

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

JUKI®

LU-1510

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

LU-1510-7

1-NEEDLE, UNISON FEED, LOCKSTITCH MACHINE

LU-1508

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

LU-1508H

ENGINEER'S MANUAL

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 by 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.

In addition, for the motor for the sewing machine with thread trimmer, refer to the separate Instruction Manual or Engineer's Manual for the motor. And for the control panel, refer to the Instruction Manual for the control panel.

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

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1. SPECIFICATIONS

No.	Item	Specifications	
1	Model name	LU-1510	LU-1510-7
2	Name of machine	1-needle, unison feed, lockstitch machine (automatic lubrication)	1-needle, unison feed, lockstitch machine with automatic thread trimmer (automatic lubrication)
3	Application	For heavy-weight materials	
4	Sewing speed	Max. 2,500 rpm	Max. 3,000 rpm
5	Needle	SCHMETZ 135 x 17 Nm 125 to 180 Standard : Nm 160	
6	Thread to be used	#30 to #5	
7	Thread to be trimmed	–	#30 to #5
8	Stitch length	Max. 9 mm (both normal/reverse feed)	
9	Lift of presser foot	Hand lifter : 9 mm Knee lifter : 16 mm	
10	Stitch adjusting method	Dial method	
11	Reverse feed method	Lever type	Air cylinder type (With touch-back switch)
12	Thread take-up lever	Slide-type thread take-up lever	
13	Needle bar stroke	36 mm	
14	Alternate vertical movement amount	2.5 mm to 6.5 mm Slot adjustment type	1 mm to 6.5 mm Alternate vertical dial adjustment type
15	Hook	Full-rotary vertical-axis 2.0-fold capacity hook (latch type)	
16	Feed mechanism	Elliptic feed	
17	Main shaft/hook driving shaft drive	Timing belt	
18	Thread trimming method	–	Cam-drive scissor trimming method
19	Lubrication	Automatic (partial manual oiling)	
20	Lubricating oil	JUKI New Defrix Oil No. 2	
21	Bed size	517 mm x 178 mm	
22	Free space for sewing	255 mm x 99 mm	
23	Handwheel size	Effective diameter of V belt section : \varnothing 93.3 mm Outer diameter : \varnothing 160 mm	
24	Motor	2P, 400W	SC-380

No.	Item	Specifications	
		LU-1508	LU-1508H
1	Model name	LU-1508	LU-1508H
2	Name of machine	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 190 Nm 125 to 180 Standard : Nm 160
6	Thread to be used	#30 to #5	#8 to #1
7	Stitch length	Max. 9 mm (both normal/reverse feed)	Max. 10 mm (both normal/reverse feed)
8	Lift of presser foot	Hand lifter : 9 mm Knee lifter : 16 mm	
9	Stitch adjusting method	Dial method	
10	Reverse feed method	Lever type	
11	Thread take-up lever	Slide-type thread take-up lever	
12	Needle bar stroke	36 mm	38 mm
13	Alternate vertical movement amount	2.5 mm to 6.5 mm Slot adjustment type	
14	Hook	Full-rotary vertical-axis 2.0-fold capacity hook (latch type)	
15	Feed mechanism	Ellipse feed	Box feed
16	Main shaft/hook driving shaft drive	Timing belt	
17	Lubrication	Manual oiling	
18	Lubricating oil	JUKI New Defrix Oil No. 2	
19	Bed size	517 mm x 178 mm	
20	Free space for sewing	255 mm x 99 mm	
21	Handwheel size	Effective diameter of V belt section : \varnothing 93.3 mm	
		Outer diameter : \varnothing 160 mm	Outer diameter : \varnothing 175 mm
22	Motor	2P, 400W	2P, 400W

2. STANDARD ADJUSTMENT

1) Position of the needle entry

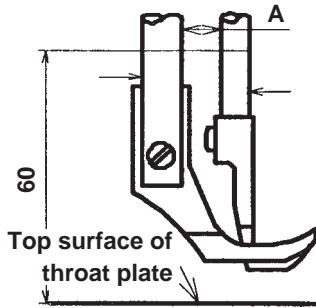


Fig. 1

Model	Dimension A
LU-1510-7	9 ± 0.1 mm
LU-1510	8.5 ± 0.1 mm
LU-1508	
LU-1508H	8 ± 0.1 mm

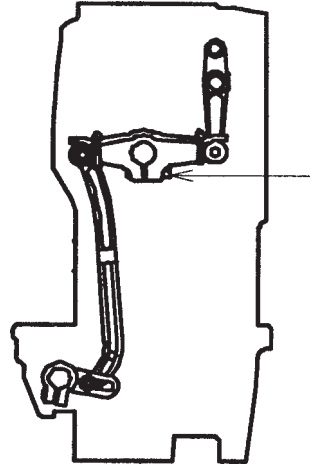


Fig. 2

Conditions

- Needle bar is set to the lower dead point of its stroke.
- Feed amount : 0 mm

2) Longitudinal position of the feed dog

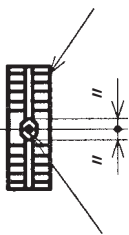


Fig. 3

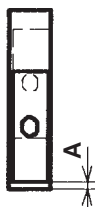


Fig. 4

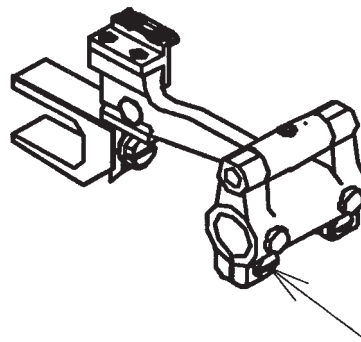


Fig. 5

A = Clearance between the throat plate and the feed dog when the feed dog travels to the front end.

Conditions

- Needle bar is set to the lower dead point of its stroke.
- Feed amount : 0 mm

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the stitch dial to “0” mm. 2. Turn the handwheel to bring the needle bar to the lower dead point of its stroke. 3. Loosen setscrew in the needle bar frame rear arm. 4. Adjust the clearance between presser bar and walking bar to the dimension A and securely tighten the setscrew. At this time, measure the distance from the top surface of the throat plate to the line as shown in Fig. 1 with the presser foot raised. <p>(Caution) • Tighten the setscrew so that there is no thrust play in the needle bar frame shaft.</p>	<ul style="list-style-type: none"> • Stitch skipping or needle breakage will result. • Loose stitches will result.
<ol style="list-style-type: none"> 1. Set the stitch dial to “0” mm. 2. Turn the handwheel to bring the needle bar to the lower dead point of its stroke. 3. Loosen setscrew in the feed rocker. 4. Move the feed bar to adjust so that needle enters the center of the needle hole of feed dog, and securely tighten the setscrew. <p>How to check</p> <ol style="list-style-type: none"> 1. Set the stitch dial at the maximum. 2. Turn the handwheel and check that the clearance between the slot in the throat plate and the feed dog is as shown in Fig. 4 at the position where the feed dog travels to its front end. <p>In addition, check that the feed dog does not come in contact with the throat plate at the position where the feed dog travels to its rear end.</p> <p>(Standard)</p> <ul style="list-style-type: none"> • When the feed amount is at its maximum, A = approx. 1.5 mm. 	<ul style="list-style-type: none"> • The throat plate comes in contact with the feed dog and contact noise will occur. As a result, the throat plate and the feed dog may be damaged. • Irregular stitches will result.

Standard Adjustment

3) Lateral position of the feed dog

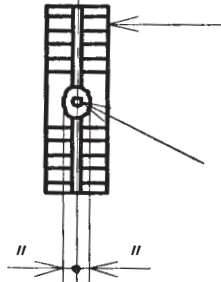


Fig. 6

Conditions

- Needle bar is set to the lower dead point of its stroke.
- Feed amount : 0 mm

4) Height of the feed dog

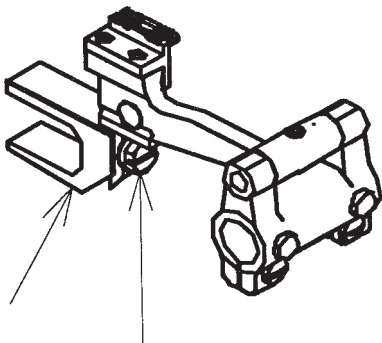


Fig. 7

Conditions

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

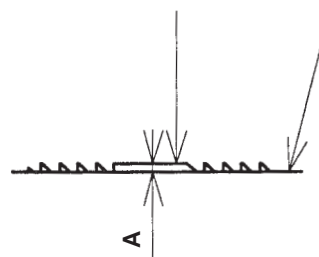


Fig. 8

Model	Dimension A
LU-1510	0.4 to 0.5 mm
LU-1510-7	
LU-1508	0.8 to 0.9 mm
LU-1508H	

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the stitch dial to “0” mm. 2. Turn the handwheel to bring the needle bar to the lower dead point of its stroke. 3. Loosen the setscrew in the feed rocker as shown in Fig. 5. 4. Move the feed bar to adjust so that needle enters the center of the needle hole of feed dog , and securely tighten the setscrew. 	<ul style="list-style-type: none"> • Stitch skipping or thread breakage will result. • Loose stitches will result. • Needle breakage will result.
<ol style="list-style-type: none"> 1. Set the stitch dial to “0” mm. 2. Turn the handwheel to bring the height of the feed dog at its maximum. (Set the needle bar to the lower dead point of its stroke.) 3. Loosen setscrew in the feed bar fork and move feed bar fork up or down to adjust feed dog to the dimension A from top surface (central section) of the throat plate, and securely tighten the setscrew. 	<p>When the height of the feed dog is excessively high :</p> <ul style="list-style-type: none"> • Stitch length becomes larger than the graduation of the stitch dial. • Balloon stitches will result. • Phenomenon of the return of the sewing product will occur. <p>When the height of the feed dog is excessively low :</p> <ul style="list-style-type: none"> • Stitch length becomes smaller than the graduation of the stitch dial. • Feed force will be deteriorated.

Standard Adjustment

5) Height of the hook

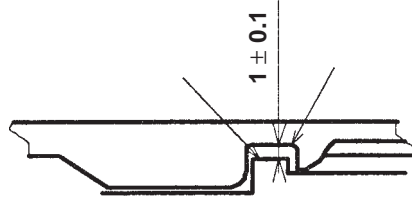


Fig. 9

6) Adjusting the inner hook guide

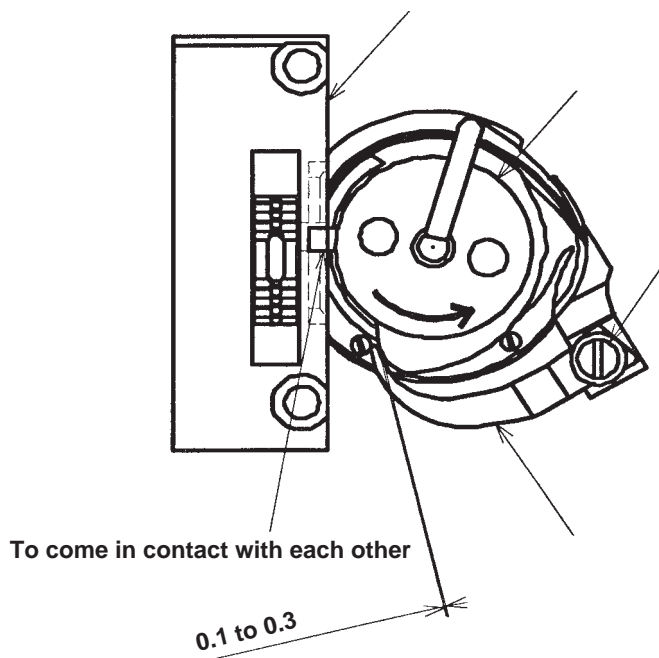


Fig. 10

Conditions

- When the inner hook guide travels to its back end.
- Press the inner hook stopper to the groove in the throat plate.

Adjustment Procedures	Results of Improper Adjustment
<p>1. Replace the thrust washer of the hook shaft upper bushing and adjust so that the clearance provided between inner hook stopping section in the throat plate and top surface of the inner hook stopper is 1 ± 0.1 mm. (For the kind of the thrust washer, refer to “6. Selective parts and consumable parts” on page 44.)</p>	<ul style="list-style-type: none"> • Stitch skipping or thread breakage will result. • Needle breakage will result. • Irregular stitches will result.
<ol style="list-style-type: none"> 1. Turn the handwheel to bring inner hook guide to its back end position. 2. Turn inner hook in the reverse direction of rotation of the hook (in the direction of the arrow) and fit the inner hook stopper to the inner hook stopping section in throat plate . 3. Loosen setscrew in the inner hook guide crank and adjust so that a clearance of 0.1 to 0.3 mm is provided between the inner hook guide and the protruding section of the inner hook. 4. After the adjustment, securely tighten the setscrew. 	<p>When the clearance is larger than the specified value :</p> <ul style="list-style-type: none"> • Loose stitches or thread breakage will result. <p>When the clearance is smaller than the specified value :</p> <ul style="list-style-type: none"> • Inner hook or inner hook guide may be damaged.

Standard Adjustment

7) Needle-to-hook timing

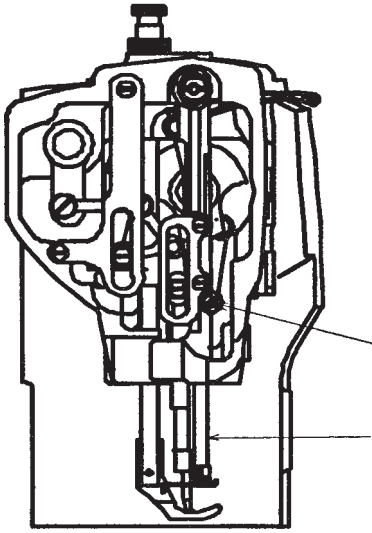


Fig. 11

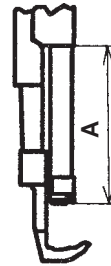


Fig. 12

Model	Dimension A
LU-1510	56.8 mm
LU-1508	
LU-1510-7	58.8 mm
LU-1508H	52.3 mm

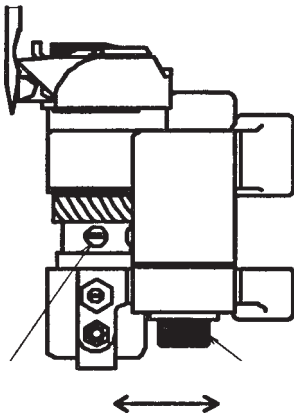


Fig. 13

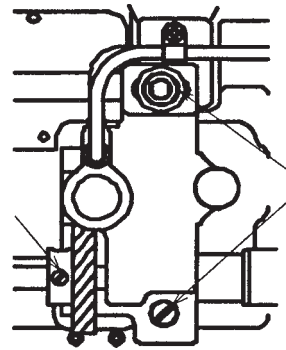


Fig. 14

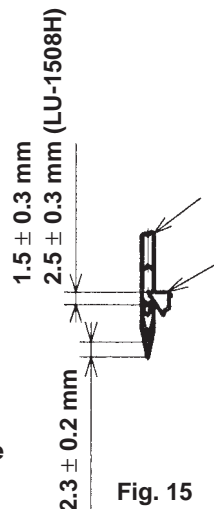


Fig. 15

Conditions

- Feed amount : 0 mm
- Needle bar goes up from the lower dead point of its stroke.

