

*Carole*

# INSTRUCTION MANUAL

## CK-35



# CONTENTS

<b>OUTLINE OF THE CK-35</b> .....	1
<b>PARTS TO BE ASSEMBLED</b> .....	2
<b>PART NAME</b>	
KNITTER & RIBBER .....	4
MOTOR DRIVE .....	6
COLOUR CHANGER .....	6
OPERATION PANEL .....	7
DATA TRANSMITTING PANEL .....	7
ACCESSORY .....	8

## ASSEMBLING (STEP 1)

1. ADJUSTING THE KNITTER .....	10
2. ATTACHING THE RIBBER .....	13
3. ASSEMBLING THE YARN TENSION UNIT .....	15
4. SECURING THE MOTOR HEAD TO THE RAIL .....	17
5. ADJUSTING THE BELT IN THE RAIL .....	17
6. CONNECTING THE CORDS .....	18
7. ACCESSORY PLATE .....	19

## ASSEMBLING (STEP 2)

### ORGANIZING THE MACHINE

Type A .....	21
Type B .....	24
Type C .....	26

## BEFORE OPERATING THE CK-35

### CARRIAGE OPERATION

MOTOR DRIVE .....	28
-------------------	----

## TRANSFERRING THE DATA

### LOADING & SAVING

## KNITTING

### OPERATION CHART

WHEN USING THE COLOUR CHANGER — TYPE A AND TYPE B .....	30
WHEN NOT USING THE COLOUR CHANGER — TYPE C .....	32
WHEN USING THE MOTOR DRIVE .....	32
WHEN MOVING THE CARRIAGE BY HAND .....	33

### THREADING THE YARN

1. YARN TENSION UNIT .....	34
2. THREADING THE CHANGER YARN HOLDER .....	36

### OPERATION PANEL

BLOCK SELECT KEY .....	39
BLOCK REPEAT KEY .....	40
BLOCK START KEY .....	41
MEMORY KEY • RECALL MEMORY KEY .....	41
UP KEY, DOWN KEY .....	42

COUNTER • COUNTER KEY • COUNTER PAUSE KEY .....	43
DISPLAY SELECT KEY .....	44

### STARTING TO KNIT (CAST ON)

AUTOMATIC ARRANGE OF THE YARN .....	46
PLAIN STITCH KEY .....	48
CAST-ON .....	50
• WHEN USING THE RIBBER .....	50
• WHEN NOT USING THE RIBBER .....	52
NEEDLE SELECTION .....	54
KNITTING .....	55

## PATTERN KNITTING

DOUBLE BED JACQUARD .....	56
ENGLISH RIB .....	56
FISHERMAN'S RIB .....	57
RIB TUCK .....	57
RIB .....	58
SINGLE BED JACQUARD .....	58
FAIRISLE PATTERN .....	59
FAIRISLE PATTERN (MOTIF) .....	59
TUCK PATTERN .....	60
MULTICOLOUR TUCK PATTERN .....	60
SKIP PATTERN .....	61
MULTICOLOUR SKIP PATTERN .....	61
WEAVING PATTERN .....	62
THREAD LACE PATTERN .....	63
STOCKING STITCH (PLAIN STITCH) .....	64
PLATING .....	65
PLATED TUCK PATTERN .....	67

## DETAIL FOR EACH PART

NEEDLE POSITION .....	68
TENSION DIAL .....	68
SLIDE LEVER .....	68
CHANGE KNOB .....	69
FINE KNITTING BAR .....	69
CARRIAGE STOPPER .....	69
CAM BUTTON .....	70
CAM BUTTON RELEASE LEVER .....	71
TUCKING LEVER .....	71
CAM LEVER .....	72
SET/RELEASE TRIPPER FOR THE CAM LEVER .....	72
HOLDING CAM LEVER (K CARRIAGE) .....	73
HOLDING CAM LEVER (R CARRIAGE) .....	73
HALF PITCH LEVER .....	74
RACKING HANDLE • RACKING INDICATOR .....	74
BRACKET LEVER .....	74
END NEEDLE SELECTION MECHANISM OF THE K CARRIAGE .....	75



CHANGER SENSOR • SET MARK .....	76
TURN MARK .....	76
COLOUR CHANGER .....	77
MOTOR DRIVE .....	78
YARN END SENSOR • KNOT SENSOR .....	80
CAST-ON COMB (FOR THE KNITTER) .....	82
CAST-ON COMB (FOR THE RIBBER) .....	82
WEIGHT .....	83
WIRE-LOOP TYPE WEIGHT HANGER • CLAW TYPE WEIGHT HANGER .....	84
END STITCH PRESSER .....	84
TRANSFER NEEDLE .....	84
PRESSER .....	85
YARN GUIDE LEVER .....	85
YARN GUIDE .....	85

## HOW TO REPLACE THE SPARE PARTS

REPLACING A KNITTER NEEDLE AND A NEEDLE PRESSER FOR THE KNITTER .....	86
REPLACING A RIBBER NEEDLE .....	88
REPLACING A BRUSH .....	89
REPLACING A BELT .....	90

## USEFUL HINTS

- What to do if you want to turn off the power switches of the knitter and the motor drive to stop the block knitting temporarily. .... 92
- What to do if the motor drive stops on the border between two different patterns. .... 92
- What to do if the motor drive stops and the coupler releases the carriage. .... 93
- What to do if the motor drive stops and the coupler does not release the carriage. .... 95
- What to do if the carriage jams at the middle of the knitting while you are operating the carriage by hand. .... 96
- What to do if you want to unravel some knitting. .... 96
- What to do if the yarn often breaks. .... 96
- What to do if the yarn tension springs get twisted and the yarn is not supplied smoothly. .... 96

## BEFORE YOU THINK THE MACHINE IS OUT OF ORDER...

- If the display shows no block number when you push the block select key and the up/down key does not work... .... 97
- If the motor drive does not work when you push the S/S switch... .... 97
- If the motor drive moves the carriage outward though the carriage is at the end of the machine... .... 97
- If the display indication does not change and the carriage continues moving when you are arranging the yarns into two colour changers... .... 97
- If the same needle selection is repeated... .... 97

- If the needles are not selected and remain at B position... .... 98
- If the yarn holder does not go back and forth between the connecting arm and the colour changer smoothly... .... 98

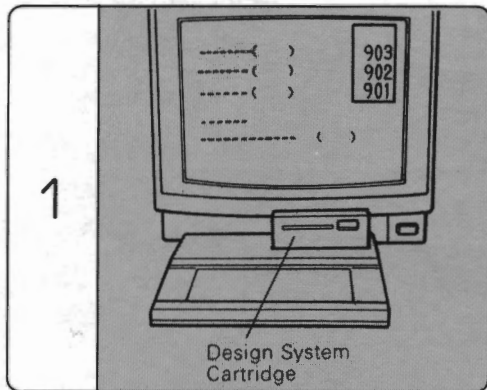
## CLEANING AND MAINTENANCE ..... 99



# OUTLINE OF THE CK35

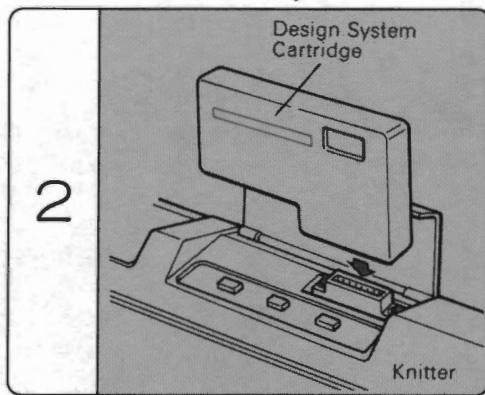
CK35 knits according to the data you program with the design system (option).  
(CK35 does not need the data of the design system when it knits stocking stitch, plating, rib, English rib, and Fisherman's rib.)

## • OPERATION STEPS

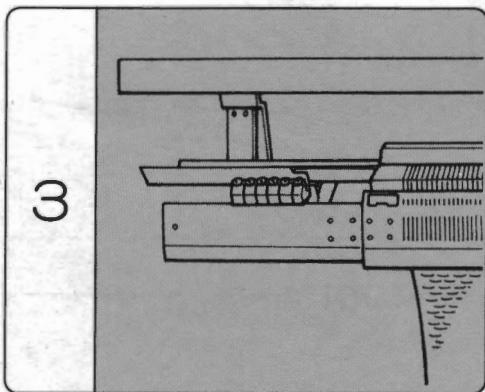


Program the data with the design system.

- ① Create the pattern.
- ② Program the block data using the created patterns.



Transmit the block data from the design system to the knitter (see page 29).



Knit according to the data (see page 30).

## • ATTENTION

CK35 is an electronic appliance which contains a micro-computer, therefore do not use or leave it in the following conditions:

- In a very hot place
- In a very humid place
- In a dusty place

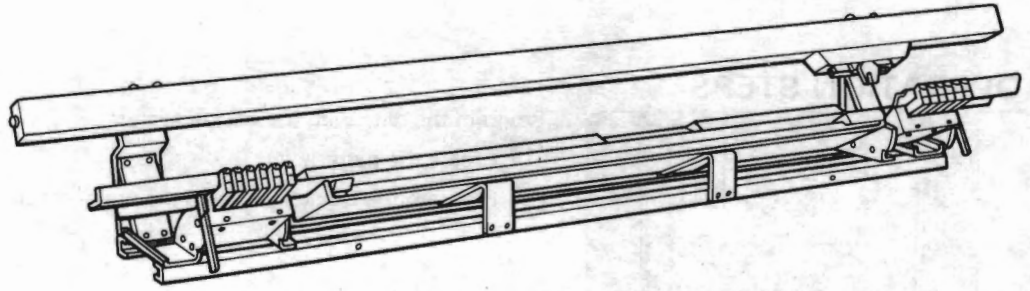
## • KNITTING YARN

Some kinds of yarn is not suitable for CK35 according to its material, thickness, and the pattern.

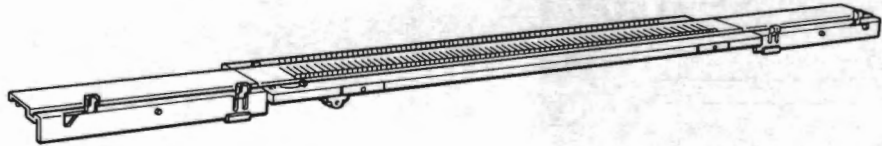
# PARTS TO BE ASSEMBLED (HOW TO ASSEMBLE CK35 ... see page 10)

## PARTS

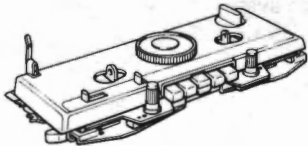
● Unit for Knitter



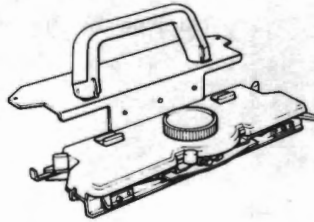
● Ribber



● K Carriage



● R Carriage



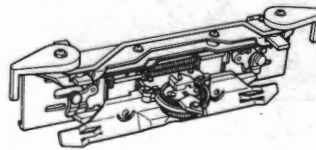
● Table Clamp



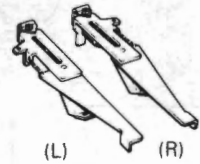
● Carriage Arm



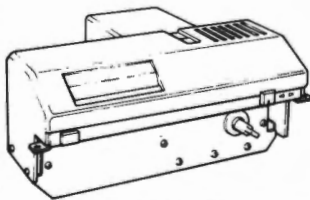
● Connecting Arm



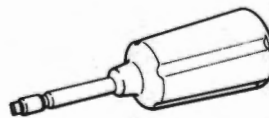
● Bracket



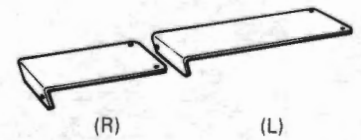
● Motor Head



● Racking Handle



● Side Rail Supporter



## SCREW

● Screw A    ● Screw B    ● Screw C    ● Screw D    ● Screw E



3 x 6 (6)    3 x 16 (10)    4.4 x 5 (2)    4 x 8 (4)    5 x 8 (6)

--- Diameter (mm) x Length (mm)

● Washer    ● Allen Bolt    ● Binder



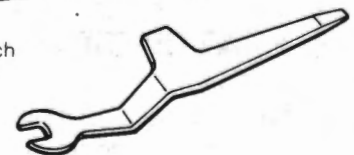
(2)    4 x 8 (2)    (5)

## TOOL

● Allen Wrench



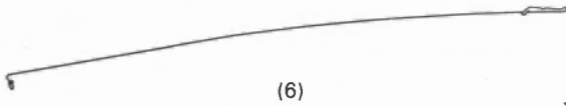
● Wrench



● Screwdriver

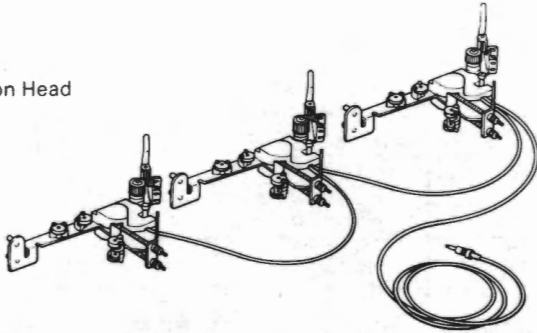


● Yarn Tension Spring



(6)

● Yarn Tension Head



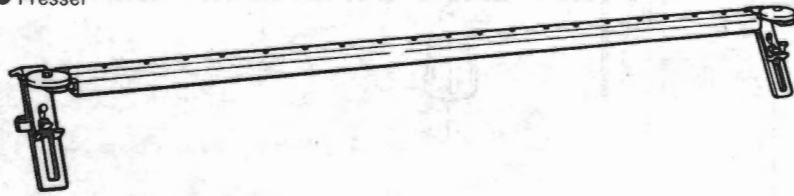
● Bar for the Yarn Tension Head



● Rear Yarn Guide Bar



● Presser



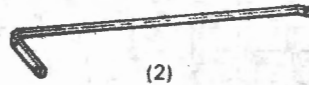
● Front Yarn Guide Bar



● Side Rail

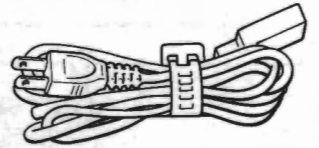


● Brace for the Front Yarn Guide Bar

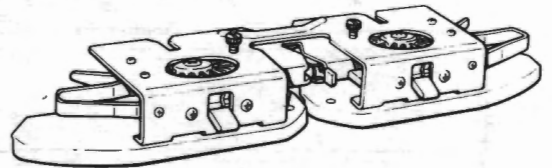


(2)

● Power Cord



● Sinker Plate Assembly

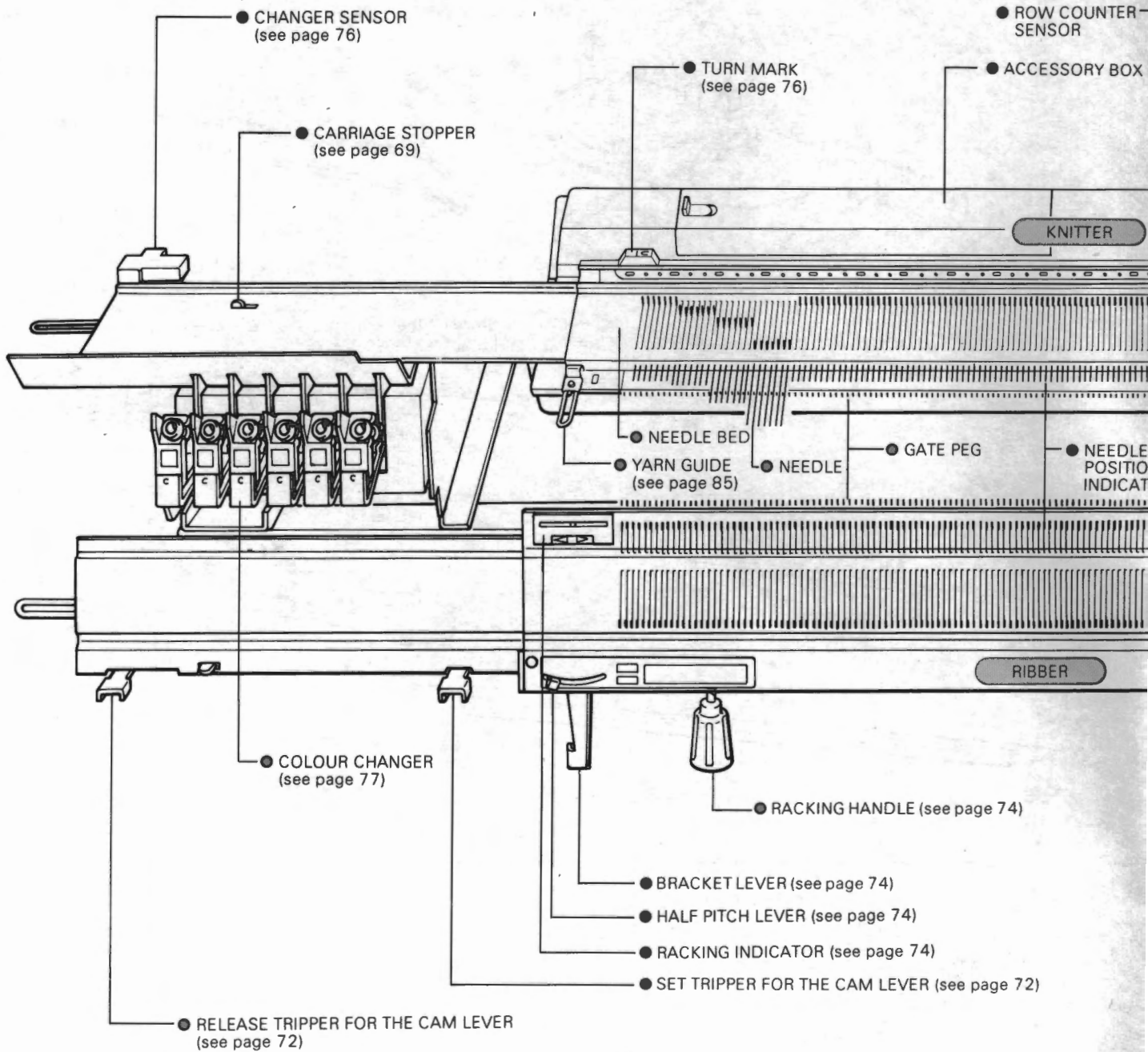


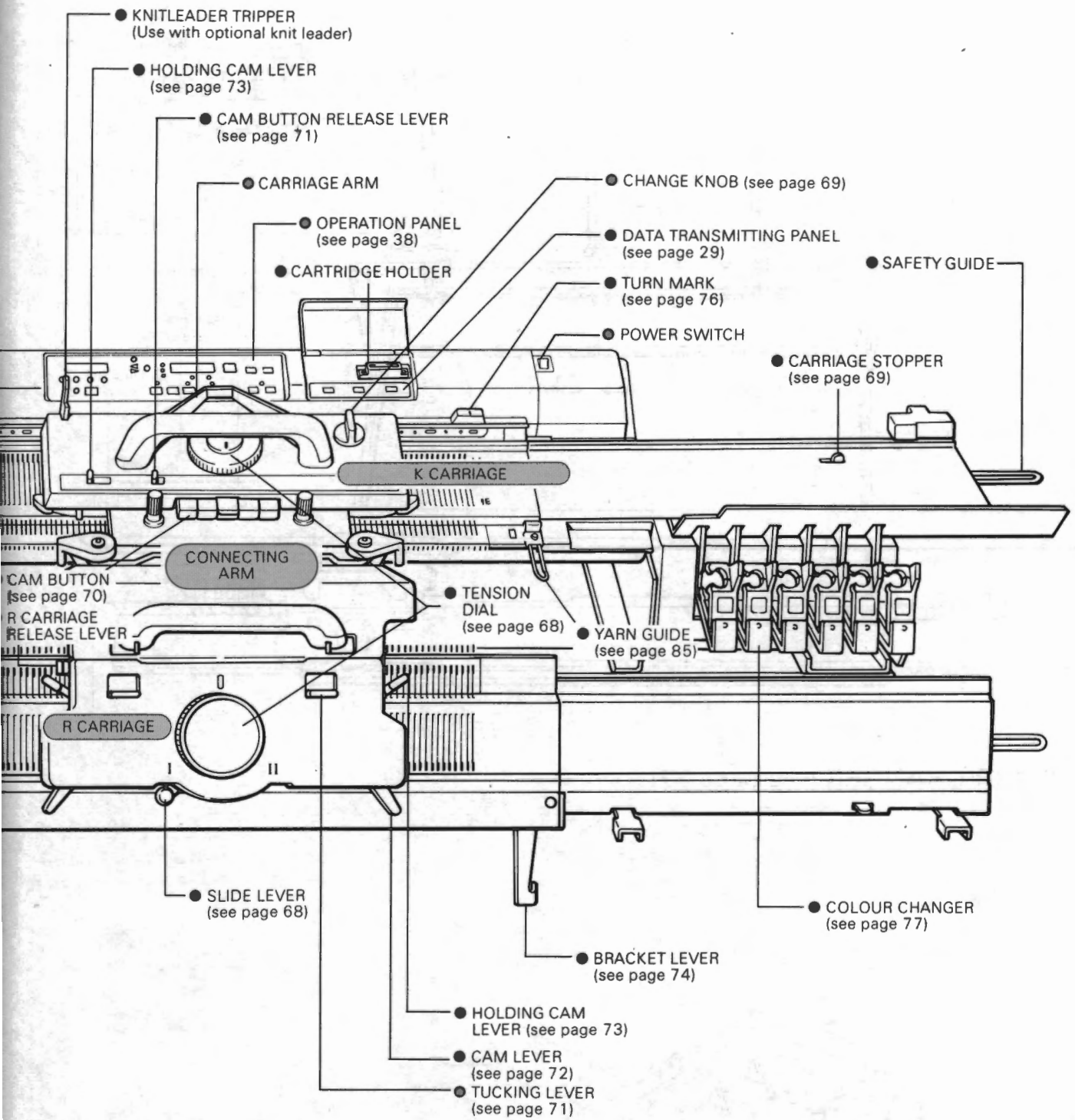


# PART NAME

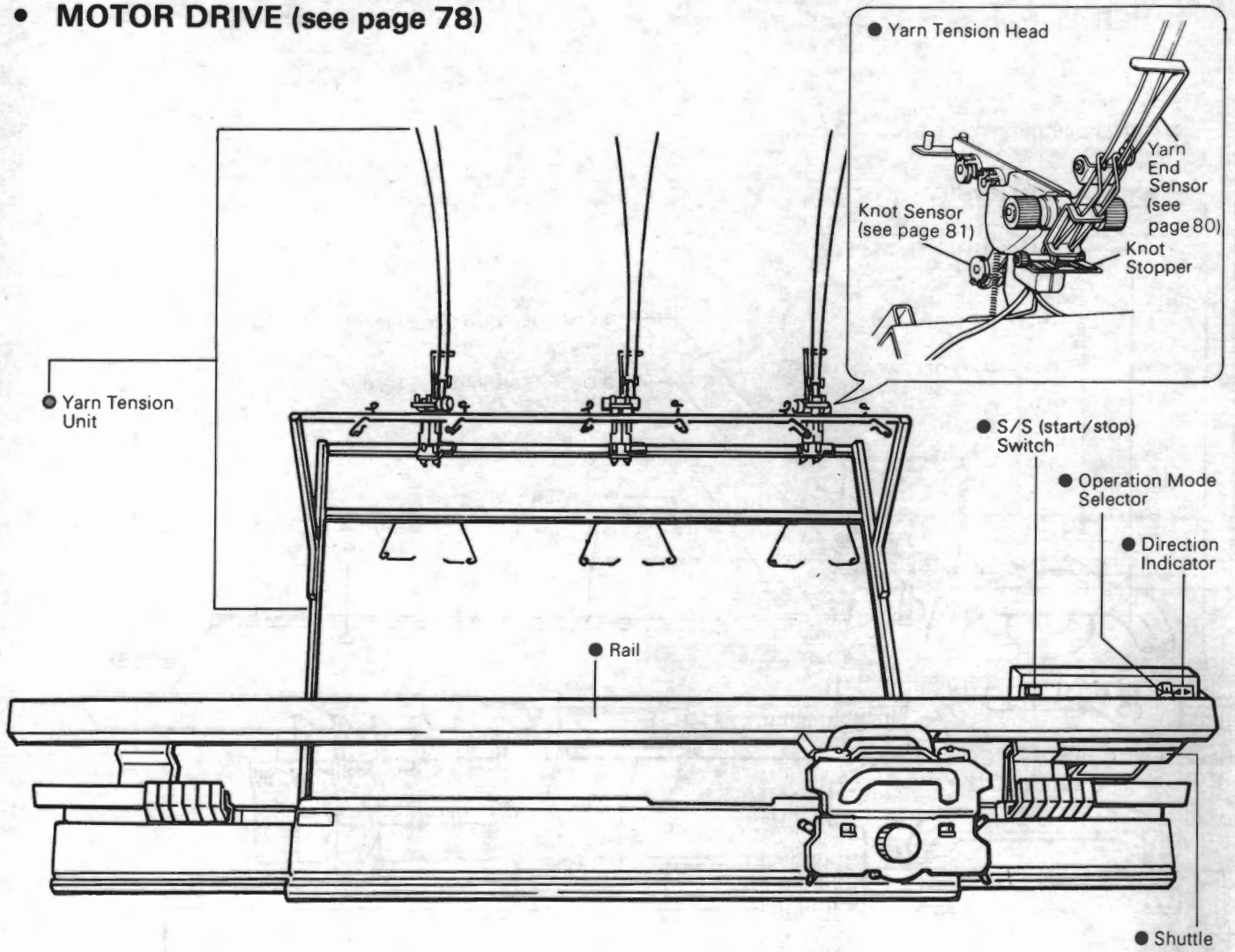
See the page in the parentheses as to detail of each part.

## ● KNITTER & RIBBER

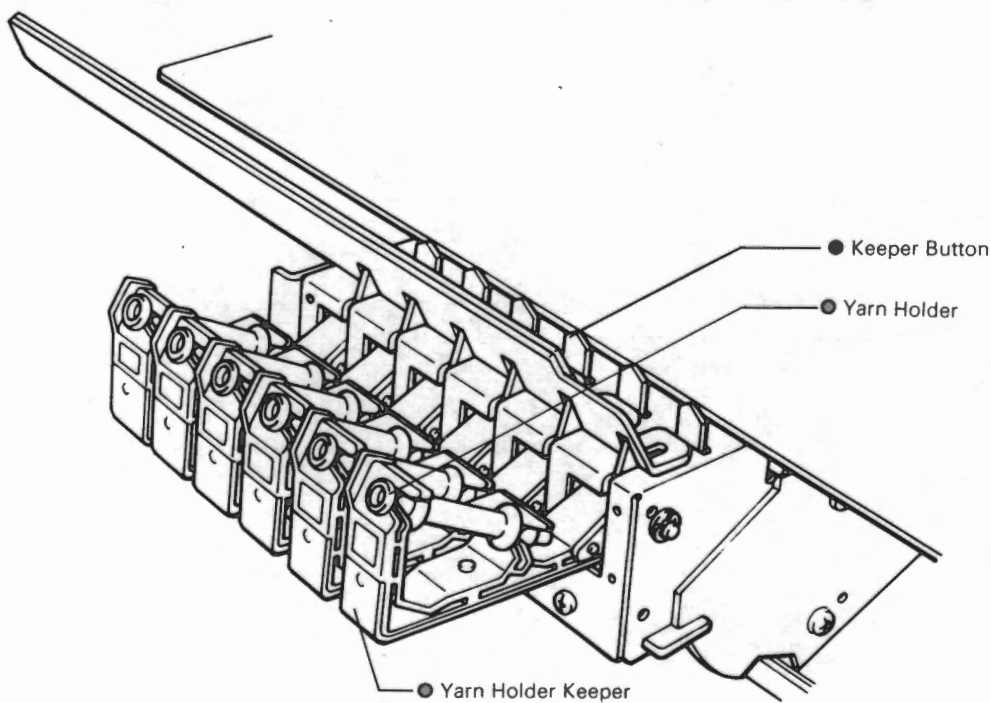




● **MOTOR DRIVE (see page 78)**

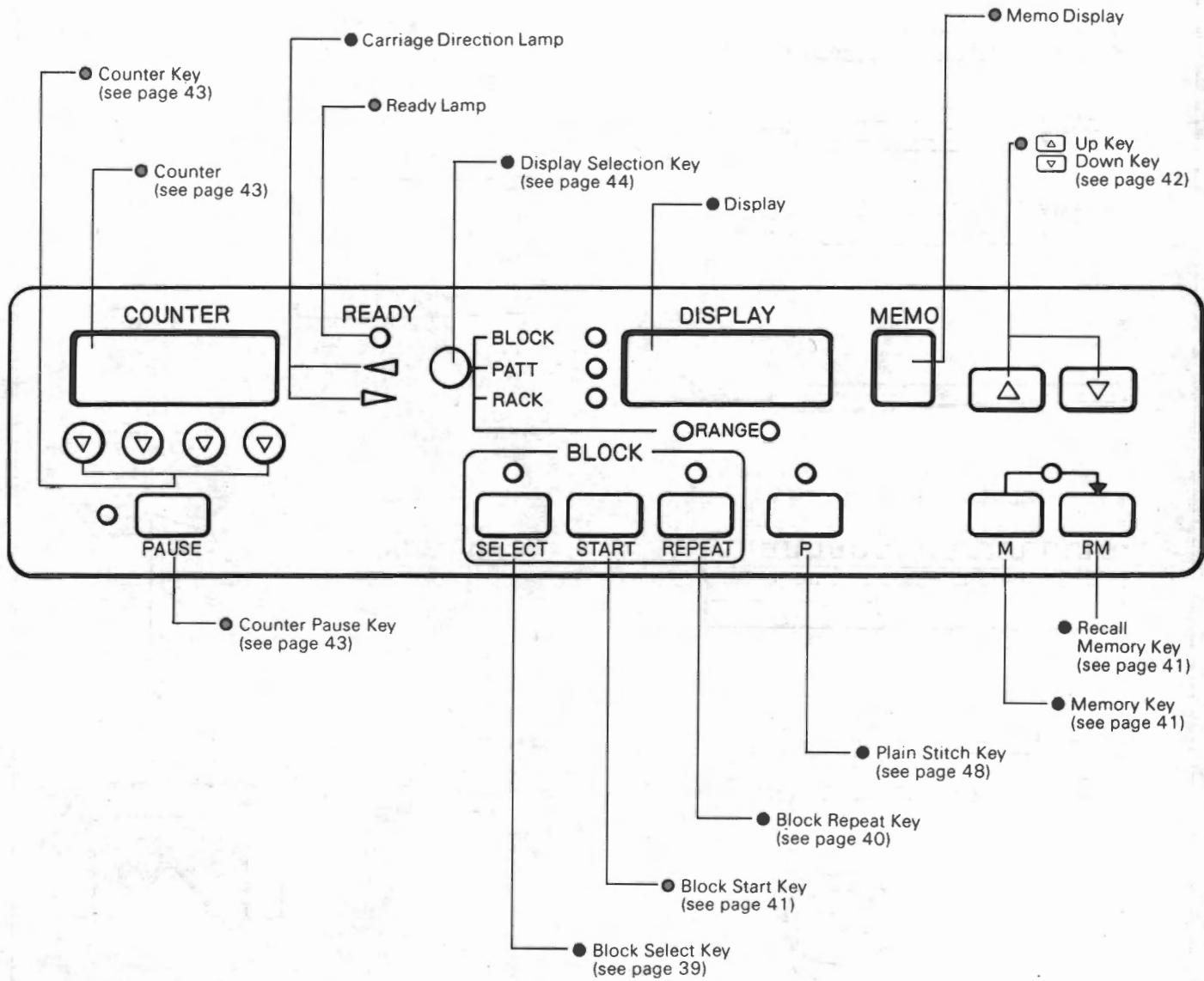


● **COLOUR CHANGER (see page 77)**

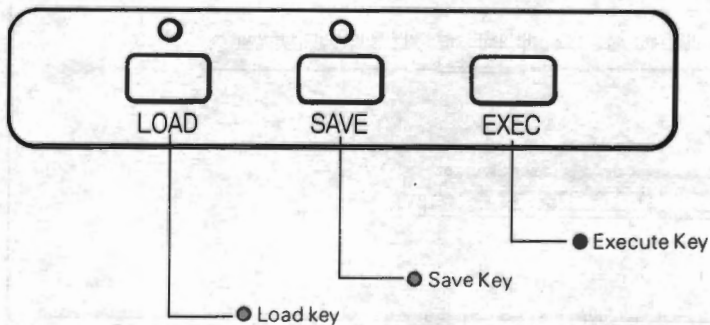




• OPERATION PANEL



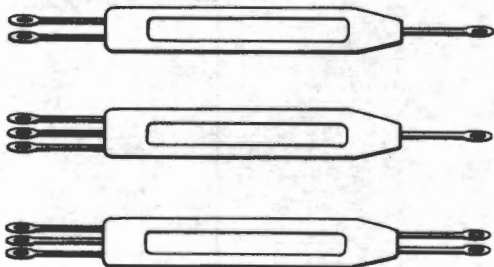
• DATA TRANSMITTING PANEL (see page 29)



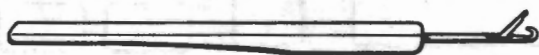
● **ACCESSORY**

**FOR KNITTING**

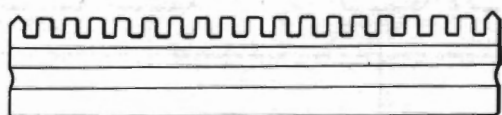
- Transfer Tool (1 x 2, 1 x 3, 2 x 3)



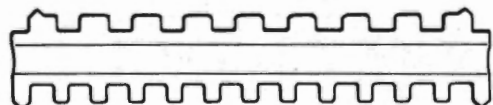
- Latchet Tool



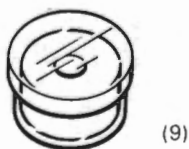
- Needle Pusher (0 x 1/1)



- Needle Pusher (1/2 x 2/2)



- Wax (In case)



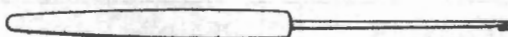
- Transfer Needle (see page 84)



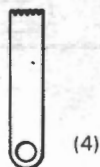
- Work Hook



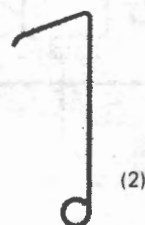
- Yarn Threader (see page 37)



- Claw Type Weight Hanger (see page 84)



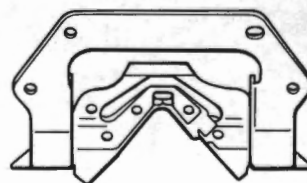
- Wire-loop Type Weight Hanger (see page 84)



- End Stitch Presser (R & L) (see page 84)

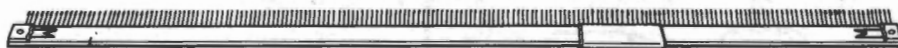


- Plating Yarn Feeder (see page 66)



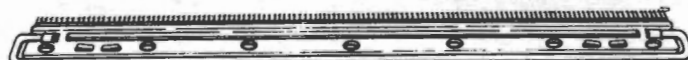
**CAST-ON COMB**

<FOR KNITTER> (see pages 53 ~ 82)

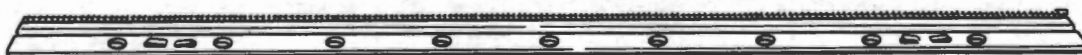


<FOR RIBBER>

- (For 130 Stitches) (see page 82)

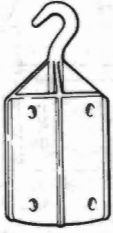


- (For 200 Stitches) (see page 50)



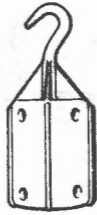
## WEIGHT (see page 83)

- Weight (large)



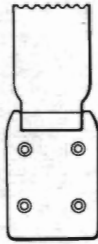
(4)

- Weight (small)



(2)

- Claw Weight



(2)

## OTHERS

- Coupler Reset Chip (see page 78)



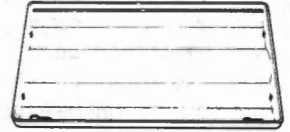
- Oil (see page 98)



- Bar for the Needle Presser (see page 86)



- Accessory Plate



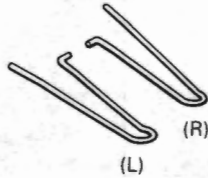
## SPARE PARTS

- Yarn Holder

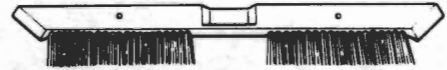


(3)

- Yarn Guide



- Brush



- Belt



- Fine Knitting Bar



- Needle Position Indicator



(For knitter)



(For ribber)

- Needle Presser



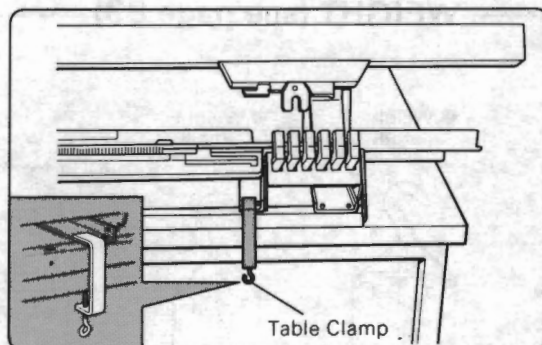
(For knitter)



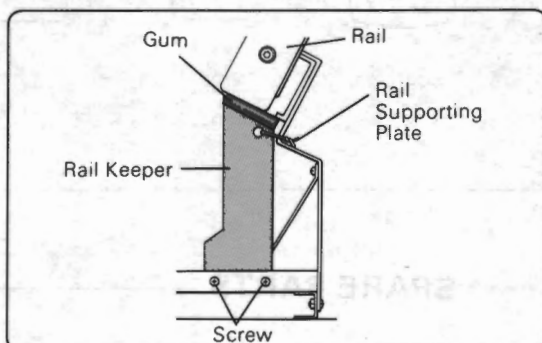
# ASSEMBLING (STEP 1)

## 1. ADJUSTING THE KNITTER

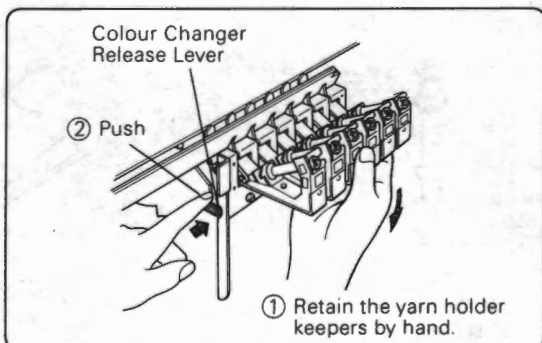
- ① Put the unit for the knitter on the table, and secure it to the table with the table clamps.



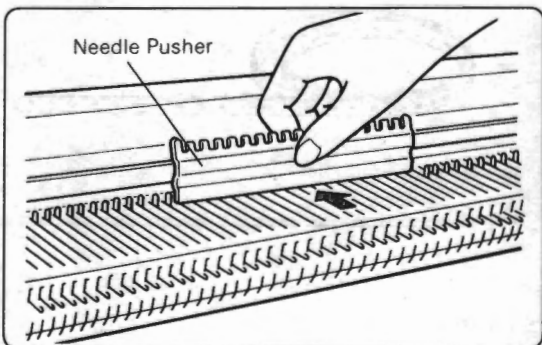
- ② Remove the wire binding the rail supporting plate and the rail keeper, which kept the position of the rail while the machine was transported from the factory. Remove the two screws to take out the rail keeper. (Remove the rail keepers of both sides.)



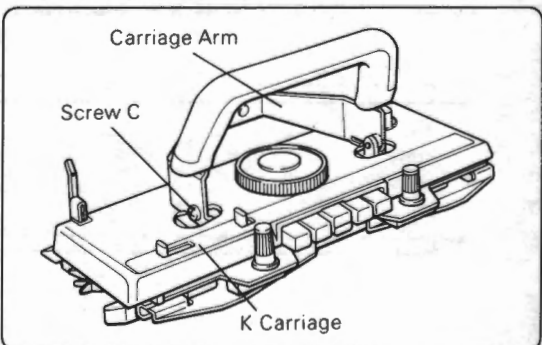
- ③ Push the colour changer release lever retaining the yarn holder keeper by hand. The colour changer is let down.



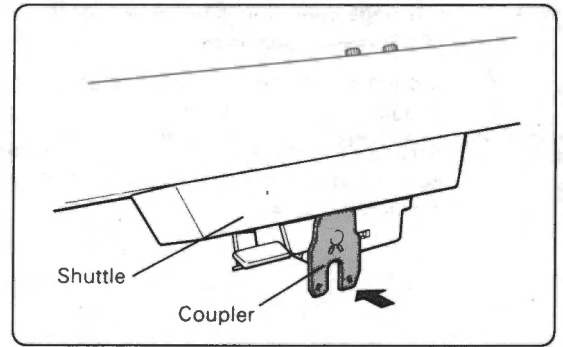
- ④ Push back all the knitter needles to the A position (as far as they go).  
• The needle pusher is in the accessory box.



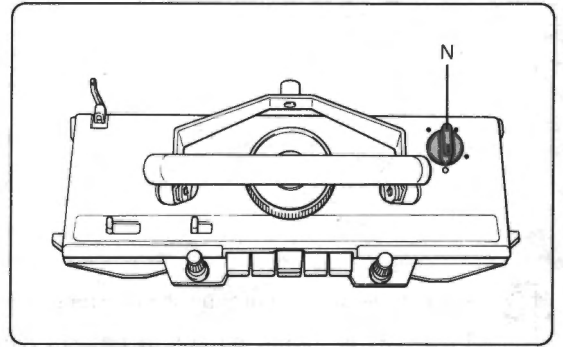
- ⑤ Fasten the carriage arm to the K carriage with the two screws C.  
<ATTENTION> Fasten the screws securely so that they do not become loose.



