SERVICING MANUAL

MODEL 134D

INDEX

WHAT TO DO WHEN

1. SEWING MACHINE CONDITION

CONDITION	CAUSE	HOW TO FIX	REFERENCE
1. The machine does not run or speed does not increase.	1. Correct power source is not used.	Use correct power source.	
	2. The power switch is off.	Turn on the snitch.	
	3. The foot controller is not plugged into sewing machine firmly.	Plug the connector into the sewing machine firmly.	
	4. The foot controller is not plugged into the power outlet firmly.	Insert the power supply plug into the wall outlet firmly.	
	5. The motor is broken.	Replace the motor and adjust the motor belt tension	P 34 & 35
	6. The foot controller is broken.	Replace the foot control.	
	7. The motor belt is dysfunctional.	Replace the motor belt and check the tension.	P 34
	8. The motor belt tension is too tight.	Adjust the motor belt tension properly.	
	9. Lint is jammed between the feed dog and the needle plate.	Remove the lint.	
	10. The main shaft is too tight laterally.	Adjust the main shaft rings to get no resistance.	P 33
	11. Not enough oil.	Apply oil to all moving parts.	P 37
	12. The wrong type oil is being used.	Apply high quality sewing machine oil.	P 37
2. The sewing light does not light up	1. Correct power source is not used	Use correct power source	
	2. Light bulb is missing.	Replace the light bulb.	P 36
	3. Light bulb is burned out.	Replace the light bulb.	P 36
3. Noisy Not come on operation	1. Not enough oil.	Apply oil to all moving parts	P 37
	2. Something is caught inside the machine.	Remove the foreign object.	
	3. Main shaft is loose.	Adjust the main shaft rings to eliminate the looseness.	P 33
	4. Knives are dull.	Adjust the position of the upper knife. Replace the upper knife.	P 27 & 28
	5. Needles are dull.	Replace the needle(s).	

CONDITION	CAUSE	HOW TO FIX	REFERENCE
3. Noisy operation	6. The needle is rubbing against the front needle guard too much.	Adjust the clearance between the needle and lower looper. (A little scraping noise is normal.)	P 19 & 20
4. Excessive vibration	1. Uneven work surface. 2. Rubber feet are not properly attached to the machine.	Use the flat surface of a table. Attach the rubber feet with the set-screws securely. Use the rat surface of a table. Replace the rubber feet. Adjust the upper shaft rings to elimi-nate the looseness.	P 33

2. POOR STITCH RESULTS

If stitching result is poor, do the following procedures.

NO. TO CHECK	SOLUTION
1. Correct needle is being used.	HA-1SP, size 14 OR size 11 SHOULD BE USED.
2. Needle and thread weights are suitable to the cloth being sewn.	Follow the instructions in the instruction manual
3. Is the machine threaded properly?	Re-thread the machine.
4. Check thread tension.	See according to the recommended tension in the instruction manual. Depending on the conditions under which you are sewing. You may have to vary from the tension settings recommended in the instruction manual
5. Is the needle bent or dull?	Change the needle.
6. Is the claw of the needle plate worn or damaged?	Change the needle plate.

(3) SEWING CONDITION

CONDITION	CAUSE	HOW TO FIX	REFERECE
1 Sewing results are poor.	1. Thread is not inserted properly into the thread tension discs.	Re-thread properly	
	2. Position of looper thread guide is off.	Adjust the looper thread guide position.	P 29
	3. The check spring is not functioning properly.	Check the function or replace it.	
	4. Thread spool is not secure.	Place thread spool securely.	
2 with heavy fabric.	1. Stitch length is too short (dense).	Increase stitch length with dial.	
	2. Presser foot pressure is too weak.	Adjust pressure with the presser adjusting screw	
3 with light fabrics, sewing results are poor.	1. Presser foot pressure is too strong.	Adjust pressure with the presser adjusting screw.	
	2. Stitch length is too long.	Decrease the stitch length with the dial.	
	3. For other causes. See the above SEWING CONDITION 1.		
4 skipping stitches	1. Needle is not inserted all up.	Insert the needle until it stops.	
	2. Too much clearance between the needle and lower looper.	Adjust to proper clearance	P 19, 20
	3. Too much clearance between the upper looper and lower looper.	Adjust to proper clearance.	P 25
	4. Too much clearance between the needle and upper looper.	Adjust to proper clearance.	P 26
	5. Needle bar height is not correct.	Adjust the needle bar height.	P 13
	6. Timing of lower looper is not correct.	Adjust lower looper timing.	P 22
	7. Position of upper looper is not correct.	Adjust upper looper position	P 23
	8. Timing relationship of the upper and lower loopers is not correct.	Adjust a timing of the upper and lower looper.	P 24
	9. The check spring is not functioning properly.	Check the function or replace it.	
	10. The tip of upper looper or lower looper is dull.	Replace the upper looper or lower looper.	

CONDITION	CAUSE	HOW TO FIX	REFERENCE
5. Breaking thread	1. Threading order is wrong.	Thread the lower looper, upper looper, right side, and needle. Then left side needle.	
	2. Tip of the upper looper or lower looper is dull or worn.	Replace the upper or lower looper.	
	3. Needle is not attached properly.	Re-set the needle	
	4. Position of the looper thread guide is off.	Adjust the looper thread guide position.	P 29
	5. When beginning sewing, both the needle thread and the looper thread are not being pulled under the presser foot.	Pull both threads under the presser foot.	
	6. Threads are jamming in the thread path.	Check the threading and fix jamming.	
	7. Needle eye is worn.	Replace the needle.	
	8. Quality of the thread is low.	Use high quality sewing thread.	
	9. Needle is hilling the needle plate, upper or lower looper.	Replace the needle or adjust clearance.	P 19, 20, 21, 26
6. Stitches are not balanced.	I. Position of the looper thread guide is off.	Adjust the looper thread guide position.	P 29
	2. Quality of the thread is low.	Use high quality sewing thread.	
	3. Telescoping thread guide bar thread guide is not directly over the spool.	Center the thread guide over the spool.	
7. Needle breaks.	1. Needle in not attached properly.	Re-set the needle	
	2. Fabric is being pulled too hard while sewing.	Pull the fabrics gently during sewing.	
	3. The needle rubs against front needle guard too much.	Adjust the clearance between the needle and lower looper.	P 19, 20
	4. Needle is hitting the lower looper too much.	Adjust the clearance between the needle and lower looper.	P 19, 20
	5. Needle is hilling the upper looper too much.	Adjust the clearance between the needle and upper looper.	P 26
	6. Improper clearance between the needle and needle guard.	Adjust clearance between the needle and needle guard.	P 19, 20, 21
	7. Feed dog liming is off.	Adjust feed dog timing.	P 16
8. Puckering	1. Position of the looper thread guide is off.	Adjust the looper thread guide position.	P 29
	2. Needle plate is not correct one for current sewing operation.	Replace the needle plate.	
	3. Feed dog liming is off.	Adjust the feed dog timing.	P 16
	4. Presser foot pressure is too strong.	Adjust the pressure with the pressure adjusting screw	
	5. Differential feed mechanism is not functioning correctly.	Adjust the differential feed ratio.	

(4) FEEDING AND CUTTING FABRRIC

CONDITION	CAUSE	HOW TO FIX	REFERENCE
1. Fabric does not feed properly.	1. presser foot is in up position.	Lower the presser foot.	
	2. Stitch length is too short.	Standard length is 2.5 to 3.5 mm.	
	3. Presser foot pressure is too weak.	Adjust the pressure with the adjusting screw.	
	4. Lint is stuck in the feed dog.	Remove the lint from the feed dog.	
	5. Feed dog height is not correct.	Adjust the feed dog height.	P 15
	6. Feed dog is worn or broken.	Replace the feed dog.	
	7. Differential feed mechanism is working.	Adjust the differential feed ratio.	
	8. Feed dog timing is off.	Adjust feed dog timing.	P 16
	9. Knife is dull.	Adjust the position of the knives.	P 27
		Adjust knife timing.	P 17
		Replace the upper knife.	P 27, 28
2. Uneven feeding.	1. Presser foot pressure is weak.	Adjust pressure with the presser adjusting screw.	
	2. Knife is dull.	Adjust position of knives. If knife is worn or broken replace it.	P 27, 28
	3. Feed dog timing is off.	Adjust feed dog timing.	P 16
3. Differen-tial feed	1. Feed dog height is not correct.	Adjust the feed dog height.	P 15
	2. Feed dog timing is off.	Adjust the feed dog timing.	P 16
	3. Knife is dull.	Confirm relationship of upper and lower knife.	P 27, 28
	4. Presser foot pressure is too weak.	Adjust the pressure with the pressure adjusting screw.	
	5. Main and sub feed dogs are not aligned.	Adjust the feed dog height.	P 5,15, 31
4. Knife	1. Knife blades are not over lapping enough.	Increase the overlap of the blades.	P 27
	2. Something is caught between the knife blades.	Remove the foreign object.	
	3. Upper knife is worn or broken.	Replace it.	P 27, 28
	4. Lower knife is worn or broken.	Replace it.	P 27, 28
	5. Presser foot pressure is too weak	Adjust the pressure with the pressure adjusting screw.	

FACE PLATE

I. Remove the setscrew (A) to remove the face plate (B).

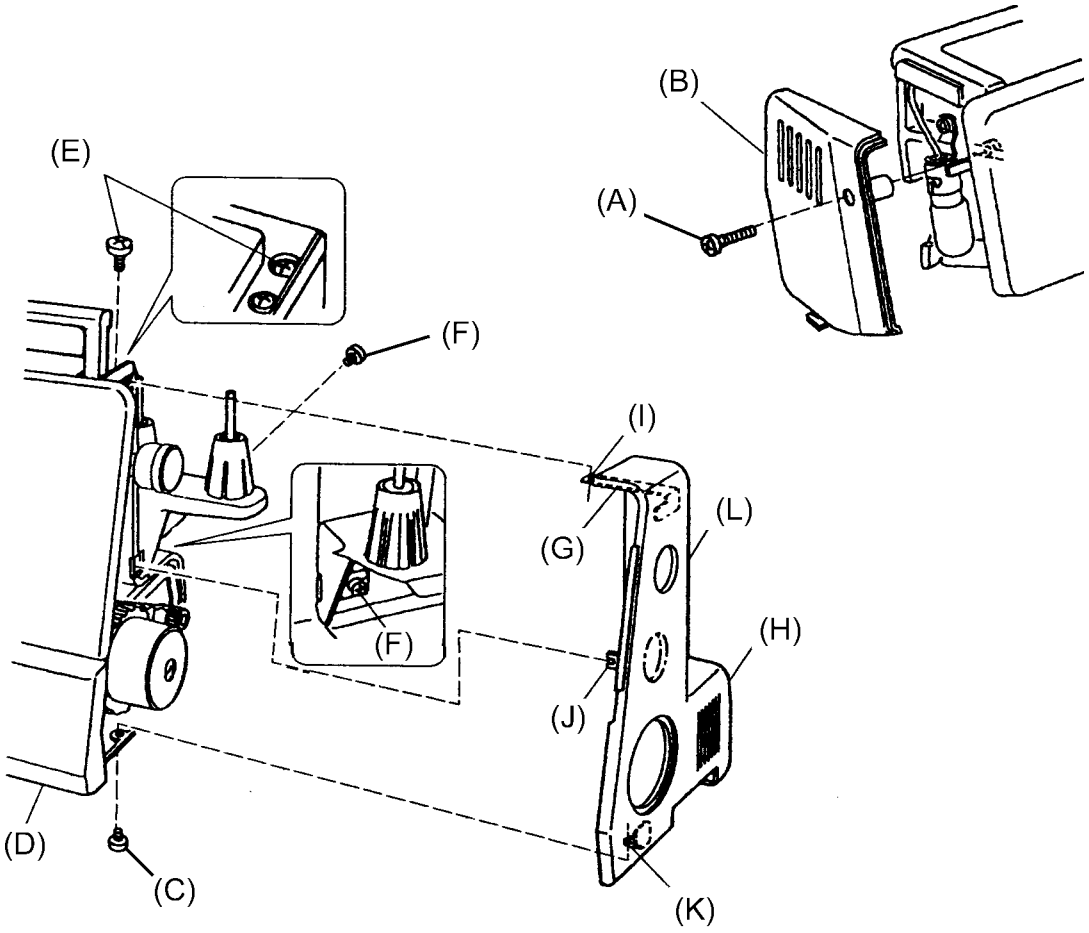
BELT COVER

TO REMOVE

1. Remove the set screw (C).
2. Open the looper cover (D).
3. Loosen the two set screw (E) and (F).
4. Pull the top end (G) and back end (H) at the same time.

