

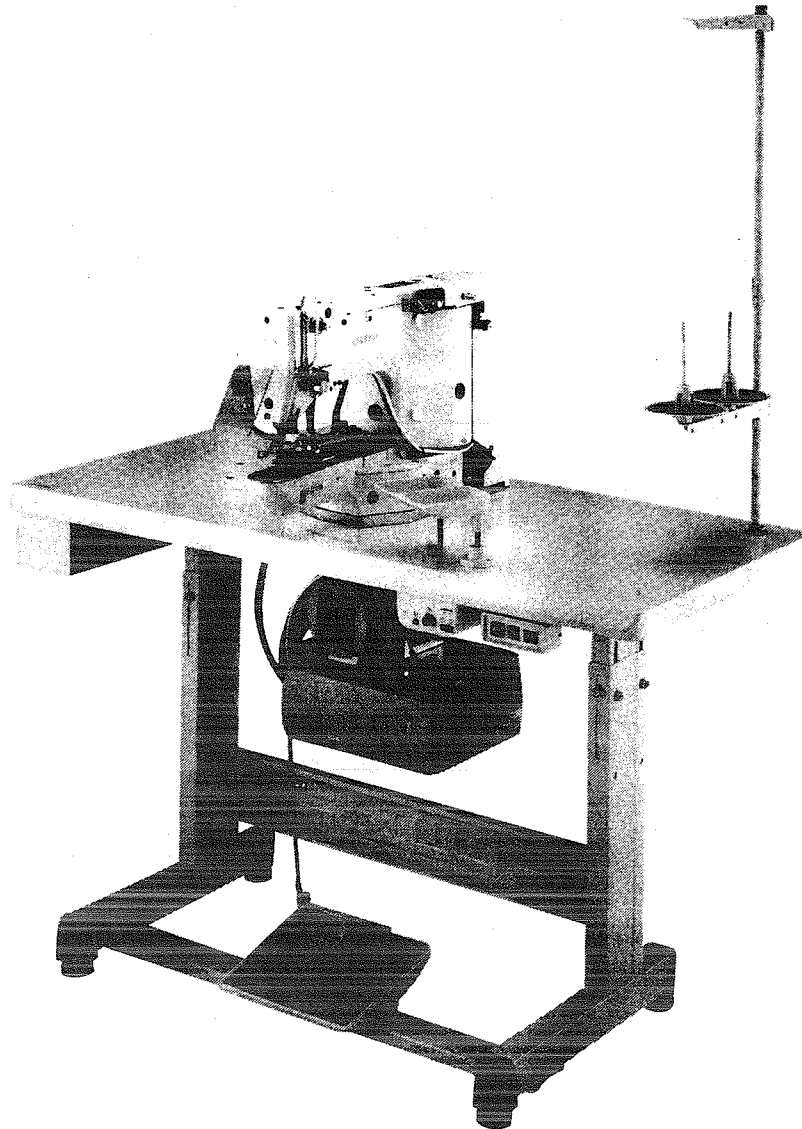
**JUKI**

**High-speed, 1-Needle, Cylinder-bed, Lockstitch  
Bartacking Machine (Servo Motor Type)**

# **LK-1850C Series**

*D. Seal*

# **ENGINEER'S MANUAL**



**No. IV-67**  
**1993. 12**

*D.S.*

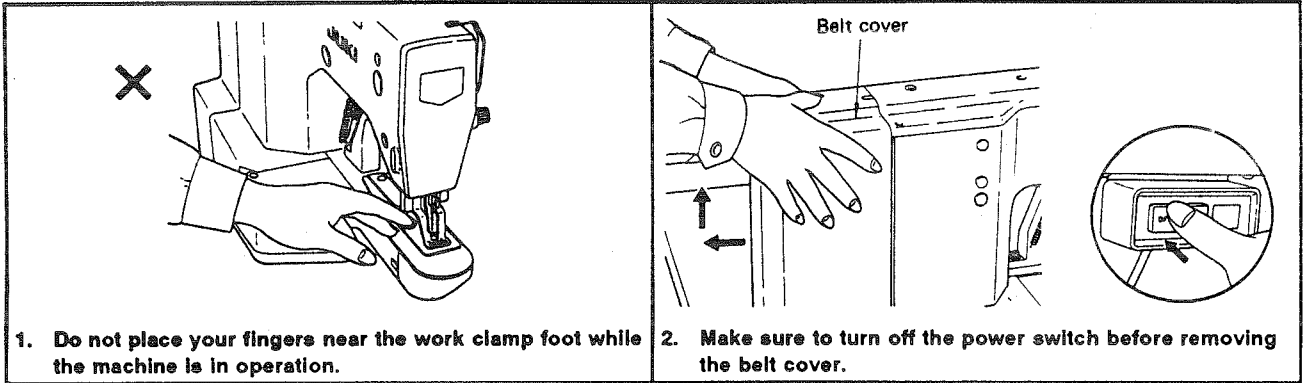
## PREFACE

This Engineer's Manual is written for technical personnel who are responsible for the service and maintenance of the machine.

The Instruction Manual for the machine intended for the maintenance personnel and operators at a garment factory contains detailed operating instructions. This manual describes "Standard Adjustment", "How to Adjust", "Effects of Adjustment", and various other information which is not covered by the Instruction Manual.

It is advisable to use the relevant Instruction Manual, Parts List and SC-5 Engineer's Manual together with this Engineer's Manual when carrying out the maintenance of the machine.

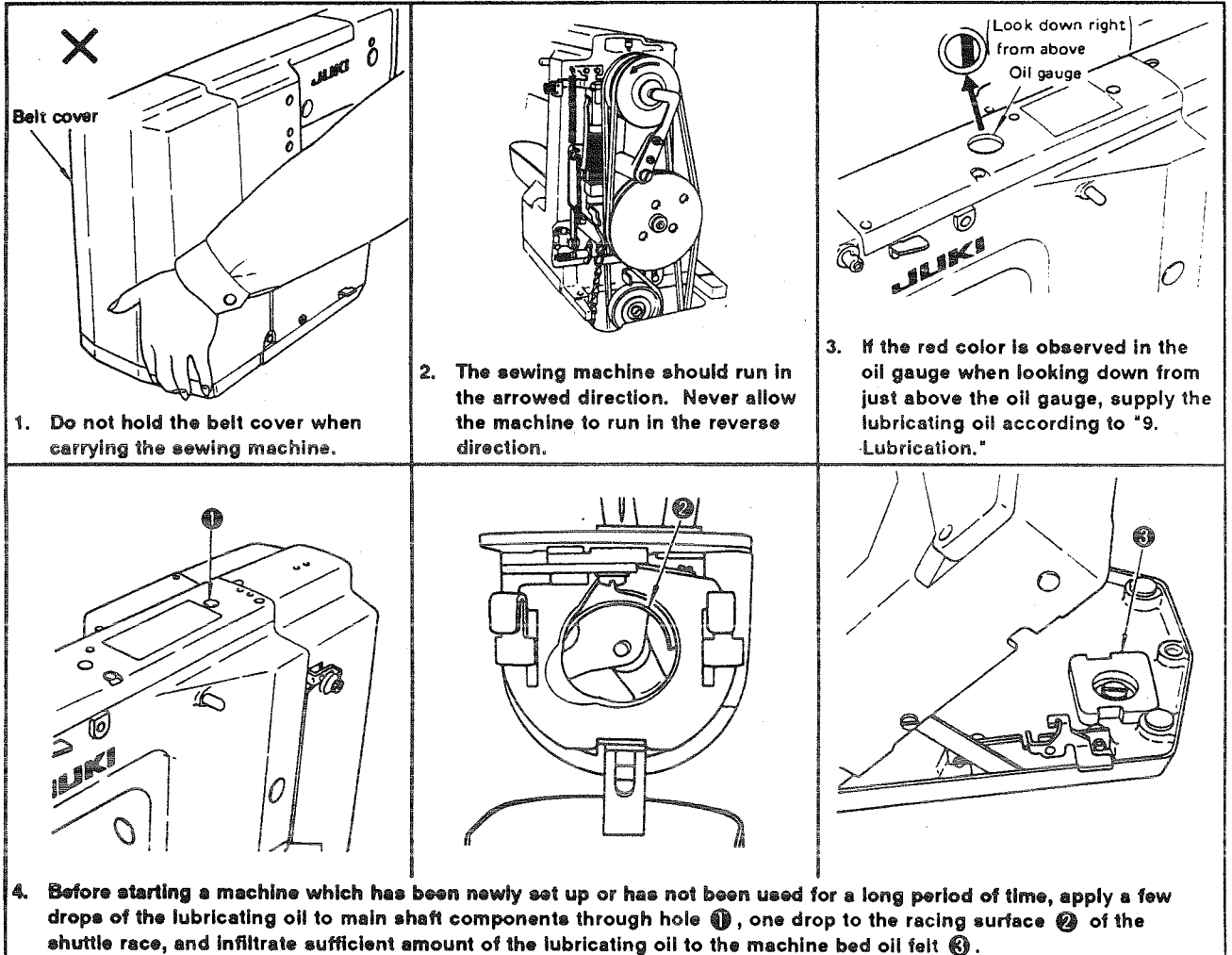
## CAUTION



3. 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.

4. If your machine is provided with a belt cover, finger guard and eye guard, never operate your machine with any of them removed.

## CAUTIONS BEFORE OPERATION



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# 1. SPECIFICATION

	Standard	Subclass			Standard	Subclass					
Model	LK-1850C Δ	LK-1852C Δ-5	LK-1852C Δ-20	LK-1852C Δ-30	LK-1854C Δ-40	LK-1852C Δ-3	LK-1852C Δ-1	LK-1853C Δ-15	LK-1854C Δ-24	LK-1854CH Δ-24	LK-1850CH Δ
Application	Large-size bartacking	←	Attaching belt loops	←	Attaching belt loops	Knit goods bartacking	*1 Buttonhole bartacking	Large-size bartacking	Extra-large bartacking	Extra-large bartacking for heavy-weight materials	Large bartacking for heavy-weight materials
Sewing speed (s.p.m.)	1800	←	←	←	1800	←	←	←	1800	←	←
Stitch diagram											
Number of stitch	42	28	28	←	42	28	28	36	42	←	←
Bartacking width (mm)	1.5 - 3	←	0	←	0	1.3 - 3 (Standard 2.5)	1.5 - 3 (Standard 2.5)	1.5 - 3	1.5 - 3.5	1.5 - 3	←
Bartacking length (mm)	8 - 16	←	6.5 - 14 (Standard 14)	13 - 25 (Standard 25)	*1 18 - 35 (Standard 25)	4 - 8 (Standard 6.5)	4 - 8 (Standard 6)	8 - 16	12 - 24	←	8 - 16
Needle	DP x 5 #14, #16	←	←	←	DP x 5 #14, #16	DP x 5 #11	DP x 5 #14, #16	←	DP x 5 #14, #16	DP x 3 #23	←
Lift of presser foot (mm)	Max. 17	←	←	←	Max. 17	←	←	←	Max. 17	←	←
Lubricating oil	Juki New Defrix Oil No. 2	←	←	←	←	←	←	←	←	←	←

\* The following specifications are common to both the standard and subclass models.

Needle bar stroke (mm)	41.2	
Thread take-up	Link-type thread take-up	
Shuttle race	Half-rotary shuttle race (lubricated through oil wick)	
Adjustment of bartacking width & length	By feed regulator lever (fixed by nut)	
	One-touch utility lever: For the one-touch utility feed across regulating device F (optional)	
Thread trimming	Thread spreader:	Interlocked with main shaft,
	Thread trimmer:	Interlocked with lifter
Lifting system	By solenoid	1-pedal
	By air cylinder	2-pedal
Wiper	Interlocked with lifter	
Bobbin winder	Driven by belt	
Driving system	The sewing machine is stopped by intensifying/reducing the pressure using a servo motor.	
Safety device	Safety mechanism by means of the work clamp foot lower detection switch	
Lubrication	Lubricating oil: Juki New Defrix Oil No. 2	
	System: By centralized oil wick and grease filling	
Motor	AC servo motor 550 W	
Weight	40	

- \* 1. When the bartacking length is 25 to 35 mm, use the feed plate (part No. : 13547005) and work clamp foot (part No. : 13547112).
- \* 2. The machine is designed, when bartacking an eyelet buttonhole end, so that the work clamp stop mechanism automatically closes from the right- and left-hand side of the buttonhole in order to prevent the buttonhole from opening. (The closing allowance can be adjusted within the range of 0 to 4 mm.)

Numeral 1 or 2 is put in the triangle ( Δ ). "1" indicates the "solenoid type" and "2" indicates the "air cylinder type."

### 1) Motor pulley and V belt

Motor pulley Part No.	Numerical mark	V belt
MTSP00850B0	90	MTJVM004600

(Caution) Do not use the motor pulley and V belt in any combination other than the one shown in the table above.

### 2) See the following table for proper use of the feed plate and work clamp foot according to belt loop length.

	Feed plate	Work clamp foot	Work clamp foot (with a middle finger guard)
LK-1852C-20 (Standard) (14 mm or more)	13543608	13552500	13552559
	13552609	13555008	13555057
LK-1852C-30 (Standard)	13545801	13545611	13545660
LK-1854C-40 (Standard) (25 mm or more)	13545801	13545611	13545660
	13547005	13547112	13547161

LK-1851C-555/-556/-557/-558/-559 (Button attaching machine)

Subclass model	LK-1851C-555	LK-1851C-556	LK-1852C-557	LK-1851C-558	LK-1853C-559
Stitch system	Lockstitch				
Sewing speed	Normal: 2,000 s.p.m.				
Number of stitches	18, 9	16, 8	22, 11	18, 9	30, 15
Sewing size (center-to-center distance between holes in the button to be sewn)	Length: 0 to 6.5 mm Width: 2.5 to 6.5 mm (Refer to specifications of button clamp jaw levers for the sewing sizes in detail.)				
Outside diameter of applicable buttons	φ10 to φ20 mm (Refer to the specifications of the button clamp jaw levers for the button size ranging from φ8 to φ32 mm.)				
Needle	DP x 17 #14				
Applicable types of buttons	Flat buttons (4-holed buttons or 2-holed buttons)				
Needle entry	U-shape stitch	Z-shape stitch	U-shape stitch	X-shape stitch	U-shape stitch
	(with cross-over stitch)	(with cross-over stitch)	(with cross-over stitch)	(with cross-over stitch)	(with cross-over stitch)
	(without cross-over stitch)	(without cross-over stitch)	(without cross-over stitch)	(without cross-over stitch)	(without cross-over stitch)
	(18-stitch, 9-stitch)	(18-stitch, 9-stitch)	(18-stitch, 9-stitch)	(18-stitch, 9-stitch)	(18-stitch, 9-stitch)
Lift of the button clamp	13 mm				
Stitch adjusting method	Crosswise feed: Adjusted by fixing the nut Lengthwise feed: Adjusting by the one-touch utility lever				
Knot tying mechanism	Provided with a knot-tying device and a thread adjusting device				
Space pin mechanism	By the button clamp jaw lever				
Motor	AC servo motor 550 W				

The following button clamp jaw levers can be respectively mounted to the aforementioned subclass models as attachments.

Model		Z155	Z156	Z157	Z158					
Name of model (attachment)		For small button	For medium-sized button	For large button	For extra small					
Outside diameter of applicable buttons (mm)		φ10 to φ20	φ10 to φ20	φ15 to φ32	φ8 to φ9	φ9 to φ10	φ10 to φ15			
Sewing size (mm)	Length	0 to 3.5	0 to 4.5	0 to 6.5	0 to 2.5	0 to 3	0 to 3.5			
	Width	2.5 to 3.5	2.5 to 4.5	2.5 to 6.5	Max. 2.5	Max. 3	Max. 3.5			
Button clamp jaw lever	Thickness	2.2 (2.7)	2.7 (2.2)	2.7 (3.2)	2.2 (1.7)					
		En-graved marker	En-graved marker	En-graved marker	En-graved marker	En-graved marker	En-graved marker			
	Part No.	Right	MAZ155070B0	B	MAZ156070B0	C	MAZ157070BB	D	MAZ158070BA	F
			(MAZ156070B0)	C	(MAZ155070B0)	B	(MAZ157070BA)	E	(MAZ158070BB)	G
		Left	MAZ155080B0	B	MAZ156080B0	C	MAZ157080BB	D	MAZ158080BA	F
(MAZ156080B0)	C		(MAZ155080B0)	B	(MAZ157080BA)	E	(MAZ158080BB)	G		
Needle hole guide		MAZ15501000	MAZ15601000	MAZ15701000	MAZ15801000					

## 2. CAUTION TO BE TAKEN WHEN ADJUSTING THE SEWING MACHINE.

- 1) To adjust the sewing machine, be sure to turn OFF the power to the machine in advance.
- 2) The machine cannot be turned by hand without using the motor as long as the work clamp foot is in the highest position since the safety mechanism works. It is therefore necessary to turn OFF the power switch and confirm that the work clamp foot is in the lowest position. Then, turn the machine by hand.

### [ Caution ]

The direction shown by the arrow is the normal direction of rotation. Do not turn the sewing machine in the reverse direction.

