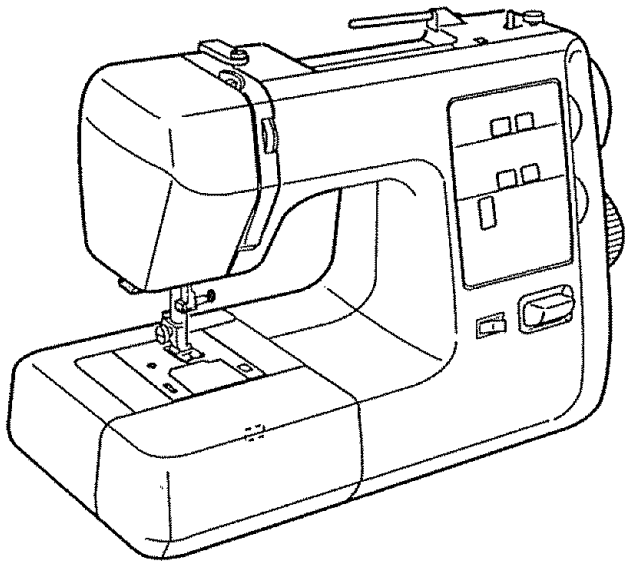
SERVICE MANUAL



SEWING MACHINE MODEL

385. 18630890

JUNE, 1998

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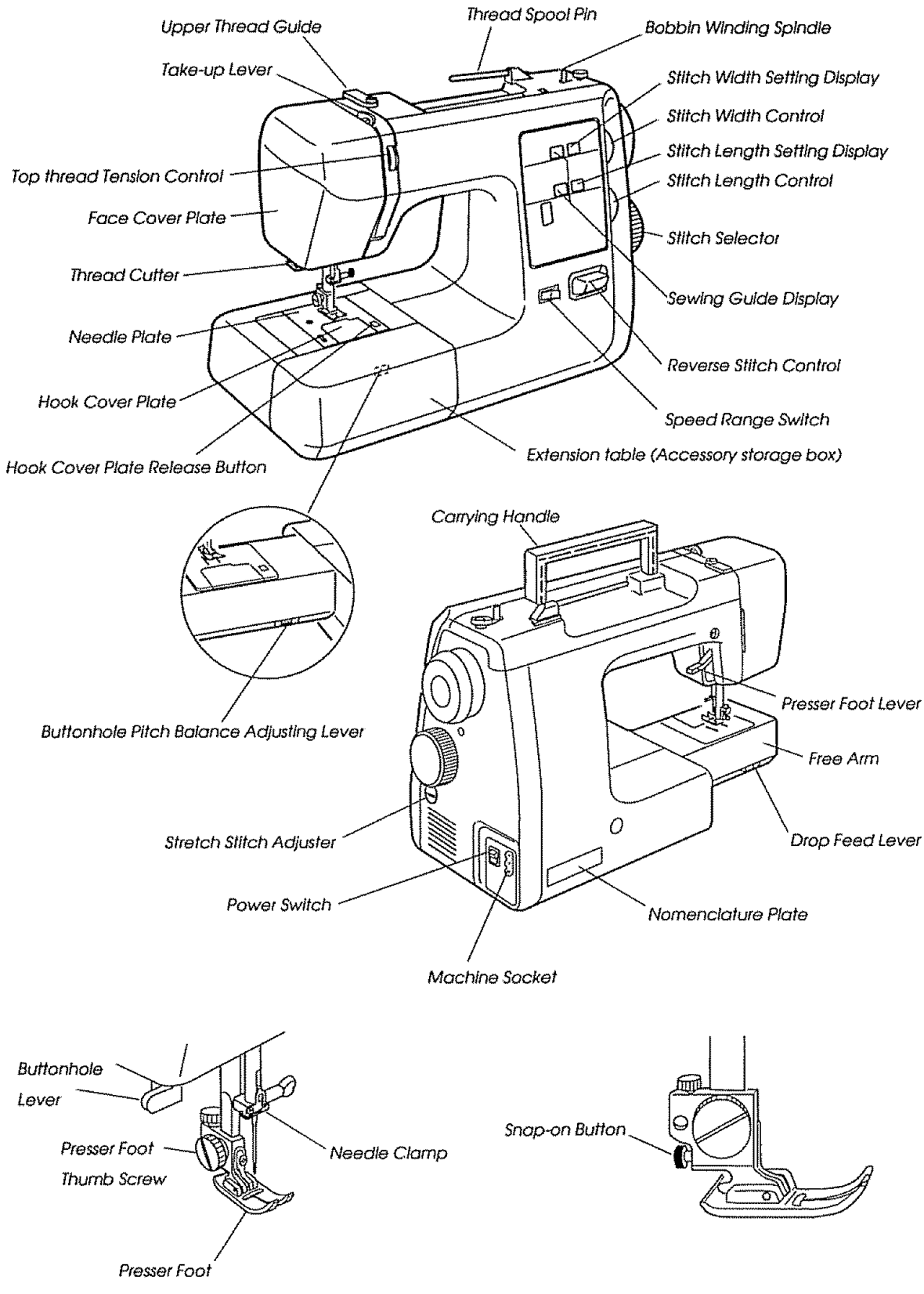
LOCATE AND IDENTIFY THE PARTS



WHAT TO DO WHEN

CONDITION	CAUSE	HOW TO FIX	REFERENCE
1. SKIPPING STITCHES	1. NEEDLE IS NOT INSERTED PROPERLY.	INSERT THE NEEDLE PROPERLY.	
	2. NEEDLE IS BENT OR WORN.	CHANGE THE NEEDLE.	
	3. INCORRECTLY THREADED.	RETHREAD.	
	4. NEEDLE OR THREAD ARE INAPPROPRIATE FOR FABRIC BEING SEWN.	USE THE RECOMMENDED SEWING NEEDLE AND THREAD.	
	5. SEWING ON STRETCH FABRIC.	USE A #11 BLUE TIP NEEDLE.	
	6. PRESSER FOOT PRESSURE IS TOO WEAK.	ADJUST THE PRESSER BAR LEVEL TO MAKE THE PRESSURE STRONGER.	
	7. INAPPROPRIATE NEEDLE BAR HEIGHT.	SEE MECHANICAL ADJUSTMENT "NEEDLE BAR HEIGHT".	P.22, 23
	8. INAPPROPRIATE NEEDLE TO SHUTTLE TIMING.	SEE MECHANICAL ADJUSTMENT "NEEDLE TO SHUTTLE TIMING".	P.24, 25
	9. INAPPROPRIATE NEEDLE TO SHUTTLE CLEARANCE.	SEE MECHANICAL ADJUSTMENT "NEEDLE CLEARANCE TO SHUTTLE."	P.26
2. FABRIC NOT MOVING	1. PRESSER FOOT PRESSURE IS TOO WEAK.	ADJUST THE PRESSER BAR LEVEL TO MAKE THE PRESSURE STRONGER.	
	2. INCORRECT F.D. HEIGHT.	SEE MECHANICAL ADJUSTMENT "FEED DOG HEIGHT."	P.20, 21
	3. F.D. IS IN DOWN POSITION.	RAISE THE F.D. LEVEL.	
	4. THREAD ON BOTTOM SIDE OF FABRIC IS JAMMED UP.	MAKE SURE TO BRING BOTH NEEDLE AND BOBBIN THREAD UNDER THE FOOT WHEN STARTING SEWING.	
	5. FEED DOG TEETH ARE WORN.	CHANGE THE FEED DOG.	

CONDITION	CAUSE	HOW TO FIX	REFERENCE
3. BREAKING UPPER THREAD	1. INITIAL SEWING SPEED IS TOO FAST.	START WITH MEDIUM SPEED.	
	2. THREAD PATH IS INCORRECT.	USE THE PROPER THREAD PATH.	
	3. NEEDLE IS BENT OR DULL.	REPLACE WITH A NEW NEEDLE.	
	4. UPPER THREAD TENSION IS TOO STRONG.	ADJUST UPPER THREAD TENSION CORRECTLY.	
	5. NEEDLE SIZE IS INAPPROPRIATE FOR FABRIC.	USE APPROPRIATE NEEDLE AND THREAD FOR FABRIC IN USE.	
	6. NEEDLE EYE IS WORN.	CHANGE THE NEEDLE.	
	7. NEEDLE HOLE IN NEEDLE PLATE IS WORN OR BURRED.	REPAIR THE HOLE OR REPLACE THE NEEDLE PLATE.	
4. BREAKING BOBBIN THREAD	1. INCORRECTLY THREADED BOBBIN.	THREAD BOBBIN CORRECTLY.	
	2. TOO MUCH THREAD IS AROUND ON THE BOBBIN.	ADJUST THE POSITION OF STOPPER.	
	3. LINT IS STUCK INSIDE THE BOBBIN HOLDER.	CLEAN THE SHUTTLE.	
	4. THREAD QUALITY IS TOO LOW.	CHANGE TO A HIGH QUALITY SEWING THREAD.	
	5. THREAD IS JAMMING AROUND THE BOBBIN.	CLEAR OUT THE JAMMING THREAD.	
5. NEEDLE BREAKS	1. NEEDLE IS HITTING THE NEEDLE PLATE.	SEE MECHANICAL ADJUSTMENT "NEEDLE POSITION."	P.30 , 31
	2. NEEDLE IS BENT OR WORN.	CHANGE THE NEEDLE.	
	3. NEEDLE IS HITTING THE SHUTTLE.	SEE MECHANICAL ADJUSTMENT "NEEDLE CLEARANCE TO SHUTTLE."	P.26
	4. THE FABRIC MOVES WHILE THE NEEDLE IS PIERCING IT, OR THE NEEDLE ZIGZAGS WHILE IN FABRIC.	SEE MECHANICAL ADJUSTMENT "NEEDLE SWING."	P.13
	5. FABRIC IS BEING PULLED TOO STRONGLY WHILE SEWING.	GUIDE THE FABRIC GENTLY WHILE SEWING.	

CONDITION	CAUSE	HOW TO FIX	REFERENCE
6. NOISY OPERATION	1. BACKLASH BETWEEN SHUTTLE HOOK GEAR AND LOWER SHAFT GEAR IS TOO GREAT.	SEE MECHANICAL ADJUSTMENT "BACKLASH (LOWER SHAFT GEAR)."	P.27
	2. LOWER SHAFT GEAR IS LOOSE.	ELIMINATE THE LOOSENESS.	
	3. INAPPROPRIATE BELT TENSION.	SEE MECHANICAL ADJUSTMENT "MOTOR BELT TENSION."	P.37
	4. NOT ENOUGH OIL	OIL ALL MOVING PARTS.	
	5. UPPER SHAFT IS LOOSE	ELIMINATE THE LOOSENESS	
7. DEFORMATION PATTERN	1. INAPPROPRIATE FEED BALANCE	SEE MECHANICAL ADJUSTMENT "STRETCH STITCH BALANCE."	P.18, 19
	2. INAPPROPRIATE ZIGZAG SYNCHRONIZATION.	SEE MECHANICAL ADJUSTMENT "NEEDLE SWING."	P.13
	3. UPPER THREAD TENSION IS TOO STRONG.	SEE MECHANICAL ADJUSTMENT "TOP TENSION."	
8. IMPROPER BUTTONHOLE	1. BUTTONHOLE STITCH BALANCE IS NOT CORRECT.	SEE MECHANICAL ADJUSTMENT "BUTTONHOLE STITCH BALANCE."	P.28, 29
	2. IMPROPER SIZE ON AUTO BUTTONHOLE	SEE MECHANICAL ADJUSTMENT "BUTTONHOLE FUNCTION (1)."	P.35
	3. CHANGING TO BAR TACK IS TOO FAST OR WILL NOT WORK.	SEE MECHANICAL ADJUSTMENT "BUTTONHOLE FUNCTION (2)."	P.36

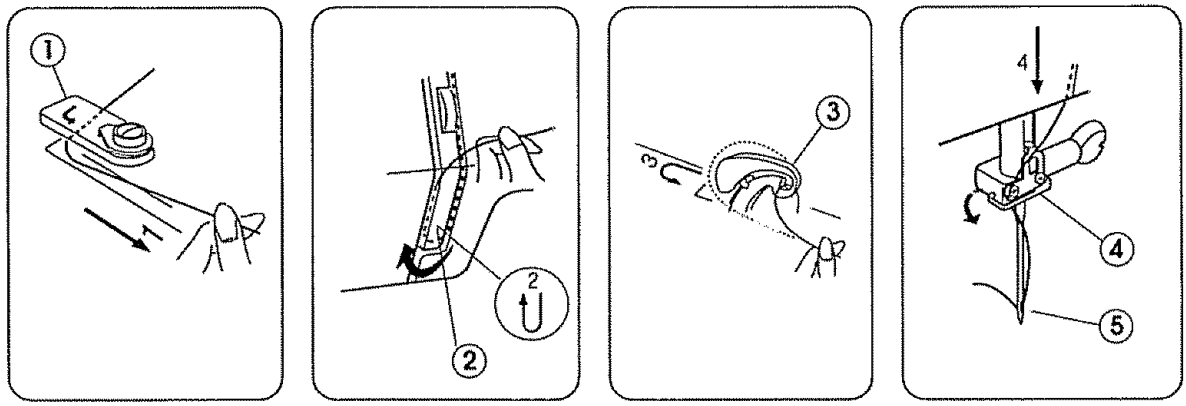
THREADING OF MACHINE

THE NUMBERED STEPS BELOW FOLLOW THE NUMBERS ON THE ILLUSTRATIONS.
DOTTED LINES SHOW PLACES WHERE LOOPS AND THEN IS PULLED TIGHT.