TO ATTACH

5. While inserting the three projections (I, J & K). Push the belt cover (L) against the machine body.
6. Tighten the three set screws (C, E & F).
7. Close the looper cover (D).



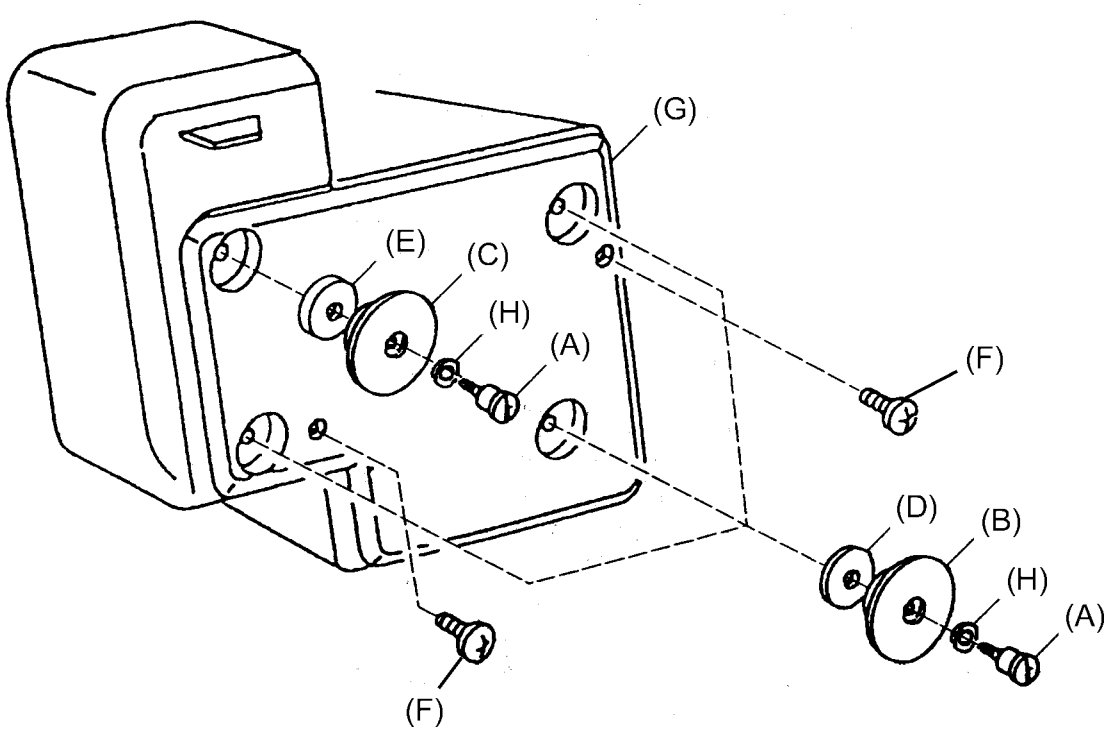
MACHINE BASE

TO REMOVE

1. Remove the four hinge screws (A), base cushions (B & C), washers (D, E & H). Washer (E) is thicker than the other three washers.
2. Remove the 2 set screws (F).
3. Remove the machine base (G).

TO ATTACH

4. Attach the machine base (G), and tighten the 2 setscrews (F).
5. Attach the washers (D & E), base cushions (B & C) and washers, and tighten the four hinge screws (A).



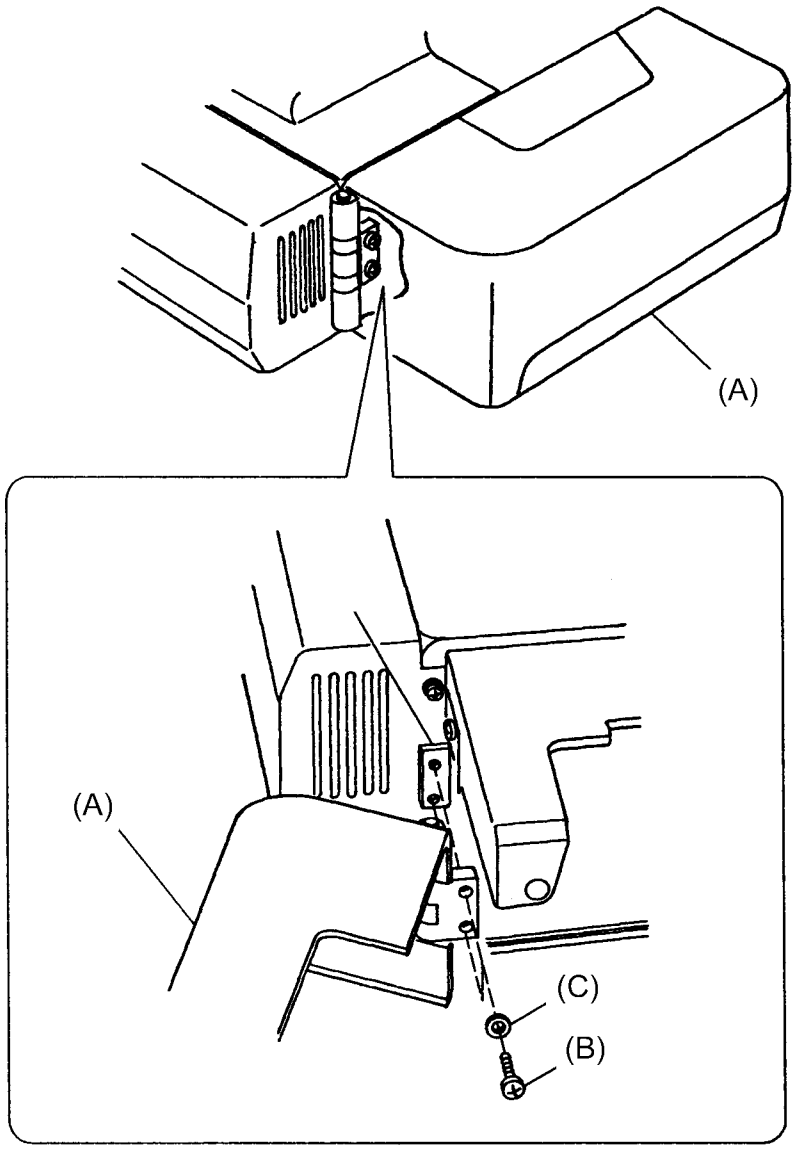
SIDE COVER

TO REMOVE

1. Open the side cover (A) to the left.
2. Remove the two setscrews (B) and washers (C).
3. Remove the side cover (A).

TO ATTACH

4. Attach the side cover (A) to the setting plate (D) temporarily with two screws (B) and washers (C).
5. Adjust the opening and closing function of side cover (A).
6. Tighten the 2 screws (B) firmly.



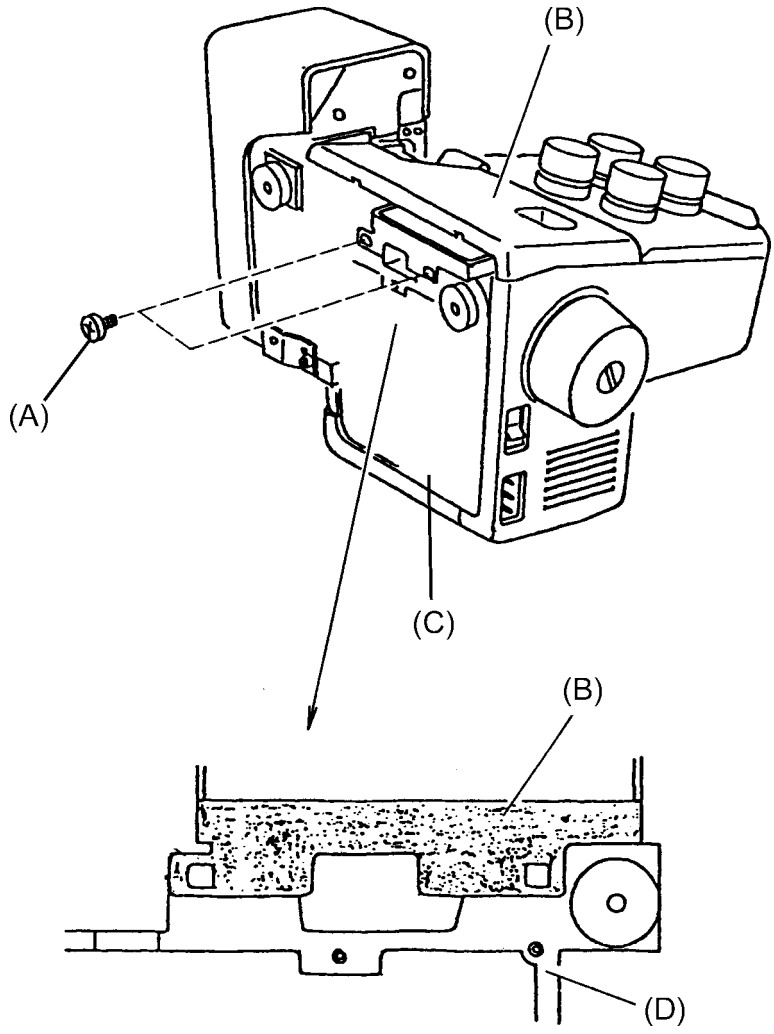
LOOPER COVER UNIT

TO REMOVE

1. Remove the machine base (C).
2. Remove the two set screws (A), and remove the looper cover unit (B).

TO ATTACH

3. Attach the looper cover unit (B) to the machine body (D) temporarily with 2 set screws (A).
4. Adjust the opening and closing functions of looper cover (B).
5. Tighten two set screws (A) firmly.
6. Attach the machine base (C).



