Note

The Models 270 & 370 fine gauge machines are similar to the standard gauge machines 260 and 360. Many of the adjustments and settings for both machine types are incorporated in the 260/360 manual. The 270/370 manual deals with the differences which are specific to the fine gauge machines.

SERVICE MANUAL

FOR

MODEL F-370/270

C O N T E N T S

[1] SPECIFICATION OF MACHINE

(Specification of Machine)

Model	FK-370	
Specification	Pitch	3.6mm
	Number of needle	250
	Dimension	full length: 1,110mm width : 207.5mm height : 93mm
	Weight	12.7kg
	Needle selection mechanism	Punch Card
	Needle selection size	30 stitches

(Optional Function)

L Carriage LC-370 (Carriage exclusively for knitting lacework)

Lace Carriage performs normal lace stitch, fashion lace as well as plain stitch in a single stroke.

(Other Available products)

1. NP-F Card
2. Handy Punch Model PM-2-F
3. Punching Machine Model PM-10-F

[2] SPECIAL FEATURES OF MACHINE

(Main Characteristics)

1. Automatic Needle Selection with Punch Card system.
2. Standard size of needle selection: 30 needles.
3. Needle Pitch: 3.6mm.
4. Number of needle: 250 needles.
5. Lace Carriage is available for optional purchase.

(Details for the Characteristics)

1. Similar to SK-360, this model also offers punch card automatic needle selection mechanism.
2. Standard Needle Selection size has been increased to 30 stitches to meet the fine materials.
3. Fair Isle pattern on the 3.6mm pitch needle is neater than that on the 4.5mm pitch, since floats of yarn on the back of the fabric is rather tighter.
4. If fine or fairly fine yarns are knitted on the 4.5mm pitch knitter, total width of fabric is not sufficient, so the number of needles on this knitter has been increased to 250 needles.
5. The optional Lace Carriage, exclusive for the Model FK-370/270 performs normal lace stitches or fashion laces in a single stroke of Carriage as easy as for plain stitch.

2 - 1 Special Features of FK-370

In comparison with SK-360, this model gives you better results with superfine to fairly fine yarns, without sacrificing performance in knitting.

(1) Stitch types

stockinet, fair isle, tuck stitch, slip stitch, weaving, punch lace, plating, magic point knitting, normal lace, fashion lace (using an optional carriage)

(2) producing beautiful knitting using superfine to fairly fine yarn

(3) automatic needle selection with 30 stitches under punch card system

(4) Knit radar being fitted on right side center so as to be seen easily.

(5) Through interlocking the release lever and the side lever, the carriage is subjected to a trial run by a single operation.

(6) Weaving brush and Tuck brush are built in the arm.

(7) An Accessory compartment is provided on the main body.

(8) Magic point knitting is produced with a new magic cam and point cam M.

(9) A stand is provided to hold a Transfer Tools, and a Tappet Tool .

(10) giving refined impression and new design based on off-white color having some antique rose color as an accent.

(11) Lace stitch pattern is produced using a single carriage (LC-370) opitonally available.

2 - 2 Special Features of LC-370

With SK-370 option lace carriage, knitting lace with superfine to fairly fine yarns can be produced by a single carriage through a single operation.

(This is used exclusively for FK-370 and cannot be applied to other models.)

(1) Knitting funciton

stockinet
normal lace stitch (including fashion lace stitch)
knitting lacework by magic point.

(2) Single Carriage performs knitting and transferring stitches on a single stroke, fabric is knitted speedily.

(3) It requires no extension rail.

(4) Lace pattern to be reproduced on the fabric is easily imagined from the punched card.

(5) Standard pattern size is 30 stitches wide and 60 rows long.

(6) Row Counter Lever is connected with the Cam Lever, so row counting is stopped when fashion lace is in progress.

(7) It is possible to place the edge pins side by side in a row to knit Stockinet in the lace stitch fabric. (multiples of 2.)

(8) The accessories necessary for knitting lace are also provided within a unit.

accessories	punch cards (10) for knitting lace
	edge pins (6)
	comb weights (3)
	claw weights (3)

[3] STRUCTURAL AND HANDLING CAUTIONS

1. Because of small pitch between latch needles, needle retainer guide cannot be fitted. Upon exchanging a needle, insert the needle retainer along the needle bed properly.

2. K arm and L arm for SK-370 cannot be used for other models (SK-360 etc.) (K arm and L arm have indentification seal on them.) Vice versa, K arm and L arm of other models cannot be used for SK-370. Be sure to strictly follow the correct use to avoid damaging latch needles and other parts.

3. The following accessories are exclusively for SK-370.

   SK-370 ——— transfer tools, tappet tool, needle pusher, punch cards, card snaps, point cam M, point cam E, yarn separators, spare needles

   LC-370 ——— punch cards, edge pin

   Avoid to use these accessories on other models, or to use accessories for other models on SK-370.

4. S piece of S drum has been changed into S piece L (for left side) and S piece R (for right side) of different shapes.
   Upon repairing, adjsuting and exchanging, be sure to fix them in right sides.

[4] CAUTIONS FOR KNITTING

1. A very fine yarn (superfine yarn etc.) is not suitable for cast-on. Use a slightly thicker one for cast-on.

2. Since the FK-370 has been disigned for knitting fine yarns, if medium or thicker yarns are used, the stitches may float or slip depending on the type of punch card or stitch types.

   If the above problems are encountered, follow the procedure below:-

   (1) Operate the carriage slowly in a constant speed.

   (2) To stabilize the stitches, hang weights on the fabric.

   (3) Set the Stitch Dial to smaller positions.

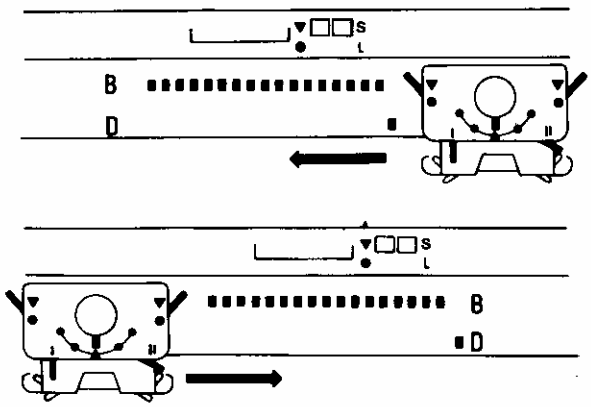
3. Because of a smaller sized latch needle etc., thicker yarns such as fairly fine yarn may not be effectively made into platting. Follow the conditions below-mentioned.

   (1) Yarns to be knitted shall be superfine and superfine or very fine and superfine. The stitch dial is set to 7 - 8.

   (2) The tension dial shall be set to slightly loose position. (both knitting and plating yarns to 1 - 2.)

   (3) Knit in plain stitches.

   (4) Knitting procedure



* Set the Russel Lever to II for the right and I for the left. Set the Cam Lever to Stockinet.

(1) When operating a Carriage from right to left, be sure to push right end needle into D position before starting knitting.

(2) Return the Carriage to right.

5. Knitting with the Lace Carriage

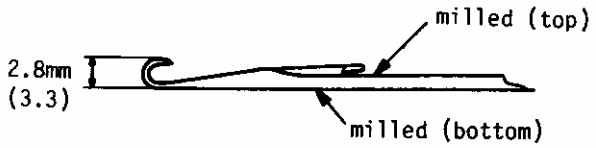
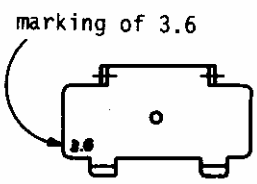
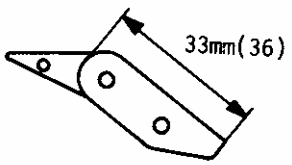
For the Stockinet, yarns of superfine and medium-fine can be knitted without any difficulty. But for lace stitch patterns, thickness of yarn and Stitch Dial setting are very important because transferring stitches is performed in addition to knitting.
The yarns of medium size or more are not suitable for this Lace Carriage.

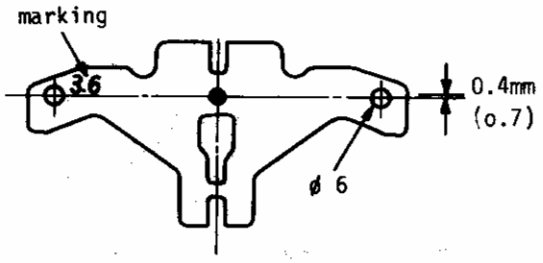
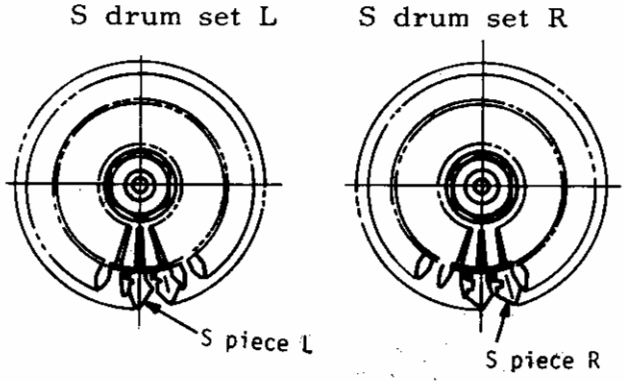
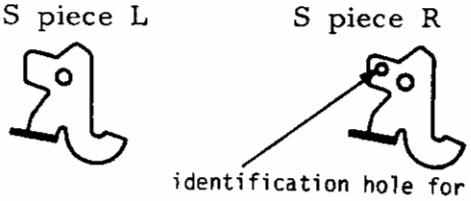
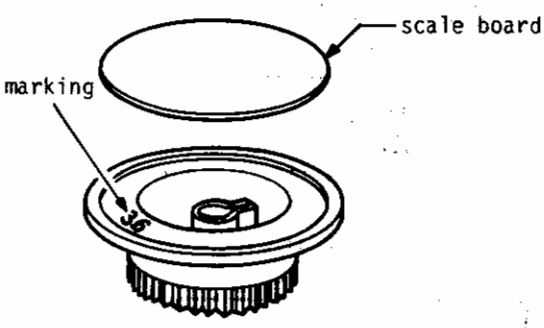
[5] EXCLUSIVE PARTS FOR SK-370 AND LC-370

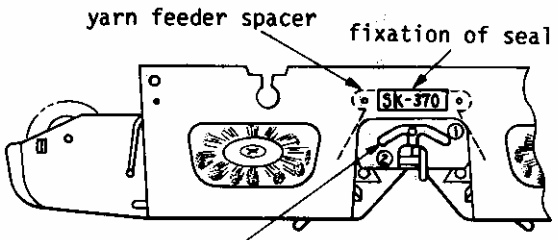
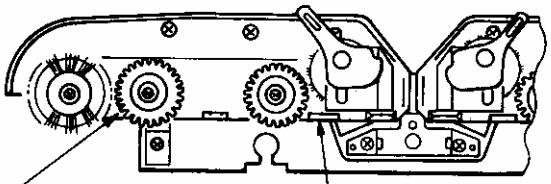
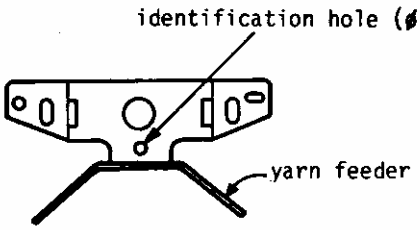
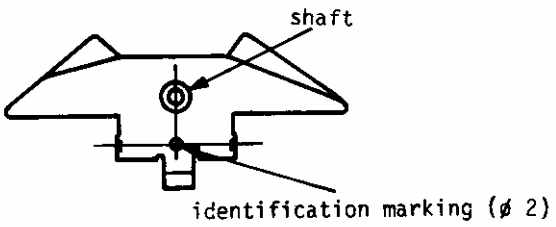
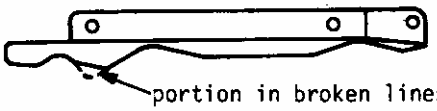
SK-360/260 (4.5mm pitch) and FK-370 are almost identical in their constructions and functions, excepting the following differences as listed below.

5 - 1 SK-370

figures in ( ) are for SK-360.

parts name	differences	identification
(Needle Beds)		
1. needle bed unit No.2	needle groove and rack pitch 3.6mm (4.5) no. of grooves 250 (200	same as left
2. sinker	pitch 3.6mm (4.5) diameter ϕ 1.4mm (ϕ 1.6)	"
3. latch needle	change in configuration 	"
4. side rack R.L	pitch 3.6mm (4.5)	"
5. needle no. display tape 3.6	stitch no. display right and left 125 (100)	"
6. needle retainer guide	not used due to smaller pitch	
(Patterns)		
1. pattern unit	pitch of touch lever groove 3.6mm (4.5) no. of touch lever grooves 30 (24)	"
2. touch lever	change in configuration dia. of tip ϕ 1.5mm (ϕ 1.6)	"
(Carriage arms)		
1. carriage plate A (only for K carriage)	change position for oval hole in which main cam shaft B moves.	
2. main cam R.L	change in configuration of main cam 	same to left

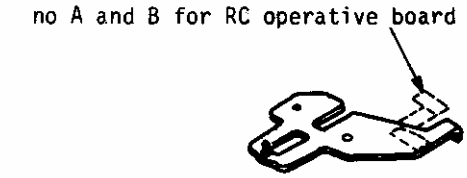
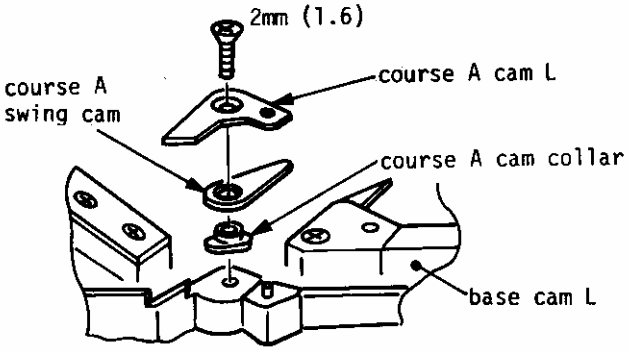
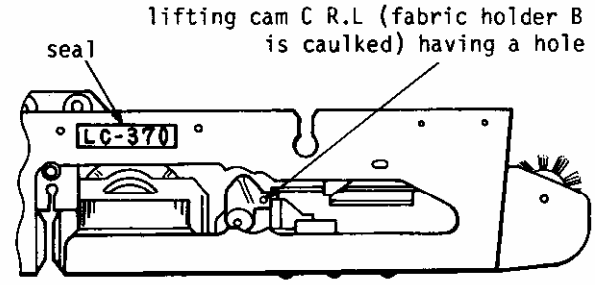
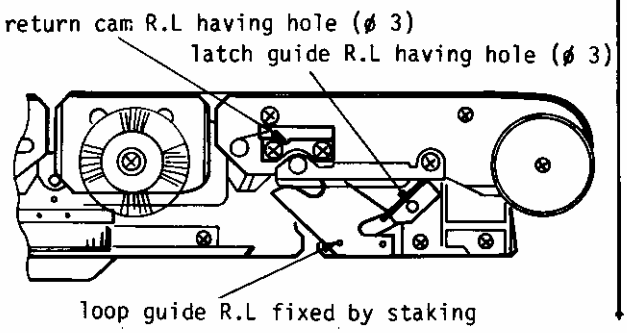
parts name	differences	identification
3. Travelling plate (only for K carriage)	change in hole position for accepting the head of the main cam nut 	marking of 3.6
4. M drum	M piece pitch 3.6mm (4.5) no. of M pieces 30 (24) M piece gear pitch 3.6mm (4.5)	same as left
5. M piece	change in configuration thickness 0.8 (1)	same as left
6. S drum set R.L	S piece pitch 3.6mm (4.5) no. of S pieces 30 (24) S drum gear pitch 3.6mm (4.5) 	"
7. S piece R.L	change in configuration and setting R.L thickness 0.8mm (1) 	same as left
8. dial (only for K carriage)	change in spiral conriguration 	marking: 3.6 color: antique rose
	Numeral in brackets is for 360/260 knitters.	

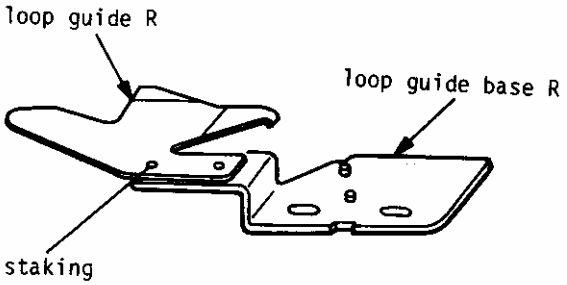
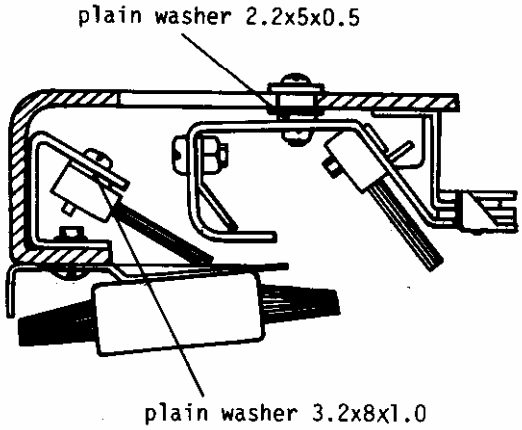
parts name	differences	identification
9. arm	change in configuration of fabric presser R.L. and yarn feeder set etc. fabric gear no. 4 (2)  	"SK-370" seal pasted
10. yarn feeder	change of upper hole of yarn feeder 1 (Refer to arm figure) change in height and configuration of lower face of yarn feeder 2	same as left
11. plating yarn feeder	change in position of yarn feeder 	indentification hole (ϕ 2mm)
12. fabric gear	no. used 2 → 4 change in no. of teeth and pitch	same as left
13. weaving brush base R.L	change in shaft position of weaving brush 	identification marking (ϕ 2)
14. guide plate R.L	chagne in configuration 	same as left

parts name	differences	identification
(Accessories)		
1. transfer tool 1-2 " 1-3 " 2-3	chagne in configuration of the transfer needle change in color natural (semitransparent)	marking of 3.6
2. tappet tool	change in needle configuration	color: natural
3. needle pusher 0 - 1/1	pitch 3.6mm (4.5) material iron plate (SPCC-SD)	same as left
4. ravel cord	change in length 3600mm (2900)	color: pink
5. card snap	change in snap hole and ⏢ section to meet changed punch card hole ϕ 2.8mm (ϕ 3.5)	color: blue
6. yarn separator	change in configuration change in pitch 3.6mm (4.5)	marking: 3.6 color: yellow
7. point cam M R.L	change in configuration and pitch	color: orange L black R white
8. gauge scale	addition of row scale 101 - 102 (used also for SK-360)	same as left
9. KR scale set	addition of scale No.8 8 (7) (51 - 54)	same as left
10. punch card set	change in hole ϕ 2.8mm (ϕ 3.5) change in hole no. 30 (24) change in pattern	print color: bule
11. Pattern paper set	change in design	print color: blue
12. auxiliary feeding cam	excluded	

5 - 2 LC-370

figures in ( ) are for LC-1

parts name	differences	identification
(Carriage)		
1.	no A and B for RC 	same as left
2. course A cam R.L	change in plate thickness 1.2mm (1.6)	same as left
3. course A cam collar	change in surface treatment chrome plating (black) change in seat height 2mm (1.6) 	"
4. M drum set S drum set R.L	same as parts for the drum for SK-370K	
(Arm)		
1. arm unit	change in fabric holder B set R.L etc.  	"LC-370" seal pasted.

parts name	defferences	identification
2. return cam R.L	change in configuration	identification hole (ϕ 3mm) (Refer to arm)
3. ratch guide R.L	change in configuration	identification hole (ϕ 3mm) (Refer to arm)
4. loop guide set R.L	change in configuration of loop guides R.L and guide base R.L 	same to left
5. plain washer 2.2x5x0.5	added to yarn feeder collar A section 1	same to left
6. plain washer 3.2x8x1.0	added to upper of needle brush 2 	"

