

DOUBLE-NEEDLE LOCKSTITCH NEEDLE-FEED
INDUSTRIAL SEWING MACHINE

MODEL

LT2-2220-B0B

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 high-frequency welders.

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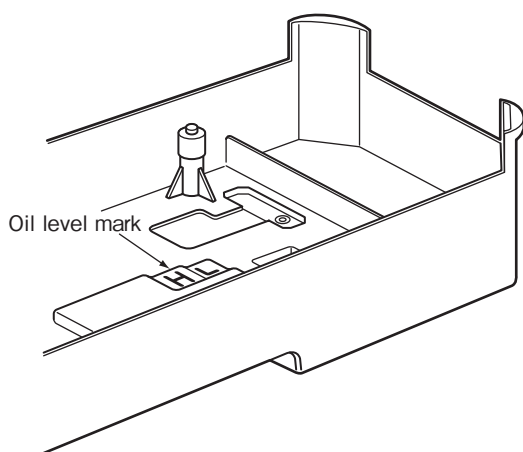
USAGE PRECAUTION

1 Lubrication (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.

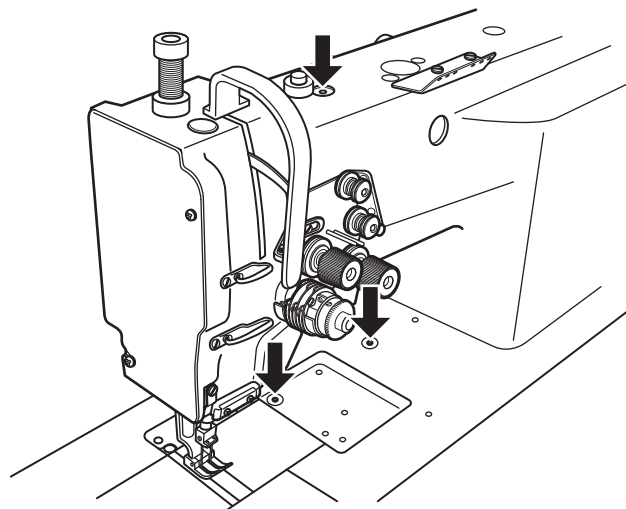
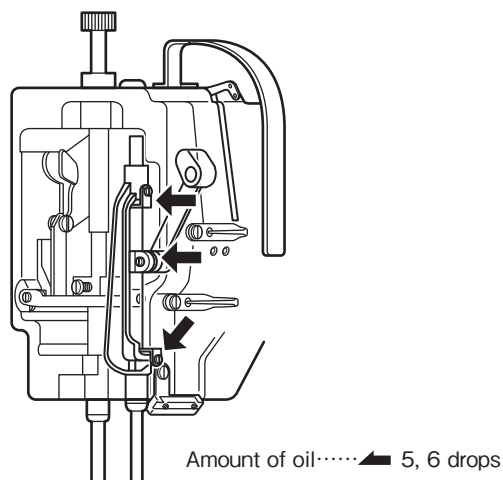
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MC70M : Specific gravity (15°C) = 0.86 (g/cm³)
: Viscosity (40°C) = 10.9 (mm²/s)



2 Lubrication (2)

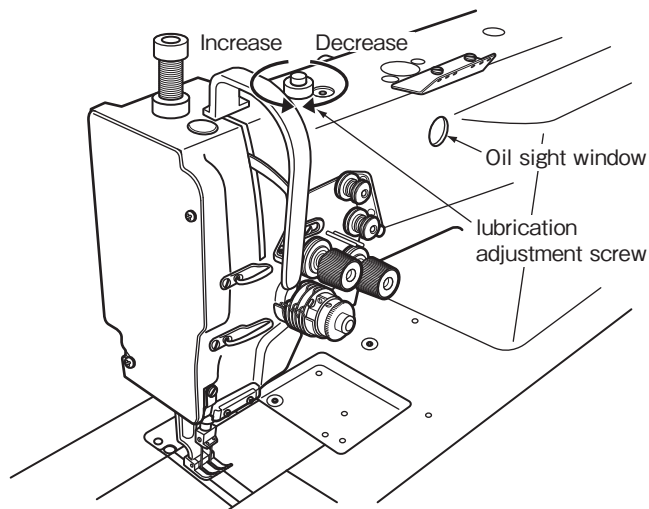
When a new sewing machine is used for the first time, or sewing machine left out of use for considerably long time is used again, replenish a suitable amount of oil to the portions indicated by arrows in the below figure.



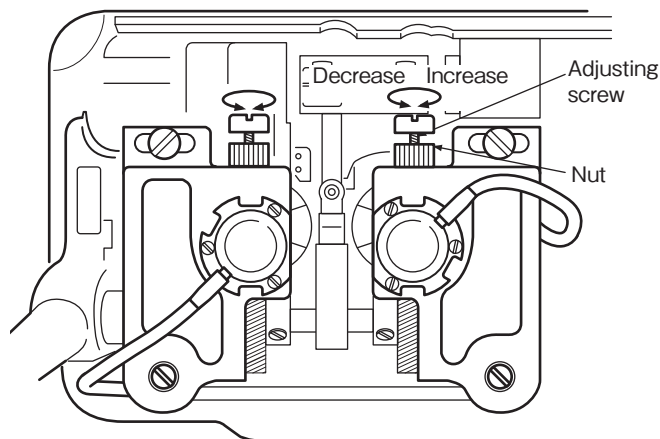
USAGE PRECAUTION

3 Lubrication condition and adjustment on lubrication to the thread take up lever

- (1) See dripping of oil through the oil sight window to check oiling condition during operation.
- (2) Adjust lubrication quantity to the thread take up lever mechanism by turning the lubrication adjustment screw.



