

SERVICE MANUAL FOR

B21




B17

B15

● GENERAL INFORMATION ●

- This service manual was compiled for use when repairing the B21, B17, B15 Zigzag Stitch Sewing Machines.
- Use this manual, together with the Parts Catalog, when making repairs.
- This manual was written based on the most up-to-date product specifications at the time of printing. Some machine specifications may have been changed to improve the quality of the product. Contact the manufacturer or your local sales representative for information on such changes.

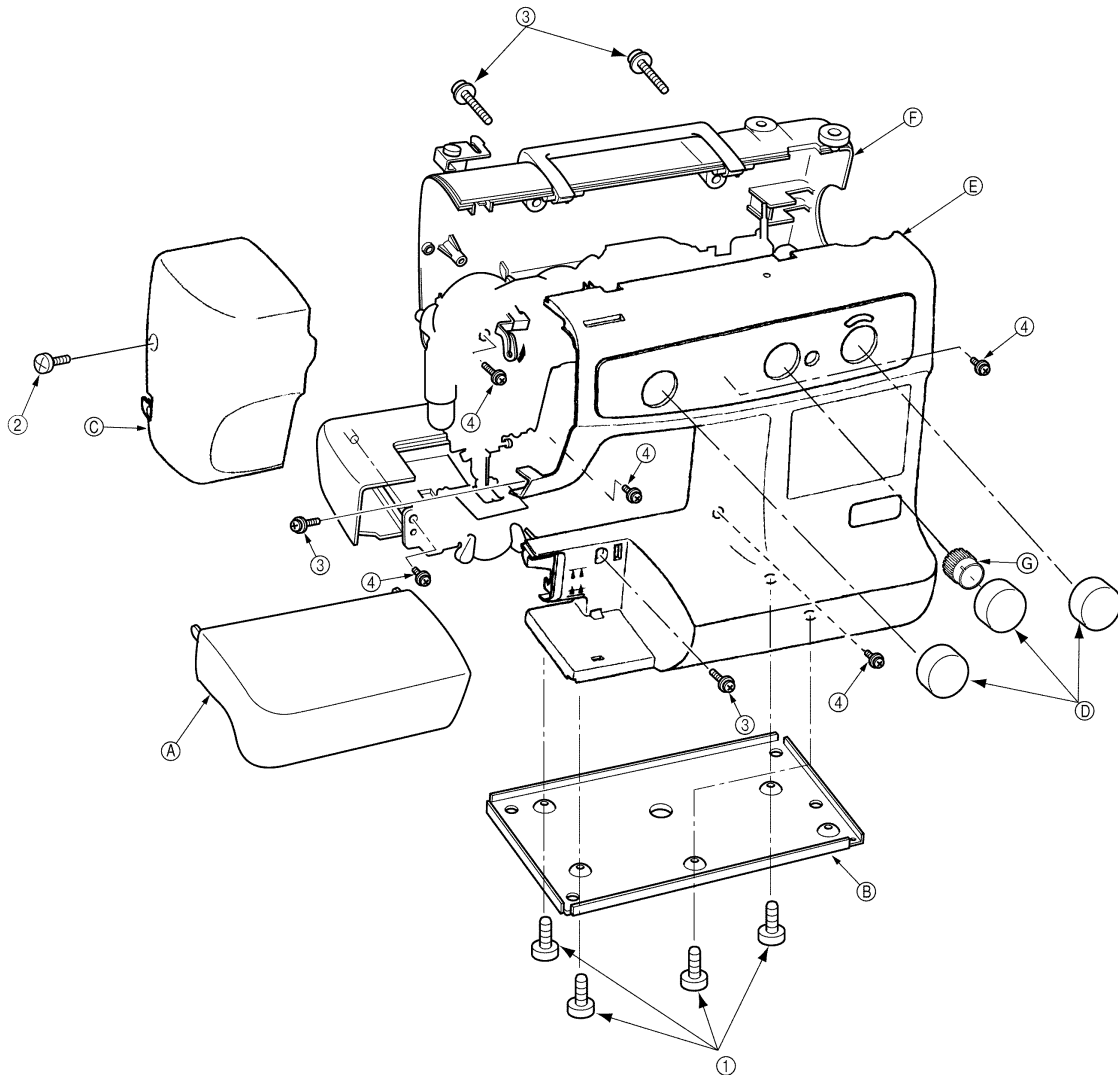
- Symbols used

	Move the part in the direction of the arrow.
	Set the clearance as indicated.
	Move the part to its highest or lowest position.

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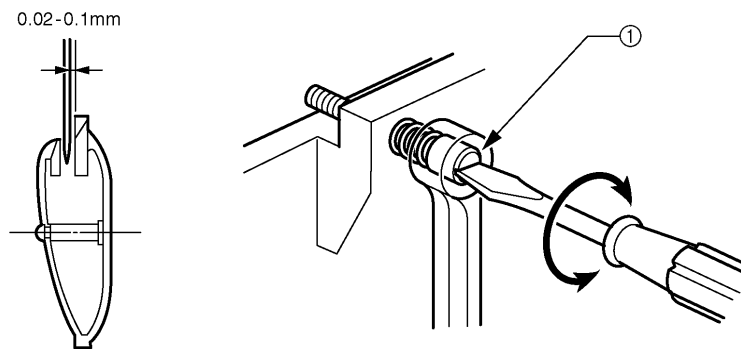
Removing order of covers



- Remove accessory table (A).
- Loosen and remove the screws ❶ then remove the base plate (B).
- Loosen and remove the screw ❷ then remove the face plate (C).
- Remove all selection dials (D) and gear (G).
- Loosen and remove the screws ❸ then remove the front cover (E).
- Loosen and remove the screws ❹ lower the presser foot lifter, then remove the rear cover (F).

Note: See pages 23-24 for assembly of selecting dial and feed dial.

Clearance between the needle and the shuttle hook point



Standard

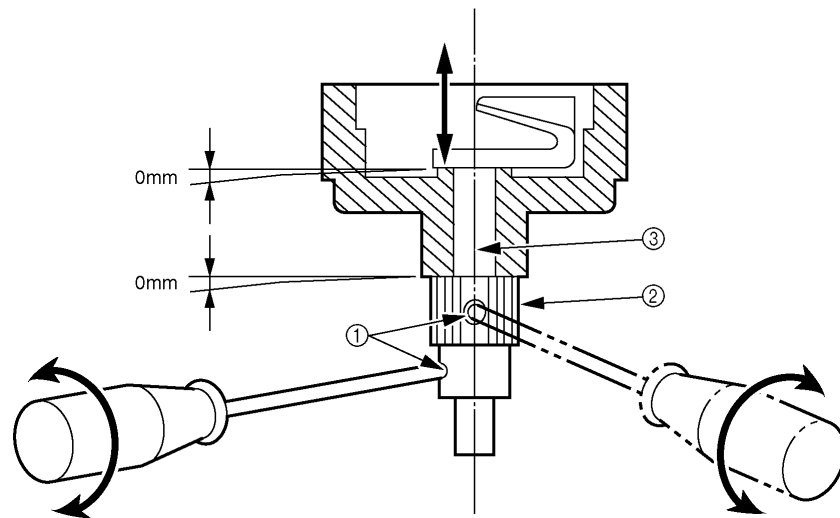
- Clearance between the needle and the shuttle hook point should be 0.02 to 0.1mm.

Adjustment

B21	B17	B15	Pattern	Stitch length	Stitch width
2	2	3	Straight stitch (center needle position)		M

Turn the needle bar support stud ❶ clockwise or counter clockwise to make adjustment.