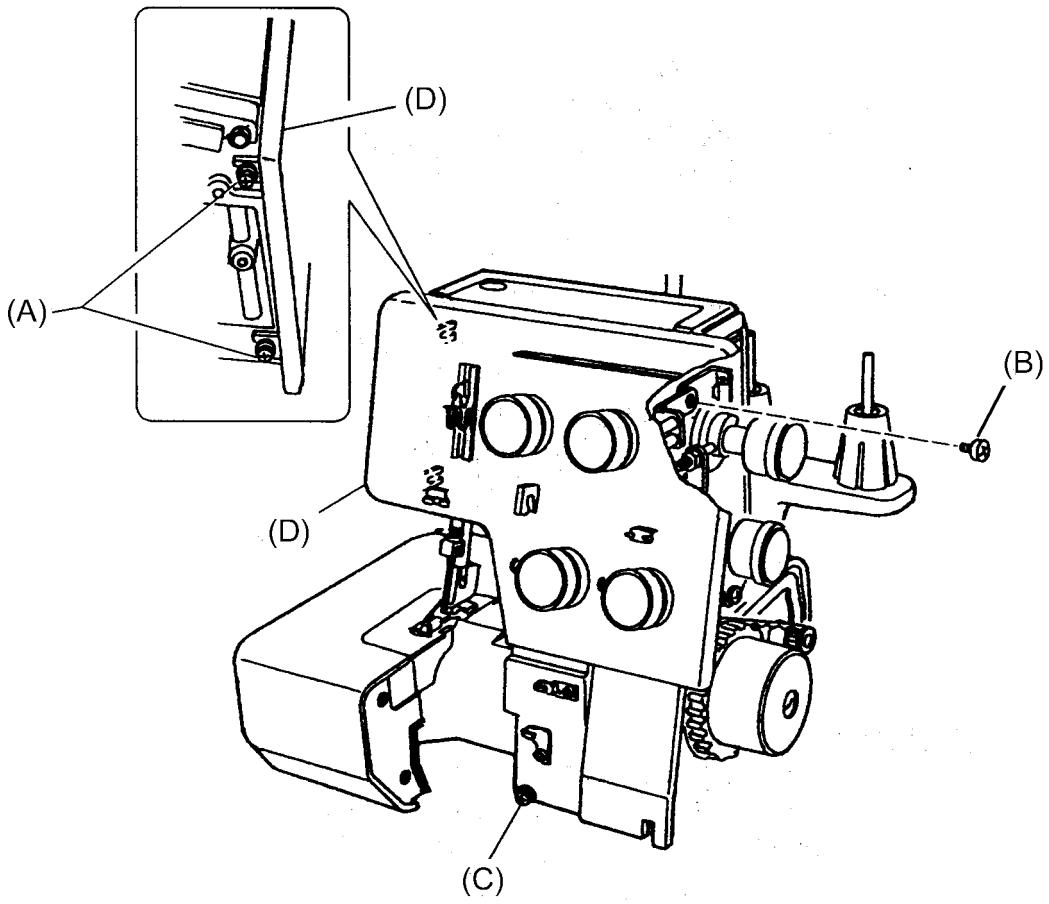
FRONT PANEL UNIT

TO REMOVE

1. Remove the face plate, belt cover. Machine base and looper cover unit.
2. Loosen the 2 setscrews (A).
3. Remove the setscrews (B).
4. Loosen the setscrew (C) to remove the front panel unit (D).

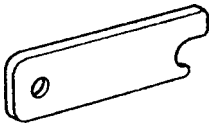
TO ATTACH

5. Attach the front panel unit (D) by fastening the screws (A , B and C).
6. Attach the looper cover unit, machine base, belt cover and face plate.

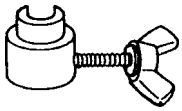


GAUGE FOR SERVICING

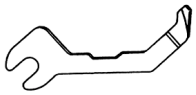
Distance gauge
No. 8289



Thickness gauge
No. 787-G03



Needle gauge
NO. 787-G02



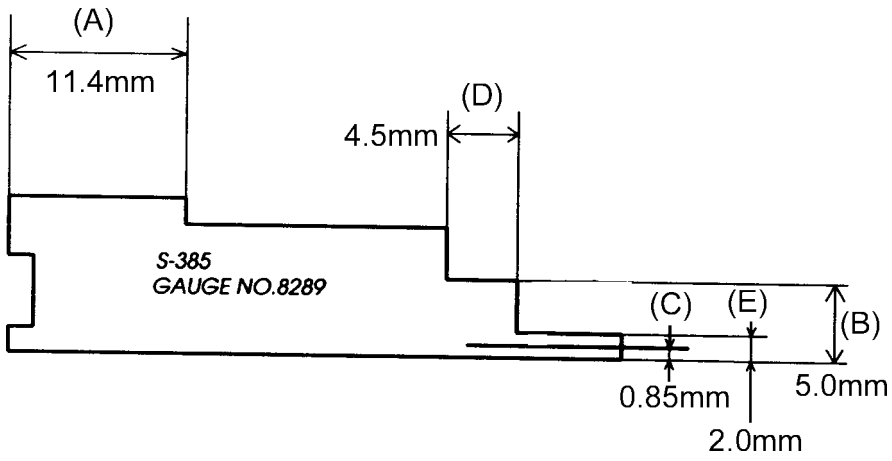
Lower looper height
NO.787-G01

GAUGE FOR SERVICING

Adjustments can be done effectively and correctly with this gauge. Use needle HA-1 SP, size 11 or 14, when using this gauge.

(A): for needle bar height
(B): for presser bar height
(C): for feed dog height & position of knives
(D): for upper looper position
(E): for feed timing

Thickness of the gauge (1.7mm): for upper looper position & feed timing

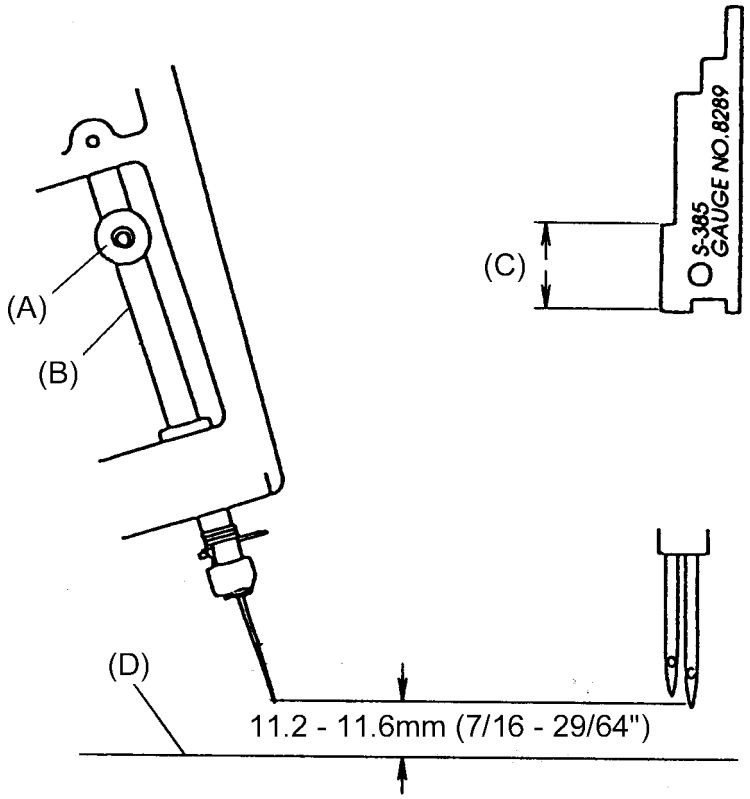


NEEDLE BAR HEIGHT

The distance between the tip of needle on the right and the surface of needle plate (D) should be 11.2 to 11.6 mm (7/16 to 29/64) when the needle bar is at the highest position.

TO ADJUST

1. Remove the face plate (Refer to page 6) and the presser foot.
2. Turn the hand wheel toward you with your hand to set the needle bar (B) at the highest position.
3. Loosen the set screw (A) and adjust the height by using the part (C) of the gauge No. 8289. Tighten the set screw (A) after the adjustment is done.
   Note: Be careful not to turn the needle bar (B).
4. Turn the hand wheel toward you one cycle, and recheck the needle bar height. Check the clearance between needles and lower looper / needle guards/fixed needle guard/upper looper. (Refer to pages 19, 20, 21 & 26.)
5. Attach the face plate (Refer to page 6) and presser foot.

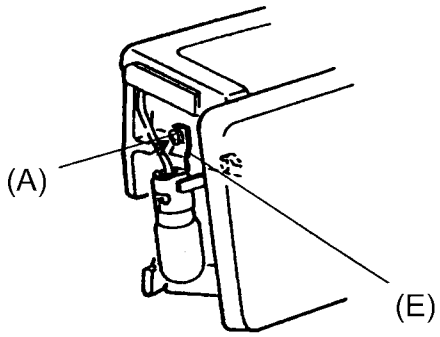


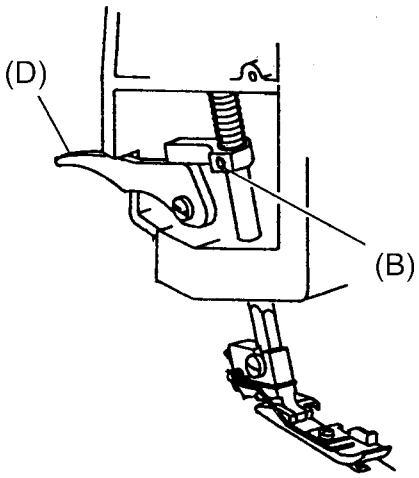
PRESSER BAR HEIGHT

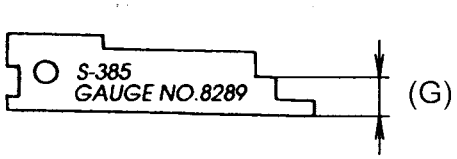
The distance between the surface of needle plate (C) and bottom of presser foot should be 4.7 to 5.3 mm (47/256 to 53/256) when the presser bar lifter (D) is raised.

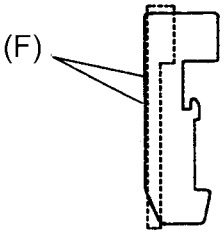
TO ADJUST

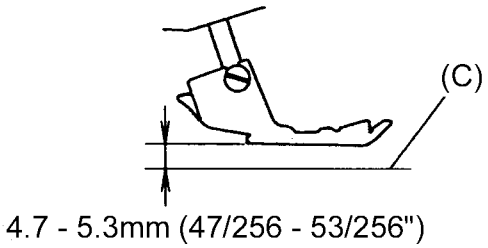
1. Remove the face plate (Refer to page 6.)
2. Remove the set screw (A) to move the lamp socket unit (E).
3. Raise the presser bar lifter (D) and loosen the set screw (B). Then adjust the presser bar height by using the part (G) of the gauge No. 8289. The side of presser foot should be paralleled with the hole of needle plate (F).
4. Tighten the set screw (B).
5. Tighten the set screw (A).
6. Attach the face plate (Refer to page 6).









