

*Empisal*

**KR-70 RIBBER**

**AN EMPISAL PUBLICATION**

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MODELS KR70 AND KR70 A INSTRUCTION BOOK TO BE READ FOR MODEL KR-90  
WITH FOLLOWING AMENDMENTS

ATTACHING THE RIBBER TO THE KNITTER (Page 3 Inst. Book) should read:-

1. Unscrew the thumb screws from the brackets on both ends of the Ribber.
2. Hold the Ribber with both hands so that the gates of the Ribber are up and the purl needle butts are towards you.
3. Push both bracket feet (each of which forms a lip) onto main knitting bed (top lip placed on top of knitting bed and bottom lip will then automatically slide under bed). Push left side bracket on first to match hole for screw, and then the right side bracket - which is adjustable.

Follow paragraphs 4 to 9 as per instruction book.

THE RIBBER CARRIAGE (A.B.) PAGE 5.

4. Lock Knobs (not illustrated), for use when ribber jams:

By raising knobs, the rib needles are released and rib carriage can be moved either to right or left. (See page 14 for detailed instructions on jammed needles).

Tension Chart Page 7 to read:-

SELVEDGE

3 Ply 0 (zero) minus 2 clicks  
4 Ply 0 (zero) minus 2 clicks  
5 Ply 0 (zero) plus 1 click  
8 Ply 1 (One) plus 2 clicks

BASQUE

0 (zero)  
0 (zero) plus 1 click  
2 (Two) plus click  
Top 7/Bottom

NOTE: FOR MINUS CLICKS TURN TENSION DIAL ANTI-CLOCKWISE TO 0 (ZERO) THEN CONTINUE TURNING SLOWLY AND COUNT REQUIRED CLICKS.

To unlock the Carriage page 14 should read:-

Should the carriages jam over the operating needles:

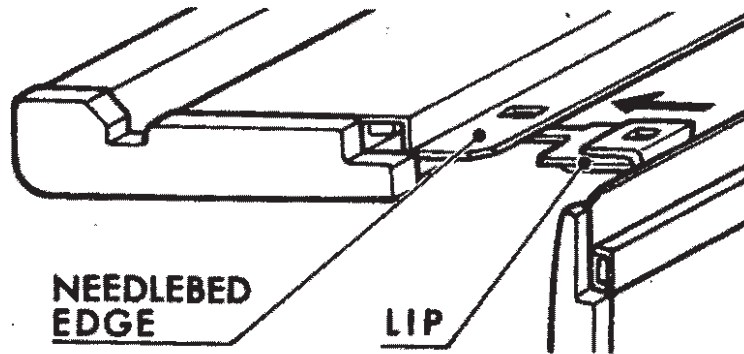
1. Release the Feeder brush assembly from the Rib Carriage (Page 3 Para. 3)
2. Raise the Main Bed carriage completely free of needles and slide it to the side it commenced its course.
3. Raise Lock Knobs on Tib Carriage and slide it back to the side it commenced its course.
4. Check for the cause of the jamming and correct it.
5. Return the needles on both beds to their correct positions, making sure all stitches are IN THE HOOKS of needles.
6. Reconnect the carriage and continue knitting.

## RIBBER AMENDMENTS

Page 3.

Fixing the ribber to the Knitter, should read:-

- No. 3 Push the lips of the brackets over the edge of the main needle bed as far as they will go and secure in this position as described in 4. and 5. and as illustrated below.



Page 7.

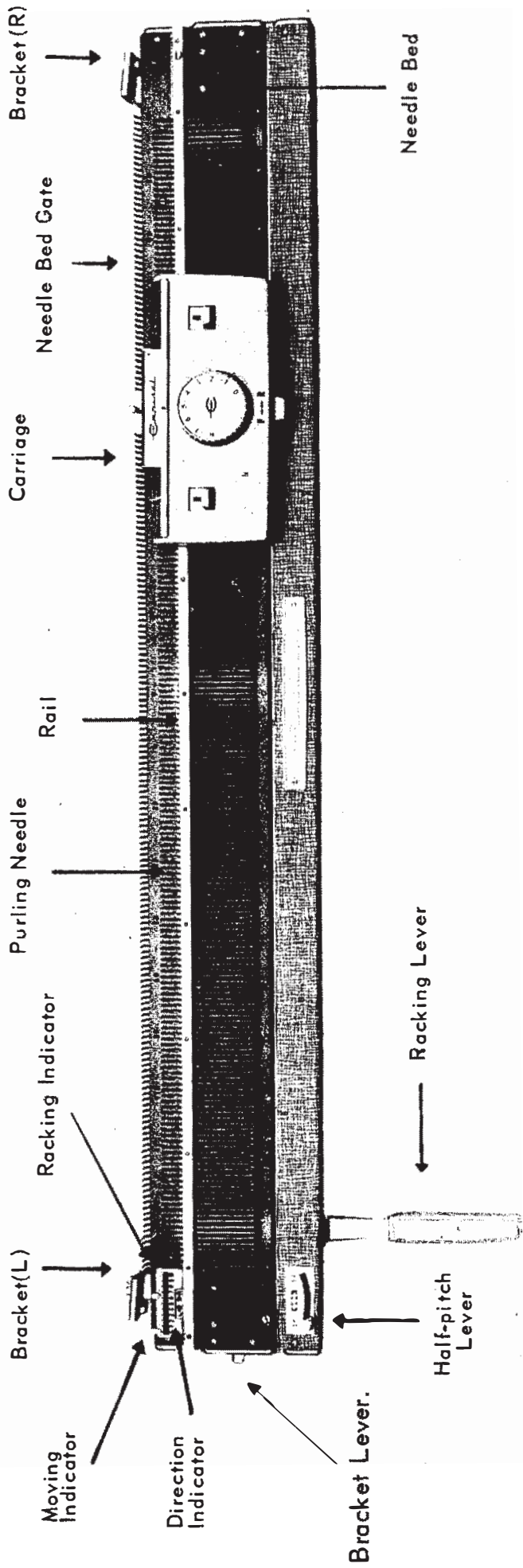
### Tension Chart:

#### SELVEDGE

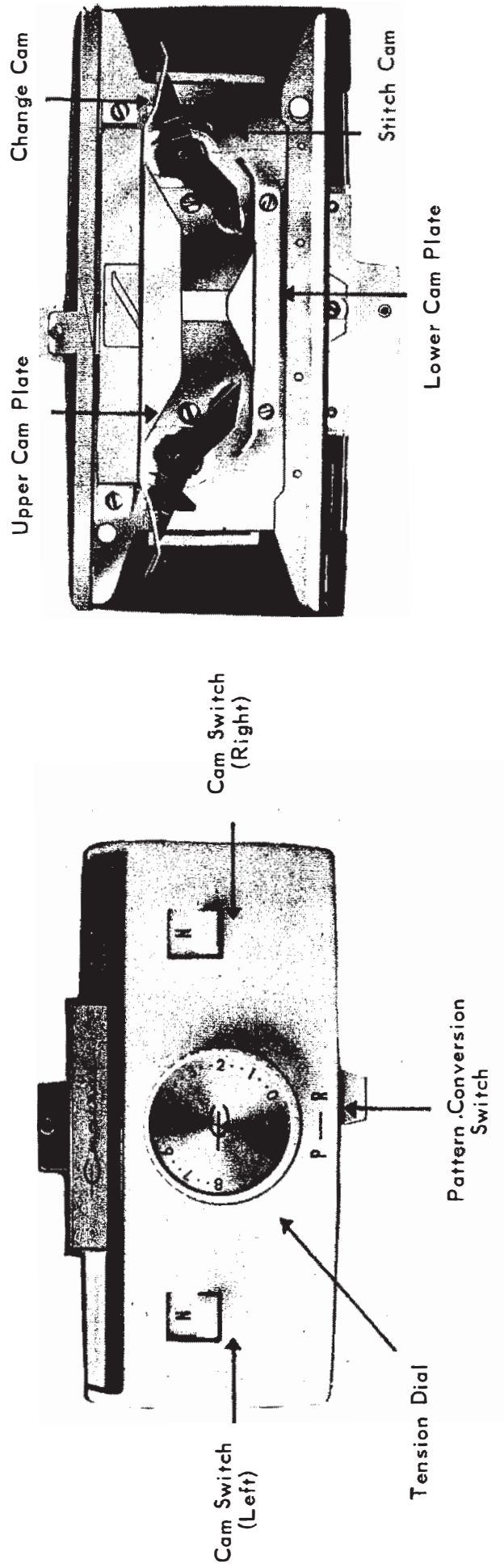
3 ply TO  
4 ply TO.1  
5 ply TI  
8 ply T5.2

