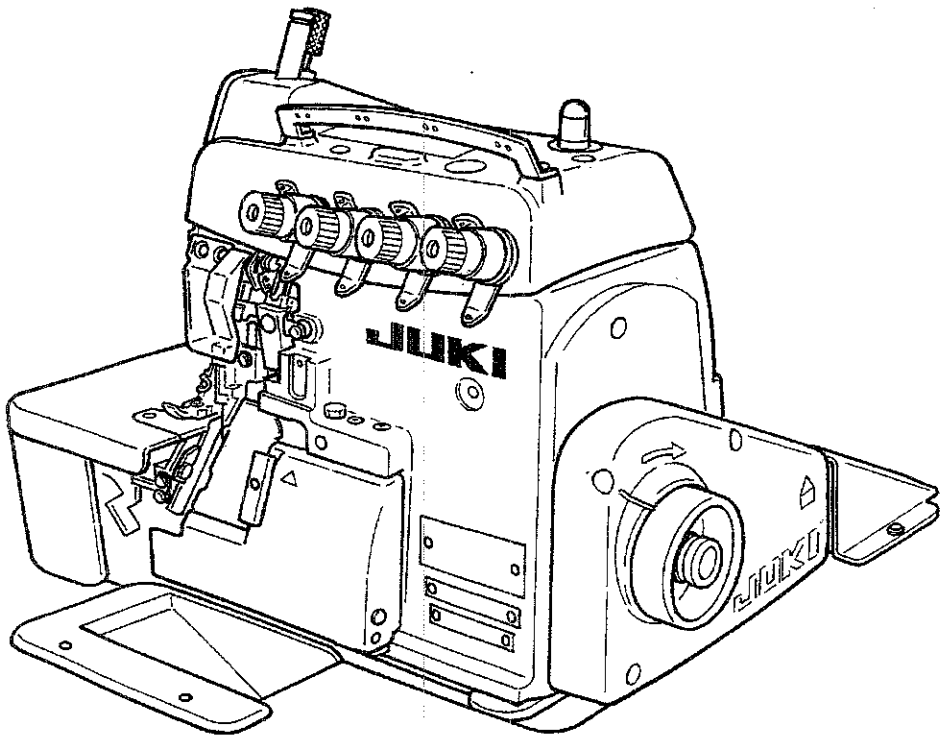
Calvin

JUKI®

High-Speed Overlock Machine / Super-High-Speed Overlock Machine / Safety Stitch Machine

MO-6000S series
MO-6900G series
(for Extra-heavy-weight Materials)
ENGINEER'S MANUAL



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PREFACE

This Engineer's Manual is written for the technical personnel who are responsible for the service and maintenance of the machine.

The Instruction Manual for these machines intended for the maintenance personnel and operators at an apparel factory contains operating instructions in detail. And this manual describes "Standard Adjustment", "Adjustment Procedures", "Results of Improper Adjustment", and other important information which are not covered by the Instruction Manual.

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

In addition, for the motor for the sewing machine with thread trimmer, refer to the separate Instruction Manual or Engineer's Manual for the motor. And for the control panel, refer to the Instruction Manual for the control panel.

This manual gives the "Standard Adjustment" on the former page under which the most basic adjustment value is described, and on the latter page "Results of Improper Adjustment" under which stitching errors and troubles arising from mechanical failures are described together with the "Adjustment Procedures".

CONTENTS

1. SPECIFICATIONS

(1) MO-6700S SERIES

No.	Item	Specifications		
1	Model	MO-6704S	MO-6714S	MO-6716S
2	Description	1-needle Overlock machine	2-needle Overlock machine	2-needle Safety stitch machine
3	Stitch type F. S. T.	JIS E13 (USA standard : 504)	JIS E24 (USA standard : 514)	JIS E13 + D12 (USA standard : 516)
4	Sewing speed	7,000 rpm		
5	Stitch length	0.8 to 4mm		1.5 to 4 mm
6	Needle gauge	–	2, 2.4, 3.2 mm	2, 3.2, 4, 4.8 mm
7	Overedging width	1.6, 3.2, 4, 4.8 mm	3.2, 4, 4.8 mm	3.2, 4, 4.8, 6.4 mm
8	Differential feed ratio	Gathering 1 : 2 (Max.1 : 4), Stretching 1 : 0.7 (Max.1 : 0.6)		
9	Needle bar stroke	24.5mm		
10	Needle tilt angle	20°		
11	Needle	ORGAN DC X 27 (Standard) (DC X 1 can be used as well.)		
12	Presser lifting amount	7.0 mm	6.5 mm	7.0 mm
13	Presser foot pressure	49N (5Kg)		
14	Stitch adjusting method	By pushbutton		
15	Upper knife	Flat knife		
16	Differential feed adjustment	By lever with micro adjustment mechanism		
17	Weight	28 kg		
18	Lubrication	Gear-type automatic lubrication		
19	Lubricating oil	* JUKI MACHINE OIL 18 (Equivalent to ISO VG 18)		
20	Needle cooler	Optional		
21	Needle thread heat remover	Optional		
22	Micro presser lifting device	Provided as standard		
23	Motor	2P 550W (In case of 7,000 rpm) 2P 400W (in case of less than 7,000 rpm)		

* **JUKI MACHINE OIL 18 (Equivalent to ISO VG 18)**
Part No. : MML018900CA (900 m ℓ)

(2) MO-6900S SERIES

No.	Item	Specifications		
1	Model	MO-6904S	MO-6914S	MO-6916S
2	Description	1-needle Overlock machine	2-needle Overlock machine	2-needle Safety stitch machine
3	Stitch type F. S. T.	JIS E13 (USA standard : 504)	JIS E24 (USA standard : 514)	JIS E13 + D12 (USA standard : 516)
4	Sewing speed	8,500 rpm	8,000 rpm	
5	Stitch length	0.8 to 4mm		1.5 to 4 mm
6	Needle gauge	–	2, 2.4, 3.2 mm	2, 3.2, 4, 4.8 mm
7	Overedging width	1.6, 3.2, 4, 4.8 mm	3.2, 4, 4.8 mm	3.2, 4, 4.8, 6.4 mm
8	Differential feed ratio	Gathering 1 : 2 (Max.1 : 4), Stretching 1 : 0.7 (Max.1 : 0.6)		
9	Needle bar stroke	24.5mm		
10	Needle tilt angle	20°		
11	Needle	ORGAN DC X 27 (Standard) (DC X 1 can be used as well.)		
12	Presser lifting amount	7.0 mm	6.5 mm	7.0 mm
13	Presser foot pressure	49N (5Kg)		
14	Stitch adjusting method	By pushbutton		
15	Upper knife	Flat knife		
16	Differential feed adjustment	By lever with micro adjustment mechanism		
17	Weight	28 kg		
18	Lubrication	Gear-type automatic lubrication		
19	Lubricating oil	* JUKI MACHINE OIL 18 (Equivalent to ISO VG 18)		
20	Needle cooler	Provided as standard (Excluding some of subclass machines)		
21	Needle thread heat remover	Provided as standard (Excluding some of subclass machines)		
22	Micro presser lifting device	Provided as standard		
23	Motor	2P 550W (In case of not less than 7,000 rpm) 2P 400W (In case of less than 7,000 rpm)		

*** JUKI MACHINE OIL 18 (Equivalent to ISO VG 18)**
Part No. : MML018900CA (900 m ℓ)

(3) MO-6900G SERIES

No.	Item	Specifications		
1	Model	MO-6904G	MO-6914G	MO-6916G
2	Description	1-needle Overlock machine	2-needle Overlock machine	2-needle Safety stitch machine
3	Stitch type F. S. T.	JIS E13 (USA standard : 504)	JIS E24 (USA standard : 514)	JIS E13 + D12 (USA standard : 516)
4	Sewing speed	6,000 rpm		
5	Stitch length	2.5 to 5 mm		
6	Needle gauge	–	2.6 mm	4.8 mm
7	Overedging width	4.8, 10 mm	6.4 mm	4.8, 6.4 mm
8	Differential feed ratio	Gathering 1 : 1.75 (Max.1 : 3.8) Stretching 1 : 0.6	Gathering 1 : 2 (Max.1 : 3.8) Stretching 1 : 0.7 (Max.1 : 0.6)	Gathering 1 : 1.75 (Max.1 : 3.8) Stretching 1 : 0.6
9	Needle bar stroke	28.8 mm		
10	Needle tilt angle	20°		
11	Needle	ORGAN DO X 5		
12	Presser lifting amount	Max. 8 mm		
13	Presser foot pressure	49N (5Kg)		
14	Stitch adjusting method	By pushbutton		
15	Upper knife	Flat knife		
16	Differential feed adjustment	By lever with micro adjustment mechanism		
17	Weight	28 kg		
18	Lubrication	Gear-type automatic lubrication		
19	Lubricating oil	* JUKI MACHINE OIL 18 (Equivalent to ISO VG 18)		
20	Needle cooler	Provided as standard (Excluding some of subclass machines)		
21	Needle thread heat remover	Provided as standard (Excluding some of subclass machines)		
22	Micro presser lifting device	Provided as standard		
23	Motor	2P 400W		

*** JUKI MACHINE OIL 18 (Equivalent to ISO VG 18)**
Part No. : MML018900CA (900 m ℓ)

2. MODEL NUMBERING SYSTEM

MO-6000 SERIES MODEL NUMBERING SYSTEM

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

MO6△△△□□□△△△△/□△△△-□□△

4 Machine code

7	High-speed (7,000 rpm)
9	Super-high-speed (From 8,000 rpm)

5. 6 Seam code

03	Splicing
04	1-needle 3-thread overlock (504)
05	For blind hemmong (505)
12	2-needle 4-thread mock safety stitch (512)
14	2-needle 4-thread overlock (514)
16	2-needle 5-thread safety stitch (516)
43	3-needle 6-thread safety stitch
45	2-needle double chainstitch

8 Needle gauge code

0	1-needle
B	2.0 mm
C	2.4 mm, 2.6 mm (for extra-heavy-weight materials)
D	3.2 mm
E	4.0 mm
F	4.8 mm
1	4.8 mm + 2.0 mm

7 Basic specification code

S	Standard
G	Extra heavy-weight materials * 6900 only

9 Overedging width code

A	1.6 mm
D	3.2 mm
E	4.0 mm
F	4.8 mm
H	6.4 mm
M	10.0 mm
N	18.0 mm

10 Feed dog code

4	2-row
5	1-row
6	3-row
7	4-row

11 Material code

Classification based on materials to be used		
1	Extra light-weight to light-weight materials	For light-weight materials such as shirts or the like
2	Light-weight to medium-weight materials	Knit wear only
3		General fabrics
4	Medium-weight to heavy-weight materials	Knit wear only such as sweater or the like
5		Medium-weight to heavy-weight materials such as denim or the like
6		For heavy-weight materials
7	Heavy-weight to extra heavy-weight materials	Heavy-weight materials for jeans, car mattress, etc.

12 Application code

Classification based on type of operation and process	
0	Standard
1	For blind stitching
2	For gathering
4	For attaching tape
5	For binding
6	For binding tape
D	Splicing *
E	Car mattress
F	Soft chain

* In case of the splicing, 13th figure is [1].

13 Special machine code

Special classification of machine, structure and specification other than gauge set	
0	Standard
6	Feed dog provided with a lip
7	Upper looper high throw type
F	For swim suits
H	Upper looper extra high throw type
1	For splicing

15 to 18 Device and attachment code

G02/Q141	Presser foot/tape guide for attaching tape
G39/Q141	Presser foot (for sharp curve)/tape guide for attaching tape
L121	Blind hemming ruler
S159	Swing type ruffler (pedal-interlocking type for safety stitch)
S161	Swing type ruffler (Manual lever type for safety stitch)
S162	Swing type ruffler (Manual lever type for overlock)
N077	Four-fold binder

20 Machine head code

A	Standard machine head (Common to all specifications)

21 Accessory code

A	For general export *
B	For JE
G	For China

22 Machine head code

0	Fully-sunken type
1	Semi-sunken type

The numberings after "–" (hyphen) of 19th figure will be used on and after April 1, 2002. They are not described on the catalogue or the like.

* The general export specification is for Hong Kong, U.S.A., Japan and Singapore.

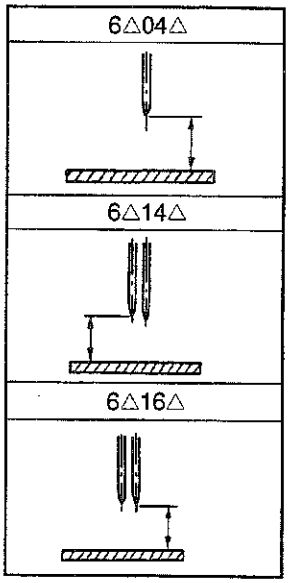
3. STANDARD ADJUSTMENT

Standard Adjustment

(1) Adjusting the needle height

When the needle(s) is in the highest position, the needle height from the throat plate surface should be as shown below.

(Unit : mm)



	Model			1-needle/ 2-needle : left	2-needle : right
1-needle overlock machine	MO- 6△04S	-△△△	-△△0	10.5	–
	MO- 6△05S	-△△△	-△△6		
	MO- 6△04S	-△△△	-△△H	11.3	–
2-needle overlock machine	MO- 6△12S	-△△△	507 - 50F	11.0	9.4
	MO- 6△12S	-CE4	-40H	11.3	9.9
	MO- 6△14S	-B△△	-3△7	10.5	9.1
	MO- 6△14S	-B△△	20H - 40H	11.3	9.9
Safety stitch machine	MO- 6△16S	-△△△	-△△0	10.5	–
	MO- 6△16S	-△△△	-△△H	11.3	–
	MO- 6△16S	-△△△	-60H	13	–
	MO- 6△43S	-△△△	-△△H	11.3	9.9
	MO- 6△45S	-△△△	-360	9.8	–
MO-6900G	MO- 6903G	-0N6	-3D1	15.4	–
	MO- 6904G	-0F6	-700	14.4	–
	MO- 6905G	-0M6	-7△0	15.4	–
	MO- 6914G	-CH6	-700	14.1	12.6
	MO- 6916G	-F△6	-700	14.1	–

The adjustment of needle height for the 2-needle overlock machine should be made in reference to the left needle.

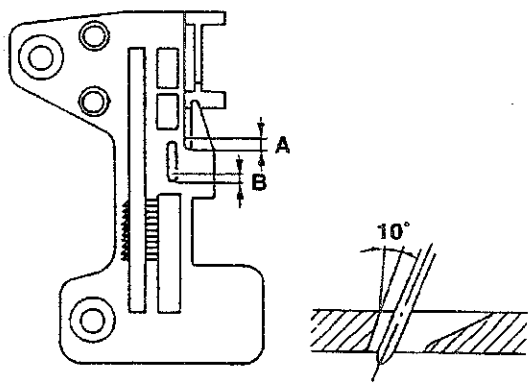
(2) Positioning the throat plate

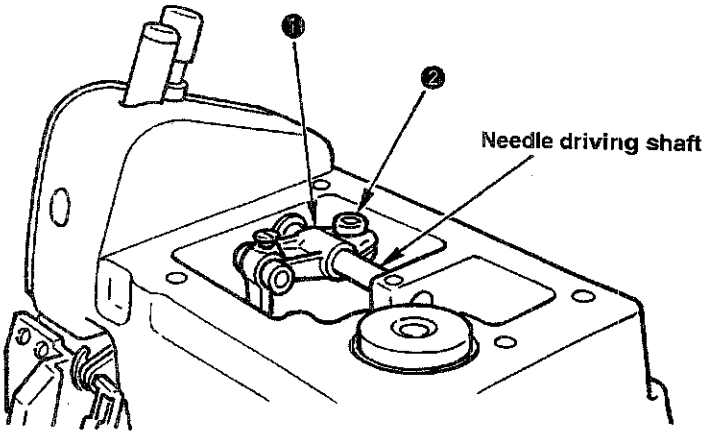
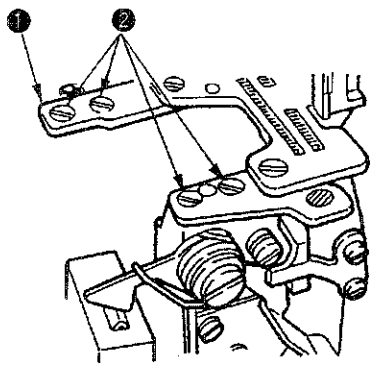
The needle entry point should be such that the distances listed below are provided between the needle slot edge of the throat plate and the center of needle.

Overlock side A	1.3
Double-chainstitch side B	1.0

(Unit : mm)

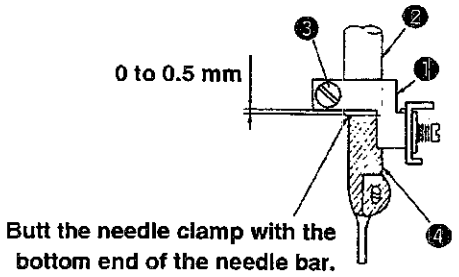
Note that "A=1.8" and "B=1.5" for MO-6△16S-△△△-60H, "A=1.6" and "B=1.3" for MO-69△△G



Adjustment Procedures	Results of Improper Adjustment
1) Take off the upper cover, loosen setscrew ❷ of needle driving forked crank ❶ and move needle driving forked crank ❶ up or down to adjust the needle height.  	○ Any other needle height than specified here will badly affect the action of the lower looper, the timing for catching the upper looper thread, etc.
(NOTE) Do not fully loosen the setscrew ❷ of the needle driving forked crank ❶. **If the needle driving forked crank has got out of position laterally when its setscrew was loosened, fully loosen the setscrew and turn pulley to allow the forked crank to turn until it settles by itself. Then tighten the setscrew to fix the forked crank at that position.**	○ Improper lateral position of the needle driving forked crank will cause seizure, play, or other troubles.
1) Loosen setscrews ❷ of throat plate base ❶ and move throat plate base ❶ back and forth to adjust dimension A or B.  	○ Improperly positioned throat plate will cause needle breakage, contact of the needles will the throat plate, or other troubles.

(3) Installing position of the needle clamp

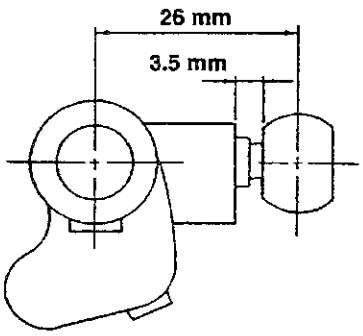
Needle clamp connecting stud ❶ should fit with the bottom end of needle bar ❷ or spaced within 0 to 0.5 mm.

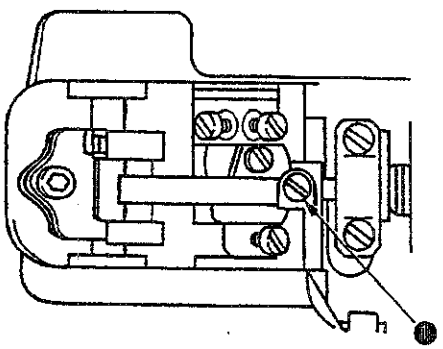


(4) Adjusting the length of the lower looper holder (Applicable only to MO-6△16S / MO-6916G series)

The center-to-center distance should be 26 mm.

At this time, the clearance between the end surface of the arm and the neck of the ball should be 3.5 mm.



