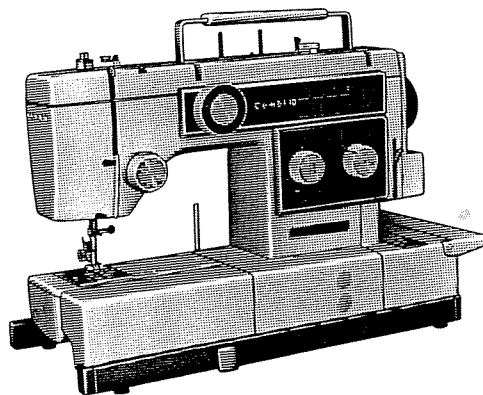
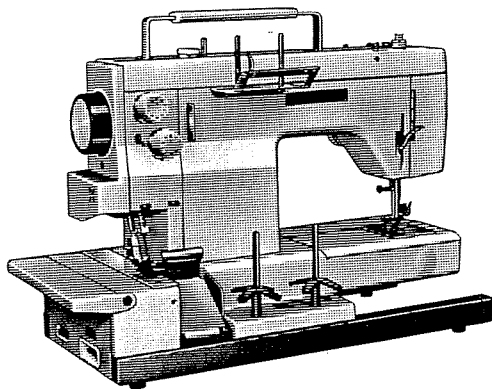


SERVICING MANUAL

Combi 10




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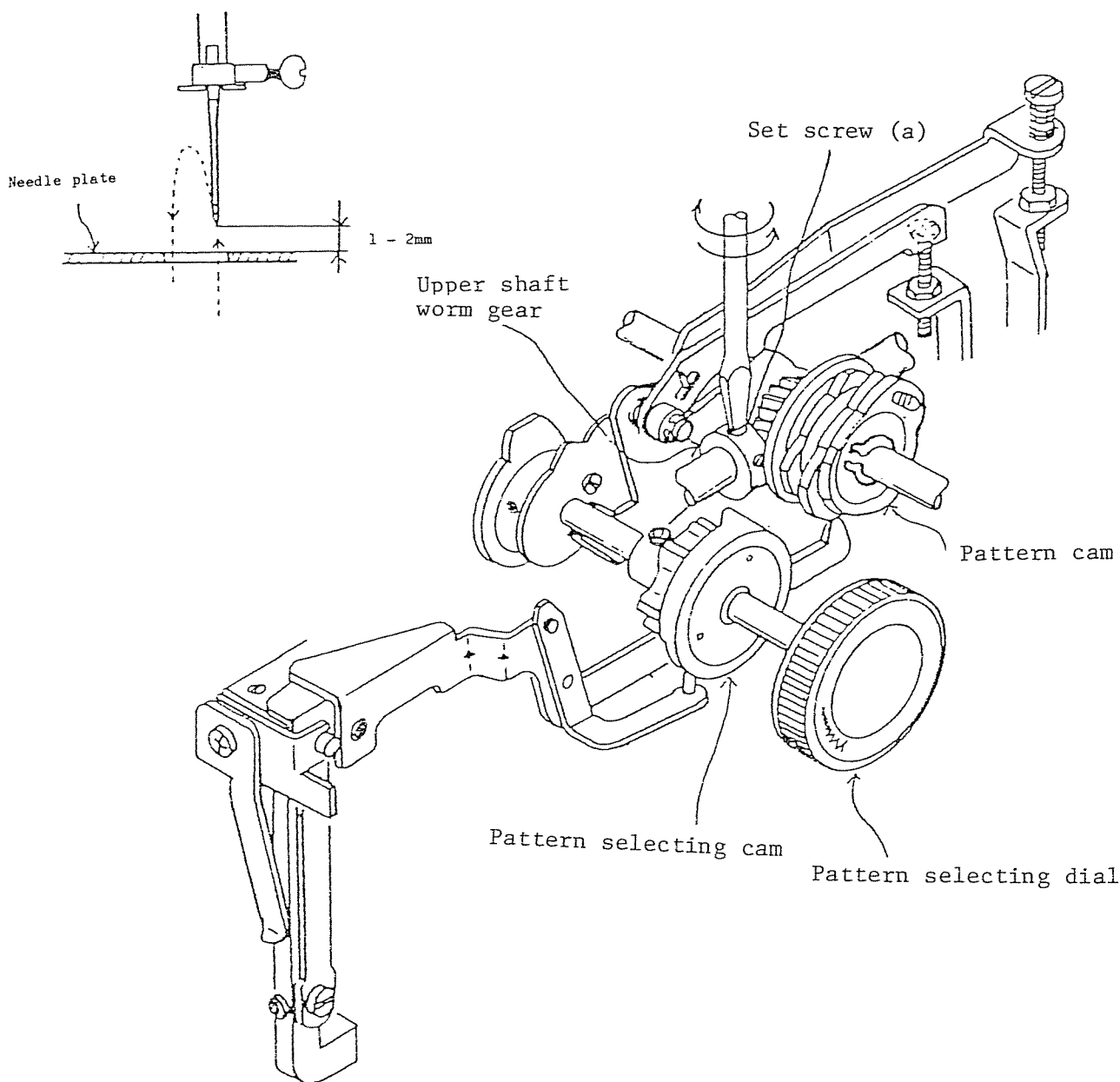
TIMING OF NEEDLE SWING

The height of needle must be 1-2mm from the needle plate when the needle starts to swing to the left.

1. Set the pattern selector dial at "  " (the maximum zigzag width) and remove the top cover.
2. Loosen two set screws (a) on the upper shaft worm gear.
3. Holding one of the two screws (a) with screw driver in order to keep the upper shaft worm gear from rotating, turn the balance wheel counter-clockwise and make adjustment so that the needle starts to swing leftward when the tip of needle is 1-2mm high from the needle plate.
4. Tighten two set screws (a) after adjustment.
5. Attach the top cover.


NOTE:

In case of the upper shaft worm gear play against pattern cam is too large, move the gear in the direction of overlock mechanism before tightening two set screws (a).

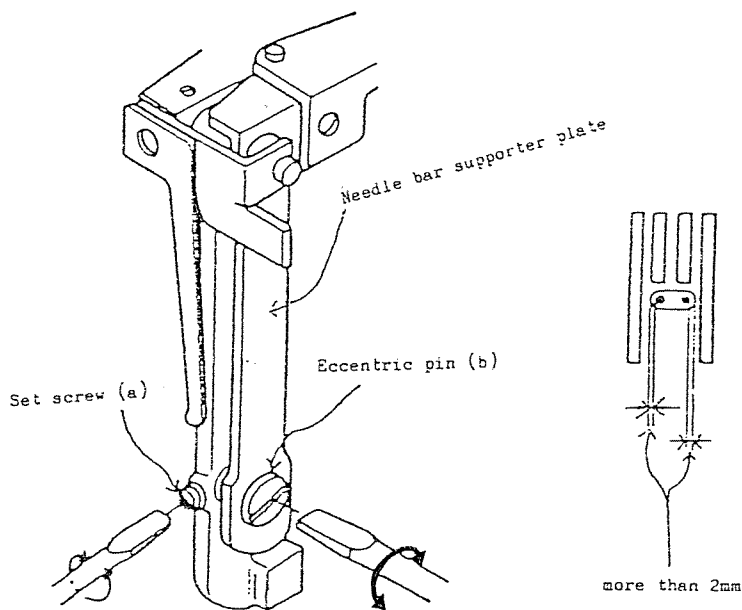


NEEDLE DROP

When the needle drops in the needle hole of needle plate, clearance between the needle and the needle hole should be more than 0.2mm.

1. Set the pattern selector dial at "  " (the maximum zigzag width) and turn the balance wheel counter-clockwise to bring down the needle into the needle hole.
2. Open the face plate and loosen set screw (a).
3. Turn eccentric pin (b) to obtain the optimum clearance (more than 2mm).
4. Tighten set screw (a) and close the face plate.
5. Check the NEEDLE DROP position.

Note: After adjustment of needle drop, check if HOOK TIMING, HEIGHT OF NEEDLE BAR and "M" NEEDLE POSITION are correct.



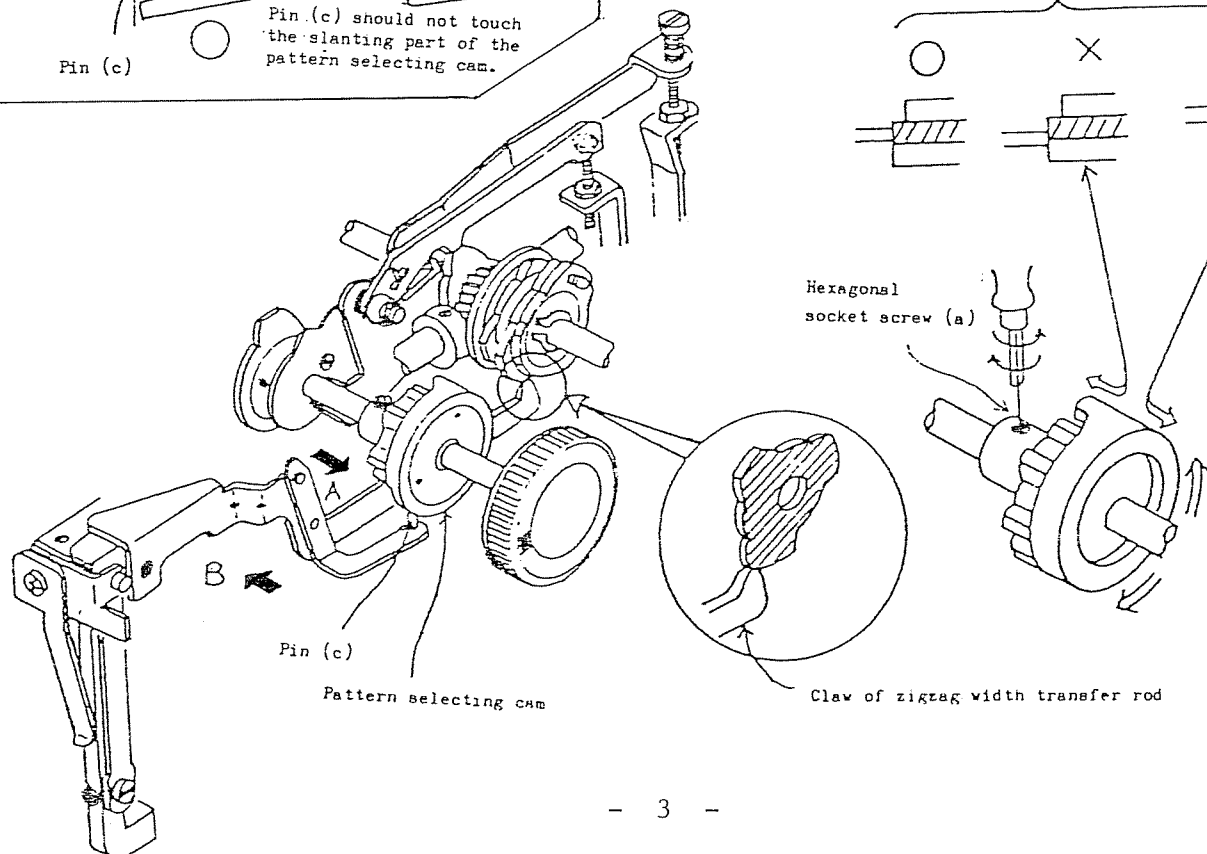
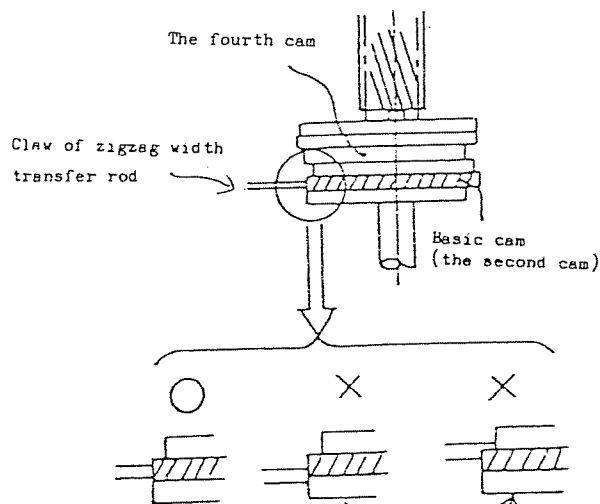
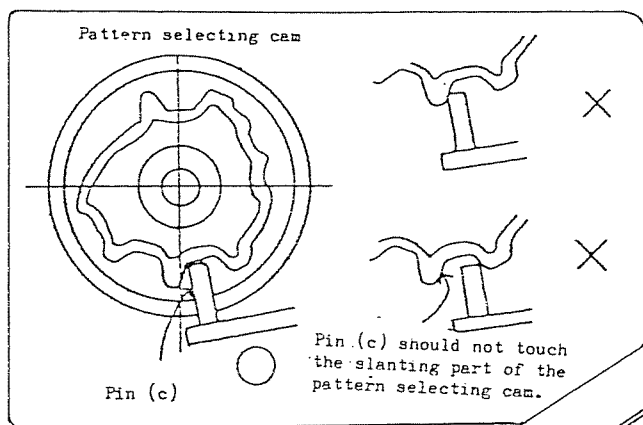
POSITION OF PATTERN SELECTING CAM

Correct condition:


The indication line on pattern selecting cam is faced just above, cam follower of zigzag transfer rod should be set at the center of the first pattern cam from this side. The pin should be set at "A" position on the pattern selecting cam.

If not, adjust as follows:


1. Remove the top cover.
2. Loosen two set screws(a), then loosen two set screws(b).
3. Set the indication line on the pattern selecting cam just above.
Move the pattern selecting cam backward and forward in order to position the cam follower of zigzag transfer rod at the center of the first pattern cam from this side.
4. Move the pattern selecting cam rightward and left ward so that the pin should be at "A" position on the pattern selecting cam.
Make sure the pattern selecting cam position should not disposition in the back and forth direction.
5. Tighten two set screws(a).
6. Position the index spring at concave portion on pattern selecting cam.
Then tighten set screw(b).
7. Adjust "M" needle position and buttonhole selecting position.
Then test the each pattern sewing.
8. Attach the top cover after adjustment.



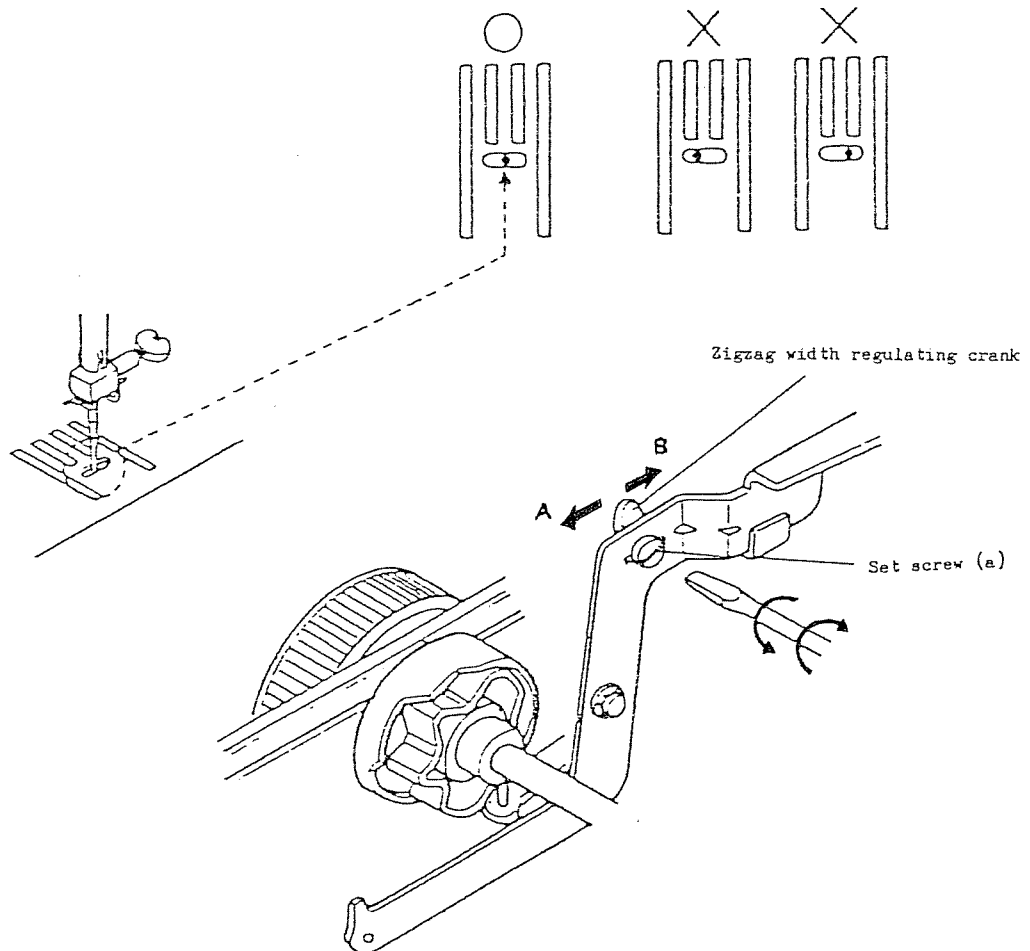
"M" NEEDLE POSITION

With the pattern selector dial set at "  ", the needle must drop at the centre of hole on needle plate.
If not, adjust as follows:

Note: Before adjustment, check if NEEDLE DROP is correct.

1. Set the pattern selector dial at "  " and remove the top cover.
2. Loosen set screw (a)
3. Adjust needle position by moving the zigzag width regulating crank.
 - 1) If the needle drops leftward, move the zigzag width regulating crank in the direction of "A".
 - 2) If the needle drops rightward, move the zigzag width regulating crank in the direction of "B".
4. Tighten set screw (a). Then, attach the top cover.

Note: Check if CUTTING SPACE OF BUTTONHOLE and POSITION OF PRESSER BAR are correct.



