JUKI®

HIGH-SPEED 1-NEEDLE LOCKSTITCH MACHINE WITH AUTOMATIC THREAD TRIMMER

DDL-9000

ENGINEER'S MANUAL

29338001
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 this machine 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 this machine.

CONTENTS

* For the control box and the operation panel, read the Instruction Manual for the SC-900.

1. OUTLINE

1-1 Features

1) Different from the conventional sewing machines with oil pan type, this machine has no oil reservoir and stain of the materials and oil stain when performing maintenance or moving the machine do not occur.
2) For DS type, an exclusive complete dry hook is employed and there is no oil tank. It is possible to completely protect the sewing materials from oil stain.
3) A compact AC servomotor is built in the machine head. It is not necessary to fix the belt on the machine head when setting up the machine, and to perform adjustment as before. In addition, there is no stain from the worn powder of V-belt.
4) Workability such as handling of materials, easy-to observe needle entry area, etc. is taken seriously. Sewing space is enough expanded.
5) Noise and vibration when sewing are decreased to improve the sewing environment and to decrease the operator's burden.
6) Smooth feeding of materials has been obtained by the improvement of feed dog and thread take-up lever. As a result, low-tension sewing has been realized.
7) Calibration markings have been added to the respective adjusting sections such as presser spring regulator and so on considering adjusting operations.
8) The superior portions of JUKI existing lockstitch machines with automatic thread trimmer have been succeeded to the operation panel and the control box of these machines, and reliability and easy operability have been improved.

1-2 Specifications (Table of DDL-9000 series specifications)

		SS (Minute-quantity lubrication type)	DS (dry-head type)
1	Max. sewing speed	5,000 rpm * 4,000 rpm or less when stitch length is 4 mm or more and RP hook is used.	4,000 rpm
2	Bed size	178 mm X 517 mm	←
3	Number of revolution of resistor pack	4,000 rpm (excluding a part of export territory)	←
4	Max. stitch length (normal/reverse feed)	5 mm	←
5	Needle bar stroke	30.7 mm	←
6	Thread trimming system	Horizontal type	←
7	Bobbin winder	Built-in at top surface of machine head type (with bobbin thread retainer)	←
8	Wiper (WB only)	Side sweeping type driven by solenoid	←
9	Automatic reverse feed	Built-in solenoid type	←
10	Lubrication system	Lubricating to oil tank for hook lubrication Use New Defrix Oil No. 1. By plunger pump	Oil tank is not provided (complete nonlubrication).
11	No. of needle used	Equivalent to DB X 1 #9 to 18 (Equivalent to SCHMETZ Nm65 to 110)	←
12	Lift of presser foot (knee lifter)	10 mm (max. 15 mm, AK : max. 10 mm)	←
13	Throat plate	Standard : 3-row 11028008 (with engraved marker line) Export standard : 4-row B1109012i0B	←
14	Feed dog (Part No.)	B1613012A00 (3-row feed dog), B1613012i00 (4-row feed dog)	←
15	Presser foot (standard)	B15240120BA (excluding a part of export territory)	←
16	Kind of hook (Part No.)	Lubrication hook (11038650) Lubrication hook with needle guard (11141355)	RP hook (22890206) RP hook with needle guard (22890404)
17	Part No. of needle bar	For DB X 1 (11035003) FOR SCHMETZ (11141207)	For DB X 1 (22886907) For SCHMETZ (22887004)
18	Thread tension (asm.) (Part No.)	Standard with calibration markings (23626054)	←
19	Thread take-up spring	Standard (22921605)	←
20	Thread tension spring	Standard (22921704)	←
21	Presser spring	Standard (B1505227000A)	←
22	Bobbin case asm.	11038759 (standard with spring)	22896252 (with spring for dry-head)
23	Bobbin	B9117552A00 (aluminum) For export B911701200 (iron)	←
24	Feed dog height (reference)	0.75 to 0.85 mm (standard)	←
25	Lubrication of needle bar	Minute-quantity lubrication by oil wick	Nonlubrication
26	Drive system	Built-in compact AC servomotor	←
27	Transmission mechanism	Timing belt system	←
28	Motor output	Rated output 450W	←
29	Power supply	3-phase 200V, single phase 100V	←
30	Solenoid drive power source	DC 34V	←
31	Additional function	Micro-lifter screw is provided as standard.	←
		Tension release reset function when sewing thick overlapped section	←
32	Device/optional	AK-118 (window plate type auto-lifter)	←
		AE-8 (bobbin thread remaining amount detector)	AE-8 (bobbin thread remaining amount detector) * Replace with existing RP hook (11079456). This device can be used only when sewing speed is 3,000 rpm or less.
		ED-4 (compact material end detector)	←
		Dial micro-lifter	←
		Turret presser (existing one can be used.)	←
		Optional switch (23632656)	←
		Exclusive grease for maintenance 500g tin (Part No. 23640204)	←

(Table of DDL-9000 series specifications)

		DF (for extra-light-weight materials, foundation)	SH for heavy-weight material)
1	Max. sewing speed	3,500 rpm	4,500 rpm (4,000 rpm or less when stitch length is 4 mm or more.)
2	Bed size	178 mm X 517 mm	←
3	Number of revolution of resistor pack	3,500 rpm (excluding a part of export territory)	4,000 rpm
4	Max. stitch length (normal/reverse feed)	4 mm	5 mm
5	Needle bar stroke	30.7 mm	35 mm
6	Thread trimming system	Horizontal type	Moving knife for thick thread with bobbin thread clamp
7	Bobbin winder	Built-in at top surface of machine head type (with bobbin thread retainer)	←
8	Wiper (WB only)	Side sweeping type driven by solenoid	←
9	Automatic reverse feed	Built-in solenoid type	←
10	Lubrication system	Oil tank is not provided (complete nonlubrication).	Lubricating to oil tank for hook lubrication. Use New Defrix Oil No. 1. Plunger pump is used.
11	No. of needle used	Equivalent to DB X 1 #8 to 11 (Equivalent to SCHMETZ Nm65 to 75) Equivalent to DB X 1SF #9 to 11	Equivalent to DB X 1 #19 to 23 (Equivalent to SCHMETZ Nm120 to 160)
12	Lift of presser foot (knee lifter)	10 mm (max. 15 mm), AK : max. 10 mm	←
13	Throat plate	Standard : 4-row 11001906 (with engraved marker line) Export standard : 4-row B1109012i0B	Standard : 4-row 11400801
14	Feed dog (Part No.)	B1613155W00 (4-row feed dog), B1613012i00 (4-row feed dog)	11403003 (4-row feed dog)
15	Presser foot (standard)	B1524555DBB (excluding a part of export territory)	D1524555EBL
16	Kind of hook (Part No.)	RP hook (22890206) Hook with needle guard (22890404)	Lubrication hook (11092251)
17	Part No. of needle bar	For DB X 1 (22886907) For SCHMETZ (22887004)	H type (11091303)
18	Thread tension (asm.) (Part No.)	For light-weight materials with calibration markings (23627250)	For heavy-weight materials with calibration markings (23626062)
19	Thread take-up spring	Low tension (D3128555D00)	Standard (22921605)
20	Thread tension spring	Low tension (D3129555D00)	High tension (22962005)
21	Presser spring	Extra low tension (11162104)	High tension (B1505552000A)
22	Bobbin case asm.	22896252 (with spring for dry-head)	11038759 (standard with spring)
23	Bobbin	B9117552A00 (aluminum)	B9117012000 (iron)
24	Feed dog height (reference)	0.75 to 0.85 mm (standard)	1 to 1.2 mm (standard)
25	Lubrication of needle bar	Nonlubrication	Minute-quantity lubrication by oil wick
26	Drive system	Built-in compact AC servomotor	←
27	Transmission mechanism	Timing belt system	←
28	Motor output	Rated output 450W	←
29	Power supply	3-phase 200V, single phase 100V	←
30	Solenoid drive power source	DC 34V	←
31	Additional function	Micro-lifter screw is provided as standard.	←
		Tension release reset function when sewing thick overlapped section	←
32	Device/optional	AK-118 (window plate type auto-lifter)	←
		AE-8 (bobbin thread remaining amount detector) * Replace with existing RP hook (11079456). This device can be used only when sewing speed is 3,000 rpm or less.	AE-8 (bobbin thread remaining amount detector)
		ED-4 (compact material end detector)	←
		Dial micro-lifter	←
		Turret presser (existing one can be used.)	←
		Optional switch (23632656)	←
		Exclusive grease for maintenance 500g tin (Part No. 23640204)	←

1-3 Application

1) Standard type (SS)
   It is suited for the wide using range from light-weight general fabrics to medium- and heavy-weight fabrics.
   (It is especially suited for the process for which a high speed revolution of the sewing machine is required or the process for which hook lubrication is required in accordance with the nature of thread used.)

2) Dry type (DS)
   It is suited for the wide using range from light-weight general fabrics to medium- and heavy-weight fabrics.
   (It is most suited for the process of sewing newly developed materials in the market of ladies' wear, shirts, silk, coat, etc., or the complete dry process of light-weight fabric, etc. to which the oil stain is particularly disliked.

3) For hard-to-sew materials and foundation garment (DF)
   It is suited for the process for which handling performance under low speed and low pressure of presser foot is particularly required when sewing foundation garment or the like.
   (Particularly, this type is effective for the assembly process of brassieres or the like, or sewing hard-to-sew materials. It is suited for the process for which handling at low speed is required.)

4) For heavy-weight materials (SH)
   It is suited for sewing heavy-weight materials such as denim, vinyl leather, etc.

1-4 Cautions when operating

1) Be sure to drain oil from oil tank and attach the air vent cap (red rubber cap) attached to the air vent (gold bushing) located on the side of machine bed when transporting the sewing machine.

2) When placing the SS or SH type sewing machine head on a stand or the like before setting up the sewing machine head on the table, take care whether there is a protrusion under the machine head to protect the oil tank from damage.

3) Even when using RP hook with the SS type machine, do not drain oil from oil tank. (Seizure of hook shaft metal will result.)
   In addition, when using the RP hook, loosen the oil amount adjusting screw until it will go no further and adjust so that oil does not come out from the front of hook shaft.

4) To protect accident when performing maintenance, be sure to securely set the safety switch connector to the control box.

5) Oil is kept in the gear box for lubrication. Replacement of oil is not necessary. Do not remove the lid of gear box unless it is necessary.
   * When the lid of the box has been removed, it is necessary to replace the packing with a new one.

6) When making the sewing machine run idle, be sure to operate the sewing machine after removing the bobbin case.
   When the bobbin thread is in the bobbin case, the thread is protruded from the bobbin case by running idle of the machine and the thread is entangled in hook race or hook shaft. As a result, the machine will be out of order.

2. OPERATION

2-1 Configuration

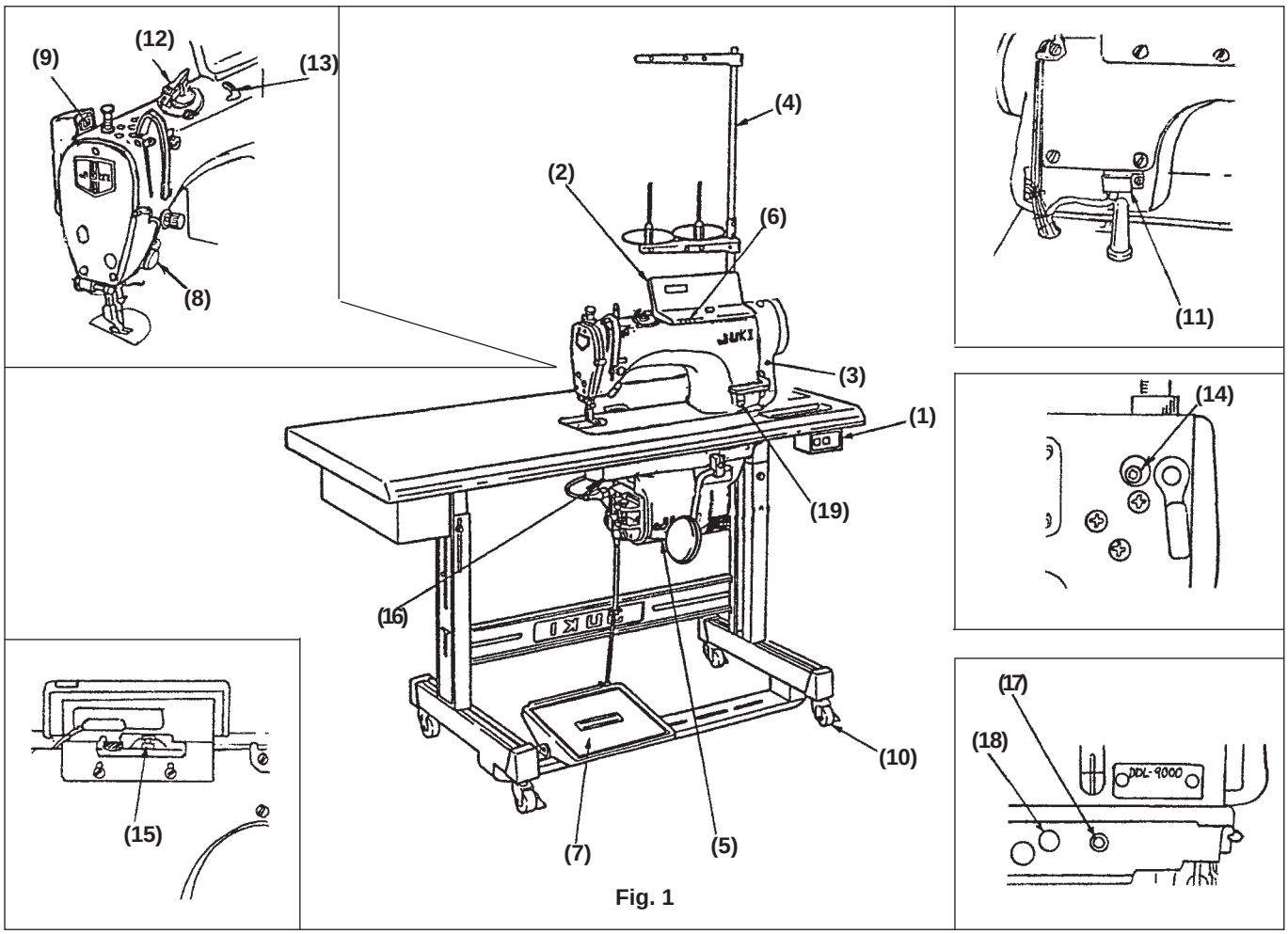


Fig. 1

(1) Power switch
(2) Operation panel
(3) Pulley cover
(4) Thread stand
(5) PSC box
(6) Max. speed control knob
(7) Operation pedal
(8) Touch-back switch
(9) Wiper device
(10) Screw for level adjustment of table/stand (Caster)
(11) Resistor pack
(12) Bobbin winder
(13) Thread trimmer retainer
(14) Tension release change-over screw
(15) Micro-lifter screw
(16) Under cover
(17) Oil hole
(18) Air vent
(19) Oil amount indication window (SS, SH)

2-2 Check points before trial operation and operation

1) Make sure that the wiring to the control box is securely performed.
2) Make sure that the safety switch securely works. (Check whether the warning buzzer beeps when the sewing machine head is tilted.)
3) Check that the red rubber cap of air vent (17) located on the front side of machine bed has been removed.
4) First, make the sewing machine run at low speed and check that there is no abnormal noise.
5) Depress the back part of the pedal and check that the thread trimmer securely functions.
6) For the SS type, check that oil is kept in oil tank.
7) For the SS type, check that the amount of oil in the hook is appropriate.

(1) Power switch
Power switch for motor, PSC, operation panel, etc.

(2) Operation panel
This panel can set automatic reverse feed stitching, pattern sewing, etc.

(3) Pulley cover
This is a cover for safety and prevents dust which enters inside motor.

(4) Thread stand

(5) PSC box
Circuits to control the sewing machine and motor, output circuits to function the respective outputs (thread trimmer solenoid, back solenoid, etc.), pedal sensor to detect the pedal operation, and power circuits to function the respective functions are stored in this box.

(6) Max. speed control knob (Max. speed limitation variable resistor)
This is a variable resistor to limit the maximum speed by analog.

(7) Operation pedal
Speed control of sewing machine, thread trimming operation or presser lifting operation (for AK-118 type only) can be performed through the operation of depressing the front part or back part of the pedal.

(8) Touch-back switch
This is a hand operated switch to perform reverse feed stitching.

(9) Wiper device
Needle thread after thread trimming is wiped out by wiper signal output from the PSC box.

(10) Screw for level adjustment of table/stand (Caster)
Adjust the screw in accordance with the floor on which the operator works so that there is no play and less vibration.

(11) Resistor pack
This is used to automatically identify the model of sewing machine used.

(12) Bobbin winder
This is a bobbin winder built in the machine hed.

(13) Thread trimmer retainer
This works to cut and retain bobbin thread wound with the bobbin winder.

(14) Tension release change-over screw
When handling the materials at the corner of thick overlapped section or the like by using the knee lifter, this screw makes thread release work and prevents thread from partial defective thread tightness.

(15) Micro-lifter screw
When sewing hard-to-sew materials such as velvet or the like, sewing can be performed in a condition that the presser foot is slightly lifted.

(16) Under cover
This cover prevents lint or dust which occurs at the time of sewing from falling on the floor.

(17) Oil hole
For the SS and SH types, when oiling into oil tank, use this hole after removing the cap.

(18) Air vent
This is used to prevent the inside pressure from being increased due to rise of tempearture in the gear box when the sewing machine is operated.

(19) Oil amount indication window (SS, SH)
This indicates the oil amount in oil tank. Fill oil when the top end of indication rod comes to the lower engraved marker line.

(Trial operation)

1) Operation when the power is turned ON
   When turning ON the power switch, the sewing machine rotates up to the needle-up position excluding the case where the needle position at that time is the position other than the up-stop position and stops at needle-up position.

2) Pedal operation
   Pedal can be operated in four steps.

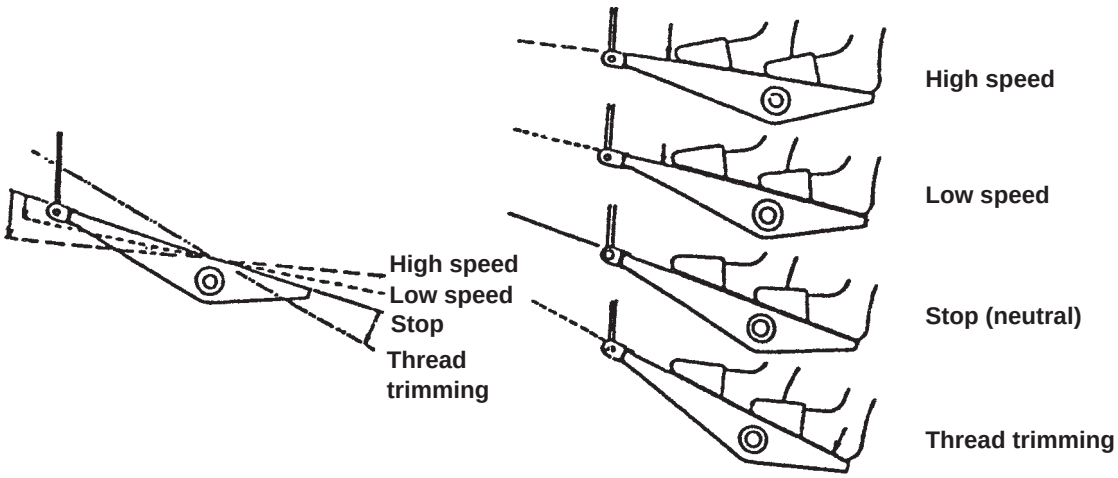


Fig. 2

① The machine runs at low sewing speed when you lightly depress the front part of the pedal.

② The machine runs at high sewing speed when you further depress the front part of the pedal. (However, when the automatic reverse feed stitching switch is preset, the machine runs at high speed after it completes reverse feed stitching.)

③ The machine stops (with its needle up or down according to the set of stop position) when you reset the pedal to stop (neutral).

④ The machine trims threads and stops with its needle up when you fully depress the back part of the pedal.

○ The machine will completely perform thread trimming even if you reset the pedal to its neutral position immediately after the machine started thread trimming action.
At this time, if you depress the front part of the pedal instead of neutral, thread trimming is performed normally. However, safety circuit works and the machine continues to stop after completing thread trimming. At this time, return the pedal to the neutral position once.

○ Wiper works when the wiper is provided (WB type).

3) Pedal operation with the pedal type auto-lifter (AK118)
Pedal can be operated in five steps.

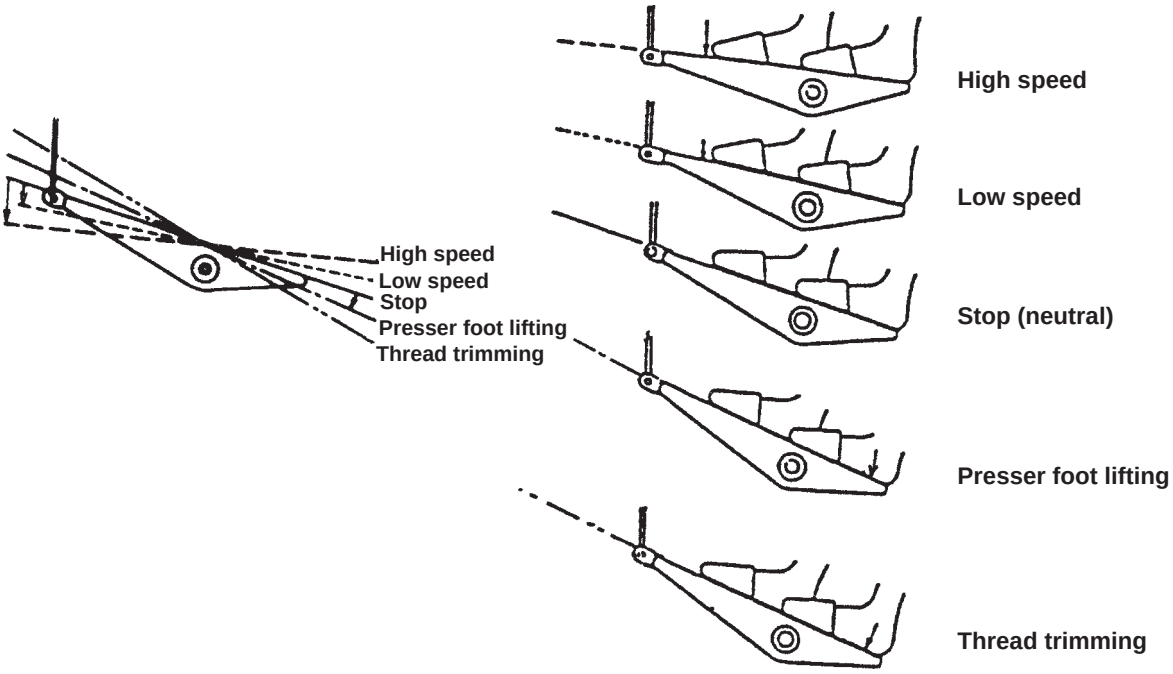


Fig. 3

① The machine runs at low speed when you lightly depress the front part of the pedal.

② The machine runs at high speed when you further depress the front part of the pedal. (However, when the automatic reverse feed stitching switch is preset, the machine runs at high speed after it completes reverse feed stitching.)

③ The machine stops (with its needle down) when you reset the pedal to stop (neutral).

④ The presser foot goes up when you lightly depress the back part of the pedal.

⑤ If you furthrer depress the back part, the presser foot comes down and the thread trimmer is actuated. After the machine has stopped with its needle up, the presser foot goes up.
○ Wiper works when the wiper is provided (WB type).