(Accessories)

1. edge pin	change in pitch of the foot set on needle bed 3.6mm (4.5) change in configuration so that margin of two stitches or more can be provided	color: yellow
2. punch card set	change in hole dia. ϕ 2.8mm (ϕ 3.5) change in no. of holes 30 (24) chagne in pattern	print color: blue
3. rib knitter installation screw	not included	

5 - 3 Accessories for E-370

part name	differeces	identification
(Punching machine PM-10-F)		
1. PM punch 2.8	change to meet new punch card hole ϕ 2.8 (ϕ 3.5)	same to left
2. PM die 2.8	change to meet new punch card hole ϕ 2.8 (ϕ 3.5)	"
3. PM rack 3.6	change in pitch 3.6mm (4.5)	"
4. others	change in color	"
(Handy punch PM-2-F)		
1. PM punch	change to meet new punch card hole ϕ 2.8 (ϕ3.5)	same to left
2. PM punch receiver	change to meet new punch card hole	"
3. others	change in color	"
(NP-F card)		
1. card sack	color change: blue	same to left
2. card	hole change	print color: blue
3. graph paper	print color: blue	same to left

[6] REPAIRS AND ADJUSTMENTS

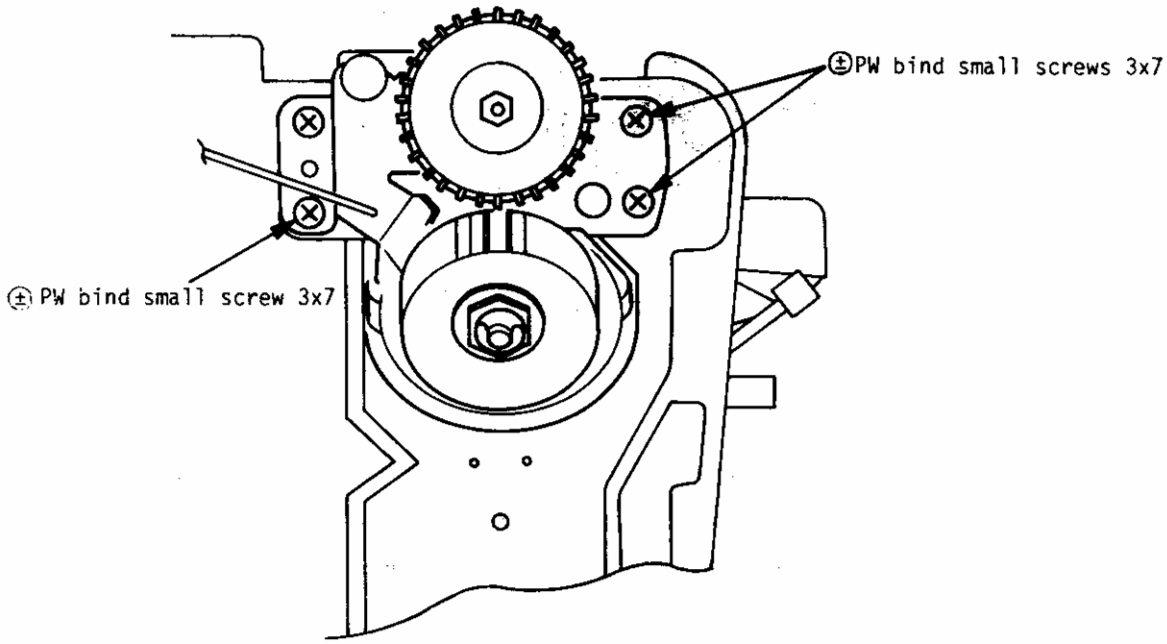
FK-370/270, its K Carriage and L Carriage, are constructed identically with the SK-360/260, its K Carriage and L Carriage. Therefore, this chapter only deals with items having different adjusting procedure. As for other items, refer to Service Manual for SK-360/260.

I FK-370

1. Adjustment of drum

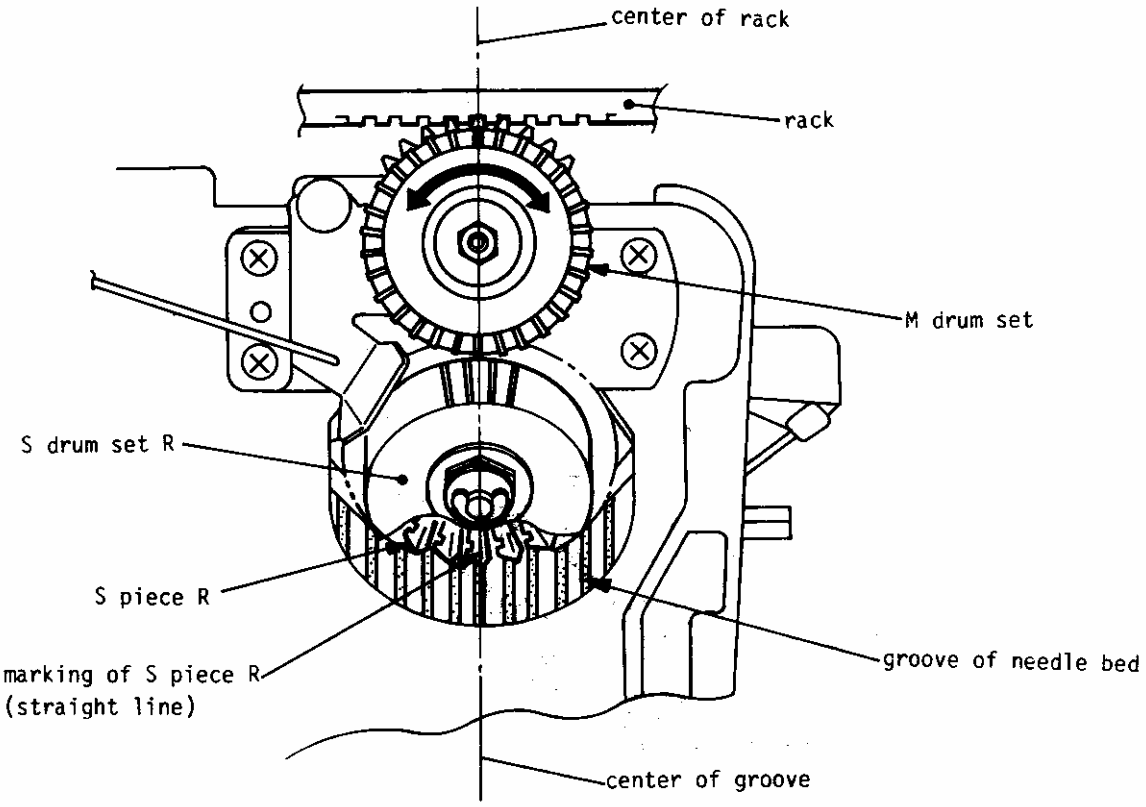
(1) Take off a raising spring and SP holder

(2) Loosen three PW bind small screws 3x7 which fix the drum stand.



(3) Make sure that no punch card presents in the pattern unit. Then, clear out the piece of M drum and S drum by passing the carriage once. (All S pieces of S drum are lowered down and the latch needle being advanced)

(4) Shift the carriage so that the center of M drum gear meets the center of rack of the needle bed.
Displacing the drum base right and leftward, set the marking (straight line) of S piece tip of S drum to the center of the groove of needle bed. At the same time, while moving the drum base back and forth, adjust so that the clearance between M drum gear and rack becomes minimum (0.2mm on circumference).



note 1. Do not set with the projecting section of the tip of S piece.

note 2. Adjust correctly, since pitch has been made small.

Upon adjustment, tighten three PW bind small screws.

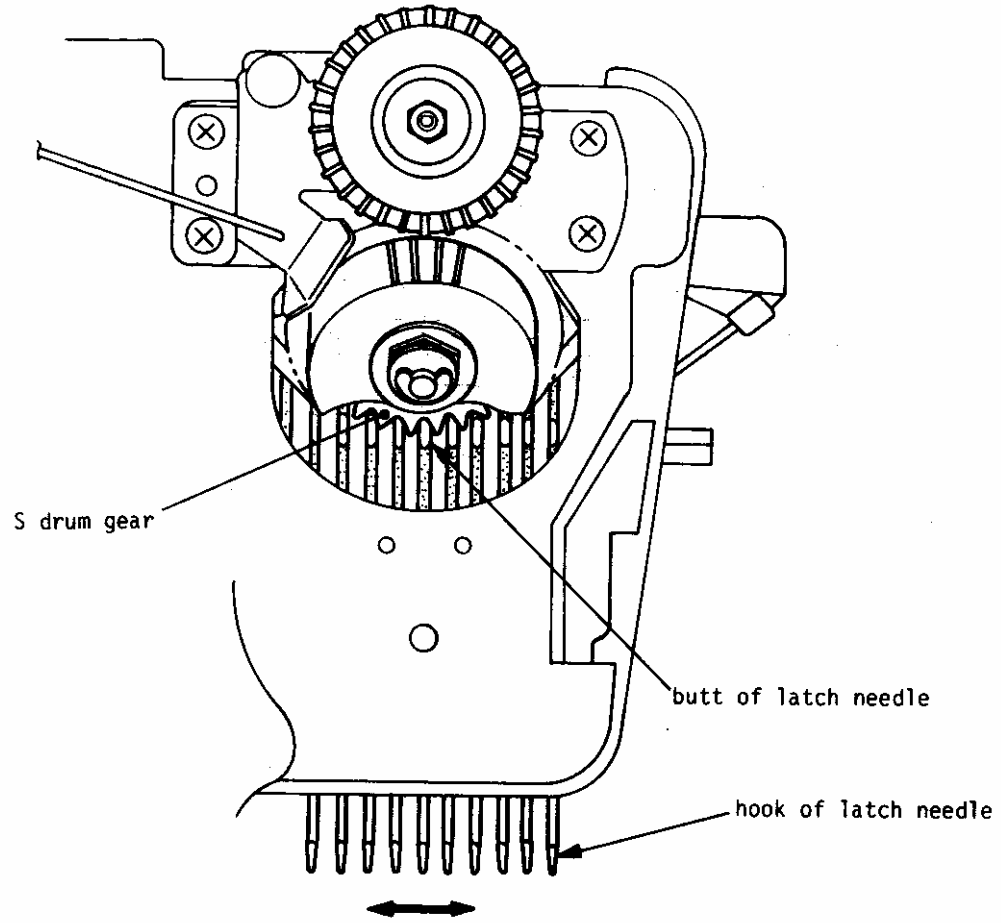
(5) Set the marking of the tip of S piece L of S drum set L to the center of the groove.

(S piece R and L have different configurations.)

(6) Check the adjustment.

a) Raising all S pieces of S drum, make latch needles ready to be selected backward.

b) Bringing out 10 latch needles into B position, confirm that the hook of latch needles are not moved horizontally when S drum gear and the latch needle are engaged or that the latch needle does not come forward.



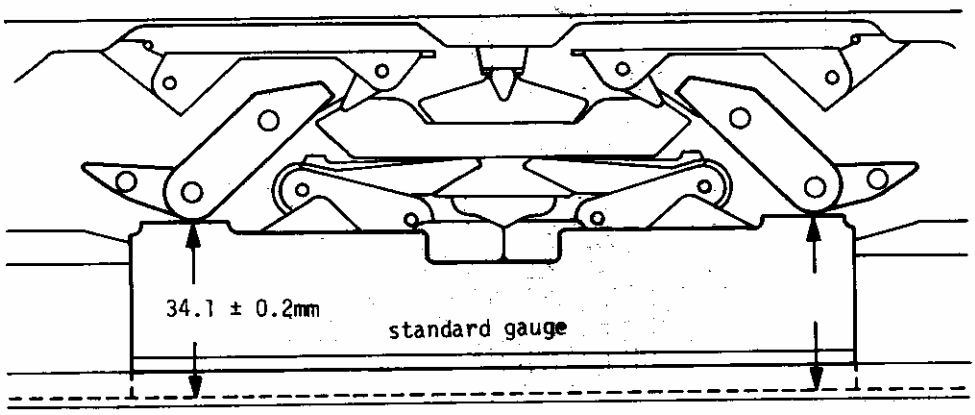
(latch needles do not move horizontally nor come forward.)

note: When adjusting with S drum gear, follow the same procedure as is used in the other punch card knitters.

2. Standard dimension of main cam

The standard dimensions from the internal face of carriage pipe to the left and right main cams are:

Stitch Dial		
5.2	⟶	$34.1^{\pm 0.2}$mm (standard gauge)

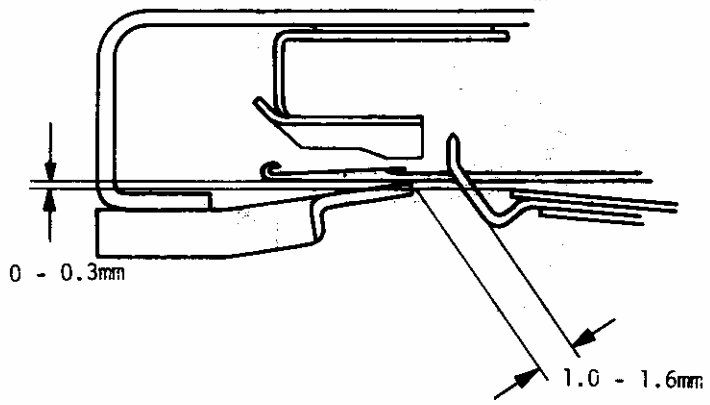


Cares should be taken when adjusting the main cams or replacing the scale for the stitch dial.

3. Adjusting arm

3 - 1 Adjustment of fabric presser

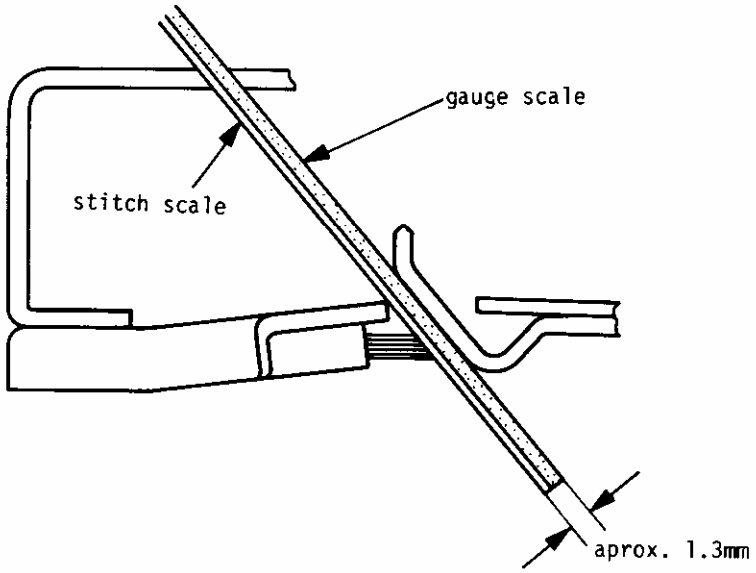
PN:	0 - 0.3mm (same to SK-360)
PS:	1.0 - 1.6mm (standard gauge 1.3)



3 - 2 Adjustment of PS

Upon adjusting PS, first take off the fabric gear and weaving brush inside the fabric holder.

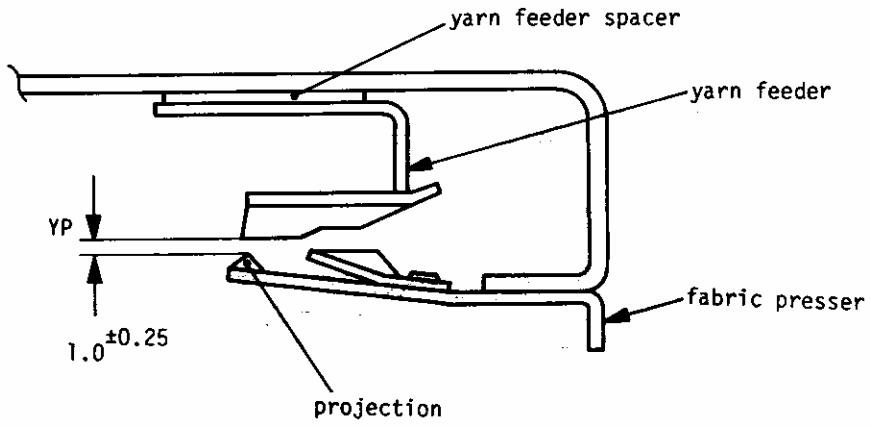
One Stitch Scale and the Gauge Scale make a thickness of 1.3mm usable for checking the PS clearance.



3 - 3 Adjustment of PN

PN dimension is 0 - 0.3mm (same to SK-360), in which the clearance between yarn feeder and the projection of fabric holder is:

YP : $1.0^{\pm 2.5}$ mm



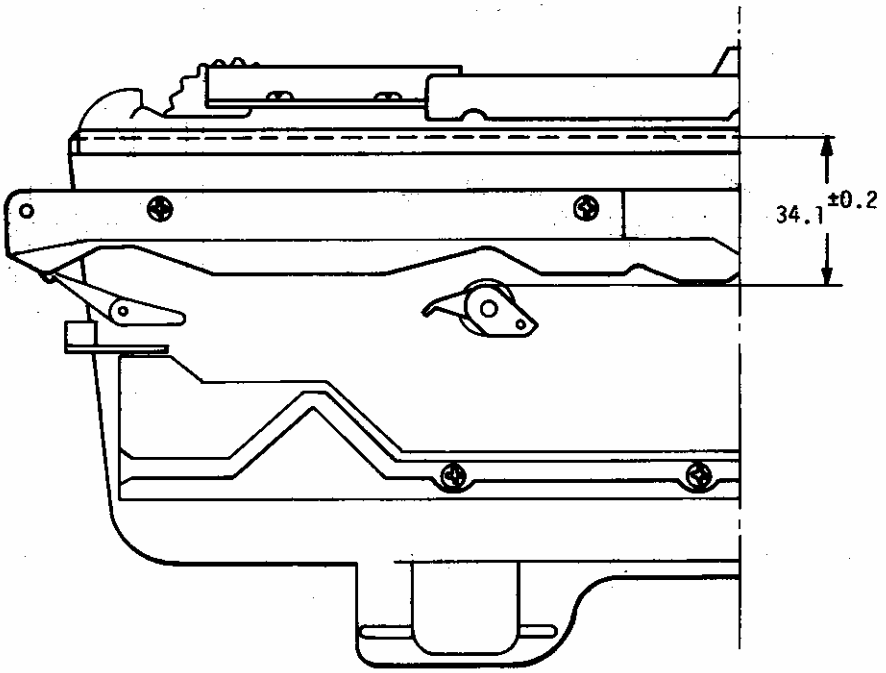
note: By tightening PN, the clearance of YP gets narrow, while it is made bigger by loosening PN. Thus, adjust the relation of YP by adjusting PN.