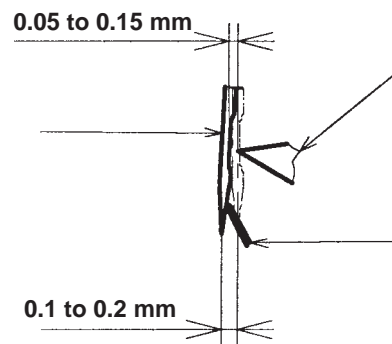


Fig. 16

Adjustment Procedures	Results of Improper Adjustment
<p>. Standard of the lower dead point of the needle bar</p> <ol style="list-style-type: none"> 1. Set the stitch dial to “0” mm. 2. Turn the handwheel to bring needle bar to the lower dead point of its stroke. 3. Loosen the setscrew in the face plate to remove the face plate. 4. Loosen setscrew in the needle bar connection. At this time, loosen the setscrew to such an extent that the needle bar moves up or down by hand since the needle bar drops if the setscrew is fully loosened. 5. Adjust the distance from the lower end of the needle bar frame to the lower end of the needle bar to the dimension A, and tighten the setscrew. (For the LU-1510-7, there is an engraved marker line on the needle bar.) <p>. Needle-to-blade point of hook timing</p> <ol style="list-style-type: none"> 1. Set the stitch dial to “0” mm. 2. Turn the handwheel and loosen setscrew in the needle bar connection to adjust so that a clearance of 1.5 mm is provided between the top end of the needle eyelet of needle and blade point of the hook when needle bar is raised by 2.3 mm from the lower dead point of its stroke. Then, tighten the setscrew again. (For the LU-1510-7, there is an engraved marker line on the needle bar.) 3. Turn the handwheel to make the needle bar ascend by 2.3 mm from the lower dead point of its stroke. Loosen two setscrews in the screw gear (small) so that blade point of the hook is almost aligned with the center of needle . For the LU-1508H, however, 2.5 ± 0.3 mm instead of 2.3 mm is applied. 4. Loosen setscrew in the hook shaft saddle and move the hook shaft saddle to the right or left until a clearance of 0.05 to 0.15 mm is provided between the blade point of the hook and the needle at the position where blade point of the hook is almost aligned with the center of needle . After the adjustment, tighten the setscrew. 5. Loosen two setscrews in the screw gear (large) and move the screw gear (large) to the right or left until blade point of the hook is aligned with the center of needle . After the adjustment, tighten the setscrews. 6. Set the stitch dial at the maximum and check that the needle and the blade point of the hook do not come in contact with each other. <p>. Adjusting the hook needle guard</p> <ol style="list-style-type: none"> 1. Bend hook needle guard to adjust so that the hook needle guard pushes the side face of the needle to lean the needle by 0.1 to 0.2 mm away from its straight position. <p>(Caution) • After tightening the screw gears of the hook shaft, check that there is no thrust play in the hook shaft.</p> <ul style="list-style-type: none"> • Check that there is a backlash in the screw gears of the hook shaft. 	

Standard Adjustment

8) Presser lifter lever

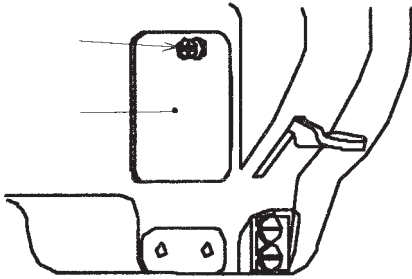


Fig. 17

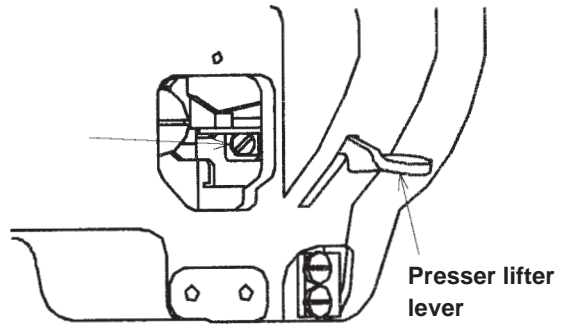


Fig. 18

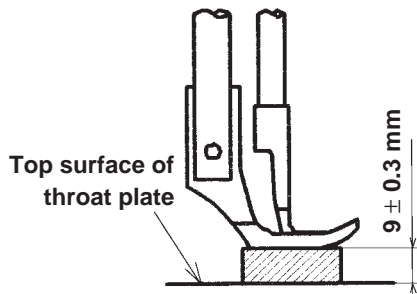


Fig. 19

Condition

- State that the presser lifter lever is lifted.

9) Knee lifter

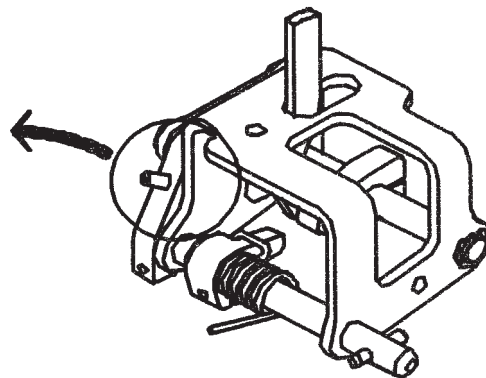
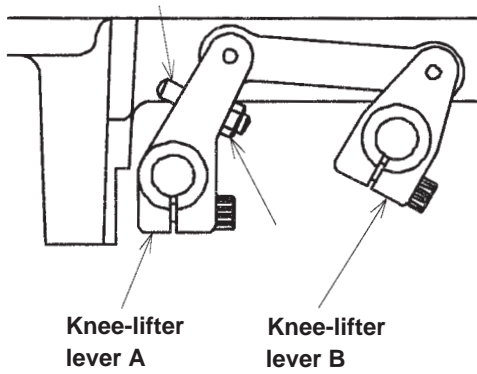


Fig. 20

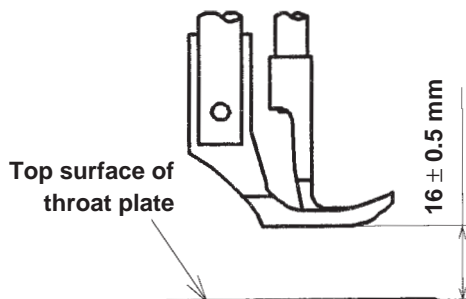


Fig. 21

Condition

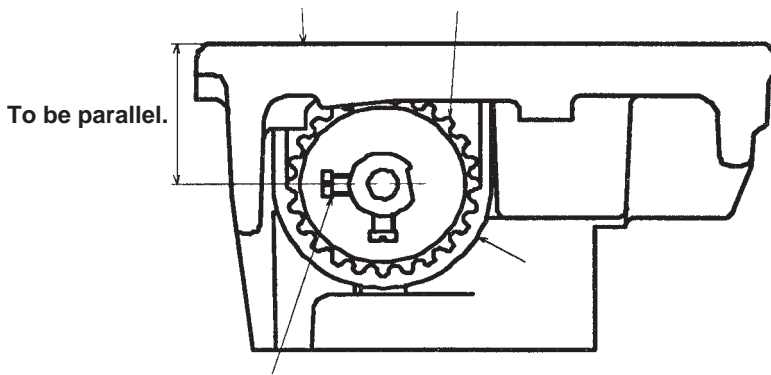
- Lifting amount when the stopper screw of knee-lifter lever A comes in contact with the machine bed.

* When the automatic presser foot lifter is attached, refer to the item "(2) Automatic presser foot lifter" of the Engineer's Manual for LU-1500 series on page 41.

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrew in the side cover located on the anti-operator's side, and remove side cover . 2. Loosen screw in the presser bar holder to make the state that the presser lifter lever is lifted. 3. Adjust the lifting amount of the presser foot to 9 ± 0.3 mm. At this time, the adjustment can be performed with ease if you insert a thing of 9 mm in thickness in between the top surface of throat plate and the lower face of presser foot. 4. Tighten the screw in the presser bar holder. Move the presser foot to the right or left and tighten the screw in the state that the presser foot does not interfere with the walking foot. 5. Remove the thing inserted in between the top surface of throat plate and the lower face of presser foot, and attach the side cover. 	<p>When the lifting amount of the presser foot is large :</p> <ul style="list-style-type: none"> • Presser foot is held rising even when the presser lifter lever is returned to the home position. <p>When the lifting amount of the presser foot is small :</p> <ul style="list-style-type: none"> • Presser foot is not sufficiently lifted and workability may be deteriorated.
<ol style="list-style-type: none"> 1. Remove the knee pad plate and tilt the machine arm. 2. Loosen stopper nut and adjust the lifting amount by the screwing amount of stopper screw . Adjust the height from the top surface of throat plate to the lower face of presser foot to 16 ± 0.5 mm. 3. Taking care not to move the stopper screw, tighten the stopper nut. <ul style="list-style-type: none"> • Screw in the stopper screw Lifting amount is decreased. • Loosen the stopper screw Lifting amount is increased. 	<p>When the lifting amount of the presser foot is large :</p> <ul style="list-style-type: none"> • Top end of the needle bar interferes with the walking foot when the presser foot is lifted, and the walking foot may be broken. <p>When the lifting amount of the presser foot is small :</p> <ul style="list-style-type: none"> • Presser foot is not sufficiently lifted and workability may be deteriorated.

Standard Adjustment

10) Main shaft-to-hook driving shaft timing



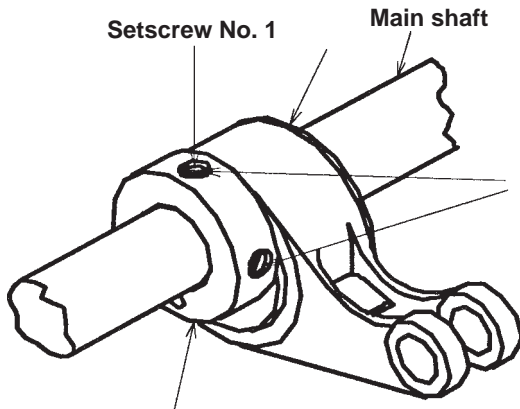
Conditions

- Feed amount : 0 mm
- Needle bar is set to the lower dead point of its stroke.

Fig. 22

11) Feed drive eccentric cam timing

In case of LU-1508, LU-1510, LU-1510-7



Conditions

- Feed amount : Maximum
- Needle bar is set to the lower dead point of its stroke.

Fig. 23

In case of LU-1508H

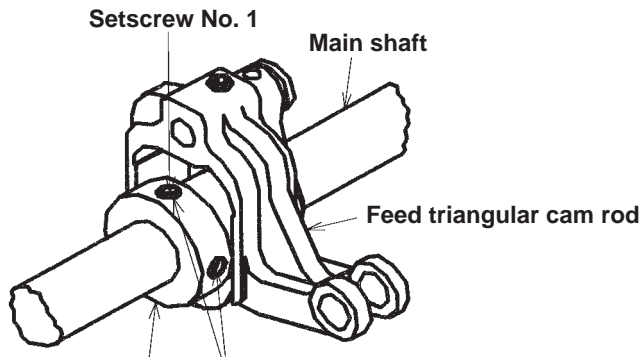


Fig. 24

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the stitch dial to “0” mm. 2. Turn the handwheel to bring the needle bar to the lower dead point of its stroke. 3. Turn the handwheel so that screw No. 2 in the lower sprocket wheel is parallel to top surface of the machine bed. 4. Engage timing belt with lower sprocket wheel . <p>(Caution) • Fig. 17 shows the state when it is observed from the handwheel side.</p>	<ul style="list-style-type: none"> • Loose stitches will result. • Feed timing and needle-to-hook timing will change.
<p>In case of LU-1508H</p> <ol style="list-style-type: none"> 1. Set the stitch dial at its maximum. 2. Loosen two setscrews in the feed drive eccentric cam. 3. Turn the handwheel to bring the needle bar to the lower dead point of its stroke. 4. Turn feed drive eccentric cam to adjust so that the feed dog does not move even when moving the reverse feed control lever. 5. Securely tighten the setscrews. <p>(Standard)</p> <ul style="list-style-type: none"> • Setscrew No. 1 in the feed drive eccentric cam faces almost just above at the lower dead point of the needle bar <p>In case of LU-1508H</p> <ol style="list-style-type: none"> 1. Set the stitch dial at its maximum. 2. Loosen two setscrews in the feed triangular cam. 3. Turn feed triangular cam to adjust so that the feed dog does not move even when moving the reverse feed control lever. 4. Securely tighten the setscrews. <p>(Standard)</p> <ul style="list-style-type: none"> • Setscrew No. 1 in the feed triangular cam faces almost just above at the lower dead <p>(Caution) • When performing adjustment, if the cam slips in the axial direction, torque becomes heavy. So, be careful.</p> <ul style="list-style-type: none"> • Adjust the feed drive crank connecting rod so that it is positioned almost in the center of the end face of thrust collar of the feed drive eccentric cam and the end face of the feed drive eccentric cam. • After adjusting the feed drive timing, re-adjust the top feed timing. 	<ul style="list-style-type: none"> • Pitch error at high/low speed will be deteriorated. • Thread tension will change. • Stitch tightening in normal/reverse feed will change.

Standard Adjustment

12) Installing position of the alternate vertical movement amount detecting switch

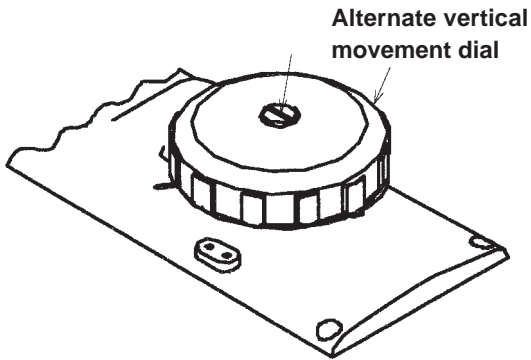


Fig. 25

Sewing speed of LU-1510-7

Amount of alternate vertical movement	Stitch length : Less than 6 mm	Stitch length : More than 6 mm to less than 9 mm
Less than 2.5 mm	3,000 rpm	2,000 rpm
2.5 to less than 4 mm	2,400 rpm	2,000 rpm
4 to less than 4.75 mm	2,000 rpm	2,000 rpm
4.75 to less than 6.5	1,800 rpm	1,800 rpm

- Speed in terms of the amount of alternate vertical movement can be automatically changed over in 4 stages.

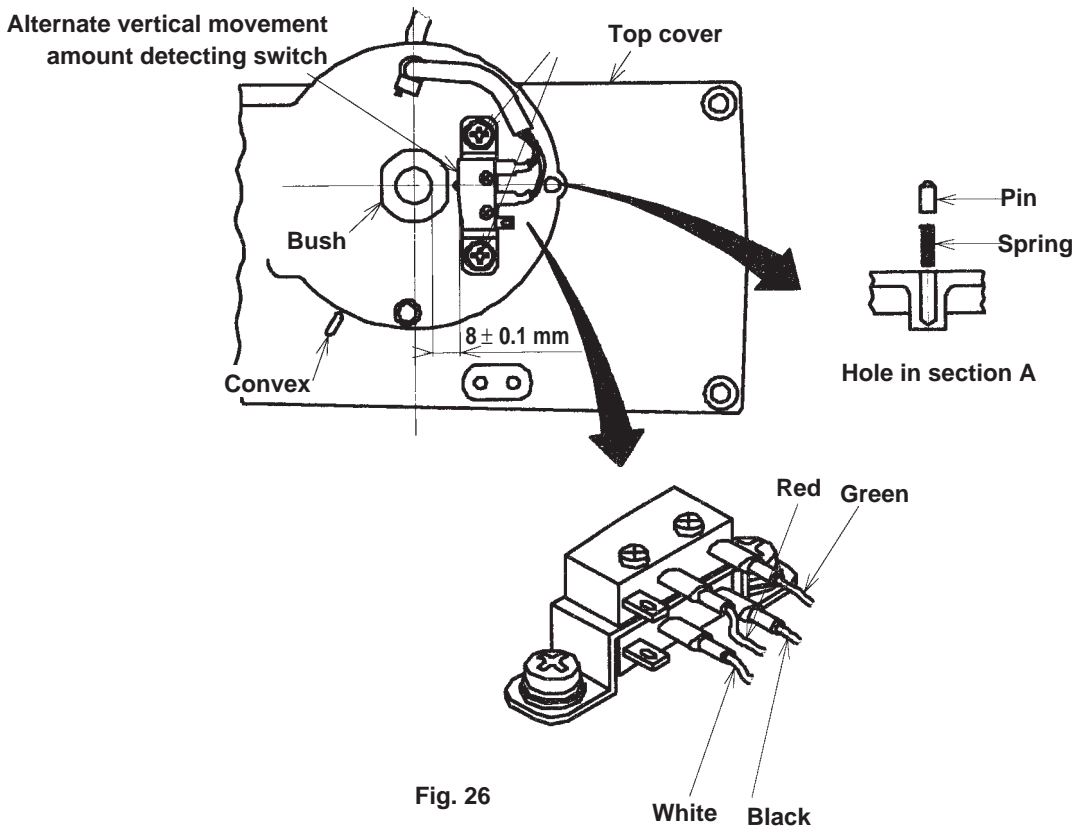


Fig. 26

Scale of alternate vertical movement dial	Switch (upper) (Wires : Red/green)	Switch (lower) (Wires : White/black)
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"> 1. Turn the alternate vertical movement dial to adjust the scale "1" to the convex of the top cover. 2. Loosen setscrew in the alternate vertical movement dial and remove the alternate vertical movement dial. At this time, be careful since there are a pin and a spring in the hole in section A. 3. Loosen setscrews for installing the alternate vertical movement amount detecting switch and adjust the distance from the inner diameter of the bush to the end face of the switch main body to 8 ± 0.1 mm, and tighten the setscrews. 4. Adjust the scale "1" on the alternate vertical movement dial to the convex of the top cover, place the pin and the spring in the hole in section A, attach the alternate vertical movement dial, and tighten the setscrew. <p>(Caution) When the position of the alternate vertical amount detecting switch is changed, make sure that the relation between the alternate vertical movement dial and the sewing speed is proper.</p>	<ul style="list-style-type: none"> • Sewing speed may not change even when the alternate vertical movement dial is turned.

