

JUKI®

MO-3300 Series

ENGINEER'S MANUAL

29328507

No.00

PREFACE

This Engineer's Manual is written for the technical personnel who are responsible for the service and maintenance of the sewing machine. This manual describes "Adjustment Procedure", "Results of Improper Adjustment", and other functions which are not covered by the Instruction Book intended for the maintenance personnel and sewing operators at a sewing factory.

All personnel engaged in repair of MO-3300 are required to carefully read Section 2 "Standard Adjustment" which contains important information on the maintenance of MO-3300.

The "Standard Adjustment" consists of two parts; the former part presents illustration and simplified explanation for the convenience of reconfirmation of the required adjustment values in carrying out actual adjustment after reading this manual once; and the latter part provides "Results of Improper Adjustment" in which sewing and / or mechanical failures, and the correcting procedures are explained for those persons who perform such adjustment for the first time. It is advisable to use "MO-3300 Parts Book" together with this Engineer's Manual.

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1. SPECIFICATIONS

MO-3300 SERIES

1	Model	MO-3304	MO-3314	MO-3316
2	Description	1-needle overlock machine	2-needle overlock machine	Safety stitch machine (interlock)
3	Stitch type F.S.T.	504	514	516
4	Max. sewing speed (rpm)	6,500		
5	Stitch length (mm)	1.0 to 3.6		1.5 to 3.6
6	Needle gauge (mm)		2.0	3.2, 4.8
7	Overedging width (mm)	4.0, 4.8		4.0, 4.8, 6.4
8	Differential feed ratio	Gathering 1 : 1.9 (Max. 1 : 2.9), Stretching 1 : 0.8 (Max. 1 : 0.6)		
9	Needle bar stroke (mm)	25.5		
10	Needle tilt angle	20°		
11	Needle	ORGAN DCX27 (standard), DCX1 can be used.		
12	Presser lifting amount (mm)	6.5		
13	Presser foot pressure	Max. 64N (6.5kg)		
14	Stitch adjusting method	By pushbutton		
15	Upper knife	Flat knife		
16	Differential feed adjustment	By lever + micro-adjustment		
17	Weight (kg)	25		
18	Lubrication	Trochoid pump type automatic lubrication		
19	Lubricating oil	New Defrix Oil No. 2		
20	Needle cooler	By silicon oil lubricating unit for the needle tip		
21	Motor	2P 400w		

* There is no interchangeability between gauges for MO-3300 series and those for MO-3900, -3700 and -3600. Use the gauges for MO-3300 series.

2. MODEL NUMBERING SYSTEM

MO-3300
JUKI CORPORATION

Class BE6-42H
S170/X○○

Attachment & Device Code

Model No. Code

Subclass Code

Extra Order (On the Spot) code

MO-3300 - BE6 - 42H / S170 / X○○

Model code	Indicates the classification by models
MO-33△△	High-speed high-grade series for standard overlock machine

Seam code	Stitch type
(Conforms to USA standard)	
01	..... 501
02	..... 502
03	..... 503
04	..... 504
05	..... 505
12	..... 512
14	..... 514
15	..... 515
16	..... 516
21	..... 521
40	..... 540
43	..... 3-needle safety stitch
45	..... 2-needle double chain stitch

Special specification code	Special specifications
	requiring considerable difference in mechanical configuration.
No mark	... For domestic market specifications
E	..... For export General specifications

Needle gauge code	Needle gauge (mm)
0	..... 1-needle
X	..... 1.2
A	..... 1.6
B	..... 2.0
C	..... 2.4
D	..... 3.2
E	..... 4.0
F	..... 4.8
G	..... 5.6
H	..... 6.4
K	..... 8.0
R	..... 6.8
BB	..... 2x2
D.B	..... 3.2x2
F.B	..... 4.8x2
	3-needle
	Safety switch side
	Overlock side

Overedging width code	Overedging width (mm)
A	..... 1.6
B	..... 2.0
C	..... 2.4
D	..... 3.2
E	..... 4.0
F	..... 4.8
G	..... 5.6
H	..... 6.4
K	..... 8.0

Feed dog code	Number of feed dog rows
5	..... 1-row
4	..... 2-row
6	..... 3-row
7	..... 4-row

Material code	Classification based on type and thickness of materials to be used (The figures show grade of material thickness.)
1	Extra-light
2	For knitted goods
3	Standard for knitted goods, general fabrics, wool knit, sweater, bulky
4	
5	Heavy-weight materials
6	Heavy-weight materials

Application code	Classification based on type of operation
0	..... For unslitching
1	..... For blind hemming
2	..... For gathering
3	..... For piping
4	..... For attaching tape
B	..... For piping and gathering
	Codes of alphabets starting from A are only intended to be used for combinations of 1 to 9 and special-purpose materials.

Special machine code	These codes indicate special classifications of mechanical components other than gauge components.
0	..... Standard
H	..... Upper looper extra high throw type
	Alphabets are only intended to be used for combinations of 1 to 9 and the machines.

Specifying code for class	These cords indicate partial change or specifying of subclass model components (See below for the details)
*1	Classification
	Replacement gauge
	Throat plate
	Feed dog
	Presser foot
	Looper
*2	Attachments
	Blind hemming
	Gathering
	Tape guide

Extra-order code	*3
	Codes that are designated in case where it is necessary to respond to the need for any special type of part on the spot.
	Extra orders are numbered in the order of occurrence and the detailed description is given in a separate sheet.

*1 Mainly concerned with separate gauges except for inseparable gauge sets such as throat plate and feed dog. In this case, list the simultaneous replacement parts. When replacing some discrete gauges, write as follows. (Example) G09/H01/H03)

*2 Attachments or the like that will work as a unit or a set that can be mounted on standard machines (Accompanied by simultaneous replacement gauge parts)

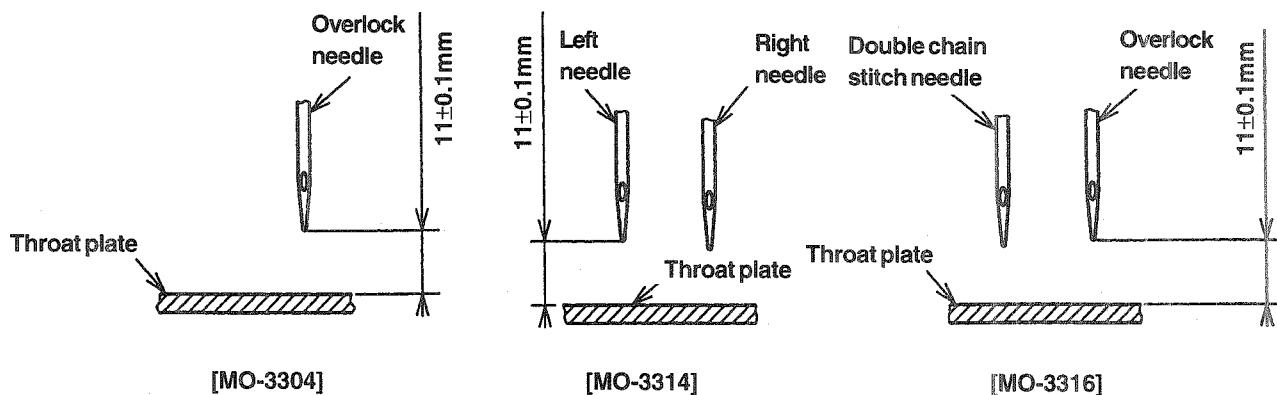
*3 Coding is made when required to deliver the machine head on which extra-ordered components excluding gauges and attachments should be mounted beforehand. (Depending on the conversion table of code)

3. STANDARD ADJUSTMENT (FOR MAIN UNIT)

Standard Adjustment

(1) Adjusting the needle height

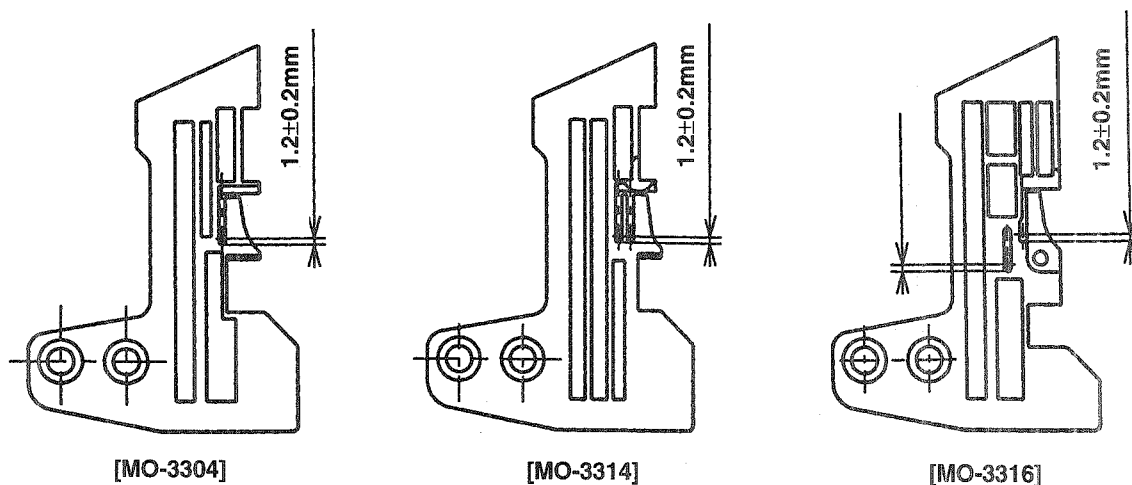
Height of the needle from the top surface of the throat plate when the needle is in the highest position.



(2) Positioning the throat plate

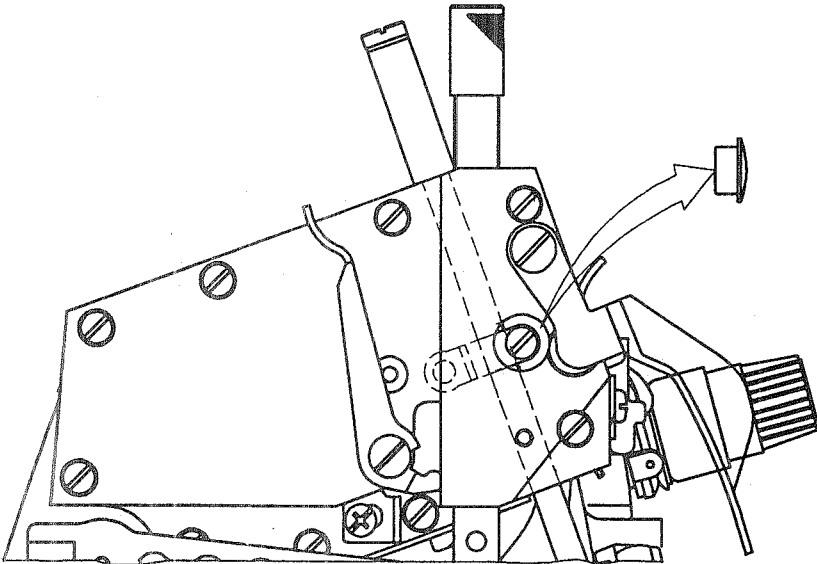
Needle entry point (from the needle slot edge of the throat plate to the center of the needle)

Overlock side	1.2mm
Double-chainstitch side	1.3mm



Adjustment Procedures

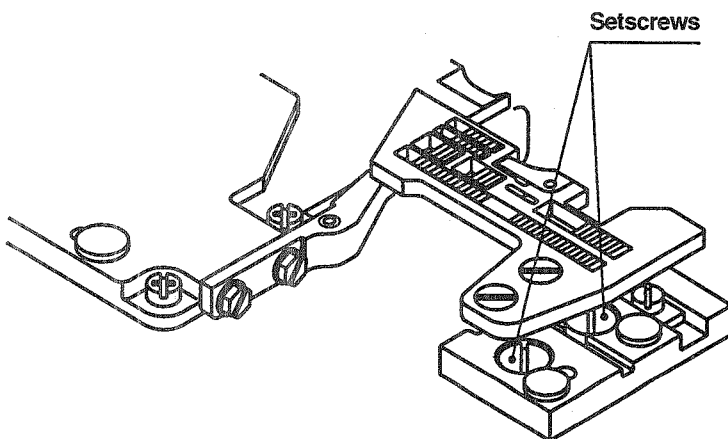
- Remove the side face cover rubber cap, and loosen the setscrew in the needle bar bushing to perform the adjustment of the height of the needle.



Results of Improper Adjustment

- Any other needle height than specified here will badly affect the scooping position of the lower looper, the timing for catching the upper looper thread, etc. So, it is not desirable to change the height of the needle.

Loosen the setscrews in the throat plate base to make the adjustment.



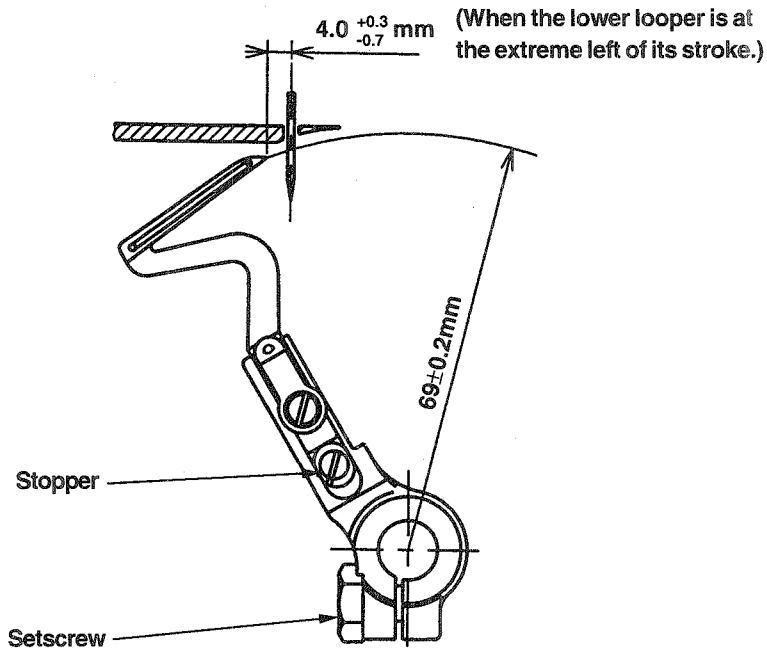
- Improperly positioned throat plate will cause needle breakage, contact with the feed dog, or other troubles. So, it is not desirable to change the position.

Standard Adjustment

(3) Adjusting the lower looper

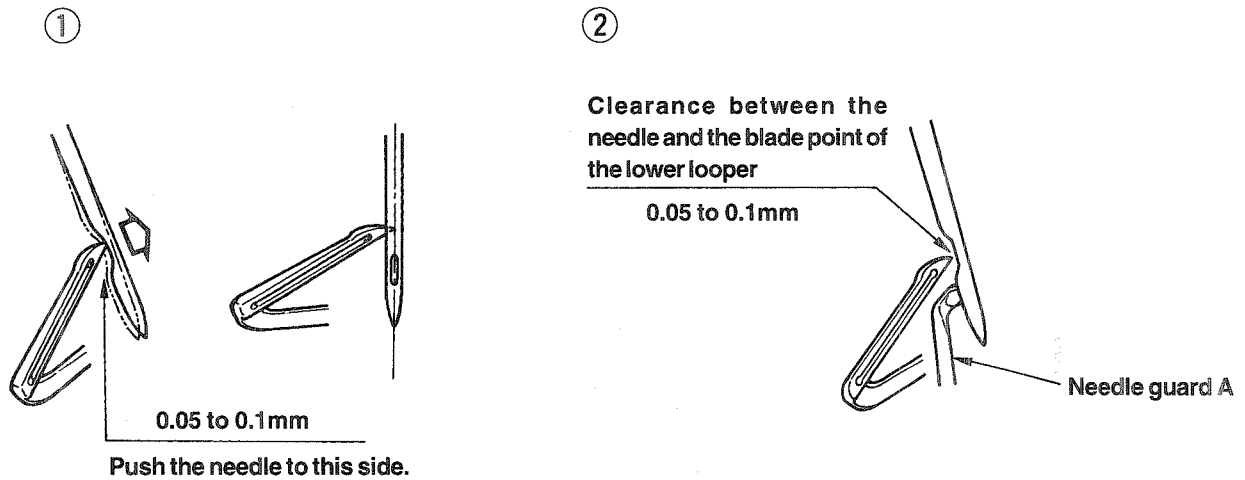
1) Returning amount of the lower looper

Returning amount of the lower looper : $4.0^{+0.3}_{-0.7}$ mm



2) Clearance between the lower looper and the needle

The clearance should be 0 to 0.05 mm.



