



# MODEL LH-1162

2-NEEDLE, NEEDLE FEED LOCKSTITCHER  
WITH ORGANIZED SPLIT NEEDLE BAR

## INSTRUCTION BOOK

Before operating your JUKI Lockstitch Machine, please read this Instruction Book carefully in order to operate it in the correct and efficient manners.

### BEFORE OPERATION

1. Don't run the machine before filling the oil reservoir with the prescribed lubricating oil.
2. After setting up your machine, make sure that it runs in the correct direction; lower the needle by turning the handwheel and watch the handwheel's revolution by momentarily switching the power "on" (correct rotational direction of the handwheel: counterclockwise when viewed from the handwheel's end).
3. Run the newly installed machine at a speed of 2500 s.p.m. or lower for the first 4 weeks.

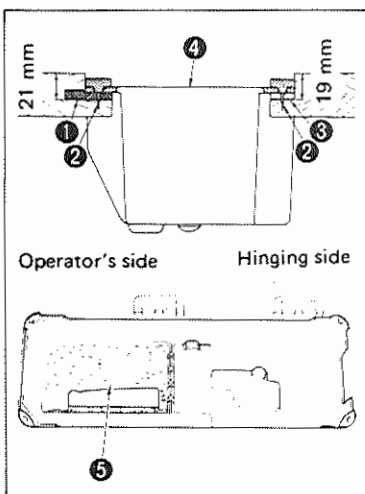
### CAUTION IN OPERATION

1. Don't put your hand under the needle when you turn "on" the power switch or operate the machine.
2. Don't put your hand into the thread take-up cover while the machine is running.
3. Don't forget to cut off the power supply before you tilt the machine head backwards or replace the V-belt.
4. Never bring your fingers or hair close to, or place anything on the handwheel, V-belt, bobbin winder wheel or motor during operation. It may lead to serious personal injuries.
5. If your machine is provided with a belt cover, finger guard and eye guard, never operate your machine with any of them removed.

### SPECIFICATIONS

Stitch specification	A	S
Fabrics	Light-weight	General fabric medium-weight
Sewing speed	See "29. TABLE OF SEWING SPEED FOR GAUGES" (P. 10)	
Stitch length (max.)	4 mm (5/32") (Forward and reverse)	Forward: 6 mm (15/65") Reverse: 4 mm (5/32")
Needle	DP x 17 #9 ~ #11	DP x 17 #11 ~ #18
Needle gauge	1/8", 5/32", 3/16" (standard), 7/32", 1/4", 9/32", 5/16", 3/8", 1/2"	
Presser foot lift	9 mm (23/64") by hand lifter, 10 mm (25/64") by knee lifter	
Lubricating oil	JUKI New Defrix Oil No. 1	

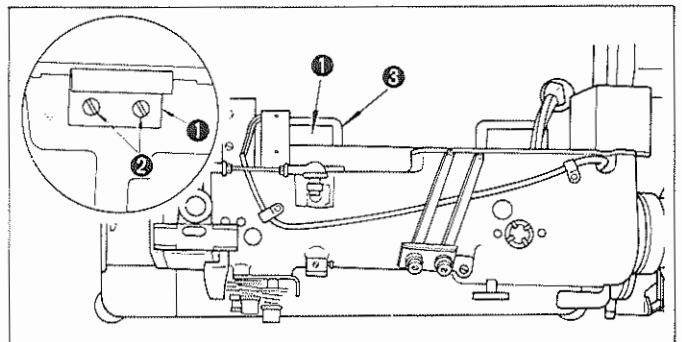
### 1. INSTALLATION



#### ★ Attaching the oil reservoir:

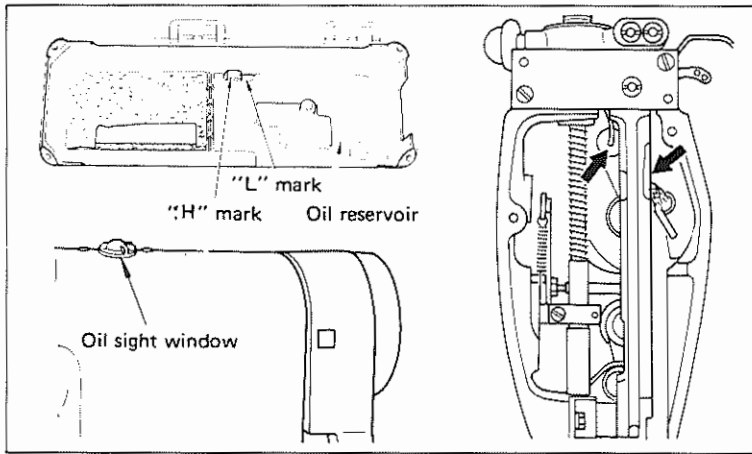
Nail rubber cushions ① on two corners on the operator's side using nails ②, nail felt cushions ③ on the two corners on the hinging side using nails ② and place oil reservoir ④ in the way that it is supported by these four corners.

Place foamed polyurethane pad ⑤ on the bottom of the oil reservoir.



Fasten hinge ① to the bed surface using flush-head screws ② and place the head on the rubber cushions on four corners by engaging the hinge with rubber hinge ③ on the table.

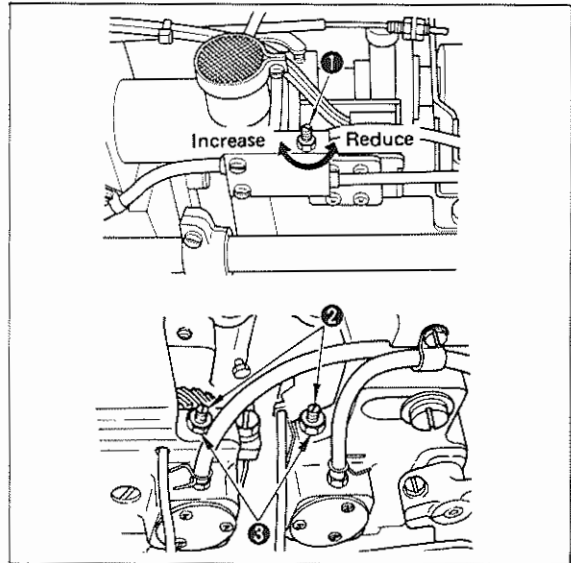
## 2. LUBRICATION



### ★ Before operating machine:

1. Pour the JUKI New Defrix Oil No. 1 into the oil reservoir up to "H" mark.
2. Add the same lubricating oil as soon as the oil level has come down to the "L" mark level.
3. Run the machine and make sure that the oil splash is seen in the oil tank window.