Clearance between the shuttle driver and the race way



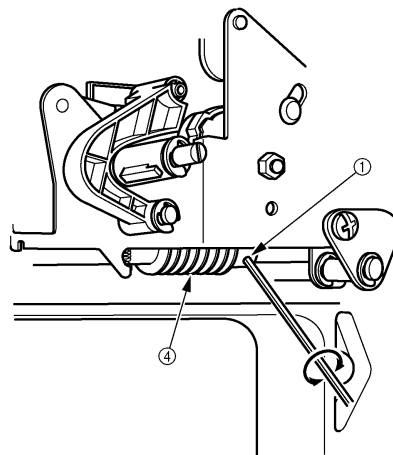
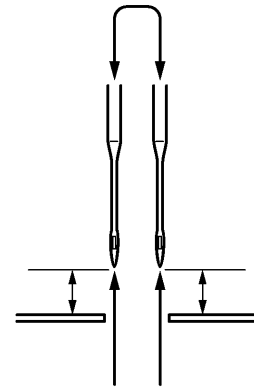
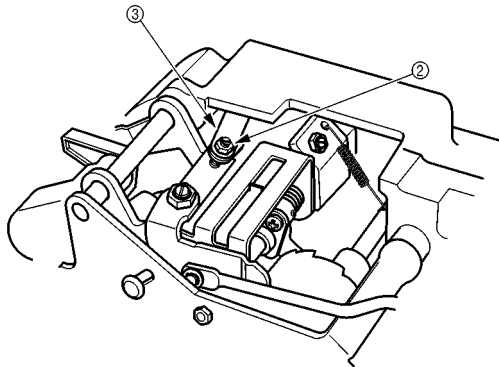
Standard

- The shuttle driver should rotate smoothly, no play should be felt in the race way.

Adjustment

1. Loosen setscrews ① of the driver shaft gear ②.
2. Adjust the clearance of the driver shaft ③.
3. Retighten the setscrews ①.

Needle swing (Parabola)



Standard

The sideways movement of the needle must be equal completed in the up and down motion. When the needle is in the descending stroke sideways end movement, this at the right side, turn the zig-zag width dial from 5 - 0 and back, the needle movement should be less than 0.1mm.

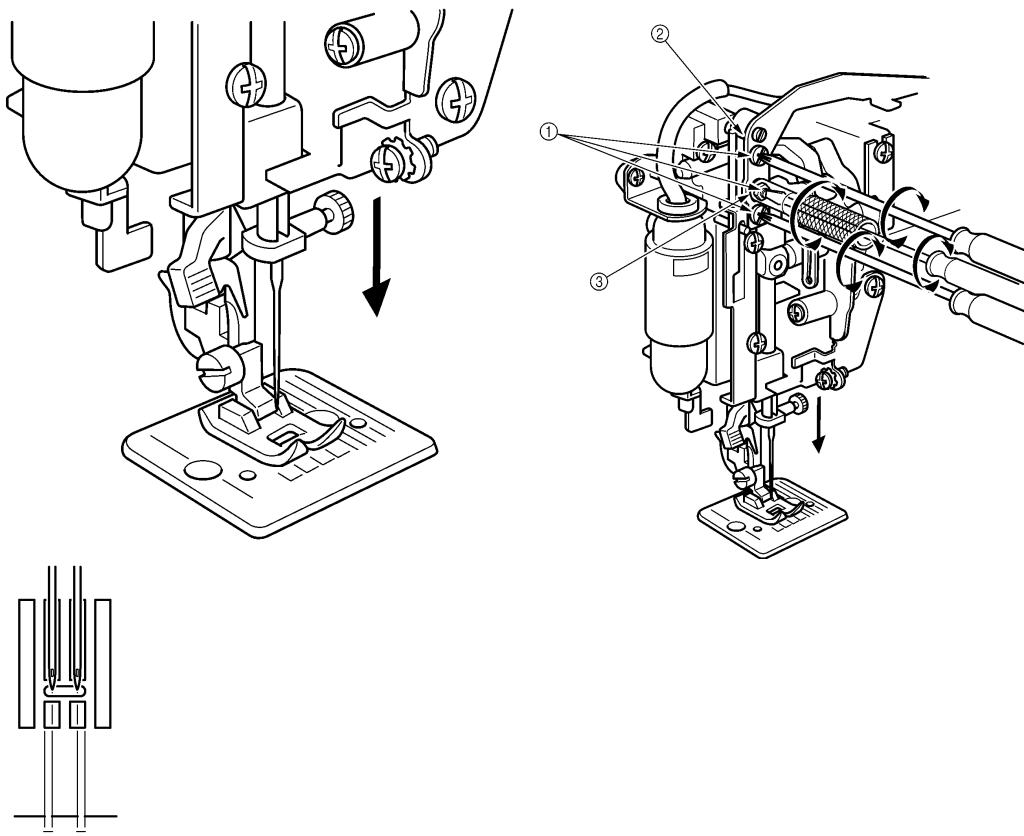
Adjustment

B21	B17	B15	Pattern	Stitch length	Stitch width
3	3	2	Zig - Zag		0 - 5

1. Loosen the set screws ❶ of the worm gear ❷.
2. Turn the worm gear ❷ to make adjustment.
3. Retighten the set screws ❶.
4. Loosen the nut ❸ of the adjusting screw ❹ for zero needle movement.
5. Turn the adjusting screw ❹ in or out until there is no needle movement.
6. Retighten the nut ❸.

Note: There should be no play or bind at the pattern cam.

Needle position on zigzag to the needle plate



Standard

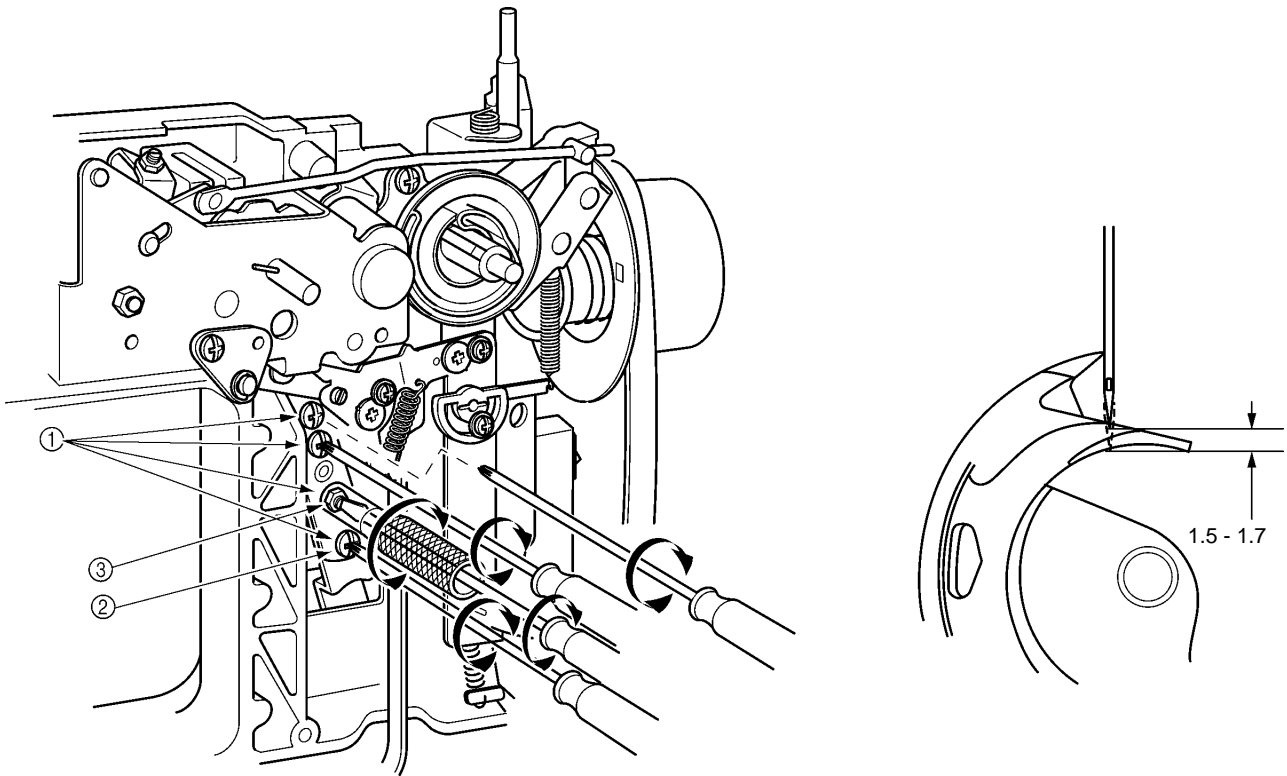
- The left and right needle penetrations must be equidistant to the edge of the stitch plate.

