

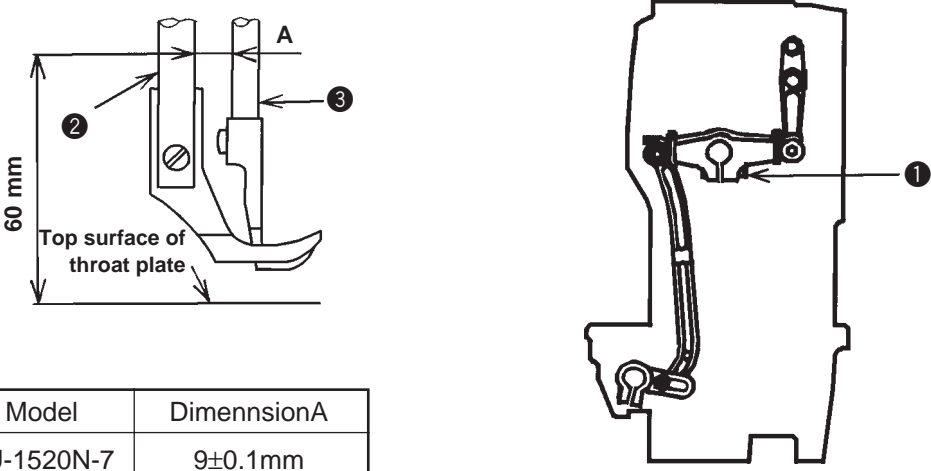
1. SPECIFICATIONS

No.	Item	Specifications
1	Model	LU-1520N-7
2	Model name	1-needle, unison feed, lockstitch machine with automatic thread trimmer (Needle thread roll-in and shorter-thread remaining type)
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	Ellipse feed
17	Top and bottom feed actuation mechanism	Timing belt
18	Thread trimming mechanism	Air cylinder + cam-driven scissors type
19	Needle thread roll-in mechanism	Threading by air cylinder + thread presser type
20	Automatic presser foot lifter mechanism	Air cylinder type
21	Lubrication	Automatic lubrication (partially by manual)
22	Lubricating oil	JUKI New Defrix Oil No. 2
23	Cylinder bed diameter	517 mm x 178 mm
24	Free space for sewing	255 mm x 99 mm
25	Size of handwheel	V belt effective diameter : \varnothing 93.3 mm Outer diameter : \varnothing 160 mm
26	Motor	SC-380

2. STANDARD ADJUSTMENT

(1) Needle entry position

Standard Adjustment



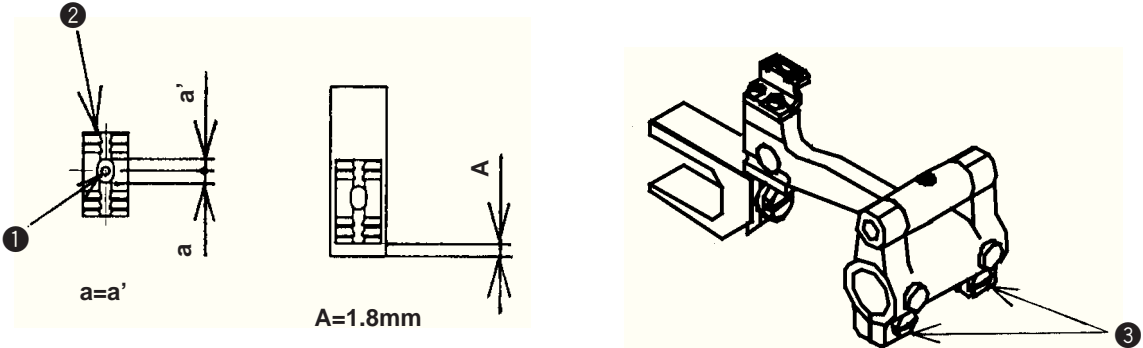
Model	DimenensionA
LU-1520N-7	9±0.1mm

Conditions

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

(2) Longitudinal position of the feed dog

Standard Adjustment



Conditions

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

A = Clearance between the feed dog and the throat plate when the feed amount is maximum and the feed dog travels fully to the front

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Turn the handwheel to bring the needle bar to the lowest dead point of its stroke. 3. Loosen clamping screw ❶ in the needle bar rocking rear arm. 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. Then securely tighten clamping screw ❶ in the needle bar rocking rear arm. <p>(Caution) Tighten the screw so that the needle bar rocking shaft has no thrust play.</p>	<ul style="list-style-type: none"> ○ Stitch skipping or needle breakage will result. ○ Poorly tensed stitches will result.

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Turn the handwheel to bring the needle bar to the lowest dead point of its stroke. 3. Loosen clamping screw ❸ in the feed rocker. 4. Move the feed base 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') <p>Checking method</p> <ol style="list-style-type: none"> 1. Set the stitch dial to the maximum. 2. Turn the handwheel and check that clearance A in terms of the groove of the throat plate is 1.8 mm when feed dog ❷ travels fully to the front. <p>In addition, 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 rear.</p> <p>(Standard) When the feed amount is maximum, A = approximately 1.8 mm.</p>	<ul style="list-style-type: none"> ○ 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. ○ Irregular stitches may result.

(3) Lateral position of the feed dog

Standard Adjustment

a a' $a=a'$

Conditions

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

A B Adjust the position to almost $A = B$.

(4) Height of the feed dog

Standard Adjustment

Model	Dimension A
LU-1520N-7	0.4 to 0.5 mm

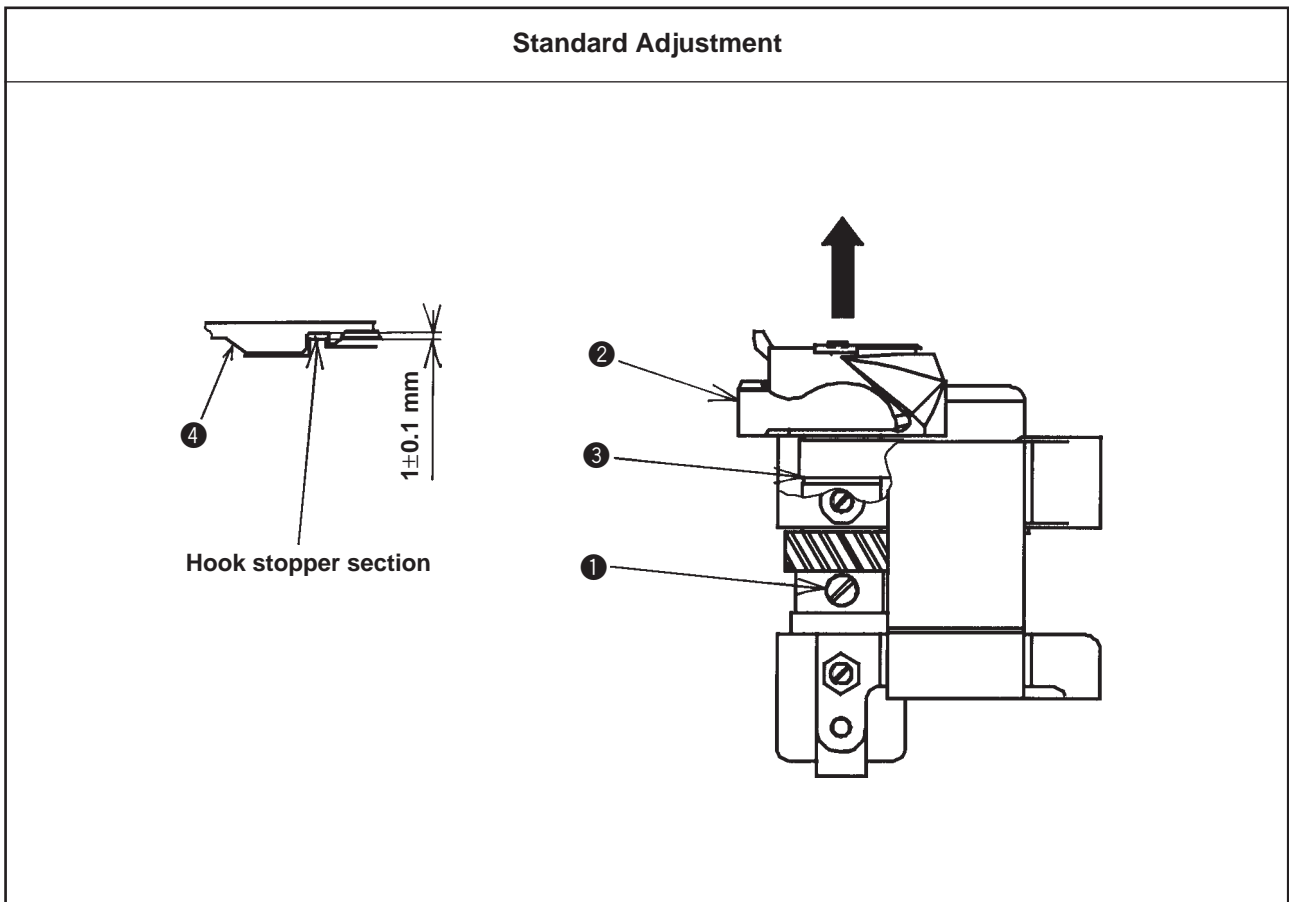
Conditions

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

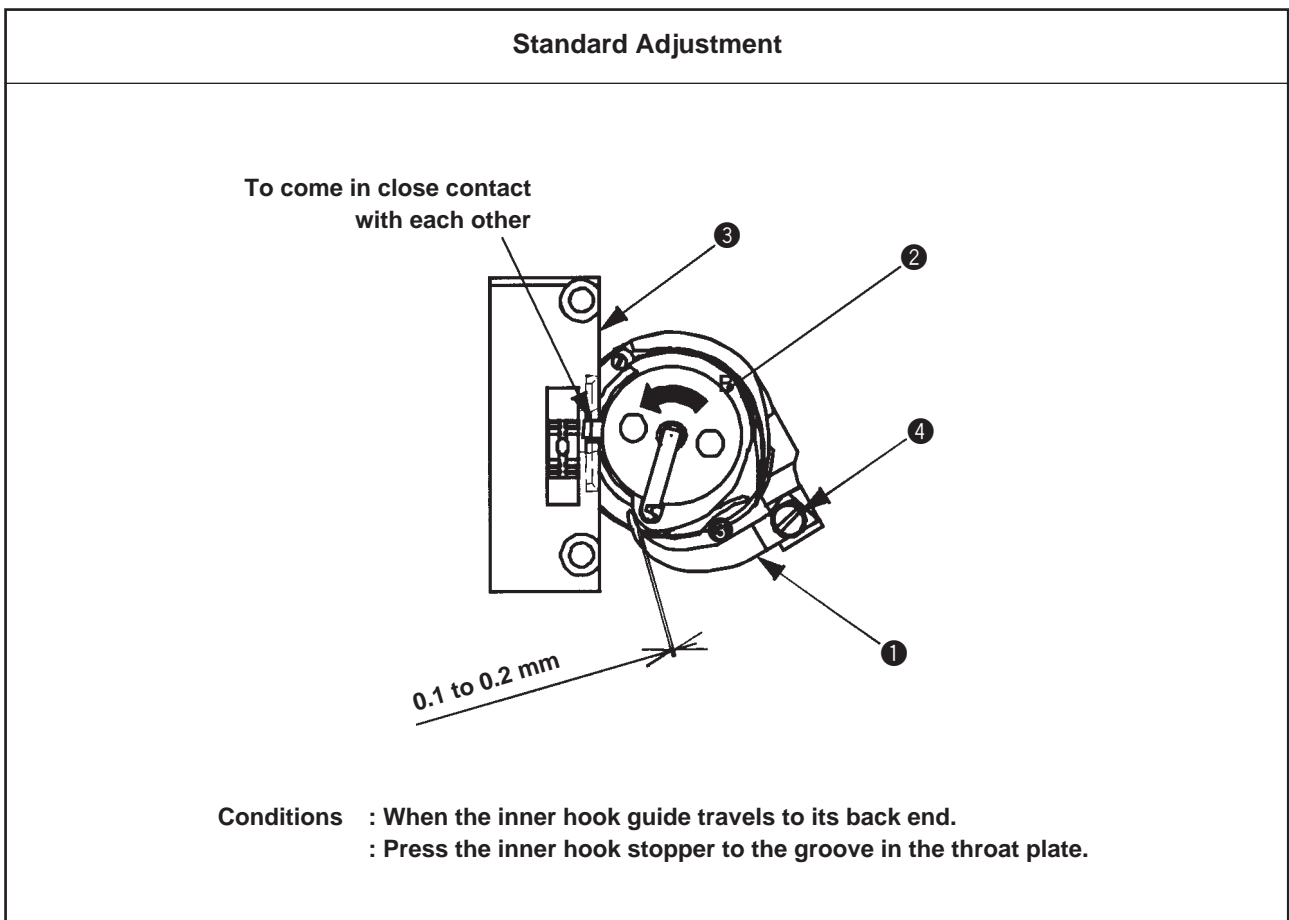
Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Turn the handwheel to bring the needle bar to the lowest dead point of its stroke. 3. Loosen clamping screw ③ in the feed rocker. 4. Move the feed base and adjust so that needle ①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

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the stitch dial to "0". 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.) 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. 	<p>When the height of the feed dog is higher than the specified value :</p> <ul style="list-style-type: none"> ○ Stitch pitch becomes larger than the scale of the feed dial. ○ Balloon stitches will result. ○ Return of sewing product will occur. ○ Feed dog comes in contact with the knife, and the knife and the feed dog may be damaged. <p>When the height of the feed dog is lower than the specified value :</p> <ul style="list-style-type: none"> ○ Stitch pitch becomes smaller than the scale of the feed dial. ○ Feed force will be deteriorated.

(5) Height of the hook



(6) Adjusting the inner hook guide

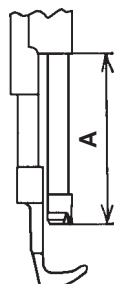
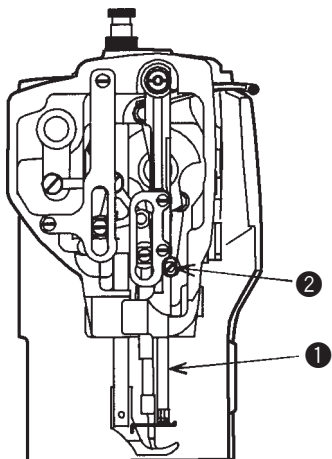


Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen two setscrews ❶ in the screw gear (small). 2. Draw out hook ❷ in the direction of the arrow. (At this time, bring No. 1 screw of setscrews ❶ to the front of the operator.) 3. Replace thrust plate ❸ and adjust so that a clearance of 1 ± 0.1mm 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".) 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.) 	<ul style="list-style-type: none"> ○ Stitch skipping or thread breakage will result. ○ Needle breakage will result. ○ Irregular stitches will result.

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Turn the handwheel to bring inner hook guide ❶ to its back end position. 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. 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 0.1 to 0.2 mm. 4. After the adjustment, securely tighten setscrew ❹ in the inner hook guide arm. 	<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.

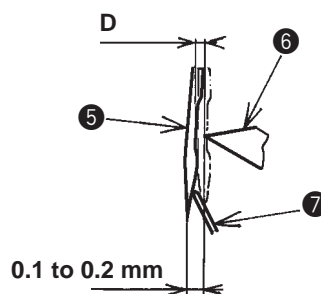
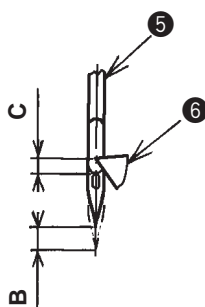
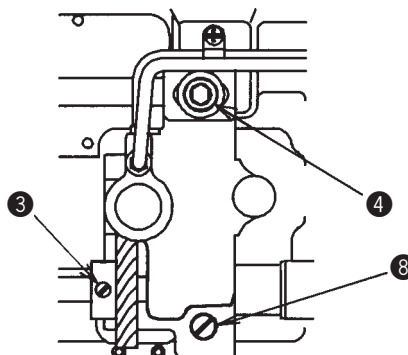
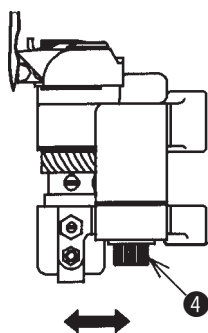
(7) Needle-to-hook timing

Standard Adjustment



Model	Dimension A
LU-1520N-7	58.7 mm

Standard : Engraved marker line on the upper side of needle bar



Conditions : Feed amount : 0 mm
 : Needle bar rises from the lowest dead point of its stroke.

Model	Dimension B	Dimension C	Dimension D
LU-1520N-7	2.3±0.2 mm	1.5±0.2 mm	0.05 to 0.1 mm

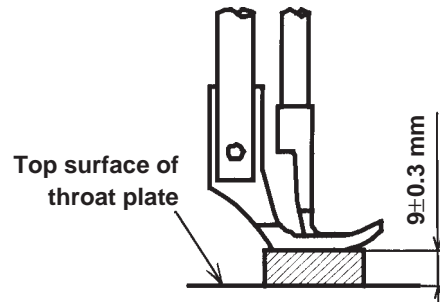
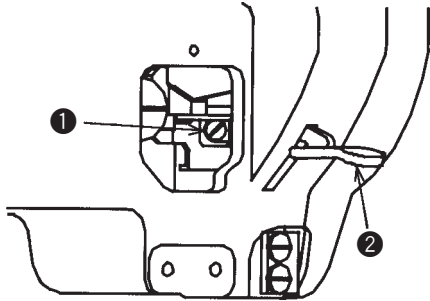
Standard of dimension B : Engraved marker line on the lower side of needle bar

Adjustment Procedures	Results of Improper Adjustment
<p>1) Standard of the lowest dead point of the needle bar</p> <ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Turn the handwheel to bring needle bar ❶ to the lowest dead point of its stroke. 3. Loosen the setscrew in the face plate to remove the face plate. 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. 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. <p>2) Needle-to-blade point of hook timing</p> <ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Loosen two setscrews ❸ in the screw gear (large). 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. 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. 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. 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. <p>3) Adjusting the needle guard of the hook</p> <ol style="list-style-type: none"> 1. Bend needle guard ❷ and adjust so that the needle guard ❷ comes in contact 0.1 to 0.2 mm with the needle. <p>(Caution)</p> <ol style="list-style-type: none"> 1. After tightening the hook shaft screw gear, check that the hook shaft has no thrust play. 2. Check that the hook shaft screw gear has backlash. 	<ul style="list-style-type: none"> ○ Stitch skipping or thread breakage will result. ○ Loose stitches will result.