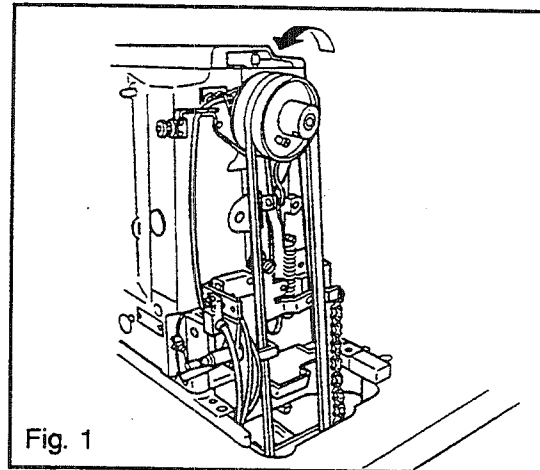
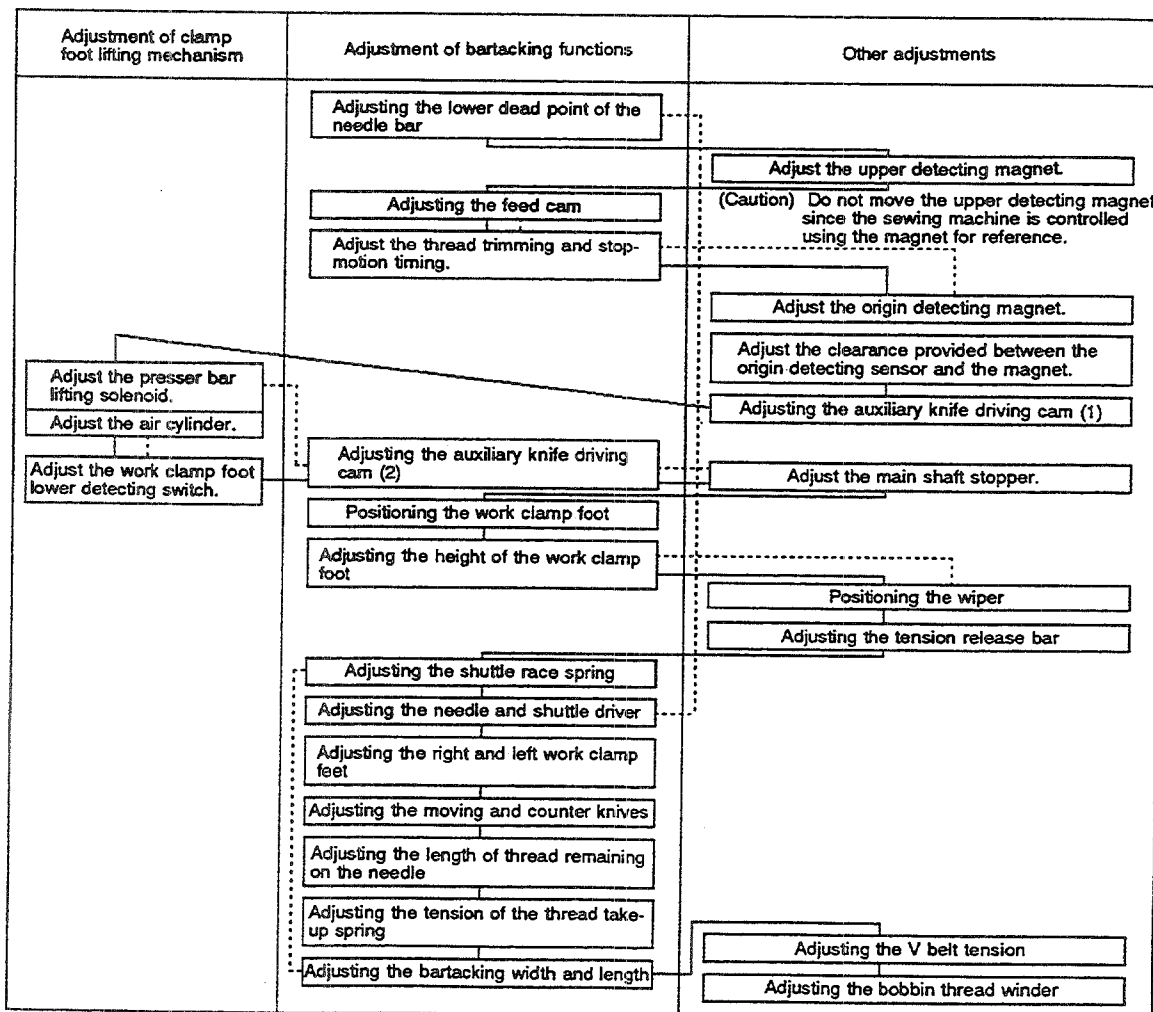


Fig. 1

## 3. STANDARD ADJUSTMENT FLOW CHART



#### 4. STANDARD ADJUSTMENT

##### Standard Adjustment

##### (1) Height of the needle bar

The upper marker line engraved on the needle bar should be flush with the bottom end of the lower needle bar bushing when the needle bar is at the lowest point of its stroke.

[ Caution ] Perform this adjustment first before making any other adjustment.

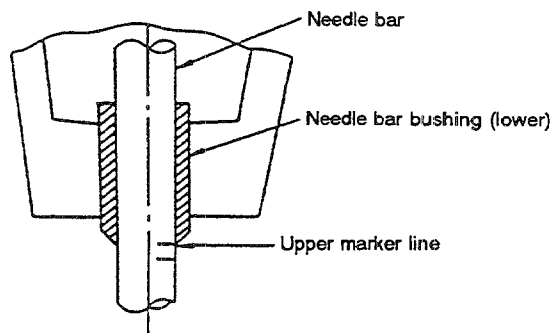


Fig. 2

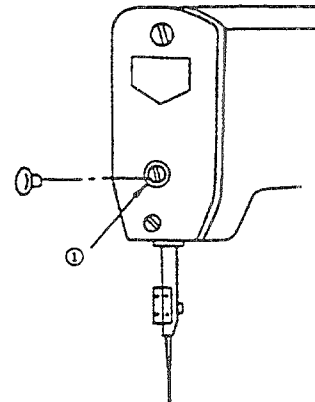


Fig. 3

##### (2) Adjustment of the feed cam

Adjustment should be made so that the feed is completed when the needle point is 8 to 12 mm above the throat plate surface.

(It is advisable to make this adjustment during lateral feed).

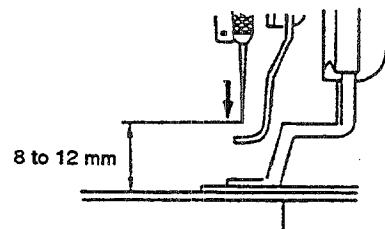


Fig. 4



How to Adjust	Effects of Adjustment
<p>1) Turn the driving pulley by hand until the needle bar reaches the lowest point of its stroke.</p> <p>2) Remove the rubber plug from the face plate.</p> <p>3) Loosen setscrew ①, and move the needle bar up or down to make the adjustment.</p> <p>4) After adjustment, securely tighten setscrew ①.</p> <p><b>[ Caution ]</b>  Adjusting the sewing machine with the power turned ON is very dangerous since the machine may operate during the adjustment.  So, be sure to turn OFF the power to the sewing machine before adjusting the machine.</p>	<ul style="list-style-type: none"> <li>● Improper adjustment will cause stitch skipping or thread breakage.</li> </ul>
<p>Loosen nut ① and then cam guide pin ②. This will allow feed cam ③ to be moved in the direction of rotation for adjustment.</p> <ul style="list-style-type: none"> <li>● When the feed cam is turned in direction A, the feed timing advances.</li> <li>● When the feed cam is turned in direction B, the feed timing is delayed.</li> </ul> <div data-bbox="267 1323 803 1743" data-label="Diagram"> </div> <p style="text-align: right;">Fig. 5</p> <p><b>[ Caution ]</b>  Perform this adjustment first after the adjustment of the height of the needle bar. Make sure to readjust thread trimmer stop-motion regulating cam ④ whenever the feed cam has been adjusted.</p>	<ul style="list-style-type: none"> <li>● When it is adjusted to 8 mm or so, well-tensed stitches will result.</li> <li>● When it is adjusted to 12 mm or so, protrusion of the first stitch needle thread onto the material surface will be prevented when sewing with a synthetic thread.</li> </ul> <p>* Adjust the height of the needle point above the throat plate to 10 to 12 mm when using extra heavy-weight materials.</p>

## Standard Adjustment

### (3) Adjusting the upper detecting magnet of the driving pulley

Adjust so that an upper detection signal is input when the point that is reached by turning the drive pulley from the white marker dot which indicates the stop position of the drive pulley by 20 mm (18 mm for the button sewing machine) in the reverse direction is located as illustrated in Fig. 6.

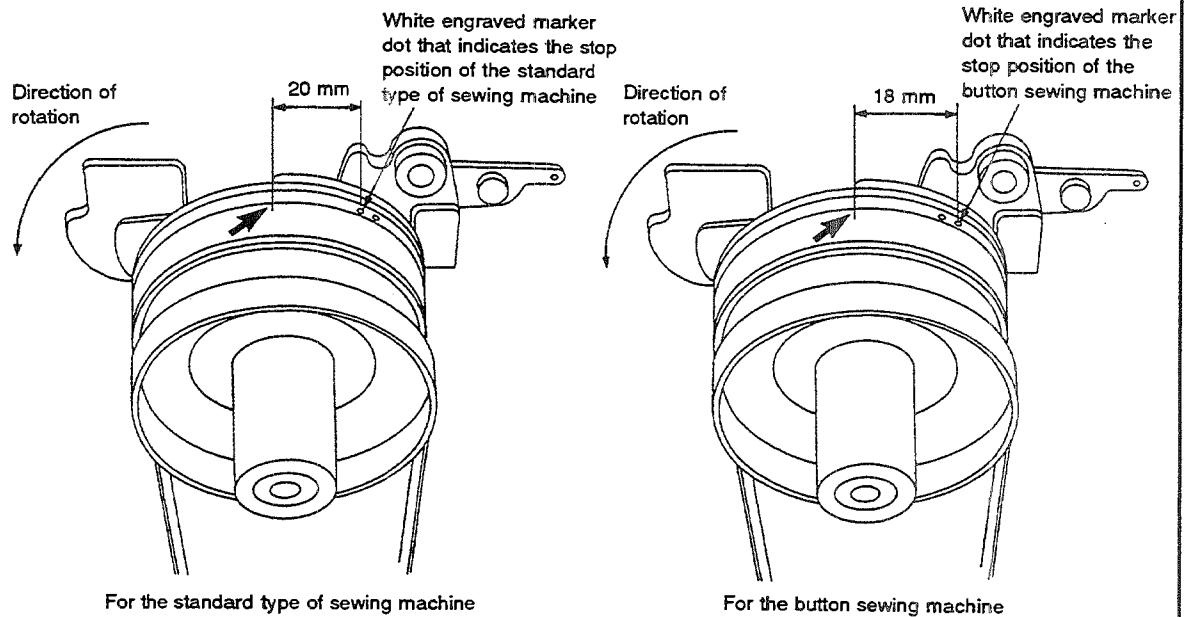


Fig. 6

### (4) Thread trimming stop-motion timing

Adjust, when the needle bar ascends before the sewing machine stops, so that the thread trimmer stop-motion regulating cam roller moves from the highest position of the thread trimmer stop-motion regulating cam down to the lowest position when the distance from the top surface of the throat plate and the needle tip is in the range shown in Fig. 7.

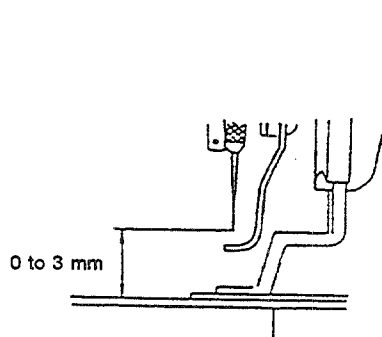


Fig. 7

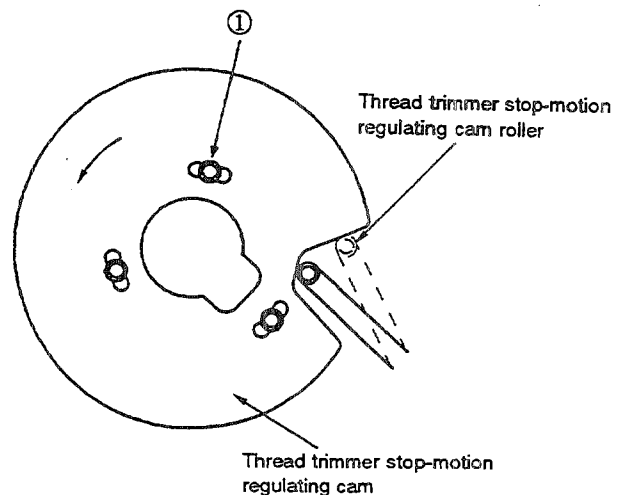
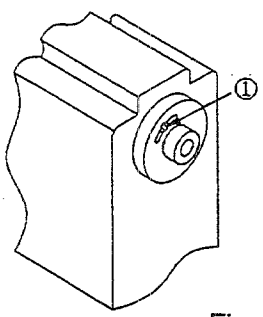


Fig. 8

How to Adjust	Effects of Adjustment				
<p>1) Find a point that is 20 mm (18 mm for the button sewing machine), using a pair of calipers or the like, away from the white marker dot which indicates the stop position of the drive pulley in the reverse direction of rotation. Adjust so that the point is straight up (at the corner of the stator installing plate). (Carefully confirm the position of the white marker dot which indicates the stop position in accordance with the type of sewing machine used, either the standard type machine or the button sewing machine.)</p> <p>2) Adjust upper detection signal ① so that an upper detection signal is input at the aforementioned timing. (Refer to the Engineer's Manual for the SC-5 for how to confirm the upper detection signal.)</p> <p>3) After the completion of the adjustment, drive the sewing machine by approximately five to ten times to confirm that the white marker dot engraved on the drive pulley which indicates the stop position is straight up when the sewing machine stops.</p> <p>If the angle of the drive pulley when the needle bar is in the highest dead point is taken as 0°, the angle of the main shaft will be :</p> <table data-bbox="154 1050 519 1186"> <tr> <td>Standard type of sewing machine</td> <td>18°</td> </tr> <tr> <td>Button sewing machine</td> <td>26°</td> </tr> </table>  <p style="text-align: right;">Fig. 9</p>	Standard type of sewing machine	18°	Button sewing machine	26°	<p>If the timing of the upper detecting signal is improperly adjusted, the sewing machine will fail to stop at the correct position.</p> <p><b>[ Caution ]</b>  <b>The upper detecting magnet is the reference used for controlling the sewing machine.</b>  <b>So, never loosen the screw in it.</b></p>
Standard type of sewing machine	18°				
Button sewing machine	26°				
<p>Loosen three screws ① in the thread trimmer and stop-motion regulating cam, and adjust the cam by moving it within the screw slots.</p>	<p>If the thread trimming and stop-motion timing is extremely advanced, the thread trimmer will actuate at the position that is one stitch away from the correct position. In this case, an abnormal noise will be produced by the thread trimmer.</p> <p>If the thread trimming and stop-motion timing is retarded, thread trimming failure will be caused.</p> <p>If it is extremely retarded, the thread trimmer will not actuate at the time of stop-motion and will actuate at the first stitch of the next sewing. In this case, an abnormal noise will be produced by the thread trimmer.</p>				

## Standard Adjustment

### (5) Adjusting the origin detecting magnet

The origin detecting signal should be adjusted so that the hole sensor is turned ON (lights up) when the white marker dot engraved on the driving pulley is brought to the position as illustrated in Fig. 11.

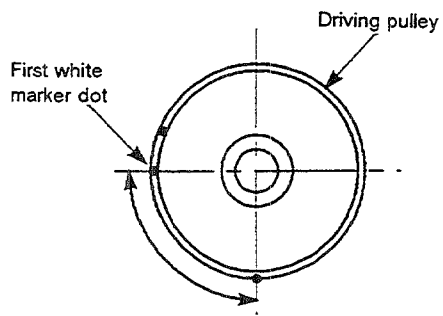


Fig. 11

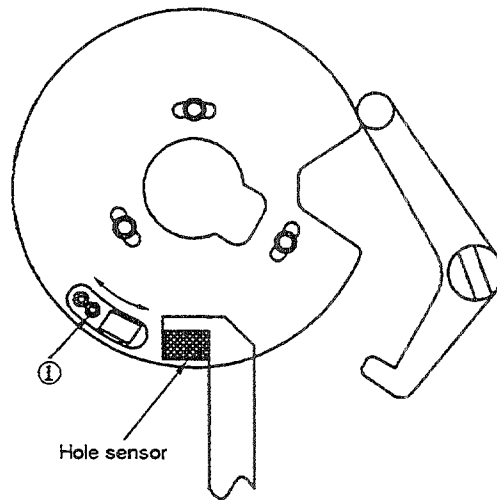


Fig. 12

### (6) Clearance provided between the origin detecting sensor and the magnet

Adjust the clearance provided between the origin detecting sensor (hole sensor) and the magnet to 1 mm.

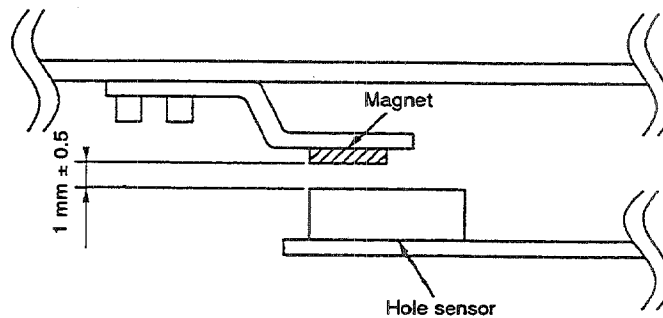
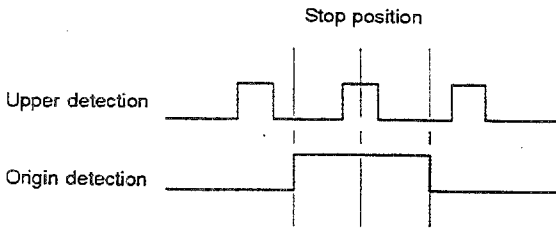
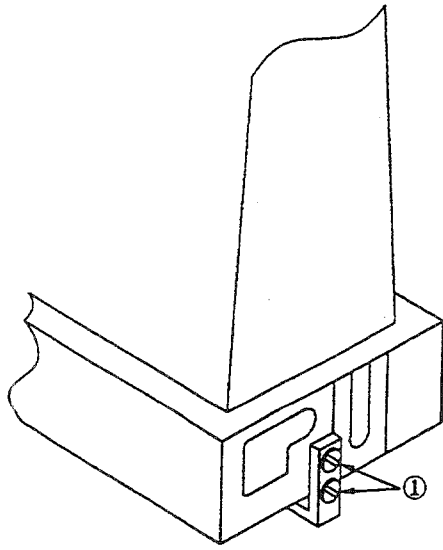


Fig. 13

How to Adjust	Effects of Adjustment
<p>Pressing the second push-button on the control box, turn ON the power to the machine. (That makes the machine enter the function setting mode. In this case, the sewing machine will not be operated by depressing the foot pedal.)</p> <ol style="list-style-type: none"> <li>1) Turn the driving pulley by hand until the white marker dot engraved on the driving pulley is brought to the position shown in Fig. 11.</li> <li>2) Loosen screw ① in the origin detecting magnet and adjust so that the hole sensor LED lights up at the aforementioned moment.</li> </ol> <p>Important point for the adjustment</p>  <p>The origin detection signal should be input as long as the upper detection signal is being input when the sewing machine stops. The origin detection signal should not overlap the upper detection signals input before the sewing machine stops and after the sewing machine re-starts.</p>	<ul style="list-style-type: none"> <li>● If the origin detecting timing is excessively advanced, the sewing machine will stop without actuating the thread trimmer.</li> <li>● If the origin detecting timing is excessively retarded, the thread trimmer actuates when the sewing machine runs at high speed. In this case, an abnormal noise will be produced by the thread trimmer.</li> <li>● If the origin detecting timing is not improperly adjusted, error message "E34" will be shown on the display.</li> </ul>
<ol style="list-style-type: none"> <li>1) Loosen screws ① in the sensor mounting bracket. Adjust the clearance provided between the origin detecting sensor (hole sensor) and the magnet by moving the sensor mounting bracket up or down.</li> </ol>  <p style="text-align: center;">Fig. 14</p>	<ul style="list-style-type: none"> <li>● If there is no clearance between the origin detecting sensor (hole sensor) and the magnet, the hole sensor will come in contact with the magnet and break.</li> <li>● If the clearance provided between the origin detecting sensor (hole sensor) and the magnet is too large, the detecting range will be widened resulting in the origin detecting error "E34."</li> </ul>

### Standard Adjustment

#### (7) Adjusting the thread trimmer auxiliary cam (1)

Adjust so that a clearance of 1 mm is provided between thread trimmer auxiliary cam ③ and roller ④ when thread trimmer regulating lever roller ① rests on the periphery of thread trimmer stop-motion regulating cam ②.

