

brother®

SERVICE MANUAL FOR

LZ2-B852

LZ2-B853

LZ2-B854



BROTHER INDUSTRIES, LTD.

NAGOYA, JAPAN

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TROUBLESHOOTING GUIDE

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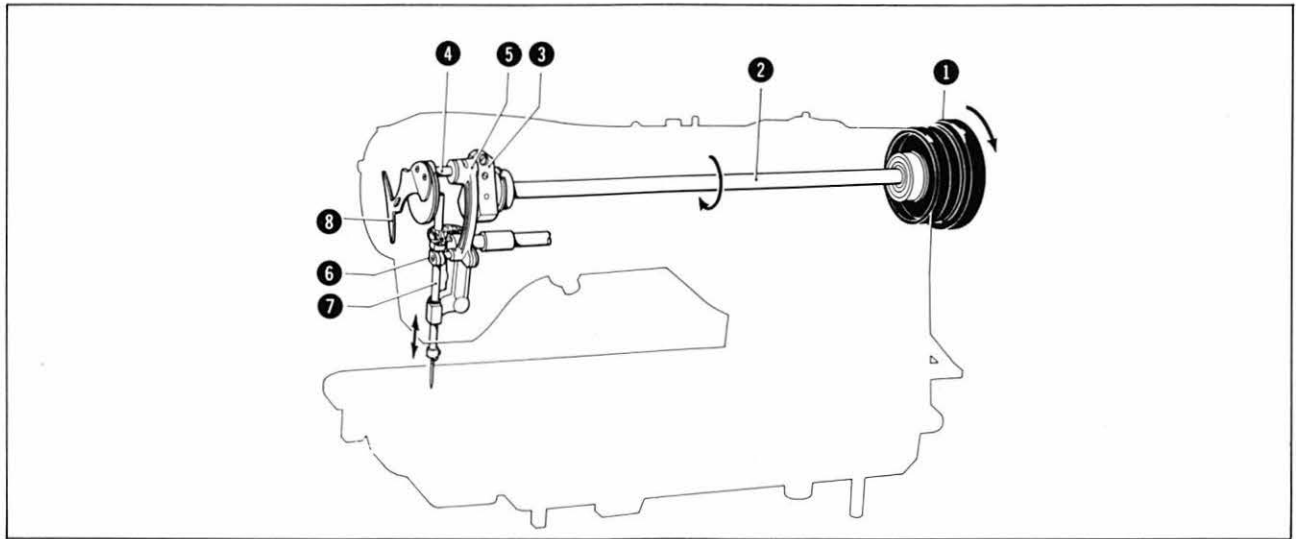
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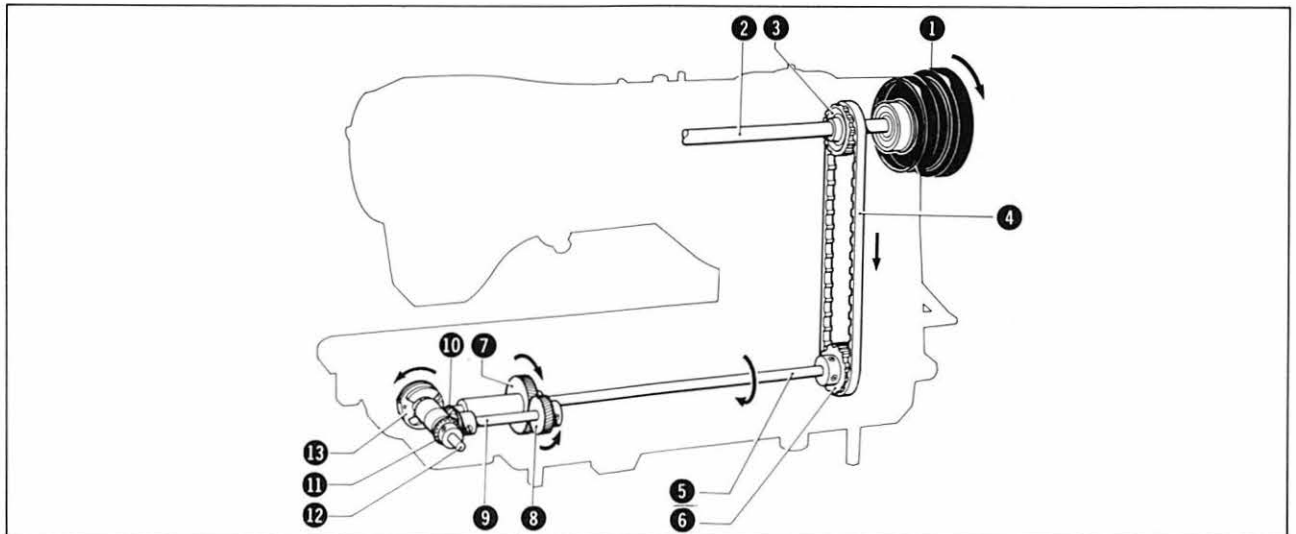
MECHANISM

1 UPPER SHAFT AND NEEDLE BAR MECHANISM



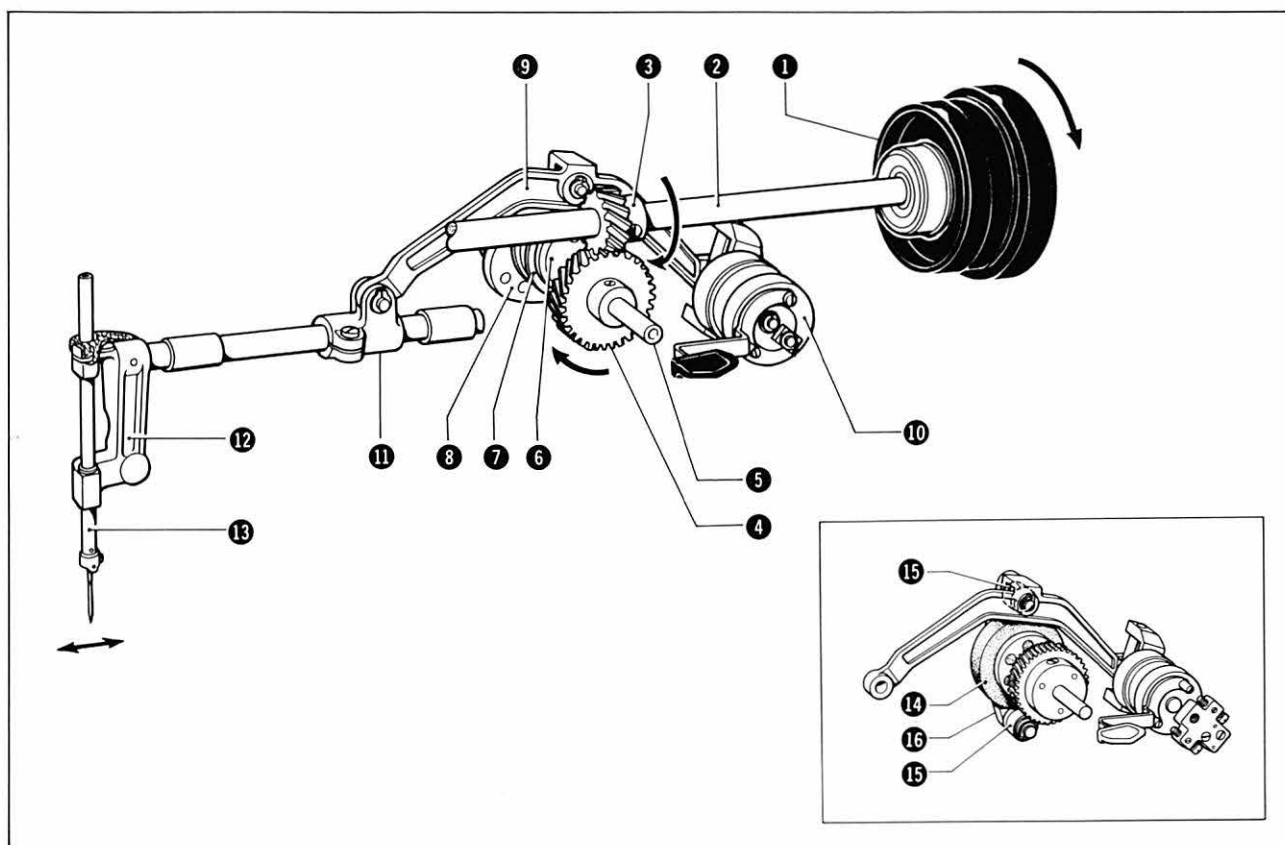
1. When the machine pulley ① is turned in the direction of the arrow, the upper shaft ② rotates and in turn rotates the thread take-up crank ③.
2. The movement of the thread take-up crank ③ is then transmitted to the needle bar connecting link ⑤ via the needle bar crank stud ④ which is connected to the thread take-up crank ③.
3. The needle bar connecting link ⑤ in turn moves the needle bar clamp ⑥ up and down.
4. The needle bar clamp ⑥, in turn, moves the needle bar ⑦ up and down.
5. Finally, the thread take-up lever ⑧ is also driven via the needle bar crank stud ④.

2 LOWER SHAFT AND ROTARY HOOK MECHANISM



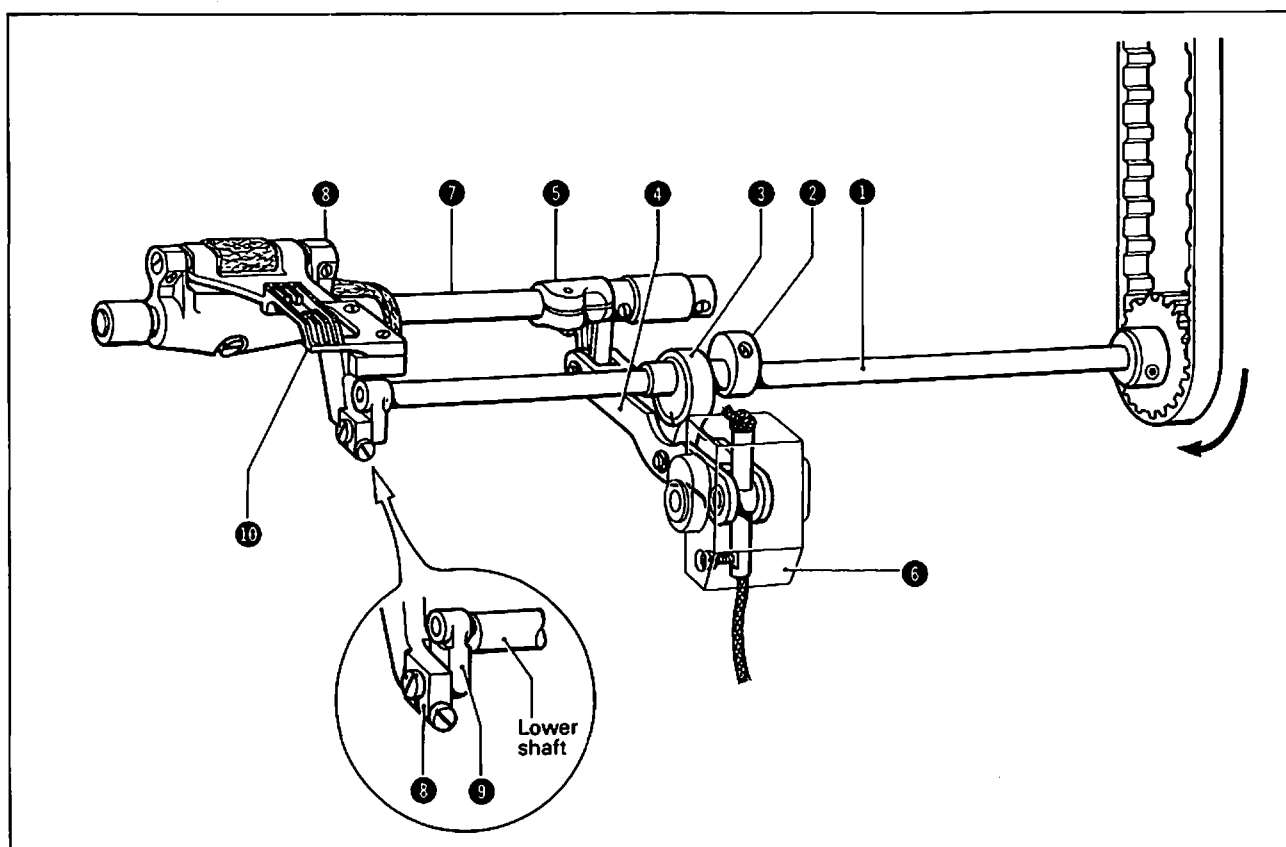
1. When the machine pulley ① is rotated in the direction of the arrow, timing pulley U ③, which is connected to the upper shaft ②, rotates.
2. Next, timing pulley D ⑥, connected to the lower shaft ⑤, is rotated by timing pulley U ③ via the timing belt ④.
3. Timing pulley D ⑥ in turn drives the lower shaft ⑤ and gear ⑦.
4. Finally, the gear ⑦ rotations are transferred through the lower shaft pinion gear ⑧, the rotary hook drive shaft ⑨, bevel gear ⑩, bevel pinion gear ⑪ and rotary hook shaft ⑫ to drive the rotary hook ⑬.

3 ZIG-ZAG MECHANISM



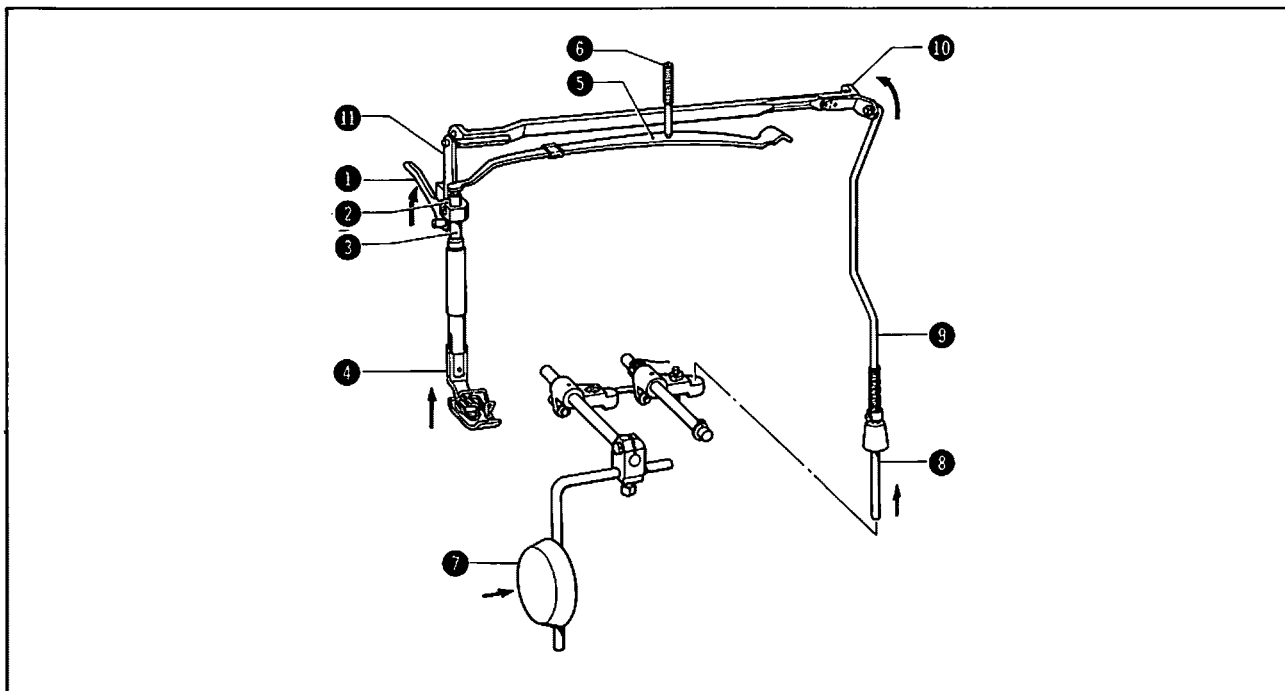
1. When the machine pulley ① is turned in the direction of the arrow, the upper shaft gear ③, connected to the upper shaft ②, rotates.
 2. Upper-shaft gear ③ rotation is then transmitted to the shaft ⑤ via the needle vibrating gear ④.
 3. Two cams ⑥ are installed on the shaft ⑤; the shaft ⑤ drives the cam guide ⑧ vertically via the two links ⑦. (on models LZ2-B852 and B853)
 - The cam ⑭ connected to the shaft ⑤ drives the roller guide ⑯ which holds the two cam rollers ⑮ vertically. (model LZ2-B854)
 4. The needle vibrating rod ⑨ is connected to the cam guide ⑧ and pivots on the zigzag control ⑩ to shift right and left. (models LZ2-B852 and B853)
 - The needle vibrating rod ⑨ is connected to the roller guide ⑯ and pivots on the zigzag control ⑩ to shift right and left. (model LZ2-B854)
 5. The joint ⑪ connected to the needle vibrating rod ⑨ relays the right/left shifting motion of the vibrating rod to the needle bar ⑬ which is connected to the frame assembly ⑫.
- * The above explanation applies to the mechanisms in models LZ2-B852 and B853. Those parts that differ in model LZ2-B854 are so indicated with a “●” symbol.