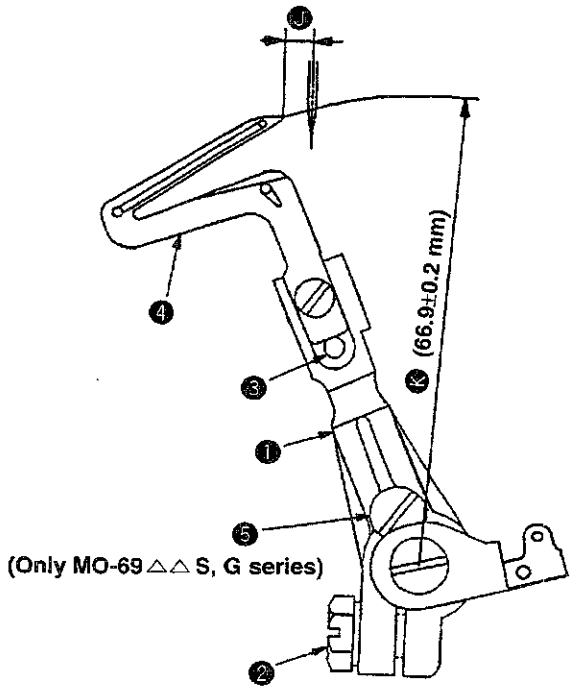


Adjustment Procedures	Results of Improper Adjustment
1) Loosen setscrew ❸ and adjust, by slightly turning needle clamp ❹, the clearance provided between the right-hand side needle and the lower looper (for 2-needle overlock machine) and the clearance provided between the needle hole in the throat plate and the needle (for safety stitch machine).	○ If the clearance provided between the needle and the looper is excessive, the needle thread will be likely to skip at the time of tucking. ○ If the clearance provided between the needle and the looper is insufficient, the needle will break or the looper blade point will be damaged causing thread breakage.
1) Loosen setscrew ❶ of the lower looper holder from the rear of the frame. Since it is difficult to accurately measure the center-to-center distance, perform adjustment to provide a 3.5 mm distance between the end surface of the arm and the neck of the ball as illustrated.	○ Increasing the center-to-center distance will give a smaller stroke of the duble chain looper or lower looper, and decreasing the distance will give larger stroke.

(5) Adjusting the lower looper

1) Returning amount of the lower looper

The distance between the blade point of the lower looper and the center of the needle should be as follows when the lower looper is at the extreme left of its stroke.

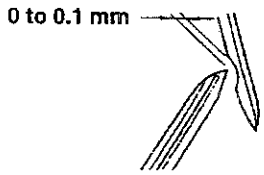


(Unit : mm)

Model				Dimension J
1-needle overlock machine	MO- 6△04S 6△05S	0A5 -0A4 to 0E4 0D6	15△ -210 3△△	4.0
	MO- 6△04S	0F4 - 0F6	3△0 - 500	3.7
	MO- 6△04S	0D4 to 0E4 - 0F6	4△H - 50H	3.8
2-needle overlock machine	MO- 6△14S	BD4 to BE4 - BD6 to BE6	-3△7	3.8
	MO- 6△14S	BD6 to BF6 - BE7	20H - 4△H	3.8
	MO- 6△12S	-CE4	-40H	4.0
	MO- 6△12S	-DF6	50F - 507	2.2
Safety stitch machine	MO- 6△16S	-△△△	3△0 - 500	3.7
	MO- 6△16S	BE4 -DD△ F△△	4△H - 5△H	3.8
	MO- 6△16S	-F△6	-60H	2.8
	MO- 6△43S	-△△△	-△△H	3.8
MO-6900G	MO- 6903G	-0N6	-3D1	1.4
	MO- 6904G	-0F6	-700	3.5
	MO- 6905G	-0M6	-7△0	1.3
	MO- 6914G	-CH6	-700	3.3
	MO- 6916G	-F△6	-700	3.7

2) Clearance between the lower looper and the needle

The clearance should be 0 to 0.1 mm.



Adjustment Procedures	Results of Improper Adjustment
1) Returning amount of the lower looper ① Loosen setscrew ❷ of lower looper support arm ❶ and adjust lower looper ❹ to make adjustment of the returning amount. **(Referential information)** **1. Radius ❸ of lower looper ❹ will be 66.9 mm when the lower looper is inserted into lower looper support arm ❶ until it contacts with stopper pin ❸ and then is fixed.** **2. The rocking angle of the lower looper will be 26°.** **(MO-6△△△S)** **The rocking angle of the lower looper will be 32°.** **(MO-69△△G)**	○ Excessive return of the lower looper tends to cause stitch skipping when filament thread is used. ○ Insufficient return of the lower looper tends to cause needle thread stitch skipping when spun thread is used.
2) Clearance between the lower looper and the needle MO-6700S Series ① Loosen setscrew ❷ of lower looper support arm ❶ to the extent that it is temporarily tightened. Now, make the adjustment by moving lower looper support arm ❶ back and forth. MO-6900S, 6900G Series. ① Loosen setscrew ❷ of lower looper support arm ❶ to the extent that it is temporarily tightened. Then finely adjust the longitudinal position of the looper using fine adjustment screw ❺. ② Turn fine adjustment screw ❺ clockwise to move lower looper ❹ away from the needle. Turn the screw counterclockwise to move lower looper ❹ closer to it.	○ 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.

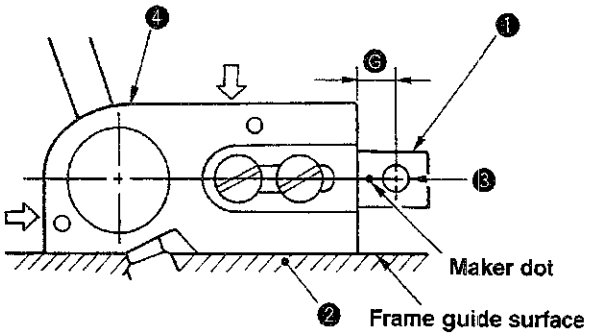
(6) Position of the upper looper guide

Vertical position :

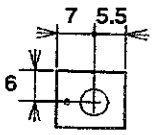
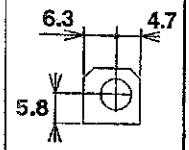
To be in close contact with the frame guide surface.

Laternal position :

To be pressed against the upper looper guide support gauge ❶.



(Unit : mm)

Upper looper guide support gauge		
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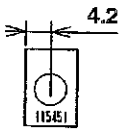
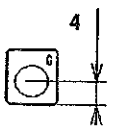
		
	11545100	12375606

(Unit : mm)

	Model			Dimension G
1-needle overlock machine	MO- 6△04S 6△05S	0A5 -0A4 to 0E4 0D6	15△ -210 3△△	
	MO- 6△04S	0F4 0F6	3△0 500	
	MO- 6△04S	0D4 to 0E4 0F6	4△H 50H	
2-needle overlock machine	MO- 6△14S	BD4 to BE4 BD6 to BE6	-3△7	
	MO- 6△14S	BD6 to BF6 BE7	20H 4△H	
	MO- 6△12S	-CE4	-40H	
	MO- 6△12S	-DF6	507 50F	

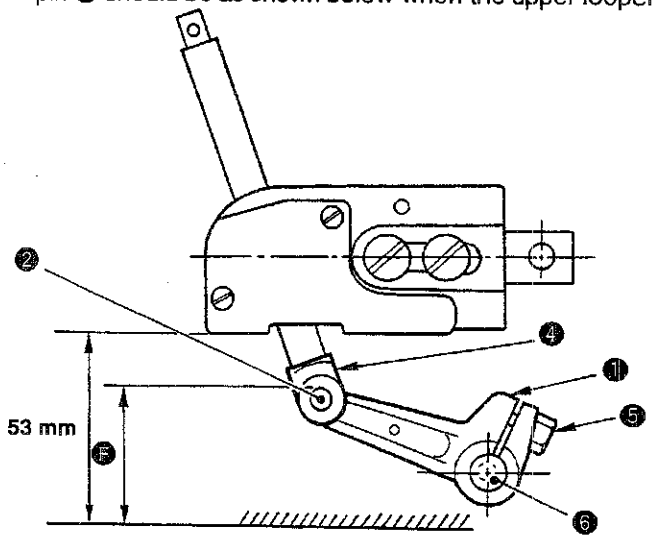
(Unit : mm)

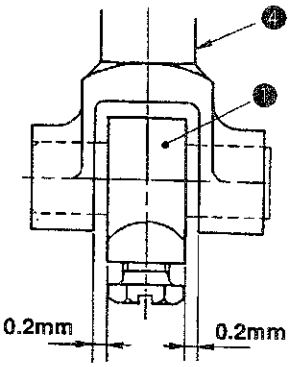
	Model			Dimension G
Safety stitch machine	MO- 6△16S	-△△△	3△0 500	
	MO- 6△16S	BE4 -DD△ F△△	4△H 50H	
	MO- 6△16S	-F△6	-60H	
	MO- 6△43S	-△△△	-△△H	
MO-6900G	MO- 6903G	-0N6	-3D1	
	MO- 6904G	-0F6	-700	
	MO- 6905G	-0M6	-7△0	
	MO- 6914G	-CH6	-700	
	MO- 6916G	-F△6	-700	

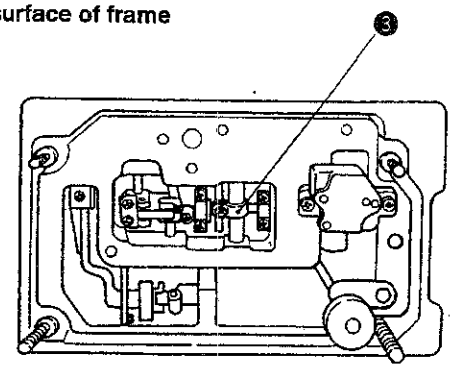
Adjustment Procedures	Results of Improper Adjustment
1) Fit upper looper guide support gauge ❶ over gauge fixing pin ❸ which has been driven in frame ❷ and secure the gauge with an O ring. Then position the gauge taking the marker dot engraved on it or the chamfering direction as reference. 2) When installin upper looper guide support ❹, press it against the gauge while keeping the upper looper guide support into close contact with the frame guide surface, then tighten the screws. **(Caution) Refer to "4- (4) -1) - ⑦ Various sealants" for the various sealants.**	○ If the upper looper guide has 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.

(7) Positioning the upper looper holder

The distance between the bottom surface of the frame and the upper end of the upper looper holder pin ❷ should be as shown below when the upper looper holder ❶ is at the highest point of its stroke.







(Unit : mm)

	Model			Dimension Ⓕ
1-needle overlock machine	MO- 6△04S 6△05S	0A5 -0A4 to 0E4 0D6	15△ -210 3△△	45.0
	MO- 6△04S	0F4 - 0F6	3△0 - 500	46.2
	MO- 6△04S	0D4 to 0E4 - 0F6	4△H - 50H	48.2
2-needle overlock machine	MO- 6△14S	BD4 to BE4 - BD6 to BE6	-3△7	47.3
	MO- 6△14S	BD△ to BF△ - BE7	20H - 4△H	48.4
	MO- 6△12S	-CE4	-40H	46.8
	MO- 6△12S	-DF6	507 - 50F	46.9

(Unit : mm)

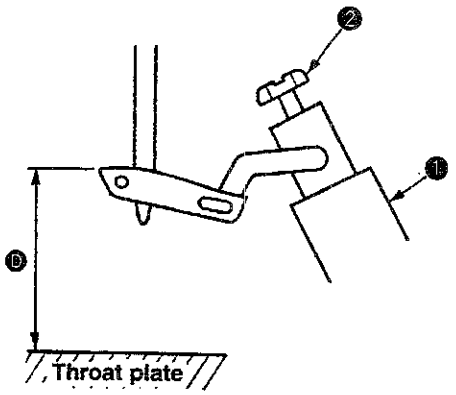
	Model			Dimension Ⓕ
Safety stitch machine	MO- 6△16S	-△△△	3△0 - 500	46.2
	MO- 6△16S	BE4 -DD△ F△△	4△H - 5△H	48.2
	MO- 6△16S	-F△6	-60H	48.4
	MO- 6△43S	-△△△	-△△H	48.4
MO-6900G serise	MO- 6903G	-0N6	-3D1	51.2
	MO- 6904G	-0F6	-700	50.7
	MO- 6905G	-0M6	-7△0	51.7
	MO- 6914G	-CH6	-700	49.3
	MO- 6916G	-F△6	-700	48.8

Adjustment Procedures	Results of Improper Adjustment
1) Loosen the setscrew of upper looper ball arm ❸ and setscrew ❺ of the upper looper holder. 2) Adjust the clearances between upper looper bracket ❹ and upper looper holder ❶ to approximately 0.2 mm respectively, and tighten setscrew ❺ of the upper looper holder. (Make sure that the upper looper holder smoothly moves together with upper looper shaft ❻.) 3) Then determine dimension Ⓕ from the bottom surface of the frame to the top surface of upper looper holder pin ❷ before tightening the setscrew of upper looper ball arm ❸. **(Caution) Replace upper looper holder ❶ according to the needle gauge size.**	○ Inaccurately positioned upper looper holder will cause excessive projection of the upper looper, resulting in stitch skipping, or other troubles. **(Caution) To adjust the upper looper ball arm, take dimension Ⓕ 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.**

(8) Positioning the upper looper

1) Height of the upper looper

The distance between the throat plate surface and the blade point of the looper should be as follows when the upper looper is at the extreme left of its travel.



(Unit : mm)

	Model			Dimension Ⓓ
1-needle overlock machine	MO-	6△04S -△△△ -△△0 6△05S -△△△ -△△6		11.0
	MO-	6△04S -△△△	-△△H	11.3
2-needle overlock machine	MO-	6△14S -BD4 to BE4 BD6 to BE6	-307	10.3
	MO-	6△14S -BD△ to BF△ BE7	-20H -4△H	11.0
	MO-	6△12S -CE4	-40H	11.8
	MO-	6△12S -DF6	-507 50F	11.0

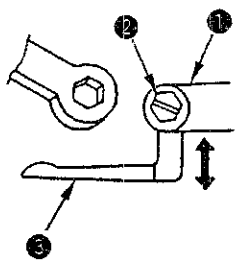
(Unit : mm)

	Model			Dimension Ⓓ
Safety stitch machine	MO-	6△16S -△△△ -△△0		11.0
	MO-	6△16S -BE4 -DD△ F△△	-4△H -5△H	11.3
	MO-	6△16S -F△6	-60H	12.8
	MO-	6△43S -△△△	-△△H	11.0
MO-6900G series	MO-	6903G -0N6	-3D1	13.6
	MO-	6904G -0F6	-700	13.7
	MO-	6905G -0M6	-7△0	12.0
	MO-	6914G -CH6	-700	12.9
	MO-	6916G -F△6	-700	13.7

2) Longitudinal position of the upper looper

① The clearance between the upper and lower loopers should be 0.1 to 0.2 mm when they cross with each other.

② The clearance between the upper looper ❸ and the needle should be 0 to 0.2 mm.



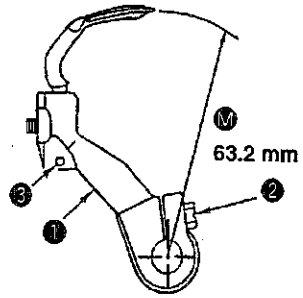
Adjustment Procedures	Results of Improper Adjustment
1) Height of the upper looper ① Set a hexagon screwdriver onto setscrew ❷ at the end of upper looper bracket ❶ to adjust height ❺. ② When adjusting the height, pay attention also to the clearance produced between the upper looper and the lower looper at the time of their crossing.	○ If the upper looper has been positioned too high, an excessive clearance will be produced between the upper looper and the needle. As the result, the upper looper thread will fail to catch the needle thread, and stitch skipping occurs. ○ 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 touch other component when the presser foot goes up.
2) Longitudinal position of the upper looper ① Loosen setscrew ❷ at the top end of upper looper bracket ❶ to move upper looper ❸ back or forth for positioning the clearance of 0.1 to 0.2 mm between the upper looper and the lower looper at the time of their crossing or the clearance of 0 to 0.2 mm between upper looper ❸ and the needle.	○ Excessive clearance will cause stitch skipping. ○ Insufficient clearance will cause the upper looper to come in contact with the lower looper.

(9) Adjusting the double chain looper (Applicable only to MO-6△16S/6916G series)

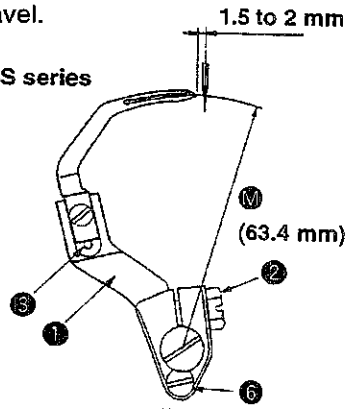
1) Returning amount of the double chain looper

The distance between the needle center and the blade point of the double chain looper should be 1.5 to 2 mm when the looper is at the extreme left of its travel.

MO-6916G series



MO-6△16S series



MO-6916S only

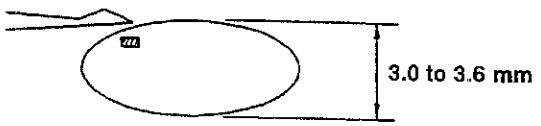
2) Longitudinal motion (Avoid motion)

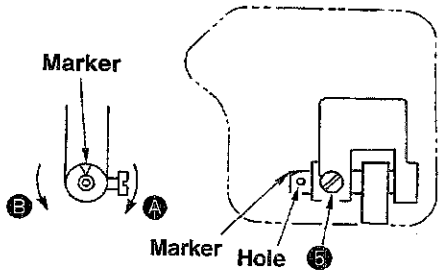
The standard minor axis of the elliptical motion should be :

3.0 mm (MO-6△16S).

3.5 mm (MO-6916G).

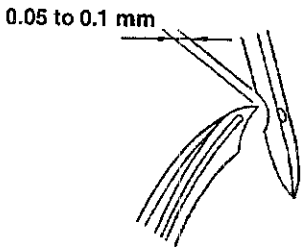
Note : The avoid motion should be adjusted in accordance with Needle No.

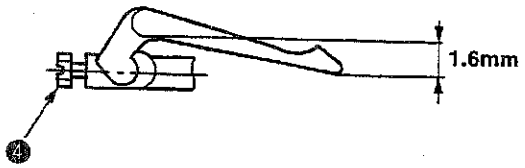
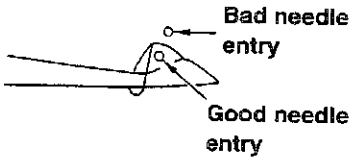




3) Clearance between the double chain looper and the needle

The clearance should be 0.05 to 0.1 mm.