4 Adjustment of lubrication to the rotating hook



5 Installation of the 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.

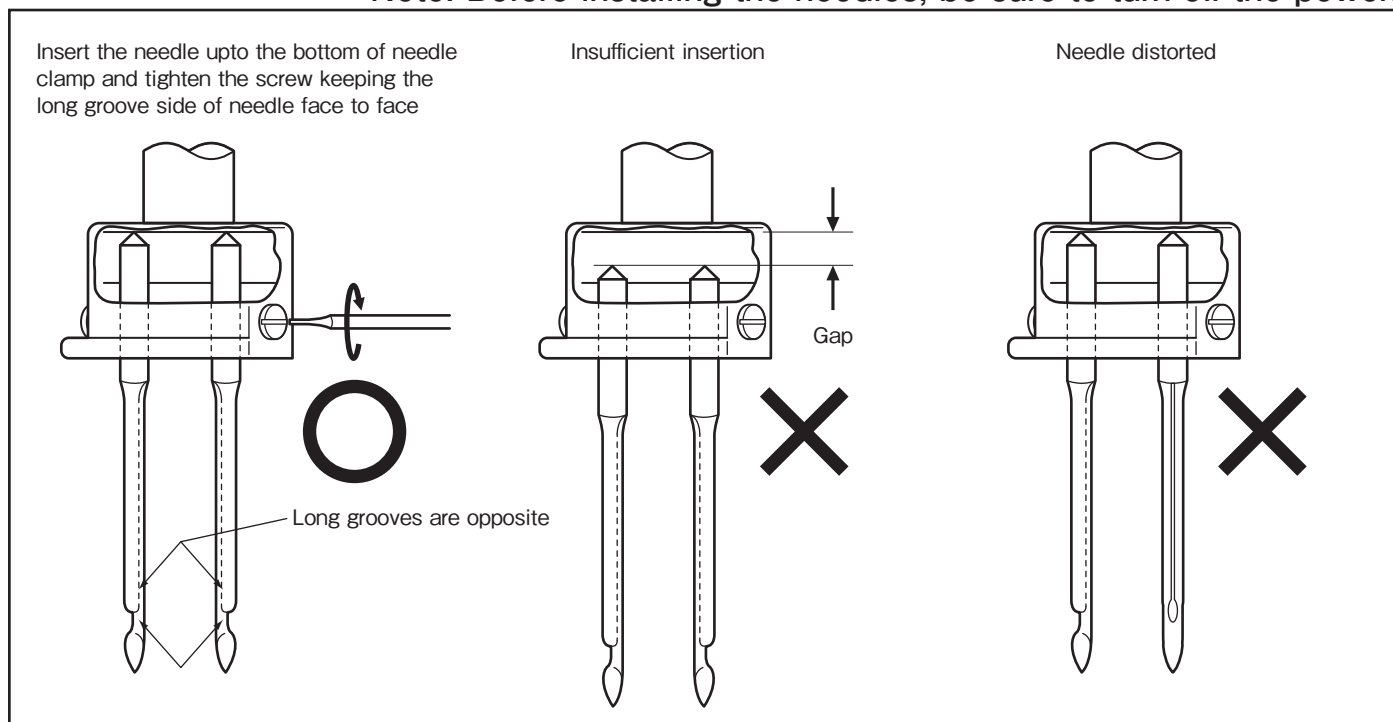
6 Precaution on operation

- (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

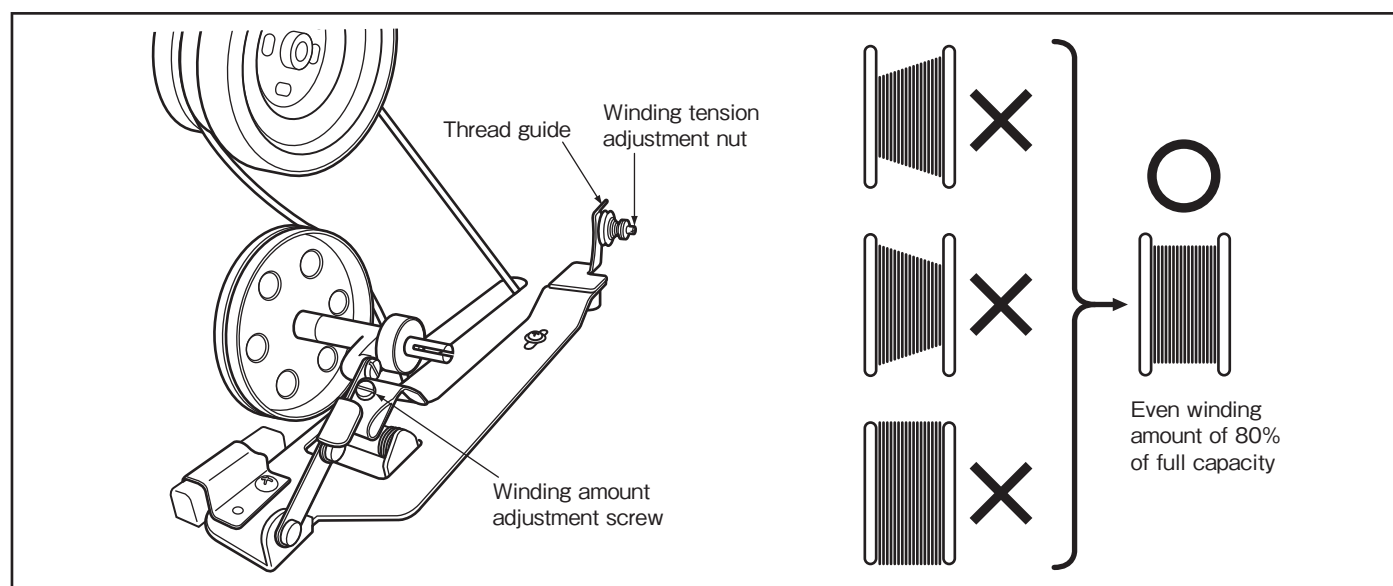
Note: Before installing the needles, be sure to turn off the power.



2 Winding of the bobbin thread

Note: When bobbin thread is wound, keep the presser foot lifted.

- Adjustment**
- **Tension of wound thread** Slack winding is recommended for polyester thread and nylon thread.
 - **Conically wound thread** Move the thread guide toward smaller diameter of wound thread layer.
 - **Amount of wound thread** Loosen the winding amount adjustment screw to decrease thread winding amount and tighten the screw to increase thread winding amount.



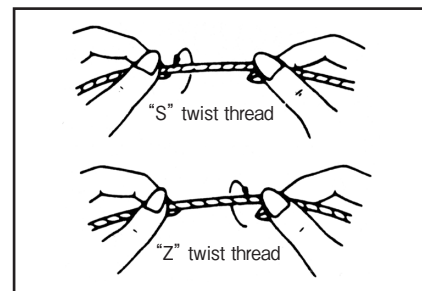
HOW TO USE

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.