**(CAUTION)** Before operating newly installed machines or machines which have not been used for a relatively long period of time, apply two or three drops of oil to the parts by arrows and let them idle for about 10 minutes at 2000 s.p.m.



### ★ Adjustment of oil amount for the face plate components:

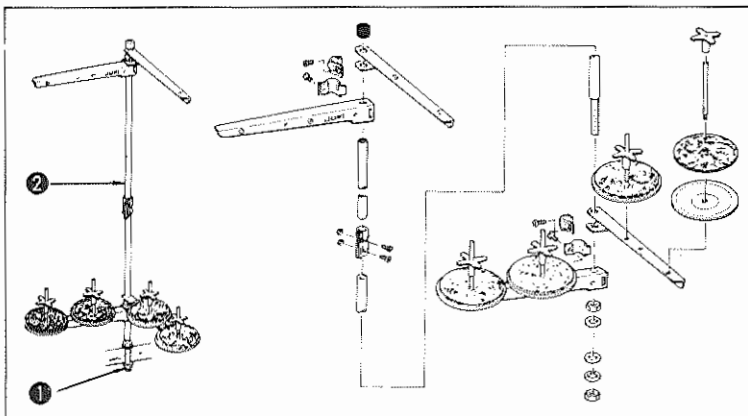
Turn screw ① clockwise to increase or counter-clockwise to reduce the amount of lubricating oil supplied to the components in the face plate.

### ★ Adjustment of oil amount for the hook:

Loosen nut ③ and turn adjusting screw ② clockwise to increase or counter clockwise to reduce the amount of oil fed to the hook.

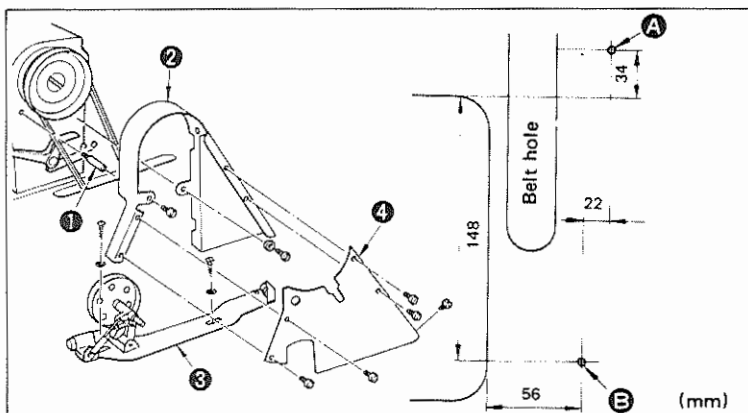
**(CAUTION)** In order to prevent adjusting screw ② from breakdown, gently tighten nut ③.

## 3. INSTALLATION OF THREAD STAND



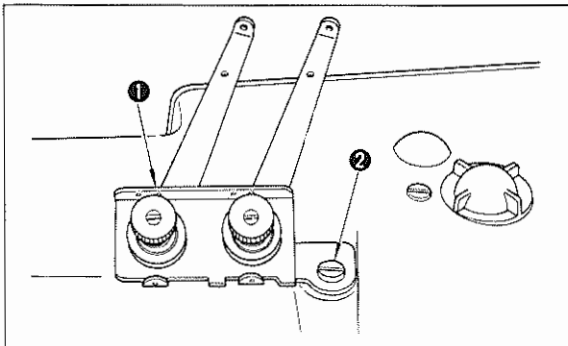
Assemble the thread stand, set it up on the machine table using the installation hole in the table and tighten nut ① gently. When you use power supplied by the overhead power line, pass the power supply cord through hollow spool rest rod ②.

## 4. ATTACHING THE BELT COVER AND THREAD WINDER



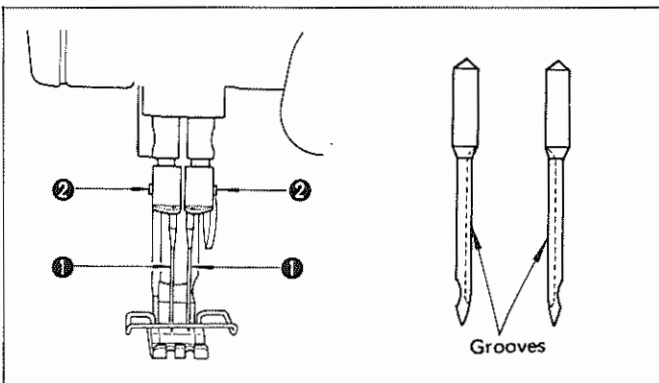
1. Make guide holes A and B in the table for wood screws.
2. Screw belt cover post ① into the tapped hole in the machine arm.
3. Fix belt cover ② to the belt cover post and then to the groove on the machine arm.
4. Put thread winder assembly ③ in the belt cover and adjust its position.
5. Attach top cover ④ to the belt cover.
6. Tilt the head back and make sure that the belt cover does not touch the table.
7. Fix the thread winder using the wood screws and guide holes A and B.

## 5. ATTACHING THE THREAD GUIDE BASE



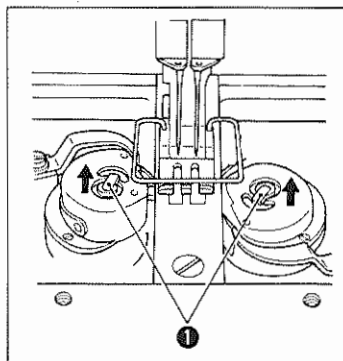
Using setscrew ②, securely fix supplied thread guide base ① on the machine head.