Standard Adjustment

13) Top feed cam timing

In case of LU-1508, LU1508H, LU1510

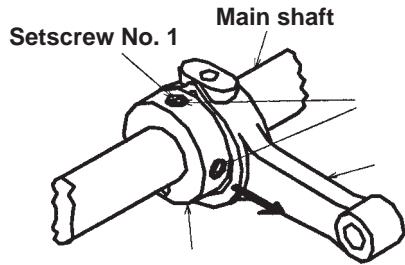


Fig. 27

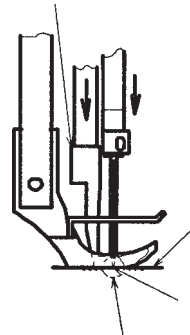


Fig. 28

Conditions

- Feed amount : 0 mm
- Amount of alternate vertical movement : Standard
- When the needle comes down.

In case of LU-1510-7

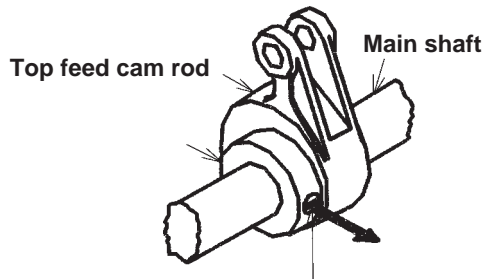
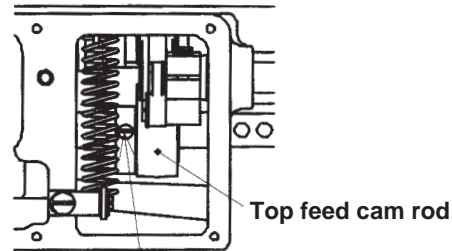


Fig. 29



Screw No. 1

Fig. 30

14) Feed movement

. Amount of alternate vertical movement of walking foot and presser foot

In case of the machine without thread trimmer

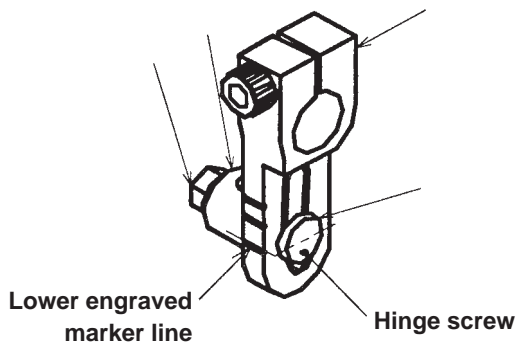


Fig. 31

Standard

- Lower engraved marker line on top feed rear arm is aligned with the center of hinge screw .

Standard of the amount of alternate vertical movement of walking foot and presser foot

- Upper engraved marker line : Approx. 5 mm
- Intermediate engraved marker line : Approx. 4 mm
- Lower engraved marker line : Approx. 3 mm

Sewing speed table

• In case of LU-1510 and LU-1508

Amount of alternate vertical movement of walking foot and presser foot	Stitch length : 6 mm or less	Stitch length : More than 6 mm to 9 mm or less
	Less than 3 mm	2,500 rpm
3 mm to less than 4 mm	2,000 rpm	2,000 rpm
4 mm to less than 6.5 mm	1,600 rpm	1,600 rpm

• In case of LU-1510-7

Amount of alternate vertical movement of walking foot and presser foot	Stitch length : 6 mm or less	Stitch length : More than 6 mm to 9 mm or less
	Less than 2.5 mm	3,000 rpm
2.5 to less than 4 mm	2,400 rpm	2,000 rpm
4 mm to less than 4.75 mm	2,000 rpm	2,000 rpm
4.75 mm to less than 6.5 mm	1,800 rpm	1,800 rpm

• In case of LU-1508H

Amount of alternate vertical movement of walking foot and presser foot	Stitch length : 6 mm or less	Stitch length : More than 6 mm to 10 mm or less
	Less than 4 mm	2,000 rpm
4 mm to less than 6.5 mm	1,600 rpm	1,600 rpm

Adjustment Procedures	Results of Improper Adjustment
<p>In case of LU-1508, LU-1508H, LU-1510.</p> <ol style="list-style-type: none"> 1. Set the stitch dial to "0" mm. 2. Adjust the amount of alternate vertical movement of walking foot and presser foot to the standard. (Refer to "10) Feed movement" on page 13.) 3. Loosen two setscrews in the top feed cam. 4. Turn top feed cam to the position where three points of needle tip, top surface of the throat plate and walking foot (presser foot face) are aligned with each other on condition that the amount of alternate vertical movement of walking foot and presser foot is equal. 5. Securely tighten the setscrews. <p>(Standard)</p> <ul style="list-style-type: none"> • Setscrew No. 2 in the top feed cam faces in the direction of the center (in the direction of the arrow mark) of the small end section of top feed rod at the lower dead point of the needle bar. <p>In case of LU-1510-7</p> <ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Adjust the scale of the alternate vertical movement dial to "3". 3. Remove the setscrews in the window plate C, and remove the window plate C and the window plate C packing. 4. Loosen two setscrews in the top feed cam. 5. Turn top feed cam to the position where three points of needle tip, top surface of the throat plate and walking foot (presser foot face) are aligned with each other on condition that the amount of alternate vertical movement of walking foot and presser foot is equal. 6. Securely tighten the setscrews. <p>(Standard)</p> <ul style="list-style-type: none"> • Setscrew No. 2 in the top feed cam faces just above when needle and walking foot go up and are aligned with the top surface of throat plate and the setscrew No. 1 in the top feed cam faces in the direction of the arrow mark. (Perform adjustment at the position where three points are aligned with each other when needle and walking foot come down.) 	<ul style="list-style-type: none"> • Pitch error at high/low speed will be deteriorated.
<p>I. Amount of alternate vertical movement of walking foot and presser foot</p> <p>In case of the machine without thread trimmer</p> <ol style="list-style-type: none"> 1. Loosen hinge screw nut of the top feed rod. 2. Move the position of boss of the cam rod up or down to adjust. 3. After the adjustment, tighten the nut. <ul style="list-style-type: none"> • Upper section of the slot operating amount is increased. • Lower section of the slot operating amount is decreased. <p>(Caution)</p> <ul style="list-style-type: none"> • The maximum sewing speed has been specified in accordance with sewing conditions. Set the maximum sewing speed appropriately in accordance with the sewing conditions given taking care not to exceed the corresponding specified value. 	<p>Increase the operating height in accordance with the sewing products.</p> <ul style="list-style-type: none"> • Sewing of sponge or the like • Sewing of the material with stepped section <p>When the operating amount is increased, stitch length pitch and the graduation on the stitch dial will change.</p> <p>Slightly decrease the number of revolution of the motor since feed force is deteriorated.</p>

Standard Adjustment

In case of the machine with thread trimmer

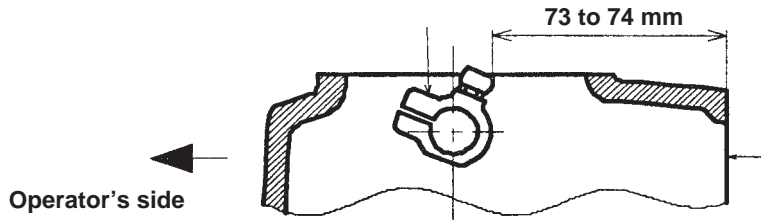


Fig. 32

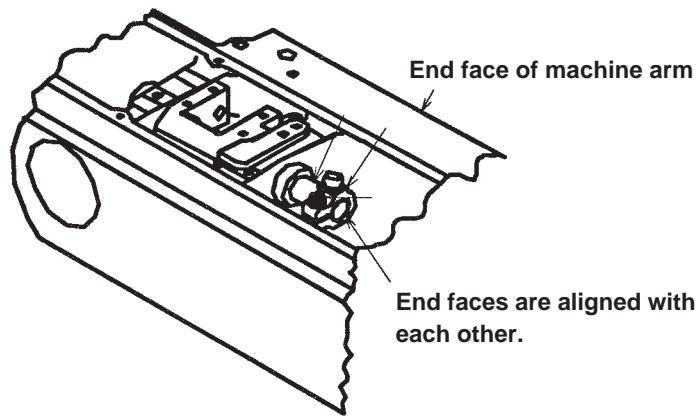


Fig. 33

. Amount of alternate movement of walking foot and presser foot

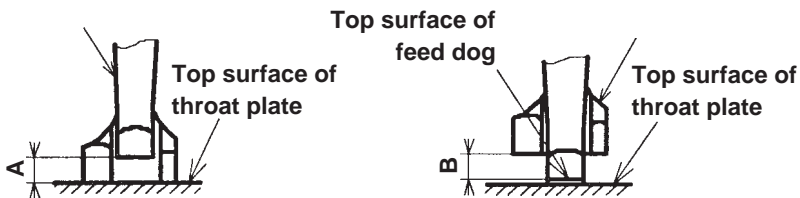


Fig. 34

Standard

- Setscrew No. 1 in the feed drive eccentric cam is aligned with the engraved marker dot on the main shaft.

Conditions

- Feed amount : 0 mm
- Amount of alternate vertical movement of walking foot and presser foot : Standard

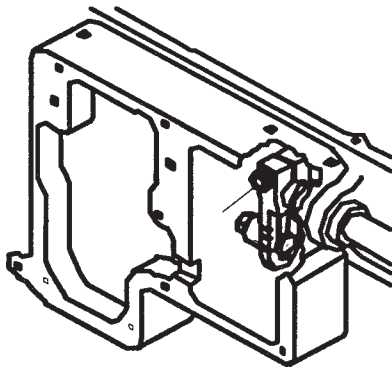


Fig. 35 In case of the machine without thread trimmer

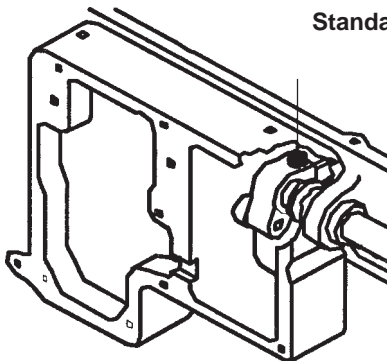


Fig. 36 In case of the machine with thread trimmer

Adjustment Procedures	Results of Improper Adjustment
<p>In case of the machine with thread trimmer</p> <ol style="list-style-type: none"> 1. Remove the top cover. 2. Loosen setscrew in the alternate vertical movement adjusting arm. 3. Set alternate vertical movement adjusting arm to the position of 73 to 74 mm from end face of the machine arm, and assemble it so that its end face is flush with the end face of alternate vertical movement changer shaft in the lateral direction. 4. Securely tighten the setscrew in the alternate vertical movement adjusting arm. 5. Set the alternate vertical movement dial to the minimum, and install the top cover. 6. Turn the alternate vertical movement dial and check that the numeral on the dial and the amount of alternate vertical movement are proper each other. 	
<ol style="list-style-type: none"> 1. Set the stitch dial to "0" mm. 2. Turn the handwheel to check that amount of vertical movement of walking foot is almost equal to that of presser foot . 3. If the respective amounts of vertical movement are different, loosen setscrew in the top feed rear arm to make the respective amounts equal. <p>Adjust the amounts to nearly $A = B$.</p> <p>When the amount of vertical movement of walking foot is greater :</p> <ol style="list-style-type: none"> 1) Loosen the setscrew in the top feed rear arm in the state that the walking foot is slightly raised and press the walking foot to the feed dog. 2) Tighten the setscrew, and turn the handwheel to check the amount of the vertical movement. 	<p>Make the amount of the vertical movement of walking foot greater than that of presser foot in accordance with the sewing products.</p> <ul style="list-style-type: none"> • Sewing of sponge or the like • Sewing of the material with stepped section <p>When the amounts of alternate vertical movement of walking foot and presser foot are excessively different from each other :</p> <ul style="list-style-type: none"> • Stitch length pitch in terms of the graduation of dial will change. • Slightly decrease the number of revolution of the motor since feed force is deteriorated.

Standard Adjustment

15) Needle sway (Optional selection of LU-1510 and LU-1510-7 only)