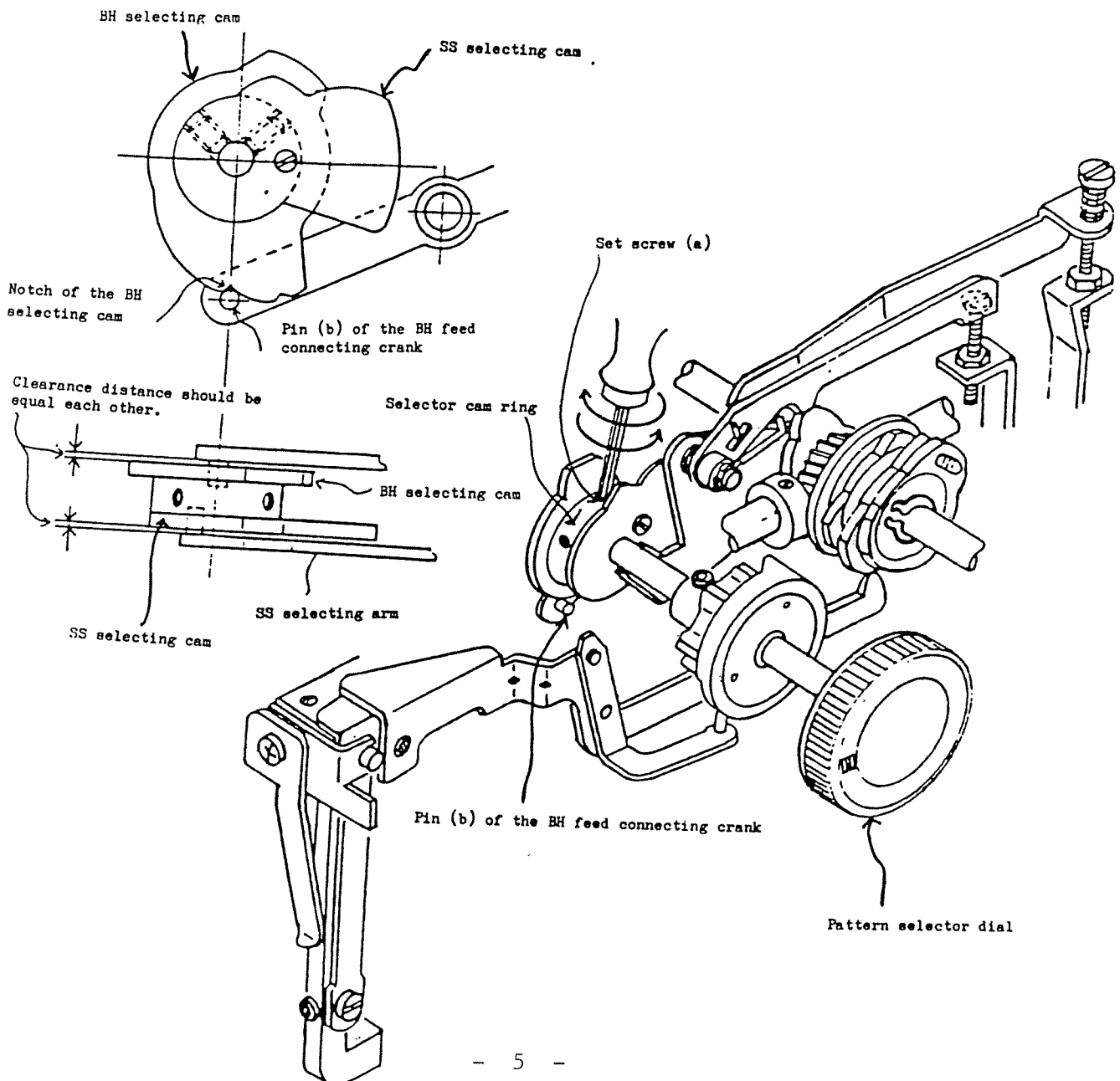
POSITION OF BUTTONHOLE SELECTING CAM

Correct condition:


The pin of buttonhole feed connecting crank should be set at concave portion on the buttonhole selecting cam with the pattern selector dial at "□".

If not, adjust as follows:

1. Remove the top cover.
2. Set the pattern selector dial at "□".
3. Loosen set screw (a).
4. Make clearance between selecting cam and buttonhole feed connecting crank about 0.5 mm, then position the concave portion of buttonhole selecting cam at pin of buttonhole feed connecting crank.
5. Tighten set screw (a).
6. Attach the top cover.




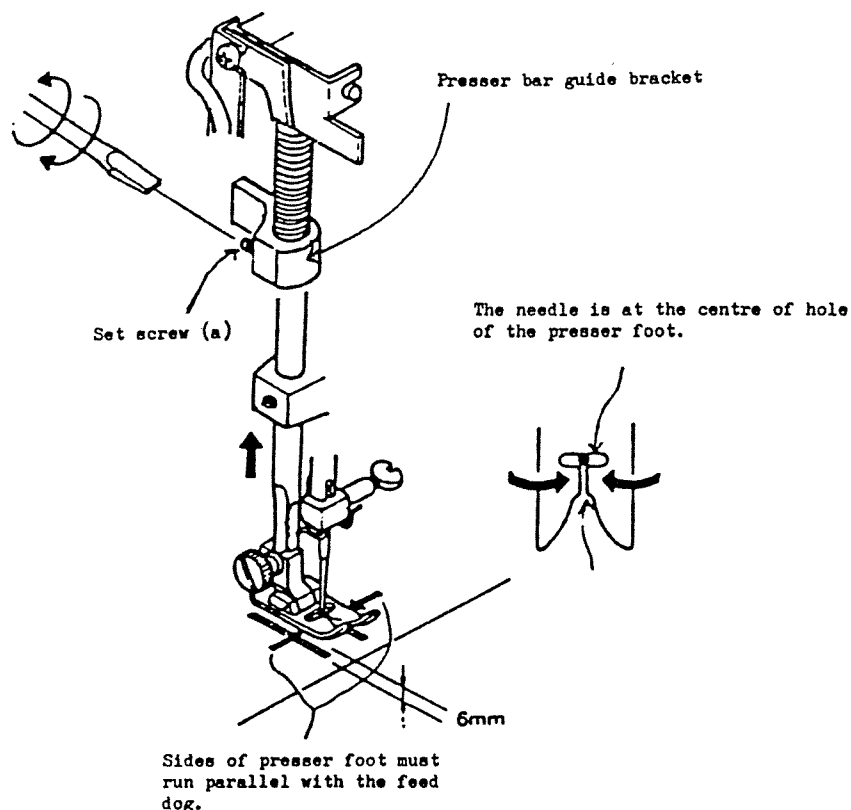
POSITION OF PRESSER BAR

When the pattern selector dial is set at "", needle must drop at the center of hole on presser foot.

Note:


Before adjustment, check if NEEDLE DROP and "M" NEEDLE POSITION are correct.

1. Remove the face plate.
2. Set the pattern selector dial at "".
3. Raise the presser bar by lifting the presser bar lifter and loosen set screw(a) of presser bar guide bracket.
4. Adjust the position of presser bar so that the needle is at the center of hole on presser foot. Then position the side of presser foot to parallel with the feed dog window on needle plate.
5. Adjust the height of presser foot to 6 mm in height from the needle plate.
6. Tighten set screw(a).
7. Attach the top cover.



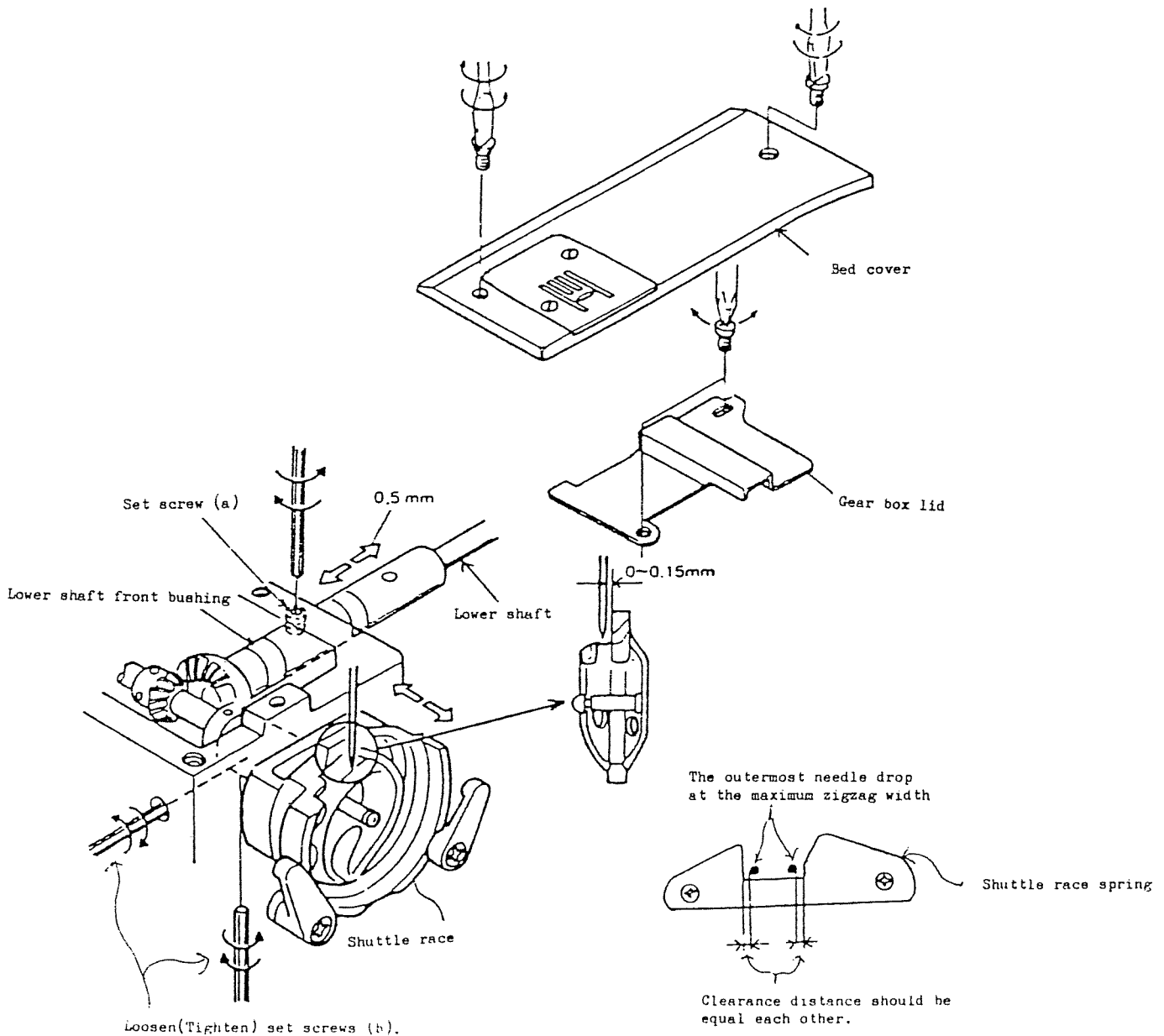
CLEARANCE BETWEEN NEEDLE AND HOOK

The optimum clearance distance between the needle and the hook is 0 - 0.15mm.


1. Set the pattern selector dial at "  " .
2. Remove the bed cover and gear box lid by loosening set screws.
3. Loosen set screw (a) and move the lower shaft front bushing to the right side about 0.5mm (be careful not to slip the lower shaft gear), then tighten set screw (a) temporarily.
4. Loosen two set screws (b) which fix the shuttle race and the shuttle race body becomes movable.
5. Make the clearance between the needle and the hook 0 - 0.15mm.

* Do not turn the shuttle race body while adjusting.

6. Check the clearance between the needle and the shuttle race spring is as below.
7. Tighten two set screws (b).
8. Loosen set screw (a) and move the lower shaft to the left while adjusting vibration of gears. Then, tighten set screw (a) firmly.
9. Attach the bed cover and the gear box lid.




HOOKE TIMING

With the pattern selector dial set at "  " (zigzag width 0), turn the balance wheel counter-clockwise until the tip of hook meets the left side of needle. (Use needle #14.)

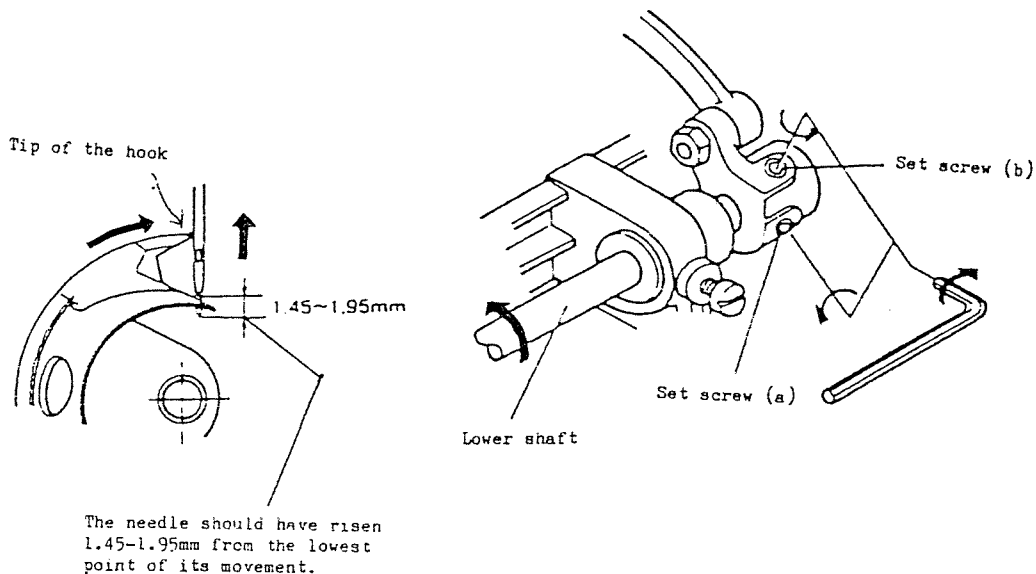
At this point, if the needle has risen to a height of 1.45 - 1.95mm from its lowest point, it shows that hook timing is correct.

If not, adjust as follows:

Note: Before adjusting hook timing, check if NEEDLE DROP is correct.

1. Set the pattern selector dial at "  " (zigzag width 0).
2. Loosen set screw (a).
3. Turn the balance wheel counter-clockwise until the needle comes up to 1.45 - 1.95mm from its lowest point.
4. Loosen set screw (b).
5. While holding the balance wheel so that the upper shaft does not rotate, turn the lower shaft in the direction of arrow as per the illustration until the tip of hook meets the left side of needle.
6. Tighten screw (a) and (b).

Note: After adjustment, check FEED LIFTING CAM POSITION.



HEIGHT OF NEEDLE BAR

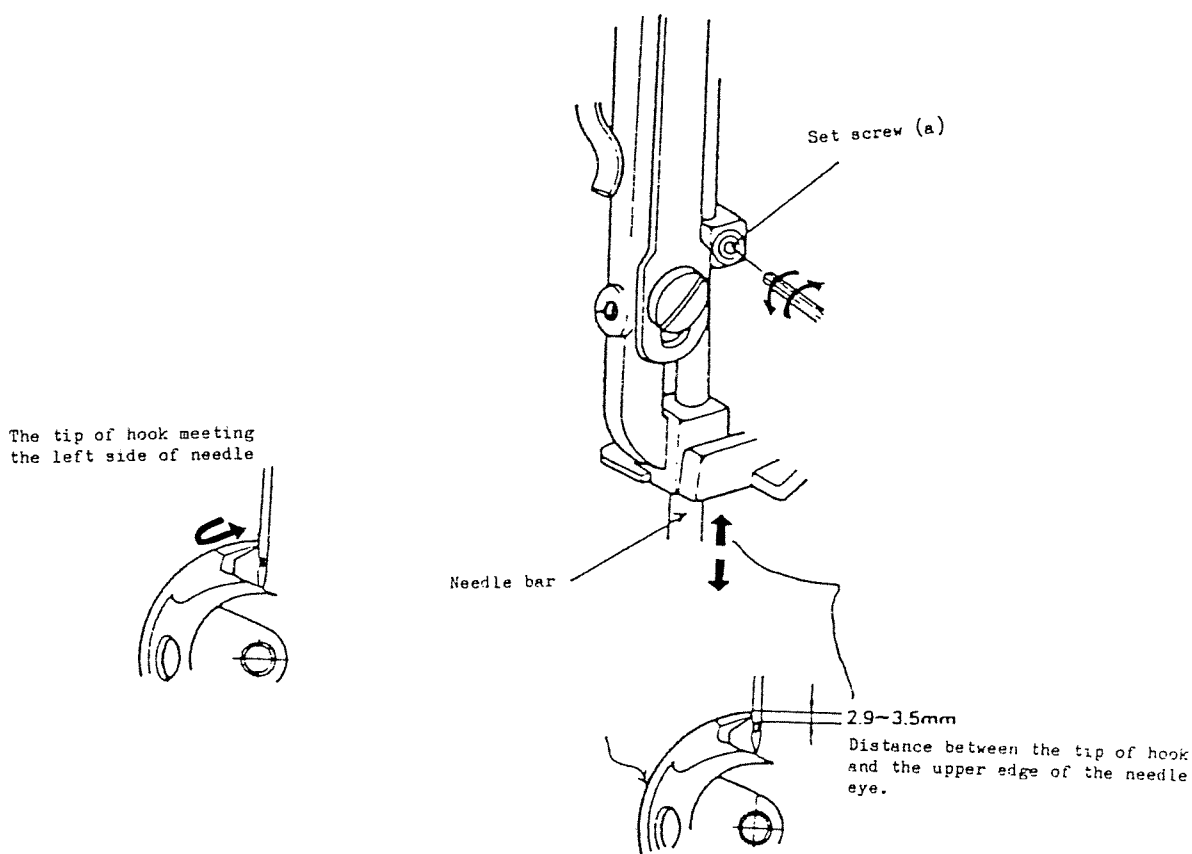
Turn the balance wheel counter-clockwise until the needle bar comes down to its lowest point. Then, turn the balance wheel further until the tip of hook meets the left side of needle. At this point, distance between the tip of hook and upper edge of the needle eye must be 2.9-3.5mm. If not, adjust as follows:

Note: Before adjusting HEIGHT OF NEEDLE BAR, check if NEEDLE DROP and HOOK TIMING are correct.

1. Set the pattern selector dial at "0":
2. Turn the balance wheel counter-clockwise until the tip of hook meets the left side of needle.
3. Loosen set screw (a).
4. Move the needle bar vertically to make the distance between the tip of hook and the upper edge of needle eye 2.9-3.5mm.

Note: Do not turn the needle bar.