## 6. ATTACHING THE NEEDLES



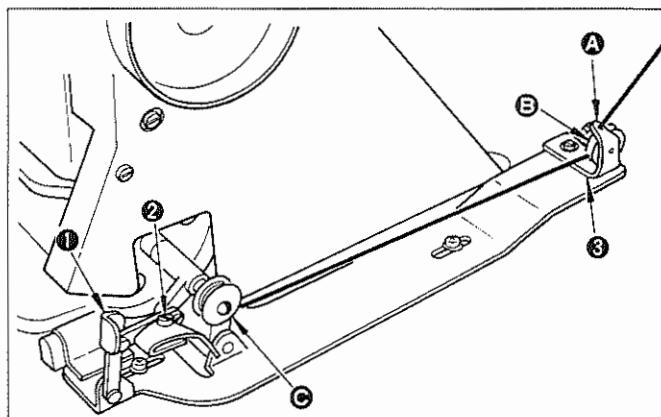
- ★ Turn off the motor switch.
- ★ Make sure that the motor has completely stopped and attach the needle as follows;
  1. Turn the handwheel to bring the needle bar to the highest position of its stroke.
  2. Insert both needles ① into the needle clamp holes as far as they will go in the way that their long grooves face each other and firmly tighten clamp screws ②

## 7. HOW TO TAKE OUT THE BOBBIN CASE



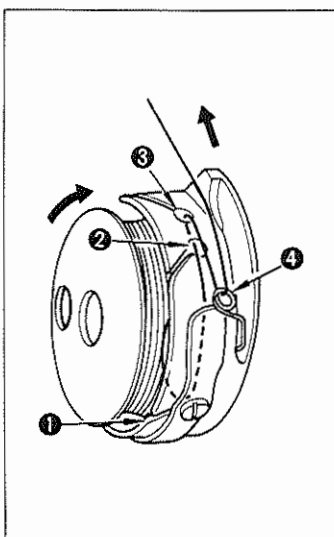
1. Lift latch ① and take out the bobbin case and the bobbin together.
2. Hold the bobbin case by latch raised, put it into the shaft in the hook correctly and release the latch.

## 8. WINDING THE BOBBINS (SINGLE BOBBIN WINDER)



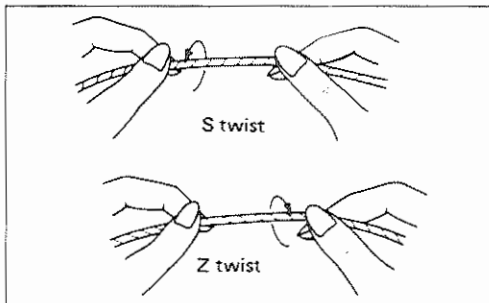
1. Take the thread end from a thread spool, pass it through the thread guides as illustrated (A, E, C) and wind it several turns round the bobbin.
2. Tilt bobbin presser ① permitting the thread winder pulley to touch the running belt.
3. Adjust screw ② to wind a bobbin about 80% of its capacity; turn the adjusting screw clockwise to increase or counterclockwise to reduce the amount of thread to be wound.
4. If the bobbin is wound unevenly, adjust it by moving the position of tension bracket ③ to the left or the right.
5. When the bobbin is filled up, the bobbin presser automatically releases the thread winder pulley from the running belt.

## 9. THREADING THE BOBBIN CASE



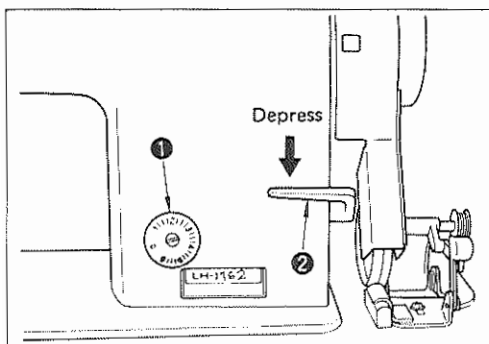
1. Hold a bobbin in the way that the thread end is directed to the right and put it into the bobbin case.
2. Pass the thread through guide slip ① on the bobbin case.
3. Pull the thread so that it passes under the tension spring.
4. Pass it through another guide slit ② on the bobbin case.
5. Pass the thread through guide slit ③ on the bobbin case from the inside.
6. Pass the thread through the loop of bobbin thread absorbing spring ④.

## 10. TWIST OF SEWING THREAD



It is advisable to use the left-twist thread (S twist) for the needle on the left and the right-twist thread (Z twist) for the needle on the right. If it is not possible, use only the right-twist thread (Z twist). Either twist will do for the bobbin thread.

## 12. STITCH LENGTH

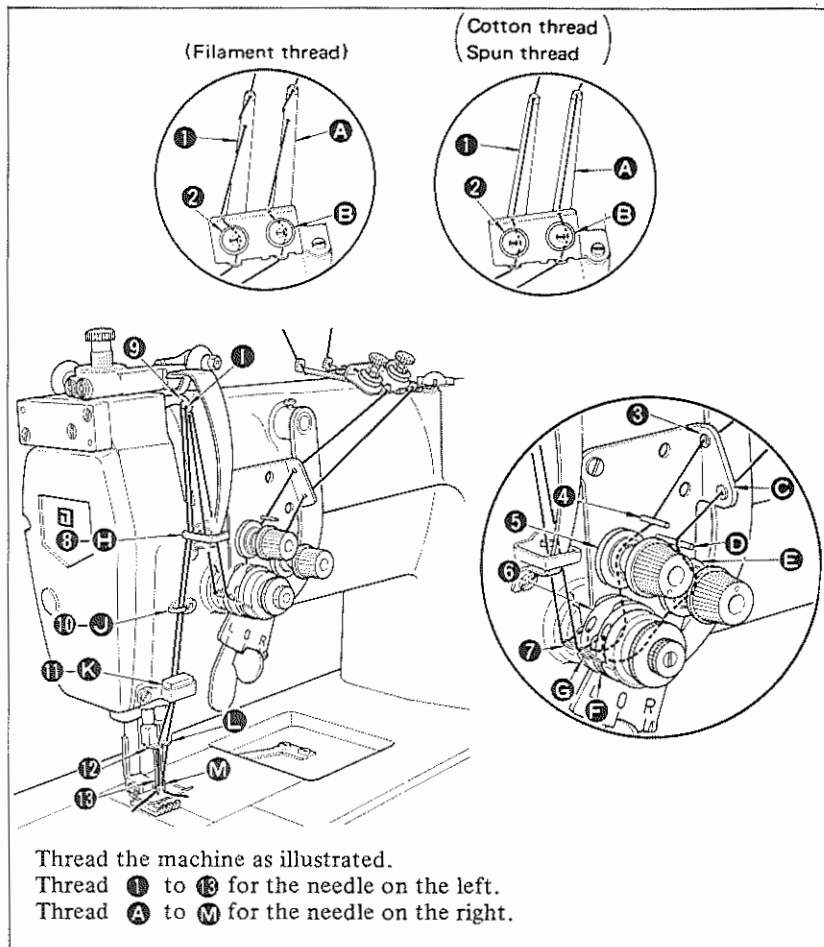


Set stitch dial ① for a desired stitch length.

