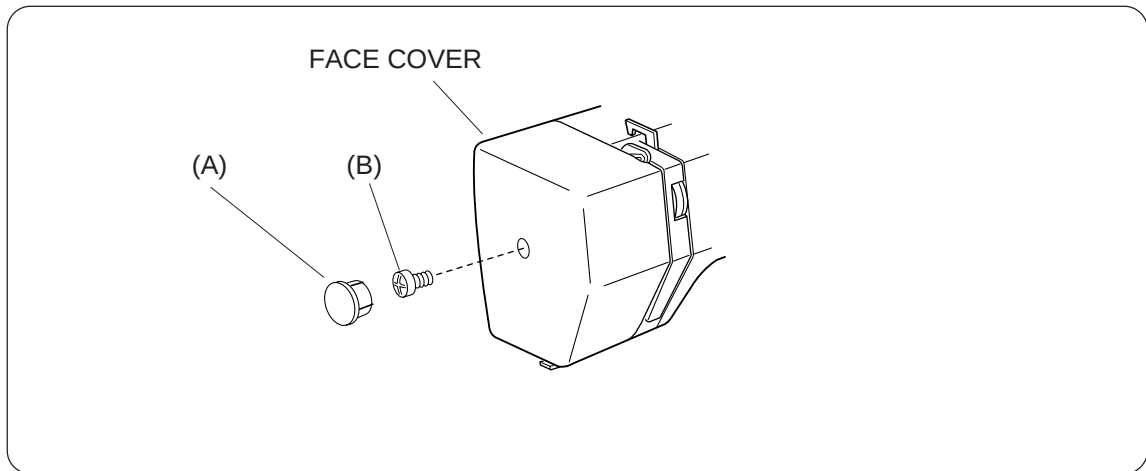


SERVICE ACCESS

FACE COVER



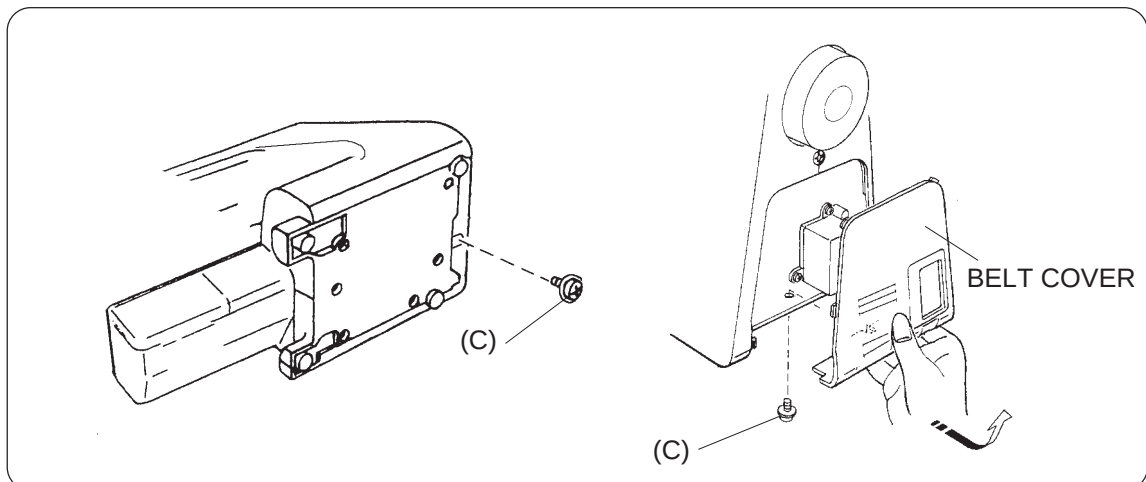
TO REMOVE:

1. REMOVE THE FACE COVER BY REMOVING THE CAP (A) AND SETSCREW (B).

TO ATTACH:

2. FOLLOW THE ABOVE PROCEDURE IN REVERSE.

BELT COVER



TO REMOVE:

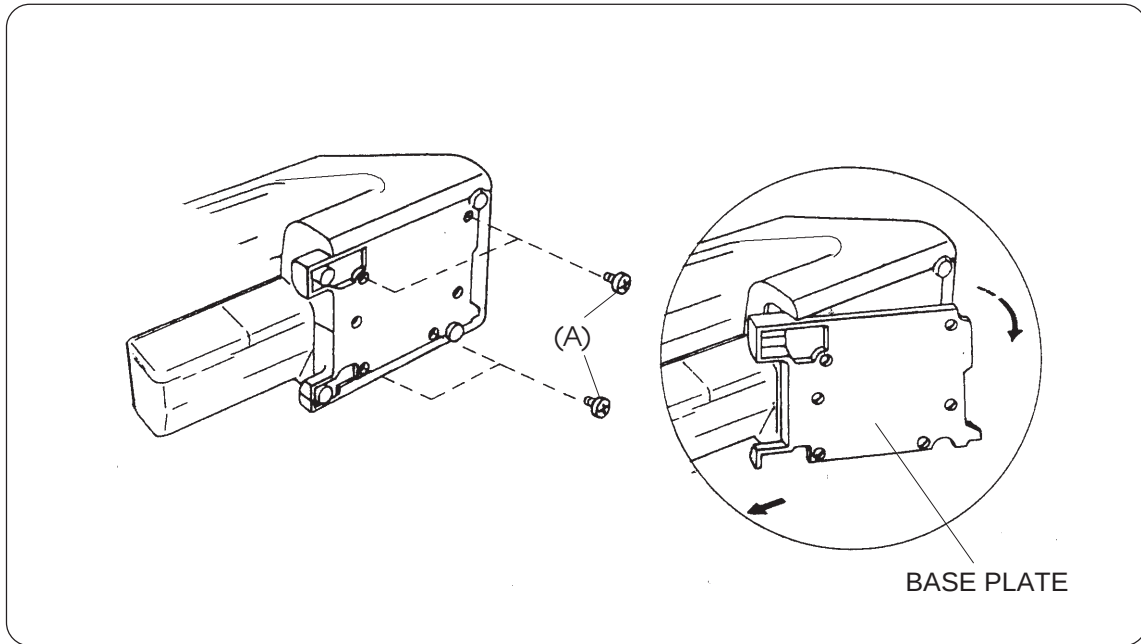
1. LOOSEN SETSCREW (C).
2. TAKE THE BELT COVER OUT.

TO ATTACH:

3. FOLLOW THE ABOVE PROCEDURE IN REVERSE.

SERVICE ACCESS

BASE PLATE



TO REMOVE:

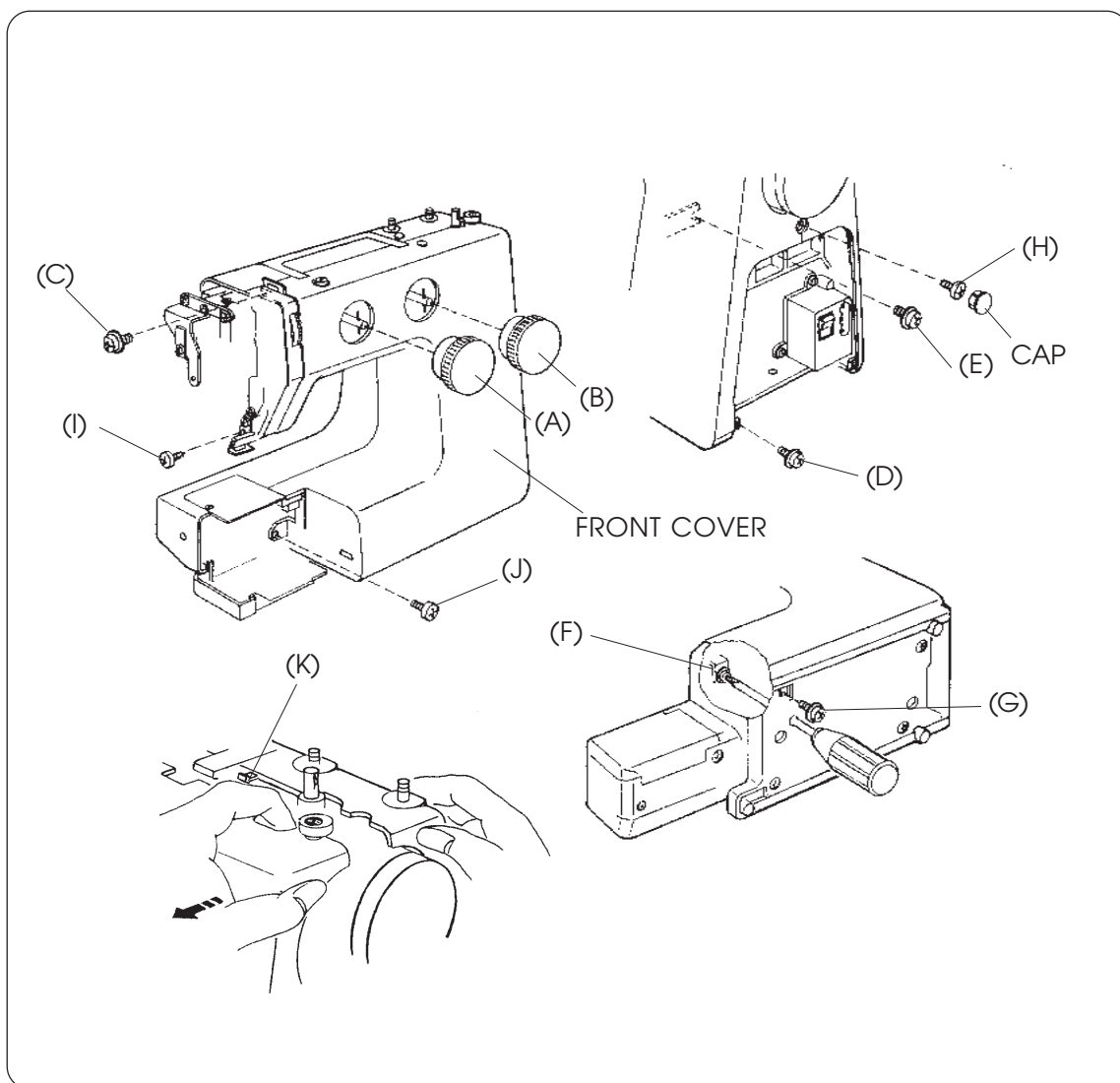
1. LOOSEN THE SETSCREWS (A).
2. REMOVE THE BASE PLATE.

TO ATTACH:

3. MOUNT THE BASE PLATE AND SECURE IT WITH FOUR SETSCREWS.

SERVICE ACCESS

FRONT COVER



TO REMOVE:

1. REMOVE THE FACE COVER, AND REMOVE THE BELT COVER (SEE PAGE 4).
2. REMOVE DIALS (A), (B).
3. LOOSEN SETSCREWS (C), (D), (E), (F), AND (G), REMOVE SETSCREWS (H), (I) AND (J), AND THEN, REMOVE THE FRONT COVER.

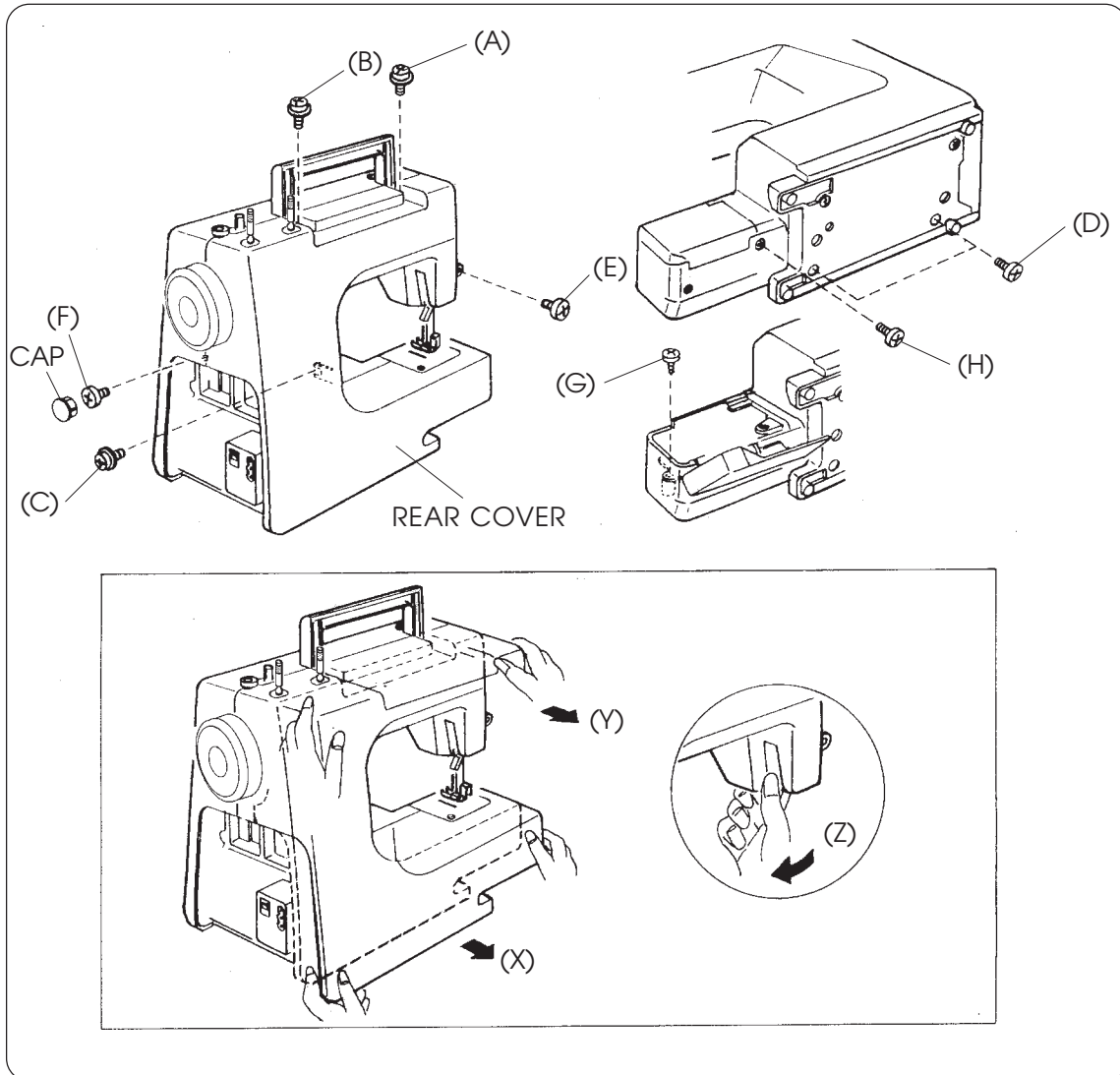
NOTE: UNHOOK THE TAB (K) FROM THE REAR COVER WHEN REMOVING THE FRONT COVER.

TO ATTACH:

4. MOUNT THE FRONT COVER IN REVERSE PROCEDURE OF THE REMOVING.

SERVICE ACCESS

REAR COVER



TO REMOVE:

1. REMOVE THE FACE COVER AND BELT COVER (SEE PAGE 4).

NOTE: PULL UP THE SPOOL PINS.

2. LOOSEN SETSCREWS (A), (B), (C) AND (D) (2 PCS.), REMOVE SETSCREWS (E), (F), (G) AND (H), AND THEN, REMOVE THE REAR COVER.

NOTE: REMOVE THE REAR COVER IN THE ORDER OF (X) (LOWER PART) → (Y) (UPPER PART) → (Z) (PRESSER FOOT LIFTER PART). (REMOVE THE BED COVER TOGETHER.)

