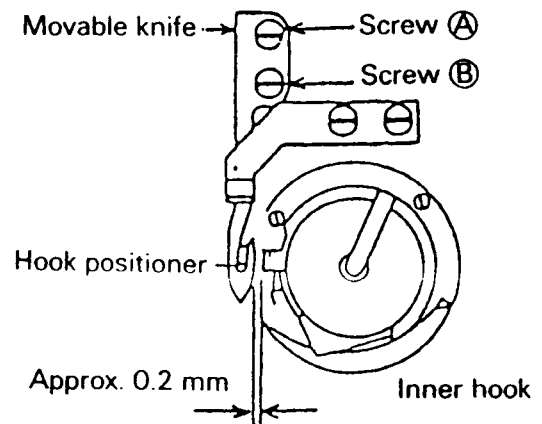
1. Initial position of movable knife

- (1) Turn the balance wheel and lower the needle bar to the lowest position.
- (2) Push the cam follower crank so that the cam roller enters into the thread trimmer cam groove.
- (3) Turn the balance wheel until the black mark point on the arm meets the white mark point on the balance wheel.
Set the cam follower crank at this position with a screwdriver temporarily preventing the cam roller coming out from the cam groove.
- (4) Loosen the thread trimmer rocking crank clamp bolts (A) and (B)
- (5) Adjust the movable knife so that the movable knife end slant portion protrudes 0 – 0.5 mm from the fixed knife, as shown in Figure and tighten the bolts (A) and (B)



2. Gap between movable knife and bobbin case holder stopper

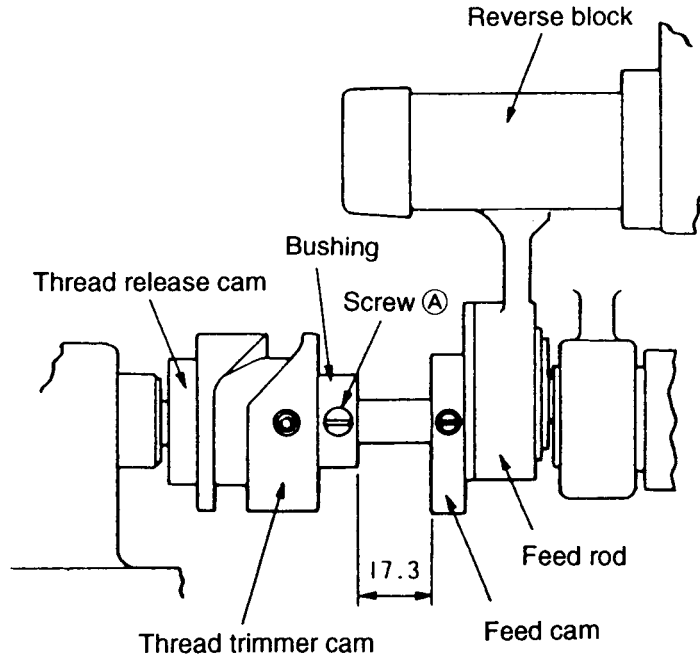
- (1) Turn the balance wheel by hand until needle reaches the lowest position.
- (2) With the needle at the lowest position, depress cam follower crank, turn the balance wheel until the movable knife reaches the extremity of its stroke.
- (3) Manually rotate the inner hook in the direction indicated by arrow in Figure and adjust gap between the movable knife and the inner hook stopper to about 0.5 mm (the screws (A) and (B) should be loosened for this adjustment).