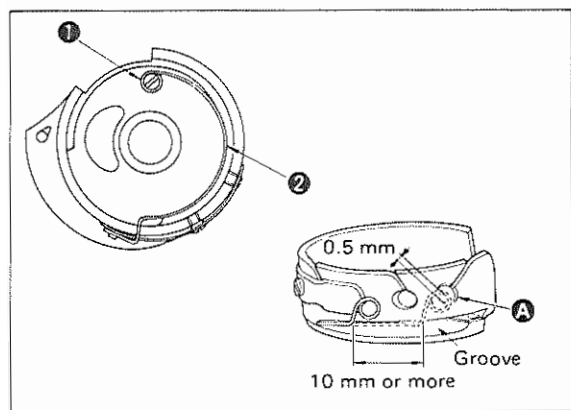
### ★ Reverse feed operation

1. Depress reverse feed control lever ②.
2. Reverse stitches are made as long as you keep depressing lever ②.
3. Release lever ②, and the machine will run forward.

## 11. THREADING THE MACHINE

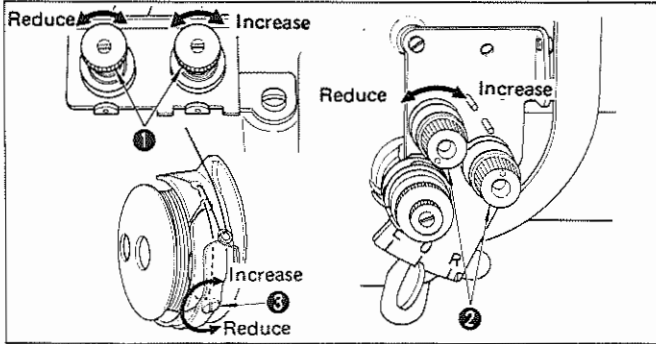


## 13. HOW TO REPLACE THE BOBBIN THREAD ABSORPTING SPRING



1. Loosen setscrew ① and remove bobbin thread absorbing spring ② from the groove on the bobbin case.
2. Insert a new spring in the bobbin case.
3. Fasten the spring to the bobbin case using screw ① in the way that the looped end of the spring can overlap 0.5 mm (1/64") with thread hole A when the spring is expanded and can withdraw 10 mm (25/64") or more from the expanded point when the spring is released as shown in the drawing. (Tension of the spring when it overlaps 0.5 mm with hole A is 8 to 12 g and becomes zero when it is released.)

## 14. THREAD TENSION



### ★ Needle thread tension

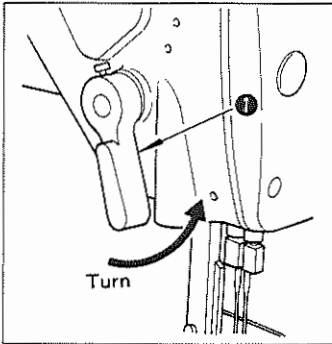
Lightly tighten the thread tension nut ① in order to permit the needle thread to run smoothly.

Turn thread tension nut No. 2 ② clockwise to increase or counterclockwise to reduce the needle thread tension.

### ★ Bobbin thread tension

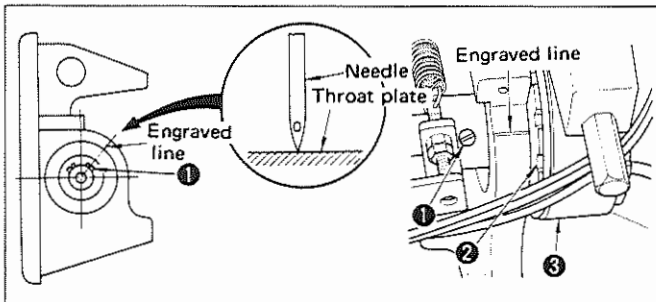
Turn tension adjusting screw ③ clockwise to increase or counterclockwise to reduce the bobbin thread tension.

## 16. HAND LIFTER



When you want to keep the presser foot in the lifted position, turn hand lifter ① in the direction of the arrow. By so doing, the presser foot will rise 9 mm (23/64") and stay until the hand lifter is lowered. Operate the knee lifter, and the presser foot will rise 10 mm (25/64") from its working level.

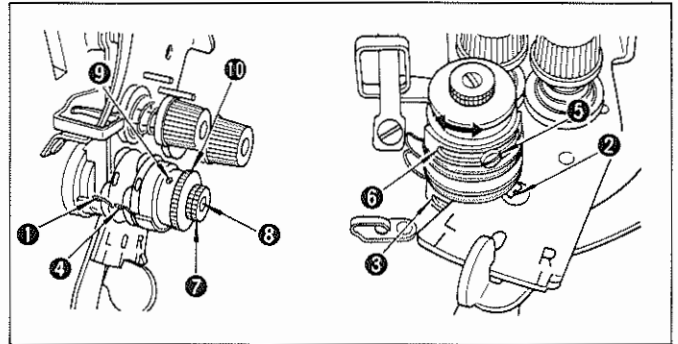
## 18. RELATION BETWEEN THE MAIN SHAFT AND THE HOOK DRIVING SHAFT



Relation between the main shaft and the hook driving shaft is determined by the timing belt. If you replace or remove the timing belt from the shaft for repair or adjustment of the related parts, you must position the timing belt exactly in the following way;

1. Set the stitch dial to "0".
2. Turn the handwheel in the normal direction until the pointed end of the needle had come down to the level of the throat plate.
3. Turn the hook driving shaft in the normal direction until the center of No. 1 setscrew ① of the hook driving shaft thrust collar aligns with the engraved line on the bed.
4. Put timing belt ③ on lower sprocket wheel ② taking care not to move the hook driving shaft and the main shaft from the above-mentioned position.

