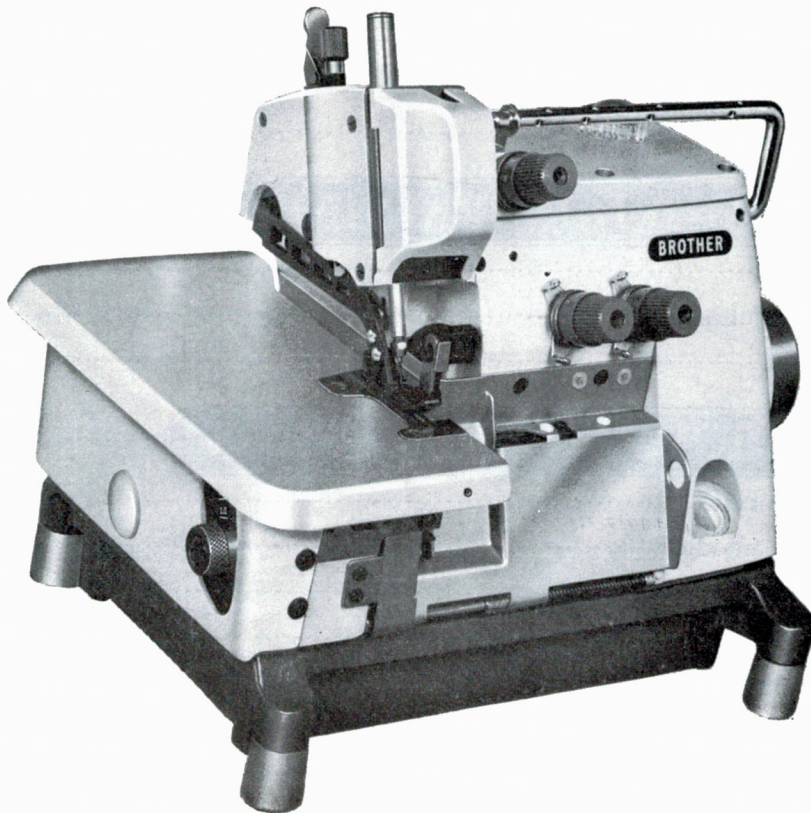


INSTRUCTION MANUAL
FOR
BROTHER EF4-B511, B531



High Speed **Single** Needle Overlock Machine
Twin

BROTHER INDUSTRIES, LTD.
NAGOYA, JAPAN

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FEATURES

1. A fully automatic lubricating system and a needle cooler assure reliable high-speed sewing.
2. Pushbutton controls permit easy adjustment of stitch length with a simple setting of the face plate scale.
3. Differential feed ratio can be easily adjusted with a lever without using a tool.
4. Blade engaging angle can be easily adjusted for sharp cutting performance.
5. Superb design and colour brighten working environment and ensure to lessen the operator's fatigue.



KINDS OF SEWING MACHINES

BROTHER INDUSTRIES LTD.

EF4-B511-

MADE IN JAPAN

Sub class No.	Stitch type	No. of Needles	No. of threads	Needle gauge	Sewing width (Bight)	Max. stitch length	Differential ratio	Presser foot lift	Feed dog		Needle size (DC×1)	Sewing speed (s.p.m.)	Use	Devices	
									Pitch	(Main) (Differential) Type					
001-3 -4 -5 -6		1	3	—	3 4 5 6	3.6	0.6~1.8	6	1.6		# 11	6500	Thin & medium-thick materials Knit under wear Knit shirts Sportswear	Sewing sleeves on Forming sleeves Joining body parts Joining inner leg edges	—
002-5 -6 -7		1	3	—	5 6 7	2.5	1.3~4	7	2		# 14	6000	Bulky knitwear Sweaters Cardigans Bulky sweaters	Sewing sleeves on Forming sleeves Joining body parts	—
003-3 -4		1	3	—	3 4	3.6	0.6~1.8	6	1.6		# 9	6500	For Blind-hemming Knit underwear Knit shirts T-shirts	Blind-hemming	Edge hemming ruler
004-3 -4		1	3	—	3 4	3.6	0.6~1.8	6	1.6		# 9	6500	For Blind-hemming Knit underwear Knit shirts T-shirts	Blind-hemming	Edge hemming ruler
005-4 -5		1	2	—	4 5	3.6	0.6~1.8	4	1.6		# 14	6000	For serging Trousers Skirts	Serging	Serging ruler
006-4		1	3	—	4	3.6	0.6~1.8	4	1.6		# 14	6000	For serging Trousers Skirts	Serging	Serging ruler
007-2 -4		1	3	—	2 4	3.6	0.6~1.8	6	1.6		# 11	6500	Curling Handkerchiefs Scarfs	—	—
008-5		1	3	—	5	3.3	1~3	5	1.6		# 11	6000	Ruffling Ladies & children's wear Neglige	Sewing sleeves on Sewing cuffs on Sewing frills on	Ruffler
009-5		1	3	—	5	3.3	1~3	5	1.6		# 11	6000	Ruffling (Piping) Ladies & children's wear Neglige	Sewing sleeves on Sewing cuffs on Sewing frills on	Wrapper Ruffler Tape winder
010-5		1	3	—	5	3.6	0.6~1.8	6	1.6		# 11	6500	Taping thin & medium-thick materials Knit underwear Knit shirts T-shirts	Joining shoulder parts	Tape guide

Sub class No.	Stitch type	No. of Needles	No. of threads	Needle gauge	Sewing width (Bight)	Max. stitch length	Differential ratio	Presser foot lift	Feed dog		Needle size (DC×1)	Sewing speed (s.p.m)	Use	Devices	
									Pitch	(Main) Type					
O11-6		1	3	—	6	2.5	1.3~4	7	2		# 14	6000	Bulky knitwear taping		Tape guide
													Sweaters Cardigans, bulky sweaters	Joining shoulder parts	
O12-3 -4 -5 -6		1	3	—	3	3.6	0.6~1.8	6	1.6		# 11	6500	Backtacking		Back tack Thread release
					4								Knit underwear Knit shirts Sportswear	Sewing sleeves on Forming sleeves Joining body parts Joining inner leg edge	
					5										
					6										

BROTHER INDUSTRIES LTD.

EF4-B531-

MADE IN JAPAN

Sub class No.	Stitch type	No. of Needles	No. of threads	Needle gauge	Sewing width (Bight)	Max. stitch length	Differential ratio	Presser foot lift	Feed dog		Needle size (DC×1)	Sewing speed (s.p.m)	Use	Devices	
									Pitch	(Main) Type					
O21-4		2	4	1.8	4	3.6	0.6~1.8	6	1.6		(DC×3) # 11	6500	Thin materials		—
													Knit underwear Tricot underwear	Sewing sleeves on Forming sleeves Joining body parts Joining inner leg edges	
O22-5 -6		2	4	2.2	5	3.6	0.6~1.8	6	1.6		(DC×1) # 11	6500	Thin & medium-thick materials		—
					6								Knit underwear Knit shirts T-shirts	Sewing sleeves on Forming sleeves Joining body parts Joining inner leg edges	
O23-5 -6		2	4	2.2	5	3.6	0.6~1.8	6	1.6		(DC×1) # 11	6500	Thin & medium-thick materials		—
					6								Dress shirts Blouses	Sewing sleeves on Forming sleeves Joining body sections	
O24-5		2	4	3	5	3.6	0.6~1.8	6	1.6		(DC×1) # 11	6500	Thin & medium-thick materials		—
													Knit underwear Knit shirts T-shirts	Sewing sleeves on Forming sleeves Joining body parts Joining inner leg edges	
O25-6		2	4	3	6	3.6	0.6~1.8	6	1.6		(DC×1) # 11	6500	Thin & medium-thick materials		—
													Dress shirts Blouse	Sewing sleeves on Forming sleeves Joining body sections	
O26-4 -5 -6		2	4	1.8	4	2.5	1.3~4	7	1.6		(DC×3) # 11	6000	Bulky knitwear		—
					5								Sweater Cardigans Bulky sweater	Sewing sleeves on Forming sleeves Joining body sections	
					6										