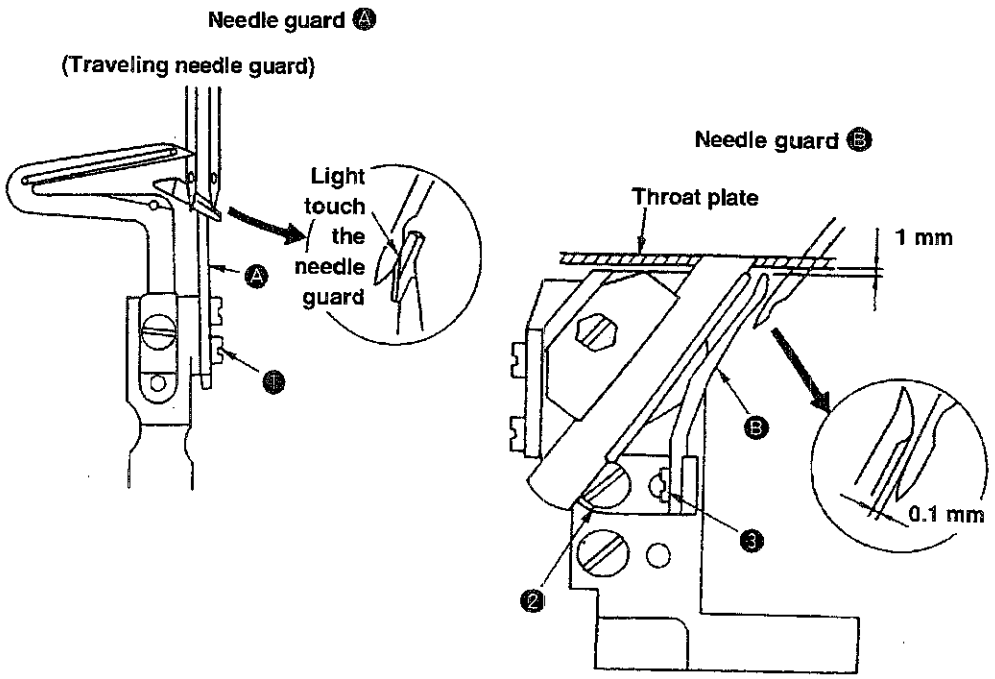
Adjustment Procedures	Results of Improper Adjustment
1) Returning amount of the double chain looper ① Loosen setscrew ❷ of double chain lopper driving arm ❶ to make this adjustment. ② Radius Ⓜ of the double chain looper driving arm ❶ will be 63.4 mm when it is lowered until it comes in contact with stopper pin ❸. ③ For MO-6916G type machines, radius Ⓜ will be 63.2 mm. ④ Adjust the tilt of double chain looper with setscrew ❹. Adjust the tilt to 1.6 mm.  	○ Excessive return of the double chain looper will cause frequent stitch skipping when filament thread is used. ○ Insufficient return of the double chain looper will cause frequent thread stitch skipping when a spun thread is used.
2) Longitudinal motion (Avoid motion) ① Open the cover of the adjusting hole on the rear of the frame, loosen setscrew ❺, and put a ø2 rod in the hole. Now, make the adjustment by turning the rod back and forth. Marker : This side ..... Minimum (for standard to thin needle) Ⓐ Marker : Far side ..... Maximum (for thick needles) Ⓑ } As observed from this side	○ If the avoid motion is too large, triangle stitch skipping will often occur.  ○ Insufficient avoid motion will cause the needle point to hit the looper, producing scratches on the needle point or looper.
3) Clearance between the double chain looper and the needle ① Temporarily tighten setscrew ❷ in the double chain looper, and finely adjust the longitudinal position of the double chain looper. Adjust the clearance to 0.05 to 0.1 mm. MO-6916S series only ② Turn fine adjustment screw ❻ clockwise to move the double chain looper away from the needle. Turn it counterclockwise to move the double chain looper closer to it.	○ Excessive clearance will cause frequent needle thread stitch skipping. ○ Insufficient clearance will cause to looper to hit the needle, leading to needle breakage or scratches on the looper blade point with consequent thread breakage.

(10) Adjusting the height and clearance of the needle guard

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

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

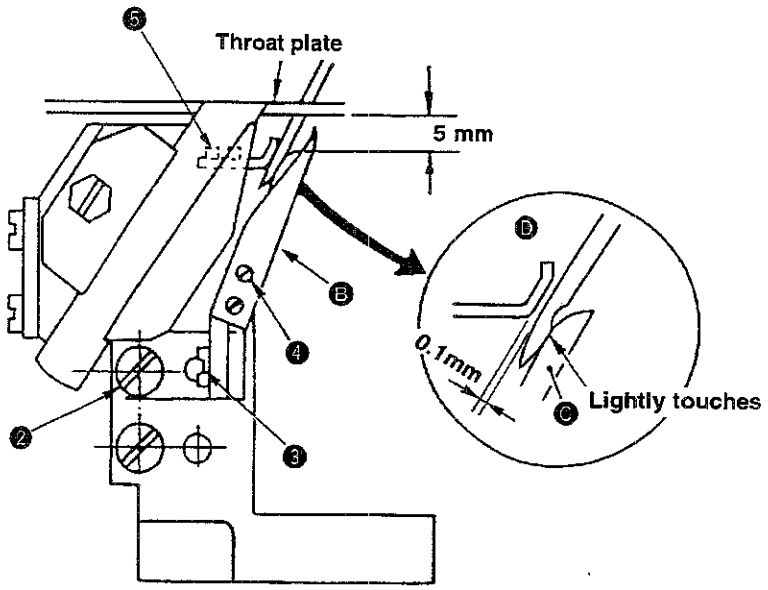
The needle guard Ⓑ should be located 1 mm below the throat plate bottom surface.



2) For safely stitch machine

The safely stitch machine has four needle guards, Ⓐ, Ⓑ, Ⓒ and Ⓓ. The needle guards Ⓐ and Ⓑ are positioned in the same manner as those for the overlock machine.

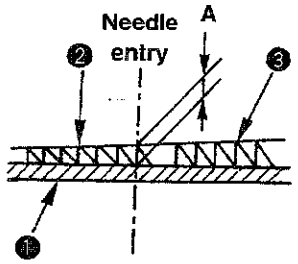
The needle guard Ⓒ should be positioned 5 mm below the throat plate bottom surface.



Adjustment Procedures	Results of Improper Adjustment
1) For 1-needle or 2-needle overlock machine ① Adjust needle guard Ⓐ with setscrews ❶ in the needle guard so that it lightly comes in contact with the needle when the blade point of the lower looper reaches the needle center. ② To adjust the clearance provided between needle guard Ⓑ and the needle when the needle bar is at the lowest point of its stroke, loosen setscrews ❷ in the needle guard support and turn needle guard Ⓑ to adjust the clearance to 0.1 mm. ③ Adjust the height of needle guard Ⓑ to 1 mm from the throat plate bottom surface with setscrew ❸ in the needle guard.	○ Excessively close contact between the needle guard Ⓐ and the needles will lead to needle bend or stitch skipping. ○ A clearance left between the needle guard Ⓐ 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. ○ If the needle guard Ⓑ is too high, thread loops will be damaged with resultant stitch skipping. Also, double chain loops will be affected, causing double chain stitch skipping. ○ If the needle guard Ⓑ is too low, the needle cooling felt will be lowered, resulting in deteriorated effect of the cooling and needle guard. ○ Excessive clearance between the needle guard Ⓑ 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.
2) For safety stitch machine ① Loosen setscrews ❹ in the needle guard, and adjust the clearance provided between needle guard Ⓒ and the needle so that it lightly comes in contact with the needle. ② Adjust the installing height of needle guard Ⓒ to 5 mm with setscrew ❸ in the needle guard. ③ Adjust the clearance provided between needle guard Ⓓ and the needle to 0.1 mm with setscrews ❺. **(NOTE) Check again the clearance provided between needle guard Ⓑ and the needle after adjusting the height of needle guard Ⓒ.**	○ If the needle guard Ⓒ is too high, the needle thread loops will be damaged, and stitch skipping occur. If it is too low, the needle points will be crushed. ○ If the clearance between the needle guard Ⓒ 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, 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 wear on the needle guard and scratches on the needles will occur. ○ Excessive clearance left between the needle guard Ⓓ 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.

(11) Adjusting the height of the feed dog

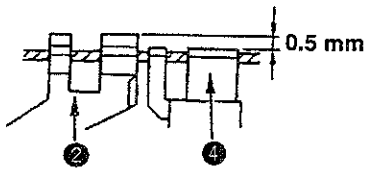
The height of main feed dog ❷ from the top surface of the throat plate ❶ should be as follows when it is at its highest posion.

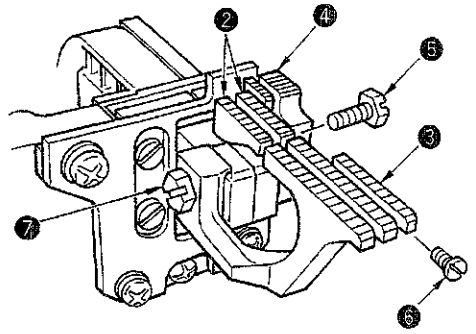


(Unit : mm)

Model	Dimension A
MO-6△00S Series	1.0
MO-6904G Series MO-6916G Series	1.3
MO-6914G Series	1.2

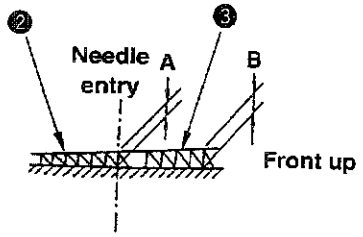
Auxiliary feed dog ❹ is 0.5 mm lower than main feed dog ❷.



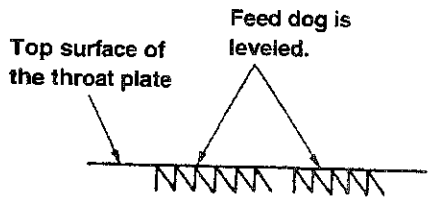


(12) Adjusting the tillt of the feed dog

Tilt of the feed dogs when the feed dogs have come up most.

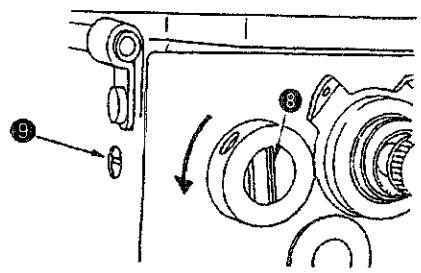


When the feed dog juts out the top surface of the throat plate



(Unit : mm)

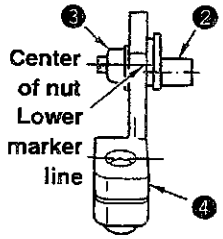
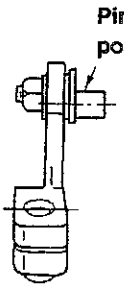
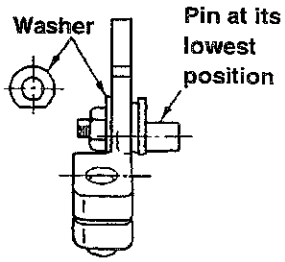
Model	Dimension A	Dimension B
MO-6△00S Series	1.0	(1.2)
MO-6904G Series MO-6916G Series	1.3	(1.5)
MO-6914G Series	1.2	(1.4)



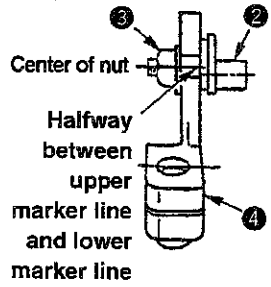
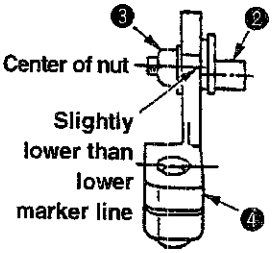
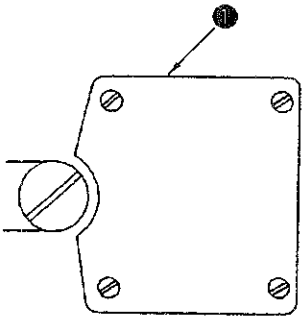
Adjustment Procedures	Results of Improper Adjustment
1) Adjust the height of main feed dog ❷ to dimension A with setscrew ❺. 2) Adjust the height of differential feed dog ❸ with setscrew ❼ so that there is no difference in level between main feed dog ❷ and differential feed dog ❸. 3) Adjust the height of auxiliary feed dog ❹ with setscrew ❻ so that it is 0.5 mm lower than main feed dog ❷.	○ 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.
1) Use the tilt of the feed dog when it is in its highest position as a reference and adjust so that the feed dog is flush with the throat plate when the feed dog juts out the throat plate. 2) Feed bar shaft ❽ consists of an eccentric shaft. Loosen setscrew ❾ to perform adjustment. When the marker line is set at middle .....The feed dog will be flat. When the marker line is set at bottom .....The feed dog will be tilted with its front up (in the arrowed direction). When the marker line is set at top .....The feed dog will be tilted with its front down. **(NOTE) The marker line should be used just as the reference since it slightly differs with that of each machine due to the disparity of the components.** **Confirm the accurate tilt of the feed dog by observing the feed dog itself.**	○ 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.

(13) Adjusting the differential feed ratio

MO-6000S Serise

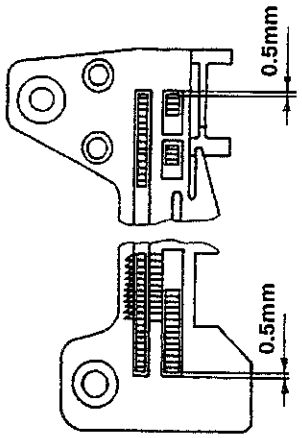
		
(Standard) Gathering: 1: 2 Stretching: 1: 0.7	(Max, stretching) Gathering: 1:1.6 Stretching: 1:0.6	(Max, gathering) Gathering: 1: 4 Stretching: 1: 1.3

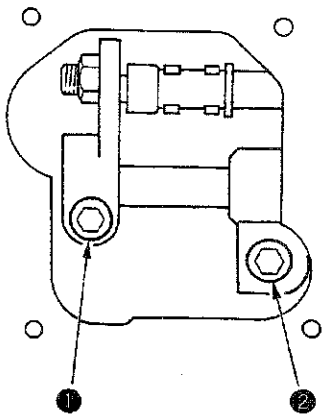
MO-6900G Serise

		
(MO6904G, MO6916G) Gathering: 1: 1.75 Stretching: 1: 0.6	(MO-6914G) Gathering: 1:2.0 Stretching: 1:0.7	

(14) Longitudinal position of the feed dog

When the feed pitch is maximized and the differential feed ratio is also maximized, the clearances of the front and rear ends of the feed dog, and the throat plate should be spaced approximately 0.5 mm respectively.



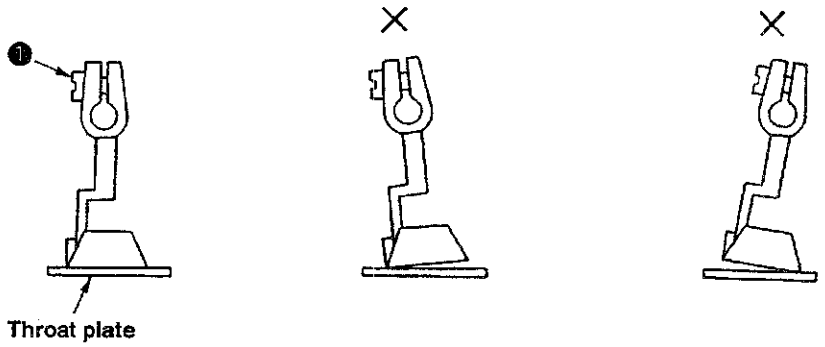


Adjustment Procedures	Results of Improper Adjustment
1) Remove cover ❶ on the rear of the frame and loosen main feed pin and nut ❸. 2) Move main feed pin ❷ up or down to adjust the differential feed ratio. 3) Adjust so that the lower engraved marker line on main feed rocker ❹ aligns with the center of nut ❸. (Standard) 4) When adjusting the maximum stretching, adjust main feed pin ❷ to the highest position. 5) When adjusting the maximum gathering, adjust main feed pin ❷ to the lowest position. 6) After performing adjustment, tighten the main feed pin and nut ❺, and install cover ❶.	
1) Remove the cover on the rear of the frame, loosen main feed bracket clamping screw ❶ and differential feed bracket clamping screw ❷, and adjust the clearances provided between the front and rear ends of the feed dogs and the slots in the throat plates to approximately 0.5 mm. Then tighten main feed bracket clamping screw ❶ and differential feed bracket clamping screw ❷.	○ 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.

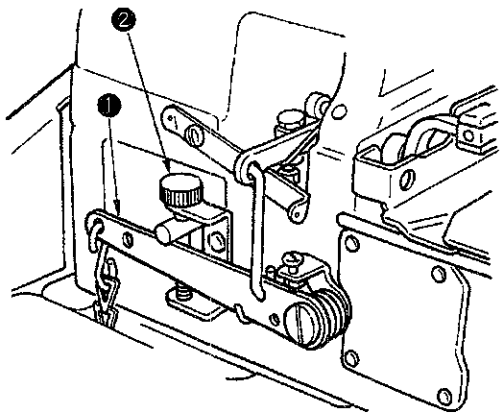
(15) Adjusting the presser foot

1) Adjusting the tilt of the presser foot

The presser foot should be positioned so that the feed dogs go down under the specified presser foot pressure, and the presser foot sole comes in contact evenly with the throat plate surface.



2) Adjusting the micro-lifting mechanism of the presser foot

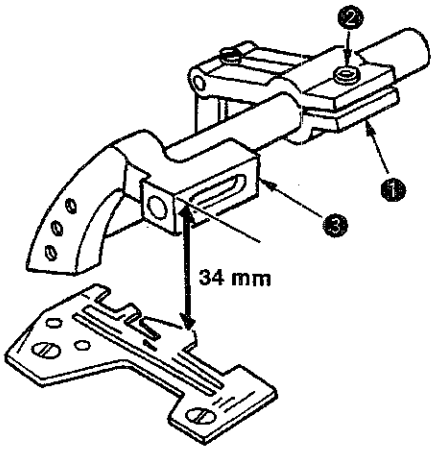


Adjustment Procedures	Results of Improper Adjustment
1) Adjusting the tilt of the presser foot ① Turn the handwheel and place the feed dog in the position where the feed dog does not jut out the top surface of the throat plate. ② Loosen setscrew ❶ and adjust so that the presser fopot sole comes in contact evenly with the throat plate top surface. Then tighten setscrew ❶. **(Reference) Accurate adjustment can be made by using two pieces of thin paper to check for even drawing-out tension. In addition, even contact of the presser foot with the throat plate top surface is achieved rather easily by tightening the screw while pushing the right side of the presser foot.**	○ Uneven contact will result in bad straight material feed, weak feed power, or puckering.
2) Adjusting the micro-lifting mechanism of the presser foot ① When moving presser lifting lever ❶ just a little, perform it with fine adjustment screw ❷.	

(16) Positioning the upper knife arm shaft

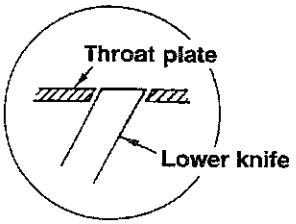
The upper knife shaft should be positioned 34 mm above the top surface of the throat plate when it is at its highest position.

MO-6△16S-F△6-60H : 35 mm

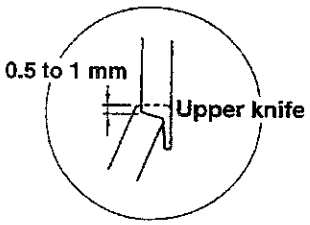


(17) Positioning the upper and lower knives, and available overedge widths

1) Lower knife

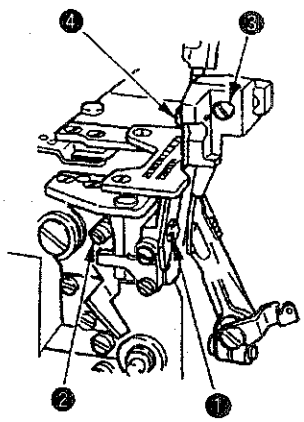


2) Upper knife



3) Overedging width

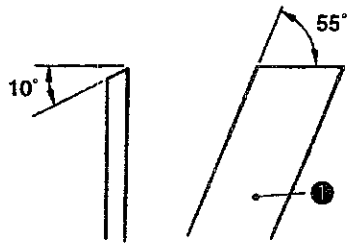
Overedging width can be adjusted from 1.6 to 6.4 mm.



