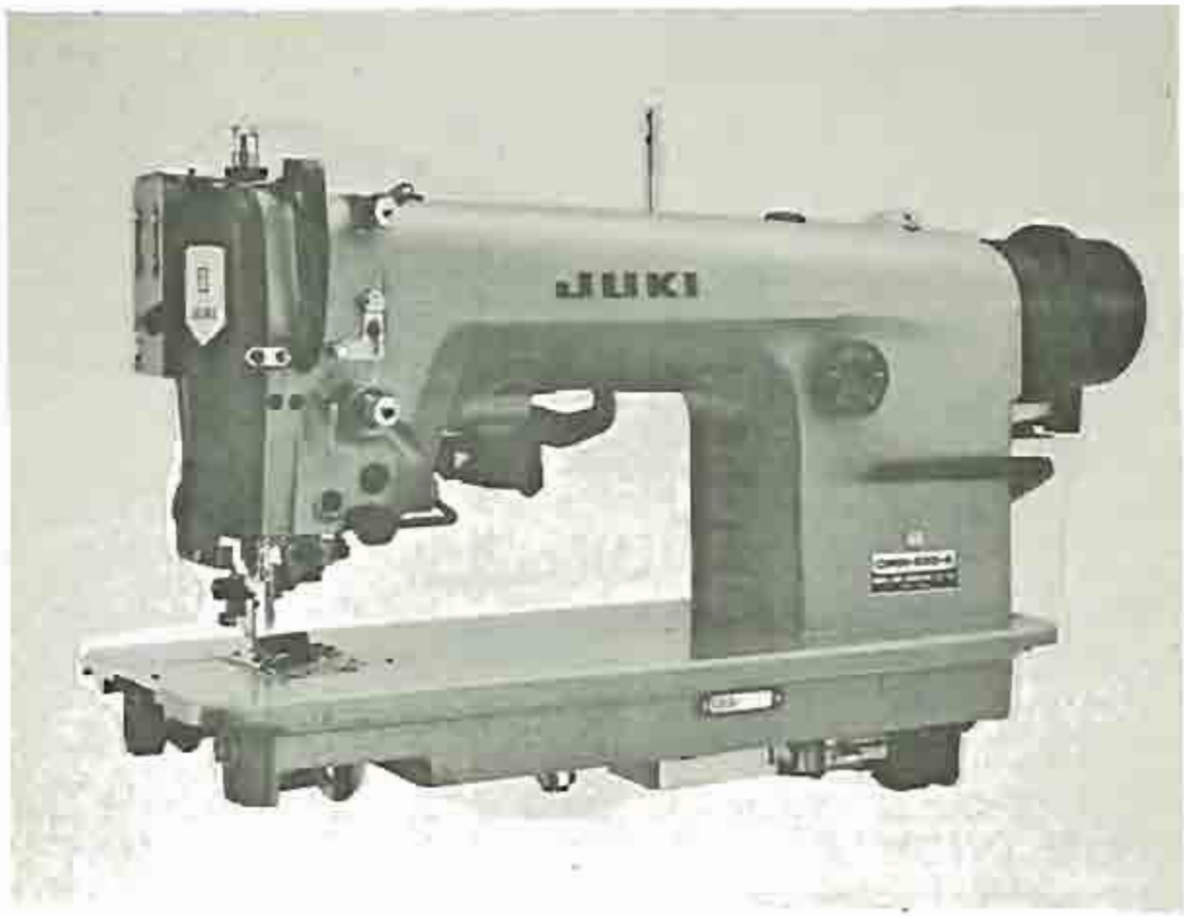
JUKI®

DMN-530-4 Series

1-Needle Lockstitcher with Needle Feed,
Vertical Edge Trimmer and Automatic Thread Trimmer

ENGINEER'S MANUAL



TOKYO JUKI INDUSTRIAL CO., LTD.

FORWARD

This Engineer's Manual is designed for service technicians. The handling of the machine is also explained in considerable detail in the Instructions Manual designed for service engineers and operators, but this Engineer's Manual includes information not given in the Instructions Manual such as adjustment method and phenomena due to changes in settings. When servicing the machine refer to the Instructions Manual and the Parts Lists as well as this Engineer's manual. The "Standard Adjustments" on the front page of this manual shows the basic settings, and the "phenomena due to changes in settings" on the back page describes phenomena due to sewing and mechanical faults and explains the relevant adjustment methods.

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I. INTRODUCTION

(1) Features and applications

The model DMN-530-4 has cloth cutting knife, automatic thread trimmer and needle feed components. The automatic reverse feed mechanism and the wiper components are installed at users' option. The cloth cutting knife driving mechanism is enclosed in the machine arm providing a sufficient space on the machine bed. The knife is conveniently operated by a lever. The thread trimmer works on the principle of rocking motion. This model is mainly used to sew collars, pocket flaps, sleeves and small parts of general medium-weight fabrics and also suitable for sewing and cutting the quiltings and rain coat materials which are relatively hard to cut in the conventional manners.

(2) Available gauges

Cutting width varies with the selected gauge set out of 3.2 mm (1/8″), 4.0 mm (5/32″), 4.8 mm (3/16″), 5.6 mm (7/32″) and 6.4 mm (1/4″). (You have to change the presser foot, feed dog and waste material guard along with the gauge plate as listed in 7. GAUGE SETS FOR SPECIAL SPECIFICATIONS.

2. SPECIFICATIONS

Model	:	DMN-530-4-4B (2B)
Type	:	1-needle lockstitcher with needle feed and cloth cutting knife
Use	:	General medium-weight fabrics
Sewing speed	:	Max. 5,000 s.p.m. (4,000 s.p.m. when the feed pitch is set for 4 mm (5/32″) or greater)
Thread take-up	:	Link type thread take-up mechanism
Needle bar stroke	:	30.5 mm (1-13/64″)
Presser foot lift	:	5.5 mm (7/32″) by hand lifter 10 mm (25/64″) by knee lifter
Feed mechanism	:	Feed system : Feed regulation block slide system
Feed regulation	:	By Feed driving rocker block
Stitch length	:	Max. 5 mm (13/64″)
Stitch length regulation	:	By stitch dial
Reverse feed control	:	Automatic reverse feed system (magnetic type), Reverse feed pitch : 0 ~ 3 mm (1/8″)
Sewing hook	:	Automatic lubrication rotary hook
Lubrication	:	Automatic lubrication
Oil circulation system	:	By plunger pump
Cloth cutting knife stroke	:	6.5 mm (1/4″)
Knife blade length	:	10 mm (25/64″)
Gauges	:	3.2 mm (1/8″), 4.0 (5/32″), 4.8 (3/16″), 5.6 (7/32″) and 6.4 (1/4″)
Knife rest point	:	1.8 mm (1/16″) above its lower dead point
Needle feed system	:	Interlocked with bottom feed component (same as DLN-415)
Lubricating oil	:	JUKI New Defrix Oil No. 1
Bed size	:	477 x 178 mm (18-25/32″ x 7″)
Head weight	:	34 Kg
Motor	:	400W Electro-motor (special design)
Knife driving system	:	Lever operation
Automatic thread trimmer	:	Rocking type

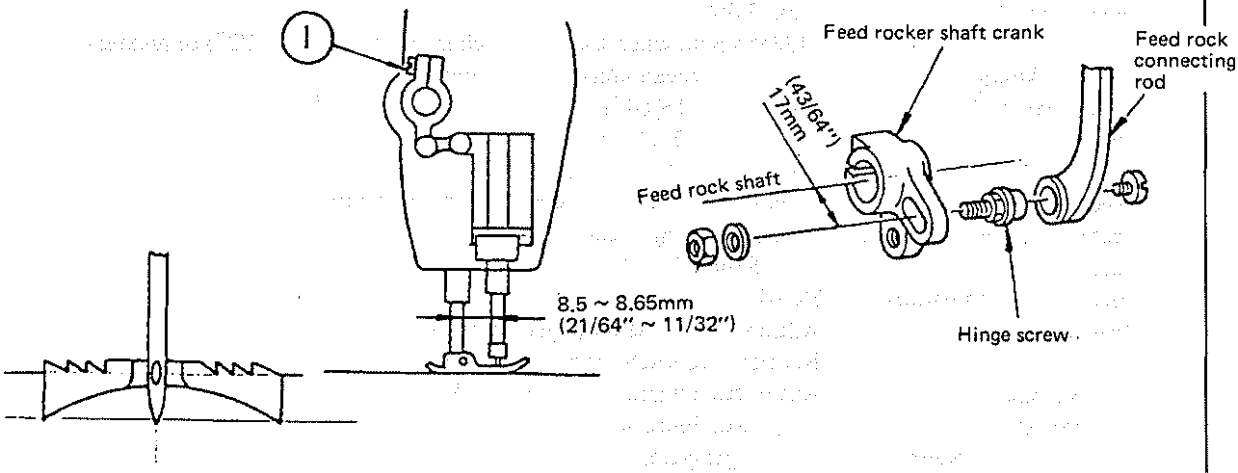
3. ADJUSTMENT STANDARDS

ADJUSTMENT STANDARDS

1. Needle bar

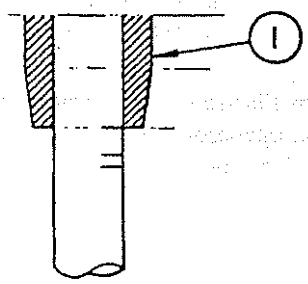
(1) Needle bar rocking motion

The distance from the farthest end of the presser bar to the farthest end of the needle bar must be 8.5 to 8.65 mm (5/16″ to 11/32″) when the feed pitch is set to "0".



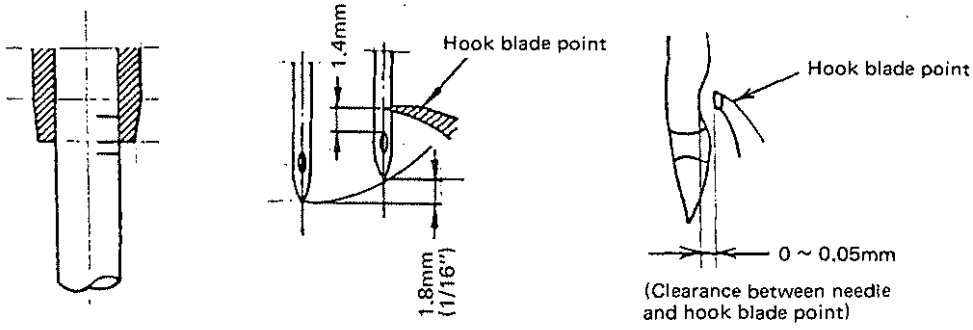
(2) Needle bar height

The No. 1 engraved line on the needle bar must meet the lower end face of the needle bar frame when the needle bar has come down to the lowest point of its stroke.



2. Needle-to-hook relation (when the feed pitch is set for 2 mm (5/64″)).

The needle-to-hook relation must satisfy the following conditions when the needle bar has come up and its No. 2 engraved line meets the lower end face of the needle bar frame.



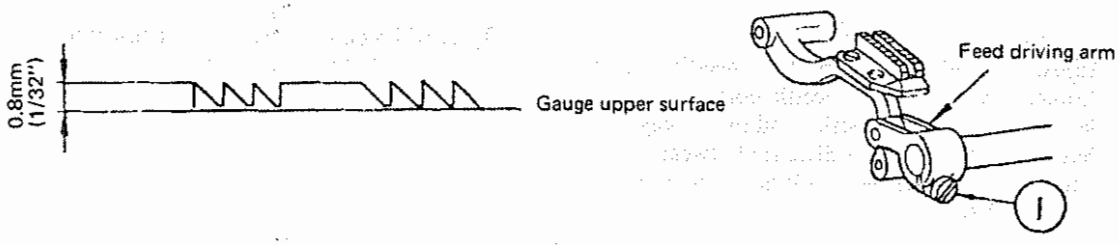
HOW TO ADJUST	EFFECT OF ADJUSTMENT
1-(1) a) Set the stitch dial to "0". b) Loosen screw ① to set free the driving crank. c) Provide a 8.5 mm to 8.65 mm (5/16″ ~ 11/32″) clearance between the presser bar and the needle bar. d) Tighten screw ①. e) Adjust the feed dog to permit the needle to pass through the center of its needle hole. f) Set the feed rock connecting rod in the way that the center-to-center distance between its hinge screw and the feed rock shaft becomes 17 mm (43/64″).	○ By providing a 17 mm (43/64″) center-to-center distance between the hinge screw and the feed rock shaft, the ratio of the needle rocking motion to the feed dog motion becomes 1 : 1. By providing a maximum center-to-center distance between them, the ratio becomes 1.2 : 1.
1-(2) Loosen the screw which sets the needle bar connection and adjust the needle bar height.	○ Adjust the needle bar height accurately, because it influences the feed timing and needle-to-hook relation.
2. Align the hook blade point with the center of the needle with a 0 to 0.05 mm clearance when the No. 2 engraved line on the needle bar meets the lower end face of needle bar frame ①. At this moment, the needle has rised 1.8 mm from its lower dead point and the top end of the needle eye stays 1.4 mm below the hook blade point.	○ If the needle-to-hook relation is not correct, it may cause skip stitching or thread breakage.