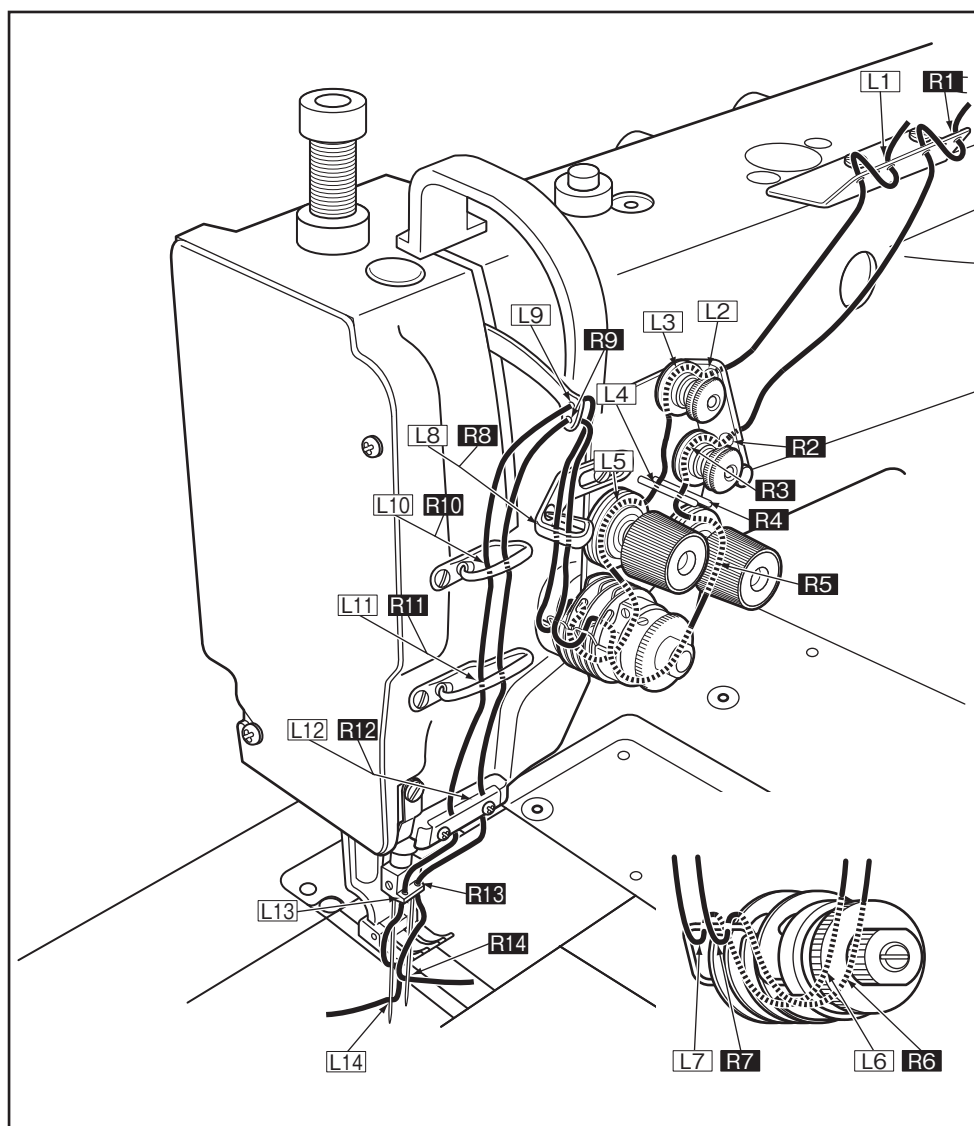
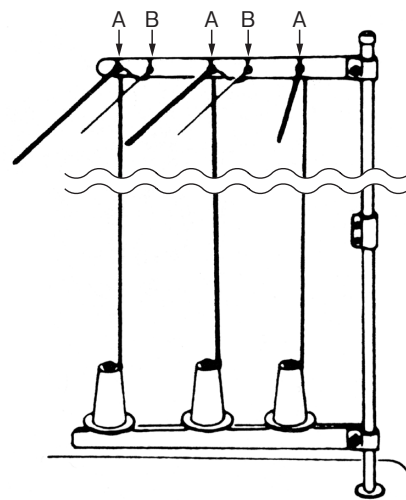
When discriminate use of needle threads is impossible, use “Z” twist thread in both the needles.

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

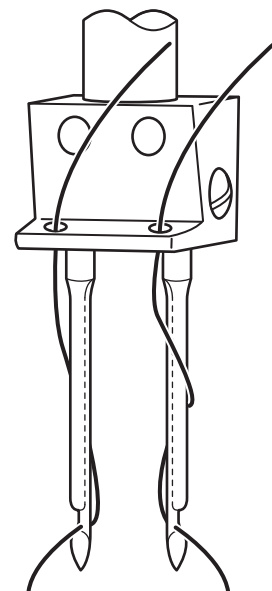


4 Threading of needle threads

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.

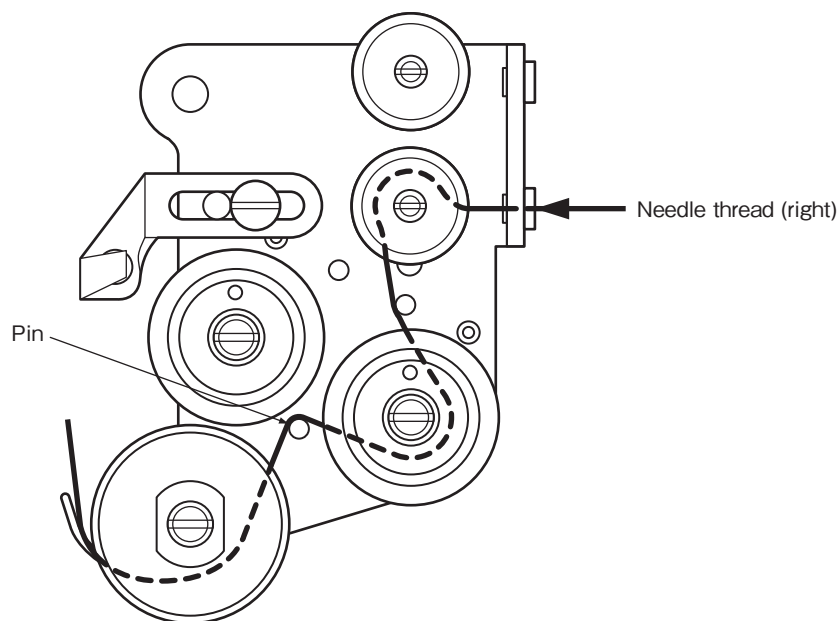


Note: When needles of small gauge (#11 or less) are used, each needle thread should be wound about 3/4 rotation around needles and then passed through needle eyes as shown in the figure, to assure neat stitches. It is recommended to use stepped needle.



HOW TO USE

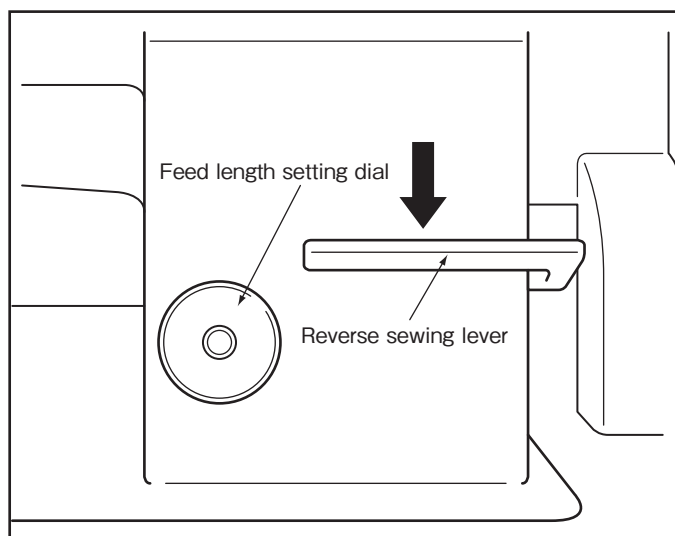
3. If the strong twisted thread (nylon or Tetron, etc.) is used and needle threads tension is strong (about 500gf or more), the right thread may be released from the thread tension disc. In this case, thread only the right thread as shown in the figure (keep the left thread standard).



HOW TO USE

5 Adjustment of feed (stitch) length and backstitch

- Adjustment of feed (stitch) length...Adjust feed length by turning the feed length setting dial while depressing the reverse sewing lever.
- Backstitch...Direction of stitching can be reversed by depressing the reverse sewing lever.