Adjustment Procedures	Results of Improper Adjustment
1) Remove the upper cover, loosen setscrew ❷ in upper knife driving arm ❶, and turn upper knife shaft ❸ to adjust the position from the top surface of the throat plate to 34 mm. **(Caution) Be sure to fully tighten the setscrew since upper knife shaft ❸ is subjected to high load.**	○ Improperly positioned upper knife arm shaft will come in contact with the frame. If it is moved with the position of the upper knife unchanged, proper engagement of the knives will be disturbed, prohibiting sharp cutting of the knives.
1) Lower knife ① Adjust the vertical position of the lower knife by screw ❶ so that the blade top aligns with the top surface of the throat plate. ② Tighten screw ❷ after bringing the upper knife to its lowest position of its stroke. **2) Upper knife** ① Adjust the position of the upper knife by screw ❹ so that the engagement with the lower knife is 0.5 to 1 mm when the upper knife is in the lowest position of its stroke. **(Caution) Adjust the lateral position of the lower knife by screw ❷. Adjust the lateral position of the upper knife by screw ❸. After performing adjustment, be sure to fix the knife. Otherwise, the durability of the knife will be affected.** **3) Overedging width** ① Adjust the overedging width in the following way : Laterally position the upper knife before loosening screw ❷. Tighten screw ❷ when the upper knife has settled by itself under the pressure applied by the spring. Repeat this adjustment procedure to obtain desired overedging width.	○ The lower knife, if positioned too high, will catch materials or cause no contact of the presser foot with the throat plate top surface. ○ If the lower knife is positioned too low, the cutting width will be changed or materials will be caught by the lower knife. ○ The upper knife, if positioned too high, will fail to cut materials. ○ Unsharp cutting or abnormal wear on the knives will result unless the lower knife is laterally positioned and fixed at a position where it has settled by itself under the upper knife spring.

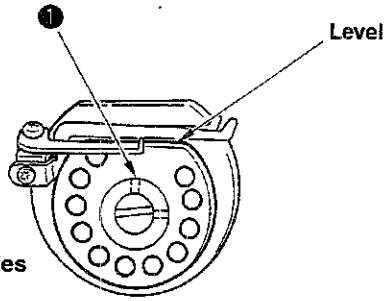
(18) Resharpening of the knife

Lower knife gauge
Part No. 11996907



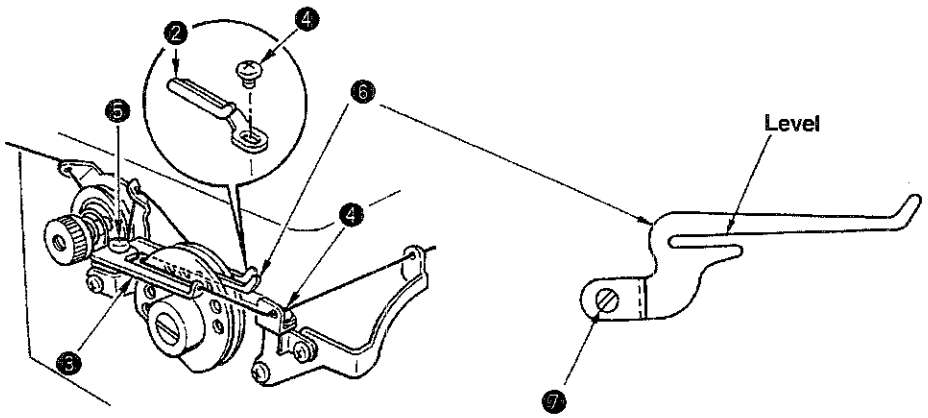
(19) Position of the thread cam (Applicable only to MO-6△16△ series)

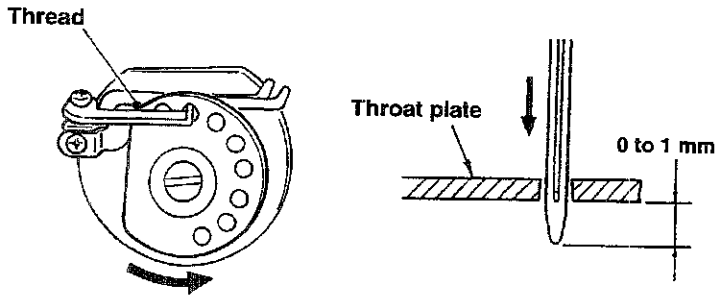
1) Adjustment of the thread cam



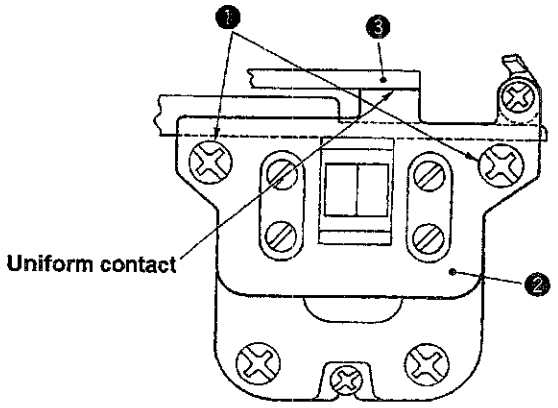
MO-6△16△ series

2) Adjusting looper thread cam thread guides A and B and the looper thread cam nail

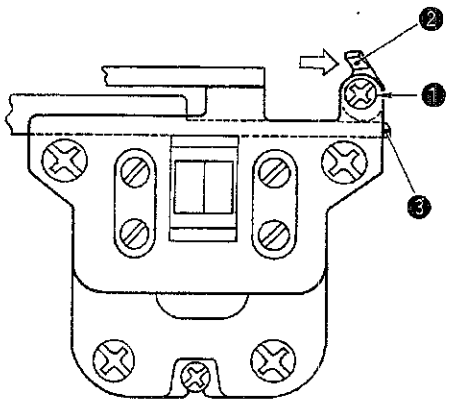


Adjustment Procedures	Results of Improper Adjustment
1) When the knives have become dull, fully resharpen lower knife ❶ until the contact mark of it disappears. 2) When the upper knife has become dull, replace it with a new one. (This is because the upper knife is a serrated carbide knife.)	○ If the 10° angle of the lower knife is exceeded, the durability of the knife will be deteriorated, often resulting in blade chipping. ○ If the angle is smaller than 10°, the knife will be dull. ○ If the 55° angle is not observed, the knife may catch materials.
1) Adjusting the thread cam ① Adjust the position of the thread cam by its setscrew ❶ with the needles at their upper dead point so that the straight section of the thread cam is leveled. ② Laterally position the thread cam so that the looper thread cam nail is located at the center of the thread cam groove. **[How to check for proper positioning]** Check that the thread cam releases the looper thread when the needle tip begins to come out of the bottom surface of the throat plate by 0 to 1 mm.  	○ If the timing of the 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 thread cam is too late, puckering and loose looper thread stitches will results.
2) Adjusting the looper thread cam thread guides A and B and the looper thread cam nail ① Install looper thread cam thread guides A ❷ and B ❸ at the center of the slots with setscrews A ❹ and B ❺. ② Install looper thread cam nail ❻ with setscrew ❼ so that the straight section of the forked portion is leveled.	○ If the chain looper thread guide is moved away from you, the take-up amount of the lower looper thread will decrease. In this case, puckering may result there by impairing the feeling of the finished product.

(20) Adjusting the throat plate support

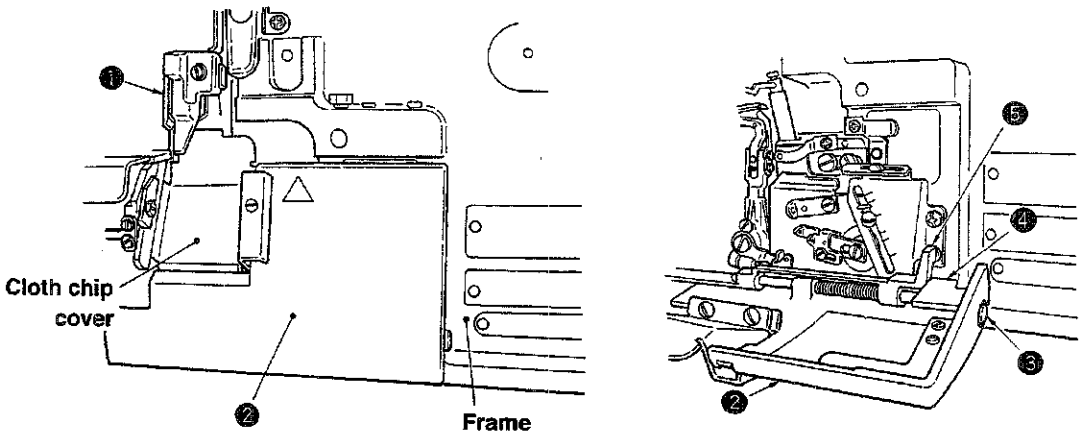


(21) Adjusting the feed mechanism cover presser



(22) Adjusting the looper cover

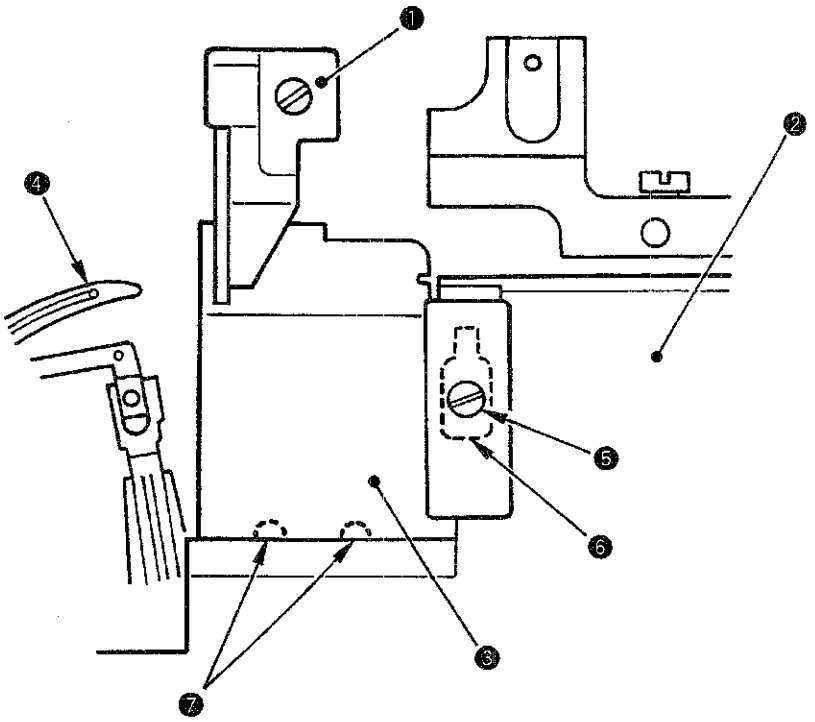
○ The looper cover should smoothly close without coming in contact with upper knife ❶ when slowly closing looper cover ❷ with upper knife ❶ in its lowest position of its troke.



Adjustment Procedures	Results of Improper Adjustment
1) Loosen setscrews ❶ and adjust so that throat plate support ❷ should not come in single-sided contact but come in uniform contact with throat plate ❸ using setscrews ❶.	○ 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.
1) Loosen setscrew ❶ and press feed mechanism cover presser ❷ in the direction of arrow. 2) Press feed mechanism cover ❸ and tighten setscrew ❶ so that the feed mechanism cover should not rise. **(Caution) Check that feed mechanism cover ❸ is pressed so that it should not rise.**	○ If the feed mechanism cover is not fully pressed and the cover rises, oil leakage will be caused.
1) Close looper cover ❷, loosen setscrew ❸, and move looper cover guide plate ❹ back and forth until the looper cover is brought to a position where the cover smoothly closes. 2) Move looper cover guide plate ❹ until it slightly comes in contact with looper cover receiving bracket ❺. Now, fix the guide plate by tightening setscrew ❸.	

(23) Adjusting the cloth chip cover

○ When cloth chip cover ❸ is pressed away from you, it should not rattle.
In addition, the cloth chip cover should not come in contact with upper knife ❶ and lower looper ❹.

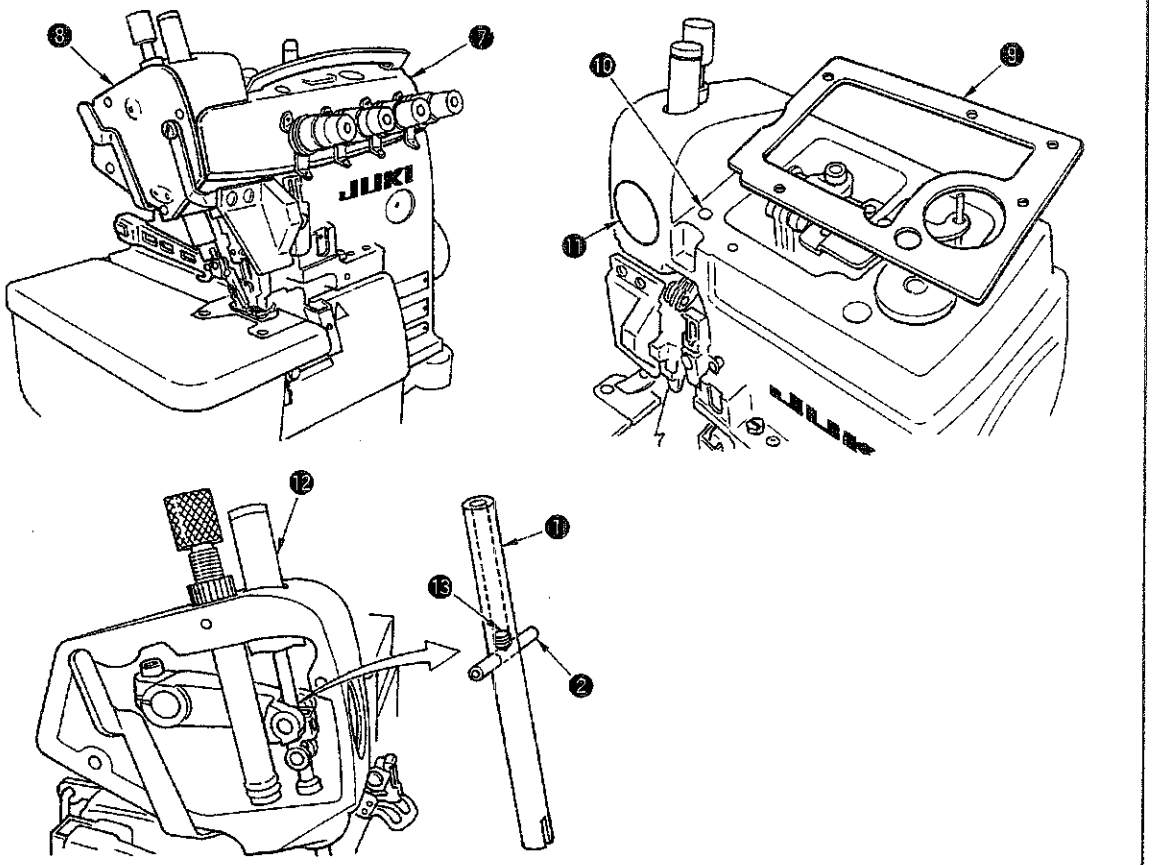


(Located inside)

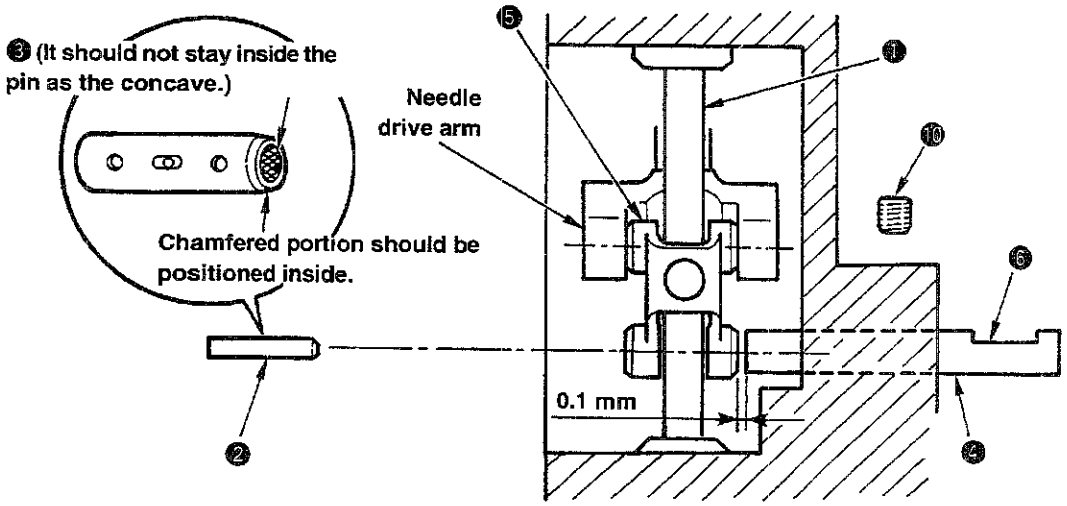
Adjustment Procedures	Results of Improper Adjustment
1) Loosen setscrew ❺ and temporarily tighten the setscrew with cloth chip cover stopper ❻ raised. 2) Loosen setscrews ❼ in the cloth chip cover, and adjust the longitudinal position of cloth chip cover ❸. 3) Loosen setscrew ❺ in the cloth chip cover stopper again, and press cloth chip cover stopper ❻ downward until the stopper slightly comes in contact with looper cover ❷. Now, tighten setscrew ❺. 4) Finally, confirm that cloth chip cover ❸ comes in contact with neither upper knife ❶ nor lower looper ❹.	

(24) Adjusting the needle mechanism

1. Disassembling



2. Adjustment

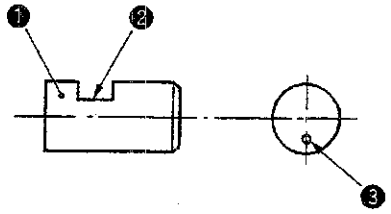


Adjustment Procedures	Results of Improper Adjustment
1. Disassembling 1) Remove top cover ❼ and side cover ❽. 2) If packing ❾ of the top cover has been adhered on the frame, also remove packing ❾. 3) Remove needle front plug ⓫. 4) Loosen setscrew ⓾ of needle lubricating pin ❹ and remove needle lubricating pin ❹. 5) Remove needle bar upper bushing cap screw ⓬ and loosen setscrew ⓭ in the needle drive pin. 6) Fitting needle drive pin ❷ in the hole on the frame side, thrust the pin until it can be drawn out.	
2. Adjustment 1) Bring needle bar ❶ to the lower dead point. 2) Adjust oil wick ❸ in needle drive pin ❷ so that it should be flush with the chamfered plane of the pin. (If oil wick ❸ sinks inside the chamfered plane as the concave, oil will not be fed smoothly.) 3) Install needle lubricating pin ❹ in place with its oil inlet ❻ faced above. 4) Adjust with setscrew ⓾ so that the clearance between needle lubricating pin ❹ and needle drive connecting link ❺ is 0.1 mm. (It is convenient to use a 0.1 mm clearance gauge or the like.)	○ If the oil wick is installed in the needle drive connecting link pin inside the pin as the concave, oil will not lubricated properly resulting in seizure. ○ If the clearance provided between the needle lubricating pin and the needle drive connecting link is too small, the related components will come in contact with each other. ○ If the clearance provided between the needle lubricating pin and the needle drive connecting link is too large, oil wll not be fed properly resulting in seizure. ○ If the oil inlet does not face upward, oil will not be fed resulting in seizure.