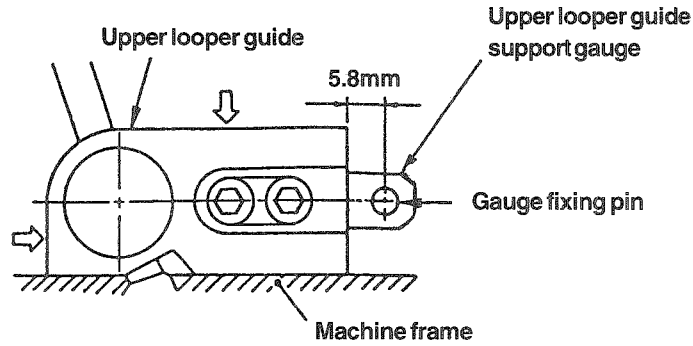
Adjustment Procedures	Results of Improper Adjustment
<ul style="list-style-type: none"> ○ Loosen the setscrew in the lower looper support arm to make the adjustment of the returning amount of the lower looper. (Reference information) The radius of the lower looper will be 69 mm when the lower looper is inserted into the support arm until it comes in contact with the stopper pin and then fixed. ① In the state that the blade point of the lower looper is aligned with the center of the needle, adjust the lower looper so that the needle is pushed to this side by 0.05 to 0.1 mm by the blade point of the lower looper. ② Next, in the state that the needle is pushed to this side by the needle guard A, adjust the needle guard A so that a clearance of 0 to 0.05 mm should be provided between the needle and the blade point of the lower looper. ○ For the 2-needle overlock machines, adjust both the left and right needles in the same manner. 	<ul style="list-style-type: none"> ○ Excessive return of the lower looper tends to cause needle thread stitch skipping when filament thread is used. ○ Insufficient return of the lower looper tends to cause needle thread stitch skipping when mixed yarn is used. ○ Excessive clearance will often cause needle thread stitch skipping. ○ Insufficient clearance will cause needle breakage due to the contact of the looper with the needle, or produce scratches on the blade point of the looper, leading to needle thread breakage or other troubles.

Standard Adjustment

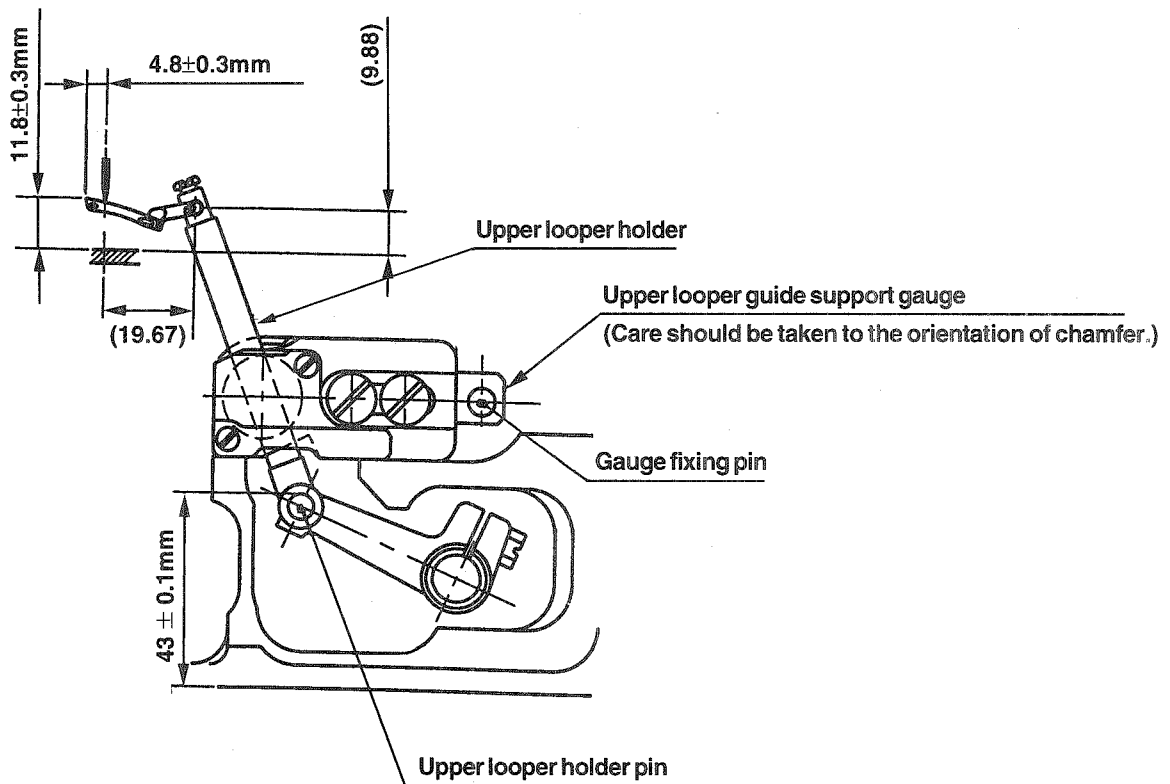
(4) Position of the upper looper guide

Vertical position : To be in close contact with the frame guide surface.

Lateral position : To be pressed against the upper looper guide support gauge.



(5) Positioning the upper looper arm and the upper looper



Adjustment Procedures

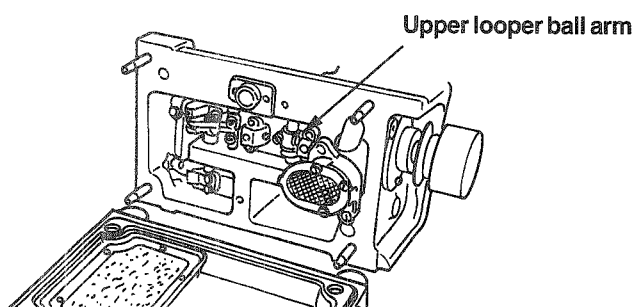
- Enter the upper looper guide support gauge to the gauge fixing pin which is fit in the machine frame by driving fit and perform come-off prevention with the rubber ring. Then adjust the position of the upper looper guide referring to the orientation of chamfer.
- Making the upper looper guide come in close contact with the bottom surface of the machine frame, press it against the gauge and then tighten the screw.

<Adjustment procedure>

Loosen the upper looper ball arm.

Position the upper looper holder so that it smoothly moves when it is allowed to have a slightly larger stroke than that of the upper looper clamp, then tighten the setscrew of the upper looper holder. (Make sure that the upper looper holder smoothly moves together with the shaft.)

Then properly adjust the distance between the bottom surface of the machine frame and the top of the upper looper holder pin before tightening the setscrew in the upper looper ball arm.



- Set a hexagonal wrench key onto the setscrew located at the upper side of the upper looper holder to adjust the height of the upper looper. Determine the position while observing the clearance produced between the upper looper and lower looper at the time of their crossing.

Results of Improper Adjustment

- If the upper looper guide has been improperly positioned vertically, it will cause oil leakage or disturbed path of the upper looper with resultant stitch skipping.
- If the upper looper guide has been inaccurately positioned laterally, it will cause stitch skipping, or contact with the looper.
- Inaccurately positioned upper looper holder will cause excessive projection of the upper looper, resulting in stitch skipping, or contact.
- If the upper looper ball arm has been improperly positioned longitudinally, seizure will result (mainly because the arm sticks when it goes up).

(Caution)

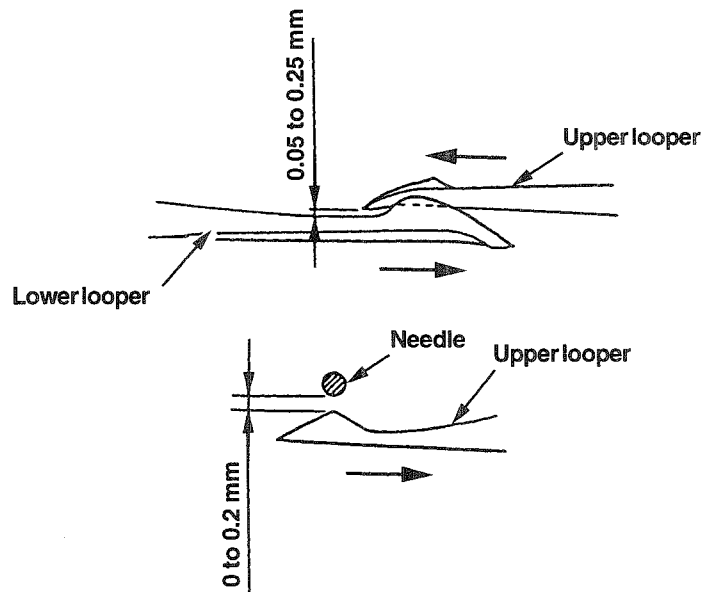
To adjust the upper looper ball arm, take the position of the upper looper arm as standard. Remember that the projecting amount and the height of the upper looper should eventually be properly adjusted. So, confirm the dimensions related to the upper looper.

- If the upper looper has been positioned too high, an excessive clearance will be produced between the upper looper and the needle. As a result, the upper looper thread will fail to catch the needle thread, and stitch skipping will occur.
- On the contrary, if the upper looper has been positioned too low, the needle point will hit the looper, causing needle breakage. Also, the looper will come in contact with other components when the presser foot goes up.

Standard Adjustment

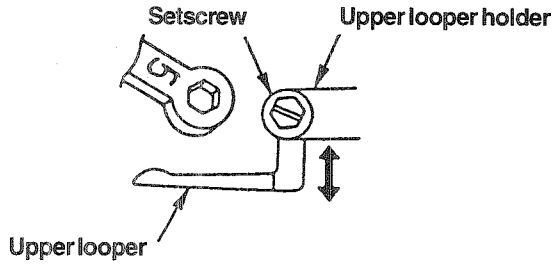
Longitudinal position of the upper looper

- ① The clearance provided between the upper and lower loopers should be 0.05 to 0.25 mm when they cross with each other.
- ② The clearance provided between the upper looper and the needle should be 0 to 0.2 mm.



Adjustment Procedures

- Loosen the setscrew located at the top end of the upper looper holder to move the looper back or forth for positioning.



Results of Improper Adjustment

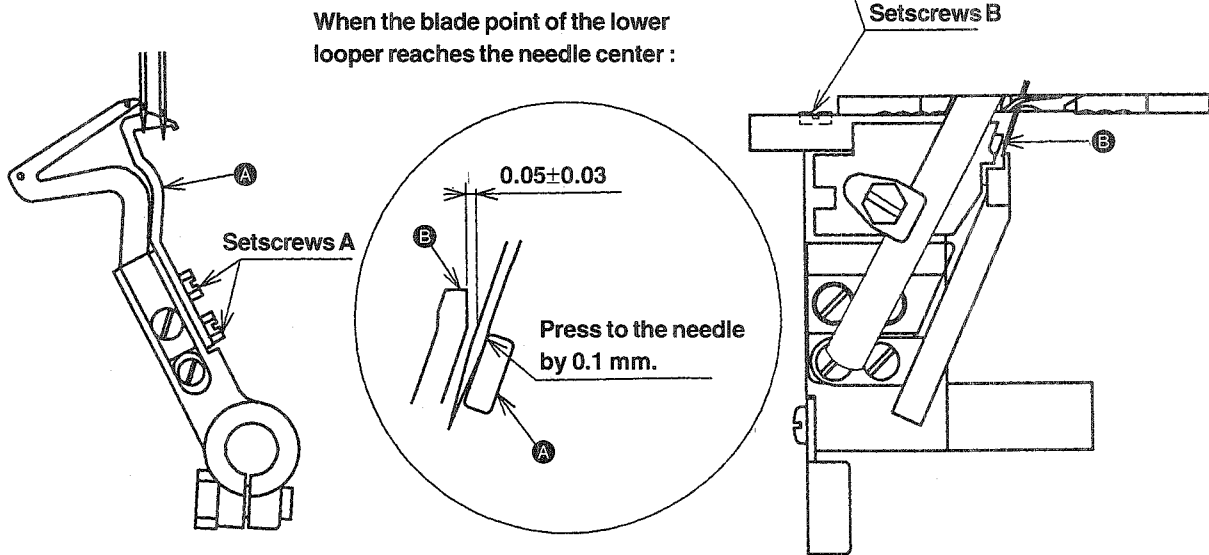
- Excessive clearance will cause stitch skipping.
- Insufficient clearance will cause the upper looper to come in contact with the lower looper.

Standard Adjustment

(7) Positioning the needle guard

1) For 1-needle or 2-needle overlock machine

The overlock machine has two needle guards, A and B.

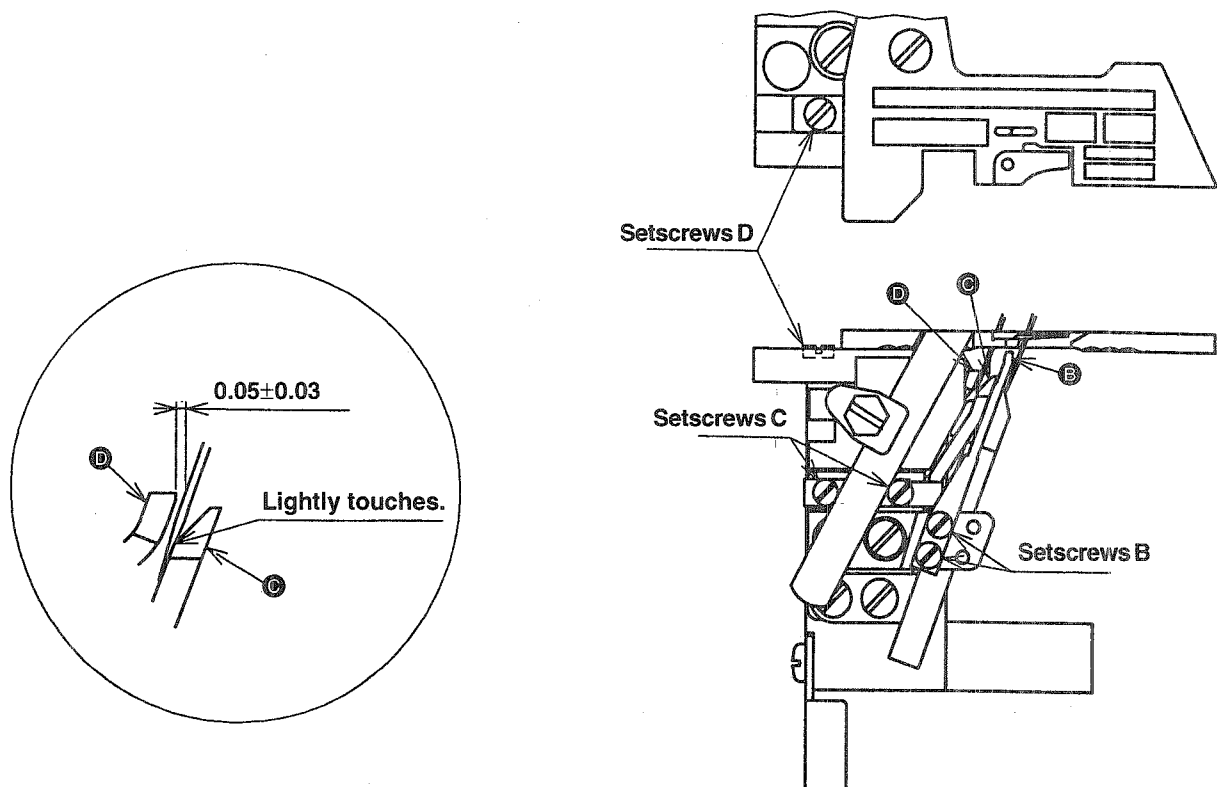


2) For safety stitch (interlock) machine

The safety stitch machine has four needle guards, A, B, C and D.

The needle guards, A and B are positioned in the same manner as those for the overlock machine.

The needle guards, C and D, for the interlock needle should be positioned as shown in the following figure.

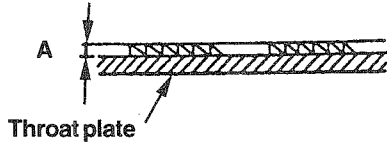


Adjustment Procedures	Results of Improper Adjustment
<ul style="list-style-type: none"> ○ Loosen the setscrews A and adjust the clearance provided between needle guard A and the needle. ○ Loosen the setscrews B and adjust the clearance provided between needle guard B and the needle. 	<ul style="list-style-type: none"> ○ Excessively close contact between needle guard A and the needles will lead to needle bend or stitch skipping. ○ A clearance provided between needle guard A and the needles will cause the looper blade point to come in contact with the needles, leading to needle or blade point breakage, or other troubles. ○ Excessive clearance provided between needle guard B and the needle will cause stitch skipping due to needle shake. On the contrary, insufficient clearance will cause the needle guards to catch the needles between them, leading to wear on the needle guards and scratches on the needles.
<ul style="list-style-type: none"> ○ Loosen the setscrews C and adjust the clearance provided between needle guard C and the needle. ○ Loosen the setscrews D and adjust the clearance provided between needle guard D and the needle. 	<ul style="list-style-type: none"> ○ If the clearance provided between needle guard C and the needles is too large, the double chain looper blade point will come in contact with the needles, causing the breakage of the needles or looper blade point. No clearance left between them will cause them to come in excessively close contact with each other, and needle bend, wear on the needle guard or scratches on the needles will occur. ○ Excessive clearance provided between needle guard D and the needles will cause stitch skipping due to needle shake, and insufficient clearance will cause the needle guards to catch the needles between them, leading to wear on the needle guards and scratches on the needles.

Standard Adjustment

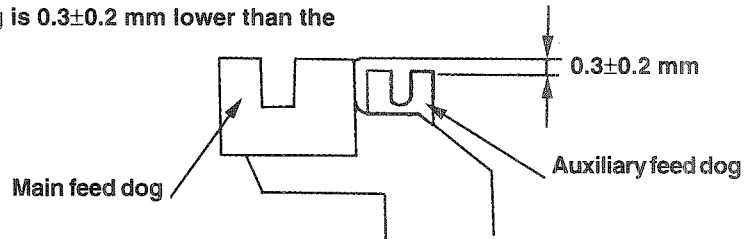
(8) Adjusting the height of the feed dog

The height of the feed dog from the top surface of the throat plate when the feed dog is at its highest position :



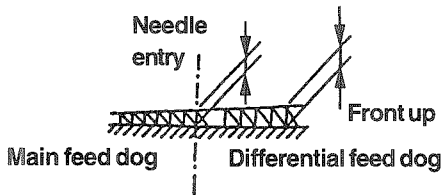
Model	Height of the feed dog : A
MO-3304E	1 mm
MO-3314E-△△△-40H/42H	
MO-3316E	1.2 mm
MO-3314E-△△△-44H	

The auxiliary feed dog is 0.3 ± 0.2 mm lower than the main feed dog.