5. Tighten screw (a).



BACKLASH OF LOWER SHAFT

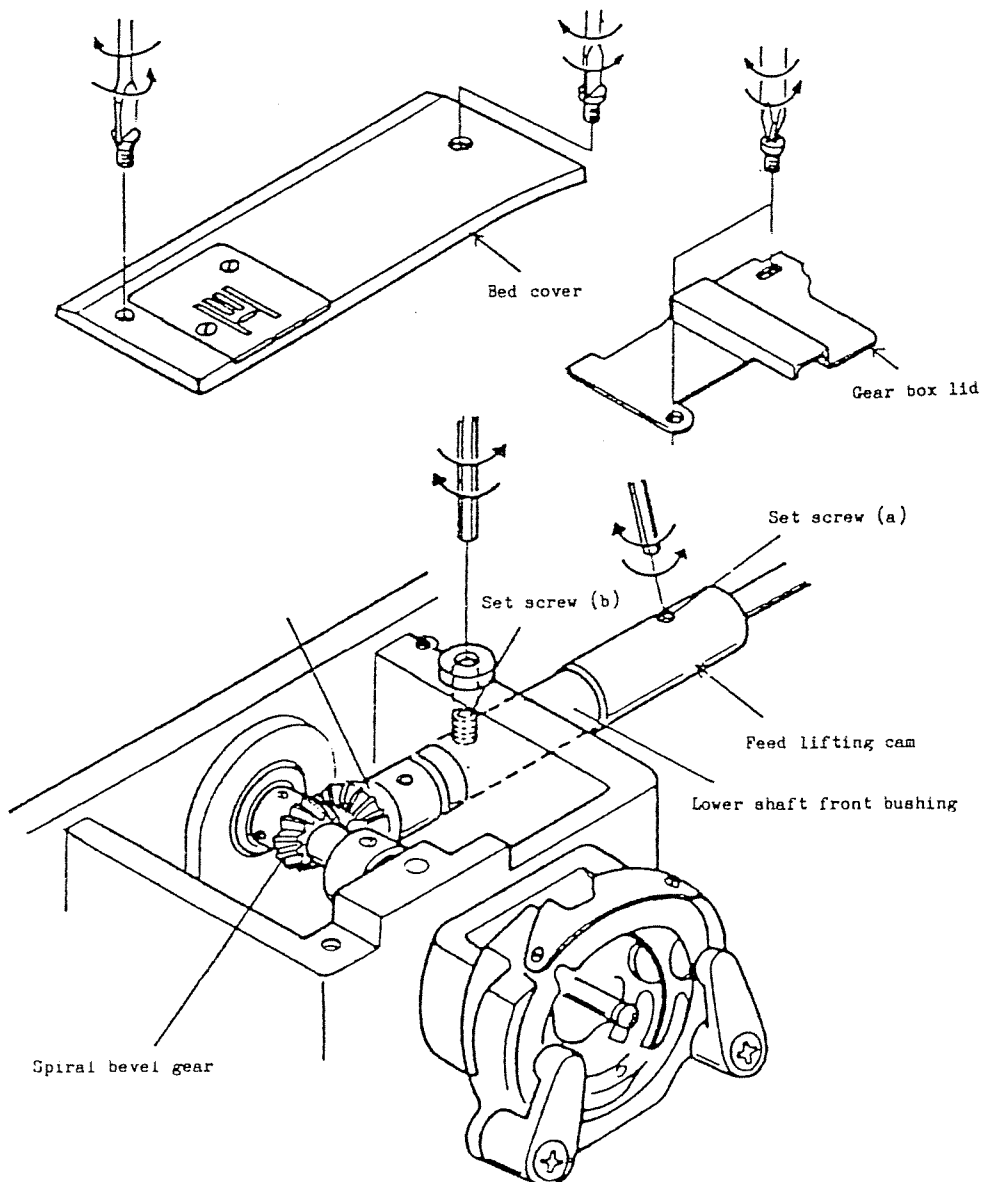
If the lower shaft has much vibration in its thrust direction or rotatory direction, make adjustment as follows. (vibration should be within 0.03mm in thrust direction and within 0.3mm in rotatory direction.)

1. Remove the bed cover and the gear box lid.
2. Loosen set screw (a) on the feed lifting cam.
3. Push the feed lifting cam to the lower shaft front bushing to make vibration of lower shaft in thrust direction within 0.03mm. Then, tighten set screw (a).

Note: When loosening set screw (a), do not turn the feed lifting cam.


4. Loosen set screw (b) on the lower shaft front bushing.
5. Push the lower shaft front bushing to the spiral bevel gear to make vibration of the lower shaft in rotatory direction within 0.3mm. Then, tighten set screw (b).
6. Turn the balance wheel counter-clockwise and check if the lower shaft rotates easily with proper smoothness and vibration.
7. Attach the bed cover and the gear box lid.

Note: After adjustment, check if HOOK TIMING and HEIGHT OF NEEDLE BAR are correct.



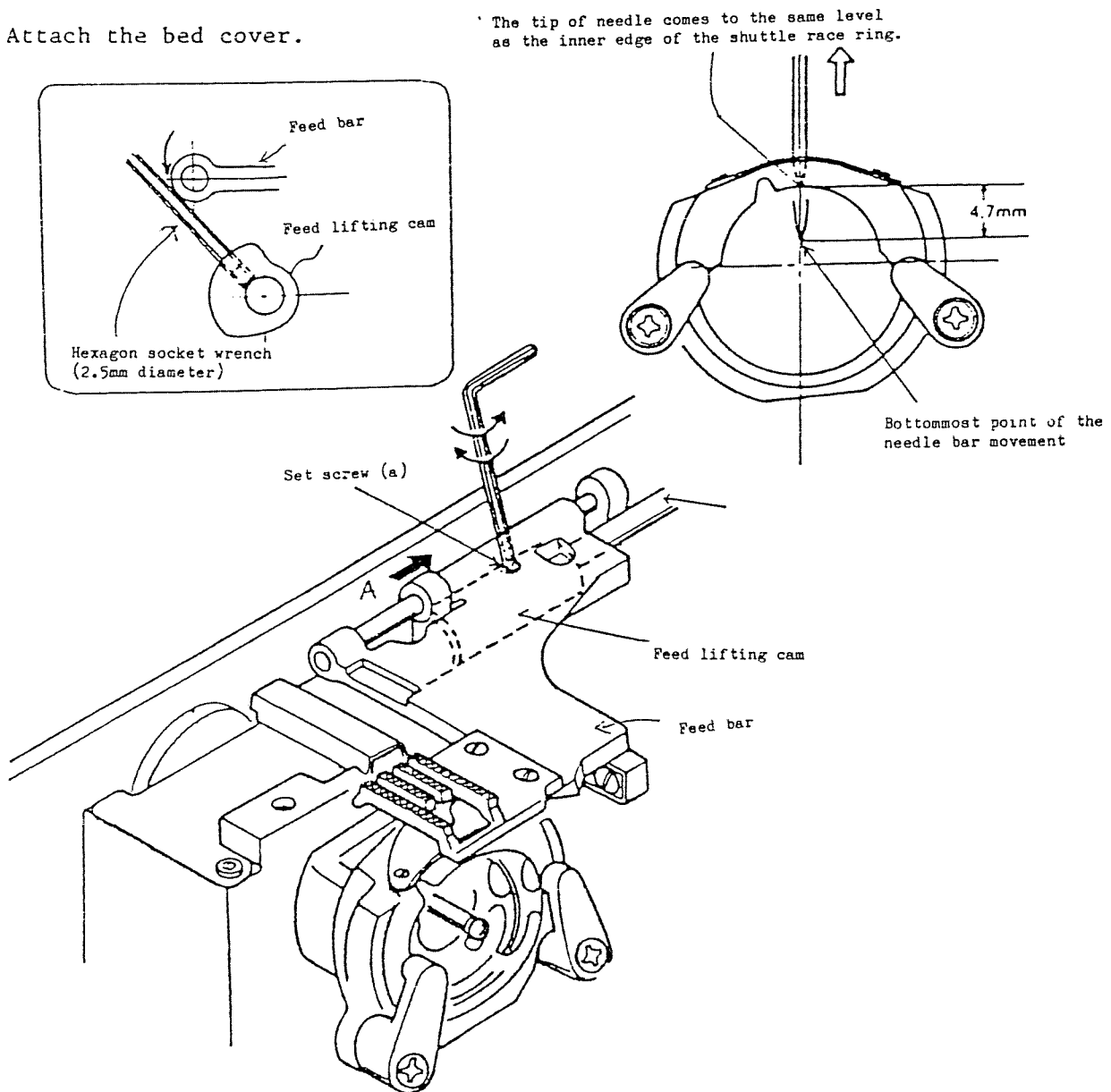
POSITION OF FEED LIFTING CAM

Before adjustment, check if HOOK TIMING and CLEARANCE BETWEEN NEEDLE AND HOOK are correct.

1. Set the pattern selector dial at "  ".
2. Remove the bed cover.
3. Turn the balance wheel counter-clockwise until the needle bar comes up to 4.7mm from its lowest point. (At this point, the tip of needle is at the same level as inner edge of shuttle race ring as illustrated below.)
4. Loosen set screw (a) on the feed lifting cam.
5. Turn the feed lifting cam with hexagon socket wrench (2.5mm diameter) until the wrench hits the feed bar. Then, tighten set screw (a).

Note: Adjust carefully so that the lower shaft does not vibrate.

6. Attach the bed cover.

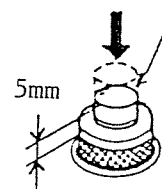


HEIGHT OF FEED DOG

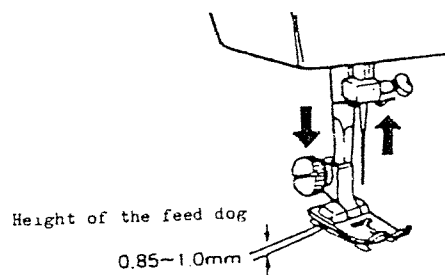
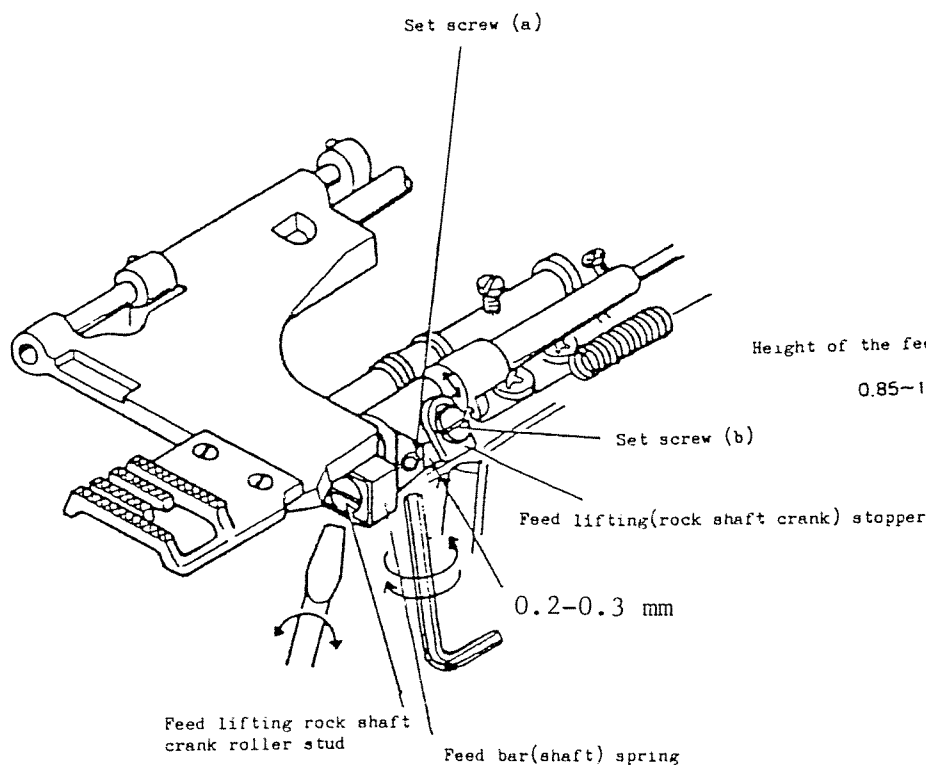
With the darner set at medium (the darner appears about 5mm from the top), the optimum height of feed dog should be 0.85-1.0mm from the needle plate.

1. Set the darner at medium. (The darner appears about 5mm from the top.)
2. Set the stitch length regulator dial at 4. Then, raise the needle bar to its highest point.
3. Loosen set screw (a).
4. Adjust height of feed dog 0.85 - 1.0mm from the needle plate by turning feed lifting rock shaft crank roller stud with screw driver. Then, tighten set screw (a).
5. Turn the balance wheel counter-clockwise and check if height of feed dog is adjusted properly.
6. Turn the balance wheel counter-clockwise until the feed dog comes to its lowest point. Loosen set screw (b) and make clearance between the feed lifting stopper and bed plate 0.2 - 0.3mm. Then, tighten set screw (b).

Note: A. When you set stitch length regulator dial at "▲▲▲", the feed dog should not touch the shuttle race body unit.
 B. With the stitch length regulator dial set at 4, the feed lifting rock shaft crank roller stud should not touch the feed bar spring.



Set the darner position.



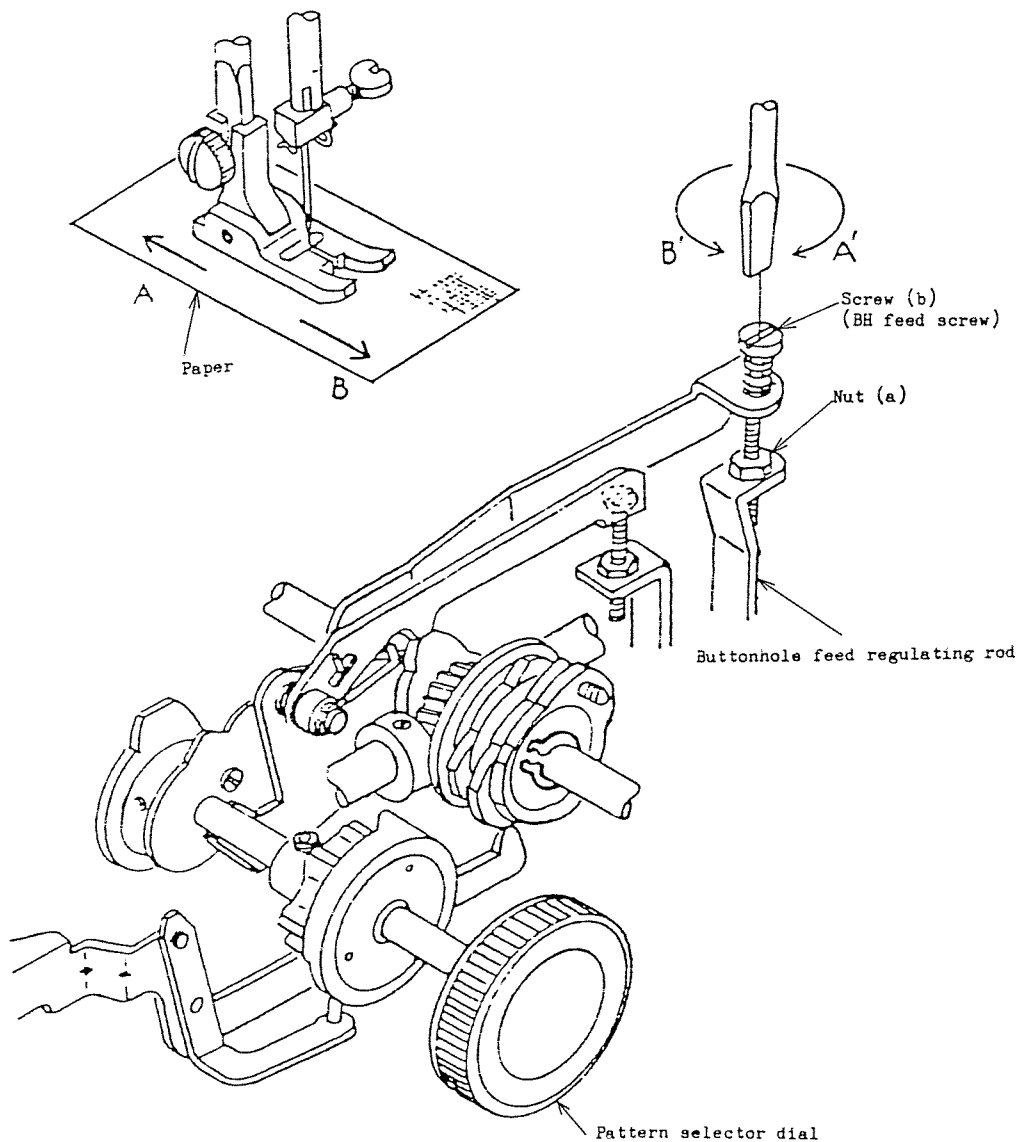
BAR-TUCK FEED OF BUTTONHOLE

In buttonhole sewing, bar-tuck feed should not exceed 1 mm for 20 stitches.

* When you make this adjustment, use the buttonhole foot.

1. Remove the top cover.
2. Set the pattern selector dial at "□" and the stitch length regulator dial at "4".
3. Loosen the nut (a).
4. Place a piece of paper under the presser foot and turn the balance wheel counter-clockwise.
 - i) If the paper moves to the direction of (A), turn the screw (b) clockwise. (direction of A')
 - ii) If the paper moves to the direction of (B), turn the screw (b) counter-clockwise. (direction of B')
5. Tighten the nut (a).
6. Attach the top cover.

Note: After adjustment, check FEED DIFFERENCE OF BUTTONHOLE.



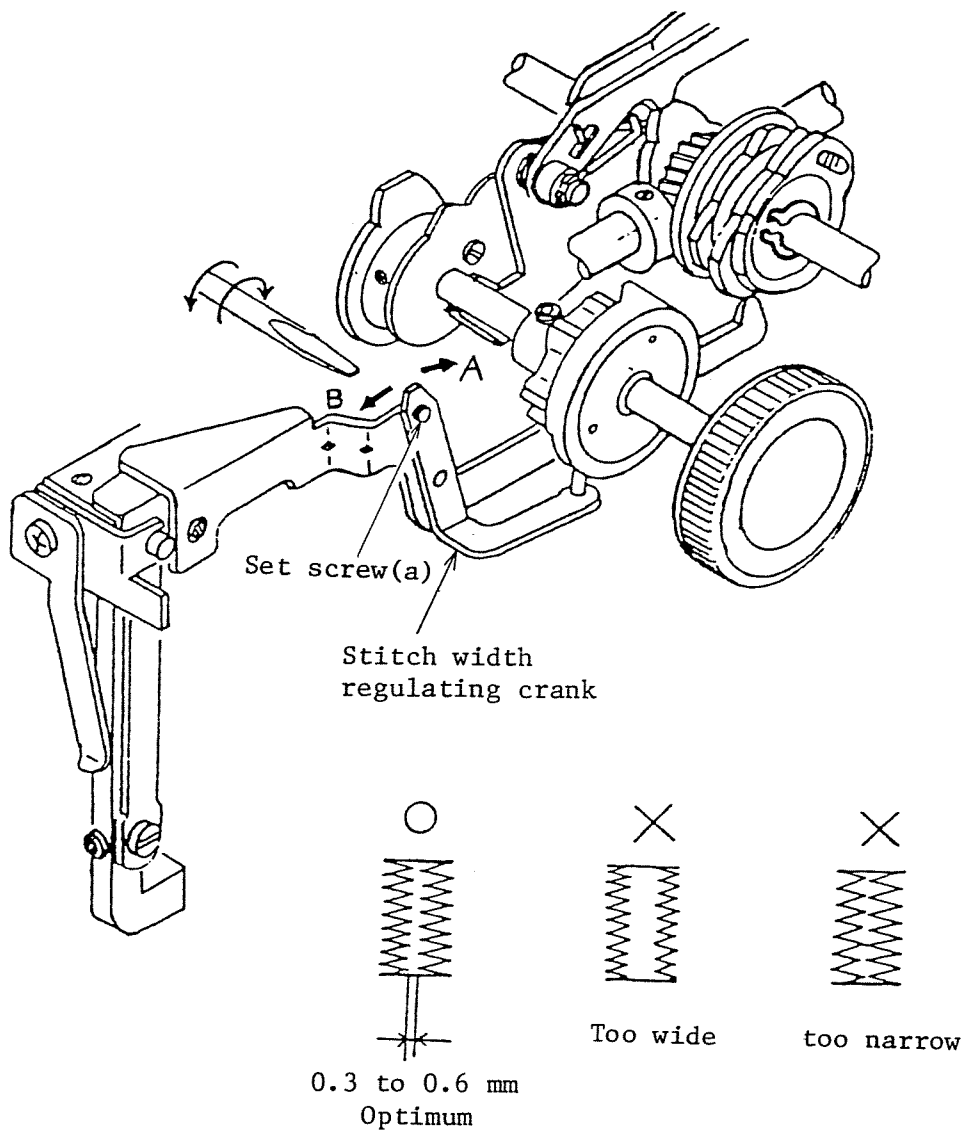
CUTTING SPACE OF BUTTONHOLE

The optimum width of cutting space of buttonhole should be 0.3 to 0.6 mm.

