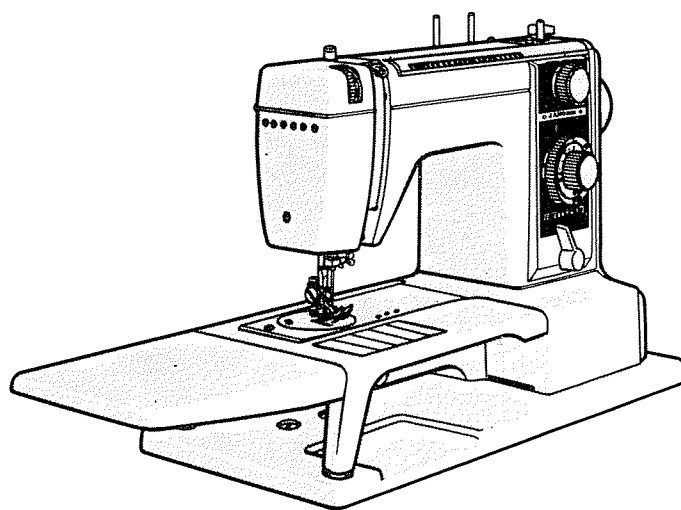


SERVICING MANUAL




XL-II

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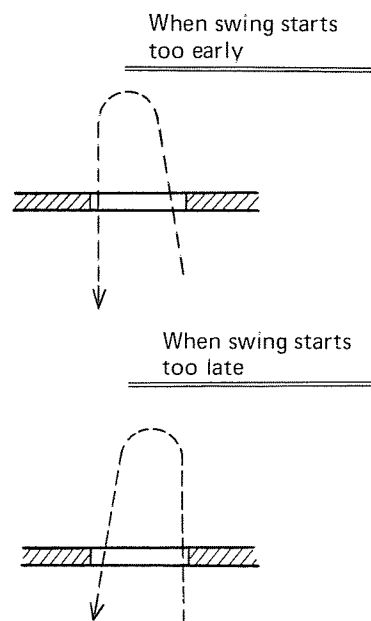
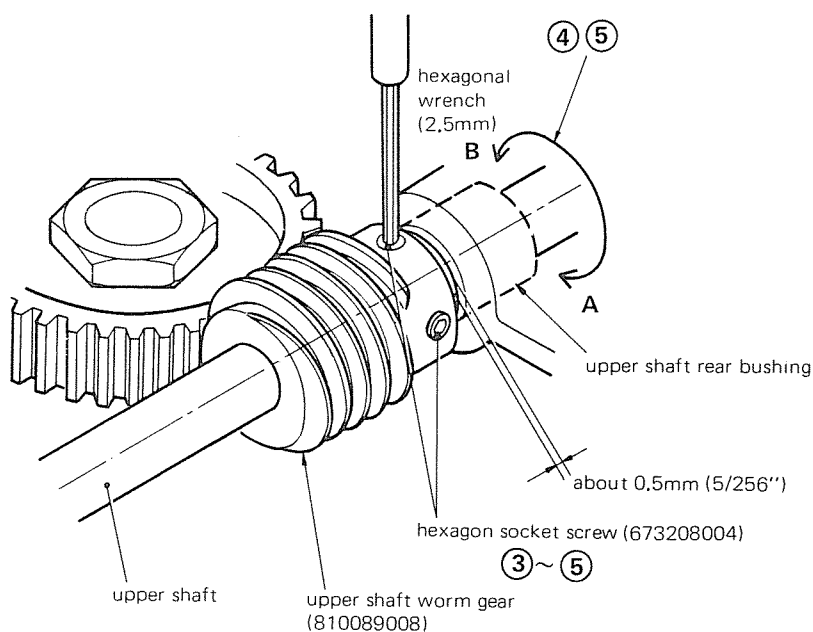
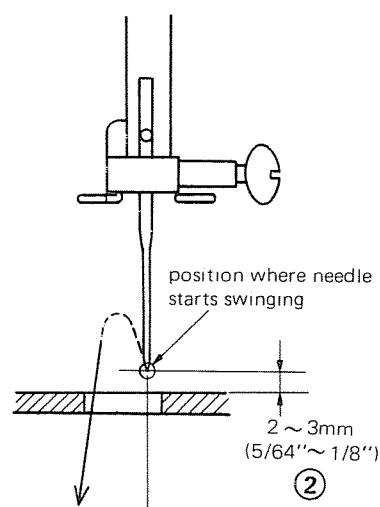
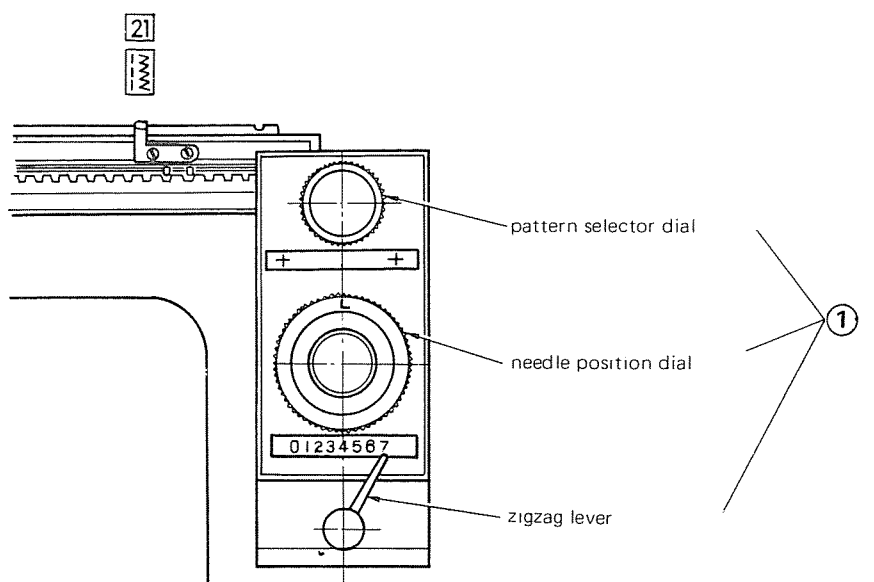
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ADJUSTMENT FOR TIMING OF NEEDLE SWING


In case needle swings while needle is in fabric with zigzag lever set at “7”, make adjustment as follows:

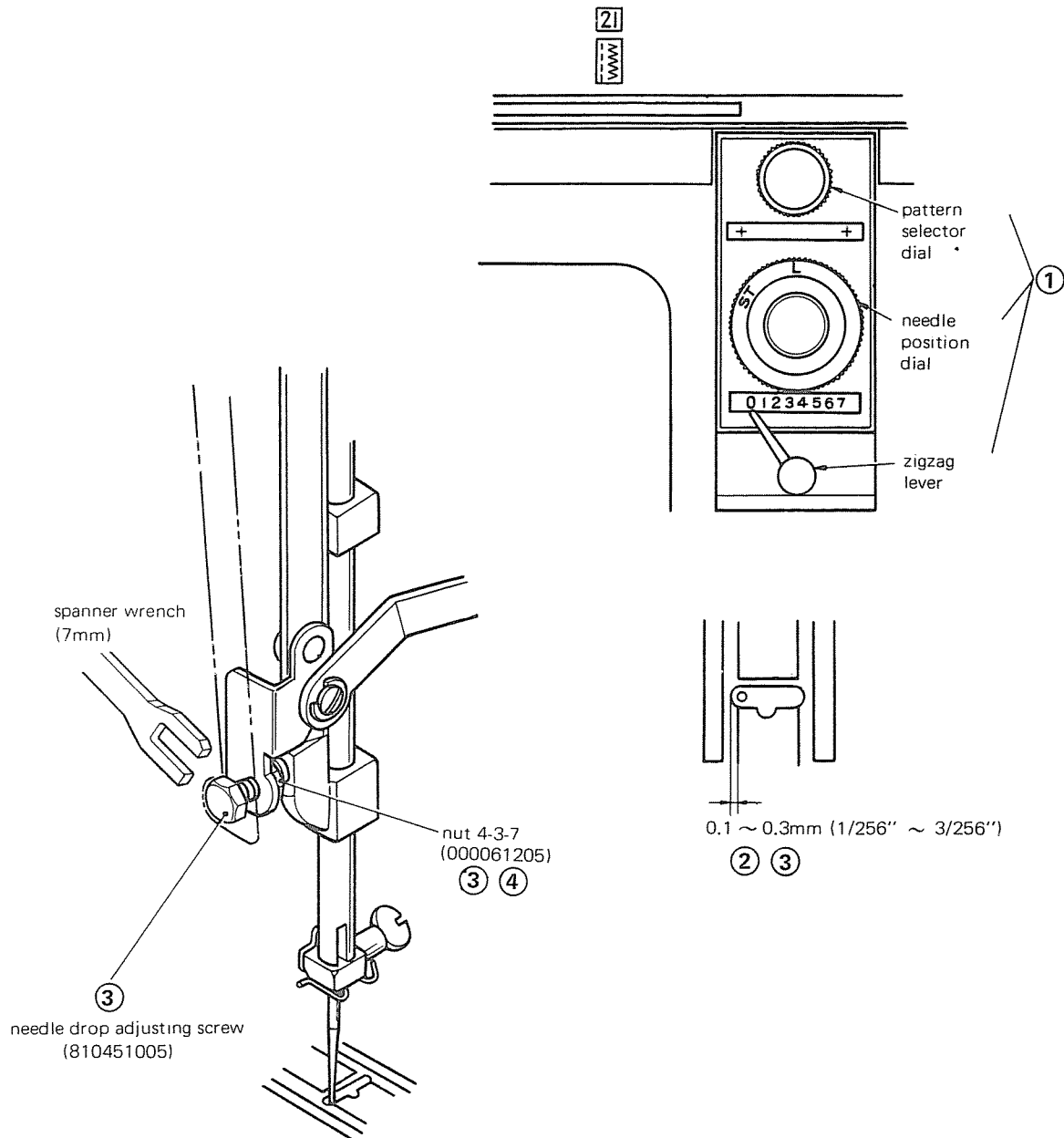
1. Set pattern selector dial at “”, needle position dial at “L” and zigzag lever at “7”.
2. Turn balance wheel slowly toward you and see if needle starts swinging about 2 ~ 3mm ($5/64'' \sim 1/8''$) above needle plate in its right upward stroke.
3. Loosen hexagon socket screws (673208004).
4. Hold upper shaft worm gear (810089008) with screw driver in place and turn balance wheel slightly:
 - (a) When needle starts swinging too early, turn balance wheel in the (A) direction.
 - (b) When needle starts swinging too late, turn balance wheel in the (B) direction.
5. Tighten hexagon socket screws (673208004).