Sub class No.	Stitch type	No. of Needles	No. of threads	Needle gauge	Sewing width (Bight)	Max. stitch length	Differential ratio	Presser foot lift	Feed dog		Needle size (DC×1)	Sewing speed (s.p.m)	Use	Devices	
									Pitch	(Main) Type					
027-5 -6 -7		2	4	2.2	5 6 7	2.5	1.3-4	7	2		(DC×1) # 14	6000	Bulky knit wear Sweaters Cardigans Bulky sweaters	Sewing sleeves on Forming sleeves Joining body sections	—
028-5 -6 -7		2	4	2.2	5 6 7	2.5	1.3-4	7	2		(DC×1) # 14	6000	Bulky knit wear Sweaters Cardigans Bulky sweaters	Sewing sleeves on Forming sleeves Joining body sections	—
031-7		2	4	3	7	3.6	0.6-1.8	7	2.5		(DC×1) # 21	6000	Heavy materials Denim wear Curtains Cushions	Run stitching Serging	—
032-7		2	4	3	7	3.6	0.6-1.8	7	2.5		(DC×1) # 21	6000	Heavy materials Denim wear Curtains Cushions	Run stitching Serging	—
033-5		2	4	2.2	5	3.3	1-3	5	1.6		(DC×1) # 11	6000	Ruffling Ladies & children's wear Neglige	Sewing sleeves on Sewing cuffs on Sewing frills on	Ruffler
034-5		2	4	2.2	5	3.3	1-3	5	1.6		(DC×1) # 11	6000	Ruffling Ladies & children's wear Neglige	Sewing sleeves on Sewing cuffs on Sewing frills on	Ruffler
037-5		2	4	2.2	5	3.3	1-3	5	1.6		(DC×1) # 11	6000	Ruffling (with piping) Ladies & children's wear Blouses	Sewing sleeves on Sewing cuffs on Sewing frills on	Wrapper Ruffler Tape winder
041-5		2	4	2.2	5	3.6	0.6-1.8	6	1.6		(DC×1) # 11	6500	Taping thin & medium-thick materials Knit underwear Knit shirts T-shirts	Joining shoulder parts	Tape guide
045-5 -6 -7		2	4	2.2	5 6 7	2.5	1.3-4	7	2		(DC×1) # 14	6000	Bulky knit taping Sweaters Cardigans Bulky sweaters	Joining shoulder parts	Tape guide
049-5 -6		2	4	2.2	5 6	3.6	0.6-1.8	6	1.6		(DC×1) # 11	6500	Backtacking Knit underwear Knit shirts Sportswear	Sewing sleeves on Forming sleeves Joining body parts Joining inner leg edges	Back tack Thread release

A. INSTALLING

1. Installing the machine head

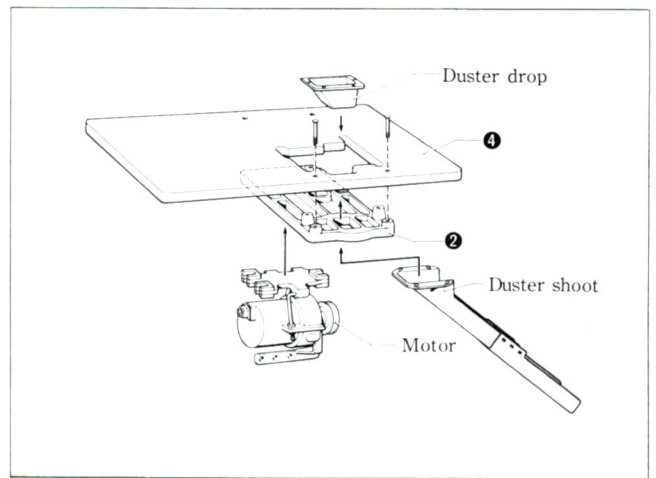
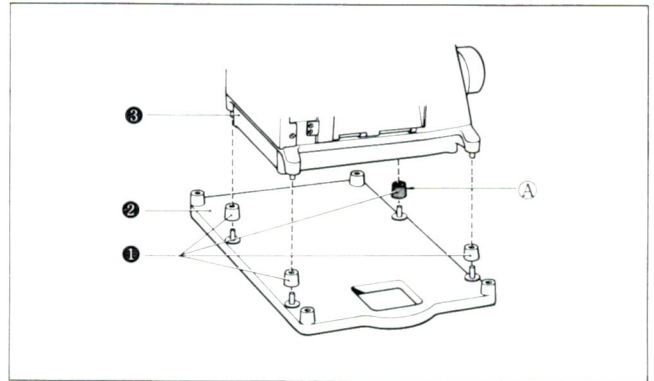
The machine head is a semi submerged type.
A set of parts for its installation are included in the accessories.

Install the machine head in the following order.

- (1) Fit four rubber pads **1** on head rest **2**.
(Install the black rubber pad **A** into the right end pin as shown at figure.)
- (2) Place machine head **3** on rubber pads **1**.

※If you have purchase this machine as head only, install it as mentioned below.

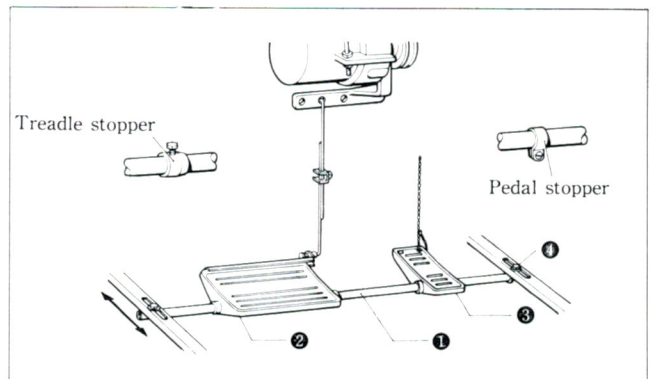
- (a) Make table top **4** as shown in the attached table sheet.
- (b) Install head rest **2** as shown at right.
- (c) Follow the above-mentioned installing order (1) and (2) for installing the machine head.



2. Installing the treadle

Loosen hex bolt **4** which fastens treadle support shaft **1**, and install treadle **2** and presser bar lifter pedal **3** as shown at right.

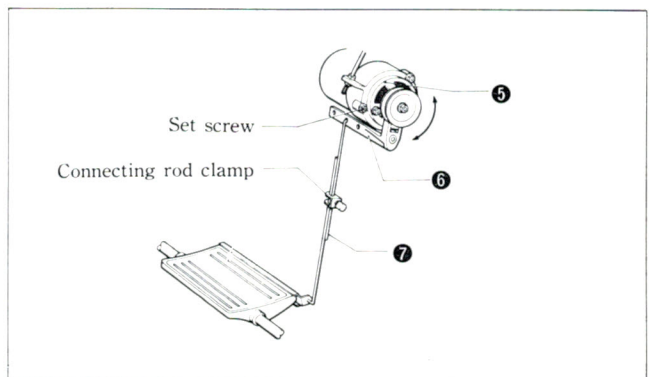
Adjust the treadle and presser bar lifter pedal forward or back with the treadle support shaft.



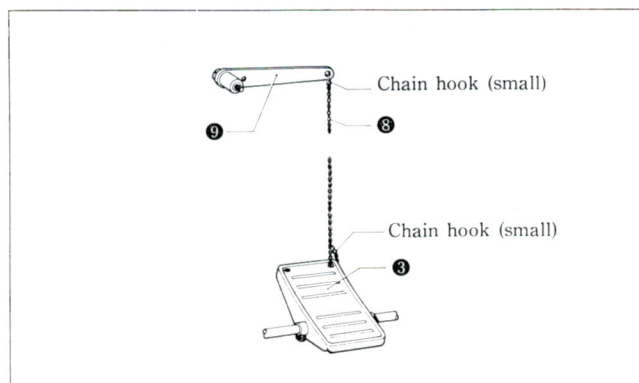
Install connecting rod **7** to link the motor with the treadle as shown at right.

Turn motor bracket **5** until clutch lever **6** is in line with the connecting rod.

※Make this adjustment after placing the belt at the correct tension.



Install chain ⑧ to link presser bar lifter lever ⑨ to the presser bar lifter pedal as shown at right.



3. Sewing speed

For the sewing speed of your machine, refer to the table of "Kinds of Sewing Machine" on Pages 2~4. When using your new machine for the first time, operate it at about 5,500 stitches per minute for the first 100 hours (or about 2 or 3 months). This will ensure your sewing machine a long life.

4. Motor pulley and belt

The motor to be used with this machine must be a 2-pole,

Single-phase : MD-344

Three-phase : MD-354

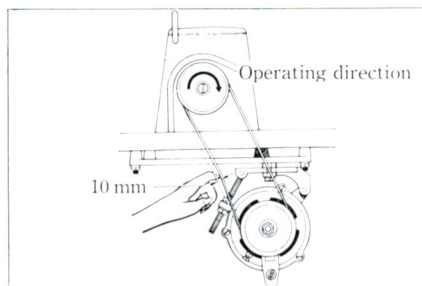
Use an M-type V-belt.

Select a motor pulley and a belt by referring to the table at right.

