

1-NEEDLE, UNISON FEED, LOCKSTITCH MACHINE  
(AUTOMATIC LUBRICATION)

**JUKI®**

## **LU-1510N**

1-NEEDLE, UNISON FEED, LOCKSTITCH MACHINE WITH AUTOMATIC THREAD  
TRIMMER (AUTOMATIC LUBRICATION)

## **LU-1510N-7, LU-1511N-7**

1-NEEDLE, UNISON FEED, LOCKSTITCH MACHINE

## **LU-1508N, LU-1509N**

1-NEEDLE, UNISON FEED, LOCKSTITCH MACHINE (FOR EXTRA HEAVY-WEIGHT MATERIALS)

## **LU-1508NH, LU-1509NH**

2-NEEDLE, UNISON FEED, LOCKSTITCH MACHINE (AUTOMATIC LUBRICATION)

## **LU-1560N, LU-1561N**

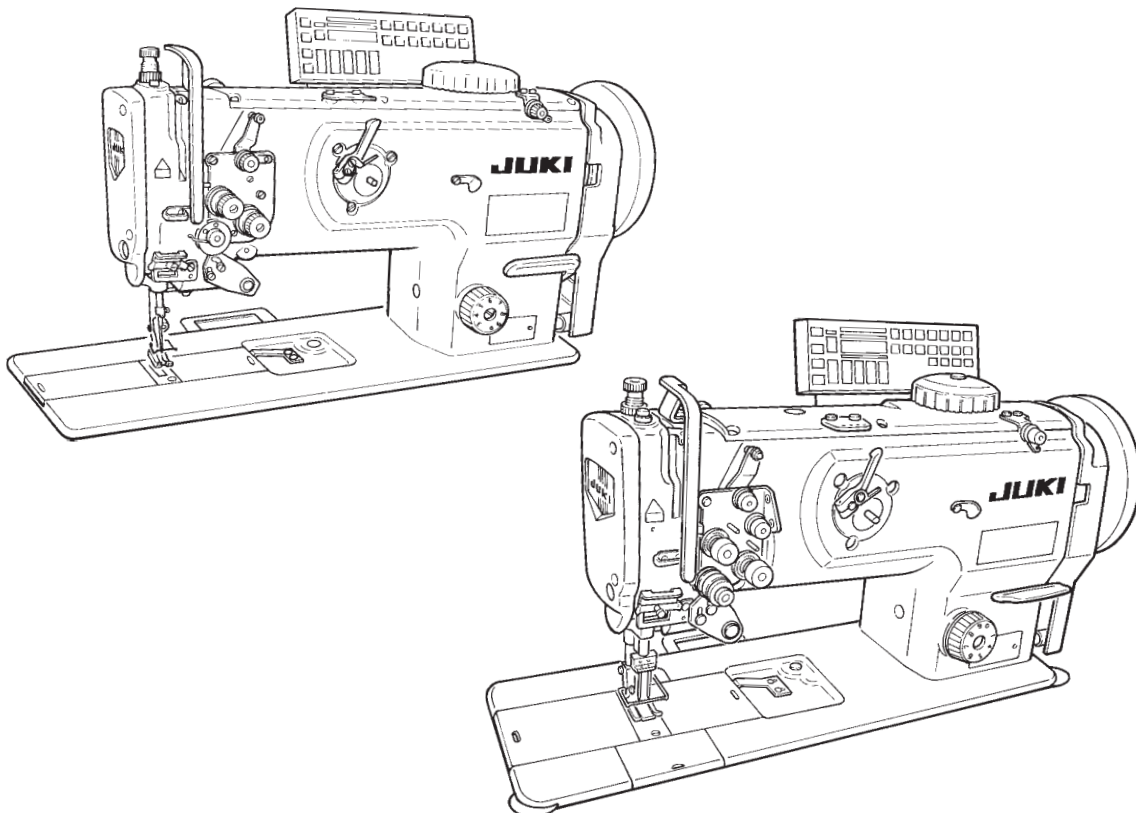
2-NEEDLE, UNISON FEED, LOCKSTITCH MACHINE WITH AUTOMATIC THREAD  
TRIMMER (AUTOMATIC LUBRICATION)

## **LU-1560N-7, LU-1561N-7**

2-NEEDLE, UNISON FEED, LOCKSTITCH MACHINE WITH ORGANIZED SPLIT NEEDLE BAR

## **LU-1565N**

# **ENGINEER'S MANUAL**



**29340700**  
**No.E337-02**

## **PREFACE**

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

The Instruction Manual for these machines intended for the maintenance personnel and operators at an apparel factory contains operating instructions in detail. And this manual describes "Standard Adjustment", Adjustment Procedures", "Results of Improper Adjustment", and other important information which are not covered in the Instruction Manual.

It is advisable to use the relevant Instruction Manual and Parts List together with this Engineer's Manual when carrying out the maintenance of these machines.

This manual gives the "Standard Adjustment" on the former page under which the most basic adjustment value is described and on the latter page the "Results of Improper Adjustment" under which stitching errors and troubles arising from mechanical failures and "How To Adjust" are described.

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# 1. SPECIFICATIONS

No.	Item	Specifications
1	Model	LU-1510N (Standard gauge type)
2	Model name	1-needle, unison feed, lockstitch machine (automatic lubrication)
3	Application	For heavy-weight materials
4	Sewing speed	Max. 2,500 rpm
5	Needle	SCHMETZ 135 X 17 Nm 125 to 180 Standard : Nm 160
6	Thread possible to be sewn	#30 to #5
7	Stitch length	Max. 9 mm (normal/reverse feed)
8	Presser foot lift	Hand lifter : 9 mm    Knee lifter : 16 mm
9	Stitch length adjusting mechanism	By dial
10	Reverse stitch adjusting method	By lever
11	Thread take-up	Slide thread take-up
12	Needle bar stroke	36 mm
13	Alternate foot stroke	2.5 mm to 6.5 mm Alternate foot stroke adjusted by long hole
14	Hook	Full-rotary vertical-axis 2-fold hook (Latch type)
15	Feed mechanism	Box feed
16	Top and bottom feed actuation mechanism	Timing belt
17	Lubrication	Automatic lubrication (partially by manual)
18	Lubricating oil	JUKI New Defrix Oil No. 2 (equivalent to ISO standard VG32)
19	Cylinder bed diameter	517 mm x 178 mm
20	Free space for sewing	255 mm x 99 mm
21	Size of handwheel	V belt effective diameter : $\varnothing 93.3$ mm    Outer diameter : $\varnothing 160$ mm
22	Motor	2P, 400W, 4P, 400W

No.	Item	Specifications
1	Model	LU-1510N-7 (Standard gauge type) LU-1511N-7 (LU-2210 gauge type)
2	Model name	1-needle, unison feed, lockstitch machine with automatic thread trimmer
3	Application	For heavy-weight materials
4	Sewing speed	Max. 3,000 rpm
5	Needle	SCHMETZ 135 X 17 Nm 125 to 180 Standard : Nm 160
6	Thread possible to be sewn	#30 to #5
7	Thread possible to be trimmed	#30 to #5
8	Stitch length	Max. 9 mm (normal/reverse feed)
9	Presser foot lift	Hand lifter : 9 mm    Knee lifter : 16 mm
10	Stitch length adjusting mechanism	By dial
11	Reverse stitch adjusting method	Air cylinder type (with touch-back switch)
12	Thread take-up	Slide thread take-up
13	Needle bar stroke	36 mm
14	Alternate foot stroke	1 mm to 6.5 mm Alternate foot stroke adjusted by dial
15	Hook	Full-rotary vertical-axis 2-fold hook (Latch type)
16	Feed mechanism	Box feed
17	Top and bottom feed actuation mechanism	Timing belt
18	Thread trimming mechanism	Cam-driven scissors type
19	Lubrication	Automatic lubrication (partially by manual)
20	Lubricating oil	JUKI New Defrix Oil No. 2 (equivalent to ISO standard VG32)
21	Cylinder bed diameter	517 mm x 178 mm
22	Free space for sewing	255 mm x 99 mm
23	Size of handwheel	V belt effective diameter : $\varnothing$ 93.3 mm    Outer diameter : $\varnothing$ 160 mm
24	Motor	SC-380

No.	Item	Specifications	
1	Model	LU-1508N (Standard gauge type) LU-1509N (LU-2210 gauge type)	LU-1508NH (Standard gauge type) LU-1509NH (LU-2210 gauge type)
2	Model name	1-needle, unison feed, lockstitch machine	1-needle, unison feed, lockstitch machine (For extra heavy-weight materials)
3	Application	For heavy-weight materials	For extra heavy-weight materials
4	Sewing speed	Max. 2,500 rpm	Max. 2,000 rpm
5	Needle	SCHMETZ 135 X 17 Nm 125 to 180 Standard : Nm 160	SCHMETZ 190R Nm 125 to 180 Standard : Nm 160
6	Thread possible to be sewn	#30 to #5	#8 to #1
7	Stitch length	Max. 9 mm (normal/reverse feed)	Max. 10 mm (normal/reverse feed)
8	Presser foot lift	Hand lifter : 9 mm	Knee lifter : 16 mm
9	Stitch length adjusting mechanism	By dial	
10	Reverse stitch adjusting method	By lever	
11	Thread take-up	Slide thread take-up	
12	Needle bar stroke	36 mm	38 mm
13	Alternate foot stroke	2.5 mm to 6.5 mm Alternate foot stroke adjusted by long hole	
14	Hook	Full-rotary vertical-axis 2-fold hook (Latch type)	
15	Feed mechanism	Box feed	Complete box feed
16	Top and bottom feed actuation mechanism	Timing belt	
17	Lubrication	By manual (Centralized tank lubrication system)	
18	Lubricating oil	JUKI New Defrix Oil No. 2 (equivalent to ISO standard VG32)	
19	Cylinder bed diameter	517 mm x 178 mm	
20	Free space for sewing	255 mm x 99 mm	
21	Size of handwheel	V belt effective diameter : $\varnothing 93.3$ mm	
		Outer diameter : $\varnothing 160$ mm	Outer diameter : $\varnothing 175$ mm
22	Motor	2P, 400W, 4P, 400W	

No.	Item	Specifications	
1	Model	LU-1560N (Standard gauge type) LU-1561N (LU-2260 gauge type)	LU-1560N-7 (Standard gauge type) LU-1561N-7 (LU-2260 gauge type)
2	Model name	2-needle, unison feed, lockstitch machine (Automatic lubrication)	2-needle, unison feed, lockstitch machine with automatic thread trimmer (Automatic lubrication)
3	Application	For heavy-weight materials	
4	Sewing speed	Max. 2,500 rpm	
5	Needle	SCHMETZ 135 X 17 Nm 125 to 180 Standard : Nm 160	
6	Thread possible to be sewn	#30 to #5	
7	Thread possible to be trimmed	–	#30 to #5
8	Stitch length	Max. 9 mm (normal/reverse feed)	
9	Presser foot lift	Hand lifter : 9 mm	
		Knee lifter : 16 mm	Auto-lifter : 16 mm
10	Stitch length adjusting mechanism	By dial	
11	Reverse stitch adjusting method	By lever	Air cylinder type (with touch-back switch)
12	Thread take-up	Slide thread take-up	
13	Needle bar stroke	36 mm	
14	Alternate foot stroke	2.5 mm to 6.5 mm Alternate foot stroke adjusted by long hole	1 mm to 6.5 mm Alternate foot stroke adjusted by dial
15	Hook	Full-rotary vertical-axis 2-fold hook (Latch type)	
16	Feed mechanism	Box feed	
17	Top and bottom feed actuation mechanism	Timing belt	
18	Thread trimming mechanism	–	Cam-driven scissors type
19	Lubrication	Automatic lubrication (partially by manual)	
20	Lubricating oil	JUKI New Defrix Oil No. 2 (Equivalent to ISO standard VG32)	
21	Cylinder bed diameter	517 mm x 178 mm	
22	Free space for sewing	255 mm x 99 mm	
23	Size of handwheel	V belt effective diameter : ø93.3 mm    Outer diameter : ø160 mm	
24	Motor	2P, 400W, 4P, 400W	SC-380

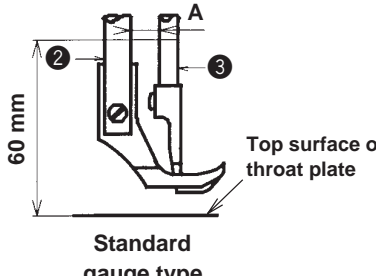


No.	Item	Specifications
1	Model	LU-1565N
2	Model name	2-needle, unison feed, lockstitch machine (With organized split needle bar)
3	Application	For heavy-weight materials
4	Sewing speed	Max. 2,000 rpm
5	Needle	SCHMETZ 135 X 17 Nm 125 to 180 Standard : Nm 160
6	Thread possible to be sewn	#30 to #5
7	Thread possible to be trimmed	–
8	Stitch length	Max. 9 mm (normal/reverse feed)
9	Presser foot lift	Hand lifter : 9 mm    Knee lifter : 16 mm
10	Stitch length adjusting mechanism	By dial
11	Reverse stitch adjusting method	By lever
12	Thread take-up	Slide thread take-up
13	Needle bar stroke	33.36 mm
14	Alternate foot stroke	2.5 mm to 6.5 mm    Alternate foot stroke adjusted by long hole
15	Hook	Full-rotary vertical-axis 2-fold hook (Cap type)
16	Feed mechanism	Box feed
17	Top and bottom feed actuation mechanism	Timing belt
18	Thread trimming mechanism	–
19	Lubrication	By manual
20	Lubricating oil	JUKI New Defrix Oil No. 2 (Equivalent to ISO standard VG32)
21	Cylinder bed diameter	517 mm x 178 mm
22	Free space for sewing	255 mm x 99 mm
23	Size of handwheel	V belt effective diameter : $\varnothing 93.3$ mm    Outer diameter : $\varnothing 160$ mm
24	Motor	2P, 400W, 4P, 400W

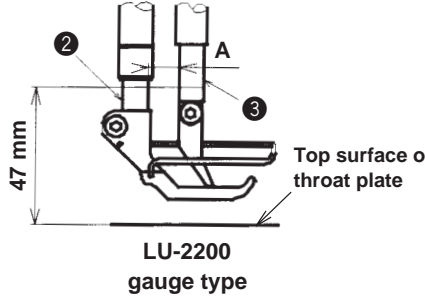
## 2. STANDARD ADJUSTMENT

### (1) Needle entry position

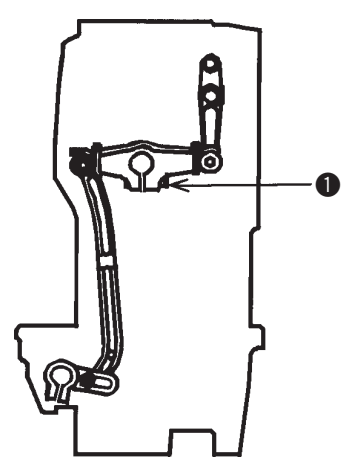
**Standard Adjustment**



Standard gauge type



LU-2200 gauge type



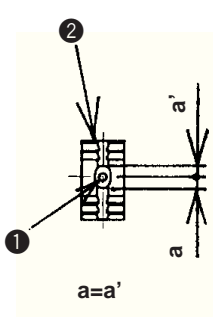
Model	DimennsionA
LU-1561N-7	11.5±0.1mm
LU-1511N-7	11±0.1mm
LU-1509N	
LU-1561N	10±0.1mm
LU-1509NH	
LU-1510N-7	9±0.1mm
LU-1560N-7	
LU-1560N	
LU-1508N	8.5±0.1mm
LU-1510N	
LU-1508NH	8±0.1mm
LU-1565N	

**Conditions**

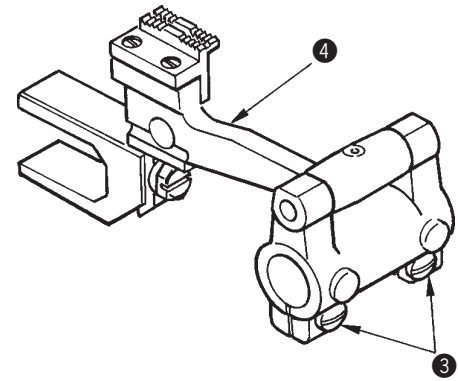
- Needle bar at lowest dead point
- Feed amount : 0 mm

### (2) Longitudinal position of the feed dog

**Standard Adjustment**



$a=a'$



**Conditions**

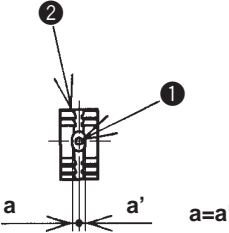
- Needle bar at lowest dead point
- Feed amount : 0 mm

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Set the stitch dial to "0".</li> <li>2. Turn the handwheel to bring the needle bar to the lowest dead point of its stroke.</li> <li>3. Loosen clamping screw ❶ in the needle bar rocking rear arm.</li> <li>4. In the state that the presser foot is raised, adjust the clearance between presser bar ❷ and walking bar ❸ to dimension A at the position where the distance from the top surface of the throat plate to the presser foot is 60 mm (standard gauge type) or 47 mm (LU-2200 gauge type), Then securely tighten clamping screw ❶ in the needle bar rocking rear arm.</li> </ol> <p><b>(Caution) Tighten the screw so that the needle bar rocking shaft has no thrust play.</b></p>	<ul style="list-style-type: none"> <li>○ Stitch skipping or needle breakage will result.</li> <li>○ Poorly tensed stitches will result.</li> </ul>

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Set the stitch dial to "0".</li> <li>2. Turn the handwheel to bring the needle bar to the lowest dead point of its stroke.</li> <li>3. Loosen clamping screw ❸ in the feed rocker.</li> <li>4. Move the feed base ❹ and adjust so that needle ❶ enters the center of the needle hole in feed dog ❷. Then securely tighten clamping screw ❸ in the feed rocker. (a = a')</li> </ol> <p>Checking method</p> <ol style="list-style-type: none"> <li>1. Set the stitch dial to the maximum.</li> <li>2. Turn the handwheel and make sure that feed dog ❷ does not come in contact with the throat plate at the position where the feed dog travels fully to the front or to the rear.</li> </ol>	<ul style="list-style-type: none"> <li>○ The throat plate comes in contact with the feed dog and contacting noise occurs and the throat plate or the feed dog may be damaged.</li> <li>○ Irregular stitches may result.</li> </ul>

### (3) Lateral position of the feed dog

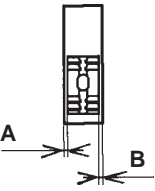
**Standard Adjustment**



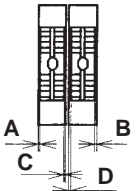
$a = a'$

**Conditions**

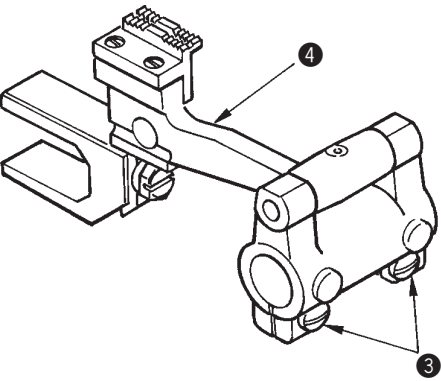
- Needle bar at lowest dead point
- Feed amount : 0 mm



In case of 1-needle



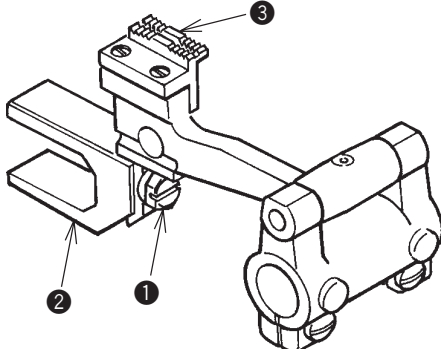
In case of 2-needle

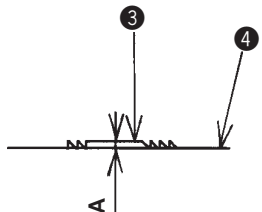


Adjust so that  $A = B$  and  $C = D$  are almost obtained.

### (4) Height of the feed dog

**Standard Adjustment**





Model	Dimension A
LU-1509N	0.4 to 0.5 mm
LU-1509NH	
LU-1510N-7	
LU-1511N-7	
LU-1560N-7	
LU-1561N	
LU-1561N-7	0.8 to 0.9 mm
LU-1508N	
LU-1508NH	
LU-1510N	
LU-1560N	
LU-1565N	

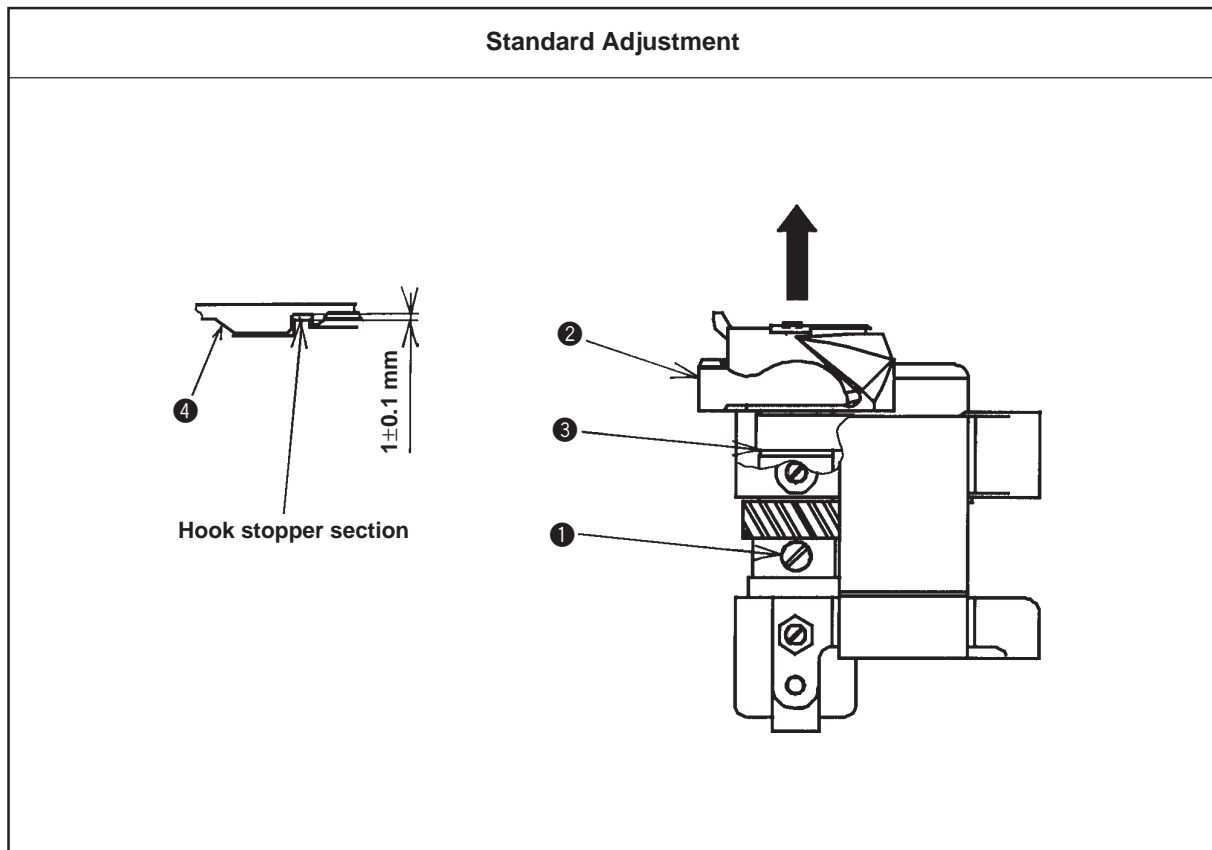
**Conditions**

- Feed amount : 0 mm
- Height of feed dog is maximum.