RAISE THE TAKE-UP LEVER TO ITS HIGHEST POSITION BY TURNING THE HAND WHEEL TOWARD YOU.
RAISE THE PRESSER FOOT LEVER.
PLACE SPOOL ON PIN WITH THREAD COMING FROM THE BACK OF THE SPOOL.

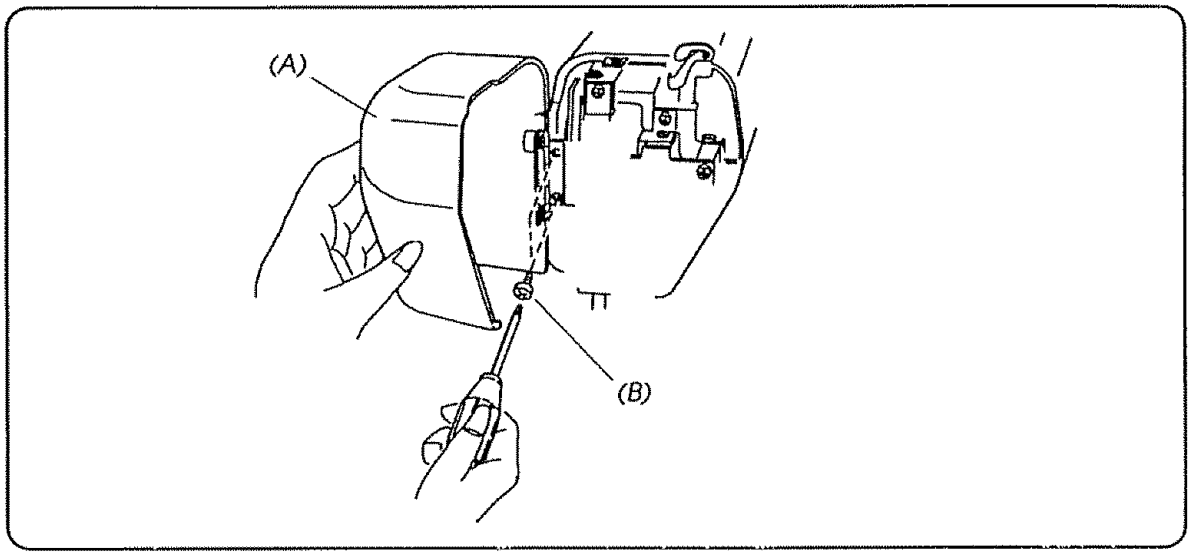
1. DRAW THREAD THROUGH THE THREAD GUIDE.
2. HOLDING THREAD TAUT WITH RIGHT HAND, DRAW THREAD DOWN INTO THE TENSION AREA AND THEN AROUND THE CHECK SPRING HOLDER.
3. FIRMLY DRAW THREAD UP AND THROUGH THE TAKE-UP LEVER FROM RIGHT TO LEFT.
4. PULL THE THREAD TO THE LEFT AND SLIP IT INTO THE NEEDLE BAR THREAD GUIDE.
5. THREAD NEEDLE FROM FRONT TO BACK.

NOTE: YOU MAY WANT TO CUT THE END OF THREAD WITH SHARP SCISSORS FOR EASIER NEEDLE THREADING.



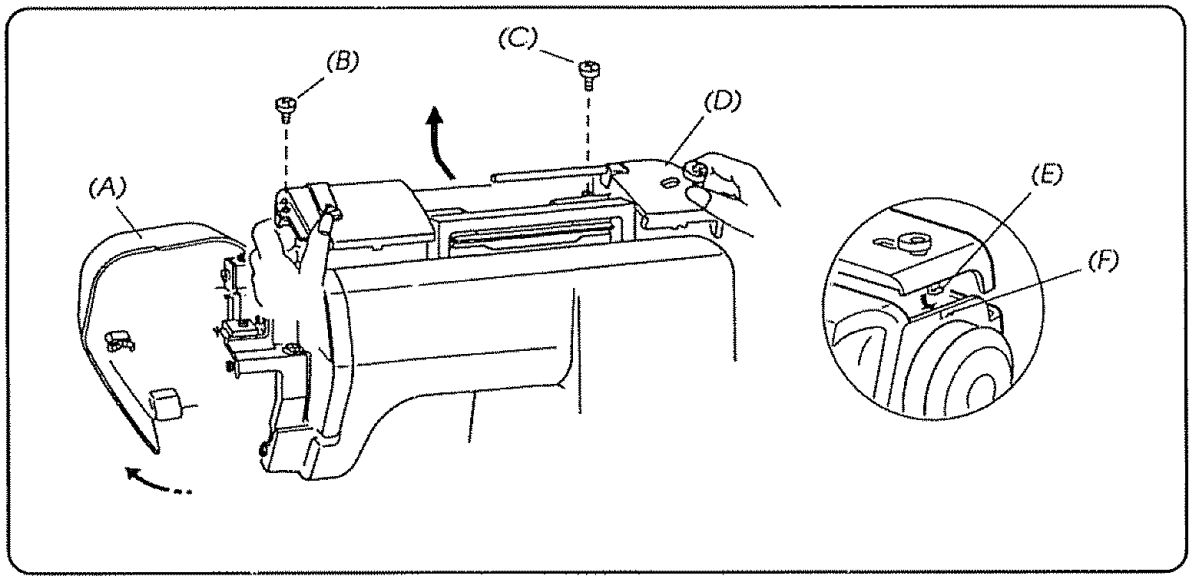
SERVICE ACCESS

FACE COVER



1. OPEN THE FACE COVER (A).
2. REMOVE THE SET SCREWS (B).
3. TAKE THE FACE COVER (A) OFF.

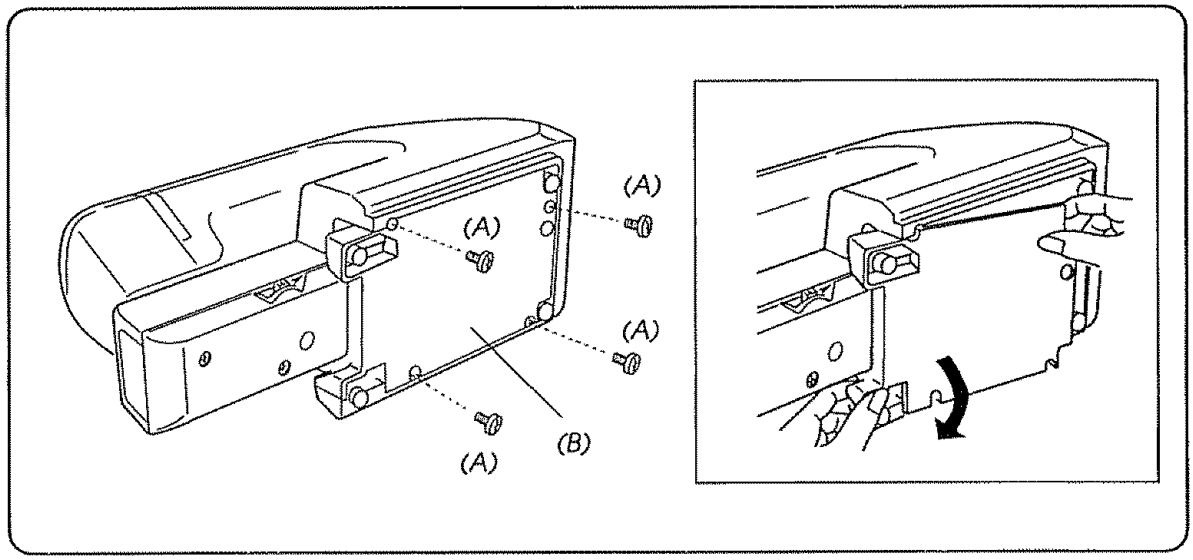
TOP COVER



1. OPEN THE FACE COVER (A).
2. REMOVE SET SCREWS (B) AND (C).
3. TAKE THE TOP COVER (D) OFF.
   * WHEN YOU REPLACE THE TOP COVER, SET THE PROJECTION (E) INTO THE GROOVE (F) OF THE BELT COVER.

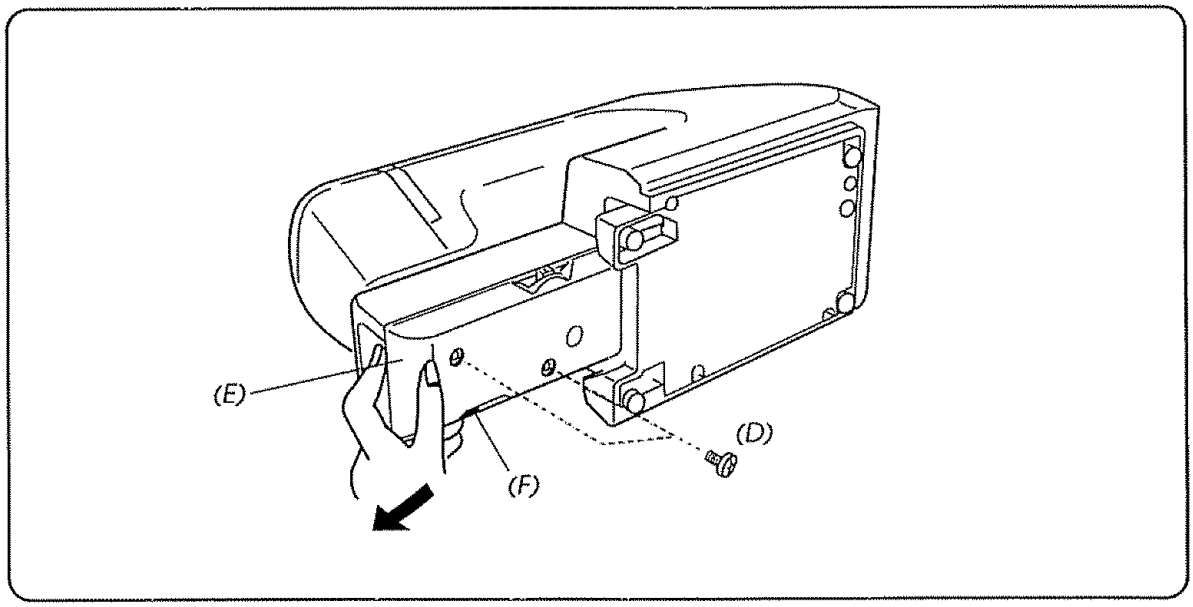
SERVICE ACCESS

BASE PLATE



1. REMOVE 4 SET SCREWS (A).
2. REMOVE THE BASE PLATE (B).

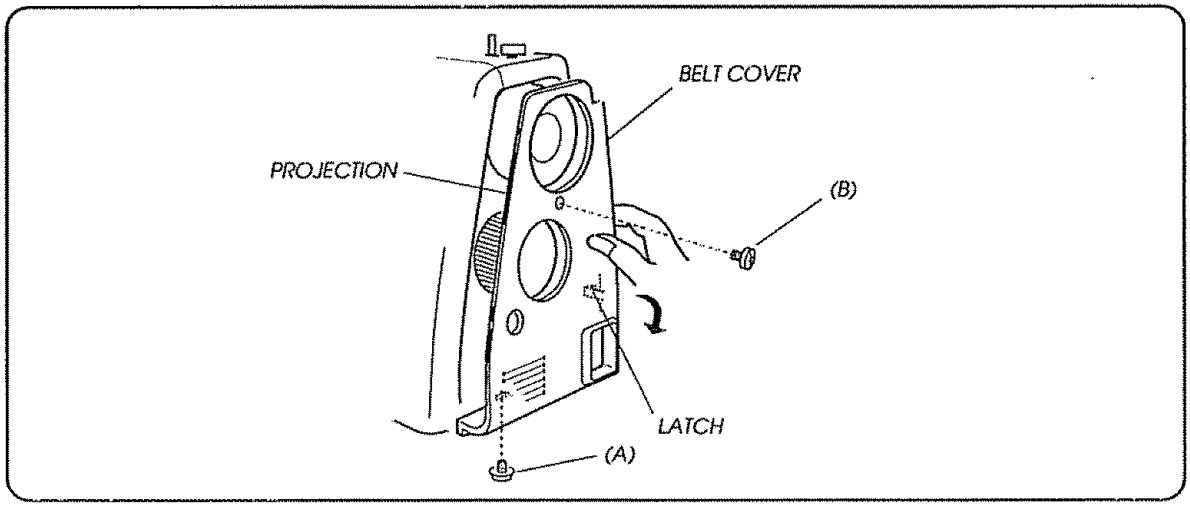
BED COVER



1. REMOVE 2 SET SCREWS (D).
2. REMOVE THE BED COVER (E).
   * WHEN YOU REPLACE THE BED COVER, SET THE DROP LEVER (F) IN THE LEFT POSITION.