TO ATTACH:

3. MOUNT THE REAR COVER IN REVERSE PROCEDURE OF THE REMOVING.

MECHANICAL ADJUSTMENT

NEEDLE THREAD TENSION

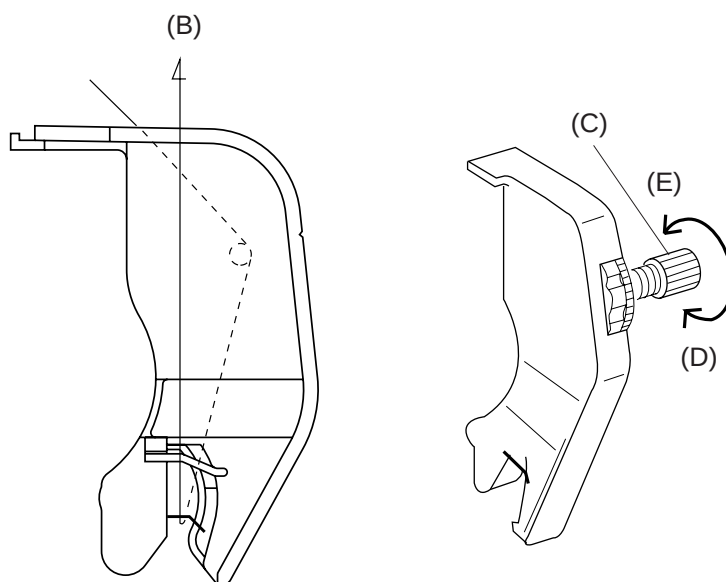
TO CHECK:

THE STANDARD UPPER THREAD TENSION SHOULD BE 65–95 g WHEN PULLING THE THREAD (COTTON THREAD #50) IN THE DIRECTION OF (B) WITH SETTING THE TENSION DIAL AT “3.” (MAKE SURE THE FOOT SHOULD BE LOWERED.)

IF THE TENSION IS OUT OF THE STANDARD RANGE, ADJUST IT AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. REMOVE THE FRONT COVER UNIT (SEE PAGE 6).
2. TURN THE ADJUSTING NUT (C) IN THE DIRECTION OF (D) WHEN THE UPPER THREAD TENSION IS TOO TIGHT.
TURN THE ADJUSTING NUT (C) IN THE DIRECTION OF (E) WHEN THE UPPER THREAD TENSION IS TOO LOOSE.
3. ATTACH THE FRONT COVER UNIT.



MECHANICAL ADJUSTMENT

BOBBIN TENSION

TO CHECK:

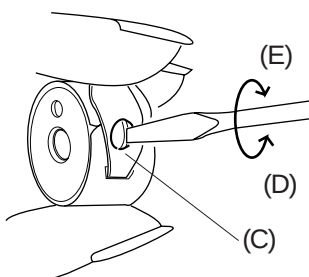
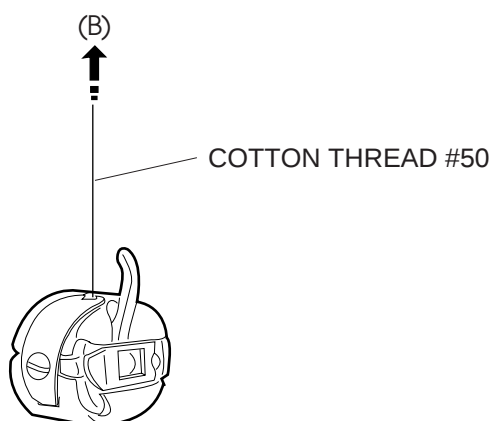
SET THE BOBBIN IN THE BOBBIN CASE AND PASS THE THREAD (COTTON #50) THROUGH THE TENSION SPRING.

THE BOBBIN THREAD TENSION SHOULD BE 45–55g WHEN PULLING THE THREAD IN THE DIRECTION OF (B).

IF THE TENSION IS OUT OF THE RANGE, ADJUST IT AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. TURN THE ADJUSTING SCREW (C) IN THE DIRECTION OF (D) WHEN THE BOBBIN THREAD TENSION IS TOO TIGHT.
2. TURN THE ADJUSTING SCREW (C) IN THE DIRECTION OF (E) WHEN THE BOBBIN THREAD TENSION IS TOO LOOSE.



MECHANICAL ADJUSTMENT

PRESSER BAR HEIGHT AND ALIGNMENT

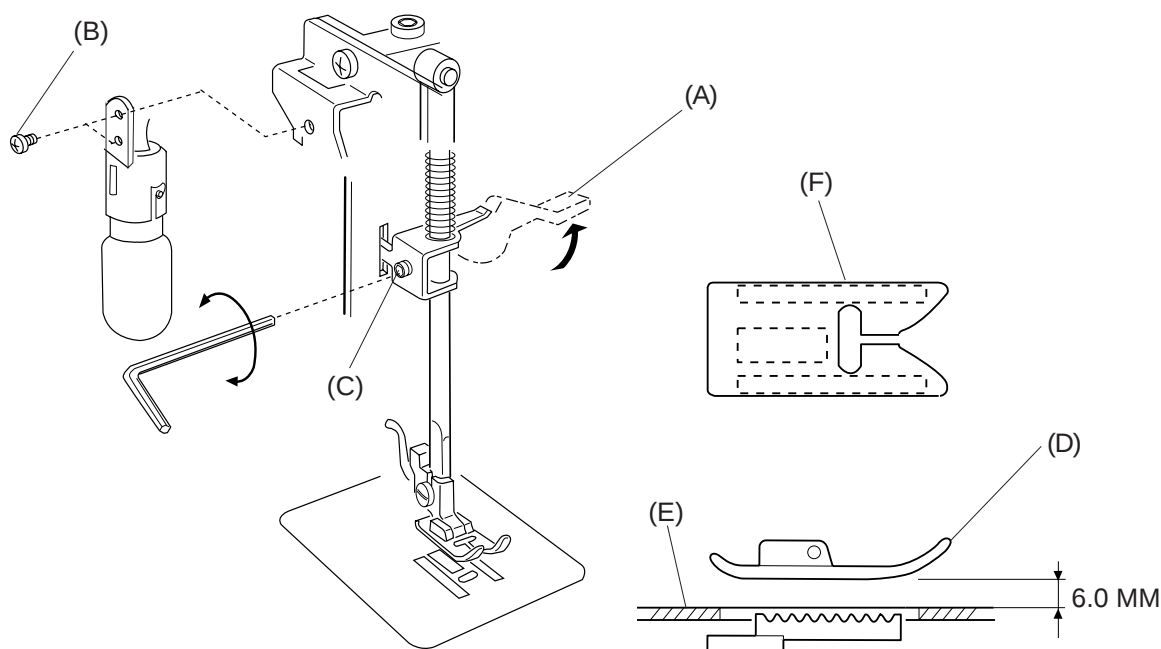
TO CHECK:

1. RAISE THE PRESSER FOOT LIFTER (A).
2. THE DISTANCE BETWEEN THE PRESSER FOOT (D) AND THE NEEDLE PLATE (E) SHOULD BE 6.0 MM (0.24").

ADJUSTMENT PROCEDURE:

1. REMOVE THE FACE COVER (SEE PAGE 4).
2. REMOVE THE SCREW (B) AND THE LAMP SOCKET, THEN LOOSEN THE SCREW (C) ON THE PRESSER BAR HOLDER.
ADJUST THE DISTANCE BETWEEN THE PRESSER FOOT (D) AND THE NEEDLE PLATE (D) TO 6.0 MM (0.24").
3. TIGHTEN THE SCREW (C) SECURELY.
4. TIGHTEN THE SCREW (B) TO SECURE THE LAMP SOCKET.
5. ATTACH THE FACE COVER.

NOTE: WHEN YOU TIGHTEN THE SCREW (B), MAKE SURE THAT BOTH SIDES OF THE PRESSER FOOT ARE PARALLEL TO THE FEED DOG SLOTS (F) IN THE NEEDLE PLATE.



