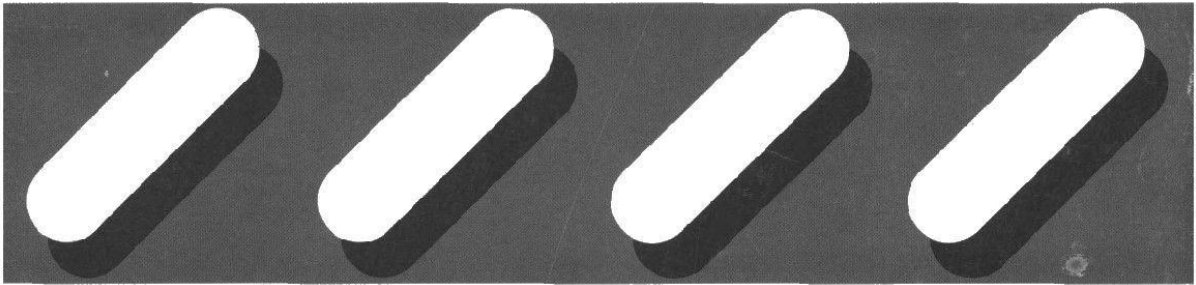
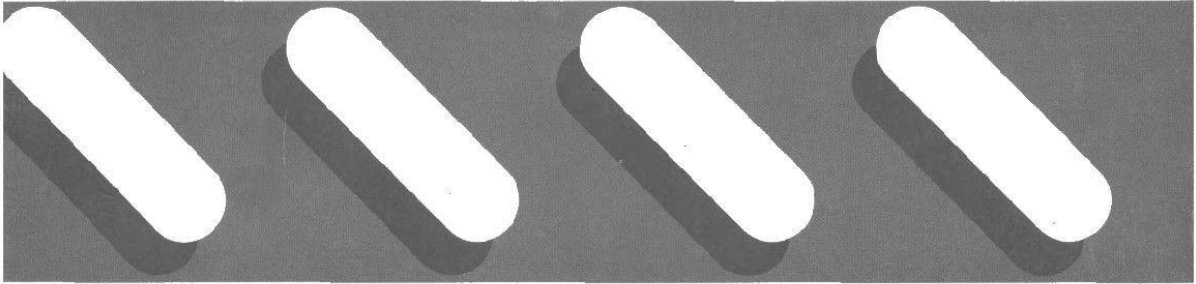


PRINTER FRIENDLY

# INSTRUCTION BOOK



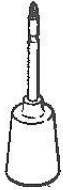
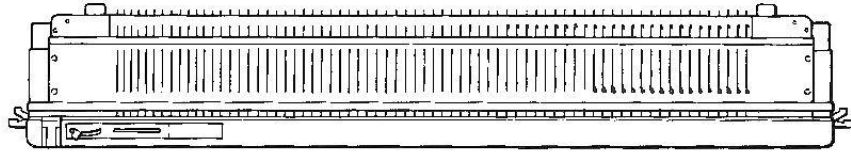
Ribbing Attachment **MOD. SRP 60 N**

# CONTENTS

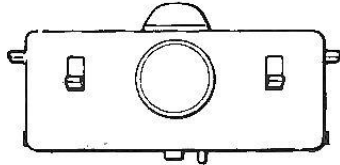
	page
MACHINE AND ACCESSORIES .....	1
SETTING THE RIBBER ON THE KNITTER.....	2
RIBBER AND NEEDLE BED .....	6
RIBBER CARRIAGE .....	8
RIBBER ARM .....	10
P CARRIAGE .....	12
OPERATION TABLE .....	13
YARN AND STITCH DIALS .....	15
CAST-ON AND KNITTING .....	16
CAST-ON FOR TIGHTER EDGE .....	23
REMOVE THE FABRIC FROM THE MACHINE .....	24
VARIOUS RIB STITCHES	
Rib stitches without using Punch Card.	
K1.P1. Rib .....	25
DOUBLE RIB .....	26
TUBULAR KNITTING .....	26
K2.P2. Rib .....	27
WIDE RIB .....	28
ENGLISH RIB .....	29
SWUNG ENGLISH RIB .....	29
VARIATION OF ENGLISH RIB .....	30
HERRINGBONE SWING .....	31
VARIATION SWING .....	32
PIN TUCK .....	34
PICK RIB .....	35
SWUNG PICK RIB .....	36
PLATING RIB .....	37
Rib stitches using Punch Card	
PUNCH PIN TUCK .....	40
PUNCH TUCK RIB .....	41
TUCK RIB STITCH .....	42
DRIVE LACE .....	43
PILE KNITTING .....	46
Double Face knitting with Automatic Yarn Changer .....	50
TAKING A TENSION GAUGE .....	53
KNITTING TECHNIQUES	
Increasing 1 stitch .....	55
Increasing multiple stitches .....	55
Decreasing 1 stitch .....	57
Decreasing multiple stitches .....	57
Partial knitting .....	59
Waste knitting .....	65
Buttonhole .....	66
WHAT TO DO IF...	
If the Carriage has jammed during knitting .....	67
If a stitch has dropped .....	68
If incorrectly knitted .....	69
If stitches float .....	70
If P Carriage has jammed .....	71
If the Ribber Arm does not fit on the Standard Carriage properly .....	71
If you knit with the Knitter only with the Ribber connected .....	71
If a needles has been damaged .....	72
MAINTAINING THE MACHINE .....	73
REPACKING THE RIBBER .....	74

# MACHINE AND ACCESSORIES

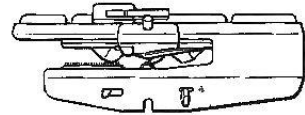
RIBBER  
NEEDLE BED



SWING HANDLE

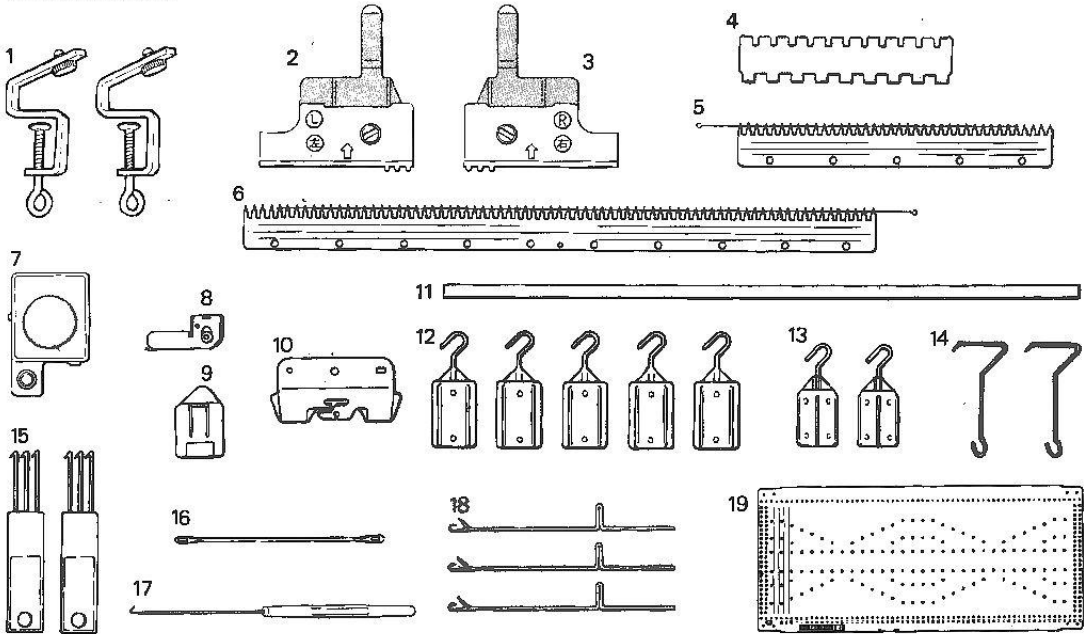


RIBBER CARRIAGE



RIBBER ARM

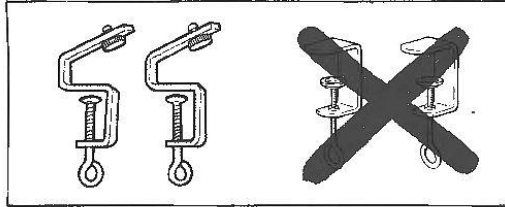
## ACCESSORIES



1. Ribber Clamp (2)
2. Auxiliary Piece (L)
3. Auxiliary Piece (R)
4. Needle Pusher (2/2-2/1)
5. Cast-on Comb (short)  
Cast-on Wire (short)
6. Cast-on Comb (long)  
Cast-on Wire (long)
7. P Carriage
8. P Presser
9. Driving Cam

10. Plating Yarn Feeder
11. Close Knit Bar
12. Ribber Weight (5)
13. Edge Weight (2)
14. Side Hanger (2)
15. Hanger Comb (2)
16. Double-eye Transfer Tool
17. Hook Tool
18. Spare Needle (3)
19. Punch Card (10)

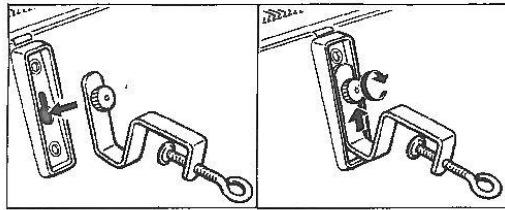
## SETTING THE RIBBER ON THE KNITTER



1. Fasten the Knitter to a table, using Ribber Clamps instead of Knitter Clamps.

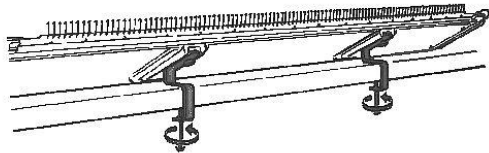
- ① Take Ribber Clamps and turn screws in arrowed direction as far as they go.

DO NOT USE KNITTER CLAMPS.



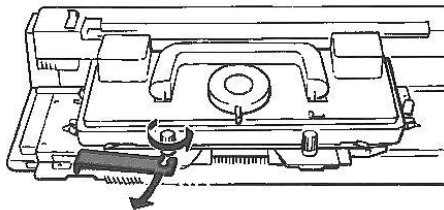
- ② Raise front of Knitter and insert screw head into keyhole slot.

- ③ Pull Clamps upwards and tighten screws.



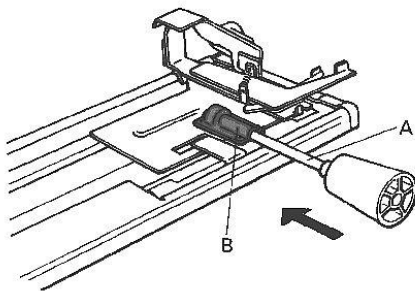
- ④ Place Clamps on table edge and push them backwards until they are against the table. Tighten Clamps firmly by turning screws in arrowed direction.

DO NOT OVER TIGHTEN.



2. Remove Carriage Fastener.

DO NOT ATTACH KNITTER ARM TO CARRIAGE. LACE CARRIAGE MUST NOT BE USED FOR RIBBING.



3. Insert Swing Handle shaft "A" into Swing Bearing "B" at the back of the left side of Ribber.

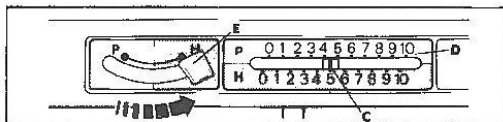
Push and twist handle until it clicks into position.

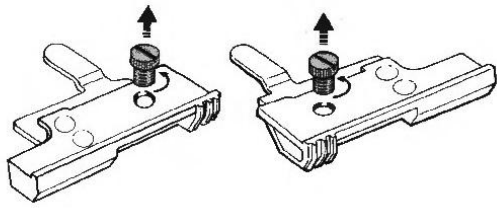
Ensure that Pointer "C" on Swing Indicator "D" moves when turning Handle to the left and right.

Set Half-Pitch Lever "E" to H.

By turning Handle, set Indicator Pointer "C" to 5 on lower scale H.

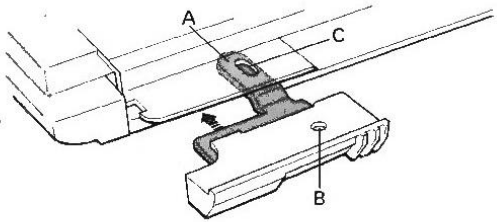
*Note: When Half-Pitch Lever "E" is set to P, read upper P scale. When Half-Pitch Lever is set to H, read lower H scale.*





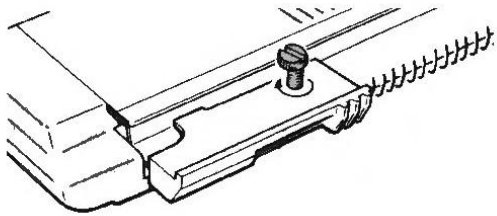
4. Take out Auxiliary Pieces, marked (L) and (R), and remove screws from them.

*To MOD.700/600 users:  
Remove Ribber Holders and Auxiliary Plates if previously installed, referring to the Insertion.*



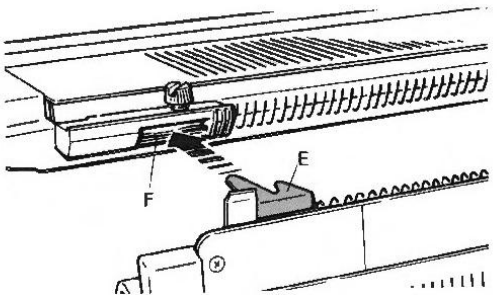
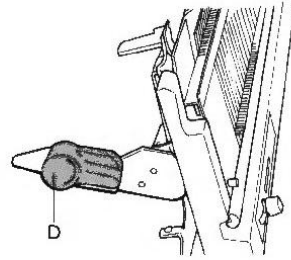
5. Insert finger "A" of Auxiliary Piece into underneath the front end of Knitter, (L) for left and (R) for right respectively, and push until plastic part of Auxiliary Piece covers front edge of Bed.

Ensure hole "B" of Auxiliary Piece corresponding with slot "C" on Bed.



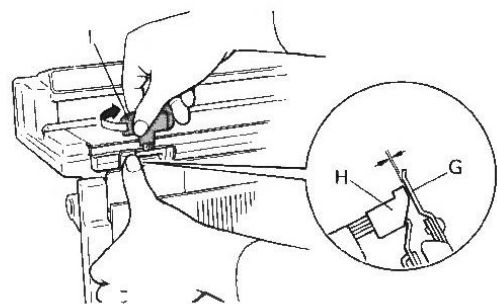
6. Insert Ribber Joiner Screws into Auxiliary Pieces and fix loosely.

7. Down both Push-up Cams "D" towards you.

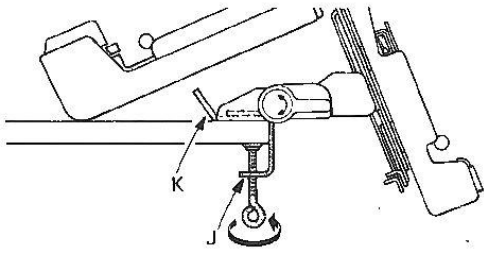


8. Hold Ribber with both hands and insert Ribber Joiner "E" on both sides into slots of Auxiliary Pieces "F". It will be easier to insert the right side first.

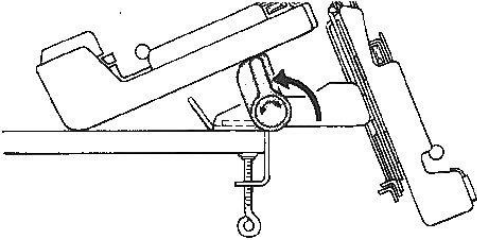
Ensure Ribber Needle Bed is at its highest position.  
If not, push the Bed with both hands as far up as it goes.



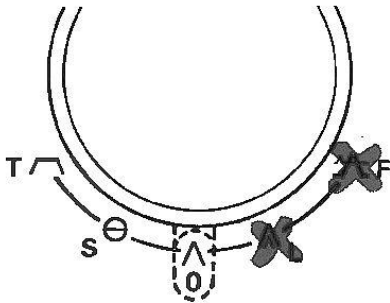
9. Fitting Ribber Stopper "G" to Auxiliary Piece "H" snugly, fasten both screws with Screw Driver "I".



10. With Knitter Clamps "J", secure foot of Ribber Joiner Supports "K" to the table.



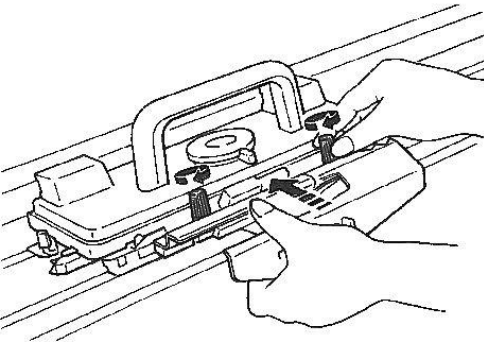
11. Lift Push-up Cams in arrow direction to support Knitter.



12. Set Cam Lever on Knitter Carriage to Stockinet.

**IMPORTANT**

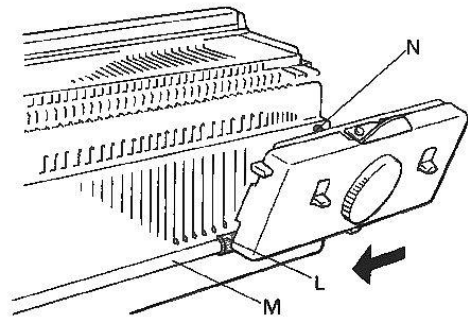
Cam Lever should never be set to FAIR ISLE (↗) or PUNCH LACE (↖) when Ribber Arm is in position.



13. Loosen both Arm Nuts of Knitter Carriage. Take Ribber Arm and slide it under two Arm Nuts. Push Ribber Arm as far back as it goes and tighten Arm Nuts firmly by turning them in arrow direction.

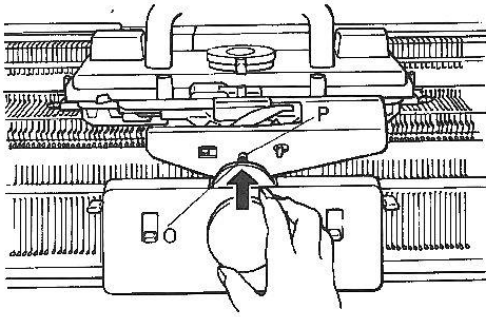
**IMPORTANT**

Ensure that Arm Nuts fit correctly into cutout of Ribber Arm. Do not remove or attach Ribber to Knitter with the Ribber Arm on Knitter Carriage.



14. Take Ribber Carriage and Slide Pipe "L" on the Ribber Rail "M" from the right side.

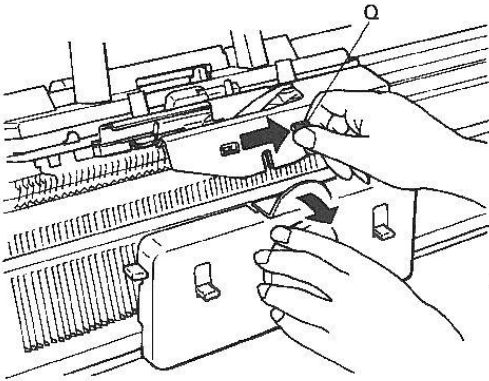
Tilt the Ribber Carriage towards you to clear the Stopper Pin "N" on Ribber Needle Bed.



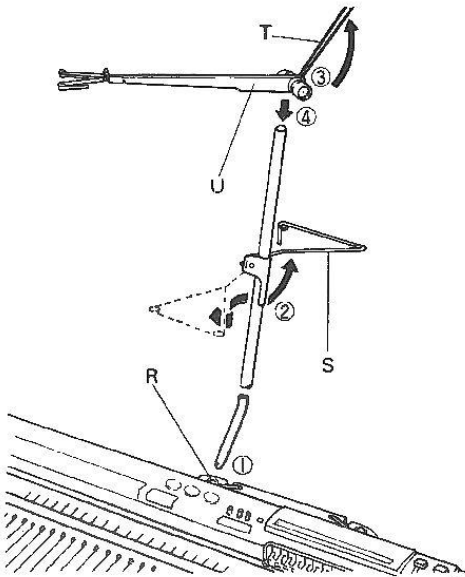
15. Slowly move the Ribber Carriage towards the Knitter Carriage and tilt the Carriage to position it in front of the Ribber Arm. Press Link Pin "O" into slot "P" of Ribber Arm until it clicks into position.

**CHECK POINT**

*Move Carriage a few times across Needle Bed to ensure Knitter/Ribber Carriage and Ribber Arm are assembled correctly.*



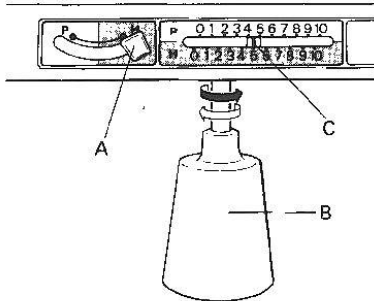
- To release Ribber Carriage from Ribber Arm, push Link Knob "Q" towards right and tilt the Carriage.



16. Assemble Auto-Tension and Yarn Rod.

- ① Insert the bent end of Yarn Rod into either bracket socket "R" at both sides of Carrying Handle.
- ② Turn Tension Guide "S" to the back of the Yarn Rod.
- ③ Turn Tension Springs "T" upwards till they click into position.
- ④ Place the Auto-Tension "U" on top of the Yarn Rod.

# RIBBER NEEDLE BED

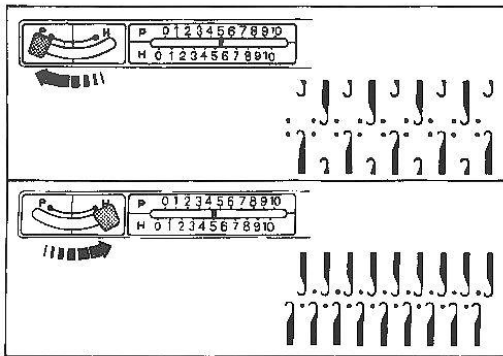


## Half-Pitch Lever

There are two setting positions (**P** or **H**) for Half-Pitch Lever "A". Moving the Half-Pitch Lever changes the position of the ribber needles in relation to the knitter needles.

## Swing Handle

By rotating Swing Handle "B" to the right or left, Ribber Needle Bed can be moved right and left. At every click position of the Swing Handle the Ribber Bed is moved by one needle pitch.



## Swing Indicator

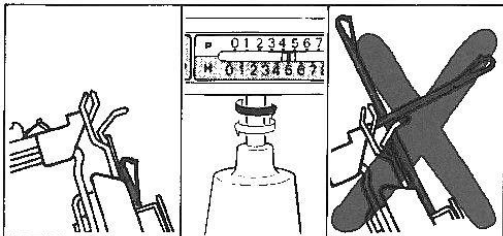
Swing Indicator "C" shows position of Ribber Needle Bed against Knitter Needle Bed.

## P Scale

When the Half-Pitch Lever is set at **P** position, the needles on the Ribber are directly opposite to Knitter Needles. This scale is used when every alternate needle is used.

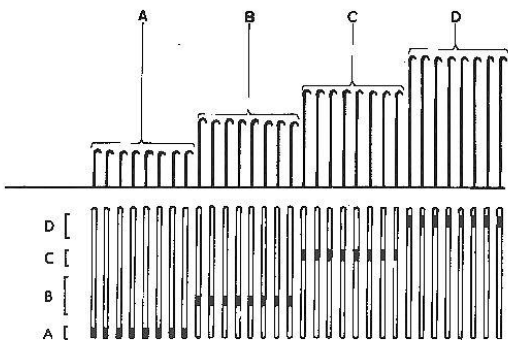
## H Scale

When the Half-Pitch Lever is set at **H** position, the needles on the ribber are shifted by half a needle pitch. Ribber needles are in the centre of two knitter needles. This scale is used when every needle is used.



## IMPORTANT

*Do not turn Swing Handle while needles are in C or D position on both beds.*



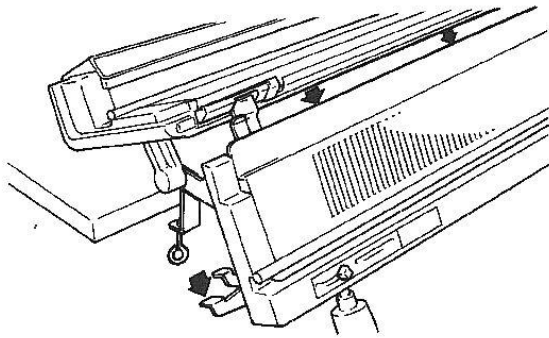
## Needle Positions

On both left and right ends of Needle Bed, you will see markings A, B, C and D associated with brackets "J".