3. CONFIGURATION

3-1 Adjusting the needle stop position

1) Adjusting the upper stop position (Upper stop position after thread trimming)
   The standrad needle stop position is obtained, when needle stops after thread trimming, by aligning the red marker dot on the machine arm with the white marker dot on the handwheel.
   Stop the needle in its highest position, and loosen screw (A) in the figure on the right to perform adjustment within the slot of the screw.
   ○ To advance needle stop position → Direction (1)
   ○ To delay needle stop position → Direction (2)

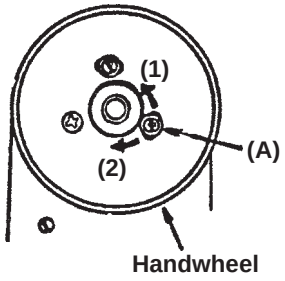


Fig. 4

2) Adjusting the lower stop position
   The lower needle stop position when the pedal is returned to the neutral position after the front part of the pedal is depressed can be adjusted by loosening screw (B) in the figure on the right and adjusting within the slot of the screw.
   ○ To advance needle stop position → Direction (1)
   ○ To delay needle stop position → Direction (2)

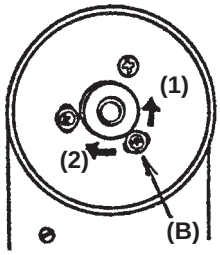


Fig. 5

[Caution] Do not rotate the machine with screws (A) and (B) loosened.Just loosen the screws, and do not remove them.

3-2 Adjusting the wiper (WB type)

1. Adjusting the wiper position

Adjust the wiper position in accordance with the thickness of fabric to be sewn.
Normally, adjust it as follows :

1) Turn the handwheel in the normal direction to align white marker dot (1) with marker dot (2) on the machine arm.
2) Insert wiper (3) into wiper shaft (4) so that a clearance of 2 mm is provided between the top end of the wiper and the top end of the needle. At this time, adjust so that the distance from the flat section of the wiper to the center of the needle is 1 mm. Securely fix the wiper with wiper adjusting screw (5) as if pressing wiper (3) with wiper collar (6) .

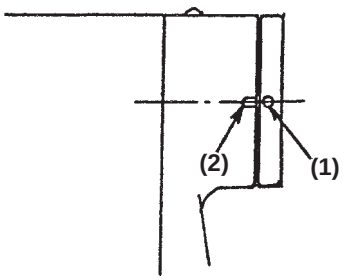


Fig. 6

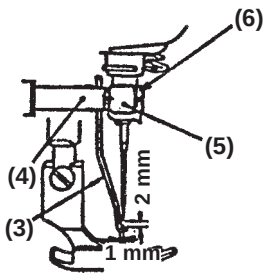


Fig. 7

[Caution] Do not loosen the wiper solenoid setscrew. When the wiper is not used, turn OFF the wiper seesaw switch.

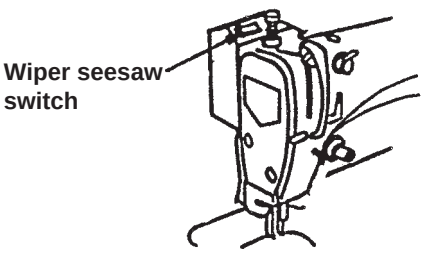
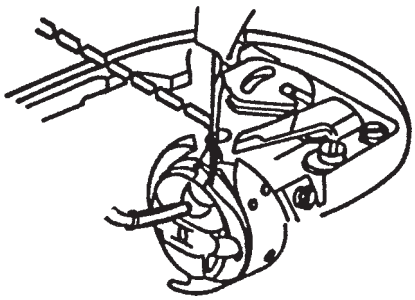
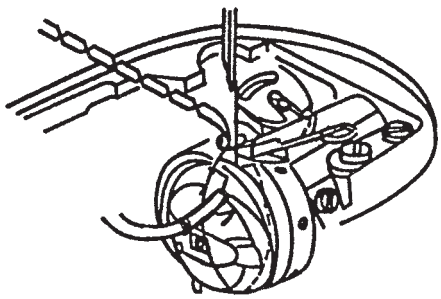


Fig. 8

3-3 Principle of thread trimming

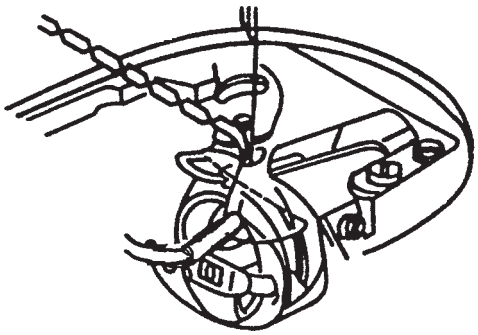


1. Blade point of hook scoops needle thread.

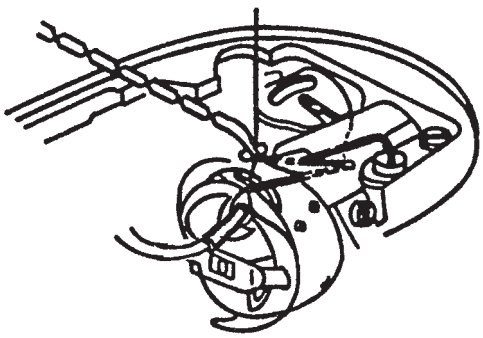


2. Moving knife handles threads (recedes).

Fig. 9



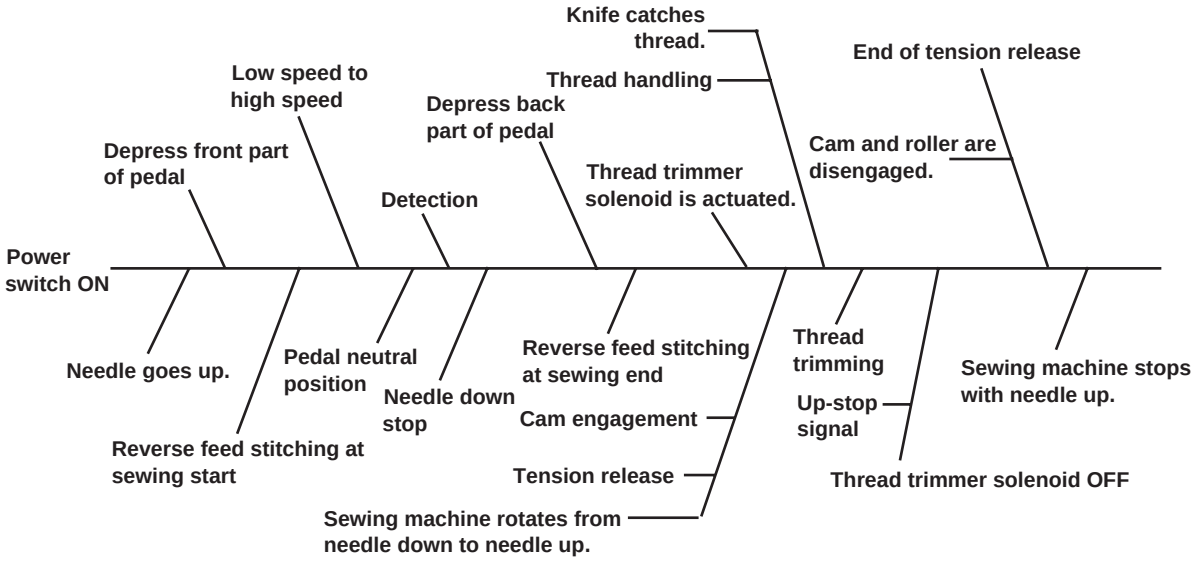
3. Moving knife catches needle and bobbin threads (advances).



4. Thread trimming

Fig. 10

3-4 Sequence of thread trimming



[Caution] **This sequence shows the state that the automatic reverse feed stitching switch is turned ON at the start of sewing and at the end of sewing.**

(Reference) 1. Marker dot on the handwheel shows the standard value of cam timing. The timing can be more advanced by 2˚ or more delayed by 5˚ than that in case of cotton thread or synthetic thread. At this time, however, confirm that moving knife securely separates two pieces of needle thread at the bottom face of throat plate. If the cam timing is excessively advanced or delayed, the needle thread remaining at the top of needle will be shorter and may slip from the needle immediately after thread trimming. In addition, roller may not enter the groove of thread trimmer cam. So, be careful.

2. Basically, the thread trimmer cam timing is common to cotton thread and synthetic thread. For the thin synthetic thread, however, if the following troubles occur :

① One or several stitches skip at the start of sewing.

② Thread slips from needle at the start of sewing.

Perform the following adjustments for synthetic thread (special) (In case of thin threads)

③ Align marker dot on the machine arm (Fig 13 (3)) with green marker dot on the handwheel (Fig. 13 (1)) and adjust thread tension No. 1 to lengthen the thread remaining on the needle after thread trimming within the range that nothing interferes with the finish of sewing.

④ Make one stitch of soft start at the start of sewing.

[Caution] Adjustment ① is not applied to thick threads.
When thread trimmer cam timing is delayed (in the direction of green), phenomena such as dispersion of adjustment, non-trimming of thread without completing thread trimming depending on the kinds of threads may occur.
In this case, slightly delay the needle upper stop position.

3-5 Observing and adjusting the thread trimmer cam timing

1) Proper observing of the thread trimmer cam timing

Thread trimmer cam timing for both cotton and synthetic threads can be easily adjusted by aligning marker dot on the machine arm with that on the handwheel.

Tilt the machine head, turn the handwheel by hand until the thread take-up lever goes up slightly near the upper dead point, press thread take-up picker (Fig. 12 (1)) to the right with fingers, and roller enters the cam groove of thread trimmer cam to engage with each other. At the same state, turn the handwheel in the reverse direction as against the normal operation of the sewing machine, and there is a position where the sewing machine does not rotate. At this time, adjust the cam timing so that marker dot (Fig. 13 (1)) of the machine arm shown in Fig. 13 is aligned with marker dot (Fig. 13 (1)) on the handwheel. This is the cam timing for cotton thread and synthetic thread.

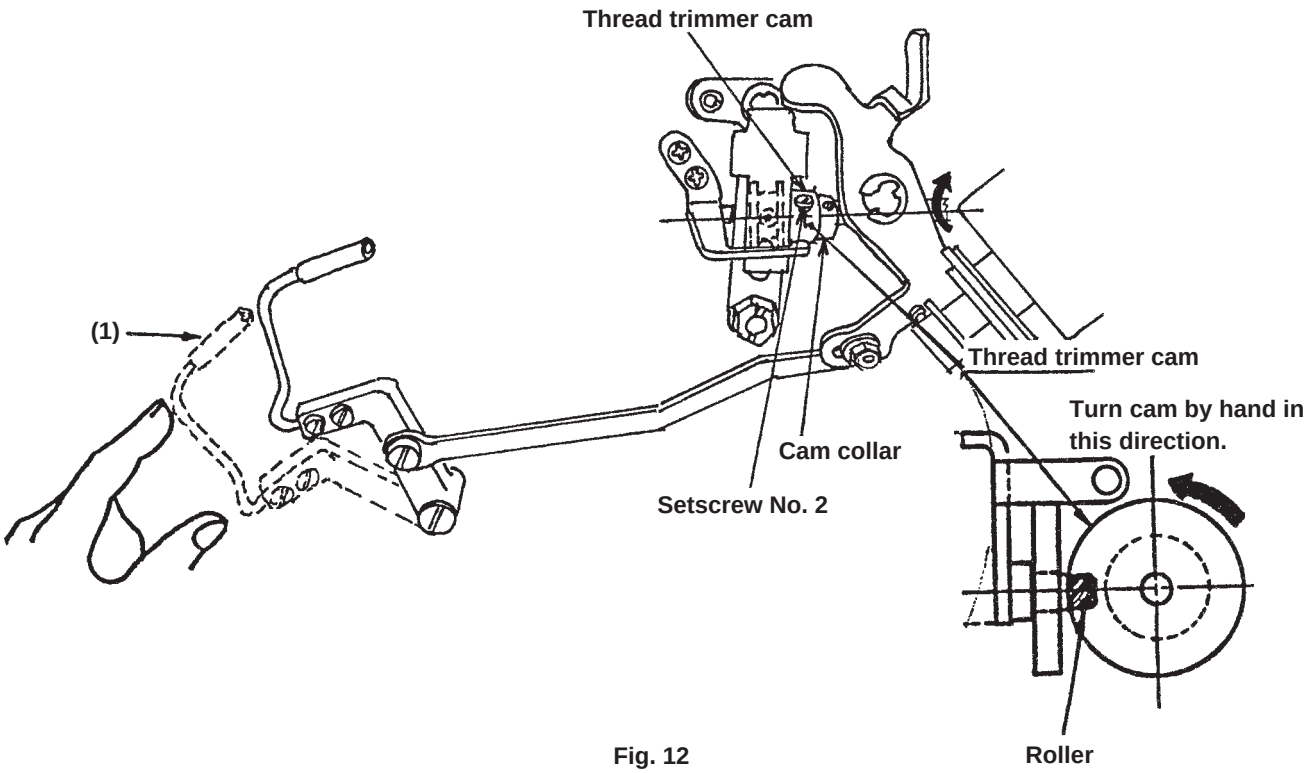


Fig. 12

2) Adjusting the thread trimmer cam timing

First, loosen two setscrews (Fig. 12) in the thread trimmer cam in the order of No. 1 and No. 2, and align marker dot on the hand wheel with marker dot on the machine arm. (Fig. 13 (1) and red (2) or green (3))

Next, pressing thread take-up picker (Fig. 12 (1)) to the right, engsage cam and roller, turn cam only with finger top in the reverse direction as against the rotating direction of hook driving shaft without turning the hook driving shaft (arrow mark in Fig. 12). Press the cam to roller (Fig. 12) at the position where the cam does not rotate, and tighten setscrews in the cam in the order of No. 2 and No. 1.

When the cam collar has not been moved, press the thread trimmer cam to the cam collar and tighten the setscrews in the order of No. 2 and No. 1.

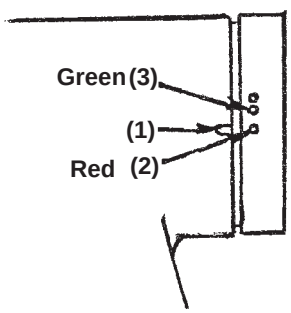


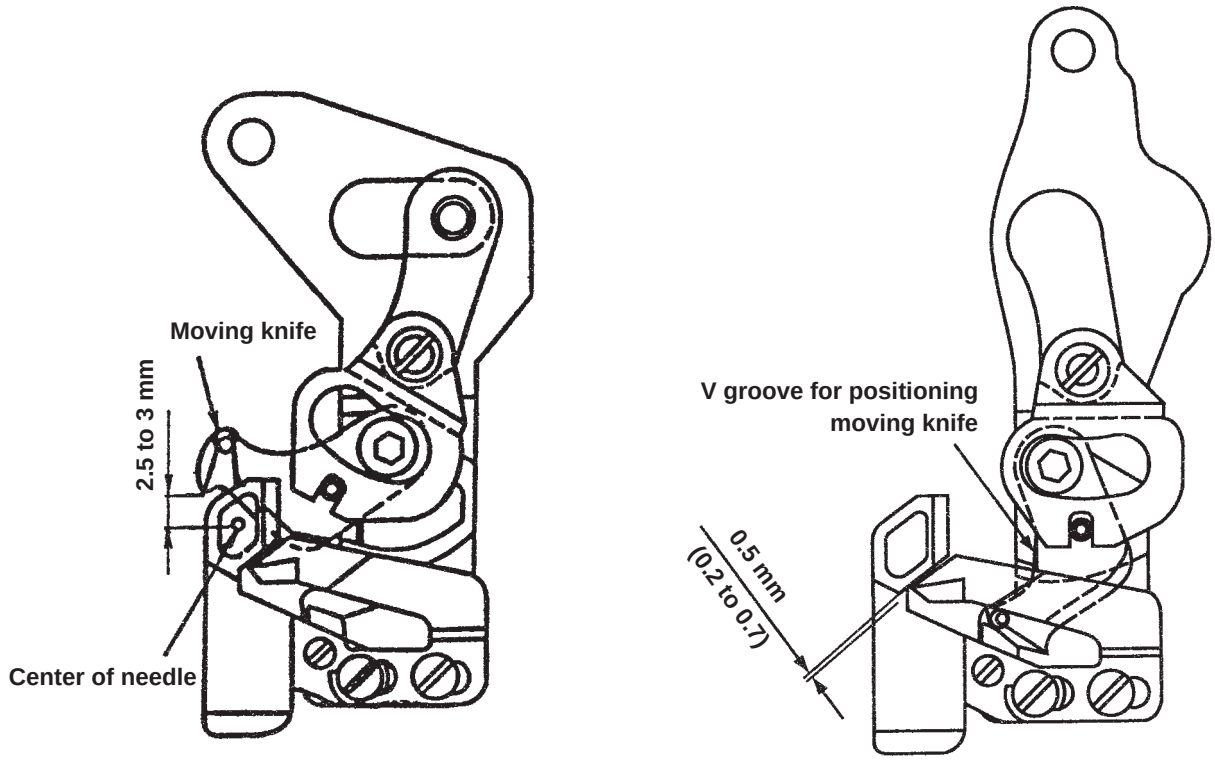
Fig. 13

3-6 Adjusting the position of moving knife movement

1) Proper movement of the moving knife

The position of moving knife when it moves until it will go no further is the position where the front top end of moving knife is receded 2.5 to 3 mm from the center of the needle. When the amount of recession is excessively small, the moving knife cannot scoop needle thread or bobbin thread when trimming thread, and if the amount is excessively large, feed dog may come in contact with moving knife. Therefore, properly adjust the moving knife position.

Reference for positioning the moving knife at the predetermined position is the position where the V groove indicated on the knife installing base is aligned with the periphery of moving knife.



When moving knife recedes most. **Predetermined position**

Fig. 14

2) Adjusting the moving knife position

Adjustment is performed by changing the right and left positions of moving knife link pin (Fig. 15 (1)) when the sewing machine stops.

① Loosen the lock nut of moving knife link pin (Fig. 15 (1)).

② Following the predetermined position in Fig. 14, move the moving knife link pin to the left and right so that V groove (Fig. 14) for positioning moving knife on the knife installing base is aligned with the periphery of moving knife.

③ Tighten the lock nut of moving knife link pin at the proper position.

Set the position of moving knife pin to the right to increase the amount of recession, and to the left to decrease the amount.

3) When adjustment cannot be performed by moving knife link pin only

① Loosen the lock nut of moving knife link pin (Fig. 15 (1)).

② Adjust so that the center of moving knife link pin is aligned with V groove (Fig. 15 (2)) of the center of slot in knife driving arm (Fig. 15 (3)), and tighten the lock nut to fix the pin.

③ Loosen two setscrews (Fig. 15 (4)) in driving arm stopper (Fig. 15 (5)).

④ Move knife driving arm (Fig. 15 (2)) so that V groove (Fig. 14) on the knife installing base is aligned with the periphery of moving knife, press it to driving arm stopper (Fig. 15 (4)) at that position, and tighten setscrews (Fig. 15 (5)).

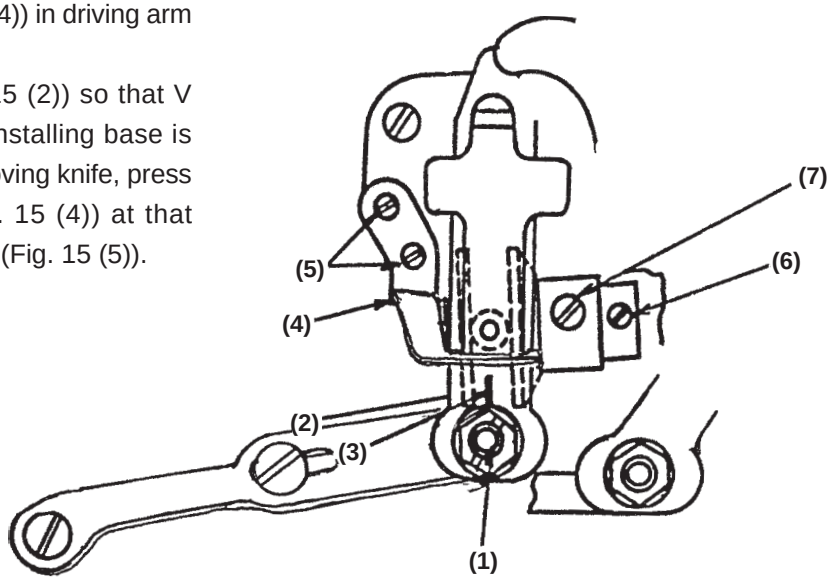


Fig. 15

⑤ Loosen the respective two setscrews in thread trimmer cam (Fig. 15 (7)) and cam collar (Fig. 15 (6)).

⑥ Align marker dot (red : Fig. 13 (2) or green (3)) on the handwheel with marker dot (Fig. 13 (1)) on the machine arm.

⑦ Turn with finger top setscrew No. 2 (Fig. 15 (7)) in the thread trimmer cam so that it comes to this side, and press the thread take-up picker to the right when the setscrew comes to this side.

⑧ Move the cam to the right and left to engage the cam with the roller.

⑨ In this state, lightly pulling the cam to the right, move it in the direction of arrow (this side) until it will rotate no further.

⑩ Temporarily tighten setscrew No. 2 (Fig. 15 (7)) in the cam.

⑪ At this time, check the following matters :

a) Marker dot on the handwheel is aligned with that on the machine arm.

b) Roller smoothly enters the groove in the cam.

c) Amount of recession of knife is 2.5 to 3 mm (SH : 3 to 3.5 mm).

⑫ Securely tighten two setscrews in the cam.

⑬ Press cam collar to the cam, and tighten one setscrew.

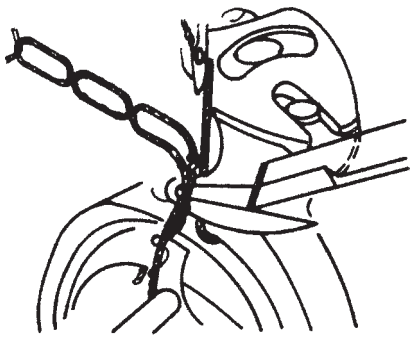


Fig. 16

[Caution] ○ Amount of recession of knife is largely affected even when adjustment of left and right positions of moving knife link pin is finely performed.

○ Check whether moving knife handles thread as shown in Fig. 16.

3-7 Properly installing the counter knife

The dimension of proper installation of the counter knife is as shown in Fig. 17. The standard distance from thread guide for knife attached so that needle enters the center of window to the top end of counter knife blade is 0.5 mm.

At this time, a clearance of approximate 4 mm is provided between the center of needle and the top end of counter knife blade.

The top end of counter knife blade is 0.6 mm above the installing face. (Fig. 18)

Sharpness will change when installing angle of the top end of counter knife blade is changed. Sharpness is shown only when cutting blade sections of counter knife and moving knife are closely engaged with each other.

When adjusting or replacing the counter knife, be sure to check the sharpness and adjust the installing angle of counter knife.

Counter knife can be installed by moving to the right from the standard installing position.

At this time, the feeding length of needle thread and bobbin thread is lengthened more not only as much as the moving distance of knife than the standard time, but also thread trimming timing is delayed. As a result, the length of needle thread remaining at the top end of needle is extra lengthened. (Fig. 20)

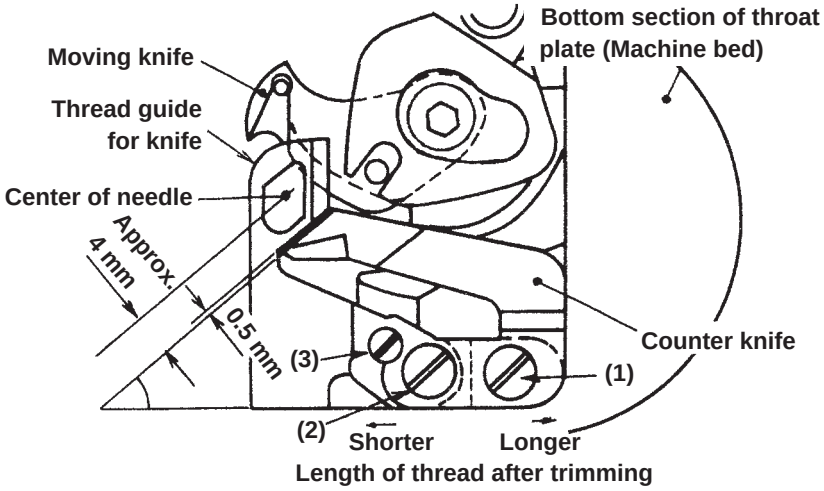


Fig. 17

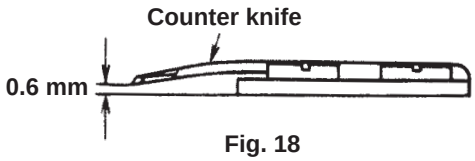


Fig. 18

For the synthetic thread, move counter knife to the right to delay thread trimming timing.