SERVICE ACCESS

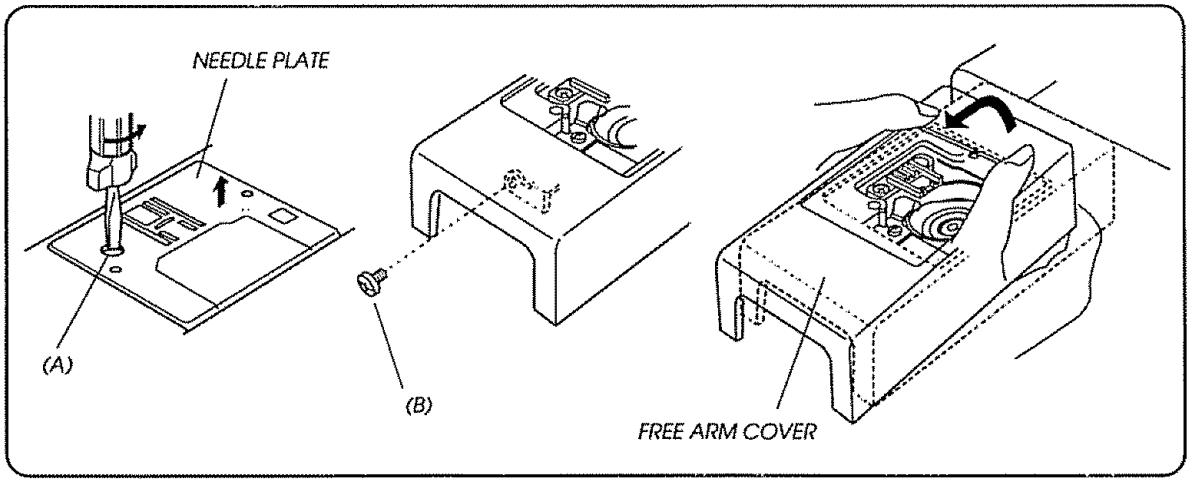
BELT COVER



LOOSEN SET SCREW (A) AND REMOVE SET SCREW (B). PULL THE RIGHT SIDE OF BELT COVER IN THE DIRECTION OF ARROW, AS ILLUSTRATED AND TAKE THE LATCH OFF. THEN REMOVE THE BELT COVER.

* WHEN YOU ATTACH THE BELT COVER, SET THE PROJECTION INTO THE GROOVE OF THE FRONT COVER.

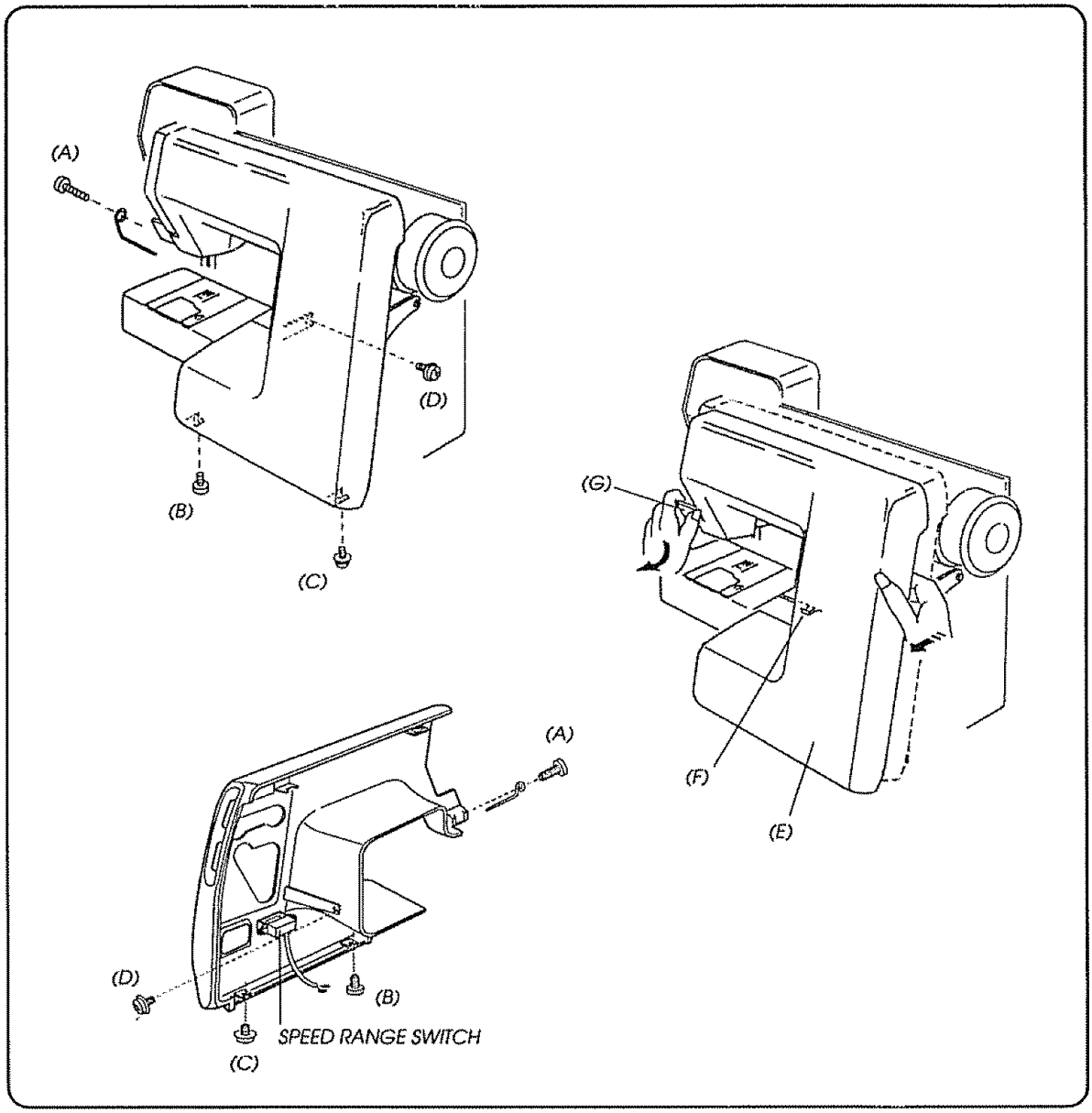
FREE ARM COVER



1. REMOVE SET SCREW (A) AND THE NEEDLE PLATE.
2. REMOVE THE BED COVER (SEE PAGE 7).
3. REMOVE SCREW (B) AND THE FREE ARM COVER.

SERVICE ACCESS

FRONT COVER

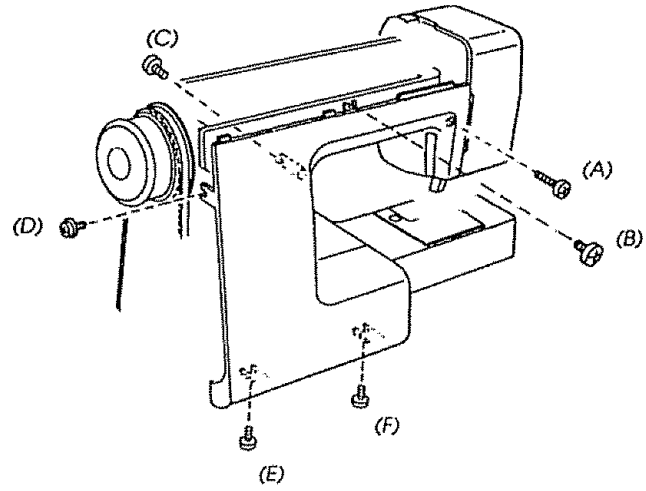


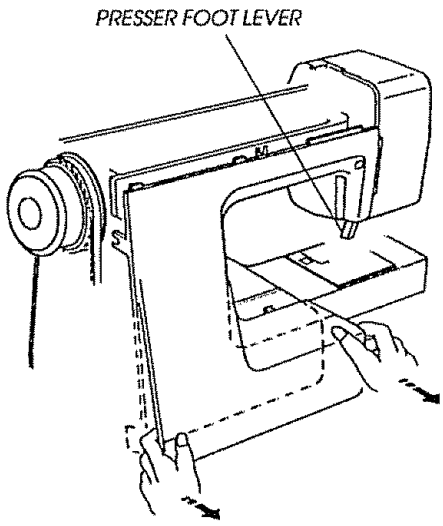
1. OPEN THE FACE COVER .
2. REMOVE THE TOP COVER (SEE P.6), THE BELT COVER. (SEE P.8)
3. REMOVE SET SCREW (A), (B).
4. LOOSEN SET SCREWS (C), (D) THEN REMOVE THE FRONT COVER (E).
5. PULL THE FRONT COVER OFF THE LATCH (F) OF THE REAR COVER.
6. REMOVE THE LOWER PART OF THE THREAD GUIDE (G).

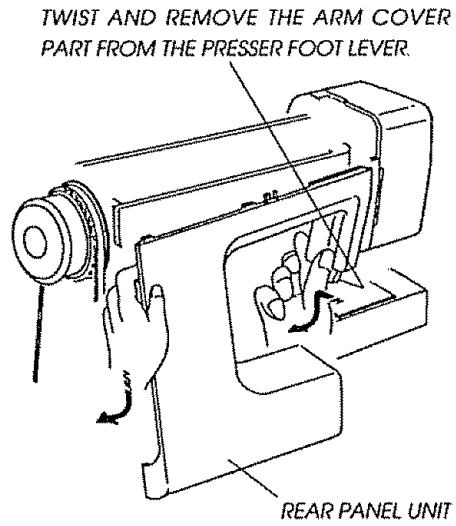
* TO REPLACE, FOLLOW THIS PROCEDURE IN REVERSE.

SERVICE ACCESS

REAR PANEL







1. OPEN THE FACE COVER.
2. REMOVE THE TOP COVER UNIT (SEE P.6), THE BELT COVER (SEE P.8) AND THE FRONT COVER. (SEE P.9)
3. REMOVE SET SCREWS (A) ,(B), (C), AND LOOSEN SET SCREWS (D) - (F).
4. LOWER THE PRESSER FOOT LEVER AND PULL AWAY THE REAR PANEL UNIT FROM THE MACHINE FRAME. TWIST AND REMOVE THE ARM COVER PART FROM THE PRESSER FOOT LEVER.

* WHEN YOU ATTACH THE REAR PANEL, PUT THE "WINDOW" ON THE PLASTIC PANEL OVER THE PRESSER FOOT LEVER. THEN, REPLACE THE 6 SCREWS.

MECHANICAL ADJUSTMENT

TOP TENSION

TO CHECK:

1. SET THE TENSION DIAL AT "4 "AND RAISE THE PRESSER FOOT.
2. PASS THE THREAD (A) BETWEEN THE DISCS AND DRAW THE THREAD (A) DOWN AROUND THE CHECK SPRING HOLDER AS IN FIG. 1.
3. LOWER THE PRESSER FOOT AND BRING THE THREAD (A) UP.
4. TOP TENSION SHOULD BE 75 - 90g WHEN PULLING THE THREAD (A) UP IN THE DIRECTION (B).
   * USE POLYESTER SEWING THREAD #50 (WHITE).
   * IF IT IS NOT WITHIN THE ABOVE LIMITS, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. REMOVE FRONT COVER UNIT. (SEE P.9)
2. PULL SPRING (C) AWAY FROM THE LEAD SCREW (D).
3. IF THE TOP TENSION IS TOO LOOSE, TURN THE LEAD SCREW (D) IN THE DIRECTION (E).
   IF THE TOP TENSION IS TOO TIGHT, TURN THE LEAD SCREW (D) IN THE DIRECTION (F).