These four needle positions are used during knitting.

- A — Non-working position
- B — Working position
- C — Needles in this position always operate.
- D — Holding position (Needles in this position are knitted back to B position when Russel Levers are at = position. They do not knit when Russel Levers are at — position.)



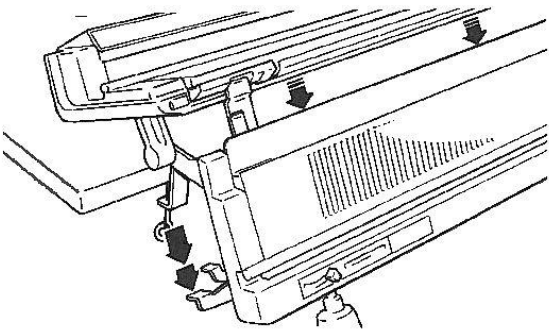


### Drop Levers

On both left and right ends of Needle Bed you will find Drop Levers. Using these levers changes position of Needle Bed.

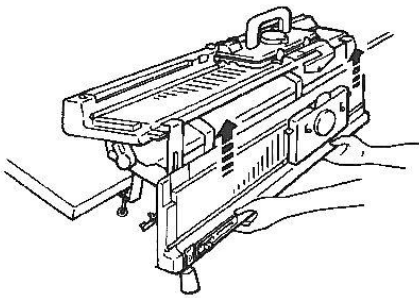
### Middle position

Depress Drop Levers on both sides once, and Ribber Bed is lowered to its middle position. This position is used when picking up stitches.



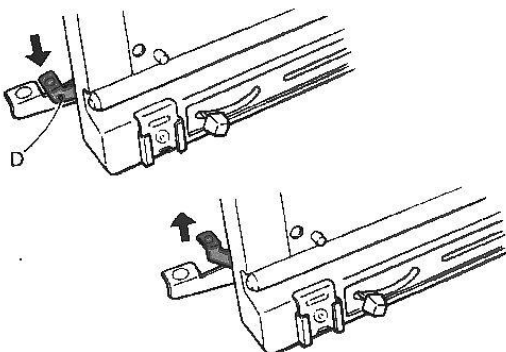
### Lowest position

Depress Drop Levers twice, and Ribber Bed moves to its lowest position. This position is used when knitting only on Knitter.



To restore Ribber Bed to knitting position, push up both ends of the Ribber simultaneously.

Knit Rib stitches in this position.



### Pile Levers

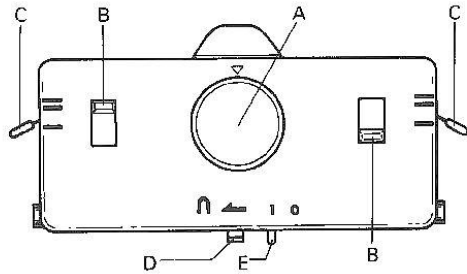
Pile Levers are located above Drop Levers and used to broaden the gap between Knitter and Ribber.

For pile knitting, press down the Pile Levers "D" until they click.

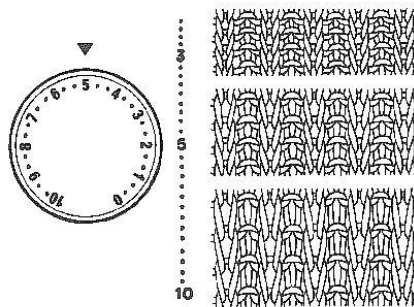
For normal knitting, ensure both Pile Levers are in upper position.

To restore the levers to upper position, lift them with your fingers.

# RIBBER CARRIAGE

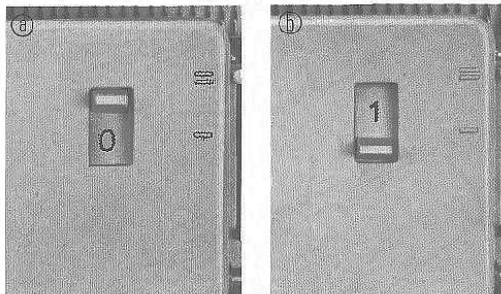


- A — Stich Dial
- B — Set Levers
- C — Russel Levers
- D — Pick Knob
- E — Auto-set Lever



## Stich Dial

Controls stitch size.  
 Set a selected number or dot to ▼ mark.  
 The larger the number the bigger the stitch, and the smaller the number the smaller the stitch.  
 According to the thickness of yarn to be used, select proper setting of Stich Dial. (Refer to page 15)

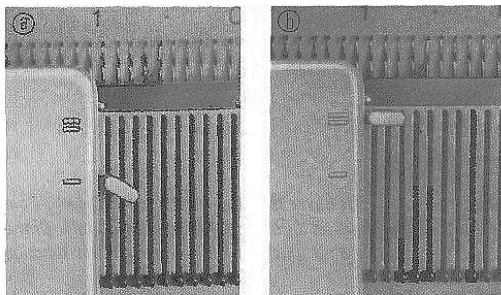


## Set Levers

Control needles in "B" position.  
 When Pick Knob is set at "▲", the Set Levers function as described below.

- (a) NON KNITTING POSITION, needles in B position will not knit.
- (b) KNITTING POSITION, needles in B position will knit.

Left Lever works when the Carriage moves to the left.  
 Right Lever works when the Carriage moves to the right.

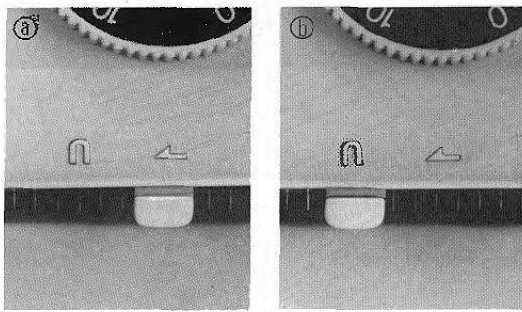


## Russel Levers

Control needles in "D" position.

- (a) NON KNITTING POSITION, needles remain in D position.
- (b) KNITTING POSITION, needles in D position will knit back to B position.

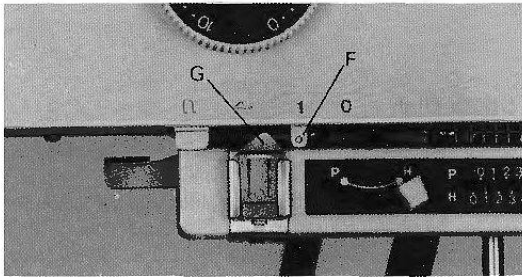
Left Lever works when the Carriage moves to the left.  
 Right Lever works when the Carriage moves to the right.



### Pick Knob

Works on the needles in B position when Set Lever on the leading side is set at **D**.

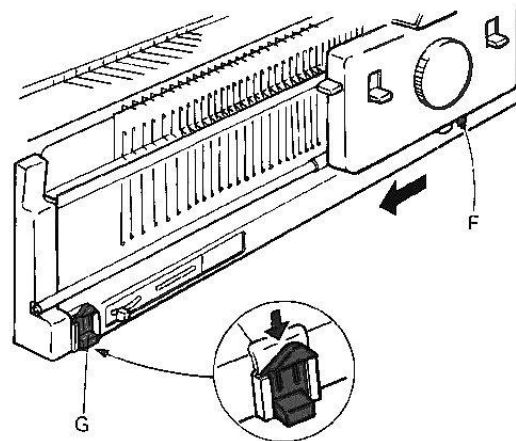
- Ⓐ NON KNITTING POSITION, yarn is not knitted.
- Ⓑ PICK POSITION, yarn is laid into needle hook only.



### Auto-set Lever and Driving Cam

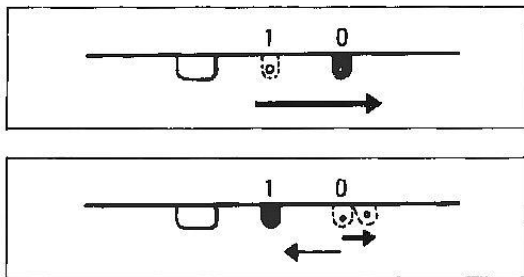
Auto-set Lever "F" controls the needles in B position instead of the Set Levers and selects KNITTING or NON-KNITTING rows automatically every second row. The Auto-set Lever works in conjunction with the Driving Cam.

Used to knit Pick Rib (refer to pages 35, 36) and Double Face Knitting (refer to pages 50 ~ 52).



Operate the Auto-set Lever as follows:—

1. Set both Set Levers to 1.
2. Fit Driving Cam into place at the left end of the Ribber.
3. Move the Carriage to the extreme left until the Auto-set Lever is operated by the Driving Cam.



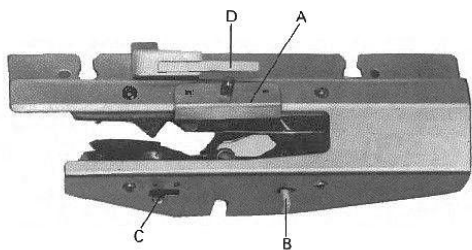
To change the position of Auto-set Lever manually.  
(From 1 to 0)  
Push the Lever to the right.

(From 0 to 1)  
Push the Lever slightly to the right, then release it.

**Note:**

When the Auto-set Lever is not in use, remove Driving Cam from the Ribber and be sure to set Auto-set Lever to 1. (If the Auto-set Lever is at 0 position, Set Levers will not function properly.)

## RIBBER ARM



- A — Main Yarn Feeder
- B — Link Knob
- C — Auxiliary Yarn Feeder Lever
- D — Driving Lever

### Main Yarn Feeder

Use Main Yarn Feeder for all types of rib knitting except plating rib knitting (refer to pages 37 ~ 38).

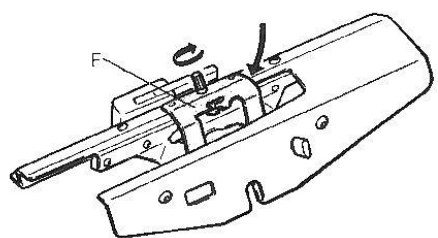
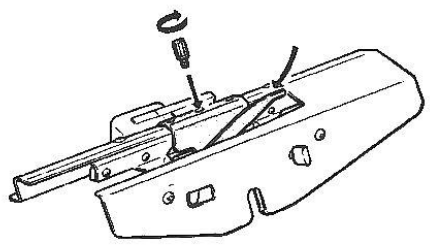
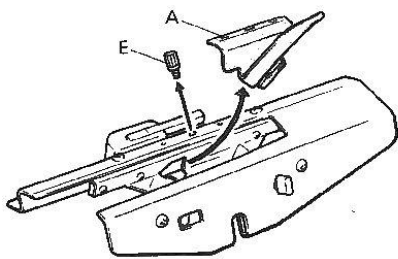
When plating rib knitting, exchange Main Yarn Feeder for Plating Yarn Feeder "F".

### How to remove Yarn Feeder

Remove Yarn Feeder Screw "E". Slide the Yarn Feeder "A" to the right and lift it off.

### How to attach Yarn Feeders

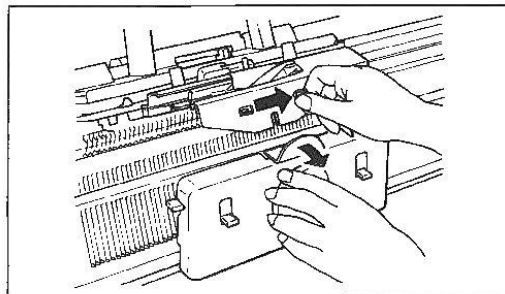
With feeder side facing you, insert it from the right side and match both securing holes of Yarn Feeder and Arm. Secure them with Yarn Feeder Screw.

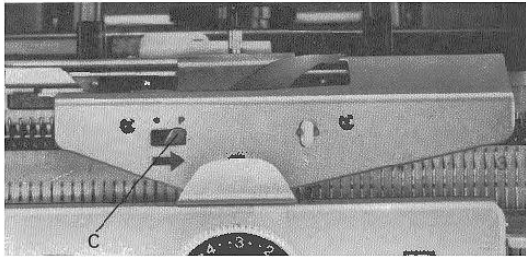


*Use Plating Yarn Feeder "F" only for plating rib knitting.*

### Link Knob

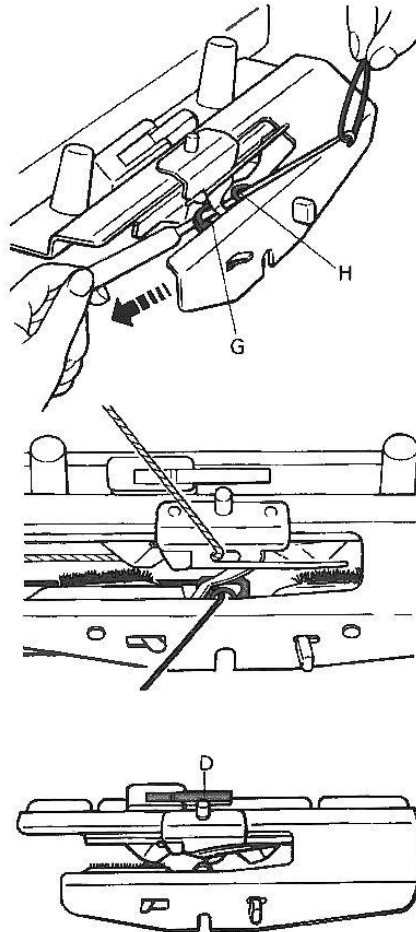
Push the Knob to the right to disconnect Ribber Carriage.





### Auxiliary Yarn Feeder Lever

Set Auxiliary Yarn Feeder Lever "C" to **P** mark to work pile knitting. Auxiliary Yarn Feeder moves to the operating position.



### How to thread Auxiliary Yarn Feeder

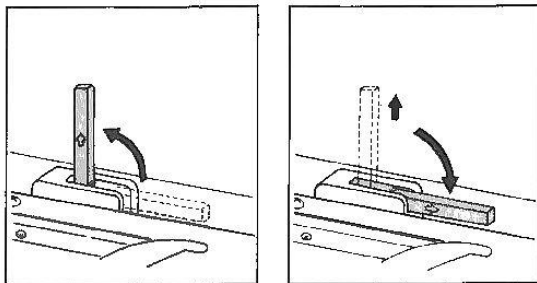
1. Remove Ribber Carriage from Arm using Link Knob, and lower the Ribber to the middle position by depressing Drop Levers once.
2. Move the Carriage to the left end of the Needle Bed until the Yarn Feeder is free of the bed. (Do not remove Carriage from bed.)
3. Make a loop of yarn and hold it above Auxiliary Yarn Feeder.
4. Insert Hook Tool from underneath through Auxiliary Yarn Feeder "G" and Yarn Guide "H", then catch yarn loop.
5. Pull Hook Tool downwards threading yarn through Yarn Guide and Auxiliary Yarn Feeder.
6. Insert the yarn between both Needle Beds, tie the yarn end to hook of Weight on Cast-on Comb and restore the Ribber to its original position.
7. Connect Ribber Carriage to Arm.

Ensure Ribber needles are correctly lined up in B position.

**Always set Auxiliary Yarn Feeder Lever to ● mark except when pile knitting.**

### Driving Lever

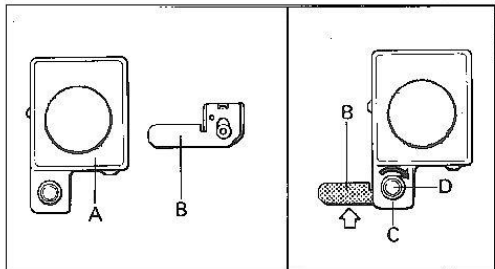
When using Yarn Changer, raise this lever "D".



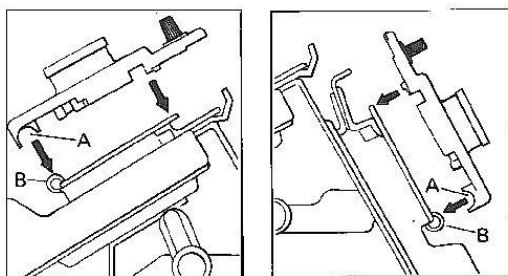
When knitting without Yarn Changer, keep this lever in the rest position.

To put lever in the rest position, lift it slightly, then lay it down.

# CARRIAGE

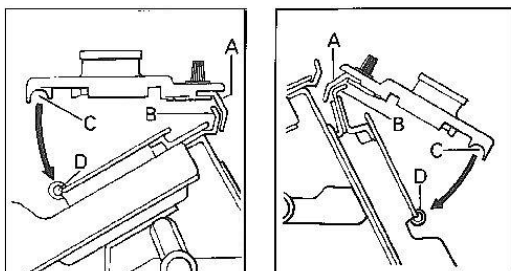


In drive lace knitting, use P Carriage "A" without P Presser "B".  
 In pile knitting, use P Carriage "A" with P Presser "B" attached.  
 Place P Presser "B" underneath Arm "C" and secure with fastening screw "D".



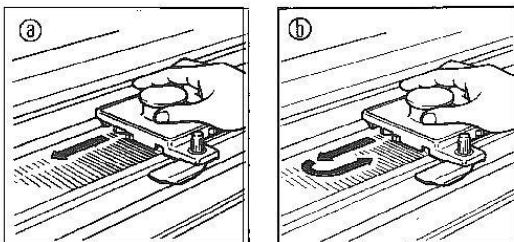
## WITHOUT P PRESSER

Place P Carriage straight onto Knitter or Ribber Needle Bed ensuring rail guide "A" fits correctly on rail "B".



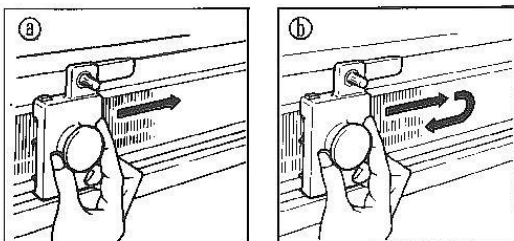
## WITH P PRESSER ATTACHED

Place P Presser "A" over sinker posts "B" first, then place rail guide "C" onto rail "D".



On Knitter always start from the right side.

- (a) Move P Carriage once (right → left).  
Stitches will be behind latches and needles are aligned in C position.
- (b) Move P Carriage twice (right → left → right).  
Stitches have slipped off needles.

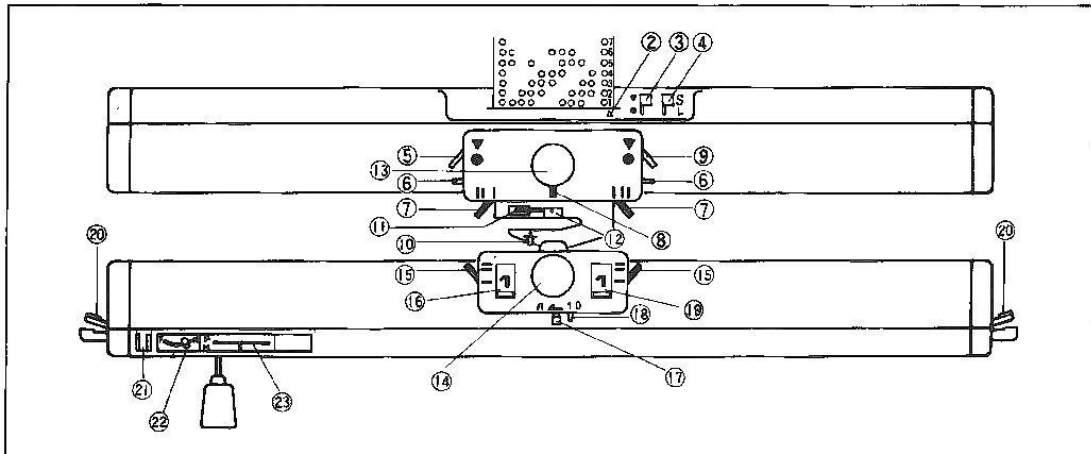


On Ribber always start from the left side.

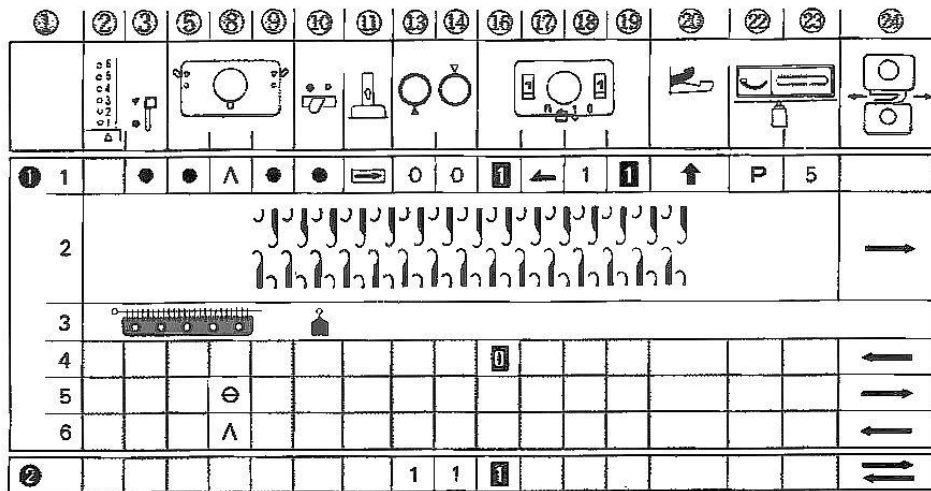
- (a) Move P Carriage once (left → right).  
Stitches will be behind latches and needles are aligned in C position.
- (b) Move P Carriage twice (left → right → left).  
Stitches have slipped off needles.

# OPERATION TABLE

For Cast-on and main knitting, Operation Table gives settings and operation of machine.

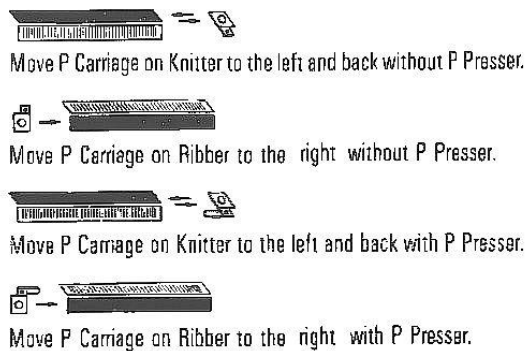
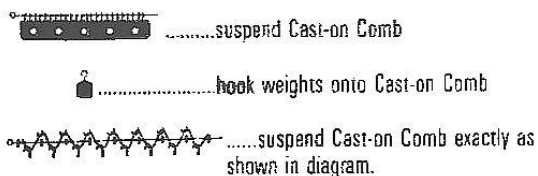
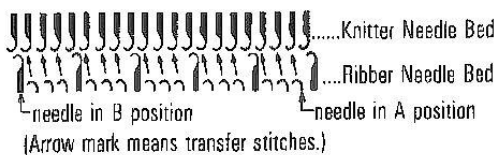


PATTERN PANEL	②	Pattern Row Number *	*Set the Punch Card only when ↓ mark is denoted and lock at 1. **Always set L Knob to S.
	③	Stop Knob	
	④	L Knob **	
KNITTER CARRIAGE	⑤	Side Lever (left).	*Always set Intarsia Levers at 1 when using Ribber. ** Except when partial knitting, set Russel Levers at II.
	⑥	Intarsia Levers *	
	⑦	Russel Levers **	
	⑧	Cam Lever	
	⑨	Side Lever (right)	
RIBBER ARM	⑩	Auxiliary Yarn Feeder Lever	*Except when plating rib, use Main Yarn Feeder.
	⑪	Driving Lever	
	⑫	Yarn Feeder *	
STITCH DIALS	⑬	Knitter Stitch Dial *	*Set the Stitch Dials referring to table on page 15.
	⑭	Ribber Stitch Dial *	
RIBBER CARRIAGE	⑮	Russel Levers *	*Except when partial knitting, set Russel Levers at =.
	⑯	Set Lever (left)	
	⑰	Pick Knob	
	⑱	Auto-set Lever	
	⑲	Set Lever (right)	
RIBBER NEEDLE BED	⑳	Pile Levers *	* Set Pile Levers to upper position when ↑ mark is denoted and set them to lower position when ↓ mark. ** Install Driving Cam only for Pick Rib and Double Face Knitting.
	㉑	Driving Cam **	
	㉒	Half-Pitch Lever	
	㉓	Swing Indicator	



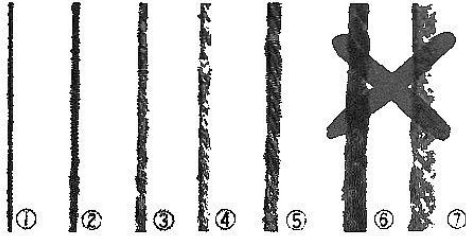
- ① — Procedural order of the Operation Table.
- ② — Arrow mark indicates direction of Carriage and number shows the number of rows to be knitted.