II LC-370

1. Standard dimension of main cam

The standard dimensions from the internal face of carriage pipe to the left and right main cams are:

Stitch Dial		
4.1	———————	$34.1^{\pm 0.2}$mm (standard gauge)

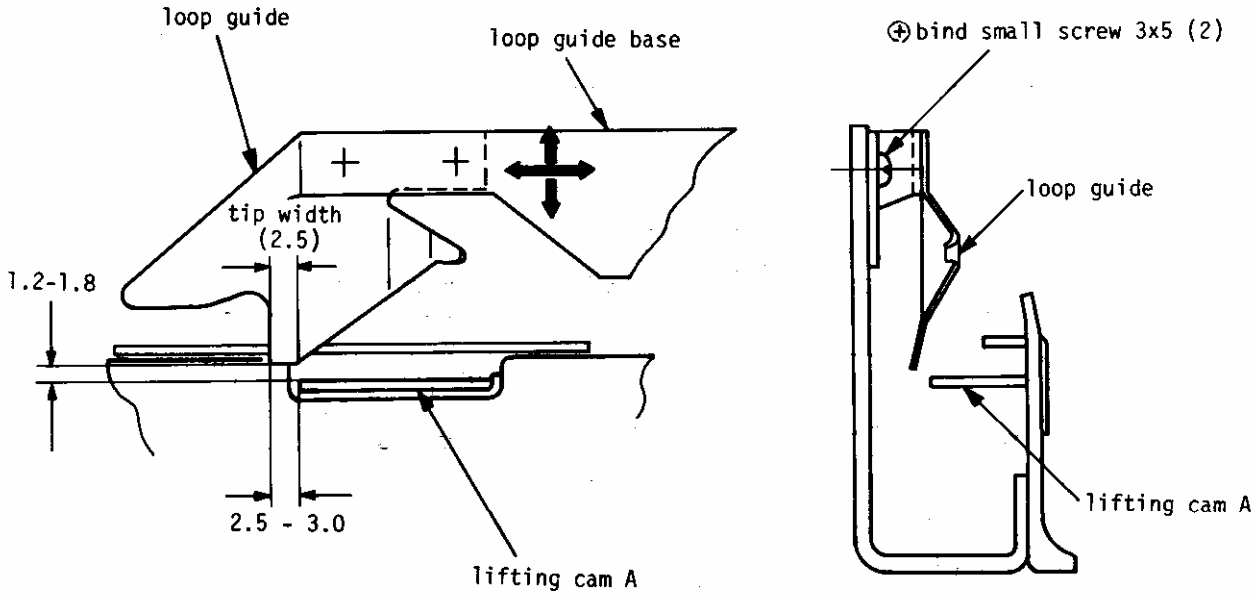


Cares should be taken when adjusting the main cams or renewing the scale for the stitch dial.

2. Adjusting loop guide, back and forth and left and right

Back and forth and left and right clearance of the loop guide against the lifting cam A is:

backward/forward : 1.2 - 1.8mm left/right : 2.5 - 3.0mm



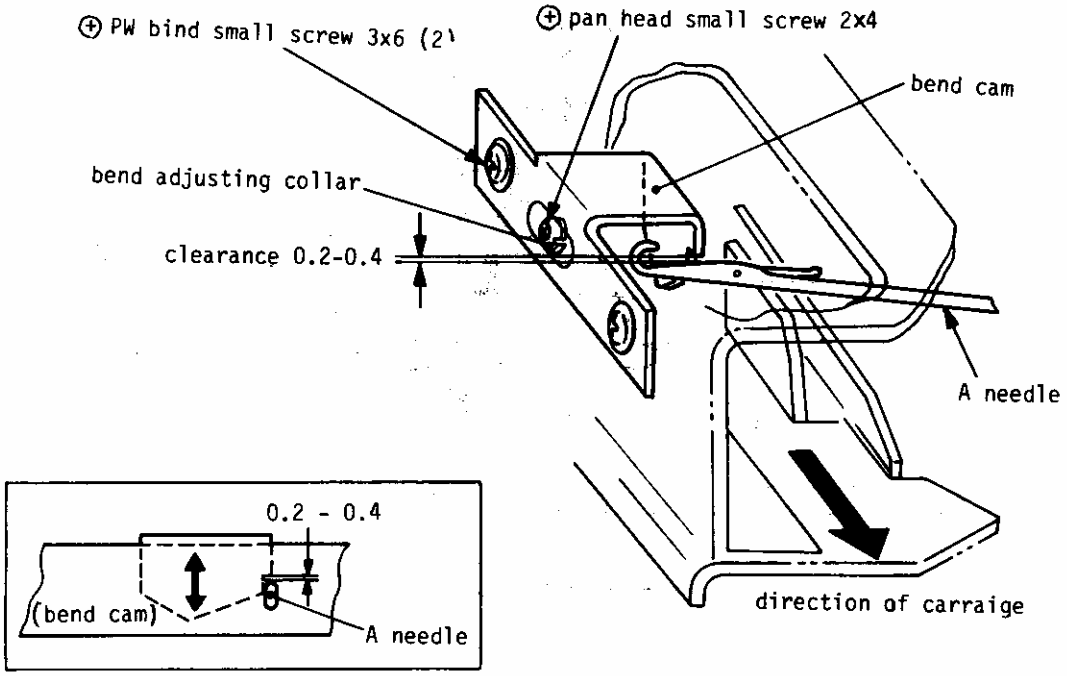
Loosening two bind small screws 3x5 fixing the loop guide base, adjust through shifting guide base either backward/forward or right/left.

3. Adjusting bend cam, vertically and horizontally

3 - 1 Vertical adjustment of bend cam

Vertical clearance of bend cam against A needle is:

vertical clearance: 0.2 - 0.4mm



(Method of adjustment)

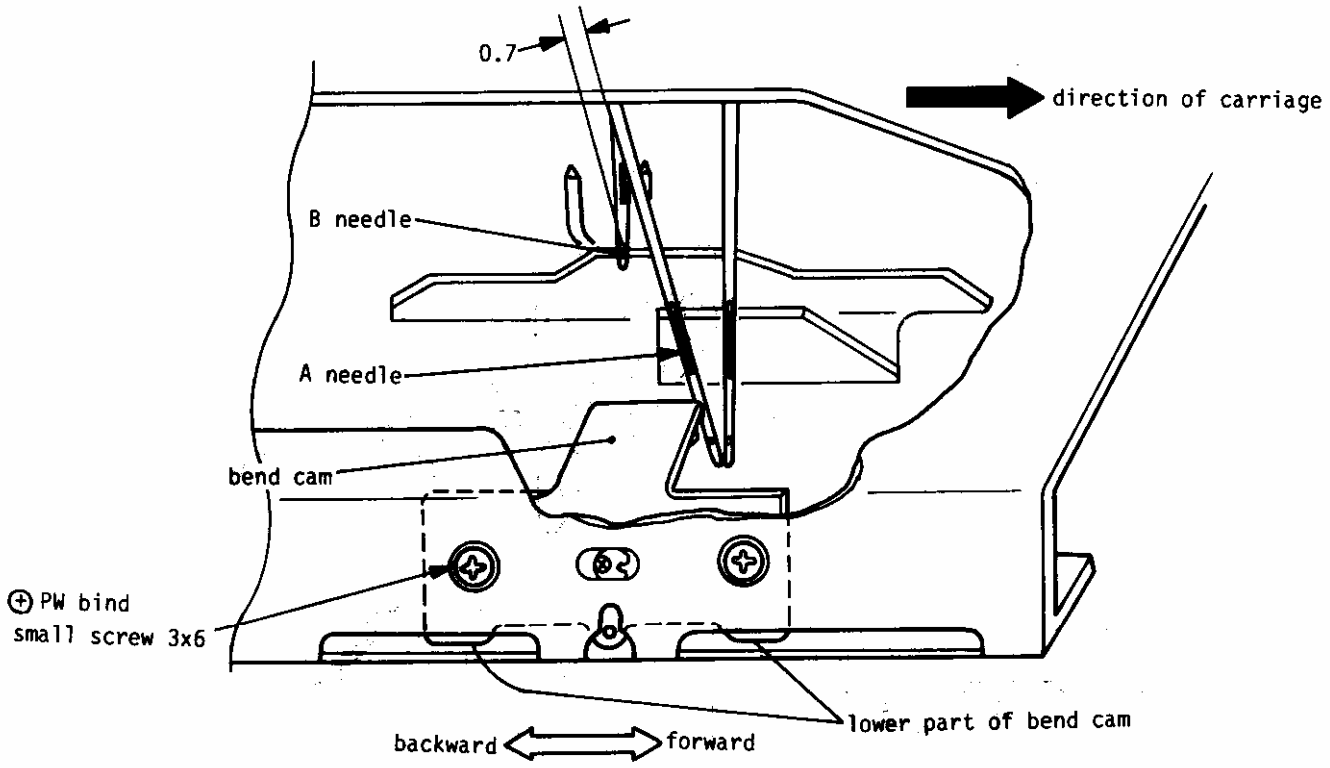
It basically follows the conventional method.
First, loosen two ⊕ PW binding head small screw 3x6 and a pan head small screw 2x4.
Using a bend cam vertical adjustment tool, adjust the clearance by turning a bend adjusting collar.

3 - 2 Horizontal adjustment of bend cam

Amount of bend of A needle against B needle by the bend cam is:

adjustment measurement: 0.7mm

(same to LC-1)



(Method of adjustment)

It basically follows the conventional method.

1. This shows a state that A needle is almost released from bend cam.
2. Adjsut teh clearance between the tip of hook of B needle and A needle to be as much as 0.7mm.
3. Loosening two bind small screws 3x6, adjsut the following.

   when bend amount being small —— Shift a bend cam forward.
   when bend amount being large —— Shift a bend cam backward.

   Upon this time, be sure to shift a bend cam in parallel as observing the lower part of it so that the vertical adjustment of bend cam (item 3 - 1) is not deviated.

SERVICE MANUAL
FOR MODEL
FRP-70
RIBBING ATTACHMENT

CONTENTS

1. DEFECTS AND METHODS OF THEIR DETECTION

For correct and rapid repair or adjustment, it is important to understand clearly the causes of the defective part of the machine. This list is for your easy detection of any defects that might occur.

<table>
<tr><th>Condition of Defects</th><th>Check Points</th><th>Causes</th><th>Countermeasures</th></tr>
<tr><td rowspan="5">In the case that the stitch size on the left end of the fabric is different from that on the right side.</td><td>Check if there is any clearance between the Drop Lever and Auxiliary Piece. There should be no clearance between them on either the right or left sides.</td><td>If there is a clearance between the Drop Lever and Auxiliary Piece (R) or (L), the stitch size will be larger on the side there is a clearance.</td><td>Reset the Ribber to the Knitter</td></tr>
<tr><td>Check if the weights are hung correctly.</td><td>If the hanging weights are unbalanced, the stitches will be larger on the side where the weights are heavier.</td><td>Confirm the balance of the stitches and the Cast on Comb and then hang the weights to keep their balance.</td></tr>
<tr><td>Check if the horizontal space between the Ribber Needle Bed and the Knitter is within the allowed measurement.</td><td rowspan="2">If the space between the Knitter and the Ribber varies from left to right, the length of the knitted fabric will differ on both the right and left sides.</td><td>Adjust the horizontal space between the Knitter and the Ribber.</td></tr>
<tr><td>Check if the vertical space between the Ribber Needle Bed and the Knitter is within the allowed measurememt</td><td>Check the vertical space between the Ribber and the Knitter</td></tr>
<tr><td colspan="3">In the case that the stitch sizes on both the right and left sides of the fabric are different, most defects can be adjusted if the above four points are checked and countermeasures taken.</td></tr>
</table>

Conditions of Defects	Check Points	Causes	Countermeasures
	Check the L Dimension of the Ribber.	If the L Dimension varies by more than 2 m/m on the right and left sides, the stitch size on the right and left edges of the fabric will differ.	Adjust the L Dimension of the Ribber.
In the case that the stitches float.	Check the opening and closing condition of the latch needles and/or if their is warpage on their hooks.	If the opening and closing of the latches are not smooth, or there is warpage on the hooks, stitches will float.	Adjust the latch needles or exchange them with new ones.
	Check the weights.	If the number of weights are not sufficient, the stitches tend to float.	Increase the number of weights.
	Check if the Close Knit Bar is being used (when the yarn is thinner than a fine yarn.	When knitting with a medium, thin or lightweight yarn, or if the gauge is too tight, the stitches tend to float because the hook cannot rise up.	Insert the Close Knit Bar between the Sinker Posts and the front edge of the Needle Bed of the Knitter.
	Check if the stitch gauge is correct.	If the Stitch Dial is not set to the number equivalent to the thickness of the yarn, the stitches tend to float.	Adjust the Stitch Dial or increase the number of weights. (However, as there is a limit to the number of weights that can be used, loosen the gauge.

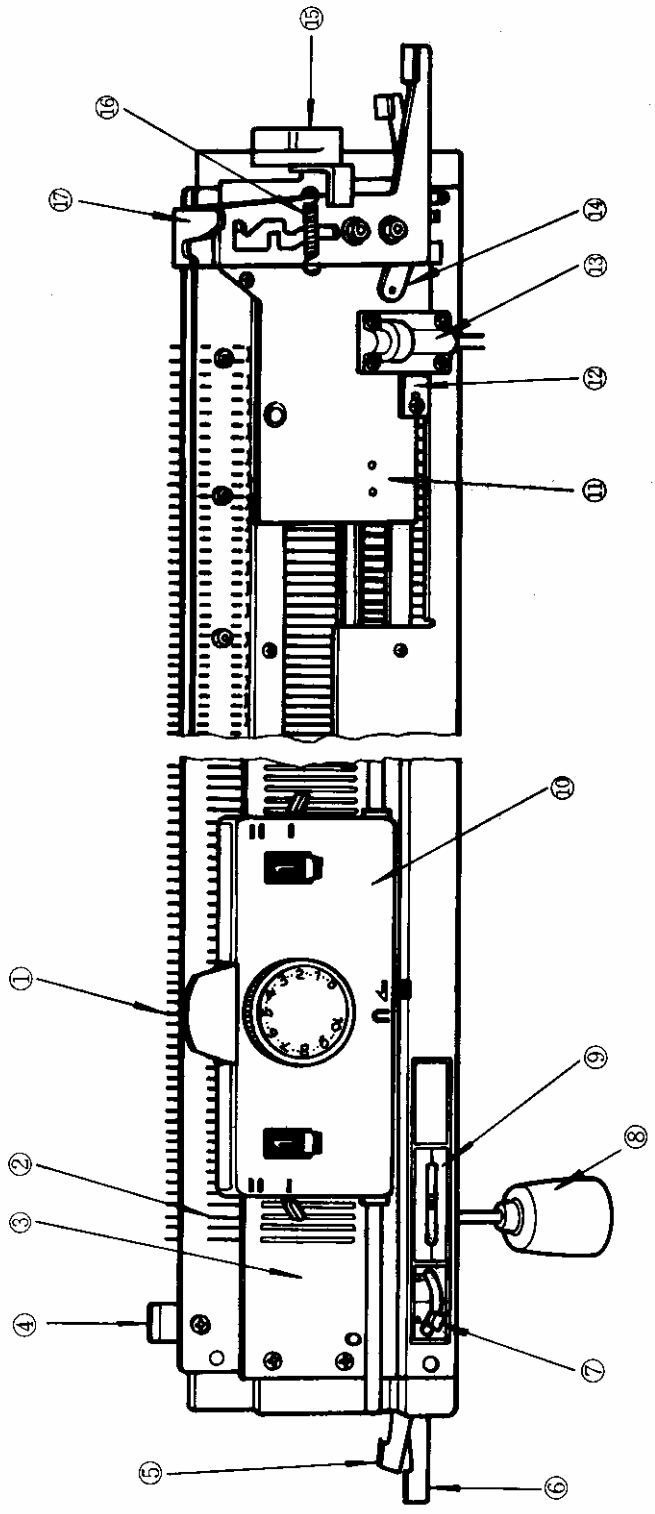
Condition of Defects	Check Points	Causes	Countermeasures
In the case that stitches sometimes float.	Check if the Edge Weight Hook or the Hanger Comb is in use (together with their respective weights).	If the Edge Weight Hooks or the Hanger Combs (together with their respective weights) are not in use, the stitches at both edges will become loose and float	Hang the Edhe Weight Hooks with weights or the Hanger Comb and reset them after every 10 - 15 rows of knitting.
In the case that stitches drop.	Check the opening and closing of the Needle latches.	If the opening and closing of the Needle latches are not smooth, the stitches tend to drop.	Adjust the Needle latches or exchange them for new ones.
	Check the vertical position of the Yarn Feeder.	If the Yarn Feeder is positioned too high, the Needles cannot catch the yarn.	Adjust the vertical position of the Yarn Feeder
	Check the horizontal position of the Yarn Feeder.	If the Yarn Feeder is positioned too far away from the Ribber Needles, the stitches will easily drop.	Adjust the horizontal position of the Yarn Feeder.
In the case that the latches and hooks bend	Check if the vertical and/or horizontal position of the Ribber to the Knitter is within the standard measurement.	If the Ribber's Needle Bed is positioned too far away from the Knitter, the Ribber's Needles will touch the Yarn Feeder and may damage them.	Adjust the vertical and/or horizontal position of the Ribber

Conditions of Defects	Check Points	Causes	Countermeasures
	Check the vertical position of the Yarn Feeder.	If the Yarn Feeder is positioned too near the Ribber Needles, the latches of the Needles will touch the Yarn Feeder and may be damaged.	Adjust the vertical position of the Yarn Feeder.
	Check the horizontal position of the Yarn Feeder.	If the Yarn Feeder is positioned too low, it will touch the hooks of the Knitter Needles and the Needles may be damaged.	Adjust the horizontal position of the Yarn Feeder.
	Check the position of the Ribber Needles relative to the Knitter Needles.	When the Half Pitch Lever is set at the H position, and double rib knitting is made, the Ribber Needles will touch the Knitter needles and be damaged.	Adjust the position of the Needlss.
In the case that the stitches at both ends become loosened or slip off.	Check if there are burrs on the Ribber Arm or the Yarn Feeder.	If there are burrs on the Ribber Arm or Yarn Feeder, the yarn will be caught and it will become loosened and may slip off.	File the burr smoothly with sandpaper.
	Check the Tension Dial.	If the yarn is threaded incorrectly or the Tension Dial is not set properly, the Tension Spring will not work effectively and the stitches may slip off.	Confirm if the yarn threading or Dial setting is proper.

Condition of Defects	Check Points	Causes	Countermeasures
In the case the fabric shows course stripes.	Check the position of the Ribber Needles relative to Knitter Needles.	If the Needles are positioned improperly, the stitches will be irregular in size and the fabric will be very poor looking.	Adjust the position of the Needles.
	Check the Joint Stopper.	If the Joint Stopper is not positioned correctly, the size of the stitches will vary during every movement of the Carriage.	Adjust the position of the Joint Stopper.
	Check the dimension between the inner surface of the Carriage Pipe and the Main Cams.	If there is a difference in size between the Main Cams and the Carriage Pipe, the size of the stitches will vary during every movement of the Carriage.	Adjust the dimension between the Main Cams and the Carriage Pipe so that there is no difference between them.
In the case that the Carriage is too heavy to operate.	Check the lubrication of the sliding parts.	Lack of lubrication on those sliding parts will result in sluggish movement of the Carriage.	Wipe clean the surface and then wipe with an oiled cloth to apply oil to them.