Note: The clearance between upper shaft worm gear and upper shaft rear bushing should be about 0.5mm ($5/256''$).



ADJUSTMENT OF NEEDLE DROP

1. Set pattern selector dial at “”, needle position dial at “L” and zigzag lever at “0”.
2. Turn balance wheel toward you to see if clearance between left side of needle and left edge of need hole is about 0.1 ~ 0.3mm (1/256" ~ 3/256").
3. If not, loosen nut 4-3-7 (000061205) and turn needle drop adjusting screw (810451005) clockwise or anti-clockwise to make adjustment.
4. Tighten nut 4-3-7 (000061205) after adjustment.



ADJUSTMENT FOR “0” POSITION OF ZIGZAG STITCH

If needle zigzags with zigzag lever set at “0”, make adjustment as follows:

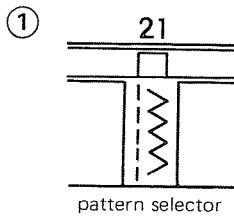

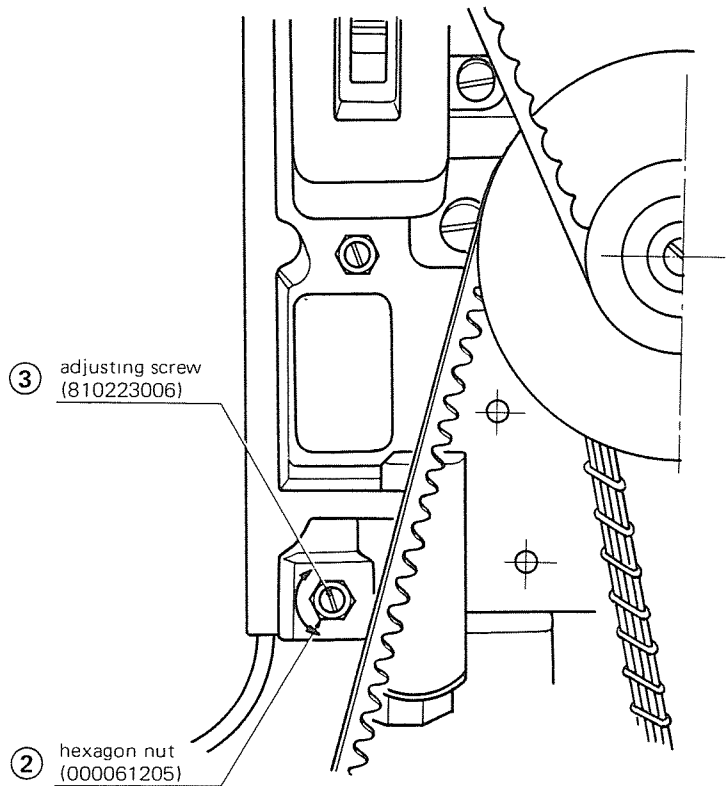
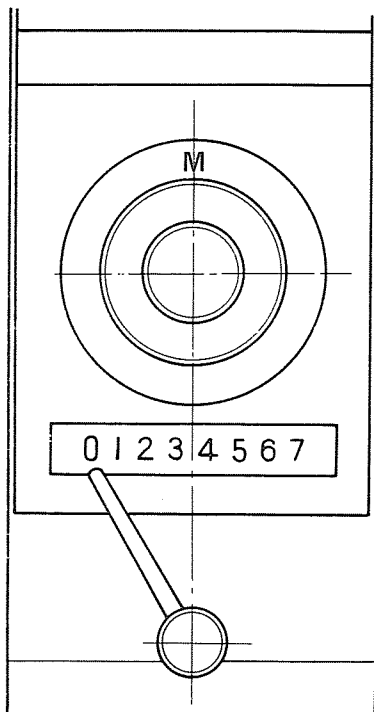

1. Set zigzag lever at “0”, needle position dial at “M” and pattern selector dial at “


Diagram 1 shows a close-up of the pattern selector dial. A vertical line with a zigzag symbol is centered within a rectangular frame. The number "21" is printed above the frame. Below the frame, the text "pattern selector" is written.

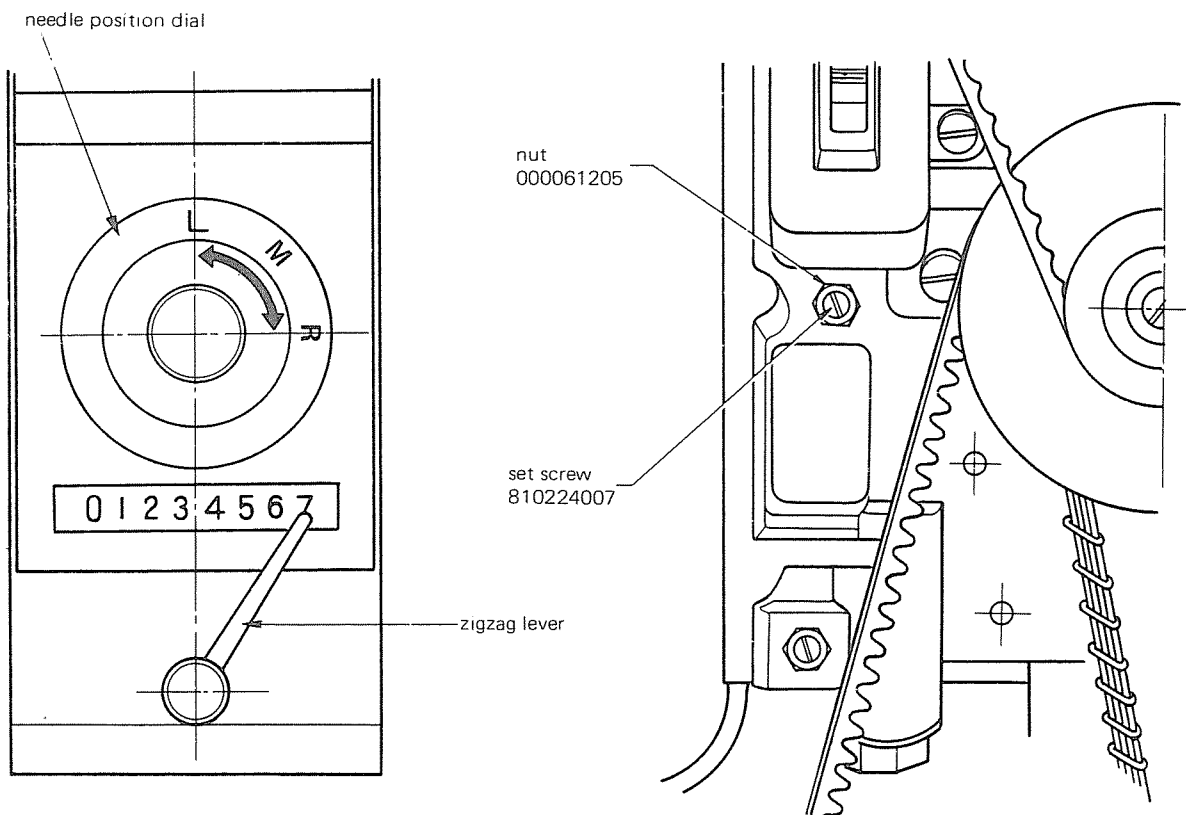
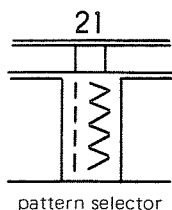


ADJUSTMENT OF MAXIMUM ZIGZAG WIDTH

When needle does not move by changing needle position “L” to “R” or “R” to “L” by moving needle position dial with setting pattern selector dial at “”, zigzag lever at “7” (maximum zigzag width) and needle at the lowest position of its travel, maximum zigzag width is adjusted correctly.