ADJUSTMENT STANDARDS

3. Feed mechanism

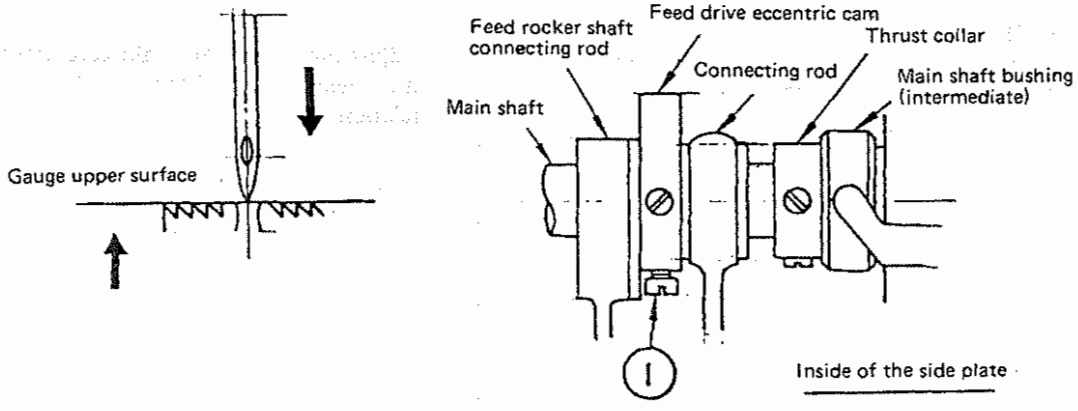
(1) Feed dog height

Protrusion from the gauge plate surface : 0.8 mm (1/32″) (When the feed pitch is 2 mm (5/64″))



(2) Phase of feed dog (when the feed pitch is 2 mm (5/64″))

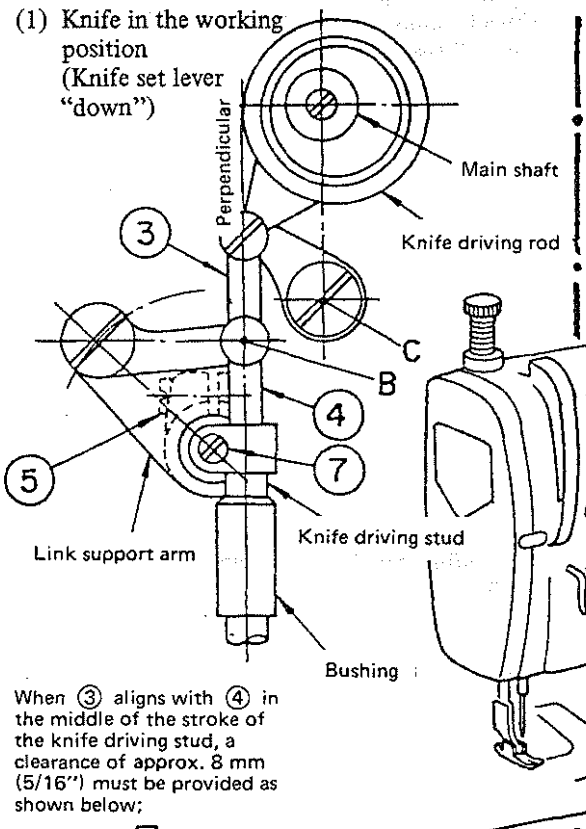
The top end of the needle (in downward motion) must meets the upper surface of the feed dog (in upward motion) at the level of the gauge plate surface.



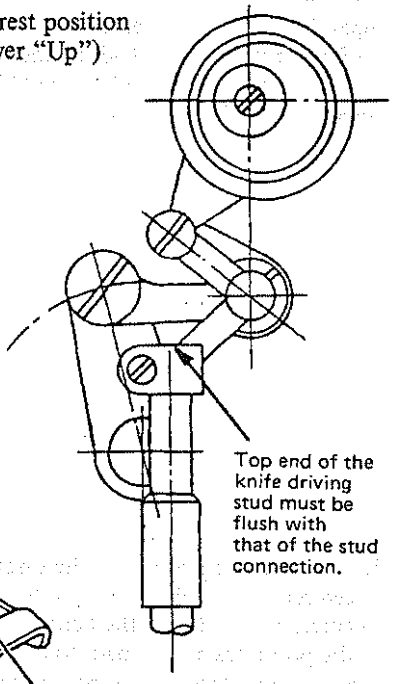
HOW TO ADJUST	EFFECT OF ADJUSTMENT
3-(1) Turn the handwheel to bring the feed dog to its upper dead point. Loosen screw ① to set free the feed driving arm and adjust the height of the feed dog. Let it protrude 0.8 mm (1/32″) from the gauge plate surface and tighten screw ①).	○ If the feed dog is too low, it may touch the thread trimmer knife. If it is too high, it may touch the gauge plate.
3-(2) Remove the side plate from the machine arm, loosen screw ① which sets the feed driving eccentric cam and turn the handwheel until the needle point has come down to the level of the gauge plate surface. In this position of the needle, turn the feed drive eccentric cam until the upper surface of the feed dog has come up to the level of the gauge plate surface and tighten screw ①.	○ This influences the thread tension or causes cloth to slip.

4. Stroke of the cloth cutting knife

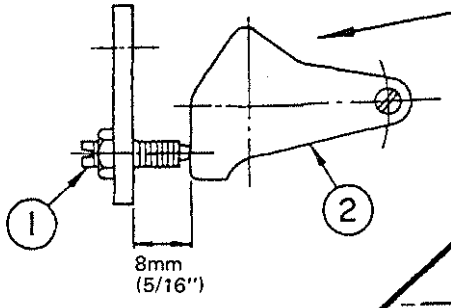
(1) Knife in the working position (Knife set lever "down")

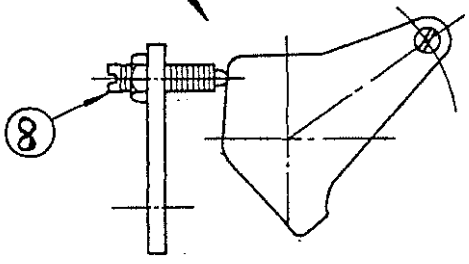


(2) Knife in the rest position (Knife set lever "Up")



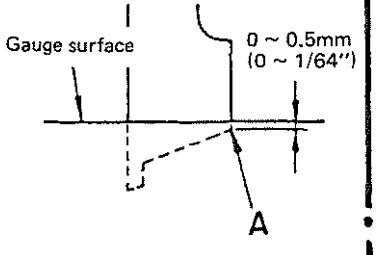
When ③ aligns with ④ in the middle of the stroke of the knife driving stud, a clearance of approx. 8 mm (5/16") must be provided as shown below;

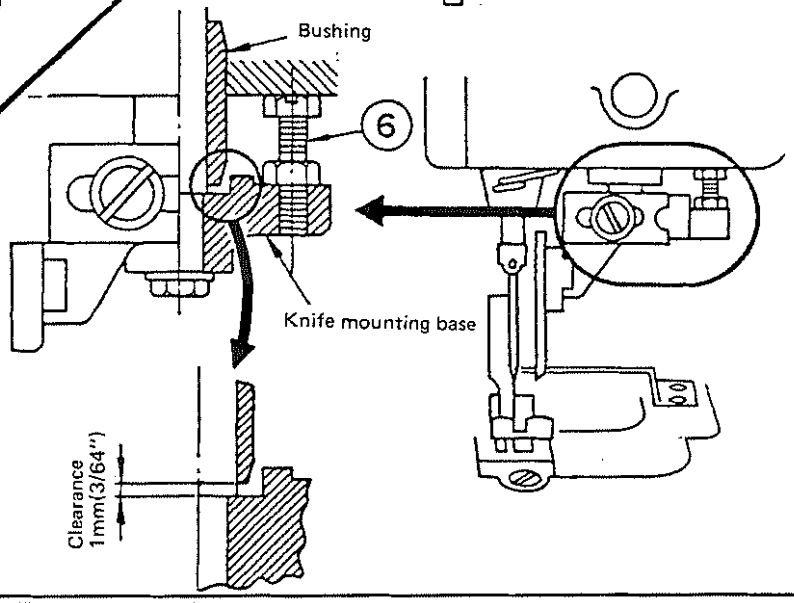




Knife set lever

(3) Knife in the correct position



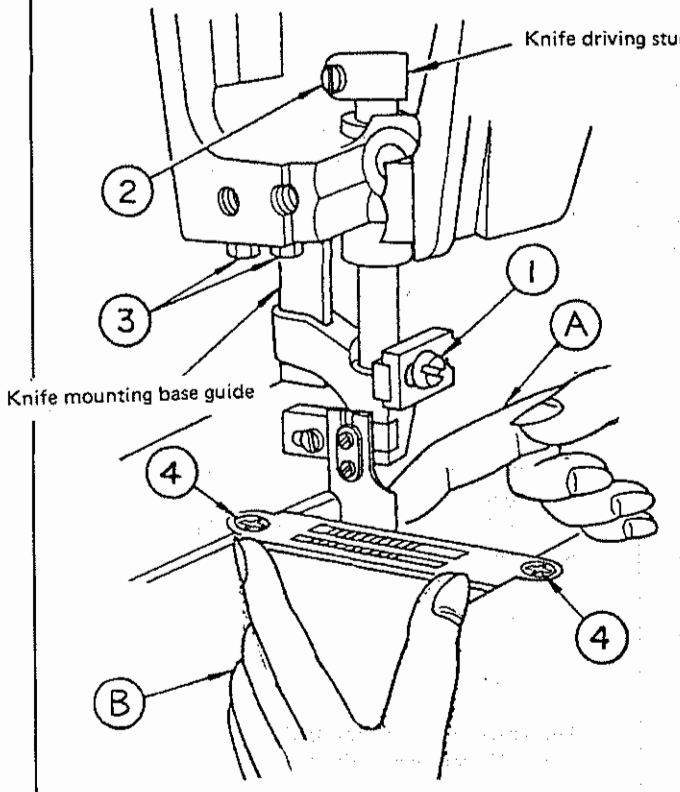


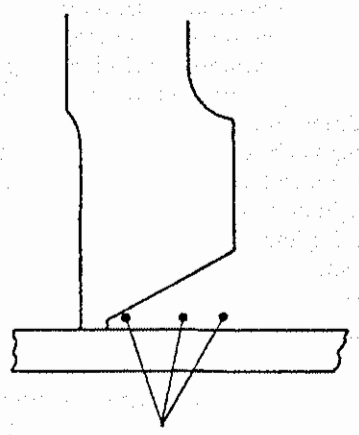
HOW TO ADJUST	EFFECT OF ADJUSTMENT
4-(1) a) With the knife set lever "down" (knife in the working position), turn the handwheel to bring the cloth cutting knife to the middle point between its upper and lower dead points and adjust screw ① (lower one of two stopper screws) to space knife set lever shaft ② 8 mm (5/16″) from the set lever stopper as illustrated. b) If you disassemble the cloth cutting knife components, you must adjust other components in addition to a) as follows; Bring knife set lever shaft ② into contact with the top end of screw ① , loosen screw ⑤ and retighten it in the way that knife driving connecting link ③ becomes in line with knife driving rod ④ and approximately perpendicular with the axis of the knife driving stud.	○ If screw ⑧ is adjusted independent of screw ①, it may change the pressure given to the lever causing the lever to shake when operated. ○ If they are not in line, it may reduce the knife stroke and cause the lever to shake.
4-(2) a) Loosen knife mounting base stopper screw ⑥ and leave it down. Lift the knife set lever gradually as you let the machine run at a low speed, the stroke of the knife will reduce. When the stroke of the knife becomes "0" (point B overlaps with point C), bring the top end of screw ⑧ (upper one of two screws) into contact with the knife set lever shaft and tighten its locknut (adjust it by turning screw ⑧ with a screw driver). b) After the above adjustment make sure that there is a clearance between the end face of the knife mounting base and the bottom end of the bushing (standard clearance : 1 mm (3/64″)). When necessary, loosen screw ⑦ and lower the knife driving stud to adjust the clearance. c) Check that the knife driving stud has an axial play and fix stopper screw ⑥ in the way that its head touches the jaw of the frame when the knife driving stud is in the middle position of its play.	○ The knife set lever shakes, if adjustment is incorrect. ○ The knife set lever fails to rest in the upper position, if adjustment is incorrect. ○ The knife set lever may shake. ○ The knife set lever fails to rest in the upper position. ○ The knife set lever clicks when it is lowered.
4-(3) Turn the handwheel until the knife has come down to the lowest point of its stroke and adjust the knife so that its edge "A" comes down 0 to 0.05 0.05 mm below the level of the gauge plate surface.	○ The knife hits the waste material guard. ○ The knife set lever fails to rest in the upper position.

ADJUSTMENT STANDARDS

5. Sharpness of the cloth cutting knife

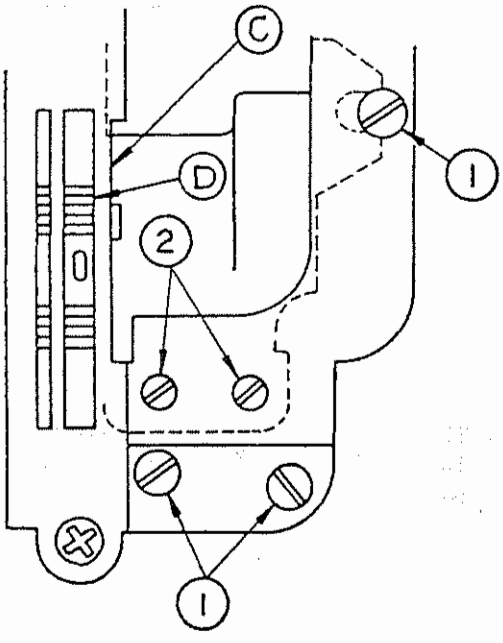
○ Gauge-to-knife relation

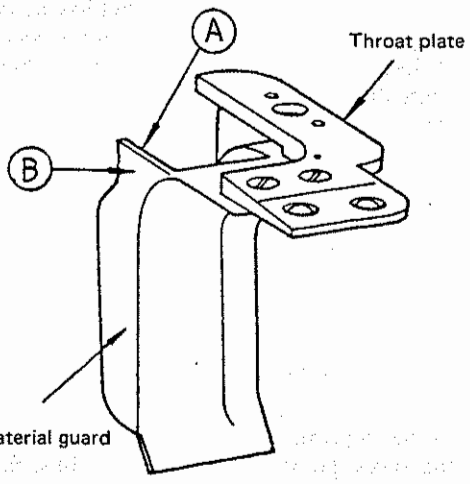




Ensure that polyester thread #50 or equivalent is sharply cut at each point.

