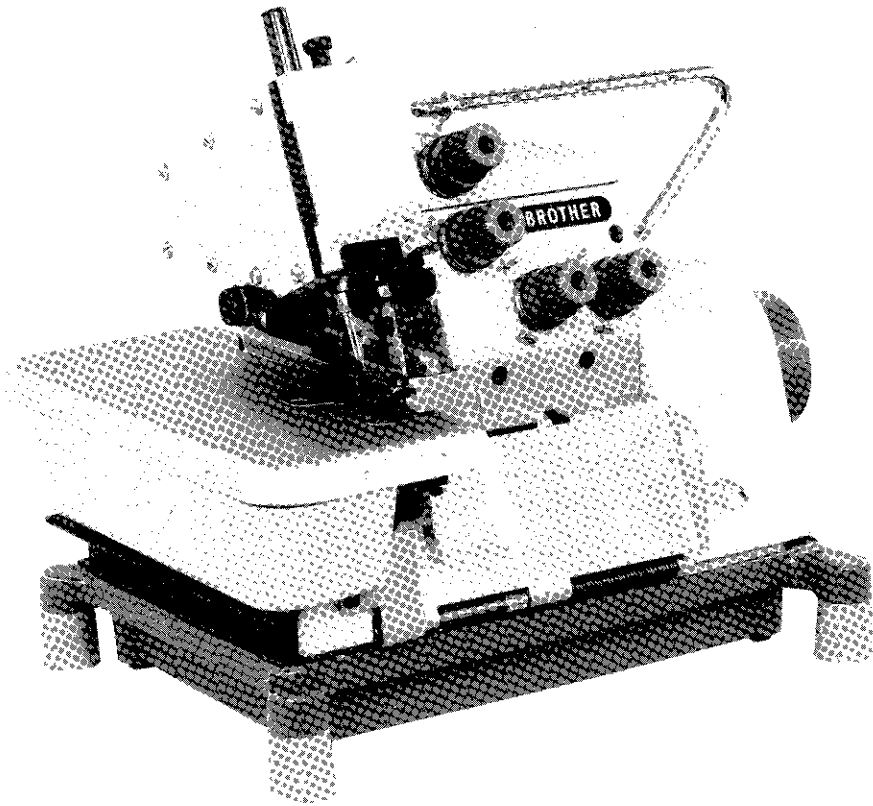


# SERVICE MANUAL

FOR

**BROTHER MODEL EF4-B561, 571  
MA4-B581**



**BROTHER INDUSTRIES, LTD.,  
NAGOYA, JAPAN.**

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# 1. FEATURES






















1. These models have the same sewing performance as the high-speed types (Models EF4-B511, B531 and MA4-B551) so they can be used for normal stitching, ruffling, bulky stitching and many other applications.
  2. Differential feed ratio can be changed by a "banana type" device which assures a wide differential range.
  3. High-lift specifications ... 7mm in presser foot rise and 7mm in maximum stitch width ... are available for denim bulky and other thick materials.
  4. Blade engaging angle can be easily adjusted for sharp cutting performance.
  5. Oil level in the oil pan can be easily checked with the special oil guage on the front.
  6. Superb design and colour brighten working environment and ensure to lessen the operator's fatigue.
- \* Most of the gauge parts, expendable parts, attachments and other devices of these models are interchangeable with those of Models EF4-B511, B531 and MA4-B551.

## 2. SPECIFICATION


 **BROTHER INDUSTRIES LTD.**

EF4-B561-

MADE IN JAPAN


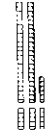

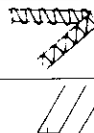








Sub-class No.	Stitch form	No. of needle	No. of thread	Needle gauge (mm)	Bight (mm)	Maximum stitch length (mm)	Differential feed ratio	Height of presser foot	Pitch (mm) of feed dog	Differential Type of feed dog	Needle (DC×1)	Maximum sewing speed (spm)	Usage (material)	Attachment
001-3 -4 -5 -6		1	3	—	3 4 5 6	3.6	0.3~1.8	6	1.6	(a)  (b) 	#11	5000	Thin, medium Knitted underwear, shirts. Sports wear	—
002-5 -6 -7		1	3	—	5 6 7	2.5	0.4~3.6	7	2		#14	5000	Bulky knit Sweater Cardigan Bulky sweater	—
003-3 -4 -5	 	1	3	—	3 4 5	3.6	0.3~1.8	6	1.6		#9	5000	Blind hemming Knitted underwear, shirts. Tee shirts	•Blind hemming ruler
004-3 -4 -5	 	1	2	—	3 4 5	3.6	0.3~1.8	6	1.6		#9	500	Blind hemming Knitted underwear, shirts. Tee shirts	•Blind hemming ruler
005-3 -4 -5 -6		1	2	—	3 4 5 6	3.6	0.3~1.8	4	1.6		#14	5000	Serging Trousers Skirts	•Edge hemming ruler
006-3 -4 -5 -6		1	3	—	3 4 5 6	3.6	0.3~1.8	4	1.6		#14	5000	Serging Trousers Skirts	•Edge hemming ruler
007-2 -4 ★	 	1	3	—	2 4	3.6	0.3~1.8	6	1.6		#11	5000	Curling Handkerchief Scarf	—
008-5 ★	 	1	3	—	5	3.3	0.3~2.7	5	1.6		#11	5000	Ruffling Coats for women & children. Negligee	•Ruffler

# SPECIFICATION

 BROTHEP INDUSTRIES LTD.

EF4-B561-

MADE IN JAPAN

Sub-class No.	Stitch form	No. of needle	No. of thread	Needle gauge (mm)	Bight (mm)	Maximum stitch length (mm)	Differential feed ratio	Height of presser foot	Pitch (mm) of feed dog	Differential Type of feed dog	Needle (DC×1)	Maximum sewing speed (spm)	Usage (material)	Attachment
009-5		1	3	-	5	3.3	0.3~2.7	5	1.6		#11	5000	Ruffling (w/piping) Coats for women & children. Negligee	•Wrapper •Ruffler •Tape-winder
★														
010-3		1	3	-	3	4	0.3~1.8	6	1.6		#11	5000	Thin, medium taping Knitted underwear, shirts. Tee shirts	•Tape-guide
-4					4									
-5					5									
-6					6									
011-5		1	3	-	5	2.5	0.4~3.6	7	2		#14	5000	Bulky knit taping Sweater Cardigan Bulky sweater	•Tape-guide
-6					6									
-7					7									





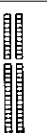



















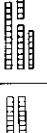




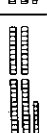









★ Extra cost of attachment will be required for the sub-class marked with asterisk.

# SPECIFICATION

 BROTHER INDUSTRIES LTD.

EF4-B571-

MADE IN JAPAN

Sub-class No.	Stitch form	No. of needle	No. of thread	Needle gauge (mm)	Bight (mm)	Maximum stitch length (mm)	Differential feed ratio	Height of presser foot	Pitch (mm) of feed dog	Differential Type of feed dog	Needle (DC x 1)	Maximum sewing speed (spm)	Usage (material)	Attachment
021-4										(a)  (b) 			Thin	
-5		2	4	1.8	5	3.6	0.3~1.8	6	1.6		#11 (DCX3)	5000	Knitted & tricot underwear	-
022-5										(a)  (b) 			Thin, medium	
-6		2	4	2.2	6	3.6	0.3~1.8	6	1.6		#11	5000	Knitted underwear, shirts.	-
-7					7								Tee shirts	
023-5										(a)  (b) 			Thin, medium	
-6		2	4	2.2	6	3.6	0.3~1.8	6	1.6		#11	5000	Collared shirts	-
-7	mock				7								Blouse	
024-5										(a)  (b) 			Thin, medium	
		2	4	3	5	3.6	0.3~1.8	6	1.6		#11	5000	Knitted underwear, shirts.	-
													Tee shirts	
025-6										(a)  (b) 			Thin, medium	
	mock	2	4	3	6	3.6	0.3~1.8	6	1.6		#11	5000	Collared shirts	-
													Blouse	
026-4										(a)  (b) 			Bulky knit	
-5		2	4	1.8	5	2.5	0.4~3.6	7	1.6		#11 (DCX3)	5000	Sweater	-
													Cardigan	
													Bulky sweater	
027-5										(a)  (b) 			Bulky knit	
-6		2	4	2.2	6	2.5	0.4~3.6	7	2		#14	5000	Sweater	-
-7					7								Cardigan	
													Bulky sweater	
028-5										(a)  (b) 			Bulky knit	
-6		2	4	2.2	6	2.5	0.4~3.6	7	2		#14	5000	Sweater	-
-7	mock				7								Cardigan	
													Bulky sweater	
031-7										(a)  (b)			Extra heavy	
		2	4	3	7	3.6	0.3~1.8	7	2.5		#21	5000	Denim	-
													Curtain	
													Cushin	
032-7										(a)  (b)			Extra heavy	
	mock	2	4	3	7	3.6	0.3~1.8	7	2.5		#21	5000	Denim	-
													Curtain	
													Cushion	

# SPECIFICATION

BROTHER INDUSTRIES LTD.

EF4-B571-

MADE IN JAPAN

Sub-class No.	Stitch form	No. of needle	No. of thread	Needle gauge (mm)	Bight (mm)	Maximum stitch length (mm)	Differential feed ratio	Height of presser foot	Pitch (mm) of feed dog	Differential Type of feed dog	Needle (DC×1)	Maximum sewing speed (spm)	Usage (material)	Attachment
033-5		3	4	2.2	5	3.3	0.3~2.7	5	1.6	(a) (b)	#11	5000	Ruffling Coats for women & children Neglige	•Ruffler
034-5	 mock	2	4	2.2	5	3.3	0.3~2.7	5	1.6	(a) (b)	#11	5000	Ruffling Coats for women & children Neglige	•Ruffler
★ 037-5	 mock	2	4	2.2	5	3.3	0.3~2.7	5	1.6	(a) (b)	#11	5000	Ruffling (w/piping) Coats for women & children Blouse	•Wrapper •Ruffler •Tape-winder
★ 038-5	 mock	2	4	2.2	5	3.3	0.3~2.7	5	1.6	(a) (b)	#11	5000	Ruffling (w/piping) Coats for women & children Blouse	•Wrapper •Ruffler •Tape-winder
041-5 -6 -7	 mock	2	4	2.2	5 6 7	3.6	0.3~1.8	6	1.6	(a) (b)	#11	5000	Thin, medium taping Knitted underwear shirts. Tee shirts	•Tape-guide
042-5 -6 -7	 mock	2	4	2.2	5 6 7	3.6	0.3~1.8	6	1.6	(a) (b)	#11	5000	Thin, medium taping Knitted underwear shirts. Tee shirts	•Tape-guide
045-5 -6 -7	 mock	2	4	2.2	5 6 7	2.5	0.4~3.6	7	2	(a) (b)	#14	5000	Bulky knit taping Sweater Cardigan Bulky sweater	•Tape-guide
046-5 -6 -7	 mock	2	4	2.2	5 6 7	2.5	0.4~3.6	7	2	(a) (b)	#14	5000	Bulky knit taping Sweater Cardigan Bulky sweater	•Tape-






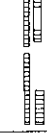

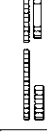









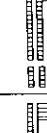





★ Extra cost of attachment will be required for the sub-class marked with asterisk.

# SPECIFICATION

 **BROTHER INDUSTRIES LTD**

**MA4-B581-**

MADE IN JAPAN

Sub-class No.	Stitch form	No. of needle	No. of thread	Needle gauge (mm)	Bight (mm)	Maximum stitch length (mm)	Differential feed ratio	Height of presser foot	Pitch (mm) of feed dog	Differential Type of feed dog	Needle (DC x 1 DMx13)	Maximum sewing speed (spm)	Usage (material)	Attachment
061-2 -3 -4 -5		2	5	2	2 3 4 5	3.6	0.3~1.8	4	1.6		#11	5000	Thin Blouse Shirts	-
062-2 -3 -4 -5		2	4	2	2 3 4 5	3.6	0.3~1.8	4	1.6		#11	5000	Thin Blouse Shirts	-
063-3 -4 -5		2	5	3	3 4 5	3.6	0.3~1.8	6	1.6		#14	5000	Thin, medium Jumper Pajamas Coats	-
064-3 -4 -5		2	4	3	3 4 5	3.6	0.3~1.8	6	1.6		#14	5000	Thin, medium Jumper Pajamas Coats	-
065-5 -6 -7		2	5	5	5 6 7	3.6	0.3~1.8	6 6.5	1.6		#16	5000	Medium, heavy Working dress, trousers, coats for women	-
066-5 -6 -7		2	4	5	5 6 7	3.6	0.3~1.8	6 6.5	1.6		#16	5000	Medium, heavy Working dress, trousers, coats for women	-
067-4 ★	 	2	5	2	4	3.3	0.3~2.7	5	1.6		#14	5000	Thin, medium Blouse Negligee	•Ruffler
068-4 ★	 	2	4	2	4	3.3	0.3~2.7	5	1.6		#14	5000	Ruffling Blouse Negligee	•Ruffler
069-5 ★	 	2	5	3	5	3.3	0.3~2.7	5	1.6		#14	5000	Thin, medium Coats for children & women	•Ruffler
070-5 ★	 	2	4	3	5	3.3	0.3~2.7	5	1.6		#14	5000	Ruffling Coats Blouse Negligee	•Ruffler



# SPECIFICATION

BROTHER INDUSTRIES LTD.

MA4-B581-

MADE IN JAPAN


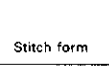
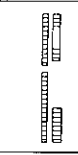


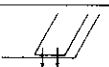
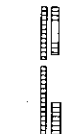
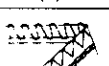



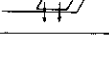


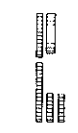
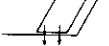


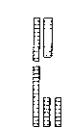


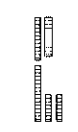


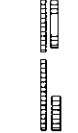

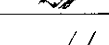
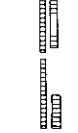
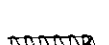

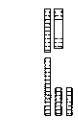
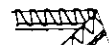

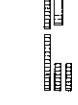
Sub-class No.	Stitch form	No. of needle	No. of thread	Needle gauge (mm)	Bight (mm)	Maximum stitch length (mm)	Differential feed ratio	Height of presser foot	Pitch (mm) of feed dog	Differential Type of feed dog	Needle (DC x 1 DMx13)	Maximum sewing speed (spm)	Usage (material)	Attachment	
071-5		2	5	5	6	3.3	0.3~2.7	5	1.6	(a) (b)	#14	5000	Medium, heavy	• Ruffler	
-6													Coats for children & women		
★															
072-6		2	4	5	6	3.3	0.3~2.7	5	1.6		#14	5000	Ruffling	• Ruffler	
★													Coats for children & women		
073-4		2	5	2	4	3.3	0.3~2.7	5	1.6		#14	5000	Thin, medium Ruffling (w/piping)	• Wrapper • Ruffler • Tape-winder	
★													Blouse Neglige		
074-4		2	4	2	4	3.3	0.3~2.7	5	1.6		#14	5000	Ruffling (w/piping)	• Wrapper • Ruffler • Tape-winder	
★													Blouse Neglige		
075-5		2	5	3	5	3.3	0.3~2.7	5	1.6		#14	500	Thin, medium Ruffling (w/piping)	• Wrapper • Ruffler • Tape-winder	
★													Coats for women & children		
076-5		2	4	3	5	3.3	0.3~2.7	5	1.6		#14	500	Ruffling (w/piping)	• Wrapper • Ruffler • Tape-winder	
★													Coats for women & children		
077-6		2	5	5	6	3.3	0.3~2.7	5	1.6		#14	5000	Thin, medium Ruffling (w/piping)	• Wrapper • Ruffler • Tape-winder	
★													Coats for women & children		
078-6		2	4	5	6	3.3	0.3~2.7	5	1.6		#14	5000	Ruffling (w/piping)	• Wrapper • Ruffler • Tape-winder	
★													Coats for women & children		
079-3		2	5	2	4	3.6	0.3~1.8	4	1.6		#11	5000	Thin, medium taping	• Tape-guide	
-4													Knitted underwear Shirts		
-5													Tee shirts, pajamas		
080-3		2	4	2	4	3.6	0.3~1.8	4	1.6		#11	5000	Thin, medium taping	• Tape-guide	
-4													Knitted underwear Shirts		
-5													Tee shirts, pajamas		