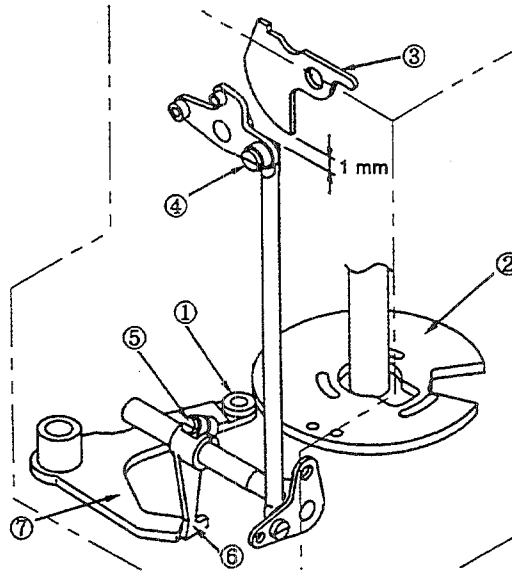


Fig. 15

#### (8) Adjusting the solenoid of the work clamp foot lifting solenoid (only for the solenoid type machine)

A clearance of 1 mm should be provided between the work clamp foot lifting lever and the work clamp foot lifting lever stopper when the work clamp foot lifting solenoid is in operation.

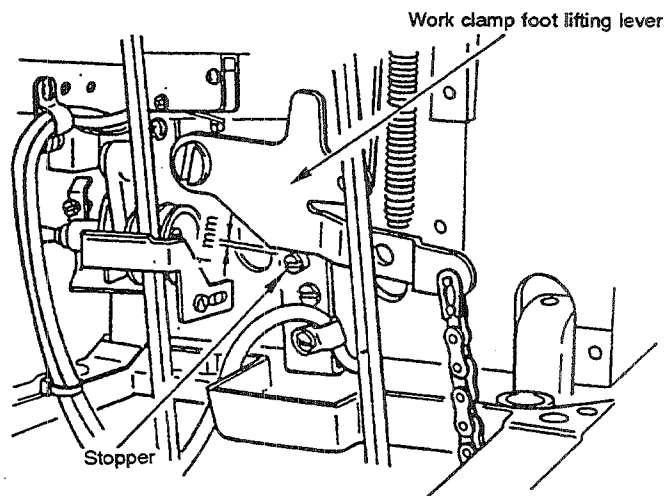


Fig. 16

### How to Adjust

- 1) Turn the driving pulley by hand until thread trimmer regulating lever roller ① is brought onto the periphery of thread trimmer stop-motion regulating cam ②.
- 2) Put a clearance gauge of 1 mm between thread trimmer auxiliary cam ③ and roller ④.
- 3) Make the top end of thread trimmer regulating lever ⑦ come in contact with the top end of thread trimmer regulating arm ⑥.
- 4) In the aforementioned state, fix thread trimmer regulating arm ⑥ by tightening screw ⑤.

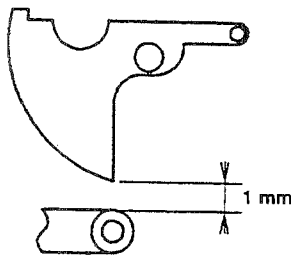


Fig. 17

#### [ Caution ]

Provide a 1 mm clearance between the outermost periphery of the arched portion of thread trimmer auxiliary cam ③ and roller ④.

### Effects of Adjustment

If the clearance provided between the thread trimmer auxiliary cam and roller is insufficient, the thread trimmer auxiliary cam is not released when thread trimmer regulating lever roller ① is put on the periphery of thread trimmer stop-motion regulating cam ②. This results in a thread trimming failure.

If the clearance is larger than the specified value, the thread trimming cam will come in contact with the roller.

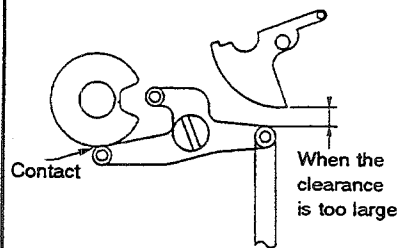


Fig. 18

- 1) Confirm that the work clamp foot lifting solenoid is in operation (the work clamp foot is raised). It is not necessary to turn OFF the power to the machine when adjusting the solenoid. However, be sure to carefully perform the adjustment.
- 2) Now, loosen nut ②, and adjust the position of lever ④ by turning plunger ③ with a screwdriver so that a 1 mm clearance is obtained between the work clamp foot lifting lever and the stopper. Turning the plunger clockwise (in the direction of the solid arrow) will tense the chain. Turning the plunger counterclockwise (in the direction of the dotted arrow) will slacken it.

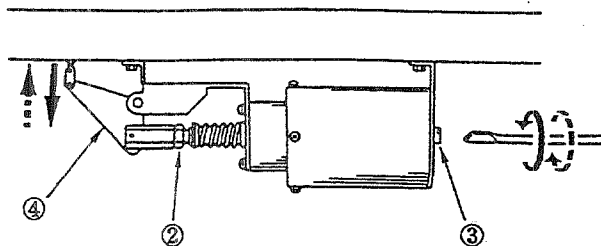


Fig. 19

- If no clearance is provided between the work clamp foot lifting lever and the stopper, they will come in contact with each other, causing the stopper to break.

If the chain fails to sufficiently slacken when the work clamp foot lifting solenoid is turned OFF and the work clamp foot lifting lever is raised (the work clamp foot comes down), no clearance will be provided between the thread trimmer auxiliary cam and the roller. This results in a thread trimming failure.

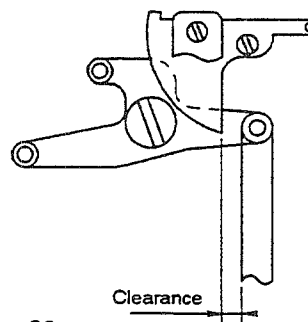


Fig. 20

## Standard Adjustment

### (9) Adjusting the air cylinder (only for the air cylinder type machine)

When the work clamp foot is lowered (the cylinder returns to its home position), the end face of the cylinder should be spaced 16 mm from the cylinder presser plate.

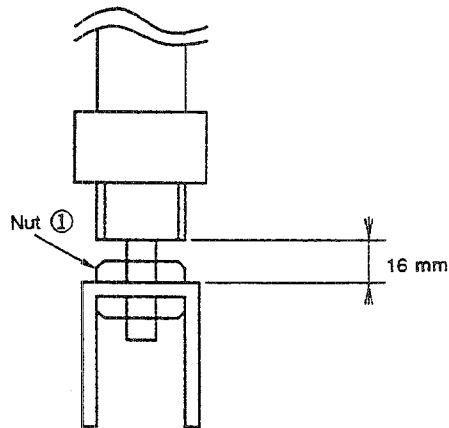


Fig. 21

### (10) Adjusting the work clamp foot lower detecting switch

When work clamp foot lifting lever ② is raised (the work clamp foot is lowered), the clearance provided between the actuator of the work clamp foot lower detecting switch and the main unit of the switch should be adjusted to 0.5 mm or less.

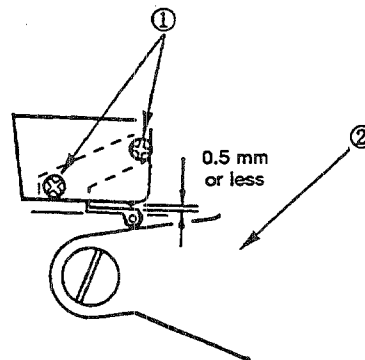
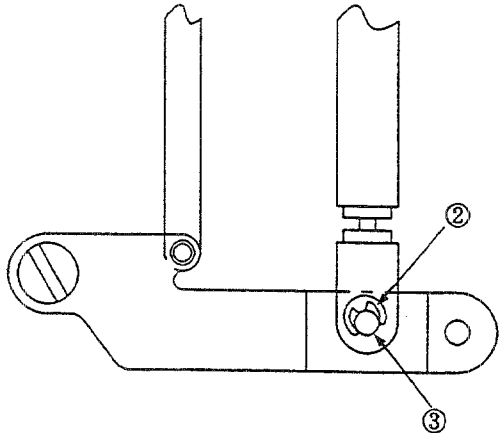
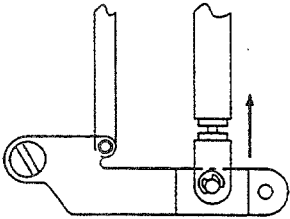


Fig. 22



How to Adjust	Effects of Adjustment
<p>1) Remove E ring ② from the cylinder presser pin. Draw out cylinder presser pin ③.</p> <p>2) Loosen cylinder nut ①. Adjust so that the end face of the cylinder is spaced 15 mm from the cylinder presser plate.</p>  <p style="text-align: center;">Fig. 23</p>	<p>The distance of 16 mm provided between the end face of the cylinder and the cylinder presser plate is used as the reference value which determines the stroke of the work clamp foot lifting lever. So, it is necessary to check the height of the work clamp foot, tension release bar, thread trimmer auxiliary cam and main shaft stopper after the completion of the adjustment.</p>
<p>1) Confirm that the work clamp foot lifting lever is in the raised position.</p> <p>Solenoid..... When the work clamp foot lifting lever comes in contact with the stopper while the solenoid is in the OFF state</p> <p>Air cylinder... When the air cylinder is returning to its home position</p>  <p style="text-align: center;">Fig. 24</p> <p>2) Loosen screw ① in the work clamp foot lower detecting switch and adjust the clearance provided between the main unit and actuator of the switch to 0.5 mm or less.</p>	<p>If no clearance is provided between the actuator and main unit of the work clamp foot lower detecting switch, the switch may break. If the clearance exceeds 0.5 mm, the switch will not be turned ON, resulting in "E35" error.</p>

## Standard Adjustment

### (11) Adjusting the thread trimmer auxiliary cam (2)

When roller ② enters the recess on the thread trimmer cam, a clearance of 0.3 to 0.5 mm should be provided between roller ③ and the top end of the thread trimmer auxiliary cam.

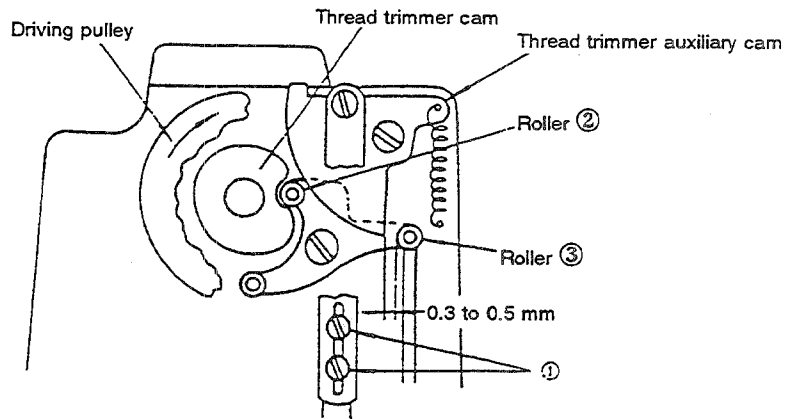


Fig. 25

### (12) Adjusting the main shaft stopper

When the work clamp foot is raised, main shaft stopper ① should come in contact with main shaft stopper plate ② to cause the main shaft to be locked with the lowest end of the needle bar is spaced 47 mm (53 mm for the button sewing machine) from the throat plate.

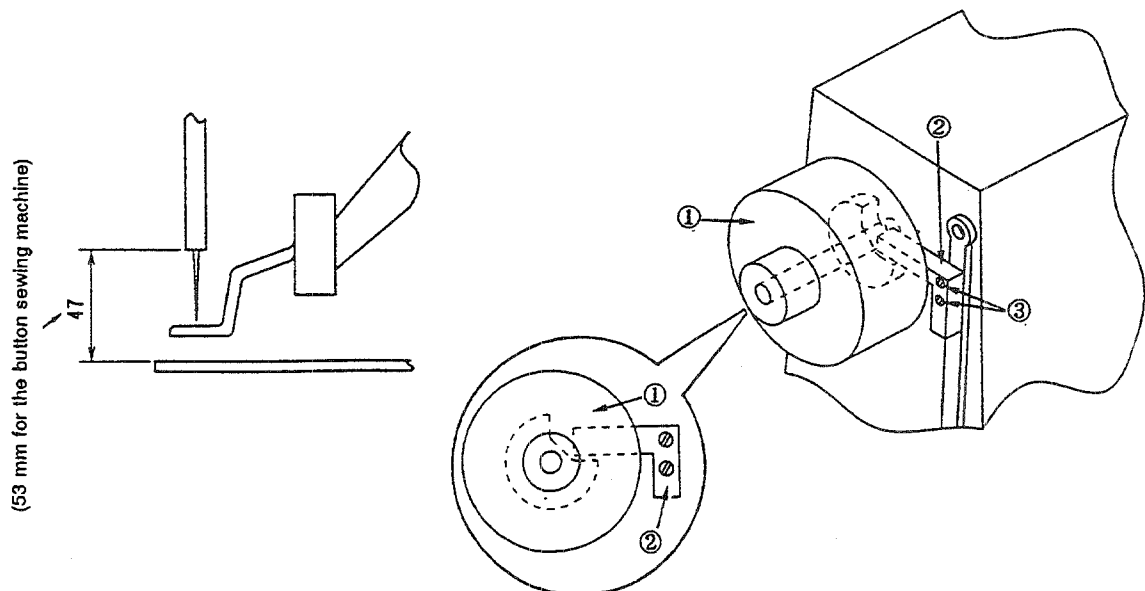
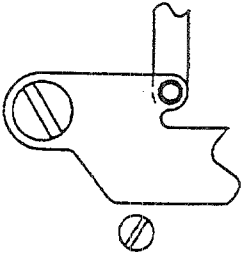


Fig. 26

Fig. 27

How to Adjust	Effects of Adjustment
<ol style="list-style-type: none"> <li>1) Turn OFF the power to the machine and lower the work clamp foot.</li> <li>2) Release the thread trimmer auxiliary cam and bring it to the position as shown in Fig. 25.</li> <li>3) Turn the driving pulley in the direction of the arrow until roller ② enters the recess on the thread trimmer cam.</li> <li>4) Now, loosen screw ① and adjust so that a 0.3 to 0.5 mm clearance is obtained between roller ③ and the top end of the auxiliary cam.</li> </ol>	<ul style="list-style-type: none"> <li>● If the clearance between the roller and the thread trimmer auxiliary cam is excessively larger than the specified value: Thread trimming timing will be retarded, resulting in a thread trimming failure.</li> <li>● If no clearance is provided between the roller and the cam and they come in contact with each other: Operation of the thread trimmer is interrupted when the thread is spread. In this case, the thread is not cut.</li> </ul>
<ol style="list-style-type: none"> <li>1) Confirm that the work clamp foot is raised. (When the work clamp foot lifting solenoid or the air cylinder is in operation)</li> <li>2) Turn the driving pulley by hand until the bottom end of the needle bar is spaced 47 mm from the throat plate.</li> <li>3) Now, loosen screw ③ in the main shaft stopper and adjust so that main shaft stopper ① comes in contact with main shaft stopper plate ②.</li> </ol> <p>[ Caution ] When the work clamp foot is raised:</p> <ul style="list-style-type: none"> <li>● A clearance of 1 mm is provided between the work clamp foot lifting lever and the stopper (for the solenoid type machine).</li> <li>● The cylinder moves away from its home position (extrudes) (for the air cylinder type machine).</li> </ul> <div style="text-align: center;">  </div> <p style="text-align: center;">Fig. 28</p>	<p>If the distance provided between the bottom end of the needle bar and the throat plate is excessively larger than 47 mm, the main shaft stopper will come in contact with the main shaft stopper plate when the work clamp foot is raised. In this case, the needle bar will move up and down.</p> <p>If the distance provided between the bottom end of the needle bar and the throat plate is excessively smaller than 47 mm, the needle will interfere with the wiper when the driving pulley is turned by hand and the power to the machine is turned OFF.</p> <p><b>Caution)</b> Be sure to confirm that the main shaft comes in contact with the main shaft stopper. Also confirm that the needle does not come in contact with the wiper when the main shaft is locked.</p>

## Standard Adjustment

### (13) Position of the work clamp foot

Turn the driving pulley by hand and perform adjustment to equalize the both clearances A between the needle and the work clamp feet in the longitudinal feed.  
Also make equal the both clearances B between the feed plates and the work clamp feet.

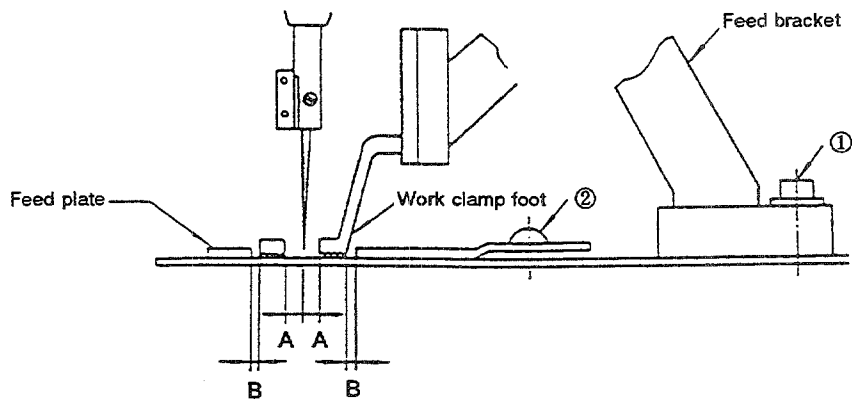


Fig. 29

How to Adjust	Effects of Adjustment
<p>1) Loosen screw ① and make adjustment of the work clamp foot within the slot in the feed bracket.</p> <p>2) Loosen screw ② and adjust the position of the feed plate by the slot in the feed plate.</p> <p><b>[ Caution ]</b> Be sure to perform the adjustment with the power to the machine turned OFF.</p>	<p>● If the two clearances A are not equal, either work clamp foot may interfere with the needle, leading to needle breakage during longitudinal feed.</p>



How to Adjust	Effects of Adjustment
<p>Stop the machine with the work clamp feet up, and loosen screw ① to make adjustment.</p> <p>If the right and left work clamp feet are not levelled, perform further adjustment using screw ②.</p>	<ul style="list-style-type: none"> <li>● If the work clamp feet are too high, they will interfere with the wiper when the wiper is actuated.</li> <li>● If screws ② are too low, the feed bracket will interfere with the lowering shaft. (Point A)</li> </ul>
<p>Adjust the position of the wiper by screw ①. Move the wiper by moving the work clamp foot lifting lever up or down. (For the air cylinder type machine, let the compressed air out of the sewing machine.) Perform this adjustment with the white marker dot engraved on the driving pulley aligned with the top end of the installing plate as shown in Fig. 33. Adjust the longitudinal position of the wiper so that an arc drawn by the wiper when it spreads the thread passes just under the needle.</p> <p><b>[ Caution ]</b> Turn OFF the power when adjusting the wiper.</p>	<ul style="list-style-type: none"> <li>● If the clearance is smaller than 2.5 mm; The wiper will interfere with the needle point, resulting in needle breakage or scratches on the needle.</li> <li>● If the clearance is much larger than 2.5 mm; The needle clamp screw will hit the wiper when the needle bar goes down.</li> </ul>

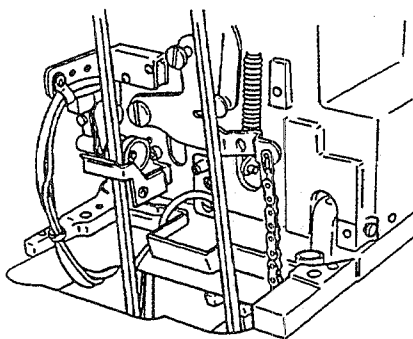


Fig. 32

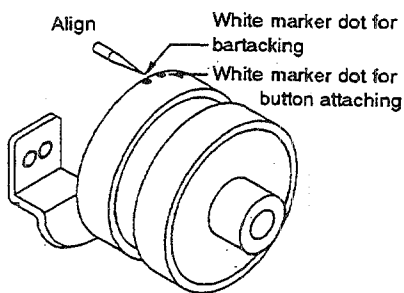


Fig. 33

## Standard Adjustment

### (16) Adjustment of the tension release bar

Tension release bar ③ should project 4 mm from the surface of supporter ② with the work clamp feet up when the machine stops. (Check that the tension disk is not raised while the sewing machine is in operation.)