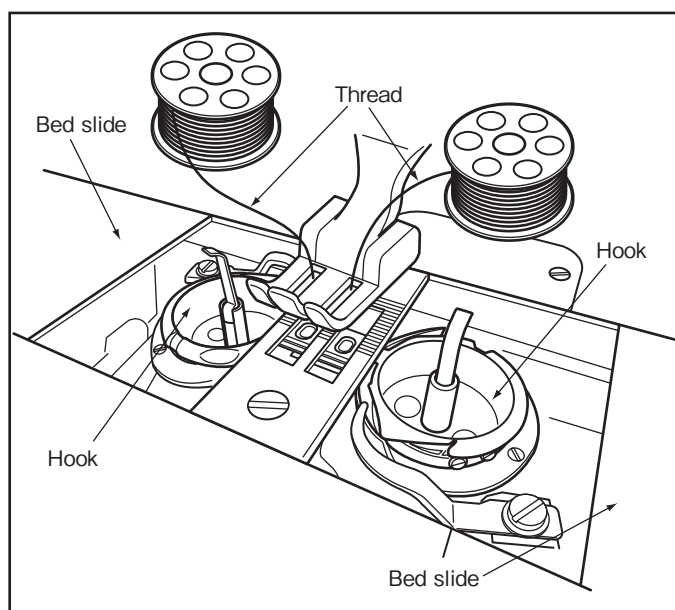
6 Adjustment of the needle thread guide

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

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

7 Setting of bobbins

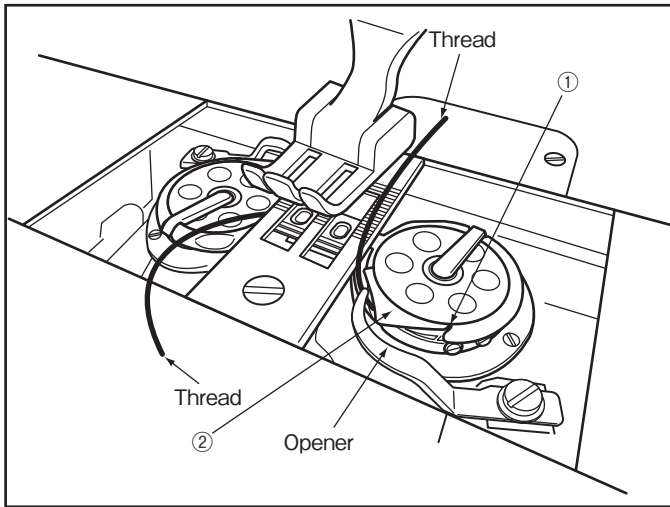
- (1) Pull out 5 cm thread tail from bobbins.
- (2) Put bobbins into hooks in the direction as the following figure.



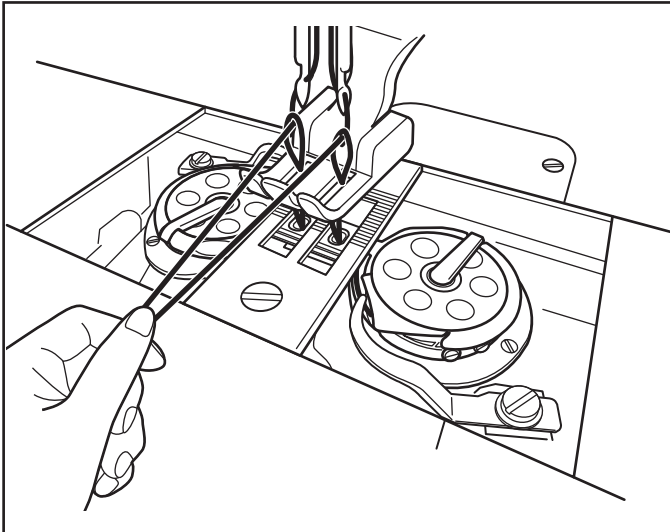
HOW TO USE

8 Threading of bobbin threads

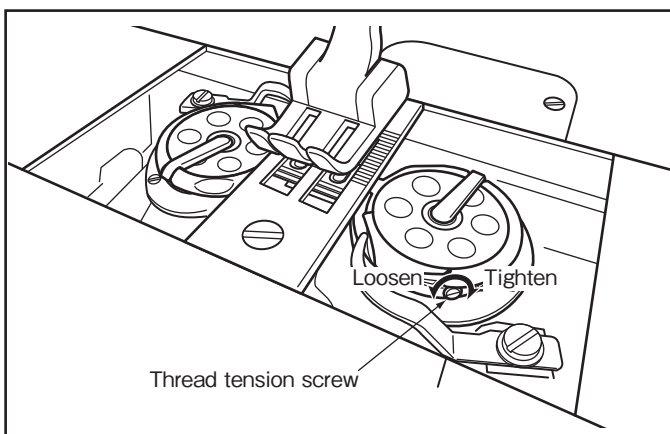
- (1) Put bobbin thread into the slit ①, pass under the lug ② and extend it above the bed.



- (2) 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.

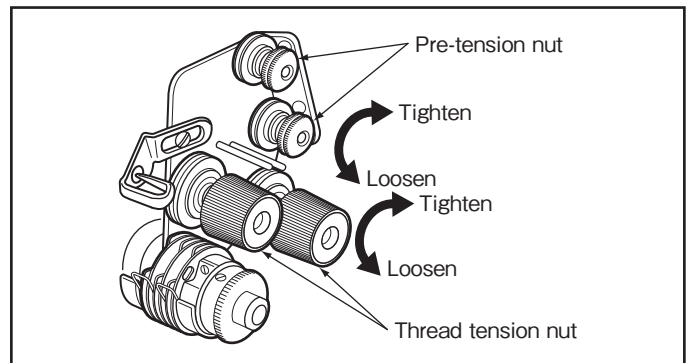


9 Adjustment of bobbin threads tension



10 Adjustment of needle threads tension

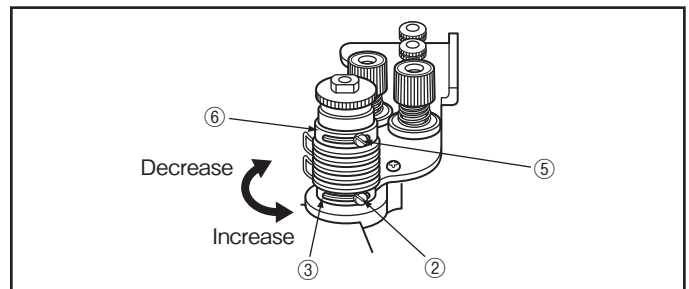
Adjust needle threads tension by turning thread tension nuts.