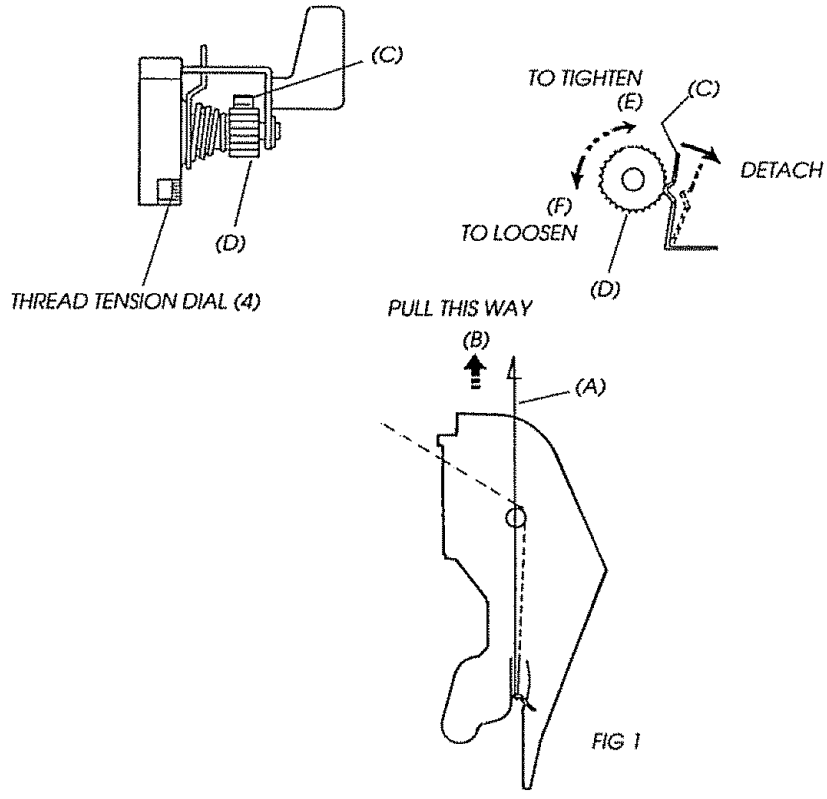


FIG 1

MECHANICAL ADJUSTMENT

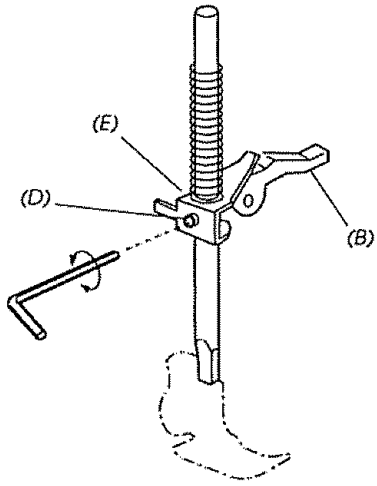
PRESSER BAR HEIGHT AND ALIGNMENT

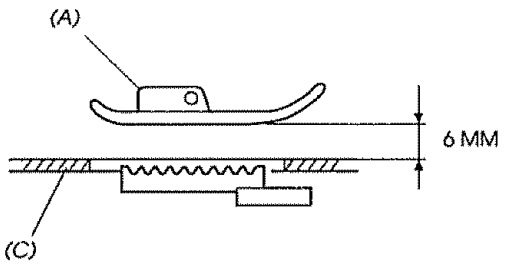
TO CHECK:

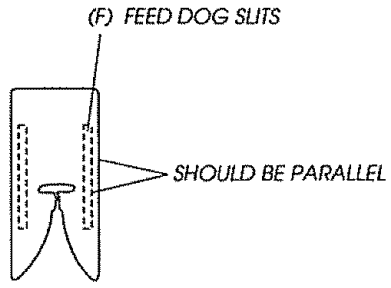
1. RAISE THE PRESSER FOOT LEVER (B).
2. THE DISTANCE BETWEEN THE ZIGZAG FOOT (A) AND THE NEEDLE PLATE (C) SHOULD BE 6.0 MM (0.24").
   * IF THIS IS NOT THE CASE, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER.
2. RAISE THE PRESSER FOOT LEVER (B) AND LOOSEN THE HEXAGONAL SOCKET SCREW (D) ON THE PRESSER BAR HOLDER (E).
3. ADJUST THE DISTANCE BETWEEN THE ZIGZAG FOOT (A) AND THE NEEDLE PLATE (C) TO 6.0 MM (0.24").
4. TIGHTEN THE SET SCREW (D) SECURELY.
   NOTE: WHEN YOU TIGHTEN THE SET SCREW (D), MAKE SURE THE ZIGZAG FOOT (A) RUNS PARALLEL WIHT THE FEED DOG







MECHANICAL ADJUSTMENT

NEEDLE SWING

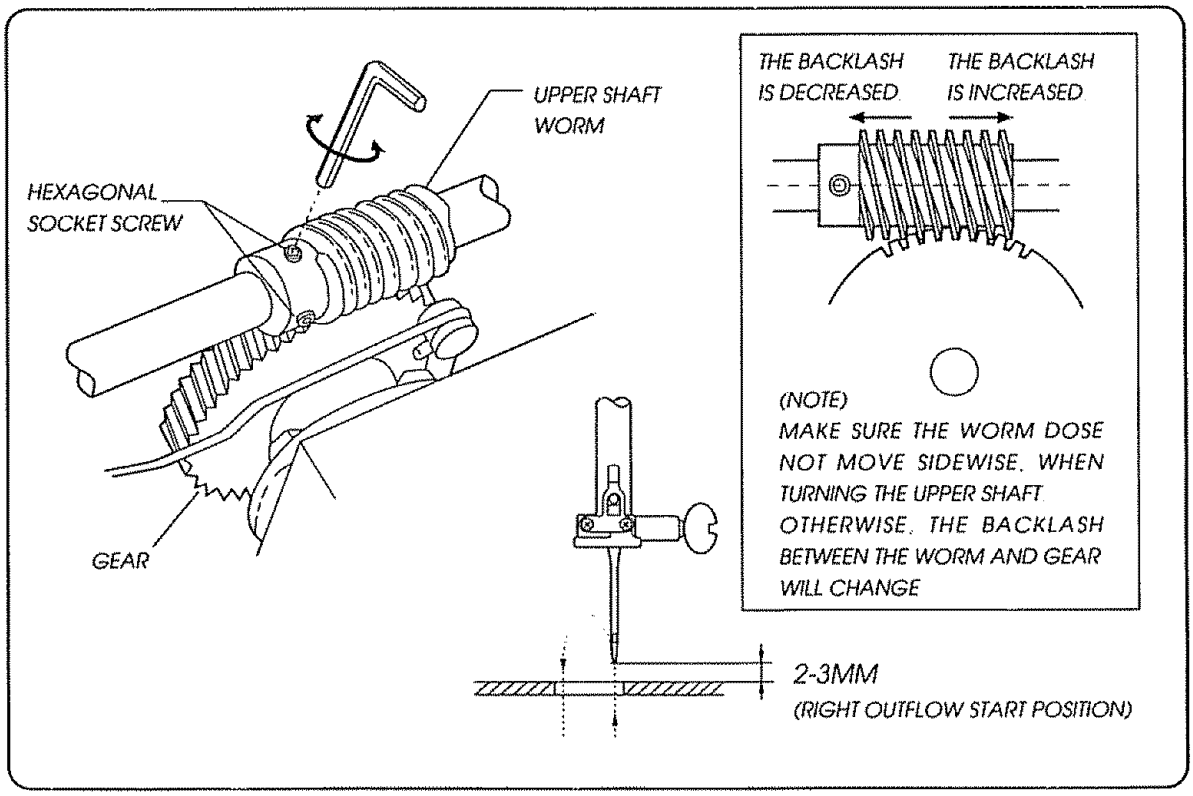
TO CHECK:

IF THE NEEDLE BAR MOVES SIDEWISE WHILE THE NEEDLE IS IN THE FABRIC IN ZIGZAG STITCHING, ADJUST IT AS FOLLOWS:
(THE NEEDLE SHOULD START SWINGING WHEN 2 (0.08") TO 3MM (0.12") ABOVE THE NEEDLE PLATE.)

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER (SEE P.6), SET THE PATTERN SELECTOR DIAL AT " ≋ " AND SELECT THE MAXIMUM ZIGZAG WIDTH.
2. LOOSEN THE TWO HEXAGONAL SOCKET SCREWS ON THE UPPER SHAFT WORM.
3. WHILE HOLDING THE UPPER SHAFT WORM IN PLACE, CAREFULLY TURN THE BALANCE WHEEL AND ADJUST SO THAT LATERAL NEEDLE SWING STARTS FROM A POSITION 2MM (0.08") TO 3MM (0.12") ABOVE THE NEEDLE PLATE IN RIGHT OUTFLOW.
4. TIGHTEN THE TWO HEXAGONAL SOCKET SCREWS ON THE UPPER SHAFT WORM.
5. ATTACH THE TOP COVER (UNIT).

NOTE: FOR REMOVAL AND REPLACEMENT OF THE TOP COVER (UNIT), SEE TO PAGE 2. AFTER ADJUSTMENT OF THE TIMING OF LATERAL NEEDLE SWING, MAKE SURE THAT THERE IS NO BACKLASH BETWEEN THE UPPER SHAFT WORM AND THE OTHER GEAR AND THAT SMOOTH ROTATION IS OBTAINED.



MECHANICAL ADJUSTMENT

STRAIGHT STITCHING

TO CHECK:

1. SET THE STITCH WIDTH DIAL AT " 0 " AND THE STITCH SELECTOR AT  .
2. TURN THE HAND WHEEL BY HAND.
3. THE NEEDLE SHOULD NOT SWING SIDE TO SIDE AT THIS SETTING.

SELECTED PATTERN

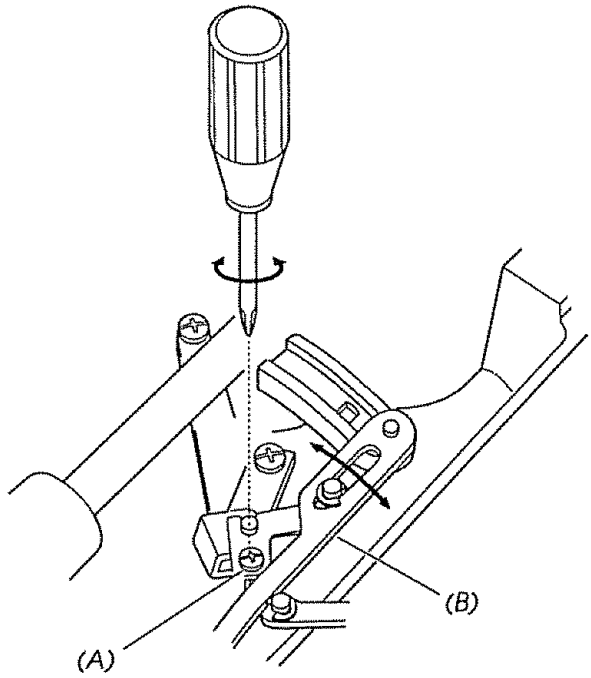
STITCH WIDTH DIAL

MECHANICAL ADJUSTMENT

STRAIGHT STITCHING

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER. (SEE P.6)
2. LOOSEN SET SCREW (A).
3. MOVE THE ZIGZAG WIDTH ROD (B) UNTIL THE NEEDLE CEASES ITS ZIGZAG MOVEMENT WHEN YOU TURN THE HAND WHEEL TOWARD YOU.
4. TIGHTEN SET SCREW (A) SECURELY.

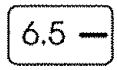


MECHANICAL ADJUSTMENT

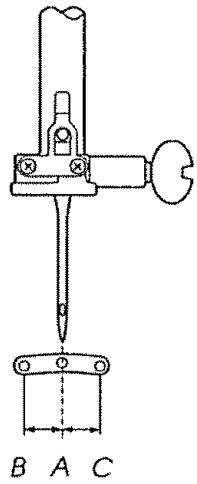
DISTRIBUTION OF NEEDLE SWING

TO CHECK:

1. SET THE STITCH WIDTH DIAL TO " 0 " AND THE STITCH SELECTOR AT  .
2. RAISE THE NEEDLE TO ITS HIGHEST POSITION.
3. DROP THE FEED DOGS.
4. PLACE A PIECE OF PAPER ON THE NEEDLE PLATE AND LOWER THE PRESSER FOOT.
5. LOWER THE NEEDLE TO MARK NEEDLE POINT (A) ON A PIECE OF PAPER BY TURNING HAND WHEEL.
6. RAISE THE NEEDLE TO ITS HIGHEST POSITION.
7. TURN THE STITCH WIDTH DIAL TO 6.5.
8. LOWER THE NEEDLE TO MARK NEEDLE POINTS (B) AND (C) ON THE PIECE OF PAPER BY TURNING THE HAND WHEEL.
9. THE DISTANCE BETWEEN A-B AND A-C SHOULD BE EQUAL.



SELECTED PATTERN STITCH WIDTH DIAL

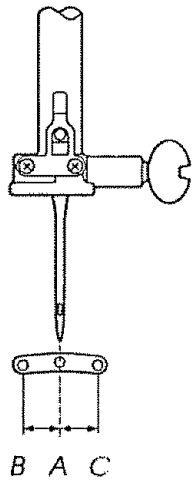


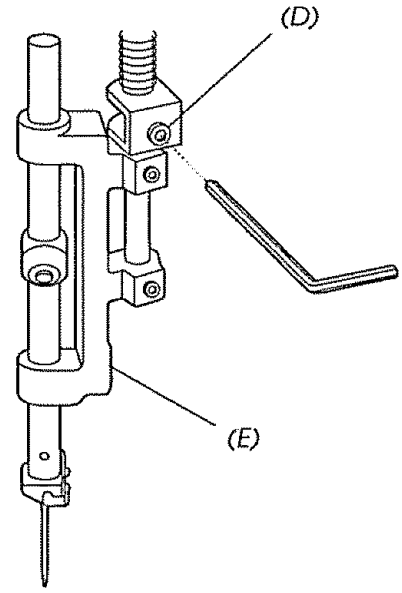
MECHANICAL ADJUSTMENT

DISTRIBUTION OF NEEDLE SWING

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER AND LOOSEN HEXAGONAL SOCKET SCREW (D).
2. MOVE THE NEEDLE BAR SUPPORTER (E) EITHER DIRECTION UNTIL THE DISTANCES A TO B AND A TO C BECOME EQUAL.
3. TIGHTEN HEXAGONAL SOCKET SCREW (D) SECURELY.