MECHANICAL ADJUSTMENT

NEEDLE SWING

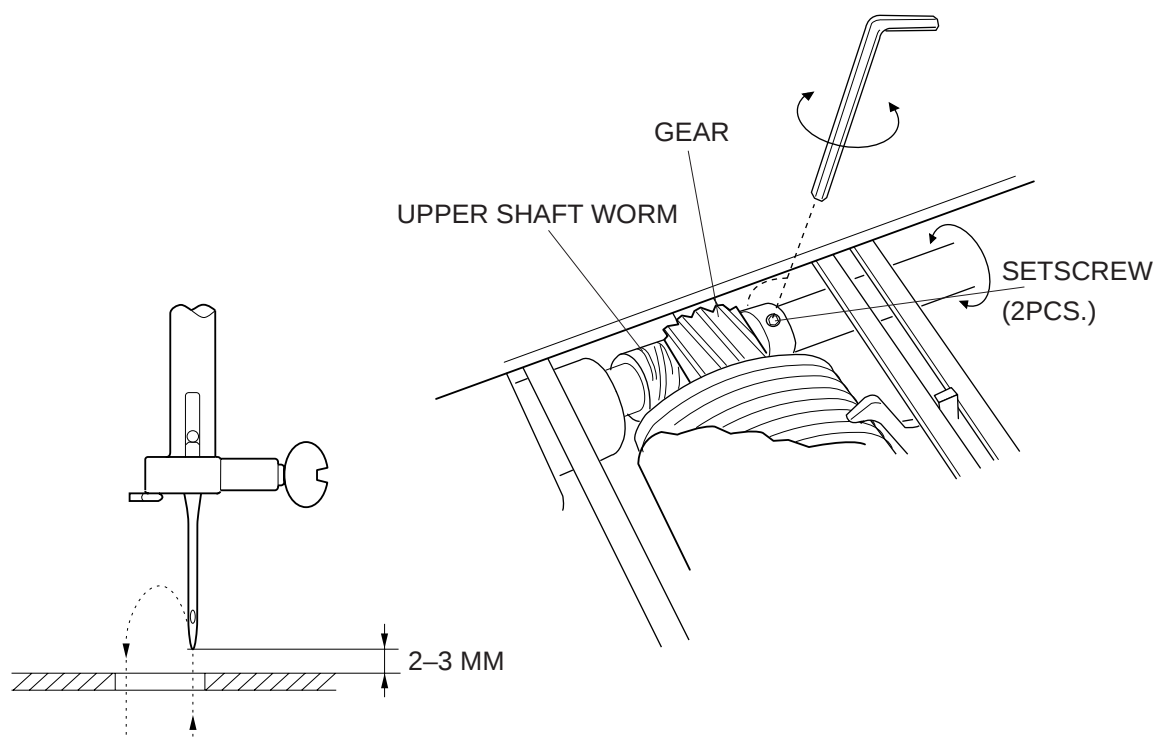
TO CHECK:

ADJUST THE NEEDLE SWING ACCORDING TO THE FOLLOWING PROCEDURE, IF THE NEEDLE BAR STARTS MOVING SIDEWAYS WHILE THE NEEDLE IS IN THE FABRIC AT SEWING THE ZIGZAG PATTERN (WITH MAXIMUM ZIGZAG WIDTH).

ADJUSTMENT PROCEDURE:

1. SET THE PATTERN SELECTOR DIAL WITH MAXIMUM ZIGZAG WIDTH, AND REMOVE THE FRONT COVER (SEE PAGE 6).
2. LOOSEN TWO SETSCREWS.
3. ADJUST THE NEEDLE SWING BY TURNING THE HANDWHEEL, WHILE HOLDING THE WORM SO AS NOT TO ROTATE IT, UNTIL THE NEEDLE SWING STARTS 2–3 MM ABOVE THE NEEDLE PLATE AFTER THE NEEDLE HAS COME OUT OF THE RIGHT SIDE OF THE NEEDLE HOLE.
4. TIGHTEN TWO SETSCREWS.
5. MOUNT THE FRONT COVER.

NOTE: AFTER ADJUSTING THE NEEDLE SWING, CHECK THAT THE UPPER SHAFT WORM AND GEAR ROTATE SMOOTHLY WITHOUT ANY BACKLASH BETWEEN THEM.



MECHANICAL ADJUSTMENT

NEEDLE DROP

TO CHECK:

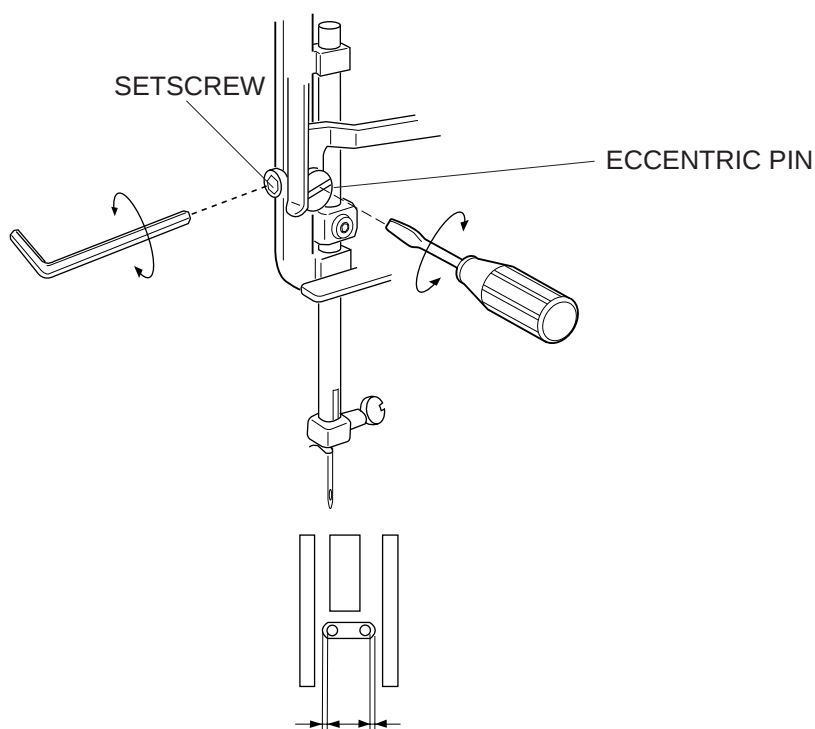
WHEN THE NEEDLE SWINGS IN MAXIMUM ZIGZAG WIDTH, THE DISTANCE BETWEEN BOTH ENDS OF THE NEEDLE HOLE IN THE NEEDLE PLATE AND THE NEEDLE DROP POSITIONS SHOULD BE EQUAL.

IF NOT, ADJUST AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. REMOVE THE FACE COVER (SEE PAGE 4).
2. SET THE PATTERN SELECTOR DIAL AT MAXIMUM ZIGZAG WIDTH.
3. LOOSEN THE SETSCREW.
4. TURN THE ECCENTRIC PIN TO ADJUST THE NEEDLE DROP.
5. TIGHTEN THE SETSCREW.
6. ATTACH THE FACE COVER.

NOTE: CHECK THE HOOK TIMING AFTER THIS ADJUSTMENT.



MECHANICAL ADJUSTMENT

CLEARANCE BETWEEN NEEDLE AND HOOK (ADJUSTMENT METHOD NO. 1)

TO CHECK:

THE CLEARANCE BETWEEN THE NEEDLE AND SHUTTLE RACE SHOULD BE -0.05 TO $+0.10$ MM.

IF NOT, ADJUST AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. REMOVE THE FACE COVER (SEE PAGE 4).
2. SET THE PATTERN SELECTOR DIAL AT "C: D".
3. LOOSEN SCREW (A), AND MOVE THE NEEDLE BAR SUPPORTER IN THE DIRECTION OF THE ARROWS TO GET A CLEARANCE BETWEEN -0.05 TO $+0.10$ MM.

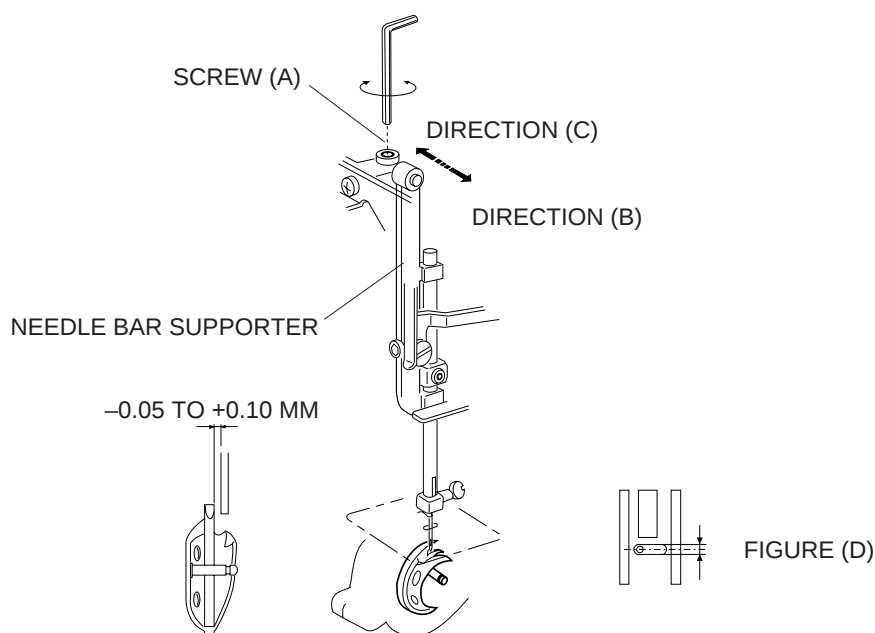
* IF CLEARANCE IS TOO WIDE, MOVE THE NEEDLE BAR SUPPORTER IN THE DIRECTION (B).