OPERATION

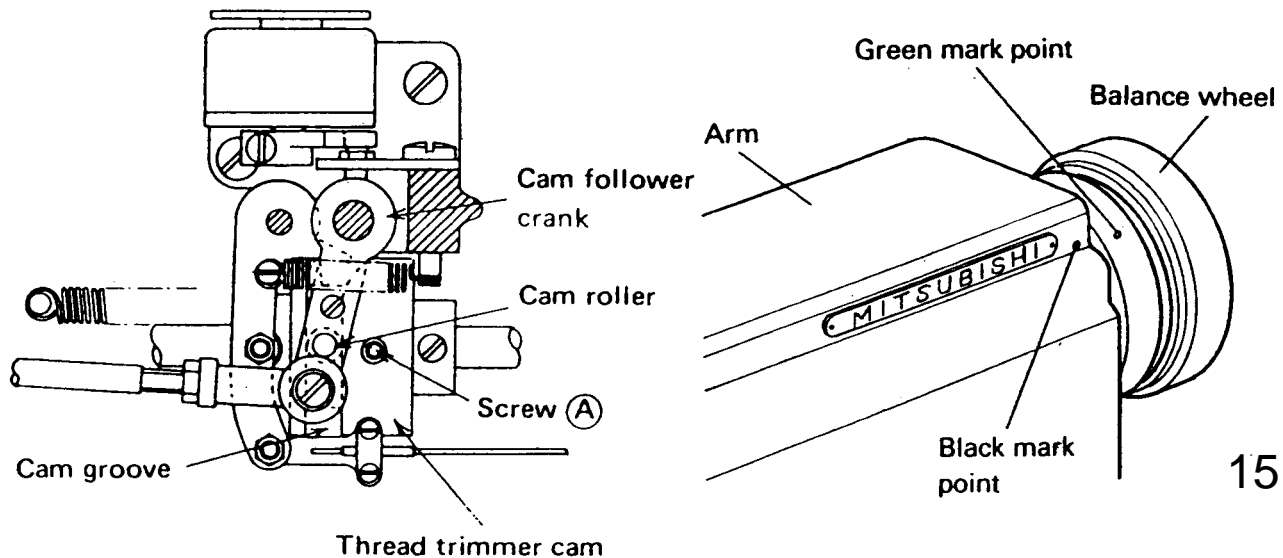
22 Installation position of thread trimmer cam

- (1) Adjust the clearance between the feed cam and the bushing to 17.3 mm and then tighten the screw (A) to the lower shaft set stopper.
- (2) Place the thread trimmer cam on the end face of bushing and the thread release cam on the end face of thread trimmer cam (making the clearance between each part zero.), then tighten them with screws.



23 Adjustment of thread trimmer cam

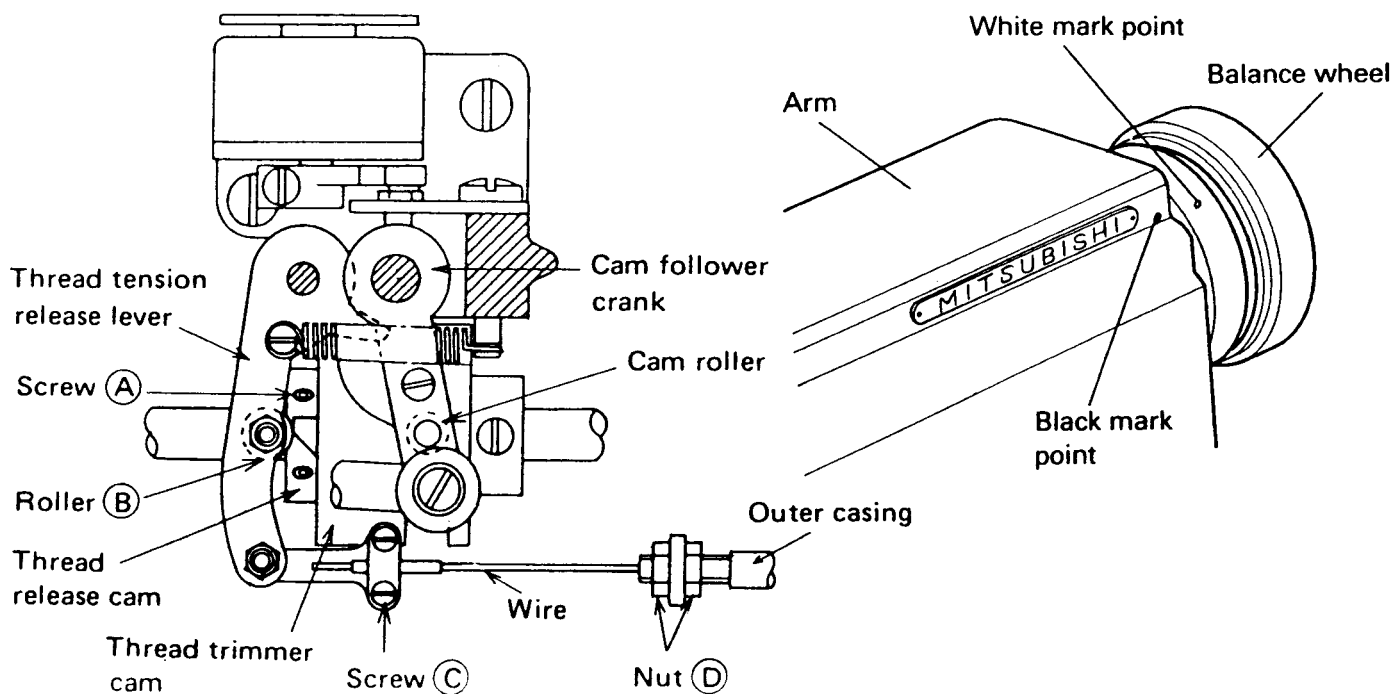
- (1) Turn the balance wheel by hand until the needles reach the lowest position.
- (2) Maintaining the needle position, depress the cam follower crank and put the cam roller into the groove of thread trimmer cam.
- (3) Turning the balance wheel by hand, adjust the thread trimmer cam so that the movable knife starts moving when the green mark point on the balance wheel comes in line with the black mark point on the arm.
To adjust, loosen two thread trimmer cam clamp screws (A)