#### BASQUE

T1.2  
T5  
T7  
T10.  
8,

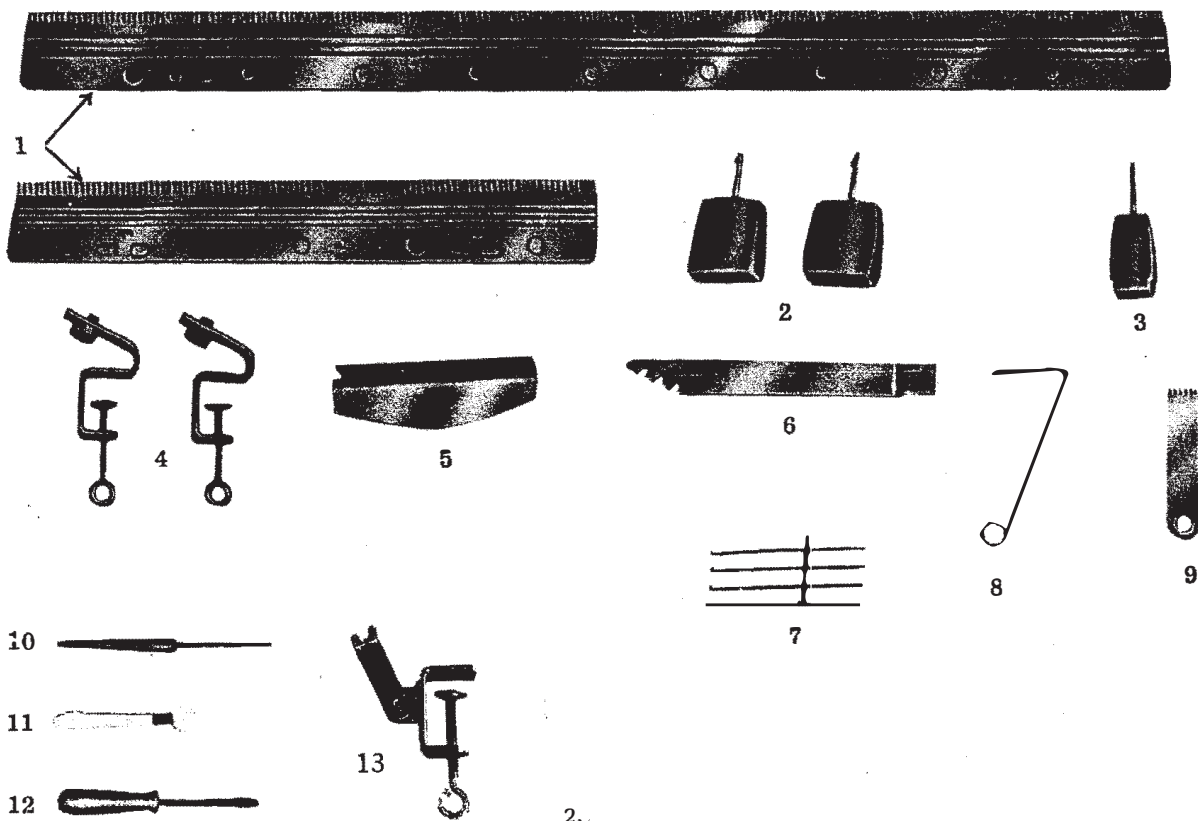


## THE CARRIAGE

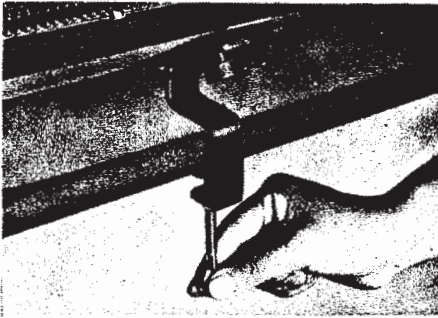


## KR 70 AUXILIARY BED ACCESSORIES.

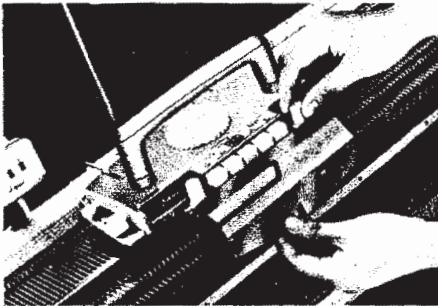
- |   |   |
|---|---|
| 1) Long Cast on Comb .<br>Short Cast on Comb. | Used for casting on. These differ in shape from the combs supplied for Single-bed knitting because of the different method used when casting on for double-bed knitting.    |
| 2) Large weights.<br>3) Small weights.        | Weights assist in the correct formation of stitches, and enable the work to flow smoothly from the knitter.   |
| 4) Clamps.                                    | These two clamps should be used to replace those supplied with the Single-bed unit - They change the angle of the knitter, better to accommodate the Double-bed attachment. |
| 5) Feeder Brush assembly.                     | This assembly replaces the "Sinker plate assembly" which is used on the Single-bed knitter. As the name implies it feeds the yarn to the knitter.                           |
| 6) Yarn rest.                                 | To hold and separate different yarns when not in use.   |
| 7) Spare needle.                              | Replacement part.   |
| 8) Weight hangers.<br>(Pin type)              | Useful when increasing stitches at either edge of the knitting.   |
| 9) Claw - weight hangers.                     | Hung onto the fabric in positions where extra pull is needed particularly useful in patterning.   |
| 10) Workhook.                                 | Used to pick up dropped stitches or for transferring stitches.  |
| 11) Spanner.                                  | Maintenance tool also used to set the pitch screw.  |
| 12) Screwdriver.                              | Maintenance tool.   |
| 13) Stabilizer Clamp.                         | To prevent shimmying of the ribber in operation   |



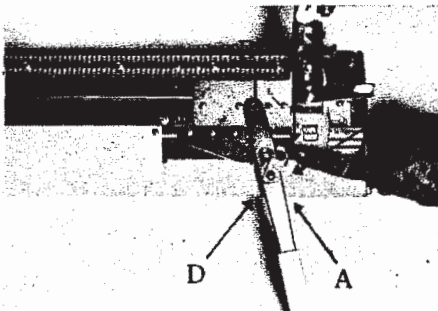
## PREPARING THE KNITTING MACHINE TO FIT THE RIBBER



1. Secure the knitter onto a flat table.  
Use the table clamps especially provided as an accessory for the ribber, instead of the regular knitter clamp which is used only when normal knitting work is done.
2. Set the row counter, needle selection set lever and the automatic yarn tension unit.



3. Set the carriage on the knitter. Loosen the thumb screw place the feeder brush assembly onto the carriage and tighten it in position.

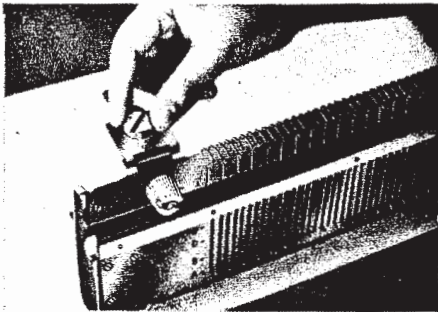


## PREPARING THE RIBBER

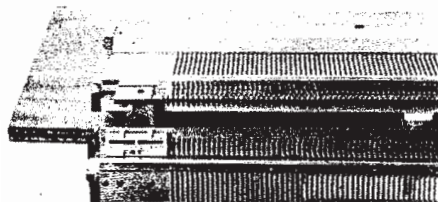
1. Set the racking lever on the back side of the ribber.  
open the lever lock (A) fit the pin (B) of the lever into the groove of the guide plate (L) and fit the hole (C) on the stud (D) of the guide plate and lock racking lever.

2. Set the carriage onto the ribber.

## FIXING THE RIBBER TO THE KNITTER.



1. Unscrew the thumb screws from the brackets on both sides of the ribber.
2. Hold the ribber with both hands so that the gates of the ribber are up and the purl needle butts are towards you.
3. Push the lips of the brackets over the edge of the main needle bed as far as they will go and secure in this position as described in 4. and 5. and as illustrated below.

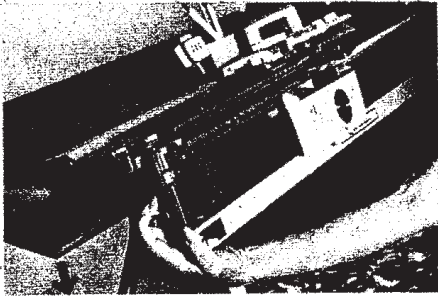


4. Hold the yarn rest in position above the left hand bracket, then fasten to the main bed by using the thumb screw supplied.



5. Fasten the right-hand bracket to the needle bed using the other thumb screw

6. Lift up the ribber with the palm of your hands as high as it will go until it stays in position without holding. This is the normal working position of the ribber.

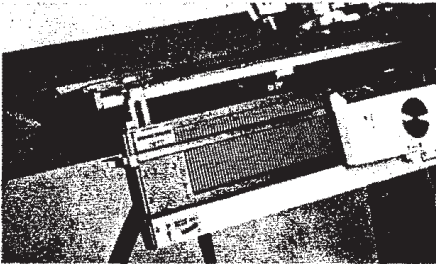


7. With a hand at each end of the ribber, push down together, the levers of the brackets. The ribber will come down one step.

This position is used for picking up dropped stitches.

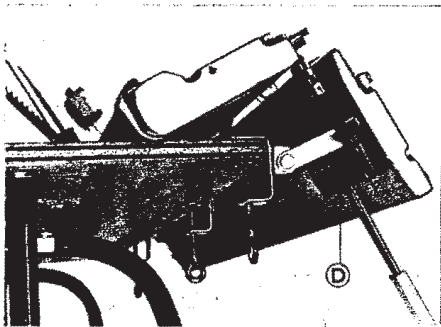
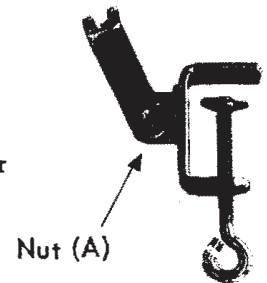
8. Push down the levers again and the ribber will come down one more step. At this position the ribber is at rest and single bed knitting work can be done without removing the ribber.