* IF CLEARANCE IS TOO NARROW, MOVE THE NEEDLE BAR SUPPORTER IN THE DIRECTION (C).

NOTE: AFTER THIS ADJUSTMENT, CHECK THAT THE CLEARANCE BETWEEN THE NEEDLE AND NEEDLE PLATE IS 0.15 MM OR MORE AS SHOWN IN FIGURE (D).

IF NOT, ADJUST THE CLEARANCE BETWEEN NEEDLE AND SHUTTLE RACE BY USING ADJUSTMENT METHOD, ABOVE AFTER READJUST THE CLEARANCE BETWEEN NEEDLE AND NEEDLE PLATE IS 0.15 MM OR MORE.

4. ATTACH THE FACE COVER.



CLEARANCE BETWEEN NEEDLE AND *NEEDLE*
PLATE SHOULD BE 0.15 MM OR MORE.

MECHANICAL ADJUSTMENT

CLEARANCE BETWEEN NEEDLE AND HOOK (ADJUSTMENT METHOD NO.2)

TO CHECK:

USE THIS ADJUSTMENT METHOD NO. 2 IF THE CLEARANCE CANNOT BE ADJUSTED BY METHOD NO.1.

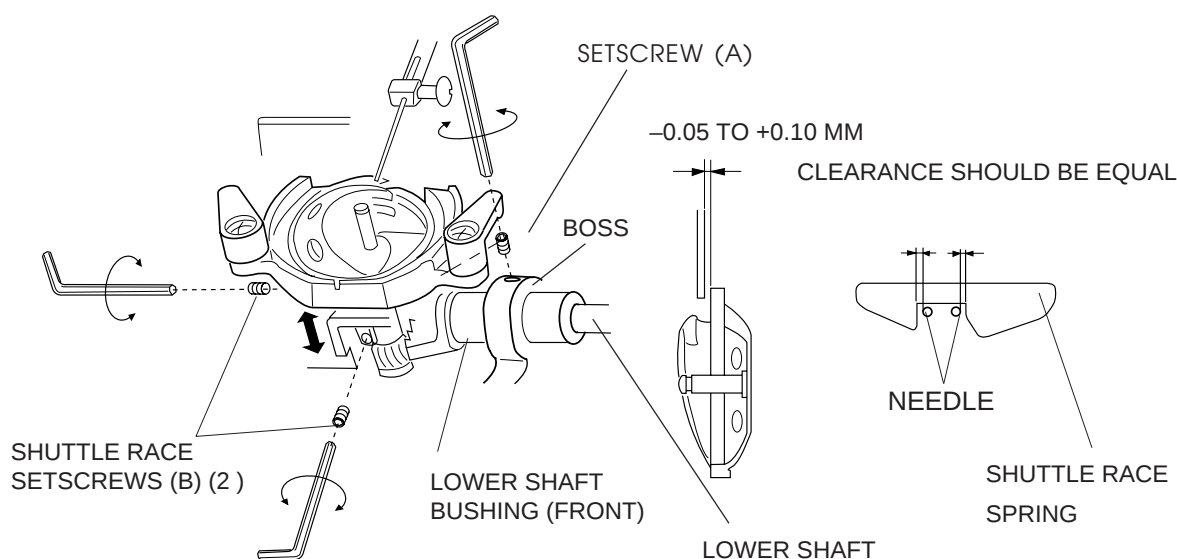
THE CLEARANCE BETWEEN THE NEEDLE AND SHUTTLE RACE SHOULD BE -0.05 TO $+0.10$ MM.

ADJUSTMENT PROCEDURE:

1. SET THE PATTERN SELECTOR DIAL AT "C" .
2. REMOVE THE REAR COVER (SEE PAGE 7).
3. LOOSEN THE SCREW (A) ON THE LOWER SHAFT BUSHING AND SLIDE THE GEAR ABOUT 0.5 MM TO THE RIGHT TO CREATE SOME SLACK BETWEEN THE GEARS.
4. LOWER THE NEEDLE AND LOOSEN THE TWO SHUTTLE RACE SETSCREWS (B). PULL UP OR PUSH DOWN THE SHUTTLE RACE TO ADJUST THE CLEARANCE BETWEEN THE NEEDLE AND THE SHUTTLE RACE IN THE RANGE OF -0.05 TO $+0.10$ MM.
5. SET THE PATTERN SELECTOR DIAL AT "Z" , TURN THE HANDWHEEL TO CHECK IF THE CLEARANCE BETWEEN THE NEEDLE AND INNER EDGES OF THE SHUTTLE RACE SPRING AT THE LEFT AND RIGHT NEEDLE DROPS ARE EQUAL. IF NOT, ADJUST BY TURNING THE SHUTTLE RACE UNIT.
6. TIGHTEN THE TWO SHUTTLE RACE SETSCREWS (B).
7. SLIDE THE GEAR BACK TO THE ORIGINAL POSITION WHILE ADJUSTING THE BACKLASH.
8. TIGHTEN SCREW (A) FIRMLY.
9. ATTACH THE REAR COVER.

NOTE: THE BACKLASH SHOULD BE 0.3 MM OR LESS AND THE LOWER SHAFT SHOULD TURN SMOOTHLY.

AFTER THE ADJUSTMENT, CHECK THE HOOK TIMING.



MECHANICAL ADJUSTMENT

FEED DOG HEIGHT

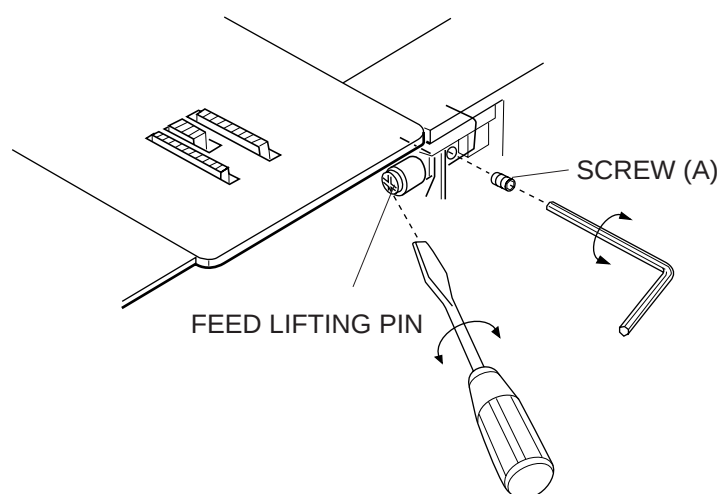
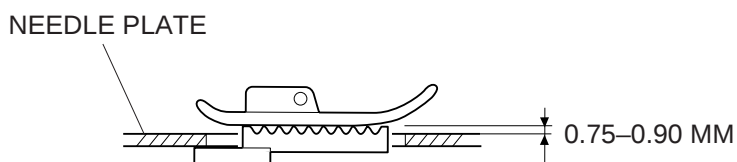
TO CHECK:

1. LOWER THE PRESSER FOOT.
2. TURN THE HANDWHEEL TOWARD YOU TO BRING THE FEED DOG TO ITS HIGHEST POSITION. THE HEIGHT OF THE FEED DOG FROM THE NEEDLE PLATE SHOULD BE 0.75 TO 0.90 MM.