Pulley O.D(mm)	90	95	100	105	110	115	120	125	130	135	140
Belt size (inches)				(36)							
					(37)						
Sewing speed (spm)	50Hz	—	—	—	—	5000	5500	6000	6500	—	—
	60Hz	5000	5500	6000	6500	—	—	—	—	—	—

5. Installing the belt and belt cover

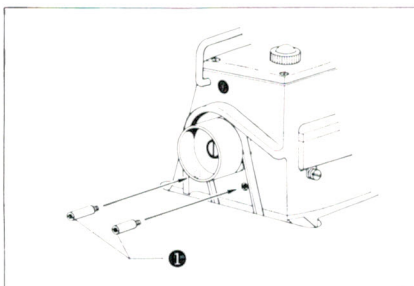
Installing the belt



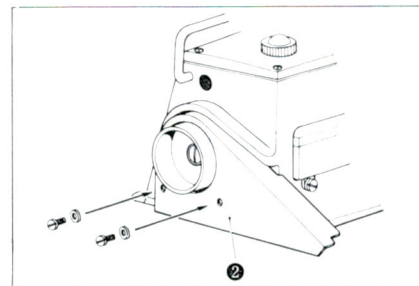
- (1) Adjust the belt will give in about 10 mm when depressed with your finger.
- (2) The correct operating direction of your sewing machine is clockwise as viewed from the pulley side.

Installing the belt cover

(Extra cost of the belt cover will be required.)



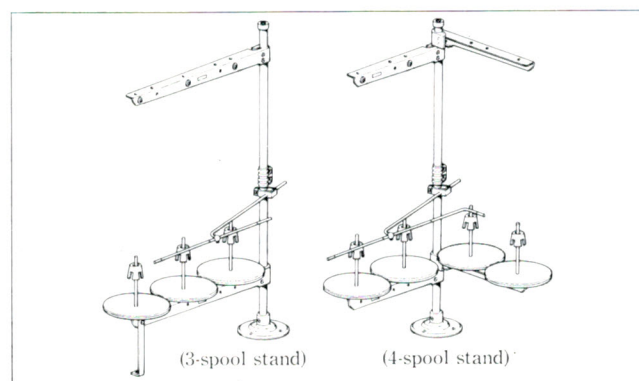
- (1) Install the stud ⑩ on the machine head.



- (2) Install the belt cover ⑪ on the stud ⑩.

6. Installing the spool stand

Install the spool stand in the right end corner of the table with screws, making sure that it will not interfere with machine operation.



B. OILING AND OIL DRAINING

1. Oil to be used

Use the BROTHER oil (turbine oil #90) supplied as accessory.

2. Oiling and Oil change

All oil has been drained from the machine prior to shipment. Before operating your machine, remove oil cap ❶ by turning it counterclockwise, and pour the oil into the machine, using the accessory funnel.

Stop supplying the oil when the oil level has reached the upper reference line of the oil gauge as shown at right.

- ※ Before using your machine, be sure to check the oil level to see that it is some where between the two reference lines.
- Add the oil if the oil level is below the lower reference line of the oil gauge.

When operating the machine for the first time after unpacking it, or after a long period of non-use, be sure to pour a few drops of oil on needle bar ❷ and over looper holder ❸.

- ※ If the machine is used every day, it need not be oiled daily.

Be sure to change the oil for the sake of your machine's long life after 100 hours (about 2 or 3 months) of running in. After that period, change the oil once about every 3 months.

- ※ It is recommended for ensuring your machine's long that oil reservoir ❺ be removed, and the inside of the oil reservoir, pump and wire gauze be cleaned about twice every year.

When draining the oil, remove hinge screw ❹ shown at right.

3. Needle cooler

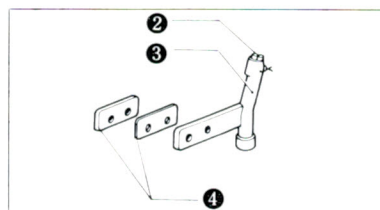
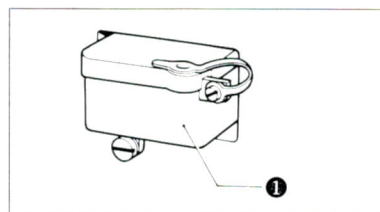
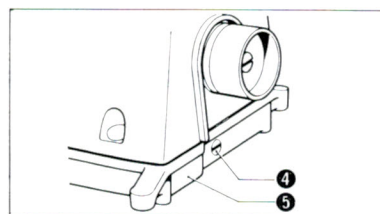
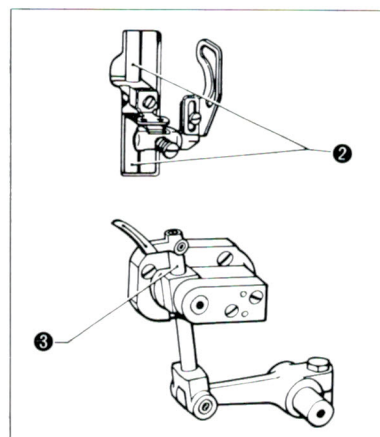
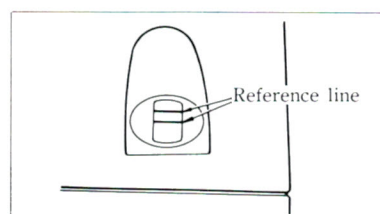
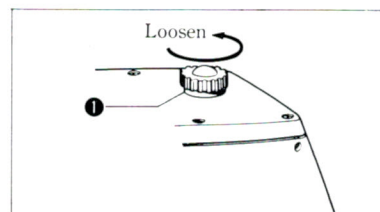
Use the needle cooler when sewing synthetic fabrics or chemical-coated fabrics, or when using synthetic threads.

(1) Oil to be used..... Silicon oil

(2) Directions for use

Fill tank ❶ (tank capacity : 30 cc) with the accessory silicon oil.

- ※ When using the machine for the first time after unpacking it, or after a long period of non-use, pour a few drops of silicon oil on felt ❷ to make it wet. Then begin sewing.
- ※ The twin-needles model EF4-B531 has spacers ❹ (for 2mm or 3mm stitch width) which are installed together with felt support ❸.



C. COLLECT WAY OF OPERATION

1. Needle and thread

Select a needle and thread by referring to the tables below.

Single-needle, two threads

Fabrics	Needle		Needle thread		Looper thread	
	Type	Size	Type	Count	Type	Count
Wool, Dacron, thin materials, trouser fabric	DC×1	#14	Cotton	#60/2	Cotton	#60/2
Wool, Dacron, medium-thick materials, trouser fabric	"	"	"	"	"	"
Knit materials jersey	"	"	Woolly Nylon	110/2 denier	Woolly Nylon	110/2 denier

Single-needle, three threads

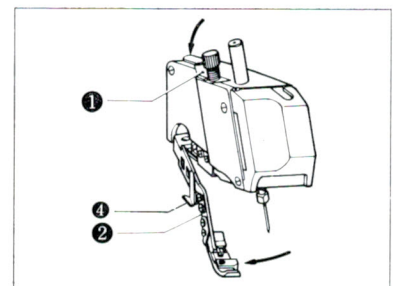
Fabrics	Needle		Needle thread		Looper thread	
	Type	Size	Type	Count	Type	Count
Knit materials	DC×1	#9	Cotton	#60/2	Cotton	#60/2
	"	"	Synthetic thread	#60	Synthetic thread	#60
Thin knit materials	"	#11	"	#60	"	#60
	"	"	Woolly Nylon	110/2 denier	Woolly Nylon	110/2 denier
Thick knit materials	"	#14	Synthetic thread	#50	Yarn	Very thin
Knit materials (Blind-hemming)	"	#9	Cotton	#60/2	Cotton	#60/2
	"	"	Woolly Nylon	110/2 denier	Woolly	110/2 denier

Twin-needles, four threads

Type of stitch	Fabrics	Needle		Needle thread		Looper thread	
		Type	Size	Type	Count	Type	Count
Double-needle Four threads	Knit materials	DC×1 (DC×3)	#9	Cotton	#60/2	Cotton	#60/2
	Thin knit materials	"	#11	Synthetic thread	#60	Synthetic thread	#60
	Bulky knit	"	#14	"	#50	Yarn	Very thin
Mock safety	Broad cloth	"	#11	Cotton	#80	Cotton	#80
	Jersey	"	#14	Dacron	#50	Dacron	#50

2. Installing the needle

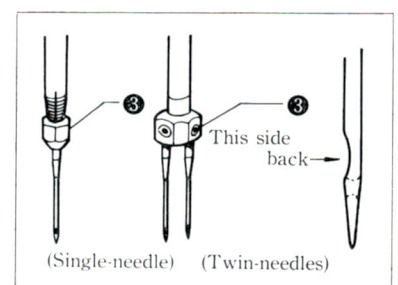
Turn the pulley until the needle bar is raised close to the highest position, press down presser bar lifter ①, and open presser arm ② in the arrow direction.



Loosen needle clamp nut ③, hold the needle with its recessed side facing back, insert the needle all the way into the needle clamp hole, and then tighten the needle clamp nut.

