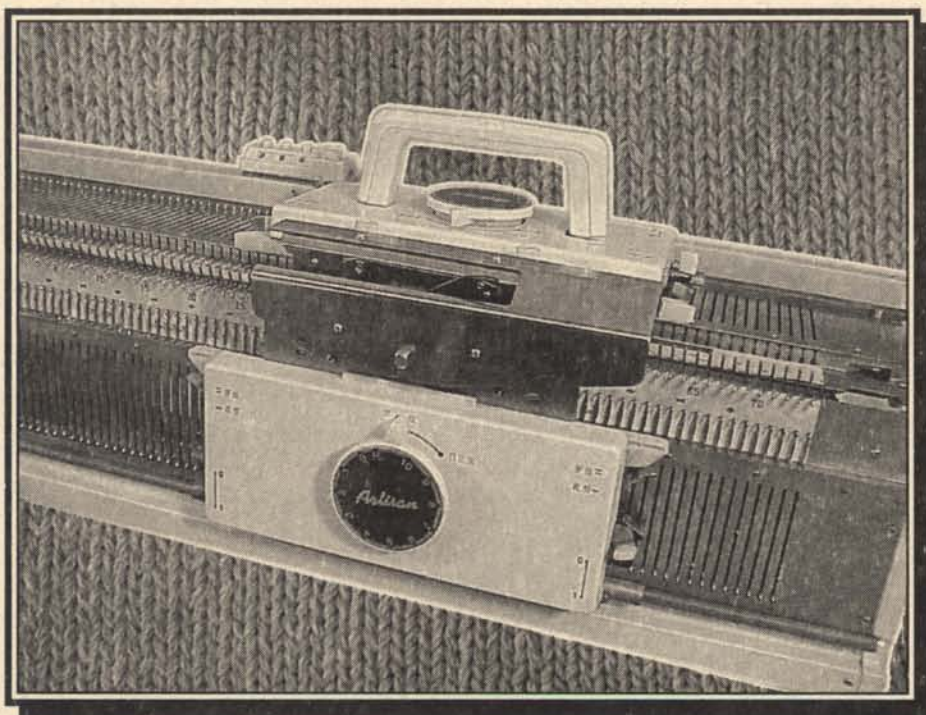


Artisan Knitting Machines



Artisan 70D^{PLUS} Mid Gauge Instruction Book

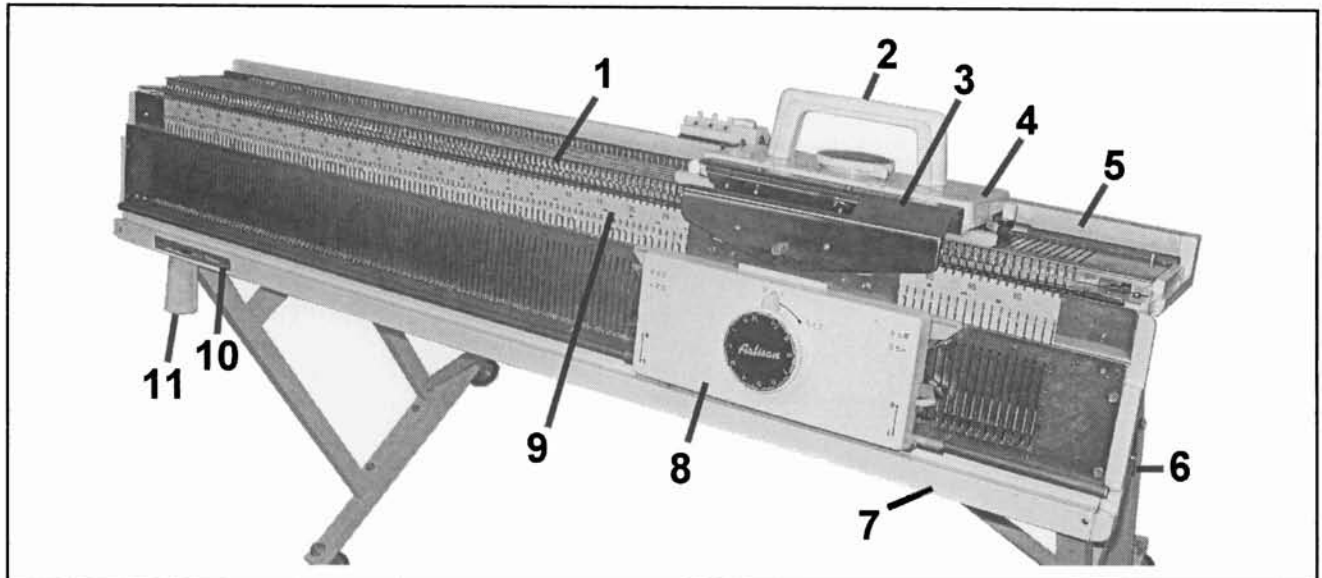
Distinctive Knits

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Knitting Machine Parts

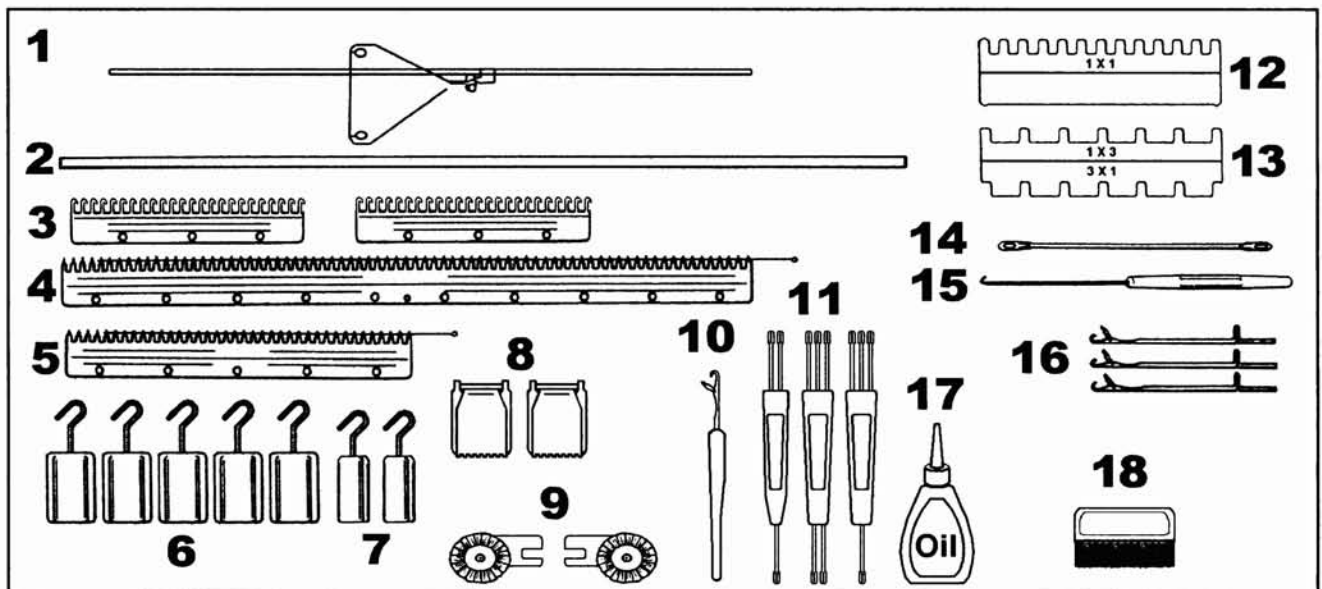


- 1. Sinker Posts
- 2. Knitter Bed Carriage Handle
- 3. Double Bed Sinker Plate
- 4. Knitter Bed Carriage

- 5. Knitter Bed
- 6. Ribber Bed Release Lever
- 7. Ribber Bed
- 8. Ribber Carriage

- 9. Needle Number Strip
- 10. Racking Indicator
- 11. Racking Handle

Accessories

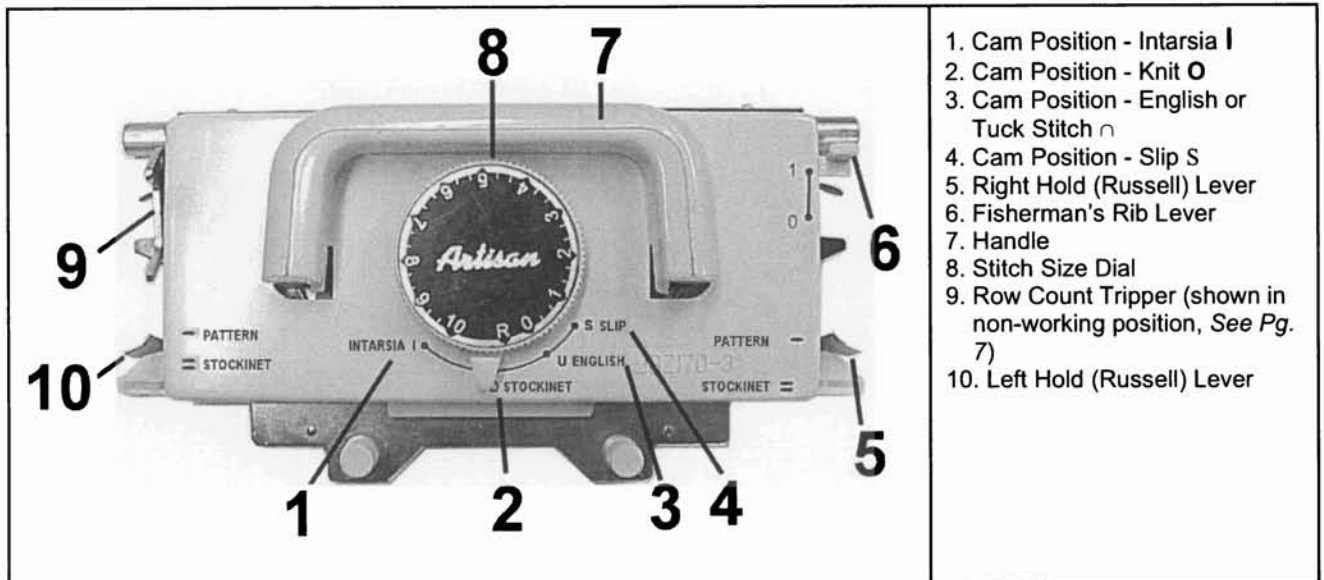


- 1. Tension Mast
- 2. Ribber Sinker Post Cover (blue plastic)
- 3. Single Bed Cast On Comb (2)
- 4. Double Bed Cast On Comb Long
- 5. Double Bed Cast On Comb Short
- 6. Large Weights (5)

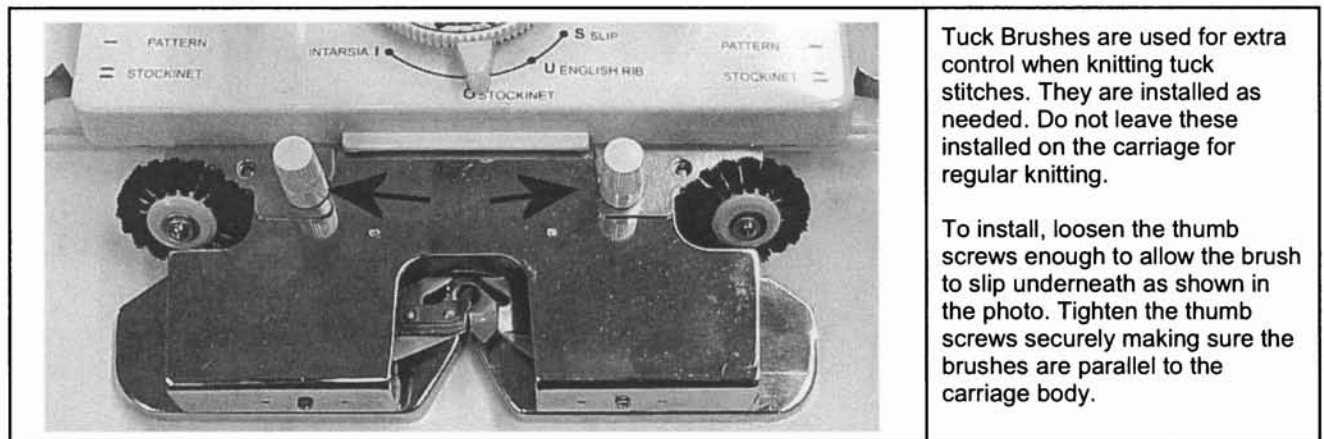
- 7. Small Weights (2)
- 8. Claw Weights (2)
- 9. Tuck Brushes (See Pg. 4.)
- 10. Latch Tool or Tappet Tool
- 11. 1x2 2x3 1x3 Transfer Tools
- 12. 1x1 Needle Selector
- 13. 1x3 3x1 Needle Selector

- 14. Double Eye Needle
- 15. Utility Hook
- 16. Spare Needles
- 17. Oil
- 18. Cleaning Brush

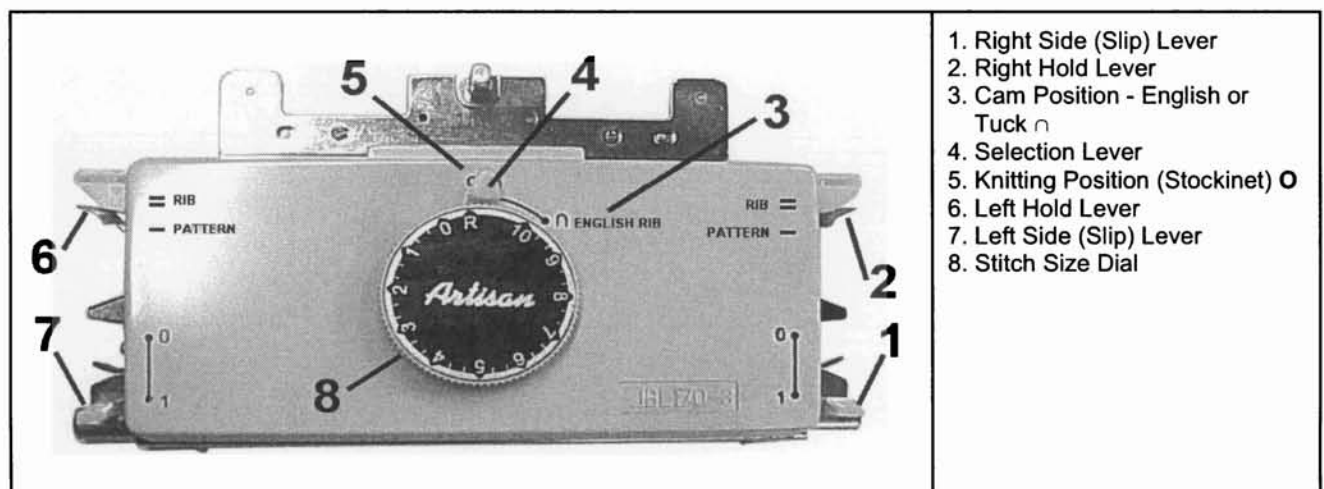
Knitter Bed Carriage



Tuck Brush Installation



Ribber Bed Carriage

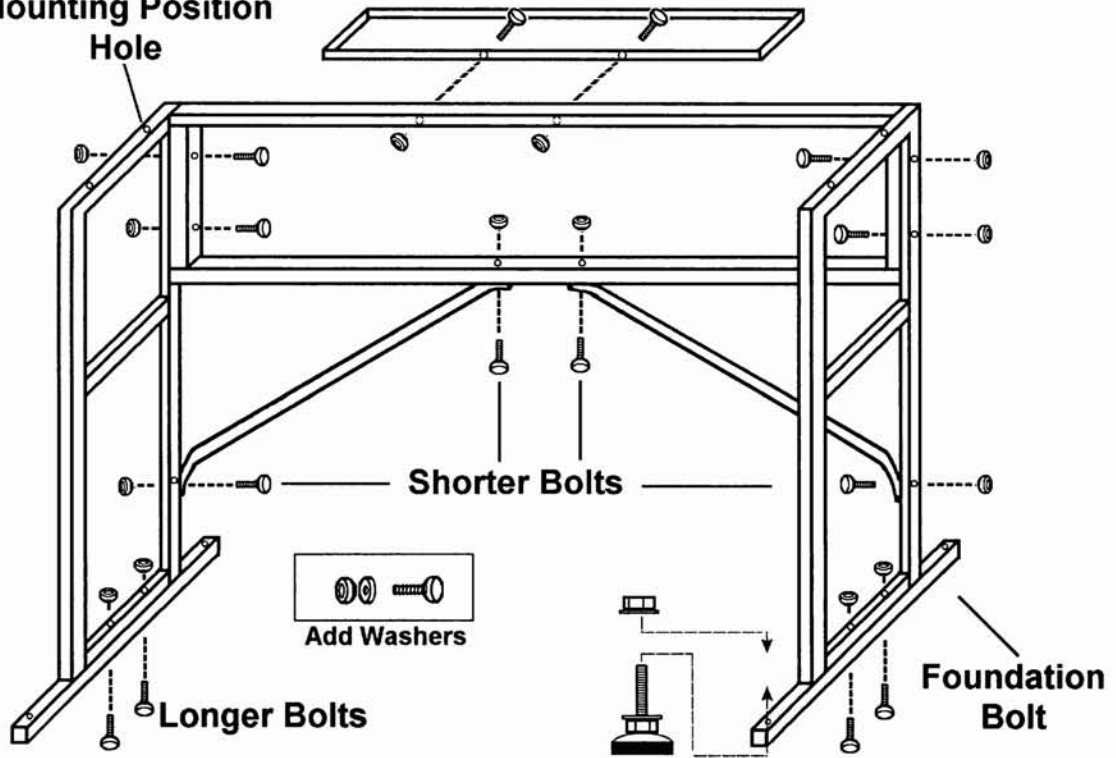


NOTE: The Cam Setting labeled **ENGLISH RIB** on both carriages is more commonly known as the **TUCK** setting used in the patterns in this manual as well as other knitting machine publications.

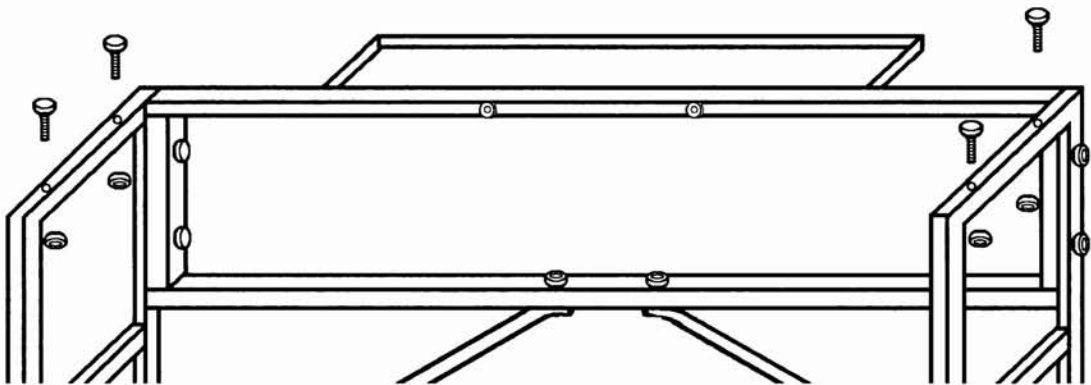
Setting Up The Stand and Knitting Machine

Assemble Knitting Machine Stand as shown. Place a washer on the bolt. Insert bolt into assembly. Place a second washer on the bolt. Place and secure nut. Do not over tighten.
Some pieces may already be partially assembled.

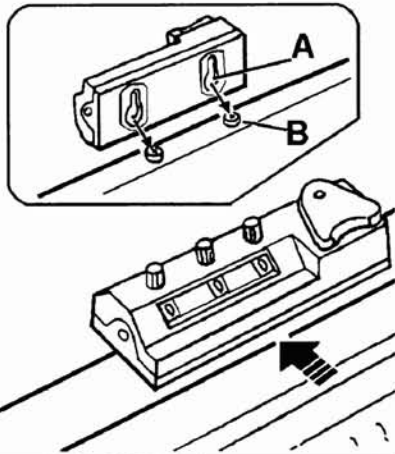
**Knitting Machine
Mounting
Position
Hole**



Place the knitting machine over mounting holes and bolt down.



Row Counter:

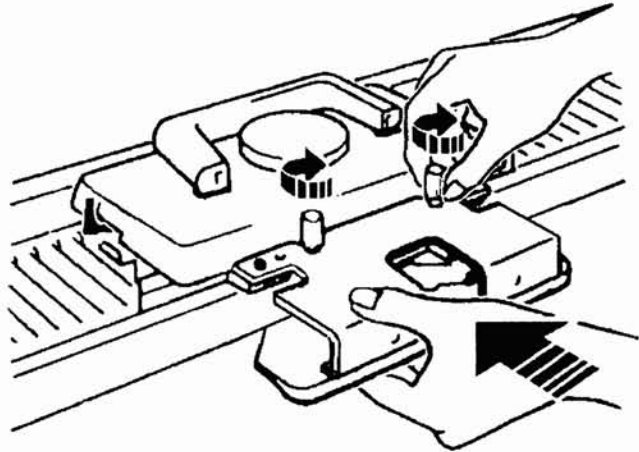


Attach the Row Counter by fitting the slots of the Counter "A" to the studs "B" on top of the knitter bed on the machine.

Push it back in the direction of the arrow until it snaps into position.

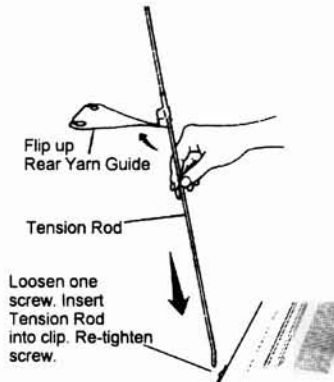
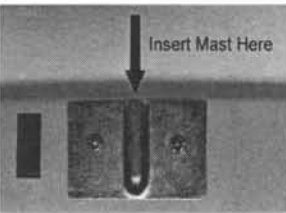
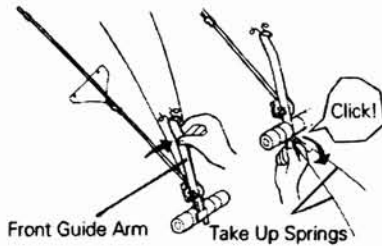
Reset the row number by turning the individual knobs.

Single Bed Sinker Plate:



First, lower the Ribber Bed by depressing the Drop Levers. (See Page 31). The Single Bed Sinker Plate cannot be installed on the Knitter Bed Carriage if the Ribber Bed is raised to the upper position.

Position Single Bed Sinker Plate under the Sinker Plate Knobs. Make sure that the Sinker Plate has been pushed all the way back and settled into position. Tighten Sinker Plate Knobs until snug. Do not over tighten. Raise Handle to snap it into working position.

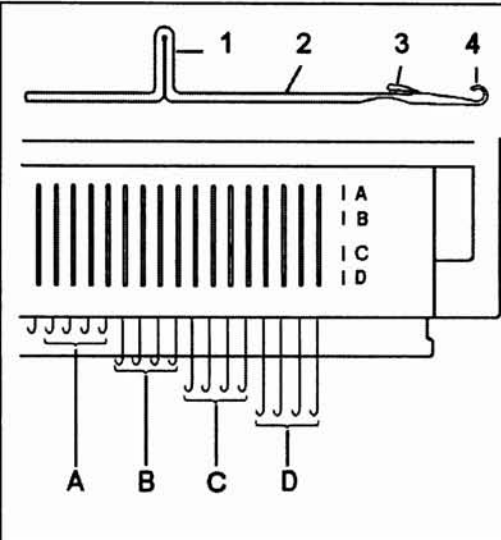
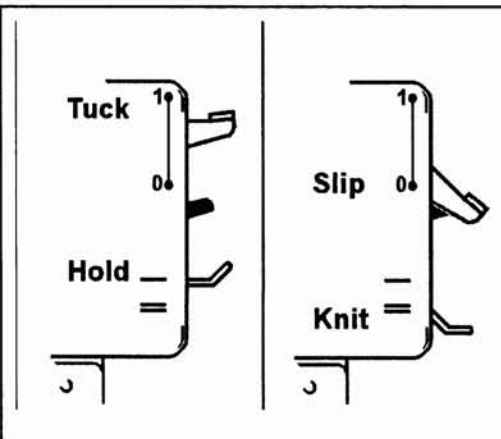

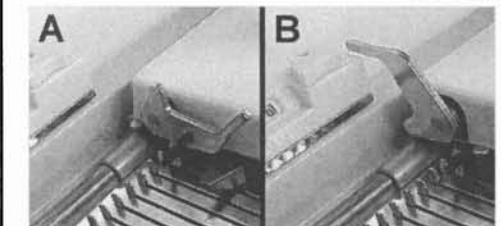


Opening and installing the tension mast:

1. Open the tension mast assembly as shown in the diagram on the left: Unwind the wires from around the mast. Pull up the larger metal "nose" first. Pull up the yarn take up springs (antenna).
2. When the assembly is correctly set up there will be a click. The assembly is set for use.
3. The end of the mast is inserted into the cleat at the center back of the machine as shown in the photo to the left. Loosen (do not remove) one of the screws holding the cleat to the machine.
4. Insert the end of the mast into the cleat so the "nose" at the top of the tension assembly is pointing to the front of the machine.
5. Hold the mast in position and re-tighten the screw.
6. Flip up the Rear Yarn Guide into the position shown in the lower diagram.