6. Position of the waste materials guard

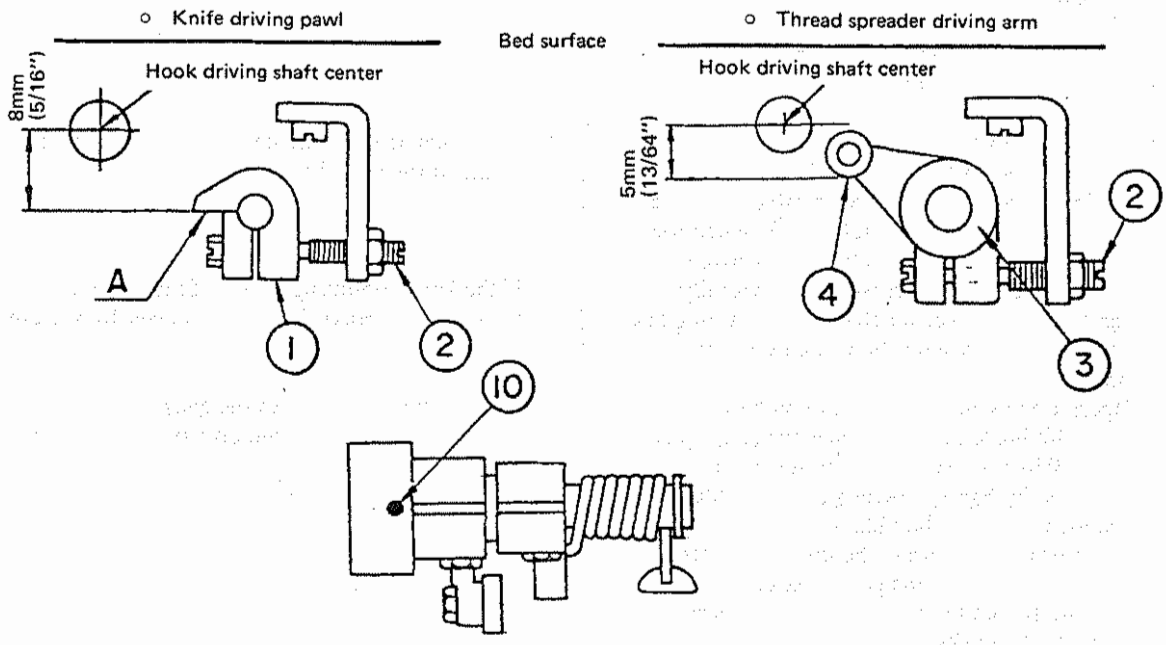




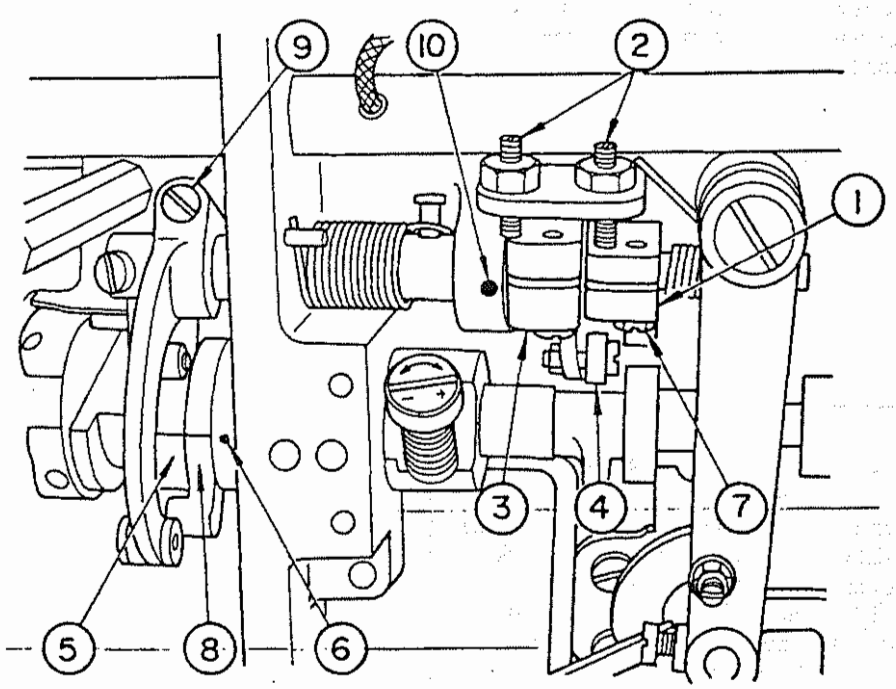
HOW TO ADJUST	EFFECT OF ADJUSTMENT
5. a) Loosen screw ① which fastens the knife holder in place and also screw ② which clamps the knife driving stud connection, respectively. (Caution) It is advisable not to loosen screws ③, because positioning of the knife mounting base guide is rather difficult. b) Tighten screw ① and then screw ② in the way that the knife blade evenly touches the blade of the gauge plate by pressing the knife with your finger as illustrated Ⓐ, when the knife is in the lowest position of its stroke. c) If you have loosened screws ③, carefully tighten them to permit the knife mounting base to smoothly move on the guide by moving it up and down. d) Operate the knife set lever and make sure that the knife blade evenly touches the gauge plate blade. When necessary, loosen screw ① and retighten by lightly pressing the knife blade against the gauge plate blade Ⓐ. (Caution) Don't press the knife blade strongly against the gauge plate. e) Operate the knife set lever and make sure that it smoothly works. f) Confirm that a piece of polyester thread (#50) is sharply cut at the front, middle and end points of the blade. g) If the above adjustment does not bring you a favorable result, loosen screws ④ which fix the gauge plate, press the gauge plate lightly against the knife blade and tighten screws ④ alternately. (Caution) Although screw ④ has a flush head, slight adjustment in its position is possible.	○ Sharpness of the knife depends on the contact of the knife with the gauge plate blade. ○ If the knife mounting base guide is fixed inproperly, it may cause the knife set lever to operate heavily. ○ If the knife blade presses the gauge plate too intensely, it may wear out and give an excessive load to the lever operation.
6. Loosen screw ① which fixes the throat plate and two screws ② which fix the waste material guard and retighten these in the way that adge Ⓐ of the waste material guard does not jut out from blade ⓒ of the gauge plate and that face Ⓑ does not touch face Ⓓ of the feed dog. Make sure that the knife blade does not touch the waste material guard when the knife set lever is operated.	

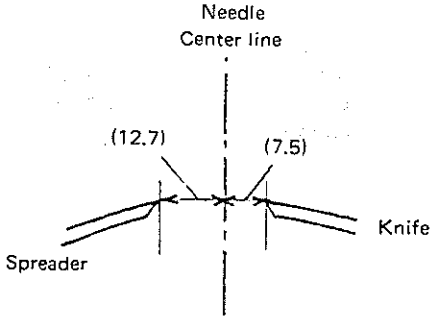
7. Thread trimmer

(1) Initial position



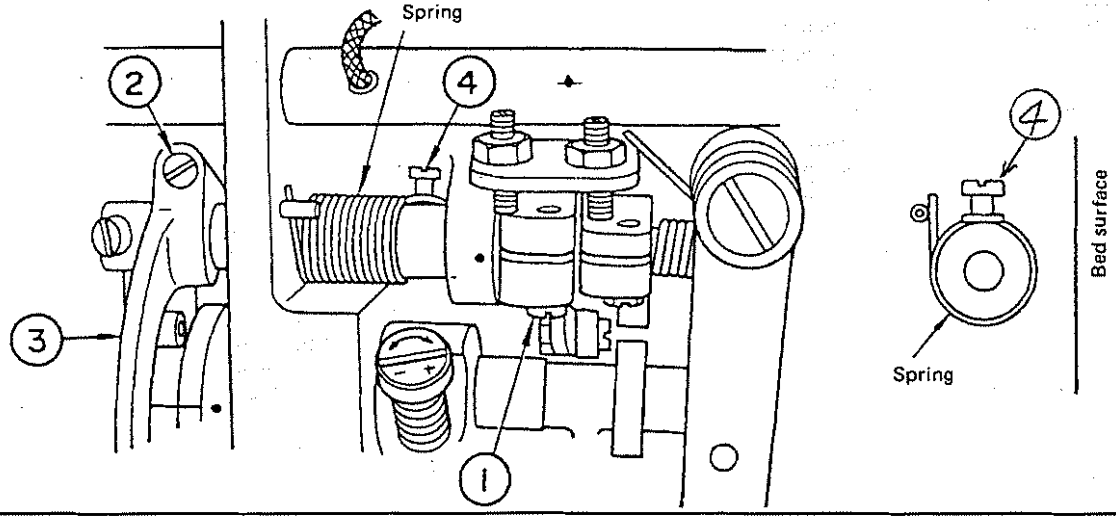
(2) Knife mounting base and thread spreader mounting base



HOW TO ADJUST	EFFECT OF ADJUSTMENT
7-(1) ○ Initial position of knife driving pawl ①: Face Ⓐ must be 8 mm (5/16″) below the level of the hook driving shaft center. Adjust it by screw ②. ○ Initial position of thread spreader (driving) arm ③; The bottom end of cam roller ④ must be 5 mm (13/64″) below the level of the hook driving shaft center. Adjust it by screw ②. ○ In addition to the above, both slots in knife driving pawl ① and thread spreader driving arm ③ must be in line with marker spot ⑩ engraved on the boss of the bed. (Remarks) It is advisable not to loosen screw ② when unnecessary.	○ If ① is set for greater than 8 mm; It increases the knife stroke and causes the knife mounting base pin to slip off or the knife mounting base to hit the throat plate stopper screw. ○ If ① is set for smaller than 8 mm; It reduces the knife stroke and causes failure in thread trimming operation. ○ If ④ is set for greater than 5 mm; The thread spreader hits other components. The thread spreader starts working too early to properly spread the thread. ○ If ④ is set for smaller than 5 mm; The thread spreader starts working too late to take up the needle thread to cut. The bobbin thread to be left for the next start of stitching becomes too short causing stitch-skipping at the start of next sewing.
7-(2) ○ Initial position of knife mounting base ⑤: Align the engraved line on the knife mounting base with marker spot ⑥ engraved on the hook driving shaft bushing (front) and tighten screw ⑦ to fasten the knife driving pawl. ○ Initial position of thread spreader mounting base ⑧: Align the engraved line on the thread spreader mounting base with marker spot ⑥ engraved on the hook driving shaft bushing (front) and tighten screw ⑨ to fasten the thread spreader driving arm. ○ By the above adjustment, the knife and the spreader are spaced from the needle center line as shown below;  	○ If the engraved line on the knife mounting base is lower than the marker spot, the knife mounting base pin may slip off or the knife may fail to cut the thread. ○ If the engraved line on the knife mounting base is higher than the marker spot, the knife mounting base may hit the throat plate stopper pin. ○ If the engraved line on the thread spreader mounting base is lower than the marker spot, the spreader may work too early to take up the thread or the thread spreader mounting base may hit machine bed. ○ If the engraved line on the thread spreader mounting base is higher than the marker spot, the spreader may work too early to take up the needle thread causing failure in thread trimming. Thread to start next stitch becomes too short causing stitch-skipping at the start of next sewing.

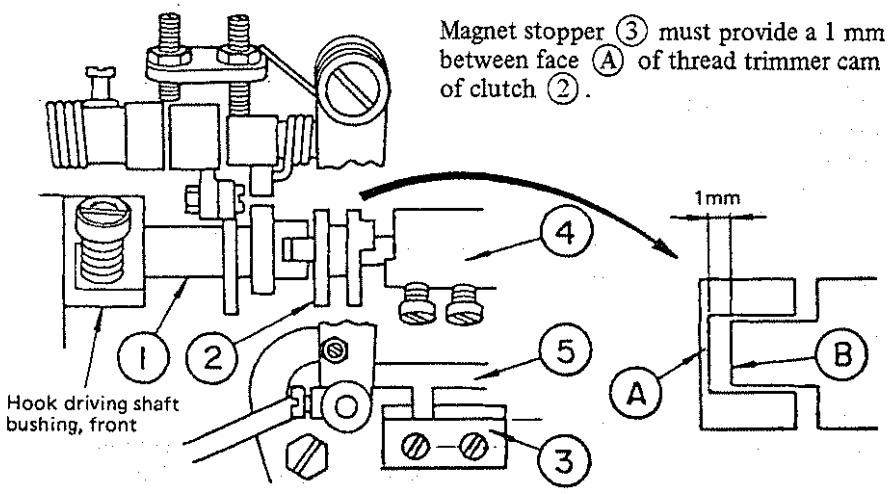
ADJUSTMENT STANDARDS

(3) Thread spreader spring
Initial position : Hinge screw ④ anchoring the thread spreader spring must stay in the illustrated position and parallel to the bed surface.

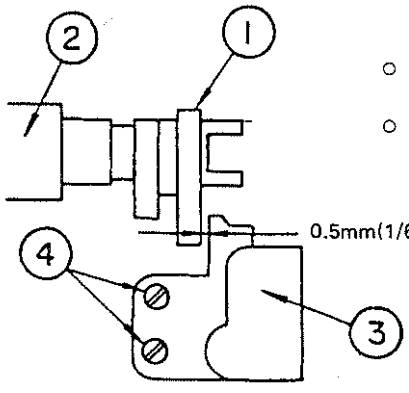


(4) Magnet stopper

Magnet stopper ③ must provide a 1 mm (3/64") clearance between face Ⓐ of thread trimmer cam ① and face Ⓑ of clutch ②.



(5) Wire driving lever base

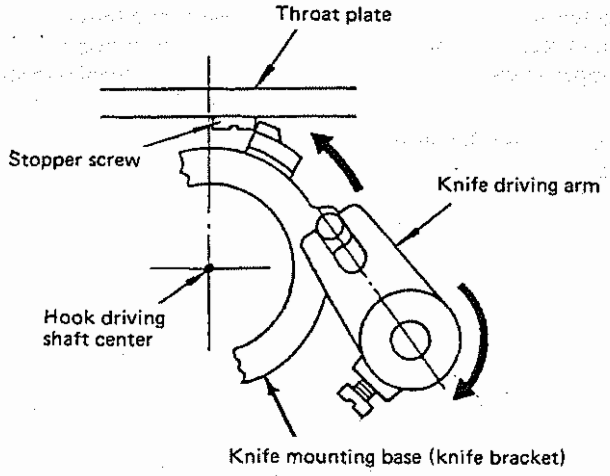


- Clearance at the thread trimmer cam : Approx. 0.5 mm (1/64")
- Thread trimmer cam must work smoothly.

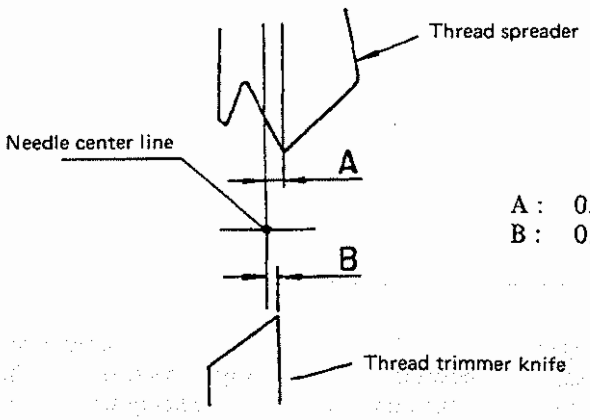
HOW TO ADJUST	EFFECT OF ADJUSTMENT
7-(3) a) Loosen screw ① which fastens the thread spreader (driving) arm and screw ② which fastens the thread spreader driving arm. b) Pull thread spreader driving arm ③ toward you as far as it will go and tighten screw ②. c) Push in arm ③ and tighten screw ① by pressing it against the stopper screw. d) Loosen screw ②. ○ Repeat procedures a) to d) increase the tension of the spring until hing screw ④ becomes parallel to the machine bed.	○ If the spring tension is lower than the above-mentioned standard, the thread spreader may fail to come back to its initial position and may hit by the needle. ○ If the spring tension is higher, it may overload the motor during the process of thread trimming causing the needle-up stop action to delay. It also fatigues the spring material.
7-(4) a) Set free magnet stopper ③. b) Press magnet stopper ③ against the projection on magnet link ⑤ and fix it in such a position where a 1 mm (3/64″) clearance is provided between face Ⓐ and Ⓑ. (This adjustment must be made by pressing thread trimmer cam ① lightly against the hook driving shaft bushing (front)).	○ If the clearance is greater than 1 mm, clutch ② fails to disengage thread trimmer driving collar ④ after thread trimming operation.
7-(5) Press thread trimmer cam ① against hook driving shaft bushing (front) ② and adjust the position of wire driving lever base ③ to provide a 0.5 mm (1/64″) clearance at the thread trimmer cam by two setscrews ④.	○ If wire driving lever base ③ pushes cam ① away, it overloads the thread trimmer and delays the needle-up stop action.