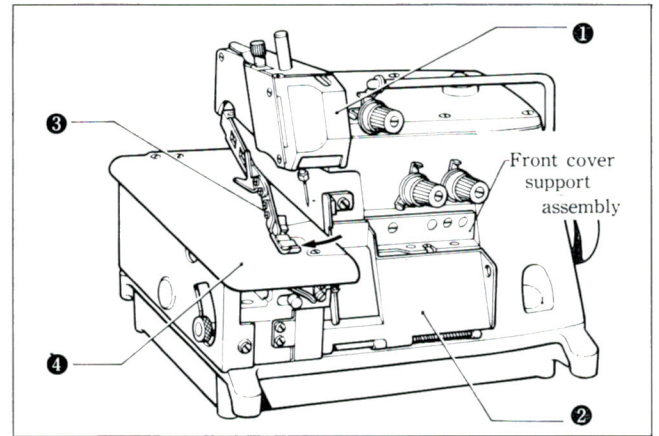
※In the figure at right, the numeral ③ on the right indicates the twin-needles clamp screw.

Install trimming knife ④ on the main presser arm.



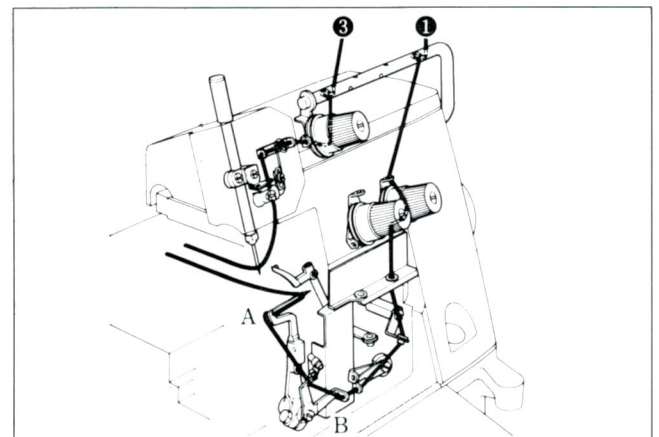
3. Threading

Before threading, open face plate cover ①, front cover ② and cloth plate ④, turn the pulley until the needle is raised up highest, and then open presser arm ③.

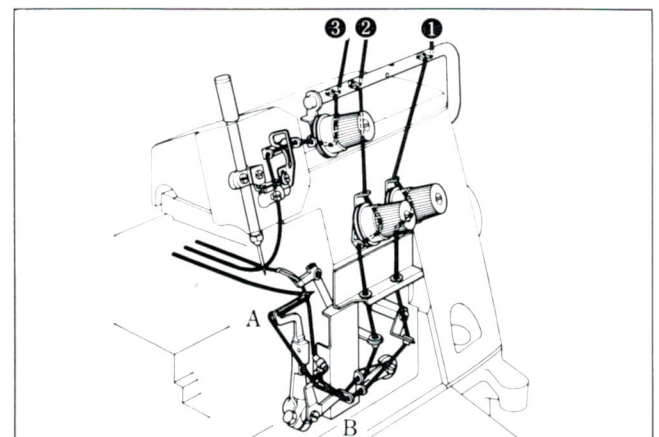


(1) B511

In case of two threads, pass under looper thread ① first and then needle thread ③ as shown at right.

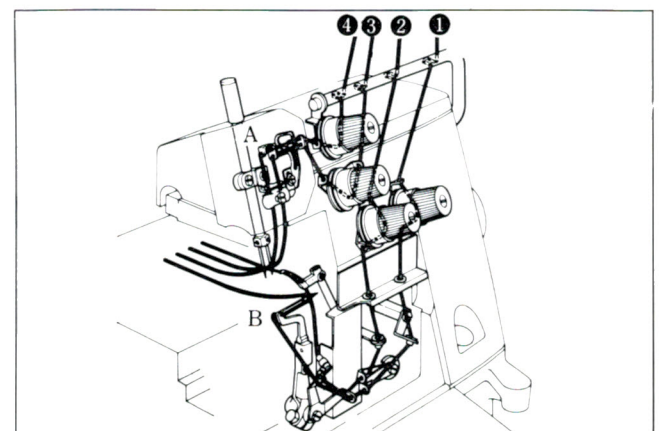


In case of three threads, pass under looper thread ① first, over looper thread ② second, and finally needle thread ③ as shown at right.



(2) B531

In case of four threads, pass under looper thread ① first, over looper thread ② second, needle thread ③ third and finally needle thread ④ as shown at right.



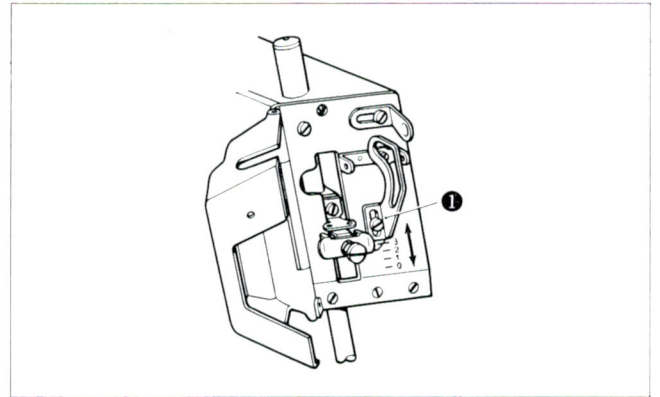
4. Thread tension

Thread tension may change depending on the kind of the cloth and thread used, stitch width, stitch length, the position of each thread takeup, and the position of the thread guides. If it changes so much, adjust it as mentioned below.

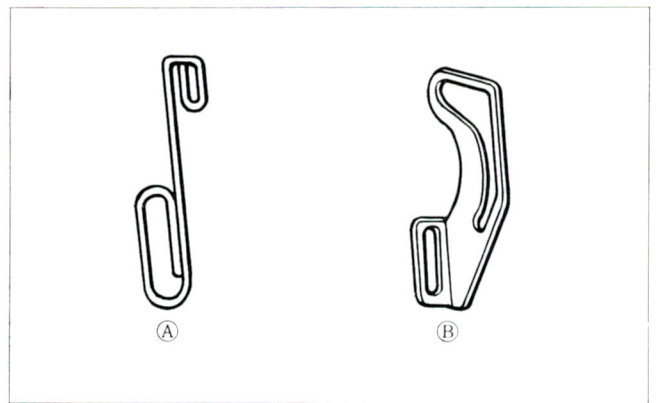
(1) Adjusting the overlock stitch needle thread takeup

To increase the thread tension, lower needle thread takeup ❶. To decrease it, raise the needle thread takeup.

The center position in the adjustable range is standard.



Use the thread takeup for two threads (A) or for three threads (B) as appropriate to your sewing purpose.

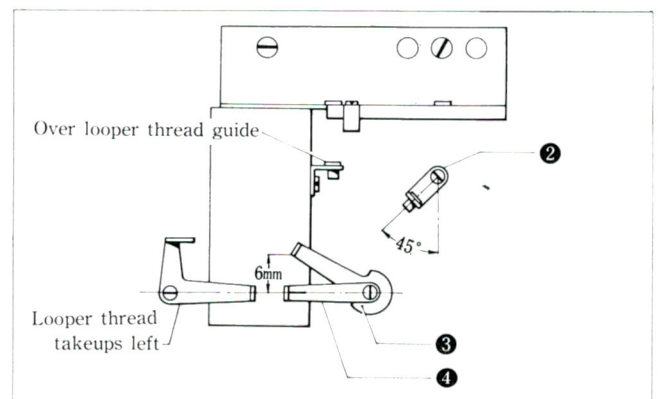


(2) Adjusting the overlock stitch looper thread takeups and thread guides

The figure at right shows the standard positions of the looper thread takeups and each thread guide when the needle bar is up highest.

More thread will be fed when looper thread takeups right ❸, ❹ are raised; and less thread when they are lowered.

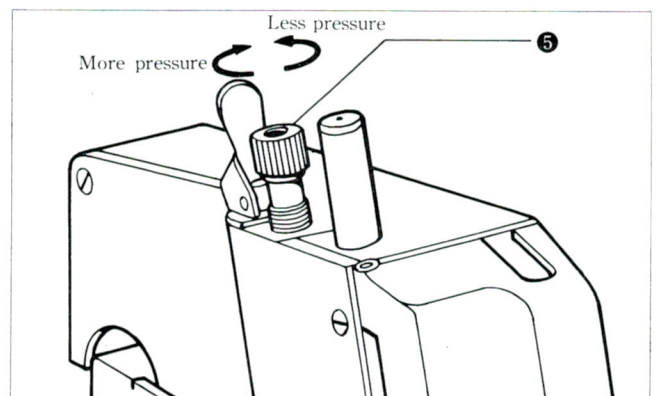
More thread will be fed when under looper thread guide ❷ is moved to the left; and less thread when it is moved to the right.