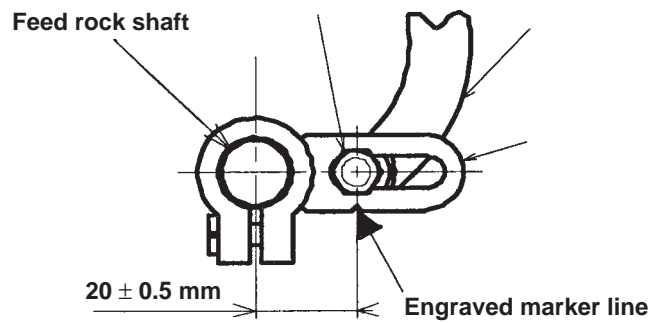


Fig. 37

16) Stitch length of normal/reverse feed

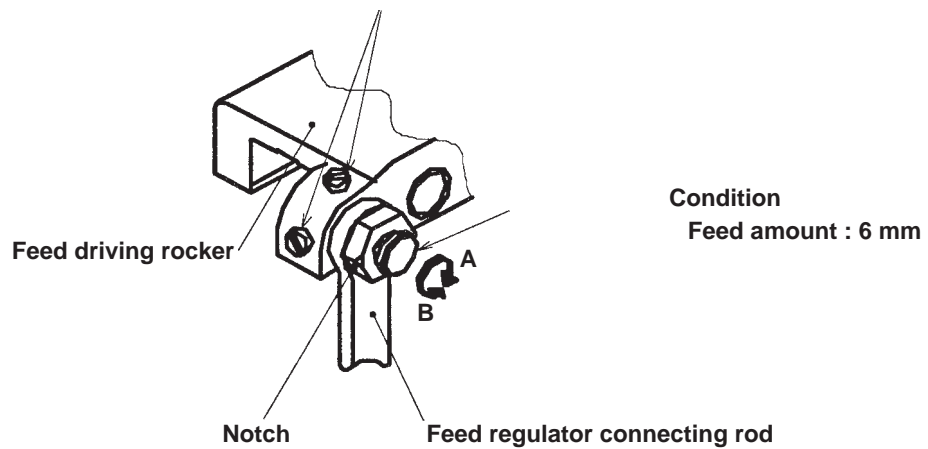


Fig. 38

17) Balancer

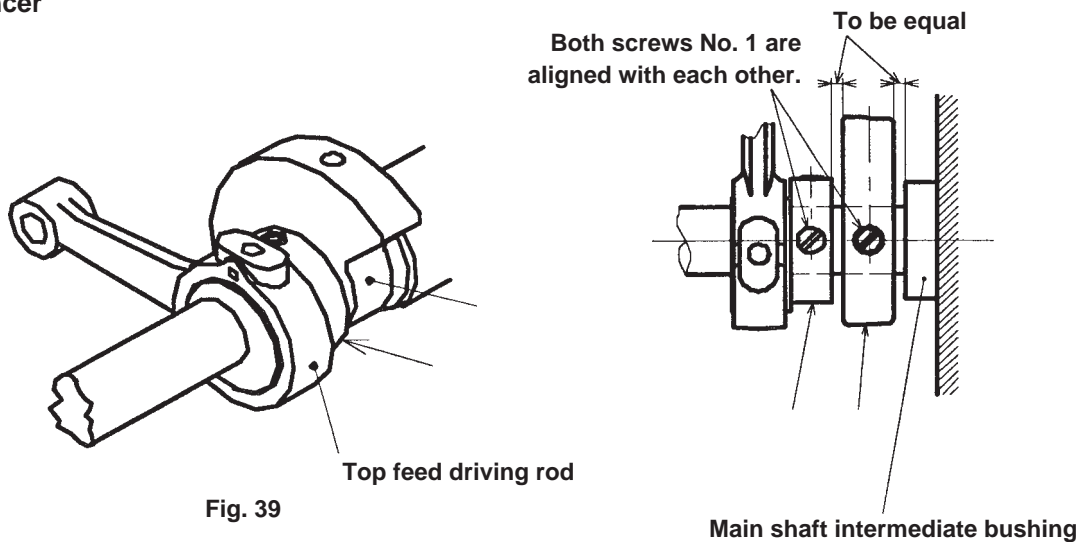


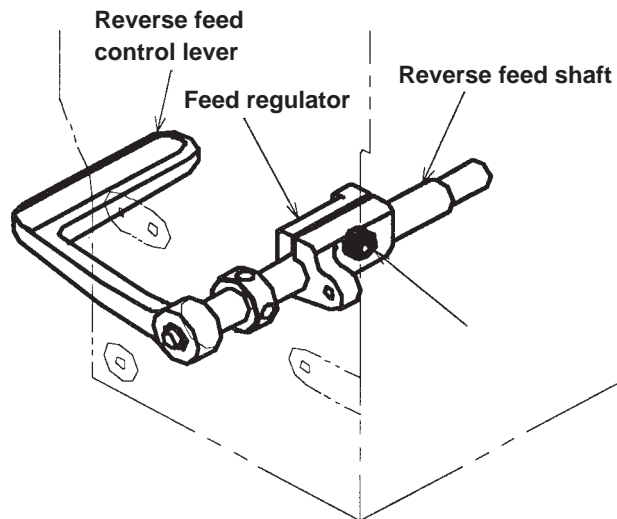
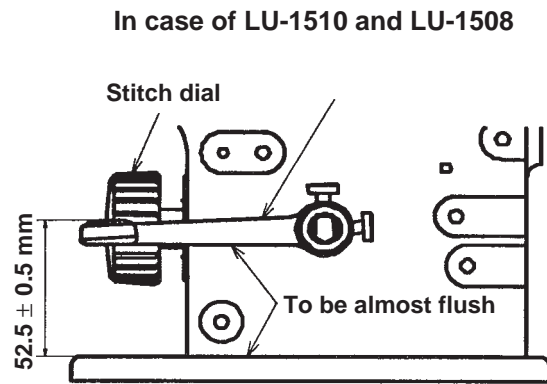
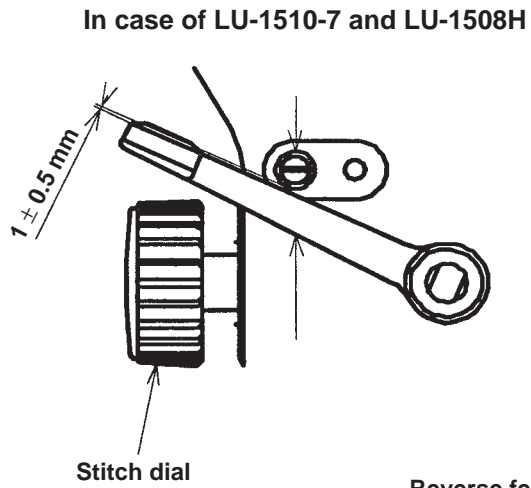
Fig. 39

Fig. 40

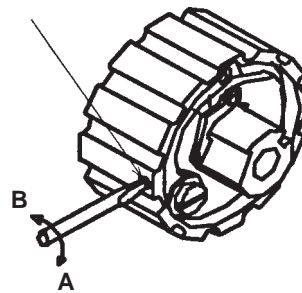
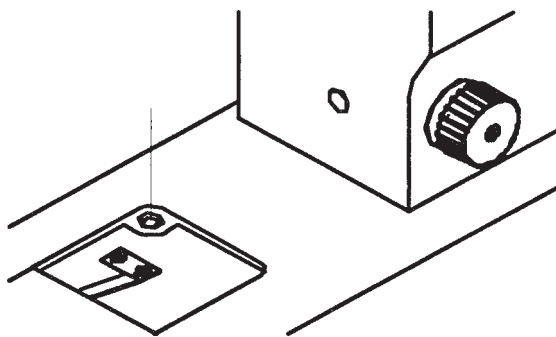
Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen hinge screw nut of the feed drive rear arm. 2. Move feed rock connecting rod so that the distance from the center of the feed rock shaft to the center of the hinge screw is 20 ± 0.5 mm and tighten the nut. 3. Turn the handwheel to check the needle sway. <p>(Standard)</p> <ul style="list-style-type: none"> • Engraved marker line on feed drive rear arm is aligned with the center of the hinge screw. 	<ul style="list-style-type: none"> • Needle breakage or stitch skipping will result.
<ol style="list-style-type: none"> 1. Set the stitch dial to 6 mm. 2. Loosen two setscrews in the feed regulator eccentric pin. 3. Turn feed regulator eccentric pin to adjust the stitch length. Direction A reverse feed pitch is increased. Direction B normal feed pitch is increased. 4. After the adjustment, securely tighten the setscrews. <p>(Standard)</p> <ul style="list-style-type: none"> • When the direction of the notch of eccentric pin is set to the right sideway as shown in Fig. 29, the feed amounts of normal and reverse feeds are nearly the same. 	<ul style="list-style-type: none"> • Respective stitch lengths of normal and reverse feeds do not match.
<ol style="list-style-type: none"> 1. Turn the handwheel to make the screw No. 1 of top feed cam upward. 2. Adjust so that the screw No. 1 of balancer is aligned with the screw No. 1 of the top feed cam, and securely tighten the screws. At this time, adjust so that the clearances between the end face of top feed cam, main shaft intermediate bushing and the end face of balancer are nearly equal. 	<ul style="list-style-type: none"> • Vibration is increased.

Standard Adjustment

18) Position of the reverse feed control lever



19) Safety clutch



Adjustment Procedures	Results of Improper Adjustment
<p>In case of LU-1510-7 and LU-1508H</p> <ol style="list-style-type: none"> 1. Set the stitch dial to the maximum. 2. At this time, loosen hexagon headed bolt in the feed regulator to adjust so that a clearance of 1 ± 0.5 mm is provided between reverse feed control lever and reverse feed control lever stopper . <p>In case of LU-1510 and LU-1508</p> <ol style="list-style-type: none"> 1. Set the stitch dial to "0" mm. 2. At this time, loosen hexagon headed bolt in the feed regulator to adjust so that a distance of 52.5 ± 0.5 mm is provided between the top surface of the machine bed and reverse feed control lever . <p>(Standard)</p> <ul style="list-style-type: none"> • Bottom surface of the reverse feed control lever is almost flush with the top surface of the machine bed. <p>(Caution) • Check that the reverse feed control lever does not interfere with the machine bed or machine arm when the stitch dial is set to the maximum.</p>	<p>When the position of the reverse feed control lever is low :</p> <p>Reverse feed control lever interferes with the machine bed and the stitch length of the reverse feed stitching will be decreased.</p> <p>When the position of the reverse feed control lever is high :</p> <p>Reverse feed control lever interferes with the stopper or the machine arm and stitch length of the normal feed stitching will be decreased.</p>
<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> <p>Resetting procedure</p> <ol style="list-style-type: none"> 1. Check the moving part of the sewing machine, and look for and remove the cause which the safety clutch has functioned. 2. Pressing push button located on the top surface of the machine bed, strongly turn the handwheel in the reverse direction of rotation. 3. Resetting procedure completes when the handwheel cannot be turned with "click". <p>Adjusting the working torque of the safety clutch</p> <ol style="list-style-type: none"> 1. Tilt the machine head. 2. Turn torque release adjusting screw located at the periphery of hook driving shaft sprocket wheel to adjust the torque release. 	

Standard Adjustment

20) Lubrication

In case of LU-1508 and LU-1508H

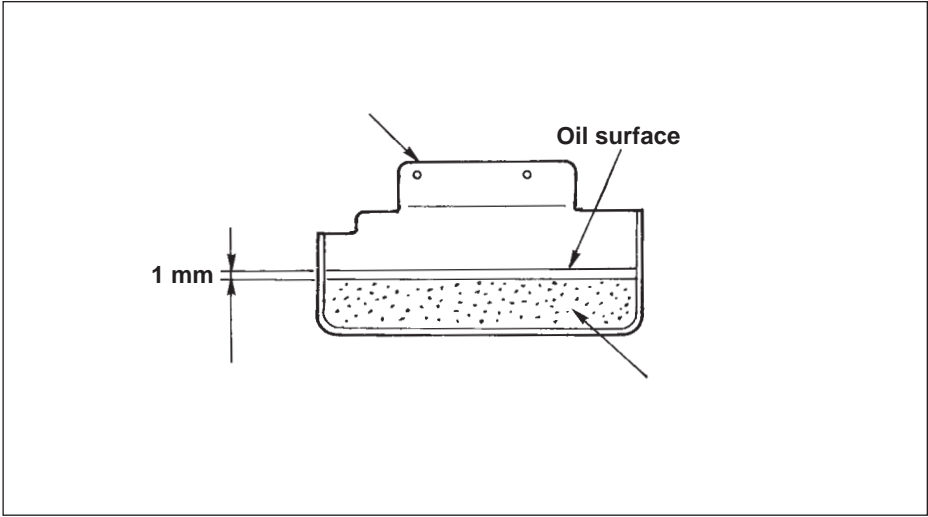


Fig. 46

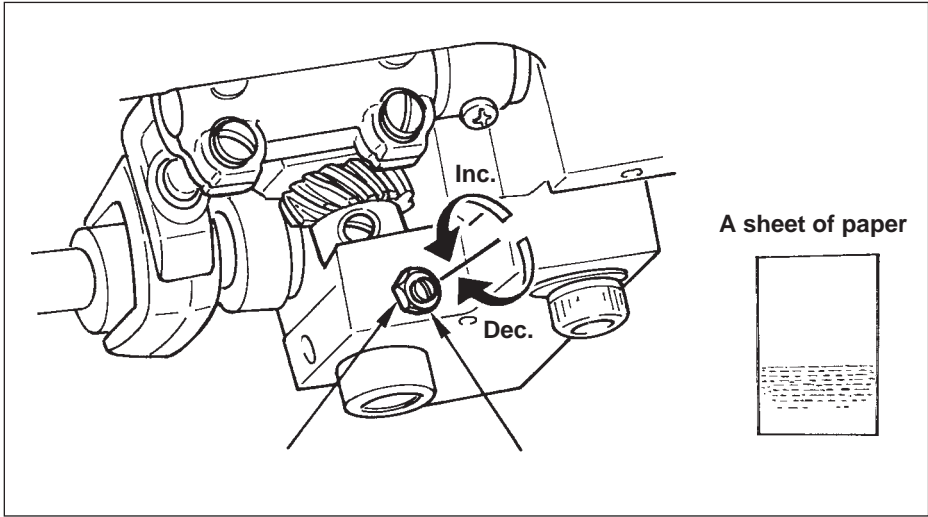


Fig. 47

Adjustment Procedures	Results of Improper Adjustment
<p>1. Put sponge in oil reservoir and fill the oil reservoir with oil so that the oil surface is higher by 1 mm than the upper surface of the sponge. Necessary amount of oil is approximately 500 cc.</p> <p>2. Adjustment of the amount of oil in the hook is performed with oil amount adjustment screw after loosening nut . Turning the oil amount adjustment screw clockwise will increase the amount of oil in the hook, or counterclockwise will decrease it.</p> <p>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 figure on the left.</p> <p>(Caution) • If oil is filled at once, the oil may overflow the oil reservoir. So, be careful.</p>	<p>When the amount of oil is short :</p> <ul style="list-style-type: none"> • Loose stitches will result. • Hook is heated resulting in seizure. <p>When the amount of oil is too much :</p> <ul style="list-style-type: none"> • Thread is stained with oil. Or, the cloth may be stained.