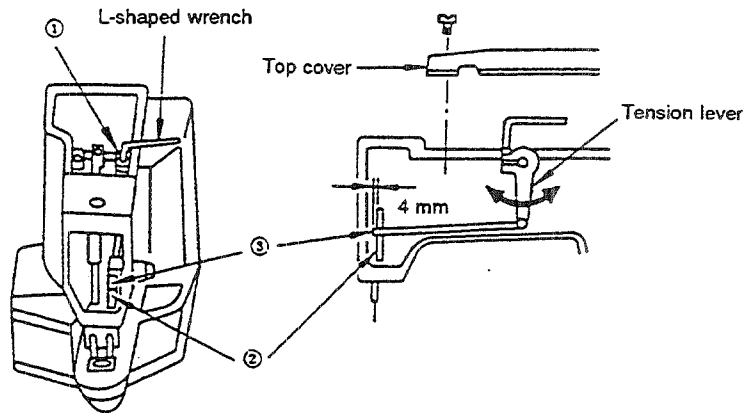


Fig. 34

### (17) Position of the shuttle race spring

The shuttle race spring should be evenly positioned laterally with respect to the needle entry point, and it should be positioned longitudinally so that the rear edge of the needle aligns with corner (A) as shown below.

#### [ Note ]

Pressure of any scratches on area (B) may cause breakage of the bobbin thread. Grind and smooth out scratches if any.

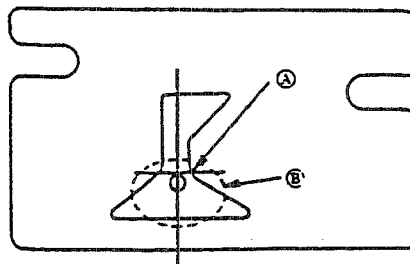
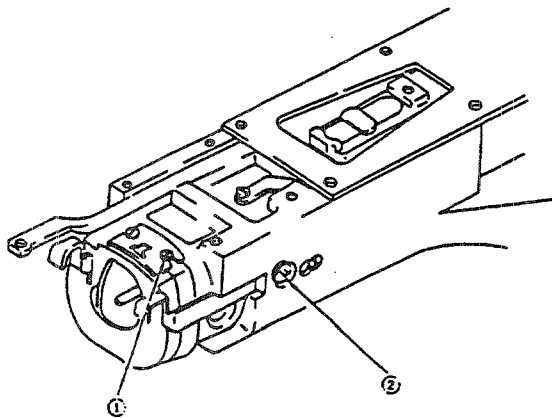


Fig. 35



How to Adjust	Effects of Adjustment
<p>With the machine in stationary state, remove the top cover and the face cover, and loosen screw ① to make adjustment with the work clamp feet up.</p>	<ul style="list-style-type: none"> <li>● If the projection of the tension release bar is smaller than 4 mm; The tension discs will be left released during machine operation. If the projection is much smaller than 4 mm, tension release bar ③ will come off supporter ② when the work clamp feet begins to go up and consequently the work clamp feet fail to go up. Also, the tension discs will not be released.</li> <li>● If the projection of the tension release bar is larger than 4 mm; The end of tension release bar ③ will hit the face cover when the work clamp feet go up, producing a loud noise. Also, the thread will not be released at the time of thread trimming, and as a result, the needle thread will be cut extremely short.</li> </ul>
<p>Remove the feed bracket, feed plate and throat plate, then perform adjustment using screw ①.</p> <p><b>[ Note ]</b>  The lateral position of the shuttle race spring is affected also by the locking position of setscrew ②. Turn OFF the power when adjusting the position of the shuttle race spring.</p>  <p style="text-align: center;">Fig. 36</p>	<ul style="list-style-type: none"> <li>● Lateral or longitudinal deviation of the shuttle race spring will cause the needle thread to bite into the shuttle race.</li> <li>● If the shuttle race spring is positioned excessively in the rear, the moving knife may fail to catch the needle thread.</li> </ul>

## Standard Adjustment

### (18) Adjustment of the timing between the needle and the shuttle

#### 1) Timing of the needle bar

The needle bar goes up from the lowest point of its stroke until the lower marker line engraved on the needle bar is flush with the bottom end of the needle bar bushing (lower). (Fig. 37)

#### 2) Timing of the shuttle

When the state is as described in the above 1), the center of the needle coincides with the point of the shuttle at (A). (Fig. 38)

#### 3) Clearance between the needle and shuttle driver

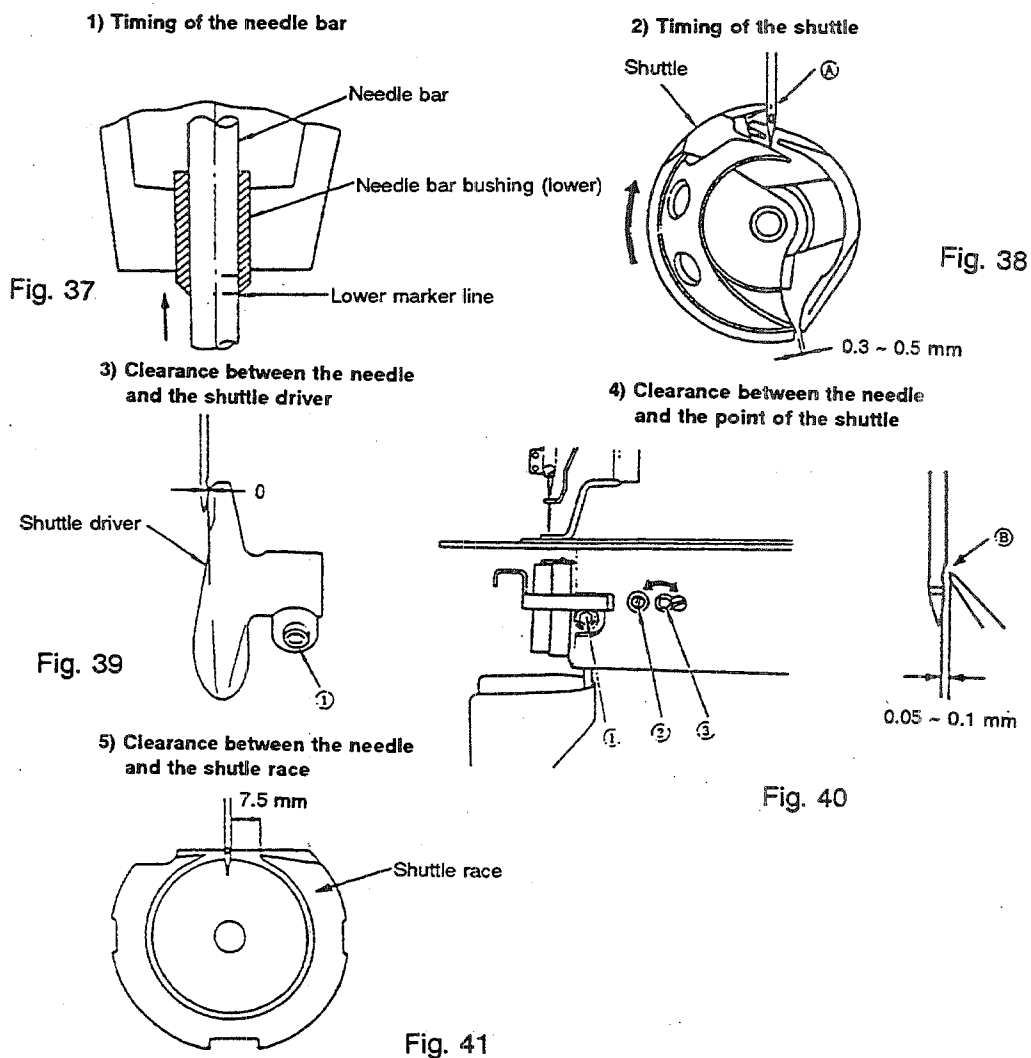
When the state is as described in the above 2), there should be no clearance between the needle and the shuttle driver. (Fig. 39)

#### 4) Clearance between the needle and the point of the shuttle

When the state is as described in 2), the clearance (B) between the needle and the point of the shuttle should be 0.05 to 0.1 mm. (Fig. 40)

#### 5) Clearance between the needle and the shuttle race

The clearance between the side face of the needle and the shuttle race should be 7.5 mm. (Fig. 41)



How to Adjust	Effects of Adjustment
<p>1) Referring to Standard Adjustment (1) Height of the needle bar, make the lower marker line engraved on the needle bar flush with the bottom end of the bushing, and adjust the rotational and longitudinal directions of the shuttle driver.</p> <p>2) and 3) Loosen setscrew ① of the shuttle driver.</p> <p>[ Caution ]  <b>Ensure to turn the shuttle in the arrowed direction as shown in Fig. 38 when adjusting the timing of the shuttle.</b></p> <p>4) Loosen setscrew ② of the shuttle race, and turn eccentric shaft ③ to make adjustment.</p> <p>5) Loosen setscrew ② to perform adjustment.          Enough care should be exercised when performing the adjustment described in 4), namely the adjustment of the clearance between the needle and the point of the shuttle.</p> <p>[ Note ]  <b>The clearance in the rotational direction between the shuttle and the shuttle driver should be 0.3 mm to 0.5 mm as shown in Fig. 38.</b>  <b>Adjust the clearance provided between the shuttle and the shuttle driver by tapping portion ④.</b>  <b>After adjustment, check that point ③ is evenly spaced vertically with respect to the shuttle.</b>  <b>Adjusting the clearance provided between the shuttle and the shuttle driver with the power turned ON is very dangerous since the sewing machine may operate during the adjustment.</b>  <b>So, be sure to turn OFF the power to the sewing machine before performing this adjustment.</b></p> <div data-bbox="402 1318 695 1596" data-label="Image"> </div> <p style="text-align: center;">Fig. 42</p>	<p>1) and 2) Slightly reduce the height of the needle bar (upper marker line) for floppy material, and on the contrary, slightly increase the height for heavy-weight material to adjust the timing of the shuttle.          (For prevention of stitch skipping.)</p> <p>3) If the clearance is more than 0 mm, the needle will be bent in the direction of the shuttle point, causing scratches on the shuttle point and the needle. On the contrary, however, excessive contact between the needle and the shuttle driver may cause stitch skipping.</p> <p>4) If the clearance is greater than 0.05 to 0.1 mm, stitch skipping will occur. If it is smaller than the specified values, the needle strikes the shuttle point and scratches occur, leading to thread breakage or fine splits of thread.</p> <p>5) If the clearance is smaller than 7.5 mm the needle thread will not be fully spread, often causing the needle thread to bite into the shuttle.</p> <p>● If the clearance between the shuttle drive and the shuttle is greater than 0.3 to 0.5 mm, the shuttle noise will be louder. On the contrary, if the clearance is not enough, poorly tensed stitches will result when sewing with a thick thread.</p>

## Standard Adjustment

### (25) Adjustment of the belt tension

Adjust the belt tension so that the belt slackens, when an approximately 500 g load is applied by fingers to the center of the belt (shown by the arrow  $\Leftrightarrow$ ), to the extent that the center of the belt descends as deep as approximately 6 mm.

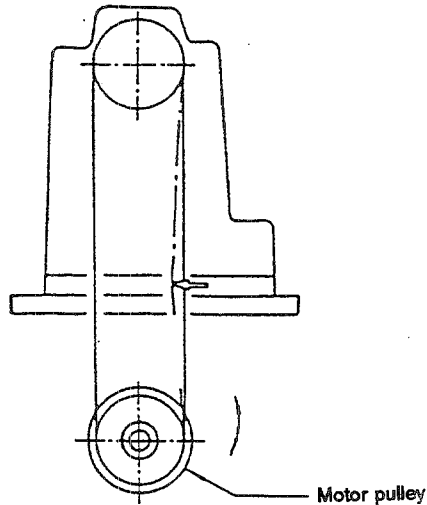


Fig. 51

### (26) Adjustment of the bobbin winder

The clearance between the bobbin winding wheel and the V belt should be about 3 mm when the wheel is not winding a bobbin.

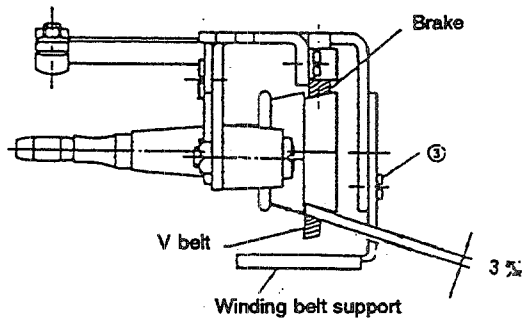


Fig. 52

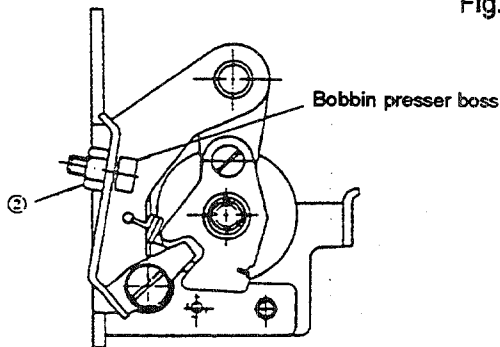


Fig. 53

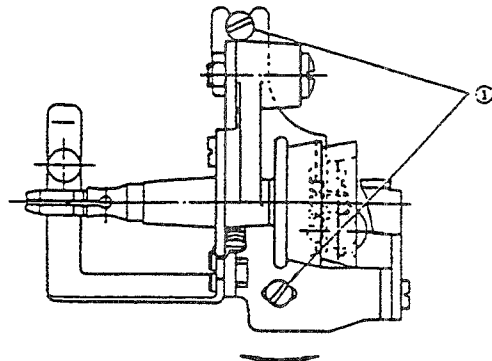
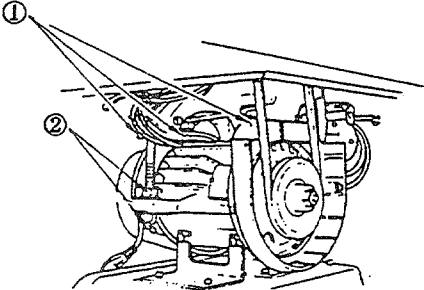
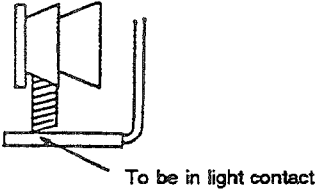
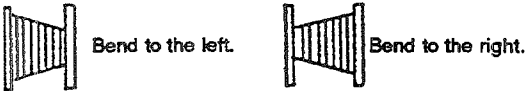


Fig. 54

How to Adjust	Effects of Adjustment
<p>Loosen fixing screw ① and nut ②, and move up or down the motor mounting base to make adjustment.</p>  <p>Fig. 55</p>	<ul style="list-style-type: none"> <li>● If the belt tension is insufficient, the belt will vibrate heavily and the number of revolutions of the sewing machine will not be increased and the stop position of the sewing machine will vary.</li> </ul>
<p>1) Adjust the position of the V belt by moving the motor.</p> <p>2) Perform adjustment by screw ③ so that the winding belt support comes in light contact with the edge of the belt while a bobbin is being wound.</p>  <p>Fig. 56</p> <p>3) If a bobbin is wound unevenly, loosen screw ① and bend the bobbin winder to the right or left.</p>  <p>Fig. 57</p> <p>4) To adjust the amount of thread to be wound round a bobbin, loosen nut ② and move back or forth the bobbin presser boss to make adjustment.</p>	<ul style="list-style-type: none"> <li>● If the clearance allowed is smaller than 3 mm, the belt will touch the winding wheel and wear out.</li> <li>● If the belt support fails to come in light contact with the belt, the winding speed will be low.</li> </ul>

Only for the sewing machine for button sewing

Standard Adjustment

(27) Adjusting the position of the feed plate (for sewing 2-holed buttons)

For the sewing size 3 mm (Z155 attachment for small buttons)

Adjust the lateral position of the feed plate so that a clearance of 1 mm is provided between the recess on feed plate ① and the boss of needle hole guide ② when the needle enters the first needle entry point.

Adjust the longitudinal position of the feed plate so that the needle hole guide comes to the center of the recess on feed plate ①.

