



TOYOTA

Knitting machines

KS950

STEP 1

PREPARATION

MACHINE AND CARRIAGE.....	2	NEEDLE POSITION, LATCH NEEDLE,	
LACE ATTACHMENTS AND		ROW COUNTER AND EXTENSION RAILS.....	8
ACCESSORIES.....	3	END NEEDLE SELECTION MECHANISM.....	9
SETTING UP.....	4	PLACING CARRIAGE ON THE NEEDLE BED.....	9
PREPARATION OF YARN.....	6	THREADING.....	10
YARN TYPES AND TENSIONS.....	7	CAST ON.....	11
		SIMPLE REMOVAL.....	12

STEP 2

KNITTING PATTERNS

PUNCH CARD.....	13	TUCK STITCH PATTERNS.....	20
INSERTING PUNCH CARD.....	14	SLIP STITCH PATTERNS.....	21
FAIRISLE PATTERNS.....	15	LACE PATTERNS.....	23
EXTENDED PATTERNS.....	17	MOTIF MAGIC.....	26
WEAVING PATTERNS.....	18	PLAITING.....	27

STEP 3

KNITTING TECHNIQUES

INCREASING STITCHES.....	30	DOUBLE WELTS.....	38
DECREASING STITCHES.....	31	RIBBED BAND.....	39
PARTIAL KNITTING BY DECREASING.....	32	CASTING OFF.....	40
PARTIAL KNITTING BY INCREASING.....	34	FINISHINGS.....	41
PLAIN HEM.....	36	TENSION SWATCH.....	43
PICOT HEM.....	37	HOW TO KNIT A LADY'S PULLOVER.....	44

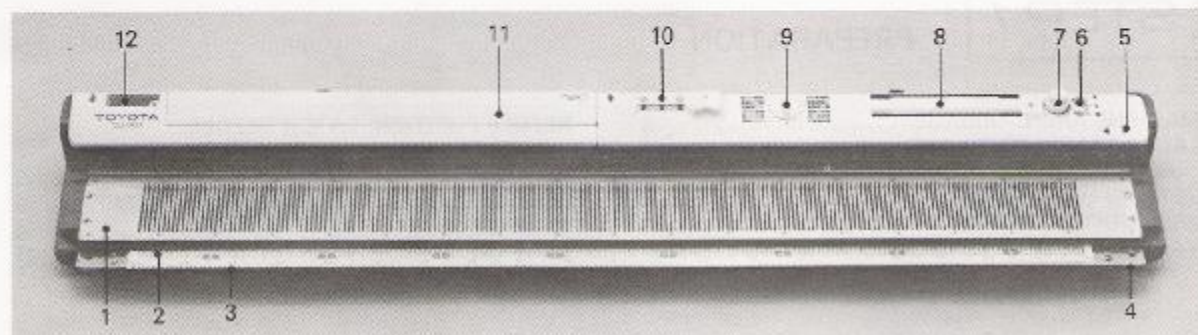
STEP 4

HELPFUL HINTS

REPAIRING A DROPPED STITCH.....	47	PROPER CARE OF THE MACHINE.....	51
CARRIAGE JAMMING.....	48	PACKING.....	51
CHANGING A NEEDLE.....	50		

STEP 1

MACHINE



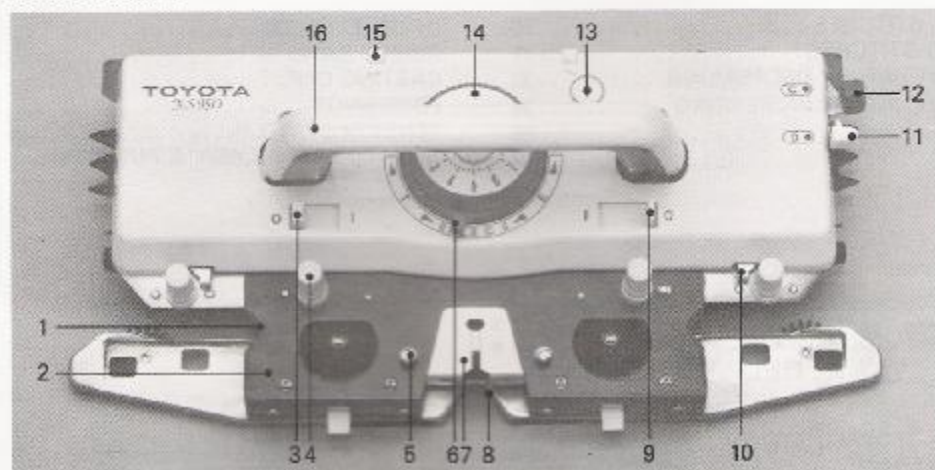
- | | | | |
|-----------------|-----------------------|-----------------------|-------------------|
| 1 Needle bed | 4 Yarn holder | 7 Feeder dial | 10 Row counter |
| 2 Latch needles | 5 Direction indicator | 8 Card slot | 11 Accessory case |
| 3 Sinker hooks | 6 Card stop lever | 9 Motif magic control | 12 Tool stand |

CASE COVER



- 1 Cast on comb

CARRIAGE



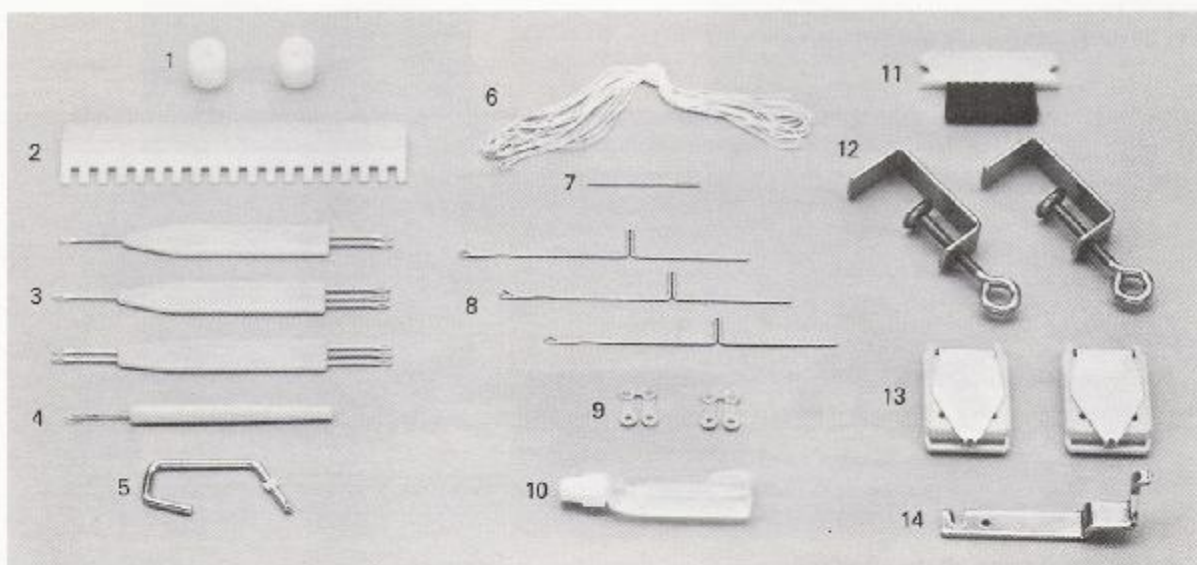
- | | | |
|-----------------------|---------------------------|----------------------------------|
| 1 Weaving yarn guides | 7 Yarn feeder | 13 Groove for row counter lever |
| 2 Fabric presser | 8 Yarn feeder lever | 14 Tension dial |
| 3 Partial knit lever | 9 Transfer stitch lever | 15 Adjustment marks for plaiting |
| 4 Thumb screws | 10 Lace cam switch lever | 16 Carriage handle |
| 5 Small thumb screws | 11 Card lever | |
| 6 Pattern lever | 12 Carriage release lever | |

LACE ATTACHMENT & FABRIC PRESSER

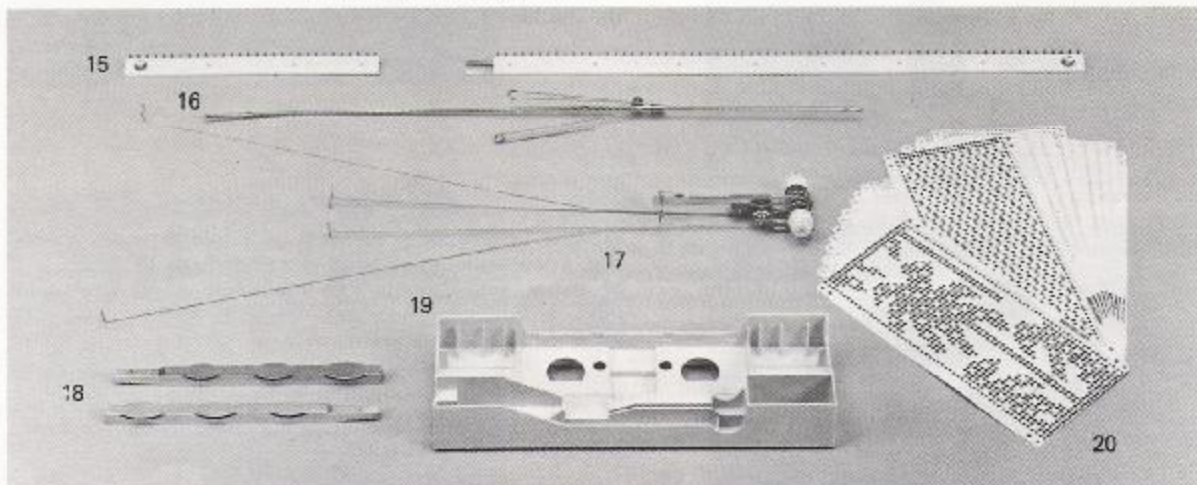


1 Lace attachments 2 Weaving levers 3 Thumb screws

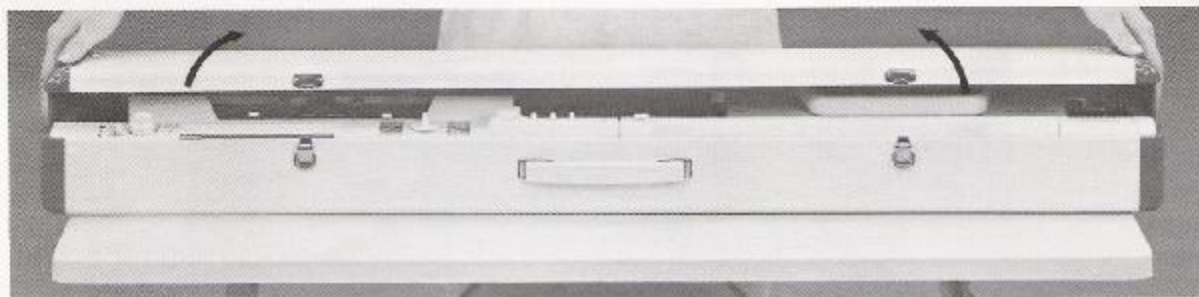
ACCESSORIES



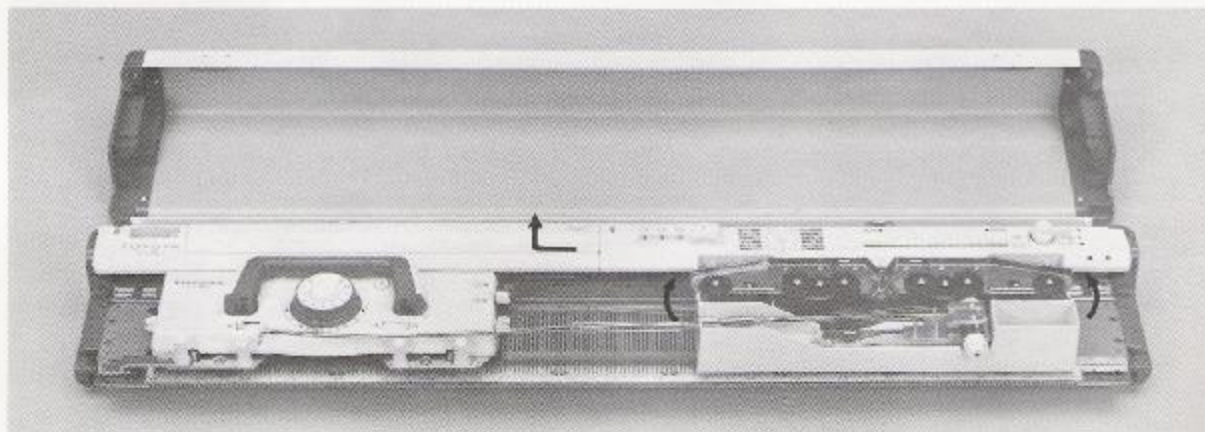
1 Paraffin wax	5 Row counter lever	9 Card snaps	13 Weights	17 Tension wire unit
2 Selector comb	6 Nylon cord	10 Oil	14 Carriage lock	18 Extension rails
3 Transfer tools	7 Tapestry needle	11 Brush	15 Cast on comb	19 Storage case
4 Latch tool	8 Spare latch needles	12 Clamps	16 Upper tension rod	20 Basic punch cards



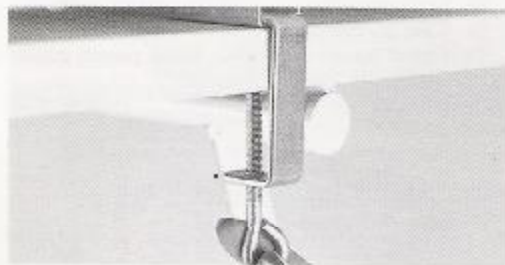
SETTING UP THE MACHINE



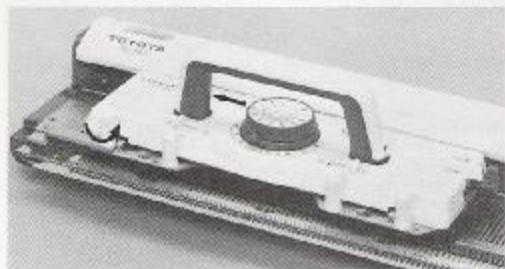
Place the knitting machine on the table, case handle away from you.
Unlock both latches at rear of machine case.
Lift up cover and move it towards you.



Take the storage case off the machine.
Push the lock lever towards left and remove the lid of accessory case.



Take both table clamps from accessory case.
Insert clamps into the slots underside of machine.
Secure to the table.
The machine should now be securely attached to the table top.

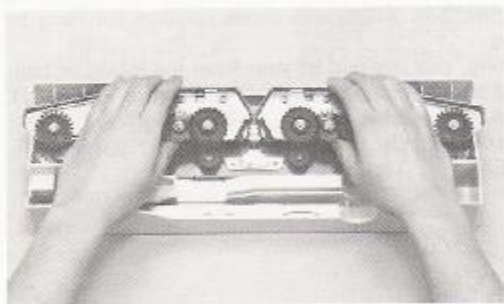
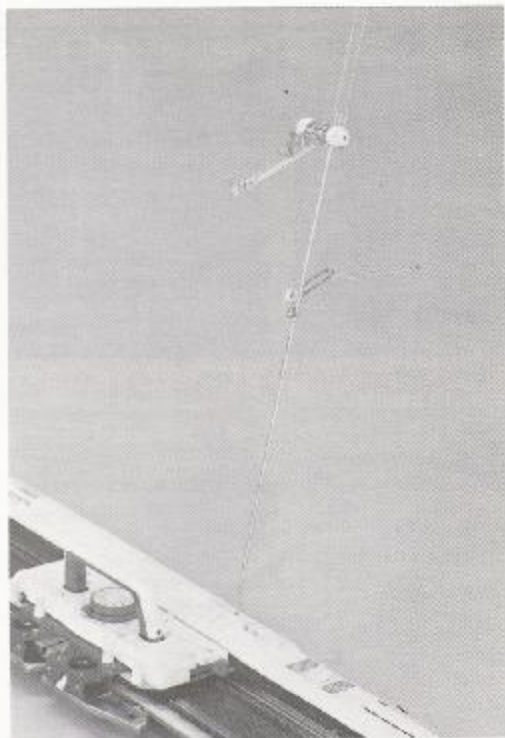
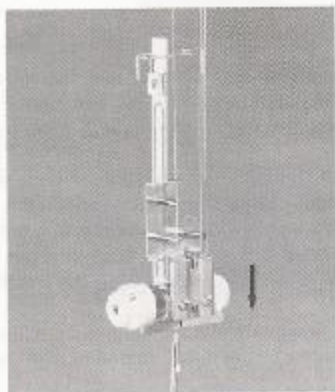


While not being used, the carriage is locked to the needle bed. Loosen thumb screw at left of carriage in direction of arrow. Pull carriage lock towards you and remove it from carriage and needle bed.
Place carriage lock in accessory case.

Raise the handle.
(To fold down the handle, push the projection, small arrow, and fold it backwards.)

Take out the tension rod and upper tension unit from the case. Insert the angled end of tension rod well into the groove. Slide upper tension unit on to rod, the end of the rod must fit firmly into the notch of the tension unit. Pull the front yarn guide towards you and down, and pull the rear yarn guide at the back of the rod up towards the back.

*When packing the machine, push all needles back to A position and take the same procedures above in reverse.



Take out the fabric presser from its storage case.

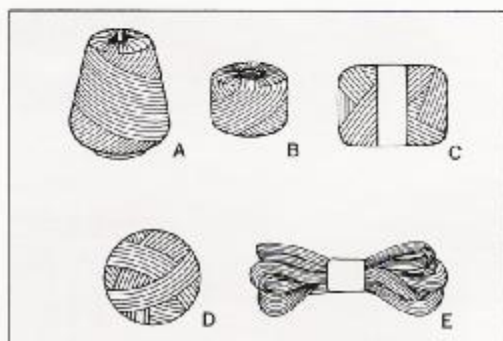


Loosen thumb screws and slide the fabric presser on to carriage, pull the presser slightly forward so that both cutouts fit round the screws and two pegs of carriage (arrows) into the holes of fabric presser.

Tighten screws.

The outer thumb screws are for setting lace attachments.

