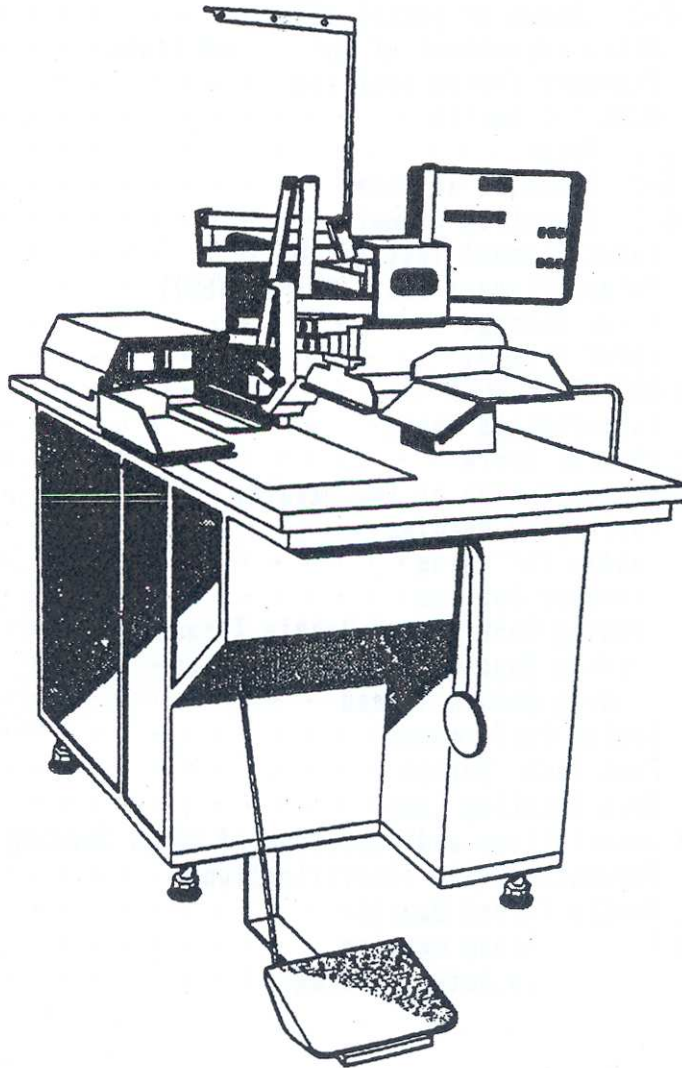


**AMF REECE**  
*Better Ideas, Better Made*

# Series 48

Lockstitch Pocket Welting Machines  
for  
Patch, Flap Loader and Stacker



Service Manual

# Contents

	Page
1. Description . . . . .	1
2. Numbering of Model Plate . . . . .	1
3. General Specifications . . . . .	2
4. Installation . . . . .	3
4-1 Unpacking . . . . .	3
4-2 Installation . . . . .	3
4-3 Removing Carriage Shipping Lock . . . . .	3
4-4 Connection of Power Cords . . . . .	3
4-5 Connection of Air System . . . . .	3
4-6 Lubrication . . . . .	3
4-7 Sewing Machine Rotation . . . . .	4
5. Instruction for Control Panel . . . . .	5
5-1 Switches on Control Panel . . . . .	5
5-2 Handling of Keys . . . . .	8
5-2-1 Setting cycle sewing . . . . .	8
5-2-2 Selection of pocket size . . . . .	9
5-2-3 Change of pocket size . . . . .	10
5-3 Micro adjustment of Knives and Flaps . . . . .	10
5-4 Standard sewing position . . . . .	11
5-5 MODE SET Switch . . . . .	12
5-5-1 Modes . . . . .	12
5-5-2 Function of Modes . . . . .	12
5-5-3 Operation example . . . . .	17
5-6 Input Element Test (INPUT TEST) . . . . .	17
5-7 Output Element Test (OUTPUT TEST) . . . . .	17
5-8 Error Message . . . . .	18
5-9 INPUT ELEMENT . . . . .	19
5-10 OUTPUT ELEMENT . . . . .	20
5-11 Intermediate Board . . . . .	21
5-12 Control Board . . . . .	22
6. Proper Operation of the Machine . . . . .	23
6-1 Installing Needles . . . . .	23
6-2 Needle Threading . . . . .	23
6-3 Removing Bobbins . . . . .	23
6-4 Loading Bobbins and Bobbin Threading . . . . .	24
6-5 Holding Needle and Bobbin Thread . . . . .	24
6-6 Winding Bobbin Thread . . . . .	24
6-7 Sewing Performance . . . . .	25
6-8 Foot Pedal Switch . . . . .	26
6-9 Work Locating Lamp . . . . .	26
6-10 Descriptions and Functions of Metal Sensing Switches . . . . .	27
6-11 Pneumatic Valve Identification . . . . .	28
6-12 Needle Thread Monitor . . . . .	29
6-13 Bobbin Thread Monitor . . . . .	29
7. Notice Before Actual Sewing . . . . .	30

8.	Adjustment . . . . .	30
8-1	Adjustment of timing between Rotary Hook and Thread Take-up . . . . .	30
8-2	Adjustment of timing between Needle and Rotary Hook . . . . .	30
8-3	Application of Gauge (For Needle and Rotary Hook) . . . . .	32
8-4	Replacement of Center Knife . . . . .	33
8-5	Replacement of Tab Knife . . . . .	33
8-6	Adjustment of Tab Knife . . . . .	34
8-7	Replacement of Needle Thread Trimming Knife . . . . .	34
8-8	Replacement of Bobbin Thread Trimming Fixed Knives . . . . .	35
8-9	Replacement of Bobbin Thread Trimming Movable Knife . . . . .	35
8-10	Adjustment of Carriage . . . . .	36
8-11	Adjustment of Patch Guide . . . . .	38
8-12	Adjustment of Needle Thread Mount Block . . . . .	39
8-13	Adjustment of Jumping Guide . . . . .	39
8-14	Conversion between Single Welting and Double Welting . . . . .	40
8-15	Adjustment at the change of Patch Guide . . . . .	41
8-16	Adjustment at the change of Needle Bite Size . . . . .	41
9.	Adjustment of Sewing Operation . . . . .	42
9-1	Tab Knife position . . . . .	42
9-2	Adjustment of Optics Sensor . . . . .	43
10.	Diagnosis of Trouble . . . . .	44
10-1	Listing of sewing troubles and their correction . . . . .	44
10-2	Listing of Sewing Head Troubles and their Correction . . . . .	45
11.	Adjustment of Patch Loader . . . . .	46
11-1	Adjusting the timing of Needle Plate . . . . .	46
11-2	Adjusting the position of Patch Space . . . . .	46
12.	Adjustment of Flap Loader . . . . .	47
13.	Operation Sequence of Patch Loader and Flap Loader . . . . .	48
13-1	Patch Loader . . . . .	48
13-2	Flap Loader . . . . .	49
14.	Stacker . . . . .	50
14-1	Coat Stacker (MODE No.84→0) . . . . .	50
14-2	Trouser Stacker (MODE No.84→1) . . . . .	50
14-3	Remover (MODE No.84→2) . . . . .	51
14-4	Air Ejector (MODE No.84→3) . . . . .	51

## 1. Description

Lockstitch Pocket Welting Machine (for attaching flaps)

## 2. Numbering of Model Plate

(example)    S 4 8 - J A 1 0 - 1 8 5 D - 2 2 J - 1 0 0  
                  |           | | |           | |           | |           |  
                  ①           ②③④           ⑤ ⑥           ⑦ ⑧           ⑨

- ① Symbol of Series
- ② Kind of Patch and/or Flap Loader  
E: without Patch and Flap Loader  
F: Patch Loader(Right), Complete Set  
G: Patch Loader(Left), Complete Set  
H: Patch and Flap Loader, Complete Set  
(P=Right, F=Left)  
J: Patch and Flap Loader, Complete Set  
(P=Left, F=Right)
- ③ Kind of Rack Leg  
A: Adjustable Foot
- ④ Needle Bite Size  
10: 10mm  
12: 12mm
- ⑤ Size of Patch Guide  
185: 18.5mm  
220: 22.0mm
- ⑥ Kind of Welting  
S: Single welting  
D: Double welting
- ⑦ Indication of Operating Voltage  
22: 220 V  
38: 380 V
- ⑧ Phase, Frequency and Motor  
J : 3 phase, 60 Hz, positioner motor  
C : 3 phase, 50 Hz, positioner motor
- ⑨ Language of Panel Indication  
100: English  
400: Japanese

### 3. General Specifications

Model: Series 48 (attaching flaps)  
Description: Lockstitch Automatic Pocket Welting Machine  
(for attaching flaps)  
Measurements: Width: 75 cm (not with Stacker)  
Length: 145 cm  
Height: 182 cm (including Thread Stand)  
Weight: Gross 350 kg (including Sewing Head and Stacker)  
Application: Welting to the reverse of front facing of trousers and  
slacks, attaching flaps on suit and jacket and welting  
of pocket.  
Sewing Head: LT2-B833 (2-needle rockstitch machine with center knife)  
Stitch Type: ISO(301·301)  
Sewing Speed: Max. 3000 spm  
Ordinary 2000 spm  
Needle Bite Size: 10 mm, 12 mm  
(14, 16, 18 and 20 mm are available on special order)  
Needle to be used: Schmetz 190R #100 or Organ Mt×190 #16  
Material to be sewn: light~medium-heavy  
Sewing Length: 40~180 mm (available up to 220 mm on special order.)  
Center Knife: Upper driving system  
Feed: Numerial Control type with I/O check function using  
stepping motor  
Control System: by micro-computer, contactless type  
Power Supply: Standard — 3-phase, 200 V, 50/60 Hz  
Power consumption: 700 W  
Air Supply: Pneumatic pressure: 5kgf/cm<sup>2</sup>  
Air consumption: 12 l/min

## 4. Installation

### 4-1 Unpacking

After unpacking carefully, check the damage on each parts of machine.

### 4-2 Installation

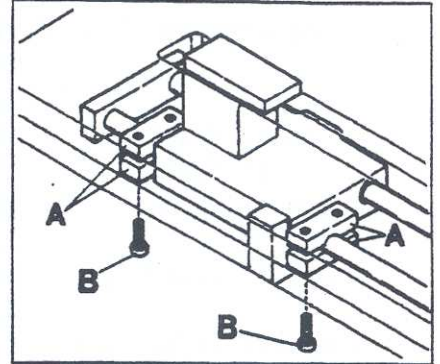
Adjust the height and level using four adjustable feet.

