

JUKI®

Cylinder-Bed, 1-Needle, Unison Feed, Lockstitch Machine (Vertical Hook)

LS-341N

Cylinder-Bed, 1-Needle, Unison Feed, Lockstitch Machine with Automatic
Thread Trimmer (Vertical Hook)

LS-341N-7

ENGINEER'S MANUAL

29322500

No.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", "Results of Improper Adjustment" and other important information which are not covered by the Instruction Manual.

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

In addition, refer the motor of the sewing machine with thread trimmer to the Instruction Manual and Engineer's Manual for the motor. Also, refer the control panel 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 the "Results of Improper Adjustment", phenomena arising from stitching errors and troubles caused by mechanical failures, and "Adjustment Procedures" are described.

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1. SPECIFICATIONS

No.	ITEM	SPECIFICATIONS	
1	Model	LS-341N	LS-341N-7
2	Name of machine	Cylinder-bed, 1-needle, unison feed, lockstitch machine (vertical hook)	Cylinder-bed, 1-needle, unison feed, lockstitch machine with automatic thread trimmer (vertical hook)
3	Applications	Medium- to heavy-weight materials	
4	Sewing speed	Max. 2,000 rpm	
5	Needle	DP x 17 #14 to #24	DP x 17 #16 to #24 D type : SCHMETZ DP x 17 Nm 100 to 130
6	Thread	#40 to #8	#30 to #5
7	Thread to be cut		#30 to #5
8	Stitch length	Max. 6 mm (for both normal and reverse feeds)	
9	Lift of presser foot	By hand lifter : 8.5 mm By knee lifter : 15 mm By auto-lifter : 15 mm	
10	Stitch adjustment system	Butterfly dial type	
11	Reverse stitching system	Lever type	Lever type, Air cylinder type
12	Thread take-up	Slide thread take-up	
13	Needle bar stroke	33.36 mm	
14	Amount of alternating vertical movement	2.3 mm to 6 mm	
15	Hook	Full-rotary vertical hook (1.6-fold hook)	
16	Feed mechanism	Box feed	
17	Uper feed mechanism	Interlocking with lower feed type	
18	Main and hook driving shaft drive	Timing belt	
19	Lubrication	Manual	
20	Lubricating oil	JUKI New Defrix Oil No. 1	
21	Diameter of cylinder	72 mm	
22	Material handling area	250 mm X 105 mm	
23	Motor	4P-400W	AC Servo motor
24	Belt	M type V belt	MH type V belt

2. STANDARD ADJUSTMENT

Standard Adjustment

1) Longitudinal position of the feed dog

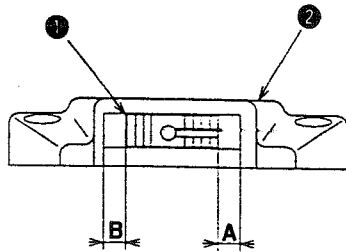


Fig. 1

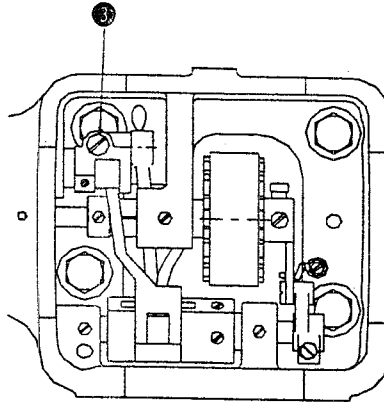


Fig. 2

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

B = Clearance between the feed dog and the throat plate when the feed dog travels to the back end.

- Standard type

A = B = Approximately 1.5 mm (Feed amount : 6 mm)

- D type

A = B = Approximately 1.3 mm (Feed amount : 4 mm)

2) Position of needle entry (longitudinal position)

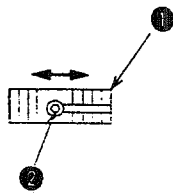


Fig. 3

Conditions

- Needle bar at the lower dead point
- Feed amount : 0 mm

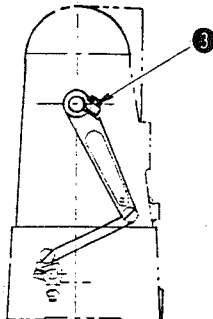


Fig. 4

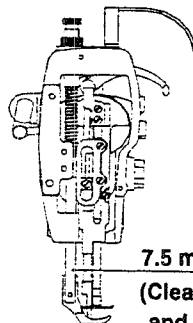


Fig. 5

7.5 mm

(Clearance between presser bar and upper feed bar)

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the feed dial to 6 mm. 2. Loosen feed rocker shaft crank setscrew ③. 3. Adjust the position of feed dog ① so that the longitudinal clearance between the feed dog and the slot on throat plate ② is equal when feed dog ① travels, and securely tighten setscrew ③. 	<ul style="list-style-type: none"> • Throat plate ② comes in contact with feed dog ①. As a result, contacting noise will be produced. • Irregular stitches will occur.
<ol style="list-style-type: none"> 1. Set the feed dial to 0 mm. 2. Turn the handwheel to bring the needle bar in the lower dead point. 3. Loosen needle bar frame driving arm setscrew ③. 4. Adjust so that needle ② comes in the center of the hole in feed dog ①, and securely tighten the setscrew. <p>(Caution) Tighten the setscrew so that there is no thrust play at the needle bar frame rock shaft.</p> <p>☆ Reference for the position of needle entry (longitudinal position) Clearance between the presser bar and the upper feed bar is approximately 7.5 mm when the feed amount is 0 mm. (Lower face of the needle bar frame)</p>	<ul style="list-style-type: none"> • Stitch skipping and needle breakage will result. • Loose stitches will result.

Standard Adjustment

3) Position of needle entry (lateral position)

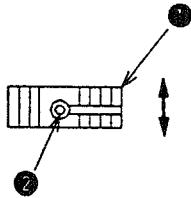


Fig. 6

Conditions

- Needle bar at the lower dead point
- Feed amount : 0 mm

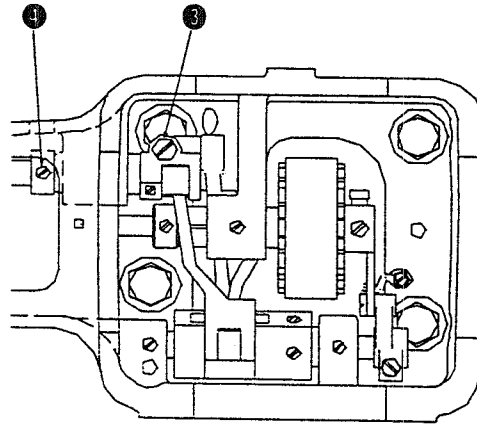


Fig. 7

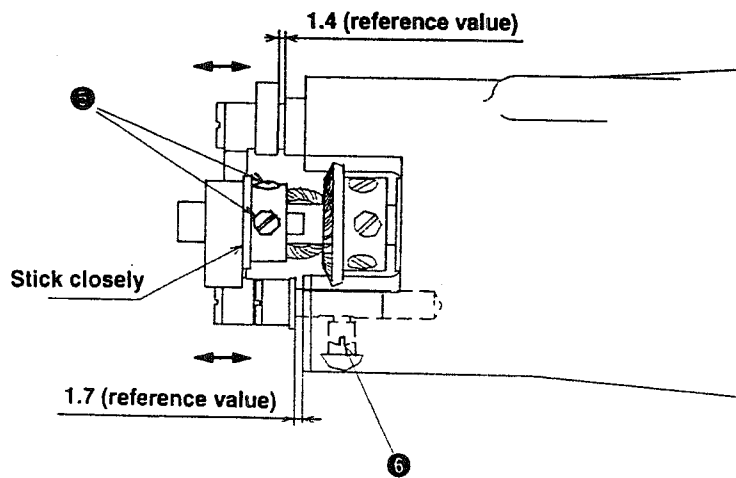


Fig. 8

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the feed dial to 0 mm. 2. Remove the throat plate and the throat plate base frame. 3. Loosen two setscrews ④ in the feed rocker shaft thrust collar. 4. Loosen setscrew ⑤ in the feed rocker shaft crank. 5. Loosen setscrew ⑥ in the feed bar link shaft. 6. Loosen two setscrews ⑦ in the feed vertical cam. 7. Turn the handwheel to bring the needle bar in the lower dead point. 8. Finely move the feed rocker shaft and the feed bar link in the direction of arrow as shown in Fig. 8 to adjust the needle entry. 9. After the adjustment, securely tighten two setscrews ④ in the feed rocker shaft thrust collar, setscrew ⑤ in the feed rocker shaft crank, setscrew ⑥ in the feed bar link shaft and two setscrews ⑦ in the feed vertical cam. <p>(Caution) • When tightening two setscrews ⑦ in the feed vertical cam, tighten them after sticking the end face of the feed vertical cam to the end face of the feed bar crank.</p> <ul style="list-style-type: none"> • Tighten the setscrews so that there is no thrust play at the feed rocker shaft. 	<ul style="list-style-type: none"> • Stitch skipping and thread breakage will result. • Loose stitches will result. • Needle breakage will result.