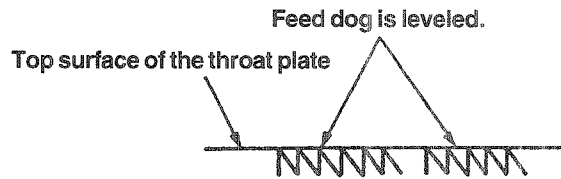


(9) Adjusting the tilt of the feed dog

Tilt when the feed dog is at its highest position. When the feed dog juts out the top surface of the throat plate.



Note that needle entry is 1.2 mm and front up is 1.4 mm only for MO-3314E-△△△-44H.



Adjust the tilt of the feed dog when it is in its highest position so that the feed dog is flush with the throat plate when the feed dog juts out the throat plate.

(10) Changing the differential feed ratio

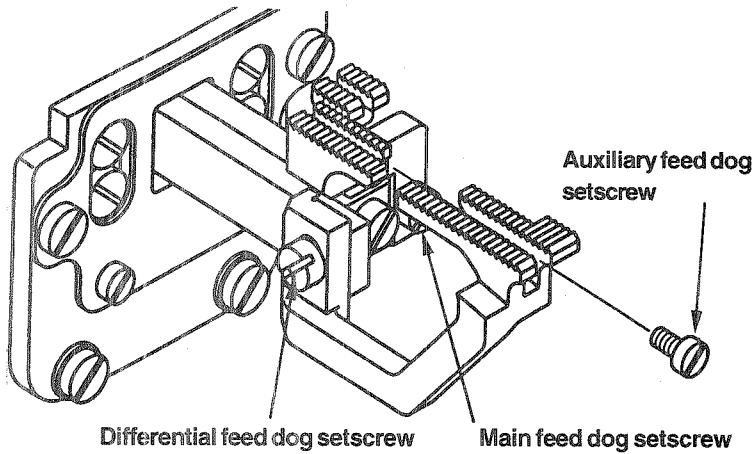
Generally, the adjustment of differential feed is made by the differential feed adjusting lever. However, if a desired adjustment cannot be made by this lever, the differential feed ratio should be changed.

	Nut Main feed pin (18) Main feed rocker	Pin at its highest position 19.3	Pin at the lowest position 12
(Standard)	Gathering : 1 : 1.9 Stretching : 1 : 0.7	(Max. stretching) Gathering : 1 : 1.5 Stretching : 1 : 0.6	(Max. gathering) Gathering : 1 : 2.9 Stretching : 1 : 1.4

Adjustment Procedures

Results of Improper Adjustment

- Perform the adjustment by the respective setscrews.



- If the feed dogs are too high, the needles will be deflected and broken when sewing heavy-weight materials. The feed dogs will tend to suffer scratches when sewing light-weight materials. Puckering will frequently occur.
- If the feed dogs are too low, insufficient feed power will result.
- If the auxiliary feed dog is too high, chain-off thread will be often jammed.
- If the main feed dog and differential feed dog are set at different heights, proper differential feeding action will be hindered.

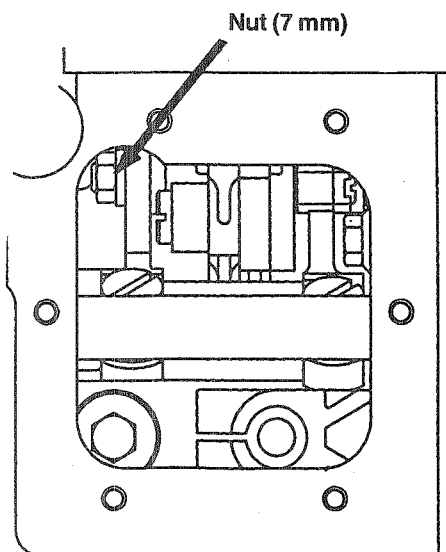
- The feed bar shaft consists of an eccentric shaft. Loosen the setscrew to perform the adjustment.

- When tilted with the front up
Good material catching will be obtained.
- When tilted with the front down
Uneven feed and puckering will be effectively prevented.

- Remove the cover on the rear of the machine frame, loosen the nut of the main feed pin, and adjust the position of the pin.

When the pin is set at its highest position ...
Max. stretching is obtained.

When the pin is set at its lowest position ...
Max. gathering is obtained.



Standard Adjustment

(11) Longitudinal position of the feed bar

When the feed pitch is maximized and the differential feed ratio is 1 : 1.9 (standard max. gathering), the position should be adjusted as follows :

Longitudinal position of the main feed dog

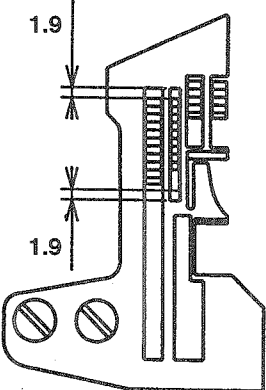
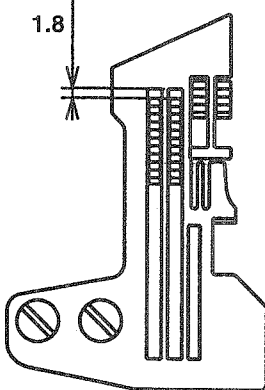
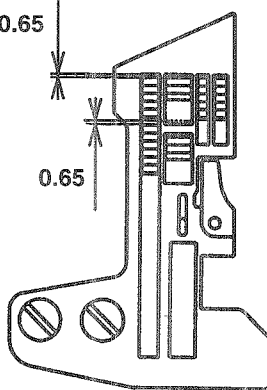
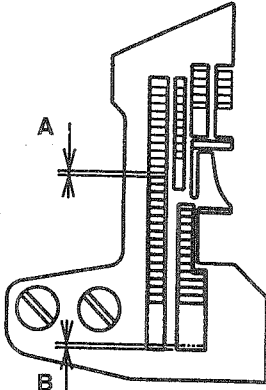
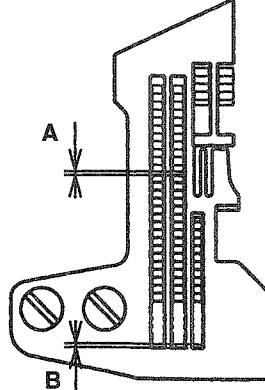
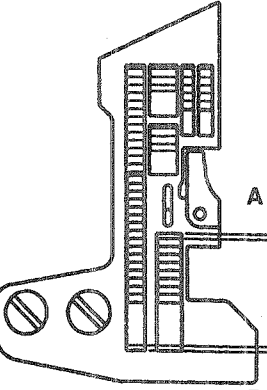
For 04 type : Clearance provided between the throat plate and the main feed dog is 1.9 mm when the main feed dog moves back until it goes no further (the front and rear ends of the main feed dog should be equally spaced.).

For 14 type : Clearance provided between the throat plate and the main feed dog is 1.8 mm when the main feed dog moves back until it goes no further.

For 16 type : Clearance provided between the throat plate and the main feed dog is 0.65 mm when the main feed dog moves back until it goes no further (the front and rear ends of the main feed dog should be equally spaced.).

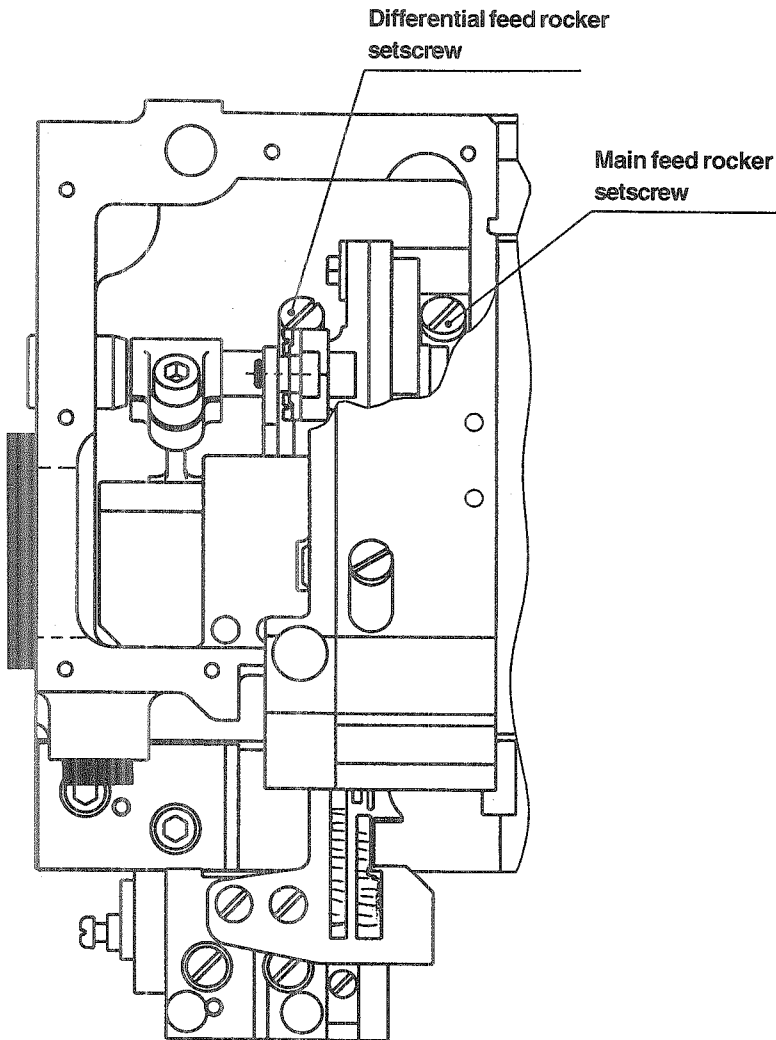
Longitudinal position of the differential feed dog

Clearance provided between the throat plate and the main feed dog should be equally spaced in the longitudinal position.

MO-3304	MO-3314	MO-3316
<p>Main feed dog</p> 	<p>Main feed dog</p> 	<p>Main feed dog</p> 
<p>Differential feed dog</p> 	<p>Differential feed dog</p> 	<p>Differential feed dog</p> 
<p>A = B (equally spaced : 0.8 mm)</p>	<p>A = B (equally spaced : 0.8 mm)</p>	<p>A = B (equally spaced : 1.2 mm)</p>

Adjustment Procedures

- Remove the feed mechanism cover, loosen the main feed rocker setscrew and the differential feed rocker setscrew, and adjust the clearance provided between the throat plate and the feed dog.



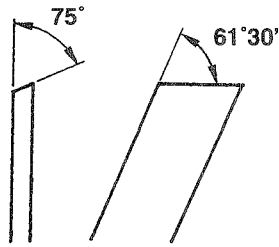
For installing the feed mechanism cover, refer to the item ⑦ given in 4-(3) Cautions on installation.

Results of Improper Adjustment

- If the clearance provided between the throat plate and the feed dog is too small, they will come in contact with each other when the sewing machine runs at high speed.

Standard Adjustment

(15) Resharpener of the knife

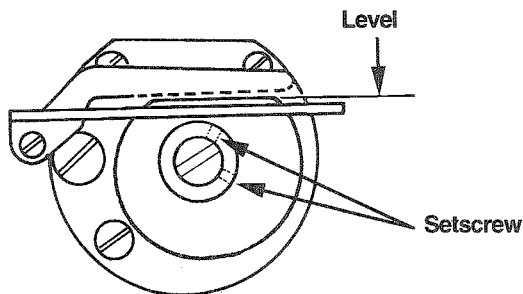


[Note] The lower knife is exclusive for MO-3300 series.

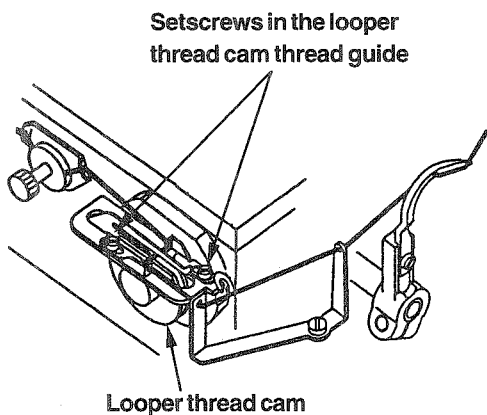
(16) Position of the looper thread cam (Applicable only to MO-3316 series)

1) Adjustment of the looper thread cam

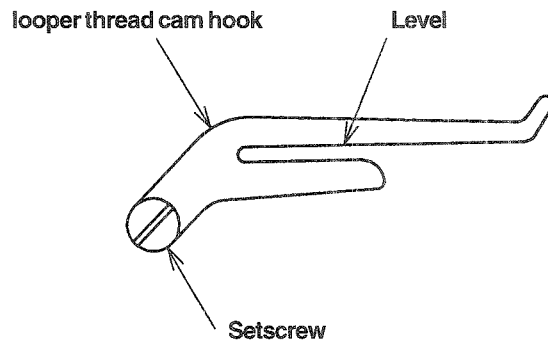
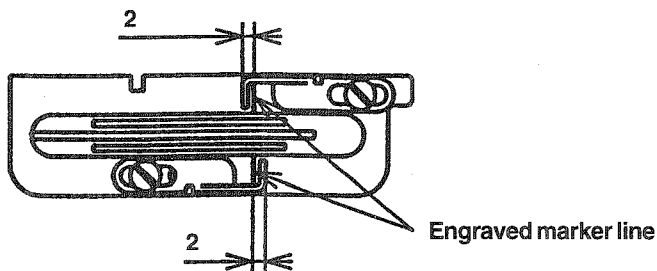
Install the looper thread cam so that its straight section is leveled when the needle is in its highest position of its stroke.



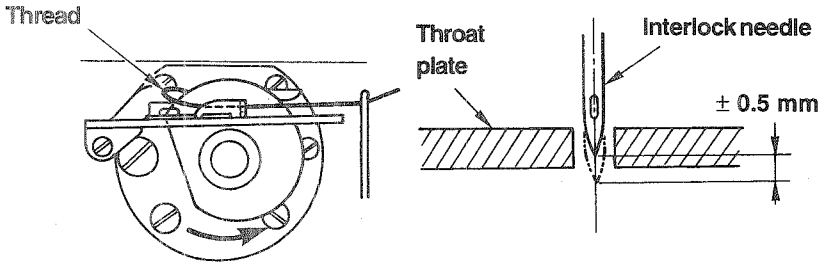
2) Adjusting the looper cam thread guide and the looper thread cam hook



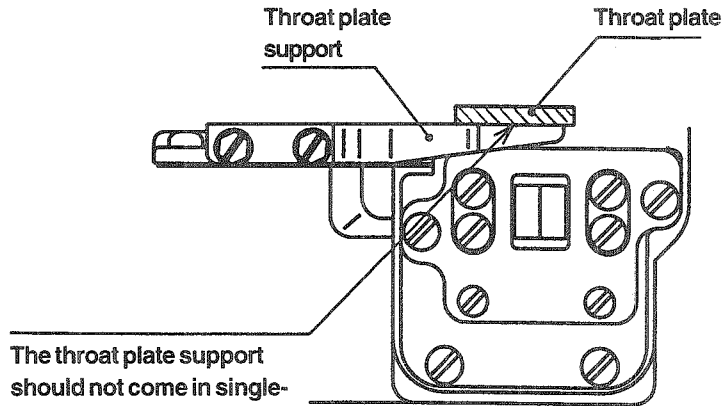
Set the thread guide as shown in the following figure.



Set the looper thread cam hook so that the straight section of the forked portion is leveled.

Adjustment Procedures	Results of Improper Adjustment
<ul style="list-style-type: none"> ○ When the lower knife has become dull, fully sharpen it. ○ In principle, no sharpening of the upper knife is done. When the upper knife has become dull, replace it. (This is because the upper knife is a serrated carbide knife.) 	<ul style="list-style-type: none"> ○ If the 75° angle of the lower knife is smaller than 75°, the durability of the knife will be deteriorated, often resulting in blade chipping. ○ If the 75° angle is exceeded, the knife will become dull. ○ If the 61°30' angle is not observed to a great extent, the knife may catch materials.
<ul style="list-style-type: none"> ○ Adjust the position of the looper thread cam by its setscrew with the needles at their upper dead point. ○ Laterally position the looper thread cam so that the looper thread cam hook is located at the center of the looper thread cam groove. <p>[How to check for proper positioning] Check that the looper thread cam releases the looper thread when the needle point begins to come out of the bottom surface of the throat plate.</p> 	<ul style="list-style-type: none"> ○ If the timing of the looper thread cam is too early, the needle point will fail to enter a thread triangle, resulting in looper thread stitch skipping. ○ If the timing of the looper thread cam is too late, puckering and loose looper thread stitches will result.