6 Push back the coupler until it is locked.

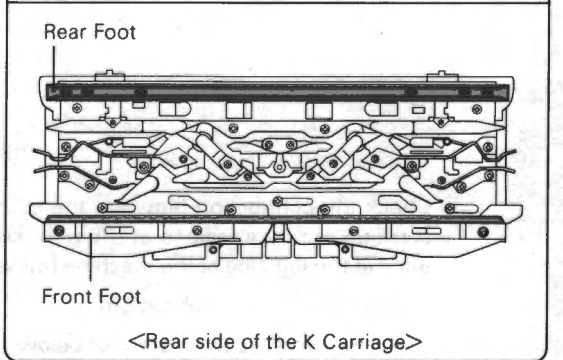
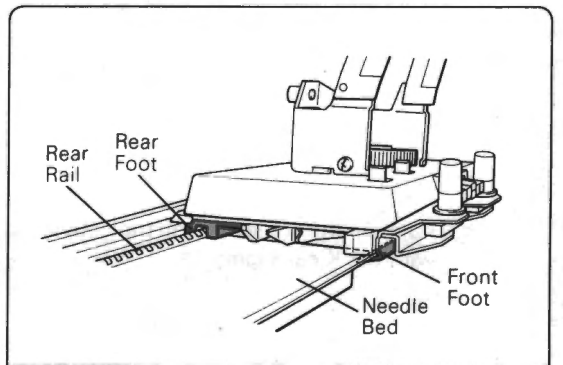


7 Set the change knob to "N".

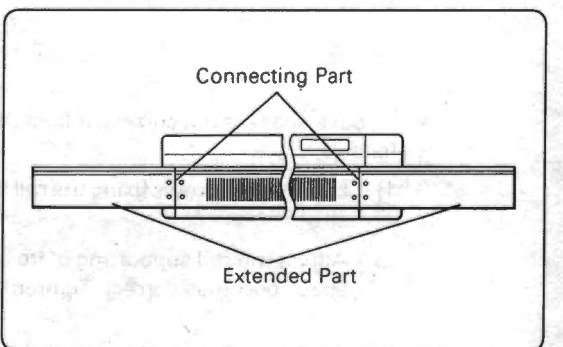


8 Slide the K carriage onto the needle bed.

Slide the K carriage onto the needle bed. Ensure that the rear foot has engaged the rear rail and the front foot has engaged the front edge of the needle bed.

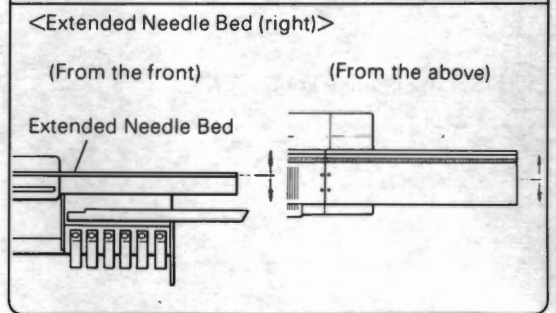
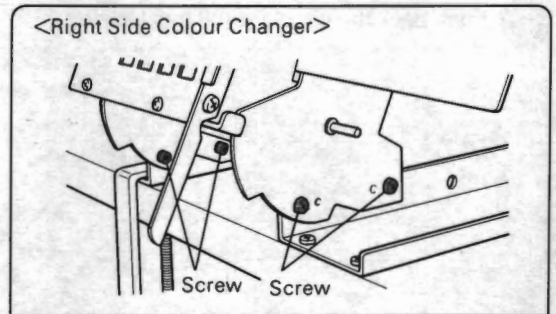


9 Move the K carriage right and left by hand. Check if the carriage movement is heavy on the connecting part or the extended part. If it is, see the next page.



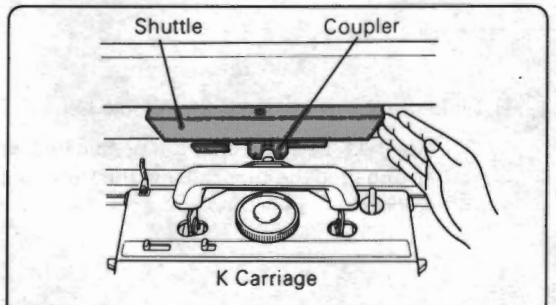
- If the carriage operation is heavy, adjust the position of the extended part of the needle bed as follows:

- ① Loosen four screws of the colour changer of which side extended needle bed makes the carriage operation heavy.
- ② Arrange the position of the extended needle bed so that it is connected to the needle bed in a straight line. Tighten the screws.



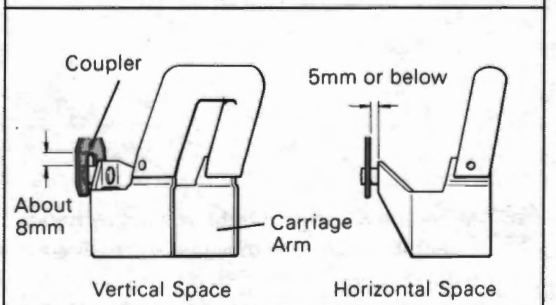
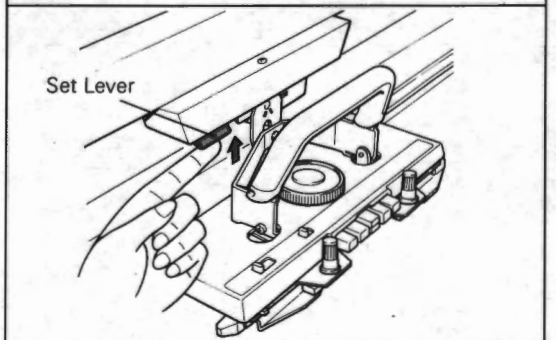
- ⑩ Check if the position of the rail is correct as follows:

- ① Move the shuttle to the K carriage by hand.
- ② Push up the set lever, and the coupler moves forward and joins with the K carriage.



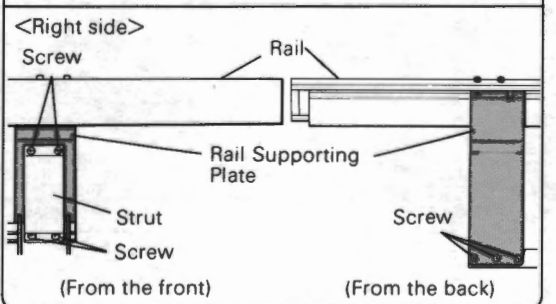
- ③ Check the connection between the coupler and the pin of the carriage arm twice; once at the right side of the machine and once at the left side of the machine (move the carriage by hand).

- Vertical space = about 8mm
- Horizontal space = 5mm or below



- If above space is not correct, adjust the position of the rail as follows:

- 1) Loosen the screws fixing the rail supporting plate and the strut.
- 2) Adjust the rail supporting plate and the strut so that the space becomes correct. Tighten the screws.

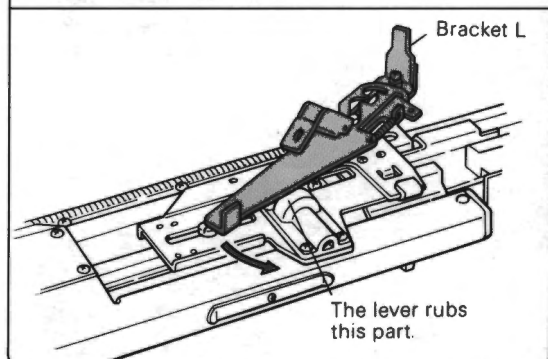
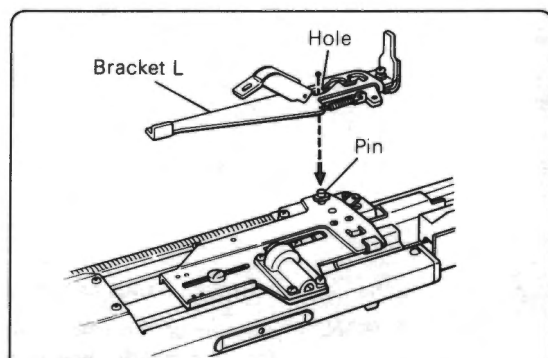




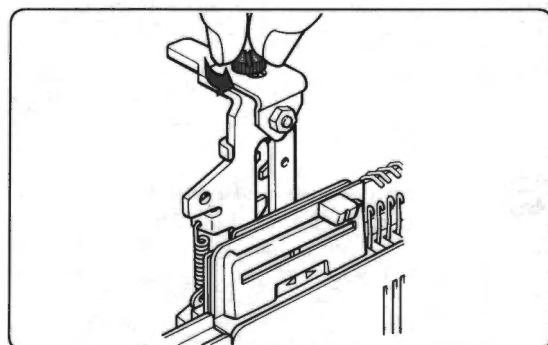
## 2. ATTACHING THE RIBBER

- ① Attach the brackets to the ribber.
- ① Turn over the ribber. Put the pin on the rear side of the ribber into the hole of the bracket L. Turn the bracket lever counterclockwise 90°. (It does not matter if the lever rubs the ribber.)

- ② Attach the bracket R in the same way. (Turn the bracket lever clockwise.)

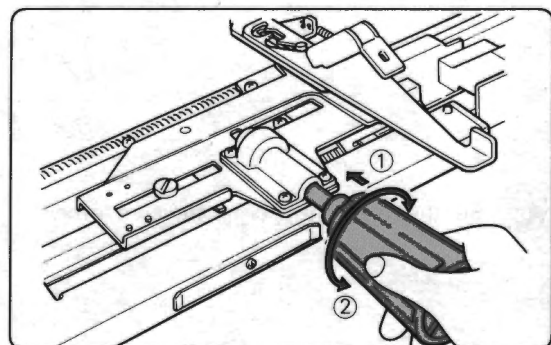


- ② Remove the thumb screws from the brackets.



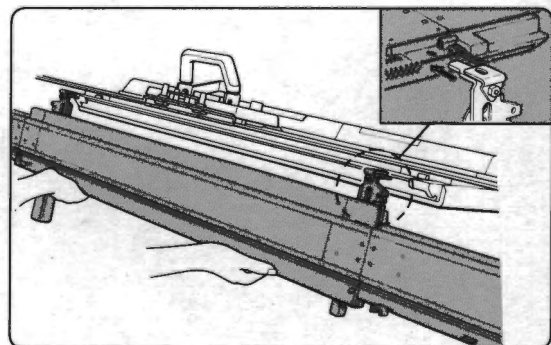
- ③ Insert the racking handle into the handle holder, and turning the handle, push it in until you hear the click.

- ♣ After setting the racking handle, check the working of the handle by turning it back and forth.

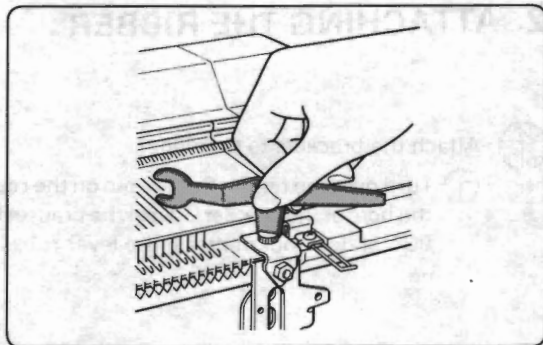


- ④ Push up the colour changer to the working position (see step ③ on page 21).

- ⑤ Hold the ribber with both hands so that the gate pegs of the ribber are up and the butts of the ribber needles are toward you. Insert the bracket R beneath the knitter bed as far as it will go, then insert the bracket L.

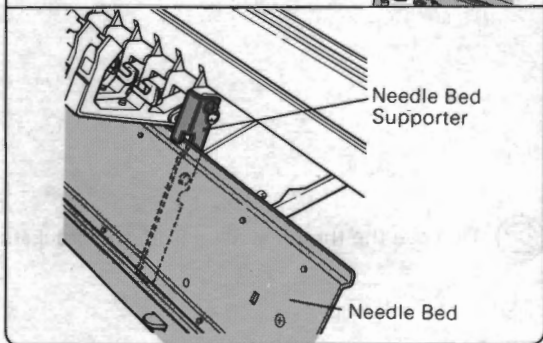
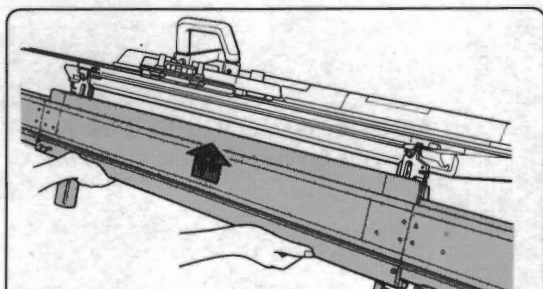


- 6 Screw the bracket tightly with the wrench pushing the ribber as far as it will go.

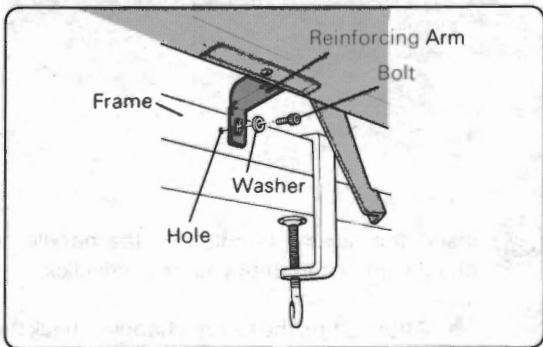


- 7 Push up the ribber with both hands as high as it will go.

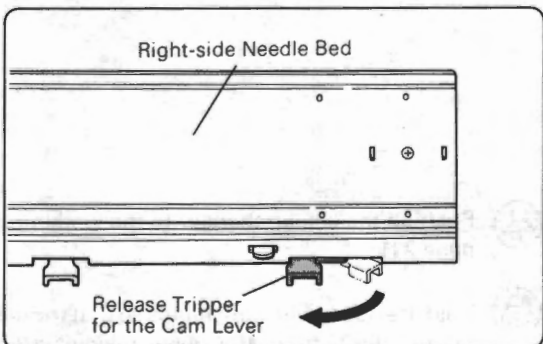
<ATTENTION> Whenever the ribber is pushed up, make sure that the needle bed of the ribber stays in the cavity of the needle bed supporters which are beside the right and left colour changers.



- 8 With the washers and bolts, fasten the reinforcing arms of both brackets to the frame of the unit.

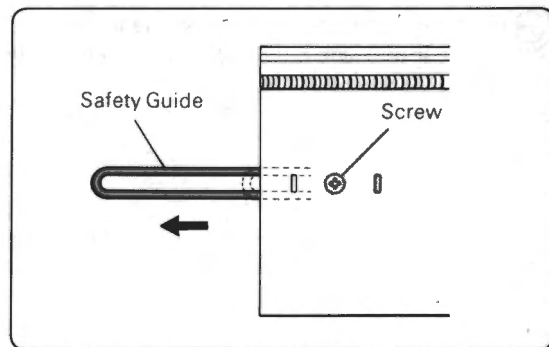


- 9 Set the release tripper for the cam lever.



- ⑩ Set the four safety guides (both sides of the knitter needle bed and both sides of the ribber needle bed).

- ① Loosen the screw.
- ② Pull out the safety guide.
- ③ Tighten the screw to secure the safety guide.

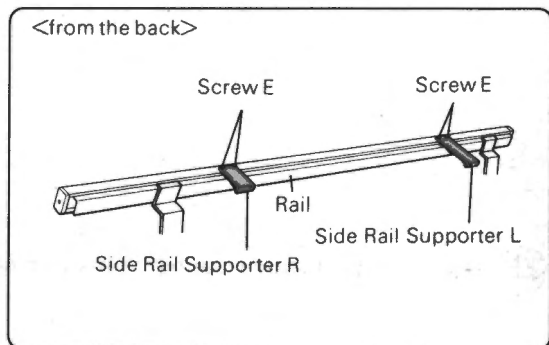


### 3. ASSEMBLING THE YARN TENSION UNIT

- ① Attach the side rail to the unit.

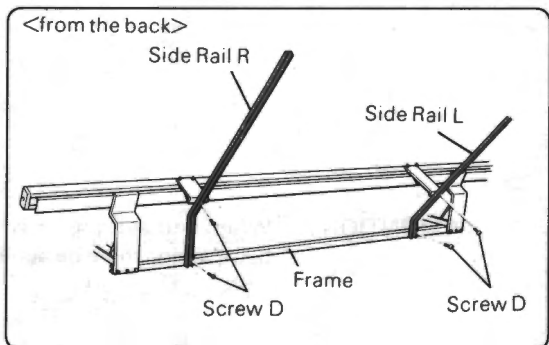
- ① Attach the side rail supporters L & R to the rail of the motor drive with the screws E.

<ATTENTION> The side rail supporter R is smaller than L.



- ② Fasten the side rails L & R to each side rail supporter and the frame of the unit with the screws D.

<ATTENTION> Two side rails are different in shape.

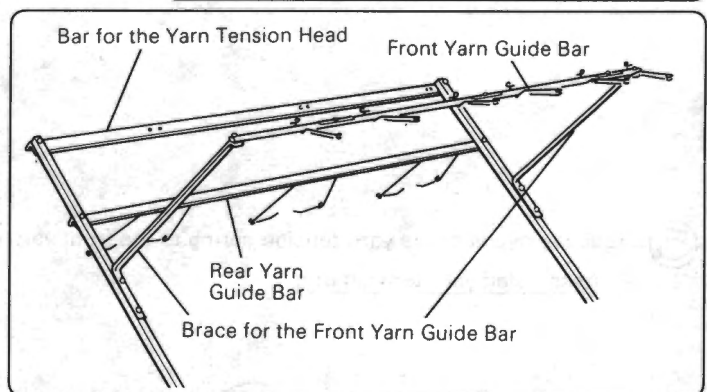


- ③ Fasten the bar for the yarn tension head to the side rails with the screws B.

- ④ Fasten the rear yarn guide bar to the side rails with the screws B.

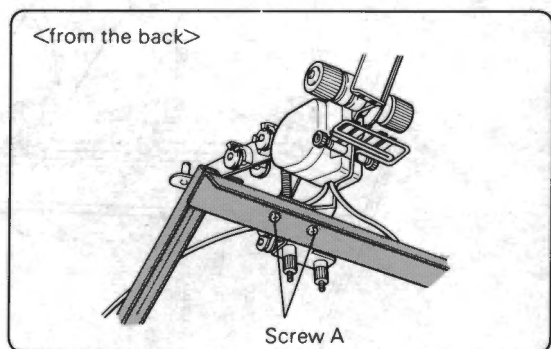
- ⑤ With the screws B, fasten the right and left braces for the front yarn guide bar to the side rails (use two screws for each brace).

- ⑥ Fasten the front yarn guide bar to the brace with the screws B.

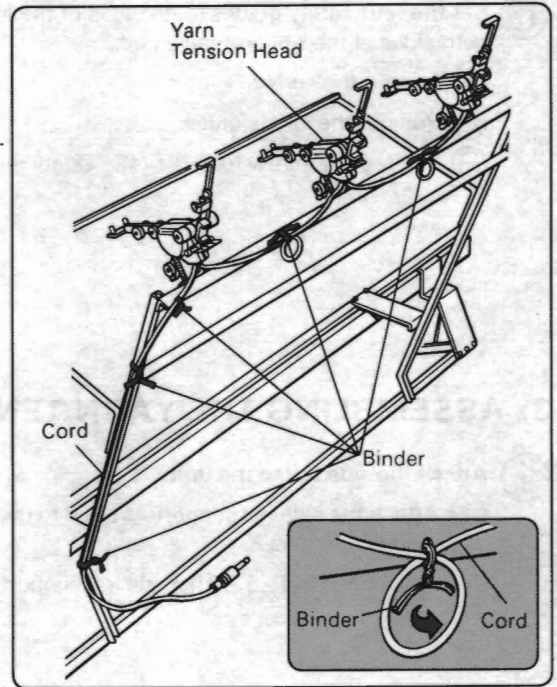


- ② Attach the yarn tension head to the bar.

- ① Fasten the yarn tension heads to the bar with the screws A (use two screws for each head).

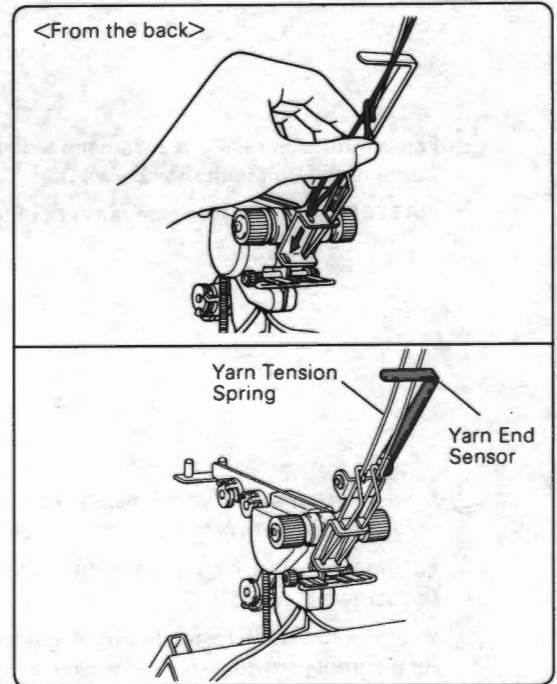


- ③ Tie the cord of the yarn tension head (cord for the yarn end sensor) to the bar and side rail R with the binders at the five points.

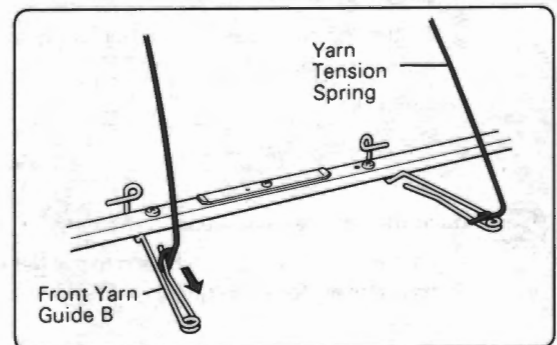
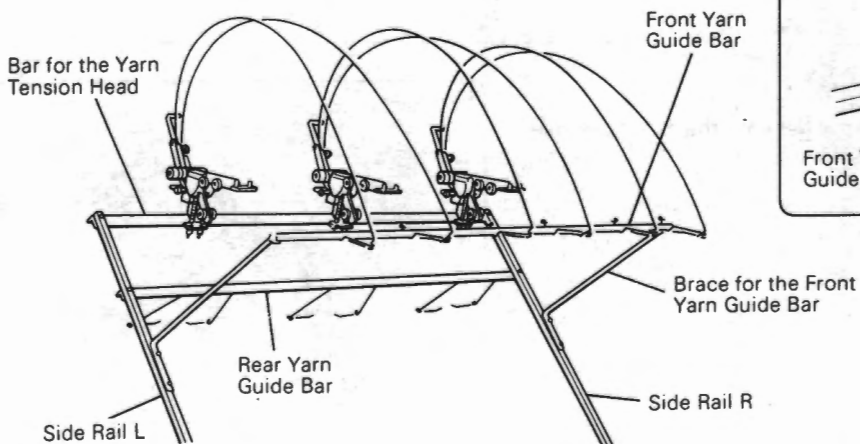


- ④ Attach the yarn tension springs to the yarn tension heads.

<ATTENTION> When you see the yarn tension head from the back, spring must be behind the yarn end sensor.



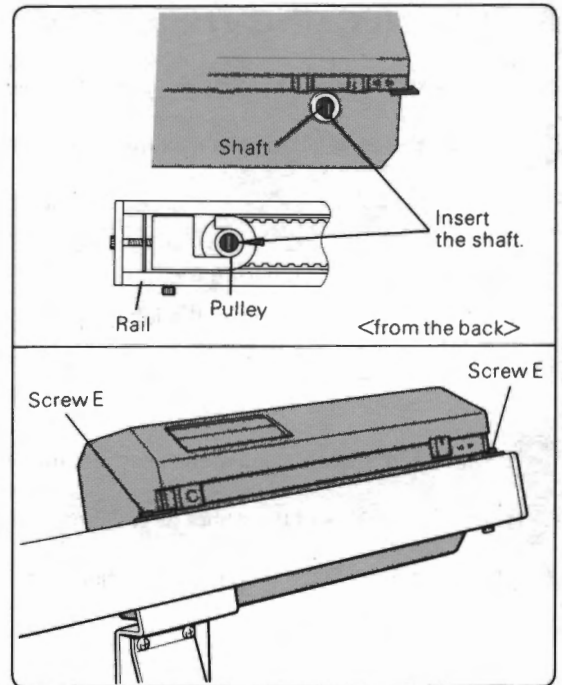
- ⑤ Hook the eyelet of the yarn tension spring to the front yarn guide B.
- Assembled yarn tension unit





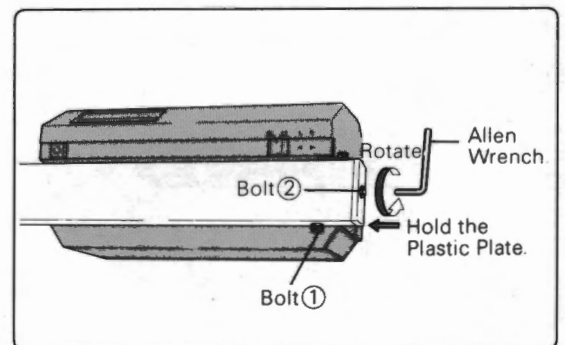
#### 4. SECURING THE MOTOR HEAD TO THE RAIL

Insert the shaft of the motor head into the hole of the pulley which is placed at the right side of the rail. Secure the motor head to the rail using two screws E.

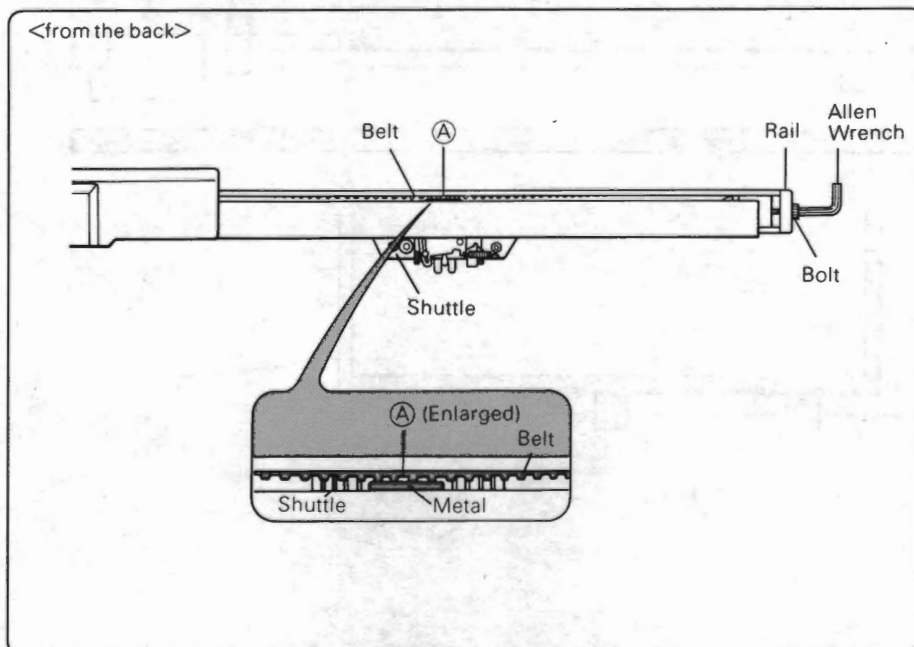


#### 5. ADJUSTING THE BELT IN THE RAIL

- ① Remove the safety lock (locked during transportation from the factory).
  - ① Loosen the bolt ① a few rotations. Loosen the bolt ② (counterclockwise) three rotations holding the plastic plate.
  - ② Tighten the bolt ① holding the plastic plate and the bolt ② .
  - ③ Tighten the bolt ② (clockwise) two rotations.



- ② Adjust the belt.
  - ① Move the shuttle to the center of the rail. Loosen the bolt at the opposite side of the rail to the motor head, until the belt touches the metal of the shuttle.
  - ② Tighten the bolt (clockwise) three and half rotations.



## 6. CONNECTING THE CORDS

Connect the cords referring to the wiring diagram below.

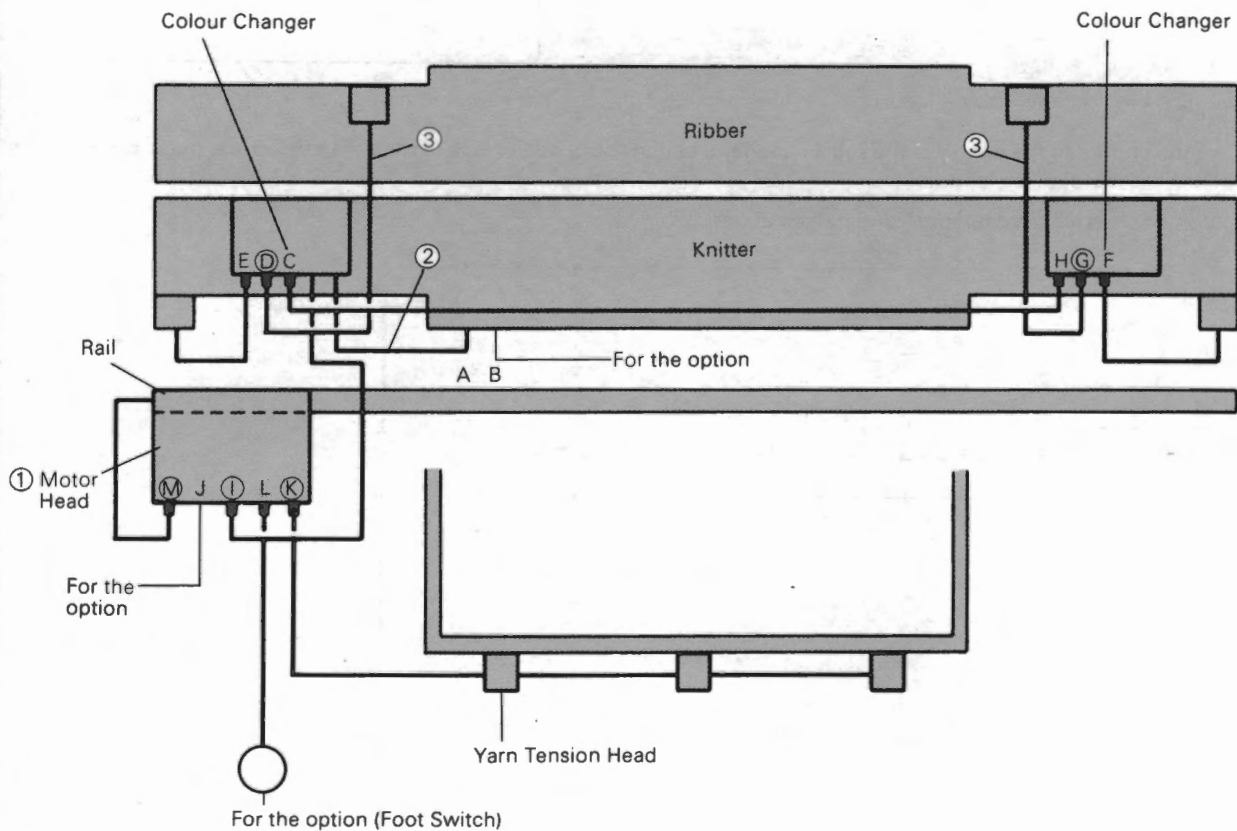
- 1 Insert the plugs as listed below into the jacks behind the motor head.

Plug		Jack
	Plug from the rail	M
I	Plug from the left (from the behind) colour changer	I
	Plug from the yarn tension head	K

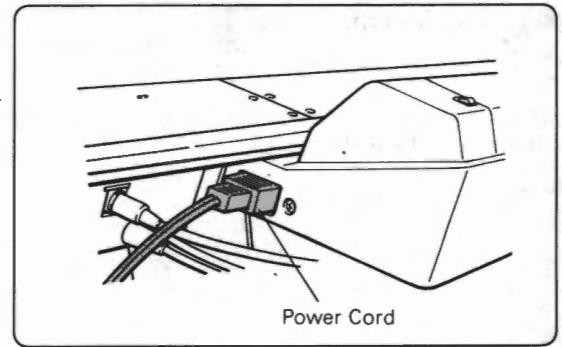
- 2 Make sure that the plug of the left (from the behind) colour changer (A) is inserted into the jack at the rear side of the knitter.
  - 3 Insert the plugs of the ribber (D & G) into the jacks behind the right and left colour changers.
- ♣ Make sure that each plug is inserted into the jack securely.

### WIRING

<From the above>



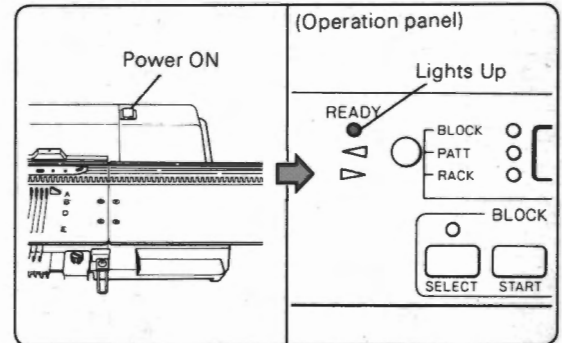
- ④ Insert the power cord into the AC inlet of the right-side colour changer.



- ⑤ Plug the power cords of the motor head and the knitter into the wall outlet.

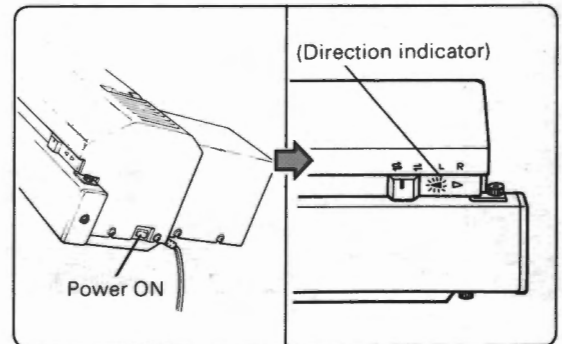
- ⑥ ① Switch on the power of the knitter.

The ready lamp blinks for a few seconds, and then lights up. (Other lamps and the indication on the panel differ according to circumstances.)



- ② Switch on the power of the motor head.

Either lamp of the direction indicator lights up.



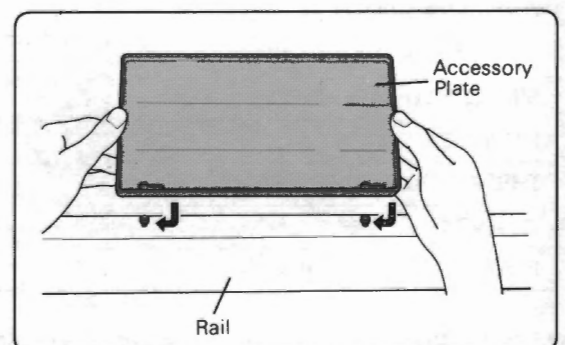
♥ If the ready lamp or the direction indicator does not light up, switch off the power of the knitter and motor head, and then check following points.

- 1) Is every cord connected correctly? (See page 18.)
- 2) Is the yarn tension spring hooked to the front yarn guide B? (See page 16.)

- ♣ When yarn is not threaded to the yarn tension unit, hook the yarn tension spring to the front yarn guide B. If you do not do so, the yarn end sensor will react and the direction indicator of the motor head shows "error".

## 7. ACCESSORY PLATE

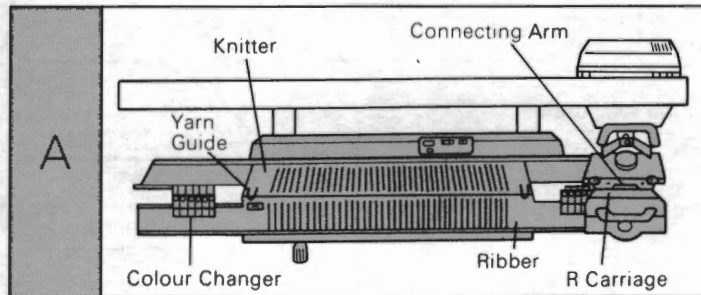
Attach the accessory plate to the rail.



# ASSEMBLING (STEP 2)

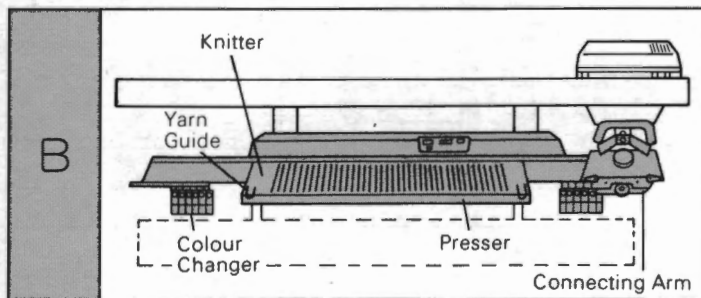
## ORGANIZING THE MACHINE

CK-35 is composed of many parts such as the knitter, ribber, colour changer and so on. Combine the components according to the pattern as follows:



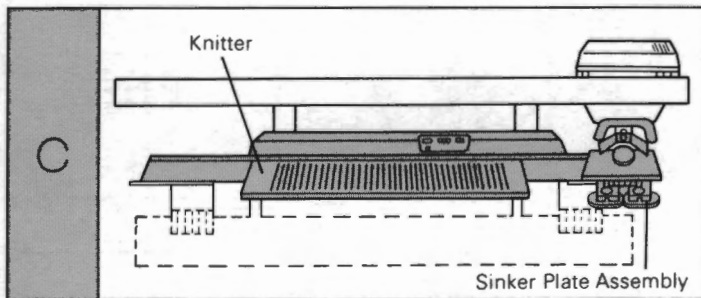
### Type A

- Main components ... Knitter  
Ribber  
Colour Changer  
Connecting Arm  
R Carriage  
Yarn Guide



### Type B

- Main components ... Knitter  
Presser  
Colour Changer  
Connecting Arm  
Yarn Guide



### Type C

- Main components ... Knitter  
Sinker Plate Assembly

### • VARIOUS PATTERNS AND THE COMBINATIONS OF THE COMPONENTS

PATTERN	TYPE		
	TYPE A	TYPE B	TYPE C
DOUBLE BED JACQUARD	○		
RIB	○		
ENGLISH RIB, FISHERMAN'S RIB	○		
RIB TUCK	○		
STOCKING STITCH		○	○
TUCK (MULTICOLOUR TUCK)		○ (Multicolour tuck)	○
SKIP (MULTICOLOUR SKIP)		○ (Multicolour skip)	○
SINGLE BED JACQUARD		○	
FAIRISLE			○
THREAD LACE			○
WEAVING			○ (Hand operating only)
PLATING, PLATED TUCK			○

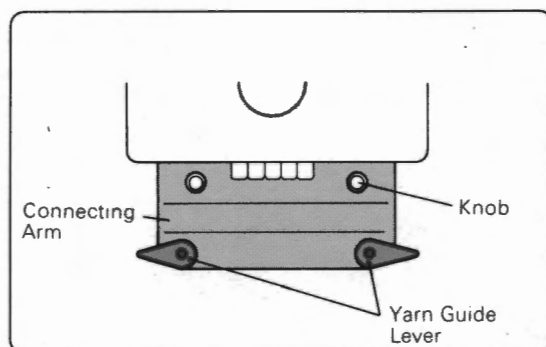
- Motor drive can be used for all the patterns except weaving.  
You can also knit the pattern by hand without using the motor drive.



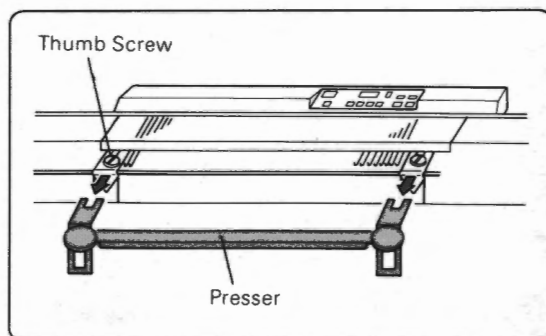
## • Type A

- ① Attach the connecting arm to the K carriage.
  - ① Loosen the knobs and screw the connecting arm onto the K carriage.
 

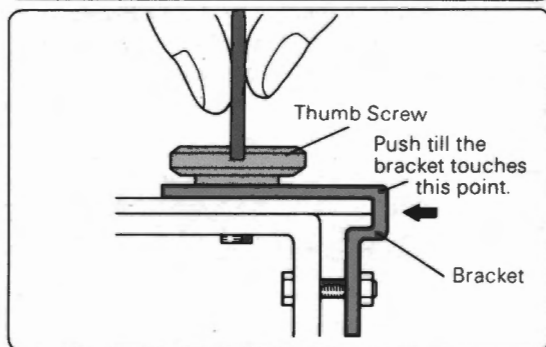
<ATTENTION> Tighten the knob securely.
  - ② Set the yarn guide levers as shown in the figure.



- ② Remove the presser, if it is attached.
  - ① Loosen the thumb screws of the right and left brackets and remove the presser.

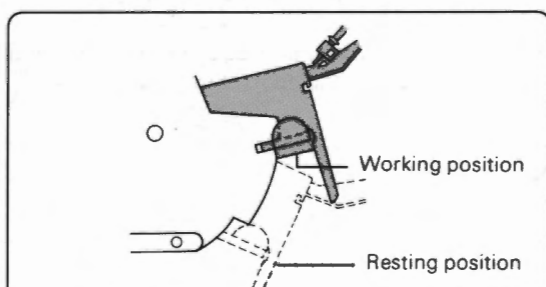


- ② Push the bracket as far as it will go and tighten the thumb screws.



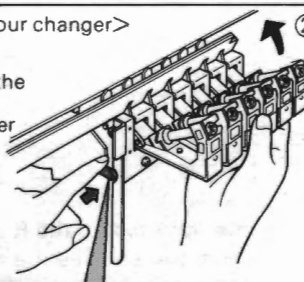
- ③ Set the colour changers to the working position.
 

Press the colour changer lever and push up the colour changer until you hear "click" and the lever is locked.  
(When the colour changer is at the working position already, make sure that the lever is locked securely.)



- <left colour changer>
- ② Push up the colour changer.

- ① Press the colour changer lever.

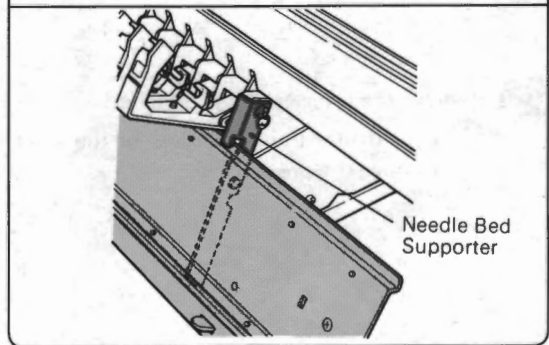
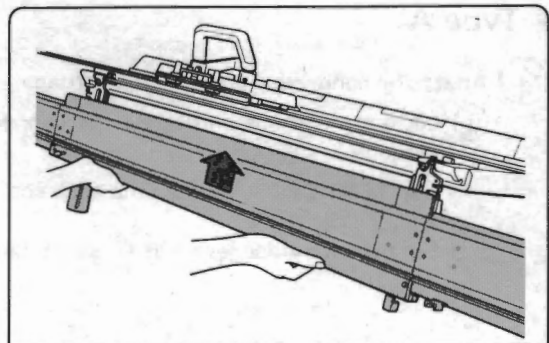


Lever Being Locked

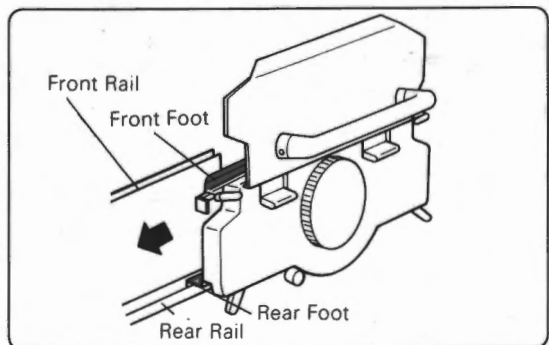
Groove

This part must be held in the groove.