To completely adjust, however, it is also necessary to adjust thread trimmer cam timing.

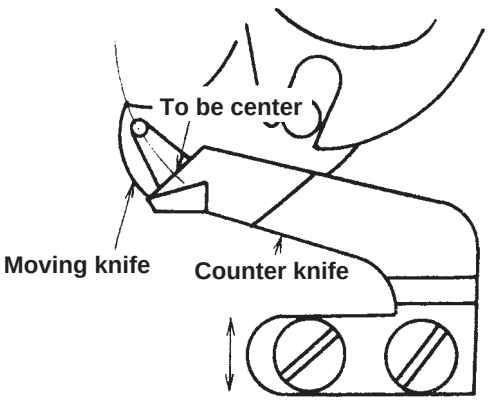


Fig. 19

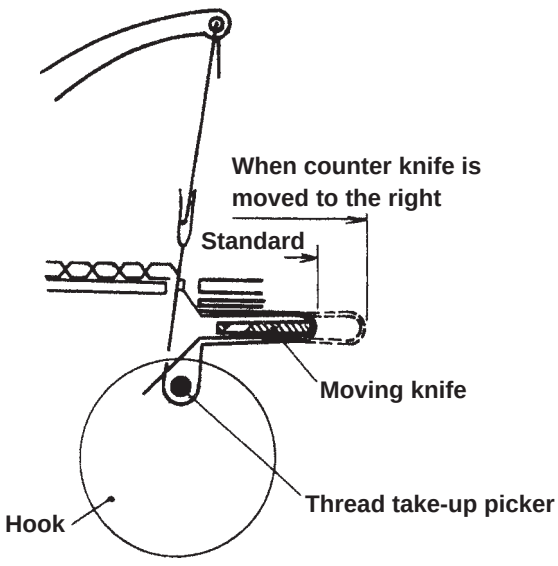


Fig. 20

Properly installing the thread guide for knife

Install the thread guide for knife so that the needle enters just in the center of the window (hole).

3-8 Rising amount of the thread tension disk No. 2

1) Observing the rising amount of the thread tension disk No. 2
   Lift the presser foot at the position where the thread take-up lever comes slightly to this side of its upper dead point. Then, check that the rising amount of the thread tension disk No. 2 is 0.5 to 1mm when thread take-up picker (Fig. 12 (1)) is pressed to the right.
2) Adjusting the rising amount of the thread tension disk No. 2
   ① To increase the rising amount, loosen screw (Fig. 21 (1)) and move thread release wire (2) to the right.
   ② To decrease the rising amount, loosen screw (1) and move thread release wire (2) to the left. After performing adjustment, securely tighten screw (1).

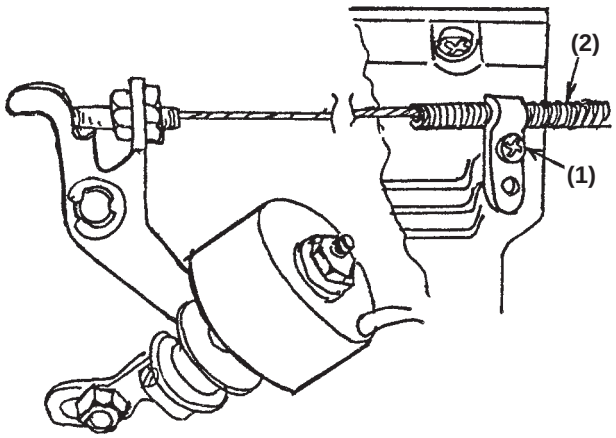


Fig. 21

3-9 Sharpening the knife blade

The shape of blade top of the counter knife affects most the sharpness of the knife.
In many cases, the sharpness is improved by sharpening the blade of the counter knife only.
It is important that the blade face of the counter knife comes in contact with the blade section of the moving knife.

○ The sharpness is improved by sharpening face A in Fig. 22 only. (Pay attention to the angle shown in Fig. 22.)

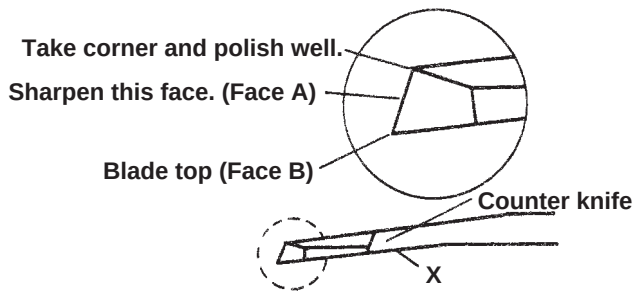
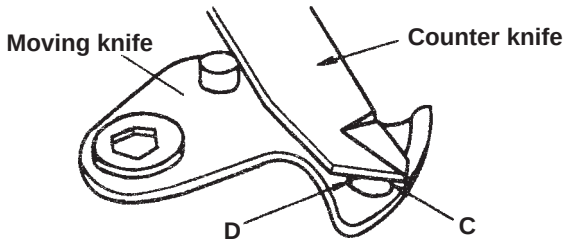


Fig. 22



C and D sections of moving knife should simultaneously come in contact with counter knife.

Fig. 23

○ The sharpness is deteriorated when the top end of face B has been worn out and got round. Carefully sharpen the blade without changing the angle.

○ When the sharpness is insufficient although the blade face is enough sharpened, it is because the left and right blade faces of moving knife and counter knife do not simulataneously come in contact with each other. At this time, adjust the inclination of the counter knife.

(Reference) To improve the contact of the blades of moving knife and counter knife, it is effective to change the angle of the arrow mark shown in Fig. 24.

When the side of D in Fig. 23 is hard to cut, decrease this angle, and when the side of C is hard to cut, increase the angle.

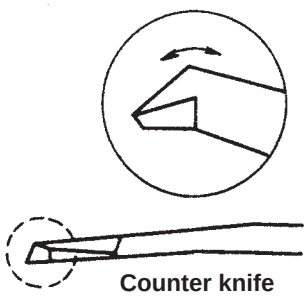


Fig. 24

3-10 Replacing the moving knife

When replacing the moving knife, replace it in the following procedure.

1) Remove moving knife hinge screw (Fig. 26 (1)).
2) Slide moving knife link (Fig. 26 (2)) to this side, and draw moving knife link (2) from knife forked pin (Fig. 26 (3)).
3) Loosen and take out moving knife hinge screw (Fig. 25 (3)) using 3 mm hexagonal wrenck key (Fig. 25 (4)).
4) Loosen and remove knife forked base hinge screw (Fig. 25 (1)). Lift up knife forked base (Fig. 25 (2)) and remove the pin of moving knife from the forked groove in the knife forked base.
5) Remover the pin of moving knife, slide the moving knife to the left and take it out from the bottom face of knife forked base.

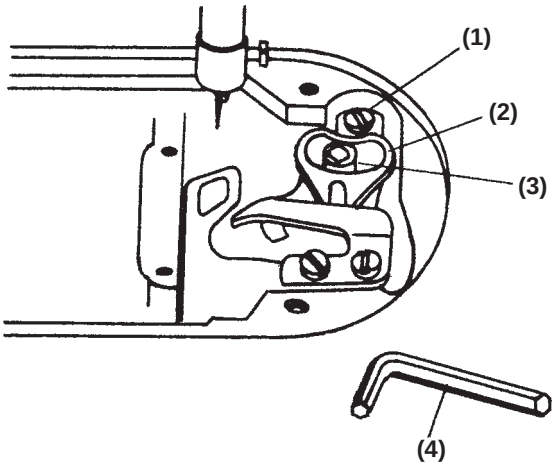


Fig. 25

Perform installation in the reverse order of the aforementioned procedure.

When tightening the moving knife hinge screw, move the moving knife by hand and check that it smoothly moves without play.

Next, securely insert the forked groove in the knife forked base into the moving knife pin, and tighten the knife forked base hinge screw.

Insert the moving knife link into knife forked pin (Fig. 26 (3)), and attch moving knife link hinge screw (Fig. 26 (1)).

Finally, move the moving knife link to the left and right, and check that the moving knife moves.

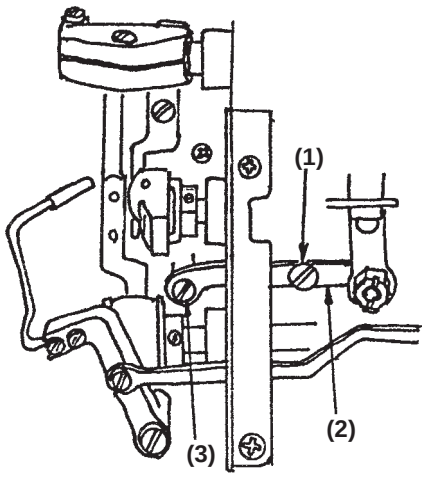


Fig. 26

3-11 Replacing the thread guide for knife

When replacing the thread guide for knife, loosen screws (2) and (3) shown in Fig. 17, and replace it with screw (1) tightened.

If the installing angle of counter knife is moved, perform re-adjustment referring to the item of 3-7 “Properly installing the counter knife”.

3-12 Adjusting the thread take-up picker

If thread take-up picker (Fig. 27 (3)) excessively enters in the direction of bobbin case when trimming thread, bobbin does not rotate and bobbin thread is trimmed shorter than the standard. As a result, slip-off of thread occurs at the start of sewing.

On the contrary, if it insufficiently enters, needle thread slips from the top end of thread take-up picker when trimming thread. As a result, needle thread remaining at the needle top after thread trimming is shorter resulting in slip-off of thread.

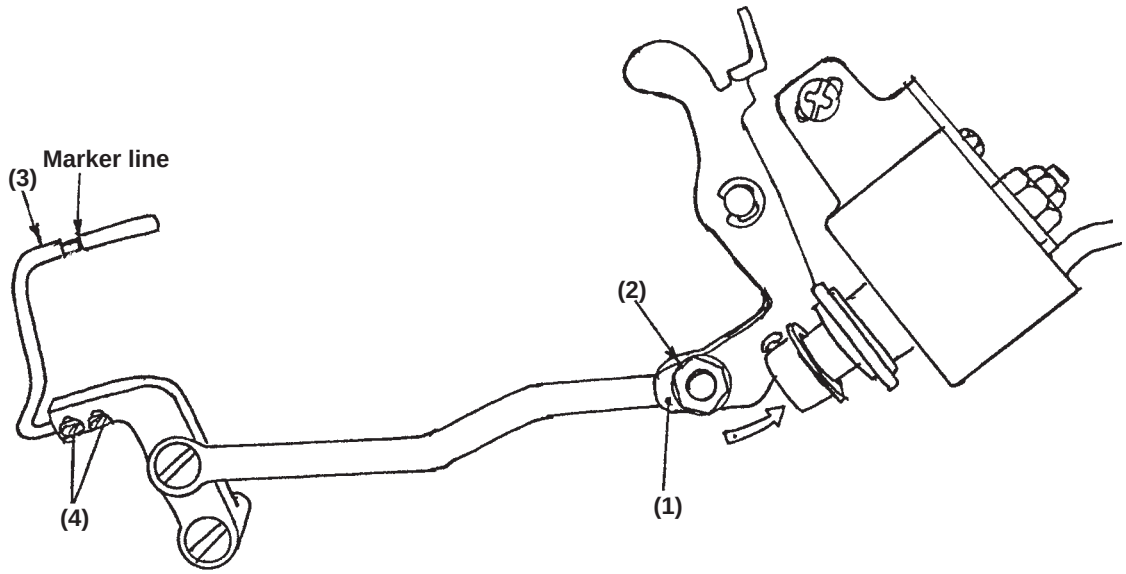


Fig. 27

1) Proper position of the thread take-up picker

Adjust the thread take-up picker so that bobbin thread is lightly pulled out in the state that clutch plate (Fig. 27 (1)) is pressed in the direction of the arrow mark (right side). At this time, as shown in Fig. 28, adjust so that a clearance of 1.0 to 1.5 mm is provided between the top end of thread take-up picker (bobbin presser) and the notch in the upper section of bobbin. In addtion, after the clutch plate has been pressed to the right, lightly press thread take-up picker (3) and adjust so that the rear end of bobbin presser is aligned with the marker line on the thread take-up picker in the state that the play is removed.

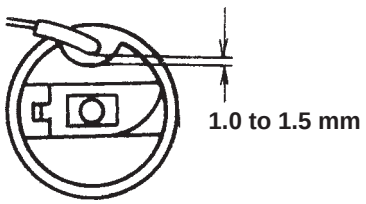


Fig. 28

2) Adjusting the thread take-up picker

Loosen screws (Fig. 27 (4)) and adjust so that the top end (bobbin presser) of thread take-up picker is located as shown in Fig. 28.

To adjust the depth of thread take-up picker, move the position of picker link pin (Fig. 27 (2)).

After performing adjustment, tighten the lock nut of picker lik pin.

3-13 Adjusting the clutch plate and the thread trimmer solenoid

The stroke of thread trimmer solenoid is 6 mm.

Installing positions of the clutch plate and the solenoid are the positions where the clearance of section A is 0.1 to 0.5 mm when the thread trimmer solenoid is drawn (Fig. 30).

In this state, tighten solenoid setscrew (Fig. 30 (10)).

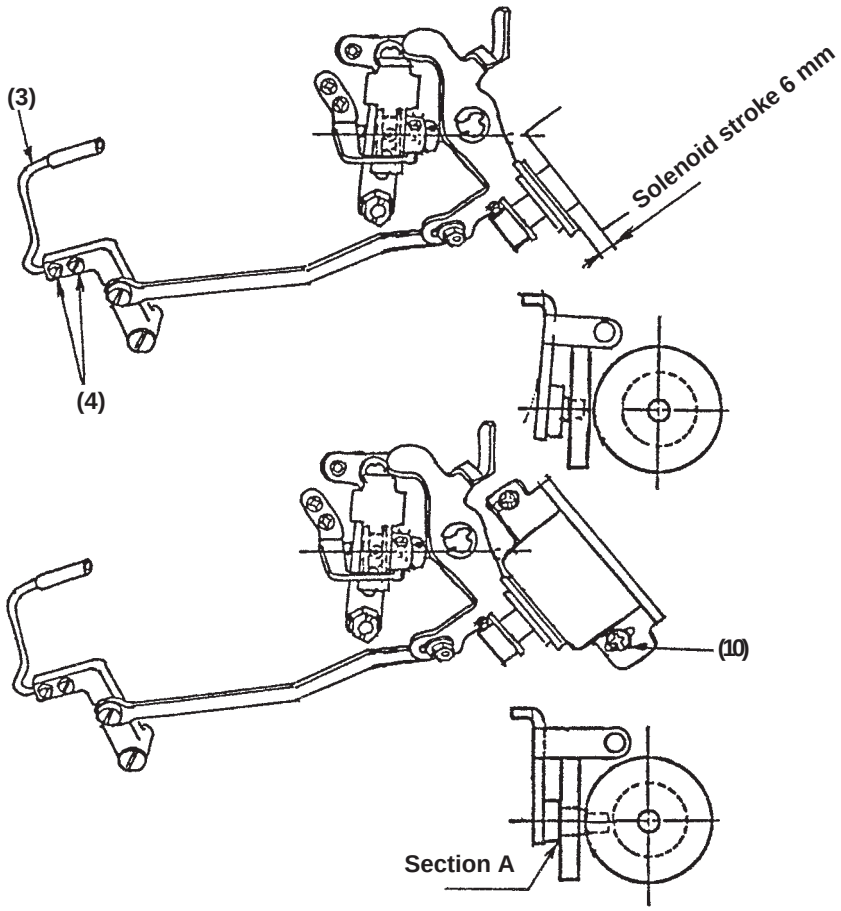


Fig. 30

3-14 Driving arm stopper

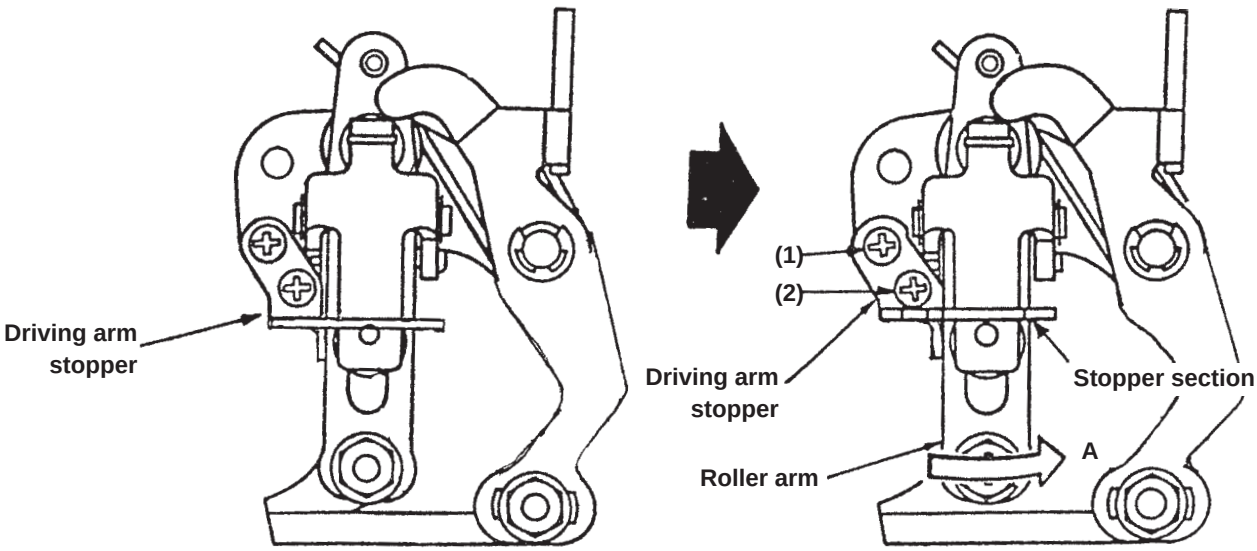


Fig. 31

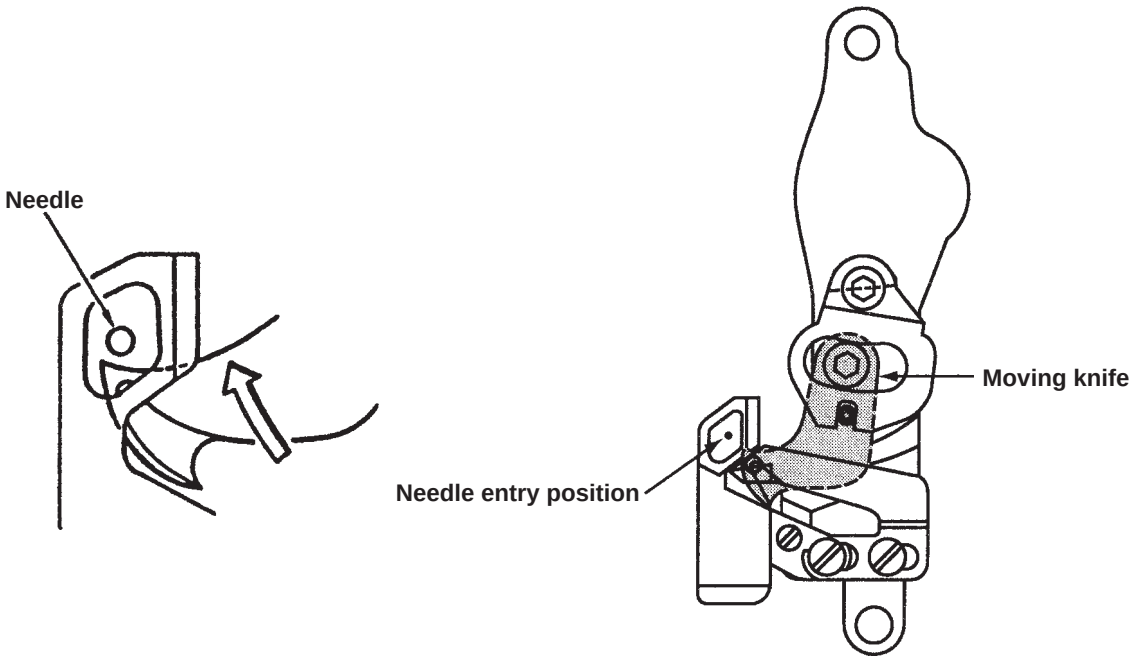


Fig. 32

1) Press the roller arm in the direction of the arrow mark to press it to the stopper section of the thread trimmer control plate.
2) At this time, adjust with screws (1) and (2) so that the stopper section works at the position where the moving knife does not reach the needle entry position.

3-15 Installing/removing the knife installing base

1) Remove the hook and the bobbin case holder.
2) Lift up moving knife link (Fig. 33 (1)) to this side and remove it from knife forkd pin (Fig. 33 (2)) after removing moving knife link hinge screw (Fig. 33 (3)).
3) Remove knife installing base setscrew (Fig. 33 (5)), and remove knife installing base (Fig. 25 (4)).

Perform the installation in the reverse order of the aforementioned procedure.

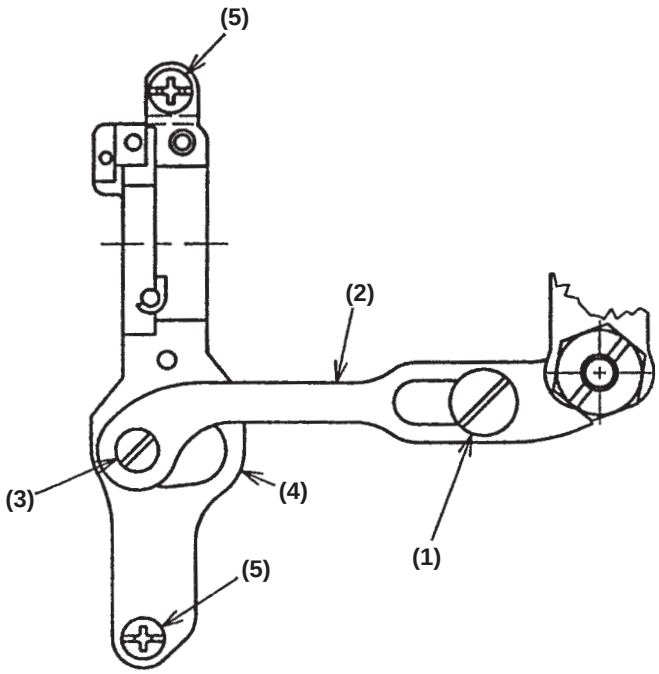
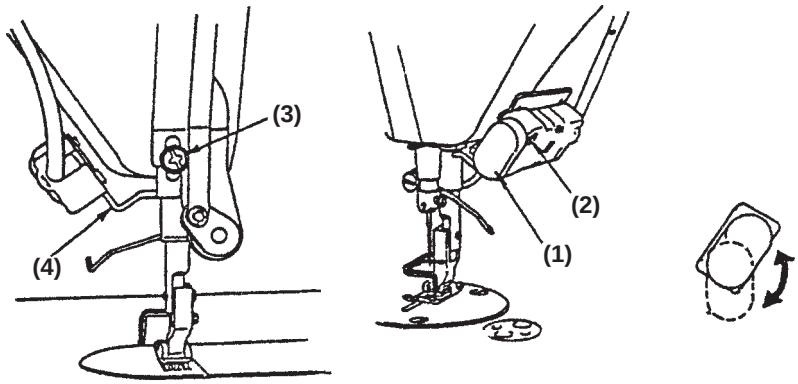


Fig. 33

3-16 Adjusting the position of the touch-back switch

The height of the touch-back switch can be changed by turning push button (1). When you desire to further change the position, loosen setscrew (2) to slide it up or down, or loosen setscrew (3) to move it up or down together with switch base (4).