(8) Lift of the presser foot

Standard Adjustment

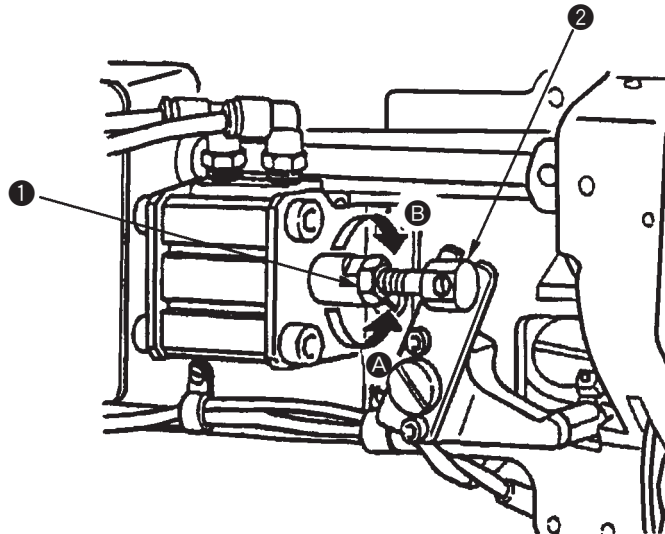
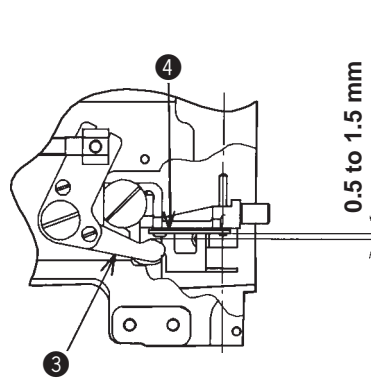
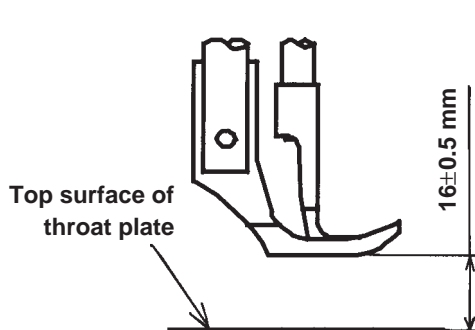
1) Hand lifter



Condition

- State that the hand lifter is raised

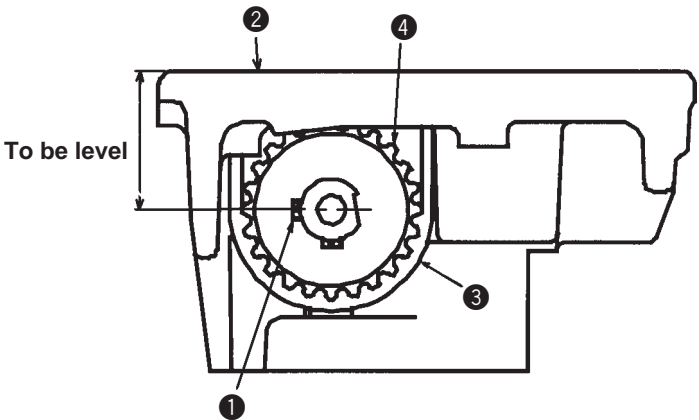
2) Automatic presser foot lifter



Adjustment Procedures	Results of Improper Adjustment
<p>1) Hand lifter</p> <ol style="list-style-type: none"> Loosen clamping screw ❶ in the presser bar bracket to set the hand lifter ❷ to the raised state. Adjust the lifting amount to 9 ± 0.3 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. Tighten clamping screw ❶ 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. 	<p>When the lifting amount is higher than the specified value :</p> <ul style="list-style-type: none"> 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. <p>When the lifting amount is lower than the specified value :</p> <ul style="list-style-type: none"> The presser foot is not sufficiently raised and the working property may be deteriorated.
<p>2) Automatic presser foot lifter</p> <ol style="list-style-type: none"> 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 16 ± 0.5 mm. <ul style="list-style-type: none"> Turn in the direction A → Lifting amount is increased. Turn in the direction B → Lifting amount is decreased. <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"> 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. <p>When the lifting amount is lower than the specified value :</p> <ul style="list-style-type: none"> The presser foot is not sufficiently raised and the working property may be deteriorated.

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

Standard Adjustment



To be level

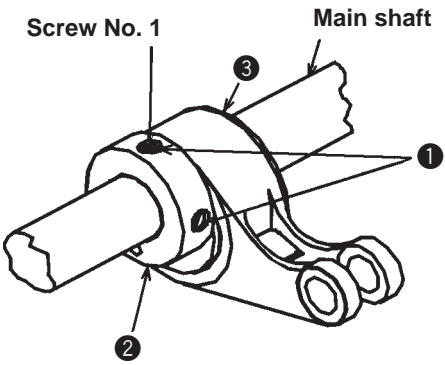
Conditions

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

(10) Feed cam timing

Standard Adjustment

1) Horizontal feed cam timing



Screw No. 1

Main shaft

Conditions

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

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

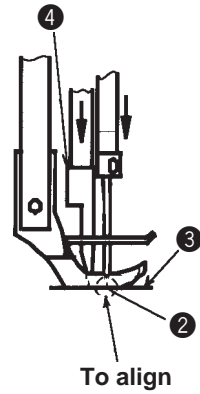
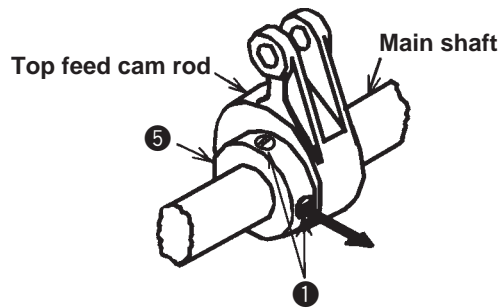
Adjustment Procedures	Results of Improper Adjustment
<p>1) Horizontal feed cam timing</p> <ol style="list-style-type: none"> 1. Set the stitch dial to the maximum. 2. Loosen two setscrews ① in the horizontal feed eccentric cam. 3. Turn the handwheel to bring the needle bar to the lowest dead point of its stroke. 4. Turn feed eccentric cam ② and adjust the timing so that the feed dog no longer moves even when the reverse feed control lever is moved. 5. Securely tighten two setscrews ① in the horizontal feed eccentric cam. <p>(Standard) The setscrew No. 1 in the horizontal feed eccentric cam faces almost right above at the lowest dead point of the needle bar.</p> <p>(Caution)</p> <ol style="list-style-type: none"> 1. If the cam slips in the axial direction at the time of adjustment, torque becomes heavy. So, be careful. 2. Adjust the horizontal feed rod so that it comes almost in the center between the edge of horizontal feed cam lid ③ and that of horizontal feed eccentric cam. 3. After adjusting the horizontal feed timing, re-adjust the vertical feed timing. 	<ul style="list-style-type: none"> ○ Pitch error at high or low speed will be deteriorated. ○ Thread tension will vary. ○ Stitch tightness at normal and reverse feed will vary.

Standard Adjustment

2) Top feed cam timing

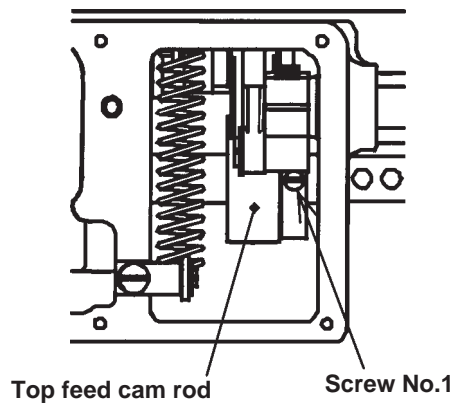
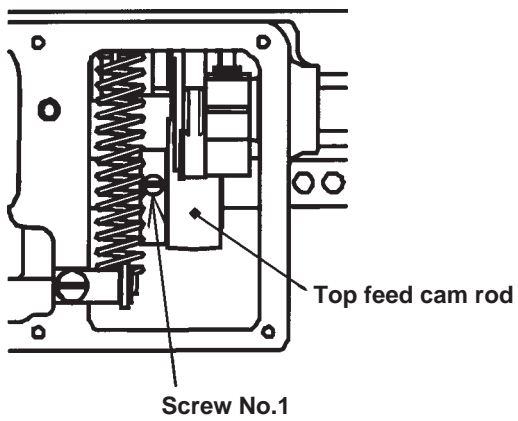
Conditions

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



○ When DL device is not provided

○ When DL device is provided

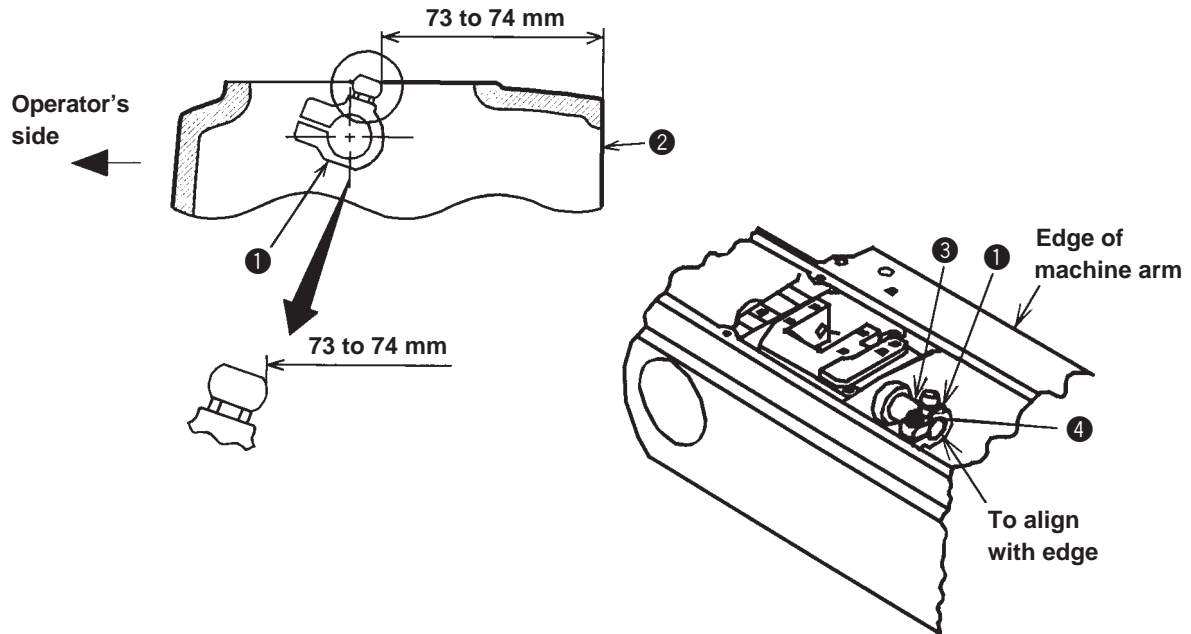


Adjustment Procedures	Results of Improper Adjustment
<p>2) Top feed cam timing</p> <ol style="list-style-type: none"> 1. Set the stitch dial to "6". 2. Set the alternate vertical dial to "3". 3. Remove the window plate setscrew and remove the window plate and the window plate packing. 4. Loosen two setscrews ① in the top feed cam. 5. Turn top feed cam ⑤ to the position where three points of top end ② of the needle eyelet, top surface ③ of the throat plate and walking foot ④ (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. 6. Securely tighten two setscrews ① in the top feed cam. <p>(Standard) Screw No. 2 of top feed cam ⑤ faces just above and screw No. 1 of top feed cam ⑤ faces to the direction of the arrow when needle tip ② and walking foot ④ align with top surface ③ of the throat plate at the time of their going up.</p> <p>(Adjust the timing at the position where three points are aligned with one another when top end ② of the needle and walking foot ④ are coming down.)</p>	<ul style="list-style-type: none"> ○ Pitch error at high or low speed will be deteriorated.

