

**MITSUBISHI
INDUSTRIAL
SEWING
MACHINE**

Model

LT2-2230

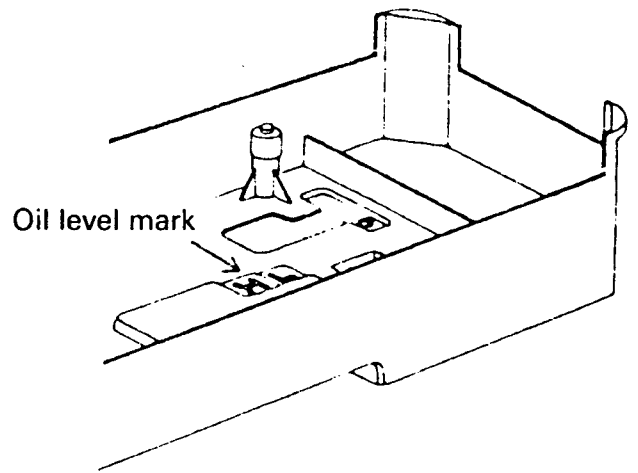
Classes

**Double-Needle
Needle feed
Lockstitch, Automatic
Undertrimmer,
Variable Speed**

INSTRUCTION MANUAL

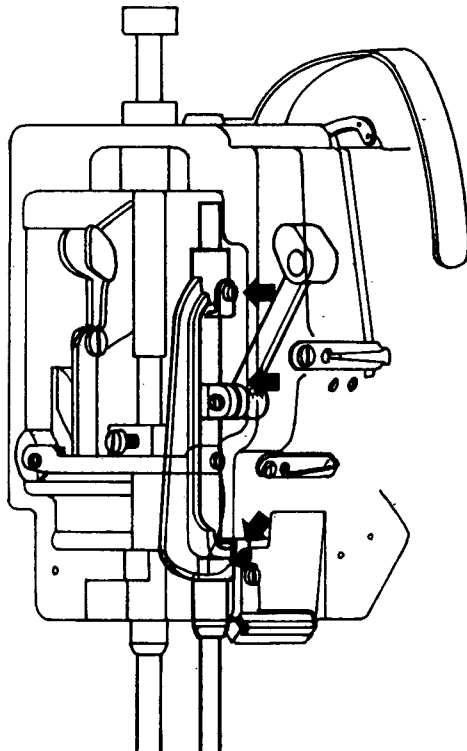
1 Oiling (1)


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 white spindle oil specified by Mitsubishi.



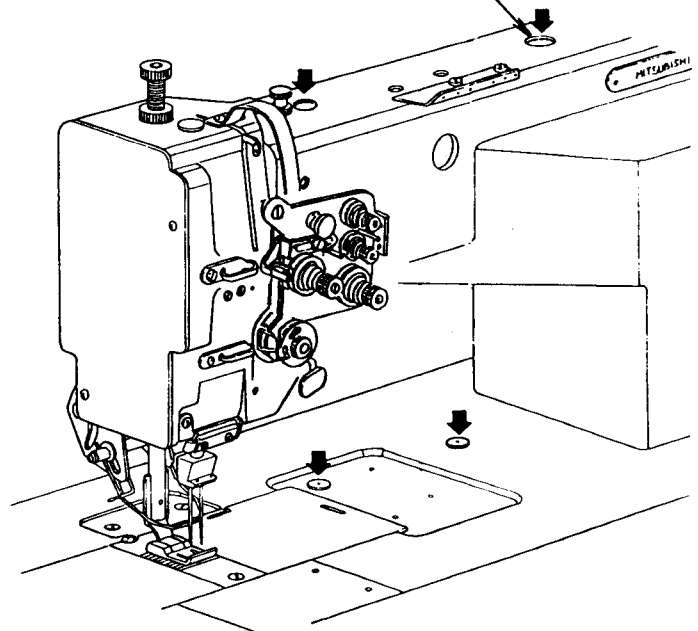
Oiling (2)

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 figures.



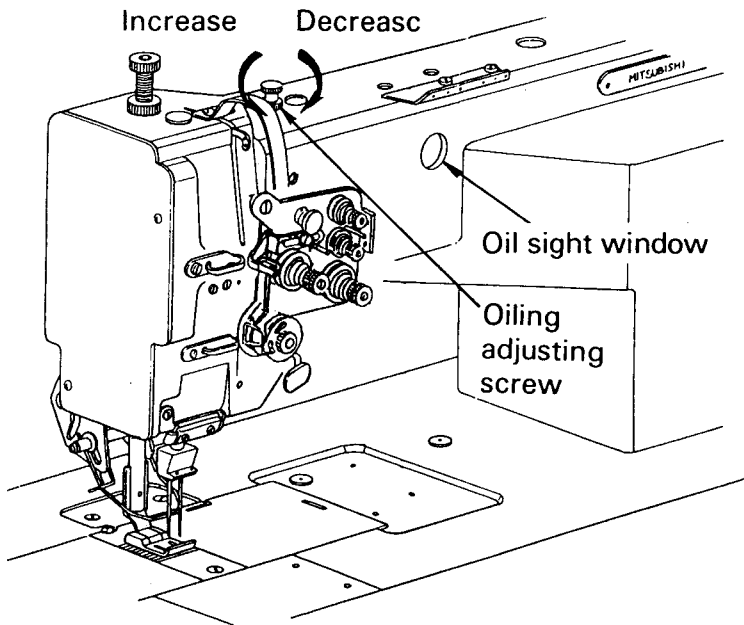
Amount of oil ...  5 ~ 6 drops

Don't replenish oil here in the case of "B" type sewing machine!

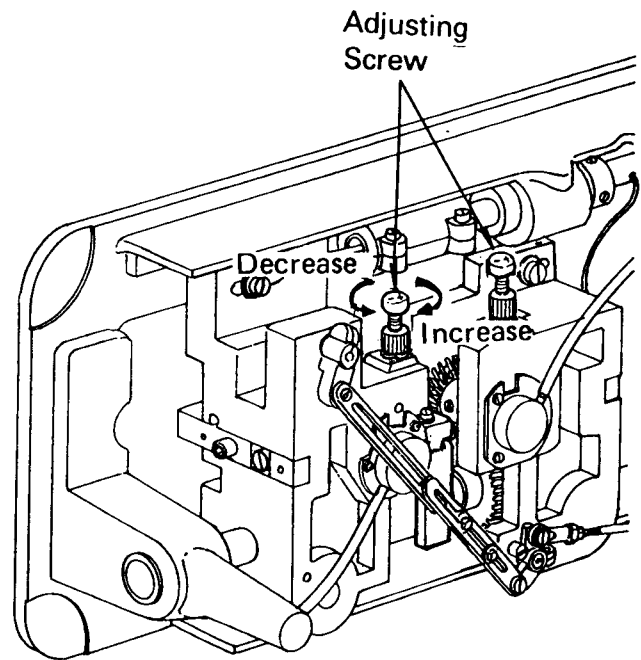


2 Oiling condition and adjustment on oiling to thread take-up lever

- (1) See dripping of oil during operation through the oil sight window to check oiling condition in the machine arm.
- (2) Please use the oiling adjusting screw with respect to oiling to thread take-up lever mechanism.