If needle moves, make adjustment as follows:

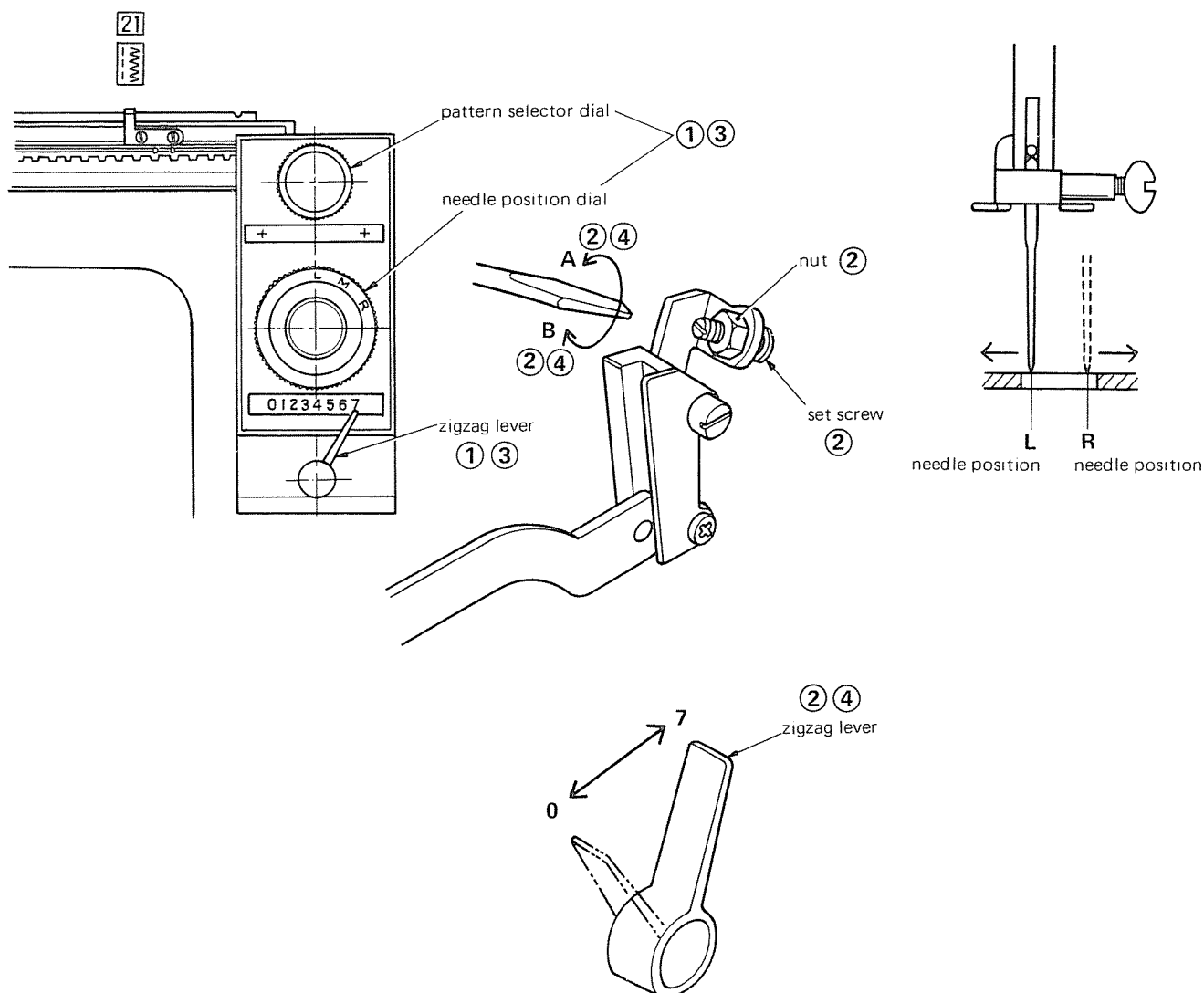
1. Make sure that timing of needle swing and needle drop are correctly adjusted. (If not, make adjustments before adjustment of maximum zigzag width.)
2. Set pattern selector dial at “”.
3. Set zigzag lever at “7” (maximum zigzag width). Then turn balance wheel toward you until needle comes to the left and lowest position of its travel and turn needle position dial between “L” and “R”.
4. When needle moves, loosen hexagonal nut (000061205) and turn set screw (810224007) to avoid needle moving.
5. Tighten hexagonal nut (000061205) and attach belt cover (812035108).



CORRECTING UNEVEN ZIGZAG STITCH

When manual patterns are sewn with needle position at either “L” or “R”, if the stitches at the respective needle positions appear to be irregular, make adjustment as follows:

1. Set pattern selector dial at “”, needle position dial at “L” and zigzag lever at “7”.
Turn balance wheel toward you until needle just reaches surface level of needle plate in the left down stroke of its travel.
2. Move zigzag lever “0” to “7” to see in which direction needle staggers. Loosen nut (000062701) and turn set screw (810164008).
 - a) When needle staggers to the inner direction, turn set screw (810164008) anti-clockwise (in the direction of “A”).
 - b) When needle staggers to the outer direction, turn set screw (810164008) clockwise (in the direction of “B”).
3. Then set needle position dial at “R” and zigzag lever at “7”. Turn balance wheel toward you until needle just reaches surface level of needle plate in the right down stroke.
4. Move zigzag lever “0” to “7” to see in which direction needle staggers.
 - a) When needle staggers to the inner direction, turn set screw (810164008) clockwise.
 - b) When needle staggers to the outer direction, turn set screw (810164008) anti-clockwise.
5. Make sure that point of needle swings outside 0.15mm (3/512”) on both needle positions respectively.

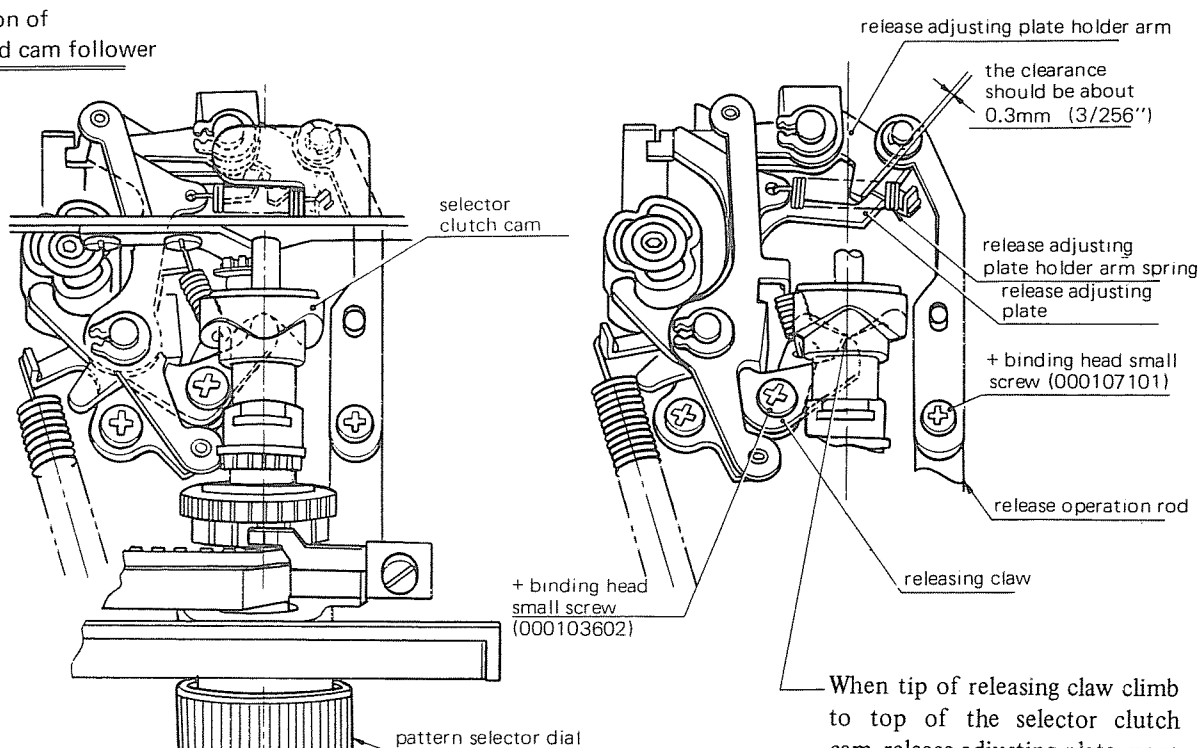


ADJUSTMENT OF PATTERN SELECTOR DIAL

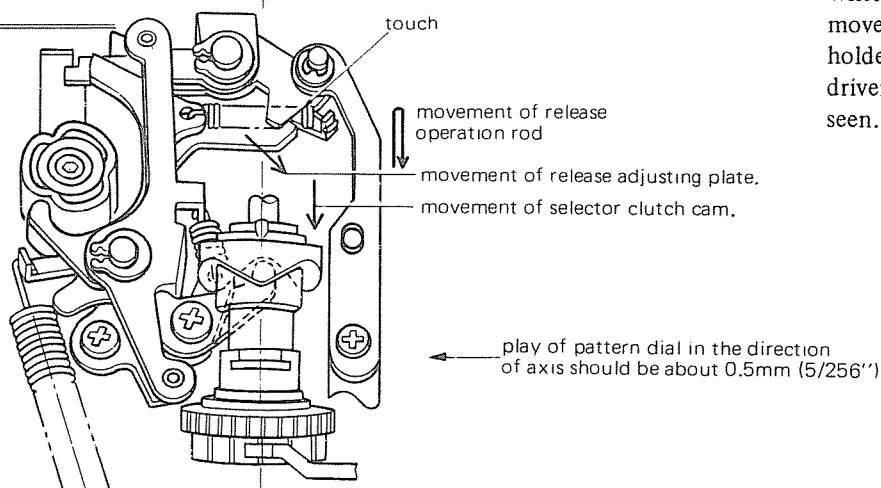
To select stitch pattern, turn pattern selector dial so that pointer will point at desired stitch pattern. Selection mechanism consists of continuous two steps: (1) First, turn dial to release pattern cam follower. (2) Turn knob further to move pointer to desired stitch pattern. (Continuous turn of these two steps can be workable.) If pointer works incorrectly, make adjustment as follows:

1. Remove top cover.
2. Loosen set screw (000103602) and set screw (000107101).
3. When release adjusting plate (810319000) move to the largest extent by turning pattern selector dial, adjust releasing claw (810318009) so that the clearance between release adjusting plate (810319000) and release adjusting plate holder arm (810341001) will be about 0.3mm (3/256"). Then tighten set screw (000103602).
4. When pattern cam follower claw is released, adjust release operation rod so that the play of pattern dial in the direction of its axis should be about 0.5mm (5/256").

Engaged position of
pattern cam and cam follower



Disengaged position of
pattern cam and
cam follower



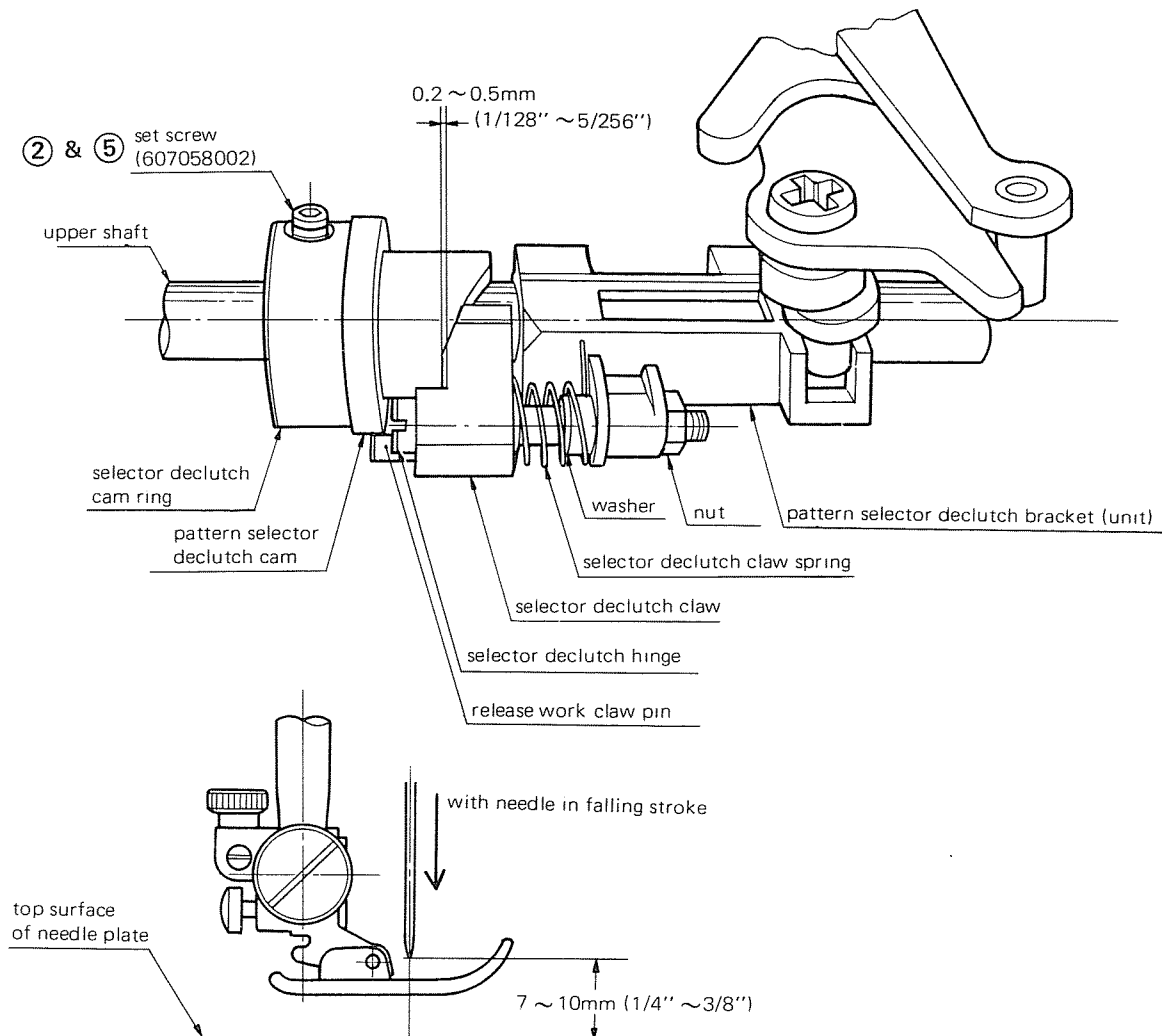
When tip of releasing claw climb to top of the selector clutch cam, release adjusting plate move to the largest extent.

When checking this movement, move aside release adjusting plate holder arm spring by screw driver, otherwise it cannot be seen.

ADJUSTMENT OF AUTOMATIC SETTING DEVICE FOR CAM FOLLOWER CLAW IN ZIGZAG CAM BLOCK FRAME

When the push on pattern selector dial is forgotten after selecting stitch pattern by turning dial, cam follower claw is automatically engaged by turning upper shaft. In this case, cam follower claw cannot be seen as it is enclosed in zigzag cam block frame (unit), but you may be able to tell this with a click sound. When selected stitch is not automatically set by turning upper shaft, make adjustment as follows:

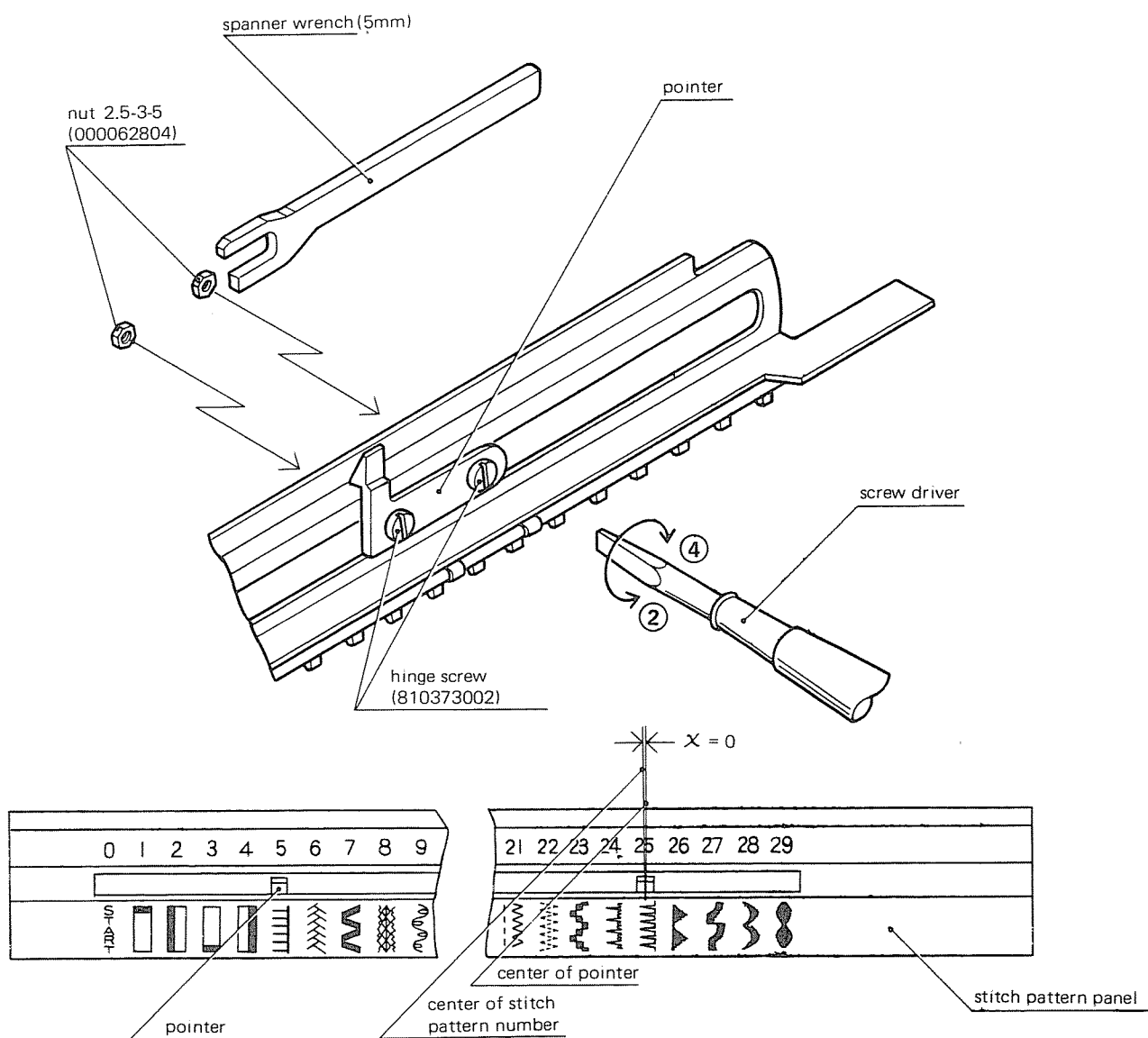
1. Remove top cover (unit).
2. Loosen set screw (607058002).
3. Turn upper shaft slowly by turning balance wheel toward you. Then stop turning when point of needle comes to 7 ~ 10mm (1/4" ~ 3/8") above top surface of needle plate in its falling stroke.
4. While keeping upper shaft in position by holding balance wheel, move pattern selector declutch cam (810091003) and selector declutch cam ring (810092004) until release work claw pin will mount on brim of pattern selector declutch cam and the cam will come in contact with the claw. In this condition, the clearance between the cam and the claw should be 0.2 ~ 0.5mm (1/128" ~ 5/256"). Also the cam and the claw should touch each other.
5. Tighten set screw (607058002).