ADJUSTMENT STANDARDS

(6) Thread trimming motion



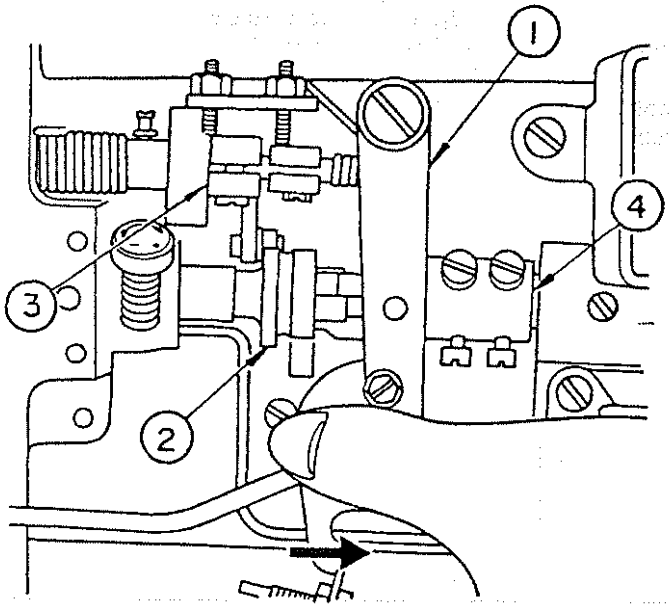
(7) Knife-to-spreader relation



A : 0.2 ~ 0.7 mm
B : 0.1 ~ 0.4 mm

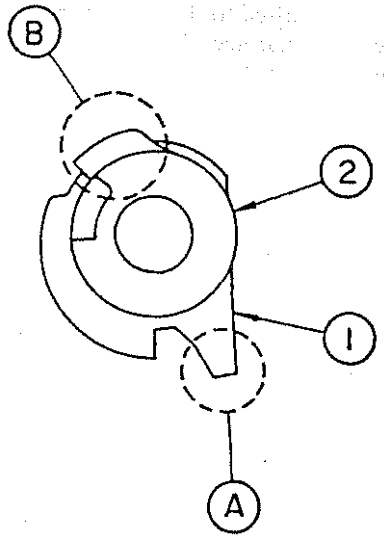
HOW TO ADJUST	EFFECT OF ADJUSTMENT
7-(6) ○ After the knife has been brought to the end of its stroke by the thread trimmer cam, the knife driving arm must be permitted to advance further until it is blocked by a contact made by the stopper screw protruding from the throat plate with the projection on the knife mounting base. Make sure that the knife driving arm is not blocked before the knife completes its full stroke.	○ If the knife driving arm is blocked before the knife completes its full stroke, it overloads the thread trimming mechanism causing the machine to stop. ○ Adjust the knife driving pawl accurately (make the knife stroke smaller). ○ Adjust the position of the knife mounting base accurately (make the initial position of the knife lower).
7-(7) ○ Thread trimmer knife Fine adjustment of the knife position can be made within the clearance provided by two screw holes in the knife. ○ Thread spreader Position of the thread spreader is fixed by the blush-head screws. (Caution) These adjustment are necessary only after the hook driving shaft bushing (front) has been moved or replaced.	○ If the thread trimmer knife is shifted to the left from the needle center line, it may fail to cut the thread. If it is shifted to the right from the needle center line, it cuts the needle thread at two points causing the needle thread toescape from the needle eye when starting the next stitch. ○ If the threader is shifted to the right or the left from the needle center line, the knife may fail to cut the needle thread.

(8) Timing of thread trimming action



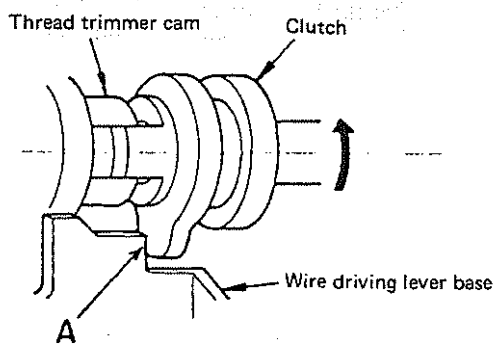
The thread spreader must start moving when the red marker spot engraved on the handwheel meets the red marker spot on the machine arm.

(9) Coupling of clutch to thread trimmer cam



○ Viewed from the clutch side.

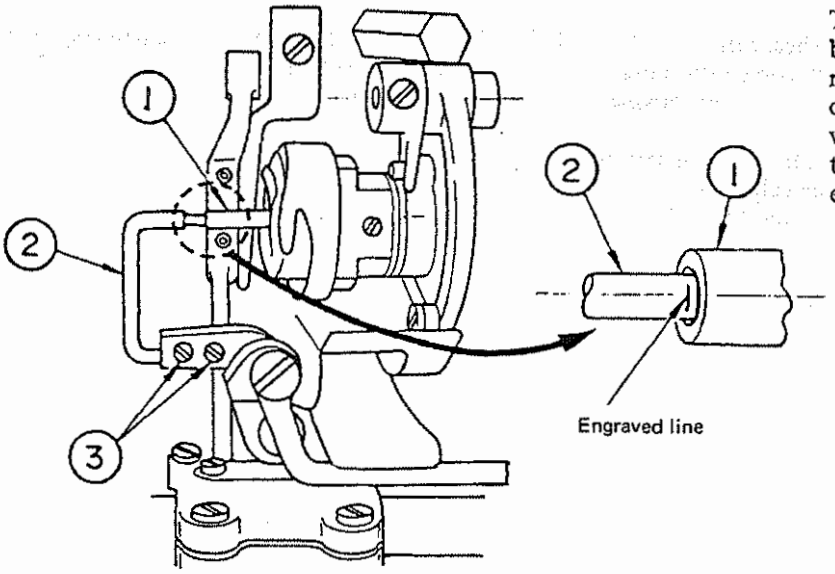
○ The clutch must be coupled to the thread trimmer cam in such a way that portion Ⓑ of clutch ② is located on the opposite side of portion Ⓐ of thread trimmer cam ① as illustrated.



○ Edge A continues to hold the clutch until thread trimming action has been completed even if the thread trimmer solenoid will go "OFF" prior to it.

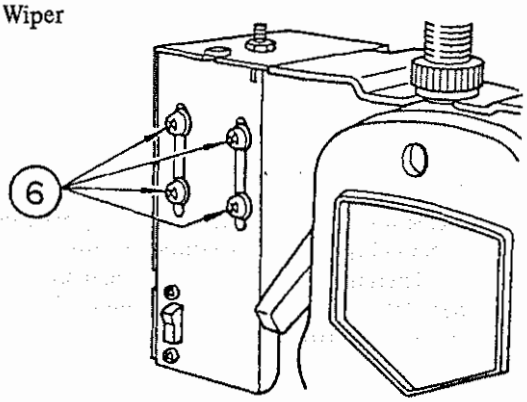
HOW TO ADJUST	EFFECT OF ADJUSTMENT
7-(8) a) Magnet arm ① moved to the right as soon as the needle bar has passed the lowest point of its stroke. b) Continue to turn the handwheel further, and thread trimmer cam ② will come into contact with the cam roller on thread spreader (driving) arm ③. c) In this state of the machine, tighten four screws to fix thread trimmer driving collar ④ in the way that the red marker spot on the handwheel meets the red marker spot on the machine arm.	○ If the timing is too early, the thread spreader may fail to take up the thread to cut. ○ If the timing is too late, the machine may stop with the needle "up" before completion of thread trimming action.
7-(9)	○ If portions Ⓐ and Ⓑ are located in the reverse way (upside down), the safety measures for thread trimming operation become ineffective. Therefore, if the thread trimmer solenoid goes "OFF" at an early timing, the knife may fail to return from its cutting position.

(10) Bobbin stopper



The engraved line on bobbin stopper ② must meet the end face of bobbin presser ① when the thread trimmer solenoid is excited.

8. Wiper

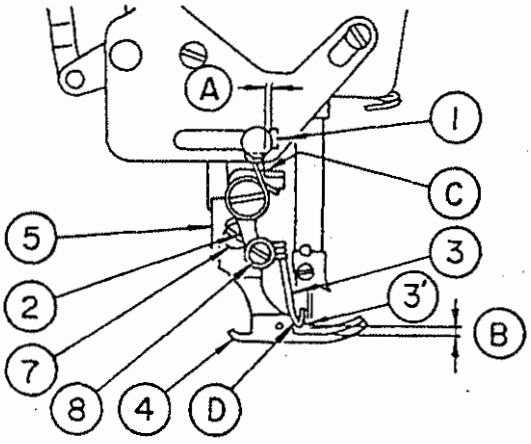


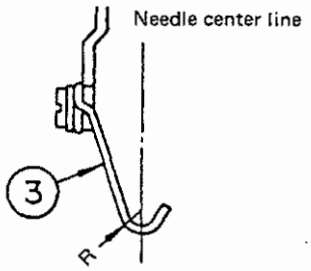
(1) Clearance between wiper driving plate ① and wiper arm ②: (A)=0.5 mm

(2) Clearance between bottom end ③' of wiper ③ and presser foot ④: (B)=0.5 mm

(3) Wiper arm ② must touch wiper holder ⑤ at point Ⓒ and, at the same time, wiper ③ must touch presser foot ④ lightly at point Ⓓ.

(4) The center of curvature of the wiper's hooked end must be in line with the center line of the needle when viewed from the operator's side.

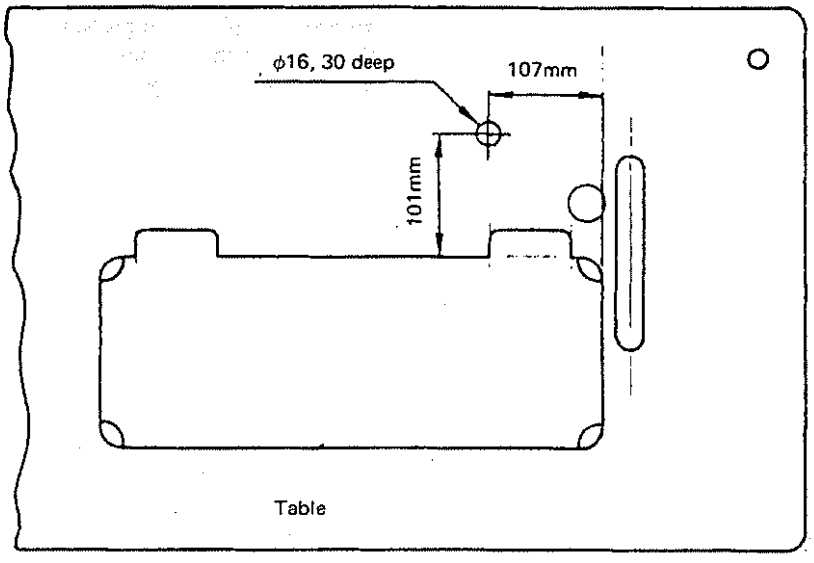




HOW TO ADJUST	EFFECT OF ADJUSTMENT
7-(10) Loosen screws ③ which fasten bobbin stopper ② to its bracket and adjust stopper ②.	○ If the engraved line does not reach the end face of the bobbin presser, the bobbin presser fails to press the bobbin during a thread trimming action permitting the bobbin to spin. ○ If the engraved line goes far into the bobbin presser, it applies high pressure beyond the flexibility of the bobbin presser and the bobbin presser may be broken.
8-(1) Loosen four screws ⑥, provide a 0.5 mm clearance Ⓐ and retighten screws ⑥. 8-(2) Loosen presser foot clamp screw ⑦, adjust the position of wiper holder ⑤ to provide a 0.5 mm clearance Ⓑ and firmly tighten screw ⑦. 8-(3) Loosen wiper setscrew ⑧, adjust the position of wiper ③ in the way that it provides a light contact with point Ⓓ when it touches at point Ⓒ and retighten screw ⑧.	○ If Ⓐ greater than 0.5 mm, it reduces the wiper stroke causing the wiper to fail to take up the thread to cut. ○ If Ⓐis 0 mm it provides a clearance at point Ⓓ causing the needle to touch the wiper. ○ If Ⓑis greater than 0.5 mm, the wiper will hit the needle to break. ○ If Ⓑis 0 mm, it provides a clearance at point Ⓓ causing the wiper to touch the needle. ○ If there is a clearance at Ⓒ; ○ Ⓐ is 0 mm. See 8-(11). ○ If there is a clearance at Ⓒ and it touches at Ⓓ, it gives high tension to the wiper and the wiper may be broken. ○ If the hooked end of the wiper is not in line with the needle center line, the wiper fails to take up the thread to cut.

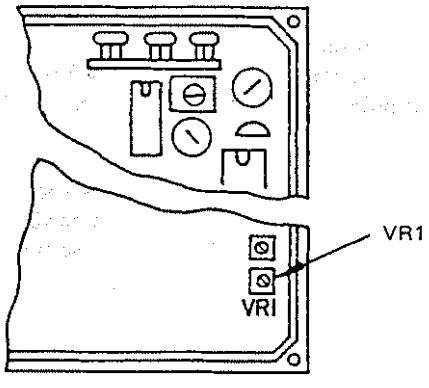
9. Head support rod

Make a hole to set up the head support rod in the position specified by this drawing.



10. Adjusting the motor for low speed operation

Set HITACHI Electro-motor (MA-21 or MA-2) for low speed operation (230 s.p.m.), which is necessary for thread trimming process.