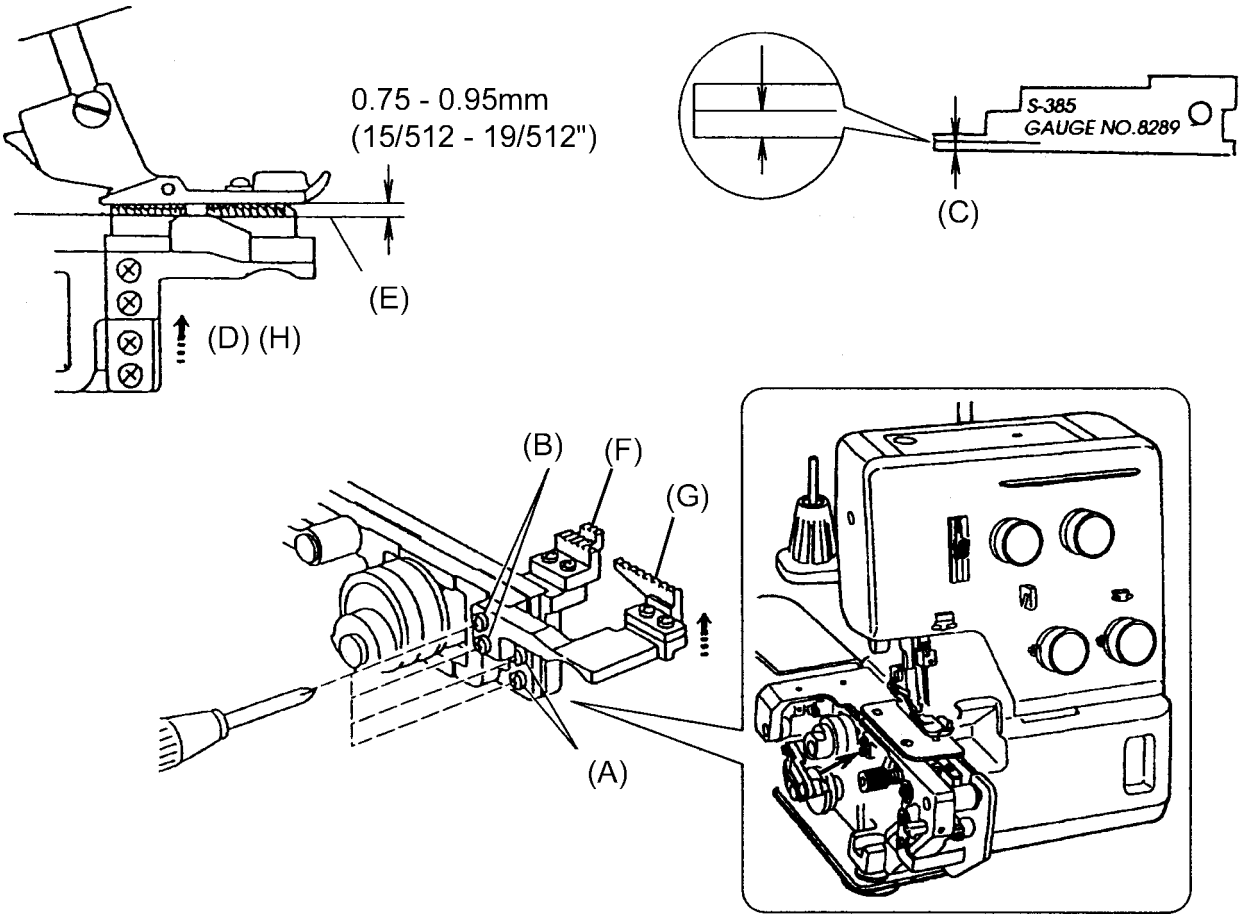


FEED DOG HEIGHT

When the presser foot is lowered and the feed dogs are at their highest position. The distance between the surface of needle plate (E) and bottom of presser foot should be 0.75 and 0.95 mm (15/512 to 19/512)

TO ADJUST

1. Set the stitch length dial at “3” and the differential feed dial at “1.0”.
2. Lower the presser foot and raise the feed dogs to the highest position by turning the hand wheel.
3. Loosen the 4 main & sub feed dog screws (A & B).
4. Push the main feed dog (F) straight upward (D) and adjust the distance between the surface of needle plate (E) and bottom of presser foot, then tighten the 2 set screws (a).
5. While keeping the foot parallel with the surface of the needle plate (E), push the sub feed dog (G) straight upward (H) until its teeth touch the bottom of foot. Then tighten the 2 set screws (B).
6. Check if these 2 feed dogs (F & G) are attached in parallel with the surface of needle plate (E) while turning the hand wheel.

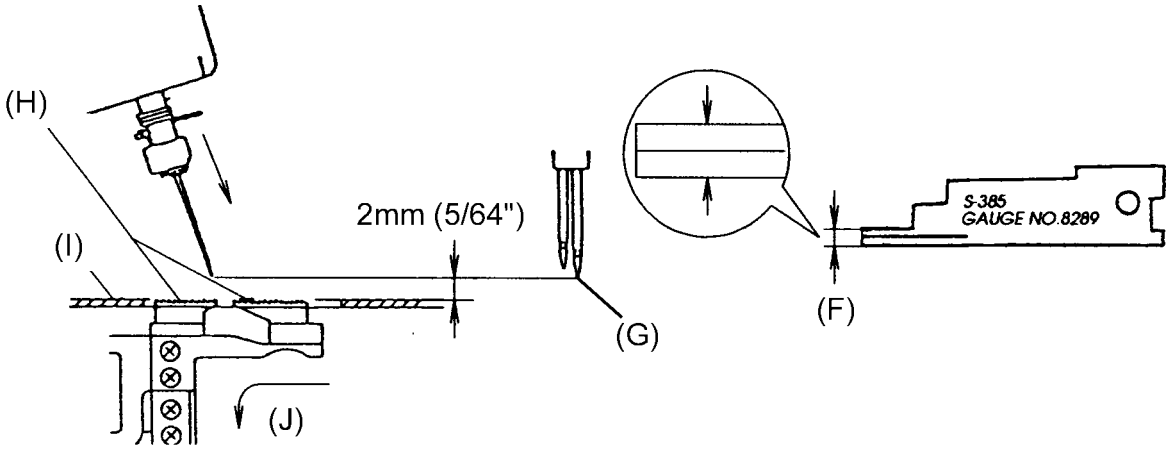


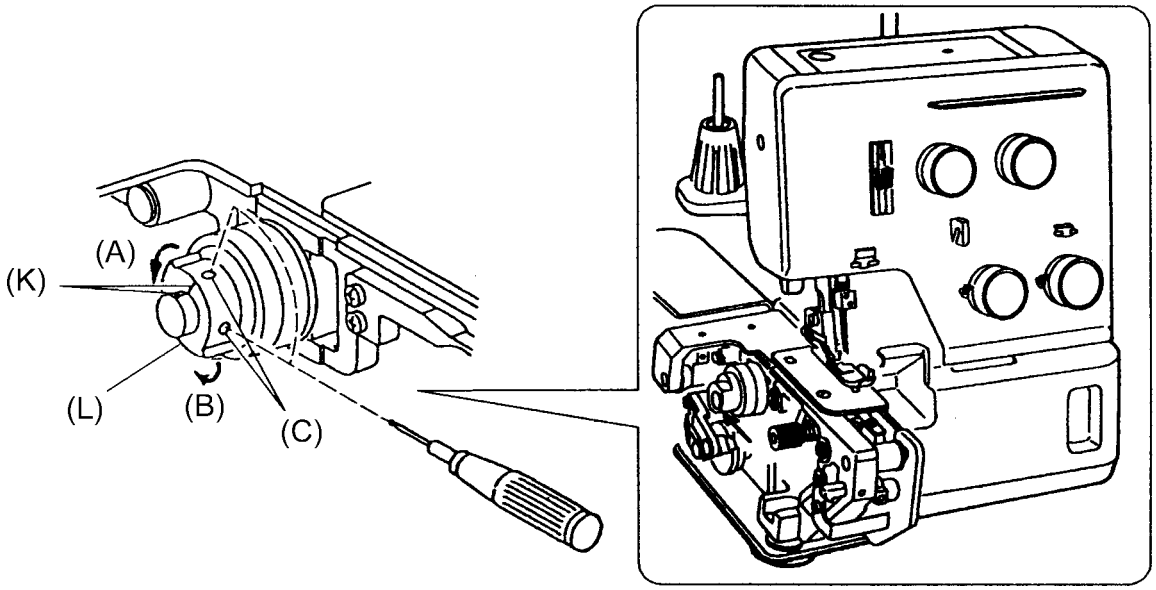
FEED TIMING

When the presser foot is lowered and the tip of right needle (G) is 2 mm (5/64”) above the needle plate in its downward motion, the top of the feed dog teeth (H) should be leveled with the top surface of needle plate (I) at the rearmost position (J).

TO ADJUST

1. Set the stitch length dial at “4” and the differential feed dial at “1.0”.
2. Raise the presser foot and move the needle downward until the tip of the right needle comes 2 mm (5/64’) above the needle plate. The part (F) of the gauge No. 8289 is 2mm.
3. Lower the presser foot and loosen the 2 screws (C) and adjust the position of the feed cam (L) while aiming the guide lines (K).
   * Turn the feed cam (L) to the direction of (A) if the feed dogs are lower than the surface of the needle plate (I).
   * Turn the feed cam (L) to the direction of (B) if the feed dogs are higher than the surface of the needle plate (I).
4. Tighten the 2 screws (C) firmly.



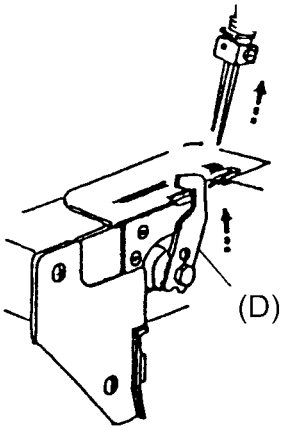


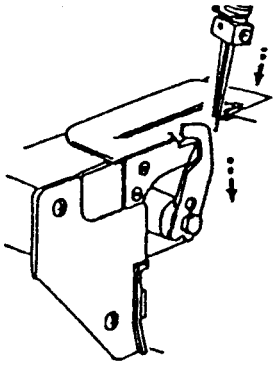
UPPER KNIFE TIMING

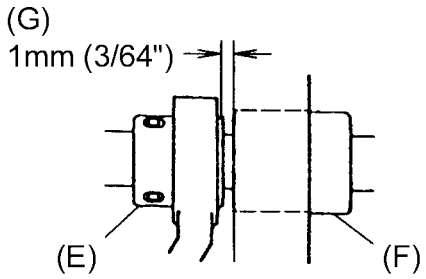
When the needle bar is at the highest position, the upper knife (D) should be also at the highest position.

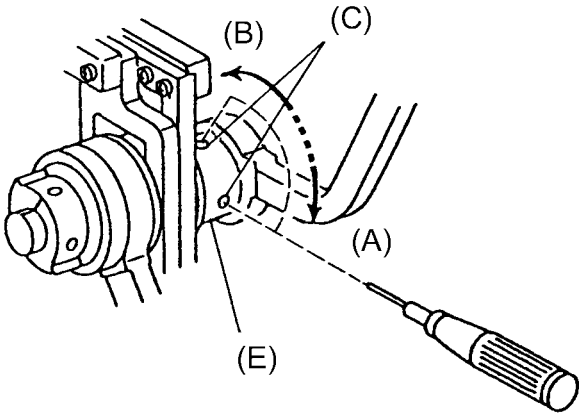
TO ADJUST

1. Remove the machine base (Refer to page 7).
2. Loosen the 2 set screws (C), then
   * turn the upper knife drive cam (E) to the direction of (A) when the upper knife timing is delayed.
   * turn the upper knife drive cam (E) to the direction of (B) when the upper knife timing is advanced.
3. Tighten the 2 set screws (C) firmly.
   There should be 1 mm clearance (G) between upper knife drive cam (E) and bushing (F).
4. Turn the balance wheel toward you one cycle, and recheck the upper knife timing.
5. Attach the machine base (Refer to page 7).









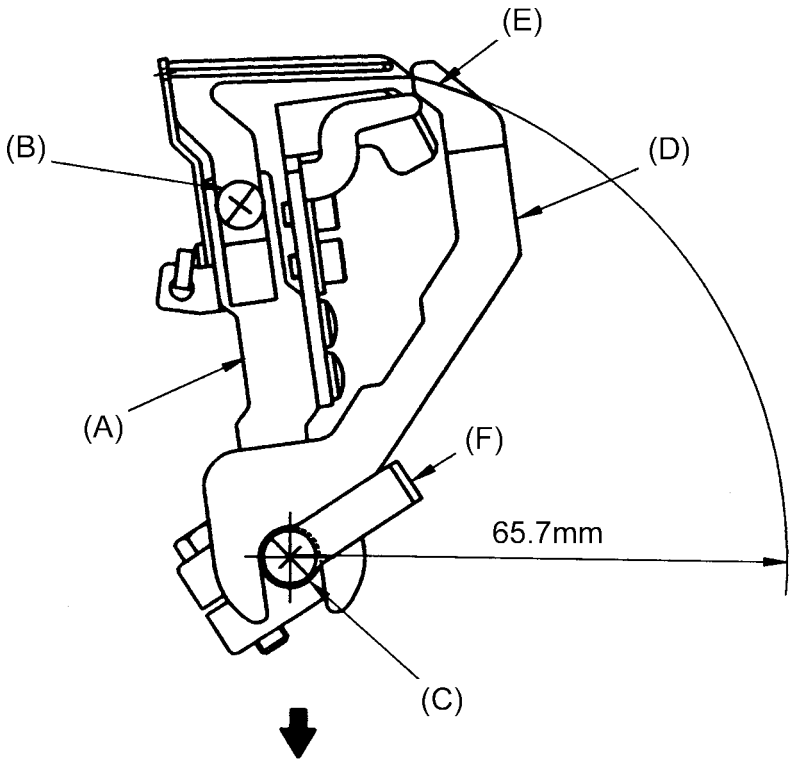
LOWER LOOPER HEIGHT

The height of the lower looper (B) should be 65.7 mm from the center of the lower looper shaft (C).