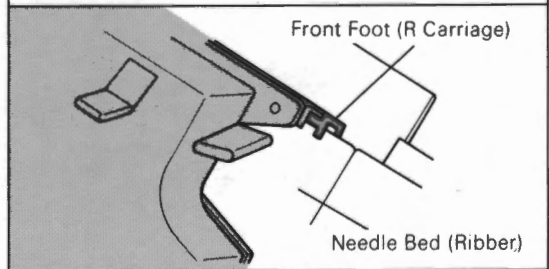
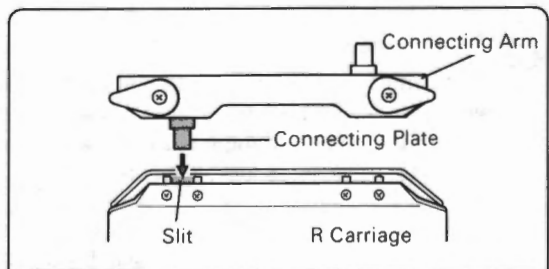
- ④ Push up the ribber to the highest position with both hands.  
**<ATTENTION>** When the ribber is pushed up, make sure that the needle bed of the ribber stays in the cavity of the needle bed supporters which are beside the right and left colour changers.



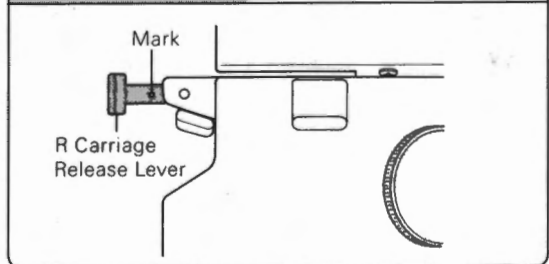
- ⑤ Slide the R carriage onto the needle bed of the ribber.  
 ① Place the rear foot of the R carriage into right end of the rear rail and keeping off the front foot from the front rail, move the R carriage to the K carriage.



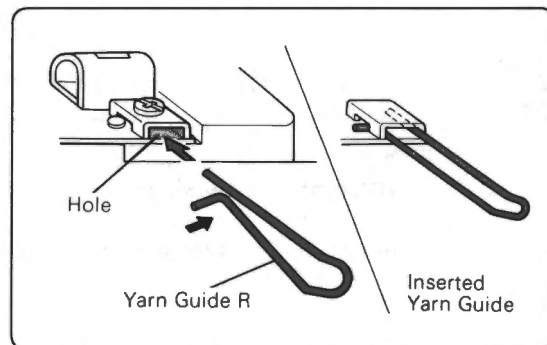
- ② Pushing the R carriage release lever, attach the R carriage to the connecting arm so that the connecting plate is inserted into the slit of the R carriage and that the front foot of the R carriage engages the edge of the needle bed.



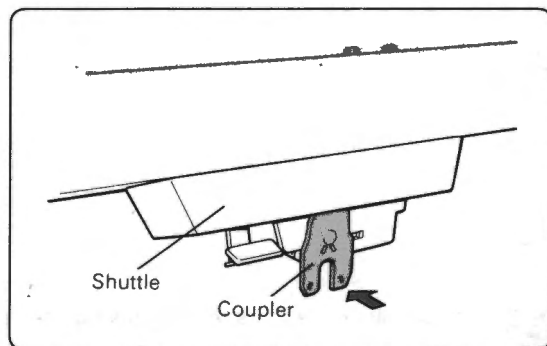
- ♣ When the front foot of the R carriage engages the edge of the needle bed, you can see the mark • on the R carriage release lever. If you cannot see it, pull out the lever.



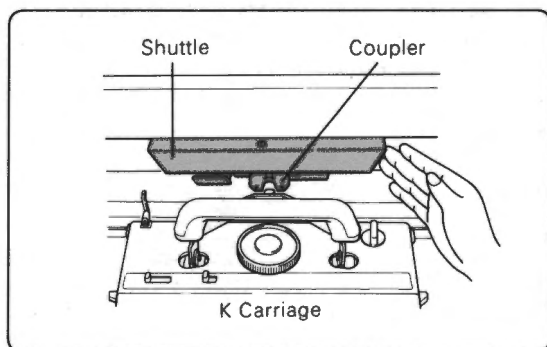
- ⑥ Insert the yarn guides into the holes at both sides of the knitter pressing them inside.  
(Make sure that the yarn guide R is set at right side and the yarn guide L is set at left side.)



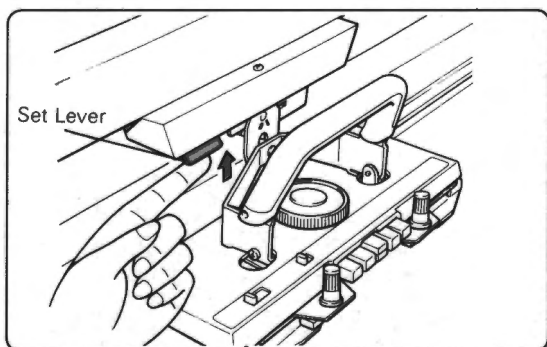
- ⑦ Connect the K carriage to the coupler of the motor drive.
- ① Push back the coupler until it clicks and is locked.



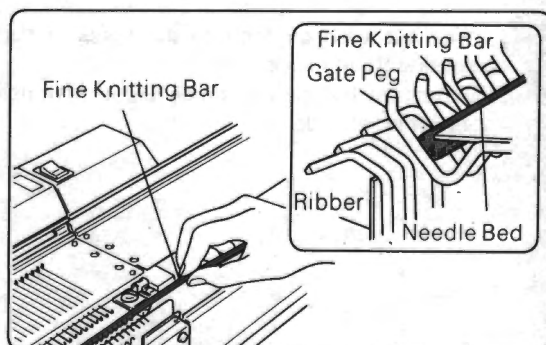
- ② Move the shuttle to the K carriage by hand.  
<ATTENTION> Do not press the S/S switch of the motor drive.



- ③ Push up the set lever, and the coupler moves forward and joins with the K carriage.



- ⑧ Insert the fine knitting bar to the edge of the knitter needle bed.  
(Fine knitting bar is already set when delivering from the factory.)
- <ATTENTION> If the knitting does not lie smoothly (for example, using the thick yarn), remove the fine knitting bar.

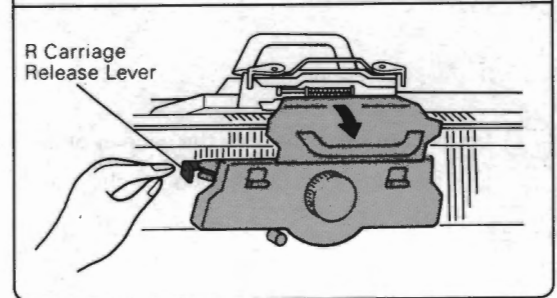
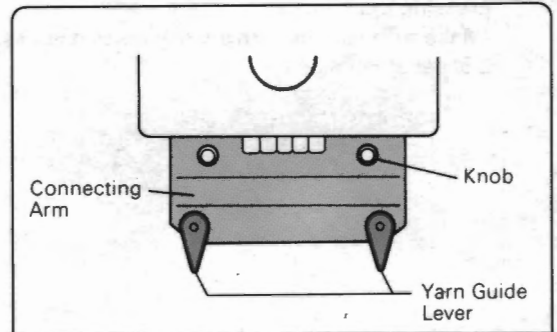


## • Type B

- ① Attach the connecting arm to the K carriage.
  - ① Loosen the knobs and screw the connecting arm onto the K carriage.
 

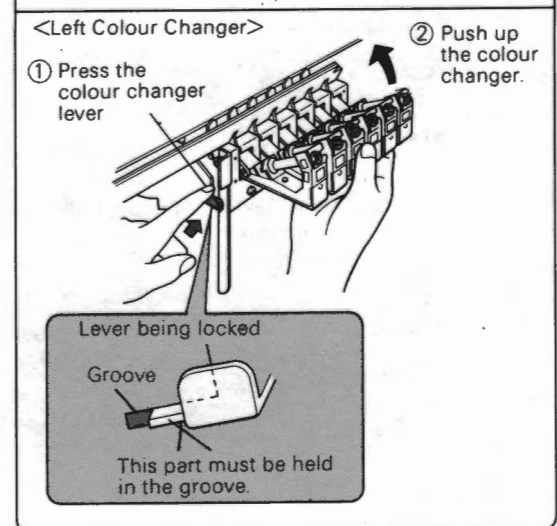
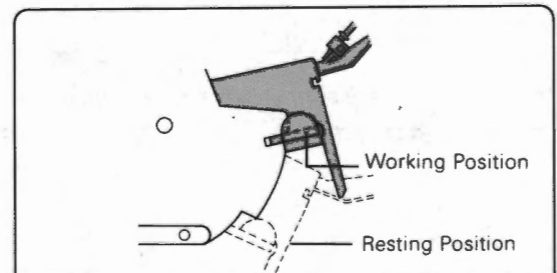
<ATTENTION> Tighten the knob securely.
  - ② Set the yarn guide levers as shown in the figure.

- ♣ If the K carriage and the R carriage is connected, disconnect the R carriage and the K carriage pushing the R carriage release lever.



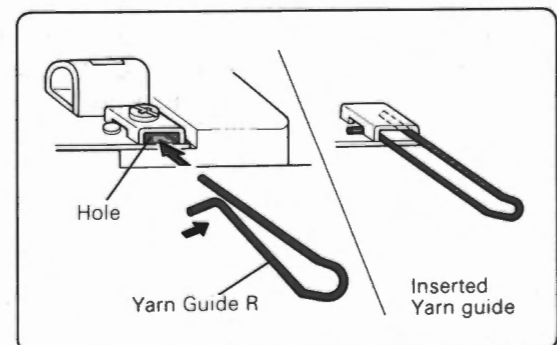
- ② Set the colour changers to the working position.
 

Press the colour changer lever and push up the colour changer until you hear "click" and the lever is locked.  
(When the colour changer is at the working position already, make sure that the lever is locked securely.)



- ③ Insert the yarn guides into the holes at both sides of the knitter pressing them inside.
 

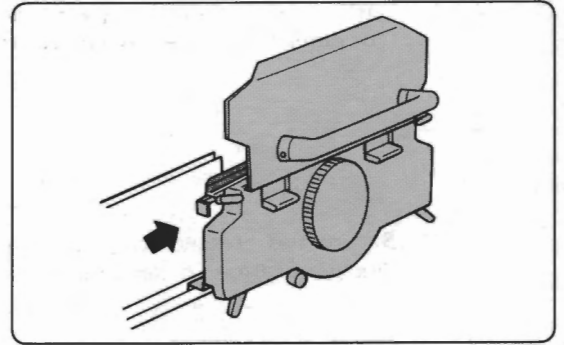
(Make sure that the yarn guide R is set at right side and the yarn guide L is set at left side.)



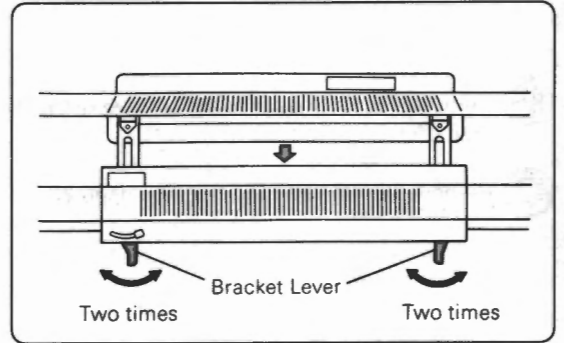


④ Let down the ribber to the resting position.

① Remove the R carriage from the needle bed by sliding it to right or left keeping the front foot off the needle bed.

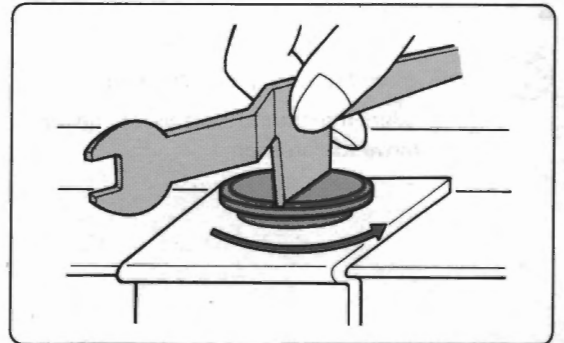


② Push down the bracket levers to let down the ribber two steps.

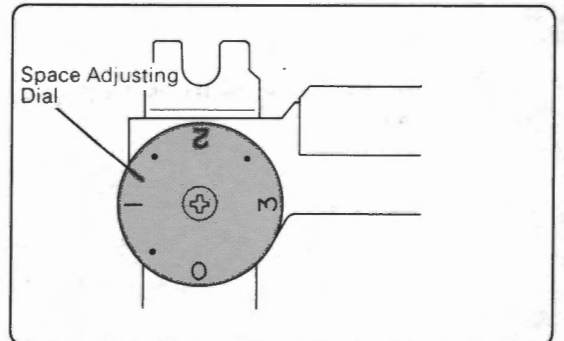


⑤ Attach the presser to the knitter.

① Loosen the thumb screws of both brackets.

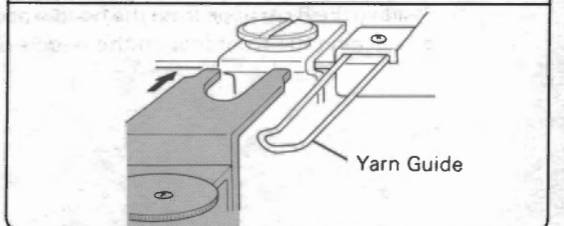
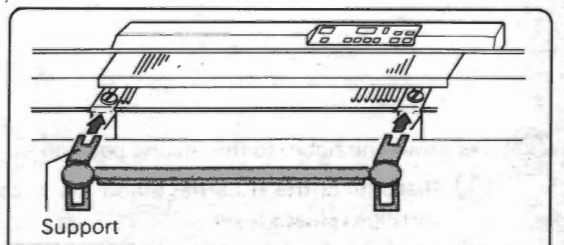


② Set the space adjusting dial to 0 as shown in the figure.



③ Insert the right presser support under the loosened right thumb screw, then insert the left one under the left thumb screw.

<ATTENTION> Be careful so that the presser does not touch the yarn guide.

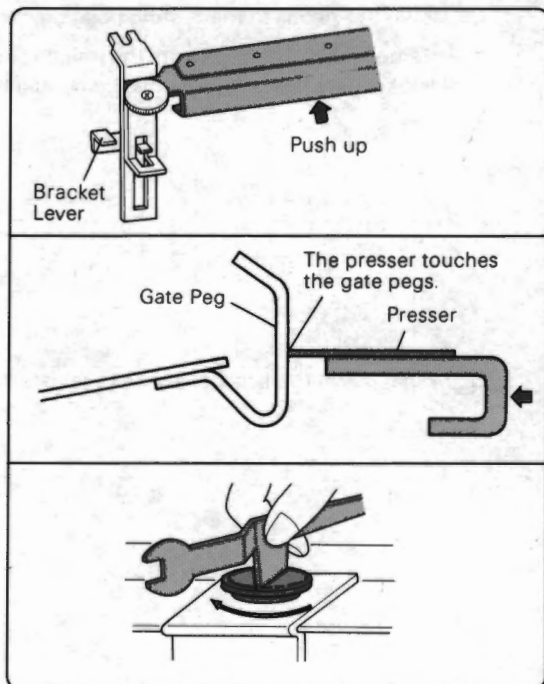


- ④ 1) Push up the presser as high as it will go.  
(You can let down the presser with the bracket lever.)

- 2) Secure the presser screw pushing the presser in the direction of arrow so that the presser touches the gate pegs.

- ⑥ Connect the K carriage to the coupler of the motor drive (see page 23 step ⑦).

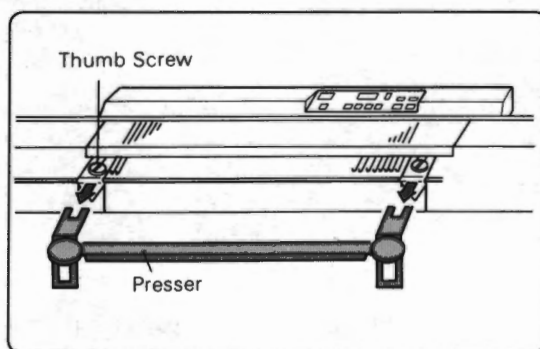
- ⑦ Remove the fine knitting bar (see page 23 ③).



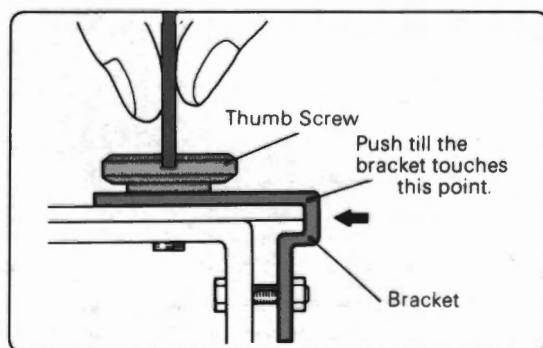
## • Type C

- ① Remove the presser, if it is attached.

- ① Loosen the thumb screws of the right and left brackets and remove the presser.



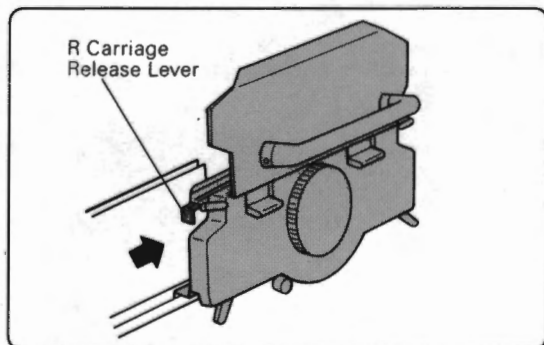
- ② Push the bracket as far as it will go and tighten the thumb screws.



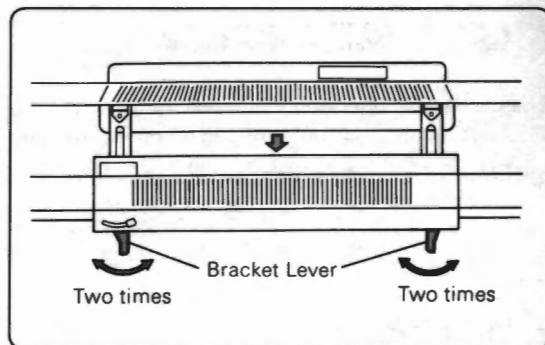
- ② Let down the ribber to the resting position.

- ① Disconnect the R carriage and the K carriage pushing the R carriage release lever.

- ② Remove the R carriage from the needle bed by sliding it to right or left keeping the front foot off the needle bed.

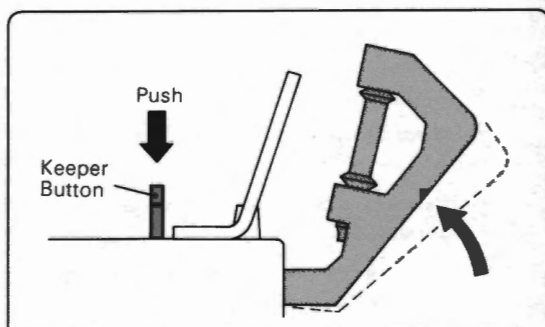


③ Push down the bracket levers to let down the ribber two steps.

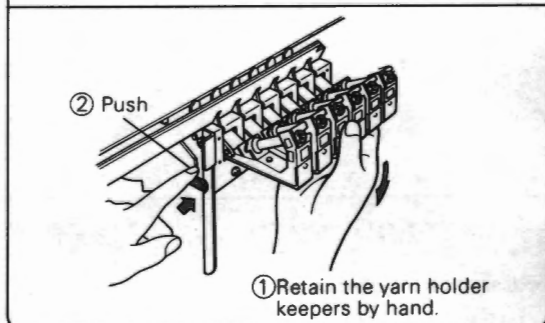


③ Set the colour changers to the resting position.

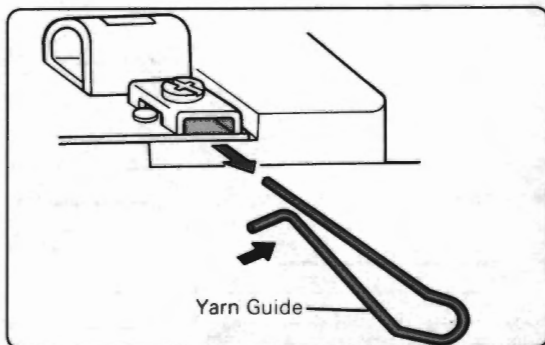
① Make all the yarn holder keepers come up by pushing the keeper buttons.



② Push the colour changer release lever retaining the yarn holder keeper by hand.  
The colour changer is let down.



④ Remove yarn guides (R & L) from the knitter pressing them inside.

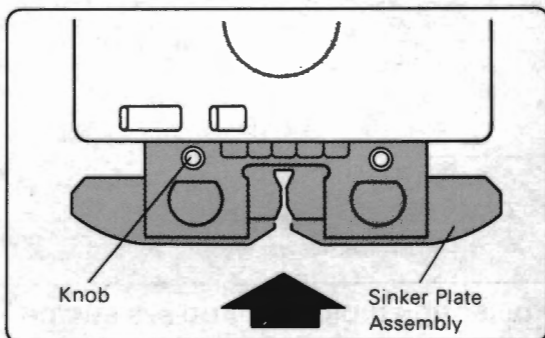


⑤ Loosen the knobs and screw the sinker plate assembly onto the K carriage.

<ATTENTION> Tighten the knob securely.

⑥ If you use the motor drive, connect the K carriage to the coupler of the motor drive (see page 23 step ⑦).

⑦ Remove the fine knitting bar (see page 23 ⑥).



# BEFORE OPERATING THE CK-35

## CARRIAGE OPERATION

The carriage is operated using the motor drive or by hand.

This instruction manual is based on operation using the carriage with the motor drive, but operate carriage by hand if you like it.

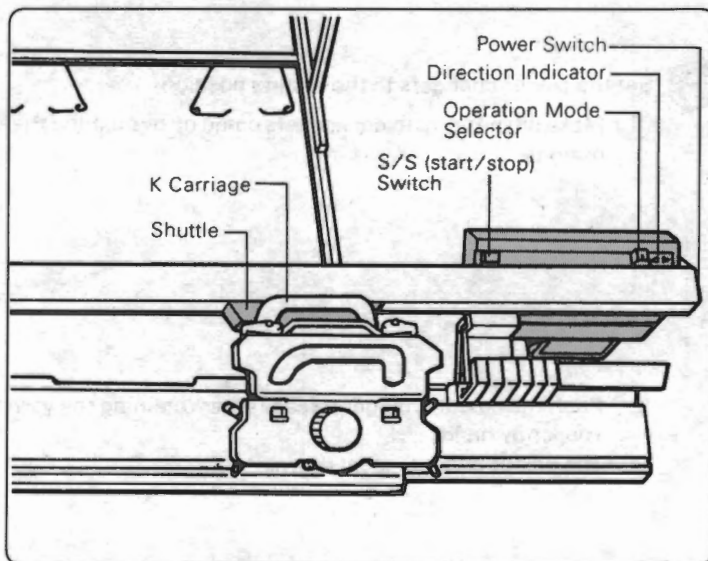
<REMARK> If this manual says "by hand", operate the carriage by hand, do not use the motor drive.

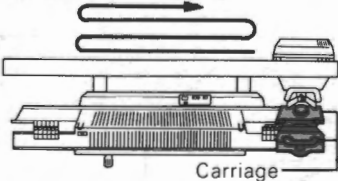
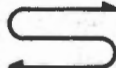
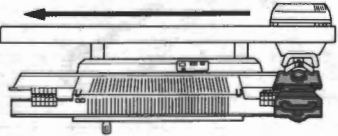

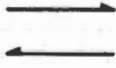
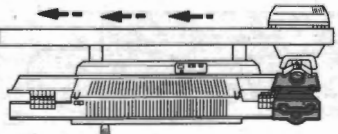
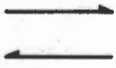
### • MOTOR DRIVE

Following explanation outlines the motor drive (see page 78 for the detailed explanation).

♣ If you move the motor drive without yarn, check the following points.

- Power of the motor drive and the knitter is turned on.
- The coupler of the motor drive and the K carriage is connected.
- The eyelet of the yarn tension spring is hooked to the front yarn guide B.



Carriage movement	Operation mode selector	S/S switch
<ul style="list-style-type: none"> <li>• Carriage moves continuously.</li> </ul> 		Continuous operation Push the S/S switch, the carriage moves continuously. Push the S/S switch while the carriage is moving, then the carriage stops.
<ul style="list-style-type: none"> <li>• Carriage moves one row.</li> </ul> 	 	Continuous operation or intermittent operation Keep pushing the S/S switch until the carriage finishes knitting one row.
<ul style="list-style-type: none"> <li>• Carriage moves short distance.</li> </ul> 		Intermittent operation The carriage moves while you keep pushing the S/S switch. The carriage stops when you release the S/S switch.

### <DIRECTION INDICATOR AND S/S SWITCH>



(The left and right lamps blink alternately.)

..... Push the S/S switch to stop blinking of the lamps. The left or right lamp lights up.




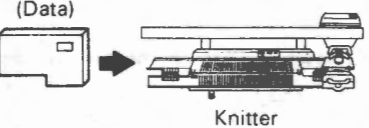

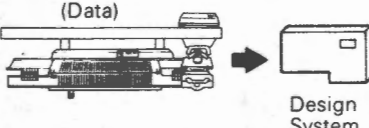
(The left or right lamp is lit.)

..... Push the S/S switch. The carriage moves to the direction which the indicator lamp shows.



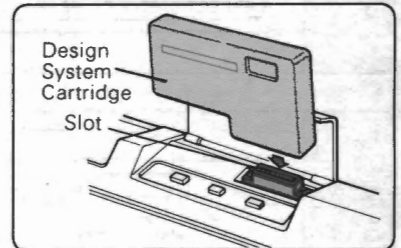
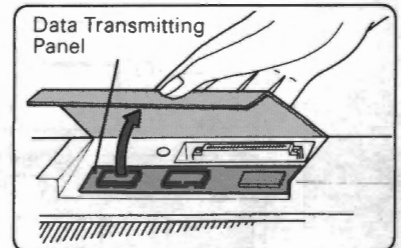
# TRANSFERRING THE DATA

## LOADING & SAVING

 <p>LOAD KEY</p>	<p style="text-align: center;"><b>LOADING PROGRAM</b></p>  <p style="text-align: center;">(Data) → Knitter</p>	<ul style="list-style-type: none"> <li>Load the data from the design system to the knitter with this program. This program is necessary for knitting according to the block data entered with the design system.</li> </ul> <p><b>REMARK:</b> When loading the new data to the knitter, all the stored data in the memory of the knitter will be deleted.</p>
 <p>SAVE KEY</p>	<p style="text-align: center;"><b>SAVING PROGRAM</b></p>  <p style="text-align: center;">(Data) → Design System</p>	<ul style="list-style-type: none"> <li>Save the data from the knitter to the design system with this program.</li> </ul> <p><b>REMARK:</b> When saving the data to the design system, all the data in the design system such as block data and the created pattern, will be deleted.</p>

### PROGRAMMING

- ① Turn off the power switch of the design system and take out the cartridge.
- ② Turn off the power switch of the knitter.
- ③ Open the lid of the data transmitting panel to the right of the operation panel. Insert the cartridge into the slot.  
Turn on the power switch of the knitter.  
(Start lamp blinks and after a few seconds it is lit up.)
- ④ Make sure that the lamp of the plain stitch key is not lit.  
(If it is lit, push the plain stitch key to turn it off.)
- ⑤ Program the loading or saving on the data transmitting panel (see the procedure below).



#### ⑥ LOADING PROGRAM

- ① Push the load key.  
(The ready lamp goes out and the load lamp is lit.)
- LOAD

●
- ② Push the execute key.  
(The load lamp blinks.)
- LOAD

☀
- ↓
- When the loading is completed, the ready lamp is lit.
- LOAD

●
- READY
- (The load lamp goes out.)  
The data has been transmitted from the design system to the knitter.
- ③ Turn off the power switch of the knitter. Take out the cartridge.

#### ⑥ SAVING PROGRAM


- ① Push the save key.  
(The ready lamp goes out and the save lamp is lit.)
- SAVE

●
- ② Push the execute key.  
(The save lamp blinks.)
- SAVE

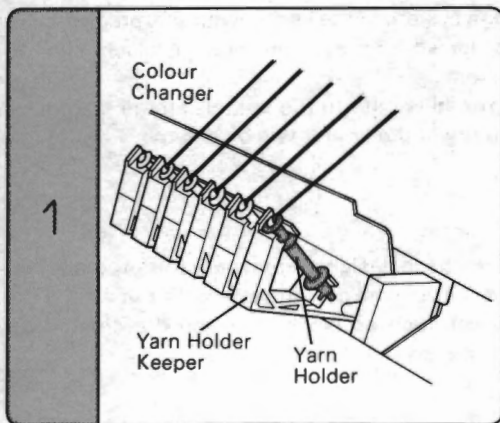
☀
- ↓
- When the saving is completed, the ready lamp is lit.
- LOAD

●
- READY
- (The save lamp goes out.)  
The data has been transmitted from the knitter to the carriage.
- ③ Turn off the power switch of the knitter and take out the cartridge.

### <REMARK>

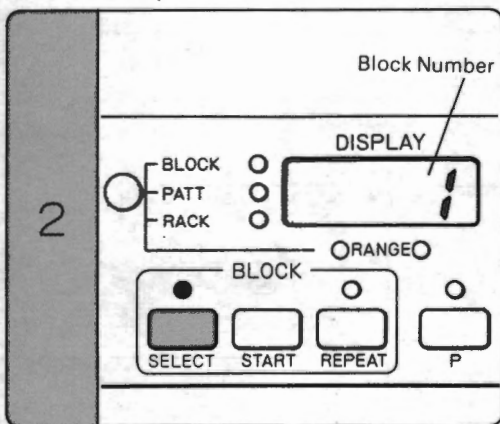
- If you do not take out the cartridge, motor drive does not move when you push the S/S switch.
-  ... If the display shows this message while you transfer the data, it means that the cartridge has some defects. Turn off power switch of the knitter and take out the cartridge. Insert the cartridge into the pattern programming device and turn on the power switch of the pattern programming device.

## OPERATION CHART (WHEN USING THE COLOUR CHANGER — TYPE A AND TYPE B)



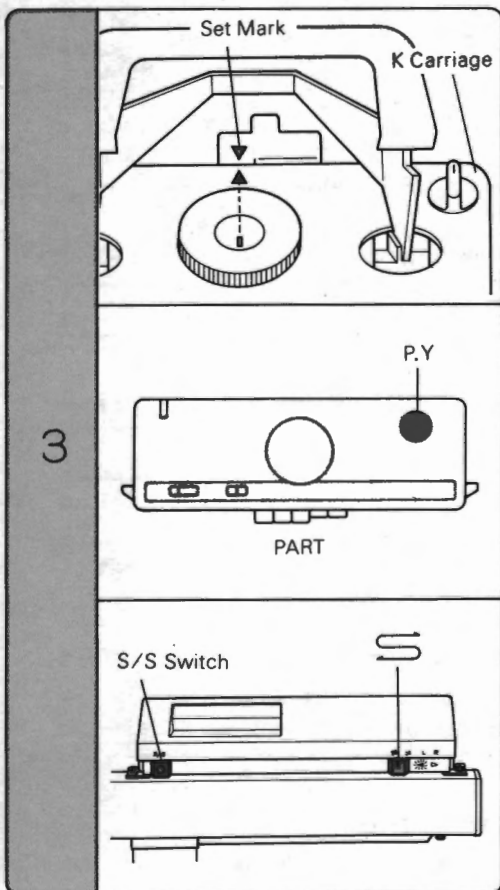
Thread the yarn tension unit. (See page 34.)  
Thread the yarn into the yarn holder and set it into the left yarn holder keeper. (See page 36.)

♣ When using the presser, let down the presser before you thread the yarn. (see page 85.)



Turn on the power of the knitter and the motor drive.  
Select the block number to be knitted (see page 39).

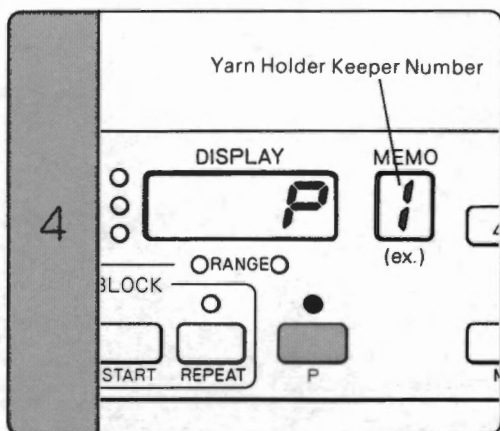
- ① Push the block select key. The lamp is lit.
- ② Select the block number to be knitted using the up key and down key.
- ③ Push the block select key. The lamp of it goes out and the ready lamp is lit.



The knitter arranges the yarn holders in two colour changers (see page 46).

The display shows **y--**.

- ① Move the carriage to the right end of the knitter by hand so that the center of the carriage comes at the set mark.
- ② Set the change knob to "P.Y" and push both PART buttons.
- ③ Bring back the needles to A or B position.
- ④ Set the operation mode selector to "S"
- ⑤ Push the S/S switch. The carriage moves and the yarn holders are put into right and left colour changers. After the arrangement is finished, the carriage stops.
- ⑥ Clip the yarn end of the yarn holders in the right colour changer, to the yarn clip at the right side of the ribber.

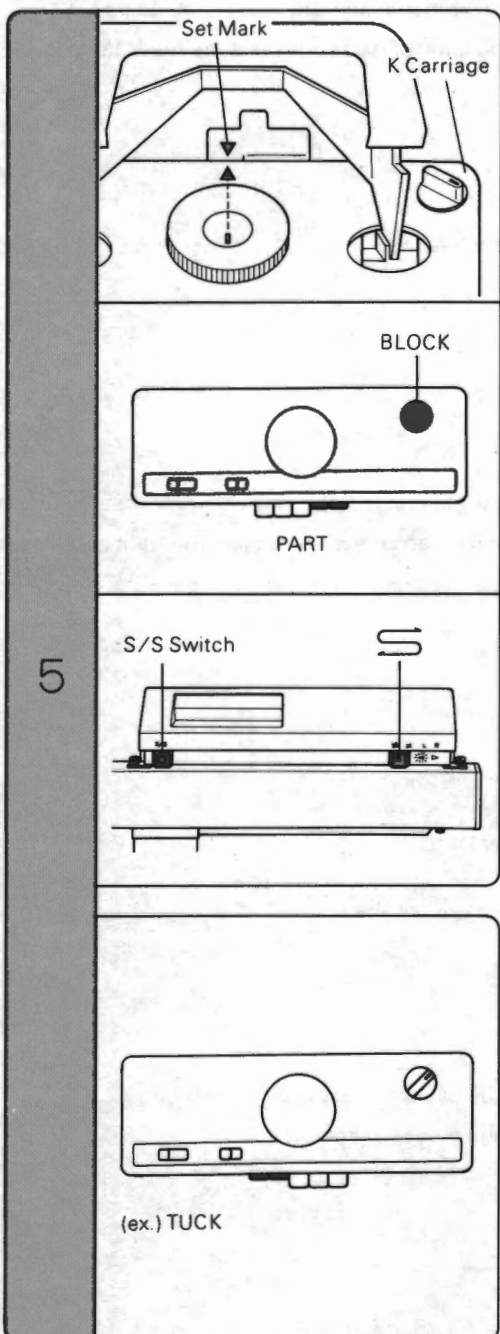


Cast on using the plain stitch key.

Using the plain stitch key.... see page 48.

Casting on

- When using the ribber.... see page 50.
- When not using the ribber.... see page 52.
- ♣ When you use the presser, push it up to the working position after casting-on (see page 85).



Select the needles for the first row (see page 54).

(The memo display shows □.)

① Make sure that the center of the carriage is at/outside the right or left set mark.

② Set the change knob to "BLOCK" and push both PART buttons.

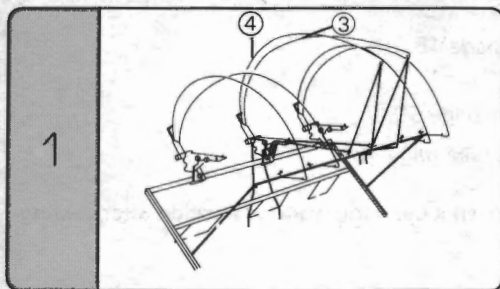
- ♣ When using the ribber....  
The cam lever of the R carriage is automatically set to S when the carriage starts (this occurs only when using the colour changer).

③ Set the operation mode selector to " S ".

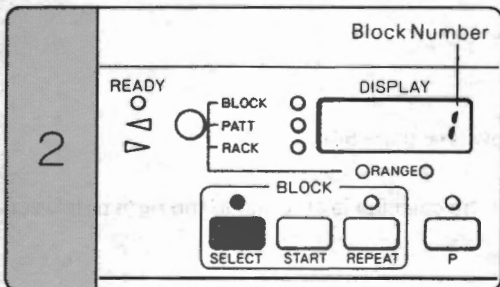
- When knitting the pattern created in pattern mode 1 — 4 with the design system....  
Push the S/S switch. The carriage moves and the needles are selected for the first row. Then the carriage begins pattern knitting continuously.
- When knitting the pattern created in pattern mode 5 with the design system....
  - 1) Push the S/S switch. The needles are selected for the first row. After that, carriage stops.  
(First or second operation of the carriage selects the needles.)
  - 2) Set the carriage according to the pattern (see pages 56 ~ 67).
  - 3) Push the S/S switch. The carriage begins pattern knitting.

## OPERATION CHART (WHEN NOT USING THE COLOUR CHANGER — TYPE C)

### • WHEN USING THE MOTOR DRIVE

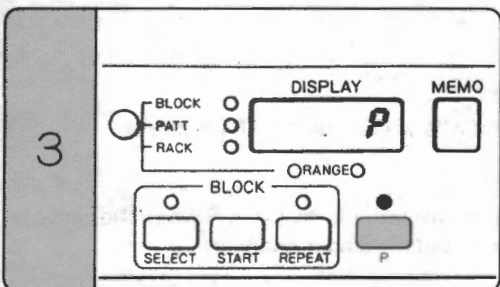


Thread the yarn into the yarn tension unit ③ or ④ (see page 34).



Turn on the power of the knitter and the motor drive.  
Select the block number to be knitted (see page 39).

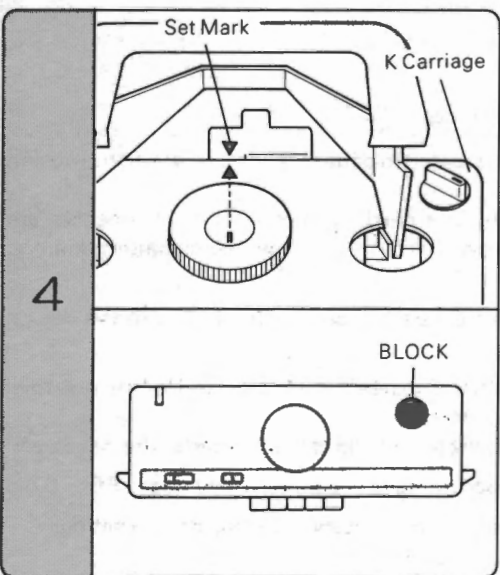
- ① Push the block select key. The lamp is lit.
- ② Select the block number to be knitted using the up key and down key.
- ③ Push the block select key. The lamp of it goes out and the ready lamp is lit.



Cast on using the plain stitch key.

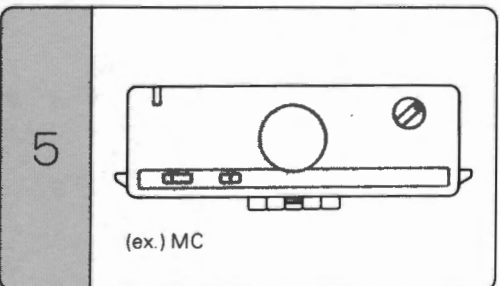
Using the plain stitch key.... see page 48.

Casting on.... see page 52.



Select the needles for the first row (see page 54).

- ① Make sure that the center of the carriage is at/outside the right or left set mark.
- ② Set the change knob to "BLOCK".
- ③ Set the operation mode selector to "S".
- ④ Push the S/S switch. The K carriage moves one row. The needles are selected to B or D position.

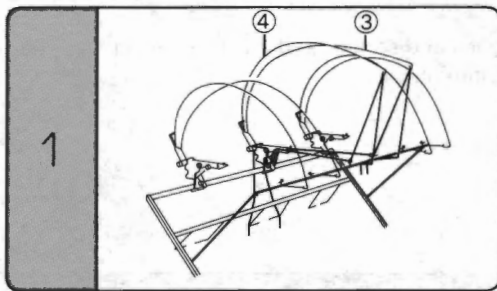


Set the K carriage according to the pattern (see pages 56 ~ 67).

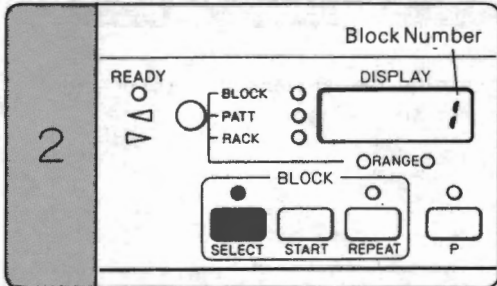
Push the S/S switch. The carriage moves to knit.



## • WHEN MOVING THE CARRIAGE BY HAND.

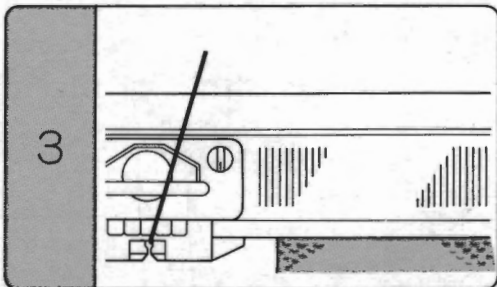


Thread the yarn into the yarn tension unit ③ or ④ (see page 34).



Turn on the power of the knitter and the motor drive.  
Select the block number to be knitted (see page 39).

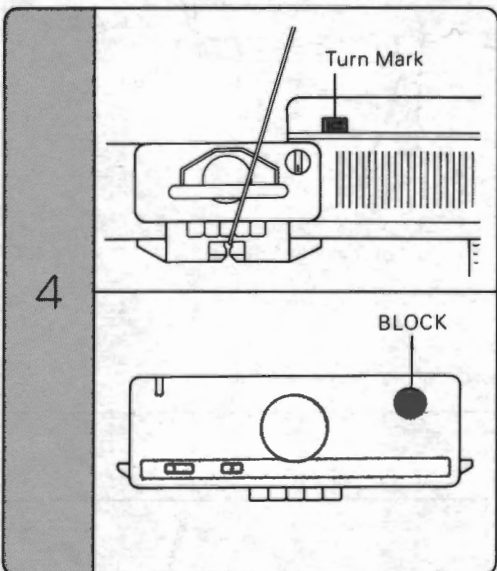
- ① Push the block select key. The lamp of it is lit.
- ② Select the block number to be knitted using the up key and down key.
- ③ Push the block select key. The lamp of it goes out and the ready lamp is lit.