Standard Adjustment

4) Needle-to-hook timing

Conditions
• Feed amount : 3 mm

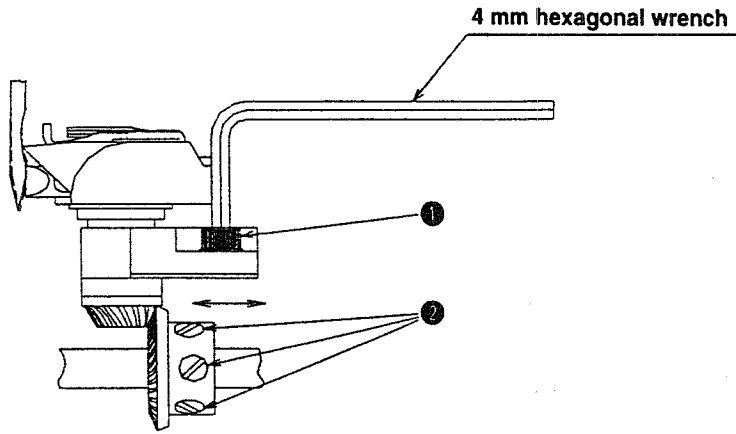


Fig. 9

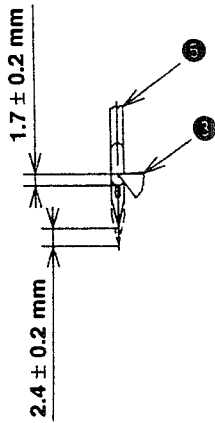


Fig. 10

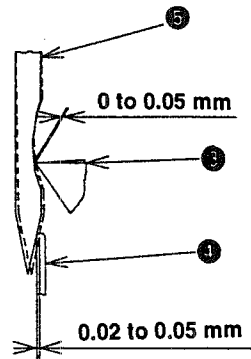


Fig. 11

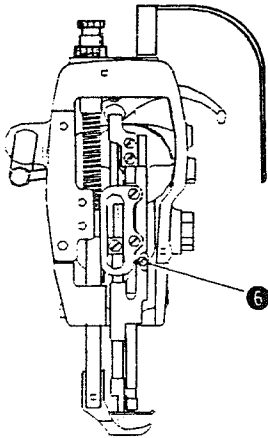


Fig. 12

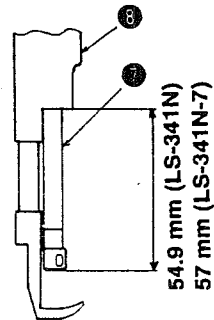


Fig. 13

Adjustment Procedures	Results of Improper Adjustment
<p>I) The lower dead point of the needle bar for reference</p> <ol style="list-style-type: none"> 1. Set the feed dial to 0 mm. 2. Turn the handwheel to bring needle bar ⑦ to its lower dead point. 3. Remove the face plate, loosen setscrew ⑥ in the needle bar connection, move needle bar ⑦ up or down and adjust the distance from the lower end of needle bar frame ⑧ to the lower end of the needle bar to 54.9 mm (LS-341N) or 57 mm (LS-341N-79). Then, temporarily tighten the setscrew. [There is an engraved marker line on the needle bar for reference.] <p>II) Clearance between the needle and the blade point of hook</p> <ol style="list-style-type: none"> 1. Set the feed dial to 3 mm. 2. Remove the gear cover. 3. Loosen three setscrews ② in the hook driving shaft bevel gear and turn the handwheel to raise needle bar ⑦ by 2.4 mm from the lower dead point of the needle bar. [There is an engraved marker line on the needle bar for reference.] 4. Loosen two setscrews ① in the hook driving shaft saddle, move the hook driving shaft in the direction of arrow and adjust the clearance between needle ⑤ and blade point ③ of the hook to 0 to 0.05 mm. <p>III) Needle-to-blade point of hook timing</p> <ol style="list-style-type: none"> 1. Raise needle bar by 2.4 mm from its lower dead point, turn the hook so that blade point ③ of the hook is aligned with the center of needle ⑤, and securely tighten three setscrews ②. 2. At this time, the distance between blade point ③ of the hook and the top end of the needle eyelet is to be 1.7 mm. If the distance has not been obtained, loosen setscrew ⑥ in the needle bar connection and perform fine adjustment. Then, securely tighten the setscrew. <p>IV) Adjusting the needle guard of the hook</p> <ol style="list-style-type: none"> 1. Bend needle guard ④ and adjust so that the needle guard comes in contact 0.02 to 0.05 mm with the needle. <p>(Caution) When the hook shaft saddle is shifted, the backlash of the bevel gear will change. It is necessary to adjust the axial direction of the hook driving shaft bevel gear. (Backlash : 2 degrees)</p>	<ul style="list-style-type: none"> • Stitch skipping and thread breakage will result. • Needle breakage will result. • Irregular stitches will result.

Standard Adjustment

5) Adjusting the inner hook guide

Conditions

- When the inner hook guide travels to the back end.
- Press the hook stopper to the slit on the throat plate.

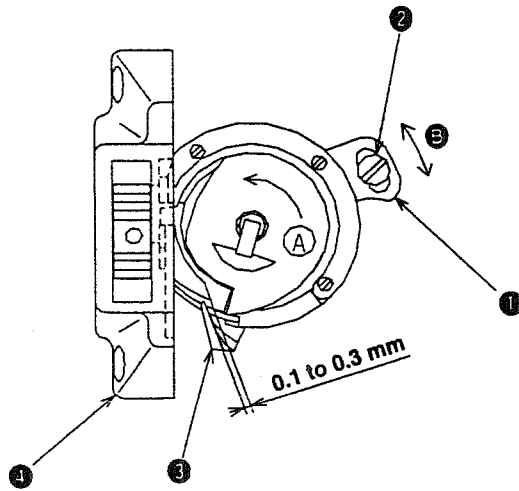


Fig. 14

6) Height of the feed dog

Conditions

- Feed amount : 0 mm
- When the feed dog protrudes most.

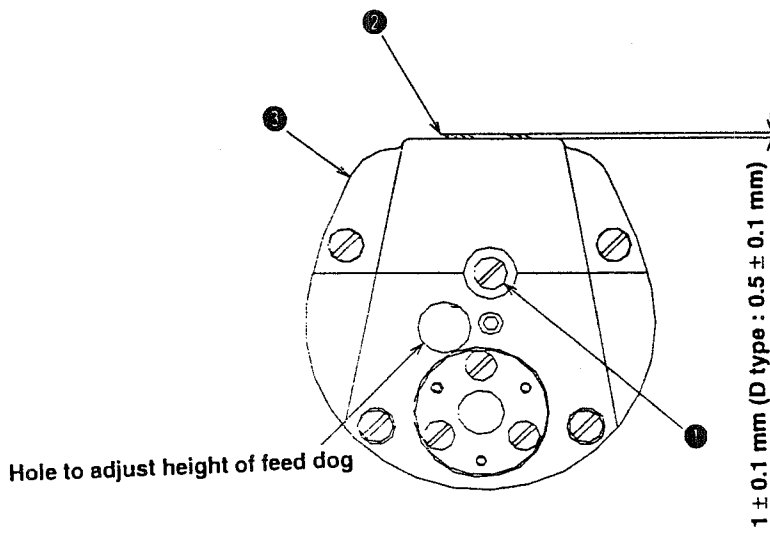


Fig. 15

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Turn the handwheel in its normal rotational direction to bring the inner hook guide ③ to its back end position. 2. Turn the bobbin case in the direction of arrow A until the hook stopper comes in contact with the slit on throat plate ④. 3. Loosen setscrew ② in the inner hook guide adjusting plate, move inner hook guide adjusting plate ① in the direction of arrow B, and adjust so that clearance between inner hook guide ③ and the protruding section of the bobbin case should be 0.1 to 0.3 mm. 4. After the adjustment, securely tighten the setscrew. 	<p>If the clearance is excessive :</p> <ul style="list-style-type: none"> • Loose stitches (balloon stitch or isolated idling loops) will result. <p>If the clearance is insufficient :</p> <ul style="list-style-type: none"> • Inner hook breakage will result.
<ol style="list-style-type: none"> 1. Set the feed dial to 0 mm. 2. Turn the handwheel to bring the feed dog to the position where it protrudes most from the throat plate. 3. Loosen setscrew ① in the feed dog. 4. Adjust the protruding amount of feed dog ② to 1 ± 0.1 mm (D type : 0.5 ± 0.1 mm) above the top surface of throat plate ③. Then, securely tighten setscrew ① in the feed dog. <p>(Caution) Tightening torque of the setscrew in the feed dog is 4 ± 0.5 Nm.</p>	<p>When the height of the feed dog is high :</p> <ul style="list-style-type: none"> • Stitch length will be larger than the feed dial graduation. • Isolated idling stitches will be produced. <p>When the height of the feed dog is low :</p> <ul style="list-style-type: none"> • Stitch length will be less than the feed dial graduation. • Feed force will be weakened.