3 Adjustment on oiling to rotating hook



4 Cautions on operation

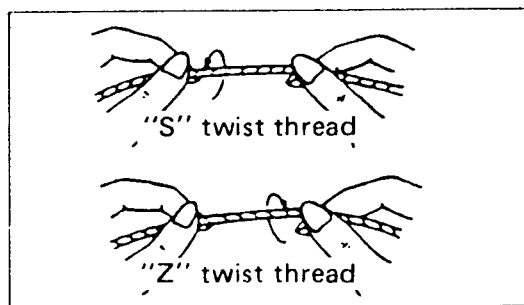
- (1) When the power is turned on or off, keep foot away from the pedal.
- (2) It should be noted that the brake may not work when the power is interrupted or power failure occurs during sewing machine operation.
- (3) Since dust in the control box might cause malfunction or control troubles, be sure 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.



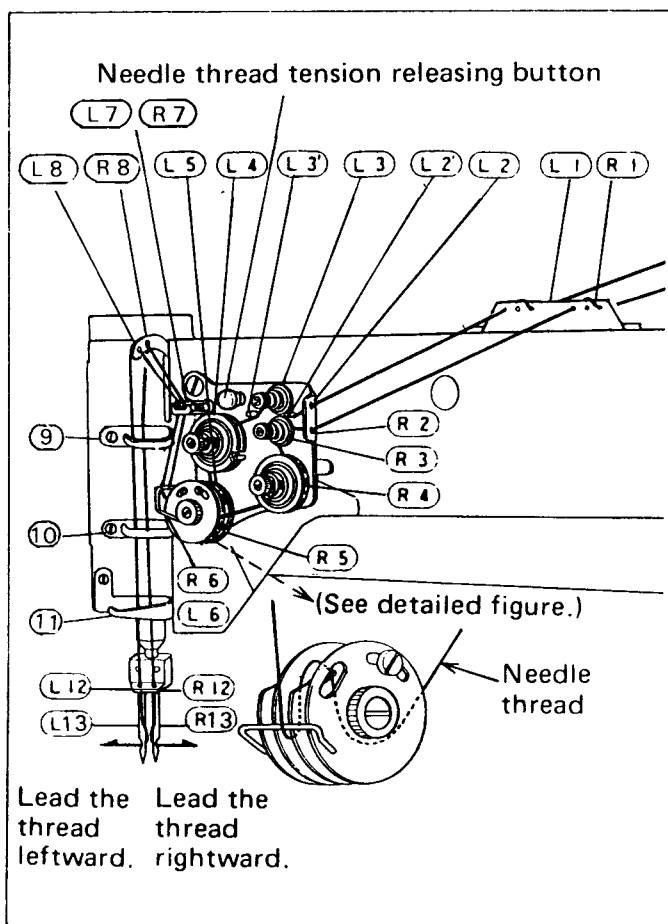
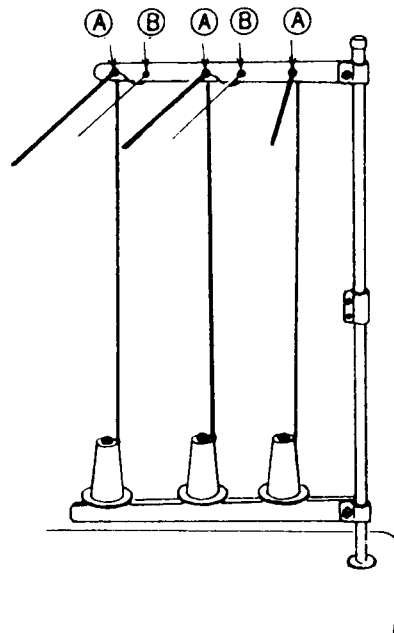
4 Threading of needle threads

- (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.



OPERATION

Timing between rotating hook motion and needle motion

- (1) Set stitch length on the stitch length setting dial shown table.
- (2) When needle is lifted (A) shown table, from the lowest position, the following positional relationship should be maintained.

- The upper edge of needle eye should be 1.0 ~ 1.6 mm 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.

- (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.)

● Position adjustment of hook point

Adjust the hook point so that it comes to the center of needle axis.

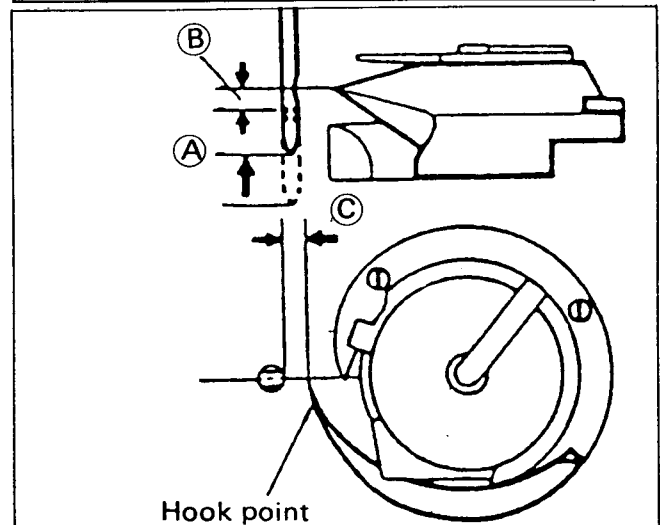
- (1) Lean the machine head backward and loosen three set screws of hook shaft gear (small).
- (2) Turn the balance wheel and stop when the needle is lifted (A) mm shown table from the lowest position.
- (3) Rotate the hook by hand to position the hook point to the center of needle axis.
- (4) Move the hook bracket leftward or rightward and position it so that gap between the hook point and side face of needle is 0.05 mm. For this adjustment, each screws (A), (B) and two of (C) should be loosened.