OPERATION

24 Adjustment of needle threads tension release assembly

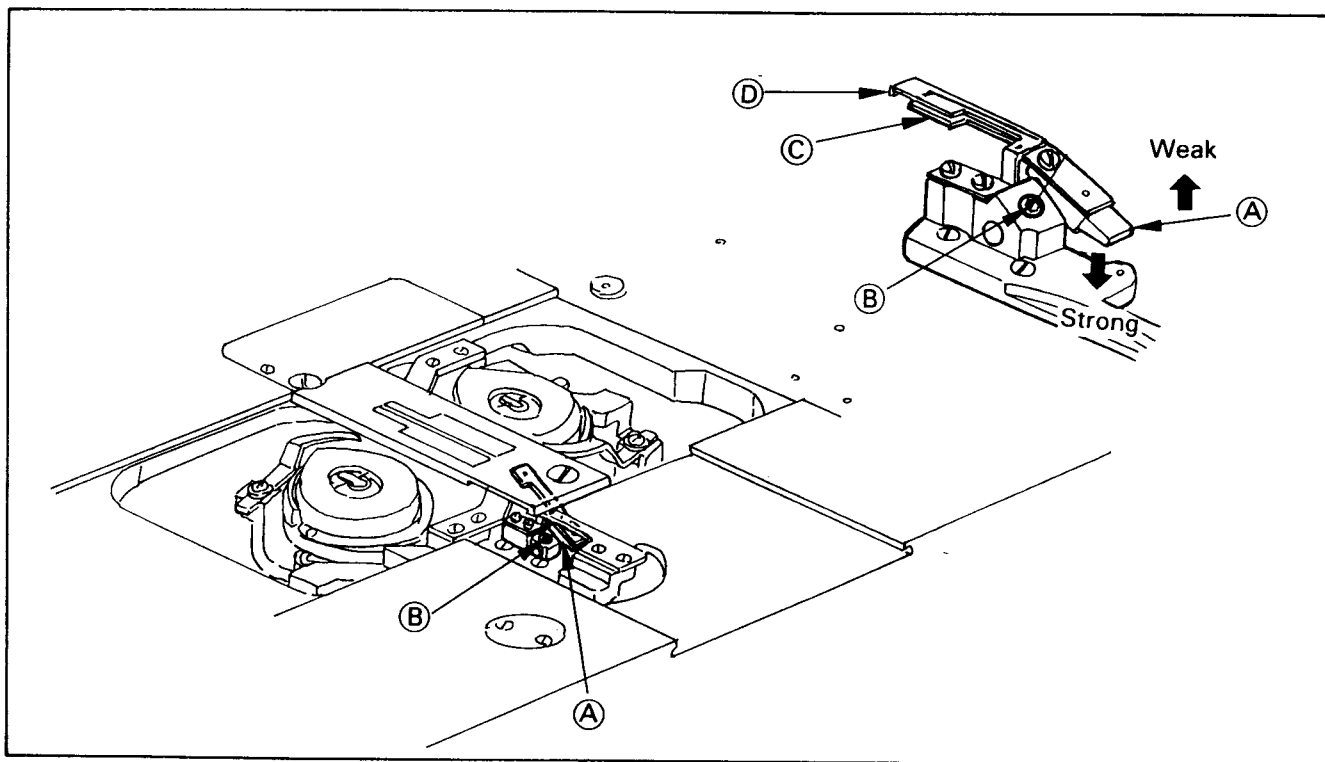
- (1) Turn the balance wheel by hand until the needles reach the lowest position.
- (2) Maintaining the needle position, depress the cam follower crank and put the cam roller into the groove of thread trimmer cam.
- (3) Turning the balance wheel by hand, adjust the thread tension release cam so that the tension disc close when the white mark point on the balance wheel comes in line with the black mark point on the arm.
To adjust, loosen two tension release cam clamp screws (A).
- (4) Opening degree of tension disc should be adjusted with the tension release roller (B) mounted on the convexed portion of thread release cam, as shown in Fig.
To adjust, loosen the screws (C) and draw the wire.
- (5) Make fine adjustment by loosening the nut (D).
- (6) Loosen the nut (D) and make the outer casing approach rightward to increase the opening value.