Standard Adjustment

7) Main shaft-to-hook driving shaft timing

Conditions

- Feed amount : 0 mm
- Thread take-up at the upper dead point

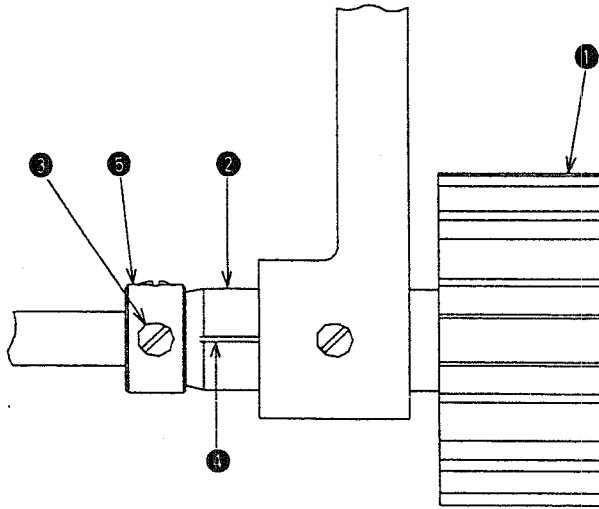


Fig. 16

8) Upper feed cam timing

Conditions

- When the needle comes down.

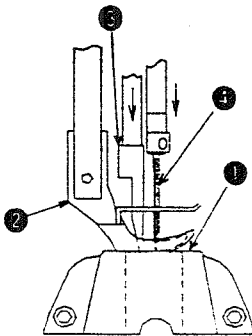


Fig. 17

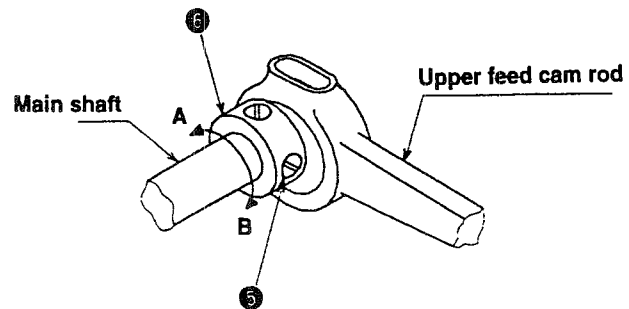


Fig. 18

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the feed dial to 0 mm. 2. Turn the handwheel to bring the thread take-up to its upper dead point. 3. Turn lower sprocket wheel ❶ to the position where setscrew No. 1 ❸ in hook driving shaft thrust holder ❷ is aligned with engraved marker line ❹ on hook driving shaft bushing, rear, ❺ and put the timing belt to the lower sprocket wheel. 	<ul style="list-style-type: none"> • Loose stitches will result. • Feed timing and needle-to-hook timing will change.
<ol style="list-style-type: none"> 1. Loosen two setscrews ❷ in the upper feed cam. 2. Turn upper feed cam ❸ to the position where three points of top surface ❶ of the throat plate, needle (top point) and walking foot ❹ align one another. 3. After the adjustment, securely tighten two setscrews ❷. 	<p>If the timing is excessively advanced (in the direction of A) :</p> <ul style="list-style-type: none"> • Stitch length will be less than the feed dial graduation. • Reverse feed motion will be applied to the walking foot. <p>If the timing is excessively retarded (in the direction of B) :</p> <ul style="list-style-type: none"> • Stitch length will be larger than the feed dial graduation. • Hangnail of needle thread will occur.

Standard Adjustment

9) Upper feed movement

① Amount of alternating vertical movement

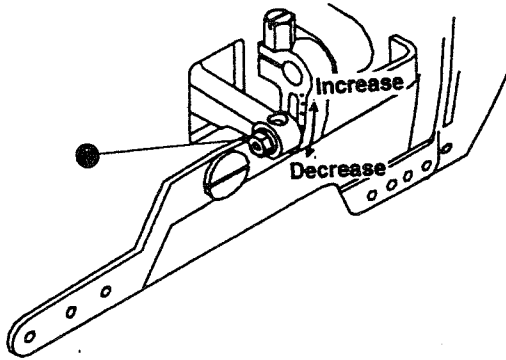


Fig. 19

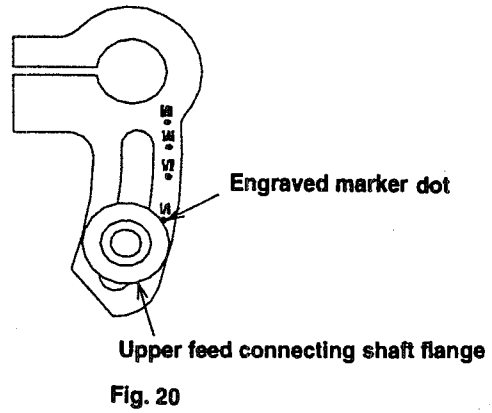


Fig. 20

Standard

- Engraved marker dot 1/8 of the upper feed rod is aligned with periphery of the upper feed driving rod boss.

② Amount of alternating movement

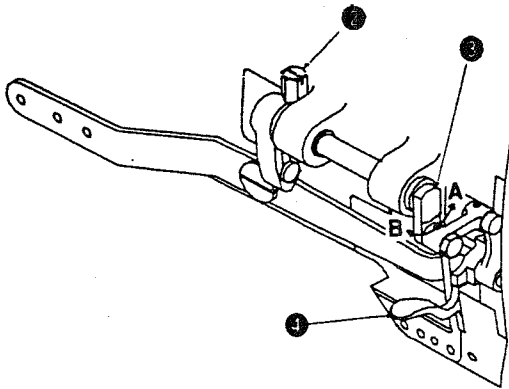
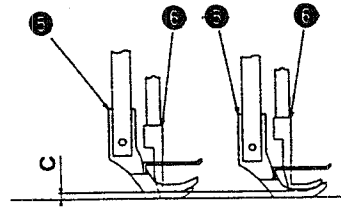


Fig. 21



C : Equal

Fig. 22

Conditions

- Feed amount : 0 mm

Adjustment Procedures	Results of Improper Adjustment
<p>Amount of alternating vertical movement</p> <ol style="list-style-type: none"> 1. Loosen nut ❶ of the upper feed driving rod connecting stud hinge screw. 2. Move the position of cam rod boss up or down to adjust the amount. 3. After the adjustment, securely tighten nut ❶ . <ul style="list-style-type: none"> • Upper portion of slot → amount of movement is increased. • Lower portion of slot → amount of movement is decreased. 	<ul style="list-style-type: none"> • Increase the height of movement in accordance with the material to be sewn. <ul style="list-style-type: none"> • Sewing of sponge or the like • Sewing of overlapped material • If the amount of movement is increased, stitch length differs from feed dial graduation. • Lower the motor rotation slightly since feed force is deteriorated.
<p>Amount of alternating movement</p> <ol style="list-style-type: none"> 1. Set the feed dial to 0 mm. 2. Manually turn the handwheel to bring the thread take-up to its lowest point. 3. Lower hand lifter ❶ . 4. Loosen setscrew ❷ in the upper feed rod. 5. When upper feed driving shaft ❸ is shifted to the direction of A, the amount of vertical movement of walking foot ❹ and presser foot ❺ becomes equal. 6. When upper feed driving shaft ❸ is shifted to the direction of B, the amount of vertical movement of presser foot ❺ is decreased and the amount of vertical movement of walking foot ❹ is increased. 7. Securely tighten setscrew ❷ in the upper feed rod. 	<ul style="list-style-type: none"> • Make the amount of vertical movement of the walking foot more than that of the presser foot depending on the material to be sewn. <ul style="list-style-type: none"> • Sewing of sponge or the like • Sewing of overlapped material • Sewing of piping • In case the amount of alternating vertical movement is excessively different : <ul style="list-style-type: none"> • Stitch length differs from the feed dial graduation. • Lower the motor rotation slightly since feed force is deteriorated.