PREPARATION OF YARN

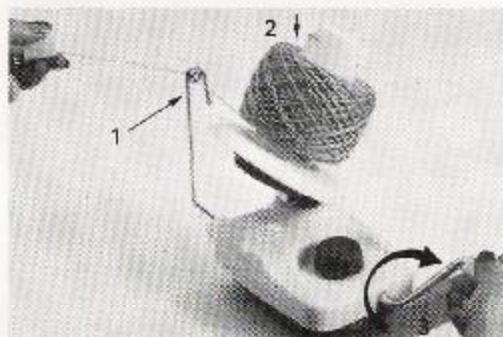


A wide range of yarns and wools can be knitted on your machine. However, if this is the first time that you are using a knitting machine, use a soft medium thickness wool to start with.

Careful preparation of yarn is important, it makes knitting more enjoyable and saves a lot of trouble.

The top picture shows yarns wound up in five different ways. A cone and B-wound ball are ready and suitable for machine knitting.

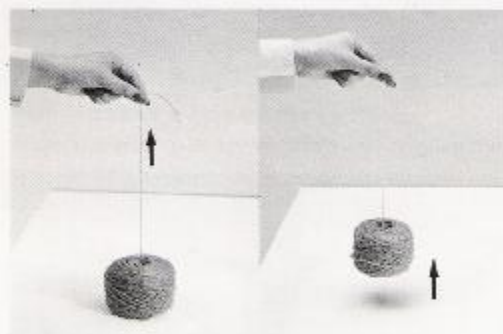
Do NOT use C, D and E as they are. They must be re-wound first.



To prepare your yarns you should use the wool winder, a useful OPTIONAL accessory. Insert the yarn end through guide 1 and across the top of the cone 2, then turn handle 3.

While winding let the yarn run through or over wax, this will smooth the thread. After the first winding the ball will be somewhat tight so you need to re-wind a second time.

For this, first remove the yarn end from the top of the cone and then the ball. Start re-winding with the inside end of the ball.



Do not use tangled or knotted yarn, untie or break the thread and wind a new ball. Knots can cause carriage jamming or faulty knitting.

To start knitting, pull the end of yarn from the inside of ball. The yarn end should come freely from the centre WITHOUT lifting the ball off the table.

Diagram Far LEFT: OK

LEFT : Too tight.



If the yarn does NOT flow smoothly, pull out a small amount from the centre and start knitting with the thread end 1.

It is impossible to knit from a hank, E in top picture.

Place the hank on the skein holder, optional.

Thread one end through guide and across top of cone and wind as explained above.

YARN TYPES AND TENSIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
TYPE OF YARN ACTUAL SIZE														
NAMES	COTTON	FINE	SOFT 2ply	FINE MEDIUM 3ply	MEDIUM 4ply	THICK 2ply	THICK 3ply	CREPE 4ply	WOOL 6.5y	CREPE 8ply	*WOOL 12ply	BOUCLE	THIN MOHAIR	TWEED
TENSION	2-4	2-4	1-3	2-4	3-5	5-6	4-6	5-7	6-8	8-9	8-10	4-6	4-6	4-6
LACE KNITTING	4-5	4-5	3-4	4-5	5-6	5-6	5-6	6-7	(7-8)	—	—	4-6	4-6	—

* Use every other needle.

- There are so many different types of yarn that it is impossible to tell you which Tension to use for which type of yarn. The above chart can only be a general guide since names and types vary in each country.
- Same as for hand knitting, you need to find the correct Tension (stitch size) for the yarn you wish to use. You will soon find out that stitch patterns look much better when knitted with the correct stitch size (Tension).
- In the centre of the carriage is the Tension dial. The dial gives you the choice between more than 30 settings. Two little dots between the numbers are Tensions as well.



When the Tension dial is set to 0, the stitches will be TIGHT (SMALL).

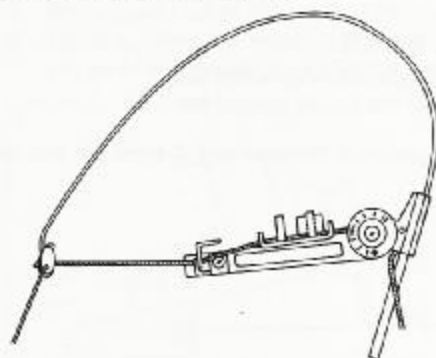


When the Tension dial is set to 10, the stitches will be LOOSE (LARGE).



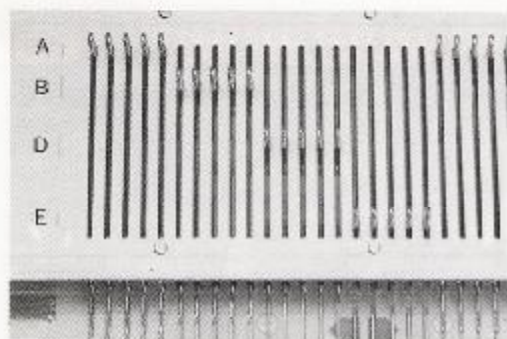
- When knitting double welts (hung hems) use Tension settings 2 or 3 numbers LOWER (TIGHTER) than for the main knitting.

ADJUSTING TENSIONS



Adjust the tension dial according to the type of yarn until the pressure on the yarn is correct and eyelet of the tension wire is level with the front yarn guide as in fig.

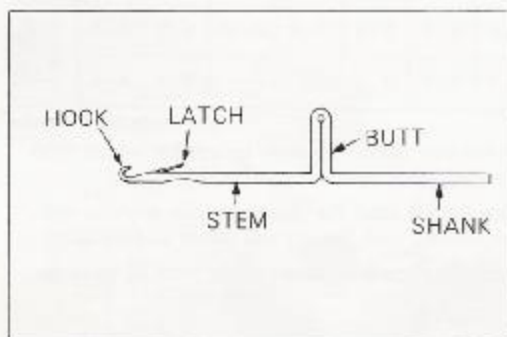
TYPE OF YARN	UPPER TENSION UNIT	TENSION DIAL
Thin, fine yarn	+ to \updownarrow	1 to 4
Medium yarn	\updownarrow	4 to 7
Medium to thick yarn	\updownarrow to -	8 to 10



NEEDLE POSITION

On BOTH sides of the needle bed are markings A—B—D—E. These are needle positions.

- A - Non-knitting position
- B - Working position for PLAIN
- D - Selected pattern needle position
- E - Holding position for partial knitting



LATCH NEEDLE

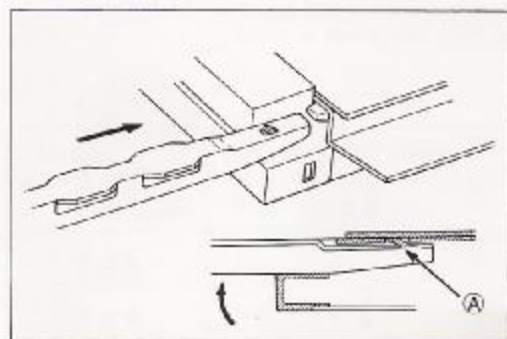
The knitting machine has 200 needles, 100 on each side of centre and numbered in groups of 10 on the needle bed.



ROW COUNTER AND ROW COUNTER LEVER

Match the guides of the row counter lever to the grooves and insert it until it is completely set.

It will automatically register a row when the carriage passes the row counter.



EXTENSION RAILS

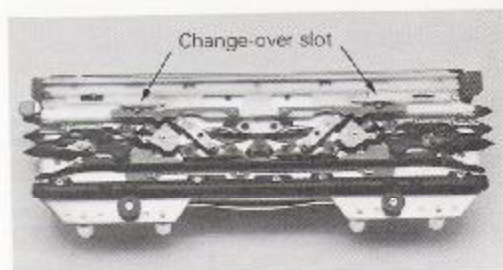
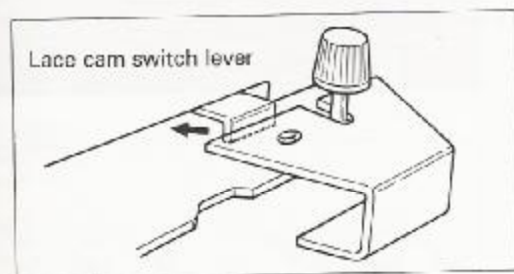
Either of the two rails will fit on either side. Insert the rails into the needle presser bar.

Lift the rail end upwards. Remove peg (A) from the bed and pull it out.

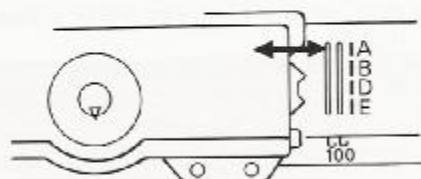
END NEEDLE SELECTION MECHANISM

In pattern knitting and lace knitting, the end needles are selected automatically (as shown in the chart) regardless of the punch card. This is to avoid dropping stitches.

End needle D Selection		Without fitting the lace attachments, both 1st needles of the pattern are always selected.	For pattern knitting except lace knitting
End needle B Selection		By fitting the lace attachments lace cam switch levers are pushed to working position, as is the end needle selection mechanism.	For lace knitting
No end needle Selection		By turning the change-over slot marked in red at the back of the carriage the end needle selection mechanism is set to a non-working position. Use the latch needle or transfer tool to turn the change-over slot.	For the knitting to use every other needle For motif knitting in patterns



PLACING THE CARRIAGE ON THE NEEDLE BED

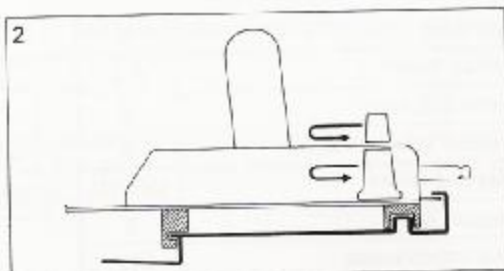
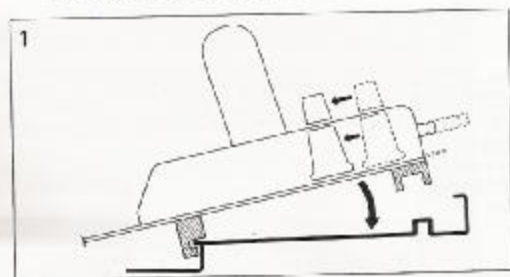


* To mount from the case end

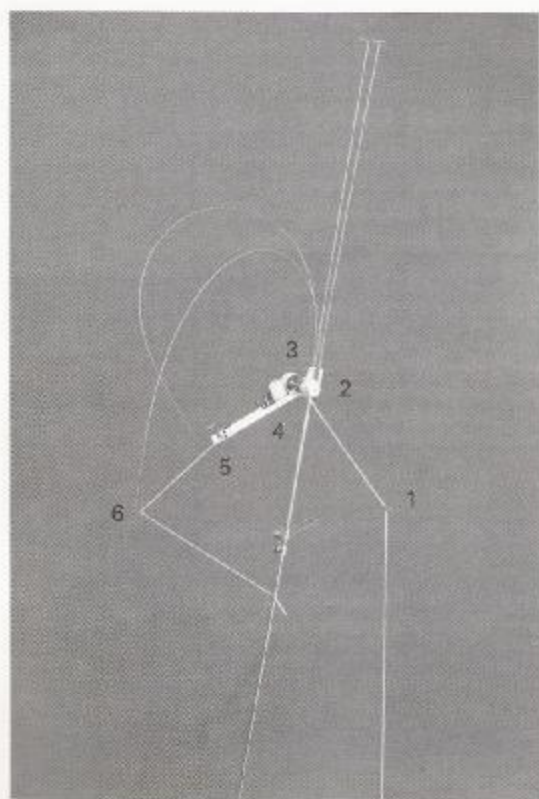
The carriage stopper works on the case end to stop the carriage dropping from the bed. To pull out the carriage or to mount it, continue sliding it outwards or inwards although it will feel "heavy". The carriage feels "heavy" when the side of carriage passes the 100th needle at either end.

* To mount from the middle of bed

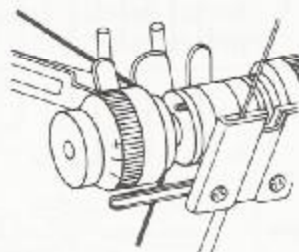
1. Set the selection lever from C to 0.
2. Fit the guide rail of the carriage into the front rail (Fig. 1)
3. While pushing the carriage release lever towards you, lower the back of carriage onto the back rail. Let go of the release lever. (This is easier to do without the fabric presser.)



THREADING THE YARN



Place a ready wound ball behind the machine. Thread the yarn end through the RIGHT side rear yarn guide 1, between the rear pin and upper tension unit 2, under the pin between two discs 3,



under the wax 4, through the front guide 5, through the tension wire eyelet 6.

Hook it onto the yarn clipper on the rod.

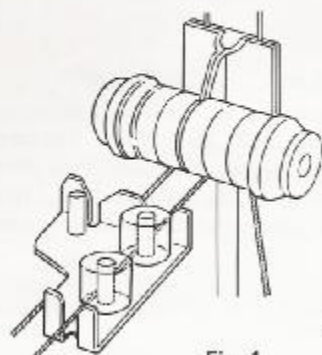


Fig. 1

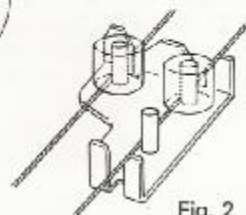


Fig. 2

For lace knitting place the two reels of paraffin wax, one behind the other, so as the lace yarn will be applied with wax twice. (Fig. 1)

*If the yarn pulls too tightly, set the upper tension dial toward — (refer to the diagram on page 7 to adjust the tension).

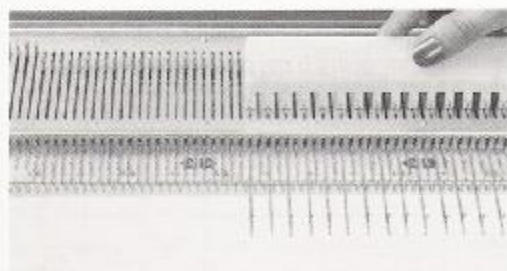
For plain and other pattern knitting. (Fig. 2)

CARRIAGE SETTING

Card lever	0	
Pattern lever	P-L	
Partial knit lever	0	
Transfer stitch lever	0	
Weaving levers	DOWN	
Tension dial	5	
Lace attachments	OFF	

Carriage is set for plain knitting.

CAST ON

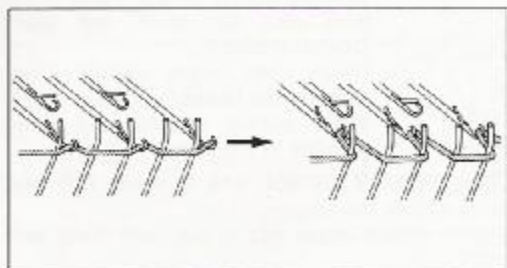


Row counter shows 000.

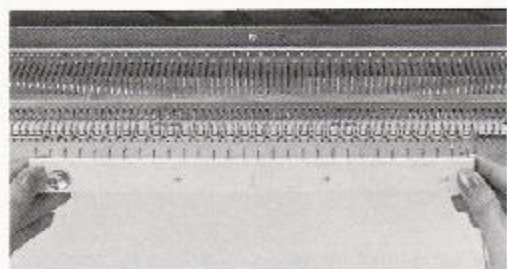
Carriage is at RIGHT and set it for plain knitting as on previous page. Take the selector comb, and with its 1/1 edge bring the every other needle to E position.



Slide open yarn feeder, thread the yarn and close the feeder. Slowly move carriage to the left, passing needles in E position.



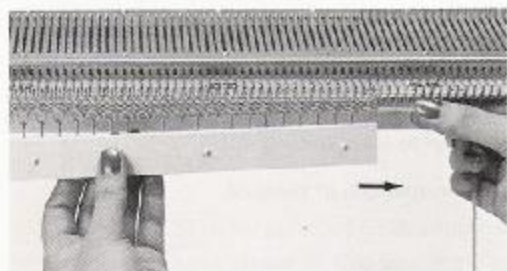
You will find that on the left edge 2 or 3 needles are pulled to the front and yarn is straight. Push edge needles to B position.



Remove cast on comb from case cover.

Hang cast on comb on loops, be sure it is balanced.

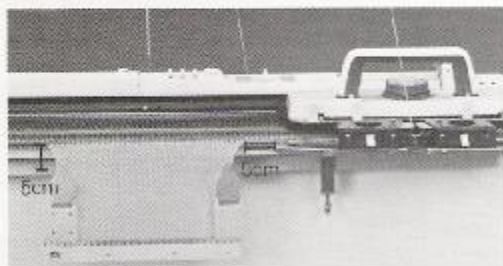
Using straight edge of selector comb, bring remaining needles in A position to B position.



Slowly knit to right, past the working needles. All needles in B position have loops.

Knit 4 more rows.

At beginning of knitting pull thread to right, this will tighten the loops of the first row and prevent cast on comb from dropping off the knitting.



Hang weights at the edges of the knitting 5 cm below the sinker. Move them up after having knitted 60 rows or one card pattern.

- * Reverse carriage after going 5 cm past knitting. Do not move it back part-way along a row.
- * If carriage jams while knitting, see page 48.

OPEN CAST ON WITH NYLON CORD



Carriage is at RIGHT and all settings for plain.

Set required needles to B position.

Thread waste yarn through LEFT side upper tension unit and into feeder ①

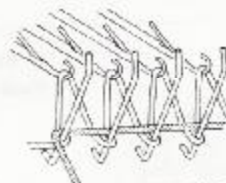
Move carriage across and pass the needles.

Adjust loops at LEFT edge.

- * On the first row knitted with "Cast on with nylon cord", set Tension dial to 7 or looser. From the second row, reset to normal tension.

Take nylon cord from accessory case.

Lay the centre of nylon cord across the loops, BETWEEN sinker hooks and needle hooks.



Hold **BOTH ENDS TOGETHER** with your left hand, pull them **DOWN FIRMLY**.

Nylon cord comes slightly lower than needle hooks.

Push centre needle and edge needles to E position.

Hold nylon cord **FIRMLY DOWN**, knit 6 rows. Pull and remove nylon cord from the knitting.