CAST-ON	① 1	Set machine controls for the initial row.
	2	Arrange needles, and knit the initial row.
	3	Suspend Cast-on Comb with weights.
	4—6	Change machine controls for knitting subsequent 3 rows.
Rearrange needles for main knitting by transferring stitches if necessary.		
MAIN KNITTING	②	Re-set machine controls for working main knitting. Follow the sequence 1, 2....and repeat the same.





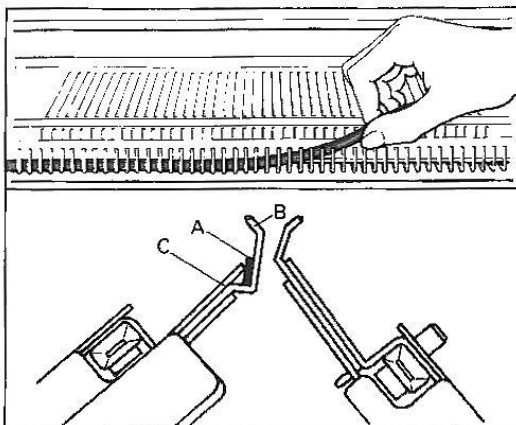
# YARN AND STITCH DIALS



Stitch Dial setting will vary according to thickness of yarn and type of knitting. Picture shows actual size of yarns. Very thick yarns (⑥, ⑦) are not suitable for rib Knitting. The table below shows the recommended Stitch Dial settings for each type of yarn and type of knitting. For your reference, recommended numbers are shown below.

TYPE OF YARN		thin ① ②		light ③ ④		medium ④ ⑤		thick ⑤ ⑥	
TENSION DIAL		7		5-7		3-5		1-3	
STITCH DIAL									
CAST-ON (every needle selection)	initial row	0	0	0	0	0	0	-	-
	subsequent rows	0	0	1	1	2	2	-	-
CAST-ON (every other needle selection)	initial row	-	-	0	0	0	0	0	0
	subsequent rows	-	-	0	0	0	0	2	2
DOUBLE RIB		0-1		1-2		3-4		-	
K1.P1. RIB		-		0-1		2-3		6-7	
K2.P2. RIB		-		2-3		3-4		6-7	
WIDE RIB *		-		3-4	5-6	4-5	6-7	6-7	8-9
TUBULAR KNITTING *		2-3	4-5	4-5	6-7	5-6	7-8	-	

\*Set the Ribber Stitch Dial two full numbers higher than that of the Knitter.



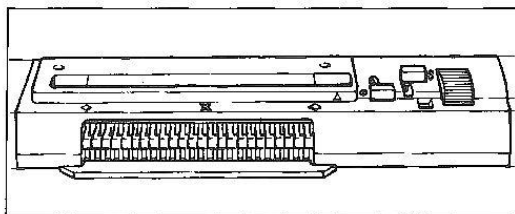
When knitting with thin or light yarns or in tuck ribs with Punch Card, use Close Knit Bar.

Before arranging needles, place Close Knit Bar "A" between Sinker Posts "B" and front edge "C" of Knitter Needle Bed.

# CAST-ON AND KNITTING

Following the Operation Table, cast-on and knit K1,P1. Rib using medium type of yarn.

① 1	● ● ^ ● ●	⇐ 0 0	⇐ 1	⇐ 1	⇐ P	⇐ 5		
2								→
3								
4								⇐
5		⊖						⇐
6		^						⇐
②						3 3	1	⇐



## CAST-ON

① —1 Set machine controls for the initial row.

### PATTERN PANEL

Punch Card not in use.

Stop Knob.....●

### KNITTER CARRIAGE

Side Levers (left & right).....●

Cam Lever.....^

### RIBBER ARM

Auxiliary Yarn Feeder Lever.....●

Driving Lever.....resting position

### STITCH DIALS

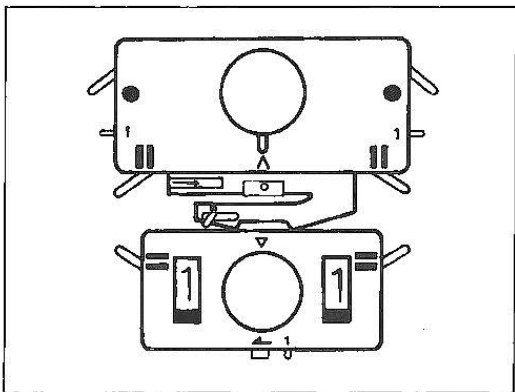
Knitter & Ribber.....0

### RIBBER CARRIAGE

Set Levers (left & right).....1

Pick Knob.....⇐

Auto-set Lever.....1

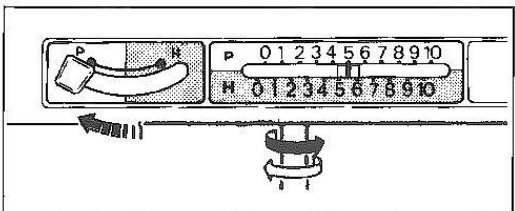


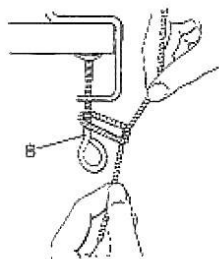
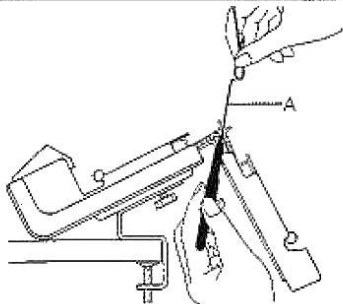
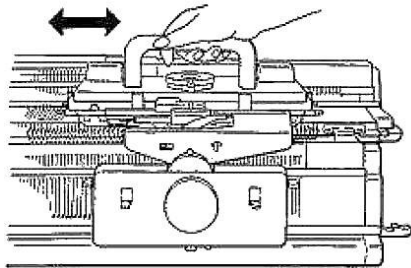
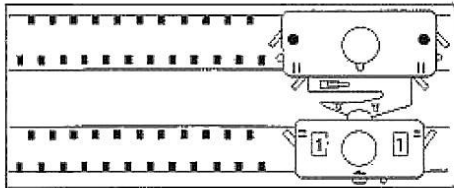
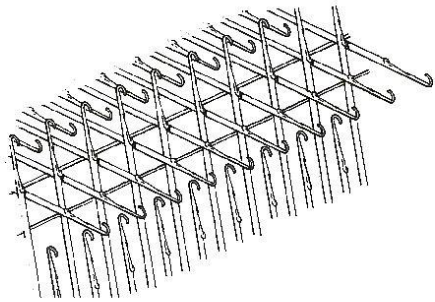
### RIBBER NEEDLE BED

Pile Levers (left & right).....↑

Half-Pitch Lever.....P

Swing Indicator.....5





**1—2 Arrange needles for knitting the initial row.**

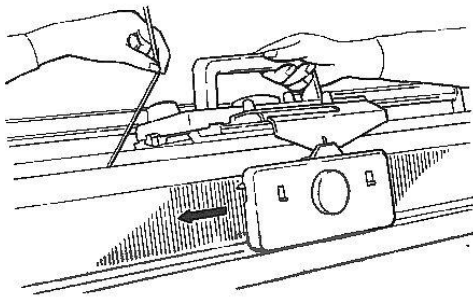
1. Arrange needles of both beds for cast-on.
- (1) Using 1/1 Needle Pusher, bring 25 needles to D position on both sides of centre(O) of Knitter Needle Bed. (Alternate needles.)
- (2) Bring ribber needles to D position, alternating them with needles of Knitter.

- (3) Move Carriage 1—2 times carefully across needles in D position and leave it at right side. (Needles in D position will be aligned in B position on both beds.)

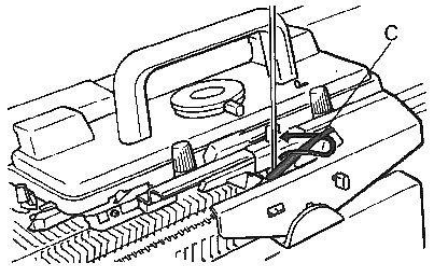
**2. Thread yarn into Yarn Feeder.**

- (1) After threading yarn through Auto-Tension, make a loop at the end of yarn.
- (2) Insert Hook Tool "A" between Knitter and Ribber beds, from underneath, catch yarn end, and pull it down.

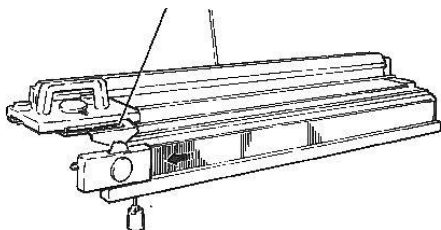
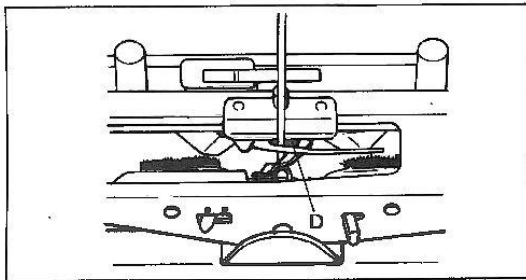
- (3) Hold yarn end and tie it around left Clamp Screw Grip "B".



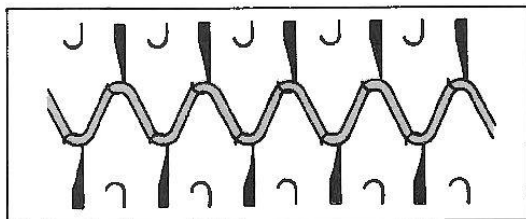
(4) Move Carriage from right to left till yarn goes into Yarn Feeder.



(5) Guide yarn along Yarn Guide "C" to thread it into Main Yarn Feeder "D".



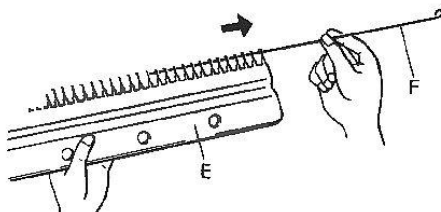
Move Carriage to left end of Needle Bed.



3. Knit the initial row.

Take up slack of yarn and move Carriage from the left to the right.

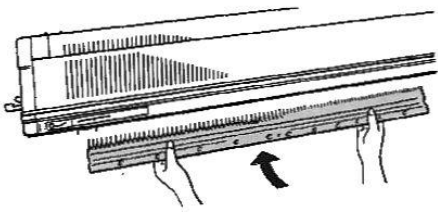
Yarn will be hooked alternately on Knitter and Ribber needles.



① —3 Suspend Cast-on Comb with Weights.

1. Suspend Cast-on Comb.

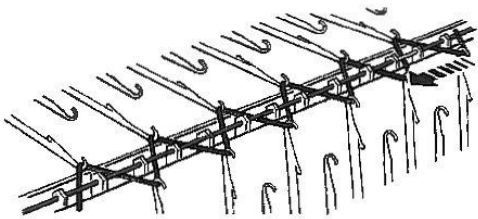
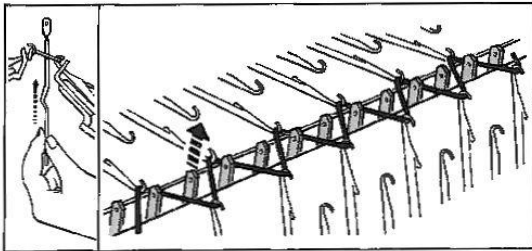
(1) Take out short Cast-on Comb "E" and remove wire "F" from its teeth.



(2) From underneath, insert Comb between Knitter and Ribber Bed, then push it carefully upwards until teeth clear zig-zagged yarn.

Hang Comb so that it is balanced horizontally between working needles.

*Make sure the yarn is centralized on the comb, or the knitting will be incorrectly weighted.*

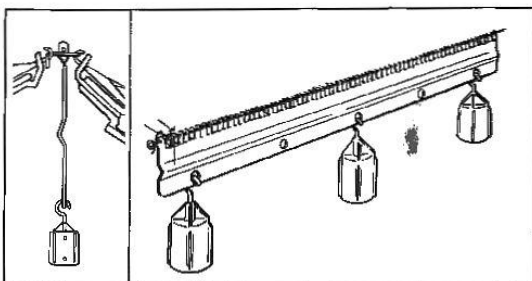


(3) Insert Wire through holes of Cast-on Comb teeth.

Hang Cast-on Comb as shown below.

for alternate needle knitting.

for every needle knitting.



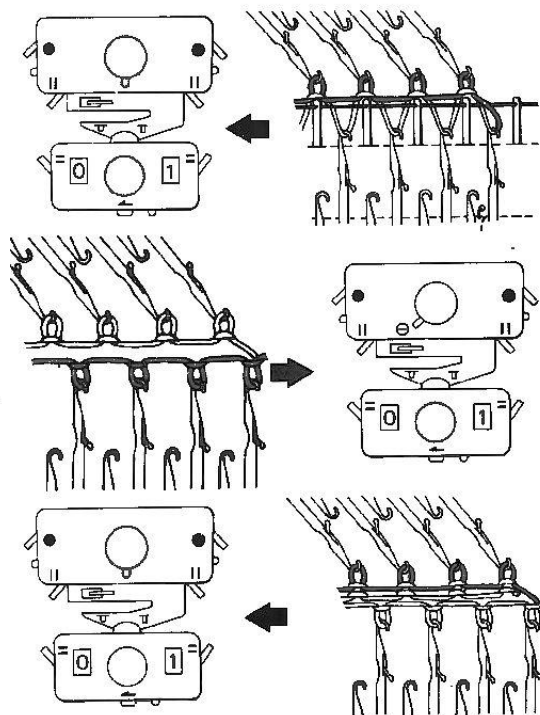
2. Hook Weights.

Use two Ribber Weights (large) and hook them onto left and right sides of Cast-on Comb.

For your reference use up to

- 80 needles 2 Weights
- 120 needles 3 Weights
- 160 needles 4 Weights
- 200 needles 5 Weights

*Hook Weights at even intervals.*



① — 4 ~ 5 Change machine controls for knitting subsequent 3 rows.

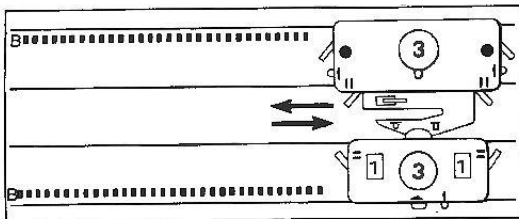
— 4 Set left Set Lever to "0" and move Carriage from the right to the left. (Knitter needles only will knit.)

— 5 Set Knitter Cam Lever to "⊖" and return Carriage to the right. (Ribber needles only will knit.)

— 6 Re-set Knitter Cam Lever to "∧" and move Carriage once more from the right to the left. (Knitter needles only will knit.)

CAST-ON IS COMPLETED.

Remove yarn end from Clamp.



② Main knitting

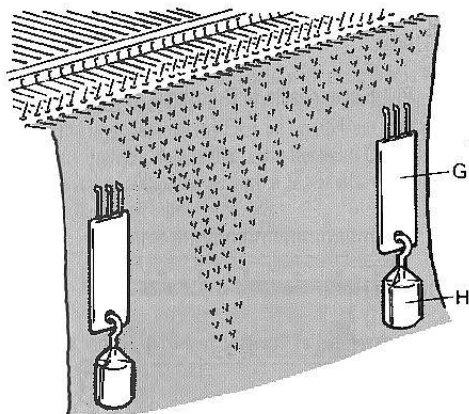
Re-set machine controls for working main knitting. (Needle arrangement for main knitting is the same as for cast-on.)

1. Change Carriage settings.

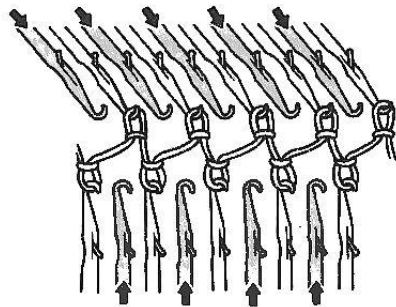
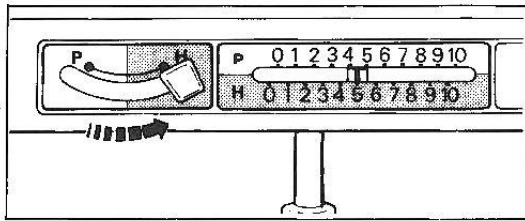
Set Lever (left)..... 1  
 Stitch Dial (Knitter & Ribber)..... 3  
 Other settings are unchanged.

2. Knit several rows of K1. P1. Rib and hang Hanger Comb "G" with Edge Weight "H" on both sides of the fabric.

After approx. 10 rows are knitted, move Hanger Comb up in order to obtain better results.



\* If the Cast-on Comb reaches the floor, remove the Weights from the Comb, roll the fabric up with the Comb, and hook Weights again.

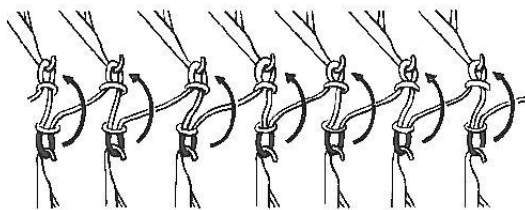
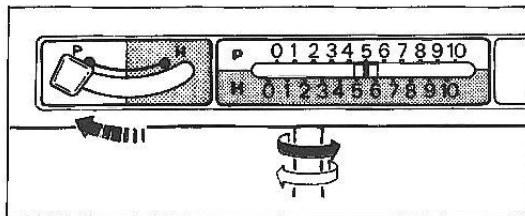


For practice, continue to knit DOUBLE RIB following instructions below.

1. Set Half-Pitch Lever to H.

2. Push empty Knitter and Ribber needles to B position.

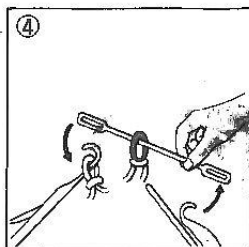
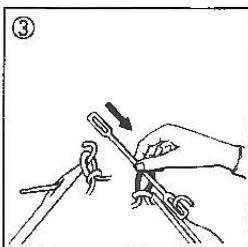
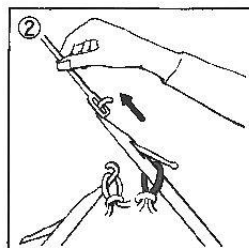
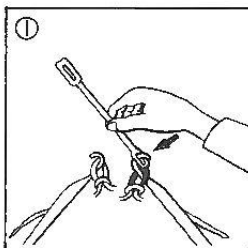
3. Knit 15 rows.



For practice, continue to knit only on the Knitter following instructions below.

1. Set Half-Pitch Lever to P.

2. Transfer every Ribber stitch to the corresponding Knitter needle using Double-eye Transfer Tool.

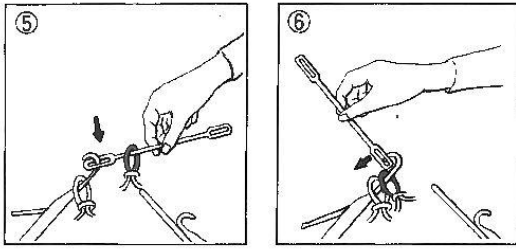


① Place eye of Double-eye Transfer Tool into Ribber needle hook.

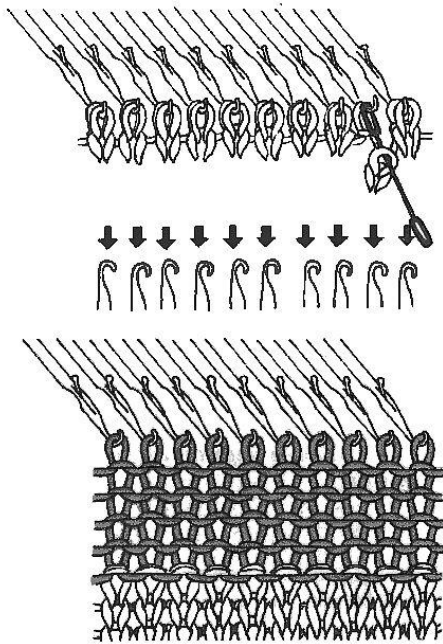
② Pull Ribber needle to D position.

③ Push Ribber needle to A position.

④ Remove eye of Transfer Tool from Ribber needle hook.



- ⑤ Place opposite eye into Knitter needle hook.
- ⑥ Tilt Transfer Tool until stitch slides into Knitter needle hook. Remove Transfer Tool. Push needle in B position slightly towards A position to ensure that transferred stitch lies correctly in needle hook.

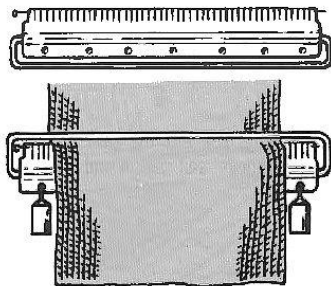


- 3. Push every Ribber needle in B position to A position.
- 4. Disconnect Ribber Carriage from the Arm and rest Ribber Bed in the lowest position.
- 5. Exchange Ribber Arm for Knitter Arm and thread yarn into Feeder ①. Continue to knit.

## Useful Optional Accessories

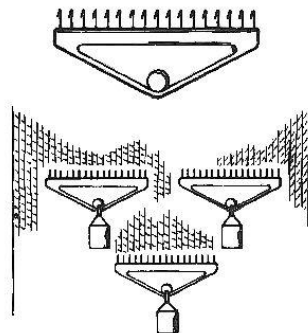
### Cast-on Hanger Comb

This 140-needle wide Cast-on Comb with cross bar is for use in place of the Ribber Cast-on Comb. When the Hanger Comb reaches the floor, remove the Cast-on Comb from the fabric by pulling out the wire. Insert the fabric between Comb and Bar as shown below. Also comes with a 50-needle wide Cast-on Comb for narrower fabrics.



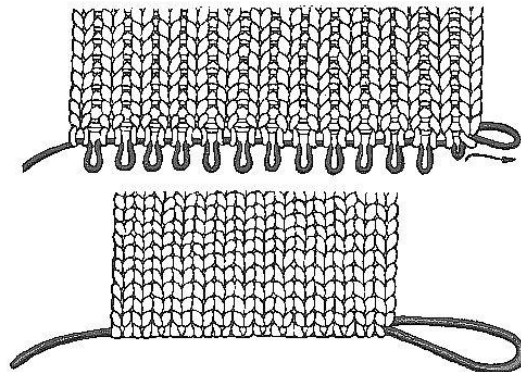
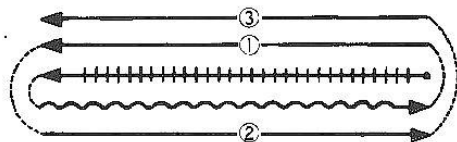
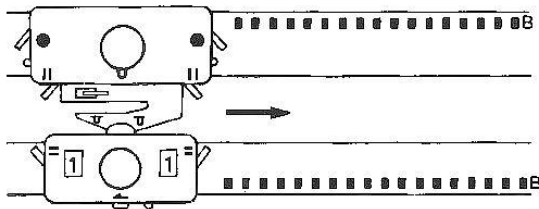
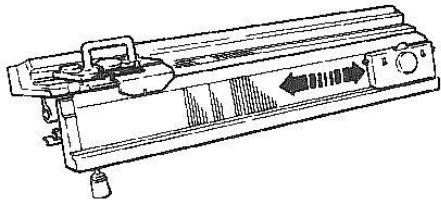
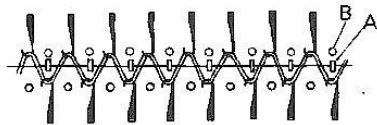
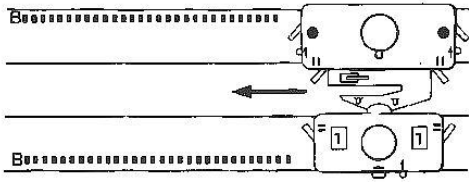
### Hanger Comb Set

Consists of three separate hanger combs for use with the ribber edge weights. Each comb covers 38-needle wide fabric and they can be used singly or all together. Weight Set (Hanger Comb with three small weights) is also available.





## CAST-ON FOR TIGHTER EDGE



To make the cast-on edge of fabric tighter, when knitting with thin yarn, work the initial row following the procedure given below.

\* Insert Close Knit Bar referring to page 15.

- ① — 1 Set machine controls for the initial row as instructed in the Operation Table.
- 2 Arrange the needles and knit the initial row from the right to the left.
- 3 Suspend Cast-on Comb with Weights.

*Insert Cast-on Comb so that its teeth "A" are in line with knitter Sinker Posts "B" as illustrated.*

\* Disconnect the Ribber Carriage from Arm and move it twice across the needles to drop stitches on Ribber needles.