Cast on.

- ♣ You do not have to use the plain stitch key when you move the carriage by hand.

Casting on.... see page 52.

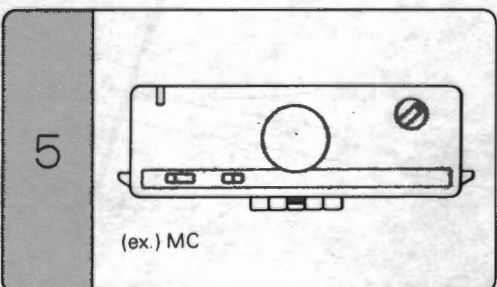


Select the needles for the first row (see page 54).

- ① Make sure that the center of the K carriage is outside the left or right turn mark.

- ② Set the change knob to "BLOCK".
- ③ Move the K carriage slowly to the opposite side across the turn mark. The needles are selected to B or D position.

- ♣ You need to operate the K carriage once across the turn mark when you start knitting.



Set the K carriage according to the pattern (see pages 56 ~ 67).

Move the K carriage right and left to knit.



## THREADING THE YARN

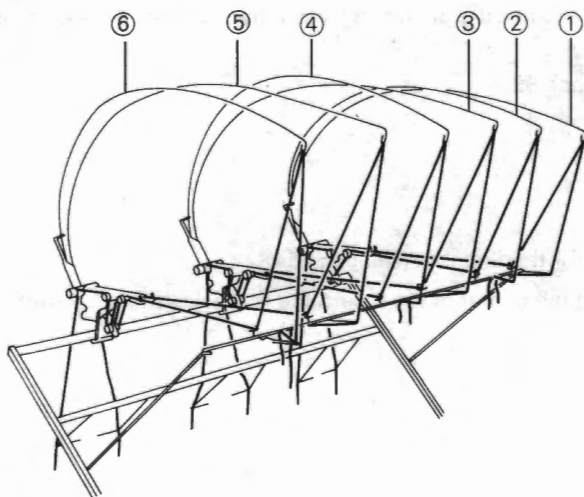
### 1. YARN TENSION UNIT

The yarn tension unit automatically controls the supply of the yarn. (It has a yarn end sensor and a yarn knot sensor. The sensors detect any problems in the supply of yarn causing the motor drive to automatically stop.)

#### • Using the yarn tension unit

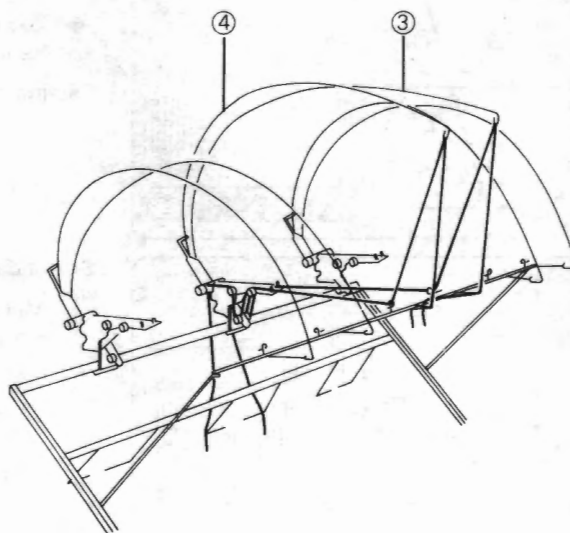
##### When using the colour changer

- Thread each yarn to the yarn tension unit of which number corresponds to the yarn number that you use for colouring or memo-input. (For example, thread the yarn "1" to the yarn tension unit ①.)



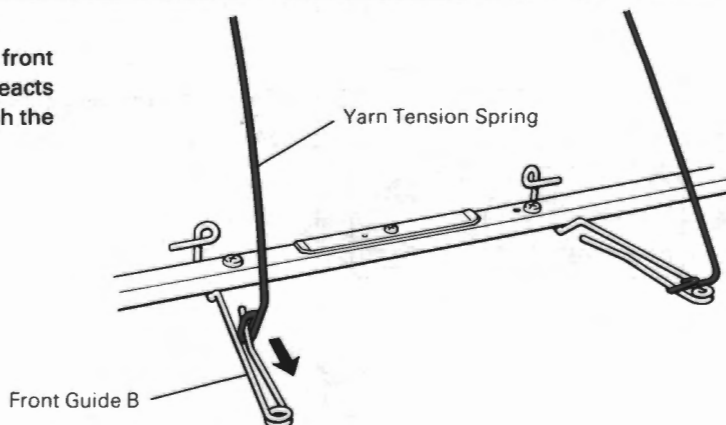
##### When using the sinker plate assembly

- Thread the yarn into the yarn tension unit ③ or ④ to prevent the yarn slackening.

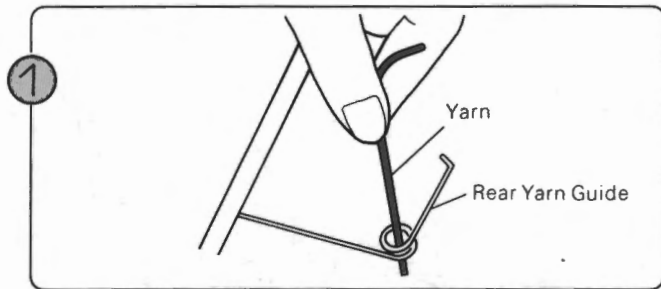


#### If any yarn tension unit is not used....

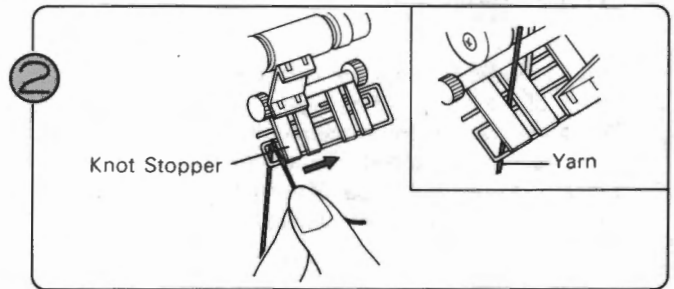
Hook the eyelet of the yarn tension spring to the front guide B. If you do not do so, the yarn end sensor reacts and the motor drive does not move when you push the S/S switch.



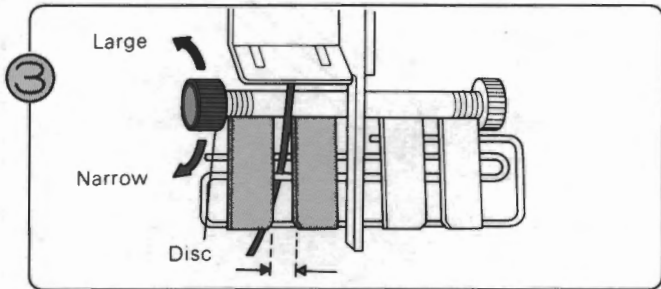
## • Threading the yarn



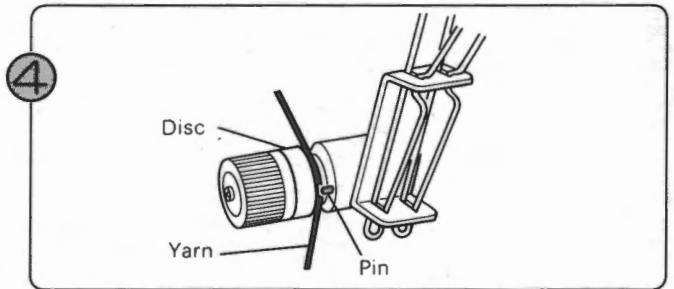
Thread the yarn into the rear yarn guide.



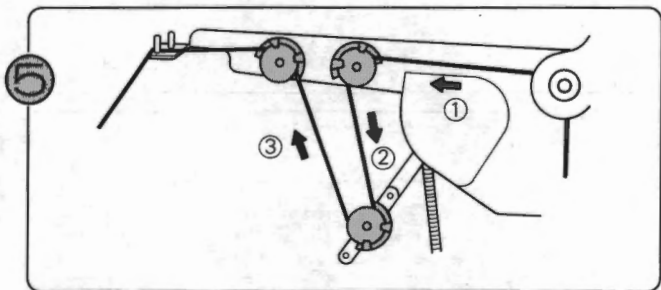
Thread the yarn under the knot stopper.



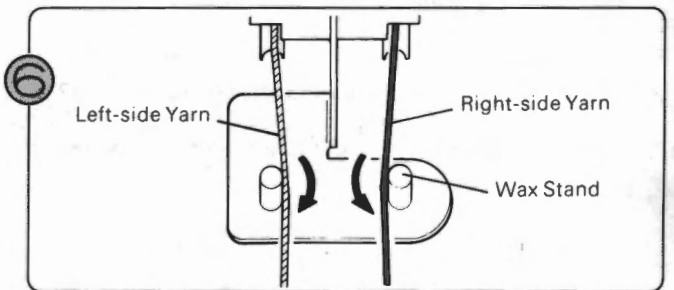
Adjust the disc of the stopper to change the space between the two plates according to the yarn (see page 81).



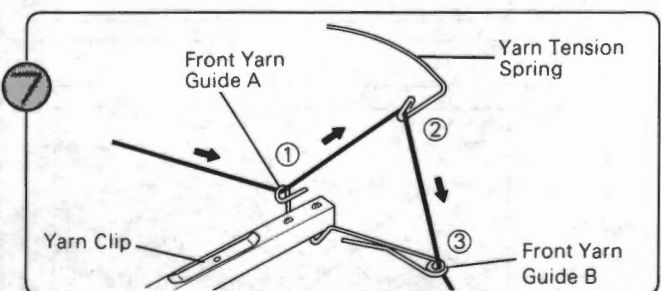
Pass the yarn under the pin and between the two discs.



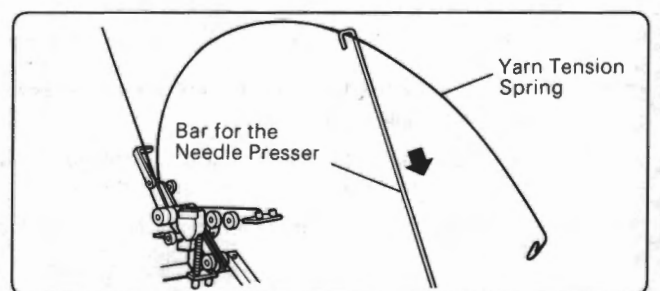
Thread the yarn into the rollers as shown above.



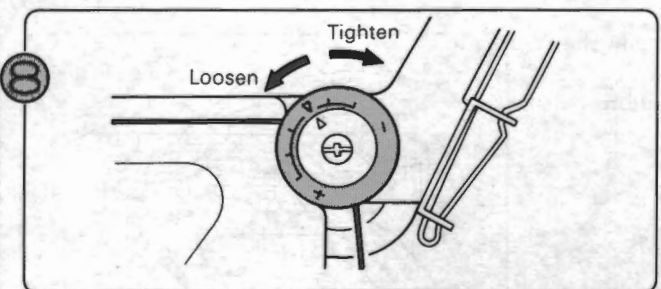
Pass the yarn inside the wax stand.



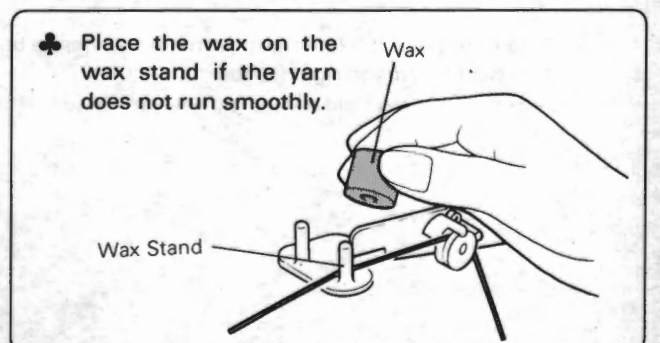
Thread the yarn as shown above and clip the yarn end under the yarn clip.



Draw the yarn tension spring toward you with the bar included in the machine (see page 9). Be careful not to bend the spring.



Set the arrow mark to adjust the yarn tension according to the yarn.



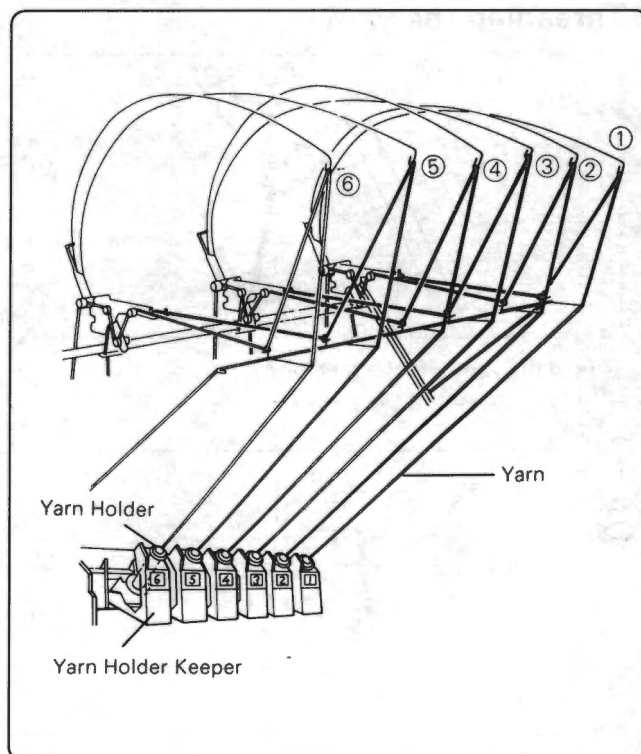
Place the wax on the wax stand if the yarn does not run smoothly.

## 2. THREADING THE CHANGER YARN HOLDER

Thread all the yarn on the yarn tension unit into the yarn holder of the left colour changer.

Thread the yarn on the tension unit ① into the yarn holder ① and thread other holders from the right.

Make sure that the number of the tension unit corresponds to that of the yarn holder keeper.

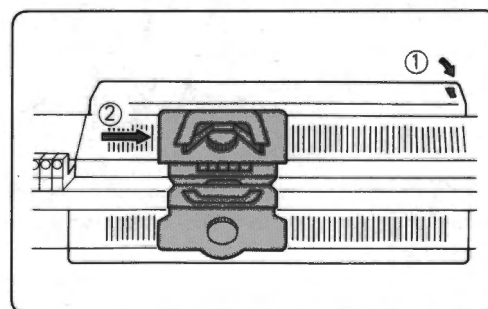


### • Before threading the yarn holder...

Check the following points.

♥ Is the carriage near the left colour changer? If yes...

Turn off the power of the knitter and slide the carriage to the right.



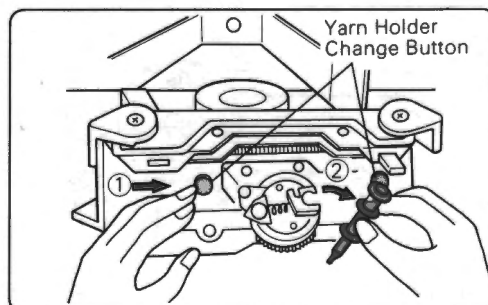
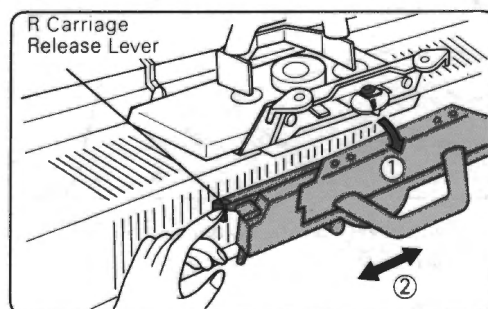
♥ Does the carriage have the yarn holder? If yes...

Remove the yarn holder as follows:

① If the R carriage and K carriage are connected, push the R carriage release lever to disconnect the R carriage.

② Slide the R carriage to right or left keeping the front foot off the needle bed.

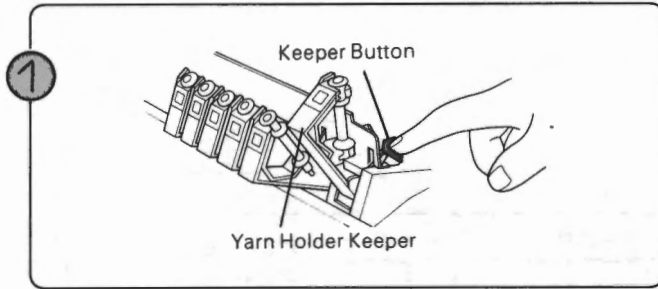
③ When you push the left (right) yarn holder change button inside, the yarn holder turns to right (left). Remove the yarn holder pushing the yarn holder change button.



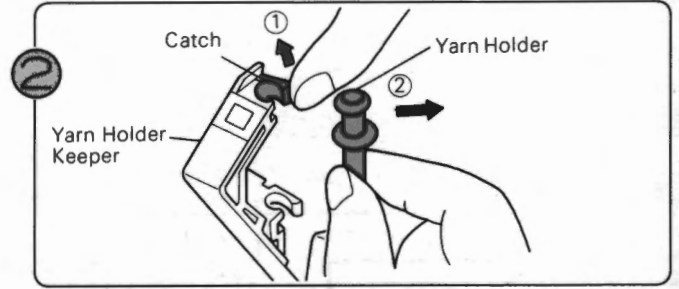
## • THREADING THE COLOUR CHANGER

<ATTENTION>

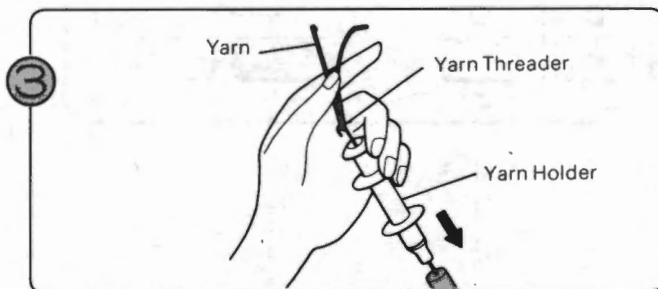
- The yarns should not be crossed.
- When using the presser, let it down before threading the yarn (see page 85).



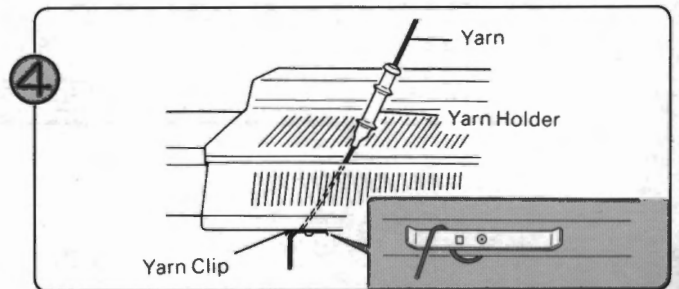
Push the right end keeper button, the yarn holder keeper ① comes up.



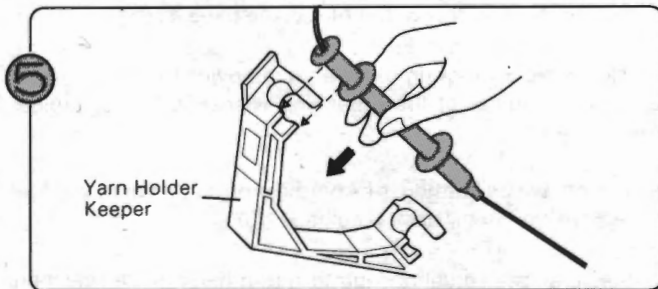
Unfasten the catch of the keeper to remove the yarn holder.



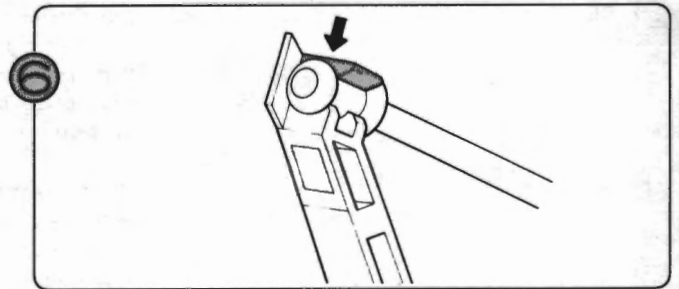
Take off the yarn on the yarn tension unit ① and thread it into the yarn holder using the yarn threader.



Let the yarn end pass between the knitter and ribber, and hook it in the yarn clip at left end of the ribber.



Fix the yarn holder into the keeper.

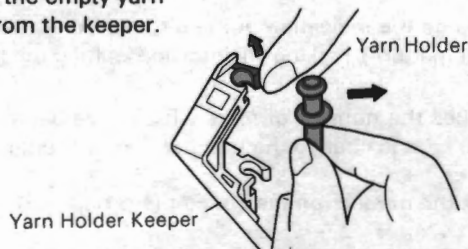


Press the keeper lightly to make it down.

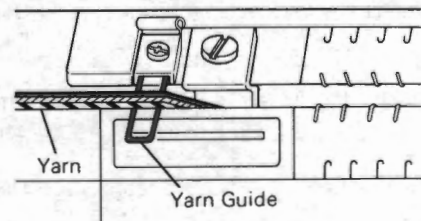
- ♥ If the keeper does not go back, turn off the power of the knitter and press it again.

## • ATTENTION

- Remove the empty yarn holder from the keeper.



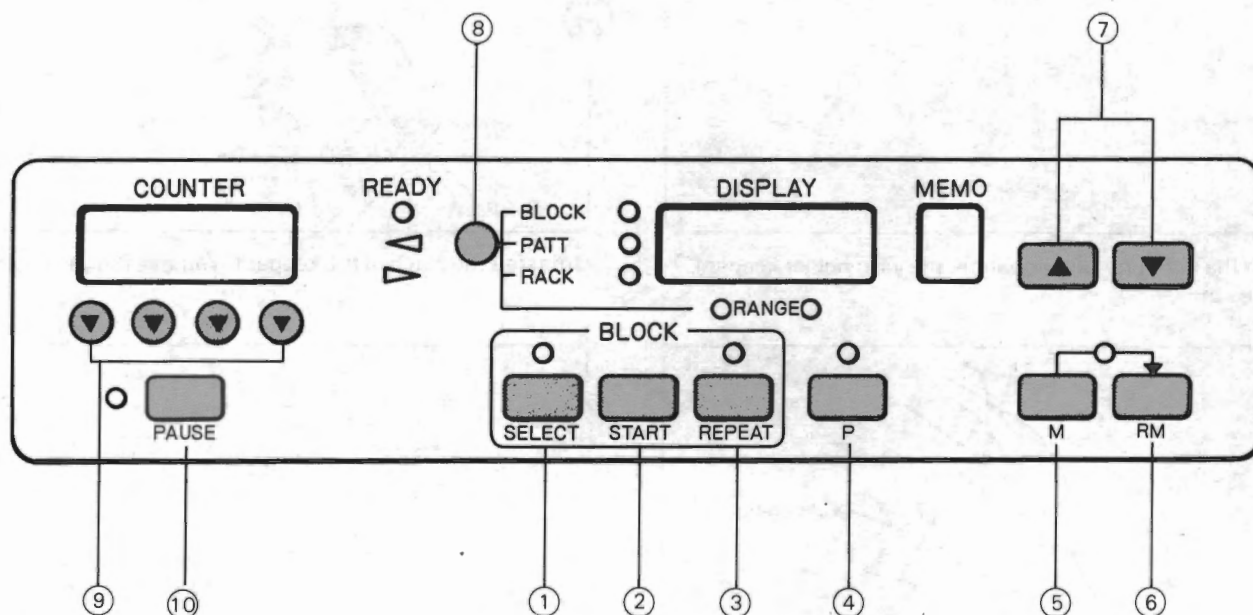
- Place the yarns on the yarn guide.





## OPERATION PANEL

Use the keys on the operation panel as occasion demands.  
These keys do not work while you are knitting using the motor drive.



- ① Block select key ..... Select the block you are going to knit. This must be done at the beginning (see page 39).
- ② Block start key ..... Use this key to get back to the first row of the block (see page 41).
- ③ Block repeat key ..... When you repeat the same block many times without removing the knitting from the needle bed, enter the number of the times you repeat (call this number "repeat number") (see page 40).
- ④ Plain stitch key ..... Use this key for casting-on, waste knitting, rib knitting, and so on when you knit with the colour changer or the motor drive (see page 48).
- ⑤ Memory key ..... Use this key to memorize all the conditions (pattern number, needle selection, indication on the operation panel, and so on) when you push this key (see page 41).
- ⑥ Recall memory key ..... Use this key to recall the memorized condition (see page 41).
- ⑦ Up key, Down key .....
  - ① Use this key to select the block number or repeat number.
  - ② Use this key to change the row number of the block or the pattern indicated in the display (see page 42).
- ⑧ Display select key ..... Use this key to change the indication in the display. Select from row number (block), row number (pattern), racking position and knitting range (see page 44).
- ⑨ Counter key ..... The counter indicates the number of rows which have been knitted by the K carriage. Use these keys to change the number on the counter (see page 43).
- ⑩ Counter pause key ..... Use this key to lock the number on the counter (see page 43).



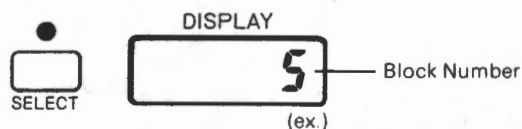
## • BLOCK SELECT KEY



Use this key to select the block you are going to knit. When you knit according to the block data programmed with the design system, you should select the block at the beginning. You can also check the block number you are now knitting with this key, while knitting.

### SELECTING THE BLOCK

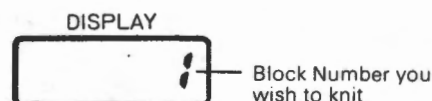
- ① Make sure that the ready lamp is lit and push the block select key.



The lamp of the block select key is lit and the ready lamp goes out. The display shows the block number you selected last. (When you select the block number for the first time you transmit the data from the design system cartridge to the knitter, the display shows the block number you programmed last with the design system.)

- ♥ If the display does not show any block number... It means that the knitter has not received any block data from the design system cartridge because there is no block data in it, or that you deleted the block number you programmed last. If the knitter has not received any block data, the up/down key does not work in the step ②.

- ② Change the block number in the display with the up or down key.



- ③ Make sure that the display shows the block number you wish to knit, and push the block select key.



The lamp of the block select key goes out and the ready lamp is lit. You have completed selecting the block.

- ♣ When you select the block, the knitter (ribber) is ready to knit from the first row of the block and repeat number is automatically set to 1 (if you repeat the block, see page 40). However, even if you push the block select key and change the display, the knitter resume knitting where it left off, if you at last select the same number as the knitter left off and turn off the lamp of the block select key. If you want to knit from the first row, push the block start key.

### CHECKING THE BLOCK

You can check the block number by following above steps ① and ② (if you change the block number, return it to the former one).

- ♣ The row number (block) indicated in the display does not change even if you check the block number, because you do not change the block number.

## • BLOCK REPEAT KEY



When you repeat the same block many times without removing the knitting from the needle bed, enter the number of times you repeat (call this number "repeat number").

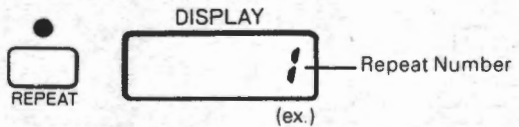
- Whenever you select the block number, the knitter is automatically set to repeat the block once. Therefore, you need to set the repeat number after selecting the block number if you repeat the same block.
- You can change the repeat number amid knitting.
- The repeat number decreases as one block is finished, and it is set to 1 when the block is finished repeating the required number of times.

### USING THE BLOCK REPEAT KEY

- ① Make sure that the ready lamp is lit and push the block repeat key.

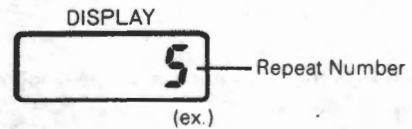


The lamp of the block repeat key is lit and the ready lamp goes off. The display shows how many times the knitter is set to repeat block (repeat number).



- ♣ When you push the block repeat key while knitting, the display shows how many blocks will be knitted (including the block now being knitted).

- ② Set the repeat number using the up or down key.



- ♣ If you set the repeat number while knitting, include the block now being knitted.

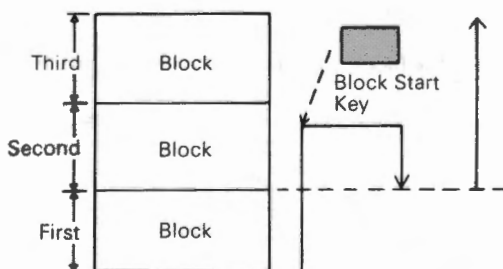
- ③ Push the block repeat key.



The lamp of the block repeat key goes off and the ready lamp is lit. You have completed setting the repeat number.



### <ATTENTION>



- When you push the block start key while repeating the blocks, the knitter knits from the first row of the block you are now knitting. For example, if you set the knitter to repeat the block three times and push the block start key while knitting the second block, the knitter starts from the first row of the second block.

## • BLOCK START KEY



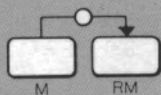
Use this key to get back to the first row of the block.

- When using the colour changer ..... Arrange the yarn holders in two colour changers, and begin knitting.
- When using the sinker plate assembly ..... Select the needles for the first row, and begin knitting.

## • MEMORY KEY

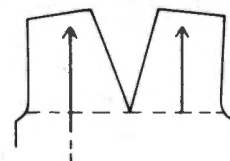
## • RECALL MEMORY KEY

Memory Lamp



### Memory key

When you push this key, the memory lamp is lit and all the conditions (pattern number, needle selection, indication on the operation panel, and so on) at that time are memorized. In other words, all the settings for the next row knitting is memorized. This function is effective, for example, when knitting the neck line.



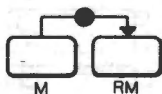
### Recall memory key

When you push the recall memory key, memorized condition is recalled and the knitter then has the same settings as those when you turned on the memory lamp.

- When using the colour changer ..... Arrange the yarn holders in two colour changers, and begin knitting.
- When using the sinker plate assembly ... Select the needles for the first row, and begin knitting.

You can use the recall memory key any time while the memory lamp is lit.

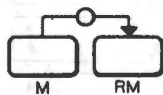
## USING THE MEMORY KEY



- To memorize the data for the row of which needle selection has been now completed...

Push the memory key.

The memory lamp is lit. The knitter keeps the memory of this row while the memory lamp is lit.



- To cancel the memory....

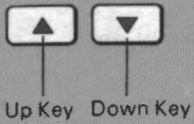
Push the memory key.

The memory lamp goes out and the memory is canceled.

- ♣ Memory remains even if you turn off the power switch while the memory lamp is lit. When you turn on the switch, the memory lamp is lit again.

- ♣ If you select another block while the memory lamp is lit, memory is canceled and the lamp goes out.

## • UP KEY, DOWN KEY



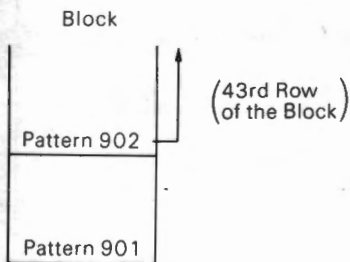
Up/down key has two functions as below.

- ① When you select the block, or set the repeat number, change the number in the display using these keys.
  - ② While knitting, change the row number (block, or pattern) indicated in the display using these keys.
- ♣ After changing the row number....
- When using the colour changer ..... Arrange the yarn holders in two colour changers, and begin knitting.
  - When using the sinker plate assembly .... Select the needles for the first row, and begin knitting.

### USING UP/DOWN KEYS

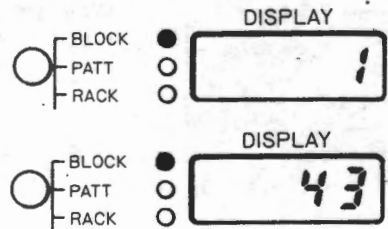
Function ① is explained in the pages of block select key and block repeat key. Now, see the following explanations to understand the function ②.

(ex.) When you want to begin knitting from the middle of the block....



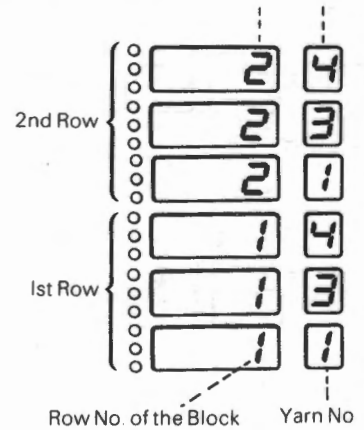
<Begin knitting from the 43rd row of the block>

- ① Change the display to row number of the block, with the display select key (see page 44).
- ② Advance the row number with the up key. You can knit from the indicated row number.

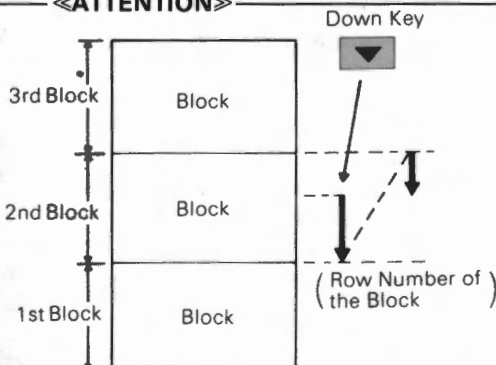


### ♣ When knitting the pattern using the colour changer...

One complete row of single bed jacquard or double bed jacquard is made by several carriage movements. For example, if one row has three colours, one complete row is made by three carriage movements and the number in the display changes by one as you push the up/down key three times as shown right. Yarn number is indicated in the memo display as the row number is indicated in the display, and yarn number in the memo display changes in the knitting order as you push the up/down key.



### <<ATTENTION>>

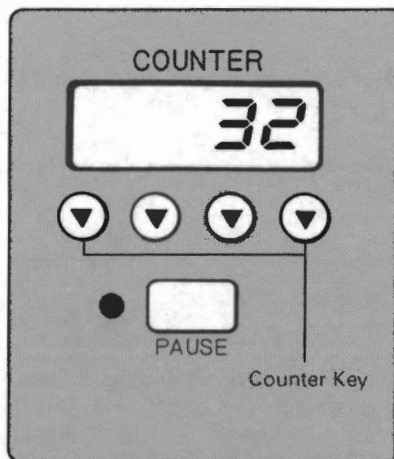


Row number (block, or pattern) is changed within the block now being knitted.

For example, get back the row number while knitting the second block using the down key. The row number goes to the last row of the second block after the first row of the second block.



• COUNTER • COUNTER KEY • COUNTER PAUSE KEY



**Counter**

This display indicates the number of rows which have been knitted by the K carriage (ex. 32 rows have been knitted.)

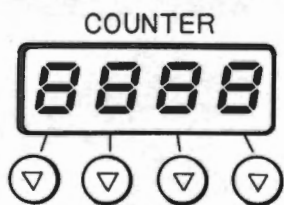
**Counter key**

You can change the number on the counter with these keys. They are used not only before knitting but also while knitting, if necessary.

**Counter pause key**

You can lock the number on the counter with this key.

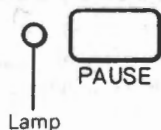
**USING THE COUNTER KEY**



The counter display has 4 digits.

- **Setting the counter**  
Push the counter key under the number to be changed. Pushing the key puts back the number by 1.
- **Changing the number to 0**  
Keep pushing the counter key. The changing speed becomes faster and stops at 0.

**COUNTER PAUSE KEY**

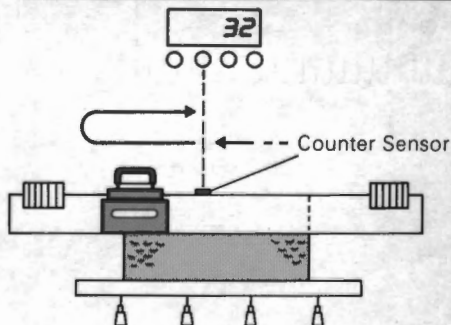


- **To lock the number on the counter.....**  
Push the counter pause key. The left lamp to the pause key light up. While the lamp is lit, the K carriage movement does not advance the counter.
- **To cancel the lock of the counter.....**  
Push the counter pause key. The left lamp to the pause key goes out. While the lamp is not lit, the K carriage movement advances the row counter.

**WHEN THE COUNTER DOES NOT ADVANCE**

When the colour changer is used, the K carriage movement for the automatic yarn arranging or the first row of needle selection does not advance the counter. (When the colour changer is not used, the K carriage movement for the first row of needle selection advances the counter.) When knitting single bed jacquard or double bed jacquard, sometimes the K carriage movement does not advance the row counter. See the instruction below as detail.

**WHEN THE COUNTER DISPLAY CHANGES**

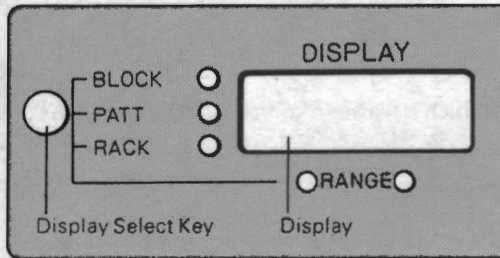


The number in the counter changes when the K carriage passes across the counter sensor at the center of the needle bed.

- ♣ One row of single bed jacquard or double bed jacquard is put into several carriage movements when being knit. One row of the counter means one row of the completed pattern, for example, if one row is put into three carriage movements, the counter advances every three movements of the carriage. The counter advances when the K carriage passes across the counter sensor knitting the last row of the one sequence.



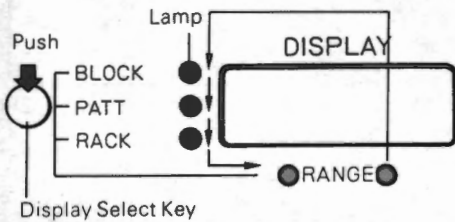
## • DISPLAY SELECT KEY



Select the display from row number (block), row number (pattern), racking position and knitting range, with this key.

- ♣ You can select the display indication not only before knitting but also while knitting.

### DISPLAY SELECT KEY



If you repeatedly push the display select key, each lamp of row number (block), row number (pattern), racking position and knitting range lights up one by one. Select the display indication with the display select key.

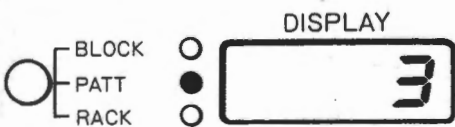
If any of these lamps is lit, you can select the display indication.

### DISPLAY INDICATION



shows the next row number in the block data.

(ex. Now the needle selection for 15th row of the block data is being done or has been finished. You are going to knit the 15th row from now.)



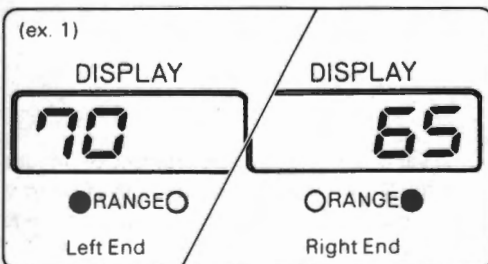
shows the next row number in the pattern.

(ex. Now the needle selection for third row of the pattern is being done or has been finished. You are going to knit the third row next.)



This indication is used when knitting racking pattern.

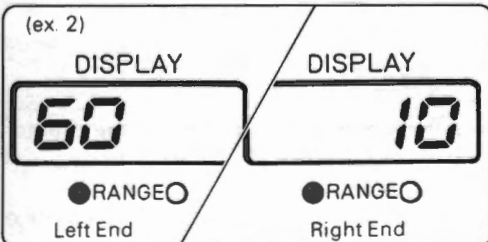
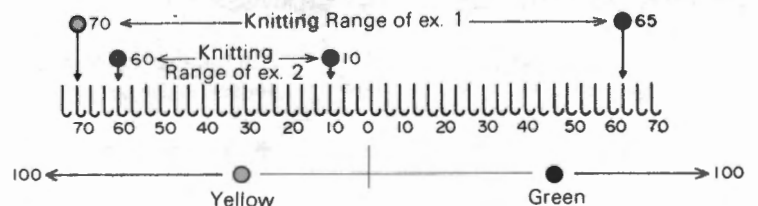
If you enter the racking position using the option "INPUT MEMO DATA" with the design system, it is indicated in the display while knitting.  
(ex. Set the racking position to 7 for the next row after finishing this row.)



shows the knitting range programmed with the design system using the option "SET KNITTING RANGE".

#### (Indication of the knitting range)

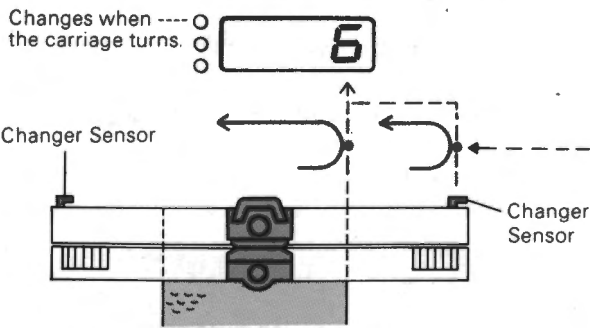
The number on the display is the needle number of the knitter. The display shows the left end of the knitting range and the right end alternately. The number indicated at the left side of the display is the left end needle number. The number indicated at the right side is the right end needle number. Needles to the left of the needle bed are represented by yellow and to the right by green. You can distinguish between the needles to the right and needles to the left by the colour of the lamp.



## WHEN DOES THE DISPLAY INDICATION CHANGE?

The display indication changes as follows:

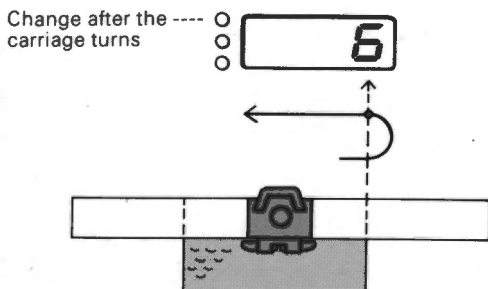
- **While knitting**



- When using the colour changer ....  
The display indication changes when the carriage turns.

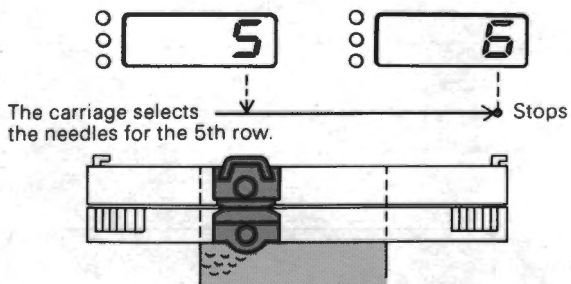
(At the yarn changing row the carriage moves to the colour changer and turns at the changer sensor.)

- ♣ One row of single bed jacquard or double bed jacquard is put into several carriage movements when being knit. One row on the display means one row of the finished pattern, which is completed by the several carriage movements. For example, if one row is put into three carriage movements, the display indication changes as the carriage moves three times, in other words, it changes before selecting the first row of one sequence.