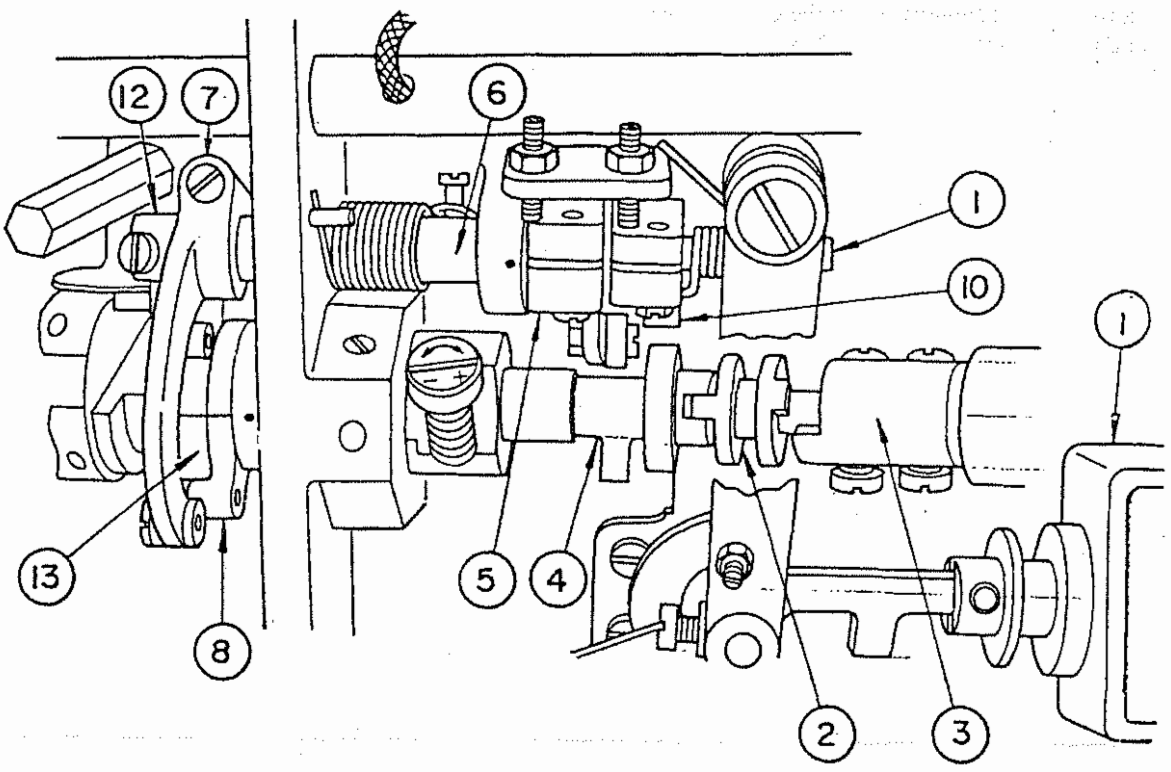
Logic circuit board in the HITACHI MA-21, MA-2 motor control box

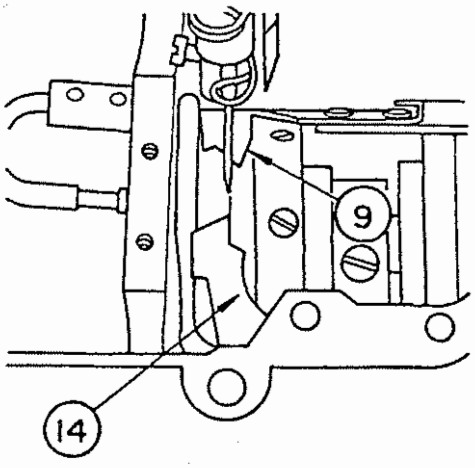
HOW TO ADJUST	EFFECT OF ADJUSTMENT
9. Change the position of the head support rod according to the drawing from the original position, because the head support rod in the original position does not support the tilted head with optinum balance.	○ The head support rod in the original position does not support stably the tilted head.
10. Adjust VR1 on the logic circuit board located in the control box of HITACHI MA-21 or MA-2 motor for the low speed of 230 ± 10 s.p.m.	○ If the motor runs at higher or lower than 230 ± 10 s.p.m. during thread trimming operation, the machine may fail to stop accurately in its needle up stop position or the needle may hits the wiper.

4. MECHANISM OF SPECIAL COMPONENTS

1. Functional descriptions of the thread trimmer

○ Outline





(1) Thread trimmer solenoid is excited to actuate clutch ② .

(2) Clutch ② engages with thread trimmer driving collar ③ .

(3) Revolution of the hook driving shaft is transmitted to thread trimmer cam ④ via clutch ② and collar ③ .

(4) Thread trimmer cam ④ acts on thread spreader (driving) arm ⑤ and turns thread spreader driving shaft ⑥ .

(5) Thread spreader driving shaft ⑥ turns thread spreader driving arm ⑦ and rocks thread spreader mounting base ⑧ .

(6) Thread spreader ⑨ fixed to base ⑧ takes the thread to cut.

(7) On the other hand, thread trimmer cam ④ actuated knife driving pawl ⑩ and turns knife driving arm ⑫ via thread trimmer knife shaft ⑪ .

(8) Knife driving arm ⑫ rocks knife mounting base ⑬ and thread trimmer knife ⑭ fixed to base ⑬ rocks to cut the thread being held by thread spreader ⑨ .

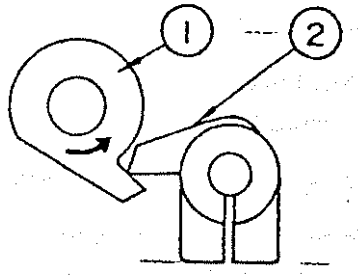
(9) After thread trimming, thread spreader arm ⑤ and knife driving pawl ⑩ are released from thread trimmer cam ④ causing thread spreader mounting base ⑧ and knife mounting base ⑬ to return to their original positions.

○ Safety system of thread trimming mechanism

Model DMN-530-4 has a thread trimmer which incorporates the safety system to let the thread trimmer carry out its action even if the thread trimmer solenoid accidentally widthdraws before completion of thread trimming process.

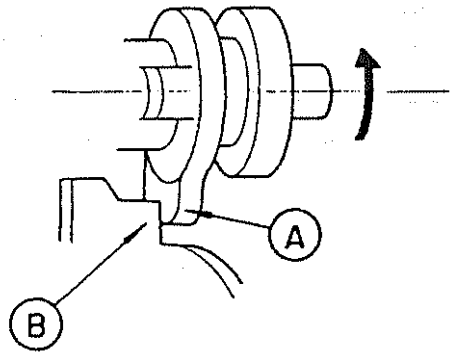
(Descriptions)

(1) When the thread trimmer solenoid is excited, thread trimmer cam ① comes into contact with knife driving pawl ② .



(2) At this moment, lobe Ⓐ of the clutch arrives to rest on portion Ⓑ of the wire driving lever base.

(3) Even if the thread trimmer solenoid accidentally withdraws from its working position, the clutch is held continuously in the same working position by portion Ⓑ of the wire driving lever base.

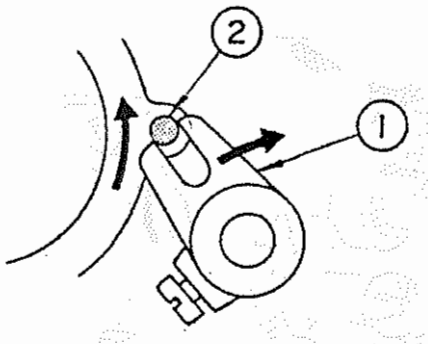


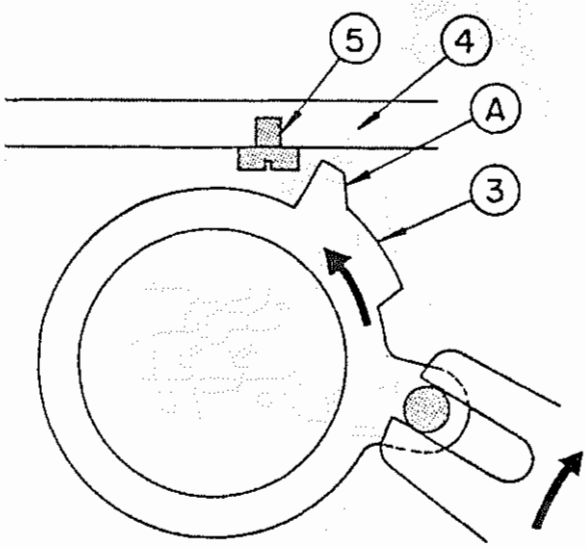
(4) In other words, the clutch and the thread trimmer driving collar remain engaging with each other even if the solenoid accidentally withdraws.

(5) The thread is completely cut before lobe Ⓐ of clutch departs from portion Ⓑ . Thus safe operation of thread trimmer is ensured.

○ Stopper screw on the throat plate

A stopper screw is set in the rear of the throat plate in order to prevent knife driving arm ① from slipping out from knife mounting base pin ②.



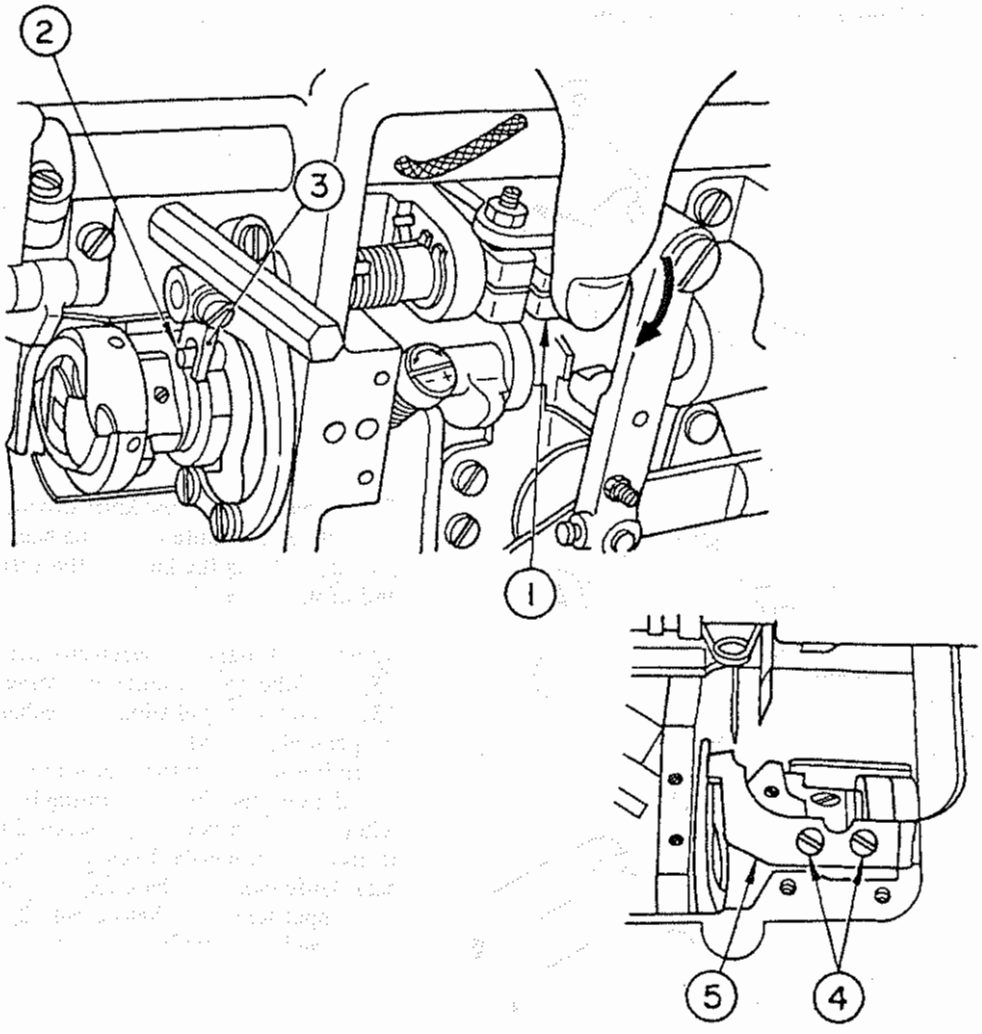


These figures show how knife driving arm ① acts on the knife mounting base via pin ② to bring the knife to the extreme end of its stroke.

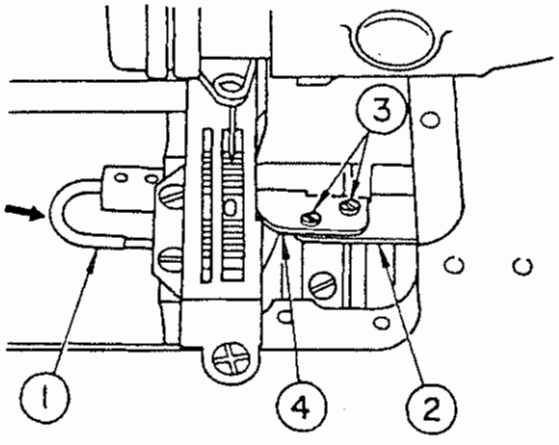
There is a clearance between stopper screw ⑤ and lobe Ⓐ of knife mounting base ③ when the thread trimmer mechanism is operated by hand.
When it is driven by the motor in the actual operation, knife mounting base will go closer to the stopper screw due to its moment of inertia. Even in the worst case, knife mounting base ③ is blocked by stopper screw ⑤ before pin ② is disengaged from knife driving arm ①.

