TOYOTA

knitting machines

SERVICE MANUAL

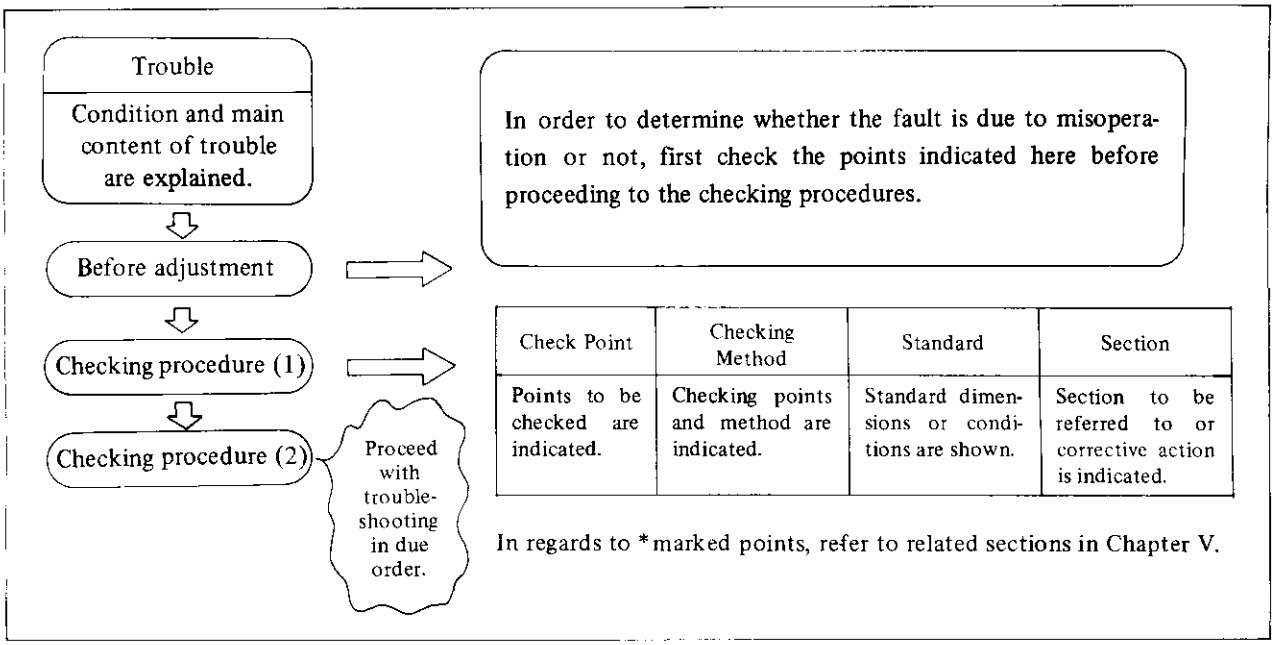
MODEL KS757 KR504
KS858 KR505

AISIN SEIKI CO., LTD.

Guide to the Manual

When trouble occurs, see CHAPTER IV "TROUBLESHOOTING". This chapter shows how to determine defective portion, procedure for repair, adjustment, or part changing work and also which item to see in CHAPTER V and CHAPTER VI.
The following explains the terms, which are used in CHAPTER IV and CHAPTER V, in details.

CHAPTER IV "TROUBLESHOOTING"



CHAPTER V "ADJUSTMENT"

PREPARATION

Preparatory work for troubleshooting or repair work is written. This work reveals the point to be checked or adjusted.

CHECK

Follow the description to judge whether there is fault or not. Be sure to follow the setting conditions during troubleshooting.

ADJUSTMENT

The procedure and content of work are written. Parts to be installed or removed are indicated by small letters. In the case of adjustment, direction is shown by arrow and capital letter.

NOTE

Caution and check point during adjustment are written. Be sure to follow the description. Otherwise, another fault may occur.

CONTENTS

I SPECIFICATIONS

I. Specifications of Main Machine (KS757, KS858)

NO.	Item	Description
1	Type	Needle operating type single needle bed knitting machine
2	Knit stitch variation	Plain knitting, Tuck knitting with dial, Tuck knitting with lever, Weaving knitting, Slip loop knitting, Partial knitting, Fairisle knitting, Lace knitting
3	Applicable yarn	Cotton, Fine yarn (S2/20), Fine medium 3 ply yarn (S3/18), Medium 4 ply yarn (4/18), Wool 6 ply yarn (4/10), wool 12 ply yarn (S4/7), and other synthetic fiber equivalent to S2/20 (type of yarn shall conform to JIS L 1022.)
4	Mumber of needles	200
5	Pitch	4.5 mm
6	Stitch tension	Dial switching (Raising/knitting cam adjustment) 0 . . . 1 – 10 33 divisions equally spaced
7	Cam switching	Raising cam, tuck cam, fairisle knitting cam, variable cam - Rotary dial type (center) Side cam - Rotary lever type (right and left sides) Weaving knitting presser wheel (weaving wheel) - Rotary lever type (front)
8	Yarn feeder	Main yarn, fairisle knitting yarn - Dual yarn feeder fixed type (yarn feeder "0" with opening/closing lever)
9	Needle selection unit	Needle bed built-in preselection type Needle selection unit: 12 needles Control system: both punch card and push button Pattern movement device: up to 11 pitches for only push button Row feed stopper: lever switch type
10	Upper tension	Double yarn take-up (spring tension type)
11	Carriage handle	Pick-up and bring down type Locked at standing position
12	Accessory box	Integral with pattern board Detachable lid with a scale graduated in mm
13	Accessory unit	Lace carriage
14	Standard weight	13 kg (main unit–8.9 kg, carriage–1.5 kg, lace carriage–1.0 kg, aux. rail–0.3 kg, accessory–1.3 kg)
15	Overall height X overall width X overall length	98.2 X 192.5 X 1058 (mm)
16	Operating speed	Main carriage: 50 to 70 cm/sec. Lace carriage: 50 to 70 cm/sec.

2. Specifications of Ribber (KR504, KR505)

NO.	Item	Description
1	Type	Needle operating, installing type rib knitting machine
2	Knit stitch variation	Rib knitting, Simul knit, Single fisherman's rib, Double fisherman's rib, Tuck pattern rib, Swing rib, Tubular knitting, Pin tuck knitting, Skinny rib, Honeycomb rib, etc.
3	Applicable yarn	Cotton, Fine yarn (S2/20), Fine medium 3ply yarn (S3/18), Medium-4ply yarn (S4/18), Wool 6ply yarn (S4/10) and other synthetic fiber equivalent to S2/20 (kind of yarn shall conform to JIS L 1022.)
4	Number of needles	200
5	Pitch	4.5 mm
6	Stitch tension adjustment	Dial switching system: 1 . . 0 . . 1 – 10 (33 divisions equally spaced)
7	Cam switching	Raising cam: Slide lever type (Right and left independent type at upper surface) Knitting cam: Slide lever type (Right and left simultaneous type at upper surface) Partial knitting cam: Rotating lever type (Right and left independent type at side portion)
8	Carriage handle	Raise-up and bring down type Locked at upright position (right inside
9	Yarn feeder	Two-color yarn feeder: Yarn feeder Ⓞ: Movable type (For ordinary ribbing) Yarn feeder Ⓢ: Fixing type (For simulknit)
10	Needle bed racking device	Rotary handle
11	Needle bed racking amount	10 pitches (0 ~ 5 ~ 10); 5 pitches equally divided to right and left provided with racking direction indicator (at front surface on left side)
12	Half pitch switching	Rotary lever (at front surface on left side)
13	Needle bed dropping device	Vertical rotary lever (side portion, right and left independent, two-row type)
14	Needle bed dropping amount	1st row: 22 mm; 2nd row: 24 mm Total: 46 mm
15	Applicable needle	Round latch needle
16	Operating speed	50 – 70 cm/sec
17	Standard weight	10.8 kg
18	Overall height X overall width X overall length	70 X 55 X 1110 (mm)

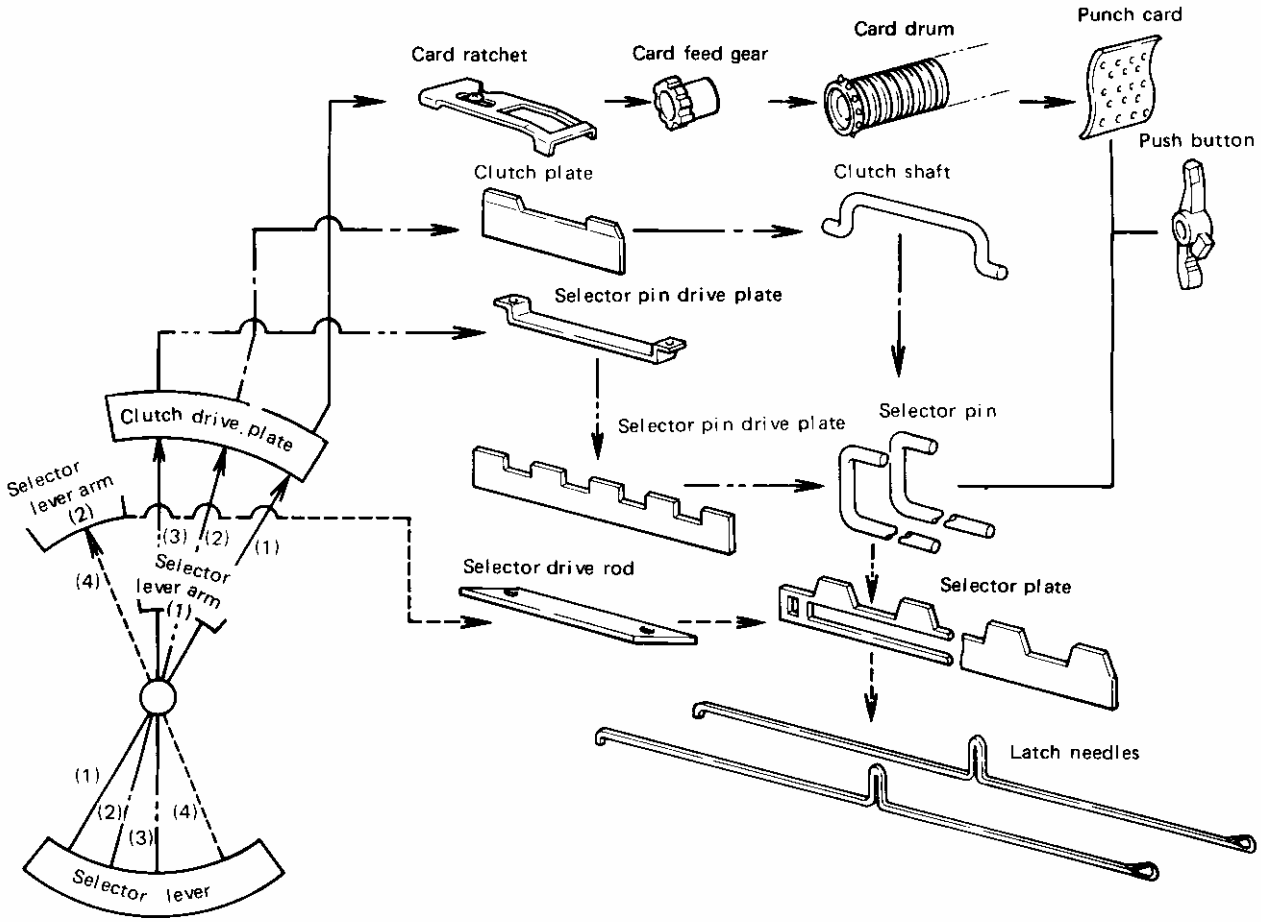
II MECHANISM

II-1 Needle Selection Mechanism

○ Needle bed built-in preselection type

The needle bed is incorporated with needle selection device. By control of selector lever, selector plate is moved back and forth to select latch needles for desired arrangement.

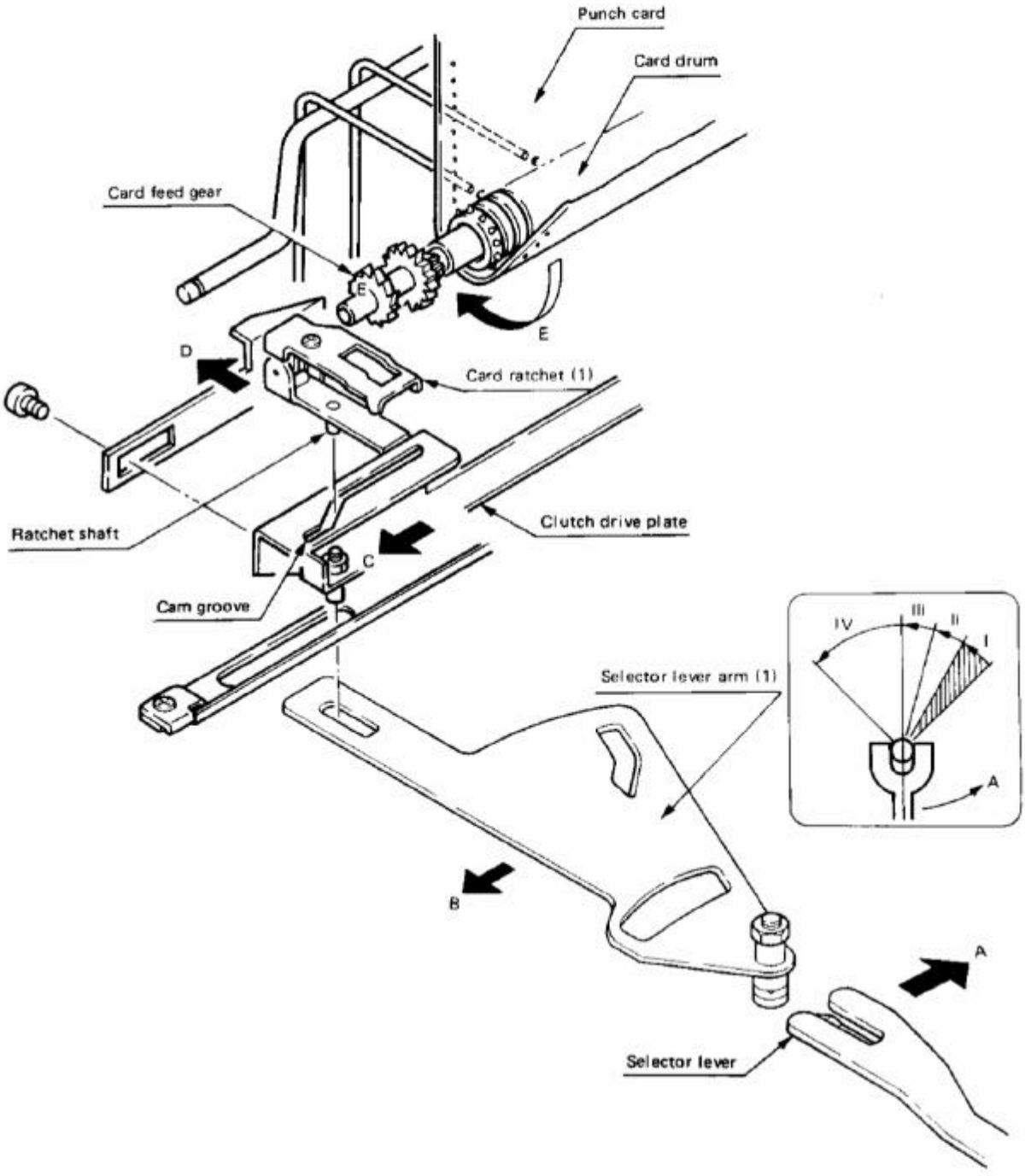
Pattern selection is made in units of 12 needles and uses both punch card and push button systems. Manual pattern can be moved side to side up to 11 pitches. The configuration is as shown below.



Functions of selector lever

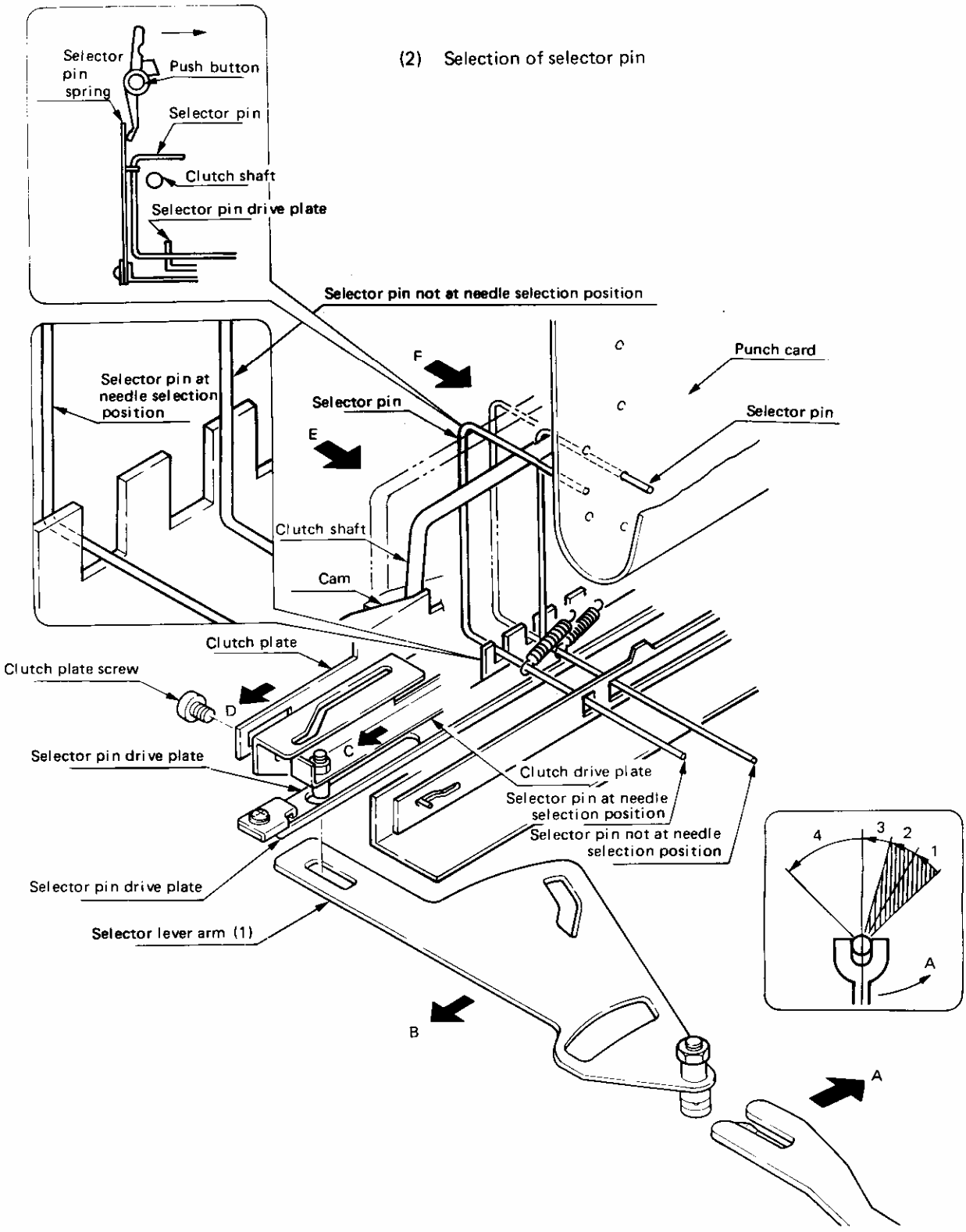
Lever Position	Function
1st step	Feed punch card.
2nd step	Selects selector pin.
3rd step	Selects selector plate.
4th step	Moves selector plate.

(1) Card feed



When selector lever is moved 1 step in "A" direction, the motion is transmitted from selector lever arm, clutch drive plate (cam groove), ratchet shaft, card ratchet, card feed gear, card drum, to punch card.
The cam groove of clutch drive plate slides ratchet shaft in "D" direction, and card ratchet engages the tooth of card feed gear and turns it 1 tooth in "E" direction. When card feed gear turns, the card drum turns and feeds punch card 1 tooth.