TO ADJUST

1. Set the upper knife in down position to loosen set screw (A).
2. Turn the hand wheel to set the lower looper (B) at the rightmost position.
3. Remove set screw (A) and remove the lower looper (B).
4. Turn the hand wheel to set the lower looper (B) at the leftmost position.
5. Set the gauge No. 787-G01 (D) to the lower looper shaft (C).
6. Turn the hand wheel to set the lower looper (B) at the rightmost position.
7. Loosen set screw (A), and move the lower looper up or down to set the tip of lower looper in line with guide line (E) of the gauge (D) as shown.
   * Make sure the gauge (D) is pushed down as far as it goes.
8. Tighten set screw (A).
9. Remove the gauge (D) and set the upper knife in up position.

   Note: you can adjust the height of the lower looper (B) without removing the lower looper thread guide (F).



CLEARANCE BETWEEN THE NEEDLES AND THE LOWER LOOPER I NEEDLE GUARDS

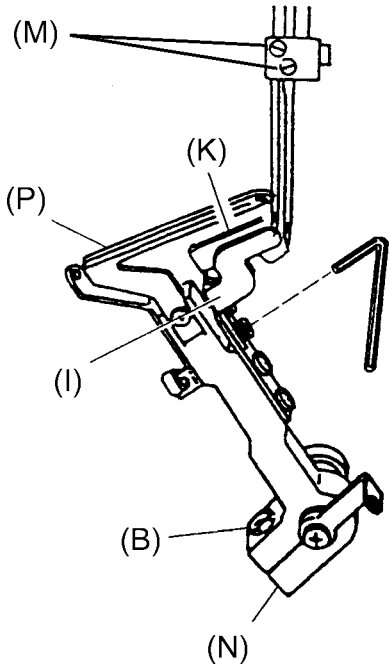
In case of size 11 needles are used, when the tip of the lower looper comes from the left just behind the needle on the left or right, the clearance between both needles (G) and the lower looper (P) should be 0 to 0.05 mm (S).
In case of size 14 needles are used, the clearance should be 0 to 0.05 mm (H) when the needles are pushed slightly by the front needle guard (I).

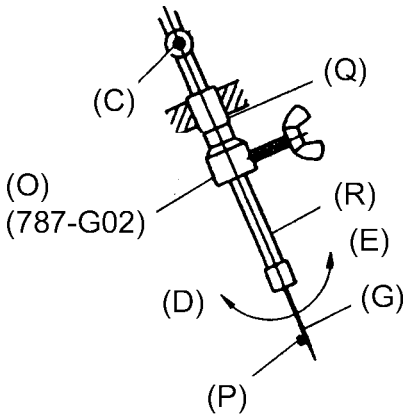
In this condition, the clearance between both needles (G or J) and the rear needle guard (K) should be 0 to 0.2 mm (L).

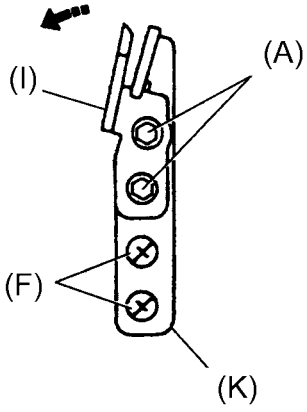
TO ADJUST

1. Remove the face plate (Refer to page 6) presser foot needle plate and needles. Insert a size 11 needle on the right.
   * To replace a needle, loosen the 2 screws (M) on the needle clamp.
2. Turn the hand wheel toward you to bring the tip of the lower looper (P) just behind the needle from the left.
3. Loosen hexagon socket screws (A) and move front needle guard (I) toward you to get clearance between the front needle guard (I) and the needle (G).
4. In this condition, the clearance between the right needle (G) and lower looper (P) should be 0 to 0.05 mm (S). If not, loosen hexagon bolt (B) just enough to move the lower looper driving arm (N). Move it backward or frontward to get the proper clearance between lower looper (P) and needle (G). Tighten hexagon bolt (B). Do not tighten hexagon bolt (B) too much. Otherwise the lower looper driving arm (N) will be cracked.
5. Insert a size 11 needle on the left.
6. Turn the hand wheel toward you to bring the tip of the lower looper (P) just behind the needle on the left from the left.
7. Clearance between the left needle (G) and lower looper (P) should be 0 to 0.05 mm (S). If not, set the needle gauge No. 787-G02 (O) as shown. Loosen set screw (C) and turn the needle bar (P) in the direction of (D) or (E) to get proper clearance between the left needle and lower looper (P). Tighten set screw (C) firmly.
8. Remove the gauge (O).

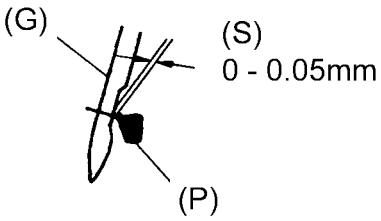
   * There should be no clearance between the needle bar lower bushing (Q) and the gauge (P).

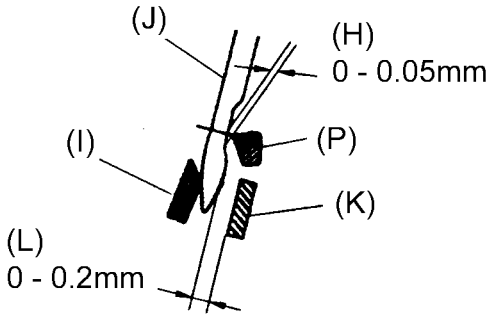






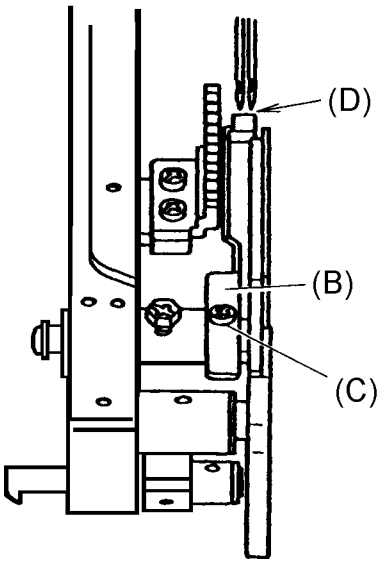
(F)

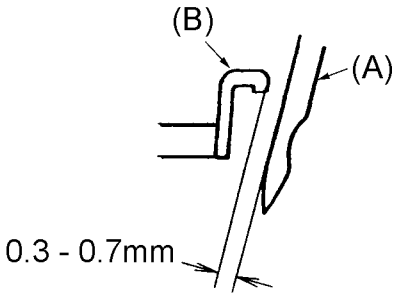




TO ADJUST THE POSITION OF THE FRONT NEEDLE GUARD.

9. Replace both needles with size 14 needles.
10. Push the front needle guard (I) slightly to adjust the clearance between the size 14 needles (J) and the lower looper (P) to 0 to 0.05 mm (H). Tighten hexagon socket screws (A).
    Note: No need to adjust the position of rear needle guard (K)
11. Check the lower looper timing (Refer to page 22).
12. Check the clearance between the loopers (Refer to page 25).
13. Attach the face plate (Refer to page 6), needle plate and presser foot.



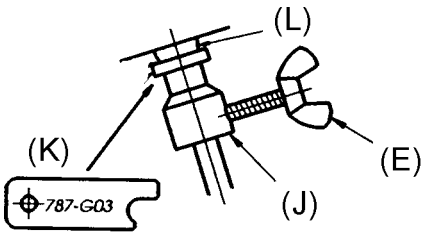


TO ADJUST THE CLEARANCE BETWEEN THE NEEDLE AND THE FIXED NEEDLE GUARD

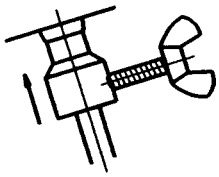
The clearance between the needle (A) and the fixed needle guard (B) should be 0.3 to 0.7mm (3/256" to 7/256").

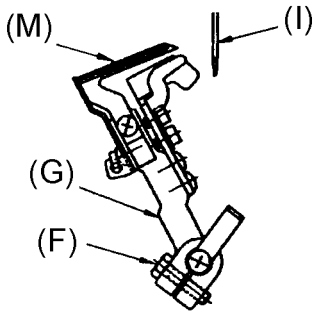
TO ADJUST

1. Open the side cover and looper cover. Remove the presser foot and needle plate.
2. Bring the needle to the lowest position.
3. Loosen set screw (C). Adjust the fixed needle guard (B) by moving it back and forth. The clearance between the needle (A) and the fixed needle guard (B) should be 0.3 to 0.7 mm (3/256 to 7/256'). Tighten set screw (C).
   * Be careful not to move the fixed needle guard laterally (left or right).
4. Attach the needle plate and presser foot. Close the side cover and looper cover.

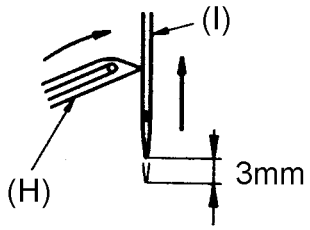


*** A ***


*** B ***



*** C ***



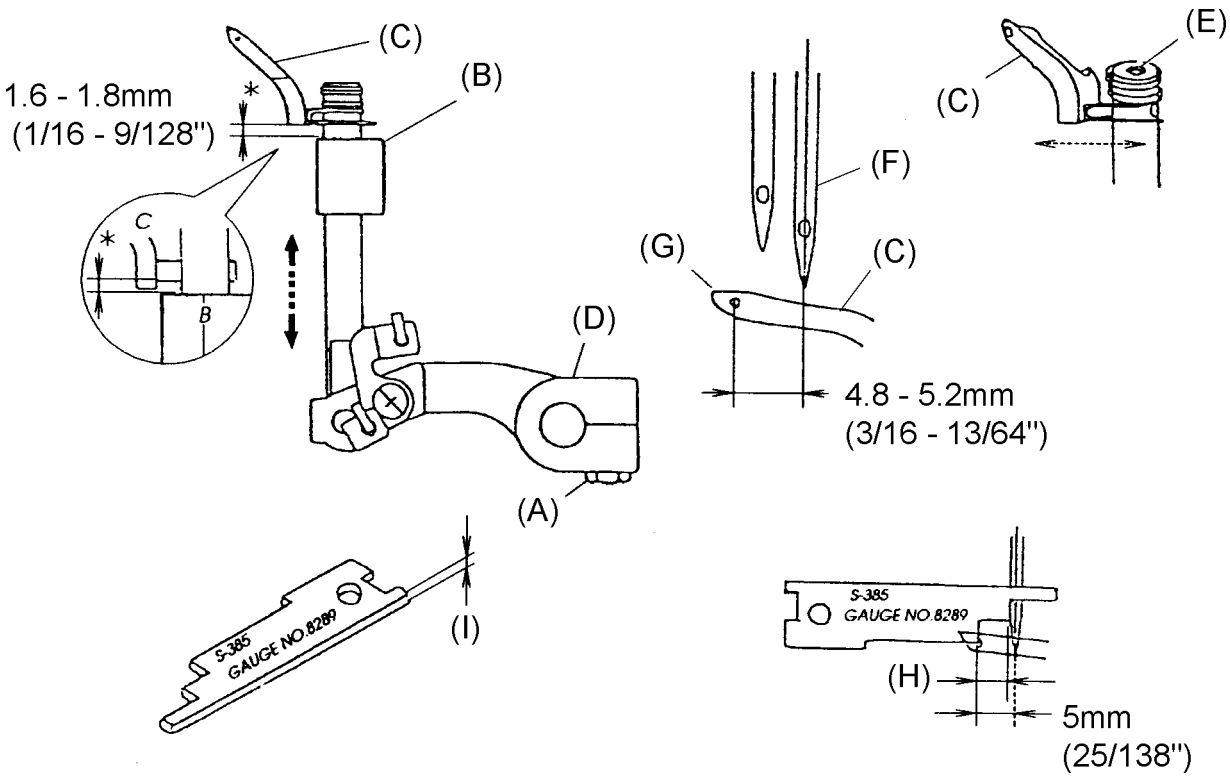
*** D ***

LOWER LOOPER TIMING

When the needle comes up 2.8 to 3.2mm (7/64 to 1/8") from the lowest position, the tip of the lower looper (H) comes just left of the needle (I) on the right.