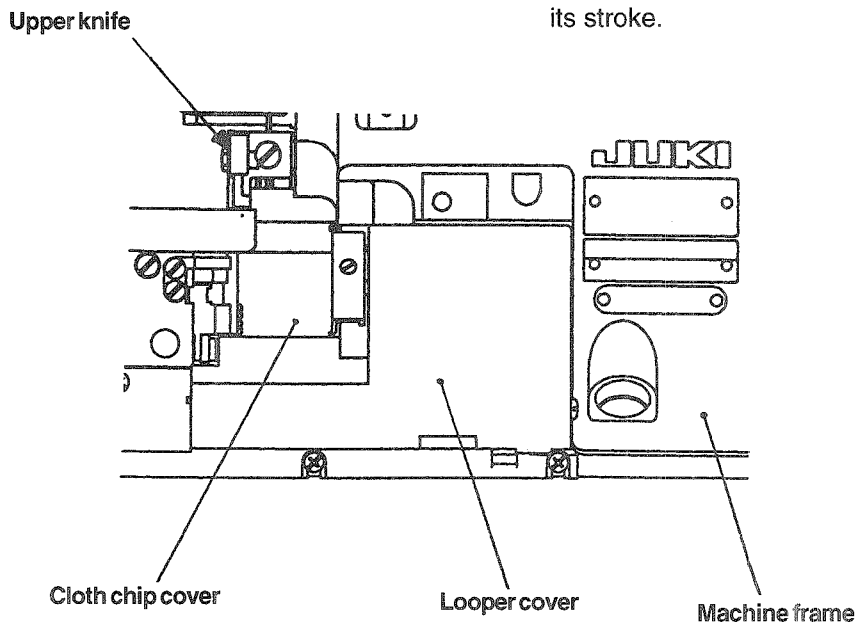
(17) Adjusting the throat plate support



The throat plate support should not come in single-sided contact but come in uniform contact with the throat plate.

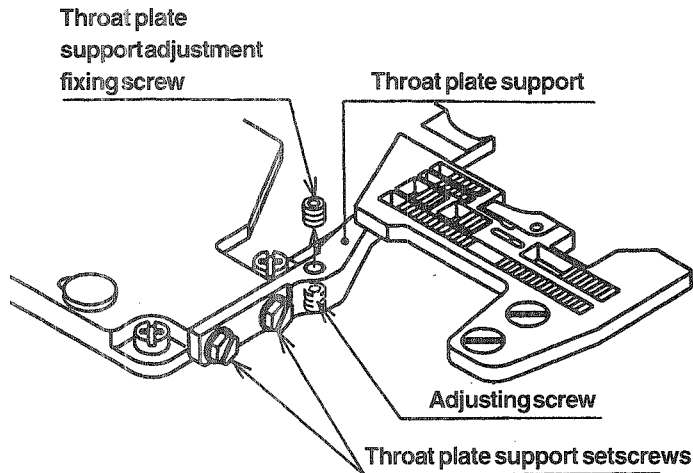
(18) Adjusting the looper cover

- The looper cover should smoothly close when slowly closing the looper cover with the upper knife in its lowest position of its stroke.



Adjustment Procedures

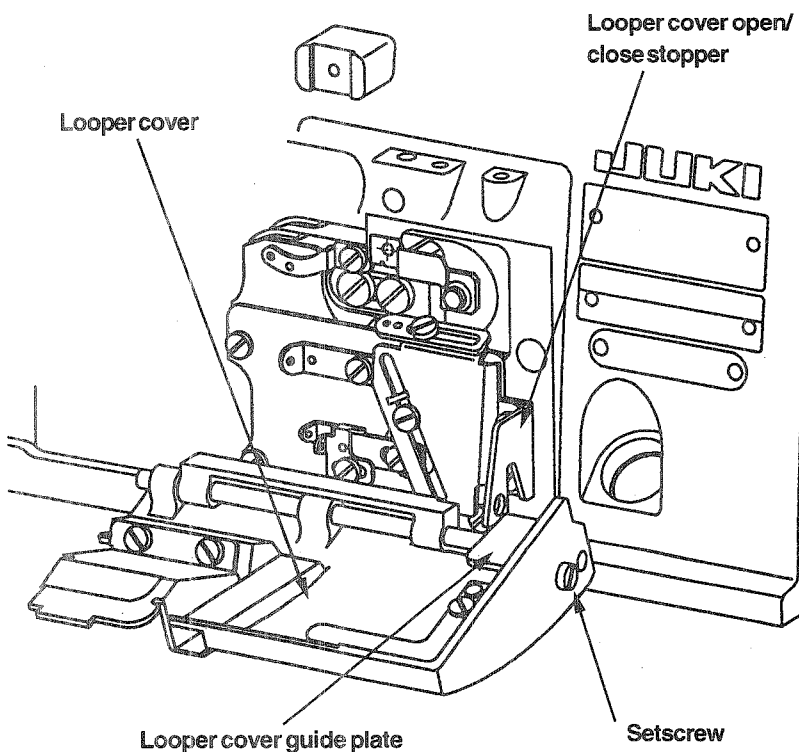
1. Draw out the throat plate support adjustment fixing screw.
2. Loosen the throat plate support setscrews (temporarily tightened), and adjust the height of the throat plate support with the adjusting screw so that the throat plate support comes in uniform contact with the throat plate.
3. Fix the throat plate support with the setscrews, and finally fix the throat plate support adjustment fixing screw.



Results of Improper Adjustment

- If the throat plate support comes in single-sided contact with the throat plate or does not come in contact with it, the throat plate will vibrate severely.

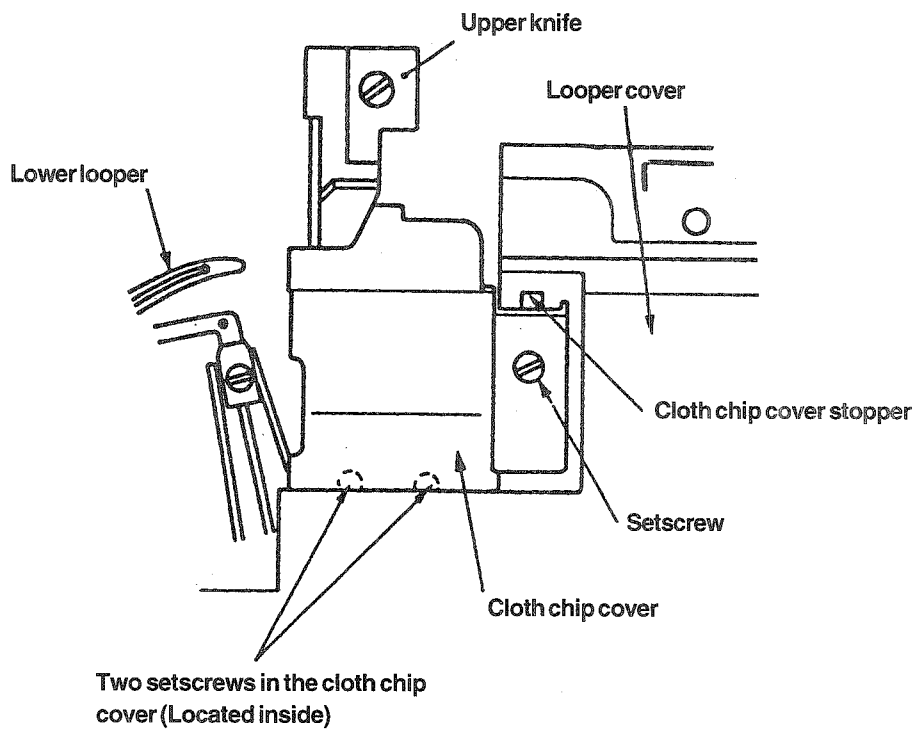
- In the state that the looper cover is closed, loosen the setscrew, and move the looper cover guide plate back and forth until the looper cover is brought to a position where the cover smoothly closes.



Standard Adjustment

(19) Adjusting the cloth chip cover

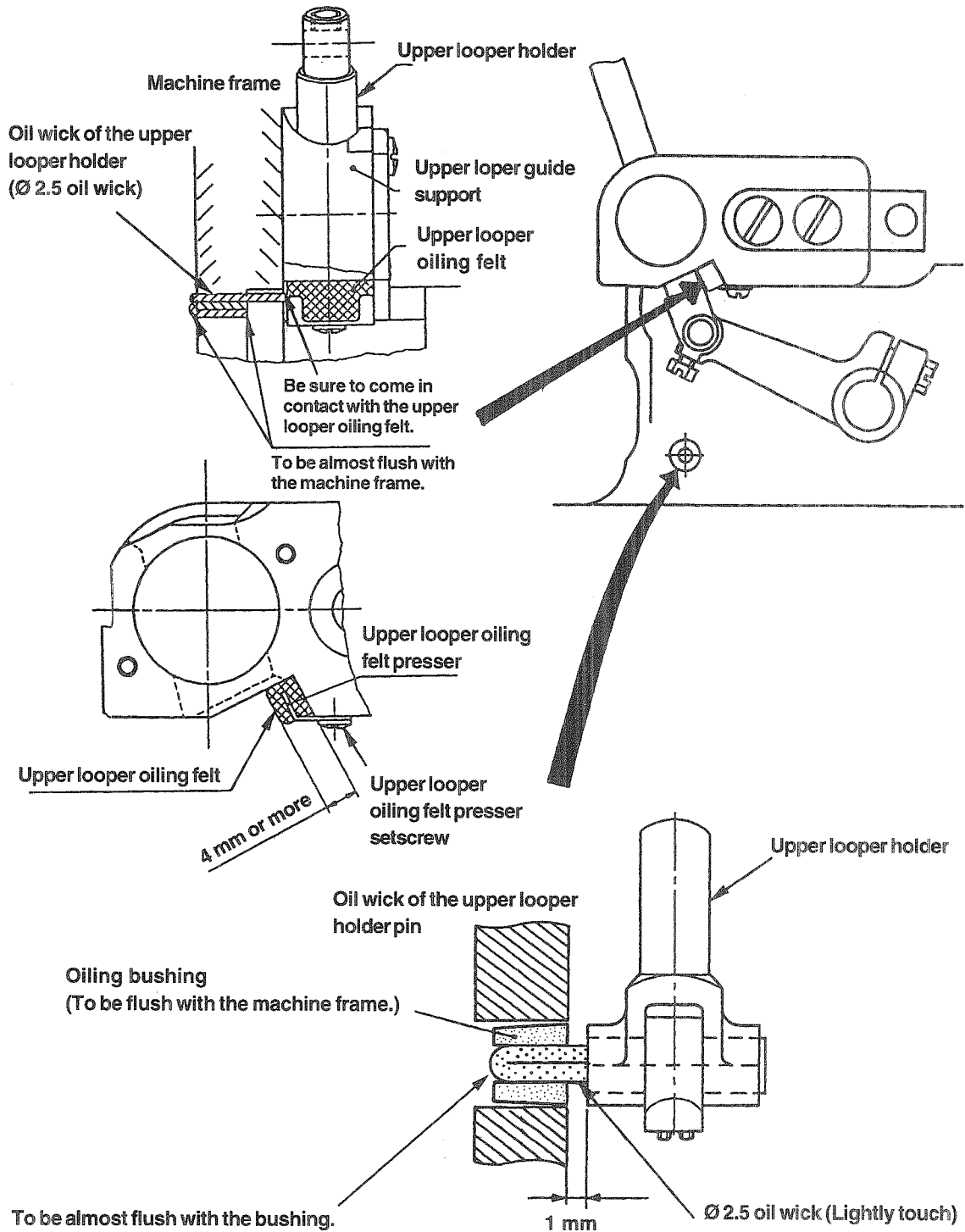
- When the cloth chip cover is pressed away from you, it should not rattle. In addition, the cloth chip cover should not come in contact with the upper knife, the double chain looper and the lower looper



Adjustment Procedures	Results of Improper Adjustment
<ul style="list-style-type: none"> ○ Temporarily tighten the setscrew with the cloth chip cover stopper raised. ○ Loosen the setscrew in the cloth chip cover, and adjust the longitudinal position of the cloth chip cover. ○ Loosen the setscrew in the cloth chip cover stopper again, and press the cloth chip cover stopper downward until the stopper slightly comes in contact with the looper cover. Now, tighten the setscrew. ○ Finally, confirm that the cloth chip cover does not come in contact with either the upper knife or the looper. <p>(Caution) Be sure to check that the cloth chip cover does not come in contact with the upper knife, the lower looper and the double chain looper.</p>	<ul style="list-style-type: none"> ○ If a clearance is provided between the cloth chip cover stopper and the looper cover, the cloth chip cover comes in contact with the lower looper and the double chain looper, resulting in damage of the looper when the cloth chip cover is pressed by the cloth or the like.

Standard Adjustment

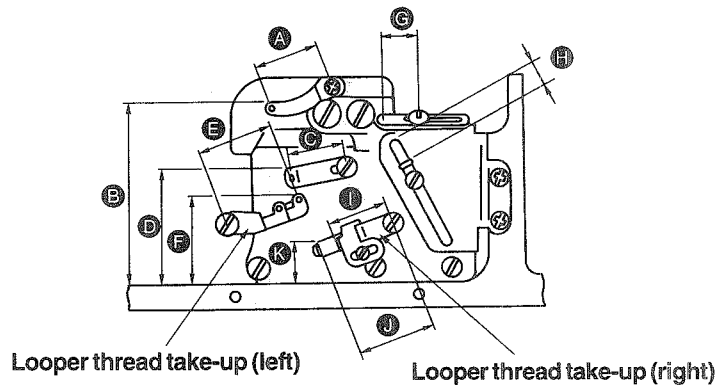
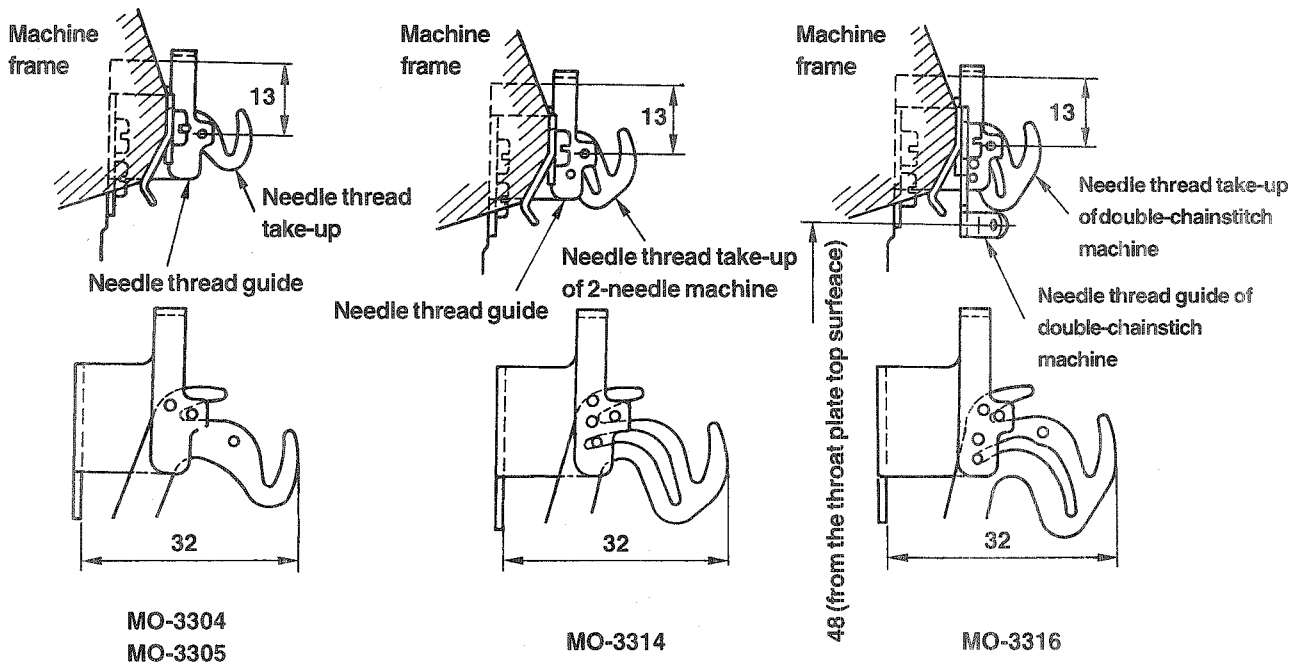
(20) Upper looper guide, and oil wick of the upper looper holder pin



Adjustment Procedures	Results of Improper Adjustment
<p>Upper looper guide portion</p> <ul style="list-style-type: none"> ○ Be sure to cut both end faces of the oil wick in the upper looper holder pin, and not to make the oil wick come out of the end faces. ○ Oiling to the upper looper oil absorbent felt is performed by the oil wick in the machine frame. Be careful so that length of the oil wick is not excessively long. The oil wick should be flush with the inside wall face of the machine frame. In addition, make one of the oil wicks come in contact with the oil absorbent felt. ○ Set the upper looper oil absorbent felt so that it projects 4 mm from the looper guide support as shown in the figure. And, confirm that the upper looper holder comes in contact with the felt at the top position. ○ Oiling to the upper looper holder pin is performed by the oiling bushing (Ø 2.5 oil wick). Make the bushing flush with the machine frame. In addition, adjust so that the oil wick comes out by 1 mm and slightly comes in contact with the upper looper holder pin. 	<ul style="list-style-type: none"> ○ If the oil wick fails to come in contact with the holder pin, the pin will not be oiled. As a result, the seizure of the pin will occur. ○ If the upper looper holder does not come in contact with the felt at the top position, the holder is not oiled. As a result, the seizure of the upper looper holder will occur.