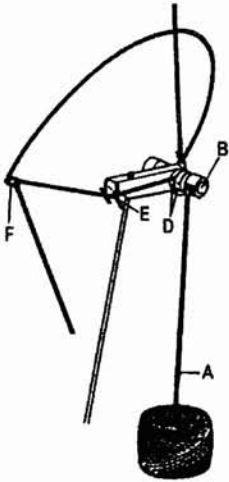
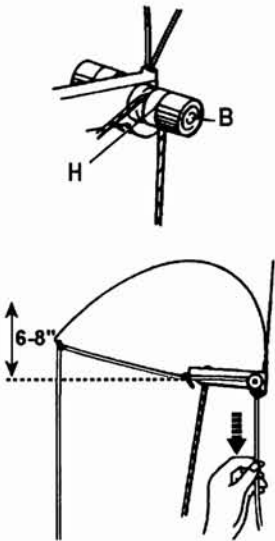
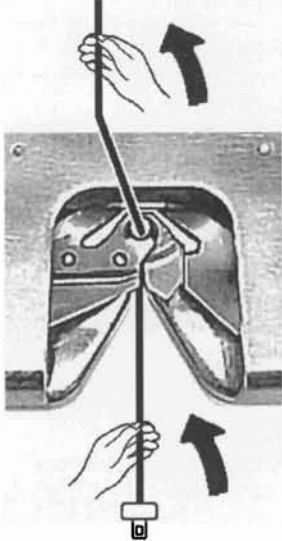
Note: On either side of the clip that holds the Rear Yarn Guide to the tension mast is a prong. When not using yarn that has been threaded through the assembly, pull the yarn down into the clip to hold it out of the way.

Needle Bed and Carriage

 <p>The diagram shows a side view of a latch needle with four numbered parts: 1 (Needle Butt), 2 (Shaft or Rod), 3 (Latch), and 4 (Hook). Below it, a top-down view of the needle bed shows four columns of needles labeled A, B, C, and D. Below the needle bed, four sets of hold levers are shown, also labeled A, B, C, and D, corresponding to the needle positions.</p>	<p>Latch Needle:</p> <p>1 - Needle Butt 2 - Shaft (or Rod) 3 - Latch 4 - Hook</p> <p>Needle Positions:</p> <p>A = Non-working position B = Working position C = Upper working position D = Needles KNIT when Hold levers are in position = Needles DO NOT KNIT or HOLD when Hold levers are in position — This is referred to as <i>needles in hold</i>.</p>
 <p>The diagrams show two levers. The Side Lever has positions '1' (labeled 'Tuck') and '0' (labeled 'Slip'). The Hold Lever has positions '-' (labeled 'Hold') and '=' (labeled 'Knit').</p>	<p>Side Lever and Hold Lever:</p> <p>Side Lever - Controls the needles in B position Side Lever in "1" position: Needles knit (Cam Setting "0") OR Needles tuck (Selection Cam set to "n" position). Side Lever in "0" position: Needles always slip when carriage is moved to the right.</p> <p>Hold Lever - Controls the needles in D position Position — (Hold) : The needles in D position Hold the stitches on the needle shank and do not knit. Position = (Knit Back): The needles in D position are Knitted and moved back to B position.</p>
 <p>The dial is circular with numbers 0 through 10 and an 'R' position. The word 'Artisan' is written in the center. An arrow points to the '0' position.</p>	<p>Stitch Size Dial:</p> <p>Use this to control the size of stitches. The higher the number on the Stitch Dial, the larger the stitch size.</p> <p>The R position is the tightest stitch and is used for the FIRST ROW ONLY of the cast-on for R-ibbing</p>
 <p>Image (A) shows the tripper pulled back. Image (B) shows the tripper in its normal working position.</p>	<p>Row Count Tripper:</p> <p>(A) The row count tripper in NON-working position. It should be pulled back to non-working position when ever you have a jam, need to undo a row or make a free pass (non-knitting pass) of the carriage. Return it to working position when knitting is resumed.</p> <p>(B) The row count tripper in working position.</p>

Knitting and Operating The Knitting Machine

Auto Tension Mast, Tension Dial And Threading

		
<p>Thread the right side of the Auto Tension as follows:</p> <ol style="list-style-type: none"> 1 Bring yarn (A) up behind the right Tension guide assembly 2. Position yarn behind the Tension Dial (B) 3. Pull yarn down between two tension discs (D) 4. Then through right yarn guide eyelet (E) 5. Then through the right Tension Spring eyelet (F) 6. Temporarily anchor the yarn to the machine by winding it several times around the side lever on the ribbing bed. 	<p>Adjust the Tension Dial (B):</p> <p>Adjust the Tension Dial according to the type of yarn by turning the Tension Dial (B) to the required tension number which appears at the middle of the dial. Use the following instruction to set the tension:</p> <ol style="list-style-type: none"> 1. Yarn must come freely from the yarn ball. 2. Pull down on the back of the yarn until the tension wire is below the horizontal (dashed line). Let go of the yarn. The eye on the tension wire should stop about 6-8" above the horizontal line. <p>Note: The higher the number on the tension dial, the tighter the tension and narrower the distance. Some yarn is slippery (rayon) and will not adjust using this method. Observe the 6-8" gap while actually knitting slippery yarn and adjust accordingly.</p>	<p>Threading The Single Bed Sinker Plate:</p> <p>Allow a 12-inch tail of yarn to hang between the beds. Attach a yarn clip or clothes pin to the yarn tail letting it hang down between and under the beds.</p> <p>Hold onto the yarn above and below the sinker plate with either hand as illustrated. Holding the yarn taught, push the yarn away from you into the central slot in the feeder plate until the yarn reaches the round hole. Pull the yarn up and down to make sure it isn't caught. (See above.) Secure or hold the yarn end. The carriage is now threaded.</p>

Managing Cast-on Comb And Weights

In the instructions for various techniques you will be told to hang the cast-on comb and weights. When ever you are using weights, observe the weights as they begin to reach the floor. If the weights do reach the floor, they are no longer effective. The knitting machine may jam or the knitting fall from the machine. At the very least, the gauge will change. To avoid this situation, once the weights are very near the floor, they need to be rehung as follows:

Single Bed Knitting: Remove the weights and comb. Claw the comb back on to the knitting about 1" below the needles so it grabs the knitting as evenly as possible. Rehang the weights and continue to knit. The knitting will be a little narrower than the comb. Make sure that the comb is balanced and pulling evenly on the knitting.

Double Bed Knitting: Unhook the weights. *Do not remove the comb from the knitting.* Wind the comb towards you inside the knitting jelly roll style enough times to reach almost to the underside of the beds. Make sure the knitting is wound flat and is not curled under at the edges. The knitting will also be narrower than the comb.

Replace the weights in approximately the same place as they were originally as follows: Take the weight and hook it through the fabric from the back side of the knitting in such a way as to be able to catch the hook in the top part of the fabric rolled around the comb. In other words, the hook of the weight is poked through the knitting from the back and hooked into the top of the fabric roll.

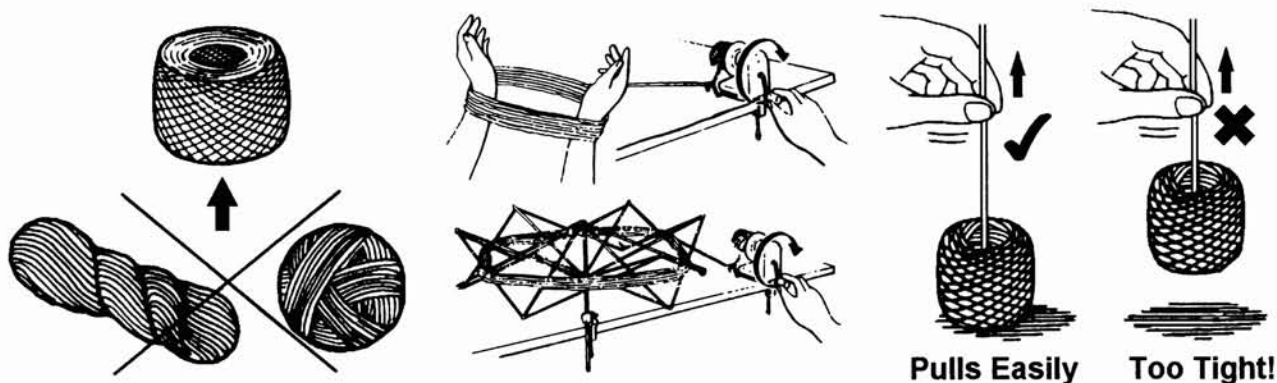
Yarn Preparation

Yarn purchased in balls or skeins must be rewound. The yarn must flow freely from the source or uneven stitches will appear in the knitting. Yarn on cones does not need to be rewound.

Type of yarn	Type of yarn useable within the limits of the Artisan 70D
Pure wool	4-Ply, Double Knitting (DK), Light Weight Worsted
Synthetic	Double Knitting, Light Weight Worsted
Blends	Double Knitting, Light Weight Worsted
Cotton	Double Knitting, Light Weight Worsted NOTE: Pre-waxing is highly recommended

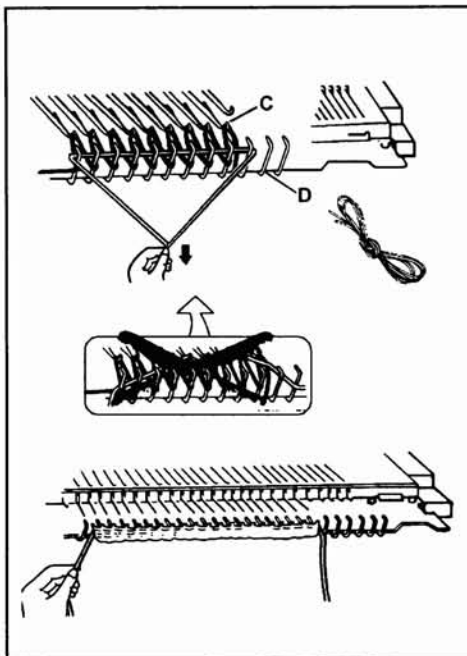
Winding Yarn

An optional Yarn Ball Winder is recommended for winding hand knitting and non-coned yarn. Open the skein of yarn and place it on an optional Swift or Skein Holder to wind it into a ball suitable for machine knitting. Ensure that the yarn end comes freely out of the yarn ball. Pull skeins should be rewound as well.



Single Bed Cast-On Methods

<p>E-Wrap in E position</p>	<p>E-wrap Cast-on:</p> <ol style="list-style-type: none"> 1. Carriage on the right. Push the needles required to D position. 2. Place a yarn clip or clothes pin on the tail end of the yarn and let it hang down between the beds left of the needles in B position. Leave a 12" tail. 3. Wind the yarn loosely around the empty needles starting from the left in a counter-clockwise direction as follows: <ul style="list-style-type: none"> (A) bring yarn up between needles 1 and 2. (B) wind yarn counterclockwise around needle 1 and come up between needles 2 and 3. (C) wind yarn counterclockwise around needle 2 and come up between needles 3 and 4. Etc. Notice that the yarn is behind the latches. <p>HINT: With your left index finger, hold the yarn down against the sinker posts under the needles (as if holding your finger under your nose to stop a sneeze) moving your finger along as each stitch is formed.</p> <ol style="list-style-type: none"> 4. Knit one row. Hang Single Bed Cast-on Comb and Weights. Cast-on is complete.
------------------------------------	---



Cast-on With Ravel Cord:

1. Push the required number of needles from A position to D position using the flat side of the Needle Pusher.
2. Thread the yarn into the Yarn Feeder. Knit one row from right to left.
3. Lay the Ravel Cord across the yarn loops between needle hooks (C) and sinker posts (D).

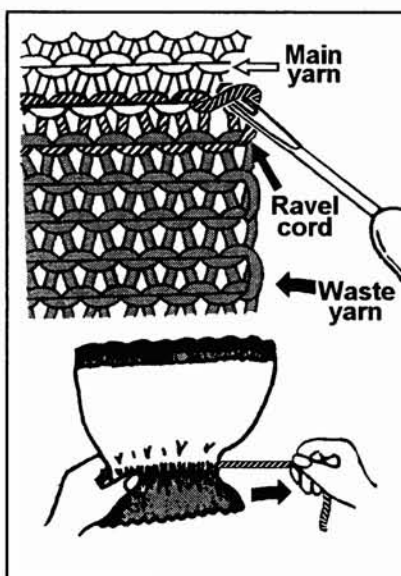
NOTE: Ensure that the Ravel Cord lies correctly across the yarn loops as well as between the needle hooks and behind the sinker posts and is not caught in the needle hooks.

4. Continue to knit 5 to 6 rows.
5. Pull the Ravel Cord out from the left. Cast-on has been finished.
6. Hang the Single Bed Cast-on Comb and Weights onto the fabric.

NOTE: This cast-on is not closed and will unravel. The cast-on edge requires further finishing. This is also a good way to start with waste yarn.

How To Knit A Row Of Knitting:

Ensure that the carriage has passed the last working needle by approximately 1" (2-3 cm). Do not reverse direction of knitting before row is completed. Always move the carriage at an even speed.



Cast-on Using Waste Yarn:

1. Cast-on with waste yarn (grey yarn in diagram) using any cast-on and knit several rows ending with carriage on left. Remove waste yarn from carriage.
2. Thread and knit one row with Ravel Cord. (Zebra color yarn in diagram).
3. Thread and continue to knit with Main Yarn completing the piece. (White yarn in diagram).
4. When the fabric is finished, remove the Ravel Cord as follows: using a transfer tool, pick out the first stitches in ravel cord on either end.
5. Holding the waste yarn, gently pull the ravel cord out of the fabric releasing the main knitting. If the ravel cord pulls tightly, pick it out with the tool. NOTE: The cast-on is not closed and will unravel. The cast-on edge requires further finishing. This can be done before the ravel cord is removed.

Removing The Knitted Fabric Using Waste Yarn From The Machine:

1. After knitting the piece in the Main Color, replace the Main Color with Waste Yarn.
2. Set the carriages to knit stockinet That is, "O" on both carriages.
3. Knit at least 6 rows of waste yarn. Cut and remove the waste yarn from Yarn Feeder.
4. Cut the Main Color yarn and secure it to the machine. Remove the weights from the knitting.
5. Move the Carriage(s) across the knitting. The knitting drops off the needles.
6. The waste yarn is holding the last row of Main Color knitting and prevents it from raveling. There has to be enough waste yarn knitted so that it doesn't unravel.

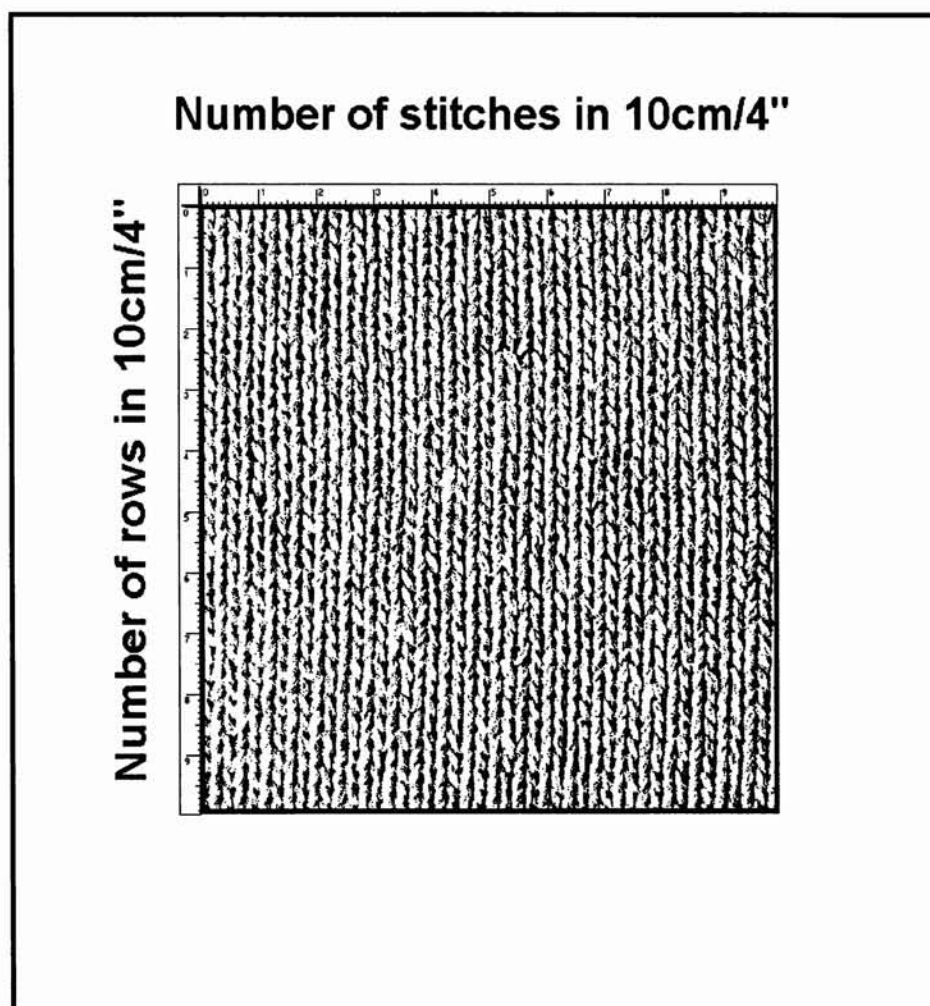
HINT: Bind off the waste yarn to prevent any unraveling.

Knit A Test Swatch To DETERMINE STITCH SIZE Used To Knit The Piece:

1. Cast on over 40 needles.
2. Starting with a slightly larger stitch size than for the yarn you are using, knit in pattern until about two inches of knitting has been produced. Write down the stitch size used. Knit 2 rows in contrasting color yarn. This will separate the sections as Stitch Size is adjusted.
3. Tighten (decrease) the stitch size and knit the same number of rows. Note the stitch size. Knit 2 rows of contrasting yarn.
4. Repeat step 3 the number of times desired.
5. Allow the knitting to rest for several hours.
6. Block the piece by following yarn manufacturer's directions.
7. Determine which part of the swatch suits your needs. Reference the stitch size used for that segment.
8. Proceed to make a *Test Swatch To Determine Gauge*.

Knit A Test Swatch To DETERMINE GAUGE:

First, determine the Stitch Dial number or Stitch Size before knitting a Test Swatch as described above.



Knit the Test Swatch with the selected yarn, in pattern at the pre-determined stitch size as follows:

Push up 20 needles on either side of "0" on the Needle Bed and cast-on. Knit 60 rows in pattern. Bind-off. Remove the swatch from the machine and leave it for several hours to relax. Block the swatch by steaming lightly or laundering according yarn manufacturer's instructions.

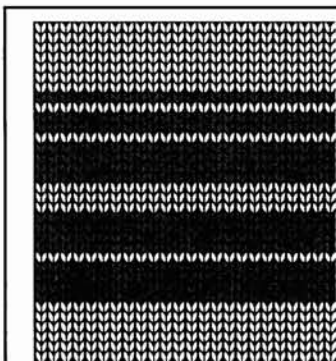
Measuring The Tension Swatch:

Lay the swatch on the table. With a ruler, carefully count the number of Stitches in 4 inches or 10 cm. Count the number of Rows in 4 inches or 10 cm. You have determined the Stitch and Row gauge. You are now able to calculate the garment.

NOTE: The larger the tension swatch, the more accurate the gauge. For DK weight yarn, consider casting on over 30 needles left and right.

Single Bed Patterning

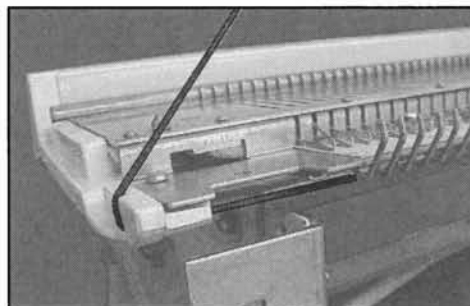
Stripe Patterns:



Continue to knit stripes by changing to a different color yarn in the Yarn Feeder as required.

Notes: The yarn in the left Tension Spring must always be placed in the yarn rest at the left end of the needle bed where there is a 1/2" wide notch to hold the yarn. The yarn in the right Tension Spring goes into the right yarn rest.

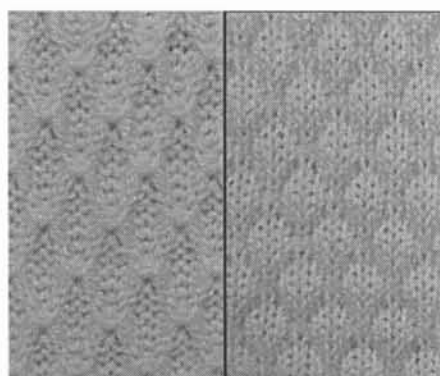
You must always rest the yarn from the left side of the tension assembly in the notch on the left side of the beds and the yarn from the right side of the tension assembly in the notch on the right side of the beds. Always follow this rule no matter which side you change the yarn on, otherwise the yarn will tangle.



Yarn from Left side of tension assembly in the yarn slot at the left side of the knitter bed.

Pull-Up Tuck Stitch:

Stitch Pattern No. 1 – Tuck								
(1)	v	(2)	v	(3)	(4)	(5)	(6)	(7)
12							=	→
11								←
10								→
9								←
8								→
7							—	←
6							=	→
5								←
4								→
3								←
2								→
1							—	O — A ←



Stitch Pattern No. 1: Purl | Knit side

Stitch Pattern No. 1 - Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR).

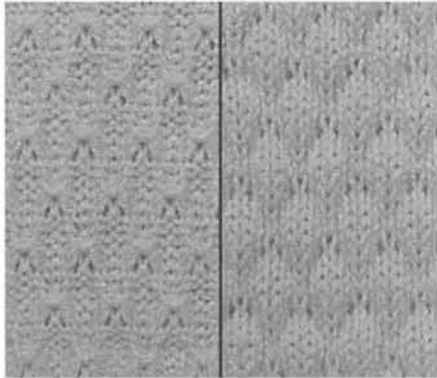
Begin Pattern: Use the 3:1 needle pusher to quickly set up this pattern.

Start at row 1 at the bottom of the chart and work upwards. Push up the needles represented by the dark squares to D position. Set the Cam Lever to "O". Set the stitch size for the yarn used (probably Size 7 or 8). Set the Hold Levers to "—" position. Set the Row Counter to 000. Knit to the left then right a total of five times. The carriage is on the left (COL). The row counter says 005. Usually noted in patterns as RC005. Set the RIGHT Hold Lever to "=" and knit 1 row causing the needles in D position to knit back to B position. RC006 Push up the needles represented by the dark squares on line 7 to D position. Set the RIGHT Hold Lever to "—" and knit 5 rows to RC011. The carriage is on the left (COL). Set the RIGHT Hold Lever to "=". Knit one row to the right which causes the needles in D position to return to B position. RC012. Repeat the pattern to the number of rows required. If possible, end on row 6 or 12 to make binding off easier. That is, bind off after knitting all the stitches back to B position. A plain knit row in a Tuck Pattern is also known as the Clearing Row and is easier to bind off.

Stitch Pattern No. 2 – Tuck

	(1)	v-----	(2)	-----v	(3)	(4)	(5)	(6)	(7)	
24										→
23					=					←
22										→
21										←
20										→
19					—					←
18										→
17					=					←
16										→
15										←
14										→
13					—					←
12										→
11					=					←
10										→
9										←
8										→
7					—					←
6										→
5										←
4										→
3										←
2										→
1					—	O	—	A		←

◇ X



Stitch Pattern No. 2: Purl | Knit side

Stitch Pattern No. 2 - Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR).

Begin Pattern: Use the 3:1 needle pusher to quickly set up this pattern.