Similar adjustment should be made for the machine with casters.

### 4-3 Removing Carriage Shipping Lock

To prevent the Carriage from moveing in transit, it was pushed back and fastened both at front and rear with Split Clamps(A).

Remove Screws(B) and Clamps(A).



### 4-4 Connectinon of Power Cords

Connect red, black and white cords to the power supply system of the factory (AC 200 V). Green cord is an earth line. Grounding must be complete.

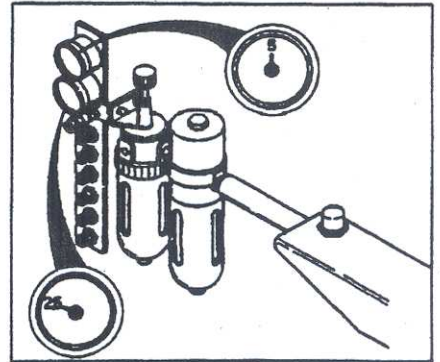
Note: In case of incomplete connection, malfunctioning might occur by electric noise.

### 4-5 Connection of Air System

Connect the Air Supply Horse with Coupler and fit the hose band without fail.

Set the air pressure to 0.5 MPa (5kgf/cm<sup>2</sup>) and 0.25 MPa (2.5kgf/cm<sup>2</sup>) respectively.

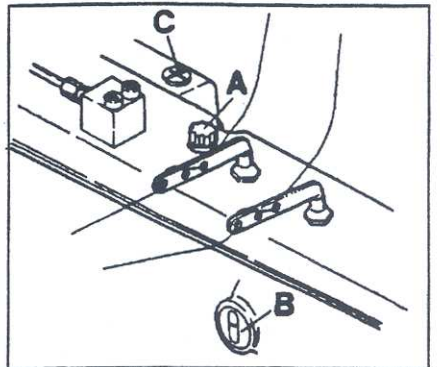
Air Supply pressure must be over 0.6 MPa (6kgf/cm<sup>2</sup>). Filter and Oil Mist Separator are automatic; therefore they will automatically purge unnecessary condaensation.



### 4-6 Lubrication

#### \* Filling Oil Reservoir

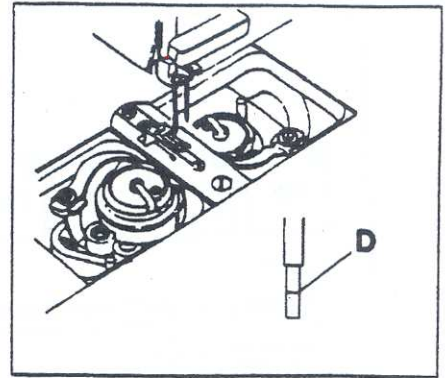
Remove Oil Seal Plug(A) and fill the oil up to the mark at Sight Gauge(B). Add oil before the oil level disappears at Sight Gauge without fail. Before operating Sewing Head, feed oil to the Position(C) without fail.



\* Lubricating Rotary Hook

Remove two Oil Gauges(D) (which acts as dip sticks) add oil up to the mark on the gauge through the gauge holes.

※ When the oil decreases to the tip of the gauge, lubricating to Rotary Hook stops.

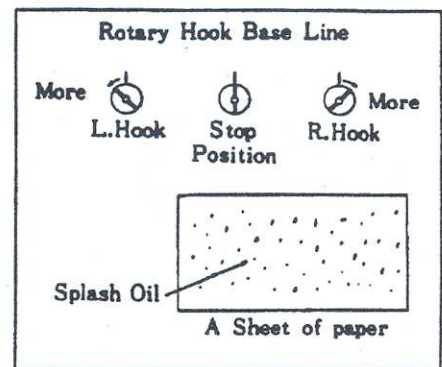
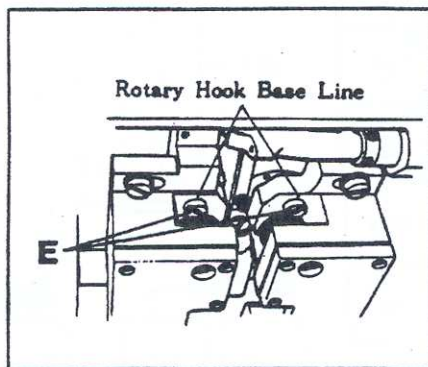


\* Adjusting the Rotary Hook oil flow

Adjust the oil flow by turning Screws(E) to the base line of Rotary Hook.

※ When changing Rotary Hook, adjust the rotary hook oil flow as shown in the illustration without fail.

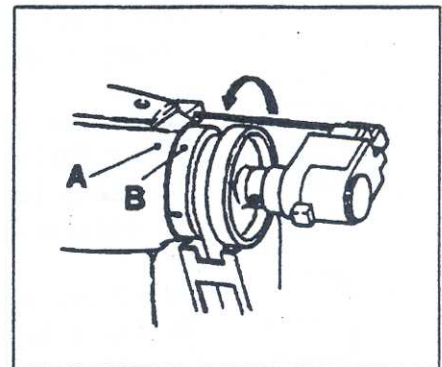
(The oil scattered from Rotary Hook should look like the illustration below after 10 seconds.)



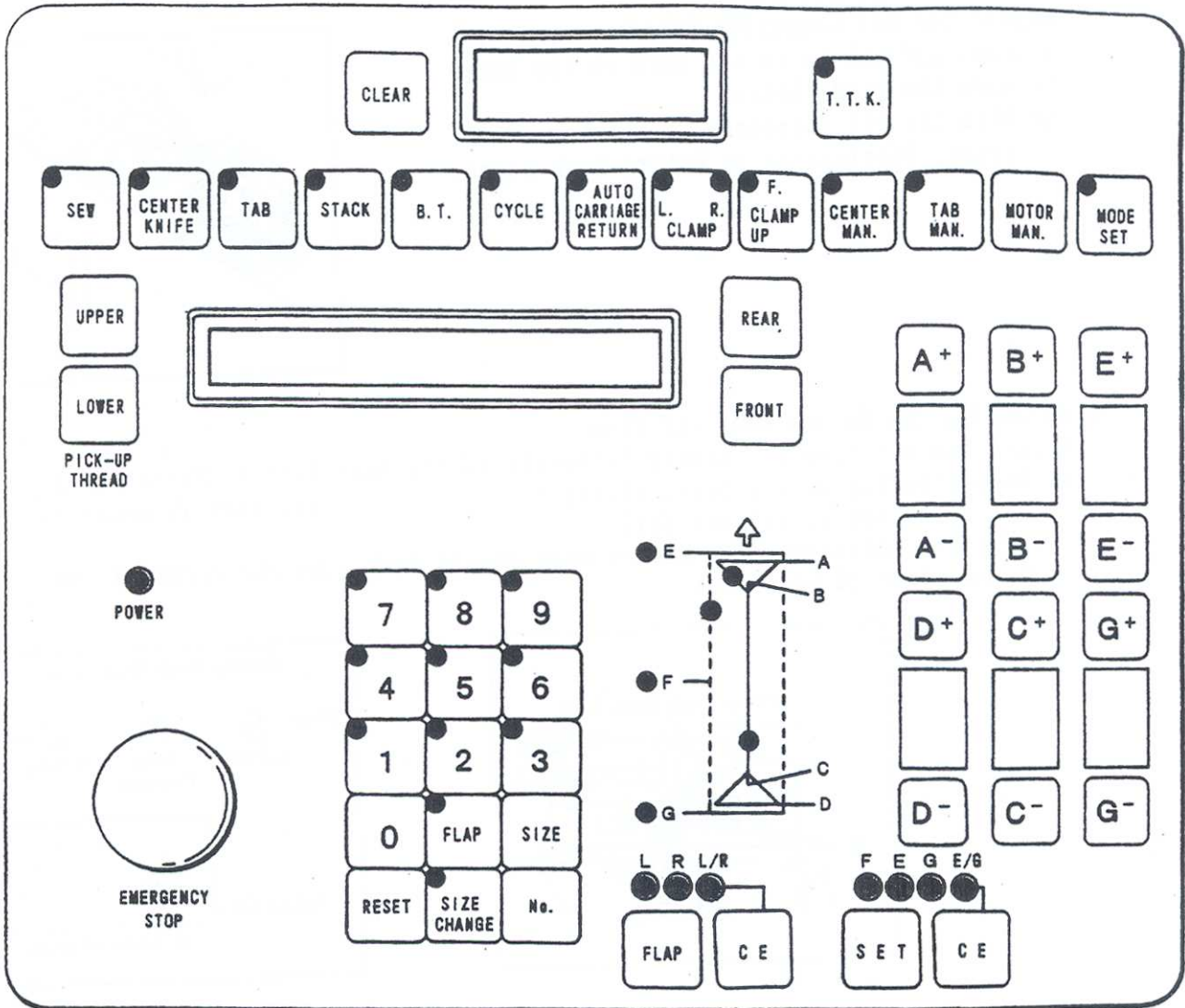
**4-7 Sewing Machine Rotation**

With the red mark(A) of the machine and the white mark(B) of Pulley are not aligned, turn Power Switch on, and make sure that the machine rotates counter-clockwise seen from Pulley side.






If it rotates clockwise, interchange any two of the red, black or white wires located on the end of the machine Power Cord.










## 5. Instruction for Control Panel








### 5-1 Switches on Control Panel

- (1)  Switch for sewing.  
Sewing is done when Lamp is on.
- (2)  Switch for operating Center Knife.  
Center Knife operates when Lamp is on.  
When Lamp for **SEW** is off, even if this Lamp is on, Center Knife does not operate.
- (3)  Switch for operating Tab Knife.  
Tab Knife operates when Lamp is on.  
When Lamp for **CENTER KNIFE** is off, even if this Lamp is on, Tab Knife does not operate.
- (4)  Switch for actuating Stacker.  
Stacker operates when Lamp is on.
- (5)  Switch for back-tacking.  
Back-tacking is done when Lamp is on.  
When Lamp is off, the stitches become short-dense both at sewing start and sewing finish.








- (6)  Cycle sewing is done when Lamp is on.
- (7)  (Auto Carriage Return)  
Carriage returns automatically when Lamp is on.  
When Lamp is off, it returns by pressing Knee Switch.
- (8)  (Left Right Clamp)  
When treadling Pedal, Clamp Foot on the side which Lamp is on lowers first.  
When both Lamps are on, both Clamp Feet lower simultaneously.
- (9)  (Front Clamp Up)  
When Lamp is on, Clamp Foot return holding the fabric.  
When Lamp is off, Clamp Foot release the fabric after Tab Knife cuts the fabric.
- (10)  (Center Manual)  
Center Knife can be lowered manually.  
This is used when replacing and adjusting the Knife.
- (11)  (Tab Manual Up)  
Tab Knife can be raised manually.  
This is used when replacing and adjusting the Knife.
- (12)  (Sewing Motor Manual)  
The Machine Motor rotates while pressing this Switch.