9. To return to working position see item 6.



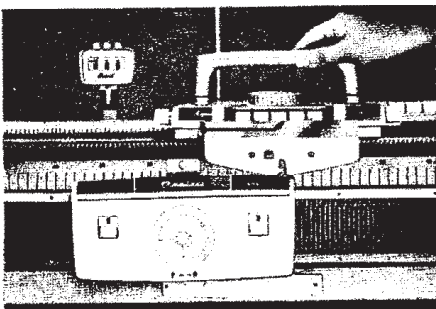
#### FIXING THE STABILIZER CLAMP TO THE RIBBER.

It is used to secure the ends of the ribber onto the table to prevent the ribber shimmying during operation.



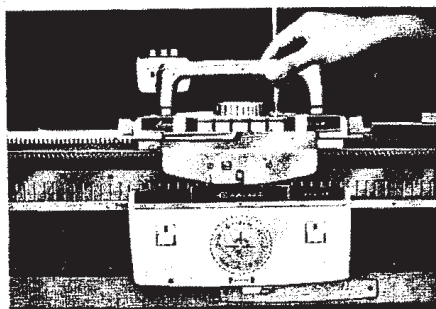
1. Loosen the nut of the clamps with spanner. As shown in illus, slide the fork of the clamp holder (C) into the groove of the stud (D) at the back of the brackets and secure the clamp.

2. Tighten down the nut (A) with spanner.



#### ASSEMBLING THE CARRIAGES.

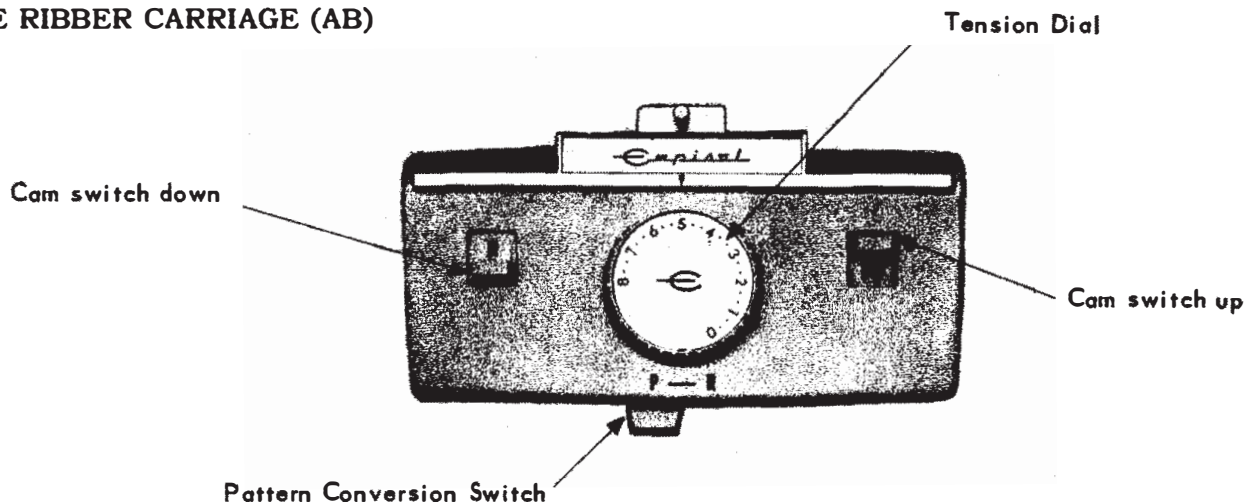
When the ribber is in the closed position slide the ribber carriage (AB) under the feeder brush assembly (see page 3, Para. 3) where it will be caught to form a unit joined to the carriage (MB). To release the ribber bed raise the release knob (left front of feeder brush assembly) and raise the knitter carriage. The ribber carriage will be released and can then be moved independently to either side.



To remove the ribber carriage from the needle bed, remove the nearest retaining screw (these are found on the lower left and upper right of the ribber) and slide the carriage off the bed.



## THE RIBBER CARRIAGE (AB)



### 1) Cam Switches

There are two Cam Switches, one at each side of the tension control knob. Each of these switches has two positions :-

**Down** - When the letter N is indicated. When both switches are in the N position the cams are set for Normal knitting.

**Up** - When the letters P - R are indicated.

P represents patterning and R round or circular knitting. When either switch is up it sets the saddle for patterning on the respective 'course' (See main bed book).

For patterning purposes, it is possible to work with one switch on N and the other on P R; other patterns may require both switches to be on P - R.

### 2) Pattern Conversion Switch

This switch situated beneath the carriage affects the movement of the needles on the knitting side when the relative Cam Switch is on PR (Up). The switch should be kept on position P (on the left) for all normal patterning, and only moved to position R (on the right) when tubular and U-style knitting is intended.

### 3) Tension Dial

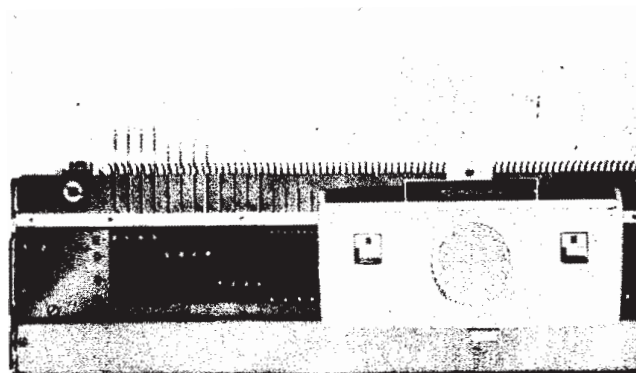
This is graduated in a similar manner to that on the Knitter Carriage but only from 1 to 8.

As a general rule the Ribber Carriage tension dial should be set at the same reading as that on the Knitter Carriage.

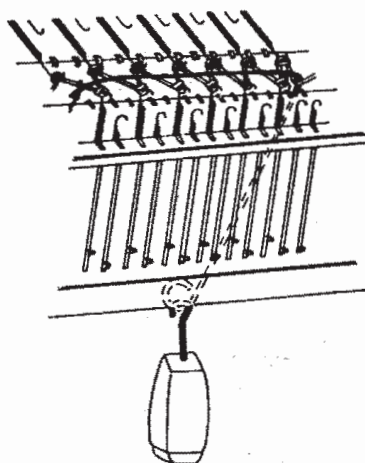
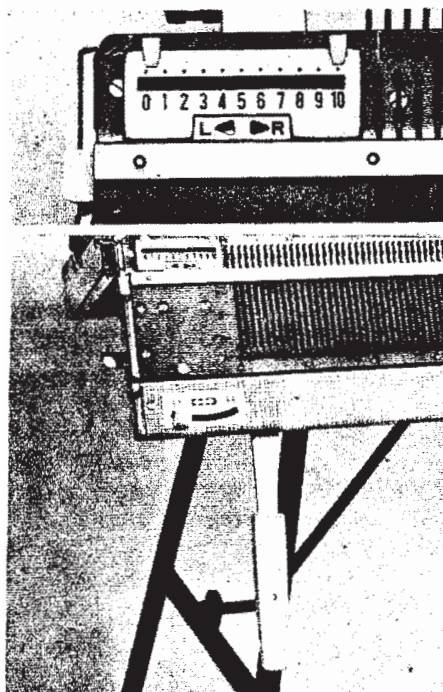
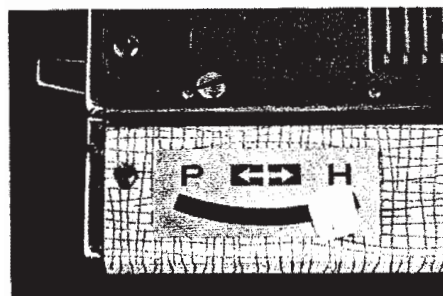
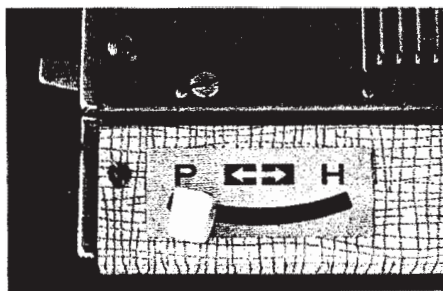
## NEEDLE POSITIONS ON RIBBER BED.

There are 4 needle positions. (Sk. DB 11.)

1. Position E - Holding position.
2. Position D - Patterning position.
3. Position B - Normal knitting position.
4. Position A - Resting or non-knitting position, against the base of the needlegrooves).



(SK. DB11)

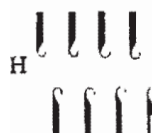


### HALF PITCH LEVER.

The half pitch lever is on the left side below the needle bed. 2 Positions of the half pitch lever are shown on the indicating plate of the needle cover as P and H.



Position P: Knitting needles and purl needles directly opposite to each other.



Position H: Purl needles are halfway between two knitting needles.

### RACKING LEVER.

Racking lever is used for racking and zig-zag patterns. Lever in vertical position is central position. By moving lever to left or right from vertical position, ribber moves 5 pitches to the left or right. Normally, set the indicator to No.5 which shows centre position. The two moving indicators on the indicating plate for racking are used as an index of the racking range. Arrow head indicates the racking direction.