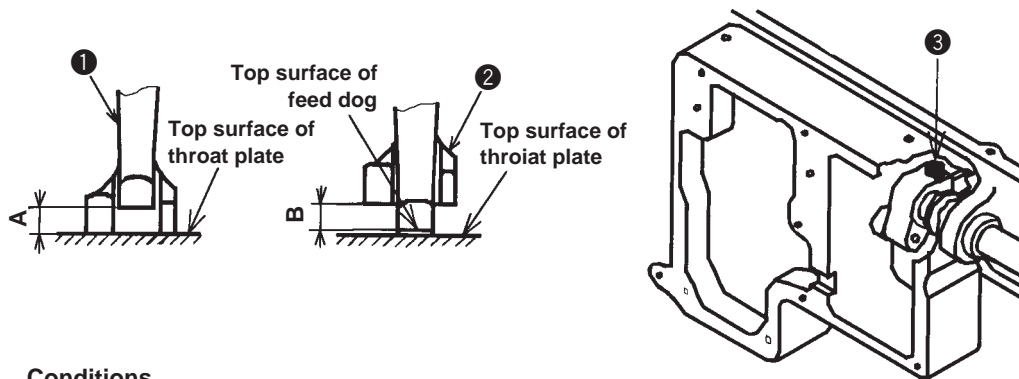
(11) Feed motion

Standard Adjustment

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



2) Alternate momentum

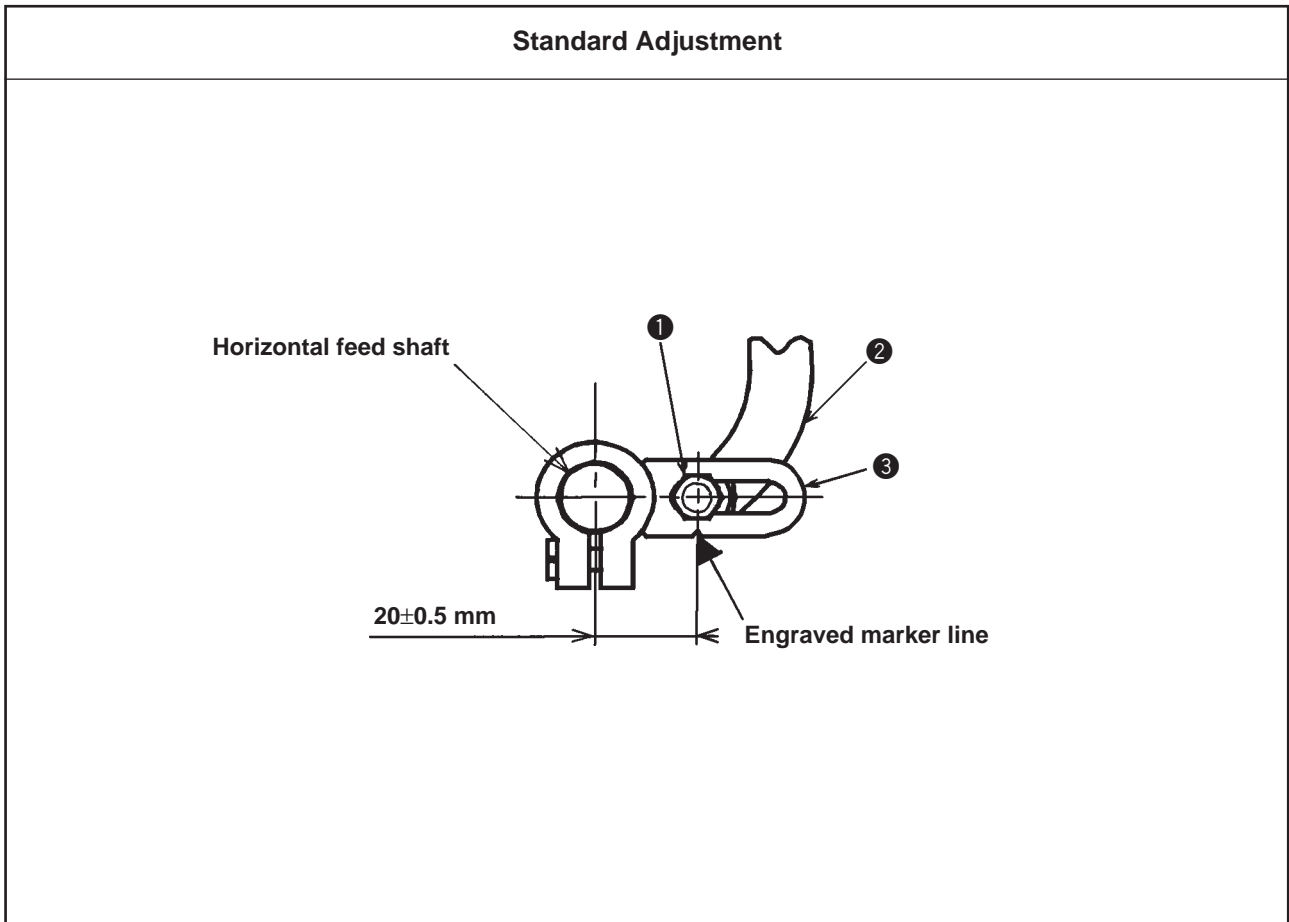


Conditions

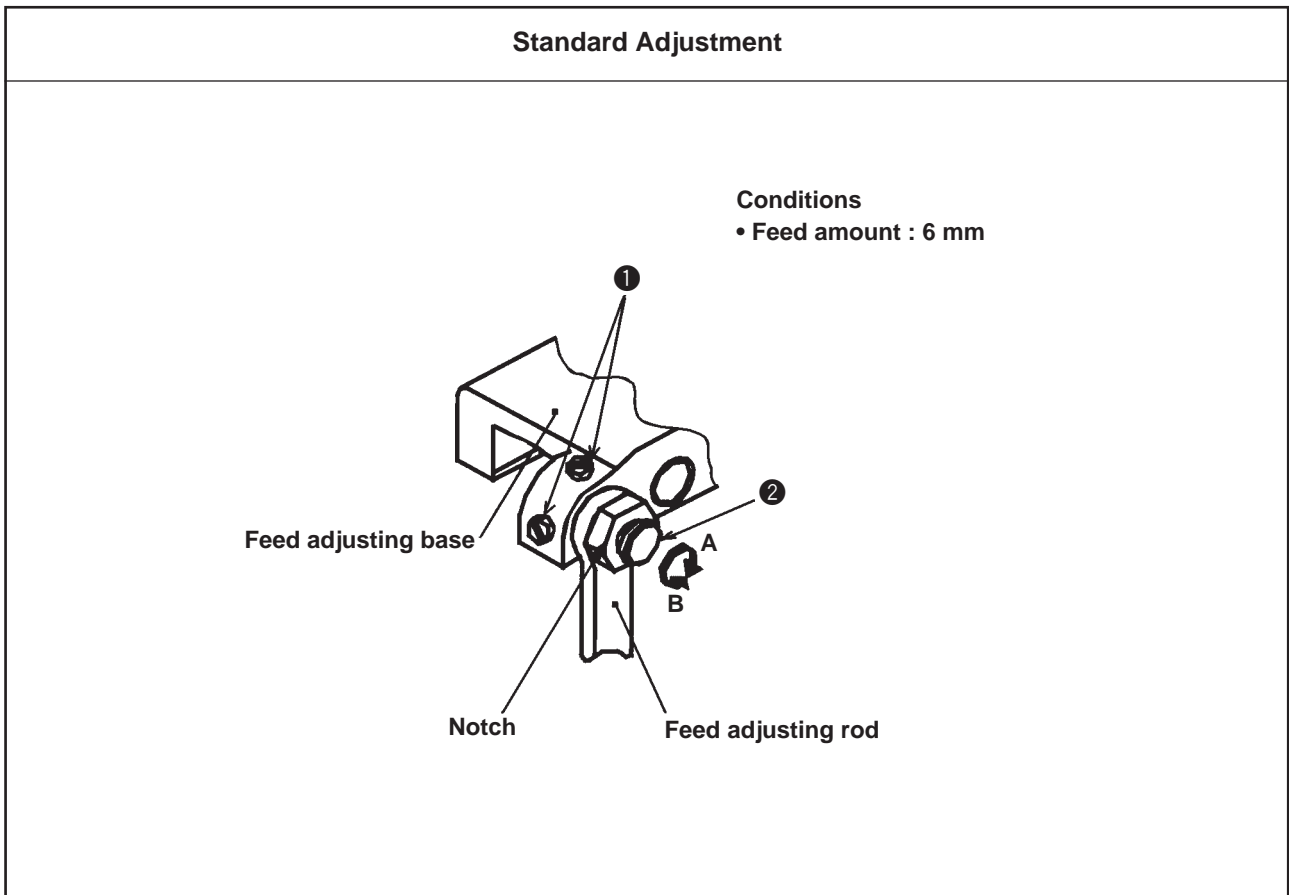
- Feed amount : 0 mm
- Amount of alternate vertical movement : standard

Adjustment Procedures	Results of Improper Adjustment
<p>1) Amount of alternate vertical movement</p> <ol style="list-style-type: none"> 1. Remove the top cover. 2. Loosen setscrew ④ in the vertical adjusting arm. 3. Adjust the position of vertical adjusting arm ① to 73 to 74 mm from edge ② of the machine arm and assemble it so that it aligns with the edge of vertical change base ③ in the lateral direction. 4. Securely tighten setscrew ④ in the vertical adjusting arm. 5. Set the alternate vertical dial to the minimum and attach the top cover. 6. Turn the alternate vertical dial and check to be sure that the scale of dial and the amount of alternate vertical movement are correct. 	<p>Increase the vertical stroke of the walking foot in accordance with the sewing products.</p> <ul style="list-style-type: none"> ○ Sewing sponge material or the like ○ Sewing material with overlapped sections
<p>2) Alternate momentum</p> <ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Turn the handwheel to make sure that the amount of alternate vertical movement of walking foot ① and presser foot ② is almost equal. 3. When the amount is not equal, loosen setscrew ③ in the top feed rear arm and adjust so that the amount should be equal. Adjust the amount almost to A = B. <ul style="list-style-type: none"> ○ 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"> 1) Loosen setscrew ③ in the top feed rear arm in the state that walking foot ① is raised a little, press walking foot ① to the feed dog. 2) Re-tighten setscrew ③ in the top feed rear arm and turn the handwheel to make sure of the amount of alternate vertical movement. 	<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"> ○ Sewing sponge material or the like ○ Sewing material with overlapped sections <p>When the alternative vertical strokes of the walking foot and presser foot are considerably different</p> <ul style="list-style-type: none"> ○ The stitch pitch is different from the value set by the dial. ○ Decrease the number of revolution of the motor a little since the feed efficiency is decreased.

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



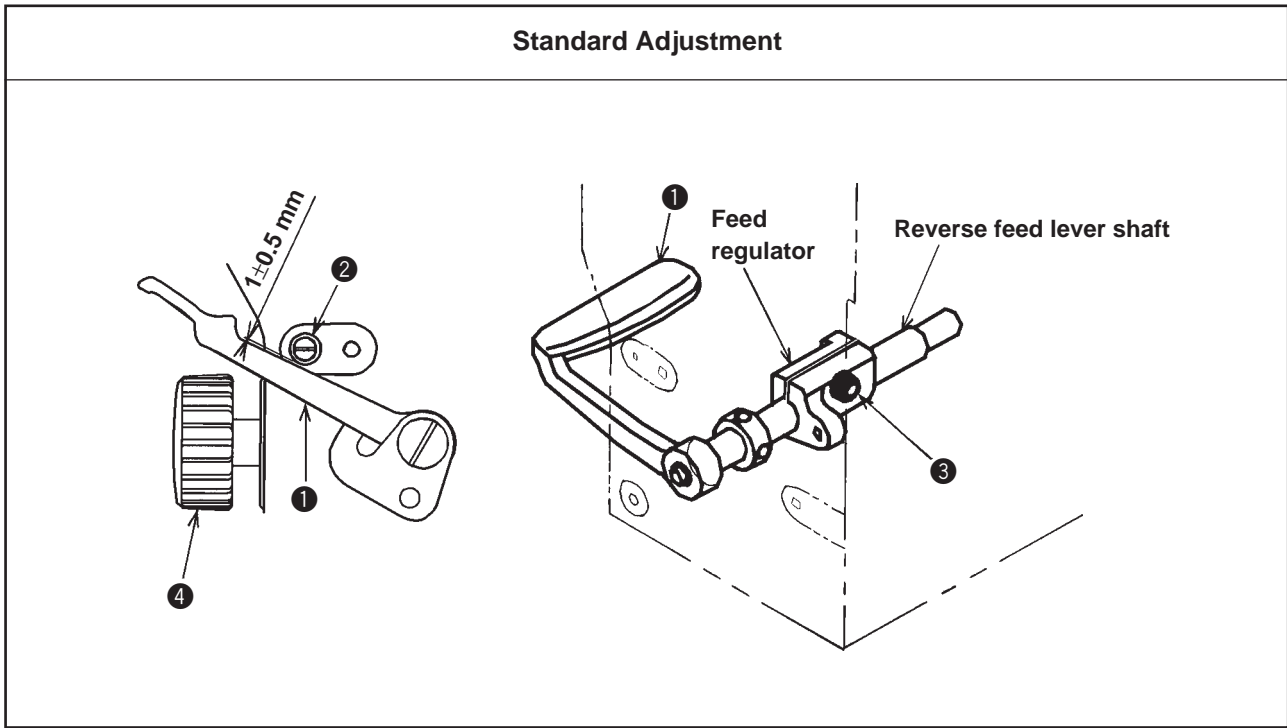
(13) Stitch length of normal/reverse feed



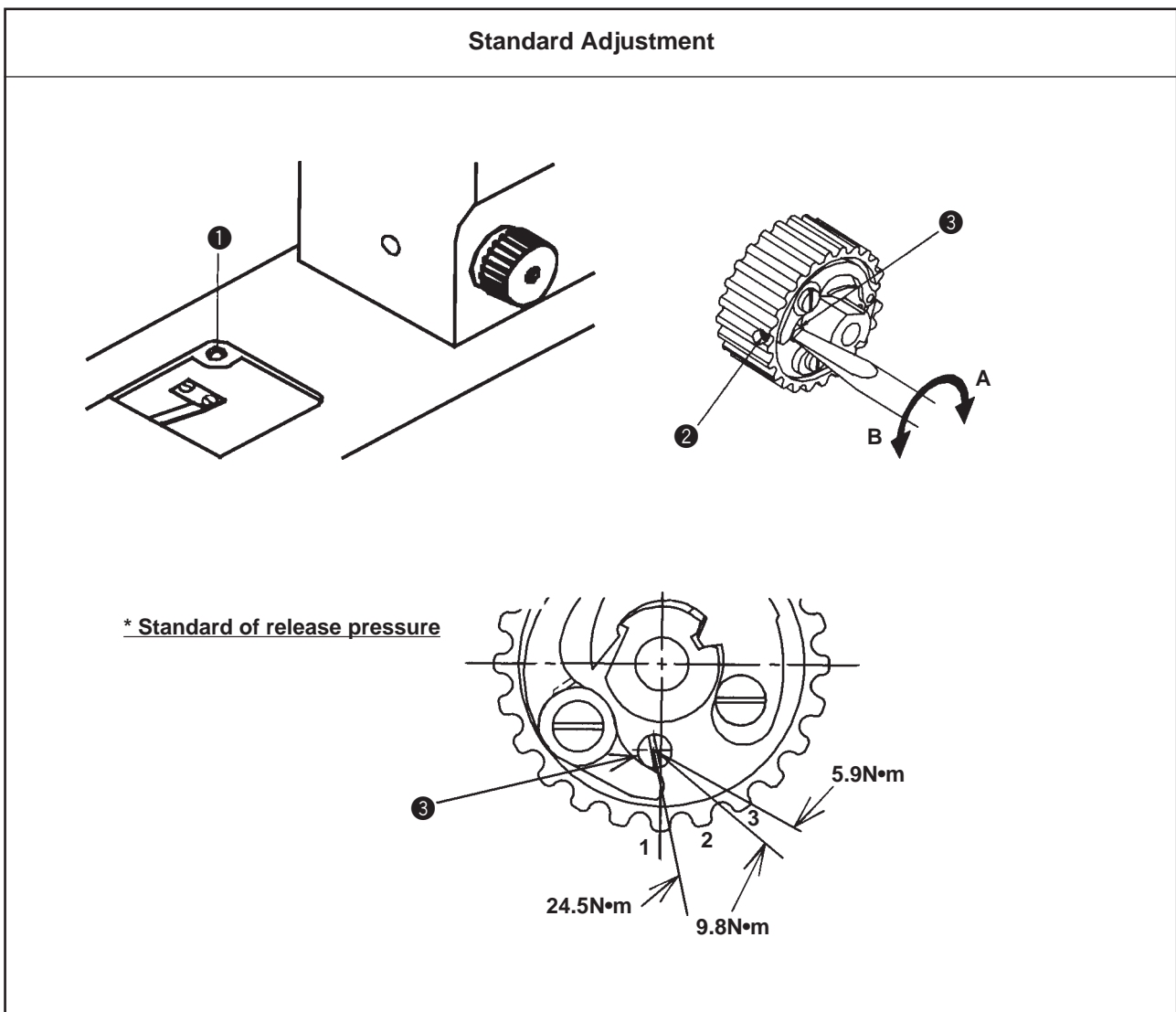
Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen hinge screw nut ❶ in the horizontal feed rear arm.</p> <p>2. Move horizontal feed connecting rod ❷ so that the distance from the center of the horizontal feed shaft to that of the hinge screw is 20 ± 0.5 mm and tighten the nut ❶.</p> <p>3. Turn the handwheel to check the needle sway.</p> <p>(Standard) 1. The engraved marker line on horizontal feed rear arm ❸ aligns with the center of the hinge screw.</p> <p>2. When the distance is lengthened more than the standard adjustment value, the bottom feed amount is decreased.</p> <p>(Caution) 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"> ○ Needle breakage or stitch skipping will result.

Adjustment Procedures	Results of Improper Adjustment
<p>1. Set the stitch dial to "6".</p> <p>2. Loosen two setscrews ❶ in the feed adjusting eccentric pin.</p> <p>3. Turn feed adjusting eccentric pin ❷ to adjust the stitch</p> <ul style="list-style-type: none"> ○ length. Direction A → reverse feed pitch is increased. ○ Direction B → normal feed pitch is increased. <p>4. After the adjustment, securely tighten two setscrews ❶ in the feed adjusting eccentric pin.</p> <p>(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.</p>	<ul style="list-style-type: none"> ○ Respective stitch lengths of normal and reverse feeds do not match.

(14) Position of the reverse feed control lever



(15) Safety clutch

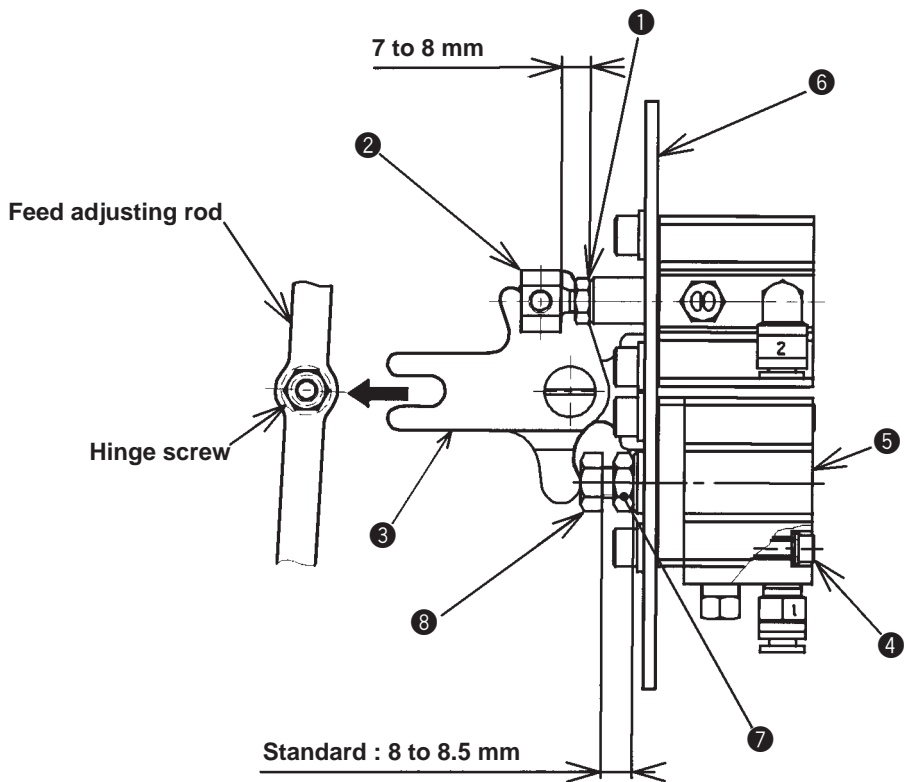


Adjustment Procedures	Results of Improper Adjustment
<p>1. Set the stitch dial ④ to the maximum.</p> <p>2. Loosen hexagon headed bolt ③ in the feed regulator to adjust so that a clearance of 1 ± 0.5 mm is provided between reverse feed control lever ① and reverse feed control lever stopper ②.</p> <p>(Caution) 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.</p>	<p>When the position of the reverse feed control lever is low</p> <ul style="list-style-type: none"> ○ Reverse feed control lever interferes with the machine bed and the stitch length of the reverse feed stitching will be decreased. <p>When the position of the reverse feed control lever is high</p> <ul style="list-style-type: none"> ○ Reverse feed control lever interferes with the stopper or the machine arm and stitch length of the normal feed stitching will be decreased.