Break waste yarn, attach upper end to rod, pull lower end out of feeder ①.

Thread nylon cord into feeder ① and knit one row to right. While moving carriage let nylon cord slide through your fingers so that it can be knitted.

Attach cast on comb through waste knitting.

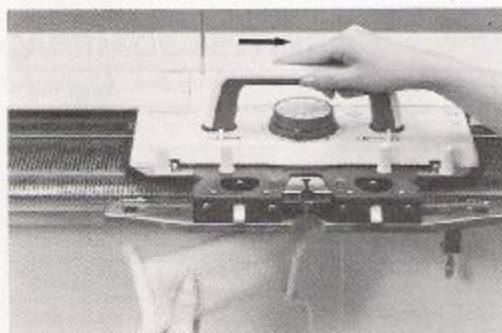
Thread main yarn (col. 1) through right side upper tension unit and into feeder ①.

Continue knitting.

The bottom edge will have open loops and no closed edge.



SIMPLE REMOVAL OF THE KNITTING



First break thread above carriage and attach upper end to rod and pull lower end down below carriage.

Hold cast on comb and slide carriage across knitting, the stitches will now come off the needles.

Use this method of removing the knitting when knitting tension swatches, samples or when you have made a mistake and need to unravel to start knitting again.

See p.40 for other methods of removal.

STEP 2

PATTERN CHART

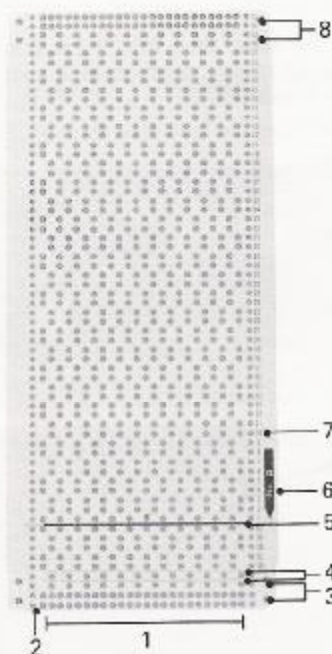
CARD NO.	FAIRISLE	WEAVING	TUCK	SLIP	LACE	REMARKS
1	★	★	★	★		Basic
2	★	★	★	★		Basic
3	★	★	★			Basic
4	★	★		★		Basic
5	★					Change colour
6	★					Motif magic
7	★					
8	★					Change colour
9	★					Change colour
10	★					
11	★	★				
12	★	★		★		
13			★	★		
14			★	★		
15	★			★		
16					★	Basic lace
17					★	Basic lace
18					★	Transfer stitches
19					★	Transfer stitches
20					★	Transfer stitches

This chart shows which type of stitch pattern can be knitted with each punch card. The mark ★ means that this card can be knitted in this type of stitch pattern.

For example:

Card No. 1—Fairisle, Weaving, Tuck, and Slip.

PUNCH CARD



- 1 — 24 needle width of punch card pattern
- 2 — Feeding holes
- 3 — Snap holes — bottom
- 4 — Card match lines
- 5 — Starting line of stitch pattern
- 6 — Card number
- 7 — Number of rows
- 8 — Snap holes — top

MARKINGS ON CARD

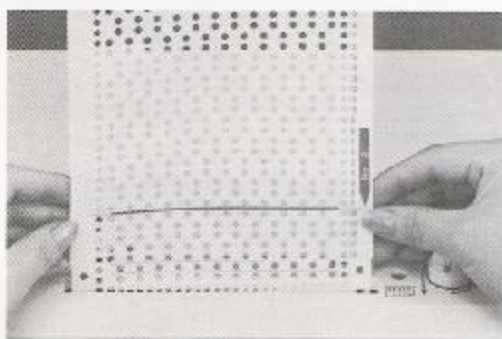
- — Change colours in feeder ②, on cards No. 5, and 9.
- — Change colours in feeder ①, on card No. 8.
- — Slide carriage across the knitting in the direction the arrow shows to select and transfer the stitches in lace knitting.
- ⊕ — After setting Transfer stitch lever to "0", slide carriage in direction of the arrow. (Cards No. 18-20)
- ⊞ — After setting Transfer stitch lever to "II", slide carriage in direction of the arrow. (Cards No. 18-20)

- ★ There are 20 ready punched cards supplied with your knitting machine. They are numbered 1 to 20.
- ★ Take care not to break or fold your punch card, this could result in faulty stitch pattern knitting.

WHAT THE NEEDLES DO

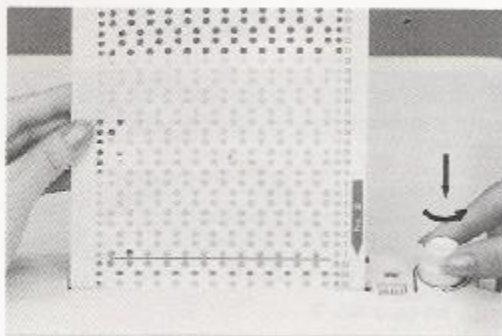
- FAIRISLE PATTERNS** : Punched position will be selected and knit col. 2 (contrast colour yarn)
- WEAVING PATTERNS** : Punched position will be selected and weave in the thread.
- TUCK PATTERNS** : Punched position will be selected and knit.
Non-selected needles will remain in B position with yarn in needle hook.
- SLIP PATTERNS** : Punched position will be selected and knit.
Non-selected needles will remain in B position, and the yarn passes under the needle hook.
- LACE PATTERNS** : Punched position will be selected for transferring stitches.

INSERTING PUNCH CARD



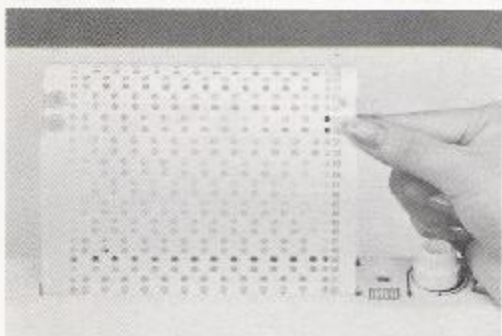
Take the punch card and hold it with the number at the **RIGHT** side.

Hold the card above the card slot and insert it. The first horizontal red card-match line runs along the top edge of card slot.



Press feeder dial and at the same time turn it for 2 or 3 positions to lock card in anticlockwise direction as shown by the arrow. Check that card is fed in level.

Turn feeder dial until punch card is half way through card slot.



Overlap the card ends, front end on top of back end and adjust the snap holes.

Join the ends with two card snaps.

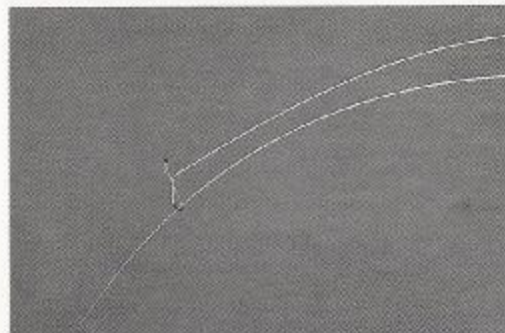
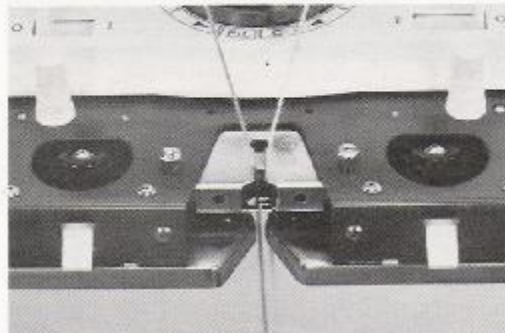
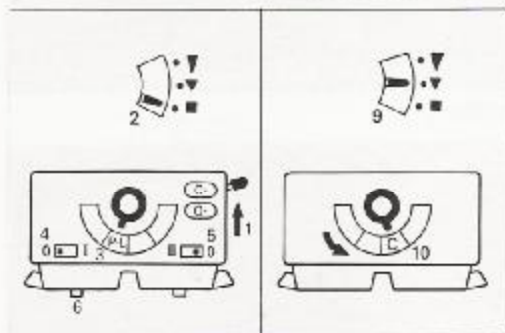
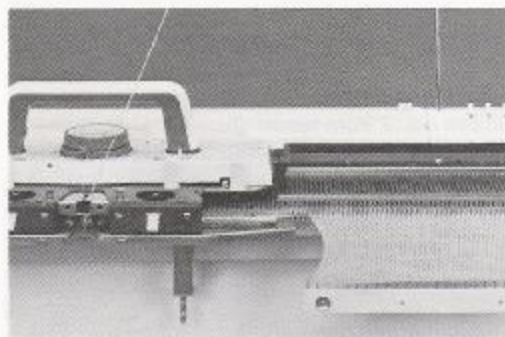
Turn punch card and set it row 1.

★ Do not reverse punch card when overlapped edges of punch card are in the machine.

FAIRISLE PATTERNS

★ For Fairisle patterns, you will knit TWO different colours in ONE row automatically. To make matters simple, we will call the main yarn — col. 1 and the contrasting yarn col. 2. Every additional colour will have a following number.

★ We recommend that all colours for Fairisle patterns should be of the same thickness.



Cast on and knit several rows of plain stitch.
Carriage at LEFT.
Insert and set punch card.

- 1 Set card lever to C.
- 2 Card stop lever at ■.
- 3 Pattern dial at P.L.
- 4 Partial knit lever at 0.
- 5 Transfer stitch lever at 0.
- 6 Weaving levers, DOWN.
- 7 Motif magic control at ●.
- 8 Change-over slot of end needle selection at ⊕.

Knit 1 row to RIGHT.
The needles have been selected in B and D positions.

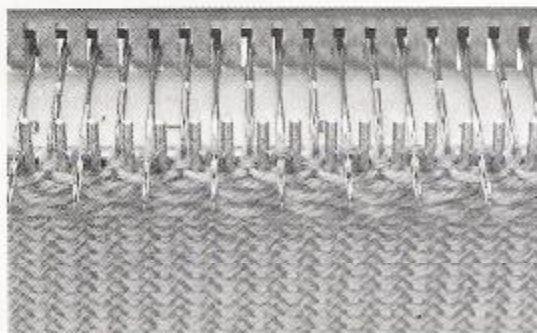
- 9 Card stop lever to ▼.
- 10 Pattern dial to C.

Set row counter to 000 and row counter lever to working position.

Thread col.2 through at LEFT side threading points of upper tension unit, and into feeder②, well BEHIND the spring clip. Fasten the end of col.2 to a table clamp.

*Hook a short tension wire to each of the long tension wires. Adjust upper tension unit. (See p.7)

*Set weaving levers UP to + for thinner yarns including medium 4 ply.



Knit 1 row to LEFT, the needles in B position have knitted col. 1 and the needles in D position have knitted col. 2.

Using the end needle selection mechanism, and needles are selected in D pos.

Release yarns from table clamp.

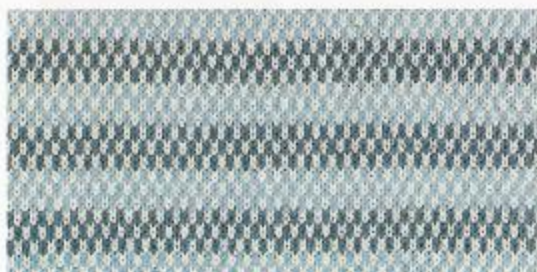
Hook weights at edges of the knitting 5 cm below the needle hooks.

Continue knitting this way.

- ★ To stop Fairisle pattern,
 - 1 Card lever to 0,
 - 2 Pattern dial to P-L,
 and remove col. 2 from feeder ②.



Card No. 1



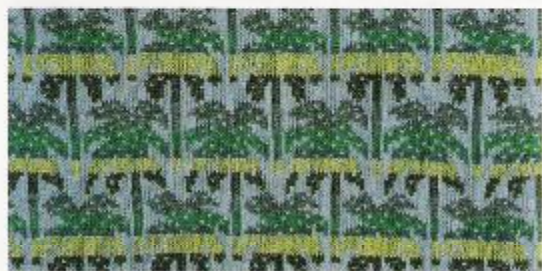
Card No. 2



Card No. 3



Card No. 4



Card No. 5



Card No. 5



Card No. 6



Card No. 7



Card No. 8



Card No. 9



Card No. 10



Card No. 11



Card No. 12



Card No. 15

EXTENDING PATTERNS

Place carriage at **RIGHT**.

Set punch card.

Set carriage as for fairisle, steps 1—8 on page 15.

Knit to left.

Thread col. 2 and set pattern dial to C.

Knit to right.

Card stop lever to ▼.

Continue knitting extended patterns.

★ While working extended patterns, change Colours at **LEFT**.

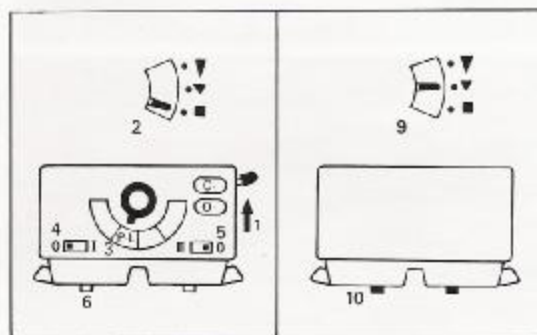


Card No. 10

WEAVING PATTERNS

Weaving stitch patterns are very popular for all kinds of fabrics. They can be knitted with very fine to very heavy type of yarns. The usage for woven material is unlimited, you can make fashionable garments from it as well as use it for carpets, cushion covers or furnishing fabrics.

When knitting woven materials, we recommend that you use a fine to medium type yarn for knitting and a heavy type yarn for the contrast. The actual knitting yarn should NOT be too thick, as the fabric will become too heavy and stiff.



Cast on and knit several rows of plain stitch.

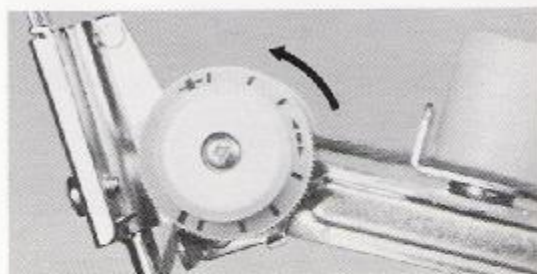
Carriage at LEFT.

Insert and set punch card

- 1 Set card lever to C.
- 2 Card stop lever at ■.
- 3 Pattern dial at P.L.
- 4 Partial knit lever at 0.
- 5 Transfer stitch lever at 0.
- 6 Weaving levers, DOWN.
- 7 Motif magic control at ●.
- 8 Change-over slot of end needle selection at ⊕.
Knit 1 row to RIGHT.
The needle have been selected.
- 9 Card stop lever to ▼.
- 10 Weaving levers UP to +.



Hook the short tension wire to the one used for the main yarn.



Adjust the tension discs, the LEFT side one to the thickness of the weaving thread between $\frac{1}{2}$ and —.

According to weaving yarn you use, change the tension dial on the carriage. When using 6 ply change tension dial 1 full number larger and when 8 ply change it 2 full numbers larger.

Set row counter to 000 and row counter lever to working position.

Thread weaving yarn through at LEFT side threading points of upper tension unit.
Do not thread it into yarn feeder ②.

Pull thread down between knitting and carriage and secure end to table clamp.

Put paraffin wax on the pins.

Knit 1 row to LEFT. Release weaving thread from table clamp.





Be sure the weaving yarn is caught in WEAVING YARN GUIDE(arrow).

Let the yarn pass under carriage towards RIGHT.
Move carriage a little further to LEFT to free weaving yarn.
Let the thread go, the tension wire will pull it up at LEFT of the knitting.

Knit 1 row to RIGHT.

The needles have been selected in B and D positions.

Again remove the weaving thread and bring it to the LEFT of carriage. Move carriage to right to free weaving yarn.

Let the thread go, the tension wire will pull it up.

Continue knitting.

- ★ To stop Weaving pattern,
1 Card lever to 0.
2 Weaving levers DOWN.
and remove weaving yarn.



Card No. 1



Card No. 2



Card No. 3



Card No. 4

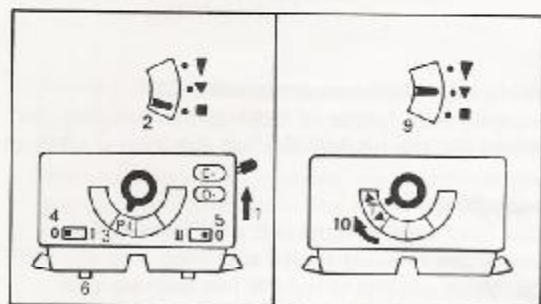


Card No. 11



Card No. 12

TUCK STITCH PATTERNS



★ To stop TUCK stitch patterns, set Card lever to 0 and pattern dial to P-L.

When casting on, hang weights at the edge of cast on comb for Card No. 1 and 2.

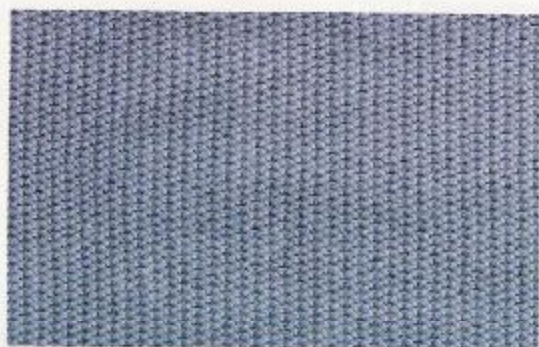
Move them up as knitting progresses.

Cast on and knit several rows of plain stitch.

Carriage at LEFT. Insert and set punch card.

- 1 Set card lever to C.
- 2 Card stop lever at ■.
- 3 Pattern dial at P-L.
- 4 Partial knit lever at 0.
- 5 Transfer stitch lever at 0.
- 6 Weaving levers, DOWN.
- 7 Motif magic control at ●.
- 8 Change-over slot of end needle selection at ⊕.
- 9 Card stop lever to ▼.
- 10 Pattern dial to T.

Set row counter to 000 and row counter lever to working position.
Continue knitting.