Note: In the adjustment, do not excessively loosen set screws (C) and always maintain meshing of hook shaft gear and lower shaft gear.

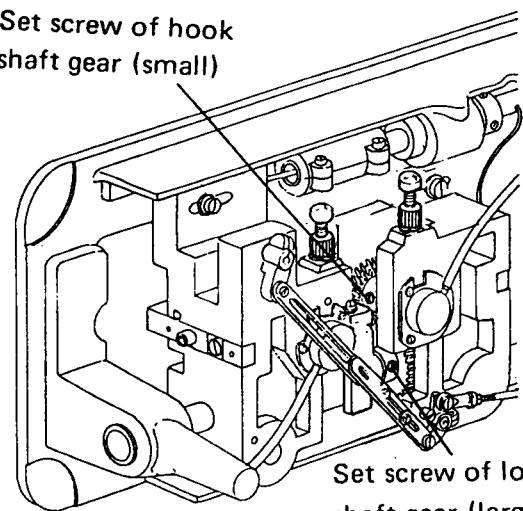
- (5) Tighten the set screws in the following order:

- ① While pressing the lower shaft gear (large) against the side face of hook bracket, tighten the set screws (C) first.
- ② After checking gap between the needle and the hook, tighten the set screws (A).
- ③ Then tighten the set screws (B).

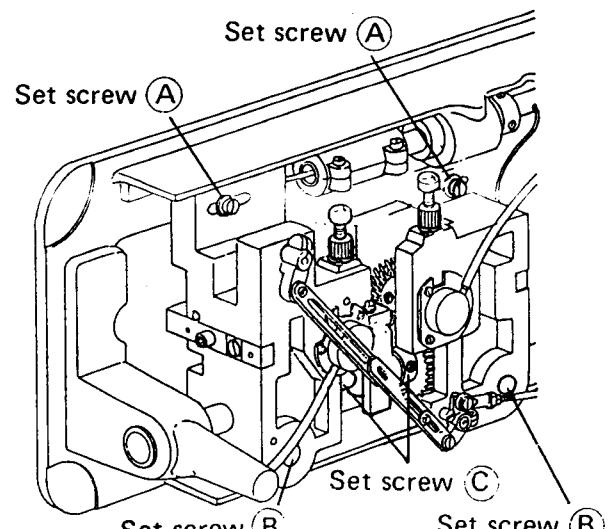
Class	-L	-M	-B
Set the stitch length	2	3	4.5
Needle lift (A)	2.0 mm	2.2 mm	2.4 mm
Gap (B)	1.0 ~ 1.6 mm		
Clearance (C)	0.05 mm		



Set screw of hook shaft gear (small)



Set screw of lower shaft gear (large)

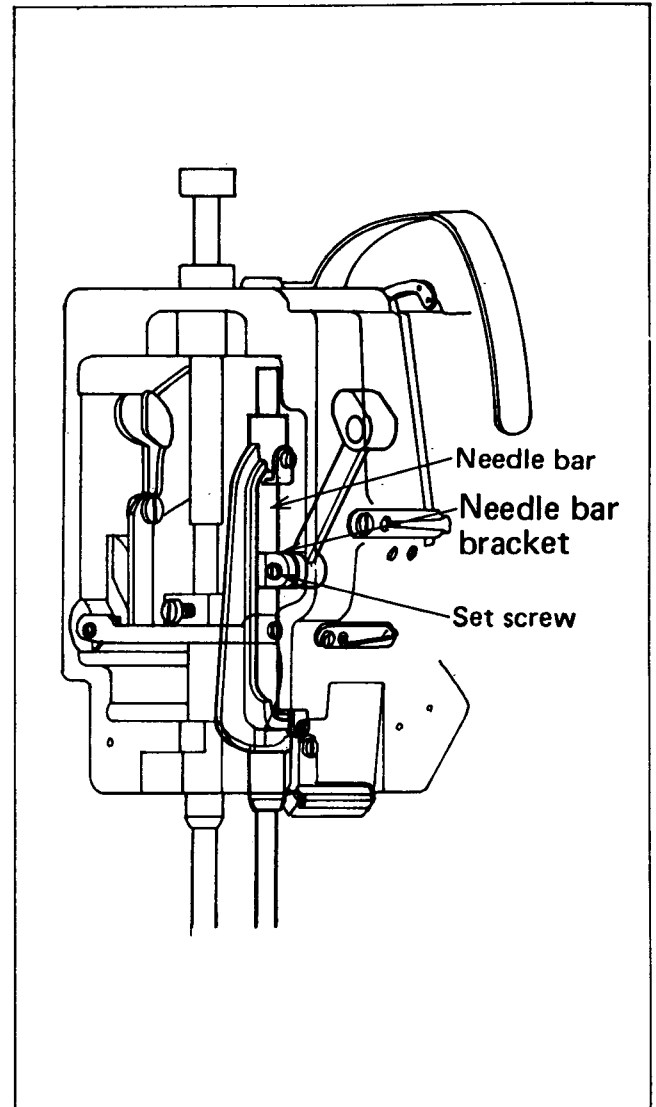


OPERATION

● Position adjustment of needle point

Adjust needle position so that gap between the upper edge of needle eye and the hook point is **(B)** mm when the needle is lifted by **(A)** mm from its lowest position shown in before page.

- (1) Remove the face plate, loosen the set screw of needle bar bracket and vertically move the bar to adjust.
- (2) After the adjustment, tighten the set screw.