ADJUSTMENT OF POINTER POSITION

Pointer should be adjusted to point the center of required pattern number. If not, make adjustment as follows:


1. Remove presser feet compartment (811003001) by loosening + binding head small screw 3 x 6 (000078319) of presser feet compartment located under basting foot. Then remove top cover unit (813602002).
2. Hold nuts 2.5-3-5 (000062804) with spanner wrench and loosen hinge screws (810373002).
3. Position pointer to at each center point of stitch patterns No.5 and No.25 by moving pointer.
4. Tighten hinge screws (810373002) while holding nuts 2.5-3-5 (000062804) and attach top cover unit (813602002) with + binding head small screw 3 x 6 (000078319), set screws (366003109) and presser feet compartment with +binding head small screw 3 x 6 (000078319).
5. Sew on test piece and see if the stitched patterns are the same as the indicated patterns by pointer.
6. If not, repeat 1 ~ 5.



ADJUSTMENT OF HEIGHT OF NEEDLE BAR

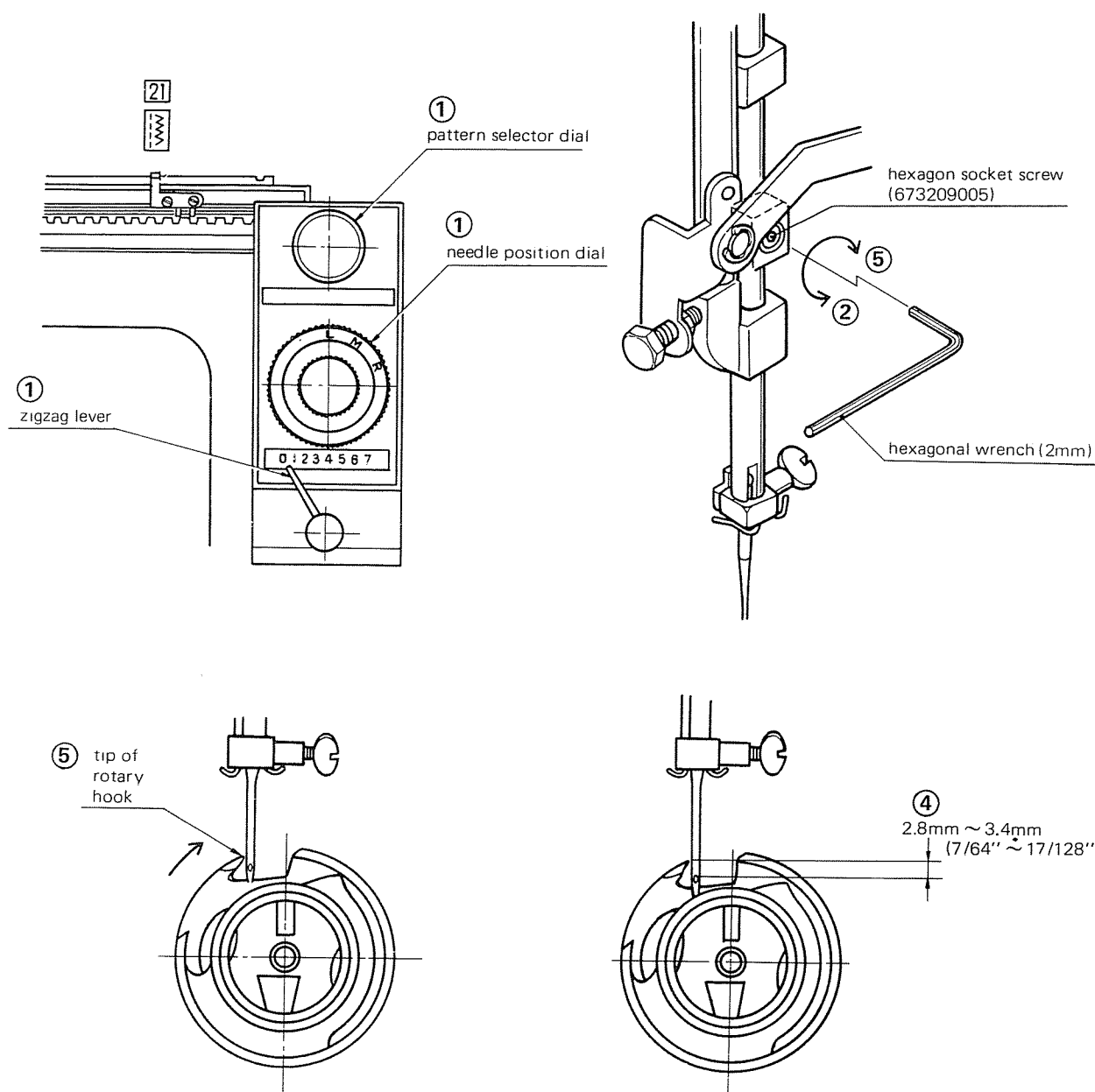
Turn balance wheel toward you until needle bar comes to lowest point of its travel. Then again turn balance wheel until tip of shuttle hook meets left side of needle.

Distance between upper edge of needle eye and tip of rotary hook should be 2.8mm ~ 3.4mm (7/64" ~ 17/128"). If not, make adjustment as follows:


1. Set pattern selector dial at “”, needle position dial at “L” and zigzag lever at “0”.
2. Turn balance wheel toward you until needle bar comes to lowest point of its travel. Then loosen hexagon socket screw (673209005) with hexagonal wrench.
3. Turn balance wheel toward you until tip of rotary hook comes to left side of needle.
4. Move needle bar upward and downward to adjust height of needle bar 2.8mm ~ 3.4mm (7/64" ~ 17/128").
5. Tighten hexagon socket screw (673209005) firmly.

Note: * Balance wheel must be turned toward you.

* Make sure that needle bar has not been rotated around its axis during the adjustments.