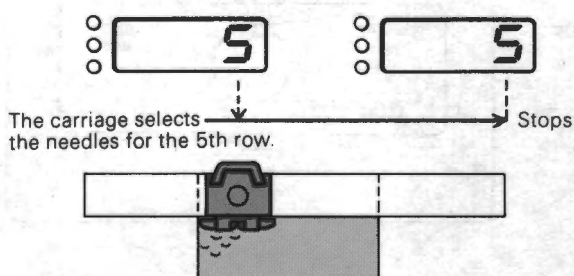


- When not using the colour changer....  
The display indication changes after the carriage turns.

- **When the motor drive automatically stops the carriage outside the knitting, (for example, because you set the stop position with the design system) (except when the carriage stops because of some trouble) ....**



- When using the colour changer....  
The display indication changes to the one for the next row when the carriage stops.



- When not using the colour changer....  
The display indication does not change when the carriage stops, and changes when the carriage turns to knit the next row.

## STARTING TO KNIT (CAST ON)

### • AUTOMATIC ARRANGING OF THE YARN

- When using the colour changer\*1, yarns (yarn holders) are automatically arranged into two colour changers after you push the block select key\*2, block start key, recall memory key, or up/down key.

\*1 ... You use the colour changer for the pattern which has the memo data (yarn number) in the section "HOLDER" of the memo-input screen.

\*2 ... When you push the block select key only to check the block number, yarns are not arranged into the colour changers.

- When you push the S/S switch, the carriage moves to put the yarns into two colour changers.

- ♣ When you use the block select key or the block start key....

Yarns of number 1, 3, 5, are put into the right colour changer.

Yarns of number 2, 4, 6, are put into the left colour changer.

(If you specify the yarn arrange using the option "SET HOLDER POSITION" of the design system, yarns are arranged as you specify.)

- ♣ When you use the up/down key....

Yarns are automatically arranged to knit the next row smoothly.

- ♣ When you use the recall memory key....

Yarns are arranged into the same position as they were when the memory key was pushed.

- ① • When starting to knit

Thread all the yarns into the left colour changer.

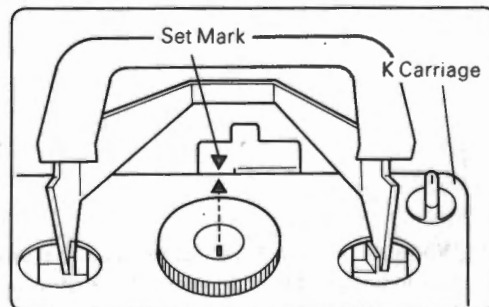
Move the carriage to the right end of the knitter by hand so that the center of the carriage comes at the set mark.

- While knitting

Leave the yarns as they are.

- ♥ If the carriage has the yarn holder in it, move the carriage by hand across the right or left colour changer. The yarn holder returns to the colour changer.

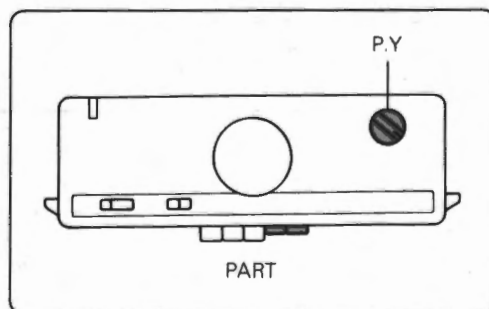
Move the carriage to right or left end of the knitter by hand so that the center of the carriage comes at the set mark.



- ② Set the change knob to "P.Y" and push both part buttons.

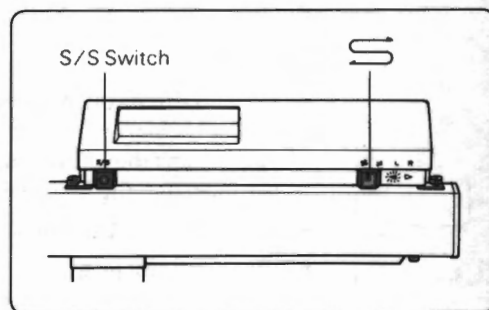
- ♣ When using the ribber....

The cam lever of the R carriage is automatically set to S to arrange the yarns into colour changers, when the carriage starts.



3 Bring back the needles to A or B position.

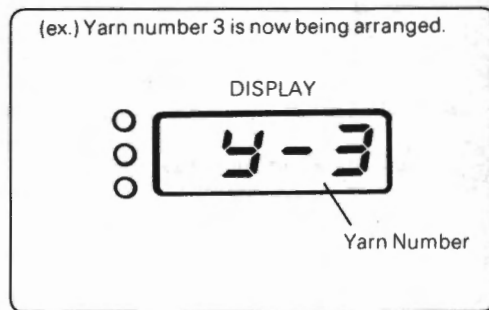
4 Set the operation mode selector to " S ".  
Make sure that the K carriage is connected to the coupler of the motor drive. Push the S/S switch. The carriage moves and the yarns are put into right and left colour changers.



While the knitter is arranging the yarn, the display shows the yarn number which is now being arranged (see the example as shown right).

When the carriage is moving without the yarn, the display shows **Y--**

After arranging is finished, the carriage stops at the opposite side to the yarn which will knit the first row.



5 Clip the yarn end of the yarn holders in right colour changer, to the yarn clip at the right side of the ribber.

**ATTENTION:** If the yarns are arranged with the knitting on the needles and a yarn is put into the opposite side colour changer to the yarn end, cut the yarn float on the knitting and hook the yarn end of the holder to the yarn clip of the ribber.

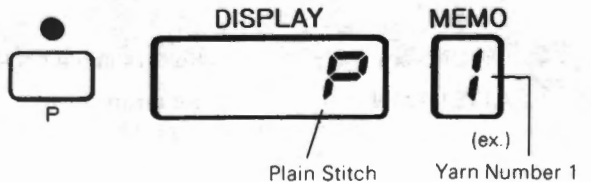
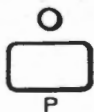
## • PLAIN STITCH KEY

When using the colour changer or the motor drive, use this key for casting-on, waste knitting, rib knitting, and so on.

- The lamp of the plain stitch key is lit when you push this key. While this lamp is lit, you can stop knitting block and knit in plain stitch. Plain stitch means the knitting which does not require the needle selection, therefore you can knit the rib with this key and also knit the selvedge and so on because you can use the cam button (K carriage) and the cam lever and tucking lever (R carriage).
- Whenever you use the plain stitch key, set the change knob to "P.Y".
- When you knit in plain stitch using the colour changer, knit even number of rows to give back the yarn to the colour changer where the yarn was at first.

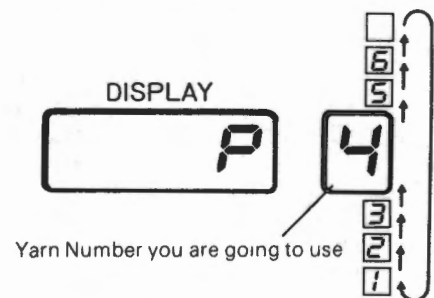
① Push the plain stitch key.

The lamp of the plain stitch key is lit and the ready lamp goes out. The memo display shows the yarn number with which you knitted in plain stitch last.



② Using the up/down key, change the yarn number in the memo display to the one you are going to knit.

The number changes one by one.

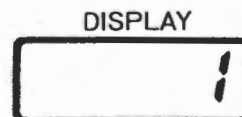


♣ If, for example, you push the up key, the number changes in the order as shown above.

♣ If you do not use the colour changer and use the sinker plate assembly, empty the memo display.

③ Confirm the yarn number in the memo display and push the plain stitch key.

The ready lamp is lit. (The lamp of the plain stitch key is still lit.)



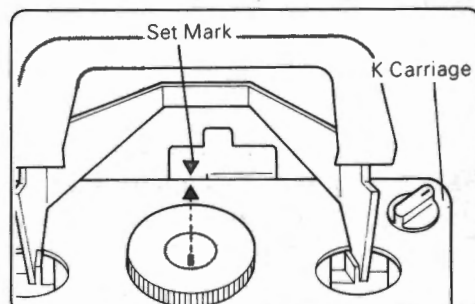
### ♣ Display indication

- If you select the row number (block) ..... } The display shows 1.
- If you select the row number (pattern) ..... }
- If you select the racking position ..... The display shows nothing.
- If you select the knitting range ..... The display shows L100 and R100.

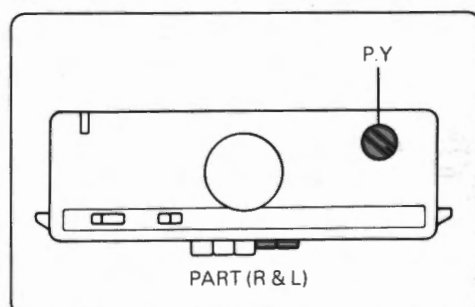


- ④ • When you cast on, see the following pages....  
 When using the ribber.... pages 50 ~ 51.  
 When not using the ribber.... pages 52 ~ 53.
- When the knitting hangs on the needle, follow the steps below.

- ① Move the carriage by hand so that the center of the carriage comes at the set mark.

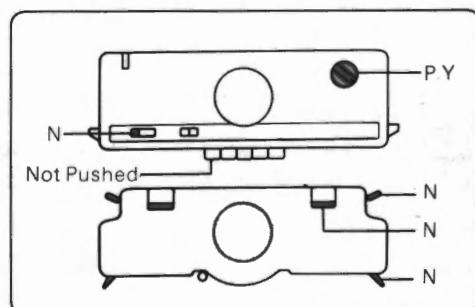


- ② When you use the colour changer and the necessary yarn is opposite side colour changer to the carriage, set the carriage as shown right and move it to the opposite side (the center of the carriage should be at the set mark).



- ♣ When you use the ribber, set both the cam levers to S.

- ③ Set the carriage for plain knitting or rib knitting. Do not fail to set the change knob to "P.Y".



- ♣ When you use the sinker plate assembly, thread the yarn into the yarn feeder A of the sinker plate assembly and clip the yarn end to the yarn clip of the ribber.

- ⑤ Enter the number of rows to be knitted in plain stitch or rib, as the repeat number (see page 40).

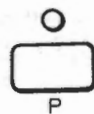
- ♣ When you set 1 as the repeat number and use the motor drive, it stops after knitting one row even if the operation mode is set to "S". (The carriage moves more slowly than the normal speed.)
- ♣ When using the colour changer, enter even number as the repeat number so that the yarn goes back to the colour changer where the yarn was set before.

- ⑥ Push the S/S switch. The knitting starts.

- ♣ When using the motor drive, it moves within the range of L100 and R100 at every row.

- ⑦ When knitting is finished, push the plain stitch key.

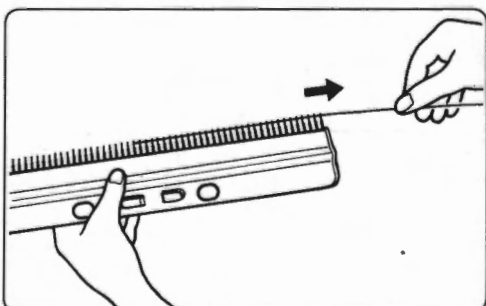
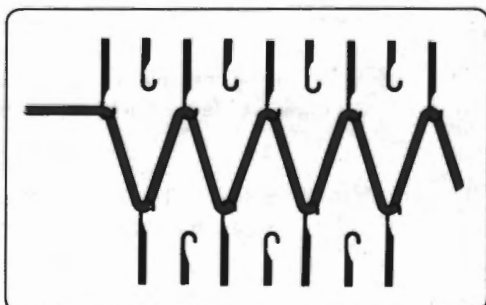
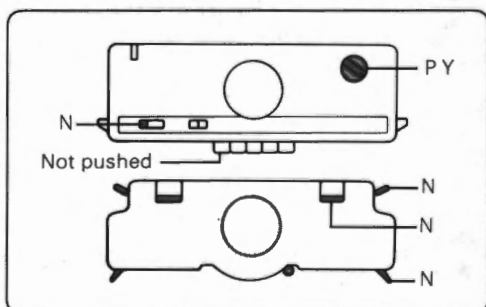
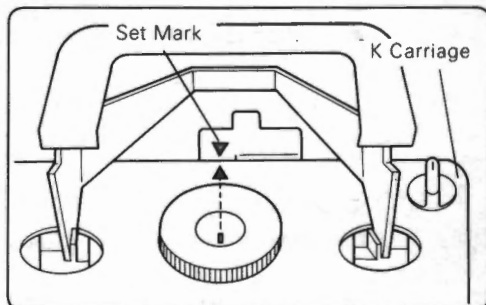
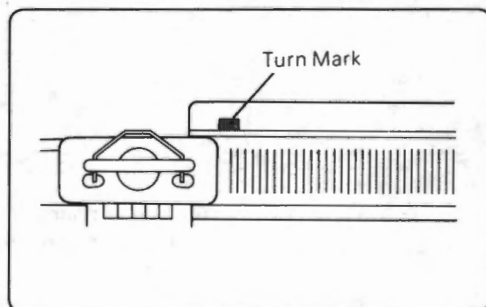
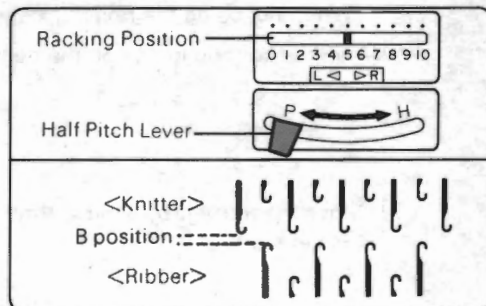
The lamp of the plain stitch key goes out and the knitter is ready to knit the selected block.



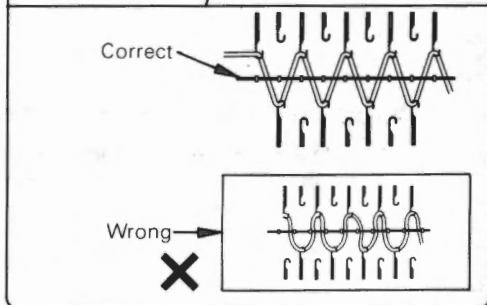
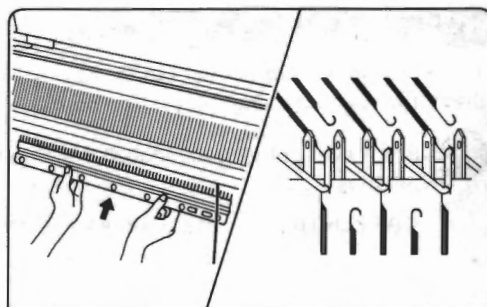
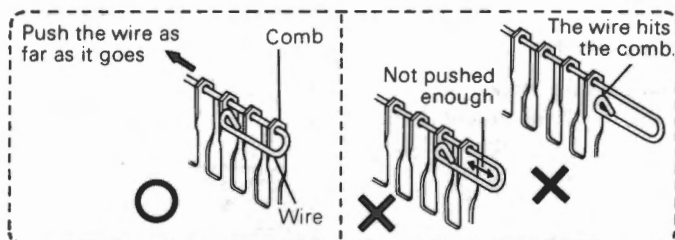
## • CAST-ON

### WHEN USING THE RIBBER

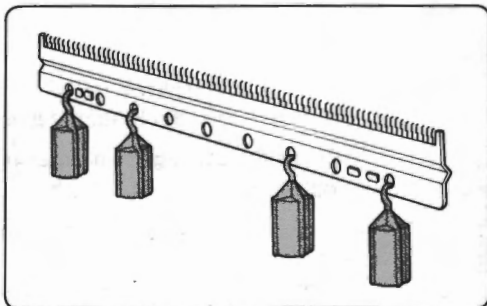
- ① Set the racking position to 5.  
Set the half pitch lever according to the needle arrangement.
  - ♣ Illustrations show the example of 1x1 rib.
- ② Bring forward the required number of needles to B position.
  - ♣ If you want to move the carriage to align the needles...
    - ① Make sure that the carriage is outside the turn mark.  
Turn off the power of the knitter. Set the change knob to "N".  
(Release the part buttons.)
    - ② Move the carriage two times by hand to align the needles in B position.
    - ③ Return the carriage to the former position (outside the turn mark) and turn on the power of the knitter.
- ③ Move the carriage to right or left by hand so that the center of the carriage comes at the set mark.
- ④ Set the carriage as shown in the illustration.  
Tension dials and slide lever should be arranged according to your knitting and yarn.
- ⑤ Move the carriage one row. (If the necessary yarn is opposite side colour changer to the carriage, move one row to the opposite side, and then move one row.) The carriage receives the yarn when it passes across the colour changer. The yarn hangs on the needles of the knitter and ribber.
- ⑥ Hang on the cast-on comb.
  - ① Pull out the wire from the cast-on comb.



- ② Insert the comb between the needles in such a way that the top of the comb does not disturb or drop the yarn hanging on the needles. Pass the wire through the top of the comb.

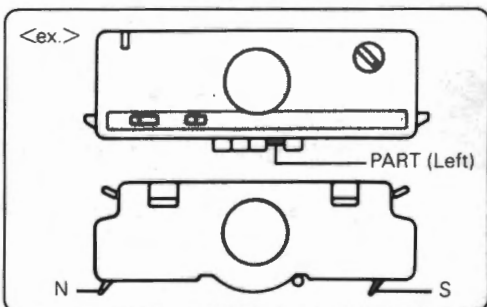


- ⑦ Hang the weights to give enough tension to the knitting (see page 83).

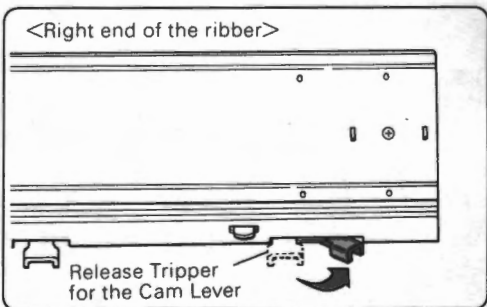


- ⑧ If you knit the selvedge, follow the steps below.

- ① Set the part button of the K carriage and the cam lever of the R carriage.



- ② Turn and push in the release trippers at both ends of the ribber to lock it.

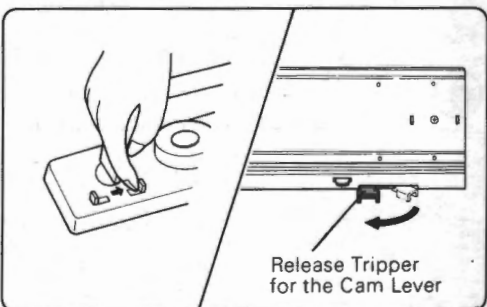


- ③ Move the carriage three times.

- After finishing the selvedge....

- ① Push the cam button release lever to cancel the part button. Set back the cam lever to N.

- ② Cancel the lock of the release trippers.



- ⑨ After casting-on, go back to the step ⑤ on page 49.

## WHEN NOT USING THE RIBBER

There are many kinds of methods for cast-on. The following steps explain one of them, the method using the cast-on comb.

- ① Bring every other needle to B position between the required number of needles.

**<ATTENTION>** If the presser is attached, let it down to the resting position.

♣ If you want to move the carriage to align the needles....

- ① Make sure that the carriage is outside the turn mark.
  - ♣ When using the plain stitch key, turn off the power of the knitter.

- ② Set the change knob to "N".  
(Release the cam button, if it is pushed.)

- ③ Move the carriage two times by hand to align the needles in B position.

- ④ Return the carriage to the former position (outside the turn mark).
  - ♣ When using the plain stitch key, turn on the power of the knitter.

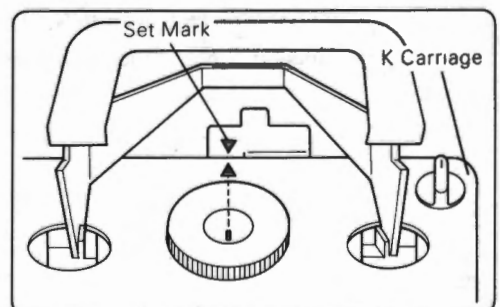
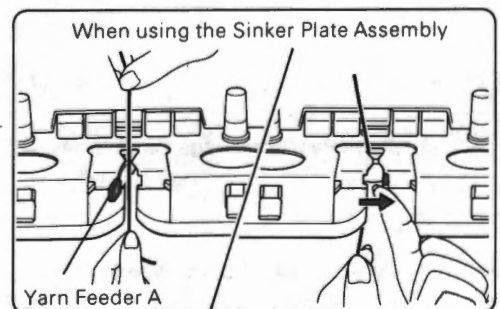
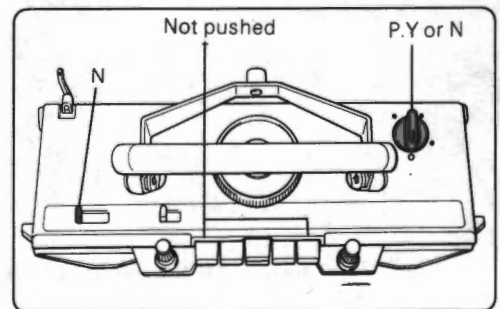
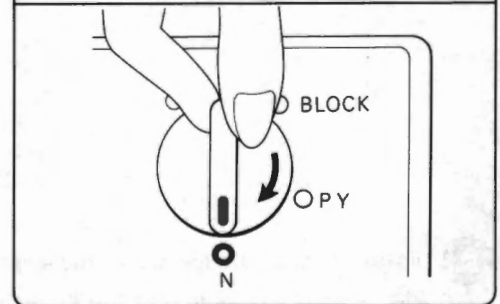
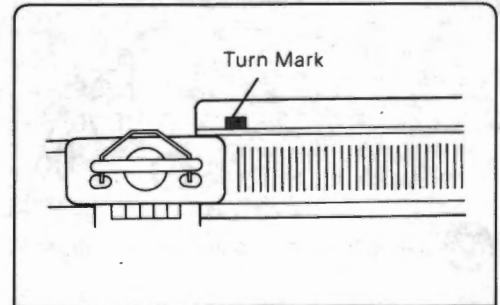
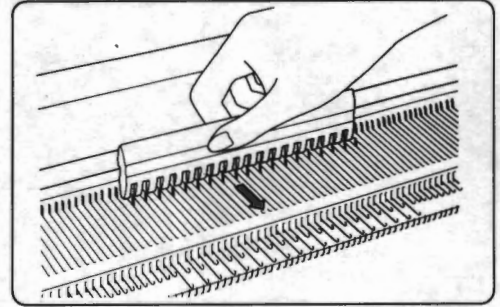
- ② Set the carriage as shown in the illustration.  
Tension dial should be arranged according to the yarn.  
Set the change knob as follows:

- When using the plain stitch key.... P.Y
- When not using the plain stitch key.... N

- ③ When using the sinker plate assembly, thread the yarn as follows:

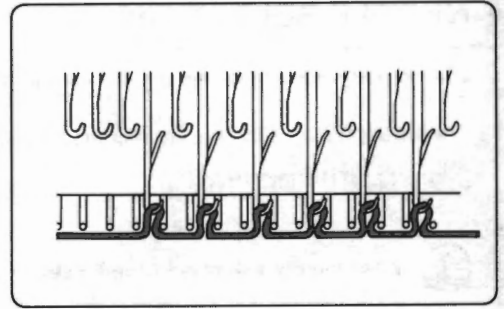
- ① Open the yarn feeder A and insert the yarn.
- ② Close the yarn feeder A.

- ④ When using the motor drive, move the carriage by hand so that the center of the carriage comes at the set mark.

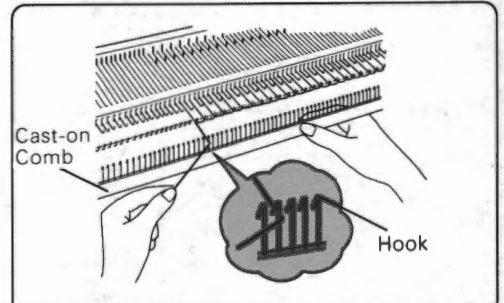


- 5 Move the carriage one row.  
(If you are using the colour changer and the necessary yarn is opposite side colour changer to the carriage, move one row to the opposite side, and then move one row.)

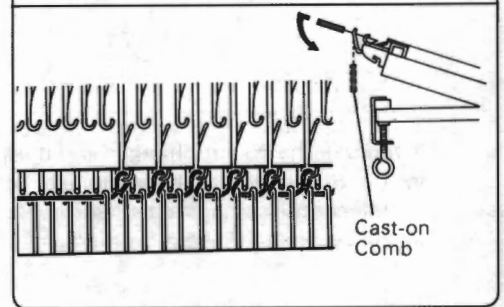
The yarn hangs on the needles in B position.



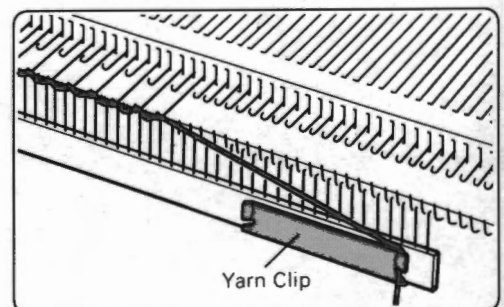
- 6 Hang on the cast-on comb.
- 1 Hold the cast-on comb as shown with the hooks facing the machine.
  - 2 Pull the yarn through the hook toward you.



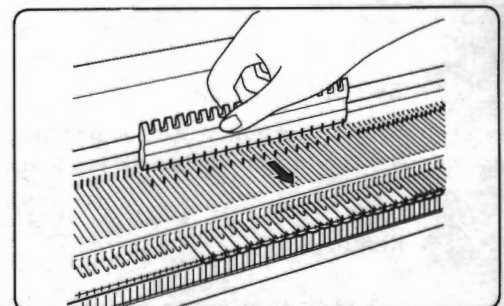
- 3 Hook the cast-on comb over the loops and let it down.



- 7 When using the sinker plate assembly, hook the loose yarn end under the yarn clip on the cast-on comb.



- 8 Bring forward the needles to B position from A position between the required number of needles.



- 9 Hang the weights to give enough tension to the knitting (see page 83).

- 10 Move the carriage one row. Casting-on is finished.
- When using the plain stitch key.....  
After casting-on, go back to the step 5 on page 49.  
<ATTENTION> When using the colour changer, push up the presser to the working position.
  - When not using the plain stitch key...  
Continue knitting to knit in plain stitch.



## • NEEDLE SELECTION

During pattern knitting, the needles are automatically set into B position or D position.

- ◆ See the pages of operation chart for the detailed steps of the first needle selection.

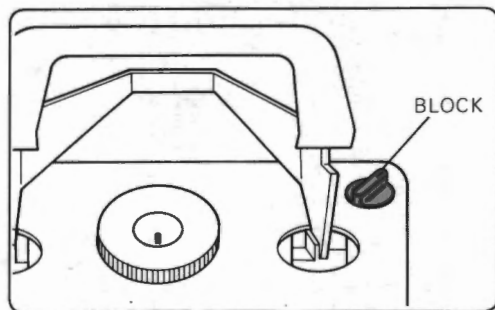
### PATTERN KNITTING

#### ① First needle selection (needle selection for the first row)

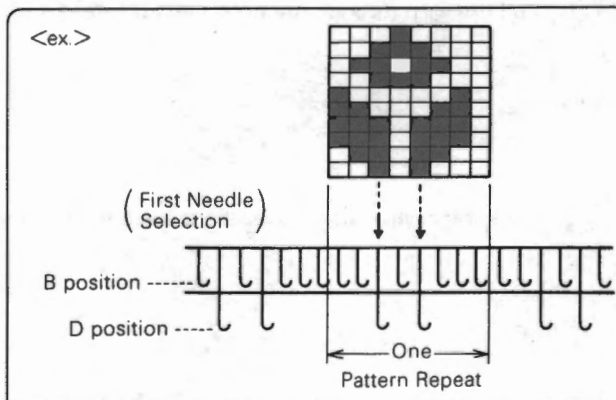
Set the change knob to "BLOCK" and move the carriage once or twice\*.



Needles are selected to B or D position for the first row.



\* If you use the colour changer and the yarn for the first row is at the same side colour changer as the carriage, needles are selected by the second carriage movement.



#### PATTERN AND NEEDLE SELECTION

- Pattern created in pattern mode 5  
Stitch drawn by the DRAW key....  
The needle is selected to D position.  
Except above stitches....  
The needle is selected to B position.
- Pattern created in pattern mode 1 — 4  
Stitch to be knitted in next row....  
The needle is selected to D position.  
Stitch not to be knitted in next row....  
The needle is selected to B position.

#### ② Cam button setting

Set the cam button according to the pattern.

Stitch formation in B and D position is determined by the cam button setting (see page 70).

#### ③ Knitting

- ① Move the carriage one row. ➡ The carriage selects the needles for the second row knitting the first row.
  - ② Move the carriage one row. ➡ The carriage selects the needles for the third row knitting the second row.
  - ③ Move the carriage one row. ➡ The carriage selects the needles for the fourth row knitting the third row.
- Above is repeated.

When you see the needle bed after moving the carriage, needles are selected to B and D position for the next row.

## • KNITTING

After the first needle selection, now is the time for the actual knitting. Set the counter, repeat number, and so on if necessary.

- ① Set the carriage according to the pattern (see pages 56 ~ 67).
- ② Start knitting.

### WHEN USING THE MOTOR DRIVE

- When using the colour changer

- ① Make sure that the center of the carriage is at or outside the set mark and push the S/S switch. (The carriage receives the yarn when it passes the colour changer and starts knitting.)
- ② When all the yarns set to the colour changer knit at least one row, remove them from the yarn clip under the ribber.
- ③ When block knitting is completed, the motor drive stops automatically. Now the row number (block) in the display is 1 or 2.

- When using the sinker plate assembly

- ① Make sure that the center of the carriage is at or outside the set mark.
- ② If the pattern needs the contrast yarn, thread it into the yarn feeder B.
- ③ Push the S/S switch. (Knitting starts.)
- ④ When the block knitting is completed, the motor drive stops automatically. Now the row number (block) in the display is 1.

♥ When the carriage stops while knitting, check the direction indicator (see page 79) of the motor drive and the display of the knitter to understand the reason of stopping.

### WHEN NOT USING THE MOTOR DRIVE

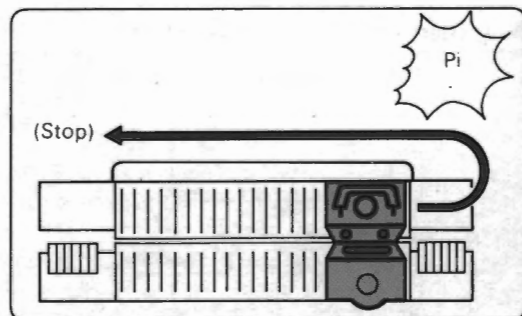
- When using the colour changer

- ① Move the carriage until the center of the carriage comes at or outside the set mark.
- ② Begin knitting. (The carriage receives the yarn when it passes the colour changer.)  
<REMARK> Move the carriage from the end (at or outside the set mark) to end at every row. If you do not, the buzzer beeps to warn you.
- ③ When all the yarns set to the colour changer knit at least one row, remove them from the yarn clip under the ribber.

- When using the sinker plate assembly

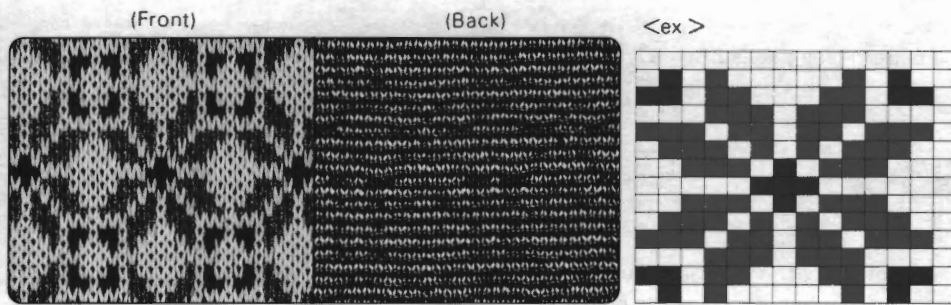
- ① If the pattern needs the contrast yarn, thread it into the yarn feeder B.
- ② Begin knitting.  
<REMARK> While knitting, you must take the carriage past the center of the machine at every row.

♥ When you hear the sound "Pi" while knitting, finish that row and stop the carriage. The last row is the one you specified using the option "SET STOP POSITION" or "INPUT MEMO DATA (section "STOP")", or the end row of the block. When you finish the block, the row number (block) in the display is 1 or 2.



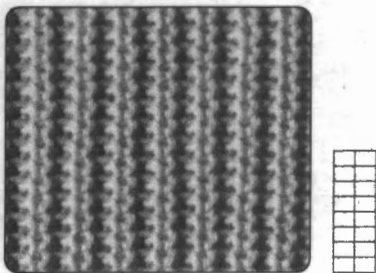
# PATTERN KNITTING

## • DOUBLE BED JACQUARD



CARRIAGE SETTING	DESIGN SYSTEM
	<p>PATTERN MODE: 2 — 4 END NEEDLE SELECTION: FREE</p>
<b>KNITTING</b>	
<p>END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)</p>	

## • ENGLISH RIB



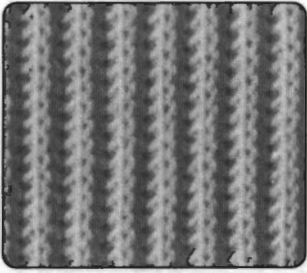
### ♣ USING THE DESIGN SYSTEM

CARRIAGE SETTING	DESIGN SYSTEM
	<p>PATTERN MODE: 5 PATTERN AREA: Number of stitches = any number Number of rows = any even number ♣ Needle selection is not necessary, so you do not have to draw.</p> <p>INPUT MEMO DATA: Section "HOLDER" END NEEDLE SELECTION: FREE SET KNITTING RANGE: Actual knitting width</p>
<b>KNITTING</b>	
<p>END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)</p>	

### ♣ USING THE PLAIN STITCH KEY

CARRIAGE SETTING	KNITTING
	<p>PLAIN STITCH KEY: see page 48.</p>

## • FISHERMAN'S RIB



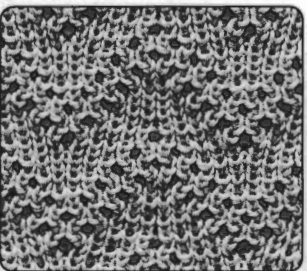
### ♣ USING THE DESIGN SYSTEM

CARRIAGE SETTING	DESIGN SYSTEM
	<p>PATTERN MODE: 5            PATTERN AREA: Number of stitches = any number            Number of rows = any even number            ♣ Needle selection is not necessary, so you do not have to draw.</p> <p>INPUT MEMO DATA: Section "HOLDER"            END NEEDLE SELECTION: FREE            SET KNITTING RANGE: Actual knitting width</p>
	<p style="text-align: center;"><b>KNITTING</b></p> <p>END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)</p>

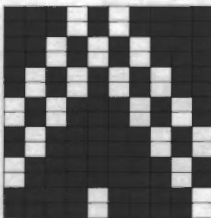
### ♣ USING THE PLAIN STITCH KEY

CARRIAGE SETTING	KNITTING
	<p>PLAIN STITCH KEY: see page 48.</p>

## • RIB TUCK

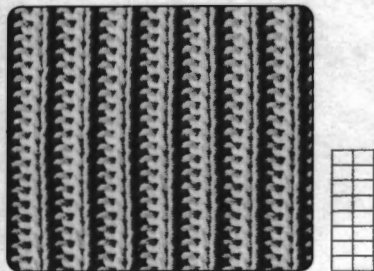


<ex.>



CARRIAGE SETTING	DESIGN SYSTEM
	<p>PATTERN MODE: 5            INPUT MEMO DATA: Section "HOLDER"            END NEEDLE SELECTION: FREE            SET KNITTING RANGE: Actual knitting width</p>
	<p style="text-align: center;"><b>KNITTING</b></p> <p>END NEEDLE SELECTION (K CARRIAGE): ON (see page 75)</p>

• RIB



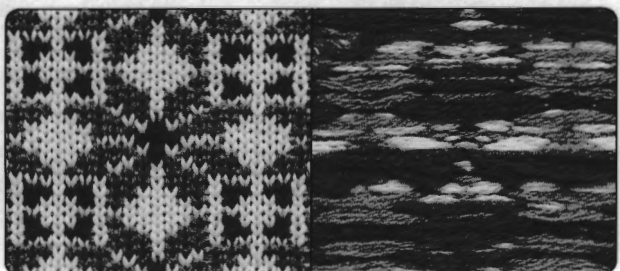
♣ USING THE DESIGN SYSTEM

CARRIAGE SETTING	DESIGN SYSTEM
	<p>PATTERN MODE: 5            PATTERN AREA: Any number of stitches and rows            ♣ Needle selection is not necessary, so you do not have to draw.</p> <p>INPUT MEMO DATA: Section "HOLDER"            END NEEDLE SELECTION: FREE            SET KNITTING RANGE: Actual knitting width</p>
<b>KNITTING</b>	
<p>END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)</p>	

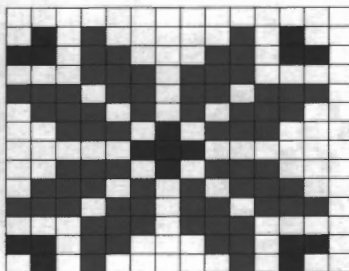
♣ USING THE PLAIN STITCH KEY

CARRIAGE SETTING	KNITTING
	<p>PLAIN STITCH KEY: see page 48.</p>

• SINGLE BED JACQUARD



<ex.>



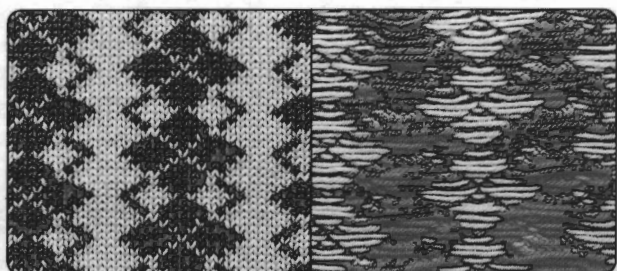
CARRIAGE SETTING	DESIGN SYSTEM
	<p>PATTERN MODE: 1            END NEEDLE SELECTION: ON            SET KNITTING RANGE: Actual knitting width</p>
<b>KNITTING</b>	
<p>END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)</p>	

<ATTENTION>

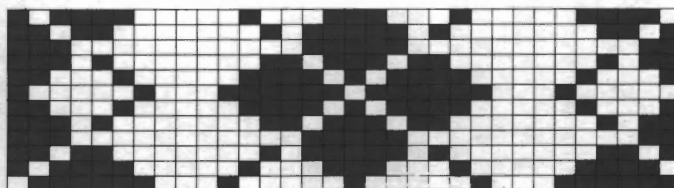
- If you increase/decrease the stitch....  
 Set the end needle selection of the design system to "FREE" when the knitting range changes. Check the end needles every row and bring forward them to D position if they remain in B position. But, when all the needles align in B position, the carriage moves without knitting, therefore do not bring the end needles to D position.

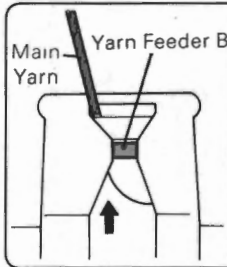
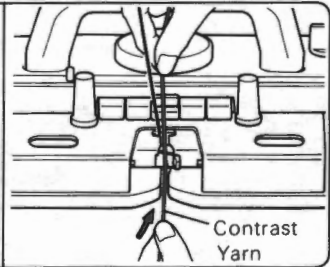


## • FAIRISLE PATTERN



<ex.>



CARRIAGE SETTING	DESIGN SYSTEM
	<p>PATTERN MODE: 5            END NEEDLE SELECTION: ON            SET KNITTING RANGE: Actual knitting width</p>
	<p style="text-align: center;"><b>KNITTING</b></p> <p>END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)            CONTRAST YARN: After first row needle selection, thread the contrast yarn into the yarn feeder B without opening the yarn feeder A.</p> <div style="display: flex; justify-content: space-around;">   </div>

### <ATTENTION>

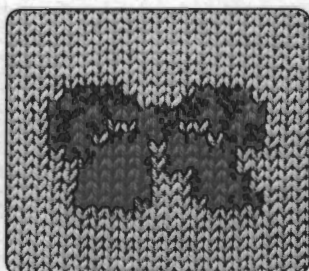
- If there are any rows where you use only the main yarn....

All the needles are aligned to B position. When this happens, take the contrast yarn out of the yarn feeder B.

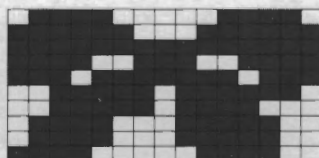
- If you increase/decrease the stitch....

Set the end needle selection mechanism of the K carriage to "ON" (see page 75) and the end needle selection of the design system to "FREE", because end needle selection mechanism of the K carriage brings the end needles to D position every row even if the knitting range changes. But, in this case, end needles are brought to D position when there are any rows where you use only the main yarn. Therefore, if this happens, bring the end needles back to B position.

## • FAIRISLE PATTERN (MOTIF)

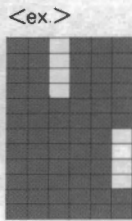
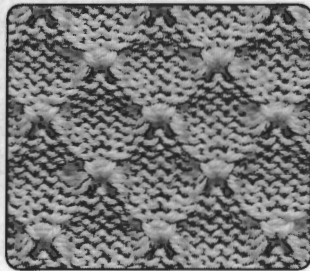


<ex.>



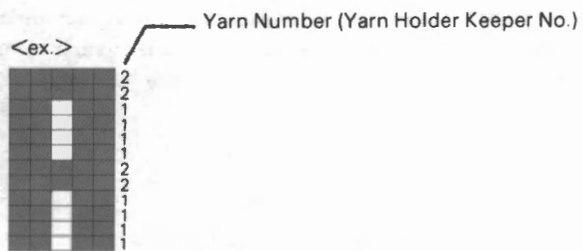
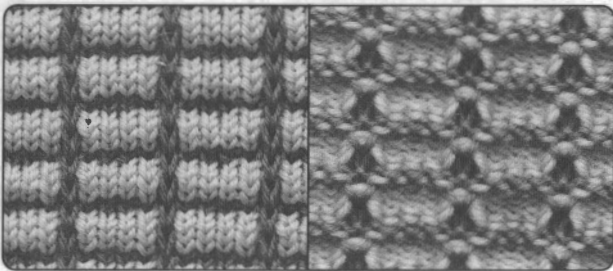
CARRIAGE SETTING: Same as FAIRISLE PATTERN  
 DESIGN SYSTEM: Same as FAIRISLE PATTERN except END NEEDLE SELECTION  
 END NEEDLE SELECTION: FREE  
 KNITTING: Same as FAIRISLE PATTERN except END NEEDLE SELECTION (K CARRIAGE)  
 END NEEDLE SELECTION (K CARRIAGE): FREE

## • TUCK PATTERN



CARRIAGE SETTING	DESIGN SYSTEM
	<p><b>PATTERN MODE: 5</b>  <b>END NEEDLE SELECTION: FREE</b>  <b>SET KNITTING RANGE: Actual knitting width</b></p> <hr/> <p><b>KNITTING</b></p> <p><b>END NEEDLE SELECTION (K CARRIAGE): ON</b> (see page 75)  <b>RUBBER WHEEL:</b> After the first row needle selection put the rubber wheels of the sinker plate assembly to working position.</p> <div data-bbox="843 801 1401 1034" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> </div> <ol style="list-style-type: none"> <li>(1) Remove the sinker plate assembly and turn it over.</li> <li>(2) Move the rubber wheels to the arrow-direction pushing them.</li> </ol> <ul style="list-style-type: none"> <li>• After you finish knitting tuck pattern, push the rubber wheels to non-working position.</li> </ul>

## • MULTICOLOUR TUCK PATTERN



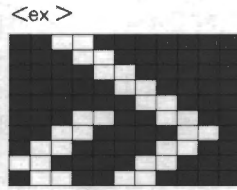
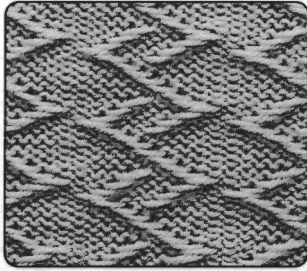
CARRIAGE SETTING	DESIGN SYSTEM
	<p><b>PATTERN MODE: 5</b>  <b>INPUT MEMO DATA: Section "HOLDER"</b>  <b>END NEEDLE SELECTION: ON</b>  <b>SET KNITTING RANGE: Actual knitting width</b></p> <hr/> <p><b>KNITTING</b></p> <p><b>END NEEDLE SELECTION (K CARRIAGE): FREE</b> (see page 75)</p>

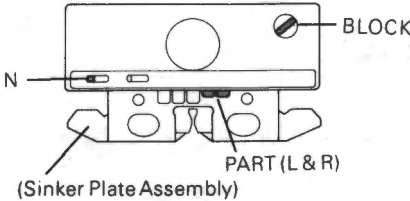
### <ATTENTION>

- If you increase/decrease the stitch....