11 Adjustment of the thread take up spring

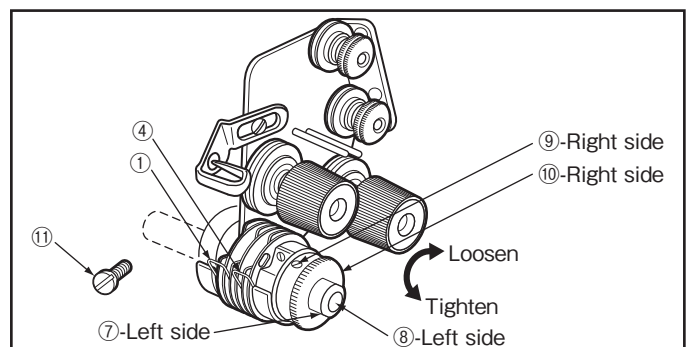
1. Adjusting movable range of the thread take up spring

- (1) To adjust the thread take up spring ① for the left thread, loosen the stopper stop screw ② and move the stopper ③.
- (2) To adjust the thread take up spring ④ for the right thread, loosen the stopper stop screw ⑤ and move the stopper ⑥.



2. Adjusting intensity of the thread take up spring

- (1) Left thread:
Loosen the lock nut ⑦, and remove the face plate.
Loosen the screw ⑪ in the arm.
Turn the adjusting shaft ⑧.
After adjustment, tighten the screw ⑪, and tighten the lock nut ⑦.
- (2) Right thread:
Loosen the screw ⑨, and turn the adjusting nut ⑩.
After adjustment, tighten the screw ⑨.



12 Timing between the rotating hook motion and the needle motion

Adjust right and left timing in the same way at the same time.

Note: If you remove the presser foot, the throat plate, and the feed dog, it makes easier to adjust.

- (1) Set feed length to 4.5 mm.
- (2) Loosen all screws ①, ②, ③, ④, and slide each hook saddle to outside.

Note: At this time, don't loosen the set screw ⑤ too much.

- (3) Check that the first screw of the large gear enters a notch, and set the needle bar at the lowest position.
- (4) Slide the large gear to the hook saddle and mesh with the small gear. At this time, adjust it so that one of three set screws ⑥ faces upward.
- (5) Lift the needle bar 2.4 mm from the lowest position, and adjust the saddle hook position so that the gap between the tip of the hook and the scarf of the needle is 0.05 mm or lower.

- (6) Tighten screws ①, ②.

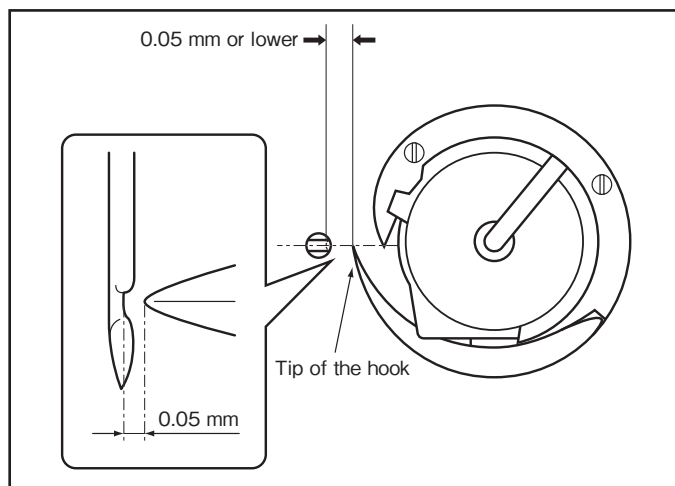
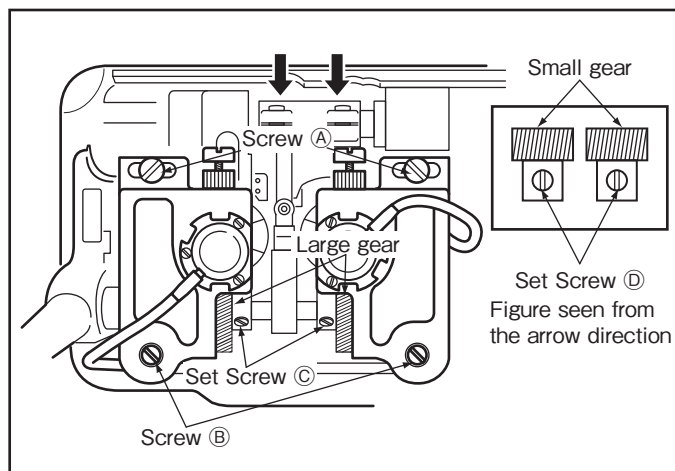
Note: Be careful not to overtighten screws ②.

- (7) Have a small gap between the large gear and the saddle hook, and tighten all set screws ③.
- (8) Lift the needle bar 2.4 mm from the lowest position again, and adjust the tip of the hook position so that it is in the center of the needle.

- (9) While checking that the tip of the hook is in the center of the needle, and tighten set screws ④.

Note: Tighten each screw ④ little by little.

- (10) Return the machine head to the original position and adjust the needle guide position so that it come lightly in contact with the needle.