# SPECIFICATION

 **BROTHER INDUSTRIES LTD.**

**MA4-B581-**

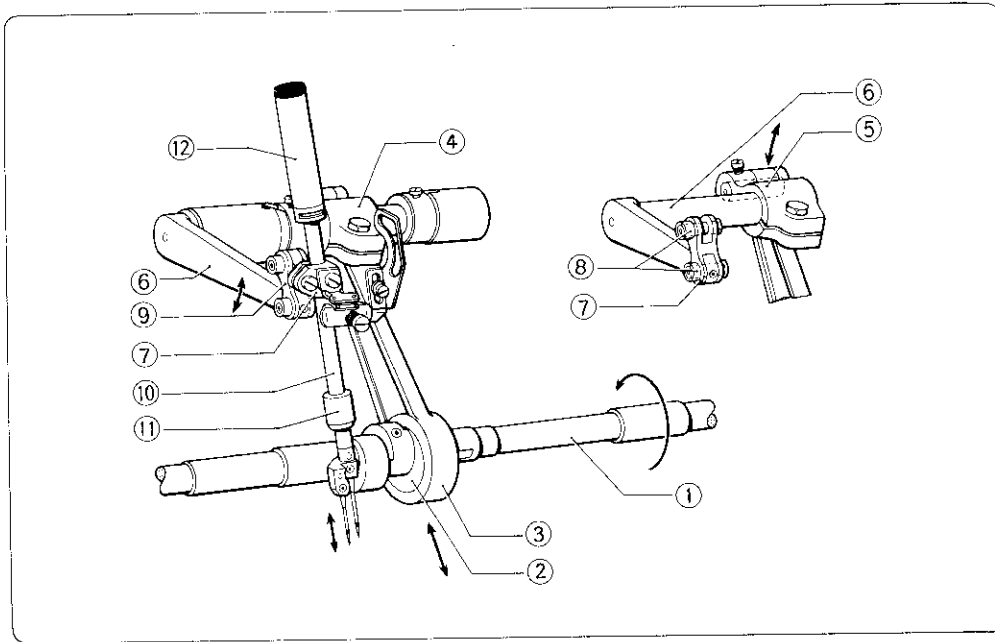
MADE IN JAPAN

Sub-class No.	Stitch form	No. of needle	No. of thread	Needle gauge (mm)	Bight (mm)	Maximum stitch length (mm)	Differential feed ratio	Height of presser foot	Pitch (mm) of feed dog	Differential Type of feed dog	Needle (DC x 1 DM x 13)	Maximum sewing speed (spm)	Usage (material)	Attachment
081-3					3								Thin, medium taping	•Tape-guide
-4		2	5	3	4	3.6	0.3~1.8	6	1.6		#14	5000	Knitted underwear	
-5					5								Shirts Tee shirts, pajamas	
082-3					3								Thin, medium taping	•Tape-guide
-4		2	4	3	4	3.6	0.3~1.8	6	1.6		#14	5000	Knitted underwear	
-5					5								Shirts Tee shirts, pajamas	
083-5					5								Thin, thick taping	•Tape-guide
-6		2	5	5	6	3.6	0.3~1.8	6	1.6		#16	5000	Knitted underwear	
-7					7								Shirts Tee shirts, pajamas	
084-5					5								Thin, thick taping	•Tape-guide
-6		2	4	5	6	3.6	0.3~1.8	6	1.6		#16	5000	Knitted underwear	
-7					7								Shirts Tee shirts, pajamas	
087-5					5								Extra heavy	-
-6		2	5	5	6	3.6	0.3~1.8	3.5	2.5		#21	5000	Denim Curtain	
★														
088-5					5								Extra heavy	-
-6		2	4	5	6	3.6	0.3~1.8	3.5	2.5		#21	5000	Denim Curtain	
★														
089-5					5								Thin, medium binding	•Binder •Tape-winder
★		2	5	3	5	3.6	0.3~1.8	6	1.6		#14	5000	Coats for children & women, knitted good	
090-5					5								Thin, medium binding	•Binder •Tape-winder
★		2	4	3	5	3.6	0.3~1.8	6	1.6		#14	5000	Coats for children & women, knitted goods	
092-5					5								Extra heavy	•Serrated angle knife
-6		2	5	5	6	3.6	0.3~1.8	3.5	2.5		#21	5000	Denim Curtain	
★														
093-5					5								Extra heavy	•Serrated angle knife
-6		2	4	5	6	3.6	0.3~1.8	3.5	2.5		#21	5000	Denim Curtain	
★														

★ Extra cost of attachment will be required for the sub-class marked with asterisk.

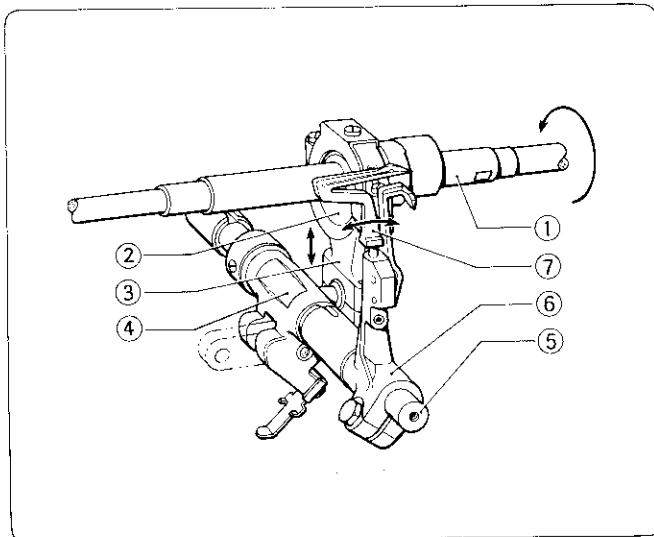
# 3. DESCRIPTION OF MECHANISM

## 1 NEEDLE BAR MECHANISM



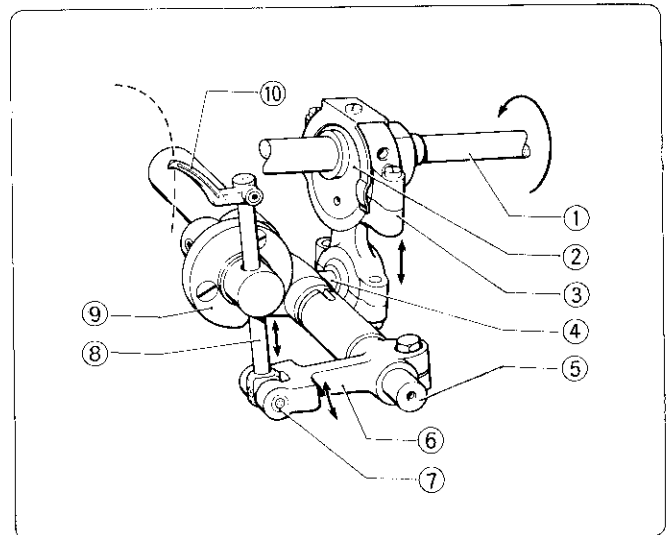
- In case that crank shaft ① may rotate to the direction indicated with arrow, with needle bar and upper knife eccentric cam ②, needle arm driving crank rod ③ connected with crank shaft moves up and down.
- As the upper portion of needle arm driving crank rod ③ is connected with needle arm driving lever ④ with its pin ⑤, needle bar crank shaft ⑥ gets the oscillating movement.
- Needle bar clamp ⑦ connected needle bar crank shaft ⑥ with needle bar crank shaft ⑧ and needle bar link is fitted into the top of needle bar crank shaft and gets up and down movement.
- Needle bar ⑩ that is held by needle bar clamp ⑦ is guided by needle bar bushing lower ⑪ and needle bar bushing upper ⑫.

## 2 UNDER LOOPER MECHANISM



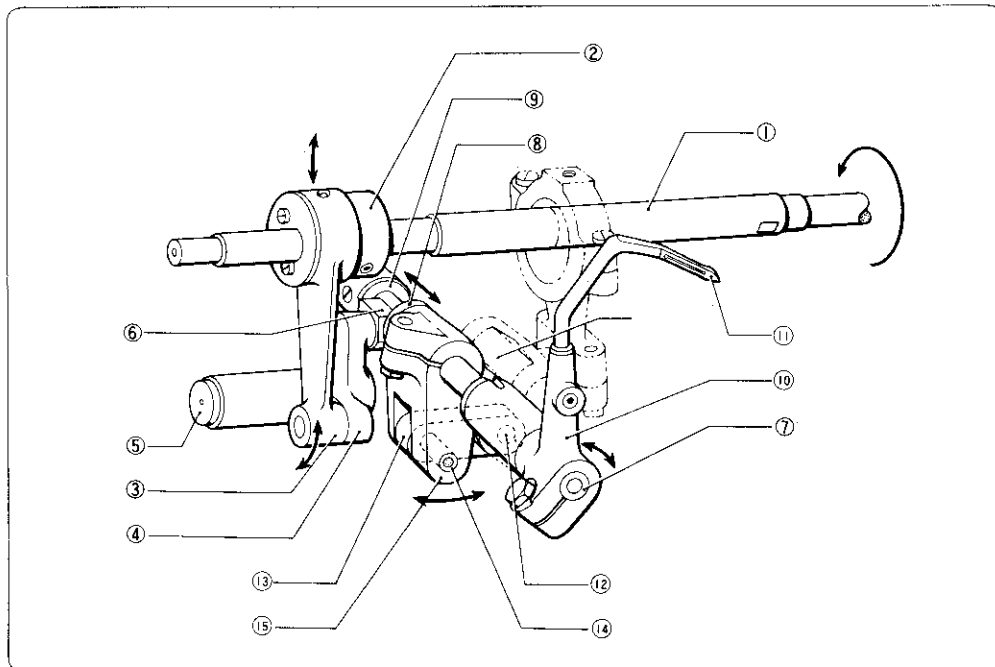
- In case that crank shaft ① may rotate to the direction indicated with arrow, with under looper eccentric cam ②, under looper connecting rod ③ moves up and down.
- Under looper ⑦ fitted into under looper holder ⑥ gets the oscillating movement with the intermediate action of under looper connecting lever ④ connected with under looper connecting rod ③ and under looper lever shaft ⑤.

## 3 OVER LOOPER MECHANISM



- In case that crank shaft ① may rotate to the direction indicated with arrow, with over looper eccentric cam ②, over looper connecting rod ③ moves up and down.
- Over looper driving lever ⑥ gets the oscillating movement with the intermediate action of over looper connecting lever ④ connected with over looper connecting rod ③ and over looper lever shaft ⑤.
- Its oscillation motion makes the over looper ⑩ describe an ideal orbit about over looper holder ⑧ and over looper holder guide assembly ⑨ via over looper holder pin ⑦.

#### 4 DOUBLE CHAIN STITCH LOOPER MECHANISM



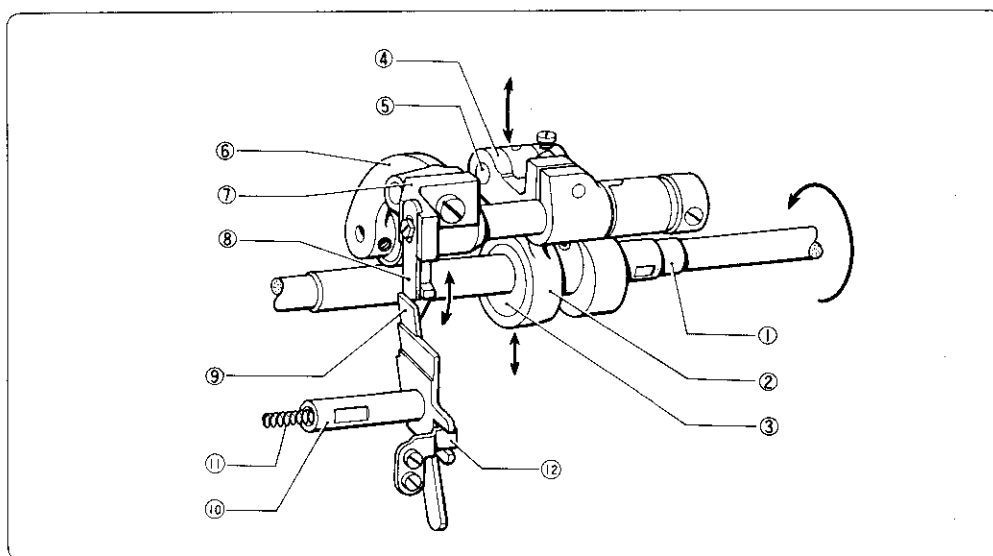
##### 1) Double chain stitch looper back and forth movement mechanism

- In case that crank shaft ① may rotate to the direction indicated with arrow, with longitudinal eccentric cam ②, longitudinal feed driving rod ③ moves up and down.
- Longitudinal feed lever slide block ⑥ with longitudinal feed lever ④ is fitted into the top end of longitudinal feed driving rod ③ and gets back and forth movement making longitudinal feed lever shaft ⑤ as a fulcrum.
- Longitudinal feed lever slide block ⑥ connected between thrust collar ⑧ upon longitudinal feed shaft ⑦ and set collar ⑨, it carries to double chain stitch looper ⑪ with the intermediate action of longitudinal feed shaft ⑦ and double chain stitch looper holder ⑩.

##### 2) Double chain stitch oscillating mechanism

- Chain stitch driving lever ⑮ is conveyed the oscillating motion by under looper connecting lever ⑯ with the intermediate action of under looper connecting lever pin ⑭, chain stitch link ⑬ and chain stitch driving lever pin ⑭.
- Its oscillation motion is conveyed to longitudinal feed shaft ⑦, double chain stitch looper holder ⑩ and double chain stitch looper ⑪.

#### 5 KNIVES MECHANISM



##### 1) Upper knife mechanism

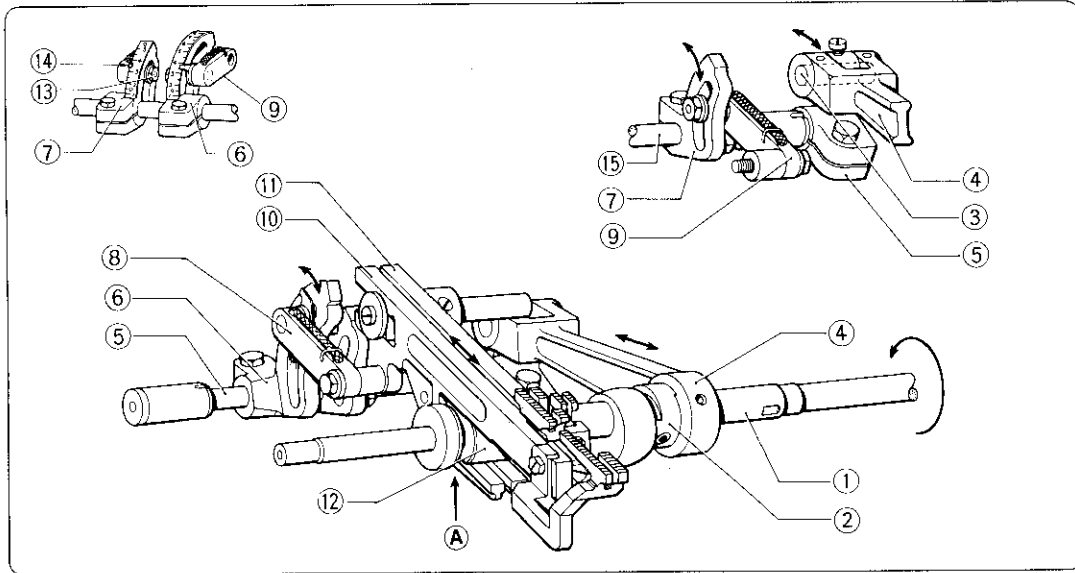
- In case that crank shaft ① may rotate to the direction indicated with arrow, with needle bar and upper knife eccentric cam ②, upper knife driving rod ③ moves up and down.

- The top end of upper knife driving rod ② is connected with upper knife driving lever ④ with pin ⑤, then upper knife driving lever ④ gets oscillating movement.
- Upper knife ⑧ is connected upper knife holder ⑦, gets oscillating movement with the intermediate action of upper knife driving lever ④ and upper knife driving arm ⑥.

## 2) Lower knife mechanism

- Lower knife ⑨ is fixed with lower knife holder ⑩ and being pushed to upper knife ⑧ with the pressure of lower knife holder spring ⑪ plays a role of edge trimming with upper knife ⑧. And lower knife holder guide ⑫ plays role of positioning of lower knife ⑨ and guide of lower knife holder ⑩.

## ⑥ FEED MECHANISM



### 1) Horizontal feed mechanism

- In case that crank shaft ① may rotate to the direction indicated with arrow, with under looper eccentric cam ②, feed rod ④ connected with under looper eccentric cam ②, gets back and forth movement.
- The top end of feed rod ④ is connected with feed arm ⑤ with pin ③ thus feed arm makes oscillating movement.
- Feed arm ⑤ is fitted with feed shaft ⑮, so that main feed arm ⑦ and differential feed arm ⑥ get oscillating movements because these two arms are fitted with feed shaft ⑮.
- This oscillating movement becomes horizontal movement of main feed bar ⑪ and differential feed bar ⑩ with the movements of main feed link ⑨ and differential feed link ⑧.

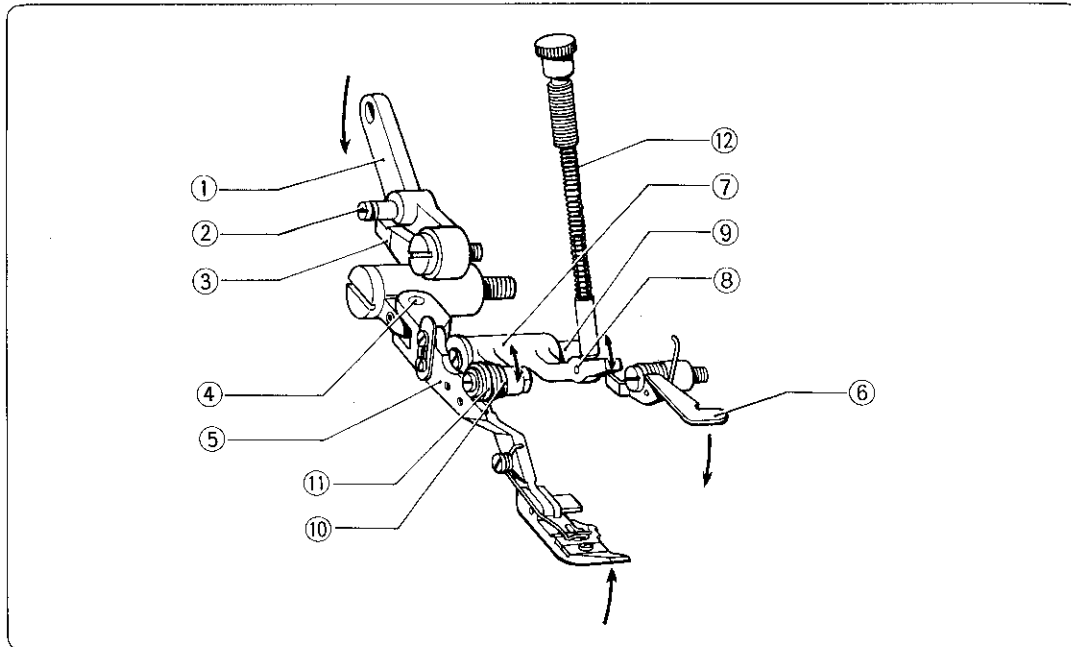
### 2) Vertical feed mechanism

- The part being fitted with crank shaft ① is eccentric, so that part ① of feed lifting slide block ⑫, main feed bar ⑪ and differential feed bar ⑩ get vertical movements.