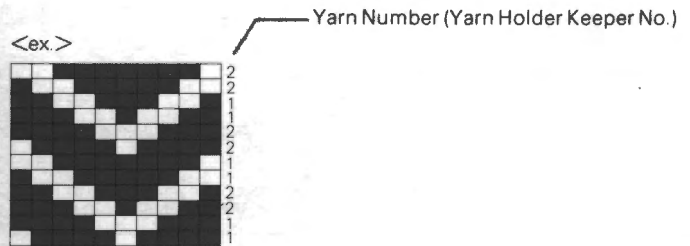
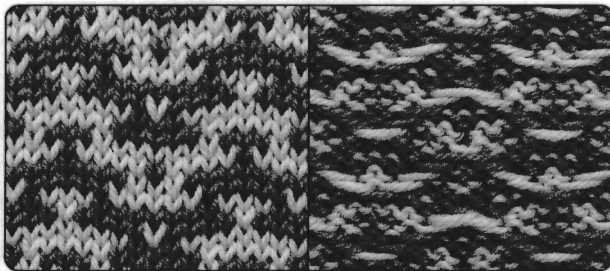
Set the end needle selection of the design system to "FREE" when the knitting range changes. Check the end needles every row and bring forward them to D position if they remain in B position. But, when all the needles align in B position, the carriage moves without knitting, therefore do not bring the end needles to D position.

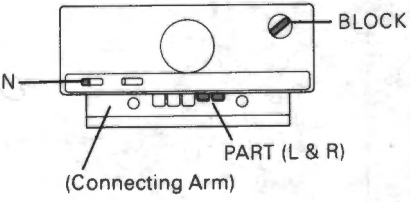
## • SKIP PATTERN



CARRIAGE SETTING	DESIGN SYSTEM
	PATTERN MODE: 5 END NEEDLE SELECTION: FREE SET KNITTING RANGE: Actual knitting width
	<b>KNITTING</b>
	END NEEDLE SELECTION (K CARRIAGE): ON (see page 75)

## • MULTICOLOUR SKIP PATTERN

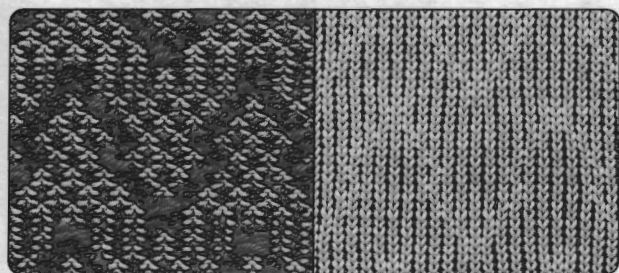


CARRIAGE SETTING	DESIGN SYSTEM
	PATTERN MODE: 5 INPUT MEMO DATA: Section "HOLDER" END NEEDLE SELECTION: ON SET KNITTING RANGE: Actual knitting width
	<b>KNITTING</b>
	END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)

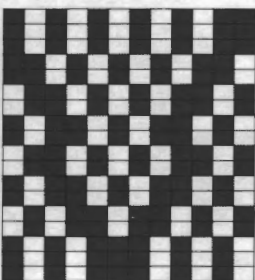
### <ATTENTION>

- If you increase/decrease the stitch...  
 Set the end needle selection of the design system to "FREE" when the knitting range changes. Check the end needles every row and bring forward them to D position if they remain in B position. But, when all the needles align in B position, the carriage moves without knitting, therefore do not bring the end needles to D position.

# WEAVING PATTERN



<ex>

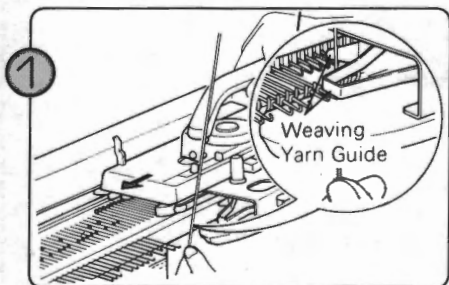


CARRIAGE SETTING	DESIGN SYSTEM
	<p><b>PATTERN MODE: 5</b> <b>END NEEDLE SELECTION: FREE</b></p> <p align="center"><b>KNITTING</b></p> <p><b>END NEEDLE SELECTION (K CARRIAGE): ON</b> (see page 75) <b>WEAVING LEVER:</b> After the first row needle selection set the weaving levers to "W.T".</p> <ul style="list-style-type: none"> <li>• When finishing the weaving pattern, set the weaving levers to "N".</li> </ul> <p><b>WEAVING YARN:</b> See the instruction below.</p>

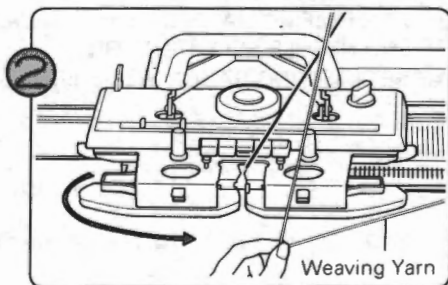
## <KNITTING THE WEAVING YARN>

### METHOD 1

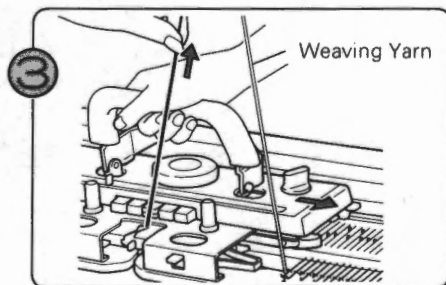
Thread the weaving yarn into the yarn tension unit.



Hold the end of the weaving yarn with your hand, and thread it into the weaving yarn guide at the moving-direction side of the K carriage. Then move the K carriage across the needle bed.



Remove the weaving yarn from the weaving yarn guide by moving the K carriage slightly to the outside. Pass the weaving yarn under the K carriage to the opposite side.



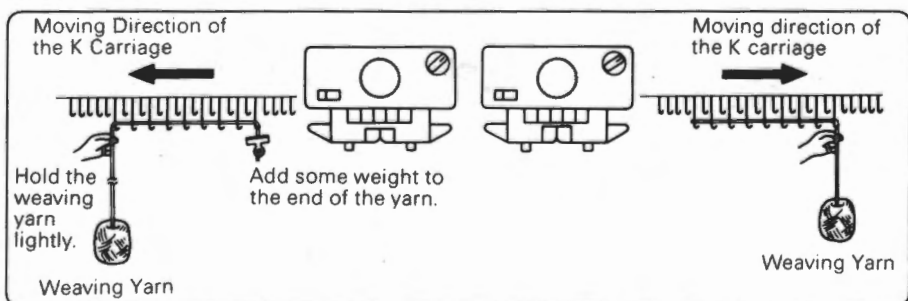
Move the K carriage across the needle bed, pulling the main yarn upwards slightly — ensure that the weaving yarn is in the weaving yarn guide.

♣ Release the yarn end after knitting one row.

### METHOD 2

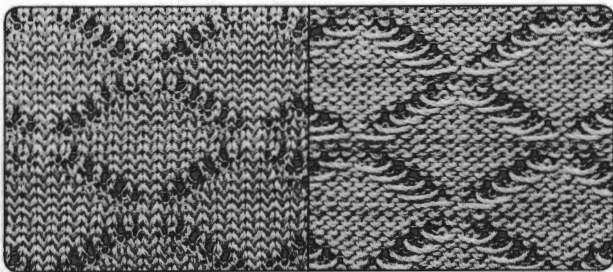
Lay the weaving yarn across the needles by hand.

Lay the weaving yarn across the selected needles, beginning from the same side as the K carriage, as illustrated.

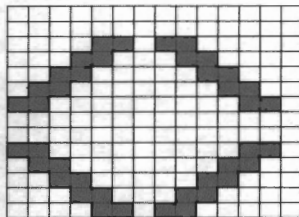




## • THREAD LACE PATTERN



<ex.>



CARRIAGE SETTING	DESIGN SYSTEM
	<p><b>PATTERN MODE: 5</b>  <b>END NEEDLE SELECTION: OFF</b>  <b>SET KNITTING RANGE: Actual knitting width</b></p>
	<p style="text-align: center;"><b>KNITTING</b></p> <p><b>END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)</b>  <b>CONTRAST YARN: After first row needle selection, thread the contrast yarn into the yarn feeder B without opening the yarn feeder A.</b></p> <div style="display: flex; justify-content: space-around;"> </div>

### <ATTENTION>

- If you increase/decrease the stitch.....

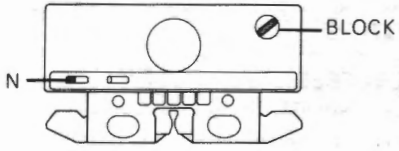
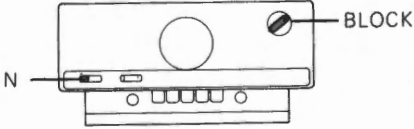
The end needle selection of the design system does not work when the knitting range changes. Check the end needles at every row, and bring it back to B position if it is in D position.



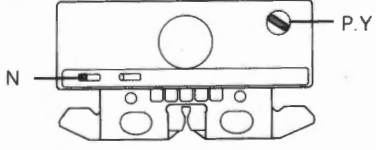
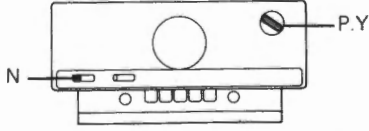
## • STOCKING STITCH (PLAIN STITCH)



### ♣ USING THE DESIGN SYSTEM

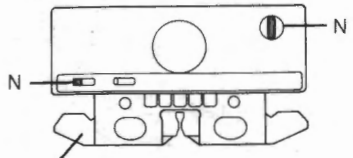
CARRIAGE SETTING	DESIGN SYSTEM
<ul style="list-style-type: none"> <li>Using the sinker plate assembly</li> </ul> 	<p>PATTERN MODE: 5            PATTERN AREA: Any number of stitches and rows            ♣ Needle selection is not necessary, so you do not have to draw.            END NEEDLE SELECTION: FREE            SET KNITTING RANGE: Actual knitting width</p>
	<b>KNITTING</b>
	END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)
CARRIAGE SETTING	DESIGN SYSTEM
<ul style="list-style-type: none"> <li>Using the colour changer</li> </ul> 	<p>PATTERN MODE: 5            PATTERN AREA: Any number of stitches and rows            ♣ Needle selection is not necessary, so you do not have to draw.            INPUT MEMO DATA: Section "HOLDER"            END NEEDLE SELECTION: FREE            SET KNITTING RANGE: Actual knitting width</p>
	<b>KNITTING</b>
	END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)

### ♣ USING THE PLAIN STITCH KEY

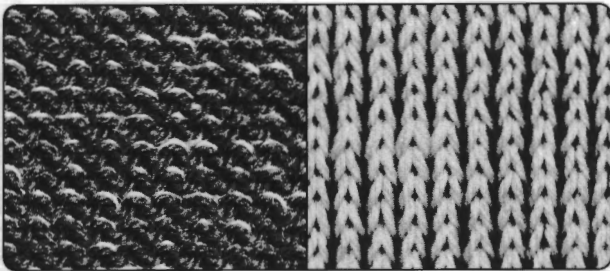
CARRIAGE SETTING	KNITTING
<ul style="list-style-type: none"> <li>Using the sinker plate assembly</li> </ul> 	PLAIN STITCH KEY: see page 48.
<ul style="list-style-type: none"> <li>Using the colour changer</li> </ul> 	

♣ When you knit stripe in stocking stitch (plain stitch), see page 77-78 of the design system carriage instruction manual.

♣ WITHOUT USING THE MOTOR DRIVE

CARRIAGE SETTING	KNITTING
 <p>(Sinker Plate Assembly)</p>	<p>When you knit by hand, set the change knob to "N". It does not matter if the power switch of the knitter is ON or OFF.</p>

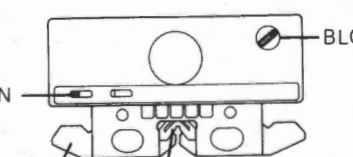
• PLATING



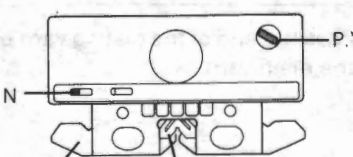
• See page 66 to use the plating yarn feeder.



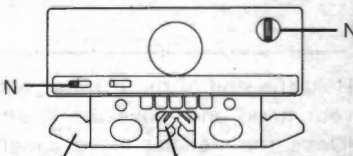
♣ USING THE DESIGN SYSTEM

CARRIAGE SETTING	DESIGN SYSTEM
 <p>(Sinker Plate Assembly) (Plating Yarn Feeder)</p>	<p>PATTERN MODE: 5            PATTERN AREA: Any number of stitches and rows            ♣ Needle selection is not necessary, so you do not have to draw.            END NEEDLE SELECTION: FREE            SET KNITTING RANGE: Actual knitting width</p>
	<b>KNITTING</b>
	<p>END NEEDLE SELECTION (K CARRIAGE): FREE (see page 75)</p>

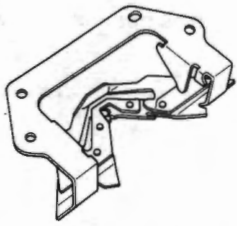
♣ USING THE PLAIN STITCH KEY

CARRIAGE SETTING	KNITTING
 <p>(Sinker Plate Assembly) (Plating Yarn Feeder)</p>	<p>PLAIN STITCH KEY: see page 48.</p>

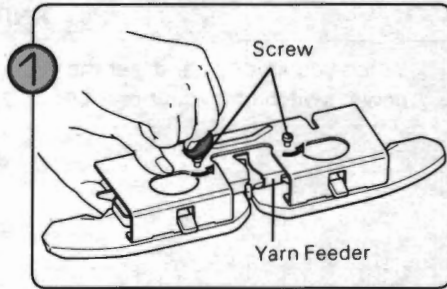
♣ WITHOUT USING THE MOTOR DRIVE

CARRIAGE SETTING	KNITTING
 <p>(Sinker Plate Assembly) (Plating Yarn Feeder)</p>	<p>When you knit by hand, set the change knob to "N". It does not matter if the power switch of the knitter is ON or OFF.</p>

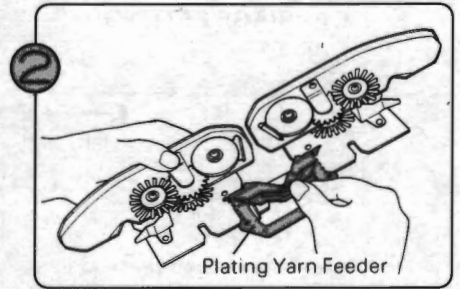
<ATTACHING THE PLATING YARN FEEDER TO THE SINKER PLATE ASSEMBLY>



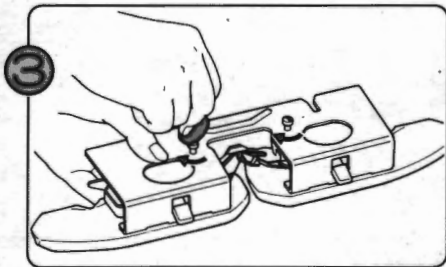
Plating Yarn Feeder



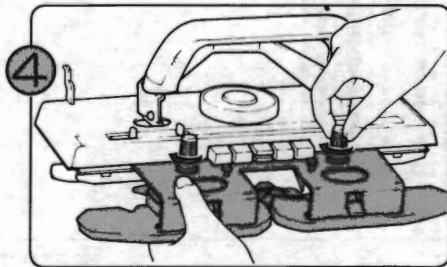
Remove the sinker plate assembly from the K carriage. Take off the two screws and the yarn feeder from the sinker plate assembly.



Fit the plating yarn feeder into the sinker plate assembly as shown above.

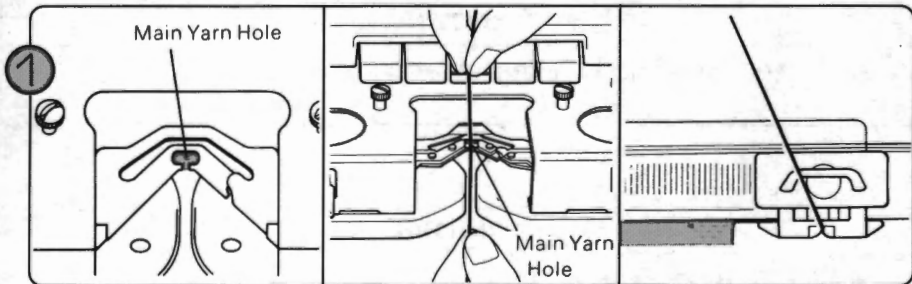


Fasten the two screws.

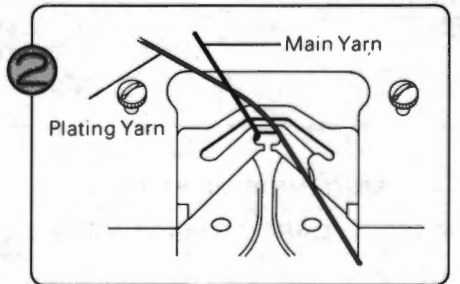


After you have changed the yarn feeder, screw the sinker plate assembly back on the K carriage.

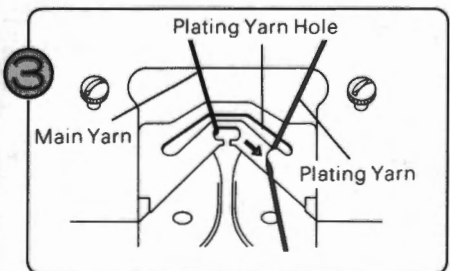
<STARTING TO KNIT IN PLATING>



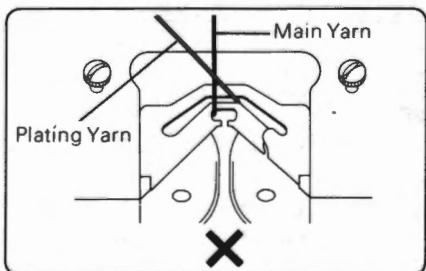
Thread the main yarn into the main yarn hole and knit a few rows in stocking stitch.



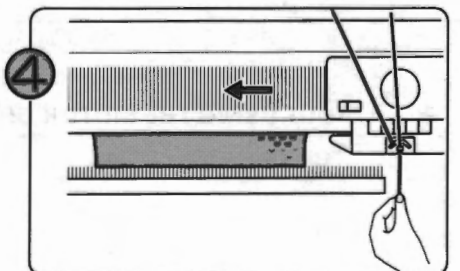
Pass the end of the plating yarn behind the main yarn.



Now thread the plating yarn into the plating yarn hole.

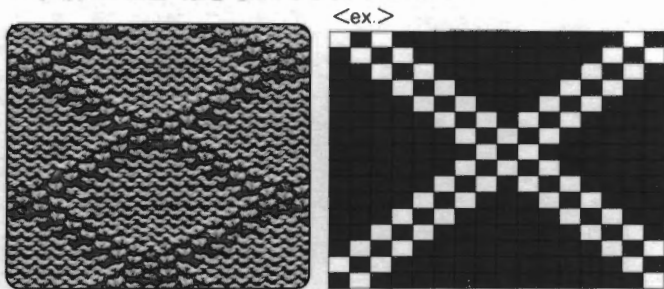


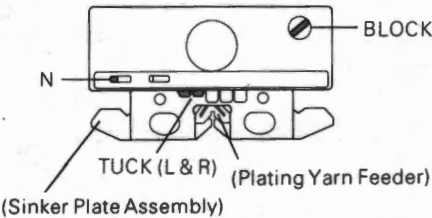
Make sure the two yarns are not crossed.



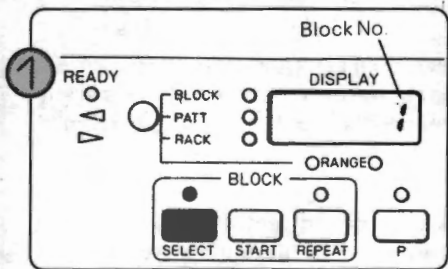
Hold the end of the plating yarn with your hand and move the K carriage. (Once the needles have caught the yarn, you can release the yarn end.)

# • PLATED TUCK PATTERN

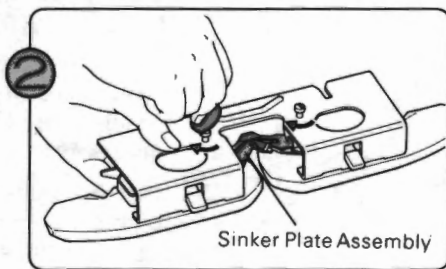


CARRIAGE SETTING	DESIGN SYSTEM
	<p>PATTERN MODE: 5            END NEEDLE SELECTION: FREE            SET KNITTING RANGE: Actual knitting width</p>
	<p style="text-align: center;"><b>KNITTING</b></p> <p>END NEEDLE SELECTION (K CARRIAGE): ON (see page 75)</p>

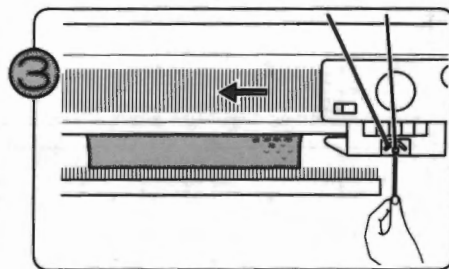
## <STARTING TO KNIT THE PLATED TUCK STITCH PATTERN>



1 Select the block number you are going to knit (see page 39).

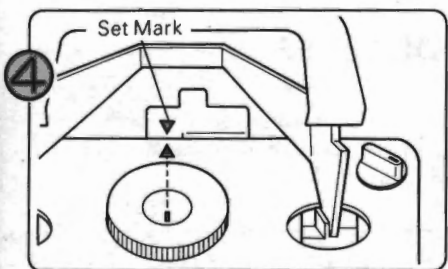


2 Attach the plating yarn feeder to the K carriage (see page 66).

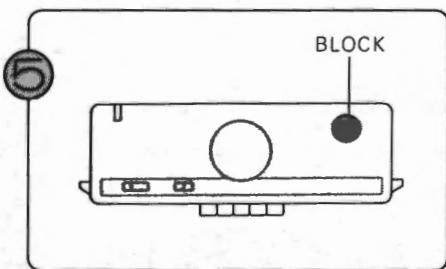


3 Knit a few rows in plating using the plain stitch key.

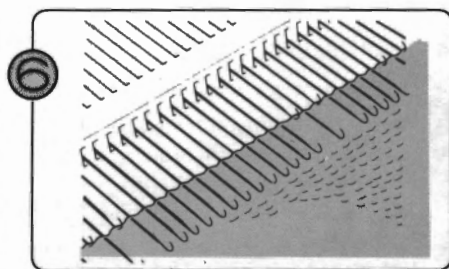
- Plain stitch key.... see page 48.
- Knitting in plating.... see page 66.



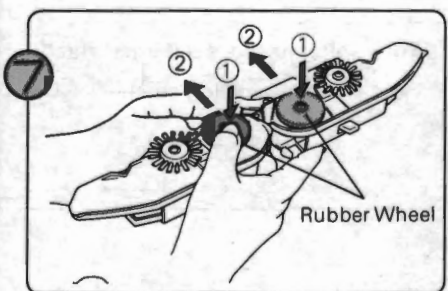
4 Make sure that the center of the K carriage is at or outside the set mark.



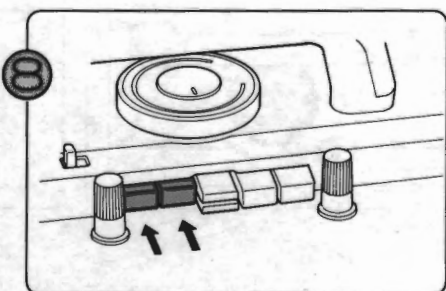
5 Set the change knob to "BLOCK".



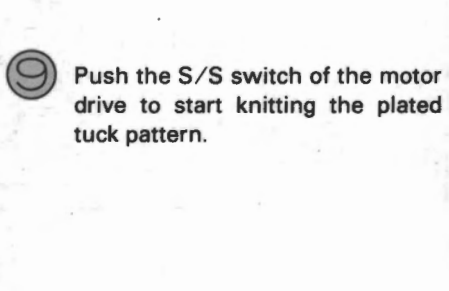
6 Push the S/S switch of the motor drive. Carriage moves one row to select the needles for the first row.



7 Put the rubber wheels to the working position (see page 60).



8 Push both the tuck buttons.



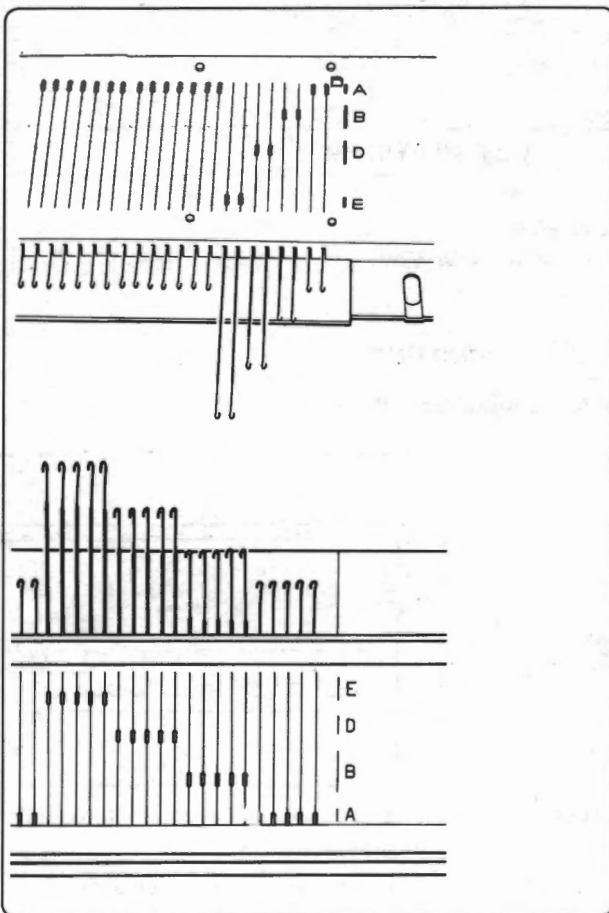
9 Push the S/S switch of the motor drive to start knitting the plated tuck pattern.



# DETAIL FOR EACH PART

## • NEEDLE POSITION

The needle works in a different way according to its position. Needle position A, B, D, and E are indicated on the needle bed.



### • Knitter

- A. Non-working position
- B. Working position  
Used for general knitting purposes.
- D. Upper working position  
Selected needles are brought to this position in pattern knitting by the K carriage. It depends on the used cam button what kind of stitch is made on each needle in B or D position (see page 70).
- E. Holding position  
Used for shaping e. g. necklines, shoulders, darts (see page 73).

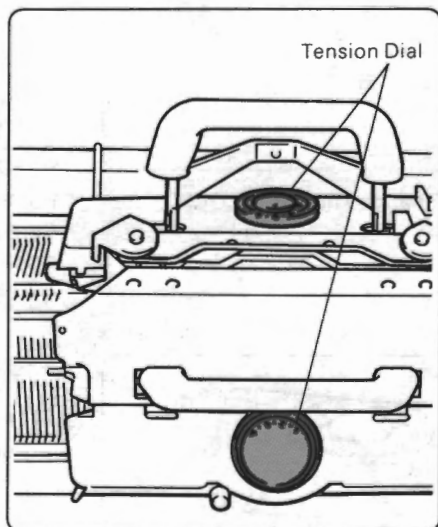
### • Ribber

- E. Holding position  
Used for shaping e. g. necklines, shoulders, darts (see page 73).
- D. Needles in this position knit and automatically return to B position even if the cam lever or the tucking lever is at any position. (Put the needles to D position by hand if necessary.)
- B. Working position  
Used for general knitting purposes. It depends on the setting of the cam lever and the tucking lever what kind of stitch is made on the needle in B position (see pages 71 ~ 72).
- A. Non-working position

## • TENSION DIAL

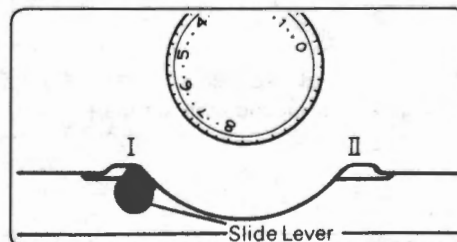
Adjust the tension dial according to the yarn in order to alter the size of your stitches. The bigger number is set, the larger the stitch becomes (looser tension). The smaller number is set, the smaller the stitch becomes (tighter tension).

- When you arrange the tension of the stitches on the ribber side, use both the tension dial and slide lever.



## • SLIDE LEVER

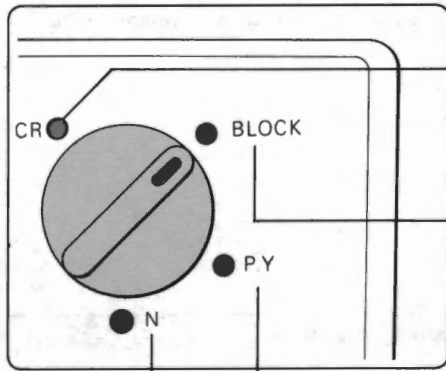
Adjust the slide lever together with the tension dial order to alter the size of the ribber side stitches.



- I ..... For a softer and looser (larger) stitch
- II ..... For a firmer (smaller) stitch



## • CHANGE KNOB



**CR**

This setting is used to release the carriage from the needle bed.

**BLOCK**

This setting is used to knit according to the block data programmed with the design system whether knitting pattern or stocking stitch.

**P.Y**

This setting is used to arrange the yarn holders to the two colour changers and to knit using the plain stitch key.

**N**

This setting is used to knit the garment which is not programmed with the design system.

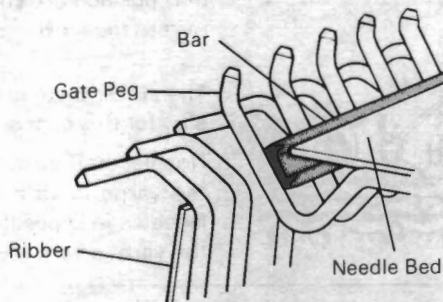
(ex. stocking stitch and plating knitted with the sinker plate assembly, by hand)

**<ATTENTION>** When knitting the lace pattern using the optional lace carriage, set the change knob to "N" even if you knit according to the block data programmed with the design system.

## • FINE KNITTING BAR

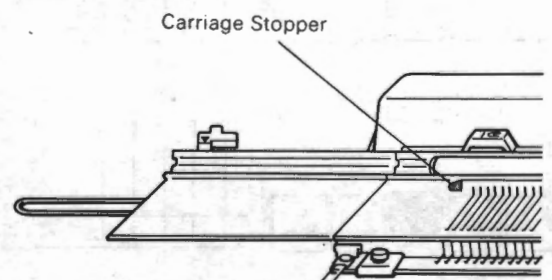
This bar helps the stitch of the knitter to slip out of the needle hook securely.

Use this bar when you knit the fine yarn using the ribber.



## • CARRIAGE STOPPER

This stopper prevents the carriage from falling.




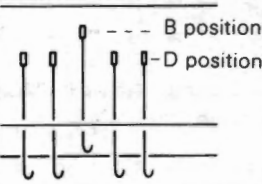
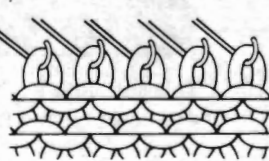

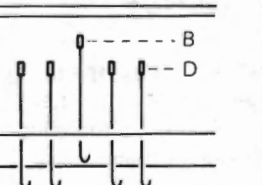
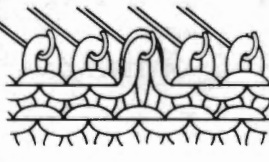

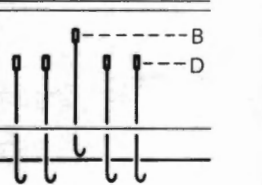
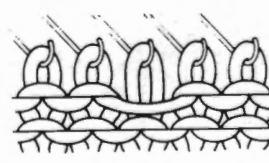

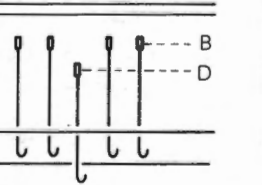
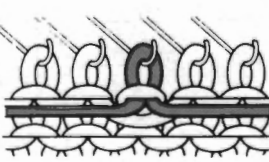

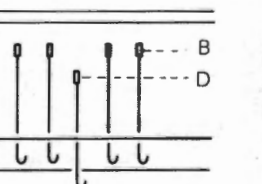

# • CAM BUTTON

The cam button is mainly used for pattern knitting and the stitch formation depends on which cam button is pushed. The cam button works on the knitter side stitches.

- The cam button is locked at the position you pressed fully. When using two cam buttons, press them simultaneously.

<REMARK> Do not press the L button (both upper and lower) with other cam buttons.

<Stitch formation according to the cam button and needle position>

Cam button	Needle position	Stitch formation
		
		
		
		
		

With no cam button pushed, needles in B and D position are knitted as shown.

There are two tuck buttons and two part buttons. Each left buttons works when the K carriage moves leftward. Each right button works when the K carriage moves rightward. Use either or both buttons properly according to the pattern.

- When only right (left) button is pushed and the K carriage moves leftward (rightward), needles in B and D position are knitted in stocking stitch.
- The tuck button and part button can be used only in combinations below.



The sinker plate assembly is necessary for this cam setting.

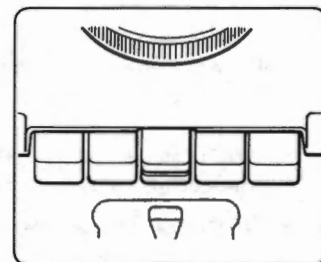
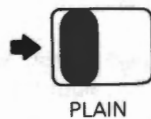
Needles in B position are knitted by the yarn in yarn feeder A. Needles in D position are knitted by the yarn in yarn feeder B.

The sinker plate assembly is necessary for this cam setting.

Needles in B position are knitted by the yarns in yarn feeder A and B. Needles in D position are knitted by the yarn in yarn feeder B.

## • CAM BUTTON RELEASE LEVER

Slide the cam button release lever to the right so as to release the cam buttons.



## • TUCKING LEVER

When the tucking lever is set to T, ribber needles in B position do not knit but only catch the yarn in the hook. The right lever works when the R carriage moves rightward. The left lever works when the R carriage moves leftward.

**<ATTENTION>** If the cam lever is set to S, the cam lever setting has the priority over that of the tucking lever. Therefore, the tucking lever setting is not effective even if it is set to T while the cam lever is set to S.

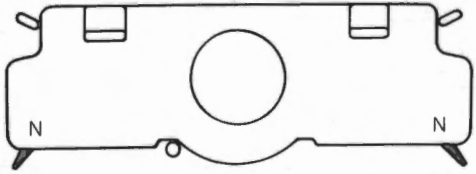
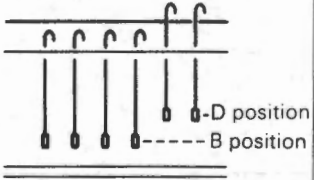
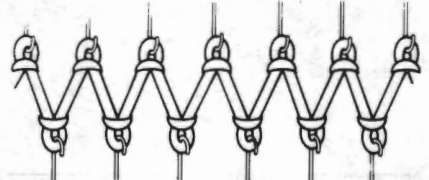
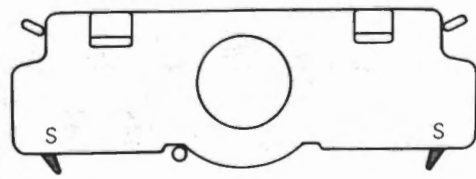
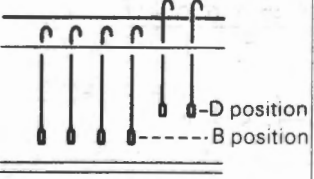
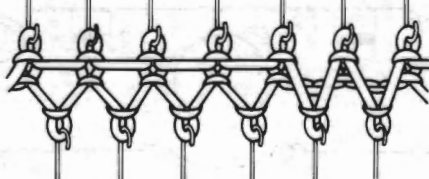
Tucking lever	Needle position (ribber)	Stitch formation
	<p>-D position -B position</p>	
	<p>-D position -B position</p>	

## • CAM LEVER

When the cam lever is set to S, ribber needles in B position do not knit. The right lever works when the R carriage moves rightward. The left lever works when the R carriage moves leftward. The knitting machine computer controls and sets the cam lever to S: (After that, the cam lever is set to N automatically.)

- When it is necessary to move the carriage without knitting because the necessary yarn is at the opposite side colour changer to the carriage (when using the colour changer).
- When you arrange the yarn holders to the two colour changers.
- When you put the \* mark in the section "CAM" using the option "INPUT MEMO DATA" of the design system.

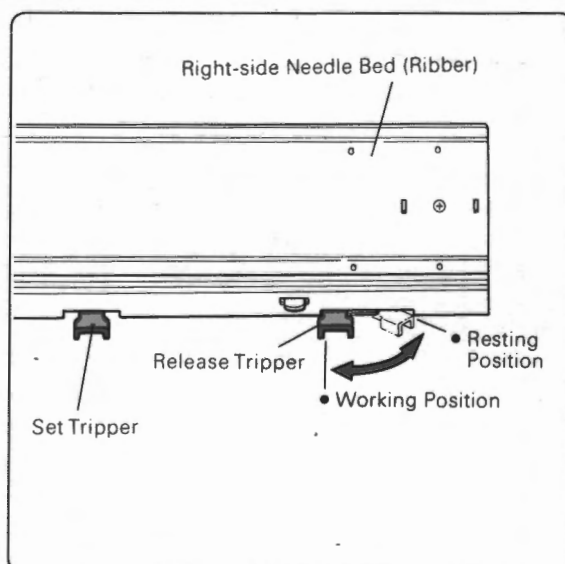
<REMARK> The computer controls the cam lever setting only when the release tripper for the cam lever is set at the working position.

Cam lever	Needle position (ribber)	Stitch formation
		
		

## • SET/RELEASE TRIPPER FOR THE CAM LEVER

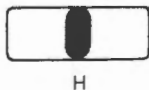
These trippers are at both sides of the ribber. Outside one is the release tripper and inside one is the set tripper.

- **Set tripper**  
Sets the cam lever of the R carriage to S. (The computer controls this. See the above explanation.)
- **Release tripper**  
Sets the cam lever of the R carriage to N when it is at the working position. Put it at the working position normally.
- ♣ Put it at the resting position when you set the cam lever to S by hand and knit more than two rows with the cam lever set at S. (ex. selvedge for the rib)



## • HOLDING CAM LEVER (K CARRIAGE)

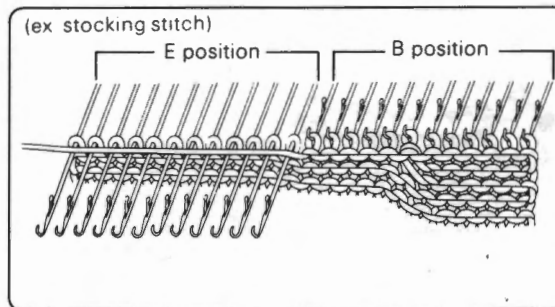
This lever works on the stitches of the knitter.



----- This setting is used for partial knitting.

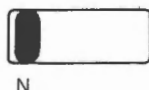
### <When knitting in stocking stitch>

- Needles in B and D position knit and align in B position when you move the K carriage.
- Needles in E position do not knit and remain in E position when you move the K carriage.



### <When knitting the pattern which requires needle selection>

- Needles in B and D position knit according to the pattern and are selected for the next row when you move the K carriage.
- Needles in E position do not knit and remains in E position when you move the K carriage.



----- This setting is used for other occasions.

### <When knitting in stocking stitch>

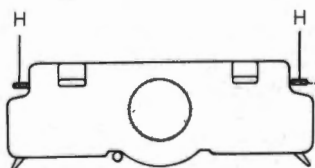
- Needles in B, D and E position knit and align in B position when you move the K carriage.

### <When knitting the pattern which requires needle selection>

- Needles in B and D position knit according to the pattern and are selected for the next row when you move the K carriage.
- Needles in E position knit the same way as ones in D position do and are selected for the next row according to the pattern when you move the K carriage.

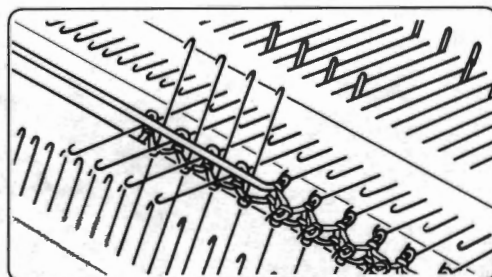
## • HOLDING CAM LEVER (R CARRIAGE)

This lever works on the stitches of the ribber.

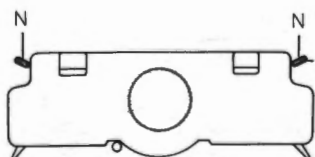


----- This setting is used for partial knitting.

- Needles in B and D position knit (stitch formation depends on the setting of the cam lever and tucking lever) and align in B position when you move the R carriage.
- Needles in E position do not knit and remains in E position when you move the R carriage.



(This illustration shows the example when holding cam levers of K and R carriages are set to H.)