(3) Presser foot pressure adjustment

Adjust the presser foot pressure with presser foot adjusting screw ❺.

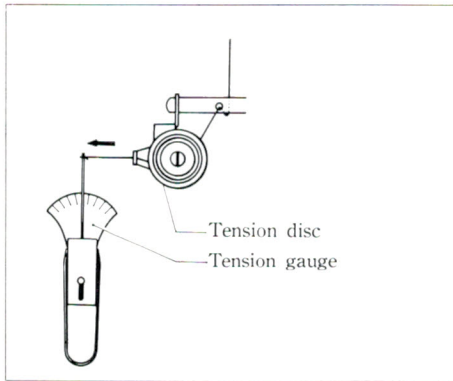
Turn it clockwise to increase the pressure, or counter clockwise to decrease it.



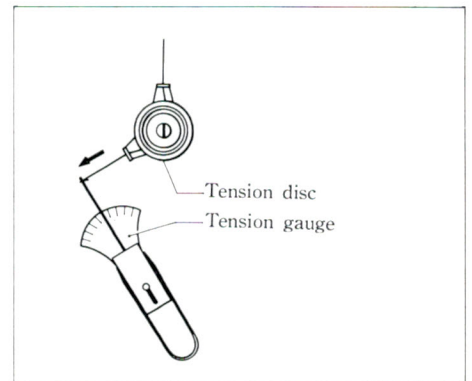
(4) Thread tension

Measure the thread tension as shown below.

(Needle thread tension)



(Looper thread tension)



Adjust the tension of each thread by referring to the tables below. (In grams)

(Single-needle, two threads)

Fabrics	Thread		Needle thread tension	Looper thread tension
	Kind	Count		
Wool, Dacron, thin materials, trouser fabric	Cotton	#60/2	18~28	8~18
Wool, Dacron, medium-thick materials, trouser fabric	"	"	"	"
Knit materials, jersey	Woolly	110/2 denier	10~20	15~25

(Single-needle, three threads)

Fabrics	Thread		Needle thread tension	Over looper thread tension	Under looper thread tension
	Kind	Count			
Knit materials	Cotton	#60/2	43~73	6~22	6~22
	Synthetic thread	#60	40~70	4~18	4~18
Thin knit materials	"	"	"	"	4~18
	Woolly nylon	110/2 denier	30~50	4~15	4~15
Thick materials	Needle: Synthetic thread Looper: Yarn	#50 Very thin	50~80	4~15	4~15
Knit materials (Blind hemming)	Cotton	#60/2	15~25	8~15	22~32
	Woolly nylon	110/2 denier	10~20	2~10	6~18

(Twin-needles, four threads)..... Four-thread overlock

Fabric	Thread		Left needle thread tension	Right needle thread tension	Over looper thread tension	Under looper thread tension
	Kind	Count				
Knit materials	Cotton	#60/2	60~80	30~50	6~18	8~20
Thin knit materials	Synthetic thread	#60	40~60	25~45	4~16	6~18
Bulky	Needle: Synthetic thread Looper: Yarn	#50 Very thin	70~90	35~55	3~10	5~15

(Twin-needles, four threads).....Mock safety

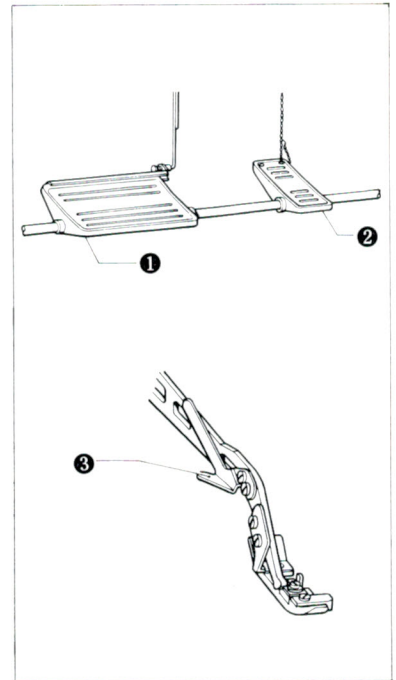
Fabric	Thread		Left needle thread tension	Right needle thread tension	Over looper thread tension	Under looper thread tension
	Kind	Count				
Broad cloth	Cotton	#80	50~80	45~70	8~15	8~15
Jersey	Dacron	#50	50~70	25~50	10~20	8~18

5. How to sew

Press the push button switch ON, depress presser bar lifter pedal ②, place the work under the presser foot, and release the presser bar lifter pedal.

When treadle ① is depressed, the work will be fed and sewn.

After sewing, run the machine without the work until about 5 or 6 cm of thread is out, and cut the thread with blade ③ by pulling the thread toward yourself.



6. Adjusting stitch width

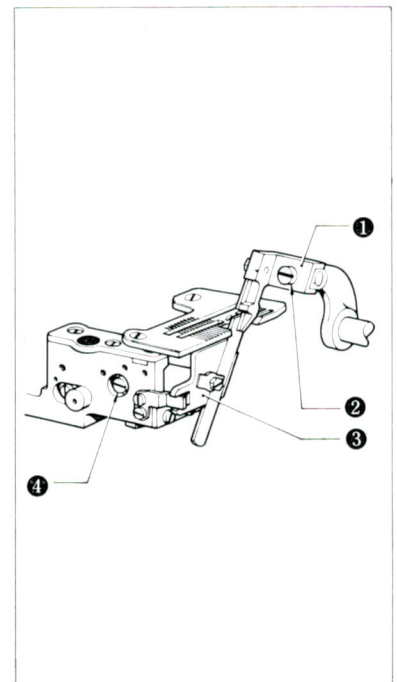
Stitch width depends on cloth trimming width and the width of the tongue of the needle plate.

(1) To increase stitch width

- Loosen upper knife holder set screw ②, move upper knife holder ① rightward as much as necessary, and retighten the set screw securely.
- Loosen lower knife holder set screw ④, and with the lower knife pushed against the upper knife by the lower knife holder spring, lower the upper knife close to its lowest position and retighten the lower knife holder set screw.

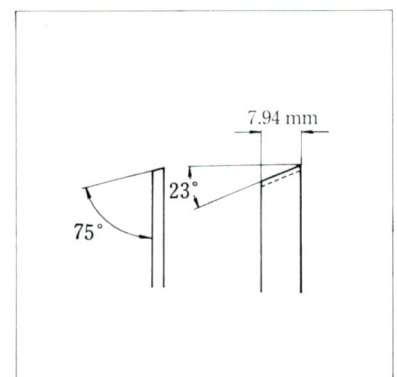
(1) To decrease stitch width

- Loosen the lower knife holder set screw, move lower knife holder ③ leftward as much as necessary, and temporarily tighten the set screw.
- Loosen the upper knife holder set screw, move the upper knife holder until the upper knife contacts the lower knife, and retighten the set screw securely.
- Loosen the screw temporarily tightened in step (a), make sure that the lower knife is pressed against the upper knife by the lower knife holder spring, lower the upper knife close to its lowest position, and retighten the set screw securely.



(Caution)

- Since stitch width depends on cloth trimming width and the width of the needle plate's tongue, cloth trimming width must be changed at the same time in case of changing stitch width by more than 1 mm.
- If the knife cutting performance has dropped, sharpen the lower knife as shown at right.
The upper knife cannot be sharpened with an ordinary whetstone.

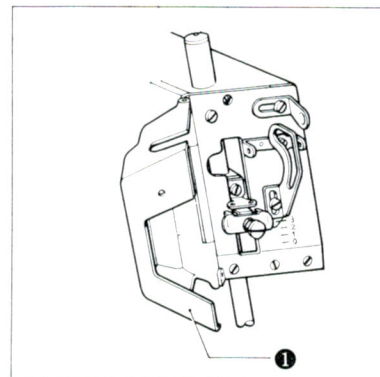


7. Adjusting stitch length

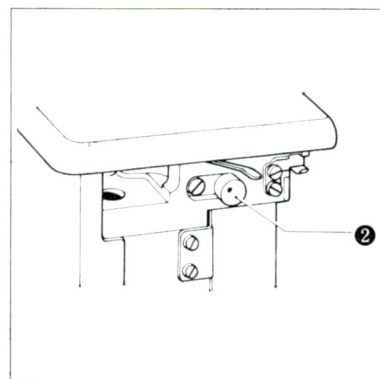
Stitch length is steplessly adjustable.

Open face plate cover ❶, and turn the pulley in the normal operating direction while pressing pushbutton ❷ so the pushbutton will go in further.

With the pushbutton kept in, turn the pulley forward and back until your desired stitch length is in line with the mark on the scale of the face plate, and then release the pushbutton.