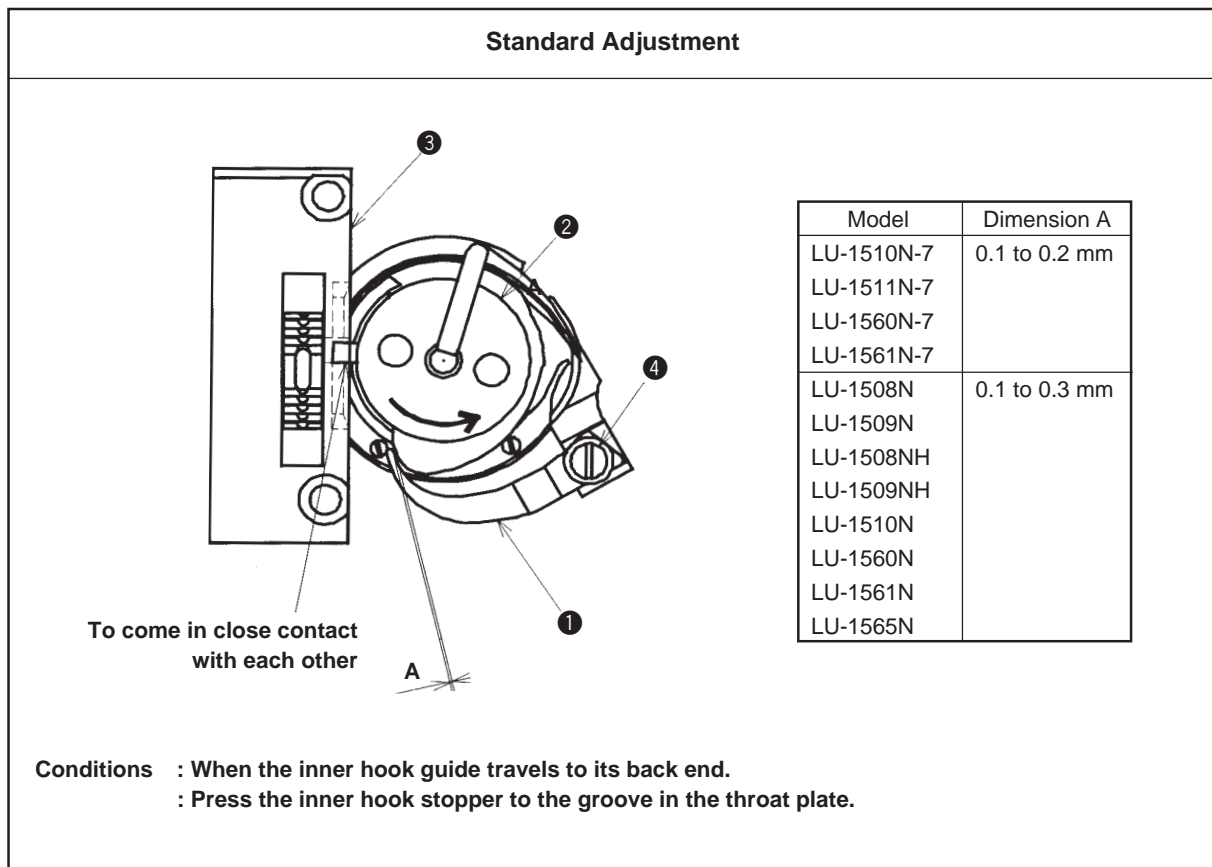
Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Set the stitch dial to "0".</li> <li>2. Turn the handwheel to bring the needle bar to the lowest dead point of its stroke.</li> <li>3. Loosen clamping screw ③ in the feed rocker.</li> <li>4. Move the feed base ④ and adjust so that needle ① enters the center of the needle hole in feed dog ②. Then securely tighten clamping screw ③ in the feed rocker. (a = a')</li> </ol> <p>In addition, adjust the lateral clearances of feed dog ② in terms of the window of throat plate to almost equal values. (A = B and C = D)</p>	<ul style="list-style-type: none"> <li>○ Stitch skipping or thread breakage will result.</li> <li>○ Poorly tensed stitches will result.</li> <li>○ Needle breakage will result.</li> </ul>

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Set the stitch dial to "0".</li> <li>2. Turn the handwheel to bring the height of the feed dog to the maximum. (Bring the needle bar to the lowest dead point of its stroke.)</li> <li>3. Loosen setscrew ① in the feed bar slide fork, move feed bar slide fork ② up or down and adjust feed dog ③ from top surface ④ of the throat plate (center section) to the dimension A. Then securely tighten setscrew ① in the feed bar slide fork.</li> </ol>	<p>When the height of the feed dog is higher than the specified value :</p> <ul style="list-style-type: none"> <li>○ Stitch pitch becomes larger than the scale of the feed dial.</li> <li>○ Balloon stitches will result.</li> <li>○ Return of sewing product will occur.</li> <li>○ Feed dog comes in contact with the knife, and the knife and the feed dog may be damaged.</li> </ul> <p>When the height of the feed dog is lower than the specified value :</p> <ul style="list-style-type: none"> <li>○ Stitch pitch becomes smaller than the scale of the feed dial.</li> <li>○ Feed force will be deteriorated.</li> </ul>

## (5) Height of the hook



## (6) Adjusting the inner hook guide

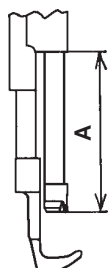
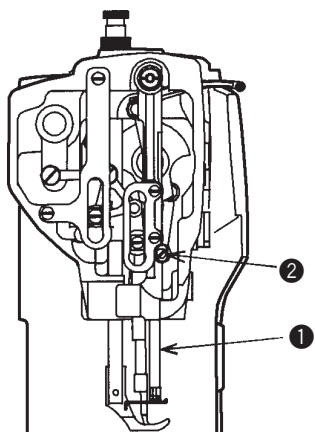


Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Loosen two setscrews ❶ in the screw gear (small).</li> <li>2. Draw out hook ❷ in the direction of the arrow. (At this time, bring No. 1 screw of setscrews ❶ to the front of the operator.)</li> <li>3. Replace thrust plate ❸ and adjust so that a clearance of <math>1\pm0.1\text{mm}</math> is provided between throat plate ❹ and the top surface of hook stopper section of hook ❷. (For the kind of thrust plate ❸, refer to "5. Selective parts and consumable parts".)</li> <li>4. Assemble hook ❷ so that the notched section of the shaft of hook ❷ comes to the front of the operator and tighten setscrews ❶. (The notched section should align with No. 1 screw of setscrews ❶.)</li> </ol> <ul style="list-style-type: none"> <li>○ In case of 2-needle, left and right are the same adjustment value.</li> </ul>	<ul style="list-style-type: none"> <li>○ Stitch skipping or thread breakage will result.</li> <li>○ Needle breakage will result.</li> <li>○ Irregular stitches will result.</li> </ul>

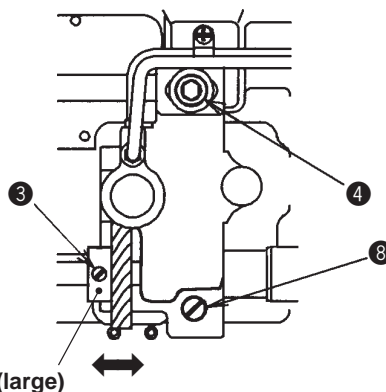
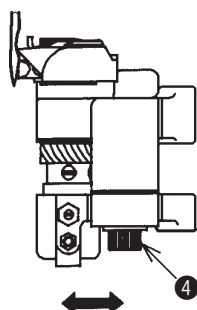
Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Turn the handwheel to bring inner hook guide ❶ to its back end position.</li> <li>2. Turn inner hook ❷ in the reverse direction of rotation of the hook (in the direction of arrow mark A) and fit the inner hook stopper to the inner hook stopping section in throat plate ❸.</li> <li>3. Loosen setscrew ❹ in the inner hook guide arm and adjust the clearance between inner hook guide ❶ and the protruding section of inner hook ❷ to dimension A.</li> <li>4. After the adjustment, securely tighten setscrew ❹ in the inner hook guide arm.</li> </ol> <ul style="list-style-type: none"> <li>○ In case of 2-needle, left and right are the same adjustment value.</li> </ul>	<p>When the clearance is larger than the specified value :</p> <ul style="list-style-type: none"> <li>○ Loose stitches or thread breakage will result.</li> </ul> <p>When the clearance is smaller than the specified value :</p> <ul style="list-style-type: none"> <li>○ Inner hook or inner hook guide may be damaged.</li> </ul>

## (7) Needle-to-hook timing

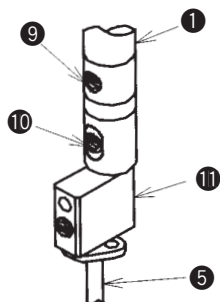
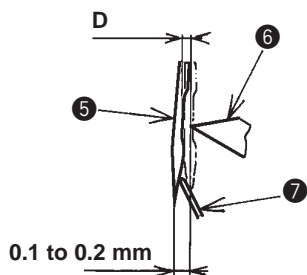
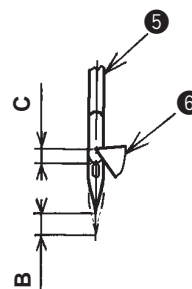
### Standard Adjustment



Model	Dimension A
LU-1510N-7	58.7 mm
LU-1511N-7	57.7 mm
LU-1508N	56.7 mm
LU-1510N	
LU-1509N	55.7 mm
LU-1561N-7	55.9 mm
LU-1560N-7	56 mm
LU-1561N	53.9 mm
LU-1560N	54 mm
LU-1508NH	52.3 mm
LU-1509NH	51.3 mm



Screw gear (large)



Model	Dimension B	Dimension C	Dimension D
LU-1510N-7	2.3±0.2 mm	1.5±0.2 mm	0.05 to 0.1 mm
LU-1511N-7			
LU-1560N-7			
LU-1561N-7			
LU-1508N	18 <sup>+0.3</sup> <sub>-0.1</sub> mm	1.5±0.3 mm	0.05 to 0.15 mm
LU-1509N			
LU-1510N			
LU-1560N			
LU-1561N	2.5±0.3 mm	2.5±0.3 mm	
LU-1508NH			
LU-1509NH			
LU-1565N		2.8±0.3 mm	

Conditions : Feed amount : 0 mm

: Needle bar rises from the lowest dead point of its stroke.

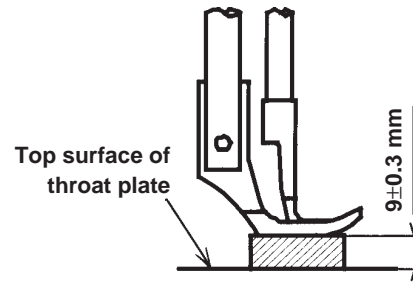
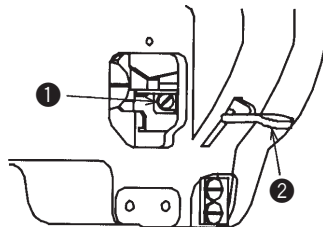
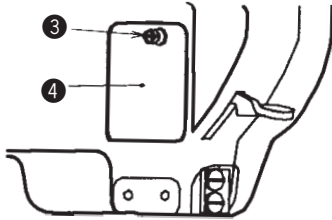


Adjustment Procedures	Results of Improper Adjustment
<p><b>1) Standard of the lowest dead point of the needle bar</b></p> <ol style="list-style-type: none"> <li>1. Set the stitch dial to "0".</li> <li>2. Turn the handwheel to bring needle bar ❶ to the lowest dead point of its stroke.</li> <li>3. Loosen the setscrew in the face plate to remove the face plate.</li> <li>4. Loosen clamping screw ❷ in the needle bar holder. At this time, loosen the screw to such an extent that needle bar ❶ moves up and down by hand since needle bar ❶ drops if the screw is fully loosened.</li> <li>5. Adjust the distance from the lower end of needle bar frame to the lower end of the needle bar to dimension A. Then tighten clamping screw ❷ in the needle bar holder. (For LU-1510N-7, there is an engraved marker line in needle bar ❶.)</li> </ol> <p><b>2) Needle-to-blade point of hook timing</b></p> <ol style="list-style-type: none"> <li>1. Set the stitch dial to "0".</li> <li>2. Loosen two setscrews ❸ in the screw gear (large).</li> <li>3. Turn the handwheel and when dimensions B and C are approximately obtained, loosen setscrew A ❹ and setscrew B ❸ in the hook shaft driving saddle. Then move the hook driving shaft saddle to the right or left to adjust the clearance between needle ❺ and blade point ❻ of the hook to dimension D. Then securely tighten setscrew A ❹ and setscrew B ❸.</li> <li>4. Turn the handwheel and move the screw gear (large) to the right or left so that needle ❺ aligns with blade point ❻ of the hook when needle bar ❶ is raised from the lowest dead point of its stroke to dimension B. Then tighten two setscrews ❸.</li> <li>5. Turn the handwheel and loosen clamping screw ❷ in the needle bar holder to adjust so that the distance from the top end of the eyelet of needle ❺ to blade point ❻ of the hook becomes dimension C when needle bar ❶ is raised from the lowest dead point of its stroke to dimension B. Then tighten again the clamping screw. (For LU-1510N-7, there is an engraved marker line in needle bar ❶.) However, in case of LU-1565N, loosen clamping screws ❾ and ❿ and turn needle clamp ⓫ to adjust. Then tighten again the clamping screws. The range to turn needle clamp ⓫ is as wide as the clearance between the width of long hole of needle bar ❶ and clamping screw ❿.</li> <li>6. Set the stitch dial to the maximum and check that needle ❺ does not come in contact with blade point ❻ of the hook. (For the dimension, refer to the respective models in the list.)</li> </ol> <p><b>3) Adjusting the needle guard of the hook</b></p> <ol style="list-style-type: none"> <li>1. Bend needle guard ❼ and adjust so that the needle guard ❼ comes in contact 0.1 to 0.2 mm with the needle.</li> </ol> <p><b>(Caution)</b></p> <ol style="list-style-type: none"> <li>1. After tightening the hook shaft screw gear, check that the hook shaft has no thrust play.</li> <li>2. Check that the hook shaft screw gear has backlash.</li> <li>3. In case of 2-needle, left and right are the same adjustment value.</li> </ol>	<ul style="list-style-type: none"> <li>○ Stitch skipping or thread breakage will result.</li> <li>○ Loose stitches will result.</li> </ul>

## (8) Lift of the presser foot

### Standard Adjustment

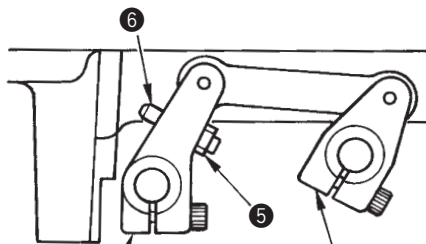
#### 1) Hand lifter



#### Condition

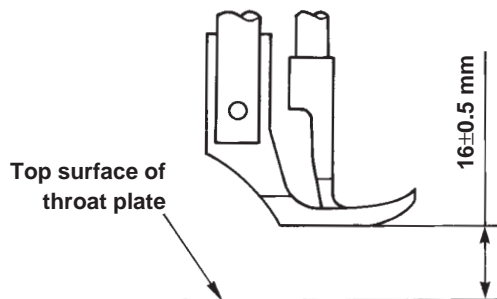
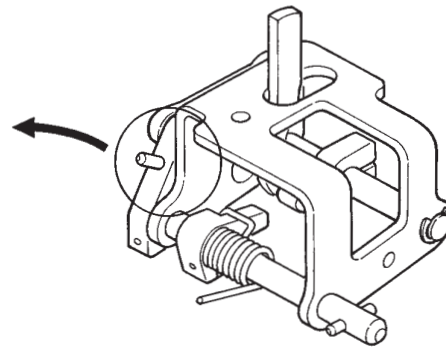
- State that the hand lifter is raised

#### 2) Knee lifter (Without thread trimmer only)



Knee lifter lever A

Knee lifter lever B

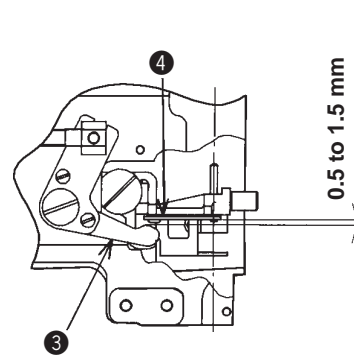
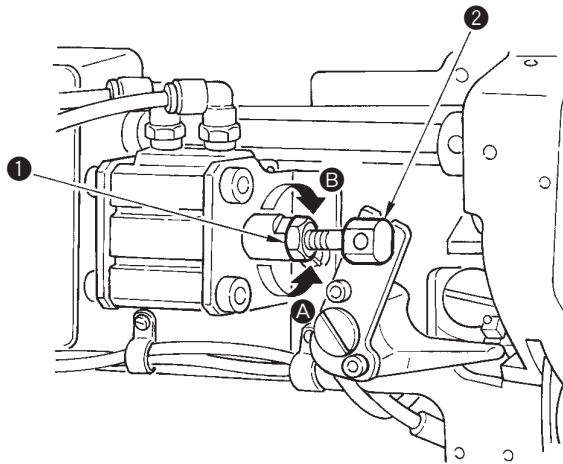
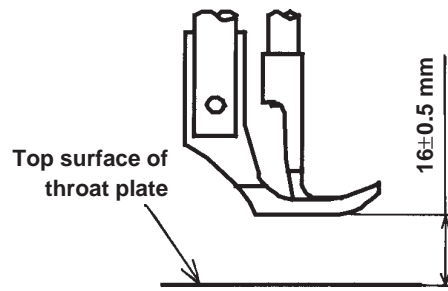


Conditions : Lifting amount when stopper screw ⑥ comes in contact with knee lifter lever A

Adjustment Procedures	Results of Improper Adjustment
<p><b>1) Hand lifter</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrew ③ in the side cover located at the anti-operator's side of the machine arm and remove side cover ④. (Machine without thread trimmer only)</li> <li>2. Loosen clamping screw ① in the presser bar bracket to set the hand lifter ② to the raised state.</li> <li>3. Adjust the lifting amount to <math>9 \pm 0.3</math> mm. At this time, the adjustment can be easily performed when inserting a thing of 9 mm thick between the top surface of the throat plate and the bottom face of the presser foot.</li> <li>4. Tighten clamping screw ① in the presser bar bracket. Move the presser foot to the left or the right and tighten the screw in the state that the presser foot does not interfere with the walking foot.</li> <li>5. Remove the thing inserted between the top surface of the throat plate and the bottom face of the presser foot.</li> <li>6. Attach side cover ④ (Machine without thread trimmer only)</li> </ol>	<p>When the lifting amount is higher than the specified value :</p> <ul style="list-style-type: none"> <li>○ The presser foot is held raised from the top surface of the throat plate even when the hand lifter is returned to its home position.</li> </ul> <p>When the lifting amount is lower than the specified value :</p> <ul style="list-style-type: none"> <li>○ The presser foot is not sufficiently raised and the working property may be deteriorated.</li> </ul>
<p><b>2) Knee lifter (Machine without thread trimmer only)</b></p> <ol style="list-style-type: none"> <li>1. Remove the knee press plate and tilt the machine arm.</li> <li>2. Loosen stopper nut ⑤ and adjust the lifting amount by screwing amount of stopper screw ⑥. Adjust the height from the top surface of the throat plate to the bottom face of the presser foot to <math>16 \pm 0.5</math> mm.</li> <li>3. Taking care so as not to move stopper screw ⑥, tighten stopper nut ⑤. <ul style="list-style-type: none"> <li>○ Tighten stopper screw ⑥ → Lifting amount is decreased.</li> <li>○ Loosen stopper screw ⑥ → Lifting amount is increased.</li> </ul> </li> </ol>	<p>When the lifting amount is higher than the specified value :</p> <ul style="list-style-type: none"> <li>○ The top end of the needle bar interferes with the walking foot and the walking foot may be damaged when the presser foot is raised.</li> </ul> <p>When the lifting amount is lower than the specified value :</p> <ul style="list-style-type: none"> <li>○ The presser foot is not sufficiently raised and the working property may be deteriorated.</li> </ul>

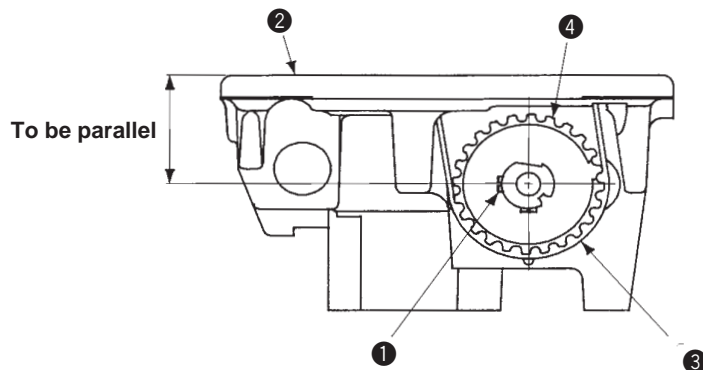
### Standard Adjustment

#### 3) Automatic presser foot lifter (Machine with thread trimmer only)



#### (9) Timing between the upper shaft and the lower shaft

### Standard Adjustment



#### Conditions

- Feed amount : 0 mm
- Needle bar at lowest dead point

Adjustment Procedures	Results of Improper Adjustment
<p><b>3) Automatic presser foot lifter (Machine with thread trimmer only)</b></p> <p>1. Loosen cylinder nut ❶ and adjust the screwing amount of cylinder connecting screw ❷ so that the height from the top surface of the throat plate to the bottom surface of the presser foot becomes <math>16 \pm 0.5</math> mm.</p> <ul style="list-style-type: none"> <li>○ Turn in the direction ➊ → Lifting amount is increased.</li> <li>○ Turn in the direction ➋ → Lifting amount is decreased.</li> </ul> <p>After the adjustment, check that there is a clearance of 0.5 to 1.5 mm between automatic presser foot lifter lever A ❸ and thread tension release plate ❹ when the presser foot is lowered.</p>	<p>When the lifting amount is higher than the specified value :</p> <ul style="list-style-type: none"> <li>○ The top end of the needle bar interferes with the walking foot and the walking foot may be damaged when the presser foot is raised.</li> </ul> <p>When the lifting amount is lower than the specified value :</p> <ul style="list-style-type: none"> <li>○ The presser foot is not sufficiently raised and the working property may be deteriorated.</li> </ul>

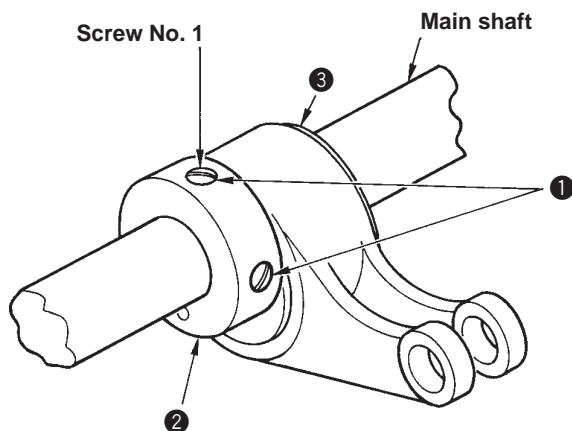
Adjustment Procedures	Results of Improper Adjustment
<p>1. Set the stitch dial to "0".</p> <p>2. Remove timing belt ❸.</p> <p>3. Turn the handwheel to bring the needle bar to the lowest dead point of its stroke.</p> <p>4. Turn screw No. 2 ❶ so that it is parallel to top surface ❷ of the machine bed.</p> <p>5. Fit timing belt ❸ to lower sprocket ❹.</p> <p><b>(Caution) The illustration is as observed from the handwheel side.</b></p>	<ul style="list-style-type: none"> <li>○ Stitches will be poorly tensed.</li> <li>○ Feed timing and needle to hook timing will vary.</li> </ul>

## (10) Feed cam timing

### Standard Adjustment

#### 1) Horizontal feed cam timing

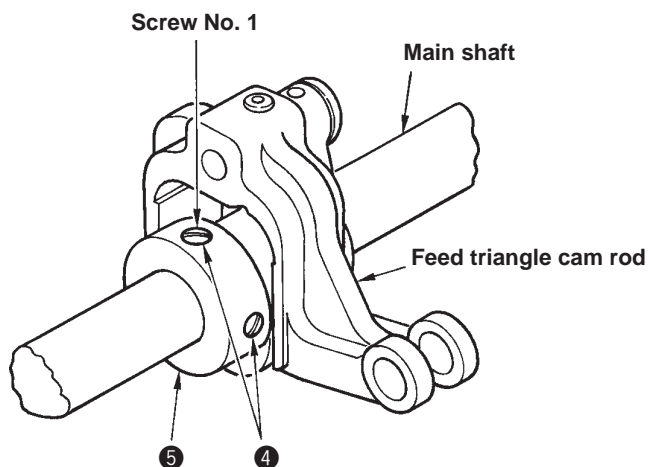
- In case of LU type machines other than LU-1508NH and LU-1509NH



#### Conditions

- Feed amount : maximum
- Needle bat at lowest dead point

- In case of LU-1508NH and LU-1509NH

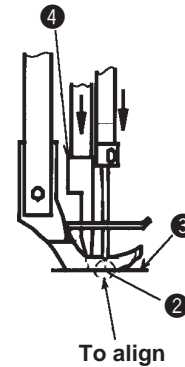
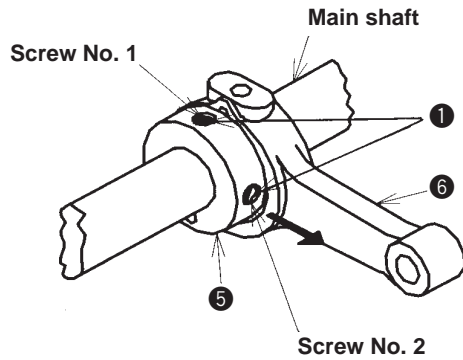




## Standard Adjustment

### 2) Top feed cam timing

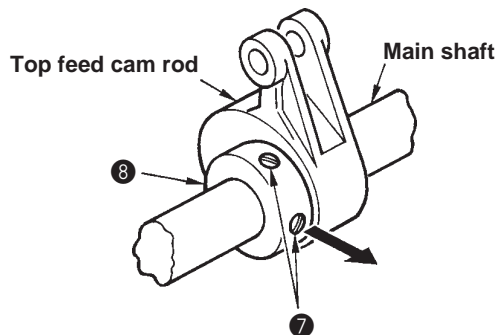
- In case of the machine without thread trimmer



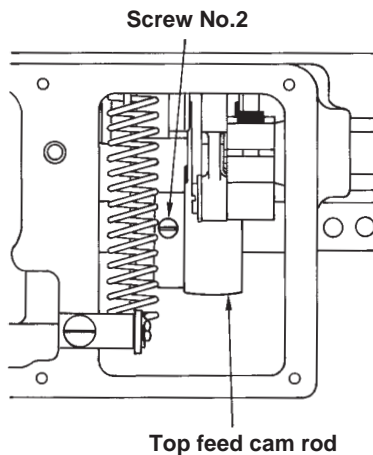
#### Conditions

- Feed amount : 6 mm
- When needle and walking foot are lowered.