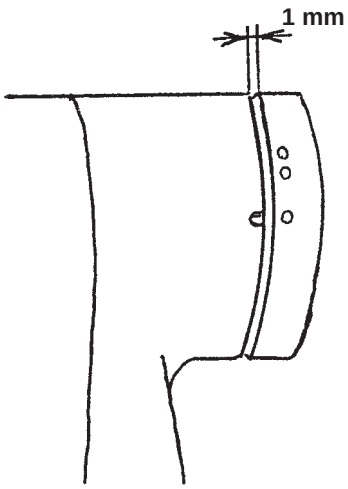
In addition, tightening torque of setscrew (2) should be moderate since the screw is tightened in the plastic base. And, securely and strongly tighten setscrew (3).



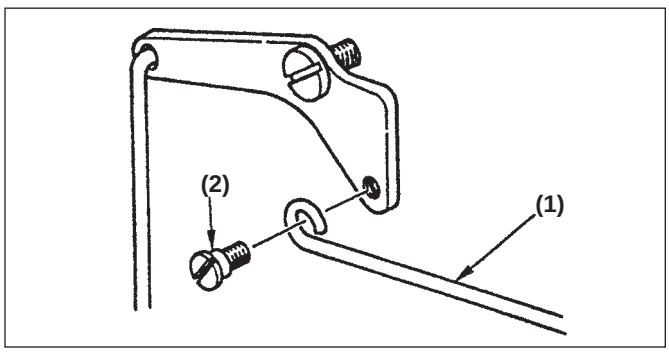
3-17 Adjusting the position of the handwheel

When removing the handwheel, be sure to check the following matters for adjustment.

1) Provide a clearance of 1 mm between handwheel (1) and the pulley cover. If the clearance is too narrow, the position detector solenoid comes in contact with the synchronizer. If it is too wide, defective detection may occur.
2) Be sure to adjust screw No. 1 in the handwheel to the flat section of the motor shaft, and tighten the screws in the order of No. 1 and No. 2.



3-18 Adjusting the automatic presser lifter (AK118)



1) Remove the side plate of the sewing machine head and remove hinge screw (2) of knee lifter side rod (1).

2) Remove hinge screw (4) in knee lifter link (3), replace the link with knee lifter link (5) to which spring (6) supplied with the machine is set, and install it with hinge screw (7).
At this time, tilt the machine head and check that knee lifter connecting rod (8) enters in the hole of connecting rod guide (9).

3) Tighten knee lifter side rod pin (10) with knee lifter link (5) which has been replaced using screw. Then, install knee lifter side rod with pin (1).

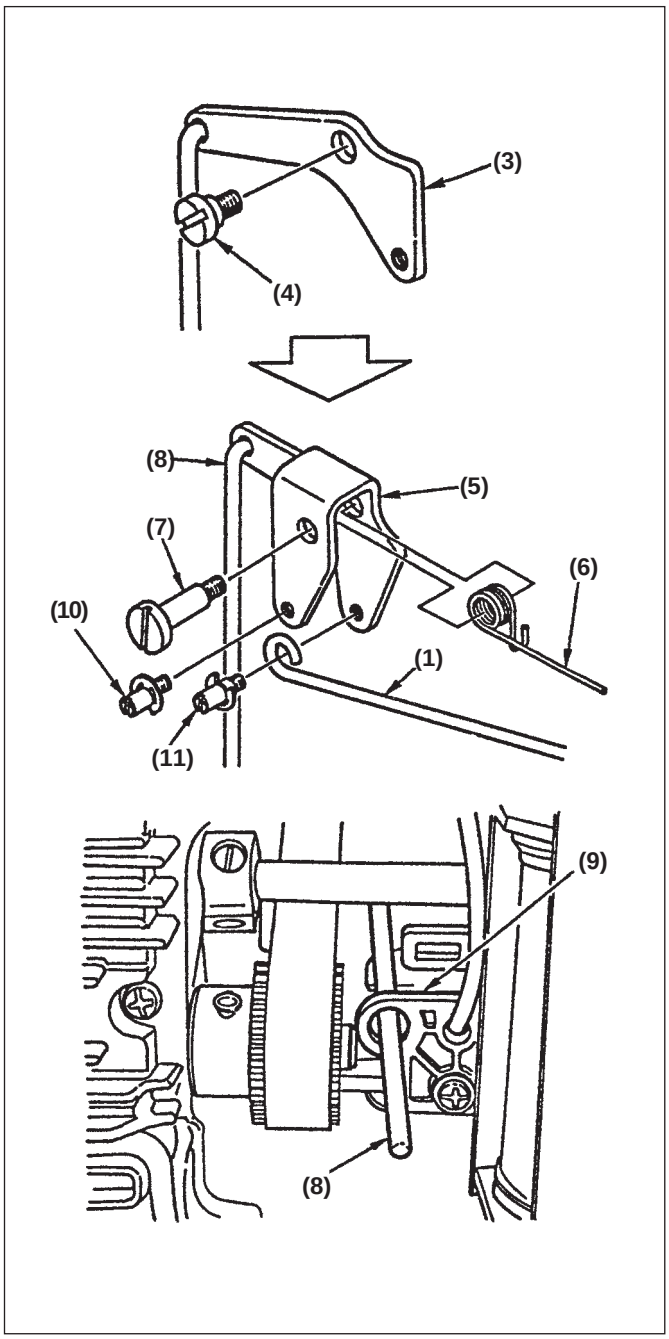
(Caution) 1. Knee lifter side rod is easily loosened. Securely tighten it.
2. Apply grease to the respective hinge screw sections.

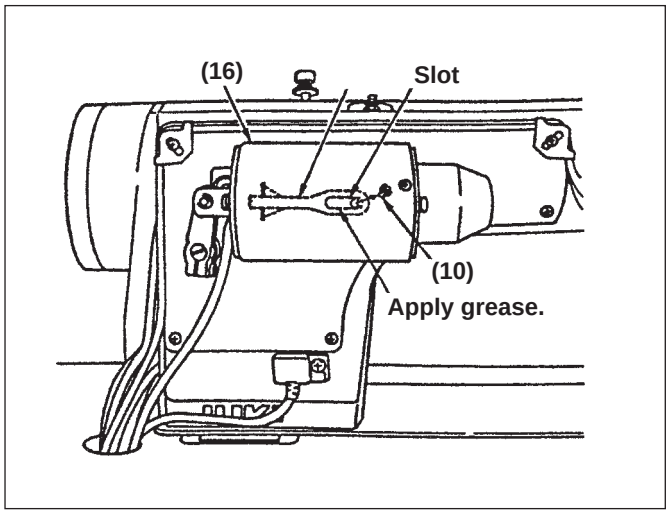
4) Install knee lifter link spring retainer (14) on wire presser base (15) so that tension release wire (12) and oil pipe (13) are pressed with the hook. At this time, pay attention to the routing of oil pipe (13) and wire (12).

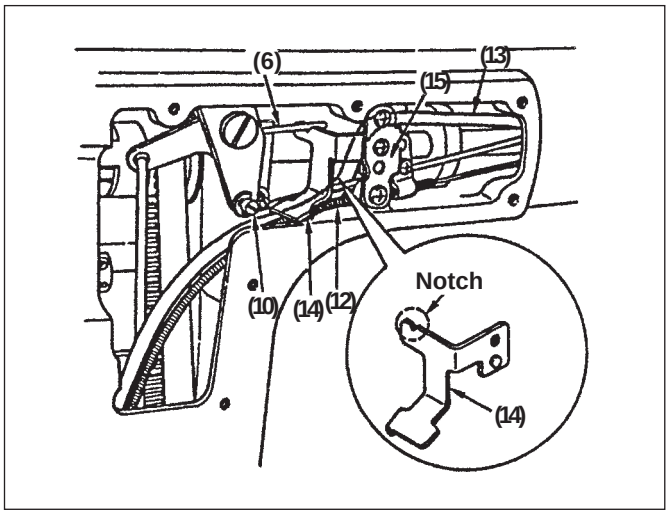
5) Hook knee lifter link spring (6) to the notch of knee lifter link spring retainer (14).

6) Install the AK device (asm.) (16) on the machine arm.
At this time, install it so that the slot of solenoid link (17) is set to knee lifter side rod pin (10).

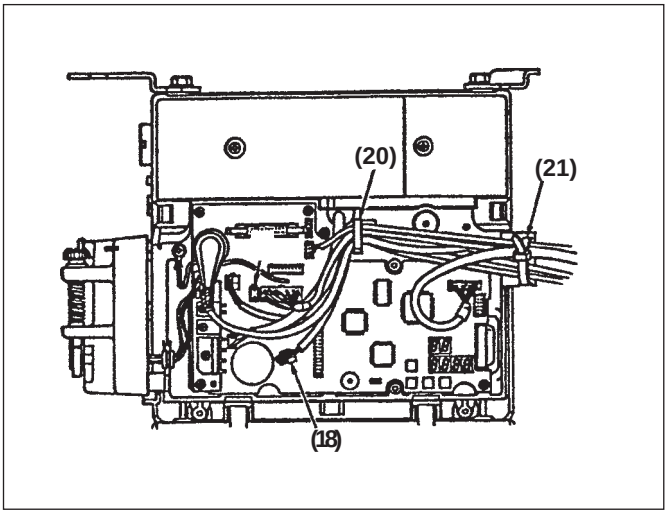
(Caution) Apply grease to the slot of solenoid link (17).



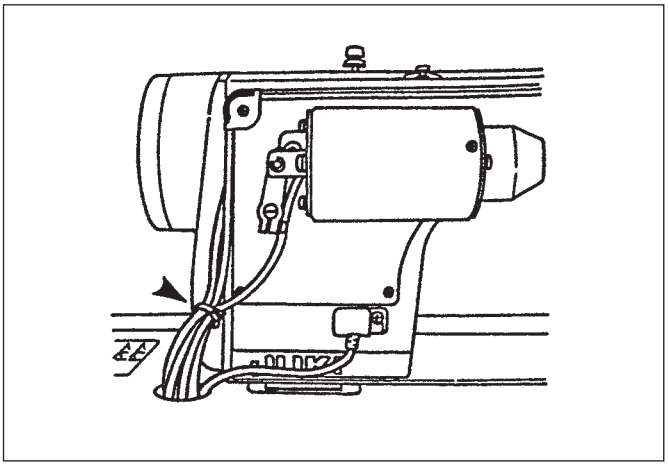




7) Pass cord (16) of AK device (asm.) through the hole of the table and insert 2P connector (18) into 2P connector (19) (2P white CN9) located on the control circuit board.
Arrange the cord with other cords using cord clamp (20) and cable band (21) so that they do not hang loose.



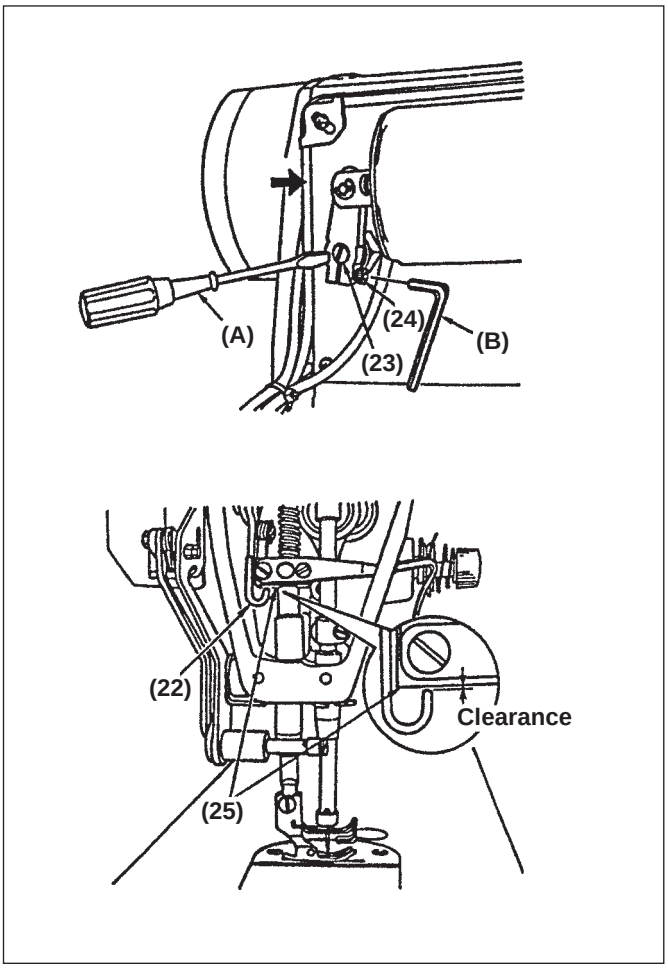
8) Bundle the cord with other cords using the cord band supplied with the machine.



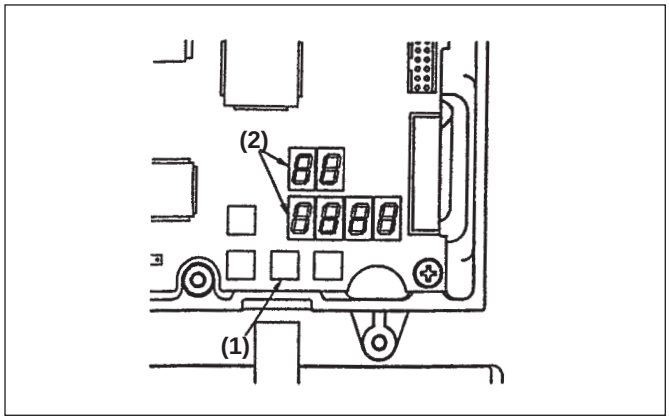
9) Remove the face plate of the machine head, and lower the presser foot to make a state that lifting plate (22) is pressed down. Turn solenoid shaft (23) to the left with screwdriver (A) and tighten screw (24) using hexagonal wrench key (B). At this time, set the solenoid in the state that it is pressed in the direction of the arrow mark.

(Caution) Check that there is a clearance between the bottom face of presser bar guide bracket (25) and the top end of lifting plate (22) in the state that the presser foot comes in close contact with the throat plate.

10) When using the AK device, use it after removing the head support rod on the table.



Selecting the automatic presser lifting function

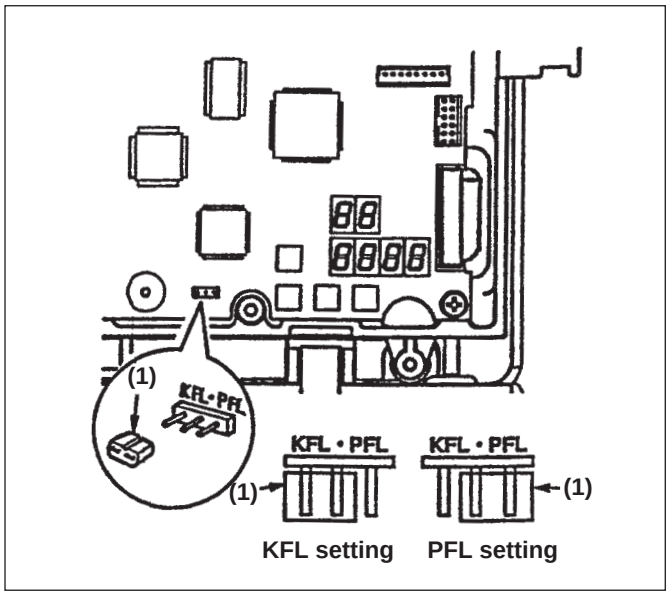


1) Pressing switch (1) in the control box, turn ON the power switch.
2) LED will be displayed (2) (FL ON) with “beep”, and the automatic presser lifting function becomes effective.
3) Turn OFF the switch once and again turn it ON.
4) Repeat operations 1) through 3), and LED display will be “FL ON. The automatic presser lifting function does not work.

FL ON : Automatic presser lifting function is effective.
FL OFF : Automatic presser lifting function does not work.
(Similarly, the presser foot does not automatically go up when programmed stitching is completed.)

(Caution) 1. Turn ON the power again after one second or more has passed without fail.
(If the action of ON/OFF of the power is quick, setting may not be well changed over.)
2. If this function is not properly selected, the automatic presser lifter does not work.
3. If “FL ON” is selected without installing the automatic presser lifter, the starting at the start of sewing is momentarily delayed. In addition, the touch-back switch may not work. Be sure to select “FL OFF” when the automatic presser lifter is not installed.

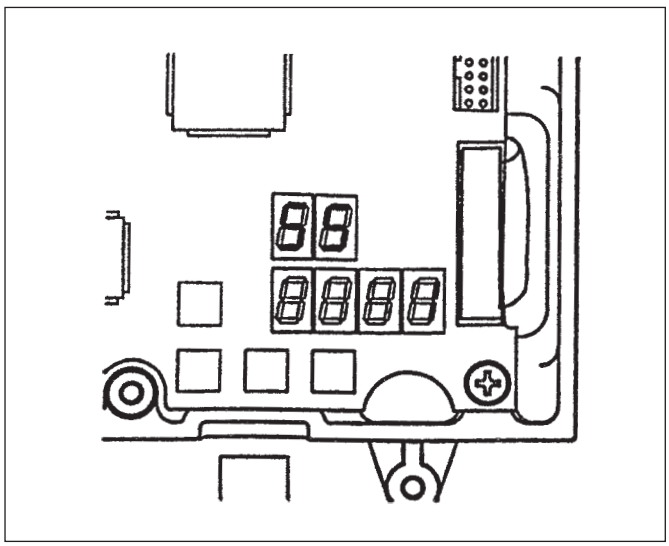
Selecting the presser foot lifting by pedal



The presser foot can be lifted with the operation of depressing the back part of the pedal by changing jumper (1) located on the control circuit board.
Follow the silk screen indication located on the upper side of the jumper to change.
PFL : Presser foot can be lifted by depressing the back part of the pedal.
KFL : Presser lifting operation by pedal is not performed.

(Caution) 1. When changing the jumper, be sure to do the work after turning OFF the power. If the jumper is changed while the power is ON, the setting does not change. The main unit may be broken.
2. When PFL is selected, the thread trimming point will automatically descends.

Selecting the automatic presser foot lifting after thread trimming



1) This function can be selected by function setting No. 55 of the SC-900.
1 : Presser foot automatically goes up after thread trimming.
(Standard setting at the time of delivery)
(When the programmed stitcing is selected with CP-360 panel, it works according to the setting of the operation panel.)
0 : Automatic presser foot lifting after thread trimming is not performed.
(Similarly, the presser foot does not automatically go up when the programmed stitching is completed.)

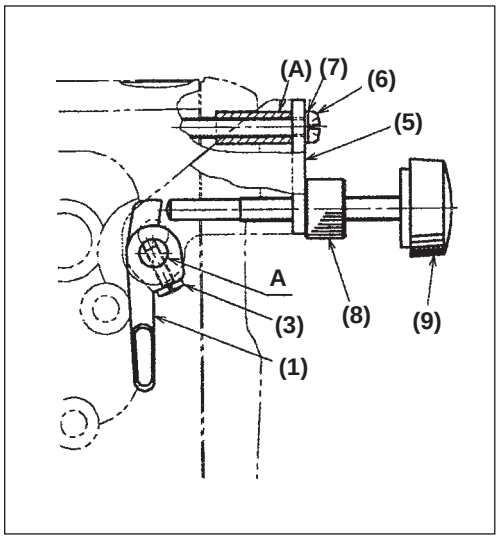
(Caution) For the details of the function setting, refer to the Instruction Manual for the SC-900.

3-19 Optionals (Presser foot micro-lifter)

When straight stitching is not performed since slip-off of fabrics occurs dut to the pressure of presser foot in case of fluffy masterials such as velevet or the like, or hard-to-sew materials, if presser foot micro-lifter (2311056) is used, the presser foot can be minutely lifted at the face plate section with ease, and sewing can be performed. As a result, handling and finish of fabrics are improved.

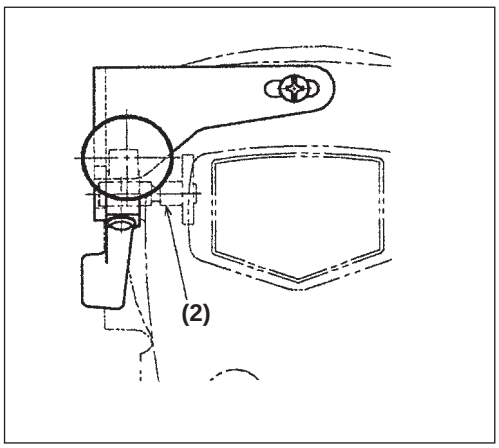
(Assembling the presser foot micro-lifter)

1) Remove the setscrew in the hand lifter, and remove the plastic hand lifter.
2) Remove the face plate, insert micro-lifter hand lifter (1) into hand lifter cam shaft (2) while pressing hand lifter cam shaft (2) with fingers so that it does not move in the direction of inside of the machine arm, and securely tighten it with setscrew (3).
3) Temporarily tighten two setscrews under the face plate, insert collar (4) supplied with the machine into the upper setscrew section, insert guide hole A of installing base (5) into the top end of hand lifter cam shaft, and securely tighten the micro-lifter with setscrew (6) through washer (7) while checking that micro-lifter hand lifter (1) lightly moves.



(Adjustment)

1) Loosen micro-lifter nut (8), turn micro-lifter hand lifter knob (9) to this side, and the presser foot gradually goes up.
2) Tighten nut (8) to fix the micro-lifter at the position where the optimum condition of the sewing materials is obtained after trial sewing.



3-20 AE-8 (Bobbin thread remaining amount detector)

When the amount of remaining bobbin thread reaches the set value, buzzer will sound to warn the operator not to perform the next operation of depressing the front part of the pedal.

It is especially effective for the splicing and the process where resewing is not possible.

For installation, optional printed circuit board A (M97014610A0) which is separately available is required.

For the details, refer to the Instruction Manual attached at the time of purcahse of the device.

(Caution) This device cannot be used with DS and DF types. When it is compelled, use this device with existing RP hook 11079456 and at sewing speed of 3,000 rpm or less.

3-21 ED-4 (Compact material end sensor)

When the sensor detects a material end, the sewing machine automatically stops and thread trimming is performed.This enhances productivity by allowing the operator to conduct sewing work without running to look out for missing stitches.

For installation, optional printed circuit board A (M9701460A0) which is separately available is required.

Refer to the Instruction Manual attached at the time of purchase of the device.

3-22 PK-70 and -71 (3-step pedal)

Refer to the Instruction Manual attached at the time of purchase of the device.

3-23 Adjusting the tension release change-over

When the sole of the presser foot is lifted 3.5 mm or more with the knee pad or AK device, the tension release works and the thread tension disk rises. As a result, tension is not applied to the needle thread.

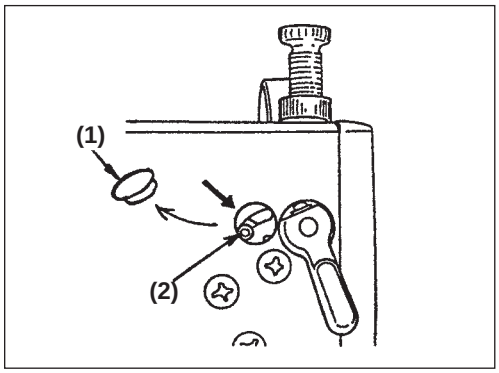
When the presser foot is lifted by the thickness of the overlapped section of the fabric instead of the knee lifter, the tension release does not work.

Especially when the knee lifter is used at the thick section to handle the material during sewing, thread tension may become deffective.

In this case, the tension release can be released by performing the following adjustments.

(Thread trimming function is not affected since the tension release works when thread trimming.)

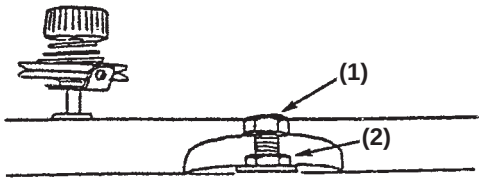
1) Remove rubber cap (1) located on the rear face of face plate of the machine head.
   When the machine is provided with the wiper, perform the work after removing the wiper base.
2) Loosen change-over screw (2) with 3 mm hexagonal wrenck key. Turn it downward until it will go no further, and tighten it again. Tension release is possible with the knee lifter. Turn it upward until it will go no further, and tighten it again. Tension release is not possible with the knee lifter.