Starting at row 1, push up the needles represented by the dark squares to D position.

Set the carriage settings to those shown to the right on the chart for row 1.

Set the row counter to RC000

Knit 4 rows.

Row 5: Change the LEFT Hold Lever to "=" and knit 2 rows.

Row 7: Set the LEFT Hold Lever to "—". Push up the needles represented by the dark squares in row 7 of the pattern to D position. Knit 4 rows.

Row 11: Change the LEFT Hold Lever to "=" and knit 2 rows.

Row 13: Set the LEFT Hold Lever to "—". Push up the needles represented by the dark squares in row 13 of the pattern to D position. Knit 4 rows.

Row 17: Change the LEFT Hold Lever to "=" and knit 2 rows.

Row 19: Set the LEFT Hold Lever to "—". Push up the needles represented by the dark squares in row 19 of the pattern to D position. Knit 4 rows.

Row 23: Change the LEFT Hold Lever to "=" and knit 2 rows.

Continue following the chart until the required number of rows have been knitted.

HINT: The 2 rows knitted with the Hold Lever set to "=" can be knitted in another color for a spectacular two color effect.

Stitch Pattern No. 3 – Tuck

	(1) v-----	(2) -----v	(3)	(4)	(5)	(6)	(7)	
24								→
23								←
22								→
21								←
20								→
19								←
18								→
17								←
16								→
15								←
14								→
13								←
12								→
11								←
10								→
9								←
8								→
7								←
6								→
5								←
4								→
3								←
2								→
1								←
	◇	X						

Stitch Pattern No. 3 - Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR). Use the 1:1 needle pusher to quickly set up this pattern.

Begin Pattern: Starting at row 1, push up the needles represented by the dark squares to D position.

Set the carriage settings to those shown to the right on the chart for row 1.

Set the row counter to RC000

Knit 6 rows.

Row 7: Change the LEFT Hold Lever to "=" and knit 2 rows.

Row 9: Set the LEFT Hold Lever to "—".

Push up the needles represented by the dark squares in row 9 of the pattern to D position. Knit 6 rows.

Row 15: Change the LEFT Hold Lever to "=" and knit 2 rows.

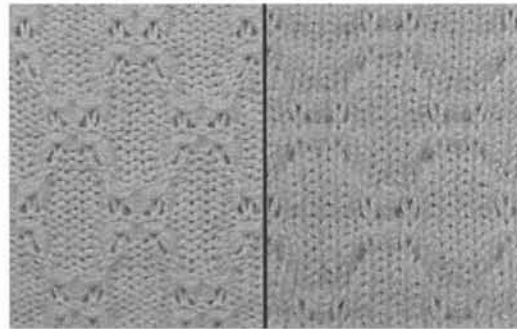
Row 17: Set the LEFT Hold Lever to "—". Knit 6 rows.

Row 23: Set the LEFT Hold Lever to "=", Knit 2 rows.

Row 25: Set the LEFT Hold Lever to "—". Knit 6 rows.

Row 31: Set the LEFT Hold Lever to "=", Knit 2 rows.

Continue following the chart from Row 1 to Row 32 until the required number of rows have been knitted.



Stitch Pattern No. 3: Purl | Knit side

Stitch Pattern No. 4 – Tuck

	(1) v-----	(2) -----v	(3)	(4)	(5)	(6)	(7)	
8								→
7								←
6								→
5								←
4								→
3								←
2								→
1								←
	◇	X						

Stitch Pattern No. 4 - Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR). Use the 1:1 needle pusher to quickly set up this pattern.

Begin Pattern: Starting at row 1, push up the needles represented by the dark squares to D position.

Set the carriage settings to those shown to the right on the chart for row 1.

Set the row counter to RC000

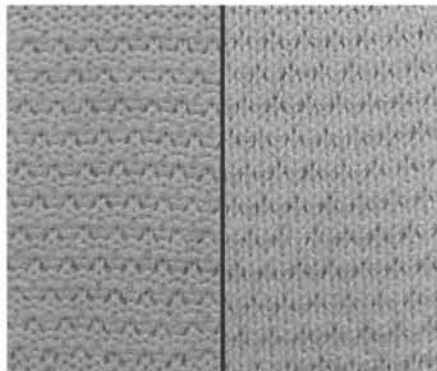
Knit 2 rows.

Row 3: Change the LEFT Hold Lever to "=" and knit 2 rows.

Row 5: Set the LEFT Hold Lever to "—". Push up the needles represented by the dark squares in row 5 of the pattern to D position. Knit 2 rows.

Row 7: Change the LEFT Hold Lever to "=" and knit 2 rows.

Continue following the chart until the required number of rows have been knitted.



Stitch Pattern No. 4: Purl | Knit sides

Stitch Pattern No. 5 – Tuck

	(1) v-----	(2) -----v	(3)	(4)	(5)	(6)	(7)											
4																		→
3																		←
2																		→
1																		←
	◇		X															

Stitch Pattern No. 5 - Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR). Use the 1:1 needle pusher to quickly set up this pattern.

Begin Pattern: Starting at row 1, push up the needles represented by the dark squares to D position.

Set the carriage settings to those shown to the right on the chart for row 1. Set the row counter to RC000

Knit 2 rows.

Change the LEFT Hold Lever to "=" and knit 2 rows.

Continue following the chart repeating rows 1 to 4 until the required number of rows have been knitted.

Stitch Pattern No. 6 – Tuck

	(1) v-----	(2) -----v	(3)	(4)	(5)	(6)	(7)											
8																		→
7																		←
6																		→
5																		←
4																		→
3																		←
2																		→
1																		←
	◇		X															

Stitch Pattern No. 6 - Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR). Use the 1:1 needle pusher to quickly set up this pattern.

Begin Pattern: Starting at row 1, push up the needles represented by the dark squares to D position.

Set the carriage settings to those shown to the right on the chart for row 1.

Set the row counter to RC000

Knit 3 rows.

Change the RIGHT Hold Lever to "=" and knit 1 row.

Set the RIGHT Hold Lever to "—".

Push up the needles represented by the dark squares in row 5 of the pattern to D position.

Continue following the chart repeating rows 1 to 8 changing Hold Levers where indicated until the required number of rows have been knitted.

Stitch Pattern No. 7 – Two Color Tuck

	(1) v-----	(2) -----v	(3)	(4)	(5)	(6)	(7)											
12																		→
11																		←
10																		→
9																		←
8																		→
7																		←
6																		→
5																		←
4																		→
3																		←
2																		→
1																		←
	◇		X															

Stitch Pattern No. 7 - Two Color Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR). Use the 1:1 needle pusher to quickly set up this pattern.

Begin Pattern: Starting at row 1 using Color A, set the carriage setting to those shown to the right on the chart for row 1. Set the row counter to RC000. Knit 2 rows.

Row 3: Change to Color B and push up the needles represented by the dark squares to D position.

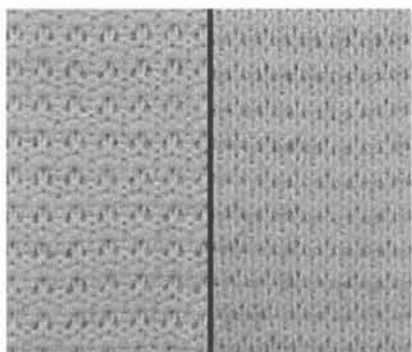
Set the carriage settings to those shown to the right on the chart for row 3. Knit 4 rows.

Row 7: Change the LEFT Hold Lever to "=" and using Color A, knit 2 rows.

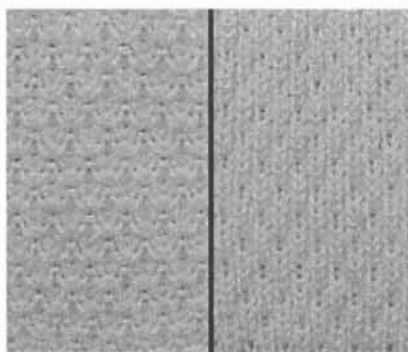
Row 9: Set the LEFT Hold Lever to "—".

Push up the needles represented by the dark squares in row 9 of the pattern to D position. Using Color B, knit 4 rows.

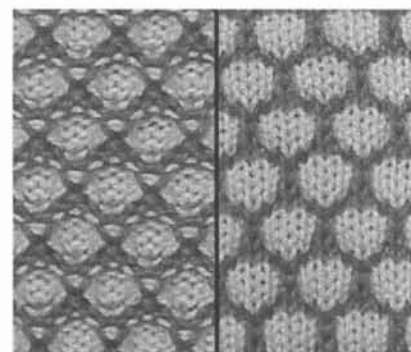
Continue following the chart repeating rows 1 to 12 changing colors where indicated until the required number of rows have been knitted.



Stitch Pattern No 5: Purl | Knit sides



Stitch Pattern No 6: Purl | Knit sides



Stitch Pattern No 7: Purl | Knit sides

Stitch Pattern No. 8 – Two Color Tuck

	(1)	v-----	(2)	-----v	(3)	(4)	(5)	(6)	(7)	
12									=	→
11										←
10										→
9										←
8										→
7									— B	←
6									=	→
5										←
4										→
3										←
2										→
1									— O — A	←

◇ X

Stitch Pattern No. 8 - Two Color Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR). Use the 3:1 needle pusher to quickly set up this pattern.

Begin Pattern: Starting at row 1 using Color A, set the carriage setting to those shown to the right on the chart for row 1. Set the row counter to RC000. Knit 5 rows.

Row 6: Change to Color B. Change the RIGHT Hold Lever to "=" and knit 1 row.

Row 7: Push up the needles represented by the dark squares to D position. Set the carriage settings to those shown to the right on the chart for row 7. Knit 5 rows.

Row 12: Change to Color B. Change the RIGHT Hold Lever to "=" and knit 1 row.

Continue following the chart repeating rows 1 to 12 changing colors and the Hold Lever where indicated until the required number of rows have been knitted.

HINT: After knitting row 6 or row 12, cut Color B yarn leaving about 6" to sew in later.

Stitch Pattern No. 9 – Two Color Tuck

	(1)	v-----	(2)	-----v	(3)	(4)	(5)	(6)	(7)	
20										→
21										←
18										→
17										←
16										→
15									— B	←
14										→
13										←
12										→
11									= = A	←
10										→
9										←
8										→
7										←
6										→
5									— B	←
4										→
3										←
2										→
1									= O = A	←

◇ X

Stitch Pattern No. 9 - Two Color Tuck:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR). Use the 3:1 needle pusher to quickly set up this pattern.

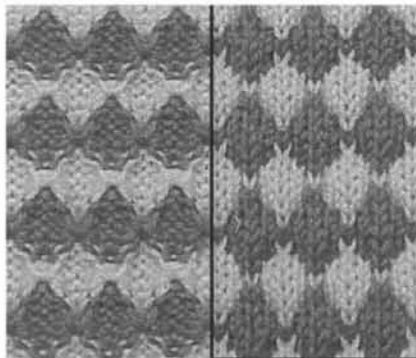
Begin Pattern: Starting at row 1 using Color A, set the carriage settings to those shown to the right on the chart for row 1. Set the row counter to RC000. Knit 4 rows.

Row 5: Change to Color B. Change BOTH Hold Levers to "—" and knit 6 rows.

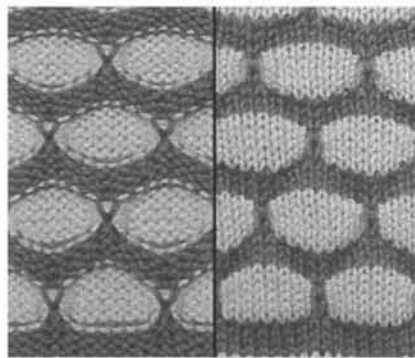
Row 11: Change to Color A. Change BOTH Hold Levers to "=" and knit 4 rows.

Row 15: Change to Color B. Change BOTH Hold Levers to "—" and knit 6 rows.

Continue following the chart repeating rows 1 to 20 changing colors and the Hold Lever where indicated until the required number of rows have been knitted.



Stitch Pattern No 8: Purl | Knit sides



Stitch Pattern No 9: Purl | Knit sides

Stitch Pattern No. 10 – Jacquard or Fair Isle

	(1) v-----	(2) -----v	(3)	(4)	(5)	(6)	(7)
14							→
13						A	←
12							→
11						B	←
10							→
9						A	←
8							→
7						B	←
6							→
5						A	←
4							→
3				S		B	←
2							→
1				= O =		A	←

◇ X

Stitch Pattern No. 10 - Jacquard or Fair Isle:

Push the required needles to B position. Knit the cast-on over the needles required. When ready to knit the pattern, end with Carriage On the Right (COR).

Begin Pattern: Starting at Row 1 using the Main Color A, set the carriage settings to those shown to the right on the chart for row 1. Set the row counter to RC000. Knit 2 rows.

Row 3: Change the knitting cam to S or Slip Position.* Change to Color B. *Push up the needles represented by the dark squares to C or D position.* Knit 1 row. *Repeat* once more.

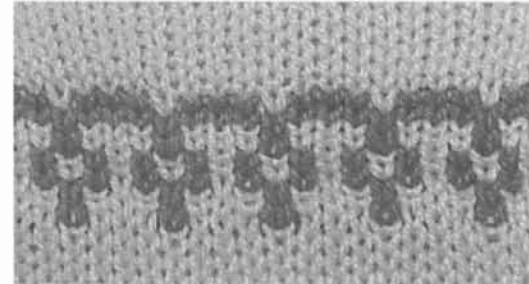
Row 5: Color A. *Push up the needles represented by the dark squares to C or D position.* Knit 1 row. *Repeat* once more.

Row 7: Color B. *Push up the needles represented by the dark squares to C or D position.* Knit 1 row. *Repeat* once more.

Row 9: Color A. *Push up the needles represented by the dark squares to C or D position.* Knit 1 row. *Repeat* once more.

Row 11: Color B. *Push up the needles represented by the dark squares to C or D position.* Knit 1 row. *Repeat* once more.

Row 13: Color A. *Push up the needles represented by the dark squares to C or D position.* Knit 1 row. *Repeat* once more. Side lever allows two rows of knitting?? Not indicated in chart.



Stitch Pattern No 10: Fair Isle Pattern

Stitch Pattern No. 11 – Slip Stitch

	(1) v-----	(2) -----v	(3)	(4)	(5)	(6)	(7)
12							→
11							←
10							→
9							←
8							→
7				O			←
6							→
5							←
4							→
3							←
2							→
1				= S =		A	←

◇ X

Stitch Pattern No. 11 - Slip Stitch:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR).

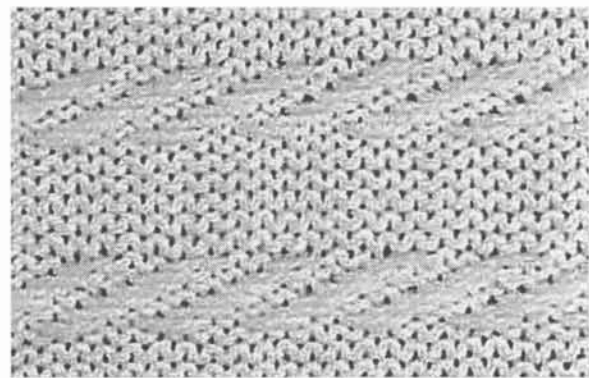
Begin Pattern: Using Color A, set the carriage settings to those shown to the right on the chart for row 1. Set the Knitting Cam to S for Slip Stitch. Set the row counter to RC000.

Row 1: Push the needles represented by the dark squares to C or D position. Knit 1 row.

Rows 2 to 6: Repeat Row 1 instructions.

Row 7: Change Knitting Cam to O or Plane Knitting position. Knit 6 rows.

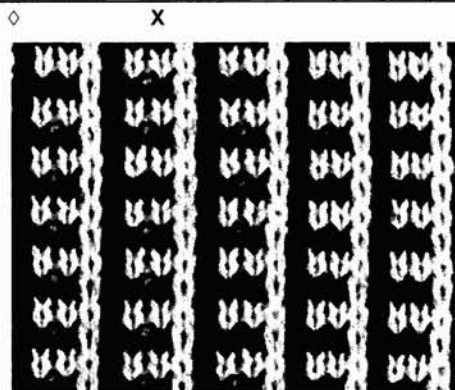
Continue following the chart repeating rows 1 to 12 changing the Knitting Cam as indicated in the chart until the required number of rows have been knitted.



Stitch Pattern No 11: The purl side is the right side

Stitch Pattern No. 12 – Two Color Slip Stitch

	(1)	v-----	(2)-----v	(3)	(4)	(5)	(6)	(7)
4	■	■	■	■	■	■	■	→
3	■	■	■	■	■	■	■	B ←
2	■	■	■	■	■	■	■	→
1	■	■	■	■	■	■	■	←



Stitch Pattern No 12

Stitch Pattern No. 12 - Two Color Slip Stitch:

Push the required needles to B position. Knit the cast-on over the needles required. End with Carriage On the Right (COR).

Begin Pattern: Using Color A, set the carriage settings to those shown to the right on the chart for row 1. Set the Knitting Cam to S for Slip Stitch. Set the row counter to RC000.

Row 1: Using Color A, push the needles represented by the dark squares to C or D position. Knit 1 row.

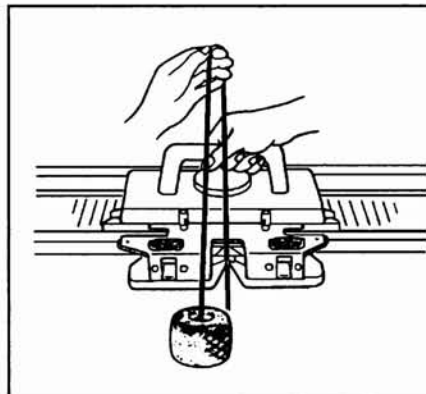
Row 2: Repeat Row 1 instruction.

Rows 3: Using Color B, push the needles represented by the dark squares to C or D position. Knit 1 row.

Row 4: Repeat Row 3 instruction.

Continue following the chart repeating rows 1 to 4 changing the Yarn Color every two rows as indicated in the chart until the required number of rows have been knitted.

How To Hand Feed Yarn



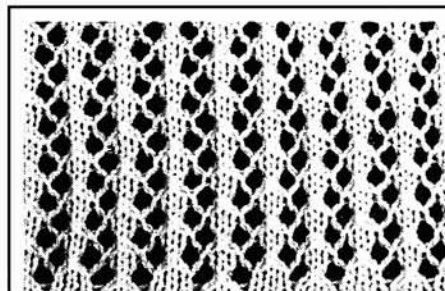
Hand feeding the yarn directly into the yarn Feeder is useful in the following instances: Knitting three different colors for the third color; Knitting Ravel Cord to separate the main yarn and waste knitting; and the yarn end is too short to thread through the Auto Tension.

Method:

1. Place the third source of yarn on the floor in front of the machine.
2. Place the yarn end into the Yarn Feeder on the carriage. Use a clothes pin underneath to add weight to the yarn.
3. Hold the yarn between the left thumb and forefinger lightly above the Yarn Feeder. Use the right hand and move the Carriage slowly to knit.

HINT: Use the right thumb to guide the yarn. Hold the yarn in the crook of your thumb using only your fingers to hold and push the carriage.

Lace Stitch



Lace patterns are worked by transferring the stitches using a Transfer Tool while knitting in stockinet.

1. Transfer the stitch from the needle corresponding to the "O" mark onto the needle marked "X" using a Transfer Tool. Always transfer stitches in the same order. E.g, always start with the stitch on the right.
2. Reset empty needles to B position.
3. Knit 2 rows in stockinet.

| = Knit Stitch

						8
			o	▲	o	7
						6
o	▲	o				5
						4
			o	▲	o	3
						2
o	▲	o				1
Pattern Chart						ROW

Cable Stitch

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td> </td><td> </td><td>-</td><td> </td><td> </td><td> </td><td> </td><td> </td><td>-</td><td> </td><td> </td><td>6</td></tr> <tr><td> </td><td> </td><td>-</td><td> </td><td> </td><td> </td><td> </td><td> </td><td>-</td><td> </td><td> </td><td>5</td></tr> <tr><td> </td><td> </td><td>-</td><td> </td><td> </td><td> </td><td> </td><td> </td><td>-</td><td> </td><td> </td><td>4</td></tr> <tr><td> </td><td> </td><td>-</td><td> </td><td> </td><td> </td><td> </td><td> </td><td>-</td><td> </td><td> </td><td>3</td></tr> <tr><td> </td><td> </td><td>-</td><td> </td><td> </td><td> </td><td> </td><td> </td><td>-</td><td> </td><td> </td><td>2</td></tr> <tr><td> </td><td> </td><td>-</td><td> </td><td> </td><td> </td><td> </td><td> </td><td>-</td><td> </td><td> </td><td>1</td></tr> <tr><td colspan="11" style="text-align: center;">Pattern Chart</td><td style="text-align: center;">ROW</td></tr> </table>			-						-			6			-						-			5			-						-			4			-						-			3			-						-			2			-						-			1	Pattern Chart											ROW		
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Pattern Chart											ROW																																																																											
	<p>Drop one stitch at either side of the 6 stitches of the cable. Using two 3-prong Transfer Tools, remove the 6 stitches from their needles. Cross the two Transfer Tools and replace each group of 3 stitches on their new needles. The three stitches replaced first determines the slant of the cable. The above illustrations show a cable that slants to the right.</p>	<p>Pick up the dropped stitches at the side of the crossed stitches using the Tappet Tool. Re knit the dropped stitches and replace them onto their original needles.</p> <p> = Knit Stitch — = Purl Stitch</p>																																																																																				

Plating

	<p>Use two strands of thinner yarn. For example, use two strands of 4 ply machine knitting yarn. This would equal one strand of DK weight which is the normal weight that this machine knits.</p> <p>Install the Single Bed Sinker Plate. Set-up for stockinet knitting.</p> <p>Thread the knit side color into the main yarn feeder. Thread the purl side color through the plating yarn feeder. The opening is to the right of the main yarn opening.</p> <p>Make sure that the plating yarn passes behind the main yarn as it comes from the tension mast and are not twisted around one another. Proceed with knitting.</p> <p>Note: Plating can be used for lace and tuck patterns as well.</p>
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The Intarsia Setting

NOTE FOR THE INTARSIA INSTRUCTION SECTION ONLY:

The knitter carriage, when the cam is placed at the "I" position (Intarsia Position), will be referred to as the *Intarsia Carriage*.

A Quick Overview: The Intarsia setting knits the working needles back to form a stitch and returns them to C position which is the working position for doing Intarsia. The stitch remains behind the latch, thus leaving the hook empty. Yarn must now be manually placed onto the now empty needle hooks. The main yarn is removed from the Intarsia Carriage while knitting intarsia.

Establish Knitting First

If you are using ribbing, complete the ribbing and transfer the stitches from the ribber bed to the knitter bed. Knit up to one row before the row that you want to start the Intarsia. Set the Cam to "I" (Intarsia). Knit the last row. All the needles will knit and come forward to the "C" position.

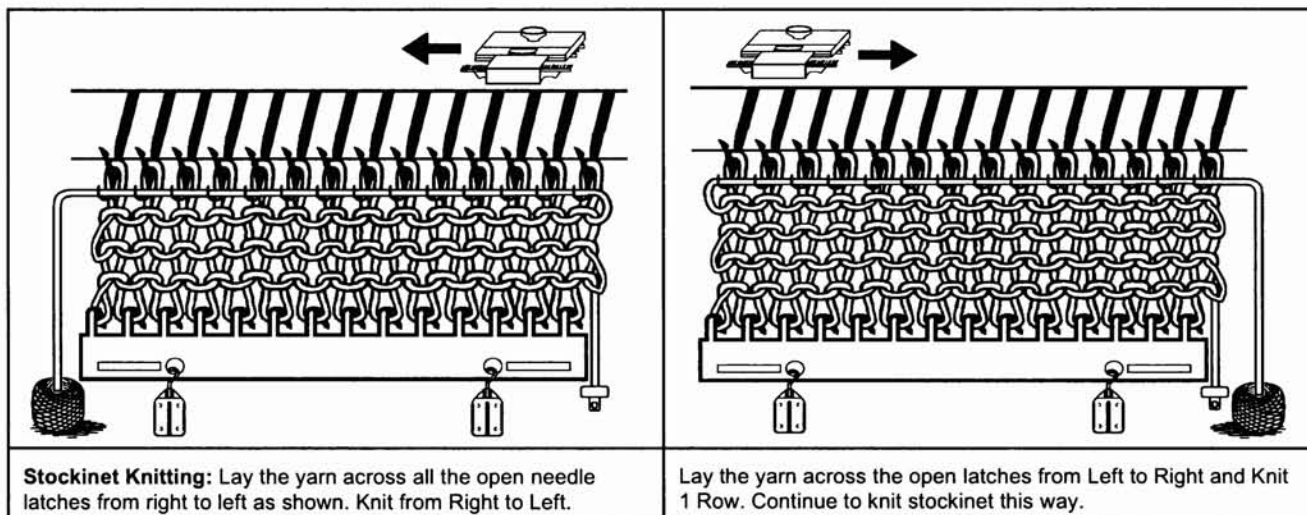
Remove the yarn from the Knitter Carriage.