- In case of the machine with thread trimmer

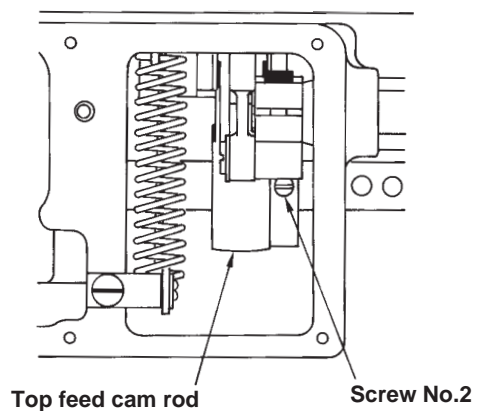


- When DL device is not provided



Standard : Screw No. 2 faces almost front at the highest dead point of the needle bar.

- When DL device is provided



Standard : Screw No. 2 faces almost front at the lowest dead point of the thread take-up.



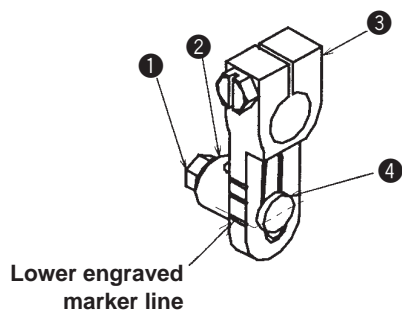
Adjustment Procedures	Results of Improper Adjustment
<p><b>2) Top feed cam timing</b></p> <ul style="list-style-type: none"> <li>○ In case of the machine without thread trimmer</li> </ul> <ol style="list-style-type: none"> <li>1. Set the stitch dial to "6".</li> <li>2. Adjust the amount of alternate vertical movement of both the walking foot and the presser foot to the standard (the lower engraved marker line on the top feed rear arm aligns with the center of the hinge screw). Refer to "(11)-1) Amount of alternate vertical movement".</li> <li>3. Loosen the setscrew in the window plate and remove the window plate.</li> <li>4. Loosen two setscrews ❶ in the top feed cam.</li> <li>5. Turn top feed cam ❺ to the position where three points of top end ❷ of the needle, top surface ❸ of the throat plate and walking foot ❹ (pressing face) are aligned with one another on condition that the amount of alternate vertical movement of both the walking foot and the presser foot is equal.</li> <li>6. Securely tighten two setscrews ❶ in the top feed cam.</li> <li>7. Attach the window plate.</li> </ol> <p><b>(Standard) The screw No. 2 in the top feed cam faces to the direction of the center (direction of arrow mark) of the small edge section of top feed rod ❸ at the lowest dead point of the needle bar.</b></p> <ul style="list-style-type: none"> <li>○ In case of the machine without thread trimmer</li> <li>○ When DL device is not provided</li> </ul> <ol style="list-style-type: none"> <li>1. Set the stitch dial to "6".</li> <li>2. Set the alternate vertical dial to "3".</li> <li>3. Remove the window plate setscrew and remove the window plate and the window plate packing.</li> <li>4. Loosen two setscrews ❷ in the top feed cam.</li> <li>5. Turn top feed cam ❸ to the position where three points of top end ❷ of the needle eyelet, top surface ❸ of the throat plate and walking foot ❹ (pressing face) are aligned with one another on condition that the amount of alternate vertical movement of both the walking foot and the presser foot is equal.</li> <li>6. Securely tighten two setscrews ❷ in the top feed cam.</li> <li>7. Attach the window plate and the window plate packing.</li> </ol> <p><b>(Standard) The screw No. 2 in the top feed cam faces to the anti-operator's side at the highest dead point of the needle bar as shown in the figure. (Adjust the timing at the position where three points are aligned with one another when top end ❷ of the needle, top surface ❸ of the throat plate and walking foot ❹ are coming down.)</b></p> <ul style="list-style-type: none"> <li>○ When DL device is provided</li> </ul> <ol style="list-style-type: none"> <li>1. Set the stitch dial to "6".</li> <li>2. Remove the window plate setscrew and remove the window plate with cylinder and the window plate packing. At this time, it is easier to remove them when the scale of alternate vertical dial is set to the maximum.</li> <li>3. Set the alternate vertical dial to "3".</li> <li>4. Loosen two setscrews ❶ in the top feed cam.</li> <li>5. Turn top feed cam ❺ to the position where three points of top end ❷ of the needle eyelet, top surface ❸ of the throat plate and walking foot ❹ (pressing face) are aligned with one another on condition that the amount of alternate vertical movement of both the walking foot and the presser foot is equal.</li> <li>6. Securely tighten two setscrews ❶ in the top feed cam.</li> <li>7. Attach the window plate with cylinder and the window plate packing.</li> </ol> <p><b>(Standard) The screw No. 2 in the top feed cam faces almost front at the lowest dead point of the thread take-up. (Adjust the timing at the position where three points are aligned with one another when top end ❷ of the needle, top surface ❸ of the throat plate and walking foot ❹ are coming down.)</b></p>	<ul style="list-style-type: none"> <li>○ Pitch error at high or low speed is apt to occur.</li> </ul>

## (11) Feed motion

### Standard Adjustment

#### 1) Amount of alternate vertical movement (position of the vertical adjusting arm)

- In case of the machine without thread trimmer



Standard of amount of alternate vertical movement  
 Upper engraved marker line : Approx. 5 mm  
 Center engraved marker line : Approx. 4 mm  
 Lower engraved marker line : Approx. 3 mm

Standard adjustment value : Lower engraved marker line of top feed rear arm  
 ③ aligns with the center of hinge screw ④.

#### List of sewing speed

- In case of LU-1508N, LU-1509N, LU-1560N and LU-1561N

Amount of alternate vertical movement	Stitch length less than 6 mm	Stitch length more than 6 mm and less than 9 mm
Less than 3 mm	2500rpm	2000rpm
3 to less than 4 mm	2000rpm	2000rpm
4 to less than 6.5 mm	1600rpm	1600rpm

- In case of LU-1508NH and LU-1509NH

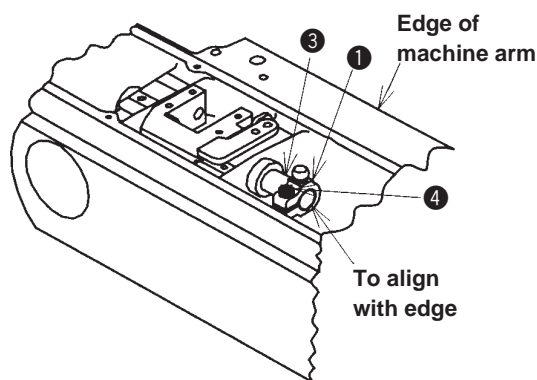
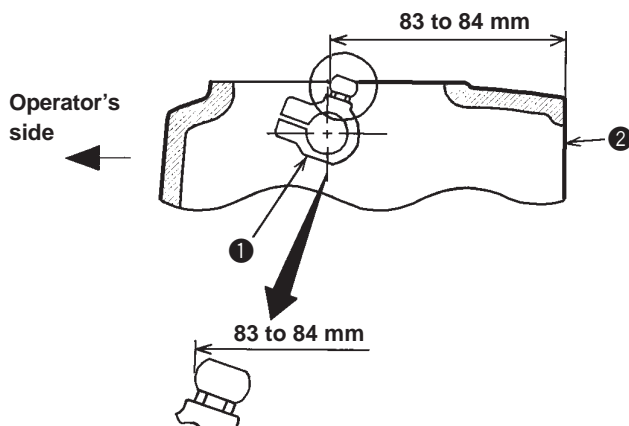
Amount of alternate vertical movement	Stitch length less than 6 mm	Stitch length more than 6 mm and less than 10 mm
Less than 4 mm	2000rpm	1600rpm
4 to less than 6.5 mm	1600rpm	1600rpm

- In case of LU-1565N

Amount of alternate vertical movement	Stitch length less than 9 mm
Less than 4 mm	2000rpm
4 to less than 6.5 mm	1600rpm

- In case of the machine with thread trimmer

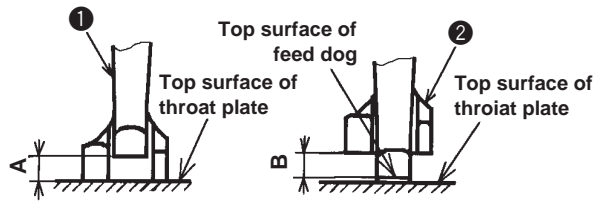
- In case of the machine with thread trimmer, refer to "(23) Alternate vertical dial".





## Standard Adjustment

### 2) Alternate momentum

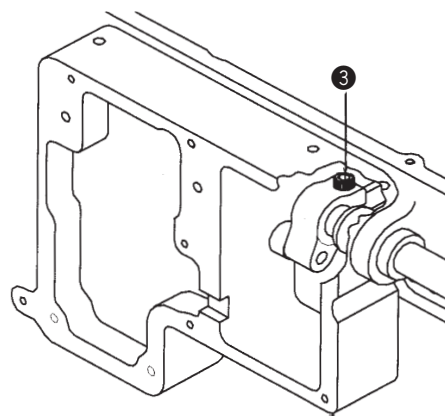
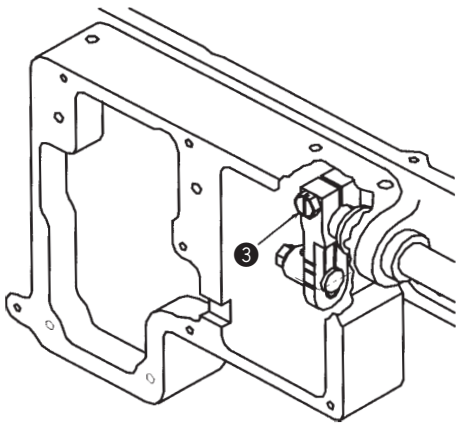


#### Conditions

- Feed amount : 0 mm
- Amount of alternate vertical movement : standard

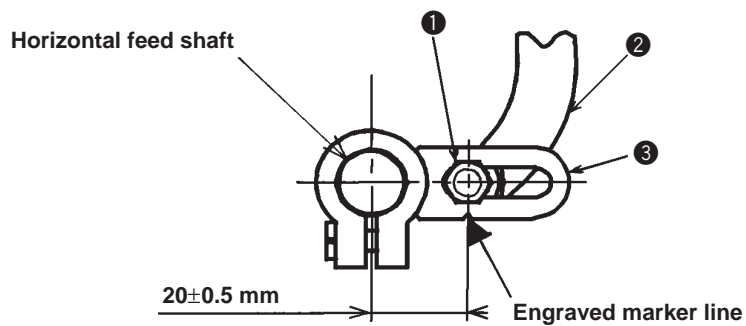
○ In case of the machine without thread trimmer

○ In case of the machine with thread trimmer



### (12) Needle sway (Adjusting the bottom feed amount)

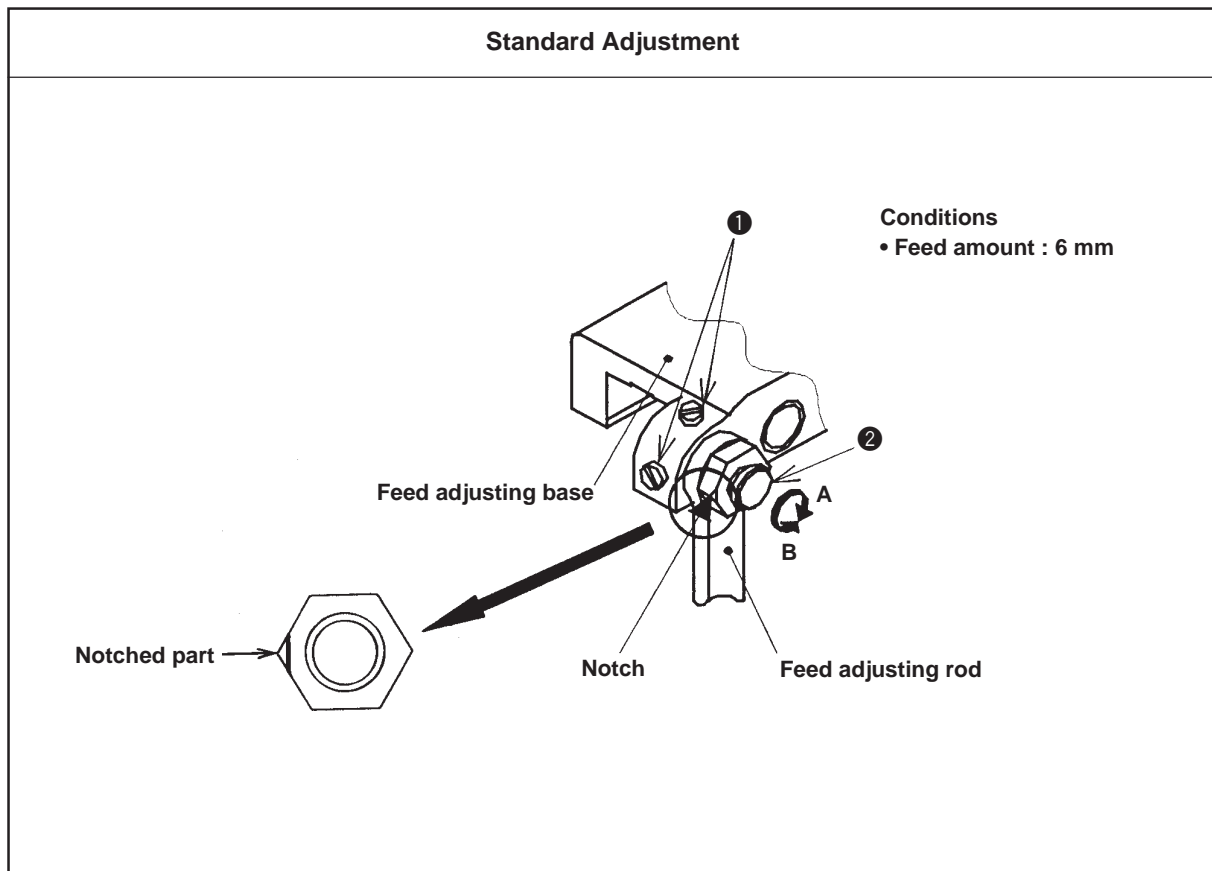
## Standard Adjustment



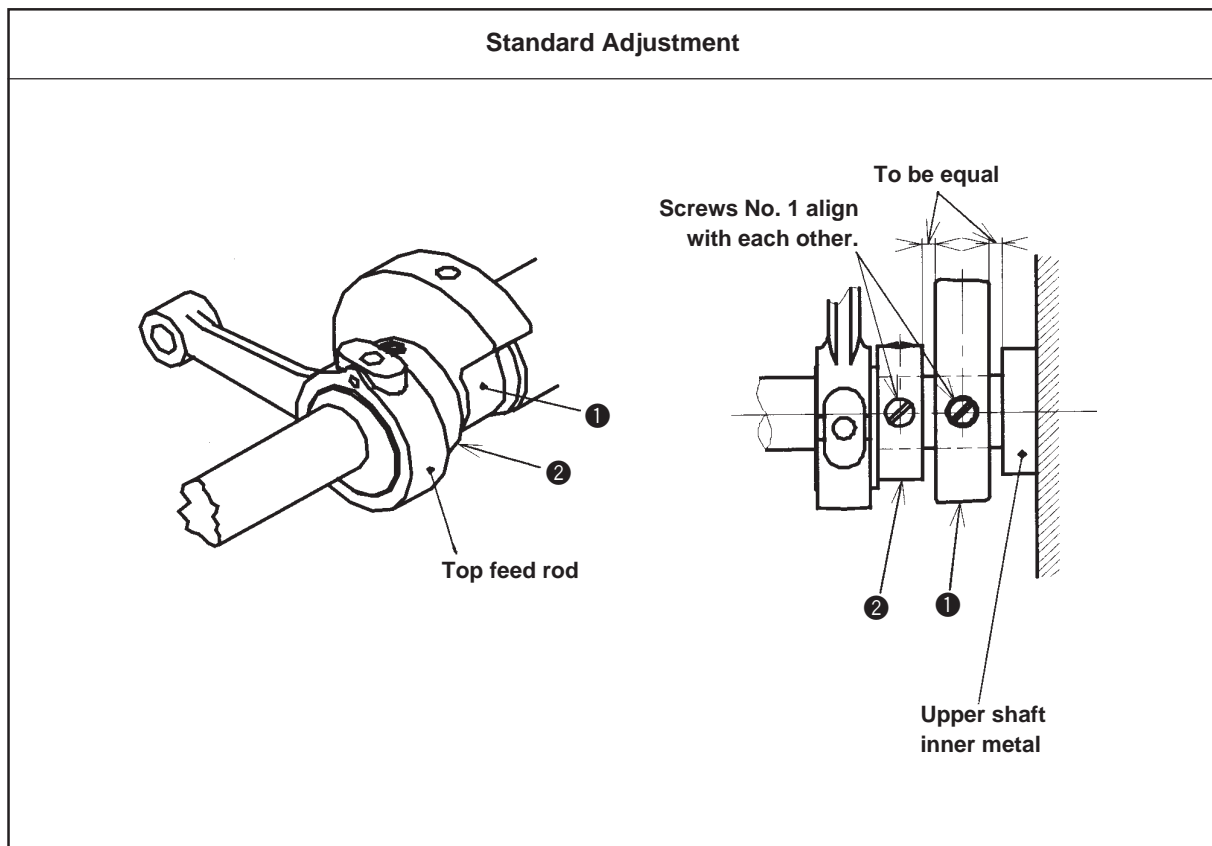
Adjustment Procedures	Results of Improper Adjustment
<p><b>2) Alternate momentum</b></p> <ol style="list-style-type: none"> <li>1. Set the stitch dial to "0".</li> <li>2. Turn the handwheel to make sure that the amount of alternate vertical movement of walking foot ❶ and presser foot ❷ is almost equal.</li> <li>3. When the amount is not equal, loosen setscrew ❸ in the top feed rear arm and adjust so that the amount should be equal.</li> </ol> <p>Adjust the amount almost to <math>A = B</math>.</p> <ul style="list-style-type: none"> <li>○ In case of the machine without thread trimmer Loosen the window plate setscrew and remove the window plate to adjust the amount.</li> <li>○ In case of the machine with thread trimmer Remove the rubber plug to adjust the amount.</li> <li>○ When the amount of alternate vertical movement of the walking foot is larger than that of the presser foot : <ol style="list-style-type: none"> <li>1) Loosen setscrew ❸ in the top feed rear arm in the state that walking foot ❶ is raised a little, press walking foot ❶ to the feed dog.</li> <li>2) Re-tighten setscrew ❸ in the top feed rear arm and turn the handwheel to make sure of the amount of alternate vertical movement.</li> </ol> </li> </ul>	<p>Adjust the vertical stroke of the walking foot so that it is larger than that of the presser foot in accordance with the sewing products.</p> <ul style="list-style-type: none"> <li>○ Sewing sponge material or the like</li> <li>○ Sewing material with overlapped sections</li> </ul> <p>When the alternative vertical strokes of the walking foot and presser foot are considerably different</p> <ul style="list-style-type: none"> <li>○ The stitch pitch is different from the value set by the dial.</li> <li>○ Decrease the number of revolution of the motor a little since the feed efficiency is decreased.</li> </ul>

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Loosen hinge screw nut ❶ in the horizontal feed rear arm.</li> <li>2. Move horizontal feed connecting rod ❷ so that the distance from the center of the horizontal feed shaft to that of the hinge screw is <math>20 \pm 0.5</math> mm and tighten the nut ❶.</li> <li>3. Turn the handwheel to check the needle sway.</li> </ol> <p><b>(Standard)</b></p> <ol style="list-style-type: none"> <li>1. The engraved marker line on horizontal feed rear arm ❸ aligns with the center of the hinge screw.</li> <li>2. When the distance is lengthened more than the standard adjustment value, the bottom feed amount is decreased.</li> </ol> <p><b>(Caution)</b> When you desire to change the bottom feed amount, re-adjust the needle entry position since the needle entry position changes.</p>	<ul style="list-style-type: none"> <li>○ Needle breakage or stitch skipping will result.</li> </ul>

### (13) Stitch length of normal/reverse feed



### (14) Balancer (Machine without thread trimmer only)

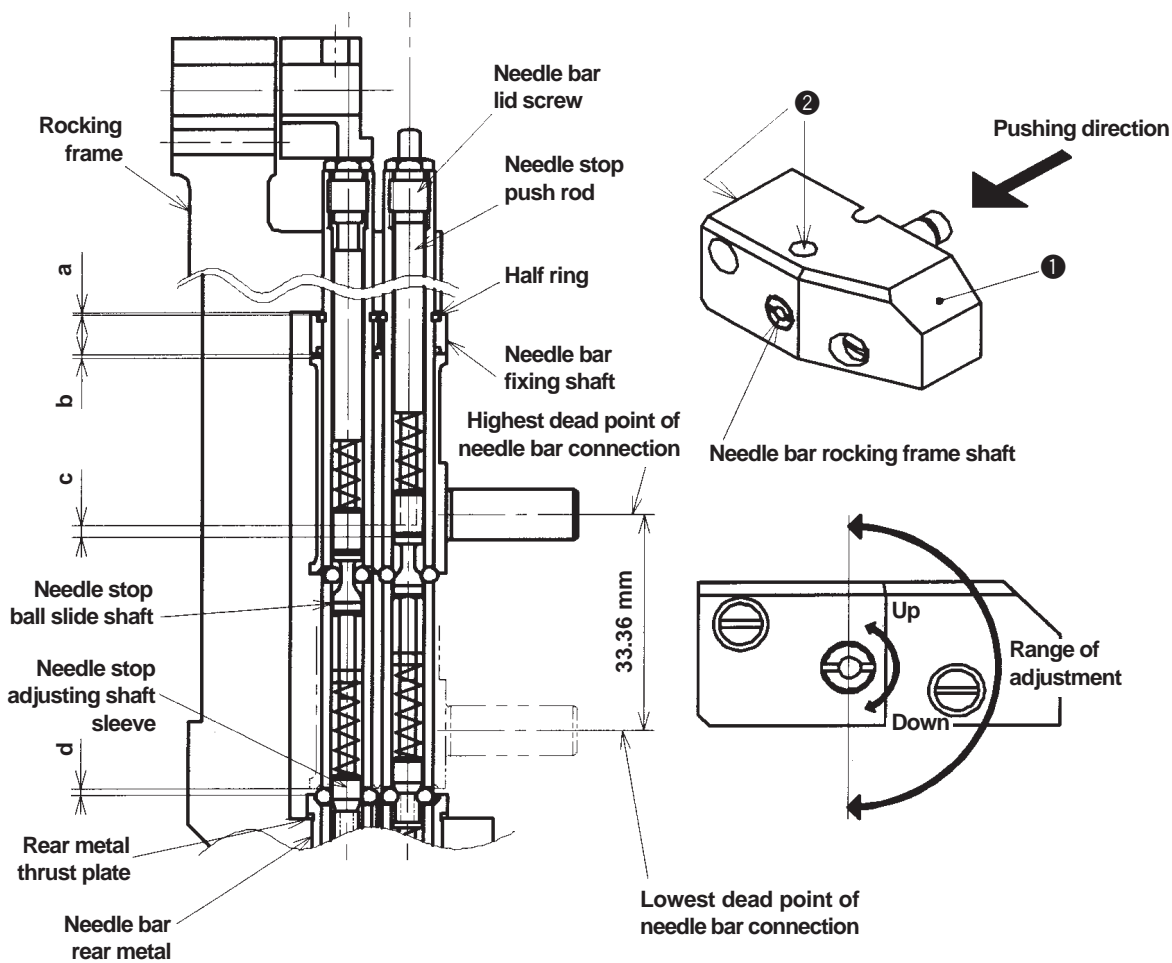


Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Set the stitch dial to "6".</li> <li>2. Loosen two setscrews ❶ in the feed adjusting eccentric pin.</li> <li>3. Turn feed adjusting eccentric pin ❷ to adjust the stitch <ul style="list-style-type: none"> <li>○ length. Direction A → reverse feed pitch is increased.</li> <li>○ Direction B → normal feed pitch is increased.</li> </ul> </li> <li>4. After the adjustment, securely tighten two setscrews ❶ in the feed adjusting eccentric pin.</li> </ol> <p><b>(Standard) When the direction of the notch of feed adjusting eccentric pin ❷ is set to the right sideways as shown in the illustration, the feed amounts of normal and reverse feeds are nearly the same.</b></p>	<ul style="list-style-type: none"> <li>○ Respective stitch lengths of normal and reverse feeds do not match.</li> </ul>

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Turn the handwheel to face above screw No. 1 in top feed cam ❷.</li> <li>2. Adjust so that screw No. 1 in balancer ❶ aligns with screw No. 1 in top feed cam ❷ and securely tighten two setscrews in balancer ❶.</li> </ol> <p>At this time, make almost equal the clearances between the edge of top feed cam ❷, the upper shaft inner metal and the edge of balancer ❶.</p>	<ul style="list-style-type: none"> <li>○ Vibration becomes big.</li> </ul>

## (15) Vertical position of the needle bar rocking frame

### Standard Adjustment



Conditions : Feed amount : 0 mm  
: Rear metal thrust : 0.6 mm

○ Respective clearances of the vertical position of the needle bar

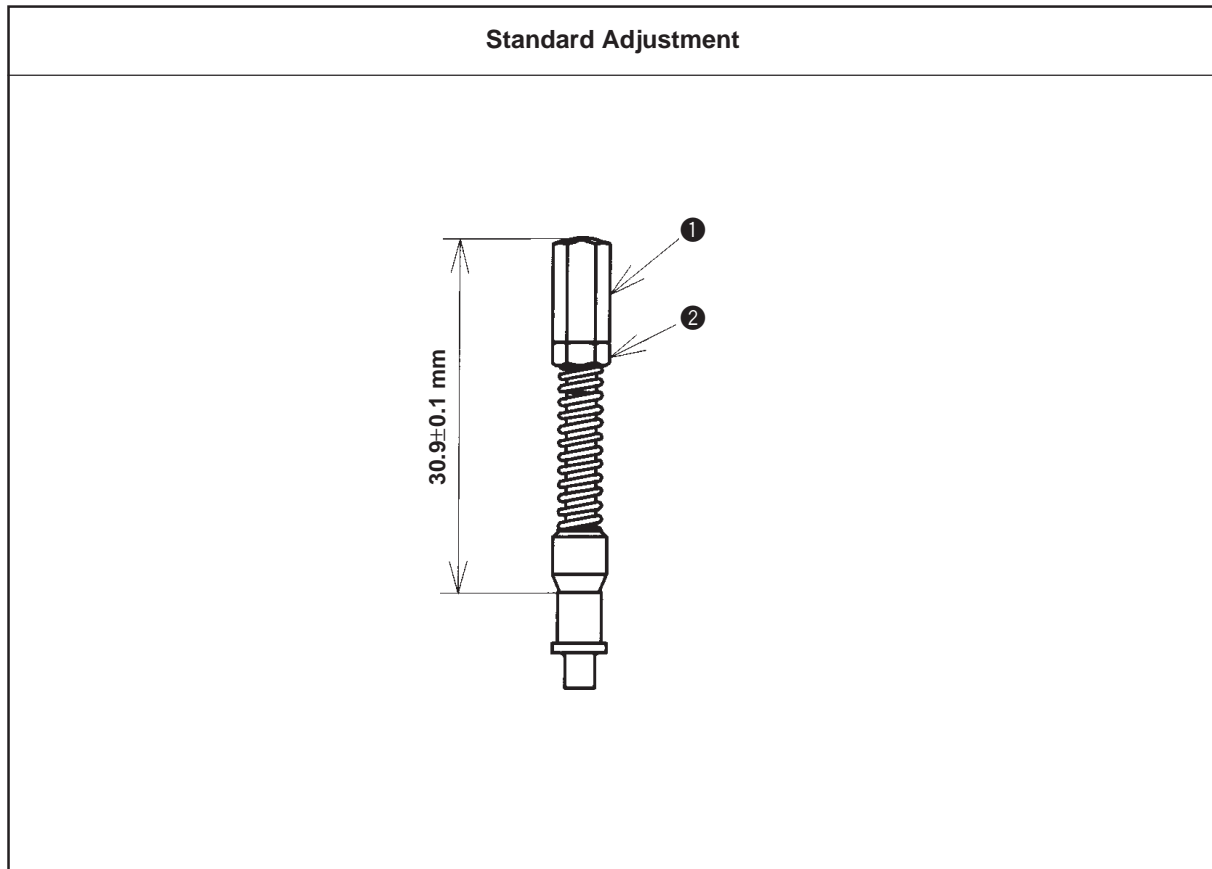
Clearance State	a	b	c	d
2-needle	0.2 mm	Without	0.4 mm	0.2 mm
1-needle	0.2 mm	0.15 mm	Without	0.2 mm

(Make the respective clearances more than numerical values in the list above.)