(2) Selection of selector pin



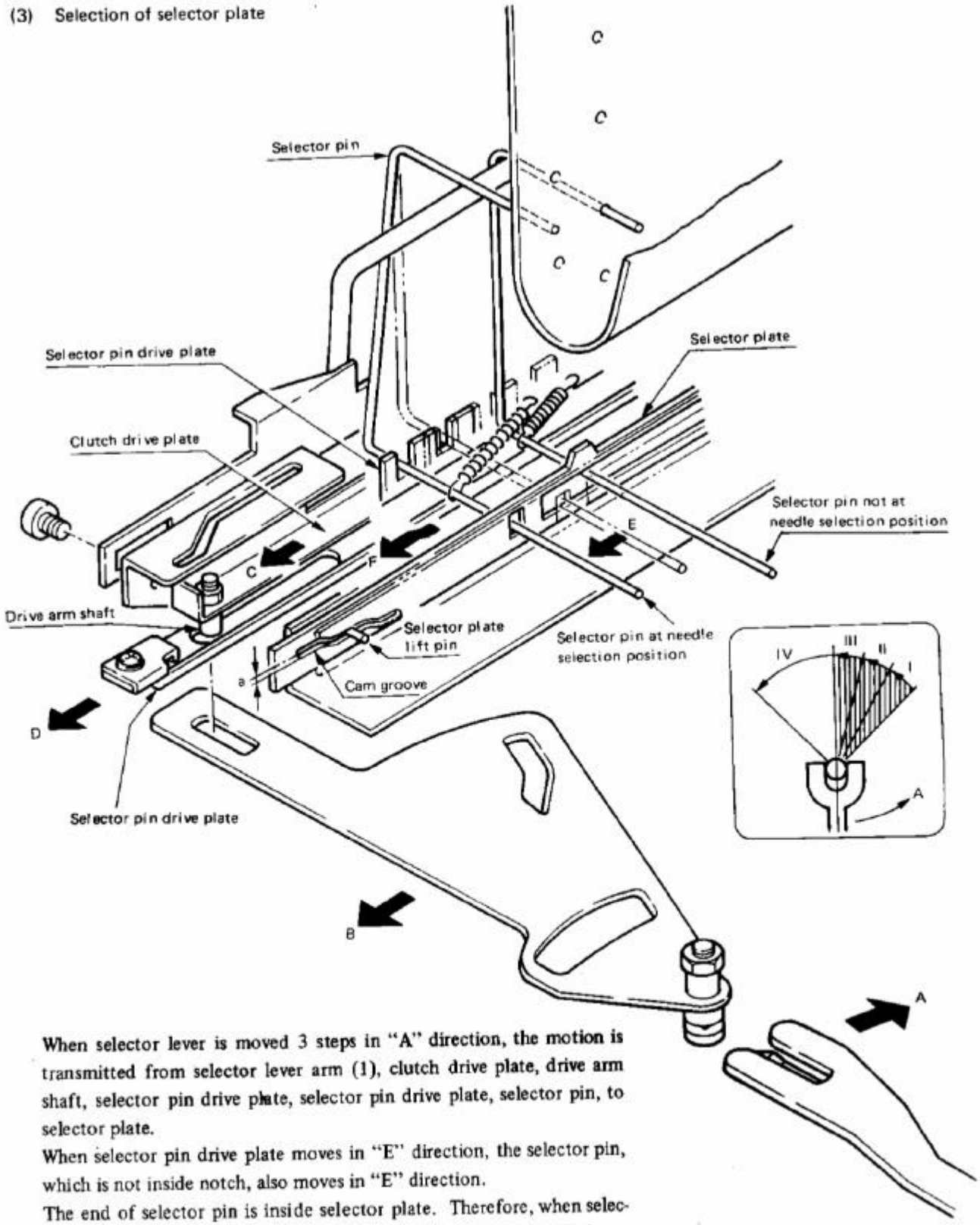
When selector lever is moved 2 steps in "A" direction, the motion is transmitted from selector lever arm (1), clutch drive plate, clutch plate screw, clutch plate, to clutch shaft.

When clutch plate slides in "D" direction, clutch shaft disengages from the cam surface of clutch plate and tilts in "E" direction. Selector pin is normally supported by clutch shaft. Therefore, when clutch shaft disengages, selector pin is pressed by selector pin spring and pushed out in "F" direction.

Where there is a punch card hole, selector pin moves forward (in "E" direction) and disengages from the notch of selector pin drive plate, and therefore, needle selection is not made. However, where there is a punch card hole, the forward motion of selector pin is stopped by card and selector pin remains inside the notch of selector pin drive plate, and therefore, needle selection is made.

When push button is controlled, selector pin is supported as shown in the figure and forward motion is not made, and therefore, needle selection is made like the operation where there is not a punch card hole.

(3) Selection of selector plate



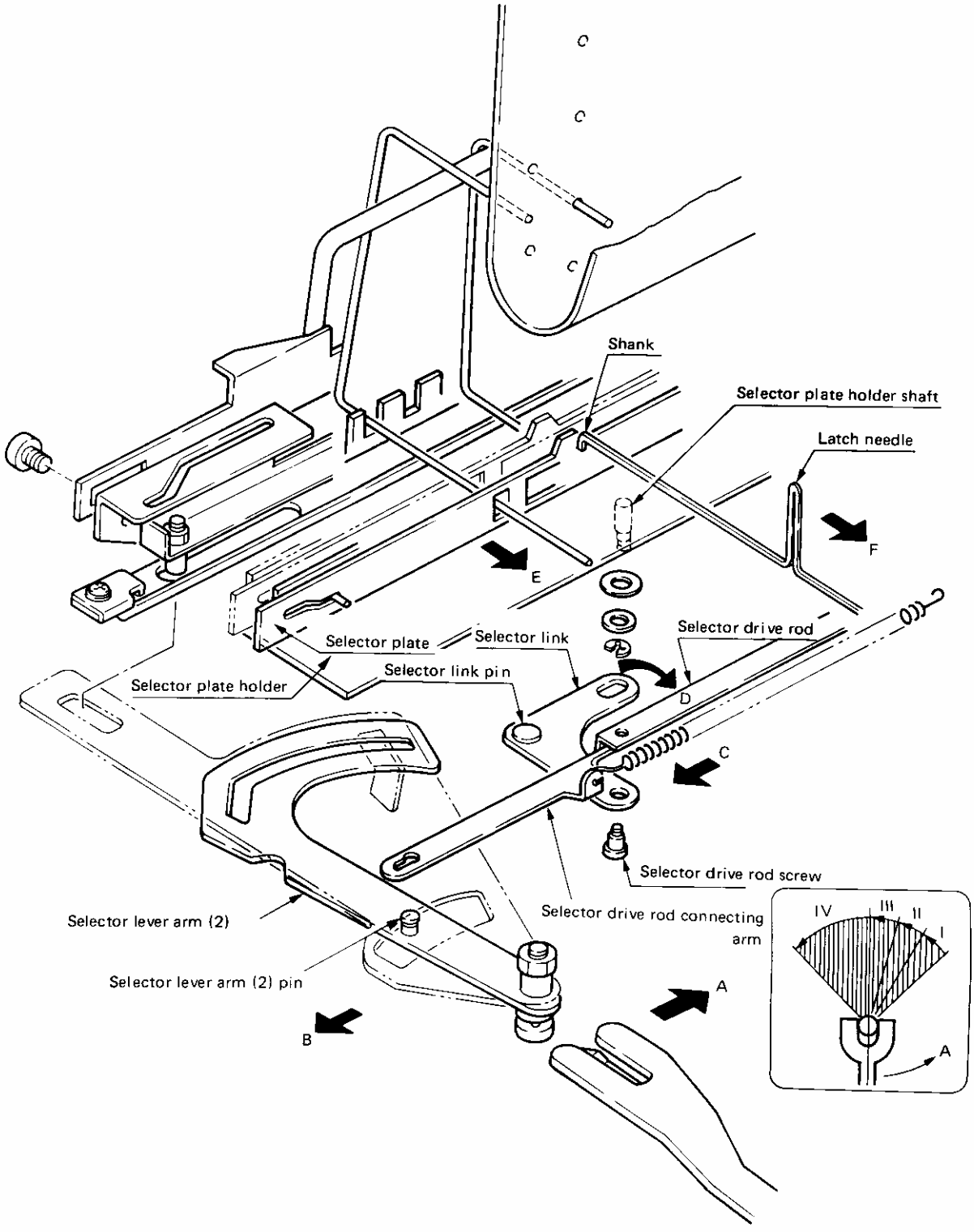
When selector lever is moved 3 steps in "A" direction, the motion is transmitted from selector lever arm (1), clutch drive plate, drive arm shaft, selector pin drive plate, selector pin drive plate, selector pin, to selector plate.

When selector pin drive plate moves in "E" direction, the selector pin, which is not inside notch, also moves in "E" direction.

The end of selector pin is inside selector plate. Therefore, when selector pin moves in "E" direction, selector plate also slides in "F" direction.

When selector plate slides, the cam groove position of selector plate changes and selector plate lift pin raises selector plate by the cam groove dimension (a). When 1 selector pin moves, 1 selector plate always moves.

(4) Movement of selector plate



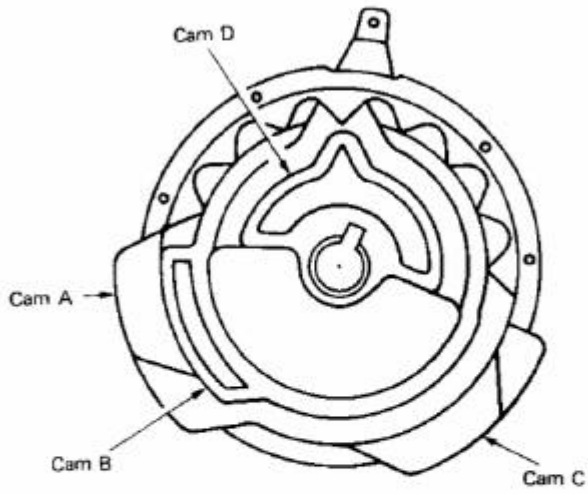
When selector lever is moved 4 steps in "A" direction, the motion is transmitted from selector lever arm (2), selector lever arm pin, selector drive rod connecting arm, selector link, selector plate holder shaft, selector plate holder, selector plate, to latch needle.

When selector link is pulled in "C" direction, selector link is moved in "D" direction at the fulcrum of selector link pin and moves selector plate holder forward via selector plate holder shaft of selector link.

Selector plate is inside selector plate holder. Therefore, the selector plate, which has been risen at high position in the steps up to preceding section (3), pushes out the shank of latch needle. Latch needle is pushed out to the D position of needle plate.

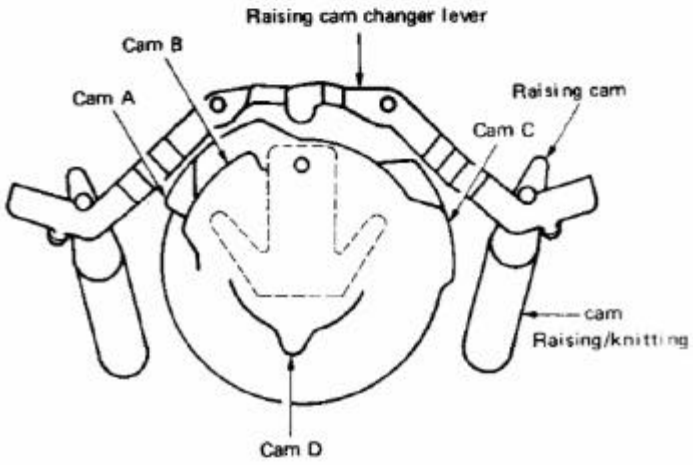
II-2 Cam Mechanism and Passage of Carriage

When pattern dial is turned, the cam surfaces A, B, C, and D of dial moves raising cam change lever, tuck cam board, and fairisle knitting cam link, switches the cam, and makes up each passage of carriage.

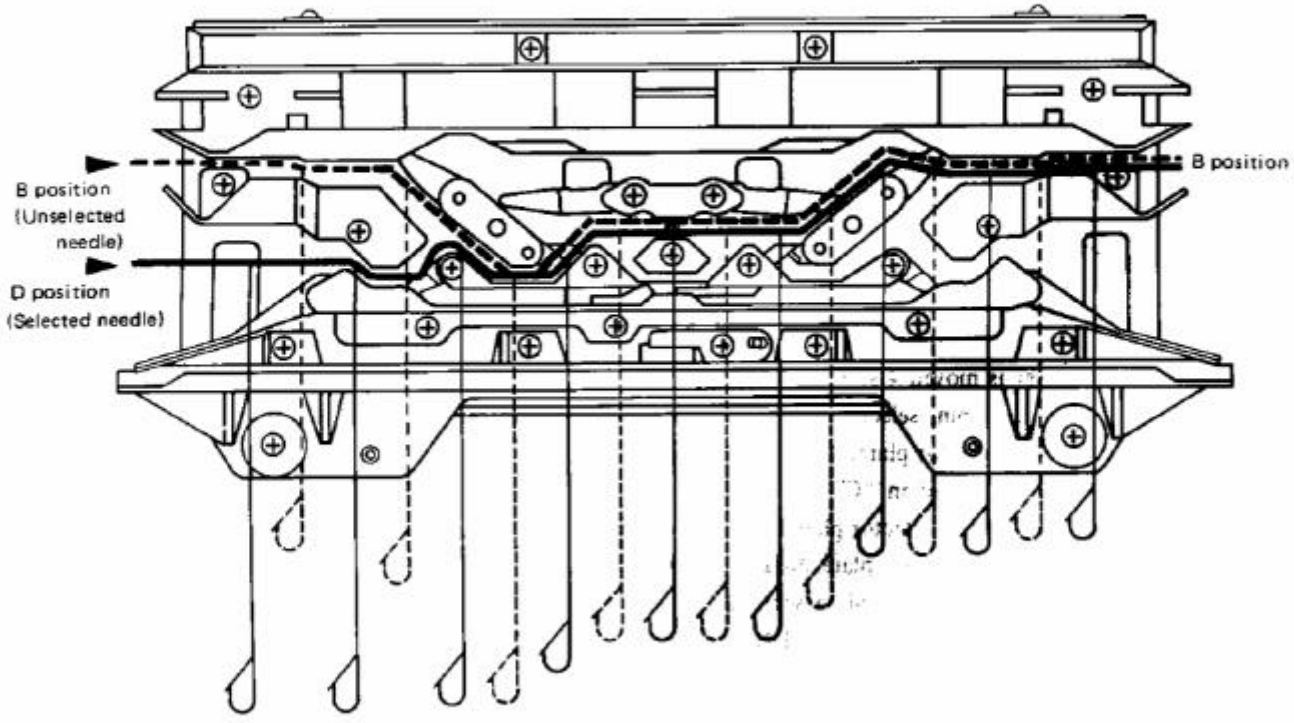


—Plain knitting—

When pattern dial is set to "PLAIN" (NORMAL), the operations of cames, A, B, C, and D are reset and each cam returns to plain knitting state to make up plain knitting passage.

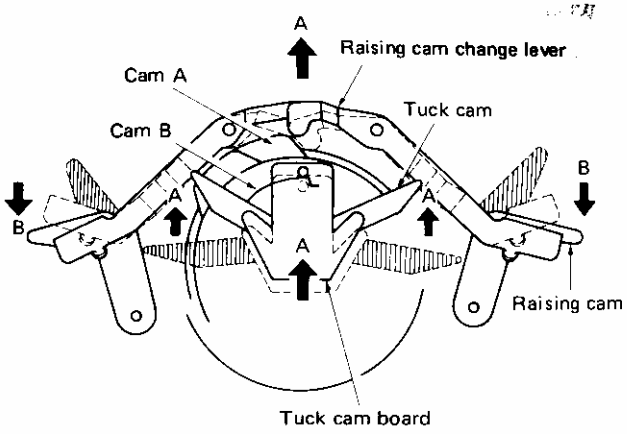


Passage du chariot

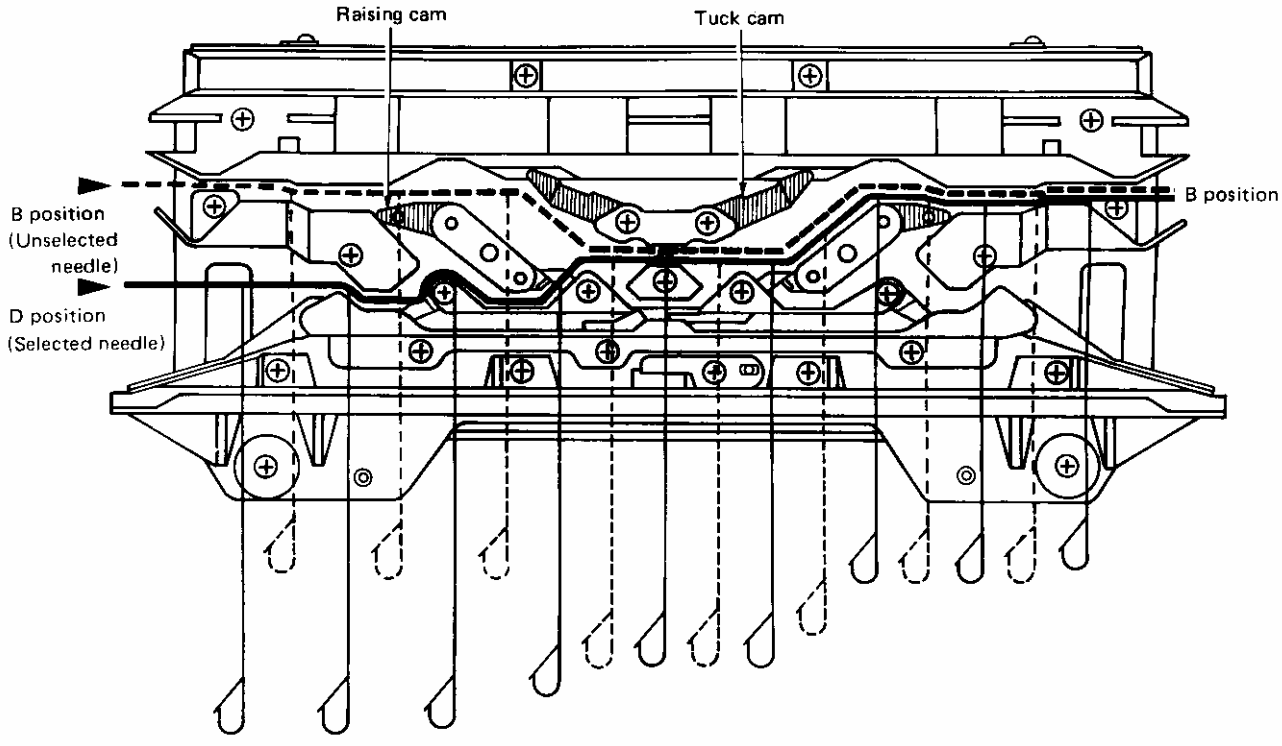


—**Tuck knitting** with dial—

When pattern dial is set to "TUCK" (JETE), cam **A** pushes up raising cam change lever in "**A**" direction and both ends of raising cam change lever switch the raising cams in "**B**" direction. At the same time, cam **B** pushes up tuck cam board in "**A**" direction and both ends of tuck cam board push up tuck cams in "**A**" direction to make up tuck knitting passage.