## 15. THREAD TAKE-UP SPRING



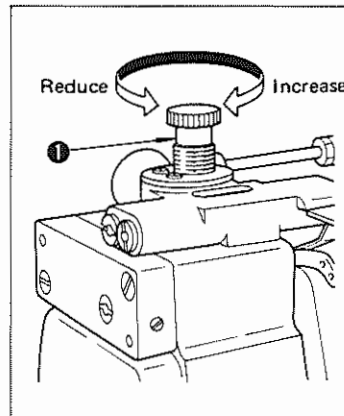
### ★ When you want to change the stroke of the spring:

1. Stroke of take-up spring ① on the left is adjustable by moving stopper ③ to the left or the right after loosening stopper setscrew ②.
2. Stroke of take-up spring ④ on the right is adjustable by moving stopper ⑥ to the left or the right after loosening stopper setscrew ⑤.
3. Move the stopper to the right to increase or to the left to reduce the stroke of the take-up spring.

### ★ When you want to change the tension of the spring:

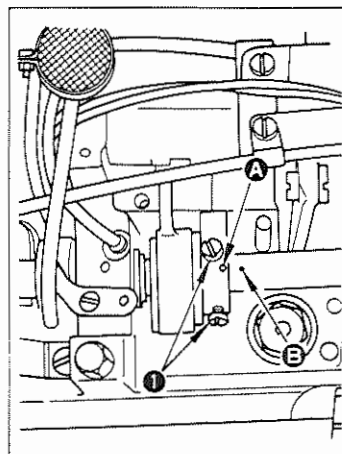
1. Tension of the take-up spring on the left is adjustable by turning stud ⑧ counterclockwise to increase or clockwise to reduce after loosening nut ⑦.
2. Tension of the take-up spring on the right is adjustable by turning spring guide ⑩ clockwise to increase or counterclockwise to reduce after loosening setscrew ⑨.

## 17. ADJUSTMENT OF THE PRESSURE OF THE PRESSER FOOT



Turn presser spring regulator ① clockwise to increase or counterclockwise to reduce the pressure of the presser foot.

## 19. ADJUSTING THE FEED TIMING

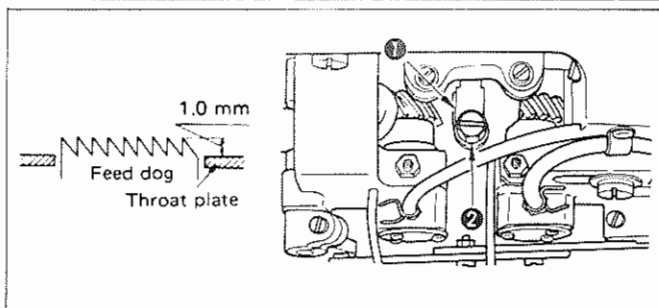


The feed eccentric guide must be fixed in phase with the hook driving shaft.

1. Loosen screws ① which set the feed eccentric guide.
2. Align engraved marker spot A on the eccentric guide with marker spot B on the hook driving shaft.

(CAUTION) When adjusting the feed eccentric guide, take care not to move it in the axial direction. Because it may increase the load.

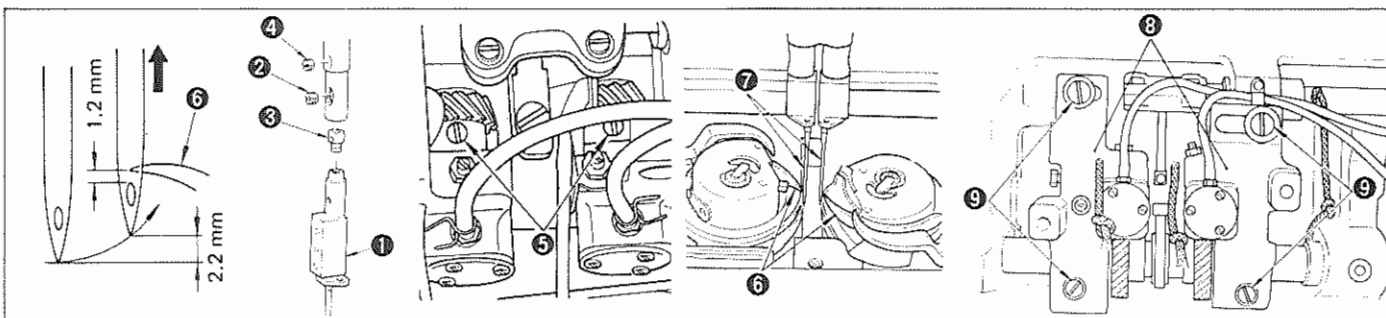
## 20. HEIGHT OF THE FEED DOG



The feed dog must protrude its teeth 1.0 mm from throat plate surface when it has come up to the highest point of its trajectory.

1. Set the stitch dial to "0".
2. Turn the handwheel in the normal direction to bring the feed dog to the highest point.
3. Loosen screw ② and adjust the height of the feed dog to 0.9 mm by moving feed bar slide fork ①.

## 21. NEEDLE-TO-HOOK RELATION



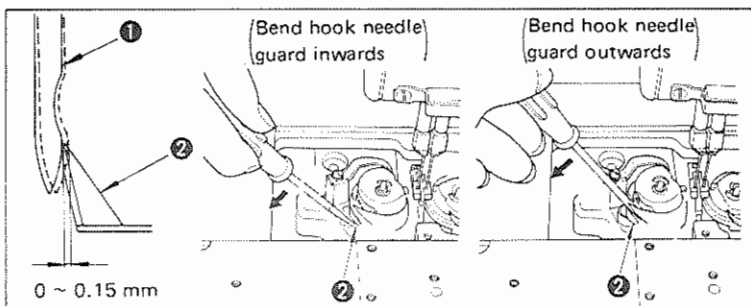
★ Set the needle-to-hook relation as follows:

1. Set the stitch dial to "4" ("A" specification : "2").
2. The standard adjustment is such that the hook blade point aligns with the center of the needle, and a distance of 1.2 mm is provided between the upper edge of the needle hole and hook blade point ⑥ when the handwheel is turned to position the needle bar above the lowest point of its stroke.
3. If the machine does not have the above standard settings, remove screw ②, and give needle clamp ① one turn (adjusting amount: 0.6 mm), or remove screw ④ and give spring guard ③ a half turn (adjusting amount: 0.3 mm) to make proper adjustment.