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"> ○ Resetting procedure <ul style="list-style-type: none"> 1. Checking the moving part of the sewing machine, and look for and remove the cause which the safety clutch has functioned. 2. Pressing push button ① 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”. ○ Adjusting the working torque of the safety clutch <ul style="list-style-type: none"> 1. Tilt the machine head. 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. <p>* Standard of release pressure 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"> ○ $24.5\text{N} \cdot \text{m}$: Top of tooth of 1st sprocket ○ $9.8\text{N} \cdot \text{m}$: Center of bottom between 2nd and 3rd sprockets ○ $5.9\text{N} \cdot \text{m}$: Top of tooth of 3rd sprocket 	

(16) Reverse feed cylinder and condensation cylinder

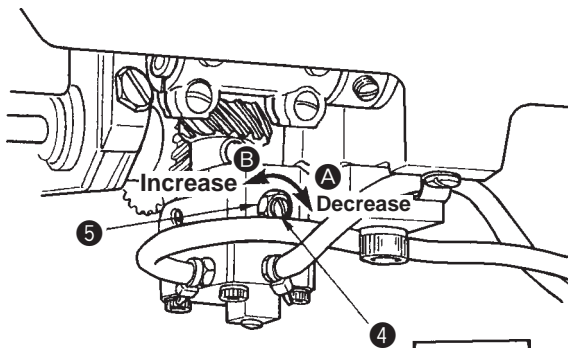
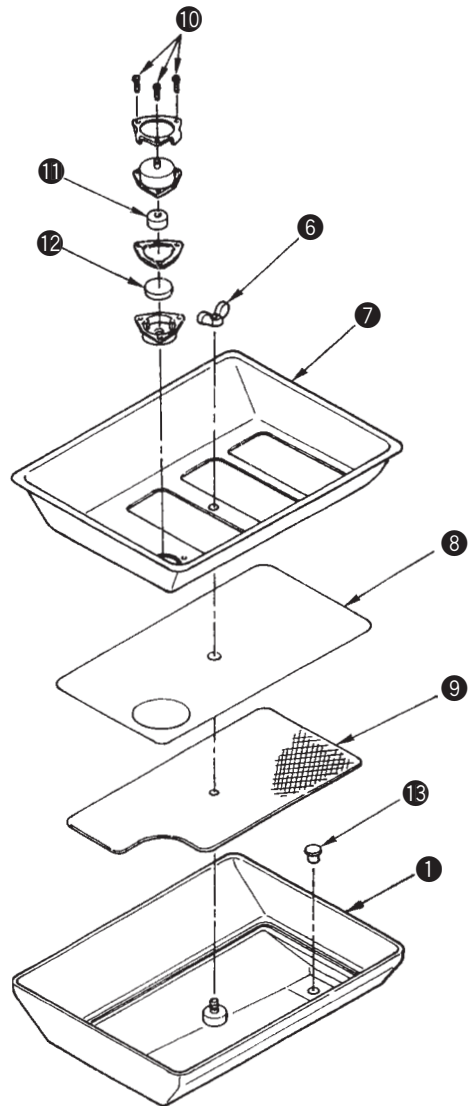
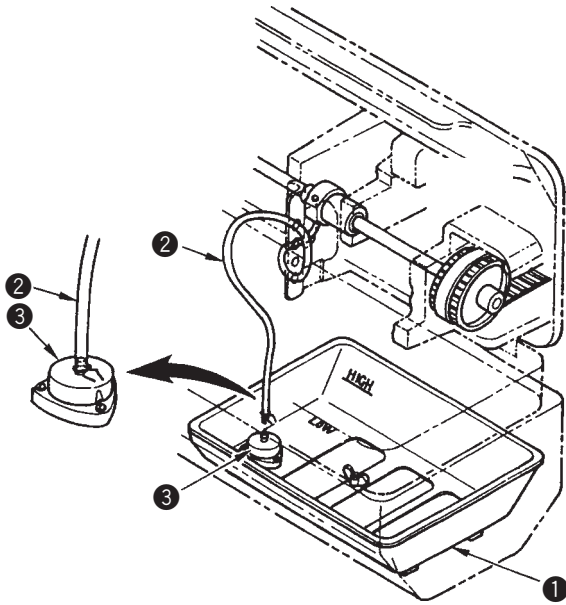
Standard Adjustment



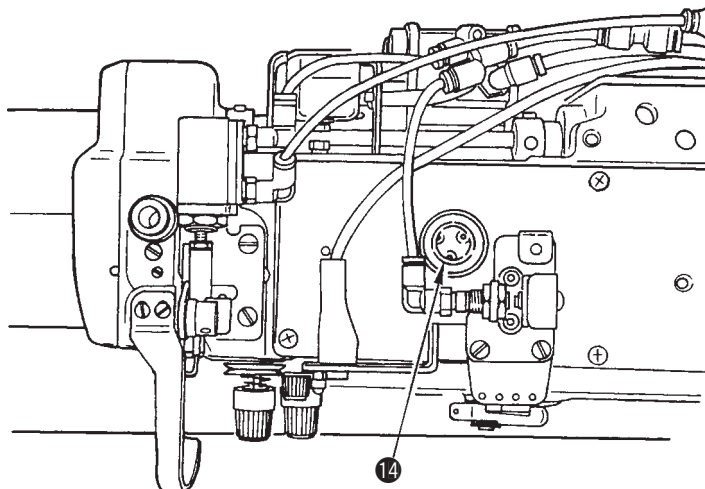
Adjustment Procedures	Results of Improper Adjustment
<p>○ Reverse feed cylinder</p> <ol style="list-style-type: none"> 1. Loosen nut ①. 2. Turn the shaft of cylinder ⑤ and adjust so that the distance from the end of shaft of cylinder ⑤ to cylinder connecting screw ② should be 7 to 8 mm. 3. Tighten nut ①. <p>* When installing on the machine arm, install the cylinder so that the fork section of reverse feed link ③ enters the hinge screw of the feed adjusting rod.</p> <p>○ Condensation cylinder</p> <ol style="list-style-type: none"> 1. Loosen two setscrews ④ and remove cylinder ⑤ from window plate ⑥. 2. Loosen nut ⑦. 3. Turn condensation cylinder screw ⑧ and adjust so that the distance from the end of shaft of cylinder ⑤ to condensation cylinder screw ⑧ should be 8 to 8.5 mm. 4. Tighten nut ⑦. 5. Install cylinder ⑤ on window plate ⑥ with two setscrews ④. <p>Confirmation</p> <ol style="list-style-type: none"> 1. Actually perform sewing. 2. Check that the stitch length of one stitch before thread trimming is 1.5 to 2 mm of reverse feed stitching. 	<p>○ When the fork section does not enter the hinge screw, stitches of the reverse feed may not be obtained.</p> <p>When the distance from the cylinder to the cylinder screw is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Stitch length of one stitch before thread trimming becomes smaller. ○ Stitch skipping occurs at the time of thread trimming and needle/ bobbin threads may not be cut. <p>When the distance from the cylinder to the cylinder screw is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Stitch length of one stitch before thread trimming becomes larger. ○ Remaining bobbin thread length after thread trimming is longer. ○ Waiting knife base interferes with feed dog or feed base resulting in breakage..

(17) Lubrication

Standard Adjustment



A sheet of paper



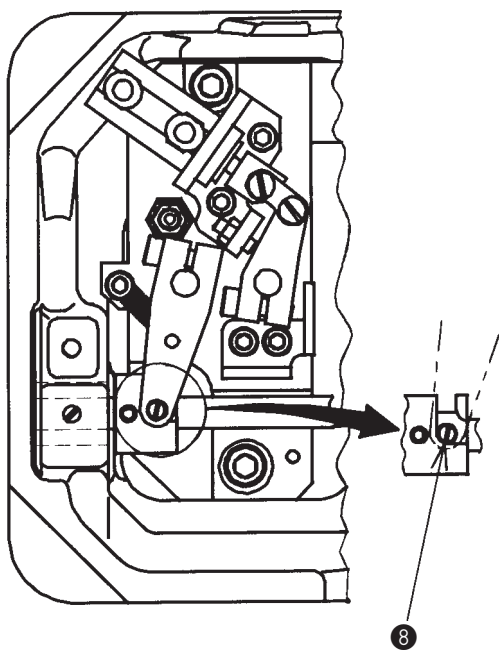
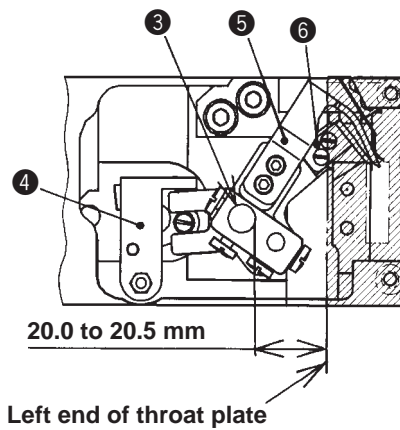
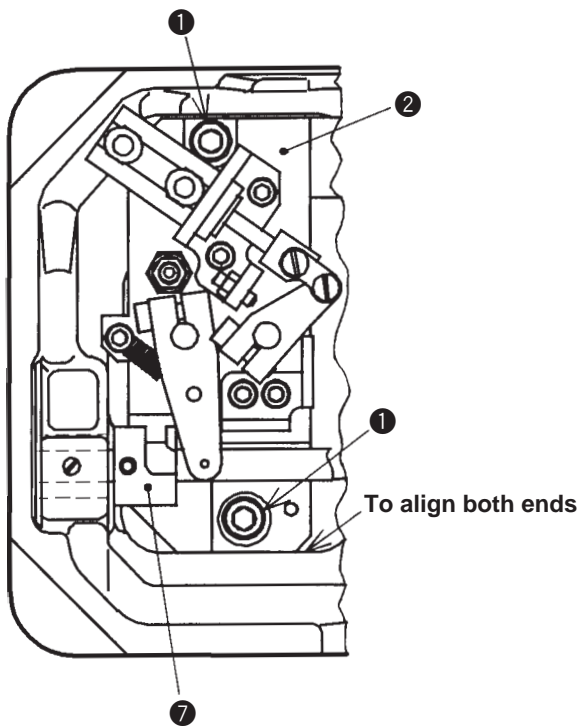
Adjustment Procedures	Results of Improper Adjustment
<p>1. Insert the projection located at the bottom of oil tank ❶ into the waste oil hole of the oil pan.</p> <p>2. Insert oil pipe ❷ into filter ❸ of the oil tank and fix the pipe with a clip.</p> <p>3. Pour the JUKI New Defrix Oil No. 2 into the oil tank ❶ until HIGH level is reached.</p> <p>4. Add the same lubricating oil up to HIGH level as soon as the oil level has come down to LOW level.</p> <p>5. After the lubrication, you can see from oil sight window ❶ that the oil rises up when the operation is normal. (However, the machine should run at 1,500 rpm or more.)</p> <p>○ Adjusting the amount of oil in the hook</p> <p>1. Loosen nut ❷ and turn oil amount adjustment screw ❸. Turning the screw clockwise A will decrease the amount of oil in the hook or counterclockwise B will increase it.</p> <p>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> <p>(Caution) 1. Approximately once a month, clean the oil tank ❶ and the filter case.</p> <p>2. If the filter ❸ is clogged with soil, lubrication fails resulting in trouble.</p> <p>○ Cleaning the oil tank</p> <p>1. Remove the oil pipe ❷ from oil tank ❶.</p> <p>2. Remove butterfly nut ❹ and take out cover (upper) ❺, filter ❽ and cover (lower) ❾ to clean the oil tank.</p> <p>3. Remove filter case setscrews ❿, and clean filter element ⓫ located on the inside of the filter case and magnet ⓬.</p> <p>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.</p> <p>5. Fix the filter case in which filter element ⓫ and magnet ⓬ are placed to cover (upper) ❺ with setscrews ❿.</p> <p>6. Place cover (lower) ❾, filter ❽ and cover (upper) ❺ in order in the oil tank ❶, and fix them with butterfly nut ❹.</p> <p>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.</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. In addition, the cloth may be stained.

(18) Thread trimmer device

Standard Adjustment

1) Lateral position of the thread trimmer base

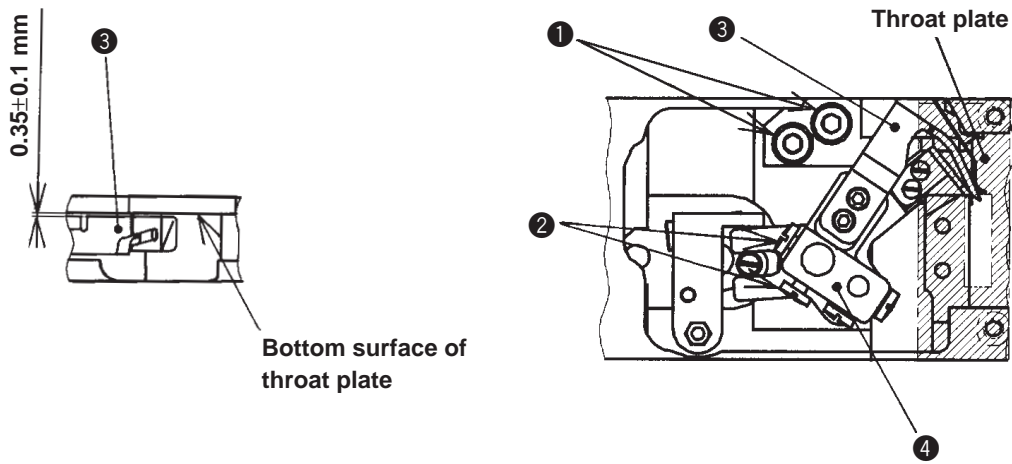
Condition : Thread trimmer base aligns with end of machine bed



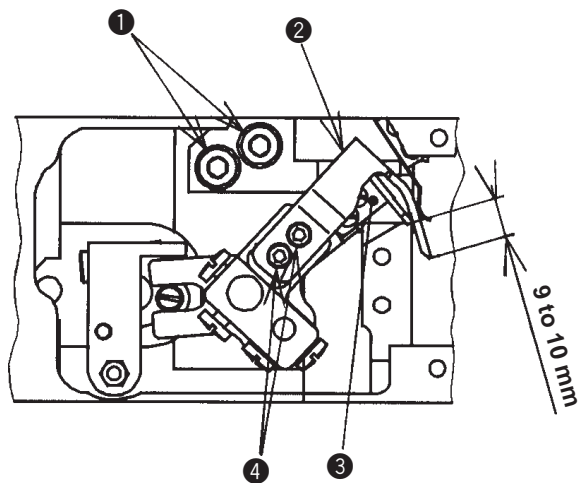
Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrew ❶ in the thread trimmer base. 2. Move thread trimmer base ❷ so that the distance from moving knife drive shaft ❸ to the left end of the throat plate is 20 to 20.5 mm. Perform moving in the state that the end of thread trimmer base ❷ comes in close contact with the end of the machine bed. 3. Tighten setscrew ❶ in the thread trimmer base. <p>Confirmation</p> <ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Remove the air hose connecting to the regulator and cut off the air. 3. Raising upward knife fixing plate ❹, advance moving knife ❺ and waiting knife ❻ by hand. 4. Turn the handwheel in the state that cam roller ❸ is located in the groove of thread trimmer cam ❷ and adjust the needle bar to the upper dead point of its stroke. 5. Advance moving knife ❺ and check that moving knife ❺ does not interfere with the inner hook. 6. Return moving knife ❺ and waiting knife ❻ to the respective initial positions and connect the air hose to the regulator. 	<p>When the distance from the moving knife drive shaft to the left end of the throat plate is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Failure of needle/bobbin threads trimming will result. ○ Moving knife interferes with needle to cause them to break. <p>When the distance from the moving knife drive shaft to the left end of the throat plate is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Defective clamp will result. ○ Moving knife interferes with the inner hook to cause them to break.