OPERATION

14 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

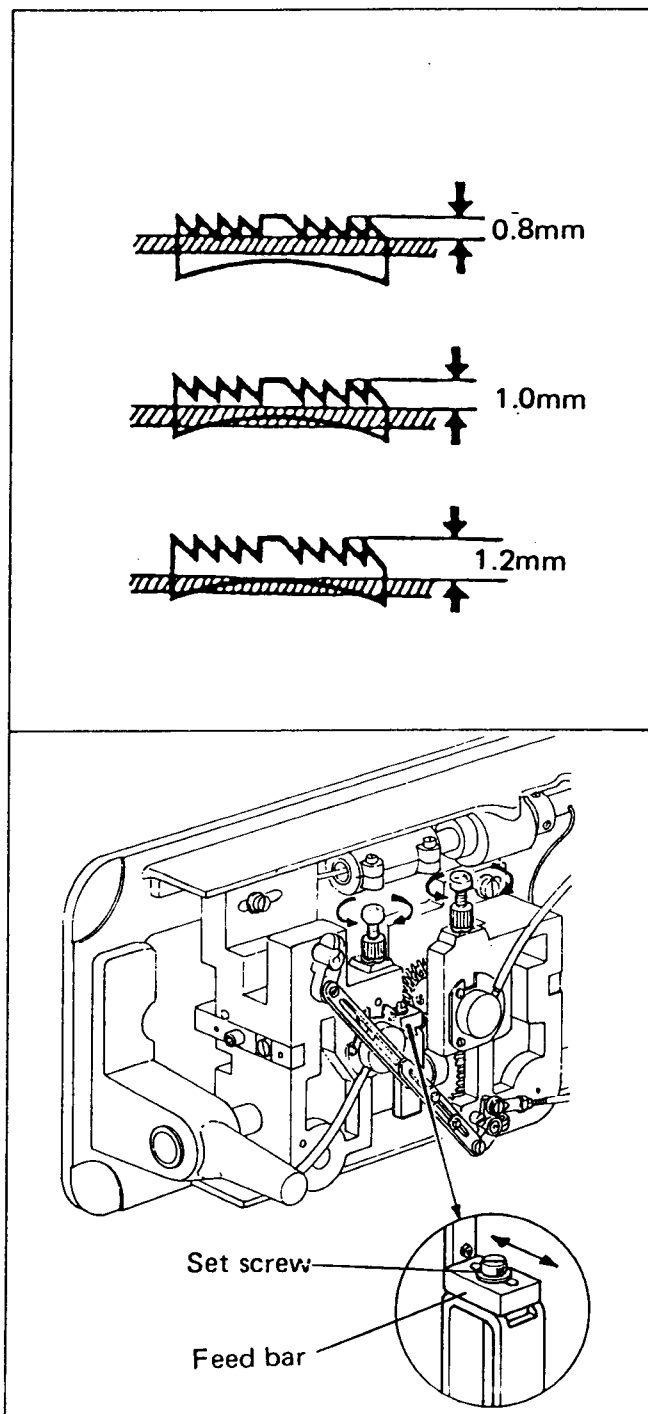
For usual fabrics . . . Approx. 1.0mm from throat plate

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 mm.

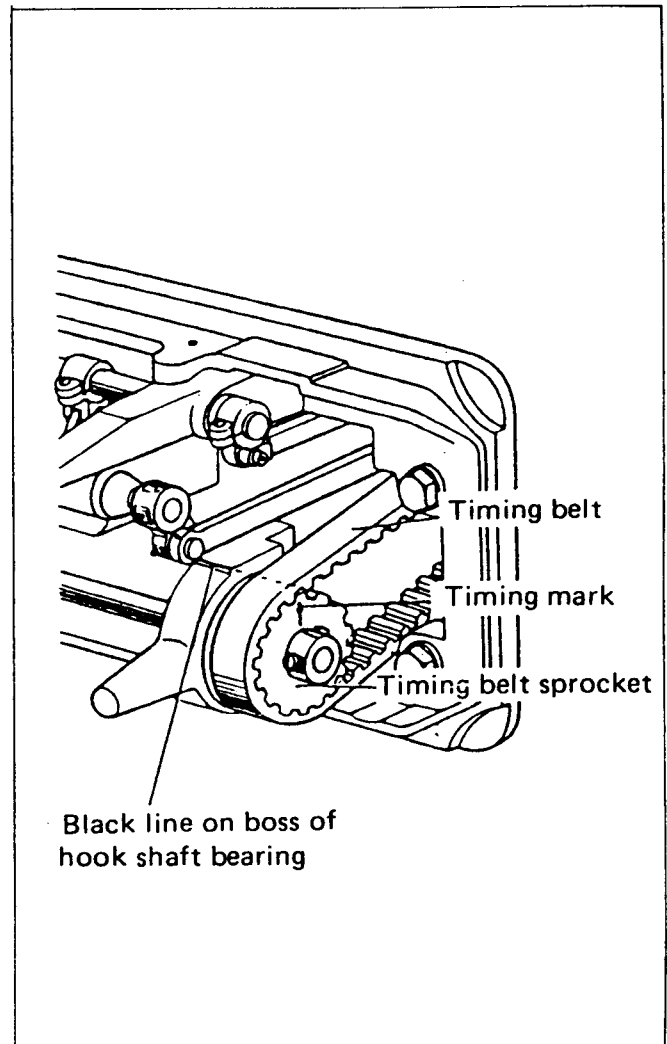


OPERATION

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

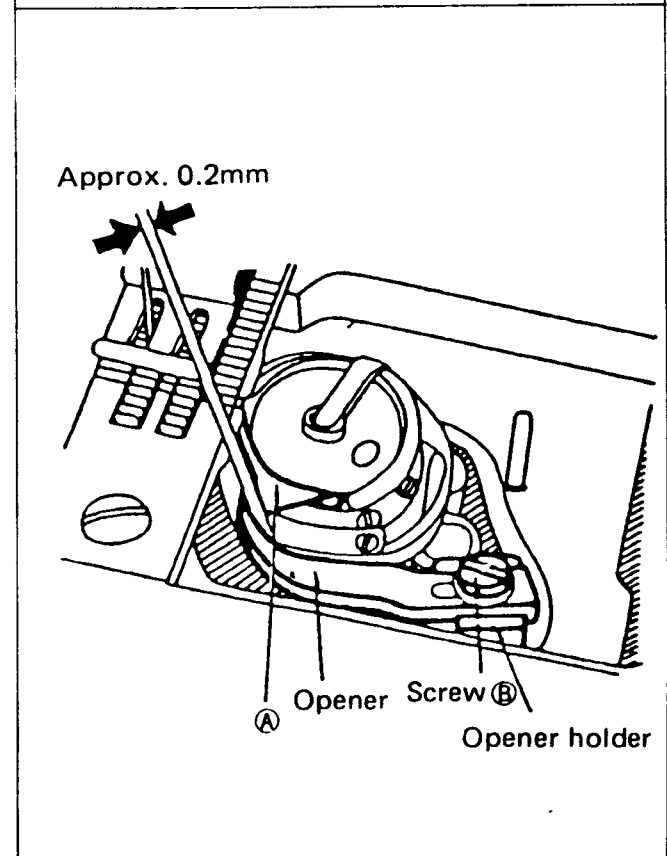
When the timing belt (cog belt) was removed for its replacement, for example, the relationship between rotating hook motion and take-up lever motion should be adjusted as follows:

- (1) Turn the balance wheel and stop when the take-up lever is lifted to its top position.
- (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 hook 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.