Standard Adjustment

In case of LU-1510 and LU-1510-7

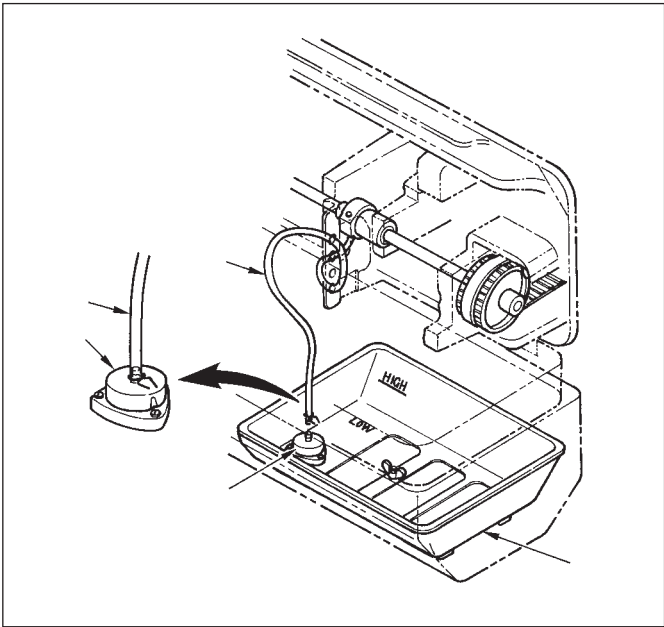


Fig. 48

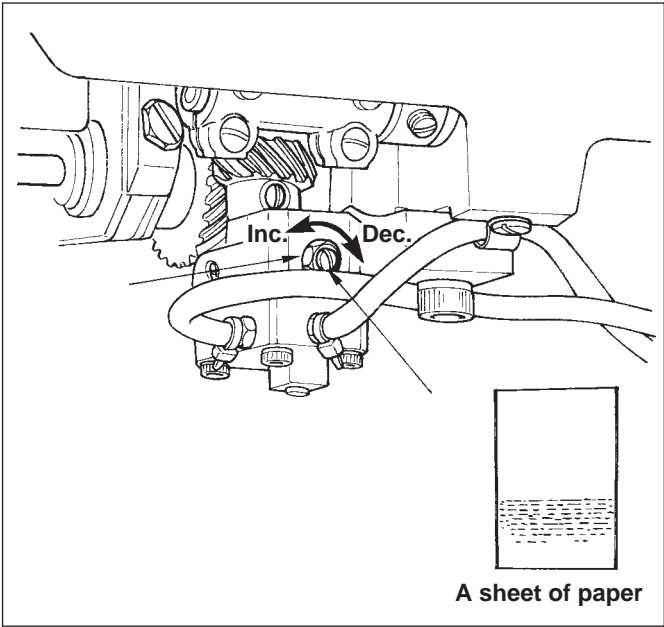


Fig. 50

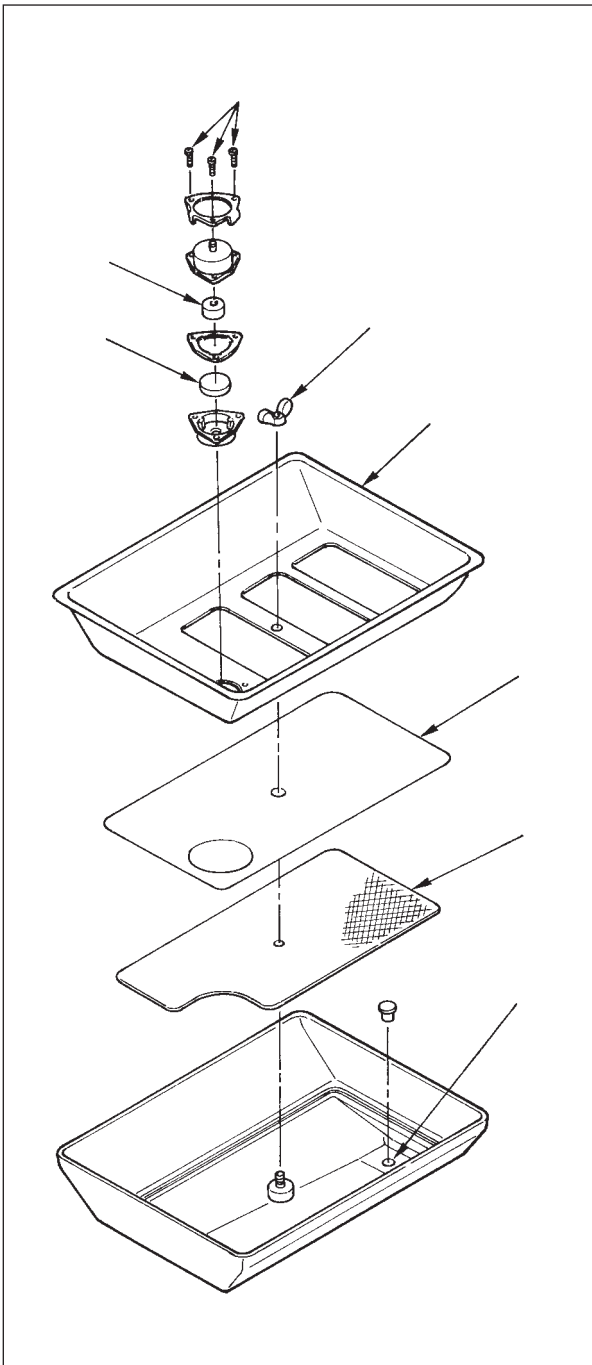


Fig. 49

A sheet of paper

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Insert the projection located at the bottom of oil tank into the waste oil hole of the oil pan. 2. Insert oil pipe into filter of the oil tank and fix the pipe with a clip. 3. Pour the JUKI New Defrix Oil No. 2 into the oil tank until HIGH level is reached. 4. Add the same lubricating oil up to HIGH level as soon as the oil level has come down to LOW level. 5. After the lubrication, you can see from oil sight window that the oil rises up when the operation is normal. (However, the machine should run at 1,500 rpm or more.) <p>Cleaning the oil tank</p> <ol style="list-style-type: none"> 1. Remove the oil pipe from the oil tank. 2. Remove butterfly nut and take out cover (upper), filter and cover (lower) to clean the oil tank. 3. Remove filter case setscrews, and clean filter element located on the inside of the filter case and magnet. 4. When replacing the oil in the oil tank, remove stopper in the oil tank. Then, the oil can be drained from the installing port of the waste oil container in the oil pan. After draining, securely set the stopper to the oil tank. When taking out the oil tank, take it out after draining the oil. 5. Fix the filter case in which the filter element and the magnet are placed to the cover (upper) with the setscrews. 6. Place the cover (lower), the filter and the cover (upper) in order in the oil tank, and fix them with the butterfly nut. 7. Insert the oil pipe into the oil tank and fix it with a clip. Fill the oil tank with JUKI New Defrix Oil No. 2 up to HIGH level. <p>Adjusting the amount of oil in the hook</p> <ol style="list-style-type: none"> 1. Adjustment of the amount of oil in the hook is performed with oil amount adjustment screw after loosening nut. Turning the oil amount adjustment screw clockwise will decrease the amount of oil in the hook, or counterclockwise will increase it. 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. <p>(Caution) • Approximately once a month, clean the oil tank and the filter case. If the filter is clogged with soil, lubrication fails resulting in trouble.</p>	<p>When the amount of oil is short :</p> <ul style="list-style-type: none"> • Loose stitches will result. • Hook is heated resulting in seizure. <p>When the amount of oil is too much :</p> <ul style="list-style-type: none"> • Thread is stained with oil. Or, the cloth may be stained.

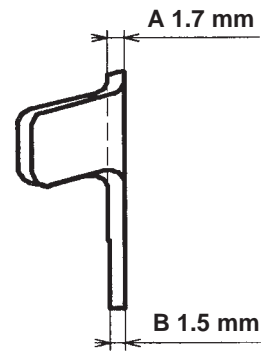
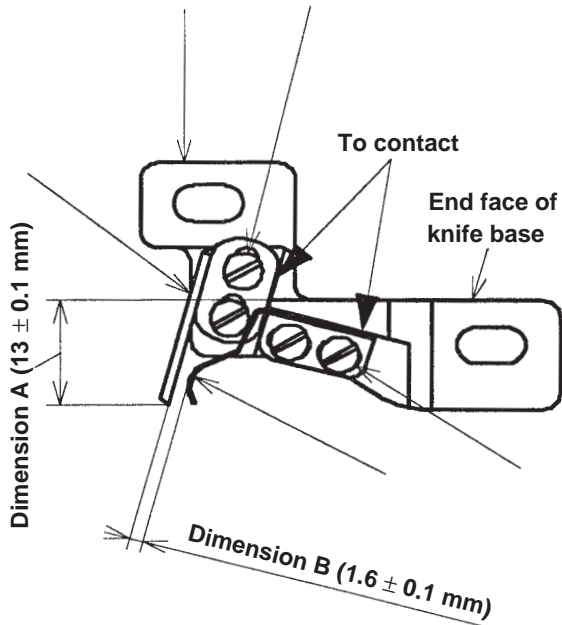
3. STANDARD ADJUSTMENT OF THE ADDITIONAL DEVICES (LU-1510-7)

(1) Thread trimmer device

1) Position of the counter knife and the clamp spring

Condition

- To make the end face come in contact with the difference in step of counter knife base



Counter knife gauge

Fig. 51

2) Position of the counter knife base

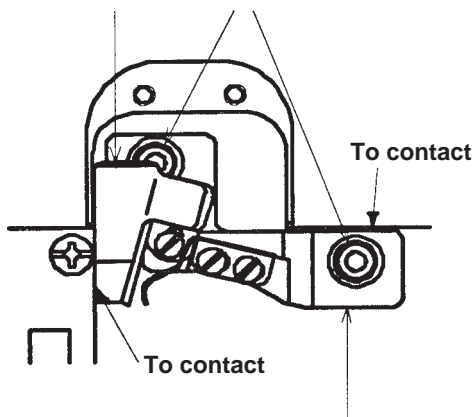


Fig. 52

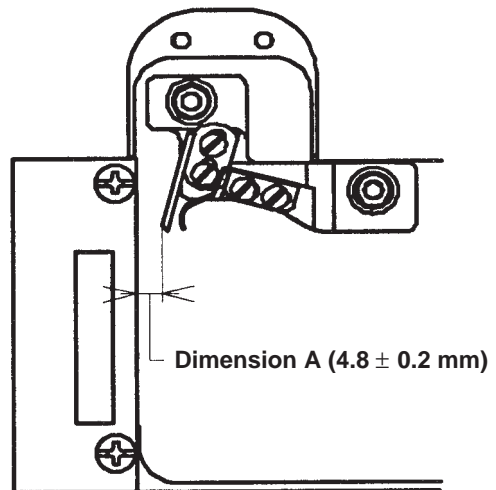
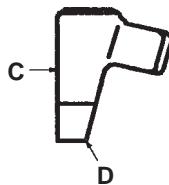


Fig. 53

Condition

- To make the end face come in contact with the difference in step of hook shaft saddle



Counter knife gauge

Adjustment Procedures	Results of Improper Adjustment
<p>Position of the counter knife</p> <ol style="list-style-type: none"> 1. Loosen counter knife setscrews . 2. Make the end face of the counter knife come in contact with the difference in step of the counter knife base. 3. Adjust so that the distance between the end face of counter knife base and the top end of counter knife is 13 ± 0.1 mm. 4. Tighten the setscrews. <p>Position of the clamp spring</p> <ol style="list-style-type: none"> 1. Loosen clamp spring setscrews . 2. Make the end face of clamp spring come in contact with the difference in step of the counter knife base. 3. Slide the spring while making it come in contact with, and adjust the position using section A or B of the counter knife gauge. 4. Section A is 1.7 mm in thickness and section B 1.5 mm. Adjust the position of clamp spring so that when this section is inserted between the counter knife and the clamp spring, you feel that section A is slightly caught between them and you do not feel that section B is caught. At this time, the clearance between the counter knife and the clamp spring is approximately 1.6 mm. 5. Tighten the setscrews. <p>(Caution) • When the position of the counter knife and/or the clamp spring is moved, re-adjust the position of the counter knife base and the knife pressure.</p>	<p>When dimension A is large :</p> <ul style="list-style-type: none"> • Length of bobbin thread clamp is shortened. As a result, stitch skipping will occur. <p>When dimension A is small :</p> <ul style="list-style-type: none"> • Defective thread trimming will result. <p>When dimension B is large :</p> <ul style="list-style-type: none"> • Defective bobbin thread clamp will occur. • Stitch skipping at the start of sewing will occur. <p>When dimension B is small :</p> <ul style="list-style-type: none"> • Needle thread is clamped and cloth is hard to be taken out. Simultaneous removing of bobbin thread clamp will result. • Excessive clamp pressure is applied and deformation of the clamp spring will occur.
<ol style="list-style-type: none"> 1. Loosen setscrews in the counter knife base. 2. Move the counter knife base to the position as shown in Fig. 42 using the counter knife gauge supplied as accessory. Make the end face of the counter knife base come in contact with the difference in step of the hook shaft saddle in the longitudinal direction. Make the section “C” of the counter knife gauge come in contact with the end face of the throat plate in the lateral direction. 3. Move the counter knife base and adjust so that the top end of the counter knife comes in contact with the section “D” of the counter knife gauge, and securely tighten the setscrews. At this time, the distance from the end face of the throat plate to the top end of the counter knife is 4.8 mm. <p>(Caution) • When the counter knife base is moved, re-adjust the knife pressure.</p>	<p>When dimension A is large :</p> <ul style="list-style-type: none"> • Knife pressure is increased resulting in motor-stop. <p>When dimension A is small :</p> <ul style="list-style-type: none"> • Knife pressure is decreased and defective thread trimming will occur.

Standard Adjustment

3) Vertical position of the moving knife

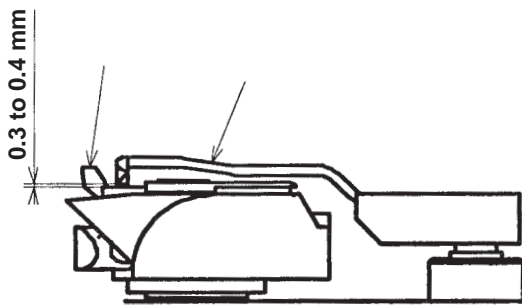


Fig. 54

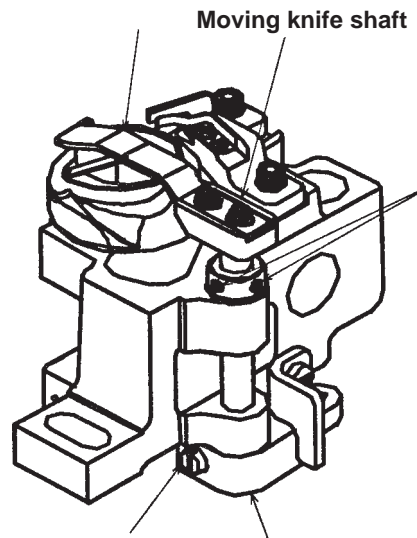


Fig. 55

4) Adjusting the knife pressure

Conditions

- Moving knife comes in contact with counter knife.
- Driving arm comes in close contact with stopper plate.

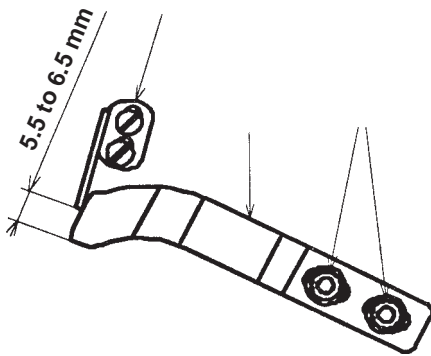


Fig. 56

Initial position

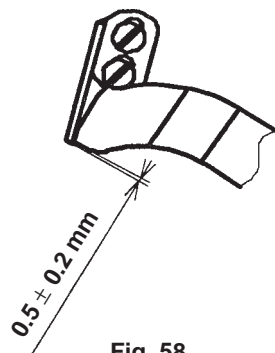


Fig. 58

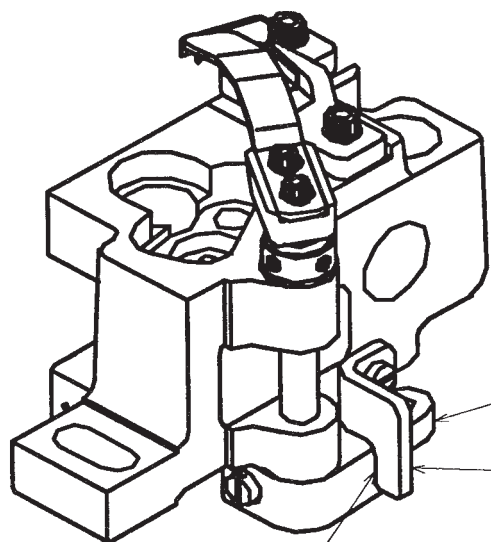
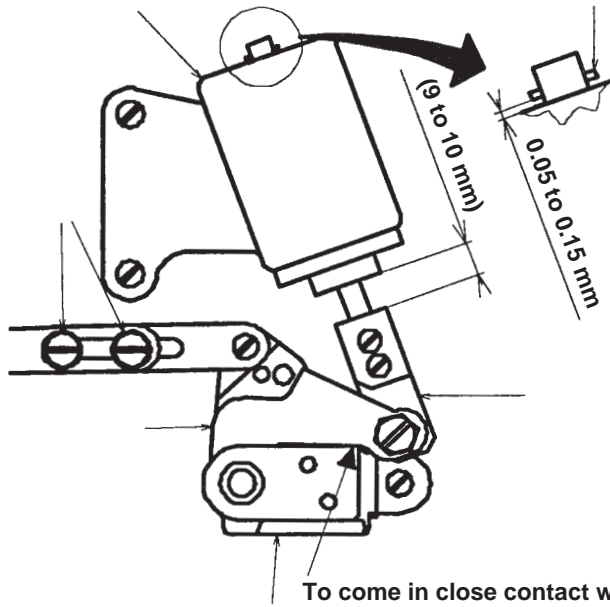


Fig. 57

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrew in the driving arm. 2. Loosen setscrews in the moving knife shaft thrust collar. 3. Adjust so that a clearance of 0.3 to 0.4 mm is provided between the bottom end of moving knife and inner hook and tighten the setscrews in the thrust collar. 4. Tighten the setscrew in the driving arm so that there is no thrust play at the moving knife shaft. 	<p>When the clearance is large :</p> <ul style="list-style-type: none"> • Defective clamp of needle and bobbin threads will occur. <p>When the clearance is small :</p> <ul style="list-style-type: none"> • Moving knife interferes with the inner hook. • There is no clearance for the thread to enter between the moving knife and the inner hook resulting in defective thread trimming.
<ol style="list-style-type: none"> 1. Loosen setscrews in the moving knife. 2. Adjust the installing position of the moving knife so that the position where moving knife starts to come in contact with counter knife starts to come in contact with each other at the position of 5.5 to 6.5 mm from the top end of the moving knife. 3. Tighten the setscrews. <p>(Caution) • Operate the sewing machine with the knife pressure minimized to such an extent that both needle and bobbin threads can be trimmed.</p> <p>Initial position</p> <ul style="list-style-type: none"> • When the moving knife travels to its back end, the distance between the top end of the counter knife and the top end of the moving knife is 0.5 ± 0.2 mm. <p>(Check)</p> <ul style="list-style-type: none"> • At this time, check that driving arm comes in close contact with thread trimmer stopper plate . 	<p>When the knife pressure is high :</p> <ul style="list-style-type: none"> • Blade sections of the counter knife and the moving knife may be damaged. • Torque at the time of thread trimming is increased resulting in motor-stop. • Defective thread trimming operation will result. <p>When the knife pressure is low :</p> <ul style="list-style-type: none"> • Defective thread trimming will result.