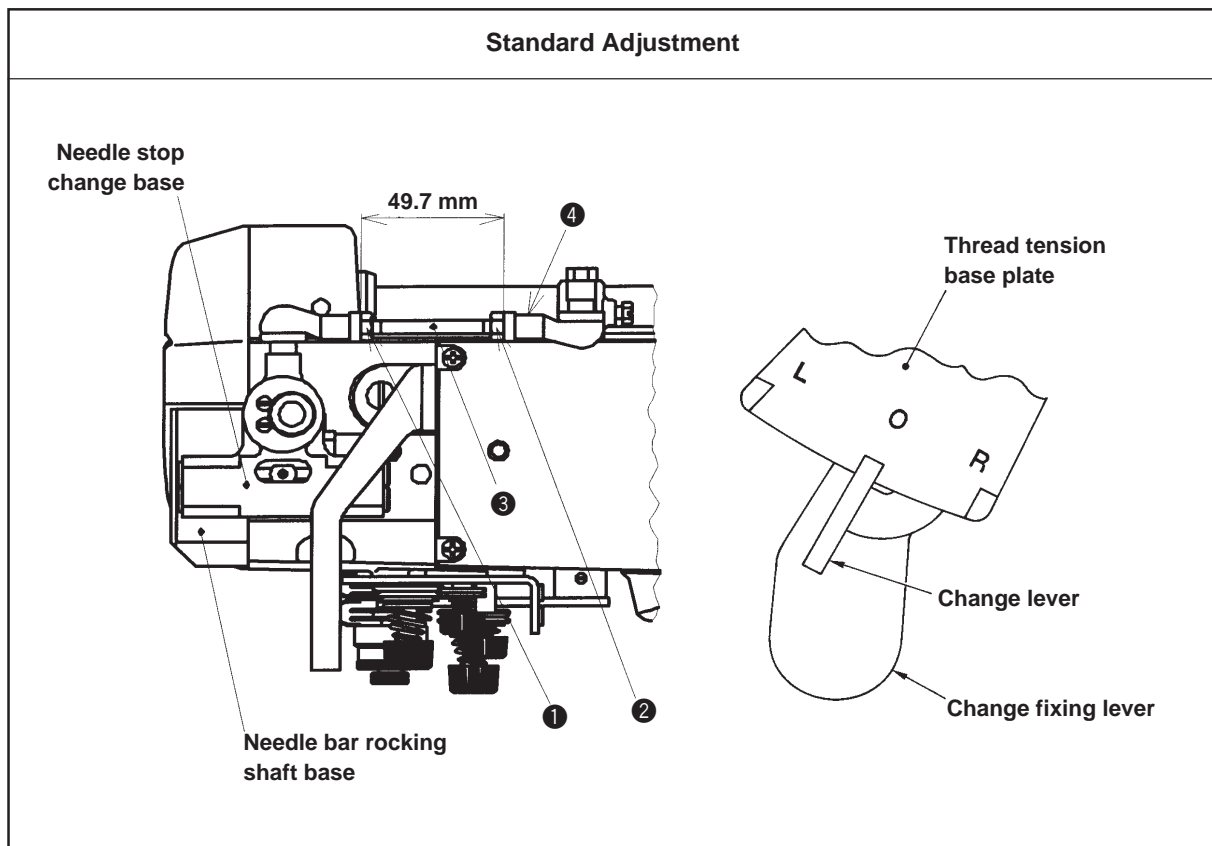


Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Loosen two setscrews ② in the needle bar rocking frame shaft attached to needle bar rocking frame ①.</li> <li>2. Pushing the needle bar rocking frame base shaft in the direction of the arrow mark, turn the needle bar rocking frame to the left or right, and the needle bar rocking frame moves up or down. <ul style="list-style-type: none"> <li>○ Turn to the left : The needle bar rocking frame goes up, and clearance "a" becomes smaller and clearance "c" becomes larger.</li> <li>○ Turn to the right : The needle bar rocking frame comes down, and clearance "a" becomes larger and clearance "c" becomes smaller.</li> </ul> <p>(Range of adjustment is until the slot of the needle bar rocking frame shaft becomes perpendicular.)</p> <li>3. After the adjustment, tighten two setscrews ② in the needle bar rocking frame shaft and fix the needle bar rocking frame shaft.</li> </li></ol> <p>Respective clearances of the vertical position of the needle bar</p> <ul style="list-style-type: none"> <li>○ a : Clearance between the needle bar rocking frame and the half ring (When the needle bar connection is at the highest dead point.)</li> <li>○ b : Clearance between the needle bar fixing shaft and the needle bar connection (When the needle bar connection is at the highest dead point.)</li> <li>○ c : Clearance between the needle stop push rod and the needle stop ball slide shaft (It is nothing to do with the position of the needle bar connection.)</li> <li>○ d : Clearance between the bottom face of the needle bar connection and the top surface of the needle bar rear metal (When the needle bar connection is at the lowest dead point.)</li> </ul> <p><b>(Caution) Clearance "b" is "0" when needle stop is simply performed. However, it is the clearance which is made when the needle bar is further pushed up from the lower side.</b></p>	<ul style="list-style-type: none"> <li>○ Trouble of the organized split needle bar occurs.</li> </ul>

**(16) Dimension of the needle stop adjusting slide shaft (asm.)**



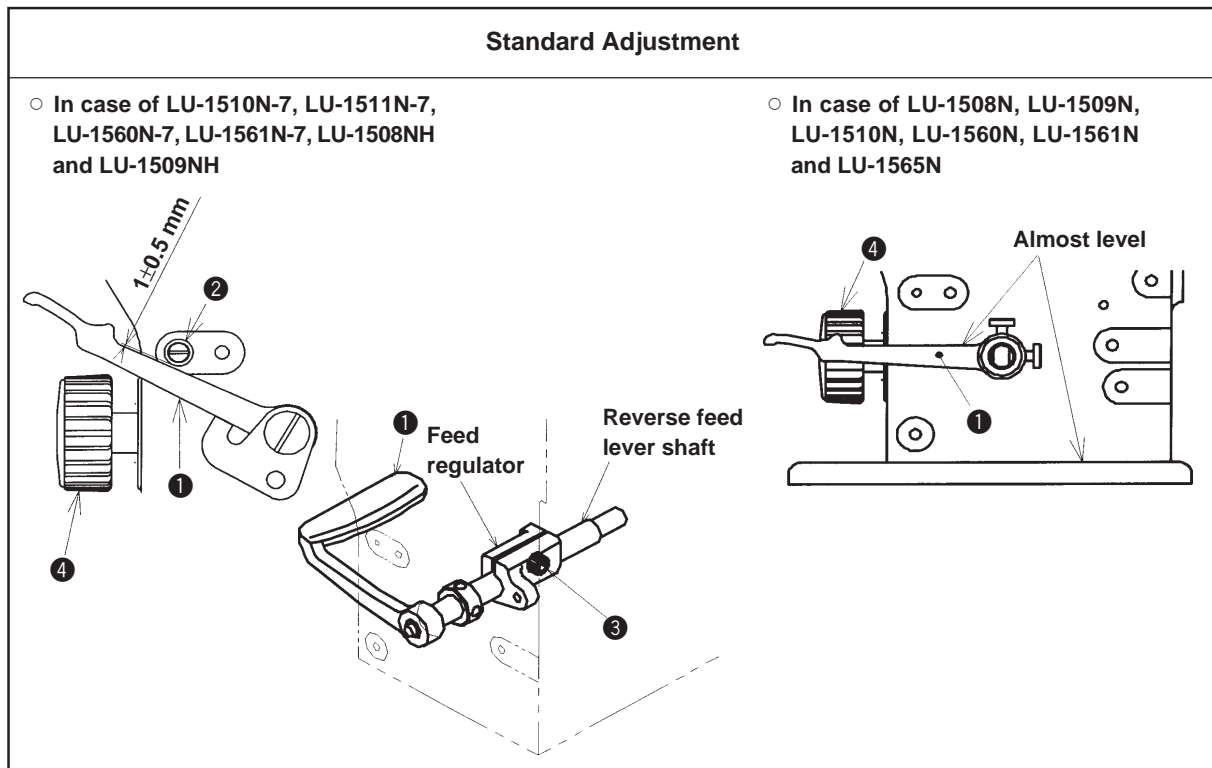
**(17) Position of the change lever**



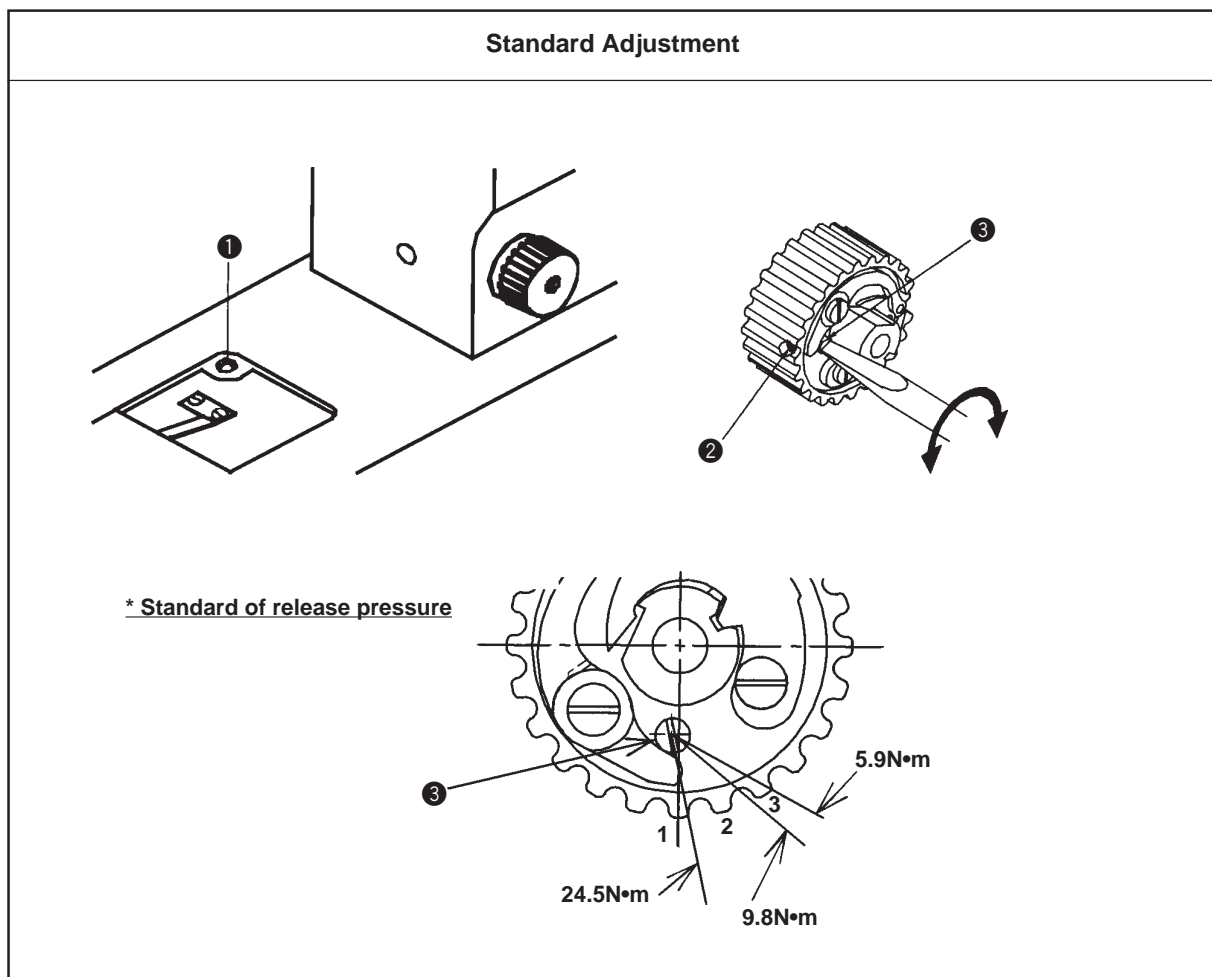
Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen needle stop adjusting screw ❶ and nut ❷, turn needle stop adjusting screw ❶ to adjust the dimension to <math>30.9 \pm 0.1</math> mm and fix it with needle stop adjusting nut ❷.</p>	<p>○ When the dimension is improper, various places related to the needle bar rocking frame will be affected and trouble of needle stop will be cause.</p>

Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen nuts ❶ and ❷ attached to ball joint ❹ and turn release adjusting shaft rod ❸ so that position "0" of the thread tension base plate aligns with the change lever.</p> <ul style="list-style-type: none"> <li>○ Increase the distance of the rod : The change lever moves in the direction R.</li> <li>○ Decrease the distance of the rod : The change lever moves in the direction L.</li> </ul> <p>2. After the adjustment, tighten nuts ❶ and ❷ while being careful that adjusting shaft rod ❸ does not turn.</p> <p><b>(Standard) Adjust the distance between both ends of ball joint ❹ to 49.7 mm.</b></p>	<p>○ When the position of the change lever is improper, trouble of the organized split needle bar occurs.</p>

## (18) Position of the reverse feed control lever



## (19) Safety clutch

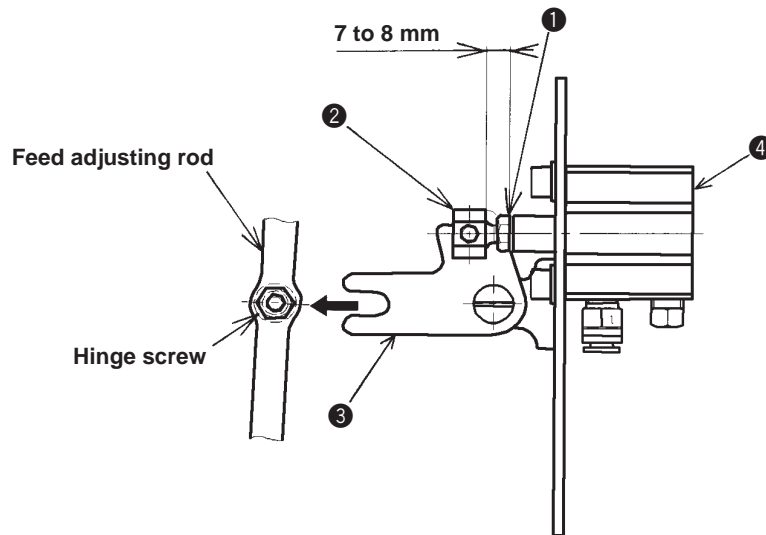


Adjustment Procedures	Results of Improper Adjustment
<ul style="list-style-type: none"> <li>○ In case of LU-1510N-7, LU-1511N-7, LU1560N-7, LU-1561N-7, LU-1508NH and LU-1509NH</li> <li>1. Set the stitch dial ④ to the maximum.</li> <li>2. Loosen hexagon headed bolt ③ in the feed regulator to adjust so that a clearance of <math>1 \pm 0.5</math> mm is provided between reverse feed control lever ① and reverse feed control lever stopper ②.</li> </ul> <ul style="list-style-type: none"> <li>○ In case of LU-1508N, LU-1509N, LU-1510N, LU-1560N, LU-1561N and LU-1565N</li> <li>1. Set the stitch dial ④ to "0".</li> <li>2. Loosen hexagon headed bolt ③ and adjust so that top surface of the machine bed is almost level to the top surface of reverse feed control lever ①.</li> </ul> <p><b>(Caution) Check that reverse feed control lever ① does not interfere with the machine bed or machine arm when the stitch dial ④ is set to the maximum.</b></p>	<p>When the position of the reverse feed control lever is low</p> <ul style="list-style-type: none"> <li>○ Reverse feed control lever interferes with the machine bed and the stitch length of the reverse feed stitching will be decreased.</li> </ul> <p>When the position of the reverse feed control lever is high</p> <ul style="list-style-type: none"> <li>○ Reverse feed control lever interferes with the stopper or the machine arm and stitch length of the normal feed stitching will be decreased.</li> </ul>

Adjustment Procedures	Results of Improper Adjustment
<p>The safety clutch functions when an excessive load is applied to the hook driving shaft or the like during sewing. When the safety clutch functions, the hook will not rotate even if turning the handwheel, and the hook driving shaft sprocket wheel only will run idle since the power is not transmitted to the hook driving shaft.</p> <ul style="list-style-type: none"> <li>○ Resetting procedure</li> <li>1. Checking the moving part of the sewing machine, and look for and remove the cause which the safety clutch has functioned.</li> <li>2. Pressing push button ① located on the top surface of the machine bed, strongly turn the handwheel in the reverse direction of rotation.</li> <li>3. Resetting procedure completes when the handwheel cannot be turned with "click".</li> <li>○ Adjusting the working torque of the safety clutch</li> <li>1. Tilt the machine head.</li> <li>2. Loosen setscrew ② located at the periphery of hook driving shaft sprocket wheel and turn release pressure adjusting pin ③ to adjust the release torque. After the adjustment, tighten setscrew ② and fix release pressure adjusting pin ③.</li> </ul> <p><b>* Standard of release pressure</b> When the direction of the slot in release pressure adjusting pin ③ is located near the places below, the relevant release pressure is obtained.</p> <ul style="list-style-type: none"> <li>○ <math>24.5\text{N} \cdot \text{m}</math> : Top of tooth of 1st sprocket</li> <li>○ <math>9.8\text{N} \cdot \text{m}</math> : Center of bottom between 2nd and 3rd sprockets</li> <li>○ <math>5.9\text{N} \cdot \text{m}</math> : Top of tooth of 3rd sprocket</li> </ul>	

## (20) Reverse feed cylinder

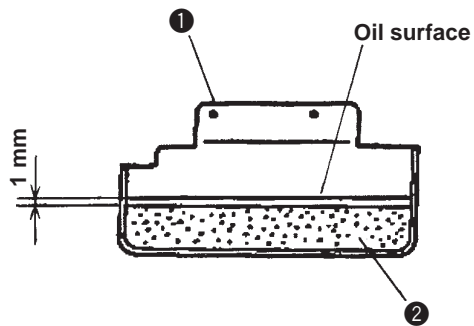
### Standard Adjustment



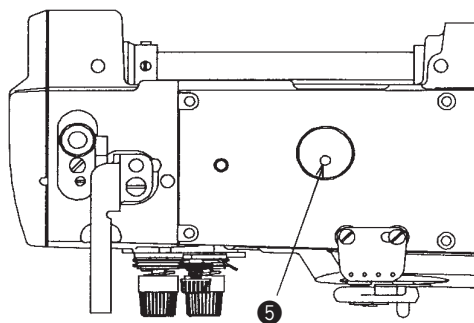
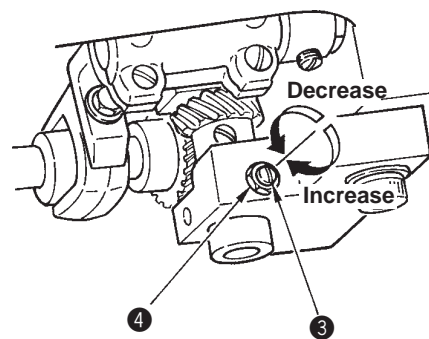
## (21) Lubrication

### Standard Adjustment

#### 1) In case of manual lubrication



Drawing of top surface of machine arm



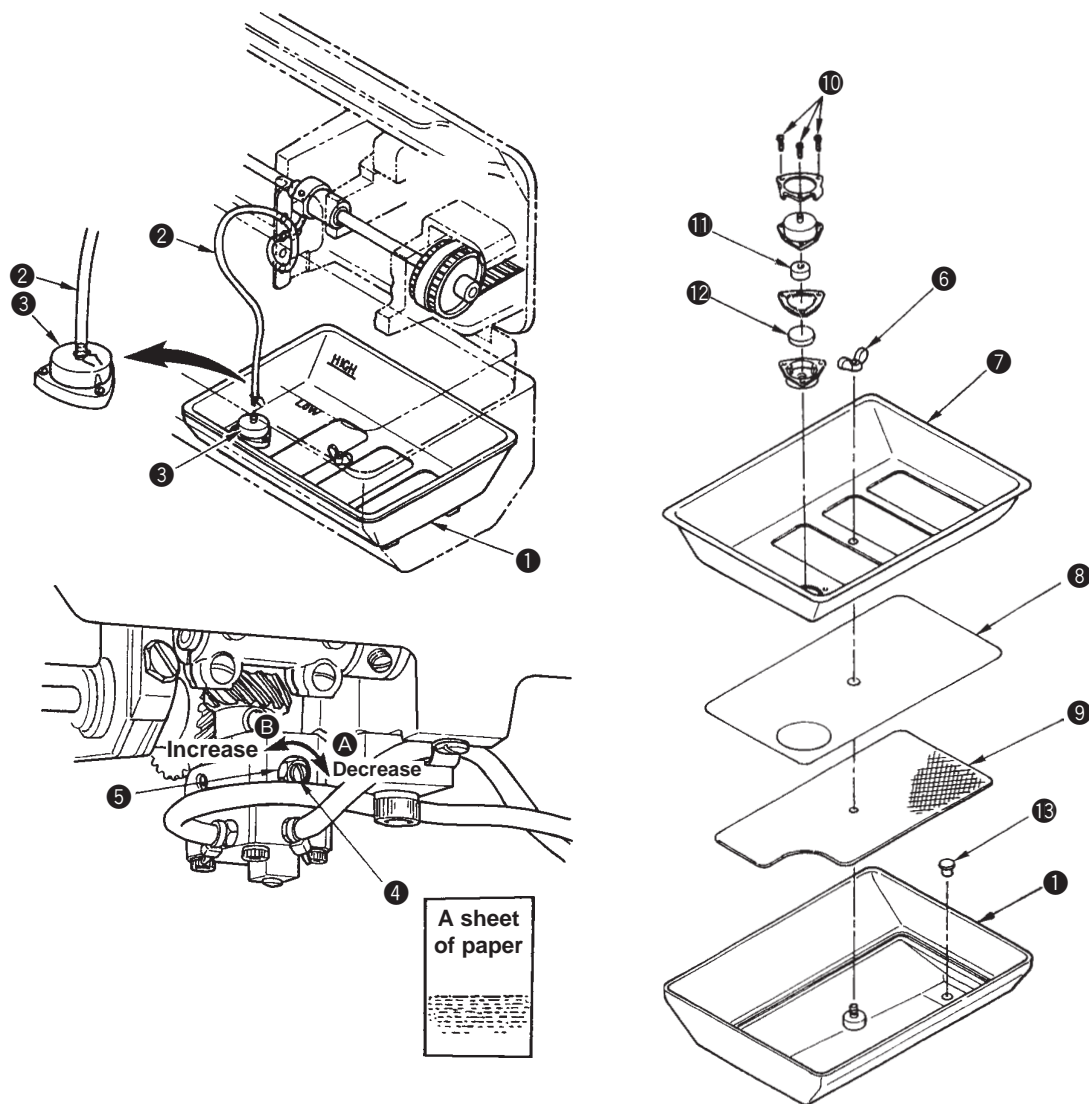
A sheet of paper

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Loosen nut ❶.</li> <li>2. Turn the shaft of cylinder ❺ and adjust so that the distance from the end of shaft of cylinder ❺ to cylinder connecting screw ❷ should be 7 to 8 mm.</li> <li>3. Tighten nut ❶.</li> </ol> <p>* When installing on the machine arm, install the cylinder so that the fork section of reverse feed link ❸ enters the hinge screw of the feed adjusting rod.</p>	<ul style="list-style-type: none"> <li>○ When the fork section does not enter the hinge screw, stitches of the reverse feed may not be obtained.</li> </ul>