Ribber Bed: Place the sinker post cover onto the Ribber sinker posts. This prevents yarn from catching on the sink post hooks. Clean the ribber bed and lower rail to remove any dirt and oil that may transfer onto the knitting yarn. Alternately, place the sinker post cover and then clean the rail. Now use masking tape to tape a piece of clean tissue paper or sheeting to the ribber bed to cover the rail area to prevent oil transfer.

Knitting Technique

NEVER place yarn over a needle hook where the latch is closed. This will drop the stitch. The yarn must be in the needle hook (not on top of the needle latch) to knit properly.

To help edge stitches or when using problematic yarn to knit off smoothly, place the yarn in the needle hooks and push the needle back just until the latch flips over the yarn. Use this technique where two yarns cross, when knitting rows with corrected knitting errors or whenever you feel you feel the need. Closing the latch insures that the stitch still knit off correctly.



Pattern Knitting:

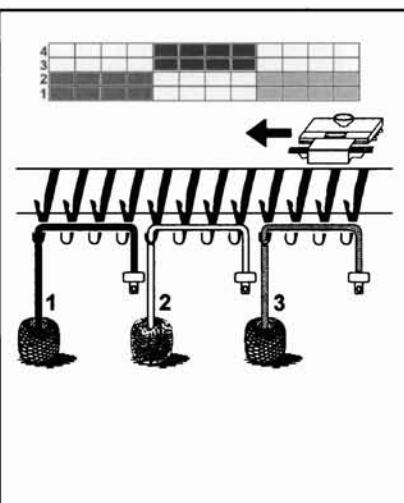
NOTE 1: *Pattern chart must be reversed as the pattern is worked on the purl side of the fabric. This is extremely important when knitting words. If the word is right reading when you are knitting, then it will be backwards on the knit side of the fabric. Be sure to reverse or mirror the image. (See Hint below).*

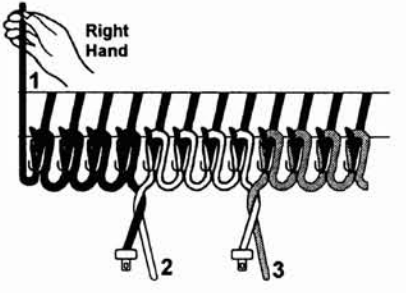
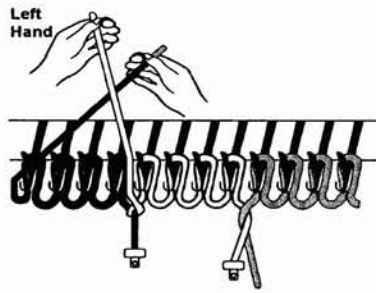
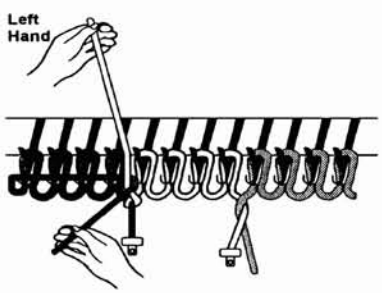
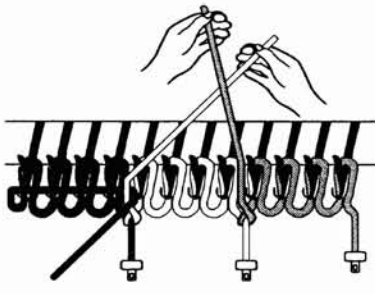
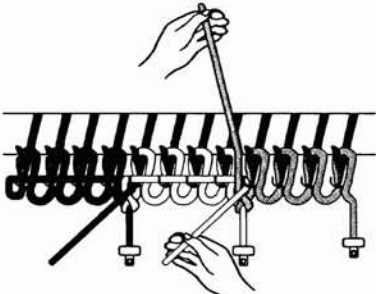
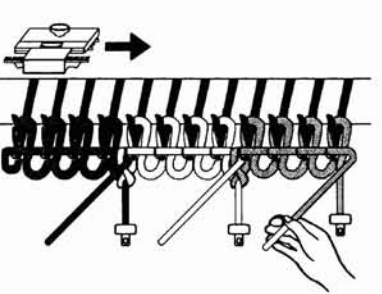
NOTE 2: The established knitting is not shown in the diagrams for visual simplicity.

Intarsia is a practical method for knitting geometric or pictorial patterns without floats on the back of the fabric following graphs.

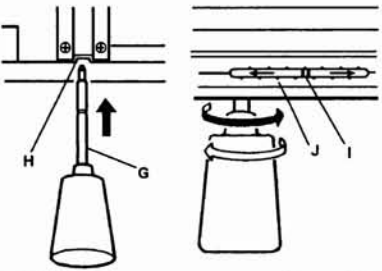
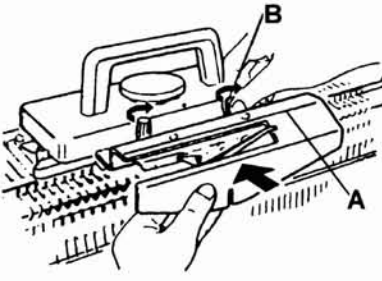
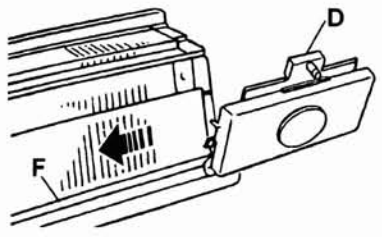
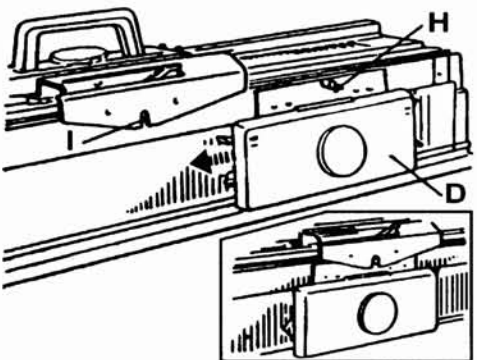
1. Clip or clothespin the yarn end. Lay yarn into needles following the chart. The clipped yarn end is nearest the carriage and hangs about 8 inches below the sinker posts. The yarn must travel through the needle hooks **away** from the carriage side toward the yarn source. The illustration shows the correct layout when the carriage is on the right while working with the yarn towards the left.

2. Slowly knit one row to the left. Check for any stitches that did not knit through. Manually knit these stitches. The carriage is now on the LEFT.



		
<p>3. With your RIGHT hand, pick up yarn #1 and raise it up and slightly behind the needle hook as shown.</p>	<p>4. With your LEFT hand, pick up yarn #2. Raise it up so it goes between the two needles where the color needs to change/join.</p>	<p>5. Lower yarn #1 sliding it down along yarn #2 between the needle hooks and down below the needles where the color joins. Let yarn #1 go.</p>
		
<p>6. Transfer yarn #2 to right hand. Pick up yarn #3 with left hand.</p>	<p>7. Lower yarn #2 by sliding down yarn #3 down between the needle hooks for the color join and thus down between needles as before.</p>	<p>8. Lower yarn #3 into needle hooks and, while holding yarn lightly, knit one row.</p>
<p>Continue to work back and forth following your chart. Introduce and remove yarn colors as needed. Remove clips once the knitting is established and place them on the ends of newly added yarn.</p> <p>When finished, darn in the ends of the yarn following the edges within the motif. Pull the yarn slightly to close up holes which normally occur in the knitting process when yarn is introduced.</p> <p>HINT: Make a photocopy of the chart onto a piece of clear mylar. Turn the mylar piece over and paper clip it to a sheet of white paper.</p> <p>SUGGESTION: To know more about Intarsia, ask your dealer about the book called "Intarsia" by Sherry & Keely Stuever for \$15.95 (soft cover). This book covers Intarsia for both hand and machine knitters extensively.</p>		

Ribber Bed Section

	<p>Attaching The Racking Handle</p> <p>On the underside on the left side of the Ribber, locate the racking bearing. Insert the Racking Handle shaft "G" from underneath into Racking Bearing "H". Push Handle in while twisting until you hear a click with a light jerk. The handle will be secured and will not fall out. Ensure that Pointer "I" on Racking indicator "J" moves when turning Handle to the left or right.</p>
	<p>Assemble Ribber Arm to Knitter Carriage and Ribber Carriage to Ribber Needle Bed</p> <p>Loosen both Arm Nuts of Knitter Carriage, Take Ribber Arm "A" and slide it under the two Arm Nuts "B". Push Ribber Arm as far back as it goes and tighten Arm Nuts firmly. Do not over tighten or they will be too tight to undo. If this occurs, place a soft cloth over the Arm Nut. Use a plier to loosen. Turn to the left or counter clockwise to loosen.</p>
	<p>Mount Ribber Carriage "D" onto the Ribber Rail "F" from the right-hand side.</p>
	<p>Move Ribber Carriage towards Knitter Carriage. Lifting the Knitter Carriage, move Ribber Carriage until the Link Pin "H" will slide into the slot of the Arm. Lower Knitter Carriage onto the Ribber Carriage Pin to connect the carriages.</p>

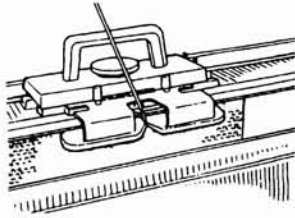
Ribber Bed Needle Positions

<p>On both left and right side of the Needle Bed you will see markings [A] [B] [C] [D]. These four needle positions are selected during knitting.</p>		
<p>[A] Non-working Position [B] Working Position [C] Upper Working Position [D] Hold Position</p>		
	<p>Pitch</p> <p>Half Pitch</p>	<p>OK</p> <p>Wrong</p>
<p>Racking Indicator "C" shows the position of Ribber Bed needles on the P Scale (upper) or on the H Scale (lower).</p>	<p>P Position is Full-Pitch. The needles are positioned directly opposite one another. The lever is set to P when every other needle selection is used.</p>	<p>H Position is Half-Pitch. The needles are positioned between one another. The lever is set to H when <i>every needle</i> selection is used. Important: Do not turn the Racking Handle when needles on the Ribber are crossed with those of the Knitter.</p>

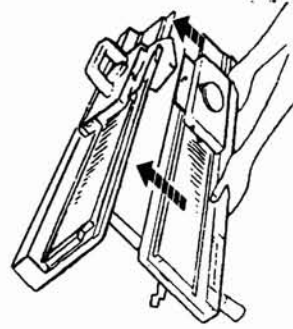
Drop Levers:

On both the left and right sides of the Ribber Bed you will find Drop Levers. Using these levers you can change position of the Ribber Needle Bed. Press them down to drop the ribber bed. You may have to pull the ribber bed down while depressing the lever as it sometimes sticks.

<p>A</p>	<p>B</p>	<p>C</p>
<p>A Top Position (Knitting Position) - This position is used for knitting rib stitches and other double bed fabrics.</p>	<p>B Middle Position - Depress Drop Levers on both sides once and Ribber Bed is lowered to its middle position. This position is used when picking up stitches.</p>	<p>C Lowest Position - Depress Drop Levers Twice and the Ribber Bed is lowered to its lowest position. This position is used when knitting on the Knitter Bed only or whenever you are not using the ribber bed.</p>

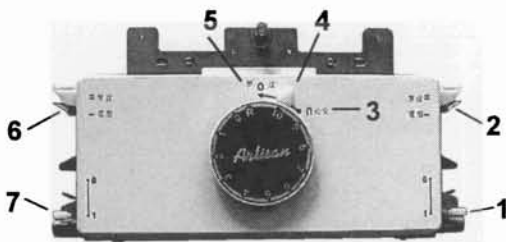


With Ribber in lowest position, you can knit using the Knitter Arm.

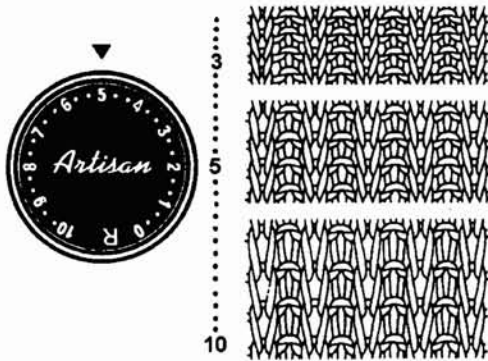


To restore the Ribber Bed to its top position, remove Knitter Arm if it is installed and lift up both ends of the Ribber Bed in the direction of the arrows with your hands until it locks in knitting position. It is OK to close the beds with the Ribber Arm installed as shown in the diagram

Ribber Carriage



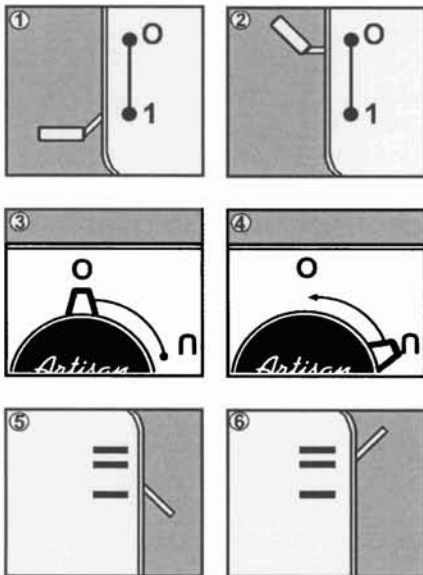
1. Right Side Lever (1 = knit; 2 = Slip)
2. Right Hold (Russell) Lever (— to hold; = to knit back)
3. Cam position for Tuck
4. Cam Lever
5. Cam position for Knit (Slip)
6. Left Hold (Russell) Lever (— to hold; = to knit back)
7. Left Side Lever (1 = knit; 2 = Slip)



Stitch Size Dial

The Stitch Dial controls the Stitch Size. Set a selected number to the ▼ mark. The larger the number, the larger (looser) the stitch. The smaller the number, the smaller (tighter) the stitch. The "R" setting is the tightest setting and is used primarily for double bed cast on.

There are two stops available between each whole stitch size. These are represented by the small dots in the illustration but do not appear on the stitch dial. On a knitting pattern, if the stitch size is 7 plus two clicks higher, the notation in the pattern would be "Stitch Size 7. ." where the two dots after the 7 represent the two stops between stitch size 7 and 8.



Levers and Cams

Side Levers

- Fig. ① Lever in 1 position: Needles in B position knit.
 Fig. ② Lever in 0 position: Needles in B position slip.

Selection Cams

- Fig. ③: Selection Cam set to O: Needles in B position knit.
 Fig. ④: Selection Cam set to U: Needles in B position tuck.

Hold Levers

- ⑤ Needles in D position do not knit. Called Holding Position.
 ⑥ Needles in D position knit back to B position.

NOTE: The left levers work when moving the Carriage to the left. The right levers work when moving the Carriage to the right.

Understanding A Double Bed Operation Diagram

Diagram 1 illustrates the location of all the levers and dials. The numbers in each circle corresponds to the numbers found across the top of Diagram 2. Each column under each number shows the settings and/or changes required as you knit each row.

Diagram 1:

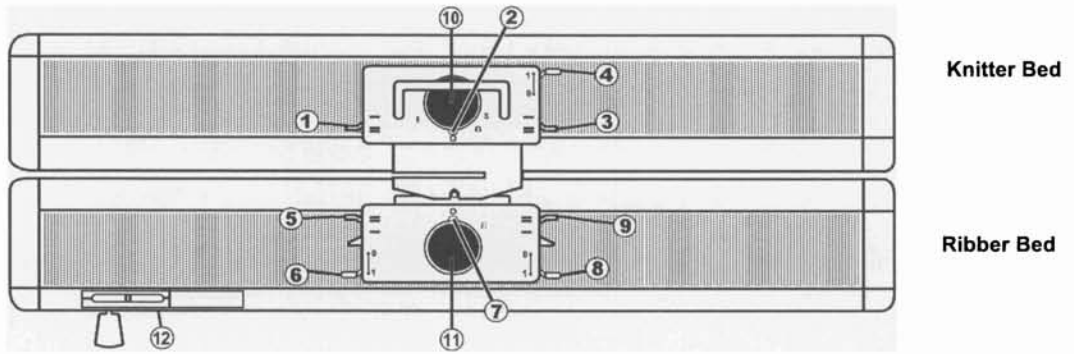
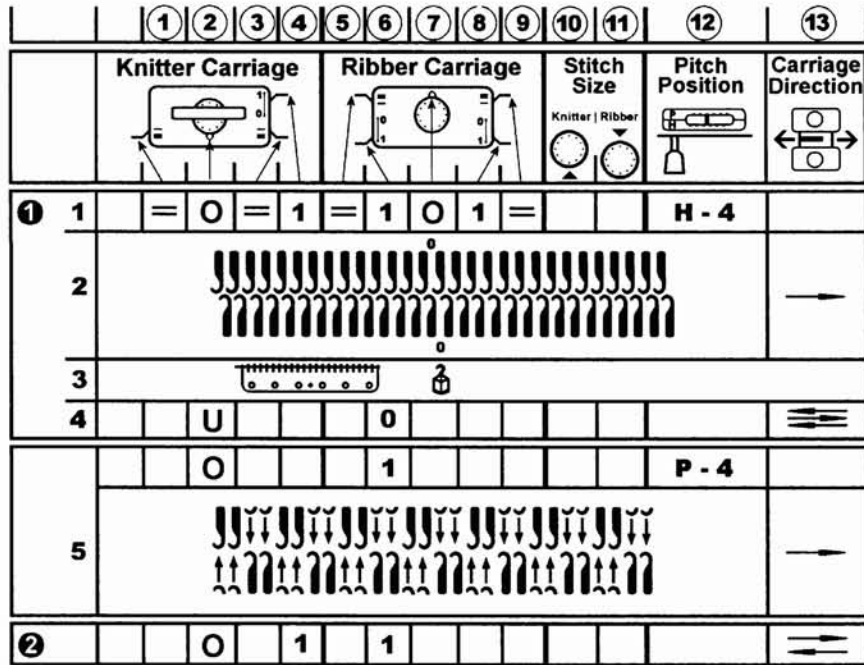





Diagram 2:



Lever Settings For Operation Diagram

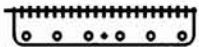

Refer to the numbers in the white circles across the top of the above Needle Bed Diagram (top) and Operation Table.

<p>Knitter Carriage</p>	<p>Cross reference numbers below to those found in Diagram 1</p>	
	1	Left Hold Lever
	2	Cam Selector for Knitter
	3	Right Hold Lever
	4	Right Side Lever
	5	Left Side Lever
	6	Left Hold Lever
	7	Cam Selector for Ribber
	8	Right Side Lever
	9	Right Hold Lever
<p>Ribber Carriage</p>		<p>Lever Settings for Ribber Carriage</p>

	Stitch Size Dial	10	Knitter Stitch Size Dial
		11	Ribber Stitch Size Dial
	Racking Indicator	12	Racking Indicator: Turn the racking handle to match the number shown in the diagram or written in a pattern. H = half pitch (needles pass between one another) P = pitch (needles opposite one another)
	Knitting Direction Color Changes	13	Arrow mark indicates carriage direction. Push the Carriage in the indicated direction (either left or right or multiple rows) Color changes are also shown in this column. If no color change is indicated, then use the Main Color.

A Brief Explanation of Each Row of the Diagram

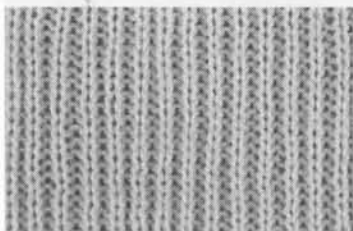
Refer to the numbers in the black circles at the left side of the above Operation Diagram. The regular numbers refer to the row numbers found in the table below:


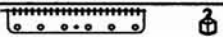
Cast On	❶ 1	Set machine controls for the initial row according to Operation Table
	2	Arrange needles required in the pattern shown in the diagram and Knit the initial row. 0 indicates the center of the machine.
	3	Suspend Cast-on Comb with Weights  
	4	Change machine controls for knitting subsequent 3 rows.
Changes For Main Knitting	5	Rearrange needles for main knitting by transferring stitches as shown. Empty needles are pushed down to A position also called "out of work" position.
Main Knitting	❷	Re-set machine controls for working main knitting. Follow the sequence: complete instructions for row 1, then row 2. Repeat these two rows as necessary.

Overview of the Following Section: The instruction for **Tubular Cast-on For 1:1 Ribbing** is explained in full detail in order to help new knitter understand the Knitting Diagram. Beginning on Page 38, instructions become more abbreviated.

TUBULAR CAST-ON FOR 1:1 RIBBING

Cast-On: Let's begin with K1 P1 Rib as an example. Referring to **Understanding A Double Bed Operation Table** on Page 31 as necessary, look at the Operation Table for K1, P1 (or 1:1) Ribbing below:

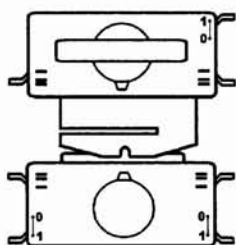
	<p>K1, P1 Rib or 1:1 Rib This is the most basic ribbing formed on every other needle using both the Knitter and Ribber Beds. Knit Stitches alternate with purl stitches. The fabric is very elastic width wise. This type of ribbing is knitted using heavier yarn. Knit following the Operation Chart below.</p>
---	---

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction
① 1	* = O = 1 = 1 O 1 =	R R	P - 3		
2					→
3					
4			0	0	→
5	U				→
6					→
②	= O =	= 1 O 1 =	3 3	P - 3	↔

Detailed Explanation Of The Tubular Cast-on For 1:1 Ribbing Diagram

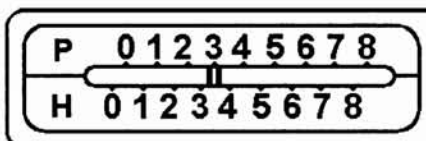
The above diagram is explained in the following steps starting with Section ①, Row 1 by reading the instructional symbols from left to right. NOTE: The carriages are always positioned on the RIGHT hand side of the machine unless instructed otherwise. In the above diagram, the carriages will begin knitting from the LEFT (see * in the following instructions).

Section ①, Row 1 Setting The Levers On The Carriages (read row 1 of diagram from left to right)



Set **Knitter Carriage** for knitting as follows:
 NOTE: The first box/column (marked "**") is always empty and has no instruction.
 = Left Hold Lever is set to =
 O Cam Selection Lever is set to "O"
 = Right Hold Lever is set to =

Set **Ribber Carriage** for knitting as follows:
 = Left Hold Lever is set to =
 1 Left Side Lever is set to 1
 O Cam Selection Lever
 1 Right Side Lever is set to 1
 = Right Hold Lever is set to =
 R **Knitter Bed:** Set Stitch Size dial to R (this is the small stitch size)
 R **Ribber Bed:** Set Stitch Size dial to R (this is the small stitch size)

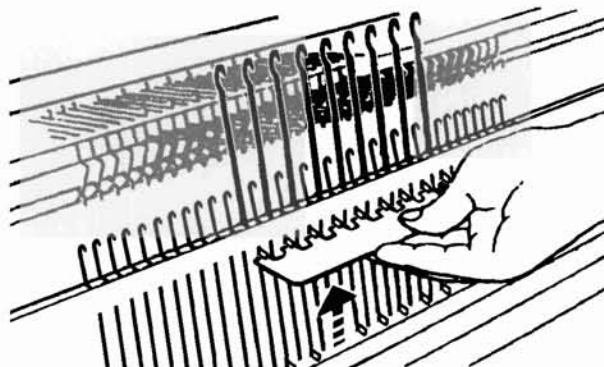


P Pitch position is when needles are exactly opposite one another across the two beds
 H Half-pitch position is when needles are half-way between one another across the two beds

Set the pitch to **P - 3** as shown in the diagram (left).

Carriage Direction: The last box indicates which direction and number of times to push the carriages. Row 1 is a set-up row only and therefore there is no arrow. The carriages are not moved. Any **Yarn Color Changes** will be indicated in this column.