Note: (10), (11) and (12) actuate only when Carriage is in the rear.

- (13)  The memory are changed and the check of I/O elements is done by this switch. Refer to Items 5-5, 5-6, and 5-7.
- (14)  While this is pressed, Trimming Hanger lowers.
- (15)  Switch for bobbin thread trimming.
- (16)  Switch for Carriage back.  
When pressed, Carriage backs till it reaches to the rear end.
- (17)  Switch for Carriage forward.  
When pressed, Carriage moves forward till it reaches to the front end.

Note: (16) and (17) move slowly when Emergency Switch actuates.  
When Needle is lowered or Tab Knife is raised, "EMERGENCY STOP" operates.

- (18)  This makes numeral on Pocket Counter "zero".
- (19)  micro-adjustment of Tab Knife  
This calls 2nd function for adjusting Tab Knife.
- (20)  This is used to return Patch Loader to the initial state or to release "EMERGENCY STOP".
- (21)  This selects which Flap Clamp operate first, right or left.  
When L/R Lamp lights, left and right flap change alternately according as each sewing are done.
- (22)  When the above **FLAP** operates and L/R is in condition of selecti  
Left and right flap sewing is changed.

## 5-2 Handling of Keys

### 5-2-1 Setting cycle sewing

When Lamp is on by pressing **CYCLE**, cycle sewing can be set.

Keys **1** - **9** should be used as follows:

**1** - **6** 6 types of cycle sewings can be memorized.

**7** Cursor (square gone on and off) can be moved to left on display.

**8** Process can be selected in sewing length, attaching flap, and operating Stacker.

Whenever pressing the key **8**, the number and letter at the cursor are changed as follows:

1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → L → R → - → □

And then, the process will return to "1".

The above numbers from 1 - 9 mean the number of sewing length, "L" and "R" mean right and left of flap sewing, and "-" means the operation of Stacker. And, "□" is blank, which means no data.

Note: When "-" or "□" is shown at the cursor, even if fabric is set and Knee Switch is pressed, **NO CYCLE DATA** is shown and the Machine beeps. The Machine does not start.

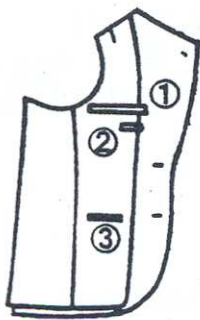
**9** Cursor can be moved to right on display.

#### <Setting example>

Sewing length has already been inputted from **1** to **9** keys.

**1**=40 **2**=50 **3**=60 **4**=80 **5**=100 **6**=120 **7**=140 **8**=160 **9**=180

For example, the process for sewing facing on upper wear is as follows:



① sewing length: 6 (120 mm)

② sewing length: 1 (40 mm)

③ sewing length: 5 (100 mm)

④ Stacker

Note: Data at the cursor is shown on the right side of the mark \*. The number in \*120 means sewing length. The letter in \*STK means Stacker operation and \*FLP means flap sewing.

Press **CYCLE** on Control Panel.  
Press the key **1**. (or **2** - **6** keys)

**8 8 8 8 8 8**  
(To set sewing length no. 6.)

**9**  
(To move cursor to right by one.)

**8**  
(To set sewing length no. 1.)

**9**  
(To move cursor to right by one.)

**8 8 8 8 8**  
(To set sewing length no. 5.)

**9**  
(To move cursor to right by one.)

**8 8 8 8 8 8 8 8 8 8 8 8**  
(To set the Stacker operation.)

Let's start cycle sewing!

Sewing process will start in the position where cursor goes on and off. Cursor should be moved to the desired position by the key **7** or **9** if necessary and then the Machine should be started. To finish cycle sewing, press **CYCLE** again.

### 5-2-2 Selection of pocket size

There are 9 sizes available - from No.1 to No.9.

Any sizes can be selected by pressing key **1** - key **9**, and then the Lamp on the key lights and the size is indicated on the display.

For attaching flap, it becomes Flap Mode by pressing the key **FLAP**.

(Example)

initial state

press **5**

press **FLAP**

indication on display

NO CYCLE DATA

6 \* 120

6 \*

6 1 \* 40

6 1 \*

6 5 \* 100

6 5 \*

6 5 - \* STK

indication

NO. 1 SIZE 40

NO. 5 SIZE 100

FLAP MODE

### 5-2-3 Change of pocket size

(Example) To change No.1 size from 40mm to 45mm and to change No.5 size from 100 mm to 105 mm.

<u>key handling</u>	<u>indication</u>
initial state	NO. 2 SIZE 60
<b>SIZE CHANGE</b>	NO. 2 SIZE 60
<b>No.</b> . . . . .	NO. 2 SIZE 60
<b>1</b> . . . . .	NO. 1 SIZE
<b>SIZE</b> . . . . .	NO. 1 SIZE
<b>4</b> . . . . .	NO. 1 SIZE 4
<b>5</b> . . . . .	NO. 1 SIZE 45
<b>No.</b> . . . . .	NO. 1 SIZE 45
<b>5</b> . . . . .	NO. 5 SIZE
<b>SIZE</b> . . . . .	NO. 5 SIZE
<b>1</b> . . . . .	NO. 5 SIZE 1
<b>0</b> . . . . .	NO. 5 SIZE 10
<b>5</b> . . . . .	NO. 5 SIZE 105
<b>SIZE CHANGE</b>	NO. 2 SIZE 60

The pocket size is returned to the condition before change.

### 5-3 Micro adjustment of Knives and Flaps

- \* **A<sup>+</sup>** **A<sup>-</sup>** Micro adjustment of Tab Knife at sewing start.
- \* **D<sup>+</sup>** **D<sup>-</sup>** Micro adjustment of Tab Knife at sewing finish.
- \* **B<sup>+</sup>** **B<sup>-</sup>** Micro adjustment of Center Knife at sewing start.
- \* **C<sup>+</sup>** **C<sup>-</sup>** Micro adjustment of Center Knife at sewing finish.
- \* **E<sup>+</sup>** **E<sup>-</sup>** Micro adjustment of flap sewing at sewing start.
- \* **G<sup>+</sup>** **G<sup>-</sup>** Micro adjustment of flap sewing at sewing finish.

The above change is at intervals of 0.5 mm.

#### 5-4 Standard sewing position

\* Standard sewing position is selected by key **SEI**.

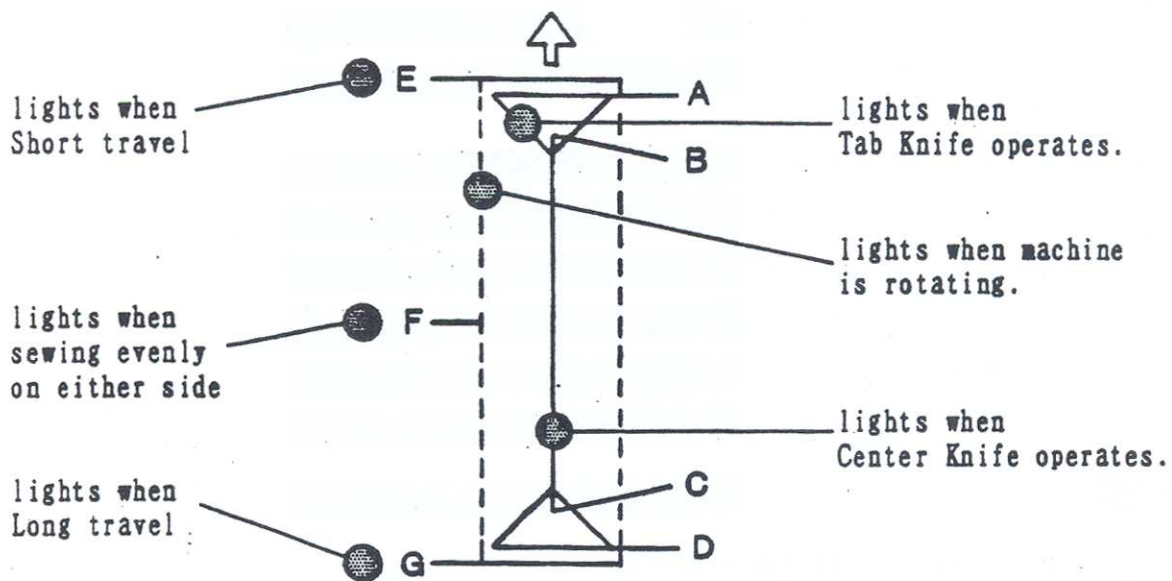
Lamp F: Sewing is done evenly on either side of the point 140 mm from needle drop position.

Lamp E: Short travel (based on sewing start).

Lamp G: Long travel (based on sewing finish).

Lamp E/G: Alternate sewing, Short travel and Long travel.

Short travel or Long travel is selected when Lamp E/G is on by pressing key **CE**.



## 5-5 MODE SET Switch

### 5-5-1 Modes

<u>Mode No.</u>	<u>Mode</u>	<u>Mode No.</u>	<u>Mode</u>
00	PANEL & MODE LOCK	21	DARTS SYSTEM
01	SEQUENCE	22	DARTS TIMER
02	SHORT DENSE	23	BACK STITCH
03	SHORT STITCH	24	FLAP LOADER
04	CENTER DENSE	25	PATCH LOADER
05	C. KNIFE START	26	AUTO PICK UP
06	C. KINFE FINISH	27	FLAP CLAMP SQ.
07	T. KNIFE START	28	AUTO PEDAL
08	T. KNIFE FINISH	29	AUTO START
09	L. FLAP START	30	CLAMP SQ.
10	L. FLAP FINISH		
11	R. FLAP START	78	INPUT TEST
12	R. FLAP FINISH	79	OUTPUT TEST
13	B. BLADE TIMER	80	ROM NO. X. XX
14	RETURN TIMER	81	MEMORY LOCK
15	AE TIMER	82	MACHINE TYPE
16	TRIMMER POS.	83	POCKET SIZE
17	TRIMMER TIMER	84	STACKER
18	PIN TIMER	85	ACCELERATION
19	F. L. UP TIMER	86	HIGH SPEED
20	POCKET COUNTER	87	LOW SPEED
		88	TAB SPEED

### 5-5-2 Function of Modes

<u>Mode No.</u>	<u>Mode</u>
00	<b>PANEL &amp; MODE LOCK</b> When set at "0", every item does not function except keys of Number, Flap Mode and Mode on Panel. The modes after Mode No. 02 cannot be accessed. When set at "1", every item can be functioned.
01	<b>OP. SEQUENCE</b> From "0" thru "9" can be used, and Mode 21 thru Mode 30 can be set for each "0" thru "9", i.e. 10 kinds of desired operation can be set.
02	<b>SHORT DENSE</b> This adjusts the pitch of stitches at end sewing. Adjustable in the range from 0.6 mm(numeral 0) to 1.5 mm(numeral 9).
03	<b>SHORT STITCH</b> Adjustable from 1 stitch to 9 stitches.
04	<b>CENTER DENSE</b> This adjusts the pitch of stitches at ordinary sewing and at back-tacking. Adjustable from 1.6 mm(numeral 0) to 3.4 mm(numeral 9).
05	<b>C. KNIFE START</b> This adjusts the position of Center Knife at sewing start. It changes at intervals of about 1 mm.