* When you make this adjustment, use the buttonhole foot.

1. Set the stitch length regulator dial at 0.5.
2. Sew buttonhole and check if width of buttonhole is correct.
3. Remove the top cover and loosen the set screw (a).
 - i) If cutting space is too wide, move the stitch width regulating crank to in the direction of "A".
 - ii) If cutting space is too narrow, move the stitch width regulating crank to in the direction of "B".
4. Tighten the set screw (a).

Note: After adjustment, check "M" needle position and needle bar position.



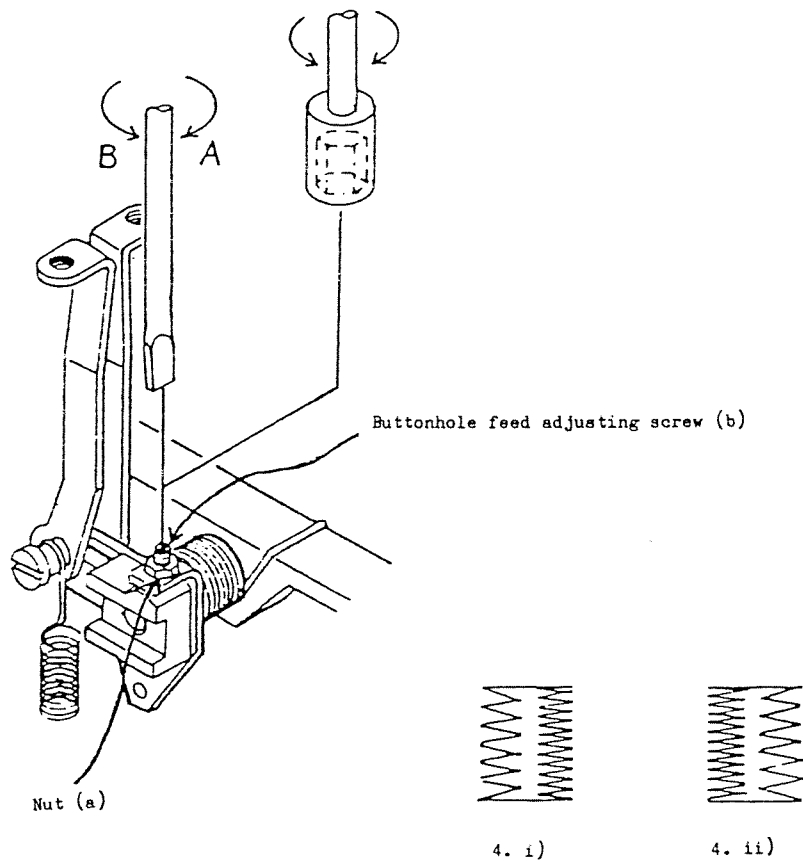
FEED DIFFERENCE OF BUTTONHOLE

The number of stitch must be 9 - 10 on the right side of buttonhole against 10 stitches on the left.

* When you make adjustment, use buttonhole foot.

1. Set the stitch length regulator dial at 0.5.
2. Sew buttonhole and check if adjustment is necessary.
3. Loosen the nut (a).
4. i) If stitch is more open on the left side, turn the buttonhole feed adjusting screw (b) clockwise (in direction of "A").
ii) If stitch is more open on the right side, turn the buttonhole feed adjusting screw (b) counter-clockwise (in direction of "B").
5. Tighten the nut (a) and attach the top cover.

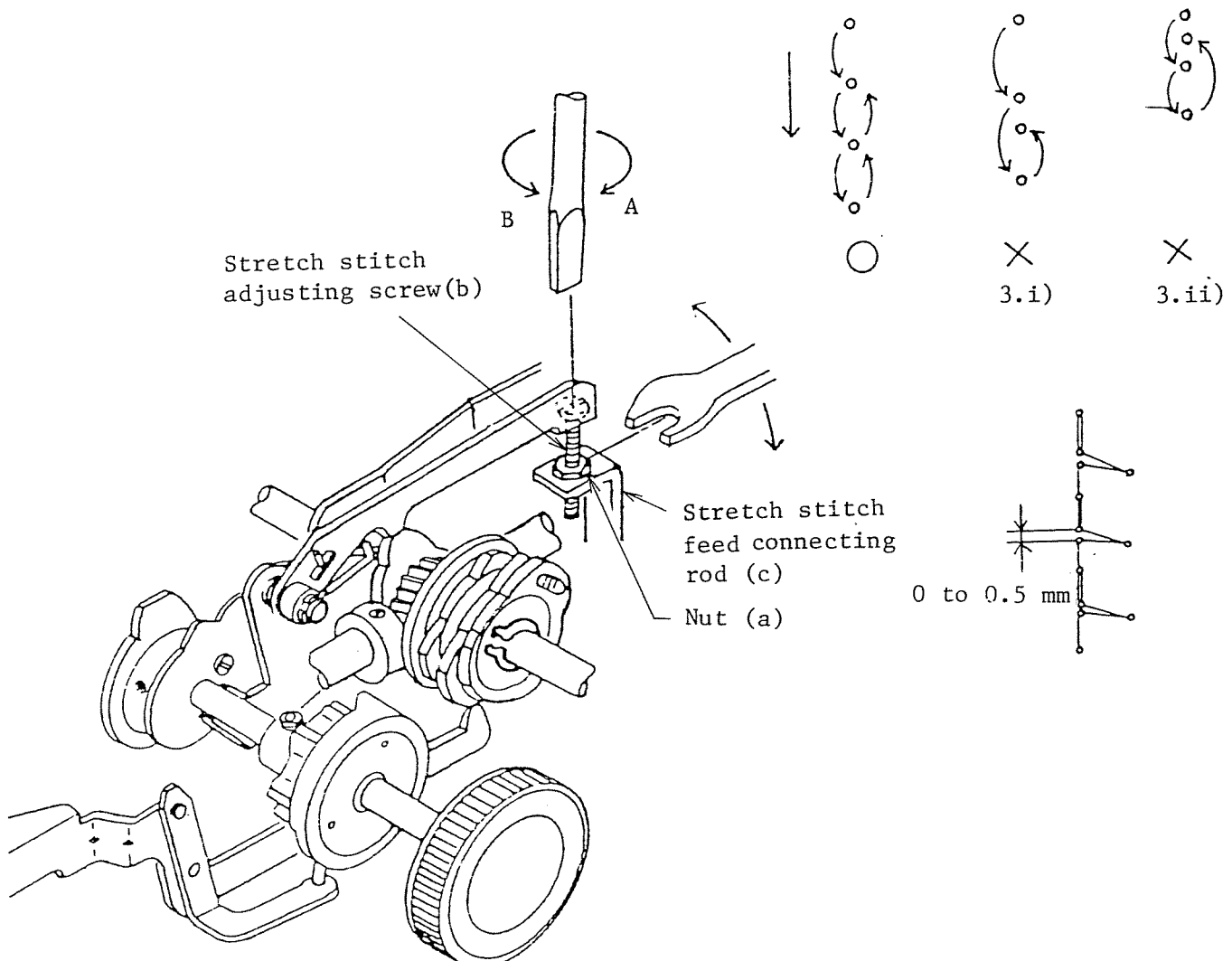
Note: After adjustment, check BAR-TUCK FEED OF BUTTONHOLE.



PITCH DIFFERENCE IN STRETCH STITCH

If there is large pitch difference between forward and backward stitching of stretch stitch, it may cause deformed patterns. Forward pitch should be nearly equal to backward pitch at stitch pattern " " and when seam is drawn out at stitch pattern " ", acceptable detached range of pitch difference should be 0 to 0.5mm.

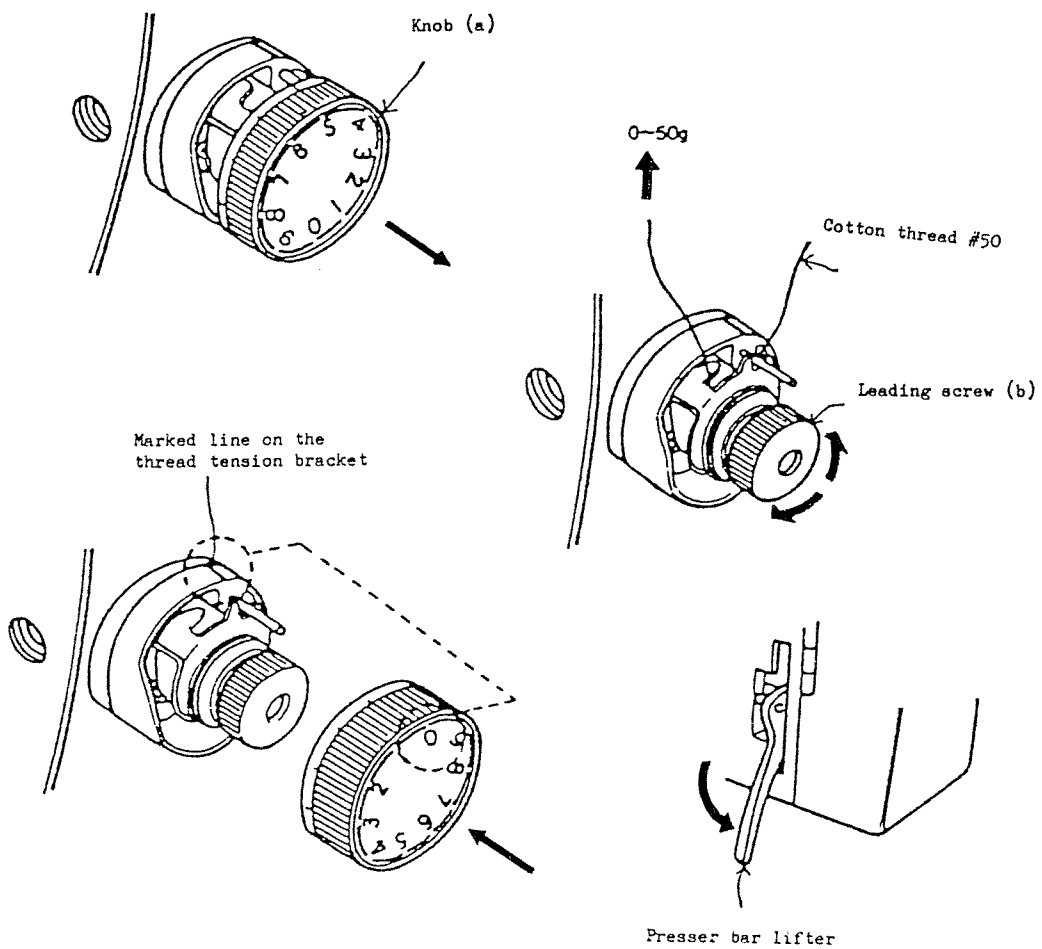
1. Set the pattern selector dial at " " and the stitch length regulator dial at "S.S". Then remove the top cover.
2. Loosen the nut(a).
3. Check forward and backward pitch.
 - i) When forward pitch is larger than backward pitch, turn the stretch stitch adjusting screw(b) clockwise in the direction of "A".
 - ii) When forward pitch is smaller than backward pitch, turn the stretch stitch adjusting screw (b) counter clockwise in the direction of "B".
4. Set the pattern selector dial at " ".
5. Sew the pattern " " and check if detachable portion is within 0 to 0.5 mm range.
6. Tighten the nut(a). (Do not bend the stretch stitch feed connecting rod (C)).
7. Attach the top cover.



THREAD TENSION

It is most desirable that thread comes off freely from thread tension with the thread tension regulator dial set 0 and thread comes off with slight friction with the dial set at 1.

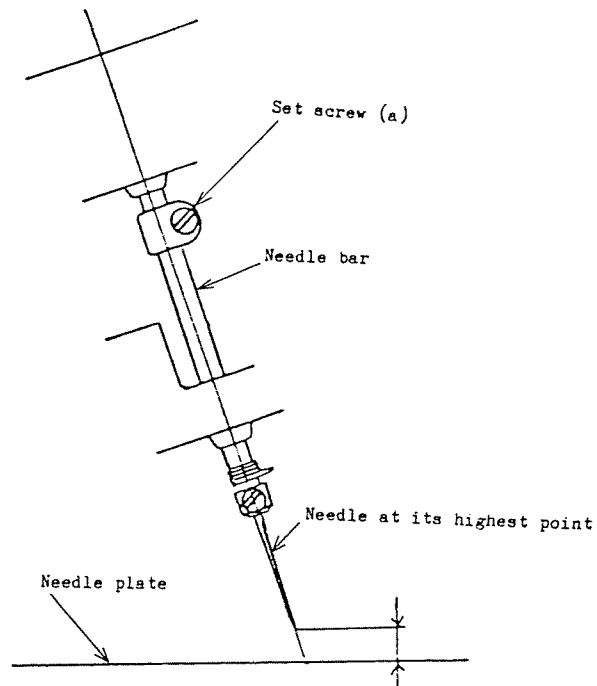
1. Lower the presser bar lifter.
2. Set the thread tension regulator dial at 5 and pull out the knob (a) from thread tension dial unit.
3. Loosen the leading screw (b) until thread tension becomes to loose that the thread comes off the discs of the thread tension without friction.
4. Set 0 of knob (a) at marked line on the thread tension bracket and thrust the knob (a) into the thread tension dial.



HEIGHT OF NEEDLE (NEEDLE BAR)

The optimum height of needle is 8.85 to 9.35mm from the needle plate when needle comes to its highest position.

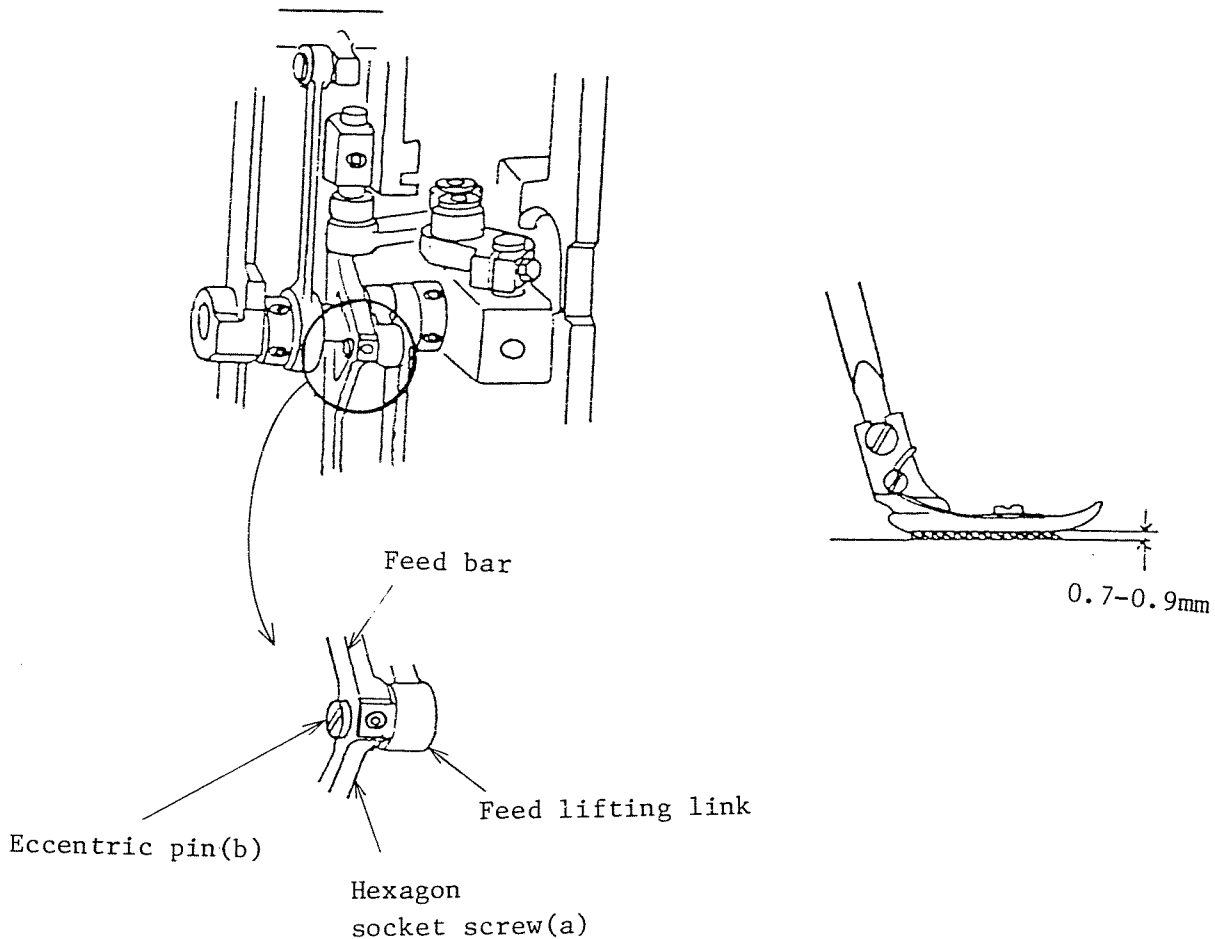
1. Remove the lamp cover.
2. Raise the needle to its highest position by turning balance wheel clockwise.
3. Loosen set screw(a). Then adjust the height of needle 8.85 to 9.35mm from the needle plate.
- * When adjusting height of needle, be careful not to turn the needle bar.
4. Tighten set screw(a).
5. Turn the balance wheel clockwise and check if the height of needle is correct.
6. Attach the lamp cover.