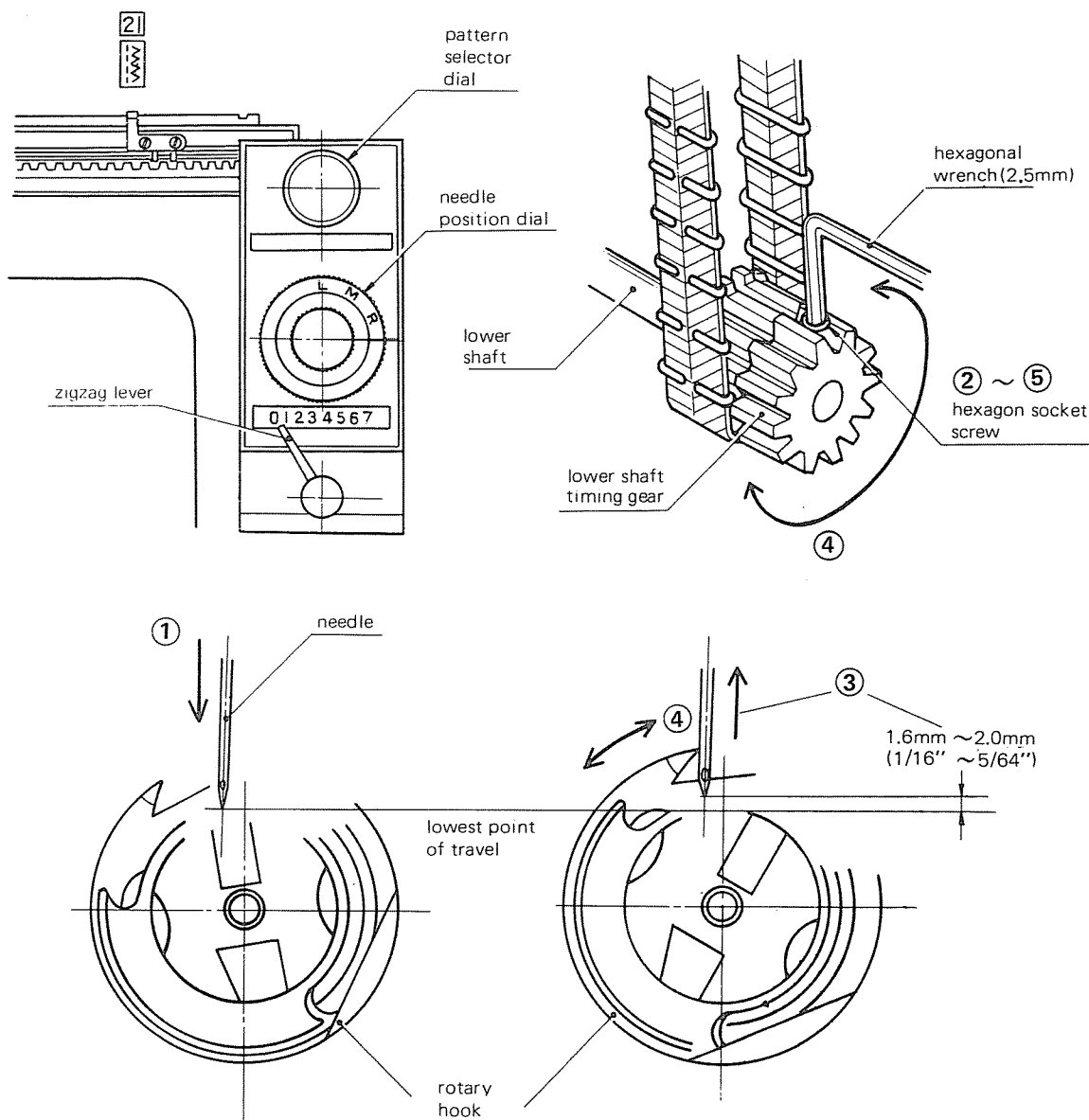


HOOK TIMING

Set pattern selector dial at “”, needle position dial at “L” and zigzag lever at “0”. Then turn balance wheel toward you until needle bar comes to lowest position of its travel. Then again turn balance wheel until tip of rotary hook meets left side of needle. The height of needle point from lowest position of its travel should be 1.6mm ~ 2.0mm (1/16" ~ 5/64").

If not, make adjustment as follows:

1. Turn balance wheel toward you until needle bar comes to lowest position of its travel.
2. Loosen hexagon socket screws (673208004).
3. While holding lower shaft with your hand, turn balance wheel slowly toward you until the height of needle point comes to 1.6mm ~ 2.0mm (1/16" ~ 5/64").
4. While holding balance wheel with your hand, rotate lower shaft until tip of shuttle hook comes to left side of needle.
5. Tighten hexagon socket screws (673208004) firmly after adjustment.



*Note: After adjustment, see if there is correct angle of feed lifting cam (673108003):

ADJUSTMENT OF CLEARANCE BETWEEN NEEDLE AND ROTARY HOOK

Clearance between needle and rotary hook should be 0 ~ 0.10mm (0" ~ 1/256").

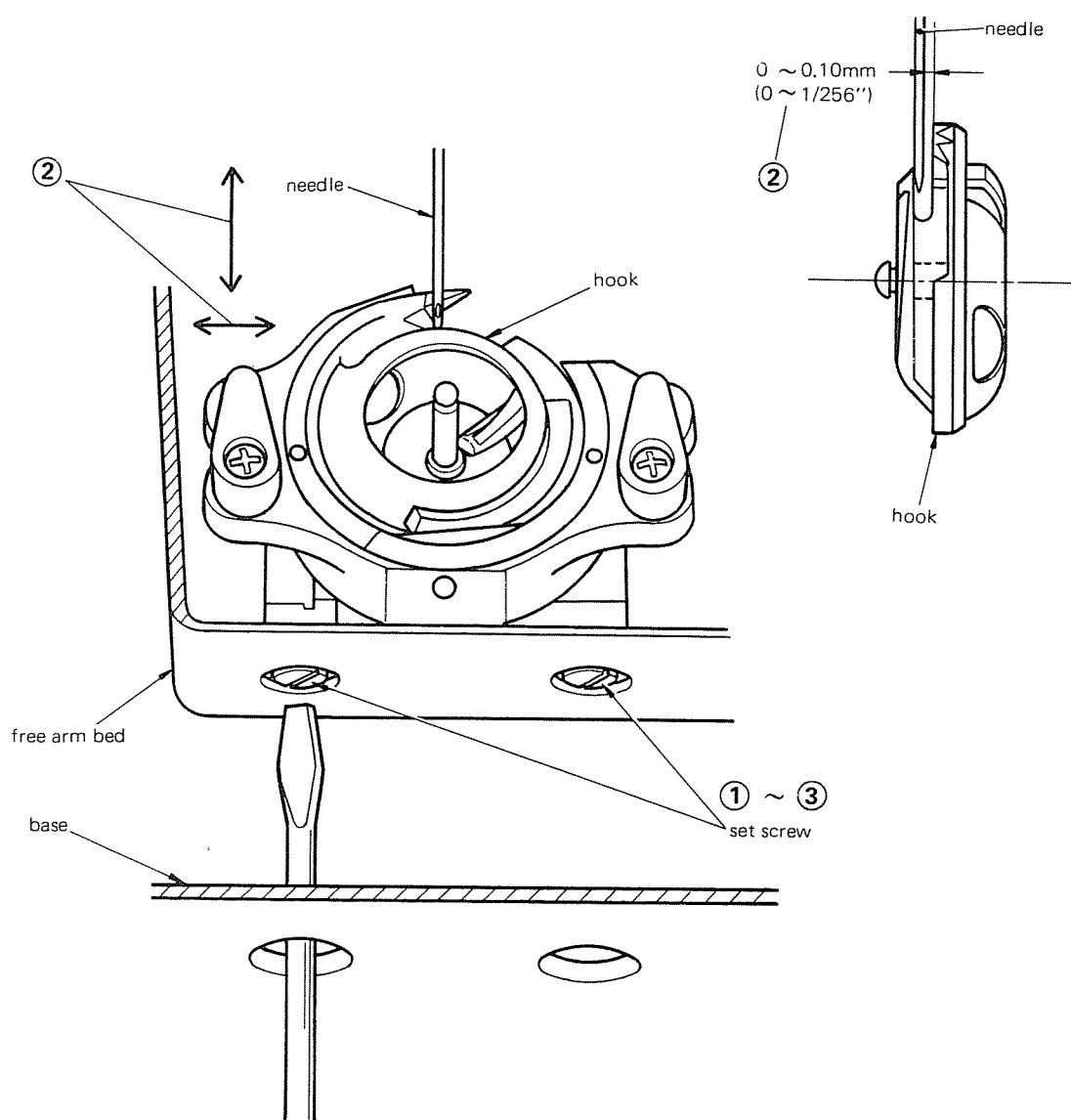
If not, make adjustment as follows:

1. Loosen set screws (672062001).
2. Move hook race (unit) and adjust clearance between needle and hook while adjusting back-rush or hook shaft gear.

Note: * The same clearance should also be secured in case of twin needle.

* Make sure that the clearance should be even at "L", "M" & "R" needle positions respectively.

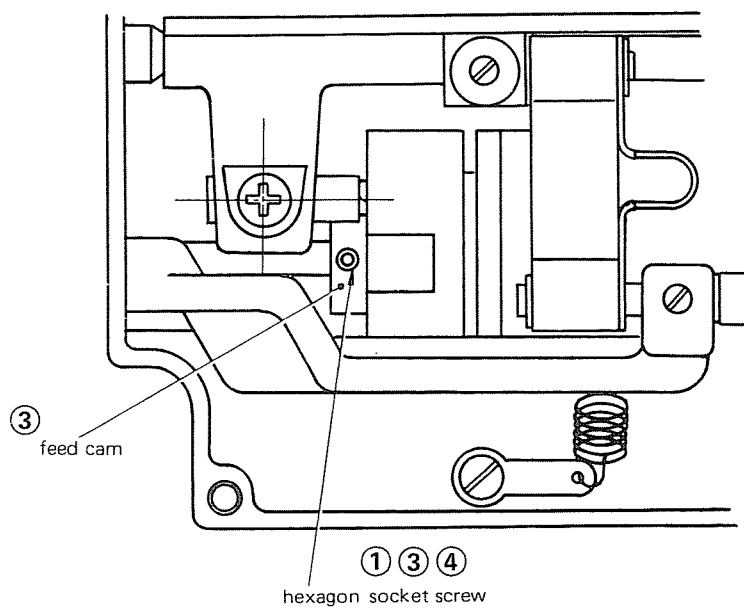
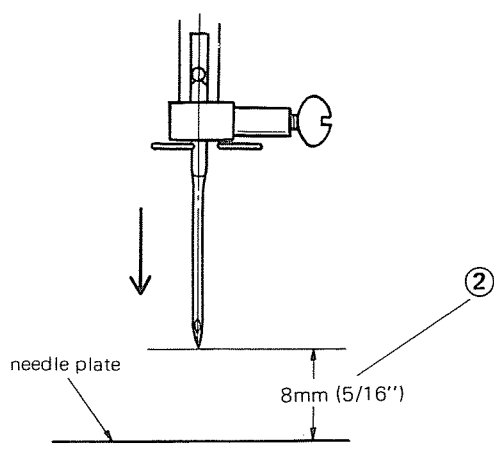
3. Tighten set screws.