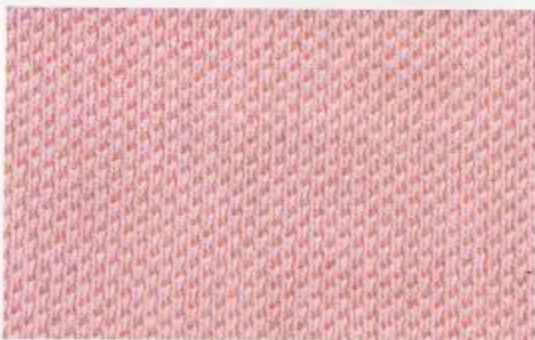
Card No. 1



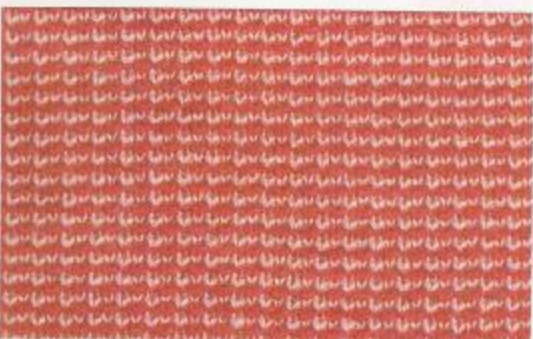
Card No. 1
Change col.1 in every 2 rows.



Card No. 1
Set pattern dial to LEFT TUCK ◀.



Card No. 2
Set pattern dial to LEFT TUCK ◀.

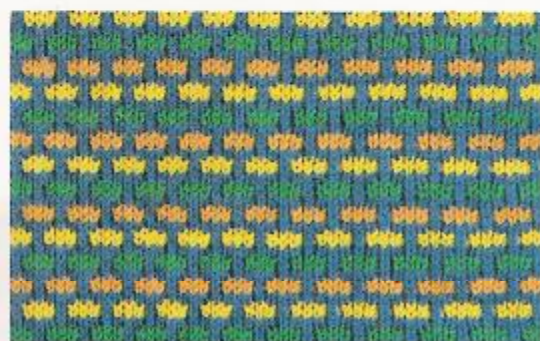


Card No. 2
Set pattern dial to LEFT TUCK ◀.
Change col.1 in every 2 rows.



Card No. 3

LARGE PATTERNS



Card No. 3

With col.2 Set pattern dial to ◀T▶, and knit 2 rows.
With col.1 Change to P-L and knit 2 rows.



Card No. 3

Change col.1 in every 4 rows.



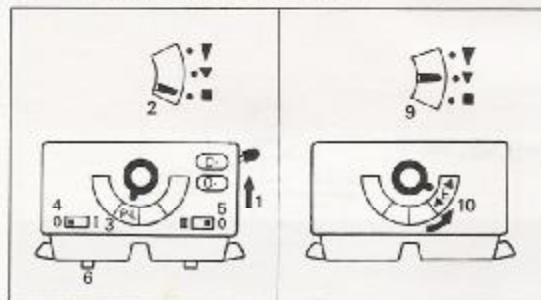
Card No. 13



Card No. 14

*If stitches fail to knit, slide carriage slowly, add extra weights or set tension dial on carriage to a smaller number.

SLIP STITCH PATTERN



★ To stop the pattern set Card lever to 0, and Pattern dial to P.L.

Cast on and knit several rows of plain stitch.
Carriage at LEFT. Insert and set punch card.

- 1 Set card lever to C.
- 2 Card stop lever at ▾.
- 3 Pattern dial at P-L.
- 4 Partial knit lever at 0.
- 5 Transfer stitch lever at 0.
- 6 Weaving levers, DOWN.
- 7 Motif magic control at ●.
- 8 Change-over slot of end needle selection at ⊕.
Knit 1 row to RIGHT. The needles have been selected.
- 9 Card stop lever to ▾.
- 10 Pattern dial to E.

Set row counter to 000 and row counter lever to working position.
Continue knitting.



Card No. 1



Card No. 2



Card No. 4



Card No. 12



Card No. 13



Card No. 14



Card No. 15



Card No. 15
Knit 11th to 30th row in Slip pattern.
Knit 6 rows in plain.

LACE PATTERNS

There are thousands of designs for garments using lace patterns. Just set the lace attachments and you can knit authentic fashionable lace.

*There are five punch cards for lace patterns, cards No. 16, 17, 18, 19 and 20. Other cards cannot be used.

*Slide carriage SLOWLY for lace patterns to avoid stitch dropping or jamming.

*We recommend the smaller number tension in the top chart on p.7 for Multiple Transfer Lace.

*If the movement of the carriage is heavy due to a low room temperature or yarn cannot be fed smoothly etc, use the optional yarn spray.

Card No.	16 and 17	Basic lace	Just slide the carriage as for other patterns. Transferring stitches, knitting and selecting needles are done at the same time.
	18, 19, and 20	Multiple Transfer lace	Transfer stitches several times to make multiple lace.

SETTING THE LACE ATTACHMENTS

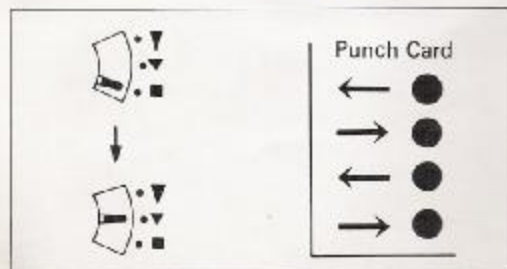
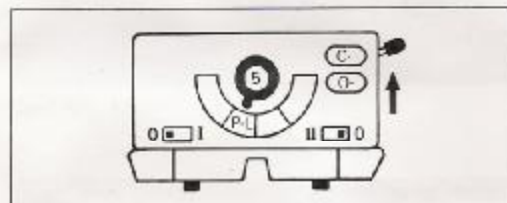


Slide the attachments onto the carriage, let both pegs on the carriage fit into the slots of the attachments. Pushing the lace cam switch lever and tighten the screws.

*Do not select needles to E position with the lace attachments on, as this causes needles to be bent.

CARRIAGE SETTING

Card lever	C
Pattern lever	P-L
Partial knit lever	0
Transfer stitch lever	0
Weaving levers	UP(+)
Tension dial	5
Lace attachments	ON
Change-over slot	Ⓜ



BASIC LACE

Operate as the procedure below for cards no. 16 and 17.

1. Cast on and knit about 5 cm of plain stitch with cast on comb.

Carriage at Left.

2. Hang weights on both edges of fabric.

3. Set carriage as shown in chart.

Be sure to set weaving levers to working position + to avoid the yarn being caught on the sinker hooks.

4. Adjusting tension

Upper tension unit	See p.7
Paraffin wax	Place 2 reels, one behind the other
Short tension wire	Non-working position

5. Insert punch card No. 16 or 17.

6. Card stop lever to ■.

7. Slide carriage to RIGHT to select needles.

8. Card stop lever to ▼.

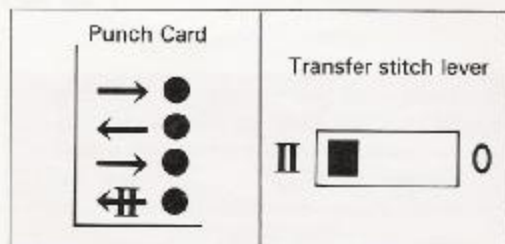
9. Slide carriage in direction of arrow.

Continue knitting.



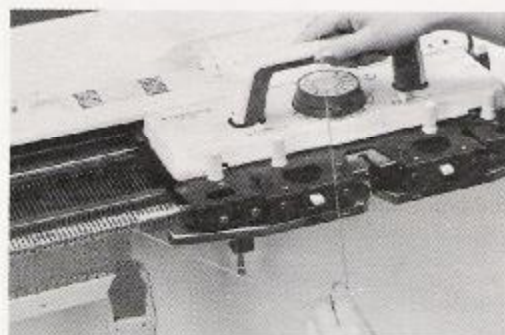
*By setting the lace attachments, the end needles will be selected to B position to avoid stitches being transferred to the adjacent needles causing dropped stitches. If needles are not selected, check that the change-over slot is set at ①.

*After knitting one card, move weights up to 5cm below top edge.



MULTIPLE TRANSFER LACE

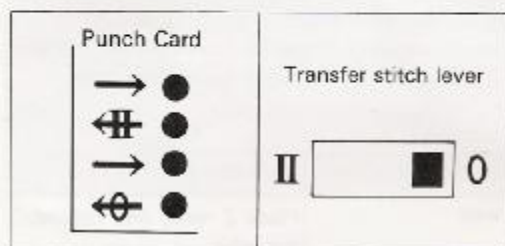
1. Use cards No. 18 to 20.
8. Follow steps 1 to 8 on previous page.
9. Set Transfer stitch lever to "II" if "II" mark is indicated on punch card.



NOTE:

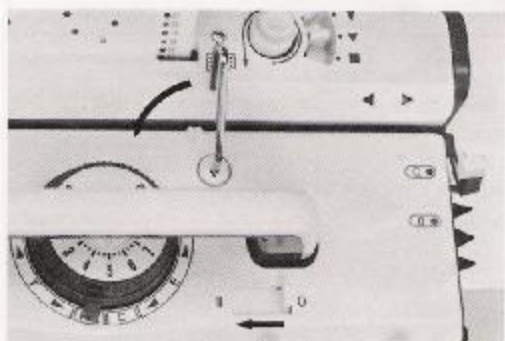
Remove yarn from the feeder, and hold it in lower front of the feeder to avoid the yarn being caught. DO NOT pull it too tightly.

10. Slide carriage to LEFT as arrow indicates. If Transfer stitch lever is at "II", the carriage will not work or knit. It will only select needles.

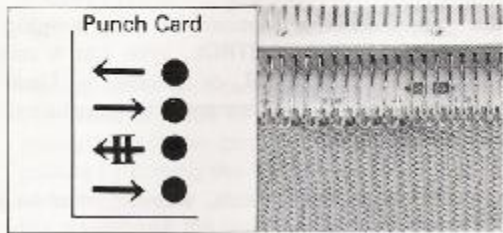


11. Slide carriage in the direction as arrow indicates.
12. Needles are not selected when "⊕" mark appears on punch card.

Set transfer stitch lever to "0". Thread yarn back to feeder and knit 1 row to LEFT.



*Row counter lever moves to non-working pos. automatically by setting transfer stitch cam lever "0" to "II". When transferring stitches, row counter does not work.



- 13. Knit one row to RIGHT as "←" mark is on punch card. Needles are selected to be transferred.
- 14. If "→" mark is on punch card, transfer stitch lever to "II". As step 9, hold yarn.

Repeat above steps 10 to 13.

*Keep weights on knitting edges. (See P.12)

You will know that the transfer stitch lever is set by noting whether the needles are selected or not.

- 1. When needles are selected after carriage movement,

Transfer lever is at "II".
Hold yarn.

- 2. When needles are not selected,

Transfer lever is at "0".



Card No. 16



Card No. 17



Card No. 18



Card No. 19



Card No. 20

MOTIF MAGIC



Card No. 1002 (Optional)



One of the very beneficial features of your knitting machine is MOTIF MAGIC CONTROL. With just a turn of it you can knit Single Motif, or Double or Triple automatically, anywhere in your garment. The possibilities of application are innumerable.

Motif Magic can be done in fairisle, weaving, and lace patterns.

Follow the instruction in each pattern.

- ★ Turn change-over slot to ⊖ end needles not selected.
- ★ Set weaving levers DOWN in fairisle pattern for Motif Magic.

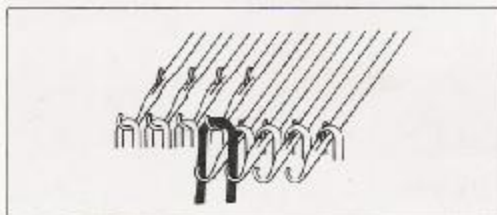
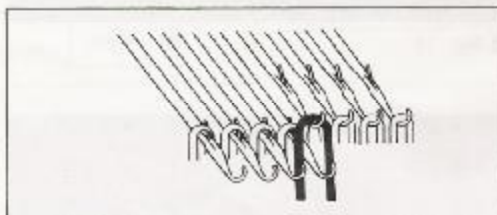
Motif Magic is divided into 5 sections on the needle bed, each section comprising 24 needles. The section numbers are printed on the film lying under the needle latches.

When it is set at the front ● mark, no motif will be knitted but the pattern will be knitted over the full width of the garment.

Motif dial will automatically transfer the stitch pattern to one of the twelve settings. You can choose one single section to knit a single motif or a repeating continuous section to knit two or three motifs.

E.g. When set at "2-3-4", motifs are made over the section 2, 3 and 4 on needle bed, see the chart below.

		FAR LEFT	LEFT	CENTRE	RIGHT	FAR RIGHT
POSITION OF MOTIF MAGIC CONTROL	●	1	2	3	4	5
MOTIF NEEDLE SECTION	100-0-100	60-37	36-13	12-12	13-36	37-60
ON THE FILM		① ①	② ②	③ ③	④ ④	⑤ ⑤



For better finishing

Carriage at LEFT.

Take one piece of col. 1 and place it over needle in B position at RIGHT of motif needles and over the FIRST of the selected motif needles. Let about 10cm hang down from the needle in B position and the rest from the motif needle.

Knit 1 row to RIGHT. Repeat the same procedure as above at LEFT of motif needles.

*Pull up col.2 yarn lightly above yarn feeder as you start to knit especially for wide-knitting or when thick yarn is used.

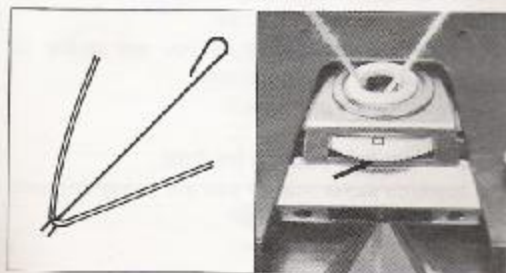
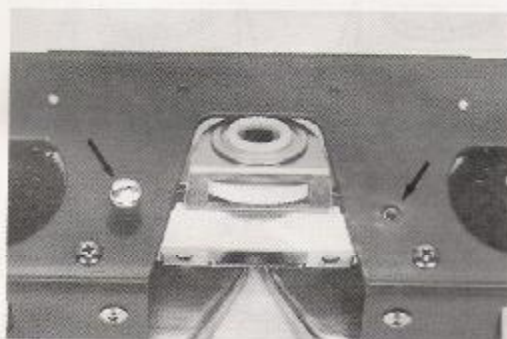
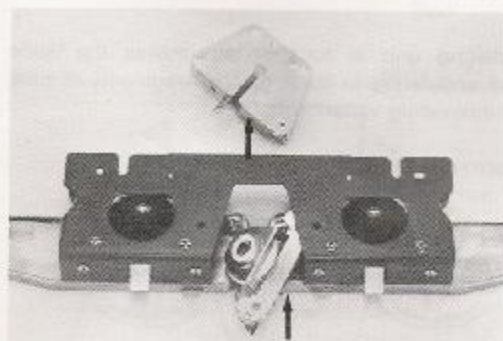
PLAITING — Using Optional plaiting feeder unit.

Plaiting is the simultaneous knitting of two colour yarns. The fabric is made in different colours on the right and wrong sides. You can also make the patterns in many colours by turning the feeder.

Let's try.

For plaiting use the special plaiting feeder unit.

Thread col. 1 and 2 through right and left upper tension units. Attach end at tension rod.



TYPE OF YARN			
ACTUAL SIZE			
NAMES	2 ply	medium 3 ply	cotton
TENSION DIAL	4-5	7-8	6-7
UPPER TENSION UNIT	⬆ ⬇ ⬆	+	⬆ ⬇ ⬆

★ Use yarns of the same thickness shown in the diagram above.

★ Place paraffin wax on the tension rods for both col.1 and col.2 yarns.

Loosen large thumb screws and remove fabric presser from carriage.

Loosen and remove small thumb screws, and turn feeder unit vertically, then take it out from fabric presser.

Take plaiting feeder unit.

Insert the unit into fabric presser as shown by arrow.

Adjust the holes for thumb screw of both the unit and fabric presser (arrows).

Tighten small thumb screws.

Plaiting feeder is set.

Attach fabric presser to carriage.

Set carriage for plain.

Turn the white part so that the ○ mark is out and you hear click sound.

Thread col. 1 into feeder using threader. (far left)

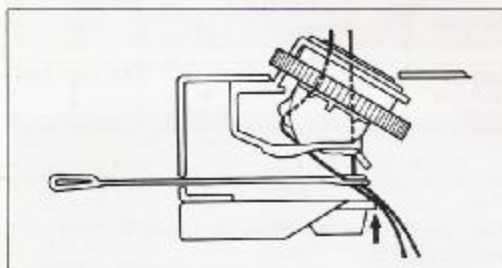
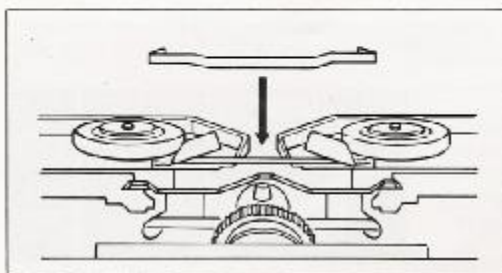
Secure the end to table clamp.

Turn white part towards the same side as you are going to move carriage, so that □ mark is out and you hear click sound.

Thread col. 2. (left)

Secure the end to table clamp.

Cast on as for ordinary knitting but be sure to hold both ends of yarns under the fabric presser away from you.



When you use hard twisted or unstretchable yarns, attach Feeder bar to prevent the yarns at the edges being reversed. After attaching plaiting feeder unit, turn the fabric presser upside down. Set Feeder bar as shown.

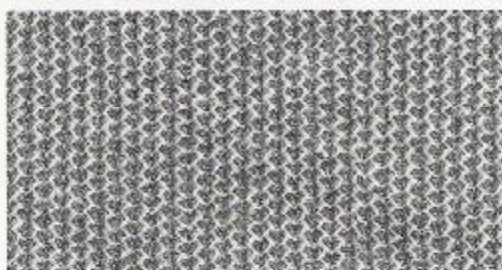
Attach fabric presser to carriage.