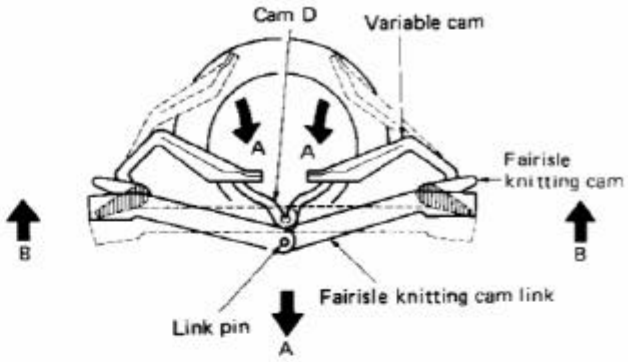


Passage of Carriage

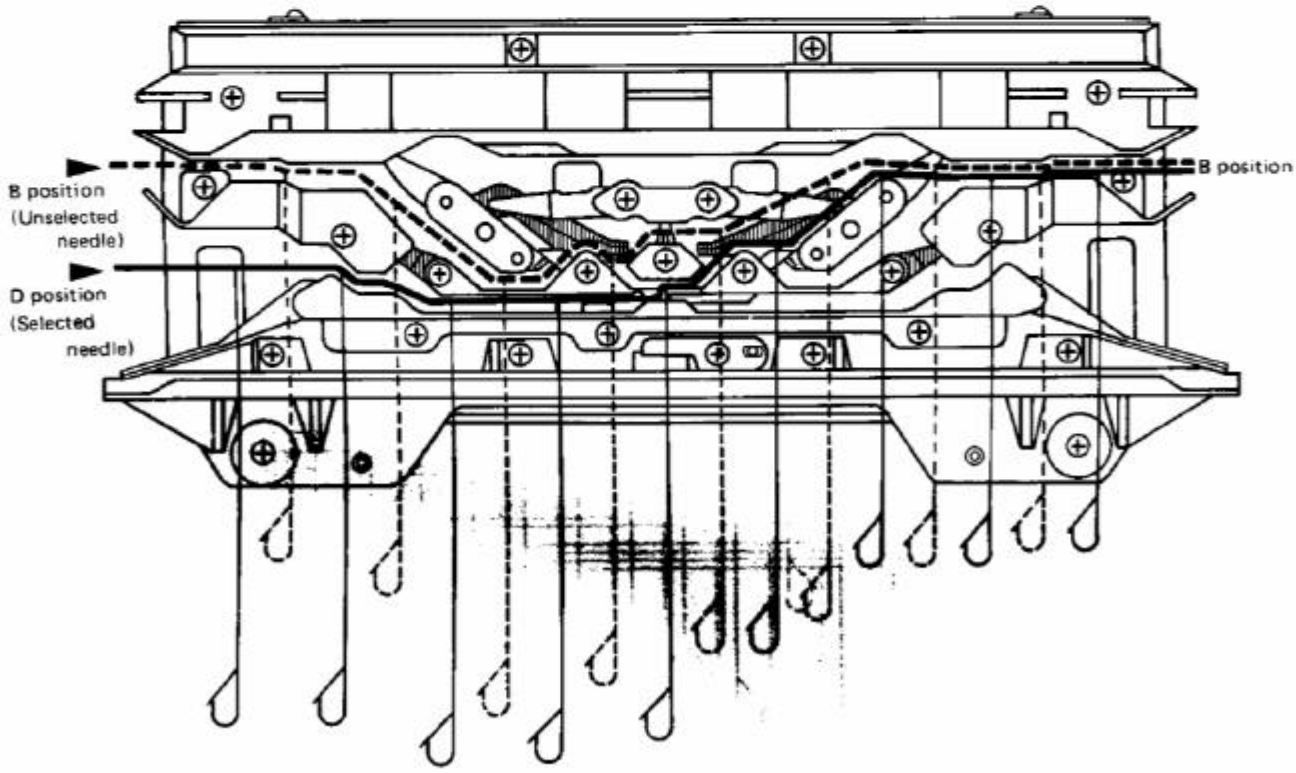


—Fairisle knitting—

When pattern dial is set to "COLOUR" (COULEUR), cam D pushes down link pin in "A" direction and both ends of fairisle knitting cam link push up fairisle knitting cams in "B" direction. At the same time, when the pins of fairisle knitting cams push up variable cams in "B" direction, the insides of variable cams lower in "A" direction to make up fairisle knitting passage.

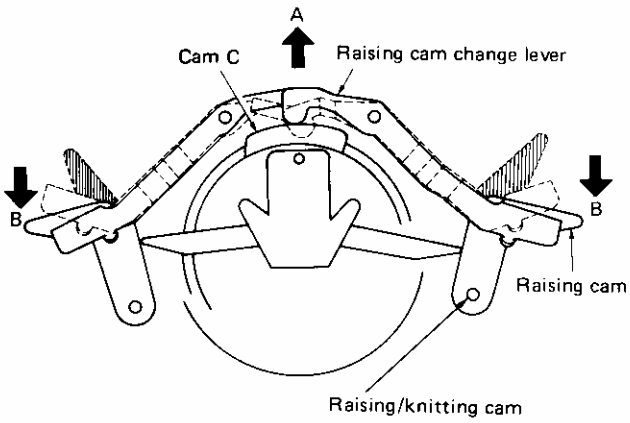


Passage of Carriage

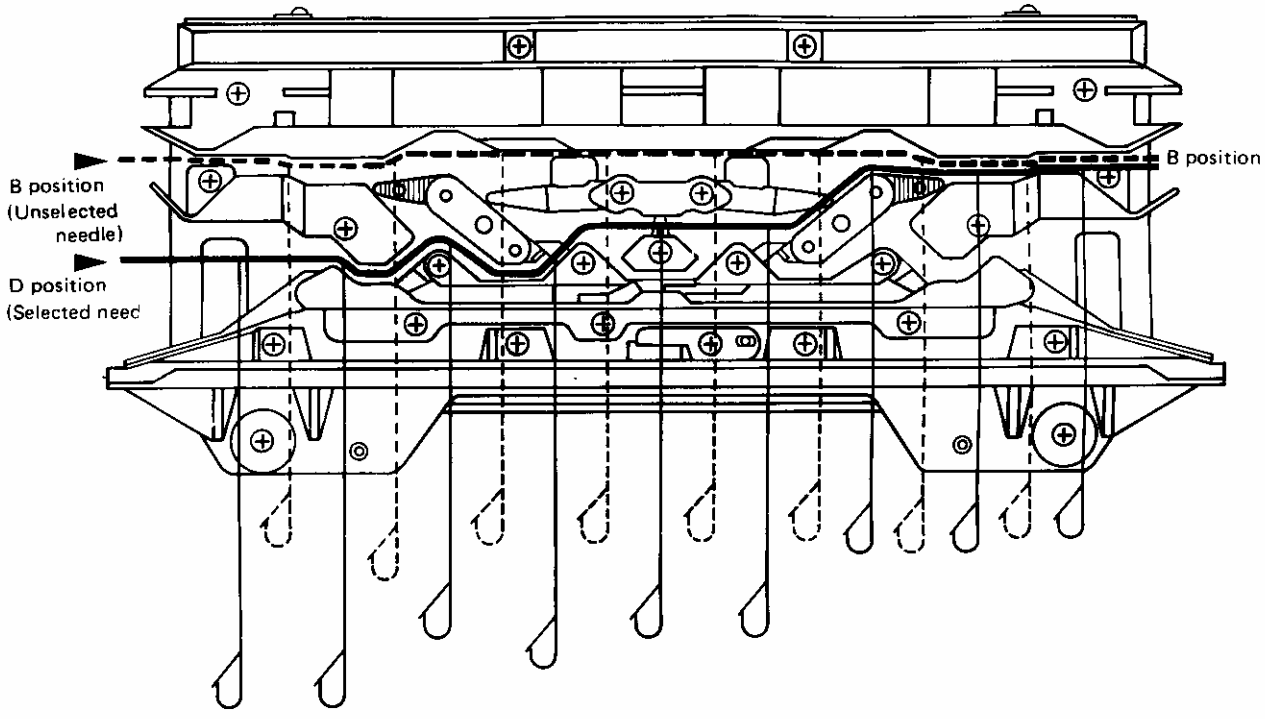


—Slip loop knitting—

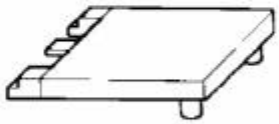
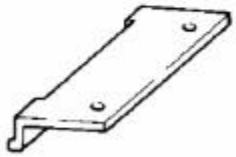
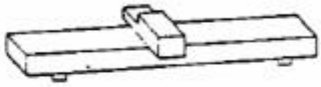
When pattern dial is set to "EMPTY" (HORS TRAVAIL), cam C pushes raising cam change lever in "A" direction and both ends of raising cam change lever lower the raising cams in "B" direction to make up slip loop knitting passage.



Passage of Carriage



III SPECIAL SERVICE TOOLS (List of SSTs)

SST NO.	Application and Schematic Diagram	Card NO.
20	○ Positioning of selection pin holder 	V-12
21	○ Positioning of tuck cam spring plate ○ Setting of tuck cam needle cam 	V-17 V-18
22	○ Positioning of raising/knitting cam 	V-7
6	○ Positioning of card drum 	V-8
13	○ Setting of yarn feeder Ⓢ amd yarn feeder Ⓞ height and back-and-forth position 	V-20 V-21
14	○ Setting of ribber mounting dimensions 	V-22

IV TROUBLESHOOTING

IV-1 Carriage and Needle Bed

Make checks in order shown by arrows.

Movement of carriage is heavy.

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Before adjustment →

- ○ Check if tension guide is not tangled with yarn.
- ○ Check if knot of yarn is too large and is not caught in tension discs.
- ○ Check if tension dial is correctly set to yarn.
- ○ Check if there is not oil shortage at carriage-and-needle bed sliding portion.
- ○ Check if fabric presser is correctly set.
- ○ Check if yarn is not winding around fabric presser wheel and brush wheel of fabric presser.
- ○ Check if latch needle is not bent or damaged.

↓

Carriage

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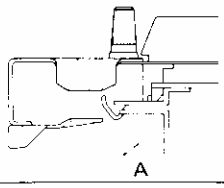
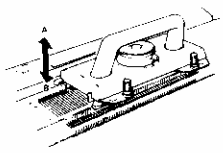
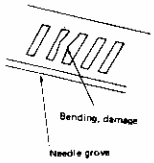
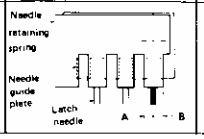
Needle bed

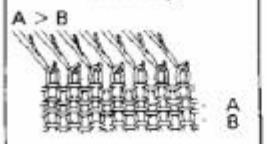
For * marked point, see adjustment section cards.

Check point	Checking Method	Standard	Section
Clearance between fabric presser and sinker hook.		A = 0.8 ~ 1.2	V-2
Play between carriage and needle bed.		A ⟷ B = 0.05 ~ 0.35	V-1
Damage or wear of cams.		There should be no damage.	VI-2 ~ 5

	Check Point	Checking Method	Standard	Section
	Damage or bending of needle groove of needle bed.		There should be no bending and damage.	Correct bending with tip of flat-blade screwdriver. Smooth damage with #800 sandpaper.
*	Clearance between needle guide plate and latch needle.		A = B	VI-9

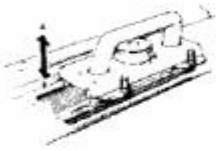
Make checks in order shown by arrows.

Uneven stitches (Horizontal uneven stitches)

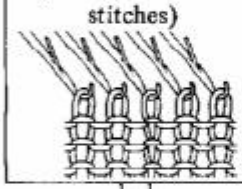


- Before adjustment
- Carriage

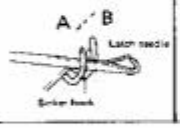
- ○ Check if wound ball has been wound too tight.
- ○ Check if tension guide is not tangled with yarn.
- ○ Check if yarn tension is too tight.

Check Point	Checking Method	Standard	Section
Side-to-side positions of raising/knitting cam.		A = B	V-7
Clearance between carriage and needle bed.		A ⟷ B = 0.05 ~ 0.35	V-1
Play of raising/knitting cam in axial direction.		A should be equal to or smaller than 0.1.	V-7

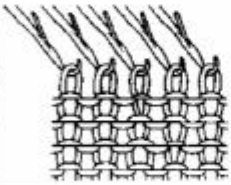
Uneven stitches (Vertical uneven stitches)



- Carriage

Check Point	Checking Method	Standard	Section
Clearance between sinker hook and latch needle.		A = B	Adjust with nipper until A equals to B.

Uneven stitches



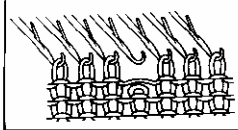
- Before adjustment
- Carriage

- ○ Check if wound ball has been wound too tight.
- ○ Check if yarn tension is too tight.
- ○ Check if carriage operating speed is uneven.

Check Point	Checking Method	Standard	Section
Damage or burr of yarn feeder.		There should be no damage and burr.	Smooth damage or burr with #800 sandpaper.
Damage or burr of fabric presser front edge.		There should be no damage and burr.	Smooth damage or burr with #800 sandpaper.

Make checks in order shown by arrows.

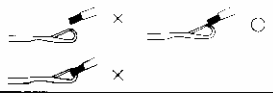
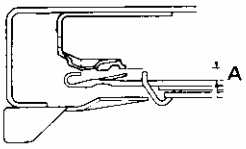
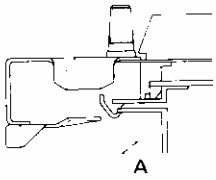
Dropped stitch



Before adjustment

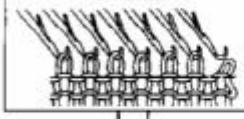
- ○ Check if needle, which has gone over to latch at the time of jammed carriage correction, is used for knitting.
- ○ Check if yarn is correctly set at yarn feeder.
- ○ Check if contrast yarn is not in yarn feeder (2) at the time of fairisle knitting.
- ○ Check if pattern dial is correctly set to type of knitting.
- ○ Check if fabric presser is correctly set.
- ○ Check if knitting weights are used (at the time of tuck knitting with dial).
- ○ Check if knitting weights position is too low (at the time of tuck knitting with dial).
- ○ Check if latch of latch needle moves smoothly.
- ○ Check for wear of latch brush.

Carriate

Check Point	Checking Method	Standard	Section
Height of latch brush.		—	V-5
Height of yarn feeder.		A = 1.0 ~ 1.2	V-3
Clearance between fabric presser and sinker hook (at the time of tuck knitting with dial).		A = 0.8 ~ 1.2	V-2

Make checks in order shown by arrows.

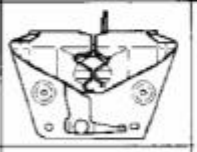
Dropped stitch at end of swatch



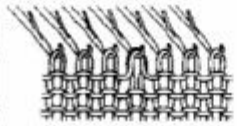
Before adjustment

- ○ Check if yarn tension is too loose.
- ○ Check if carriage stroke is too large with respect to knitting width.
- ○ Check if unselected needles at both ends are located at D position at the time of tuck knitting with dial.
- ○ Check if brush of brush wheel has not deformed.

Carriage

Check Point	Checking Method	Standard	Section
Damage and burr of yarn feeder.		There should be no damage and burr.	Smooth damage or burr with #800 sand-paper.
Damage and burr of fabric presser.		There should be no damage and burr.	Smooth damage or burr with #800 sand-paper.

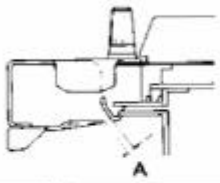
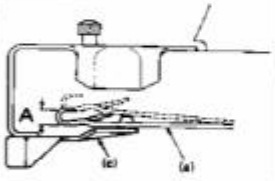
Loop slip, double loop hook



Before adjustment

- ○ Check if yarn tension is too tight (at the time of weaving knitting).
- ○ Check if tension dial is correctly set to yarn.
- ○ Check if fabric presser is correctly set.
- ○ Check if weaving brush is set at the time of weaving knitting.
- ○ Check if latch hook of latch needle is not bent.
- ○ Check if brush of brush wheel is not worn.
- ○ Check if brush of weaving brush is not worn.

Carriage

Check Point	Checking Method	Standard	Section
Clearance between fabric presser and sinker hook.		A = 0.8 ~ 1.2	V-2
Clearance between fabric presser and latch needle.		A = 0.2 ~ 0.4	V-4
Position of weaving brush (at the time of weaving knitting).		—	V-6

Make checks in order shown by arrows.

Cam fails to operate according to pattern dial.

Plain knitting ↔ fairisle knitting

Check Point	Checking Method	Standard	Section
Disengagement or breakage or fairisle knitting cam spring.	There should be no disengagement and breakage.	—	VI-2
Disengagement or breakage of variable cam spring.	↑	—	VI-5
Wear or damage of pattern dial.	There should be no wear and damage.	—	VI-1

Plain knitting ↔ tuck knitting with dial

Check Point	Checking Method	Standard	Section
Disengagement or breakage of tuck cam spring.	There should be no disengagement and breakage.	—	VI-3
Breakage of tuck cam.	There should be no breakage.	—	VI-3
Disengagement of raising cam change lever spring.	There should be no disengagement.	—	VI-6
Disengagement or breakage of raising/knitting cam spring.	There should be no disengagement and breakage.	—	VI-5
Wear or damage of pattern dial.	There should be no wear and damage.	—	VI-1

Plain knitting ↔ slip loop knitting

Check Point	Checking Method	Standard	Section
Disengagement of raising cam change lever spring.	There should be no disengagement of spring.	—	VI-6
Disengagement or breakage of raising/knitting cam spring.	There should be no disengagement and breakage of spring.	—	VI-5
Wear or damage of pattern dial.	There should be no wear and damage.	—	VI-1

IV-2 Needle Selection Unit

Make checks in order shown by arrows.

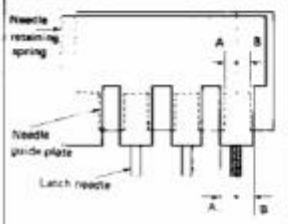
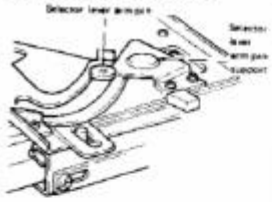
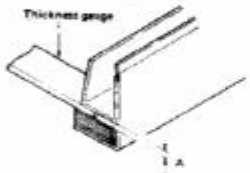
Needles are not selected according to punch card.

- ○ Check if punch card is not inserted slantly.
- ○ Check if punch card is not broken or damaged.
- ○ Check if card snap is correctly set.
- ○ Check if push button is not set when punch card is used.
- ○ Check if latch needle is not bent.
- ○ Check if needle presser bar is not bent or worn.

Before adjustment

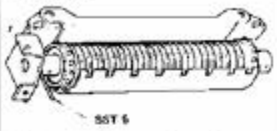
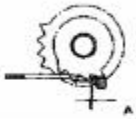
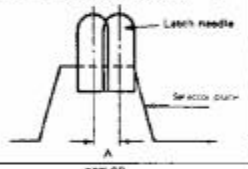
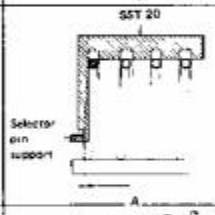
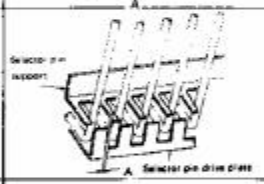
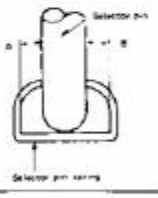
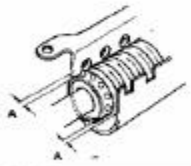
Needle bed

For * marked points, see adjustment section cards.

	Check Point	Checking Method	Standard	Section
*	Positions of needle retaining spring and needle guide plate.		Needle guide plate. A = B Center of needle retaining spring.	VI-9
*	Position of selector lever arm pin support.	When selector lever is in needle selection state. 	Selector lever arm pin should be in light contact with selector lever arm pin support.	V-15
*	Bending of selector plate. Foreign matter trapped.	Needle, which is not set by push button, is selected.	—	VI-8
*	Mounting position of selector plate holder (2).		A = 0.8 ~ 1.2	VI-8
*	Breakage of push button.	All needles should be selected when all push buttons are set.	There should be no breakage.	VI-10

Jacquard base plate

For * marked points, see adjustment section cards.

	Check Point	Checking Method	Standard	Section
	Position of card drum shaft.	SST6 should be smoothly inserted. 	SST should be smoothly inserted.	V-8
*	Pasition of card ratchet	When selector lever is operated 1 step 	A = 0	V-10
*	Position of driving rod stopper plate.	Within the range of "A" 	—	V-14
*	Position of selector pin support.		A = 0	V-12
*	Position of selector pin drive plate.		A = 0.24 ~ 0.45	V-13
*	Position of selector pin spring.		A = B	V-11
*	Position of card guide plate.		A = 1.0	V-9

IV-3 Lace knitting

Make checks in order shown by arrows.