HEIGHT OF FEED DOG

The optimum height of feed dog is 0.7 - 0.9mm from the needle plate when the presser foot is lowered by presser bar lifter.

1. Remove the base cover plate and side cover.
 2. Lower the presser foot
 3. Raise the feed dog to its highest position by turning the balance wheel clockwise.
 4. Loosen the hexagonal set screw (a). Then, turn the eccentric pin (b) to adjust height of feed dog 0.7 - 0.9mm from the needle plate.
 5. Tighten the hexagonal set screw (a).
- * Check if the feed bar and feed lifting link are joined sufficiently.
6. Turn the balance wheel and check if height of feed dog is correct.
 7. Attach the base cover plate and screw driver.



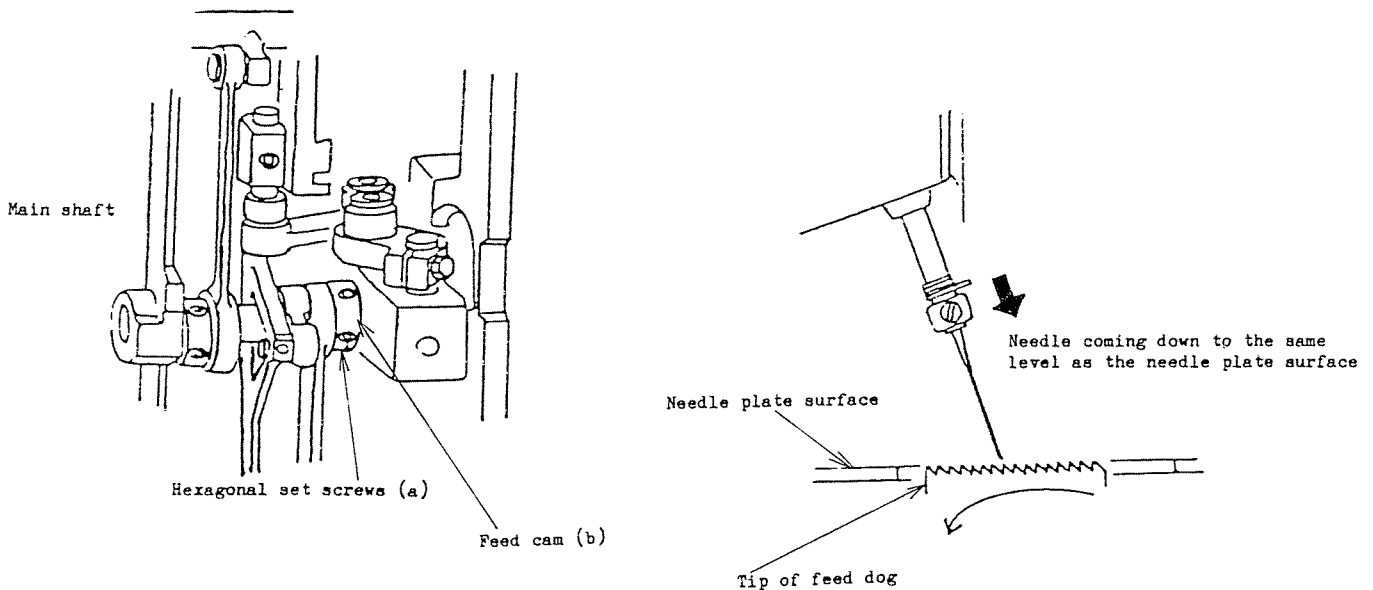
TIMING OF NEEDLE AND FEED DOG

When the tip of needle comes down from its highest point to the upper surface of needle plate, the tip of feed dog must be at the same level as upper surface of needle plate.

1. Remove the base cover plate.
2. Raise the presser foot.
3. Turn the balance wheel clockwise until the tip of needle comes down from its highest point to the upper surface of the needle plate.
4. Loosen two hexagonal set screws (a). Turn the feed cam (b) and set the tip of feed dog at the upper surface of the needle plate. Then, tighten the two hexagonal set screws (a).

Note: When you turn the feed cam(b), be careful not to cause play on the main shaft when the machine is operating.

5. Turn the balance wheel clockwise and check if the timing of the needle and the feed dog is correct.
6. Attach the base cover plate.



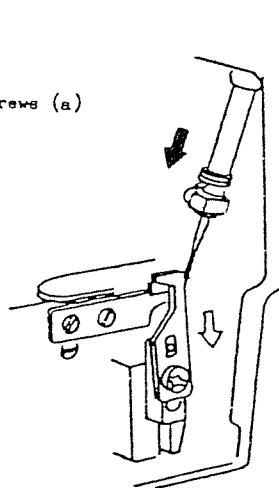
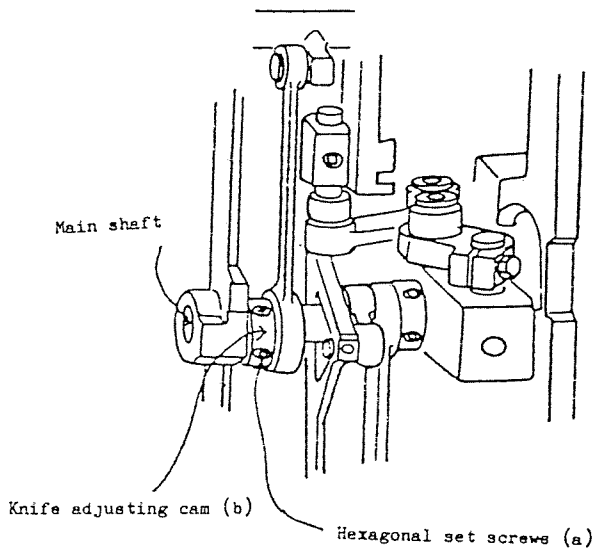
TIMING OF NEEDLE AND UPPER KNIFE

When the needle comes up to its highest position, the upper knife must be positioned at its highest too. When the needle is at its lowest position, the upper knife must be at its lowest position.

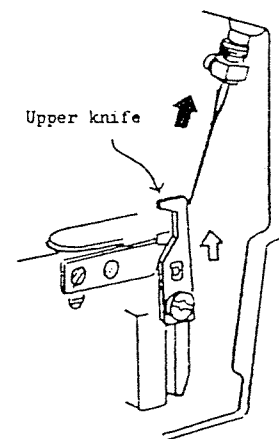
1. Remove the base cover plate.
2. Turn the balance wheel clockwise to bring down the needle to its lowest position.
3. Loosen two hexagonal set screws (a). Turn the knife adjusting cam (b) to set the upper knife at its lowest position. Then, tighten two hexagonal set screws (a).

Caution: When you turn the knife adjusting cam (b), be careful not to cause play on the main shaft when the machine is operating.

4. Turn the balance wheel and check if timing of needle and upper knife is correct.
5. Attach the base cover plate.



When the needle is going down,
the upper knife is also going down.



When the needle is going up,
the upper knife is also going up.

CLEARANCE BETWEEN NEEDLE AND LOOPER

The optimum clearance between the needle and the looper is 0 - 0.1mm when the looper catches the thread under the needle plate.

1. Take off the presser foot.
2. Remove the needle plate.
3. Remove the base cover plate.
4. Loosen the hexagonal bolt (a) and hexagonal set screw (b).
5. Turn the balance wheel clockwise to move the looper to the leftmost under the needle plate. Turn the balance wheel further until the tip of looper meets the needle.
6. Adjust the looper drive crank (c) to make the clearance between the tip of looper and the needle 0 - 0.1mm.

Note: When adjusting, be careful not to change the timing of the needle and the looper.

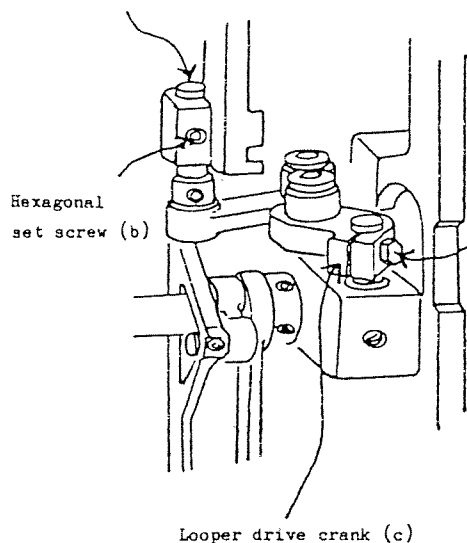
7. Tighten the hexagonal set screw (b) and the hexagonal bolt (a).

Caution: If you tighten hexagonal bolt(a) too strongly, it will break the looper drive crank.

8. Turn the balance wheel clockwise and check if the clearance between needle and looper is correct. Also check the timing of needle and looper.

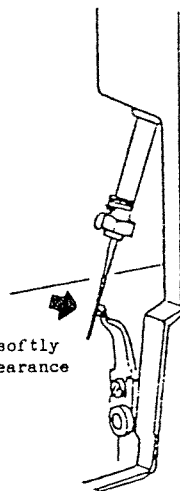
9. Attach the base cover plate, the needle plate and the presser foot.

Looper supporting shaft



Hexagonal bolt (a)

Push the needle softly to see if the clearance is correct



Looper drive crank (c)

0-0.1mm

The optimum clearance distance between the needle and the looper is 0 - 0.1mm when the looper catches the thread under the needle plate.



TIMING OF NEEDLE AND LOOPER

When the looper comes up above the needle plate and stops at its leftmost point, the tip of the looper must point at the centre of the needle.

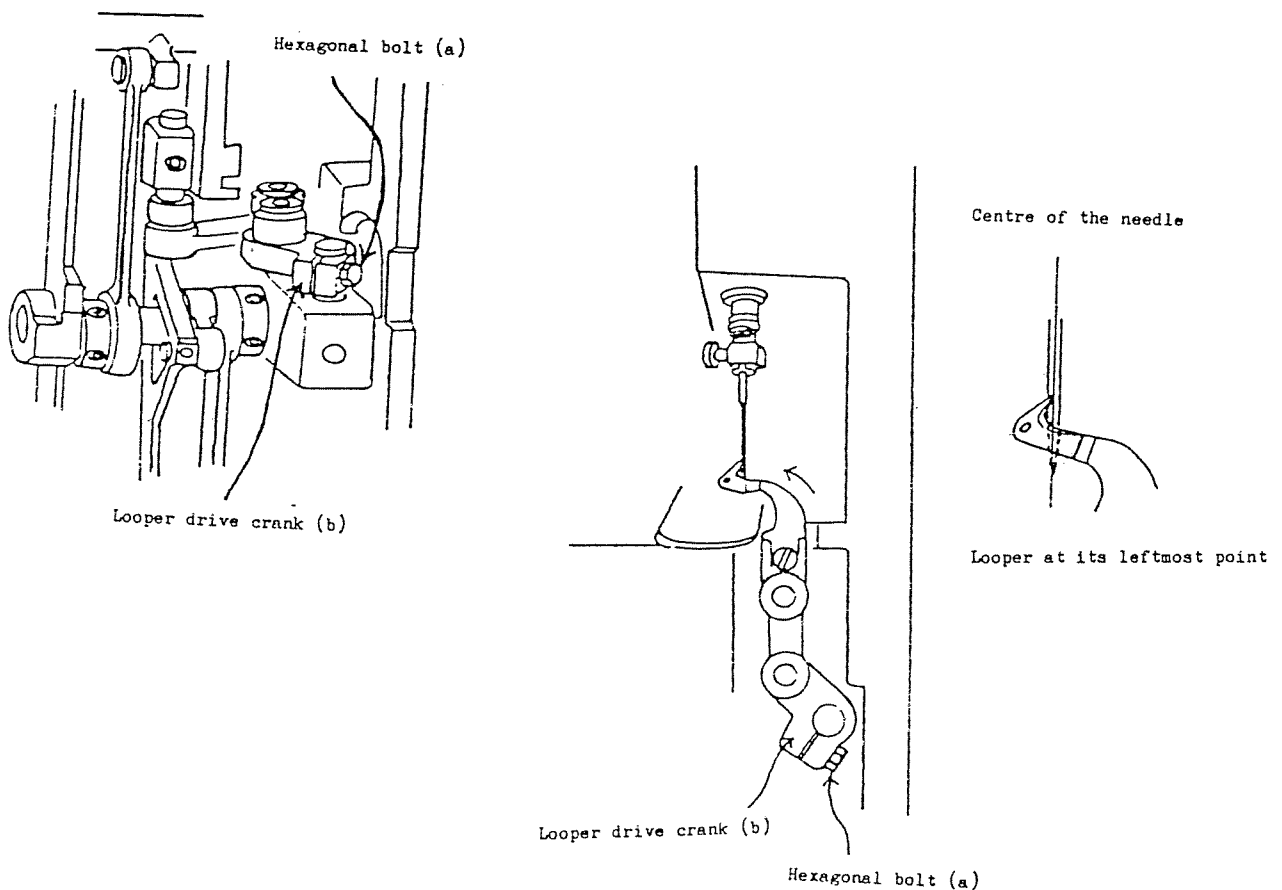
1. Remove the base cover plate.
2. Loosen hexagonal bolt (a) and adjust the position of the looper drive crank (b) so that the tip of the looper, at its leftmost position over the needle plate, points at the centre of the needle.
Then, tighten the bolt (a).

Caution: i) If you tighten bolt (a) too strongly, it will break the looper drive crank.

ii) When you move the looper drive crank, be careful not to miss the clearance between the needle and the looper.

3. Turn the balance wheel clockwise and check if the timing between needle and looper is correct. Also check the clearance between needle and looper.

4. Attach the base cover plate.

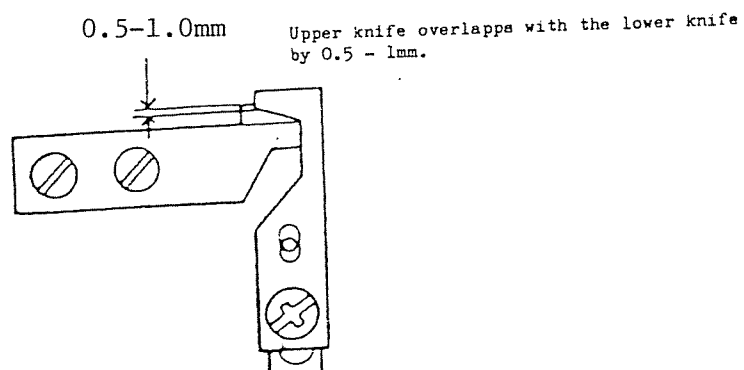
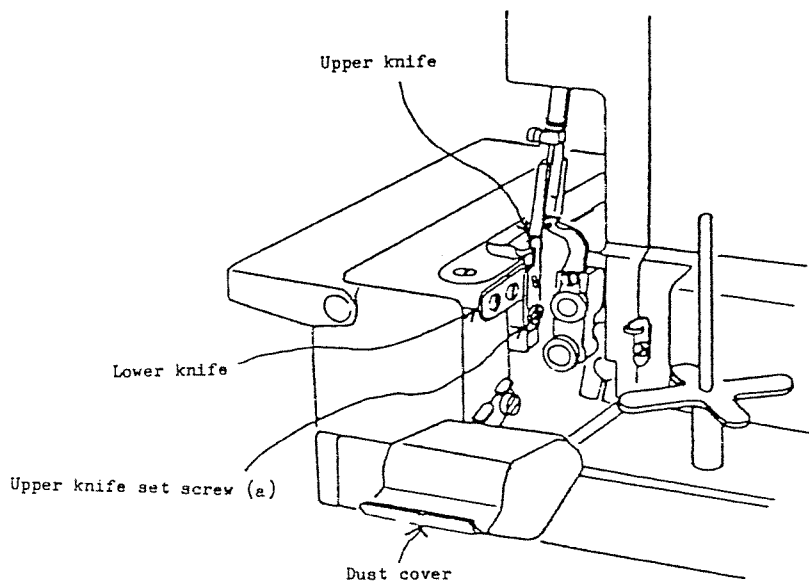


LOWER/UPPER KNIFE OVERLAP

When the upper knife comes down to its lowest point (the needle is also at its lowest point), the upper and the lower knives must overlap each other by 0.5-1mm.

Note: Before you make this adjustment, check if TIMING OF NEEDLE AND UPPER KNIFE is correct.

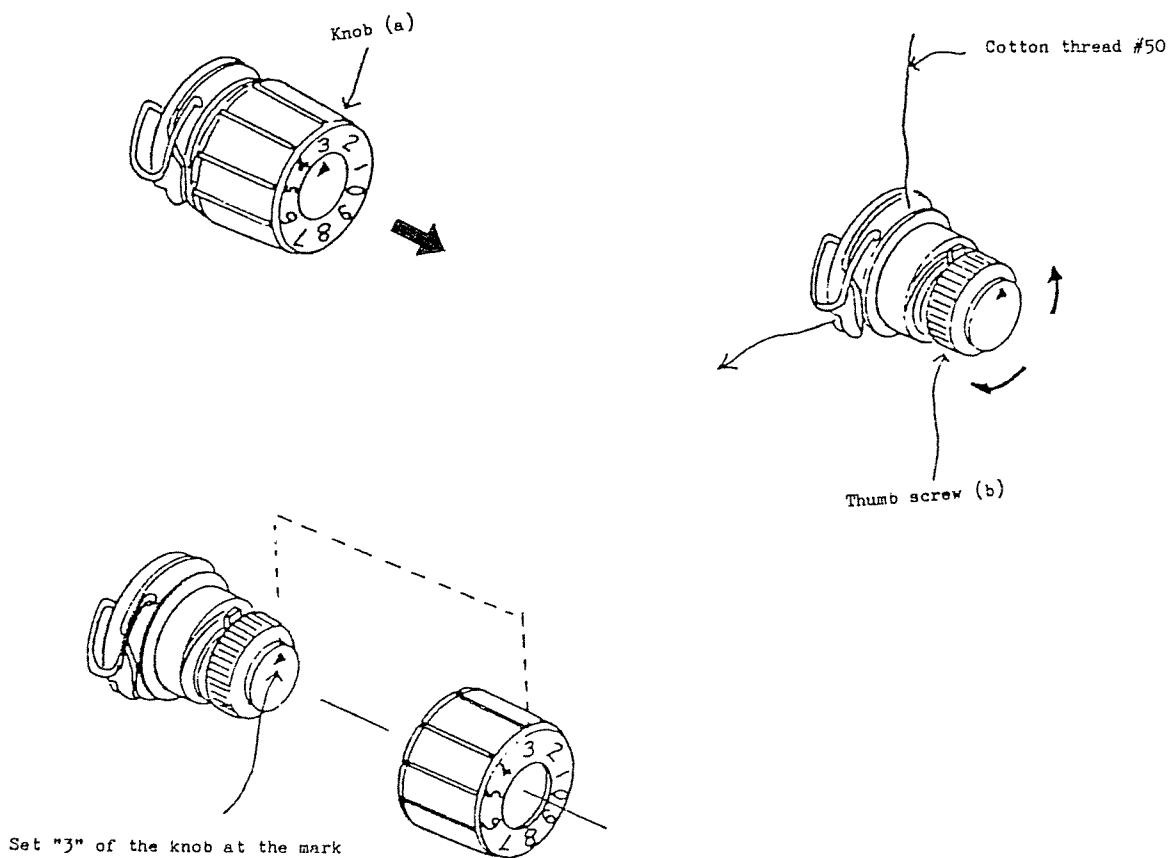
1. Open the dust cover.
2. Turn the balance wheel clockwise until the needle reaches to its lowest point.
3. Loosen the upper knife set screw (a). Then, adjust the position of the upper knife so that it overlaps with the lower knife by 0.5 - 1mm. After adjustment, tighten the screw (a).
4. Turn the balance wheel clockwise and check if adjustment is made correctly. Make sure that the upper knife does not hit the other parts.
5. Close the dust cover.