TO PLACE FEED CAM IN CORRECT POSITION

After hook timing is adjusted; place feed cam in correct position as follows:

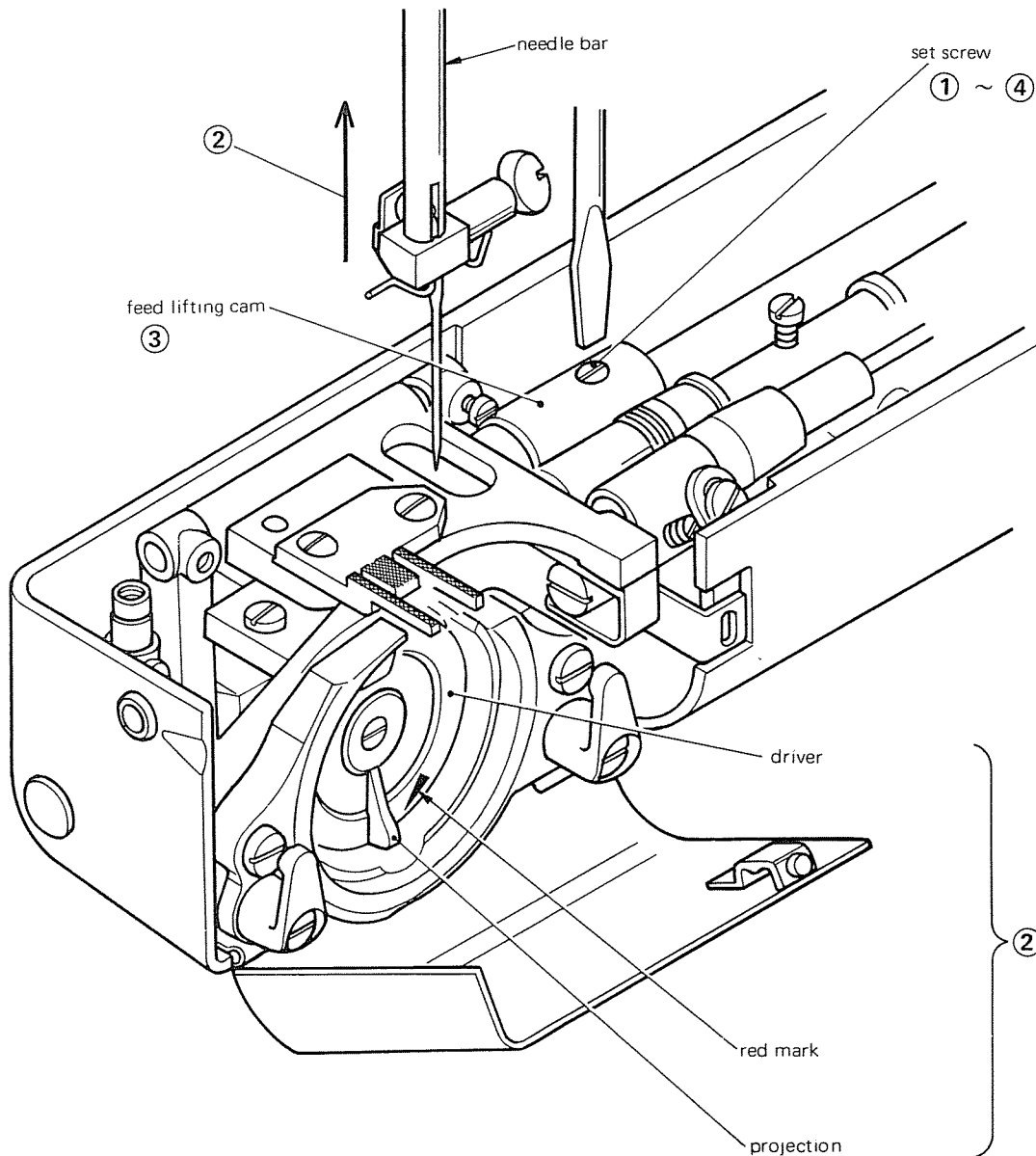
1. Remove base-lid (812047000) and loosen hexagon socket screw (607058002).
2. Turn balance wheel toward you unit tip of needle comes down to 8mm (5/16") above top surface of needle plate.
3. Turn feed cam until hexagon socket screw (607058002) comes to the right underneath.
4. Tighten hexagon socket screw (607058002).



TO POSITION FEED LIFTING CAM

After hook timing is adjusted, position feed lifting cam (673108003) correctly as follows:

1. Loosen set screw (102063000).
2. Turn balance wheel toward you until a projection near red mark on shuttle driver comes to lowest point of its turn, in condition that needle is in rising stroke of its travel.
3. Turn feed lifting cam until set screw (102063000) comes to right upside.
4. Tighten set screw (102063000) firmly.

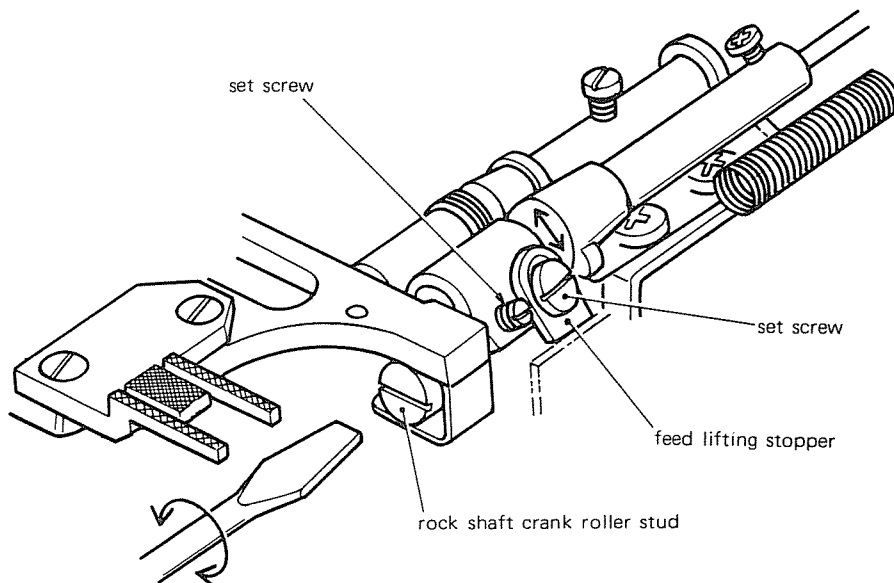


ADJUSTMENT OF HEIGHT OF FEED DOG

Set stitch length dial at “4”, lower presser foot and turn balance wheel toward you until needle bar comes to highest point of its travel. In this condition, height of feed dog above needle plate should be 0.7 ~ 0.85mm (7/256" ~ 17/512").


When stitch length dial is set at “DOWN”, feed dog should be below top surface of needle plate and should not touch hook race body (unit). To adjust:

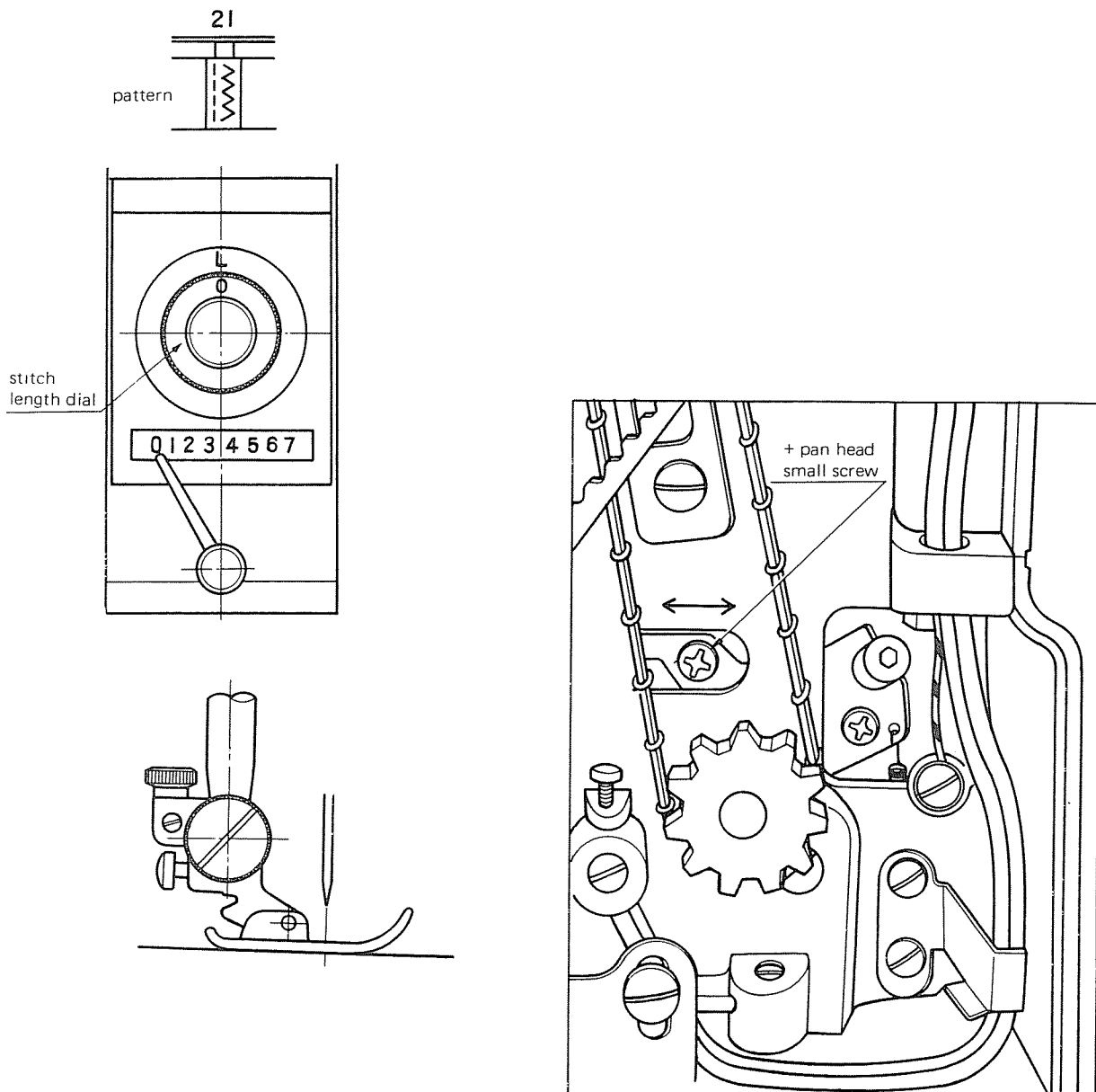
1. Set stitch length dial at “4” and turn balance wheel toward you until needle bar comes to highest point of its travel. Then lower presser foot.
2. Loosen set screw (761031000).
3. Turn feed lifting rock shaft crank roller stud (673113001) with screw driver to make adjustment.
4. Tighten set screw (761031000) after correct height of feed dog (0.7 ~ 0.85mm) is obtained.
5. Set stitch length dial at “DOWN”.
6. Loosen set screw (102021109) and make adjustment of its lower position that feed dog should not touch the hook race by moving feed lifting stopper plate upward and downward.
7. Tighten set screw (102021109) after adjustment.



ADJUSTMENT OF “0” FEED

In case machine feeds fabric when stitch length dial is set at “0”, make adjustment as follows:

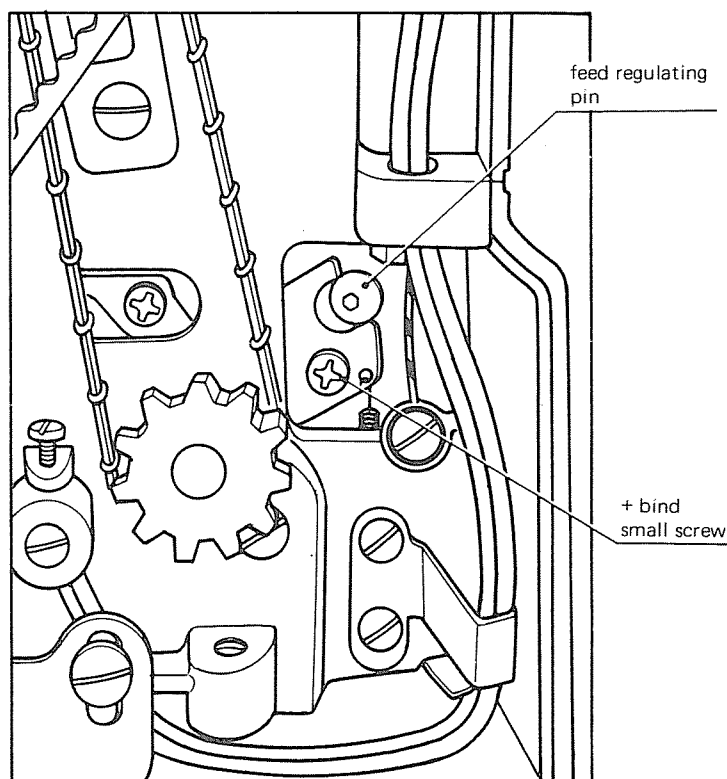
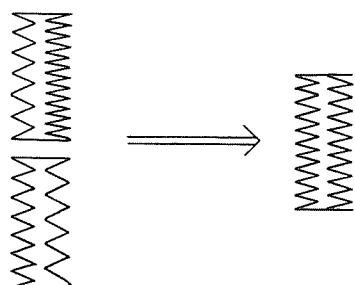
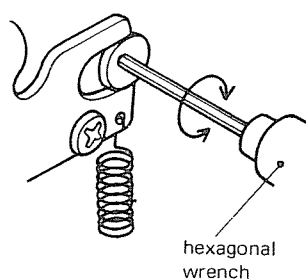
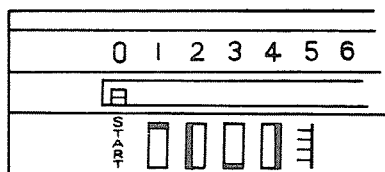
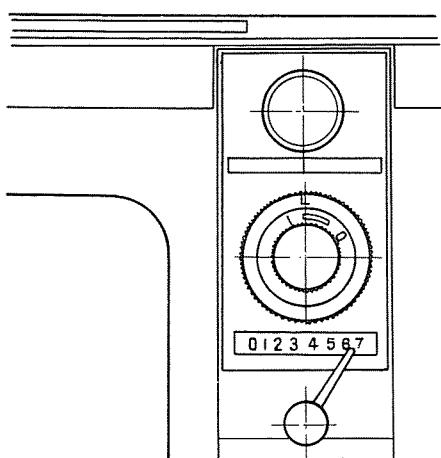
1. Set pattern selector dial at “” and stitch length dial at “0”.
2. Place a piece of paper under presser foot and lower presser foot.
3. Remove belt cover.
4. Loosen + pan head small screw (000077503). Then slightly move + pan head small screw (000077503) sideways while holding it by screwdriver. Tighten the screw (000077503) temporarily.
5. Turn balance wheel toward you and see if machine feed fabric or not.
6. When fabric is still fed by machine, repeat 4 and 5.
7. Tighten the screw (000077503) firmly after “0” feed is obtained and attach belt cover.



ADJUSTMENT OF PITCH DIFFERENCE IN BUTTONHOLE

The pitch difference between left and right rows in buttonhole seam should be 10 to 14 stitches in right side against 10 stitches in left. If not, make adjustment as follows:

1. Set stitch length dial at "0.8", needle position dial at "L" and zigzag lever at "7".
2. Stitch buttonhole and see if there is any difference between left and right rows in pitch.
3. If there is large difference between the rows, remove belt cover.
4. Loosen + binding head small screw (000103303).
5. Turn feed regulating pin (812020007) slightly with a hexagonal wrench and tighten + binding head small screw.
6. Sew buttonhole to see if there is large pitch difference between the rows.
7. When pitch difference is not sufficiently adjusted, repeat adjustment in procedure from 4 to 6.
8. Tighten + binding head small screw (000103303) firmly after adjustment and attach belt cover.



ADJUSTMENT OF TOP COVER LID OPENING

- (i) In case top cover lid does not open fully when lid opener button is pressed.
 - (1) Loosen + binding head small screws 3.5 x 5 (000103602).
 - (2) Move top cover lid hinge (810024005) slightly in the (A) direction.
 - (3) Tighten + binding head small screws 3.5 x 5 (000103602) temporarily and see if top cover opens fully when lid opener button is pressed. Then tighten the screws (000103602) firmly.
- (ii) In case top cover lid and inner lid open together when lid opener button is pressed.
 - (4) Loosen + binding head small screws 3.5 x 6 (000103004).
 - (5) Move lid opener bracket (810011009) slightly in the (B) direction.
 - (6) Tighten + binding head small screws 3.5 x 6 (000103004) temporarily and see if top cover lid and inner lid open correctly. Tighten the screws (000103004) firmly.
- (iii) In case top cover lid cannot be closed:
 - (7) Loosen + pan head small screws 3 x 4 (000100204).
 - (8) Move lid opener stopper holder (812012000) slightly in the (C) direction.
 - (9) Tighten the screw (000100204) temporarily and see if top cover lid works correctly. Then tighten the screw (000100204) firmly.

Note: After adjustment, check following points.

1. The clearances of right and left sides between top cover and top cover lid should be even.
2. Upper surface of top cover and top cover lid should be level.
3. Top cover lid should not interfere with top cover, lid opener button and bobbin winder thread guide bracket (unit).