Standard Adjustment

10) Normal and reverse feed stitching pitches

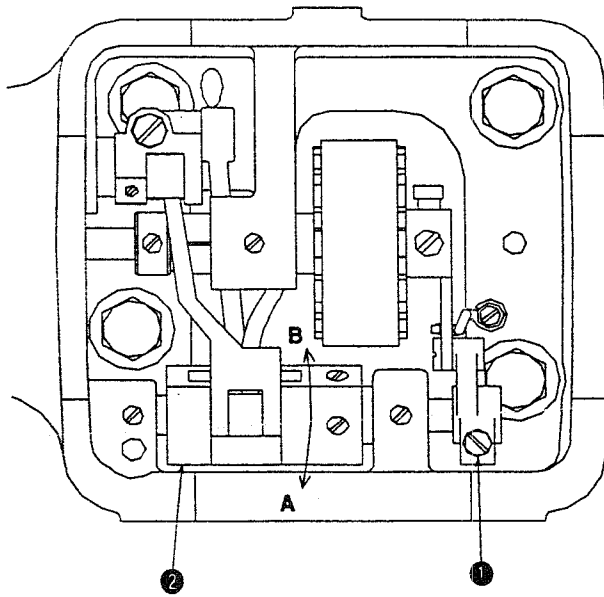


Fig. 23

11) Horizontal feed timing

Standard

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

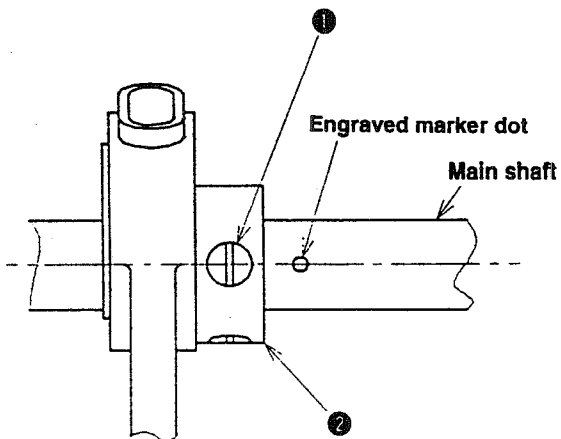
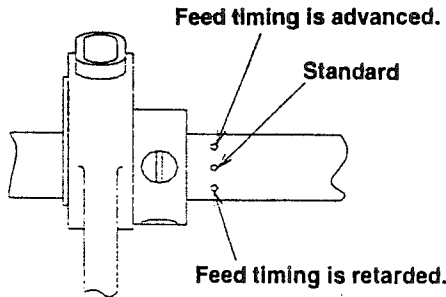


Fig. 24

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Set the feed dial to 6 mm. 2. Loosen setscrew ❶ in the feed driving rocker shaft. 3. Turn feed driving rocker ❷ in the direction of arrow to adjust the stitching pitch. <ul style="list-style-type: none"> • Direction of A → normal feed stitching pitch is increased. • Direction of B → reverse feed stitching pitch is increased. 4. After the adjustment, securely tighten setscrew ❶. 	<ul style="list-style-type: none"> • Normal feed stitching pitch does not agree with the reverse feed stitching pitch.
<ol style="list-style-type: none"> 1. Loosen two setscrews ❶ in the feed drive eccentric cam. 2. Turn feed drive eccentric cam ❷ to adjust the timing and tighten setscrews ❶. <p>(Caution) If the cam is shifted to the axial direction when performing the adjustment, an extra load will be applied. So, be careful.</p>	<ul style="list-style-type: none"> • If the feed timing is slightly retarded, well-tightened and even stitches are obtained. However, stitching pitch becomes smaller than the feed dial graduation. <div style="text-align: center;">  <p>Fig. 25</p> </div>

Standard Adjustment

12) Safety device

Standard

- Actuating torque of the safety device is 17.6 ± 1.2 Nm.
- Sewing machine should not run idle during operation.

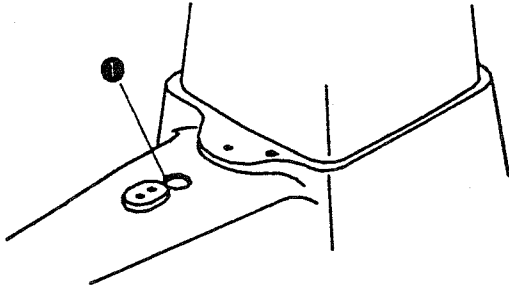


Fig. 26

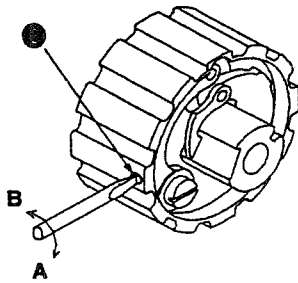


Fig. 27

13) Replacing the timing belt

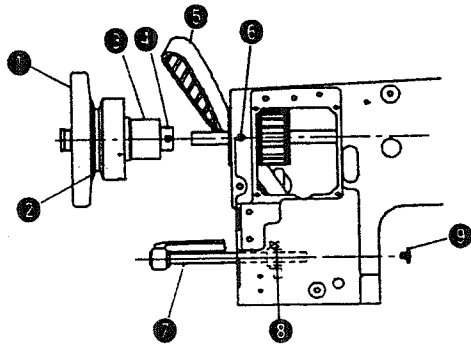


Fig. 28

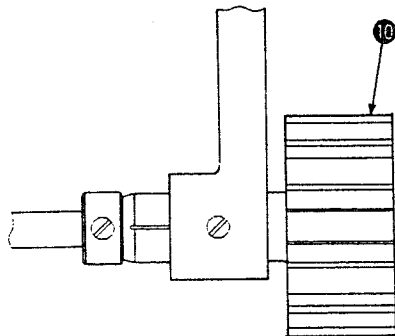


Fig. 29

Adjustment Procedures	Results of Improper Adjustment
<p>In case thread is caught in the hook during operation, the safety device works and the lower sprocket wheel only runs idle.</p> <ul style="list-style-type: none"> ● How to reset the safety device <ol style="list-style-type: none"> 1. Remove the thread caught in the hook. 2. Pressing push-button ❶, turn the handwheel in the reverse direction of rotation, and the safety device is reset. ● Adjusting the actuating torque of the safety device <p>Turn adjusting screw ❷ in the direction of arrow to adjust the torque.</p> <ul style="list-style-type: none"> • Direction of A → Actuating torque is increased. • Direction of B → Actuating torque is decreased. 	
<p>I) How to remove</p> <ol style="list-style-type: none"> 1. Loosen two setscrews ❷ in the handwheel, two setscrews ❹ in the rear main shaft bushing thrust, setscrew ❺ in the rear main shaft bushing, two setscrews ❸ in the control lever crank, and screw ❾ in the feed lever shaft respectively in the written order. 2. Remove handwheel ❶ and pull out rear main shaft bushing ❸. 3. Draw feed lever shaft ❷ to such an extent that timing belt ❻ can be pulled out. 4. Remove timing belt ❻ from lower sprocket wheel ❿, pull it out from the side window and then pull it out from the hole of rear main shaft bushing. <p>II) How to install</p> <ol style="list-style-type: none"> 1. Install it by reversing the above removing order. 2. After installation, securely tighten the respective screws. <p>(Caution) Refer to “Main shaft-to-hook driving shaft timing” on page 10 for the timing of the main shaft and hook driving shaft.</p>	

3. STANDARD ADJUSTMENT OF THE ADDITIONAL UNITS (LS-341N-7)

Standard Adjustment

(1) THREAD TRIMMER UNIT

1) Upper/lower position of the moving knife

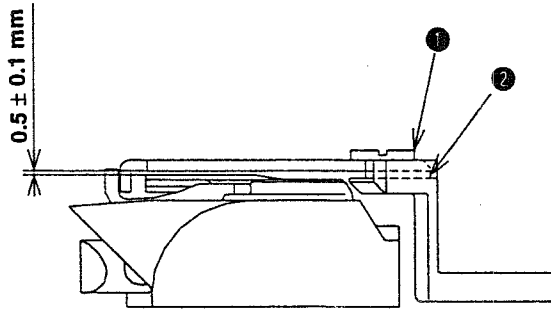


Fig. 30

Refer to page 28 for the selective parts for moving knife spacer ②.