Standard Adjustment

5) Thread trimmer solenoid

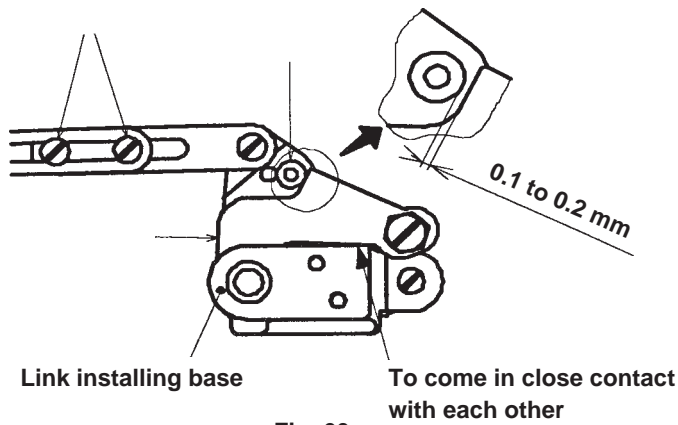


Condition

- Link installing base comes in close contact with thread trimmer driving plate.

Fig. 59

6) Thread trimmer cam



Condition

- Thread trimmer driving plate comes in close contact with link installing base.

Fig. 60

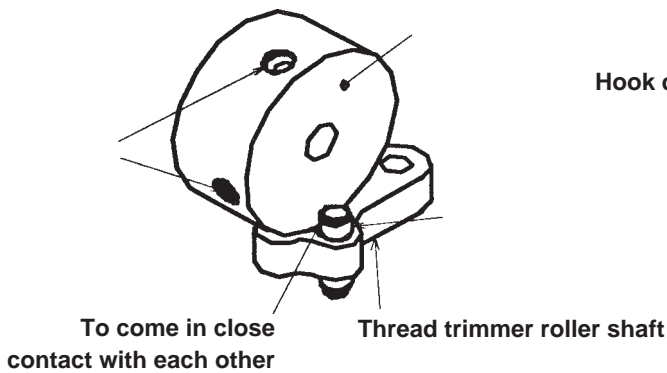


Fig. 61

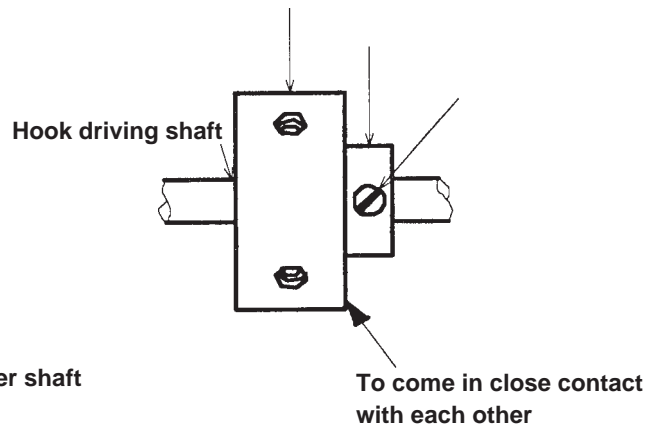


Fig. 62

Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen setscrews in the thread trimmer shaft connecting plate.</p> <p>2. Make link installing base come in close contact with thread trimmer driving plate .</p> <p>3. In this state, install solenoid connecting arm so that a clearance of 0.05 to 0.15 mm is provided between plunger stopper (roll pin) of the thread trimmer solenoid and solenoid main body .</p> <p>4. Tighten the setscrews in the connecting plate. (For connecting procedure, refer to “8) Connecting the driving arm and the thread trimmer roller arm” on page 31.)</p> <p>(Standard)</p> <ul style="list-style-type: none"> Distance between the end face of the thread trimmer solenoid and the solenoid connecting arm is 9 to 10 mm. <p>(Check)</p> <ul style="list-style-type: none"> Turn the handwheel by hand to actuate the thread trimmer and the state that the top end of the moving knife is aligned with the top end of the counter knife becomes the initial position. At this time, check that the clearance between the stopper of the thread trimmer solenoid and the solenoid main body is 0.05 to 0.15 mm. 	
<p>1. Loosen setscrews in the thread trimmer shaft connecting plate.</p> <p>2. Make a clearance of 0.1 to 0.2 mm between thread trimmer driving plate and cam roller .</p> <p>3. In this state, make the end face of thread trimmer cam come in close contact with cam roller , and temporarily tighten setscrews in the thread trimmer cam.</p> <p>4. Make safety clutch disk come in close contact with the thread trimmer cam, and securely tighten setscrew in the safety clutch disk.</p> <p>5. Tighten the setscrews in the connecting plate. (For connecting procedure, refer to “8) Connecting the driving arm and the thread trimmer roller arm” on page 31.)</p> <p>(Caution) • Install the thread trimmer cam in the state that the thread trimmer driving plate comes in close contact with the link installing base.</p>	

Standard Adjustment

7) Thread trimmer cam timing

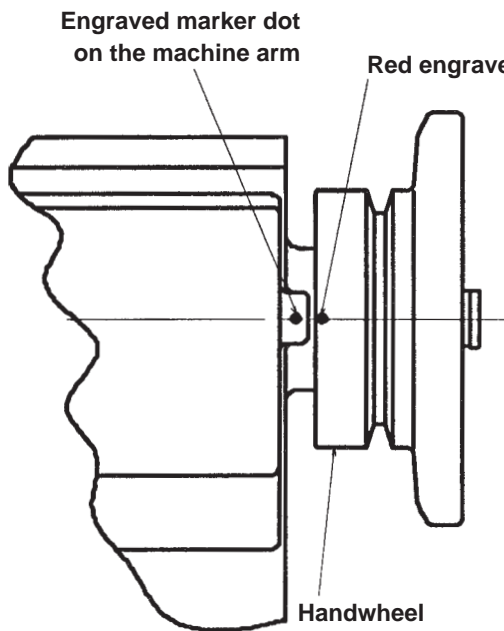


Fig. 63

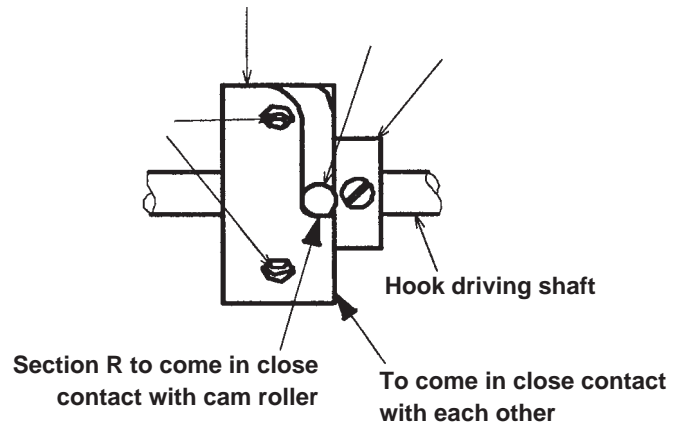


Fig. 64

Condition

- Engraved marker dot on the handwheel is aligned with engraved marker dot on the machine arm.

8) Connecting the driving arm and the thread trimmer roller arm

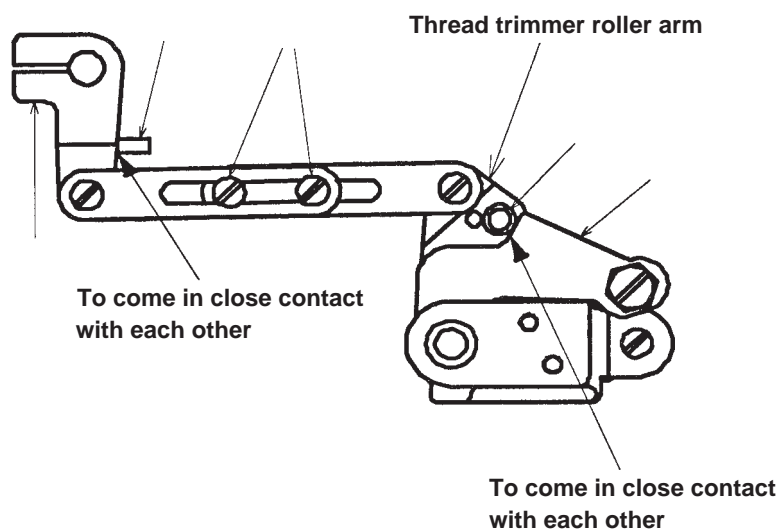


Fig. 65

Condition

- When the moving knife is positioned at the initial position. (Refer to the initial position on page 27.)

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Turn the handwheel to align the red engraved marker dot on the handwheel with the engraved marker dot on the machine arm. 2. Make thread trimmer cam come in close contact with safety clutch disk . 3. In this state, make the section R where cam groove starts to enter come in close contact with cam roller . 4. Securely tighten setscrews in the thread trimmer cam. <p>(Caution) • Check that the end face of the cam comes in close contact with the end face of the safety clutch disk.</p>	<p>When the timing is retarded :</p> <ul style="list-style-type: none"> • Thread trimming action does not complete even at the needle-up stop position and thread is not trimmed. <p>When the timing is advanced :</p> <ul style="list-style-type: none"> • Defective thread trimming will result. • Length of tread remaining on the needle after thread trimming cannot be secured and needle thread may slip off at the start of sewing or after thread trimming. • Stitch skipping at the start of sewing will result.
<ol style="list-style-type: none"> 1. Loosen setscrews in the thread trimmer shaft connecting plate. 2. Make driving arm come in close contact with thread trimmer stopper . 3. In this state, make cam roller come in close contact with thread trimmer driving plate . 4. Tighten the setscrews in the connecting plate. 	

4. INSTALLAION OF THE OPTIONAL PARTS

(1) Automatic reverse feed device

1) Removing the side plate

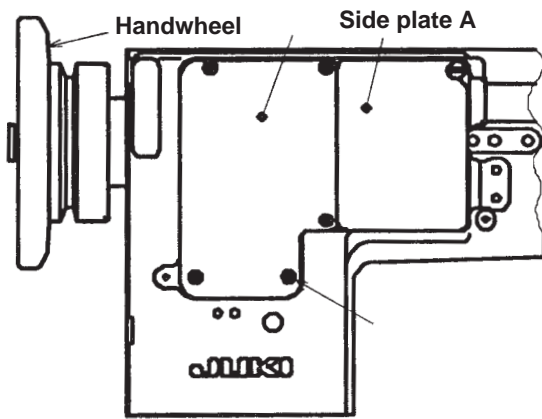


Fig. 66

2) Removing the reverse feed control lever

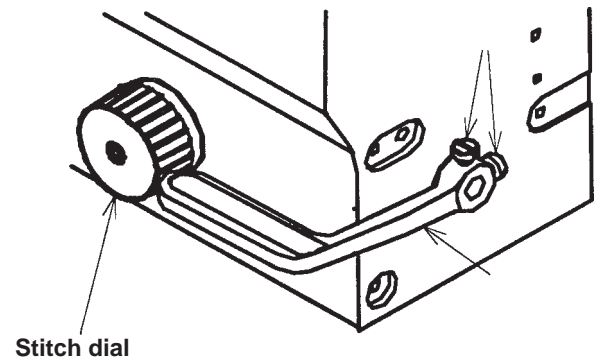


Fig. 67

3) Installing the reverse feed link hinge screw

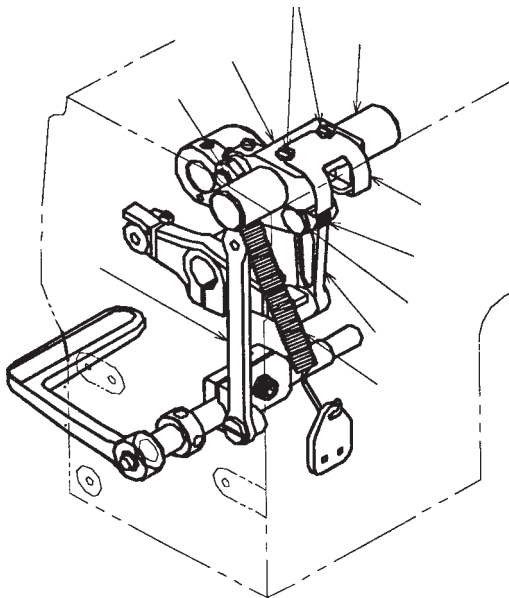


Fig. 68

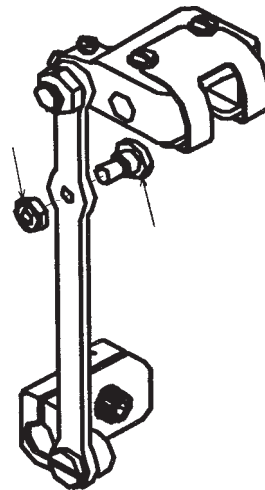


Fig. 69

Installing procedure

Removing procedure

1) Removing the side plate

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

2) Removing the reverse feed control lever

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

Removing parts list

Note	No.	Part No.	Name of part	Q'ty
	1	SS4110815SP	Side plate B setscrew	5
	2	21331806	Side plate B	1
	3	21332002	Side plate B gasket	1
	4	SS6120930SP	Reverse feed control lever setscrew	2
	5	22610505	Reverse feed control lever	1

(Caution) 1. Parts with mark are parts which are used even after replacement.

2. Part with mark is an exclusive part for the machine without automatic reverse feed device.

3) Installing the reverse feed link hinge screw

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

Attaching parts list of the 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

Installing procedure

4) Installing the reverse feed control lever

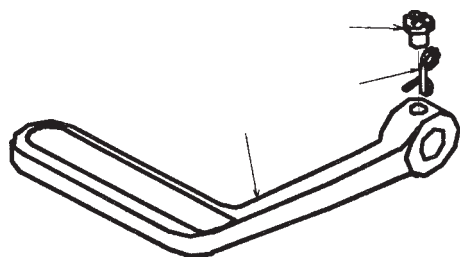


Fig. 70

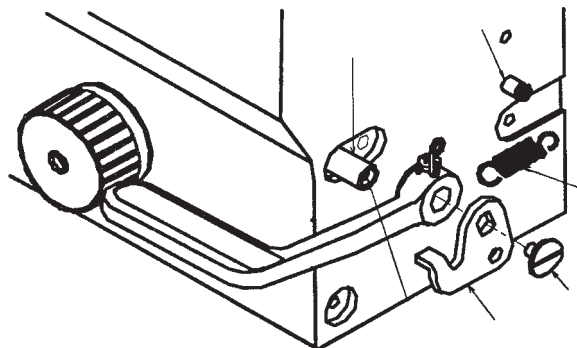


Fig. 71

5) Installing the automatic reverse feed device

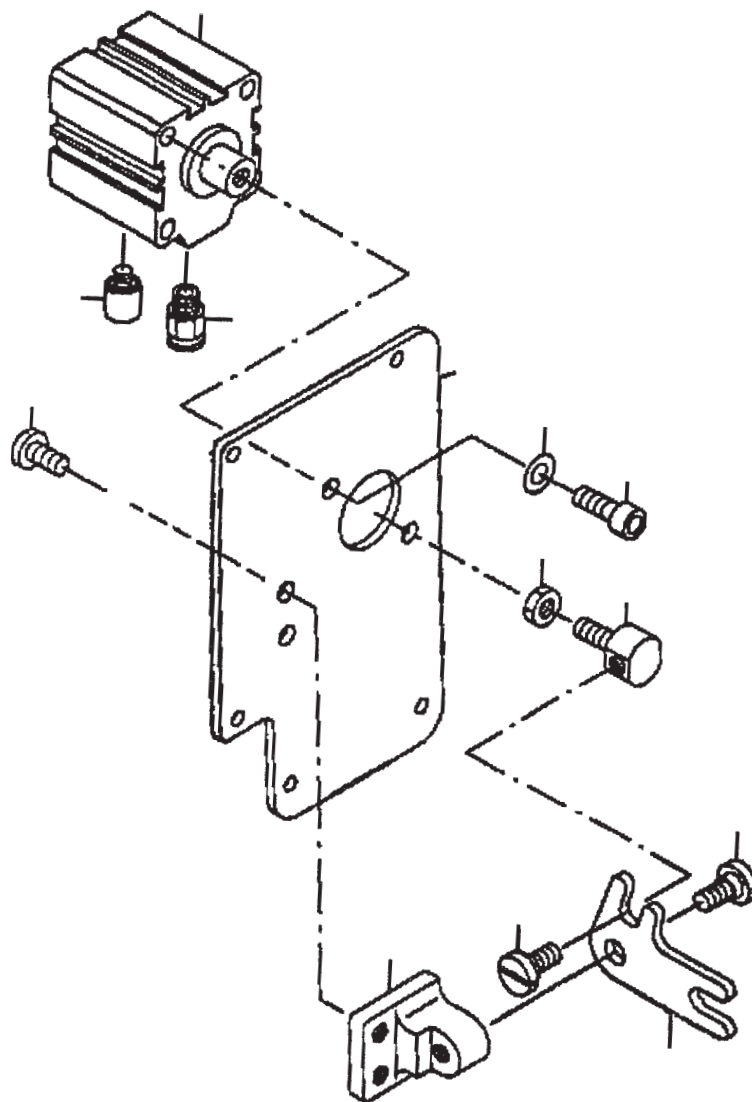


Fig. 72

Installing procedure

4) Installing the reverse feed control lever

1. Install lever spring bracket to reverse feed control lever with setscrew .
2. Install reverse feed control lever stopper to the machine arm with setscrew .
3. Install lever return spring bracket to the machine arm.
4. Insert the reverse feed control lever into the reverse feed control lever shaft, and install reverse feed shaft link with push screw .
(Install so that the projection of the reverse feed shaft link enters under the reverse feed control lever.)
5. Hook lever return spring to the lever spring bracket and the tension spring bracket.
6. Adjust the position of the reverse feed control lever.
For the adjusting procedure, refer to "14) Position of the reverse feed control lever" on page 19.