Section 1, Row 2 Set Up the Needles In 1:1 Needle Position



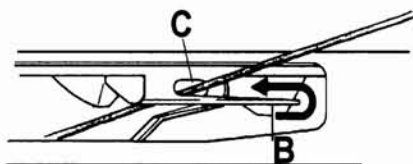
Upper row of needles in diagram: Using 1x1 Needle Pusher, push up Every Other Needle (EON) of the needles required on the Knitter bed from A to D position. E.g. if the pattern states: cast-on over 40 needles in 1:1 ribbing, of the 40 needle width, 20 needles will be pushed up to D position. NOTE: In the diagram, only the tips of the needles in A position are shown between the working needles.

Lower row of needles in diagram: Using 1x1 Needle Pusher, starting with a needle that comes up BETWEEN the first and second selected needles on the knitter bed on the left side, push up Every Other Needle (EON) of the needles required on the Ribber Bed from A to D position. Note that the first needle encountered on the left side of the diagram is on the ribber bed. Push up this one needle to D position. This "extra" needle gives you one more stitch than required. It is added to make sewing up easier. After the ribbing is completed, transfer this one stitch to the nearest needle on the ribber bed to correct the stitch count.

(*) Without yarn in the Carriages, move Carriages carefully to the left across needles in D position 1 time leaving carriages at the Left-hand side. Needles will be aligned in B position on both beds. The arrow in the carriage direction box shows that the first row of knitting is from Left to Right. This is one of the very few times this "start on Left" notations is used.

What You Should Be Seeing: On either opposite bed and between every needle in working position, is a needle in non-working position. This is referred to as "1:1 needle ribbing set-up" in machine knitting patterns. If there is a needle in working position directly opposite another needle in working position you must correct it or the needles will crash together.

NOTE: In the diagram, the first needle on the left and the last needle on the right are both on the ribber bed. This is the end needle rule. This makes it possible to sew the ribbing with an invisible seam. It also prevents having distorted edge stitches if the piece is not to be sewn to another piece (e.g., baby blankets).



Thread the tension mast with the Main Color Yarn (MC). Drop the tail of the yarn down between the two beds to the LEFT of the carriages. Attach a clothespin or secure the yarn to the machine. You want to have a 10" or longer yarn tail.

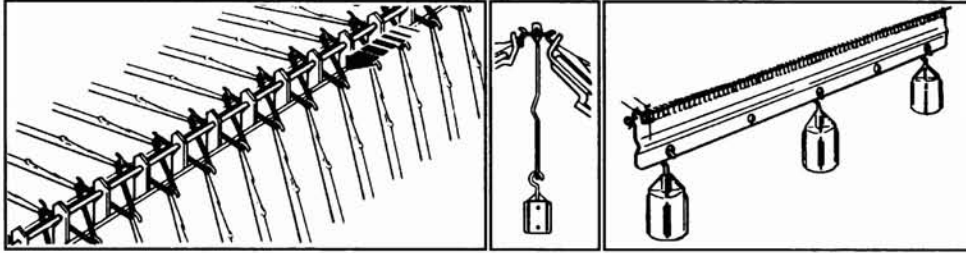
Thread yarn into Double Bed Knitting Arm (also called Double Bed Sinker Plate): Guide yarn along Yarn Guide "B" coming back into the funnel shaped area "C". NOTE: Make sure that the yarn moves freely through area C

NOTE: The stitch sizes given in the following instruction must be increased for thicker yarn.

Check to make sure that the Stitch Size Dial is set to R on both carriages.

Knit 1 Row (K1R) from left to right forming a Zig Zag row.

Section 1, Row 3 Hang The Double Bed Cast-On Comb And Weights



Select the double bed cast-on comb that is wider than the knitting. It must be wider or the knitting will not be pulled down evenly.

Remove wire from Cast-on Comb teeth by pulling it out of the comb. If it squeaks loudly, wipe it with a slightly oily cloth.

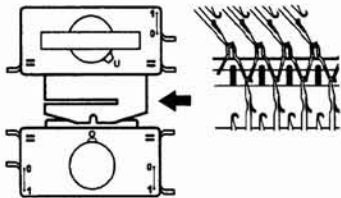
From underneath and between the Knitter and Ribber Beds: Center the comb so the middle tooth comes up at the "0" point on the number strip. Push it carefully upwards so the teeth clear the zig zagged yarn and avoids snagging the yarn.

Insert Wire through holes of Cast-on Comb teeth. Release the comb. The comb is now suspended between the beds on the knitting.
NOTE: If the wire stops moving as you are inserting it, it is because one of the teeth is a little crooked. Push the tooth back into alignment and continue to push the wire through. This may happen several times for a new comb.

The above left diagram shows the correct insertion position of the comb teeth relative to the zig zag row with the wire replaced in the comb.

Use one large weight for every 30 needles in work. Use two smaller weights if only one large weight is needed. Hook weights onto comb (middle diagram above). Weights must be in balance (right hand diagram above). As you are knitting, the comb will remain level. If it is higher on one side, move one of the weights further out along the comb on the higher side, or add a smaller weight to level the cast-on comb.

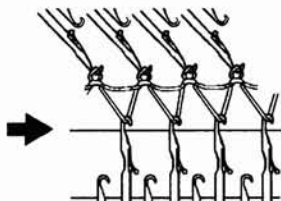
Section 1, Rows 4, 5 & 6: Set Carriages To Knit Circular (also called Tubular)



Row 4 requires three changes:

Set the Left Side Lever on the Ribber Carriage to "0". The needles will Slip (not knit) when the carriage is moving from Right to Left.
Change the Stitch Size Dial on the Knitter Carriage to "0".
Change the Stitch Size Dial on the Ribber Carriage to "0".

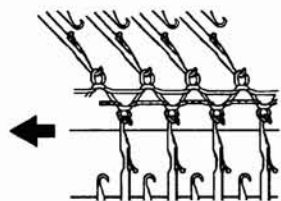
K1R (Knit 1 Row in direction of arrow).



Row 5 requires one change:

Change the Selection Cam Lever on the Knitter Carriage to "U" setting. Needles in work will Slip (not knit) when carriages move from left to right.

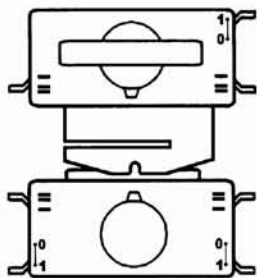
K1R (Knit 1 Row in direction of arrow).



Row 6

K1R (Knit 1 Row in direction of arrow).

Section 2 Complete The Cast-On



Change both Carriage settings to knit. *Note that some settings will not require change.* The line in Section 1 shows all the settings again to avoid error. Reading Section 2 from left to right set the carriages as follows:

Knitter Carriage:
 Left Hold Lever to =
 Set Cam Selector to "O"
 Right Hold Lever to =
 Set Side Lever to 1

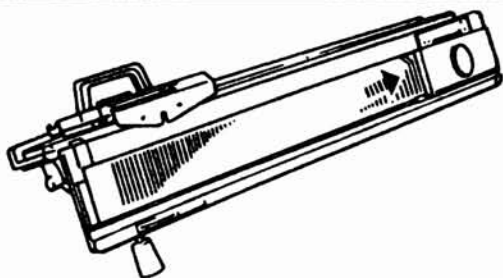
Ribber Carriage:
 Set Left Hold Lever to =
 Set Left Side Lever to 1
 Set Cam Selector to "O"
 Set Right Side Lever to 1
 Set Right Hold lever to =
 Change Knitter Carriage Stitch Size to 3
 Change Ribber Carriage Stitch Size to 3
 Set Pitch to P-3 (Full Pitch)

Knit 1 Row. The carriage is on the right side. The cast-on is finished. Now that the cast-on is finished, you must reset the Row Counter to 000 (RC000) and continue knitting in 1:1 ribbing for the required number of rows. The cast-on rows are not usually counted. Unless instructed otherwise, the row counter is left to count the rows throughout the knitting.

There are two arrows in the **Carriage Direction** column. Because this is the last item on the Operations Table, the two arrows indicate that you continue to knit for the required number of rows. This only applies when the two arrows appear at the end of the Operations Table.

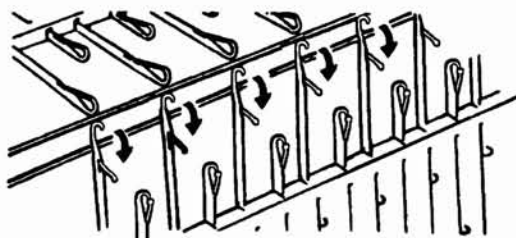
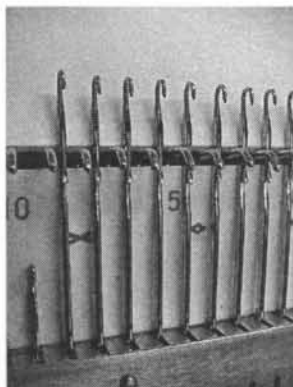
Cast-On For Tighter Edge

To make the cast-on edge of the knitting tighter or when knitting with thinner yarn such as fine to medium weight yarn, operate the initial cast-on row following the procedure below.



Set the carriages for the first cast-on row as instructed in Section 1 Row 1 in the above *Tubular Cast-on For 1:1 Ribbing* Operation Table. Do not thread the carriage.

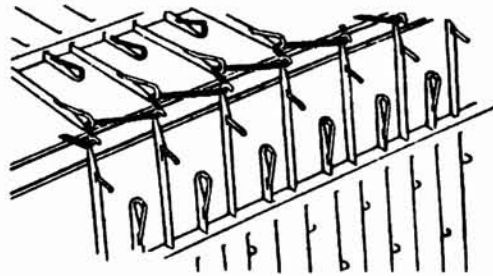
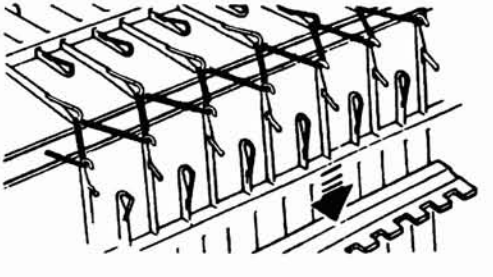
Disconnect the Ribber Carriage from the Arm and have the Knitter Carriage on the left and the Ribber Carriage on the right of the knitting.



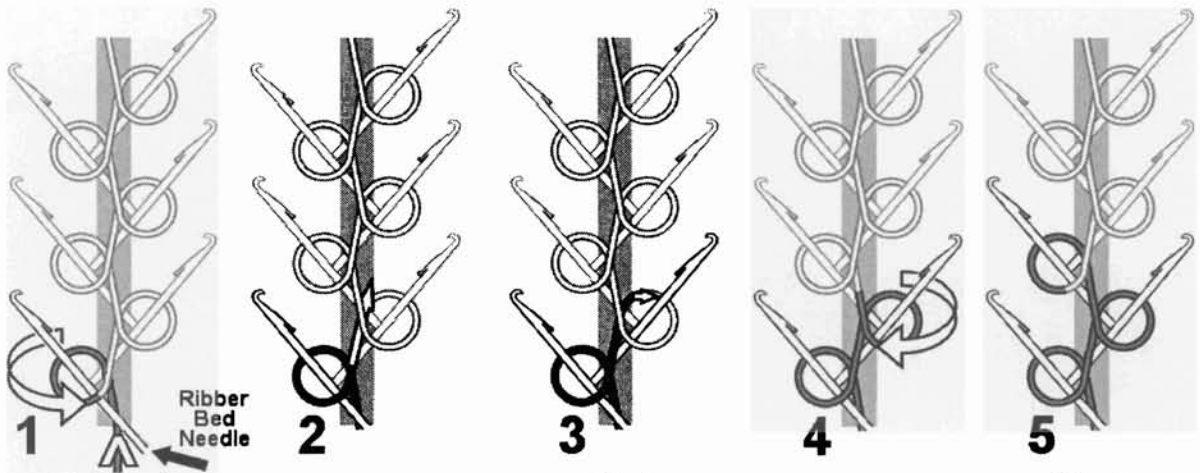
Using the 1x1 Needle Pusher, push required needles on Knitter Bed to B position

Push required needles on Ribber Bed towards C position until the latch is just below the sinker posts (see photo). When all working needles on the ribber are aligned in this position, open the latch on all the working needles.

The tip of the needle hook will be slightly higher than the needle hook on the Knitter Bed.

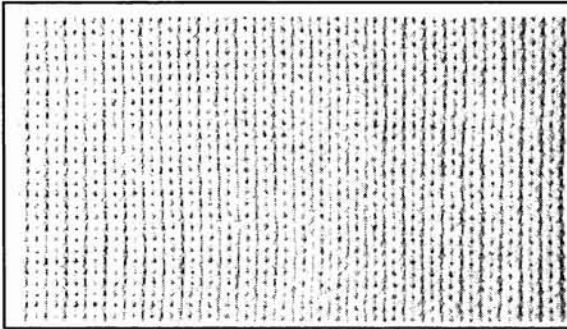
	<p>Stitch size "R" on the Knitter Carriage. Thread the Double Bed Arm Yarn Feeder and move the Knitter Carriage from left to right to knit one row.</p> <p>What You Will Be Seeing: Yarn is hooked into the Knitter Bed needles and passes around the Ribber Bed needles just under the hooks.</p>
	<p>Hang the Cast-on Comb and weights. With the 1x1 needle pusher, push the Ribber Bed needles in C position down as far as they will go towards B position.</p> <p>Connect the Ribber Carriage to the Knitter Carriage. Continue to work Rows 4, 5 and 6 following the Operation Table.</p> <p>The cast-on is now complete. Proceed with Section 2 and continue knitting.</p>

Double Bed E-Wrap Cast-On

	
<ol style="list-style-type: none"> 1. Carriages on right, beds in P position. Carriages set for plain knitting; set both carriage cams on "O", Hold Levers to =, Side Levers to 1, Main Tension Stitch Size for Ribbing. 2. Arrange needles on both beds to D position for 1x1 rib. 3. On the left-hand side of the beds, thread yarn between beds and secure underneath or use a clothespin as a yarn weight. 4. Step 1: Starting with the first needle on the left side (ribber bed needle) take yarn behind, then counter clockwise around the needle. 5. Steps 2-4: Then taking yarn to knitter bed, go behind the first needle, then around clockwise. Step 5 is beginning Step 1 again.) 	<ol style="list-style-type: none"> 6. Continue this way until all needles are E-wrapped. Load yarn into Double Bed Sinker Plate. 7. Knit 1 row. Hang double bed comb and weights. Knit required rows. <p>TROUBLE SHOOTING HINT: If carriages jam or will not slide across beds, the e-wrap is too tight. Do not pull yarn too tightly when wrapping around needles. Be sure that the loop slides down the shaft of the needle to the edge of the bed.</p> <p>This cast-on produces a very satisfactory edge. It takes a little practice to perfect this method and is well worth the effort.</p>

Double Bed Stitches

Full Needle Rib

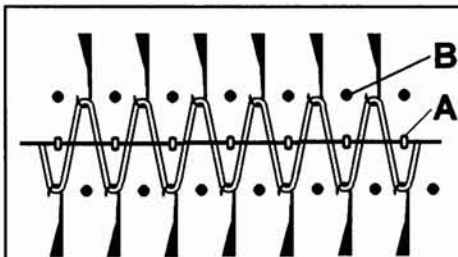


This fabric is very similar to the 1:1 Rib but is knitted with *every* needle on the Knitter and Ribber Beds rather than every other needle.

NOTE the Half-Pitch instruction: Since all needles are used, half pitch is required so the needles do not crash into one another. Half pitch allows needles to pass between one another.

This type of ribbing is suitable for medium to fine yarn weights. And is soft and more elastic than 1:1 ribbing. This type of ribbing is not usually suitable at the bottom edge of garments as it tends to be too soft and to ripple. It can be used successfully as a folded over rib where the cast-on edge is sewn to the top edge of the ribbing forming a hem.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction
①	1 = 0 = 1 = 1 0 1 =		Knitter Ribber	H - 3	
2					→
3					
4	U	0			↔
②	0	1		H - 4	↔



Hanging The Comb For Full-Needle Patterns

Following the Operation Table Section ①, Rows 1 and 2 above, complete carriage settings and needle set-up. Thread the Ribber Arm. Knit 1 Row

Row 3: Having Knit 1 Row, suspend Cast-on Comb so its teeth "A" are opposite Knitter Sinker Posts "B" as illustrated to the left.

Row 4: Continue to knit circular following the above Operation Table.

Section ②: After first row is knitted, Reset to RC000. Set carriages to plain knitting and continue knitting required rows in ribbing.

Double Bed Stitches

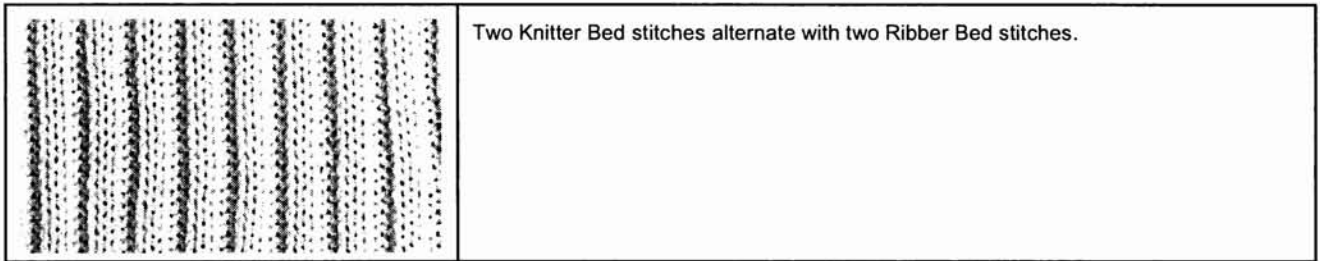
General Notes About The Following Section:

Basic instructions will no longer be written out. If you do not understand an instruction, please refer to *Understanding A Double Bed Operation Diagram* on Page 32.

New instructions will be noted and fully explained at the bottom of the Operations Table.

The Stitch Size is not given in these charts. Please read the notation marked * at the bottom of this page.

KNIT 2 PURL 2 (K2 P2) RIB (Also Called 2:2 RIB)

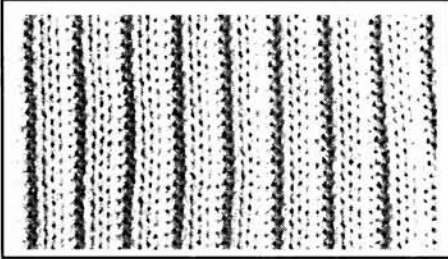


		Knitter Carriage				Ribber Carriage				Stitch Size		Pitch Position	Carriage Direction	
		Knitter Ribber												
①	1	=	O	=	1	=	1	O	1	=	2*	2*	H - 3	
	2												→	
	3													
	4		U				0				3*	3*		→
②	5											P - 3		
													→	
		O				1					4*	4*		→

* The stitch size depends on the Main Tension (MT) or Stitch Size being used to knit the ribbing.

1. The MT in this example is 4. On row 1, the stitch size is reduced to TWO full sizes smaller than the MT. The stitch size starts at 2.
2. When you reach row 4, the stitch size is increased so it is only ONE full stitch size smaller than the MT. The stitch size is now 3.
3. Transfer the stitches as shown in Line 5. The small vertical arrows indicate that you must transfer the stitch from the needle in the direction of the arrow to the needle on the opposite bed. The empty needles are pushed down into "A" position so they are out of work and no longer knit.
4. In section ②, the carriages are set to the MT. The stitch size is now 4.

Industrial Ribbing (Also called 2:1 Ribbing)



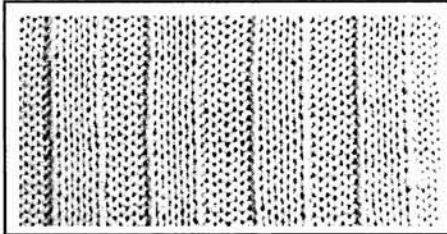
Two Knitter Bed stitches alternate with *one* Ribber Bed stitch using *Half-Pitch*. This is a very useful ribbing for finer yarn as it has more body and is very elastic. When knitting tuck patterns, this is a good choice for the bands.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction
1			Knitter Ribber 		
2					
3					
4					
2					

Transferring from Industrial Ribbing to Single Bed set up:

1. Push up out of work needles between working needles on knitter bed.
2. Transfer the stitches from the ribber bed to the nearest needle on the knitter bed. One ribber bed stitch will double up on a knitter bed needle holding a stitch. The next ribber bed stitch will transfer to the empty knitter bed needle.
3. You will have a double stitch on every 3rd needle on the knitter bed.
4. Remove double bed sinker plate. Drop the ribber down.
5. Place the single bed sinker plate on the knitter bed carriage. Thread the yarn into the sinker plate.
6. Change the knitter bed carriage stitch size to stocking stitch size.

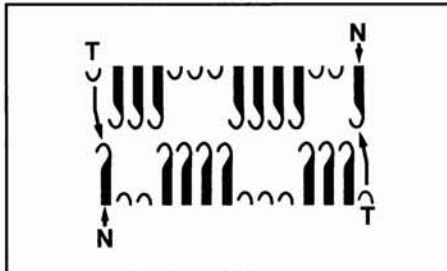
WIDE RIB



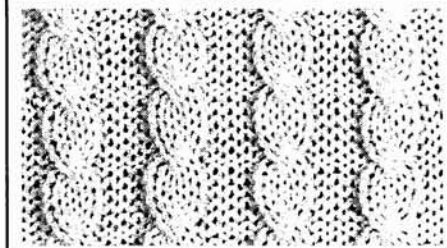
Wide Rib is knitted with ribs wider than three knit stitches and/or with more than three purl stitches. The sample is knitted with 4 knit stitches alternating with 4 purl stitches. This is referred to as 4:4 ribbing.

The Cast-On uses full-needle cast-on. When the cast-on is complete, the required number of stitches are transferred across the bed shown in Section 2 Line 5

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction							
1	=	0	=	1	=	1	0	1	=		H - 3	
2												→
3												
4		U		0								←
											H - 3	
5												→
2		0		1								←

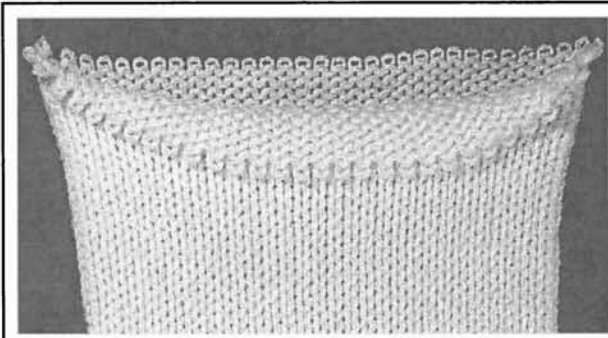


Before starting the main knitting, if more than two needles are in knitting position on their own on the end of either bed, push up a new needle (N) opposite the stitch to be transferred (T) and transfer the stitch to the corresponding needle on the opposite bed. This will make a neater edge and reduce the possibility of dropping the edge stitch(es). Use a claw weight along the edge.



Here is a variation on 4:4 Wide Rib: Cross the stitches on the knitter side to make cable stitches when using smooth yarn. Push up needles that have been cabled on the knitter bed to C position to allow the cables to knit off cleanly. If the cables seem too tight, use a larger stitch size to knit the ribbing.

TUBULAR KNITTING



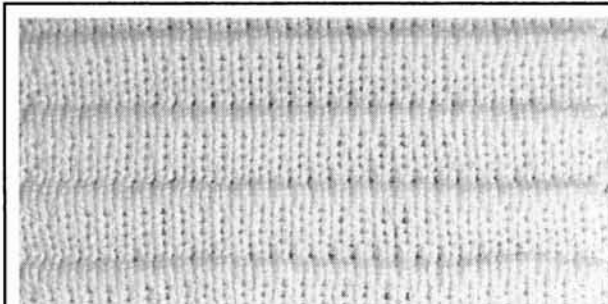
Tubular knitting is performed by knitting in one direction on the Knitter Bed only and in the opposite direction on the Ribber Bed only.

Open End Cast-on: With Waste Yarn, cast-on over two beds and hang comb and weights. Knit 4 rows. Continue with Section ②. Knit 2 rows with ravel cord or K2R with a much larger stitch size to make a loose easy to pick out row. Switch to main yarn. Use Main Stitch size and continue to knit. The beginning of the main yarn section requires further finishing before removing the ravel cord.