TO ADJUST

1. Remove the presser foot, needle plate and left-side needle.
2. Change the right-side needle to size 11 one.
3. Turn the hand wheel toward you to set the lowest needle position.
4. Set the Gauges 787-G02 (J) and 787-G03 (K) with the bolt (B) as shown in *** A ***.
   * There should be no clearance between the gauges (J & K) and the needle bar lower bushing (L).
5. Remove the Gauge 787-G03. Then turn hand wheel toward you until it touches the needle bar lower bushing (L) as shown in *** B ***.
6. In this condition, loosen the hexagon bolt (F) just enough to move the lower looper driving arm (G). Adjust the lower looper position so that the tip of lower looper comes to the left side of the needle. Tighten hexagon bolt (F) as shown in *** C *** and *** D ***. Do not tighten the bolt (F) too much. Otherwise the lower looper driving arm (G) will be cracked.
7. Remove the Gauge 787-G02.
   * Check the clearance between the needle and lower looper. (Refer to pages 19 & 20.)
   * Check the clearance between the loopers. (Refer to page 25.)
8. Attach size 14 needles to the needle clamp.
9. Attach the needle plate and presser foot.

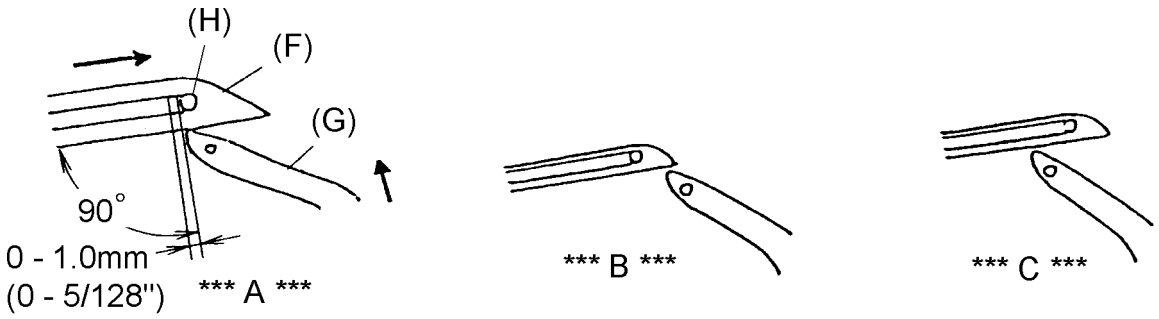


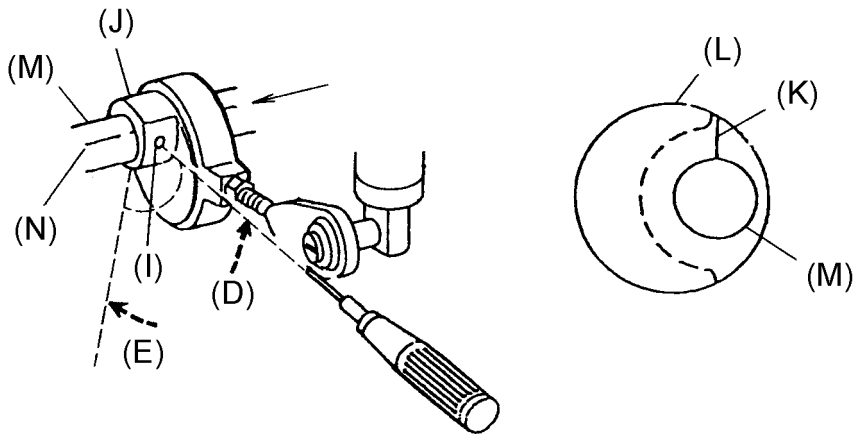
UPPER LOOPER POSITION

When the upper looper (C) is at the leftmost position. The distance between the center of needle on the right (F) and the center of looper eye (G) should be 4.8 to 5.2mm (3/16 to 3/64”).
The space between the upper looper shaft guide (B) and the bottom of the upper looper (C) should be 1.6-1.8mm (1/16 to 9/128”) when the upper looper is set at the lowest position.

TO ADJUST

1. Remove the machine base. (Refer to page 7.)
2. Make sure that the marking-off line on the upper looper drive cam is in line with the one on the main shaft. (Refer to page 17.)
3. Remove the looper cover unit. (Refer to page 9.)
4. Loosen the hexagon bolt (A), and adjust the distance between the upper looper shaft guide (B) and bottom of upper looper (C) by using the part (I) of the Gauge 8289. The distance should be 1.6 to 1.8 mm (1/16 to 9/128”) when the upper looper (C) is at the lowest position.
5. Tighten the hexagon bolt (A). Be careful not to tighten too much otherwise the upper looper drive arm (D) will be cracked.
6. Turn the hand wheel and bring the upper looper (C) to the leftmost position.
7. Loosen the set screw (E), and adjust the distance between the center of needle and center of upper looper eye (G) by using the part (H) of the Gauge 8289.
8. Tighten the set screw (E).
9. Check the upper and lower loopers timing (Refer to page 25), clearance between upper and lower loopers (Refer to page 26) and clearance between the needle and upper looper (Refer to page 26).





UPPER & LOWER LOOPERS TIMING

When lower looper (F) moves to the right, the tip of upper looper (G) meets the lower looper (F) within 1mm (5/128") from the left of lower looper eye (H) as shown in *** A ***.

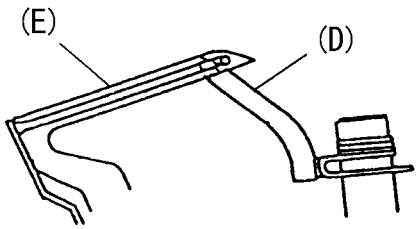
TO ADJUST

1. Before proceeding this adjustment, check the lower looper timing (Refer to page 22) and the position of upper looper (Refer to page 23).
2. Remove the machine base (Refer to page 7), needle plate and presser foot.
3. Loosen the 2 set screws (I), and adjust the timing by turning the upper looper drive cam (J) to the direction of:
   * D if the timing of upper looper is advanced as shown in *** B ***.
   * E if the timing of upper looper is delayed as shown in *** C ***.

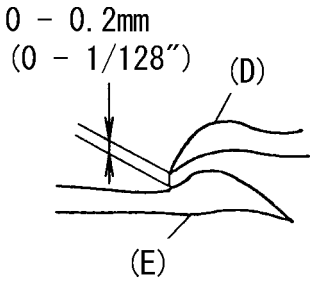
   The allowance is 1 mm (5/128") from the left edge of lower looper eye (H) as shown in *** A ***
4. Tighten the 2 set screws (I).
5. Check the clearance between the loopers. (Refer to page 25.)
6. Attach the machine base (Refer to page 25.), needle plate and presser foot.

   Note: Adjustment would be easier if the marking-off line (K) on the upper looper drive cam (L) is set in line with the marking-off line (N) of the drive shaft (M).

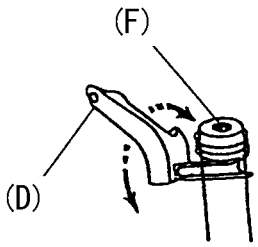
   Note: the upper looper drive cam (L) must not be moved to left or right.



*** A ***



*** B ***



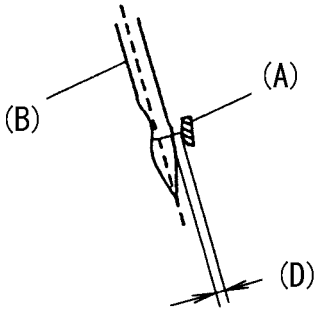
*** C ***

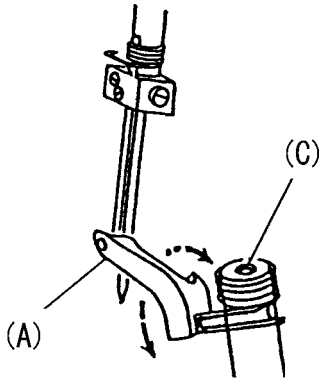
CLEARANCE BETWEEN LOOPERS

When the upper looper (D) meets lower looper (E) as shown in *** A ***, the Clearance should be 0 to 0.2 mm (0 to 1/128”) as shown in *** B ***.

TO ADJUST

1. Remove the presser foot and needle plate.
2. Turn the hand wheel toward you with your hand to bring the loopers as shown in *** A ***.
3. Loosen the set screw (F), and adjust the clearance by moving the upper looper (D) to the back or front as shown in *** C ***.
4. Tighten the set screw (F) firmly.
5. Check the clearance between the upper looper and needle (Refer to page 26).
6. Attach the needle plate and presser foot.





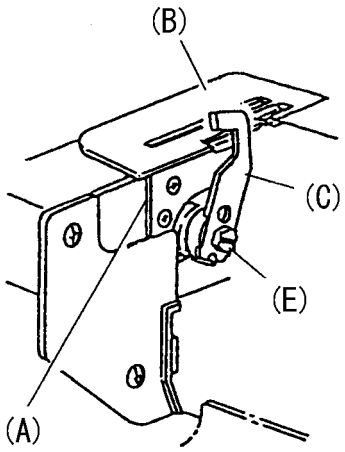
CLEARANCE BETWEEN NEEDLE AND UPPER LOOPER

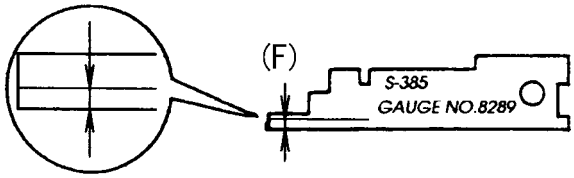
When the upper looper (A) meets with needle (B), the clearance (D) should be:

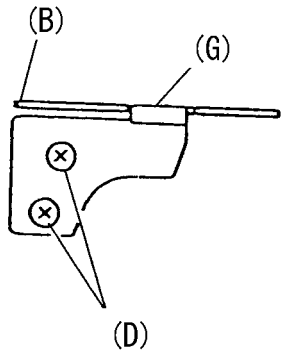
- 0.1 to +0.15mm (-1/256 to +3/512") at the needle on the left.
- 0.2 to +0.05mm (-1/128 to +1/512") at the needle on the right.