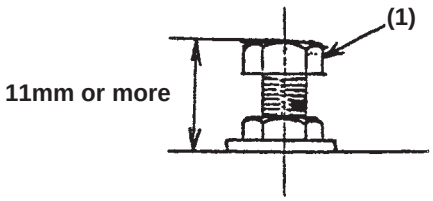
3-24 Adjusting the presser foot micro-lifter

The presser foot can be minutely lifted with ease using the micro-lifter screw installed on the machine head to perform the sewing.

1) Loosen micro-lifter nut (1), and turn micro-lifter screw (2) to the right to gradually lift the presser foot.
2) Tightn and fix nut (1) at the position where the optimum condition of the sewing material is obtained through trial sewing.



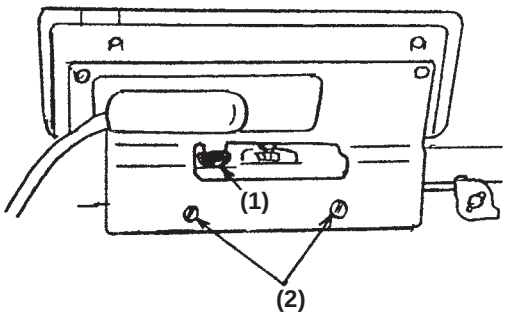
(Caution) When the micro-lifter is not used, make the height of micro-lifter screw (2) from its installing face on the machine arm 11 mm or more.
when the micro-lifter is working, the presser foot is in the state that it is rising under the standard sewing condition. As a result, feed force is excessively deteriorated.



3-25 Installing the operation panel

If the installation of the operation panel is improper, noise of snarl may occur when the machine runs at high speed.

When installing the panel, remove two setscrews (2) in the side plate and install it with the screws supplied with the panel in the state that rubber (1) of the panel installing plate is securely pressed to the upper face of the machine arm.

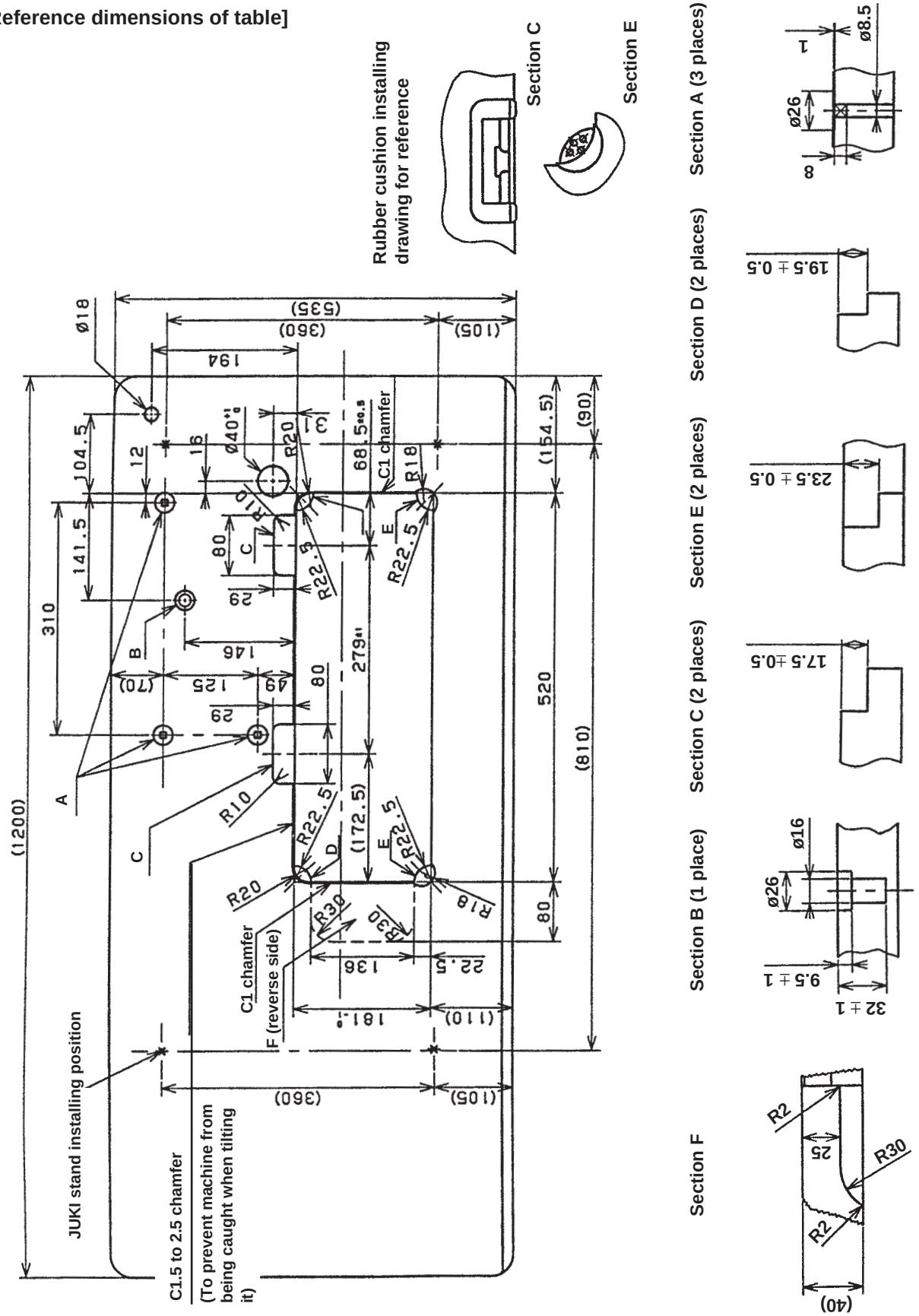


3-26 Dimensions of table

The bed size of this machine is the same as that of JUKI LH model. This machine cannot be set to the table for the exising lockstitch sewing machines.

Refer to the following dimensions only when JUKI exclusive table is not used since the main dimensions of the table are described below.

[Reference dimensions of table]



3-27 Points of adjustment and assembly of the feed mechanism

(Adjusting the feed driving components)

* To obtain the movement in the direction of the horizontal feed, feed rocker shaft (1) is rocked by means of feed rocker cam attached to feed driving shaft (2), connecting links A (4) and B (3) of feed rocker rod (19), feed adjusting link (5), and feed rocker arm (6).

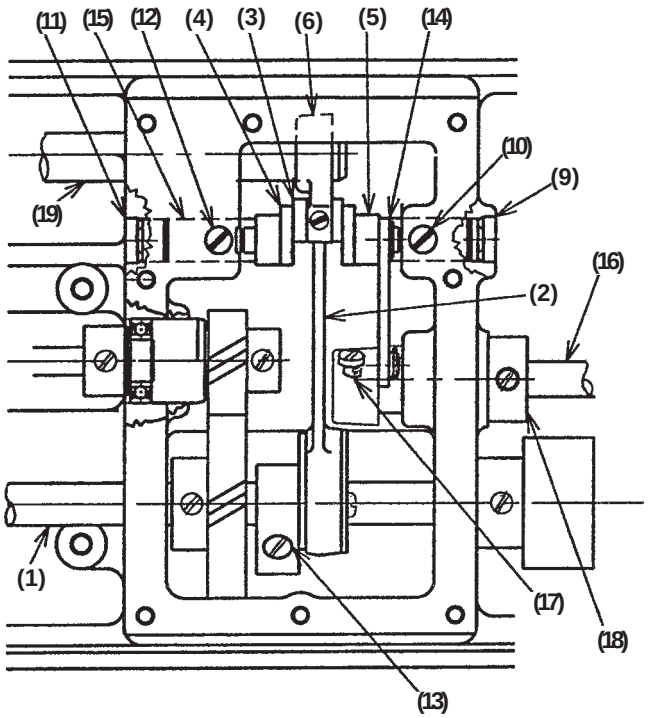
* Seizure, abnormal exothermic, pitch error, lever snarl, or defective return of lever will result due to the torque of the sewing machine unless centering and play adjustment of the aforementiond parts are securly performed. Perform readjustment in the following procedure when these phenomena are likely to occur.

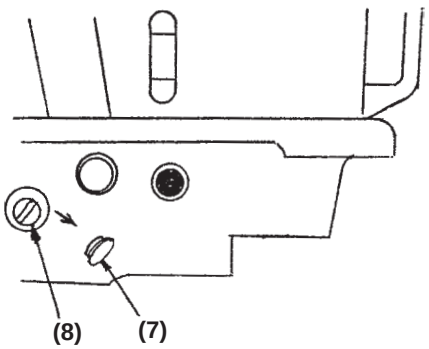
1) Remove the lid of the gear box.
   Refer to the item 3-34 for removing and attaching it.
2) Remove rubber cap (7) located on the side face of the machine bed and loosen setscrew (8) in the feed rocker arm.

* Apply sealant to the rubber cap to prevent it from oil blurredness when attaching it again.

3) Loosen two setscrews (13) in the feed rocker cam. When attaching the setscrew No. 1 again, check that it is set on the flat section.
   When loosening amount of the setscrew No. 1 is small, it can be saved for the setscrew to be slipped from the flat section.
4) When there is no trouble with feed adjusting link (5), the strain can be removed by adjusting the lateral position of the feed rocker cam or the feed rocker arm. Turn the handwheel several times and the feed rocker cam moves to the position where there is no strain. In this state, quietly tighten setscrew No. 1. Further, tighten setscrew No. 2.
5) Then, similarly, turning the handwheel by hand, adjust feed rocker arm (6) to the position where there is no strain, and tighten the setscrew.
6) If there is a play when pressing feed adjusting link (5) to the right and left, perform the following adjustments before adjustments 4) and 5).
7) Remove rubber cap (9) in the adjusting link fulcrum shaft and loosen setscrew (10) in the fulcrum shaft, insert a screwdriver from the hole from which the rubber cap is removed to lightly press the fulcrum shaft, then securely tighten setscrew (10) in the fulcrum shaft.
   The play in this section will affect largely the lever snarl. It is the point to assemble it while lightly pressing the fulcrum shaft.

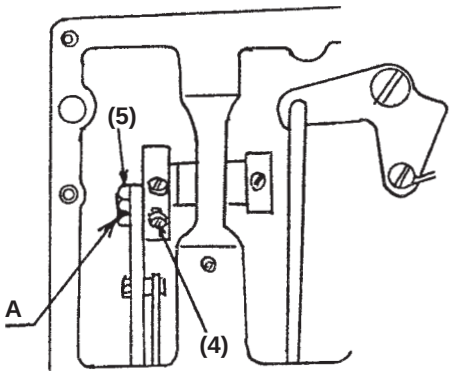
* When the adjusting link does not smoothly move although there is no lateral play in adjusting link connecting link (14), remove rubber cap (11) in the adjusting link fulcrum shaft, loosen setscrew (12) in the fulcrum shaft on this side, move the feed lever up and down to fit adjusting link (5), and adjust fulcrum shaft (15) to the position where the strain does not occur.





(Adjusting the feed adjustment components)

* When there is a lateral play in feed changing shaft (16), lever snarl, or longitudinal play of the feed dog will be large. Securely tighten setscrew (17) in the feed changing shaft arm A with a rather large-sized screwdriver, and assemble the shaft with thrust collar (18) so that it smoothly turns without play. (Refer to the illustraion on the previous page.)

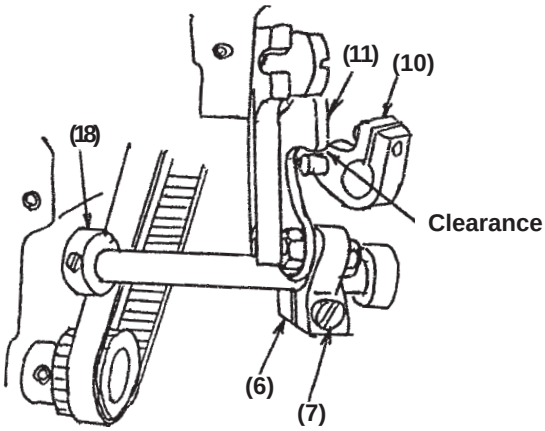


[Adjusting the feed "0" point]

Adjust the initial position from the adjusting link to the feed adjusting base in the following procedure.

1) Remove the side plate, loosen two setscrews (4) in the feed adjusting base, turn feed adjusting pin (5) with wrench, and temporarily tighten two setscrews (4) of the feed adjusting pin in the state that notch A of the pin comes to the side plate side.
2) Remove the reverse feed solenoid, and set the feed dial to "0".
3) Loosen setscrew (7) in feed changing shaft arm B (6), move adjusting link (5) (illustration on the previous page) with fingers, and securely tighten setscrew (7) in feed changing shaft arm B (6) at the position where connecting link A (8) is aligned with connecting link B (9).

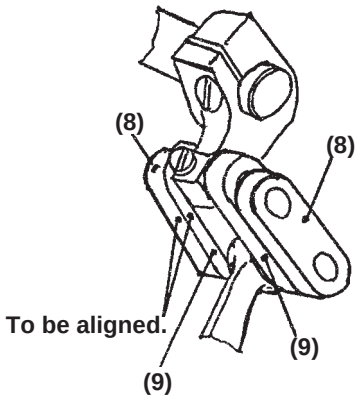
* Set the lateral position of feed changing shaft arm B to the position where a clearance of 1 mm is provided between the arm and the metal, and check that strain does not occur in adjusting rod (11).



[Adjusting the ratio of normal to reverse feed]

1) After adjusting feed "0" point, and actually place a piece of paper under the presser foot. Then, make normal feed of 10 stitches and reverse feed of 10 stitches by operation of the feed lever to check that proper ratio of normal to reverse feed is obtained. Adjust the feed dial with three graduations. If the ratio of normal to reverse feed is not proper, gradually turn the feed adjusting base pin with wrench and securely tighten two setscrews (4) of the pin at the position where the ratio of normal to reverse feed is proper since feed adjusting base pin (5) is eccentric.

* Turning clockwise feed adjusting base pin (5) increases normal feed, and counterclockwise increases reverse feed.

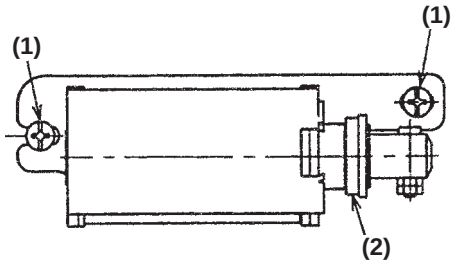


[Adjusting the position of the feed lever]

1) Adjust the tightening position of feed lever arm (10), when the feed dial is set to graduation "5", so that a clearance is provided between the arm and the claw section of feed adjusting rod (11).
   After the adjustment, make a slight play when the graduation of the feed dial is "5" and the feed lever is lightly pressed. If the play is excessive, operability is deteriorated, and if it is excessively small, the feed lever may move by the shock at the time of automatic reverse feed.

[Automatic back solenoid]

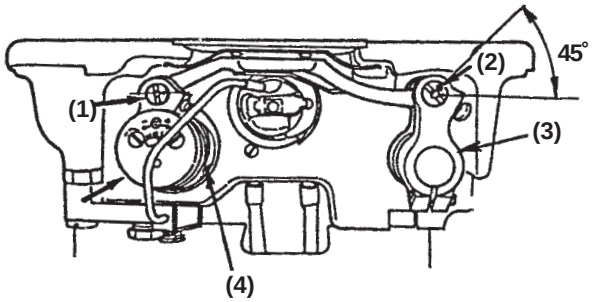
1) Loosen setscrew (1) and move the solenoid up or down to adjust the position of the automatic back solenoid.
   Setting the graduation of the feed dial at "5", press the feed lever until it will go no further. At this time, make a state that plunger rubber (2) in the solenoid exactly moves, and securely tighten setscrew (1) in the solenoid installing base with a rather large-sized screwdriver.



(Adjusting the feed mechanism of feed base components)

[Adjusting the longitudinal position of the feed dog]

1) Adjust the marker dot of feed driving base pin (1) to the right and feed rocker base pin (2) to the upper right at approximately 45˚.
   (Adjust in the state when adjustment of the feed base pin has been completed.)
2) Set the feed dial at “5”.
3) Temporarily tighten the setscrew in feed rocker base arm (3), turn the handwheel to observe the symmetry of the feed dog in terms of the groove of the throat plate. Tighten the setscrew in feed rocker base arm (3) at the position where the central symmetry is obtained.

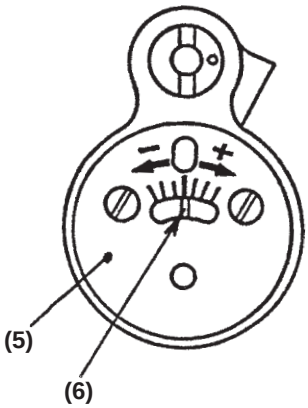


[Adjusting the lateral position of the feed dog]

1) After adjusting the longitudinal position of the feed dog, in the state that the feed dog is fixed in the almost center of the setscrew in the feed base, check the clearance in the lateral direction of the throat plate.
   If the slippage is small, it can be adjusted with the play in the installing hole of the feed dog. If it is large, however, readjust the lateral position of feed driving base arm (4) and feed rocker base arm (3).

* Loosen setscrew (4) in the feed driving cam, loosen the swetscrew in the feed rocker base arm (3), and adjust the lateral position of the feed dog.
   Determine the longitudinal position of feed rocker arm (3) referring to the points of adjusting the longitudinal position of the feed dog.

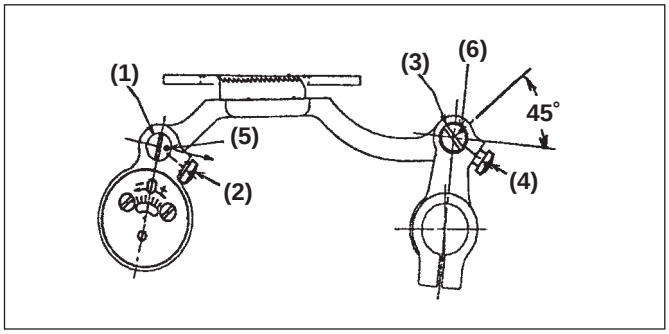
* Tighten setscrew (4) in the feed driving cam in the state that the central marker line on feed driving cam plate (5) is aligned with marker line (6) in the feed driving shaft.
   Turn the handwheel several times to and fro by hand before tightening to prevent the adjustment from the state that the feed driving base arm in terms of the feed rocker base arm is improperly positioned.
   When the feed driving cam does not lightly turn before tightening the setscrew in the feed driving cam, there is a defective part. So, be careful.



(Adjusting the feed timing and dimensions of the feed base components

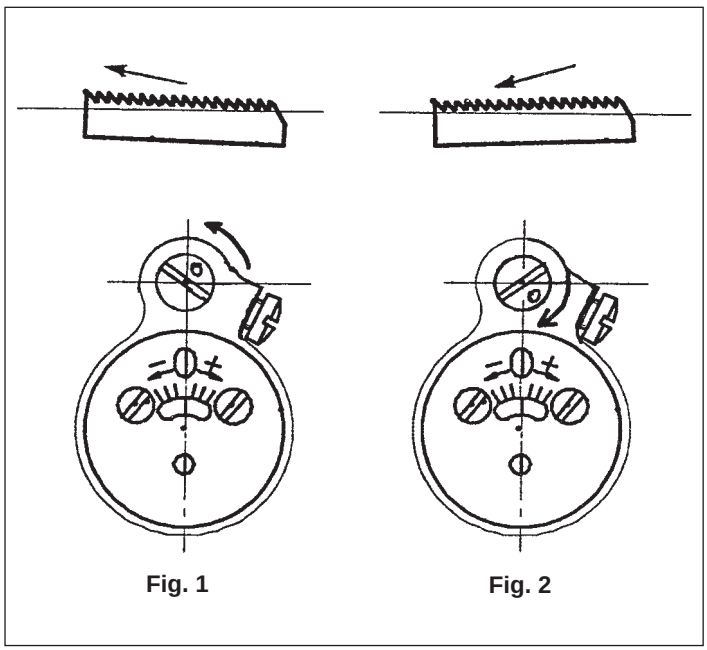
[Inclination and height of the feed dog]

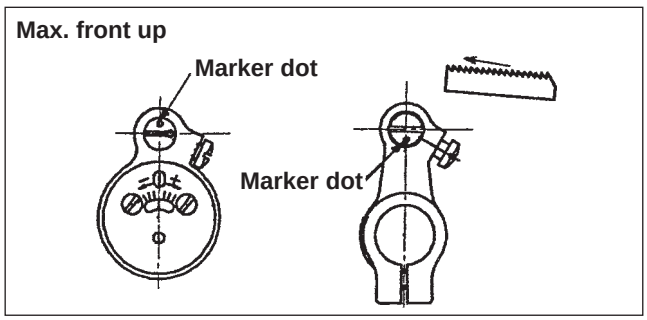
* Standard adjustment value of the inclination of the feed dog : Marker dot (6) in feed rocker base pin (3) is positioned to the upper right 45˚ and marker dot (5) in feed driving base pin (1) is positioned to the right for reference. At this time,the inclination of the feed dog is slightly raised to this side when it starts going up from the top surface of the throat plate and coming down from it.

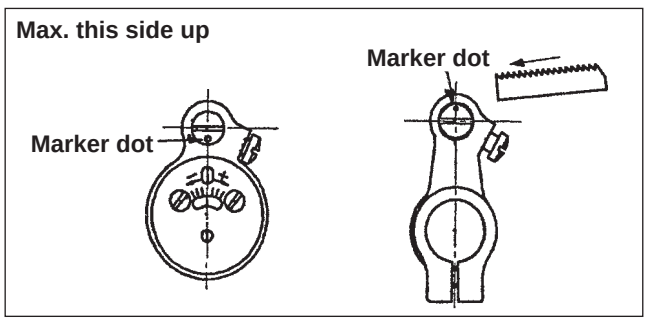


* Making this side of the feed dog raised, bite of the fabric is improved and material slippage is decreased. When improving puller effect with this side of the feed dog raised or changing the inclination in accordance with the sewing conditions, loosen screws (2) and (4), and turn feed rocker base shaft (3) and feed driving base shaft (1) with screwdriver to adjust it.
  After the adjustment, fix the feed dog with screws (5) and (6) while lightly pressing with fingers feed driving and feed rocker base shafts (1) and (3) to the rear side.

(Caution) If there is a play in the feed base, noise or defective straight stitching will result.

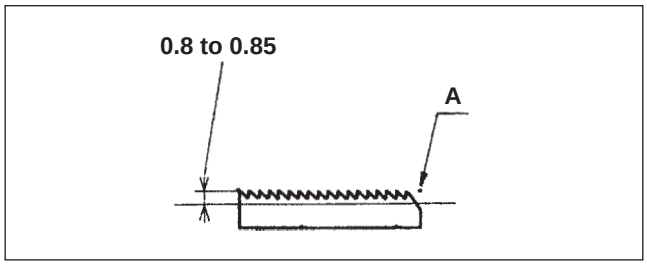






Turn the marker dot in feed driving shaft base (1) in the upper direction to tilt the feed dog with its front up. (Fig. 1)
Turn the marker dot in feed driving shaft base (1) in the lower direction to tilt the feed dog with this side up. (Fig. 2)
However, if adjusting it with feed driving shaft base (1) only, the maximum height of the feed dog is changed. Simultaneously perform the adjustment of raising and lowering the marker dot in feed rocker base shaft (3) when you do not desire to change the height.

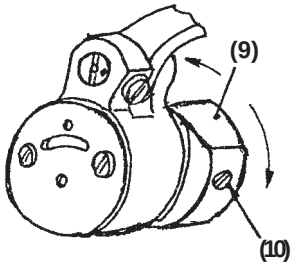
* The standard height of the feed dog is 0.8 to 0.85 mm. If the height of the feed dog is raised, feed force is improved.However, jumping of the presser foot at high speed or defects of light-weight materials is likely to occur.
* If the height of the feed dog is excessively raised, return on this side (section A side) of the feed dog occurs and feed of materials may be affected. If it is compelled to raise the height, adjust the inclination of the feed dog with its front up to decrease the return.