4 FEED MECHANISM



1. When the lower shaft ① rotates in the direction of the arrow, the eccentric cam ② connected to the lower shaft ① turns.
 2. Next, the eccentric wheel ③, which is fitted onto the eccentric cam ②, makes the feed driving lever ④ move vertically.
 3. The feed rock crank ⑤ connected to the feed driving lever ④ moves in direct relation to the feed regulator ⑥.
 4. The motion of the feed rack crank ⑤ is then transmitted to the feed bar assembly ⑧ via the feed drive shaft ⑦.
 5. The end of the lower shaft ① is the eccentric connecting link stud and vertically drives the feed bar assembly ⑧ by means of the upper feed link ⑨.
- * The action of steps 4 and 5 determines the movement of the feed dog ⑩ which is connected to the feed bar assembly ⑧.

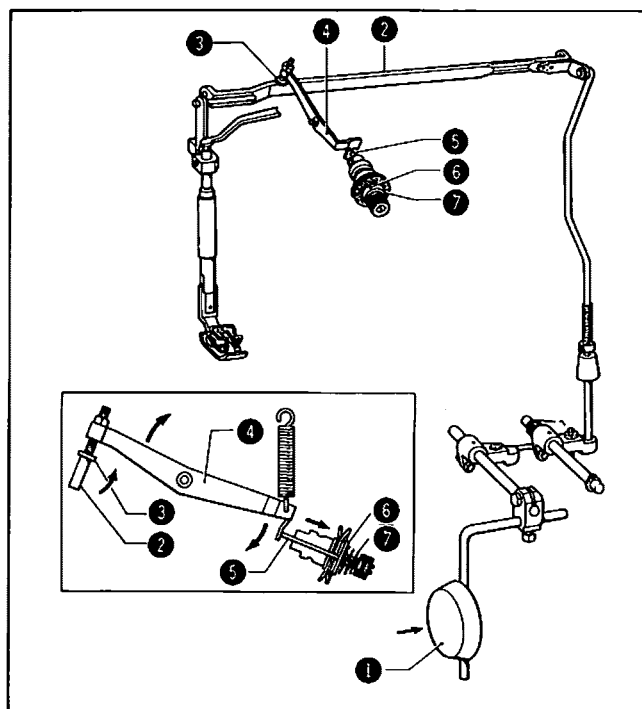
5 PRESSER MECHANISM



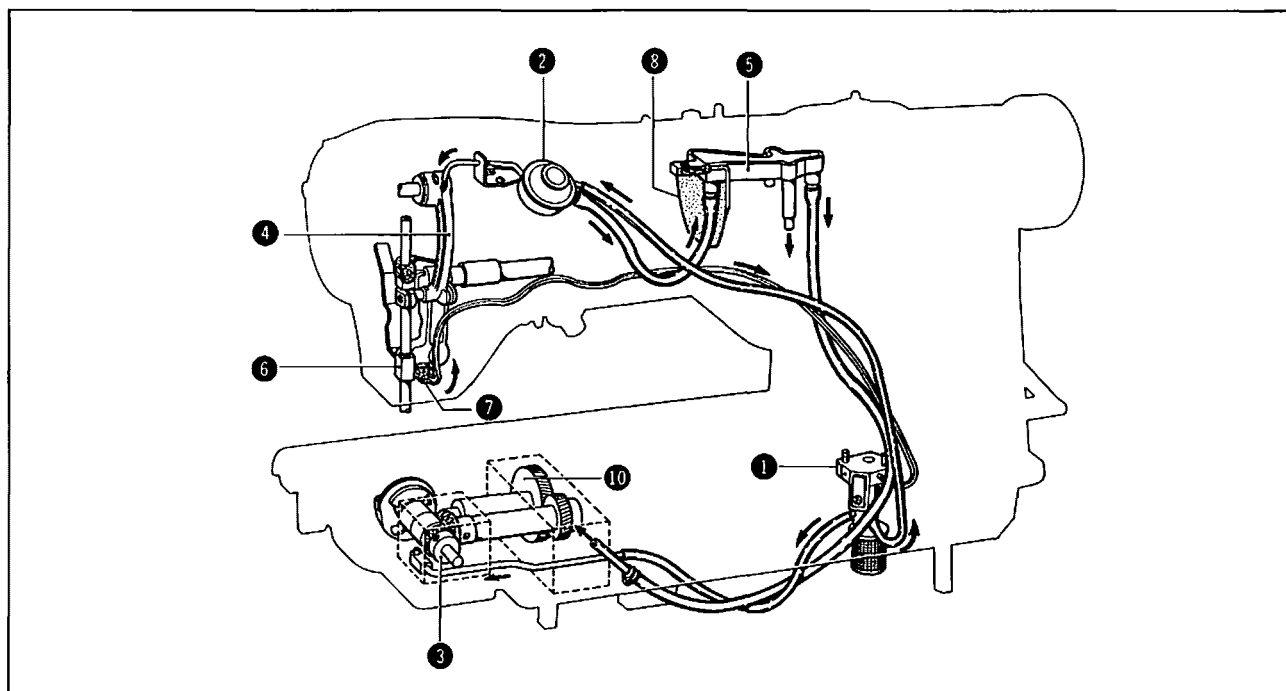
1. Raising the presser bar lifter lever ① causes the presser bar clamp ② to rise.
2. This causes the presser bar ③, which is held by the presser bar clamp ②, to rise.
3. The presser foot ④ is connected to the presser bar ③ and rises in unison with the presser bar ③.
4. The top of the presser bar ③ is depressed by the presser bar leaf spring ⑤; tightening down the presser bar adjustment screw ⑥ increases the pressure on the presser bar.
5. When the knee lifter ⑦ is pushed in the direction of the arrow, the complying bar ⑧ connected to the oil pan raises the knee lifter connecting rod ⑨ and raises the knee lifter lifting link ⑪ via the knee lifter horizontal shaft ⑩.
6. The knee lifter lifting link ⑪ is connected to the needle bar clamp ②.

6 TENSION RELEASE MECHANISM

1. When the presser foot has been raised by the knee lifter ⑦, the tension release lever ④ and screw ③ riding on the knee lifter horizontal shaft ② are raised.
2. The tension release lever ④ pushes the tension release pin ⑤ causing the tension releasing disc ⑥ to float. The thread tension assembly is now unable to apply pressure on the thread.
3. When the presser foot is not raised, the tension spring ⑦ applies pressure to the tension disc in the thread tension assembly.



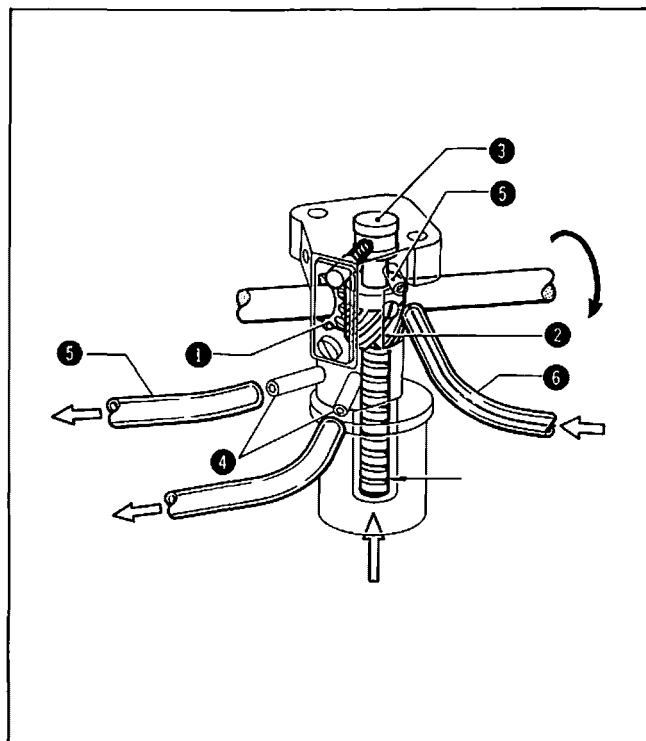
7 LUBRICATION MECHANISM



1. Oil from the oil pump assembly ① is supplied to the oil gauge ② and to the bevel gear ③ for the rotary hook.
 2. Oil is supplied from the oil gauge ② to the needle bar connecting link ④ and oil tank ⑤. Oil sprayed around the needle bar connecting link ④ oils the frame assembly ⑥ (needle bar clamp, etc.).
 3. The oil tank ⑤ supplies oil to the zigzag mechanism, lower rotary hook shaft bushing (middle) and rotary hook complete.
 4. Oil that collects in the arm chin part is sucked into the oil pump assembly ① through the felt-tipped tube ⑦.
- * The face plate, name plate, side plate R, and arm cover are each lined with packing to prevent oil leaks.
 - * Arm oil shield ⑧ prevents oil from spraying towards the face plate.
 - * Oil is supplied to the gear box cover ⑩ side of the machine from the oil tank ⑤.

Oil Pump Mechanism

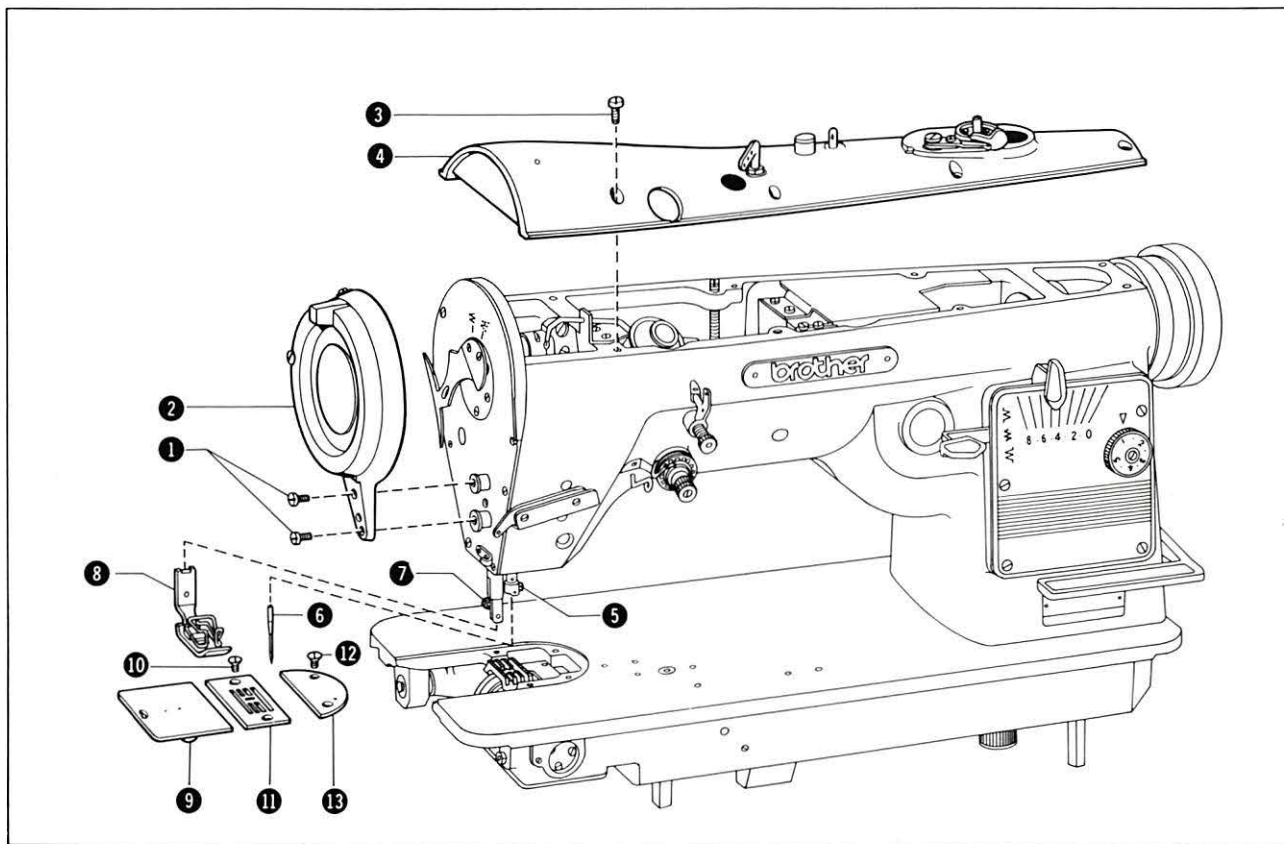
1. The pump gear ② turns when the gear ① attached to the lower shaft turns.
 2. When the pump gear ② turns, oil is pumped by the screw lifter part (bottom end) of the rotating shaft ③. The oil passes through the tubes connected to the two outlet tubes ④ on the bottom of the oil pump assembly and the oil is supplied to the oil gauge, oil tank, and rotary hook.
 3. Oil is intaken through the eccentric part of the rotating shaft ③.
- * Any oil accumulated in the arm chin part is suctioned by the felt-covered tube ⑥ connected to the tube ⑤ at the top of the oil pump assembly.



DISASSEMBLING PROCEDURES

1 COVER

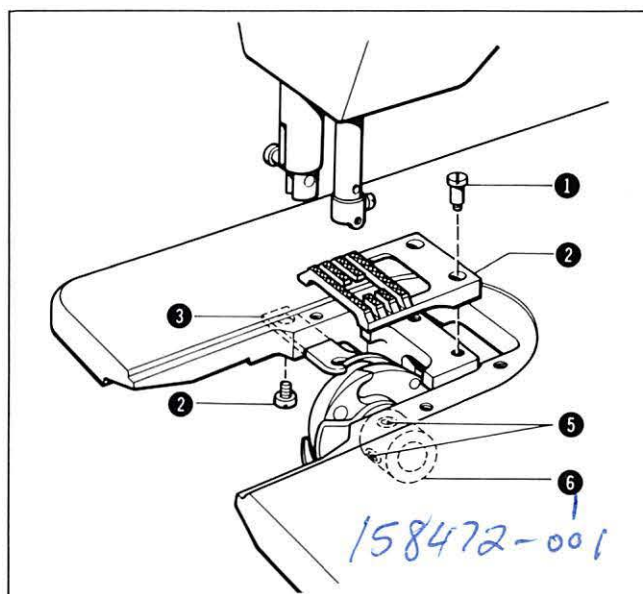
※ It is not necessary to remove all the covers.