2) Position of the counter knife

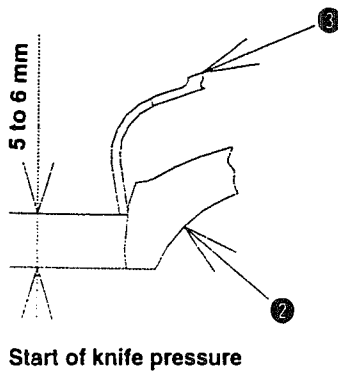


Fig. 31

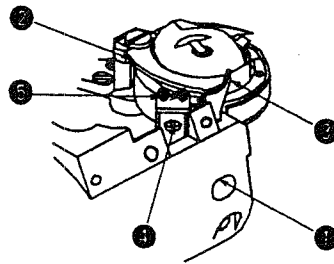


Fig. 32

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrew ❶ in the moving knife. 2. Select moving knife spacer ❷ so that the clearance between the top surface of the bobbin case and the bottom face of the moving knife is 0.5 ± 0.1 mm. 3. After the adjustment, tighten setscrew ❶. 	<ul style="list-style-type: none"> • If the clearance is wider than the specified value : <ul style="list-style-type: none"> • Defective catching of needle and bobbin threads will result. • If the clearance is narrower than the specified value : <ul style="list-style-type: none"> • There is no space where the thread enters in between the moving knife and the bobbin case. As a result, defective thread cutting will result.
<ul style="list-style-type: none"> • Adjusting the knife pressure <ol style="list-style-type: none"> 1. Loosen setscrew ❶ in the counter knife installing base. 2. Turn moving knife ❷ by hand, and tighten setscrew ❶ in the counter knife installing base so that the position where counter knife ❸ and moving knife ❷ start coming in contact with each other is 5 to 6 mm. <p>(Caution) Reduce the knife pressure as low as possible to such an extent that the needle and bobbin threads are cut together.</p> <ul style="list-style-type: none"> • Engagement of the blade faces of the moving knife and the counter knife <ol style="list-style-type: none"> 1. Slightly loosen counter knife setscrew ❹. 2. Move counter knife ❸ with counter knife adjusting screws ❺ and adjust the blade face. 3. After the adjustment, tighten setscrew ❹. <p>(Caution) If the engagement of the blade faces of the moving knife and the counter knife is not proper, thread cutting is dull however high the knife pressure may be. Make sure of the engagement of the blade faces.</p>	<ul style="list-style-type: none"> • If the knife pressure is excessively high : <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 cutting becomes large. As a result, machine lock will result. • If the knife pressure is insufficient : <ul style="list-style-type: none"> • Thread cutting will be dull. • If the engagement of the blade faces of the moving knife and the counter knife is not proper : <ul style="list-style-type: none"> • Defective thread cutting will result.

Standard Adjustment

3) Position of the thread trimmer cam and the thread trimmer timing

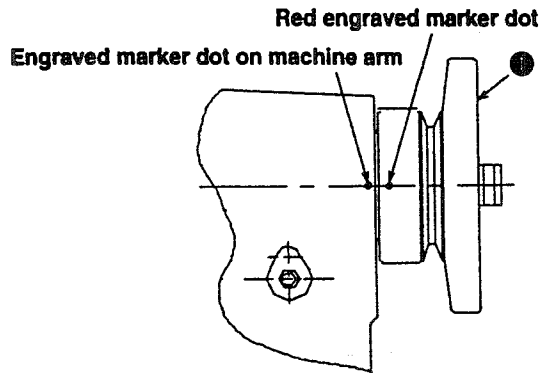


Fig. 33

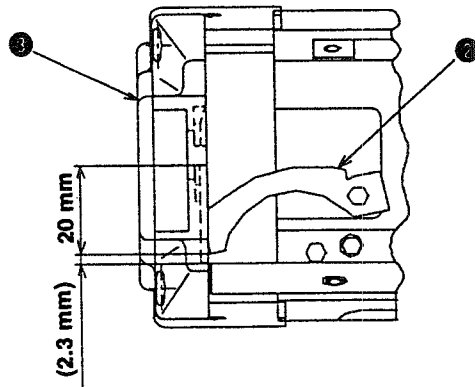


Fig. 34

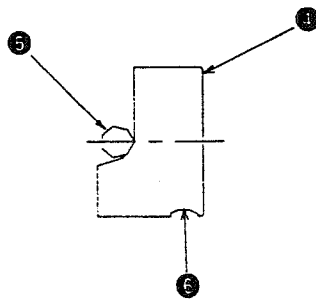


Fig. 35

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen three setscrews ⑥ in the thread trimmer cam. 2. Turn the handwheel until the engraved marker dot on the machine arm is aligned with the red engraved marker dot on the handwheel. 3. Advance moving knife ② so that the top end of the moving knife comes 20 mm from the inner hook stopper section of throat plate ③. 4. At this time, align cam roller ⑤ with the end (section of level difference) of thread trimmer cam ④, and tighten setscrews ⑥ in the thread trimmer cam. 	<ul style="list-style-type: none"> ● If the timing is excessively retarded : <ul style="list-style-type: none"> • Thread trimming motion cannot be released even at the upper stop position. As a result, thread cannot be cut. ● If the timing is excessively advanced : <ul style="list-style-type: none"> • The knife will fail to cut the thread.

Standard Adjustment

4) Position of the moving knife (position of the thread cutter solenoid)

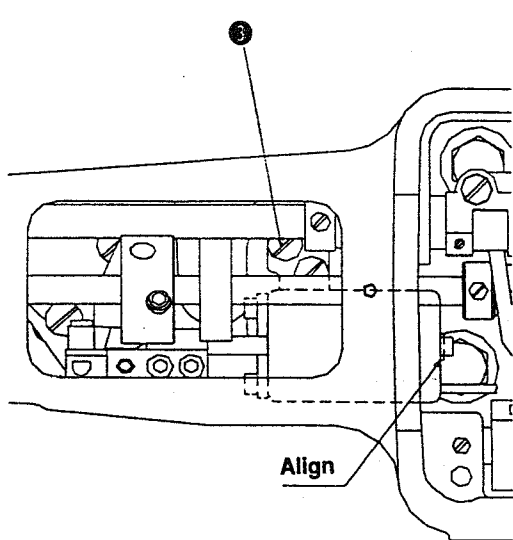


Fig. 36

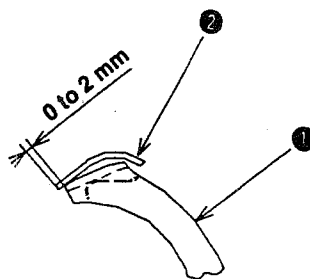


Fig. 37

5) Clamp spring

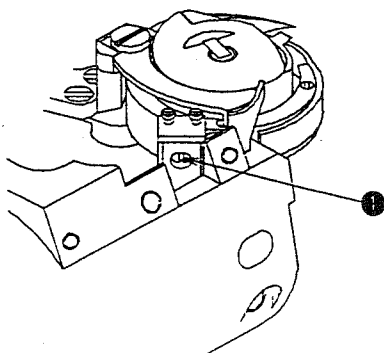


Fig. 38

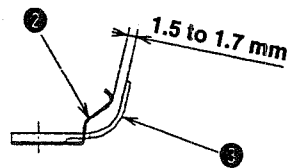


Fig. 39

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Move moving knife ❶ to the back end of its stroke. 2. Loosen two setscrews ❸ in the thread cutter solenoid. 3. Tighten setscrews ❷ in the thread cutter solenoid at the position where the top end of moving knife ❶ is drawn 0 to 2 mm from the top end of counter knife ❹. 4. At this time, make sure that the play at the top end of moving knife is 1 to 2 mm. <p>(Caution) Perform the adjustment in the state that the rear end of the thread cutter solenoid is aligned with the roll pin of the thread cutter solenoid shaft.</p>	<ul style="list-style-type: none"> ● If the moving knife is excessively drawn : <ul style="list-style-type: none"> • The moving knife comes in contact with the counter knife adjusting screw. As a result, machine lock will result. ● If the moving knife is excessively protruded : <ul style="list-style-type: none"> • The knife will fail to cut the thread. ● If the play is excessively small : <ul style="list-style-type: none"> • The cam roller constantly comes in contact with the thread trimer cam. As a result, a noise will be produced. ● If the play is excessively large : <ul style="list-style-type: none"> • The knife will fail to cut the thread.
<ol style="list-style-type: none"> 1. Slightly loosen setscrew ❶ in the counter knife. 2. Slide clamp spring ❷ to the right or left to provide a clearance of 1.5 to 1.7 mm between the clamp spring and counter knife ❸. 3. After the adjustment, tighten setscrew ❶. <p>(Caution) Adjust so that the bottom face of the moving knife does not come in contact with the clamp spring.</p>	<ul style="list-style-type: none"> ● If the clearance is wider than the specified value : <ul style="list-style-type: none"> • Defective clamping or stitch skipping at the start of sewing will result. ● If the clearance is narrower than the specified value : <ul style="list-style-type: none"> • Clamp pressure is excessively applied and deformation of the clamp spring or the like will occur.