The numerals on the scale indicate stitch length in millimeters, but actual stitch length varies with the kind and thickness of the work and the differential feed.



8. Adjusting the differential feed

The differential feed can be adjusted to any of three kinds: Stretch, normal, and gather.

Loosen differential adjusting lever set screw ❶, and raise or lower differential adjusting lever ❷ as necessary.

The lever must be lowered below the 1.0 mark for gather feed.

Set the lever at the 1.0 mark for normal feed.

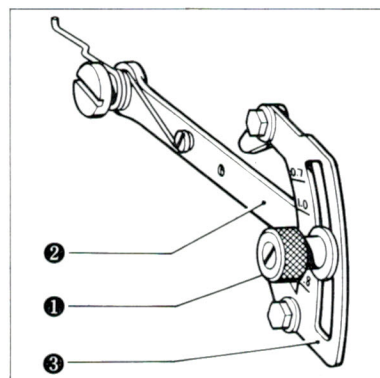
The lever must be raised above the 1.0 mark for stretch feed.

After the adjustment, tighten the differential adjusting lever set screw securely by hand.

※ There are three kinds of differential feed scales ❸:

One for denim, another for ruffler, and the last for bulky materials.

※ When the differential adjuster assembly is attached to your machine, the differential ratio can be changed with your knee while operating the machine.



D. STANDARD ADJUSTMENTS

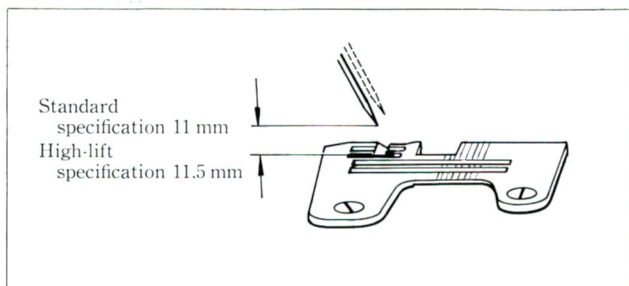
1. Adjusting the under looper and needle bar

※When adjusting the twin-needle model, adjust in reference to the left needle.

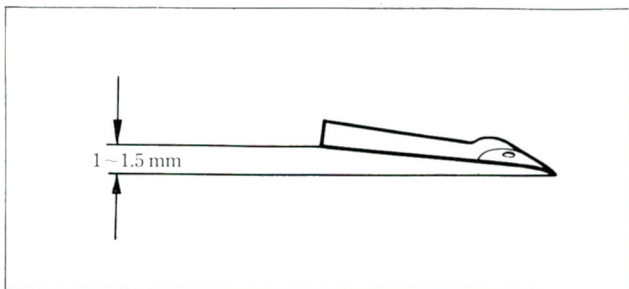
In case of the single-needle model right needle (dotted line) not adjusted.

- (1) In case of sewing machines made to the standard specifications, adjust the distance between the needle point and the top of the needle plate to 11 mm when the needle is up highest.

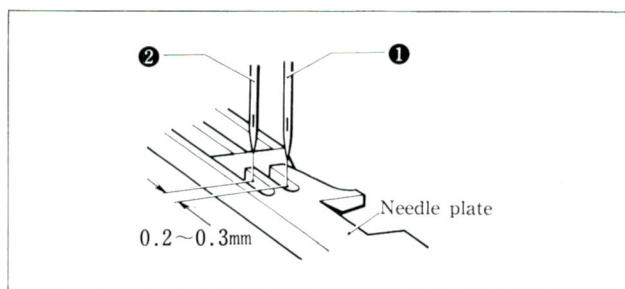
The sewing machines of the high-lift specifications must be adjusted to a distance off 11.5 mm between them.



- (2) Tilt the under looper by 1~1.5 mm, insert it all the way into the under looper holder, and install it.

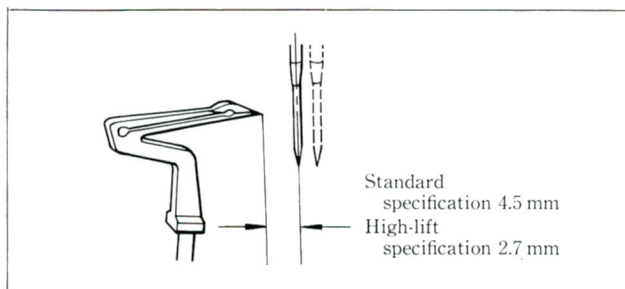


- ※In case twin-needle are used, make an adjustment by turning the needle bar so that right needle ① will be 0.2~0.3 mm forward of left needle ②.



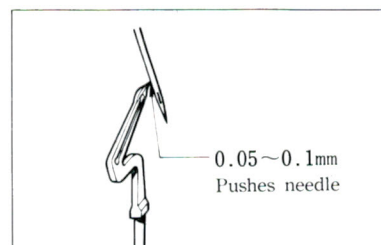
- (3) In case of sewing machines made to the standard specification, adjust the distance between the under looper point and the needle center to 4.5 mm when the under looper is at the left-most position.

The sewing machines of the high-lift specifications must be adjusted to a distance of 2.7 mm between them.



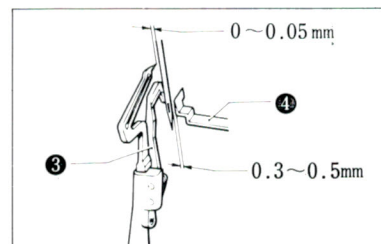
- (4) With the point of the under looper in line with the center of the needle, make an adjustment so that the point of the under looper will push the needle 0.05~0.1 mm (i. e., slightly contact the needle) in the upward travel of the needle.

In case twin-needles are used, make an adjustment so that the point of the under looper will touch both needles uniformly, or touch the right one slightly more than the left one.



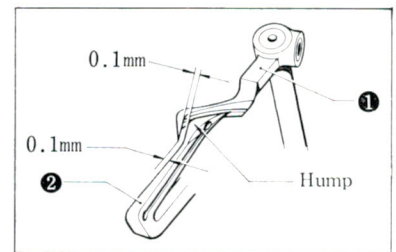
- (5) Under the condition of (4), push the needle with movable needle guard ③ until there is a clearance of 0~0.05 mm between the needle and the point of the under looper.

Also, adjust the clearance between the needle and needle guard front ④ to 0.3~0.5 mm.



2. Adjusting the over looper

- (1) Make an adjustment so that, when over looper ① meets under looper ②, the point of the over looper will pass clear of the under looper about 0.1 mm below its projected part.

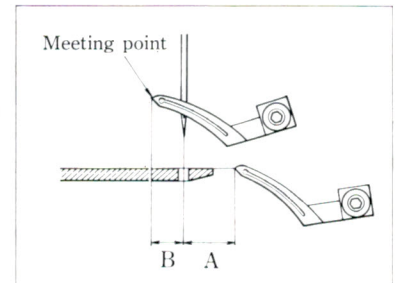


※Select meeting measurements from the table below.

There are three types of over loopers: Standard type, high-lift type, and the last for mock safety.

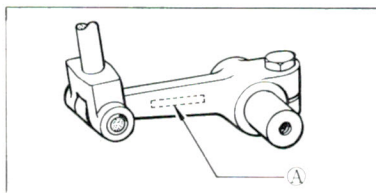
Spec.	Single needle		Double needles (Four-thread overlock)		Double needles (Mock safety)	
	Standard	High-lift	Standard	High-lift	Standard	High-lift
A	7.2	8.2	7.2	8.2	7.2	8.2
B	5.6	5	5.6	5	5.6	5

(In millimeters)

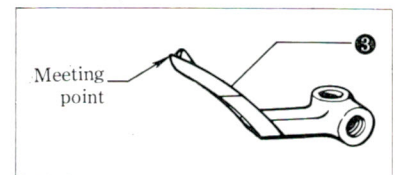


- (3) Meeting measurements for double-thread hook looper ③ are the same as shown above.

※Check part A on the over looper arm and see whether the machine is for standard use (S) or high-lift use (H).



(148378 – Standard specification)
(148381 – High-lift specification)



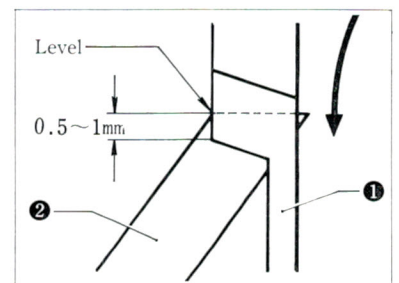
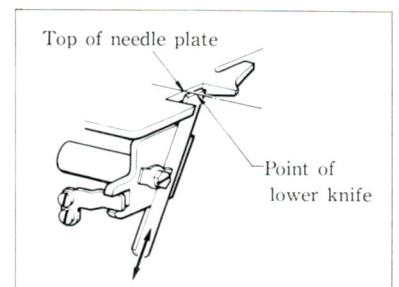
3. Adjusting thread trimming

- (1) Adjust the height of the lower knife until the point of the lower knife is flush with the top of the needle plate.
- (2) Adjust the height of upper knife ① so that, when the upper knife is lowered to its lowest position, it will engage lower knife ② 0.5~1 mm deep.