(Positioning the hook)

4. Loosen three setscrews ⑤ to set free the hook shaft gear (small). Turn the handwheel until the needle bar reaches 2.2 mm to 2.6 mm (standard: 2.2 mm) above the lowest point of its stroke.
5. With the above condition maintained, align hook blade point ⑥ with the center of needle ⑦ and fix the hook shaft gear (small) by tightening three setscrews ⑤, and loosen two setscrews ⑨ and adjust the position of hook driving saddle ⑧ to provide a clearance of 0.02 ~ 0.05 mm between hook blade point ⑥ and needle ⑦. Then retighten the setscrews.

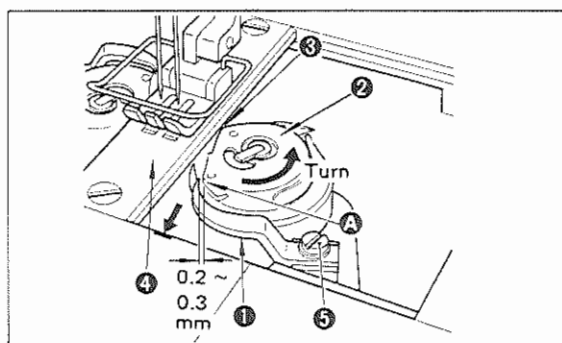
## 22. HOOK NEEDLE GUARD



When a hook is replaced, you must adjust the working point of the hook needle guard. Hook needle guard ② must push needle ① away for 0 or 0.15 mm. Adjust it by carefully bending the hook needle guard.

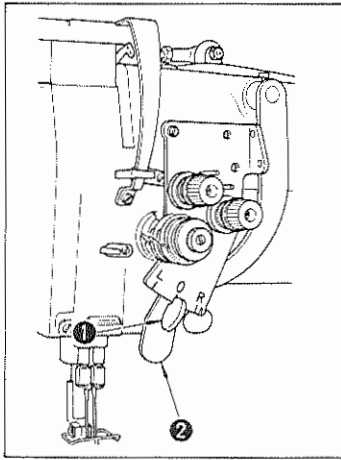
1. If you want to bend it inwards, do it from the outside of the hook needle guard using a screw driver.
2. If you want to bend it outwards, do it from the inside of the hook needle guard using a screw driver.

## 23. BOBBIN CASE OPENING LEVER



1. Turn the handwheel in the normal direction until bobbin case opening lever ① has entirely withdrawn from its working position.
2. Turn bobbin case ② in the direction of the arrow until stopper ③ rests in the groove on throat plate ④.
3. Loosen screw ⑤ and provide a 0.2 to 0.3 mm clearance between the bobbin case opening lever and protrusion ⑥ on the bobbin case.

## 24. SINGLE NEEDLE OPERATION AND THE NUMBER OF STITCHES

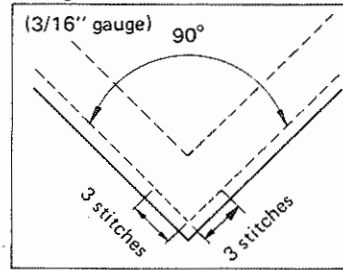


### ★ Single needle operation:

Turn lever ① to "L" to stop operation of the left needle bar or to "R" to stop the right needle bar. Press lever ②, and lever ③ will return to "0" for 2-needle operation.

### ★ Number of stitches:

Turning angle, stitch length, number of stitches and needle gauge are closely related to each other for the formation of a sharp and neat parallel corner seam. Use the Tables given below for selecting a number of stitches or stitch length. Since the Table gives you a theoretical value, you must confirm and adjust it experimentally using the fabrics to be sewn.



(EXAMPLE) If you want to make a 90° corner stitch using a 3/16" gauge with a stitch length of 1.4 mm, go to the table for 3/16" gauge, find "1.6" (stitch length) on the row of "90" (angle) and you will obtain "3" (number of stitches) on the top of the column that "1.6" is included.

(CAUTION) When you change the stitching direction of the single-needle seam at an edge of corner by turning the workpiece on the machine, do it only after the needle bar has come up 2 mm (5/64") or more from its lower dead point in order to prevent the stitch from skipping. When a sharp corner less than 40° is stitched, thread may be excessively left on the wrong side of the fabric. Because it is beyond the capacity of the bobbin thread absorption spring.

## 25. STITCH-TO-ANGLE TABLE BY GAUGE

1/8" (3.17 mm) Gauge

A \ S	1	2	3	4	5	6	7	8	9
40		4.4	2.9	2.2	1.7	1.5			
50		3.4	2.3	1.7					
60		2.7	1.8						
70	4.5	2.3	1.5						
80	3.8	1.9							
90	3.2	1.6							
100	2.6								

5/32" (3.96 mm) Gauge

A \ S	1	2	3	4	5	6	7	8	9
40			3.6	2.7	2.2	1.8	1.6		
50		4.2	2.8	2.1	1.7				
60		3.4	2.3	1.7					
70		2.8	1.9						
80	4.7	2.4	1.6						
90	4.0	2.0							
100	3.3	1.7							

3/16" (4.76 mm) Gauge

A \ S	1	2	3	4	5	6	7	8	9
40				3.3	2.6	2.2	1.9	1.6	1.5
50			3.4	2.6	2.0	1.7	1.5		
60			2.7	2.1	1.6	1.4			
70		3.4	2.3	1.7	1.4				
80		2.8	1.9	1.4					
90	4.8	2.4	1.6						
100	4.0	2.0							