<u>Mode No.</u>	<u>Mode</u>
06	<b>C. KNIFE FINISH</b> This adjusts the position of Center Knife at sewing finish. It changes at intervals of about 1 mm.
07	<b>T. KNIFE START</b> This adjusts the position of Tab Knife at the sewing start. It changes at intervals of about 2 mm.
08	<b>T. KNIFE FINISH</b> This fixes the position of Tab Knife at sewing finish.
09	<b>L. FLAP START</b> This fixes the position of left flap sewing at sewing start. It changes at intervals of about 1 mm.
10	<b>L. FLAP FINISH</b> This adjust the position of left flap sewing at sewing finish. It changes at intervals of 1mm.
11	<b>R. FLAP START</b> This fixes the position of right flap sewing at sewing start. It changes at intervals of about 1mm.
12	<b>R. FLAP FINISH</b> This fixes the position of sewing finish at the right flap sewing. It changes at intervals of about 1 mm.
13	<b>B. BLADE TIMER</b> For the machine without Patch Loader, this is to set the time until Brush Blade gets out. (0~0.9 second)
14	<b>RETURN TIMER</b> Waiting time when the Carriage returns automatically. (0.2~2 second)
15	<b>AE TIMER</b> This sets the operating time of Air Ejector when Air Ejector is set by MODE 84. (0.2~2 second)
16	<b>TRIMMER POS.</b> This fixes the operating position of Thread Trimmer at the sewing finish. (40~58 mm)
17	<b>TRIMMER TIMER</b> For the adjustment of time during which Thread Trimmer operates. (0~0.225 second)
18	<b>PIN TIMER</b> The time during which Needle Plate of Patch Loader operates. (0.1~0.28 second)
19	<b>F. L. UP TIMER</b> This is the time from the clamp of flap by Flap Clamp to the lift of Flap Loader. (0~0.45 second)



Mode No.      Mode

**20      POCKET COUNTER**

To select the increment of numerals on counters for sewing or for Stacker.

0 : for each sewing

1 : for each operation of Stacker

Note : that the following Mode 21~30 changes according to OP. SEQUENCE No.

**21      DARTS SYSTEM**

When set at "0", DARTS SYSTEM does not operate.

When set at "1", DARTS SYSTEM operate.

When set at "2" Darts Cylinder is raised with full pressure.

**22      DARTS TIMER**

To set the time from pressing the fabric by Clamp Foot to the release of Darts Cylinder.

**23      BACK STITCH**

Stitch number of back-tacking. (0~4 stitch)

**24      FLAP LOADER**

When set at "0", Flap Loader does not operate.

When set at "1", Flap Loader operates in case of Flap Mode.

When set at "2", Flap Loader operates in any mode.

**25      PATCH LOADER**

When set at "0", Patch Loader does not operate.

When set at "1", it operates.

**26      AUTO PICK UP**

When set at "1", Patch Loader and Flap Loader operate during Carriage returns forward.

When set at "0", Patch Loader and Flap Loader operate by actuating Knee Switch.

**27      FLAP CLAMP SQ.**

When set at "1", Left and Right Flap Clamp operate.

In case of inserting flap manually, set it at "1".

When set at "0", Flap Clamps do not operate. But when using Flap Loader left or right side of it to which Flap Loader is attached operates.

**28      AUTO PEDAL**

When set at "1", Clamp Foot, Patch Loader and Flap Loader operate by pressing Knee Switch. At this time, set Patch Loader and Flap Loader to be operated and set Mode 27 at "0".

When set at "2", Clamp Foot, Patch Loader and Flap Loader operate automatically when Carriage returns. Set Mode 26 at "1".

When set at "0", Clamp Foot etc. can be operated by treading Pedal.

**29      AUTO START**

When set at "0", sewing can be started by pressing Knee Switch.

When set at "1" thru "9", sewing starts automatically, and "1" thru "9" functions as a timer for regulating time before the start.

- | <u>Mode No.</u>   | <u>Mode</u>   |
|---|---|
| 30  | <b>CLAMP SQ.</b><br>When set at "0", Clamp Foot is operated by Dual Pressure System.<br>When set at "1", it cannot be operated by Dual Pressure System but can be operated by "change over system" of Left and Right Clamp Foot on Panel.   |
| 31  | <b>L. FLP BT CORR.</b><br>When back-tacking is performed on the left flap, the sewing start position is corrected.  |
| 32  | <b>R. FLP BT CORR.</b><br>When back-tacking is performed on the right flap, the sewing start position is corrected.   |
| Note: Concerning the above 31 and 32, the greater the number, the greater the correction. |   |
| 78  | <b>INPUT TEST</b><br>Refer to Item 5-6.   |
| 79  | <b>OUTPUT TEST</b><br>Refer to Item 5-7.  |
| 80  | <b>ROM NO. X. XX</b><br>This indicates the number of ROM which is now used.   |
| 81  | <b>MEMORY LOCK</b><br>When this is set at "0", MODE NO.82~99 cannot be called up.<br>When this is set at "1", the above becomes possible.<br>This is to prevent the mistake in changing the number.   |
| 82  | <b>MACHINE TYPE</b><br>When set at "0" : for domestic type<br>When set at "1" : The machine operates as an auto-trouser-model for export. (Left Patch Loader, Right Flap Loader)<br>When set at "2" : The machine operates as an auto-coat-model for export. (Right Patch Loader, Left Flap Loader)<br>When set at "3" : for export |
| 83  | <b>POCKET SIZE</b><br>When set at "0" : The pocket size is set from 40 mm to 185 mm.<br>When set at "1" : The pocket size is set from 40 mm to 225 mm.<br>When set at "2" : The pocket size is set from 20 mm to 185 mm.  |
| 84  | <b>STACKER</b><br>This operates when this is set at<br><ul style="list-style-type: none"> <li>"0" : as Coat Stacker</li> <li>"1" : as Trouser Stacker</li> <li>"2" : as Remover</li> <li>"3" : as Air Ejector</li> </ul>  |
| 85  | <b>ACCELERATION</b><br>Adjusting the acceleration of Carriage.  |

- 86    **HIGH SPEED**  
Adjusting maximum speed of Carriage movement.
- 87    **LOW SPEED**  
Adjusting initial speed of Carriage movement.
- 88    **TAB SPEED**  
This adjusts the Carriage speed from the sewing finish to the position of Tab Knife's throw.
- 89    **START SPEED**  
Speed until the fabric is fed to the sewing start position is set.  
The greater the number, the faster the speed.

### 5-5-3 Operation example

For SHORT DENSE

No. 0 2

For POCKET COUNTER

No. 2 0

After this, select the number from 0 to 9.

(example)

MODE SET

No. 0 3 6 ..... (1)  
No. 0 1 1 ..... (2)

By pushing keys as shown (1), SHORT STITCH is set at 6 stiches and by pushing keys as shown (2), OPERATION SEQUENCE (operation of Patch Loader, etc.) is set at "1".

By pushing key **MODE SET** once again, this Mode is released.

### 5-6 Input Element Test (INPUT TEST)

For this, push the keys as follows.

MODE SET No. 7 8

The display : 00 CLAMP FRONT 1(0)

The last digit 1 and 0 indicates ON(1) or OFF(0) of input.  
(In case of No. 41 and No. 42, "ON" and "OFF" are reversed.)

For other input, push keys as follows:

No. X Y (Select 00 - 45 for "X" and "Y".)

For Input element, refer to the item "5-9".

To end this test, press "EMERGENCY STOP"

### 5-7 Output Element Test (OUTPUT TEST)

For this, push the keys as follows.

MODE SET No. 7 9

The display : 00 PANEL TEST

Keeping this condition, push key **UPPER**, then the output element can be checked.

For other test, push the keys as follows:

No. X Y (Select 00 - 33 for "X" and "Y".)

For Output element, refer to the item "5-10".

To end this test, press "EMERGENCY STOP"

## 5-8 Error Message

When the following Error Messages are displayed, correct the items and then press **RESET** key.

MANUAL STOP	This is displayed when "EMERGENCY STOP" is pressed.
LEFT BOBBIN	There is no thread in Left bobbin.
RIGHT BOBBIN	There is no thread in Right Bobbin.
OPTICS SENSOR OFF	Optics Sensor is not functioning.
NEEDLE THREAD	Needle thread is broken.
REFLECTIVE TAPE	Defective Reflective Tape
HEEL BACK	Pedal is heeled back.
NEEDLE NOT UP	Needle is not raised.
TAB NOT LOW	Tab Knife is not lowered.
TAB NOT FRONT	Tab Knife does not return.
UNDER SIZE	Size is too small or too large.
OVER SIZE	
CLAMP NOT FRONT	Carriage is not in the front.
DOOR OPEN	Head Cover is open.
P.G. NOT UP	Patch Guide is not raised.
L. & R. BOBBIN	There is no thread in both left and right Bobbin
BOBBIN CYLINDER	Sensing Bar of Bobbin Thread Monitor does not return.
PATCH SPACE SW	Switch which actuates automatically when Tray comes to the center is not inputted.
PIN SWITCH	Switch on the side of Head Cover is not inputted.
TRAY RET. SW	Switch which actuates when Tray returns is not inputted.
P.G. DOWN SW	Patch Guide Down Switch is not inputted.
F.L. DOWN SW	Flap Loader Down Switch is not inputted.
F.L. UNDER SW	Flap Loader Under Switch is not inputted.
TAB UP SW	Switch which actuates when Tab Knife rises is not inputted.
TAB DOWN SW	Switch which actuates when Tab Knife lowers is not inputted.
NO BATTERY	Battery for keeping data in memory is discharged. Replace Circuit Board or Battery.
TAB SHAFT	Tab Knife Shaft does not return. (Insert Metal Sensing Switch into No. 21 on Intermediate Board.)