Standard Adjustment

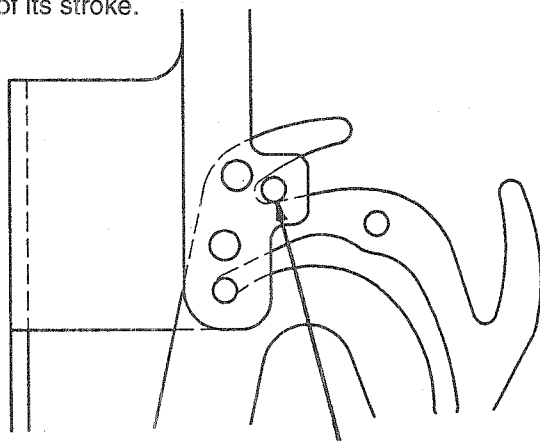
(21) Position of the thread guides and the looper thread take-ups



Symbol	MO-3304 (Standard)	MO-3314 (Standard)	MO-3316 (Standard)	MO-3305 (Blind hemming)	MO-3316 (50H heavy materials)
A	25	←	←	←	←
B	68	←	←	←	←
C	22	←	←	←	←
D	44.5	←	←	←	←
E	26	←	←	←	←
F	37	←	←	←	←
G	12	←	←	15	12
H	6	←	←	18.5	6
I	22	23.5	22	19	26.5
J	26	30	26	←	30
K	9	8	9	8	←

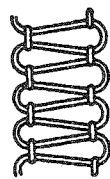
Adjustment Procedures

- Perform the adjustment by the respective setscrews. Needle thread take-up should be positioned at the lower dead point of its stroke.



Position where the lower end of the thread hole is aligned with the edge line portion of the thread take-up.

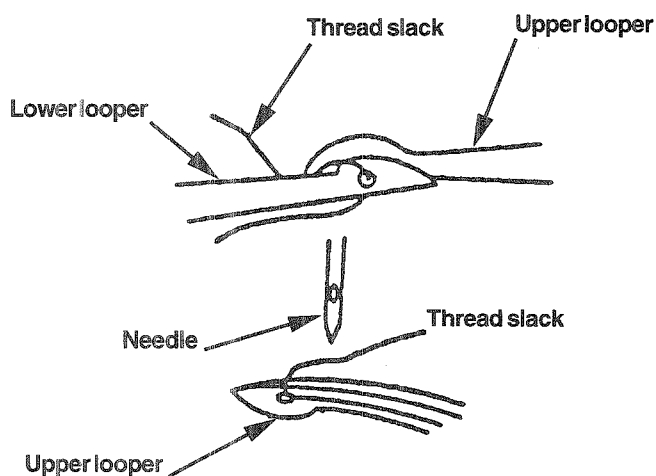
- Set distance E a little smaller when using synthetic thread or the like which tends to form stitches swelling out of the cloth edge. In addition, a smaller E is effective for preventing stitch skipping.
- Distance F is effective for raising/lowering the knotting point of the upper and lower looper thread.



Swell out

- Set this distance larger for stretchy threads, and set this smaller for thin threads which are likely to cause stitch skipping.
- It is desirable to set distance G larger for stretchy threads.
- Set distance H a little larger when making blind hemming.
- Set distance I a little smaller for blind hemming.
- Set distance K larger if stitch skipping occurs due to looper thread slack.

In addition, set it smaller for better appearance and touch of produced stitches when stretchy thread is used.



Results of Improper Adjustment

- Distance A, B or D affects least on stitch formation. Improper setting of these distances, however, will cause contact between the moving parts.
- Distance F
When set larger, the amount of the upper looper thread will be increased.
When set smaller, the amount of the upper looper thread will be decreased.
- Distance G
When set larger, the amount of the upper looper thread will be increased.
When set smaller, the amount of the upper looper thread will be decreased.
- Distance H
When set larger, the amount of the lower looper thread will be decreased.
When set smaller, the amount of the lower looper thread will be increased.
- Distance I
When set larger, the amount of the lower looper thread will be increased.
When set smaller, the amount of the lower looper thread will be decreased.
- Distance E
When set larger, the amount of the upper and lower looper threads will be increased.
When set smaller, the amount of the upper and lower looper threads will be decreased.
- Distance K
When set larger, the amount of the upper and lower looper threads will be decreased.
When set smaller, the amount of the upper and lower looper threads will be increased.

4. ADDITIONAL INFORMATION AND PRECAUTIONS

(1) Thread tension

1) Strength of tension spring and height of tension adjusting nut

Part No.	Color	Natural length	Operating length	Weight required to compress spring to operating length
12284709	Red	19.5	11.5	430 ± 50
12284808	Yellow	17.8	9.8	320 ± 35
12284907	Blue	17.3	9.3	150 ± 20

2) Springs used for each model

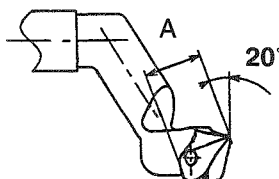
Model \ Where to use	Needle thread	Double-chainstitch needle thread	Upper looper thread	Lower looper thread
MO-3304 series	Red	–	Yellow	Blue
MO-3305 series	Red	–	Yellow	Blue
MO-3314 series	Red • Yellow	–	Yellow	Blue
MO-3316 series	Red	Red	Yellow	Blue

(2) Upper looper of the MO-3300

Use a proper upper looper in accordance with the needle No. When ordering, specify the boxed numbers shown in the table below.

Part attached with an asterisk (*) Factory-installed on the standard machine head at the time of delivery

Model	Nos. engraved	Needle No. on upper looper	Upper looper thickness A
MO-3304	* 1248 <input type="checkbox"/> 1107	#9, #11, #14	3.1
	1248 <input type="checkbox"/> 1008	#14, #16, #18	2.9
MO-3314	* 1248 <input type="checkbox"/> 1008		2.9
MO-3316	* 1248 <input type="checkbox"/> 1107	#9, #11, #14	3.1
	1248 <input type="checkbox"/> 1008	#14, #16, #18	2.9

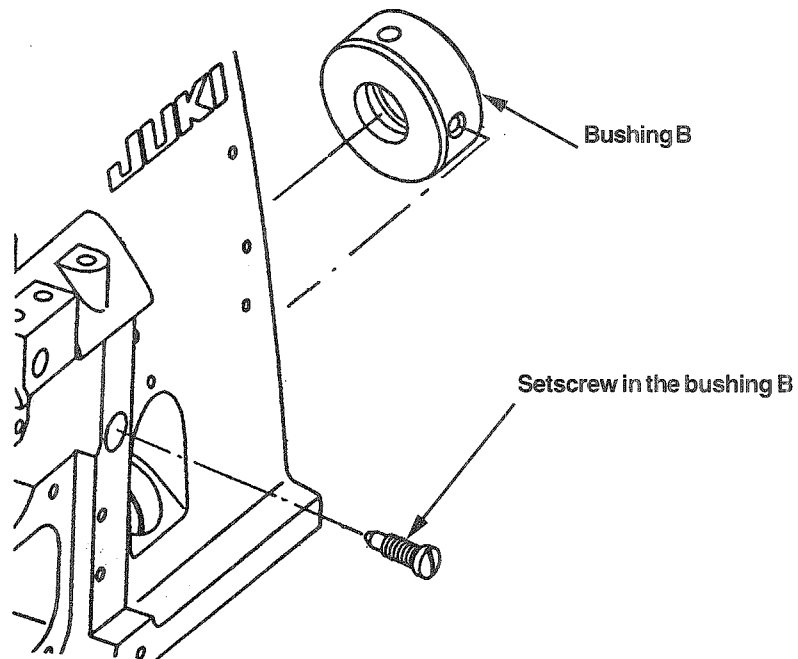


(3) Cautions on the installation

1) Application of sealant

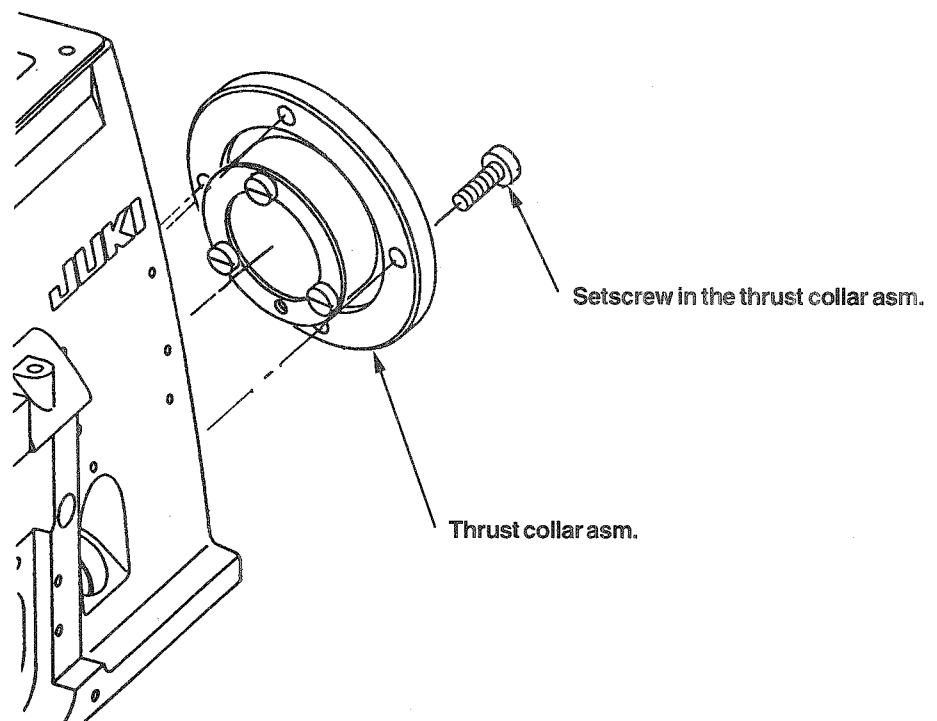
- ① Setscrew in the bushing B

Apply the JUKI seal (THREE BOND TB1104D) to the screw portion of the setscrew in the bushing B.



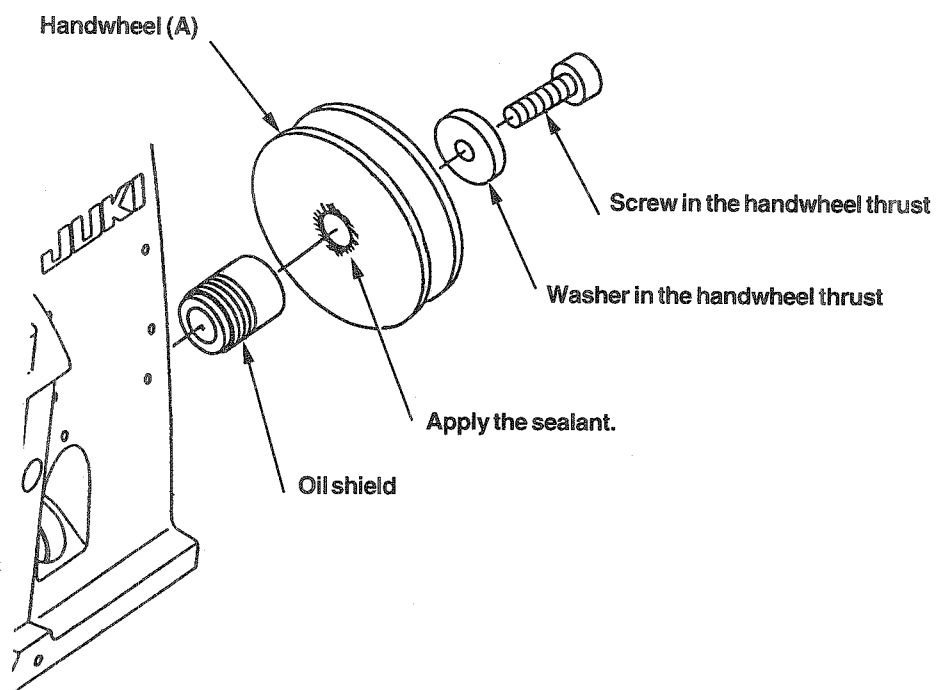
- ② Setscrews in the thrust collar asm.

Apply the JUKI seal (THREE BOND TB1104D) to the screw portion of four setscrews in the thrust collar asm.



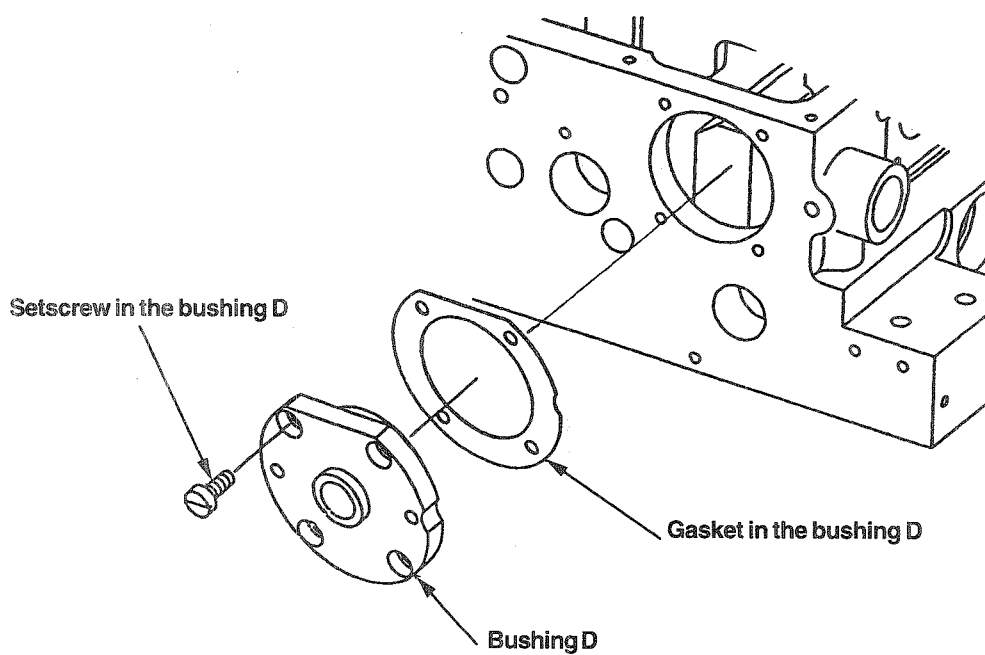
③ Handwheel (A)

Apply the JUKI seal (THREE BOND TB1104D) to the end faces of the oil shield and the handwheel (A).



④ Setscrew in the bushing D

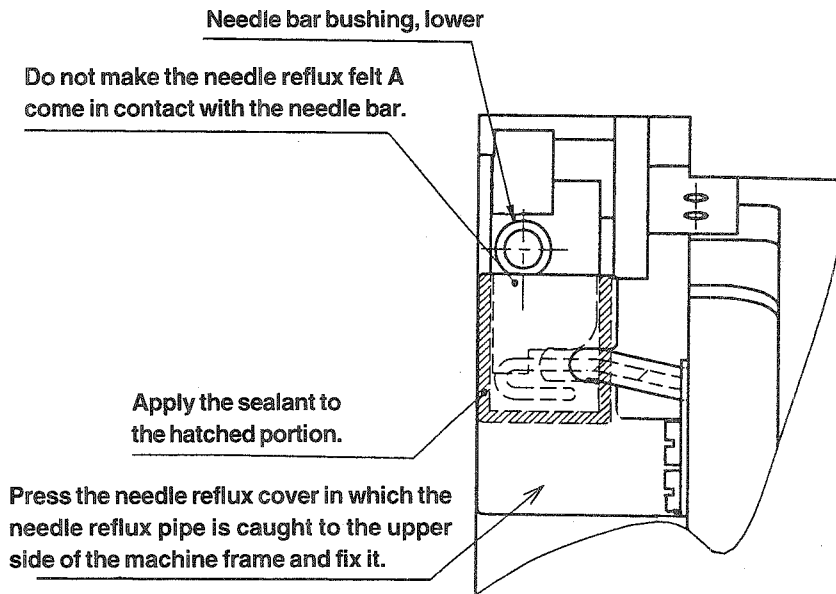
Apply the JUKI seal (THREE BOND TB1104D) to the screw portion of the four setscrews in the bushing D.



⑤ Needle reflux cover

When installing the needle reflux cover, apply the JUKI seal (THREE BOND TB1104D) between the cover and the machine frame.