1. Disassembling and reassembling the thread trimmer

(1) Thread trimmer knife

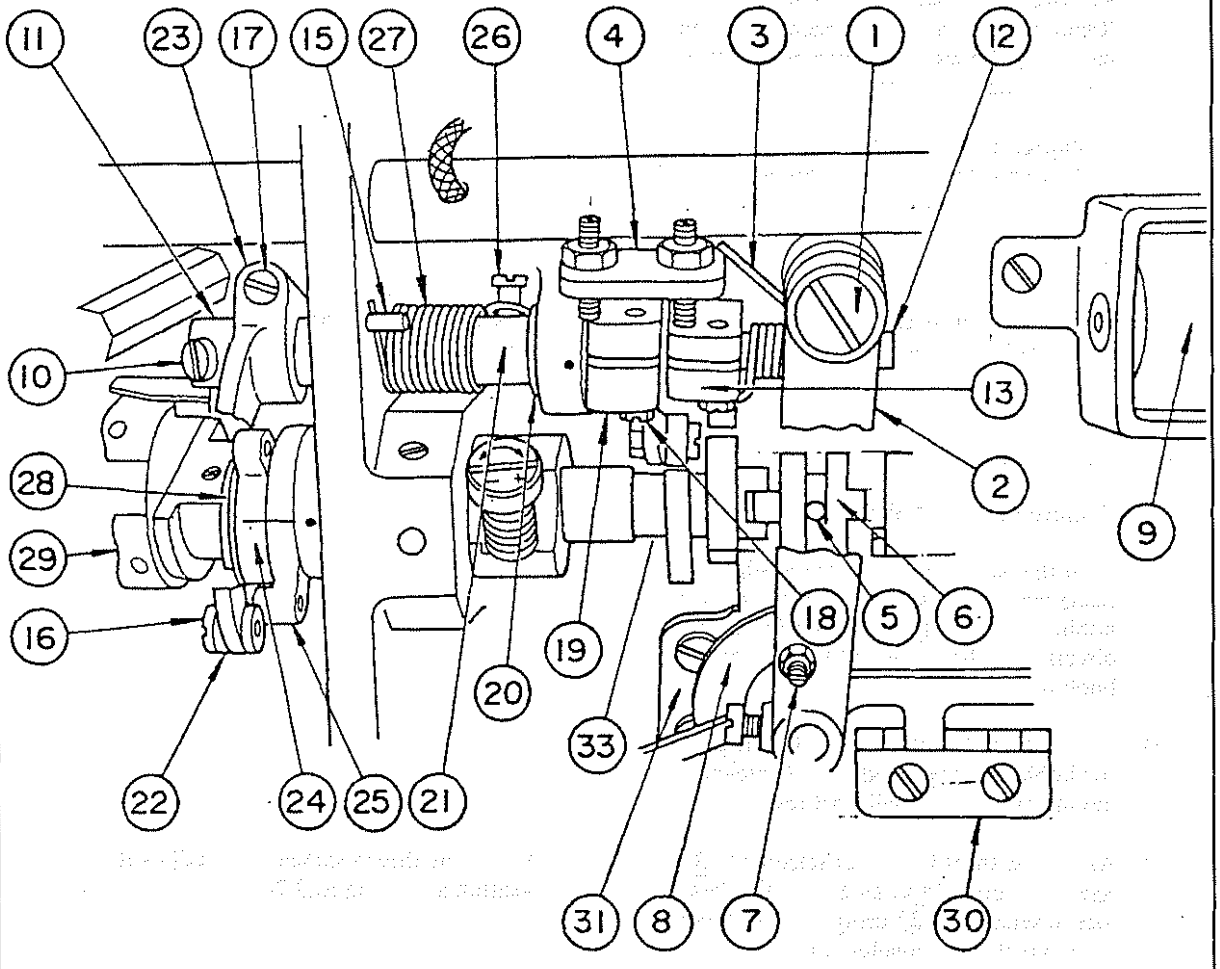


(2) Thread spreader



HOW TO DISASSEMBLE	HOW TO ASSEMBLE
2-(1) Thread trimmer knife 1) Remove the throat plate assembly. Remove the throat plate assembly accompanied by the waste material guard by tilting the machine head back. 2) Disengage knife mounting base pin ② from knife driving arm ③ by pushing down knife driving pawl ① with your finger as illustrated. 3) Raise the tilted machine head. 4) Remove two knife setscrews ④ and take out thread trimmer knife ⑤.	○ Attach the thread trimmer knife and adjust its position according to 3-7-(7).
2-(2) Thread spreader 1) Remove the throat plate assembly. 2) Turn the handwheel until the needle start rising from its lower dead point and push bobbin stopper ① with your finger in the direction of the arrow until it presses the bobbin. 3) Turn the handwheel further as your push the bobbin stopper, and thread spreader mounting base ② will start revolving. 4) As soon as thread spreader setscrews ③ have been brought to an accessible place, loosen setscrews ③ using a screw driver. Take out thread spreader ④.	○ Attach the thread spreader and adjust its position according to 3-7-(7).

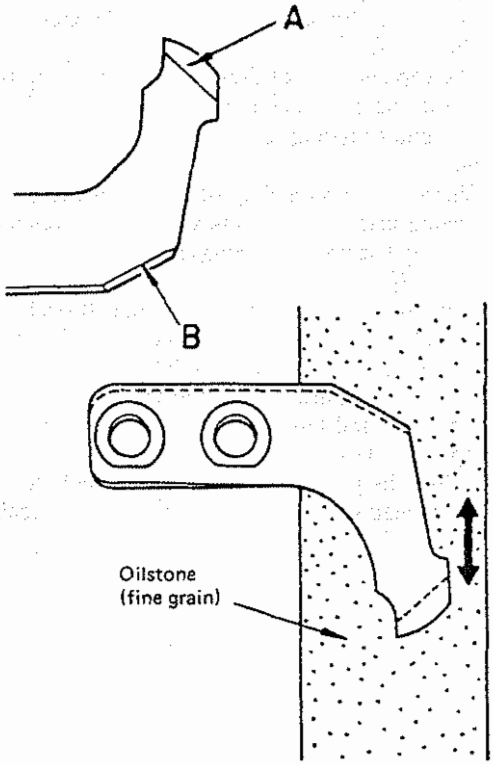
(3) Thread trimmer driving components



HOW TO DISASSEMBLE	HOW TO ASSEMBLE
(3) 1) Loosen magnet arm hinge screw ① and pull out magnet arm ②. 2) Remove solenoid assembly ⑨. 3) Loosen knife driving arm setscrew ⑩ and remove knife driving arm ⑪. 4) After removing knife driving arm ⑪, thread trimmer knife ⑫ accompanied by knife driving pawl ⑬ can be freely pulled out to the right. 5) Remove hinge screw ⑯ from thread spreader connecting link and loosen both thread spreader driving arm screw ⑰ and thread spreader (driving) arm screw ⑱.	○ Let one end of magnet arm spring ③ rest against magnet stopper ④. ○ Let clutch driving pin ⑤ rest in the groove on clutch ⑥. ○ The top end of wire driving lever pin ⑦ must rest in the oval hole in wire driving lever ⑧. ○ One end of spring ㉗ must rest against spring pin ⑮. ○ Eliminate the axial play of thread spreader driving shaft ㉑ by adjusting the clearances at thread spreader (driving) arm ⑲ and stop ring ⑳. ○ Tighten screw ⑰ in the way that thread spreader driving arm ㉓ acts smoothly on thread spreader connecting link ㉒. ○ Adjust the position of thread spreader (driving) arm ⑲ and knife driving pawl ⑬ according to 3-7-(1). ○ Adjust the position of knife mounting base ㉔ and thread spreader mounting base ㉕ according to 3-7-(2).
6) Remove hinge screw ㉖ from thread spreader driving shaft ㉑ and pull out shaft ㉑ to the left by opening stopper ring ⑳. 7) Remove hook assembly ㉙. 8) Remove retainer ring ㉘ and pull out knife mounting base ㉔ and thread spreader mounting base ㉕. 9) Remove magnet stopper ㉚. 10) Remove wire driving lever base ㉛. 11) Remove magnet stopper ④. 12) Take out the hook driving shaft.	○ Adjust the tension of spring ㉗ according to 7-(3) of Adjustment Standards. ○ Both knife mounting base ㉔ and thread spreader mounting base ㉕ must move smoothly after retaining ring ㉘ has been inserted. ○ Adjust the position of magnet stopper ㉚ according to 3-7-(4). ○ Adjust the position of wire driving lever base ㉛ according to 3-7-(5). ○ Adjust the engagement of clutch ⑥ with thread trimmer cam ㉝ according to 3-7-(9).

(4) Sharpness of the thread trimmer knife

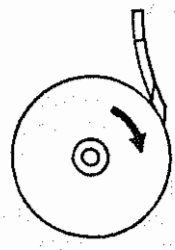
The thread trimmer knife must be sharp enough to cut a piece of nylon thread #8 with a force of 700 g or less. When necessary, resharpen the knife blade in the following way;

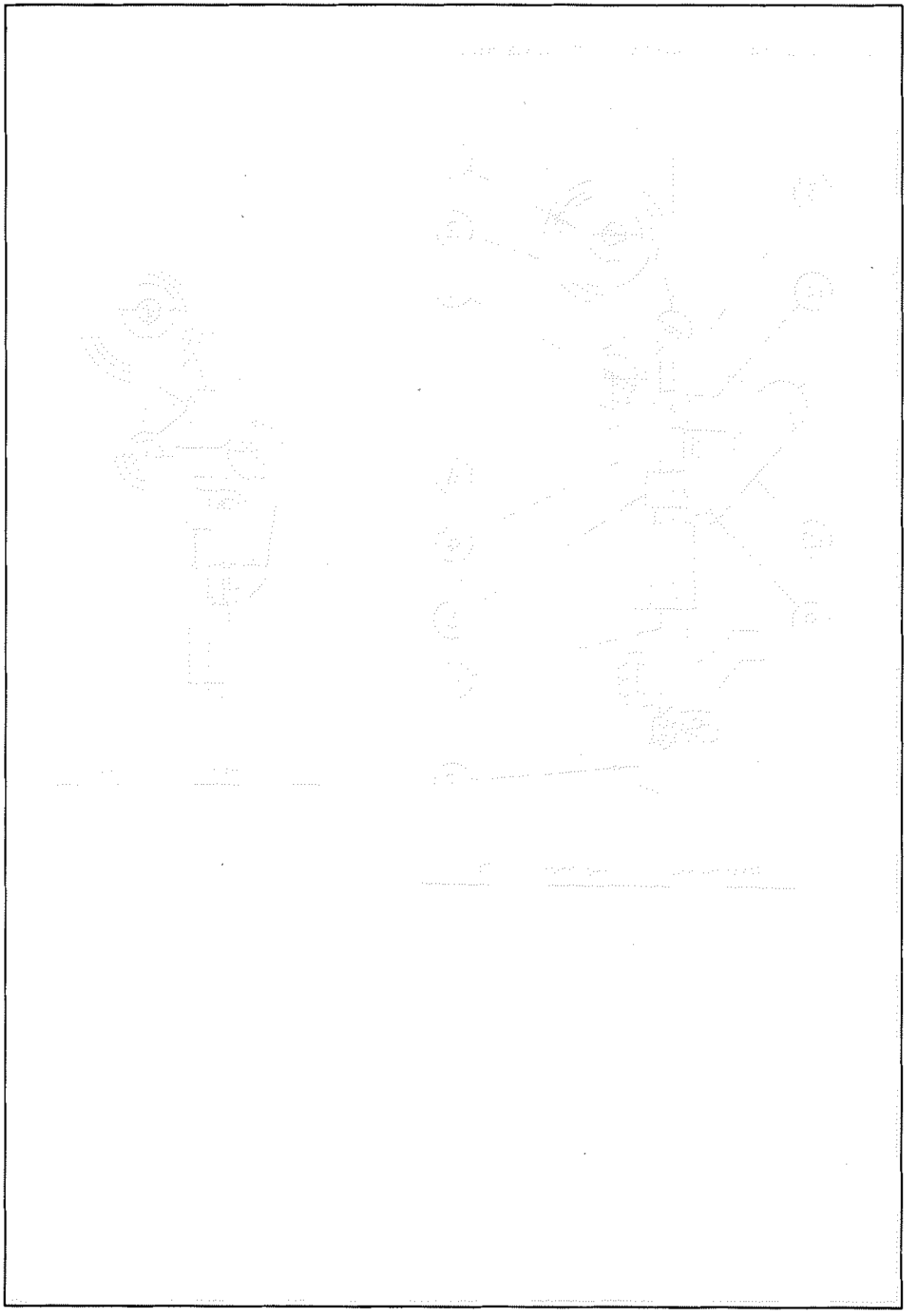


Press knife blade (A) and guide face (B) of the thread trimmer knife against a fine-grain oilstone and shapen the knife blade by sliding in the direction of the arrow.

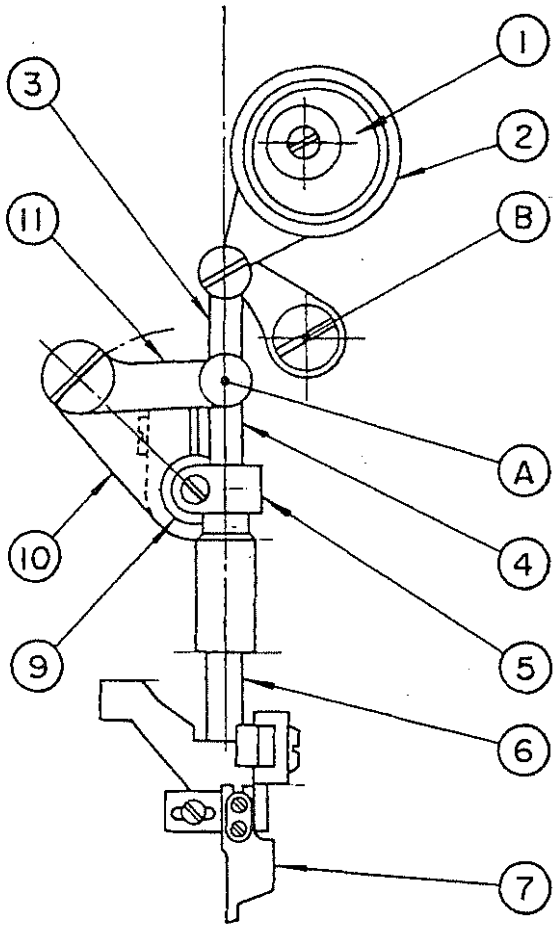
After sharpening, remove burrs by lightly applying oilstone a few times.

Alternatively, you may buff rear face of the knife blade using a buffing wheel.
This method is simple and saves you time, but the sharpness does not last long.

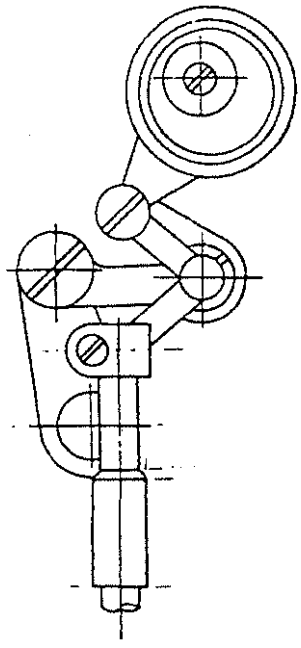




3. Functional descriptions of the cloth cutting mechanism



When the knife is lowered (lever "down")



When the knife is lifted (lever "up")

3.

○ When the knife is in cloth cutting position :

1) Knife driving rod crank ② is turned round by the knife driving cam (eccentric cam).

2) Knife driving rod ② moves knife driving connection link ③ .

3) Connection link ③ move knife driving rod ④ .

4) Motion of knife driving rod ④ is transmitted to knife driving stud ⑥ via knife driving stud connection ⑤ .

5) Connection ⑤ moves knife ⑦ up and down.