### 3) Stitch length regulator and differential feed mechanism

- As for the adjustment stitch length, loosen nut ⑬ and adjust the scale on indicator plate ⑭ in accordance with the scale on main feed arm ⑦ and then retighten nut ⑬.
- The differential ratio can be adjusted by changing the scale on differential feed arm ⑥ against the scale on main feed arm ⑦.
- In case of shrink feed, set the scale on differential feed arm ⑥ to a larger number than that of the scale on main feed arm ⑦.
- In case of stretch feed, set the scale on differential feed arm ⑥ to a smaller number than that of the scale on main feed arm ⑦.

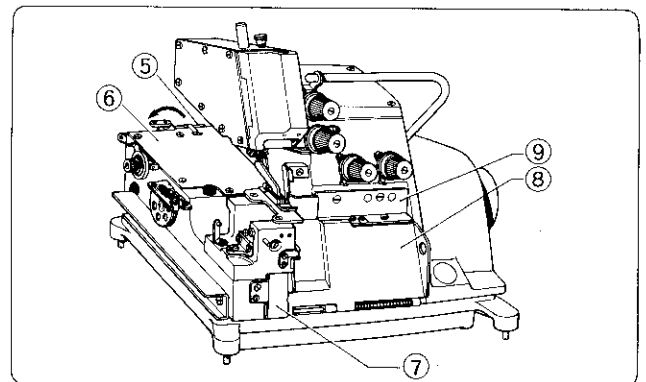
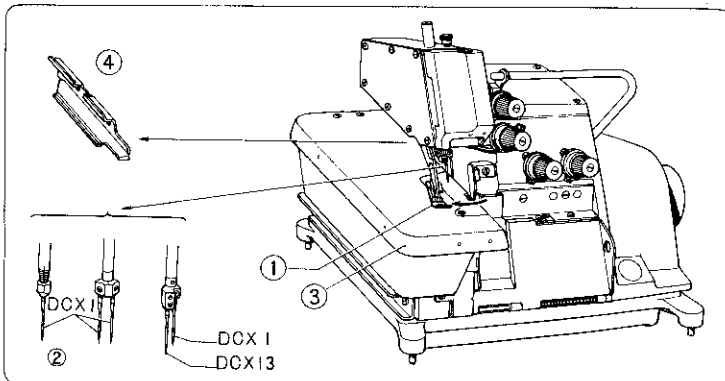
## 7 PRESSER FOOT MECHANISM



- In case that presser foot lifter lever ① is depressed down, presser foot supporter ③ is lowered with spring hook ②.
- Main presser arm connected with pin ④ is raised with presser foot supporter ③.
- If presser bar lifter ⑥ is depressed down as per above figure, presser bar lever ⑦, presser arm roller shaft ⑩ and presser arm roller ⑪ are raised with roller ⑧ knocked into presser bar lever as a fulcrum presser bar lever shaft ⑨, thus main presser arm ⑤ is released from the pressure of presser bar spring ⑫.

## 4. DISASSEMBLING PROCEDURES

### 1 COVER



#### Procedures

Q'ty of  
screw

- 1 Turn the pulley until the needle bar is raised to the highest position, and then turn out presser foot ① above needle plate.
- 2 Remove needles ②.
- 3 Remove cloth plate ③.
- 4 Remove cloth guide (L) ④.

2

2

2

2

Q'ty of  
screw

- 5 Open feed mechanism cover (B) ⑤ and remove feed mechanism cover ⑥.

4

- 6 Remove front cover guide ⑦.

2

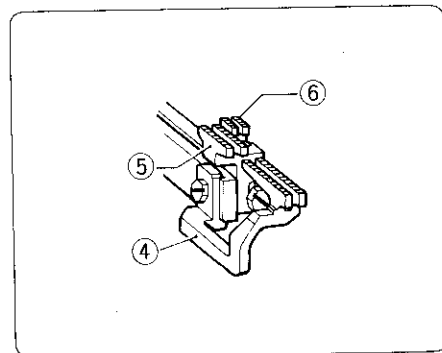
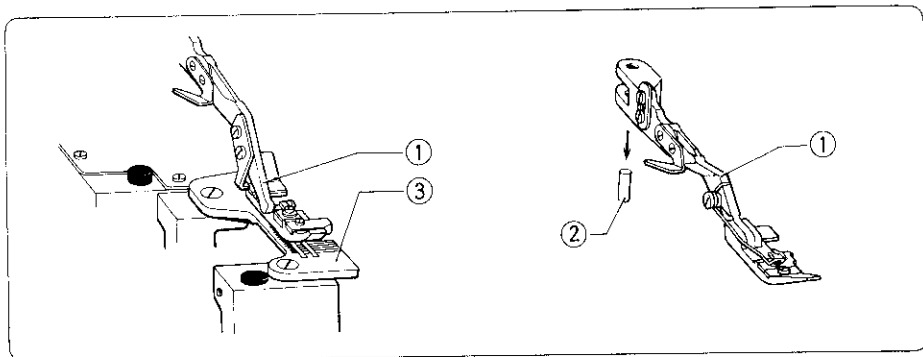
- 7 Remove front cover ⑧.

2

- 8 Remove front cover supporter ⑨.

2

## 2 PRESSER FOOT AND FEED MECHANISM



### Procedures

- 1 Remove presser foot ①.  
(In case of safety stitch, after pull out pin ②, remove presser foot ①.)
- 2 Turn the pulley until the needle bar is raised to the highest position.

Q'ty of screw

1

- 3 Remove needle plate ③.
- 4 Remove differential feed dog ④.
- 5 Turn the pulley until the under looper to the left mostly and remove main feed dog ⑤.
- 6 Remove chain feed dog. ⑥

Q'ty of screw

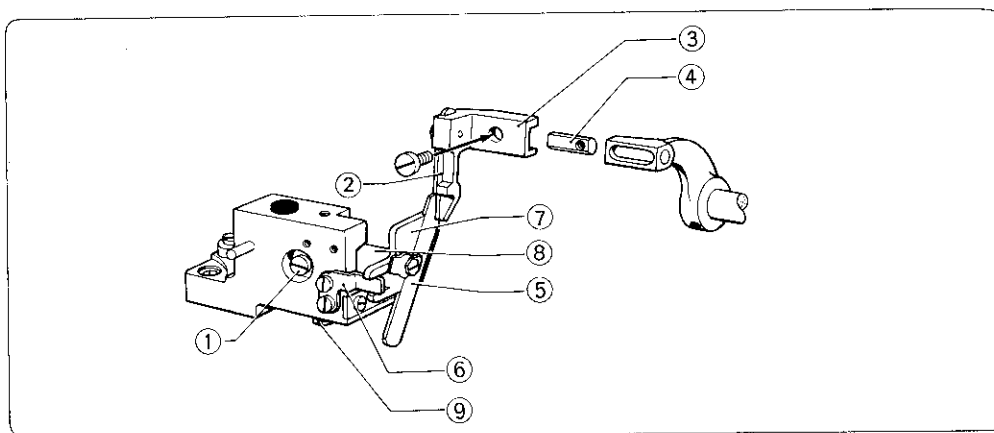
2

1

1

1

## 3 KNIVES MECHANISM



### Procedures

- 1 Loosen screw ① and turn lower knife holder ⑦ to the left direction, then tighten it.
- 2 Remove upper knife ②.
- 3 Remove upper knife holder ③.
- 4 Remove nut ④.
- 5 Remove lower knife ⑤ as holding it by hand. 1

Q'ty of screw

1

1

1

1

- 6 Remove lower knife holder guide ⑥.
- 7 Remove lower knife holder ⑦ as holding it by hand. (Pull out spring for lower knife holder ⑦ also.)
- 8 Remove lower knife holder supporter ⑧. 2  
(At first loosen bolt ⑨ under the needle plate support bracket ⑩.)

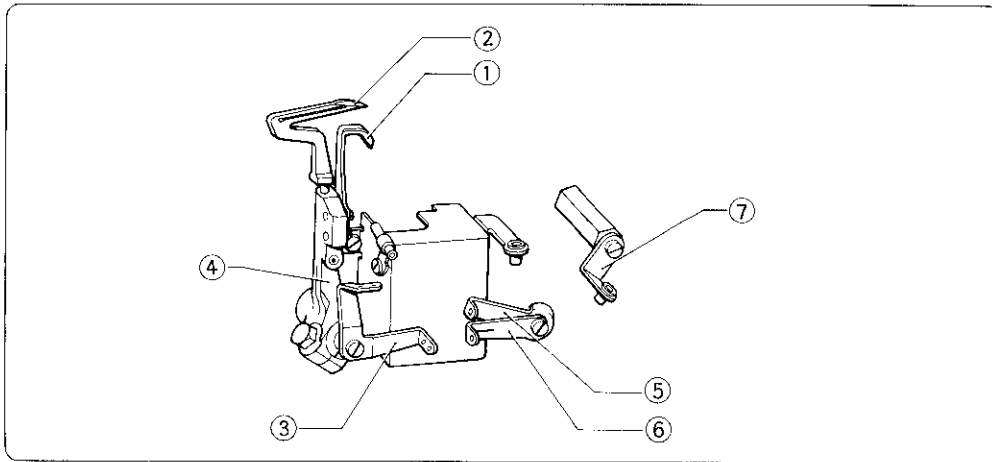
Q'ty of screw

2

1

2

#### 4 UNDER LOOPER MECHANISM



##### Procedures

- 1 Turn the pulley until under looper ② to the left mostly, and then remove movable needle guard ①.
- 2 Set under looper ② at the center position in the operation range, and then remove under looper ②.

Q'ty of screw

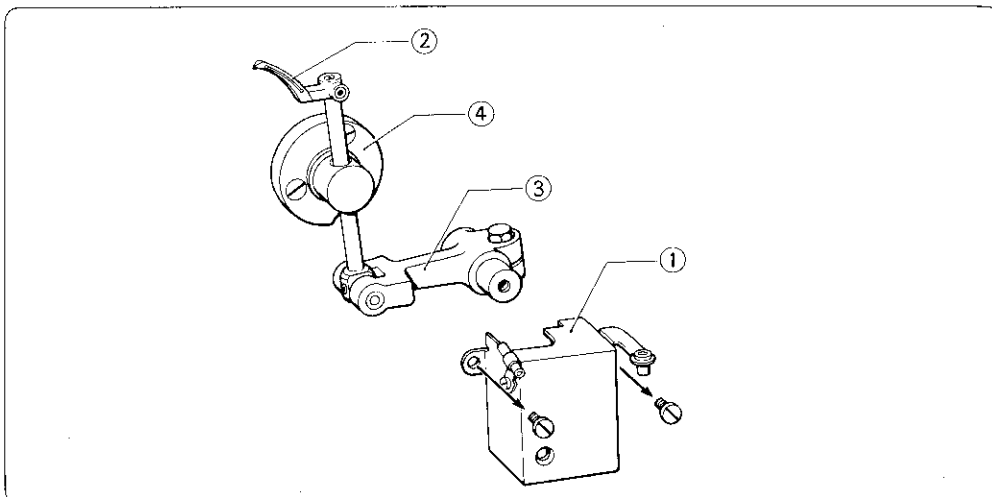
##### Procedures

- 3 Remove looper thread take up (L) ③.
- 4 Remove under looper holder ④.
- 5 Remove over looper thread take-up (R) ⑤ and under looper thread take-up (R) ⑥.
- 6 Remove under looper thread guide ⑦.

Q'ty of screw

1  
1  
1  
1

#### 5 OVER LOOPER MECHANISM



##### Procedures

- 1 Remove inside cover ①.  
(Set over looper ② to the left mostly.)
- 2 Remove over looper ②.

Q'ty of screw

##### Procedures

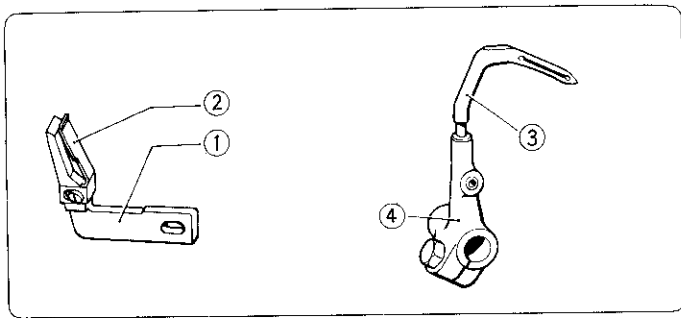
- 3 Remove over looper driving lever ③ and over looper holder guide assembly ④ at the same time.

Q'ty of screw

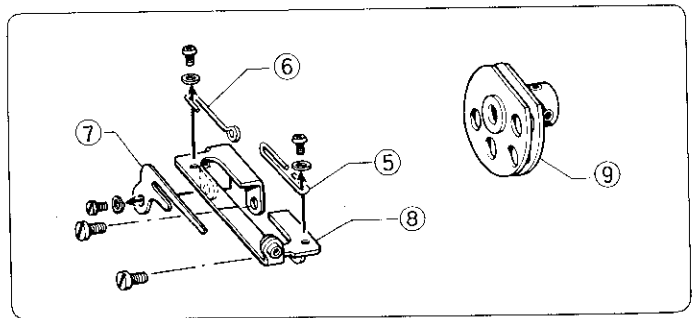
1  
1.3



## 6 DOUBLE CHAIN STITCH LOOPER MECHANISM

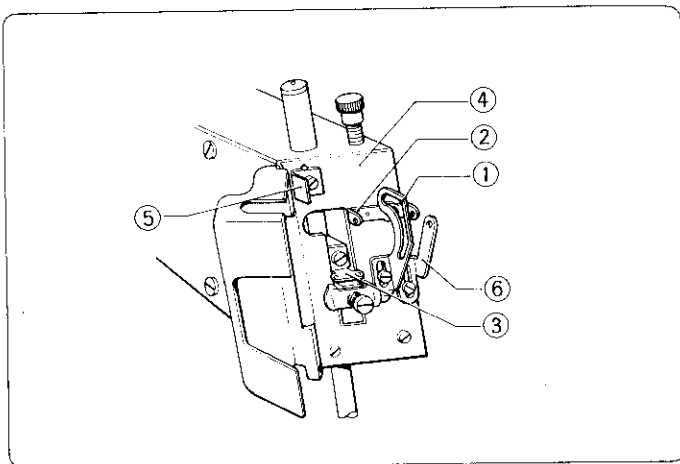


Procedures	Q'ty of screw
1 Remove needle guard (B) ①.	1
2 Remove needle guard (F) ② from needle guide (B) ①.	1
3 Remove double chain stitch-looper ③.	1
4 Remove double chain stitch looper holder ④.	1
5 Remove thread guide (R) ⑤ and (L) ⑥.	1

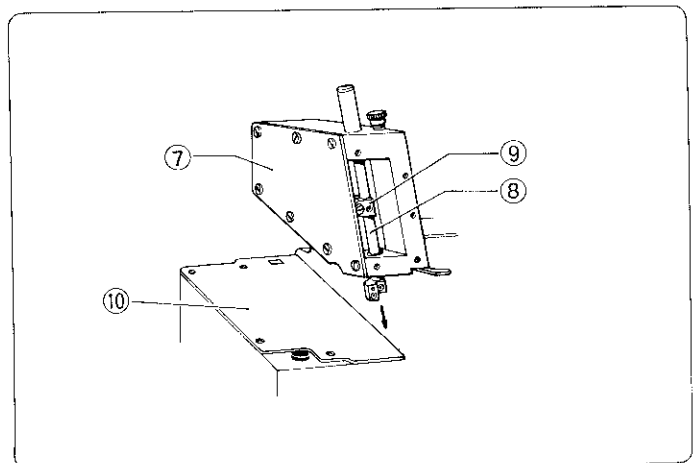


Procedures	Q'ty of screw
6 Remove thread handler ⑦.	1
7 Remove thread take-up bracket ⑧. (Put screw driver into the hole of double chain stitch looper take-up and loosen set screw.)	2
8 Remove double chain stitch looper take-up ⑨.	2