### HOW TO USE THE ACCESSORIES

1. *Cast-on comb* is used for casting on the first row of stitches which is the foundation of the knitting.
2. **WEIGHTS.** The most expensive industrial machines use weights (gravity) for drawing the fabric out of the machine and those supplied with the knitter can be considered as an extra pair of hands, do not be sparing in the use of weights while working – remove them if the fabric is to be left standing in the knitter for any length of time. Replace them before starting work again. Another good tip is to knit two or three rows of scrap wool before leaving the knitting standing, and unravel them before starting to knit again. This prevents the fabric becoming marked while standing. For every 50 stitches use at least one large weight. From 150 stitches upwards use additional small weights at the sides.

## USE OF THE ACCESSORIES

3. **WEIGHT HANGERS.** These are used on the sides of the fabric for extra gravity (pull). They are also most useful as short cast on combs when casting on or increasing up to 20 stitches.
4. **CLAW WEIGHT HANGERS** are convenient for gripping the fabric at the selvages and to hold weights for additional pull.

## USEFUL HINTS

### THE CARRIAGES

Operate the carriages carefully and do not jerk or bang them.

The Main Bed carriage should be held firmly onto the needle-bed, without exerting heavy pressure.

Frequently dropped stitches are caused by raising the MB carriage when operating it across the knitting.

### FEEDING OF YARNS

Check that the yarn is properly in the feeder, especially when changing colour otherwise the fabric will fall off the knitter.

### TENSIONS

As thicknesses of yarn are so varied, no hard and fast rule can be applied, so that as with all knitting, tensions should be tested before knitting.

The following chart can only be considered as a rough guide :-

### TENSION CHART.

Selvedge	Basque.
3-ply 0	1
4-ply 0	2 or 2.2
5-ply 1	4
8-ply 3	Top 10 Bottom. 8

## THREADING THE CARRIAGE FEEDER

After threading the Carriage Feeder, see that the excess yarn falls between the two beds.

## CAST ON COMBS AND WEIGHTS

When attached to panels see that the cast-on comb hangs horizontally.

When attaching comb to the cast-on row, adjust the position of the weights if necessary, so that the comb hangs horizontally.

## DROPPED STITCHES

It is always easier to pick up dropped stitches if you 'open' the beds.

## NEEDLE SETTINGS

It is always better to set your needles so that the larger number is in action on the MB. Of greater importance, however, is to ensure that the outer edge needles are on the MB.

## PANELS

A panel is any single piece of knitting whether it be a sleeve back or front of a garment or either side of the front of an open cardigan, etc.

## PANELS CATCHING ON NEEDLE-BED

Should you notice that the knitting is not falling between the needle-beds evenly, or that yarn seems to be "lumping" in one place, check that one or more loops has not caught on the gate pegs.

If you find this has happened, unhook the caught loop or loops with a work-hook or latch hook.

If there are no caught loops, the indication may be that extra weights are needed.

**CASTING ON FOR 1 x 1 RIB**

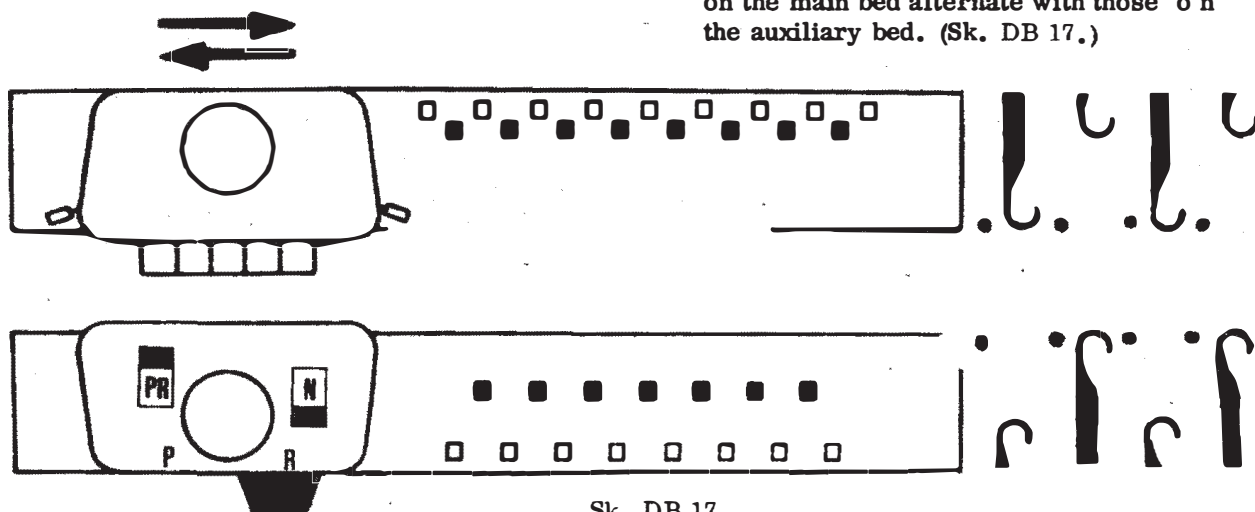
1 x 1 Rib is the basic rib for all knitting and is widely used for bands and welts, for cuffs, collars, pockets, etc., and for many decorative and functional purposes because of the soft elastic fabric it produces.

**NOTES:**

1. In most examples given in this book no Tension Dial settings are recommended. Set the tensions as for single-bed knitting according to the yarn used.

For the cast-on, however (up to Step 15), the tension should be about 3 to 4 full points lower than for the rest of the knitting.

2. The number of needles to be used is not mentioned; for practice purposes set into operation about 20 on each side of the centre "0". These are the needles referred to in the following examples.



Sk. DB 17.

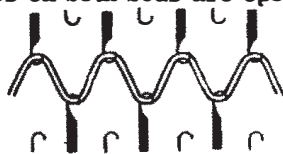
**Note:**

The outer needles in each case must be on the main bed. (In other words, 1 more needle must be in action on the main bed than is raised on the auxiliary-bed).

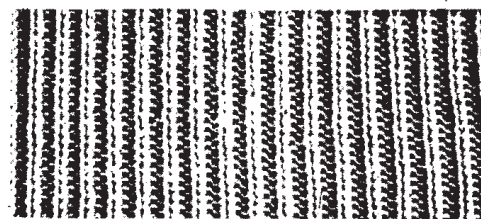
Main Bed needles - Position B.

Auxiliary Bed needles - Position B.

Ensure that the latches of all raised needles on both beds are open.



Sk. DB 18.



Sk. DB 16.

- Needlebed Pitch - On P.
- Carriages (Joined; at the Left of the needle beds).
- Main Bed = MB
- Pattern Selector Button - Knit Code 1.
- Holding Cam Levers - Both on I.
- Tension - O.
- Auxiliary Bed = AB
- Cam Switches - Left : Up P-R.
- Right: Down N.
- Pattern Conversion Switch- on R.
- Tension - O.

**Needle Arrangement ( See Note 2 Page 13 )**

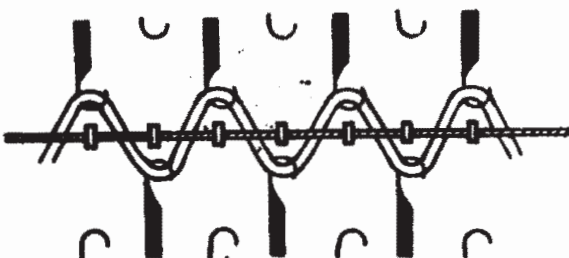
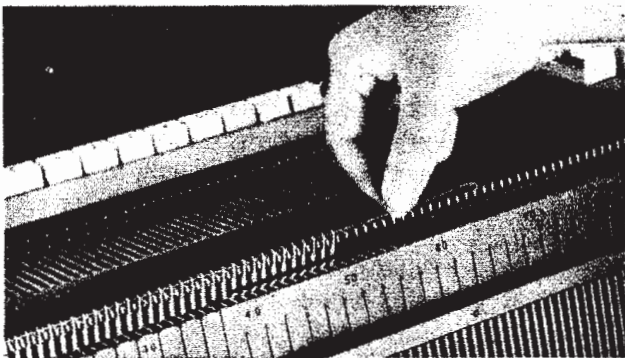
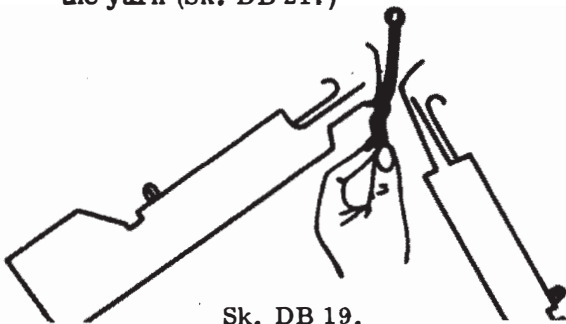
Use 1 x 1 needle-pusher to raise every second needle on both beds so that those on the main bed alternate with those on the auxiliary bed. (Sk. DB 17.)

**CASTING-ON (FOR 1 x 1 RIB)**

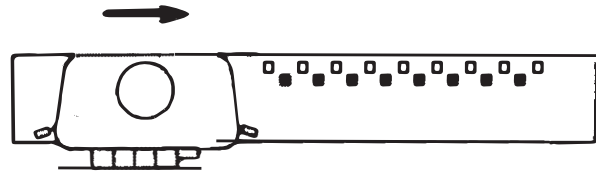
1. Thread the yarn through the automatic yarn tension unit.
2. Pull the yarn down well below the knitter between the needle beds so that when the take-up spring on the automatic yarn tension unit returns upwards, there is about 10" hanging below the MB carriage.
3. Thread the yarn through the carriage feeder.
4. Operate the joined carriages from Left to Right across the needles. (The yarn will be caught on the needles of both beds, (Sk. DB 18.) and all in action needles in both beds will be returned to Position B.