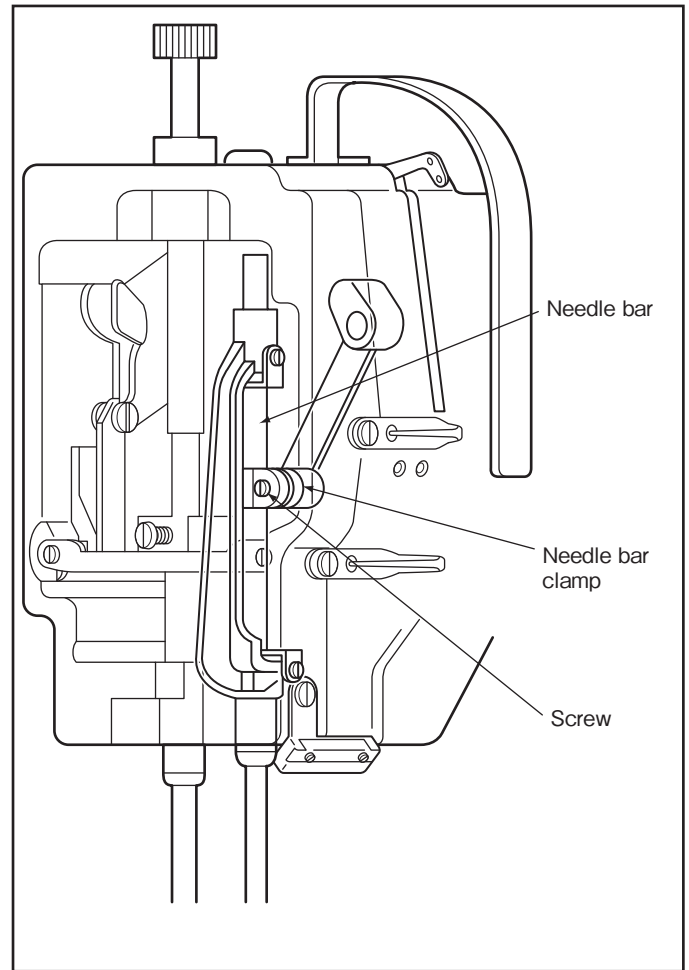


HOW TO USE

● Adjustment of the needle up and down position

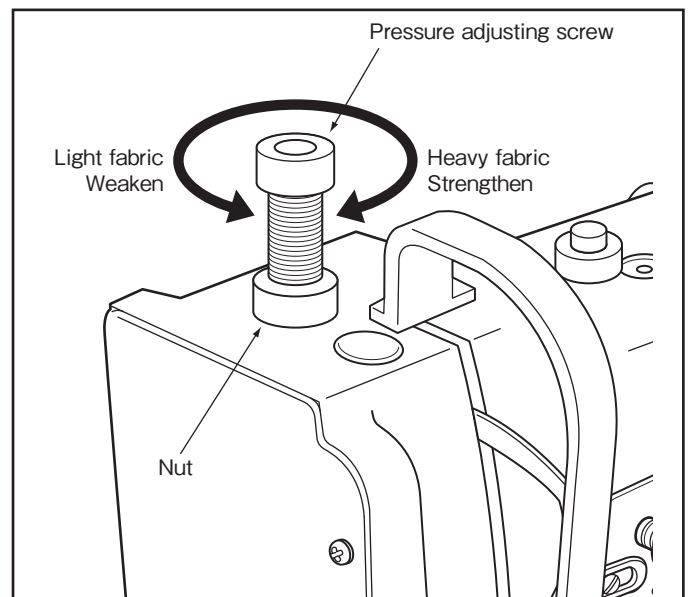
When the needle is lifted 2.4 mm from the lowest position, adjust the needle position so that the gap between the top of needle eye and the tip of the hook is 1.0 to 2.0 mm.

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



13 Adjustment of the presser foot pressure

- (1) Adjust the presser foot pressure by loosening the nut and turning the pressure adjusting screw.
- (2) After adjustment, fully tighten the nut.



HOW TO USE

14 Adjustment of the feed dog height

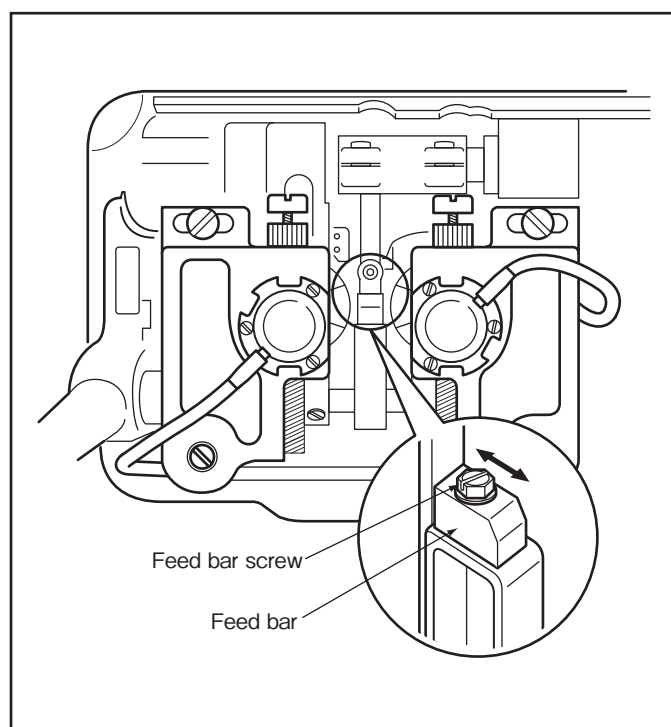
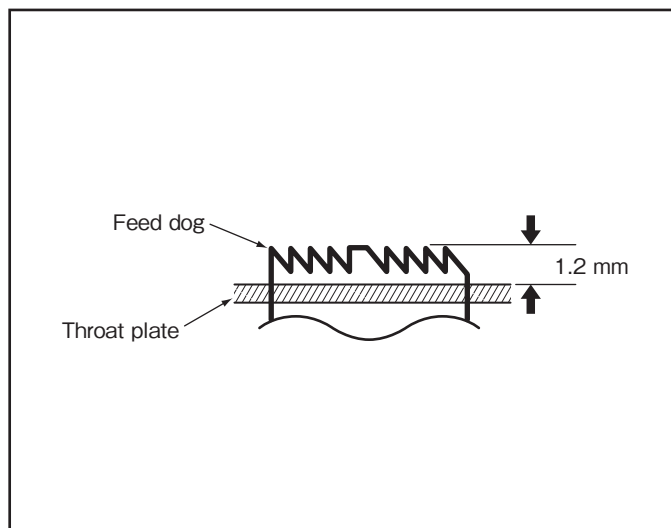
The feed dog height and the presser foot pressure must be adjusted according to the fabric.

- ◆ 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 the feed bar screw.
- (4) Vertically move the feed bar (in the direction indicated by the arrow in the figure) to adjust it to an adequate height.
- (5) After adjusting, tighten the feed bar screw.

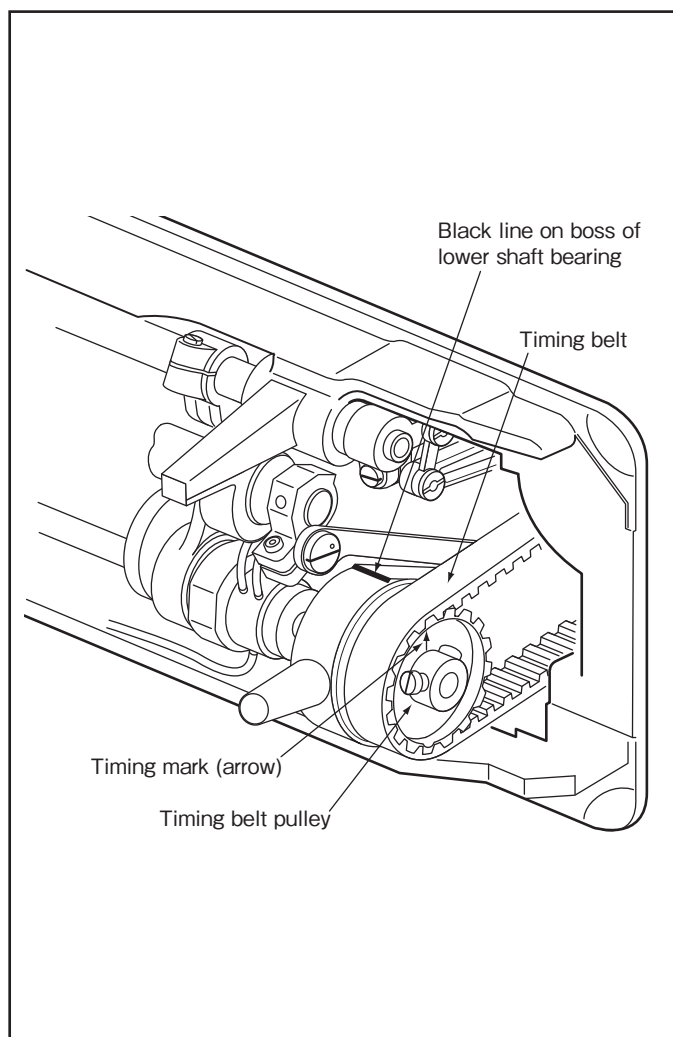
The feed dog height is factory-adjusted to 1.2 mm.