16 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 (A) and the opener is approximately 0.2 mm.
- (3) If the gap is too large or small, loosen the opener set screw (A) and adjust position of the opener.

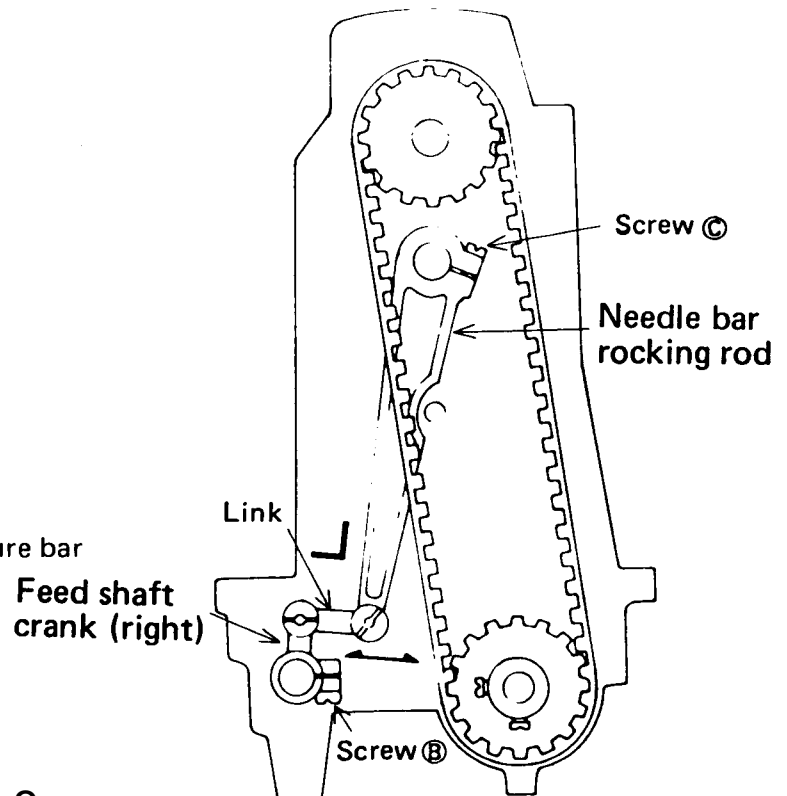
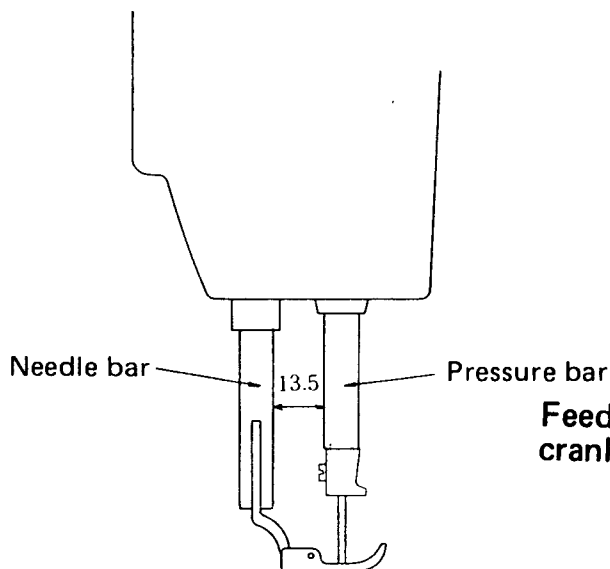
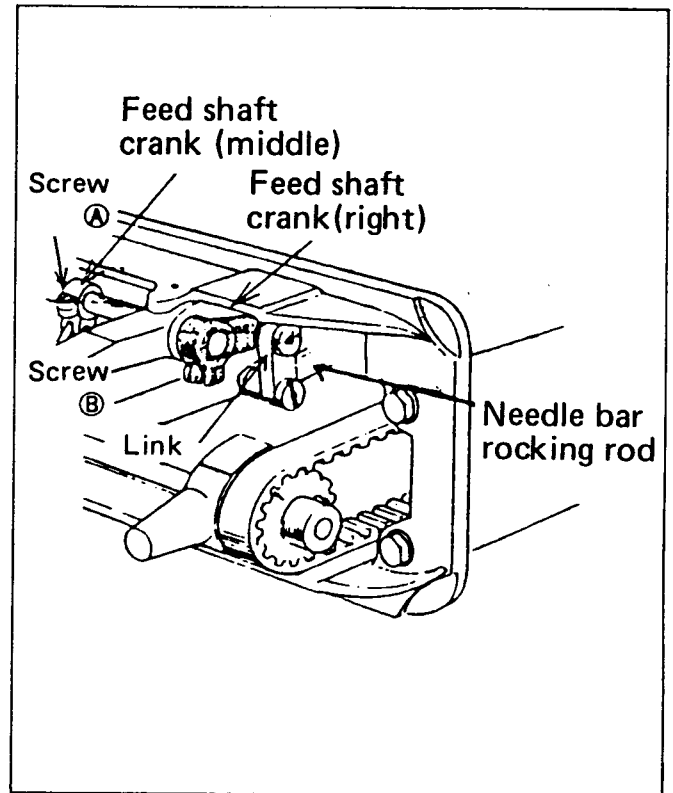


OPERATION

17 Relationship between needle motion and feed dog motion

○ The feed dog should be adjusted so that the needle can plunge into the feed dog needle hole at the center of the hole.

- (1) Set stitch length to "0" on the stitch length setting dial.
- (2) Lean the machine head backward.
- (3) Loosen the feed shaft crank set screw (A) and (B)
- (4) Lower the needle to the lowest position.
- (5) Adjust the distance between the pressure bar and the needle bar to be 13.5, and tentatively tighten the screws (A) and (B) of the feed shaft crank.
- (6) Check that the right feed 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 the screw (C) and move the needle bar rocking rod in the arrow direction to adjust.
- (8) After the completion of adjustment, fully tighten the screws (A), (B) and (C).



3 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.