5. Insert the cast-on comb.

- a) Pull out the wire from the appropriate cast-on comb.
- b) With the cast-on comb teeth upwards, pass it upwards from beneath the two beds so that the teeth project through and above the yarn which now lies across the needles. (Sk. DB 19.)
- c) Rethread the cast-on comb wire through the holes (Sk. DB 20.)
- d) Release the comb so that it is hanging on the yarn (Sk. DB 21.)

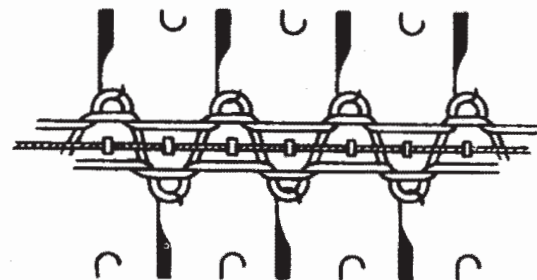
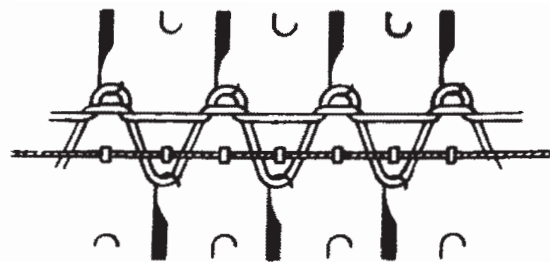


- e) Wind the loose end of the yarn round the cast-on comb to prevent the first stitch unravelling.
6. Hang the weights onto the cast-on comb. (If the cast-on comb does not hang horizontally move the position of the weights until the comb is horizontal).



7. Press the Right "Part" button (Code 2) MB. (Sk. DB 22.)

8. Operate the joined carriages from Right to Left (Sk. DB 23.) (The Main Bed needles form stitches and return to Position B).



9. Operate the joined carriages from Left to Right (Sk. DB 24.) (The AB needles will form stitches and return to position B).

10. a. Set the tension two full numbers lower than that required for the Main fabric.
- b. Reset the MB Carriage on Knit (Code 1).
- c. Lower the Left Cam Switch to N.

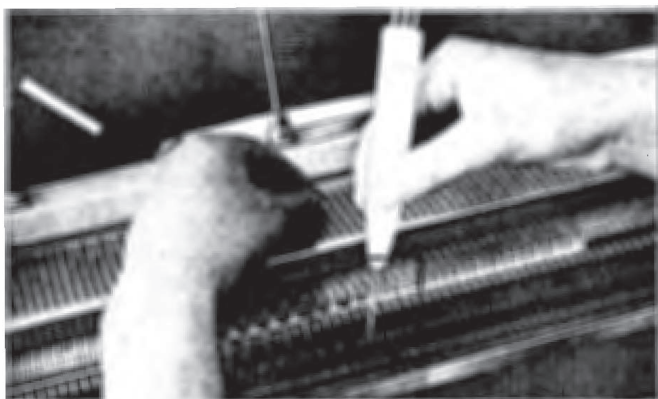
11. Operate the joined carriages from Right to Left. The automatic cast-on is now complete.

12. Set Tension for Basque.

Note that both carriages are now set for normal knitting - In this setting each time the joined carriages pass across the fabric another row is knitted in a rib pattern.

### CHANGING FROM RIB TO PLAIN KNITTING

1. On the Main bed, raise to Position B the intervening A Position needles and open their latches.
2. Using the transfer needle, transfer the stitches from the AB needle to the empty MB needle.
3. Place empty AB needles in Position A.



Sk. DB 25.

### FROM PLAIN KNITTING TO RIB KNITTING

1. Raise to Position B the AB needles according to the rib pattern to be knitted.
2. Using the transfer needle, transfer stitches from the MB needles to corresponding B position AB needles.
3. Place the empty MB needles in Position A.



Sk. DB 26.

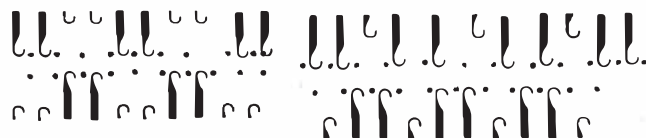
### RIB VARIATIONS

Numerous variations of rib patterns can be knitted. They should however all be cast on as 1 x 1 rib up to Step 11 in order to form the selvedge. After this step the needles are reset by transferring stitches from one bed to the other according to the rib formation.

The following are needle settings for various ribs; the carriage settings remain the same although the Needle Bed Pitch may alter.

#### 1. 2 x 2 Rib

Method 1: Needle Bed Pitch P. Use the 2 x 2 needle pusher to raise the needles in pairs so that those on the main bed alternate with those on the auxiliary bed. It is advisable to have the "outer" needles at each end of the main bed. (Sk. DB 27.)



Sk. DB 27.

Sk. DB 28.

#### 2. 2 x 2 Rib

Method 2: Needle Bed Pitch H. This method gives greater elasticity and because of the extra needles used, more bulk to the fabric. Use a 2 x 1 needle pusher, and raise needles on Main Bed in pairs to Position B with one intermediate needle remaining in Position A. Repeat this on the Auxiliary Bed one needle over to the right. (i.e. the raised needles on the Auxiliary Bed are opposite the A position needle on the main bed.) (Sk. DB 28.)



Sk. DB 29.

#### 3. 2 x 1 Rib Needle Bed Pitch P.

Using the 2 x 1 needle pusher raise the needles on the Main Bed in pairs to position B with one intermediate needle remaining in Position A. Reverse this on the Auxiliary bed so that the raised needle on the AB is opposite the out of action (Position A) needle on the MB. It is advisable that the "outer" needles at each edge should be on the Main Bed.

## KNITTING FULL NEEDLE RIB

To knit a Full Needle Rib the system is the same as for 1 x 1 rib described previously.

The exception is in the Needle arrangement, and Needle Bed Pitch. In the full needle rib every needle on both the Main Bed and the Auxiliary Bed is used. The advantage is that very fine yarns (2-ply and finer) can be used in this method and will knit up into a comparatively thicker fabric with a generous elasticity.

With the finer wools casting on tensions can be as low as 1 on both carriages, and need only be raised about 2 full points for normal knitting.

### CASTING ON FOR FULL NEEDLE RIB

Needle Bed Pitch:- H

Carriages (Both carriages at the left of the needle-beds).

Main Bed = MB

Pattern Selector Button - Knit (Code 1).  
Holding Cam Levers - Both on I.

Auxiliary Bed = AB

Cam Switches - Right Down N.  
- Left Up: P-R.

Needle Arrangement (See note 2 of 1 x 1 rib).

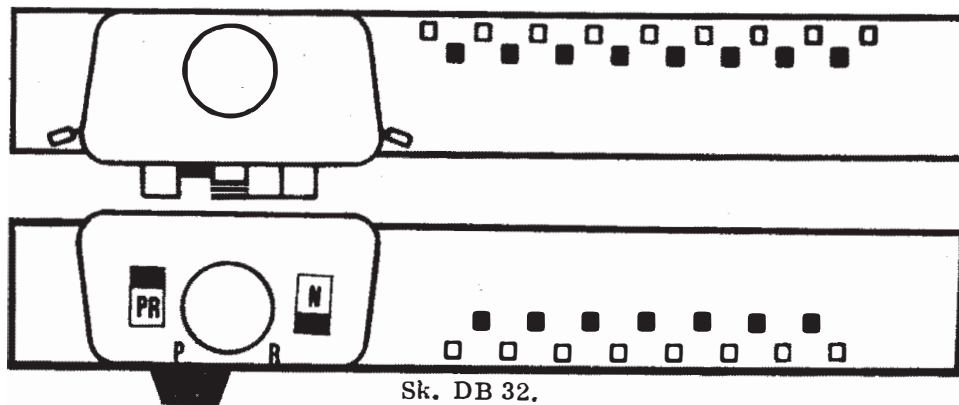
Using the straight edge needle cutter raise every needle:-

On the Main Bed (MB) to position B )

On the Auxiliary Bed (AB) to position B )



Sk. DB 30.



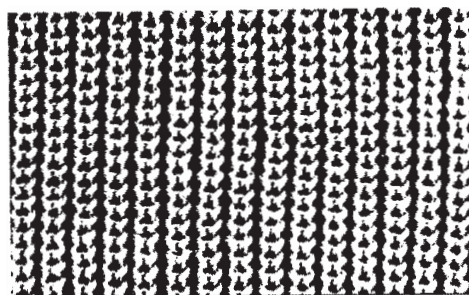
Note:

The outer needle in each case should be on the Main Bed.  
See that all needle latches on both beds are open.

### CASTING ON AND KNITTING

Follow steps 1 to 11 of Cast-on for 1 x 1 Rib, but adjust the tensions for the yarn used, then knit the required length of rib.

## TO KNIT FISHERMANS RIB



Sk. DB 31.

Fishermans Rib is a pronounced raised rib equal on both sides of the fabric and is ideal for producing heavier fabrics from thinner yarns.

Casting On (For Fishermans Rib)

Set the Carriages and cast on as for 1 x 1 rib up to Step 11.

KNITTING (Fishermans rib).