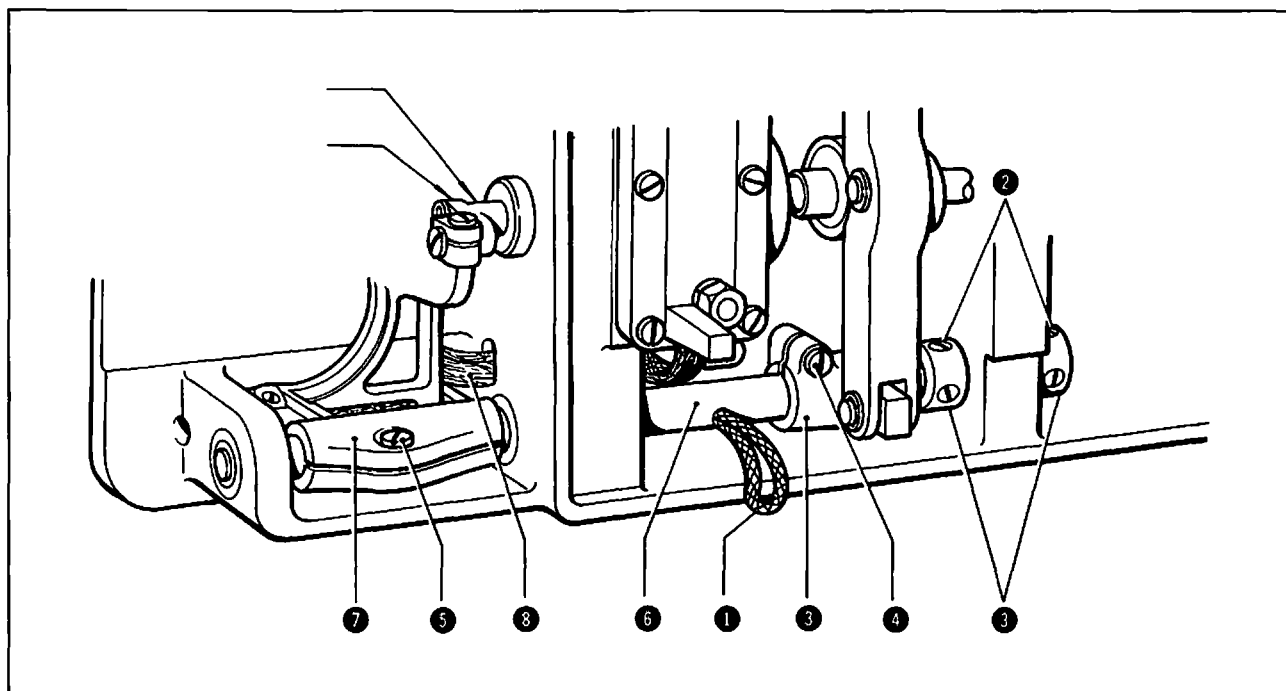
1. Remove the two screws ①, and remove the thread take-up guard cover ②.
2. Remove the two screws ③, and remove the arm cover ④.
3. Loosen the screw ⑤, and remove the needle ⑥.
4. Loosen the screw ⑦, and remove the presser foot ⑧.
5. Remove the needle slide ⑨.
6. Remove the two screws ①, and remove the needle plate ⑪.
7. Remove the two screws ⑫, and remove the needle plate ⑬.

2 ROTARY HOOK

1. Remove the two screws ①, and remove the feed dog ②.
2. Tilt the machine.
3. Remove the screw ③, and remove the rotary hook position bracket ④.
4. Loosen the two screws ⑤, and remove the rotary hook ⑥.

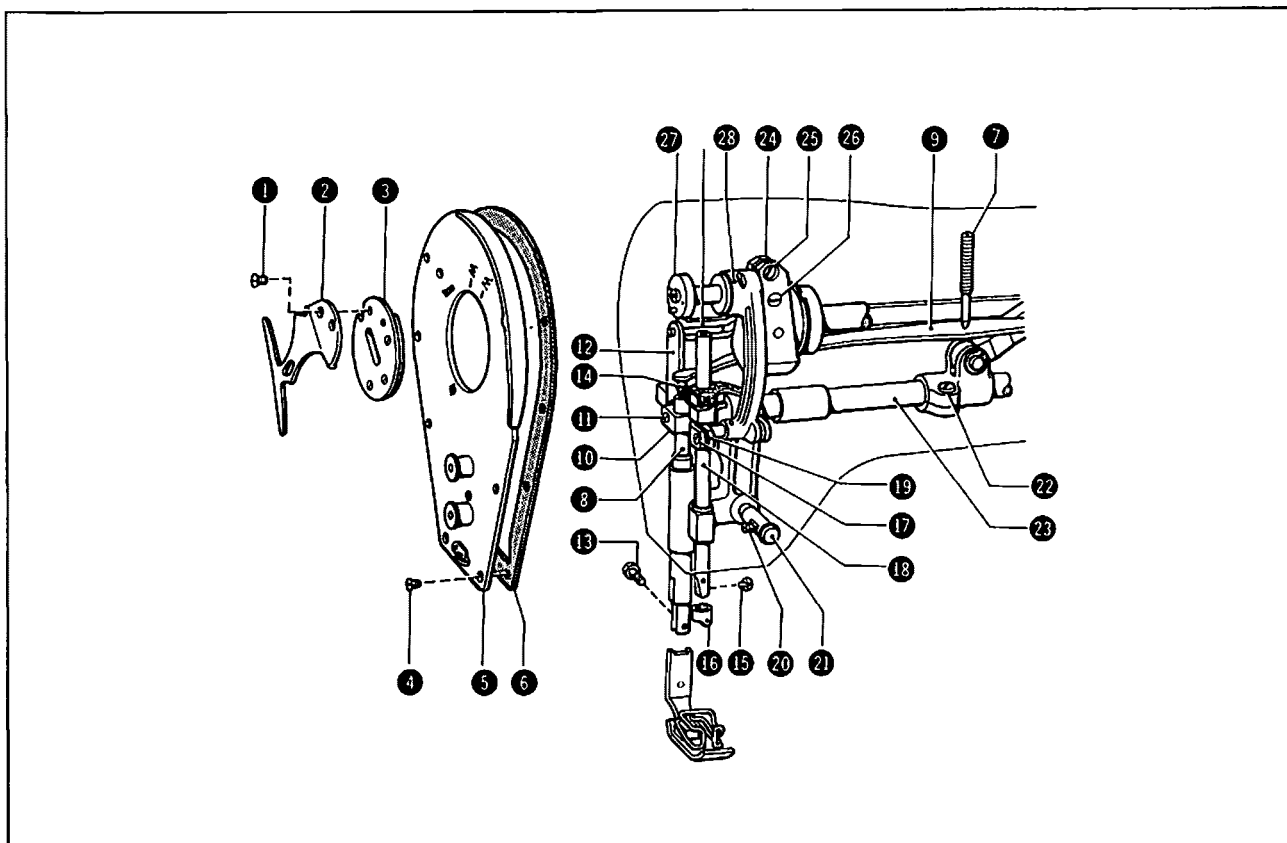


3 FEED MECHANISM



1. Pull the wick ① left or right and remove it.
2. Loosen the four screws ②, and confirm that the two collars ③ move.
3. Loosen the screw ④.
4. Loosen the screw ⑤.
5. Pull the feed drive shaft ⑥ to the left and remove.
6. Now the two collars ③ and drive shaft arm assembly ⑦ can be removed.
7. Refer to page 13 for felt ⑧ and wick ① replacement.

4 PRESSER BAR AND NEEDLE BAR



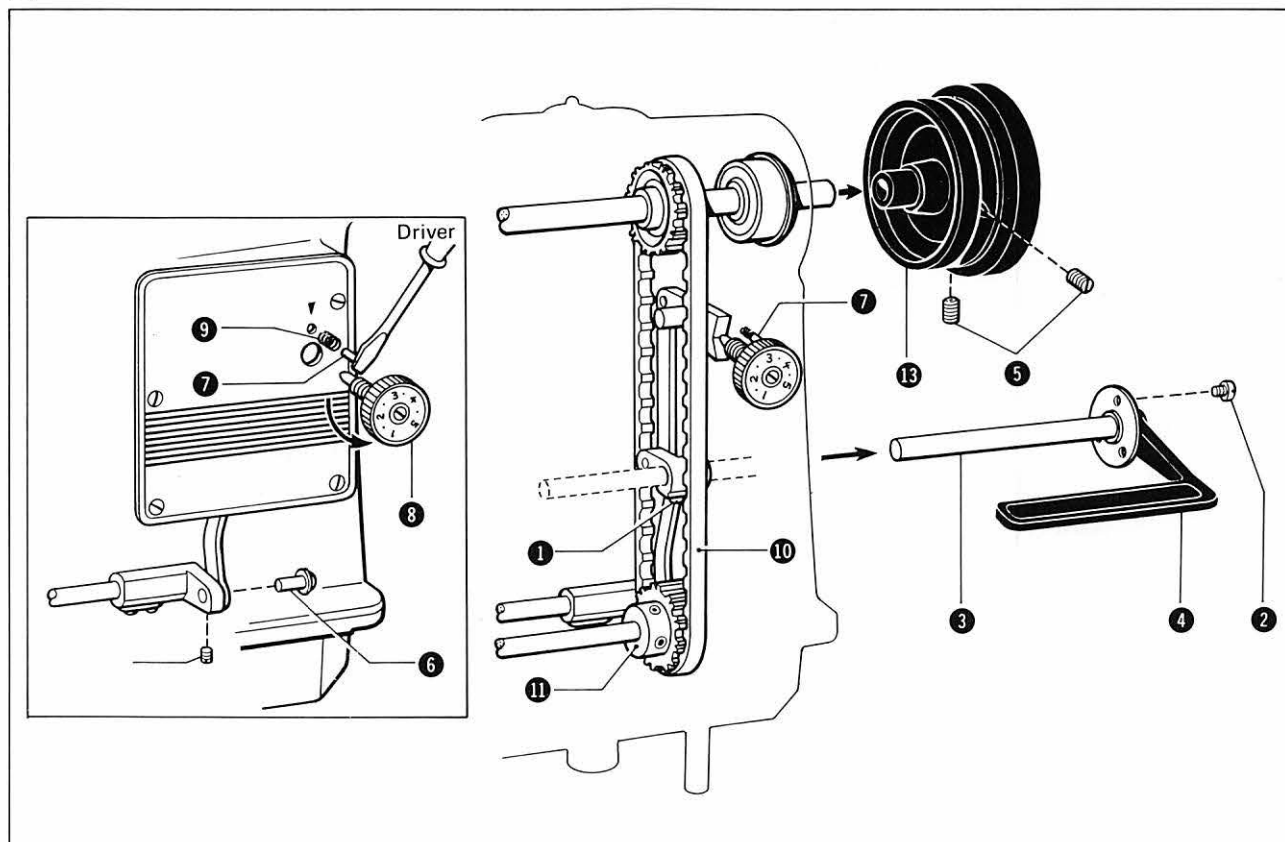
Presser Bar

1. Raise the machine.
2. Remove the two screws ①, and remove the thread take-up lever ②. The thread take-up mounting disc ③ can also be removed.
3. Remove the eight screws ④, and remove the face plate ⑤. The packing ⑥ can also be removed.
4. Loosen the work clamp adjustment screw ⑦ until there is no pressure applied to the presser bar ⑧.
- * Note that if the screw is loosened too much the presser bar leaf spring ⑨ will come out.
5. Loosen the screw ⑪ for the presser bar clamp ⑩, and lower the presser bar ⑧; remove the presser bar clamp ⑩ and link assembly ⑫ together.
6. After removing the screw ⑬, remove the presser bar ⑧ from the top.
- * Be careful not to lose the presser bar ball bearing ⑭ on the top of the presser bar ⑧.

Needle Bar

7. Remove the screw ⑮ and remove the needle bar thread guide ⑯.
8. Loosen the screw ⑰, and remove the needle bar ⑱ from the top.
- * When the needle bar ⑱ is removed, the needle bar clamp ⑲ can be removed.
9. Loosen the screw ⑳, and pull pin F ㉑ forward and out.
10. Loosen the screw ㉒, and remove the needle bar frame ㉓.
- * Loosen the screws ㉔ and ㉕ to the thread take-up crank ㉔, and the needle bar crank stud ㉗ and needle bar connecting link ㉘ can be removed.

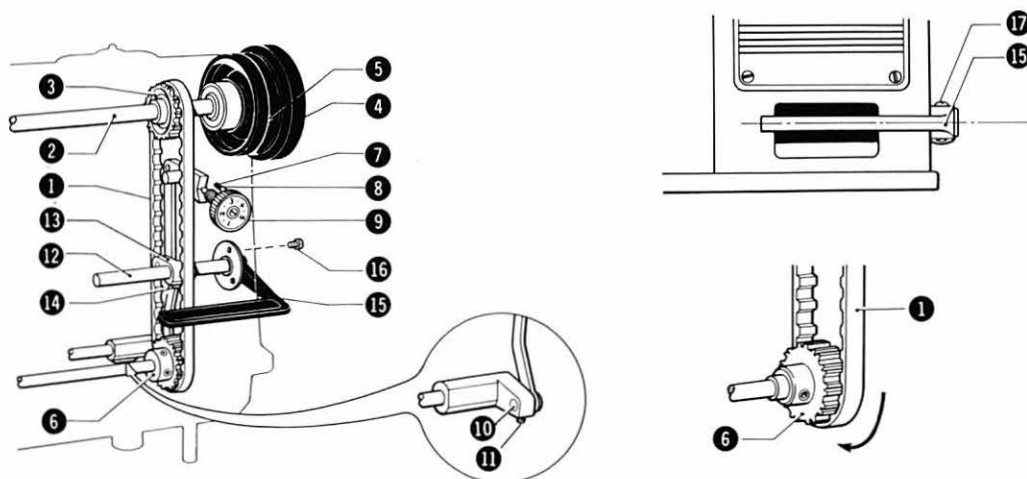
5 TIMING BELT



1. Tilt the machine.
2. Loosen screw ① and remove the three screws ②; remove the reverse lever shaft ③ and reverse lever ④.
3. Loosen screw ⑤ and remove the feed regulator stud ④.
4. While depressing pin ⑦ with a screwdriver, remove the length control dial ⑧.
- * Be careful not to lose the pin ⑦ or spring ⑨.
5. Take the timing belt ⑩ off of timing pulley D ⑪.
6. Raise the machine.
7. Loosen the two screws ⑫ and remove the machine pulley assembly ⑬.
8. Take the timing belt ⑩ off of the arm.