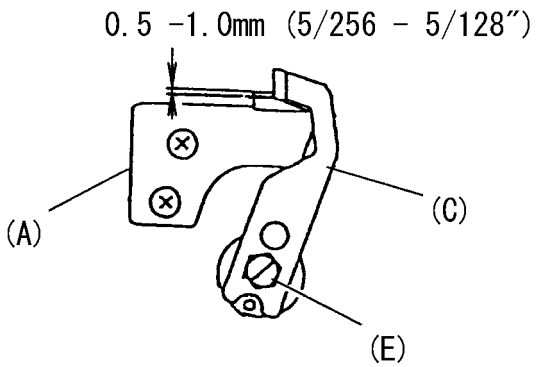
TO ADJUST

1. Turn the hand wheel toward you with your hand to bring the needle just behind the upper looper (A) in downward travel.
2. Loosen the set screw (C), and adjust the clearance between the both needles and upper looper (A).
3. Tighten the set screw (C).
4. Check the clearance between the loopers. (Refer to page 25.)
5. Check the upper looper position after the adjustment. (Refer to page 23.)







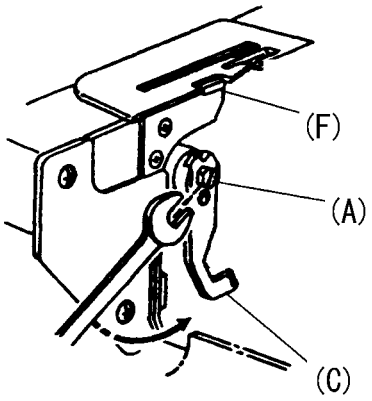


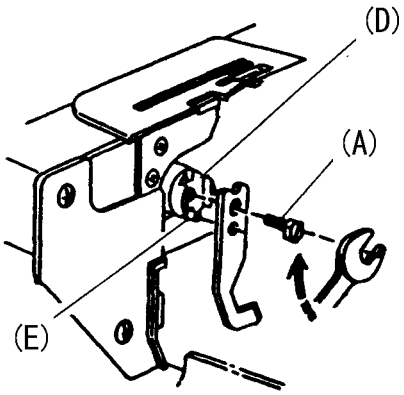
POSITION OF KNIVES

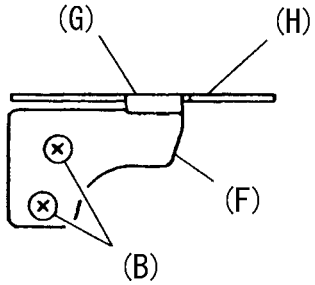
The top of lower knife (A) should be leveled with the surface of needle plate (B).
When the upper knife (C) is at the lowest position, the front lower corner of upper knife (C) should be 0.5 to 1.0 mm (5/256 to 5/128”) below the edge of lower knife.

TO ADJUST

1. Before proceeding this adjustment, check the upper knife timing. (Refer to page 17.)
2. Loosen the 2 set screws (D), and adjust the lower knife position so that the top (G) of the lower knife is leveled with the surface of the needle plate. Tighten the 2 set screws (D).
3. Turn the hand wheel to bring upper knife (C) at the lowest position.
4. Loosen the hexagon bolt (E). And adjust the position of upper knife (C) by using the part (F) of Gauge 8289.
5. Tighten the hexagon bolt (E).







POSITION OF LOWER LOOPER THREAD GUIDES

LOWER LOOPER THREAD GUIDE (A)

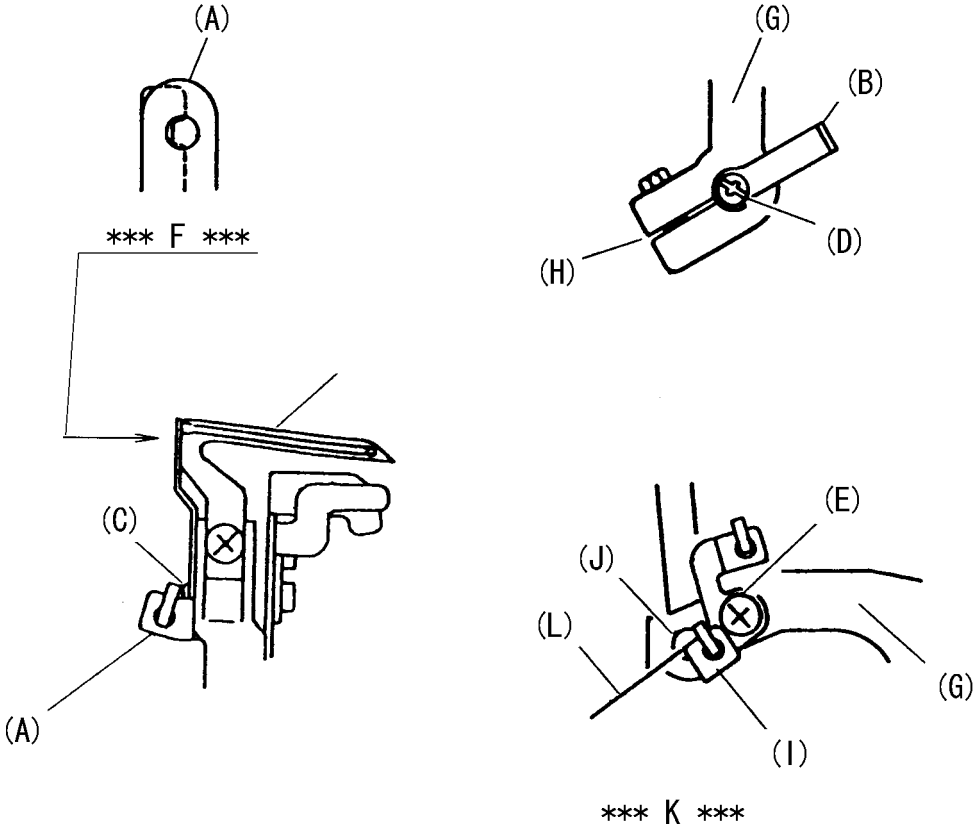
Loosen the set screw (C), and adjust the lower looper thread guide (A) so that the hole of thread guide is in line with the groove of lower looper as shown in ** F **.
Be careful not to raise the lower looper thread guide (A) too high. Otherwise it will touch the metal of the arm, the feed dog or the feed dog platform.

LOWER LOOPER THREAD GUIDE(B)

Loosen set screw (D) on lower looper thread guide (B). Align lower looper thread guide (B) with the slit (H) on the lower looper drive arm (G) as shown. Tighten set screw (D).

LOOPER THREAD TAKE-UP LEVER (I)

Loosen the set screw (E), and adjust the position of looper thread take-up lever (I) so that the side of looper thread take-up lever (I) comes over the center (L) of hole (J) as shown in ** K **.



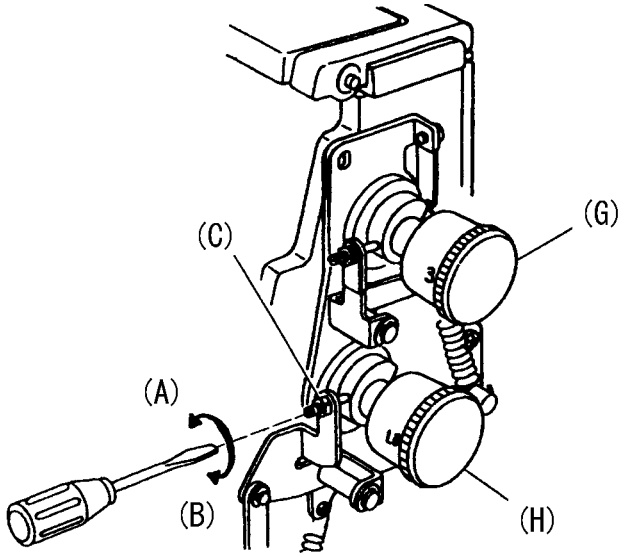
DIFFERENTIAL FEED RATIO

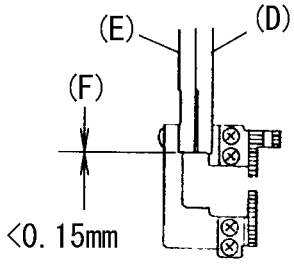
CORRECT SETTING

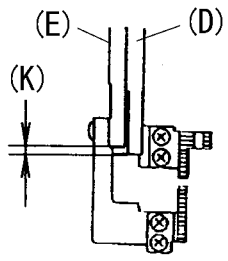
When the stitch length dial (G) is set at “3” and the differential feed dial (H) at 1.0, the difference of the feed amount between the main feed dog (D) and sub feed dog (E) should be less than 0.15mm (1/128”) (F).

TO ADJUST

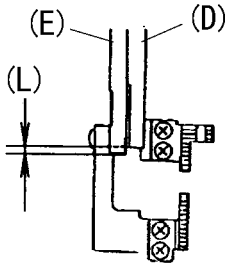
1. Remove the front panel unit and needle plate. (Refer to page 10).
2. Set the stitch length dial (G) at “3” and the differential feed dial (H) at “1.0”.
3. Adjust the difference of the amount of movement between main feed dog (D) and sub feed dog (E).
   * If the amount of movement (K) of sub feed dog (E) is larger than that of main feed dog (D) as shown in ** I **, turn the adjust screw (C) counter-clockwise (direction of A).
   * If the amount of movement (L) of sub feed dog (E) is smaller than that of main feed dog (D) as shown in ** J **, turn the adjust screw (C) clockwise (direction of B).
4. Attach the front panel unit and needle plate. (Refer to page 10).







*** I ***



*** J ***

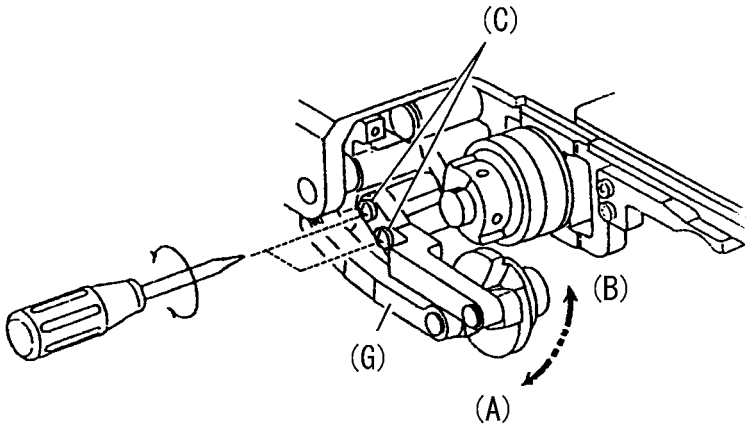
CLEARANCE BETWEEN MAIN & SUB FEED DOGS

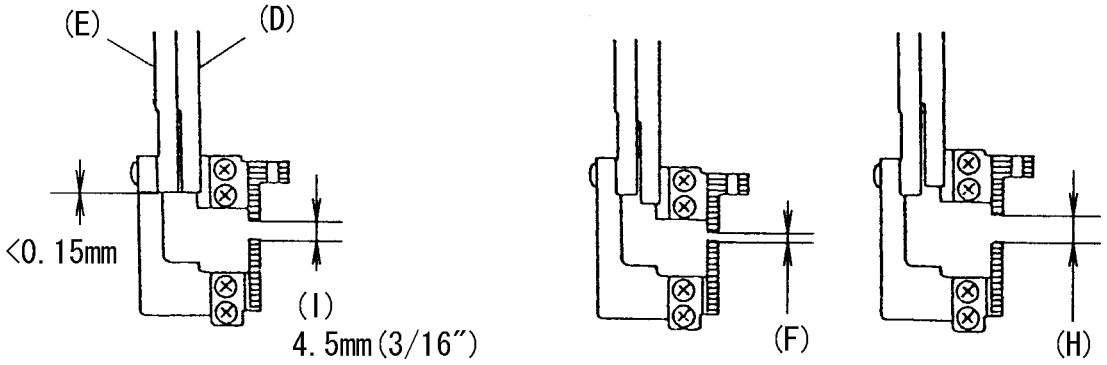
CORRECT SETTING

When the differential feed dial is set at “1 .0”, the front ends of both main (D) and sub feed (E) dogs should be level (less than 0.15 mm) (1/12&) or the clearance between both feed dogs should be 4.5 mm (3/16”) (I).