MECHANICAL ADJUSTMENT

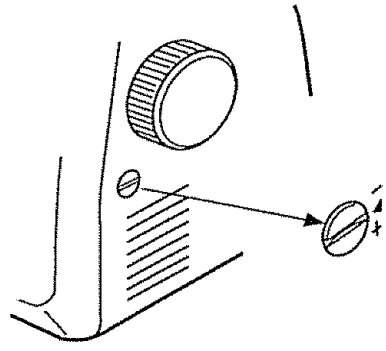
STRETCH STITCH BALANCE

TO CHECK:

1. SET THE STITCH SELECTOR AT ≡≡≡ , STITCH LENGTH DIAL AT STRETCH STITCH AND STRETCH STITCH ADJUSTER AT ◄ .
2. PLACE A PIECE OF PAPER ON THE NEEDLE PLATE AND LOWER THE PRESSER FOOT.
3. TURN THE HAND WHEEL TO MARK NEEDLE POINTS ON THE PAPER.
4. THE NEEDLE SHOULD PENETRATE THE SAME HOLES IN FORWARD AND REVERSE DIRECTION WHILE TURNING THE HAND WHEEL TOWARDS YOU.

SELECTED PATTERN

STITCH LENGTH DIAL



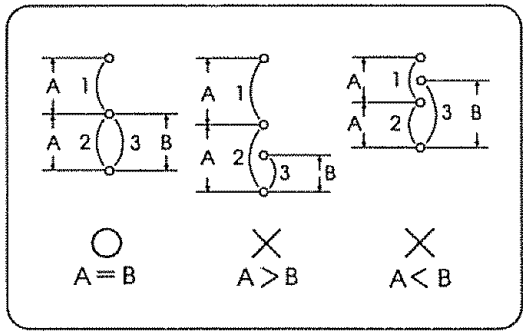
MECHANICAL ADJUSTMENT

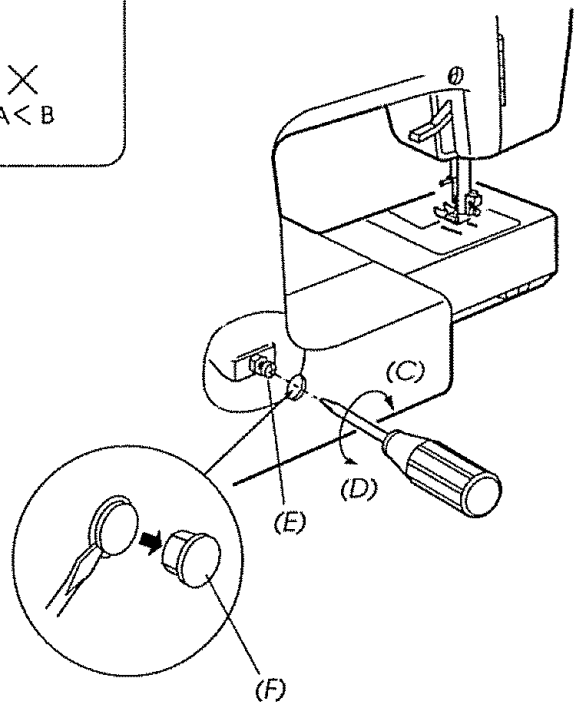
STRETCH STITCH BALANCE

ADJUSTMENT PROCEDURE:

1. REMOVE THE CAP (F).
2. IF THE REVERSE STITCH LENGTH (B) IS SHORTER THAN THE FORWARD STITCH LENGTH (A), TURN THE ADJUSTING SET SCREW (E) IN THE DIRECTION OF (C).

   IF THE REVERSE STITCH LENGTH (B) IS LONGER THAN THE FORWARD STITCH LENGTH (A), TURN THE ADJUSTING SET SCREW (E) IN THE DIRECTION OF (D).





MECHANICAL ADJUSTMENT

FEED DOG HEIGHT

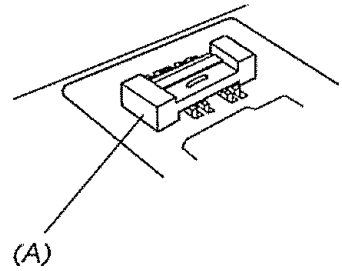
TO CHECK:

1. SET THE STITCH LENGTH DIAL AT 4 AND RAISE THE NEEDLE TO ITS HIGHEST POSITION.
2. RAISE THE PRESSER FOOT AND PLACE THE FEED DOG HEIGHT GAUGE (#68496) ON THE NEEDLE PLATE.
3. TURN THE HAND WHEEL AND CHECK THE FEED DOG HEIGHT.
4. THE FEED DOG HEIGHT SHOULD BE AS PER CHART 1.

CHART 1

GAUGE		FEED DOG HEIGHT
FACE (A) 0.95MM	FACE (B) 0.75MM	
NOT MOVING	MOVING	CORRECT
NOT MOVING	NOT MOVING	LOW
MOVING	MOVING	HIGH

STITCH LENGTH DIAL

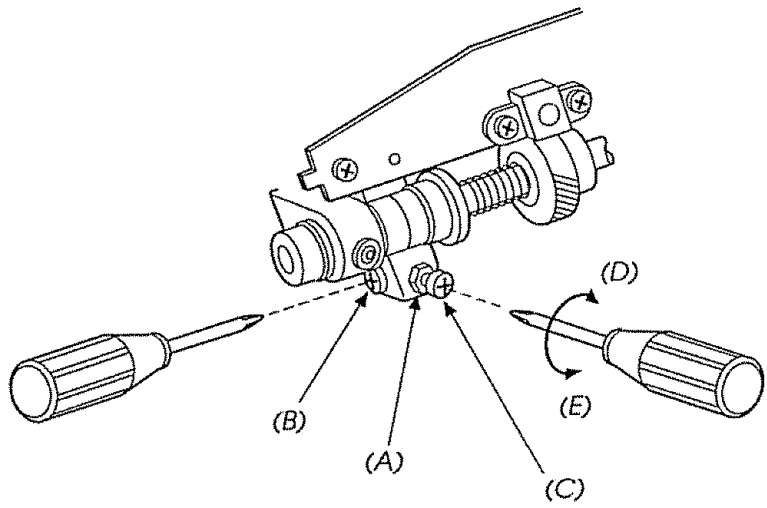


MECHANICAL ADJUSTMENT

FEED DOG HEIGHT

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER.
2. LOOSEN THE NUT (A) AND THE SET SCREW (B).
3. TURN THE ADJUSTING SCREW (C) IN THE DIRECTION OF (D) WHEN THE FEED DOG HEIGHT IS LOW OR IN THE DIRECTION OF (E) WHEN THE FEED DOG HEIGHT IS HIGH..
4. TIGHTEN THE NUT (A) AND THE SET SCREW (B) SECURELY.



MECHANICAL ADJUSTMENT

NEEDLE BAR HEIGHT

MACHINE SETTING:

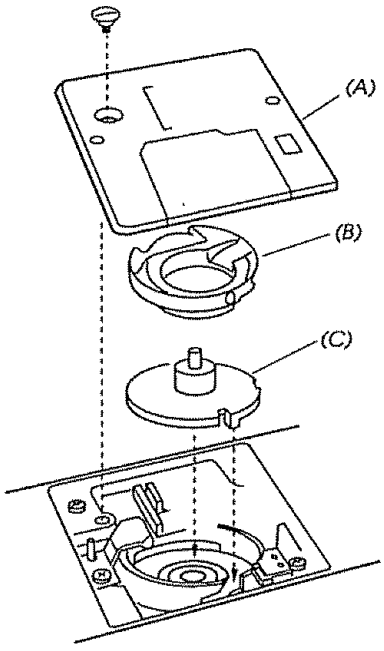
1. SET THE STITCH SELECTOR AT ⊕ , ZIG ZAG WIDTH AT "6.5."

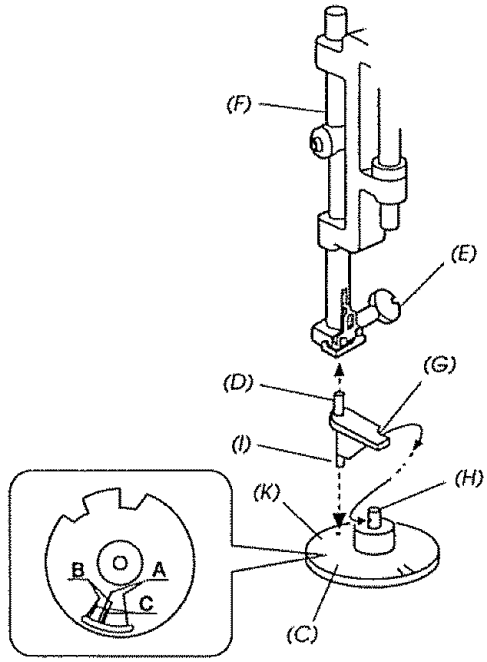
PREPARATION:

1. REMOVE THE NEEDLE, PRESSER FOOT, NEEDLE PLATE (A) AND BOBBIN HOLDER (B).
2. INSERT THE RADIAL TIMING GAUGE #68497 (C) ONTO THE HOOK.
3. ATTACH THE NEEDLE BAR HEIGHT GAUGE #68168 (D).
   * PUSH IT UP UNTIL IT STOPS.
4. TIGHTEN THE NEEDLE CLAMP SCREW (E).

TO CHECK:

1. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE BAR (F) REACHES ITS LOWEST POSITION.
   * IF FINGER (G) COMES DOWN ON TOP OF PIN (H), OR IF PIN (I) TOUCHES THE SURFACE OF GAUGE (K) TOO FORCEFULLY, ADJUST AS PER THE INSTRUCTIONS ON THE NEXT PAGE.
2. THE FACE OF FINGER (G) SHOULD HIT THE SIDE OF PIN (H) AND THE END OF PIN (I) SHOULD TOUCH THE SURFACE OF GAUGE (K) WHEN THE NEEDLE BAR (F) REACHES ITS LOWEST POSITION.



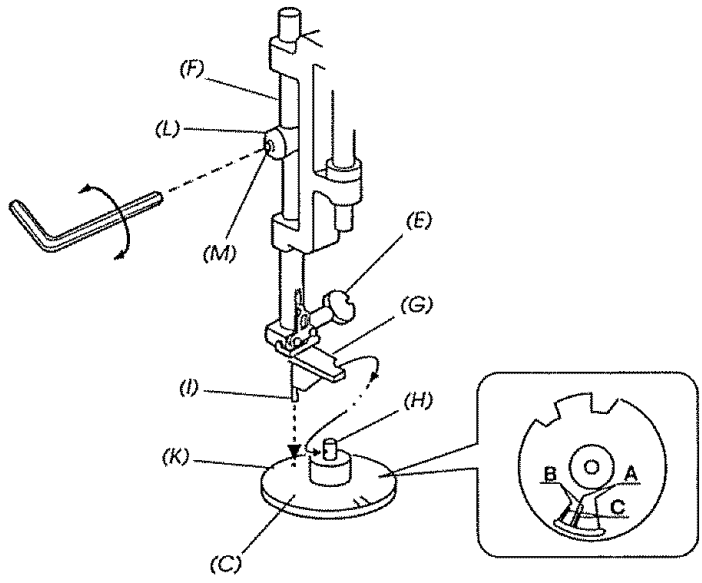


MECHANICAL ADJUSTMENT

NEEDLE BAR HEIGHT

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER.
2. LOOSEN THE HEXAGONAL SOCKET SCREW (M) ON THE NEEDLE BAR HOLDER (L).
3. MOVE THE NEEDLE BAR (F) UP OR DOWN TO ADJUST THE POSITION OF THE NEEDLE BAR (F) SO THAT THE FACE OF FINGER (G) HITS THE SIDE OF PIN (H) AND THE END OF PIN (I) TOUCHES THE SURFACE OF GAUGE (K).
4. TIGHTEN THE HEXAGONAL SOCKET SCREW (M) SECURELY.



MECHANICAL ADJUSTMENT

NEEDLE TO SHUTTLE TIMING

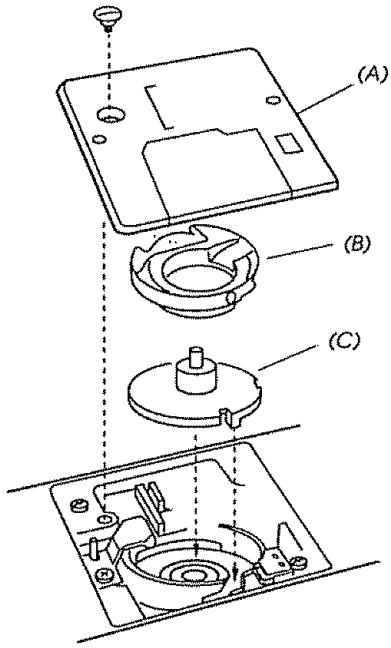
1. SET THE STITCH SELECTOR AT , ZIG ZAG WIDTH AT "6.5."