Both carriages should now be at the left of the Needle beds.

1. Change both tension dial readings 3 to 4 full numbers higher.

2. Reset the carriages :-

MB: Right Tuck Button in

AB: Cam Switches: Left Up :- P-R  
Right Down:-N

Pattern Conversion Switch: P

3. Operate carriages Left to Right.  
The needles on both beds form stitches.

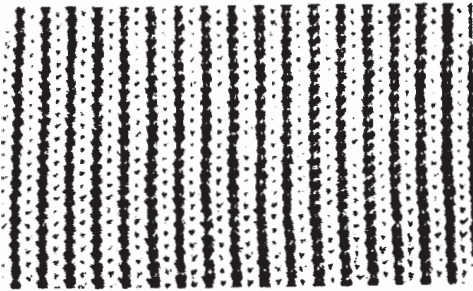
4. Operate carriages R to L.

The MB needles form stitches.

The AB needles form "Tuck" stitches, and return to Position B.

Repeat steps 3 & 4 above for the required length of rib or fabric.

**TO KNIT ENGLISH RIB**



Sk. DB 33.

English rib produces a pleasant full bodied fabric, smooth ribbed on one side and thick ribbed on the other.

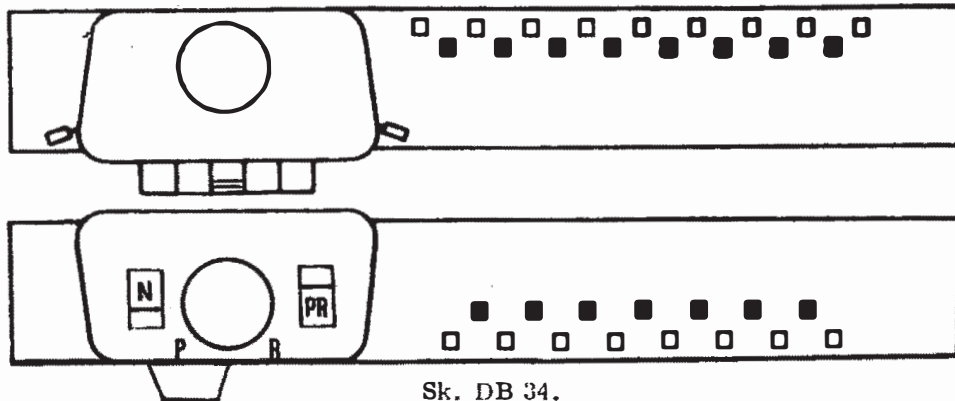
**Casting On (For English Rib)**

Set the Carriages and cast on as for 1 x 1 Rib up to step 11.

**Knitting (English Rib)**

Both carriages should now be on the left side of the Needle Beds.

1. Change both tension dial readings 3 to 5 full numbers higher.



Sk. DB 34.

2. Reset the carriages.  
MB: Pattern Selector Buttons knit (Code 1)  
AB: Cam switches: Right Up - PR  
  Left Down - N  
  Pattern conversion switch on P.
3. Operate carriages Left to Right.  
MB needles knit  
AB needles knit.
4. Operate carriages Right to Left  
MB needles knit  
AB needles form Tuck stitches.

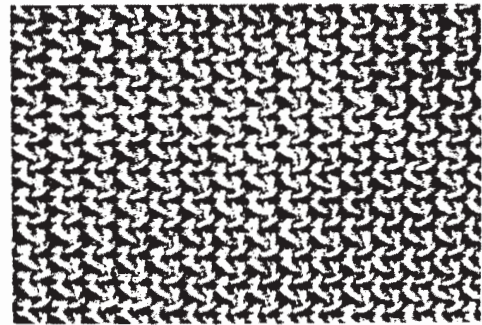
Repeat steps 3 & 4 above for the length of rib or fabric.

**ZIG-ZAG RIB PATTERNS**

The 3 patterns which follow are for fancy rib and make use of the movement of the Auxiliary bed. Only the thinner yarns should be used as the Needle bed Pitch is on H as for full needle rib.

**CASTING ON FOR FULL NEEDLE ZIG-ZAG RIB PATTERNS**

For each of these patterns set the carriages and cast on as for full needle rib up to step 11, after which the carriages should be on the left.



Sk. DB 35.

**Zig-Zag Pattern No. 1**

**RESET THE CARRIAGES:**

- MB: Pattern Selector Buttons - Knit Code 1.
- AB: Cam Switches - Both down N.

Pattern Conversion switch - P.

Knit with the carriages set as above; each time the carriages are on the right move either to the left or the right so that the AB needles alternate to each side of the MB needles above them. (This movement of the needle beds is called "racking").



### Zig-Zag Pattern No. 2

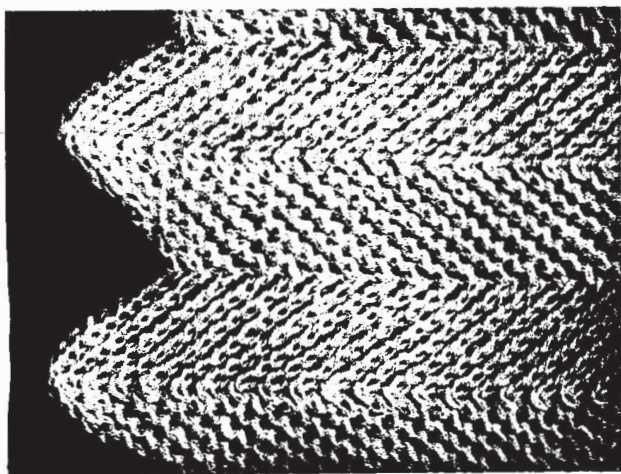
Exactly as Zig Zag Pattern No.1 except that the AB is racked after each row to create a closer Zig-Zag.

### Zig-Zag Pattern No. 3

(Fishermans Rib Style) (Sk. DB 36.)

MB: Pattern Selector Buttons - Knit (Code 1)

AB: Cam Switches Left up - PR  
Right down - N.



Sk. DB 36.

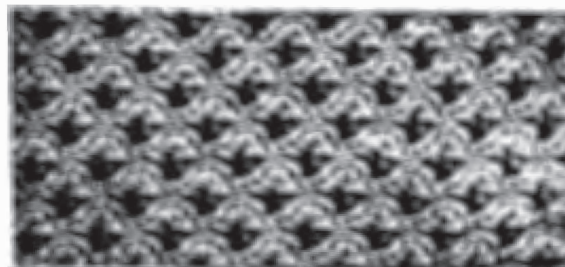
Knit with the carriages set as above, and "rack" after each of rows 1 to 9.

Do not rack after the 10th row.

Commence racking again after the 11th row, and rack after each row until the 19th row, then omit the racking after the 20th row.

By not racking after the 10th and 20th rows, the direction of the zig-zag changes. To repeat the pattern commence again from row 1.

### TUCK RIB



Sk. DB 37.

This pattern is to illustrate that rib patterns need not be straight lines in the fabric.

Casting On:

Needlebed Pitch on P

Set the carriages and cast on as for 1 x 1 rib up to step 11.

The carriages should now be on the left.

Knitting The Tuck Rib

#### 1. Reset the carriages:

MB. Pattern Selector Buttons : press in both Tuck buttons (Code 6).  
Holding Cam Levers both on I.

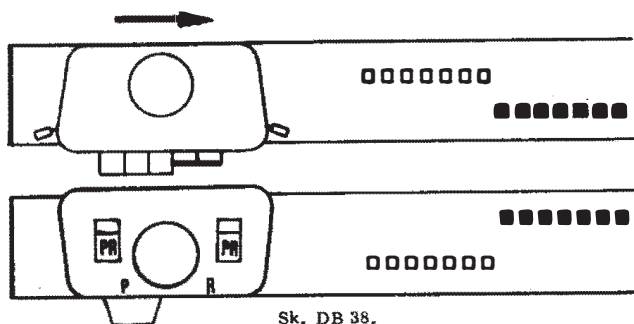
AB. Cam Switches : Both down N.

Note: Each row (before operating the carriages) raise to E position the MB in action needle nearest the carriage to prevent dropped stitches in the selvedge.

2. Slide dial on 1.
3. Set N.S.B.'s 1, 2, 5, 6.
4. Raise the needles (Use Needle Selector Key).
5. Operate carriages L to R.
6. Raise the needles.
7. Operate carriages R to L.
8. Repeat steps 4 to 7.
9. Slide dial on 2.
10. Repeat steps 4 to 8.
11. Slide Dial on 1.

To repeat the Pattern start at Step 4.

**RIBBING ( Using partial Knit P.S.P).**



The ability to knit on part of the fabric is of considerable importance when making plackets or darts, various openings such as buttonholes, neck-lines, pockets and generally for shaping garments including diagonal shaping or patterning in two colours.

The example given is to be knitted on a piece of fabric in the knitter, carriages on left.

**MB Carriage**

Pattern Selector Buttons - Knit (Code 1 )  
 Holding Cam Levers - Both on II

**AB Carriage**

Cam Switches - Both down ( N )  
 Pattern Conversion Switch- on P

**Needles**

On both beds raise to E Position all the needles on the half of the fabric furthest from the carriage.

**Knitting**

It is now possible to knit and shape on the B position needles as the E position needles will hold the loops on the fabric until brought back into action.

As one side of the fabric becomes longer it becomes necessary to balance it; for this, claw weights should be hung onto the fabric and raised every few rows.