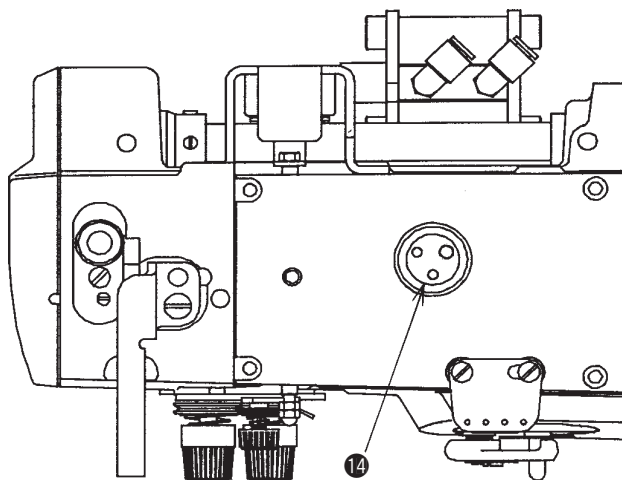
Adjustment Procedures	Results of Improper Adjustment
<p><b>1) In case of manual lubrication</b></p> <ol style="list-style-type: none"> <li>1. Place oil reservoir packing ❷ in oil reservoir ❶ and pour oil so that the oil surface is higher by 1 mm than the top surface of oil reservoir packing. The necessary amount of oil is approximately 500 ml.</li> <li>2. Loosen nut ❹ and turn oil amount adjustment screw ❸ to adjust the amount of oil in the hook. Turning the screw clockwise will increase the amount of oil or counterclockwise will decrease it.</li> <li>3. The appropriate amount of oil, when a sheet of paper is placed near the periphery of the hook, is to such an extent that splashes of oil from the hook appear in approximately five seconds as shown in the sheet of paper.</li> <li>4. Lubricate oil of 5 ml to tank ❺ located on the top surface of machine arm once a week.</li> </ol> <p><b>(Caution)</b> 1. When oil is poured at once, there is a case where oil overflows from oil reservoir ❶. So, be careful. 2. When oil is poured to tank ❺ more than is necessary, oil leakage will be caused. So, be careful.</p>	<p>When the amount of oil is short</p> <ul style="list-style-type: none"> <li>○ Loose stitches will result.</li> <li>○ Hoo is heated resulting in seizure.</li> </ul> <p>When the amount of oil is too much</p> <ul style="list-style-type: none"> <li>○ Thread is stained with oil. In addition, the cloth may be stained.</li> <li>○ Trouble of sewing will be caused.</li> </ul>

## Standard Adjustment

### 2) In case of automatic lubrication



Drawing of top surface of machine arm



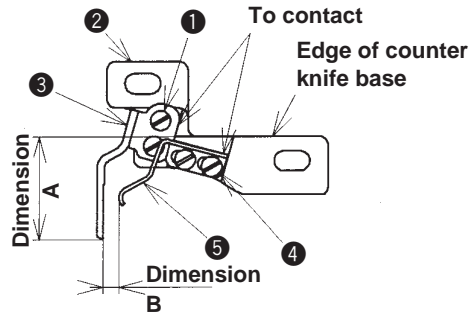


Adjustment Procedures	Results of Improper Adjustment
<p><b>2) In case of automatic lubrication</b></p> <ol style="list-style-type: none"> <li>1. Insert the projection located at the bottom of oil tank ❶ into the waste oil hole of the oil pan.</li> <li>2. Insert oil pipe ❷ into filter ❸ of the oil tank and fix the pipe with a clip.</li> <li>3. Pour the JUKI New Defrix Oil No. 2 into the oil tank ❶ until HIGH level is reached.</li> <li>4. Add the same lubricating oil up to HIGH level as soon as the oil level has come down to LOW level.</li> <li>5. After the lubrication, you can see from oil sight window located at the top surface of the machine arm ❿ that the oil rises up when the operation is normal. (However, the machine should run at 1,500 rpm or more.)</li> </ol> <ul style="list-style-type: none"> <li>○ Adjusting the amount of oil in the hook</li> </ul> <ol style="list-style-type: none"> <li>1. Loosen nut ❺ and turn oil amount adjustment screw ❹. Turning the screw clockwise ➊ will decrease the amount of oil in the hook or counterclockwise ➋ will increase it.</li> <li>2. The appropriate amount of oil, when a sheet of paper is placed near the periphery of the hook, is to such an extent that splashes of oil from the hook appear in approximately five seconds as shown in the figure on the left.</li> </ol> <p><b>(Caution) 1. Approximately once a month, clean the oil tank ❶ and the filter case.</b></p> <p><b>2. If the filter ❸ is clogged with soil, lubrication fails resulting in trouble.</b></p> <ul style="list-style-type: none"> <li>○ Cleaning the oil tank</li> </ul> <ol style="list-style-type: none"> <li>1. Remove the oil pipe ❷ from oil tank ❶.</li> <li>2. Remove butterfly nut ❻ and take out cover (upper) ❼, filter ❸ and cover (lower) ❽ to clean the oil tank.</li> <li>3. Remove filter case setscrews ❿, and clean filter element ⓫ located on the inside of the filter case and magnet ⓬.</li> <li>4. When replacing the oil in the oil tank, remove stopper ⓭ in the oil tank ❶. Then, the oil can be drained from the installing port of the waste oil container in the oil pan. After draining, securely set stopper ⓭ to the oil tank. When taking out the oil tank ❶, take it out after draining the oil.</li> <li>5. Fix the filter case in which filter element ⓫ and magnet ⓬ are placed to cover (upper) ❼ with setscrews ❿.</li> <li>6. Place cover (lower) ❽, filter ❸ and cover (upper) ❼ in order in the oil tank ❶, and fix them with butterfly nut ❻.</li> <li>7. Insert the oil pipe ❷ into the oil tank ❶ and fix it with a clip. Fill the oil tank with JUKI New Defrix Oil No. 2 up to HIGH level.</li> </ol>	<p>When the amount of oil is short</p> <ul style="list-style-type: none"> <li>○ Loose stitches will result.</li> <li>○ Hook is heated resulting in seizure.</li> </ul> <p>When the amount of oil is too much</p> <ul style="list-style-type: none"> <li>○ Thread is stained with oil. In addition, the cloth may be stained.</li> <li>○ Trouble of sewing will be caused.</li> </ul>

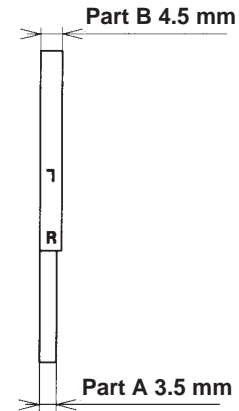
## (22) Thread trimmer device

### Standard Adjustment

#### 1) Position of the counter knife and the clamp spring



Counter knife gauge for both  
1-needle and 2-needle



Conditions : Make the edge of counter knife come in contact with the step difference of counter knife base.

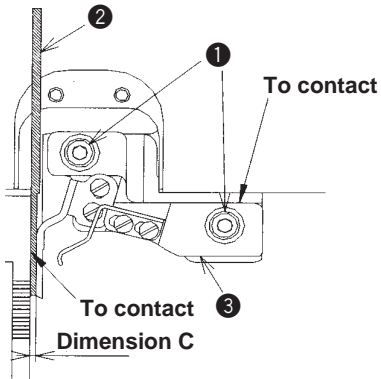
Dimension Model	Left		Right	
	Dimension A	Dimension B	Dimension A	Dimension B
LU-1510N-7	—	—	23.2±0.1 mm	3.5±0.1 mm
LU-1511N-7	—	—		
LU-1560N-7	21.3±0.1 mm	4.5±0.1 mm		
LU-1561N-7				

Adjustment Procedures	Results of Improper Adjustment									
<p><b>1) Position of the counter knife and the clamp spring</b></p> <p>1. Loosen setscrews ❶ in the counter knife.</p> <p>2. Make the edge of counter knife ❸ come in contact with the step difference of counter knife base ❷.</p> <p>3. Adjust the distance from the edge of counter knife base ❷ to the top end of counter knife to ❸ dimension A.</p> <p>4. Tighten setscrews ❶ in the counter knife.</p> <p>Position of the clamp spring</p> <p>1. Loosen clamp spring setscrews ❹.</p> <p>2. Make the edge of clamp spring ❺ come in contact with the step difference of counter knife base ❷.</p> <p>3. Slide the clamp spring while making it come in contact with the step difference of the counter knife base, and adjust the distance to dimension B.</p> <p>4. Tighten clamp spring setscrews ❹.</p> <p>For the details, refer to the list below.</p> <p><b>(Caution) When the position of counter knife ❸ and clamp spring ❺ is moved, re-adjust the position of counter knife base ❷ and the knife pressure.</b></p> <p style="text-align: center;">List</p> <table><tr><th></th><th>Position of left clamp spring</th><th>Position of right clamp spring</th></tr><tr><td>LU-1510N-7 LU-1511N-7</td><td></td><td>Thickness of part A is 3.5 mm. Insert this part between counter knife ❸ and clamp spring ❺, and adjust clamp spring ❺ so that there is no clearance.</td></tr><tr><td>LU-1560N-7 LU-1561N-7</td><td>Thickness of part B is 4.5 mm. Insert this part between counter knife ❸ and clamp spring ❺, and adjust clamp spring ❺ so that there is no clearance.</td><td></td></tr></table>		Position of left clamp spring	Position of right clamp spring	LU-1510N-7 LU-1511N-7		Thickness of part A is 3.5 mm. Insert this part between counter knife ❸ and clamp spring ❺, and adjust clamp spring ❺ so that there is no clearance.	LU-1560N-7 LU-1561N-7	Thickness of part B is 4.5 mm. Insert this part between counter knife ❸ and clamp spring ❺, and adjust clamp spring ❺ so that there is no clearance.		<p>When dimension A is larger</p> <ul style="list-style-type: none"><li>○ Length of bobbin thread clamp is shortened and stitch skipping occurs.</li><li>○ Setting/taking out bobbin cannot be performed.</li></ul> <p>When dimensionA is smaller</p> <ul style="list-style-type: none"><li>○ Thread trimming failure will be caused.</li></ul> <p>When dimesion B is larger</p> <ul style="list-style-type: none"><li>○ Bobbin thread clamp failure occurs.</li><li>○ Stitch skipping at the start of sewing will be caused.</li></ul> <p>When dimension B is smaller</p> <ul style="list-style-type: none"><li>○ It is difficult to clamp needle thread and take out cloth, and the trouble that bobbin thread clamp is simultaneously removed will be caused.</li><li>○ Clamp spring interferes with the rear edge of moving knife and deformation of clamp spring or the like occurs.</li></ul>
	Position of left clamp spring	Position of right clamp spring								
LU-1510N-7 LU-1511N-7		Thickness of part A is 3.5 mm. Insert this part between counter knife ❸ and clamp spring ❺, and adjust clamp spring ❺ so that there is no clearance.								
LU-1560N-7 LU-1561N-7	Thickness of part B is 4.5 mm. Insert this part between counter knife ❸ and clamp spring ❺, and adjust clamp spring ❺ so that there is no clearance.									

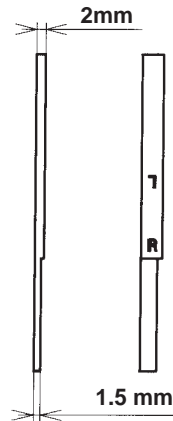
## Standard Adjustment

### 2) Position of the counter knife base

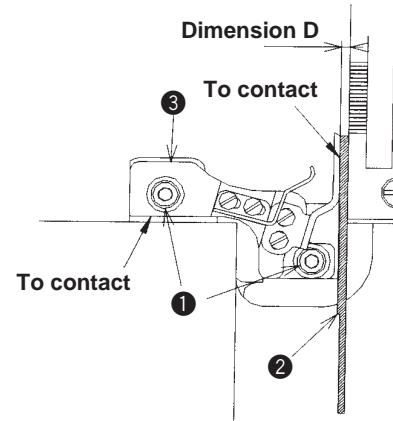
- Adjusting procedure of counter knife base (right)



- Counter knife gauge for both 1-needle and 2-needle



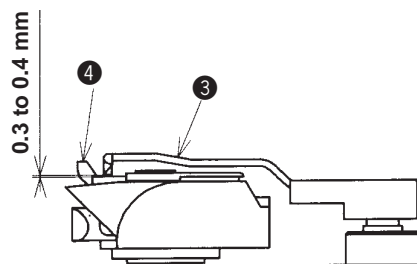
- Adjusting procedure of counter knife base (left)



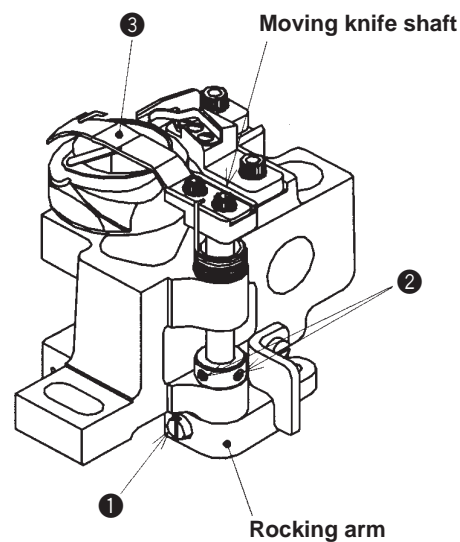
Dimension	Dimension C	Dimension D
Model		
LU-1510N-7	1.5.±0.2 mm	—
LU-1511N-7		
LU-1560N-7		2±0.2 mm
LU-1561N-7		

Condition : Make the edge of counter knife base come in contact with the step difference of hook shaft base.

### 3) Vertical position of the moving knife



Adjust at the center part.



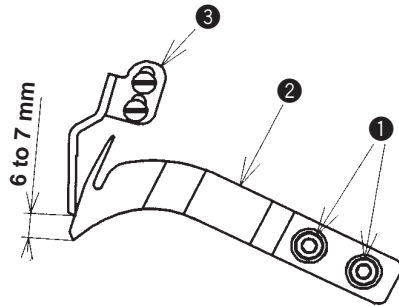
Dimension	Left	Right
Model		
LU-1510N-7	0.3 to 0.4 mm	
LU-1511N-7		
LU-1560N-7		
LU-1561N-7		

Adjustment Procedures	Results of Improper Adjustment
<p><b>2) Position of the counter knife base</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrews ❶ in the counter knife base.</li> <li>2. Use counter knife gauge ❷ supplied as accessories and move counter knife base ❸ to the position as shown in the figure. For the longitudinal position, make the edge of counter knife base ❸ come in contact with the step difference of the hook shaft base. For the lateral direction, insert counter knife gauge ❷ between the throat plate and the counter knife, and tighten two setscrews ❶ in the counter knife base so that there is no clearance. * For the right side, use plane R of counter knife gauge ❷ and for the left side, use plane L of the gauge.</li> </ol> <p><b>(Caution) When counter knife base ❸ is moved, adjust again the knife pressure.</b></p>	<p>When dimension C or D is larger</p> <ul style="list-style-type: none"> <li>○ Knife pressure is increased and motor stop will be caused.</li> <li>○ Setting/taking out bobbin cannot be performed.</li> <li>○ Counter knife base interferes with the rear end of moving knife, and moving knife and counter knife will be broken.</li> </ul> <p>When dimension C or D is smaller</p> <ul style="list-style-type: none"> <li>○ Knife pressure is decreased and thread trimming failure occurs.</li> <li>○ Moving knife interferes with the hook stopping section, and thread trimming failure occurs or moving knife is broken.</li> </ul>
<p><b>3) Vertical position of the moving knife</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrew ❶ in the rocking arm.</li> <li>2. Loosen setscrews ❷ in the moving knife shaft thrust collar.</li> <li>3. Adjust so that the clearance between the center part of bottom end of moving knife ❸ and inner hook ❹ is 0.3 to 0.4 mm, and tighten setscrews ❷ in the thrust collar.</li> <li>4. Tighten setscrew ❶ in the rocking arm so that there is no thrust play at the moving knife shaft.</li> <li>5. In case of 2-needle, both the left and right are the same adjustment value.</li> </ol> <p><b>(Caution) Adjust the height of moving knife ❸ at the center part of moving knife ❸.</b></p>	<p>When the clearance is larger</p> <ul style="list-style-type: none"> <li>○ Clamp failure of needle thread and bobbin thread occurs.</li> </ul> <p>When the clearance is smaller</p> <ul style="list-style-type: none"> <li>○ Moving knife interferes with the inner hook.</li> <li>○ There is no clearance where thread enters between moving knife and inner hook. As a result, thread trimming failure will be caused.</li> </ul>

## Standard Adjustment

### 4) Adjusting the knife pressure

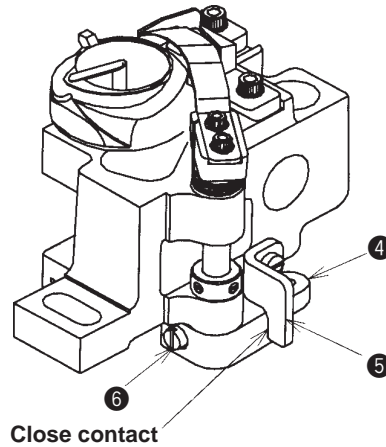
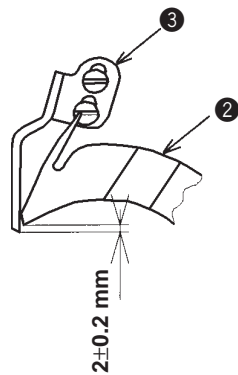
#### ○ Knife pressure



Conditions : Moving knife and counter knife come in contact with each other.

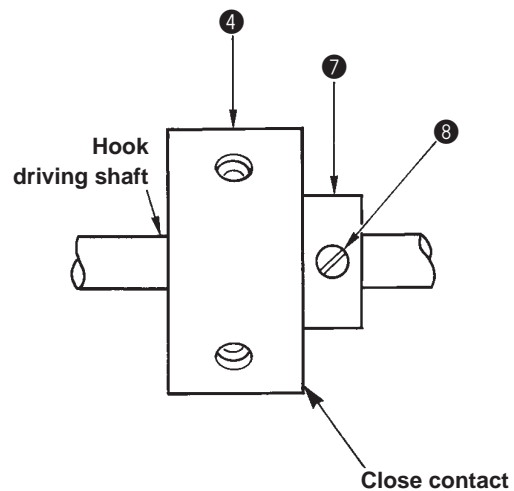
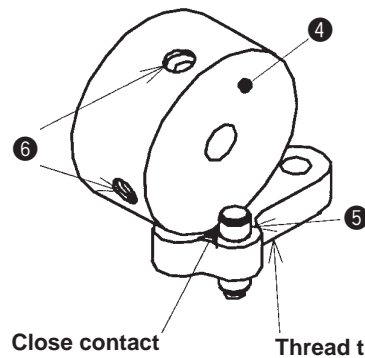
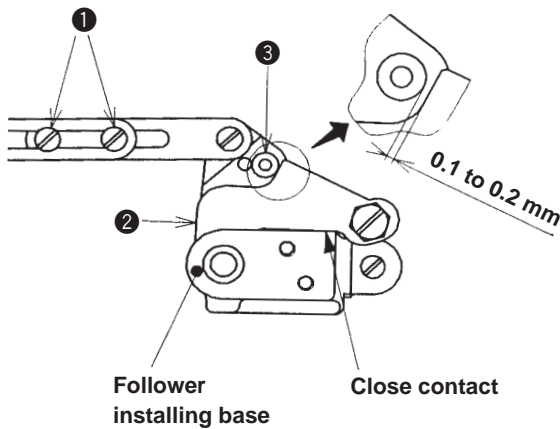
: Rocking arm and stopper plate come in close contact with each other.

#### ○ Initial position



### 5) Thread trimmer cam

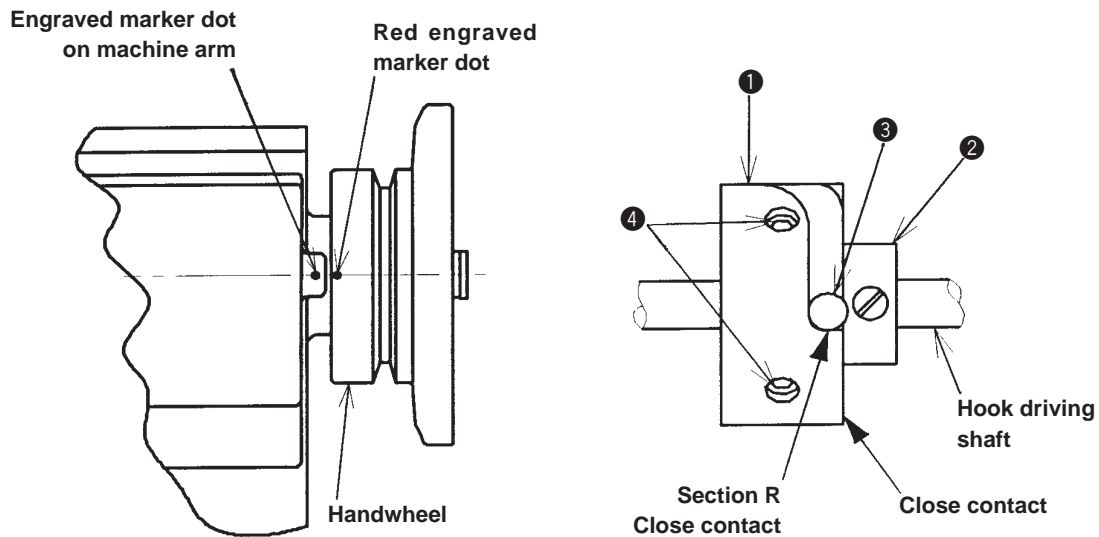
Conditions : Thread trimmer driving plate comes in close contact with follower installing base.



Adjustment Procedures	Results of Improper Adjustment
<p><b>4) Adjusting the knife pressure</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrews ❶ in the moving knife.</li> <li>2. Adjust the installing position of the moving knife so that the position where moving knife ❷ and counter Knife ❸ start coming in contact with each other starts at the position of 6 to 7 mm from the top end of the moving knife. At this time, if moving knife ❷ comes in contact with the clamp spring, the knife pressure is increased by the clamp pressure. So, adjust the knife pressure in the state that the clamp pressure is not applied to the knife.</li> <li>3. Tighten setscrews ❶ in the moving knife.</li> </ol> <p><b>(Caution) Operate the sewing machine with the knife pressure minimized to such an extent that both needle and bobbin threads can be trimmed.</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrew ❹ in the rocking arm.</li> <li>2. Adjust so that the distance between the top end of the counter knife ❸ and the top end of the moving knife is <math>2 \pm 0.2</math> mm when moving knife ❷ travels to its back end.</li> <li>3. Tighten setscrew ❹ in the rocking arm so that there is no thrust play at the moving knife shaft.</li> <li>4. In case of 2-needle, both the left and right are the same adjustment value.</li> </ol> <p><b>(Check) At this time, check that rocking arm ❹ comes in close contact with thread trimmer stopper plate ❺.</b></p>	<p>When the knife pressure is high</p> <ul style="list-style-type: none"> <li>○ Blade sections of the counter knife and the moving knife may be damaged.</li> <li>○ Torque at the time of thread trimming is increased resulting in motor-stop.</li> <li>○ Defective thread trimming operation will result.</li> </ul> <p>When the knife pressure is low</p> <ul style="list-style-type: none"> <li>○ Defective thread trimming will result.</li> </ul>
<p><b>5) Thread trimmer cam</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrews ❶ in the thread trimmer shaft connecting plate.</li> <li>2. Adjust the clearance between thread trimmer driving plate ❷ and cam roller A ❸ to 0.1 to 0.2 mm.</li> <li>3. Make the edge of thread trimmer cam ❹ come in close contact with cam roller B ❺, and temporarily tighten setscrews ❻ in the thread trimmer cam.</li> <li>4. Make safety clutch disk ❼ come in close contact with thread trimmer cam ❹, and securely tighten setscrew ❽ in the safety clutch disk.</li> <li>5. Tighten setscrews ❶ in the thread trimmer shaft connecting plate. (For connecting procedure, refer to "7) Connecting the rocking arm and the thread trimmer roller arm".</li> </ol> <p><b>(Caution) Install the thread trimmer cam in the state that thread trimmer driving plate ❷ comes in close contact with the follower installing base.</b></p>	<p>When there is no clearance between the cam roller and the driving plate</p> <ul style="list-style-type: none"> <li>○ Thread trimmer cam interferes with the cam roller resulting in breakage or machine lock.</li> </ul> <p>When the clearance between the cam roller and the driving plate is large</p> <ul style="list-style-type: none"> <li>○ Cam roller enters during operation resulting in machine rock.</li> </ul>

## Standard Adjustment

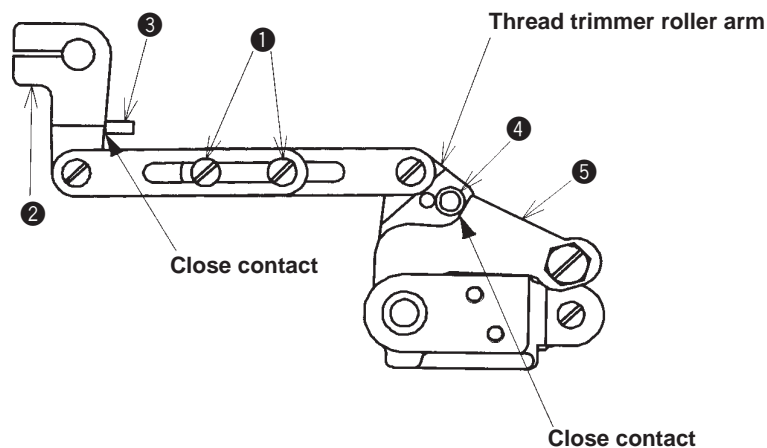
### 6) Thread trimmer cam timing



Conditions : Engraved marker dot on the handwheel aligns with engraved marker dot on machine arm.