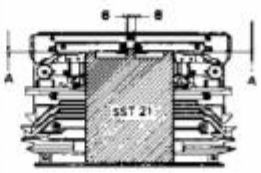
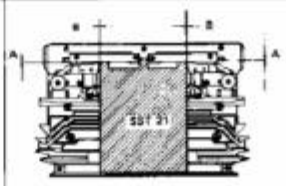
(1) Selected needle drops stitch.

Before adjustment →

- ○ Check if cast-on comb assy and knitting weights are used according to instruction manual.
- ○ Check if fabric does not touch hand or knee.
- ○ Check if needle is not selected at both ends of swatch.
- ○ Check if 2 or more needles have not been selected consecutively.
- ○ Check if lace carriage is moved too fast.
- ○ Check if pattern dial is correctly set to yarn.
- ○ Check if latch of latch needle moves smoothly.
- ○ Check if latch needle is not bent.

Lace carriage →

For * marked points, see adjustment section cards.

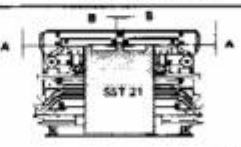
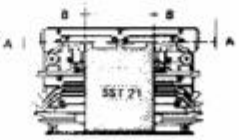
	Check Point	Checking Method	Standard	Section
*	Position of transfer needle cam.		A = 0 B = 0	V-18
*	Position of latch cam.		A = 0 B = 0	V-17
	Improper angle of needle cam bracket.		A = 0 ~ 0.2	Replace according to V-18. (Each)
	Clearance between lace carriage and needle bed.		A ↔ B = 0.05 ~ 0.35	V-16

(2) Lace carriage comes to a stop during sliding.

Before adjustment →

- ○ Check if needle is not bent.
- ○ Check if selector lever is not stopped halfway.
- ○ Check if lace carriage has not been returned during operation.

Lace carriage →

	Check Point	Checking Method	Standard	Section
*	Position of transfer needle cam.		A = 0 B = 0	V-18
*	Position of latch cam.		A = 0 B = 0	V-17

IV-4 Ribber

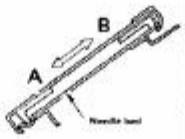
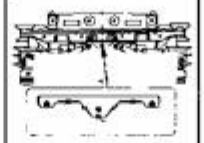
Make checks in order shown by arrows.

Movement of rib carriage is heavy.

Before adjustment

- Check if wound ball has been wound too tight.
- Check if tension guide is not tangled with yarn.
- Check if yarn tension is too tight.
- Check if pattern dial is correctly set to yarn.
- Check if there is not oil shortage at carriage-and-needle bed sliding portion.
- Check if latch needle is not bent.
- Check if coupling is correctly set.

Rib carriage

Checking Point	Checking Method	Standard	Section
Clearance between carriage and needle bed.		0.05 to 0.3 in A and B directions.	V-19
Damage of guide cam Sliding surface.		There should be no damage.	Remove 3 guide cam set screws and replace guide cam.

Needle bed

Bending or damage of needle bed groove.	Needle bed 	There should be no bending and damage.	Correct bending with screwdriver. Correct damage with #800 sandpaper.

Make checks in order shown by arrows.

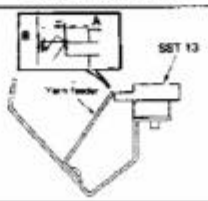
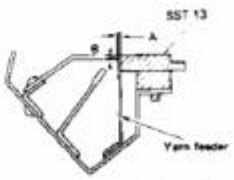
Dropped stitch (Rib knitting)

Before adjustment

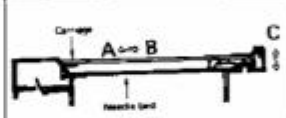
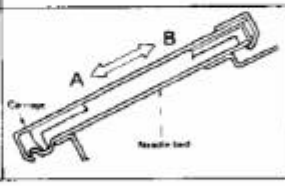
- ○ Check if knitting weights are too light.
- ○ Check if yarn is correctly passed into yarn feeder.
- ○ Check if carriage is moved too fast.
- ○ Check if tension dial is correctly set to yarn.
- ○ Check if latch of latch needle moves smoothly.
- ○ Check if the number of rows is too large at the time of tuck pattern rib, or pin tuck knitting.

For * marked points, see adjustment section cards.

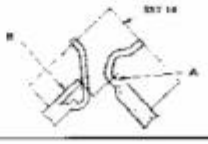
Coupling

	Check Point	Checking Method	Standard	Section
*	Position of yarn feeder Ⓢ		A = 0.2 or less B = 0.2 or less	V-21
*	Position of yarn feeder Ⓞ		A = 0.2 or less B = 0.2 or less	V-20
	Wear or deformation of latch brush		There should be no wear and deformation.	Replace.

Carriage

Check Point	Checking Method	Standard	Section
Clearance between carriage and needle bed (KS757, KS858)		0.1 to 0.5 in A and B directions 0.05 to 0.35 in C and D directions.	(KS757) (KS858) V-1
Clearance between carriage and needle bed (KR504, KR505)		0.05 to 0.3 in A and B directions.	(KR504) (KR505) V-19

Needle bed mounting position

Check Point	Checking Method	Standard	Section
Mounting positions of needle beds on main machine and ribber.		A = 0.2 or less B = 0.2 or less	V-22

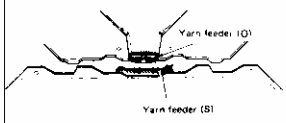
Make checks in order shown by arrows.

Yarn slackens at end of swatch. (Rib knitting)

Before adjustment

- ○ Check if carriage is moved too fast at both ends of swatch.
- ○ Check if yarn has not come off of upper tension complete.
- ○ Check if yarn tension is too low.

Coupling

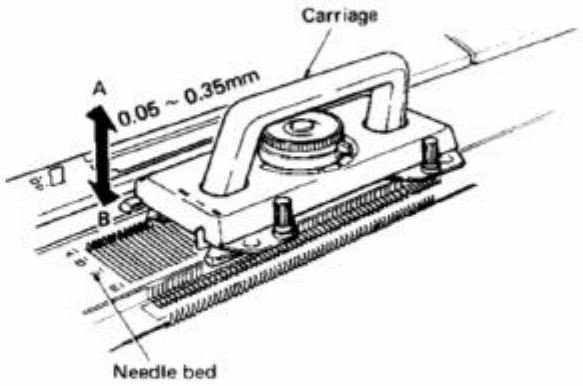
Check Point	Checking Method	Standard	Section
Damage or burr of yarn feeder.		There should be no damage and burr.	Replace.
Deformation of latch brush.		There should be no deformation.	Replace.

V ADJUSTMENT

V-1 Clearance between Carriage and Needle Bed

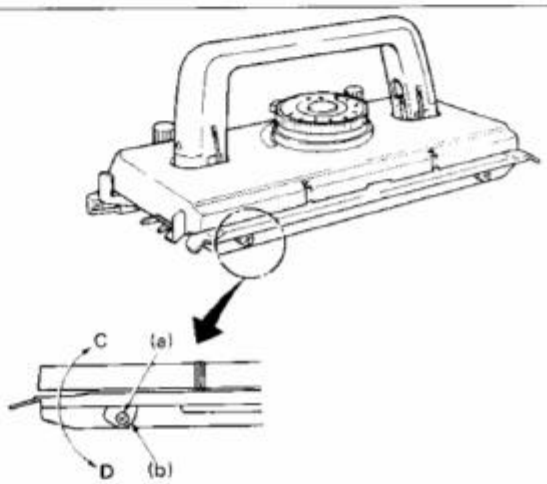
CHECK

(1) When rear foot is moved in A and B directions, clearance should be within the range of 0.05 and 0.35 mm.



ADJUSTMENT

(1) Loosen set screw (a).
(2) When clearance is larger than 0.35 mm, move adjusting plate (b) in C direction.
When clearance is smaller than 0.05 mm, move adjusting plate (b) in D direction.
(3) Tighten set screw (a).



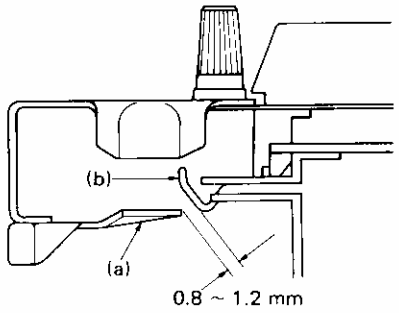
NOTE

(1) After adjustment, install carriage to needle bed and make sure that carriage moves smoothly from right end to left end.

V-2 Clearance between Fabric Presser and Sinker Hooks

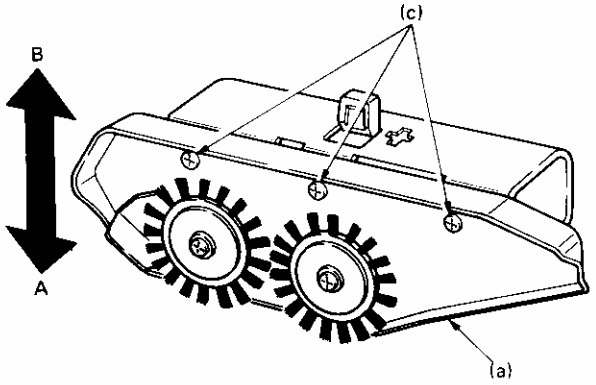
CHECK

(1) Clearance between fabric presser (a) and sinker hook (b) should be within the range of 0.8 and 1.2 mm.



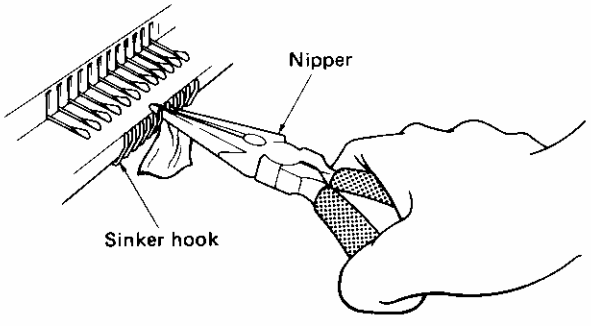
ADJUSTMENT

(1) Loosen 3 set screws (c).
(2) When clearance is larger than 1.2 mm, move fabric presser (a) in A direction.
When clearance is smaller than 0.8 mm, move fabric presser (a) in B direction.
(3) Tighten set screws (c).



NOTE

(1) When sinker hook has bent partially and is in contact with fabric presser, apply a cloth to sinker and correct it with a nipper.

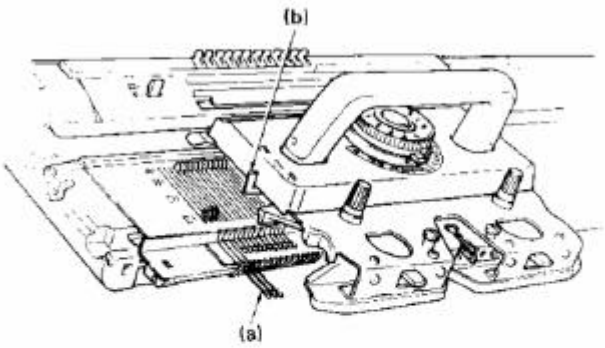


V-3 Height of Yarn Feeder

PREPARATION

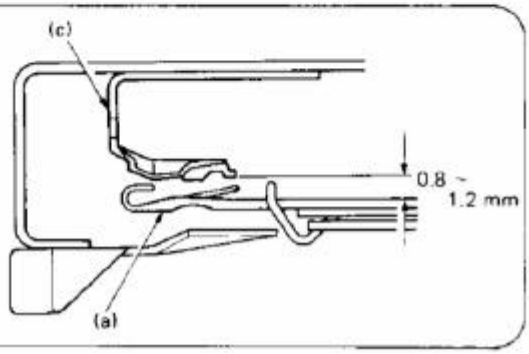
(1) Bring out 2 or 3 latch needles (a) to E position of needle bed.

(2) Move side lever (b) to "I" position.



CHECK

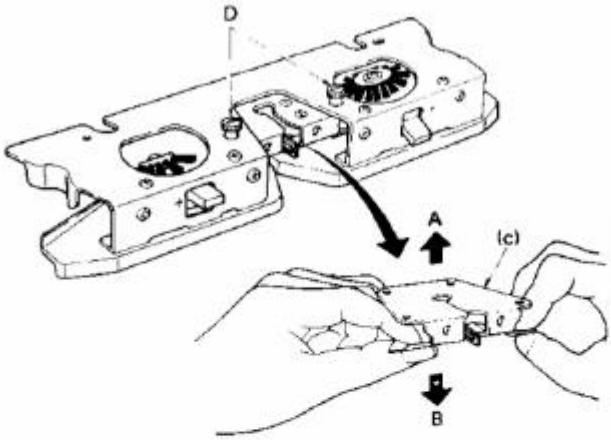
(1) When carriage is slid, clearance between the lower surface of yarn feeder (c) and the upper surface of latch needle (a) should be within the range of 0.8 and 1.2 mm.



ADJUSTMENT

(1) Unscrew both small thumb screws (d) and remove yarn feeder (c).

(2) When clearance is larger than 1.2 mm, bend the lower surface of yarn feeder (c) in B direction.
When clearance is smaller than 0.8 mm, bend the lower surface of yarn feeder (c) in A direction.



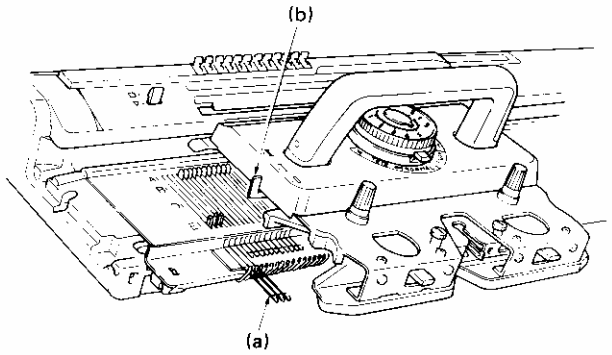
NOTE

(1) When bending amount is large, it is recommended to wind a cloth around yarn feeder (c) and use a pair of pliers, pincers, etc.

V-4 Clearance between Fabric Presser and Latch Needles

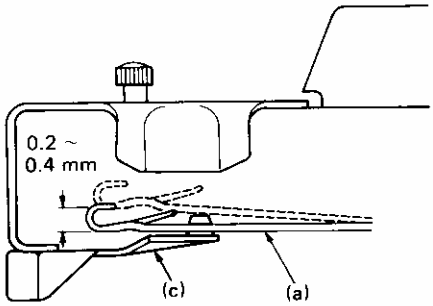
PREPARATION

(1) Bring out 2 or 3 latch needles (a) to E position of needle bed.
(2) Move side lever (b) to "I" position.



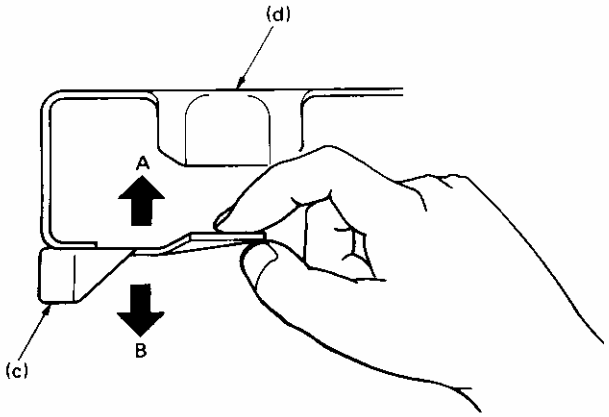
CHECK

(1) When carriage is slid, the latch needles (a), which have been set at E position, should lift 0.2 to 0.4 mm at the convex portion of fabric presser (c).



ADJUSTMENT

(1) When lift amount is larger than 0.4 mm, bend fabric presser (c) in B direction.
When lift amount is smaller than 0.2 mm, bend fabric presser (c) in A direction.



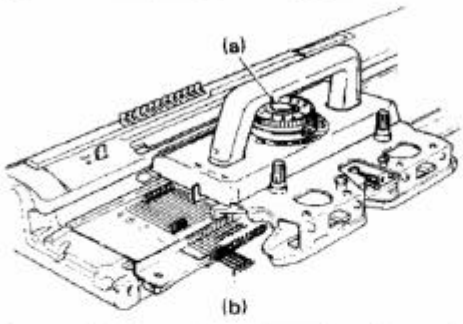
NOTE

(1) Make adjustment exercising care not to bend fabric presser base (b).
(2) Check "V-2 Clearance between Fabric Presser and Sinker Hooks".
(3) Check "V-3 Height of Yarn Feeder".

V-5 Height of Latch Brush

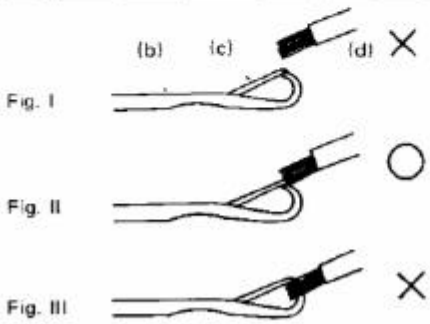
PREPARATION

(1) Set pattern dial (a) to "PLAIN" (NORMAL).
(2) Bring out 5 to 10 latch needles (b) to E position of needle bed.



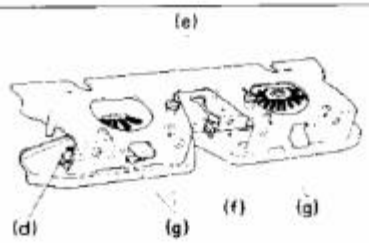
CHECK

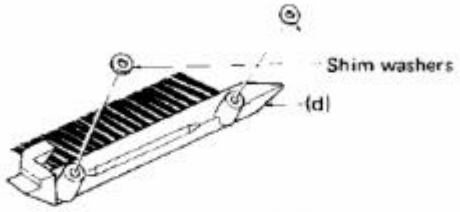
(1) When carriage is slid side to side, the latches (c) of latch needles (b) should come into contact with the tip of latch brush (d) and latches should be positively open.

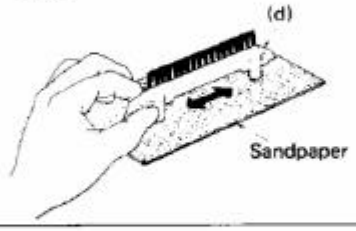


ADJUSTMENT

(1) Unscrew both small thumb screws (e) and remove yarn feeder (f).
(2) Unscrew set screws (g) and remove latch brush (d).
(3) When latch brush (d) is in the state as shown in CHECK Fig. I, set shim washers. (Fig. 2) When latch brush (d) is in the state as shown in CHECK Fig. III, file off the mounting portion of latch brush (d) with sandpaper (#300 to 500). (Fig. 3)







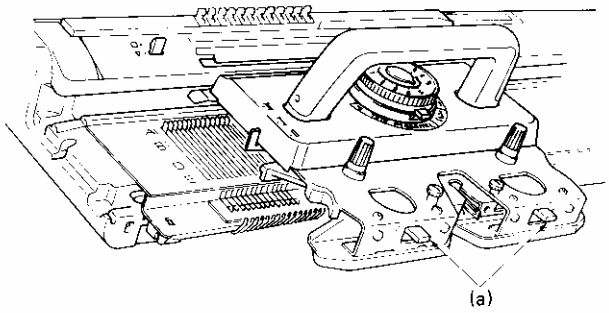
NOTE

(1) When the bristles in latch brush (d) are deformed or worn, change latch brush.

V-6 Position of Weaving Brush

PREPARATION

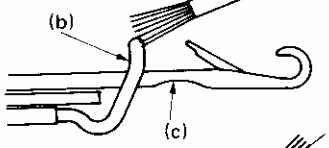
(1) Set weaving lever (a) to "+".



CHECK

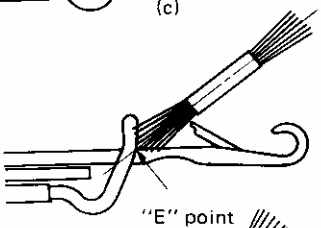
(1) When carriage is slid side to side, the center of weaving brush (d) should be aligned with "E" point.