(25) Position of the upper looper lubricating pin

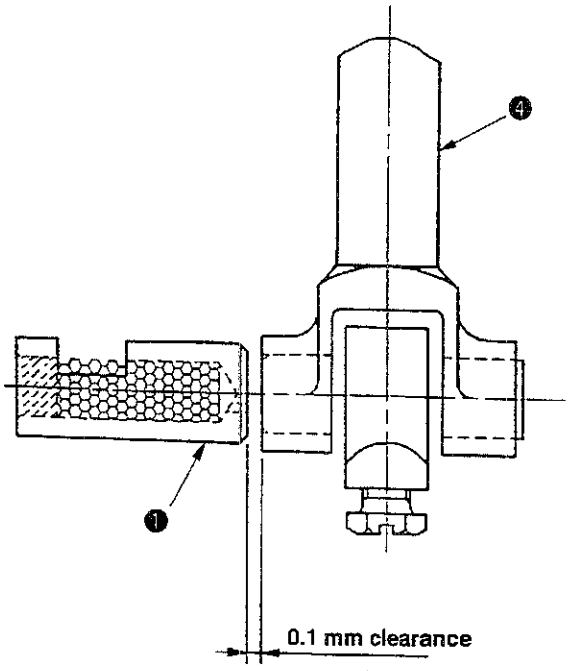
1) Orientation of the lubricating pin

Oil inlet ❷ of upper looper lubricating pin ❶ should face upward.



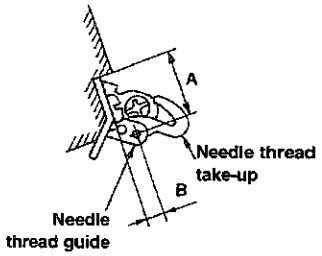
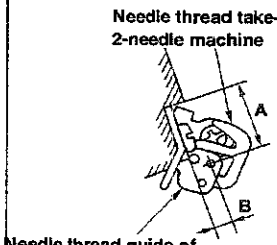
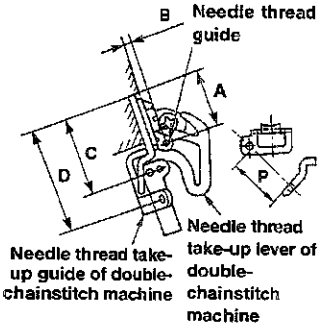
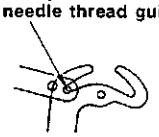
2) Setting the lubricating pin

The clearance provided between upper looper lubricating pin ❶ and upper looper bracket ❹ should be 0.1 mm.

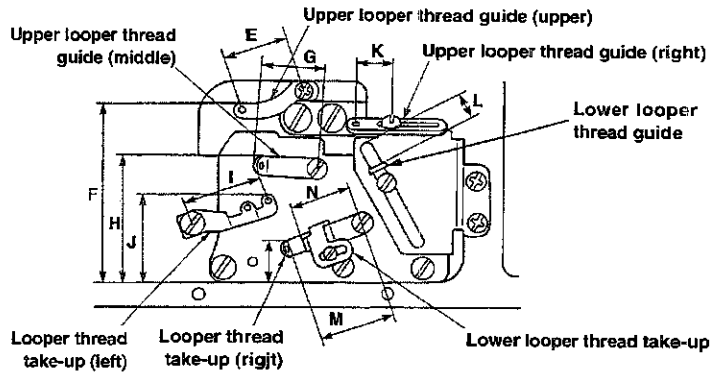


Adjustment Procedures	Results of Improper Adjustment
1) Orientation of the lubricating pin ① When upper looper lubricating pin ❶ is set with oil inlet ❷ faced upward, lubricating hole ❸ is in the lower section as observed from this side.	○ If the oil inlet does not face upward, oil will not be fed resulting in seizure.
2) Setting the lubricating pin ① Remove the oil reservoir, loosen the setscrew and adjust the clearance provided between upper looper lubricating pin ❸ and upper looper bracket ❹ to 0.1 mm using a 0.1 mm clearance gauge or the like.	○ If the clearance provided between the upper looper lubricating pin and the upper looper bracket is too small, the related components will come in contact with each other. ○ If the clearance provided between the upper looper lubricating pin and the upper looper bracket is too large, oil will not be fed resulting in seizure.

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

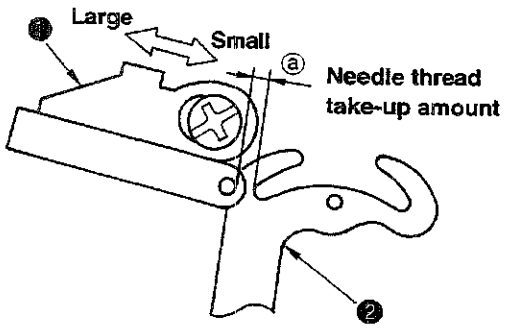
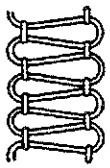
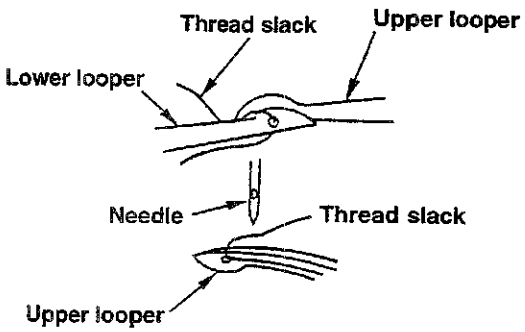
MO-6△04S	MO-6△14S	MO-6△16S
		
The thread hole in the needle thread guide and the hooked portion of the needle thread take-up are in the position where 2/3 of the hole in the needle thread guide can be observed. 	The thread hole in the needle thread guide and the hooked portion of the needle thread take-up are in the position where 2/3 of the hole in the needle thread guide can be observed. 	The thread hole in the needle thread guide and the hooked portion of the needle thread take-up are in the position where 2/3 of the hole in the needle thread guide can be observed.  The thread hole in the double-chainstitch needle thread guide and the hooked portion of the needle thread take-up are in the position where the entire hole in the needle thread guide can be observed.

(Caution) The needle thread take-up shall be positioned at the lower dead point.



(Unit : mm)

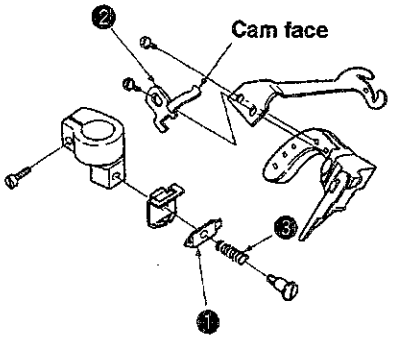
Symbol	MO-6△04S (Standard)		MO-6△14S (Standard)		MO-6△16S (Standard)		MO-6△05S (Hemming)		MO-6△04S (Soft chain)	MO-6△16S (Soft chain)
	General thread	Woolly thread	General thread	Woolly thread	General thread	Woolly thread	General thread	Woolly thread	General thread	General thread
A	15.8	←	←	←	←	←	←	←	13.5	13.5
B	3.4	←	←	←	1.8	←	3.4	←	2.1	0.5
C	-	-	-	-	21.5	←	-	-	-	23.8
D	-	-	-	-	30.5	←	-	-	-	31
E	22	←	←	←	←	←	←	←	←	←
F	65	←	←	←	←	←	←	←	←	←
G	17.5	←	←	←	←	←	←	←	←	←
H	43.5	←	←	←	←	←	40.5	←	43.5	←
I	26.5	←	←	←	←	←	24	←	26.5	24
J	38	41	38	←	34	36	38	42	43.5	36.5
K	15	←	12	15	12	15	12	←	14	←
L	6.5	←	10	←	6.5	←	24	34	←	27
M	29	←	←	←	27.5	←	29	←	26.5	←
N	27	21	23	←	20	←	24	←	19	←
O	11	←	←	←	←	←	12	←	9.5	←
P	-	-	-	-	15	←	-	-	-	12.5

Adjustment Procedures	Results of Improper Adjustment
1) Perform the adjustment by the setscrews. Position of the needle thread guide ❶ and needle thread take up ❷ lever is a very important decisive factor when making soft chains since the needle thread take-up amount is increased in this case. So, carefully position these parts.  	○ Distance ⓐ When set smaller, better tightness of needle thread stitches will be obtained. When set larger, loose needle thread stitches will result.
2) Set distance I a little smaller when using synthetic thread or the like which tends to form stitches swelling out of the cloth edge. A smaller I is effective for preventing stitch skipping.  	○ Distance E, F and H exert least influence on stitch formation, however, improper setting of these distances will cause contact between the moving parts. ○ Distance J 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.
3) Distance J is related to the vertical knotting point of the upper and lower looper threads. Set this distance larger for wooly thread, and set it smaller for thin thread which is likely to cause stitch skipping.	○ Distance K 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.
4) It is desirable to set distance K larger for stretchy threads such as wooly thread.	
5) Set distance L a little larger when making blind hemming soft chain stitches.	○ Distance L 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.
6) Set distance N a little smaller for blind hemming or making soft chain stitches.	○ Distance N 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.
7) Set distance O larger if stitch skipping occurs due to looper thread slack. Set it smaller for better appearance and touch of produced stitches when wooly thread is used.  	○ Distance I 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 O 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.

(27) Adjusting soft chain making mechanism

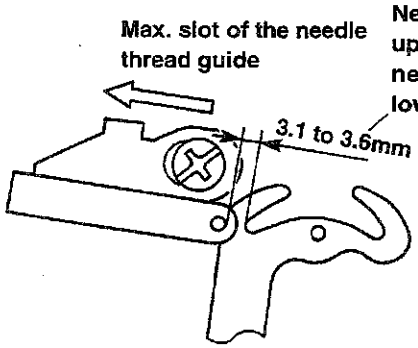
1) Replacing the parts with those exclusively designed for making soft chains

❶ Needle thread presser plate C 12112504
❷ Driving cam 12112603
❸ Needle thread presser spring B 12112702
❹ Throat plate ..... (only for 1-needle overlock machine)
0D4-300 ..... R4200J6DD0A

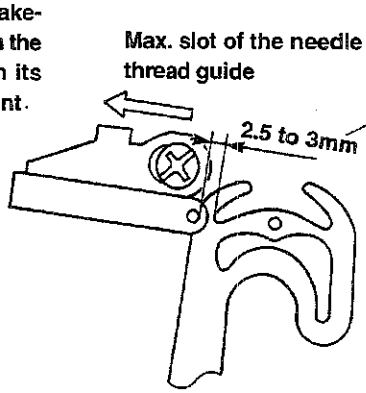


2) Adjustment value

① Needle thread guide and needle thread take-up lever
Adjust the needle thread guide to increase the needle thread feeding amount when the needle bar is in the lowest dead point of its stroke.



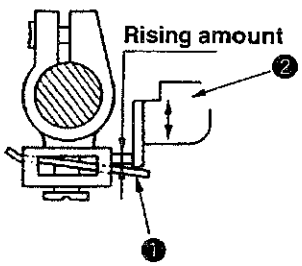
(04 1-needle overlock machine)

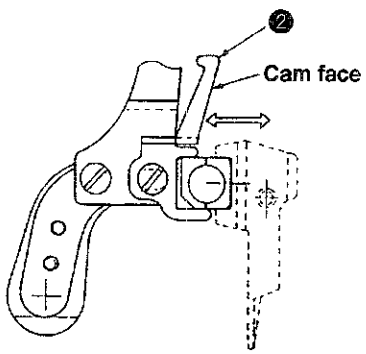


(16 Safely stitch machine)

② Adjust the rising amount of needle thread presser plate C.
Adjust the rising amount of needle thread presser plate C ❶ to 0.6 to 1 mm (max.) by moving driving cam ❷ to the right and left within the slot.

Rising amount : 0.6 to 1 mm (max.)





3) Important points in adjustment

① Increase the thread take-up amount of the needle thread take-up lever.
Refer to the adjustment values related to the needle thread guide and needle thread take-up lever.

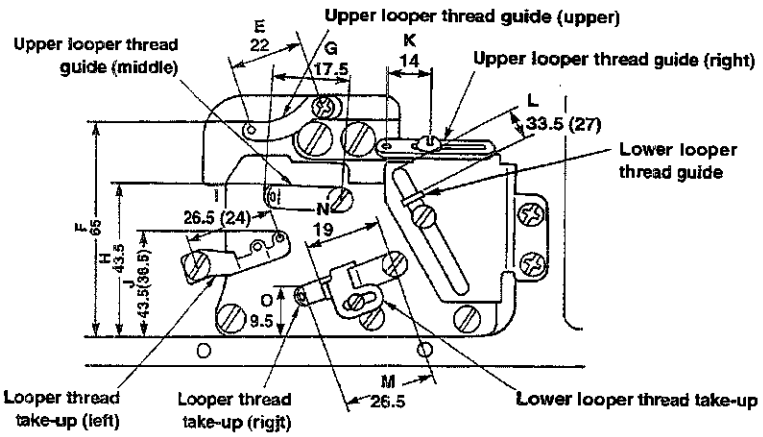
② Reduce the feed of the looper threads. (Mainly lower looper thread)
Set J, K, L and M for the soft chain distances.
Fine adjustment of J and M is required to produce even stitches.

③ Adjsut the thread tension while checking the appearance and touch of the stitches produced.
1) Minimize the needle thread tension as far as satisfactory tightness of needle thread stitches is obtained.
2) Increase the upper looper thread tension as much as possible.

④ If the chain-off thread does not stretch satisfactorily, and if it is not satisfied, proceed with the following.
1) Increase the upper looper thread tension.
2) Further increase distances J and K.
3) Further increase the upper looper thread tension.
4) Increase the lower looper thread tension to a maximum as far as good tightness of needle thread stitches is maintained.
5) Increase the thread take-up amount. If the needle thread is poorly tensed, increase the needle thread tension.

⑤ Fine adjustment for producing stitches with better appearance and touch
1) If the knotting point varies at high or low sewing speed, slightly reduce L, and increase the lower looper thread tension.
2) If a knot is made at a high point, increase J and I.
3) If the needle thread is likely to break, decrease the thread take-up amount and lower the needle thread tension.

⑥ Pay attention to the following
1) Minimize the needle thread tension as far as satisfactory tightness of needle thread stitches is obtained.
2) The knot of upper and lower looper threads should be made near the upper edge of a material.
3) Minimize the lower looper thread tension as far as even stitches are maintained.
4) For a safety stitch machine, adjust the soft chain making mechanism so that uniform chain-off thread is produced during double-chain stitching and overlocking.



The value given in ( ) parentheses is the adjustment value for the safety stitch machine. (Unit : mm)

Soft chain stitches

When the chain-off thread is pulled. ⇨

Looper thread should not be loosened and stretch well

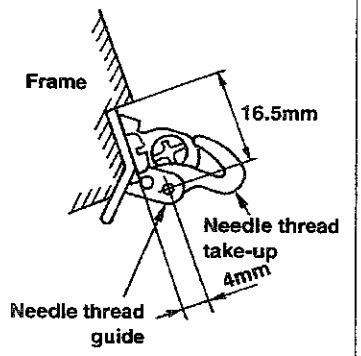
Standard stitches

When the chain-off thread is pulled. ⇨

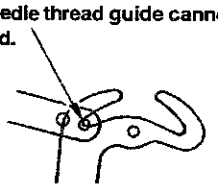
The looper thread loosens

(28) Position of the thread guides and the looper thread take-ups of MO-6900G

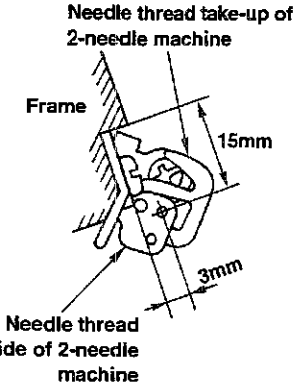
MO-6904G



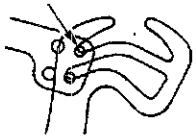
The thread hole in the needle thread guide and the hooked portion of the needle thread take-up are in the position where 1/2 to the entire hole in the needle thread guide cannot be observed.



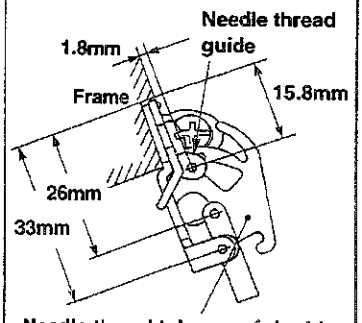
MO-6914G



The thread hole in the needle thread guide and the hooked portion of the needle thread take-up are in the position where 1/2 to the entire hole in the needle thread guide cannot be observed.

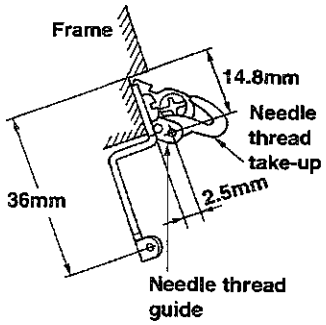


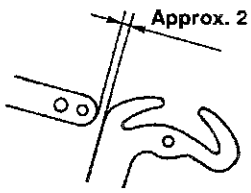
MO-6916G



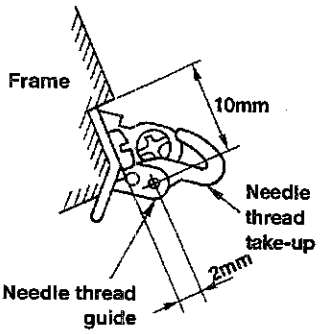
The thread hole in the needle thread guide and the hooked portion of the needle thread take-up are in the position where 1/2 to the entire hole in the needle thread guide cannot be observed.

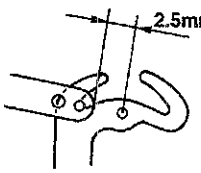
MO-6903G





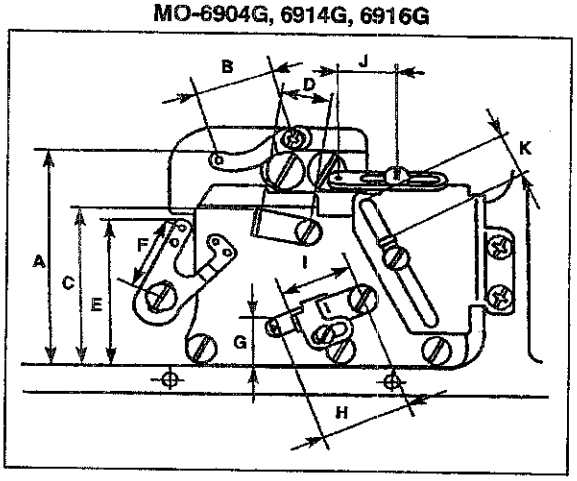
MO-6905G



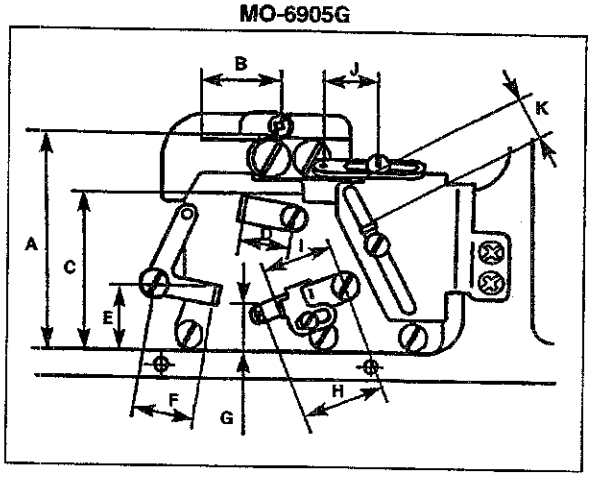


(Caution) The needle thread take-up shall be positioned at the lower dead point.