Thread col. 1 and 2 into the feeder at \circ and \square marks. Slide carriage to right until the feeder of carriage comes off the bed.

Holding both ends of yarns with hands, bring them behind the Feeder bar using Threader.

Start knitting following explanation on previous page.

PLAITING TUCK PATTERN

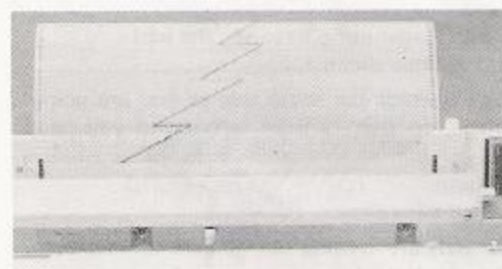


Card No. 1

Using the plaiting unit in tuck pattern makes the fabric attractive and undulating in texture. The irregularity of tuck knitting is an interesting variation.

- Turn pattern dial to "T"
- Set " \square " mark at front

YOUR ORIGINAL PLAINTING PATTERN

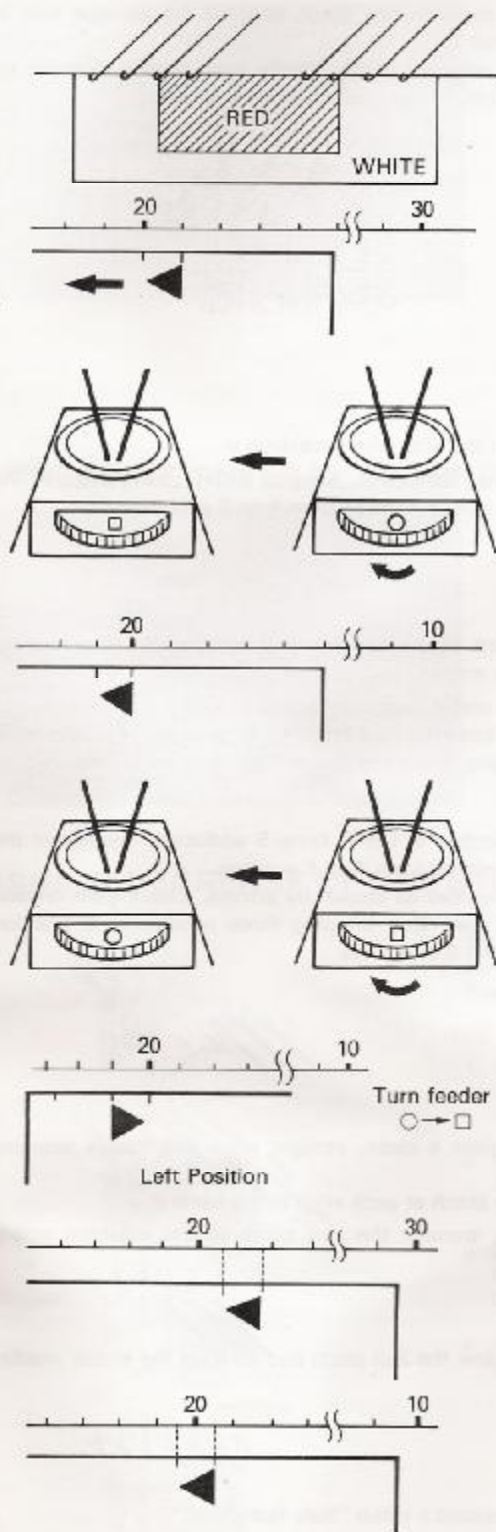


To make your original patterns, knit Tracer (optional) is very handy.

Before doing this pattern, please read carefully "How to use the adjustment marks" on p.29.

1. Draw pattern onto Knit Tracer sheet.
 2. Set row counter .
 3. Set Knit Tracer to your tension swatch.
 4. Set " \circ " mark at front. Carriage at RIGHT.
 5. Read stitch number on Knit Tracer.
 6. Slide carriage to LEFT until adjustment mark meets stitch number you have read on scale.
 7. Turn feeder forwards same side as you are going to move carriage until " \square " mark appears.
 8. Knit the rest to complete one row.
 9. Read stitch number.
 10. Slide carriage to required position on scale.
 11. Turn feeder towards same side as you are going to move carriage.
 12. Knit the rest to complete one row.
- Repeat steps 4 to 12 above.

How to use the adjustment marks for plating



Let's assume you are knitting a square pattern, changing colours at 10cm on both sides, as shown in Figure.

Ⓐ If tension dial is set at 4 or 5.

(a) When you move carriage from Right to Left.

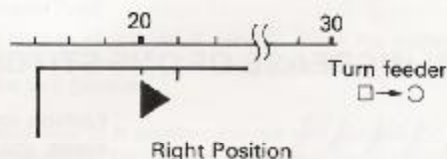
1 Set ◀ mark at Position 20 at Right on scale.

2 Turn feeder towards same side as you are going to move carriage, so ○ mark changes to ◻ mark.

3 Set ◀ mark at Position 20 at Left on scale.

4 Again turn feeder towards same side as you are going to move carriage, so that ◻ mark changes to ○ mark.

(b) When you move carriage from Left to Right.



Ⓑ If tension dial is set at 6, 7 or 8.

By setting ◀ mark at Position 20 on the scale the machine is set one and a half stitches ahead of Position 20.

*The method to turn the feeder the same side you are going to move the carriage, is the same as above step.

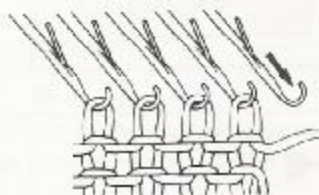
STEP 3

SIMPLE INCREASE OF ONE STITCH

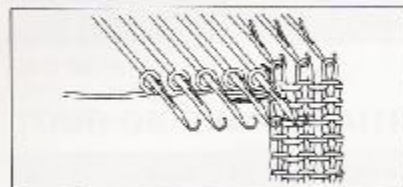
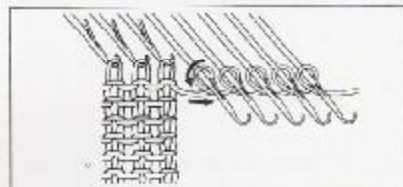
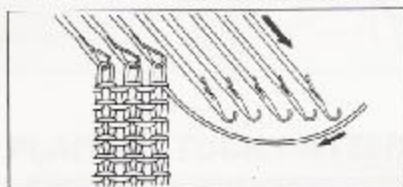


You can increase one stitch only on the carriage side in this method.

Push the adjacent empty needle from A to B position on carriage side. Move carriage across the knitting.



INCREASING SEVERAL STITCHES



Increase stitches on the side where carriage is.

To increase 5 stitches at RIGHT, bring at RIGHT hand edge of the knitting, the next 5 empty needles from A to E position.

Pull some yarn from below carriage and wind round the needles evenly as shown by arrows.

Check yarn tension and if necessary adjust it. Knit 1 row.

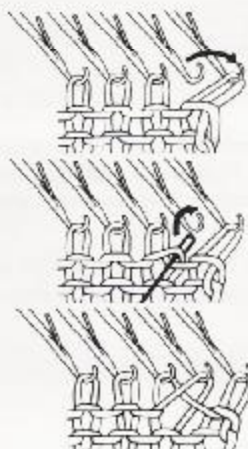
The needles have been knitted back to B position. For the next 3-4 rows, knit bringing those needles to E position each time.

For increasing 5 stitches at LEFT, bring 5 additional needles at the LEFT edge of the knitting from A to E position.

Wind yarn round needles as shown by arrows. Check yarn tension and adjust. Knit 1 row. Knit bringing those needles to E position each time for the next 3 or 4 rows.

Continue knitting.

FASHION INCREASE OF ONE STITCH



Fashion increase gives a clean, straight edge and makes seaming easier, too.

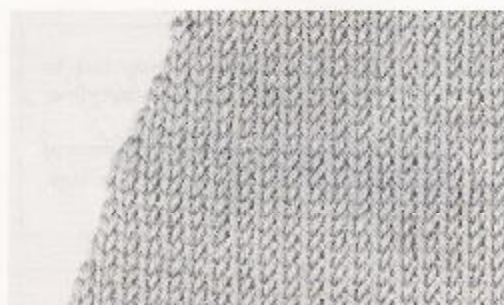
You can increase a stitch at each edge in the same row.

With transfer tool, transfer the end stitch to the adjacent empty needle.

Pick up the loop below the 2nd stitch and lift it on the empty needle.

You have now increased a stitch "fully fashioned."

SIMPLE DECREASE ON ONE STITCH



You can decrease a stitch at each edge of the same row.



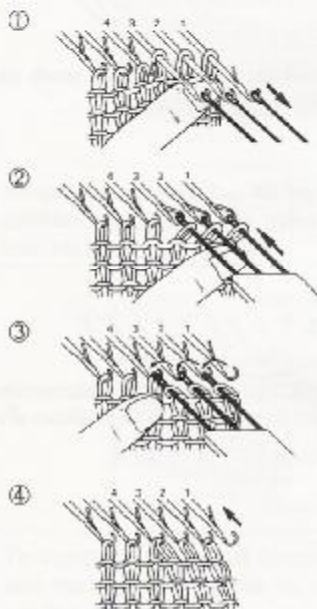
With single transfer tool remove the edge stitch off its needle and transfer it to the adjacent needle inside the knitting. Push the empty needle back to A position.

DECREASING SEVERAL STITCHES



Use the same method as CASTING OFF—BIND OFF METHOD explained on page 40.

FASHION DECREASE OF ONE STITCH — Using Double or Triple Transfer Tool



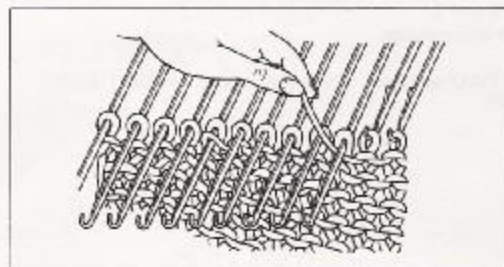
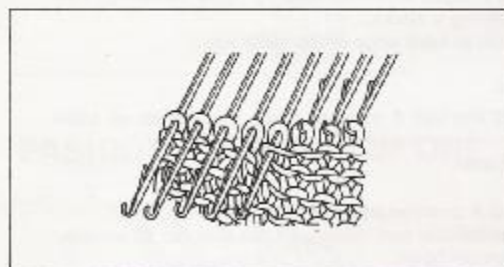
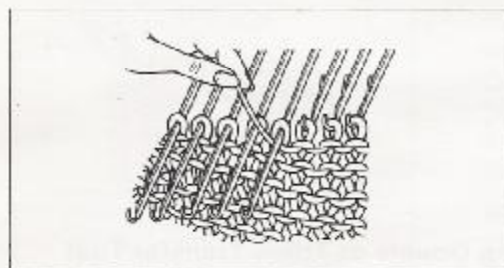
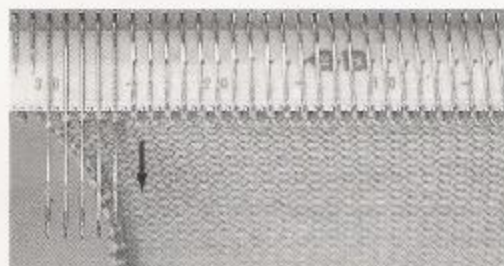
This type of decreasing stitches is mainly used for raglan shaping. This can also be used for shaping V necks. You can decrease 1 stitch at each edge of the same row.

(For Triple Transfer Tool)

- 1 Open the latches of the last 4 needles. Place the eyelets of triple transfer tool in the hooks of the LAST 3 needles. Pull needles to E position.
- 2 Push needles back to A position and pull to B position. The 3 stitches are on transfer tool. Slowly lift the tool out of needles, the latches should remain open.
- 3 Move transfer tool 1-needle space inside the knitting and into the hooks of needles 4, 3 and 2. Let the stitches slide into needles.
- 4 Needle 4 has now TWO stitches. Bring the empty needle 1 back to A position.

STEP 3

PARTIAL KNITTING BY DECREASING



IN PLAIN STITCH

Use this technique not only to make bust darts but to create shapes such as shoulder slopes, round neckline, heel and toe of sock.

Partial knitting is the technique of knitting only a part of row by holding a certain number of needles in E position.

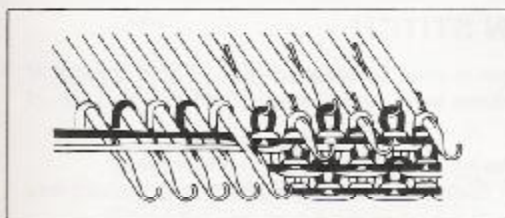
- 1 Carriage at RIGHT.
Partial knit lever to I.
At LEFT edge, push a group of needles from B to E position following your garment pattern.

- 2 Knit one row.
Bring the yarn under the first needle in E position and let it pass over the others.

- 3 Knit one row back.
*If partial knitting is required on the other side, work as same as step 1 before knitting the next row.

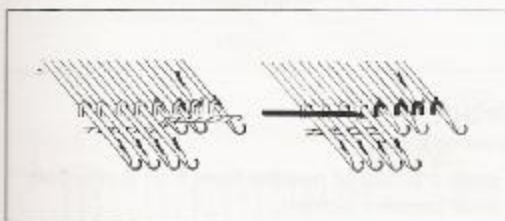
- 4 Repeat above steps.
To complete the partial knitting, push back the needles in E position at opposite end to carriage to D position and knit.
Partial knit lever to 0.

IN PATTERN STITCH

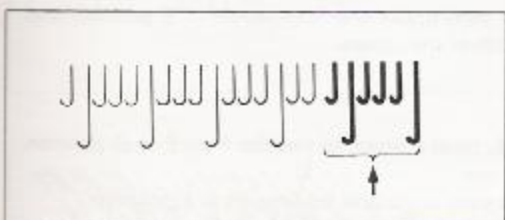


Follow steps 1 to 3 on previous page.

In **FAIRISLE** knitting, place **BOTH** col. 1 and col. 2 yarns. In **PLAITING**, place only col. 1 under the first needle. Col. 2 passes over all the E-position needles.



In **WEAVING** bring weaving yarn under all the E-position needles. Do not use weaving guide on carriage. Col. 1 is under the first needle and over the others as usually.



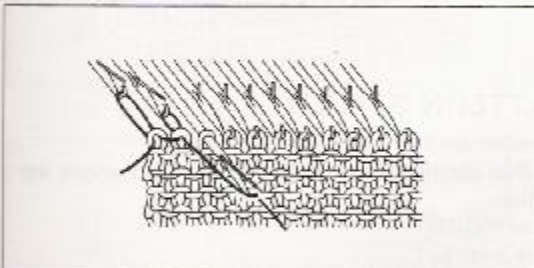
Now complete partial knitting.

Using single transfer tool, set the needles from E to B or D position following the pattern position.

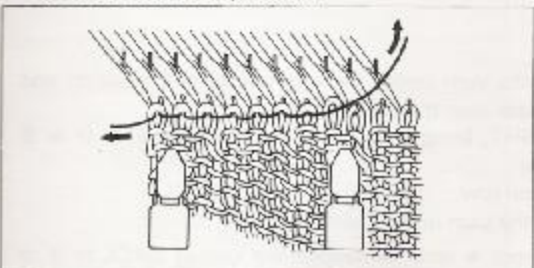
Knit one row.

Partial knit lever to 0.

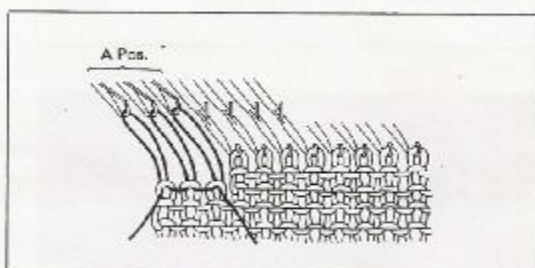
IN LACE PATTERN



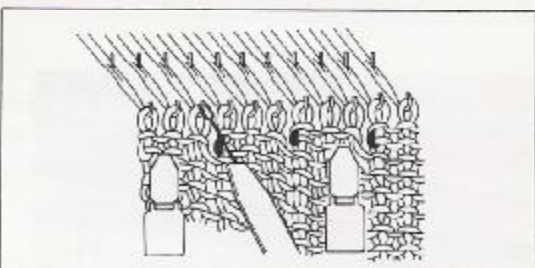
1. Bring required needles to be decreased to D position. Knit with the nylon cord and push needles back to A position.



3. To complete the partial knitting, hang weights and transfer the stitches to the hooks of the needles.

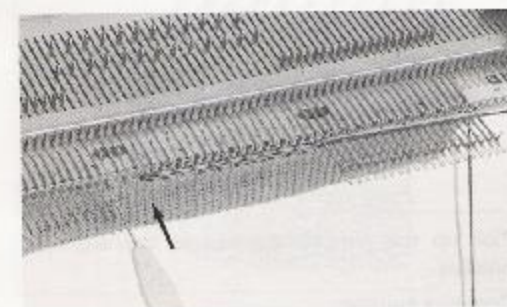
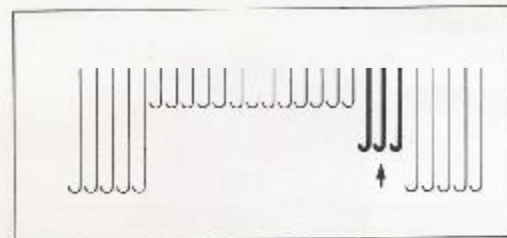
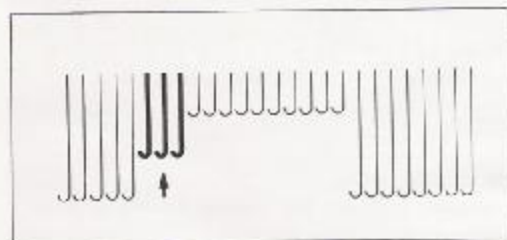


2. Knit two rows.
Repeat steps 1 to 2.



4. Pick up the marked stitches to the adjacent needles.
Continue knitting.

PARTIAL KNITTING BY INCREASING



IN PLAIN STITCH

This technique is used for shaping such as side corners of skirt panel above hem, puffed sleeves and heel and toe of sock.