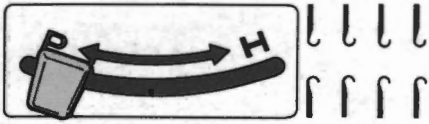
----- This setting is used for other occasions.

- Needles in B and D position knit (stitch formation depends on the setting of the cam lever and tucking lever) and align in B position when you move the R carriage.
- Needles in E position knit and align in B position when you move the R carriage.



## • HALF PITCH LEVER

P .... Needles of the knitter and ones of the ribber are opposite to each other.

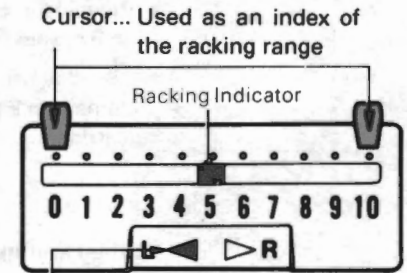
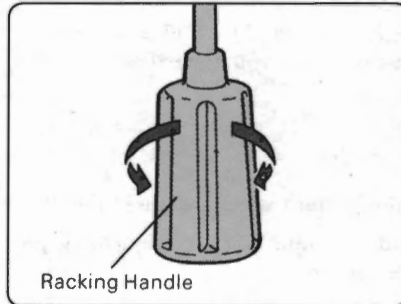


H .... The needle of the ribber is half way between the two needles of the knitter.



## • RACKING HANDLE • RACKING INDICATOR

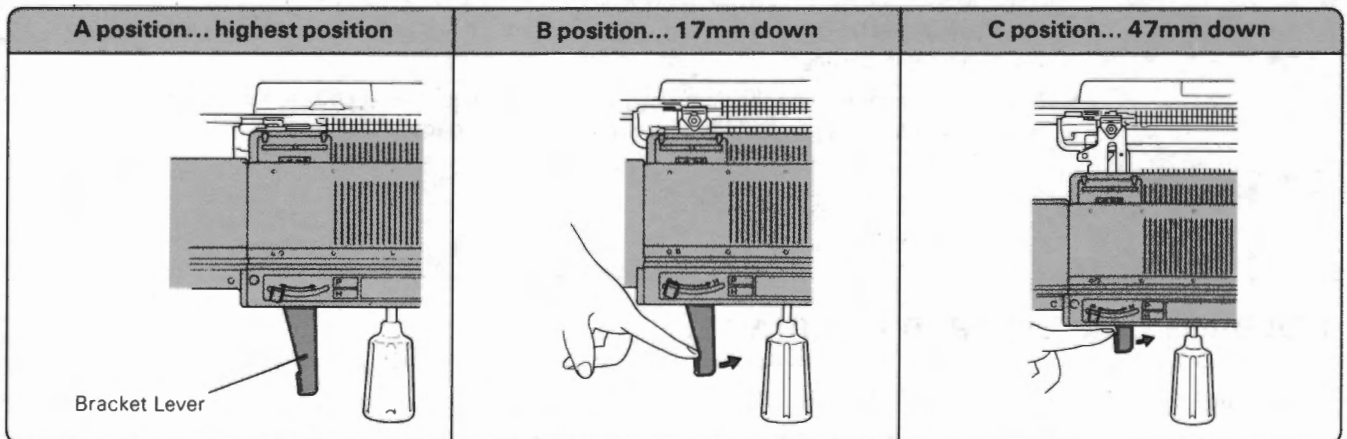
- The racking handle is used to shift the stitches up to 10 pitches in the horizontal direction. You can knit the racking pattern and zigzag pattern using this handle.
- The racking indicator shows the racking position, which is normally set to 5, center position.



Direction indicator shows the direction of racking movement.

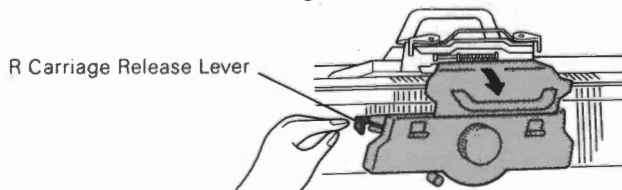
## • BRACKET LEVER

These levers are used to let down the ribber.



- Normal working position for the ribber.
- You can pick up dropped stitches or see knitting work at this position. Push down the levers from A position and the ribber will come down one step.
- You can knit with the single bed at this position. Push down the levers from B position.

- ♣ When the K carriage and the R carriage is connected.



Disengage R carriage release lever and let down the ribber.

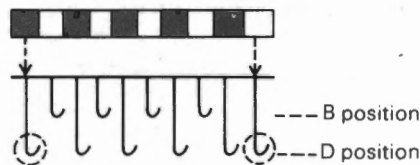
- ♣ To return the ribber to A position, push up the ribber with both hands until it stays still without holding.

## • END NEEDLE SELECTION MECHANISM OF THE K CARRIAGE

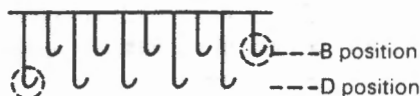
- Set the end needle selection of the K carriage to ON or FREE. Each setting works on the \*end needle as follows:  
\*end needle... End needle selection of the K carriage works on the end needles of the actual knitting. Therefore, it is effective when you increase/decrease stitches.

ON... End needles are brought to D position at every row in disregard of the pattern data.

(ex ) Pattern Data



FREE... End needles are selected to B and D position according to the pattern data.



You can also set the end needle selection with the design system. See page 58 of the design system instruction manual to know the difference between two and combine them effectively.

- The end needle selection mechanism of the K carriage works when the change knob is set at "BLOCK".

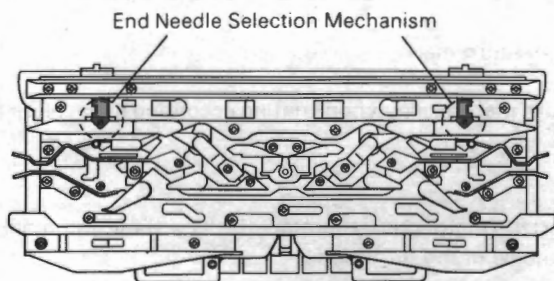
### THE REASON WHY YOU SET THE END NEEDLE SELECTION

You have to set the end needle selection according to the pattern because some patterns require that end needles are brought to D position at every row to be knitted beautifully, or thread lace patterns require that end needles stay in B position at every row to prevent dropping stitches. See pages 56 ~ 67 to know the end needle selection setting (both of the K carriage and the design system) of each pattern.

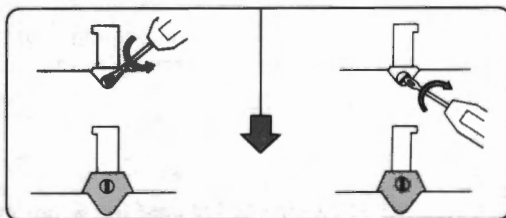
<ATTENTION> When you knit the open stitch pattern, set the end needle selection of the K carriage to free position.

### SETTING THE END NEEDLE SELECTION MECHANISM OF THE K CARRIAGE

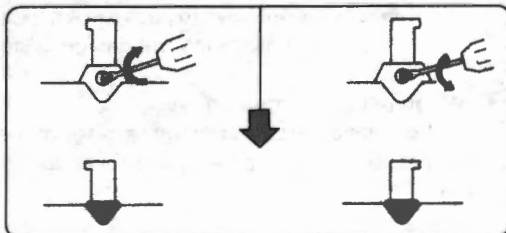
- 1 Remove the K carriage from the needle bed.
- 2 Set the change knob to "BLOCK".
- 3 Turn the K carriage over and set the mechanism to ON or FREE.



• ON



• FREE



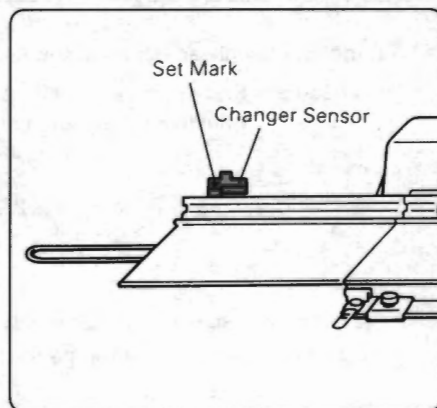
## • CHANGER SENSOR • SET MARK

Changer sensors are located at the both end of the knitter and have the set mark on it.

### • Changer Sensor

The carriage (the center of it) moves to the changer sensor so that the yarns are changed by the colour changer.

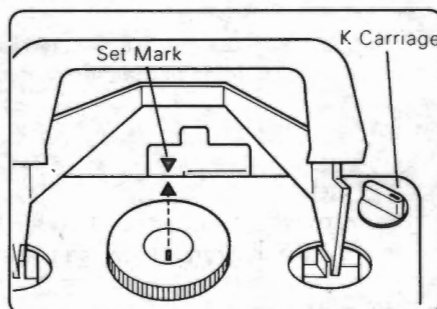
When using the motor drive, the carriage automatically moves to the colour changer and turns at that point on the yarn changing row.



### • Set Mark

The computer of the motor drive perceives the K carriage at the position of the set mark. When you start the motor drive, place the center of the carriage at either set mark and push the S/S switch.

<ATTENTION> Whenever you start the motor drive again after turning off the power of the motor drive or the knitter, place the center of the carriage at the either set mark and push the S/S switch.



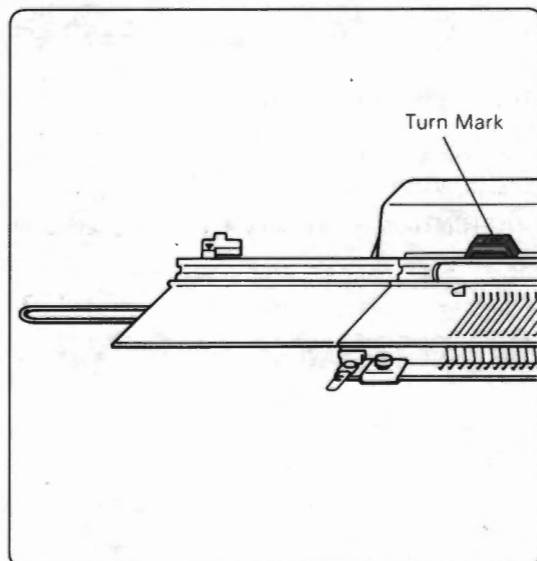
## • TURN MARK

The computer of the knitter perceives the K carriage at the position of the turn mark.

### • When knitting by hand according to the block data programmed with the design system...

Set the change knob to "BLOCK" and pass the K carriage across either turn mark in the following cases:

- When you select the needles for the first row of the block...
- When you continue knitting after removing the K carriage from the needle bed in the middle of the block knitting...
- When you continue knitting after changing the position of the change knob from "BLOCK" in the middle of the block knitting...
- When you continue knitting after turning off the power of the knitter in the middle of the block knitting...



♣ You only need to pass the K carriage once across the turn mark.

♣ You do not have to pass the K carriage across the turn mark except when knitting according to the block data programmed with the design system.

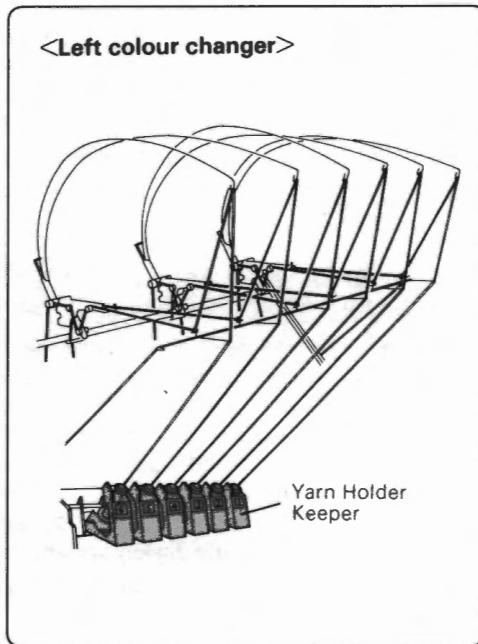
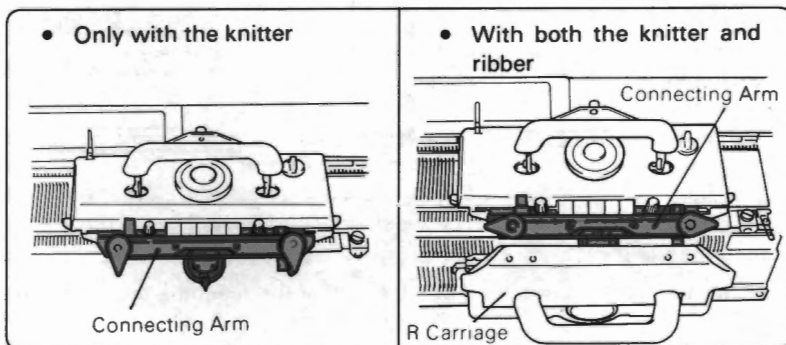
### • When using the motor drive...

You place the center of the carriage at the set mark to start the motor drive, therefore the K carriage automatically passes across the turn mark (because the set mark is outside of the turn mark).

## • COLOUR CHANGER

The colour changer is used to automatically set the necessary yarn in the carriages (connecting arm) or change the yarn.

- The colour changer is used whenever you use the connecting arm. (The colour changer can be used when knitting with knitter only or with knitter and ribber.)



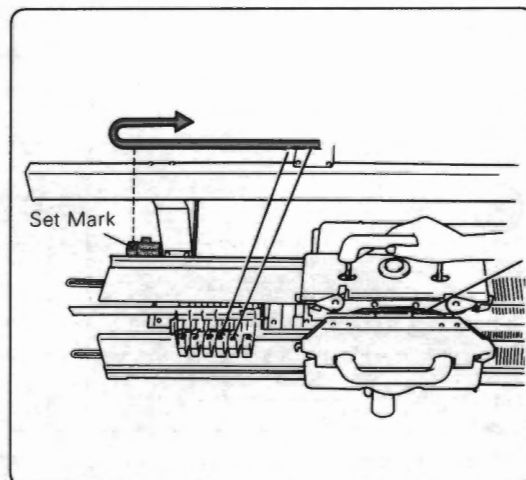
- ♣ The colour changer cannot be used for patterns knitted with the sinker plate assembly such as fairisle, thread lace, or plating.

- The colour changer has up to 6 yarns.
- The knitter has two colour changers at both ends of it, therefore you can change the yarn every row.
- It is programmed with the design system which yarn to use or where to change the yarn. Thereby, the yarn is automatically changed into the specified yarn at the specified row while knitting (how to program... see page 37 (item "HOLDER" of the option "INPUT MEMO DATA") of the design system instruction manual).
- ♣ When you knit single bed jacquard or double bed jacquard, the computers of the knitter and the design system decides the order of yarn changing according to the colouring entered with the design system. Therefore you do not have to enter the yarn changing data.
- ♣ When you do not knit according to the data programmed with the design system, for example, you knit the rib for cuff, waste knitting, you can specify the yarn number to knit it when pushing the plain stitch key (see page 48).

### WHEN YOU OPERATE THE CARRIAGE BY HAND...

When you operate the carriage by hand and change the yarn using the colour changer, move the carriage until the center of it passes the set mark and turn it at every row. The yarn is changed automatically at the specified row.

- <ATTENTION> If you turn the carriage before passing it across the set mark, the yarn cannot be changed at the yarn changing row. If this happens, the buzzer beeps. Then move the carriage again until the center of the carriage passes the set mark and turn it, so the yarn is changed.





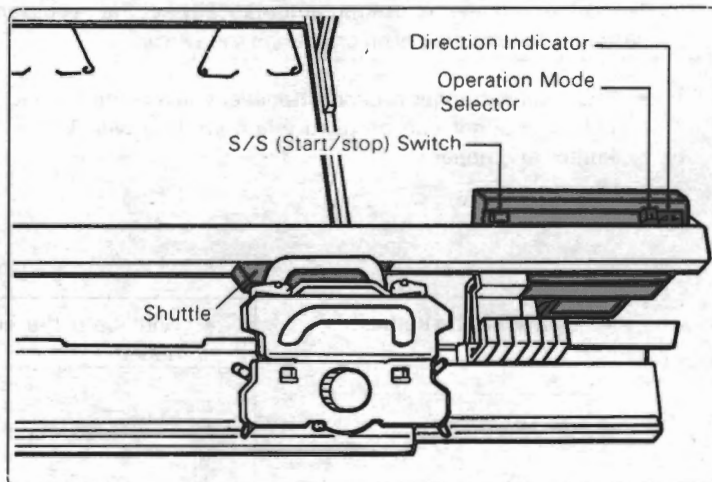
## • MOTOR DRIVE

The motor drive moves the K carriage and the knitting is automatically done.

**<ATTENTION>** The motor drive does not work without power on both the motor drive and the knitter.

### OPERATION RANGE SETTING AND MOVEMENT OF THE SHUTTLE

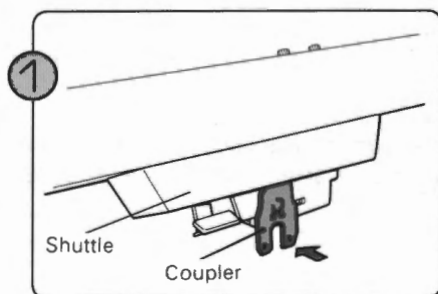
- Operation range of the shuttle depends on the knitting range setting of the design system, but if the colour changer is used, the shuttle moves over the range to the colour changer at the yarn changing row so the yarn is changed automatically. When the knitting range is not set with the design system, it is supposed to be left 100 and right 100 and the shuttle moves between right end and left end of the machine (see pages 67—68 of the design system instruction manual).
- When using the plain stitch key, the shuttle moves between right end and left end of the machine disregarding the set operation range.



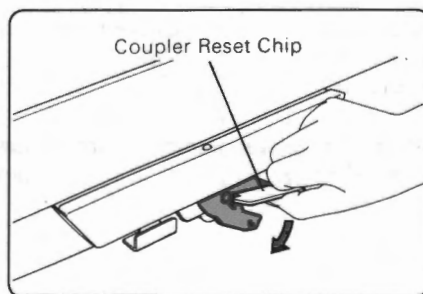
### AUTO-STOP

- The knitting machine computer controls the motor drive and stops it automatically when required knitting is finished. If you enter a certain row where the motor drive stops when programming the pattern or block data, the computer stops the motor drive at that row (see the options "INPUT MEMO DATA" and "SET STOP POSITION" in the design system instruction manual).

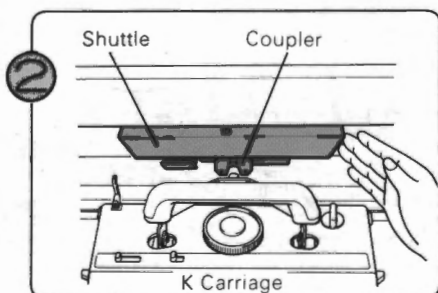
### CONNECTING THE CARRIAGE TO THE COUPLER



Make sure that the coupler is pressed back.

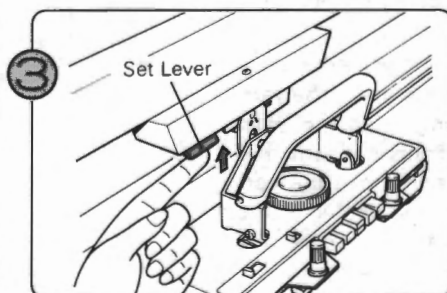


\* If the coupler inclines right or left, turn it back by setting the coupler reset chip on the coupler.



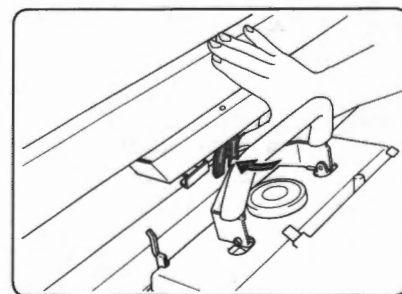
Move the coupler to the K carriage by hand.

**<ATTENTION>** Do not press the S/S switch.



Push up the set lever, and the coupler moves forward and joins with the K carriage.


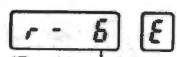






### REMOVING



Push back the coupler until it clicks and is locked.

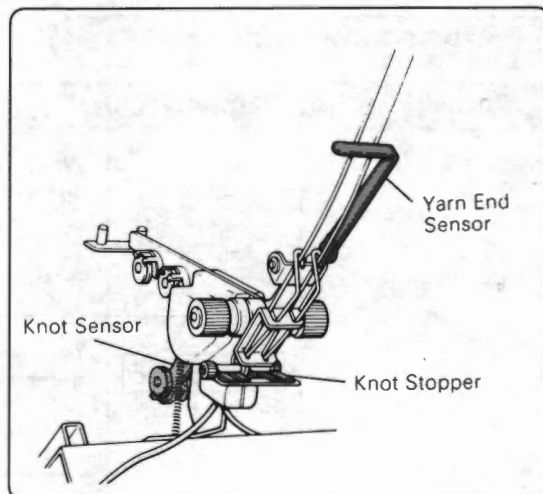


## DIRECTION INDICATOR

	Direction indicator	Display	Condition
<b>Normal</b>	L R 		When you push the S/S switch, the shuttle moves in the direction of the lit arrow. (In the left illustration, the left lamp is lit, so the shuttle will move from right to left.)
		 (Rack)   Racking Position	You need to change the racking position. Turn the racking handle and set the number indicated in the display. Push the S/S switch. The shuttle moves again.
	 (The right and left lamp is lit alternately.)		<ul style="list-style-type: none"> <li>• The block knitting is finished.</li> <li>• The shuttle stops automatically at the preselected row you programmed with the design system.</li> <li>• The shuttle stops because you set the knitting range with the design system and changed it at this row. (When you select the display for knitting range using the display select key, the display indicates the knitting range.)</li> </ul> <p>When you want to start the shuttle after necessary operation</p> <p style="padding-left: 20px;">Push the S/S switch. The indicator shows the direction.</p> <p style="padding-left: 20px;">Push the S/S switch again. The shuttle starts moving.</p>
<b>Abnormal</b>			If both lamps are lit when turning on the power switch of the motor drive, check the following: <ul style="list-style-type: none"> <li>• Power switch of the knitter is not turned on.</li> <li>• Motor drive and the knitter are not connected securely or the connecting cable is down.</li> </ul>
	 (The right and left lamps blink simultaneously.)	 (Over-Load)	<ul style="list-style-type: none"> <li>• The shuttle stops because the motor is overloaded.</li> <li>• The carriage stops inadvertently but the coupler does not release the carriage.</li> </ul> <p>Remove any cause for trouble and push the S/S switch. The indicator shows the direction. Push the S/S switch again. The shuttle starts moving.</p>
	 (Either lamp blinks.)	 (Yarn-Error)	<ul style="list-style-type: none"> <li>• The yarn end sensor or the knot sensor perceives a trouble of the yarn (see page 80 ~ 81).</li> <li>• The carriage stops inadvertently and the coupler releases the carriage.</li> </ul> <p>In the former case, set the yarn correctly. The indicator shows the direction. Push the S/S switch. The shuttle starts moving.</p> <p>In the latter case, turn the inclined coupler back to the correct position. The indicator shows the direction. If the carriage should jam, see page 93 to start again.</p>

## • YARN END SENSOR • KNOT SENSOR

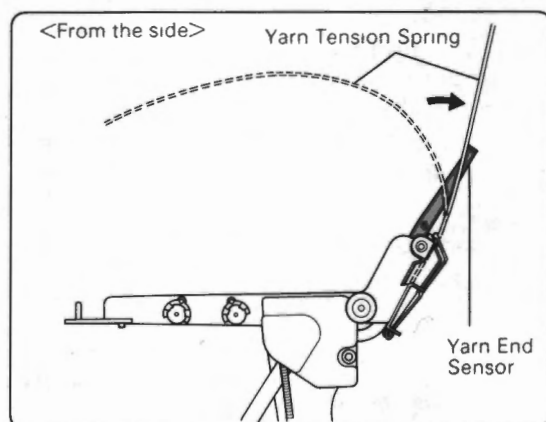
The yarn end sensor and the knot sensor are mounted on the yarn tension head. When you use the motor drive and these sensors perceive a problem in the yarn supply, the motor drive stops the carriage.



### • YARN END SENSOR

When the yarn in the yarn tension unit is used up, the yarn tension spring is set free and touches the yarn end sensor and stops the motor drive.

**<ATTENTION>** If any yarn tension unit is not used, the yarn end sensor works and the motor drive does not work even when you push the S/S switch. Hook the eyelet of the yarn tension spring to the front guide B and stop the yarn end sensor working (see page 34).

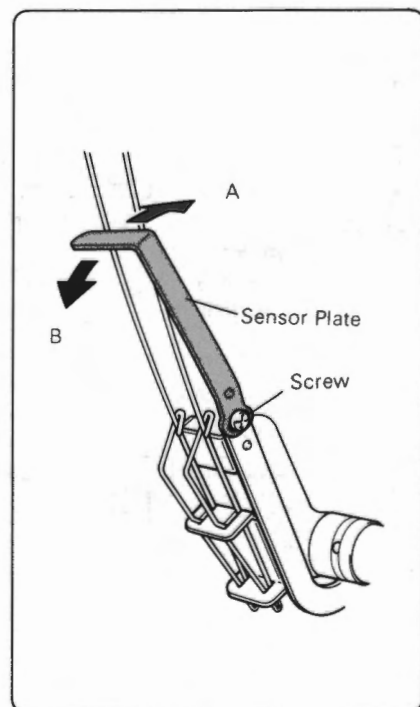


### <CONTROLLING THE SENSITIVITY OF THE YARN END SENSOR>

Control the sensitivity of the yarn end sensor by inclining the sensor plate. As you incline it to the direction of A, the sensitivity increases, and vice versa.

#### • Inclining the sensor plate

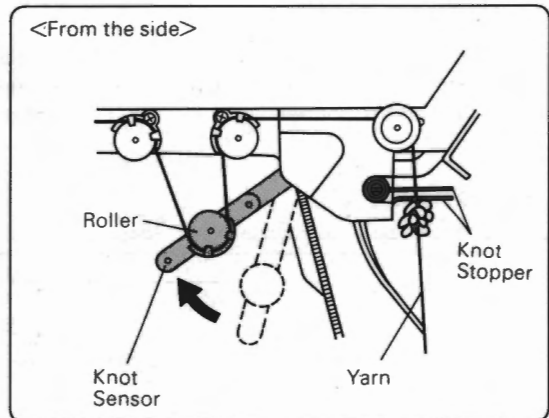
Loosen the screw to incline the sensor plate.  
(Remember to screw it lastly.)



• **KNOT SENSOR**

The knot sensor works in the following manner:

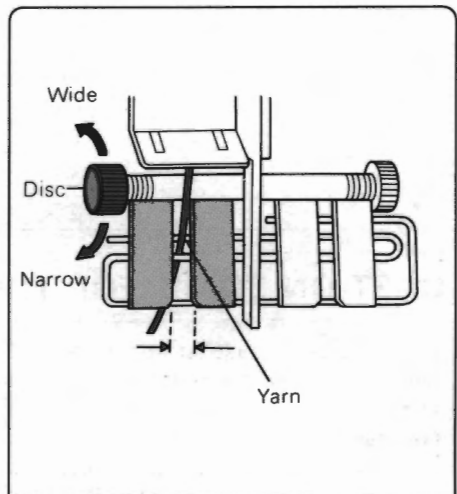
- 1) The knot stopper stops the knot of the yarn.
- 2) The supply of the yarn stops.
- 3) The yarn tension increases and the yarn upholds the roller.
- 4) Upon the knot sensor function the motor drive unit will cease.



<CONTROLLING THE SENSITIVITY OF THE KNOT SENSOR>

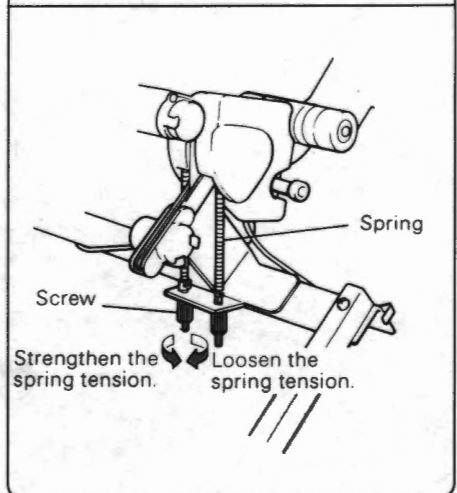
- Ⓐ Adjust the space between two plates of the knot stopper.  
As the space becomes narrower, the knot sensor perceives a smaller knots.

- **Adjusting the space**  
Adjust the space according to the yarn using the disc.  
Make sure that the yarn passes between the two plates smoothly.



- Ⓑ Adjust the spring of the roller.  
By changing the strength of the spring, which is connected to the knot sensor, the roller becomes easy to go up (i.e. the sensitivity of the knot sensor increases), or hard to go up (i.e. the sensitivity of the knot sensor decreases).

- **Changing the strength of the spring tension**
  - When you make the sensitivity of the knot sensor increase, or the yarn is fine or weak....  
Turn the screw counterclockwise to weaken the spring tension.
  - When you make the sensitivity of the knot sensor decrease....  
Turn the screw clockwise to strengthen the spring tension.



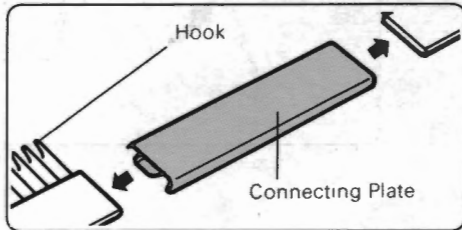
<ATTENTION> When you use the weak yarn, it may break before it upholds the roller if the spring tension is too strong. To prevent it, loosen the spring tension when using weak yarn.

## • CAST-ON COMB (FOR THE KNITTER)

This is hooked to stitch loops and weights can be added when knitting only with the knitter. This is used, for example, to cast on (make the beginning row of the knitting) (see page 52).

- The cast-on comb is in two sections of 140 and 60 needles, making a total of 200 needles. You can take these apart by removing the connecting plate if you wish to shorten the length.

- 200 stitches



- 140 stitches

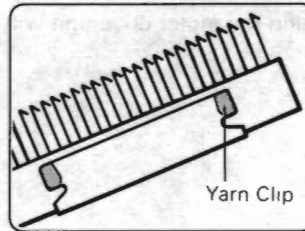


- 60 stitches



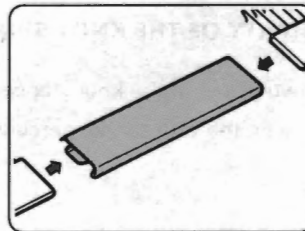
### USING THE CONNECTING PLATE

With a 140 or 60 stitch cast-on comb



Use the connecting plate by attaching it as a yarn clip to the end of the comb.

With a 200 stitch cast-on comb

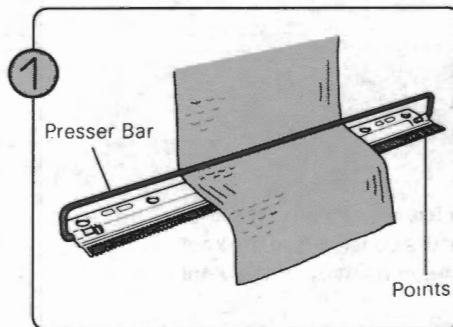


Use the connecting plate to join the two cast-on combs together.

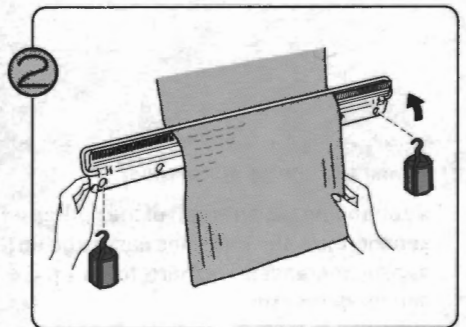
## • CAST-ON COMB (FOR THE RIBBER)

This is used to cast on (make the beginning row of the knitting) when knitting with the knitter and ribber (see page 50).

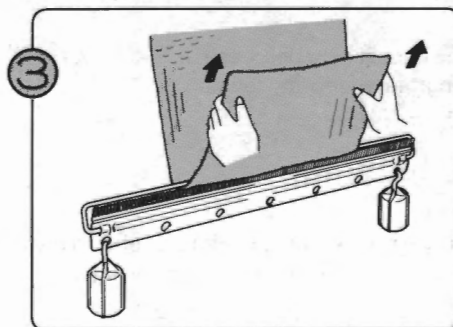
Also short cast-on comb can be used as a weight hanger as described right.



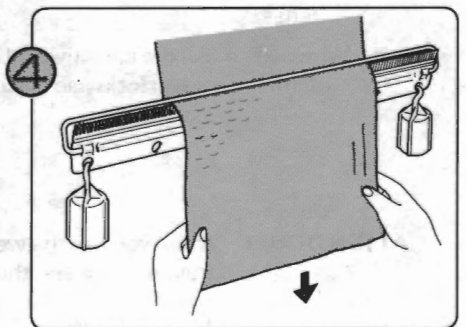
Hold the cast-on comb with points facing you. With the presser bar up, pass the knitting between the presser bar and comb from behind.



Turn the cast-on comb so that the comb may hold the knitting and hang the weights on the comb.



When you reset the cast-on comb, pull up the knitting without taking away the weights to let the cast-on comb go up.



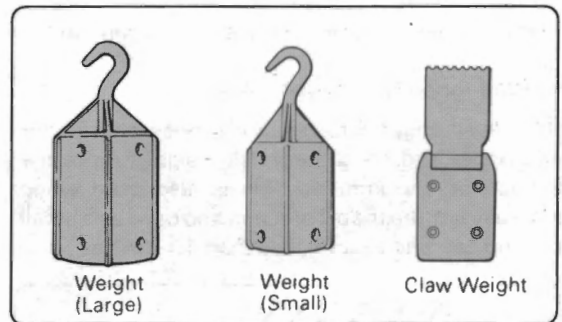
Pull the knitting down to lock it. Make sure that the knitting is given the balanced weight.



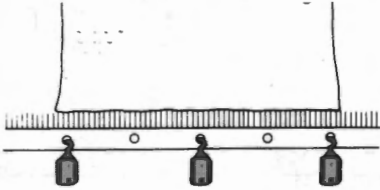
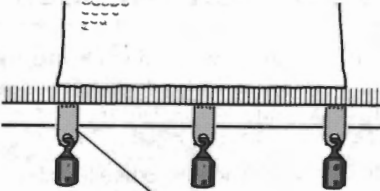
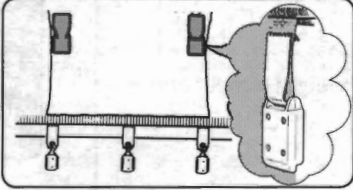
## • WEIGHT

These are used to help your knitting hang properly and to prevent it from lifting up. There are three types of weights and use them according to the pattern stitch or knitting width.

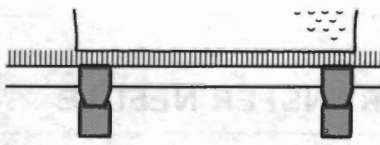
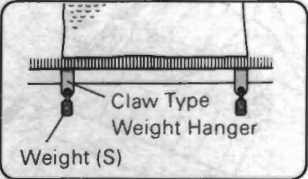
- ♣ Following explanation shows the number of weights to be used, but it may vary according to the yarn or tension dial setting. Therefore, use this information as a rough guide only.



## • PATTERN KNITTED USING THE COLOUR CHANGER

Weight to be used					Hanging the weight
Knitting width (stitches)	50	100	150	200	
Weight	No weight	Weight (S) 2 pcs.	Weight (L) 3 pcs.	Weight (L) 4 pcs.	<ul style="list-style-type: none"> <li>When using the ribber                              </li> <li>When not using the ribber                              </li> </ul>
<p><b>&lt;ATTENTION&gt;</b> The edge of your knitting sometimes does not lie smoothly, then do the following:</p> <ul style="list-style-type: none"> <li>When using the ribber Hang the small weights onto the edges of the actual knitting using the claw type weight hanger or the wire-loop type weight hanger (see page 84).</li> <li>When not using the ribber Hang the claw weights on the edges of the actual knitting.</li> </ul> 					
Rehang the weights every 20 rows or so in both cases.					

## • PATTERN KNITTED USING THE SINKER PLATE ASSEMBLY

Weight to be used	Hanging the weight
Generally, hang two claw weights onto the cast-on comb in disregard of the knitting width.	
<p><b>&lt;ATTENTION&gt;</b> Your knitting sometimes does not lie smoothly, then do the following:</p> <ul style="list-style-type: none"> <li>When the edge of your knitting does not lie smoothly... Hang the claw weights on the edges of the actual knitting. Rehang the weights every 20 rows or so.</li> <li>When the whole knitting does not lie smoothly... Hang the small weights onto the cast-on comb using the claw type weight hanger.</li> </ul> 	



## • WIRE-LOOP TYPE WEIGHT HANGER

## • CLAW TYPE WEIGHT HANGER

These are used with the weight to help your knitting hang properly and to prevent it from lifting up.

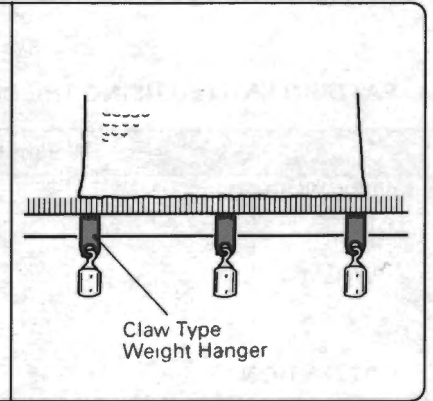
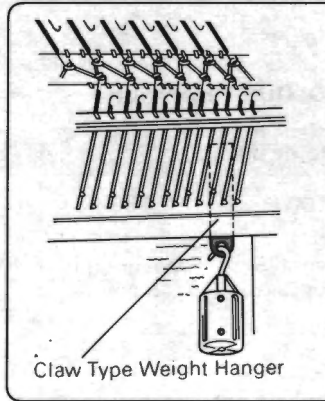
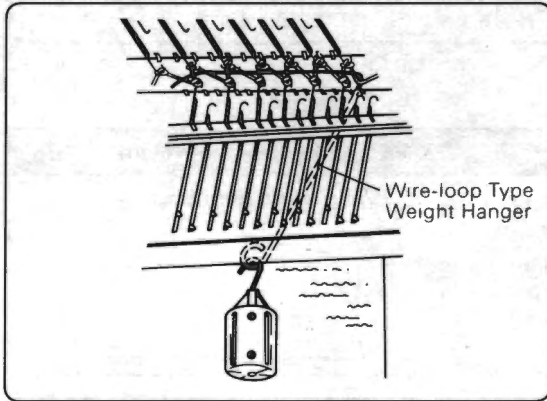
### • Wire-loop type weight hanger

Hook this hanger onto the yarn between the knitter and ribber and hang the small weight to give the tension on the knitting. This is also used when increasing more than 2 stitches and used as a small cast-on comb to cast on less than 10 stitches.

### • Claw type weight hanger

Hang this on the edge of the actual knitting and hook the small weight into its hole.

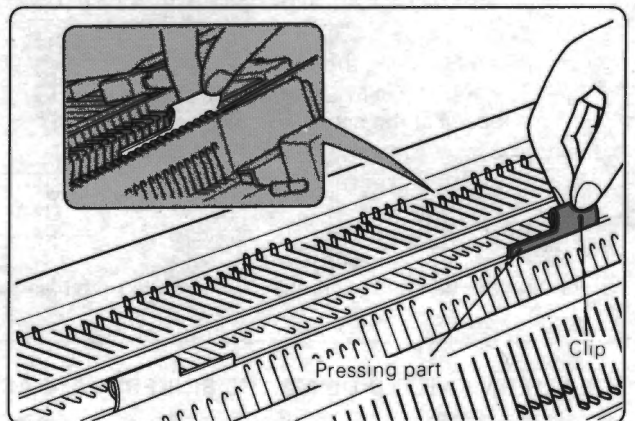
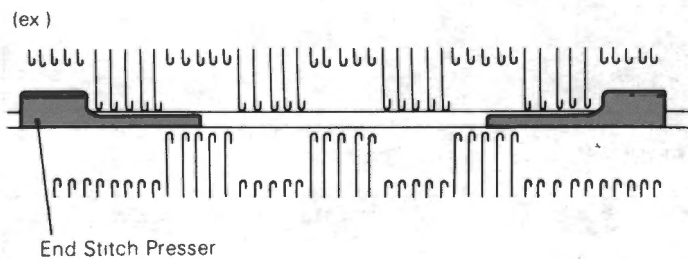
This can be used to give more weight to the cast-on comb for the knitter as shown in the illustration.



## • END STITCH PRESSER

When there are several stitches on the knitter at the edge of the knitting, this presser holds down these stitches so that they are knitted securely.

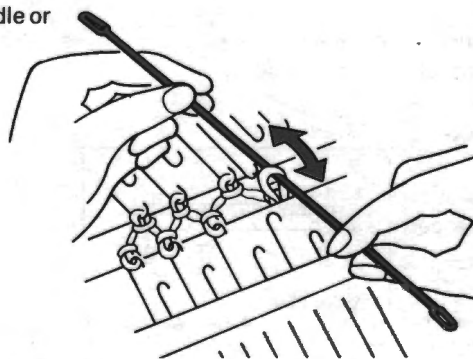
- It is recommendable to use the claw type weight hanger and weight together.



Put the clip of the presser on the end of the gate pegs of the knitter. Slide it inward until the pressing part covers the edge stitches.

## • TRANSFER NEEDLE

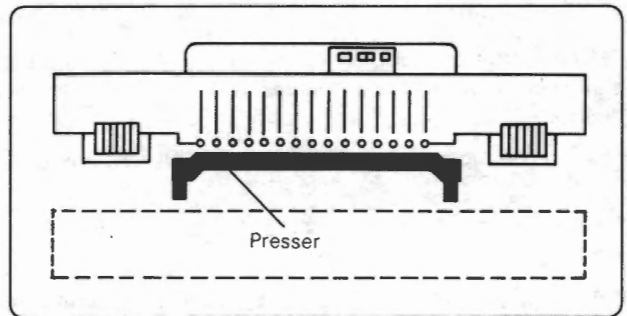
This is used to transfer the stitch from the knitter needle to the ribber needle or vice versa.



## • PRESSER

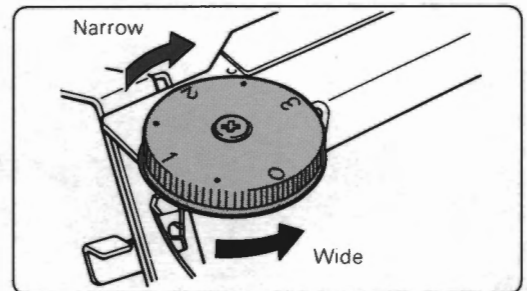
The presser is used when you use the colour changer without operating the ribber.  
This presses the knitting so that the stitch go behind the latch and the knitting hang properly.

- ◆ See page 25 to attach the presser.



### SPACE ADJUSTING DIAL

Adjust the space between the gate pegs of the knitter and the presser with this dial. As the larger number is set, the space becomes wider. Arrange the dial according to the yarn. Set the larger number when using thick yarn.