Adjustment

B21	B17	B15	Pattern	Stitch length	Stitch width
3	3	2	Max. Zig - Zag		5

- Loosen the setscrew ❶ of the zigzag connecting rod ❷.
- Loosen the fixation screw of the eccentric nut ❸.
- Turn the eccentric nut ❸ to make adjustment.
- Retighten the fixation screw of the eccentric nut ❸.
- Retighten the setscrew ❶.

Loop lift



Standard

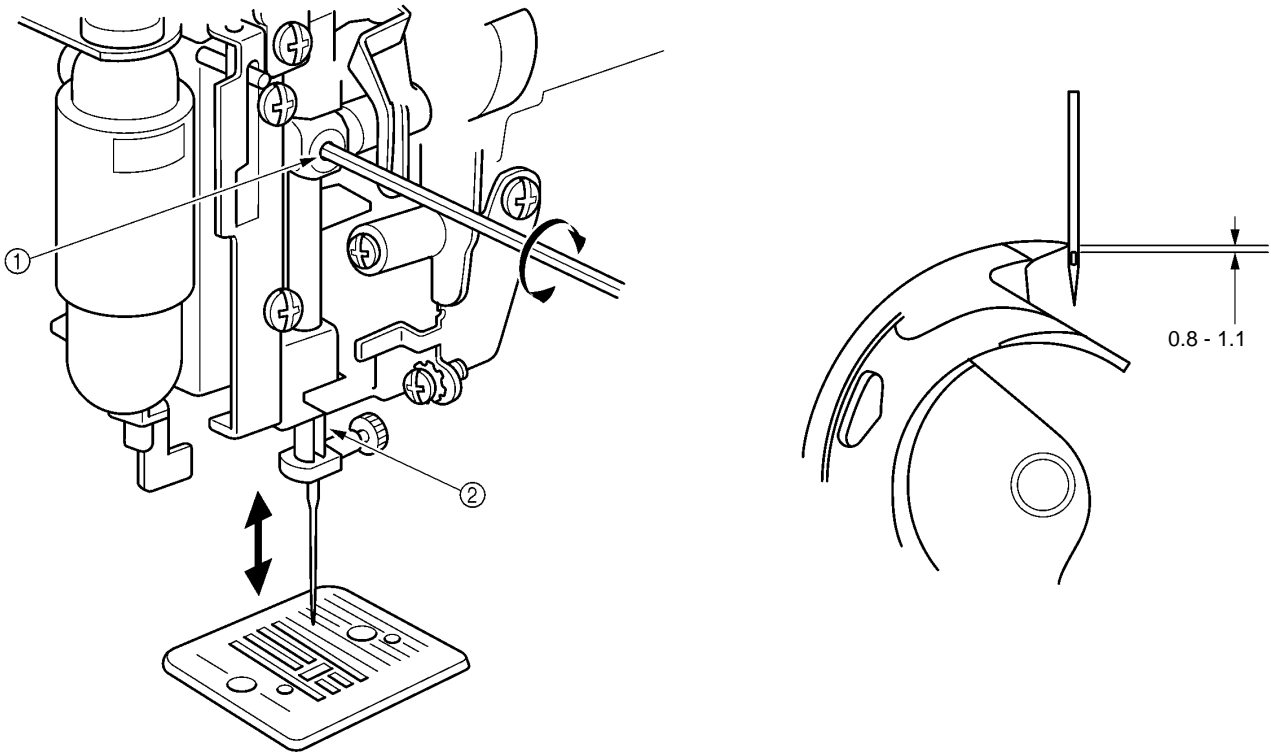
- When the needle bar moves 1.50 - 1.70mm upwards from its lowest position at the left side.
- The shuttle hook point should align with the left side of the needle.

Adjustment

B21	B17	B15	Pattern	Stitch length	Stitch width
3	3	2	Max. Zig - Zag		5

1. Loosen the setscrews ❶ on the drive connecting rod ❷.
2. Loosen the fixation screw of the eccentric nut ❸.
3. Turn the eccentric nut ❸ to make adjustment.
- 4 Retighten the fixation screw of the eccentric nut ❸.
5. Retighten the setscrews ❶.

Height of the needle bar



Standard

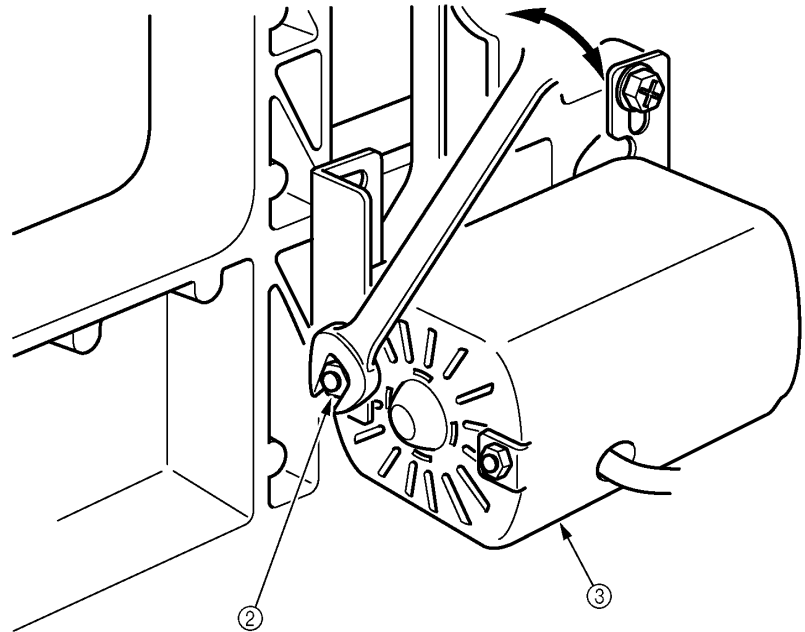
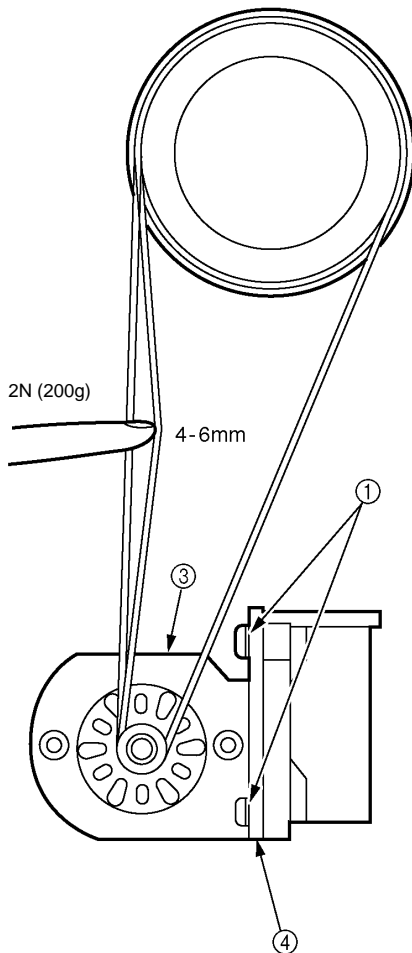
- When the needle is at the right side, the shuttle hook point is aligned with the left side of the needle, the shuttle hook point lower edge should be 0.80 - 1.10mm above the upper edge of the needle eye.