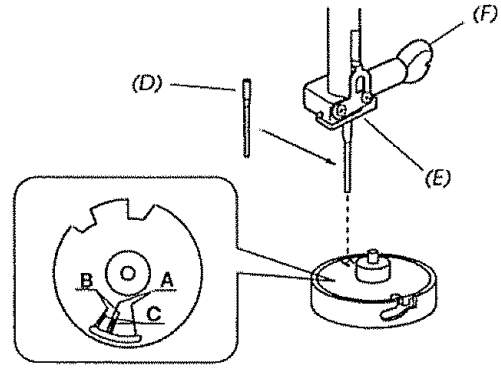
PREPARATION:

1. REMOVE THE NEEDLE, PRESSER FOOT, NEEDLE PLATE (A) AND BOBBIN HOLDER (B).
2. INSERT THE RADIAL TIMING GAUGE #68497 (C) SO THAT THE SMALL FINGER ON THE GAUGE FITS INTO THE SLOT NEAR THE TIP OF THE HOOK.
3. PUT THE TEST PIN #68368 (D) IN THE NEEDLE HOLDER (E).
   * PUSH UP IT UNTIL IT STOPS.
4. TIGHTEN THE NEEDLE CLAMP SCREW (F).

TO CHECK:

1. TURN THE HANDWHEEL TOWARD YOU UNTIL THE TIP OF TEST PIN #68368 (D) SLIGHTLY TOUCHES THE RADIAL TIMING GAUGE #68497 (C).
2. THE TIP OF TEST PIN #68368 (D) SHOULD BE BETWEEN THE TWO WHITE LINES OF THE RADIAL TIMING GAUGE #68497 (C).
   * IF THE TEST PIN DOES NOT FALL BETWEEN THE 2 WHITE LINES ON THE RADIAL TIMING GAUGE, ADJUST AS FOLLOWS.



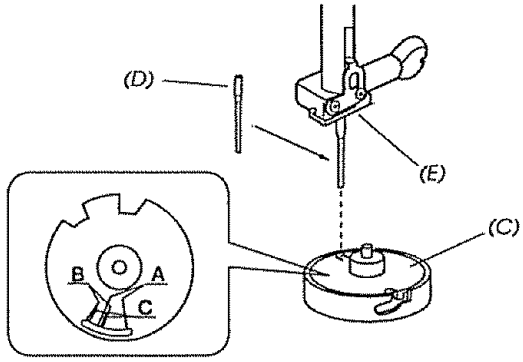


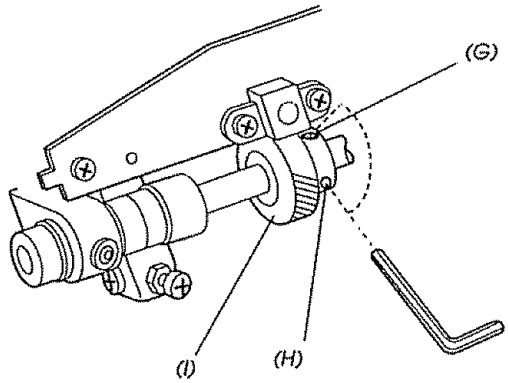
MECHANICAL ADJUSTMENT

NEEDLE TO SHUTTLE TIMING

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER. (SEE P.7)
2. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE BAR REACHES THE LOWEST POSITION.
3. LOOSEN HEXAGONAL SOCKET SCREWS (G) AND (H).
4. HOLD THE HANDWHEEL, AND TURN THE LOWER SHAFT GEAR (I) UNTIL THE TEST PIN #68368 (D) COMES IN BETWEEN THE TWO WHITE LINES OF THE RADIAL TIMING GAUGE #68497 (C).
5. TIGHTEN HEXAGONAL SOCKET SCREWS (G) AND (H).





MECHANICAL ADJUSTMENT

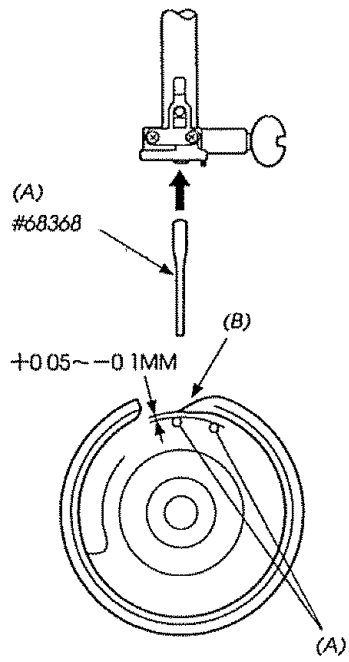
NEEDLE CLEARANCE TO SHUTTLE

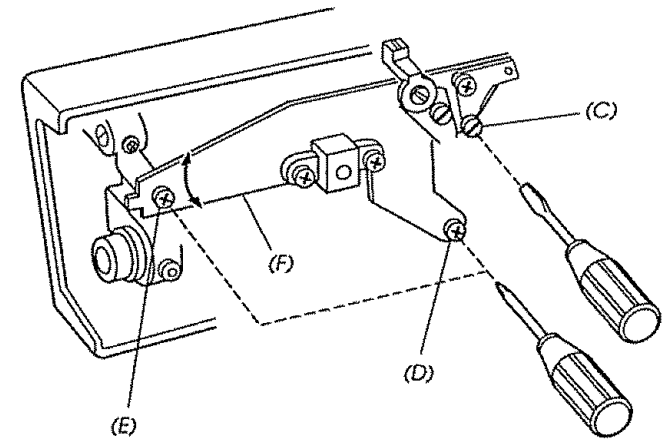
TO CHECK:

1. SET THE STITCH SELECTOR AT  .
2. REPLACE THE NEEDLE WITH THE TEST PIN #68368 (A).
2. TURN THE HAND WHEEL SLOWLY BY HAND UNTIL THE NEEDLE BAR REACHES ITS LOWEST POSITION.
3. THE CLEARANCE BETWEEN THE TEST PIN (A) AND THE SHARP END (B) OF THE SHUTTLE HOOK SHOULD BE BETWEEN +0.05 (0.002") AND – 0.10 MM (-0.004").

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER. (SEE P.7)
2. LOOSEN SET SCREWS (C), (D) AND (E).
3. TIGHTEN SET SCREW (C) TEMPORARILY.
4. MOVE PLATE (F) TO EITHER DIRECTION AS SHOWN BY THE ARROW UNTIL THE CLEARANCE BETWEEN THE TEST PIN (A) AND THE SHARP END (B) OF THE SHUTTLE HOOK BECOMES +0.05 AND –0.10 MM.
5. TIGHTEN THE SET SCREWS (C), (D) AND (E) SECURELY.





MECHANICAL ADJUSTMENT

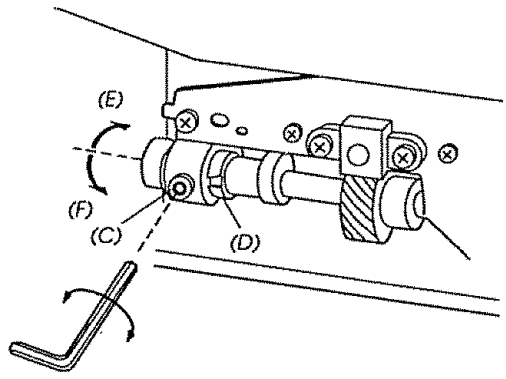
BACKLASH (LOWER SHAFT GEAR)

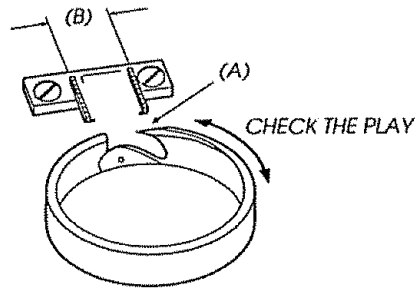
TO CHECK:

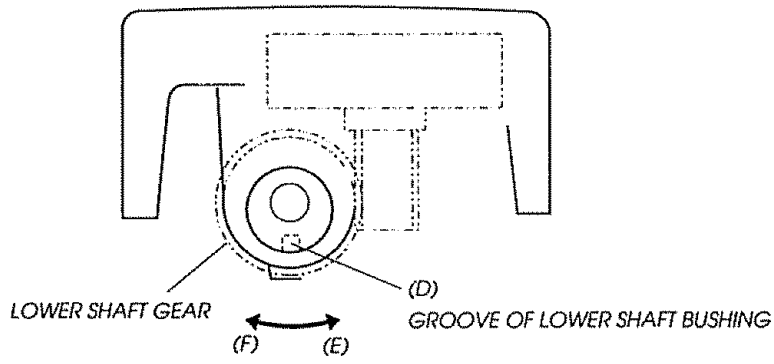
1. REMOVE THE NEEDLE PLATE AND BOBBIN HOLDER.
2. TURN THE HAND WHEEL SLOWLY TOWARD YOU UNTIL THE TIP OF THE SHUTTLE HOOK (A) IS BETWEEN BOTH ENDS (B) OF THE FEED DOG.
3. ROTATE THE HOOK RACE CLOCKWISE AND COINTER CLOCKWISE BY HAND AND CHECK THE PLAY. IT SHOULD BE WITHIN 0.8 MM (0.03").
   * IF THERE IS MORE THAN 0.8 MM (0.03") BACKLASH BETWEEN THE GEARS, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER (SEE P.7) AND LOOSEN HEXAGONAL SOCKET SCREW (C).
2. TURN THE LOWER SHAFT BUSHING (ECCENTRIC BUSHING) (D) IN DIRECTION (E) WHEN THE PLAY AT THE SHUTTLE HOOK TIP IS TOO SMALL.
3. TURN THE LOWER SHAFT BUSHING (ECCENTRIC BUSHING) (D) IN DIRECTION (F) WHEN THE PLAY AT THE SHUTTLE HOOK TIP IS TOO LARGE.
4. TIGHTEN HEXAGONAL SOCKET SCREW (C) SECURELY AFTER ADJUSTMENT.





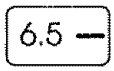


MECHANICAL ADJUSTMENT

BUTTONHOLE STITCH BALANCE

TO CHECK:

1. SET THE MACHINE AS FOLLOWS:
   STITCH SELECTOR..... 
   STITCH LENGTH DIAL..... BLUE ZONE
   STITCH WIDTH DIAL..... 6.5
2. ATTACH THE AUTOMATIC BUTTONHOLE FOOT.
3. SEW BUTTONHOLE AND CHECK THE STITCH BALANCE BETWEEN THE RIGHT SIDE AND LEFT SIDE OF BUTTONHOLE.
4. THE CORRECT BUTTONHOLE STITCH BALANCE IS WHEN THERE IS THE SAME COARSE ON THE RIGHT AND LEFT SIDES OF BUTTONHOLE.



WIDTH STITCH WIDTH DIAL

LENGTH STITCH LENGTH DIAL

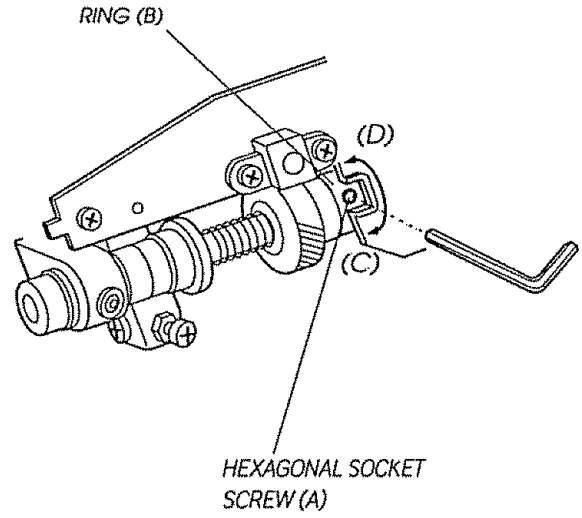
SELECTED PATTERN

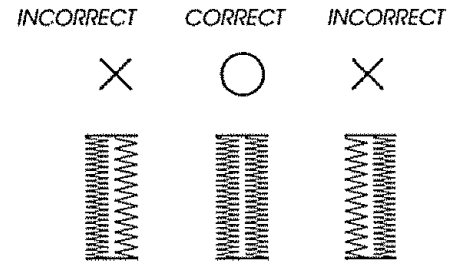
MECHANICAL ADJUSTMENT

BUTTONHOLE STITCH BALANCE

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER. (SEE P.7)
2. LOOSEN HEXAGONAL SOCKET SCREW (A).
3. IF THE RIGHT SIDE OF THE BUTTONHOLE IS TOO SPARSE, TURN THE RING (B) IN THE DIRECTION OF (C).
   IF THE LEFT SIDE OF THE BUTTONHOLE IS TOO SPARSE, TURN THE RING (B) IN THE DIRECTION OF (D).
4. TIGHTEN HEXAGONAL SOCKET SCREW (A) SECURELY.





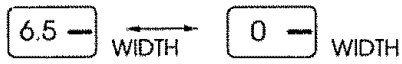
MECHANICAL ADJUSTMENT

NEEDLE POSITION

TO CHECK:

1. SET THE MACHINE AS FOLLOWS:
   STITCH SELECTOR ..... 
   STITCH WIDTH DIAL 6.5
2. TURN THE HAND WHEEL TOWARD YOU UNTIL THE NEEDLE COMES TO CENTER POSITION.
3. THE NEEDLE SHOULD NOT MOVE WHEN YOU TURN THE STITCH WIDTH DIAL TO " 0 ".