Fig. I



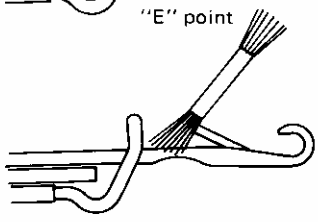
×

Fig. II



○

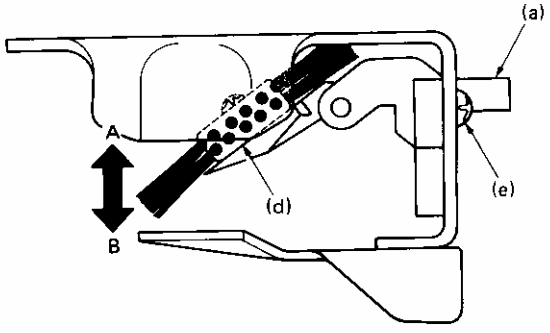
Fig. III



×

ADJUSTMENT

(1) Loosen set screw (e).
(2) When the state is as shown in CHECK Fig. I, move weaving brush (d) in B direction.
When the state is as shown in CHECK Fig. III, move weaving brush (d) in A direction.
(3) Tighten set screw (e).



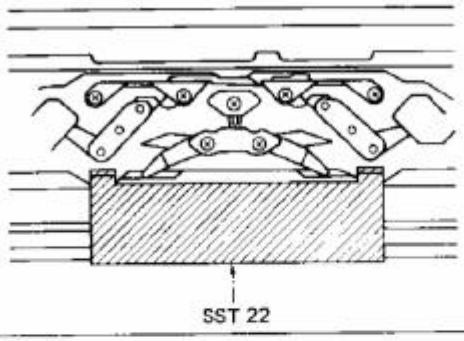
NOTE

(1) When weaving brush (d) is worn or deformed, change weaving brush.

V-7 Longitudinal Position of Raising/Knitting Cam

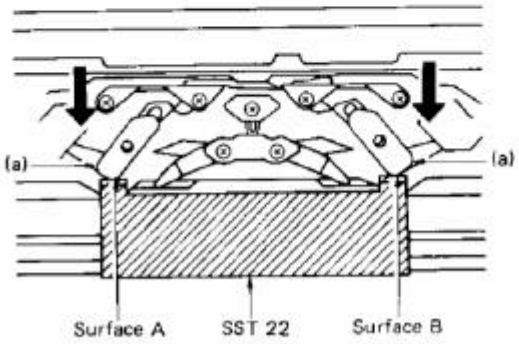
PREPARATION

(1) Set pattern dial to "TUCK" (JETE).
(2) Set tension dial to "0".
(3) Set SST 22 as shown in the figure.



CHECK

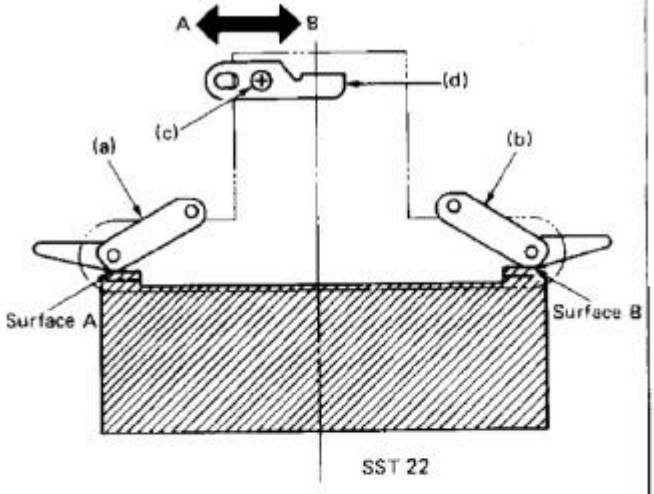
(1) Turn tension dial to larger value until raising/knitting cams (a) make contact with SST 22.
(2) At this time, there should be no clearance at surface A and surface B.



ADJUSTMENT

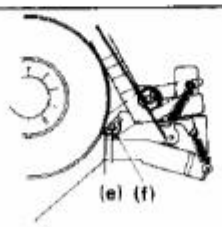
Clearance at surface A.
(1) Loosen set screw (c).
(2) Move knitting cam guide plate adjusting plate (d) in A direction.
(3) Tighten set screw (c).

Clearance at surface B.
(1) Loosen set screw (c).
(2) Move knitting cam guide plate adjusting plate (d) in B direction.
(3) Tighten set screw (c).



NOTE

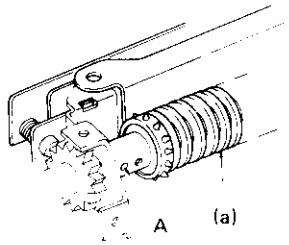
(1) When there are plays in vertical direction at raising/knitting cam, set washer (f) to raising/knitting cam shaft (e).



V-8 Position of Card Drum Shaft

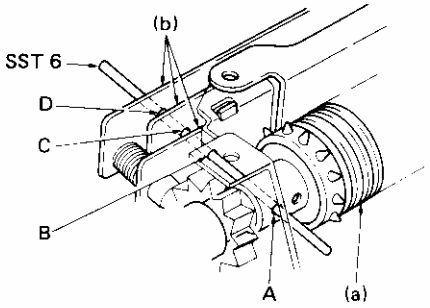
PREPARATION

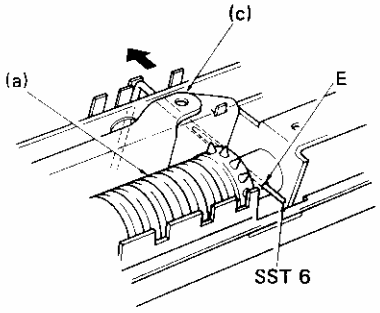
(1) Remove pattern board (1). (See VI-7.)
(2) Turn feeder dial until the positioning hole (A) of card drum shaft (a) faces front.



CHECK

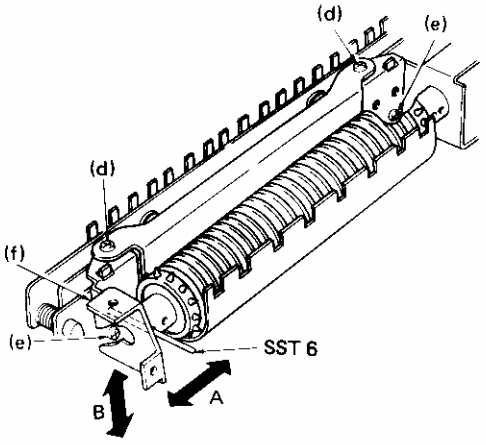
(1) The left hand positioning hole "A" of card drum shaft (a) should be aligned with the positioning holes "B", "C" and "D" of jacquard base plate (assy) (b) and SST-6 should pass these holes smoothly.
(2) When SST-6 is lightly inerted through the right hand positioning hole "E" of card drum shaft (a), selector pin (c) should move.





ADJUSTMENT

(1) Loosen 2 set screws (d).
(2) Loosen 2 set screws (e).
(3) Move card drum shaft holder (f) in A or B direction so that SST-6 smoothly enters holes.
(4) Tighten set screws (d) and (e).



NOTE

(1) When card drum shaft holder (f) has been adjusted in A direction, make sure that the play of card drum shaft (a) in A direction is within the range of 0.1 and 0.2 mm and also drum shaft (a) turns smoothly.

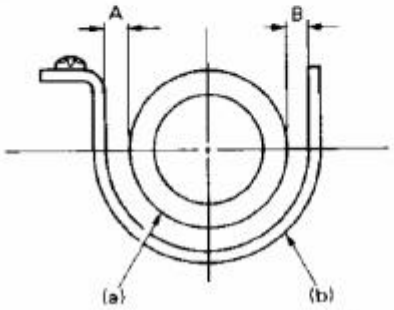
V-9 Position of Card Guide Plate

PREPARATION

(1) Remove pattern board (1). (See VI-7.)

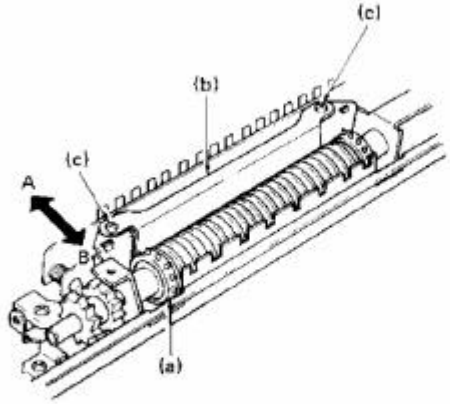
CHECK

(1) Thickness gauge (1 mm) should smoothly enter spaces (A and B) between card drum shaft (a) and card guide plate (b).



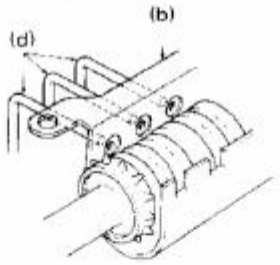
ADJUSTMENT

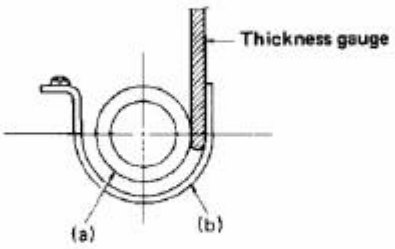
(1) Loosen 2 set screws (c).
(2) Move card guide plate (b) in A or B direction.



NOTE

(1) When card guide plate (b) has moved side to side, make adjustment so that selector pins (d) are aligned with the centers of holes in card guide plate (b).
(2) Measure with thickness at the center of card drum shaft (a).





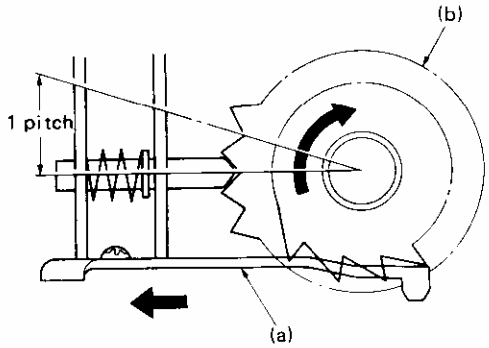
V-10 Position of Card Ratchet

PREPARATION

(1) Remove pattern board (1). (See VI-7.)

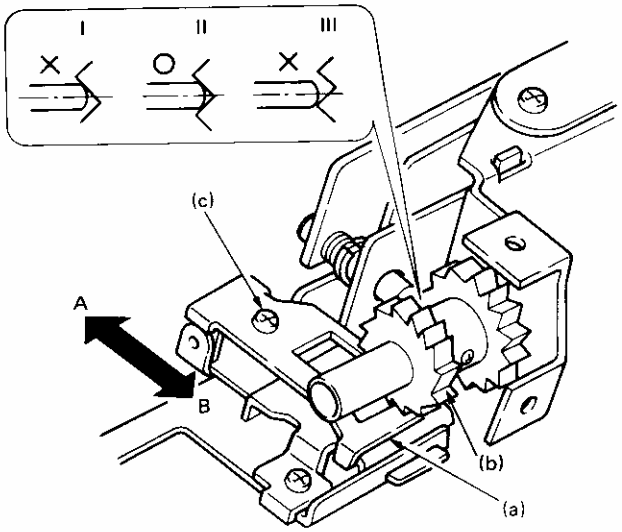
CHECK

(1) When selector lever is pulled, card ratchet (a) should feed the card feed gear (b) 1 pitch.



ADJUSTMENT

(1) Loosen set screw (c).
(2) When the state is as shown in Fig. I, move card ratchet (a) in A direction.
(3) When the state is as shown in Fig. III, move card ratchet (a) in B direction.
(4) Tighten set screw (c).



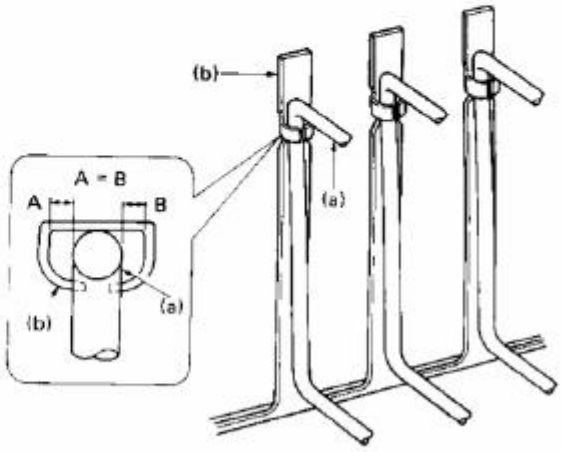
V-11 Position of Selector Pin Spring

PREPARATION

(1) Remove pattern board (1). (See VI-7.)

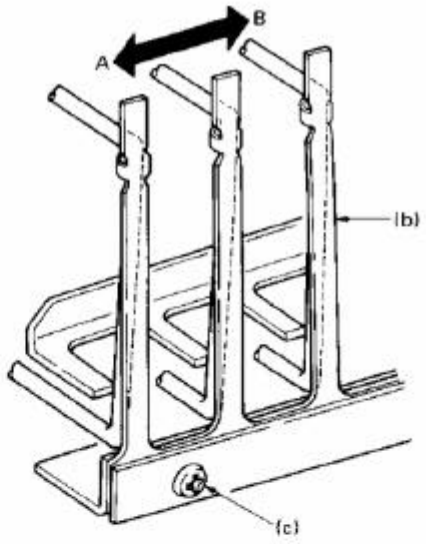
CHECK

(1) Clearances A and B between selector pin (a) and selector pin spring (b) should be equal.



ADJUSTMENT

(1) Remove pattern board (2). (See VI-7.)
(2) Remove needle bed complete from lower case. (See VI-7.)
(3) Loosen 4 set screws (c).
(4) Move selector pin spring (b) in A or B direction.
(5) Tighten 4 set screws (c).



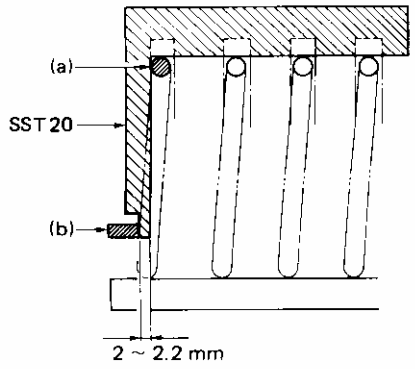
V-12 Position of Selector Pin Holder

PREPARATION

(1) Remove pattern board (1). (See VI-7.)

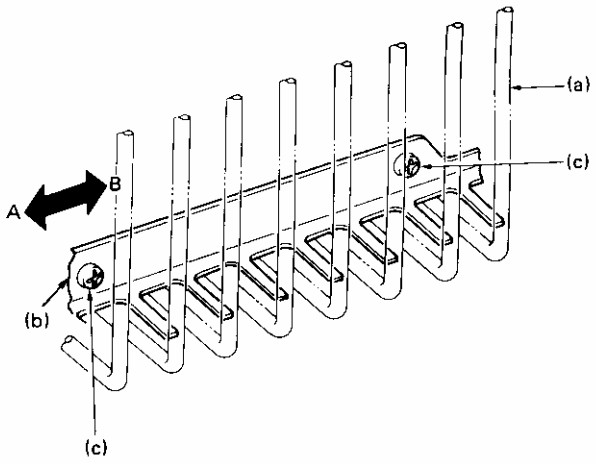
CHECK

(1) When SST 20 is inserted between selector pins (a) and selector pin holder (b), selector pin holder (b) should come into light contact with SST 20.



ADJUSTMENT

(1) Remove pattern board (2). (See VI-7.)
(2) Remove needle bed complete from lower case.
(3) Loosen 3 set screws (c).
(4) Move selector pin holder (b) in A or B direction.
(5) Tighten 3 set screws (c).



NOTE

(1) Set SST 20 **horizontally onto 4 selector pins (a).**
(2) **When SST 20 comes into contact with selector** pin holder (b), do not push it forcibly.

V-13 Position of Selector Pin Drive Plate

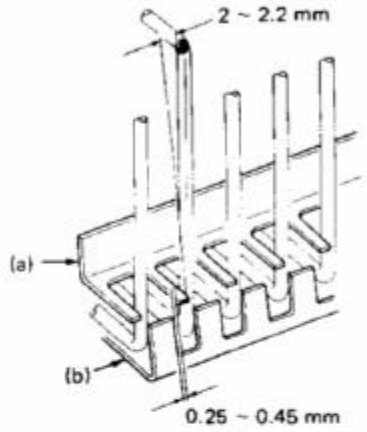
PREPARATION

(1) Remove pattern board (1). (See VI-7.)

CHECK

(1) Make sure that "V-12 Position of Selector Pin Holder" is correct (2 to 2.2 mm).

(2) When thickness gauge is inserted between selector pin holder (a) and selector pin drive plate (b), clearance should be within the range of 0.25 and 0.45 mm.

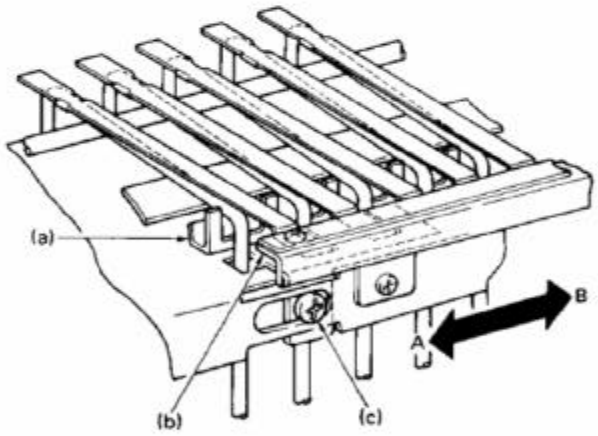


ADJUSTMENT

(1) Remove pattern board (2). (See VI-7.)

(2) Remove needle bed complete from lower case. (See VI-7.)

(3) Loosen 2 set screws (c) in the lower surface of needle bed and move selector pin drive plate (b) in A or B direction.



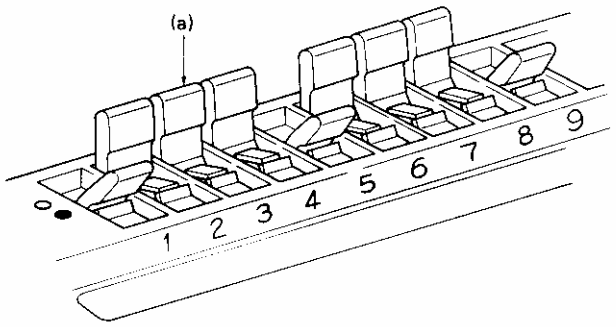
NOTE

(1) Before adjusting selector pin drive plate (b), be sure to adjust "Position of Selector Pin Holder".

V-14 Position of Driving Rod Stopper Plate

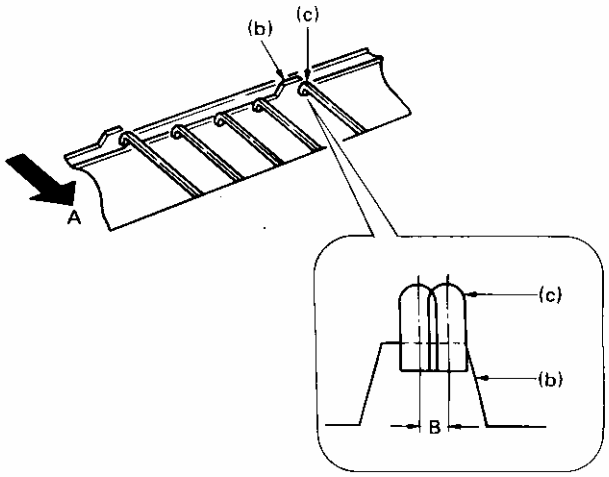
PREPARATION

(1) Remove pattern boards (1) and (2). (See VI-7.)
(2) **Install only pattern board (1) on jacquard base plate assy.**
(3) **Set the 1st, 5th and 9th push buttons (a).**
(4) Set 30 latch needles to E position in the center part of needle bed.