IF IT IS NOT IN THE RANGE, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. OPEN THE SHUTTLE COVER.
2. LOWER THE PRESSER FOOT AND TURN THE HANDWHEEL TOWARD YOU UNTIL THE FEED DOG COMES TO ITS HIGHEST POINT.
3. LOOSEN THE SCREW (A) .
4. TURN THE FEED LIFTING PIN TO ADJUST THE HEIGHT OF FEED DOG (0.75–0.90 MM).
5. TIGHTEN THE SCREW (A).
6. TURN THE HANDWHEEL TOWARD YOU TO RECHECK THE HEIGHT OF FEED DOG.



MECHANICAL ADJUSTMENT

NEEDLE BAR HEIGHT

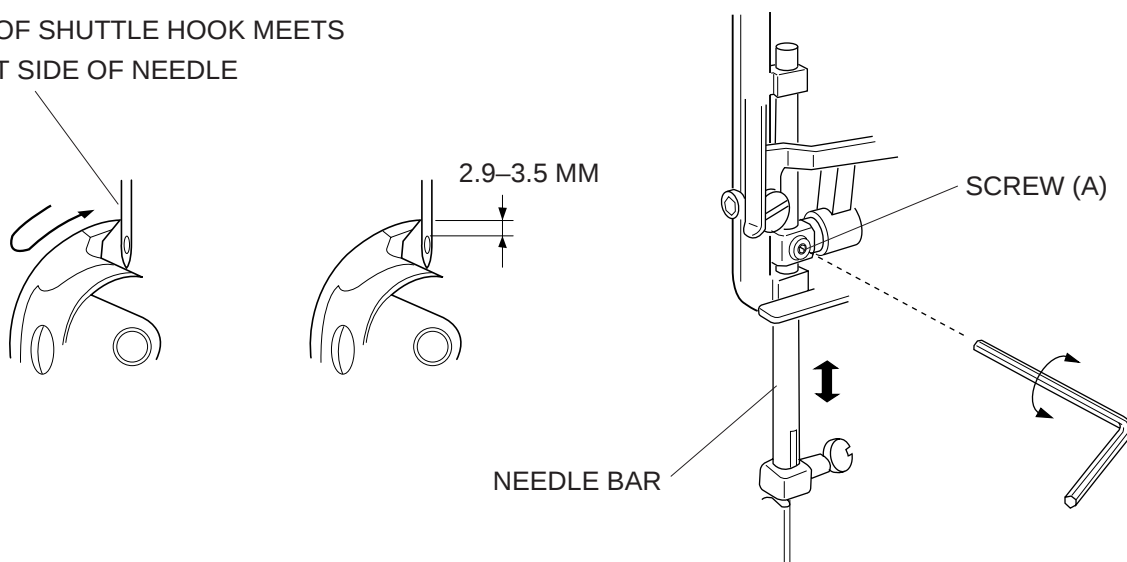
TO CHECK:

WHEN THE TIP OF SHUTTLE HOOK MEETS THE LEFT SIDE OF THE NEEDLE IN ASCENDING TRAVEL OF THE NEEDLE FROM ITS LEFT AND LOWEST POSITION, THE DISTANCE BETWEEN THE TOP OF THE NEEDLE EYE AND THE TIP OF THE SHUTTLE HOOK SHOULD BE IN THE RANGE OF 2.9-3.5 MM.

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER.
2. SET THE PATTERN SELECTOR DIAL AT "C: D".
3. OPEN THE SHUTTLE COVER.
4. REMOVE THE SHUTTLE RACE RING.
5. TURN THE HANDWHEEL TOWARD YOU UNTIL THE TIP OF THE SHUTTLE HOOK MEETS THE LEFT SIDE OF THE NEEDLE.
6. LOOSEN THE NEEDLE BAR CONNECTING STUD SCREW (A).
7. ADJUST THE HEIGHT OF THE NEEDLE BAR BY MOVING THE NEEDLE BAR UPWARD OR DOWNWARD WITHOUT TURNING IT.
8. TIGHTEN THE SCREW (A).
9. ATTACH THE SHUTTLE RACE RING.

TIP OF SHUTTLE HOOK MEETS
LEFT SIDE OF NEEDLE



MECHANICAL ADJUSTMENT

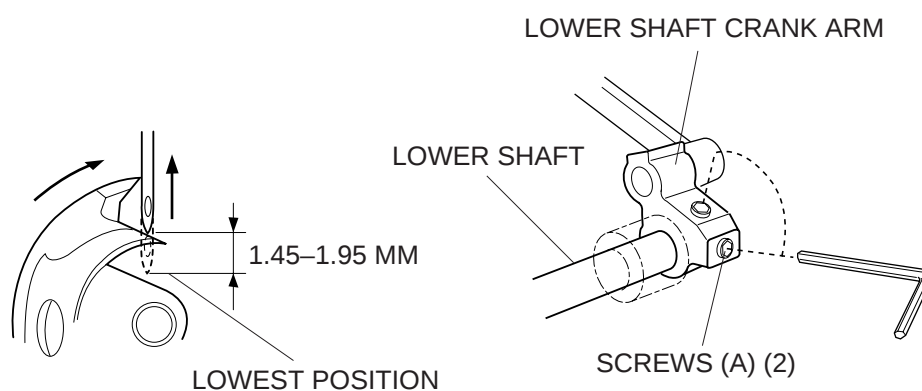
NEEDLE TIMING TO SHUTTLE

TO CHECK:

THE HEIGHT OF THE NEEDLE POINT FROM ITS LOWEST POINT SHOULD BE IN THE RANGE OF 1.45-1.95 MM WHEN THE TIP OF THE SHUTTLE HOOK MEETS THE LEFT SIDE OF THE NEEDLE AT THE LEFT NEEDLE POSITION IN ASCENDING TRAVEL.

ADJUSTMENT PROCEDURE:

1. SET THE PATTERN SELECTOR DIAL AT “C”.
2. REMOVE THE BASE (SEE PAGE 5).
3. OPEN THE SHUTTLE COVER.
4. REMOVE THE SHUTTLE RACE RING.
5. TURN THE HANDWHEEL TOWARD YOU UNTIL THE TIP OF THE SHUTTLE HOOK MEETS THE LEFT SIDE OF THE NEEDLE.
6. LOOSEN THE LOWER SHAFT CRANK ARM SCREWS (A).
7. WHILE HOLDING THE SHUTTLE HOOK SO IT DOESN'T TURN, TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE COMES TO ITS LOWEST POSITION.
THEN, FURTHER TURN THE BALANCEWHEEL TO RAISE THE NEEDLE ABOUT 1.7 MM FROM ITS LOWEST POSITION.
8. TIGHTEN THE SCREWS (A).
9. TURN THE BALANCEWHEEL TOWARD YOU TO CHECK IF THE HEIGHT IS IN THE RANGE OF 1.45-1.95 MM.
IF IT IS NOT IN THIS RANGE, REPEAT THE ABOVE PROCEDURE.
10. ATTACH THE SHUTTLE RACE RING.
11. ATTACH THE BASE.