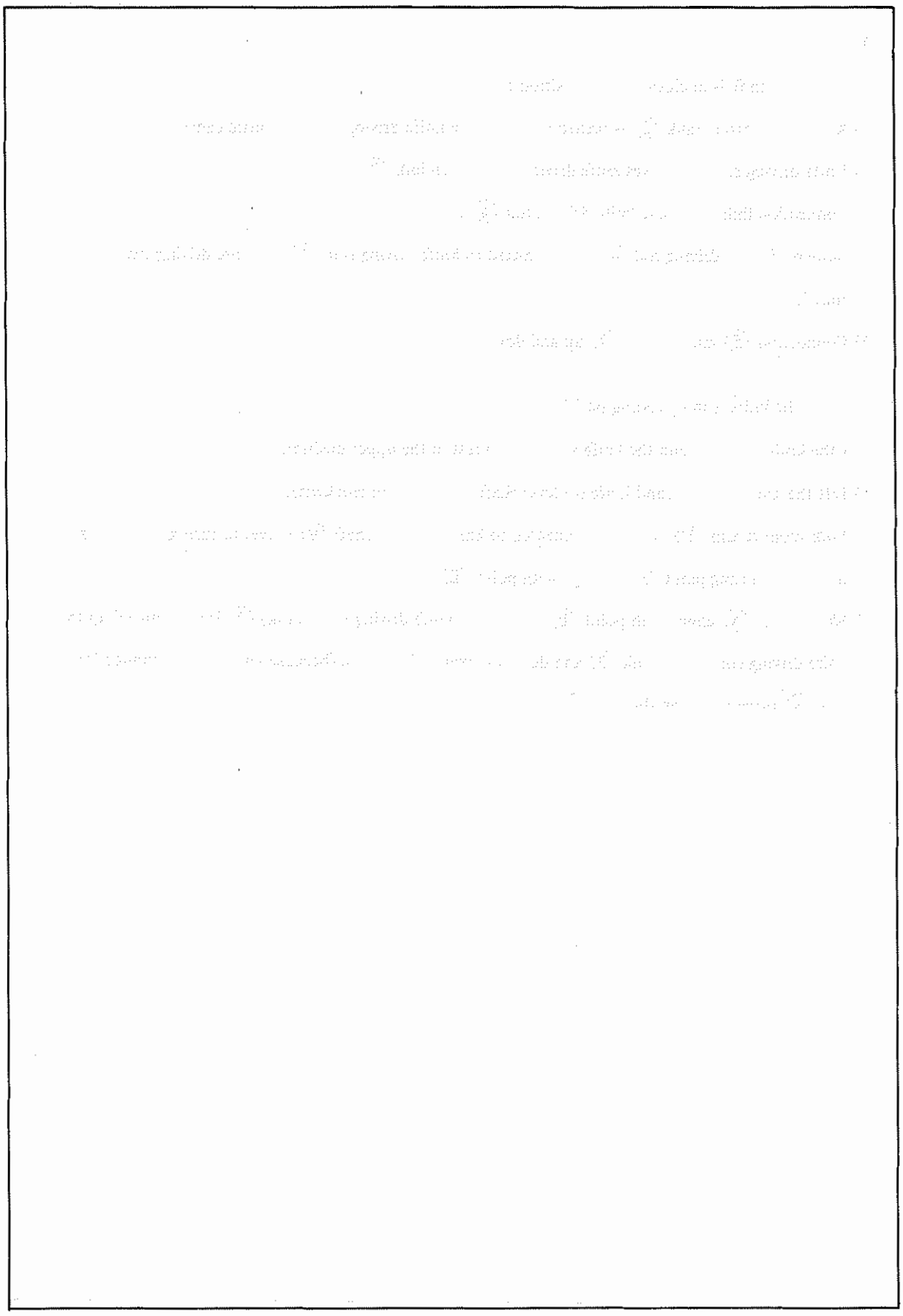
○ When the knife is in its resting position :

Lift the knife set lever, and the knife will rise and rest in the upper position.

1) Lift the knife set lever, and knife set lever shaft ⑨ will turn clockwise.

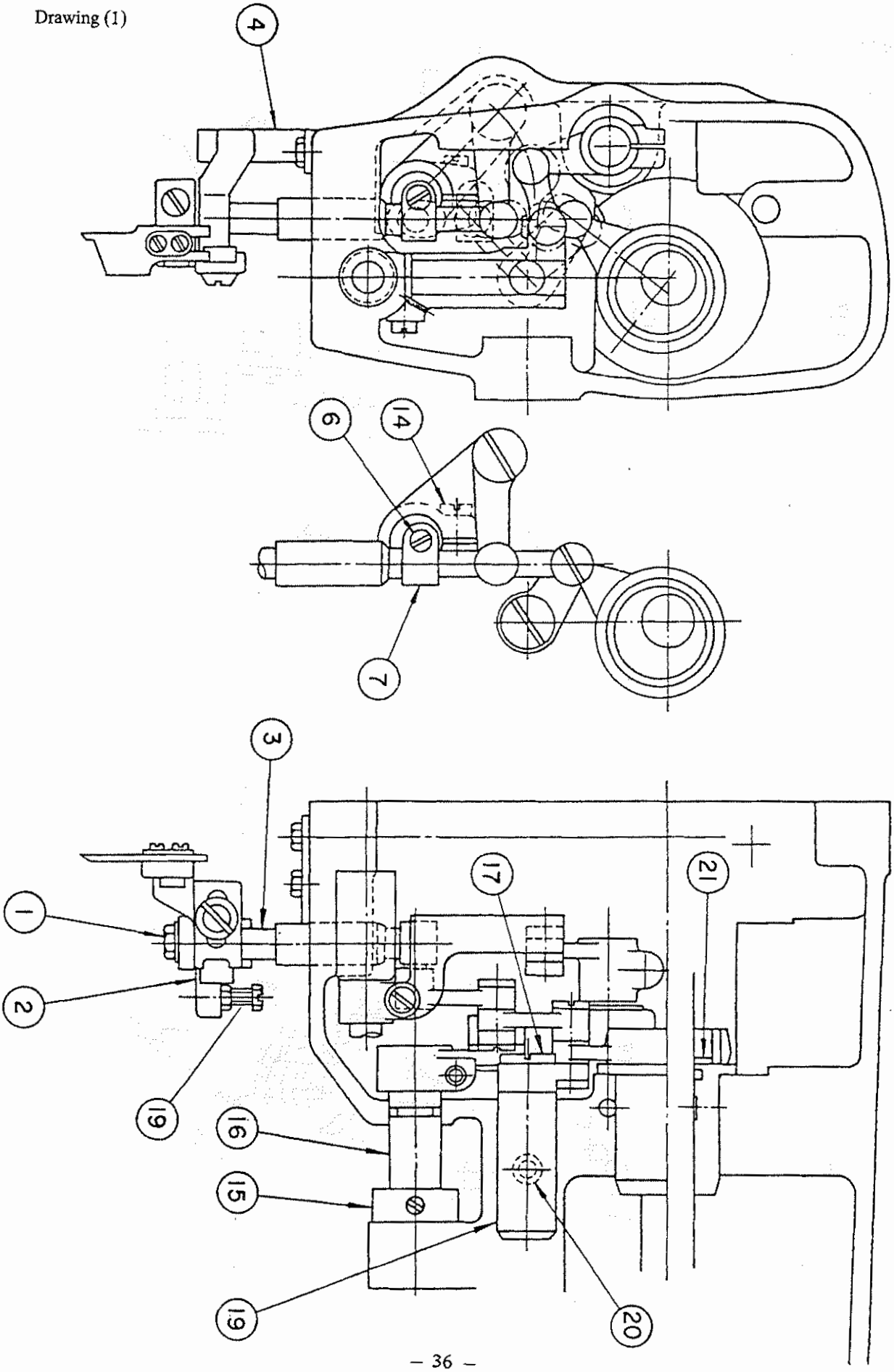
2) Link support arm ⑩ which is connected to knife set lever shaft ⑨ moves to turn knife driving link ⑪ causing point Ⓐ to align with point Ⓑ .

3) When point Ⓐ aligns with point Ⓑ , motion of knife driving rod (crank) ② is transmitted up to knife driving connection link ③ and does not exert other parts. (because knife driving connection link ③ turns round on the axis Ⓑ)



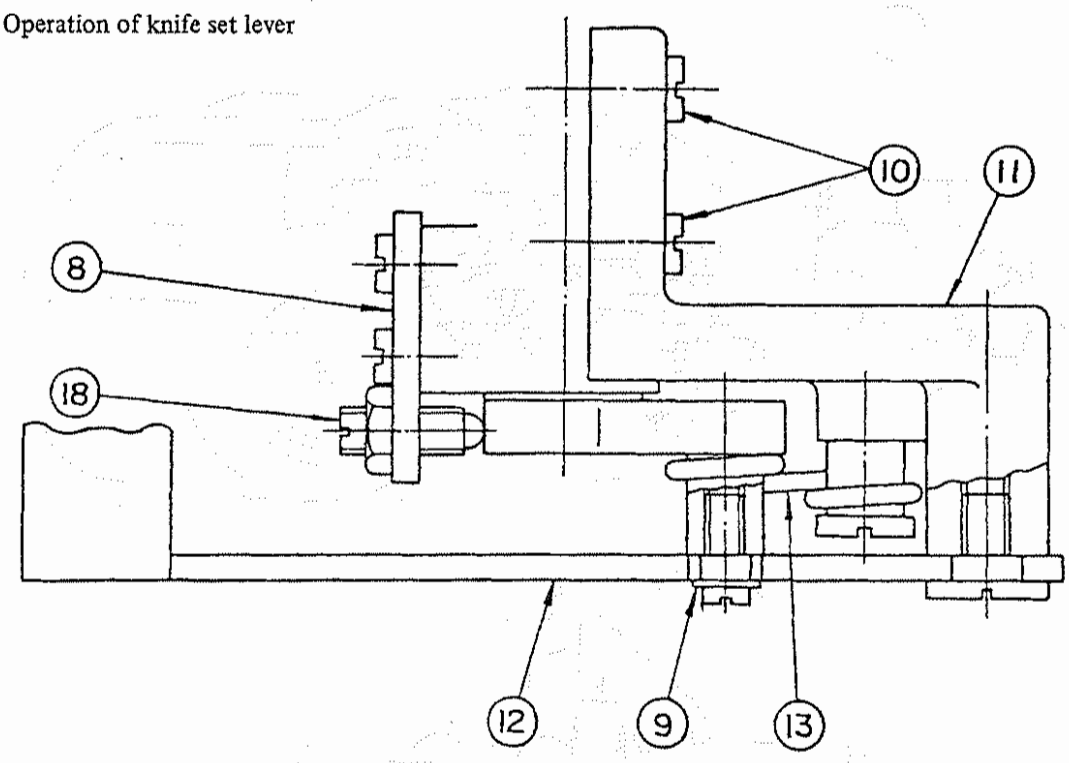
4. Disassembling and reassembling the cloth cutting mechanism

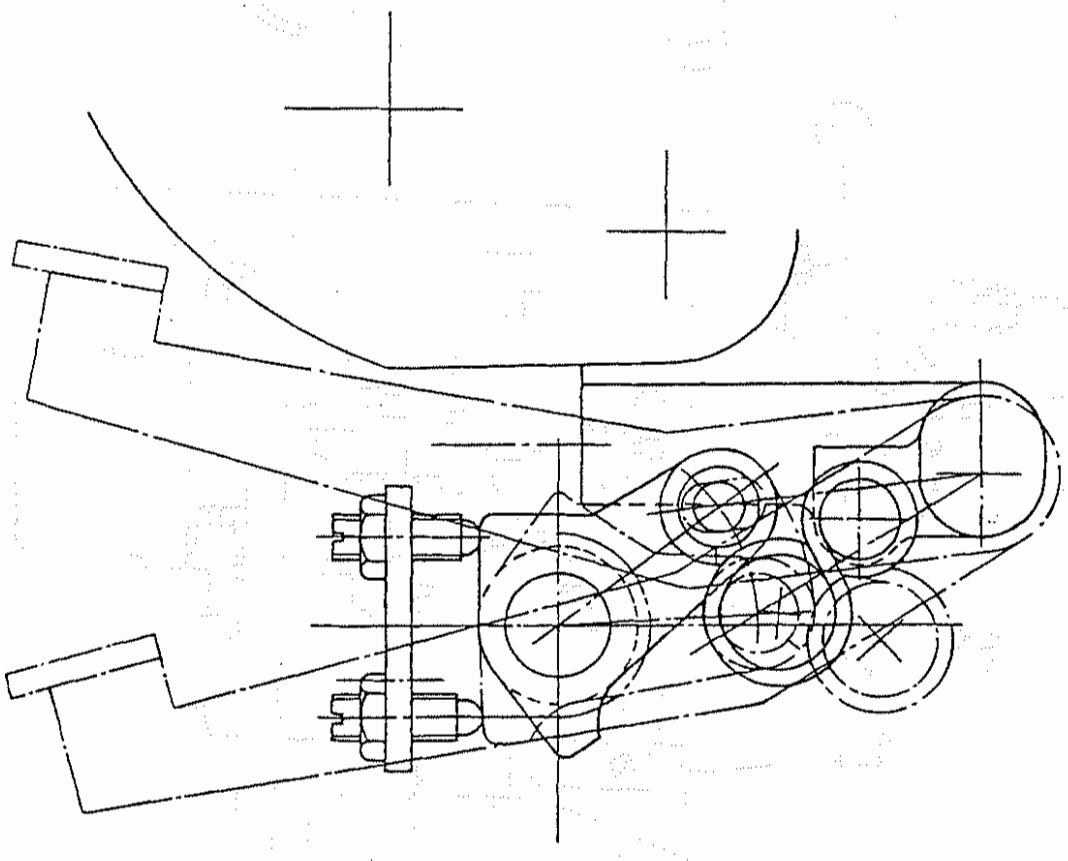
Drawing (1)



Drawing (2)

Operation of knife set lever



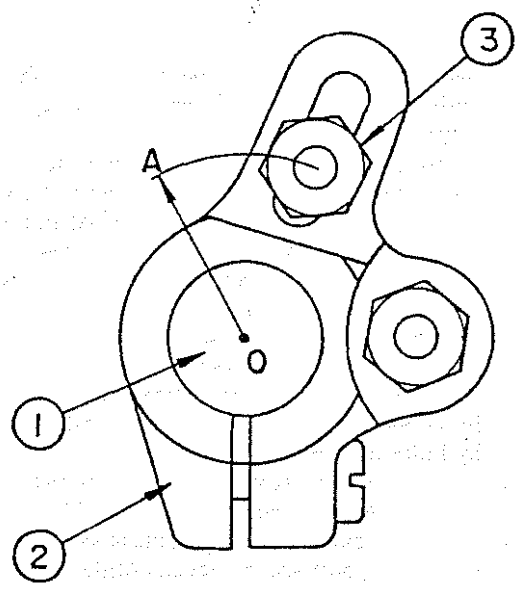


HOW TO DISASSEMBLE	HOW TO ASSEMBLE
1) Remove nut ① and pull out knife mounting base ② (together with the knife) from knife driving stud ③.	○ Sharpen the knife blade according to 3-4-(5).
2) Remove knife mounting base guide ④.	○ When attaching knife mounting base guide ④, make sure that the knife set lever is operated smoothly.
3) Remove the throat plate.	
4) Loosen clamp screw ⑥ and pull out knife driving stud ③ downwards.	○ Set knife driving stud connection ⑦ flush with the top face of knife driving stud ③ and tighten screw ⑥.
5) Remove knife driving stud connection ⑦.	○ Adjust stopper screws ⑱ so that knife mounting base ② stops in its upper rest position when knife set lever ⑫ is lifted and, to the contrary, it comes down 6.5 mm (1/4″) from its upper rest position when the lever is lowered.
6) Remove set lever shaft stopper ⑧.	
7) Remove snap ring ⑨ from the set lever pin, screws ⑩ from the set lever base and then remove set lever base ⑪ (the set lever base can be removed as an assembly of the base, knife set lever ⑫ and spring Ⓑ).	○ Adjust the height of screw ⑨ in the way that the screw head prevents knife mounting base ② from playing in the vertical direction when it has been brought up to its upper rest position by knife set lever ⑫.
8) Loosen link support arm fastening screw ⑭, set free thrust collar ⑮ and pull out knife set lever shaft ⑯.	○ When fastening screws ①, make sure that knife set lever can be operated smoothly. ○ When tightening screw ⑭, make sure that the link support arm moves smoothly.
9) Remove shaft ⑰ from the knife driving rod link shaft.	○ When tightening screw ⑰, loosen screw ⑳ and adjust to permit knife driving rod link shaft to revolve smoothly without friction.
10) Take out knife driving rod (crank) assembly leaving the counterweight being set on the main shaft.	○ Knife cam thrust collar ㉑ must press the main shaft bushing (front) without slipping off. ○ The knife driving rod crank assembly and the related components must smoothly revolve without friction.