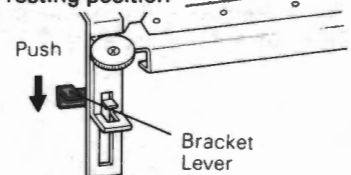


### LETTING UP/DOWN THE PRESSER

Let down the presser to resting position when you start knitting, do the manual work, etc ....

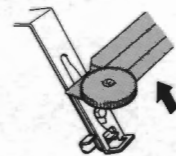
**<ATTENTION>** If the space adjusting dial is set to 0, presser operation is difficult to let up/down. When letting up/down the presser, set the space adjusting dial to any number EXCEPT "0".

- To the resting position



Push right and left bracket levers so as to let down the presser.

- To the working position

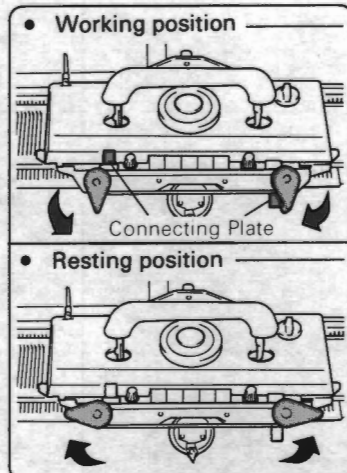


Push up the presser.

## • YARN GUIDE LEVER

The yarn guide lever prevents the yarn from being hooked on the connecting plate.

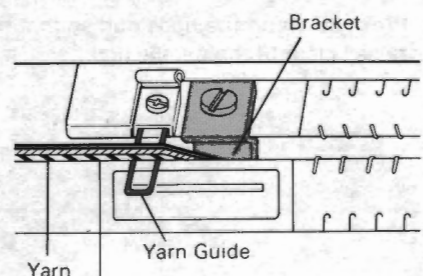
Set the yarn guide lever at the resting position only for connecting the R carriage with the connecting arm. In other cases, set them at the working position.



## • YARN GUIDE

The yarn guide prevents the yarn from being hooked on the bracket.

- Remove the yarn guide when using the sinker plate assembly (see page 27).

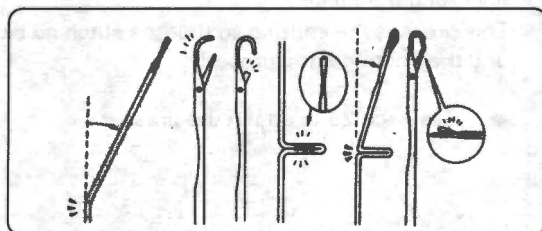


# HOW TO REPLACE THE SPARE PARTS

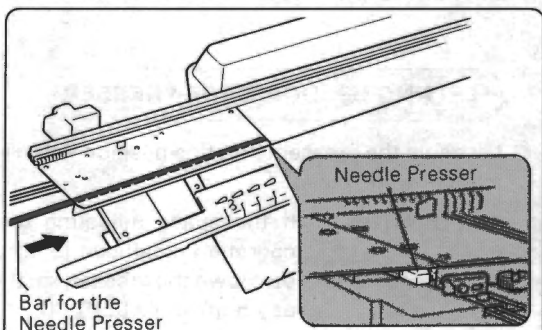
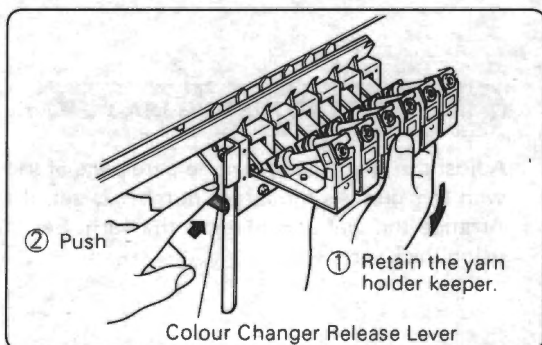
## • REPLACING A KNITTER NEEDLE AND A NEEDLE PRESSER FOR THE KNITTER

- Needles that are bent, broken or damaged will cause problems during knitting. Replace these needles with new ones following the steps below.
- When you replace the needle presser, only do steps ①, ② and ③.

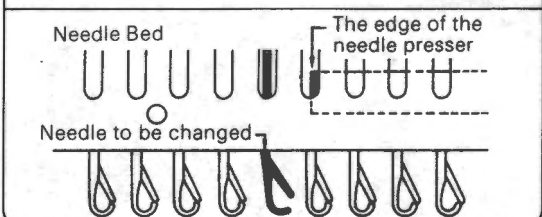
① Push the colour changer release lever retaining the yarn holder keeper by hand. The colour changer is let down.



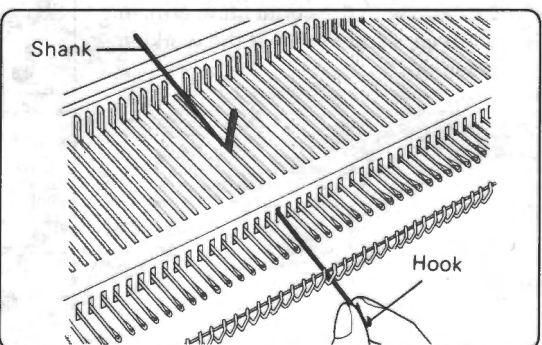
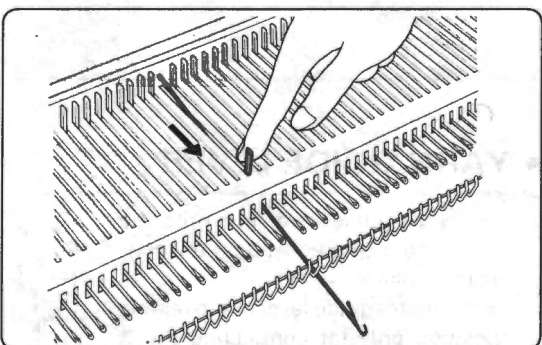
② Push one end of the needle presser with the bar included in the machine (see page 9) until the needle presser passes the needle to be changed. When replacing the needle presser, draw it out by hand when it appears at the other end.



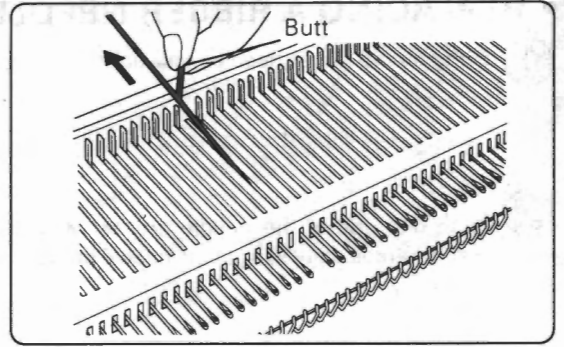
③ Push the faulty needle forward to E position.



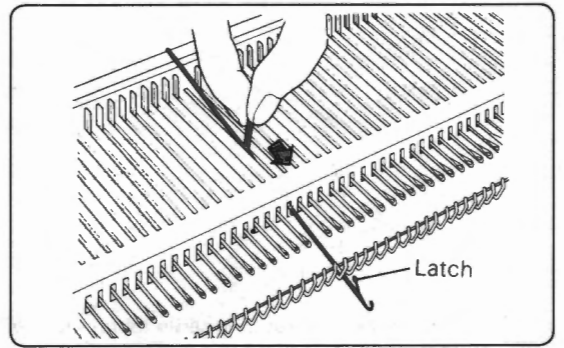
④ Press down on the hook end so that the shank end of the needle is raised clear of the needle bed.



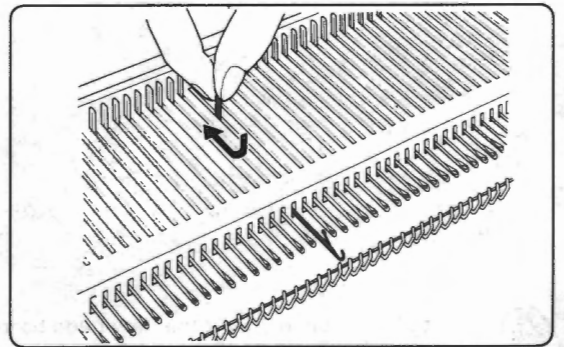
- 5 Catch hold of the shank end or the butt and lift the faulty needle out from the needle bed.



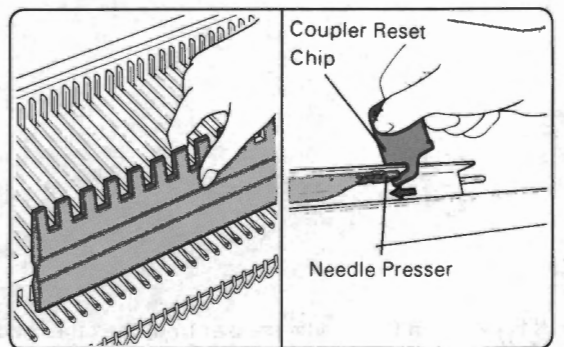
- 6 With the latch open, insert the new needles to the E position as shown.



- 7 Push the butt and return the needle to A or B position.



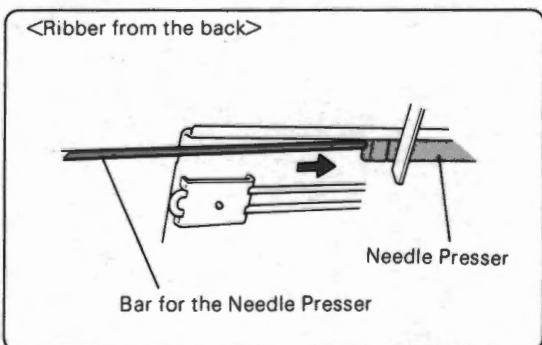
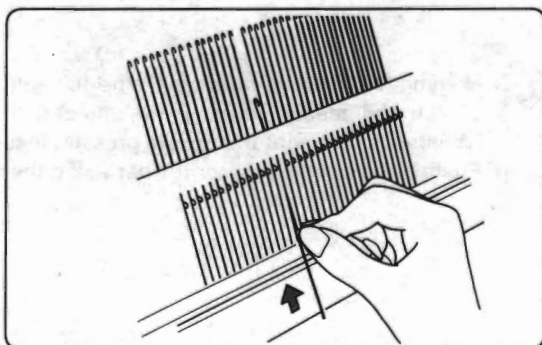
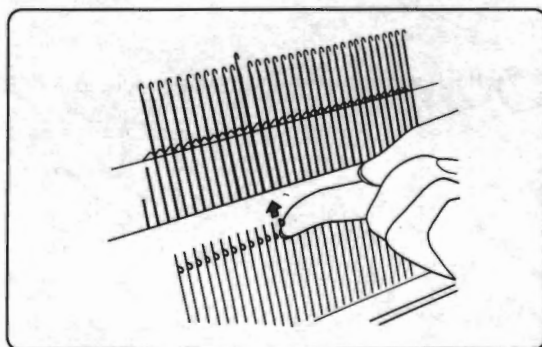
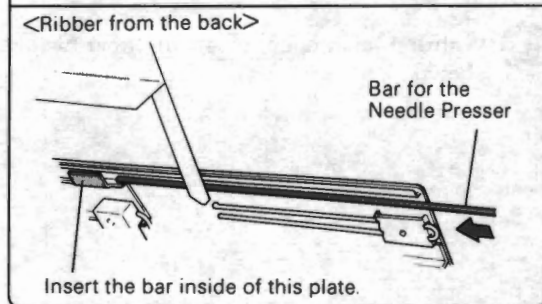
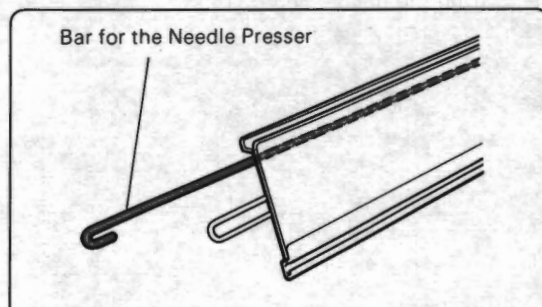
- 8 Holding the needles down with the flat side of the needle pusher, push in the needle presser to the end of the needle bed by hand. (When you draw out the needle presser, insert it into the left end.) Push in the needle presser further using the coupler reset chip.





## • REPLACING A RIBBER NEEDLE

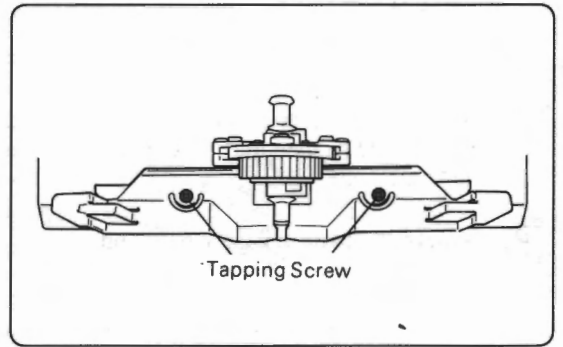
- ① Bring all the ribber needles forward to E position.
- ② Push one end of the needle presser with the bar included in the machine (see page 9) until the needle presser passes the needle to be changed.
- ③ Bring forward the faulty needle as far as it will go. Hold the butt and draw out the needle.
- ④ With the latch open, insert the new needles into the needle bed and place it at the same position as other needles.
- ⑤ Push in the needle presser from the other end using the bar.



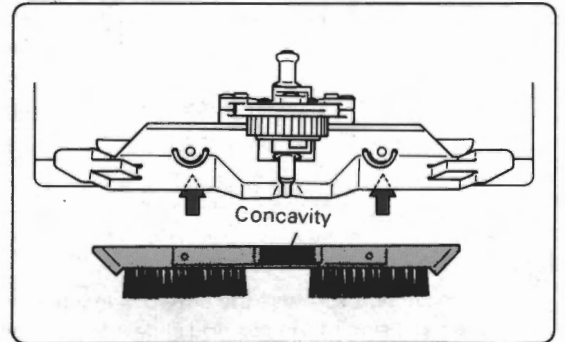


## • REPLACING A BRUSH

- 1 Turn over the connecting arm.  
Loosen the tapping screw and remove the brush.



- 2 With the concavity of the new brush facing you, insert the brush and fasten.



## • REPLACING A BELT

- ① Turn off the power of the knitter.  
Take out the power cord of the knitter from the wall outlet.  
Take out the connecting cable, which is connecting the right (from the front) colour changer and the knitter, from the jack of the knitter.

- ② Remove the pattern case whole unit.

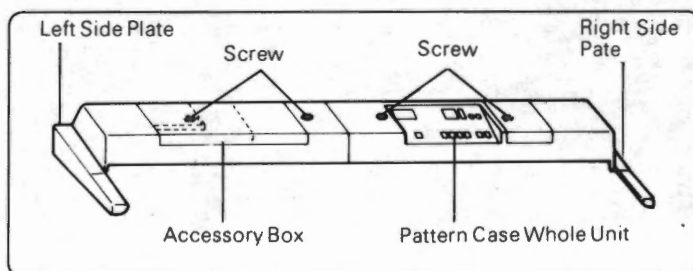
- ① Remove two screws (one of two is located next to the cartridge slot) (see the illustration below). Lift the left side of the unit and slide it to the left so that the right side comes out of the side plate. Place it behind the knitter.

<CAUTION> Seven cords are connected to the main p.c. board of the pattern case whole unit. Therefore, handle the unit carefully in order not to pull it by force.

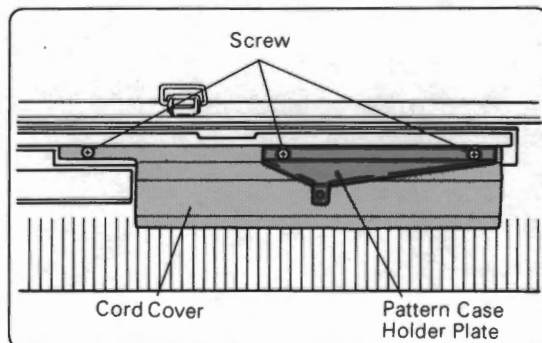
- ② Pull out the seven cords from the main p.c. board.

- ③ Remove the accessory box.

Remove two screws (one of two is inside the box). Lift the right side of the box and slide it to the right so that the left side comes out of the side plate.



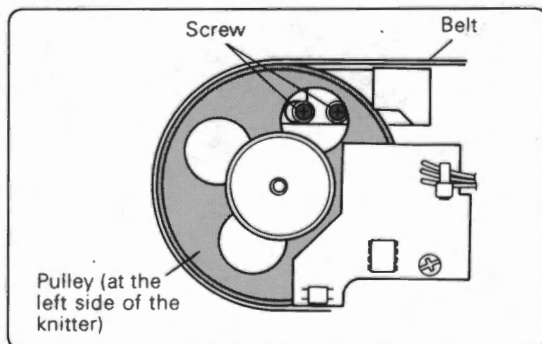
- ④ Remove three screws to take off the cord cover and the pattern case holder plate.



- ⑤ Remove the belt.

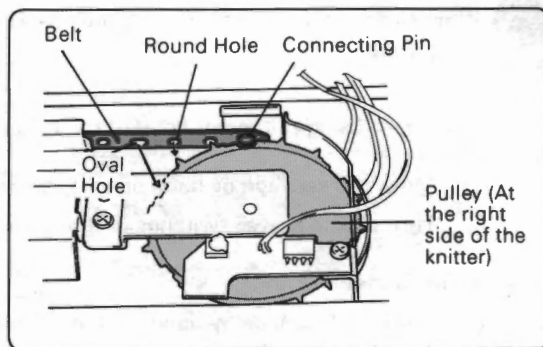
- ① Loosen two screws under the pulley.  
(If you cannot find the screws, turn the pulley.)

- ② Pull out the belt.

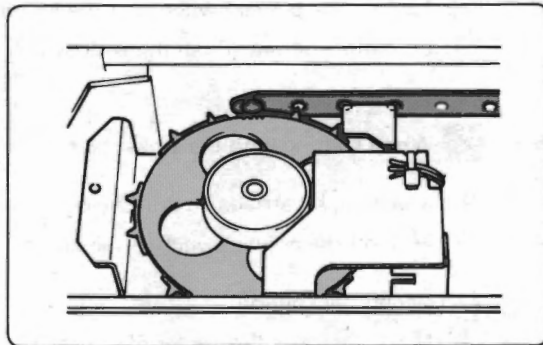


⑥ Attach the new belt.

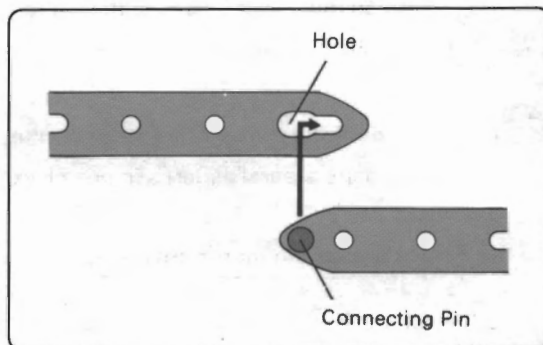
- ① Adjust the belt to the pulley at the right side of the knitter as shown in the illustration (the connecting pin should be inside).
- ② Turn the pulley clockwise so that the belt appears to the rear rail side.



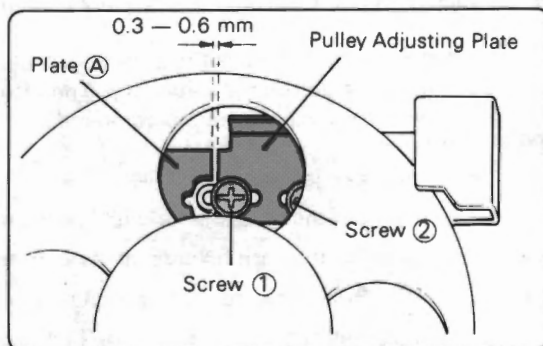
- ③ Adjust the belt to the pulley at the left side of the knitter in the same way and turn the pulley counterclockwise.



- ④ Fix the connecting pin into the hole of the other side.



- ⑤ Adjust the pulley adjusting plate at the left side of the knitter. (Turn the pulley in the following steps so that the hole of the pulley is in the position as shown in the illustration:  
Set the K carriage on the needle bed.  
Set the change knob to "P.Y" or "BLOCK".  
Move the K carriage right or left and the pulley turns.)  
Adjust the space between the plate (A) and the pulley adjusting plate to 0.3 mm — 0.6 mm. Tighten screw ① first. Then turn the pulley clockwise a little and tighten screw ②.



⑦ Attach the cord cover and pattern case holder plate with the three screws.

⑧ Attach the accessory box.

- ① Fix the left side of the accessory box under the left side plate.
- ② Tighten two screws (one of two is inside the box).

⑨ Attach the pattern case whole unit.

- ① Connect seven cords to the main p.c. board.
- ② Fix the right side of the unit under the right side plate.
- ③ Tighten two screws (one of two is located next to the cartridge slot).

⑩ Plug the connecting cable from the right colour changer to the jack at the rear side of the pattern case whole unit. Plug the power cord into the wall outlet.

# USEFUL HINTS

- A** What to do if you want to turn off the power switches of the knitter and the motor drive to stop the block knitting temporarily.

■ When using the motor drive or the colour changer

- ① Move the carriage by hand so that the center of it is outside the set mark.
- ② Turn off the power switches of the knitter and the motor drive.

• To continue knitting...

- ① Move the carriage by hand so that the center of it comes to the set mark. Make sure that the carriage setting is correct.
- ② Turn on the power switches of the knitter and the motor drive.
- ③ Continue knitting. (Push the S/S switch when using the motor drive.)

■ When knitting with the sinker plate assembly by hand

- ① Move the K carriage so that the center of it is outside the turn mark.
- ② Turn off the power switch of the knitter.

• To continue knitting...

- ① Make sure that the center of the carriage is outside the turn mark and that the carriage setting is correct.
- ② Turn on the power switch of the knitter.
- ③ Continue knitting.

- B** What to do if the motor drive stops on the border between two different patterns.

If you combine several patterns in one block, the motor drive sometimes stops on the border between patterns.

## When the motor drive stops

The computer of the knitter classified the patterns into four groups (see the explanation below).

If one block contains the patterns which belong to different groups, the motor drive automatically stops on the border between such patterns. Then do the necessary operation according to the group as follows:

♣ If one block contains the patterns which have different pattern number but belong to the same group, the motor drive does not stop on the border. If you need to stop the motor drive to change the carriage setting, etc ..., set the stop position with the design system beforehand.

• Double bed jacquard

- ① Set the machine for double bed jacquard.
- ② Put the yarn holders into two colour changers.
- ③ Bring forward the required number of ribber needles to B position.
- ④ Select the needles for the first row of the pattern.

• Single bed jacquard

- ① If the ribber needles have knitting on them, transfer all the stitches on the ribber needles to the knitter needles.
- ② Set the machine for single bed jacquard.
- ③ Put the yarn holders into two colour changers.
- ④ Select the needles for the first row of the pattern.

- Pattern, of which pattern mode is 5, knitted using the colour changer
  - ① If the pattern does not need the ribber but the ribber needles have knitting on them, transfer all the stitches on the ribber needles to the knitter needles.
  - ② Set the machine for the next pattern.
  - ③ Put the yarn holders into two colour changers.
  - ④ If the pattern needs the ribber, bring the required number of ribber needles forward to B position.
  - ⑤ Select the needles for the first row of the pattern.
- Pattern of which pattern mode is 5 and which does not require the colour changer
  - ① If the ribber needles have knitting on them, transfer all the stitches on the ribber needles to the knitter needles.
 

**<CAUTION>** Needles have been selected for the first row of the pattern already, therefore be careful not to change the needle selection when transferring the stitches.
  - ② Set the machine for the next pattern. Set the K carriage.
  - ③ Start the next pattern knitting.

**C What to do if the motor drive stops and the coupler releases the carriage.**

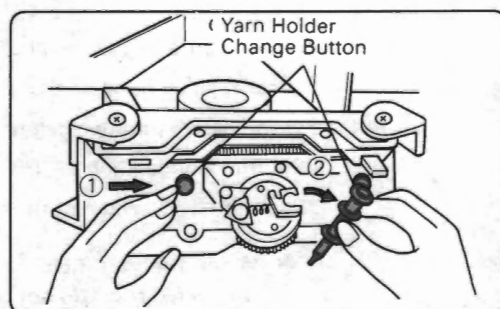
Move the shuttle by hand in the moving direction to the edge of the rail.  
Try to move the carriage by hand in the moving direction.

- If the carriage moves...
  - ① Turn back the inclined coupler using the coupler reset chip.
  - ② Push back the coupler.
  - ③ Move the carriage by hand in the moving direction to the shuttle.
  - ④ Connect the carriage and the shuttle.
  - ⑤ Move the center of the carriage to the set mark by hand. Push the S/S switch to continue knitting.
- If the carriage jams...
 

Follow the steps below:

**1 When using the colour changer**


- ① If you are using the ribber, disconnect the R carriage and the K carriage pushing the R carriage release lever. Slide the R carriage keeping the front foot off the needle bed and put it at the edge of the ribber.
- ② Push the left (right) yarn holder change button of the connecting arm inside. The yarn holder turns right (left), therefore pull it out.



- ③ Set the yarn holder of step 2 into the corresponding yarn holder keeper of the left or right colour changer.
  - ④ Set the change knob to "CR" and remove the K carriage from the needle bed. (Then do not put it on the needle bed.)
  - ⑤ Place all the stitches in the needle hooks and align the needles in B position. Unravel the knitting (see next page).
- ♣ If a needle has slipped back down the needle bed, place the eye of the transfer tool in the hook of the needle and pull it towards you. The needle comes up.



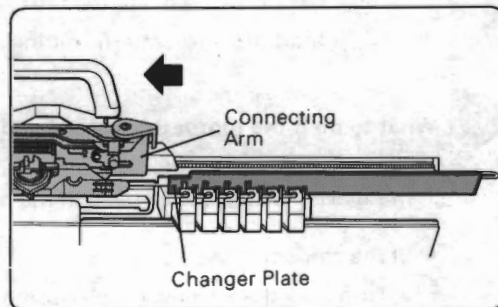
### <Unraveling the knitting>

- 1) Unravel the last row which was knitted to the middle and push the down key on the operation panel once. (If the memo display shows , push the down key once more.)
  - ♣ The memo display shows the yarn number (yarn holder number) of which yarn you have just unraveled. It means that the knitter is ready to start knitting with this yarn.
- 2) If you unravel more rows, push the down key once as you unravel one row.
- 3) After unraveling, align all the needles in B position.

⑥ Set the change knob to "N" and push both part buttons.

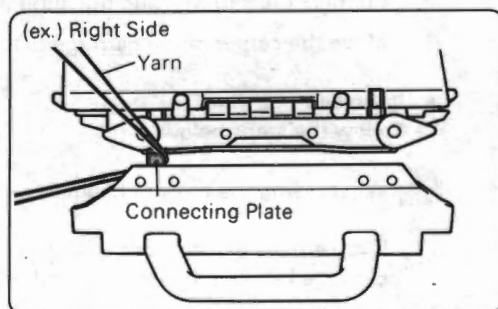
⑦ Slide the K carriage onto the needle bed.

- 1) Slide the K carriage onto the needle bed from either side.
- 2) Move the K carriage inside so that the outside edge of the connecting arm clears the changer plate.



- 3) Move the K carriage outside until it hits the carriage stopper lightly.

⑧ If you are using the ribber, connect the R carriage to the K carriage (see page 22). Remember to hook the yarns in the carriage-side colour changer to the connecting plate inside.



⑨ Connect the K carriage and the shuttle (see page 78).

⑩ Move the carriage by hand so that the center of it is at the set mark.

⑪ Put the yarn holders into two colour changers.

- 1) Set the change knob to "P.Y" and push both part buttons.
- 2) Push the S/S switch of the motor drive.

- ♣ When the yarn holders have been put into two colour changers and the yarn goes across the knitting, unraveled rows do not correspond to the number of times you pushed the down key. In this case push the up/down key until the display shows the correct row number and put the yarn holders into two colour changers again.

⑫ Select the needles for the next row.

- 1) Set the change knob to "BLOCK". Make sure that both part buttons are pushed.

- 2) • In case of single/double bed jacquard

Push the S/S switch of the motor drive. The needle selection is done and the pattern knitting starts.

- In case of other patterns

(1) Push the S/S switch of the motor drive. The carriage moves and selects the needles.

(2) Set the carriage according to the pattern and push the S/S switch. Pattern knitting resumes.

## 2 When using the sinker plate assembly

- ① Take the yarn out of the yarn feeder.
- ② Remove the sinker plate assembly from the K carriage.
- ③ Set the change knob to "CR" and remove the K carriage from the needle bed.
- ④ Place all the stitches in the needle hooks and align all the needles in B position. Unravel the knitting (see the instruction below).

♣ If a needle has slipped back down the needle bed, place the eye of the transfer tool in the hook of the needle and pull it towards you. The needle comes up.

### <Unraveling the knitting>

- 1) Unravel the last row which was knitted to the middle and push the down key on the operation panel once. The row number of the block (or the pattern) in the display goes back one row.  
(If the memo display shows  , push the down key once more.)
  - 2) If you unravel more rows, push the down key once as you unravel one row.
  - 3) After unraveling, align all the needles in B position.
- ⑤ Set the change knob to "N". Slide the K carriage onto the needle bed from the opposite side of the yarn.
  - ⑥ Connect the K carriage and the shuttle (see page 78).
  - ⑦ Move the carriage by hand so that the center of the carriage comes at the set mark.
  - ⑧ Select the needle for the next row.
    - 1) Set the change knob to "BLOCK". Push both part buttons.
    - 2) Push the S/S switch of the motor drive. The carriage moves and selects the needles.
  - ⑨ Set the K carriage according to the pattern. Thread the yarn into the yarn feeder.
  - ⑩ Push the S/S switch. The pattern knitting resumes.

## D What to do if the motor drive stops and the coupler does not release the carriage.

- If either lamp of the direction indicator is lit and the memo display does not indicate "E"...  
Push the S/S switch. The motor drive starts again.

♣ This happens when the yarn end sensor or the knot sensor stopped the motor drive but the yarn trouble was settled after that.

Check the following points to find out why the yarn end sensor or the knot sensor stopped the motor drive.

- Make sure that the yarn is supplied smoothly. If it isn't, the knot sensor is the cause for the motor drive to disengage.
  - Make sure that the yarn tension spring touches the yarn end sensor. If it does, the yarn end sensor is the cause for the motor drive to disengage. If the spring often touches the sensor, control the sensitivity of the yarn end sensor (see page 80).
- In other cases...  
See page 79.

**E** What to do if the carriage jams in the middle of knitting while you are operating the carriage by hand.

See the steps of pages 93—95 starting from “If the carriage jams...”.

When the step says “Push the S/S switch.”, move the carriage by hand.

When using the sinker plate assembly, move the carriage so that the center of it is outside the set mark in step ⑦ ( ② ).

**F** What to do if you want to unravel some knitting. (The carriage should be outside the knitting.)

① Move the carriage to the end of the machine.

- When using the colour changer, the yarn holder goes back to the colour changer when the carriage passes the colour changer.
- When using the sinker plate assembly, take the yarn out of the yarn feeder.

② Check the carriage direction lamp on the operation panel. If it indicates the opposite direction to the carriage, the display indication is for the next row. In this case push the down key once. (If the memo display shows □, push the down key once more.)

③ Unravel one row and push the down key once. (If the memo display shows □, push the down key once more.) If you unravel more rows, push the down key once as you unravel one row.

④ After unraveling, align all the needles in B position.

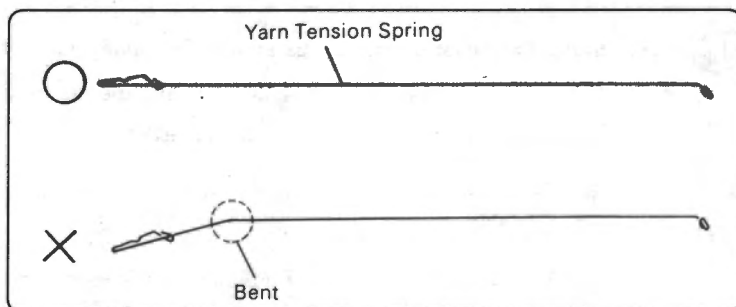
- ⑤
- When using the colour changer...  
Follow the steps ● - ■ ⑩ ~ ⑫ .
  - When using the sinker plate assembly...  
Follow the steps ● - ■ ⑦ ~ ⑩ .

**G** What to do if the yarn often breaks.

- Check the setting of the tension dials and the slide lever.
- Check if the setting of the tension dials and the slide lever.
- Use the wax.
- Check if the root of the yarn tension spring is bent.  
If it is, remove the spring from the yarn tension head and straighten it by hand.

<ATTENTION>

When threading the yarn tension spring, use the bar and be careful not to bend it (see page 35).

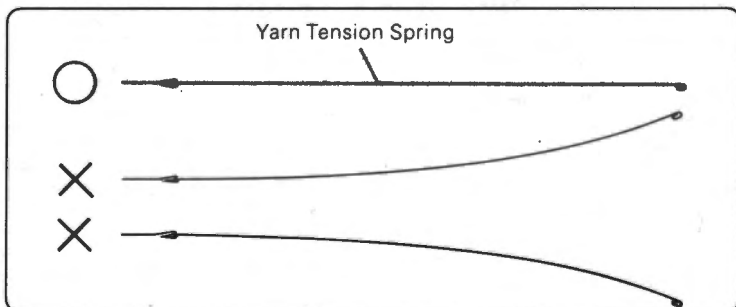


**H** What to do if the yarn tension springs get twisted and the yarn is not supplied smoothly.

Check if the yarn tension spring is bent.  
If it is, remove the spring from the yarn tension head and straighten it by hand.

<ATTENTION>

When threading the yarn tension spring, use the bar and be careful not to bend it (see page 35).



# BEFORE YOU THINK THE MACHINE IS OUT OF ORDER...

Before you think the machine is out of order, check the following points.

- A** If the display shows no block number when you push the block select key and the up/down key does not work...  
The computer of the knitter has no block data. Transmit the block data from the design system cartridge (see page 29).
- ♣ The computer of the knitter memorizes the data transmitted from the design system cartridge about 10 days after powering on the machine about one hour.
- B** If the motor drive does not work when you push the S/S switch...
- Are the power switches of the motor drive and the knitter turned on?
  - Is either lamp of the direction indicator lit up? (If the lamp shows other conditions, see page 79.)
  - Is the ready lamp of the knitter lit? (The motor drive does not work while programming.)
  - Is the cartridge in the slot of the knitter? (If the cartridge is in the slot, take it out after turning off the power switch of the knitter.)
- C** If the motor drive moves the carriage outward though the carriage is at the end of the machine...
- Move the carriage by hand so that the center of it comes at the set mark, and push the S/S switch. (Above happens when you push the S/S switch without connecting the carriage to the shuttle.)
- D** If the display indication does not change and the carriage continues moving when you are arranging the yarns into two colour changers...
- Is the change knob set to "N"?
  - Did you move the carriage so that the center of it passed the set mark (while operating the carriage by hand)?
- E** If the same needle selection is repeated...
- Did you change the direction of the carriage before it passed the center of the machine? If so, the same needle selection is repeated.
- When using the motor drive  
Enter the knitting range so the carriage passes the center of the machine at every row with the option "SET KNITTING RANGE" of the design system (see page 67 of the design system instruction manual).
  - When moving the carriage by hand  
If you find the mistake (that you have turned the carriage before it passed the center of the machine) when you see the same needle selection is repeated, and you have not turned the carriage yet, you can correct the needle selection. Follow the steps below and continue knitting.
    - ① Bring back the needles in D position to B.
    - ② Push both part buttons of the K carriage. (When you are using the ribber, set both cam levers to S and put both release trippers for the cam lever at the resting position.)
    - ③ Move the carriage one row. (Remember to take it across the center of the machine.)
    - ④ Bring back the needles in D position to B.
    - ⑤ Move the carriage one more row. The needles are selected correctly.
    - ⑥ Set the carriage according to the pattern. (When you are using the ribber, put both release trippers back to working position.) You can now continue knitting.

**F** If the needles are not selected and remain at B position...

- Did you set the change knob to "BLOCK" and begin with the K carriage outside the turn mark on the first row of the pattern or after unraveling some rows?
- When you began to pattern knit again after moving the K carriage outside the turn mark, did the K carriage pass the turn mark with the change knob set at "BLOCK"?
- Is the ready lamp lit? If it isn't, programming has not been finished. Finish the program.
- Is the ready lamp and the lamp of plain stitch key lit? If they are, the knitter is ready to knit using the plain stitch key. Push the plain stitch key to turn off the lamp of it?
- Does the buzzer beep?

You did not move the carriage to the set mark, therefore...

- The yarn was not changed at the yarn changing row.  
OR
- The cam lever of the R carriage was not changed when it should have been changed.

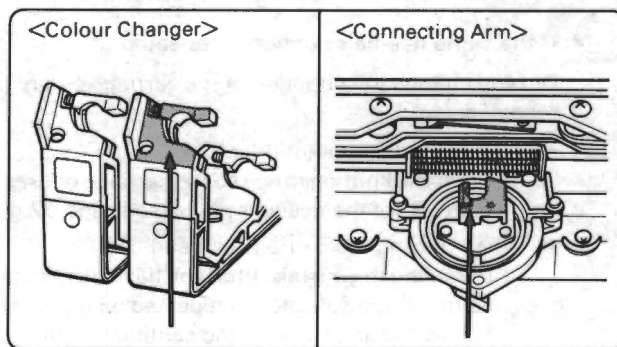
Then, follow the steps below:

- ① Unravel one row.
- ② Push both part buttons of the K carriage. (When using the ribber, set both cam levers to S.)
- ③ Move the carriage one row so that the center of the carriage passes across the opposite side set mark. The needles are selected.
- ④ Set the carriage according to the pattern and continue knitting.

**G** If the yarn holder does not go back and forth between the connecting arm and the colour changer smoothly...

Is there any dust in the arrow-indicated parts of the colour changer and the connecting arm?

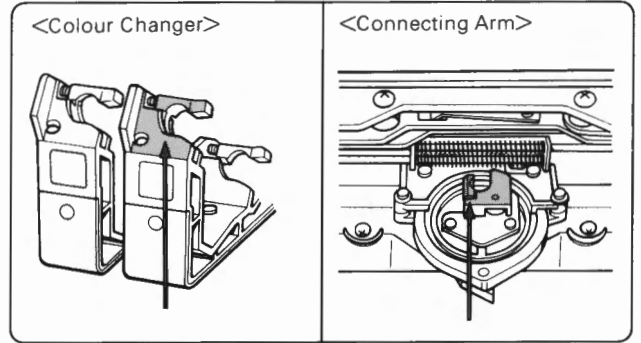
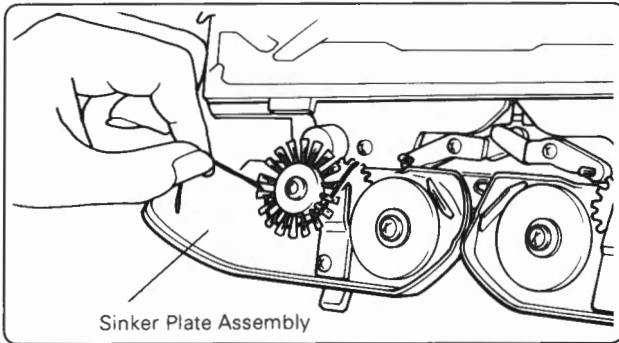
If it is, remove it with the soft cloth.



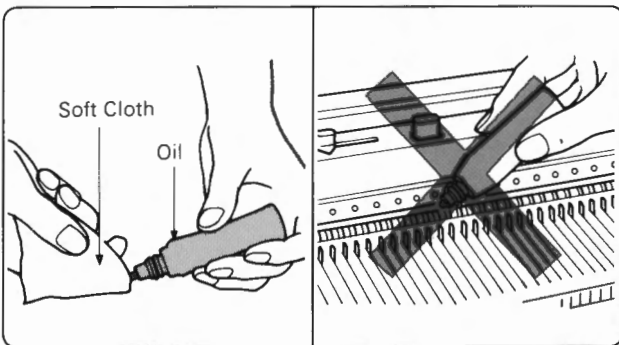


# CLEANING AND MAINTENANCE

- ① Remove any dust or fluff from the rear side of the K/R carriage with the soft cloth. Remove any fluff or strands of yarn from the brushes and the rubber wheels of the sinker plate assembly. Remove any dust from the arrow-indicated parts of the colour changer and the connecting arm.



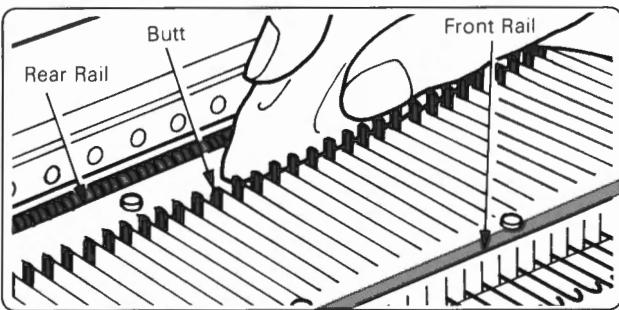
- ② Oil the machine as shown below.



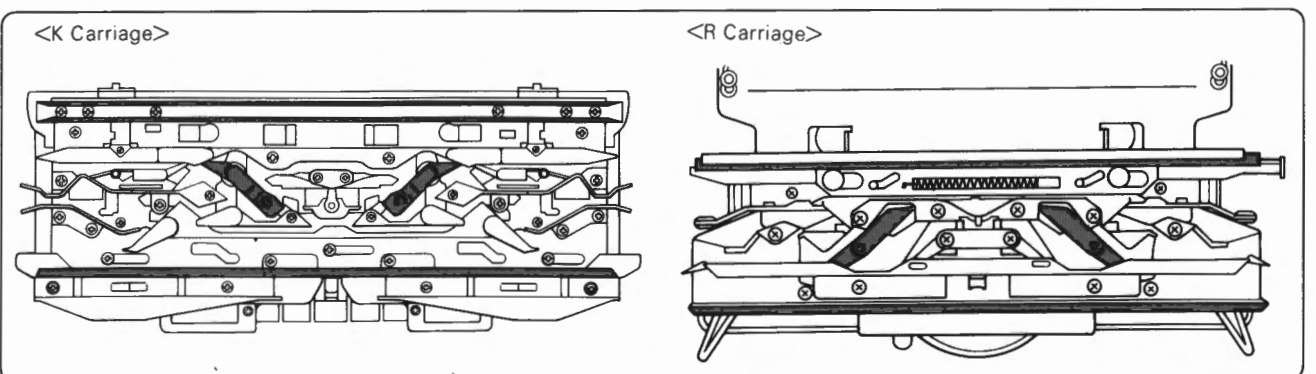
Wipe the metal parts with an oily cloth and clean plastic parts with a soft cloth and mild, neutral detergent.

<REMARK>

- Do not put oil directly onto the machine.
- Do not use alcohol, benzin, thinners or petrol.



Arrange all needles of knitter and ribber in B position and clean the butts, rear and front rails as shown, using an oily cloth.



Clean and lubricate the areas indicated above, using an oily cloth. (This is effective when the carriage feels heavy to operate.)