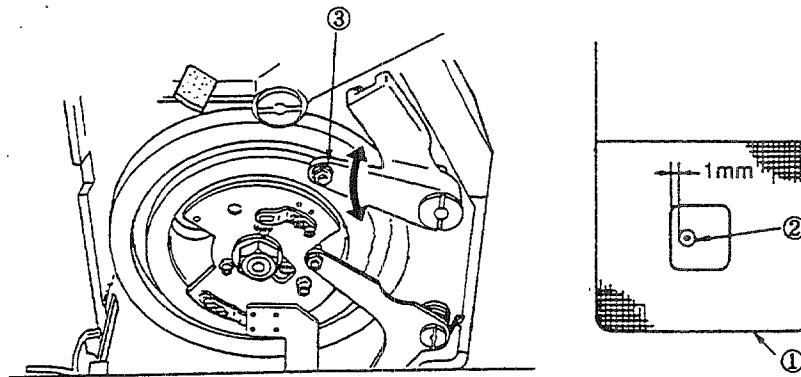


Fig. 58

(28) Adjusting the position of the feed plate (for sewing 4-holed buttons)

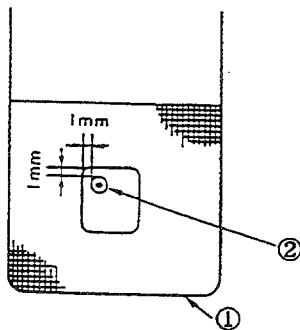


Fig. 59

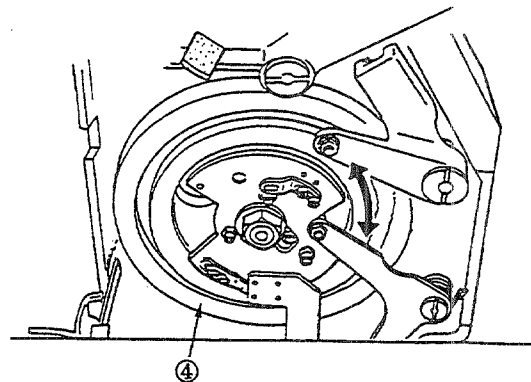


Fig. 60

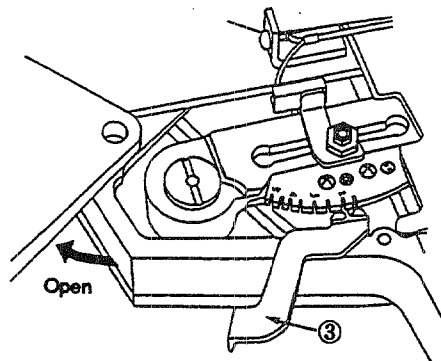


Fig. 61

How to Adjust	Effects of Adjustment
<p>1) Operate the one-touch utility feed lever to bring the feed plate to the 2-holed button sewing position.</p> <p>2) Turn the driving pulley by hand to make the needle enter the first needle entry point.</p> <p>3) Now, loosen nut ③ and adjust the position of the feed plate in terms of the lateral direction so that a clearance of 1 mm is provided between the recess on feed plate ① and the boss of needle hole guide ②.</p> <p>In terms of the longitudinal direction, move feed plate ① back or forth to adjust so that the needle hole guide is aligned with the center of the recess on feed plate ①.</p> <p><b>[ Caution ]</b>  <b>If the feed plate has been changed or the sewing size exceeds 3 mm, confirm that the recess on the feed plate does not come in contact with the boss of the needle hole guide at the 1st and 2nd needle entries.</b></p>	<p>If the clearance provided between the recess on the feed plate and the boss of the needle hole guide is larger or smaller than 1 mm, the recess on the feed plate may come in contact with the needle hole guide when the sewing size is larger than 3 mm.</p>
<p>Adjust the position of the feed plate in terms of the lateral direction as in the case of sewing 2-holed buttons. When the Z155 (attachment for small buttons) is used and the sewing size is 3 mm x 3 mm, adjust so that a clearance of 1 mm is provided between the recess on feed plate ① and the periphery of needle hole guide ② when the needle enters the first needle entry point.</p> <p>In terms of the longitudinal position of the feed plate, move feed plate ① back or forth to adjust so that a 1 mm clearance is provided between the recess on feed plate ① and the periphery of needle hole guide.</p> <p><b>[ Caution ]</b>  <b>If the feed plate has been changed or the sewing size exceeds 3 mm, confirm that the recess on the feed plate does not come in contact with the boss of the needle hole guide at the 1st and 2nd needle entries.</b></p>	<p>If the clearance provided between the recess on the feed plate and the boss of the needle hole guide is larger or smaller than 1 mm, the recess on the feed plate may come in contact with the needle hole guide when the sewing size is larger than 3 mm.</p>

Standard Adjustment

(29) Adjusting the feed timing

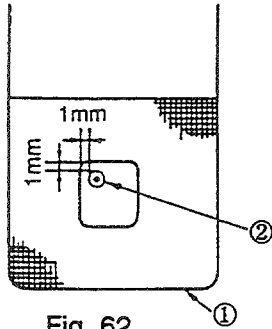


Fig. 62

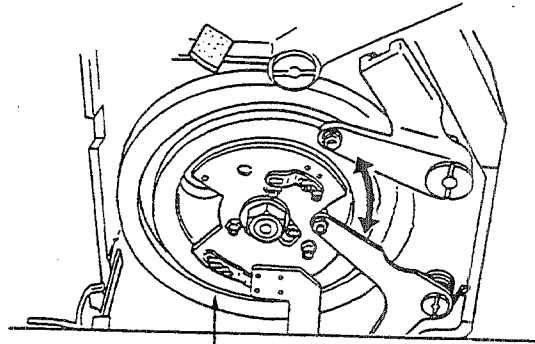


Fig. 63

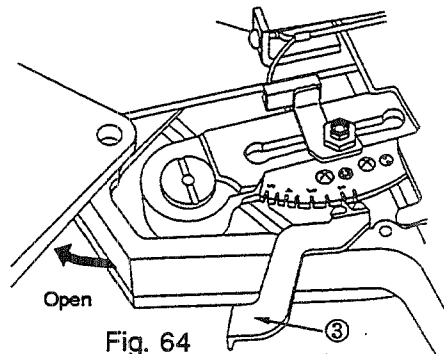


Fig. 64

(30) Adjusting the needle entry

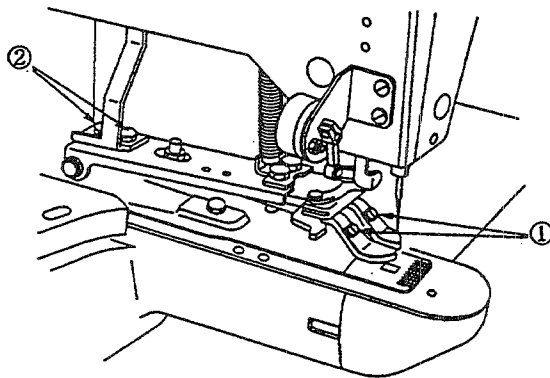
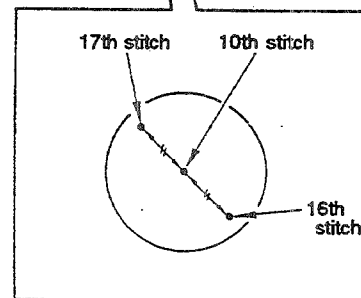
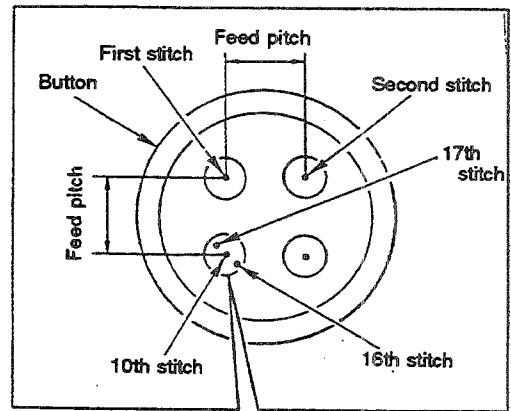


Fig. 65





How to Adjust	Effects of Adjustment
<p>1) For the LK-1851C-555, -1851C-556, -1852C-557 and -1851C-558, lower the button clamp jaw levers when the sewing machine is in the stop-motion state and adjust the position of feed plate ① by feed cam ④ in the direction of the arrow (↔) so that the feed plate will not move back or forth even when one-touch utility feed lever ③ is moved to the right or left. The feed timing is automatically determined properly by performing this adjustment. After the adjustment, needle hole guide ② is brought to the center of the recess on feed plate ① at the time of stop-motion. (In terms of the longitudinal direction)</p> <p>2) Refer to page 22 for how to adjust the feed timing for the LK-1853-559.</p>	
<p>Place a button in button clamp jaw levers ①. Loosen screws ② in the button clamp mechanism base and adjust the needle entries in the lateral and longitudinal directions by turning the driving pulley by hand.</p> <p>Adjusting procedure is described below taking the sewing of a button with 18 stitches using U-shape stitching function as an example.</p> <p>1) Finely adjust the lateral feed pitch so that the needle enters the center of a button hole at the first and second needle entries.</p> <p>2) Further turn the sewing machine until the feed driving mechanism actuates. Now, finely adjust the longitudinal feed pitch so that the needle enters just the center of a button hole at the 10th needle entry. (You may set the lever at the middle of the notch on the scale.)</p> <p>3) Finally, adjust the button clamp jaw levers so that the 16th and 17th needle entry points are equidistantly spaced from the center of a button hole in terms of the stitching direction.</p> <p><b>[ Caution ]</b>  <b>When adjusting the needle entries, the needle may come in contact with the button in accordance with the button hole diameter. When you actually start up the sewing machine, however, the needle entry point will be closer to the center of the respective holes in the button, as compared with the needle entry point made at the time of adjustment.</b></p>	

Only for the sewing machine for button sewing

Standard Adjustment

(31) Adjusting the timing of the knot tying plate

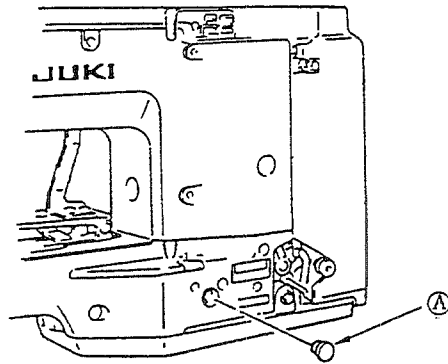


Fig. 66

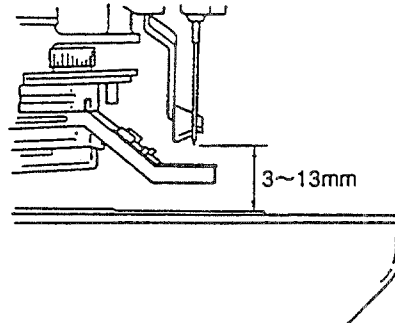


Fig. 67

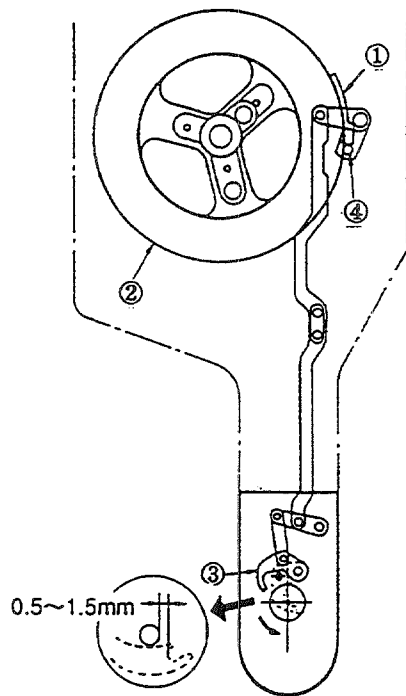


Fig. 68

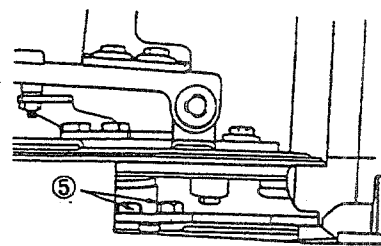


Fig. 69

How to Adjust	Effects of Adjustment
<p>1) Knot tying plate ③ actuates at the 8th and 17th needle entries when sewing a button with 18 stitches. It actuates at the 7th and 15th needle entries in the case of 16 stitches, at the 10th and 21th needle entries in the case of 22 stitches or at the 14th and 29th needle entries in the case of 30 stitches. Tilt the sewing machine, remove large plug (A) from the back right section of the machine head and shift knot tying notch ① that is mounted on the feed cam ② to adjust so that the top end of the needle is located 3 to 13 mm above the feed plate when knot tying plate ③ starts moving then stops.</p> <p>2) To adjust the forward end position (shown by the dotted line) of knot tying plate ③, loosen first screws ⑤ in the knot tying connecting plate. Then, adjust so that the hook-shaped threading point of knot tying plate ③ is spaced 0.5 to 1.5 mm from the edge of needle eyelet. (In the state where knot tying roller ④ rests on knot tying notch ①)</p>	<p>If the knot tying notch fails to actuate at the specified needle entries, thread knots will not be made with consistency. If the timing of the knot tying notch (3 to 13 mm) is excessively advanced or retarded, the needle will come in contact with the knot tying plate, resulting in needle breakage.</p>

**Only for the sewing machine for button sewing**

**Standard Adjustment**

**(32) Adjusting the position of the wiper**

The end face of wiper should be spaced 15 to 17 mm from the center of the needle.

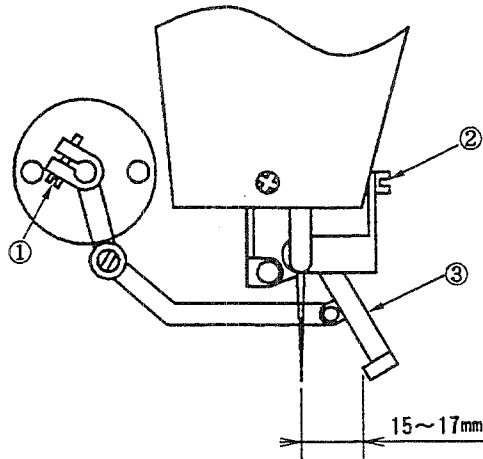


Fig. 70

**(33) Adjusting the stroke of the thread trimming solenoid**

The stroke of the thread trimming solenoid should be adjusted to 7 to 8 mm.

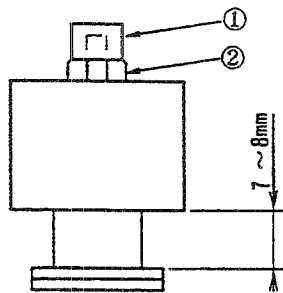


Fig. 71

How to Adjust	Effects of Adjustment
<p>1) Loosen screw ① in the wiper arm connecting stud.  2) Loosen screw ② in the wiper installing plate, and move the installing plate up or down to properly position the wiper.</p> <p>[ Caution ]  To adjust the position of the wiper, tighten the adjustment screw with the wiper pressed by hand in the direction of the arrow.</p>	<ul style="list-style-type: none"> <li>● If the distance provided between the end face of the wiper and the center of the needle is smaller than 17 mm:  The wiper will come in contact with the needle clamp screw when the needle bar comes down.</li> <li>● If the distance provided between the end face of the wiper and the center of the needle is larger than 17 mm:  The wiper will interfere with the top end of the needle. In this case, the needle will break or the needle tip will be damaged.</li> </ul>
<p>Adjust the stroke of the thread trimming solenoid by tightening or loosening presser bar ① and nut ②.</p> <div data-bbox="430 1339 669 1516" data-label="Image"> </div> <p style="text-align: center;">Fig. 72</p>	<p>If the stroke of the thread trimming solenoid is too small, the thread trimmer auxiliary cam will fail to properly engage with the roller, resulting in a thread trimming failure with abnormal noise.</p>

Only for the sewing machine for button sewing

### Standard Adjustment

#### (34) Adjusting the tension releasing solenoid

Dimensions related to the position of the tension releasing solenoid presser pin is 0 to 1 mm in terms of direction A and 0.5 mm in terms of direction B.

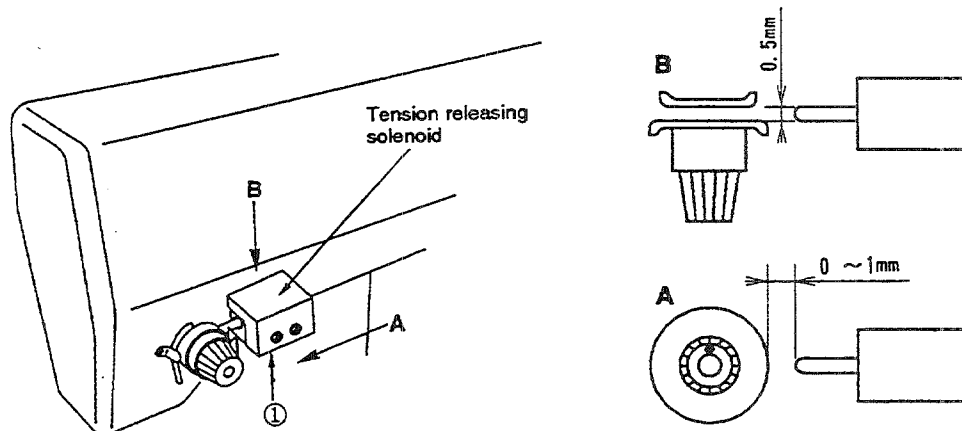


Fig. 73

#### (35) Adjusting the thread adjusting device

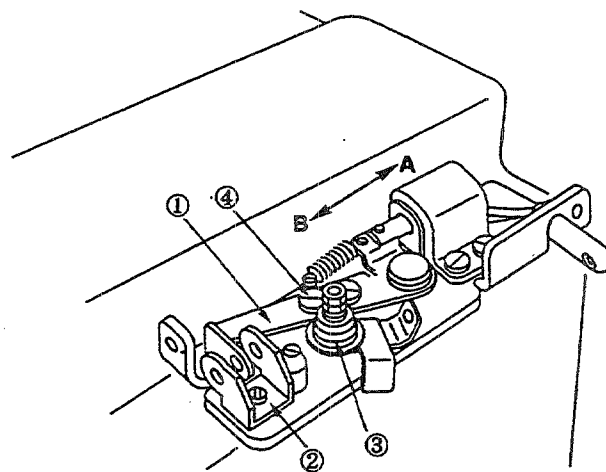


Fig. 74

How to Adjust	Effects of Adjustment
<p>1) Loosen two screws in the tension releasing solenoid installing plate and adjust the position of the solenoid simultaneously in directions A and B.</p>	<p>If the dimension in direction A is larger than 0 to 1 mm, the tension disk will not rise to release the thread tension when the solenoid actuates. As a result, the length of thread remaining at the needle after thread trimming will be reduced and the thread will slip off the needle eyelet.</p> <p>If the dimension in direction A is smaller than 0 to 1 mm, the tension disk will be held raised causing a stitching failure. (Lifting failure)</p>
<p>1) Adjust thread guide ② for the thread adjusting device so that the thread path hole in thread adjusting lever ① and thread path hole in thread guide ② for the thread adjusting device lie on a straight line when the sewing machine is in operation.</p> <p>2) Loosen screw ④ in the thread adjusting arm and adjust so that tension disk ③ of thread adjusting device rises when the solenoid moves in direction A, or closes when the solenoid moves in direction B.</p>	<p>If the tension disk of the thread adjusting device fails to close, thread knots will not be made with consistency.</p>

**Only for the sewing machine for button sewing**

**Standard Adjustment**

**(36) Position of the moving knife and counter knife**

Position of the counter knife:

A clearance of 0.5 mm should be provided between the counter knife and the needle hole guide.

Position of the moving knife:

A clearance of 1.5 mm should be provided between the rear end of the moving knife and the edge of the needle eyelet when the sewing machine stops (before the work clamp foot goes up).