7/32" (5.56 mm) Gauge

A \ S	1	2	3	4	5	6	7	8	9
40			5.1	3.8	3.1	2.5	2.2	1.9	1.7
50			4.0	3.0	2.4	2.0	1.7	1.5	
60		4.8	3.2	2.4	1.9	1.6			
70		4.0	2.6	2.0	1.6				
80		3.3	2.2	1.7					
90	5.6	2.8	1.9	1.4					
100	4.7	2.3	1.6						

1/4" (6.35 mm) Gauge

A \ S	1	2	3	4	5	6	7	8	9
40				4.4	3.5	2.9	2.5	2.2	2.0
50			4.6	3.4	2.8	2.3	2.0	1.7	1.6
60			3.7	2.8	2.2	1.9	1.6		
70		4.6	3.1	2.3	1.9	1.6			
80		3.8	2.6	1.9	1.6				
90		3.2	2.2	1.6					
100		2.7	1.8						

9/32" (7.14 mm) Gauge

A \ S	1	2	3	4	5	6	7	8	9
40				4.9	3.9	3.3	2.8	2.5	2.2
50			5.1	3.8	3.1	2.6	2.2	1.9	1.7
60			4.1	3.1	2.5	2.1	1.8	1.5	
70		5.1	3.4	2.5	2.0	1.7	1.5		
80		4.3	2.8	2.1	1.7	1.4			
90		3.6	2.4	1.8	1.4				
100		3.0	2.0	1.5					

5/16" (7.93 mm) Gauge

A \ S	1	2	3	4	5	6	7	8	9
40					4.4	3.7	3.2	2.8	2.5
50				4.3	3.4	2.9	2.5	2.2	1.9
60			4.6	3.5	2.8	2.3	2.0	1.8	1.6
70			3.8	2.9	2.3	1.9	1.7	1.5	
80		4.8	3.2	2.4	1.9	1.6			
90		4.0	2.7	2.0	1.6				
100		3.4	2.3	1.7					

3/8" (9.52 mm) Gauge



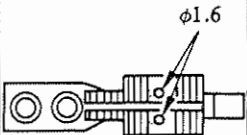
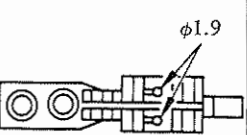
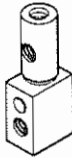

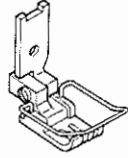
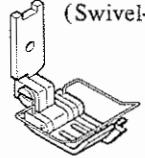
A \ S	1	2	3	4	5	6	7	8	9
40						4.4	3.7	3.3	2.9
50					4.1	3.4	2.9	2.6	2.3
60				4.1	3.3	2.7	2.4	2.1	1.8
70			4.5	3.4	2.7	2.3	1.9	1.7	
80			3.8	2.8	2.3	1.9	1.6		
90		4.8	3.2	2.4	1.9	1.6			
100		4.0	2.7	2.0	1.6				

1/2" (12.7 mm) Gauge

A \ S	1	2	3	4	5	6	7	8	9
40						5.8	5.0	4.4	3.9
50					5.5	4.5	3.9	3.4	3.0
60				5.5	4.4	3.7	3.1	2.8	2.4
70				4.5	3.6	3.0	2.6	2.3	2.0
80			5.1	3.8	3.1	2.5	2.2	1.9	1.7
90			4.2	3.2	2.5	2.1	1.8	1.6	1.4
100		5.3	3.6	2.7	2.1	1.8	1.5	1.3	

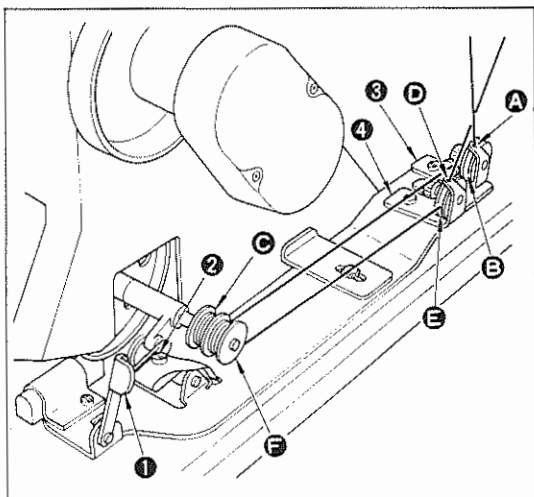
(Note) S : Number of stitches    A : Turning angle

## 26. GAUGE SETS

		Throat plate		Feed dog	
					
		(For 4 mm long stitch)	(For 6 mm long stitch)		
Needle gauge		"A" specification	"S" specification	"A" specification	"S" specification
1	1/8" (3.2 mm)	10135101	10227106	*B1613512B0B	10225100
2	5/32" (4.0 mm)	10135200	10227205	10172708	B1613512C00
3	3/16" (4.8 mm)	10135309	10137503	10172807	B1613512D00
4	7/32" (5.6 mm)	10135408	10227304	10172906	B1613512E00
5	1/4" (6.4 mm)	10135507	10137602	10173003	B1613512F00
6	9/32" (7.1 mm)	10135606	10227403	10173102	B1613512G00
7	5/16" (7.9 mm)	10135705	10137701	10173201	B1613512H00
8	3/8" (9.5 mm)	10135804	10137800	10173300	B1613512K00
9	1/2" (12.7 mm)	10136000	10137909	10173508	B1613512L00
		Needle clamp, left	Needle clamp, right	Presser foot	Presser foot (Swivel-guide)
					
Needle gauge		Common to all specifications			
1	1/8" (3.2 mm)	B1402526BA0A	B1402526BA0A	10222255	
2	5/32" (4.0 mm)	B1402526CA0A	B1402526CA0A	10222354	
3	3/16" (4.8 mm)	B1402526DALA	B1402526DARA	10222453	
4	7/32" (5.6 mm)	10228559	10228567	10222552	
5	1/4" (6.4 mm)	B1402526FALA	B1402526FARA	10222651	10237055
6	9/32" (7.1 mm)	B1402526GALA	B1402526GARA	10222750	
7	5/16" (7.9 mm)	B1402526HALA	B1402526HARA	10222859	
8	3/8" (9.5 mm)	B1402526KALA	B1402526KARA	10222958	
9	1/2" (12.7 mm)	B1402526LALA	B1402526LARA	10223253	

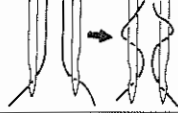
\* .... The size of feed dog needle hole is  $\phi 1.4$ .