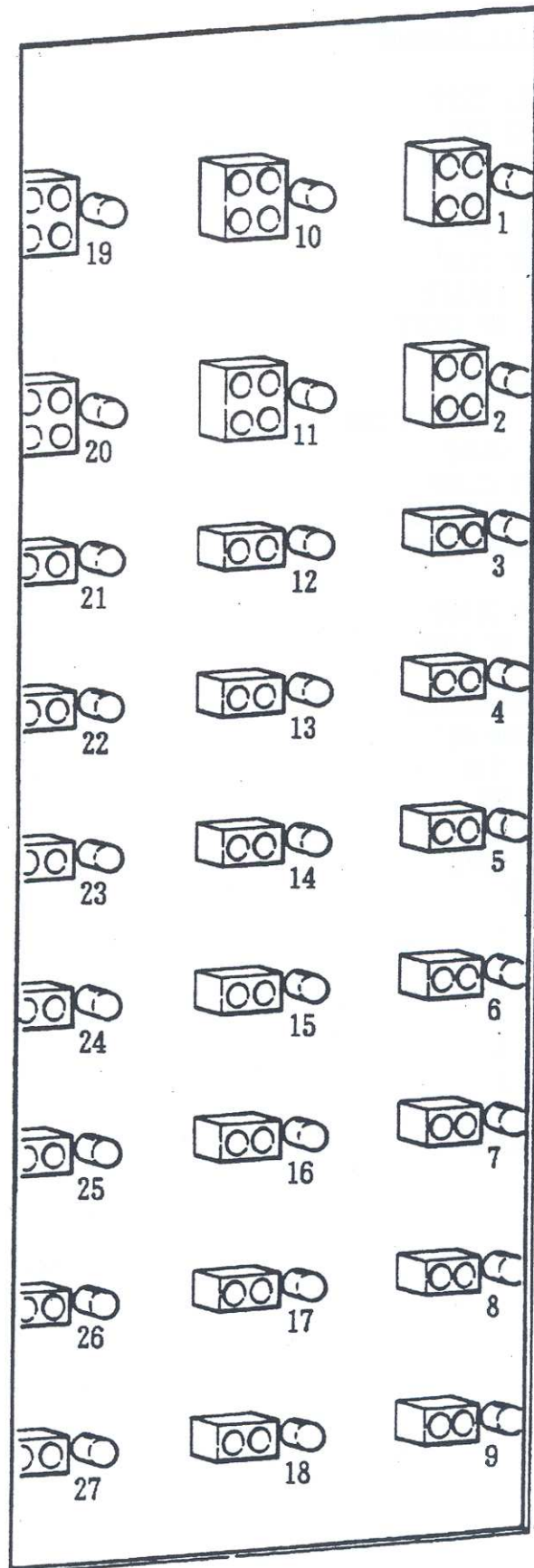
## 5-9 INPUT ELEMENT

<u>No.</u>	<u>Connector No. on Intermediate Board</u>	<u>LED No. on Control Board</u>	<u>Input Element</u>
00	9	1	CLAMP FRONT
01	8	2	SPEED DOWN
02	7	3	CLAMP REAR
03	1	4	L. PHOTO EYE
04	10	5	R. PHOTO EYE
05	6	6	F.L. CENTER
06	5	7	TRAY RIGHT
07	4	8	TAB FRONT
08	—	9	PEDAL 1
09	—	10	PEDAL 2
10	—	11	PEDAL 3
11	—	12	PEDAL 4
12	—	13	PEDAL 5
13	—	14	PEDAL 6
14	2	15	DOOR OPEN
15	18	16	TAB UPPER
16	17	17	TAB LOWER
17	16	18	TRAY CENTER
18	15	19	P.G. LOWER
19	14	20	PIN
20	13	21	F.L. DOWN
21	12	22	P.G. UPPER
22	—	23	SPARE 1
23	—	24	SPARE 2
24	27	25	STACKER 1
25	26	26	STACKER 2
26	25	27	STACKER 3
27	24	28	STACKER 4
28	22, 23	29	BOBBIN CYLINDER
29	19	30	L. BOBBIN BAR
30	19	31	R. BOBBIN BAR
31~38	—	32~39	SPARE
39	21	44	TAB SHAFT
40	—	41	EMERGENCY
41	3	43	KNEE SWITCH
42	20	42	NEEDLE THREAD MONITOR
43	—	44	SPARE
44	—	45	NEEDLE UP
45	—	46	MOTOR OFF

## 5-10 OUTPUT ELEMENT

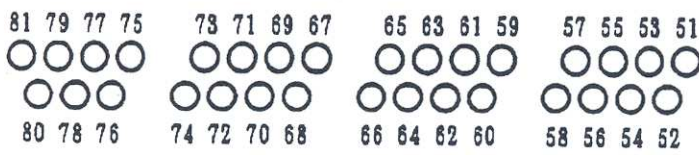
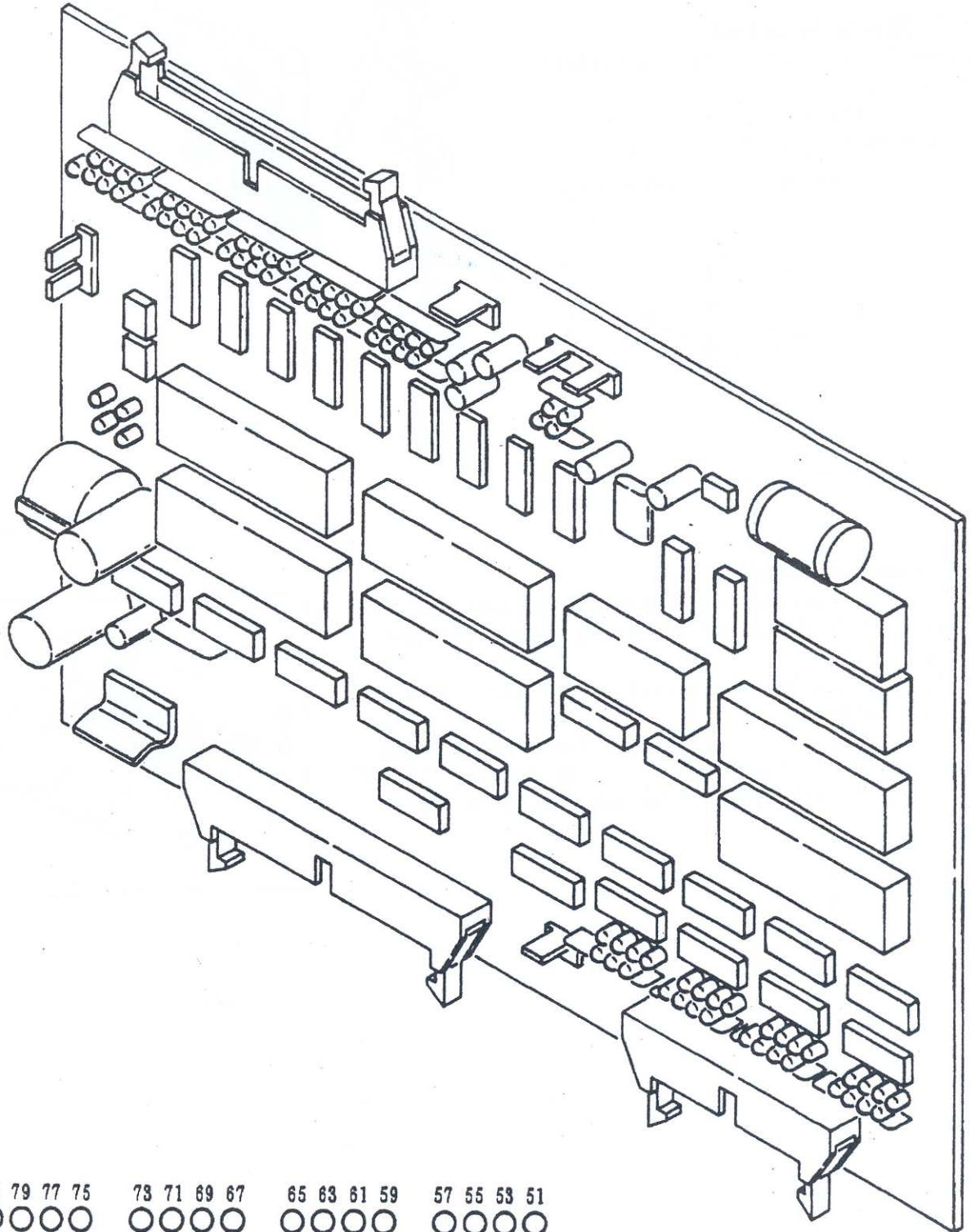
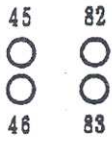
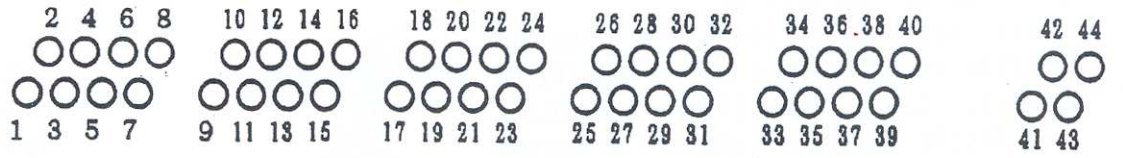
<u>No.</u>	<u>LED No. on Control Board</u>	<u>Output Element</u>
00	—	PANEL TEST
01	51	DARTS CYL.
02	52	PATCH CLAMP
03	53	F.L. DOWN
04	54	OPEN FLAP
05	55	CLAMP FLAP
06	56	FLAP LOADER
07	57	P.G. UP SHORT
08	58	PIN
09	59	PATCH TRAY
10	60	LEFT CLAMP AT LOW
11	61	LEFT CLAMP
12	62	RIGHT CLAMP
13	63	L. FLAP CLAMP
14	64	R. FLAP CLAMP
15	65	AIR
16	66	BRUSH BLADE
17	67	P.G. UP LONG
18	68	P.G. DOWN
19	69	THREAD HOLDER
20	70	TENSION RLS
21	71	CLAMP TAB
22	72	C. KNIFE
23	73	LOWER TRIM
24	74	UPPER TRIM
25	75	TAB UP
26	76	STACK 1
27	77	STACK 2
28	78	STACK 3
29	81	SPARE 1
30	80	SPARE 2
31	79	SPARE 3
32	82	HIGH MOTOR
33	83	LOW MOTOR

5-11 Intermediate Board (Connector No.)