## 7 NEEDLE BAR MECHANISM



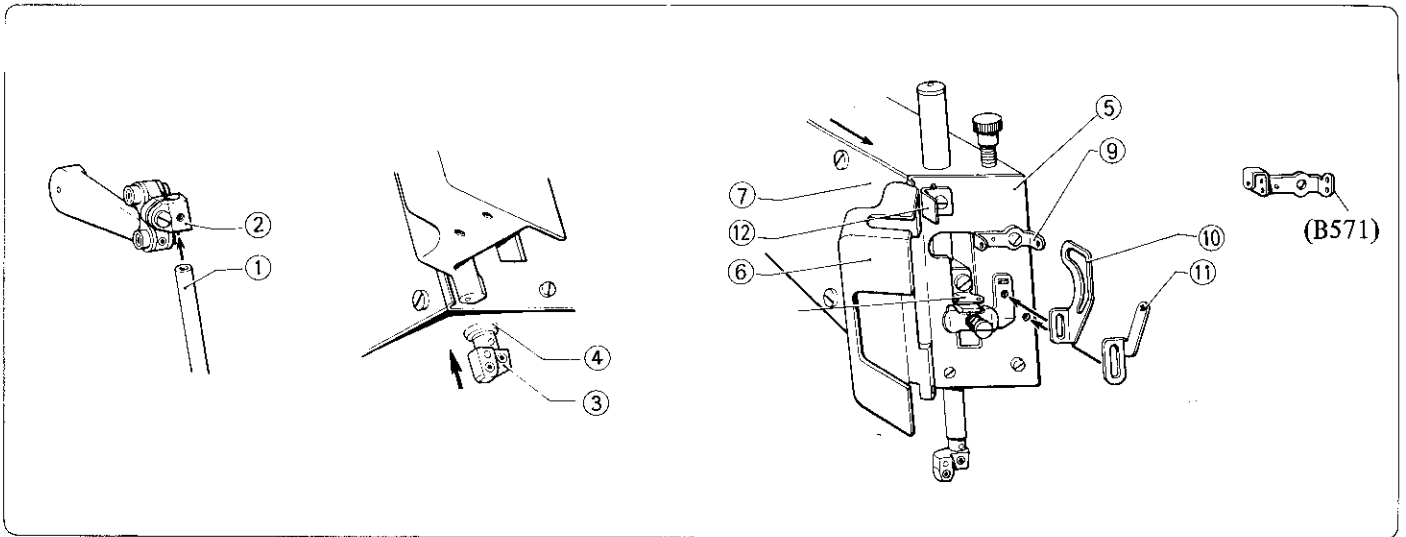
Procedures	Q'ty of screw
1 Remove needle thread take-up ①.	1
2 Remove needle thread guide (A) ②.	1
3 Remove needle thread take-up supporter ③.	1
4 Remove chain stitch needle thread guide ⑥ (B581).	1
5 Remove face plate ④. (Stopper spring ⑤ is naturally to be removed out.)	4 3(B581)



Procedures	Q'ty of screw
6 Remove needle mechanism cover ⑥, taking care not to spoil the packing. (Put feed mechanism cover ⑩ on the machine body.)	7
7 Loosen screw for needle bar clamp ⑦ and pull-out needle bar ⑧ lower.	1

# 5. ASSEMBLING ADJUSTMENT PROCEDURES

## 1 NEEDLE BAR MECHANISM



### Procedures

Q'ty of screw

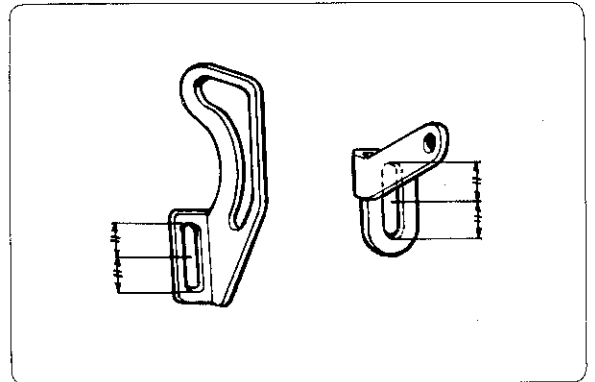
- 1 Insert needle bar ① into needle bar clamp ②.
- 2 Turn the pulley until the needle bar clamp ② is raised to the highest position, and then temporarily fasten the needle bar ① at a height where the needle clamp ③ is barely hidden in needle bar bushing lower ④. 1
- 3 Install face plate ⑤ to the machine body.  
(Install stopper spring ⑫ at the same time, and adjust it when face plate cover ⑥ is closed without cranky.) 4
- 4 Install needle mechanism cover ⑦ to the machine body firmly putting of face plate ⑤ lightly, then take care not make any clearance. 3 (B581)
- 5 Install needle thread take-up supporter ⑧ to needle bar clamp ②. 1
- 6 Install needle thread guide (A) ⑨ to face plate ⑤. 1

Q'ty of screw

- 7 Install needle thread take-up ⑩ to needle thread take-up supporter ⑧. 1
  - Normally, it should be fastened in the center of its adjustable range.  
Lower its position to increase the needle thread tension.  
Raise its position to decrease the needle thread tension.

**Safety Stitch** Install chain stitch thread guide ⑪ to face plate ⑤. 1

- Normally, it should be fastened in the center of its adjustable range.  
Raise its position if the needle thread winds itself around the looper.  
Also raise its position to increase the needle thread tension.  
Lower its position to decrease the needle thread tension.



**Procedures**

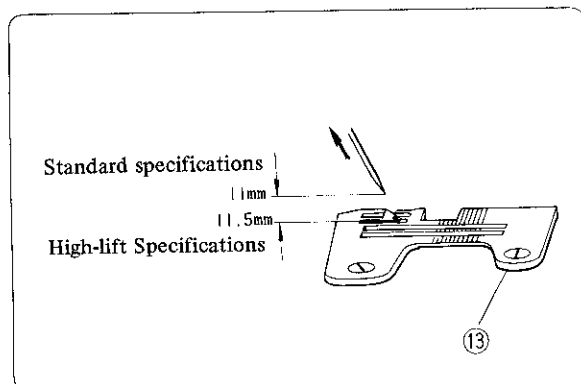
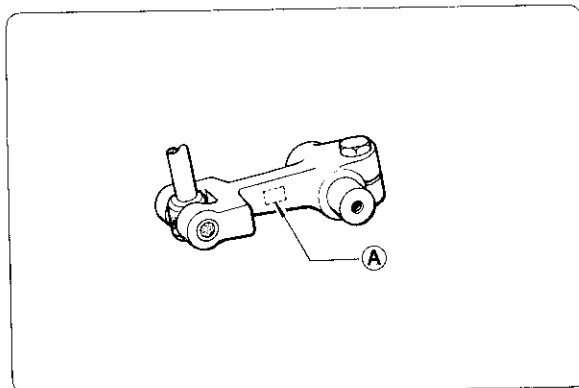
Q'ty of  
screw

2

- 8 Insert needles all the way into needle clamp ③ and tighten screws.
- 9 Install needle plate ⑬.
- 10 Check part ① on the over looper driving lever and see whether the machine is for standard use (S) or high-lift use (H).
- 11 Standard needle for adjustment is as follows.
  - In case of the twin-needle, use the left needle.
  - In case of the safety stitch, use the hemming needle.

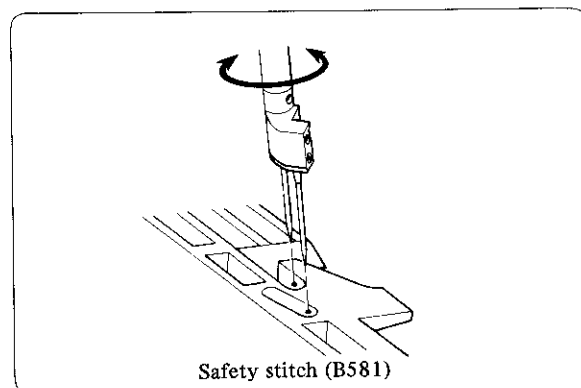
◆ The below items of ⑫ and **Safety Stitch** should be taken simultaneously.

- 12 In case of sewing machines made to the standard specifications, adjust the distance between the needle point and the top of needle plate to 11mm when the needle is up highest. The sewing machines of the high-lift specifications must be adjusted to a distance of 11.5mm between them.



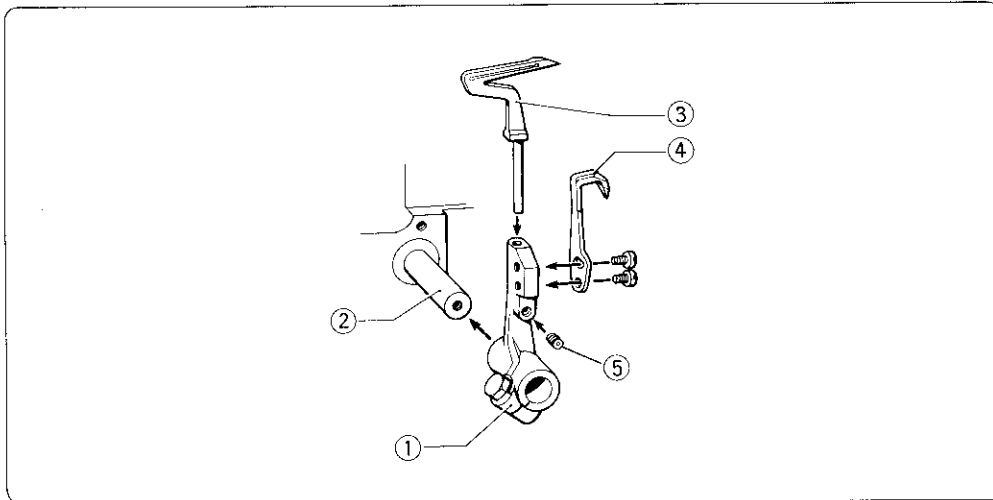
**Safety Stitch**

Turn the pulley slowly, lower needle slightly into needle plate and adjust it so needles will be in the center of needle plate slot, by turning needle bar.



- 13 In case of the single needle, tighten needle bar clamp with screw.
  - In case of the twin-needle, temporarily fasten needle bar clamp with screw.
  - In case of the safety stitch, after make sure needle should be in the center of needle plate slot, tighten needle bar clamp with screw.

## 2 UNDER LOOPER MECHANISM

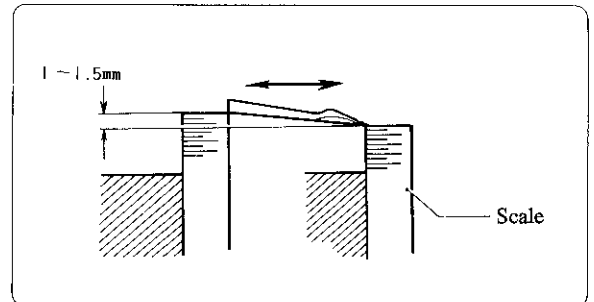


### Procedures

- 1 Remove needles and needle plate.
- 2 Temporarily fasten under looper holder ① on under looper lever shaft ②.
- 3 Insert under looper ③ all the way into under looper holder ①.
- 4 Measure under looper ③ tilt at its point and bottom, adjust it until the measurement difference is in the range of 1 to 1.5 mm, and then fasten under looper ③ with screw ⑤.
- 5 Install the standard needle for adjustment into needle clamp.

Q'ty of screw

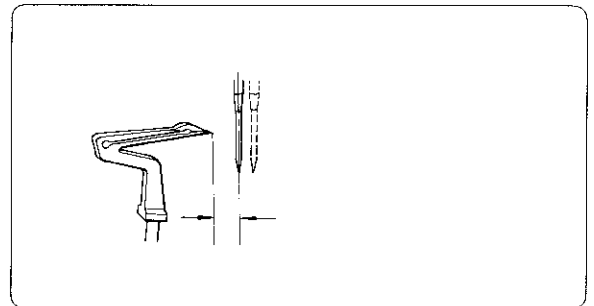
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1

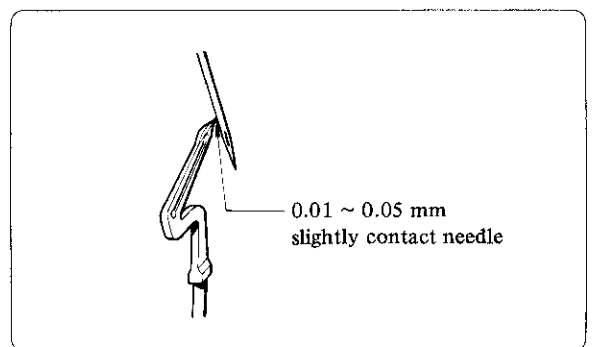
◆ The below items of ⑥ and ⑦ should be taken simultaneously.

- 6 In case of sewing machines made to the standard specifications, adjust the distance between the under looper point and the needle center to 4.5mm when the under looper is at the left most position. The sewing machine of the high-lift specifications must be adjusted to a distance of 2.2mm between them. (Sidewise positioning)



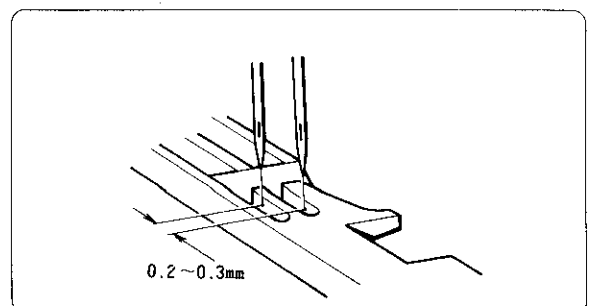
**Safety Stitch** In case of standard specifications, that distance is 4.7mm.  
In case of high-lift specifications, that distance is 2.2mm.

- 7 With the point of under looper in line with the center of needle, make an adjustment so that the point of under looper will push needle 0.01 ~ 0.05mm (i.e., slightly contact needle) in the upward travel of needle. However, in case of sewing for thick materials, must be adjusted to touch about 0 to 0.05mm between them. (Longitudinal positioning)



\* 0.05 to 0.07mm for cotton fabrics; 0.08 to 0.1mm for chemical fabrics.

**Twin Needles** Install the right needle into needle clamp, loosen screw for needle bar clamp, turn the needle bar until the under looper point hits both needles by approximately the same depth or the right needle slightly deeper, and then retighten screw for needle bar clamp. Also check the height of needle bar at the same time.  
(See the figure at right.)

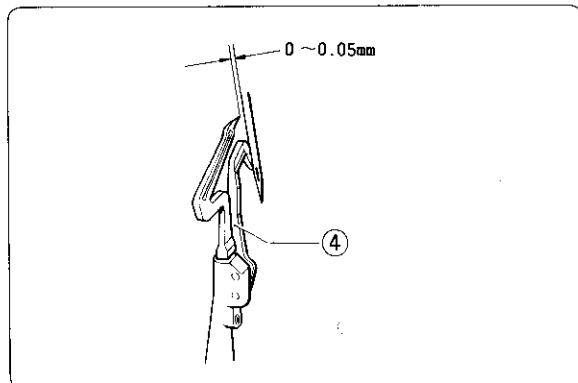


**Procedures**

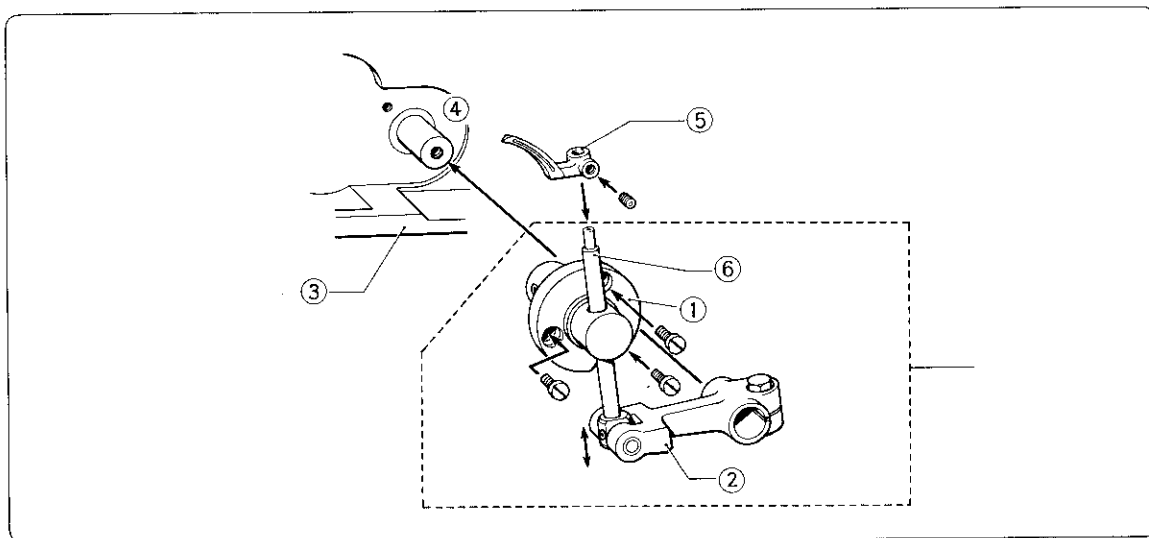
- 8 Turn the pulley until under looper to the left mostly, and then temporarily fasten movable needle guard ④ to under looper holder ①.
  - 9 Match the under looper point with the needle center on the needle's upward travel, move movable needle guard ④ until it contacts needle, adjust the clearance between the under looper point and needle to 0 to 0.05mm, and fasten movable needle guard ④.
- \* 0.02 to 0.05mm for cotton fabrics; 0 to 0.03mm for chemical fabrics.

Q'ty of screw

2



**③ OVER LOOPER MECHANISM**



**Procedures**

Q'ty of screw

- 1 Fit over looper holder guide assembly ① onto flame ③ and over looper driving lever ② onto over looper lever shaft ④ at the same time.
  - 2 Temporarily fasten over looper holder guide assembly ①.
  - 3 Move the over looper driving lever ② up or down until there is the least resistance so over looper driving lever ② is in alignment with over looper lever shaft ④, and then temporarily fasten it. (Turn the pulley, make sure that the machine smoothly.)
  - 4 Insert over looper ⑤ all the way into over looper holder ④, and temporarily fasten it. (Turn the pulley in order to make sure that the machine runs smoothly.)
  - 5 Install needle plate.
  - 6 Select the correct distance A and B from the table below according to your machine specifications, make an adjustment by moving the over looper holder guide assembly ① to the right or left, (decide A measurement), by moving over looper driving lever ② to up or down (decide B measurement), and then fasten them securely.
- \* When changing your machine from the standard specifications to the high-lift specifications, replace over looper and over looper holder assembly, and make an adjustment.