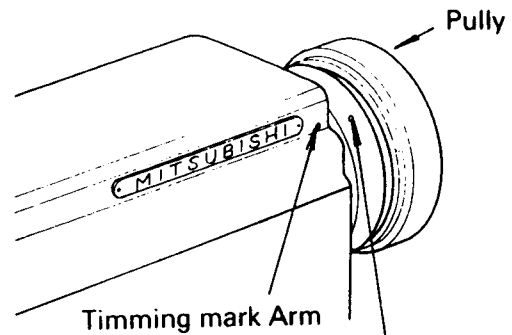
2. Adjust of "Down" position

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

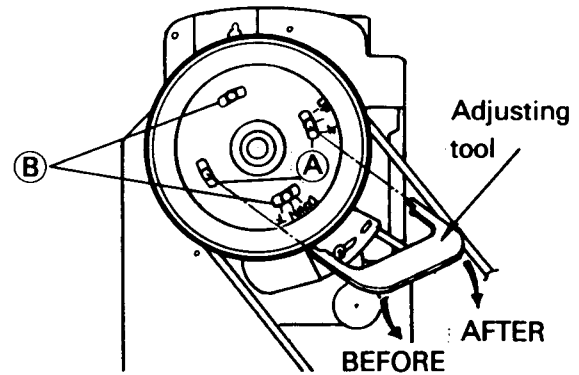
- 1. Disconnect the plug (12 pins) of cable from the machine head.
- 2. Run the machine and stop at "Down" position.
- 3.

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.



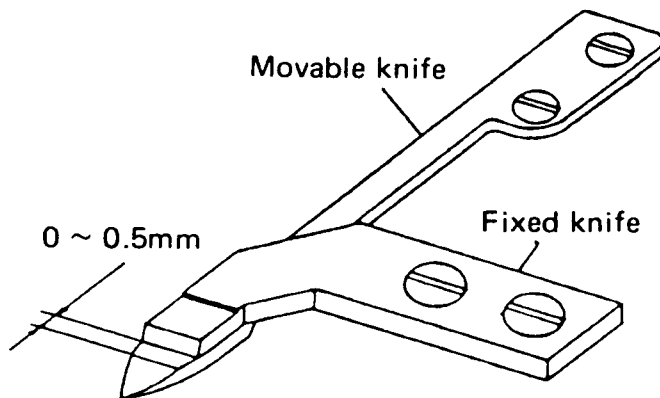
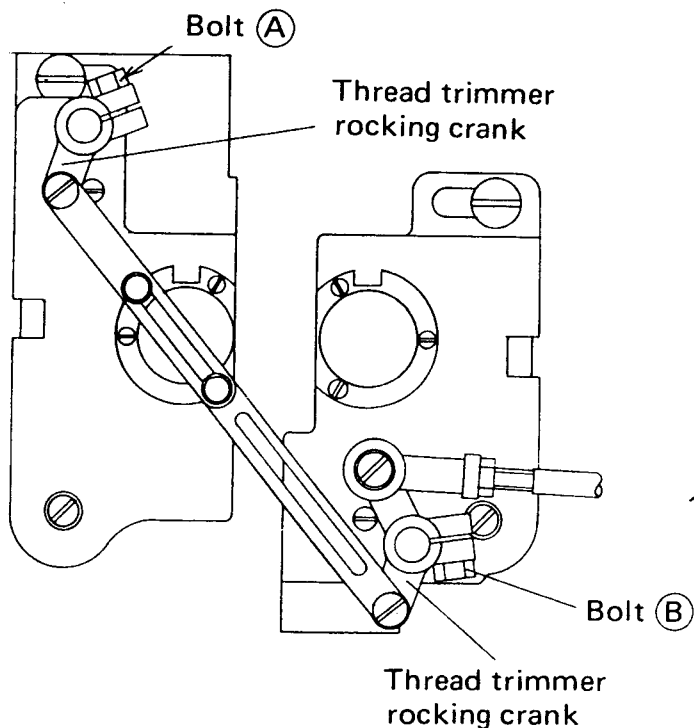
white mark	"Up" position
Black mark	"Down" position



18 Installation of movable knife

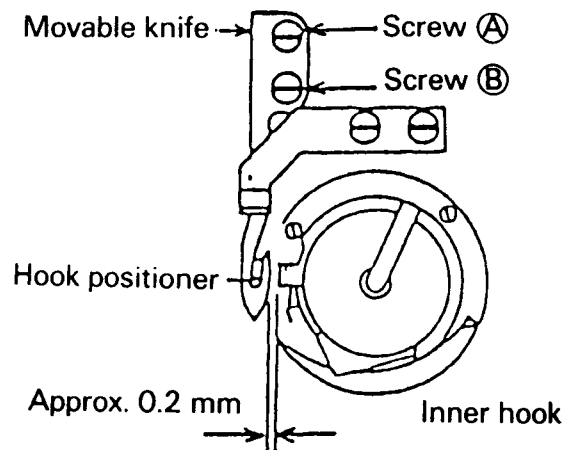
1. Initial position of movable knife

- (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).



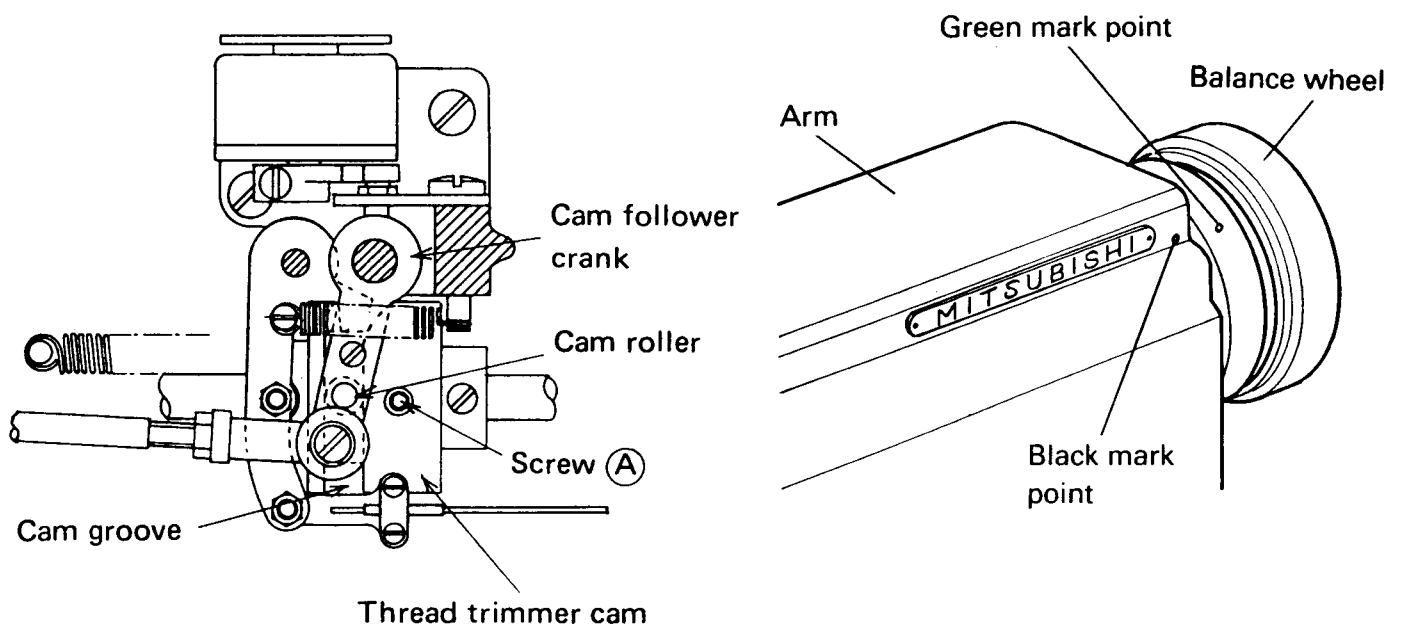
2. Gap between movable knife and bobbin case holder stopper