Standard Adjustment

(2) REVERSE FEED MECHANISM

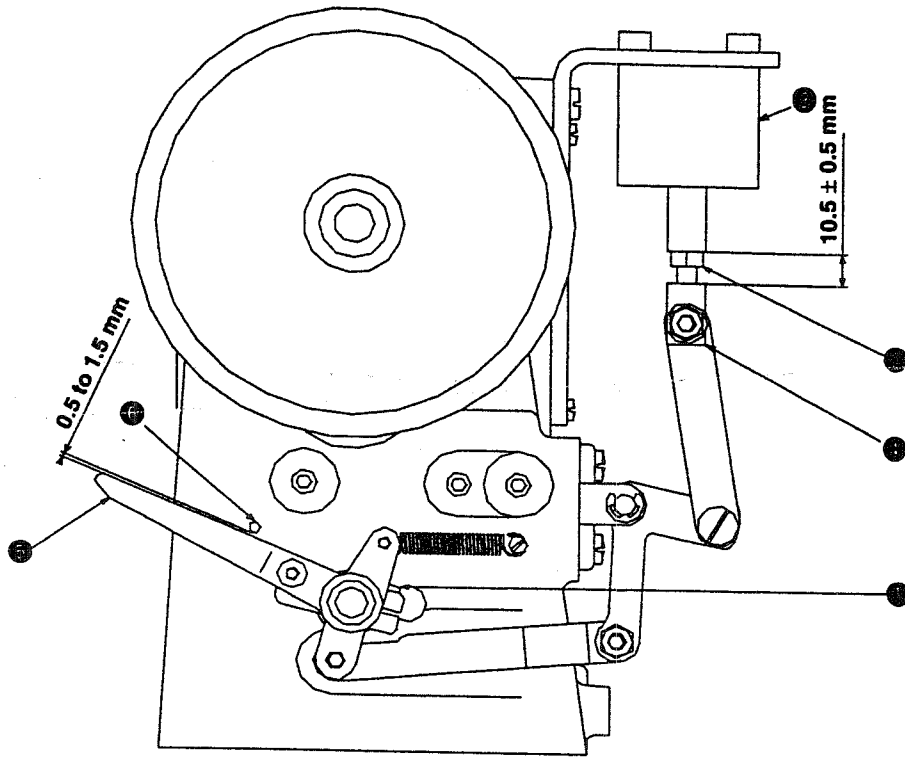


Fig. 40

Conditions

- Feed amount : 6 mm

Adjustment Procedures	Results of Improper Adjustment
<ul style="list-style-type: none"> ● Position of the reverse feed lever <ol style="list-style-type: none"> 1. Set the feed dial to 6 mm. 2. Loosen setscrew ④ in the reverse feed connecting arm. 3. Tighten setscrew ④ so that a clearance of 0.5 to 1.5 mm is provided between reverse feed lever ⑤ and stopper ⑥ when reverse feed lever ⑤ is slightly pressed down. ● Position of the reverse feed cylinder <ol style="list-style-type: none"> 1. Set the feed dial to 6 mm. 2. Loosen knuckle joint lock nut ⑦. 3. Adjust so that a clearance of 10.5 ± 0.5 mm is provided between the top end of the rod of reverse feed cylinder ⑧ and knuckle joint ⑨. 4. Securely tighten knuckle joint lock nut ⑦. <p>(Caution) Make sure that the feed adjusting base comes in contact with the feed adjusting screw when the reverse feed lever is pressed or released.</p>	<ul style="list-style-type: none"> ● If the clearance between the stopper and the lever is wider than the specified value : <ul style="list-style-type: none"> • Reverse feed lever interferes with the machine bed. As a result, stitch length of the reverse feed stitching becomes smaller. ● If the clearance between the stopper and the lever is narrower than the specified value : <ul style="list-style-type: none"> • Reverse feed lever interferes with the stopper. As a result, stitch length of the normal feed stitching becomes smaller

Standard Adjustment

(3) AUTOMATIC HAND LIFTER MECHANISM

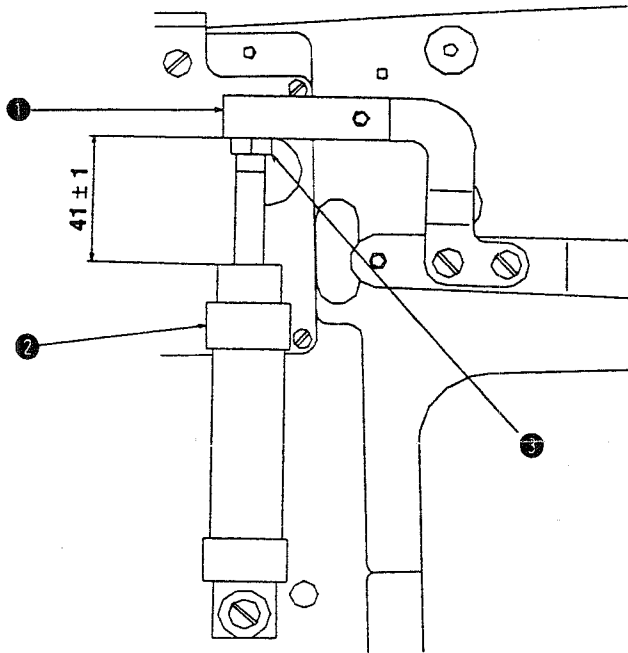


Fig. 41

(4) POSITION OF THE NEEDLE STOP

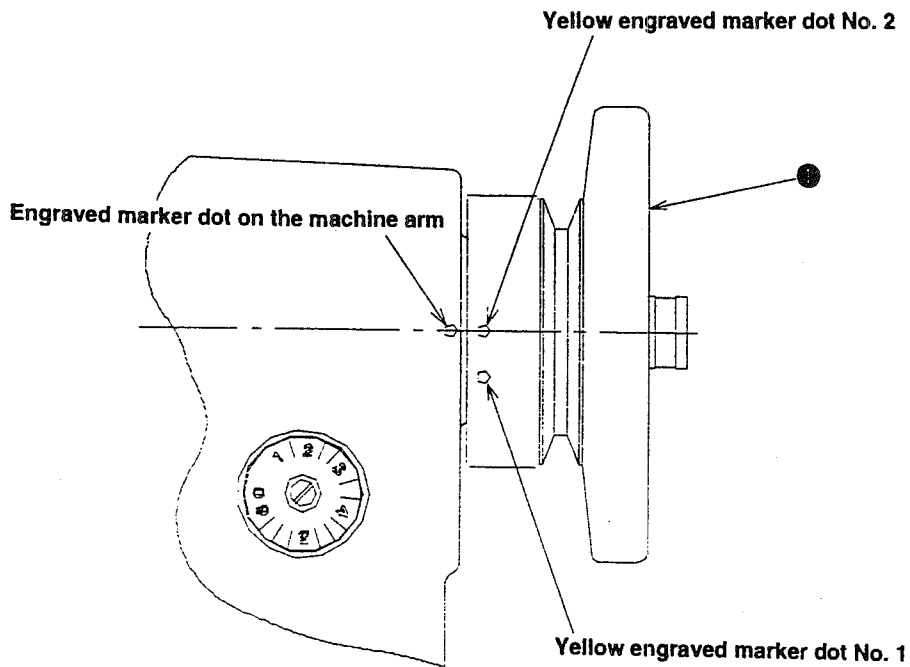


Fig. 42

Adjustment Procedures	Results of Improper Adjustment
<p>1. Bring the needle bar to its upper dead point and lower the presser foot.</p> <p>2. Adjust so that the distance between air cylinder arm ❶ and air cylinder main unit ❷ should be 41 ± 1 mm, and tighten nut ❸.</p> <p>(Caution) Make sure that the presser foot is lifted 15 mm above the top surface of the throat plate when the air cylinder is drawn.</p>	
<p>Standard (in case the function of reverse revolution to lift the needle is provided.)</p> <p>The engraved marker dot on the machine arm should be aligned with the yellow engraved marker dot No. 2 on handwheel ❶ when the sewing machine has stopped after thread trimming.</p> <p>When it is desired to stop the needle at higher position. Adjust so that the engraved marker dot on the machine arm is aligned with the yellow engraved marker dot No. 1 on handwheel ❶ when the sewing machine has stopped after thread trimming.</p> <p>Refer to the Instruction Manual for the motor for the adjustment procedures.</p>	