To change over and knit the opposite side of the fabric proceed as follows:-

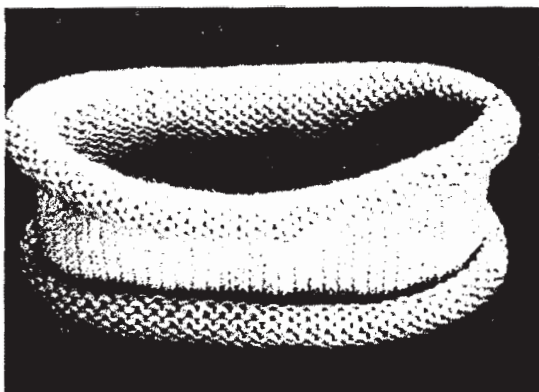
1. Remove yarn from feeder and hang it out of the way on the side of the knitter.
2. a) MB Carriage Press in both "Part" buttons (Code 3)  
 b) AB Carriage Raise both Cam Switches (PR)
3. Operate the carriages across the needles to the opposite side of the fabric. ( As the carriage is in neutral no knitting movement will take place.)
4. Lower the E position needles on both beds to position D.
5. Raise to E position the needles in B position on both beds.
6. Reset the carriages as they were before step 2.
7. Thread the carriage yarn feeder from the second ball of wool (or break off previous yarn and rethread.)
8. Continue knitting and shaping. The opposite side of the panel will now be knitted, and claw weights should be used as on the previously knitted side.

**TO UNLOCK THE CARRIAGE**

Should the carriages jam over the operating needles :

- 1) Release the lock on the feeder.
- 2) Raise the MB Carriage and slide it to the side it commenced its course.
- 3) Secure the stitches on the AB Needle to prevent them falling off in the next step.
- 4) Slide the AB Carriage back to the side it commenced its course.
- 5) Check for the cause of the jamming and correct it.
- 6) Return the needles on both beds to their correct position.
- 7) Reconnect the carriage and continue knitting.

**"TUBULAR KNITTING" (CIRCULAR KNIT)**



Sk. DB 39.

Tubular Knitting more often called Circular Knitting is knitted only in plain stocking stitch, the construction achieved being a circular tube without join.

The size of the tube depends upon the number of needles used on both needle beds.

**CASTING ON FOR CIRCULAR KNITTING**

**SETTING OF CARRIAGES :** (Both on Left of Needle Bed).

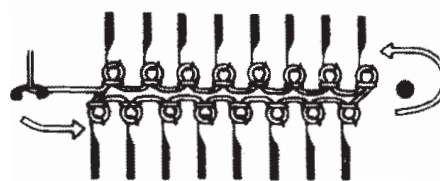
- Needle Bed Pitch - H
- Main Bed = MB
  - Pattern Selector button - Plain Knitting (Code 1)
  - Holding Cam Levers - Both Position I. Set on a small tension.
- Auxiliary Bed = AB.
  - Cam Switches - Left up. - Right down.
  - Pattern conversion switch - on R.
  - Set on a small tension.

**Needlesetting**

Needles MB - Raise into action ("Position B" an equal number of needles on each side of the centre "0").

Needles AB - Raise into action (Position C) an equal number of needles starting with the needle on the outer left of the main bed so that they adjoin those of the main bed. (Sk. DB 40.)

Ensure that the latches of all raised needles on both beds are open.



Sk. DB 40.

**Note:**

Because all the needles are in action on both needle beds the threads looped across the needles will be closer to each other; take care then when inserting the cast-on comb not to push the threads off the needles.

**Circular Knitting**

1. Follow steps 1 to 9 of Cast on for 1 x 1 Rib.
2. The joined carriages should now be on the right of the needle bed.
3. Set the tensions according to the thickness of the yarn to be used.
4. Repeat steps 8 & 9 for the length of the tube required - One full circular row is made each time steps 8 & 9 are repeated.

**Note:**

1. Row Counting: Divide the number shown on the row counter by two to ascertain the exact number of rows knitted - If you start row counter reading at "0" before step 4, should it stop on an uneven number, the circuit has not been completed.
2. If an open tube is required it is necessary to unravel the first few rows of knitting. This will leave open loops which will require to be caught or bound.

**CASTING ON FOR CIRCULAR KNITTING  
WITH A CLOSED EDGE**

Set Carriages, both on left of needle bed as described for circular knitting.

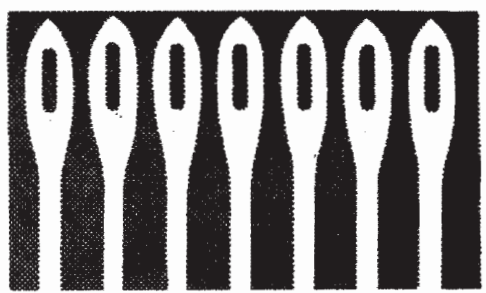
- 1-6 Using waste yarn follow steps 1 to 6 of cast on for 1 x 1 Rib on a loose tension.
7. Remove waste yarn from the carriage. Raise to E position all Main Bed needles.
8. Starting on the side furthest from the carriage and using Main Colour yarn form loops around each E position needle, after which thread the carriage. See that all loops are below the needle latch.
9. Press the Right "Part" button (Code 2).
10. Operate the joined carriages from Right to Left.
11. Unthread the carriage.
12. a. Press in both "Part" buttons on the MB carriage (Code 3).  
b. Raise both Cam Switches to P-R.  
c. Operate the unthreaded carriages from left to right (Both carriages being in "neutral" - no knitting action takes place).
13. Raise to E position all Auxiliary Bed needles.
14. Loop the MC yarn around each E position AB needle after which thread the carriage; check that all loops are below the needle latch.
15. On the Auxiliary Bed, lower to position D all E-position needles.
16. Reset the carriage controls :-  
MB : Holding Cam Levers both on I.  
Pattern Selector Buttons  
-Left button down (Code 4).  
AB : Cam Switches  
- Left Down (On N)  
- Right UP (P-R)

17. Operate the joined carriages from Right to Left.


(Knitting action now takes place on the AB needles).

18. Continue knitting, moving the joined carriages across the needles each full cycle forming another row.

After removing the fabric from the knitter, unpick the waste yarn, the tubular fabric will have a closed edge cast on.



**Empisal**  
**VARIABLE**



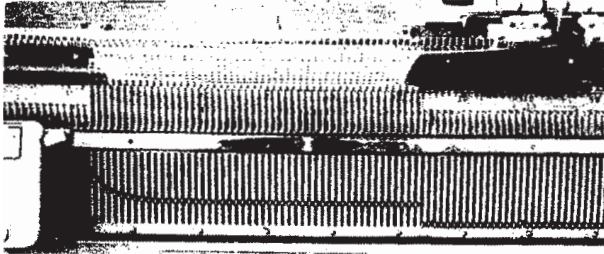
**TRANSFER HANDLE**

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**TO KNIT ON BOTH BEDS (SINGLE FABRIC)  
"U" STYLE:**

An all plain knitted fabric is achieved by knitting single fabric on both beds. Unlike circular knitting the fabric is open at one edge. One purpose of this is to be able to knit a fabric exceeding 200 needles in width - for convenience this operation is called "U" style knitting.



Sk. DB 41.

Needlebed Pitch — H

Carriages Set the controls as for 1 x 1 Rib.

Needle Setting Set an equal number of needles into position B opposite each other on both beds.

1-9. Repeat steps 1 - 9 of the Cast on for 1 x 1 Rib.

10. Reverse the Carriage settings:  
MB: Press in Left Part Button (Code 4)  
AB: Cam Switches : Left Down - N  
Right Up - PR  
Pattern Conversion switch - P

11. Operate joined carriages from right to left. (The AB needles will again form stitches.

12. Operate the carriages from left to right. (The MB needles will form stitches)

13. Reverse the Carriage settings:  
MB: Press in Right Part Button (Code 2)  
AB: Cam switches: Left Up - PR  
Right Down - N

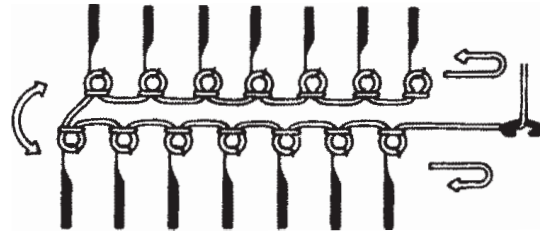
14. Operate the carriages from right to left. (The MB needles will again form stitches)

15. Operate the carriages from left to right. (The AB needles will form stitches)

Continue repeating from steps 10 to 15 for the length of the fabric.

When the fabric is removed from the knitter it will be necessary to unravel the first joined rows to open the fabric.

There are various applications for this "U" style knitting, for example making pockets - Cast on and knit as described above - Repeat steps 10 to 15 for 35 to 40 rows, after which close the fabric (after step 15, set the MB for knit then lower the Right AB Cam switch to N, and knit one row; thereafter cast off all stitches from both beds. In this way a pocket will have been knitted, closed on three sides. Other uses include separate facings for collars and cardigan fronts, either joined or open.



Sk. DB 42.

**DECREASING**

One Stitch at The Side

On the side to be decreased irrespective of the side at which the carriage is resting :

1. Transfer the side stitch from the last AB needle outwards to the adjacent (last) MB needle.
2. Place the now empty AB needle out of action and bring into action the corresponding MB needle.
3. Transfer inwards together the two stitches from the last needle onto the empty MB needle brought into action in Step 2.
4. Place the empty MB needle out of action.