Close contact

### 7) Connecting the rocking arm and the thread trimmer roller arm



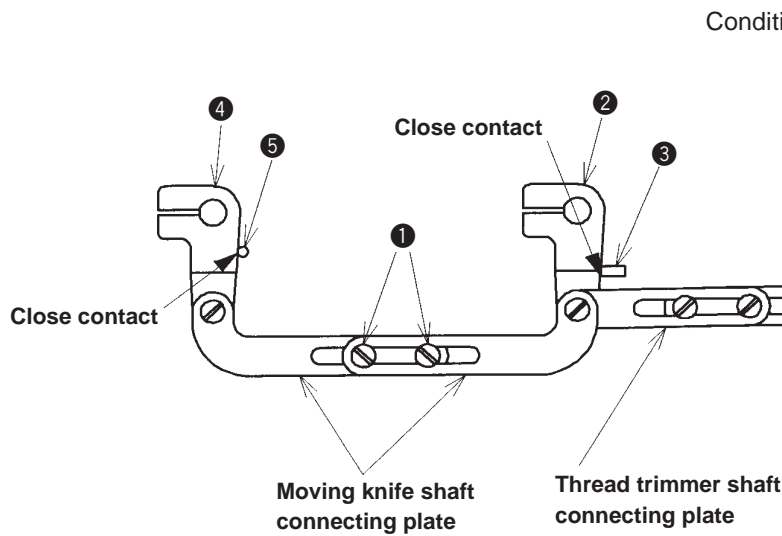
Condition : When the moving knife is positioned to the initial position. (Refer to "○ Initial position of 4) Adjusting the knife pressure".)



Adjustment Procedures	Results of Improper Adjustment
<p><b>6) Thread trimmer cam timing</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrews ④ in the thread trimmer cam which have been temporarily tightened at "5) Thread trimmer cam".</li> <li>2. Turn the handwheel to align the red engraved marker dot on the handwheel with the engraved marker dot on the machine arm.</li> <li>3. Make thread trimmer cam ① come in close contact with safety clutch disk ②.</li> <li>4. Make section R, start of entering cam groove, come in close contact with cam roller B ③.</li> <li>5. Securely tighten setscrews ④ in the thread trimmer cam.</li> </ol> <p><b>(Caution) Check that the edge of thread trimmer cam ① comes in close contact with the edge of safety clutch disk ②.</b></p>	<p>When thread trimming timing is retarded</p> <ul style="list-style-type: none"> <li>○ Thread trimming action does not complete even at the needle-up stop position. As a result, defective thread trimming will be caused.</li> </ul> <p>When thread trimming timing is advanced</p> <ul style="list-style-type: none"> <li>○ Defective thread trimming will be caused.</li> <li>○ Length of thread remaining on the needle after thread trimming cannot be secured and needle thread may slip off after thread trimming or at the start of sewing.</li> <li>○ Stitch skipping at the start of sewing will be caused.</li> </ul>
<p><b>7) Connectin the rocking arm and the thread trimmer roller arm</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrews ① in the thread trimmer shaft connecting plate.</li> <li>2. Make rocking arm ② come in close contact with thread trimmer stopper ③.</li> <li>3. Make cam roller A ④ come in close contact with thread trimmer driving plate ⑤.</li> <li>4. Tighten setscrews ① in the thread trimmer shaft connecting plate.</li> </ol>	<ul style="list-style-type: none"> <li>○ When the respective positions are not correct, defective thread trimming occurs.</li> </ul>

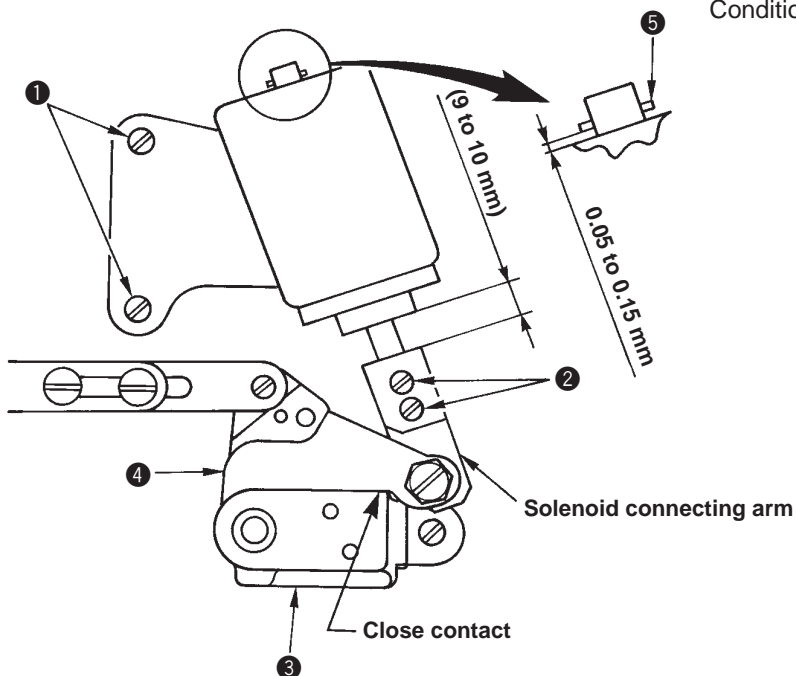
## Standard Adjustment

### 8) Connecting the left and right rocking arms (2-needle machine only)



Condition : When the moving knife is positioned to the initial position. (Refer to "○ Initial position of 4) Adjusting the knife pressure"

### 9) Thread trimmer solenoid



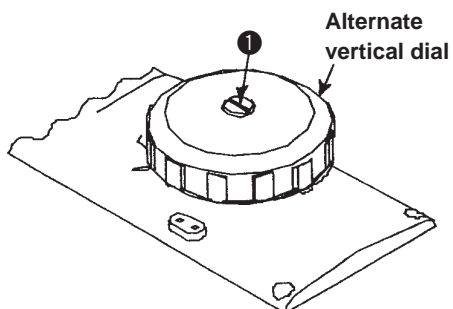
Condition : Thread trimmer driving plate comes in close contact with the follower installing base.

Adjustment Procedures	Results of Improper Adjustment
<p><b>8) Connecting the left and right rocking arms (2-needle machine only)</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrews ❶ in the moving knife shaft connectingg plate.</li> <li>2. Make rocking arm (right) ❷ come in close contact with thread trimmer stopper ❸.</li> <li>3. Make rocking arm (left) ❹ come in close contact with stopper ❺.</li> <li>4. In the state, tighten setscrews ❶ in the moving knife shaft connecting plate.</li> </ol>	<ul style="list-style-type: none"> <li>○ When the respective positions are not correct, defective thread trimming occurs.</li> </ul>
<p><b>9) Thread trimmer solenoid</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrews ❶ in the solenoid installing plate.</li> <li>2. Loosen setscrews ❷ in the solenoid connecting arm.</li> <li>3. Tighten setscrews ❶ in the solenoid installing plate at the position where the shaft of solenoid moves up or down without resistance.</li> <li>4. Make follower installing base ❸ come in close contact with thread trimmer driving plate ❹.</li> <li>5. Tighten setscrews ❷ in the solenoid connecting arm so that a clearance of 0.05 to 0.15 mm is provided between plunger stopper ❺ (roll pin) of the thread trimmer solenoid and the solenoid main body.</li> </ol> <p>(Fot the connecting procedure, refer to "7) Connecting the rocking arm and the thread trimmer roller arm".</p> <p><b>(Check) Turn the handwheel by hand to actuate the thread trimmer and check that a clearance of 0.05 to 0.15 mm is provided between stopper ❺ of the thread trimmer solenoid and the solenoid main body when the moving knife returns to the initial position.</b></p>	<p>When there is no clearance between the thread trimmer solenoid and the plunger stopper</p> <ul style="list-style-type: none"> <li>○ Plunger stopper is broken.</li> </ul> <p>When the clearance between the thread trimmer solenoid and the olunger stopper is large</p> <ul style="list-style-type: none"> <li>○ The working range of the thread trimmer solenoid becomes narrow and machine lock will be caused.</li> </ul>

## (23) Alternate vertical dial

### Standard Adjustment

#### 1) Installing position of the detection switch of the amount of alternate vertical movement



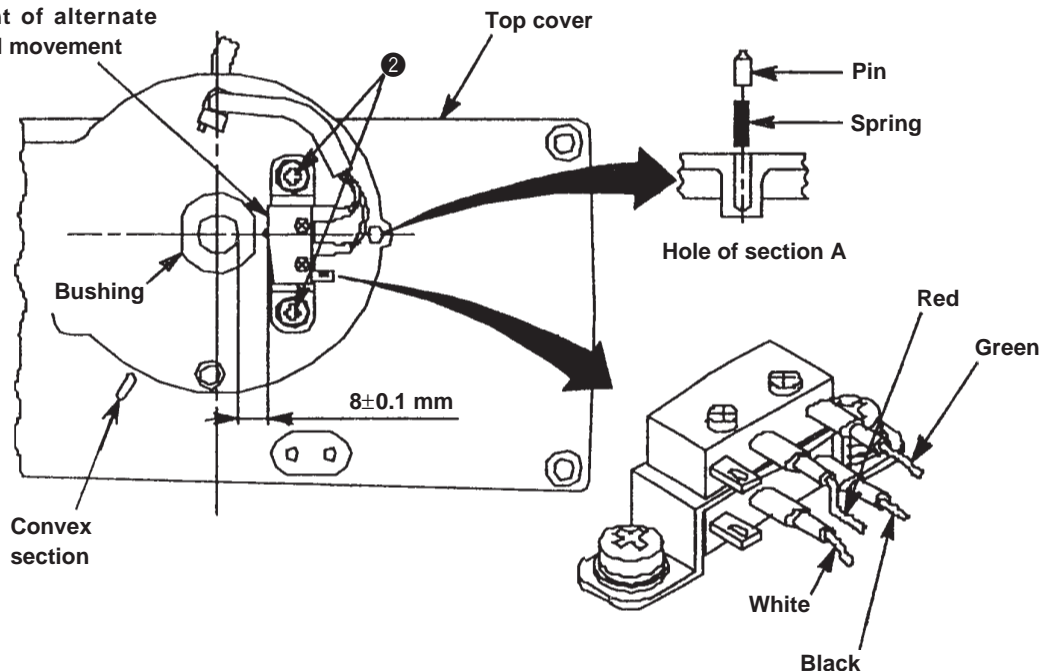
#### Sewing speed of LU-1510N-7 and LU-1511N-7

Amount of alternate vertical movement of the walking foot and presser foot	Stitch length : 6 mm or less	Stitch length : More than 6 mm and 9 mm or less
Less than 2.5 mm	3000 rpm	2000 rpm
2.5 mm to less than 4 mm	2400 rpm	2000 rpm
4 mm to less than 4.75 mm	2000 rpm	2000 rpm
4.75 mm to less than 6.5 mm	1800 rpm	1800 rpm

#### Sewing speed of LU-1560N-7 and LU-1561N-7

Amount of alternate vertical movement of the walking foot and presser foot	Stitch length : 6 mm or less	Stitch length : More than 6 mm and 9 mm or less
Less than 2.5 mm	2500 rpm	1800 rpm
2.5 mm to less than 4 mm	2200 rpm	1800 rpm
4 mm to less than 4.75 mm	1800 rpm	1800 rpm
4.75 mm to less than 6.5 mm	1600 rpm	1600 rpm

#### Detection switch of amount of alternate vertical movement



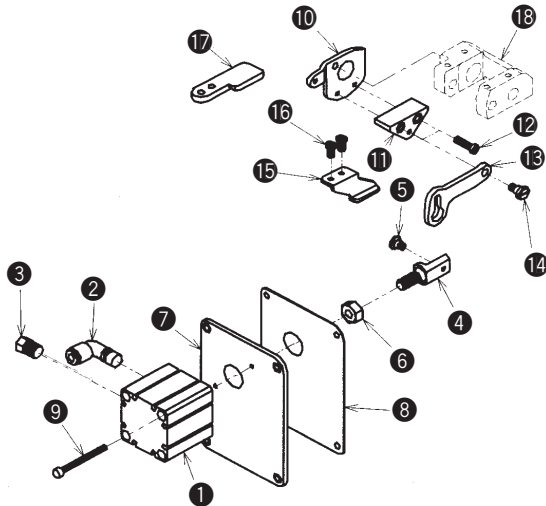
Scale of alternate vertical dial	Switch (upper) (Red and green lines)	Switch (lower) (White and black lines)
1 to 2.5	OFF	OFF
2.625 to 4	OFF	ON
4.125 to 4.75	ON	ON
4.875 to 6.5	ON	OFF

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Turn the alternate vertical dial to adjust the scale "1" to the convex section on the top cover.</li> <li>2. Loosen setscrew ❶ in the alternate vertical dial and remove the alternate vertical dial. At this time, be careful that a pin and a spring are in the hole of section A.</li> <li>3. Loosen installing screws ❷ of the detection switch of the amount of alternate vertical movement and adjust the distance from the inner diameter of the bushing to the edge of the switch body to <math>8\pm0.1</math> mm. Then tighten installing screws ❷ of the detection switch of the amount of alternate vertical movement.</li> <li>4. Adjust the scale "1" to the convex section on the top cover, place the pin and the spring in the hole of section A, install the alternate vertical dial and tighten setscrew ❶ in the alternate vertical dial.</li> </ol> <p><b>(Caution) When the position of the detection switch of the amount of alternate vertical movement is changed, check whether the relation between the alternate vertical dial and the sewing speed is normal.</b></p>	<ul style="list-style-type: none"> <li>○ Sewing speed may not change even when turning the alternate vertical dial.</li> </ul>

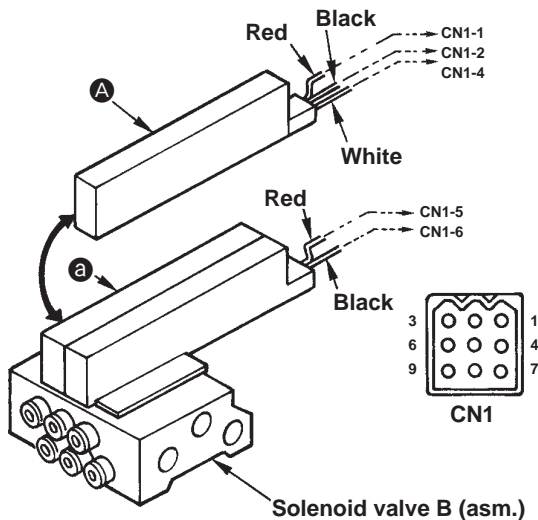
### 3. INSTALLATION OF THE OPTIONAL PARTS

#### (1) DL device (For the machine with thread trimmer only)

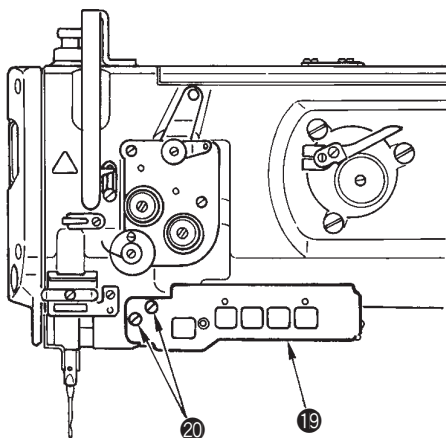
##### ○ Installing DL device (List A)



##### ○ Installing the pneumatic components (List B)



##### ○ Installing the 5-string switch (List C)



Part No. of DL21 G kit for installation after set-up of machine : GDL21000GA0

\* Please order from us with the aforementioned part No.

1. Remove window plate C and window plate packing C located on the anti-operator's side of the machine arm.
2. Attach elbow ②, muffler ③, cylinder connecting screw ④, alternate vertical link hinge screw ⑤ and cylinder connecting screw nut ⑥ to jig cylinder ①. (Assemble so that the distance from the edge of cylinder connecting screw to the end of cylinder shaft is 10 mm.)
3. Attach jig cylinder ① which has been assembled at the above step 2. to window plate F ⑦ and tighten it with jig cylinder setscrew ⑨.
4. Remove the top feed stopper plate A attached to alternate vertical change base ⑱ and install stopper plate B ⑩.
5. Tighten alternate vertical link spacer ⑪ to stopper plate B ⑩ with setscrew ⑫ and tighten alternate vertical link ⑬ with hinge screw ⑭.
6. Attach top feed stopper plate ⑰ in the kit instead of the top feed stopper plate attached to the machine arm.
7. Tighten alternate vertical link support ⑮ to the machine arm with setscrews ⑯.
8. Install window plate F ⑦ and window plate packing E ⑧. At this time, enter alternate vertical link hinge screw ⑤ to the hole of alternate vertical link ⑬ and attach it to the machine arm. (When the alternate vertical dial is set to the maximum, alternate vertical link ⑬ comes out to the front and it is easy to enter the screw in the hole.)
9. Change the automatic reverse feed device attached to window plate C to window plate D.
10. Attach the window plate D and window plate packing B with the window plate setscrew.
11. Re-adjust the respective timing adjustment referring to this manual.
12. Replace manifold ② attached to solenoid valve B (asm.) (Part No. : GAKA2301BA0) being used now with solenoid valve D ①.
13. Caulk pin terminals (male and female) to the top end of the cord.
14. Connect pin terminals (male and female) to plug CN1. Connect the terminals after checking the connecting position.
15. Attach 5-string switch (asm.) ⑲ to the machine arm with setscrews ⑳.
16. Replace the relay cord (asm.) and connect the replaced relay cord and air hose respectively.
17. Turn ON the power of motor control box. When using SC-380, set the parameter listed on the next page.
18. Check that the amount of alternate vertical movement is maximized when pressing the DL switch.

⊙ **Setting parameter when using SC-380**

1. Change over the normal mode to C mode.
2. Change function No. I7 from no to BTL.
3. Change over the mode to the normal mode.

C mode (selection : ↓ + C) : Setting of input

Function name	Symbol	Initial value	Modified value	Remarks
Change-over of input signal function	I7	no	BTL	Cancel signal

⊙ **Parts list**

● **Removing parts list**

Note	No.	Part No.	Name of part	Q'ty
	1	21339601	Top feed stopper plate A	1
	2	21339700	Top feed stopper plate	1
	3	21331905	Window plate C	1
	4	21332101	Window plate packing C	1

- Set Part No. of DL device (This part No. is the set part No. of the parts List A to List C.)

Note	No.	Part No.	Name of part	Q'ty
	1	GDL21000GA0	DL-21 G kit	1

● **Parts list related to DL device (List A)**

No.	Part No.	Name of part	Q'ty
①	PA320200100	Jig cylinder	1
②	PJ304065102	Elbow	1
③	PX015101000	Muffler	1
④	21438403	Cylinder connecting screw	1
⑤	SD0600403TP	Alternate vertical link hinge screw	1
⑥	NM6080721SE	Cylinder connecting screw nut	1
⑦	21437207	Window plate F	1
⑧	21437306	Window plate packing E	1
⑨	SM6044002TP	Jig cylinder setscrew	2
⑩	21438106	Stopper plate B	1
⑪	21438601	Alternate vertical link spacer	1
⑫	SS6111610SP	Setscrew	2
⑬	21438502	Alternate vertical link	1
⑭	SD0600452TP	Hinge screw	1
⑮	21438700	Alternate vertical link support	1
⑯	SS4110815SP	Setscrew	2
⑰	21438205	Top feed stopper plate	1
	21348909	Window plate D	1
	21332002	Window plate packing B	1
	SS4110815SP	Window plate setscrew	2

● **Pneumatic device components (List B)**

No.	Part No.	Name of part	Q'ty
Ⓐ	GAKA2302D00	Solenoid valve D	1
	BT0600401EB	Air hose	1
	HX00295000C	Wire mark [4]	3
	D6043555B00	Pin terminal (male)	2
	D6042555B00	Pin terminal (female)	1
	GAKA14040C0	Knee switch (asm.)	1
	SK3514000SC	Installing wood screw	2

● **5-string switch components (List C)**

No.	Part No.	Name of part	Q'ty
⑲	21442553	5-string switch (asm.)	1
	21391057	Relay cord (asm.)	1
	EA9500B0100	Clip band	3

**(2) Thread trimmer Ver.UP set (Part No. for 1-needle : 21389259, Part No. for 2-needle : 21389267)**

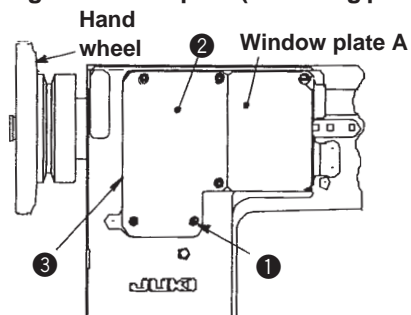
This set can shorten the length of remaining thread by replacing the parts related to the thread trimmer of LU-1510-7 and LU-1560-7 (old type machine with thread trimmer). \* Please order from us with the aforementioned part Nos. For the installing procedure, refer to the Instruction Manual inserted in the set.

**(3) Bobbin thread remaining amount detecting device (AE-10A Kit Part No. : GAE10000AA0)**

This kit can install the device which detects the remaining amount of bobbin thread in a bobbin after set-up of the machine with thread trimmer. \* Please order from us with the aforementioned part No. For the installing procedure, refer to "AE-10 Instruction Manual" inserted in the kit.

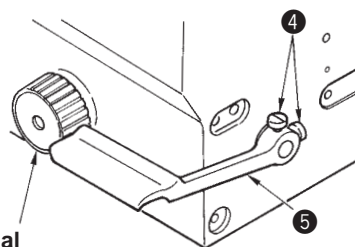
## (4) Automatic reverse feed device

### 1) Removing the window plate (Removing parts list)



1. Loosen setscrew ① in the window plate B located at anti-operator's side of the machine arm.
2. Remove window plate B ②.
3. Remove window plate packing B ③.

### 2) Removing the reverse feed control lever (Removing parts list)



Stitch dial

1. Loosen the respective setscrews in the belt cover and remove the belt cover.
2. Remove two setscrews ④ in the reverse feed control lever.
3. Remove reverse feed control lever ⑤.

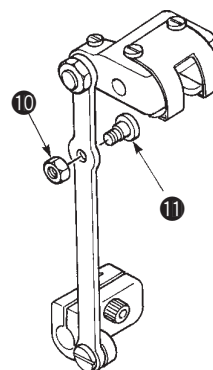
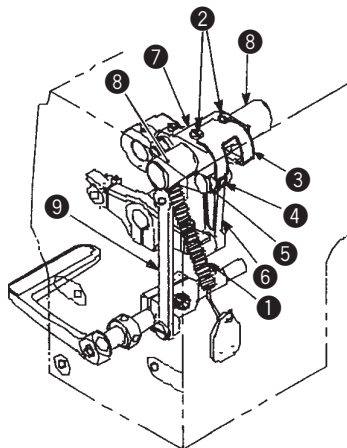
### ◎ Removing parts list of window plate and reverse feed control lever

Note	No.	Part No.	Name of part	Q'ty
★	①	SS4110815SP	Window plate B setscrew	5
※	②	21331806	Window plate B	1
★	③	21332002	Window plate packing B	1
	④	SS6120930SP	Reverse feed control lever setscrew	2
★	⑤	21388004	Reverse feed control lever	1

(Caution) 1. The parts with ★ (asterisk) mark are those to be used after replacing.

2. The part with ※ mark is the exclusive part for the machine without the automatic reverse feed device.

### 3) Installing the reverse feed link hinge screw (List 1)



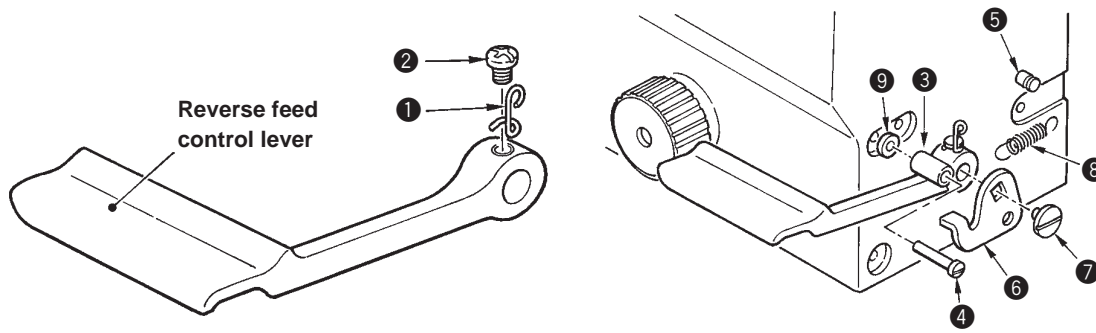
1. Remove feed driving rocker tension spring ①.
2. Loosen felt presser setscrews ② and remove felt presser ③.
3. Loosen setscrew ④ in the feed rocker link pin and remove feed rocker link pin ⑤.
4. Remove feed rocker link ⑥ from feed driving rocker ⑦.
5. Loosen the setscrew in the feed driving rocker support and move feed driving rocker support ⑧ to the right or left.
6. Draw out feed driving rocker ⑦.
7. Install reverse feed link hinge screw nut ⑩ and reverse feed link hinge screw ⑪ to feed regulator connecting rod ⑨.
8. Install the above parts by reversing the above order.