3

1

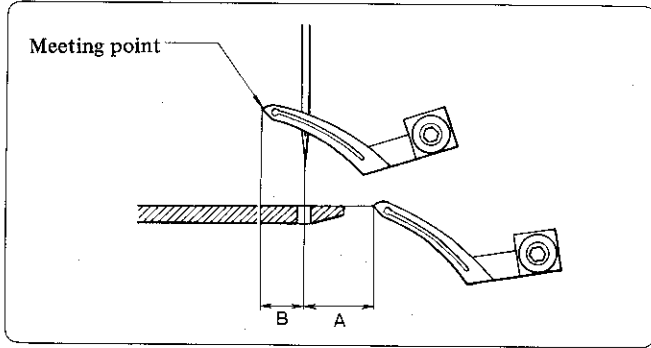
1

2

(Unit: mm)

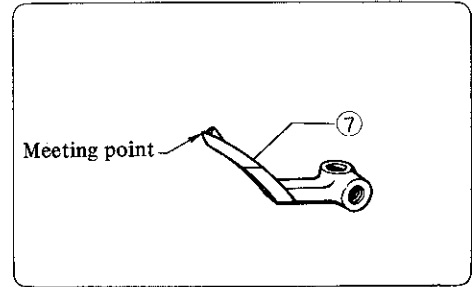
Spec. Distance	Single needle		Twin needles (four threads)		Twin needles (mock safety)		Safety stitch	
	Standard	High-lift	Standard	High-lift	Standard	High-lift	Standard	High-lift
A	7.2	8.2	7.2	8.2	7.2	8.2	7.2	8.2
B	5.6	5.6	5.6	5.6	5.6	5.6	5	5

**Procedures**



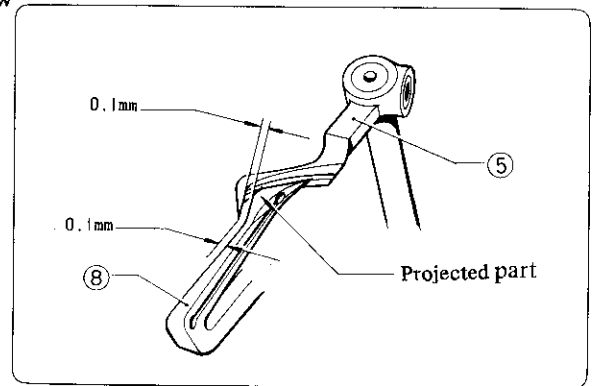
- A: Distance between over looper point and needle center when over looper point is at needle plate top.
- B: Distance between over looper point and needle center when over looper is at left extremity.

- Single needle (two threads)** Over spreader ⑦ for two threads is available. Its meeting distance is the same as that of over looper.
- Twin needles (mock safety)** Replace over looper with mock safety stitch over looper.



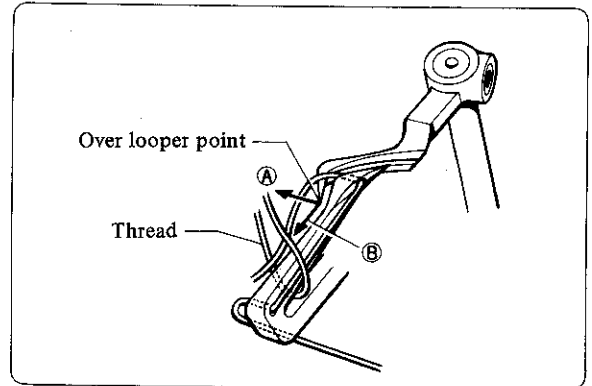
- 7 Remove needle plate.
- 8 Make sure that, when over looper ⑤ meets under looper ⑧, the point of over looper will pass clear of under looper about 0.1mm below its projected part.

Q'ty of screw  
2



- 9 In case of above-mentioned measurement is wrong, direction A in the figure at right, move over looper back or forth, direction B move over looper driving lever up or down, and fasten them.
- \* If there is a clearance of more than 0.1 mm in direction A, stitches may skip due to the failure of catching loops. Even if there is a clearance of 0.1 to 1 mm in direction B, loops can be picked up, but there is a less clearance between needle and over looper.

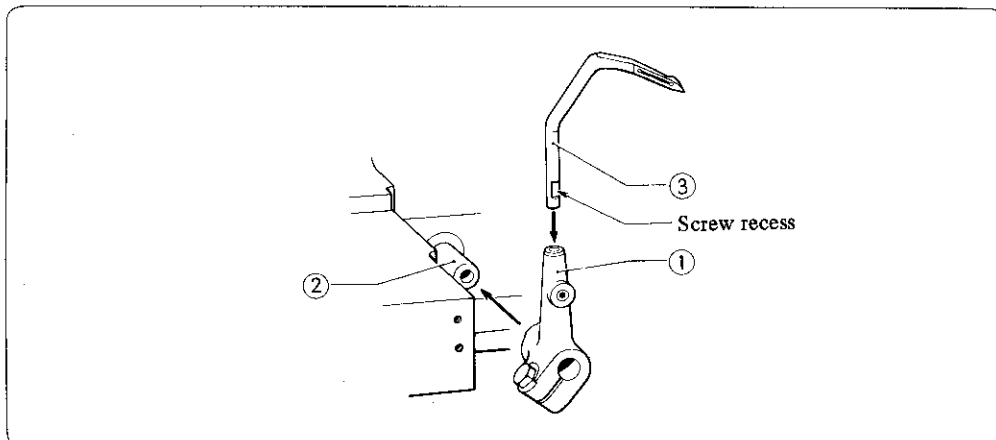
2



2

- 10 Install inside cover to flame.

**4 DOUBLE CHAIN STITCH LOOPER MECHANISM**



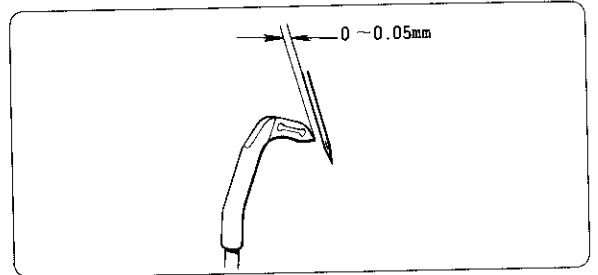
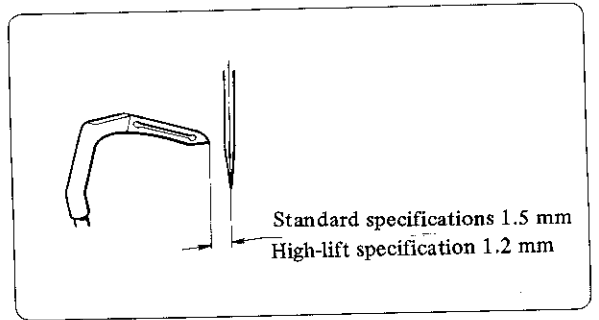
**Procedures**

Q'ty of screw

- 1 Temporarily fasten double chain stitch looper holder ① on longitudinal feed shaft ②
- 2 Install double chain stitch looper ③ by inserting it all the way into double chain stitch looper holder ①. The inclination of the looper depends on the screw recess.
- 3 Install double chain stitch needle into needle clamp.
- 4 The below items of ④ and ⑤ should be taken simultaneously.
  - 4 In case of standard specifications, make an adjustment so that the distance between the looper point and the center of needle is 1.5mm when double chain stitch looper comes to the leftmost position. In case of high-lift specifications, that distance is 1.3mm. (Sidewise potioning)
  - 5 Position the looper so that, when the looper point is in line with the needle center on the needle's upward travel, the looper point will be at about 0 to 0.05mm from needle, and then fasten double chain stitch looper holder. (Longitudinal positioning)
    - \* When stitch-skips occur, adjust it that the looper point will hit needle about 0.05 to 0.1mm deep.
- 6 Install double chain stitch needle guard (F) ④ to that of (B) ⑤ in order to make clearance about 0.3 to 0.5mm.
- 7 Temporarily fasten double chain stitch needle guard (B) to needle plate support bracket.
- 8 Match the looper point with the needle center on the needle's upward travel, hold double chain stitch needle guard (B) in contact with the needle, adjust the clearance between the looper point and the needle to 0 to 0.05 mm, and fasten double chain stitch needle guard (B) securely.

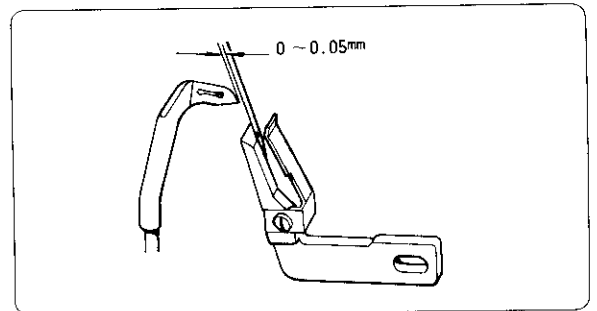
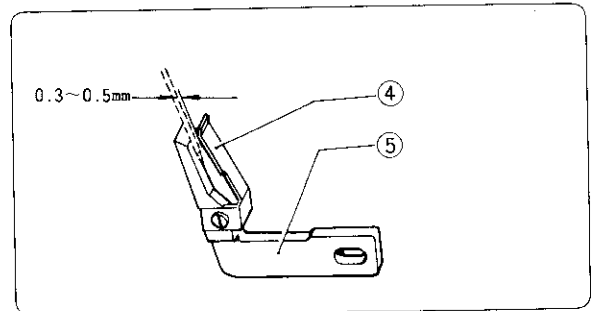
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1

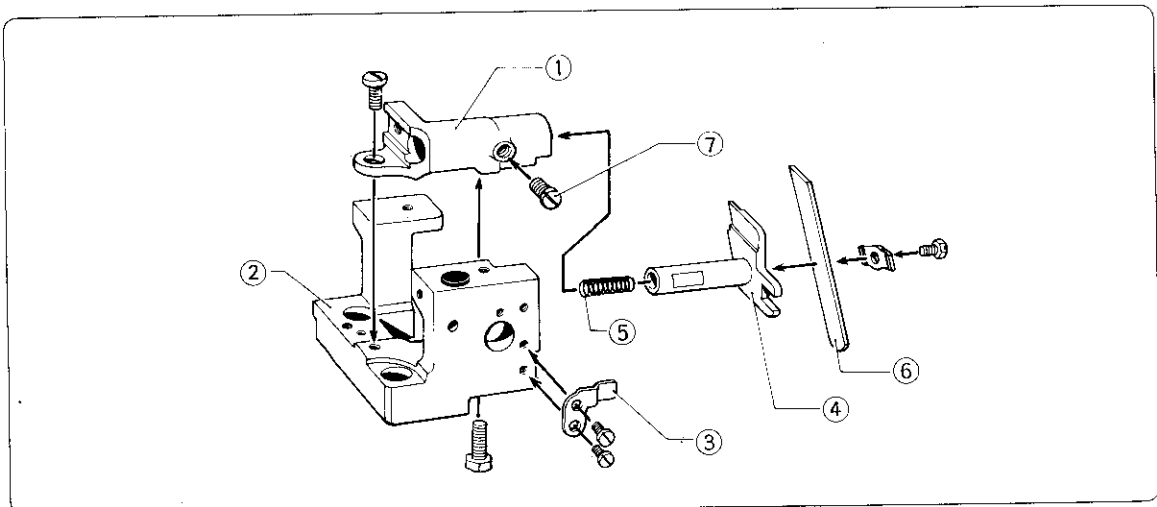


1

1



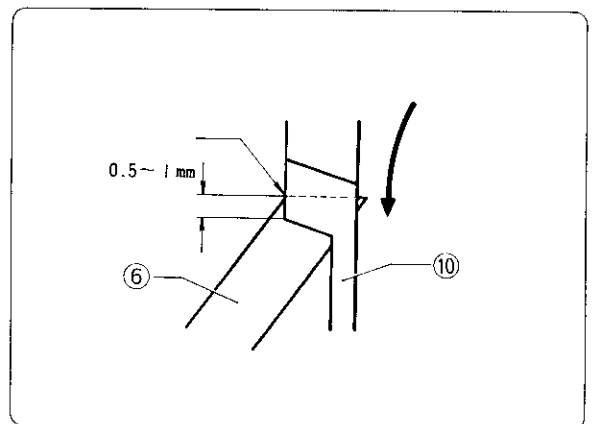
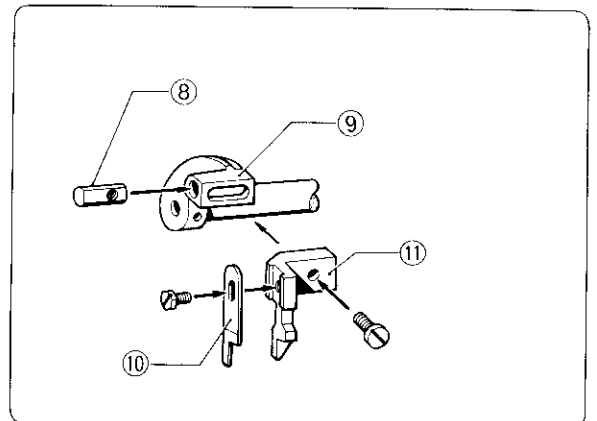
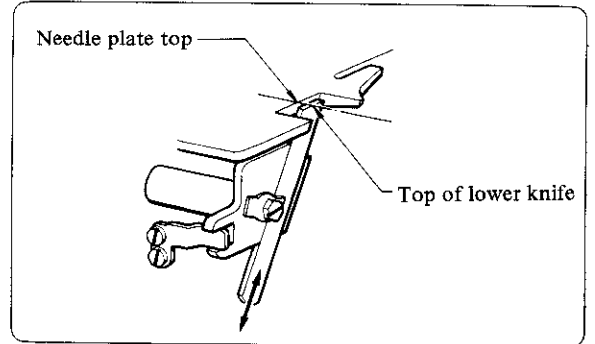
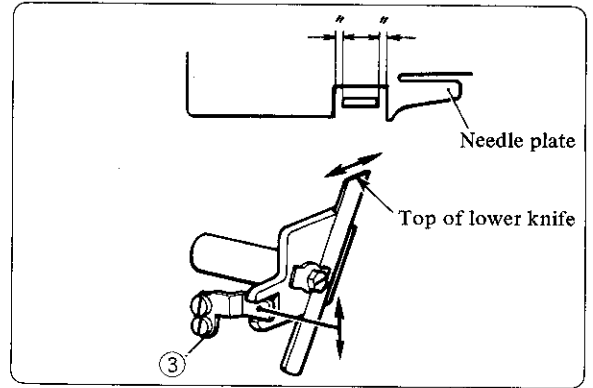
**5 KNIVES MECHANISM**



**Procedures**

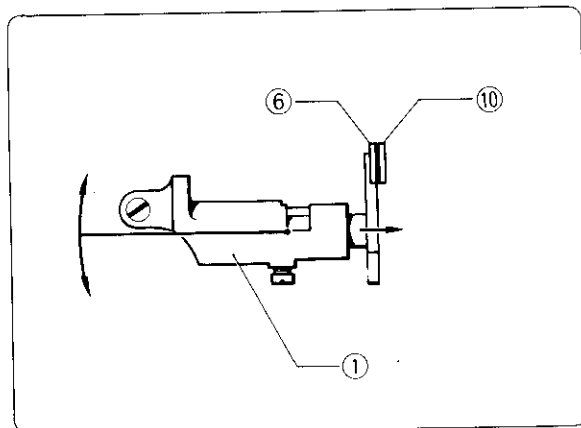
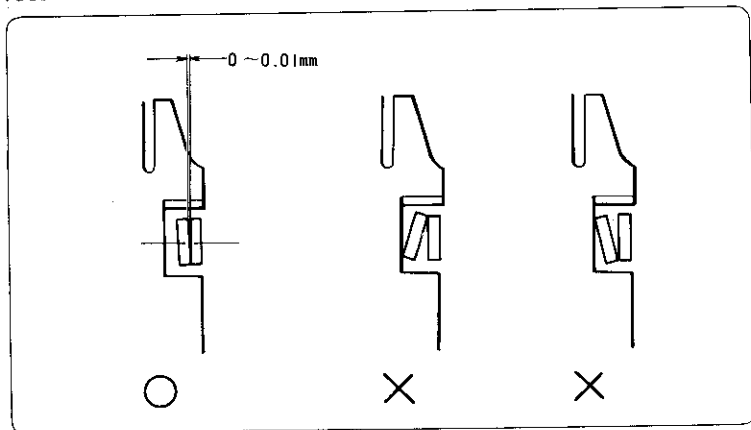
Q'ty of screw

- 1 Temporarily fasten lower knife holder support ① on needle plate support bracket ②. 2
- 2 Temporarily fasten lower knife holder guide ③ on needle plate support bracket ②. 2
- 3 Insert spring ⑤ into lower knife holder ④, fit lower knife holder into lower knife holder support ①, and tighten screw ⑦ just tight enough to keep it from sliding out (but not securely). 1
- 4 Temporarily fasten lower knife ⑥ on the lower knife holder ④. 1
- 5 Install needle plate on needle plate support bracket ②. 2
- ❑ The below items ⑥ and ⑦ should be taken simultaneously. 2
- 6 Loosen screws for lower knife holder guide ③, raise or lower the tip of lower knife holder guide so lower knife ⑥ will be longitudinally equi-distant in the needle plate slot for lower knife, and temporarily fasten it. 2
- 7 Raise or lower lower knife ⑥ until the top of lower knife is level with the needle plate top, and fasten lower knife securely. 1
- 8 Remove needle.
- 9 Turn the pulley until needle bar is raised to the highest position, fit nut ⑧ on upper knife driving arm ⑨. 1
- 10 Temporarily fasten upper knife ⑩ in upper knife holder ⑪. 1
- 11 Temporarily fasten upper knife holder ⑪ on the upper knife driving arm ⑨. 1  
(Touch upper knife to lower knife lightly.)
- 12 Loosen screw and bolt for lower knife holder support ① so as to fit lower knife face and upper knife face and temporarily tighten it. 2
- 13 Lower upper knife ⑩ all the way, and adjust so that upper knife will engage lower knife 0.5 ~ 1 mm deep. 1
- 14 When upper and lower knives are engaged, adjust the angle of lower knife so that the lower left angle of upper knife will match the upper left angle of lower knife, and fix it securely. 2
- 15 For adjusting the engagement of upper and lower knife, loosen the screw and bolt which fasten lower knife holder, turn the lower knife holder about the bolt until there is a clearance corresponding to the thickness of 0 to 0.01mm, then retighten the screw and bolt. 2  
(As per figure next page.)