THREAD TENSION

The optimum thread tension is 30 - 50g at the needle thread tension regulator and 10 - 20g at the looper thread tension regulator with both thread tension regulators set at "3". (In checking thread tension, use a cotton thread size 50.)

1. Take off the thread tension regulator knob (a).
2. Adjust thread tension by turning thumb screw (b) to make tension of the needle thread 30 - 50g and tension of the looper thread 10 - 20g.
3. After adjustment, set "3" of the knob (a) at the mark "▲" on the thread tension dial.

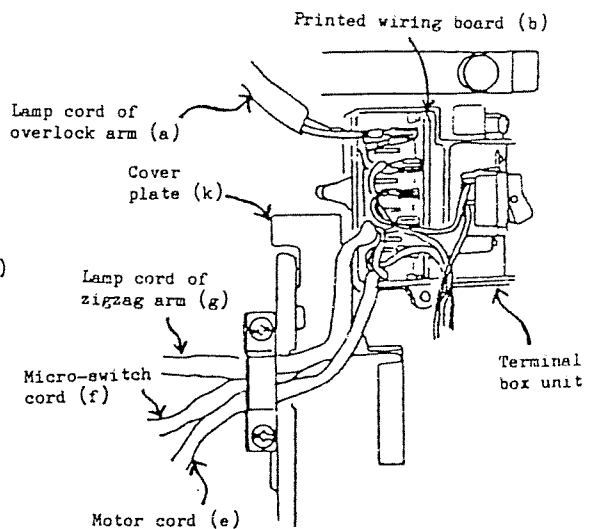
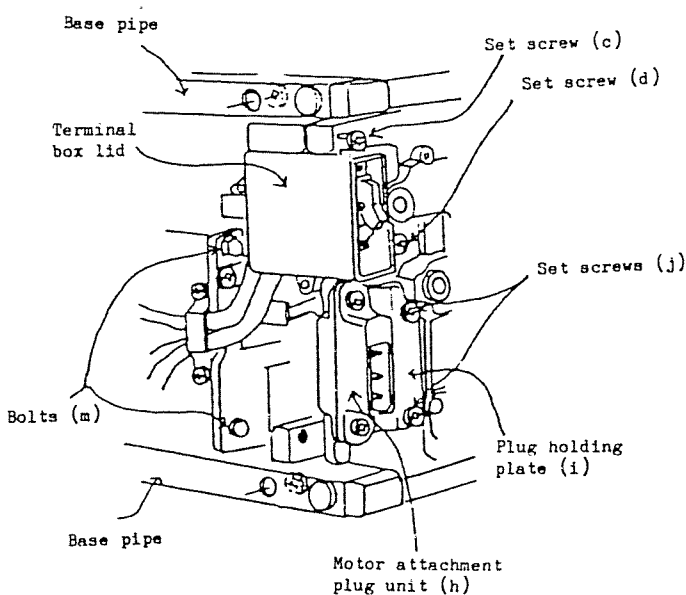
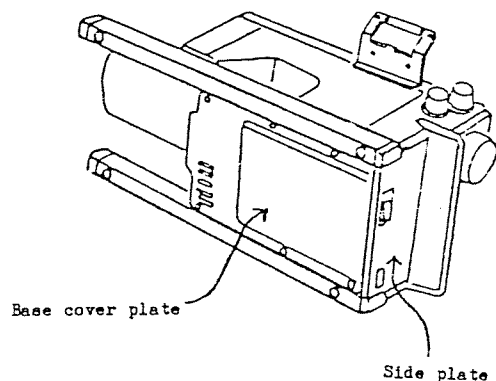
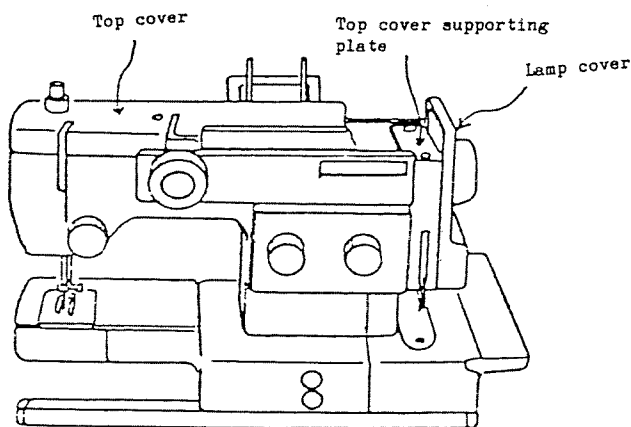


HOW TO DETACH OVERLOCK ARM (1/2)

1. Remove the top cover.
2. Remove the top cover supporting plate by loosening two screws on it.
3. Remove the lamp cover by loosening the screw.
4. Remove the side cover by loosening two set screws.
5. Remove the base cover plate by loosening six screws. (Move the base cover plate sideways and it will easily come off.)
6. Remove the terminal box lid by loosening two set screws.
7. Pull out the lamp cord (a) of the overlock arm from the printed wiring board (b).
8. Remove the terminal box unit by loosening set screw (c) and (d).
Keep the printed wiring board (b), the motor cord (e), micro-switch cord (f) and the lamp cord of zigzag arm (g) intact.
Attach the terminal box lid temporarily.
9. Remove the machine socket unit(h) together with the plug holding plate(i) by loosening two set screws(j).

Note: If the machine has an earth wire, detach the earth wire by loosening the screw.

10. Remove the cover plate(k) by loosening set screw.
11. Unscrew two bolts(m) which join the bed and the overlock arm.



HOW TO DETACH OVERLOCK ARM (2/2)

12 Take off the snap ring G-5 from the front panel frame.

* If you set stitch selection dial at overlock, you can take it off easily.

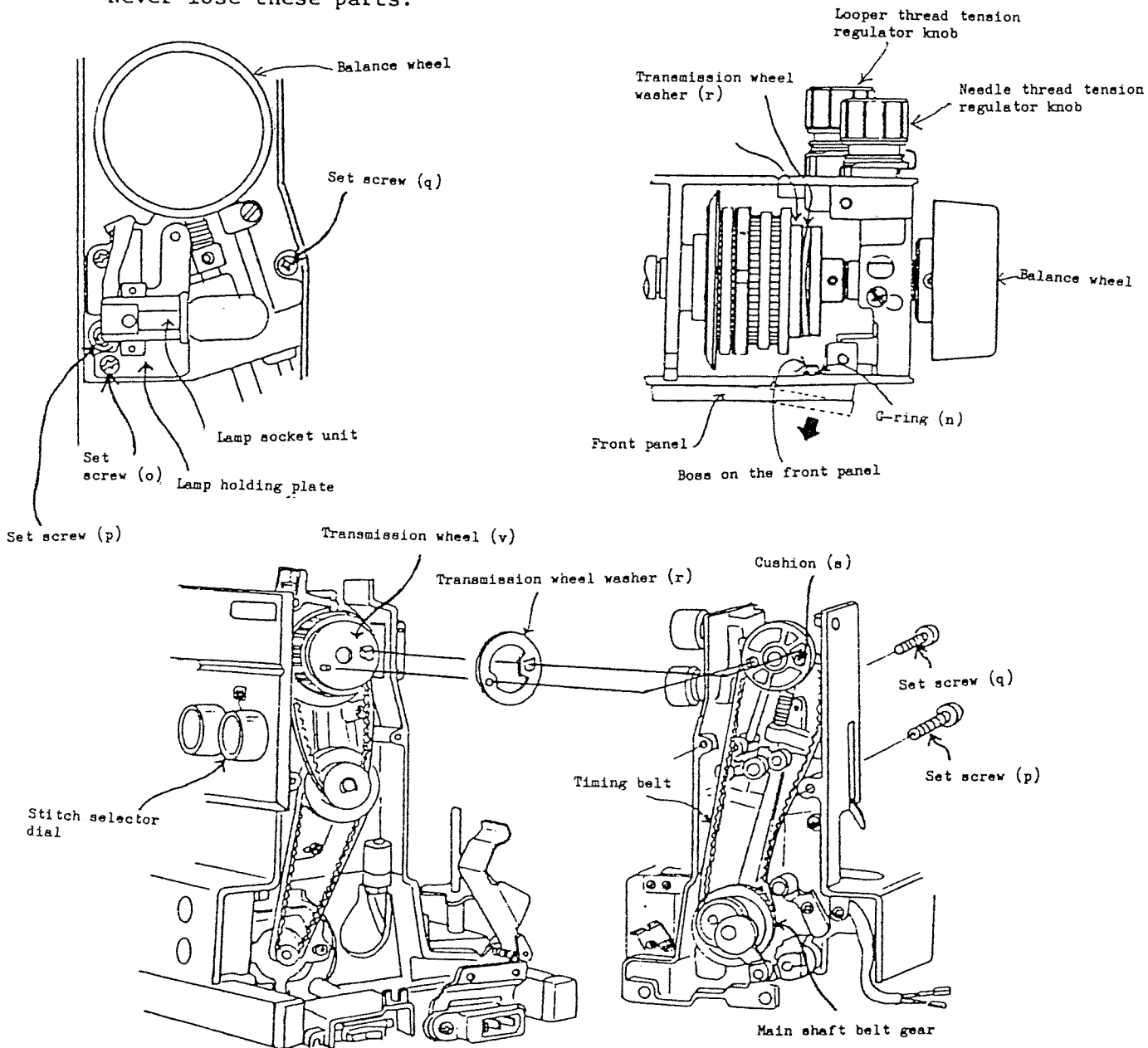
13 Remove the lamp socket unit (together with the lamp holding plate) by unscrewing two set screws (o).

14 Raise the presser foot lifter. Remove the set screw (p) and (q) which join overlock arm with zigzag arm.

15 Detach the overlock arm unit by drawing out the boss on the front panel from the overlock arm.

Note: i) When you detach the overlock arm unit, the transmission wheel washer (r) and the cushion (s) might slip off. Never lose these parts.

ii) In this operation, you remove many small parts such as screws & washer. Never lose these parts.



HOW TO ATTACH OVERLOCK ARM (1/4)

1. Turn the main shaft belt gear until the overlock needle comes to its lowest position.
2. Loosen the set screw (t). Then, pull the balance wheel as far as it goes.
3. Open the dust cover.
4. Set the timing belt on the upper shaft belt gear (small). Then, mount the overlock arm on the machine body.

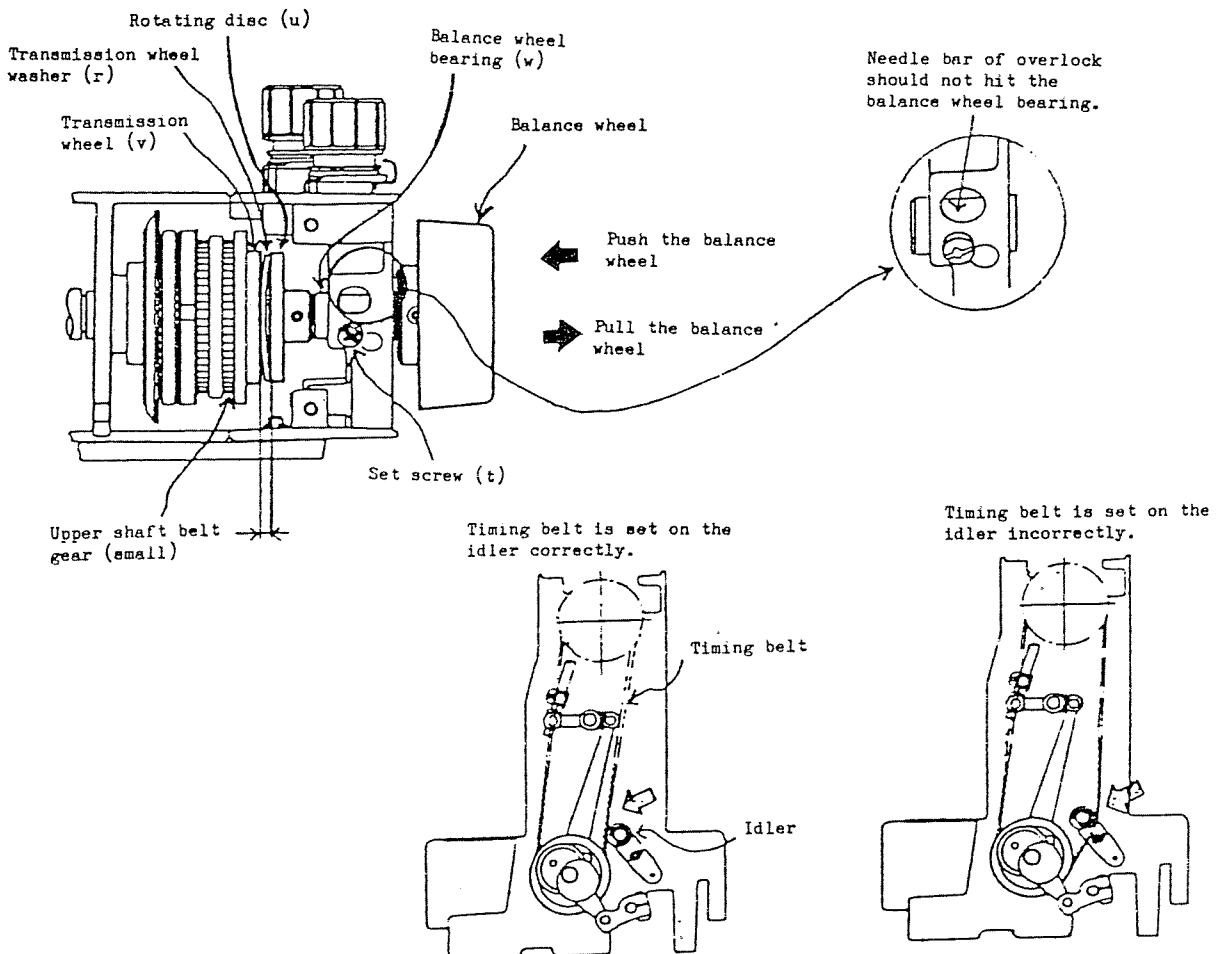
Note: Check if the timing belt is set on the idler correctly.

5. Turn the screws (p) and (q) two or three times so that the zigzag arm and the overlock arm can be joined loosely.
6. Push the balance wheel to move the rotating disc (u) toward the transmission wheel (v) as close as possible.
7. Fix position of overlock arm with its rotating disc (u) exactly fitting the transmission wheel (v). Then, tighten screws (p) and (q).
8. Pull the balance wheel and insert the transmission wheel washer (r) between the transmission wheel (v) and the rotating disc (u).
9. Push the balance wheel to make the clearance between the transmission wheel (v) and the rotating disc (u) 0.5mm. Then, tighten screw (t).

Note: i) Do not tighten the screw (t) too strong.

ii) Check if the cushion (s) is placed correctly.

iii) Turn the balance wheel counter-clockwise to see if the needle bar of overlock hits the balance wheel bearing (w).

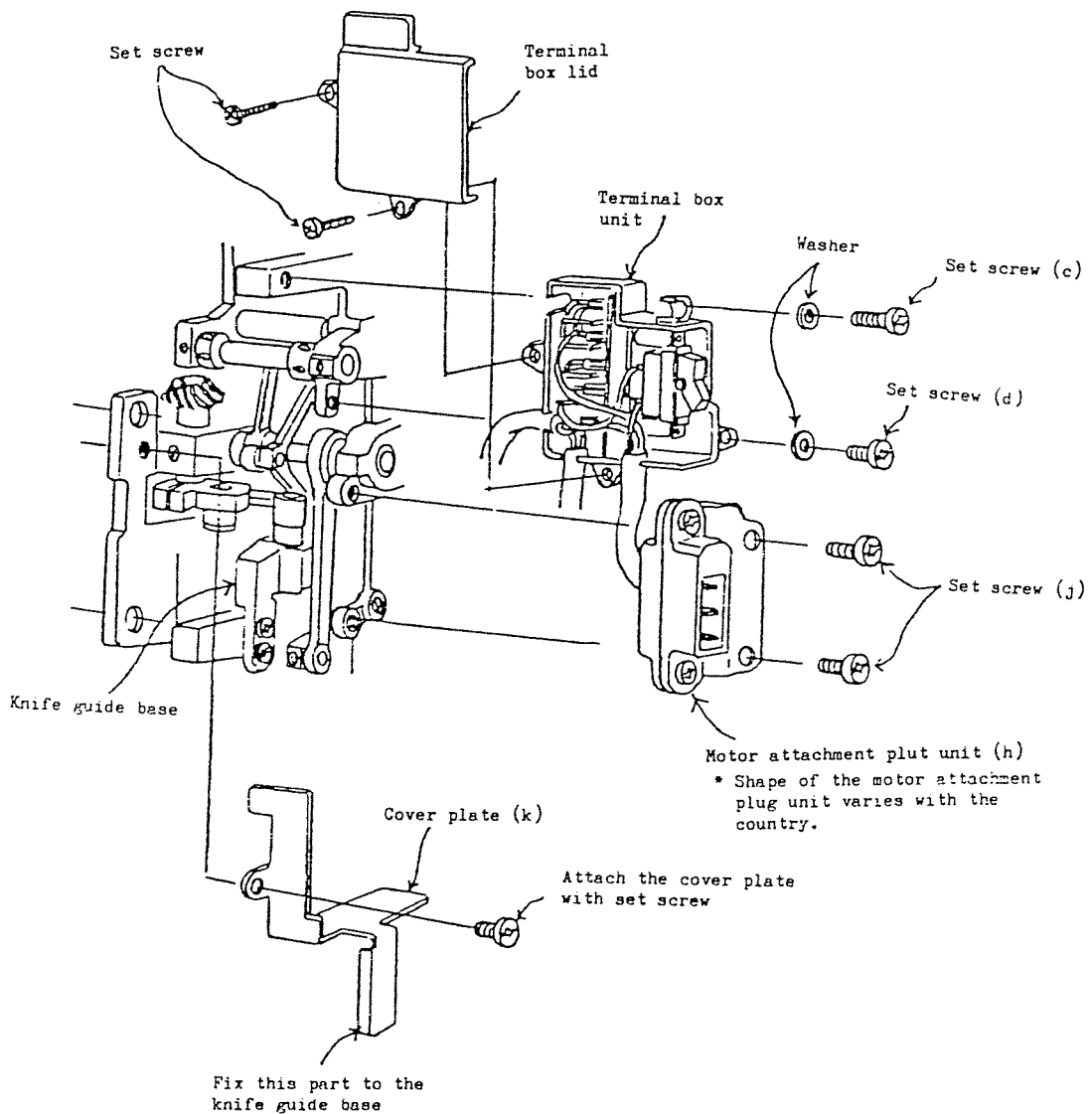


HOW TO ATTACH OVERLOCK ARM (2/4)

10. Close the dust cover.
11. Joint the overlock arm to zigzag arm with two bolts.
12. Attach the cover plate (k) with set screw and fix it to the knife guide base.