Closed End Cast-On: Do not use waste yarn. Thread with Main Yarn and set Stitch Size. Cast-on over two beds and continue to knit.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction	
①	1	= O = 1 = 1 O 1 =		H - 3		
	2					→
	3					
②		U	0		P - 3	↔

PIN TUCK

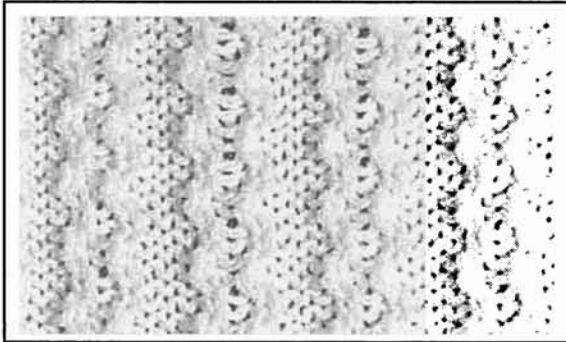


When knitting Full Needle Rib, achieve pin tuck by knitting an extra 4 or 5 rows on the knitter side only. This is achieved by changing the ribber carriage to slip in both directions.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction	
①	1	= O = 1 = 1 O 1 =		H - 3		
	2					→
	3					
	4	U	0	0		↔
②	1	O	1	1		↔)2
	2	S	0			↔)2

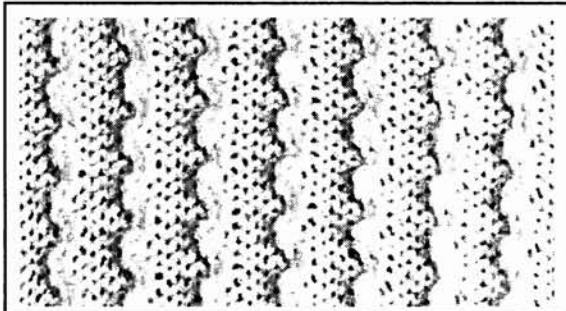
2) = repeat this instruction twice. That is, knit 4 rows.

RACKED PATTERNS



On the knitter side, use every needle and on the ribber side, push up needles in intervals desired for the pattern.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction	
			Knitter Ribber 			
①	1	= O = 1	= 1 O 1 =	H - 3		
	2					→
	3					
	4	U	0		≡≡≡	
	5					→
②	1	O	1	H - 3	≡≡≡)2	
	2			H - 5	≡≡≡)2	



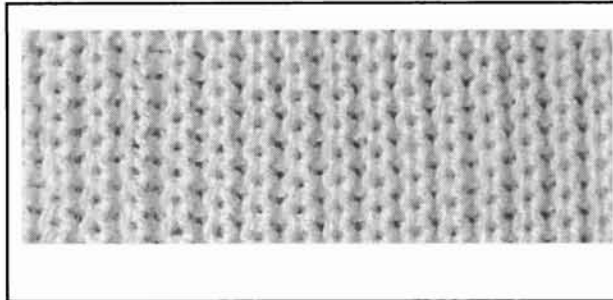
A pattern made through racking the Ribber to right and left by three needles. The sample is knitted using the following set-up.

Note: The following Operations Table replaces Section ① Line 5 and Section ② of the above Operations Table.

	5					→
②	1	O	1	1	H - 3	≡≡≡)2
	2				H - 5	≡≡≡)2

2) = repeat this instruction twice. That is, knit 4 rows.

HALF-FISHERMAN'S RIB (SINGLE ENGLISH RIB)



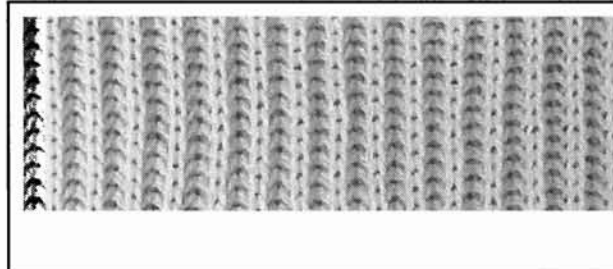
Half Fisherman's rib is formed using the 1:1 Rib (K1, P1 Rib) or Full Needle Rib Operations Tables by tucking the stitches on every other row on the Ribber Bed.

The sample is knitted using the 1:1 Rib setup which is preferred for garments. Full Needle Rib set-up is better for afghans.

Note: When making Half-Fisherman's Rib over Full-Needle Rib setup, set the Racking Indicator to H-3 and the Stitch Dial to the number suitable for the thickness of yarn being used.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction
①	1	= O = 1 = 1 O 1 =		P - 3	
2					→
3					
4		U	0		→
②		U	0	1	←

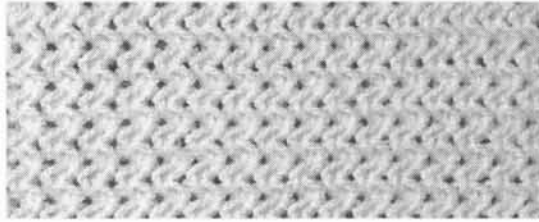
FULL-FISHERMAN'S RIB (DOUBLE ENGLISH RIB)



Full-Fisherman's (Double English) Rib is formed using either the 1:1 Rib (below) or Full Needle Rib. Unlike Half-Fisherman's Rib, tuck stitches form on *both* sides of the fabric. The sample is knitted using 1:1 Rib. Full-Fisherman's Rib widens considerably when removed from the machine. Cast-on and Bind-off must be very loose. This stitch pattern expands and becomes much wider than the cast-on or bind-off edge. If the cast-off or bind-off is too tight, the yarn is likely to break on those edges.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction
①	1	= O = 1 = 1 O 1 =		P - 3	
2					→
3					
4		U	0		→
②		U	0	0 n	←
					←

SWUNG FISHERMAN'S (ENGLISH) RIB



While knitting either version of Fisherman's Rib (English Rib), rack the Ribber by 1 needle if knitted over full-needle setup, or by 2 needles if knitted over every other needle setup. Knit 2 rows and Rack Ribber back to the original position. Knit 2 rows. Repeat.

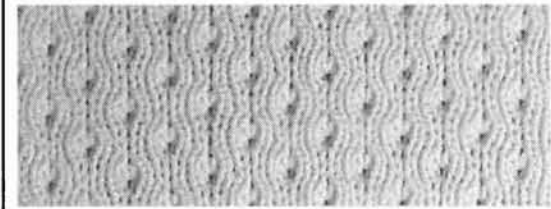
The sample is done in 1:1 Rib and requires a Pitch change of 2 positions. In the Operations Table below, this is from P-3 to P-5.

Moving the Pitch Lever in the above manner is also called Racking.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction
①	1	= 0 = 1 = 1 0 1 =		P - 3	
2					→
3					
4		U	0		
②	1	U	0 0 n	P - 3	→)2
2				P - 5	→)2

2) = repeat this instruction twice. That is, knit 4 rows.

PULL-UP TUCK RIB



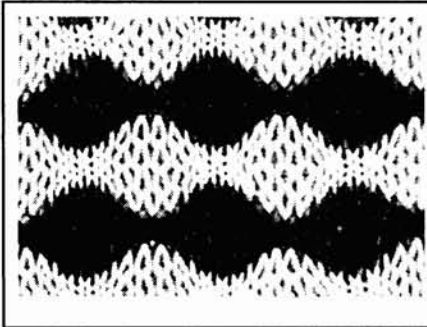
The sample is knitted over the needles arranged for Full Needle Rib as shown below, but you can try this on different needle arrangements.

Note Section ① Line 1: Push up "O" marked needles to D position. After knitting the required rows, place D position needles to C position. For Section ② Line 2, the procedure is the same, but the selected needles are different.

		Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction
①	1	= O = 1 = 1 O 1 =		Knitter Ribber	H - 3	
	2					→
	3					
	4		0	0		←←←←
	5		1	1		←←←←
	6	=	=			←←←←
②	1					←←←← 4
	2					←←←← 4

4) = repeat this instruction four times. That is, knit 8 rows.

DROP STITCH LACE



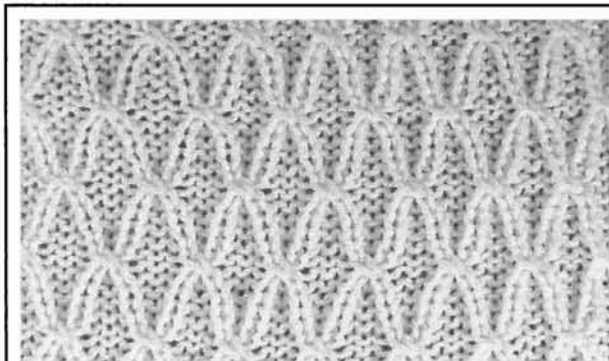
Cast-on as shown and transfer all stitches to the Knitter Bed. You will be knitting Stockinet on the Knitter Bed side. On the Ribber side, push up needles at intervals from Position A to B, knit the required rows. Drop the stitches on those needles by disconnecting the Ribber Bed Carriage and push it back and forth to drop the stitches from the Ribber Bed. Reconnect the ribber carriage. Select the new Ribber Bed Needles and knit the required rows.

Knit two different colored yarns for maximum effect. Knit using Color A and Color B alternating as shown in the Carriage Direction column. Try two different textured yarns as well.

	Knitter Carriage	Ribber Carriage	Stitch Size	Pitch Position	Carriage Direction
①	1	= O = 1 = 1 O 1 =		H - 3	
2					→
3					
4	1 * 2 *				
5				See Section ②	↔ 8
②	1	*			A ↔ 4
2	*				B ↔ 4

4) = repeat this instruction four times. That is, knit 8 rows.

CROSSED RIB AND RIB TRANSFER STITCH PATTERNS


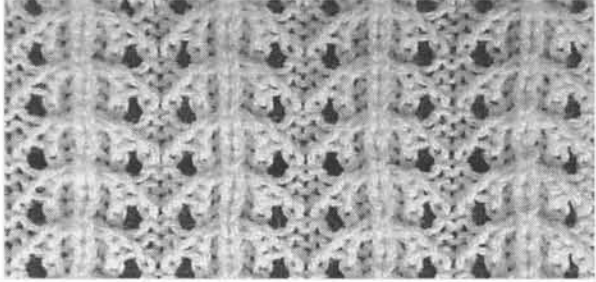




CROSSED RIB

In the knitting of Double Rib or other type of rib stitches, cross the stitches or transfer the stitches on the knitter side for making patterns.



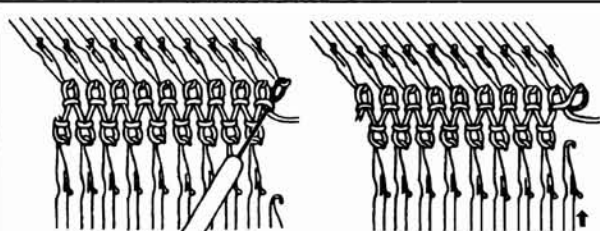
Cast-on over every needle using Full-Needle Ribbing and then transfer stitches from Knitter Bed to the Ribber Bed as shown before continuing to knit in rib stitch. Cross stitches in the same direction every time.

	<ol style="list-style-type: none"> 1. Knit 6 rows in rib stitch. 2. On the knitter, cross the "a" stitches with the "a" stitches and "b" stitches with "b" stitches. 3. Knit 6 rows in Rib stitch 4. On the Knitter, cross the "a" stitches with the "b" stitches. Remember the Right stitch goes on the Left needle first. Repeat steps 1-4.
	<p>RIB TRANSFER STITCH PATTERN</p> <p>In the knitting of Double Rib or other type of rib stitches, cross the stitches or transfer the stitches on the knitter side for making patterns.</p> <p>The Cast-On is for Full Needle Rib using Half Pitch.</p>
	<p>Cast-on over every needle and then rearrange the stitches as shown before continuing to knit in rib stitch. Suggestion: transfer EON on the Knitter Bed to it's neighbor rather than across the bed.</p>
	<ol style="list-style-type: none"> 1. Knit 6 rows in rib stitch. 2. On the Knitter Bed for every group of three needles, transfer stitches on right and left needle onto the center needle and leave the empty needles in B position. Repeat above two steps.

DOUBLE BED KNITTING TECHNIQUES

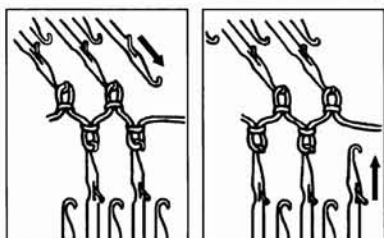
INCREASING SINGLE STITCHES

The following diagrams show three different methods of how to increase 1 stitch on either side of the knitting:



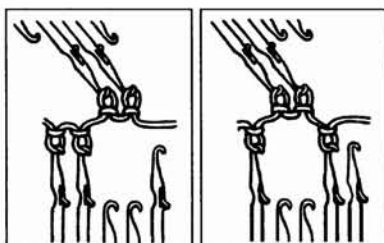
Full Needle Rib:

1. Push an adjacent Knitter Bed needle on the Carriage side to B position. A pick-up heel of the adjacent stitch below the end stitch and place it onto the empty needle.
2. On Ribber/Knitter, push the next needle into B position. Continue to knit.



1:1 Ribbing:

- Increase #:** On Carriage side, push the Knitter Bed needle to be increased to B position and continue to knit.
- Increase #2:** On Carriage side, push the Ribber Bed needles to be increased to B position and continue to knit.

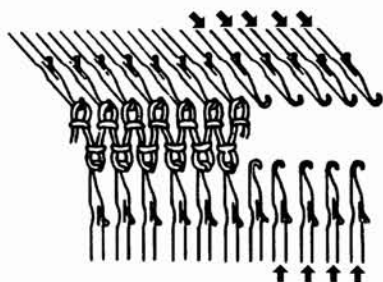


2:2 Ribbing:

On Carriage side, maintaining the needle position pattern, push the next needle up into working position and continue to knit.

Optional: After pushing the new needle up, pick up and transfer the heel of the stitch from the nearest stitch into the empty needle. Continue to knit.

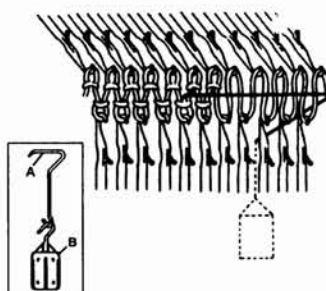
INCREASING MULTIPLE STITCHES



Increasing Full-Needle Rib:

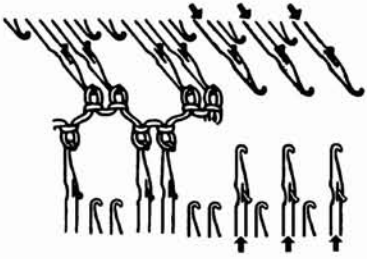
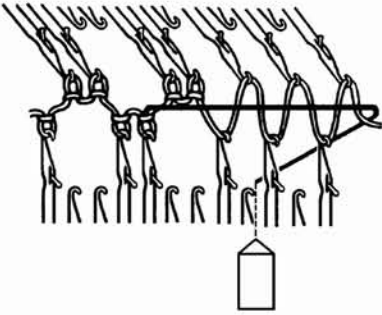
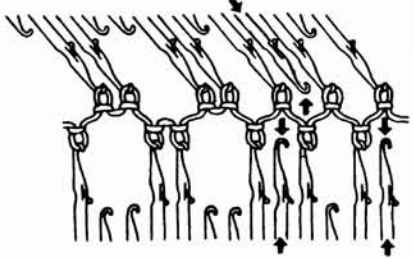
Possible only on opposite side from Carriage

1. On opposite side of Carriage, push required Knitter and Ribber Bed needles to B position.
2. Knit 1 row. Yarn lies alternately in a zig zag pattern in Knitter and Ribber Bed needle hooks.

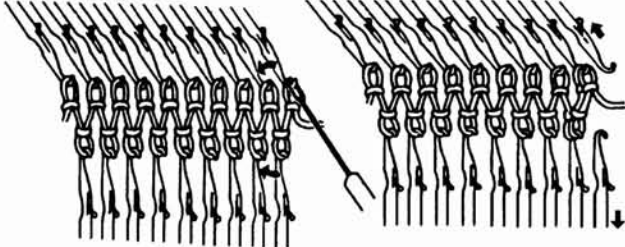


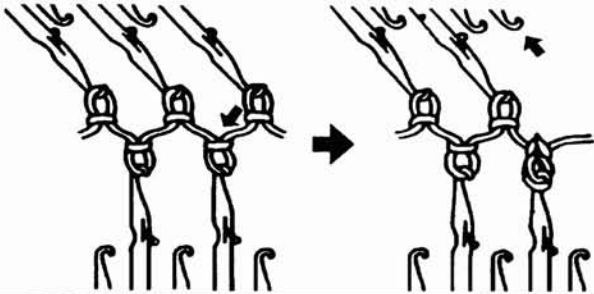
3. Use Side Hanger "A" with Edge Weight "B" attached, herein after called Edge Weight. From underneath, insert hook of Side Hanger between Knitter and Ribber Bed, push upwards and lay the hook over zig zag stitches. Ensure yarn is hooked inside Side Hanger.

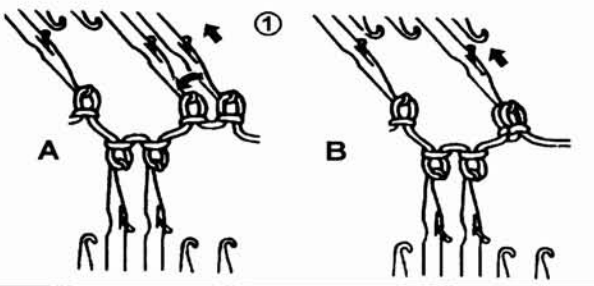
4. After approximately 10 rows are knitted, move Edge Weight up in order to obtain consistent results.

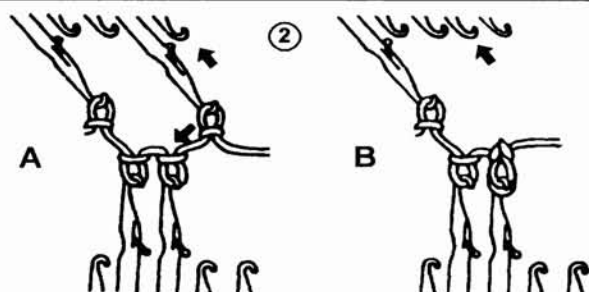
		
<p>2:2 Rib:</p> <p>1. On the side opposite Carriage, push up required number of needles for increase to B position on both Beds as shown.</p>	<p>2. Knit one row and hang Edge Weight.</p>	<p>3. Knit 1 row. Rearrange needles by transferring stitches as indicated by arrows into 2:2 position. Refer to <i>Using Double Eye Transfer Tool</i></p> <p>4. Push empty needles back to A position.</p>

DECREASING SINGLE STITCHES

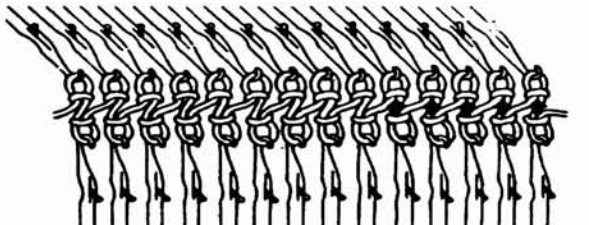
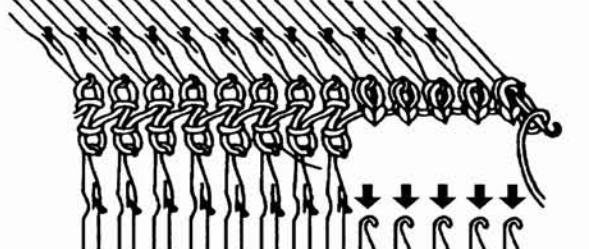
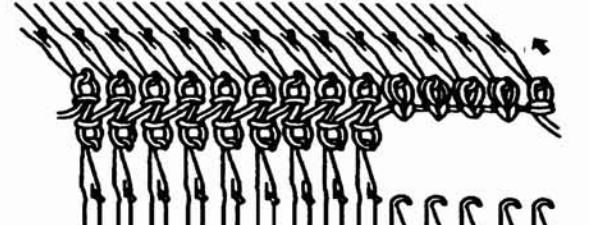
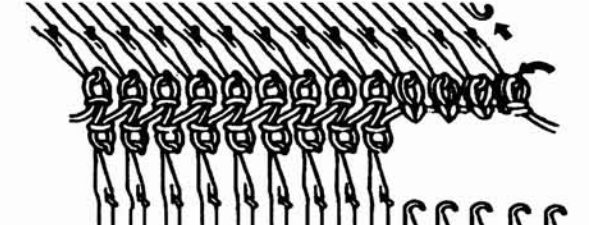
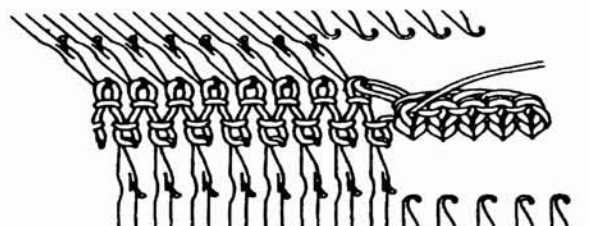
	<p>Full-Needle Rib:</p> <p>1. Possible on either end of knitting simultaneously. Transfer end stitched on both Knitter and Ribber onto the adjacent inside needles at the same time.</p> <p>2. Push back empty needles to A position. Continue to knit.</p>
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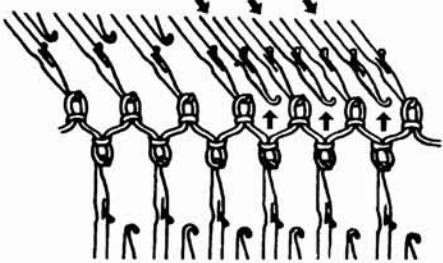
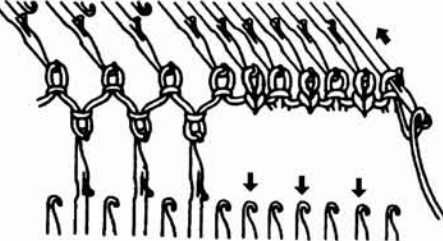


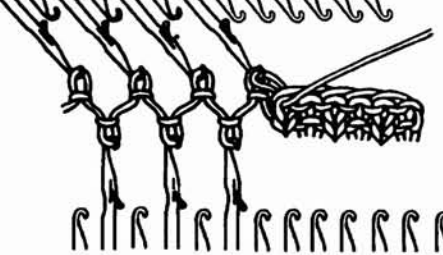
	<p>1:1 Rib:</p> <p>This can be done on either end of the knitting simultaneously.</p> <p>1. Transfer the end stitch across the bed from the Knitter Bed to the Ribber Bed (or from the Ribber Bed to the Knitter Bed)</p> <p>2. Push back the empty needle to A position.</p> <p>3. Continue to knit</p>
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	<p>2:2 Rib:</p> <p>1. If two end stitches are aligned on the Knitter or the Ribber, transfer the first end stitch to its adjacent needle. Otherwise continue with Step 2</p>
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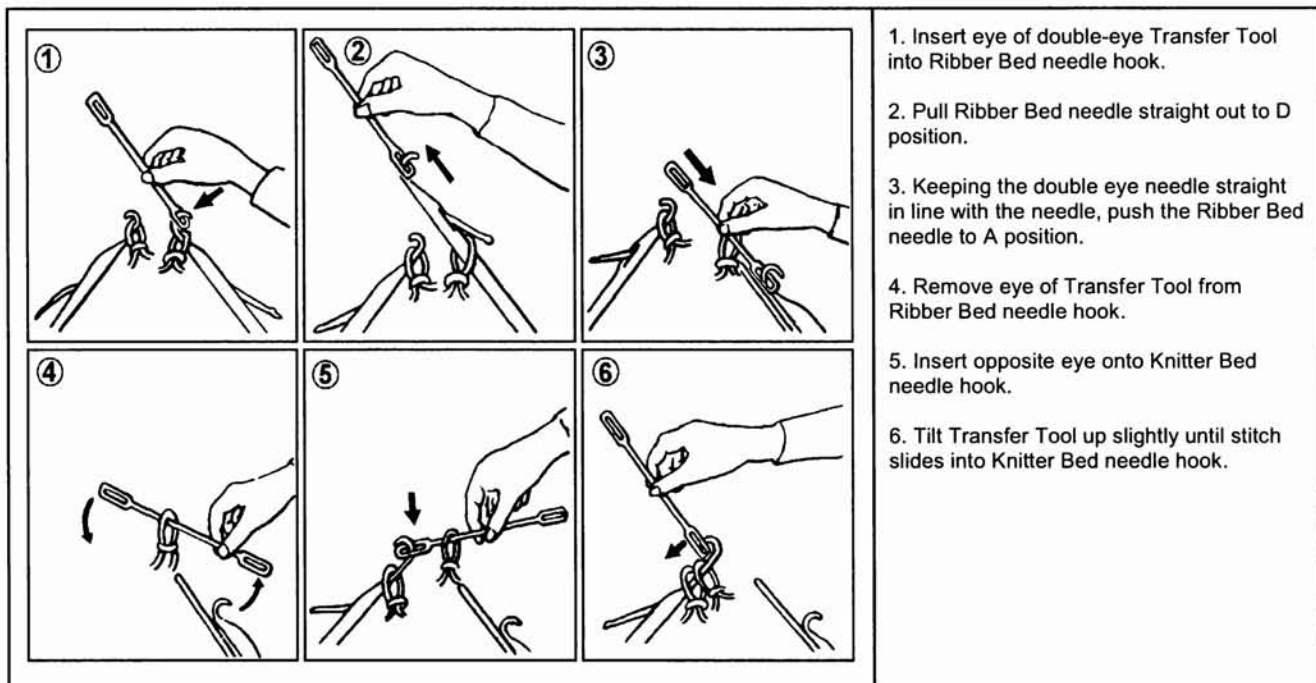
	<p>2. If a single end stitch is to be transferred, transfer it across the bed to the nearest working needle. Continue to knit.</p>
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DECREASING MULTIPLE STITCHES