TO ADJUST

1. Set the stitch length dial at “3” and the differential feed dial at “‘1.0.
2. Adjust the clearance between the main and sub feed dogs. Check if the both front ends of main feed bar and sub feed dogs are leveled.
   * If the distance between the front end of the sub feed dog and that of main feed dog is too narrow (F), loosen the two set screws (C) and lower the sub feed arm (G) by moving to the direction of A.
   * If the distance between the front end of the main feed dog and that of sub feed dog is too wide(H), loosen the two set screws (C) and raise the sub feed arm (G) by moving to the direction of B.
3. Tighten the two set screws (C) firmly.

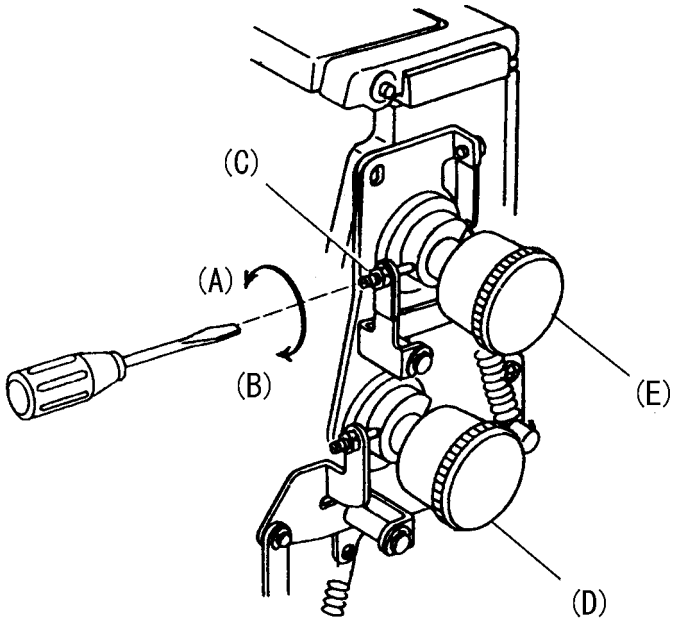


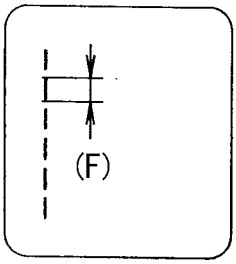


STITCH LENGTH

CORRECT SETTING
The actual stitch length (F) should be 2.8 to 3.0 mm (7/64 to 8/64”) when the stitch length dial (E) is set at “3”.

TO ADJUST
1. Remove the front panel unit. (Refer to page 10.)
2. Set the stitch length dial (E) at “3” and the differential feed dial (D) at “1.0”.
3. If actual stitch length (F) is longer than 3.0 mm (8/64’), turn the adjust screw (C) to the direction of A.
   If actual stitch length (F) is shorter than 2.8 mm (7/64”), turn the adjust screw (C) to the direction B.
4. Attach the front panel unit. (Refer to page 10.)

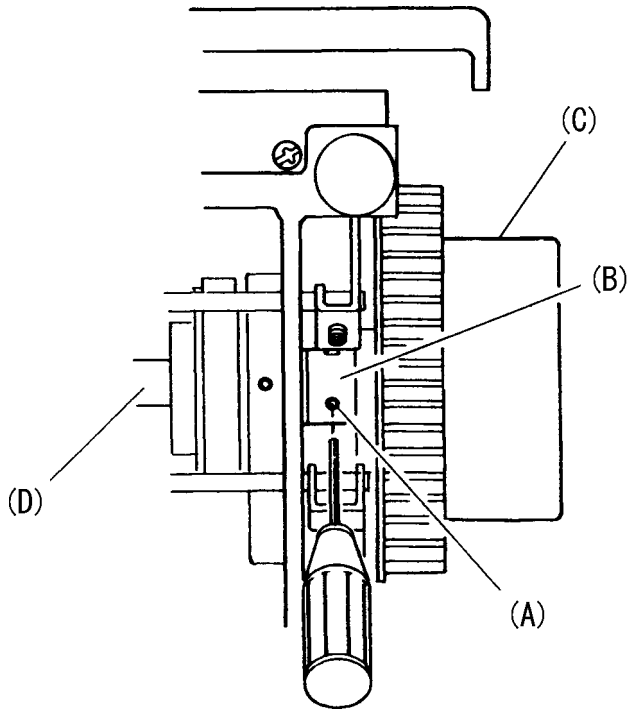




PLAY OF MAIN SHAFT

WHAT TO DO WHEN THE MAIN SHAFT IS LOOSE LATERALLY

1. Remove the belt cover and machine base (Refer to pages 6 & 7).
2. Remove the belt from the hand wheel pulley (C).
3. From the bottom of the machine, loosen set screw (A) on the main shaft ring (B). Slide the ring (B) to reduce the play on the main shaft (D). Tighten the set screws(A).
4. Put the belt back on the hand wheel.
5. Attach the belt cover and machine base (Refer to pages 6 & 7.)



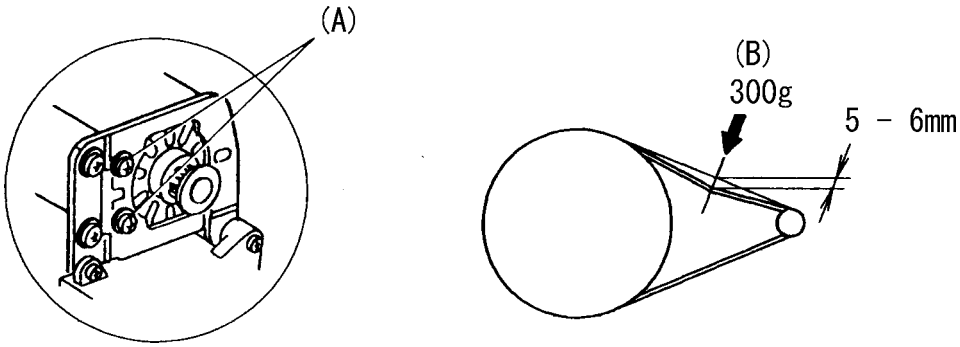
BELT TENSION

CORRECT SETTING

To check the belt tension, press the belt in the middle of the span lightly with your finger (approx. 300g). The belt should depress 5 to 6 mm (13/64” to 15/64”).

TO ADJUST

1. Remove the belt cover (Refer to page 6.)
2. Loosen the 2 set screws (B), then tighten them slightly.
   Adjust the belt pressure, then tighten both set screws firmly.
3. Turn the hand wheel a few rotation and check the belt tension again.
4. Attach the belt cover.



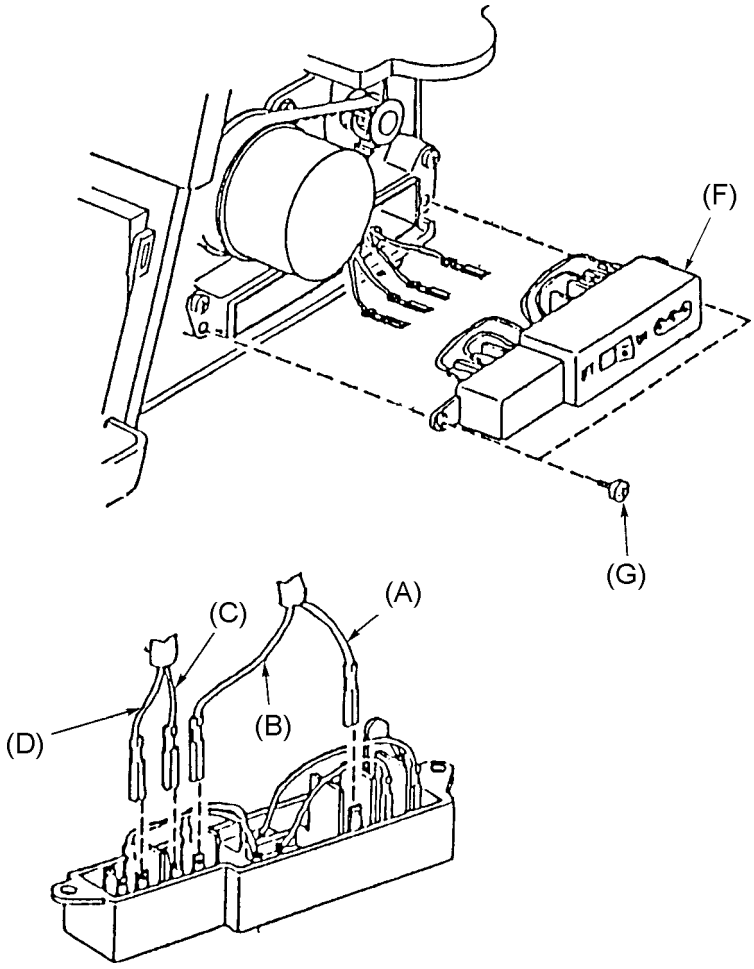
REPLACEMENT OF MACHINE SOCKET

To remove:

1. Remove the belt cover.
2. Remove the two setscrews (G), and pull out the cord connectors (A, B, C & D).

To attach:

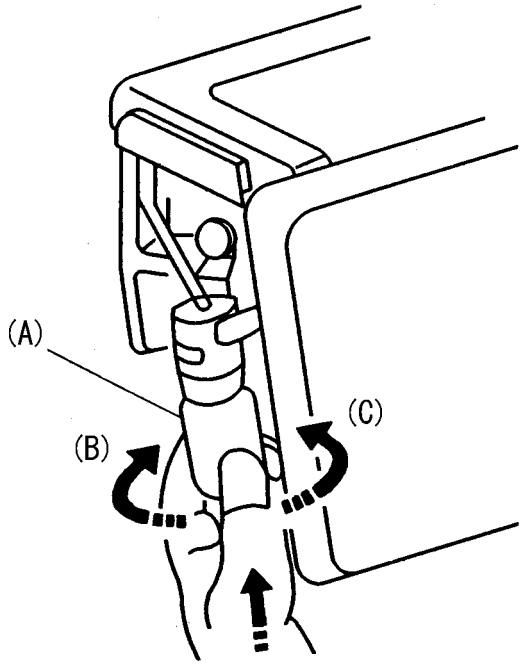
3. Insert the cord connectors (A, B, C & D) as shown below.
   Connectors:
   A: Blue for motor
   B: Brown for motor
   C: Brown for lamp socket
   D: Blue for lamp socket
4. Attach the machine socket (F), and tighten the two screws (G).
5. Attach the belt cover unit.



REPLACEMENT OF LAMP

TO CHANGE THE LAMP

1. Remove the face plate (Refer to page 6).
2. Push the light bulb (A) up and turn the bulb counter-clockwise (B) to remove it.
3. Put the new bulb in by pushing it up and turning it clockwise (C).
4. Attach the face plate (Refer to page 6).



OILING

Apply a few drops of fine quality sewing machine oil to the parts indicated with arrows (A, B, C, D, E & F).

It is recommended to apply oil once a week in normal use, once in ten hours in continuous use.