Adjustment

B21	B17	B15	Pattern	Stitch length	Stitch width
3	3	2	Max. Zig - Zag		5

1. Loosen the setscrew ❶ of the needle bar ❷.
2. Move the needle bar ❷ up or down to make adjustment.
3. Retighten the setscrew ❶.

Tension of the timing belt



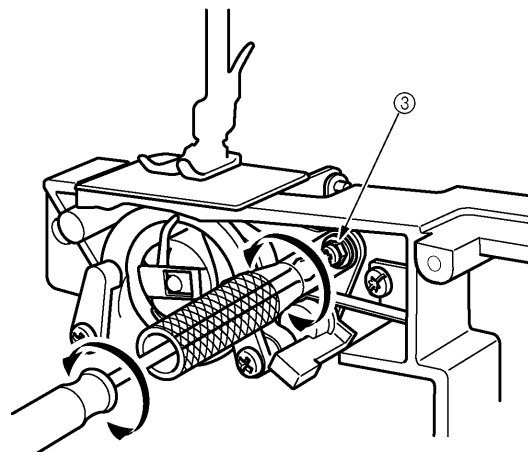
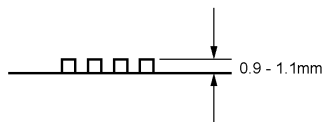
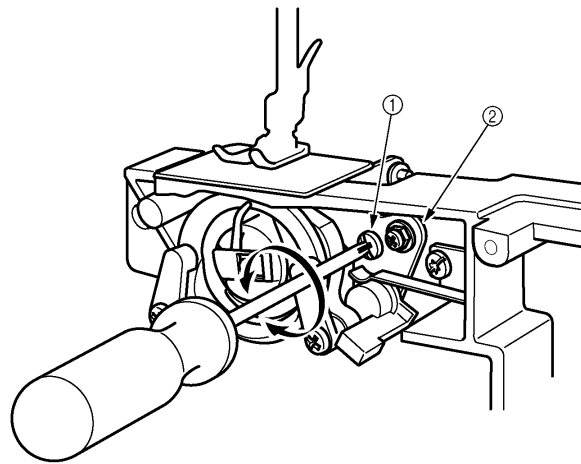
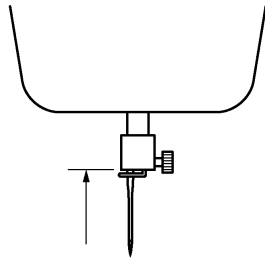
Standard

- The belt should slacken approx. 4 - 6mm under a 2N (200g) load.

Adjustment

1. Loosen the setscrews **1** on the motor holder **4**.
2. Loosen the nuts **2** on the motor holder.
3. Move the motor **3** to make adjustment.
4. Retighten the setscrews **1** and nuts **2**.

Height of the feed dogs



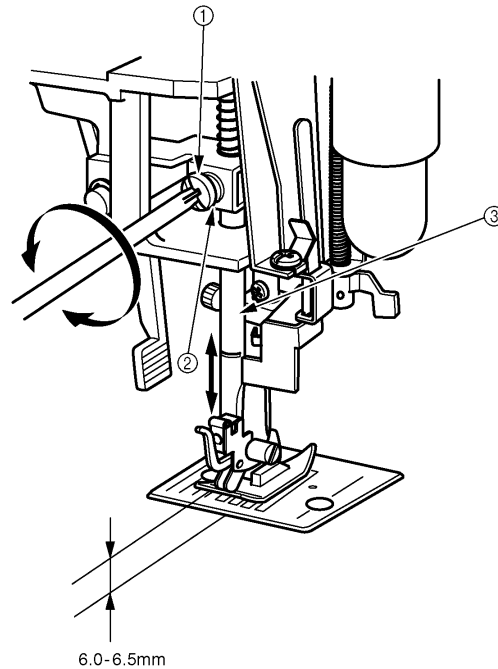
Standard

- The feed dog teeth should be 0.9 - 1.1mm above the needle plate at the highest position.

Adjustment

1. Loosen the setscrew ❶ on the vertical feed arm ❷.
2. Loosen the fixation screw of the eccentric nut ❸.
3. Turn the eccentric nut ❹ to make adjustment.
4. Retighten the fixation screw of the eccentric nut ❸.
5. Retighten the setscrew ❶.

Height of the presser bar



Standard

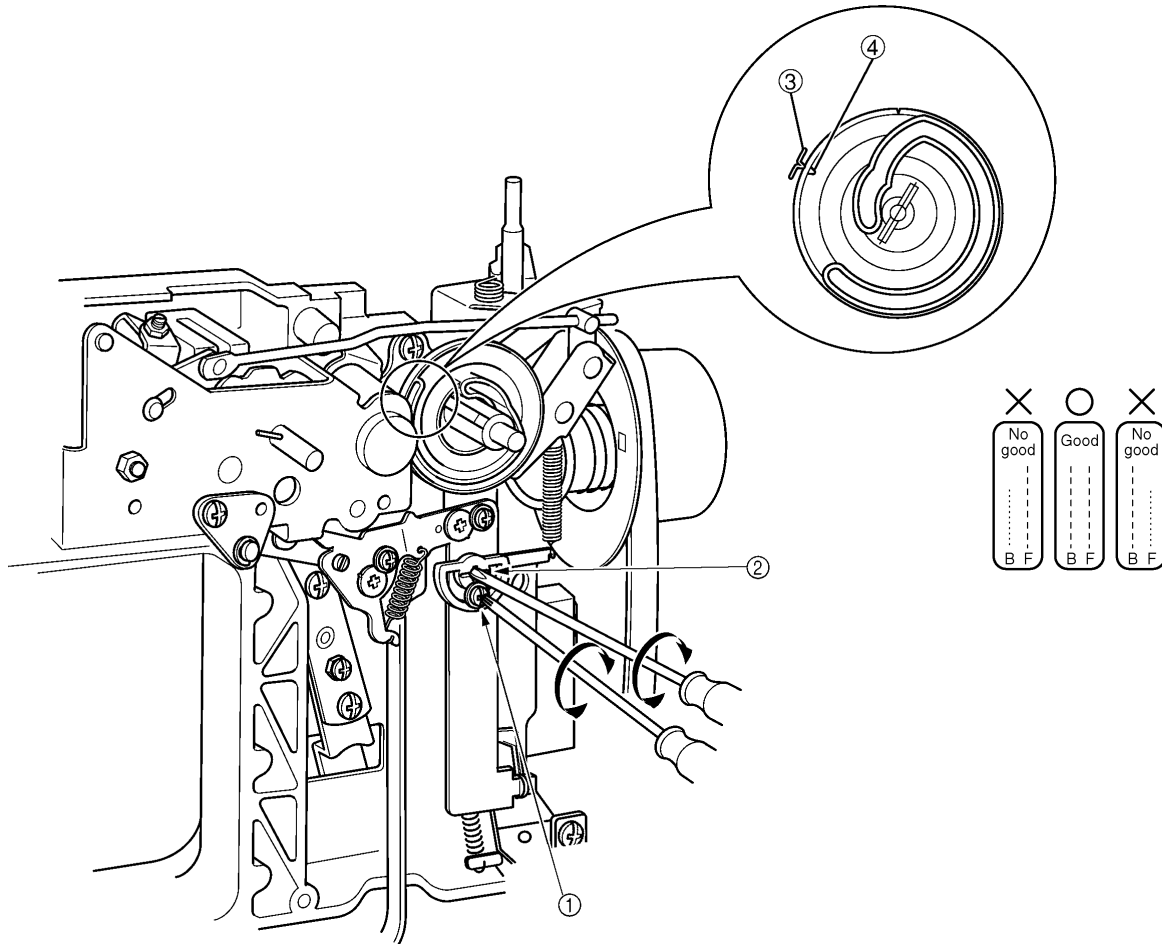
- The clearance between the presser foot and the needle plate should be between 6.0 and 6.5mm when the presser foot is raised.