2. NOMENCLATURE OF RIBBER.

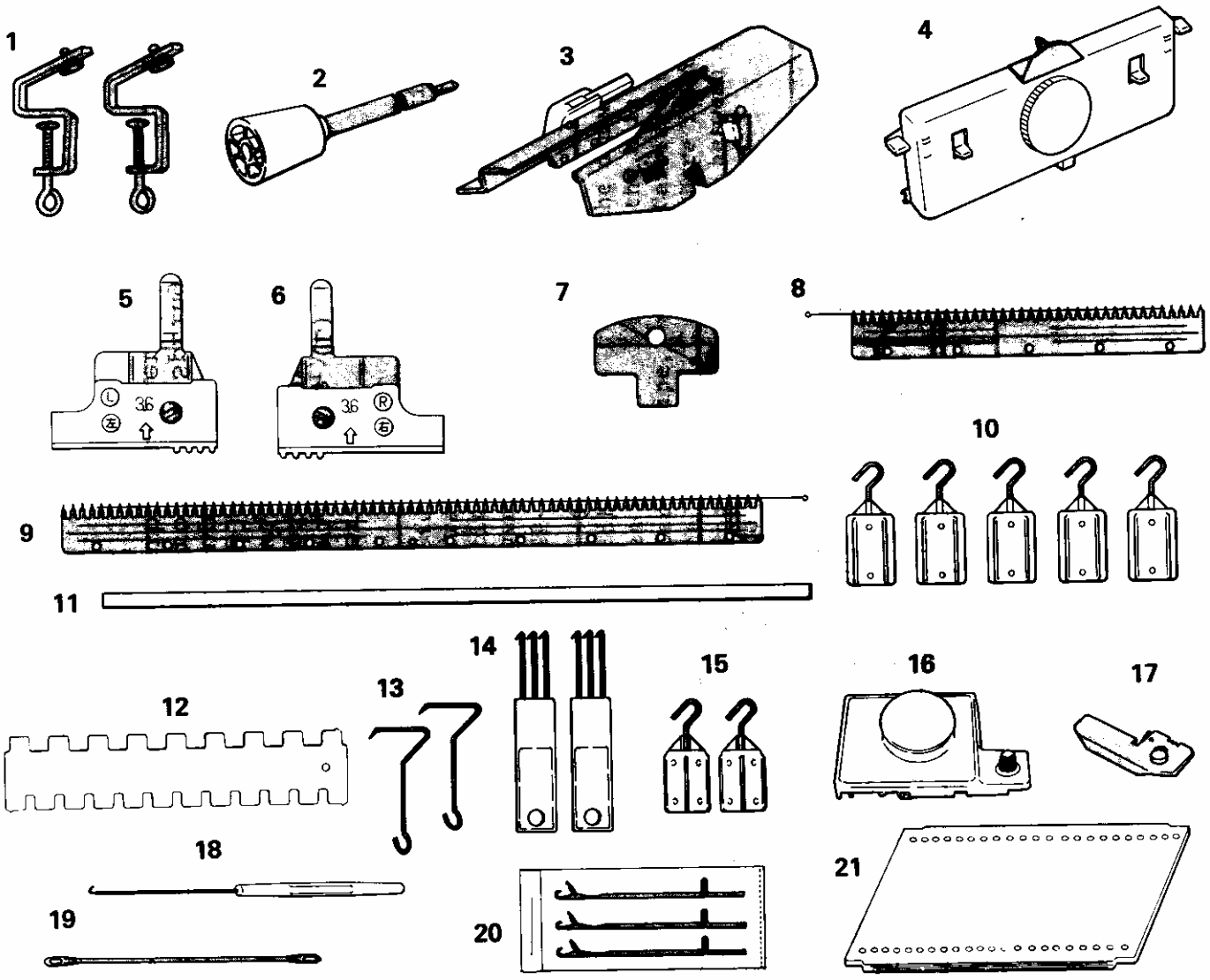
2-1 Ribber Body



1. Sinker
2. Latch Needle
3. Needle Bed
4. Ribber Stopper
5. Pile Lever
6. Drop Lever
7. Shift Scale
8. Swing Handle
9. Indicator
10. Carriage
11. Swing Plate (L)
12. Indicator Unit
13. Swing Bearing
14. Adjusting Lever
15. Supporting Cam
16. Drop Lever Spring
17. Ribber Joiner (L)

Fig. 1

2-2 Accessories.



1 Ribber Clamp
2 Swing Handle
3 Ribber Arm
4 Ribber Carriage
5 Auxiliary Piece (L)
6 Auxiliary Piece (R)
7 Screw Driver
8 Cast-on Comb (short)
Cast-on Wire (short)
9 Cast-on Comb (long)
Cast-on Wire (long)
10 Ribber Weight (large)
11 Close Knit Bar
12 Needle Pusher (2/1, 2/2)
13 Side Hanger
14 Hanger Comb
15 Edge Weight
16 P Carriage
17 P Presser
18 Hook Tool
19 Double-eye Transfer Tool
20 Spare Needle Envelope (incl. 3 needles)
21 Punch Card Set (No.FR-1 ~ No.FR-10)

2-3 Carriage (Upper Side).

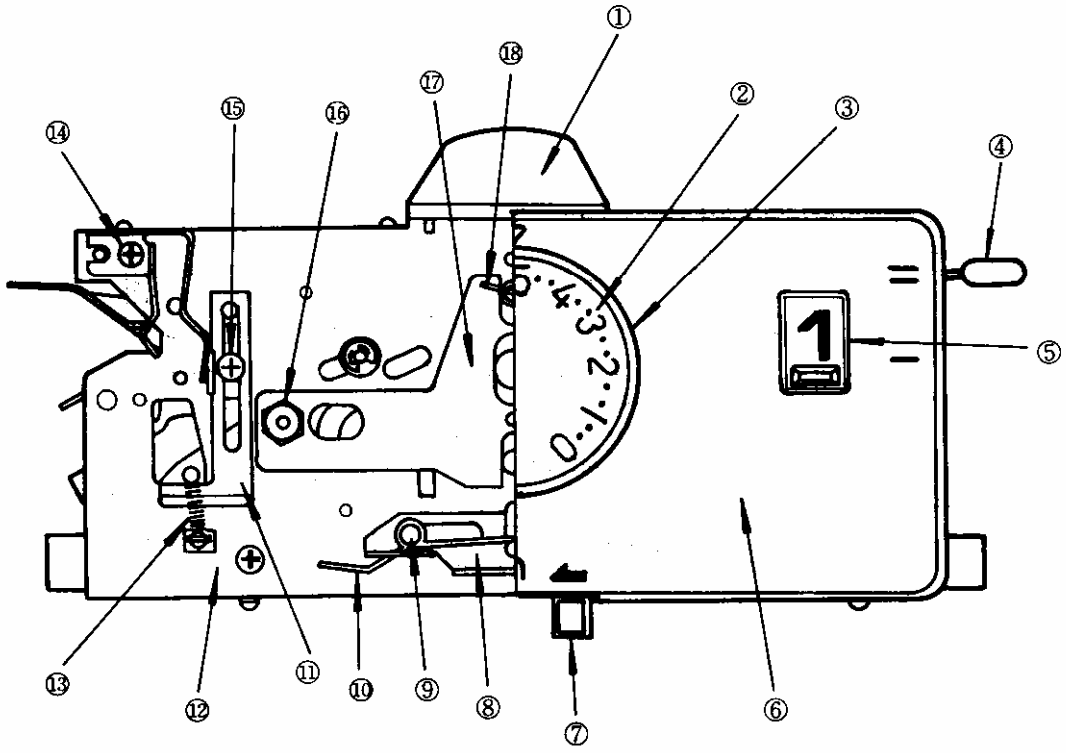


Fig. 3

1. Joiner Stopper
2. Dial Indicator
3. Stitch Dial
4. Russel Cam Knob
5. Set Lever Knob
6. Carriage Cover
7. Pick Lever Knob
8. Pick Lever
9. Pick Lever Screw
10. Pick Lever Spring
11. Set Lever (L)
12. Carriage Plate
13. Extension Spring
14. Set Lever Spring (L)
15. Set Lever Screw
16. Main Cam Nut
17. Travelling Plate
18. Dial Spring

2-4 Carriage (Rear)

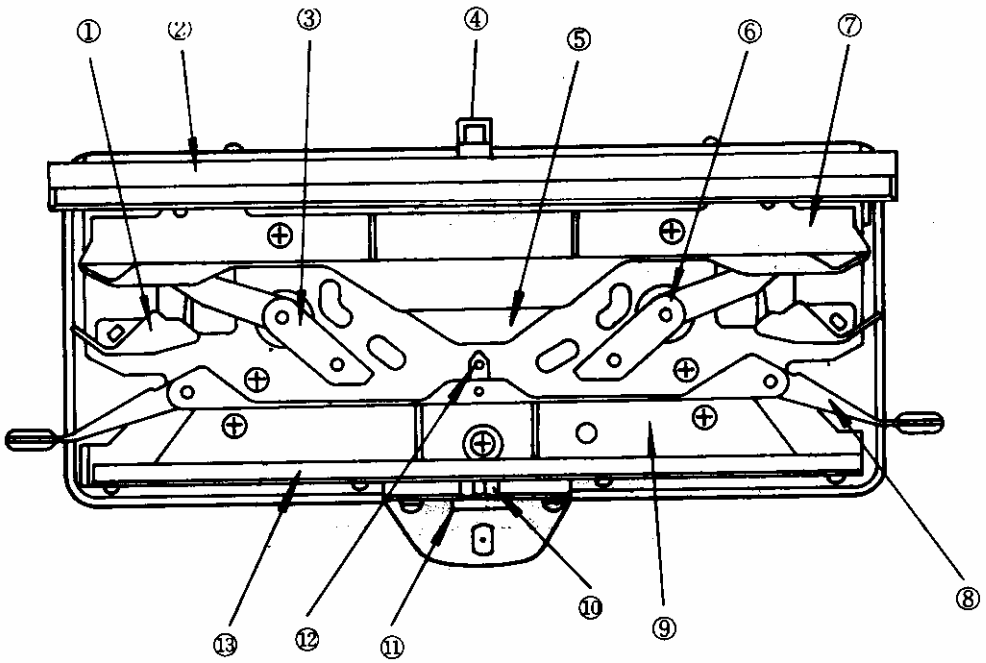
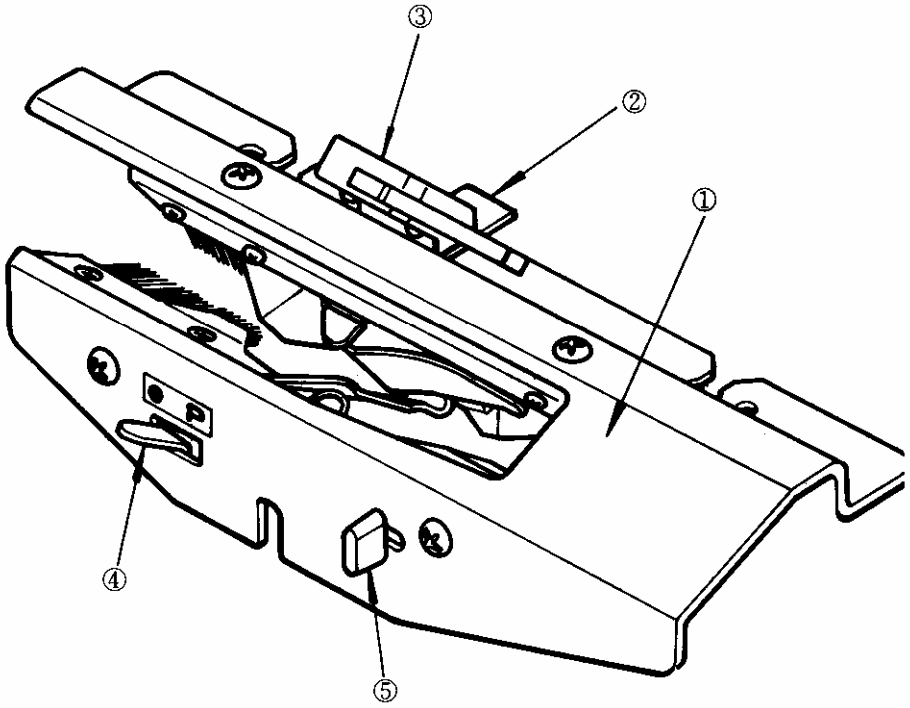


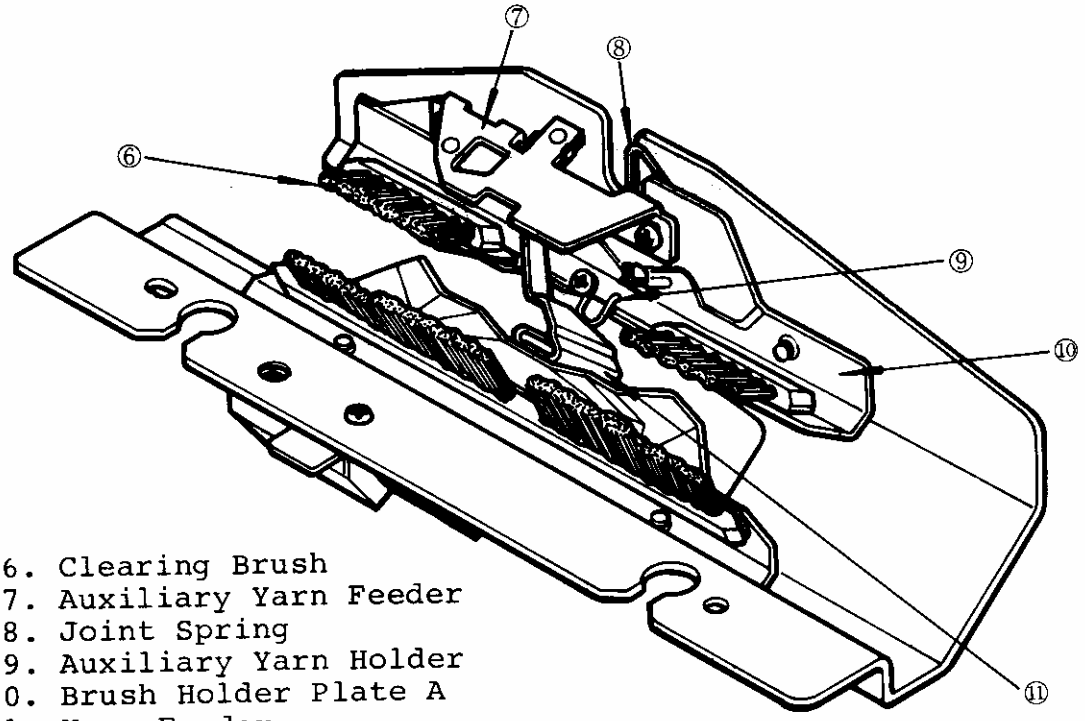
Fig. 4

1. Needle Guide B (L)
2. Carriage Pipe
3. Main Cam (L)
4. Pick Lever Knob
5. Pick Cam
6. Main Cam (R)
7. Guide Plate
8. Russel Cam (R)
9. Needle Guide A
10. Stitch Adjusting Plate
11. Joint Stopper Shaft
12. Lowering Cam
13. Carriage Slider

2-5 Arm



1. Arm
2. Driving Lever Plate
3. Driving Lever Unit
4. Auxiliary Yarn Feeder Lever
5. Joint Spring Knob



6. Clearing Brush
7. Auxiliary Yarn Feeder
8. Joint Spring
9. Auxiliary Yarn Holder
10. Brush Holder Plate A
11. Yarn Feeder

Fig. 5

3. CARRIAGE COVER DISASSEMBLY AND ASSEMBLY.

3-1 Carriage Cover Disassembly.

1. Turn the Stitch Dial in a clockwise direction until it stops.

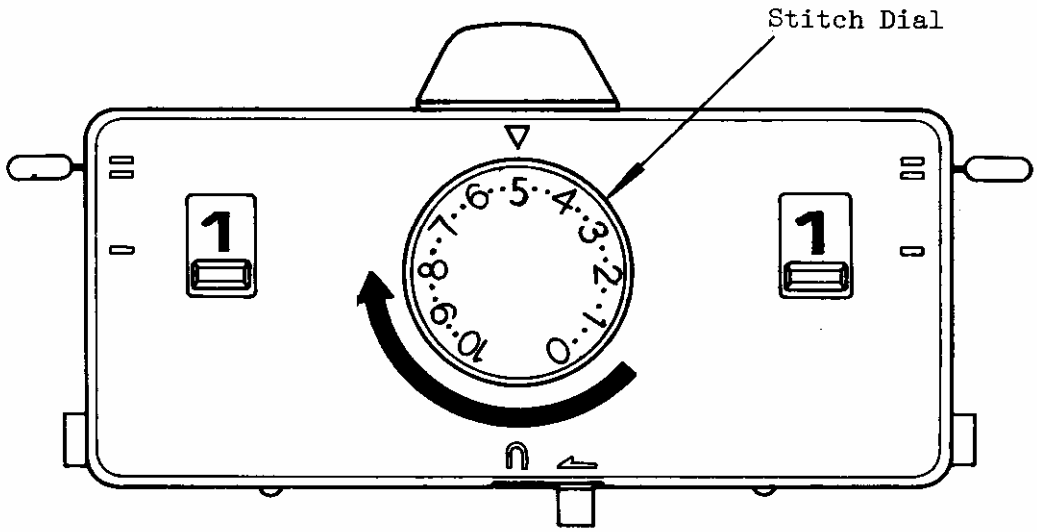


Fig. 6

2. Remove the Stitch Dial as shown in Fig. 7, below.

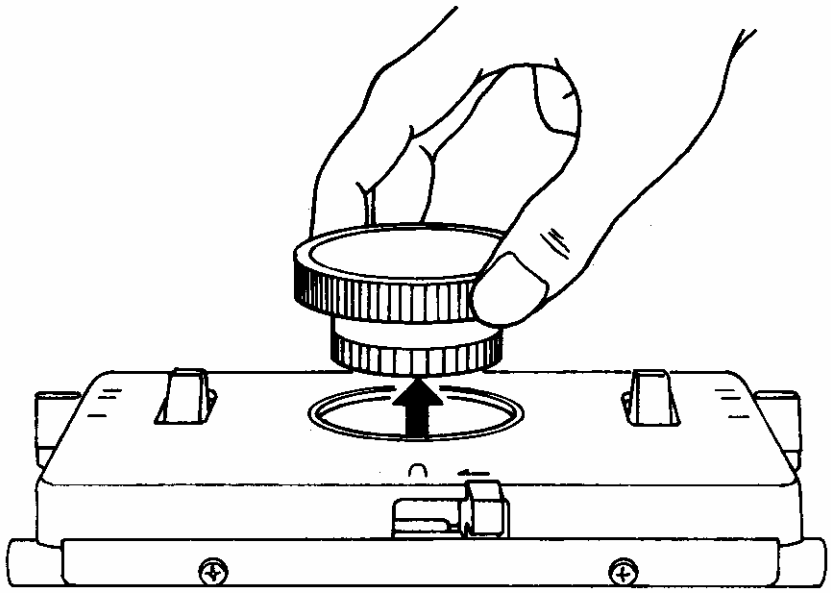


Fig. 7

3. From the rear of the Carriage, remove two + Pan Head Tapping Screws (3x12) which secures the Carriage Cover.

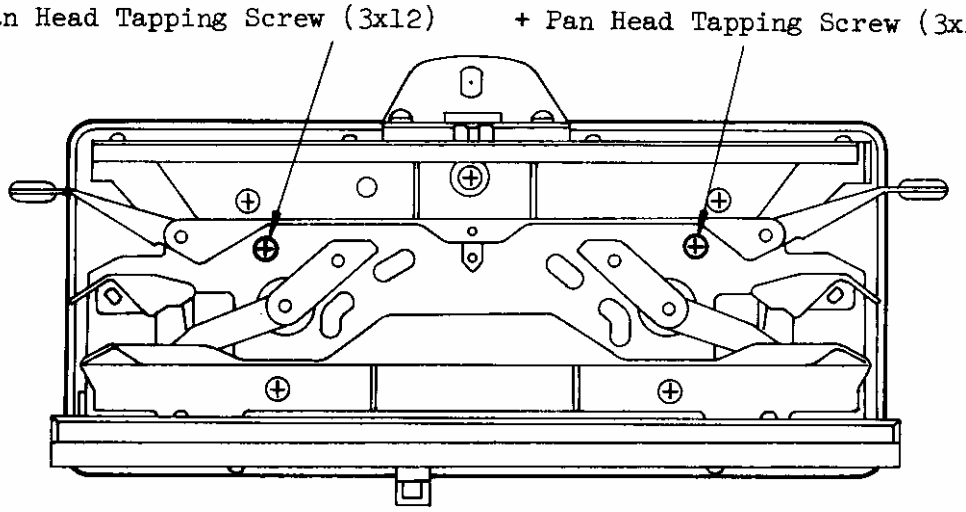


Fig. 8

3-2 Carriage Cover Assembly.