	<p>Full-Needle Rib:</p> <p>1. Temporarily set the Racking Indicator to P.</p>
	<p>2. Using Double-eye Transfer Tool, transfer stitches tom Ribber Bed needles to their corresponding Knitter Bed needles.</p> <p>3. Push empty Ribber Bed needles back to A position.</p>
	<p>4. On the side with the yarn end, push up the first needle until its stitches pass the latch and lay the knitting yarn into the needle hook.</p> <p>5. Push back the first needle to B position thus knitting the yarn through the stitches.</p>
	<p>6. Transfer the new stitch onto the next working needle and push back the empty needle to A position.</p> <p>7. Repeat steps 4-6 until all but one of the required number of stitches have been decreased.</p>
	<p>8. Place the last stitch to be decreased onto the adjacent working needle. Make sure all empty needles are returned to A position or they will begin knitting again.</p> <p>9. Return the Racking Indicator back to the original H position.</p>

	<p>1:1 Rib:</p> <ol style="list-style-type: none"> 1. On Carriage side, push up required number of Knitter Bed needles to B position. 2. Transfer stitches from Ribber Bed needles to their corresponding empty needles on the Knitter.
	<ol style="list-style-type: none"> 3. Push empty Ribber Bed needles back to A position. 4. Push up the end needle until its stitch passes the latch and lay the knitting yarn into the needle hook as shown. 5. Hold yarn end down slightly and push the needle back to B position.
	<ol style="list-style-type: none"> 6. Transfer the stitch onto the next working needle. Push back the empty needle to A position.
	<ol style="list-style-type: none"> 7. Push end working needle up to D position so both the old and new stitches are behind the latch. Lay the knitting yarn into the hook and push the needle back to B position, thus knitting off the two stitches. 8. Transfer the stitch onto the next working needle. Push back the empty needle to A position.
	<ol style="list-style-type: none"> 9. Repeat steps 6-8 until required number of stitches have been decreased. 10. Place the last stitch decreased onto adjacent working needle. <p>Note: Be sure that all empty needles are in A position as they may otherwise start to knit again.</p>

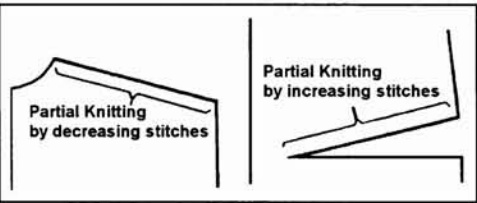
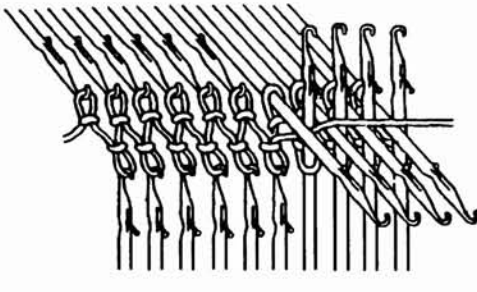
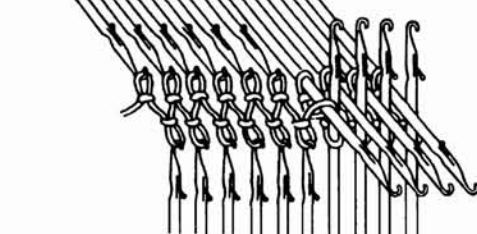
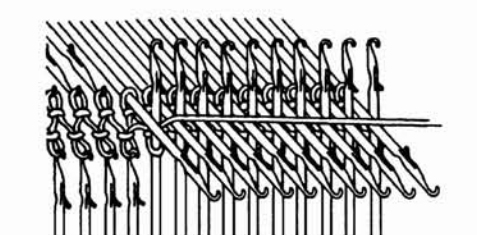
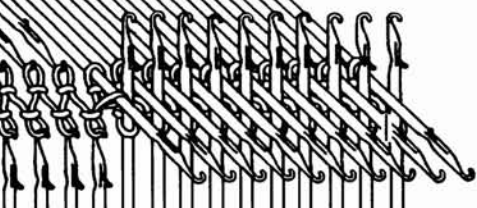
HOW TO USE DOUBLE-EYE TRANSFER TOOL

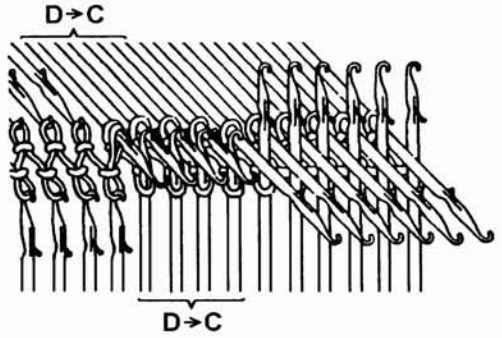


DOUBLE-BED PARTIAL KNITTING

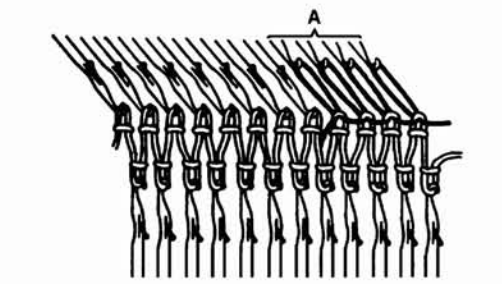
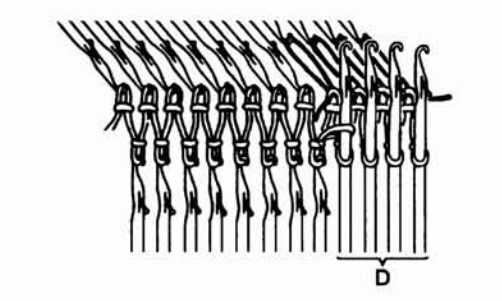
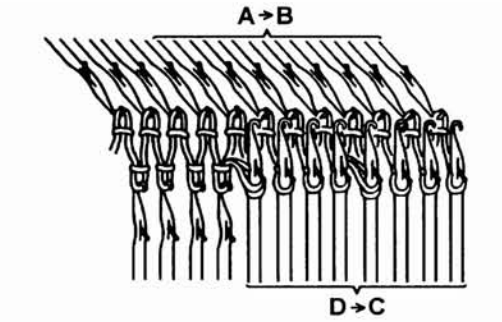
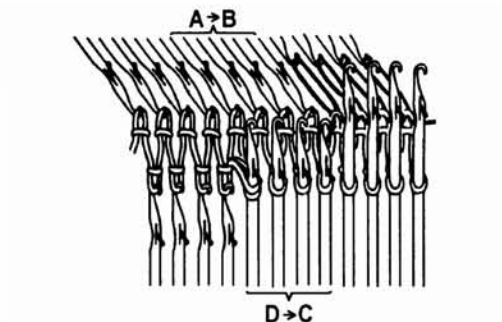
Partial knitting is a practical method for shaping a gentle slope such as a shoulder, darts, sock heels, back of slacks and so on. This method applies to Full Needle Rib, 1:1 Rib, Wide Rib, Half-Fisherman's Rib, Full-Fisherman's Rib and Pin Tuck, etc. Partial knitting is more commonly referred to as Short Rowing.

An example of a practical application is a sweater shoulder. The carriage is on the right. The pattern says to bind-off 4 stitches at the beginning of this and every other row. Rather than actually bind off the stitches, you can Short-Row them. Follow the instructions below putting 4 needles in hold every other row. When the shaping is finished, the carriage is set to knit back all the needles in hold. This is when you bind off. The result is a smooth shoulder. Using the bind-off-as-you-go method creates "steps" along the shoulder edge which is difficult to sew up.

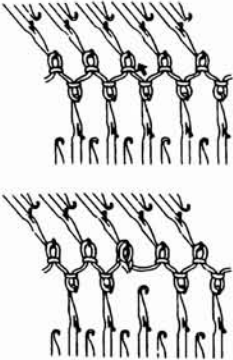
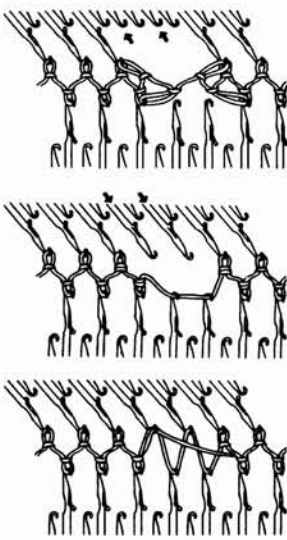
 <p>Partial Knitting by decreasing stitches</p> <p>Partial Knitting by increasing stitches</p>	<p>Partial knitting by decreasing the number of needles in working position:</p> <p>Both carriages: Set Hold Levers to "---" (hold position).</p> <p>Note: A needle placed in the hold position stops knitting but the stitch remains on the needle. Make absolutely sure that any needle put into hold is completely forward as far as it will go into the D position. A needle that is not positioned correctly may start to knit again unexpectedly.</p>
	<p>1. On the side opposite the Carriages, push up needles for the width to be shaped by partial knitting to D position. In the picture, 4 needles are placed in hold on each bed. Knit one row. Bring yarn under the first needle in D position laying it on top of the remaining needles in Hold as shown. This is called "wrapping the needle" or simply "wrap".</p> <p>Note: Be careful not to get the yarn hooked around a sinker post.</p>
	<p>2. Knit one row. Your knitting should look like that in the diagram.</p> <p>3. Repeat Steps 1-2 until required number of stitches have been decreased. That is, push needles opposite the carriage into hold. K1R, Wrap, K1R. Repeat as required.</p>
	<p>Partial knitting by increasing number of stitches in working position:</p> <p>Both carriages: Set Hold Levers to "---."</p> <p>1. On the side opposite Carriage, push up all the needles for the width to be shaped by partial knitting to D position.</p> <p>2. Knit one row</p> <p>3. Bring yarn under the first inside needle in D position as shown.</p>
	<p>4. Knit one row. Your knitting should look similar to the picture (left).</p>

	<ol style="list-style-type: none"> 5. Push needles to be returned to work from D position back to C position. 6. Repeat steps 4-5 as required.
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PARTIAL KNITTING INVOLVING RACKING PATTERNS

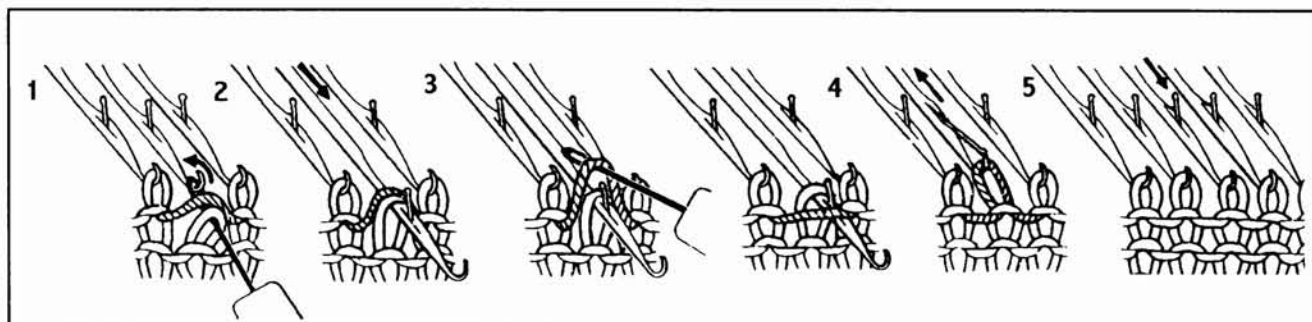
	<p>Knitter Bed needles in D position cross between the opposite Ribber Bed needles in D position. Under these conditions, you can not use the Racking Handle or you will damage the crossed needles.</p> <ol style="list-style-type: none"> 1. Hand knit stitches using ravel cord in the needles required for Short Rowing pushing the needles back to A position as shown. Drop ravel cord ends down between the beds to prevent it from catching. 2. Set the Hold levers of the Ribber to "—" position.
	<ol style="list-style-type: none"> 3. Push up corresponding Ribber Bed needles to D position. 4. Knit one row. 5. Bring Yarn under the first inside needle in D position on the Ribber Bed and knit one row. 6. Repeat steps 1-5 as required.
	<p>Partial knitting by increasing stitches:</p> <ol style="list-style-type: none"> 1. On the side opposite Carriage, place Knitter Bed stitches to be shaped by partial knitting, by hand by using ravel cord and knitting the needles from B position back to A position. Place ends of ravel cord down between the bed to prevent tangling. 2. Push corresponding Ribber Bed needles up to D position. Set both Ribber Bed Hold Levers to "—"
	<ol style="list-style-type: none"> 3. At each step in increasing stitches, replace Knitter Bed stitches back into hooks and back into B position by pulling gently on the ravel cord until the stitches pop back into the needle hook. 4. At the same time, push corresponding Ribber Bed needles in D position back to C position. 5. Knit 2 rows. 6. Repeat rows 3 to 5 as required. <p>NOTE: To prevent the Ravel Cord from catching in the Knitter or Ribber Carriage, drop the ends between the needle beds.</p>

DOUBLE BED BUTTONHOLES

	<p>Single Stitch Eyelet:</p> <ol style="list-style-type: none"> 1. At the point for eyelet, transfer one stitch from Ribber to Knitter. 2. Leave empty needle in B position. Continue to knit. 		<p>Double Stitch Eyelet:</p> <ol style="list-style-type: none"> 1. Transfer two stitches on Knitter onto their adjacent stitches at the point for the buttonhole. Push empty needles to A position. Work same on Ribber. 2. Leave empty needles on Ribber in B position. 3. Knit one row. 4. On Knitter, push up needles to B position from which stitches were transferred to adjacent needles. 5. Knit one row. 6. Hook hanging yarn on Knitter Bed needle. Continue to knit.
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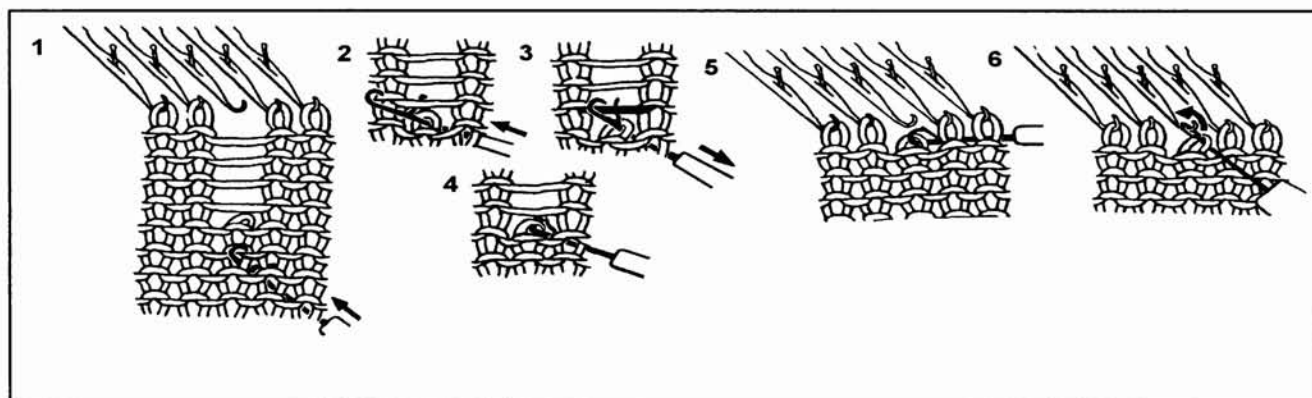
KNITTER BED TROUBLE SHOOTING

TO REPLACE A SIMPLE DROPPED STITCH:



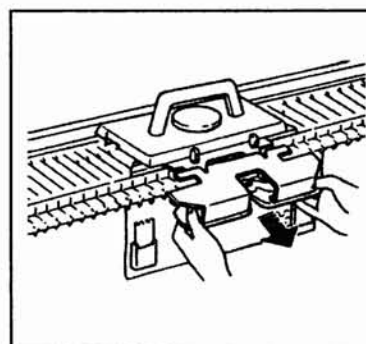
1. To replace a dropped stitch, insert a Transfer Tool prong into the dropped stitch. Replace the stitch onto the empty needle together with the bar above the stitch.
2. Push the needle forward until both stitches move behind the latch.
3. Lift up the bar using the Transfer Tool and bring it in front of the latch.
4. Push back the needle until the stitch behind the latch slips off the needle.
5. Align the needle correctly in B position.

TO REPLACE A DROPPED STITCH THAT HAS RUN:



1. From the back side of the knitting (knit side), insert the Latch Tool into a stitch a few rows below the dropped stitch. Let the stitch run down to the Latch Tool.
2. Push the Latch Tool forward until the stitch moves behind the latch on the tool.
3. Pull the tool back, catching the bar from the unraveled stitch above in the hook.
4. The stitch behind the latch slips off the tool and knits through the bar in the hook.
5. Repeat up to the top stitch.
6. When you reach to the top of the knitting, use a Transfer Tool to transfer the stitch from the Latch Tool and rehang the stitch onto the bed.
7. If one or more stitches have dropped side by side, it is usually easier to unravel the rows rather than repair the stitches.

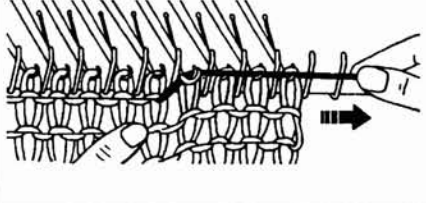


CLEARING A CARRIAGE JAM:




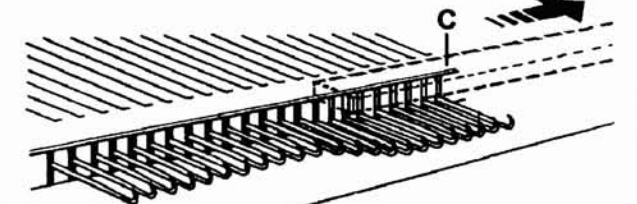
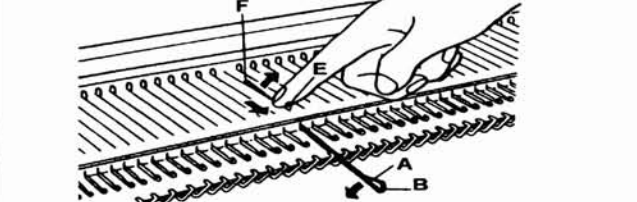


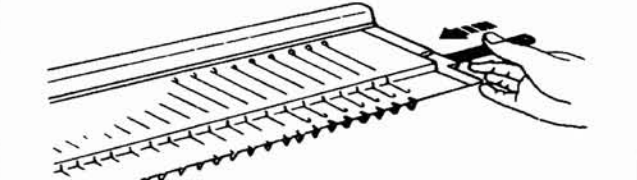
If the carriage has jammed in the middle of a row, do not use force to free the Carriage. Proceed as follows:

1. Remove the yarn from the Yarn Feeder. Loosen the Arm Nuts and remove the Sinker Plate.
2. Tilt back and hold up the front of the Carriage. Move the Carriage until it by-passes the knitting needles. **IMPORTANT:** If the carriage is to be moved past the row counter, lift the row counter tripper on the carriage flipping in back out of the way to prevent it catching on the row counter causing damage to either the tripper or row counter.
4. Unravel the row and align the needles back to B position (select needles into patterning if appropriate). Attach the Sinker Plate. Return the Row Counter by one row or as necessary. Return the row counter tripper to working position. Insert yarn and continue to knit.

TO UNRAVEL KNITTING:

	<p>Unraveling is required when: you have knitted too many rows; you have made a mistake in your knitting; the carriage has jammed; or stitches have dropped or knitted incorrectly. Make any repairs to the knitting first if possible.</p> <p>1. Move the carriage away from the knitting. (Note: If a jam has occurred, it may first be necessary to remove the sinker plate to move the carriage.) Remove the yarn from the Yarn Feeder. Hang the Claw Weights on both edges of the knitting.</p>
	<p>2. Holding the knitting downwards with you left hand, pull the feed yarn sideways. Lift the yarn upwards and very slightly backwards. The stitches of the previous row slide back onto the needle hooks.</p>
	<p>3. Ensure all stitches are in the needle hooks and the needles are aligned in B position before unraveling the next row or beginning to knit.</p> <p>NOTE: When Lace Knitting or decreased stitches are unraveled, place the transferred stitches back to their original needles before unraveling the row. In all cases, return the row Counter by the same number as rows unraveled.</p>

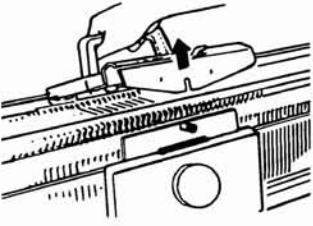
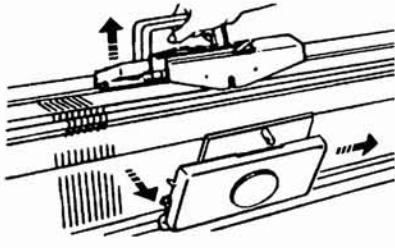
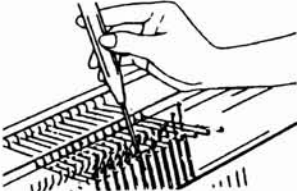
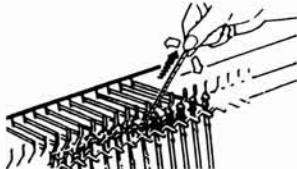
CHANGING A DAMAGED NEEDLE ON EITHER THE KNITTER OR RIBBER BED:

<p>A needle with a damaged latch or a bent needle will cause incorrect knitting, torn/broken yarn or dropped stitches. The needle latch "A" must move smoothly and lie flat over the hook "B". The needle for the Knitter and Ribber beds are interchangeable.</p>	
	
<p>1. Using the blunt end of a pencil, push the plastic end of the Needle Retainer Bar (also called Sponge Bar) in at the side nearest the damaged needle.</p>	<p>2. Pull the Needle Retainer bar out of the Needle Bed until the damaged needle has been cleared.</p>
	
<p>3. Push the damaged needle to D position. Close the latch "A" and press the hook "B" down. The shank "F" will then come out of the needle bed groove "E".</p>	<p>4. Lift up the needle by holding the butt and pull it to remove from the Needle Bed. Make sure the latch stays closed. Use wire cutters to remove badly damaged needle hooks before removal.</p>
	
<p>5. To replace a new needle, open its latch and slide it into the needle bed groove. Push the needle back to A position by holding the butt.</p>	<p>6. Push the Needle Retainer back into position. All needles will be under the sponge. The sponge side of the bar goes down, the metal side goes up when replacing the Sponge Bar.</p>

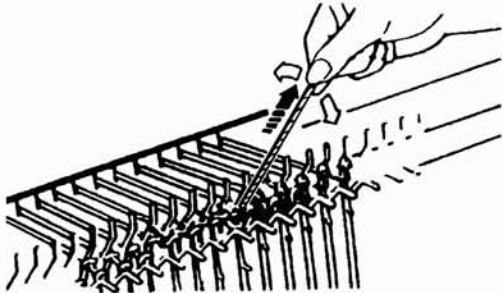
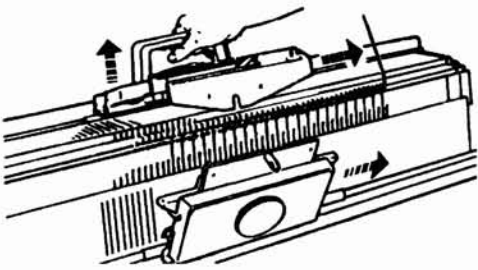
RIBBER BED TROUBLE SHOOTING

WHAT TO DO IF ...