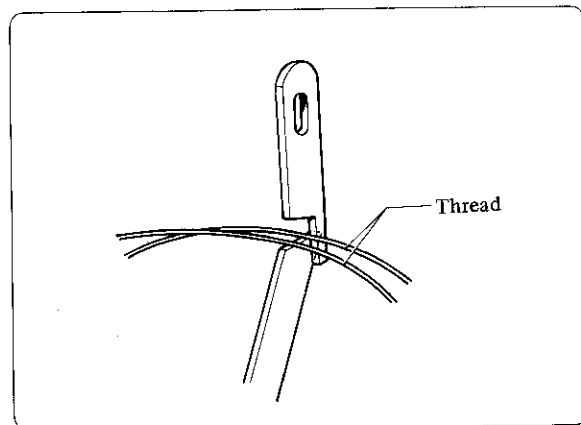
## Procedures



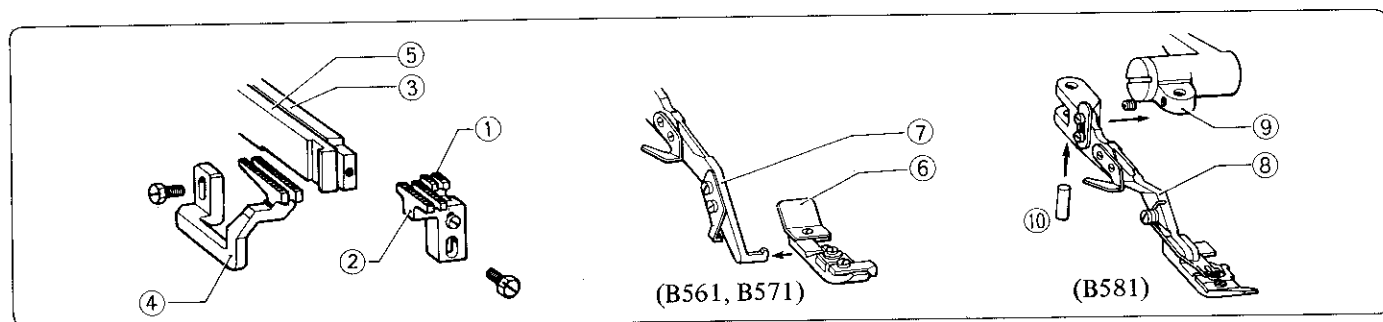
### (Note)

This adjustment is carefully done before shipment so that it is not necessary to do it. However, if it is needed, do it very carefully.

- 16 Make sure it that upper and lower knives are engaged and lower knife is pressed against upper knife by spring and then fasten lower knife holder.
- 17 Place the thread between upper and lower knives in the fore and rear parts, and see that the thread can be sharply cut.



## ⑥ FEED AND PRESSER FOOT MECHANISM



### Procedures

- 1 Remove needle plate.
- 2 Adjust chain feed dog ① at the same level as main feed dog.  
(In case of thicker thread and knitting wool and/or chaining-off hardly come out, adjust chain feed dog to a height of 0.3 ~ 0.5mm below main feed dog.)
- 3 Turn the pulley until under looper to the left mostly, temporarily fasten main feed dog ② on main feed bar ③.
- 4 Temporarily fasten differential feed dog ④ on differential feed bar ⑤.
- 5 Install needle plate on needle plate support bracket.
- 6 Turn the pulley until feed dogs are raised to the highest position, and adjust them to the following height above the top of needle plate.

Q'ty of screw

2

1

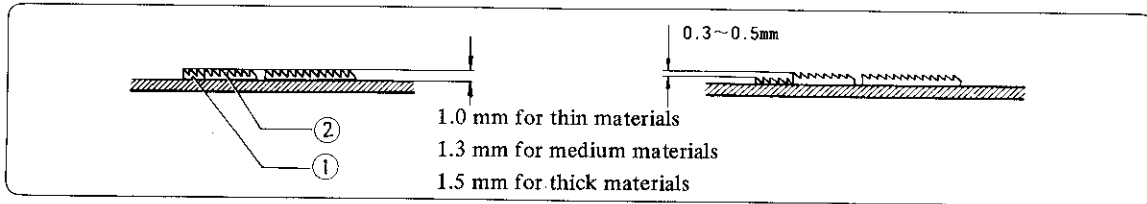
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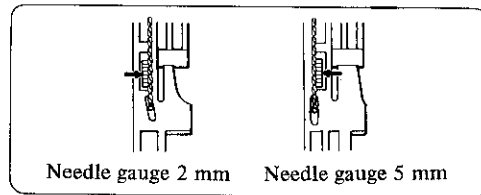
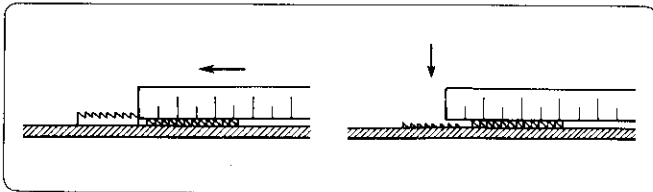
1.0mm for thin materials  
1.3mm for medium materials  
1.5mm for thick materials

However, in case of denim specification of safety stitch, its height is 1.3mm.



**Safety Stitch**

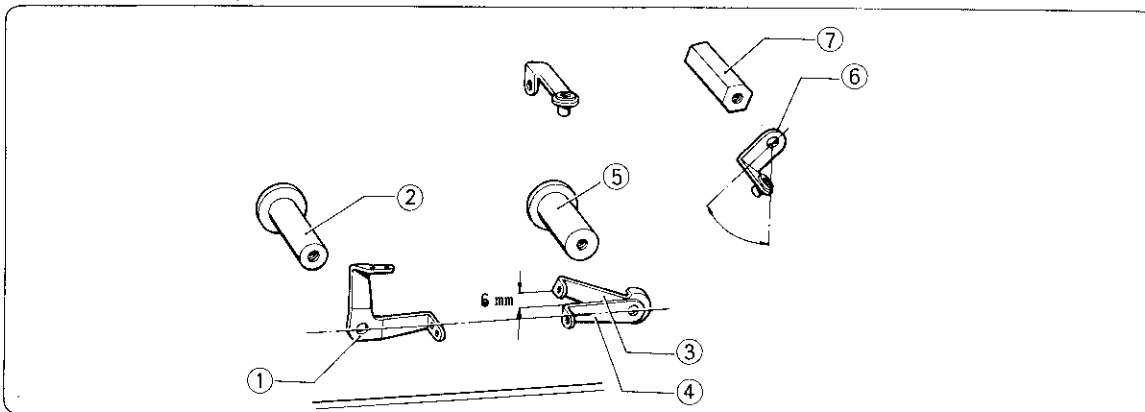
Note: When sewing safety stitches, make sure that main and differential feed dogs are level with each other. Otherwise, chaining-off cannot be sewn. Use a scale as shown below to check their levelness. In case of needle gauge 2mm and 5mm (as for needle gauge 5mm, it is available for ruffler and piping ruffler specifications only), install needle plate in light touch with feed dog in order to prevent from slipping out of chaining-off stitches.



- 7 Install presser foot ⑥ on main presser arm ⑦.  
(In case of safety stitch, install presser foot ⑧ to presser foot supporter ⑨ with pin ⑩.)

1

**7 LOOPER THREAD TAKE-UP AND THREAD GUIDE MECHANISM**

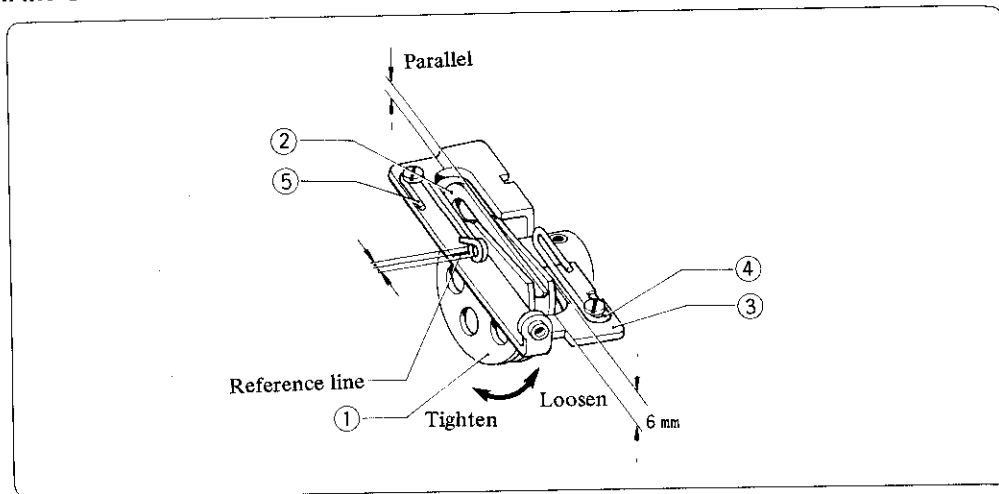


Procedures

- 1 Install looper thread take-up (L) ① to under looper lever shaft ②.      1
- 2 Install over looper thread take-up (R) ③ and under looper thread take-up (R) ④ to over looper lever shaft ⑤.      1
- 3 Install under looper thread guide ⑥ to thread guide support ⑦.      1
- 4 Adjust each thread take-up and thread guide to their standard positions as shown above after raising the needle up highest.

\* When looper thread take-up (R) is raised, less thread will be delivered. When it is lowered, more thread will be delivered. When under looper thread guide is moved to the right, less thread will be delivered. When it is moved leftward, more thread will be delivered.

## 8 DOUBLE CHAIN STITCH LOOPER THREAD TAKE-UP AND THREAD GUIDE MECHANISM



### Procedures

- 1 Fit double chain stitch thread take-up ① onto crank shaft.
- 2 Install thread handler ② to thread take-up bracket ③ parallel to it.
- 3 Install thread take-up bracket ③ to machine body.  
(Insert thread handler ② onto double chain stitch thread take-up ① in accordance with the slot of double chain stitch thread take-up.)

\* Thread consumption and timing of thread release are adjusted by moving thread handler ②.

(When the top of thread handler is raised, the looper thread tension decreases, and when it is lowered, the looper thread increases.)

- 4 Turn the pulley until needle bar is raised to the highest position.

◆ The below items ⑤ and ⑥ should be taken simultaneously.

- 5 Set double chain stitch thread take-up ① at a point where thread handler ② is in the center of the slot.
- 6 Adjust the distance between the top end of double chain stitch thread take-up ① and thread take-up bracket ③ to 6mm, and fasten it.

\* When double chain stitch thread take-up is advanced (counterclockwise), the looper thread tension increases; and when it is moved back (clockwise), the looper thread tension decreases.

- 7 Install thread guide (R) ④ and (L) ⑤ on thread take-up bracket ③, making sure that they are equi-distant from the reference line on thread take-up holder in the thread slot.

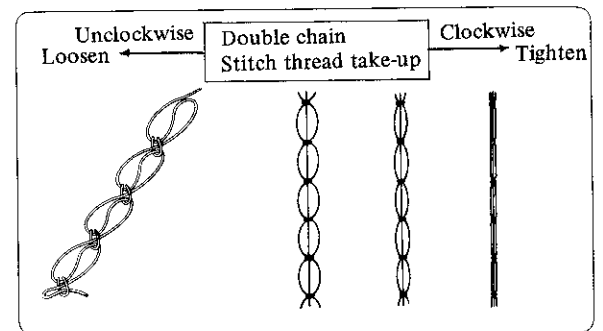
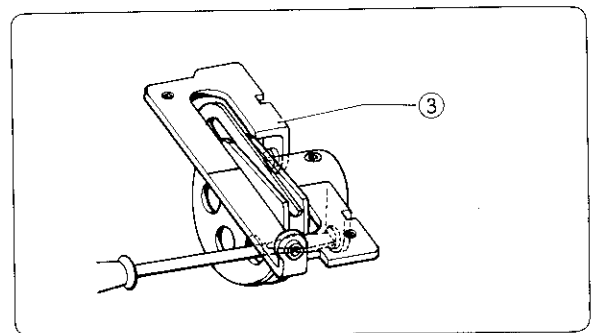
Q'ty of screw

1

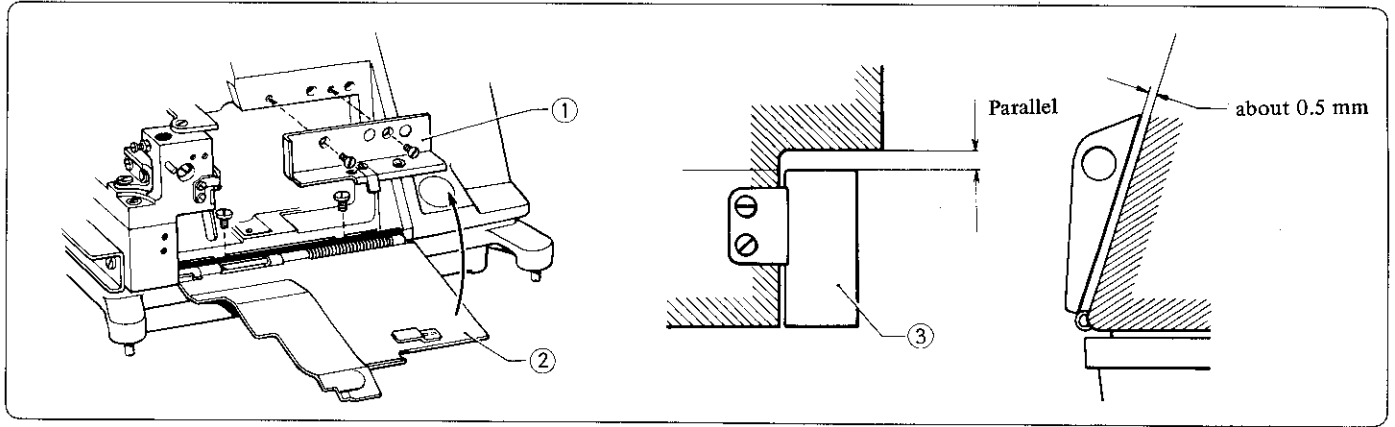
2

2

2



## 9 COVER



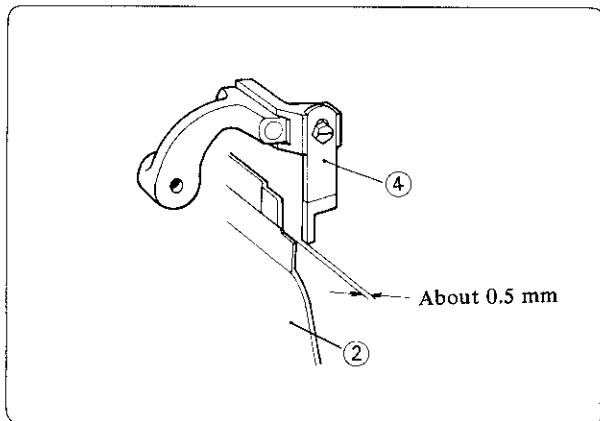
### Procedures

- |   |  |               |   |
|---|--|---------------|---|
| 1 | Temporarily fasten front cover supporter ① on machine body.            | Q'ty of screw | 2 |
| 2 | Temporarily fasten front cover ② on oil reservoir. (Close front cover) |               | 2 |
| 3 | Temporarily fasten front cover guide ③ parallel to machine body.       |               | 2 |
- \* Make an adjustment so that, when front cover ② comes off front cover guide ③, it can be put back in place as before.

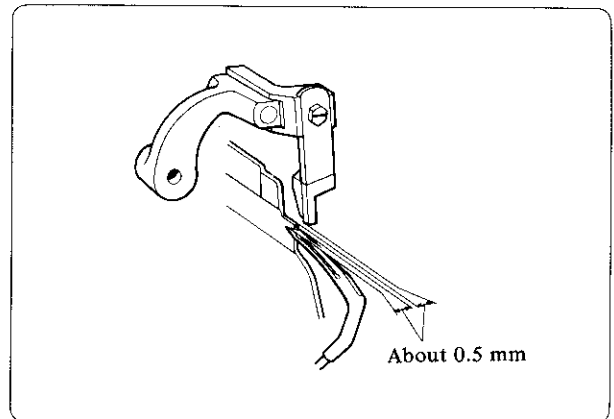
☑ The following items from ④ to ⑦ must be made while checking.