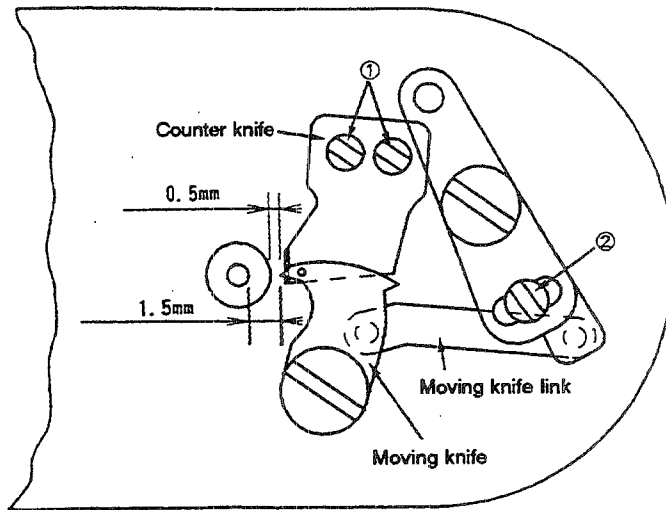


Fig. 75

**(37) Position of the 2-4 hole sensor and the detecting plate**

When the feed regulating lever is set to the 2-holed button sewing position (feed amount: 0), the LED of the 2-4 hole sensor should light up to detect the 2-holed button sewing mode. The clearance provided between the 2-4 hole sensor and the detecting plate should be adjusted to  $1 \pm 0.5$  mm.

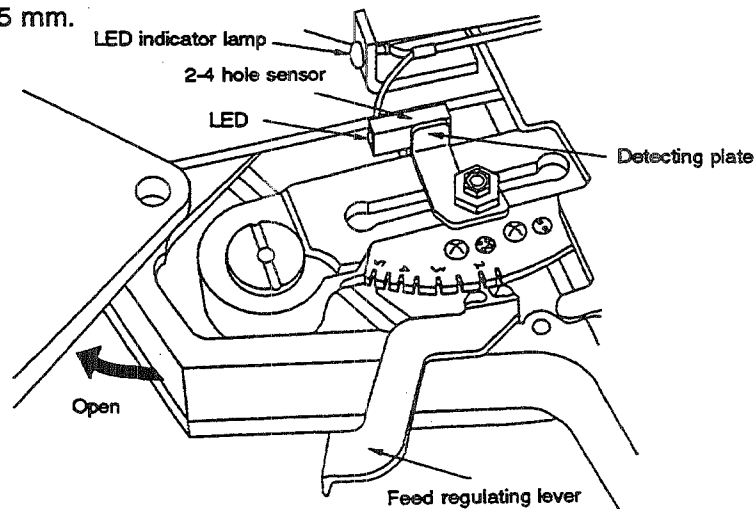


Fig. 76



How to Adjust	Effects of Adjustment
<p>1) Position of the counter knife Loosen screws ① in the counter knife and adjust the position of the knife properly.</p> <p>2) Position of the moving knife Confirm that the thread trimmer roller rests on the periphery of the thread trimmer cam. Now, loosen screw ② and adjust so that a clearance of 1.5 mm is provided between the rear end of the moving knife and the edge of the needle eyelet.</p>	<ul style="list-style-type: none"> <li>● If the clearance provided between the counter knife and the needle hole guide is smaller than 0.5 mm, the blade tip of the counter knife will cut the thread when the moving knife draws the thread. As result, the needle and bobbin threads will be cut short.</li> <li>● If the clearance provided between the counter knife and the needle hole guide is larger than 0.5 mm, the length of thread trailing from the wrong side of the material after thread trimming will increase.</li> <li>● If the moving knife approaches the needle eyelet, the thread will not spread with consistency. In this case, the thread will not be cut.</li> <li>● If the moving knife is positioned too far from the needle eyelet, the thread trimming timing will be advanced and the length of thread remaining at the needle after thread trimming will decrease. In addition, the thread trimming components will be pushed against with each other resulting in a thread trimming failure or the needle will interfere with the moving knife resulting in needle breakage.</li> </ul>
<p>Confirm, by moving the feed regulating lever to the right and left, that the LED of the 2-4 hole sensor lights up when the feed regulating lever is set to the 2-holed button sewing position. The clearance provided between the 2-4 hole sensor and the detecting plate cannot be adjusted.</p>	<p>If the 2-4 hole sensor fails to detect the 2-holed button sewing position, the sewing machine will be incapable of performing half-divided stitches sewing for 2-holed buttons even when changing over the full/half change-over switch on the operation panel. In this case, the wiper solenoid will actuate during sewing.</p>

## 5. OTHER PRECAUTIONS

### Precautions

#### (1) Configuration of the shuttle race ring

If the shuttle point has been found worn out severely, remove the shuttle race ring and check whether the hatched portion on the rear side measures 0.2 mm x 8 mm.

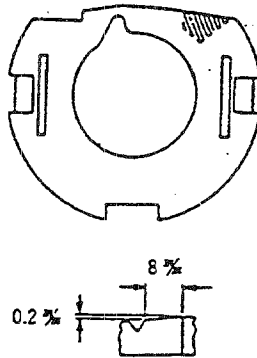


Fig. 77

#### (2) How to remove the backlash of the shuttle driver shaft

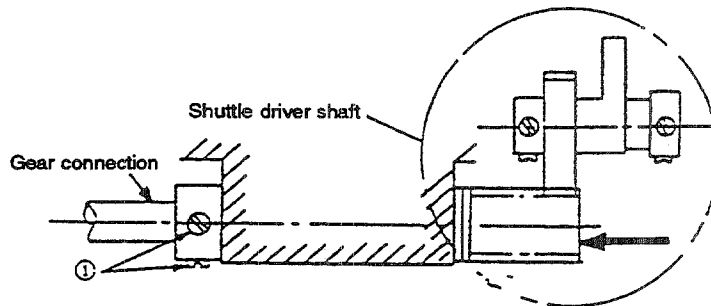


Fig. 78

#### (3) How to remove the backlash of the main shaft

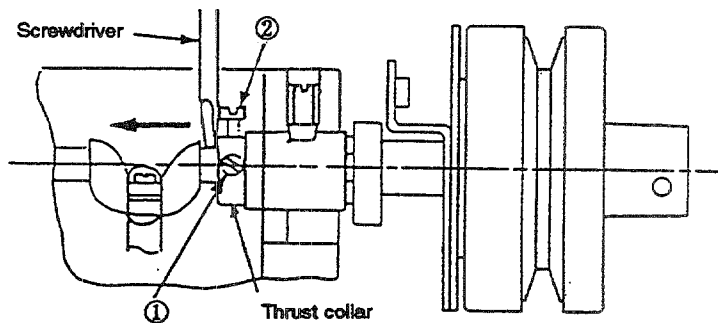


Fig. 79

Procedures	Remarks
<ul style="list-style-type: none"> <li>● If the hatched portion does not measure 0.2 mm x 8 mm, correct it using an oil stone.</li> </ul>	
<ul style="list-style-type: none"> <li>● Removing the axial backlash Loosen two setscrews ① of the thrust collar, and tighten them while pushing the shuttle driver shaft in the direction of arrow.</li> <li>● Removing the rotational backlash Replace the gear connection by an appropriate one selected among the followings. <ul style="list-style-type: none"> <li>○ 13508353 Shuttle driver shaft gear connection (Y) (0.2 smaller in dia.)</li> <li>○ 13509054 Shuttle driver shaft gear connection (Z) (0.1 smaller in dia.)</li> <li>○ 13509153 Shuttle driver shaft gear connection (A) (Standard)</li> <li>○ 13509252 Shuttle driver shaft gear connection (B) (0.1 larger in dia.)</li> <li>○ 13509351 Shuttle driver shaft gear connection (C) (0.2 larger in dia.)</li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>● Tighten thrust setscrews ① and ② while twisting the crank in the direction of arrow using a screwdriver or the like. Setscrew ① is the first setscrew. Tighten it so that it fits to the flat part of the main shaft.</li> <li>● The proper play is 0.01 to 0.04 mm.</li> </ul> <p><b>(Note)</b> Make sure to check the timing of the feed cam and the stop-motion cam after removing the backlash.</p>	<ul style="list-style-type: none"> <li>● An axial backlash on the main shaft would adversely affect the feed timing.</li> </ul>

## Precautions

(4) How to remove the backlash between the worm and worm gear.

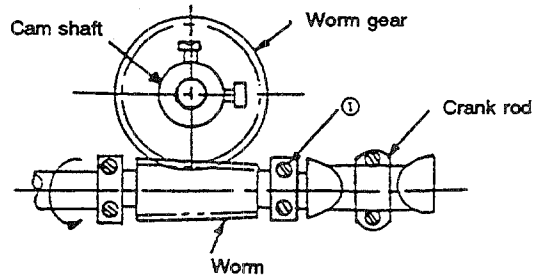


Fig. 80

(5) How to remove the backlash of the feed bracket

Backlash of the feed cam roller (Fig. 94) or feed slide block (Figs. 93 and 94) would lead to lateral or longitudinal backlash of the feed bracket.

Procedures	Remarks																																				
<p>1) Remove the top cover.</p> <p>2) Loosen four screws ①.</p> <p>3) Holding the cam shaft, turn the worm in the direction of arrow with care taken not to disturb the timing between the main shaft and the cam shaft. This will make the worm advance toward the rear bushing of the main shaft, removing the backlash.</p> <p>4) After removing the backlash, securely tighten four screws ①.</p> <p><b>(Note)</b>  <b>If the timing between the main shaft and the cam shaft has been disturbed, readjust the stop-motion timing and the feed cam.</b></p>	<ul style="list-style-type: none"> <li>● An excessive backlash would adversely affect the feed timing.</li> <li>● If no backlash is allowed, the worm will get hot, and the main shaft torque will increase.</li> </ul>																																				
<p>1) Replace the feed cam roller by one of the followings.</p> <table border="1" data-bbox="181 743 841 919"> <tbody> <tr> <td>B250228000A</td> <td>Feed cam roller</td> <td><math>\phi 9.5</math></td> <td><math>\begin{matrix} +0.01 \\ +0.005 \end{matrix}</math></td> </tr> <tr> <td>B250228000B</td> <td>Feed cam roller</td> <td><math>\phi 9.5</math></td> <td><math>\begin{matrix} +0.005 \\ 0 \end{matrix}</math></td> </tr> <tr> <td>B250228000C</td> <td>Feed cam roller</td> <td><math>\phi 9.5</math></td> <td><math>\begin{matrix} 0 \\ -0.005 \end{matrix}</math></td> </tr> <tr> <td>B250228000D</td> <td>Feed cam roller</td> <td><math>\phi 9.5</math></td> <td><math>\begin{matrix} +0.015 \\ +0.010 \end{matrix}</math></td> </tr> </tbody> </table> <p>2) Replace the feed slide block by one of the followings.</p> <table border="1" data-bbox="181 1003 841 1218"> <tbody> <tr> <td>13516604</td> <td>Feed slide block</td> <td>12</td> <td><math>\begin{matrix} -0.009 \\ -0.005 \end{matrix}</math></td> </tr> <tr> <td>13516703</td> <td>Feed slide block</td> <td>12</td> <td><math>\begin{matrix} 0 \\ -0.005 \end{matrix}</math></td> </tr> <tr> <td>13516802</td> <td>Feed slide block</td> <td>12</td> <td><math>\begin{matrix} +0.005 \\ 0 \end{matrix}</math></td> </tr> <tr> <td>13519103</td> <td>Feed slide block</td> <td>12</td> <td><math>\begin{matrix} +0.009 \\ +0.005 \end{matrix}</math></td> </tr> <tr> <td>13519202</td> <td>Feed slide block</td> <td>12</td> <td><math>\begin{matrix} +0.013 \\ +0.009 \end{matrix}</math></td> </tr> </tbody> </table>	B250228000A	Feed cam roller	$\phi 9.5$	$\begin{matrix} +0.01 \\ +0.005 \end{matrix}$	B250228000B	Feed cam roller	$\phi 9.5$	$\begin{matrix} +0.005 \\ 0 \end{matrix}$	B250228000C	Feed cam roller	$\phi 9.5$	$\begin{matrix} 0 \\ -0.005 \end{matrix}$	B250228000D	Feed cam roller	$\phi 9.5$	$\begin{matrix} +0.015 \\ +0.010 \end{matrix}$	13516604	Feed slide block	12	$\begin{matrix} -0.009 \\ -0.005 \end{matrix}$	13516703	Feed slide block	12	$\begin{matrix} 0 \\ -0.005 \end{matrix}$	13516802	Feed slide block	12	$\begin{matrix} +0.005 \\ 0 \end{matrix}$	13519103	Feed slide block	12	$\begin{matrix} +0.009 \\ +0.005 \end{matrix}$	13519202	Feed slide block	12	$\begin{matrix} +0.013 \\ +0.009 \end{matrix}$	
B250228000A	Feed cam roller	$\phi 9.5$	$\begin{matrix} +0.01 \\ +0.005 \end{matrix}$																																		
B250228000B	Feed cam roller	$\phi 9.5$	$\begin{matrix} +0.005 \\ 0 \end{matrix}$																																		
B250228000C	Feed cam roller	$\phi 9.5$	$\begin{matrix} 0 \\ -0.005 \end{matrix}$																																		
B250228000D	Feed cam roller	$\phi 9.5$	$\begin{matrix} +0.015 \\ +0.010 \end{matrix}$																																		
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13519202	Feed slide block	12	$\begin{matrix} +0.013 \\ +0.009 \end{matrix}$																																		

## 6. DISASSEMBLING & ASSEMBLING PROCEDURES AND PRECAUTIONS

### Disassembling & Assembling Procedures

#### (1) Disassembling the shuttle driver shaft

- 1) Loosen setscrew ①, and remove the shuttle driver.
  - 2) Loosen the two setscrews of the thrust collar.
  - 3) Loosen two screws in the thread trimmer link and the screw in the thread trimmer regulating arm position bracket. Then, remove the thread trimming arm shaft.
  - 4) Draw out the shuttle driver shaft to the rear.
- \* Assemble them by reversing the above disassembling procedure.

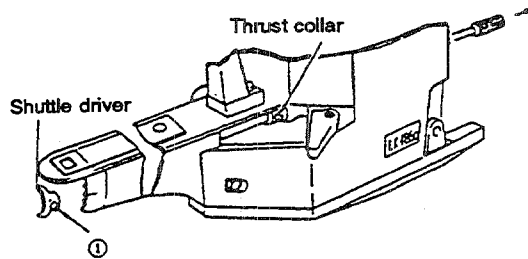


Fig. 81

#### (2) Disassembling the main shaft

- 1) Remove the needle.
  - 2) Remove two screws ① from the driving pulley, and remove the driving pulley.
  - 3) Loosen two screws ③ in the stator installing plate and remove the stator and the stator installing plate.
  - 4) Loosen two screws ① in the counterweight, two screws ③ in the crank balancer and four screws ② in the worm.
  - 5) Loosen two screws ③ in the crank rod and remove the crank rod cover.
  - 6) Loosen and remove two setscrews ④ of the thrust collar.
  - 7) Loosen and remove setscrew ⑤ of the main shaft rear bushing.
  - 8) Remove the thread take-up spring, and position the knife driving cam arm so that it does not interfere with the rear end of the bushing.
  - 9) Apply a brass bar to point A, tap it to draw out the main shaft together with rear bushing ⑦.
- \* Assemble them by reversing the above disassembling procedure.

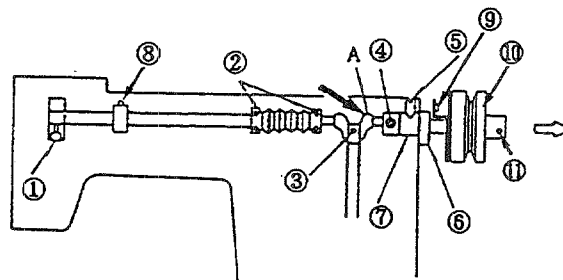


Fig. 82

### Precautions in disassembly

- When drawing out the shuttle driver shaft, never remove the dowel pin from the shuttle driver shaft gear, or else the shuttle driver shaft needle bearing will be damaged.

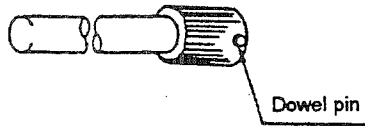


Fig. 83

### Precautions in Assembly

- When reassembling the same gears, put the mating faces of the gears to their original position to prevent loud gear noise.

- Be sure to use a soft metal such as a brass bar when tapping point A. At this time, remember to tap it gradually.
- Install the stator so that the stator and the main shaft are concentric.

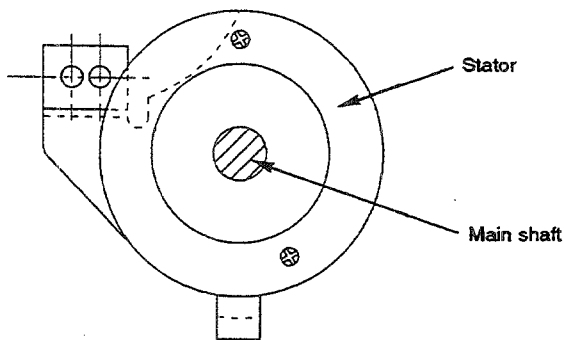


Fig. 84

- To assemble the main shaft, place a covering piece on the end of knife driving cam ④, and tap it gradually using a brass bar or the like to drive in the rear bushing of the main shaft.
- Securely fit the end of setscrew ⑤ into the long groove of the rear bushing of the main shaft, and fit it.

- If the stator is not concentric with the main shaft, the stator may come in contact with the driving pulley and magnet.

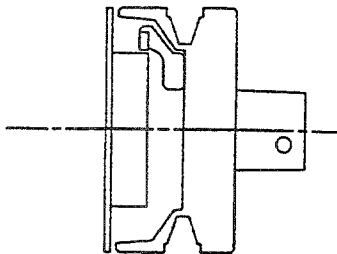


Fig. 85

## 7. PARTS TO BE FIXED WITH LOCKTITE

Since a great number of starts and stops are expected in operating this machine, the screws that are likely to loosen have been fixed with LOCKTITE.

Accordingly, whenever these parts have been disassembled, clean them with thinner and dry well before applying LOCKTITE to them for reassembly.

If it is difficult to remove a screw fixed with LOCKTITE, heat it with a torch lamp or the like. The parts using LOCKTITE that are usually disassembled are as shown below.