## 27. WINDING THE BOBBINS (TWIN BOBBIN WINDER) [SPECIAL ORDER]



1. Take the thread end from a thread spool, pass it through the thread guides **A**, **B** and **C** in that order for an inside bobbin or the thread guides **D**, **E** and **F** for an outside bobbin and wind it several turns round the bobbin.
2. Tilt bobbin presser **1** permitting the thread winder pulley to touch the running belt.
3. Adjust screw **2** to wind a bobbin about 80% of its capacity; turn the adjusting screw clockwise to increase or counterclockwise to reduce the amount of thread to be wound.
4. If the bobbin is wound unevenly, move tension bracket **3** or **4** to the left or the right so that the bobbin is wound evenly.
5. When the bobbin is filled up, the bobbin presser automatically release the thread winder pulley from the running belt.

## 28. TROUBLES AND CORRECTIVE MEASURES

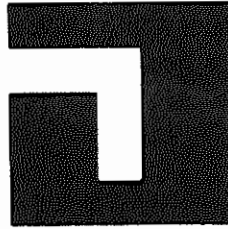
TROUBLES	CAUSES	CORRECTIVE MEASURES
<p>1. Thread breakage (Thread is untwisted or scraped)</p> <p>(Needle thread 20 to 30 mm (approx. 1") is left on the wrong side of the fabric.)</p>	<ol style="list-style-type: none"> <li>① There is a sharp edges or burrs on the thread path, needle point, hook blade point or bobbin case resting groove on the throat plate.</li> <li>② Needle thread tension is too high.</li> <li>③ Bobbin case opening lever provides an excessive clearance at the bobbin case.</li> <li>④ Hook blade point hits the needle.</li> <li>⑤ Hook is not lubricated properly.</li> <li>⑥ Needle thread tension is too low.</li> <li>⑦ Thread take-up spring is too tight and its stroke is too small.</li> <li>⑧ Needle-to-hook relation is wrong.</li> </ol>	<ul style="list-style-type: none"> <li>○ Remove sharp edges or burrs using a fine sandpaper. Polish the surface of the bobbin case resting groove on the throat plate using a buffing wheel.</li> <li>○ Adjust the needle thread tension.</li> <li>○ See 23 and adjust the clearance.</li> <li>○ Adjust the needle-to-hook relation according to 21.</li> <li>○ Increase the amount of oil supplied to the hook according to 2.</li> <li>○ Adjust the needle thread tension.</li> <li>○ Reduce the tension of the spring and increase the stroke.</li> <li>○ Adjust the needle-to-hook relation according to 21.</li> </ul>
<p>2. Stitch skipping</p>	<ol style="list-style-type: none"> <li>① Clearance between the needle and the hook blade point is too great.</li> <li>② Needle-to-hook relation is wrong.</li> <li>③ Pressing force of the presser foot is not enough.</li> <li>④ The clearance between the top end and the hook blade point is not correct.</li> <li>⑤ Hook needle guard is not functional.</li> <li>⑥ Needles are a little too thin.</li> <li>⑦ Synthetic thread or thin thread.</li> </ol>	<ul style="list-style-type: none"> <li>○ Adjust the needle-to-hook relation according to 21.</li> <li>○ Adjust the needle-to-hook relation according to 21.</li> <li>○ Tighten the presser spring regulator.</li> <li>○ Adjust the needle bar height according to 21.</li> <li>○ Adjust the position of the hook needle guard according to 22.</li> <li>○ Replace the needles by thicker ones.</li> <li>○ </li> </ul>
<p>3. Loose stitch.</p>	<ol style="list-style-type: none"> <li>① Bobbin thread does not pass through the forked end of the tension spring on the bobbin case.</li> <li>② Thread path has rough surface.</li> <li>③ Bobbin does not spin smoothly.</li> <li>④ Bobbin case opening lever provides too much clearance at the bobbin.</li> <li>⑤ Bobbin thread tension is too low.</li> <li>⑥ Bobbin is wound too tightly.</li> <li>⑦ When a filament thread is used.</li> </ol>	<ul style="list-style-type: none"> <li>○ Thread the bobbin case correctly.</li> <li>○ Remove rough surface using a fine sandpaper or polish the surface using a buffing wheel.</li> <li>○ Replace the bobbin or the hook.</li> <li>○ Adjust the bobbin case opening lever according to 23.</li> <li>○ Adjust the bobbin thread tension.</li> <li>○ Adjust the tension components on the thread winder.</li> <li>○ Use a spring to prevent the bobbin from running idle. (Loose stitches will be reduced.)</li> </ul>
<p>4. Thread escapes from the needle eye at the start of stitching.</p>	<ol style="list-style-type: none"> <li>① Thread tension given by the tension post is too high.</li> <li>② Bobbin thread tension is too low.</li> <li>③ The size of the feed dog needle hole and the stitch length are improper.</li> </ol>	<ul style="list-style-type: none"> <li>○ Loosen the tension post slightly.</li> <li>○ Increase the bobbin thread tension.</li> <li>○ Replace the feed dog.</li> </ul>

## 29. TABLE OF SEWING SPEED FOR NEEDLE GAUGES

Specification	Needle gauge	Thread	Stitch length	Sewing speed (Max.)	Sewing speed (Normal)
S	1/8" ~ 1/2"	Natural	4 mm	2,800 s.p.m.	2,500 s.p.m.
		Synthetic	4 mm	2,500 s.p.m.	2,200 s.p.m.
		Natural, Synthetic	4 ~ 6 mm	2,200 s.p.m.	2,000 s.p.m.
A	1/8" ~ 1/2"	Natural	4 mm	2,800 s.p.m.	2,500 s.p.m.
		Synthetic	4 mm	2,500 s.p.m.	2,200 s.p.m.

**(Notes)** The above sewing speed are based on the average sewing conditions.  
 You are requested to determine an optimum speed depending on the kinds of materials and sewing process.





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