5-12 Control Board(LED No.)



## 6. Proper Operation of the Machine

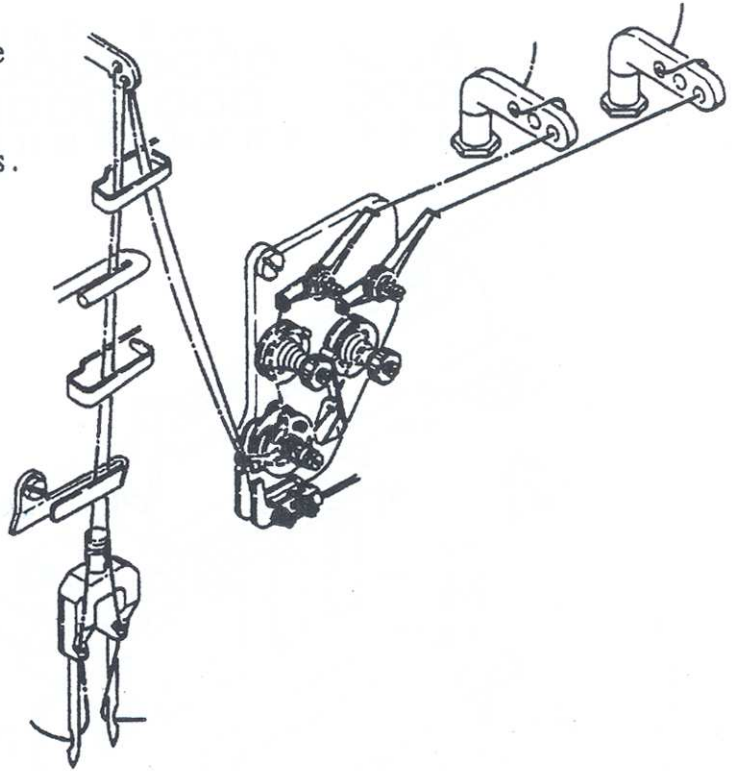
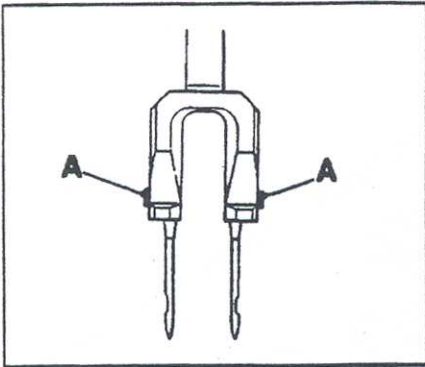
### 6-1 Installing Needles

After loosening Screws(A), holding the needles with the long groove facing inward, insert them all the way into the Needle Head and tighten the screws.

### 6-2 Needle Threading

Raise Thread Take-up to its highest position.

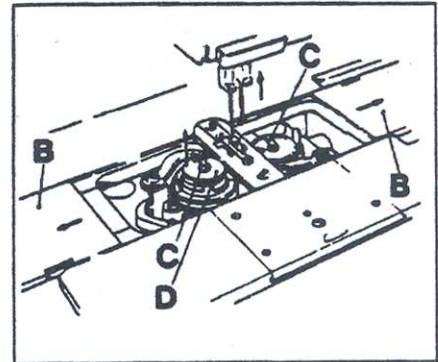
Pass the thread through the needle eyes from inside to out side.



### 6-3 Removing Bobbins

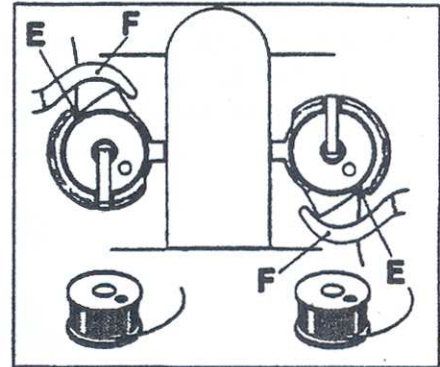
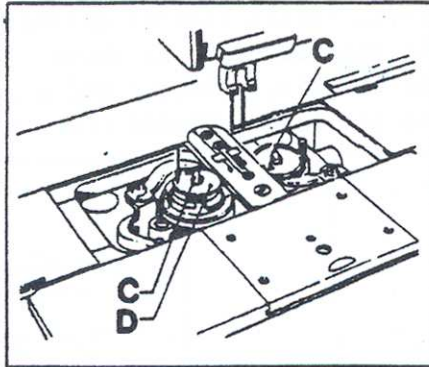
- ① Raise the needles to their highest position and open Slide Plates(B) by moving them right and left.
- ② Pull Rotary Hook Latches(C) upward and remove the Bobbins(D).

Note: In case the bobbin thread are held by Fixed Knife, release the holding by pushing "LOWER" of "PICK-UP THREAD" Switch on Control Panel.



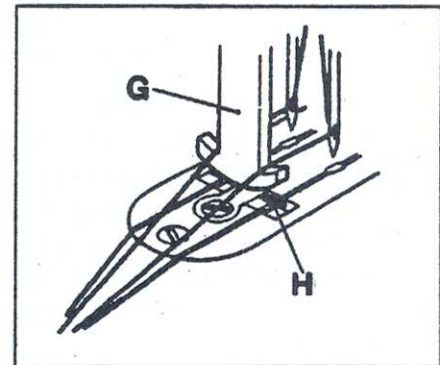
#### 6-4 Loading Bobbins and Bobbin Threading

- ① Raise the needles to their highest position and raise Rotary Hook Latches(C) upward.
- ② Holding Bobbins(D) so that the end of thread can be turned to the right and place Bobbins(right and left) into Bobbin Case.
- ③ Close the Latches(C) of Rotary Hook.
- ④ Draw out the end of thread about 50 mm, pass the thread through the slit(E) in Rotary Hook and put it under Bobbin Case Opener(F).
- ⑤ Manually turn the machine driving pulley to bring bobbin thread above Throat Plate.
- ⑥ Pull up the bobbin threads and, holding Bobbin(D) not to turn, pull the two thread forward.  
(By doing so, the correct threading is assured.)



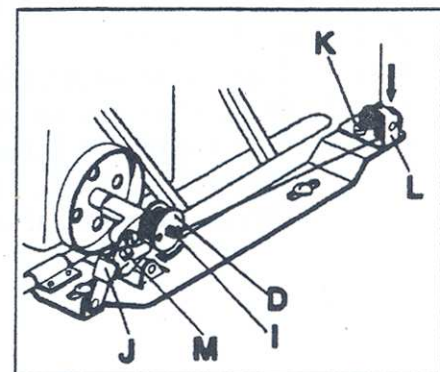
#### 6-5 Holding Needle and Bobbin Thread

- ① Align the red mark on Sewing Head with the white mark on Machine Pulley.
- ② Pull the needle and bobbin threads backwards.
- ③ Push in "PICK-UP THREAD" "UPPER" Switch and keep this condition. At this time Pick-up(G) lowers.
- ④ Pass the two needle threads over Upper Thread Pick-up(G). Release the switch; the thread will be trimmed and clamped.
- ⑤ Keep "PICK-UP THREAD" "LOWER" Switch on Control Panel in the pressed condition. Bobbin Thread Trimming Knife(H) moves to the right.
- ⑥ Pass the two bobbin thread through the slit of Throat Plate.  
Release the switch; the threads will be trimmed and clamped.



#### 6-6 Winding Bobbin Thread

- ① Push Bobbin(D) onto Bobbin Winder Shaft(I).
- ② Push Bobbin Winder Stop Latch(J) downward.
- ③ Wind the thread around Bobbin(D) several times in the direction of arrow.
- ④ Operate the machine.
- ※ If the thread cannot be wound evenly, loosen Screw(K) and adjust by moving Thread Guide(L) to the side as required.
- ※ To wind more thread, screw in Screw(M).

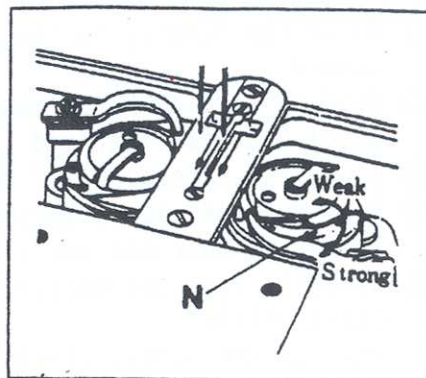


## 6-7 Sewing Performance

### ① Bobbin Thread Tension

Adjust the bobbin thread tension by turning Tension Screw(N), as the proper bobbin thread tension varies according to the fabrics and threads.

- ※ When using span yarn #50, the standard tension is 40~50g for medium-heavy and heavy materials.

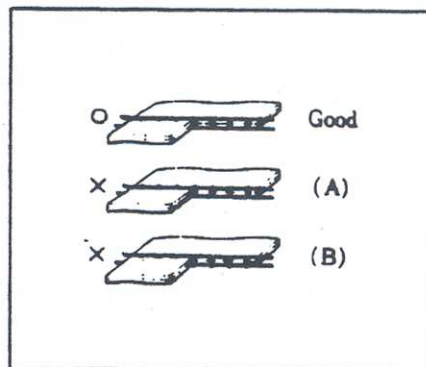
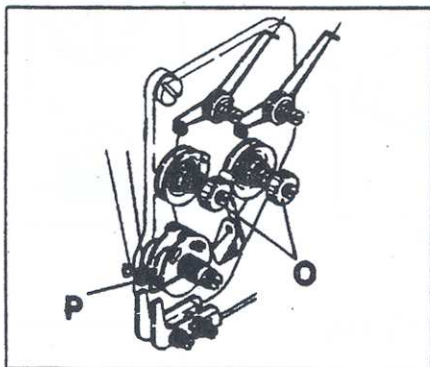


### ② Needle Thread Tension

Adjust the needle thread tension by turning Tension Nut(O).

(When the threads are not passed through Thread Take-up Spring(P), the standard tension is 100~120g for the same material as above.)

- ※ After the adjustment of bobbin thread tension, balanced and beautiful seam can be obtained by only changing the needle thread tension.