[Locus and timing of the feed dog]

☆ Locus of feed and feed driving timing in terms of the needle can be changed by loosening setscrew (10) in feed driving cam (9).

* Standard adjustment value is the state that marker dot (7) is aligned with marker dot (8) in the center.

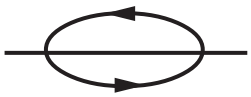


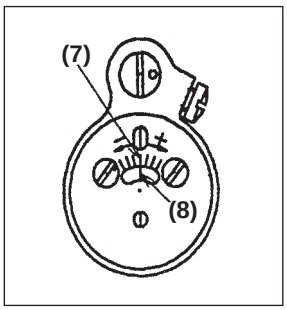
★ Loosen setscrew (9) in feed driving cam (10) and turn it to this side (direction C), and adjust the marker line to "-" side (Fig. A). Then, feed driving timing in terms of feed rocker is advanced. Change in the horizontal direction at the start of feed is decreased and the fabric is securely fed resulting in decrease of irregular stitches.

- Feed force is slightly decreased since the feed dog near the end of feed lowers faster.

★ Loosen setscrew (9) in feed driving cam (10) and turn it to the front side (direction D) , and adjust the marker line to "+" side (Fig. B). Then, feed driving timing in terms of feed rocker is delayed. Start of feed is smooth and light-weight materials become hard to be damaged although bite to the fabric is slightly deteriorated. In addition, the feed dog securely feeds fabric at the end of feed and puckering is reduced due to puller effect.

Standard adjustment





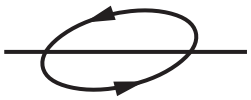


Fig. A

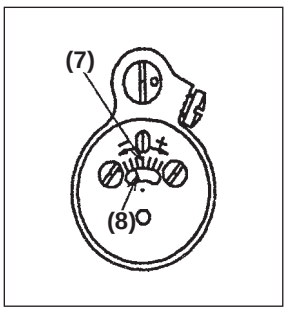
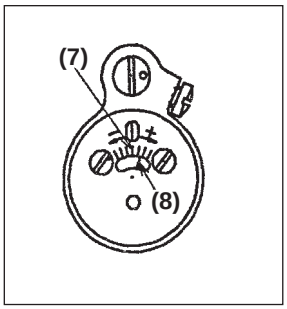


Fig. B

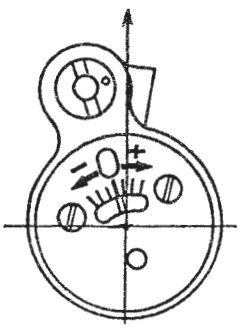


(Caution) Whenever the timing of feed driving cam (9) is changed, the feed timing in terms of the needle will be changed.
When the timing of feed driving cam is excessively changed, readjust it referring to [Adjusting the needle and feed timing].

(Reference for the position of the feed driving shaft in terms of the needle bar)
Whether the timing of the needle and the assembling position of the feed driving shaft are in the normal position can be checked by the following manner.

◎ When "+1" to "+3" of the marker line are positioned right above in the state that the marker line at the top end of feed driving shaft is adjusted to the "0" position of the feed driving cam plate when the needle bar is brought to its upper dead point, the position is normal although it is slighly different by the adjustment of timing.

Right above around here



*** Reference for the position of the feed driving cam at the needle bar upper dead point**

[Adjusting the needle and feed timing]

When performing adjustment of feed driving cam timing, or inclination and height of the feed dog, the needle and feed timing will change. As a result, defective sewing or needle breakage may result.
In this case, adjust the timing in the following procedure.

1) Checking the timing of lowering of the feed dog

Turn the handwheel by hand and check the top end of needle eyelet in the state that the top end of the feed dog is aligned with the top surface of the throat plate at the end of feed.
In this state, when the top end of the needle eyelet has been already lowered from the top surface of the throat plate, the needle pierces the material in the state that the material is being fed when sewing the thick section, and needle breakage due to needle bend may result.
On the contrary, when the top end of the needle eyelet is excessively positioned above the top surface of the throat plate, stitch tightness is deteriorated.

↓

Perform adjustment in the following procedure so that the feed dog is lowered at the top end of the needle eyelet except when intentionally changing the adjustment.

2) Adjusting the timing

☆ Adjusting places are three, lower sprocket, thread trimmer cam and hook.

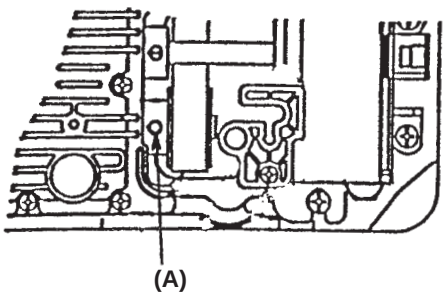
① Tilt the machine head, and loosen two setscrews (A) in the lower sprocket.

② Fix the feed driving cam at the feed dog lowering timing (position where the top end of the feed dog is aligned with the top surface of the throat plate), turn the handwheel gradually to the position where the top end of the needle eyelet is aligned with the top surface of the throat plate. In this state, tighten the two setscrews in the lower sprocket.
(Reference value for tightening torque : 4.5N•m)

③ Loosen two setscrews in the thread trimmer cam, and adjust the cam timing to the position of the red marker dot (green marker dot when the length of remaining needle thread is short). (Refer to the item 3-5.)

④ Adjust the hook timing by aligning the marker line on the needle bar with the bottom end of needle bar lower bushing.

* After the aforementioned adjustment is completed, operate the sewing machine and check whether noise occurs or thread trimmer normally works.

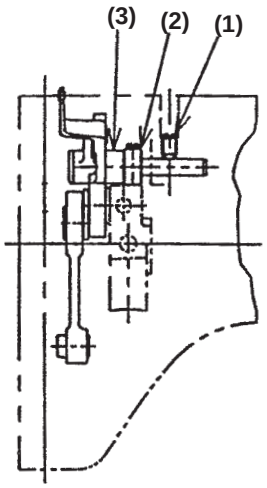


3-29 Points of adjusting and assembling the thread take-up and the needle bar mechanism

[Thread take-up]

* It is not necessary to lubricate to the thread take-up since the grease-sealed ball bearing is used.

Defective position of the thread take-up crank largely affects the durability of thread take-up and noise occurrence. Adjust the thread take-up crank shaft in the following procedure.

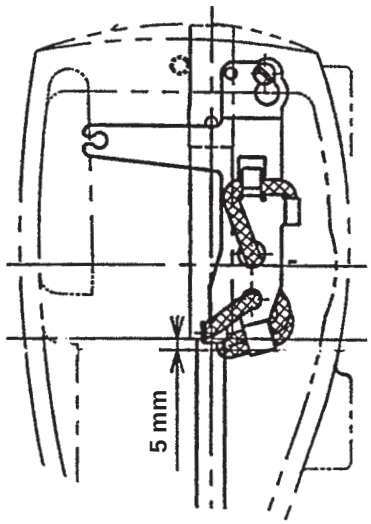


1) Loosen setscrew (1) in the thread take-up crank shaft.
2) Remove the thrust of thread take-up crank (3) with thread take-up crank shaft thrust collar (2).
3) Turn the handwheel two to three times by hand to fit the position of the thread take-up crank shaft.
4) Further, move the top end of the thread take-up to the right and left with a finger at the position near the upper dead point of the thread take-up, and check that there is a play.
5) Turn the handwheel again by hand at the position near the center of the play, and securely tighten setscrew (1) in the crank shaft in this state.

[Needle bar]

* Forced lubrication and reflux function, different from the existing sewing machines, is not provided in the face plate section.
  For SS and SH types, minimized amount of oil is supplied to the needle bar with oil wick since the maximum number of revolution is high.
  Pay attention to the following matters in order to maintain the reliability of the needle bar.

(SS, SH)



1) Check that oil wick located at the top of the oil wick support securely comes in contact with the needle bar at the position of approximately 5 mm below the needle bar upper metal and when it does not, adjust the position of the oil wick support.
2) When centering of needle bar upper and lower metals is not properly performed, seizure will result.
   Touch with fingers the periphery of the needle bar lower metal when running the sewing machine continuously for approximately 30 seconds at the speed of around 4,000 rpm, and when you feel abnormal exothermic, there is a possibility of defective centering.
   Correct the metal or replace it with a new one.

(DS, DF)

Different from SS and SH, the machine is not provided with the function of lubrication with oil wick.
Special grease is enclosed inside of the needle bar lower metal, and maintenance is not required until the sewing machine runs at the speed of 4,000 rpm.
When it is compelled to replace the needle bar, however, enclose the seaparately-available exclusive grease inside of the needle bar lower metal.
Temperature will slightly rise at the beginning of enclosing grease, and return to the normal condition when making the machine run idle for 2 to 3 minutes at the initial stage and dirty grease of initial abration is discharged. In this case, perform break-in operation for a few minutes, and use the machine from the state that grease is not discharged.

* For both SS and DS, apply a rather large quantity of the exclusive grease (23640204) to the groove of the needle bar roller.

3-29 Replacing the motor

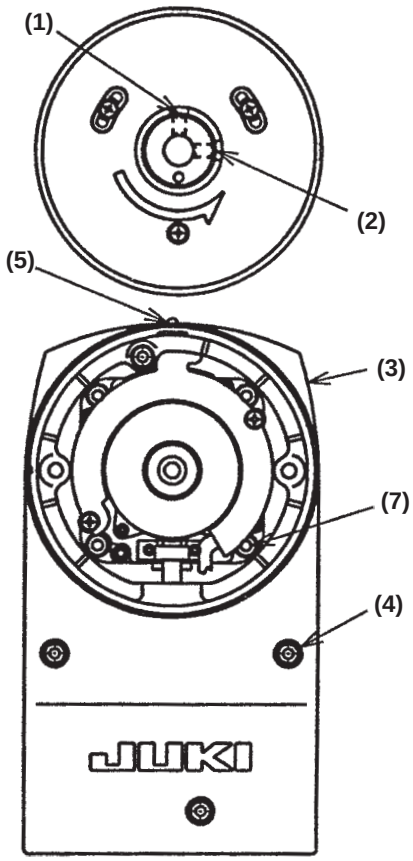
1) Lossen the setscrews in the handwheel in the order of No. 2 (2) and No. 1 (1).
2) Remove four setscrews (4) in pulley cover (3) with 4 mm hexagonal wrench key.
3) Remove the pulley cover while taking care of LED (5) of the synchronizer.
4) Remove the side plate, and loosen coupling setscrews (8) fixed to the motor shaft in the order of No. 2 and No. 1.
5) Remove four motor setscrews (7) with 4 mm hexagonal wrench key.

6-1) Gently draw out the motor, loosen coupling setscrew (6), and remove the coupling from the motor.

6-2) Insert the coupling with small hole diameter into the new motor, adjust No. 1 of setscrews (6) to the flat section and tighten it. At this time, set the clearlance betweein the motor and the coupling to 0.5 mm.

6-3) Insert the motor into the machine arm, adjust No. 1 of coupling setscrews (8) to the flat section of the main shaft, and tighten it.

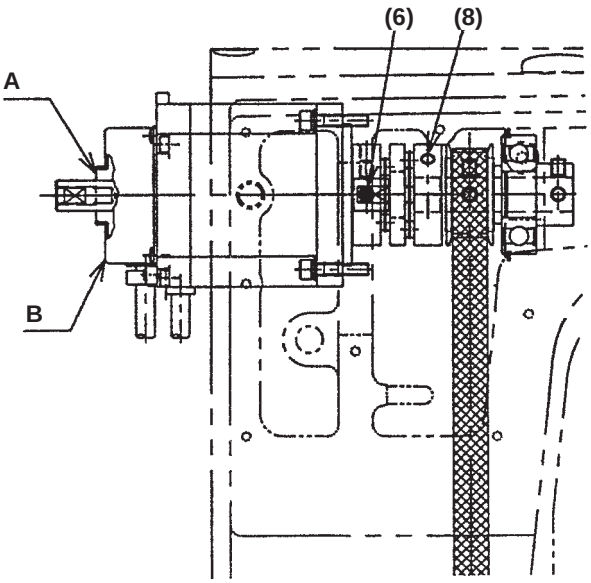
7) After installing the pulley cover, tighten the setscrews in the order of No. 1 and No. 2 at the position where a clearance of approximately 1 mm is provided between the handwheel and the pulley cover.



(Caution) There is the release section A in the shaft section of encoder case B located in the rear of the motor.

If the handwheel is held removed, dust enters from this section and damages the sensor section. As a result, malfunction of the motor may result.

When replacing the motor, take care not to allow dust to enter from the handwheel section, and quickly install the handwheel. When storing the motor itself for a long period of time, install the encoder cover (installed at the time of delivery of motor).



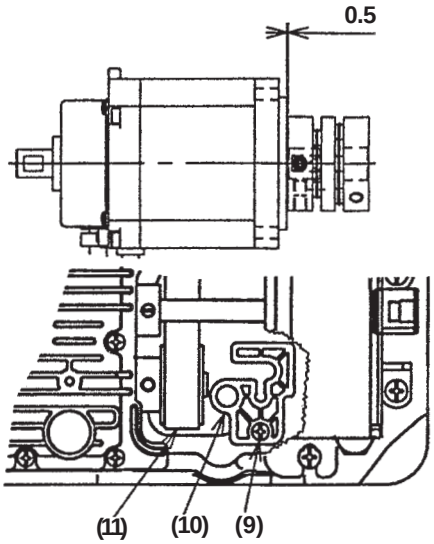
3-30 Replacing the timing belt

* Timing belt (23607302) is not necessary to replace unless a special trouble occtrs since the best quality product is used.

1) Perform removing/installing of the motor referring to [3-29 Replacing the motor].
When there is no trouble with the motor, however, loosen coupling setscrew (6) without loosening setscrew (8) , and remove the motor with couping attached.

* When the motor is separated from the coupling, set the clearance between the end face of motor and the end face of coupling to 0.5 mm when assembling them again.

2) Tilt the machine head, remove the setscrew and washer (9) located on the rear side of the machine bed, and take out connectingrod guide (10).
3) Pressing timing belt (11) in the right direction, turn the timing belt to this side with fingers to remove it.
4) Replace the timing belt and assemble it in the reverse order of the aforementioned procedure.

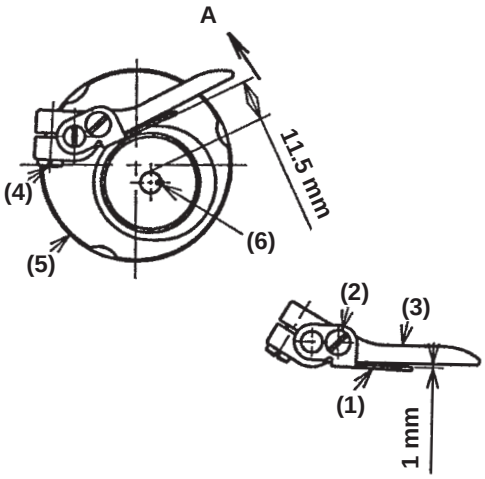


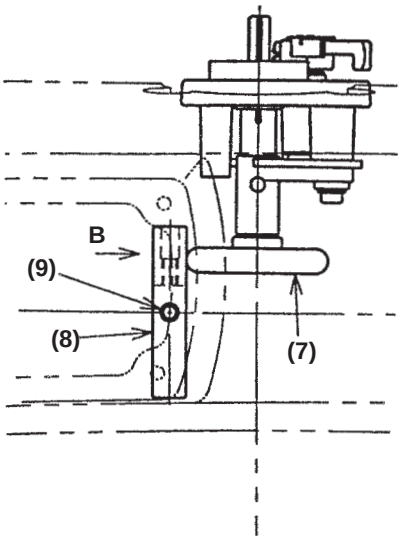
3-31 Points of adjusting and assembling of the bobbin winder

* Refer to the Instruction Manual for adjusting bobbin thread amount or uneven winding.
Perform the following adjustment when bobbin winder shaft (6) does not rotate.

1) Remove bobbin winder (asm.), and check whether the rubber of bobbin winder friction wheel (7) has been excessively worn out. If it has been excessively worn out, replace bobbin winder friction wheel (23636301).
2) If the rubber has not been worn out so much, adjust the position of the bobbin winder driving wheel in the following procedure.
3) Fix the position of bobbin lever (3) of the bobbin winder with setscrew (2) so that a clearance of approximately 1 mm is provided between bobbin winder adjust plate (2) and lever (3). Lightly press the bobbin lever in the direction of A at the position where the bobbin lever is released, and remove the play. Then, tighten lever setscrew (4) so that a clearance of approximately 11.5 mm is provided between bobbin winder shaft (6) and adjusting plate (4).
4) Install the bobbin winder onto the machine arm.
   At this time, take care not to tighten the setscrew more strongly than necessary since the bobbin fitting base is made of plastic.
5) Open the side plate.
6) Loosen setscrew (8) in bobbin winder driving wheel (9).
7) Pressing bobbin winder driving wheel (8) to bobbin winder friction wheel (7) in the state that bobbin lever (3) is pressed to bobbin winder shaft (6), fix it with setscrew (9).
8) Make bobbin lever (3) in the released state, and check that bobbin winder shaft (6) does not rotate when turning the handwheel. If it rotates, adjust again the pressing pressure of bobbin winder driving wheel (8), and fix setscrew (9) in bobbin winder driving wheel.

* After the adjustment, actually wind bobbin thread round a bobbin, and adjust the amount of bobbin thread with bobbin winder adjust plate (1).





3-32 Points of adjusting and assembling of the lubrication mechanism (SS, SH)

For the SS and SH machine heads, forced lubrication to the hook is performed by the plunger pump arranged in the hook shaft front metal. In addition, minute-quantity oil is lubricated to the needle bar through oil wick.

☆ Fill oil tank with JUKI New Defrix Oil No. 1 from the oil hole up to the marker line of the oil tank using oiler supplied with the machine in the state that the machine head is tilted when the top end of the gauge of oil amount indication window comes down to the lower marker line. Even when the gauge comes down to the lower marker line, oil still remains in the oil tank for safety. However, fill oil tank with oil as soon as possible.

☆ Approximate amount of 150 cc of oil can be filled when AK device is not provided. When the AK device is provided, the amount of oil is slightly less since the falling angle of the machine head is small.

☆ For the H type, especially pay attention to the decrease of oil since the amount of oil in the hook is large.

☆ When using the sewing machine with the head tilted to this side, the state in the oil amount indication window does not act as reference. So, be careful. (Fill oil periodically.)

☆ To adjust the amount of oil in the hook, run the sewing machine at least for approximately 30 seconds continuously and check in the state that the oil amount is stabilized.

☆ If the oil amount adjustment screw is excessively loosened, the O ring is removed and oil spurts out. Do not loosen it more than 8 turns.

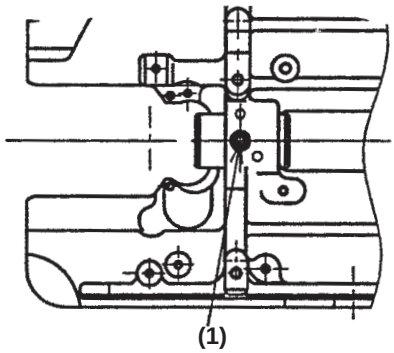
☆ Do not drain oil in the oil tank even when using the RP hook at the sewing speed of 4,000 rpm or less.
Oil is not lubricated to the hook shaft front metal and the needle bar. As a result, seizure may occur.
Set oil amount to “0” with the oil amount adjustment screw when using the RP hook.

☆ When removing the machine head from the table and placing it on the stand, if the machine head is laid or laid in the opposite side, oil leaks from air vent in the oil tank. In this case, remove drain screw in the oil tank to drain the oil, then start the work.
In addition, when attaching the drain screw, tighten it with loose tightening torque of approximate 1N•m using a small screwdriver.

☆ Oil pipe once removed is likely to slip out resulting in oil leakage. When the pipe is removed, be sure to replace it with a new one.

☆ When assembling the respective pipes, take care not allow them to come in contact with moving components.

☆ When removing the hook shaft, be sure to remove the plunger screw (1), and draw out the plunger from the groove of the hook shaft.

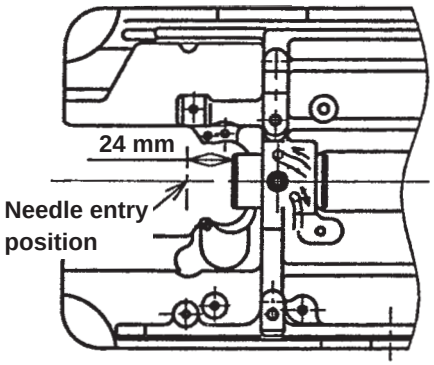


[Phenomena and corrective measures of defective lubrication]

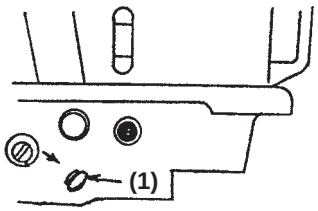
1) Oil does not come to the oil wick of the needle bar.

Phenomenon	Cause and corrective measure
Oil wick of the needle bar is dried up.	• Check whether the routing of oil wick from the float case is broken. • Apply oil to pump oil into the oil wick when the machine has not been used for a long period of time.

2) Oil amount in the hook does not appear or is small.

Phenomenon	Cause and corrective measure
Plunger pump does not work. (Oil in the pipe coming from machine bed section does not move.)  	• Plunger is not fit in the plunger groove of the hook shaft. Remove plunger screw, spring and plunger, and check that the plunger groove is placed in the center of the hole of machine bed. ↓ At the time of NG (no good) Longitudinal position of the hook shaft is slipped or the position of the hook shaft front metal is slipped. End face of the hook shaft front metal is 24 mm from the needle entry position. When this distance is proper, correct the position of the hook shaft. (Adjust the plunger groove to the center of the hole of machine bed.) (It is necessary to open the gear box and correct the positions of the gear, hook shaft bearing support and thread trimmer cam.) • Abration or burr at the top end of the plunger ↓ At the time of NG (no good) Replace the plunger.
Oil amount is small although oil in the pipe moves.	• Defective shape at the top end of oil amount adjustment screw → Replace. • Hook shaft front stopper plug felt is clogged. → Replace. • Oil hole in the lubricating hook is clogged. → Replace. • Re-check the adjustment of oil amount (Item 3-36)

3) Noise of the gear is large.

Phenomena	Cause and corrective measure
Oil is not contained or is short in the gear box.  	• Oil inside the gear box has leaked since air vent cap was not provided at the time of transportation. Remove cap (1) in the front face of machine bed, insert a rather hard string into the gear box to check that oil is enough contained inside of it. → when oil is short, open the gear box cover and suck out with vinyl pipe all oil contained inside the gear box. Then, fill the gear box with JUKI New Defrix Oil No. 2 of 140 cc. When attaching stopper plug (1), apply sealant to it.

3-33 Applying the exclusive grease

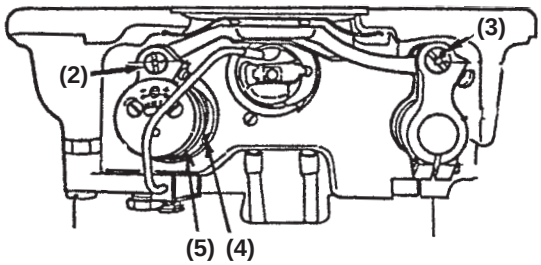
* For the parts other than the lubrication components, the exclusive grease (23640204) is applied to the parts where the lubrication is necessary. Never use other grease.
Additional grease is not necessary if the machine is normally used.
When the machine is used under the severe conditions, it is effective to fill grease periodically (once in every one or two years).

[Notes when applying grease]

1) Needle bar metal section of DS and DF machine heads
There is a grease groove inside the needle bar lower metal. Draw out the needle bar and fill the exclusive grease to the groove section. Apply a small quantity of grease to the lower end section of the upper metal. When filling the grease newly, make the sewing machine run idle for every 10 seconds, discharge extra grease that occurs at this time, and wipe it out. Perform this operation several times, and use the machine after the grease stops coming out.

2) Feed driving base pin (2) and feed rocker base pin (3) of DS and DF machine heads
There are grease grooves in feed driving base pin (2), and feed rocker base pin (3).
When using the machine under especially severe conditions, draw out the pins, and fill periodically the exclusive grease into the grease grooves.