SELECTED PATTERN



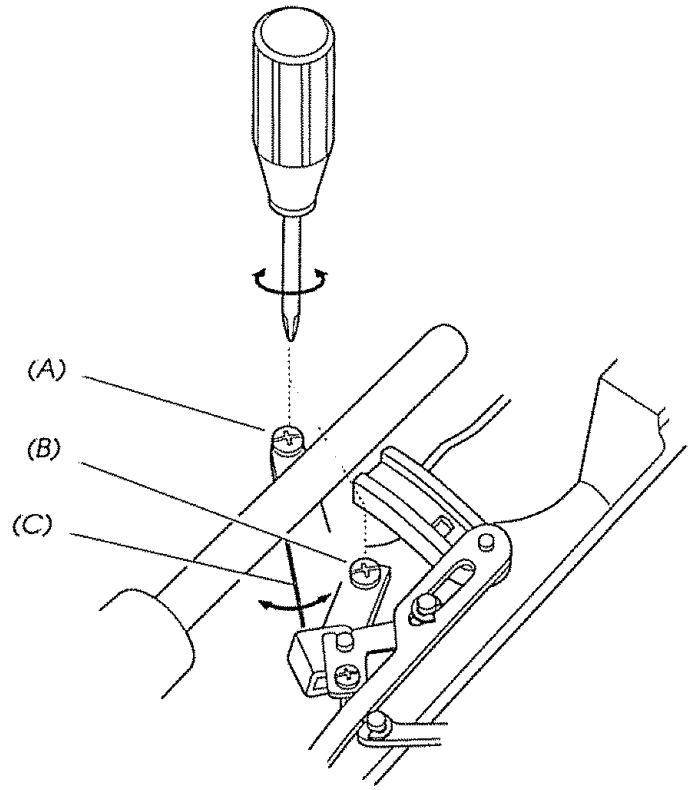
STITCH WIDTH DIAL

MECHANICAL ADJUSTMENT

NEEDLE POSITION

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER. (SEE P.6)
2. TURN THE HAND WHEEL TOWARD YOU UNTIL THE NEEDLE COMES TO THE CENTER OF THE SLIT IN THE NEEDLE PLATE.
3. LOOSEN SET SCREWS (A) AND (B).
4. TIGHTEN SET SCREW (A) SLIGHTLY.
5. MOVE THE PLATE (C) TO EITHER DIRECTION AS SHOWN BY THE ARROW UNTIL THE NEEDLE CEASES MOVEMENT, EVEN IF THE DIAL IS MOVED FROM MAXIMUM ZIGZAG WIDTH TO ZERO.



MECHANICAL ADJUSTMENT

ZERO FEEDING

TO CHECK:

1. SET THE STITCH SELECTOR TO  AND THE STITCH LENGTH DIAL TO "0."
2. PLACE A PIECE OF PAPER ON THE NEEDLE PLATE.
3. CHECK IF THE PAPER MOVES FORWARD OR BACKWARD WHEN YOU TURN THE HAND WHEEL TOWARD YOU.
4. THE MACHINE SHOULD NOT FEED A PIECE OF PAPER AT THIS SETTING.

SELECTED PATTERN

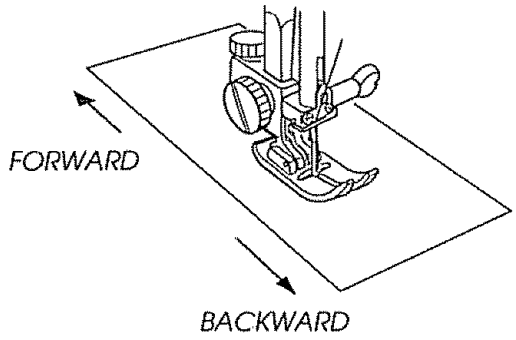
STITCH LENGTH DIAL

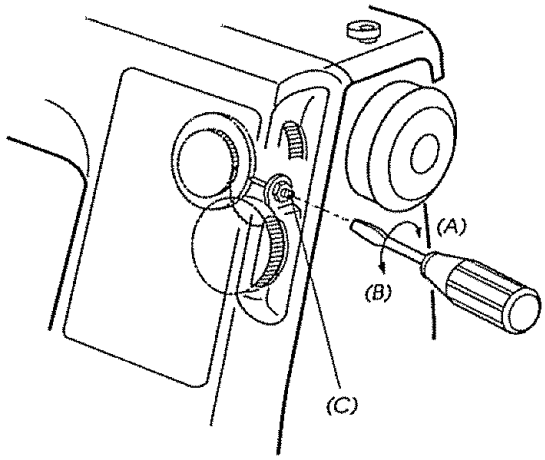
MECHANICAL ADJUSTMENT

ZERO FEEDING

ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER. (SEE P.8)
2. SET THE STITCH SELECTOR AT ⊥ AND THE STITCH LENGTH DIAL AT " 0 ".
3. PLACE A PIECE OF PAPER ON THE NEEDLE PLATE.
4. IF THE PAPER MOVES FORWARD, TURN ADJUSTING SCREW (C) IN DIRECTION (A).
   IF THE PAPER MOVES BACKWARD, TURN ADJUSTING SCREW (C) IN DIRECTION (B).





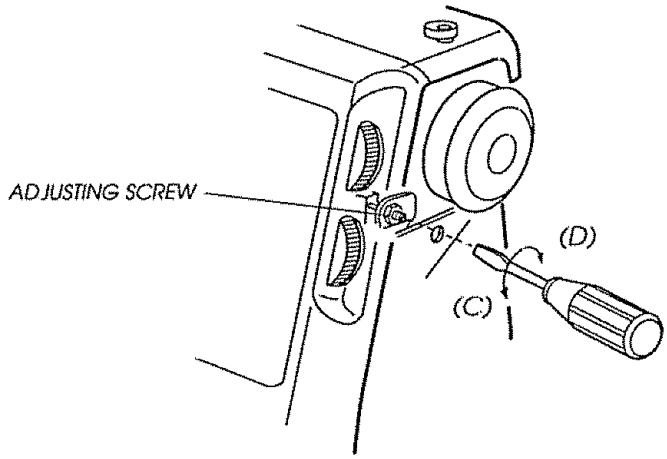
MECHANICAL ADJUSTMENT

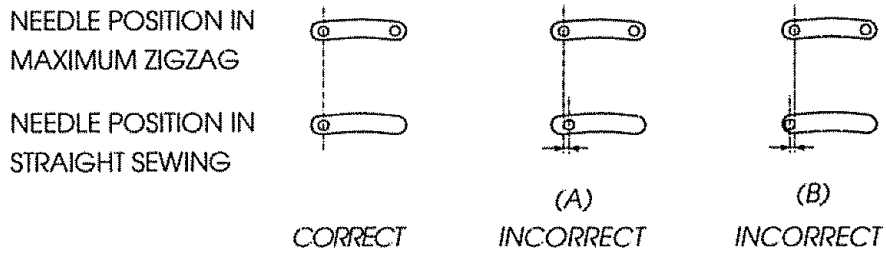
BASIC NEEDLE POSITION

* IF THE LEFT NEEDLE POSITION IN MAXIMUM ZIGZAG AND IN STRAIGHT SEWING IS NOT THE SAME, ADJUST AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER. (SEE P.8)
2. SELECT THE LEFT NEEDLE POSITION IN MAXIMUM ZIG ZAG, THEN SELECT THE LEFT NEEDLE POSITION STRAIGHT SEWING.
3. IF THE RESULT LOOKS LIKE (A) BELOW, TURN THE ADJUSTING SCREW IN DIRECTION (D). IF THE RESULT LOOKS LIKE (B) BELOW, TURN THE ADJUSTING SCREW IN DIRECTION (C).
4. REPLACE THE BELT COVER. (SEE P.8)





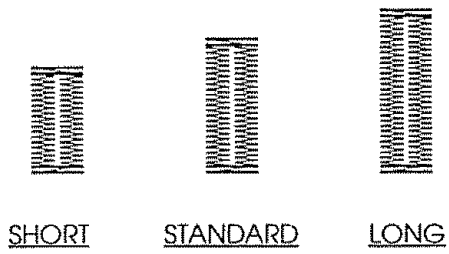
MECHANICAL ADJUSTMENT

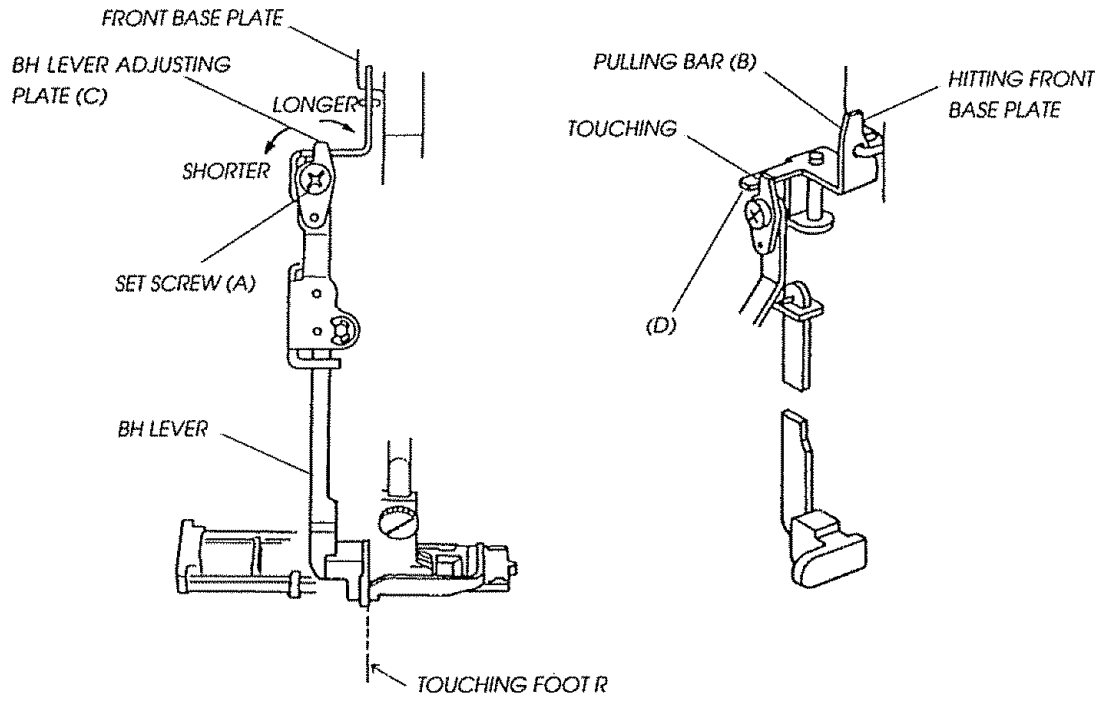
BUTTONHOLE FUNCTION (1)

* A BUTTONHOLE SEWN WITH THE AUTOMATIC BUTTONHOLE FOOT WILL BE 3MM (0.12") LONGER THAN THE ACTUAL BUTTON. THE LENGTH CAN BE ADJUSTED AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. LOWER THE FEED DOG AND ATTACH FOOT R, THEN LOWER THE PRESSER BAR.
2. LOOSEN SET SCREW (A).
3. PULL DOWN THE BH LEVER UNTIL IT TOUCHES FOOT R, AND BAR (B) HITS THE FRONT BASE PLATE. ALSO, MAKE SURE BH LEVER ADJUSTING PLATE (C) TOUCHES FINGER (D). TIGHTEN SET SCREW (A).
4. RAISE THE FEED DOG AND SEW A BUTTONHOLE. THEN, CHECK THE LENGTH.