Also align the lower knife corner with the end face of the upper knife.

Caution: The above-mentioned adjustment is not necessary because your machine has already been adjusted on the assembly line.

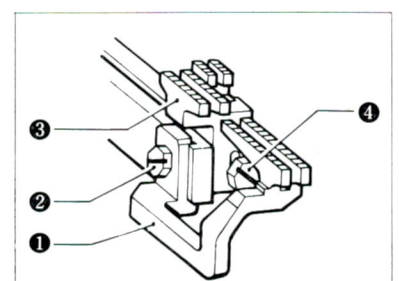
If a readjustment should become necessary, exercise great care not to damage the knives due to excessive engagement of the upper and lower knives.



4. Adjusting the feed dogs

Loosen bolt ②, and raise or lower differential feed dog ① to the correct height.

Loosen bolt ④ and adjust main feed dog ③.



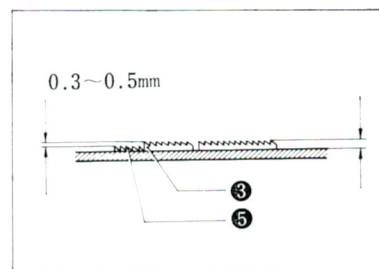
(1) Turn the pulley until the feed dogs are raised to the highest position, and adjust them to the following height above the top of the needle plate.

1.0 mm for thin materials

1.3 mm for medium-thick materials

1.5 mm for thick materials

Install chaining-off feed dog ⑤ at the same height as main feed dog. If chaining-off stitches hardly come out, lower it as shown at right.

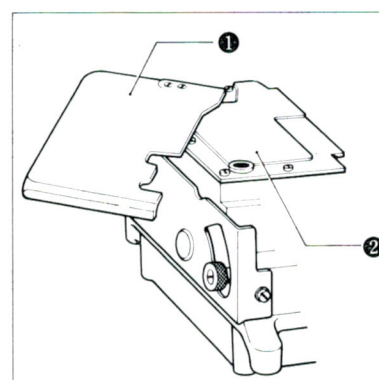


5. Adjusting the differential feed ratio

The differential range of your sewing machine is shown in the table of "Kinds of Sewing Machines" on pages 2~3.

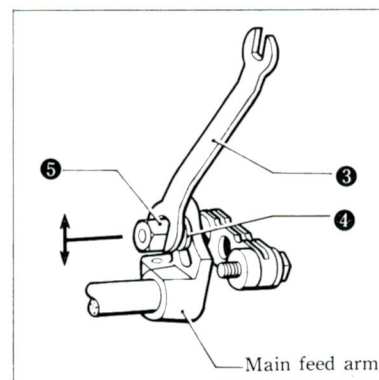
It can be changed as mentioned below.

(a) Remove cloth plate ① and feed table cover ②.

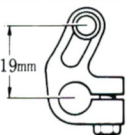
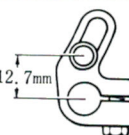
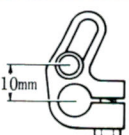




(b) Loosen nut ⑤ on main feed shaft ④, using accessory spanner ③.

(c) Position the main feed shaft by referring to the table below, and tighten the nut securely.



The table below shows the position of the main feed shaft VS. differential feed ratio.

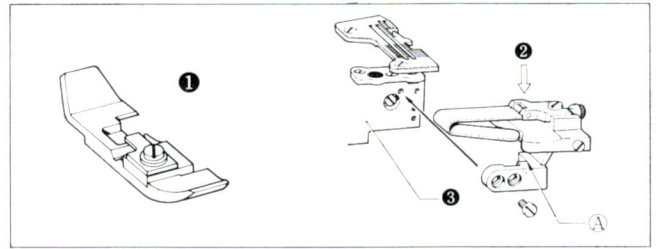
Specifications	Run stitching	Ruffler	Bulky
Differential feed ratio	0.6~1.8	1~3	1.3~4
Main feed shaft position			
Main feed shaft		←	 (eccentric shaft)

※The eccentric shaft is installed only in machines made to "bulky specifications."

E. INSTALLING AND ADJUSTING VARIOUS ATTACHMENTS

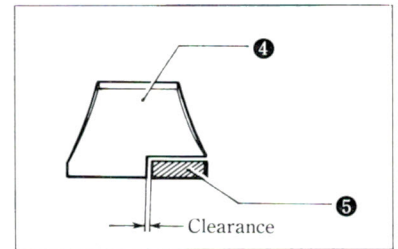
1. Blind hemming ruler

- (1) Replace the presser foot assembly with presser foot assembly for edge hemming ❶.
- (2) Install edge hemming ruler assembly ❷ in such a way that its corner A contacts the corner of needle plate support bracket ❸.

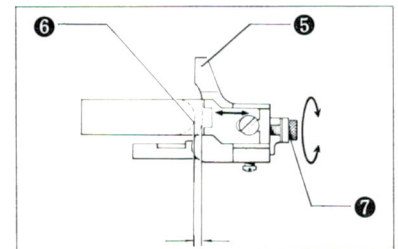


- (3) Adjust the clearance between presser foot ❹ and edge hemming ruler ❺ by moving the presser foot to the right or left so that the work will freely pass between them.

※ Adjust edge hemming width by winding a thread or rubber band half way on the edge hemming ruler assembly A.



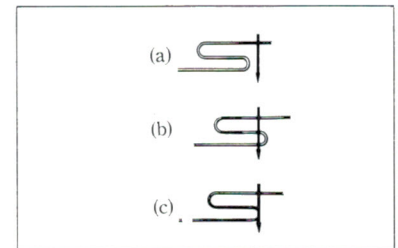
- (4) Adjust the clearance between the tip of edge hemming ruler assembly A ❻ and the edge hemming ruler by moving the edge hemming ruler assembly A to the right or left so that the work will freely pass between them.



- (5) Adjust the position of the edge hemming ruler by turning edge hemming ruler adjusting screw ❽ after actual sewing.

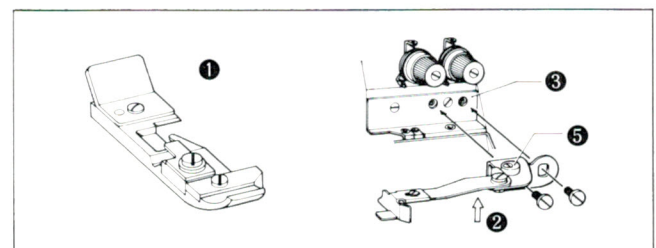
※ Generally, attention must be paid to the following to prevent irregular stitching.

1. Make sure that the work has constant tension.
2. Reduce the differential feed ratio when gathering.

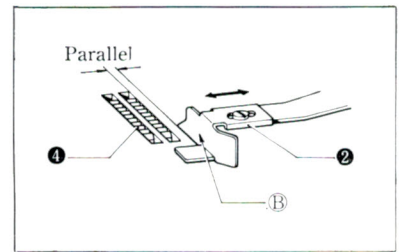


2. Serging

- (1) Replace the presser foot assembly with presser foot assembly for serging ❶.
- (2) Install serging ruler assembly ❷ on front cover support assembly ❸.

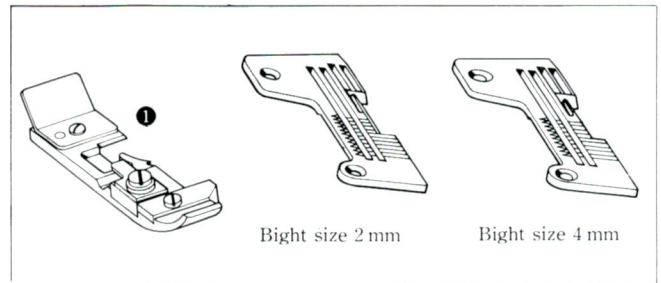


- (3) Turn stopper ⑤ until part ⑥ of the serging ruler is parallel with differential feed dog ④.
- (4) Actually sew the work, and adjust the stitch width by moving the serging ruler to the right or left.