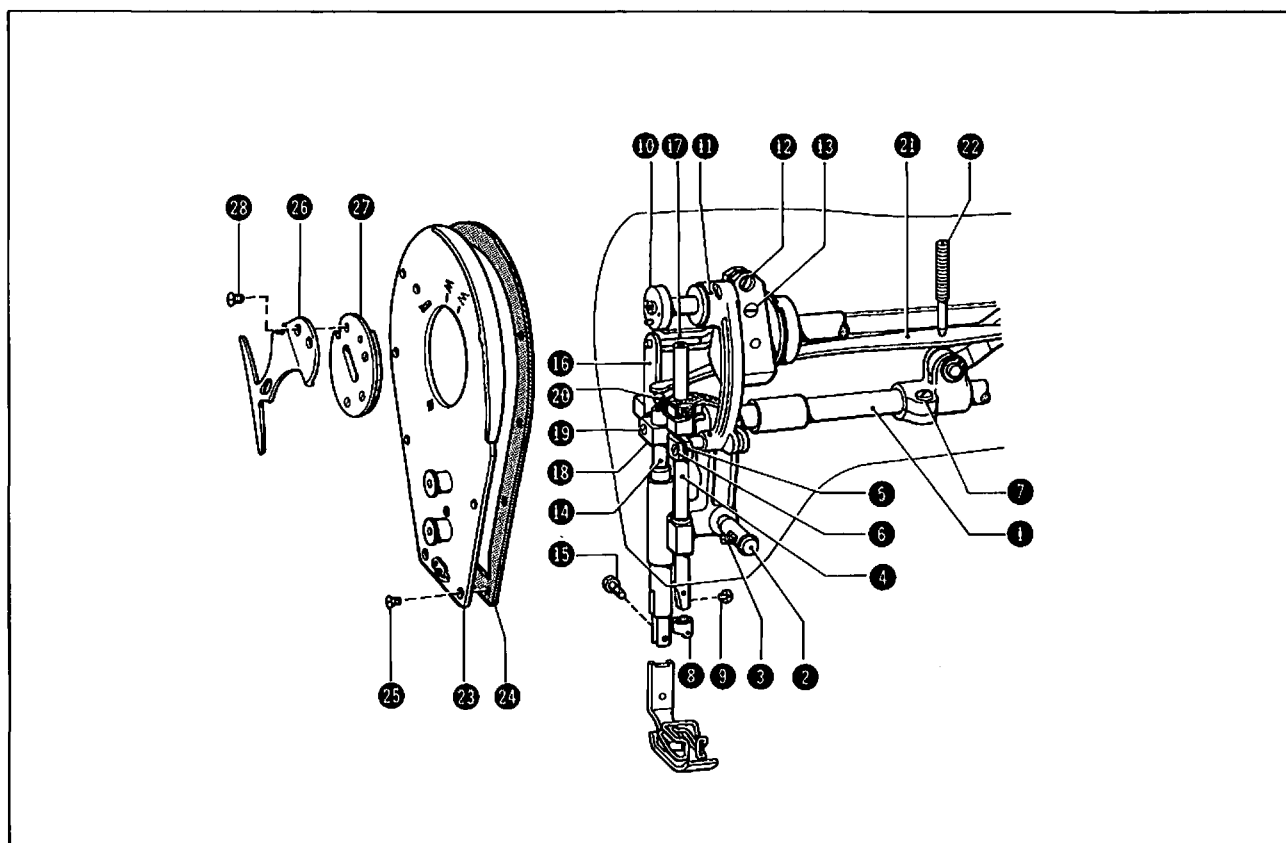
ASSEMBLING PROCEDURES

1 TIMING BELT



1. Raise the machine.
2. Mount the timing belt ① from the hole on the top of the arm onto timing pulley U ③ of the upper shaft ②.
3. Mount the machine pulley ④ onto the upper shaft ② and tighten the two mounting screws ⑤.
- * Tighten the front mounting screw ⑤, the screw found on the forward side of the rotational direction of the machine pulley, adjacent to the screw in the upper shaft ②.
4. Tilt the machine.
5. Mount the timing belt ① onto timing pulley U ③.
6. Turn the machine pulley ④ by hand, and mount the timing belt ① onto timing pulley D ⑥.
- * Turning the machine pulley ④ will mount the timing belt ① firmly onto pulley D ⑥.
7. Insert the spring ⑦ and pin ⑧, and install the length control dial ⑨.
- * Mount the edge of the length control dial into the V-groove of the backstich unit.
8. Mount the feed regulator stud ⑩ in link D and feed regulator lever D and tighten it in place with mounting screw ⑪.
9. Mount the reverse shaft ⑫ from the arm side, pass it through feed regulator lever U ⑬ and secure with mounting screw ⑭.
10. Install the reverse lever shaft ⑫ and reverse lever ⑮ with three set screws ⑯.
11. Loosen screw ⑰, set the reverse lever ⑮ to the center position and retighten the screw.
12. Turn the length control dial and set the feed length to "0" (the lowest setting).
- * The reverse lever ⑮ should not move vertically. (If it moves, tighten the length control dial. Refer to page 16.)

2 PRESSER BAR AND NEEDLE BAR



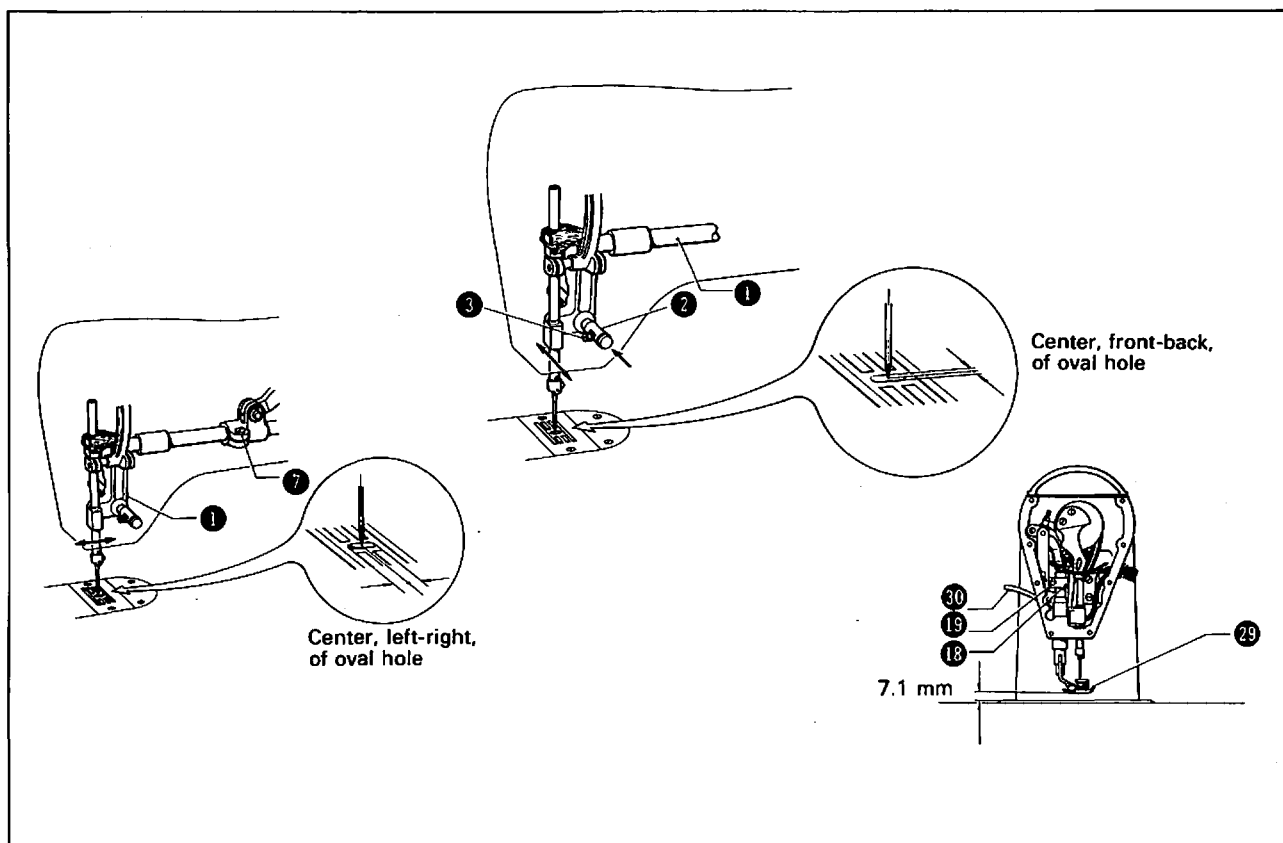
Needle Bar

1. Mount the needle bar crank rod assembly ① in the arm chin part.
2. Push pin F ② all the way in, and temporarily tighten set screw ③.
3. Mount the needle bar ④ from the top of needle bar crank rod assembly ①; pass it through the needle bar clamp ⑤ and temporarily tighten set screw ⑥.
4. Set the zigzag width scale to "0". With the needle bar ④ in the center of the oval hole in the arm chin part, temporarily tighten set screw ⑦.
5. Install the needle bar thread guide ⑧ and set screw ⑨ onto the needle bar ④.
- * Before installing the needle bar above, install the needle bar crank stud ⑩ and needle bar connecting link ⑪ with screws ⑫ and ⑬.

Presser Bar

6. Insert the presser bar ⑭ into the arm chin part and screw set screw ⑮ into the presser bar ⑭.
7. Hook the link ⑮ hole onto the horizontal shaft ⑰. Pass the presser bar ⑭ through the presser bar clamp ⑱ and temporarily tighten set screw ⑲.
8. Set the presser bar ball bearing ⑳ onto the top of the presser bar ⑭. Tighten adjustment screw ㉓ so that the presser bar leaf spring ㉑ does not come off the presser bar.

Make the adjustments on the following pages after assembling the machine as above. After adjustments are completed, install the face plate ㉒ and packing ㉔ with eight screws ㉕. Then install the thread take-up lever ㉖ and presser plate spring ㉗ with two screws ㉘.



Adjust the left-right position of the needle bar.

1. Install the needle plate and needle.
2. Set the zigzag width scale to "0". (Turn the machine pulley and confirm that the needle tip does not move either left or right.)
- * If the zigzag width will not assume a "0" position, refer to page 18 and 19 for adjustment.
3. Loosen the set screw (7) and move the needle bar crank rod assembly (1) left or right so that the needle tip is centered left and right in the needle hole of the needle plate.
4. Firmly tighten set screw (7).

Adjust the front-back position of the needle bar.

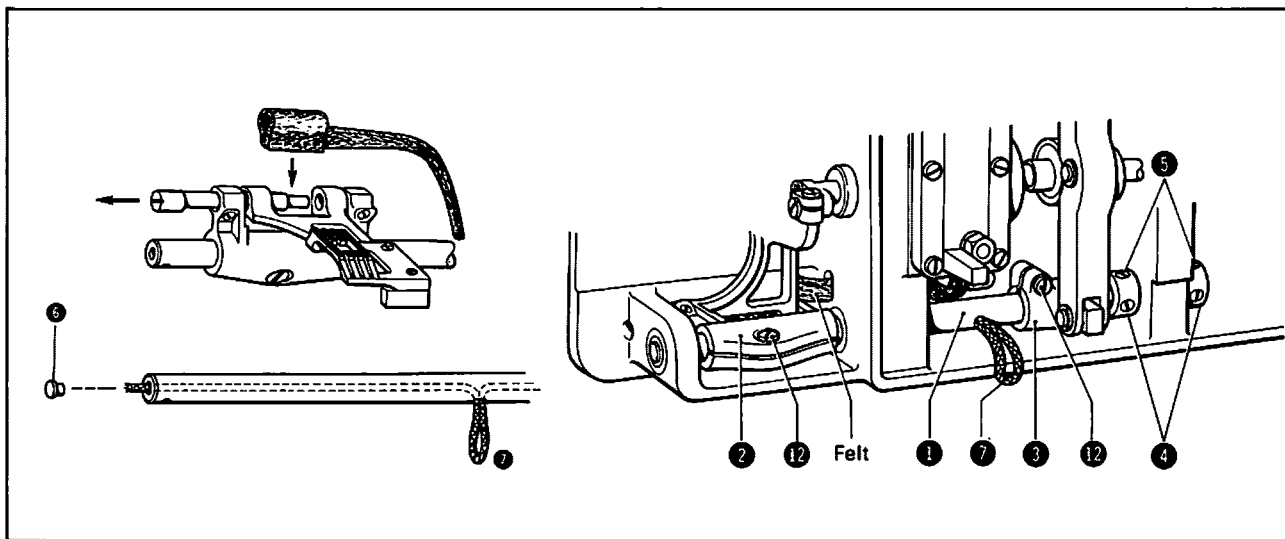
1. Loosen screw (3); depress pin F and/or R and move the needle bar crank rod assembly (1) so that the needle tip is centered front and back in the needle hole of the needle plate.
2. Make sure there is no play in the forward-back direction of the needle bar crank rod assembly and that it moves lightly when the needle zigzags.
3. Firmly tighten set screw (3).

Adjust the presser foot height

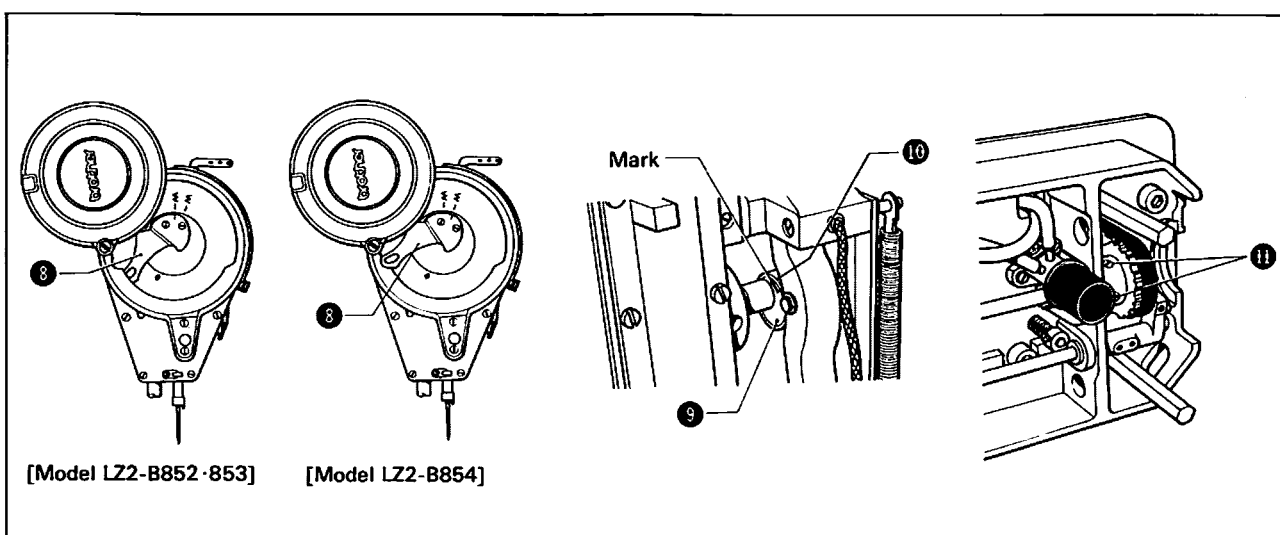
1. Install the presser foot (29).
2. Raise the presser foot (29) with the presser bar lifter lever (30).
3. Place a 7.1 mm thick block gauge under the presser foot (29); while pushing the presser bar clamp (18) down, firmly tighten set screw (19).

When adjustments are completed, install the needle, presser foot and needle plate.