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

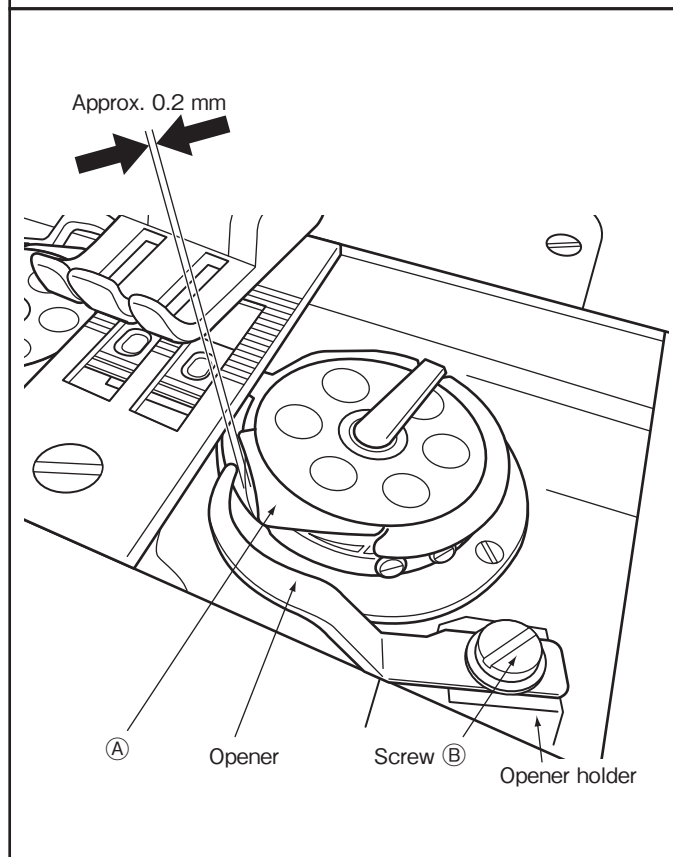
When the timing belt is removed for replacement, etc., the relation between the rotating hook motion and the thread take-up lever motion should be adjusted as follows:

- (1) Turn the pulley and stop when the thread take-up lever is lifted to the highest position.
- (2) Lean the machine head backward and check that the arrow (timing mark) put on the timing belt is aligned 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.



16 Relationship between the rotating hook motion and the opener motion

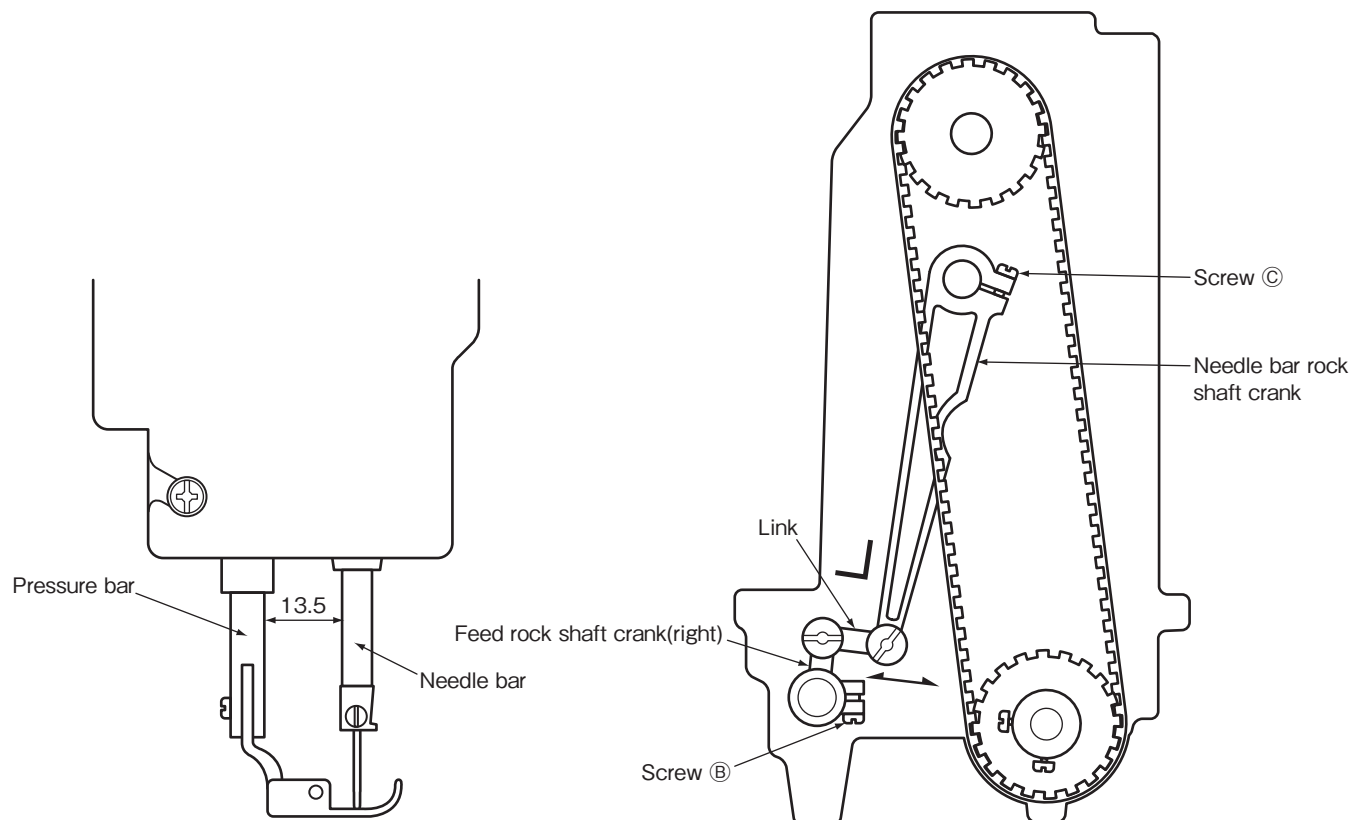
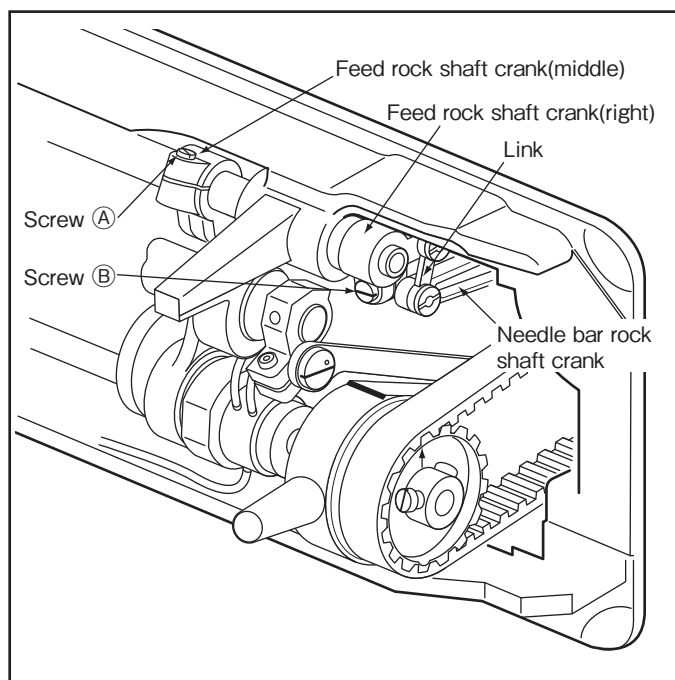
- (1) Turn the pulley by your hand and stop it at the position where the opener holder is located most remotely from the throat plate.
- (2) Check that the gap between the lug (A) and the opener is approximately 0.2 mm.
- (3) If the gap is too large or small, loosen the opener holder screw (B) and adjust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