1. Place the Carriage Cover in position and fasten it with two + Pan Head Tapping Screws (3x12) as indicated in Fig. 9.

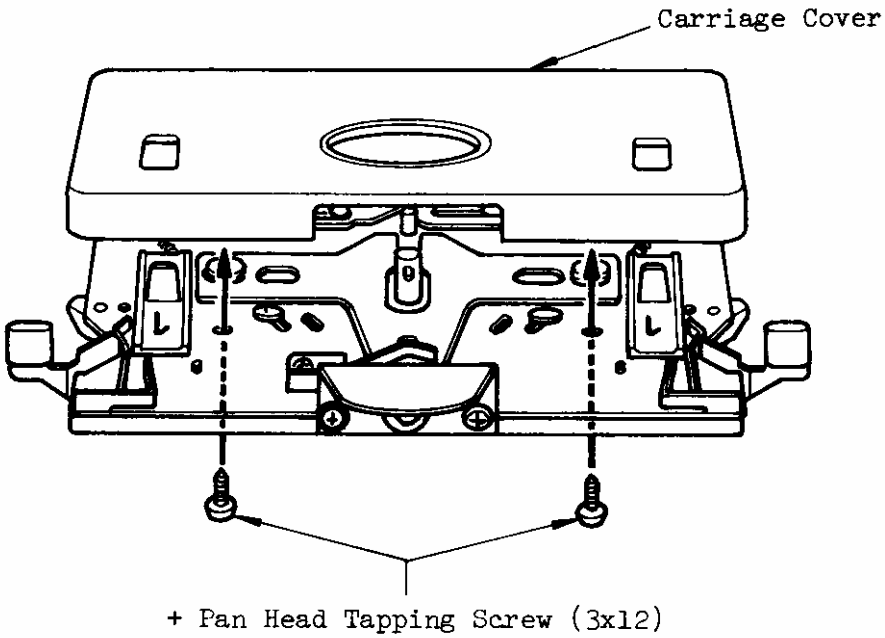


Fig. 9

2. As shown in the below Fig. 10, move the Travelling Plate Pin forward.

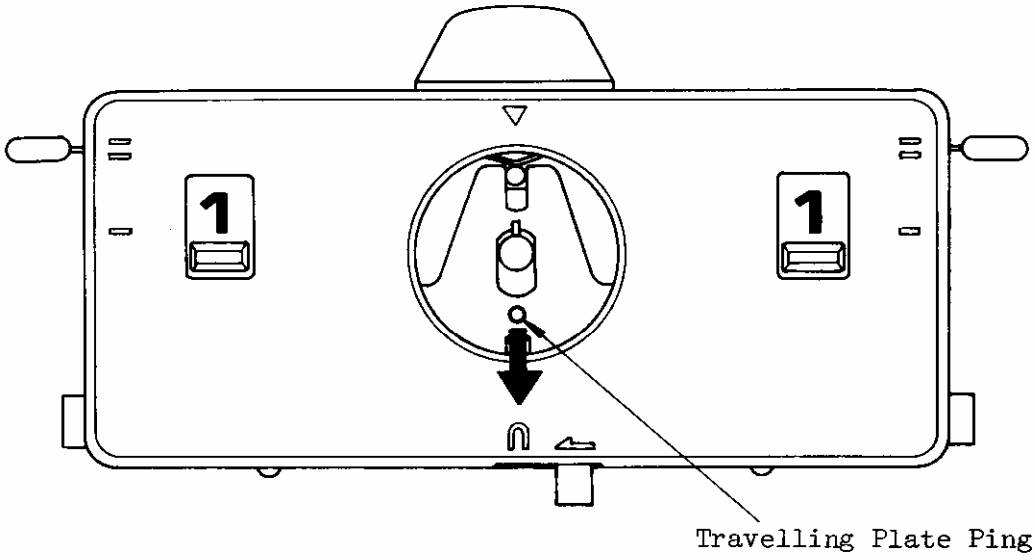


Fig. 10

3. Place the Stitch Dial onto the Dial Shaft and turn it in an anti-clockwise direction to secure it to the Carriage.

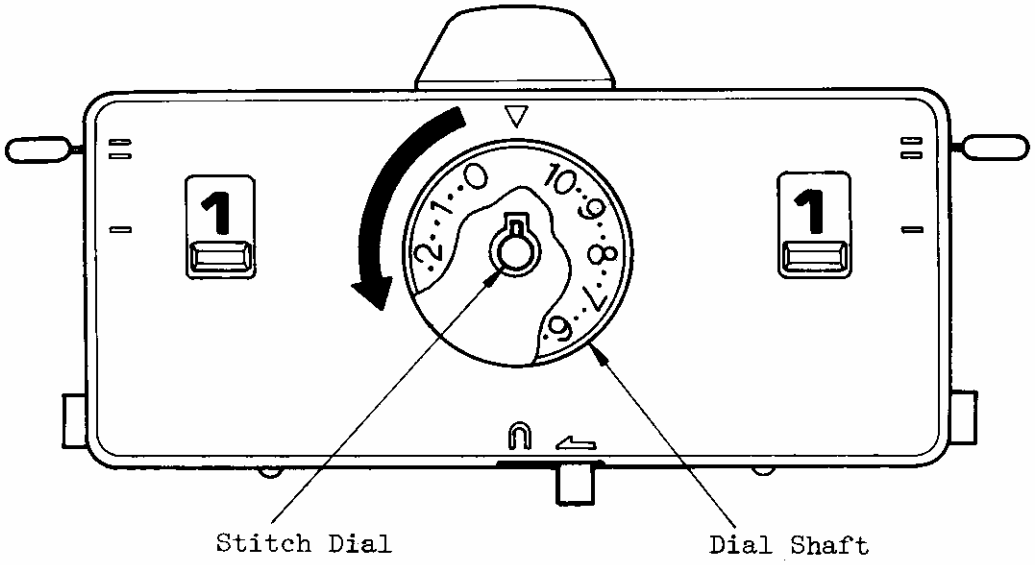


Fig. 11

4. ADJUSTMENT FOR EACH PART OF THE NEEDLE BED.

4-1 The Horizontal Measurement between Ribber and Knitter.

* Check the horizontal measurement prior to adjustment.

1. Position the Half-Pitch Lever at P.

2. Turn the Swing Handle to 5 on the P Scale.

3. On both sides of the Ribber Needle Bed, bring 5 needles to D position. The measurement between the Ribber needles and the sinkers of the Knitter must be within 0.5 m/m ± 0.2 m/m. This measurement is done with a Thickness Gauge. (If a Thickness Gauge is not available for this measurement the Gauge Scale, found in the Knitter accessories, which has a thickness of 0.5 m/m, can be used instead.)

4. If the measurement is not within the range of 0.3 m/m - 0.7 m/m, please refer to Fig. 13 on page 14 for the relevant adjustment.

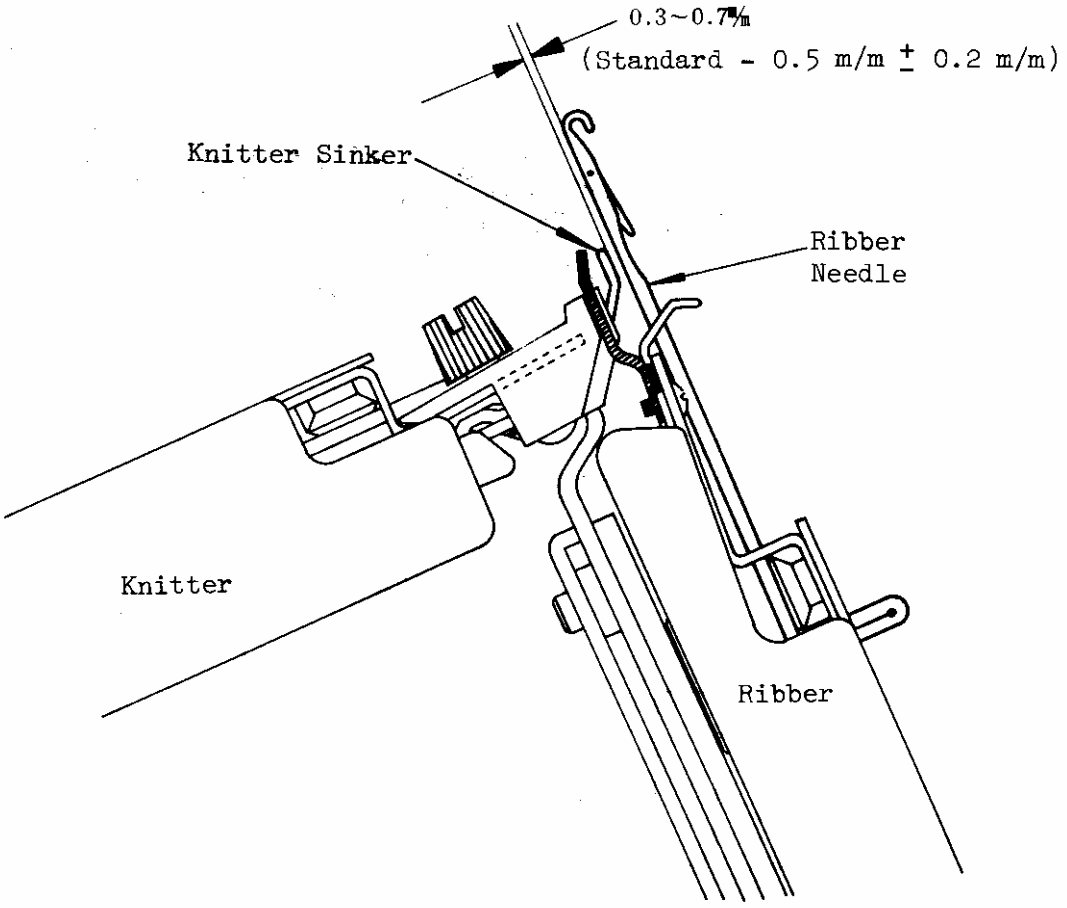


Fig. 12

A. If the space measures more than 0.7 m/m:

1. Turn the Supporting Cam (L) towards you.

2. Loosen the + Binding Head Screw (3x6), which secures the Ribber Stopper, and exchange the washer for a thinner one in order to reduce the space to the standard measurement.

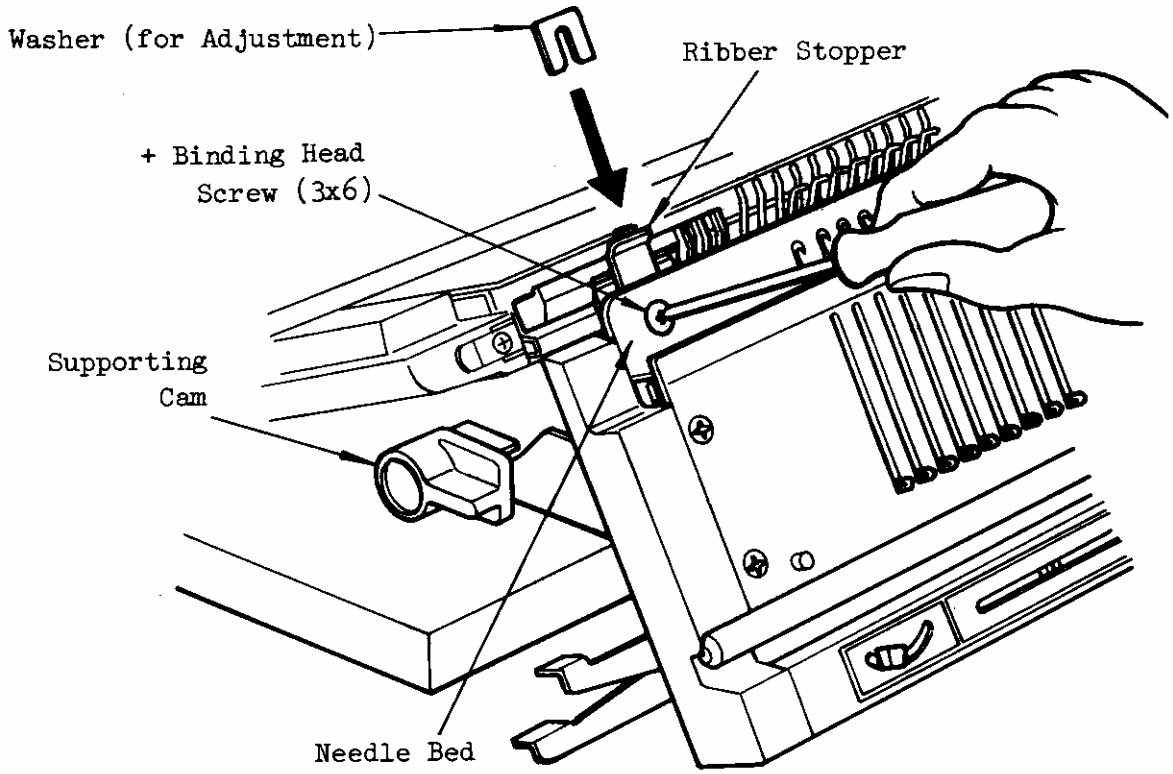


Fig. 13

* There are three different thicknesses for the washers used for this adjustment. See Fig. 14, below.

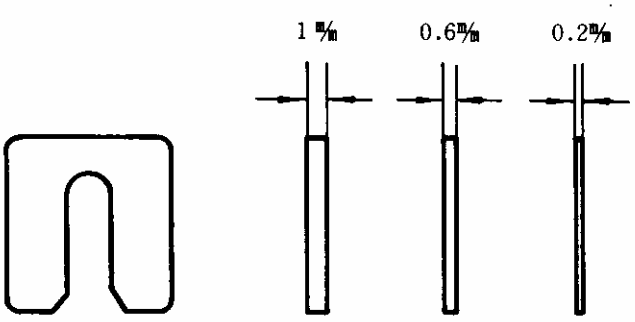


Fig. 14

B. If the space measures less than 0.3 m/m:

The adjustment is the same as that explained under "A" on page 13, the only exception being that, the washer must be exchanged for one that is thicker in width in order to increase the space to the standard measurement.

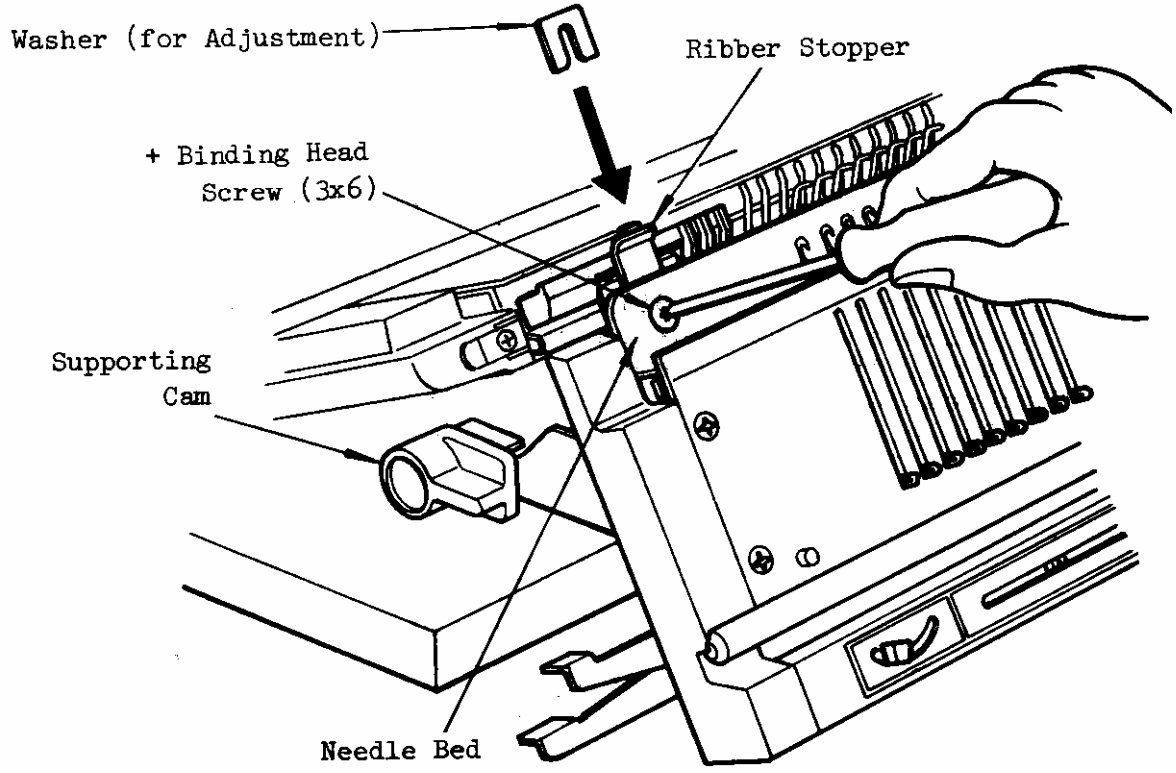


Fig. 15

4-2 The Vertical Measurement between the Ribber and Knitter.

* Confirm the vertical measurement between the Ribber and Knitter prior to adjusting the same. Position the Supporting Cam so that it is in contact with the Knitter for the relative confirmation, follow the below stated instructions.

1. Confirmation of Measurement

a) Position the Half-Pitch Lever at P.

b) Turn the Swing Handle to 5 on the P indicator.

c) Both Pile Levers should be in an upward positon.

d) On both sides of the Knitter, bring 5 needles to D position (the needles numbered 91 - 95). The measurement between the Knitter needles and the sinkers of the Ribber should be within 0.3 - 0.7 m/m. This measurement is made with a Thickness Gauge. (If a Thickness Gauge is not available for this measurement, the Gauge Scale, found in the Knitter accessories, which has a thickness of 0.5 m/m, can be used instead.)

e) If the measurement is not within 0.3 - 0.7 m/m, make the necessary adjustments following the instructions on the next page.

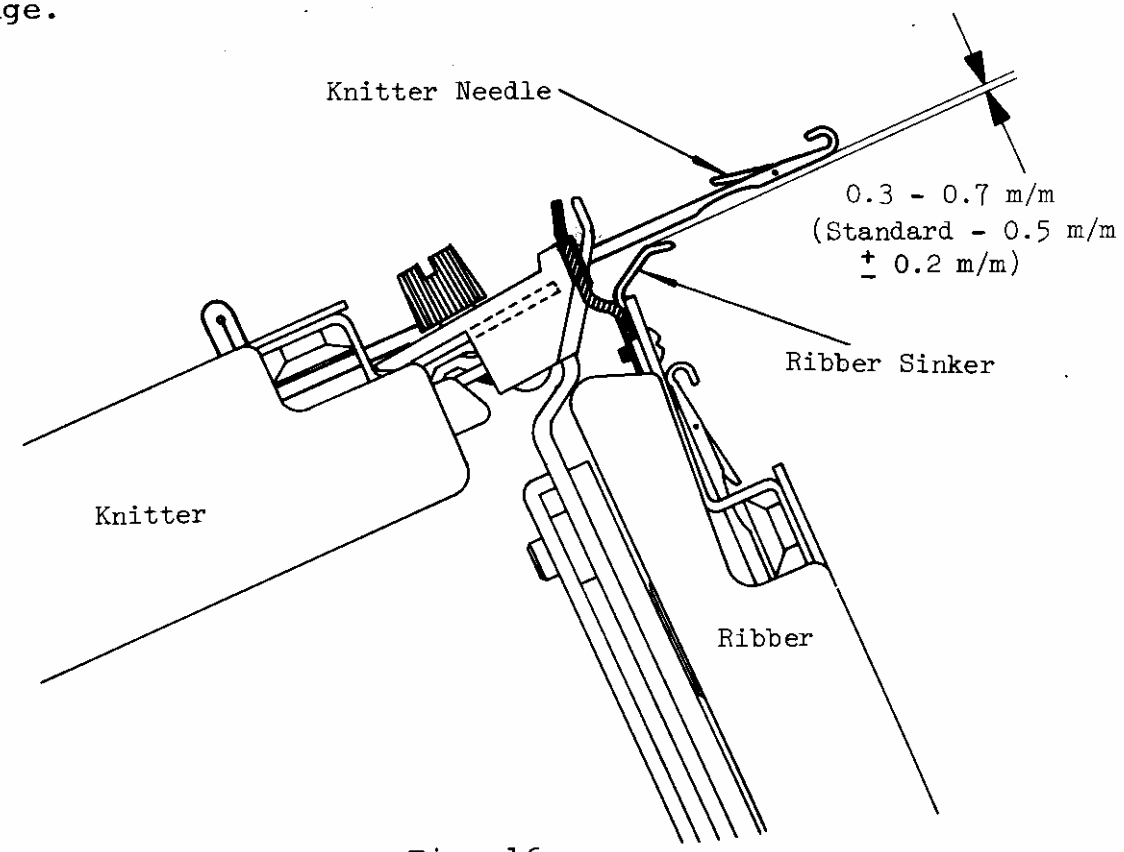


Fig. 16

2. Method of Adjustment.

1. Loosen the hexagonal nut, found behind the Drop Lever, with a 7 m/m spanner. The Adjusting Lever will now be movable.

Note: Be sure to hold the Ribber with your hand as indicated in Fig. 17, or else the Ribber will drop.