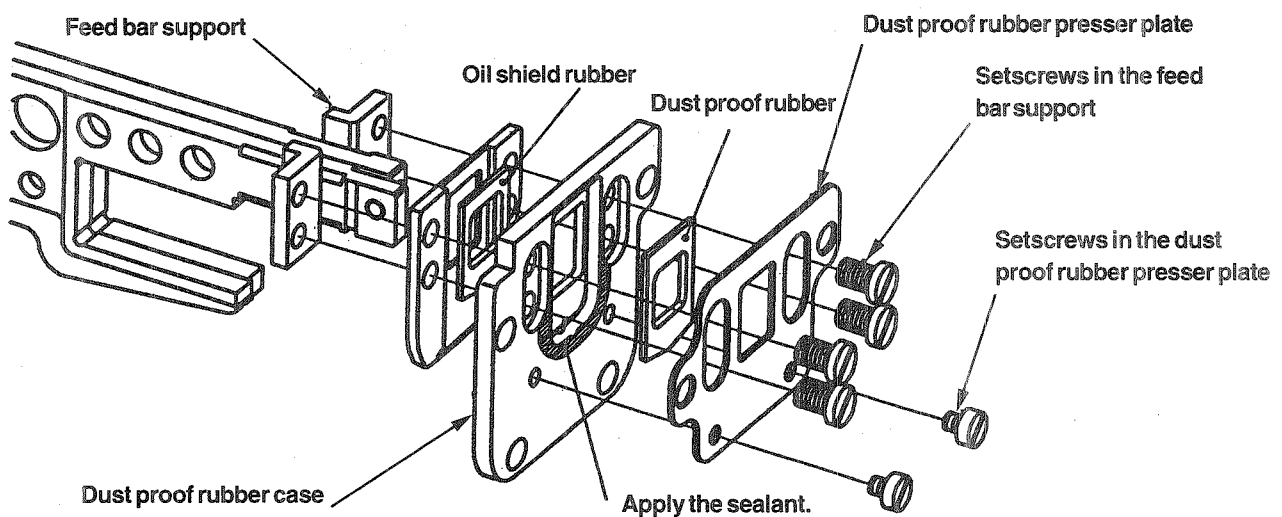
Drawing viewed from the bottom side of the needle bar bushing, lower



⑥ Dust proof rubber case

Apply the JUKI seal (THREE BOND TB1104D0) to the lower portion of the sealing face between the dust proof rubber case and the dust proof rubber presser plate, and the screw portion of the two setscrews in the dust proof rubber presser plate.

Do not loosen the setscrews in the feed bar support unless it is really necessary. If the setscrews have been loosened or removed, apply the JUKI seal (THREE BOND TB1104D) to the screw portion of the four setscrews and carefully check that there is no clearance as well as no single-sided contact exists between the feed bar support and the feed bar.

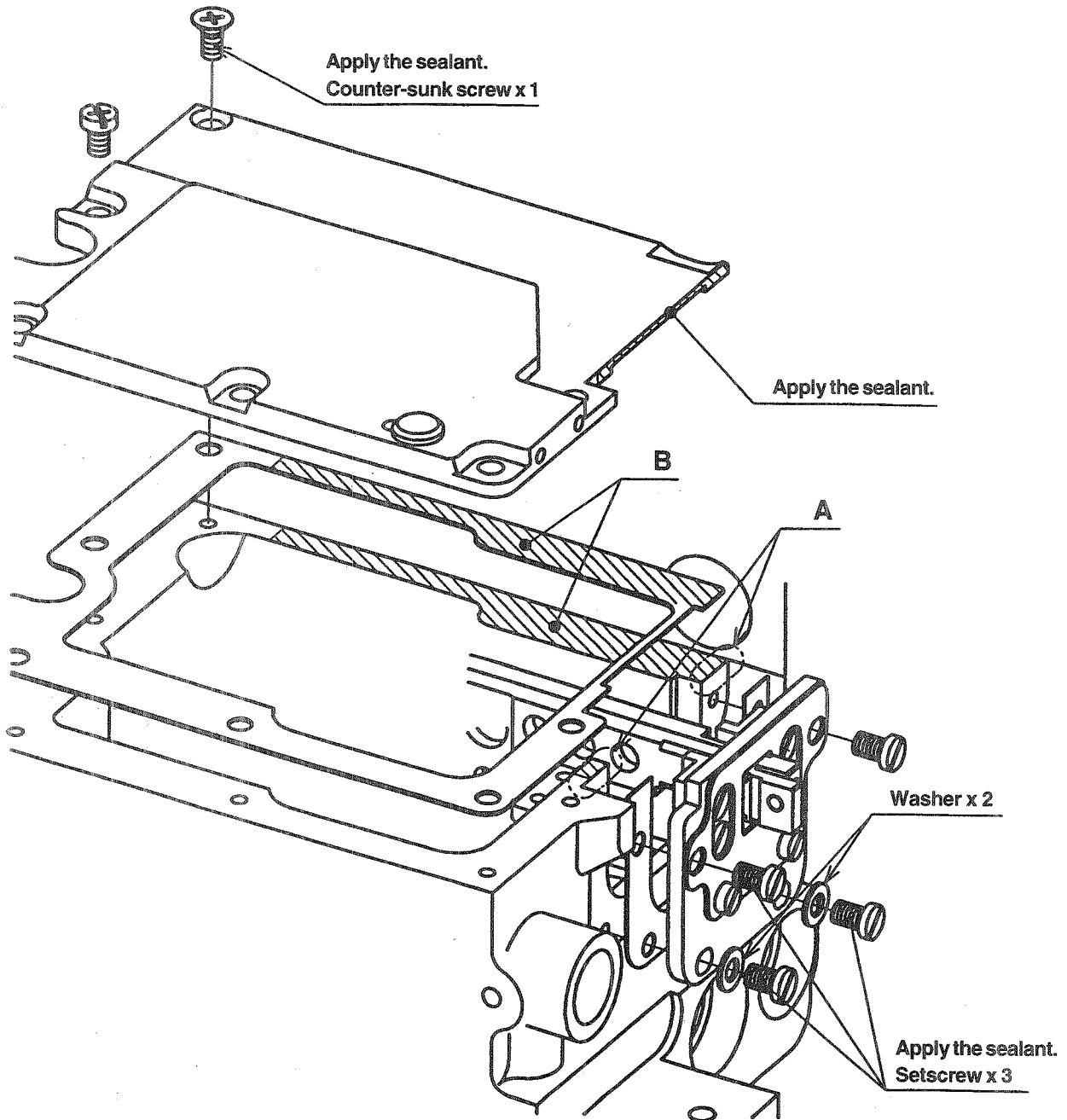


⑦ Dust proof rubber case and the feed mechanism cover

Apply the JUKI seal (THREE BOND TB1104D) to the screw portion of the three setscrews in the dust proof rubber case. (Enter washers to the two screws located on the bottom side.)

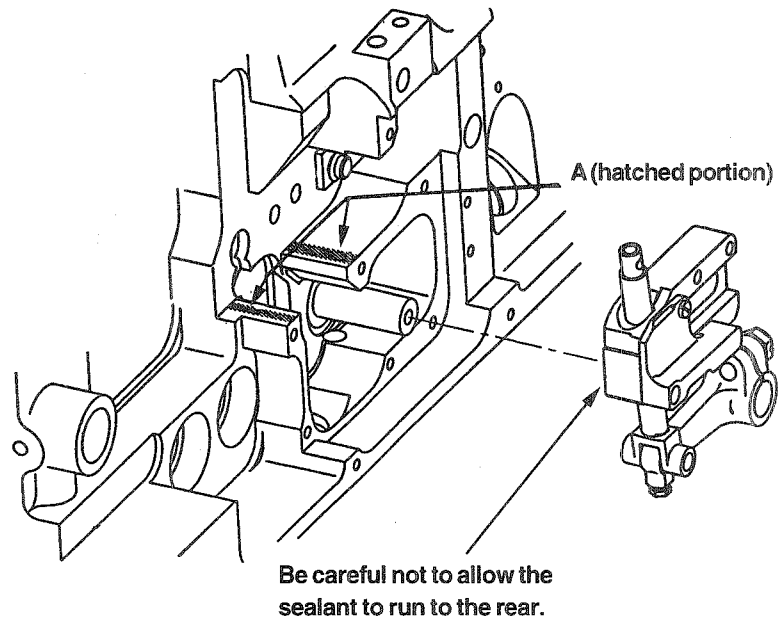
Apply the JUKI seal (THREE BOND TB1104D) to the border portion (A) between the dust proof rubber case and the machine frame, installing face of the feed mechanism cover gasket, gaskets (B), and front end face of the feed mechanism cover.

Apply the JUKI seal (THREE BOND TB1104D) to the screw portion of one of the counter-sunk screws of the feed mechanism cover setscrews.



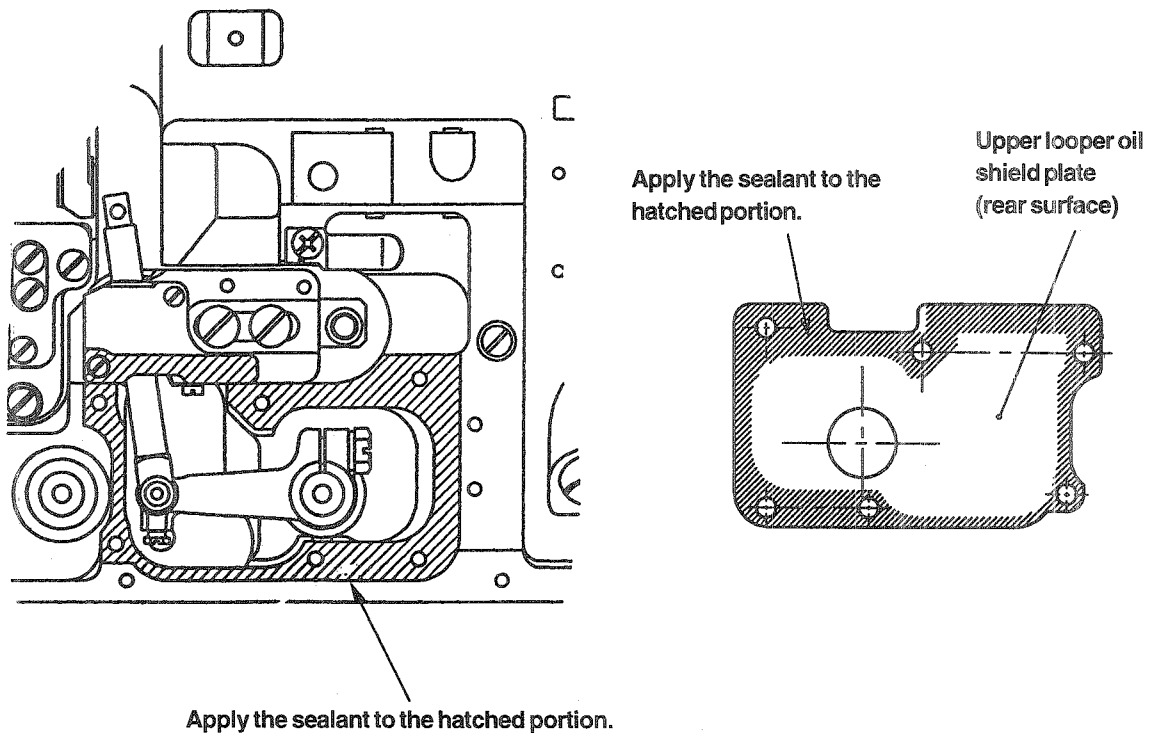
⑧ Upper looper guide support asm.

Apply the sealant (THREE BOND TB1102) to the bottom face of the upper looper guide support and installing face (A) of the machine frame.



⑨ Upper looper oil shield plate

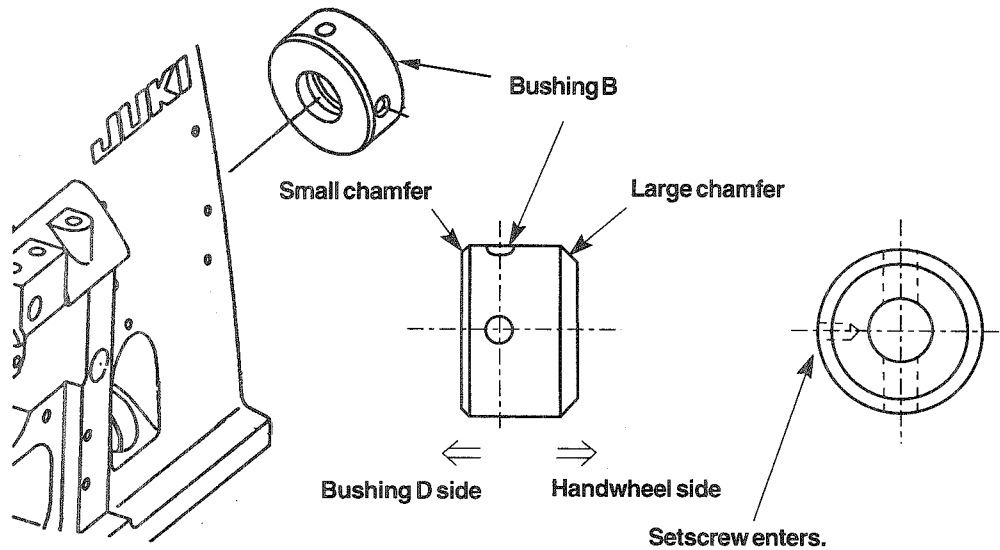
Apply the JUKI seal (THREE BOND TB1104D) to the rear surface (hatched portion) of the upper looper oil shield plate, or installing portion (hatched portion) of the oil shield plate.



2) Places where special attention should be paid to the orientation when installing

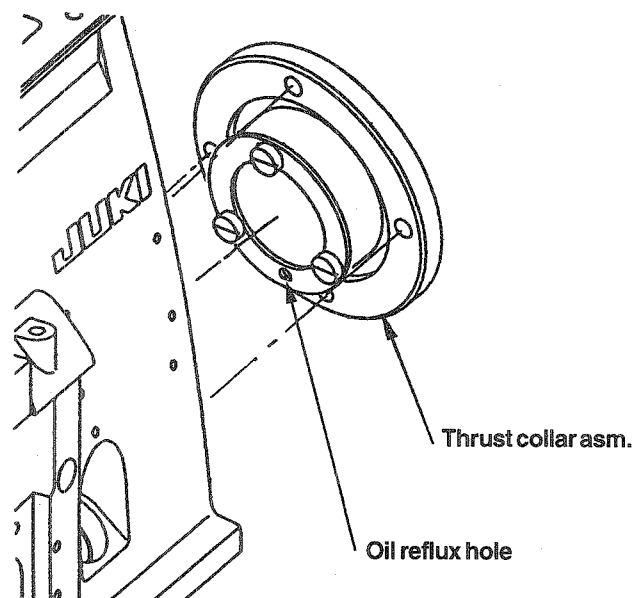
① Bushing B

Install so that the small chamfer comes to the inside (bushing D side). In addition, set the setscrew so that it enters the hole which is not penetrated to the inner diameter of the bushing.



② Thrust collar asm.

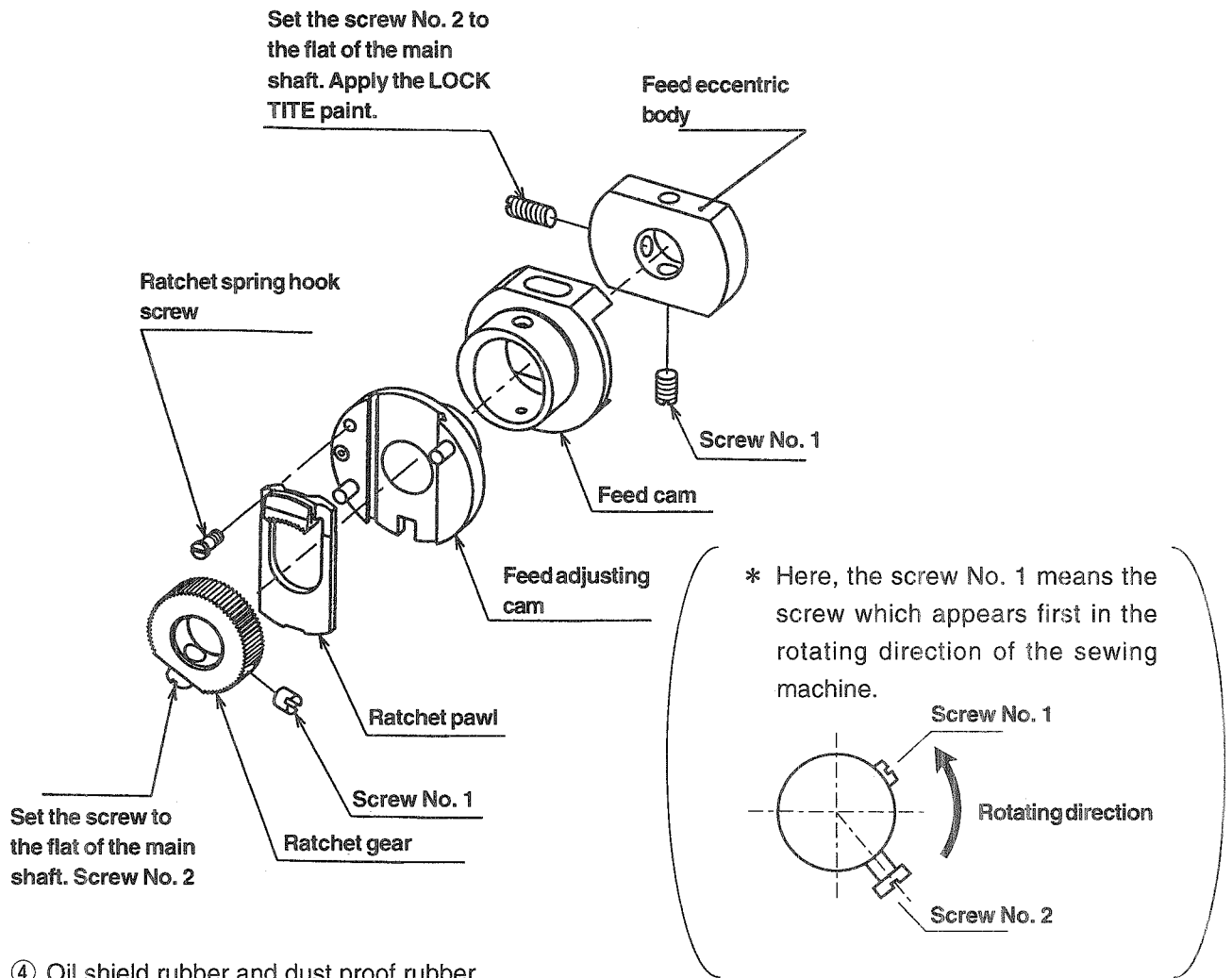
Install the thrust collar so that the oil reflux hole located at the inside of the thrust collar asm. comes below.