### ◎ Installing parts list of reverse feed link hinge screw (List 1)

Note	No.	Part No.	Name of part	Q'ty
	⑩	NS6150430SP	Reverse feed link hinge screw nut	1
	⑪	SD0800402TP	Reverse feed link hinge screw	1



#### 4) Installing the reverse feed control lever (List 2)



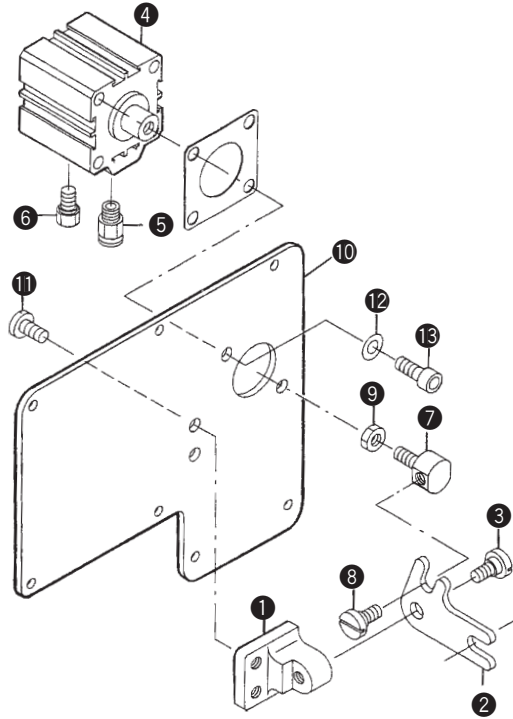
1. Install reverse feed control lever spring bracket ❶ with setscrew ❷.
2. Install reverse feed control lever stopper ❸ to the machine arm with setscrew ❹.  
(In case of LU-1508NH and LU-1509NH, add washer ❾ to reverse feed control lever stopper ❸ and install the lever with setscrew ❹.)
3. Install lever return spring bracket ❺ to the machine arm.
4. Insert the reverse feed control lever into the reverse feed control lever shaft, and install reverse feed shaft link ❻ with push screw ❼.  
(Install so that the projection of the reverse feed shaft link enters under the reverse feed control lever.)
5. Hook lever return spring ❽ to the lever spring bracket ❶ and the tension spring bracket.
6. Adjust the position of the reverse feed control lever.

For the adjusting procedure, refer to “(18) Position of the reverse feed control lever”.

#### ⊙ Installing parts list of reverse feed control lever (List 2)

Note	No.	Part No.	Name of part	Q'ty
	❶	22656003	Lever spring bracket	1
	❷	SS4120615SP	Setscrew	1
	❸	11100500	Reverse feed control lever stopper	1
	❹	SS7112420SP	Setscrew	1
	❺	10120004	Lever return spring bracket	1
	❻	22656102	Reverse feed shaft link	1
	❼	SS7120760SP	Push screw	1
	❽	13515606	Lever return spring	1
	❾	WP0502616SD	Washer	1

## 5) Installing the automatic reverse feed device (List 3)

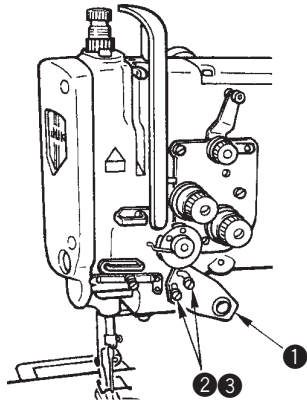


1. Install reverse feed link ② to reverse feed link installing base ① with reverse feed link hinge screw ③.
2. Install straight joint ⑤ to the inlet port of reverse feed cylinder ④ and install muffler ⑥ to the exhaust port.
3. Install reverse feed link hinge screw ⑧ and cylinder connecting screw nut ⑨ to cylinder connecting screw ⑦.
4. Install cylinder connecting screw ⑦ to reverse feed cylinder ④.
5. Temporarily tighten reverse feed link installing base ① to window plate D ⑩ with setscrew ⑪.
6. Enter reverse feed cylinder ④ to window plate D ⑩ and tighten with washer ⑫ and setscrew ⑬. (Adjust so that straight joint ⑤ and muffler ⑥ face downward and enter reverse feed link hinge screw ⑧ in the groove of reverse feed link ②.)
7. Move the piston rod of reverse feed cylinder ④ by hand and tighten setscrew ⑬ so that reverse feed cylinder ④ smoothly moves.
8. Tighten the window plate packing B and window plate D ⑩ in order with the setscrew.  
At this time, enter the groove of reverse feed link ② the reverse feed link hinge screw ③ on the side of the feed regulator connecting rod.
9. Insert the air hose into straight joint ⑤.

## © Installing parts list of automatic reverse feed device (List 3)

Note	No.	Part No.	Name of part	Q'ty
	①	21348503	Reverse feed link installing base	1
	②	21348701	Reverse feed link	1
	③	SD0800352SP	Reverse feed link hinge screw	1
	④	PA320150200	Reverse feed cylinder	1
	⑤	PJ301065104	Straight joint	1
	⑥	PX015101000	Muffler	1
	⑦	21348602	Cylinder connecting screw	1
	⑧	SD0800352SP	Reverse feed link hinge screw	1
	⑨	NM6060003SC	Cylinder connecting screw nut	1
	⑩	21348909	Window plate D	1
	⑪	SS7151210SP	Setscrew	2
	⑫	WP0641601SD	Washer	2
	⑬	SM6061602TP	Setscrew	2

## 6) Installing the touch-back switch (List 4)

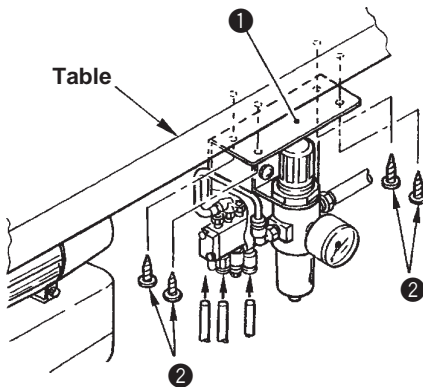


1. Install touch-back switch ① with washer ③ and setscrew ②.

### ⊙ Installing parts list of touch-back switch (List 4)

Note	No.	Part No.	Name of part	Q'ty
	①	21348859	Touch-back switch	1
	②	SS7110840SP	Switch installing plate setscrew	2
	③	WP0501016SD	Washer	2

## 7) Installing the pneumatic components (List 5)



1. Install pneumatic components (asm.) ① onto the table with setscrews ②.
2. Connect the air hose with pneumatic components (asm.) ①.

### ⊙ Installing parts list of pneumatic components (List 5)

Note	No.	Part No.	Name of part	Q'ty
	①	23105554	Pneumatic components (asm.)	1
	②	SK3482500SC	Setscrew	4

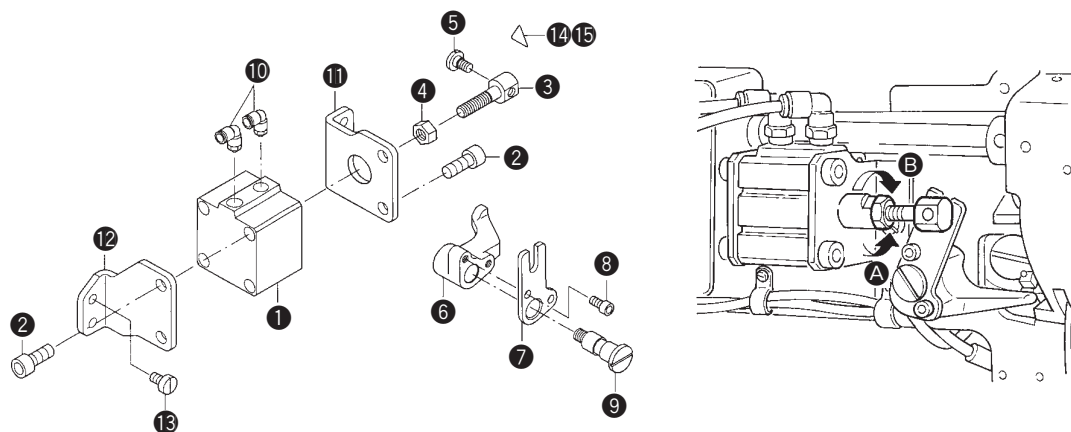
### ○ Part No. of the automatic reverse feed device set

Note	No.	Part No.	Name of part	Q'ty
		21348552	Automatic reverse feed device set	1

**(Caution) This part No. is the set part No. of the parts from list 1 to list 5.**

## (5) Automatic presser foot lifter

### 1) Installing the automatic presser foot lifter (List A)



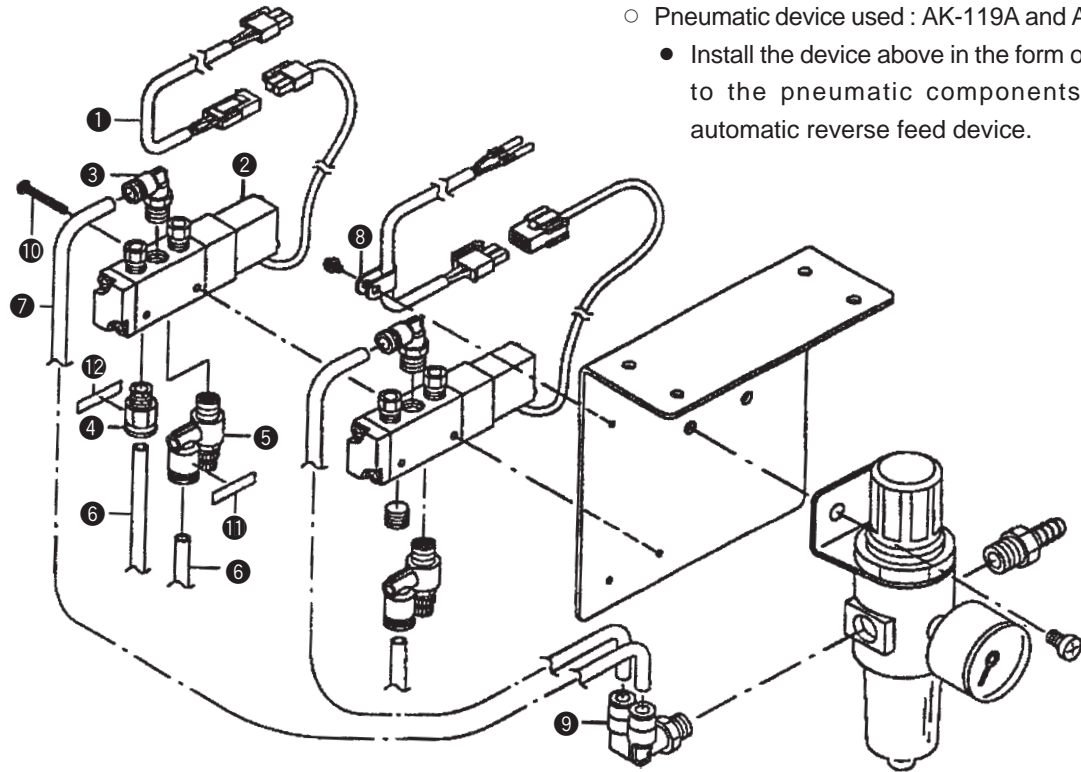
1. Remove the side plate located on the anti-operator's side of the machine arm. (List of the parts to be removed)
2. Install two elbows ⑩ to automatic presser foot lifter cylinder ①.
3. Install cylinder connecting screw ③ to automatic presser foot lifter cylinder ①.  
For the standard, adjust the distance from the end face of piston rod of automatic presser foot lifter cylinder ① to the end face of cylinder connecting screw ③ to 24 mm, and tighten nut ④.
4. Tighten cylinder stay, front ⑪ and cylinder stay, rear ⑫ to automatic presser foot lifter cylinder ① with cylinder stay setscrews ②.
5. Install automatic presser foot lifter cylinder ① which has been assembled at the above step 4. to the machine arm with setscrews ⑬.
6. Assemble automatic presser foot lifter lever B ⑦ with automatic presser foot lifter lever A ⑥.  
(Insert automatic presser foot lifter lever shaft ⑨ into the holes of both levers and tighten with hexagon headed bolt ⑧.)
7. Install automatic presser foot lifter lever A ⑥ which has been assembled at the above step 6. to the machine arm with automatic presser foot lifter lever shaft ⑨.  
(Groove of automatic presser foot lifter lever B ⑦ enters hinge screw ⑤ attached to cylinder connecting screw ③.)
8. Install pneumatic components.
9. Insert the air hose and check the operation.  
When actuating the automatic presser foot lifter, make sure that the distance from the bottom face of the presser foot to the top surface of the throat plate is  $16 \pm 0.5$  mm.  
When adjustment is required, remove automatic presser foot lifter lever shaft ⑨ and automatic presser foot lifter lever A ⑥, loosen nut ④, and turn cylinder connecting screw ③. (Turning in the direction of ① will decrease the distance, or in the direction of ② will increase it.)  
After the completion of adjustment, tighten nut ④.
10. Make sure that a clearance of 0.5 to 1.5 mm is provided between automatic presser foot lifter lever A ⑥ and the thread release supporting plate when the presser foot is lowered.
11. For the kit A (knee lifter switch), tighten presser foot lifter knee switch B (asm.) with the wood screws.

#### ⊙ Automatic presser foot lifter components (List A)

Note	No.	Part No.	Name of part	Q'ty
		GAKA19010A0	Automatic presser foot lifter (asm.)	(1)
	①	PA400150100	Automatic presser foot lifter cylinder	1
	②	SM6082502TP	Setscrew	4
	③	21356506	Cylinder connecting screw	1
	④	NM6080001SE	Nut	1
	⑤	SD0720331SP	Hinge screw	1
	⑥	21356605	Automatic presser foot lifter lever A	1
	⑦	21356803	Automatic presser foot lifter lever B	1
	⑧	SM6051002TP	Hexagon bolt	2
	⑨	21356704	Automatic presser foot lifter lever shaft	1
	⑩	PJ304065102	Elbow	2
	⑪	21356308	Cylinder stay, front	1
	⑫	21356407	Cylinder stay, rear	1
	⑬	SS6151040SP	Setscrew	4
	⑭	CM3002000B1	Caution seal for being caught (For domestic market)	1
	⑮	CM300200001	Caution seal for injury to finger (For export)	1

- In case of installing the automatic reverse feed device and the automatic presser foot lifter after set-up of machine

#### Pneumatic device components (List B)



- Pneumatic device used : AK-119A and AK-119B
- Install the device above in the form of adding to the pneumatic components of the automatic reverse feed device.

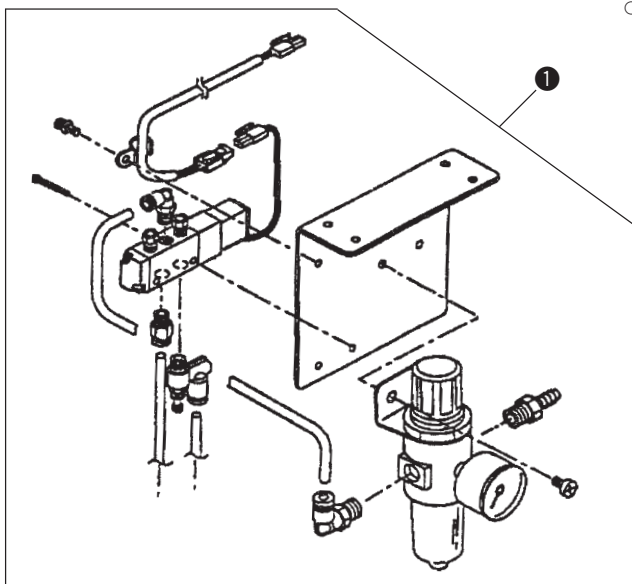
\* Type of the pneumatic device

- AK- □ □ □ A : Knee switch type
- AK- □ □ □ B : Pedal switch type

## 2) Installing the pneumatic device components

- In case of installing the automatic presser foot lifter after set-up of machine

#### Pneumatic device components (List C)



- Pneumatic device used : AK-120A and AK-120B
- Install pneumatic components (asm.) ① as listed.

### 3) Parts List

#### ⊙ Removing parts list

Note	No.	Part No.	Name of part	Q'ty
	1	21332309	Side plate cover	1
	2	SS4110815SP	Side plate cover setscrew	1

#### ⊙ Removing parts list

Set part No. of automatic presser foot lifter

(Caution : These set part Nos. are the set part Nos. of the parts from List A to List D.)

No.	Set part No.	Name of set part	Q'ty	Set contents (List No.)				Remarks
				A	B	C	D	
1	GAKA19010A0	AK119A kit	1	○	○		○	In case of installing automatic reverse feed device and automatic presser foot lifter after set-up of machine *1
2	GAKA19010B0	AK119B kit	1	○	○			
3	GAKA20010A0	AK120A kit	1	○		○	○	In case of installing automatic presser foot lifter after set-up of machine
4	GAKA20010B0	AK120B kit	1	○		○		

\* 1 : Part No. 21348552 (automatic reverse feed device set) is necessary as well.

#### ⊙ Automatic presser foot lifter components (List A)

Note	No.	Part No.	Name of part	Q'ty
		GAKA19010A0	Automatic presser foot lifter (asm.)	(1)
	①	PA400150100	Automatic presser foot lifter cylinder	1
	②	SM6082502TP	Cylinder installing screw	4
	③	21356506	Cylinder connecting screw	1
	④	NM6080001SE	Nut	1
	⑤	SD0720331SP	Hinge screw	1
	⑥	21356605	Automatic presser foot lifter lever A	1
	⑦	21356803	Automatic presser foot lifter lever B	1
	⑧	SM6051002TP	Automatic presser foot lifter lever B setscrew	2
	⑨	21356704	Automatic presser foot lifter lever shaft	1
	⑩	PJ304065102	Elbow	2
	⑪	21356308	Automatic presser foot lifter cylinder stay (front)	1
	⑫	21356407	Automatic presser foot lifter cylinder stay (rear)	1
	⑬	SS6151040SP	Cylinder stay attaching screw	4
	⑭	CM3002000B1	Caution seal for being caught	1
	⑮	CM300200001	Caution seal for injury to finger	1

#### ⊙ Pneumatic device components (List B)

Note	No.	Part No.	Name of part	Q'ty	Remarks
	①	GAKA14020A0	Cord (asm.)	1	
	②	GAKA14030A0	Solenoid valve (asm.)	1	
	③	GAK29010000	Quick joint (elbow)	1	
	④	GAK29015000	Quick joint (straight)	1	
	⑤	GAK29016000	Speed controller	1	
	⑥	BT0600401EB	Air hose	2	1.3 m
	⑦	BT0600401EB	Air hose	1	0.18 m
	⑧	HX00123000A	Cord presser	1	
	⑨	PJ309065202	Quick joint (branch elbow Y)	1	
	⑩	SM4034001SN	Solenoid valve setscrew	2	
	⑪	HX002950000	Wire mark	3	1
	⑫	HX00295000A	Wire mark	3	2

#### ⊙ Pneumatic device components (List C)

Note	No.	Part No.	Name of part	Q'ty
	①	GAKA14010A0	Pneumatic components (asm.)	1

#### ⊙ Kit A (List D)

Note	No.	Part No.	Name of part	Q'TY
	1	GAKA14040D0	Presser foot lifter knee switch B (asm.)	1
	2	SK3514000SC	Knee switch (asm.) installing wood screw	2

## 4. PORTION TO WHICH LOCKTITE IS APPLIED

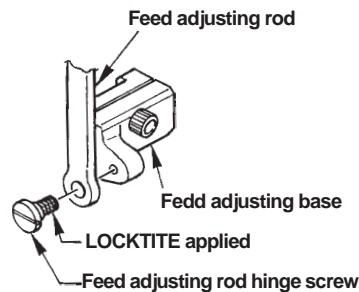
LOCKTITE has been applied to the following parts at the time of assembly at the factory.

Avoid disassembling these parts to the most. When an assembly which includes the aforementioned parts has been forced to be disassembled, be sure to wash the LOCKTITE applied part using a paint thinner or the like, and reassemble it using LOCKTITE after removing any moisture from the mating faces.

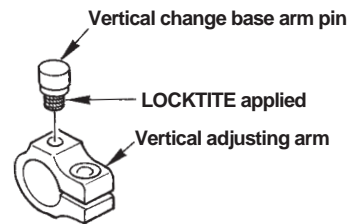
If it is hard to remove a part which has been fixed using LOCKTITE, heat it using a torch lamp or the like to help remove the part.

No.	Portion to which LOCKTITE is applied	Part No.	LOCKTITE No.
1	Feed adjusting rod hinge screw	SD0800402TP	LOCKTITE #638
2	Vertical change base arm pin	10715308	LOCKTITE #638
3	Alternate dial shaft bushing	10715100	LOCKTITE #638
4	Cylinder connecting screw hinge screw	SD0720331SP	LOCKTITE #243
5	Alternate vertical change base support shaft setscrew	SS8150710SP	LOCKTITE #243
6	Thread release bar	21441209	LOCKTITE #243
7	Inner hook guide crank pin lock nut	NS6110420SP	LOCKTITE #243
8	Automatic presser foot lifter lever shaft	21356704	LOCKTITE #243

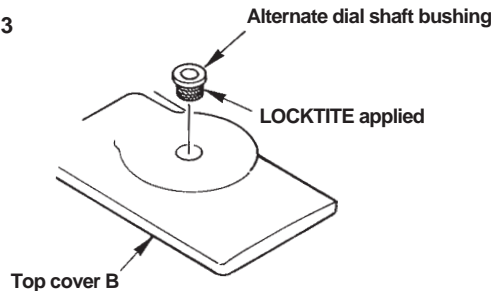
No.1



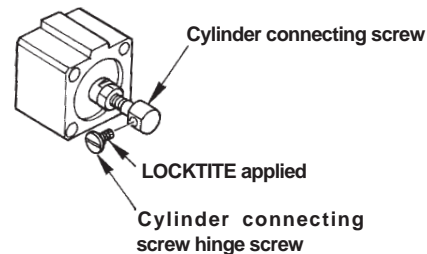
No.2



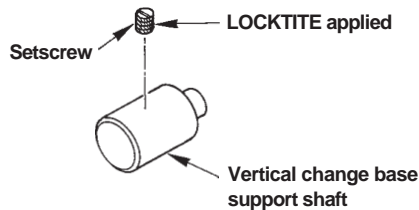
No.3



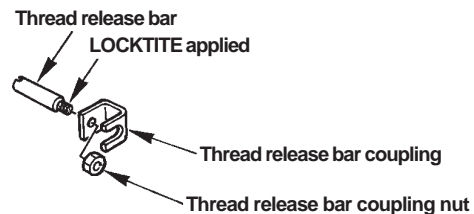
No.4



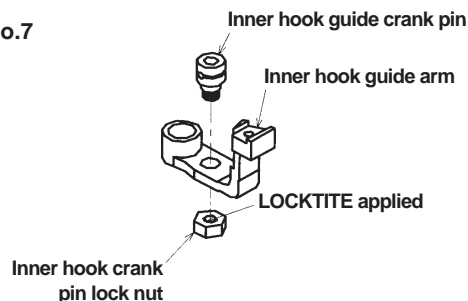
No.5



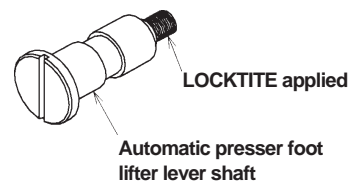
No.6



No.7



No.8





## 5. SELECTIVE PARTS AND CONSUMABLE PARTS

- Common to all LU models

Name of selective part	Part No.	Marking	Remarks
Hook shaft upper bushing thrust washer	10109700	0	t=1.0 mm
Ditto	10110906	1	t=1.1 mm
Ditto	10111003	2	t=1.2 mm
Ditto	10111102	3	t=1.3 mm (standard)
Ditto	10111201	4	t=1.4 mm
Ditto	10109809	5	t=1.5 mm
Ditto	10112506	6	t=1.6 mm
Ditto	10102605	7	t=1.7 mm
Ditto	10102704	8	t=1.8 mm

- For LU-1508N, LU-1509N and LU-1510N

Consumable part	Part No.	Remarks
Needle	MC372001600	SCHMETZ 135x17 Nm 160
Hook (asm.)	B18305630A0	
Bobbin	B9117563000	

- For LU-1508NH and LU-1509NH

Consumable part	Part No.	Remarks
Needle	MC0190R1600	SCHMETZ 190R Nm 160
Hook (asm.)	B1830563BA0	For extra thick thread
Bobbin	B9117563000	

- For LU-1510N-7 and LU-1511N-7

Consumable part	Part No.	Remarks
Needle	MC372001600	SCHMETZ 135x17 Nm 160
Hook (asm.)	21387055	
Bobbin	21334800	Aluminum bobbin (with knurl)
Counter knife base (asm.)	21389556	(With counter knife and clamp spring)
Moving knife	21389200	
Counter knife	21389309	
Clamp spring	21389408	

- For LU-1560N and LU-1561N

Consumable part	Part No.	Remarks
Needle	MC372001602	SCHMETZ 135x17 Nm 160 (2 pcs.)
Hook (asm.)	B18305630A0	
Bobbin	B9117563000	