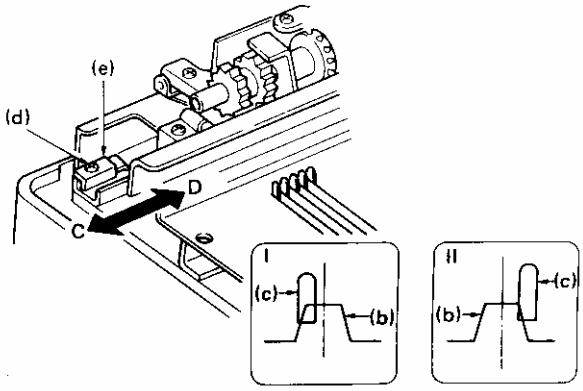
CHECK

(1) When selector plate (b) is moved in A direction by controlling selector lever, latch needles (c) should be pushed out in the **range B** of selector plate (b).



ADJUSTMENT

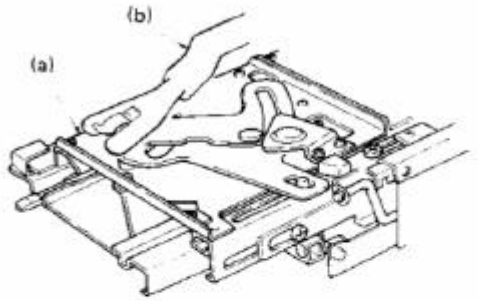
(1) Remove pattern board (1). (See VI-7.)
(2) Loosen set screw (d).
(3) **When the state is as shown in Fig. I, move driving rod stopper plate (e) in D direction. When the state is as shown in Fig. II, move driving rod stopper plate (e) in C direction.**
(4) Tighten set screw (d).



V-15 Position of Selector Lever Arm Pin Holder

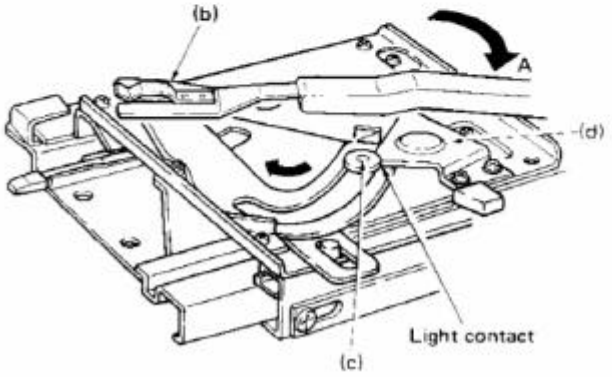
PREPARATION

(1) Remove pattern boards (1) and (2). (See VI-7.)
(2) Remove needle bed complete from lower case. (See VI-7.)
(3) Reverse needle bed (a).
(4) Set selector lever (b).



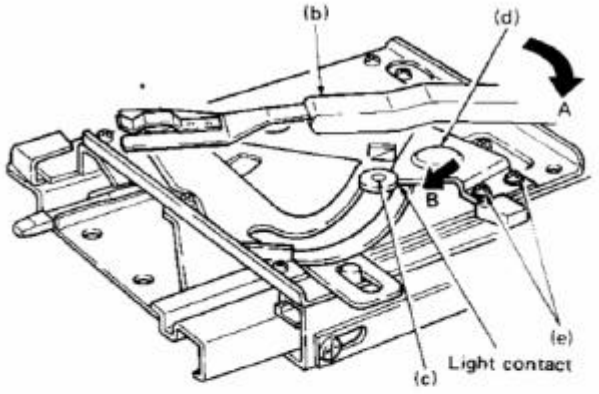
CHECK

(1) When selector lever (b) is fully pulled in A direction, selector lever arm pin (c) and selector lever arm pin support (d) should be in light contact.



ADJUSTMENT

(1) Loosen 2 set screws (e).
(2) Fully pull selector lever (b) in A direction to bring selector lever arm pin support (d) into light contact with selector lever arm pin (c) in B direction.
(3) Tighten 2 set screws (e).



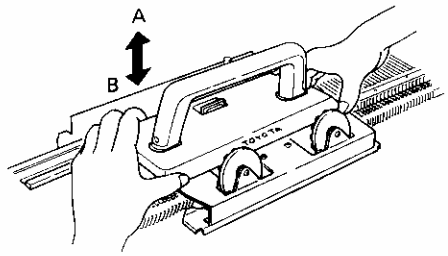
NOTE

(1) By controlling selector lever, make sure that the lever moves smoothly and also returns smoothly.

V-16 Clearance between Lace Carriage and Needle Bed

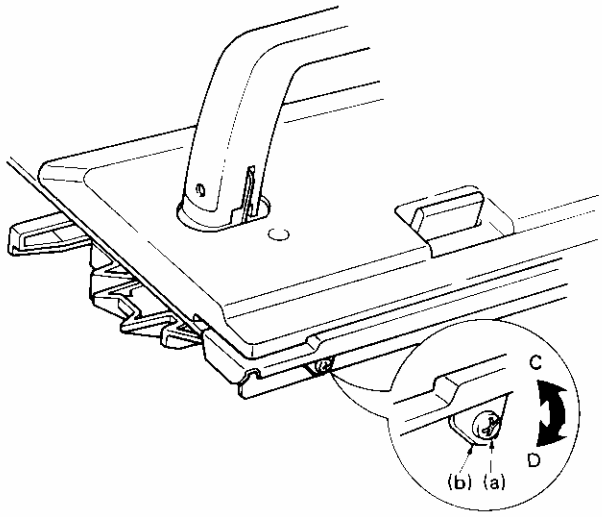
CHECK

(1) When lace carriage rear foot is moved in A and B directions, clearance should be within the range of 0.05 and 0.35 mm.



ADJUSTMENT

(1) Loosen set screw (a).
(2) When clearance is larger than 0.35 mm, move adjusting plate (b) in C direction.
(3) When clearance is smaller than 0.05 mm, move adjusting plate (b) in D direction.
(4) Tighten set screw (a).



NOTE

(1) After adjustment, install lace carriage to needle bed and make sure that lace carriage moves from right end to left end.

V-17 Position of Latch Cam

PREPARATION

(1) Unscrew 2 set screws (a) and remove latch brush.
(2) Set SST 21 as shown in Fig. II.

Fig. I

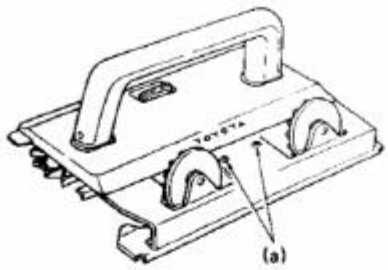
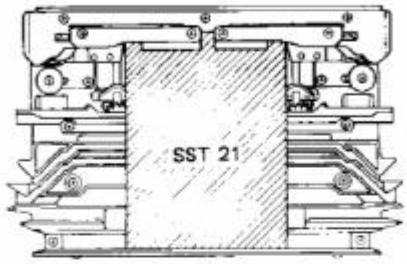
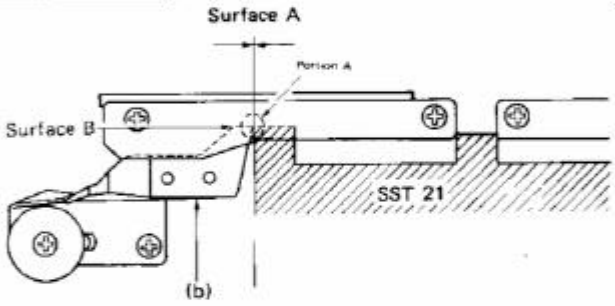


Fig. II



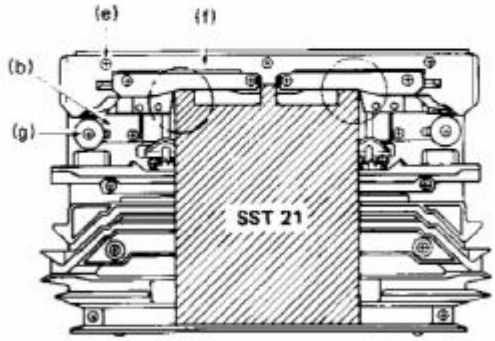
CHECK

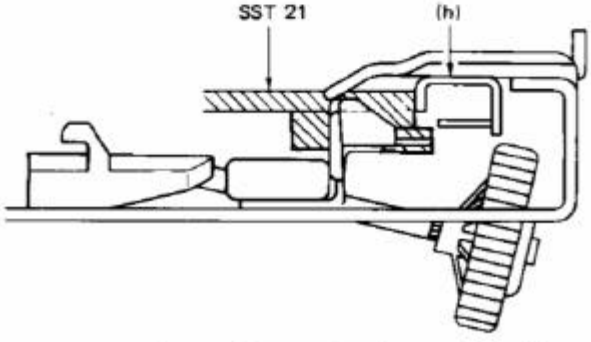
(1) Longitudinal position of latch cam
Latch cam (b) and SST 21 should be in light contact and there should be no clearance (at portion A).
(2) Transverse position of latch cam
The top end of latch cam (b) should be flush with the surface B of SST 21.



ADJUSTMENT

(1) Unscrew 3 set screws (e) and remove needle cam bracket (f).
(2) Slightly loosen set screw (g) and set latch cam (b) to SST 21.
(3) To install needle cam bracket (f), make SST 21 into light contact with (h), and in this state, tighten screw (e).
(4) Install latch brush.





NOTE

(1) When latch cam is brought into hard contact with SST 21, latch will be bent.
(2) When latch is deformed, change it.

V-18 Position of Needle Cam

PREPARATION

(1) Unscrew 2 set screws (a) and remove latch brush.
(2) Set SST 21 as shown in Fig. II.

Fig. I

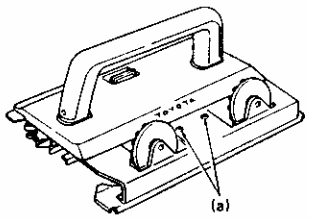
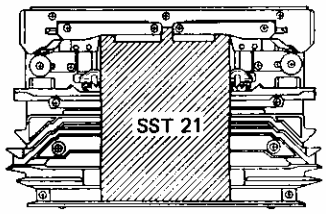
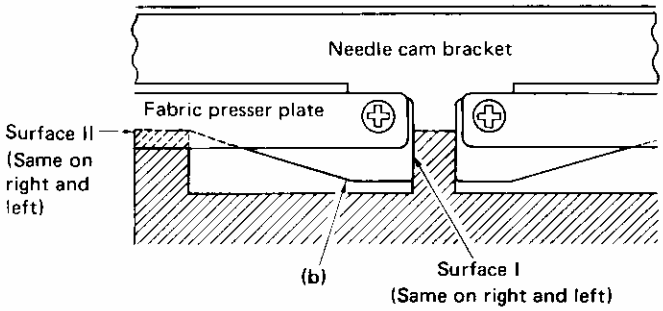


Fig. II



CHECK

(1) Needle cam (b) should be in light contact with surface I and surface II of SST 21 and should not be inclined.

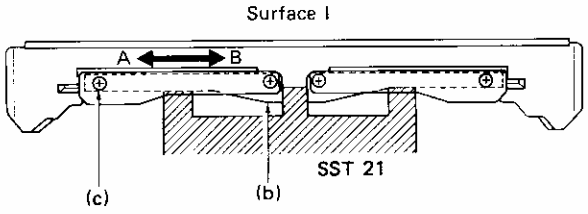


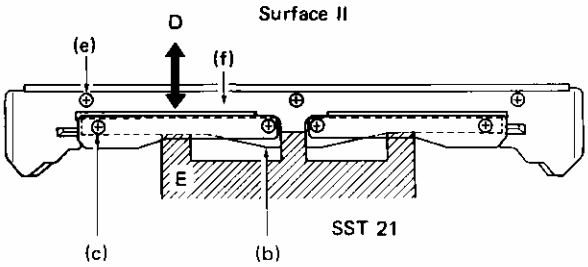
ADJUSTMENT

(1) Surface I (longitudinal position)
- Loosen set screw (c).
- Move needle cam (b) in A and B directions.
- Tighten set screw (c).

(2) Surface II (transverse position)
- Loosen set screw (e).
- Move needle cam bracket (f) in D and E directions.
- Tighten set screw (e).

(3) Install latch brush.





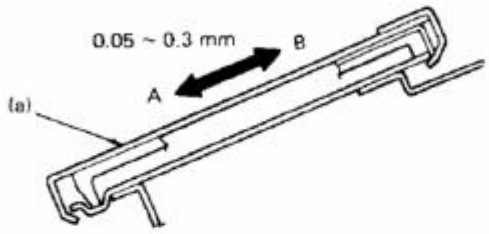
NOTE

(1) When transverse position cannot be adjusted, make adjustment by moving needle cam in vertical direction.

V-19 Clearance between Rib Carriage and Needle Bed

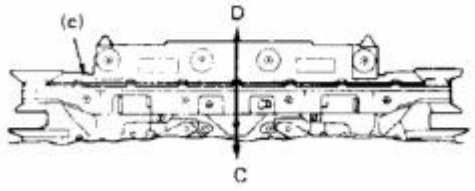
CHECK

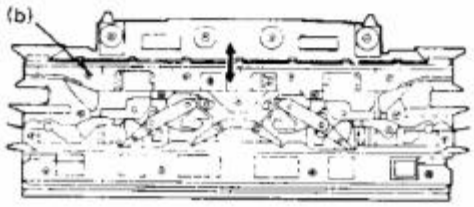
(1) When rib carriage (a) is moved in A and B directions, clearance should be within the range of 0.05 and 0.3 mm.



ADJUSTMENT

(1) Loosen 4 set screws (b).
(2) When clearance is larger than 0.3 mm, move front foot cover (c) in C direction.
(3) When clearance is smaller than 0.05 mm, move front foot cover (c) in D direction.
(4) Tighten set screw (b).





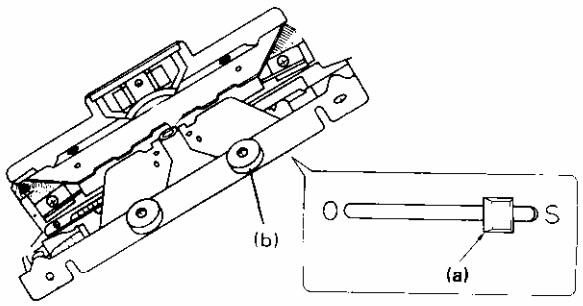
NOTE

(1) Set rib carriage to needle bed and move it from left end to right end in order to make sure that the rib carriage moves smoothly at any position.

V-20 Transverse Position of Yarn Feeder ◎ on Coupling (KR504, KR505)

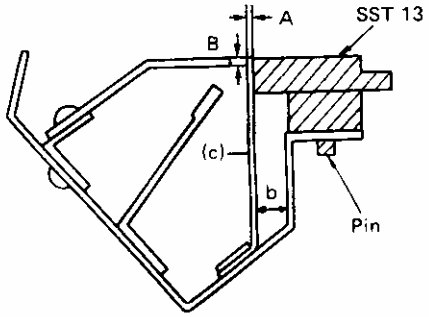
PREPARATION

(1) Move Simulk wit lever (a) to "S".
(2) Remove magnets (b).



CHECK

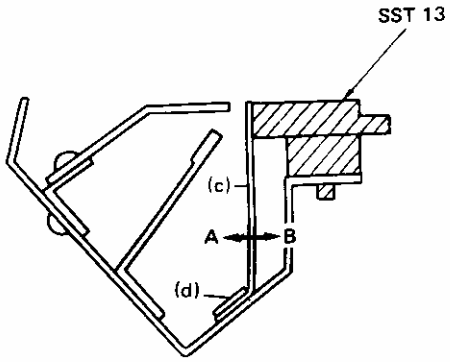
(1) Set SST SST 13.
(2) In regards to transverse position (A), clearance from SST 13 should be within 0.2 mm.
(3) In regards to height (b), difference from SST 13 should be within the range of 0 and +0.3 mm.



ADJUSTMENT

○ Adjustment of transverse position (A)
Loosen 2 set screws (d). Move yarn feeder (c) in A and B directions until it is correctly set to SST 13.

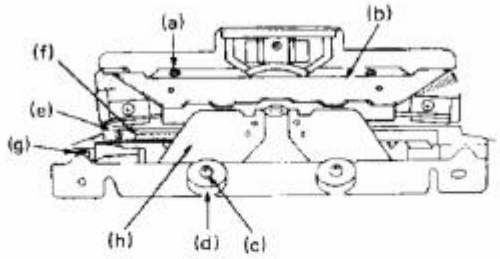
○ Adjustment of height (B)
Make adjustment by placing and removing washer(s) between yarn feeder (c) and coupling (b).



V-21 Transverse Position of Yarn Feeder Ⓢ on Coupling (KR504, KR505)

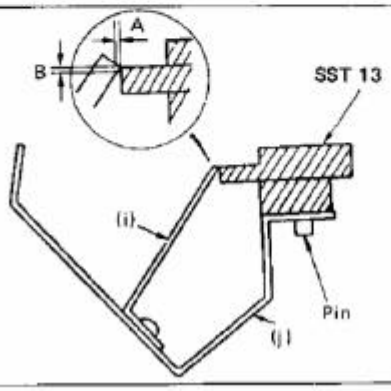
PREPARATION

(1) Unscrew 2 set screws (a) and remove latch guide (b).
(2) Unscrew each 1 set screw (c) and remove each magnet (d).
(3) Unscrew each 1 set screw (e) and remove each latch brush (f).
(4) Unscrew 2 set screws (g) and remove yarn feeder Ⓞ (h).



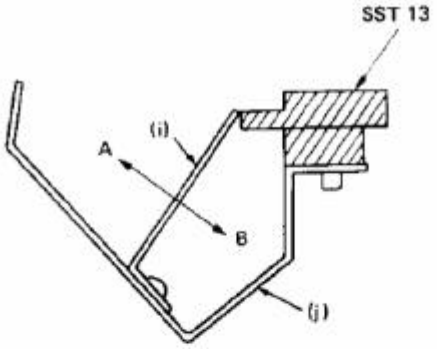
CHECK

(1) Set SST R-1.
(2) In regards to transverse position (A), clearance from SST 13 should be within 0.2 mm.
(3) In regards to height (B), difference from SST 13 should be within 0.2 mm.



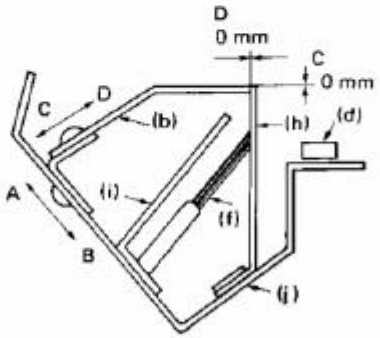
ADJUSTMENT

○ Transverse position (A)
Loosen 2 set screws in yarn feeder Ⓢ (i). Move yarn feeder Ⓢ (i) in A and B directions until it is correctly set to SST 13.
○ Height (B)
Make adjustment by placing and removing washer(s) between yarn feeder Ⓢ (i) and coupling (j).



ASSEMBLY

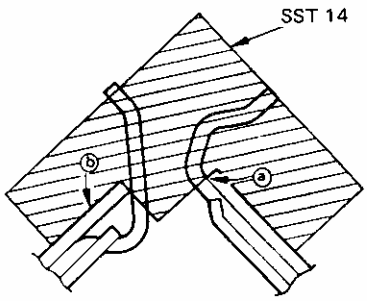
(1) Install yarn feeder Ⓞ (h). (See V- .)
(2) Install latch brush (f).
(3) Install magnets (d).
(4) Install latch guide (b).
1) Set Simulknit lever to Ⓞ
2) Adjust height (C) in A and B directions, and transverse position (D) in C and D directions.