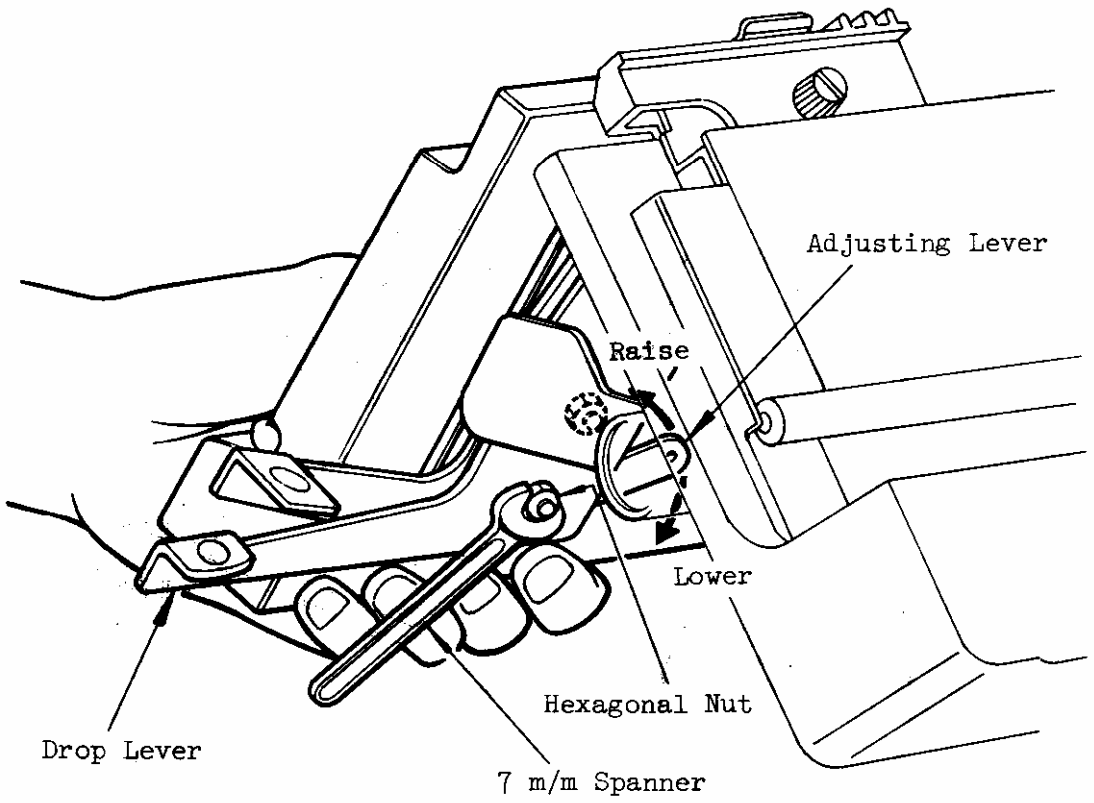


Fig. 17

2. After loosening the hexagonal nut, adjust the position by moving the Adjusting Lever in the direction of the arrow as shown in Fig. 17.

* If the vertical measurement is too wide, the Adjusting Lever must be raised.

* If the vertical measurement is too narrow, the Adjusting Lever must be lowered.

3. Fasten the hexagonal nut after the Adjustment has been completed.

4-3 Needle Alignment.

Set the Ribber to the Knitter with the Half Pitch Lever in the P position and confirm that the needles of both beds are facing each other, when in B position, see Fig. 18-1.

If the needles are not aligned, as shown in Fig. 18-2, adjust then so as they face each other.

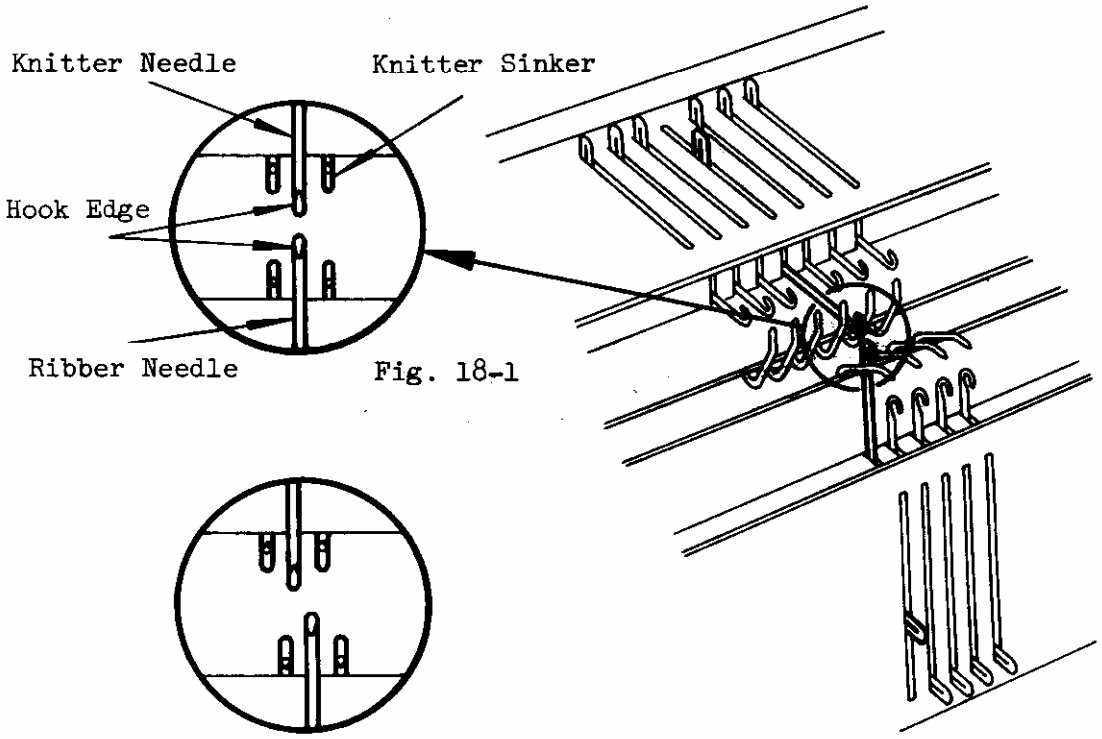


Fig. 18-1

Fig. 18-2

Fig. 18

1. Method of Adjustment

In the case that the needles are not aligned, loosen two + Binding Head Screws (3x4) which secure the Half Pitch Adjusting Plate, and adjust then so as they face each other, by tapping the Ribber lightly with your hand.

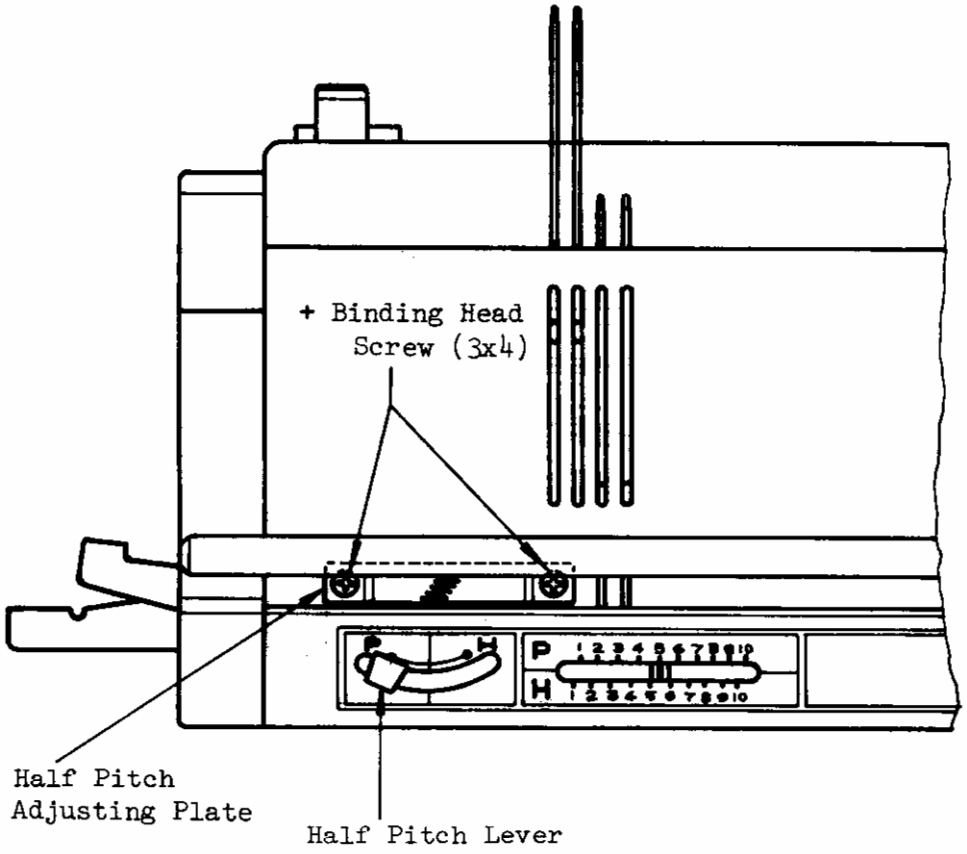


Fig. 19

Note: When this is done, adjustment of the Swing Indicator is also required.

4-4 Swing Indicator Adjustment.

1) Swing the Half-Pitch Lever to P and turn the Swing Handle to 5 as indicated on the Swing Indicator.

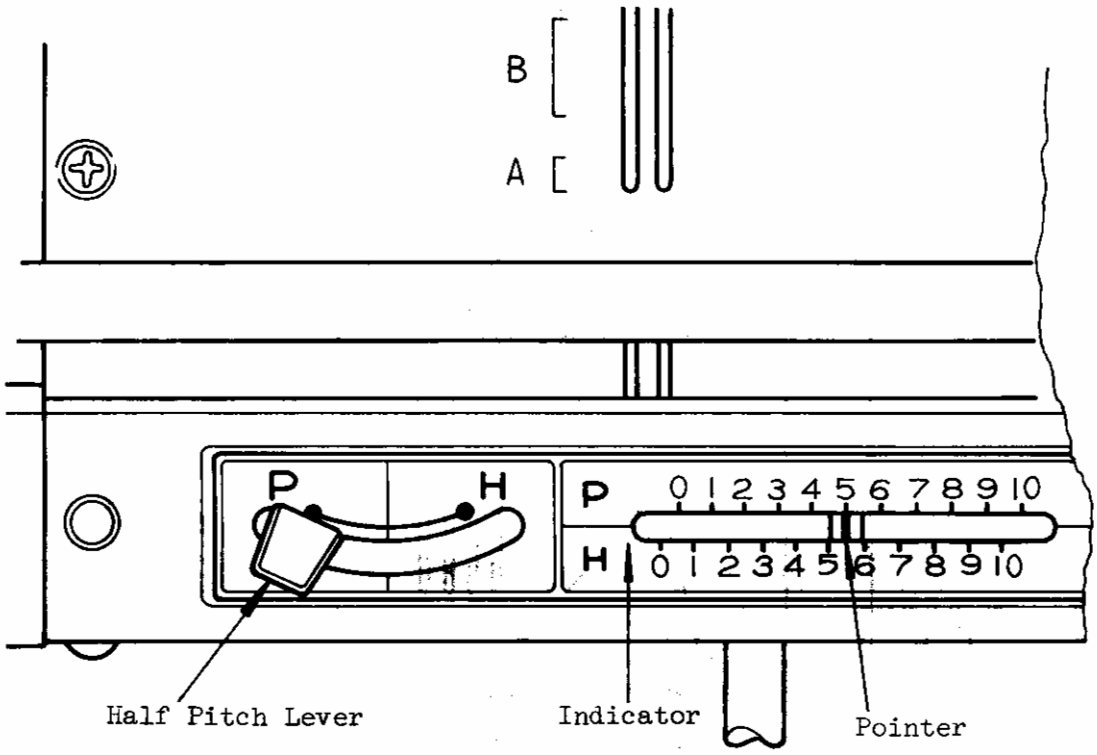


Fig. 20

2) Unless the Indicator does not point at (P)-5 exactly, loosen one ± SPW Binding Head Screw (3x7), which secures the Pointer to the back of the Ribber and adjust the Pointer by moving it to either side.

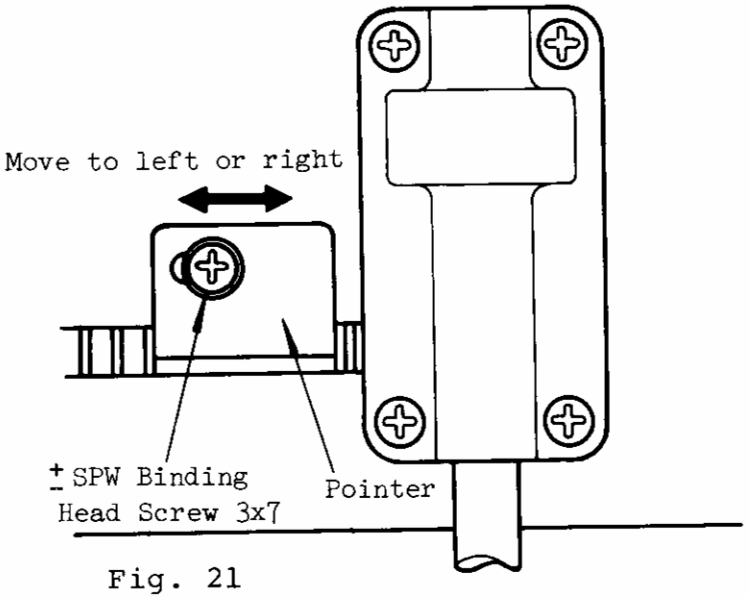


Fig. 21

4-5 Warpage of Needle Bed.

(1) The Needle Bed of the SRP-50 Ribber is warped as indicated in Fig. 22 (the vertical space between the Ribber and the main machine is 0.3 - 0.5 m/m, wider at the centre in comparison with the space at the edges).

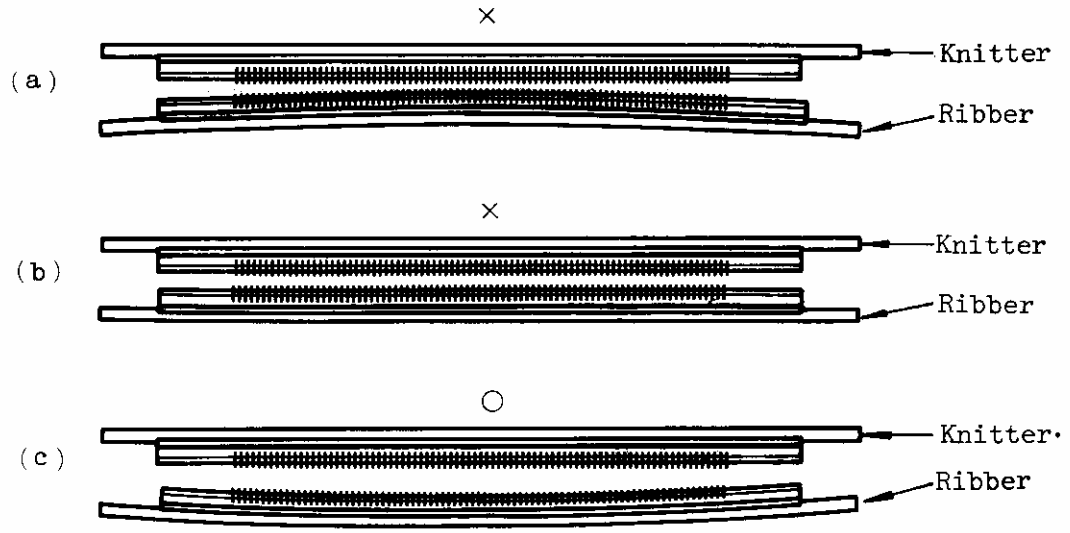


Fig. 22

(2) Adjustment of the warpage.

If the Needle Bed is warped as indicated in Fig. 22 (a) or (b), the stitches will be apt to float or drop. In this case, position the Needle Bed as shown in Fig. 23 and adjust it.

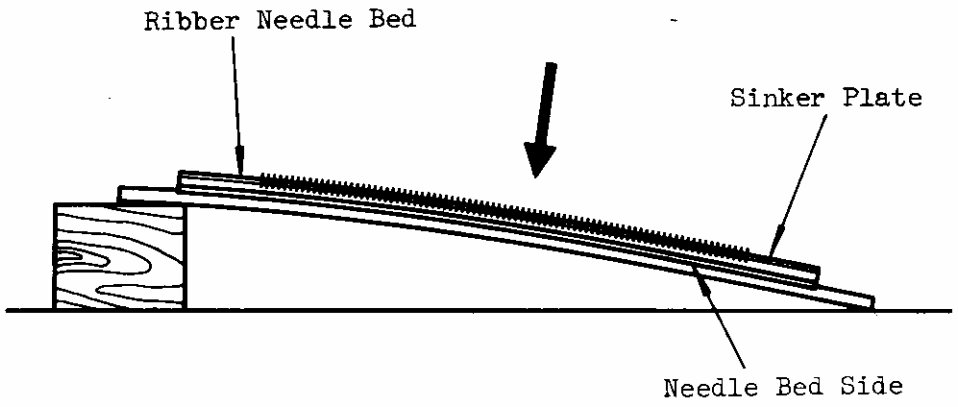


Fig. 23

4-6 L Dimension of the Needle Bed (the distance between the Sinker Post and the Carriage Rail).

L Dimension: 115.9 ± 0.25 m/m (Difference must be within 0.3 m/m)

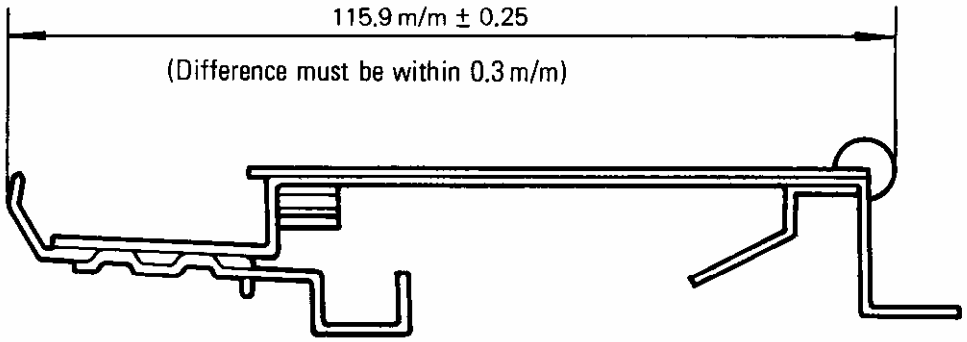


Fig. 24

Example: Measure the L Measurement

Results: **Maximum Value = 116.15 m/m**
Minimum Value = 115.20 m/m
116.15 – 115.20 = 0.95 m/m
Difference = 0.95 m/m

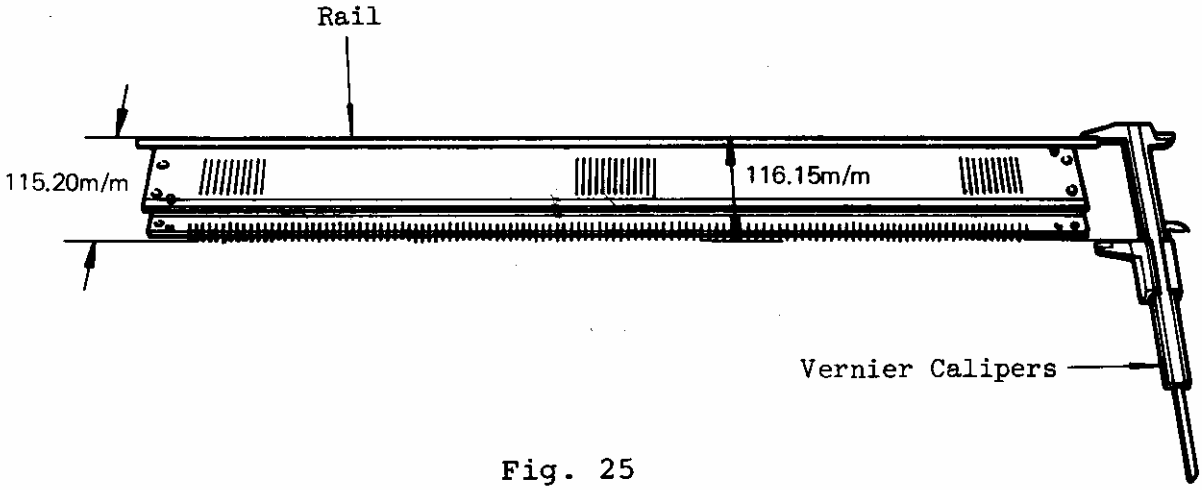


Fig. 25

1. Method of Adjustment.

To remedy the difference, adjust the sinkers to 0 – 0.3 m/m.

a) When moving the sinkers forward.