Standard Adjustment

2) Height of the moving knife



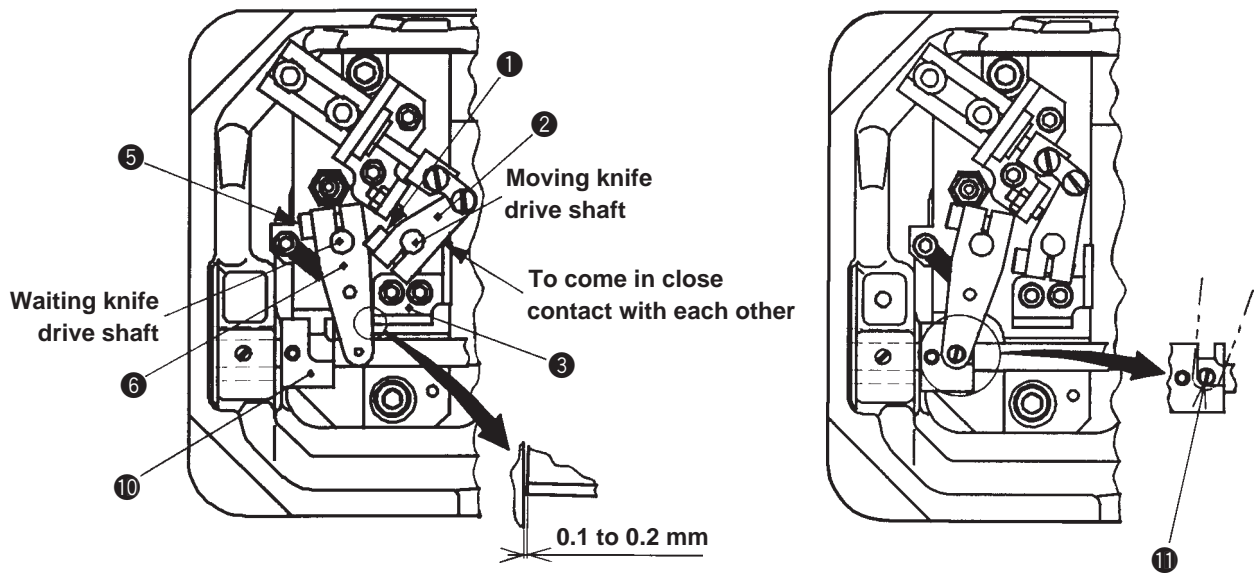
3) Knife pressure



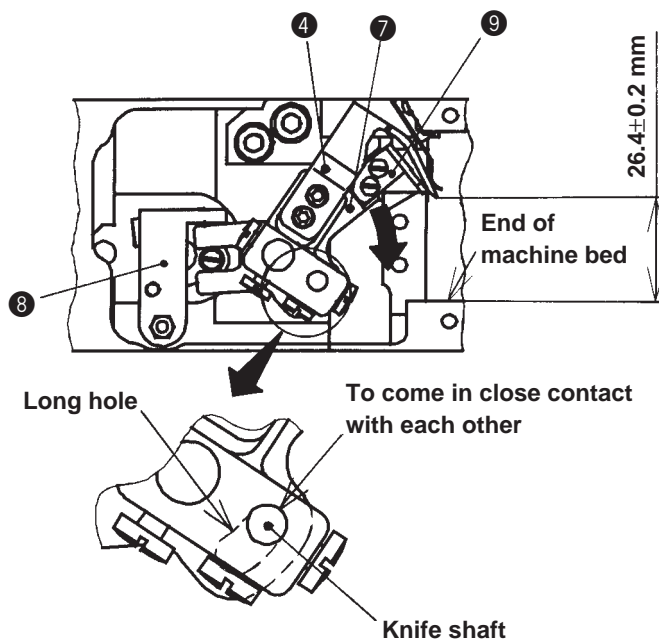
Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Remove the air hose connecting to the regulator and cut off the air. 2. Loosen setscrews ❶ in the clamp spring base so that the clamp pressure is not applied to moving knife ❸. 3. Loosen setscrews ❷ in the moving knife base. 4. Move moving knife base ❹ up or down so that the distance from moving knife ❸ to the bottom surface of the throat plate is 0.35 ± 0.1 mm. 5. Tighten setscrews ❶ in the clamp spring base. 	<p>When the distance from the moving knife to the installing plane of the throat plate is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Failure of needle/bobbin threads trimming will result. ○ Moving knife interferes with the clamp spring to cause them to break. <p>When the distance from the moving knife to the installing plane of the throat plate is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Failure of needle/bobbin threads trimming will result. ○ Moving knife interferes with the feed dog to cause them to break.
<ol style="list-style-type: none"> 1. Set the stitch dial to "0". 2. Remove the air hose connecting to the regulator and cut off the air. 3. Loosen setscrews ❶ in the clamp spring base so that the clamp pressure is not applied to moving knife ❷. 4. Advance moving knife ❸ and adjust setscrews ❹ so that it starts coming in contact with the blade section of waiting knife ❺ at the position of 9 to 10 mm from the top end of moving knife ❷. 5. Connect the air hose to the regulator. 	<p>When the knife pressure is excessively high :</p> <ul style="list-style-type: none"> ○ Blade sections of the moving knife and the waiting knife may be damaged. ○ Torque at the time of thread trimming becomes large and the moving knife cannot fully return. <p>When the knife pressure is excessively low :</p> <ul style="list-style-type: none"> ○ Defective thread trimming (failure of thread trimming, single thread trimming or defective clamp) may occur.

Standard Adjustment

4) Initial position of the moving knife and the waiting knife



- Conditions :
- : Moving knife : Moving knife drive arm ② should come in close contact with drive arm stopper ③.
 - : Waiting knife : Clearance provided between waiting knife drive arm B ⑥ and drive arm stopper ③ is 0.1 to 0.2 mm.

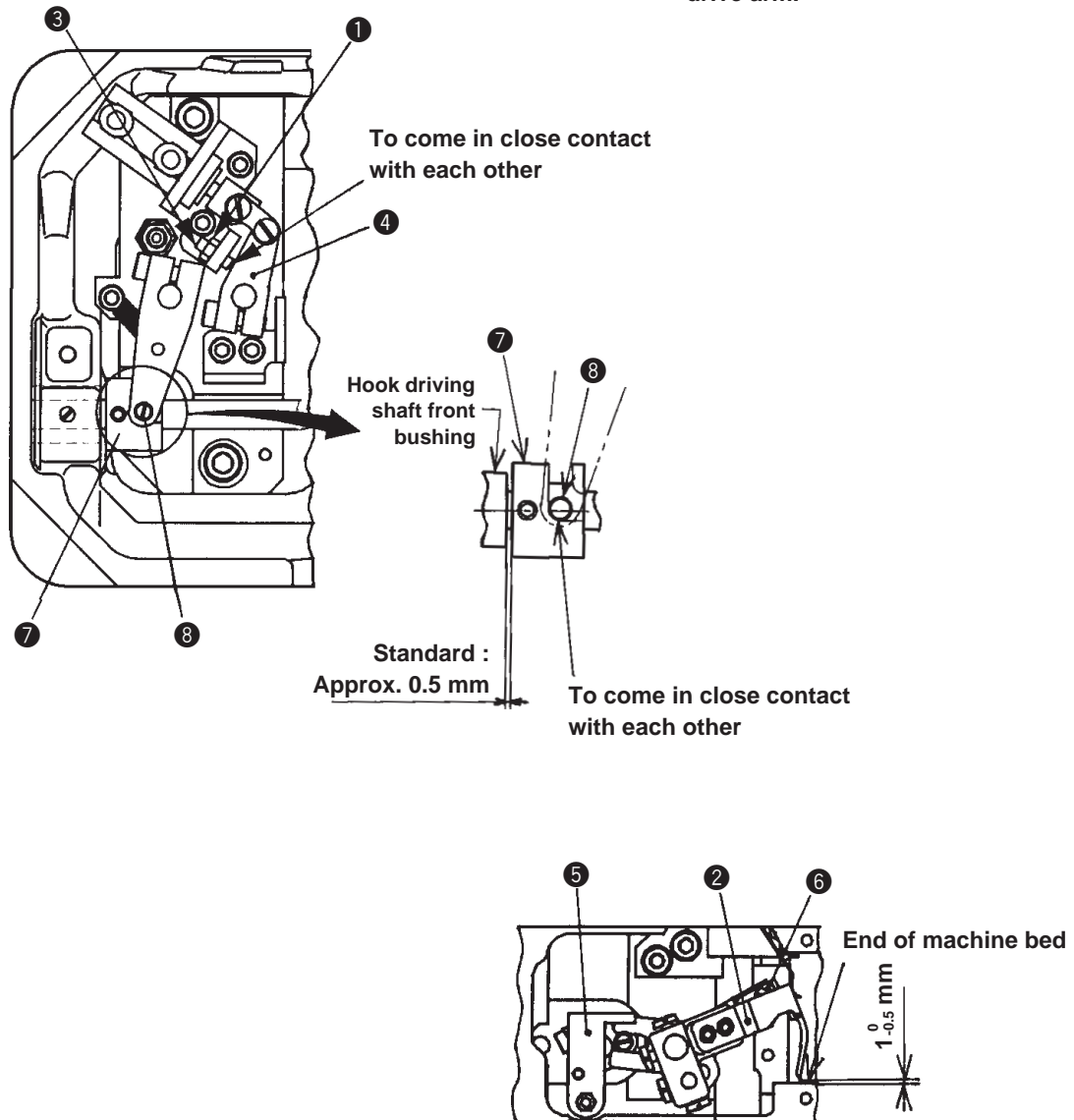


Adjustment Procedures	Results of Improper Adjustment
<p>○ Moving knife</p> <ol style="list-style-type: none"> 1. Loosen setscrew ①. 2. In the state that moving knife drive arm ② comes in close contact with drive arm stopper ③, move moving knife ④ so that the distance from the top end of moving knife ④ to the end of the machine bed is 26.4±0.2 mm. 3. Tighten setscrew ①. <p>Confirmation</p> <ol style="list-style-type: none"> 1. Set the stitch dial to “0”. 2. Remove the air hose connecting to the regulator and cut off the air. 3. Raising upward knife fixing plate ⑧, advance moving knife ④ and waiting knife ⑨ by hand. 4. Turn the handwheel in the state that cam roller ⑪ is located in the groove of thread trimmer cam ⑩ and adjust the needle bar to the upper dead point of its stroke. 5. Advance moving knife ④ and check that moving knife ④ lightly moves. 6. Return moving knife ④ and waiting knife ⑨ to the respective initial positions and connect the air hose to the regulator. <p>○ Waiting knife</p> <ol style="list-style-type: none"> 1. Loosen setscrew ⑤. 2. Press waiting knife base ⑦ in the direction of arrow A in the state that there is a clearance of 0.1 to 0.2 mm between waiting knife drive arm B ⑥ and drive arm stopper ③ and make the long hole in waiting knife base ⑦ come in close contact with the knife shaft. (At this time, moving knife ④ should stay at the initial position.) 3. Tighten setscrew ⑤. <p>Confirmation</p> <ol style="list-style-type: none"> 1. Set the stitch dial to “0”. 2. Remove the air hose connecting to the regulator and cut off the air. 3. Raising upward knife fixing plate ⑧, advance moving knife ④ and waiting knife ⑨ by hand. 4. Check that cam roller ⑪ lightly enters the groove of thread trimmer cam ⑩. <p>Standard : Lower end plane of waiting knife drive arm B ⑥ aligns with that of the waiting knife shaft.</p> <ol style="list-style-type: none"> 5. Return moving knife ④ and waiting knife ⑨ to the respective initial positions and connect the air hose to the regulator. 6. Move waiting knife ⑨ to and fro and check that there is a play of 0.1 to 0.25 mm. 	<p>When the distance from the top end of moving knife to the end of machine bed is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Defective clamp will result. ○ Moving knife interferes with the machine bed to cause the knife to break. <p>When the distance from the top end of moving knife to the end of machine bed is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Moving knife interferes with the feed dog to cause the knife to break. ○ Defective thread trimming will result. <p>When the clearance between the waiting knife drive arm B and the drive arm stopper is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Waiting knife interferes with the feed dog to cause the knife to break. <p>When the clearance between the waiting knife drive arm B and the drive arm stopper is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Breakage of the waiting knife base or the knife shaft will result. ○ When the cam roller does not move smoothly, the cam and the roller interfere with each other. As a result, breakage or machine lock will result. ○ If there is no play, breakage of the waiting knife base or the knife shaft will result.

Standard Adjustment

5) Most advanced position of the moving knife

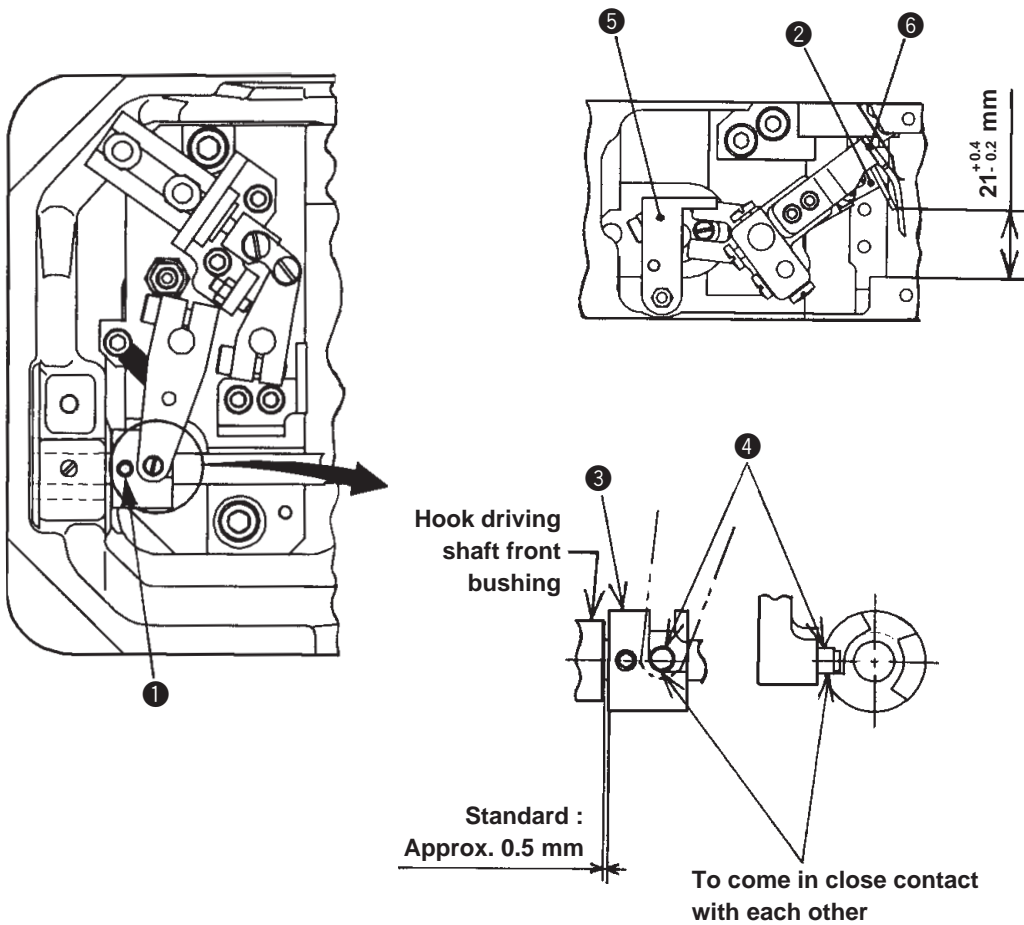
Condition : Screw should come in close contact with moving knife drive arm.



Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen nut ❶. 2. Set the stitch dial to "0". 3. Remove the air hose connecting to the regulator and cut off the air. 4. Raising upward knife fixing plate ❺, advance moving knife ❷ and waiting knife ❻ by hand. 5. Turn the handwheel in the state that cam roller ❸ is located in the groove of thread trimmer cam ❹ and adjust the needle bar to the upper dead point of its stroke. 6. Advance moving knife ❷ until it will go no further and adjust screw ❸ so that the distance from the top end of moving knife ❷ to the end of machine bed is $1_{-0.5}^0$ mm. (At this time, screw ❸ should come in close contact with moving knife drive arm ❹.) 7. Tighten nut ❶. 	<p>When the distance from the top end of moving knife to the end of machine bed is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Failure of needle/bobbin threads trimming will result. <p>When the distance from the top end of moving knife to the end of machine bed is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Moving knife interferes with the feed dog or machine bed to cause the knife to break.

Standard Adjustment

6) Most advanced position of the waiting knife and the cam timing

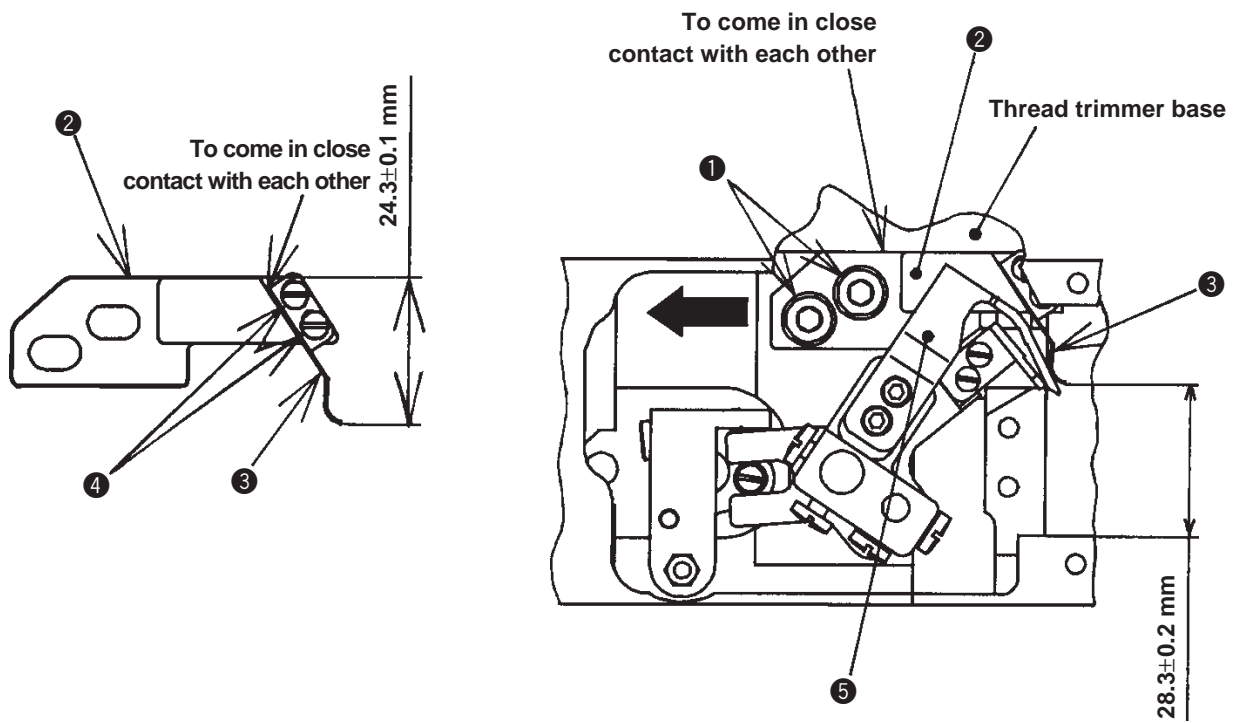


Condition : Thread trimmer cam should come in close contact with end of cam roller.