Adjustment

1. Loosen the setscrew ❶ on the presser bar guide bracket ❷.
2. Move the presser bar ❸ up or down to make adjustment.
3. Retighten the setscrew ❶.

Note: Check that the presser foot and feed dogs are aligned.

Stitch length for forward and backwards stitching



Standard

- There should be a difference of max. 10% in the lengths of the forward and backward stitching.

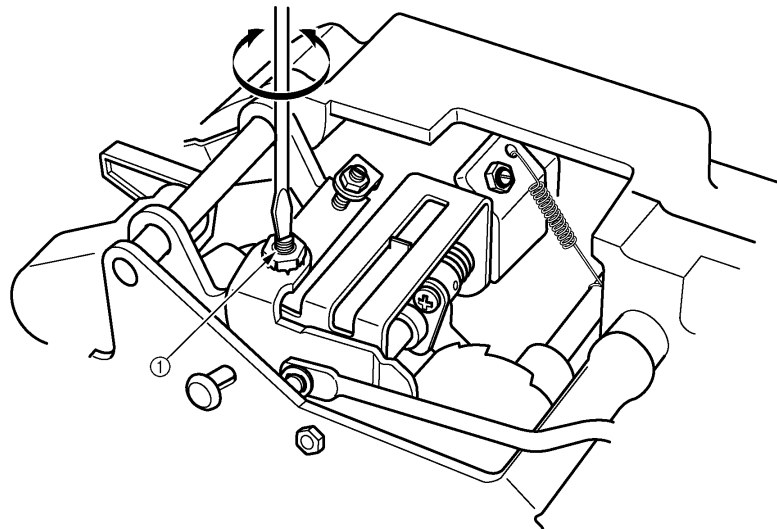
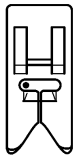
Adjustment

B21	B17	B15	Pattern	Stitch length	Stitch width
2	2	3	Straight stitch	2	

1. Loosen the setscrew ❶ on the reverse sewing regulator shaft ❷.
2. Turn the reverse sewing regulator shaft ❷ left or right to make adjustment.
3. Retighten the setscrew ❶.

Note: The notch spring ❸ and cam ❹ should line up with each other when set for stitch length 2.

Maximum stitch width when set at straight (left) and Zigzag stitch (B21, B17)



Standard

- Needle left side entry into the stitch plate should be the same, this at zigzag and straight stitch setting.

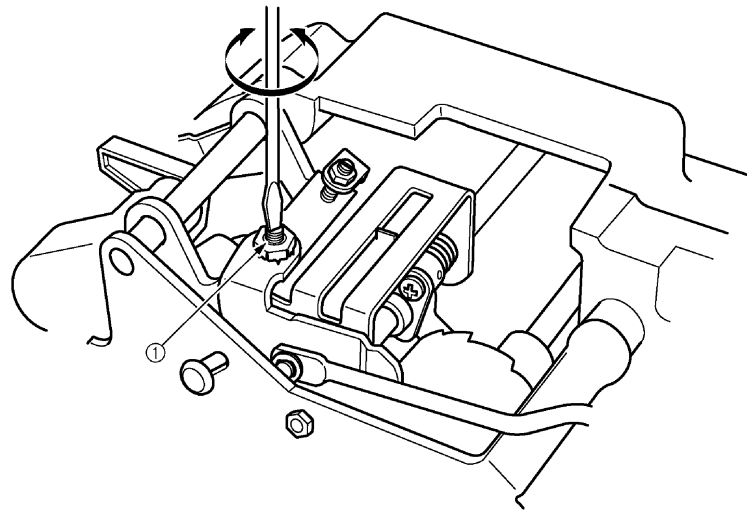
Adjustment

B21	B17	Pattern	Stitch length	Stitch width
3	3	Max. Zig - Zag		5
2	2	Straight stitch		5

1. Turn the adjusting screw ❶ in or out to make adjustment.

Adjustment tip: Lower the feed dog and place a piece of paper under the presser foot.

Buttonhole bead width (B15)



Standard

- The difference in the beads width should be less than 0.2mm, this in the forward and reverse stitching.

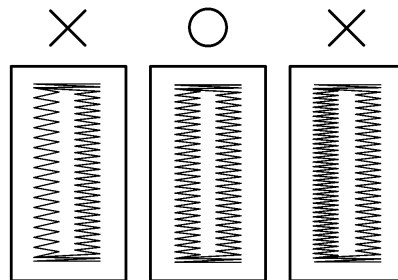
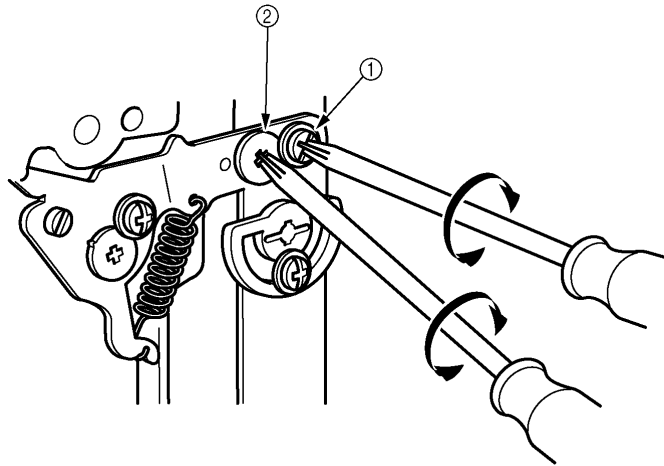
Adjustment

B15	Pattern	Stitch length	Stitch width
b/d	Buttonhole		5

1. Turn the adjusting screw ❶ in or out to make adjustment.

Adjustment tip: Lower the feed dog and place a piece of paper under the presser foot.

Buttonhole forward and reverse feeding



Standard

- The density between forward and reverse feeding should be the same.

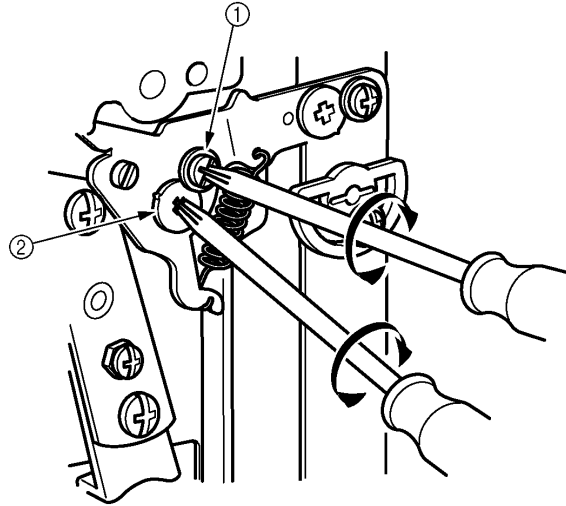
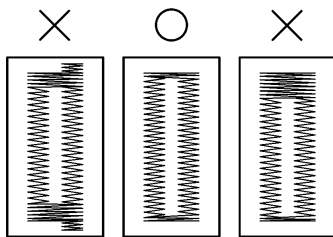
Adjustment

B21	B17	B15	Pattern	Stitch length	Stitch width
1	1	b/d	Buttonhole	□	5

- Loosen the setscrew ❶ of the adjusting eccentric ❷.
- Turn eccentric ❷ to make adjustment.
- Retighten the setscrew ❶.