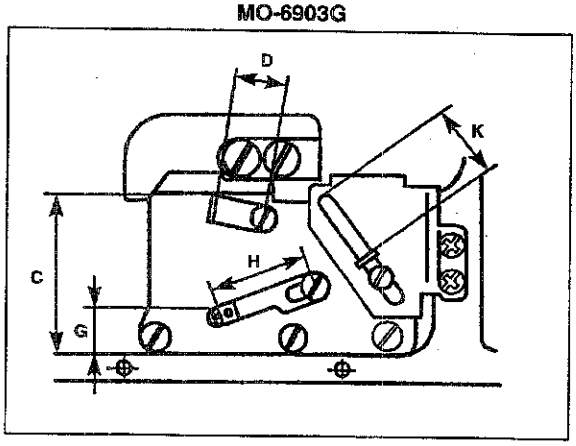
MO-6904G, 6914G, 6916G



MO-6905G



MO-6903G



(Caution) The upper looper thread-take-up (right) and the looper thread take-up (left) shall be positioned at the extreme right point of the upper looper.

(Unit : mm)

Position	MO-6904G-0M6-700	MO-6914G-CH6-700	MO-6916G-F△6-700	MO-6905G-0M6-7△0	MO-6903G-0N6-3D1
A	70	←	←	65	-
B	22	←	←	20	-
C	48	←	←	46	52
D	18	←	←	←	←
E	43	←	←	22	-
F	22	←	←	18	-
G	11	←	←	16	13
H	27	←	←	26	31
I	23	←	←	20	-
J	18	←	←	10	-
K	17	←	←	←	27

4. ADDITIONAL INFORMATION AND PRECAUTIONS

(1) Thread tension

1) Strength of tension spring

Part No.	Color	Natural length (mm)	Operating length (mm)	Weight required to compress spring to working length
11550100	Purple	19.5 mm	11.5 mm	8.92±0.49N (910 ± 50 g)
11550209	Green	19.5 mm	11.5 mm	6.27±0.49N (640 ± 50 g)
13137807	Red	19.5 mm	11.5 mm	4.21±0.49N (430 ± 50 g)
13138508	Yellow	17.8 mm	9.8 mm	3.14±0.34N (320 ± 35 g)
13138805	Blue	17.3 mm	9.3 mm	1.47±0.20N (150 ± 20 g)
B3121804000	Gray	13.8 mm	5.8 mm	1.47±0.20N (150 ± 20 g)

2) Springs used for each model.

Where to use / Model	Needle thread	Double-chainstitch needle thread	Upper looper thread	Lower looper thread
MO-6△04S series	Red	–	Yellow	Blue
MO-6△05S series	Yellow	–	Blue	Yellow
MO-6△12S series	Red Yellow	–	Yellow	Blue
MO-6△14S series	Red Yellow	–	Blue	Yellow
MO-6△16S-△△△-△△△(4△△ or lower)	Red	Yellow	Yellow	Blue
MO-6△16S-△△△-50△	Red	Red	Blue	Yellow
MO-6△16S-△△△-60H	Green	Green	Blue	Yellow
MO-6△43S series	Red Red	Yellow	Blue	Yellow
MO-6△45S series	–	Red Red	–	–
MO-6903G-0N6-3D1	Blue	–	–	Blue
MO-6904G-0F6-700	Purple	–	Yellow	Red
MO-6905G-0M6-7△0	Yellow	–	Yellow	Purple
MO-6914G-CH6-700	Red	Yellow	Yellow	Red
MO-6916G-F△6-700	Purple	Green	Yellow	Red

(2) Upper looper

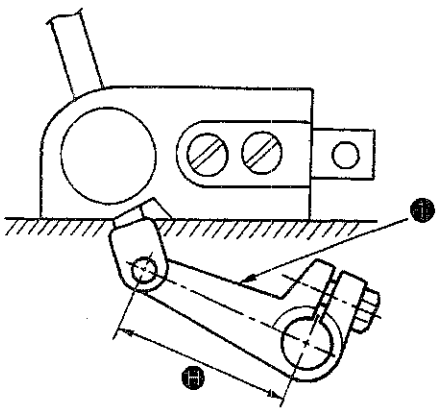
Use a proper upper looper in accordance with the needle No. When ordering, refer to the Parts List. The numbers shown in ☐ frame in the table below are engraved markers. In addition, the letters in ( ) parentheses are the kinds of the needles.

Parts Nos. with an asterisk * are factory-installed on the standard machine heads at the time of delivery.

Model	Nos.engraved on upper looper	Needle No. (kind)
6△04S series	*1188 [81]	#9 #11 #14
6△16S series	1199 [92]	#14 #16 #18
	1217 [62]	#21
6△14S series	*1217 [60]	
6903G-0N6-3D1	[120148]	#16 (DOx5)
6904G-0F6-700	[123835]	#21 (DOx5)
6905G-0M6-7△0	[123837]	#24 (DCx1)
6914G-CH6-700	[123836]	#18 (DOx5)
6916G-F△6-700	[123835]	#21 (DOx5)

(3) Center-to-center distance of the upper looper holder

The center-to-center distance of upper looper holder ❶.



(Unit : mm)

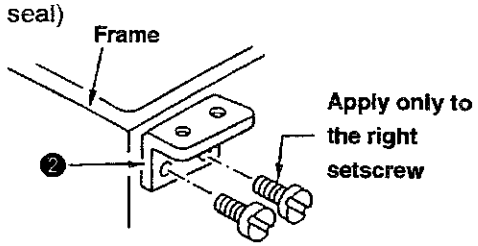
Model		Center-to-center distance Ⓗ
MO- 6△04S-△△△ / 6△05S	△△△ - △△0	38
MO- 6△04S-	0D4 to 0E4 - 0F6 / 4△H - 50H	39
MO- 6△12S-CE4	-40H	38
MO- 6△12S-D△△	-△△△	39
MO- 6△14S-△△△	-△△△	39
MO- 6△16S-△△△	-△△0	38
MO- 6△16S-	BE4 - DD△ to FF△ / 4△H - 5△H	39
MO- 6△43S-△△△	-40H	39
MO- 6903G-0N6	-3D1	※39
MO- 6904G-0F6	-700	37.5
MO- 6905G-0M6	700 - 7E0	※39
MO- 6914G-CH6	-700	37.5
MO- 6916G-	FH6 - FF6 / -700	37.5

(Caution) ※ (asterisk) marks are exclusive for the MO-6900G. They are not common to the MO-6000S series.

(4) Caution in assembly

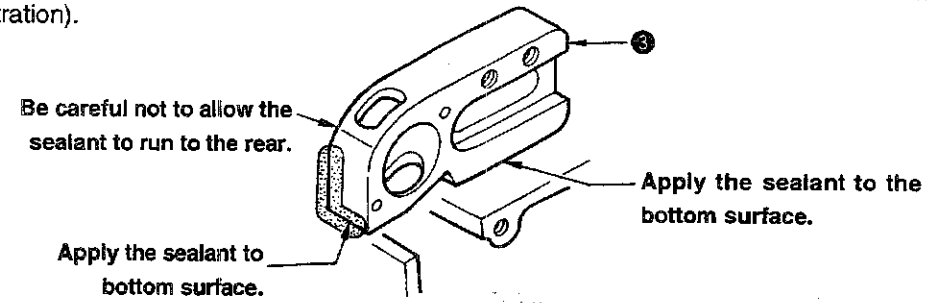
1) Application of sealant

① Setscrew of the throat plate base (B) retainer ❷ (JUKI seal)
Apply the sealant only to the right setscrew.



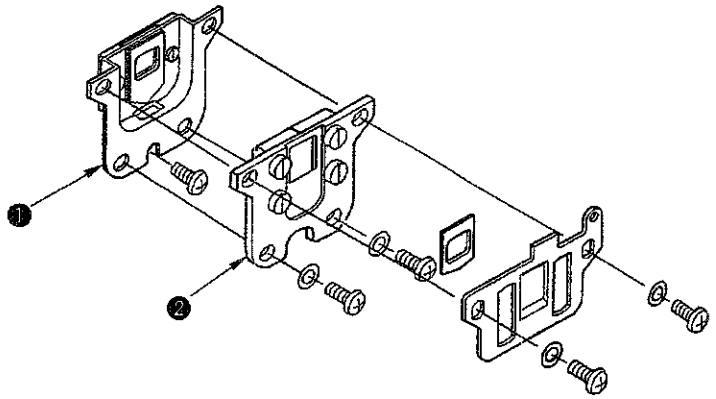
② Bottom surface of the upper looper guide support ❸ (Three-bond 1104)
Apply the sealant to the bottom surface of the upper looper guide support ❸, which contacts with the frame surface.

③ After assembling the front edge of the upper looper guide support ❸ (JUKI seal), apply the sealant to the gap of the contact surface between the frame and the upper looper guide support (▦ section in the illustration).



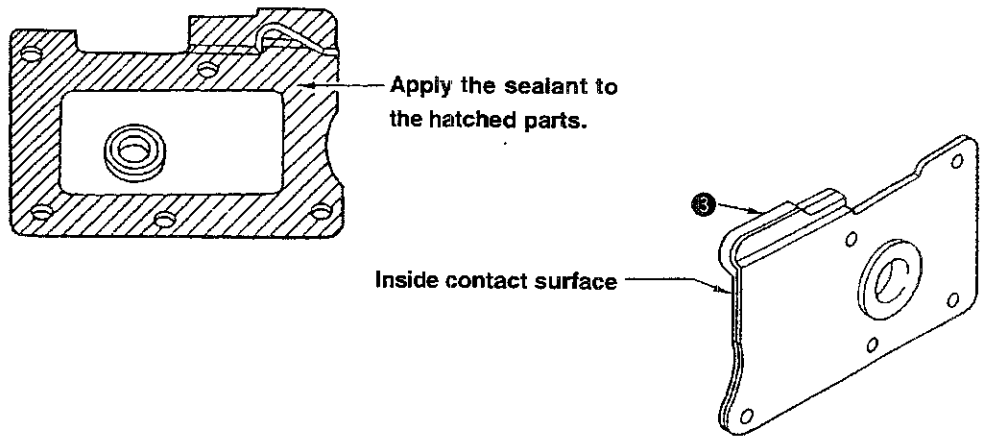
④ Portion of the setscrews of the dust-proof rubber case (JUKI seal)

Apply the sealant to the oil shield case setscrew ❶ (1 pc.) and the dust-proof rubber case ❷ setscrews (4 pcs.)



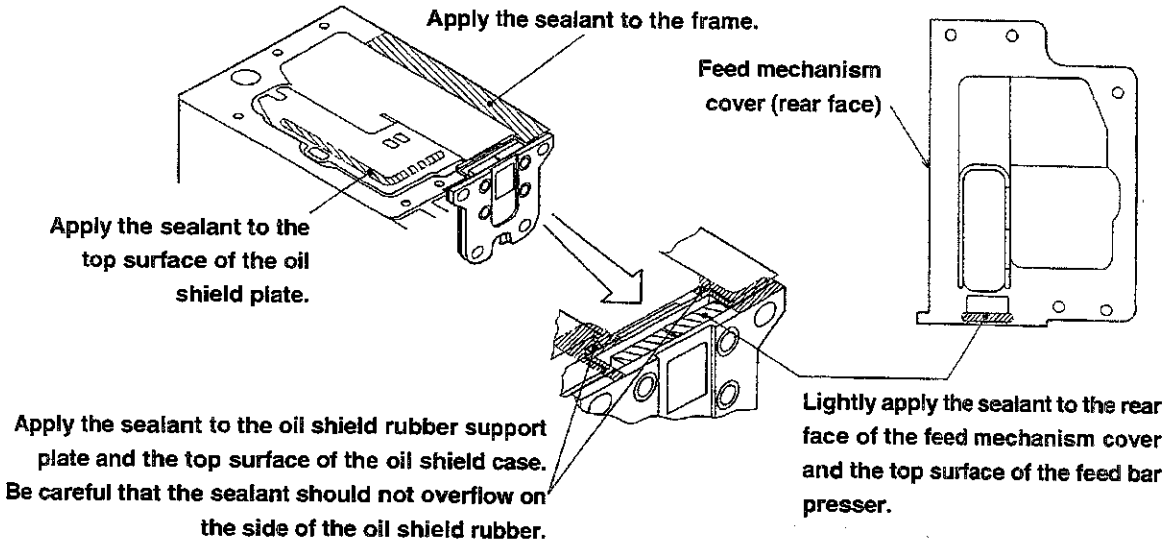
⑤ Oil shield plate assembly (JUKI seal)

Apply the sealant to the inside of the oil shield plate ❸.



⑥ Portion of the feed mechanism cover (Three-bond 1212)

Apply the sealant to the rear face of the feed mechanism cover, the top surface of the oil shield plate, the oil shield rubber support plate , the top surface of the oil shield case, and the hatched parts on the top surface of the feed bar presser.



⑦ Various sealants

Maker's name	Part No.
Three Bond	1104D ※
Three Bond	1104
Three Bond	1212

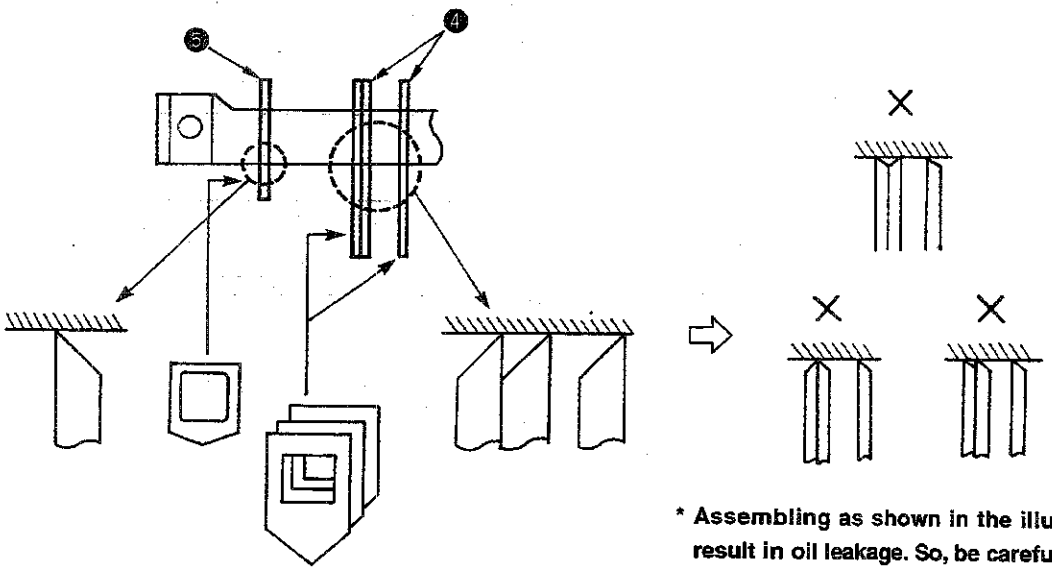
※ : It is commonly called "JUKI seal".

JUKI exclusive part Nos. of the above 3 kinds of the sealants are not set.

2) Precautions to be taken with respect to the lubricating components

① Feed bar components

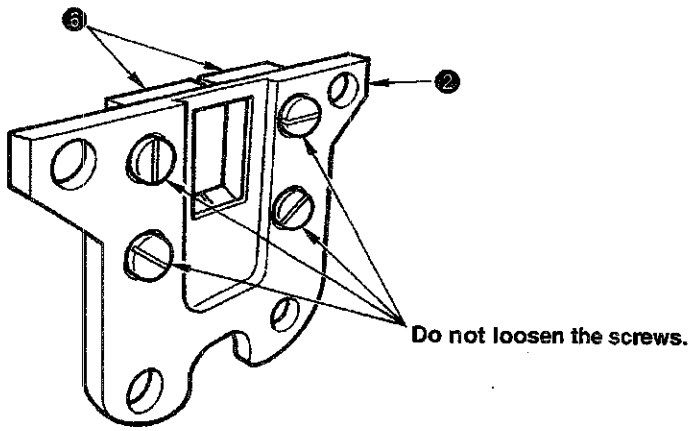
○ Be careful of the orientation of the oil shield rubber ❹ and the dust-proof rubber ❺.



*** Assembling as shown in the illustration will result in oil leakage. So, be careful.**

○ Assemble the feed bar presser ❻ and the dust-proof rubber case ❷ so that their top faces are flush with the frame plane on which the feed mechanism cover is installed.

○ Do not loosen the screws in feed bar presser ❻ unless it is necessary. The clearance between the feed bar presser and the feed bar and the contact with each other are important.



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

1) Motor pulleys and belts

MO-6△00S

Sewing speed of sewing machine (rpm)	50 Hz			60 Hz		
	Outside diameter of motor pulley mm (Effective diameter mm)	V-belt		Outside diameter of motor pulley mm (Effective diameter mm)	V-belt	
		Semi-sunken type mm (inch)	Fully-sunken type mm (inch)		Semi-sunken type mm (inch)	Fully-sunken type mm (inch)
8500	160 (155)	1016 (40)	914 (36)	135 (130)	965 (38)	864 (34)
8000	150 (145)	1016 (40)	864 (34)	125 (120)	965 (38)	813 (32)
7500	140 (135)	965 (38)	864 (34)	120 (115)	965 (38)	813 (32)
7000	130 (125)	965 (38)	864 (34)	110 (105)	914 (36)	813 (32)
6500	120 (115)	965 (38)	813 (32)	100 (95)	914 (36)	813 (32)
6000	110 (105)	914 (36)	813 (32)	95 (90)	889 (35)	762 (30)
5500	100 (95)	914 (36)	813 (32)	85 (80)	889 (35)	762 (30)
5000	90 (85)	889 (35)	762 (30)	80 (75)	864 (34)	762 (30)
4500	85 (80)	889 (35)	762 (30)	70 (65)	864 (34)	762 (30)
4000	75 (70)	864 (34)	762 (30)	60 (55)	864 (34)	737 (29)

MO-6900G

Sewing speed of sewing machine (rpm)	50 Hz			60 Hz		
	Outside diameter of motor pulley mm (Effective diameter mm)	V-belt		Outside diameter of motor pulley mm (Effective diameter mm)	V-belt	
		Semi-sunken type mm (inch)	Fully-sunken type mm (inch)		Semi-sunken type mm (inch)	Fully-sunken type mm (inch)
6000	125 (120)	965 (38)	864 (34)	105 (100)	914 (36)	838 (33)
5500	115 (110)	940 (37)	838 (33)	95 (90)	914 (36)	813 (32)
5000	105 (100)	914 (36)	838 (33)	85 (80)	889 (35)	787 (31)
4500	95 (90)	914 (36)	813 (32)	80 (75)	889 (35)	787 (31)
4000	85 (80)	889 (35)	787 (31)	70 (65)	889 (35)	787 (31)

* Use a motor of 3/4 HP (550 W) when the sewing machine runs at 7,000 rpm or higher speed.
Use a motor of 1/2 HP (400 W) when the sewing machine runs at a speed lower than 7,000 rpm.

(Caution) If a motor of less than 400W is used, in the low tenperature area, viscosity of oil increases and the sewing speed may not increase or the sewing machine may fail to run in some cases.

* Part No. of motor pulley

MTKP0xxx000 (Enter the effective diameter to "xxx.")

If the outside diameter of the motor pulley is 150 mm, the effective pulley will be 145.

.....So, the part No. will be MTKP0145000.

If the outside diameter of the motor pulley is 90 mm, the effective pulley will be 085.

.....So, the part No. will be MTKP0085000.

* Part No. of belt

MTJVM00xx00 (Enter a number that shows the belt length to "xx.")

If the belt length is 1016 mm (40 inches), enter "40" to "xx."

.....So, the part No. will be MTJVM004000.

If the belt length is 889 mm (35 inches), enter "35" to "xx."

.....So, the part No. will be MTJVM003500.