1. Loosen the hexagonal nut, nearest the position to be adjusted, by a quarter turn, and make the adjustment.

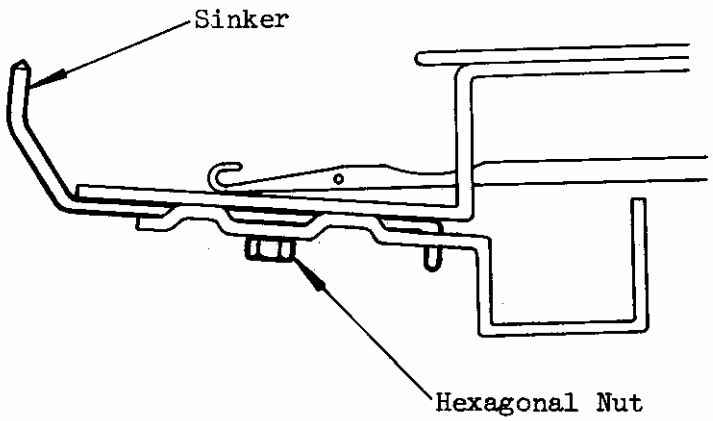


Fig. 26

2. Insert a 1 m/m thick steel plate or a metal Needle Pusher between the front edge of the Needle Bed and the sinkers as shown in Fig. 27, with the steel plate kept pressed downwards, bring it down in the arrow-marked direction and the sinkers can be moved forwards. Repeat the above method for correct alignment of the sinkers.

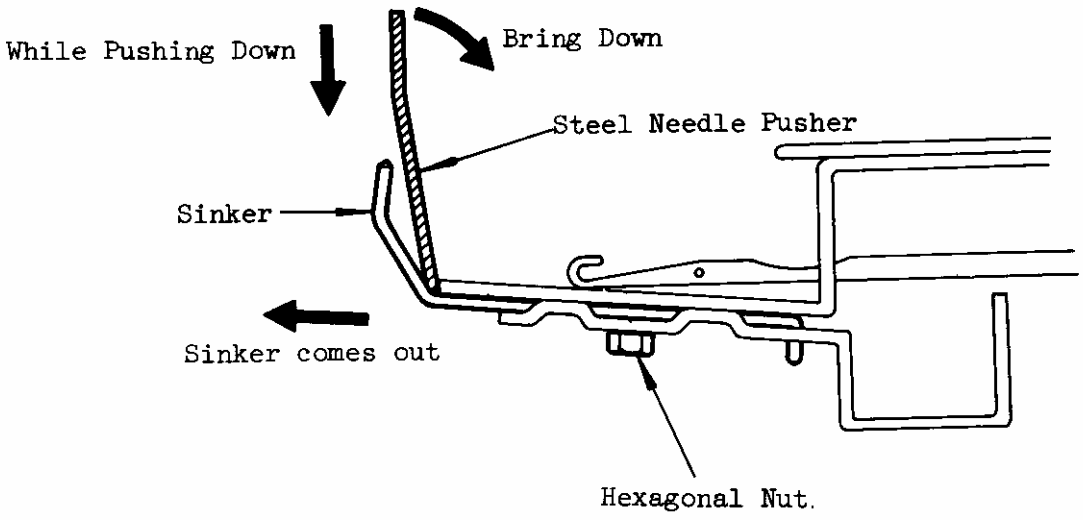


Fig. 27

3. Measure the L Dimension, after fastening the hexagonal nut tightly.

b) In the case that the sinkers are moved backwards.

1. Loosen a hexagonal nut by a quarter turn, nearest the portion to be adjusted.

2. Press the bottom of the sinkers, as shown in Fig. 28 and indicated by the white arrow, with the rounded side of a wooden hammer, or any wooden material available, as if you were rubbing it, and the sinkers can be moved towards the Needle Bed.

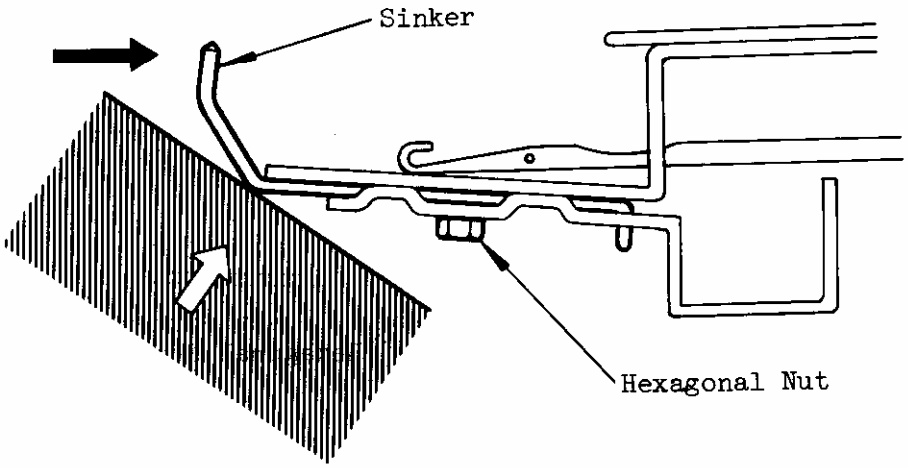


Fig. 28

3. Measure the L Dimension after fastening the hexagonal nut tightly.

5. ARM ADJUSTMENT.

5-1 Vertical Adjustment of the Yarn Feeder.

* Check the vertical clearance prior to making the relative adjustment.

1. On the left side of the Knitter Needle Bed, push 5 needles to B position.

2. Position the Cam Lever of the Knitter Carriage to Stockinet.

3. Move the Carriage to the centre of the 5 needles which were pushed to B position.

4. The clearance between the rear of the Yarn Feeder and the hook of the Knitter needle (vertical position of the Yarn Feeder), must be within the range of 0.2 - 0.8 m/m.

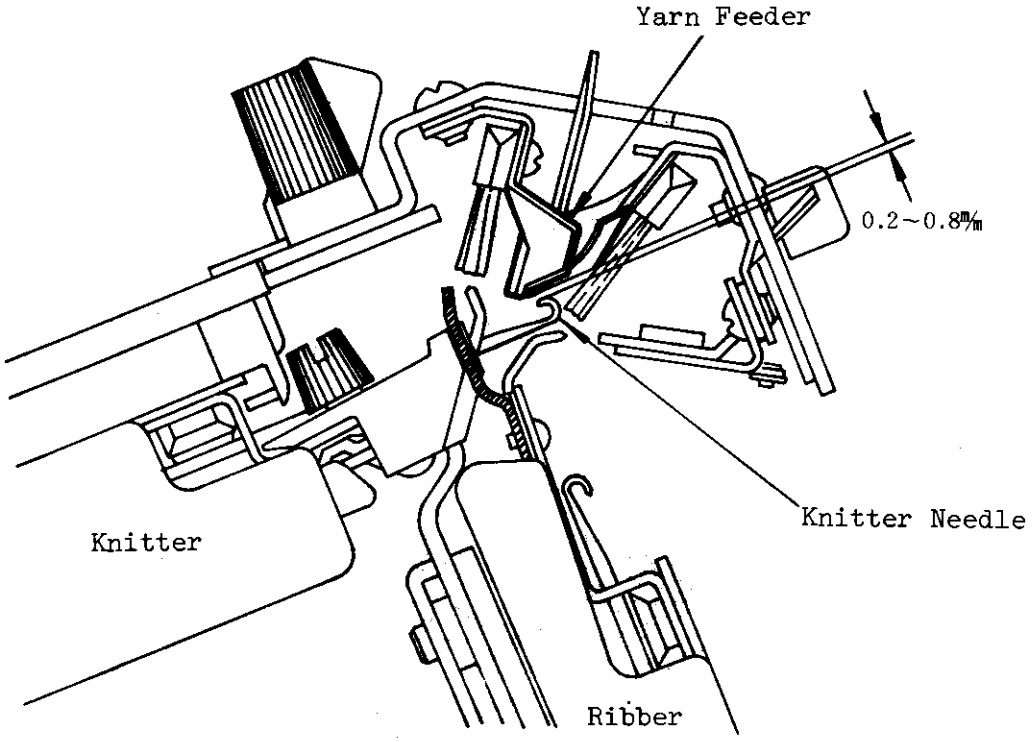


Fig. 29

1. Method of Adjustment.

1. As indicated in Fig. 30 below, trace the outline of the two Special + Truss Head Screws (3x6) situated on the top of the Arm.

2. By removing the two Special + Truss Head Screws (3x6) the Yarn Feeder can be removed. Be careful so as not to lose the washers that are held in place by the above two screws.

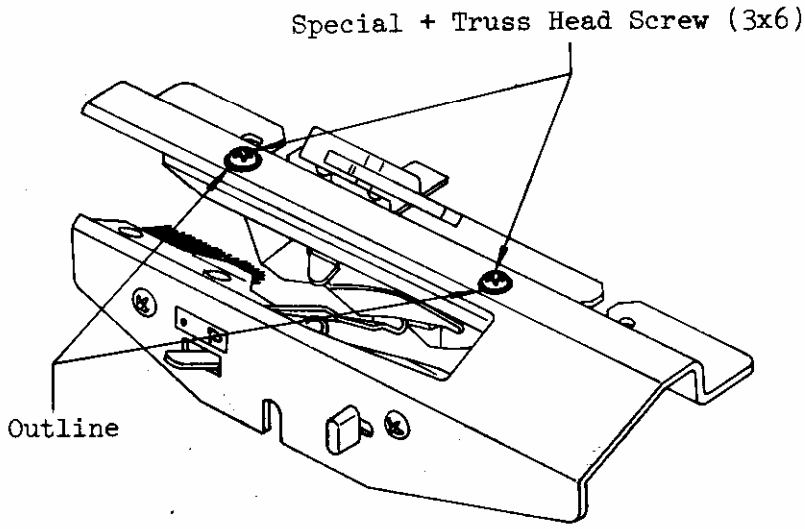


Fig. 30

3. Adjust (lower) the Yarn Feeder position by inserting a washer between the Arm and the Yarn Feeder if the distance between the needle hook and Yarn Feeder is over 0.8 m/m.

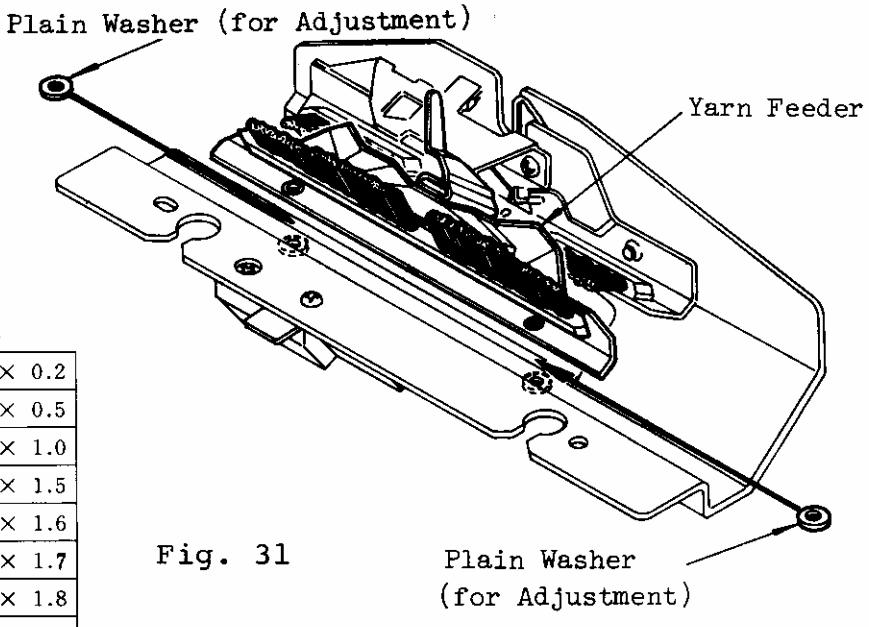


Fig. 31

List-1

Washer	4 × 8 × 0.2
〃	4 × 8 × 0.5
〃	4 × 8 × 1.0
〃	4 × 8 × 1.5
〃	4 × 8 × 1.6
〃	4 × 8 × 1.7
〃	4 × 8 × 1.8
〃	4 × 8 × 1.9
〃	4 × 8 × 2.0

5-2 Horizontal Adjustment of the Yarn Feeder.

* Check the horizontal clearance prior to making the relative adjustment.

1. On the left side of the Ribber Needle Bed push 5 needles (91st - 95th) to B position and align them in C position by using the P Carriage.

2. Move the Carriage to the centre of the 5 needles which were pushed to C Position.

3. The clearance between the rear of the Yarn Feeder and the stem of the Ribber needle (horizontal position of the Yarn Feeder) must be within the range of 0.2 - 0.6 m/m.

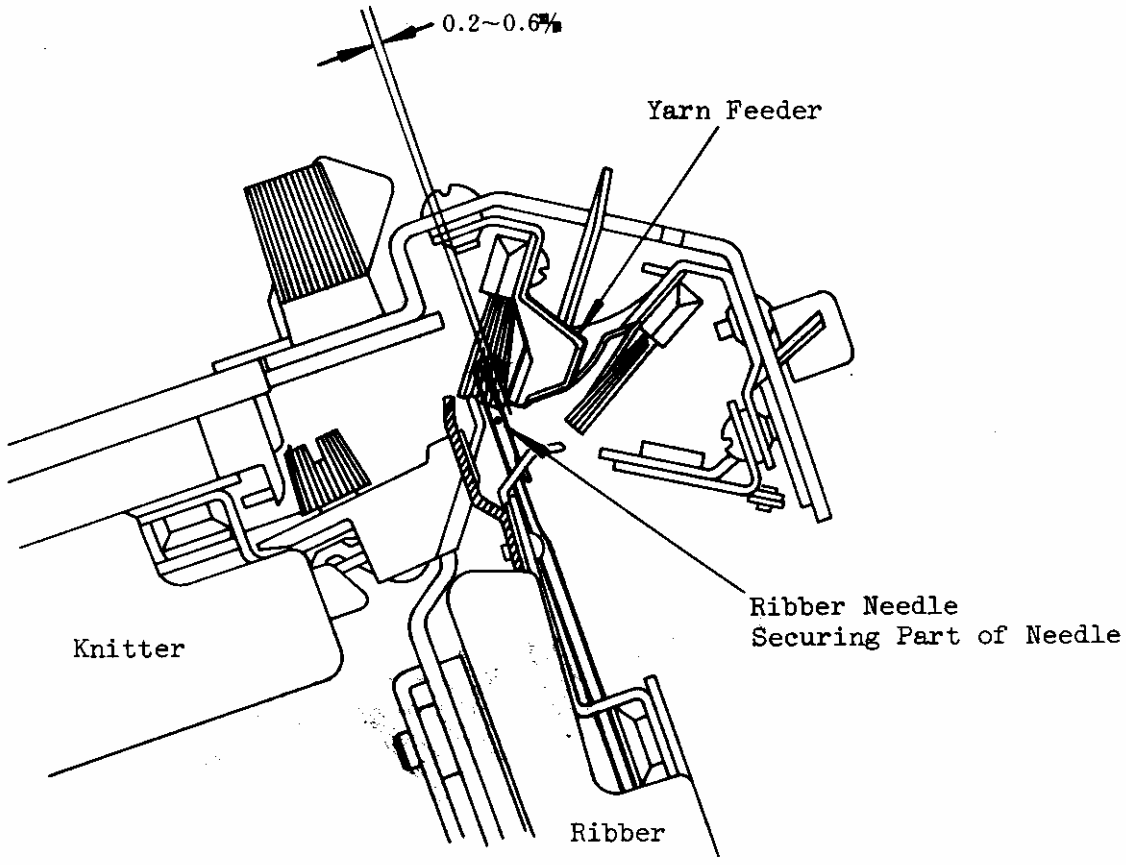


Fig. 32

1. Method of Adjustment.

1. Of the two Special + Truss Head Screws (3x8) loosen the screw positioned on the left side by a quarter or half turn, and move the Yarn Feeder either forward or backward as the case may be. Likewise, make the same adjustment with the screw positioned on the right side.

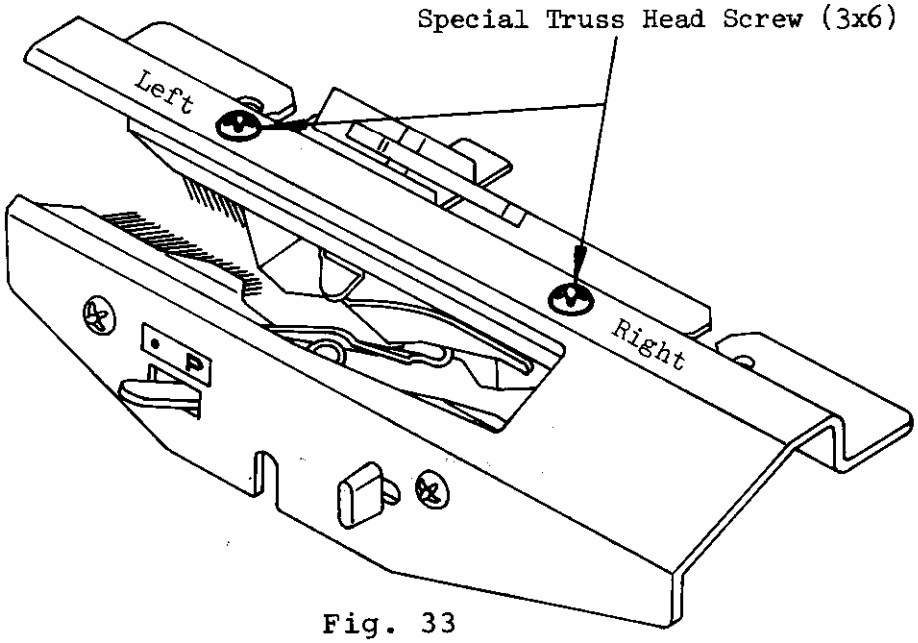


Fig. 33

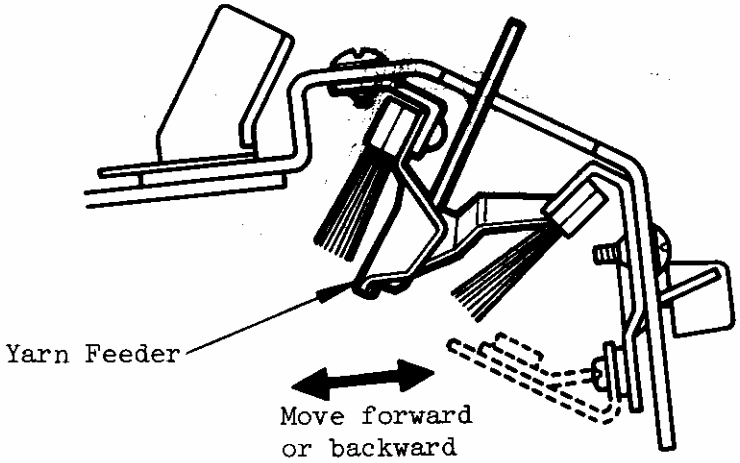


Fig. 34

* Confirmation of Adjustment.
The measurement between the Yarn Feeder and the Ribber needles (0.2 - 0.6 m/m) can be judged by the eye, but if this is difficult, insert the butt of a needle into the space. If the needle butt touches both the Yarn Feeder and Ribber needle, then the adjustment must be done over again.