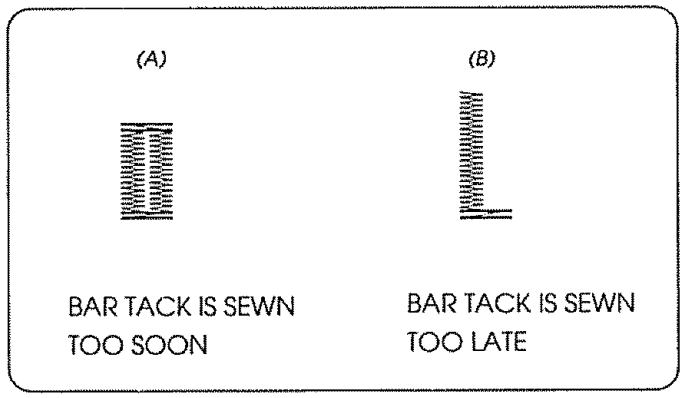
MECHANICAL ADJUSTMENT

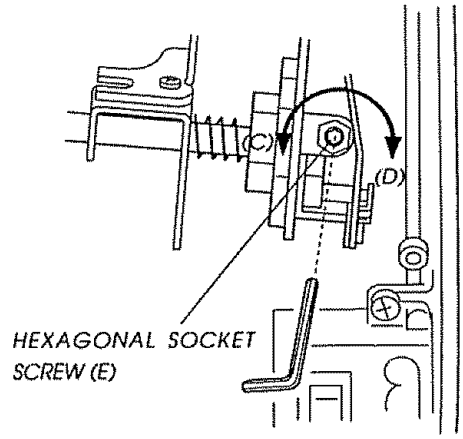
BUTTONHOLE FUNCTION (2)

* IF THE BAR TACK ON THE BUTTONHOLE OCCURS TOO EARLY, OR IF NO BAR TACK IS SEWN AT ALL, ADJUST AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER. (SEE P.8)
2. (A) IF BAR TACK IS SEWN TOO SOON, TURN THE HEXAGONAL SOCKET SCREW (E) IN DIRECTION (C).
   (B) IF BAR TACK IS SEWN TOO LATE, TURN THE HEXAGONAL SOCKET SCREW (E) IN DIRECTION (D).
3. ATTACH THE BELT COVER. (SEE P.8)





MECHANICAL ADJUSTMENT

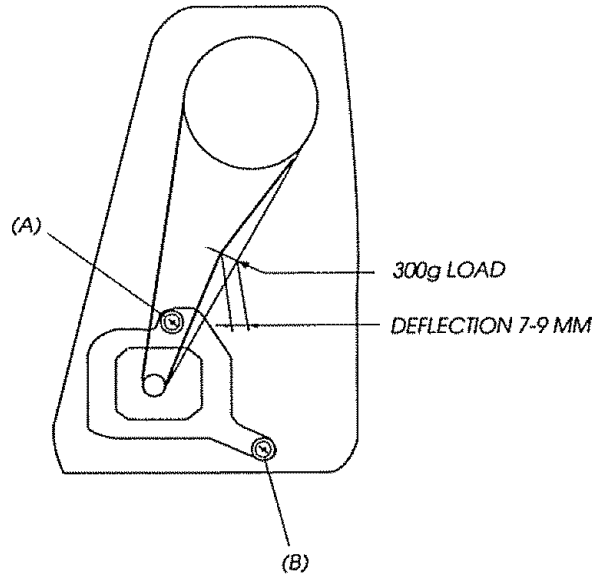
MOTOR BELT TENSION

TO CHECK:

1. IF THE MOTOR BELT TENSION IS TOO TIGHT OR TOO LOOSE, IT MAY CAUSE BELT NOISE.
   ALSO, A TOO TIGHT BELT TENSION CAN CAUSE THE MACHINE TO RUN SLOW AND WILL OVERLOAD THE MOTOR.
   TOO LOOSE A MOTOR BELT TENSION, HOWEVER, MAY CAUSE THE BELT TEETH ON THE MOTOR PULLEY TO JUMP
2. THE CORRECT MOTOR BELT TENSION IS ACHIEVED WHEN THE BELT PUSHES IN ABOUT 7MM (0.28") - 9MM (0.36") UNDER A PRESSURE OF ABOUT 300 GRAMS.

ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER. (SEE P.8)
2. LOOSEN SET SCREWS (A) AND (B).
3. MOVE THE MOTOR UP OR DOWN TO ADJUST THE DEFLECTION TO ABOUT 7MM (0.28") - 9MM (0.36").
4. TIGHTEN SET SCREWS (A) AND (B)

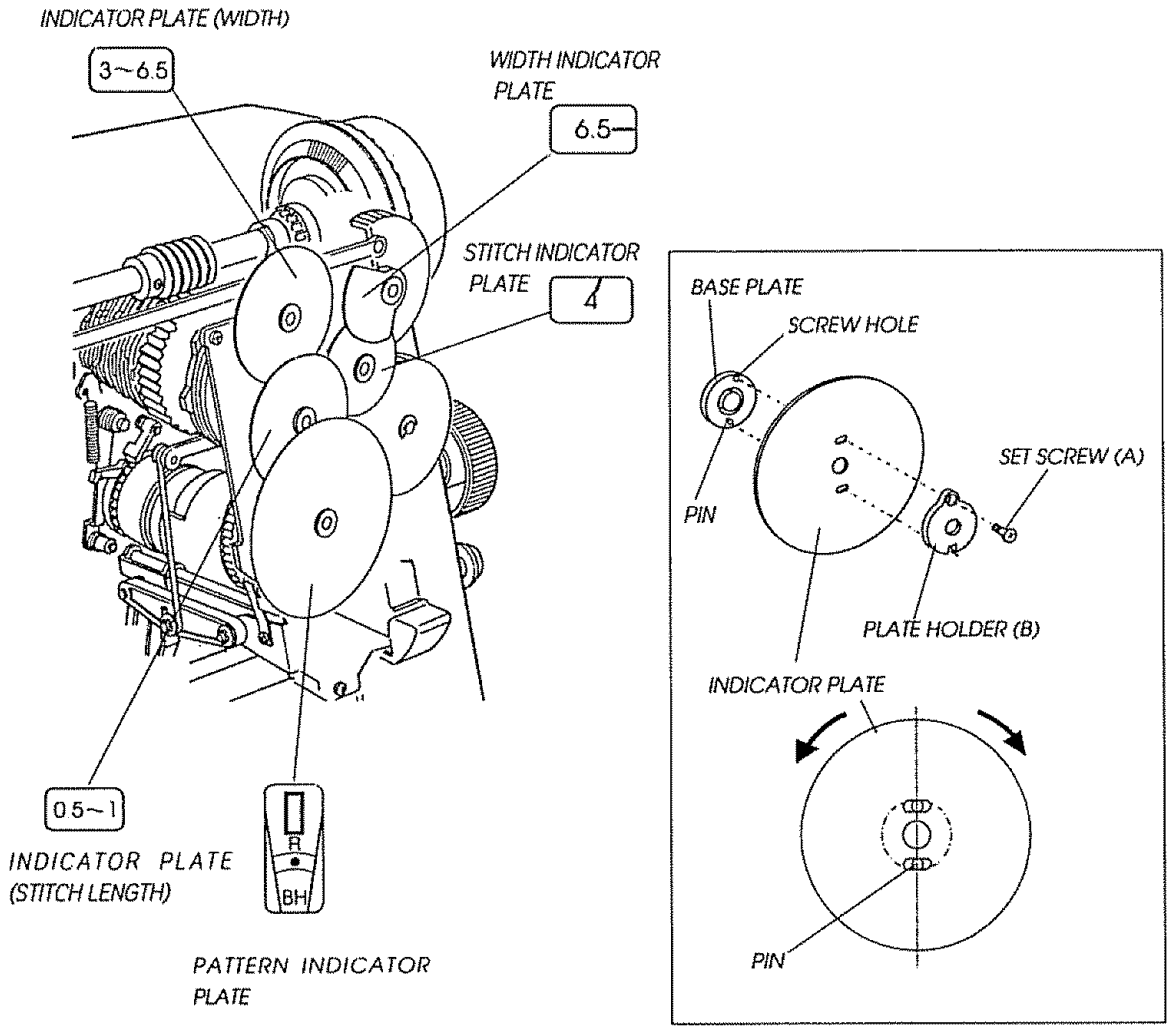


REPLACING THE INDICATOR PLATE

* WHEN YOU REPLACE THE EACH INDICATOR PLATE, DO AS FOLLOWS:

1. REMOVE THE FRONT COVER. (SEE P.9)
2. REMOVE THE SET SCREW (A), THEN REPLACE THE INDICATOR PLATE.
3. MATCH THE CENTER OF THE ARCING HOLE OF THE INDICATOR PLATE TO THE PIN AND SCREW HOLE IN THE BASE PLATE.
4. ATTACH THE PLATE HOLDER (B) AND REPLACE THE SCREW.
5. ATTACH THE FRONT COVER. MAKE SURE THE INDICATION APPEARS IN THE CENTER OF THE WINDOW.
6. IF POSITION IS OFF, REMOVE THE FRONT COVER, LOOSEN THE SET SCREW (A) AND MOVE THE INDICATOR PLATE.
7. ATTACH THE FRONT COVER (SEE P.9), THEN CHCK THE POSITION.

NOTE: MAKE SURE THE INDICATOR PLATES OVERLAP EACH OTHER IN THE CORRECT ORDER. (SEE FOLLOWING PICTURE.)



OILING

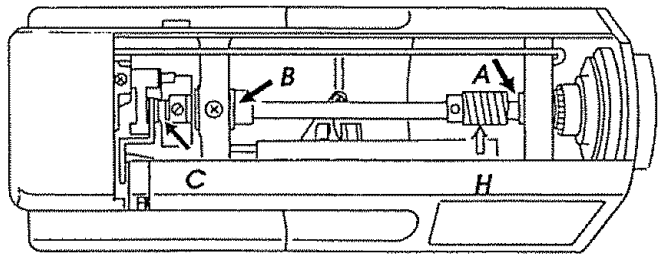
FACTORY LUBRICATED PARTS WILL PROVIDE YEARS OF HOUSEHOLD SEWING WITHOUT ROUTINE OILING, BUT YOU SHOULD STILL CHECK FOR POSSIBLE LUBRICATION NEEDS WHENEVER SERVICING MACHINES.

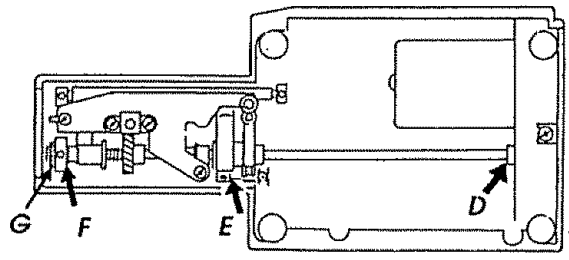
OIL:

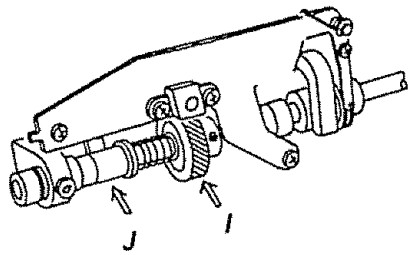
USE GOOD QUALITY SEWING MACHINE OIL AT THE POINTS (A, B, C, D, E, F & G) INDICATED BY THE BLACK ARROWS.

GREASE:

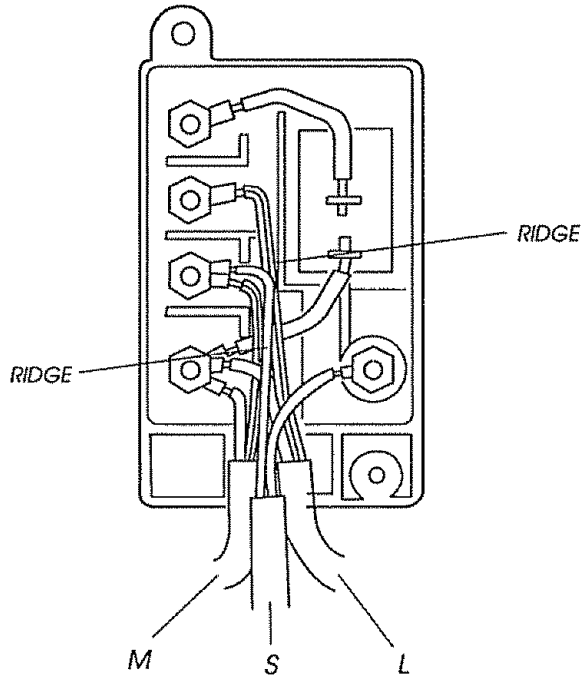
USE WHITE GREASE SUCH AS MOLYCOTE EM-40M AT THE POINTS (H, I, & J) INDICATED BY THE WHITE ARROWS.







WIRING OF TERMINAL BLOCK

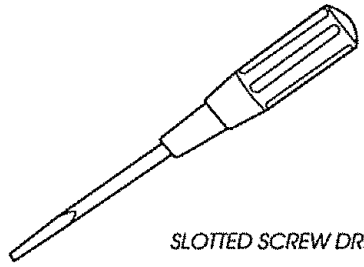


L : LAMP

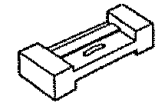
M : MOTOR

S: SPEED RANGE SWITCH

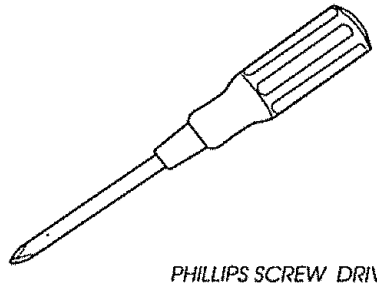
SPECIAL TOOLS REQUIRED



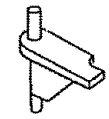
SLOTTED SCREW DRIVER



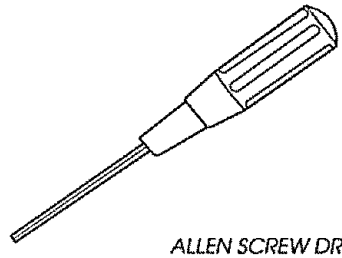
FEED DOG HEIGHT GAUGE #68496



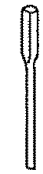
PHILLIPS SCREW DRIVER



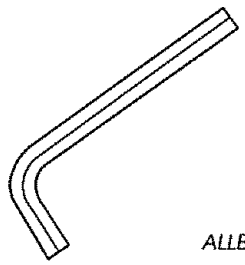
NEEDLE HEIGHT GAUGE #68168



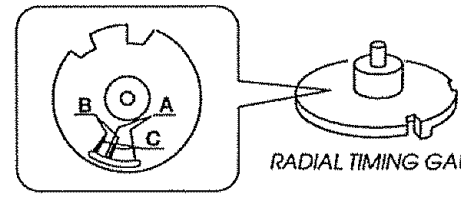
ALLEN SCREW DRIVER



TEST PIN #68368



ALLEN WRENCH



RADIAL TIMING GAUGE #68497

RADIAL TIMING GAUGE SHEET #U1369C