5. Needle Feed Mechanism

The needle feed mechanism incorporated in the model DMN-530 is basically the same as that in model DLN-415, excepting that the feed ratio of the needle feed ratio of the needle feed mechanism to the feed dog is adjustable in the case of model DMN-530.

(How to change the needle feed amount)



"A" is a distance from center "0" of feed rocker shaft (2) to center "A" of nut (3) of hinge screw which fasten the feed rocker connecting rod to the feed rocker shaft crank.

- Set "A" to 17 mm (43/64″), and the feed amount of the needle feed mechanism will become the same as that of the feed dog.
- Set "A" to greater than 17 mm (43/64″), and the needle feed amount will exceed the feed amount provided by the feed dog.

(Notes)
The maximum feed ratio of the needle feed to the feed dog is about 1.3.

5. TABLE OF SELECTIVE PARTS

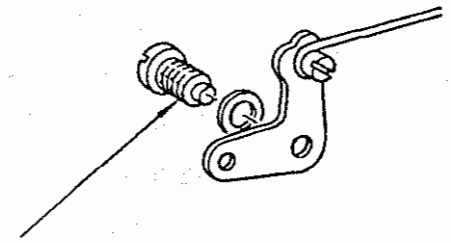
The following parts must be selected for combination use;

Parts	Part No.	
Needle bearing in the main shaft bushing (rear)	B 1230470 A00	$\phi 2$ $^{0}_{-0.002}$
	B 1230470 B00	$\phi 2$ $^{-0.002}_{-0.004}$
	B 1230470 C00	$\phi 2$ $^{-0.004}_{-0.006}$
	B 1230470 D00	$\phi 2$ $^{-0.006}_{-0.008}$
Needle bearing	B 4123522 00A	$\phi 2$ $^{0}_{-0.002}$
	B 4123522 00B	$\phi 2$ $^{-0.002}_{-0.004}$
	B 4123522 00C	$\phi 2$ $^{-0.004}_{-0.006}$
Link shaft	B 1706470 00A	$\phi 6.35$ $^{+0.011}_{+0.016}$
	B 1706470 00B	$\phi 6.35$ $^{+0.006}_{+0.011}$
	B 1706470 00C	$\phi 6.35$ $^{+0.001}_{+0.006}$
	B 1706470 00D	$\phi 6.35$ $^{-0.004}_{+0.001}$
Needle bearing B on the needle bar crank	B 1905541 A00	$\phi 2$ $^{0}_{-0.002}$
	B 1905541 B00	$\phi 2$ $^{-0.002}_{-0.004}$
	B 1905541 C00	$\phi 2$ $^{-0.004}_{-0.006}$
	B 1905541 D00	$\phi 2$ $^{-0.006}_{-0.008}$
Needle roller in the knife driving rod (crank)	B 4123522 00A	$\phi 2$ $^{0}_{-0.002}$
	B 4123522 00B	$\phi 2$ $^{-0.002}_{-0.004}$
	B 4123522 00C	$\phi 2$ $^{-0.004}_{-0.006}$

6. PARTS TO BE LOCKED WITH PAINT

The following parts have been locked up using so-called "Lock-Tight" paint. When those parts are removed, you must remove the paint from the parts using paint thinner and apply new paint to lock them up in place after adjustment. If it is difficult to remove the point-locked parts from the machine, soften the paint by applying heat using a blow torch.

Paint-locked parts to be frequently removed;



Hinge pin in the lifting lever link (left)

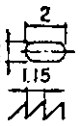
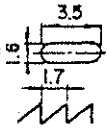
Paint-locked parts to be infrequently removed;

Stopper screw in the throat plate	SS-6080320-SP
Hinge screw in the tension release plate link	SD-0630301-SP
Presser bar bushing (lower)	B-1502-541-000
Knife driving stud bushing	B-4116-530-000

(CAUTION) Take care not to smear the bearing section of the hinge screw with lock-paint, or it may reduce the efficiency of the hinge screw.

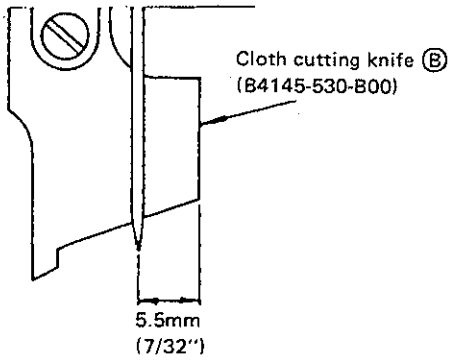
7. GAUGE SETS FOR SPECIAL SPECIFICATIONS

(1) Table of Gauge Sets

		3.2 mm (1/8")	4.0 mm (5/32")	4.8 mm (3/16")	5.6 mm (7/32")	6.4 mm (1/4")
Gauge plate		D B1190-530-D00	E B1190-530-E00	F B1190-530-F00	G B1190-530-G00	H B1190-530-H00
Feed dog	Standard Needle hole / Tooth pitch 	B1609-530-D00	B1609-530-D00	B1609-530-D00	B1609-530-G00	B1609-530-G00
	Coarse tooth Needle hole / Tooth pitch 	B1609-530-E00	B1609-530-E00	B1609-530-E00	B1609-530-H00	B1609-530-H00
Presser foot	Without finger guard	B1524-530-DA0	B1524-530-EA0	B1524-530-EA0	B1524-530-GA0	B1524-530-GA0
	With finger guard	B1524-530-DB0	B1524-530-EB0	B1524-530-EB0	B1524-530-GB0	B1524-530-GB0
Waste material guard	Standard	B1191-530-E00	B1191-530-E00	B1191-530-E00	B1191-530-G00	B1191-530-G00
	Special, without knife blade relief cavity	B1191-530-E0B	B1191-530-E0B	B1191-530-E0B	B1191-530-G0B	B1191-530-G0B

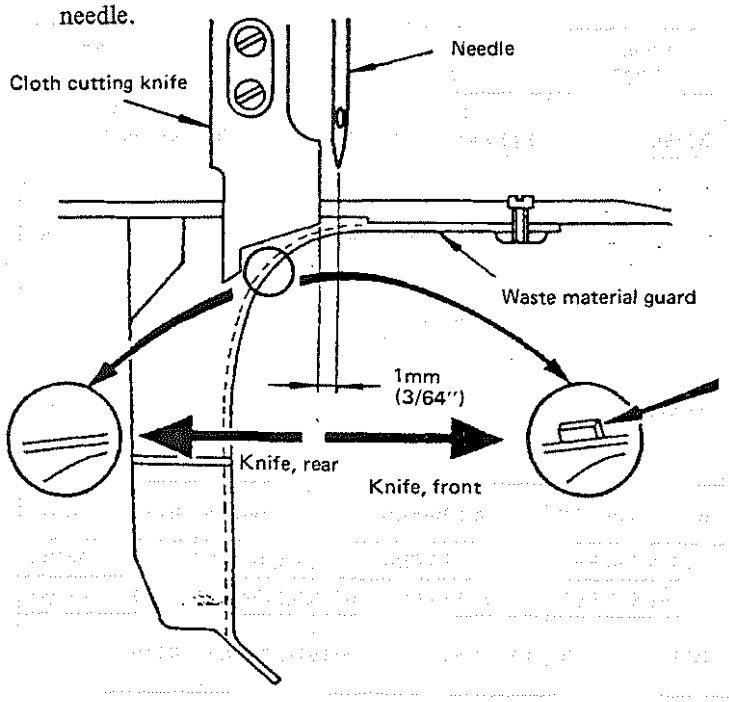
A gauge set of D, E, F, G, or H must be used according to the selected needle gauge as listed above.

(2) Cloth cutting knife Ⓑ



Cloth cutting knife Ⓑ (B4145-530-B00) has a longer knife blade than the standard knife so that it can cut the fabric 5.5 mm (7/32") (max.) ahead of the needle center, while the standard knife cuts 2 mm (5/64") ahead of the needle center.

(3) Waste material cover (without knife blade relief cavity) when the knife is set to cut behind the needle.



The waste material cover (without knife blade relief cavity) can be used only when the cloth cutting knife is set to cut behind the needle with a 1 mm (3/64") or more clearance measured from the needle center line.

Since the use of this waste material guard is quite limited, install it only when you are specially requested by your customers.

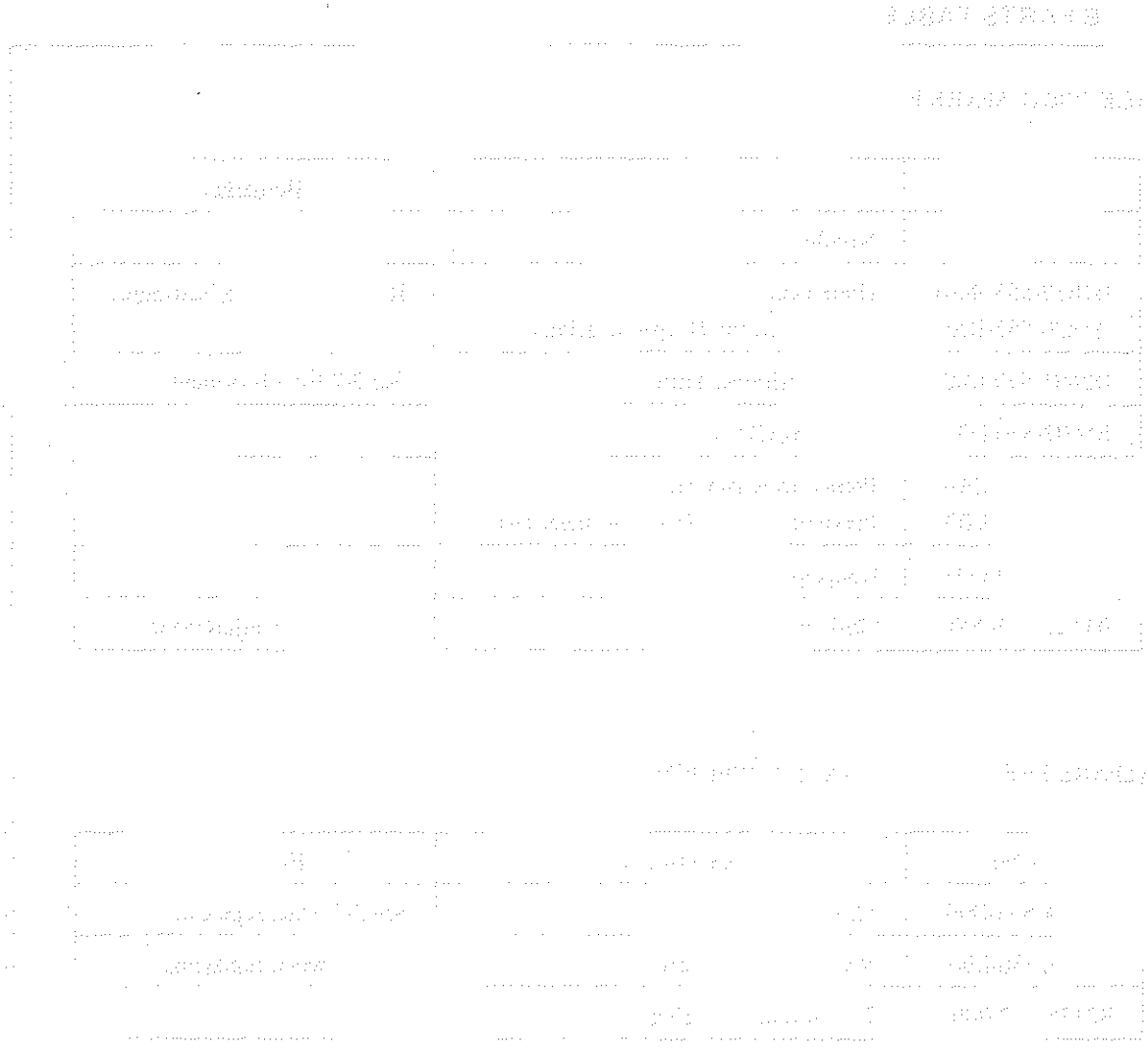
8. SPARE PARTS TABLE

(GENERAL SPARE PARTS)

Part No.	Description	Remarks
	Needle	
D1830-555-B00 D1830-555-DAA	Hook (asm) Hook (asm) for JE specifications	Refer to 3-2 for adjustment.
D2401-530-D00	Thread trimmer knife	See 3-7 for adjustment.
B1609-530-D00	Feed dog (D)	
B1524-530-EA0 B1524-530-EB0	Presser foot asm. (E) Presser foot asm. (E) with finger guard	
B1190-530-E00	Gauge plate, 3/16 F	
B4121-522-000	Cloth cutting knife	See 3-4-3 for adjustment.

(SPARE PARTS OCCASIONALLY NEEDED)

Part No.	Description	Remarks
D2404-530-D00	Thread spreader	See 3-7 when replacing.
B1191-530-E00	Waste material guard	See 3-6 when replacing.
B3128-012-000	Thread take-up spring	



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