Note: Check the cover plate, it should not hit any moving parts.


13. Attach the terminal box unit with set screw(c) and(d).
- * Never fail to place the washer between the terminal box and set screws.
14. Attach the motor attachment plug unit(h) with two set screws(j).
15. Connect the lamp cord(a) of the overlock arm with the printed wiring board(b).
16. Attach the terminal box lid with two set screws.
17. Attach the lamp socket unit with two set screws(o).



HOW TO ATTACH OVERLOCK ARM (3/4)

19. Make trial run to check the following points.

1) Zigzag machine

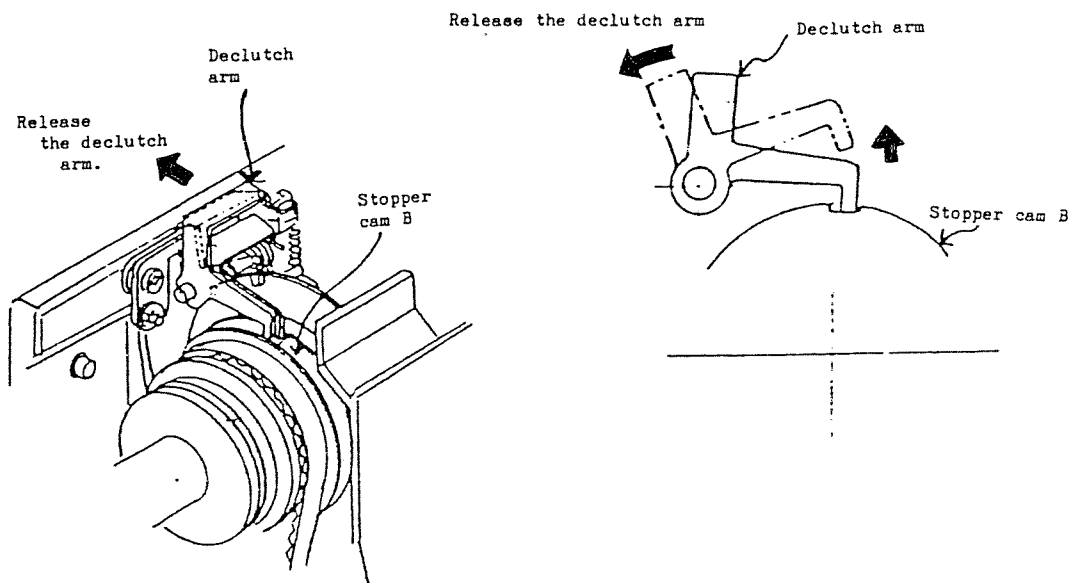
- i) Set the pattern selector dial at "  ", the stitch length regulator dial at "4" and the stitch selector dial at straight and zigzag sewing position.
- ii) Release the declutch arm from the stopper cam B by hand.
- iii) Turn the balance wheel clockwise to see if the overlock mechanism operates correctly.
Then, run the machine by foot controller and the machine should run at the optimum speed of 800 rps.

Note: In case the machine runs too slow, loosen the set screw (t) on the balance wheel bearing. Then, widen the clearance between the transmission disc and the rotating disc little by little until it runs up to the optimum speed.

2) Overlock machine (In this part, you don't need to check the speed of machine.)

- i) Stop the machine. Turn the stitch selector dial from zigzag to overlock sewing.
- ii) Release the declutch arm by hand.
- iii) Turn the balance wheel clockwise to check the overlock mechanism.

Then, run the machine by foot controller to check if the overlock machine runs smoothly.



HOW TO ATTACH OVERLOCK ARM (4/4)

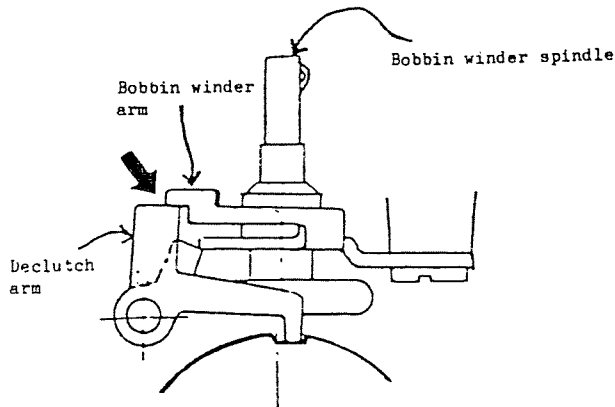
20. Attach the cover with two set screws.
21. Attach the base cover plate with six set screws.
22. Attach the front panel frame to the arm and fix it with the snap ring G-5.
23. Attach the top cover supporting plate with two set screws.
24. Attach the top cover with two set screws.

Note: i) When you attach the top cover, push the bobbin winder spindle to the winding position. If not, bobbin winder arm might hit the declutch arm, which prevent the bobbin winder spindle from functioning.
ii) See that the
iii) After you attach the top cover, check the function of the bobbin winder spindle.

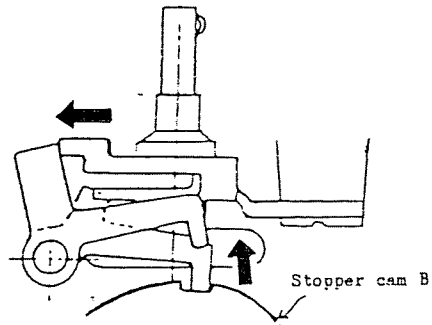
25. Attach the lamp cover with the set screw.
26. Run the zigzag machine and then the overlock machine to see if the both machines run smoothly.

Note: Do not move the stitch selector dial while the machine is running.

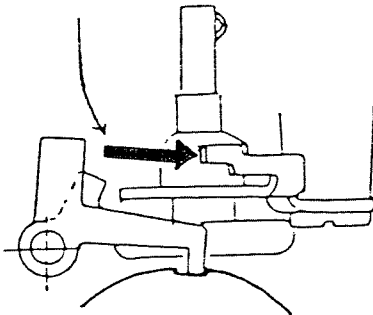
Unless you push the bobbin winder spindle to the right, the bobbin winder arm hits the declutch arm.



In normal condition of the machine, when you push the bobbin winder spindle to the left, the bobbin winder arm pushes the declutch arm and it is automatically released from the stopper cam B.

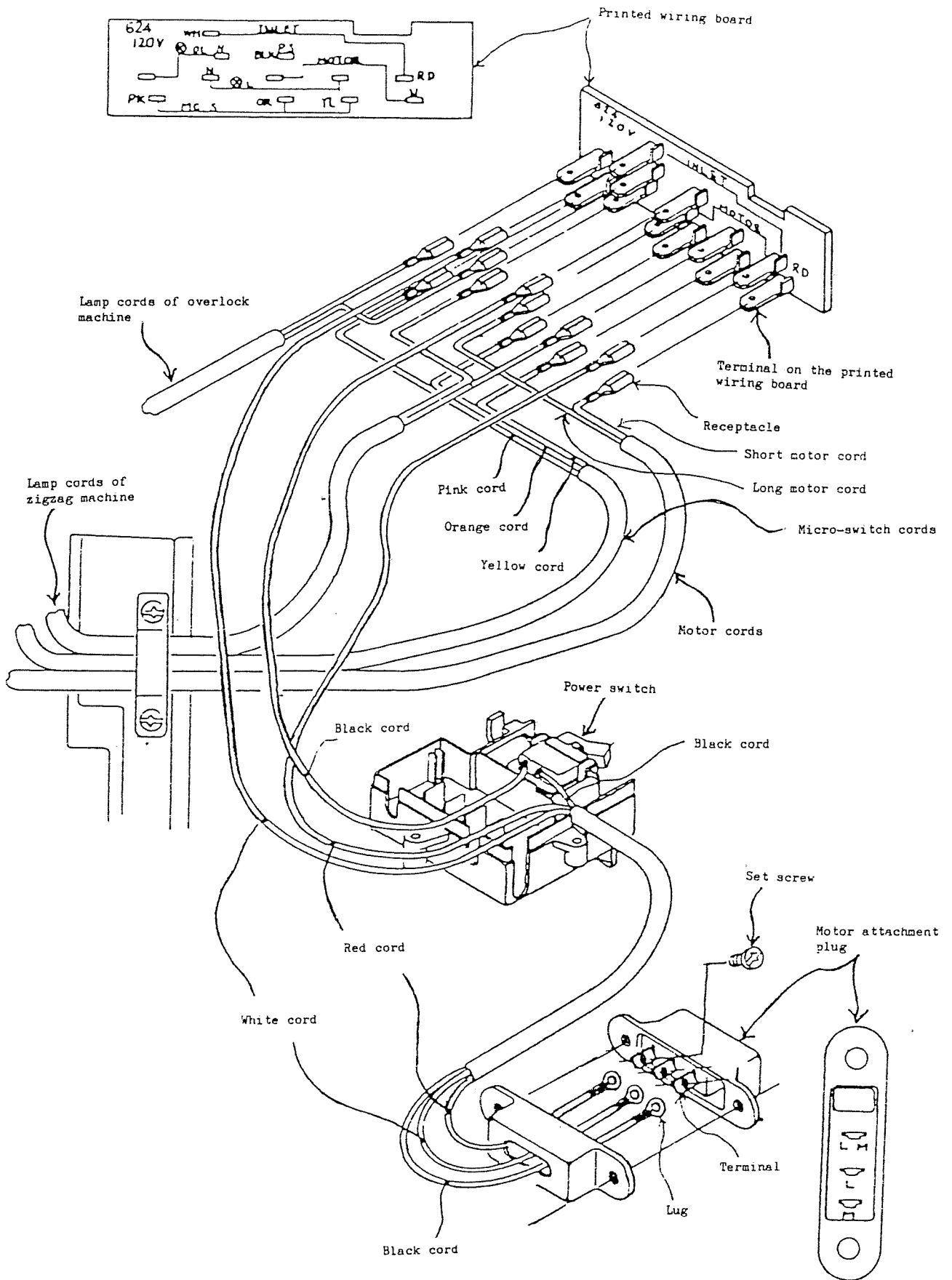


If you push the bobbin winder spindle to the right, the bobbin winder arm does not hit the declutch arm.



CONNECTION (FOR 100 - 120V)

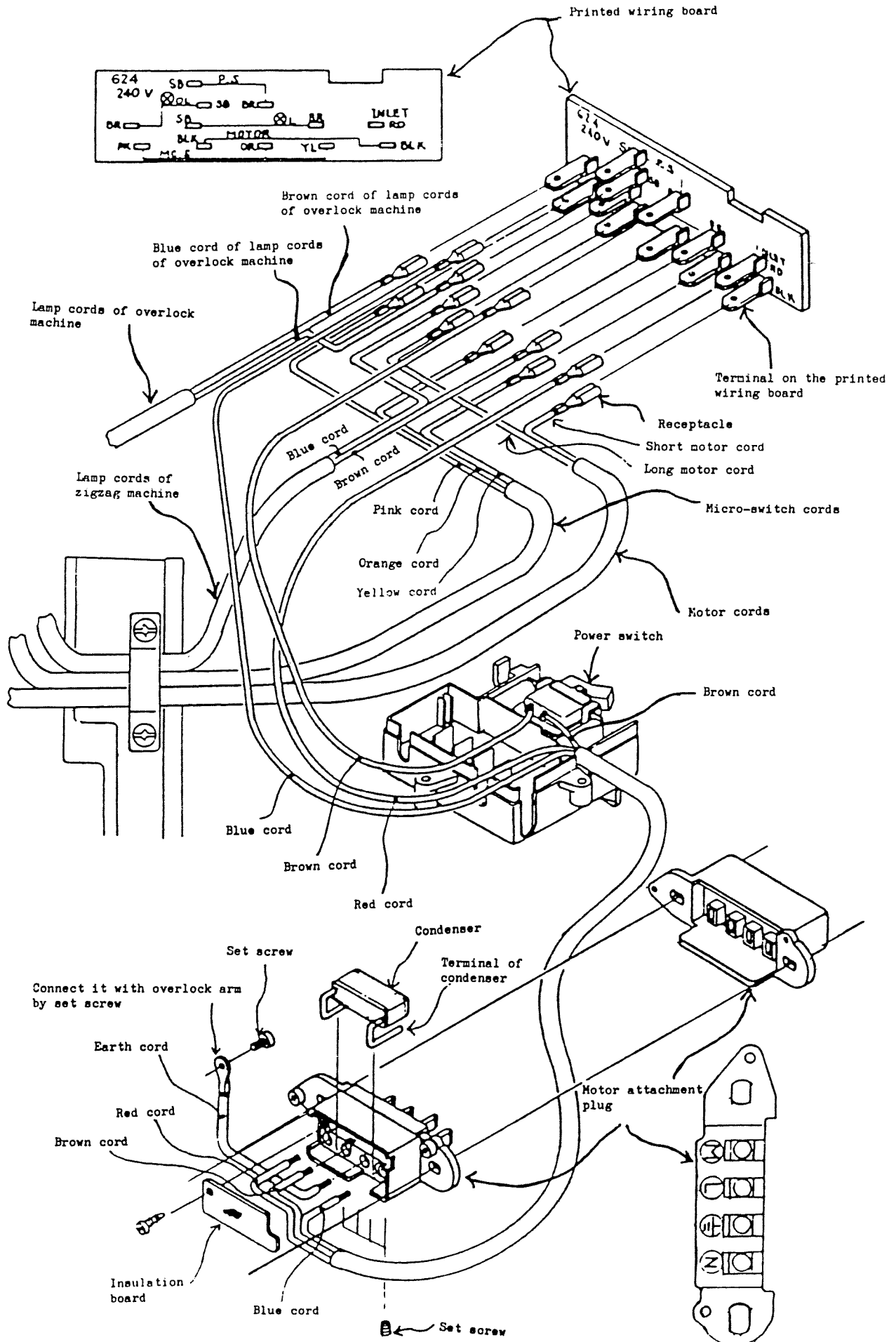
1. To connect the micro-switch cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of pink cord into the PK marked terminal on the MC.S line.
 - 2) Insert the receptacle of orange cord into the OR marked terminal on the MC.S line.
 - 3) Insert the receptacle of yellow cord into the YL marked terminal on the MC.S line.
2. To connect the lamp cords of zigzag machine with the terminals on the printed wiring board.
 - 1) Insert the receptacle long cord into the N marked terminal on the (X) L line.
 - 2) Insert the receptacle of short cord into the terminal with no mark on the (X) L line.
3. To connect the motor cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of long cord into the terminal with no mark on the MOTOR line.
 - 2) Insert the receptacle of short cord into the N marked terminal on the MOTOR line.
4. To connect the lamp cords of overlock machine with the terminals on the printed wiring board.
 - 1) Insert the receptacle of long cord into the N marked terminal on the (X) OL line.
 - 2) Insert the receptacle of short cord into the terminal with no mark on the (X) OL line.
5. To connect the power switch cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of black cord into the BLK marked terminal on the P.S. line.
 - 2) Insert the receptacle of white cord into the WH marked terminal on the INLET line.
 - 3) Insert the receptacle of red cord into the RD marked terminal on the INLET line.
6. To connect the machine plug with the motor attachment plug.
 - 1) Fix the lug of black cord to the LM marked terminal with the set screw.
 - 2) Fix the lug of white cord to the L marked terminal with the set screw.
 - 3) Fix the lug of red cord to the M marked terminal with the set screw.



CONNECTION (FOR 200-240V, WITH THE EARTH)

1. To connect the micro-switch cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of pink cord into the PK marked terminal on the MC.S line.
 - 2) Insert the receptacle of orange cord into the OR marked terminal on the MC.S line.
 - 3) Insert the receptacle of yellow cord into the YL marked terminal on the MC.S line.
2. To connect the lamp cords of zigzag machine with the terminals on the printed wiring board.
 - 1) Insert the receptacle of blue cord into the SB marked terminal on (X) L line.
 - 2) Insert the receptacle of brown cord into the BR marked terminal on (X) L line.
3. To connect the motor cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of long cord into the BLK marked terminal (located under the SB mark) on the MOTOR line.
 - 2) Insert the receptacle of short cord into the BLK marked terminal (located under the RD mark) on the MOTOR line.
4. To connect the lamp cords of overlock machine with the terminals on the printed wiring board.
 - 1) Insert the receptacle of blue cord into the SB marked terminal on the (X) OL line.
 - 2) Insert the receptacle of brown cord into the BR marked terminal on the (X) OL line.
5. To connect the power switch cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of blue cord into the SB marked terminal on the P.S. line.
 - 2) Insert the receptacle of brown cord into the BR marked terminal on the P.S. line.
 - 3) Insert the receptacle of red cord into the RD marked terminal on the INLET line.
6. To connect the power switch with the motor attachment plug.
 - 1) Insert the solder covered wire of blue cord into the (N) marked hole on the motor attachment plug together with the terminal of the condensor. Then, fix them with the set screws.
 - 2) Insert the solder covered wire of brown cord into the (L) marked hole on the motor attachment plug together with the terminal of the condensor. Then, fix them with the set screws.
 - 3) Insert the solder covered wire of red cord into the (M) marked hole of the motor attachment plug. Then, fix them with the set screws.
 - 4) Insert the solder covered wire of the earth cord into (⊕) marked hole of the motor attachment plug. Then, fix them with the set screws. Connect the other end of the earth cord with overlock arm by the set screw.