*If Cast-on Comb is suspended incorrectly, it will drop onto the floor.*

\* Connect Ribber Carriage with Arm and knit one row with the same Carriage settings.

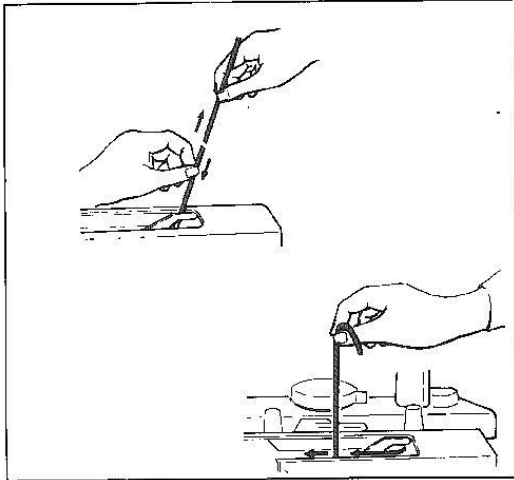
- ① — 4 ~ 6

As required in Operation Table, knit subsequent 3 rows.  
CAST-ON FOR TIGHTER EDGE IS COMPLETED.

\* When the garment has been completed, pull the yarn of the initial row from the opposite side to the yarn end. This will hold the cast-on edge tight during steaming.

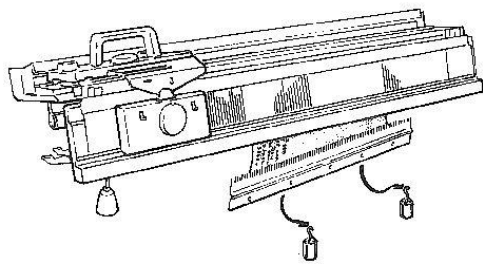
After steaming, pull out the yarn completely in the same direction as above, and sew in end.

## REMOVE THE FABRIC FROM THE MACHINE

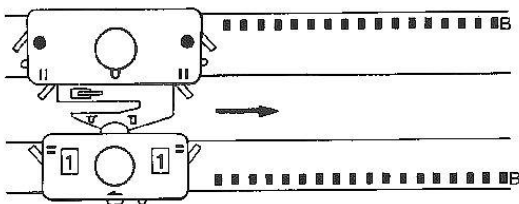


1. Cut yarn above Yarn Feeder.

2. Remove yarn from Yarn Feeder and drop yarn end between Knitter and Ribber Sinker Posts.

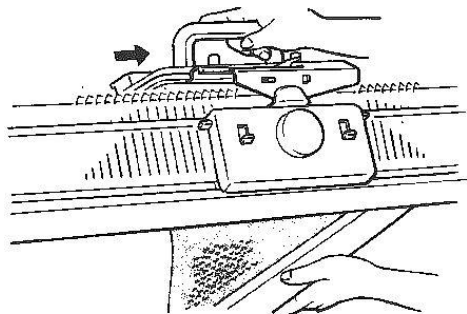


3. Remove Weights from Cast-on Comb.



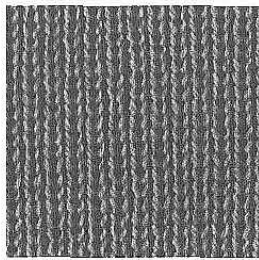
4. Change Carriage settings as follows.

Cam Lever..... **A**  
 Set Levers..... **1**  
 Russel Levers..... **II =**



5. Holding Cast-on Comb, move Carriage once across needles.  
 The stitches are released from needles.

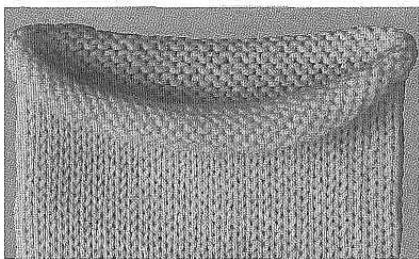




## DOUBLE RIB

The fabric is similar to the K1.P1. Rib fabric, but knitted with every needle on the Knitter and the Ribber.  
This method is used for thin yarns.  
Use Close Knit Bar. (refer to page 15.)

	08 05 04 03 02 01																				
① 1	●	●	Λ	●	●	▬	0	0	1	←	1	1	↑	H	5						
2																→					
3																					
4									0											←	
5			⊖																		→
6			Λ																		←
②									1												→



## TUBULAR KNITTING

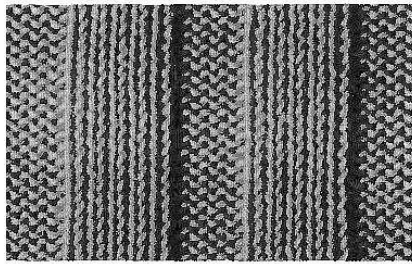
As you move Carriage back and forth, Knitter Carriage and Ribber Carriage knit alternately.  
This is mainly used for waste knitting.  
The sample is knitted using medium yarn.  
Set the Ribber Stitch Dial 2 numbers looser than that of the Knitter.

	08 05 04 03 02 01																				
① 1	●	●	Λ	●	●	▬	0	0	1	←	1	1	↑	H	5						
2																→*					
3																					
②			▽	⊖					6	8	0					P					→**

\* Knit with Ravel Cord, or waste yarn when using a lot of needles.

\*\* When moving Carriage from left to right, knit bringing four to five needles at both ends of Ribber to D position, or push all needles of Ribber to C position using P Carriage (without P Presser).





## WIDE RIB

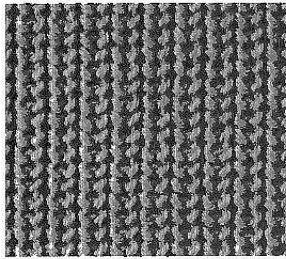
This section shows the method required for knitting more than K3.P3. stitches aligned alternately. (K5.P5. rib is shown as an example.)

Two methods for wide rib are shown below.—

One is for using medium yarn (Operation Table "A") and the other is for thick yarn. (Operation Table "B")

A												
①	1	● ● Λ ● ●	⇒	○ ○	□	←	1	□	↑	H	5	
	2											→
	3											
	4						4	6	□			←
	5			⊖								→
	6			Λ								←
	7											*
②												⇔
B												
①	1	● ● Λ ● ●	⇒	○ ○	□	←	1	□	↑	P	5	
	2											→
	3											
	4						6	8	□			←
	5			⊖								→
	6			Λ								←
	7											*
②							1					⇔

\* One end needle on the Knitter and on the Ribber must be in B position. This may change the needle arrangement, but it is essential.

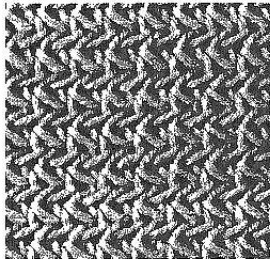


## ENGLISH RIB

This rib has a tuck pattern on Knitter side. It can be knitted in K1.P1. Rib, or in double rib.

The sample is knitted in K1.P1. Rib using medium yarn.

① 1	● ● Λ ● ●		0	0			1		↑	P	5							
2														→				
3																		
4						2												←
5			⊖															→
6			Λ															←
②			∧	▼			4	4										↔

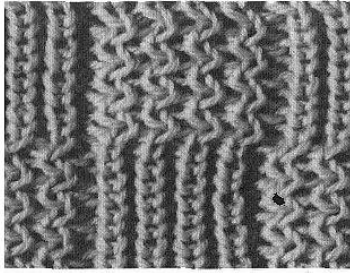


## SWUNG ENGLISH RIB

This rib has a tuck pattern on Knitter side with a 2-pitch swing in K1.P1. Rib or 1-pitch swing in double rib.

The sample is knitted in K1.P1. Rib using medium yarn.

① 1	● ● Λ ● ●		0	0			1		↑	P	5							
2														→				
3																		
4						2												←
5			⊖															→
6			Λ															←
② 1			∧	▼			4	4									5	↔)2
2																	7	↔)2



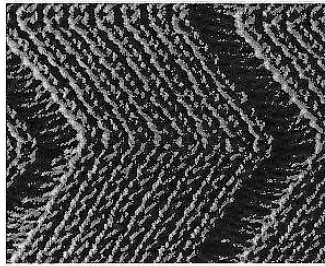
## VARIATION OF ENGLISH RIB

The fabric combines English Rib and Swung English Rib by using the needle arrangement shown in the operation table below.

The sample is knitted using medium yarn.

①	1	●	●	Λ	●	●	⇌	0	0	□	←	1	□	↑	P	5		
	2														→			
	3																	
	4									2	□							←←
	5			Θ														→→
	6			Λ														←←
	7																	
②	1			∩	▼				4	4	□				H	5	→→→→→ 16	
																6	→→→→→ 16	
	2															7	→→→→→ 16	
																6	→→→→→ 16	



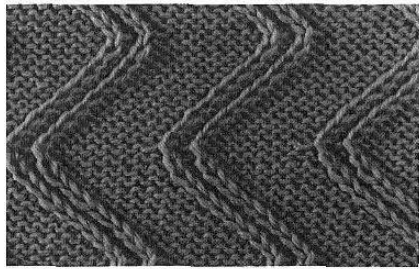


## HERRINGBONE SWING

This fabric combines tuck stitch with swing operation of Ribber.  
The sample is a variation of double rib using thin yarn.

		08 05 04 03 02 01 A																
①	1	●	●	Λ	●	●	▬	0	0	1	←	1	1	↑	H	5		
	2															→		
	3																	
	4								2	0								←
	5			⊖														→
	6			Λ														←
	7																	
②	1			∧	▼				2	1								5 →
																		6 ←
	2																	6 →
																		5 ←

*Note: Swing Ribber by 2 pitches for K1.P1. rib and 1 pitch for double rib.  
Repeat swinging back and forth for the desired number of rows, then change the direction of swinging.*



## VARIATION SWING

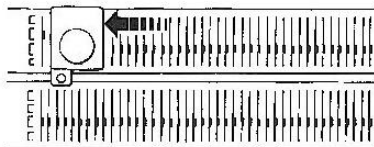
While Knitter Carriage knits in stockinet, Ribber Carriage knits with selected needles making ridges. By swinging Ribber, these ridges make various swung patterns.

The sample is knitted using medium yarn.

①	1	● ● ▲ ● ●	→	0 0	1	← 1	1	↑	H	5	
	2										→
	3										
	4						2 4	0			←
	5		⊖								→
	6		▲								→
	7										
②							6	1			5 →
											4 ←
											3 →
											2 ←
											1 →
											0 ←
											1 →
											2 →
											5 →
											10 →
											6 →
											*)

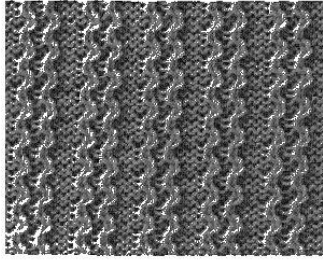
\*Knit swinging the Ribber by 1 pitch every row to the extreme right, and then to the extreme left, to make zigzag pattern.

Push 1 — 5 end needles to D position before knitting the next row.



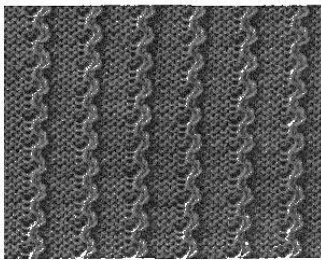
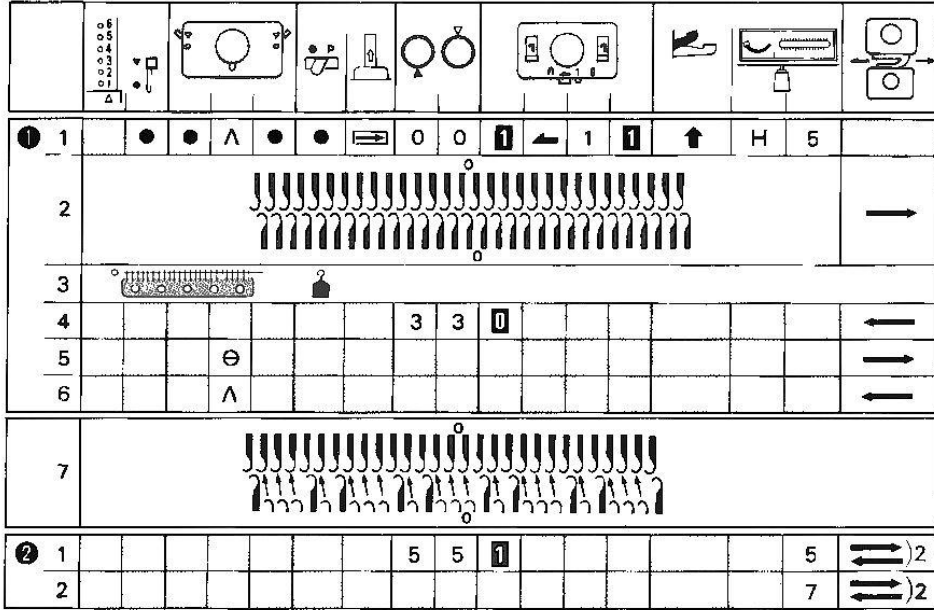
**If stitches tend to float...**

Knit pushing needles on Knitter to C position using P Carriage.

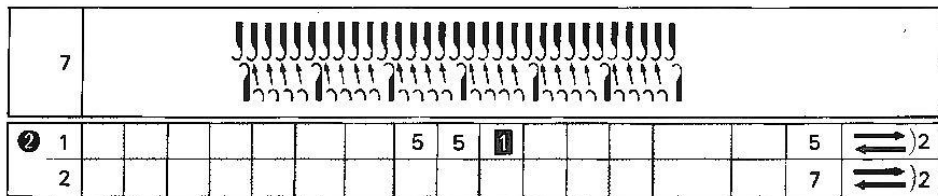


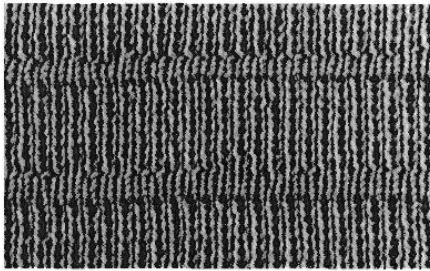
By changing the needle arrangement on the Ribber, a different effect is created.

Two samples shown below are knitted using medium yarn.



Knit in the same manner as for above ①— 1 ~ 6.  
At step 7, follow diagram below.





## PIN TUCK

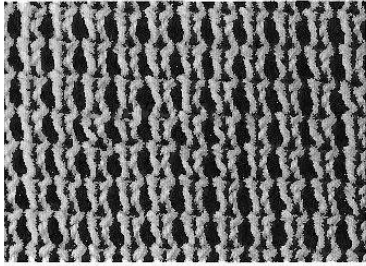
Using all needles on both beds (Double Rib needle arrangement) knit an extra 4—5 rows on the Ribber side.

The sample is knitted using thin yarn.

①	1	●	●	Λ	●	●	⇌	0	0	0	←	1	0	↑	H	5	
	2													→			
	3																
	4							2	0								→
	5			⊖													→
	6			Λ													→
②	1			Λ				2	3	1							→)10
	2			⊖													→)4
	3	Move Hanger Comb up.															

### **If stitches tend to float...**

Knit pushing needles on Ribber to C position using P Carriage.

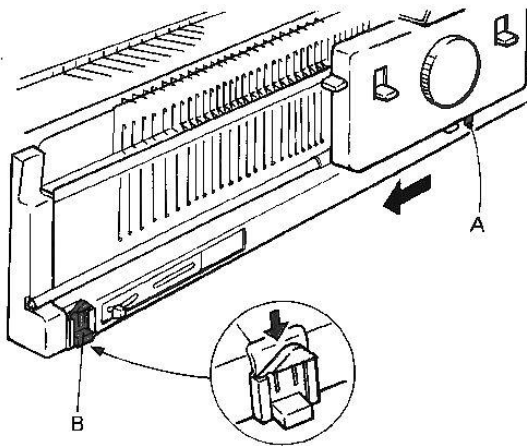


## PICK RIB

This rib tucks on the ribber, with the pattern showing on the knitter side of the fabric.

The sample is knitted in K1.P1. Rib using medium yarn.

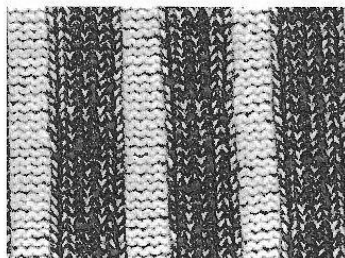
①	1	● ● Λ ● ●	⇒	0 0	1	←	1	↑	P	5
2										→
3										
4							0			←
5				⊖						→
6				Λ						→
7					4	4	1			→
8		Install Driving Cam.								
②	1						n			←
2							0			→)2
3							1			→



During main knitting, make sure the Carriage is moved to the extreme left, so the Auto-set Lever "A" is operated by the Driving Cam "B".

*Note: Be sure that Auto-set Lever is set to 1 before starting main knitting.*





## PLATING RIB

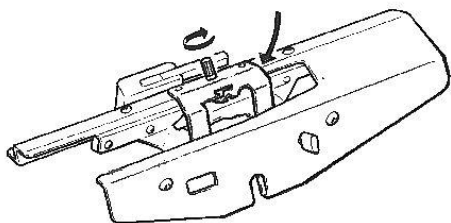
Plating Rib can be knitted by changing the Main Yarn Feeder for the Plating Yarn Feeder.

Suitable needle arrangements for plating rib include K2, P2, and wide ribs. Using these needle arrangements allows both colours of yarn to show on both sides of the fabric. Both yarns are knitted on every working needle, so use two thin yarns.

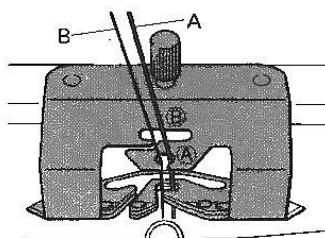
*Use thinner yarns.*

①	1	● ●	Λ ● ●	● ●	0 0	1	1	1	↑	P	5
	2										→
	3										
	4				3 3	0					←
	5		⊖								→
	6		Λ								→
	7										*
②					6 6	1					→

\* Rearrange needles as shown and thread both Yarn Feeders respectively.

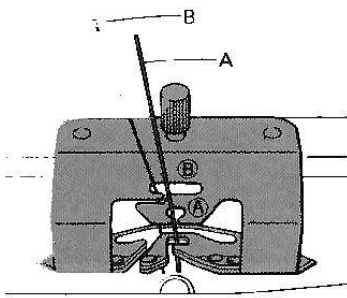


Exchange Main Yarn Feeder for Plating Yarn Feeder.



- ① — 1 Set machine controls as shown.  
Thread main yarn "A" and plating yarn "B" into Yarn Feeder (A) for the cast-on in K1,P1, rib. Do not thread any yarn into Yarn Feeder (B) when working the cast-on.

— 2~6 Cast-on following the Operation Table.



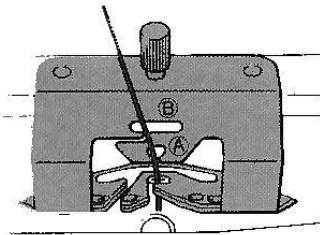
— 7 Rearrange needles for main knitting by transferring stitches.

Thread plating yarn into Yarn Feeder (B).

\* Main yarn "A" in Yarn Feeder (A) will appear on the plain side of the knitting.

\* Plating yarn "B" in Yarn Feeder (B) will appear on the purl side of the knitting.

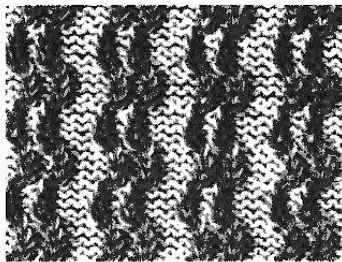
② Knit following the Operation Table.



To cast-on with every needle selection, thread one yarn into Yarn Feeder (A). Thread second yarn into Yarn Feeder (B) when cast-on is complete, but before beginning main knitting.

*Do not cross the yarns between Auto-Tension and Yarn Feeders.*

*If threading yarn is difficult, depress Drop Levers once and restore the Ribber after threading.*



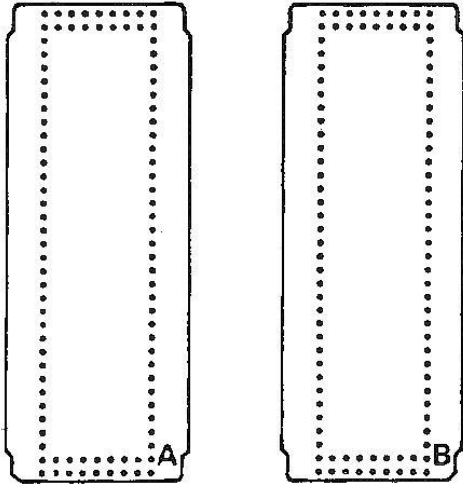
With a different needle arrangement and swinging on the Ribber, different effect is created.

\* Swing Ribber back and forth by 2 pitches every 4 rows.

	5 4 3 2 1									
① 1	● ●	Λ	● ●	⇒	0 0		1		↑	H 5
2										→
3										
4					3 3					←
5		⊖								→
6		Λ								←
7										
②					6 6					↔



## ● Rib stitches using Punch Card



### STANDARD PUNCH CARDS FOR RIB KNITTING

10 Punch Cards No.1 (R-2) ~ No.10 (R-2) are supplied.

Each Punch Card can be used in two ways and is marked "A" and "B".

Instructions for setting the Punch Card are given in Instruction Book of Knitter (Operation Manual).

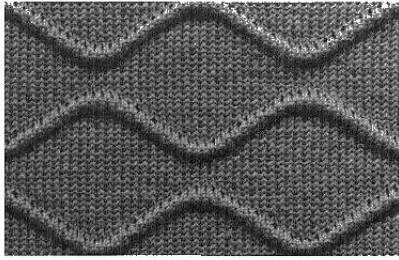
Card No.	A	B	C	D	E	F
No.1 (R-2)				○		
No.2 (R-2)				○		
No.3 (R-2)				○		
No.4 (R-2)				○		
No.5 (R-2)				○		
No.6 (R-2)				○		
No.7 (R-2)					○	○
No.8 (R-2)					○	○
No.9 (R-2)	○				○	○
No.10 (R-2)	○				○	○

With Punch Cards, the following patterns can be knitted.

- A — PUNCH PIN TUCK
- B — PUNCH TUCK RIB
- C — TUCK RIB STITCH
- D — DRIVE LACE
- E — MESH KNITTING
- F — PILE RIB

No.1					○	
No.2		○	○			
No.4		○	○			
No.7		○	○			
No.9		○	○			
No.10		○	○		○	
No.12		○	○			
No.13					○	
No.17					○	

The Knitter Punch Cards shown opposite can be used for rib stitches.



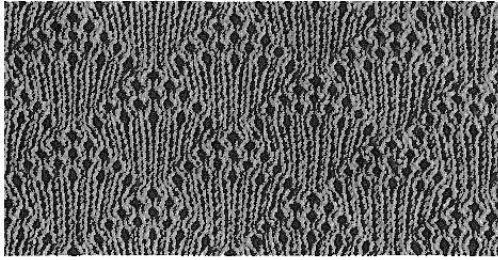
## PUNCH PIN TUCK

This fabric is a variation of Pin Tuck using Punch Card.

Use Close Knit Bar referring to page 15.

The sample is knitted using Punch Card No.9 (R-2)-A with light yarn.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



## PUNCH TUCK RIB

Tuck stitch pattern using a Punch Card knitted over the Double Rib stitch.

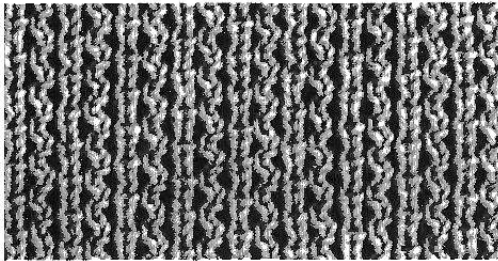
Use Close Knit Bar referring to page 15.

The sample is knitted using a light yarn with the Knitter Punch Card No.10-A.

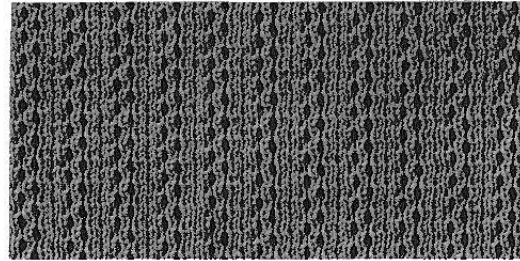
	0 1 2 3 4 5						0	0			1			H	5		
1																	
2																→	
3																	
4							1	3									←
5				⊖													→
6				∧													→
7		1~	▼	▼	∧	▼			3								→

Card Nos.2, 4, 7, 9 and 12 of the Knitter Punch Cards can be used in the same manner as above.