- 4 Adjust front cover ② so it is parallel to machine body and has a clearance about 0.5mm.

#### Overlock Stitch

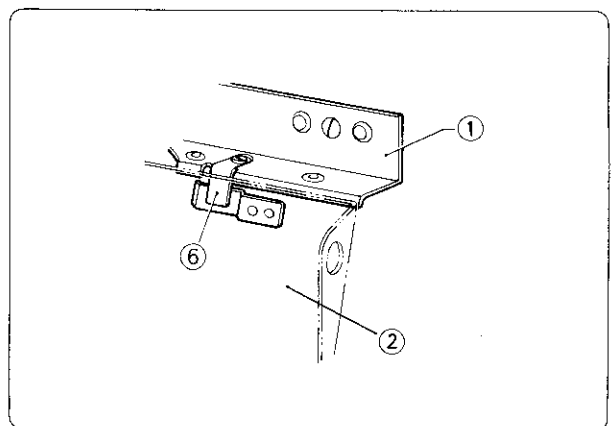
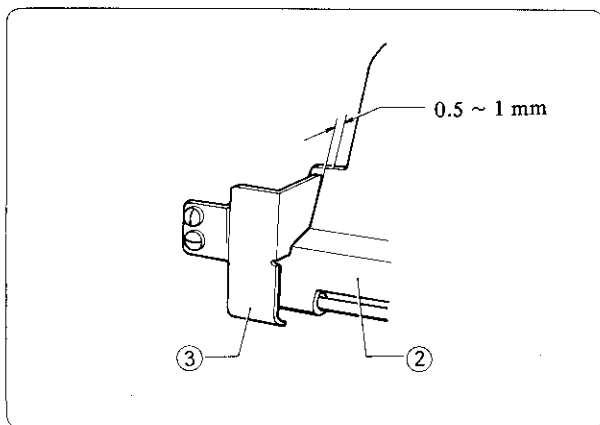


#### Safety Stitch



- 5 Make an adjustment so that, when upper knife ④ is down lowest, there is a clearance of about 0.5mm between front cover ② and upper knife ④.

Make an adjustment so that front cover will be between upper knife ④ and double chain stitch looper ⑤ and their clearance will be as shown above.



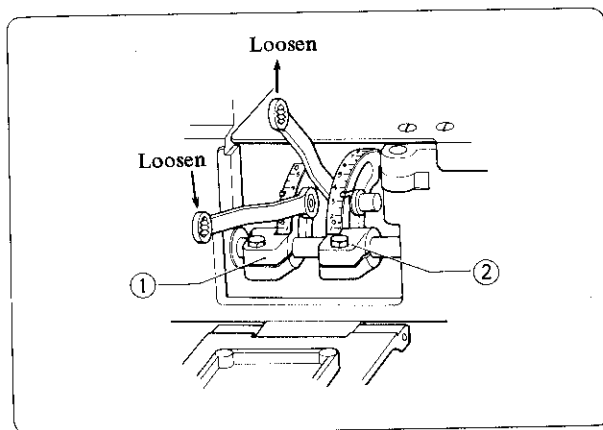
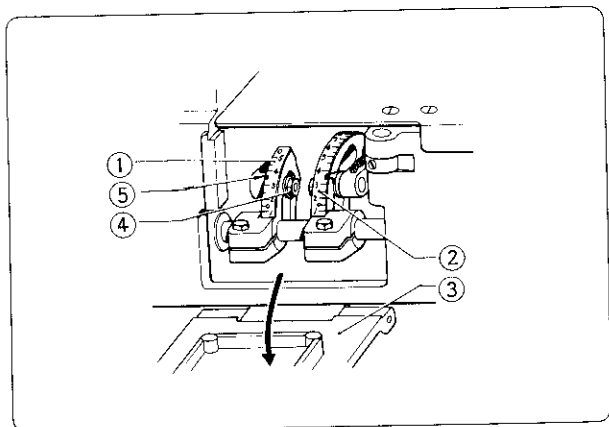
- 6 Adjust the clearance between front cover ② and front cover guide ③ to 0.5 to 1mm.

- 7 Front cover ② is held securely by front cover supporter ① and stopper spring ⑥.

# 6. STITCH LENGTH AND DIFFERENTIAL FEED ADJUSTMENTS

## 1 STITCH LENGTH ADJUSTMENT

A desired stitch length can be selected by means of the scale on main feed arm ① and the numerals on the scales of main feed arm ① and differential feed arm ② indicate stitch length in millimeters, but actual stitch length varies with the kind and thickness of the material and the differential feed.



### Procedures

- 1 Pull and open feed mechanism cover (B) ③ on the back of the machine.
- 2 Loosen nut ④.
- 3 Move feed ling indicator plate ⑤ until its red mark is in line with that number on the scale which represents your desired stitch length.
- 4 Retighten nut ④ securely.

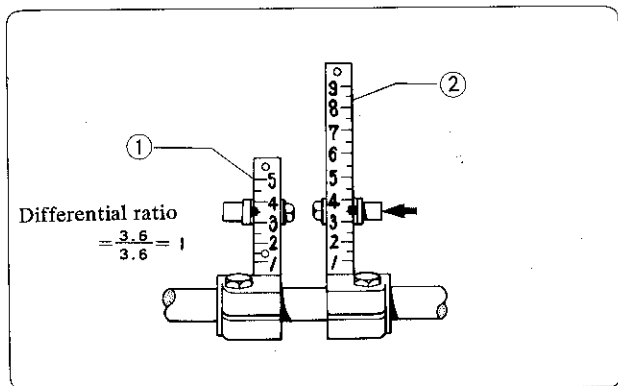
## 2 DIFFERENTIAL FEED ADJUSTMENT

Differential ratio produced by the movement of differential feed arm is to be decided depending on normal stitching, stretching and shirring.

Calculation method of differential ratio:

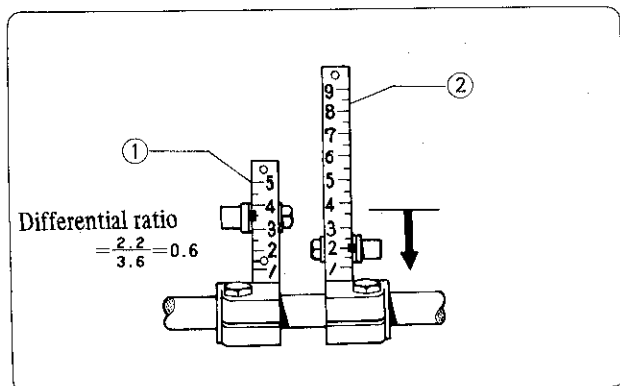
$$\text{Differential ratio} = \frac{\text{The scale on differential feed arm}}{\text{The scale on main feed arm}}$$

\* In case of the maximum stitch length in normal stitching refer below.



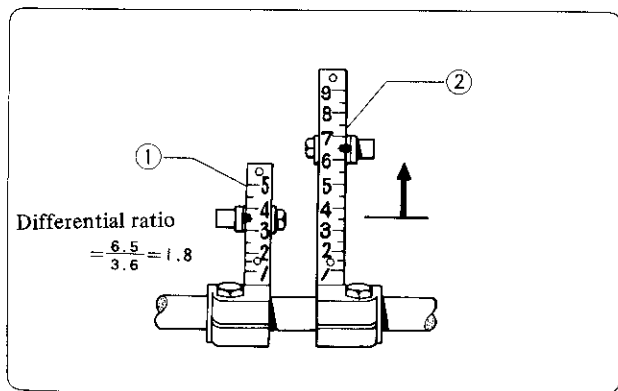
### 1 In case of normal stitching

Set the scale on differential feed arm ② in the same way as the scale on main feed arm ①.



### 2 In case of stretching

Set the scale on differential feed arm ② to a smaller number than that of the scale on main feed arm ①.



### 3 In case of shirring

Set the scale on differential feed arm ② to a larger number than that of the scale on main feed arm ①.

\* Even in case you adjust stitch length by changing the movement of main feed arm ①, make sure to remain differential ratio unchanged as before without fail.

Note: If the main feed arm ① and differential feed arm ② are set to any scale value greater than those shown at right, the feed dogs will hit the edges of the slots in needle plate.

Feed arm	Main feed arm	Differential feed arm
Specifications		
Normal stitching	3.6mm	6.5mm
Denim	3.3mm	9.0mm
Ruffler	2.5mm	9.0mm
Bulky		

## 7. SEWING INSTRUCTION

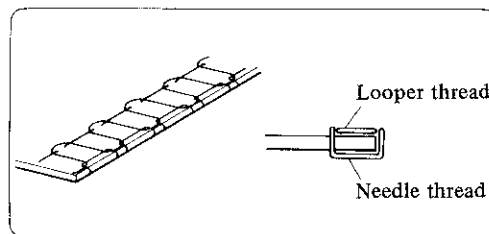
### 1 SINGLE-NEEDLE, TWO-THREAD

\* Thread tension means the tension of the thread pulled in the running direction after the tension disc.

No.	Cloth	Thread	Needle size	Differential ratio	Stitch length	Needle thread tension	Looper thread tension
1	Wool, polyester, thin trouser fabrics	Cotton #60/2	#11	1	3 ~ 3.6	18 ~ 28	8 ~ 18
2	Wool, polyester, medium-thick trouser fabrics	"	"	"	"	"	"
3	Knit fabrics, jersey	Wooly nylon	"	1 ~ 1.5	2 ~ 3	10 ~ 20	15 ~ 25

#### Note on Item 1:

Edges tend to curl when sewing thin materials. So decrease the hemming width (to about 3 to 4mm) and reduce the thread tensions to such an extent that the stitches will not be out of shape. Better stitches can be obtained by increasing the over looper tension a little above the normal level.



#### Note on Item 2:

Edges will not curl when sewing medium materials. Hemming width may be increased up to 6mm, and stitch length up to 3.6mm.

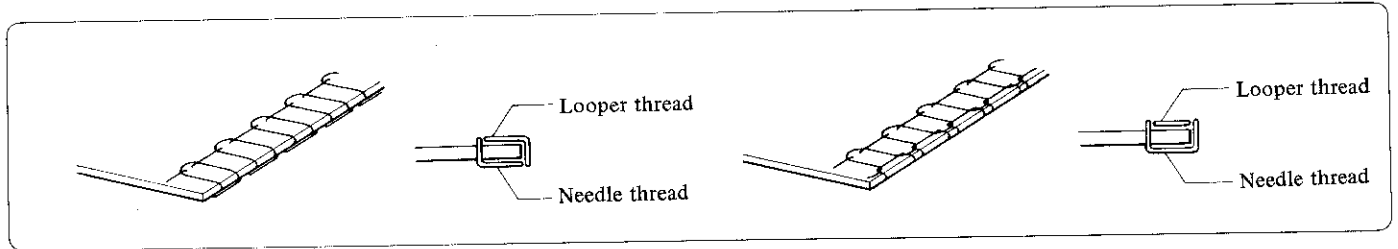
#### Note on Item 3:

It wooly nylon thread is used for both the needle and the loopers, or only for the loopers, cloth edges neatly.

The smaller the stitch length the better will be the finished stitches.

( Needle thread: Synthetic thread  
 Looper thread: Wooly nylon thread

( Needle thread: Wooly nylon thread  
 Looper thread: Wooly nylon thread



Even if wooly nylon thread is used as needle thread, there will be no skipped stitches because the thread tension is small.

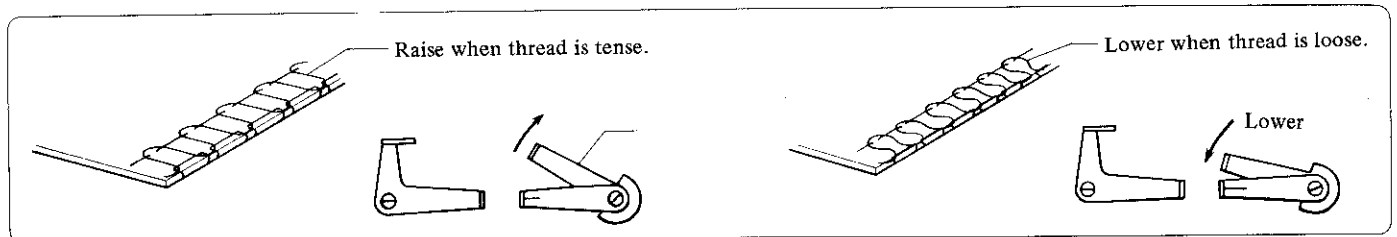
## 2 SINGLE-NEEDLE, THREE-THREAD

No.	Cloth	Thread	Needle size	Differential ratio	Stitch length	Needle thread tension	Over looper thread tension	Under looper thread tension
1	Knit under wear material	Cotton #60/2	#9	1 ~ 1.5	2 ~ 2.5	43 ~ 73	6 ~ 22	6 ~ 22
2	"	Synthetic #60	"	"	"	40 ~ 70	4 ~ 18	4 ~ 18
3	Thin knit fabrics	Synthetic #60	#11	1 ~ 2	2 ~ 2.5	40 ~ 70	4 ~ 18	4 ~ 18
4	"	Wooly nylon	"	"	"	30 ~ 50	4 ~ 15	4 ~ 15
5	Thick knit fabrics	Needle: Synthetic #60 Looper: Woolen	#14	2 ~ 3	2.2 ~ 2.8	50 ~ 80	4 ~ 15	4 ~ 15
6	Knit underwear material (Blind hemming)	Cotton #60/2	#9	1 ~ 1.5	2 ~ 2.5	15 ~ 25	8 ~ 15	22 ~ 32
7	"	Wooly nylon	"	"	"	10 ~ 20	2 ~ 10	6 ~ 18

Notes on Items 1 to 3:

Stitches will change when the over looper thread take-up (R) is raised or lowered as shown below.

Be careful not to lower the thread take-up so much because stitches at high speed will become different at low speed or vice versa.



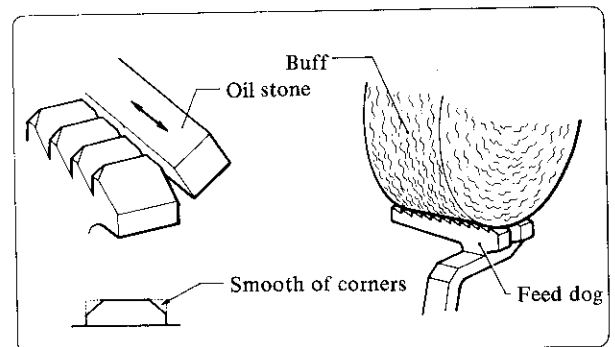
◎ If the work becomes damaged:

- 1) Decrease the presser pressure to 2 to 3kg, or by about 12 to 15 screw threads.  
A smaller pressure is effective for preventing work slipping in ordinary sewing, too.

- 2) Make the angle of feed dogs less sharp.  
When buffing the feed dogs, hold them horizontally.  
Remember not to buff them too much because excessive buffing will lower feed efficiency.

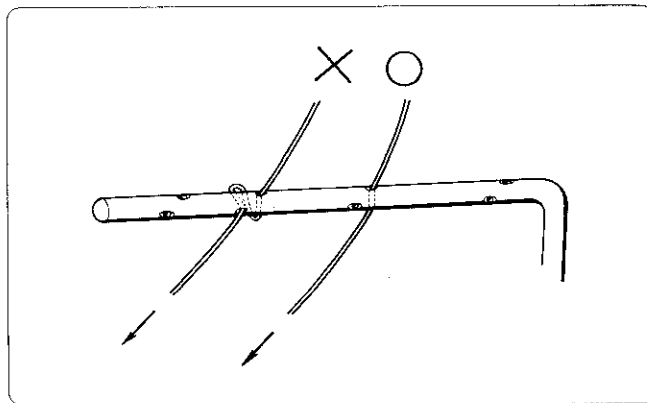
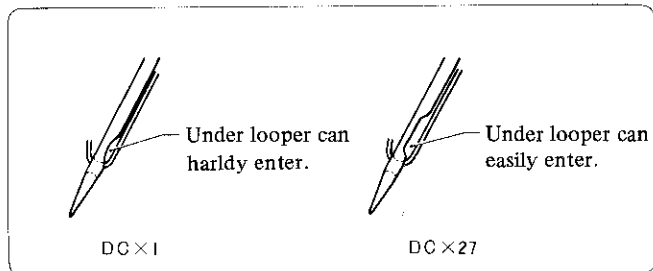
◎ If fiber breaks by needle:

- 1) Cool the needle thread.
- 2) Use a smaller needle (selecting one in the range of #7 to #9).
- 3) Use a well-shaped light ball point (Schmetz), S-point (Organ), or knit needle KN (Organ).



Note on Item 4:

When using wooly nylon thread for the needle, decrease the thread tension especially low. Stitch skipping is liable to occur, but can be effectively avoided by using a DC X27 needle.