5) Installing the automatic reverse feed device

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

Installing procedure

6) Installing the touch-back switch

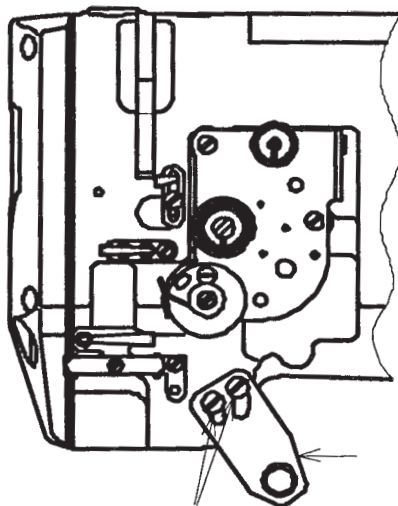


Fig. 73

7) Installing the pneumatic components

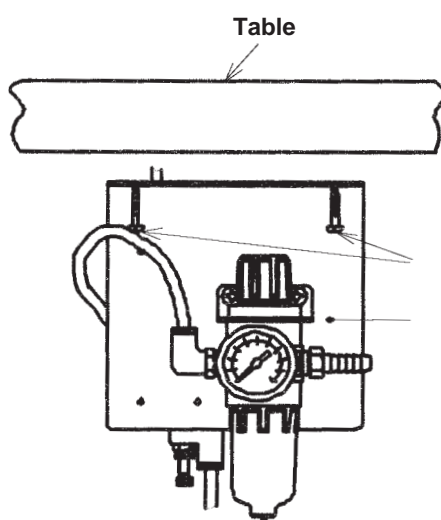


Fig. 74

1. Install the pneumatic components on the table with setscrews .
2. Connect the pneumatic components with the air hose.

Standard Adjustment

Attaching parts list of the reverse feed control lever (List 2)

Note	No.	Part No.	Name of part	Q'ty
	1	22656003	Lever spring suspension	1
	2	SS4120615SP	Lever spring suspension setscrew	1
	3	11100500	Reverse feed control lever stopper	1
	4	SS7112420SP	Reverse feed control lever stopper setscrew	1
	5	10120004	Lever return spring suspension	1
	6	22656102	Reverse feed shaft link	1
	7	SS7120760SP	Reverse feed shaft link push screw	1
	8	13515606	Lever return spring	1
	9	WP0502616SD	Reverse feed control lever stopper screw washer	1

Attaching parts list of the 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 B	1
	11	SS7151210SP	Reverse feed link installing base setscrew	2
	12	WP0641601SD	Reverse feed link installing base setscrew washer	2
	13	SM6061602TP	Reverse feed cylinder setscrew	2

Attaching parts list of the 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

Attaching parts list of the pneumatic components (List 5)

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

Set part No. of the automatic reverse feed device

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

(Caution) This part No. means the set part No. of the parts from List 1 to List 5.

Installing procedure

6) Installing the touch-back switch

1. Install touch-back switch with switch installing plate setscrews .

Installing parts list

Note	No.	Part No.	Name of part	Q'ty
	1	21348552	Automatic reverse feed device set	1
	2	21348909	Side plate D	1
	3	PA320150200	Reverse feed cylinder	1
	4	SM6061602TP	Reverse feed cylinder setscrew	2
	5	WP0641601SD	Reverse feed cylinder setscrew washer	2
	6	21348602	Cylinder connecting screw	1
	7	NM6060003SC	Cylinder connecting screw nut	1
	8	21348503	Reverse feed link installing base	1
	9	SS7151210SP	Reverse feed link installing base setscrew	2
	10	21348701	Reverse feed link	1
	11	SD0800352SP	Reverse feed link hinge screw	2
	12	PJ301065104	Straight joint	1
	13	PX015101000	Muffler	1
	14	SD0800402TP	Reverse feed link hinge screw	1
	15	NS6150430SP	Reverse feed link hinge screw nut	1
	16	22656102	Reverse feed shaft link	1
	17	SS7120760SP	Reverse feed shaft link push screw	1
	18	22656003	Lever spring bracket	1
	19	SS4120615SP	Lever spring bracket setscrew	1
	20	13515606	Lever return spring	1
	21	10120004	Lever return spring bracket	1
	22	11100500	Reverse feed control lever stopper	1
	23	SS7112420SP	Reverse feed control lever stopper setscrew	1
	24	21348859	Touch-back switch	1
	25	SS7110840SP	Switch installing plate setscrew	2

(2) Automatic presser foot lifter

1) Assembling the automatic presser foot lifter

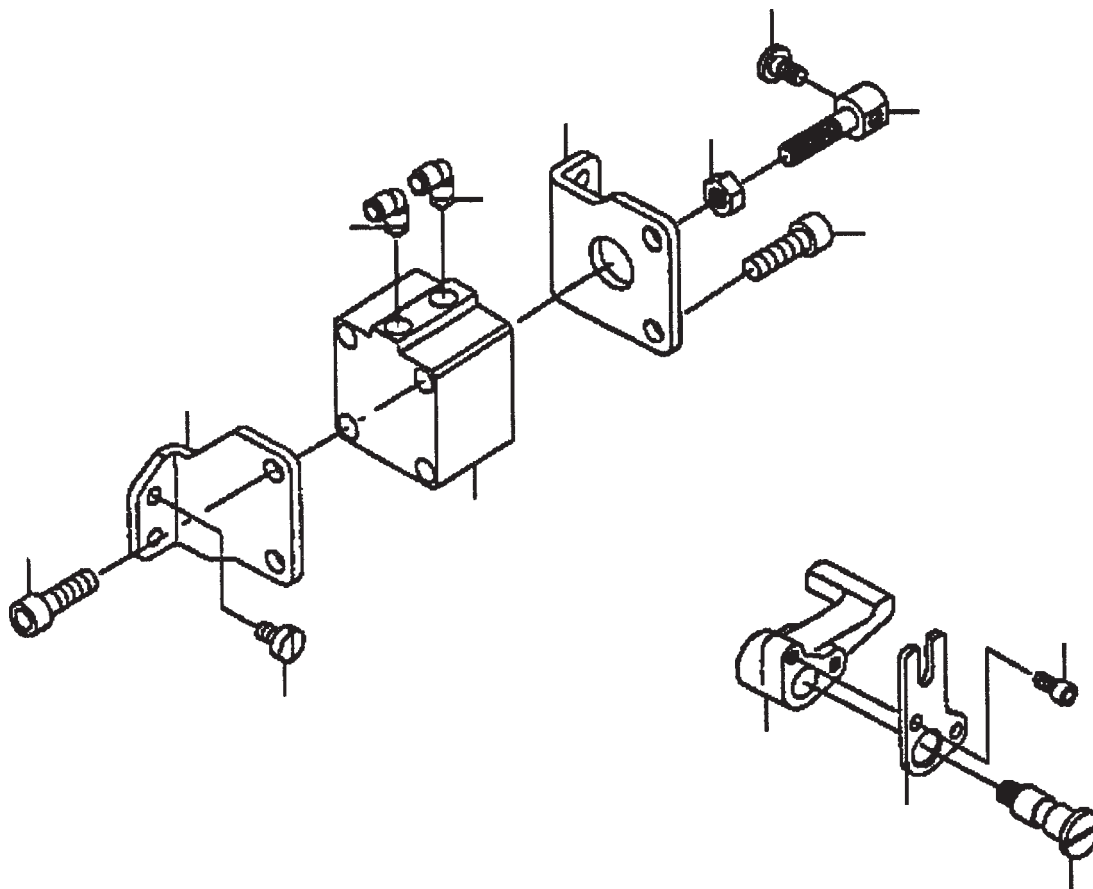


Fig. 75

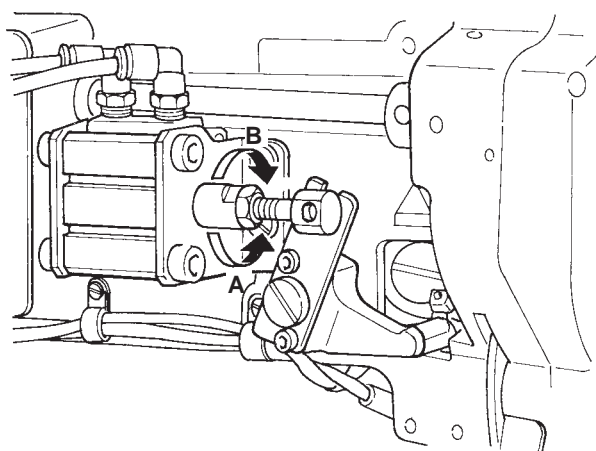


Fig. 76

Installing procedure

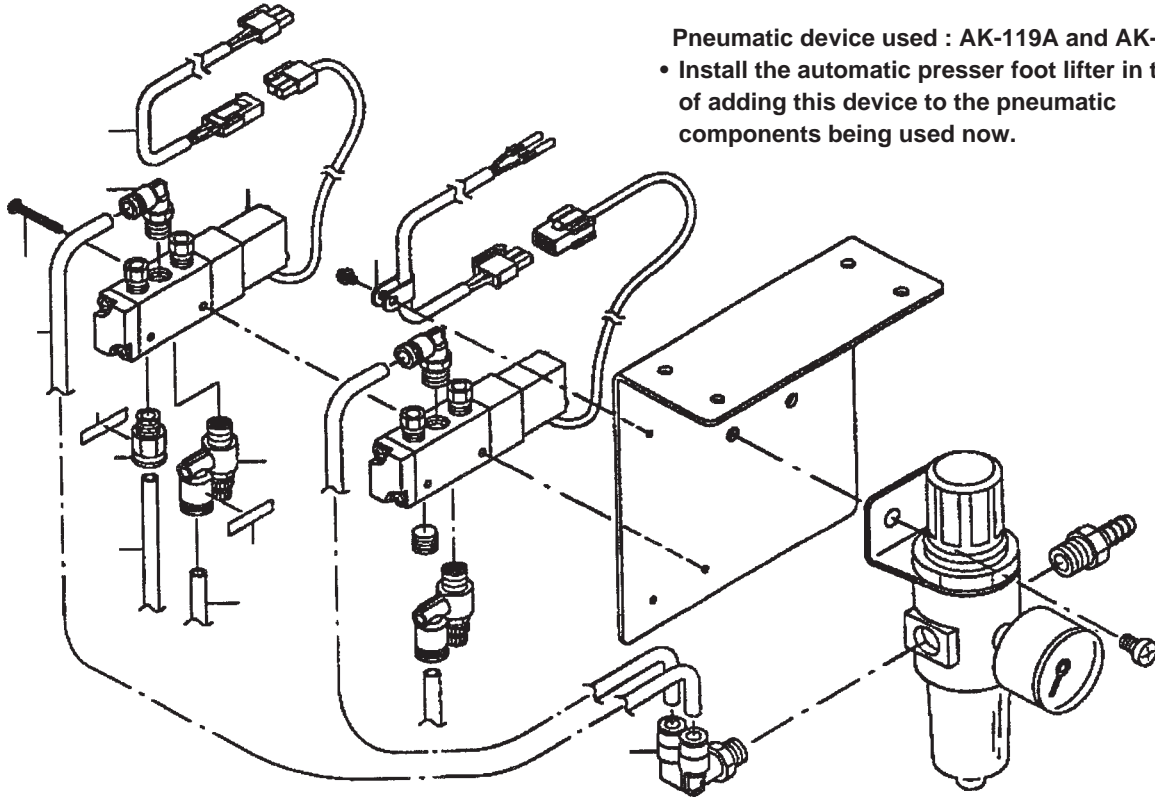
1) Installing procedure of the automatic presser foot lifter after set-up of the machine

1. Remove the side plate located on the anti-operator's side of the machine arm.
2. Install elbows to automatic presser foot lifter cylinder .
3. Install the cylinder connecting screw to the presser foot lifter cylinder.
For the standard, adjust the distance from the end face of piston rod of the presser foot lifter cylinder to the end face of the cylinder connecting screw to 24 mm, and tighten the nut.
4. Tighten cylinder stay, front and cylinder stay, rear to the presser foot lifter cylinder with setscrew .
5. Install the presser foot lifter cylinder which has been assembled at the above step 4. to the machine arm with setscrews .
6. Assemble automatic presser foot lifter lever B with automatic presser foot lifter lever A .
(Insert automatic presser foot lifter lever shaft into the holes of both levers and tighten with hexagon headed bolt .)
7. Install the automatic presser foot lifter lever A which has been assembled at the above step 6. to the machine arm with the automatic presser foot lifter lever shaft.
(Groove of the automatic presser foot lifter lever B enters the hinge screw attached to the cylinder connecting screw.)
8. Install pneumatic components.
For the LU-1510-7, add the device for presser foot lifter to the pneumatic components being used now.
For the models other than LU-1510-7, install the pneumatic components (asm.).
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 ± 0.5 mm.
When adjustment is required, remove the automatic presser foot lifter lever shaft and the automatic presser foot lifter lever A, loosen the nut, and turn the cylinder connecting screw.
(Turning in the direction of A will decrease the distance, or in the direction of B will increase it.)
After the completion of adjustment, tighten the nut.
10. Make sure that a clearance of 0.5 to 1.5 mm is provided between the automatic presser foot lifter lever A and the thread release supporting plate when the presser foot is lowered.
11. For the kit A, tighten the knee switch with wood screw.