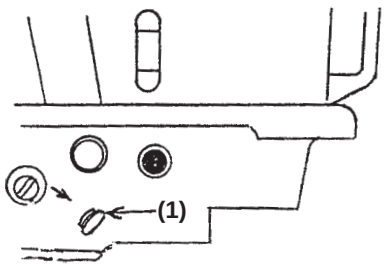
3) Feed driving base arm and feed driving cam
Exclusive grease is filled to the bearing section inside feed driving base arm (5) and feed driving cam (4).
For DS machine head, when the machine is used under especially severe conditions, it is effective to periodically add a few amount of grease to this section.



3-34 Removing/attaching the gear box cover

Do not open the gear box unless a trouble occurs.
When it is compelled to open it, take care of the following matters.
* Prepare a new gear box cover packing (23628100) before starting the work.

1) Tilt the machine head and prepare an oil receiver under the gear box.
2) Loosen the tension release wire presser and the pipe presser screw, and remove the wire and the pipe from the cover.
3) Remove the gear box setscrew, and drain oil contained inside the box.
4) When the maintenance of the inside is completed, close the gear box cover.
At this time, replace the packing with a new one. In addition, wipe clean the oil on the cover and the bed connecting plane.
Turn the setscrews one more to tighten further after tightening all setscrews to securely tighten them.
5) Remove plug (1) in the front face of machine bed, and fill JUKI Defrix Oil No. 2 of 140 cc.
When attaching plug (1) , apply sealant to it.



3-35 Points of adjuting the sewing

Adjusting the needle and the hook

Align hook blade point (1) with the center of needle (2) when the needle bar goes up from its lowest poisition and the lower end of the needle bar metal is aligned with marker line B on the needle bar.

At this time, the standard clearance between the needle and the hook blade point is approximately 0.04 to 0.1 mm.

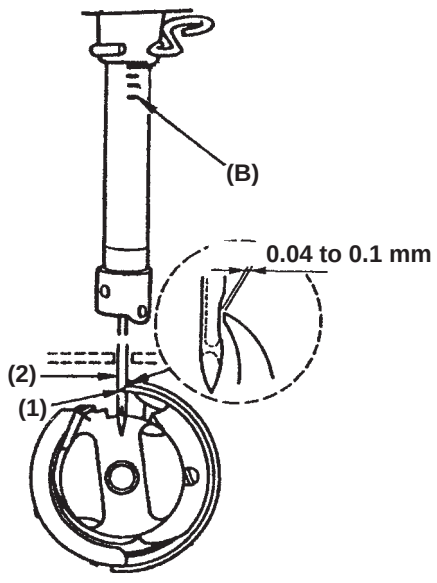
* If the clearance between the hook blade point and the needle is smaller than the specified value, the hook blade point is damaged resulting in thread breakage.
* When the needle No. is changed, be sure to check the clearance between the hook blade point and the needle.
* If the clearance is especially smaller than the specified value, the lower part of the hook blade point comes near to the needle when the hook slightly advances. Check whether there is a contact in this section.
* Adjust the needle with its indented part facing exactly to the horizontal direction. For the synthetic thread, the direction of attaching the needle is better for thread trimming when the indented part is faced slightly to the rear.

  When the indented part faces to this side is likely to affect the sewing adversely.

  Reference for adjustment value of the thread tension
* Main materials and threads are described. Based on the reference value, adjust the thread tension in accordance with materials and threads.

Cloth	Thread	Needle	Pitch (mm)	Needle thread tension (N) [Reference value]	Bobbin thread tension (N) (Top surface of throat plate) (Aim)	Thread take-up spring stroke (mm) (Aim)	Thread take-up spring tension (N) (Aim)
T/C broad	Tetron #80	DBX1#11	2	0.2 to 0.4	0.15 to 0.25	12 to 15	0.06 to 0.1
Woolen gabardine	Tetron #50	DBX1#11	2.5	0.3 to 0.7	0.15 to 0.25	10 to 16	0.1 to 0.15
Coat cloth	Tetron #30	DBX1#14	3	0.6 to 1.4	0.25 to 0.35	10 to 16	0.15 to 0.2
Cotton gabardine	Spun #60	DBX1#14	2.5	0.4 to 1.3	0.2 to 0.3	10 to 16	0.1 to 0.15
Cotton gabardine	Spun #80	DBX1#11	2	0.4 to 1.0	0.15 to 0.25	10 to 16	0.1 to 0.15
Comber broad	Spun #80	DBX1#11	2	0.4 to 1.0	0.15 to 0.25	10 to 16	0.1 to 0.15
T/C broad	Spun #80	DBX1#11	2	0.4 to 0.9	0.15 to 0.25	10 to 16	0.1 to 0.15
T/C broad	Tetron #60	DBX1#11	2	0.3 to 0.6	0.15 to 0.25	12 to 15	0.06 to 0.4

* Bobbin thread tension is the tension when pulling thread to this side in the direction of 45˚ from the top surface of the throat plate.
* Thread take-up spring stroke is the amount of thread take-up from the start to the end of spring movement.
* Thread take-up spring tension is the tension when the spring moves 0 to 1 mm at the start of movement.

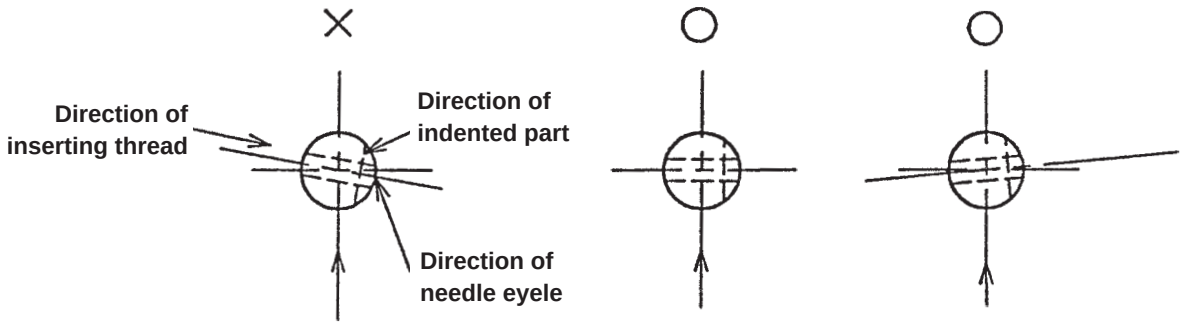


Points of adjusting sewing

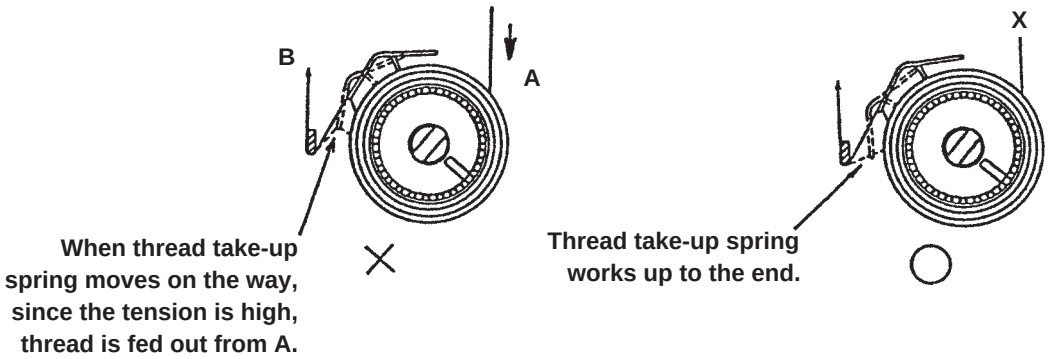
When using the plastic race hook for DS and DF, if the balance of adjustment of the thread take-up spring and the tension spring is not proper, thread breakage when sewing at high speed, thread breakage when performing reverse feed stitching, hangnail of thread, or thread breakage when performing concealed seam under stitching is likely to occur.

(Cautions when performing adjustment)

* When filament thread is used, if the indented part of the needle is tilted to this side, the loop of thread becomes unstable. As a result, thread breakage or hangnail of thread is likely to occur. For the thread with which such phenomenon is likely to occur, it is effective to slightly tilt the indented part to the operator's side.



* Comparing with the existing lubricating hook, the plastic race hook makes better loops, and is likely to be affected by the adjustment of the thread take-up spring.
  When defective stitches are apt to occur, adjust the thread take-up spring so that the stroke is longer and the tension is lower than those of the sewing machine with the lubricating hook (level to such an extent that the spring works up to the end when pulling out thread).
  It is effective to increase the stroke of the thread take-up spring to stabilize the loop, however, the spring does not show its effect enough if the adjustment is performed as shown in the illustrations below.
  Adjust the tension of the thread take-up spring to the lower than the specified value so that the thread take-up spring works up to the last when the thread is pulled out in the direction of the arrow.



* To make the size of loop small, hook adjusting timing of DF and DS types is 1.8 mm. It is less by 0.2 mm than the standard value of 2 mm. (Part No. of needle bar : 22886907)
* When even the aforementioned adjustments cannot solve sewing conditions, change the needle bar thread guide to B1418227T00. It gives resistance to needle thread, stabilizes loop and prevents thread from thread breakage.

3-36 Adjusting the amount of oil in the hook

Adjusting procedure and points of the amount of oil in the hook

★ Before adjustment ...

- Perform carefully to check the amount of oil since the hook is rotating at high speed.
- Perform adjusting the amount of oil at the sewing speed of 400 rpm.
- When adjusting and checking the amount of oil, remove bobbin, bobbin case, needle and needle thread from thread take-up.
- Remove slide plate, and check the amount of oil using oil splash confirmation paper.
- If the machine has not been sufficiently warmed up for operation, make the machine run idle for approximately three minutes. (Moderate intermittent operation)

● When the amount of oil is small, perform the adjustment from step 1) described below.

● When the amount of oil is much or you desire to slightly adjust the amount, perform the adjustment from step 3) described below.

● When adjusting the amount of oil to a small quantity (dotted line), perform the adjustment from step 1) described below.

☆ Adjusting steps of the amount of oil in the hook

1) Tighten the oil amount adjustment screw until it will go no futrther to maximize the amount of oil, and operate the machine for approximately 30 seconds in order to pull out a big quantity of oil, circulate oil to all the lubricating routing including the hook, and stablize the oil path.
2) Loosen the oil amount adjustment screw by two turns and check the amount of oil. In this case, check the amount of oil for five seconds after making the sewing machine run idle for approximately 30 seconds. (Continuous operation for 35 seconds) Place the oil splash confirmation paper under the hook while the sewing machine is operated.) (Refer to Fig. 2.)
3) Determine the turning amount of the oil amount adjustment screw from the amount of oil of this time referring to (Fig. 1), adjust the amount of oil again, and check the amount of oil for five seconds after making the sewing machine run idle for 30 seconds.
4) Adjust the position of the screw in the order of steps 2) to 3) until the appropriate amount of oil is obtained.

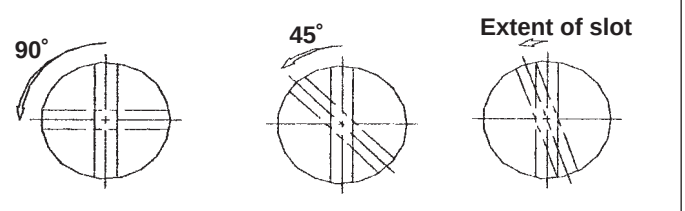
★ Cautions and points

(Note 1) When replacing the hook or for the machine head after an extended period of disuse (including the new machine head), it takes approximately 10 to 20 seconds (at the sewing speed of 4,000 rpm) until oil comes out from the hook. Take care of seizure and adjust the number of revolution at the start.

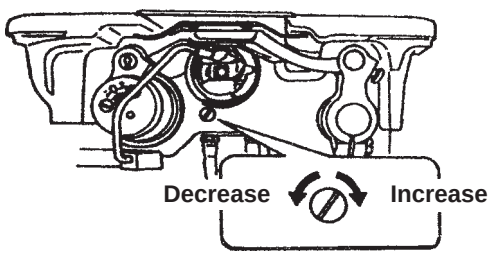
(Point 1) Perform the adjustment in the direction of squeeze (direction of loosening the screw), and more stable adjustment can be performed.

(Point 2) Standard for adjustment is generally as follows :

- Standard position of the oil adjustment screw is in the range of loosening the screw by 2 to 3 turns from the position where the screw is tightened until it will go no further.
- If the amount of oil is too much : Loosen the screw by 90˚ (1/4 turn).
- If the amount of oil is much : Loosen the screw by 45˚ (1/8 turn).
- When the adjustment is nearly completed, adjust the screw to such an extent of the length of slot of the screw. When adjusting finely, take care not to excessively turn the screw since the amount of oil changes even when slightly turning the screw.



(Fig. 1) Standard for adjusting screw



(Point 3) Perform measuring the amount of oil at least three times, and check that the amount of oil is stabilized.

(Point 4) When adjusting the amount of oil, if the amount of oil is much before adjustment, operate the sewing machine continuously for approximately one minute to discharge enough the oil adhered to the hook and the remaining oil in oil path. Especially, be carefull when using the machine with a small quantity of oil (dotted line).

(Point 5) When using the machine with a small quantity of oil (dotted line), perform checking the amount of oil periodically since the hook is affected by dust of fabric or the like.

★ Amount of oil in the hook

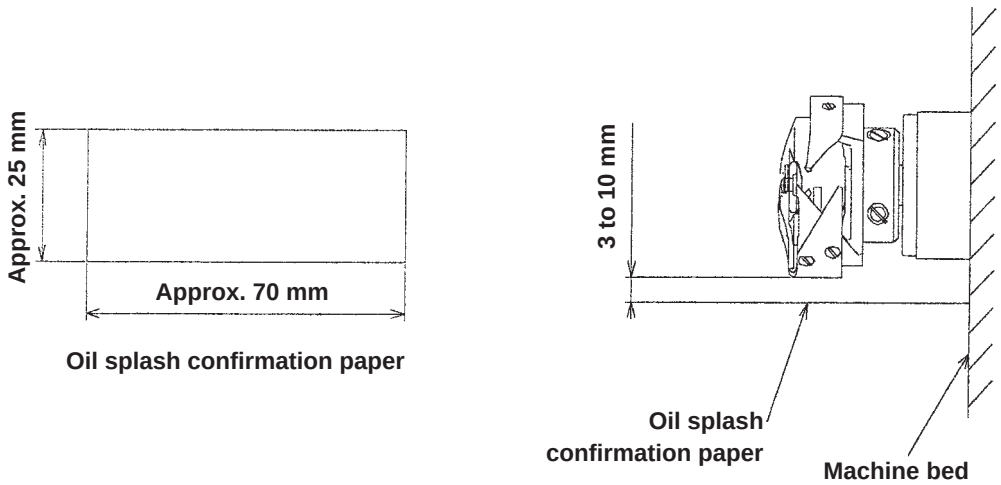
• Standard for the amount of oil in the hook and cautions are as follow :

○ Dotted line of amount of oil • • • When the oil stain is especially disliked

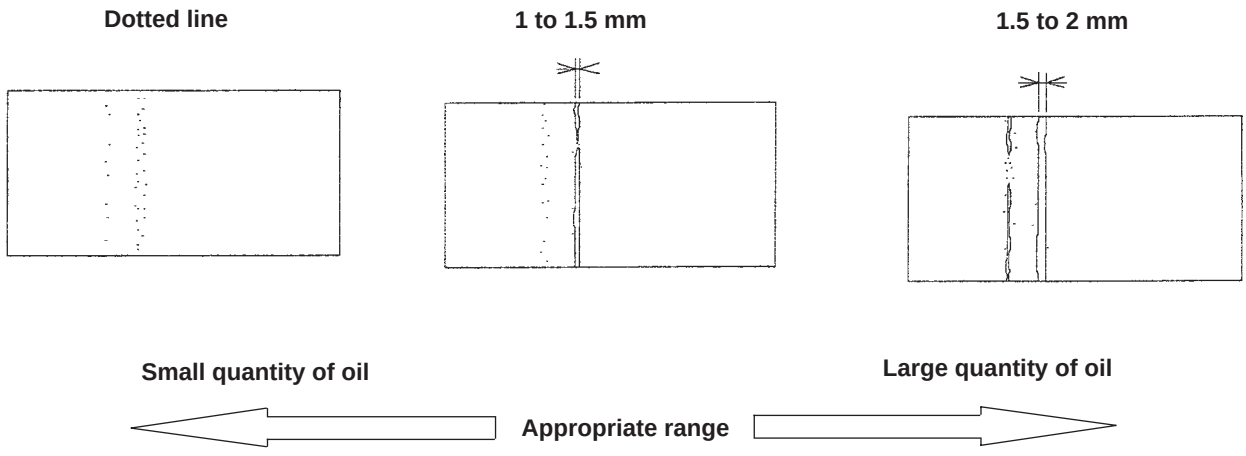
(Caution) Hook is apt to be affected by dust or the like as described in the previous page. It is necessary to check the state of amount of oil periodically.
Take care of seizure of the hook under the severe conditions (continuous operation at high speed or the like). In addition, take care of thread breakage.

○ Amount of oil is much (2 mm to up) : In case of severe conditions such as continuous operation at high speed or the like

(Caution) If the amount of oil is too much, the sewing product may be stained with oil and oil in oil tank reduces earlier than expected.



(Fig. 2) Confirming method of amount of oil in the hook



(Fig. 3) Amount of oil in the hook

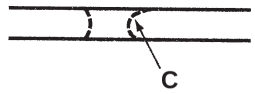
4. TROUBLES AND CORRECTIVE MEASURES (MECHANICAL PARTS)

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
1. Stitch skipping of 1 to 2 stitches occurs at the sewing start.	Needle thread remaining at the top of needle after thread trimming is too short.	Needle thread path is defective, and needle thread tension when trimming thread is too high.	Check needle thread routing, thread entangled on thread guide rod or the direction, and position of thread stand or thread entangled on it.
		Tension of thread tension disk No. 1 is too high.	Turn thread tension nut of thread tension disk No. 1 to the left to decrease tension.
		Rising amount of thread tension disk No. 2 when trimming thread is incomplete.	Check that rising amount of thread tension disk No. 2 is 0.5 to 1 mm when thread take-up picker is pressed until the top end comes in contact with bobbin. Adjust the rising amount with the position of thread tension release wire (3-8) in the rear side on machine bed. Check that the disk is loosened paralell. If not, turn thread tension spring by 180° or correct the tilt of the spring.
		Thread trimmer cam timing is too early.	Check and adjust thread trimmer cam timing referring to (3-5). Change the red dot to green dot adjustment.
		Position of thread take-up picker is improper, and needle thread slips off when trimmming thread.	Press plunger with finger so that thread trimmer solenoid is in sucked state, and when thread take-up picker is pressed until the top end comes in contact with bobbin and there is a clearance at the top end of thread take-up picker, readjust the thread take-up picker referring to (3-12).
		Counter knife is excessively near to needle. Blade point is too sharp.	Remove throat plate, and check position of counter knife or scratch on moving knife to adjust them. (3-7)
		There are scratches on knife thread guide, moving knife or hook.	Check scratches on hook (especially hook blade point) and hole of knife thread guide. If there are scratches on them, polish enough with buff. Replace the part if scratch is large.
		Lifting amount of auto lifter (AK118) is too large.	Lift of the auto-lifter is too high, presser bar thread guide lifts quickly and needle thread is pulled with the thread take-up spring. As a result, needle thread becomes short. Readjust the lift of AK device to approximately 9 mm. When using AK device, make the remaining amount of needle thread slightly longer.

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures

From the previous page

Cause (1)	Cause (2)	Checking orders and corrective measures
Needle, throat plate, or presser foot used is not proper. Or, presser foot pressure is too low.	Dimension A of presser foot is too large. Recess on the rear face of B is too large and needle thread sewn cannot be pressed when stitch length is small. 	Check sections A and B of the presser foot and section C of throat plate. * When using synthetic thread for tricot cloth : A < 0.8 mm R of sections B and C < 0.3 mm * When using synthetic thread : A < 1.2 mm and parts without recess (or the like) at sections B and C are good. * When using cotton thread, parts with smaller recesses at sections A, B, and C are good if stitch tightness is good.
	Recess on section C of throat plate is too large. 	
Needle hole on the sewing material is apt to be largely marked, or there is a clearance on the material.	Needle hole on the sewing material cannot recover, and thread is not retained and is apt to slip off. Similarly, if there is a clearance on the material, thread is apt to slip off.	Use thin needle, or T-type needle bar thread guide (B141822T00).
	Needle is too thick.	Thin needle is good if stitch tightness of needle thread is good.
	Needle hole in the throat plate is too large.	Replace it with one with smaller needle hole.
	Presser foot pressure is too low.	Increase the tension with the presser spring regulator to such an extent that feed force is not deteriorated (extent that stitchesZ are not clogged).
Hook blade point fails to catch needle thread. (Stitch skipping)	Needle-to-hook timing is improper.	Check the needle bar height and adjust it to the marker line on needle bar. For the cloth such as knit, knitted fabric, etc, slightly lower the needle bar to delay the timing.
	Tension or stroke of the thread take-up spring is too high or too large.	Decrease tension and stroke.
	Abration of hook blade tip	Correct the hook blade point, or replace the hook.
	Attaching of needle is improper.	Adjust the tilt of needle. When needle is bent, replace it.

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
	Length of bobbin thread at the sewing start is too short.	Top end of bobbin thread is pulled in bobbin case due to running idle of bobbin.	Increase tension of bobbin case holder.
			Increase bobbin thread pressure.
		Pressure of bobbin case holder is too high.	Decrease pressure. However, take care of idle running of bobbin.
		Bobbin thread is cut short since there are scratches on the hook.	Correct scratch on the hook, or replace the hook.
	Knotting of needle and bobbin threads at the sewing start is hard to be performed.	Speed of the sewing machine at the sewing start is high and bobbin thread is hard to be interlaced.	Perform one to two stitches of soft start at the sewing start.
2. Top end of needle thread appears on the fabric at the sewing start.	Needle thread remaining at the top end of needle after thread trimmingis too long.	Tension of thread tension No. 1 is too low.	Increase tension of thread tension No.1.
		Thread trimming timing is too late.	Checkc and adjust the cam timing referring to the item (3-5).
		Counter knife excessively recedes.	Adjust the counter knife referring to the item (3-7).
3. The wrong side of fabric at the sewing start is dirty. (Needle thread remains long under the fabric.)	Needle thread remaining at the top end of needle after thread trimming is too long.	Refer to the previous item [Needle thread remaining at the top end of needle after thread trimming is too long.]	Refer to the previous item [Needle thread remaining at the top end of needle after thread trimming is too long.]
	Needle thread remaining at the top end of needle after thread trimming cannot be short since throat plate, needle and presser foot are improper.	Refer to the previous item [Needle, throat plate and presser foot used are improper. Presser foot pressure is too low.]	Refer to the previous item [Needle, throat plate and presser foot used are improper. Presser foot pressure is too low.]