Some needles are already in E position in this case. Assume that the needles are in E position at both right and left edges.

Carriage at RIGHT.
Partial knit lever to I.

★ At LEFT, push a group of needles from E to D position, following your garment pattern.

Knit one row.

Bring the yarn under the first needle in E position and let it pass over the others.

At RIGHT, push a group of needles from E to D position. Knit one row.

Bring the yarn under the first needle in E position.

Repeat from ★ until all needles are knitted BACK to B position.

Partial knit lever to 0.

IN PATTERN STITCH

Some needles are in E position in this case.

Assume that the needles at both right and left edges are in E position.

Carriage at RIGHT.

Partial knit lever to I.

★ At LEFT, using single transfer tool, push a group of needles from E to D or B position following your garment and stitch pattern.

Bring the yarn under the first needle in E position and let it pass over the others.

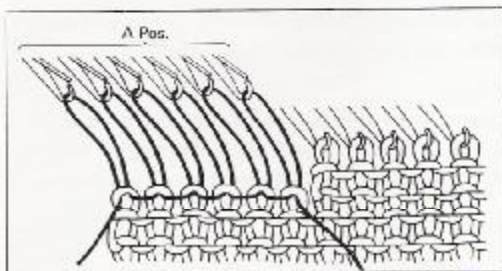
At RIGHT, bring a group of needles from E to D or B position.

Knit one row.

Bring the yarn under the first needle.

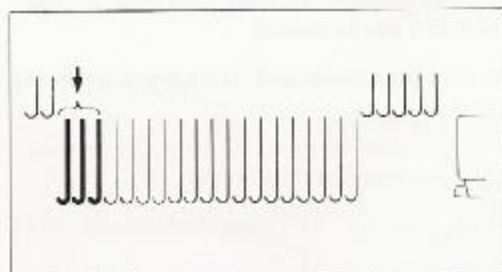
Repeat from ★ until all needles are knitted BACK to B or D position.

Partial knit lever to 0. Continue knitting.

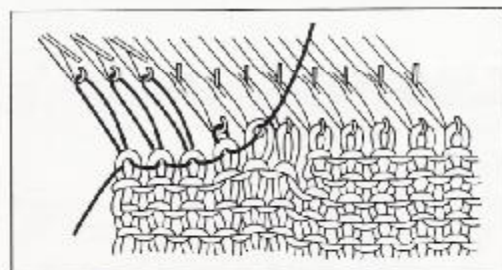


IN LACE PATTERN

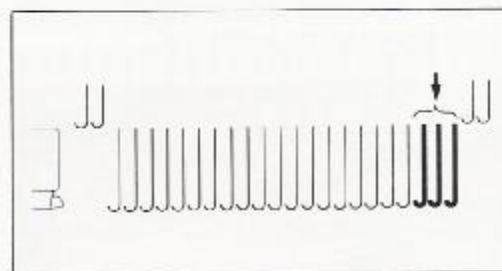
Some needles are in A position knitted with nylon cord at both edges.



Bring required needles to be increased to B position.

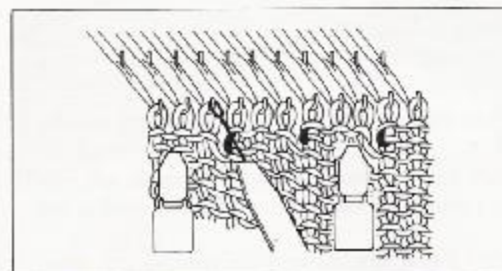


Pull nylon cord to hook the stitches onto the needles.



Knit to Left.

Bring required needles to be increased to B position.



Repeat above until all needles are knitted.

Pick up the marked stitches to the adjacent needles.

PLAIN HEM



Making hem is started with some waste knitting. Waste yarn will be removed after turning up the hem.

Carriage is at right.

Thread the waste yarn through right side upper tension unit. Cast on using cast on comb as explained on pages 11 and 12. Knit 10 rows, carriage at left and all settings for plain.

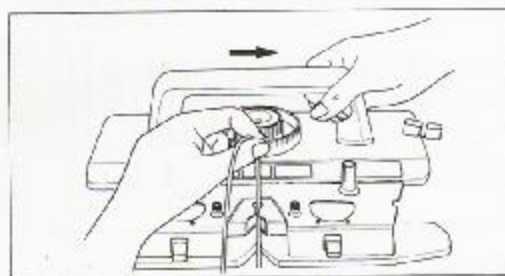
Thread nylon cord into feeder ① and knit one row to right. While moving carriage, let nylon cord slide through your fingers so that it can be knitted.

Remove nylon cord from feeder and let it hang down from the knitting.

The nylon cord will later be removed from the knitting thus separating the waste yarn from the hem.

Thread col. 1 through left side upper tension unit and into feeder ①.

Check and adjust yarn tension below and on top of carriage, there should not be any slack yarn anywhere.



Let's assume you will knit the garment with Tension 6
Set row counter to 000.

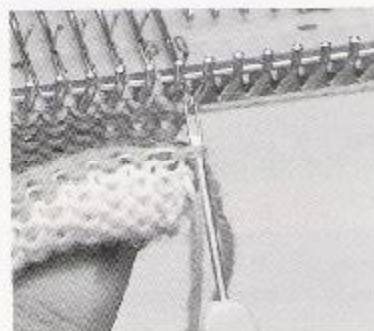
Knit 1 row Tension 6, row counter at 1.

Knit 9 rows Tension 5, row counter at 10.

Knit 1 row Tension 7, row counter at 11.

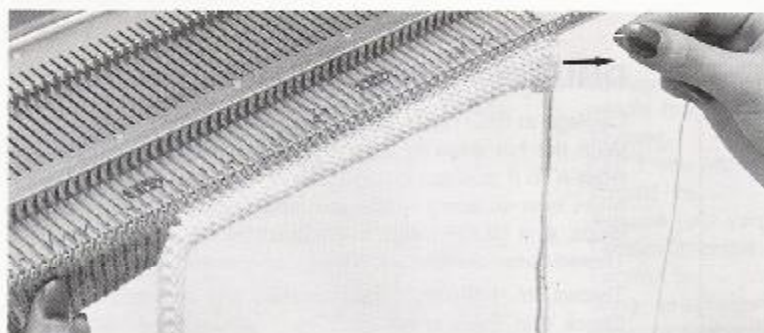
Knit 11 rows Tension 6, row counter at 22.

The first half, the back side of hem, is knitted with tighter tension to keep the shape. The normal stitches of row 1 make it easy to pick up the loops when turning up the hem. Row 11 with loose tension is "the turning row".



Remove cast on comb from the knitting. Open the needle latches. Fold the hem half way up. Take single transfer tool and insert it into the FIRST loop of the FIRST row knitted in col. 1, above nylon cord (small picture). Place the tool into the FIRST needle in B position at the RIGHT, let the loop slide into the needle hook. This needle will now have two stitches. Lift the following stitches of the row knitted after nylon cord into their needles. All needles will have 2 stitches.

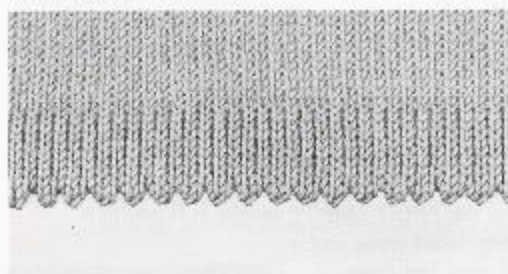
After a little practice you can use double or triple transfer tool and lift 2 or 3 stitches into the needles at a time.



Pull out nylon cord from the hem. The rows knitted with waste yarn will fall away from the hem.

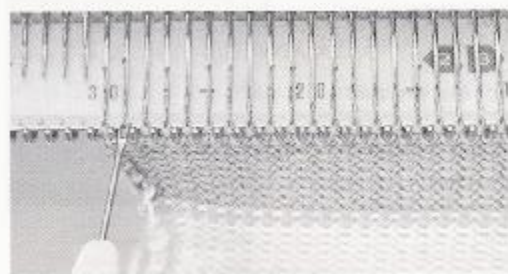
Knit 10 more rows. Attach cast on comb to the knitting above hem. When knitting hems using thick yarns, bring the needles to E position after having pulled out nylon cord from the knitting.

PICOT HEM



Picot hem gives a delicate finishing touch, and is often used for feminine garments and baby knitwear.

To make picot edge you will transfer alternate stitches using transfer tool or lace attachment.



Carriage at RIGHT and all settings for plain. Cast on with waste yarn, knit several rows. Carriage at left.

Remove waste yarn from feeder.

Knit nylon cord to right.

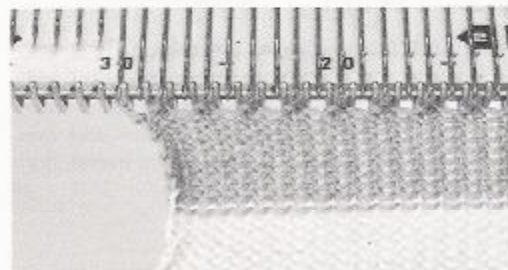
Thread col. 1 in feeder (1).

Set row counter to 000.

Assume your garment tension is 6.

Tension 6, knit 1 row.

Tension 5, knit 9 rows, row counter at 10.



Take single transfer tool and starting with the SECOND needle from LEFT, transfer every 2nd needle on to its adjacent needle to right.

Leave 2 end needles at right without transferring.

★ You can transfer the stitches with lace attachments using punch card No. 1.

Make sure all the needles are in B position.

Tension 6, knit 11 rows.

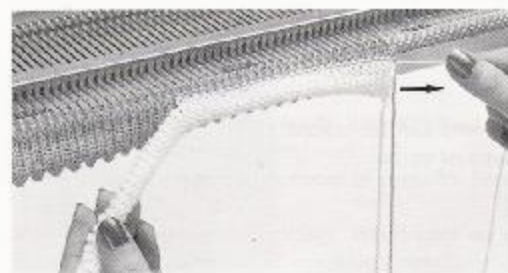
Remove cast on comb from the knitting.

Place all the loops of the FIRST row knitted in col. 1 above nylon cord on to needles.

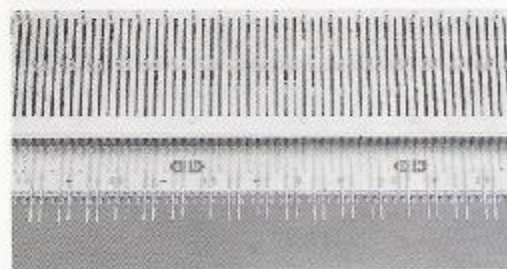
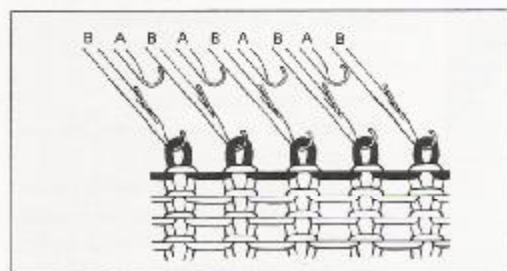
Pull nylon cord from the knitting.

Knit another 10 rows. Attach cast on comb to the knitting above hem.

Continue knitting.



DOUBLE WELTS (HUNG HEMS OF MOCK RIB)



DOUBLE 1—1 WELT

Carriage at RIGHT, all settings for plain.

With the 1/1 edge of selector comb, push every 2nd needle from A to B position.

Make cast on using waste yarn and hang cast on comb onto loops. Knit 10 rows with every 2nd needle. Carriage at LEFT. Thread nylon cord into feeder ①, knit one row to right.

Thread col. 1 through upper tension unit and into feeder ①. Check that there is no slack yarn above or below carriage. Set row counter to 000.

Assume you are using a medium type of yarn suitable for Tension 6.

Set tension dial to 3.

Knit number of rows required for depth of welt, approx. 50 rows.

With straight edge of selector comb bring remaining needles in A position to B position.

Remove cast on comb from knitting.

Fold hem half way up.

Take single transfer tool and slide it into the FIRST loop of the FIRST row knitted in col. 1 above nylon cord.

Lift loop onto the FIRST EMPTY needle in B position.

Continue lifting loops onto empty needles until welt has been completely turned up.

Hang last loop on the left end needle.

Pull and remove nylon cord from welt.

Continue knitting.

1-1 Double welts are usually knitted when using medium(4ply) to thick yarns.



DOUBLE 2—1 WELT

Push every 2nd and 3rd needles to D position. It is not possible to hang cast on comb into the loops. You will have to make OPEN CAST ON as on page 12.

Assume your yarn is suitable for Tension 6.

Set Tension to 4 and row counter to 000.

Follow steps above in 1 x 1 welt.

Fold the hem half way up.

Pick up loops of FIRST row knitted in col. 1 on to every 2nd and 3rd needles.

2-1 Double welts can be knitted with every type of yarns.



RIBBED BAND



Carriage at RIGHT, all settings for plain. Set every second needle from A to B position. Cast on with waste yarn, knit 10 rows.

Knit 1 row with nylon cord.

Thread col. 1.

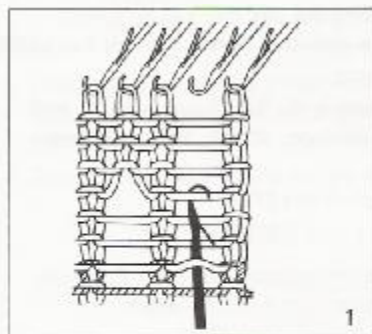
Assume your yarn is suitable for Tension 6.

Tension 3, knit 4 rows.

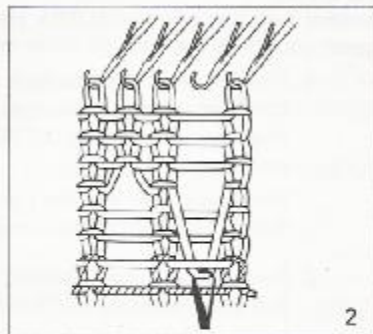
Tension 5.

Bring in-between needles to B position. At left push an adjacent empty needle to B position. Stitch number should now be even for seaming.

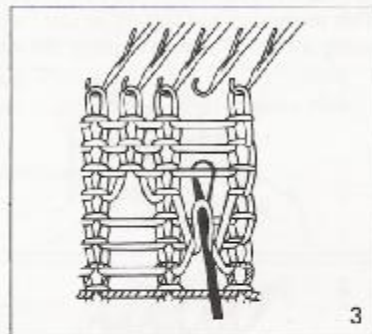
Knit approx. 10 rows.



Lift 2nd stitch off its needle and make it run down. Insert latch tool, and pick up FIRST and FOURTH bars above nylon cord.



Pull 4th bar behind 1st one. The latch will close on the upper bar. Move UP latch tool and let the loop slide behind the latch.



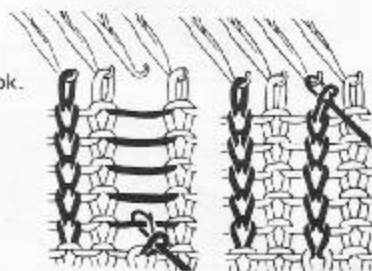
★ Catch the next bar. Pull down the tool, and let the bar pulled through the loop and slide it behind the latch. This will form a purl stitch.

Repeat ★ until the last bar forms a loop. Place this loop into the needle hook.

Repeat the above with every 2nd stitch. Leave two edge stitches at left without being purred.

Knit the rest of required number of rows for band. Purl up the stitches.

Pull nylon cord out of knitting. Insert cast on comb through welt, set Tension to 6 and continue knitting.



CASTING OFF — BIND OFF METHOD

This way you can either decrease or cast off stitches.

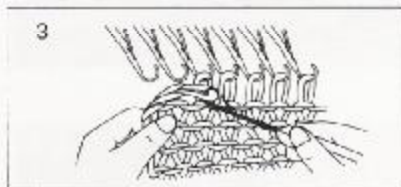
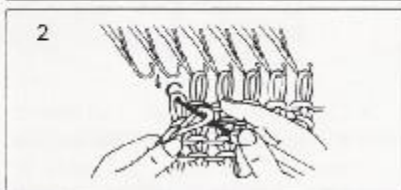
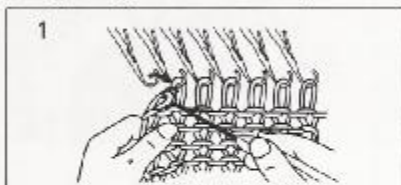
Start casting off at **RIGHT** if carriage is at **RIGHT**, and start at **LEFT** if carriage is at **LEFT**.



- 1 Assume carriage at right.
Using single transfer tool, transfer **RIGHT** edge stitch to its adjacent needle at **LEFT**. Push the needle with two stitches from B to E position.
- 2 Push the needle with two stitches back to D position, the two stitches must remain behind latch.
The needle latch must be open.
Pull the yarn from carriage and place it from **RIGHT** to **LEFT** across the open needle hook.
- 3 Pull the needle back to B position. The yarn has been pulled through both stitches and has now formed a loop in the needle hook.
Repeat this until required number of stitches are cast off on the last stitch at left.
Remove the piece from the machine.
DO NOT PULL THE YARN TOO TIGHT otherwise the width of your cast off will not correspond to the width of your garment.

CASTING OFF WITH BIG LOOPS

This method of casting off is used when knitting with thin to medium thick yarns since the last row will be knitted using a larger Tension setting. So we suggest you to do this cast off when using a yarn that needs Tension 7 or LESS.