### ③ Thread Take-up Spring

The standard operating range of Thread Take-up Spring(P) and (Q) are 7~10mm. The adjustment of operating range is made by loosening Screw(R) and moving Thread Monitor Sensing Plate up and down.

The standard strength of Thread Take-up Spring(P) and (Q) are 20~40g.

The strength of Thread Take-up Spring(P) is adjusted by loosening Screw(S). To strengthen, turn Spring Sleeve counterclockwise and to weaken, turn it clockwise.

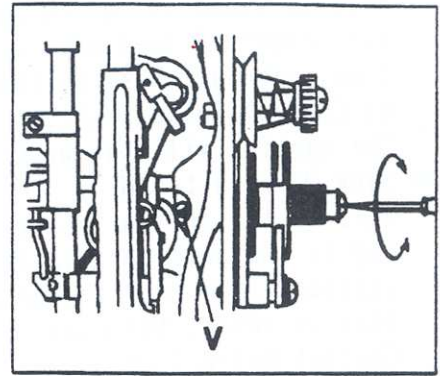
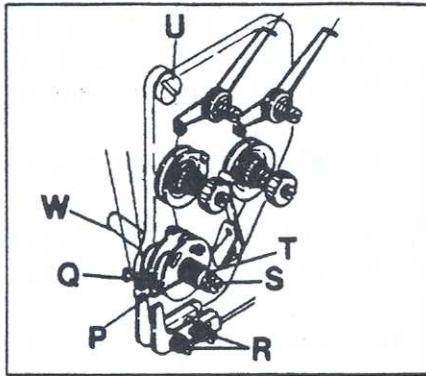
The strength of Thread Take-up Spring(Q) is adjusted following next procedure:

- ① Remove Screw(U).
- ② Loosen Screw(V) and remove Needle Thread Monitor unit.
- ③ Loosen Screw(S).
- ④ To strengthen, turn Spring Guide Shaft(W) counterclockwise and to weaken, turn it clockwise.
- ⑤ Tighten Screw(S).
- ⑥ Using Screw(U), install Needle Thread Monitor unit.
- ⑦ Tighten Screw(V).

Note 1: Tighten Screw(U) first, without fail.

Note 2: Be careful not to break the cord of Thread Monitor Sensing Plate.

Note 3: When loosening Screw(S), make sure the strength of Thread Take-up Spring(P). If it is out of standard limit, adjust the strength of Thread Take-up Spring(P) again.

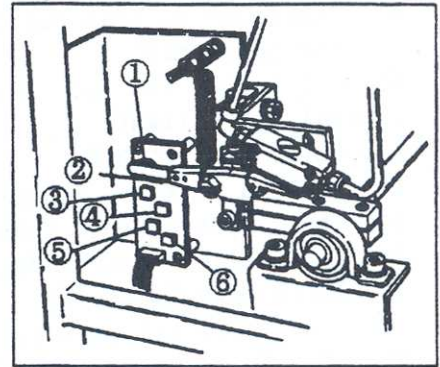


### 6-8 Foot Pedal Switch

- ① Neutral.
- ② Dartstretcher operates. (When Dartstretcher is not equipped, this position is open.)
- ③ Both Clamp Foot (Right and Left) lower. (at this time, Clamp Foot (Left) is actuated under low pressure). Or either Right or Left Clamp Foot lowers.

Note: In case of actuating only one of them (Right or Left), it is actuated under full pressure.

- ④ Both Right and Left Clamp Feet are actuated under full pressure. Or, either Right or Left Clamp Foot under full pressure.
- ⑤ Either Right or Left Flap Clamp lowers.
- ⑥ Both Right and Left Flap Clamp lower.



### 6-9 Work Locating Lamp

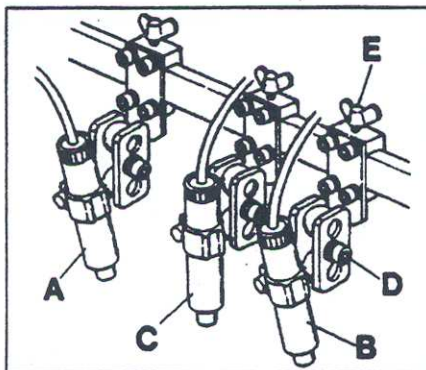
Work Locating Lamp (A) and (B) are for indicating the position of pocket of workpiece.

Set mark (+) at the position to attach pocket.

Work Locating Lamp (C) is for sewing evenly on either side of the point which is 140mm from the needle drop.

Set mark (-) at the point 140mm from the needle drop.

Left and right adjustment is made by loosening Screw (D) while front and rear adjustment is made by loosening Wing Bolt (E).



(A)	+
(C)	-
(B)	+

## 6-10 Descriptions and Functions of Metal Sensing Switchs

### \* Metal Sensing Switch(A)

When Carriage is in the most forwarded position, adjust the distance from the center of needle to the front edge of Clamp Foot to 250 mm, and at that time, set Switch(A) so that both Lamp(9) on Intermediate Board and Lamp(1) on Control Board light.

The machine will not work unless Switches(A),(B) and (C) are turned on.

### \* Slow Down Switch(B)

This is the switch to set the position of Carriage to start slow down on the way to the home position(A) to obtain secure stop after the rapid travel of Carriage from rear to the operator.

When it senses the position, Lamp(8) on Intermediate Board and Lamp(2) on Control Board light.

### \* Carriage Rear Switch(C)

This switch set the most backward position of Carriage.

With Carriage at this position, Sewing Head can be brought down backward for the adjustment.

When it senses the position, Lamp(7) on Intermediate Board and Lamp(3) on Control Board light.

### \* Tab Knife Up Switch(D)

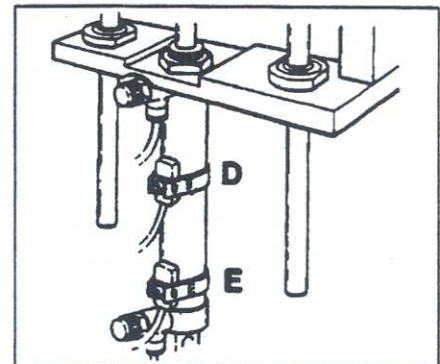
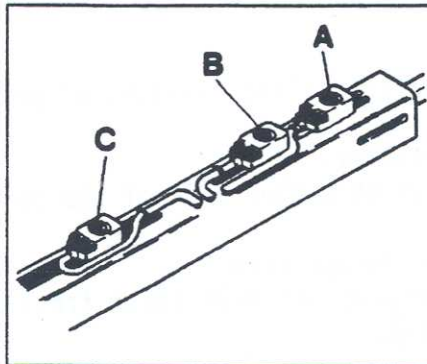
This switch sets the amount of lift of Tab Knife after sewing.

Adjust the position of this switch(D) so that Lamp(18) on Intermediate Board and Lamp(16) on Control Board light when Tab Knife rises 11mm above Slide Plate.

### \* Tab Knife Down Switch(E)

This is the switch to make sure that Tab Knife returns to the lowest position. When Tab Knife returns to the lowest position, Lamp(17) on Intermediate Board and Lamp(17) on Control Board light.

The machine will not work unless this switch is turned on.



\* Tab Knife Home Switch(F)

This is the switch to make sure that Tab Finger Holder returns to its home position.

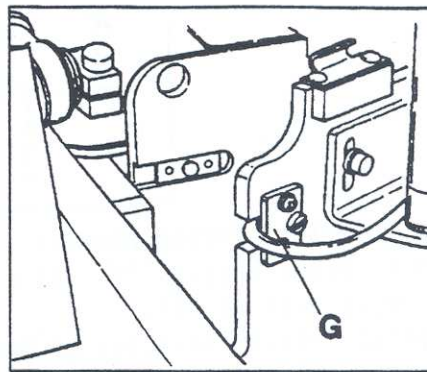
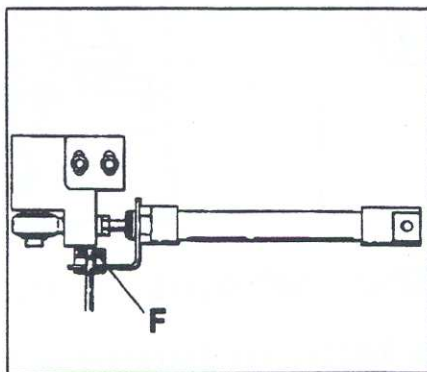
When it returns to the home position, Lamp(4) on Intermediate Board and Lamp(8) on Control Board light.

The machine will not work unless this switch is turned on.

\* Head Cover Switch(G)

While Head Cover opens, Lamp(2) on Intermediate Board and Lamp(15) on Control Board do not light.

Make sure that the lamps light when Head Cover fixed securely to Sub Head Cover. The machine will not work unless this switch is turned on.



**6-11 Pneumatic Valve Identification**

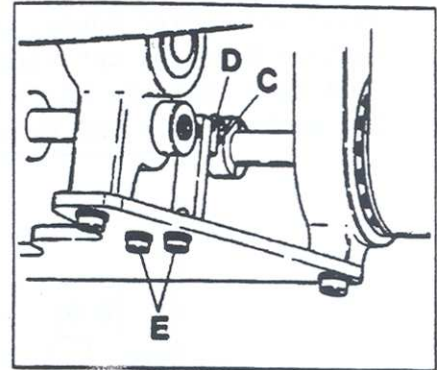
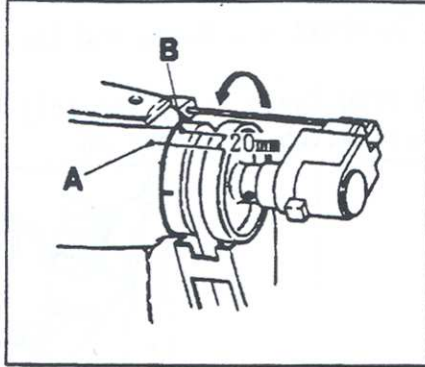
	P	
A	4 port	Stacker Clamp
B	4 port	Stacker Swing
C	Blind Cover	
D	4 port	Tab Knife
E	4 port	Needle Thread Trimming
F	4 port	Bobbin Thread Trimming
G	4 port	Center Knife
H	4 port	Tab Knife Clamping
I	3 port	Thread Release
J	3 port	Holding Needle Thread
K	3 port	Patch Guide Down (Thread Take-up)
L	3 port	Patch Guide Up
M	4 port	Brush Blade
N	3 port	Air Blow
O	4 port	Flap Clamp(Right)
P	4 port	Flap Clamp(Left)
Q	3 port	Clamp Foot Down(Right)
R	3 port	Clamp Foot Down(Left)
S	3 port	Air Pressure, low & full

R R

### 6-12 Needle Thread Monitor

Turn Machine Pulley to the machine rotating direction and adjust Magnet(C) to Position Detector(D) so that Lamp(11) on Intermediate Board lights when White Mark(B) of Machine Pulley comes 25mm before Red Mark(A) of Machine Arm, and puts off at 20mm before the Red Mark.