V-22 Mounting Positions of Main and Ribber Needle Beds

CHECK

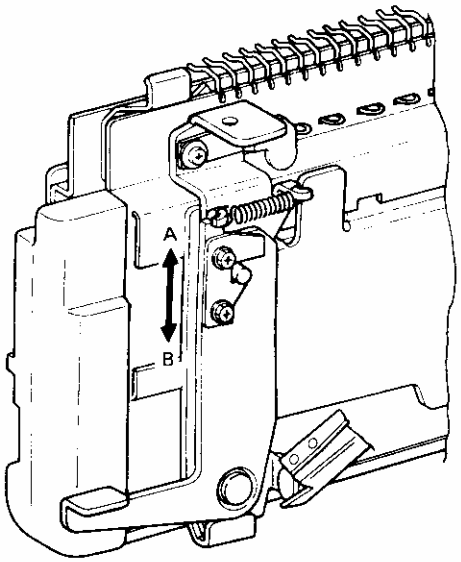
(1) When SST 14 is set to both ends of needle beds, clearance at portion (a) and portion (b) should be within 0.2 mm.



ADJUSTMENT

(1) Slightly loosen 2 bolts in drop adjuster plate (c) of needle bed with a 7 mm spanner.
- When clearance at portion (a) is larger than 0.2 mm, adjust drop adjuster plate (c) in A direction.
- When clearance at portion (b) is larger than 0.2 mm, adjust drop adjuster plate (c) in B direction.

(2) After adjustment, tighten 2 bolts.

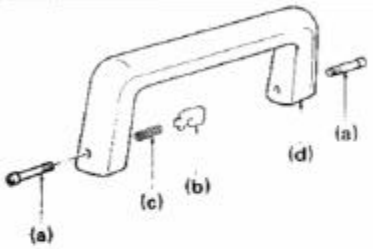


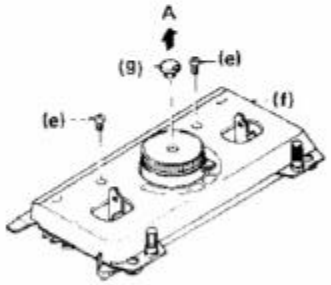
VI REPLACEMENT OF MAIN PARTS

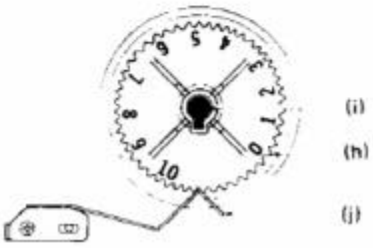
VI-1 Replacement of Tension Dial and Pattern Dial

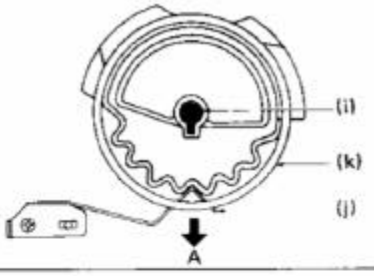
DISASSEMBLY

(1) Remove handle shafts (a).
(2) Remove handle (d) and remove handle stoppers (b) and stopper springs (c).
(3) Unscrew carriage cover tightening screws (e) and remove carriage cover (f).
(4) Pull tension dial indicator plate (g) in A direction.
(5) Align the set pin of tension dial shaft (i) with the notch of tension dial (h) and pull the dial upward.
(6) Align the set pin of tension dial shaft (i) with the notch of pattern dial (k), and while pulling positioning spring (j) in A direction, pull pattern dial upward.









ASSEMBLY

(1) Install in order of steps 6, 5, 4, 3, 2 and 1.

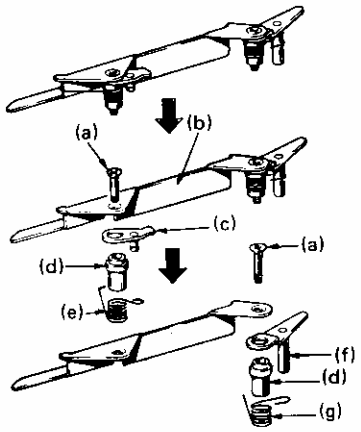
NOTE

(1) When installing pattern dial and tension dial, set them while simultaneously pulling positioning spring (j) in A direction.
(2) When removing handle, beware of the popping out of stopper spring.
(3) When handle is installed, handle stopper should be located on left side with the carriage facing front.

VI-2 Replacement of Fairisle Knitting Cam and Swing Cam

DISASSEMBLY

(1) Set pattern dial to "PLAIN" (NORMAL).
(2) Unscrew swing cam tightening screw (a) and remove swing cam (c) and fairisle knitting cam (f) from fairisle knitting cam link (b).
(3) Remove fairisle knitting cam collar (d), swing cam spring (e), and fairisle knitting cam spring (g) from swing cam (c) and fairisle cam (g).



ASSEMBLY

(1) Set fairisle knitting cam spring (g) to fairisle knitting cam collar (d). (See Fig. 1.)
(2) Install spring-loaded fairisle knitting cam collar (d) to fairisle knitting cam (f) and hook the tip (A) of spring at fairisle knitting cam shaft. (See Fig. 2.)
(3) Temporarily tighten the fairisle knitting cam collar to fairisle knitting cam link (b) with set screw (a). (Set the tip (B) of fairisle knitting cam spring at position shown in Fig. 3.)
(4) Set (e) to fairisle knitting cam collar (d). (See Fig. 4.)
(5) Install spring-loaded fairisle knitting cam collar to swing cam (c) and hook the tip (A) of spring at swing cam shaft. (See Fig. 5.)
(6) Temporarily tighten the fairisle knitting cam collar to fairisle knitting cam link (b) with set screw (a).
(7) Tighten screw where the end of swing cam (c) is located on the inside of variable cam (h). (See Fig. 6.)
(8) Fully tighten all temporarily tightened screws located on the side of fairisle knitting cam (f).

Fig. 1

Fig. 2

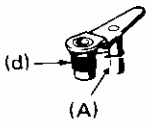


Fig. 3

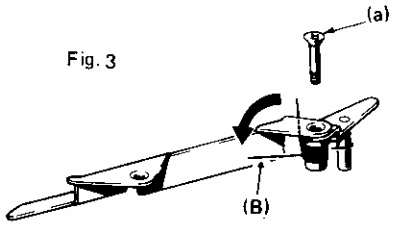
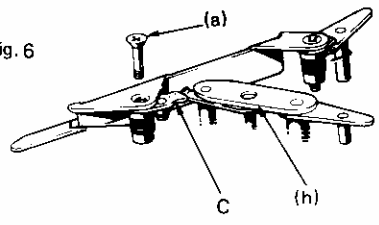


Fig. 4

Fig. 5

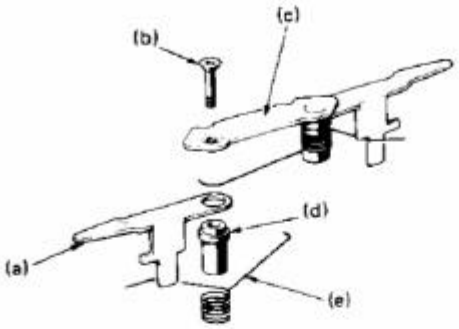
Fig. 6



VI-3 Replacement of Tuck Cams

DISASSEMBLY

(1) Fold down handle and reverse carriage.
(2) Remove setting screw (b) of tuck cam (a).
(3) Remove tuck cam guide (c), tuck cam (a), fairisle knitting cam collar (d) and tuck cam spring. (See Fig. 1.)



ASSEMBLY

(1) Insert setting screw (b) into tuck cam guide (c) and set (a), (d) and (e) in this indicated order. (See Fig. 2.)
(2) Hook the edge of tuck cam spring (A) on tuck cam. (See Fig. 3)
(3) Hook the edge of tuck cam spring (B) on fairisle knitting cam collar. (See Fig. 3)
(4) After assembly, exercising care not to drop (d) and (e), place carriage to mounting position.

(Note)
When tuck cam plates are protruding from window, bring up tuck cam board using tip of screwdriver.

(5) Tighten right and left setting screws (b).

Fig. 2

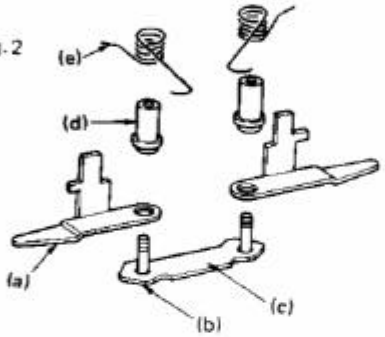
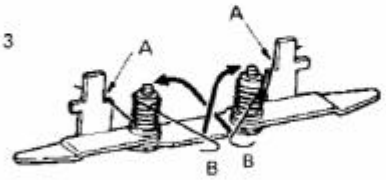


Fig. 3



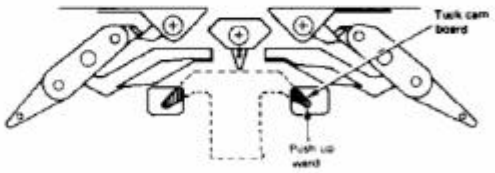


Fig. 5

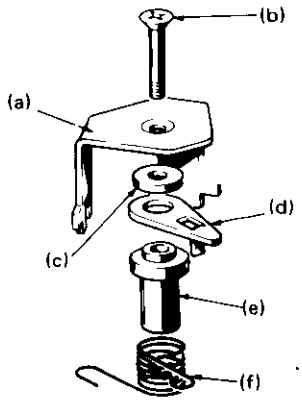
NOTE

(1) Tuck cams should return to original position by force of spring. (See Fig. 5.)
(2) When pattern dial is set to "TUCK" (JETE) or "PLAIN" (NORMAL), tuck cams should operate correctly.

VI-4 Replacement of Guide Cam and Valve Cam

DISASSEMBLY

(1) Unscrew tightening screw (b) of guide cam (a).
(2) Remove guide cam, and remove valve cam washer (c), valve cam (d), guide cam collar (e), and valve cam spring (t).



ASSEMBLY

(1) Set valve cam spring (f) to guide cam collar (e). (See Fig. 1.)
(2) Set valve cam (d) to guide cam collar, hook valve cam spring at portion A, and set the valve cam washer (c). (See Fig. 2.)
(3) Hook the tip of valve cam spring at the portion B of guide cam and set the tightening screw (b). (See Fig. 3.)
(4) Set guide cam into carriage mounting hole and tighten it with tightening screw (b).

Fig. 1

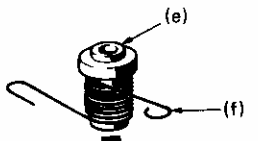


Fig. 2

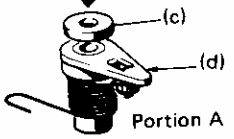
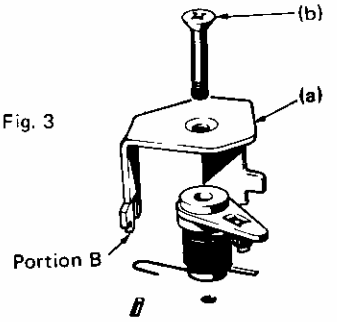


Fig. 3



NOTE

(1) Make sure that valve cam spring is securely hooked at portions A and B.
(2) The leg of guide cam should be located inside carriage mounting hole.

VI-5 Replacement of Raising/Knitting Cam and Variable Cam

DISASSEMBLY

(1) Remove handle and carriage cover. See DISASSEMBLY section of "VI-1 Replacement of Tension Dial and Pattern Dial."
(2) Remove raising cam spring (a).
(3) Remove E stop rings (b) and (c), and pull out shim washers.
(4) **Reverse the carriage.**
(5) Remove raising/knitting cam (d).
(6) Remove E stop ring (e) and remove variable cam (f).

Fig. 1

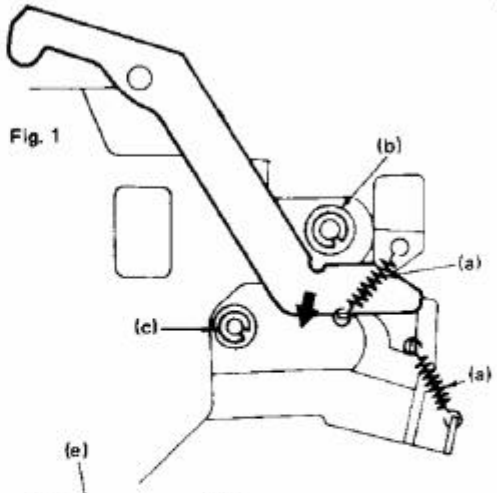


Fig. 2

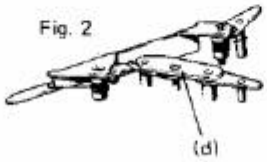
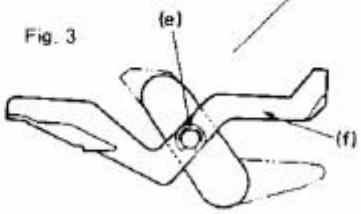


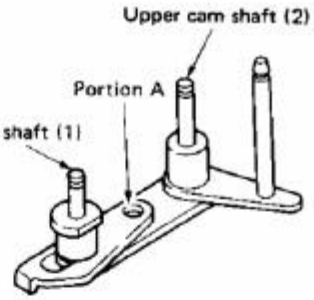
Fig. 3



ASSEMBLY

(1) Set variable cam (f) into mounting shaft.
(2) Set shim washer and clamp it with E stop ring (e).
(3) Insert raising/knitting cam into carriage setting holes and reverse carriage again to set it to original state.
(4) Set shim washers onto upper cam shafts (1) and (2), and clamp them with E stop rings (b) and (c).
(5) Hook raising cam spring (a).
(6) Install handle and carriage cover. See ASSEMBLY section of "VI-1 Replacement of Tension Dial and Pattern Dial."

Fig. 4



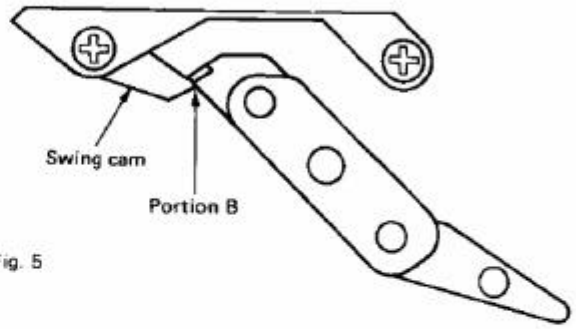


Fig. 5

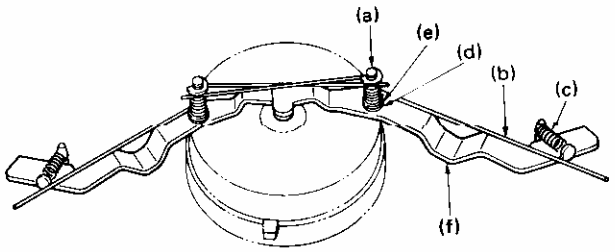
NOTE

(1) When raising/knitting cam is installed to carriage, portion A should always be located inside variable cam mounting shaft.
(2) Swing cam should always be located on the inside of raising/knitting cam. (See Fig. 5.)
(3) Be sure to check the operations of raising/knitting cam and variable cam.

VI-6 Replacement of Raising Cam Change Lever

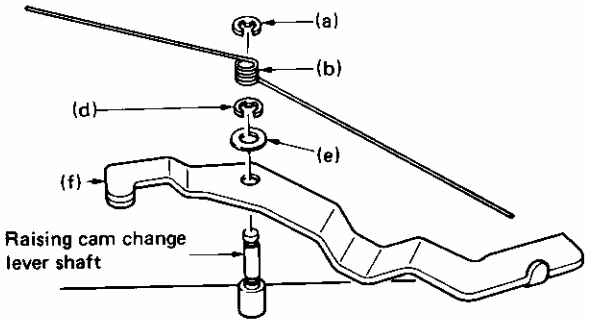
DISASSEMBLY

(1) Remove handle and carriage cover. See DISASSEMBLY section of "VI-1 Replacement of Tension Dial and Pattern Dial."
(2) Remove E stop ring (a).
(3) Remove raising cam change lever spring (b).
(4) Remove raising cam spring (c) on the side of raising cam change lever.
(5) Remove E stop ring (d) and shim washer (e).
(6) Remove raising cam change lever (f) upward.



ASSEMBLY

(1) Insert raising cam change lever (e) into raising cam change lever shaft.
(2) Set shim washer (e) and clamp it with E stop ring (d).
(3) Hook raising cam spring (c).
(4) Set raising cam change lever spring (b).
(5) Set E stop ring (a).
(6) Install handle and carriage cover. See ASSEMBLY section of "VI-1 Replacement of Tension Dial and Pattern Dial."



NOTE

(1) Raising cam change lever spring should be set as shown in Fig. 2.
(2) Be sure to check the operations of raising cam change lever and raising/knitting cam.

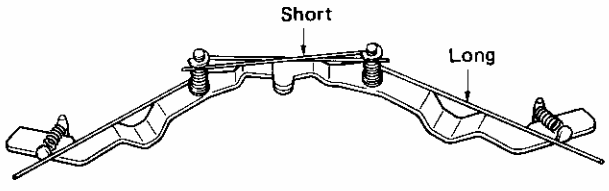
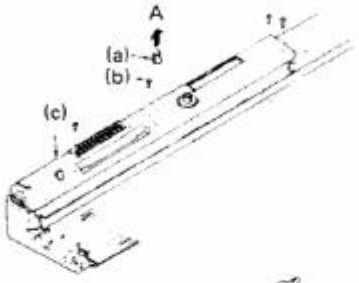


Fig. 2

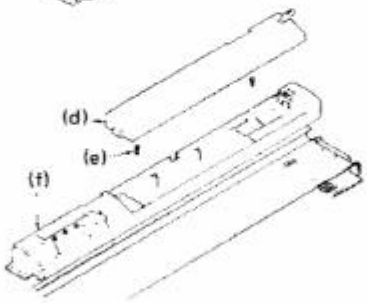
VI-7 Replacement of Jacquard Base Plate (Ass'y)

DISASSEMBLY

(1) Pull out card dial (a) in A direction.

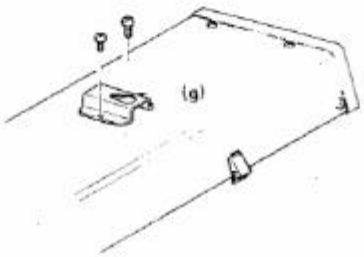


(2) Unscrew 4 set screws (b) and remove pattern board (c).

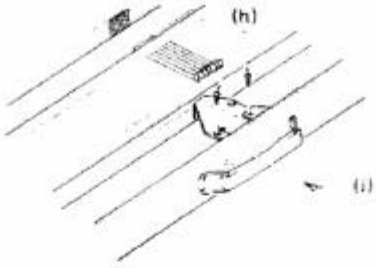


(3) Remove accessory lid (c).

(4) Unscrew 2 set screws (e) and remove pattern board (f).

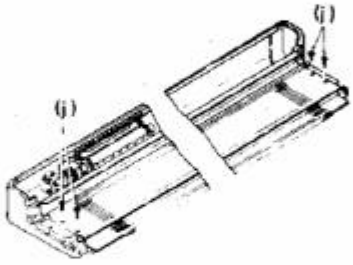


(5) Reverse main machine and remove clamps base plate (g).

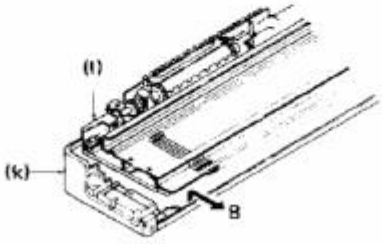


(6) Unscrew set screws (h) and (i).

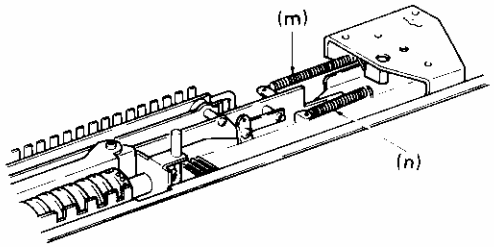
(7) Unscrew 4 set screws (j).



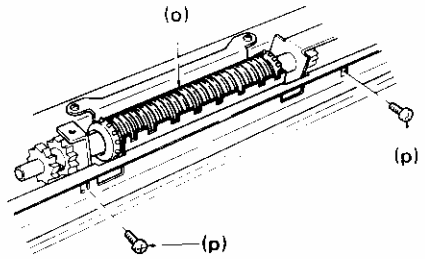
(8) Remove needle bed (1) from lower case (k) in B direction.