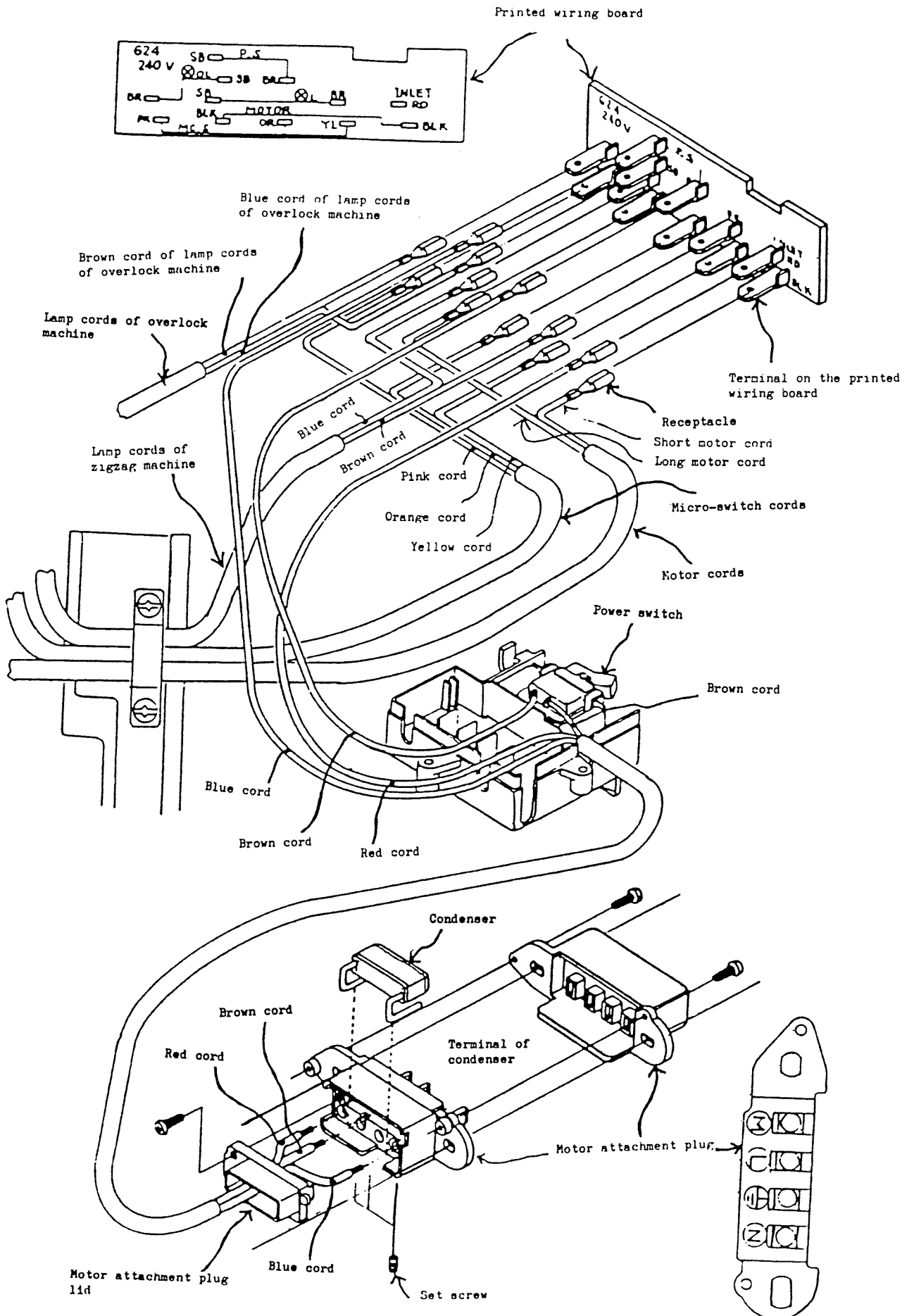
Note: i) Check that the solder covered wires and terminals of condensor are fixed sufficiently so that they do not slip off easily.
ii) Be sure to attach the insulation board after check.



CONNECTION (FOR 200-240V, WITHOUT THE EARTH)

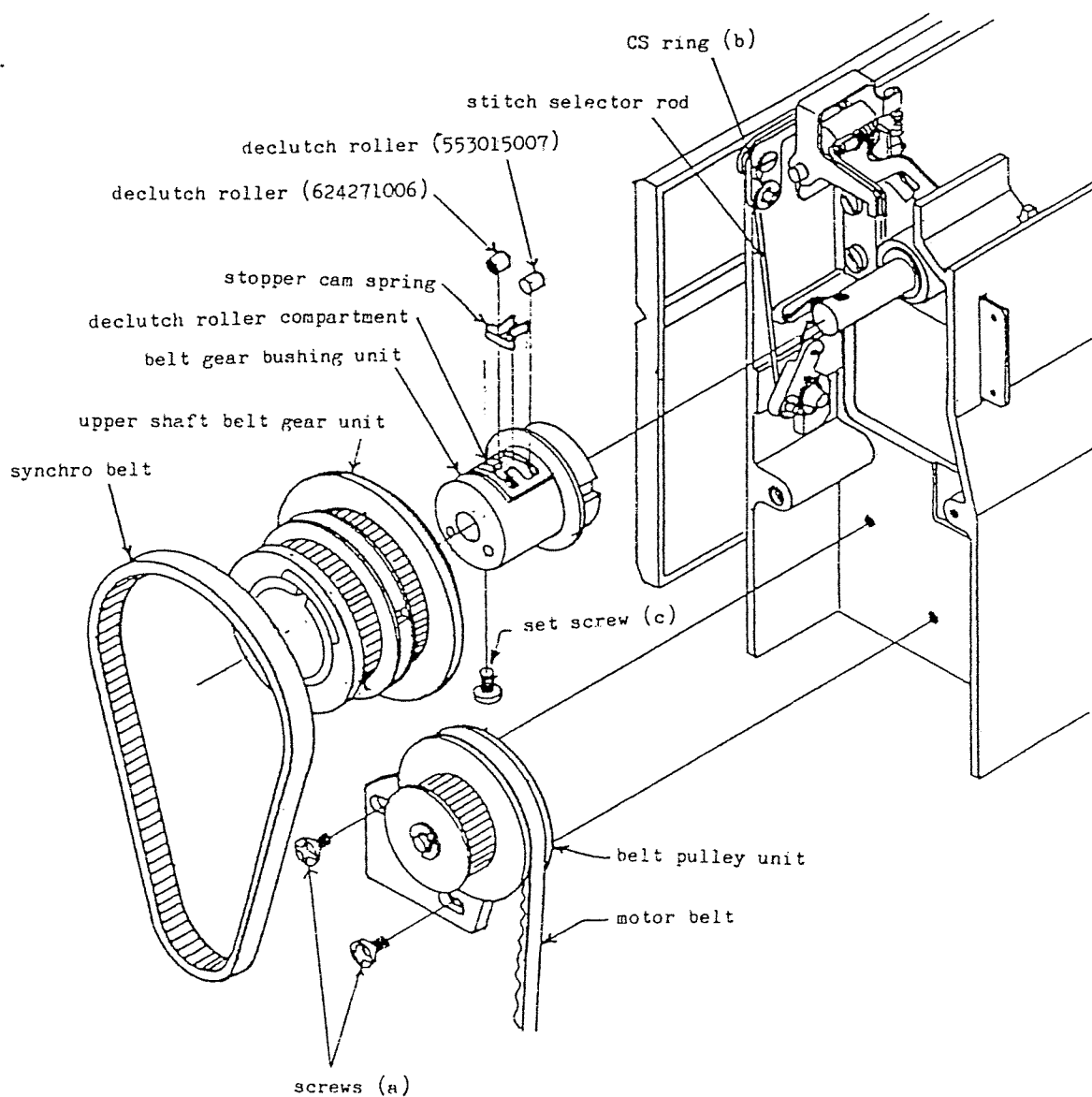
1. To connect the micro-switch cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of pink cord into the PK marked terminal on the MC.S line.
 - 2) Insert the receptacle of orange cord into the OR marked terminal on the MC.S line.
 - 3) Insert the receptacle of yellow cord into the YL marked terminal on the MC.S line.
2. To connect the lamp cords of zigzag machine with the terminals on the printed wiring board.
 - 1) Insert the receptacle of blue cord into the SB marked terminal on the (X) L line.
 - 2) Insert the receptacle of brown cord into the BR marked terminal on the (X) L line.
3. To connect the motor cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of long cord into the BLK marked terminal (located under the SB mark) on the MOTOR line.
 - 2) Insert the receptacle of short cord into the BLK marked terminal (located under the RD mark) on the MOTOR line.
4. To connect the lamp cords of overlock machine with terminals on the printed wiring board.
 - 1) Insert the receptacle of blue cord into the SB marked terminal on the (X) OL line.
 - 2) Insert the receptacle of brown cord into the BR marked terminal on the (X) OL line.
5. To connect the power switch cords with the terminals on the printed wiring board.
 - 1) Insert the receptacle of blue cord into the SB marked terminal on the P.S. line.
 - 2) Insert the receptacle of brown cord into the BR marked terminal on the P.S. line.
 - 3) Insert the receptacle of red cord into the RD marked terminal on the INLET line.
6. To connect the machine socket with the motor attachment plug.
 - 1) Insert the solder covered wire of blue cord into the (N) marked hole together with the terminal of the condensor. Then, fix them with the set screw.
 - 2) Insert the solder covered wire of brown cord into the (L) marked hole together with the terminal of the condensor.
 - 3) Insert the solder covered wire of red cord into (M) marked hole. Then, fix them with the set screw.

Note: i) Check that the solder covered wires and the terminals of the condensor are fixed sufficiently so that they do not slip off easily.
ii) Be sure to attach the motor attachment plug lid after check.



HOW TO REPLACE UPPER SHAFT BELT GEAR UNIT
AND BELT GEAR BUSHING UNIT (1/3)

1. Detach the overlock arm unit. (See the Page 26 of Servicing Manual on "HOW TO DETACH OVERLOCK ARM")
2. Remove two screws (a) and detach the belt pulley unit.
3. Remove the motor belt and the synchro belt.
4. Remove the CS ring (b).
5. i) Set the stitch selector dial at "Ordinary Sewing".
ii) While setting the stitch selector releasing arm (A) and the declutch arm free, detach the upper shaft belt gear unit.
6. Remove two declutch rollers (624271006 & 553015007) and the stopper cam spring.
7. Remove the set screw (c) to detach the belt gear bushing unit.

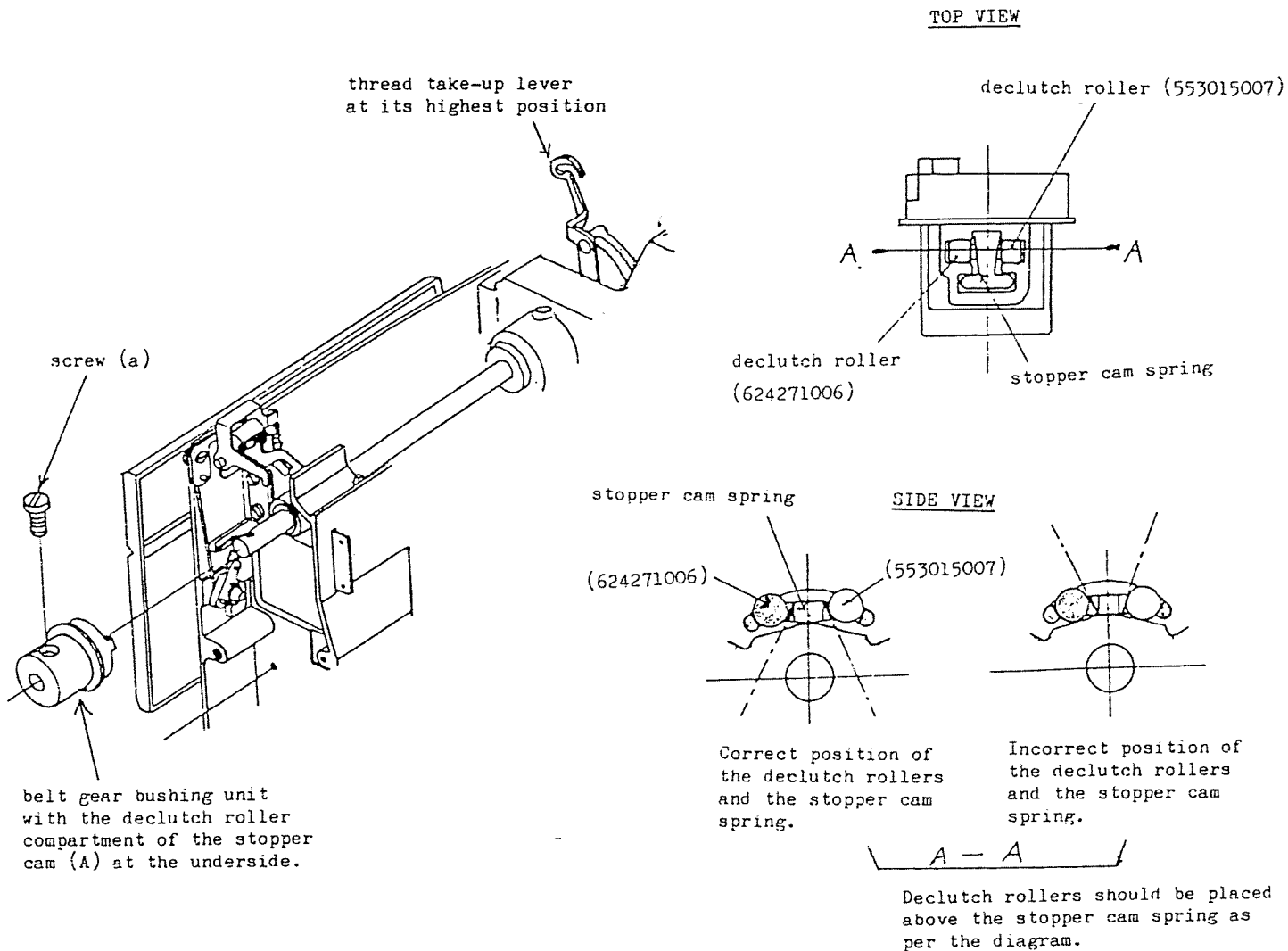


HOW TO REPLACE UPPER SHAFT BELT GEAR UNIT
AND BELT GEAR BUSHING UNIT (2/3)

1. With the thread take-up lever set at its highest position, refit the new belt gear bushing unit after the following manner:
 - i) Insert the belt gear bushing unit into the upper shaft with the declutch roller compartment of the stopper cam (A) at the underside as shown in a diagram.
 - ii) Fix the belt gear bushing unit to the upper shaft by the screw (a).
2. Turn the upper shaft until the declutch roller compartment of the stopper cam (A) comes to the upside.

(NOTE) Set the stopper cam spring and the two declutch rollers in the declutch roller compartment at the same position as shown in the diagrams at Pages 1 & 2.
3. Attach the upper shaft belt gear unit to the belt gear bushing unit.
4. Refit the motor belt and the synchro belt.

After checking the tension of the belts, fix the belt pulley unit by two screws.
5. Attach the snap ring.
6. Refit the overlock arm.



Declutch roller (553015007): Diameter 5ϕ

Declutch roller (624271006): Diameter 5.03ϕ
Side of the declutch roller (624271006) is painted in black.

HOW TO REPLACE UPPER SHAFT BELT GEAR UNIT
AND BELT GEAR BUSHING UNIT (3/3)

1. How to assemble the belt gear bushing unit.

- i) Attach the thrust receiving plate to the belt gear bushing with two screws (a).
- ii) Insert the stopper cam pins into the stopper cam washer and the stopper cam (A). Attach the stopper cam (A) to the belt gear bushing with two screws (b).

(NOTE) Adjust the position of the stopper cam pin so that the stopper cam (A) can move smoothly when it is installed on the upper shaft.

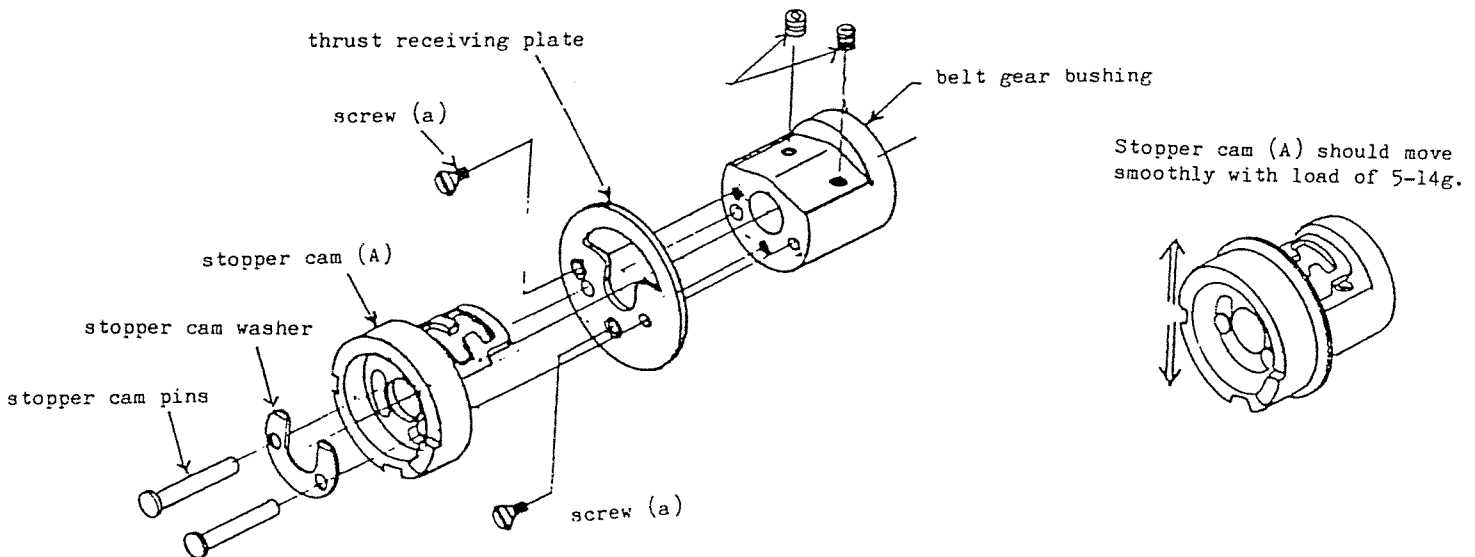
2. How to assemble the upper shaft belt gear.

- i) Attach the stopper cam (B) to the upper shaft belt gear (small). Set the two declutch rollers and the stopper cam springs (B) in the declutch roller compartment of the stopper cam (B).

- ii) Attach the upper shaft belt gear (small) to the upper shaft belt gear (large).

(NOTE) Movement of the stopper cam (B) should be smooth when it is installed on the upper shaft.

1. Belt gear bushing unit



2. Upper shaft belt gear unit