- 1) Throat plate  
Knife driving lever stud

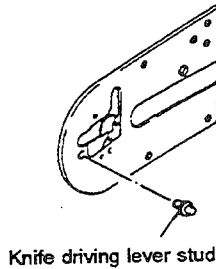


Fig. 86

- 2) Shuttle driver shaft gear  
Gear dowel pin

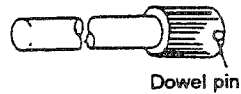


Fig. 87

- 3) Nut of the hinge screw for the thread trimmer connecting rod and the thread trimmer actuating shaft

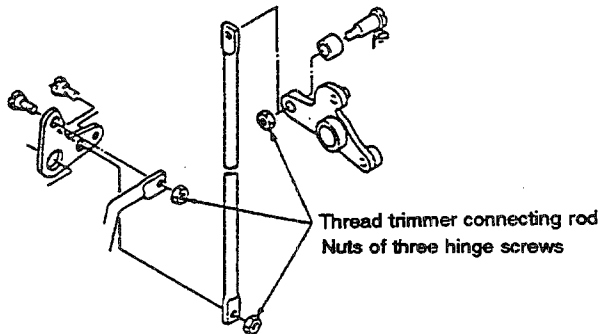


Fig. 88

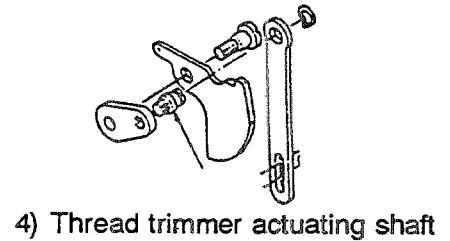


Fig. 89

### (Caution)

**LOCKTITE is used for many hinge screws. Be very careful not to allow LOCKTITE to stick to their shafts, or else the functions of the parts may be damaged.**



## 8. PARTS TO BE FILLED WITH GREASE

- (1) Refill grease once every other year or when the parts filled with grease have been disassembled.
- (2) Grease to be used  
Lithium-based grease

Maker	Description
Esso	Listan 2, Beacon 2
Shell	Albania
Nippon	Multi-nock 2, Ebinock 2
Kyoko	Rizonix 2
Idemitsu	Coronex 2

\* Use Esso Templex N3 for the pedal pressure decreasing unit components. (Supplied with the machine)

- (3) Parts to be filled with grease  
If a grease pump is not available, use a plastic oiler or an injector with its needle removed.

### 1) Main shaft components

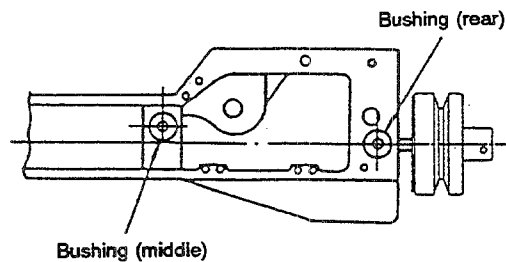


Fig. 90

### 2) Feed bracket components

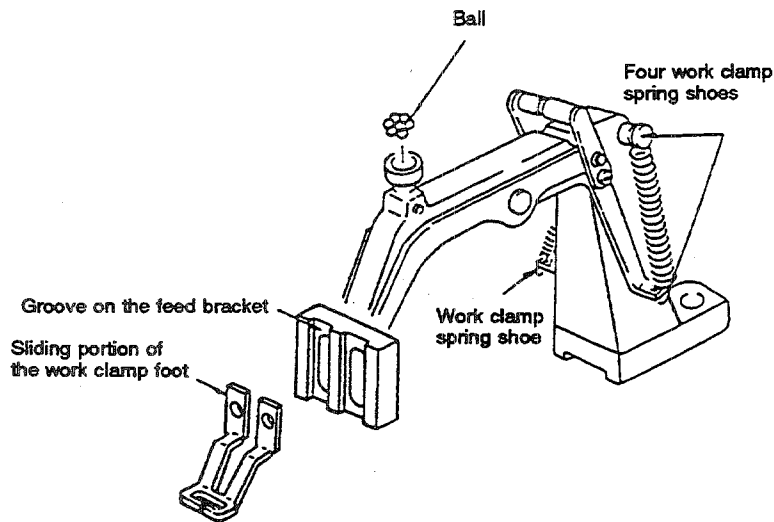


Fig. 91

3) Lowering lever and stop-motion connecting lever components

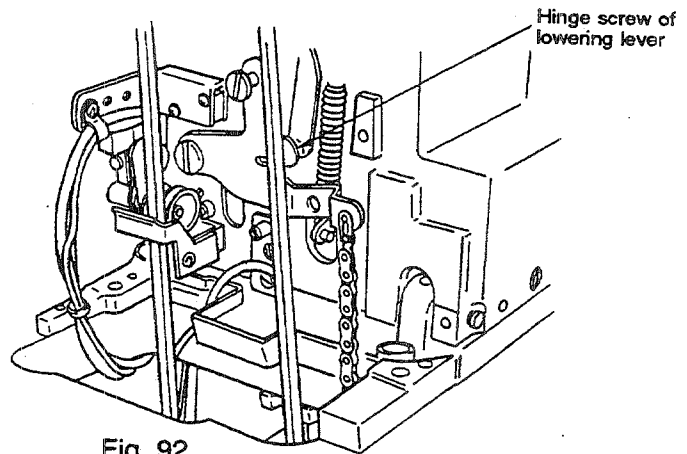


Fig. 92

4) Longitudinal and lateral feed components

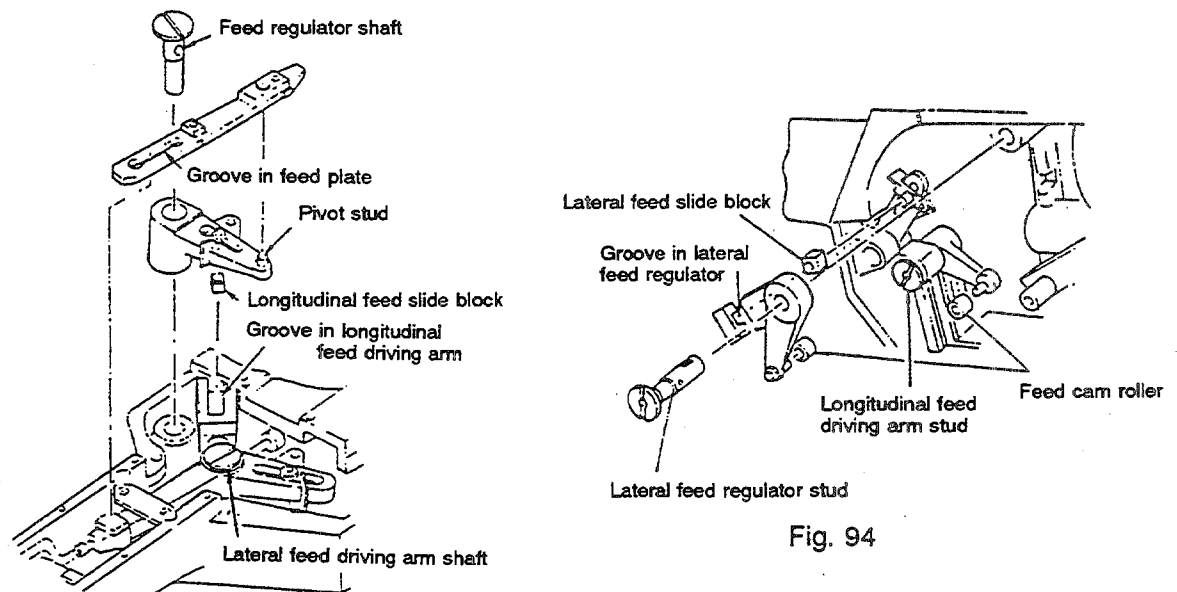


Fig. 93

Fig. 94

5) Knife driving cam components

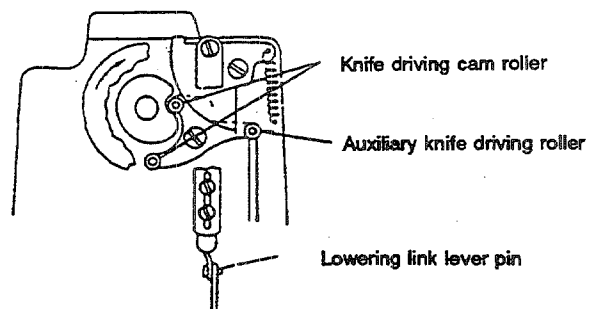
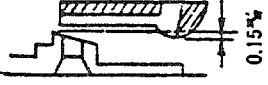



Fig. 95

## 9. EXPENDABLE PARTS

### (1) General expendable parts

Part No.	Description	Caution in installation
	Needle	
B1818280000	Shuttle	Check that the clearance of 0.3 to 0.5 mm is provided between the shuttle and the shuttle driver. If not, correct it in accordance with the pertinent "Standard Adjustment."
B24222800A0	Moving knife	Select a proper washer for the moving knife and perform adjustment so that the moving knife blade engages with the needle hole guide by 0.15 mm. 
B2424280000	Counter knife	Perform adjustment to provide a 0.1 to 0.15 mm difference in level between the counter knife blade and the needle hole guide. 
B2426280000	Needle hole guide	Replace this part if its needle hole has been scratched or grown bigger in diameter. Whenever installing a new needle hole guide, check the height of the moving and counter knives.
B3112761000	Thread take-up spring	
B2303280000	Tension release pin	

### (2) Expendable parts to be replaced infrequently

Part No.	Description	Caution in installation
13522206	Stop-motion regulating cam roller	Whenever replacing the roller, the snap ring RC0470611KP should be also replaced with a new one.

### (3) Parts likely to be lost or damaged during repair

Part No.	Description	Caution in installation
B2549280000	Balls (seven) for feed bracket	Apply grease to these balls to prevent them from falling when installing them.
SS1060210TP	Needle hole guide setscrews (two)	

## 10. PARTS FOR SUBCLASS MACHINES

### (1) Parts for changing the number of stitches

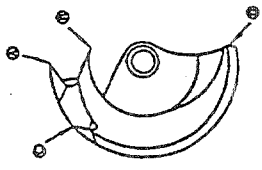
Model	No. of stitches	Worm gear	Worm
LK-1852	28	13510904	13510805
	14	"	"
LK-1853	36	13511100	13511001
LK-1854	42	13510409	13510300
	21	"	"

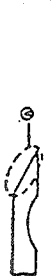
### (2) Special part and devices


Application	Description	Part No.	Remarks
For long needle (DPx17)	Needle bar	D1401L7VV00	
	Needle bar thread guide	D1405L7AM00	
	Wiper	D2101L7AM00	
For thick needle (#19 or more)	Shuttle	D1818282N00	
	Shuttle race ring (for #23 needle)	D1817282N00	
	Needle hole guide (without boss) $\phi$ 2 hole	B242628000B	
	Needle hole guide (without boss) $\phi$ 2.7 hole	D2426MMCK00	
	Needle hole guide (with boss)	D2426L7AM00	
For thick thread	Thread take-up spring	D3112L4BB00	For thread of more than #5
	Tension spring No.2	B3129053000	
	Bobbin case	B18289800AB	
For making shuttle rotation angle greater (for sewing canvas shoes)	Large oscillating rock shaft	D1805MLBH00	
For higher tension of pressure spring	Spring	13519004	

# 11. TROUBLES AND CORRECTIVE MEASURES


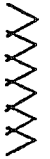
Trouble	Cause (1)	Cause (2)	Corrective measures
1. Abnormal sound is heard.	1-1) The bearing has worn out or scratched.		Replace the bearing. (Refer to Disassembling & Assembling Procedures.)
	2-1) The tension release bar hits other part.	2)-A The tension release bar hits the face plate.	Correctly adjust the tension release bar. (Refer to Standard Adjustment (11).)
2. The work clamp foot will not go down.	3-1) Stitch skipping at the first stitch.	1)-A The timing between the needle and the shuttle is wrong.	Correct the timing and the clearance between them. (Refer to Standard Adjustment (18).)
		1)-B The feed timing is wrong.	Correct the timing of the feed cam. (Refer to Standard Adjustment (2).)
	3-2) The thread remaining on the needle is not long enough.	2)-A The tension controller No. 1 has been adjusted improperly.	Correct the tension controller No. 1. (Refer to Standard Adjustment (23).)
		2)-B The tension release bar has been maladjusted.	Correctly adjust the tension release bar. (Refer to Standard Adjustment (16).)
	3-3) The bobbin thread is not long enough.	2)-C The stroke of the thread take-up spring has been maladjusted.	Correct the stroke of the thread take-up spring. (Refer to Standard Adjustment (24).)
		2)-D The difference in level between the counter knife and the moving knife is not correct.	Correct the height of the moving knife and the counter knife. (Refer to Standard Adjustment (21).)
	3-4) The bobbin thread protrudes due to racing of the bobbin.	3)-A The difference in level between the counter knife and the moving knife is not correct.	Correct the height of the moving knife and the counter knife. (Refer to Standard Adjustment (21).)
		3)-B The shuttle race spring has scratches.	Remove the scratches.
		3)-C The bobbin thread tension is too high.	Correct the bobbin thread tension.
	3-5) The sewing machine stops before the predetermined stop position is reached. (Needle bar)	5)-A The upper detecting magnet has been improperly adjusted. (The magnet has been adjusted to stop the sewing machine earlier.)	Replace the bobbin case and the bobbin with those exclusively used for LK-1850.  The upper detecting magnet has been improperly adjusted. (Refer to the Standard adjustment (3).)

Trouble	Cause (1)	Cause (2)	Corrective measures
4. Needle breakage	4-1) The clearance between the shuttle driver needle guard and the needle is not correct.		Correct the clearance between the needle and the shuttle driver. (Refer to Standard Adjustment (18).)
	4-2) The feed timing is not correct.		Correct the feed cam timing. (Refer to Standard Adjustment (2).)
	4-3) The needle hole guide has scratches.		Remove the scratches, or replace the needle hole guide.
	4-4) The needle hits the work clamp foot.		Correct the position of the work clamp foot. (Refer to Standard Adjustment (13).)
	4-5) The needle hits the moving knife.		Properly position the moving knife. (Refer to Standard Adjustment (20).)
5. Stitch skipping	5-1) The timing between the needle and the shuttle is wrong.		Correct the timing and clearance between them. (Refer to Standard Adjustment (18).)
	5-2) The needle is bent or has been attached improperly, or the needle point is blunt.		Replace or properly attach the needle.
	5-3) The feed timing is not correct.		Correct the feed cam timing. (Refer to Standard Adjustment (2).)
	5-4) The clearance between the shuttle driver needle guard and the needle is not correct.		Correct the clearance between the needle and the shuttle driver. (Refer to standard Adjustment (18).)
6. Thread breakage	6-1) Scratches on the shuttle. 	1)-A Scratch on point (A) (due to needle striking the shuttle)	Smooth out the shuttle point with an oil stone, then burnish using a blue polishing sand bar or the like. Correct the clearance between the needle and the shuttle. (Refer to Standard Adjustment (18).)
		1)-B Scratch on point (B) (produced when the needle bends or breaks)	Smooth it out with an oil stone, then burnish using a blue polishing sand bar or the like.
		1)-C Scratch on point (C) (The shuttle has been scratched at the needle when removed.)	Smooth it out with an oil stone, then burnish using a blue polishing sand bar or the like.
		1)-D scratch on point (D)	Smooth it out with an oil stone, then burnish using a blue polishing sand bar or the like.

Trouble	Cause (1)	Cause (2)	Corrective measures
	6-2) The thread bites into the shuttle.	2)-A The shuttle race spring has been positioned improperly.	Correct the position of the shuttle race spring. (Refer to Standard Adjustment (17).)
		2)-B The shuttle blade point (A) has been rounded.	Replace the shuttle.
			
		2)-C The shuttle race has positioned improperly.	Correct the position of the shuttle race. (Refer to Standard Adjustment (18).)
		2)-D The needle thread tension is not high enough.	Correct the needle thread tension.
	6-3) The shuttle driver has scratches.		Remove the scratches.
	6-4) The clearance between the shuttle driver and the shuttle is not correct.		Correct the clearance between the shuttle driver and the shuttle. (Refer to Standard Adjustment (18).)
	6-5) The needle hole guide has scratches.		Remove the scratches, or replace the needle hole guide.
	6-6) The needle has scratches, or has been bent or attached improperly.		Replace or properly attach the needle.
	6-7) The work clamp foot has been positioned improperly.		Properly position the work clamp foot. (Refer to Standard Adjustment (13).)
	6-8) The stroke of the thread take-up spring has been maladjusted.	8)-A The stroke of the thread take-up spring is too large.	Correct the stroke. (Refer to Standard Adjustment (24).)
		8)-B The tension of the thread take-up spring is too high.	Correct the tension of the thread take-up spring. (Refer to Standard Adjustment (24).)
	6-9) The needle thread tension is too high.		Correct the needle thread tension.
	6-10) The shuttle does not rotate properly.	10)-A There are fibrous wastes on the shuttle race racing surface.	Remove the shuttle, and remove the fibrous wastes.
		10)-B Poor lubrication	Lubricate the shuttle assembly.

Trouble	Cause (1)	Cause (2)	Corrective measures
7. Thread breaks at time of thread trimming. (Normal thread trimming is not done at the last stitch, and either needle thread or bobbin thread is cut.)	<p>7-1) The tension release timing is not correct.</p> <p>7-2) The moving knife has scratches.</p> <p>7-3) The shuttle race spring has scratches.</p> <p>7-4) The height of the counter knife is not correct.</p> <p>7-5) The thread path of the bottom surface of the needle hole guide is not smooth.</p> <p>7-6) The thread spreading timing of the moving knife is bad.</p> <p>7-7) The needle thread tension is too high.</p>	<p>1)-A Thread is trimmed before thread tension is released.</p> <p>4)-A The thread is cut by the projection of the moving knife before it is trimmed by the moving knife.</p> <p>5)-A The thread is cut by the needle hole guide.</p>	<p>Correctly adjust the tension release bar. (Refer to Standard Adjustment (16).)</p> <p>Using a blue polishing sand bar or the ilke, burnish the moving knife with attention paid to the blade.</p> <p>Remove the scratches.</p> <p>Correct the height of the moving and counter knives. (Refer to Standard Adjustment (21).)</p> <p>Smooth out the thread path using a blue polishing sand bar or the ilke, or replace the needle hole guide.</p> <p>Properly position the auxiliary knife driving cam and the moving knife. (Refer to Standard Adjustment (11) and (20).)</p> <p>Correct the needle thread tension.</p>
8. Thread trimming failure (The needle thread or bobbin thread is not trimmed, or the needle thread is trimmed extremely long or short upon completion of bartacking.)	<p>8-1) The knives are blunt.</p> <p>8-2) Fibrous wastes remain in the cylinder arm cap.</p>	<p>1)-A The moving knife or the counter knife have worn out.</p> <p>1)-B The moving knife does not engage with the counter knife properly.</p> <p>1)-C The moving knife has an improper vertical backlash.</p> <p>1)-D The tilt of the counter knife is not correct.</p> <p>2)-A The portion (A) of the moving knife has a burr. (Thread is trimmed in improper shape , and thread waste remains.)</p>	<p>Replace the moving knife or counter knife.</p> <p>Correct the height of the moving and counter knives. (Refer to Standard Adjustment (21).)</p> <p>The backlash should be 0.05 to 0.1 mm at the end of the moving knife. Replace the hinge screw or the moving knife.</p> <p>Correct the tilt of the blade point of the counter knife. (Refer to Standard Adjustment (22).)</p> <p>Burnish the moving knife using a blue polishing sand bar or the ilke with care taken to the blade, or replace the moving knife.</p>



Trouble	Cause (1)	Cause (2)	Corrective measures
	8-3) The moving knife does not spread the threads.	2)-B The shuttle race spring has a scratch. (Thread is trimmed in improper shape  , and thread waste remains).	Remove the scratch.
		3)-A The moving knife has been positioned improperly.	Correctly position the moving knife. (Refer to Standard Adjustment (20).)
		3)-B The moving knife has a wrong path.	Replace the moving knife or the throat plate. (Refer to Standard Adjustment (20).)
		3)-C Stop-motion failure.	Refer to 6 of Troubles and Corrective Measures.
		3)-D The shuttle race spring has been positioned improperly.	Correct the position of the shuttle race spring. (Refer to Standard Adjustment (17).)
		3)-E The sewing machine stops one stitch before the origin of the feed mechanism. (The origin detecting magnet has been improperly adjusted.)	Adjust the origin detecting magnet properly. (Refer to the Standard adjustment (5).)
		3)-F The thread trimmer auxiliary cam comes in contact with the roller.	Properly adjust the thread trimmer auxiliary cam. (Refer to the Standard adjustment (11).)
		3)-G The thread trimmer auxiliary cam comes in contact with the roller since the chain of the work clamp foot lifting solenoid is excessively tensed (the chain has no	Properly adjust the stroke of the work clamp foot lifting solenoid. (Refer to the Standard adjustment (8).)
	8-4) The last stitch is skipped.	4)-A The timing between the needle and the shuttle is bad.	Correct the timing and clearance between the needle and the shuttle. (Refer to Standard Adjustment (18).)
9. Inferior stitch tightness	9-1) The feed timing is bad.		Correct the feed cam timing. (Refer to Standard Adjustment (2).)
	9-2) The tension controller No. 2 has been maladjusted.	2)-A The needle thread tension is not high enough.	Increase the tension.
	9-3) The tension controller No. 2 is released.		Correctly install the tension controller No.2
9-4) The needle thread stitches intersect with each other as illustrated below.			Orient the needle to the left by 5 to 10 degree.