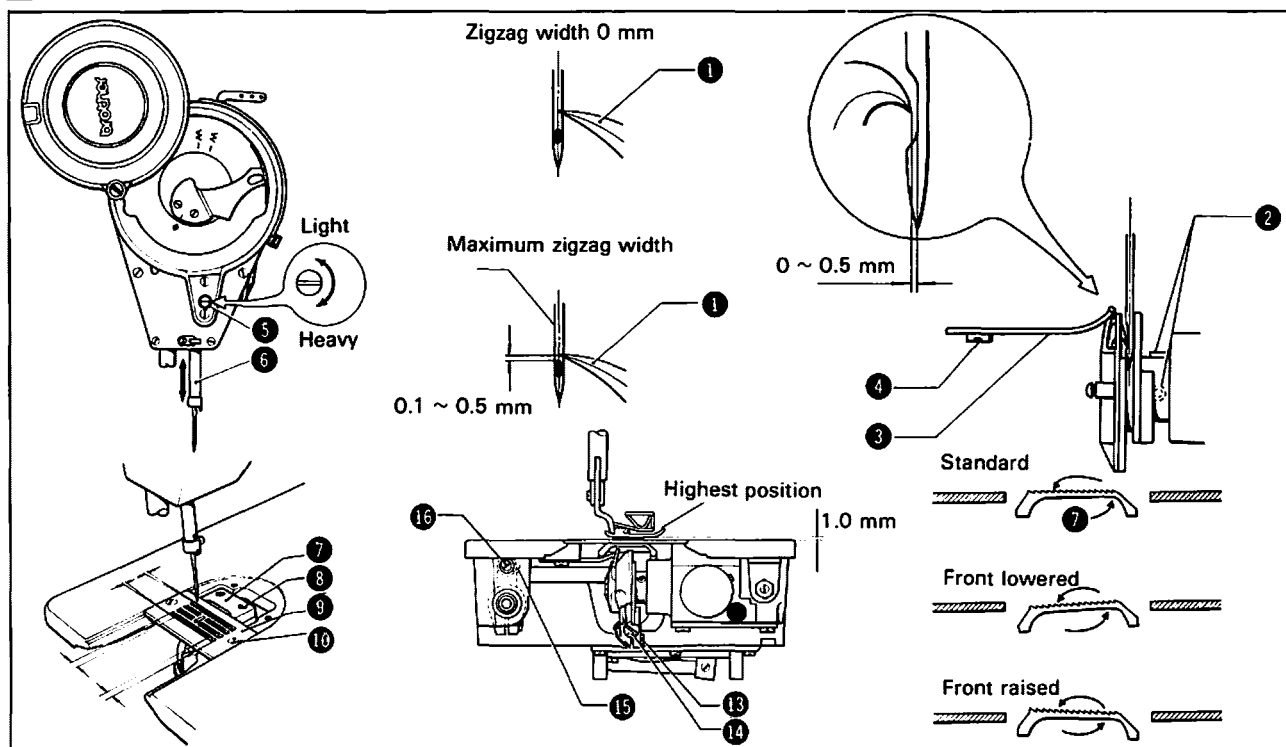
3 FEED MECHANISM



1. Tilt the machine.
2. Mount the feed driving shaft ① from the left side of the arm bed, passing it through the feed driving shaft arm ②, crank ③, and collar ④ in that order.
- * Mount the link connected to the feed driving shaft arm ② on the end of the lower shaft.
3. Align the left end of the feed driving shaft ① with the arm bed and tighten the set screw ⑤ for the collar ④.
4. Make sure there is no left-right play in the feed driving shaft ①.
5. Remove the oil cap ⑥ and insert the wick ⑦ through the feed driving shaft ①. (Pull out approx. 100 mm of the wick ⑦ from center of the feed driving shaft ①.)
6. Replace the oil cap ⑥.
- * To replace the felt: loosen the set screw, remove the feed bar hinge pin, and replace.
7. Adjust the needle and feed timing.
 - (1) On models LZ2-B852, B853 and B854: On B852, set the mark on the thread take-up lever ⑧ to the Σ mark on the face plate; on B854, set it to Σ ; on model B853, center the mark between the Σ and Σ marks.
 - (2) After properly positioning the mark on the thread take-up lever ⑧, loosen the two set screws ⑪ and align the marks on the eccentric cam ⑨ and eccentric wheel ⑩.
- * When the adjustment is ended, firmly retighten the two set screws ⑩.
8. Set the feed length regulator to "0", the smallest setting.
9. Turn the machine pulley and with the crank ③ positioned where it does not move, firmly tighten fillister screw ⑫.
10. Temporarily tighten set screw ⑬ until the front-back position adjustment of the feed dog is completed.



4 ROTARY HOOK



1. Temporarily install the rotary hook ① with two screws ②.
2. Temporarily install the rotary hook position bracket ③ with set screw ④.
3. Install the needle.
4. Adjust the needle and rotary hook timing.
- ★ Set the zigzag width to "0". (On model LZ2-B853, set the needle position adjustment lever to the center.)
Turn the machine pulley and align the mark on the thread take-up lever with the "φ" mark on the face plate. Now, align the rotary hook point ① with the needle center, and set the needle to rotary hook point ① gap between 0 ~ 0.05 mm. Then firmly tighten the screw ②.
- ★ Set the zigzag width to the maximum setting. (5 mm on model LZ2-B852, and 8 mm on models LZ2-B853 and B854.)
Turn the machine pulley and set the needle to its furthest left position.
Loosen needle bar clamp set screw ⑤ and vertically shift the needle bar ⑥, adjusting the gap between the rotary hook point ① and top edge of the thread hole in the needle to between 0.1 ~ 0.5 mm when the rotary hook point is aligned with the needle center.
Also, reconfirm that the rotary hook to rotary hook point gap is between 0 ~ 0.05 mm.
5. Install the feed dog ⑦ with the two set screws ⑧.
6. Install the needle plate ⑨ with the two screws ⑩.
7. Set the length control dial to the maximum setting.
8. Adjust the centering of the feed dog in the needle plate.
- ★ Loosen set screw ⑪ and adjust the front-back, and right-left gaps with the feed driving shaft arm ⑫ so that the feed dog ⑦ does not strike the needle plate ⑨ when the machine pulley is turned.
9. Adjust the feed dog height and bias.

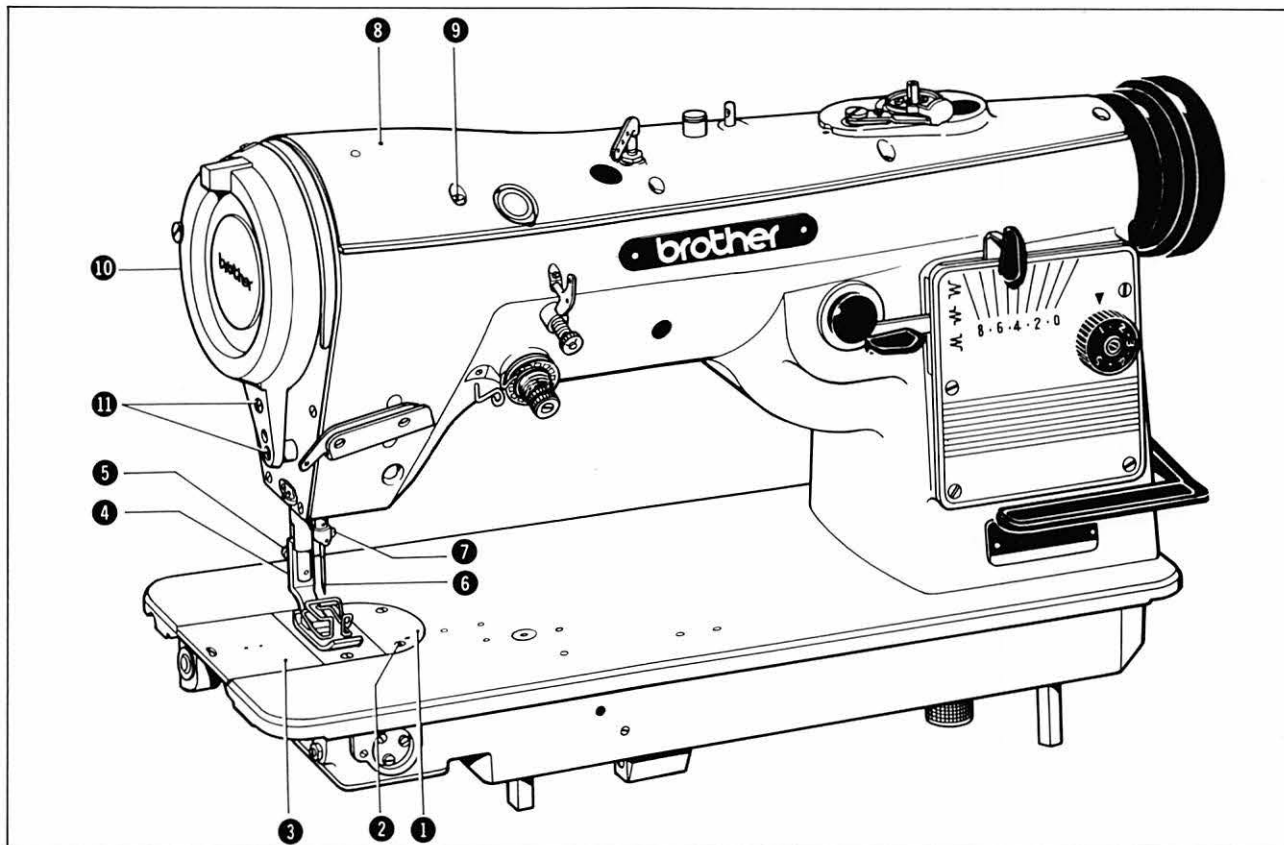
Feed Dog Height Adjustment

1. Standard height when the feed dog ⑦ is raised to its highest position above the needle plate is 0.8 mm.
2. Loosen the set screw ⑬, turn the feed bar lifting link hinge pin ⑭, and adjust the feed dog to a height 0.8 mm above the needle plate.
- ★ After adjustment, firmly tighten the set screw ⑬.

Feed Dog Level Adjustment

1. When the feed dog ⑦ is raised above the needle plate, standard level is when the feed dog ⑦ and needle plate are parallel.
To prevent puckering, adjust the feed dog bias so that the front is raised.
To prevent material from slipping (stitching from skipping), adjust the feed dog ⑦ level so that the front is lowered.
2. When adjusting the feed dog ⑦ level, loosen the two set screws ⑮, and adjust the feed bar hinge pin ⑯ with a 90° range from the standard (reference) position.
- ★ When the feed dog ⑦ level is adjusted, the feed dog height will change, making it necessary to recheck the feed dog height.
- ★ After adjustment, firmly tighten the two set screws ⑮.

5 COVER

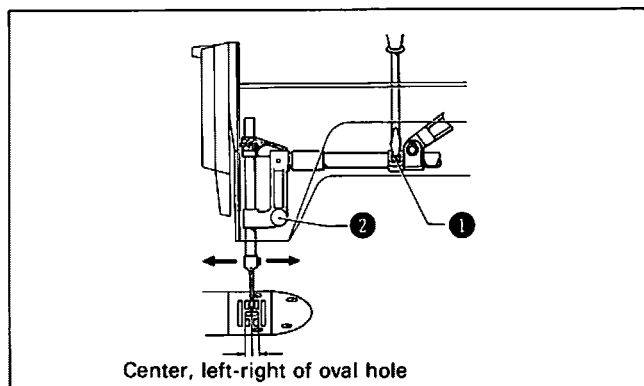


1. Raise the machine.
2. Install the needle plate ① with two screws ②.
3. Install the slide plate ③.
4. Install the presser foot ④ with set screw ⑤.
5. Install the needle ⑥ with set screw ⑦.
6. Install the arm top cover ⑧ with eight screws ⑨.
7. Install the thread take-up guard cover ⑩ with two screws ⑪.

ADJUSTING PROCEDURES

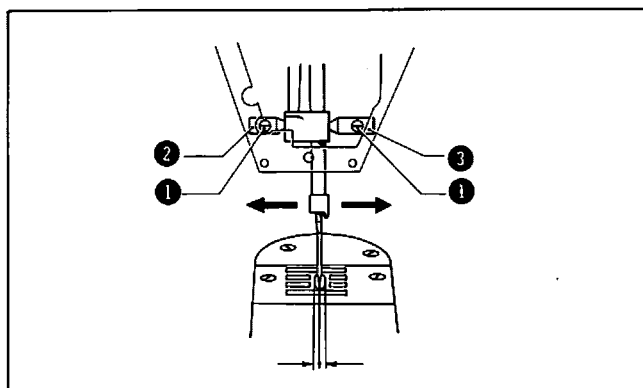
1 NEEDLE BAR POSITION (LEFT AND RIGHT) ADJUSTMENT

1. Remove the arm top cover and then make the adjustment.
2. Set the zigzag width scale to "0".
3. Loosen set screw ① from the top of the arm.
4. Adjust the needle bar crank rod ② so that the needle is positioned in the center of the needle hole in the needle plate.
5. Firmly retighten set screw ①.



2 NEEDLE BAR POSITION (FRONT AND BACK) ADJUSTMENT

1. Remove the thread take-up guard cover and face plate and then make the adjustment.
 2. Loosen the two screws ①.
 3. Push pin R ② and/or pin F ③ to adjust the needle so that it comes to the center of the needle hole in the needle plate.
 4. Firmly retighten the two screws ①.
- * When the adjustment is completed make sure the needle bar frame does not move forward and back, and that the needle moves easily and smoothly when it zigzags.

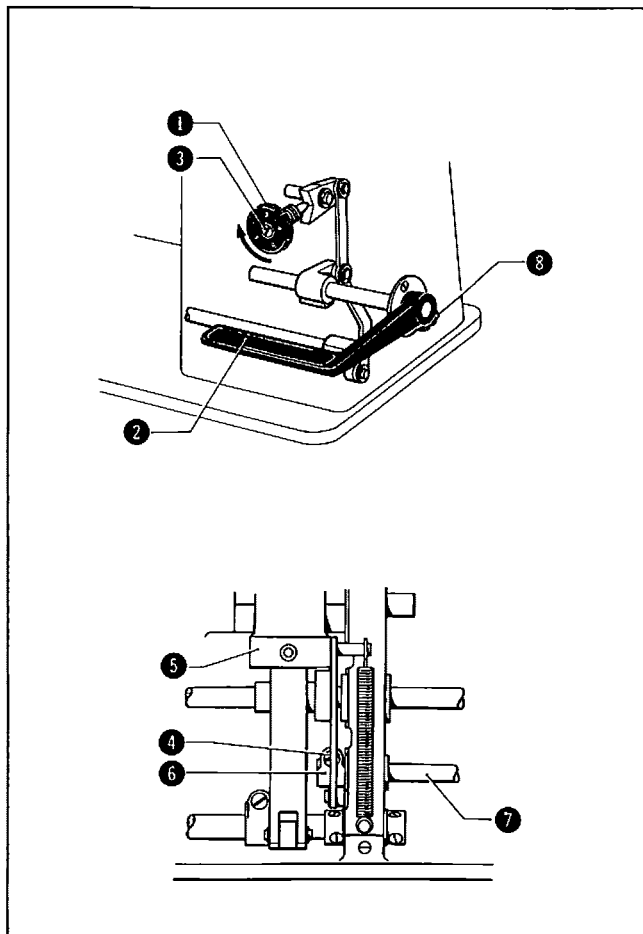


3 STITCH LENGTH ADJUSTMENT

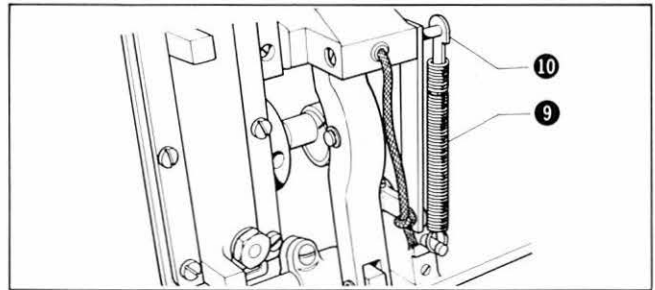
1. Turn the length dial ① clockwise all the way in (in the direction of the arrow), and make sure the reverse lever ② does not move up or down. If the reverse lever ② moves, loosen set screw ③ and turn the length control dial ① counter-clockwise back. Then retighten set screw ③ and check for any vertical movement in the reverse lever ①. Repeat this operation until the reverse lever ① will not move when the length control dial ① is turned all the way in.
 2. Turn the machine pulley and make sure the feed scale reaches "0". If the feed scale will read "0", loosen set screw ④ and adjust the feed carrier ⑤ bias with the crank ④.
- * When set screw ④ is loosened, make sure there is no movement in the feed regulator shaft ⑦.
3. Loosen set screw ⑧ and install the reverse lever so that it is level.