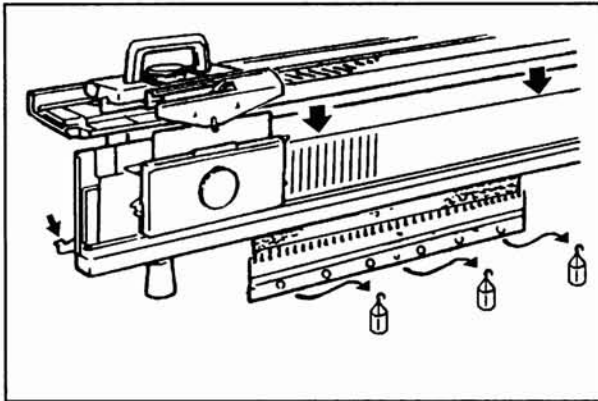
THE CARRIAGE HAS JAMMED:

	
<p>1. Lift the Knitter Bed Carriage to disconnect the Ribber Carriage. If the Ribber Arm is caught, remove it first.</p>	<p>2. Tilt Ribber Carriage toward you and move it to either end of the Needle Bed.</p>
	
<p>3. Align Knitter and Ribber Bed needles in their original position. If a stitch has slipped behind a latch of needle to be aligned, catch stitch with Transfer Tool and put it back to needle hook first, then align needles.</p>	<p>4. Hold yarn and unhook it from Knitter and Ribber Bed needle hooks by pulling it in the direction of the arrow in a zig zagging way until yarn comes to the side the carriage side is on. Reassemble carriages, re-thread, reset the Row Counter and continue to knit</p>

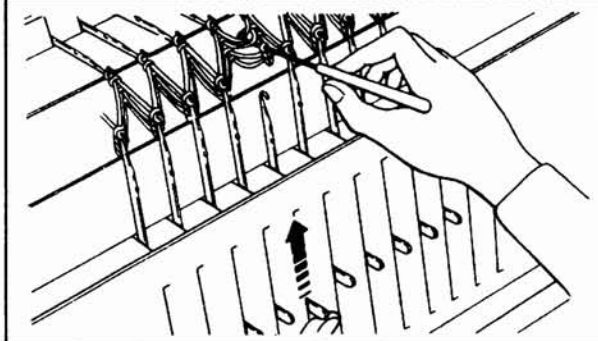
IF YOU HAVE A MISTAKE IN THE KNITTING:

	<p>1. Unravel the row incorrectly knitted. Align the needles back to B position. Return the Row Counter by the same number of rows unraveled.</p>
	<p>2. If yarn comes to the side opposite Carriage, move both Carriages to the side the yarn is on by turning Row Counter Lever back to non-working position and then lifting carriage to free move (see illustration).</p> <p>Alternate 1: Set both carriages to Slip and move them to the correct position.</p> <p>Alternate 2: Unravel one more row to have yarn on the same side as the carriage.</p>

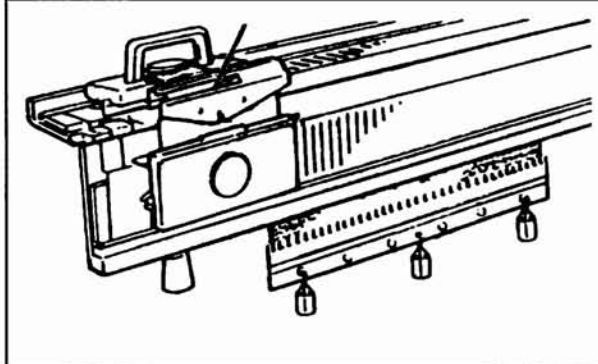
IF A STITCH HAS DROPPED:



1. Remove Weights from Cast-on Comb as they may cause dropped stitches to run. Do not remove Cast-on Comb from knitting.
2. Depress Drop Levers and bring down Ribber to middle position.

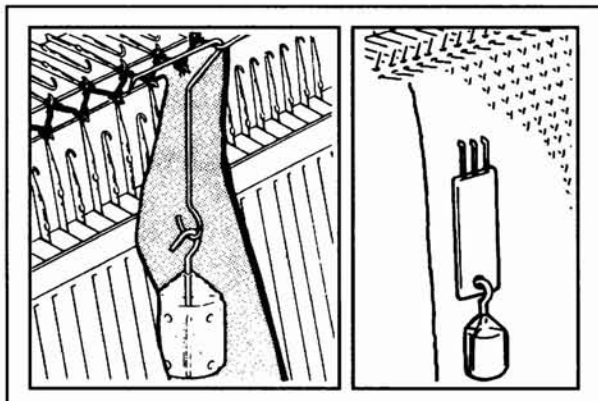


3. With Hook Tool, pick up dropped stitch and place it back on needle hook. Then reform stitches by moving needle in and out manually re-knitting stitches one by one or by using Latch Tool.



4. Raise Ribber to original position. Hook Weights back on Cast-on Comb and align needles.
5. Continue to knit.

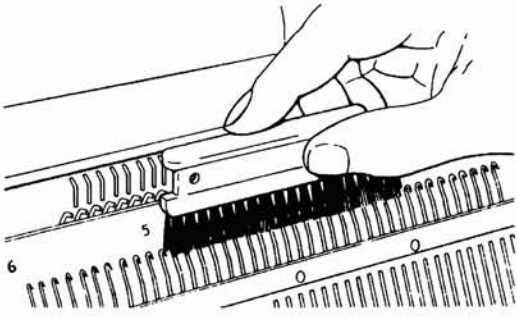
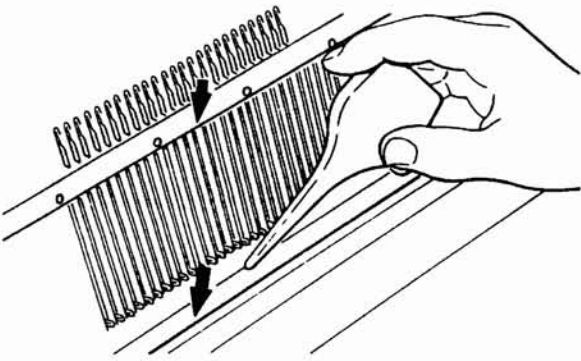
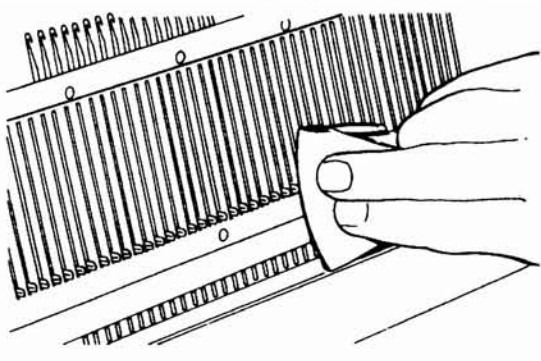
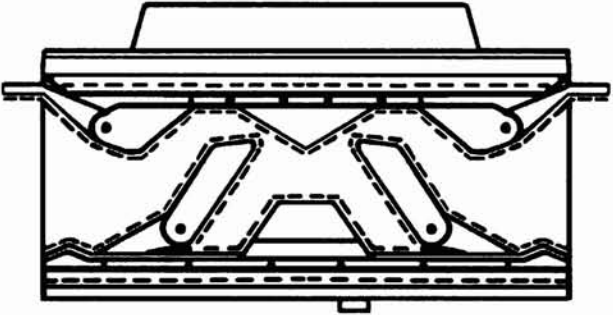
IF EDGE STITCHES ARE FALLING OFF:



When edge stitches tend to float or loop and fall off the needle, suspend the Smaller Round Weights with Wire Weight Hanger and move up every 10-15 row. See left illustration. A claw weight can be hung into the loop with care if less weight is desired.

The illustration on the right uses the Hanger Comb with Weight and is also effective.

MAINTENANCE:

	
<p>1. With Cleaning Brush remove lint or dust from Needle Bed around needles. Use a cloth to remove old oil from knitting bed rails and brass tube on both carriages.</p>	<p>2. Apply lubricant to sliding parts of needle bed. Do not apply excessive lubricant. Oil the lower rail. (Lower arrow). Use a clean cloth to oil the upper rail where the rivets are. (Upper arrow)</p>
	
<p>Rub needle butts with oil dabbed on a clean cloth.</p>	<p>With a small clean paint brush, clean underside of Carriage and apply oil over sliding parts with oil dabbed on a clean cloth along dotted lines indicated in diagram.</p>

TECHNICAL SPECIFICATIONS

Gauge of Machine	3.6 needles / inch
Needle pitch	7.0 mm
Effective length of needle bed	1022 mm (approximately 39.5 inches)
Number of needles	148 on Knitter bed and 148 on Ribber Bed
Mode of needle patterning	Manual with needle pusher
Mode of operation	Hand driven
Type of yarn	Double Knitting and Worsted Weight
Type of pattern knitting	Hold tuck stitch patterns; Hold tuck stitch pattern in colors; Slip stitch pattern; Slip stitch pattern in colors; Fairisle; Single motif; Lace stitch patterns; and Cable stitch patterns using transfer tool

Swatch Information for the Artisan 70D Plus Mid-Gauge Knitting Machine

All acrylic, acrylic/wool blends and cotton swatches were machine washed, dried in a dryer, and then gently pressed with steam iron. Hard twist wool swatches were hard pressed with steam iron. All hand knitting yarns were processed according to the manufacturer's recommendations. Here are the swatch results including tensions, stitch, and row gauge.

Yarn	Tension	Sts./In	Rows/In
Bonnie Triola Cottontale 8	3.1	6.2	8.6
----- 2 strands	9	5.0	7.5
----- 2 strands	10	4.8	7.3
Bonnie Triola Velveen - 2 strands	4.1	5.7	8.6
	5	5.3	8.3
Bramwell Artistic - 2 strands	4		
Bramwell Irene Cotton	5	5.5	8.6
Bramwell Roselan DK	4.1	5.0	7.5
	5	4.7	7.1
Bramwell Texas Chunky	8	5	7.5
Denys Brunton Cot. Sensation (2 strands)	9	5.2	7.6
Forsell Aztec Chenille	4	5.0	8.5
Forsell Pure New Wool DK	6	5.5	8.0
Forsell Shamal DK	4.1	5.0	7.5
	5	4.9	7.5
Forsell Touch of Silk DK	8	5.2	7.5
Forsell Thistledown Silk	3	6.0	9.5
Honiburd Cotton Rainbow	3.1	6.2	8.6
-----2 strands	9	5.0	7.5
	10	4.8	7.3
Honiburd Mini Cotton - 3 strands	5	5.3	8.0
Katia Papiro	9	5.0	7.5
Mary Lue's Liberty Plus	9	4.75	8.0
Mary Lue's Schuss Plus	8	5.0	7.5
Millor Cordonette	9	4.75	7.25
Noro Silk Garden	9	4.0	7.0

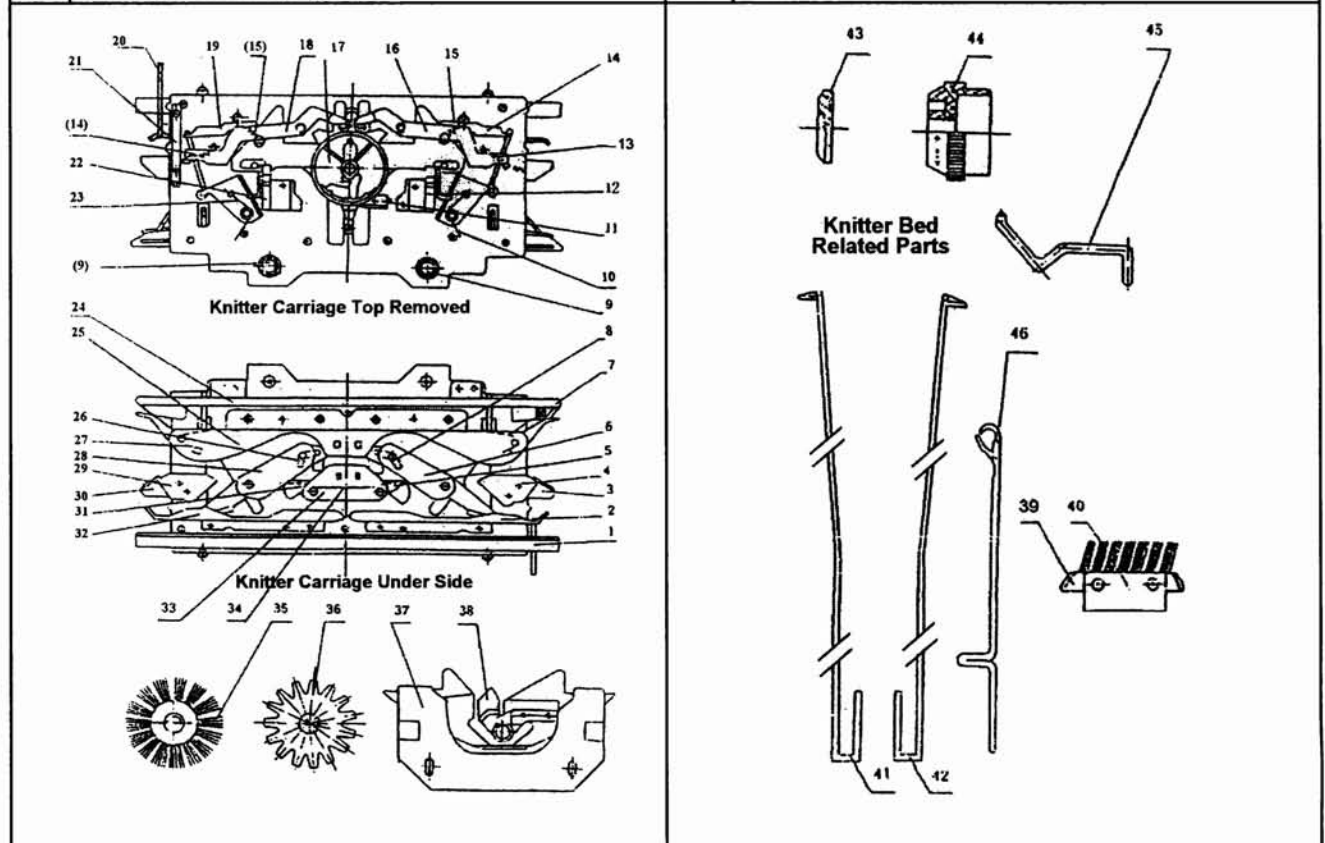
Pingouin Fleur de Laine	9	5.0	6.5
	10	4.6	6.3
Pingouin Pingofrance	5	5.3	8.0
Plymouth Encore Worsted	9.1	4.7	6.9
	10	4.7	6.7
Plymouth Encore DK	4.1	5.2	8.0
	5	5.0	7.7
Plymouth Wildflower Cotton/Acr.	5	5.2	7.7
	5.2	5.0	7.5
Silk City Rayon Chenille (1300 yds/lb)	4	4.7	6.8
Silk City 3/2 Perle Cotton	5	5.5	8.6
Silk City Velveen - 2 Strands	4.1	5.7	8.6
	5	5.3	8.3
Sirdar Denim DK	5	5.0	8.0
Sirdar Silky Look DK	4.1	5.3	8.0
	5	5.2	7.7
Sirdar Snowflake DK	4	5.0	8.0
Spectrum Detroit DK	5	5.5	8.5
Spectrum Strata Aran	10	4.4	6.8
Stephanie's Team Colors 2 strands	4	5.75	8.2
Stephanie's Team Colors - 3 strands	9	4.7	6.85
Tamm Cancun - 2 strands	9	5.1	7.5
Tamm Spirit - 2 strands	7	4.7	7.5
Tamm Trenzi - 2 strands	9	4.8	7.0
Tamm Varsity - 2 strands	9	5.0	7.0
Yeoman Brittany Cotton - 3 strands	5	5.3	8.0
Yeoman 50/50 - 3 strands	5.1	5.0	7.3
Yarn Country Kola Wool	5	5.7	7.7

Distinctive Knits would like to thank David Miles for swatching the above yarns on the GE63-70 Mid-Gauge knitting machine.

Knitter Carriage Parts List

This is a list of parts that will possibly need replacing in the future due to wear. Brushes are usually the only things that need replacement and that is after many years of use. To determine brush wear: Examine the brushes for a small area that looks like a "bite" has been taken out of it along the edge of the bristles. This is the part of the brush that open the latches on the needles. If it has completely worn away, then the brush needs to be replaced. The plastic disk that covers Part 36 will need replacement when it is chipped or broken.

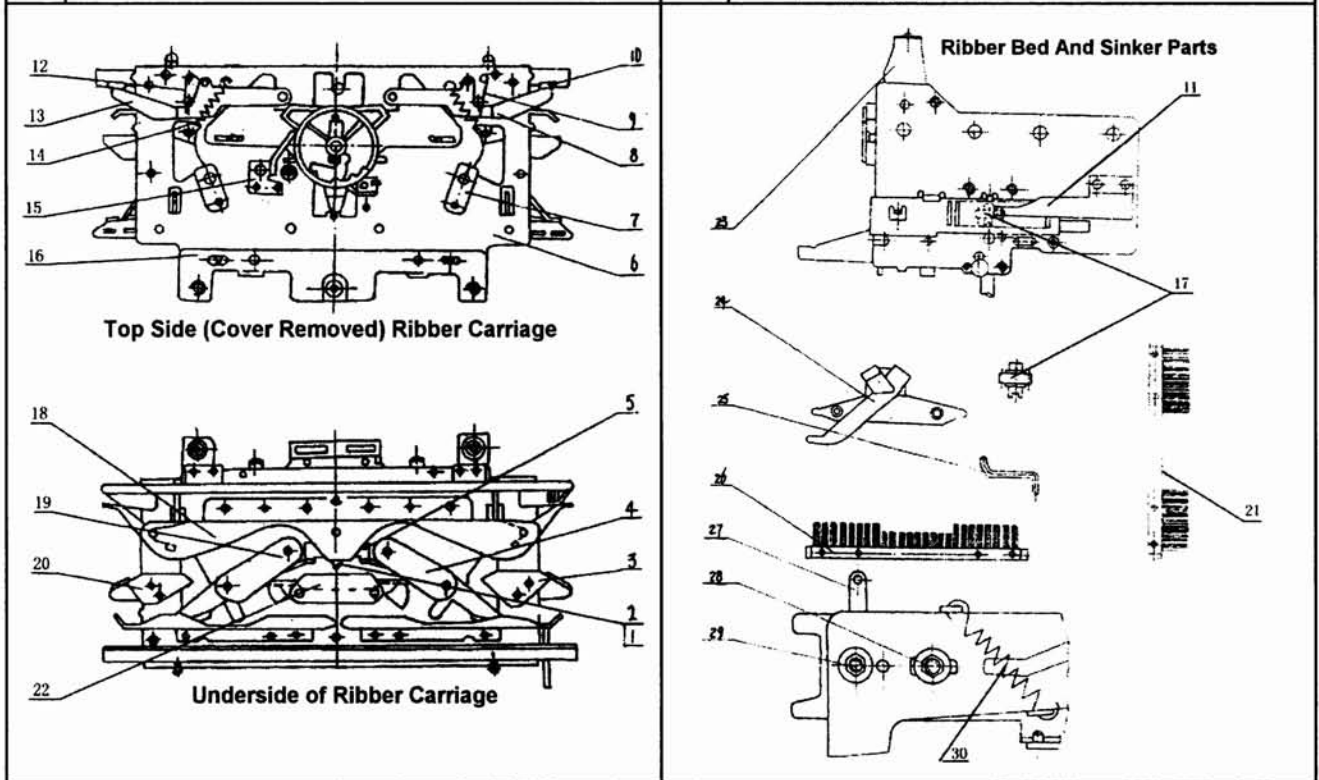
No.	Part Name	No.	Part Name
1	Guide Tube (Brass)	24	Guide Bar (Nylon)
2	Right Needle-starting Guide Bar	25	Return Guide Bar c.p.1
3	Right Needle-separating Lower Stopping Piece	26	Left Guide Cam Spring
4	Right Needle-separating Upper Stopper Piece	27	Left Return Handle Spring
5	Right Change Direction Cam	28	Left Knit Cam c.p.1
6	Right Knit Cam Complete	29	Left Needle-separating upper Stopper Piece
7	Right Return Cam Handle Spring	30	Left Needle-separating Lower Stopper Piece
8	Right Guide Cam Spring	31	Left Change Direction Cam
9	Knob c.p.1	32	Left Needle-starting Guide Bar
10	Right Stopper Plate Spring	33	Center Cam
11	Set Spring Piece	34	Center Cam Spring
12	Right Handle Bracket Spring Piece	35	Yarn Brushing Wheel
13	Short Pull-out Spring	36	Yarn Pressing Wheel
14	Lower Right Lever	37	Auxiliary Yarn Feeder
15	Long Pull-out Spring	38	Main Yarn Feeder
16	Upper Right Lever	39	Latch Brush
17	Stitch Dial	40	Latch Brush Support Arm
18	Upper Left Lever	41	(I) Left Tension Rod (I)
19	Lower Left Lever	42	(II) Right Tension Rod (II)
20	RC Tripper c.p.1	43	Tension Dial Cap
21	Row Counter Tripper Spring Piece	44	Tension Dial
22	Left Handle Bracket Spring Piece	45	Sinker Post
23	Left Stopper Plate Spring	46	Standard Needle 70D+



Ribber Carriage And Bed Parts List

This is a list of parts that will possibly need replacing in the future due to wear. Brushes are usually the only things that need replacement and that is after many years of use. To determine brush wear: Examine the brushes for a small area that looks like a "bite" has been taken out of it along the edge of the bristles. This is the part of the brush that open the latches on the needles. If it has completely worn away, then the brush needs to be replaced.

No.	Part Name	No.	Part Name
1	Guide Cam	16	Connecting Shaft c.p.1
2	Guide Cam Spring	17	Gear
3	Left needle - Separating Lower Stopper Piece	18	Return Needle Bar
4	Right Knit Cam Complete	19	Right Knit Cam c.p.1
5	Guide Cam Stopper Piece	20	Right Needle-Separating Lower Stopper Piece
6	Base Plate	21	Back Latch Brush
7	Rising Cam Stopper Plate	22	Center Cam
8	Left Raising Cam Tripper	23	Left Connecting Hook c.p.1
9	Left Tripper Spring	24	Yarn Feeder
10	Raising Cam Tripper Cap	25	Sinker Post
11	Set Spring Piece	26	Front Latch Brush
12	Right Tripper Spring	27	Micro-adjusting Handle
13	Right Raising Cam Tripper	28	Connecting Hook Shaft
14	Pull Spring (Small)	29	Micro-adjusting Handle Pin
15	Set Piece	30	Pull Spring (Large)



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Distinctive Knits ("Artisan") or its authorized service centers will, at Artisans option, repair or replace this knitting machine free of charge if it fails to operate according to Artisans specifications due to factory defects in materials or workmanship within 90 Days from the date of purchase. For One Year from the purchase date, Artisan will repair or replace defective knitting machine parts: you pay for labor charges. For repair, this knitting machine must be delivered or shipped freight and insurance prepaid to the nearest Artisan Distribution Center or dealer from whom it was purchased, together with a copy of your sales receipt

Non-durable and normal replacement parts, including, without limitation, needles are excluded from this warranty. This limited warranty also does not include cleaning, or any damage caused by accident, neglect, misuse, and ceases when you use this knitting machine for commercial purposes, or sell, rent, or otherwise dispose of it.

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Neither Artisan nor anyone else involved in the development, production, or delivery of the knitting machine shall be liable for any indirect, incidental, special, consequential, exemplary, or punitive damages arising form the use of or inability to this knitting machine, if it advised of the possibility of such damages.

This limited warranty gives you specific legal rights and you may also have other rights which vary from state to state.

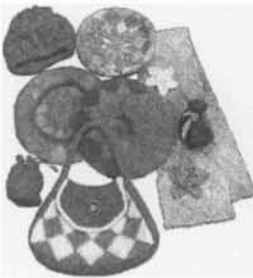
Distinctive Knits, Aurora, Indiana



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