- (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 0.2 mm (the screws (A) and (B) should be loosened for this adjustment).



19 Adjustment of thread trimmer cam

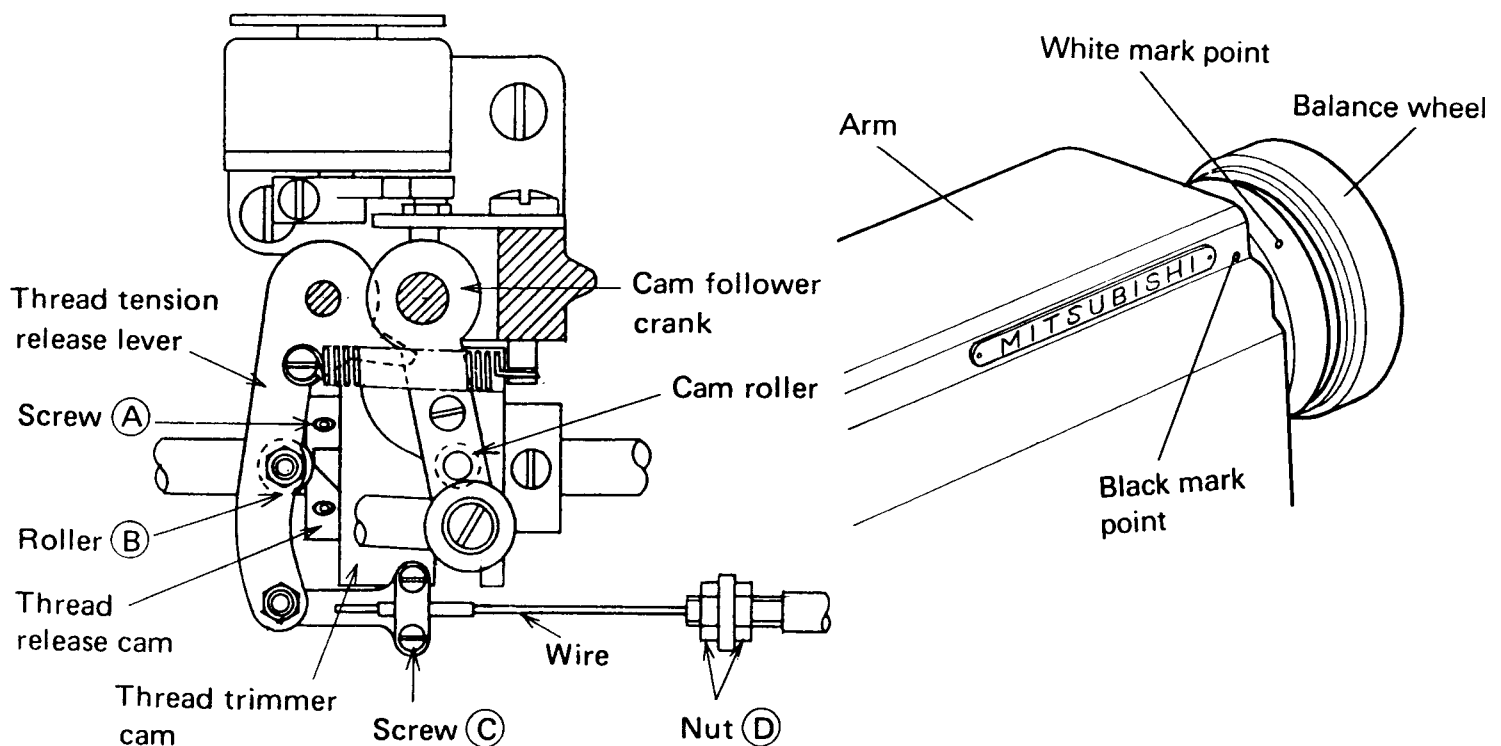
- (1) Turn the balance wheel by hand until the needles reach the lowest position.
- (2) Maintaining the needle position, depress the cam follower crank and put the cam roller into the groove of thread trimmer cam.
- (3) Turning the balance wheel by hand, adjust the thread trimmer cam so that the movable 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