4. SELECTIVE PARTS, CONSUMABLE PARTS

Name of selective parts	Part No.	Remarks
Rock shaft bushing washer	B1438512A00	t 1.35 ± 0.05 mm
Rock shaft bushing washer	B1438512B00	t 1.5 ± 0.05 mm (Standard)
Rock shaft bushing washer	B1438512C00	t 1.65 ± 0.05 mm
Hook shaft washer	B1820246000 (Mark No. 0)	t 2.10 ± 0.02 mm
Hook shaft washer	B182024600A (Mark No. 1)	t 2.05 ± 0.02 mm
Hook shaft washer	B182024600B (Mark No. 2)	t 2.00 ± 0.02 mm(Standard)
Hook shaft washer	B182024600C (Mark No. 3)	t 1.95 ± 0.02 mm
Hook shaft washer	B182024600D (Mark No. 4)	t 1.90 ± 0.02 mm
Moving knife spacer	23104300 (Mark No. A)	t 0.7 ± 0.05 mm
Moving knife spacer	23104409 (Mark No. B)	t 0.8 ± 0.05 mm
Moving knife spacer	23104508 (Mark No. C)	t 0.9 ± 0.05 mm
Moving knife spacer	23104607 (Mark No. D)	t 1.0 ± 0.05 mm (Standard)
Moving knife spacer	23104706 (Mark No. E)	t 1.1 ± 0.05 mm
Moving knife spacer	23104805 (Mark No. F)	t 1.2 ± 0.05 mm
Moving knife spacer	23104904 (Mark No. G)	t 1.3 ± 0.05 mm

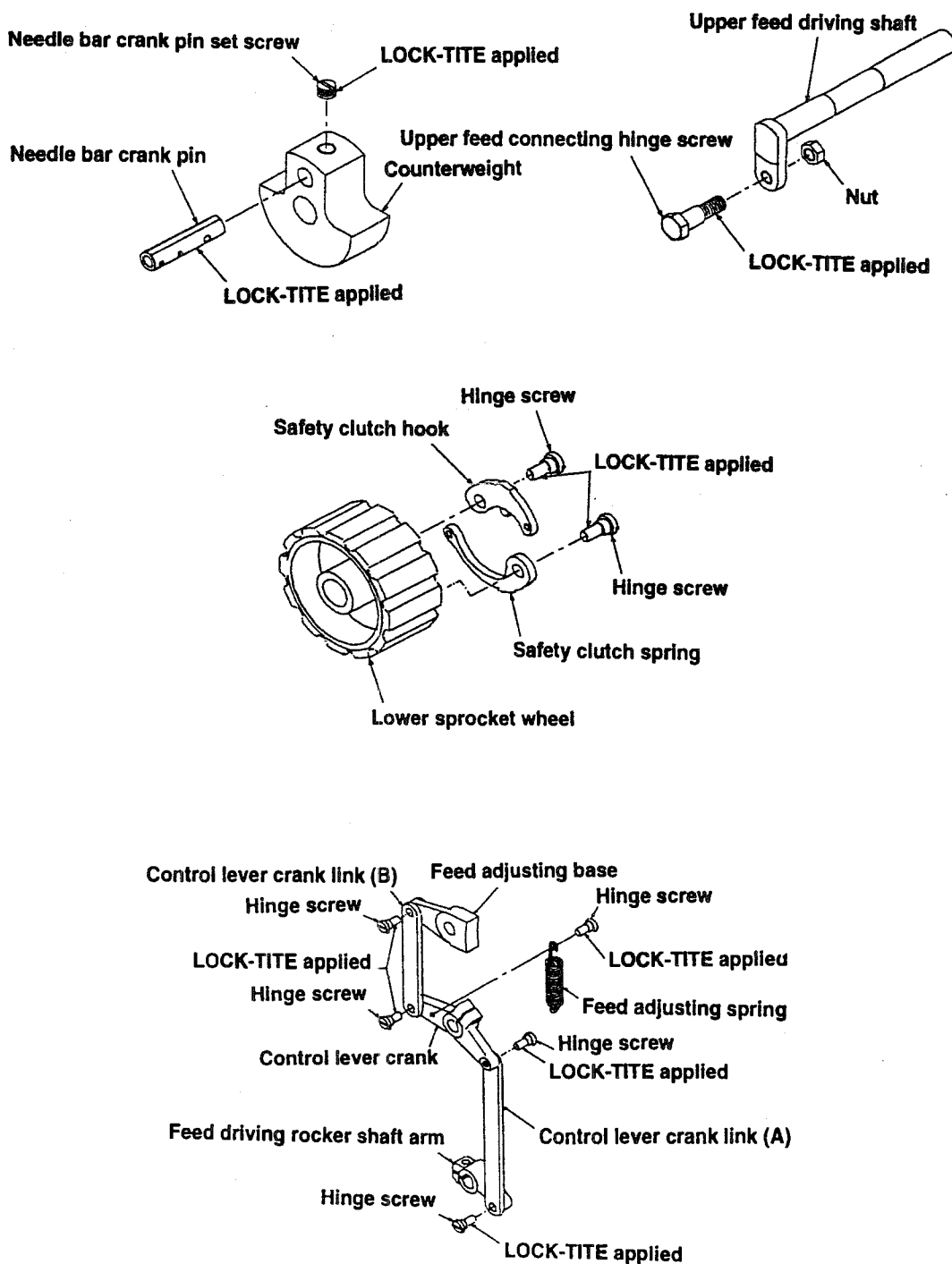
LS-341N

Name of consumable parts	Part No.	Remarks
Needle	MDP170B2300	DPx17 #23
Needle	MC372001600	SCHMETZ DPX17 Nm160
Hook (asm.)	21229752	
Cap (asm.)	21229356	
Bobbin	B9117201000	

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Name of consumable parts	Part No.	Remarks
Needle (standard type)	MDP170B2300	DPx17 #23
Needle (D type)	MC372001100	SCHMETZ DPX17 Nm110
Needle	MC372001600	SCHMETZ DPX17 Nm160
Hook (asm.) for thread trimmer	23102353	
Cap (asm.)	23025257	
Bobbin	D9117141E00	
Moving knife	23005804	
Counter knife	23005903	
Clamp spring	23103401	

5. PLACES WHERE LOCK-TITE PAINT IS USED



The parts shown in the above figure are fixed by LOCK-TITE paint.

When disassembled these parts, be sure to wash the painted portions using a paint thinner and dry up the parts. Then, assemble them applying LOCK-TITE paint.

If it is hard to remove the parts which have been fixed using LOCK-TITE paint, heat it using a torch lamp or the like to help remove the parts.

It is advisable not to break down the parts if possible.

6. TABLE OF TROUBLES IN SEWING AND CORRECTIVE MEASURES

Trouble	Cause	Checking	Corrective measure
1 Thread breakage	Thread path, needle point, blade point of the hook or the stopper groove in the throat plate has scratches.	Check the scratches on each part.	Remove scratches on the blade point of hook using a fine emery paper. Buff up the stopper groove in the throat plate.
Thread is worn out.	Needle thread tension is too high.		Adjust needle thread tension properly.
	Needle comes in contact with the blade point of hook.	Check the clearance.	Refer to "Needle-to-hook timing" on page 6.
	Clearance in the inner hook guide is too large.	Check the clearance.	Decrease clearance in the inner hook guide. Refer to "Adjusting the inner hook guide" on page 8.
Needle thread remains 2 to 3 cm on the wrong side of material.	Needle thread tension is too low.		Adjust needle thread tension properly. (This trouble is likely to occur when synthetic thread is used.)
	Thread take-up spring has an excessively high tension while it has an excessively small stroke.		Decrease tension of the thread take-up spring, and increase stroke of the spring.
	Defective feed timing		Refer to "Main shaft to hook driving shaft timing" on page 10.
	Timing between the needle and hook is too early or too late.	Check the specified value.	Refer to "Needle-to-hook timing" on page 6.
	Thread is melted by the needle heat.		Decrease the number of revolutions of sewing machine. Use silicon oil.