Trouble	Cause (1)	Cause (2)	Corrective measures
10. Stitching failure occurs when using synthetic thread.	10-1) Thread breaks because of heat.	1)-A Sewing speed is too high.	Reduce the sewing speed by turning the sewing speed control variable resistor.
		1)-B The needle used is too thick.	Replace the needle with a thinner needle or a super needle for synthetic thread.
	10-2) Thread splits finely.	2)-A Thread path is defective.	Use a silicon oil lubricating unit. (Special-specification part) Polish the thread path of the related components. Shift the take-up thread guide to the left.
	10-3) Loops of thread are produced on the fabric at the start of sewing.	3)-A Feed timing has been improperly adjusted.	Properly adjust the timing of the feed cam. (Refer to the Standard adjustment (2).) (Set the adjustment value closer to 10 mm.)
11. Work clamp foot fails to go up. Error message E35	11-1) The work clamp foot lifting solenoid falls to work. (Solenoid type machine)	1)-A The connector inside the power source is detached.	Check whether the connector inside the power source has come off.
		1)-B The solenoid cord is defective. (Disconnection)	Replace the solenoid with a new one.
		1)-C The solenoid has failed.	Replace the solenoid with a new one.
		1)-D The solenoid coil has short-circuited.	Replace the solenoid with a new one.
	11-2) The stroke of the work clamp foot lifting solenoid is improper. (Solenoid type machine)	2)-A The stroke of the work clamp foot lifting solenoid is too short.	Properly adjust the stroke of the solenoid. (Refer to the Standard adjustment (8).)
	11-3) The work clamp foot lifting air cylinder falls to operate. (Air cylinder type machine)	3)-A The air hose has come off.	Check the piping.
		3)-B Piping route from the solenoid valve to the cylinder is wrong.	Refer to the Instruction Manual for the LK-1850.
		3)-C The solenoid valve connector has come off.	Check whether the connector has come off.
		3)-D The solenoid valve has failed.	Replace the solenoid valve with a new one.
		3)-E The solenoid valve and junction cord are defective. (Disconnection)	Replace the solenoid valve and junction cord with new ones.

Trouble	Cause (1)	Cause (2)	Corrective measures
11-4) The stroke of the work clamp foot lifting air cylinder is improper. (Air cylinder type machine)		4)-A The stroke of the air cylinder is too short.	Adjust the reference value of the air cylinder. (Refer to the Standard adjustment (9).)
11-5) The main shaft stopper plate comes in contact with the stopper plate.		5)-A The main shaft stopper shaft and the stopper plate have been improperly adjusted.	Properly adjust the main shaft stopper plate. (Refer to the Standard adjustment (12).)
		5)-B The upper detecting magnet has been improperly adjusted.	Properly adjust the upper detecting magnet. (Refer to the Standard adjustment (3).)
		5)-C The stop position of the sewing machine has been improperly adjusted. (The white marker dot is not aligned with the correct stop position of the sewing machine.)	Turn the driving pulley by hand to adjust the white marker dot to the correct stop position of the sewing machine.
11-6) Height of the work clamp foot has been improperly adjusted.			Properly adjust the height of the work clamp foot. (Refer to the Standard adjustment (14).)
11-7) The work clamp foot comes in contact with the wiper.			Properly adjust the wiper. (Refer to the Standard adjustment (15).)
11-8) The work clamp lowering detecting switch fails to work.		8)-A The switch has been improperly adjusted. (The switch is not pressed.)	Properly adjust the switch. (Refer to the Standard adjustment (10).)
		8)-B The connector inside the power source is detached.	Check whether the connector inside the power source has come off.
		8)-C The switch has failed.	Replace the switch with a new one.
		8)-D The cord is defective.	Replace the cord with a new one.

Trouble	Cause (1)	Cause (2)	Corrective measures
12. The sewing machine fails to rotate. (The sewing machine fails to start up.) Error message E3	12-1) The V belt has come off.		Refer to the Instruction Manual for the LK-1850C.
	12-2) The synchronizer is defective.	2)-A The connector is detached.	Check the connector inside the power source.
		2)-B The synchronizer has failed (has broken).	Replace the synchronizer with a new one.
		2)-C The synchronizer cord is defective. (Disconnection)	Replace the synchronizer with a new one.
	12-3) The driving pulley is not equipped with an upper detecting magnet.		Attach the upper detecting magnet to the driving pulley. (Refer to the Standard adjustment (3).)
	13-1) The shaft has seized.		Replace the defective component with a new one. (Refer to page 48.)
13. The sewing machine has locked. Error message E7	13-2) The hook driving shaft has seized.		Replace the defective component with a new one. (Refer to page 48.)
	13-3) Thread is caught in the shuttle.		Remove the thread from inside the shuttle.
	13-4) The thread trimmer regulating arm comes in contact with the thread trimmer regulating lever.	4)-A The thread trimmer regulating arm has been improperly adjusted.	Properly adjust the thread trimmer regulating arm. (Refer to the Standard adjustment (7).)
14. Thread trimming mechanism produces abnormal noise.	14-1) The V belt is excessively tensed.	1)-A The tension of the V belt has been improperly adjusted.	Properly adjust the V belt tension. (Refer to the Standard adjustment (25).)
		1)-B The V belt has worn out.	Replace the V belt with a new one.
		1)-C The driving pulley or the motor pulley has worn out.	Replace the defective component with a new one.
	14-2) The origin detecting magnet has been adjusted so that it works one stitch later than the correct position.	2)-A The origin detecting magnet has been improperly adjusted.	Properly adjust the origin detecting magnet. (Refer to the Standard adjustment (9).)
	14-3) The thread trimmer actuates before the sewing machine sews the last stitch.	3)-A The thread trimming and stop-motion regulating cam has been improperly adjusted.	Properly adjust the thread trimmer stop-motion regulating cam. (Refer to the Standard adjustment (4).)

Trouble	Cause (1)	Cause (2)	Corrective measures
15. The needle comes in contact with the wiper, causing the needle to break.	15-1) The wiper is improperly positioned.	1)-A The wiper has been improperly adjusted.	Properly adjust the wiper. (Refer to the Standard adjustment (15).)
	15-2) The needle bar fails to stop at a constant position.	2)-A The V belt is not sufficiently tensed.	Adjust the V belt tension. (Refer to the Standard adjustment (35).)
	15-3) The relation between the main shaft stopper shaft and the main shaft stopper plate is defective.	2)-B The V belt has worn out.	Replace the V belt with a new one.
		2)-C The driving pulley or the motor pulley has worn out.	Replace the defective component with a new one.
15-4) The needle bar stops beyond the predetermined stop position.	3)-A The main shaft stopper plate has been improperly adjusted.	Properly adjust the main shaft stopper plate. (Refer to the Standard adjustment (12).)	
16. The sewing machine fails to stop at the origin of the feed mechanism. (It stops before the origin of the feed mechanism is reached or after it has passed the origin.)	3)-B The stroke of the work clamp foot lifting solenoid has been improperly adjusted.	Properly adjust the stroke of the solenoid. (Refer to the Standard adjustment (8).)	
	4)-A The upper detecting magnet has been improperly adjusted.	Properly adjust the upper detecting magnet. (Refer to the Standard adjustment (3).)	
Error message E34	16-1) The resistor pack does not match the number of stitches specified on the machine head.	1)-A Failed selection of the resistor pack	Use the resistor pack which matches the number of stitches specified on the machine head.
	16-2) The upper detecting signal and origin detecting signal are not input at the correct timing.	2)-A The upper detecting magnet has been improperly adjusted.	Properly adjust the upper detecting magnet. (Refer to the Standard adjustment (3).)
	2)-B The origin detecting magnet has been improperly adjusted.	Properly adjust the origin detecting magnet. (Refer to the Standard adjustment (5).)	
	16-3) The origin detecting sensor fail to actuate.	3)-A The clearance provided between the sensor and the magnet is not adequate.	Properly adjust the clearance provided between the sensor and the magnet. (Refer to the Standard adjustment (6).)
	3)-B The sensor connector has come off.	Check whether the connector inside the control box has come off.	
	3)-C The sensor cord is defective. (Disconnection)	Replace the sensor with a new one.	
	3)-D The sensor has failed.	Replace the sensor with a new one.	
	17-1) The origin detecting magnet has been adjusted to the position that is one stitch away from the correct one.	Properly adjust the origin detecting magnet. (Refer to the Standard adjustment (5).)	

The following description is applied only to the button sewing machines.

Trouble	Cause (1)	Cause (2)	Corrective measures
18. Thread knots are not made with consistency.	18-1) Thread tension of the thread adjusting device is too low. 18-2) The timing of the knot tying plate is defective. 18-3) The tension disk of the thread adjusting device fails to close.	1)-A The needle thread tension is insufficient. 2)-A The timing of the knot tying plate has not been properly adjusted. 3)-A The thread adjusting arm has not been properly adjusted. 3)-B The thread adjusting solenoid connector or pin has come off. 3)-C The thread adjusting solenoid cord is defective. (Disconnection) 3)-D The thread adjusting solenoid has failed or broken.	Increase the thread tension given by the tension disk of the thread adjusting device. Properly adjust the timing of the knot tying plate. (Refer to the Standard adjustment (31).) Adjust the thread adjusting arm. (Refer to the Standard adjustment (35).) Check the connectors inside the control box. Replace the defective component with a new one. Replace the defective component with a new one.
19. The needle thread comes off the needle eyelet.	19-1) The length of thread remaining at the needle is inadequate. 19-2) The thread tension releasing solenoid fails to actuate.	1)-A The tension disk is not raised by the thread tension releasing solenoid. 2)-A The thread tension releasing solenoid connector or pin has come off. 2)-B The thread tension releasing solenoid cord is defective. (Disconnection) 2)-C The thread tension releasing solenoid has failed (broken).	Properly adjust the position of the thread tension releasing solenoid. (Refer to the Standard adjustment (34).) Check the connectors inside the control box. Replace the defective component with a new one. Replace the defective component with a new one.

Trouble	Cause (1)	Cause (2)	Corrective measures
20. The thread trimming mechanism produces abnormal noise.	20-1) The thread trimmer auxiliary cam fails to be engaged with the roller. 20-2) The thread trimming solenoid fails to actuate.	1)-A The stroke of the thread trimming solenoid is inadequate. 2)-A The thread trimming solenoid connector or pin has come off. 2)-B The thread trimming solenoid cord is defective. (Disconnection) 2)-C The thread trimming solenoid has failed (broken).	Properly adjust the stroke of the thread trimming solenoid. (Refer to the Standard adjustment (33)). Check the connectors inside the control box. Replace the defective component with a new one. Replace the defective component with a new one.
21. The wiper fails to actuate during the sewing of a 4-holed button with cross-over stitches.	21-1) The wiper solenoid fails to actuate.	1)-A The wiper solenoid connector or pin has come off. 1)-B The wiper solenoid cord is defective. (Disconnection) 1)-C The wiper solenoid has failed (broken).	Check the connectors inside the control box. Replace the defective component with a new one. Replace the defective component with a new one.
22. The sewing machine fails to reduce the number of stitches by half and the wiper actuate during the sewing of a 2-holed button after having changed over the sewing mode to the half-divided stitching mode.	22-1) The 2-4 hole sensor fails to actuate. (The sensor LED fails to light up.)	1)-A The clearance provided between the 2-4 hole sensor and the detecting plate is inadequate. 1)-B The 2-4 hole sensor connector has come off. 1)-C The 2-4 hole sensor cord is defective. (Disconnection) 1)-D The 2-4 hole sensor has failed (broken).	Adjust the clearance provided between the 2-4 hole sensor and the detecting plate to 1 mm. Replace the defective component with a new one. Replace the defective component with a new one. Check the connector inside the control box. Replace the defective component with a new one. Replace the defective component with a new one.

## 12. ERROR CODES

If any of the following error codes is shown on the control box, refer to the Engineer's Manual for the SC-5/-6.

Error No.	Description	
E- 0	Initialization of data stored on E <sup>2</sup> PROM	
E- 1	Input power failure	
E- 2	Motor connector has come off.	
E- 3	V belt has slipped out of position or has come off. Synchronizer connector has come off. Upper position sensor has failed.	
E- 7	The sewing machine has locked.	
E-10	Solenoid has short-circuited.	



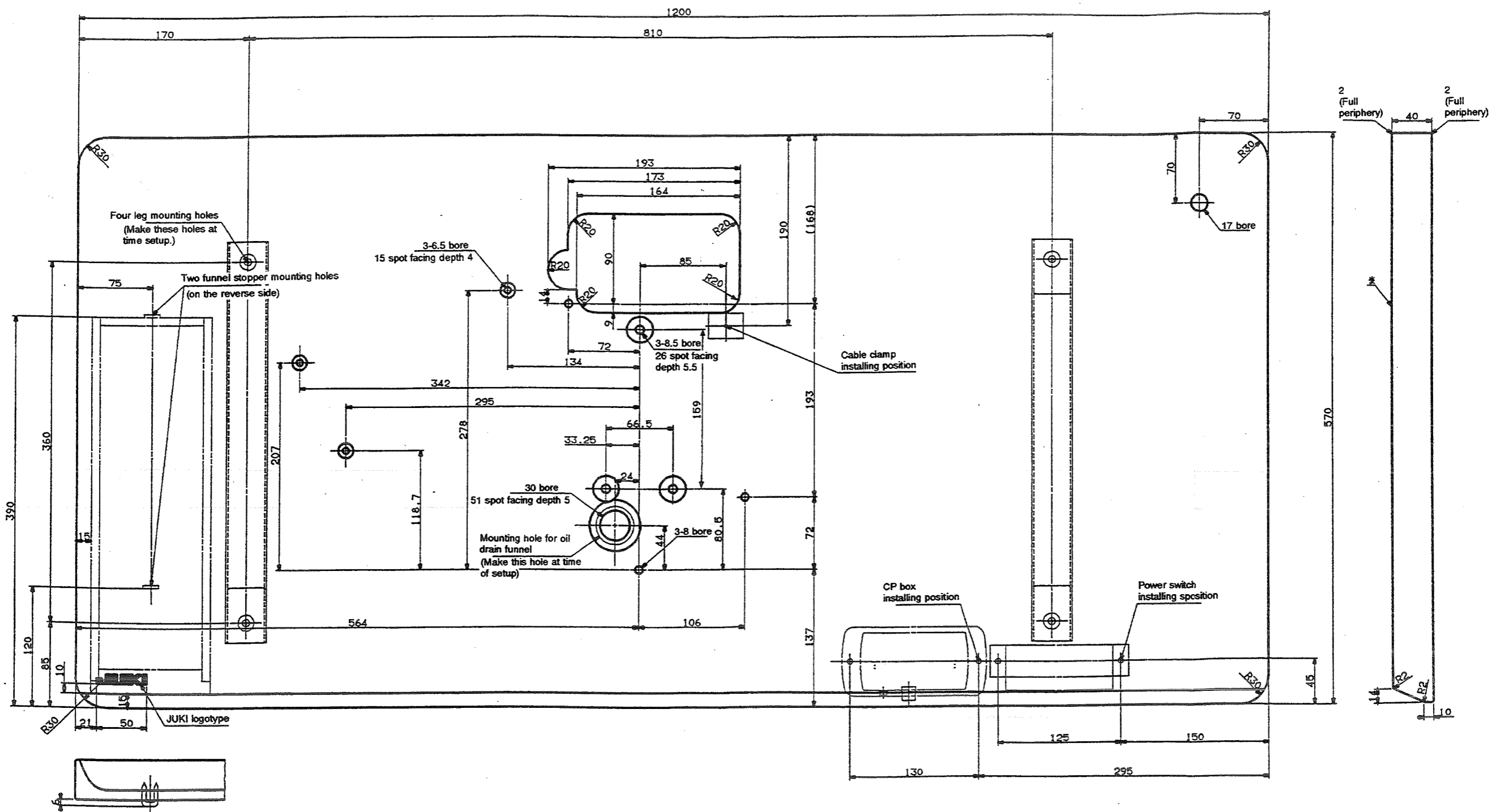
Error No.	Description	
E-11	Overvoltage of the power supply	
E-12	Overcurrent of the power supply	
E-13	Low voltage of the power supply	
E-14	Power detecting circuit has failed.	
E-20	Failed interface between the microcomputer and the gate alley	
E-22	Motor revolution control failure	
E-23	Solenoid transistor has short-circuited.	

Error No.	Description	
E-24	Motor drive transistor control failure	
E-25	Failed output voltage of the power to the solenoid	
E-26	Failed 24 V power supply	
E-30	Open phase of the motor encoder	
E-31	Open phase of the motor hole sensor	
E-33	Reverse rotation of the motor	
E-41	Failed inner circuit	

Error No.	Description	
E-42	E <sup>2</sup> PROM is defective.	
E-34	Failed detection of origin	
E-35	Failed lifting of the work clamp foot	
E-36	Power failure	

13. TABLE DIAGRAM

(1) For solenoid type





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