6. ADJUSTMENT OF THE AUXILIARY YARN FEEDER.

* Adjust both the vertical and horizontal positions of the Auxiliary Yarn Feeder simultaneously.

6-1 Each Measurement of the Auxiliary Yarn Feeder.

a) Vertical Position of the Auxiliary Yarn Feeder.

* The distance between the tip of the needle hook of the Knitter and part "A" in the diagram below, should lie within the range of 0.3 - 1.4 m/m.

b) Horizontal Position of the Auxiliary Yarn Feeder.

* The distance between the forehead of the needle hook of the Knitter and part "A" in the below diagram, should lie within the range of 0.3 - 1 m/m.

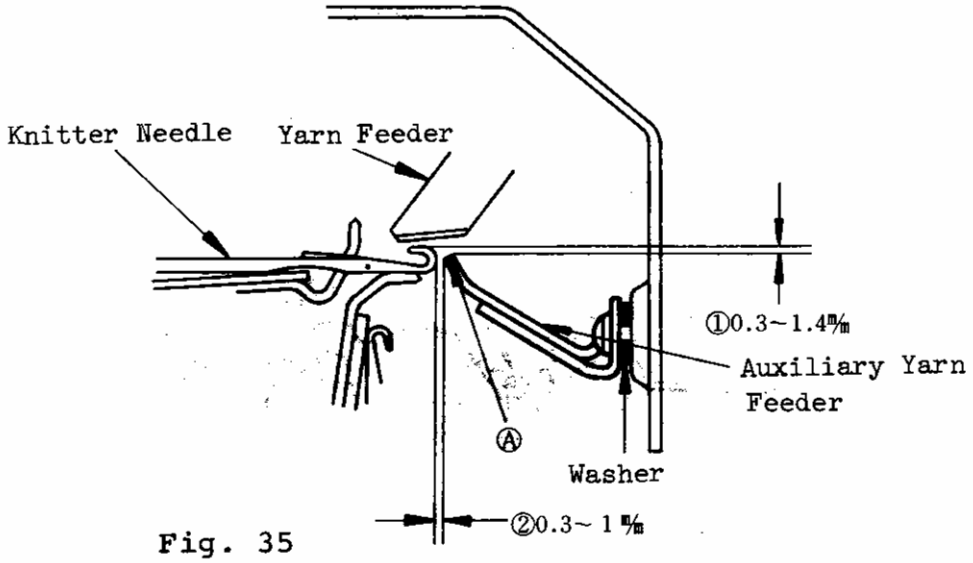


Fig. 35

6-2 How to Adjust the Vertical Position at the Auxiliary Yarn Feeder.

* Adjust the vertical position of the Auxiliary Yarn Feeder by loosening two + Pan Head Screws (3x5) and sliding the Auxiliary Yarn Feeder upward or downward.

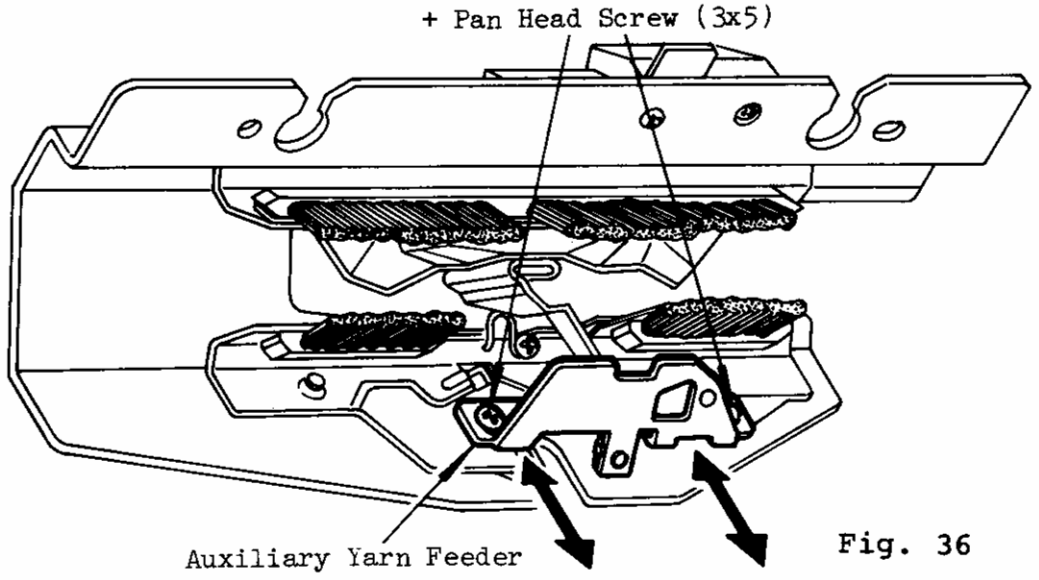


Fig. 36

6-3 How to Adjust the Horizontal Position of the Auxiliary Yarn Feeder.

* Adjust the horizontal position of the Auxiliary Yarn Feeder by inserting washers between it and the Brush Holder A, after loosening two + Pan Head Screws (3x5) which secures the Auxiliary Yarn Feeder to the Arm.

a) Insert washers to narrow the distance.
b) Remove washers to widen the distance.

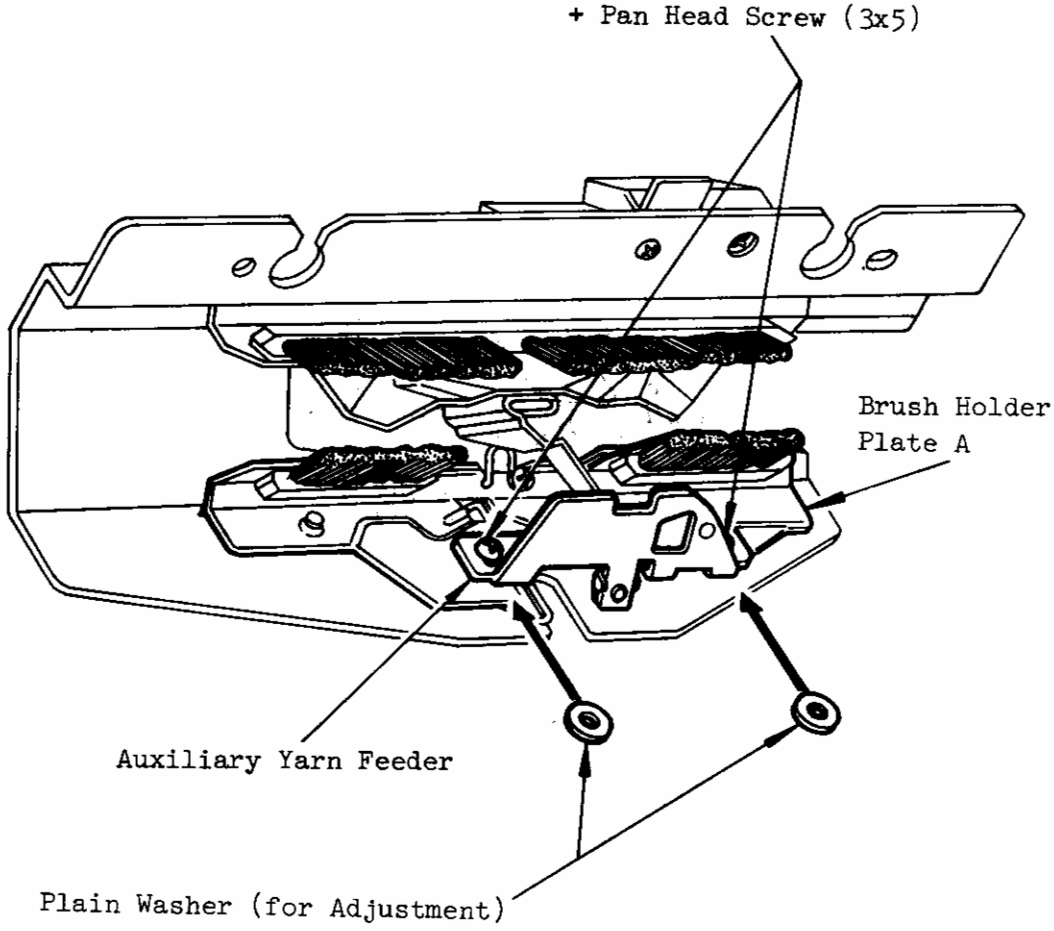


Fig. 37

7. HOW TO ADJUST THE MACHINE WHEN INCORRECT STITCHES ARE FORMED.

7-1 Causes

1. The distance between one of the Main Cams to the inner surface of the Carriage Pipe differs from that of the other.

2. The Ribber Carriage falls behind the Main Carriage, engaging the Knitter needles and Ribber needles with a time lag. The Knitter loops differ in size to the Ribber loops.

3. The needles on both beds do not meet each other.

7-2 Correcting Methods.

* Cause 1.

a) Position both Set Levers to "0" and the Stitch Dial to "1" and insert the Course Standard Gauge into the Carriage between the Carriage Pipe and Main Cams.

b) Loosen the + PW Pan Head Screw (3x6), indicated in Fig. 38 below, and turn the Stitch Dial so that the Main Cams move towards and touch the Course Standard Gauge. Once the Cams touch the Gauge, tighten the + Pan Head Screw (3x6).

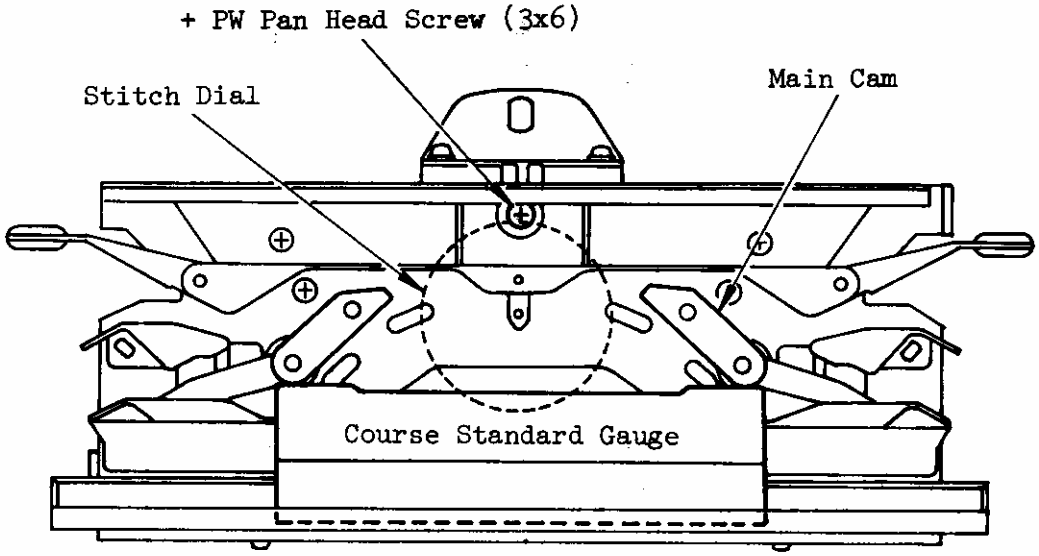


Fig. 38

* Cause 2.

a) Thread a light coloured medium sized yarn into the Yarn Feeder.

b) Set the Stitch Dial on both the Knitter and Ribber Carriages to 3.

c) Push 30 needles on both the Knitter and Ribber to B position and Cast on.

d) Prior to any adjustment, knit 40 - 50 rows, and check at what graduation the Joint Stopper is pointing to (see Fig. 39).

e) Loosen two + SPW Pan Head Screws (3x8) securing the Joint Stopper and using a Common Screw Driver (-), turn the Joint Stopper Shaft one graduation and place a mark on the Scale, after fastening the above two screws.

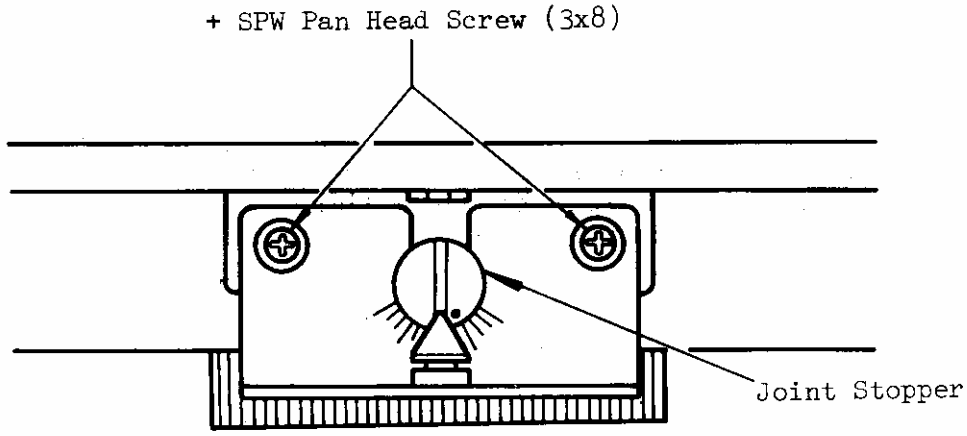


Fig. 39

f) Knit another 40 - 50 rows at knitting.

g) Repeat procedures (e) and (f) until knitting has been done with the Joint Stopper pointing to all the graduations on the Scale. Determine the most adequately knitted fabric and adjust the Joint Stopper accordingly.

List - 2

		Knitter Carriage			Ribber Carriage			Stitch Dial	H. P. Lever	Direction		Position of the Joint Stopper Shaft
		Cam Lever	Russel Lever	Side Knob	Set Lever	Pick Knob	Russel Lever					
①	(1)	Stockinet	‖ ‖	● ●	ⓘ ⓘ	◢	= =	5	H	→	40 - 50 rows	 Before Adjustment
	(2)	"	"	"	"	"	"	"	"	←		
	(3)	"	"	"	ⓘ ⓪	"	"	"	"	→	2 rows	
	(4)	"	"	"	ⓘ ⓘ	"	"	"	"	←		
②	(1)	"	"	"	"	"	"	"	"	→	40 - 50 rows	 First Movement
	(2)	"	"	"	"	"	"	"	"	←		
	(3)	"	"	"	ⓘ ⓪	"	"	"	"	→	2 rows	
	(4)	"	"	"	ⓘ ⓘ	"	"	"	"	←		
③	(1)	"	"	"	"	"	"	"	"	→	40 - 50 rows	 Second Movement
	(2)	"	"	"	"	"	"	"	"	←		
	(3)	"	"	"	ⓘ ⓪	"	"	"	"	→	2 rows	
	(4)	"	"	"	ⓘ ⓘ	"	"	"	"	←		
④	(1)	"	"	"	"	"	"	"	"	→	40 - 50 rows	 Third Movement
	(2)	"	"	"	"	"	"	"	"	←		
	(3)	"	"	"	ⓘ ⓪	"	"	"	"	→	2 rows	
	(4)	"	"	"	ⓘ ⓘ	"	"	"	"	←		
⑤	(1)	"	"	"	"	"	"	"	"	→	40 - 50 rows	 Fourth Movement
	(2)	"	"	"	"	"	"	"	"	←		
	(3)	"	"	"	ⓘ ⓪	"	"	"	"	→	2 rows	
	(4)	"	"	"	ⓘ ⓘ	"	"	"	"	←		

* Cause 3

Refer to page 19 (4-3 Needle Alignment) and adjust accordingly.

8. HOW TO USE PUNCH CARDS WHEN KNITTING WITH THE RIBBING ATTACHMENT.

1. Check the horizontal space.
   If the Ribber is attached to the Knitter at a greater distance than the standard measurement, the relative measurements come out incorrect and the Yarn Feeder will strike the Ribber needles.

2. Check the vertical space between the Knitter and the Ribber.

3. Check the powition of the Yarn Feeder.

4. If there is warpage on the Needle Bed, the Yarn Feeder on the Ribber Arm will hit the Ribber needles and damage them on the middle of the Needle Bed. If the adjustment is carried out on a Needle Bed with warpage, the relative measurements of respective parts will be incorrect, which requires readjustment.

5. It is recommended that when knitting with a Punch Card, the Close Knit Bar be positioned between the edge of the Needle Bed and the Sinker Posts, so that the stitches pass over the needle hooks easily.

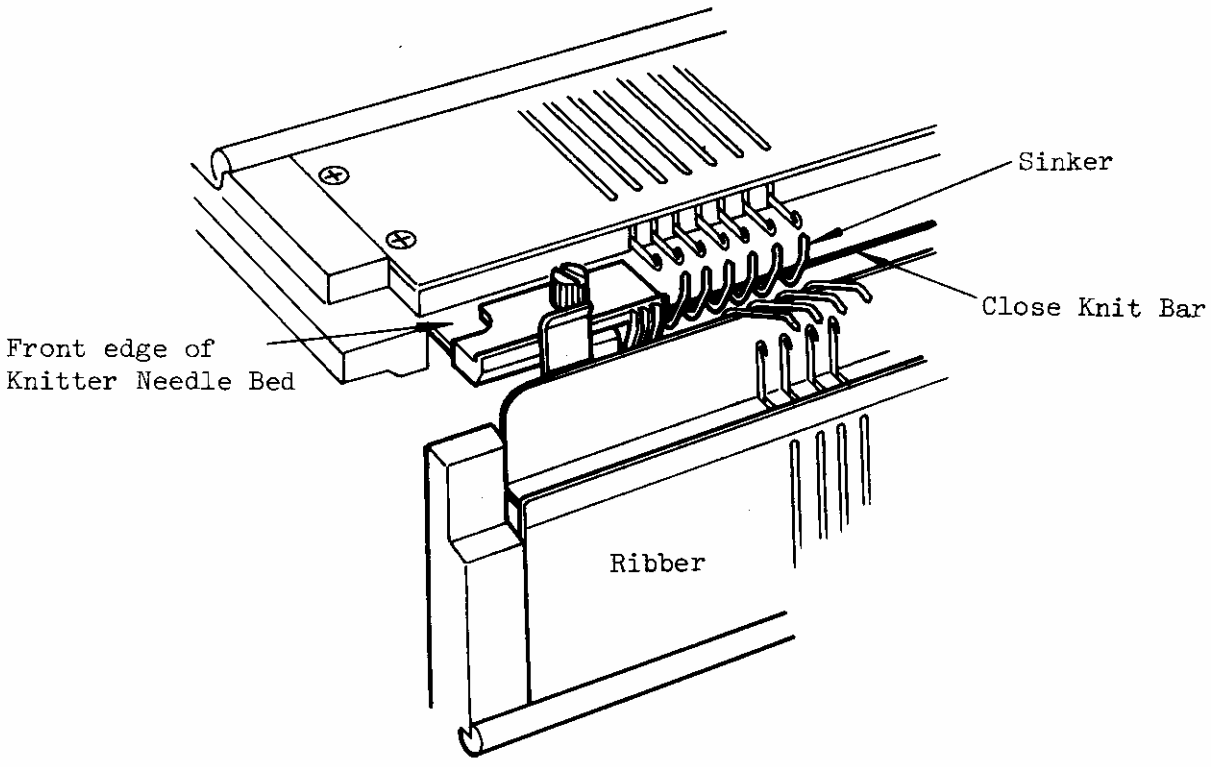


Fig. 40