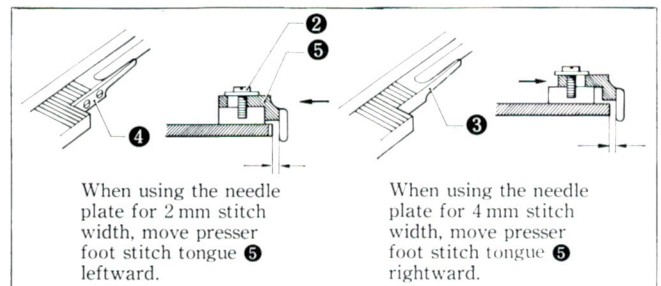


3. Curling

- (1) Replace the presser foot assembly with presser foot assembly for curling ①.
- (2) Replace the needle plate with that for curling. (Needle plates for 2 mm and 4 mm stitch widths are available.)
- (3) Adjust the position of the presser foot stitch tongue in the following order.
 - (a) Loosen set screw ②.
 - (b) Make a clearance between the needle plates tongue plate ③ or ④ and presser foot stitch tongue ⑤ just enough for the work to pass.



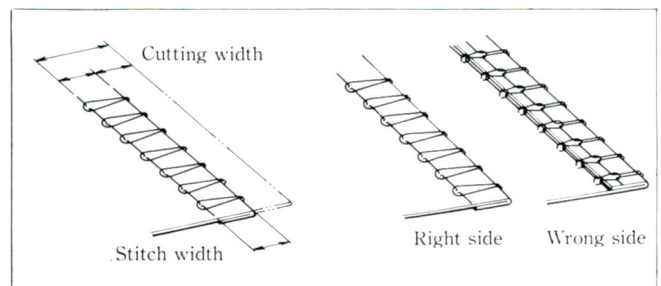
(In case of 2 mm stitch width, push the presser foot stitch tongue to the left.
In case of 4 mm stitch width, push the presser foot stitch tongue to the right.)



- (4) Cutting width should be about twice the stitch width.

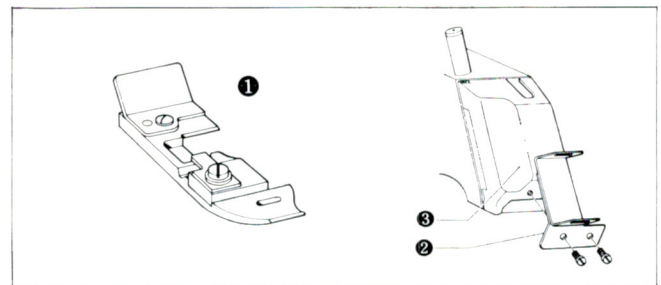
※When sewing woven fabrics, use a little wider cutting width in crosswise directions than in lengthwise directions.

- (5) Use a thread tension similar to that used for edge hemming so that sewn stitches will look beautiful like single-thread hemming stitches as shown right.



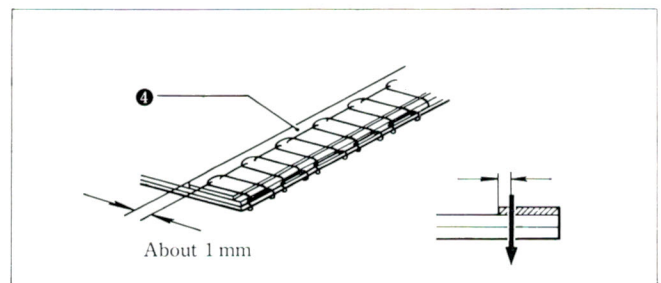
4. Taping

- (1) Replace the presser foot assembly with presser foot for taping ①.
- (2) Install tape guide ② on face plate cover ③.



- (3) Actually sew the work, and move the presser foot assembly to the right or left to adjust the position where tape ④ will be sewn.

Caution : Select a stitch width so that right edge of tape will not be cut by the knives. Otherwise, tape may not be sewn on in a satisfactory way.



TROUBLE SHOOTING GUIDE

Trouble	Cause	Inspection	Remedy	Page
Thread break	Wrong threading	Threading	See paragraph on threading.	9
	Excessive tension disc pressure.	Tension disc pressure.	Adjust to proper pressure.	11
	Poor-quality thread.	Thread quality.	Use thread of good quality.	8
	Thread is too thick for needle eyelet.	Needle size	Use needle of correct size or thread of correct count.	8
	Needle installed incorrectly.	Direction and height of needle	See paragraph on needle installing.	8
	Needle groove and needle eyelet finished poorly.	Needle groove and needle eyelet.	Replace with good needle.	8
	Needle, loopers and thread takeups not positioned properly to one another.	Clearance between needle and looper ; position of thread takeups.	See paragraphs on adjustment of under looper VS. needle bar and thread tension.	14 10
	Needle, loopers, needle plate, thread passage have flaws.	Flaws of needle, loopers, needle plate, thread passage.	Smooth with oil stone or buff.	/
Stitches skip	Wrong threading	Threading	See paragraph on threading.	9
	Excessive tension disc pressure	Tension disc pressure.	Adjust to proper pressure.	11
	Needle installed incorrectly.	Direction and height of needle	See paragraph on needle installing.	8
	Needle point blunt or bent.	Needle point and bend.	Replace with new needle.	8
	Needle, loopers and thread takeups not positioned properly to one another, or have incorrect clearance.	Clearance between needle and loopers. Timing. Thread takeup position.	See paragraphs on adjustment of under looper VS. needle bar and thread tension.	14 10
	Needle and needle guard not positioned properly to one another.	Clearance between needle and needle guard.	See paragraph on adjustment of under looper VS. needle bar.	14
	Looper point hangs down.	Looper point	Correct with oil stone, or replace with new looper.	/

Trouble	Cause	Inspection	Remedy	Page
Needle break	Needle installed incorrectly.	Direction and height of needle.	See paragraph on needle installing.	8
	Needle bent.	Needle bend.	Replace with new needle.	8
	Needle and loopers positioned improperly to one another.	Clearance between needle and loopers, their timing.	See paragraphs on adjustment of under looper VS. needle bar and adjustment of over looper.	14 15
	Needle and needle guard positioned improperly to one another.	Clearance between needle and needle guard.	See paragraph on adjustment of under looper VS. needle bar.	14
Doesn't work well without cloth.	Wrong threading.	Threading	See paragraph on threading.	9
	Excessive thread tension.	Tension disc pressure.	Adjust to correct thread tension.	11
	Loopers, thread takeups, and thread guide not positioned properly to one another.	Positions of loopers, thread takeups, thread guide	See paragraph on thread tension.	10
	Main and differential feed dogs not uniform in height.	Feed dog height	See paragraph on feed dog adjustment.	15
	Needle plate's tongue has flaws.	Flaws of needle plate's tongue	Smooth with sandpaper and polish with buff.	
Improper thread nipping.	Wrong threading.	Threading	See paragraph on threading.	9
	Thread is too thick for needle hole.	Thread count	Replace with correct needle or thread.	8
	Tension discs don't work right.	Operation of tension discs.	Remove dust from between tension discs to let them work smoothly.	
	Needle loopers and thread takeups positioned improperly to one another.	Timing of needle and loopers, positions of thread takeups.	See paragraphs on adjustment of under looper VS. needle bar and thread tension.	14 10
Poor trimming performance	Lower knife worn.	Edge of lower knife	Sharpen lower knife; see paragraph on stitch width adjustment.	12
	Upper and lower knives installed incorrectly.	Positions of upper and lower knives.	See paragraph on knife adjustment.	15

Trouble	Cause	Inspection	Remedy	Page
Needle makes too large holes in cloth.	Needle point blunt.	Crush of needle point.	Replace with new needle.	8
	Needle too thick for cloth.	Needle size	Replace with thinner needle.	8
Irregular stitches	Wrong threading	Threading	See paragraph on threading.	9
	Thread not uniform in thickness.	Thread quality	Use thread of good quality.	8
	Thread passage defective.	Flaws of thread passage	Smooth thread passage.	
	Thread takeups and thread guides not positioned properly to one another.	Positions of thread takeups and thread guides.	See paragraph on thread tension.	10
	Upper and lower knives don't cut well.	Edge of upper and lower knives	See paragraph on stitch width adjustment (Caution 2).	12
	Lower knife installed incorrectly.	Position of lower knife	See paragraph on knife adjustment.	15
Excessive wrinkles by sewing.	Needle too thick.	Needle size	Select needle suitable to cloth and threads.	8
	Differential feed not adjusted right.	Differential feed scale.	See paragraph on differential feed adjustment.	13
	Presser foot pressure incorrect.	How far presser foot adjusting screw is turned in.	Adjust pressure correctly.	10
	Excessive thread tension.	Tension disc pressure.	Adjust to correct pressure.	9
	Upper and lower knives don't cut well.	Edges of upper and lower knives.	See paragraph on stitch width adjustment (Caution 2).	12
	Trimming width and needle plates tongue	Trimming width and needle plate's tongue.	Adjust trimming width to needle plate, or replace needle plate.	12
	Feed dogs installed incorrectly.	Feed dog height.	See paragraphs on presser foot pressure adjustment and feed adjustment.	10 15