Note: Set the buttonhole balance dial slot into vertical position.

Bar tack density



Standard

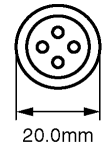
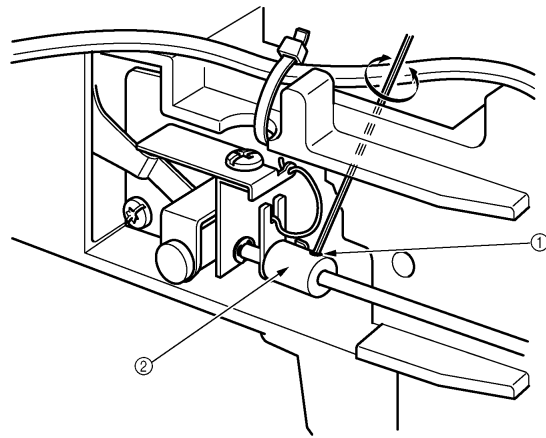
- The feeding of bar tack should be less than 1.0mm /10 stitches.

Adjustment

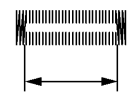
B21	B17	B15	Pattern	Stitch length	Stitch width
1	1	a/c	Buttonhole	□	5

1. Loosen the setscrew ❶ of the bar tack eccentric ❷.
2. Turn the eccentric ❷ to make adjustment.
3. Retighten the setscrew ❶.

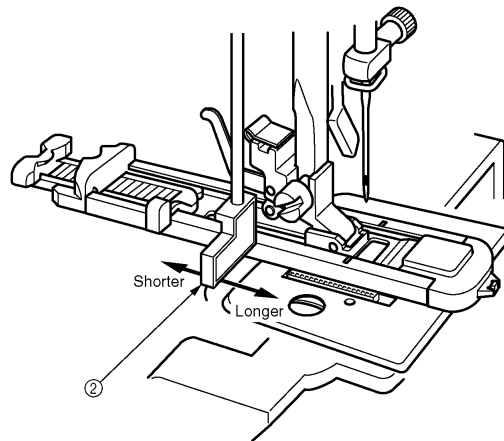
Buttonhole length



20.0mm



21.5 ± 0.5mm



Standard

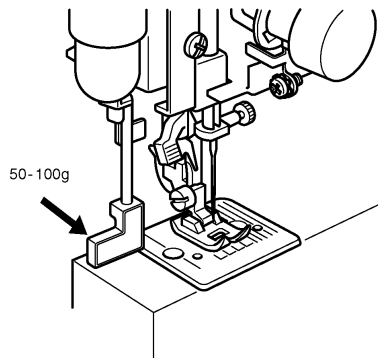
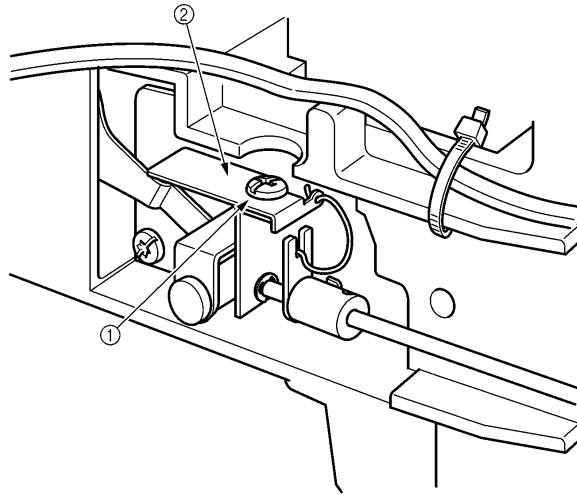
- The length of buttonhole should be $21.5 \pm 0.5\text{mm}$ when the button size is 20.0mm.

Adjustment

B21	B17	Pattern	Stitch length	Stitch width
1	1	Buttonhole		5

- Loosen the setscrew 1 of the buttonhole lever 2.
- Move the buttonhole lever 2 front or back to make adjustment.
- Retighten the setscrew 1.

Buttonhole lever torque (B21, B17)



Standard

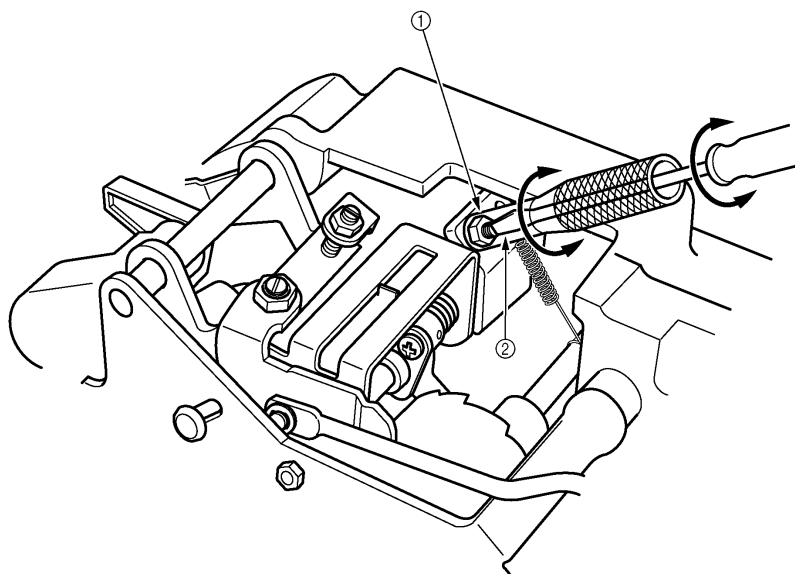
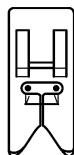
- Buttonhole lever torque should be between 0.5N (50g) and 1.1N (110g) when changing from reverse to forward sewing.

Adjustment

1. Loosen the setscrew ❶ of the torque spring ❷.
2. Adjust the torque spring ❷ accordingly.
3. Retighten the setscrew ❶.

Note: Recheck buttonhole length. (Page 16)

Maximum stitch width when set at buttonhole and zigzag stitch (B21, B17)



Standard

- Needle left side entry into the stitch plate should be the same at buttonhole and zigzag stitch setting.

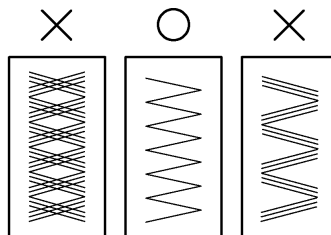
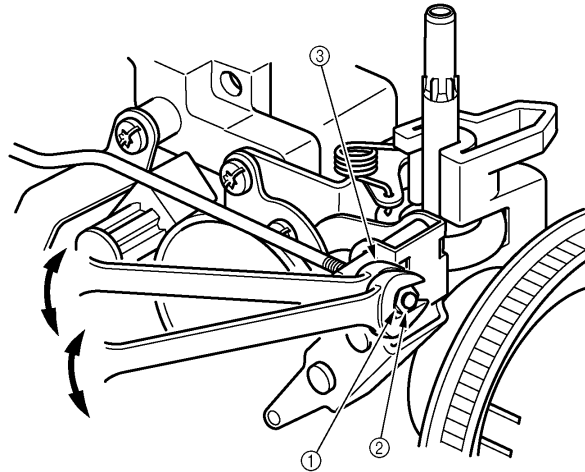
Adjustment

B21	B17	Pattern	Stitch length	Stitch width
3	3	Max. Zig - Zag		5
1	1	Buttonhole		5

1. Loosen the locknut ❶ of the adjusting screw ❷.
2. Turn the adjusting screw ❷ in or out to make adjustment.
3. Retighten the locknut ❶.