20 Adjustment of thread tension regulator

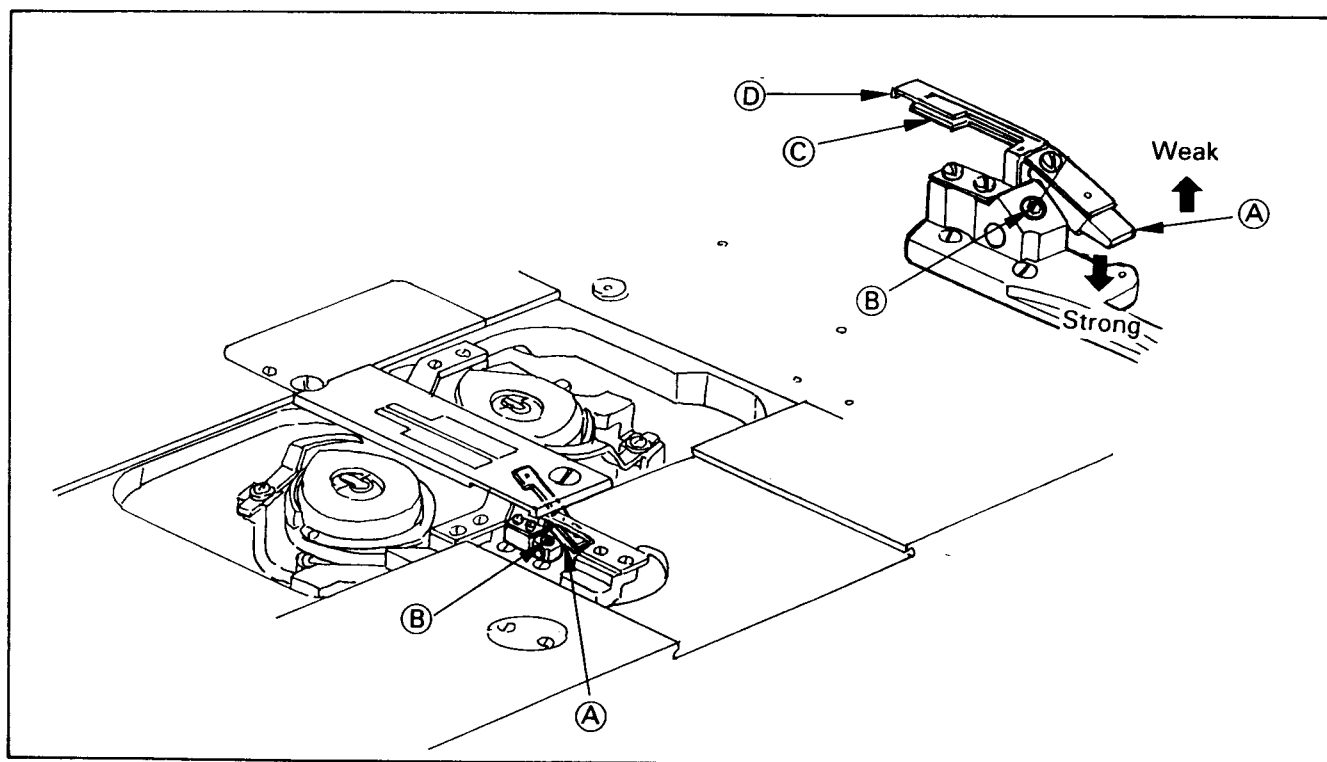
- (1) Turn the balance wheel by hand until the needles reach the lowest position.
- (2) Maintaining the needle position, depress the cam follower crank and put the cam roller into the groove of thread trimmer cam.
- (3) Turning the balance wheel by hand, adjust the thread tension release cam so that 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).



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).



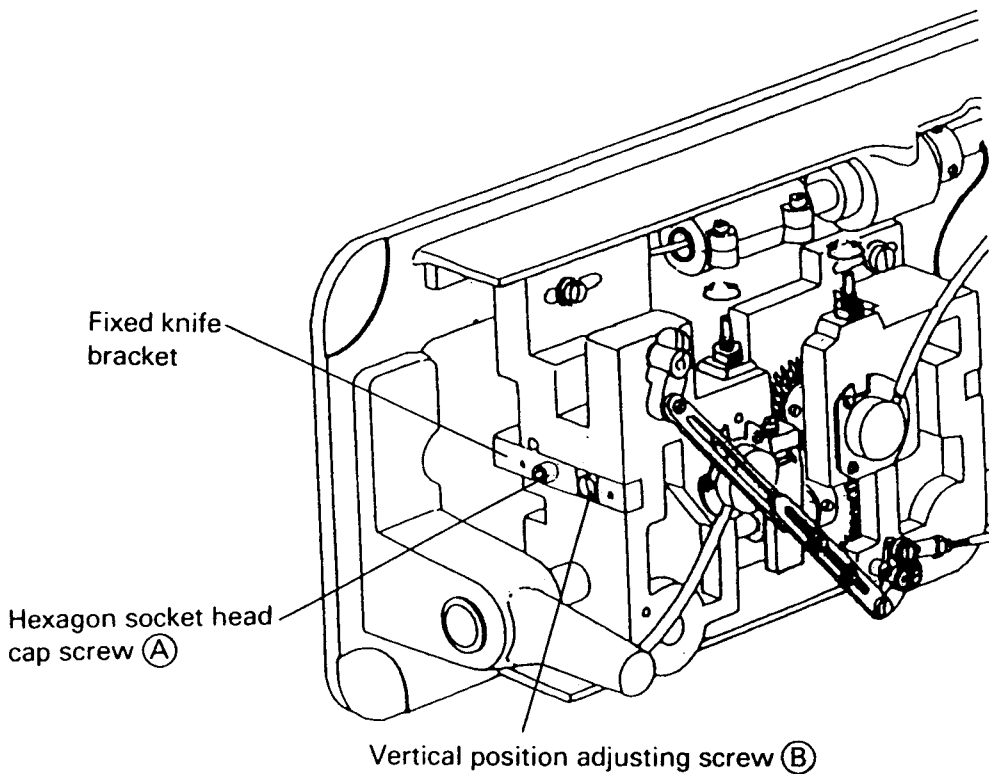
OPERATION

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).

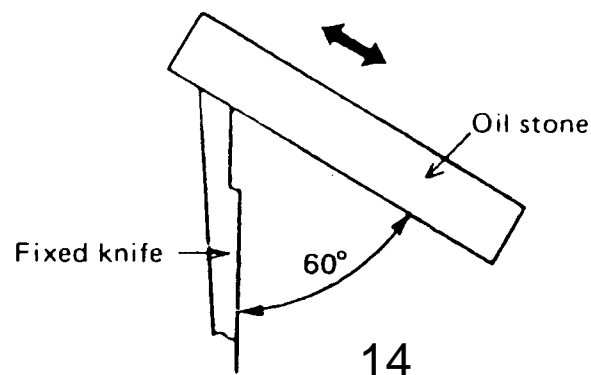
Note: Since excess pressure causes large torque to the thread trimming mechanism and trimming failure, adjust it so that thread can be trimmed with minimum pressure.

- (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.



24 Wiper adjustment

1. Run the machine then stop at "Up" position.
2. Loosen the screw ③, then adjust the base block so that the line ① and the line ② are the same plane, then tighten the screw ③.
3. Loosen the screw ④, then adjust the wiper move so as the ⑤ clearance is 2 mm, then tighten the screw ④.