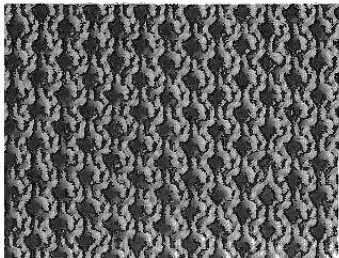
No.2 — A



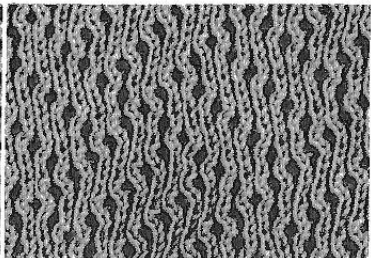
No.4 — A



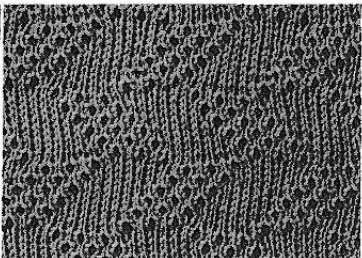
No.7 — A



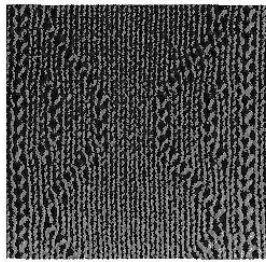
No.9 — A



No.12 — A

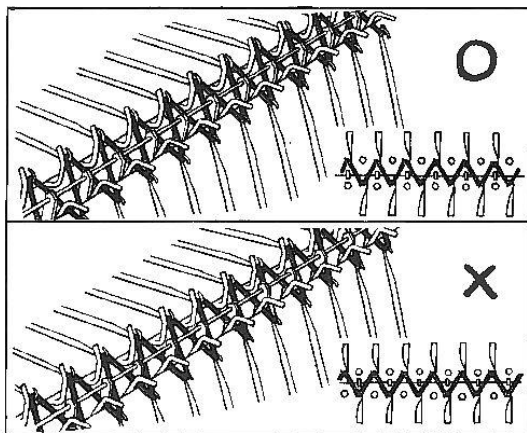
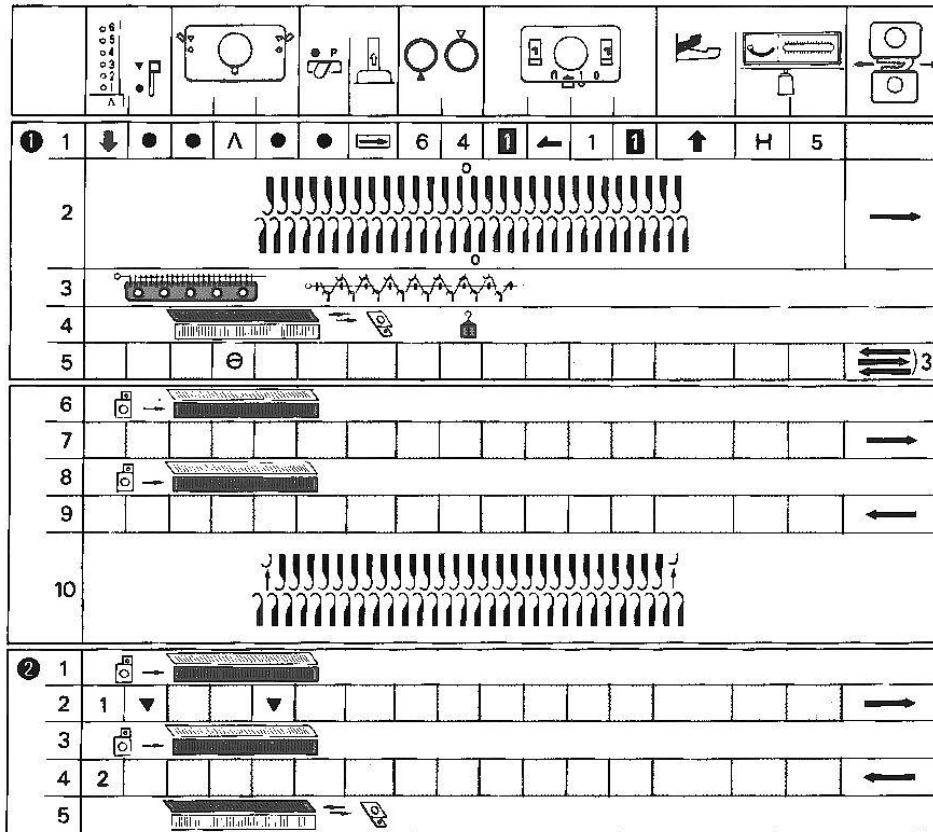




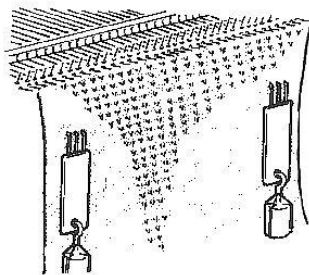
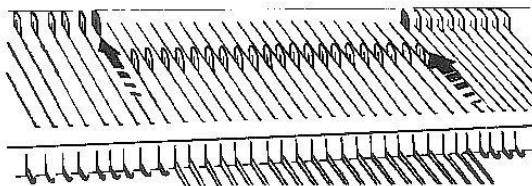
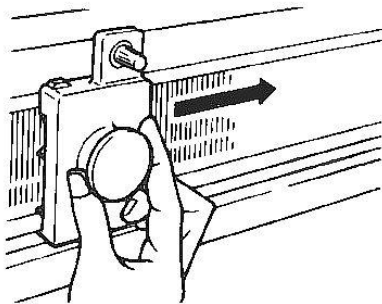
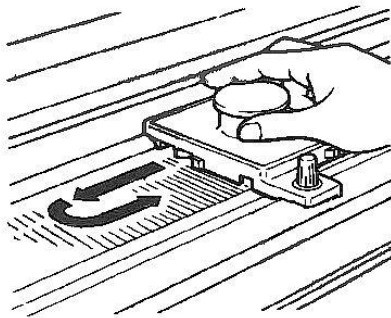


## DRIVE LACE

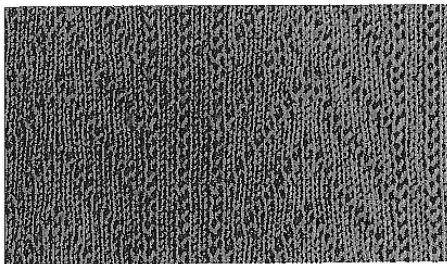
Use the same needle arrangement as for Double Rib. Knitter needles, selected by the punch card hold the yarn. These loops are released from the needles with the P Carriage, and form the lace pattern. The ribber needles knit every stitch every row. Light yarn is suitable for this type of knitting. The sample is knitted with Punch Card No. 1 (R-2)-A.



- ① — 1 Set machine controls as shown.  
*Set Stitch Dials to the same as for main knitting.*
- 2 Arrange needles as shown and knit from the left to the right with waste yarn.
- 3 When suspending Cast-on Comb (without weights), insert it so that its teeth face Ribber Sinker Posts as illustrated.



No.2 (R-2) -A



- 4 Place P Carriage (without P Presser) on the right side of Knitter Needle Bed (refer to page 12). Move P Carriage to the left and back again so that stitches are removed and the needles align in B position again.
- 5 Set Cam Lever to SLIP (S. ⊖) and knit 3 rows with waste yarn. (only the ribber needles will knit.)
- 6 Place P Carriage on the left side of Ribber Needle Bed (refer to page 12), and slide it to the right to push up needles to C position.
- 7 Exchange waste yarn for main yarn in Yarn Feeder and knit from the left to the right.
- 8 Using P Carriage on Ribber, bring needles to C position.
- 9 Knit from the right to the left.
- 10 Push both end needles on Knitter to A position.

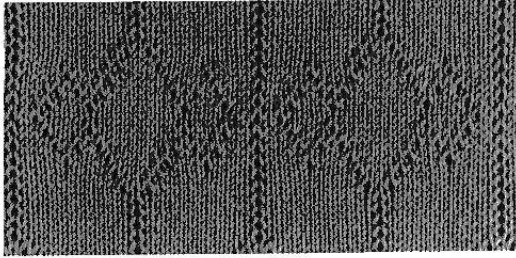
- ② — 1 Using P Carriage on Ribber, bring needles to C position.
- 2 Set Stop Knob to ▼ and right Side Lever to ▼, then knit 1 row from the left to the right. (On Ribber, all the needles in C position knit, and on Knitter, selected needles hold a loop of yarn.)
- 3 Push up Ribber needles to C position using P Carriage.
- 4 Knit one row from the right to the left.
- 5 Remove stitches on Knitter using P Carriage.

Repeat ② — 1 ~ 5 for main knitting.

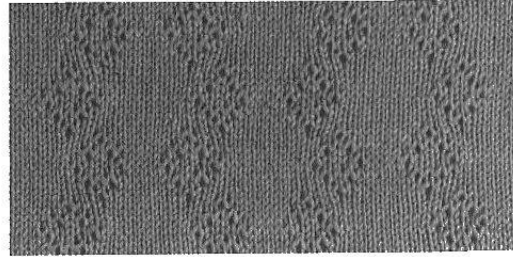
Suspend Hanger Combs with Weights after 10 rows and move them up every 10 rows.

The following samples can be knitted in the same way as above.

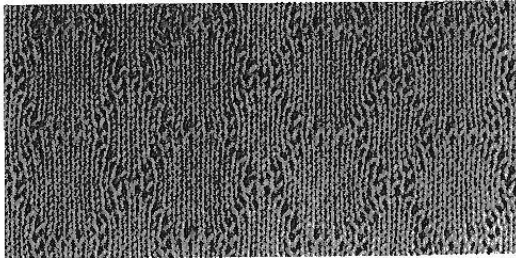
No.3 (R-2) -A



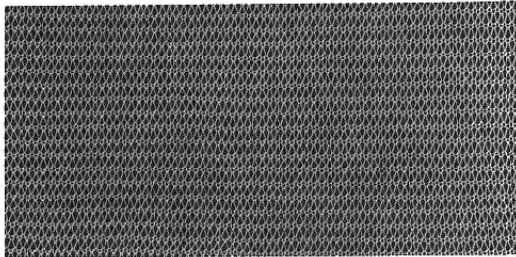
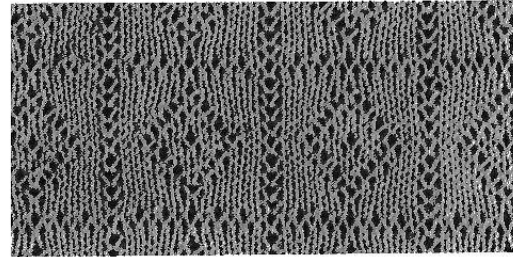
No.4 (R-2) -A



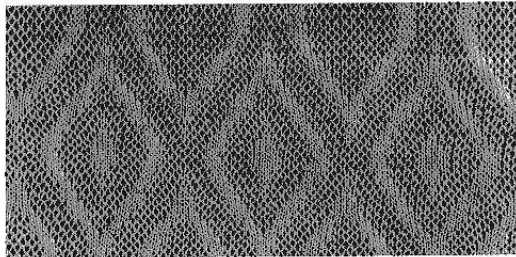
No.5 (R-2) -A



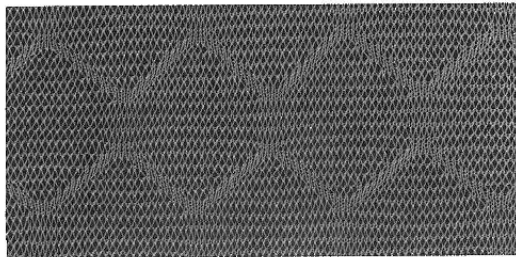
No.6 (R-2) -A



No.7 (R-2) -A



No.9 (R-2) -A



### MESH KNITTING

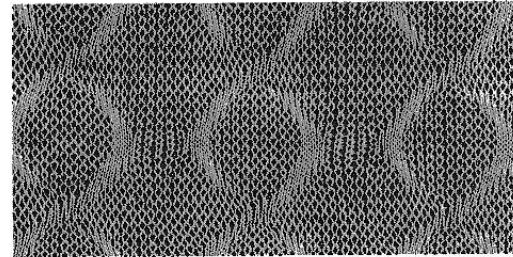
Mesh knitting is worked in the same manner as for drive lace knitting using thin yarn.

The sample on left is knitted without Punch Card.

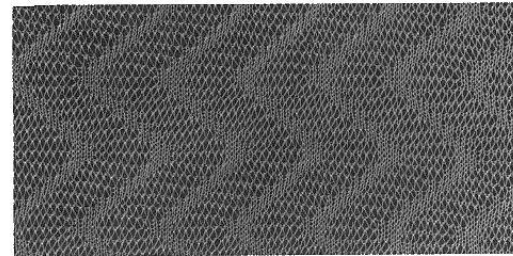
The samples below are knitted with Punch Cards.

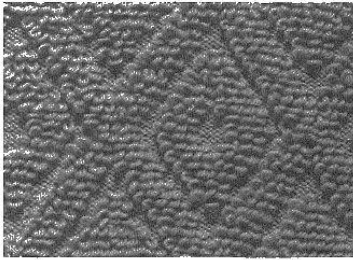
*When pressing, slide the iron from top to bottom of the fabric, not from side to side.*

No.8 (R-2) -A



No.10 (R-2) -A

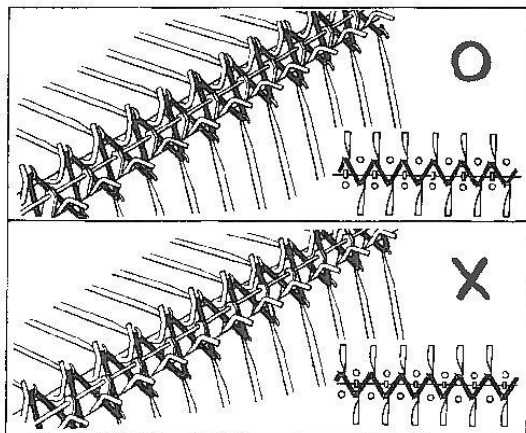
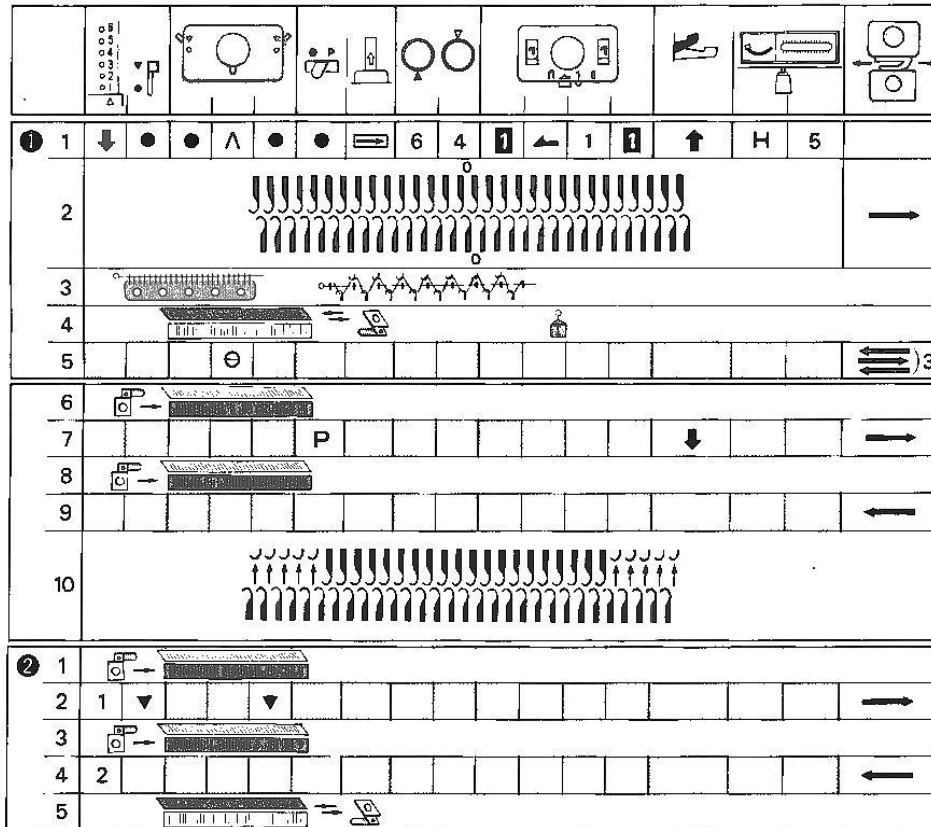




## PILE KNITTING

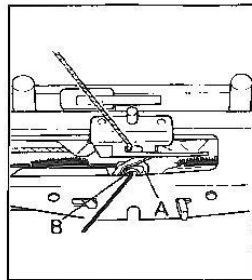
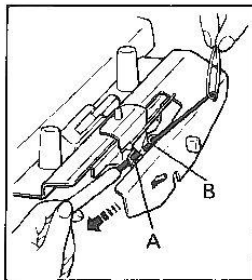
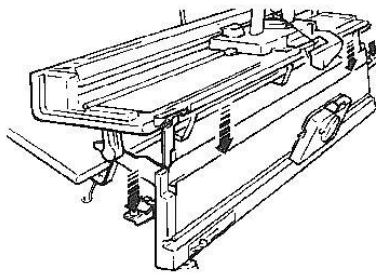
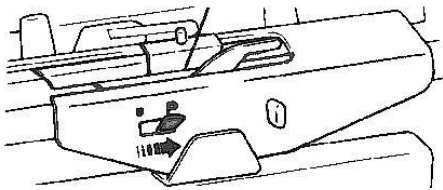
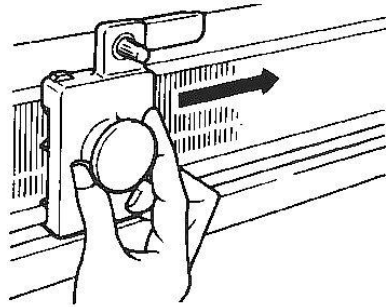
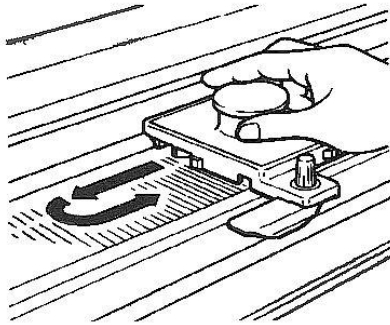
The stitches in this fabric are formed using both ground yarn and pile yarn. Knit using pile yarn only on Knitter and both yarns on Ribber, removing loops on knitter every two rows.

The sample is knitted with Punch Card No. 7 (R-2)-A using thin yarn (ground yarn) and light yarn (pile yarn).



- ① — 1 Set machine controls as instructed.  
*Set Stitch Dial to the same number as for main knitting.*
- 2 Arrange needles as shown and knit from the left to the right with waste yarn.
- 3 When suspending Cast-on Comb, insert it so that its teeth face Ribber Sinker Posts as illustrated.





① — 4 Place P Carriage with P Presser attached on the right side of Knitter Needle Bed (refer to page 12). Move P Carriage to the left and back again so that stitches on knitter are removed and the needles are aligned in B position again.

— 5 Set Cam Lever to SLIP (S, ⊖) and knit 3 rows with waste yarn.

— 6 Place P Carriage on the left side of Ribber Needle Bed (refer to page 12), and slide it to the right to push up needles to C position.

— 7 Exchange waste yarn for pile yarn in main Yarn Feeder. Set Auxiliary Yarn Feeder Lever to P (right) position, and thread ground yarn into Auxiliary Yarn Feeder following instructions below.

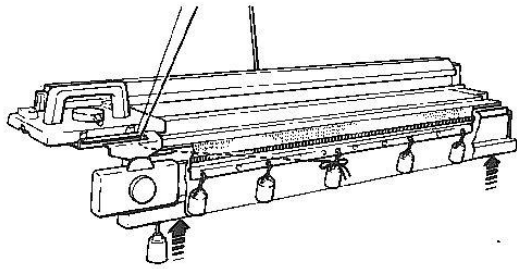
(1) Lower Ribber Needle Bed to the middle position by depressing Drop Lever (marked red) once.

(2) Thread ground yarn through Auto-Tension.

(3) Make a loop on yarn end and hold it above Auxiliary Yarn Feeder.

(4) Insert Hook Tool from underneath through Auxiliary Yarn Feeder "A" and Yarn Guide "B", then catch yarn loop.

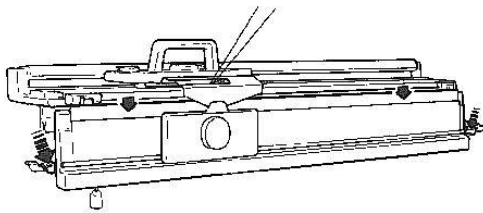
(5) Pull Hook Tool downwards threading yarn through Yarn Guide and Auxiliary Yarn Feeder.



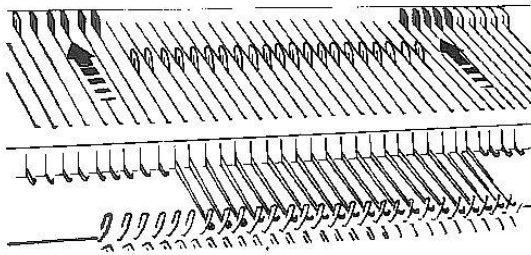
- (6) Tie yarn end to hook of Weight on Cast-on Comb.
- (7) Push up Ribber Needle Bed to its top position. Ensure Ribber needles are correctly lined up in B position.

**IMPORTANT:**

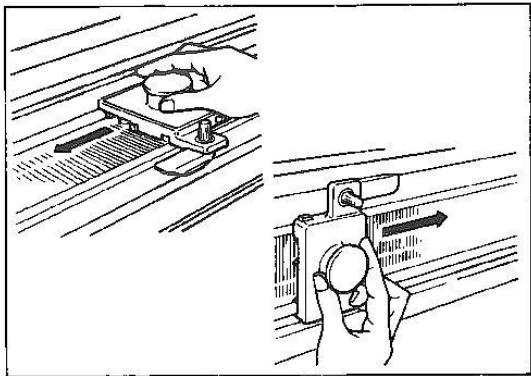
*Ensure Link Pin on Ribber Carriage is joined properly to Ribber Arm.*



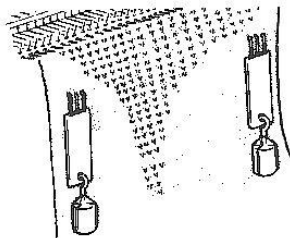
- (8) Depress both Pile Levers (marked blue) to widen space between Knitter and Ribber Needle Bed.
- (9) Knit from the left to the right.  
*If the yarn are loose, pull them back from below the Auto-Tension before moving Carriage.*



- 8 Bring Ribber needles to C position using P Carriage.
- 9 Knit from the right to the left.
- 10 On Knitter, push 5 needles back to A position at both sides of fabric to leave plain edges for seaming.



- ② — 1 Bring Ribber needles to C position using P Carriage.
- 2 Set Stop Knob to ▼ and right Side Lever to ▼, then knit from the left to the right.
- 3 Slide P Carriage on Ribber from the left to the right.

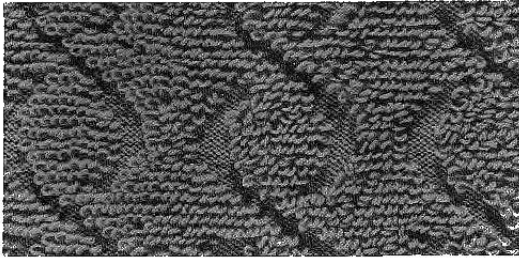


- 4 Knit 1 row from the right to the left.
- 5 Remove stitches on Knitter using P Carriage.

Repeat ② — 1 ~ 5 for main knitting.

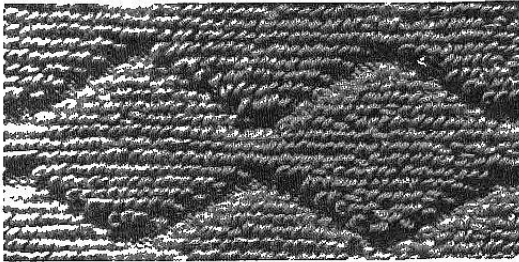
Suspend Hanger Combs with Weights after 10 rows and move them up every 10 rows.