MECHANICAL ADJUSTMENT

BUTTONHOLE FEED BALANCE

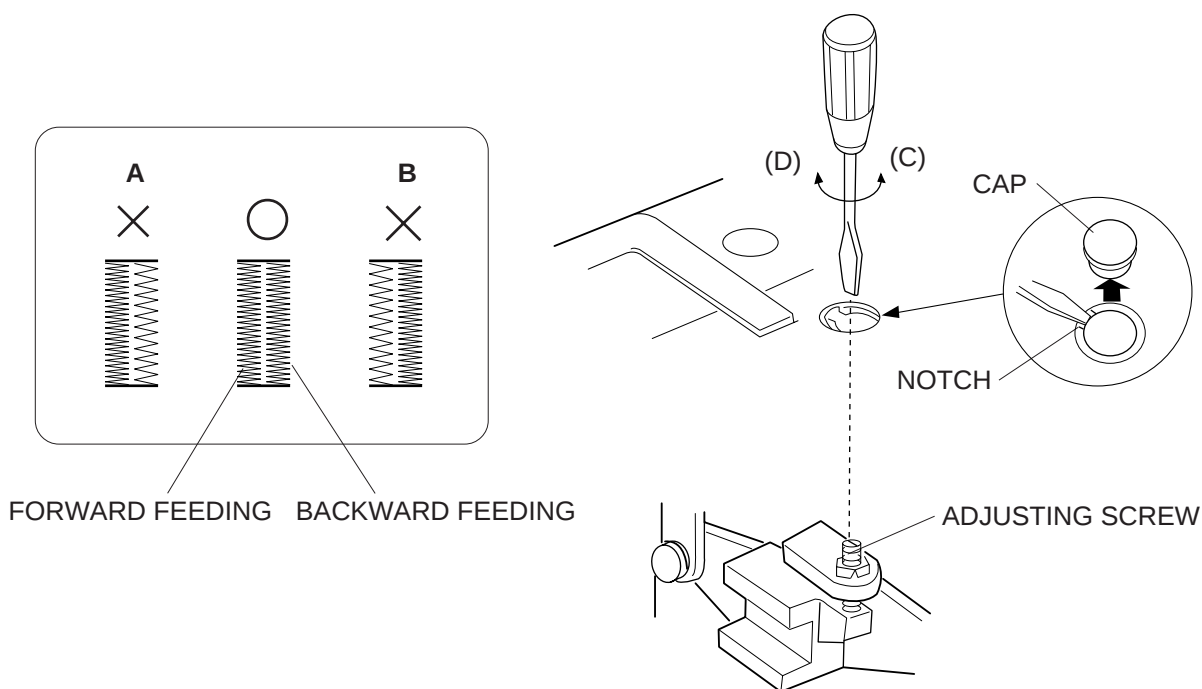
TO CHECK:

WHEN SEWING BUTTONHOLE, THE STITCHES ON EACH SIDE OF BUTTONHOLE SHOULD BE THE SAME STITCH DENSITY.

THE RANGE OF 9-12 STITCHES IN THE RIGHT SIDE ROW (BACKWARD FEEDING) AGAINST 10 STITCHES IN THE LEFT SIDE ROW (FORWARD FEEDING) IS CONSIDERED ACCEPTABLE.

ADJUSTMENT PROCEDURE:

1. CHECK THE FEED BALANCE BY SEWING BUTTONHOLES.
2. REMOVE THE CAP ON THE FRONT COVER.
3. TURN THE ADJUSTING SCREW IN THE DIRECTION OF (C) IN CASE OF (A) (RIGHT STITCHES ARE COARSE), OR IN THE DIRECTION OF (D) IN CASE OF (B) (LEFT STITCHES ARE COARSE).
4. MOUNT THE CAP.



MECHANICAL ADJUSTMENT

FEED BALANCE ON STRETCH STITCH

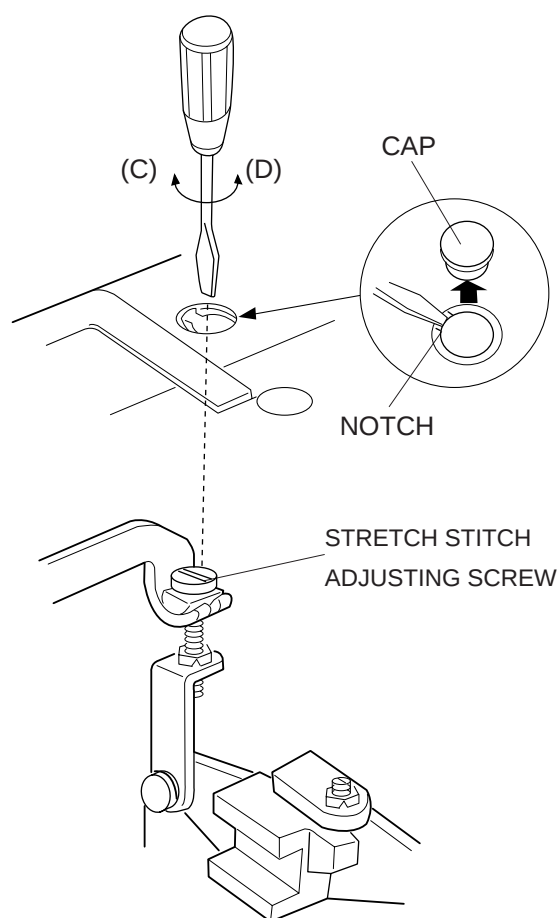
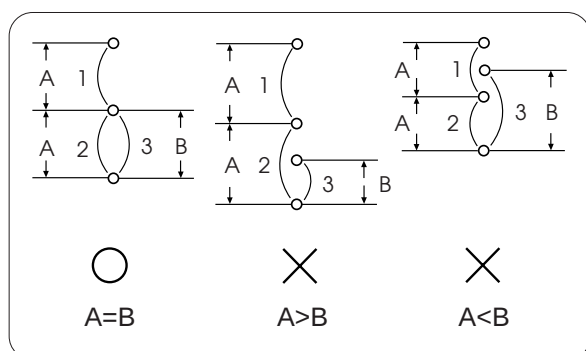
TO CHECK:

IF THE STRETCH STITCH PATTERNS ARE DISTORTED WITH SETTING THE STITCH LENGTH DIAL AT " ► ".

IN CASE OF BEING A DIFFERENCE BETWEEN FORWARD FEEDING AND BACKWARD FEEDING DURING STRETCH STITCH PATTERN SEWING, MAKE AN ADJUSTMENT AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. REMOVE THE CAP ON THE REAR COVER.
2. SET THE PATTERN SELECTOR DIAL AT " ■ " , AND THE STITCH LENGTH DIAL AT " ► ".
3. TURN THE STRETCH STITCH ADJUSTING SCREW IN THE DIRECTION OF (C) WHEN $A > B$, OR IN THE DIRECTION OF (D) WHEN $A < B$.
4. ATTACH THE CAP.



MECHANICAL ADJUSTMENT

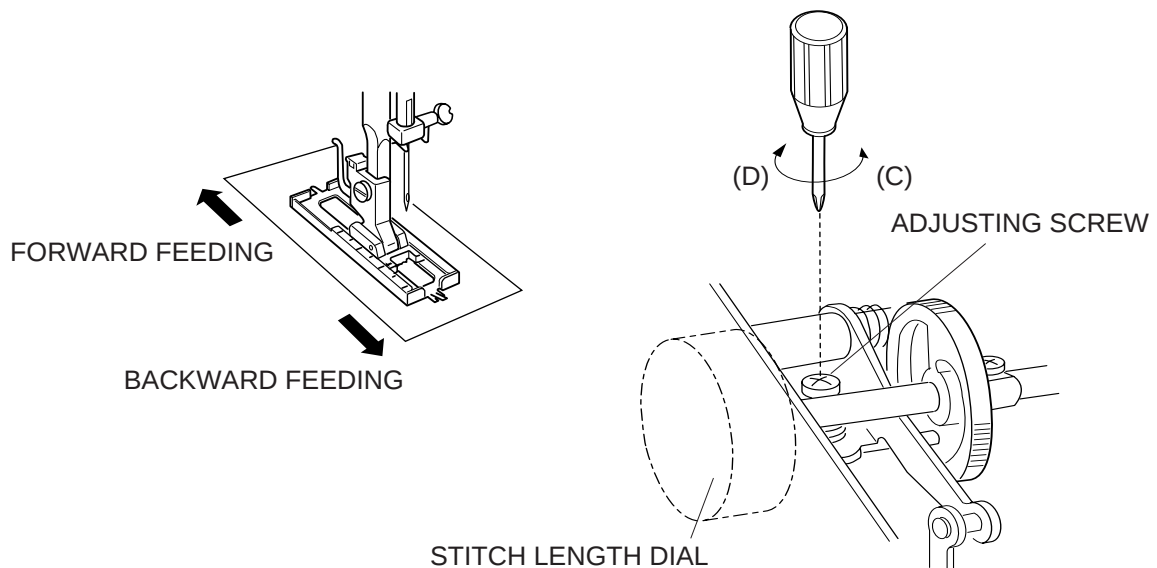
BARTACK FEED OF BUTTONHOLE

TO CHECK:

IF THE MATERIAL IS FED FORWARD OR BACKWARD WHEN SEWING BARTACK ON BUTTONHOLE, MAKE AN ADJUSTMENT AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. SET THE PATTERN SELECTOR DIAL AT " $\frac{4}{2}$ ", AND THE STITCH LENGTH DIAL AT "4".
2. REMOVE THE FRONT COVER (SEE PAGE 6).
3. PLACE A PIECE OF PAPER UNDER THE FOOT AND TURN THE HANDWHEEL.
IF THE PAPER IS FED FORWARD, TURN THE ADJUSTING SCREW IN THE DIRECTION OF (C).
IF THE PAPER IS FED BACKWARD, TURN THE ADJUSTING SCREW IN THE DIRECTION OF (D).
4. ATTACH THE FRONT COVER.