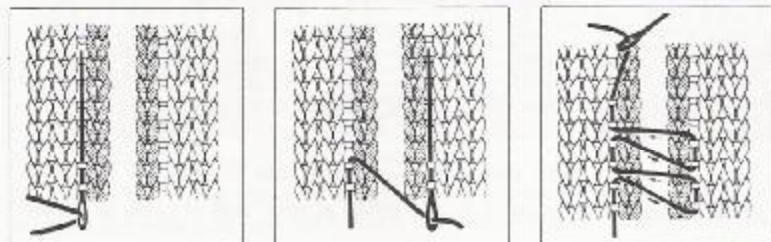
- 1 Finish knitting with carriage at **LEFT**.
Let's assume your tension setting is 6. Set Tension to 9, knit one row. Break yarn **BELOW** carriage, attach the upper yarn end to rod.
Insert latch tool into the **FIRST** stitch at **LEFT**.
Remove the stitch from needle.
- 2 Push the latch tool forward until the stitch is **BEHIND** the latch.
Pull your forefinger on the latch and hold down on stitch.
Insert latch tool into the 2nd stitch and remove it from needle.
- 3 Pull the 2nd stitch through the first one.
Let the 2nd stitch slide behind the latch and hold it down.
Remove the 3rd stitch from its needle and pull it through the 2nd stitch.
Continue this way until the last stitch is on latch tool and behind the latch.
- 4 Pull yarn end through the last stitch, this way you cast off the last stitch.

NOTE: When you have knitted the last row with the loose Tension towards **LEFT**, you must start casting off at the **RIGHT** edge. **ALWAYS** start casting off on the opposite side of carriage.

It will be easier to off if you bring the needles to E position.

FINISHINGS

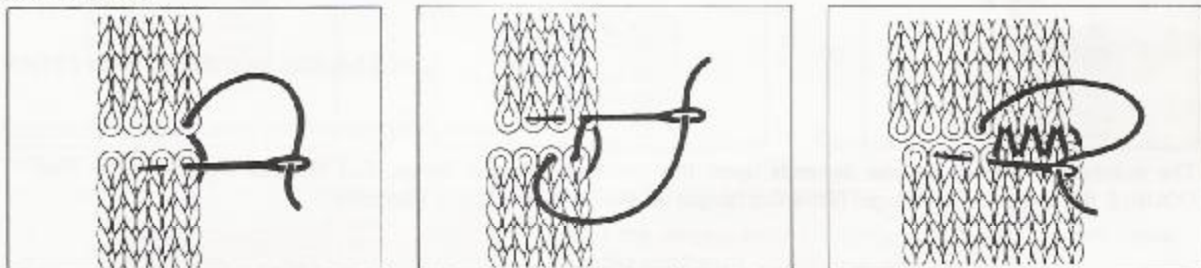
MATTRESS STITCH OR INVISIBLE SEAMS



Always take one edge stitch of each piece of knitting. Pick up two crossbars alternately several times. Hold the seam and pull the sewing thread so that the edges are pulled together and leave on invisible seam.



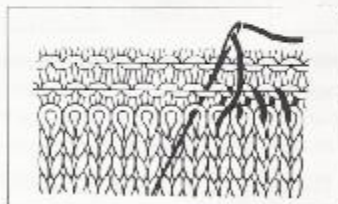
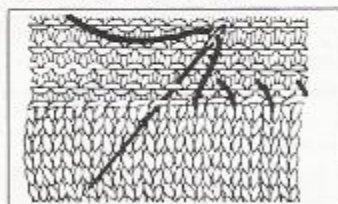
GRAFTING



Finish the pieces with waste knitting. Turn in the waste yarn and graft stitches. This is ideal for joining should seams, attaching hems and cuffs, and other applications where you do not want noticeable seams between two pieces.

After a little practice you will be able to graft stitches so that the seams will become practically invisible.

SEWING UP HEM

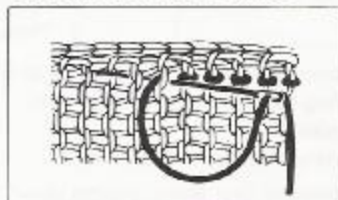


When sewing up hem, make sure you always sew through the stitches of the SAME row otherwise the hem will not be straight.

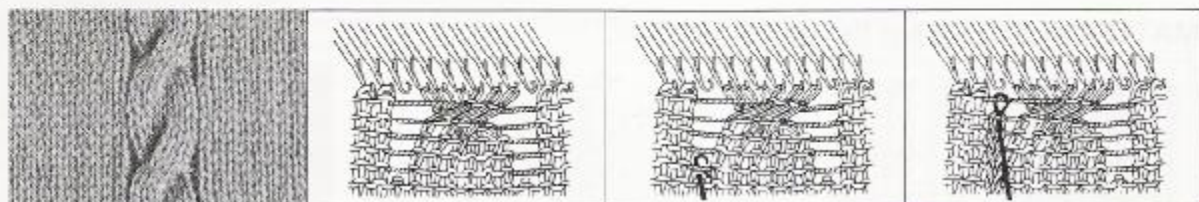
CROCHET SEAM



BACKSTITCH SEAM



CABLE STITCH PATTERN



- 1 Instead of transferring the 4th stitch let it run down each time when you cross the stitches for the cable.
- 2 When the cable is finished, run stitch down to bottom of pattern. Rib up stitch at each side of cable as shown in diagram.

FRINGES



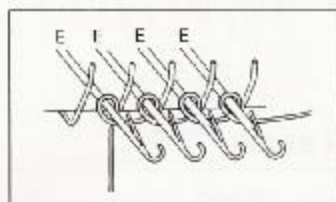
The number of strands to use depends upon the thickness of your fringe. Cut threads slightly longer than **DOUBLE** the length of the fringe. Make the fringes as shown by the above diagrams.

POMPONS



- 1 Cut two round pieces of cardboard to the size you want the pompons to be.
- 2 Thread the tapestry needle with yarn for pompon and sew round both circles until centre hole is filled up.
- 3 Cut thread round outside edge and separate the circles slightly.
- 4 Take thread or cord and tie round the centre of threads between the circles, secure end. Trim.

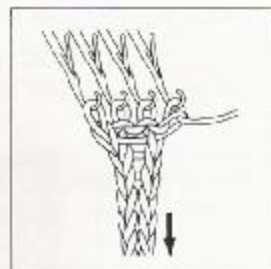
KNITTING A CORD



A knitting cord can be used in many different ways such as drawings for blouson tops or sleeves. We recommend that you use a rather tighter tension for knitting a cord.

- 1 Carriage is at **RIGHT**.
- 2 Pattern dial to **RIGHT E** ▶.
- 3 Thread up yarn.

- 4 In centre of machine bring 3 to 5 needles to **E** position.
 - 5 Make a winding cast on round the needles.
 - 6 Yarn is in feeder ①.
 - 7 Knit 1 row, bring needles to **E** position.
- Repeat Step 7 three or four times, pulling down the yarn end.
Continue knitting cord, and cast off stitches.



TENSION SWATCH

To knit perfect fitting garments, it is necessary to knit a tension square or swatch to determine the correct stitch size for the yarn and the pattern you are going to use.

SMALL TEST SAMPLE

You must find the suitable Tension setting before you knit a tension swatch by making test samples as below: Set Tension dial as you think suitable for the yarn. With the same yarn as for knitting your garment cast on 20 or 30 stitches and knit approx. 20 to 30 rows.

Feel if the fabric has the right touch. If it is too loose or too tight change the tension setting accordingly and continue this way until you have found the correct tension setting for the yarn and stitch pattern you wish to knit. Note tension setting, remove sample from machine and unravel it.

- WRONG TENSION SETTING CAUSES:
- 1 Jamming of carriage
 - 2 Hard knitting
 - 3 Faulty stitch patterns
 - 4 Dropped stitches

KNITTING TENSION SWATCH

Cast on 60 stitches using col. 1 and knit 80 rows.
Remove the swatch from machine.



RESTORING STITCHES

Pull the tension swatch slightly lengthwise, this will close up the stitches.

Check ironing instructions of yarn before pressing your tension swatch. Man-made yarns will be distorted under steam and heat and must NOT be ironed.

When using materials which need pressing such as wool and wool-blend yarn, place the swatch on the ironing board with its WRONG side up. If you like you can pin it on to the board. Do NOT press the iron, JUST LET THE STEAM PENETRATE THE FABRIC.

It is always a good thing to let the swatch rest for 24 hours before measuring.

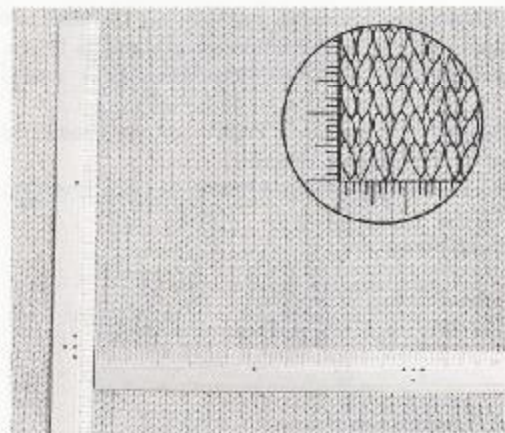
MEASURING TENSION SWATCH

Place the swatch on a table with the RIGHT side up.

Use a ruler or a tape measure across the centre of the swatch, count the number of stitches within 10 cm.

Place the ruler in the other direction and count the number of rows within 10 cm.

Make a note of yarn quality used, tension setting, and stitches and rows to 10 cm.



HOW TO KNIT A LADY'S PULLOVER

This instruction is for the pullover using medium 4 ply yarn in plain stitch.

*Pattern measurement: Bust 90cm
Length 60cm
Sleeve length 56cm

*Material: Medium 4 ply yarn approx. 400grms

*Gauge: 31 stitches by 43 rows in 10cm with Tension dial at 5

*How to calculate the tension swatch measurement

Assume you tension gauge is 31 stitches and 43 rows in 10 cm.

You wish to knit a garment 52cm in width and 54cm in length.

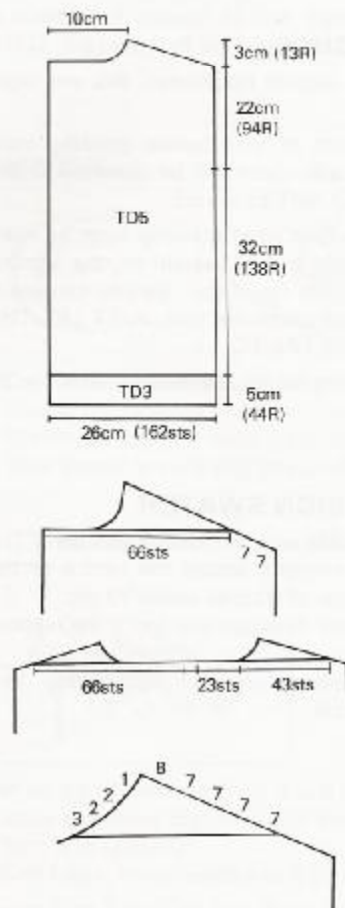
31 stitches X 5.2 (52cm) = 161.2 stitches, let's make it 162 stitches, an even number.

43 rows X 5.4 (54cm) = 232.2 rows, let's make it 232 rows, an even number.

*Abbreviations

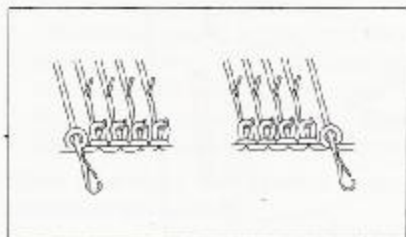
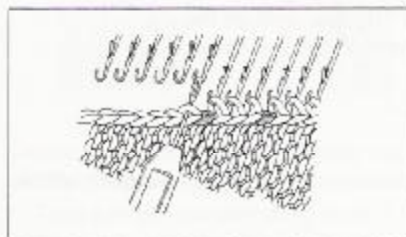
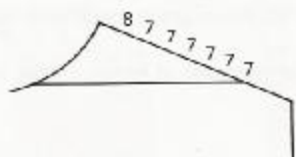
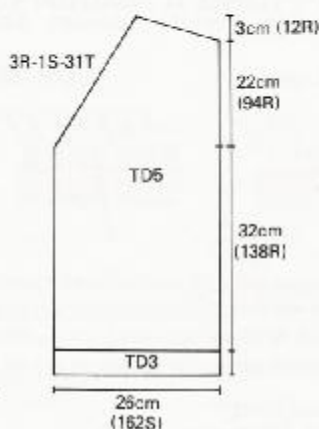
BYE = Bring yarn under the first E position needle
cm = centimetres
dec = decrease

pos = position
st(s) = stitch(es)
TD = Tension dial



BACK

1. Cast on 81 sts at each right and left of machine centre. See p.38 for double 2X1 welt. Carriage at Right. Knit 44 rows with two full number tighter tension (TD3). Fold the hem half way up. Pick up loops of first row onto every 2nd and 3rd needles. Remove nylon cord.
2. Set TD to 5. Knit 138 rows.
3. Put mark at the edge of knitting.
4. Knit 94 rows.
5. Carriage at Right. Partial knit lever to I. See p.32. Bring 7 needles on the left to E pos, knit to left. BYE and let it pass over the others. Push up 7 needles on the Right to E pos, knit to Right. BYE. Repeat above steps.
6. For Neck edge and Shoulder, bring to E pos all needles at left and 23 needles at right of centre to hold sts. Work Partial knitting by dec sts as Fig.
7. After finished partial knitting, break the yarn leaving the yarn end 6 times of the shoulder width. Push back right shoulder to D pos. (24th to 81st) Cast off with waste knitting. Push back empty needles to A pos.
8. Put the mark at the centre of the neck. Push back the needles to D pos. Cast off with waste knitting. (46sts)
9. Push back the needles to D pos. Make left side of neck reversing shapings. Waste knitting over remaining sts.



FRONT

- 1 to 3 Work as for BACK.
4. V-neck
Carriage at Right. Bring all needles at left of centre to E pos. Set partial knit lever to I.
5. With double transfer tool, at every 3rd row, dec 1st, 31 times.
6. Dec sts to shape shoulder by partial knitting in the same way as for BACK.
7. Push back the needle to D pos. Break the yarn leaving the end 10cm. Cast off with waste knitting. Empty needles to A pos.
8. Partial knit lever remains at I. Move carriage to left. Re-thread yarn and check yarn tension.
9. Set partial knit lever to 0.

Work left side in the same way as for right but reversed shapings.

SHOULDER SEAMING

1. Hold the FRONT with right side facing you, pick up sts of right shoulder on to needles. Unravel the waste knitting.
2. Hold the BACK with wrong side facing you, pick up sts of right shoulder on to the same needles. Unravel the waste knitting.
3. Knit one row right to left using the yarn end.
4. Thread tapestry needle with yarn. Back stitch as in Fig.
5. Seam the other shoulder after knitted one piece of "V" neck band.

"V" NECKBAND

1. We will make "V" neckband in two pieces.
With the wrong side of garment facing you pick up stitches along Back NECK and Right Front, and place them on to needles.
2. Bring all needles to E position. Tension same as for garment, knit one row. Wind yarn round each outside empty edge needle and bring them to E position.
Knit required number of rows for the depth of neckband. Tension 1 full number larger than for garment, knit one row.

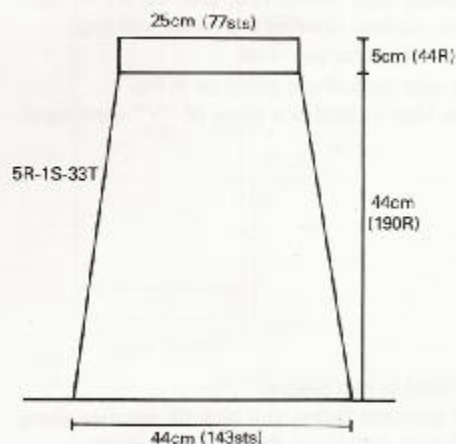


Tension 1 full number tighter than for garment, knit required number of rows.
Thread waste yarn, knit 10 rows.
Remove the knitting.



Make the other piece of neckband.
Pick up stitches along LEFT Front on to needles.

Join the other shoulder. Mattress stitch neckband seam at shoulder.
Fold neckband to inside of garment at loose centre row.
Seam along the edge.



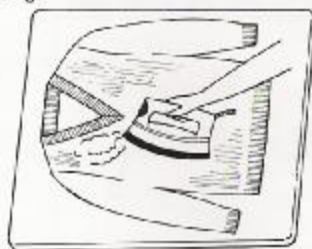
SLEEVES

1. With the wrong side of garment facing you, pick up the sts between the yarn marks. Pick up 3 sts and omit one. (143s)
2. Knit 10 rows.
3. Dec at every 5th row, 1st, 33 times.
4. Transfer every 3rd needles to adjacent needles as for double 2X1 welt. Knit 44 rows with TD3.
5. Fold the hem up and pick sts onto every 2nd and 3rd needles.
6. Knit one row with TD5 and bind off the sts.
7. Work the other sleeve in the same way.

MAKING UP

Join the side and sleeve edges using mattress stitch.
(See p.41)

Give final pressing.



STEP 4

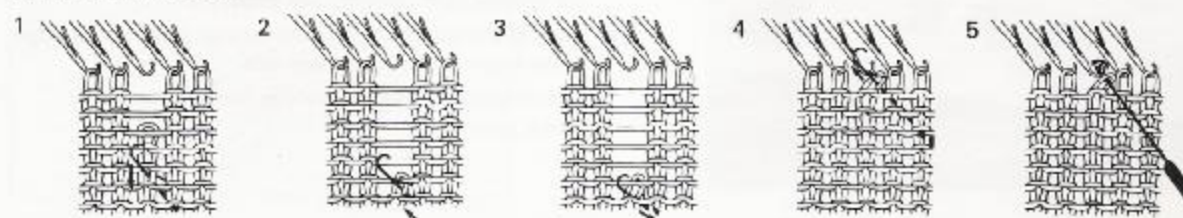
REPAIRING A DROPPED STITCH

ONE ROW



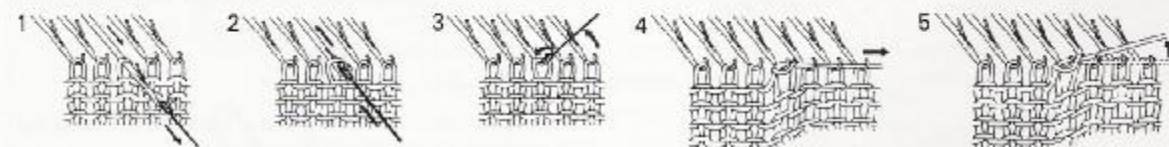
1. Insert transfer tool into the dropped stitch.
2. Lift the dropped stitch and the loose bar into the empty needle. Move the needle forward to E position.
3. Lift up the loose bar while at the same time you slide the needle back to D position.
4. Let the loose bar drop into the needle hook and pull the needle back to B position.