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
4. Thread slips off the needle eyelet at the sewing start.	Length of needle thread remaining at the top end of needle after thread trimming varies.	Tension of thread tension No. 1 is too high since thread trimming timing is too late, and thread is trimmed before moving knife engages with counter knife. (Trimming on the way)	Turn OFF the power switch, press by hand thread take-up picker to bobbin csase at the position where needle is lowered, slowly turn handwheel by hand to this side, perform thread trimming, and stop the thread take-up at the upper dead point. At this time, if the length of needle thread remaining at the top end of needle is shorter by 10 mm or more than that when performing thread trimming by pedal operation, the thread is trimmed on the way. In this case, advance thread trimmer cam timing, or decrease the tension of thread tension No. 1.
	Same cause and corrective measure as “1. Stitch skipping of 1 to 2 stitches occurs at the sewing start.”	Depth of thread take-up picker to enter bobbin case is shallow, and needle thread slips off thread take-up picker from time to time.	Adjust the thread take-up picker referring to the item (3-12).
		Sharpening the blade of counter knife is improper. (Too sharp)	Resharpen the counter knife, or replace the counter knife referring to the item (3-9).
		There are scratches on knife thread guide, moving knife or hook.	Correct the scratches with buff, or replace the parts.
		Needle is too thick.	Replace the needle with a thin one.
	Needle thread slips off needle eyelet immediately after thread trimming.	Timing is too early, or hook timing is too late. Moving knife trims the needle thread since moving knife clamps three threads before separating threads.	If needle thread slips off immediately after thread trimming, it is because needle thread remaining on the needle is trimmed due to defective thread separation of the moving knife. In this case, thread waste of approximately 40 mm falls under throat plate or under cover. At this time, delay the thread trimmer cam timing.
	Knotting of needle and bobbin threads at the sewing start is hard to be performed.	Speed of the sewing machine at the sewing start is high, and needle and bobbin threads are hard to be interlaced with each other.	Perform one to two stitches of soft start at the sewing start.
5. Defective stitching tightness at the sewing start	Needle thread tension at the sewing start is too low.	Installation of thread take-up picker is improper.	Adjust the thread take-up picker referring to the item (3-12).
		Bobbin runs idle and bobbin thread tension at the sewing start is low.	Adjust the thread take-up picker referring to the item (3-12). Adjust the tension of the idle-prevention spring of bobbin case.
		Bobbin thread tension or needle thread tension is too low.	Increase needle thread tension or bobbin thread tension.
		Presser foot or throat plate is improper.	Refer to the previous item [Needle, throat plate and presser foot used are improper. Presser foot pressure is too low.]

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
6. Needle thread is not trimmed. (Bobbin thread is trimmed.)	Stitch skipping at the last stitch	Attaching of needle is improper.	Properly attach the needle. Check whether the needle is bent.
		Stroke of thread take-up spring is too large.	Decrease the stroke of thread take-up spring.
		Hook adjusting is improper.	Check stitch skipping by operating the machine at low speed. Readjust the hook. (Advance the hook timing.)
	Sharpness of a part of blade of knife is defective.	Blade sections of moving knife and counter knife do not engage closely with each other when trimming thread. (Installing angle, position, and tilt of blade top face of the counter knife are not adjusted to the blade section of the moving knife.)	Remove throat plate, move the knife by hand, and cut approximately three pieces of cotton thread #50. The knife is good if the three threads can be cut equally. If not, sharpen the blade of counter knife, correct tilting angle at the top end, or readjust the installing position of counter knife.
7. Bobbin thread is not trimmed. (Needle thread is trimmed.)	Amount of recession of moving knife is short.	Adjustment of amount of recession of the moving knife is improper.(Lateral position of knife actuating shaft and lateral position of thread trimmer cam are improper.)	Check the amount of recession of moving knife, and adjust the lateral position of thread trimmer cam so that the amount of recession of moving knife is 2.5 to 3 mm.
	Position of bobbin thread when trimming thread is not stable.	Hook other than specified is used.	Check whether there is the bobbin thread guide groove on the hook. If not, replace the hook with one for thread trimmer.
8. Wiper comes in contact with needle.	Height of installation of wiper is improper.		Readjust the installation of wiper.
9. Moving knife breaks.	Defective timing of the respective sections	Thread trimming timing is improper.	Adjust the timing referring to the item (3-5).
		Upper stop position is improper.	Adjust the position referring to the item (3-1).
	Needle thread is tensed when trimming thread.	Thread tension disk does not rise when trimming thread.	Adjust the timing of disk rising with the thread tension setscrew.
			Loosen thread tension release wire presser (lower) and readjust the position of wire.
		Hangnail of thread	Check whether the top end of needle is blunt. Replace the needle, or use the ball-point needle.
			Check hook timing or the clearance.
			Check scratches on hook blade point or other thread paths, and correct them with buff or the like.
			Use optimum gauges or needle for the thread thickness.

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures

From the previous page

Thread trimmer control plate fails to work.	Installing position is improper.	Adjust the position referring to the item (3-14).
Timing belt slips.	Tension of timing belt is low.	Replace the timing belt.
	Knife pressure is too high.	Adjust the engagement of counter knife and moving knife. Consider to correct the counter knife.
Moving knife fixed position is improper.	Thread is not trimmed.	Adjust the position referring to the item (3-6). (Amount of recession of the moving knife)
		Adjust the position referring to the item (3-7). (Engagement of the counter knife)
Thread trimmer works at the start of next sewing after thread trimming.	Cam roller is not removed from the groove in thread trimmer cam in the resting section.	Properly adjust the relation of the positions of cam groove and roller.

5. TROUBLES IN SEWING AND CORRECTIVE MEASURES

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
Puckering	Needle is too thick.		Use a thin needle if possible. KN or SPP needle is effective.
	Thread tension (needle thread or bobbin thread) is too high.	Thread path is not smooth.	Finish the thread path.
		Hook timing is too late.	Advance the hook timing to such an extent that stitch skipping does not occur, and improve thread slipping.
		Feed timing is too early.	Delay feed in terms of needle so that thread is pulled by feed force.
		Stroke of the thread take-up is too large.	Move arm thread guide to the right, and decrease thread supply amount by the thread take-up.
		Stroke of the thread take-up is too small.	Increase the stroke.
		Material through which thread is hard to be slided.	Use silicon.
	Presser foot is defective.	Presser foot pressure is too high.	Minimize the pressure. For some materials, it is effective to use the micro-lifter screw and sew in the state that the presser foot is slightly raised..
		Finish of presser foot sole is bad.	Polish with buff or the like to improve the slide.
		Material is hard to be slided.	Use the teflon presser foot or specially processed (teflon, etc.) presser foot.
	Fabric is floppy.	Needle hole of throat plate is too large.	Replace it with gauge with small needle hole.
		Recess for thread on presser foot sole is too large.	Use the presser foot with small recess on the sole or without recess on it.
		Parallelism of presser foot is defective.	Replace the presser foot. Or, loosen the presser bar guide bracket screw and correct the needle entry position and bend of presser foot when needle entry position is improper.
		Top end of needle is blunt.	Replace the needle.

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
	Defective feed	Height of feed dog is too high and jumping of the feed dog occurs at high speed.	Lower the height of feed dog (standard 0.8 mm), or increase the pressure of the presser foot to protect it from jumping.
		Abration of top ends of teeth of feed dog	Sharpen the top ends of teeth with diamond file or the like, or replace it with a new one.
		Feed dog pitch is too coarse.	Replace the feed dog with one with fine pitch.
		Tilt of feed dog is defective.	Change the position of feed driving base pin, and tilt the feed dog with its front up to make the puller effect.
		Parallelism of feed dog is defective.	Replace the feed dog.
		Number of revolution is too high.	Decrease the number of revolution.
		Others	Use a gauge having a small clearance between groove of throat plate and moving direction of feed dog in the range that the feed dog does not come in contact with the throat plate when the feed dog is moving if the feed dog pitch is small.
Irregular stitches	Defective feed	Height of feed dog is too high.	Lower the height of feed dog (standard 0.8 mm), or increase the pressure of the presser foot to protect it from jumping.
		Locus of feed dog is defective.	Adjust the feed driving cam timing referring to [Adjusting feed timing and dimensions of the feed base]. Adjust the feed driving cam to marker line (-).
		Abration of top ends of teeth of feed dog	Sharpen the top ends.
		Feed dog pitch is to coarse.	Use the feed dog with fine pitch.
		Tilt of feed dog is defective.	Tilt the feed dog with its front down.

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
	Presser foot is defective.	Presser foot pressure is too high.	Minimize the pressure. For some materials, it is effective to use the micro-lifter screw and sew in the state that the presser foot is slightly raised.
		Finish of presser foot sole is bad.	Polish with buff or the like to improve the slide.
		Material is hard to be slipped.	Use the teflon presser foot, or specially processed (teflon, etc.) presser foot.
	Number of revolution is high.		Decrease the number of revolution.
Balloon stitches	Thread tension is low.		Increase the tension of thread tension No. 2.
	Thread take-up spring is improperly adjusted.	Stroke of thread take-up spring is small.	Balloon stitch or thread breakage is apt to occur if the stroke of thread take-up spring is small since the released thread is not pulled up enough. Adjust the stroke of thread take-up spring to a rather large value.
		Tension is low.	If the tensin is too low, when the machine runs at high speed, the spring cannot follow up and pulling-up of thread is deteriorated. As a result, balloon stitch or thread breakage is apt to occur.
		Shape of thread take-up spring is improper.	If the top end of thread take-up spring is opened, thread may be caught with it when thread is slackened. Close the top end with fingers when it is excessively opened.
		Strength of thread take-up spring is weak. Follow-up capability at high speed is defective.	The weak thread take-up spring of A type does not show the effect enough for the thread of # 60 or more since the tension at the end of motion does not become large. In this case, replace it with the standard thread take-up spring (or thread tension).
	Stroke of thread take-up is large.		Move the arm thread guide to the right to decrease the supplying amount of thread by the thread take-up.

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
	Places related to the hook are defective.	Hook timing is too early.	For cotton thread and spun thread, adjust the timing to the standard, or slightly delay the timing.
		Hook timing is too late.	For filament thread, adjust the timing to the standard, or slightly advance the timing.
		Clearance between hook and bobbin case holder is small.	Increase the clearance to improve the slide of thread.
		Amount of oil in the hook is small.	Properly adjust the amount of oil.
		Hook is defective (Thread is caught in the hook.)	Replace the hook.
	Thread path is defective	Thread path is not smooth.	Finish the thread path.
		There is a scratch in the thread path.	Finish the thread path.
		There is a burr in the thread path.	Correct threading.
	Bobbin or bobbin case is defective.	Bobbin thread is caught in the bobbin case due to improper engagement of bobbin with bobbin case.	Replace the bobbin or bobbin case.
		Bobbin thread is caught in the bobbin since thread is improperly wound round the bobbin.	Adjust the tension or position of bobbin winder thread tension. In addition, take care of uneven winding.
		Tension adjusting spring of bobbin case is defective.	Replace the bobbin case.
		Bobbin thread in the bobbin case runs idle.	Adjust the pressure of idle-prevention spring referring to the item (7).
		There is a scratch in the bobbin.	Correct the burr of scratched part, or replace the bobbin.
	Feed is defective.	Feed timing is improper, or feed dog height is low.	Slightly delay the feed timing. (Cotton thread and spun thread) Or, advance the timing. (Filament thread) Raise the heigt of feed dog.

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
Stitch skipping	Presser foot is defective.	Presser foot is rising.	Adjust the clearance between presser bar guide bracket and lifting plate. (A clearance of 0.8 to 1 mm should be provided when the presser foot comes closely in contact with the lifting plate.)
		Recess for thread on the rear side of presser foot is not provided, or small. Presser foot does not work especially when the pitch is large, or thick thread is used.	Use the presser foot with the large recess on the sole.
	Thread tension is defective.	Thread tension disk is rising.	Adjust the timing of thread tension disk rising referring to the item (3-8).
	Needle hole of throat plate is small.		Use the throat plate with large needle hole.
	Needle is thin for thread used.		Replace the needle or the thread used.
	Needle is defective.	There is a burr on the top end of needle.	Replace the needle.
	Needle is defective.	Needle is bent.	Replace the needle.
		Attaching direction of needle is improper. Or, it is not inserted until it will go no further.	Re-attach the needle. Replace the needle clamp screw. Defective stitching is apt to occur when attaching the needle with its indented part facing to this side.
		Top of needle is blunt.	Replace the needle.
		Needle is too thin for the thread used.	Replace the needle.
		Feed force is weak.	Raise the height of the feed dog.
	Places related to the hook	Top end of needle is blunt, or worn out.	Corrrect the blade point of the hook or replace the hook.
		Hook timing is defective.	Readjust the timing (advance the timing when needle thread loop can be easily formed, and delay the timing when needle thread loop is hard to be formed in accordance with the conditions of fabric and thread.
		Height of needle bar is improper.	Adjust the height of needle bar in terms of the blade point of the hook to upper or lower.
		Clearance between blade point of hook and needle is improper.	Decrease the clearance between the blade point and the needle.
		Loop formation is unstable. (When net material or the like is used.)	Turn thread around the needle, or use T-type needle bar thread guide (B1418227T00).
		There is no needle guard.	Replace the hook with one with needle guard. For SS : 1141355, For DS : 22890404
To the next page			

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
	Needle thread tension is too high.		Decrease the tension. Use silicon.
	Number of revolution is too high.		Decrease the number of revolution.
	Feed timing is defective. (Needle bend)	Needle is bent at the thich section.	Advance the feed timing.
	Thread take-up spring is improperly adjusted.	Stroke is large.	Decrease the stroke.
		Tension is high.	Decrease the tension.
	Cloth is floppy.	Presser foot is rising.	Adjust the clearance between presser bar guide bracket and lifting plate.
		Needle hole of throat plate is large.	Use the throat plate with small needle hole.
		Recess on the presser foot sole is large.	Use the presser foot with small recess on the sole, or without recess.
		Parallelism of presser foot is defective.	Replace the presser foot, or loosen presser bar guide bracket screw to adjust the bend of the presser foot.
Needle thread breakage	Thread path is defective (including throat plate and presser foot).	Thread path is not smooth.	Finish the thread path.
		There is a scratch in the thread path.	Finish the thread path.
		There is a burr in the thread path.	Recheck threading to correct.
	Needle thread tension is improper.	The tension is too high or too low.	Properly adjust the tension.
		Tension of thread tension No. 1 is too low.	Adjust so that thread between thread tension No. 1 and No. 2 does not run around.
	Thread take-up spring is improperly adjusted.	The stroke is too large or too small.	Adjust the stroke.
		The tension is too high or too low.	Adjust the tension.
		Selection of the spring for the kind of thread is improper.	In case of A type thread tension, replace the spring with standard one. (In case of thick thread of #60 or more)

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
	Needle is defective.	Needle is bent.	Replace the needle.
		There is a scratch on the needle.	Replace the needle.
		Top end of the needle is blunt.	Replace the needle.
		Attaching direction of the needle is improper.	Reattach the needle. Defective stitching is apt to occur when attaching the needle with its indented part facing to this side.
		Needle is too thin or too thick for the thread used.	Replace the needle.
		Top end of the needle is too sharp.	Use the ball-point needle.
	Places related to the hook are defective.	There are scratches on the hook thread path.	Replace the needle.
		Blade point of the hook is blunt, or worn out.	Correct the hook blade point, or replace the hook.
		Clearance between hook and bobbin case holder is small.	Increase the clearance to improve the slide of thread.
		Amount of oil in the hook is small.	Properly adjust the amount of oil in the hook.
	Places related to the hook are defective.	There are scratches on the hook thread path.	Replace the needle.
Thread breaks when reverse feed stitching or back-tack stitching is performed.	Attaching direction of the needle is improper.	Attching direction of the needle is improper.	Attach the needle with its indented part facing slightly to anti-operator's side (approx. 10°) from the exact lateral side.
		Thread take-up spring is improperly adjusted.	Adjust the thread take-up spring so that thread is not fed from the thread tension disk before the thread take-up spring moves to the end of stroke. (It is effective to adjust the spring pressure to lower, and the stroke to larger than the specified values.)
			Turn thread around the needle, or change the needle bar thread guide to T-type one (B1418227T00).
To the next page			

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
	Hook timing is delayed.	If the hook timing is delayed, needle thread loop becomes too big and is deformed. As a result, thread breakage occurs since the blade point catches thread twice.	Adjust the hook in the state that the timing is earlier by 0.2 mm than the lower marker line of needle bar. Or, change the needle bar to needle bar of 22886907. Interval of the marker lines of needle bar of 22886907 is narrower by o.2 mm than that of the standard.
	Thread take-up spring is improperly adjusted.	Stroke is too large or too small.	Adjust the stroke.
		Tension is too high or too low.	Adjust the tension.
		Selection of the spring is improper for the kind of thread.	In case of A type thread tension, replace the spring with the standard one. (In case of thick thread of #60 or more)
Thread breaks when performing idle stitching or jump stitching.	Same cause as [Thread breaks when performing reverse feed stitching or back-tack stitching]	Same cause as [Thread breaks when performing reverse feed stitching or back-tack stitching]	Same adjustment as [Thread breaks when performing reverse feed stitching or back-tack stitching]
	Position of the knife thread guide is improper.		Adjust so that needle drops in the center of the hole.
	Needle bar is positioned low.		Raise the needle bar.
Uneven stitches	Needle thread tension is too high.		Decrease the tension.
	Needle is defective.	Needle is bent.	Replace the needle.
		Top end of the needle is blunt.	Replace the needle.
		Needle is too thin.	Use a thick needle. Use the double-step needle in case of KN needle (one step needle).
		Needle is too long.	Use a short needle. Or, use a needle with long shank. (DAX1)
	Number of revolution is too high.		Decrease the number of revolution.

To the next page

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
From the previous page			
	Defective feed	Parallelism of feed dog is defective.	Replace the feed dog.
		Feed dog is slantly installed.	Correct the installation.
		There is a lateral play in the feed base.	Remove the play in the state that the feed driving base pin and the feed rocker base pin are slightly pressed.
	Presser foot is defective.	Presser foot is rising.	Readjust the position of presser bar guide bracket.
		Parallelism of presser foot is defective.	Replace the presser foot. Or, loosen the presser bar guide bracket screw and adjust the bend of presser foot.
		Presser foot pressure is too low.	Increase the presser foot pressure.
	Threading is improper.	Threading of needle thread is wrong.	Correct the threading.
		Needle bar thread guide is defective.	Try to use B1418227T00 or B1418552A00.
Broken material	Needle is defective.	Heat of needle is high.	Use silicon.
		Needle is too thick.	Use a thin needle that is as thin as possible.
		Top end of needle is blunt.	Replace the needle.
		Shape of the top end of needle is defective. (Kind of needle)	Use the ball-point needle (KN, S, J, B, U, Y, etc.)
	Number of revolution is too high.		Decrease the number of revolution.
	Cloth is excessively tensed.	Needle hole of throat plate is small.	Use the throat plate with large needle hole.
		Presser foot pressure is too high.	Decrease the pressure as low as possible.
		Feed dog is positioned high.	Lower the position as low as possible.
	Humidity of guide is too low.		Keep the humidity at approximately 65% to protect the needle from heat and charge friction.
	Feed pitch is too small.		Make the pitch as large as possible.
Bobbin is damaged.	Bobbin is damaged by the bend of needle.		Use the hook with needle guard corresponding to the needle equivalent to #11. For SS : 11141355, for DS : 22890404

Troubles	Cause (1)	Cause (2)	Checking orders and corrective measures
Irregular stitches	Places related to th hook are defective.	Amount of oil in the hook is too many or too small.	Properly adjust the amount of oil.
		Defective hook (thread is caught in the hook, thread path is defective, etc.)	Replace the hook, or correct the thread path.
	Bobbin or bobbin case is defective.	Bobbin thread is caught in the bobbin case due to the defective engagement of bobbin with bobbin case.	Replace the bobbin or bobbin case.
		Bobbin thread is caught in the bobbin case due to defective thread winding round the bobbin.	Adjust the tension or position of the bobbin winder thread tension. In addition, take care of uneven winding.
		Tension adjusting spring of bobbin case is defective.	Replace the bobbin case.
		Bobbin thread in the bobbin case runs idle.	Adjust the tension of idle-prevention spring referring to the item 7.
		Setting direction of bobbin into bobbin case is improper.	Refer to the item 7. Reverse revolution of the bobbin improves irregular stitches.
	Needle thread or bobbin thread tension is too low.		Increase the tension.
	Thread take-up spring is improperly adjusted.	Stroke of thread take-up spring is large or small.	Adjust the stroke of the thread take-up spring.
		The tension is high or low.	Adjust the tension.
	Thread path is defective.	Thread path is not smooth.	Finish the thread path.
		There is a scratch in the thread path.	Finish the thread path.
		There is a burr in the thread path.	Correct the threading.
	Cloth is floppy.	Needle hole of throat plate is too large.	Replace it with gauge with small needle hole.
		Recess for thread on the presser foot sole is too large.	Use the presser foot with small recess on the sole or without recess.
		Parallelism of the presser foot is defective.	Replace the presser foot. Or, when the needle entry position is improper, loosen the presser bar guide brackect screw and correct the needle entry position or the bend of the presser foot.
		Presser foot is rising.	Adjust the clearance between the presser bar guide bracket and the lifting plate.
	Looseness in feed movement direction	Pitch changes according to the number of revolution and irregular stitches occur.	Check the looseness in the feed driving section and remove the looseness.
	Stroke of the thread take-up is large.		Move the arm thread guide to the right and decrease the supply of thread from the thread take-up.
	There is no resistance in the thread guide rod.		Use D1113126WA0.

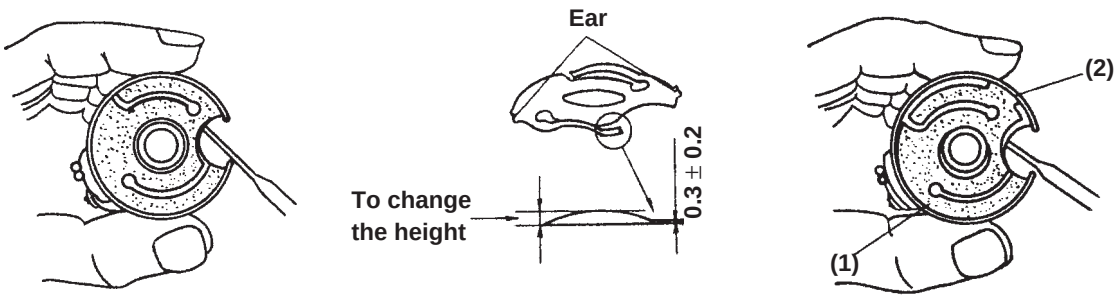
6. BOBBIN CASE WITH IDLE-PREVENTION SPRING

For the DDL-9000 series, bobbin case with idle-prevention spring is used.
Adjust the tension of the idle-prevention spring in the following procedure.

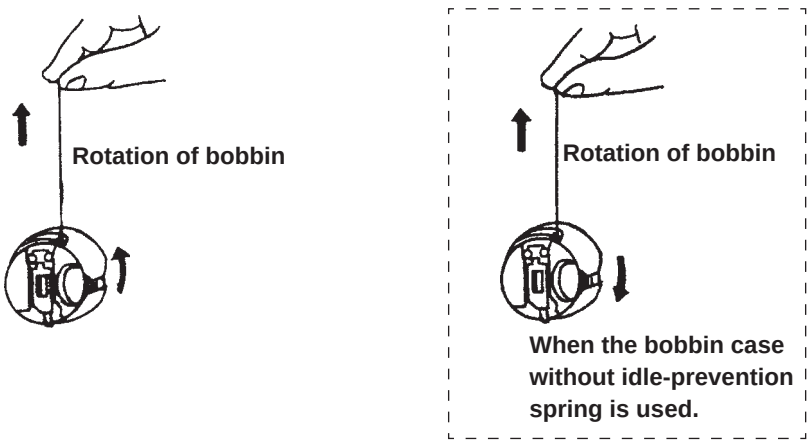
When the bobbin runs idle	→	Increase the tension of the idle-prevention spring.
When the thread is not well tightened	→	Decrease the tension of the idle-prevention spring.

*** Adjusting the idle-prevention spring**

1) Insert an old sewing needle or the like into the bobbin as shown in the illustration, and remove the spring in a manner of just lifting it.
   (Prevent the spring from jumping out with your thumb.)
2) To change the pressure of the spring, change the height of arched section of the spring.
   (Take care so that the free end pf the spring does not rise from the bobbin case.)
3) First, set the ear (1), insert a sewing needle into the bobbin, and set the ear (2) in the state that the central part of the spring is raised.
   (Part No. of bobbin case spring : D1837555B0B)



* When using the bobbin case with idle-prevention spring, be sure to set it in the direction of winding as shown in the illustration.



(Irregular stitches at high or low speed)

When the thread is excessively tightened at low speed	→	Adjust the tension of bobbin thread and that of idle-prevention spring to rather higher.
When the thread is insufficiently tightened at low spped	→	Adjust the tension of bobbin thread and that of idle-prevention spring to rather lower.

* When idle running of bobbin or irregular stitch at high or low speed makes troubles, it is effective to use the bobbin case with idle-prevention spring.

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