Adjustment Procedures	Results of Improper Adjustment
<p>○ Initial position of the waiting knife</p> <ol style="list-style-type: none"> 1. Loosen two setscrews ①. 2. Set the stitch dial to “0”. 3. Remove the air hose connecting to the regulator and cut off the air. 4. Raising upward knife fixing plate ⑤, advance moving knife ⑥ and waiting knife ② by hand. 5. Turn the handwheel in the state that cam roller ④ is located in the groove of thread trimmer cam ③ and adjust the needle bar to the upper dead point of its stroke. 6. Adjust thread trimmer cam ③ to the right or left so that the distance from the distance from the top end of waiting knife ② to the end of the machine bed is $21^{+0.4}_{-0.2}$mm when thread trimmer cam ③ comes in close contact with cam roller ④. <p>Standard : Clearance provided between thread trimmer cam ③ and the hook driving shaft front bushing is approximately 0.5 mm.</p> <p>○ Cam timing</p> <ol style="list-style-type: none"> 1. Make the end of the groove of thread trimmer cam ③ come in close contact with cam roller ④ in the state that waiting knife ② is in the most advanced position. 2. Align the red engraved marker dot on the handwheel with the engraved marker dot on the machine arm. 3. Tighten two setscrews ①. 	<p>When the distance from the top end of waiting knife to the end of machine bed is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Thread trimming length on the cloth side is lengthened. <p>When the distance from the top end of waiting knife to the end of machine bed is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Waiting knife base interferes with the feed dog or the feed base to cause the base to break. <p>When cam timing is excessively fast :</p> <ul style="list-style-type: none"> ○ Cam roller does not enter the thread trimmer cam. As a result, machine lock will result. <p>When cam timing is excessively slow :</p> <ul style="list-style-type: none"> ○ Moving knife and waiting knife do not return to the initial positions. As a result, defective clamp will be caused.

Standard Adjustment

7) Position of the clamp spring

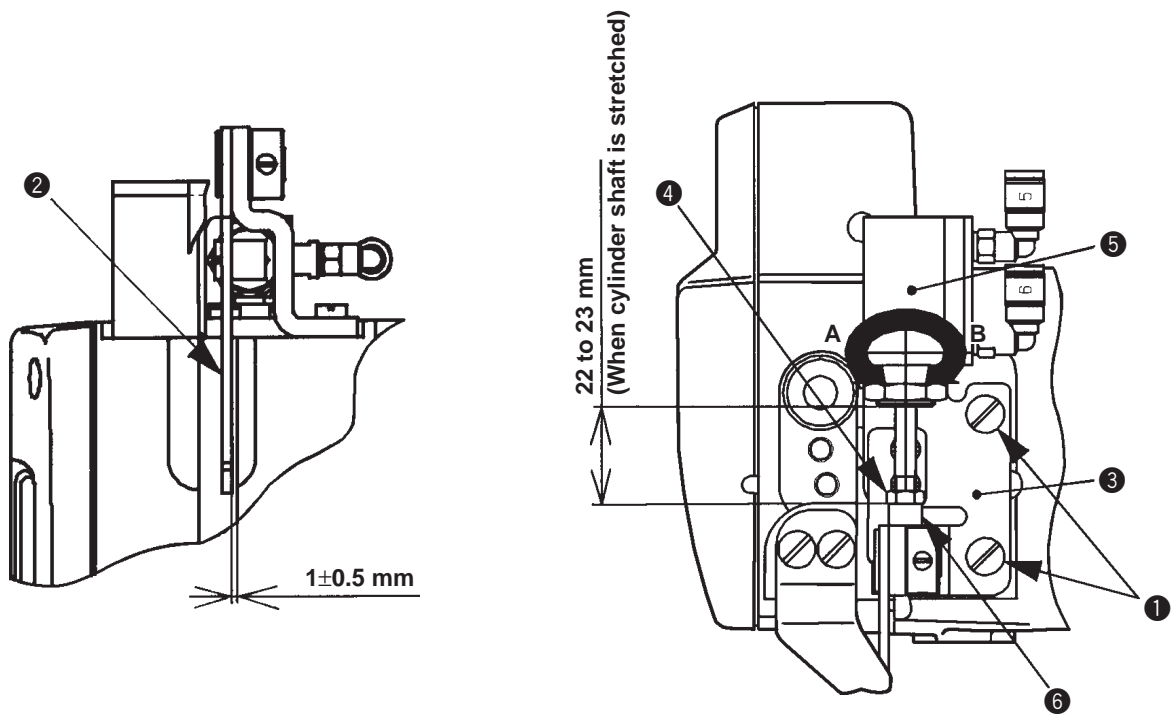


Adjustment Procedures	Results of Improper Adjustment
<p>○ Longitudinal direction</p> <ol style="list-style-type: none"> 1. Loosen setscrews ❶ and remove clamp spring base ❷. 2. Loosen setscrews ❸ and adjust so that the distance from the end of clamp spring base ❷ to the top end of clamp spring ❹ is 24.3 ± 0.1 mm. 3. Assemble again clamp spring base ❷ to the thread trimmer base and tighten setscrews ❶ so that clamp spring base ❷ comes in close contact with the end of the thread trimmer base. <p>Confirmation : Check that the distance from the top end of clamp spring ❹ to the end of the machine bed is 28.3 ± 0.2 mm.</p> <p>○ Clamp pressure</p> <ol style="list-style-type: none"> 1. Loosen setscrews ❶. 2. Move clamp spring base ❷ in the direction of the arrow by approximately 0.5 mm from the state that clamp spring ❹ comes in contact with moving knife ❺. (Clamp spring base ❷ should come in close contact with the end of the thread trimmer base.) 3. Tighten setscrews ❶. 	<p>When the clamp spring is located in the front :</p> <ul style="list-style-type: none"> ○ Clamp spring interferes with the moving knife to cause the spring and the knife to break. <p>When the clamp spring is located in the rear :</p> <ul style="list-style-type: none"> ○ Defective clamp will result. <p>When the clamp pressure is excessively low :</p> <ul style="list-style-type: none"> ○ Stitch skipping at the start of sewing will result. <p>When the clamp pressure is excessively high :</p> <ul style="list-style-type: none"> ○ "Puckering" may be produced on cloth at the start of sewing. ○ Moving knife interferes with the clamp spring to cause them to break.

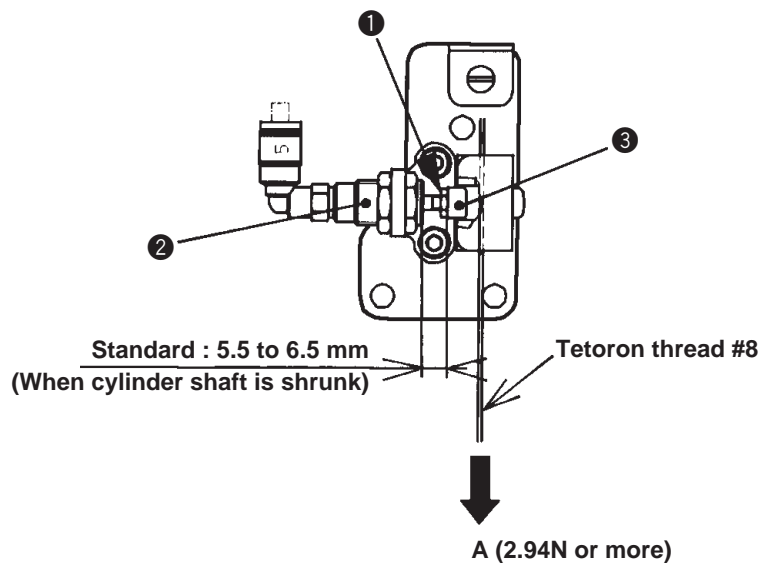
(19) Needle thread roll-in at start of sewing device

Standard Adjustment

1) Threading device



2) Thread presser device

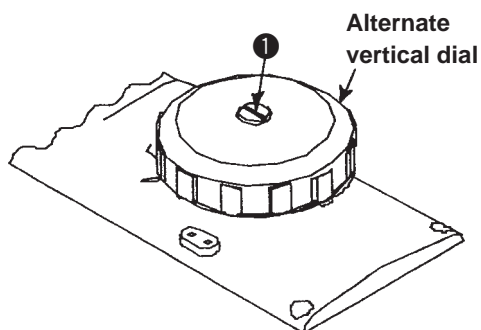


Adjustment Procedures	Results of Improper Adjustment
<ul style="list-style-type: none"> ○ Lateral position 1. Loosen setscrews ①. 2. Move cylinder base ③ so that the clearance provided between threading plate ② and the end of the groove of machine arm is 1±0.5 mm. 3. Tighten setscrews ①. ○ Adjusting the stroke of the threading plate 1. Remove the air hose connecting to the regulator and cut off the air. 2. Loosen nut ④. 3. Turn the shaft section of cylinder ⑤ and adjust so that the distance from cylinder ⑤ to cylinder knuckle ⑥ is 22 to 23 mm (when the cylinder shaft is stretched). 4. Tighten nut ④. <ul style="list-style-type: none"> ○ Turn the shaft in the direction A, and the distance is shortened and the protruding amount of threading plate ② is decreased. <ul style="list-style-type: none"> → Decrease the distance when stitch skipping occurs at the start of sewing. ○ Turn the shaft in the direction B, and the distance is lengthened and the protruding amount of threading plate ② is increased. <ul style="list-style-type: none"> → Increase the distance when needle thread remains on cloth at the start of sewing. <p>* Perform the fine adjustment with the tension controller No. 1 when stitch skipping or needle thread remaining on cloth occurs at the start of sewing.</p>	<p>When the clearance provided between the threading plate and the end of machine arm is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Threading plate comes in contact with the thread take-up. As a result, breakage will result. <p>When the clearance provided between the threading plate and the end of machine arm is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Threading plate comes in contact with machine arm. As a result, breakage will result. <p>When the distance from cylinder to knuckle is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Needle thread may remain on cloth at the start of sewing. <p>When the distance from cylinder to knuckle is larger than the specified value :</p> <ul style="list-style-type: none"> ○ Stitch skipping may occur at the start of sewing.
<ol style="list-style-type: none"> 1. Remove the air hose connecting to the regulator and cut off the air. 2. Loosen nut ①. 3. Turn the shaft section of cylinder ② and adjust so that the distance from cylinder ② to thread presser ③ is approximately 5.5 to 6.5 mm (when the cylinder shaft is shrunk). 4. Tighten nut ①. <p>Confirmation</p> <ol style="list-style-type: none"> 1. Connect the air hose to the regulator. 2. Pass a piece of tetoron thread #8 through the thread presser device when air pressure is 0.5MPa, operate the cylinder and check that the pulling force in the direction A is 2.94N or more. 	<p>When the distance from cylinder to thread presser is smaller than the specified value :</p> <ul style="list-style-type: none"> ○ Bird's nest on the wrong side of cloth may be lengthened at the start of sewing.

(20) Alternate vertical dial

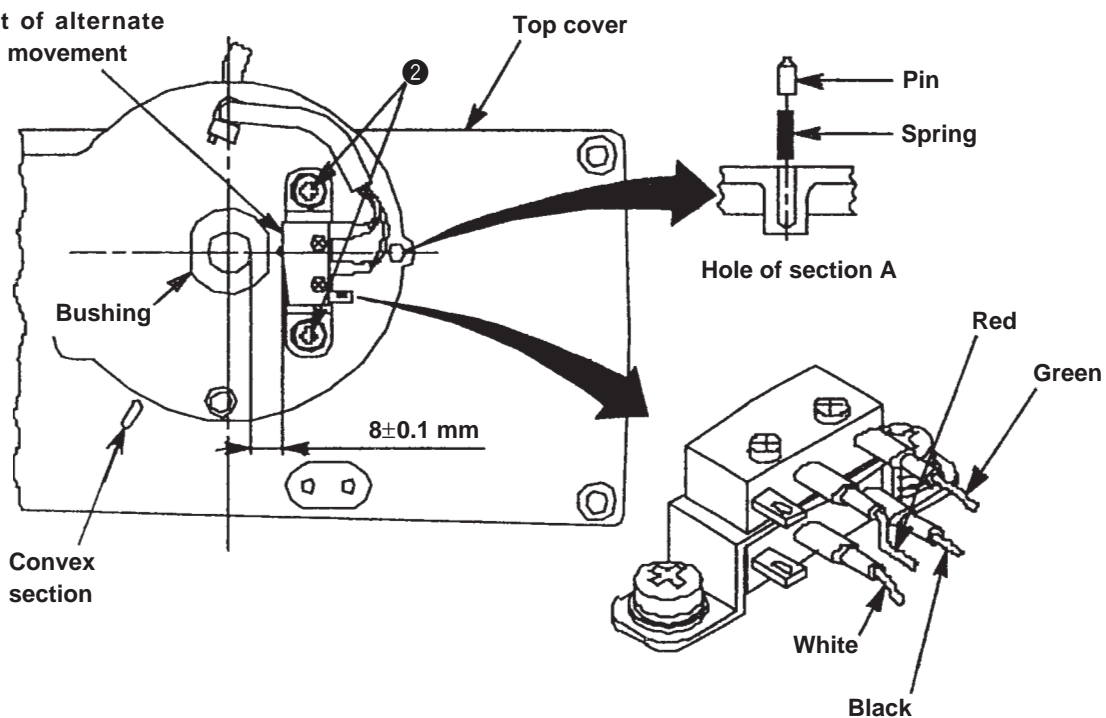
Standard Adjustment

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



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

Detection switch of amount of alternate vertical movement

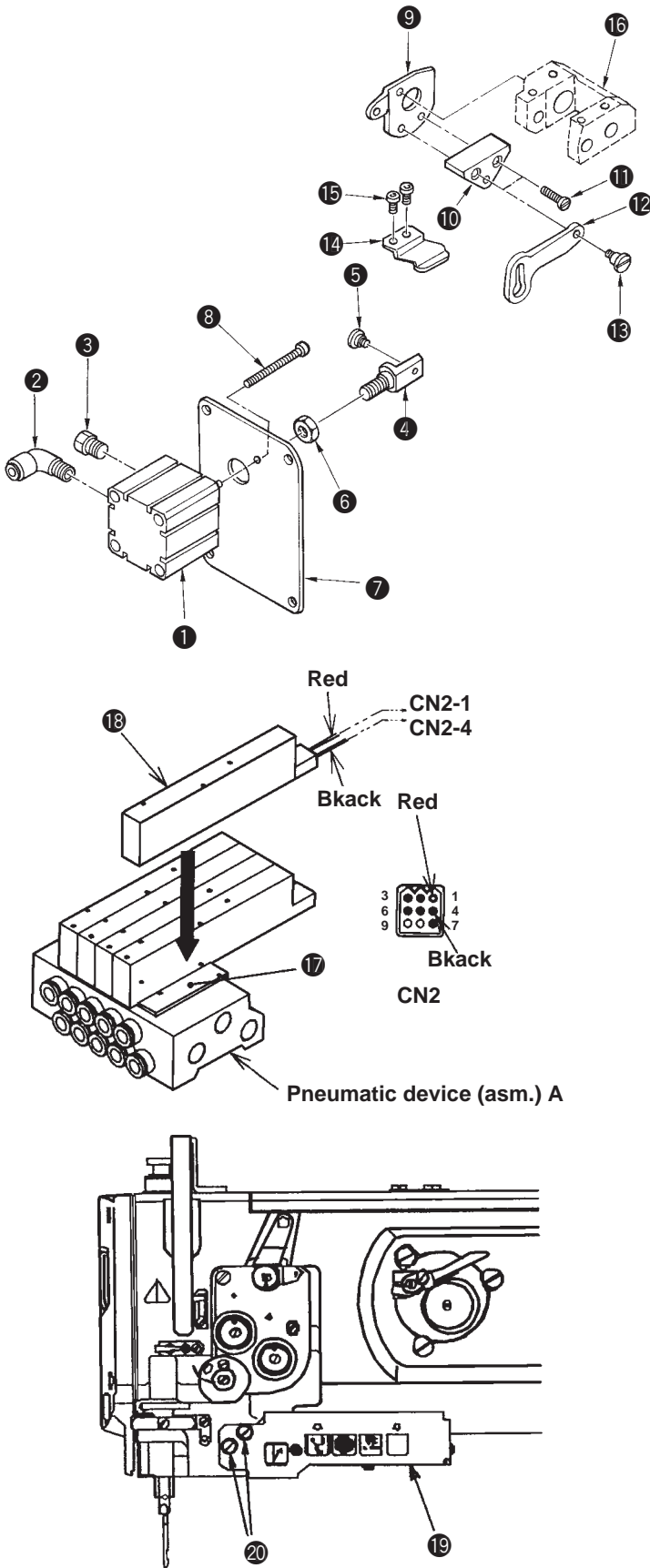


Scale of alternate vertical dial	Switch (upper) (Red and green lines)	Switch (lower) (White and black lines)
1 to 2.5	OFF	OFF
2.625 to 4	OFF	ON
4.125 to 4.75	ON	ON
4.875 to 6.5	ON	OFF

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Turn the alternate vertical dial to adjust the scale “1” to the convex section on the top cover. 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. 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 8 ± 0.1 mm. Then tighten installing screws ❷ of the detection switch of the amount of alternate vertical movement. 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. <p>(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.</p>	<ul style="list-style-type: none"> ○ Sewing speed may not change even when turning the alternate vertical dial.

3. INSTALLATION OF THE OPTIONAL PARTS

(1) DL device (DL21 Kit F for installation after set-up of machine : GDL21000FA0)



* Please order from us with the aforementioned part No.