Adjustment tip: Lower the feed dog and place a piece of paper under the presser foot.

Forward and reverse sewing for stretch stitch



Standard

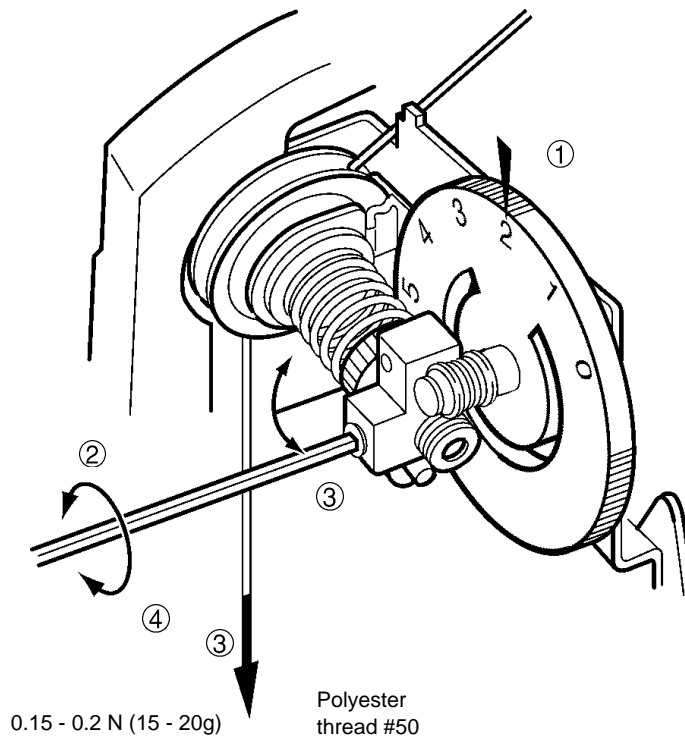
- There should be no difference between forward and reverse feed.

Adjustment

B21	B17	B15	Pattern	Stitch length	Stitch width
13	11	9	Stretch Stitch	SS	5

1. Loosen the locknut ❶ on the reverse feed control rod ❷.
2. Turn the adjusting nut ❸ in or out to make adjustment.
3. Retighten locknut ❶.

Adjustment of thread tension dial



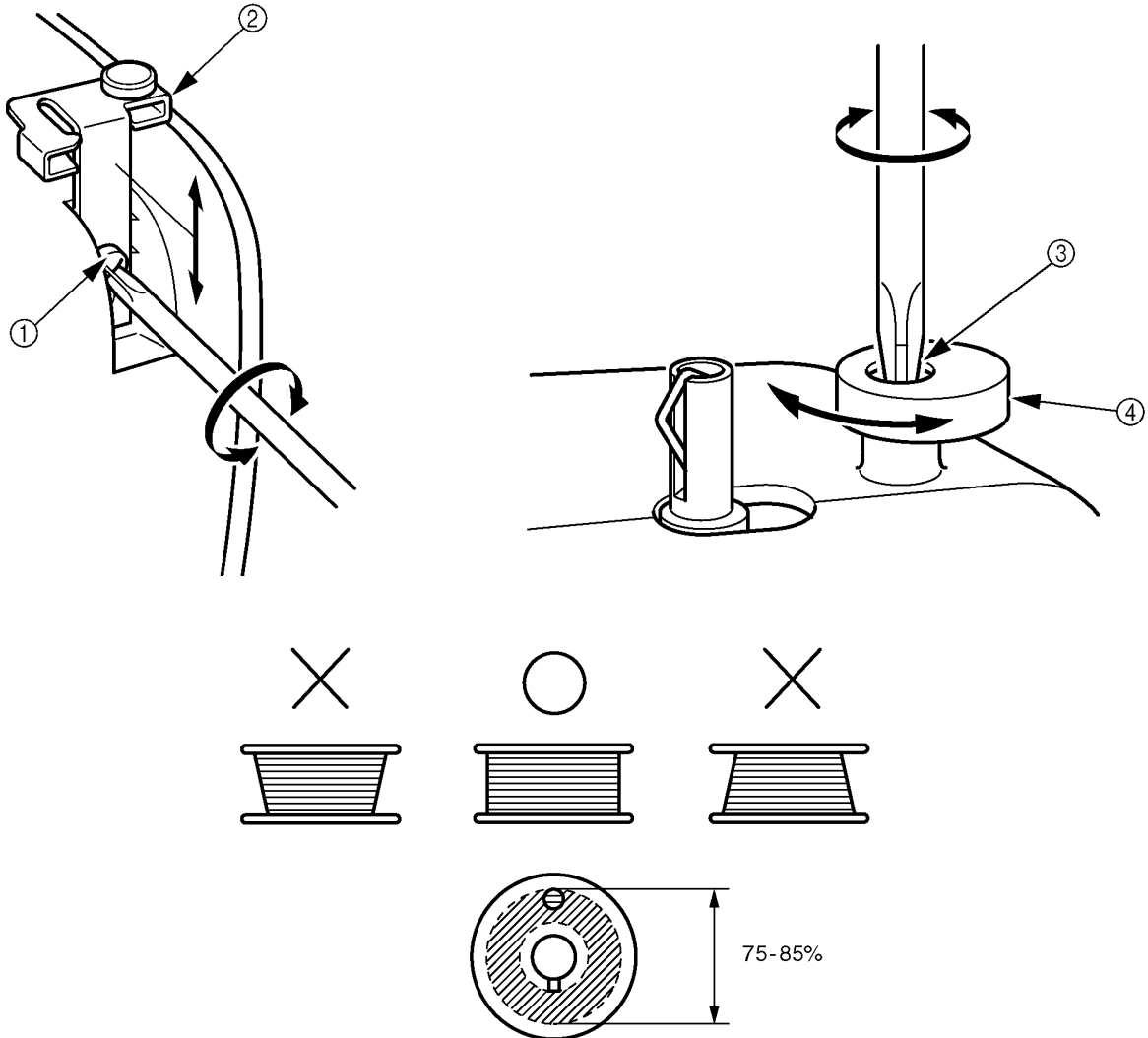
Standard

- When thread tension dial is set at "2" and presser foot is lowered, upper thread tension should be 0.15 - 0.2 N (15 - 20g) using polyester thread #50.

Adjustment

1. Set thread tension dial at "2", put polyester thread between tension discs.
2. Lower the presser foot lifter.
3. Loosen the set screw for thread tension screw.
4. Measure thread tension using tension gauge and adjustment tension to 0.15 - 0.2 N (15 - 20g) by turning thread tension screw.
5. Tighten set screw.

Bobbin Winding



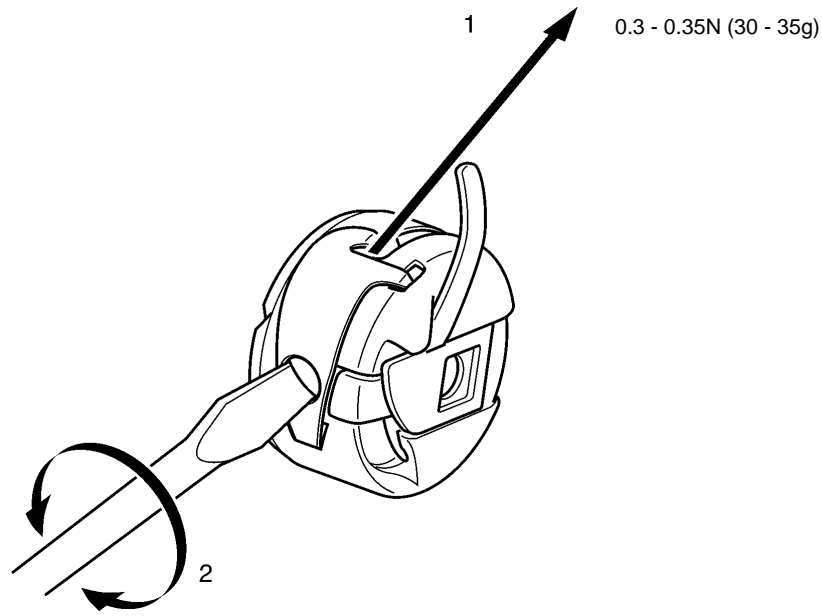
Standard

- The bobbin should be wound evenly, up to 75 - 85% of the outer diameter of the bobbin.