No.8 (R-2) -A

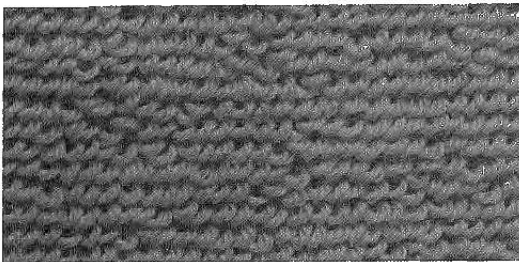
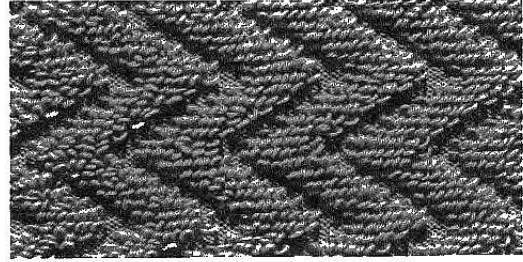


You can use Punch Cards below for Pile knitting.

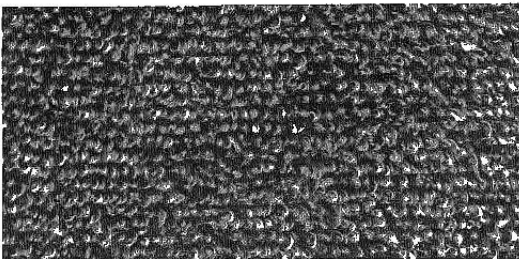
No.9 (R-2) -A



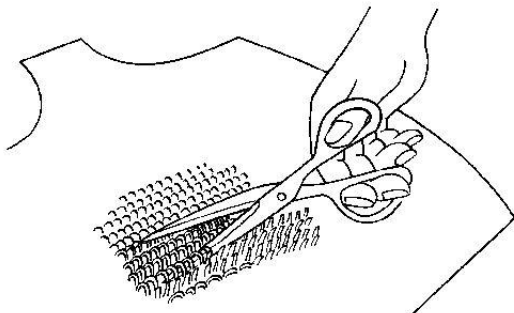
No.10 (R-2) -A



The sample on the left is knitted without a Punch Card.



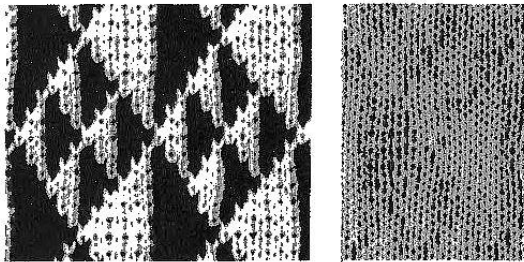
You can cut the loops of pile knitting if you wish.



To cut loops, spread fabric on a flat surface.  
Insert one scissor blade into centre of loops and cut open.  
Steam the surface of the fabric.  
DO NOT PRESS.

# ● Double Face Knitting with Automatic Yarn Changer

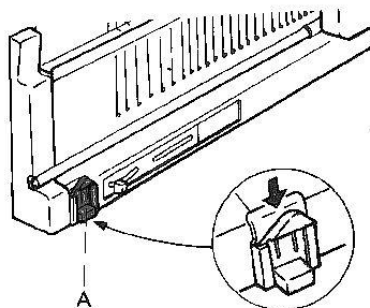
## (1) Using Punch Card for Double Jacquard



Double Jacquard without stripes on the back of fabric can be knitted by using the Auto-Set Lever

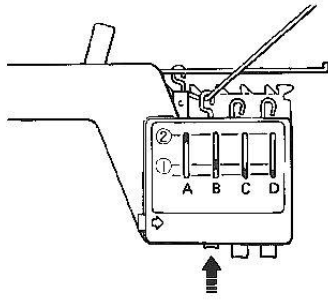
Use the Punch Cards for Double Jacquard.

	08 07 06 05 04 03 02 01 Δ	▽	A B C D	⊙ ⊙ ⊙ ⊙	Λ	●	⊞	0 0	7	←	1	1	↑	H	5	
① 1		●	⊙ ⊙ ⊙ ⊙		Λ	●	⊞	0 0	7	←	1	1	↑	H	5	
2																→
3																
4									1	1	0					←
5					⊞											→
6					Λ											→
7	↓				▽	▽			3	3	1					→
8	Hook contrast yarn on Holder B. Install Driving Cam.															
② 1	①	▽	②	①			⊞						1*			→
2	②	③	①	②									0			→
3	④		②	①									1			→

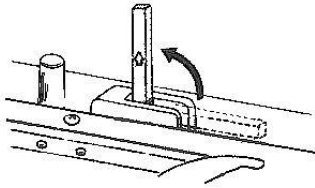


- ① — 1 ~ 6 Set machine controls, arrange the needles as instructed, and work cast-on.
- 7 Insert Punch Card and lock. Change machine controls and knit 1 row from the left to the right.
- 8 Hook contrast yarn on Holder B. Insert Driving Cam "A" into the position.

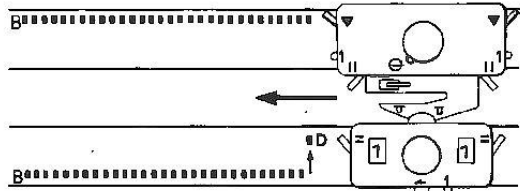
**Note:** Make sure Auto-set Levers is set to 1 before starting main knitting.



- ② — 1 Set Stop Knob to ▼.  
 Bring Holder A to ② position and Holder B to ① position.  
 Set Cam Lever to SLIP (S, ⊖).

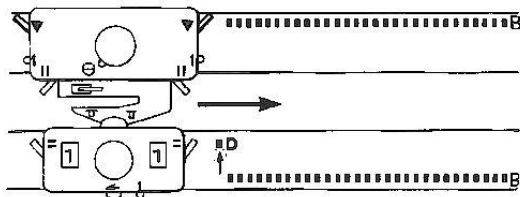


Set Driving Lever to the upright position.



Bring one end needle of Ribber on Carriage side to D position.  
 Knit 1 row from the right to the left.

*Be sure to move the Carriage to the extreme left until Auto-set Lever is operated by Driving Cam. Make sure that the Driving Lever operates Feeding Lever, and the yarn in the Main Yarn Feeder is exchanged for the yarn in Holder B.*



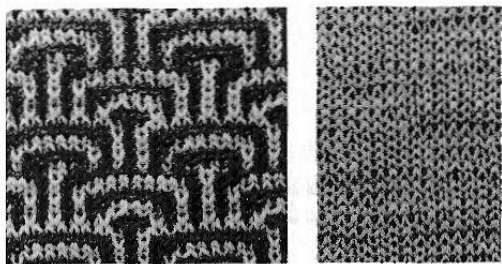
- 2 ~ 3 Pushing the end Carriage side Ribber needle to D position, continue to knit.

The operation of Auto-set Lever in Double Face knitting is as follows:—

- Set Lever "1".....Main yarn is knitted.  
 Set Lever "0".....Contrast yarn is knitted.

If you set the Lever at "0" on Operation Table ② — 1, contrast colour show on the back of the fabric.

## (2) Using Punch Card for Slip Stitch



Fabric with multi-coloured Slip stitch on the Knitter side, and a plain colour on the Ribber side can be knitted by using a punch card in conjunction with the Auto-set Lever.

Use the Knitter Slip stitch punch cards.

①	1	●	⊙	⊙	⊙	●	Λ	●	●	0	0	1	←	1	↑	H	5		
	2																		
	3																		
	4											2	2	0					←
	5						⊖												←
	6						Λ												←
	7	↓					▼	▼				4	4	1					←
	8	Hook contrast yarn on Holder B Install Driving Cam.																	
	9	1		②	①													*	←
②	1	1-2	▼	①	②				⊖									0	←
	2	3-4		②	①													1	←

① — 1 ~ 8 Set machine controls as instructed, and knit in the same manner as for "(1) Using Punch Card for Double Jacquard". (refer to page 50)

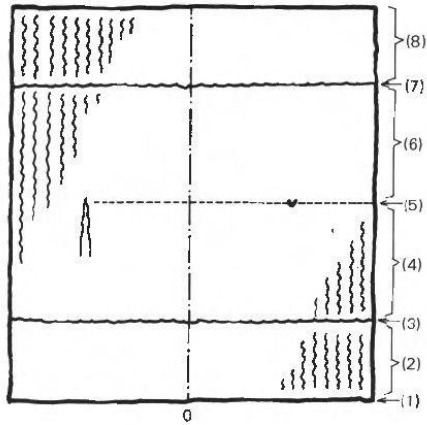
— 9 Bring Holder A to ② position and Holder B to ① position.  
Set Driving Lever to the upright position.  
Knit 1 row from the right to the left.

*Be sure to move the Carriage to the extreme left until Auto-set Lever is operated by Driving Cam and Driving Lever hits Feeding Lever.*

\* If you set the Set Lever to "0", contrast colour will show on the back of the fabric.  
Knit the first row (right to left) with the Auto-set Lever at "1".

② — 1 ~ 2 Set Stop Knob to ▼ and Cam Lever to SLIP (S, ⊖).  
Continue to knit.

## TAKING A TENSION GAUGE

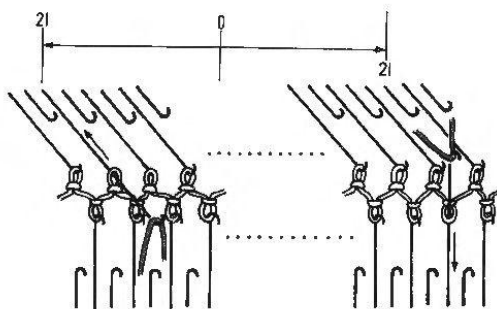
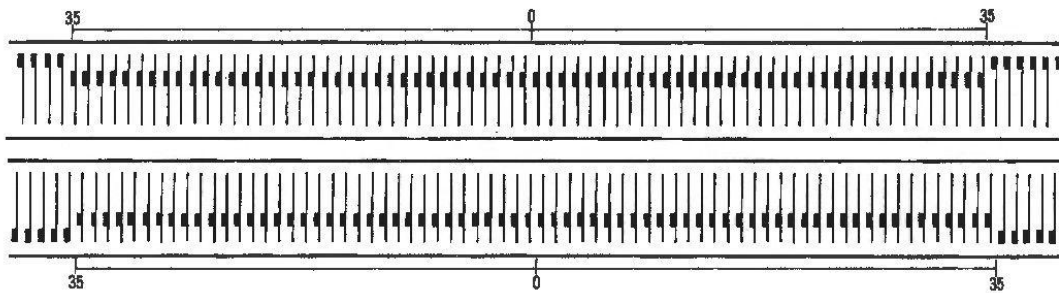


### Tension Gauge

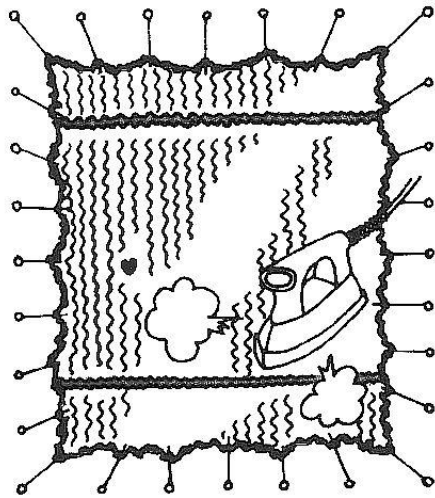
The following instructions should be used when knitting the tension swatch and taking a tension gauge.

Try different stitch dial settings till you obtain a suitable tension for the yarn and stitch pattern chosen.

- (1) Regardless of stitch type, always arrange 35 needles on both sides of centre(0) on both beds.
- (2) Cast-on and knit 20 rows with main yarn in selected stitch pattern.
- (3) With contrast yarn, knit 2 plain rows.
- (4) With main yarn in selected stitch pattern knit 30 rows.



- (5) Put yarn marks on the 21st needles on both sides of centre(0) on either Knitter or Ribber. (Yarn marks do not both have to be on same bed.)
- (6) Knit 30 rows.
- (7) With contrast yarn, knit 2 plain rows.
- (8) With main yarn, knit 20 rows.
- (9) Remove the swatch from the machine.

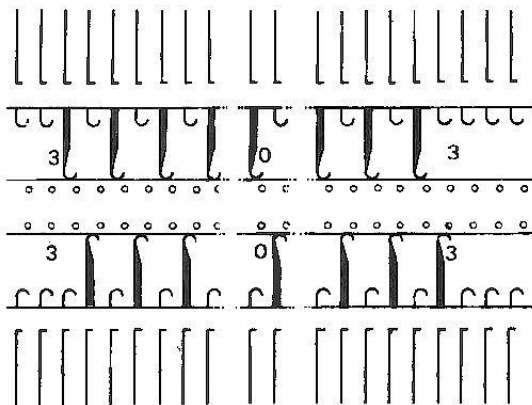
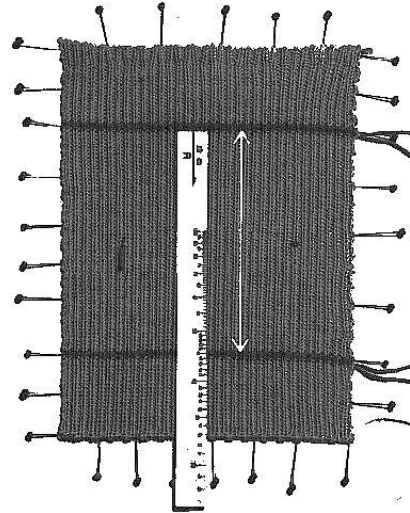
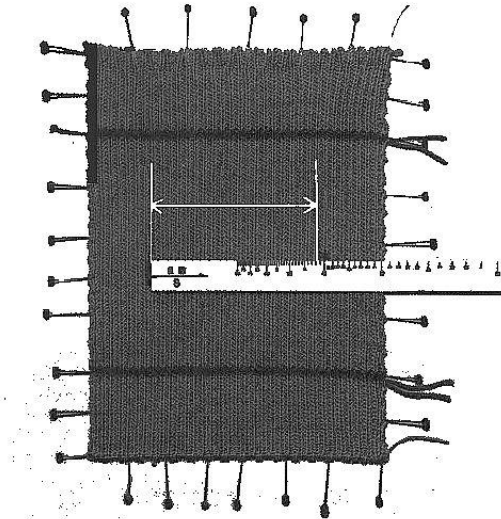


When the tension swatch is completed, remove it from the machine and leave it for several hours so that it can relax, then stretch the swatch widthways, until it looks how you want the finished garment. Pin it flat and square.

Hold a steam iron above the knitting, and blow steam evenly all over the swatch.

Allow the swatch to dry, take a tension gauge over it pinned down.

Measure the tension swatch to obtain the correct tension gauge using Gauge Scale between yarn marks.

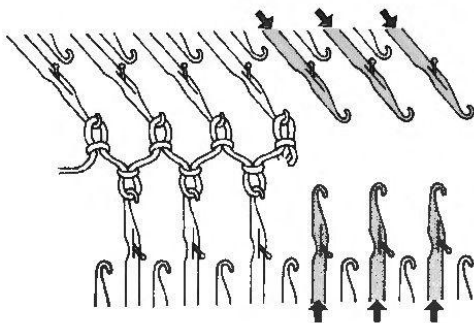
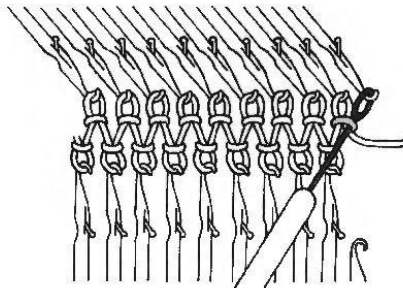
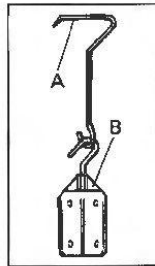
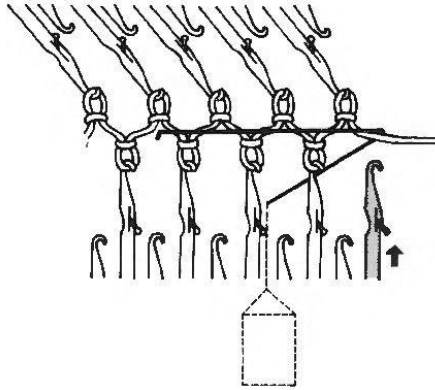


After taking tension gauge, arrange needles for the width of the total number of needles, including non-working needles as required for the garment piece to be knitted.

Example: If 60 stitches are counted on the pattern for K1, P1, rib, arrange needles for 1 × 1 within the total of 60 needles.



## KNITTING TECHNIQUES



### Increasing 1 stitch

#### In case of K1.P1. rib.

You can increase only on the Carriage side.

1. Push 1 needle on opposite needle bed of the end needle from A to B position.  
i.e. If end needle is on knitter, push needle to B position on Ribber.

2. Use Side Hanger "A" with Edge Weight "B", hereafter called Edge Weight.  
From underneath, insert hook of Side Hanger between Knitter and Ribber needle bed and lay hook over zigzag stitches.

*Move the Edge Weight up as knitting progresses.*

3. Continue to knit.

#### In case of double rib:

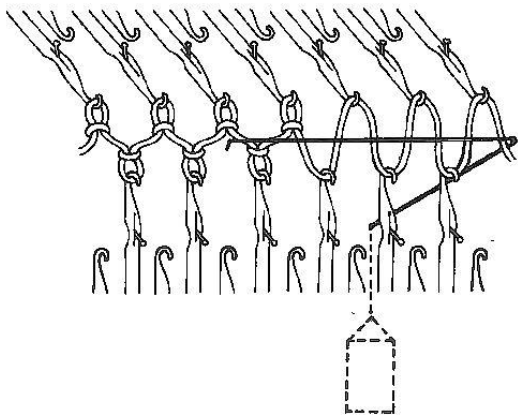
1. Push 1 adjacent Knitter/Ribber needle at Carriage side from A to B position.  
Pick up the loop below the end stitch and place it onto the empty needle as shown.
2. Push 1 Ribber/Knitter needle from A to B position.
3. Hang Edge Weight and continue to knit.

### Increasing multiple stitches

You can increase on the opposite side of the Carriage.

#### In case of K1.P1. and double rib:

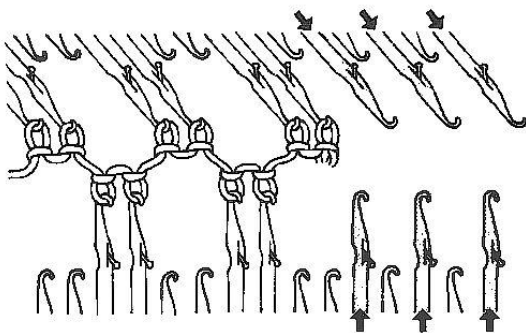
1. On opposite side of Carriage, push required Knitter and Ribber needles to B position.



2. Knit 1 row.

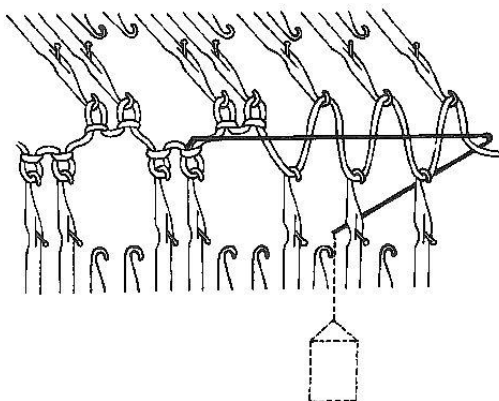
Yarn lies alternately in Knitter and Ribber needle hooks.

3. Hang Edge Weight and continue to knit.

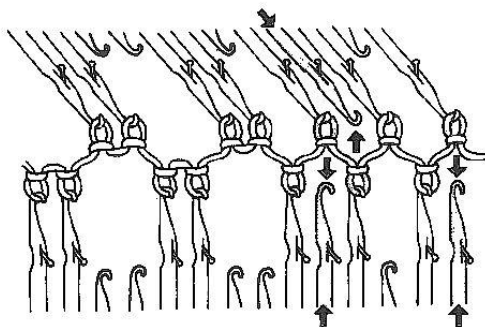


In case of K2.P2. rib:

1. On the side opposite the Carriage, push required Knitter and Ribber needles to B position as shown in diagram.

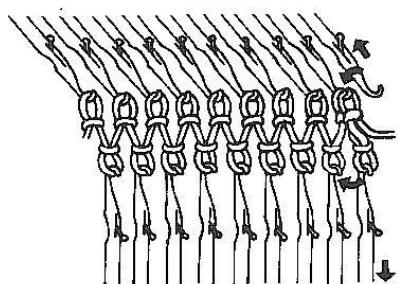


2. Knit 1 row and hang Edge Weight.



3. Knit 1 row and rearrange needles by transferring stitches as shown opposite.

4. Push empty needles back to A position. Continue to knit.

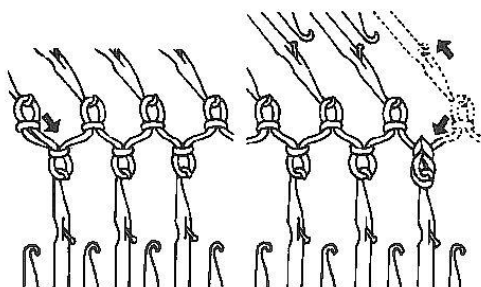


### Decreasing 1 stitch

You can decrease 1 stitch at both edges of the row at the same time.

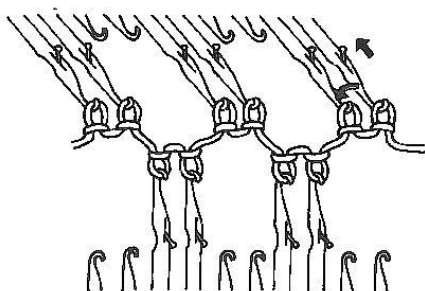
In case of double rib:

1. Transfer the end stitch on both Knitter and Ribber onto adjacent needles.
2. Push the empty needles to A position and continue to knit.



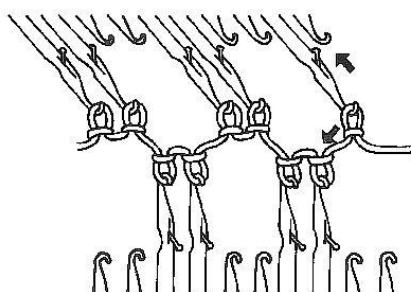
In case of K1.P1. rib:

1. Using Double-eye Transfer Tool, transfer the end stitch from Knitter to Ribber or vice versa onto the adjacent needle.
2. Push empty needle back to A position and continue to knit.

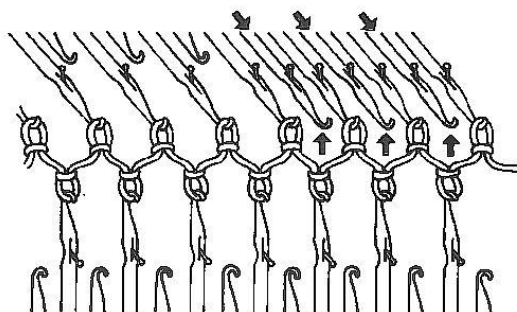


In case of K2.P2. rib:

If two end stitches are on the same Needle Bed, transfer the end stitch to its adjacent needles.



If the 1st two stitches are on different Needle Beds, transfer the end stitch to the needle on the opposite needle bed.

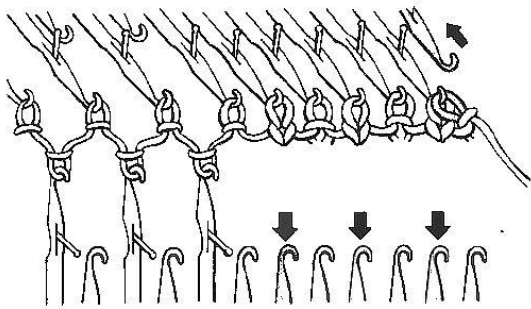


### Decreasing multiple stitches

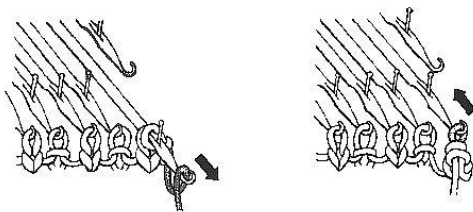
You can decrease only on the Carriage side.

In case of K1.P1. and K2.P2. rib:

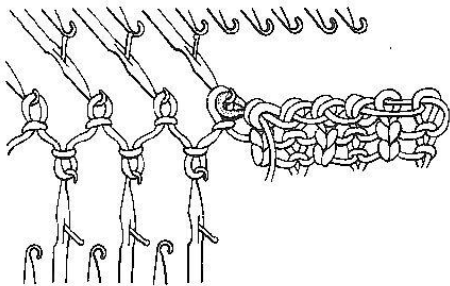
1. Push required number of empty Knitter needles to B position.
2. Transfer stitches from Ribber to their corresponding empty Knitter needles.