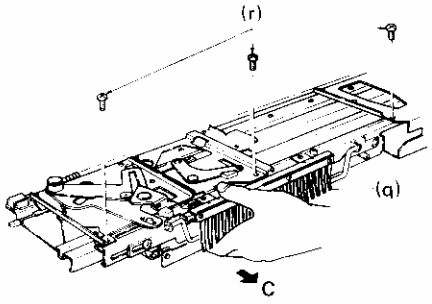
(9) **Remove clutch plate** spring (m) and selector **pin drive plate** spring (n).



(10) Unscrew 2 set screws (p) from card drum (o).



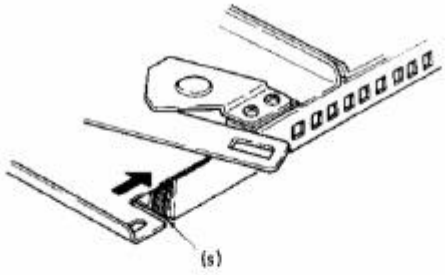
(11) Hold jacquard base plate (assy) (q) by hand and unscrew 3 set screws (r).



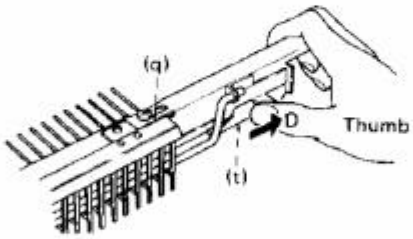
(12) Remove jacquard base plate (assy) in C direction.

ASSEMBLY

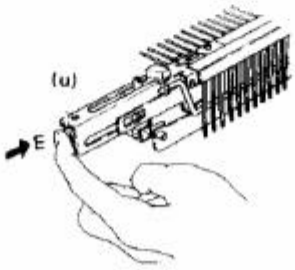
(1) Align the left end of selector plate (s).



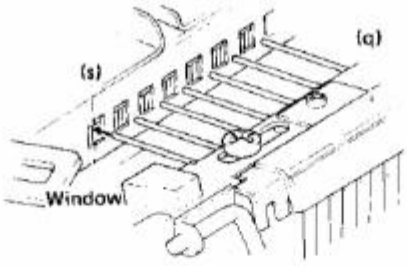
(2) Shift the clutch plate (t) of jacquard base plate (assy) in D direction.



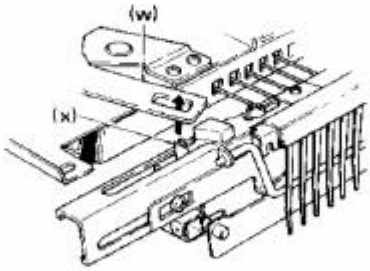
(3) Push selector pin drive plate (u) in E direction with finger.



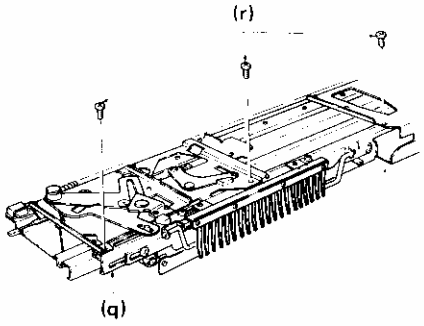
(4) In this state, align left end selector pin (v) with the left end window of selector plate (s) and push jacquard base plate (assy) (q).



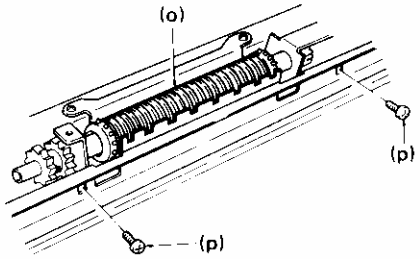
(5) Insert drive arm shaft (x) into the slot of selector lever arm (w).



(6) Temporarily tighten jacquard base plate (assy) (q) with 3 set screws.

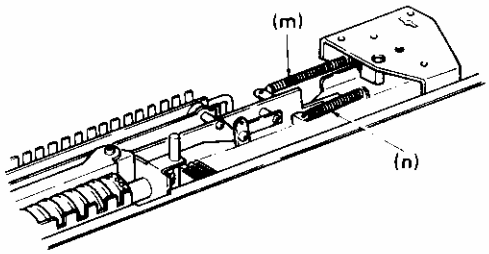


(7) Tighten 2 set screws (p) for card drum (o).



(8) Tighten 3 set screws (r) for jacquard base plate (assy) (q).

(9) Check according to the following procedures:
"V-12 Position of Selector Pin Holder"
"V-13 Position of Selector Pin Drive Plate"
"V-14 Position of Driving Rod Stopper Plate"



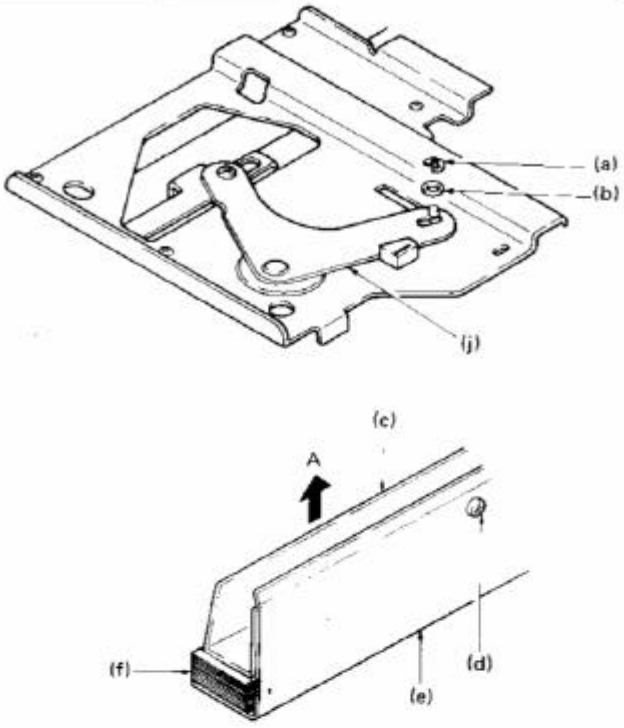
(10) Hook clutch plate spring (m) and selector pin driving plate spring (n).

(11) Set punch card and check needle selection.

(13) Install in order of disassembly steps (8) to (1).

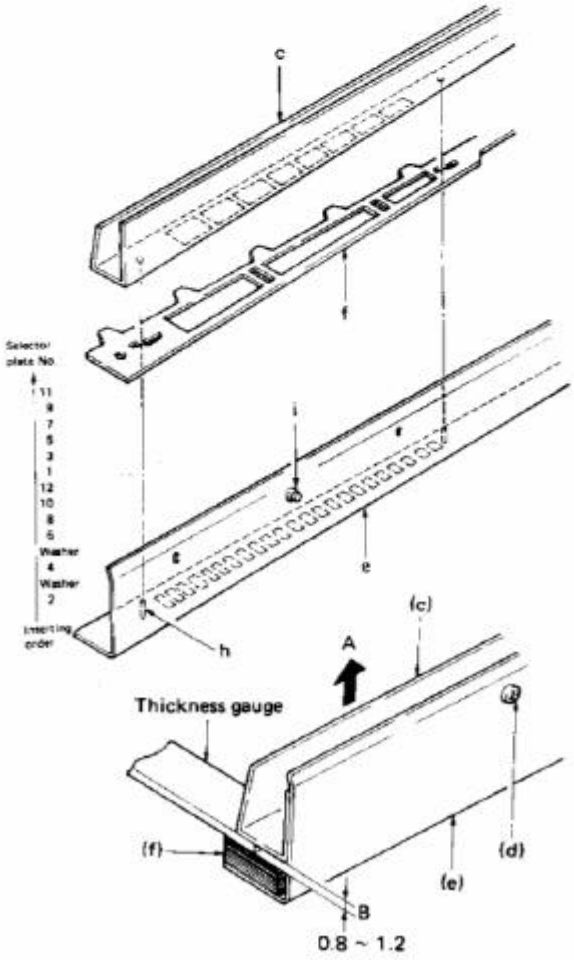
DISASSEMBLY

(1) Follow the steps 1 to 12 of DISASSEMBLY in "Replacement of Jacquard Base Plate (AssY)."
(2) Reverse needle bed to set it to original state.
(3) Bring out latch needles to E position of needle bed.
(4) Reverse needle bed.
(5) Remove E stop ring (a) and washer (b).
(6) Remove selector plate holder (assy) from needle bed.
(7) Unscrew selector plate holder set screw (d).
(8) Remove selector plate holder 2 (c) in A direction.
(9) Remove selector plates (f) from selector plate holder 1 (e).

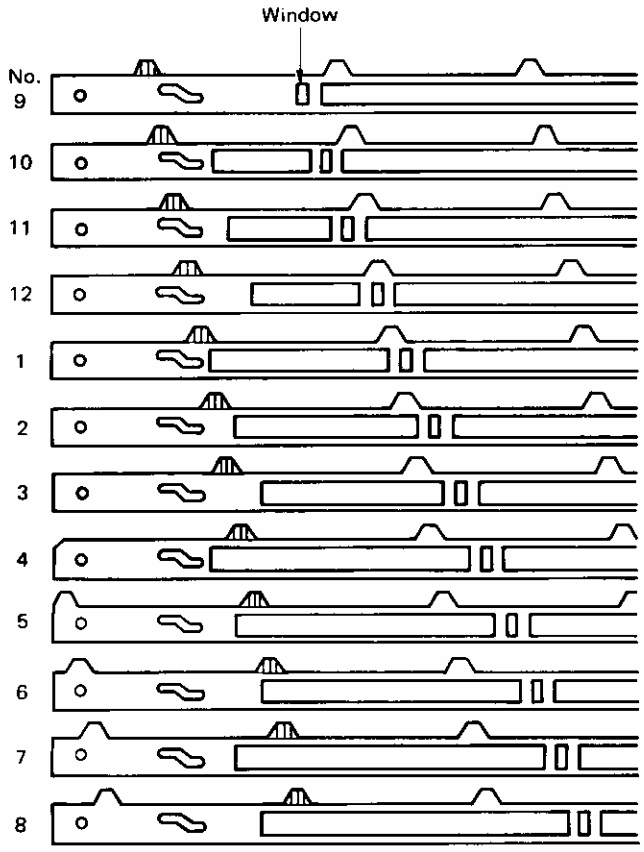


ASSEMBLY

(1) Insert selector plates into selector plate lift pins (h) of selector plate holder 1 (e) according to inserting order.
(2) Set selector plate holder 2 (c) into the selector plate lift pins of selector plate holder 1 (e).
(3) Tighten selector plate holder set screw (d). (Adjust clearances between selector plate holders and selector plates, at 3 points of portion B (left, center, and right), within the range of 0.8 and 1.2 mm by use of thickness gauge.)
(4) Set selector plate holder shaft (i) and shim washer (b) into selector link and clamp them with E stop ring (a).
(5) For assembly of jacquard base plate, see the steps 1 to 16 of DISASSEMBLY in "VI-7 Replacement of Jacquard Base Plate (Assy)."



— Discrimination between selector plate numbers —



When selector plates are arranged, the window of selector plate No. 9 is located at left end.

NOTE

(1) When selector plates are inserted, be sure to set washers between No. 2 and No. 4 and between No. 4 and No. 6.

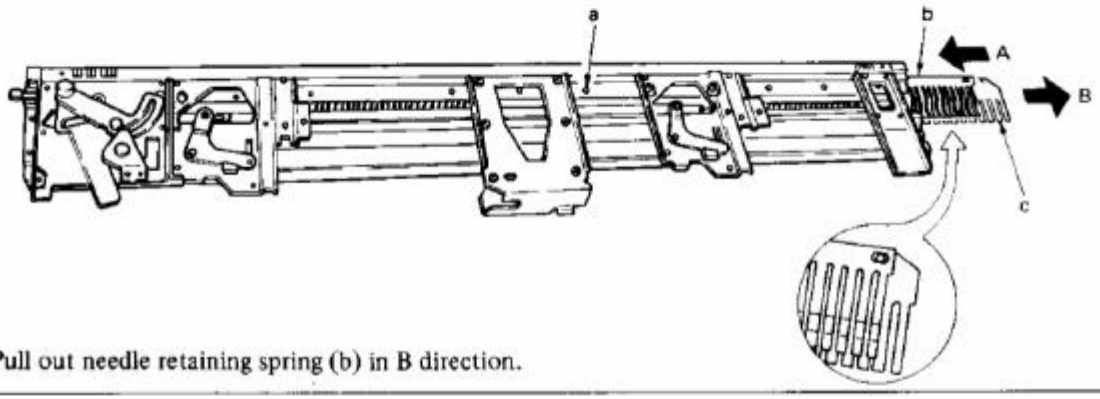
(2) Exercise care not to insert selector plates in wrong order.

VI-9 Replacement of Needle Retaining Spring

DISASSEMBLY

(1) To remove jacquard base plate (assy), follow the steps 1 to 7 in "VI-7 Replacement of Jacquard Base Plate (Assy)."

(2) Reverse needle bed and unscrew 13 needle retaining spring set screws (a).



(3) Pull out needle retaining spring (b) in B direction.

ASSEMBLY

(1) Insert needle retaining spring (b) in A direction.

(2) Align the thread holes of needle guide plate (b) and needle retaining spring (c), and tighten them.

(3) Thereafter, install jacquard base plate (assy) according to the steps 7 to 1 of DISASSEMBLY in "VI-7 Replacement of Jacquard Base Plate (Assy)."

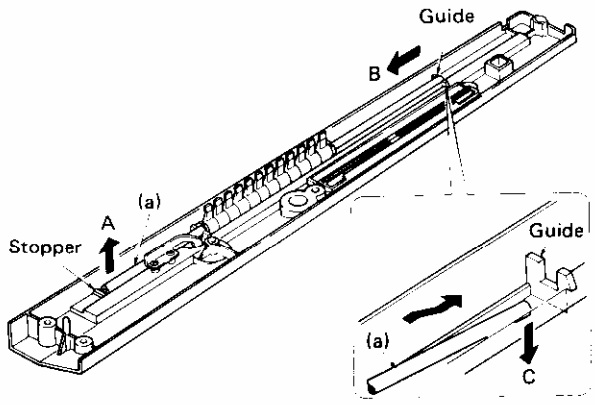
NOTE

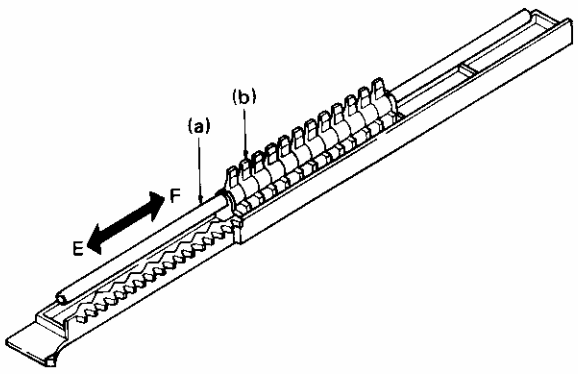
(1) When inserting needle retaining spring, exercise care not to catch needle retaining spring in latch needles, etc. so that the spring is not bent.

VI-10 Replacement of Push Buttons

DISASSEMBLY

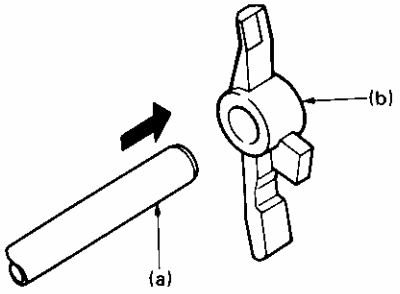
(1) Remove pattern board (1). (See VI-7.)
(2) Fully shift button shaft (a) in B direction.
(3) By lifting the left end of button shaft (a) in A direction, disengage button shaft from stopper and push it in B direction.
(4) When the right end of button shaft (a) is disengaged from guide, pull it out in D direction while simultaneously pushing it in C direction.
(5) Pull out button shaft (a) in E or F direction to remove push buttons.

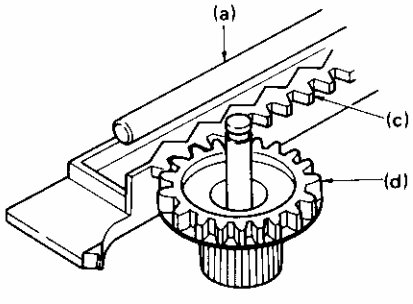




ASSEMBLY

(1) Insert button shaft (a) into push buttons (b).
(2) Align the gear of manual pattern selection base (c) with the gear of zigzag dial (d).
(3) Install in reverse procedure of disassembly steps (4) and (3).
(4) Make sure that zigzag dial moves smoothly and push buttons can be positively set.

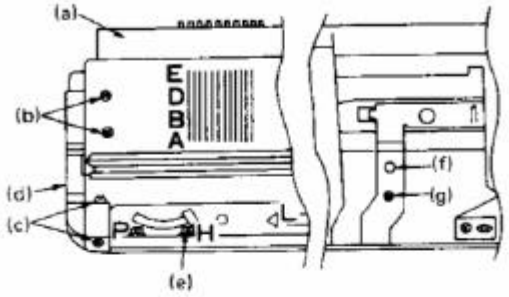


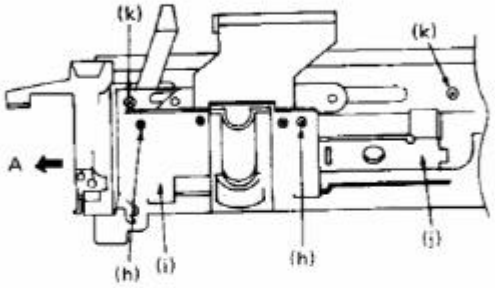


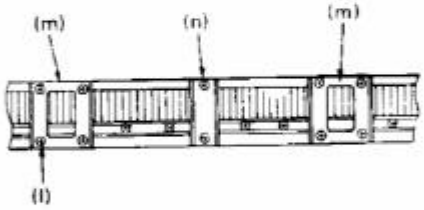
VI-11 Replacement of Ribber Needle Retaining Spring (KR504, KR505)

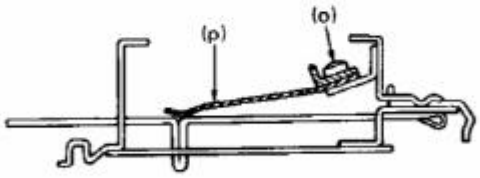
DISASSEMBLY

(1) Unscrew 4 set screws (b) from needle bed (a).
(2) Unscrew 2 set screws (c), respectively, and remove right and left case end plates (d).
(3) Remove the knob (e) of half pitch lever.
(4) Set needle bed to back side and unscrew set screw (g) from connecting plate (f).
(5) Unscrew 1 set screw from case cover.
(6) Remove case cover from needle bed.
(7) Unscrew 2 set screws (h) from left needle bed plate.
(8) Unscrew 2 set screws (k) from swing link (assy) (j).
(9) Pull out left bed plate (i) in A direction.
(10) Unscrew 2 set screws and remove right bed plate.
(11) Unscrew 10 set screws (1) and remove needle bed connecting plates (m) and (n).
(12) Unscrew 13 set screws and remove needle retaining spring presser plate (o) and needle retaining spring (p).









ASSEMBLY

(1) After locating the nicked corner of needle retaining spring (k) at right, align the holes of needle retaining spring with the holes of holder plate.

(2) Place needle retaining spring presser plate (o) over needle retaining spring (p) and temporarily tighten 13 set screws (q).

(3) Install right bed plate (with 2 set screws).

(5) Insert left bed plate (i) into needle bed and temporarily set swing link (assy) (g) to needle bed (with 2 set screws).

(6) Install left bed plate (i) to guide plate (r) **(with 2 set screws).**

(7) Install ribber to main machine and set half pitch lever to "P." After this, make sure that the latch needles (s) of main machine and those of ribber are located in line.

(8) If needle positions are dislocated, make adjustment as follows:

(8-1) Loosen set screws (k) and move swing link (assy) (j) in A and B directions.

(9) Tighten set screws (k) in swing link (assy) (j).

(10) Install in reverse order of disassembly steps (1) to (5).