Adjustment

1. Loosen the set screw ① of the pretension ② slightly.
2. Shift the pretension ② up or down until even winding is achieved.
3. Retighten the set screw ①.
4. Loosen the set screw ③ of the bobbin presser ④.
5. Adjust the bobbin presser ④ until the correct amount of thread is wound.
6. Retighten the set screw ③.

Adjustment of lower thread tension



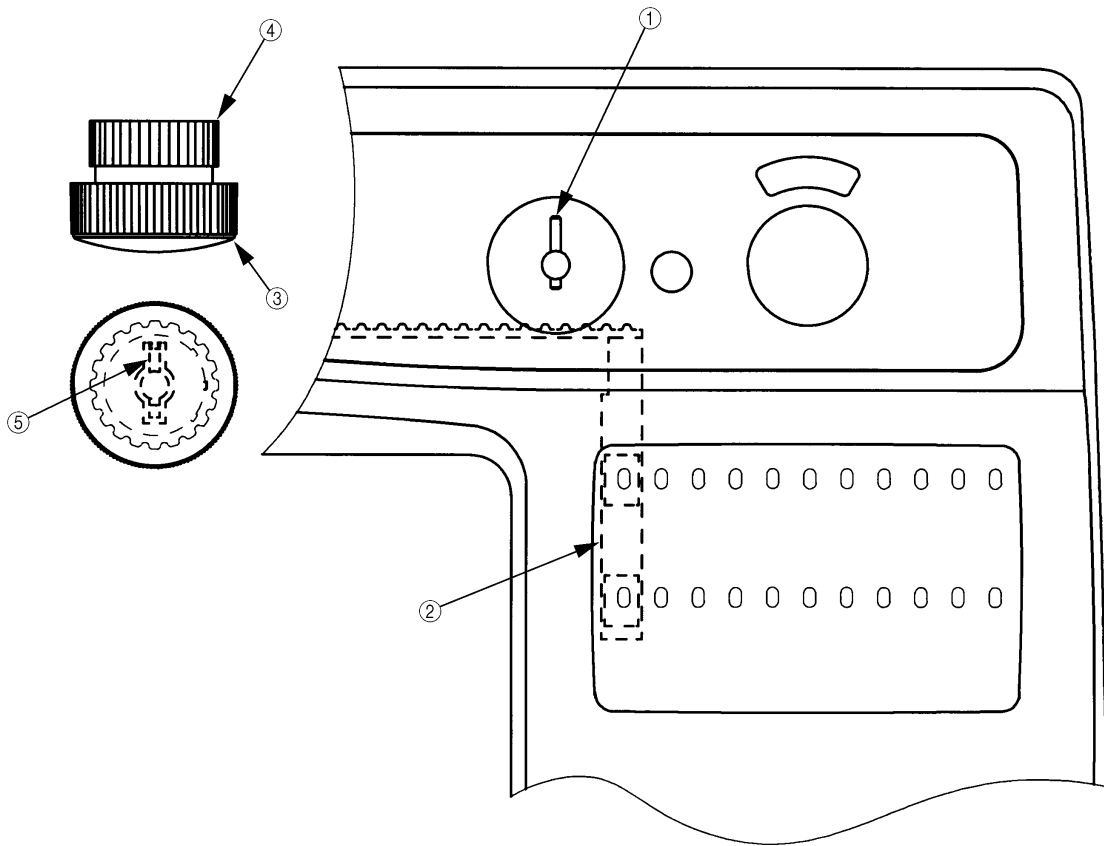
Standard

Lower thread tension: 0.3 - 0.35N (30 - 35g)

How to check the tension: Pull cotton thread #50 with tension gauge slowly.

1. Set cotton thread #50 in bobbin case and pull it with tension gauge.
2. Adjust the adjustment screw to tension 0.3 - 0.35N (30 - 35g).

Positioning of Stitch Selector Stitch Displays



Standard

- When selecting dial is turned, each stitch should be visible in center of stitch display window.

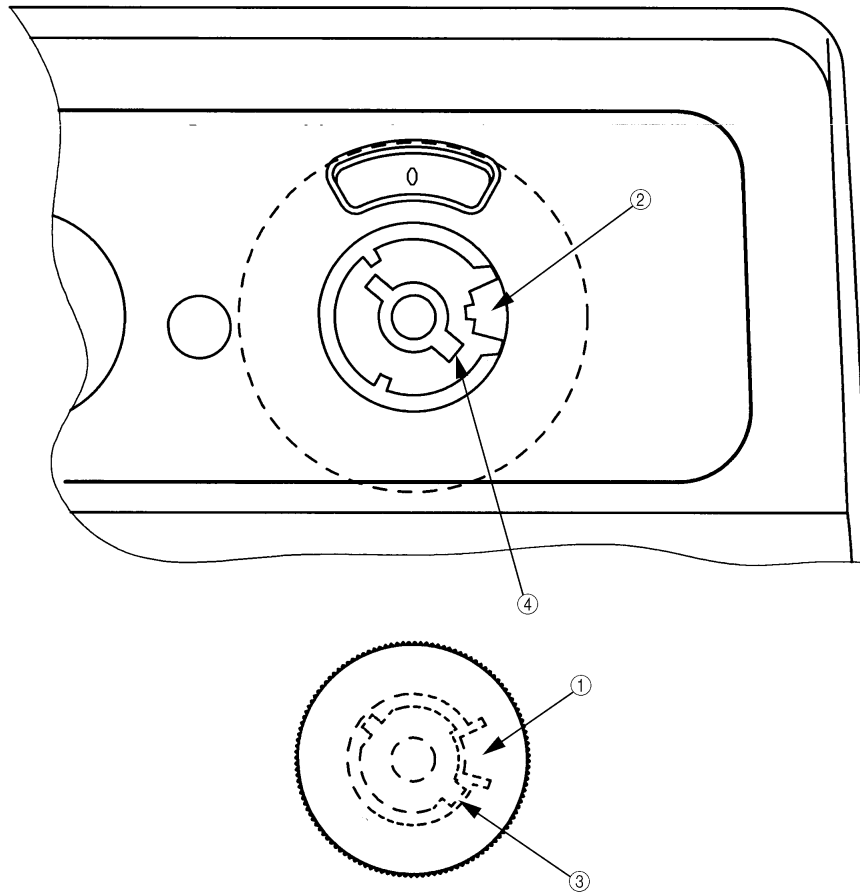
Adjustment

1. Vertically position selecting cam shaft pin ❶.
2. Line up stitch display rack ❷ with stitch images.

B21	B17	B15	Pattern
1	1	1 a/c	Buttonhole

3. Set selecting dial ❸ key in middle of slot of stitch display gear ❹ key. When key slots are filled on both sides, the stitch display rack ❷ will move 1mm to the left and right.
4. Set selecting cam shaft ❶ in selecting dial slot ❺.
5. After selecting dial is assembled, images of each stitch should be centered in stitch display window.

Positioning of Feed Dial



Standard

- Feed indicator should agree with feed.

Adjustment

Line ① groove of feed dial up with ② knob of feed indicator, and piece ③ groove of feed regulator and ④ knob of feed regulator cam together.

B21, B17, B15
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