③ Feed eccentric body and ratchet gear

Set the ratchet gear setscrew and the screw No. 2 of the feed eccentric body setscrews to the flat of the main shaft.

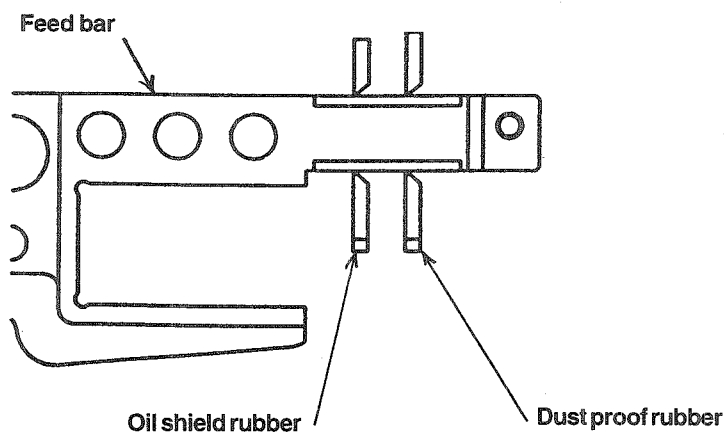
(For the double-chainstitch eccentric cam of the MO-3316, the screw No. 1 is set to the flat of the main shaft.)



④ Oil shield rubber and dust proof rubber

Install both the oil shield rubber and the dust proof rubber paying attention to the orientation and avoiding crack or the like.

(Caution) Upper side of the oil shield rubber is shorter by 1 mm than that of the dust proof rubber.



(4) Kinds of motor pulleys, belts and frame support plate bolts

1) Motor pulleys and belts

Sewing speed of sewing machine (rpm)	50 Hz			60 Hz		
	Outside diameter of motor pulley (mm)	Semi-sunken type (inch)	Fully-sunken type (inch)	Outside diameter of motor pulley (mm)	Semi-sunken type (inch)	Fully-sunken type (inch)
6,500	120.5	38	32	100.5	36	32
6,000	110.5	36	32	95.5	35	30
5,500	100.5	36	32	85.5	35	30
5,000	90.5	35	30	80.5	34	30
4,500	85.5	35	30	70.5	34	30
4,000	75.5	34	30	60.5	34	29

* Use a motor of 1/2 HP (400 W).

© Be sure to use the motor under the speed which does not exceed the limit of the sewing speed of the sewing machine.

* Part No. of motor pulley

MTKP0XXX000

(Enter the effective diameter to "XXX".)

If the outside diameter of the motor pulley is 150.5 mm, the effective pulley will be 145 mm. So, the part No. will be MTKP0145000.

If the outside diameter of the motor pulley is 90.5 mm, the effective pulley will be 085 mm. So, the part No. will be MTKP0085000.

* Part No. of belt

MTJVM00XX00

(Enter the number that shows the belt length to "XX".)

If the belt length is 40 inches, enter "40" to "XX". So, the part No. will be MTJVM004000.

If the belt length is 35 inches, enter "35" to "XX". So, the part No. will be MTJVM003500.

2) Part No. of frame support plate bolt

① Semi-sunken type 4 sets of the following parts are required.

[	Support plate bolt (A)	12448205	X 1
	① [	Locknut	31009004 X 1
		Washer	31012206 X 1
		Spring washer	31011307 X 2

② Fully-sunken type 4 sets of the following parts are required.

[	Support plate bolt (B)	12453205	X 1
	② [	Aforementioned lock nut	X 3
		Aforementioned washer	X 3
		Aforementioned spring washer	X 3

Difference of support plate (A) and (B)

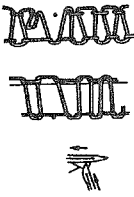
Entire length under the neck and length of threaded part

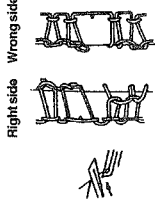
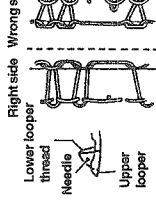

	Entire length (mm)	Length of threaded part (mm)
Bolt (A)	100	65
Bolt (B)	180	145

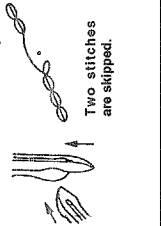
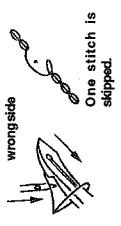
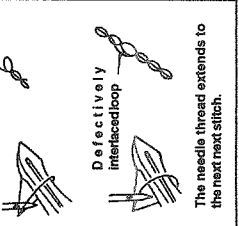
5. TROUBLES AND CORRECTIVE MEASURES

Troubles	Causes (1)	Causes (2)	Checking order and corrective measures	Ref. page
1. Needle thread breakage	<p>Threading</p> <p>Thread path</p> <p>Needle guard</p> <p>Needle</p> <p>Needle heat</p> <p>Thread</p> <p>Thread tension</p>	<p>The thread is entangled with the thread guide, or the machine head has been incorrectly threaded.</p> <p>Scratches, burrs, rust, etc. on the pawls or needle holes of the throat plate, stitch tongue, lower looper, double chain looper, needle thread take-up, needle thread presser plate, thread guide, tension disk, etc. causes friction.</p> <p>The needle hits the needle guard intensely, and sharp edges are produced on them, causing thread breakage.</p> <p>The needle is too thin for the thread used.</p> <p>The needle gets very hot, depending on the type of materials, number of piles and sewing speed, and causes the thread to burn and break.</p> <p>The thread is weak because of its poor quality.</p> <p>The thread tension is too high.</p>	<p>Refer to the threading diagram.</p> <p>Remove such scratches, burrs, etc. and perform thread path finishing. Replace major components which have been deformed due to looper, needle thread, etc. with new ones.</p> <p>Replace the needle and needle guard if they have worn.</p> <p>Replace the needle with a proper one.</p> <p>Use a thinner needle. Reduce the sewing speed. Use the needle cooler. Use an S-point needle for synthetic thread.</p> <p>Replace the thread with one of good quality.</p> <p>Reduce the thread tension. Check whether the needle thread take-up is positioned to this side, causing such excessive thread tension.</p>	13
	Contact	The double chain looper or lower looper has been improperly positioned and comes in contact with the feed dog or throat plate.	Properly position the double chain looper or lower looper.	5, 11
	Double thread hooking (only for double chain stitch)	Poor drawing up of the needle thread which has been previously removed causes the looper to catch it again.	Increase the needle thread tension. Properly position the looper thread cam. Properly position the double chain needle thread guide.	21
	Defective double chain-off thread (only for double chain stitch)	Refer to the clause referring to defective double chain-off thread.		
2. Looper thread breakage	<p>Thread path</p> <p>Adjustment of the looper thread take-up</p> <p>Thread tension</p> <p>Thread</p>	<p>Scratches, burrs, rust, etc. on the pawl of the throat plate, stitch tongue, looper, looper thread take-up, thread guide, or tension disk causes friction.</p> <p>The looper thread take-up or thread guide has been improperly positioned, causing excessive thread tension.</p> <p>The looper thread tension is too high.</p> <p>The thread is weak because of its poor quality.</p>	<p>Remove such scratches, burrs, etc. and perform thread path finishing. Replace loopers or other components which have been deformed, causing thread breakage.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Reduce the tension while checking the tension balance of needle thread and other looper thread.</p> <p>Replace the thread with one of good quality.</p>	29
	Position of the thread guide	The upper looper thread guide (left) is too high, and the thread taking balance is disturbed, resulting in the thread breakage.	Refer to the description given in the Standard Adjustment.	29
	Double chain looper avoid (only for double chain stitch)	The double chain looper strikes the needle at the back, causing the thread breakage.	Correct the longitudinal motion of the double chain looper so as not to cause the looper to strike the needle at its back.	11
	Needle heat	The needle gets hot, and the looper thread breaks when it comes in contact with the hot needle especially when the needle stops, causing needle thread breakage.	Same as the clause relating to the needle heat	

Troubles	Causes (1)	Causes (2)	Checking order and corrective measures	Ref. page
3. Needle breakage	Needle entry	The needle entry has not been correctly adjusted, and the needle strikes the throat plate or presser foot.	Correct the needle entry.	3
	Upper looper position	The upper looper juts out too much or it is too low.	Refer to the description given in the Standard Adjustment.	7
	Contact with the looper	The needle strikes the looper, resulting in needle breakage.	Re-position the looper so that it does not come in contact with the needle. Adjust the longitudinal motion of the double chain looper for the contact of its back with the needle.	5, 9, 11
	Needle guard	The needle strikes the needle guard too much. Or, the needle guard has been improperly positioned, causing the needle point to strike it.	Refer to the description given in the Standard Adjustment.	13
	Needle No.	The needle is too thin for the materials used.	Replace the needle with a thicker one.	
	Thread tension	The needle thread tension is too high.	Reduce the thread tension	
	Height of feed dog or needle	The feed dog is too high, or the needle is too low, causing the needle to deflect with resultant needle breakage.	Refer to the description given in the Standard Adjustment.	3, 15
	Insufficient presser foot pressure	When stitching the needle into cloth, the cloth cannot be fixed, and the needle is bent and broken.	Reduce the presser foot pressure.	
4. The needle point is crushed. (Double chain stitch needle)	Needle guard	The longitudinal position is not correct.	Check the clearance between the needle and needle guard.	13
	Contact with the looper	The longitudinal motion of the looper is not correct.	Correct the longitudinal motion of the looper, and increase the clearance between the back of the looper and needle when the looper reaches its most retracted position.	11
5. Overlocking needle thread stitches are skipped.	Lower looper	The blade point has defective shape, and the looper knocks down the needle thread loops and does not catch them.	Replace the lower looper.	
	Adjustment of the loopers	The clearance or the amount of return is not correct.	Refer to the description given in the Standard Adjustment.	5, 7, 9
	Needle thread presser	The movement of the plate which holds the needle thread is not correct, resulting in unstable loops.	Replace the component if it is excessively deformed out to correction or the like.	
	Needle	The needle is bent or improperly oriented. Or, the DCX1 needle is used.	Replace the bent needle with a new one. Correctly orient and attach the needle. Use a DCX27 needle. Use a DCXJ27 needle for stretchy thread.	
The lower looper fails to catch needle thread loops. (Lower stitch skipping)	Needle guard	Incorrect height or clearance prohibits correct guide for the needle. If a needle guard is too high, loops are crushed with subsequent stitch skipping.	Refer to the description given in the Standard Adjustment.	13
	Height of needle	The needle has incorrect height and does not properly pick up loops even if the looper has a correct return.	Refer to the description given in the Standard Adjustment.	3, 5
	Needle heat	Stitch skipping occurs before the thread breaks due to needle heat.	Same as the clause given in the needle thread breakage due to needle heat.	
	Position of the needle thread take-up	The installing position is placed excessively to this side, and the needle thread take-up takes too much thread, producing too small loops.	Refer to the description given in the Standard Adjustment.	29




Troubles	Causes (1)	Causes (2)	Checking order and corrective measures	Ref. page
<p>6. Lower looper stitches are skipped.</p> <p>The upper looper does not catch the lower looper thread. (Stitch skipping at meeting)</p> 	<p>Threading</p> <p>Upper looper</p> <p>Lower looper</p> <p>Adjustment of the loopers</p> <p>Thread amount</p>	<p>The thread has been entangled with the thread guide. Threading has not been correctly done.</p> <p>The blade point has a bad shape, and fails to catch the loops.</p> <p>The clearance between the needle and the back of lower looper is not correct. The distance from the blade point is unstable.</p> <p>The return amount of the lower looper, height of the upper looper, or clearance produced at time of crossing of the upper and lower loopers is not correct.</p> <p>Too much lower looper thread is fed, giving slack of thread. Slack of thread</p>	<p>See the threading diagram.</p> <p>Replace the upper looper having badly deformed blade point.</p> <p>Replace the lower looper having badly deformed blade point.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Slightly lower the looper thread take-up (left) (reduction in distance F). Or, reduce distance E to decrease the amount of thread.</p> <p>Slightly raise the looper thread take-up (right) (increase in distance K) to decrease the amount of thread. Lower the lower looper thread guide (increase in distance H) and shorten the lower looper thread take-up (decrease in distance I) to reduce the amount of thread.</p>	<p>5, 7, 9</p> <p>29</p> <p>29</p>
<p>7. Upper looper thread stitches are skipped.</p> <p>The needle does not take the upper looper thread. (Upper stitch skipping)</p> 	<p>Threading</p> <p>Threading</p> <p>Needle height</p> <p>Needle</p> <p>Adjustment of the upper looper</p> <p>Thread amount</p>	<p>The thread has been entangled with the thread guide. Threading has not been correctly done.</p> <p>The thread has been entangled with the thread guide.</p> <p>The needle, if positioned too high or low, may fail to catch the upper looper thread.</p> <p>The needle is bent or crushed in its point.</p> <p>If the height of the needle point is not correct, same as in case of the needle height, it may fail to catch the upper looper thread. The clearance between the needle and the back of the upper looper is not correct.</p> <p>Excessive upper looper thread is fed, producing slack of thread.</p> 	<p>See the threading diagram.</p> <p>Refer to the threading diagram.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Replace the needle with a new one. However, remove the cause of needle bend or needle point crush.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Slightly lower the looper thread take-up (left) (reduction in distance F), or slightly reduce distance E to reduce the amount of thread. Make the upper looper thread guide (right) shorter (reduce in distance G) to reduce the amount of thread.</p> <p>Slightly raise the looper thread take-up (right) (increase in distance K) to reduce the amount of thread.</p> <p>If the thread tension is not enough, increase it.</p>	<p>3</p> <p>3, 9</p> <p>29</p> <p>29</p>

Troubles	Causes (1)	Causes (2)	Checking order and corrective measures	Ref. page
<p>8. Double chain stitches are skipped.</p> <p>The double chain looper fails to catch needle thread loops.</p>  <p>Viewed from the wrong side Two stitches are skipped.</p>	<p>Needle height</p> <p>Needle</p> <p>Double chain looper</p> <p>Adjustment of looper</p> <p>Thread tension</p> <p>Needle guard</p> <p>Needle heat</p>	<p>If the needle height is not correct, stitch skipping occurs even when the return of the chain looper is correct.</p> <p>The needle is bent or attached with wrong orientation. A DCX1 needle is used.</p> <p>The lower part of the blade point has been deformed due to correction or the like, and the blade point feels loops.</p> <p>Clearance or returning amount is not correct.</p> <p>The thread tension is too high, preventing formation of good loops.</p> <p>The needle guard is too high, and loops are crushed. The clearance is too big, causing the needle to shake.</p> <p>The thread breaks due to heat generated on the needle, depending on the type of materials, number of piles, and sewing speed.</p> <p>The needle point has been crushed and got shorter and thicker.</p> <p>The thread hole in the tip has worn, and the looper thread comes afterward.</p>	<p>Refer to the description given in the Standard Adjustment.</p> <p>Replace the bent needle. (Remove the cause of the needle bend.) Correct the orientation of the needle. Use a DCX27 needle. (Scarf shape is good.)</p> <p>Replace the double chain looper.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Reduce the tension. However, be careful not to reduce the tension too much, otherwise unstable loops will result.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Use a thinner needle. Reduce the sewing speed. Check the coolant if necessary.</p> <p>Same as the clause 4. The needle point crush.</p> <p>Replace the double chain looper.</p>	<p>3</p> <p>11</p> <p>13</p>
<p>9. Triangle double chain looper thread stitches are skipped.</p>	<p>The needle point is crushed.</p> <p>Double chain looper]</p>	<p>Excessive return or longitudinal motion will often cause this stitch skipping.</p>	<p>Refer to the description given in the Standard Adjustment.</p>	<p>11</p>
<p>The needle fails to catch the double chain looper thread.</p>  <p>Viewed from the wrong side One stitch is skipped.</p>	<p>Adjustment of looper</p> <p>Thread cam timing</p> <p>Thread tension</p> <p>Defective threading</p>	<p>The thread cam timing is too early, causing the looper thread to slack before the needle tip enters a thread triangle.</p> <p>The looper thread tension is very low, and the looper thread is not stretched, resulting in unstable condition.</p> <p>The area around the thread cam has been threaded erroneously.</p>	<p>Refer to the description given in the Standard Adjustment.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Slightly increase the looper thread tension.</p> <p>Refer to the threading diagram.</p>	<p>21</p>
<p>10. Triangle double chain needle thread stitches are skipped.</p> <p>The needle fails to catch the needle thread loop on the double chain looper. The needle drops outside of or in the loop.</p>  <p>Defectively interfaced loop The needle thread extends to the next stitch.</p>	<p>Double chain looper</p> <p>Adjustment of looper</p> <p>Thread tension</p> <p>Stitch length</p> <p>Needle guard</p> <p>Double-chain stitch needle thread guide</p>	<p>The chain looper is too high and too close to the throat plate, or has a bad shape on the web part.</p> <p>The return is not enough, causing the needle to drop in the rear at the back of the looper.</p> <p>The needle thread tension is too low.</p> <p>The stitch length is as small as 1.5 mm or less.</p> <p>The needle guard is too high, and catches needle thread loops.</p> <p>The needle thread guide is installed too high, and it fails to tense the thread.</p>	<p>Correct the height of the chain looper by pushing it down until it comes in contact with the stopper. Replace the chain looper having a bad shape.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Slightly increase the needle thread tension.</p> <p>Slightly increase the stitch length.</p> <p>Refer to the description given in the Standard Adjustment.</p> <p>Refer to the description given in the Standard Adjustment.</p>	<p>11</p> <p>11</p> <p>13</p> <p>29</p>