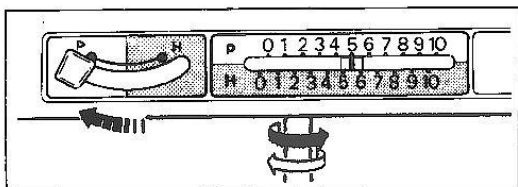
3. Push empty Ribber needles back to A position.
4. Transfer the end stitch to its adjacent needle and push empty needle back to A position.



5. Push the end working needle to D position. The two stitches are behind latch. Lay the yarn inside the needle hook.
6. Holding yarn end slightly downwards, push the needle back to B position.  
Repeat steps 4 — 6 until required number of stitches have been decreased.

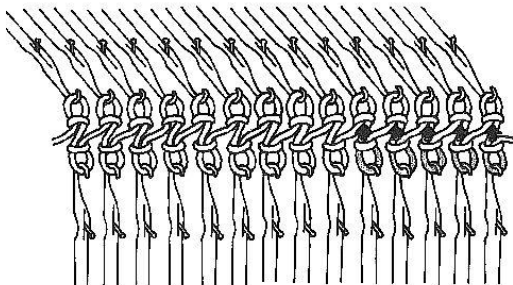


7. Place the last stitch onto adjacent needle.

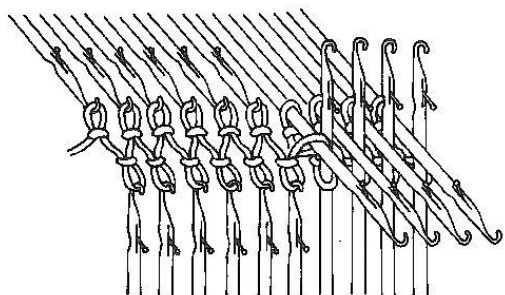
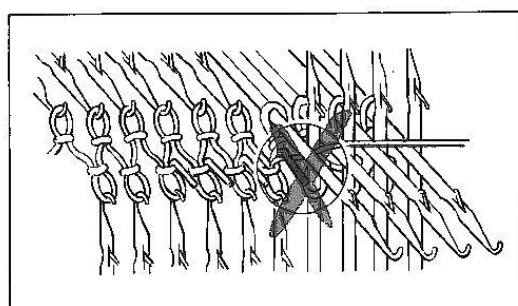
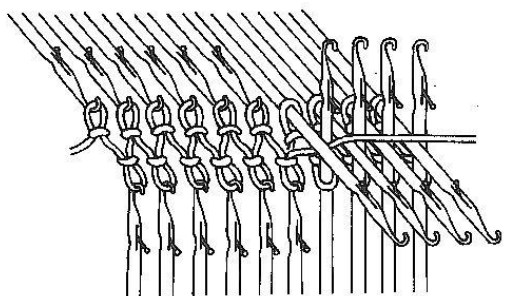
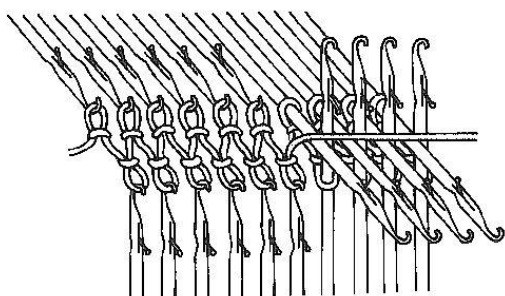
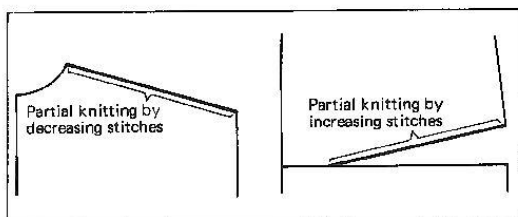


**In case of double rib:**

1. Set Half-Pitch Lever to P.



2. Transfer the required number of Ribber stitches to their corresponding Knitter needles.
3. Cast off the stitches in the same way as given for K1.P1. rib.
4. Set Half-Pitch Lever to H to continue knitting.



## Partial knitting

PARTIAL KNITTING is used to shape a gentle slope, such as shoulder, darts, etc.

You can work partial knitting only to the opposite end to the Carriage. If you wish to shape both sides, work left and right alternately.

## Decreasing stitches

Set Russel Levers on Knitter and Ribber Carriage to I and — positions respectively.

1. On the side opposite the Carriage, push needles to be decreased to D position.
2. Knit 1 row. (The needles in B position knit the yarn. The needles in D position remain inactive and the yarn passes over them.)
3. To prevent a hole forming, pass the yarn under the first inside needle in D position and over the remaining needles.

(If partial knitting is required at both sides, repeat step 1 before knitting next row.)

*Be sure that yarn is not caught in Sinker Post "A".*

4. Knit 1 row. (If partial knitting is required at both sides, apply step 3)
5. Repeat steps 1 — 4.

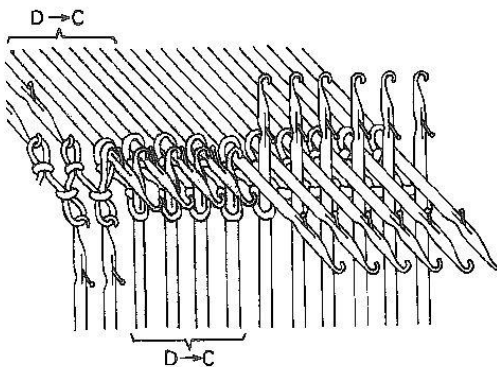
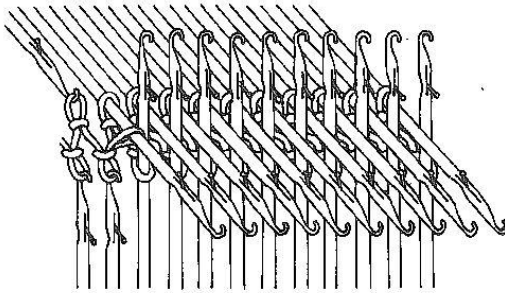
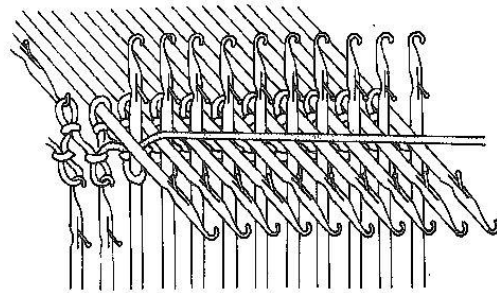
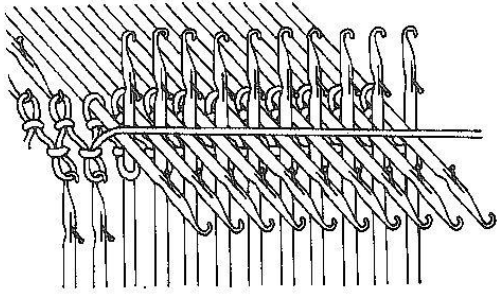
After completing partial knitting, continue as follows.

### A. Rib without pattern

Push the needles in D position at the opposite end to the Carriage back to C position. Knit 1 row. Repeat this step if partial knitting has been worked at both ends.

### B. Pattern knitting.

Using a Transfer Tool, return the needles in D position to B position, at the opposite end to the Carriage. Knit 1 row. Repeat this step if partial knitting has been worked at both ends.



### Increasing stitches

Set Russel Levers on Knitter and Ribber Carriage to I and — positions respectively.

1. On the side opposite the Carriage, push needles for the width to be shaped by partial knitting to D position.
2. Knit 1 row. The needles in B position knit the yarn. The needles in D position remain inactive and the yarn passes over them.
3. To prevent a hole forming, pass the yarn under the first inside needle to D position and over the remaining needles.

(If partial knitting is required at both sides, repeat step 1.)

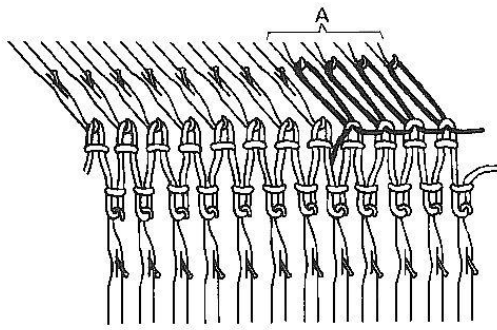
4. Knit 1 row.

(If partial knitting is required at both sides, apply step 3.)

5. On the side opposite Carriage, push needles in D position to be increased back to C position, and knit 1 row.

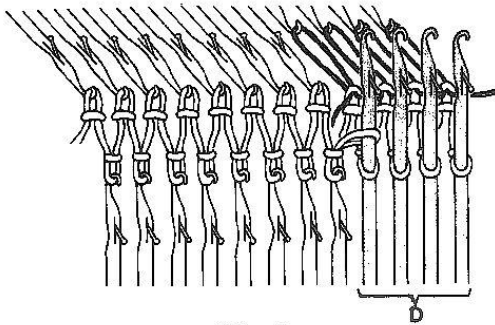
*When the pattern knitting is required, using a Transfer Tool, return the needles to be increased to B position, and knit 1 row.*

6. Repeat steps 3 — 5. (If partial knitting has been worked at both sides, repeat steps 3 and 5 only.)



### Partial knitting involving "swing"

*Knitter needles in D position cross the opposite Ribber needles in D position. Under this condition of needles, you must not swing (by using Swing Handle) Needle Bed, or you will damage the crossed needles. So, a special technique of partial knitting as undermentioned is required for swung English rib, variation swing, herringbone swing, swung pick rib and like stitches, all of which involve "swing".*



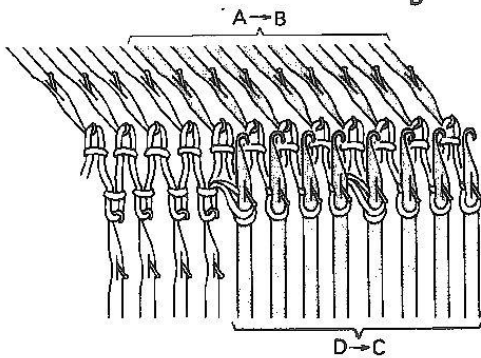
\*When working partial knitting in variation swing, knit pushing up 4 or 5 needles in B position to C position.

### Partial knitting by decreasing stitches

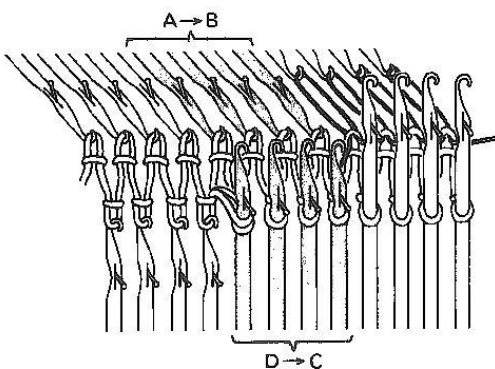
Work in the same manner as for "Partial knitting without involving swing", but work as follows instead of step (1).

On the side opposite Carriage, to hold stitches on Knitter to be decreased, knit with Ravel Cord by hand and push needles back to A position.

Push up corresponding Ribber needles to D position.



At the completion of partial knitting, push needles in D position on Ribber back to C position and replace stitches held on Ravel Cord into hooks of needles on Knitter.



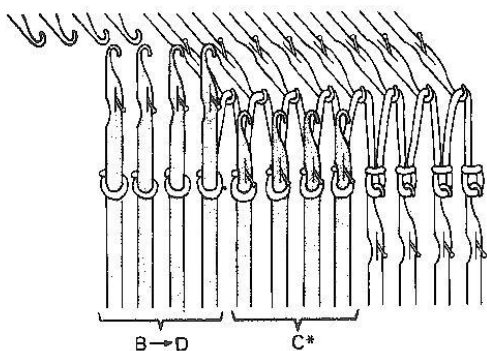
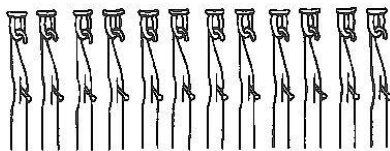
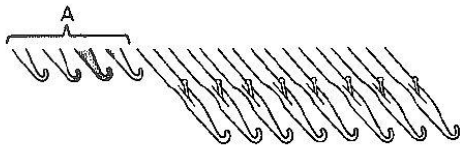
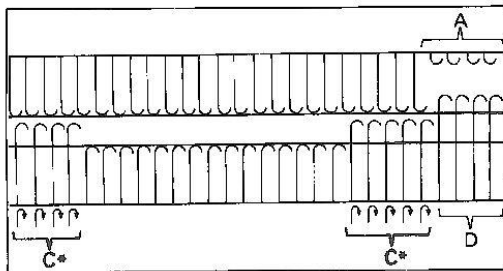
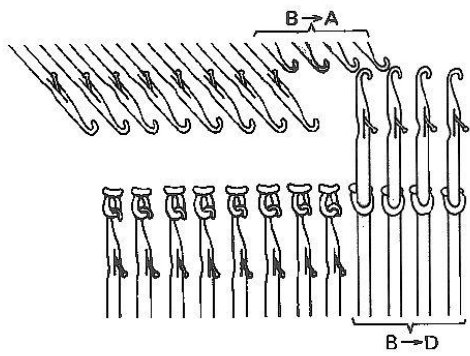
### Partial knitting by increasing stitches

On the side opposite Carriage, hold Knitter stitches to be shaped by partial knitting, with Ravel Cord, in A position and corresponding Ribber needles in D position.

At each step in increasing stitches, replace Knitter stitches back into hooks and push corresponding Ribber needles in D position back to C position, before knitting.

Other operations should be carried out in the same manner as decreasing.

*To prevent the Ravel Cord from catching in the Knitter or Ribber Carriage, drop the ends between the needle beds.*



### Partial knitting in pile knitting and drive lace knitting.

Set Russel Levers on Knitter and Ribber Carriage to 1 and — positions respectively.  
Begin partial knitting after removing stitches on knitter using P Carriage.

### Decreasing stitches at the right edge.

Carriage at left:

1. On the side opposite the Carriage, Push Knitter needles to be decreased back to A position and Ribber needles to be decreased to D position.
2. On both sides of Ribber Bed, push the end 4 or 5 working needles up to D position and then back to C position (\*) instead of bringing Ribber needles up with P Carriage because it cannot be used in partial knitting.
3. Knit 1 row.
4. To prevent a hole forming, pass the yarn under the first inside Ribber needle in D position.
5. Repeat step 2 and knit 1 row.

Repeat steps 1 — 5.

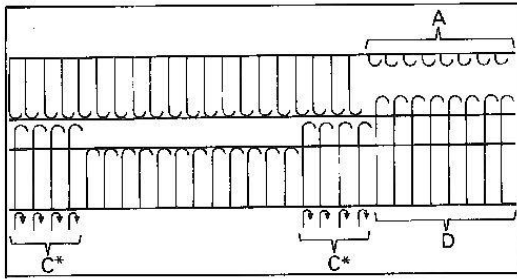
### Decreasing stitches at the left edge.

Carriage at left:

1. Push Knitter needles to be decreased back to A position on the Carriage side.
2. On both sides of Ribber Bed, push the end 4 or 5 working needles up to D position and then back to C position instead of bringing Ribber needles up with P Carriage.
3. Knit 1 row.
4. Push Ribber needles to be decreased to D position on the side opposite the Carriage.  
Repeat step 2 and knit 1 row.  
To prevent a hole forming, pass the yarn under the first inside Ribber needle in D position.

Repeat steps 1 — 5.



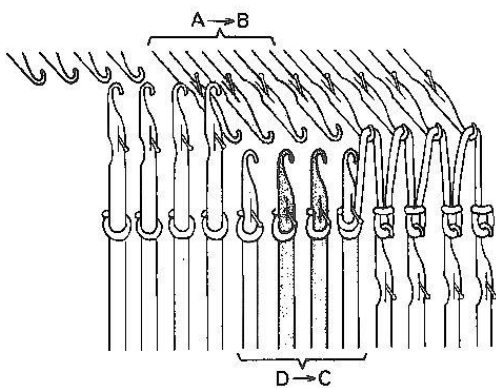
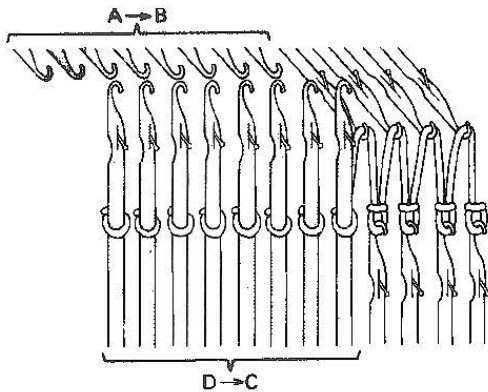
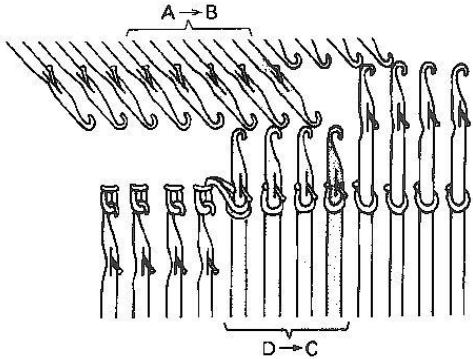


### Increasing stitches at the right edge

Carriage at left:

1. On the side opposite the Carriage, push Knitter needles back to A position, and Ribber needles to D position for the width to be shaped by partial knitting.
2. On both sides of Ribber bed, push the end 4 or 5 working needles up to D position, and then back to C position (\*) instead of bringing up Ribber needles with P Carriage.
3. Knit 1 row.
4. To prevent a hole forming, pass the yarn under the first inside Ribber needle in D position.  
Repeat step 2 and knit 1 row.
5. At the side opposite the Carriage, push Knitter needles to be increased to B position, and Ribber needles to be increased back to C position.  
Repeat step 2 and knit 1 row.

Repeat steps 4 — 5.

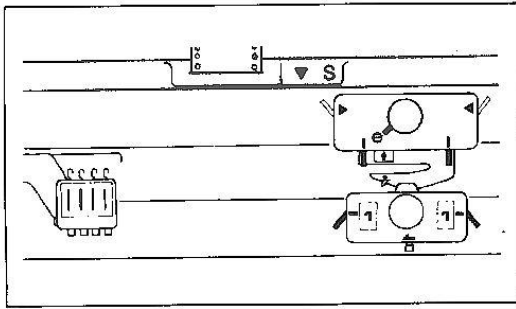


### Increasing stitches at the left edge.

Carriage at left:

1. Push Knitter needles for the width to be shaped back to A position on the Carriage side.
2. On both side of Ribber bed, push the end 4 or 5 working needles up to D position and then back to C position.
3. Knit 1 row.
4. Push Ribber needles for the width to be shaped by partial knitting to D position on the side opposite the Carriage.  
Repeat step 2 and knit 1 row.
5. To prevent a hole forming, pass the yarn under the first inside Ribber needle in D position.  
Repeat step 2 and knit 1 row.
6. At the side opposite the Carriage, push Knitter needles to be increased to B position and Ribber needles to be increased back to C position.  
Repeat step 2 and knit 1 row.

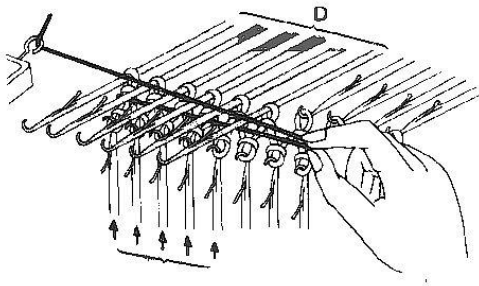
Repeat steps 5 — 6.



### Partial knitting while knitting double jacquard

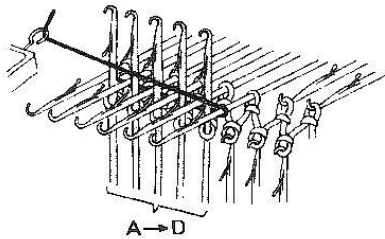
Partial knitting at right side is worked in the same way as given for double rib.

For partial knitting at left side, Set Russel Levers on Knitter and Ribber Carriage to I and II positions respectively and follow the instructions below.

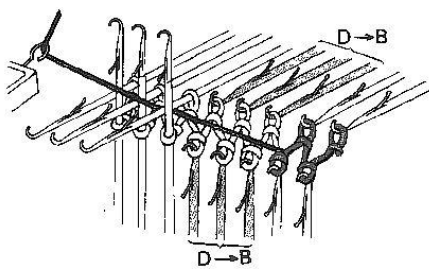


### Decreasing stitches

1. Carriage is at the right side.  
Before knitting from right to left, hold the yarn to be knitted next as shown, and push the knitter needles to be decreased to D position.

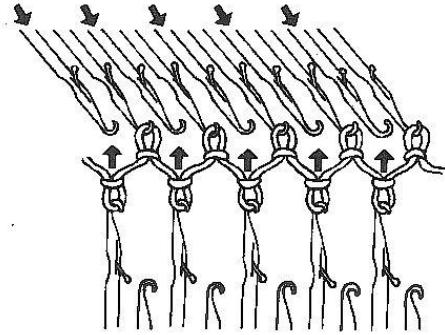


2. Push up the same number of ribber needles to D position. (The yarn must be under those needles in D position.)
3. Knit 1 row from right to left.  
Change the yarn and knit left to right.
4. Repeat steps 1 — 3.



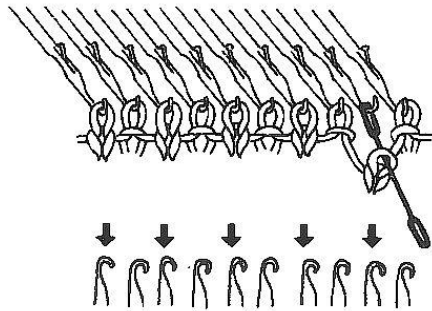
### Increasing stitches

1. Carriage is at right side.  
Using Transfer Tool, push the needles in D position to be increased, back to B position.
2. Bring the yarn in the Holder to be selected next under the first inside needles on Knitter and Ribber in D position.
3. Knit 1 row from right to left. Change the yarn and knit to right.
4. Repeat steps 1 — 3.

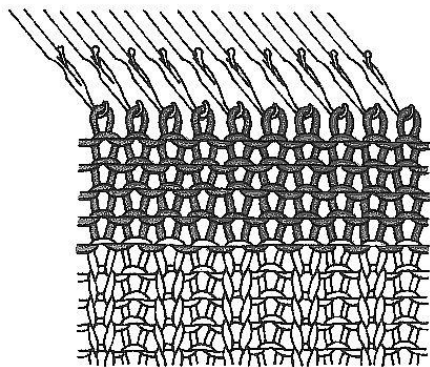


### Waste knitting

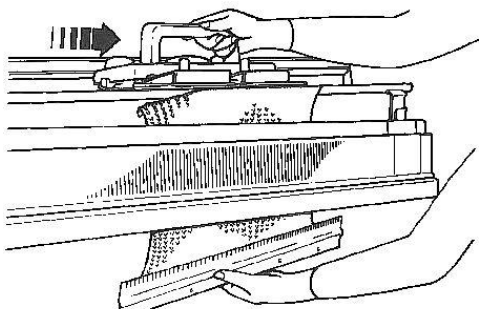
1. On Knitter, push empty needles to B position.



2. Transfer Ribber stitches to the corresponding Knitter needles. Drop Ribber to its lowest position.

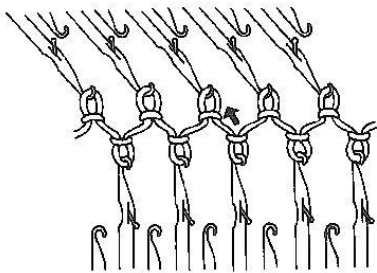


3. Exchange Ribber Arm for Knitter Arm and thread contrast yarn into Yarn Feeder. Knit 9 — 10 rows with Stitch Dial 4 — 5 higher than for double bed knitting, with Cam Lever set to Stockinet (D, ^ ).



4. Remove yarn and Weights.

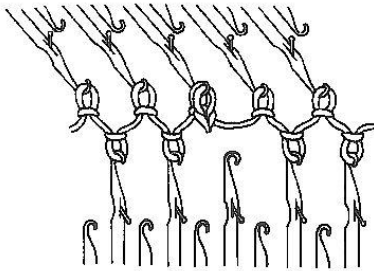
Holding Cast-on Comb, move Carriage to remove fabric from machine.