1. Remove the window plate E 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 nut ⑥ to jig cylinder ①. (Assemble so that the distance from the end of cylinder connecting screw to the end of cylinder shaft is 10 mm.)
3. Attach the jig cylinder ① which has been assembled at the above step 2. to window plate F ⑦ and tighten it with jig cylinder setscrew ⑧.
4. Remove the top feed stopper plate A attached to alternate vertical change base ⑩ and install stopper plate B ⑨.
5. Tighten alternate vertical link spacer ⑩ to top feed stopper plate B ⑨ with setscrew ⑪ and tighten alternate vertical link ⑫ with hinge screw ⑬.
6. Tighten alternate vertical link support ⑮ to the machine arm with setscrews ⑭
7. When installing window plate F ⑦, enter alternate vertical link hinge screw ⑤ to the hole of alternate vertical link ⑫ and attach it to the machine arm.
8. Re-adjust the respective timing adjustment referring to this manual.
9. Remove plate ⑰ attached to pneumatic device (asm.) A being used now and assemble solenoid valve B ⑱.
10. Connect the solenoid valve pin to the plug. (Connect the pin after checking the connecting position and No. indicated in the illustration.)
11. Install 5-string switch ⑲ on the machine arm with setscrews ⑳.
12. Replace the relay cord.
13. Connect the relay cord and the air hose respectively, turn ON the power to the motor control box and check that the amount of alternate vertical movement is maximized when pressing the DL switch.

(2) Bobbin thread remaining amount detecting device (AE-10 Kit A : GAE10000AA0)

Please order from us with the aforementioned part No.

For the installing procedure, refer to "AE-10 Instruction Manual" included in the kit.

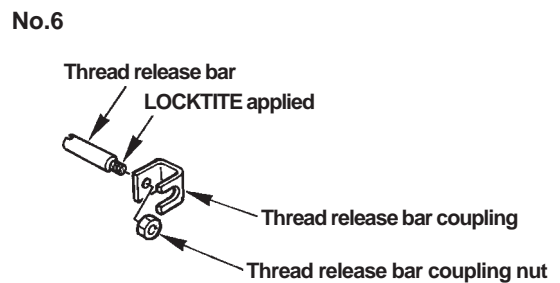
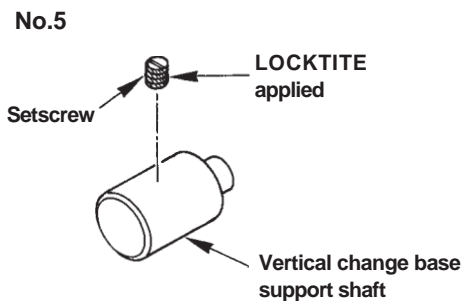
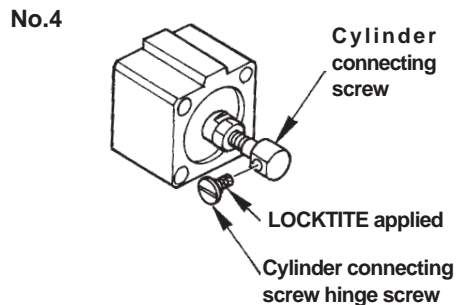
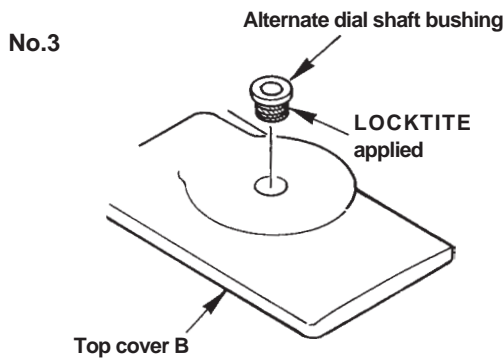
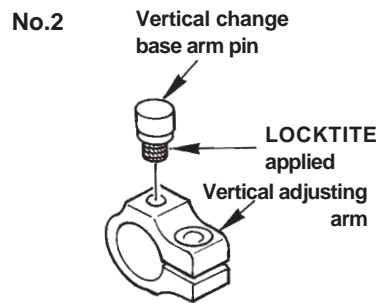
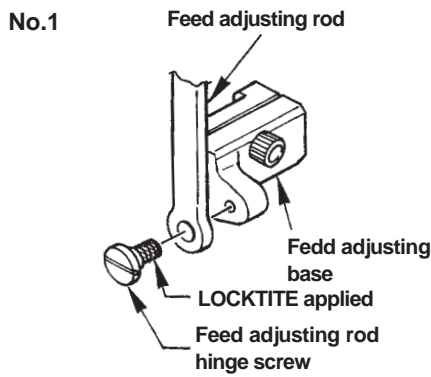
4. PORTION TO WHICH LOCKTITE IS APPLIED

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

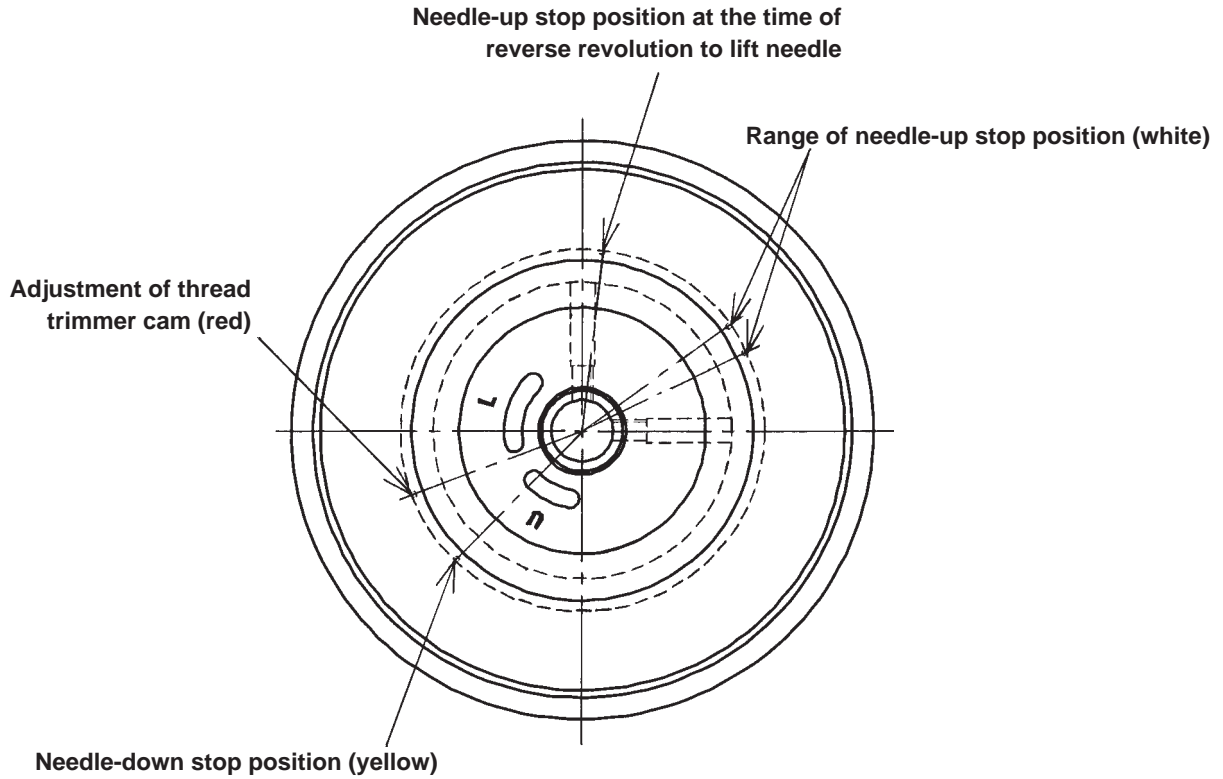


5. SELECTIVE PARTS AND CONSUMABLE PARTS

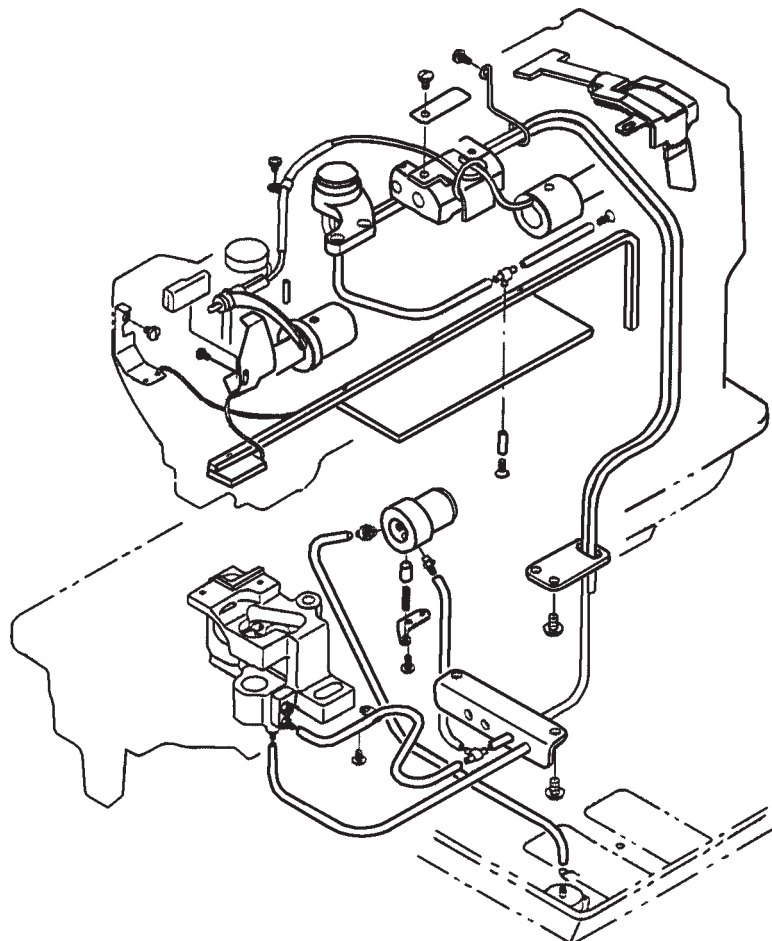
Name of selective part	Part No.	Marking	Remarks
Hook shaft upper bushing thrust washer	10109700	0	t=1.0 mm
Ditto	10110906	1	t=1.1 mm
Ditto	10111003	2	t=1.2 mm
Ditto	10111102	3	t=1.3 mm (standard)
Ditto	10111201	4	t=1.4 mm
Ditto	10109809	5	t=1.5 mm
Ditto	10112506	6	t=1.6 mm
Ditto	10102605	7	t=1.7 mm
Ditto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

Name of consumable part	Part No.	Remarks
Needle	MC372001600	SCHMETZ 135 X 17 Nm 160
Hook (asm.)	21393756	
Bobbin	21334800	Aluminum bobbin (with knurl)
Moving knife	21395801	
Waiting knife	21395900	
Clamp spring	21396007	

6. ENGRAVED MARKER DOTS ON THE HANDWHEEL

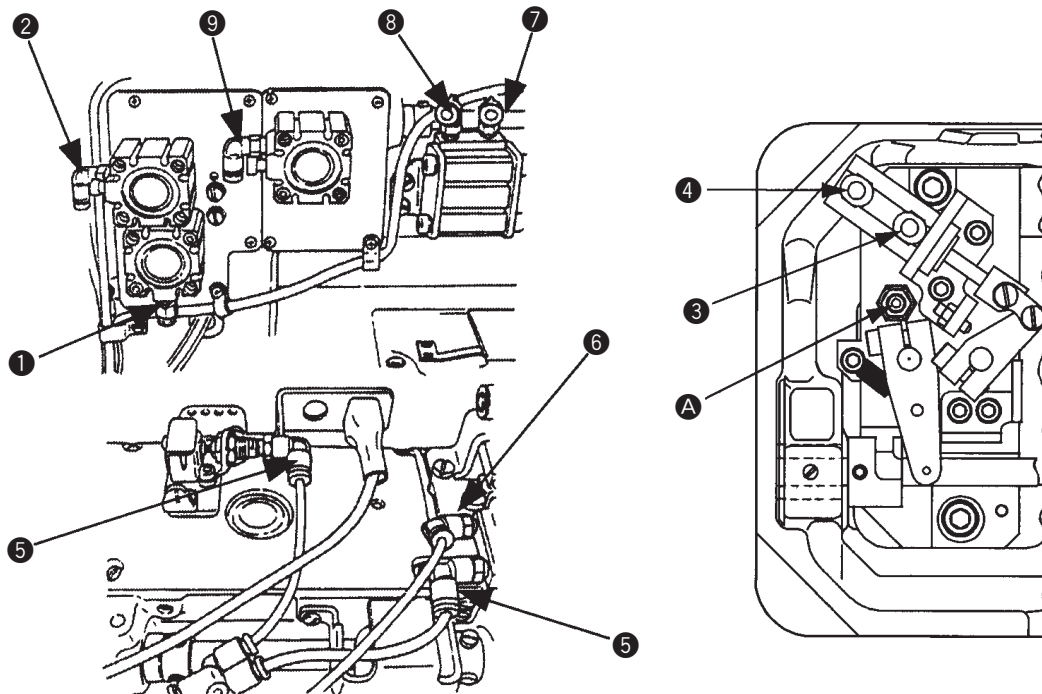
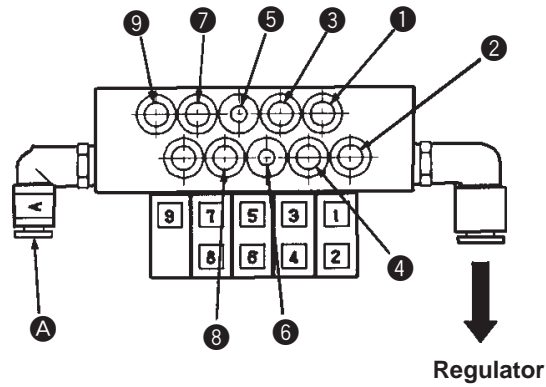


7. LUBRICATION ROUTE DIAGRAM



8. PNEUMATIC COMPONENTS PIPING

Air cylinder name	Indication No.	Remarks
Condensation	①	
Automatic reverse feed	②	
Thread trimmer	③	Cylinder pull-in side
Thread trimmer	④	Cylinder push-out side
Threading, thread presser	⑤	Cylinder push-out side
Threading	⑥	Cylinder pull-in side
Presser lift	⑦	Cylinder pull-in side
Presser lift	⑧	Cylinder push-out side
DL	⑨	For DL device only
Knife fixing	A	



9. MACHINE HEAD WIRING

(1) Connectors coming from machine head

○ 12-pin connector

Name of part	Pin No.	Remarks
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)

○ 4-pin connector

Name of part	Pin No.	Remarks
Threading switch	1	HTSW (White)
Threading switch	2	GND (Black)

○ 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	Condensation (-) (White)
5-string switch	8	Condensation (+) (Black)
5-string switch	9	-----

(2) Connectors coming from the pneumatic device

○ 9-pin connector

Name of part	Pin No.	Remarks
Solenoid valve 1	2	BT (-) (White)
Solenoid valve 1	3	BT (+) (Red)
Solenoid valve 1	7	Condensation (-) (Black)
Solenoid valve 4	5	AK (+) (Red)
Solenoid valve 4	6	AK (-) (Black)
Solenoid valve 5	1	DL (+) (Red) : For DL type only
Solenoid valve 5	4	DL (-) (Black) : For DL type only

○ 6-pin connector

Name of part	Pin No.	Remarks
Solenoid valve 2	3	Threading (+) (Red)
Solenoid valve 2	4	Threading (-) (Black)
Solenoid valve 3	1	Thread trimming (+) (Red)
Solenoid valve 3	2	Thread trimming (-) (Black)
Solenoid valve (For AE-10)	5	Air nozzle (+) (Red) : For AE-10 type only
Solenoid valve (For AE-10)	6	Air nozzle (-) (Black) : For AE-10 type only

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

* Relay cable A (asm.) : 21388855

* Relay cable B (asm.) : 21388863

○ 14-pin connector

Pin No.	Relay cable A (asm.)	Relay cable B (asm.)
1	Thread trimming (-) (Black)	Thread trimming (-) (Black)
2	Condensation (-) (Blue)	Condensation (-) (Black)
3	-----	Needle UP switch (Yellow)
4	Threading switch (White)	Threading switch (White)
5	BT switch (Yellow)	BT switch (Brown)
6	BT (-) (Red)	BT (-) (White)
7	Tension release (-) (Orange)	Tension release (-) (Black)
8	Thread trimming (+) (White)	Thread trimming (+) (White)
9	Condensation (+) (Yellow)	-----
10	Earth (Green/Yellow)	Earth (Green/Yellow)
11	GND (Black)	GND (Black)
12	GND (Blue)	GND (Red)
13	BT (+) (Orange)	BT (+) (Green)
14	Tension release (+) (Red)	Tension release (+) (White)

○ 15-pin connectot

Pin No.	Relay cable A (asm.)	Relay cable B (asm.)
1	GND (Black)	GND (Black)
2	DL switch 1 (Red)	DL switch 1 (Red)
3	-----	DL LED (-), DL (-) (Orange)
5	DL switch 2 (White)	DL switch 2 (White)
6	-----	DL switch (Red)
8	+24V (Black)	LED (+) (Blue)
9	IN2 (Black)	IN2 (Black)
10	GND (White)	GND (White)
11	Threading (+), AE-10 (+) (Yellow)	Threading (+), AE-10 (+) (Red)
12	AE-10 (-) (Blue)	AE-10 (-) (Blue)
13	OUT7 (Black)	OUT7 (Black)
14	OUT6 (Red)	OUT6 (Red)
15	Threading (-) (Orange)	Threading (-) (Orange)