Installing procedure

2) Installing the pneumatic device components

When installing the automatic presser foot lifter to LU-1510-7 after set-up of the machine

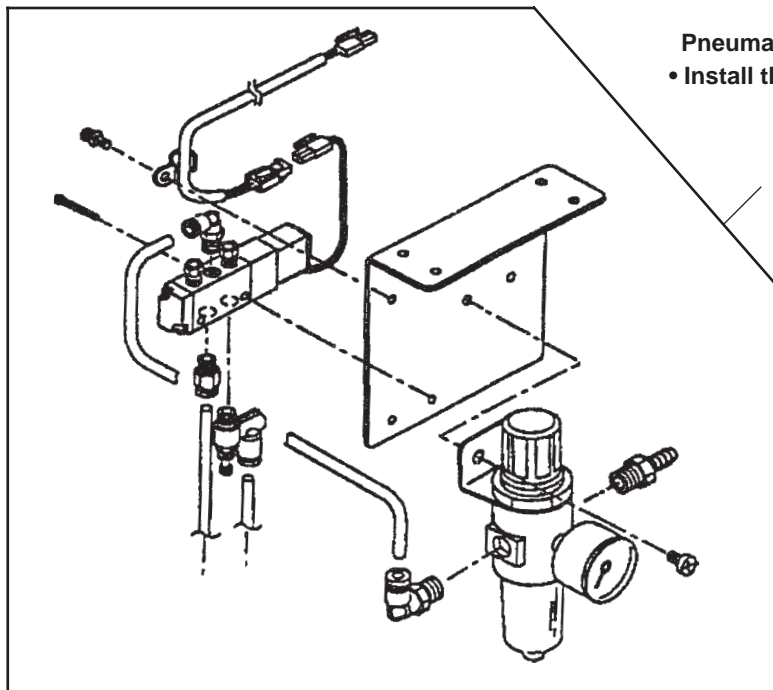


Pneumatic device used : AK-119A and AK-119B

- Install the automatic presser foot lifter in the state of adding this device to the pneumatic components being used now.

Fig. 77

When installing the automatic presser foot lifter to LU-1510, LU-1508 and LU-1508H after set-up of the machine



Pneumatic device used : AK-120K and AK-120B

- Install the pneumatic components (asm.) as listed.

Specifications of the pneumatic device

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

Fig. 78

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

Installing parts list

• Automatic presser foot lifter components (for all models)

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	21656803	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 (in case of LU-1510-7)

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 (in case of LU-1510, LU-1508 and LU-1508H)

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

• Kit A (knee lifter switch)

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

5. PORTION TO WHICH LOCKTITE IS APPLIED

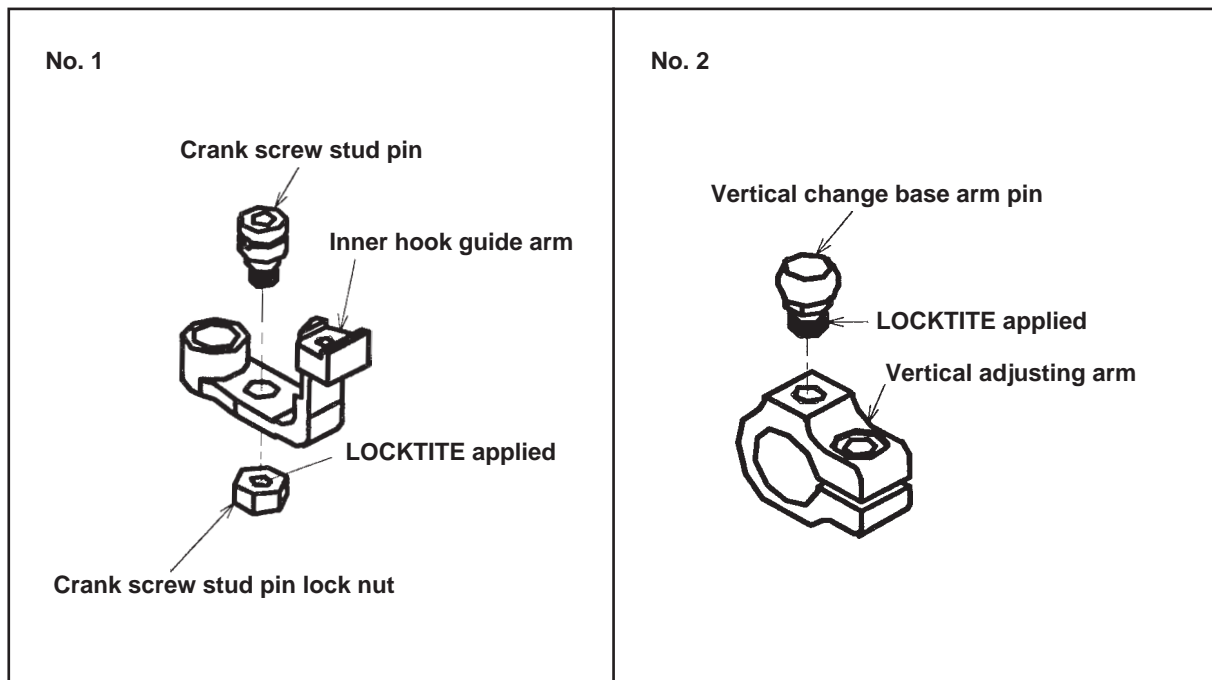
LOCKTITE has been applied to the following parts at the time of assembly at the factory.

When an assembly which includes the aforementioned parts has been disassembled, be sure to wash the LOCKTITE applied part using a paint thinner or the like, and re-assemble 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	Crank screw stud pin	NS6110420SP	LOCKTITE #242
2	Vertical change base arm pin	10715308	LOCKTITE #638

(Note) Avoid disassembling to the utmost.



6. SELECTIVE PARTS AND CONSUMABLE PARTS

For LU-1510

Name of selective part	Part No.	Marking	Remarks
Hook shaft upper bushing thrust washer	22614002	A	t=1.9 mm
Ditto	22614101	B	t=2.0 mm (standard)
Ditto	22614200	C	t=2.1 mm
Ditto	22614309	D	t=2.2 mm
Ditto	22614408	E	t=2.3 mm
Ditto	22614507	F	t=2.4 mm

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

For LU-1510-7

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

Consumable part	Part No.	Remarks
Needle	MC372001600	SCHMETZ 135x17 Nm 160
Hook (asm.)	21334552	
Bobbin	21334800	Aluminum bobbin (with knurl)
Counter knife base (asm.)	21354857	(With moving knife, counter knife and clamp spring)
Moving knife	10726305	
Counter knife	10726404	
Clamp spring	10726909	

For LU-1508

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

Hook shaft upper bushing thrust washer is the same as that for LU-1510. (See the above table.)

For LU-1508H

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

Hook shaft upper bushing thrust washer is the same as that for LU-1510. (See the above table.)

7. ENGRAVED MARKER DOTS ON THE HANDWHEEL

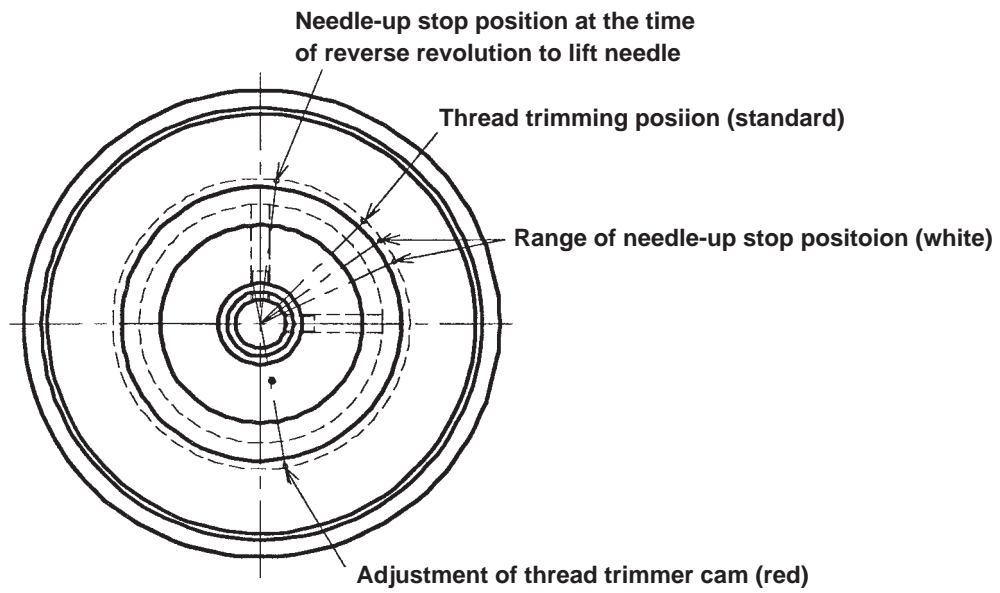


Fig. 79

8. PIPING DIAGRAM (LU-1510 AND LU-1510-7)

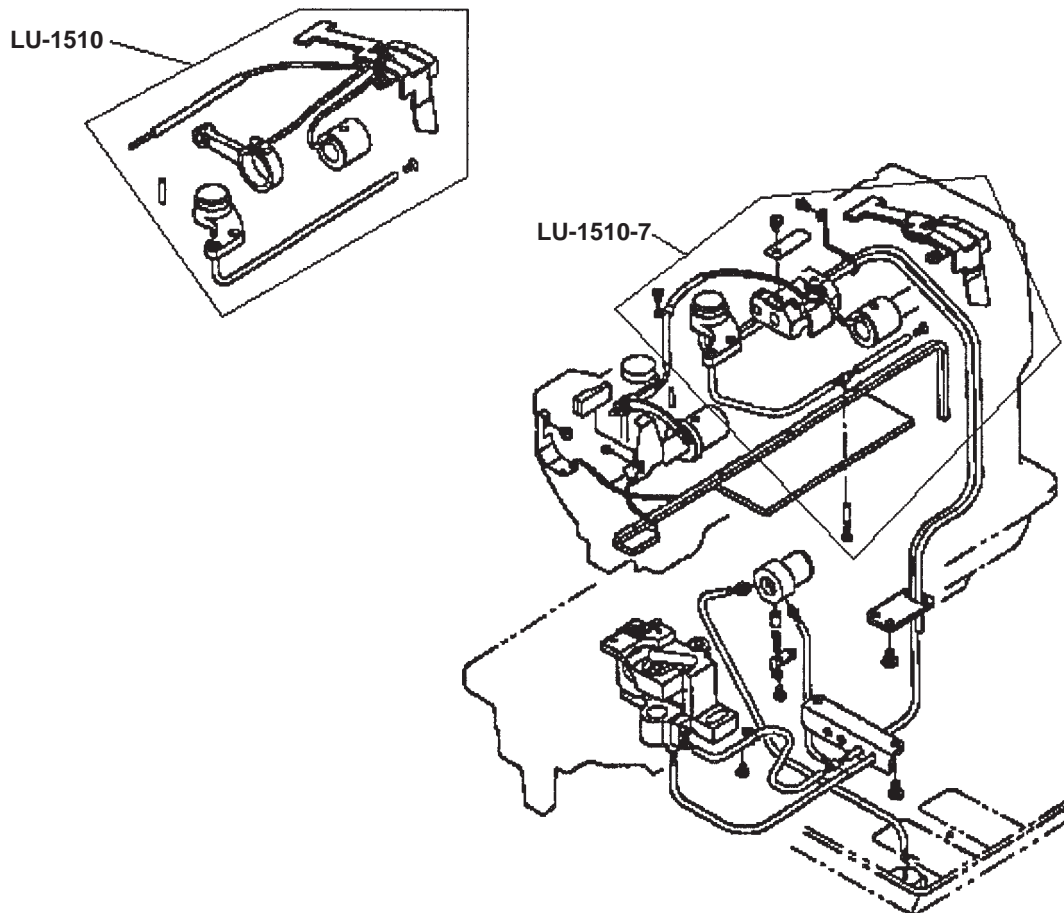


Fig. 80

9. TABLE OF TROUBLES IN SEWING AND CORRECTIVE MEASURES

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 "Needle-to-hook timing" on page 9.
	Clearance of inner hook guide is too large.	Check the clearance.	Decrease the clearance. Refer to "Adjusting the inner hook guide" on page 7.
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 the spring and increase the stroke of the spring.
	Feed timing is not proper.		Refer to "Main shaft-to-hook driving shaft timing" on page 11.
	Timing between the needle and the hook is excessively advanced or retarded.	Check the specified dimension.	Refer to "Needle-to-hook timing" on page 9.
	Thread melts due to needle heat.		Decrease the sewing speed. Use silicone oil.

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 "Needle-to-hook timing" on page 9.
	Needle-to-hook timing is excessively advanced or retarded.	Check the specified dimension.	Refer to "Needle-to-hook timing" on page 9.
	Presser foot is rising. (Pressure of the presser foot is too low.)	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 "Needle-to-hook timing" on page 9.
	Blade point of the hook is blunt.	Check the blade point of the hook.	Correct the blade point 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 "Needle-to-hook timing" on page 9.
	Thread take-up spring works excessively or the stroke of the spring is too small.		Decrease the tension of the spring and increase the stroke of the spring.
	Feed timing is not proper.		Refer to "Main shaft-to-hook driving shaft timing" on page 11.

Troubles	Causes	Checking	Corrective measures
3. Loose stitches (Balloon stitches or isolated idling-loop)	Clearance of the inner hook guide is too large.	Check the clearance.	Refer to "Adjusting the inner hook guide" on page 7.
	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 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 "Height of the feed dog" on page 5. Lower the height by 0.2 mm than the standard value.
	Feed timing is excessively advanced.		Retard the feed timing.
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)

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 the bobbin thread tension.	Replace the bobbin or hook.
	Bobbin thread tension is too low.		Increase the tension of the bobbin thread.
	Bobbin has been wound too tightly or too weakly.	Check the state of bobbin winding.	Decrease the tension applied to the bobbin winder or increase it.

Adjustment of the thread take-up spring

- Irregular stitches will be improved when decreasing the tension and the stroke.

* When using LU-1508H with the electro-motor, the correct stop-position cannot be obtained and trouble in sewing may occur since the inertia force of the handwheel is large.
In this case, use the motor with the stop-position at 1 Pos or replace the handwheel with "21332804".

10. TRABLE OF TROUBLES IN THREAD TRIMMING AND CORRECTIVE MAESURES

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 thread tensin is not applied to the needle thread.
		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 "Thread trimmer cam timing" on page 31.
		There are scratches on the moving knife and the hook.	Polish with buff or replace the part.
	Bobbin thread is not clamped.	Position of the clamp spring	Refer to "Position of the counter knife and the clamp spring" on page 25.
		Pressure of the clamp spring is too low.	Refer to "Position of the counter knife and the clamp spring" on page 25.
		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.

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" on page 50.	
	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.		
3. Defective thread trimming	Thread cannot be trimmed.	The blades of moving knife and counter knife have been improperly adjusted.	Refer to "Position of the counter knife and the clamp spring" on page 25.	
		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 "Adjusting the knife pressure" on page 27.	
	Thread remains uncut after thread trimming.	The blades of moving knife and counter knife have been improperly adjusted.	Refer to "Position of the counter knife and the clamp spring" on page 25.	
		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 "Thread trimmer cam timing" on page 31.	
		Pressure of the counter knife is insufficient.	Refer to "Adjusting the knife pressure" on page 27.	
	Moving knife stops during operation.	Thread is too thick.	Use thread within the specified value.	
		Thread trimming timing is excessively retarded.	Refer to "Thread trimmer cam timing" on page 31.	
		Tension of the needle thread is too high.	Decrease the tension of the tension controller No. 1.	
	To the next page			

Troubles	Causes	Checking	Corrective measures
		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 "Adjusting the knife pressure" on page 27.
		Initial position of the moving knife is placed excessively in the front.	Refer to "Thread trimmer cam timing" on page 31.
		Thread is not cut sharply.	Refer to Causes "Thread cannot be trimmed" and "Thread remains uncut after thread trimming" on page 51.
	Needle thread is not caught.	Stitch skipping at the last stitch	Refer to "Needle-to-hook timing" on page 9.
		Check the thread trimmer cam timing.	Refer to "Thread trimmer cam timing" on page 31.
		Top end of the moving knife has broken or been scratched.	Replace the moving knife with a new one.
	Bobbin thread is not caught.	Stroke of the moving knife is small.	Adjust the initial position of 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.
	Both needle and bobbin threads cannot be trimmed.	The blades of moving knife and counter knife have been improperly adjusted.	Refer to "Adjusting the knife pressure" on page 27.
		Pressure of the counter knife is too low.	Refer to "Adjusting the knife pressure" on page 27.
		Moving knife fails to work.	Adjust the synchronizer timing.
			Replace the thread trimmer solenoid.

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