Trouble	Cause	Checking	Corrective measure
2 Stitch skipping	Clearance between needle and blade point of hook is too large.	Check the clearance.	Refer to "Needle-to-hook timing" on page 6.
	Timing between needle and hook is too early or too late.	Check the specified value.	Refer to "Needle-to-hook timing" on page 6.
	Presser foot is raised. (Presser foot pressure is too low.)	Check the pressure.	Tighten the pressure spring regulator.
	Height of the needle bar is inadequate.	Check the lowest point of needle bar.	Refer to "Needle-to-hook timing" on page 6.
	Blade point of the hook is dull.	Check the shape of blade point of hook.	Correct the blade point of hook or replace the hook with new one.
	Size of the needle is wrong.		Replace the needle with one which is one count thicker.
	Needle guard of the hook does not function.	Check the position of hook needle guard.	Refer to "Needle-to-hook timing" on page 6.
	Thread take-up spring has an excessively high tension while it has an excessively small stroke.		Decrease the tension of thread take-up spring, and increase the stroke of the spring.
	Defective feed timing		Refer to "Main shaft to hook driving shaft timing" on page 10.

Trouble	Cause	Checking	Corrective measure
3 Loose stitches (Isolated idling loop, balloon stitches)	Forked part of the tension spring of bobbin case is not threaded.	Check the bobbin thread path.	Improve bobbin threading.
	Thread path is not properly finished.	Check the finish of each thread path.	Grind it using a fine emery paper, or buff it up.
	Bobbin does not rotate properly.	Check the change of bobbin thread tension.	Replace the bobbin or hook with new one.
	Bobbin case is not properly engaged.	Check whether or not the bobbin case is raised.	Replace the bobbin case or hook with new one.
	Height of the feed dog is too high.	Compare the height with the standard value.	Refer to "Height of the feed dog" on page 8. Lower the height by 2 mm than the standard value.
	Feed timing is too early.		Retard the feed timing.
	Thread tightness is not good when performing reverse feed stitching.	Walking foot is not of tip-divided type.	Use optional walking foot or presser foot.
	Clearance in the inner hook guide is too large.	Check the clearance.	Refer to "Adjusting the inner hook guide" on page 8.

Trouble	Cause	Checking	Corrective measure
4 Irregular stitches	Forked part of the tension spring of bobbin case is not threaded.	Check the bobbin thread path.	Perform bobbin threading.
	Thread path is not properly finished.	Check the finish of each thread path.	Grind it using a fine emery paper, or buff it up.
	Bobbin fails to rotate smoothly.	Check the change of bobbin thread tension.	Replace the bobbin or hook with new one.
	Bobbin thread tension is too low.		increase the bobbin thread tension.
	Bobbin thread has been wound too tight round the bobbin.	Check the winding condition of bobbin thread.	Decrease the bobbin thread winding tension.
	Stroke of the thread take-up spring is not properly adjusted.	Check the stroke of thread take-up spring.	Adjust so that the thread take-up spring moves approximately 1 mm from the initial position when the hook draws the thread maximumly.

Irregular stitches are improved when adjusting so that the tension of thread take-up spring is low and the stroke of the spring is small.

7. TABLE OF TROUBLES WITH THREAD TRIMMER FUNCTION AND CORRECTIVE MEASURES

Trouble	Cause	Checking	Corrective measure
1 1 to several stitches skip at the start of sewing.	Length of thread remaining at the tip of needle after thread trimming is too short.	Check the needle thread path.	Pass the thread properly. Adjust so that there is no abnormal needle thread tension.
		Thread tension given by the tension controller No. 1 is too high.	Decrease the thread 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 the tension release solenoid so that the disk can be raised.
		Thread trimming timing is too early.	Refer to "Position of the thread trimmer cam and the thread trimming timing" on page 20.
		There are scratches on the moving knife or hook.	Buff them up, or replace the part with new one.
	Failed clamp of the bobbin thread	Check the position of clamp spring.	Refer to "Clamp spring" on page 22.
		Clamp spring pressure is too low.	Refer to "Clamp spring" on page 22.
		There are scratches on the clamp spring.	Replace the clamp spring with new one.
		Needle thread removes bobbin thread.	Increase the thread tension given by the tension controller No. 1., or decrease it.
	Needle is too thick.		Replace the needle with thinner one.
	Needle hole in the feed dog is too large.		Replace the feed dog with optional one, which is of small needle hole type.
	Presser foot pressure is too low.		Increase the presser foot pressure.

Trouble	Cause	Checking	Corrective measure
2 Thread slips off the needle eyelet.	Needle thread slips off the needle eyelet immediately after thread trimming.	Check that length of needle thread remaining at the top of needle after thread trimming is too short.	Refer to the Cause "Length of thread remaining at the tip of needle after thread trimming is too short" on page 34.
	Needle thread slips off the needle eyelet at the start of sewing.	Check that length of needle thread remaining at the top of needle at the start of sewing is too short.	
3 Defective thread trimming	Thread cannot be cut.	Height of the blades of moving knife and counter knife has been improperly adjusted.	Refer to "Position of the counter knife" on page 18.
		Blade of the moving knife or that of the counter knife has worn out, or been broken.	Replace the moving knife and counter knife with new ones.
		Counter knife pressure is insufficient.	Refer to "Position of the counter knife" on page 18.
	Remaining of single thread occurs.	Height of the blades of moving knife and counter knife has been improperly adjusted.	Refer to "Position of the counter knife" on page 18.
		Blade of the moving knife or that of the counter knife has worn out, or been broken.	Replace the moving knife and counter knife with new ones.
		Thread trimming timing is excessively retarded.	Refer to "Position of the thread trimmer cam and the thread trimming timing" on page 20.
		Counter knife pressure is insufficient.	Refer to "Position of the counter knife" on page 18.
		To next page	

Trouble	Cause	Checking	Corrective measure
Moving knife stops on the way.	Thread is too thick.	Thread is too thick.	Use a thread which is equivalent to the specifications.
	Thread trimming timing is excessively retarded.	Thread trimming timing is excessively retarded.	Refer to "Position of the thread trimmer cam and the thread trimming timing" on page 20.
	Needle thread tension is too high.	Needle thread tension is too high.	Decrease the tension of the thread tension controller No. 1.
	Bobbin thread tension is too high.	Bobbin thread tension is too high.	Adjust the bobbin thread tension.
	Counter knife pressure is too high.	Counter knife pressure is too high.	Refer to "Position of the counter knife" on page 18.
	Initial position of the moving knife is excessively advanced.	Initial position of the moving knife is excessively advanced.	Refer to "Position of the thread trimmer cam and the thread trimming timing" on page 20.
	Thread is not cut sharply.	Thread is not cut sharply.	Refer to the Causes "Thread cannot be cut" and "Remaining of single thread occurs" on page 35.
Needle thread cannot be clamped.	The last stitch skips.	The last stitch skips.	Refer to "Needle-to-hook timing" on page 6.
	Check the thread trimmer cam timing.	Check the thread trimmer cam timing.	Refer to "Position of the thread trimmer cam and the thread trimming timing" on page 20.
	Tip of the moving knife is broken or has a scratch.	Tip of the moving knife is broken or has a scratch.	Replace the moving knife with new one.

To next page

Trouble	Cause	Checking	Corrective measure
	Bobbin thread cannot be clamped.	Stroke of the moving knife is too small.	Adjust the initial position of moving knife.
		Check routing of the bobbin thread.	Pass the bobbin thread properly.
		Tip of the moving knife is broken or has a scratch.	Replace the moving knife with new one.
		Check the height of moving knife.	Adjust the height of moving knife.
	Both needle thread and bobbin thread cannot be cut.	Height of the blades of moving knife and counter knife has been improperly adjusted.	Refer to "Position of the counter knife" on page 18.
		Counter knife pressure is too low.	Refer to "Position of the counter knife" on page 18.
		Moving knife fails to work.	Adjust the synchronizer timing. Replace the thread trimmer solenoid with new one.

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