HOW TO USE

17 Relationship between the needle motion and the feed dog motion

- (1) Set the stitch length to "0" on the feed length setting dial.
- (2) Set the needle at the lowest position.
- (3) Lean the machine head backward.
- (4) Loosen the feed rock shaft crank set screws ①, ②.
- (5) Adjust the distance between the pressure bar and the needle bar to 13.5 mm and temporarily tighten the feed rock shaft crank set screws ①, ②.
- (6) Check that the needle bar rock shaft crank is connected with the link at a right angle as shown in the figure.
- (7) If the connection is not a right angle, remove the Rear cover, loosen screw ③ and move the link to connect the needle bar rock shaft crank with the link at a right angle.
- (8) After adjusting, fully tighten all screws ①, ②, ③. At this time, check that the needle enters the hole at center of the feed dog.

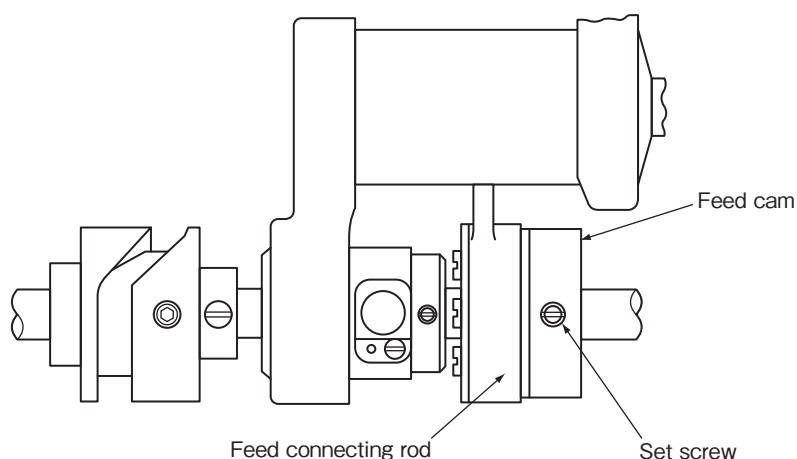
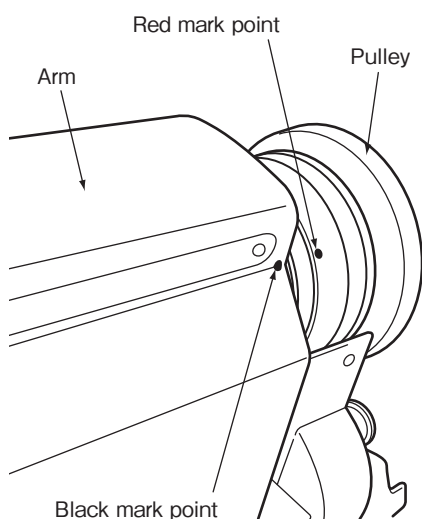
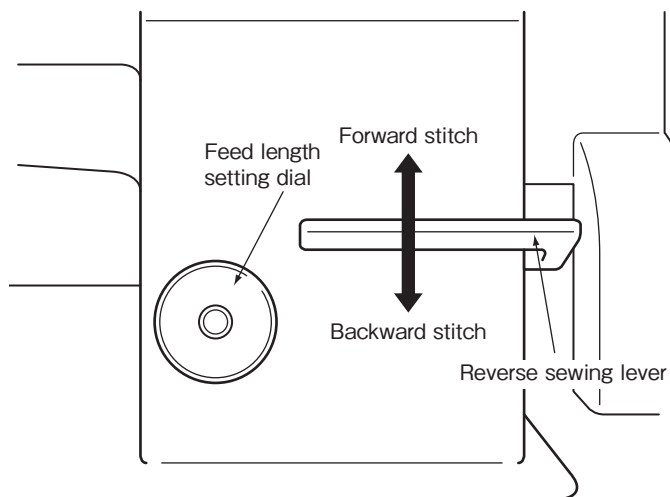


HOW TO USE

18 Installation position of the feed cam

- (1) Set the feed length setting dial to maximum.
- (2) Turn the pulley and stop it at the position where the red mark point on the pulley meets the black mark point on the arm.
- (3) Move the feed cam to the position shown in the figure, and repeat the forward stitch and the backward stitch.

At this time, set the feed cam to the lower shaft at the position where the needle (feed dog) stops.



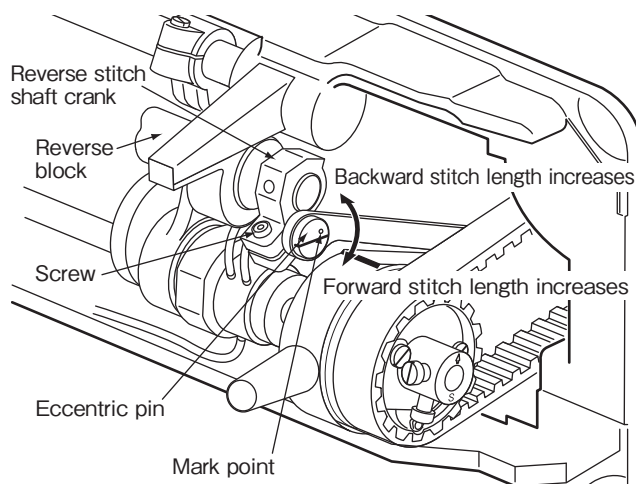
19 Adjustment of forward/backward feed length

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 clockwise.

To increase backward stitch length, turn the eccentric pin counterclockwise.

Note: Please adjust in the range where the mark point of the eccentric pin is facing to the reverse block side as shown in the figure.



SPECIFICATIONS

LT2-2220-B0B Specifications

Specifications \ Model		LT2-2220-B0B
Application		Medium-heavy material
Max. sewing speed (rpm)		3,000
Stitch length (mm)		0 to 7
Needle bar stroke (mm)		35.0
Thread take-up lever stroke (mm)		64.5
Presser foot stroke (mm)	Hand	7.0
	Knee	13.0
Needle		DP × 5 #18
Hook (horizontal rotating hook)		Large
Lubrication system		Automatic lubrication
Bed dimensions (mm)		517 × 178
Needle gauge (mm)		Standard 6.4 Special 3.2、4.8、8、9.5、12.7

Note: ●The bobbin should be of high quality free from deformation.

- Some materials, gauge sizes, and/or sewing conditions may require specifications other than those listed above.
- These specifications are subject to change for machine improvement.

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