Make the following adjustments on models LZ2-B852 and B854.

4. Set the length control dial ① to the maximum setting.
5. Check if the length set on the length control dial ① and the actual stitch length are nearly equal. If the actual and set stitch lengths are not equal, reset the length control dial ① to the minimum setting and loosen set screw ③. Turn the length control dial ① just the amount the lengths differ, and then retighten set screw ③.

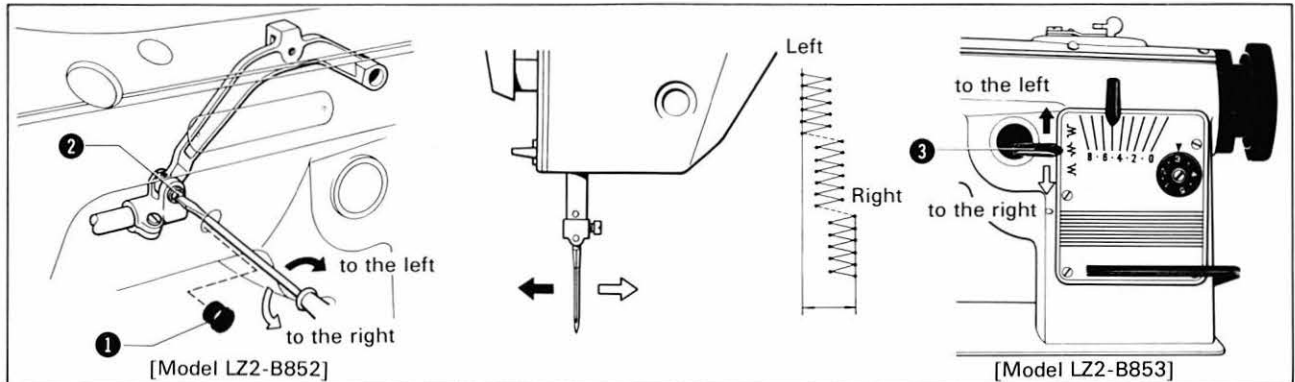


It is possible to change the stiffness of the reverse lever action. Release spring **9**, and turn the spring hook **10** to adjust.



4 REFERENCE POSITION ADJUSTMENT LEVER (NEEDLE POSITION) ADJUSTMENT

- * No adjustment is needed on model LZ2-B854 because the zigzag cam sets the reference position.
- * If adjustments are made with the needle in the material, the needle will be bent. Always make adjustments with the needle raised.



[Model LZ2-B852]

- * Turn off the machine and confirm that the motor has completely stopped running.
- ★ Remove the oil cap **1** and turn the connecting link stud **2** to adjust.
If the connecting link stud **2** is turned to the right (clockwise), the needle will move to the left. If the connecting link stud **2** is turned to the left (counter-clockwise), the needle will move to the right. Replace the oil cap **1** after adjustment.

[Model LZ2-B853]

- ★ If the needle position adjusting lever **3** is set to the $\approx$ mark (top), the needle will move to the left position.
If the needle position adjusting lever **3** is set to the $\approx$ mark (bottom), the needle will move to the right position.

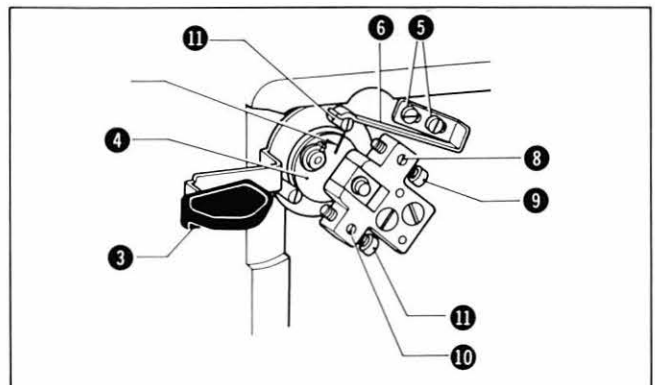
1. Set the zigzag lever to "0".
2. Set the needle adjustment lever **3** to a level position. Align the reference marks on bushing L **4** (i.e. the lines on the large and small bushings).
- If the lines are not aligned, loosen set screw **5**, and adjust the needle position set spring **6** so that the needle position adjustment lever **3** becomes level. Finally, firmly tighten set screw **5**.

- Loosen set screw **7**, and align the reference lines on the large and small bearings. Then firmly retighten set screw **7**.

For the left reference line, loosen screw **8** and turn set screw **9** to adjust.

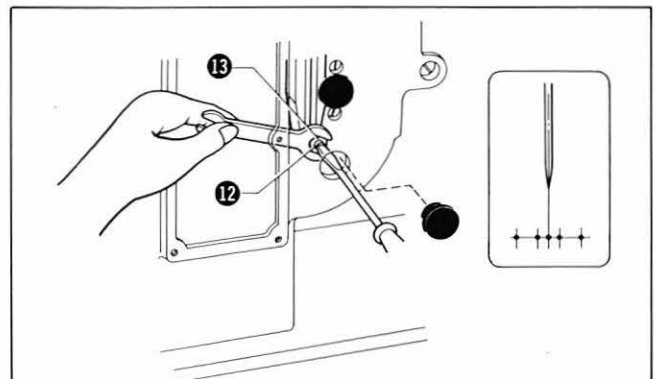
For the right reference line, loosen screw **10** and turn set screw **11**.

- * When the adjustment is completed, be sure to firmly retighten set screws **8** and **10**.
- * The stopper **11** should contact the tip of set screws **8** and **10** during use.



Zigzag Width Position Adjustment [LZ2-B854]

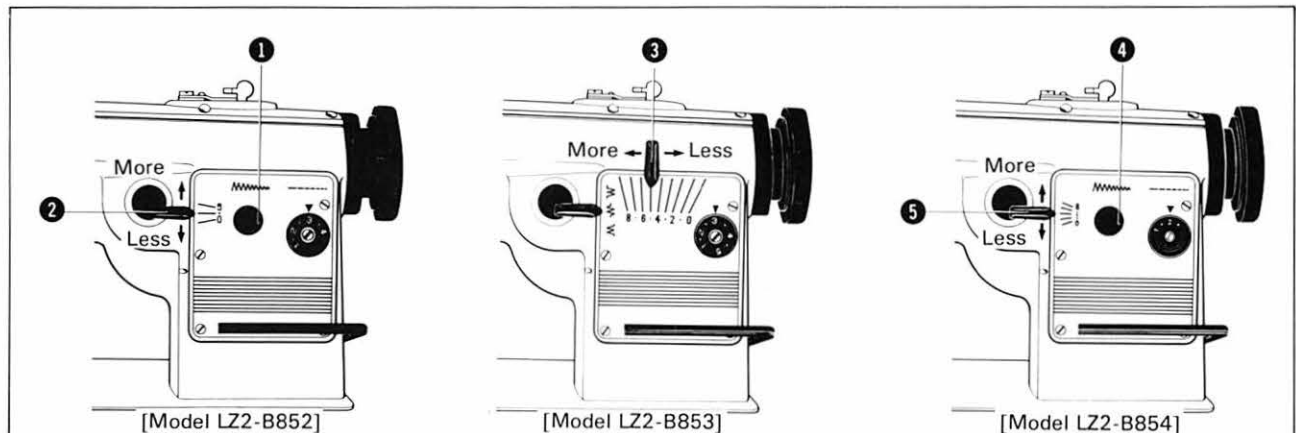
1. Remove the rubber plug on the back of the machine.
2. Loosen nut **12**, and turn the eccentric shaft **13**.
3. Set to the maximum zigzag width and adjust so that the needle drop position (stitch) comes to the center.



5 ZIGZAG WIDTH REFERENCE POSITON ADJUSTMENT

Zigzag Width Adjustment

- * Zigzag width adjustments should be made after the machine is stopped.
- * If adjustments are made with the needle in the material, the needle will be bent. Always make adjustments with the needle raised.



[Model LZ2-B852]

1. Loosen the set screw ①, and move the needle vibrating lever ② up and down, adjusting to the desired zigzag width. Remember to tighten the set screw ① after adjustment.
2. The figures in the scale on the front arm cover indicate zigzag width in mm. Maximum zigzag width is 5 mm.

[Model LZ2-B853]

1. The farther left the needle vibrating lever ③ is set, the greater the zigzag width becomes.
2. The figures in the scale on the front arm cover indicate zigzag width in mm. Maximum zigzag width is 8 mm.

[Model LZ2-B854]

1. Loosen the set screw ④, and move the needle vibrating lever ⑤ up or down, adjusting to the desired zigzag width. Remember to tighten the set screw ④ after adjustment.
2. The figures in the scale in the front arm cover indicate zigzag width in mm. Maximum zigzag width is 8 mm.

Zigzag width

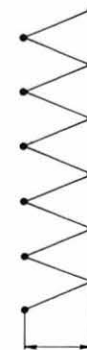
[Model LZ2-B852]

[Model LZ2-B853]

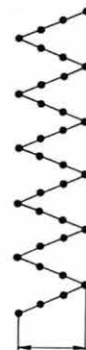
[Model LZ2-B854]



0 ~ 5 mm



0 ~ 8 mm



0 ~ 8 mm

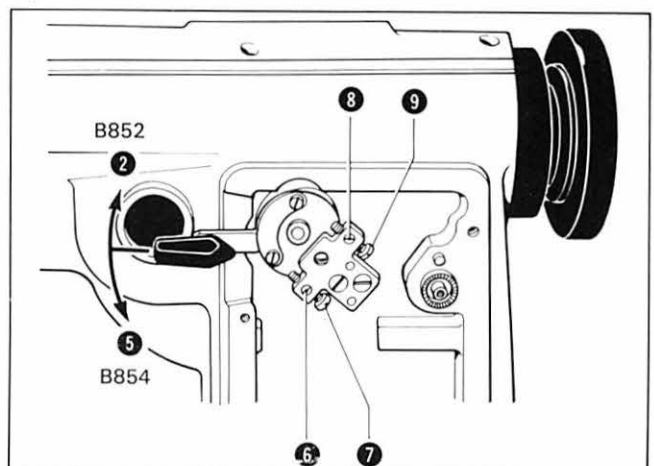
* If the above adjustments cannot be made, make the adjustment below.

Zigzag Lever Reference Position Adjustment (minimum and maximum zigzag width adjustment)

<For models LZ2-B852 and B854>

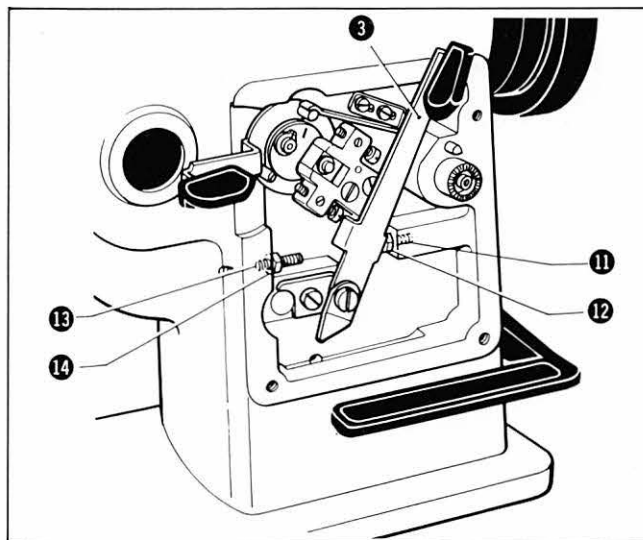
1. Remove the name plate.
2. Completely lower zigzag levers ② and ⑤.
3. Loosen set screw ⑥.
4. Turn set screw ⑦ adjusting the needle to a position where it does not vibrate.
5. Completely raise zigzag levers ② and ⑤.
6. Loosen set screw ⑥.
7. Turn set screw ⑨ and adjust the needle to the maximum zigzag width (5 mm on B852; 8 mm on B854).

* When the adjustment is completed, firmly retighten set screws ⑥ and ⑧.



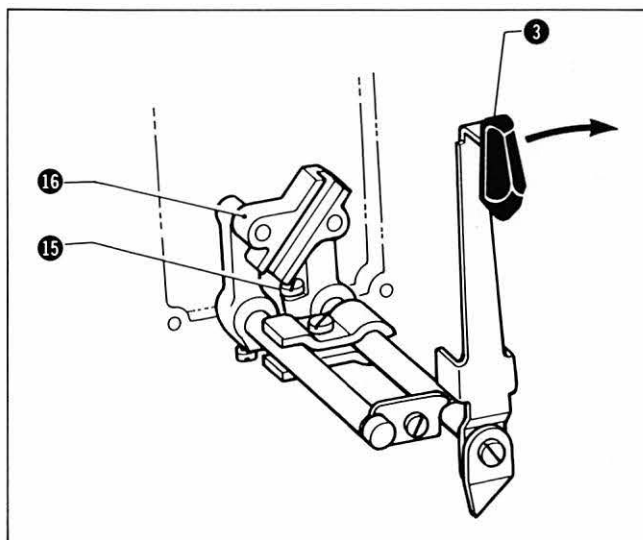
<For model LZ2-B853>

1. Remove the zigzag width scale dial assembly.
2. Remove the name plate.
3. Align the zigzag lever ③ with the "0" on the name plate.
4. Loosen nut ⑪ and adjust set screw ⑫ so that the zigzag lever ③ aligns exactly with the "0".
5. Retighten nut ⑪.
6. Move the zigzag lever ③ all the way to the left side (around "8" on the name plate).
7. Loosen nut ⑬ and turn screw ⑭, adjusting the needle to its maximum zigzag width (8 mm on B853).
8. Retighten nut ⑬. Reinstall the name plate and zigzag width scale dial.



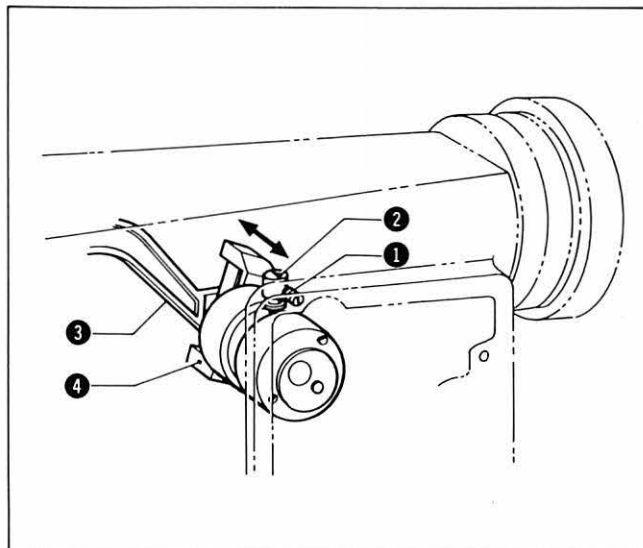
If the above adjustments cannot be made, do the following.