OPERATION

22 Adjustment of holding pressure of bobbin thread

- (1) Loosen the set screw (B) for clamping the moving regulator (A). (Please use the socket wrench 1.5 in accessories.)
- (2) The holding pressure become weak, when the moving regulator (A) is moved upward. On the other hand, the holding pressure become strong, when the moving regulator (A) is moved downward.
- (3) Set the moving regulator (A) at the position of where can be gotten adequate holding pressure of bobbin thread.
(At this adjustment, the leaf spring (C) should be located nearly under below the leaf spring (D).)
- (4) Then tighten the set screw (B).



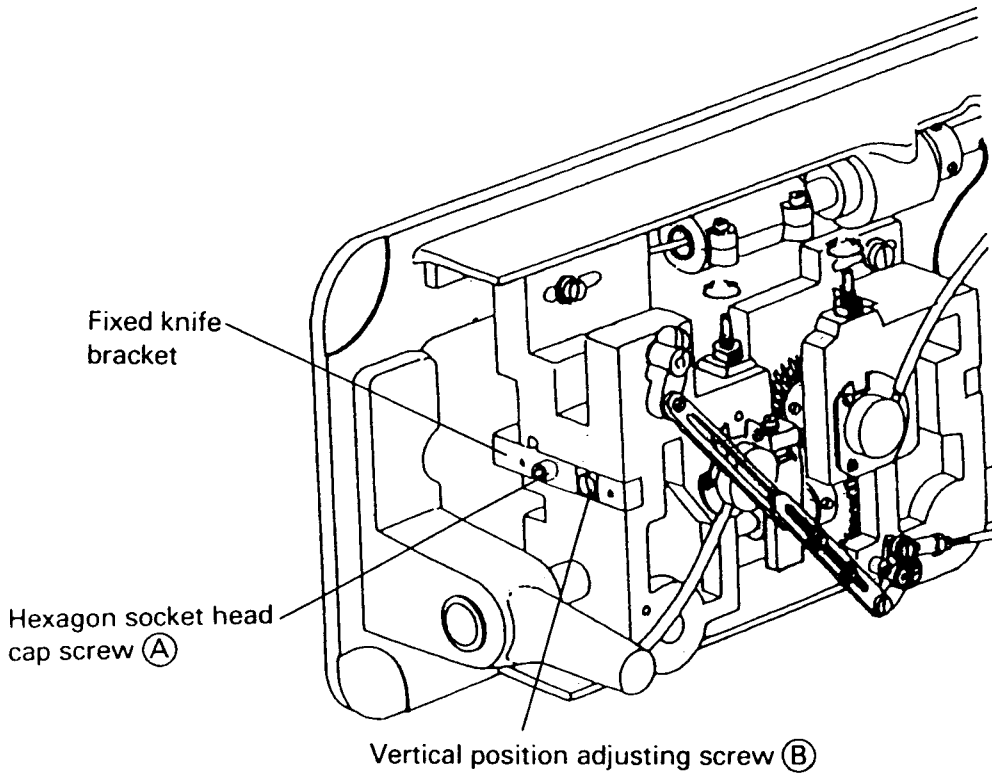
OPERATION

25 Adjustment of scissoring pressure of movable knife and fixed knife

- (1) Loosen the fixed knife bracket clamp bolt (A).
- (2) Turn the vertical position adjusting screw (B) to adjust meshing pressure and then tighten the hexagon socket head cap screw (A).

Note: Since excess pressure causes large torque to the thread trimming mechanism and trimming failure, adjust it so that thread can be trimmed with minimum pressure.

- (3) Move the movable knife and check that the thread can be sharply trimmed.



26 Sharpening of fixed knife

When the knives dull, the fixed knife should be sharpened as illustrated in Fig. Since it is very difficult to sharpen the movable knife, replace it with a new one when it dulls.