2) Pat No. of frame support plate bolt

① Semi-sunken type

Support plate bolt (A)	13155007	x4
Locknut	NS6240630SE	x4
Washer	WP1002036SE	x4
Spring washer	WS1002560KR	x4

② Fully-sunken type

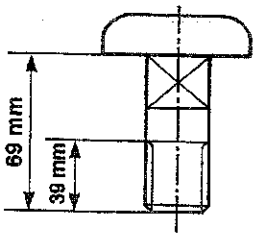
Support plate bolt (C)	13155106	x2
Support plate bolt (D)	13155205	x2
Locknut	NS6240630SE	x12
Washer	WP1002036SE	x12
Spring washer	WS1002560KR	x4

Difference of support plate bolts (A), (C) and (D)

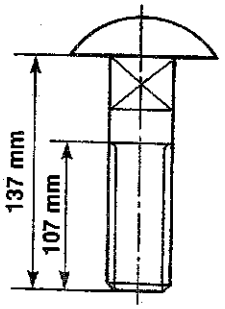
Entire length under the neck and length of threaded part

	Entire length (mm)	Length of threaded part (mm)
Support plate bolt (A)	69	39
Support plate bolt (C)	137	107
Support plate bolt (D)	149	119

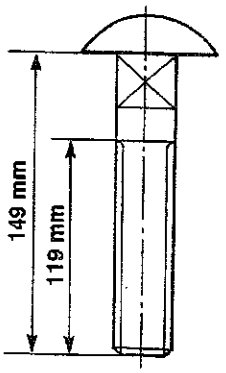
Support plate bolt (A)



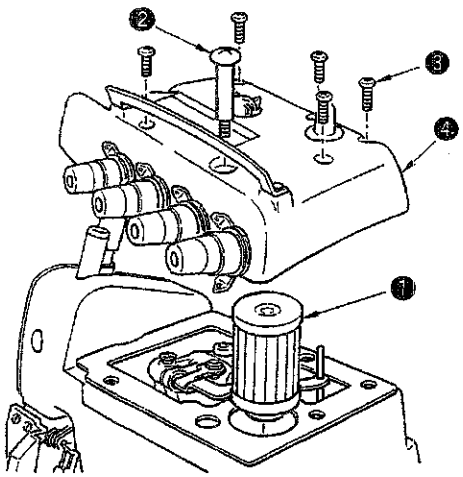
Support plate bolt (C)



Support plate bolt (D)



(6) Inspection and replacement of the cartridge filter



1. When the sewing machine is used for many hours, cartridge filter ❶ may be clogged with dust.
   When this state continues, oil is not fed through cartridge filter ❶ and abnormal worn-out or seizure of the sewing machine will be caused.
   * Normally, be sure to check cartridge filter ❶ every 6 months, and clean or replace it.
2. Inspecting/replacing procedure

1) First, remove drain screw ❷.
2) Remove setscrews ❸ and remove upper cover ❹ toward right above.

(Caution) When upper cover ❹ is moved in the lateral direction, the oil amount indicating rod or the filter may be damaged.

3) Remove and inspect cartridge filter ❶. If cartridge filter ❶ is clogged with dust, clean it or replace it with a new one.
4) Insert cartridge filter ❶ in place and install upper cover ❹ with setscrews ❸.

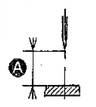
※ Part No. of cartridge filter : 11843208

5. ADJUSTMENT OF THE NEEDLE HEIGHT AND LOOPER TIMMING

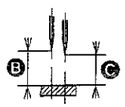
(1) MO-6000△ SERIES

Needle height

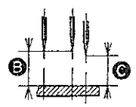
1- needle overlock macine/ safety stitch machine



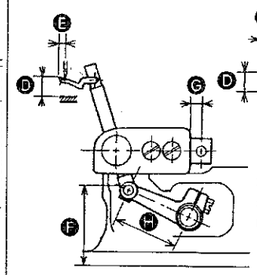
2- needle overlock machine



3-needle safety stitch

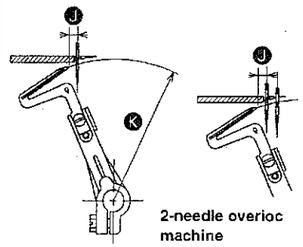


Upper looper components



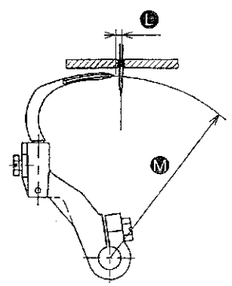
2-needle overioc machine
3-needle safety stitch machine

Lower looper components



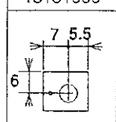
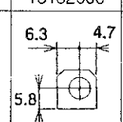
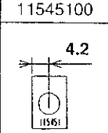
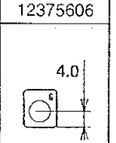
2-needle overioc machine
3-needle safety stitch machine

Double-chain looper components

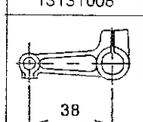
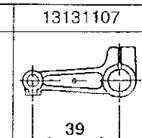
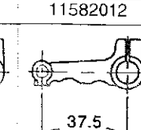
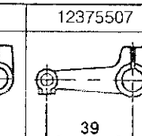


Classification	Subclass	Description	Needle height: 1-needle 2-needle (left) A B	Needle height: 2-needle (right) C	Upper looper components: Upper looper height D	Projection of upper looper E	Height of pin F	Marker of guide support	Position of guide support G	Guide support cover	Center-to-center of upper looper holder H	Marker of upper looper holder	Lower looper components: Feed amount of lower looper J	Lower looper components: Radius of lower looper K	Double-chain looper: Feed amount of double-chain looper L	Double-chain looper: Radius of double-chain looper M
1-needle overlock machine	MO- 6△04S 6△05S	0A5 to 0F5 15△ -0A4 to 0E4 -210 0D6 3△△	10.5±0.1	–	11.0±0.3	4.0±0.3	(45.0)	A	7	13222203 Marker A	38	#81 (11888609)	4.0 +0.5 −0.8	66.9	–	–
	MO- 6△04S-	0F4 300 0F6 - 500	10.5±0.1	–	11.0±0.3	4.0±0.3	(46.2)	A	6.3	13222203 A	38	#81 (11888609)	3.7 +0.5 −0.7	66.9	–	–
	MO- 6△04S-	0D4 to 0E4 4△H 0F6 - 50H	11.3±0.1	–	11.3±0.3	4.4±0.3	(48.2)	A	5.8	13222203 A	39	#19 (11991908)	3.8 +0.5 −0.8	66.9	–	–
	MO- 6904G-	0F6 -700	14.4±0.1	–	13.7±0.3	5.1±0.3	(48.8)	A	4.2	13224001	37.5	#123835 (12383501)	3.5±0.5	66.9	–	–
	MO- 6903G-	0N6 -3D1	15.4±0.1	–	13.6±0.3	5.4±0.3	(51.2)	A	4.0	13224001	39	#120148 (12014817)	1.4±0.3	66.9	–	–
	MO- 6905G-	0M6 700 - 7E0	15.4±0.1	–	12.0±0.3	6.5±0.3	(51.7)	A	4.0	13224001	39	#123837 (12383709)	1.3±0.3	66.9	–	–
2-needle overlock machine	MO- 6△14S-	BD4 to BE4 BD6 to BE6 -3△7	10.5±0.1	(9.1)	10.3±0.3	4.4±0.3	(47.3)	B	6	13222302 B	39	#60 (12176004)	3.8 +0.5 −0.8	66.9	–	–
	MO- 6△14S-	BD△ to BF△ 20H BE7 - 4△H	11.3±0.1	(9.9)	11.0±0.5	4.8±0.3	(48.4)	A	5.8	13222203 A	39	#61 (12176103)	3.8 +0.5 −0.8	66.9	–	–
	MO- 6△14G-	CH6 -700	14.1±0.1	(12.6)	12.9±0.3	6.2±0.3	(49.3)	A	4.2	13224001	37.5	#123836 (12383600)	3.3±0.5	66.9	–	–
	MO- 6△12S-	CE4 -40H	11.3±0.1	(9.9)	11.8±0.3	3.6±0.3 (Right side)	(46.8)	A	4.7	13222203 A	38	#61 (12176103)	4.0 +0.5 −0.8	66.9	–	–
	MO- 6△12S-	DF6 -507	11.0±0.1	(9.4)	11.0±0.5	3.8±0.3 (Right side)	(46.9)	B	5.5	13222302 B	39	#60 (12176004)	2.2±0.3	66.9	–	–
	MO- 6△12S-	DF6 -50F	11.0±0.3	(9.4)	11.0±0.5	3.6±0.3 (Right side)	(46.9)	B	5.5	13222302 B	39	#66 (11996600)	2.2±0.3	66.9	–	–
Safety stitch machine	MO- 6△16S- △△△	-3△0	10.5±0.1	–	11.0±0.3	4.0±0 3	(46.2)	A	6.3	13222203 A	38	#81 (11888609)	3.7 +0.5 −0.7	66.9	1.5 to 2.0	63.4
	MO- 6△16S- △△△	-500	10.5±0.1	–	11.0±0.3	4.0±0.3	(46.2)	A	6.3	13222203 A	38	#92 (11999208)	3.7 +0.5 −0.7	66.9	1.5 to 2.0	63.4
	MO- 6△16S-	BE4 40H DD△ to F△△ - 50H	11.3±0.1	–	11.3±0.3	4.4±0.3	(48.2)	A	5.8	13222203 A	39	#19 (11991908)	3.8 +0.5 −0.8	66.9	1.5 to 2.0	63.4
	MO- 6△16S-	F△6 -60H	13.0±0.1	–	12.8±0.3	4.7±0 3	(48.4)	A	5.8	13222203 A	39	#62 (12176202)	2.8 +0.3 −0.7	66.9	1.5 to 2.0	63.4
	MO- 6916G-	F△6 -700	14.1±0.1	–	13.4±0.3	5.1±0.3	(48.8)	A	4.2	13224001	37.5	#123835 (12383501)	3.5±0.5	66.9	1.7 ± 0.3	63.2
	MO- 6△43S-	1D6 -40H	11.3±0.1	(9.9)	11.0±0.3	3.6±0.3	(48.4)	A	5.8	13222203 A	39	#61 (12176103)	3.8 +0.5 −0.8	66.9	1.5 to 2.0	63.4
	MO-6△45S-	ED4 -360	9.8±0.1	–	–	–	–	–	–	–	–	–	–	–	2.0 to 2.5	63.6

Upper looper guide support gauge

13131909	13132006	11545100	12375606
			

Upper looper holder

13131008	13131107	11582012	12375507
			

6. TROUBLES AND CORRECTIVE MEASURES

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
1. Needle thread breakage	Threading	The thread is entangled with the thread guide, or the machine head has been incorrectly threaded.	Refer to the threading diagram.	
	Thread path	Scratches, burrs or rust on the pawls or needle holes of the throat plate, stitch tongue, lower looper, double chain looper, needle thread take-up, needle thread presser spring, thread guide, or tension discs causes friction.	Remove such scratches, burrs, etc. and perform thread path finishing. Replace major components such as looper, which have been deformed, causing thread breakage.	
	Needle guard	The needle hits the needle guard intensely, and sharp edges are produced on them, causing thread breakage.	Replace the needle and needle guard if they have worn,	20
	Needle	The needle is too thin for the thread.	Replace the needle by a proper one.	
	Needle heat	The needle gets very hot, depending on the type of materials, number of plies and sewing speed, and causes the thread to burn and break.	Use a thinner needle. Reduce the sewing speed. Use the needle cooler. Use an S-point needle or needle for synthetic thread.	
	Thread	The thread is weak because of its poor quality.	Replace the thread by one with good quality.	
	Thread tension	The thread tension is too high.	Reduce the thread tension. Check whether the needle thread take-up guide and needle thread guide are positioned too high, causing such excessive thread tension.	
	Contact	The double chain looper or lower looper has been improperly positioned and strikes the feed dog or throat plate.	Properly position the double chain looper or lower looper.	10, 18
	Double thread hooking (only for double chain stitch)	Poor drawing up of the needle thread causes the looper to catch it again.	Increase the needle thread tension. Properly position the thread cam. Properly position the double chainstitch thread guide.	30
	Deffective double chain-off thread (only for double chain stitch)	Refer to the clause referring to defective double chain-off thread.		
	Threading	The thread is entangled with the thread guide, or the looper has been incorrectly threaded.	Refer to the treading diagram.	

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
2. Looper thread breakage	Thread path	Scratches, burrs, rust, etc, on the paw of the throat plate, stitch tongue, looper, looper thread take-up, thread guide, or tension discs causes friction.	Remove such scratches, burrs, etc. and carry out thread path finishing. Replace loopers or other components which have been deformed, causing thread breakage.	
	Adjustment of the looper thread take-up	The looper thread take-up or thread guide has been improperly positioned, causing excessive thread tension.	Refer to the pertinent Standard Adjustment.	40
	Thread tension	The looper thread tension is too high.	Reduce the tension while checking the tension balance other looper thread.	
	Thread	The thread is weak because of its poor quality.	Replace the thread by one with good quality.	
	Position of the thread guides	The upper looper thread guide is too high, and the thread taking balance is disturbed, resulting in the thread breakage.	Refer to the pertinent Standard Adjustment.	40
	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.	18
	Needle heat	The needle gets hot, and the looper thread breaks when it comes in contact with the hot needle at the time of needle stop.	Refer to the clause relating to the needle heat causing needle thread breakage.	
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.	6
	Upper looper position	The upper looper juts out too much or it is too low.	Refer to the related Standard Adjustment.	16
	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.	

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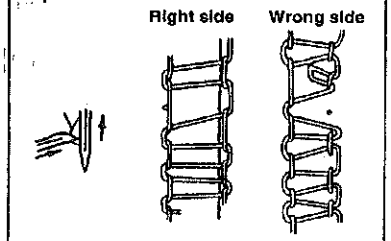
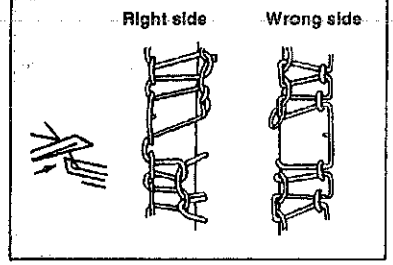
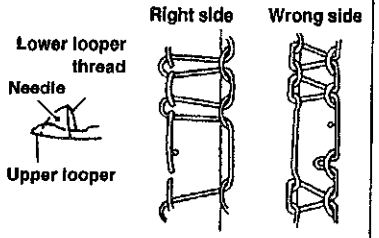
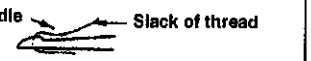
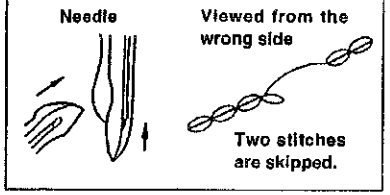
Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
From the previous page				
	Needle guards	A needle guard has been improperly positioned, causing the needle point to strike it.	Refer to the pertinent Standard Adjustment.	20
	Needle No.	The needle is too thin for the materials.	Replace the needle with a thicker one.	
	Thread tension	The thread tension is too high.	Reduce the thread tension.	
	Height of the 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 related Standard Adjustment.	6, 22
4. The needle point is crushed. (Double chain stitch needle)	Needle guard	The needle guard C is too low, or its longitudinal position is not correct.	Increase the height of the needle guard (C). Check the clearance between the needle and needle guard.	20
	Contact with the looper	The tilt of the looper is not correct. The longitudinal motion of the looper is not correct.	Check the tilt of the looper. Correct the longitudinal motion of the looper, and increase the clearance between the looper and needle when the looper reaches its most retracted position.	18
5. Overlocking needle thread stitches are skipped.	Lower looper	The blade point has defective shape and does not catch needle thread loops.	Replace the lower looper.	
The lower looper fails to catch needle thread loops. 	Adjustment of the loopers.	The clearance or the amount of return is not correct.	Refer to the relevant Standard Adjustment.	10
	Needle thread presser	The duration in which the presser holds the needle thread is not correct, and unstable loop result.	Refer to the pertinent Standard Adjustment.	
	Needle	The needle is bent or improperly oriented. A needle or DC x 1 is used.	Replace the bent needle. Correctly orient and attach the needle. Use a DC x J27 needle for a stretchy thread.	
	Needle guards	Incorrect height or clearance prohibits correct guide for the needle. If a needle guard is too high, loops are crushed with consequent stitch skipping.	Refer to the pertinent Standard Adjustment.	20

to the next page

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
From the previous page				
	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 related Standard Adjustment.	6, 10
	Needle heat	Stitch skipping occurs before the thread breaks due to needle heat.	Refer to the clause relating to the needle thread breakage due to needle heat.	
	Positioning of the needle thread take-up guide and needle thread guide	They are positioned too high, and the needle thread take-up takes too much thread, producing too small loops.	Refer to the pertinent Standard Adjustment.	40
	Threading	The thread has been entangled with a thread guide. The reading has bot been correctly done.	See the threading diagram.	
6. Lower looper stitches are skipped.	Threading	The thread has been entangled with a thread guide. Threading has not been done correctly.	Refer to the threading diagram.	
The upper looper does not catch the lower looper thread. 	Upper looper	The blade point has a bad shape, and fails to catch the loops.	Replace the upper looper with badly deformed blade point.	
	Lower looper	The clearance between the needle and the back of lower looper are not correct.	Replace the lower looper having a deformed tip.	
	Adjustment of the loopers	The feed 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.	Refer to the relevant Standard Adjustment.	10, 16
	Thread amount	Too much lower looper thread is fed, giving slack of thread.	Slightly lower the looper thread take-up (left) (reduction in distance J), or slightly reduce distance I to decrease the amount of thread.	40
			Slightly raise the looper thread take-up (right) (increase in dimension O) to decrease the amount of thread. Lower the lower looper thread guide (increase in distance L), and decrease distance N to reduce the amount of thread.	40

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
7. Upper looer thread stitches are skipped.	Threading	The thread has been entangled with a thread guide. Threading has not been done correctly.	See the threading diagram.	
The needle does not take the upper looper thread. 	Needle height	The needle, if positioned too high or low, may fail to catch the upper looper thread.	Refer to the related Standard Adjustment	6
	Needle	The needle is bent or crushed, in its point.	Replace the needle. At this time, be sure to eliminate the cause for such needle bend or needle point crush.	
	Adjustment of the upper looper.	The height of the blade point is not correct, making the upper looper unable to properly pass the thread to the needle. The clearance between the needle and the back of the upper looper is not correct.	Refer to the relevant Standard Adjustment.	6, 16
	Amount of thread	Excessive upper looper thread is fed, producing stack of thread. 	Slightly lower the looper thread take-up (left) (reduction in distance J), or slightly reduce distance I to decrease the amount of thread. Make the upper looper thread guide (right) (shorter decrease in distance K), to reduce the amount of thread.	40
			Slightly raise the looper thread take-up (right) (increase in dimension O) to decrease the amount of thread.	40
			If the thread tension is not enough, increase it.	
8. Double chain stitches are skipped.	Needle height	If the needle is not correct, stitch skipping occurs even when the return of the chain looper is correct.	Refer to the pertinent Standard Adjustment.	
The double chain looper fails to catch needle thread loops. 	Needle	The needle is bent or attached with wrong orientation. A DC x1 needle is used.	Replace the bent needle. (Remove the cause for the needle bend.) Correct the orientation of the needle. Use a DC x27 needle (with a better recess configuration).	
	Double chain looper	The lower part of the blade point has been deformed, and the blade point fells loops.	Replace the double chain looper.	