1. Remove side plate R.
 2. Move the zigzag lever ③ all the way to the right.
 3. Loosen set screw ⑮ and adjust the crank assembly ⑯ angle so that the needle will not move.
 4. Retighten set screw ⑮.
- * The stiffness in the zigzag lever ③ action can be adjusted with set screw ⑰. Adjust so that the zigzag lever ③ will not move during machine operation, and so that the zigzag lever ③ moves smoothly when the zigzag width is changed.



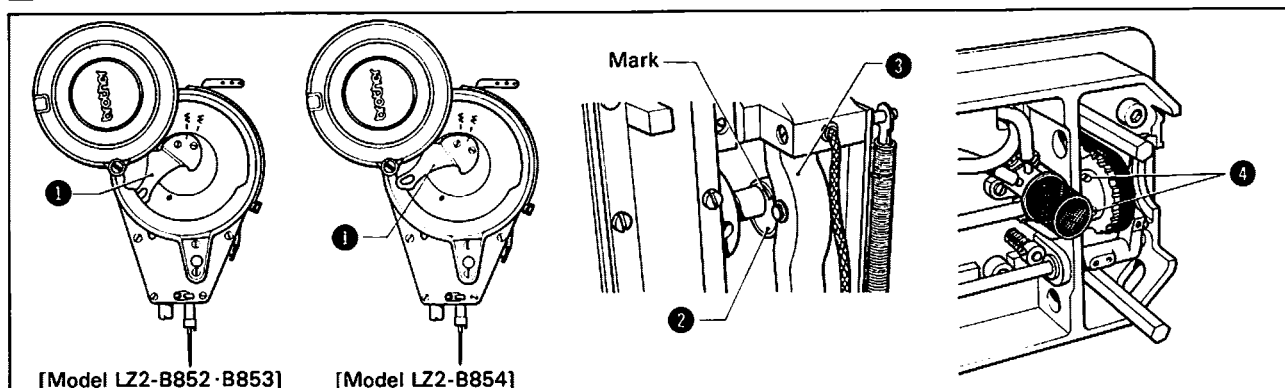
⑥ ZIGZAG REGULATOR POSITION (FRONT AND BACK) ADJUSTMENT

1. Loosen set screw ①.
 2. Adjust the position control stud ② to the position where the needle bar vibrating rod ③ and zigzag regulator ④ move lightly.
- * The position control stud ② is an eccentric shaft.
- * After the adjustment is completed, firmly tighten set screw ①.

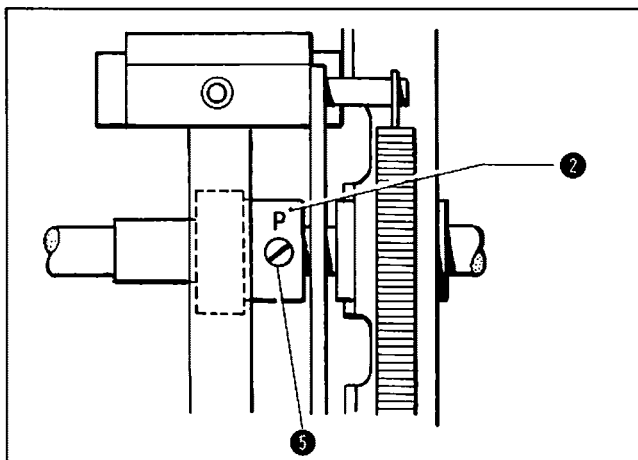


* When making any of the standard adjustments, always turn the power off and make sure the motor has completely stopped before making the adjustments.

7 NEEDLE AND FEED TIMING ADJUSTMENT

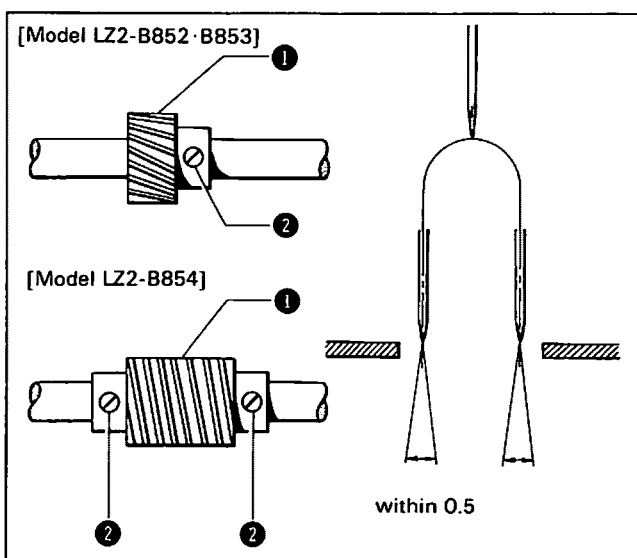


- ★ On model LZ2-B852 set the thread take-up lever ① mark to the S mark on the face plate; on model LZ2-B854, set it to the Z mark; on model LZ2-B853, center it between the S and Z marks.
Now make sure the marks on the eccentric wheel ③ and eccentric cam ② on the lower shaft are aligned.
- ★ If the needle and feed timing is out of adjustment, first appropriately align the thread take-up lever ① mark with the S or Z marks on the face plate. Then loosen the two set screws ④ and align the marks on the eccentric wheel ③ and eccentric cam ②.
- * After the adjustment is completed, firmly tighten the two set screws ④.
- * Put a pointed screw ⑤ into the P-marked screw hole on the eccentric cam ② and tighten the screw into the lower shaft screw stop.

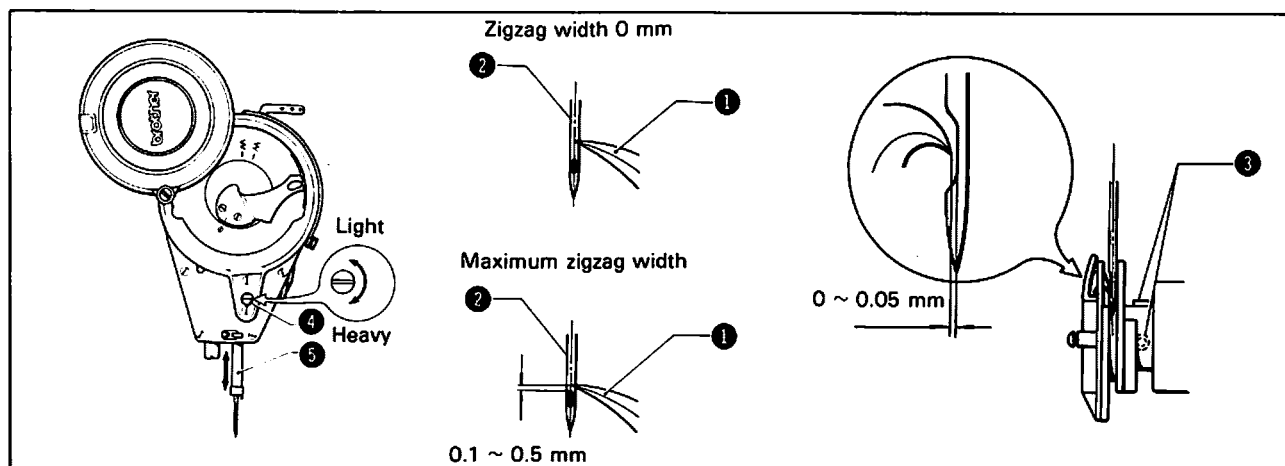


8 ADJUSTMENT OF NEEDLE SIDewise MOVEMENT

1. Loosen the set screw ② in the upper shaft gear ① on the upper shaft.
 2. Adjust the upper shaft gear ① so that the needle tip moves in an inverted "U" shape.
- * Adjust so that needle sidewise movement is as small as possible when the needle enters the needle plate. After the adjustment is completed, firmly retighten set screw ②.



9 NEEDLE AND ROTARY HOOK TIMING ADJUSTMENT



1. Set the zigzag width to 0 mm. On model LZ2-B853 set the needle position adjusting lever to the center.
 2. Turn the machine pulley, and adjust the reference line of the rotary take-up to the "φ" mark on the face plate. At this point, the rotary hook point ① should be aligned with the center of the needle ②.
Also, check that the clearance between rotary hook point ① and needle ② is between 0 ~ 0.05 mm.
When the rotary hook point ① is not aligned with the center of the needle, or when the clearance between the rotary hook point ① and needle ② is not within 0 ~ 0.05 mm, loosen the two set screws ③, and adjust the rotary hook.
 3. Set the zigzag width to the maximum setting. (On the LZ2-B852 model, set to 5 mm; on the LZ2-B853 and LZ2-B854, set to 8 mm.)
 4. Turn the machine pulley, setting the needle ② to the furthest left position.
At this time, check that the clearance between the upper lip of the needle hole and rotary hook point ① is between 0.1 ~ 0.5 mm.
 5. If the clearance is not correct, loosen the set screw ④ and adjust by raising or lowering the needle bar ⑤.
- * After adjustment, firmly tighten all of the set screws ③, ④.

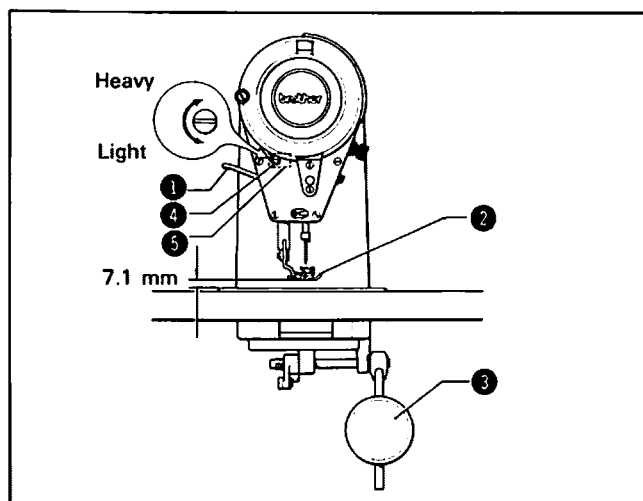
10 PRESSER FOOT HEIGHT ADJUSTMENT

* Make adjustment after turning the power off and confirming that the motor has completely stopped.

★ Standard height when the presser foot ② is raised by the presser foot lifter ① is 7.1 mm.

1. Raise the presser foot ② with the knee lifter cover ③.
2. Place a 7.1 mm thick object under the presser foot ②.
3. Loosen the set screw ④.
4. Push the presser bar position guide ⑤ down, and screw in the set screw ④.

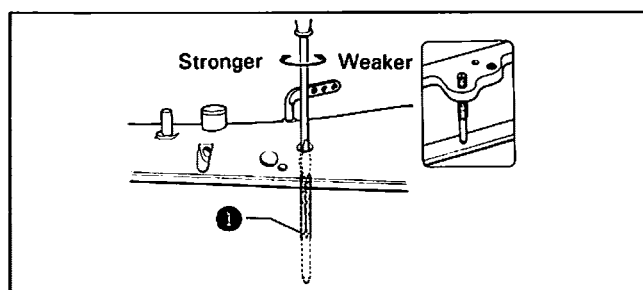
* Firmly tighten the set screw ④.



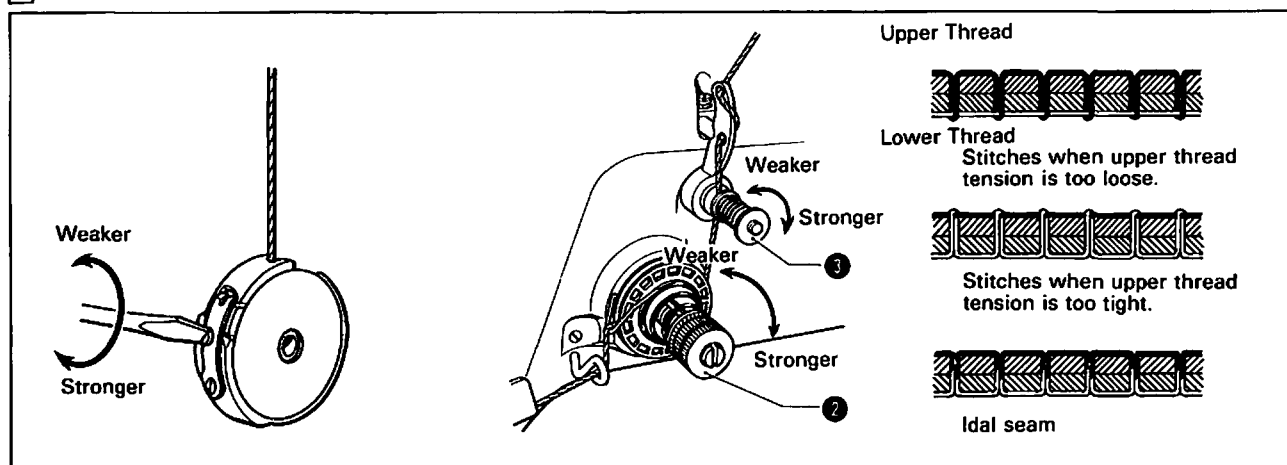
Presser Foot Pressure Adjustment

★ Presser foot pressure is adjusted by turning the presser bar spring screw stud ① with a screwdriver.

* Presser foot pressure can be adjusted between 0 ~ 9 kg to correspond to the material being sewn.



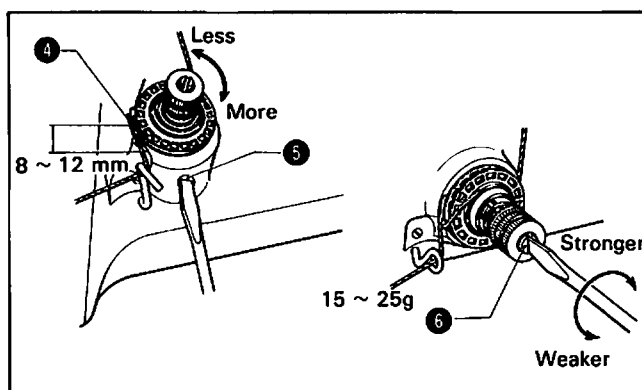
11 SEWING TENSION



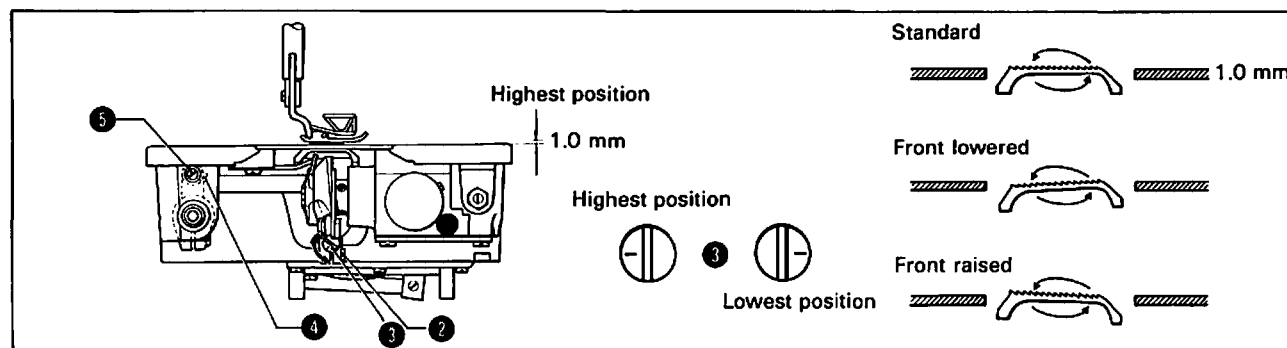
- ★ Lower thread tension is adjusted by turning the thread tension screw ①.
- ★ Because the strength of the pretension adjustment ③ is stronger than that of the rotary tension ②, fine adjustments should be made by the rotary tension ②.
- ★ Note that if the pretension ③ is too weak, the thread would around the rotary tension ② may slip.