MECHANICAL ADJUSTMENT

DISENGAGEMENT OF CAM FOLLOWER

TO CHECK:

IF THE CLEARANCE BETWEEN THE CAM FOLLOWER AND THE TOP CONVEX OF THE ZIGZAG CAM IS NOT ENOUGH, THE PATTERN SELECTOR DIAL IS BLOCKED OR WILL NOT SELECT THE CORRECT PATTERN.

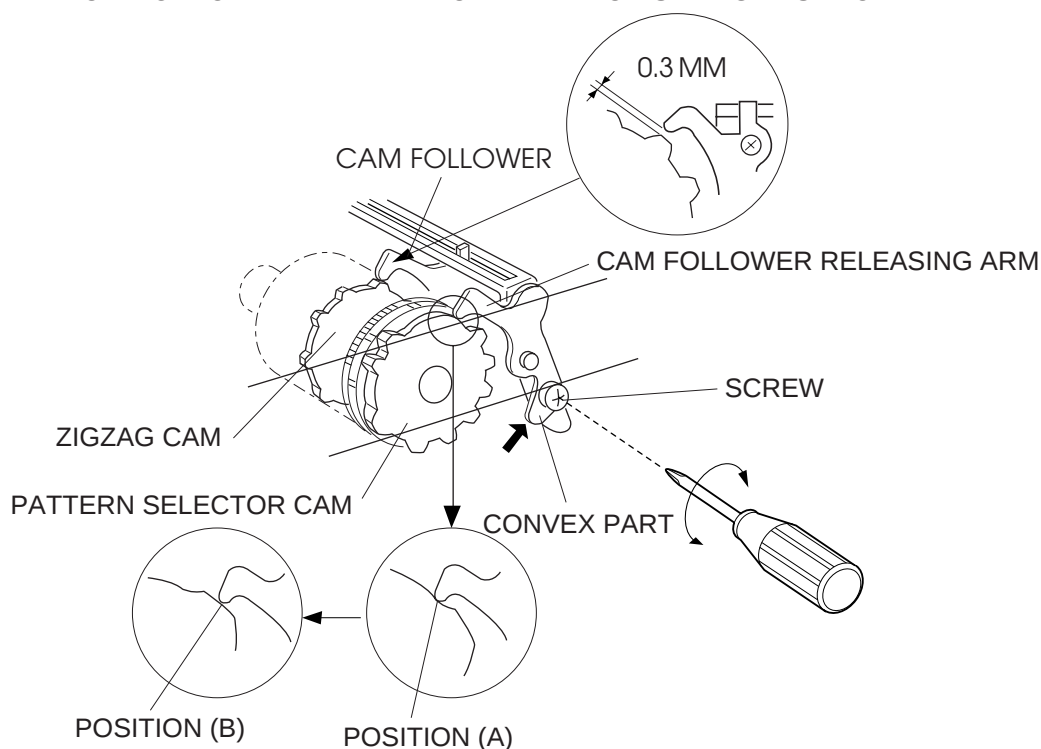
ADJUSTMENT PROCEDURE:

1. REMOVE THE FRONT COVER (SEE PAGE 6).
2. SET THE PATTERN SELECTOR DIAL AT PATTERN "  " AND THE STITCH WIDTH CONTROL AT (5).
3. PUT THE CAM FOLLOWER TO THE ZIGZAG CAM AND PUT THE CAM FOLLOWER RELEASING ARM TO THE PATTERN SELECTOR CAM.
4. LOOSEN THE SET SCREW.
5. PUSH THE CONVEX PART OF THE CAM FOLLOWER RELEASING ARM IN THE DIRECTION OF ARROW UNTIL THE CAM FOLLOWER RELEASING ARM TOUCHES POSITION (A) OF THE PATTERN SELECTOR CAM, AND THEN, TIGHTEN THE SETSCREW.

NOTE: AFTER THIS ADJUSTMENT, CHECK THAT THE CLEARANCE BETWEEN THE ZIGZAG CAM AND THE CAM FOLLOWER IS ABOUT 0.3 MM WHEN SETTING THE CAM FOLLOWER RELEASING ARM ONTO POSITION (B) OF PATTERN SELECTOR CAM.

6. MOUNT THE FRONT COVER.

NOTE: CHECK THE NEEDLE MOVEMENT FOR STRAIGHT STITCH.



MECHANICAL ADJUSTMENT

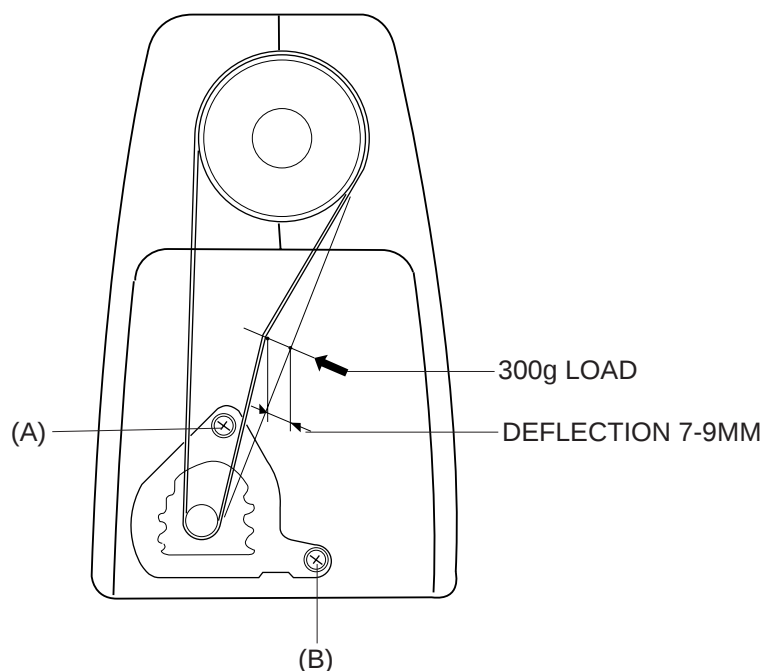
MOTOR BELT TENSION

TO CHECK:

1. IMPROPER BELT TENSION MAY CAUSE NOISE, OVERLOAD OF MOTOR, SLOW RUNNING OR MOTOR BELT JUMPING.
2. THE BELT DEFLECTION SHOULD BE 7 MM - 9 MM WHEN PRESSING THE MIDDLE OF THE MOTOR BELT WITH APPROXIMATELY 300 GRAMS OF PRESSURE.

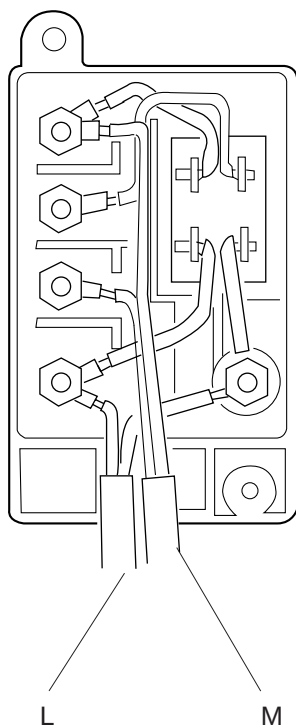
ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER (SEE PAGE 4).
2. LOOSEN THE SCREWS (A) AND (B).
3. MOVE THE MOTOR UP OR DOWN TO ADJUST THE DEFLECTION ABOUT 7 MM -9 MM.
4. TIGHTEN THE SCREWS (A) AND (B).
5. ATTACH THE BELT COVER.



WIRING

1. WIRING FOR MACHINE SOCKET UNIT.



M: MOTOR

L: LAMP