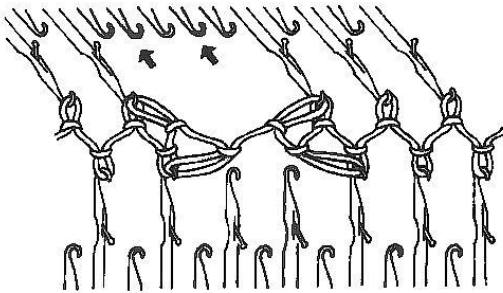
## Buttonhole

### Single stitch eyelet

1. At the point for buttonhole, transfer 1 stitch from Ribber to Knitter.

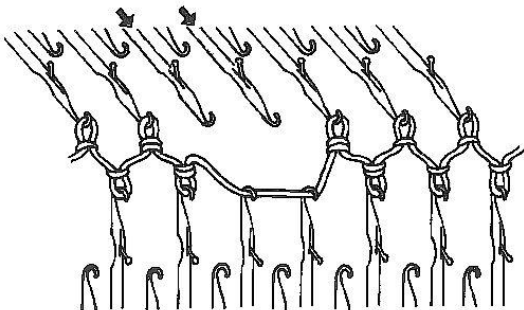


2. Leave empty needle in B position. Continue to knit.



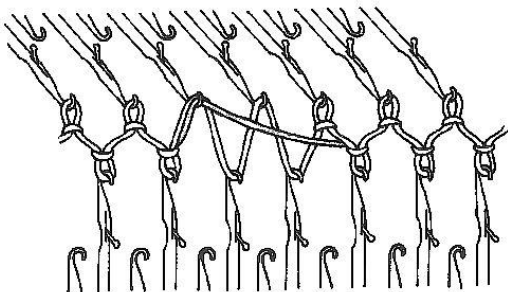
### Double stitch eyelet

1. Transfer 2 stitches at the point of the buttonhole to their adjacent needles on Knitter and Ribber.
2. Push empty needles on Knitter back to A position. Leave empty needles on Ribber in B position.



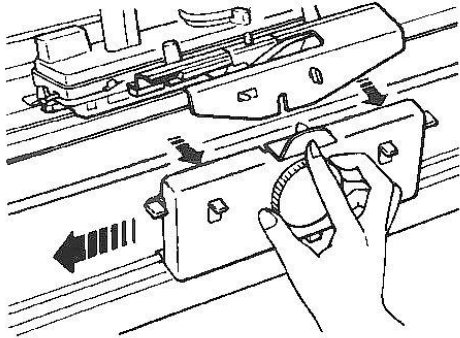
3. Knit 1 row and push the needles left in A position on step 2 to B position.

4. Knit 1 row.



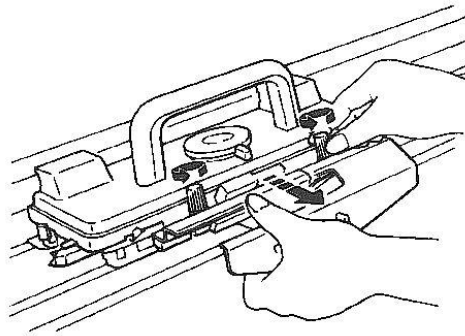
5. Hook hanging yarn on a Knitter needle. Continue to knit.

## WHAT TO DO IF...

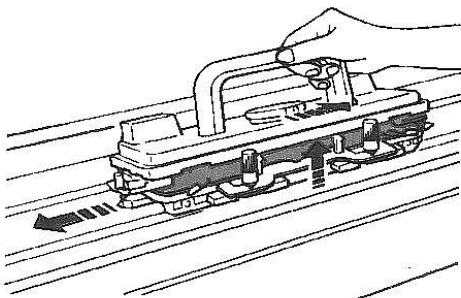


### If the Carriage has jammed during knitting...

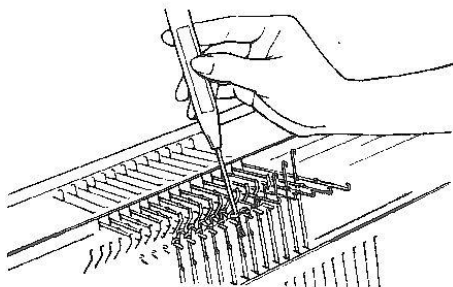
1. By pushing the Link Knob, disconnect the Ribber Carriage from the Arm and tilt it towards you, then move it to either end of the needle bed.  
**DO NOT PUSH OR PULL THE CARRIAGE BY FORCE.**



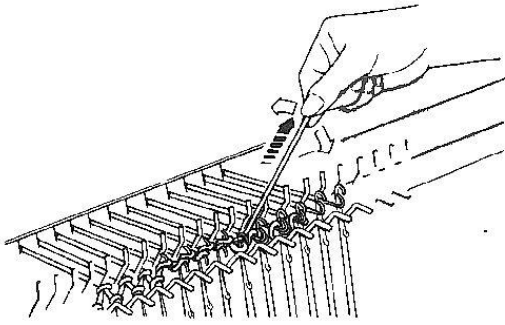
2. Remove the Ribber Arm from the Knitter Carriage.



3. Lift up the Carriage by pushing the Release Lever, and move it in the direction it was going, until it clears the working needles.



4. Check the stitches, and if stitches have moved behind the latches, replace them into the hooks using a Transfer Tool.  
If a stitch has dropped, refer to page 68.

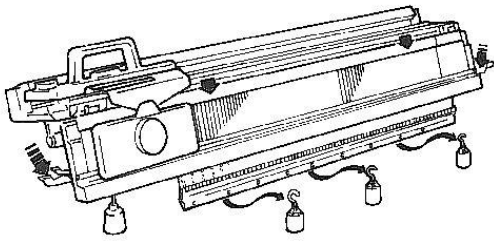


5. Align the working needles in B position and unravel the incomplete row as follows. Hold the yarn and unhook it from Knitter and Ribber needle hooks by pulling it in the arrowed directions in a zigzagging manner.

6. Pass the Carriage to the side with the yarn end and press down the Carriage to continue knitting.

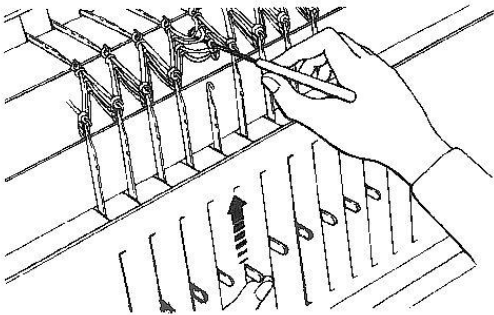
If the Row Counter, the Knit Contour (Radar) and/or the Punch Card is/are in use, refer to "If incorrectly knitted..." on page 69 before knitting again.

**If a stitch has dropped...**

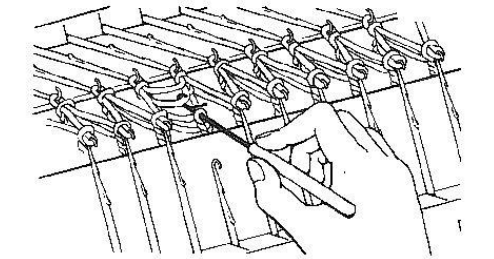


1. Remove Weights from Cast-on Comb as they may cause dropped stitches to run.

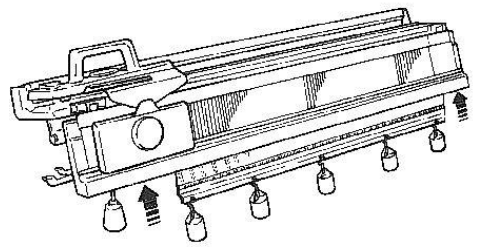
2. Depress Drop Lever and lower Ribber to middle position.



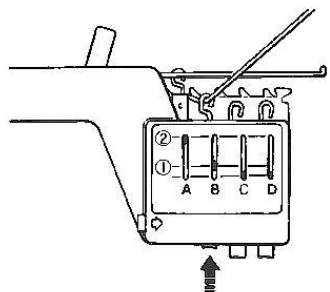
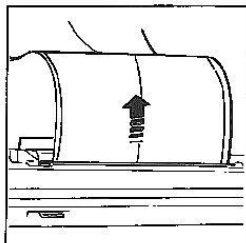
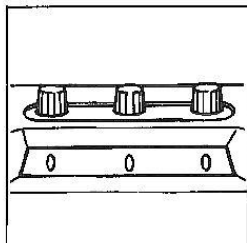
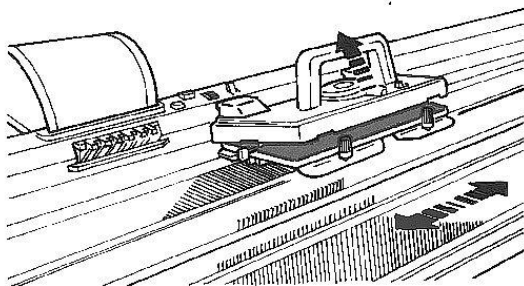
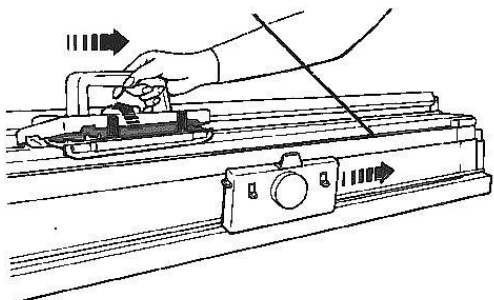
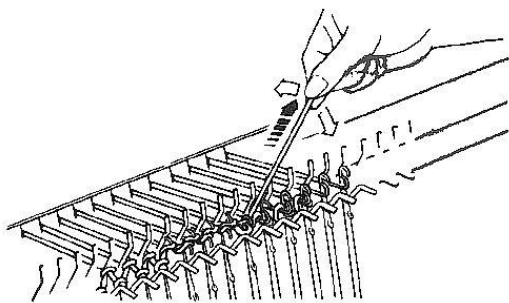
3. With Hook Tool, pick up dropped stitch and place it back on needle hook.



4. Reform stitches by moving needles back and forth or by using Tappet Tool.



5. Restore Ribber to original position, hook Weights on Cast-on Comb and align needles.



### If incorrectly knitted...

1. Remove the yarn from the Yarn Feeder and unravel the incorrectly knitted row as follows.

Hold yarn and unhook it from Knitter and Ribber needle hooks by pulling it in the arrowed directions in a zigzagging manner.

#### *In case of double jacquard:*

*If the yarn end is the left side, unravel an additional row so that it comes to the right side.*

2. Align needles in B position, and replace the yarn into the Yarn Feeder.

### If the Carriage is at the side opposite the yarn:

- (1) Disconnect Ribber Carriage from Arm and move it to yarn side while tilting Carriage.
- (2) Remove the Ribber Arm from the Knitter Carriage.
- (3) Operate the Carriage Release Lever, and move the Carriage to the side of the yarn.
- (4) Connect the Ribber Arm and Carriage to the Knitter Carriage.

### If a Punch Card is in use:

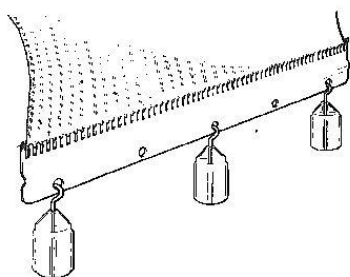
- (1) Return the Card by the same number of rows as unravelled and set Stop Knob to ●.
- (2) Work in the same manner as above, "If the Carriage is at the side opposite the yarn".

### If a Row Counter and Knit Contour (Rader) are in use:

Return them by the same number of rows as unravelled.

### In case of double jacquard:

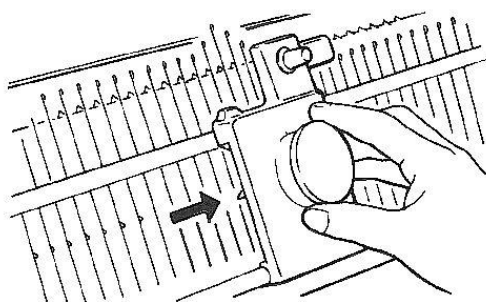
Re-arrange the Holder Buttons of the Yarn Changer and thread the right yarn into Yarn Feeder.



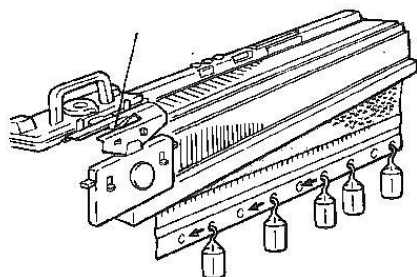
**If stitches float...**

**When stitches on full length float**

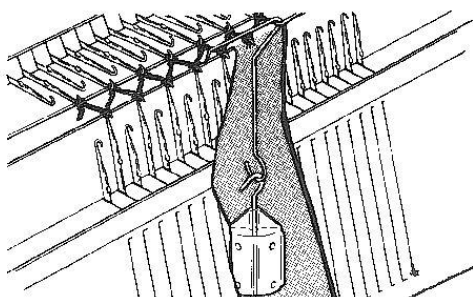
- \*Increase the number of Weights.
- \*Check the yarn and Stitch Dials.



- \*Push the needles to C position every row using P Carriage without P Presser.

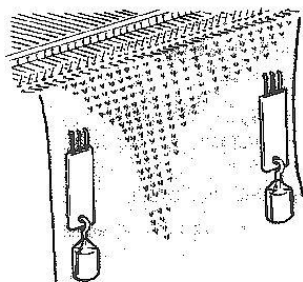


When stitches of half length of knitting float, check if Cast-on Comb with Weights is suspended horizontally.



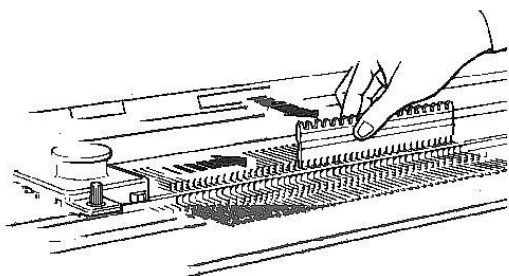
**When edge stitches tend to float**

- \*Suspend Edge Weight when increasing multiple stitches.



- \*Suspend Hanger Comb with Weight when partial knitting or knitting sectionally.

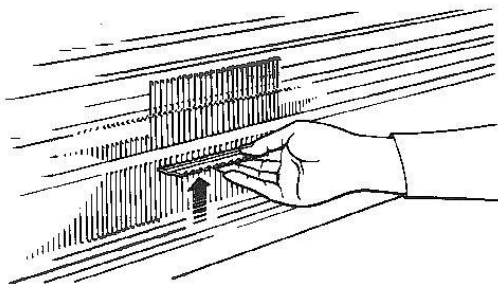




**If P Carriage has jammed...**

**If it jammed on the Knitter...**

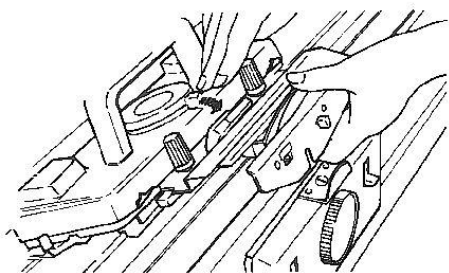
Regardless of direction in which you are moving P Carriage, remove it and push all the needles to D position, then move P Carriage from the left to the right.



**If it Jammed on the Ribber...**

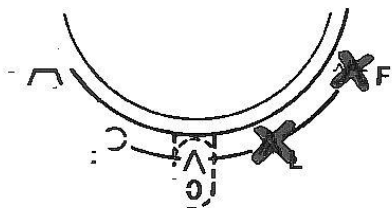
Remove P Carriage and push all the needles to D position using Needle Pusher, then knit the next row.

*If you have failed to align needles into C position for cast-on using P Carriage, push all the needles to D position and move P Carriage twice across the needles starting from right side. (Needles will align in C position.)*

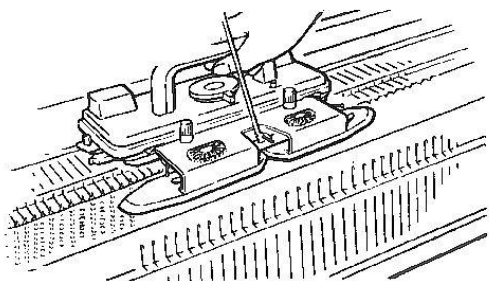


**If the Ribber Arm does not fit on the Knitter Carriage properly...**

1. Check if the top of the Knitter Carriage closed properly. The top of the Carriage must be down.



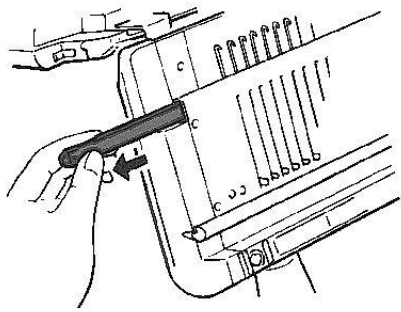
2. Check the setting of the Cam Lever. It should be set at "A" before mounting the Ribber Arm, never at "F" (FAIR ISLE) or "P" (PUNCH LACE).



**If you knit with the Knitter only with the Ribber connected...**

1. Disconnect Ribber Carriage and Arm from Knitter Carriage.
2. Lower Ribber to its lowest position by depressing Drop Levers twice.
3. Fit Knitter Arm and start knitting.

To use the Lace Carriage when the Ribber is connected, refer to Operation Manual.

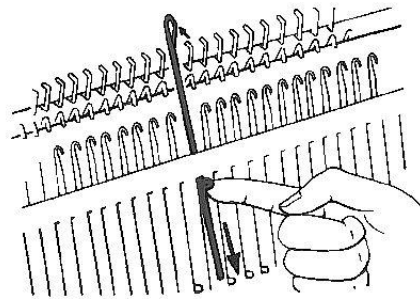


**If a needle has been damaged...**

Using a pencil or a screw driver, push the Needle Retainer in either direction

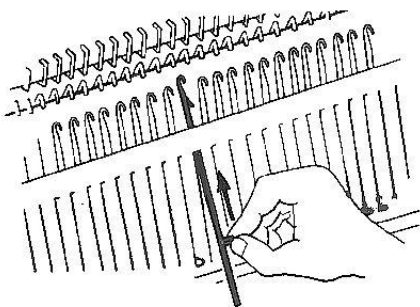
Pull the Needle Retainer toward one end until it clears the needle to be replaced.

*If a stitch is hooked on the needles, use the Tappet Tool to pick up the stitch and transfer it to the new needle.*



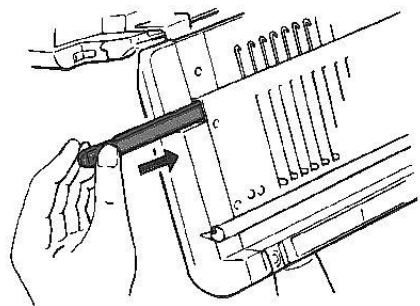
Push the damaged needles to D position. Close the latch. The shank will come out of the needle bed.

Pull it out from the Needle Bed.



To replace a new needle, open its latch and slide it into the Needle Bed groove until the hook comes out of the top opening of the Needle Bed.

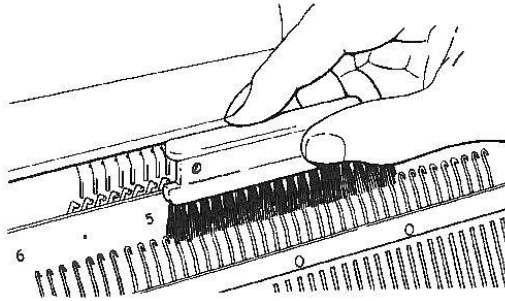
Push the needle back to A position by holding the butt.



Insert the Needle Retainer back into the Needle Bed by pushing the protruding end. To insert the Needle Retainer, press the floated needles at the front edge of the Needle Bed using the Needle Pusher.

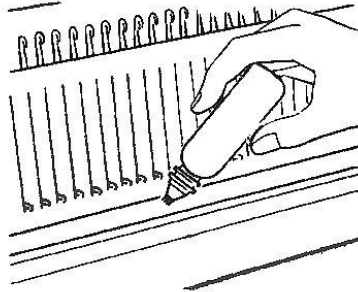
If a stitch is held on a Tappet Tool, replace it on the new needle.

# MAINTAINING THE MACHINE



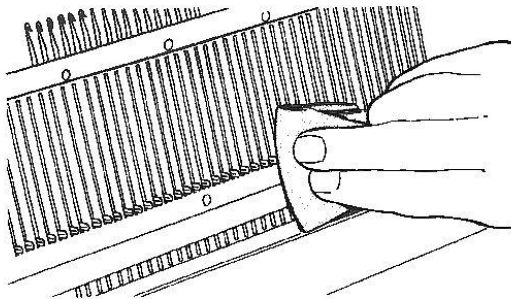
## Needle Bed

With Cleaning Brush remove lint or dust from Needle Bed.

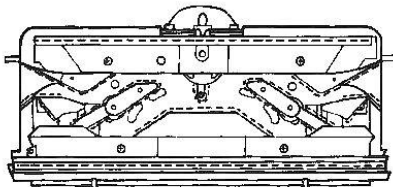


Apply oil along the rail, front guide of the Needle Bed and needle butts.

(Do not apply excessive oil.)



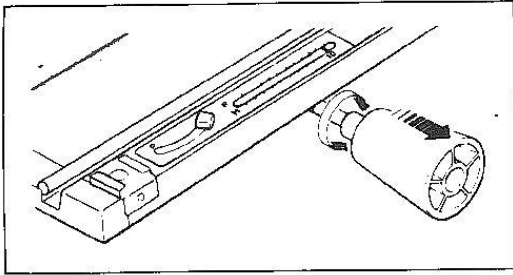
Rub latch-needle butts with oil damped cloth.



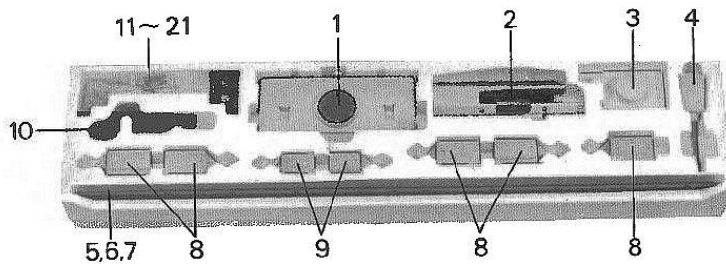
## Carriage

Clean underside of Carriage and apply oil over sliding parts with oil damped cloth.

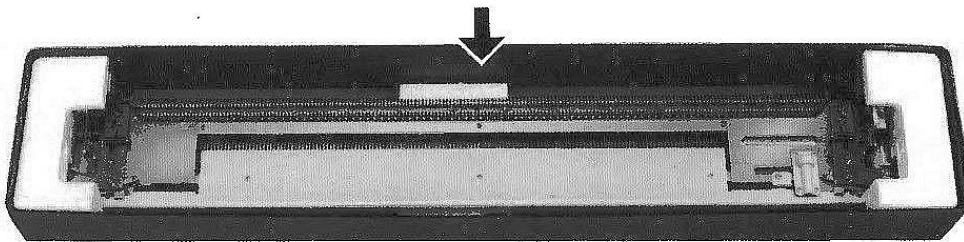
## REPACKING THE RIBBER



1. Disassemble Ribber by reversing the Procedure for assembling. Set Swing Handle at H-10 and pull it out by twisting and pulling it.
2. Before putting back Needle Bed into the box, fit polystyrene packings to both ends of Needle Bed in the following manner:—  
With the back of the Needle Bed facing you, and with the sinker posts at the top, fit the polystyrene marked "R" to the right end, and "L" to the left end.



3. Replace Accessories as shown above, then place polystyrene on top of Needle Bed in box.



- |                         |                                   |
|-------------------------|-----------------------------------|
| 1 Ribber Carriage       | 10 Ribber Clamp                   |
| 2 Ribber Arm            | 11 P Presser                      |
| 3 P Carriage            | 12 Needle Pusher (2/1, 2/2)       |
| 4 Swing Handle          | 13 Driving Cam                    |
| 5 Close Knit Bar        | 14 Plating Yarn Feeder            |
| 6 Cast-on Comb (long)   | 15 Side Hanger                    |
| Cast-on Wire (long)     | 16 Hanger Comb                    |
| 7 Cast-on Comb (short)  | 17 Hook Tool                      |
| Cast-on Wire (short)    | 18 Double-eye Transfer Tool       |
| 8 Ribber Weight (large) | 19 Spare Needle (incl. 3 needles) |
| 9 Edge Weight           | 20 Auxiliary Piece (L)            |
|                         | 21 Auxiliary Piece (R)            |