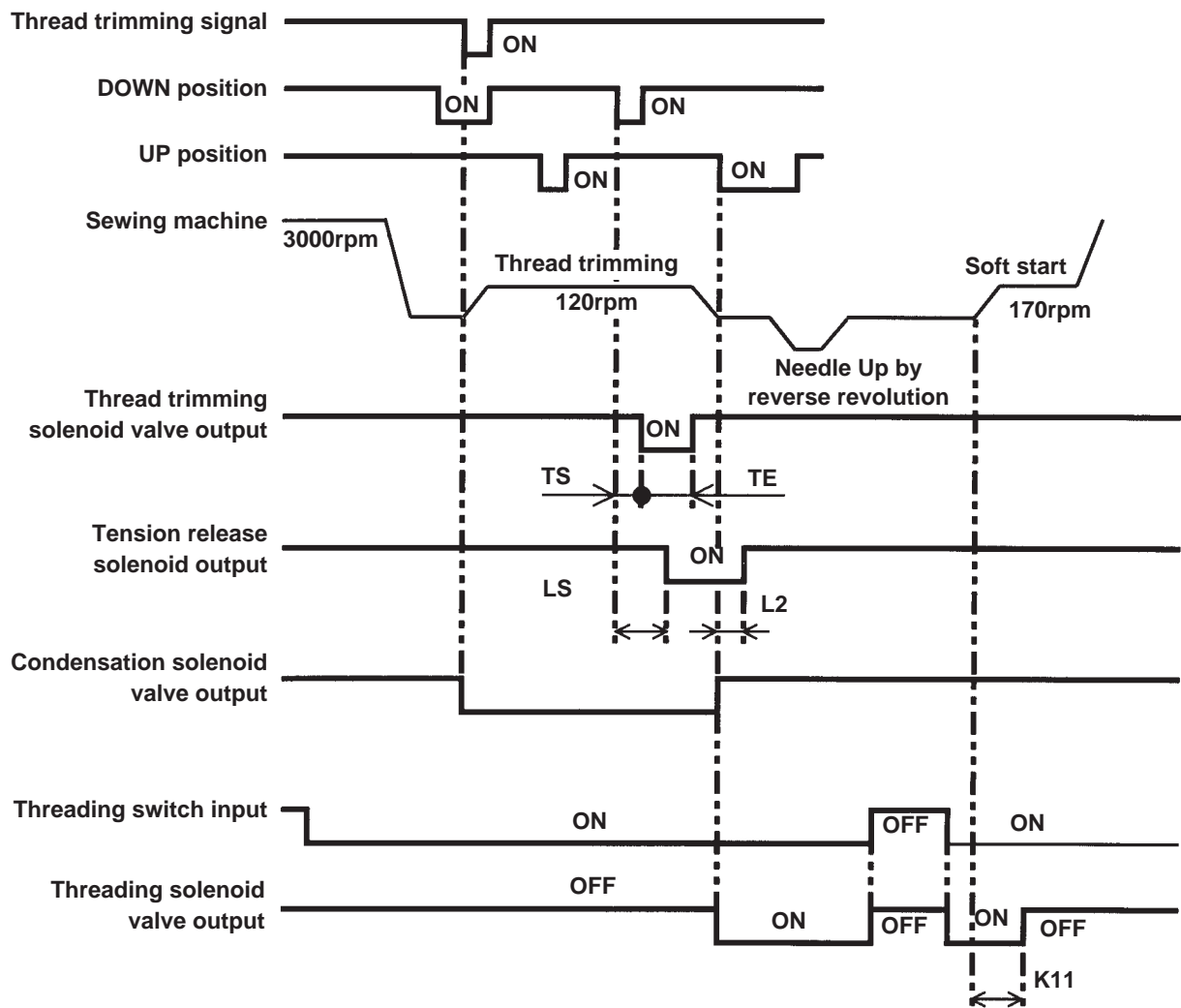
○ 6-pin connector

Pin No.	Relay cable A (asm.)	Relay cable B (asm.)
1	-----	-----
2	INA (White)	INA (White)
3	+12V (Red)	+12V (Red)
4	-----	INB (Black)
5	CKU (Black)	CKU (Black)

○ 2-pin connector

Pin No.	Relay cable A (asm.)	Relay cable B (asm.)
1	AK (-) (Black)	AK (-) (Black)
2	AK (+) (White)	AK (+) (White)

10. TIMING CHART



SC-380 program mode (standard adjustment value)

G mode

- TS (Thread trimming ON timing) : 64
- TE (Thread trimming OFF timing) : 122
- LS (Tension release ON timing) : 180
- L2 (Tension release OFF timing) : 20

When thread trimming failure occurs, change the value of TS.
 At this time, change the value of TE as "TS + TE = 186" as well.

11. 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 "(17) 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 "(17) 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.

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.

(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 "10. TIMING CHART".	
		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 "(18) -7) Position of the clamp spring".
			Pressure of the clamp spring is too low.	Refer to "(18) -7) Position of 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.	<p>Needle thread slips off the needle eyelet immediately after thread trimming.</p> <p>Needle thread slips off the needle eyelet at the start of sewing.</p>	<p>Check whether the needle thread remaining at the needle top after thread trimming is short.</p> <p>Check whether the needle thread remaining at the needle top at the start of sewing is short.</p> <p>Hard-to-slip thread is used.</p>	<p>Refer to the Cause "Needle thread remaining at the needle top after thread trimming is short"</p> <p>Decrease the number of times of threading needle thread.</p>
3	Defective thread trimming.	<p>Thread cannot be trimmed.</p> <p>Thread remains uncut after thread trimming.</p> <p>Moving knife stops during operation.</p>	<p>The blades of moving knife and waiting knife have been improperly adjusted.</p> <p>The blades of moving knife and waiting knife have worn out or broken.</p> <p>Pressure of the waiting knife is insufficient.</p> <p>Presser foot drops from cloth at the time of thread trimming.</p> <p>The blades of moving knife and waiting knife have been improperly adjusted.</p> <p>The blades of moving knife and waiting knife have worn out or broken.</p> <p>Thread trimming timing is excessively retarded.</p> <p>Pressure of the waiting knife is insufficient.</p> <p>Presser foot drops from cloth at the time of thread trimming.</p> <p>Thread is too thick.</p> <p>Thread trimming timing is excessively retarded.</p> <p>Needle thread tension is too high.</p>	<p>Refer to "(18) -3) Knife pressure" and "(18) -4) Initial position of the moving knife and the waiting knife".</p> <p>Replace the moving knife and waiting knife with new ones.</p> <p>Refer to "(18) -3) Knife pressure".</p> <p>Perform thread trimming on cloth.</p> <p>Refer to "(18) -3) Knife pressure" and "(18) -4) Initial position of the moving knife and the waiting knife".</p> <p>Replace the moving knife and waiting knife with new ones.</p> <p>Refer to "10. TIMING CHART".</p> <p>Refer to "(18) -3) Knife pressure".</p> <p>Perform thread trimming on cloth.</p> <p>Use thread within the specified value.</p> <p>Refer to "10. TIMING CHART".</p> <p>Decrease the tension of the thread tension No. 1.</p>
				<p>To the next page</p> <p>To the next page</p>

Troubles	Causes	Checking	Corrective measures
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		Tension of the bobbin thread is too high.	Adjust the tension of bobbin thread.
		Knife pressure of the waiting knife is too high.	Refer to "(18) -3) Knife pressure".
		Thread is not cut sharply.	Refer to Causes "Thread cannot be trimmed" and "Thread remains uncut after trimming".
		Presser foot drops from cloth at the time of thread trimming.	Perform thread trimming on cloth.
Needle thread is not caught.		Stitch skipping at the last stitch.	Refer to "(7) Needle-to-hook timing" Refer to "(16) Reverse feed cylinder and condensation cylinder".
		Most advanced position of the moving knife is not obtained.	Refer to "(18) -5) Most advanced position of the moving knife".
		Top end of the moving knife is broken or has burrs.	Replace the moving knife with a new one.
Bobbin thread is not caught.		Most advanced position of the moving knife is not obtained.	Refer to "(18) -5) Most advanced 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.
		Presser foot drops from cloth at the time of thread trimming.	Perform thread trimming on cloth.

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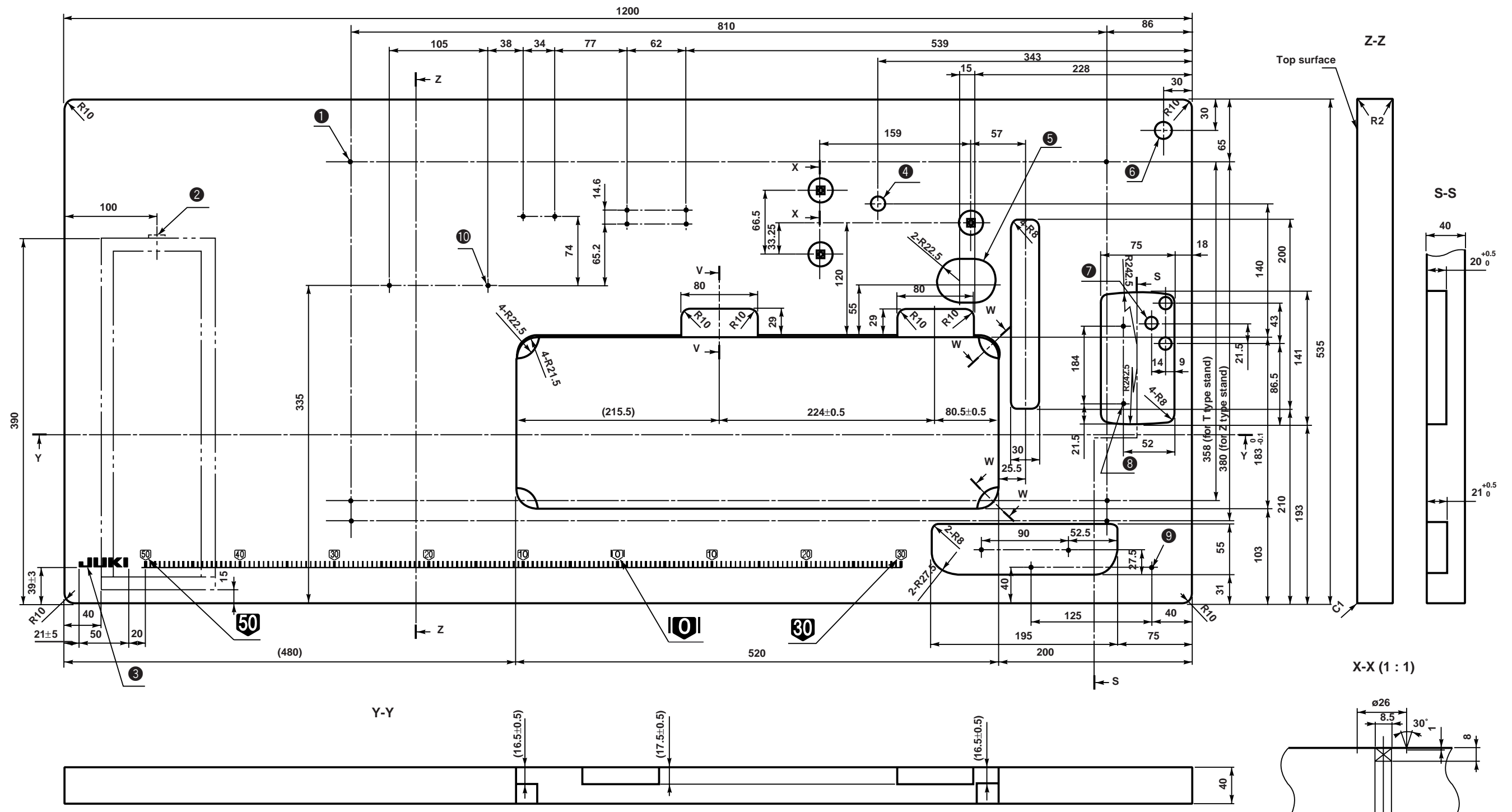


Troubles	Causes	Checking	Corrective measures
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	Both needle and bobbin thread cannot be trimmed.	<p>The blades of moving knife and waiting knife have been improperly adjusted.</p> <p>Waiting knife pressure is excessively low.</p> <p>Moving knife fails to work.</p> <p>Presser foot drops from cloth at the time of thread trimming.</p>	<p>Refer to "(18) -3) Knife pressure".</p> <p>Refer to "(18) -3) Knife pressure".</p> <p>Adjust the synchronizer timing.</p> <p>Refer to "(18) -6) Most advanced position of the waiting knife and the cam timing".</p> <p>Air pressure is excessively low. Adjust the air pressure (Adjust it to 0.5 Mpa or more.)</p> <p>Perform thread trimming on cloth.</p>
4	Needle thread remains on cloth at the start of sewing.	<p>Threading device fails to work.</p> <p>Protruding amount of the threading plate is too small.</p> <p>Cloth treads needle thread at the start of sewing.</p>	<p>Turn ON the threading switch.</p> <p>Refer to "(19) -1) Threading device".</p> <p>Adjust so that cloth does not tread needle thread.</p>

12. DRAWING OF THE TABLE



- ① 4- ϕ 3.4 Depth 10
(Drill a hole at the time of set-up)
- ② Installing position of stopper for drawer
(on the reverse side)
- ③ JUKI logotype
- ④ 16 depth 30
- ⑤ Top surface C1.5
- ⑥ 18 drill
- ⑦ 3- ϕ 13 drilled hole
- ⑧ 2- ϕ 3.5 depth 10
- ⑨ 2-3.4 depth 10
- ⑩ 8-3.4 depth 10

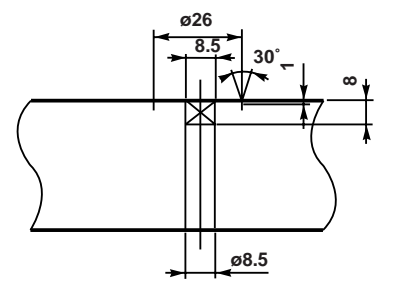
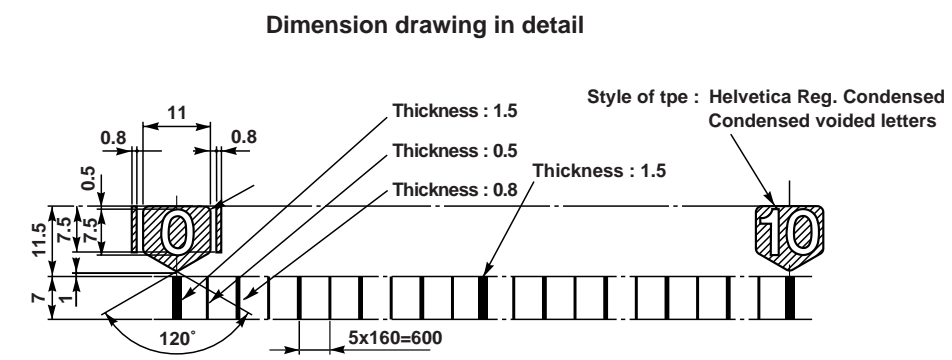
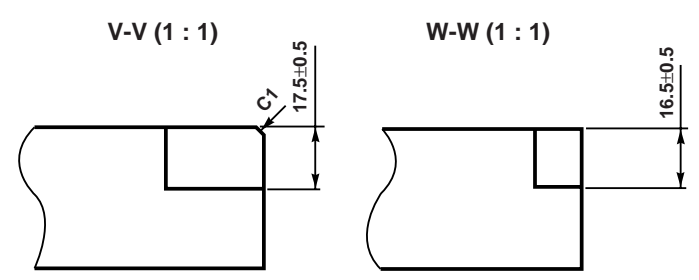


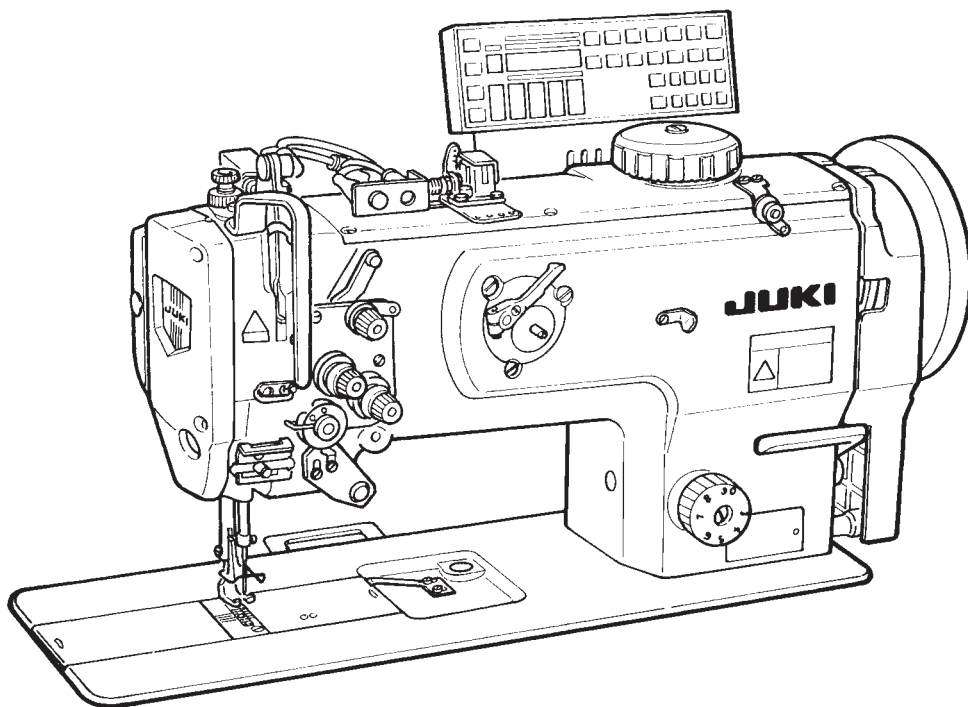
Table Part No. : 21352406

JUKI®

**1-needle, Unison-feed, Lockstitch Machine with
Automatic Thread Trimmer
(Needle thread roll-in and shorter-thread remaining type)**

LU-1520N-7

ENGINEER'S MANUAL



29359502
No.E351-00

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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