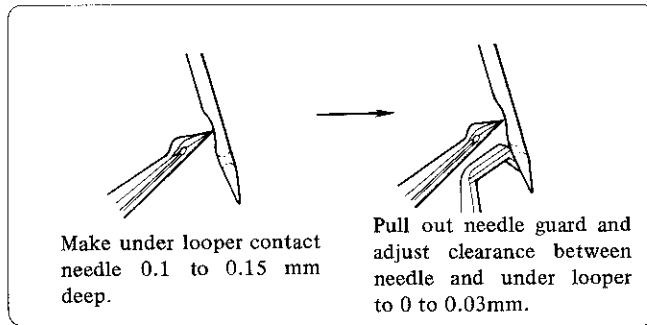
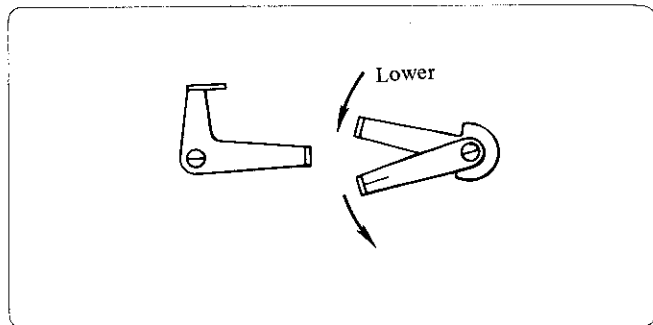


Pass the thread through the two holes in the thread guide without winding.

Note on Item 5:

Stitches tend to become loose on thick knitwork or rubber-interlaced parts. In that case, make an adjustment by lower the over looper and under looper thread take-up (R).

- ⊙ If stitches skip (Needle and under looper):
- 1) Use a DC X27 needle.
- 2) Make an adjustment by only slightly bending the needle.

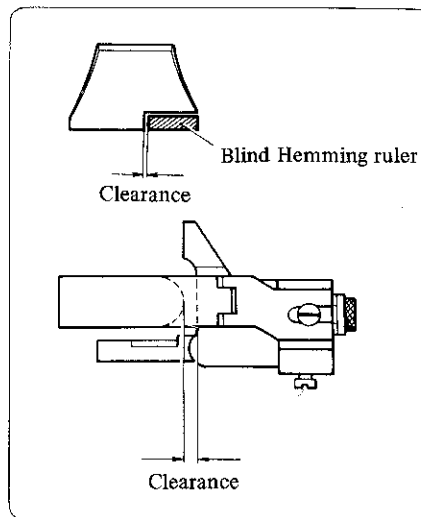


Note on Item 6: Precautions on blind hemming

- 1) Sew at constant speed.
- 2) Do not pull the work with your right hand. (If the work is pulled, stitches will be made away from the desired line.)
- 3) Push a thicker part of material under the presser foot with your left hand.

Machine adjustments:

- 1) Adjust the presser pressure to 2 to 3kg, or by about 12 to 15 screw threads.
- 2) Adjust the clearance between the presser foot and the blind hemming ruler so that the work will easily pass.
- 3) Adjust the clearance between the blind hemming ruler. An assembly's tip and the blind hemming ruler so that the work will easily pass.
- 4) Adjust hemming width by turning the blind hemming ruler adjusting screw.



Note on Item 7:

If wooly nylon is used for blind hemming, stitches will not skip because the needle thread tension is small. Pass the thread through the two holes in the thread guide without winding.



### ③ DOUBLE-NEEDLE, FOUR THREADS

No.	Cloth	Thread	Needle size	Differential ratio	Stitch length	
Double-needle four threads	1	Knit underwear material	Cotton #60/2	# 9	1 ~ 1.5	2 ~ 2.5
	2	Thin knitwork	Synthetic #60	#11	1 ~ 2	"
	3	Bulky material	Needle: Synthetic #60 Looper: Woolen	#14	2 ~ 3	2.2 ~ 2.8
Mock safety	4	Broadcloth	Cotton #80	#11	0.8 ~ 1	2 ~ 2.5
	5	Jersey	Polyester #50	#14	1.5 ~ 2	2.5 ~ 3

No.	Left needle thread tension	Right needle thread tension	Over looper thread tension	Under looper thread tension	
Double-needle four threads	1	60 ~ 80	30 ~ 50	6 ~ 18	8 ~ 20
	2	40 ~ 60	25 ~ 45	4 ~ 16	6 ~ 18
	3	70 ~ 90	35 ~ 55	3 ~ 10	5 ~ 15
Mock safety	4	50 ~ 80	45 ~ 70	8 ~ 15	8 ~ 15
	5	50 ~ 70	25 ~ 50	10 ~ 20	8 ~ 18

#### Note on Item 1:

Cotton threads in the range of #60/2 to #70/2 are weak so that the thread tension must be reduced as much as possible. A poor quality thread tends to break. In that case, do not tighten the needle thread tension but adjust the positions of the thread take-up and thread guide if the thread tension must be increased.

#### Note on Item 2:

About the same tension may be used for sewing with synthetic and cotton threads.

#### Note on Item 3:

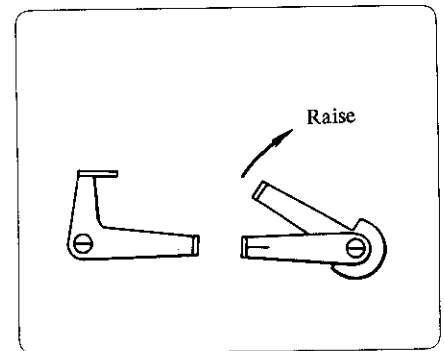
Make the same adjustment as mentioned in Item 5 for three threads.

#### Note on Item 4:

If the over looper thread tension is too small, double-needle four-thread stitches may sometimes be made. In such a case, raise the over looper thread take-up (R) to decrease thread delivery.

#### Note on Item 5:

When sewing jersey with chemical thread, it may break due to heat.



### ④ DOUBLE-NEEDLE, FIVE THREADS (Safety Stitches Only)

No.	Cloth	Thread	Needle size	Differential ratio	Stitch length
1	Broad cloth	Cotton #80	#11	0.8 ~ 1	2 ~ 2.5
2	Broad cloth	Polyester #80	"	"	"
3	Jersey	Needle: Polyester #50 Looper: Wooly nylon	#14	1.5 ~ 2	2.2 ~ 2.8
4	Gaberdine	Cotton #50	#16	1	2.5 ~ 3
5	Denim	Cotton #50	#21	"	"

No.	Double chain stitch needle thread tension	Double chain stitch looper thread tension	Over needle thread tension	Over looper thread tension	Under looper thread tension
1	20 ~ 50	5 ~ 15	40 ~ 90	10 ~ 25	8 ~ 20
2	15 ~ 45	5 ~ 10	30 ~ 80	8 ~ 20	5 ~ 15
3	25 ~ 60	8 ~ 20	25 ~ 50	5 ~ 15	8 ~ 20
4	35 ~ 60	6 ~ 15	50 ~ 100	7 ~ 20	10 ~ 30
5	80 ~ 110	10 ~ 20	70 ~ 150	10 ~ 25	15 ~ 30

Note on Items 1 and 2:

Broadcloth tends to pucker so that the thread tension must be decreased as much as possible.

Use a single type presser foot for efficient feeding.

Note on Item 3:

If wooly nylon thread is used for double chain stitches, it can resist stretching up to 130 to 150%.

Jersey tends to deviate much so decrease the presser pressure (to 2 to 3kg) and use a double type presser foot.

Remarks: If a single type presser foot is used except when sewing thin materials, initial stitches may skip, the thread may break, and chaining-off thread break may occur.

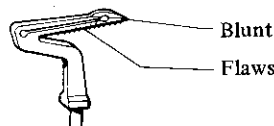
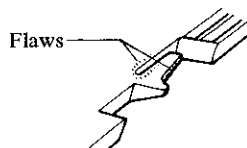
Note on Item 5:

Denim also tends to deviate much so that the presser pressure must be decreased to 2 to 3kg (by about 12 to 15 screw threads). Use gauge parts for denim specification.

## 8. TROUBLE SHOOTING

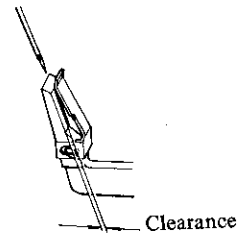
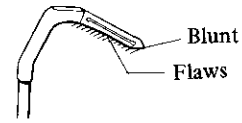
### 1 THREAD BREAKAGE (Overlock Stitch Needle)

CHECK POINT	ADJUSTMENT	PAGE
1 Wrong threading.	→ Refer to "Threading diagram."	
↓		
2 Excessive pressure of tension disc.	→ Adjust to proper pressure.	28
↓		
3 Poor thread quality.	→ Use thread of good quality.	
↓		
4 Needle groove or needle eye poorly finished	→ Change needle for a good one.	
↓		
5 Wrong position of looper thread take-up.	→ Adjust to proper position.	24
↓		
6 Needle thread passage has flaws.	→ Change thread guide for a new one.	
↓		
7 Needle plate has flaws.	→ Change it for a new one or smooth surface with oil stone or buff.	
↓		
8 Under looper has flaws.	→ Change it for new one or smooth surface with oil stone or buff.	18
↓		
9 Wrong timing of needle and looper.	→ Adjust to proper timing, needle clearance and position of needle guard.	19



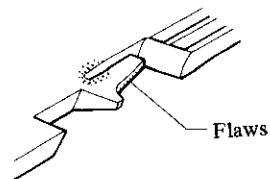
• **THREAD BREAKAGE (Double Chain Stitch Needle)**

CHECK POINT	ADJUSTMENT	PAGE
1 Wrong threading.	→ Refer to threading diagram.	31
↓ 2 Excessive pressure of tension disc.	→ Adjust to proper pressure.	
↓ 3 Poor thread quality.	→ Use thread of good quality.	
↓ 4 Needle groove or needle eye poorly finished.	→ Change needle for a good one.	16
↓ 5 Wrong position of chain stitch needle thread guide.	→ Adjust to proper position.	
↓ 6 Wrong position of looper thread take-up.	→ Adjust to proper position.	25
↓ 7 Needle thread passage has flaw.	→ Change thread guide for a new one.	20
↓ 8 Double chain stitch looper has flaw.	→ Change it for a new one or smooth surface with oil stone or buff.	
↓ 9 Wrong adjustment of needle guard.	→ Adjust to proper clearance between needle and needle guard.	21
↓ 10 Wrong timing of needle and looper.	→ Adjust to proper timing.	21


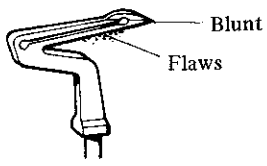


② **THREAD BREAK (Looper Thread)**

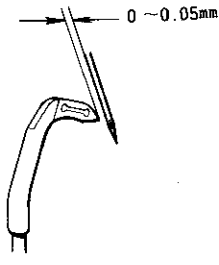
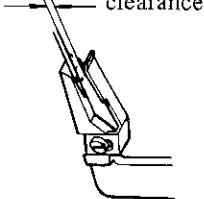
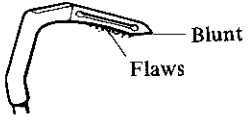
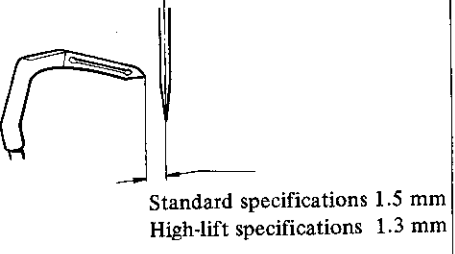
CHECK POINT	ADJUSTMENT	PAGE
1 Wrong threading.	→ Refer to threading diagram.	28
↓ 2 Excessive pressure of tension disc.	→ Adjust to proper pressure.	
↓ 3 Poor thread quality.	→ Use thread of good quality.	
↓ 4 Wrong position of looper thread take-up.	→ Adjust to proper position.	24
↓ 5 Looper thread passage has flaw.	→ Change thread guide for a new one.	
↓ 6 Needle plate has flaw.	→ Change it for a new one and smooth surface with oil stone or buff.	



③ SKIP STITCHING (Overlock Stitch)

CHECK POINT	ADJUSTMENT	PAGE
1 Wrong threading.	—————> Refer to threading diagram.	
↓ 2 Excessive pressure of tension disc.	—————> Adjust to proper pressure.	28
↓ * In case skipping between over looper and needle.		
1 Wrong position of looper thread take-up.	—————> Adjust to proper position.	24
↓ 2 Little movement into the left of over looper.	—————> Adjust the position of over looper for proper movement.	19
↓ 3 Large clearance between needle and over looper.	—————> Adjust over looper and under looper for proper clearance between needle and over looper.	18 · 19
↓ 4 Incorrect height of needle bar.	—————> Adjust to proper height.	17
↓ * In case of skipping between over looper and under looper.		
1 Large clearance between under looper and over looper.	—————> Adjust to proper clearance.	20
↓ 2 Top of over looper blunt or bent.	—————> Change it for a new one or smooth with oil stone or buff.	19
	 <p>Blunt</p>	
↓ * In case of skipping between under looper and needle.		
1 Large clearance between under looper and needle.	—————> Adjust to proper clearance.	18
↓ 2 Top of under looper blunt or bent.	—————> Change it for a new one or smooth with oil stone or buff.	18
	 <p>Blunt Flaws</p>	
↓ 3 Incorrect height of needle bar.	—————> Adjust to proper height.	17
↓ 4 Wrong timing of under looper.	—————> Adjust to proper timing.	18

• SKIP STITCHING (Double Chain Stitch)

CHECK POINT	ADJUSTMENT	PAGE
1 Wrong threading.	→ Refer to threading diagram.	
↓ 2 Excessive pressure of tension disc.	→ Adjust to proper pressure.	31
↓ 3 Wrong position of looper thread take-up.	→ Adjust to proper position.	25
↓ * In case of skipping on rightward movement of looper.		
1 Large clearance between looper and needle.	→ Adjust to proper position.	21
↓		
2 Wrong position of needle guard.	→ Adjust to proper position.	21
↓		
3 Top of looper blunt or bent.	→ Change it for a new one or smooth with oil stone or buff.	21
↓		
4 Wrong timing of double chain stitch looper.	→ Adjust to proper timing.	21
↓		

#### ④ NEEDLE BREAKAGE

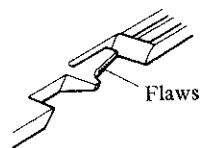
CHECK POINT	ADJUSTMENT	PAGE
1 Poor thread quality.	————→ Use thread of good quality.	
↓		
2 Needle size too small.	————→ Change it for more large one.	
↓		
3 Needle is not center of needle plate slot.	————→ Adjust to proper position.	17 · 18
↓		
4 Needle and looper out of proper relation.	————→ Adjust the position of needle guard and looper properly.	19
↓		
5 Wrong adjustment of needle guard.	————→ Adjust to proper position for needle guard.	19 · 21

#### ⑤ IMPROPER THREAD TENSION

CHECK POINT	ADJUSTMENT	PAGE
1 Poor thread quality.	————→ Use thread of good quality.	
↓		
2 Needle size too small.	————→ Change it for more large one.	
↓		
3 Too weak pressure of tension disc.	————→ Adjust to proper pressure.	28
↓		
4 Wrong position of thread take-up.	————→ Adjust to proper position.	24 · 25

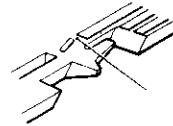
#### ⑥ WRONG CHAINING-OFF (Overlock Stitch)

CHECK POINT	ADJUSTMENT	PAGE
1 Wrong threading.	————→ Refer to thread diagram.	
↓		
2 Excessive pressure of tension disc.	————→ Adjust to proper pressure	28
↓		
3 Too weak pressure of tension disc.	————→ Adjust to proper pressure.	28
↓		
4 Wrong position of looper thread take-up.	————→ Adjust to proper position.	24
↓		
5 Wrong position of needle thread take-up.	————→ Adjust to proper position.	16
↓		
6 Wrong installment of chain feed dog.	————→ Adjust to proper position.	24
↓		
7 Needle plate has flaws.	————→ Change it for a new one, or smooth with stone oil and buff.	
↓		
8 Wrong timing between needle and looper.	————→ Adjust to proper timing.	18 · 19



• **WRONG CHAINING-OFF (Double Chain Stitch)**

CHECK POINT	ADJUSTMENT	PAGE
1 Wrong threading.	————→ Refer to threading diagram.	31
↓		
2 Excessive pressure of tension disc.	————→ Adjust to proper pressure.	
↓		
3 Too weak pressure of tension disc.	————→ Adjust to proper pressure.	
↓		
4 Wrong position of needle thread guide.	————→ Adjust to proper position.	
↓		
5 Wrong position of looper thread take-up.	————→ Adjust to proper position.	
↓		24
6 Wrong installment of main feed dog and differential feed dog.	————→ Adjust installment with the same level.	
↓		24
7 Wrong position of main feed dog.	————→ Adjust needle plate in light touch with main feed dog.	
↓		
8 Existence of clearance on the pressing part for chaining off of presser foot.	————→ Change it for a new one.	
↓		
9 Wrong timing between needle and looper.	————→ Adjust to proper timing.	21



⑦ **EXCESSIVE WRINKLES**

CHECK POINT	ADJUSTMENT	PAGE
1 Excessive pressure of tension disc.	————→ Adjust to proper pressure.	28
↓		
2 Needle size too big.	————→ Change it for a proper one suitable to needle and materials.	27
↓		
3 Wrong differential ratio.	————→ Adjust to proper ratio.	
↓		
4 Bight too wide.	————→ Adjust to proper bight.	22
↓		
5 Knives are not sharp.	————→ Change it for a new one or reglind. (In case of engagement of upper and lower knife is wrong, adjust engagement of these.)	

⑧ **SLIPAGE OF CLOTH**

CHECK POINT	ADJUSTMENT	PAGE
1 Excessive pressure of pressure foot.	————→ Adjust to proper pressure.	22
↓		
2 Knives are not sharp.	————→ Change it for a new one or reglind. (In case of engagement of upper and lower knife is wrong, adjust engagement of these.)	
↓		
3 Feed dog too high.	————→ Adjust to lower level than standard level.	24

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