In this way one stitch can be decreased at either side, or both sides at the same time and the outer selvedge needles are always on the Main Bed.



## INCREASING

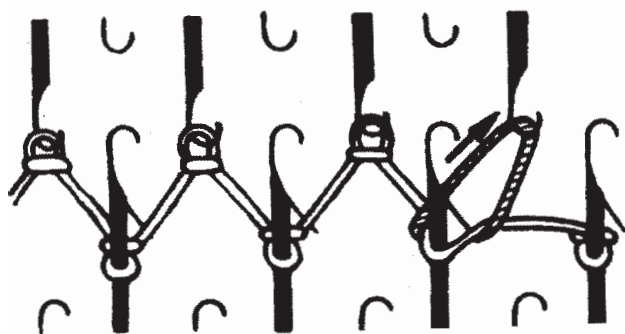
### Increasing One Stitch At The Selvedge

1. Simple Method (Alternate needles in action on each bed).

When the carriage is on the side at which the increase of one stitch is to take place, raise into action the needle nearest to the fabric.

**Note:** Always raise the MB needle first - If subsequently an increase is again necessitated, transfer the end stitch onto the next MB needle, then place the previously used MB needle out of action and bring into action the intermediate AB needle. In this way the selvedge needles are always on the Main Bed.

2. Simple Method (Full bed in action on each bed). (Fig DB42) When the carriage is on the side at which the increase is to take place, raise into action one needle on each bed nearest to the fabric.



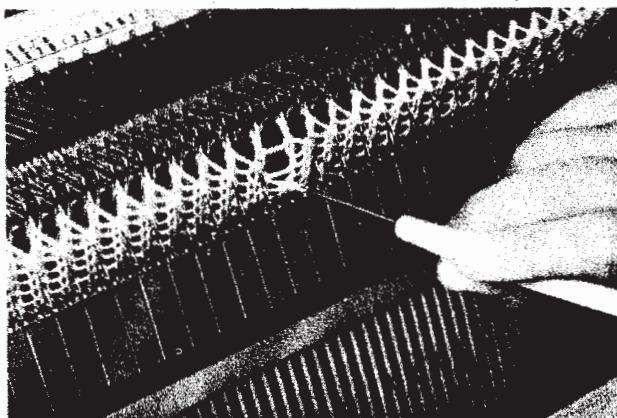
Sk. DB 43.

3. Full Fashion Method
  - (a) Transfer the last stitch outwards to the adjacent needle.
  - (b) Pick up a "half stitch" from the previous row onto the now empty needle. (Sk. DB 43.)

### Increasing Several Stitches At The Side

1. Carriage on the side opposite to that on which the increase is required.
2. Bring into action as many needles as necessary on both beds in the same sequence as those already used.
3. Operate MB carriage across the knitting. Yarn will be looped across the MB and AB needles.
4. Hang a side weight hanger with a weight on across the loops. (See Sk. DB 15 ).
5. Continue knitting.

## PICKING UP DROPPED STITCHES



Sk. DB 44.

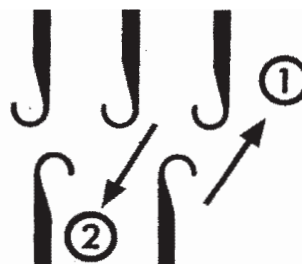
As soon as you notice a stitch has dropped try to prevent it dropping further into a ladder - If possible catch it or the stitch below it with a latchet- or work-hook; return it to its needle then with your finger on the butt of the needle reknit the caught loops in the same way as for a dropped stitch in single bed knitting.

Otherwise :

1. Remove the weights;
2. Check that all other AB stitches are above the latchet hooks.
3. Open the Auxiliary-bed by pressing with both thumbs on the gate catches at each end of the bed and allow the bed to drop; the yarn in the hooks of the AB needles will pull the needles up to Position D.
4. Catch the lowest loop of the "Run" (Ladder) with the latchet hook and crochet upwards to re-form stitches.
5. Hang the re-formed stitch on an MB needle.
6. Carefully return the Auxiliary-bed to operation position, and needles to correct position.
7. Transfer the re-formed stitch to the AB needle.

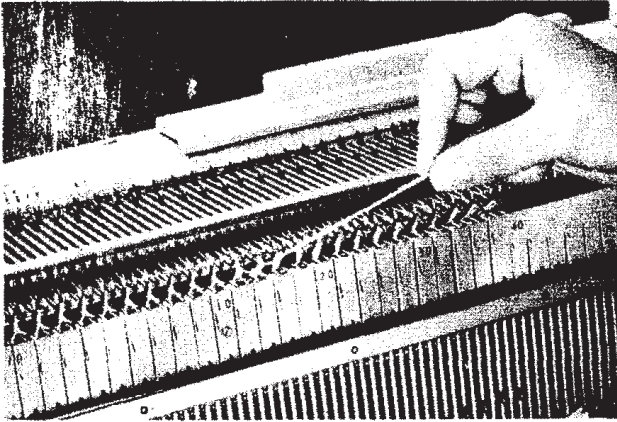
## BUTTONHOLE IN RIB.

Transfer bottom stitch to top stitch bearing RIGHT and top stitch to bottom stitch bearing left. Return empty needles to working position and knit 2-rows.



## UNRAVELLING ROWS

1. Place the AB needles in Position B.
2. Unravel as you would for single-bed knitting.



Sk. DB 45.

### TO REMOVE KNITTING FROM KNITTER

#### 1. Unbound Method

1. Remove yarn from the yarn feeder.
2. Remove all weights.
3. Operate AB carriage across needles.
4. Operate MB carriage across needles.

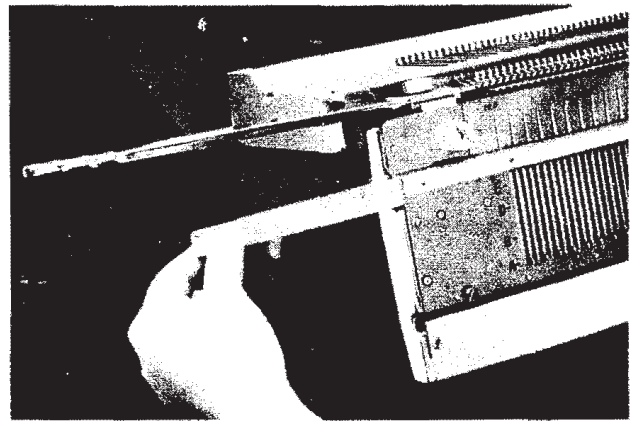
As there is no yarn in the yarn feeder to be placed over the needles to form new stitches, the previous knitting will be dropped off the needles.

#### 2. Bound Method

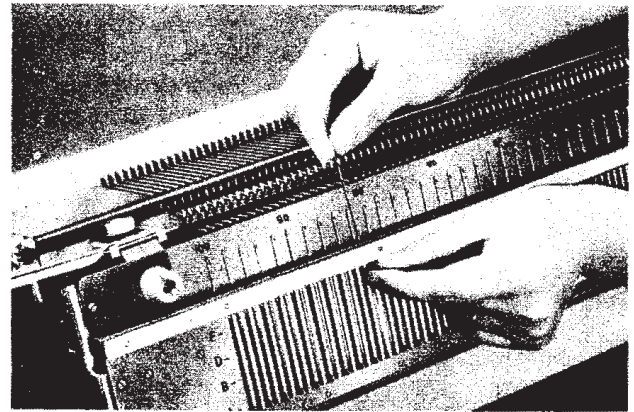
1. Transfer all stitches off the AB needles onto corresponding MB needles.
2. Cast off as for single-bed knitting.

### TO REPLACE A PURL NEEDLE

1. Press inwards either side of the needle retaining bar.
2. Slide it out to a position beyond the needle to be changed.
3. Raise the needle as high as it will go and proceed as you would for a Main Bed Needle, latchet closed to withdraw it, and opened in the new needle when replacing.
4. Replace with new needle ( latchet open ) and push the retaining bar back into normal position.



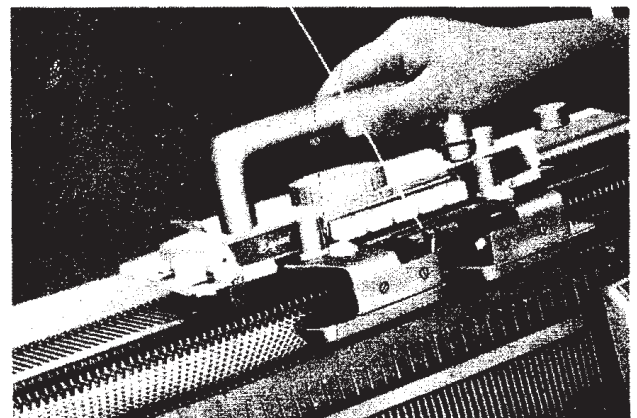
Sk. DB 47.



Sk. DB 46.

### CONVERTING TO SINGLE BED USE

1. After transferring stitches from AB take off weights & comb, drop bed, change saddle, reset tension & knit.
2. Depress both Auxiliary-bed retaining latches and allow the Auxiliary-bed to drop.
3. Remove brush arm assembly from MB carriage.
4. Replace Sinker-plate assembly onto MB carriage. The MB is now ready for single-bed operation.



Sk. DB 48.



## CARE OF YOUR RIBBER

Lavish the same care on the Ribber as you will on the main bed —