SEVERAL ROWS



1. Take the latch tool and insert it from **BEHIND** into the knitting, 1 or 2 rows **BELOW** the dropped stitch.
2. Push **DOWN** the latch tool so that the stitches unravelled down to the latch tool.
*Move latch tool towards you and let the stitch slide **BEHIND** the latch.
3. Catch the next loose bar in the latch tool hook. Pull back the latch tool, the latch will close over the bar. Pull latch tool further back and the bar is pulled through the stitch, a new stitch is in the latch tool hook.
4. Repeat from * until you have the top stitch in the latch tool hook.
5. Insert transfer tool into the last stitch from the front. Remove the latch tool carefully from the knitting. Place the stitch into the empty needle hook.

UNRAVELLING

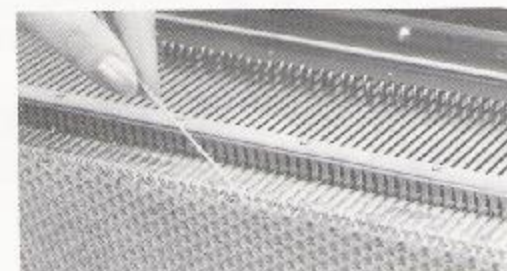
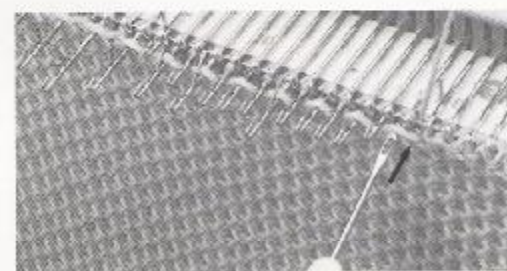


Before unravelling you must bring the needles to B position. If the stitches are over or behind the needle latch, put them back into needle hook as follows:

1. Take a single transfer tool, hook it into the needle and pull the needle forward to E position. Push the needle back to A position, the stitch is on the transfer tool.
2. Pull the needle to B position.
3. Tilt the tool up and let the stitch slide into the needle hook.
4. Hold the knitting with one hand and with the other pull the yarn sideways towards the feeder, this will pull the needles forward, slightly out of the sinker hooks.
5. Pull the yarn upwards and backwards, this way the yarn will be pulled out of the needles.
Bring the unravelled needles to B position. Unravel the complete row.

When unravelling lace patterns, make sure you put the stitches of the lace holes back into the needle before unravelling the next row.

CARRIAGE JAMMING



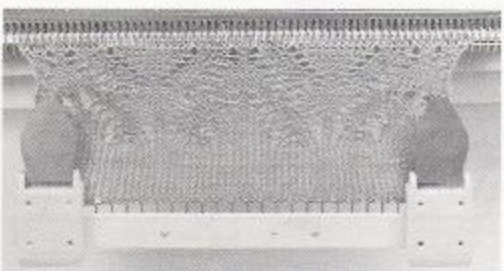
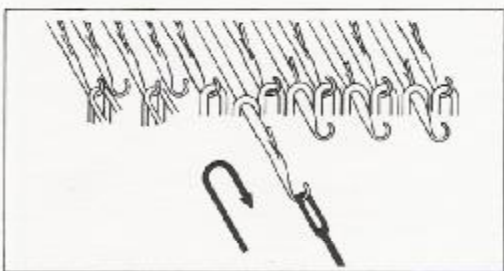
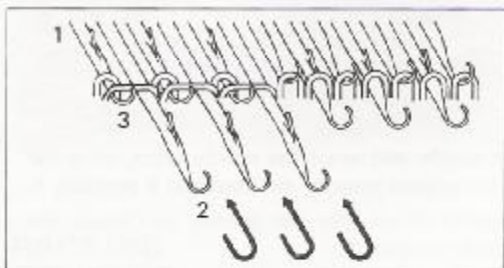
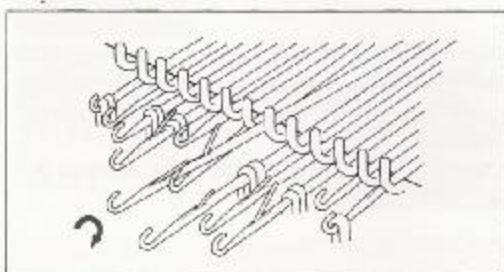
IN PLAIN STITCH

NEVER FORCE THE CARRIAGE OUT OF THE KNITTING, proceed as follows:

- 1 Remove yarn from feeder.
- 2 Loosen BOTH thumb screws and remove fabric presser. When lifting up the fabric presser make sure no needles are caught in the feeder.
- 3 Push carriage-release lever towards you, and lift carriage off needle bed.
- 4 Place carriage on needle bed out of the knitting. Let go release lever. (Detailed diagrams, page 9)
- 5 Put back the stitches into the needle hooks and set all the needles to B position, see page 47.
- 6 Unravel the stitches of the last row or rows to the edge of the knitting of the carriage side.
- 7 Attach fabric presser to carriage and rethread yarn. Check yarn tension.

IN PATTERN STITCH

- 1 Set card lever to 0.
- 2 Follow steps 1-3 in Plain stitch.
- 3 Place carriage on the needle bed out of the knitting, on the side you were knitting towards.
- 4 Put back the stitches into the needle hook and set needles to B position.
If the butts of some needles stay lower than others, push the needles to E and then back to B position using transfer tool.
- 5 Unravel the stitches until the beginning of row, the yarn is now on the opposite side of carriage. This means you always unravel ODD number of rows.
Set the needles in B position.
- 6 Set card lever to C.
- 7 Press down feeder dial and turn back punch card for the unravelled rows PLUS 1 more row.
- 8 Set card stop lever at ■ .
Set pattern dial to E of leading direction of the next row, ► or ◀ .
- 9 Slide carriage across to the side of the yarn end.
- 10 Re-set card stop lever at ▼ , and pattern dial for required stitch pattern.
- 11 Attach fabric presser to carriage.
- 12 Re-thread yarn and check yarn tension.
- 13 Turn row counter BACK for the unravelled rows if it was counted, and set row counter lever to working position.



IN LACE PATTERN

- 1 Set card lever to 0.
- 2 Remove the both lace attachments.
- 3 Remove yarn from feeder.
- 4 Remove fabric presser.
- 5 Remove weights and cast on comb from the knitting.
- 6 Push carriage-release lever towards you, and lift carriage up to place on the needle bed out of the knitting, on the side you were knitting towards.
- 7 Separate the crossed needles by lifting them up.

- 8 Some needles will have both a stitch and a loop as in diagram.

Bring the pattern needles to E position and back to B position. The loops will come off and transferred to the adjacent needles 2.

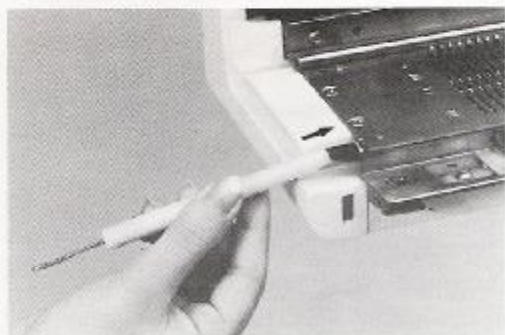
- 9 If the stitches are BEHIND the needle latches, put them into the needles hooks.

Set all the needles in B position.

If the butts of some needles stay lower than others push the needles to E and then back to B position.

- 10 Set card stop lever to ■.
Turn back punch card for 1 row.
Re-hook weights and cast on comb to the knitting.
- 11 Set Transfer stitch lever to "II" to select needles.
- 12 Re-set card stop lever to ▼, transfer stitch lever to "0". Re-thread the yarn.

CHANGING A NEEDLE



You will have to change a needle when a butt or hook is bent or a needle latch does not move smoothly. It would cause faulty needle selection.

If the needle that needs changing is at the LEFT side of the needle bed insert latch tool or pencil into the needle bed at LEFT.

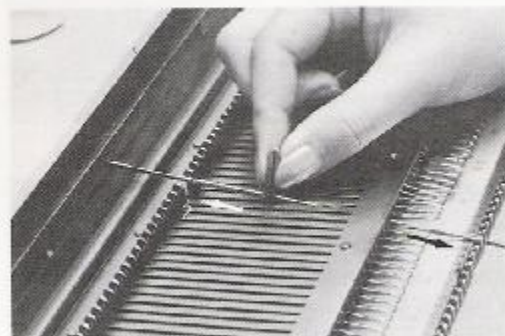
Push the tool until the bar comes out at the RIGHT of the needle bed.

Pull out the bar until the damaged needle lies free.



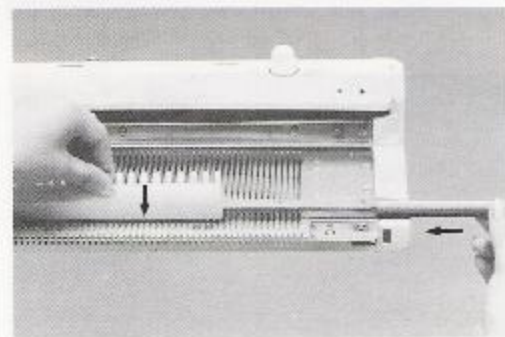
Holding the needle by the butt slide it to E position, 1, push down the hook 2 so that the needle shank comes out of the needle bed at the BACK and over the panel board of the machine.

Close the needle latch and pull out the needle at the rear, 3.



Take a spare needle and open the needle latch, slide the needle inside the groove towards the front into E position, 1.

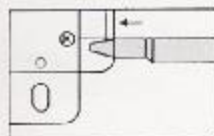
Lower the needle shank into the groove and move the needle back to A position, 2.



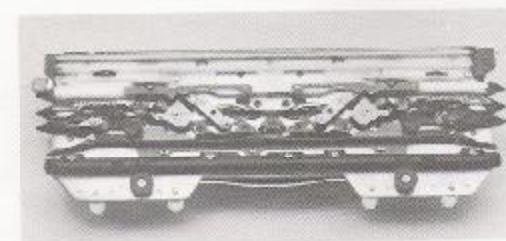
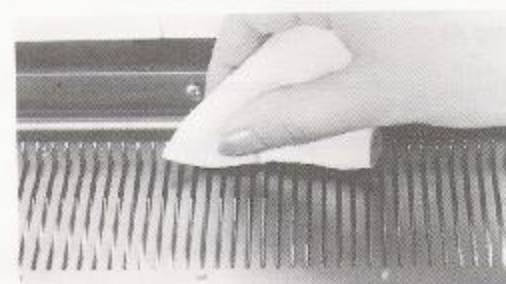
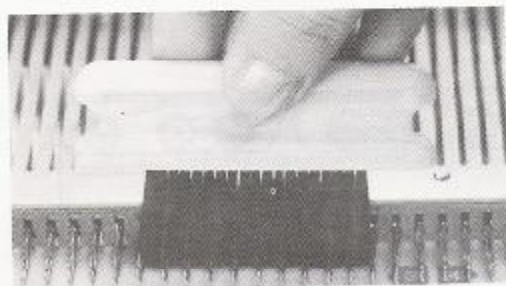
- ★ Push the needle-press bar back into the needle bed, while moving the bar hold the needles down with the straight edge of selector comb.

In case you had to remove the bar completely out of the needle bed, make sure you re-insert it with the foam rubber band on the under side of the bar (diagram).

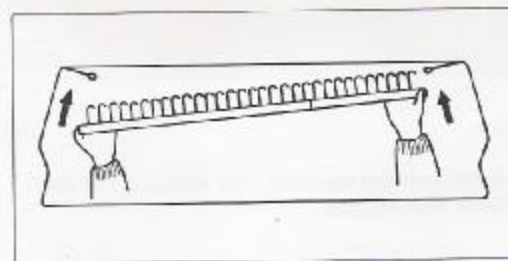
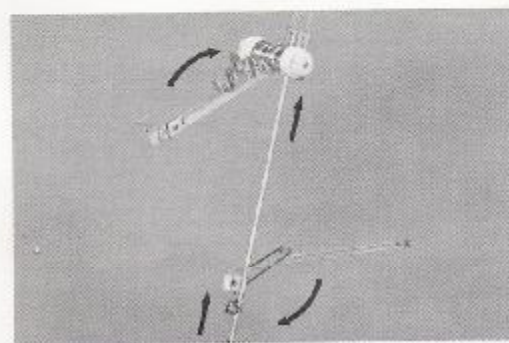
- ★ Be careful when using the latch tool to push out the bar, you could hurt your hand with the hook.



PROPER CARE OF THE MACHINE



PACKING



DUSTING

You should clean the machine each time after knitting a garment.

Bring all the needles to A position.

With the small brush remove all dust and lint from the front edge of needle bed, on plastic film.

CLEANING AND OILING

Remove all small yarn threads that may be caught around the brushes under the fabric presser.

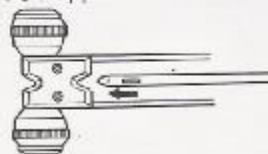
With a cloth or rag clean the rear and front rails, the needle butts and the needle bed.

Drop some oil on a cloth, rub it along needle butts and the back and front rails of needle bed. Wipe off excess. Never apply oil directly from the oil tube.

Take a clean cloth and rub the cams and parts under the carriage.

Pull oil on a cloth and rub along four cams (dotted line) and rails under the carriage. Wipe off excess.

- 1 Push all needles back to A position.
- 2 Fold upper tension unit, and replace it into case cover.



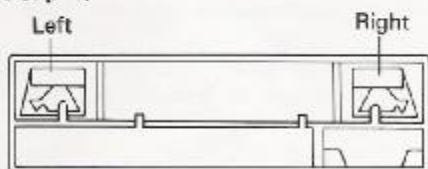
Insert tension rod with not angled side to tension unit.

- 3 Place caston comb inside of case cover.
- 4 Remove fabric presser from carriage. Replace it into the case cover.
- 5 Slide carriage to LEFT, secure with carriage lock.
*When carrying the machine, be sure carriage is secured with carriage lock.
- 6 Push the projection and fold down carriage handle backward.
- 7 Place the following in accessory case: table clamps, weights, oil, paraffin wax, transfer tools, latch tool, selector comb, tapestry needle, spare needles, nylon cord and brush.
- 8 Re-pack the punch cards in the bag. Place the bag on the needle bed.

9 Re-pack the following in storage case: fabric presser, tension unit, tension rod, extension rails, and lace attachments.

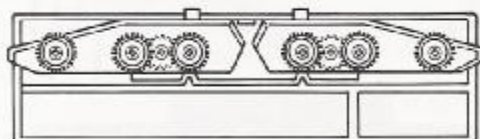
Follow steps 1 to 4 below.

(Step 1)



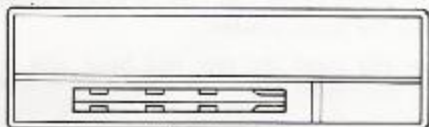
Pack the lace attachments.

(Step 2)



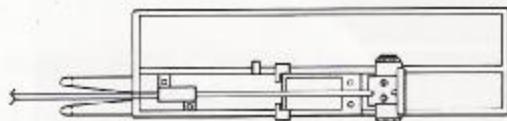
Pack the fabric presser.
Set weaving brush to non-working position.

(Step 3)



Place both extension rails facing each other and pack them together.

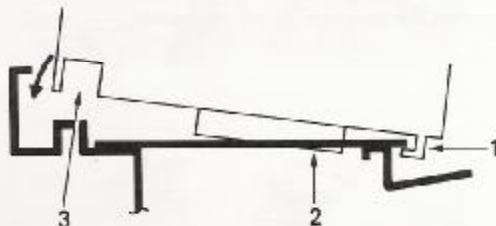
(Step 4)



Pack tension unit and tension rod.

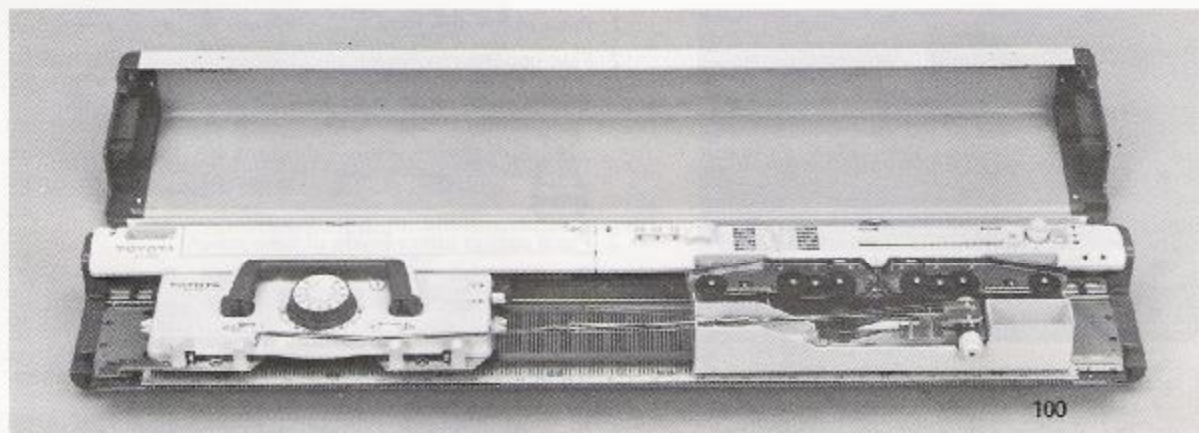
10 Place storage case into the needle bed.

(Step 1) Securing the case to the bed.



- 1 Fit the hook of the case onto the bed.
- 2 Insert the guide of the case into the groove.
- 3 Lower the back of the case onto the rail.

(Step 2) Positioning the storage case



Set to the 100th needle on the right.

11 Take the case cover and slide in from the front towards the back over the machine, the projection at each edge of case cover must fit to the dent at the machine front. Lock both latches.