Thread Take-up Spring

- ★ The standard operational range of the thread take-up spring ④ is a 8 ~ 12 mm. Also, the standard strength of the thread take-up spring is a 15 ~ 25g.
- ★ To adjust the operational range of the thread take-up spring ④, loosen the set screw ⑤ and turn the rotary tension stud bracket.
- ★ To change the strength of the thread take-up spring ④, insert the tip of a screwdriver into the slot in the tension stud ⑥ and turn, adjusting to the desired strength.



12 FEED DOG HEIGHT AND LEVEL ADJUSTMENT



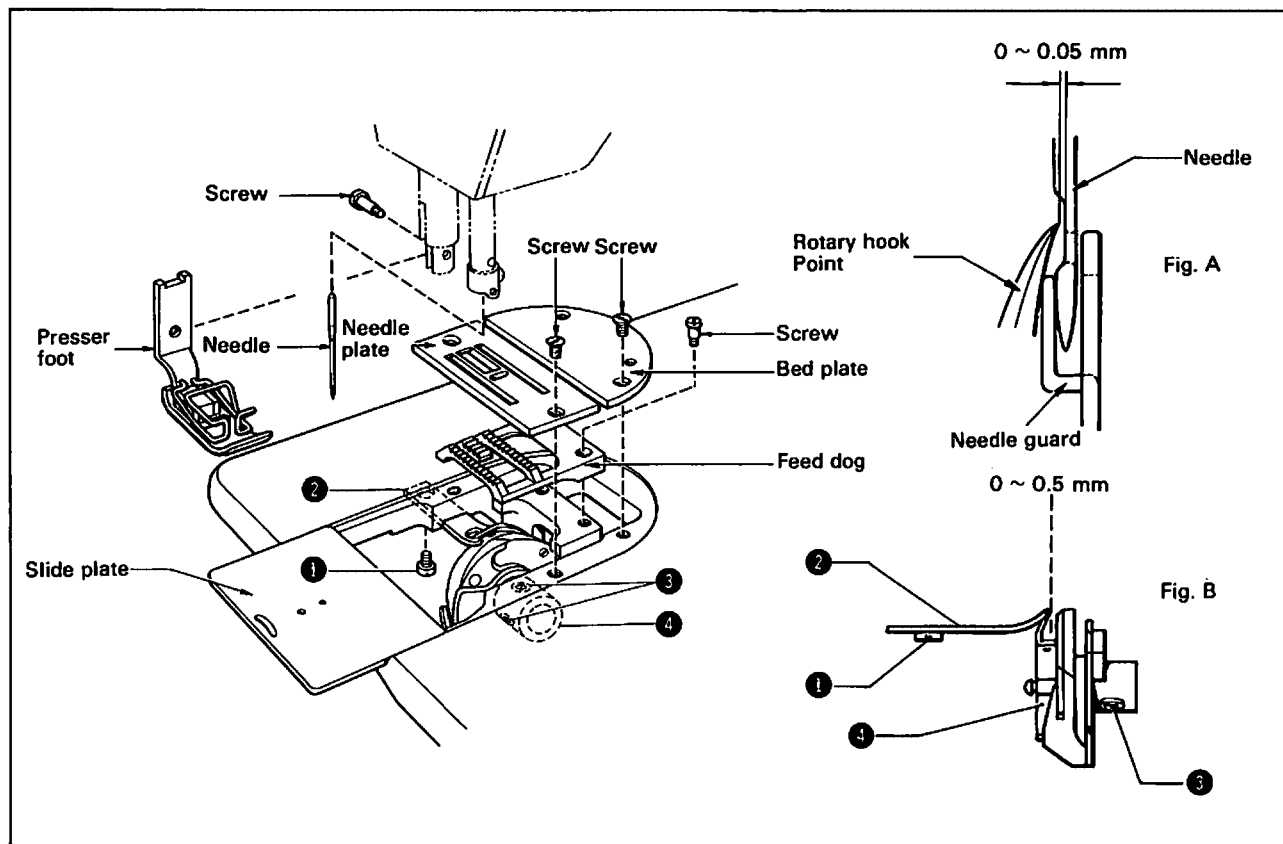
Feed Dog Height Adjustment

1. Standard height when the feed dog ① is raised to its highest position above the needle plate is 1.0 mm.
 2. Loosen the set screw ②, turn the feed bar lifting link hinge pin ③, and adjust the feed dog to a height 1.0 mm above the needle plate.
- ★ After adjustment, firmly tighten the set screw ②.

Feed Dog Level Adjustment

1. When the feed dog ① is raised above the needle plate, standard level is when the feed dog ① and needle plate are parallel.
To prevent puckering, adjust the feed dog bias so that the front is raised.
To prevent material from slipping (stitching from skipping), adjust the feed dog ① level so that the front is lowered.
 2. When adjusting the feed dog ① level, loosen the two set screws ④, and adjust the feed bar hinge pin ⑤ with a 90° range from the standard (reference) position.
- ★ When the feed dog ① level is adjusted, the feed dog height will change, making it necessary to recheck the feed dog height.
 - ★ After adjustment, firmly tighten the two set screws ④.

13 ADJUSTMENT OF ROTARY HOOK



Removal

1. Turn the machine pulley, setting the needle to the highest position.
2. Remove the needle, presser foot, bed slide, bed plate, needle plate, feed dog and bobbin case.
3. Remove the set screw ① and remove the bobbin case stop ②.
4. Loosen the two hexagon socket set screws ③, and remove the rotary hook ④.

Installation Adjustment

1. Install the rotary hook ④ by loosely screwing in the two hexagon socket set screws ③.
2. Install the bobbin case stop ② by loosely screwing in the set screw ①.
3. After adjusting the needle and rotary hook timing (refer to Section 2 of the previous page), firmly tighten the two hexagon socket set screws ③. Adjust the rotary hook ④ needle guard so that the rotary hook point and the needle will not come in contact, thus protecting against rotary hook point damage.

When replacing the rotary hook, always adjust the needle guard position. (Refer to Inset A.)

4. Adjust so that the edge of the bobbin case stop ② is installed between $0 \sim 0.5 \text{ mm}$ below the end of the rotary hook bracket (dotted line) of the inner hook. (Refer to Inset B.)
Make sure the end of the bobbin case stop ② does not extend to the right beyond the end of the rotary hook bracket (dotted line).

5. Install the feed dog, needle plate, bed plate, bed slide, presser foot, bobbin case, and needle.

* Finally, tighten all screws firmly.

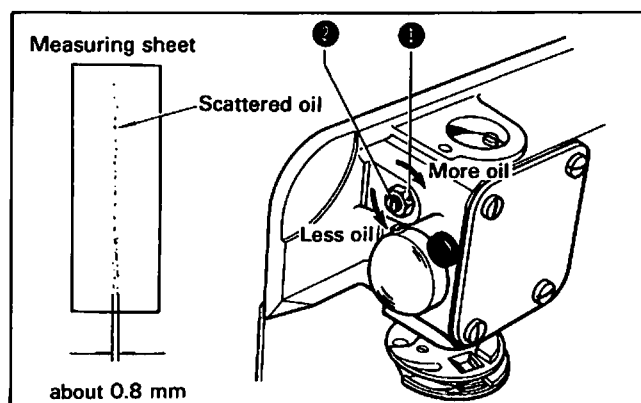
14 ROTARY HOOK OIL LEVEL ADJUSTMENT

- ★ Loosen the nut ①, and turn the rotary hook oil level adjustment screw ② to regulate the oil level.

Note: Always check the rotary hook oil level whenever the rotary hook is changed.

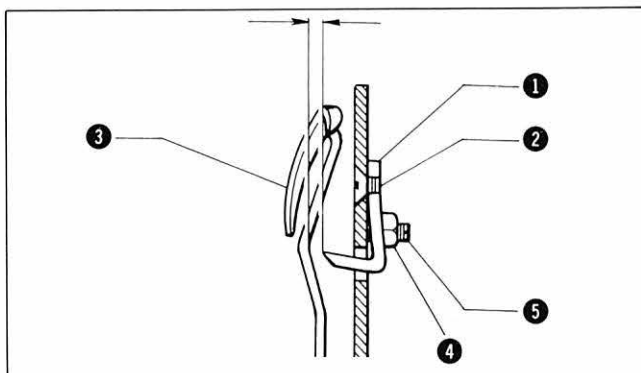
While running the machine, place a piece of paper under the rotary hook for approx. 5 seconds. Adjust the oil so that the oil being sprayed from the rotary hook forms 2 dotted lines on the paper.

- * When oil adjustment is completed, secure the adjustment screw ② with the nut ①.



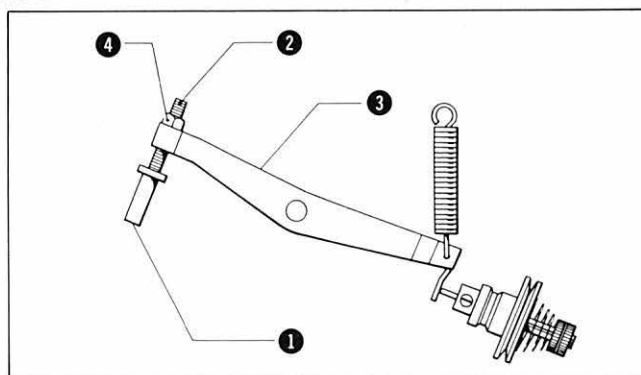
15 REPLACEMENT OF THREAD CUTTER

1. Remove eight screws, and next the face plate.
2. Remove the screw ① and then the thread cutter ②.
3. Adjust the clearance between the thread take-up lever ③ and the thread cutter ② in case of installing the thread cutter ②.
4. Loosen the nut ④ and adjust the clearance of 0.8 ~ 1.0 mm with the screw ⑤.

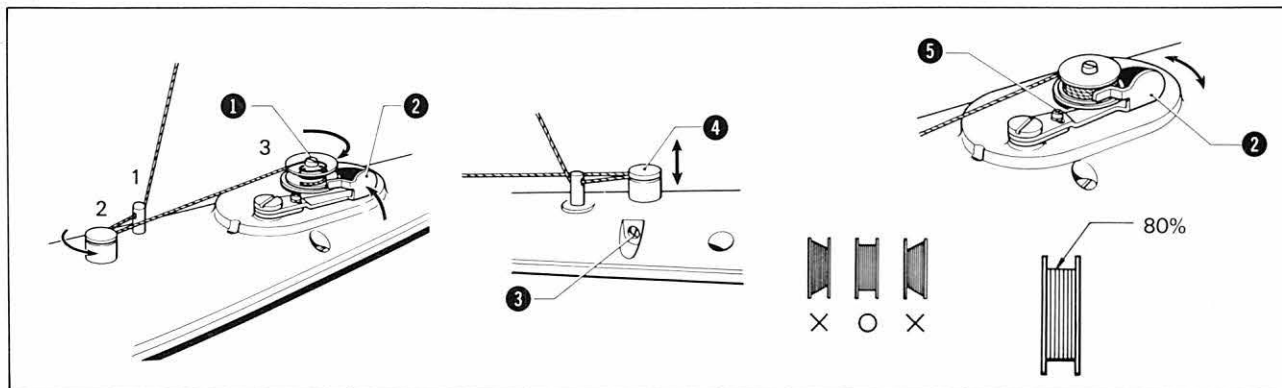


16 ADJUSTMENT OF THREAD TENSION RELEASE

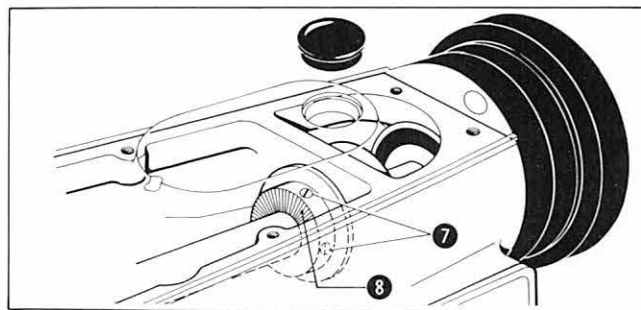
1. When the presser foot is lifted up by the presser foot lifter or the knee lifter lever, the shaft ① pushes up the screw ②, and tension release lever ③ pushes the release pin, therefore the tension between the upper tension regulators becomes weak.
2. Loosen the nut ④ and adjust the tension by turning the screw ②.



17 ADJUSTMENT OF THE QUANTITY OF THE BOBBIN WINDING



1. Push the bobbin fully onto the bobbin winder spindle ①.
2. Thread the machine as shown in the picture at the left, winding the thread onto the bobbin several times in the direction of the arrow.
3. Press the bobbin winder lever L ② onto the bobbin and run the machine.
- * When the thread will not wind evenly, loosen the clamping screw ③, and adjust the height of the thread tension stud ④.
- * Loosen the set screw ⑤ and move the bobbin winder lever L ② in and out, adjusting so that the thread winds to 80% of bobbin capacity.
4. Adjust the driving power of bobbin winding by removing the oil cap ⑥, loosening two screws ⑦, and moving the bobbin winder driving wheel ⑧.



TROUBLESHOOTING GUIDE

Trouble	Cause	Inspection	Remedy	Page
Thread breaks	Thread is wound around the thread take-up.	Thread take-up	Remove the wound-up thread.	/
	Improper threading		Correct threading	/
	Needle incorrectly installed	Needle position	Install needle in correct direction	/
	Thread is wound around the rotary hook.	Rotary hook	Remove the wound-up thread.	/
	Improper needle and rotary hook timing		Refer to "Needle and Rotary Hook Timing Adjustment".	21
	Flaw in the thread passage	Rotary hook, bobbin, rotary take-up, etc.	Clear the thread path, or replace with a new part.	/
Stitches skips	Needle incorrectly installed	Needle	Install needle in correct direction	/
	Needle bent, needle tip crushed	Needle	Replace the needle.	/
	Poor needle and rotary hook timing (needle and rotary hook, needle bar height, needle and rotary hook clearance)		Refer to "Needle and Rotary Hook Timing Adjustment".	21
	Rotary hook point-bent or crushed		Repair the rotary hook point or replace it with a new part.	21
Uneven stitches	Presser foot pressure is too great.	Presser foot pressure	Refer to "Presser Foot Pressure Adjustment".	22
	Improper feed dog height	Feed dog height	Refer to "Feed Dog Height and Bias Adjustment".	22
Thread loose tighten	Improper lower thread tension	Lower thread tension	Refer to "Sewing Tension".	22
	Improper upper thread tension	Upper thread tension	Refer to "Sewing Tension".	22
	Improper thread take-up spring tension	Thread take-up spring strength or movement	Refer to "Sewing Tension".	22
Needle breaks	Needle incorrectly installed	Needle	Install needle in correct direction	/
	Needle bent, Needle tip crushed	Needle	Replace the needle.	/
	Improper needle and rotary hook timing		Refer to "Needle and Rotary Hook Timing Adjustment".	21
	Improper needle and feed timing		Improper needle and feed timing	20
	Needle is too slender for the thread or material being sewn.		Use a needle to suit the thread or material being sewn.	/
	Low needle quality		Replace a quality needle.	/



BROTHER INDUSTRIES, LTD.

HEAD OFFICE: No. 35, 9-CHOME,
HORITA-DORI, MIZUHO-KU, NAGOYA, JAPAN 467
CABLE: BROTHER NAGOYA,
TELEX: BROTHER 4473696J & J59743