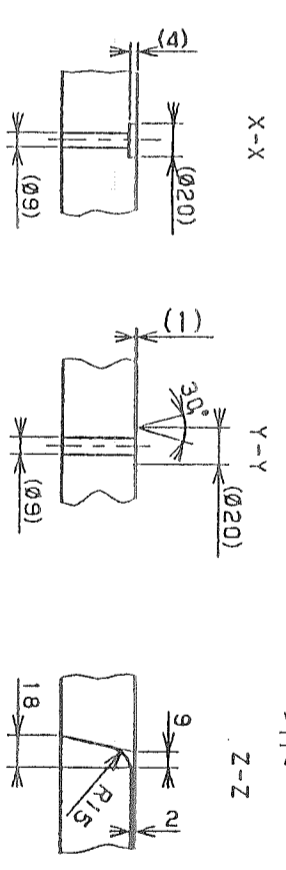
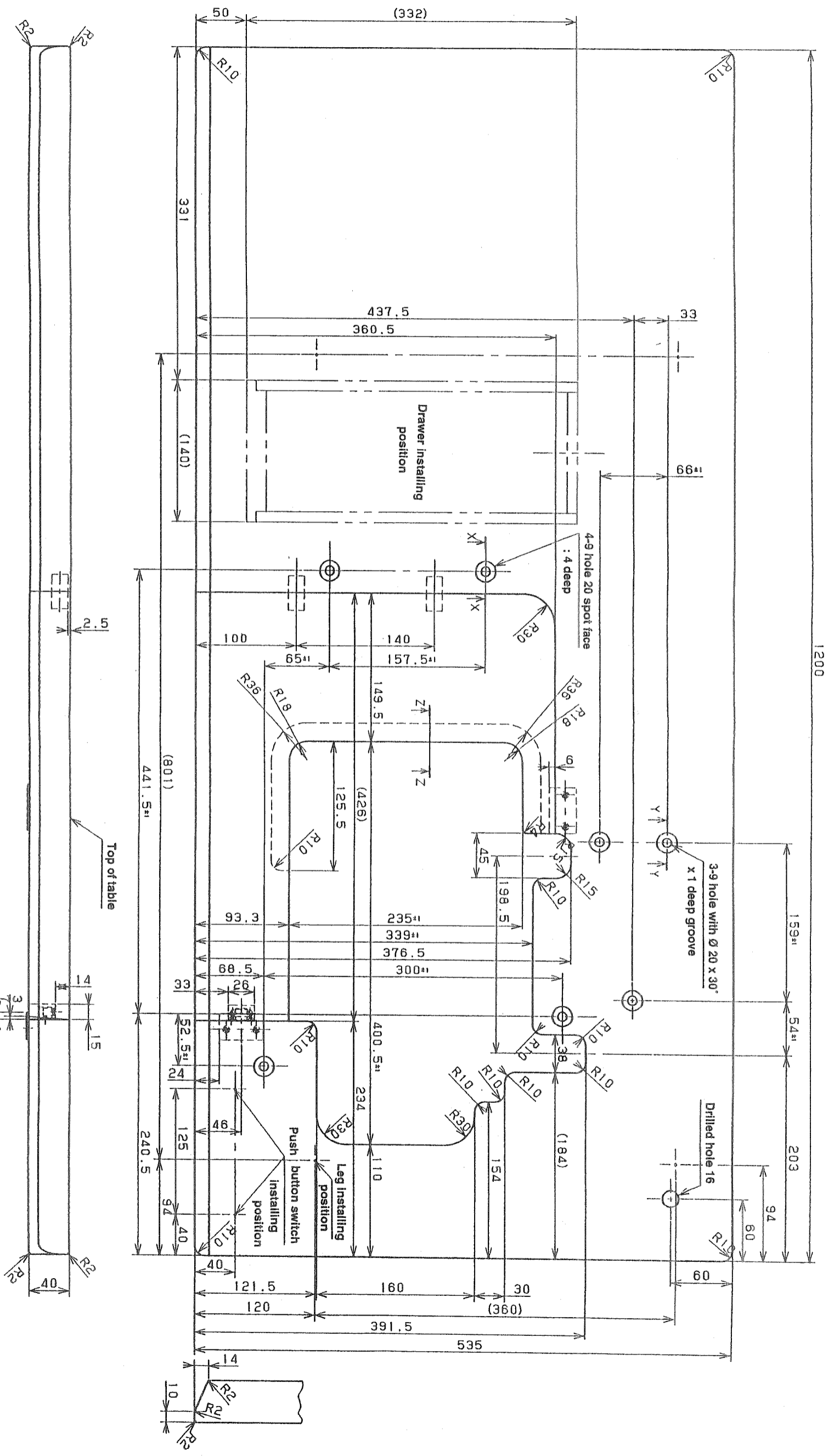
Troubles	Causes (1)	Causes (2)	Checking order and corrective measures	Ref. page
11. Defective overlocking chain-off thread (Provided that no chain-off trouble occurred when sewing operation was done with materials set on the machine.)	Installing position of the throat plate Feed dog Adjustment of looper Thread tension	The throat plate has been improperly positioned longitudinally, and chain-off thread gets in between the main feed dog and throat plate, causing defective chain-off thread. The auxiliary feed dog is too high, and interferes with chain-off thread. The auxiliary feed dog is too low. (Lower it than the main feed dog by 0.1 to 0.5 mm.) The auxiliary feed dog has scratch. Adjustment of loopers for producing chain-off thread without materials requires higher accuracy. When the thread tension is too low, it will result in unstable chain-off thread. The needle thread tension is too high, causing damaged balance with other thread tension.	Correct the position of the throat plate. Refer to the description given in the Standard Adjustment. Repair or replace the auxiliary feed dog. Refer to the description given in the Standard Adjustment. Slightly increase the tension.	3 15 7, 9
12. Defective double chainstitch chain-off thread	Adjustment of looper Needle guard Installing position of the throat plate Throat plate Presser foot Main feed dog Double hooking Thread tension	Adjustment of the loopers for producing chain-off thread without materials requires higher accuracy. The needle guard C is too high, damaging loops. The needle comes in contact with the front edge of the needle hole in the throat plate. The lateral position of the throat plate with respect to the feed dog is wrong, causing chain-off thread to drop in. A dent exists on the flat part between the rear edge of the needle hole and feed dog groove. The rear presser foot is indented and not flush with the presser foot sole, so that it cannot hold chain-off thread. The leading edge of the main feed dog is too sharp and cuts chain-off thread. The needle thread is not drawn up fully because of the insufficient return of the double chain looper, too early cam timing or wrong threading. If the stitch length is too small, the cam timing will be advanced. The needle is bent or chain-off thread runs back due to excessive needle thread tension. Both the needle thread and looper thread tension are too low, causing unstable chain-off thread.	Refer to the description given in the Standard Adjustment. Refer to the description given in the Standard Adjustment. Correctly position the throat plate with equal lateral position. Repair or replace the throat plate with a new one without dent since chain-off thread returns without being held by the throat plate, causing the chain-off thread to be defective. Replace it, or correct it to make it flush with the presser foot sole. Buff the leading edge of the main feed dog. Refer to the description given in the Standard Adjustment for the return of the double chain looper and cam timing. Refer to the threading diagram for correct threading. Retard the cam timing. Reduce the needle thread tension. Slightly increase the both tensions.	11 13 3 11, 21 21

Troubles	Causes (1)	Causes (2)	Checking order and corrective measures	Ref. page
13. Overlocking needle thread is loose.	Position of the needle thread take-up	It is positioned excessively to this side, and the thread take-up draws out excessive needle thread.	Refer to the description given in the Standard Adjustment.	29
	Thread tension	The thread tension balance has been disturbed, causing loose thread.	Refer to the description given in the Standard Adjustment for the looper thread take-up components, and increase the tension if necessary.	29
	Needle	The needle is too thin for the thread used.	Replace it with a proper one.	
14. Double chainsstitch needle thread is loose.	Thread tension	The looper thread tension is too high, and the needle thread tension is too low.	Reduce the looper thread tension to a minimum, and increase the needle thread tension.	
	Thread cam	The thread cam draws out an insufficient amount of thread.	Refer to the description given in the Standard Adjustment.	21
	Needle	The thread cam timing is bad.	Refer to the description given in the Standard Adjustment.	21
	Double-chainsstitch needle thread take-up guide	The needle is too thin for the thread used.	Replace the needle with a proper one.	
	Looper thread tension	Drawing amount of the needle thread is insufficient.	Refer to the description given in the Standard Adjustment.	29
15. Uneven overlocking stitches	Looper thread tension	The upper and lower looper thread tensions are not enough.	Slightly increase the upper and lower looper thread tensions.	29
	Looper thread take-up	The looper thread take-up (left) is too high.	Slightly lower the looper thread take-up (left).	29
	Knife width	The knife width is unsuited for the overedging width.	Make the overedging width slightly smaller than that given for the knife width.	19
	Thread path	Scratches on the thread path catch thread.	Check the thread path for scratches.	
	Presser foot	The presser foot comes in contact unevenly with the throat plate and feed dogs and tends to make snake motion.	Make the presser foot come in contact with them evenly.	19
	Thread stand	The thread does not come out smoothly.	Make the thread come out smoothly.	
16. Uneven double chainsstitches	Thread tension	The looper thread tension is not enough.	Slightly increase the tension.	19
	Presser foot	The presser foot comes in contact with the throat plate unevenly.	Make the presser foot come in contact with the throat plate evenly.	
	Knife width	The presser foot pressure is not enough.	Increase the presser foot pressure.	
17. The looper thread bulges out.	Looper thread take-up adjustment	The knife width is too small for the overedging width.	Use a knife having width suited to the overedging width.	19
	Knife width	The looper thread take-up draws out excessive amount of looper thread.	Decrease the radius of the looper thread take-up (left) (reduction in distance E). Raise the looper thread take-up (right) (increase distance K).	29
	Knife width	The knife width is too large for the overedging width.	Use a knife having width suited to the overedging width.	19
18. Looper thread bite.	Looper thread take-up adjustment	The looper thread take-up draws out insufficient amount of looper thread.	Increase the radius of the looper thread take-up (left) (increase distance E). Lower the looper thread take-up (right) (reduction in distance K).	29



Troubles	Causes (1)	Causes (2)	Checking order and corrective measures	Ref. page
19. Defective knotting position Right side  Knots are deflected to the upper-looper side.	Threading Adjustment of the looper thread take-up	Re-threading after thread breakage, etc. has been done erroneously. The height of the looper thread take-up (left) affects too much. The upper looper thread guide (right) is too short.	Refer to the threading diagram. Raise the looper thread take-up (left) to increase the amount of upper looper thread, and the knotting position moves toward the lower looper side. Increase distance G.	29
20. Uneven material feed	Presser foot pressure Presser foot	Generally, uneven material feed occurs when the presser foot pressure is too high. The hinge is too stiff to move the presser foot.	Reduce the presser foot pressure except for the uneven material feed due to puckering. Remove the stiffness provided no hinge play is produced.	29
21. Puckering (Mainly concerned with double chainstitch)	Tilt of feed dogs Height of feed dogs Adjustment of differential feed Needle Thread Thread tension Throat plate Thread cam timing Feed dogs Presser foot pressure Differential feed ratio Thread amount	Scratches on or defective finish on the presser foot sole produce friction between the presser foot and materials. The front side up affects uneven material feed. A difference in level exists between the main feed dog and differential feed dog. The differential feed has been improperly adjusted, resulting in the occurrence of uneven material feed. The needle is too thick. The thread used is too thick. Both the needle thread and looper thread tensions are too high. The throat plate having a large needle hole is used. The thread cam timing is too late. The leading edge of the feed dog has been rounded off. A difference in level exists between the main feed dog and differential feed dog. The presser foot pressure is not high enough, providing poor ironing effect. The differential feed ratio has been set for gathering. The looper thread amount is not enough, causing excessively tensed stitches.	Finish the presser foot sole (with buff or the like) since the lower cloth is fed strongly and upper cloth remains. Make the front down. However, be sure to align the differential feed dog with the main feed dog. Eliminate the difference in level. Provide differential feed suited for the material. Use a thin needle as much as possible. Use a thin thread as much as possible. Reduce the looper thread tension as much as possible, and apply a minimum of necessary needle thread tension. Replace the throat plate with one with a small needle hole. Advance the cam timing. Refer to the description given in the Standard Adjustment. Replace the feed dog. Eliminate such difference in level. Increase the presser foot pressure. Set it for stretching. Bring the thread cam thread guide fully to this side to increase the amount of the looper thread.	15

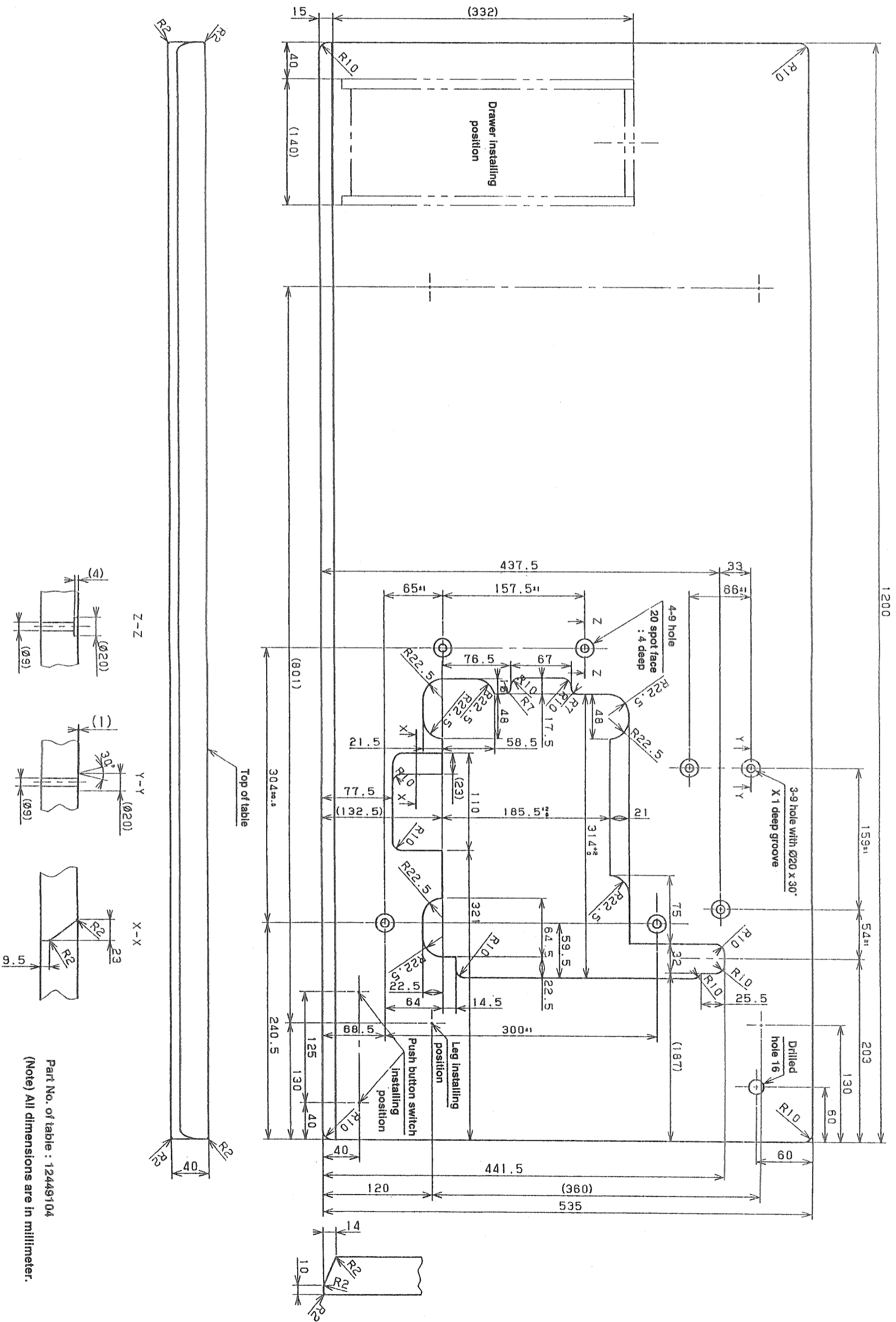
(2) Fully-sunken type



Part No. of table : 12453650
(Note) All dimensions are in millimeter.

6. DIMENSIONS OF TABLE

(1) Semi-sunken type



Part No. of table : 12449104
 (Note) All dimensions are in millimeter.

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INTERNATIONAL SALES DIVISION
8-2-1. KOKURYO-CHO.
CHOFU-SHI. TOKYO 182-8655. JAPAN
PHONE : 03(3430)4001 to 4005
FAX : 03(3430)4909 • 4914 • 4984
TELEX : J22967

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