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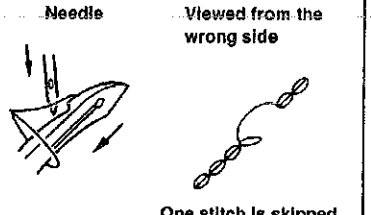
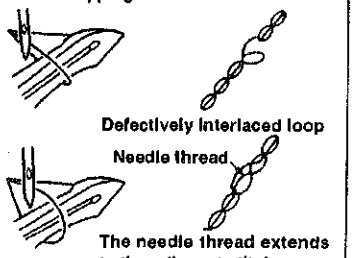
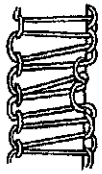
Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
From the previous page				
	Adjustment of looper	Clearance or returning amount is not correct.	Refer to the related Standard Adjustment.	18
	Thread tension	The thread tension is too high, preventing formation of good loops.	Reduce the tension. However, be careful not to reduce the tension too much, othrewise unstable loops will result.	
	Needle guards	A needle guard is too high, and loops are crushed. The clearance is too big, causing the needle to shake.	Refer to the relevant Standard Adjustment.	20
	Needle heat	The thread breaks due to heat generated on the needle, depending on the type of materials, number of plies, and sewing speed.	Use a thinner needle. Reduce the sewing speed. Check the coolant if necessary.	
9. Triangle double chain looper thread stitches are skipped.	The needle point is crushed.	The needle point has been crushed and got thicker and shorter.	Refer to the clause relating to the needle point crush.	
The needle fails to catch the double chain looper thread. 	Double chain looper	The thread hole in the tip has worn, and the looper thread does not reach the needle as shown at right.	Replace the double chain looper.	
	Adjustment of looper	Excessive return or longitudinal motion will often cause this stitch skipping.	Refer to the pertinent Standard Adjustment.	18
	Thread cam timing	The thread cam timing is too early, causing the looper thread to slack before the needle enters a thread triangle.	Refer to the pertinent Standard Adjustment.	30
	Thread tension	The lower thread tension is very low, and the thread is not stretched.	Increase the thread tension a little.	
	Threading	The area around the thread cam has threaded erroneously.	Correct the threading.	

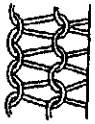
Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
10. Triangle double chain needle thread stitches are skipped. **The needle fails to catch the needle thread loop on the double chain looper, resulting in the stitch skipping shown below.**  **Defectively interlaced loop** **Needle thread** **The needle thread extends to the adjacent stitch.**	Double chain looper	The chain looper is too high and too close to the throat plate, or has bad shape.	Correct the height of the chain looper by pushing it down until it cones into contact with the stopper. Replace the chain looper having a bad shape.	18
	Adjustment of looper	The return is not enough, causing the needle to miss the loop.	Refer to the related Standard Adjustment.	18
	Thread tension	The needle thread tension is too low.	Slightly increase the needle thread tension.	
	Stitch length	The stitch length is as small as 1.5 mm or less.	Slightly increase the stitch length.	
			Adjustment of loopers for producing chain-off thread without materials requires higher accuracy than that with materials.	30
	Needle guard	A needle guard is too high, and catches needle thread loops.	Refer to the related Standard Adjustment.	20
	Double-chain stitch needle thread guide.	The needle thread guide is installed too high, and it fails to tense the thread.	Refer to the related Standard Adjustment.	40
11. Overlocking chain-off thread is bad. Provided that no chain-off trouble occurred when sewing operation was done with materials set on the machine.	Position of the throat plate	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.	Correctly position the throat plate.	
	Feed dog	The auxiliary feed dog has scratch.	Repair or replace the auxiliary feed dog.	22
		The auxiliary feed dog is too high, and interferes with chain-off thread. The auxiliary feed dog is too low. (Lower than the main feed dog by more than 0.5 mm)	Refer to the pertinent Standard Adjustment.	
	Adjustment of looper	Adjustment of loopers for producing chain-off thread without materials requires higher accuracy.	Refer to the related Standard Adjustment.	10
	Thread tension	The thread tension is too low.	Slightly increase the tension.	
		The needle thread tension is too high, causing damaged balance with other thread tension.	Check whether the needle thread take-up guide or needle thread guide is positioned too high with consequent excessive needle thread tension. And if so, correct it.	40

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
12. Problems with double chain stitch chain-off thread.	Adjustment of loopers	Adjustment of the loopers for producing chain-off thread without materials requires higher accuracy.	Refer to the related Standard Adjustment.	18
	Needle Guard	The needle guard (C) is too high, damaging loops.	Refer to the related Standard Adjustment.	20
	Position of the throat plate	The needle comes into contact with the front edge of the needle hole in the throat plate.	Correctly position the throat plate.	
		The lateral position of the throat plate with respect to the feed dogs is wrong, causing chain-off to drop in. 		
	Throat plate	A dent exists on the flat part between the rear edge of the needle hole and feed dog groove. 	Repair or replace the throat plate, since such dent causes chain-off thread to slip out.	
	Presser foot	The rear pressure foot is indented and not flush with the presser foot sole, so that it cannot hold chain-off thread.	Replace it, or correct it to make it flush with the presser foot sole.	
	Main feed dog	The leading edge of the main feed dog is too sharp and cuts chain-off thread.	Buff the leading edge of the main feed dog.	
	Double hooking	The needle thread is not drawn up fully because of the insufficient return of the double chain looper or wrong threading.	Refer to the related Standard Adjustment for the return of the double chain looper. See the threading digram for correct threading.	18, 30
		If the feed pitch is too small, the cam timing will be advanced.	Retard the cam timing.	
	Thread tension	The needle is bend or chain-odd thread runs back due to excessive needle thread tension.	Reduce the needle thread tension.	
		Both the needle thread and looper thread tension are too low.	Slightly increase the both tensions.	

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
13. Overlocking needle thread is loose.	Position of the needle thread take-up guide and needle thread guide	They are positioned too high, and the thread take-up draws out excessive needle thread.	Refer to the pertinent Standard Adjustment.	40
	Thread tension	The thread tension balance has been disturbed.	Refer to the Standard Adjustment for the looper thread take-up components, and increase the tension if necessary.	
	Needle	The needle is too thin for the thread used.	Replace it with a proper one.	
14. Double chain stitch 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 relevant Standard Adjustment.	30
		The thread cam timing is bad.	Refer to the relevant Standard Adjustment.	30
	Needle	The needle is too thin for the thread used.	Replace the needle with a proper one.	
	Double-chain stitch needle thread take-up guide	Drawing amount of the needle thread is insufficient.	Refer to the relevant Standard Adjustment.	40
15. Uneven overlocking stitches **The knotting position of the upper and lower looper threads varies as shown below.** 	Looper thread tension	The upper and lower looper thread tensions are not enough.	Slighrly increase the upper and lower looper thread tensions.	
	Looper thread take-up	The looper thread take-up (left) is too high.	Slightly lower the looper thread take-up (left)	40
	Knife width	The knife width is unsuited for the overedging width.	Make the overedging width slightly smaller than that given for the knife width.	28
	Thread path	Scratches on the thread path catch thread.	Check the thread path for scratches.	
	Presser foot	The presser foot comes into contact unevenly with the throat plate and feed dogs and tends to meander.	Make the presser foot come into contact with them evenly.	
	Thread stand	Thread dose not come out smoothly.	Make the thread come out smoothly.	

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
16. Uneven double chain stitches	Thread tension	The looper thread tension is not enough.	Slightly increase the tension.	
	Presser foot	The presser foot comes into contact with the throat plate unevenly.	Make the presser foot come into contact with the throat plate evenly.	
		The presser foot pressure is not enough.	Increase the presser foot pressure.	
17. The looper thread bulges out	Knife width	The knife width is too small for the overedging width.	Use a knife having width suited to the overedging width.	
	Looper thread take-up adjustment	The looper thread take-up draws out excessive looper thread.	Decrease the radius of the looper thread take-up (left) (reduction in dimension I). Raise the looper thread take-up (right) (increase in distance O).	40
18. Looper thread bite	Knife width	The knife width is too large for the overedging width.	Use a knife having width suited to the overedging width.	
	Adjustment of the looper thread take-up	The looper thread take-up draws out insufficient amount of looper thread.	Increase the radius of the looper thread take-up (left) (increase dimension I). Lower the looper thread take-up (right) (reduction in distance O).	40
19. Knotting position is not correct.	Threading	Re-threading after thread breakage,etc. has been done erroneously.	See the threading diagram.	
	Adjustment of the looper thread take-up	The height of the looper thread take-up (left) is not correct.	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.	40
		The upper looper thread guide (right) is too short.	Increase distance K.	

Right side



Knots are deflected to the upper looper side.

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
20. Uneven material feed	Presser foot pressure	The presser foot pressure is too high.	Reduce the presser foot pressure except for the uneven material feed due to packering.	
	Presser foot	The hinge is too stiff.	Remove the stiffness provided no hinge play is produced.	
		Scratches on or defective finish on the presser foot sole produce friction between the presser foot and materials.	Buff the presser foot sole for good surface finish.	
	Tilt of feed dogs	The front is too high.	Make the front down. However, be sure to align the differential feed dog with the main feed dog.	
	Height of feed dogs	A different in level exists between the main feed dog and differential feed dog.	Eliminate the difference in level.	
	Adjustment of differential feed	The differential feed has been improperly adjusted.	Provide differential feed suited to the material.	
21. Puckering (Mainly concerned with double chain stitch)	Needle	The needle is too thick.	Use a thin needle as much as possible.	
	Thread	The thread used is too thick.	Use a thin needle as much as possible.	
	Thread tension	Both the needle thread and looper thread tensions are too high.	Reduce the both thread tensions to a minimum.	
	Throat plate	The throat plate has a large needle hole.	Replace the throat plate with one with a small needle hole.	
	Thread cam timing	The thread cam timing is too late.	Advance the cam timing. Refer to the related Standard Adjustment.	
	Feed dogs	The leading edge of the feed dog teeth has been rounded off.	Replace the feed dog.	
		A difference in level exists between the main feed dog and differential feed dog.	Eliminate such difference in level.	

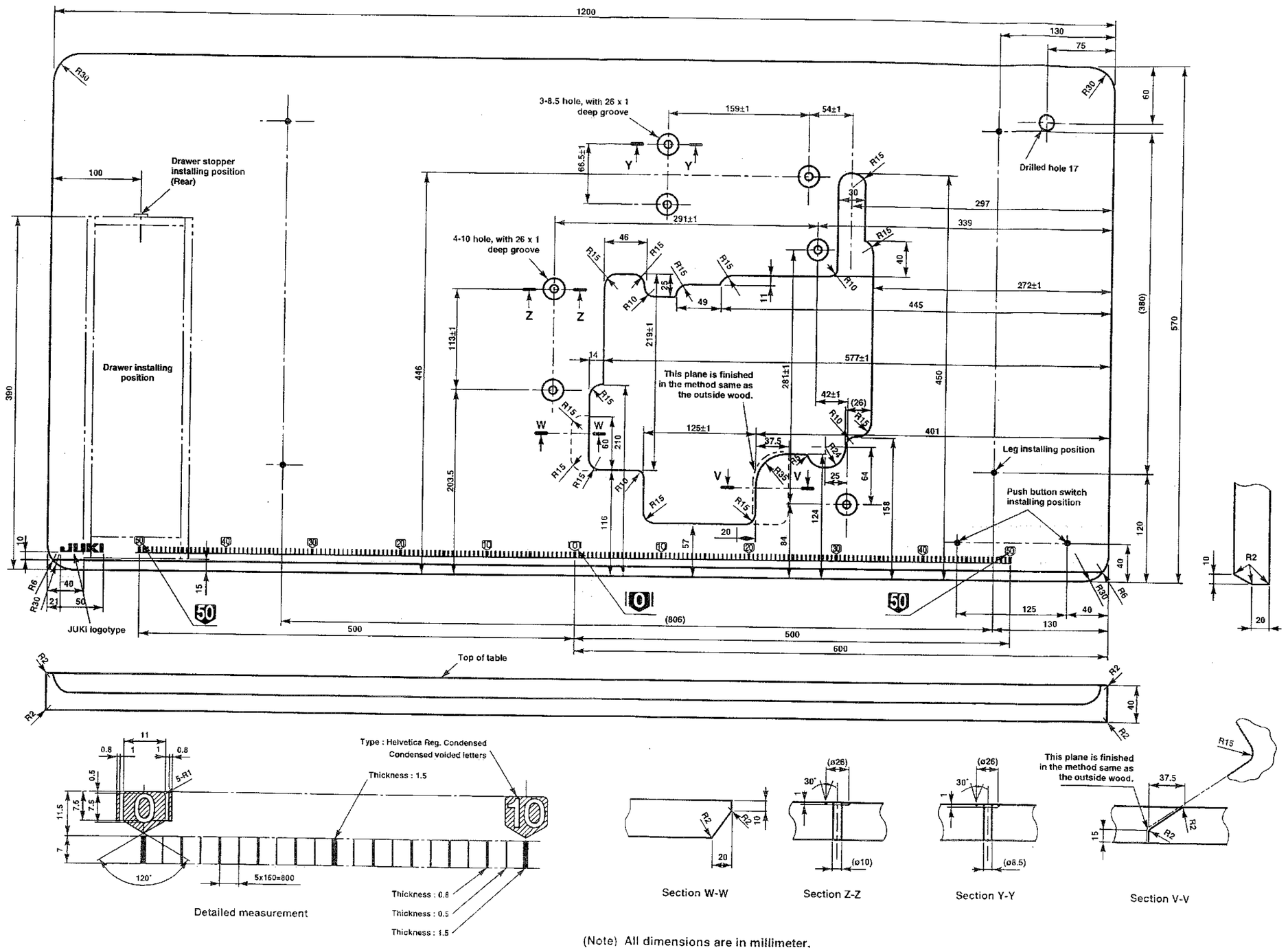
to the next page

Trouble	Case (1)	Case(2)	Check and Corrective measures	Page
From the previous page				
	Presser foot pressure	The presser foot pressure is not high enough, providing poor ironing effect.	Increase the presser foot pressure.	
	Differential feed ratio	The differential feed ratio has been set for gathering.	Set it for stretching. When stretching light-weight materials, be careful not to cause the presser foot to contact unevenly with the materials.	
	Thread amount	The looper thread amount is not enough, causing excessively tensed stitches.	Bring the thread cam thread guide fully to the front to increase the amount of looper thread.	

7. DIMENSIONS OF TABLE

Applicable models
MO-6000 Series

(1) Semi-sunken type

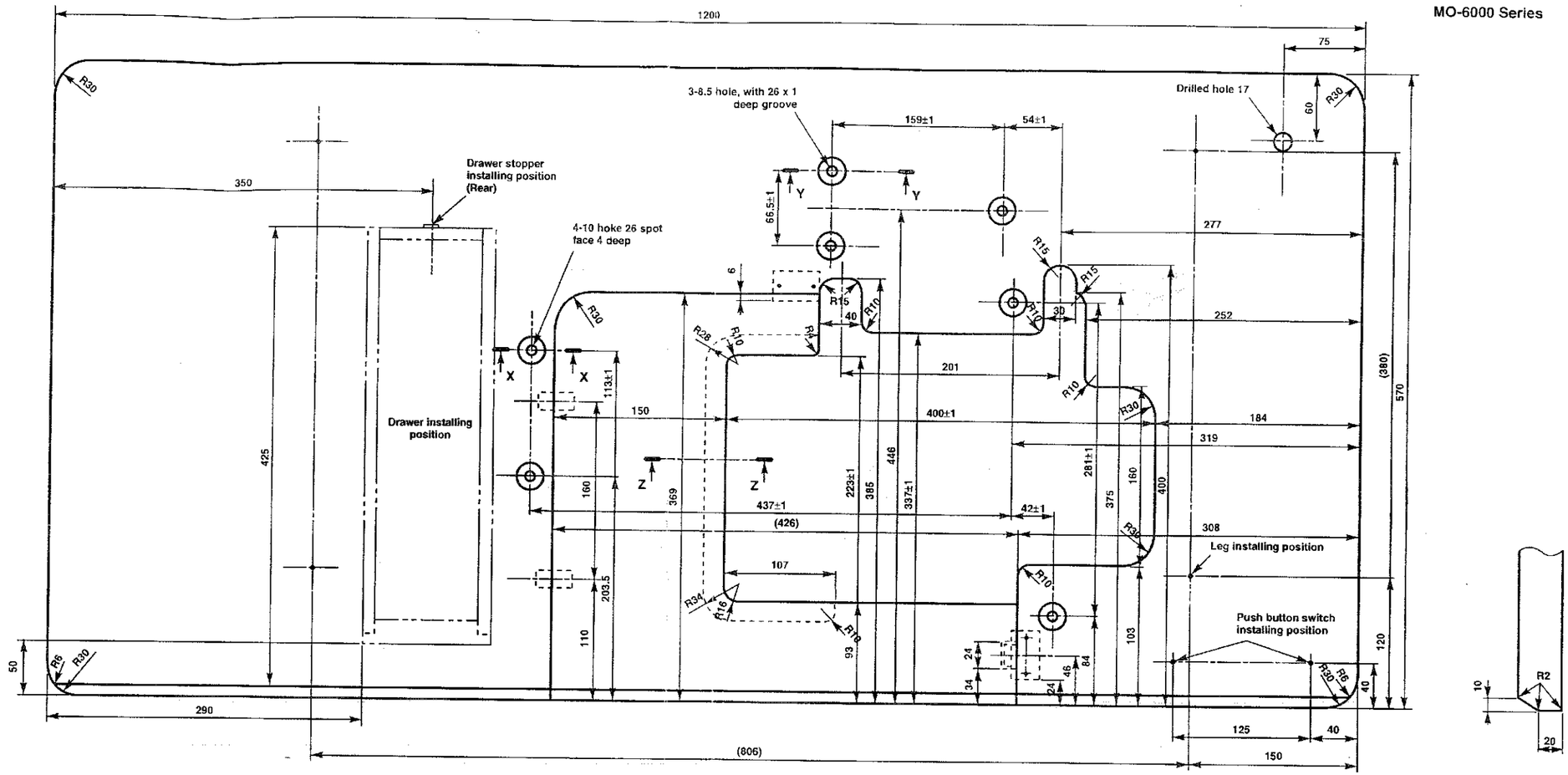


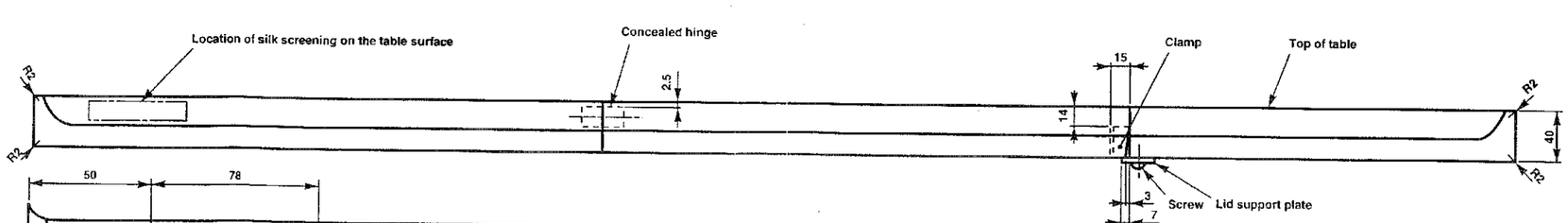
(Note) All dimensions are in millimeter.
Detailed dimensions of section W-W, section Z-Z, section Y-Y and section V-V

Part No. of table : 11959400

(2) Fully-suken type

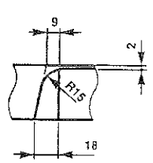
Applicable models
MO-6000 Series



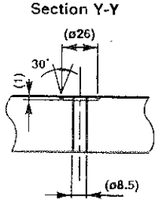


Brand label location indicating of drawing

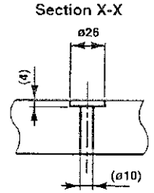
Section Z-Z



Section Y-Y



Section X-X



(Note) All dimensions are in millimeter.

Part No. of table : 11959558