- For LU-1560N-7 and LU-1561N-7

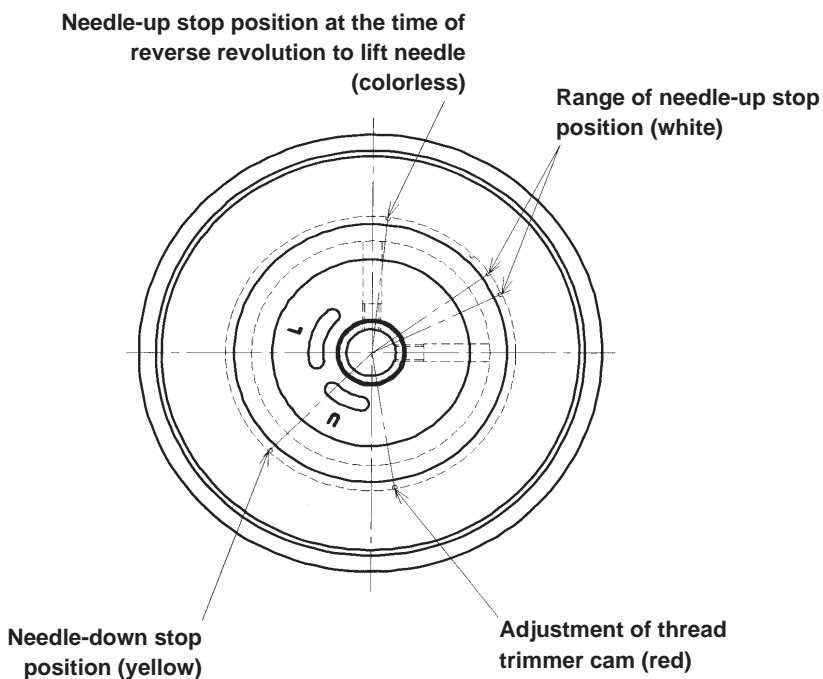
Consumable part	Part No.	Remarks
Needle	MC372001602	SCHMETZ 135x17 Nm 160 (2 pcs.)
Hook (asm.)	21387055	
Bobbin	21334800	Aluminum bobbin (with knurl)
Counter knife base, right (asm.)	21389556	(With counter knife and clamp spring)
Counter knife base, left (asm.)	21389655	(With counter knife and clamp spring)
Moving knife	21389200	
Counter knife	21389309	
Clamp spring	21389408	

- For LU-1565N

Consumable part	Part No.	Remarks
2. Needle	MC372001602	SCHMETZ 135x17 Nm 160 (2 pcs.)
3. Hook (asm.)	B18305260B0	(Vertical-axis hook (asm.) + bobbin case)
4. Vertical-axis hook (asm.)	B18305210A0	
5. Bobbin case	B18375260A0	
6. Bobbin	B9117563000	

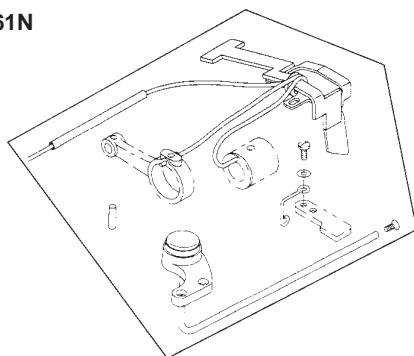


## 6. ENGRAVED MARKER DOTS ON THE HANDWHEEL (FOR THE MACHINE WITH THREAD TRIMMER ONLY)

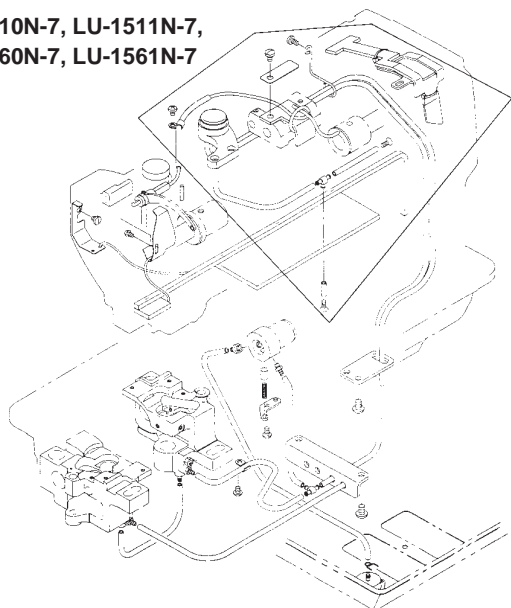


## 7. LUBRICATION ROUTE DIAGRAM

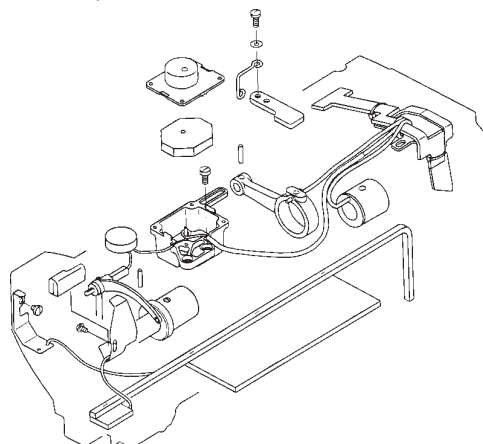
LU-1510N, LU-1560N, LU-1561N



LU-1510N-7, LU-1511N-7,  
LU-1560N-7, LU-1561N-7



LU-1508N, LU-1509N,  
LU-1508NH, LU-1509NH



## 8. MACHINE HEAD WIRING (FOR THE MACHINE WITH THREAD TRIMMER ONLY)

### (1) Connectors coming from machine head

#### ○ 12-pin connector

Name of part	Pin No.	Remarks
Thread trimmer solenoid	1	+
Thread trimmer solenoid	2	–
Tension release solenoid	3	+
Tension release solenoid	4	–
DL control switch	5	SW1 (White)
DL control switch	6	SW2 (Red)
DL control switch	7	GND (Black)
BT switch	8	BTSW (White)
BT switch	9	GND (Black)
Earth	12	(Green/Yellow)

#### ○ 6-pin connector

Name of part	Pin No.	Remarks
Synchronizer	1	SGND (Black)
Synchronizer	4	UDET (White)
Synchronizer	5	DDET (Green)
Synchronizer	6	+5V (Red)

#### ○ 6-pin connector (For AE-10 type only)

Name of part	Pin No.	Remarks
Detection switch	1	+12V (Red)
Detection switch	2	LED (Blue)
Detection switch	3	SW (Yellow)
Detection switch	4	GND (Orange)

#### ○ 15-pin connector (For DL type only)

Name of part	Pin No.	Remarks
5-string switch	1	BTSW (Brown)
5-string switch	2	GND (Red)
5-string switch	3	Needle UP (Orange)
5-string switch	4	BT cancel (Yellow)
5-string switch	5	DL (Pink)
5-string switch	6	DL (–) (Gray)
5-string switch	10	DL (LED 24V) (White)
5-string switch	13	No function
5-string switch	14	No function

#### ○ 9-pin connector (For DL type only)

Name of part	Pin No.	Remarks
5-string switch	1	DL (+) (Brown)
5-string switch	2	BT (–) (Red)
5-string switch	3	BT (+) (Orange)
5-string switch	4	DL (–) (Yellow)
5-string switch	5	FL (+) (Pink)
5-string switch	6	FL (–) (Gray)
5-string switch	7	2P (–) (White)
5-string switch	8	2P (24V) (Black)
5-string switch	9	-----

### (2) Connectors coming from pneumatic device

\* Pneumatic device B (asm.) : GAKA2301BA0

\* Pneumatic device C (asm.) : GAKA2301CA0

#### ○ 9-pin connector

Name of part	Pin No.	Pneumatic device B (asm.)	Pneumatic device C (asm.)
Solenoid valve 1	1	BT (+) (Red)	BT (+), DL (+) (Red)
Solenoid valve 1	2	BT (–) (Black)	BT (–) (Black)
Solenoid valve 1	4	–	DL (–) (White)
Solenoid valve 2	5	AK (+) (Red)	AK (+) (Red)
Solenoid valve 2	6	AK (–) (Black)	AK (–) (Black)

### (3) Connectors coming from the relay cable (Connecting side to the control box)

\* Relay cable C (asm.) : 21390950

\* Relay cable D (asm.) : 21391057

#### ○ 14-pin connector

Pin No.	Relay cable C (asm.)	Relay cable D (asm.)
1	Thread trimming (–) (Red)	Thread trimming (–) (Orange)
2	-----	2P LED (–) (Black)
3	-----	Needlw Up switch (Yellow)
4	-----	2P switch (Blue)
5	BT switch (White)	BT switch (Brown)
6	BT (–) (Black)	BT (–) (White)
7	Tension release (–) (Green)	Tension release (–) (Blue)
8	Thread trimming (+) (Brown)	Thread trimming (+) (Red)
9	-----	-----
10	Earth (Green/Yellow)	Earth (Green/Yellow)
11	-----	-----
12	GND (Black)	GND (Red)
13	BT (+) (White)	BT (+) (Green)
14	Tension release (+) (Yellow)	Tension release (+) (Yellow)

#### ○ 15-pin connectot

Pin No.	Relay cable C (asm.)	Relay cable D (asm.)
1	GND (Black)	GND (Black)
2	DL switch 1 (Red)	DL switch 1 (Red)
3	-----	DL LED (–) (Orange), DL (–) (Yellow)
4	-----	-----
5	DL switch 2 (White)	DL switch 2 (White)
6	-----	DL switch (Red)
7	-----	-----
8	+24V (Black)	+24V (Black)
9	-----	-----
10	GND (White)	GND (White)
11	AE-10 (+) (White)	AE-10 (+) (White)
12	AE-10 (–) (Black)	AE-10 (–) (Black)
13	-----	-----
14	OP (Red)	OT5 (Red)
15	-----	-----

○ 6-pin connector

Pin No.	Relay cable C (asm.)	Relay cable D (asm.)
1	-----	-----
2	INA (White)	S6 (White)
3	+12V (Red)	+12V (Red)
4	-----	INB (Black)
5	CKU (Black)	CKU (Black)
6	-----	-----

○ 2-pin connector

Pin No.	Relay cable C (asm.)	Relay cable D (asm.)
1	AK (-) (Black)	AK (-) (Black)
2	AK (+) (White)	AK (+) (White)

## 9. TABLE OF TROUBLES AND CORRECTIVE MEASURES

### (1) With regard to sewing

Troubles	Causes	Checking	Corrective measures
1 Thread breakage	Thread path, needle point, hook blade point or inner hook resting groove on the throat plate has sharp edges or burrs.	Check the sharp edge or burr on the respective parts.	Remove the sharp edges or burrs on the blade point of hook using a fine emery paper. Buff up the groove section on the throat plate.
Thread is worn out.	Needle thread tension is too high.		Adjust the needle thread tension.
	Needle comes in contact with the blade point of hook.	Check the clearance.	Refer to "(7) Needle-to-hook timing"
	Clearance of inner hook guide is too large.	Check the clearance.	Decrease the clearance. Refer to "(6) Adjusting the inner hook guide".
	Amount of oil in the hook is insufficient.	Check the amount of oil in the hook.	Adjust the amount of oil in the hook. Refer to "(21) Lubrication".
Needle thread trails 2 to 3 cm from the wrong side of the fabric.	Needle thread tension is too low.		Adjust the needle thread tension. (This trouble occurs a lot when using synthetic threads.
	Thread take-up spring works excessively or the stroke of the spring is too small.		Decrease the tension of of the thread take-up spring and increase the stroke of the spring.
	Feed timing is not proper.		Refer to "(9) Feed cam timing".
	Timing between the needle and the hook is excessively advanced or retarded.	Check the specified dimension.	Refer to "(7) Needle-to-hook timing".
	Thread melts due to needle heat.		Decrease the sewing speed. Use silicon oil. (Refer to * below.)
	Amount of oil in the hook is excessive.	Check the amount of oil in the hook.	Adjust the amount of oil in the hook. Refer to "(21) Lubrication".

\* Use separately available parts below : "21144308 Needle thread lubricator"

"B1114012000 Thread guide rod"

"B91351230B0 Silicon oiler"

	Troubles	Causes	Checking	Corrective measures
2	Stitch skipping	Clearance between the needle and the blade point of hook is too large.	Check the clearance.	Refer to “(7) Needle-to-hook timing”.
		Needle-to-hook timing is excessively advanced or retarded.	Check the specified dimension.	Refer to “(7) Needle-to-hook timing”.
		Presser foot is rising.	Check the pressure of the presser foot.	Tighten the presser spring regulator.
		Height of the needle bar is improper.	Check the lowest point of the needle bar.	Refer to “(7) Needle-to-hook timing”.
		Blade point of the hook is blunt.	Check the blade point of the hook.	Correct the blade point of the hook or replace the hook.
		Improper type of needle is used.		Replace the needle with one which is thicker than the current needle by one count.
		Hook needle guard is not functioned.	Check the functional amount of the needle guard.	Refer to “(7) Needle-to-hook timing”.
		Thread take-up spring excessively works or the stroke of the spring is too small.		Decrease the tension of the thread take-up spring and increase the stroke of the spring.
		Feed timing is not proper.		Refer to “(9) Feed cam timing”.
		Needle thread tension is too high.		Adjust the needle thread tension.

	Troubles	Causes	Checking	Corrective measures
3	Loose stitches (Balloon stitches or isolated idling loop)	Clearance between the inner hook guide and the protruding section of inner hook is too large.	Check the clearance.	Refer to “(6) Adjusting the inner hook guide”.
		Thread paths have been poorly finished.	Check the finish of the respective thread paths.	Finish using a fine emery paper or buff.
		Bobbin fails to move smoothly.	Check the change of bobbin thread tension.	Replace the bobbin or the hook.
		Thread is not well tightened in the reverse feed.	Walking foot is not of top-divided type.	Use the optional walking foot and presser foot.
		Height of the feed dog is too high.	Compare the height with the standard value.	Refer to “(4) Height of the feed dog”. Lower the height by 0.2 mm than the standard value.
		Feed timing is excessively advanced.		Retard the feed timing.
		Hard-to-slip thread is used.		Use silicon oil. (Refer to * below.)
	Loose stitches (Needle thread rises.)	Needle thread has not been fully pulled up.		Increase the needle thread tension. Use the optional walking foot. (Top-divided type)

\* Use separately available parts below : “21144308 Needle thread lubricator”  
 “B1114012000 Thread guide rod”  
 “B91351230B0 Silicon oiler”

	Troubles	Causes	Checking	Corrective measures
4	Irregular stitches	Stroke of the thread take-up spring is improper.	Check the stroke of the thread take-up spring.	Adjust the thread take-up spring to move to approximately 1 mm from the initial position when hook draws thread maximumly.
		Thread paths have been poorly finished.	Check the finish of the respective thread paths.	Finish with a fine emery paper or buff.
		Bobbin fails to move smoothly.	Check the change of bobbin thread tension.	Replace the bobbin or the hook.
		Bobbin thread tension is too low.		Increase the tension of the bobbin thread.
		Bobbin has been wound too tight or too weak.	Check the state of bobbin winding.	Decrease or increase the tension applied to the bobbin winder.
		Direction of setting bobbin is reverse.	Check the setting.	Properly set the bobbin.
5	Loose stitches at the time of corner stitching	Needle thread on the stopping side is drawn out more than is necessary.	Check the stroke of the thread take-up spring.	In crease the stroke of the thread take-up spring.
			Check the hook timing.	Retard the hook timing.
				Use the optional walking foot. (Top divided type)

#### Adjustment of the thread take-up spring

- Decrease the tension of the thread take-up spring and decrease the stroke of the spring to improve irregular stitches.

\* When the electronic stop motor is used with LU-1508NH or LU-1590NH, the correct stop position cannot be obtained since the force of inertia of the handwheel is large, and sewing trouble may occur.

In this case, use the sewing machine making the motor stop position "1pos", or replace the handwheel with one, "21332804".



## (2) With regard to thread trimming

Troubles	Causes	Checking	Corrective measures
1 One or several stitches skip at the start of sewing.	Thread remaining at the needle top after thread trimming is short.	Check the routing of needle thread.	Thread the needle thread correctly. Adjust so that abnormal needle thread tension is not applied.
		Thread tension given by the tension controller No.1 is too high.	Decrease the tension given by the tension controller No.1.
		Check the rising amount of the thread tension disk No.2 at the time of thread trimming.	Adjust so that the disk is raised by means of the thread release solenoid.
		Thread trimming timing is excessively advanced.	Refer to "(22)-6) Threader cam timing".
		There are scratches on the moving knife and the hook.	Polish with buff or replace the part.
		Presser foot drops from cloth at the time of thread trimming.	Perform thread trimming on cloth.
	Bobbin thread is not clamped.	Position of the clamp spring.	Refer to "(22)-1) Position of the counter knife and the clamp spring".
		Pressure of the clamp spring is too low.	Refer to "(22)-1) Position of the counter knife and the clamp spring".
		There are scratches on the clamp spring.	Replace the clamp spring with a new one.
		Needle thread removes bobbin thread.	Increase or decrease the tension of the tension controller No.1.
	Needle is too thick.		Replace the needle with a thinner one.
	Needle hole in the feed dog is too large.		Replace the feed dog with an optional one with small needle hole.
	Pressure of the presser foot is too low.		Increase the pressure of the presser foot.
	Stitches are too small.		Do not pass thread through the thread presser section of the thread guide on the needle bar.

	Troubles	Causes	Checking	Corrective measures
2	Thread slips off the needle eyelet.	Needle thread slips off the needle eyelet immediately after thread trimming.	Check whether the needle thread remaining at the needle top after thread trimming is short.	Refer to the Cause "Needle thread remaining at the needle top after thread trimming is short"
		Needle thread slips off the needle eyelet at the start of sewing.	Check whether the needle thread remaining at the needle top at the start of sewing is short.	
			Hard-to-slip thread is used.	Decrease the number of times of threading needle thread.
3	Defective thread trimming.	Thread cannot be trimmed.	The blades of moving knife and counter knife have been improperly adjusted.	Refer to "(22)-4 Adjusting the knife pressure" and "(22) -1), 2) and 3) Position of the moving knife and Position of the counter knife".
			The blades of moving knife and counter knife have worn out or broken.	Replace the moving knife and counter knife with new ones.
			Pressure of the counter knife is insufficient.	Refer to "(22)-4 Adjusting the knife pressure".
			Presser foot drops from cloth at the time of thread trimming.	Perform thread trimming on cloth.
		Thread remains uncut after thread trimming.	The blades of moving knife and counter knife have been improperly adjusted.	Refer to "(22)-4 Adjusting the knife pressure" and "(22)-1), 2), and 3) Position of the moving knife and Position of the counter knife".
			The blades of moving knife and counter knife have worn out or broken.	Replace the moving knife and counter knife with new ones.
			Thread trimming timing is excessively retarded.	Refer to "(22)-6 Thread trimmer cam timing".
			Pressure of the counter knife is insufficient.	Refer to "(22)-4 Adjusting the knife pressure".
			Presser foot drops from cloth at the time of thread trimming.	Perform thread trimming on cloth.
		Moving knife stops during operation.	Thread is too thick.	Use thread within the specified value.
			Thread trimming timing is excessively retarded.	Refer to "(22)-6 Thread trimmer cam timing".
			Needle thread tension is too high.	Decrease the tension of the thread tension No. 1.
		To the next page		
		To the next page		

Troubles	Causes	Checking	Corrective measures
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From the previous page

	Tension of the bobbin thread is too high.	Adjust the tension of bobbin thread.
	Knife pressure of the counter knife is too high.	Refer to "(22)-4) Adjusting the knife pressure".
	Initial position of the moving knife is excessively advanced.	Refer to "(22)-6) Thread trimmer cam timing".
	Thread is not cut sharply	Refer to Causes "Thread cannot be trimmed" and "Thread remains uncut after trimming".
Needle thread is not caught.	Stitch skipping at the last stitch.	Refer to "(7) Needle-to-hook timing"
	Check the thread trimmer cam timing.	Refer to "(22)-6) Thread trimmer cam timing".
	Top end of the moving knife is broken or has burrs.	Replace the moving knife with a new one.
Bobbin thread is not caught.	Stroke of the moving knife is small.	Refer to "(22)-3) Vertical position of the moving knife".
	Check the routing of bobbin thread.	Correctly thread bobbin thread.
	Top end of the moving knife has broken or been scratched.	Replace the moving knife with a new one.
	Check the height of moving knife.	Adjust the height of moving knife.
	Thread trimming is performed at the position where there is no sewing product.	Perform thread trimming while pulling sewing product in the feed direction.

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Troubles	Causes	Checking	Corrective measures
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Both needle and bobbin thread cannot be trimmed.

The blades of moving knife and counter knife have been improperly adjusted.

Refer to "(22)-4) Adjusting the knife pressure".

Counter knife pressure is excessively low.

Refer to "(22)-4) Adjusting the knife pressure".

Moving knife fails to work.

Refer to "Adjusting the synchronizer timing".

Refer to "(22)-5), and 6) "Thread trimmer cam and Thread trimmer cam timing".

Air pressure is excessively low. Adjust the air pressure (Adjust it to 0.5 Mpa or more.)

Replace the thread trimmer solenoid.

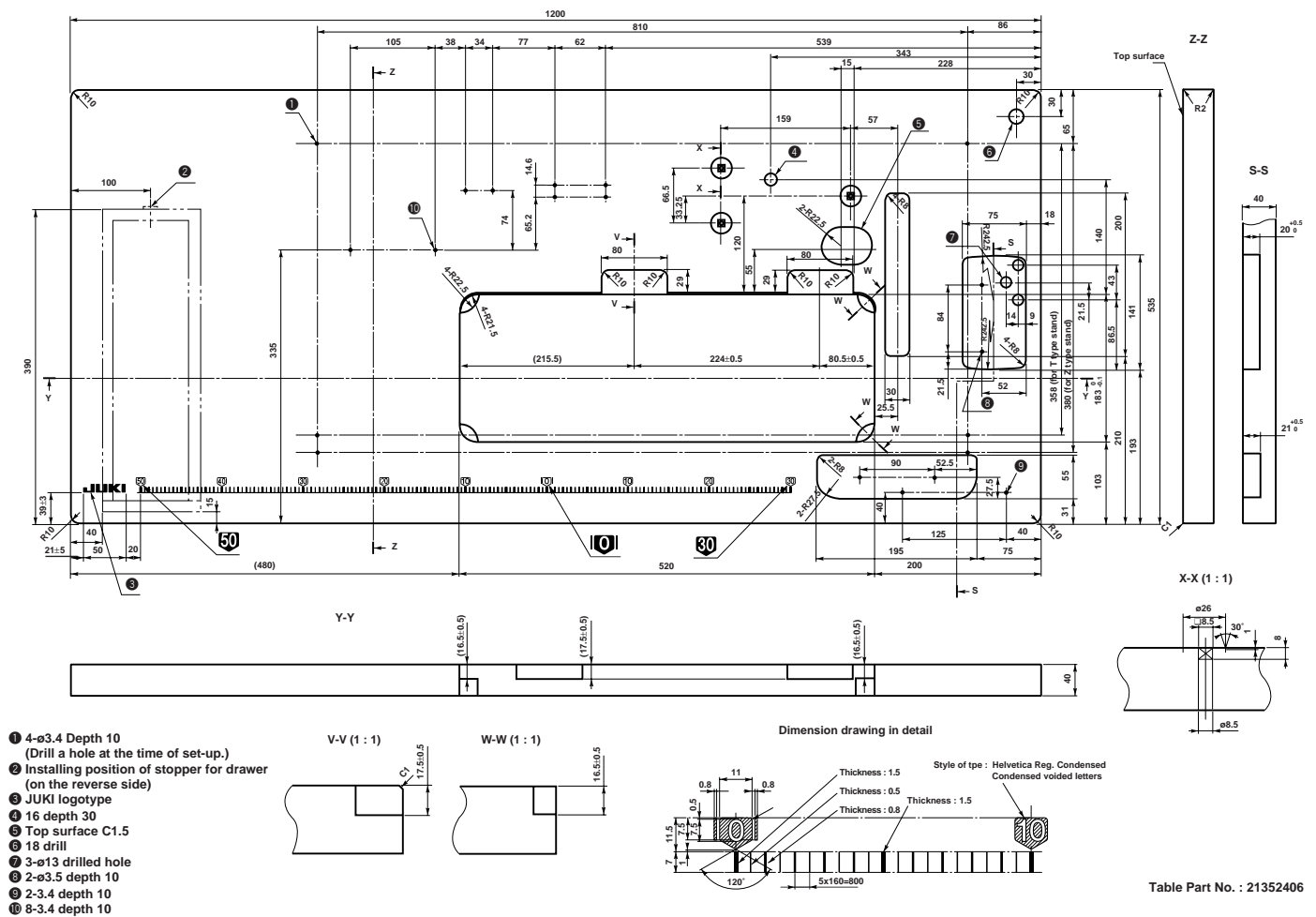
Presser foot drops from cloth at the time of thread trimming.

Perform thread trimming on cloth.

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A large rectangular area with rounded corners, intended for a drawing or diagram. Below this area are 20 horizontal lines for writing.

## 10. DRAWING OF THE TABLE





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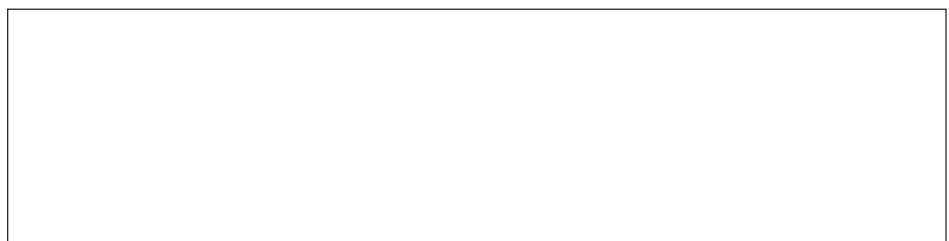
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Please do not hesitate to contact our distributors or agents in your area for further information when necessary.

**\* The description covered in this engineer's manual is subject to change for improvement of the commodity without notice.**