The clearance between Magnet(C) and Position Detector should be 0.5~1.0mm. The adjustment is made by loosening Screw(E).



### 6-13 Bobbin Thread Monitor

Turn Power Supply "ON" and press "EMERGENCY STOP" Switch. At this time, Air Supply must be off.

Metal Sensing Switches of Bobbin Thread Monitor are installed on both left and right side of Air Cylinder. The adjustment is made as follows:

- ① Position the left hand Sensing Bar to the extreme left.
- ② Position the right hand Sensing Bar to the extreme right.
- ③ Fix Metal Sensing Switch at the position that Lamp(23) on Intermediate Board and Lamp(29) on Control Board light when moving Metal Sensing Switch left and right gradually after loosening screws of the switch.

Note: Lamp(23) lights when both of left and right metal Sensing Switch sense. Then move Sensing Bar closer toward Rotary Hook till it contacts Bobbin, when the lamp on Intermediate Board lights.

For left hand one, Lamp(20) (Lamp(30) on Control Board) lights. And for right hand one, Lamp(19) (Lamp(31) on Control Board) lights.

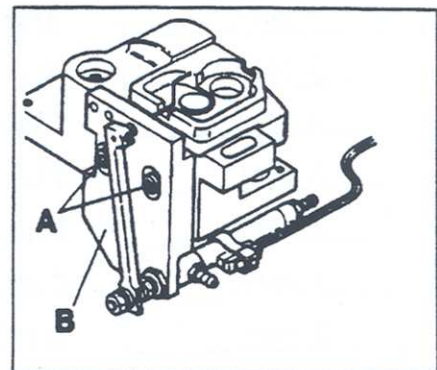
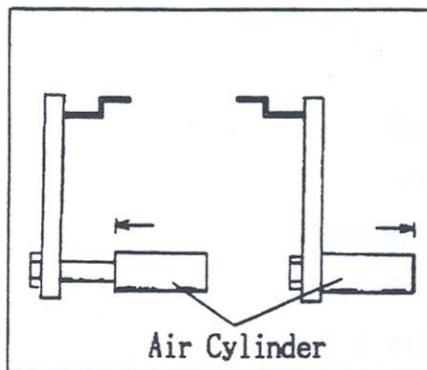
If Lamp(20) and (19) light before Sensing Bar contacts Bobbin, Sensing Bar must contact Rotary Hook Base or others. In this case, correct the position of Sensing Bar by loosening Screw(A) and moving Thread Monitor Holder(B).

Note 1: Make sure that the Lamp(23) puts off when moving Sensing Bar a little from the position where Lamp(23) on Intermediate Board lights.

Also make sure that the tip of Sensing Bar interfere the tip of Rotary Hook at the time Lamp(23) puts off.

Make sure the above items both for left and right individually.

Note 2: Even after Air Supply is cut off, Power Supply is still "ON", therefore machine must not operate when adjusting Bobbin Thread Monitor, which may cause damage to Rotary Hook and Bobbin Thread Monitor.





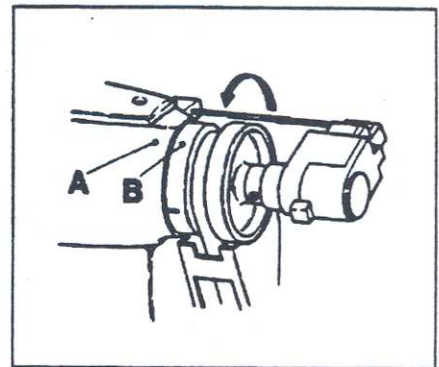
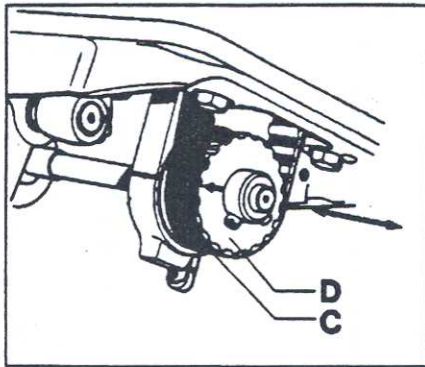
## 7. Notice Before Actual Sewing

- ① Make sure the oil amount of each parts of Sewing Head.  
Feed oil to the manual oiling points.
- ② Clean Photo Sensor and Reflective Sheet with soft cloth.
- ③ Move Carriage back and forth once or twice by actuating "CARRIAGE FEED" Switch.
- ④ Check each switches on Control Panel.
- ⑤ Check that the needle and bobbin threads are held.
- ⑥ Check the alignment of white mark on pulley and red mark on machine arm.
- ⑦ make sewing test and check sewing performance, position of Work Locating Lamp and each operation of machine parts once again.

## 8. Adjustment

### 8-1 Adjustment of timing between Rotary Hook and Thread Take-up

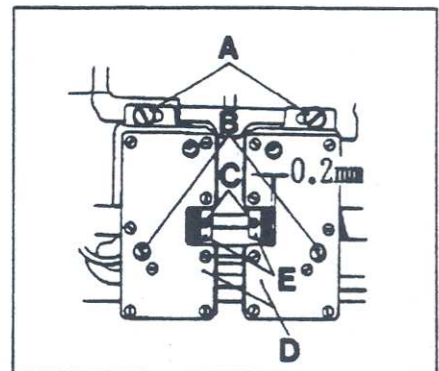
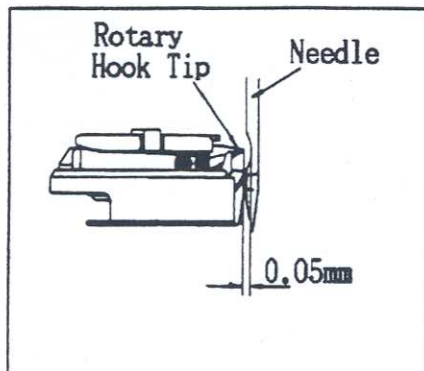
- ① Remove needles.
- ② Bring down Sewing Head and remove Timing Belt(C).
- ③ Align white mark(B) of Machine Pulley with red mark(A) of Sewing Head.
- ④ Holding Upper Shaft in place, align the arrow mark of Lower Belt Wheel(D) with the base line of Sewing Head, then set Timing Belt(C).
- ⑤ Raise up Sewing Head and install needles.



### 8-2 Adjustment of timing between Needle and Rotary Hook

\* Clearance between Needles and the Tip of Rotary Hook

- ① Clearance between Needle and Tip of Rotary Hook must be 0.05mm.  
The adjustment is made by loosening Screw(A), (B) and (C) and moving Rotary Hook Base(D) left and right.
  - ② Adjust the engagement so that the clearance between the inside of Rotary Hook Base and endsurface of Lower Shaft Gear is about 0.2 mm.  
The adjustment is made by moving Lower Shaft Gear left and right.
- ※ Tighten Screw(C) of Lower Shaft Gear(E) correctly to its flat spot.

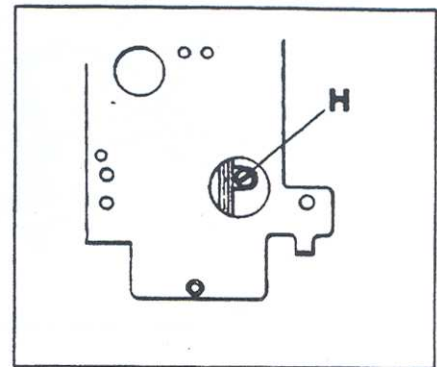
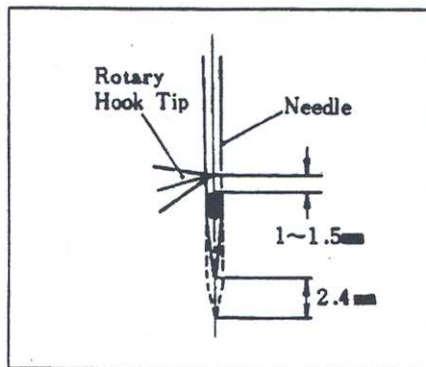
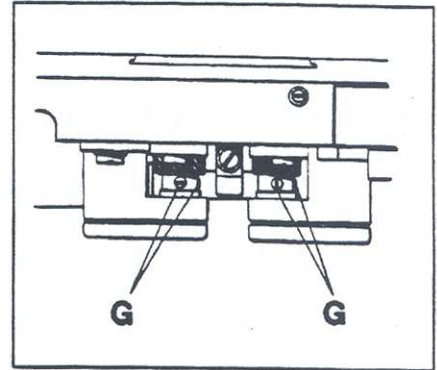
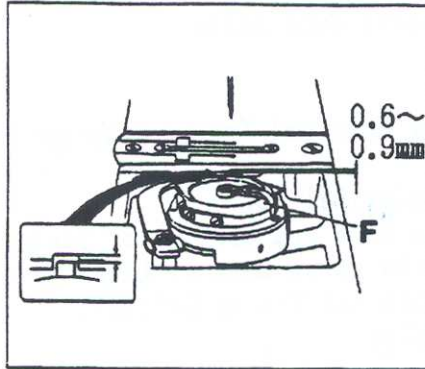


\* Clearance between Rotary Hook and Throat Plate

- ① Adjust the clearance between Rotary Hook(F) and Throat Plate to 0.6~0.9mm loosening Screws(G) and moving Rotary Hook up and down.

\* Needle Bar lift and Needle Bar height

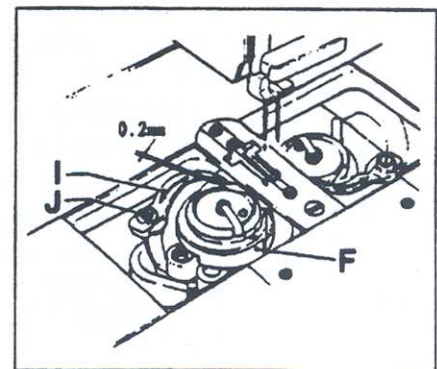
- ① Adjust Needle Bar so that Tip of Rotary Hook align with the center of Needle when Needle Bar rises 2.4mm from the lowest point.  
 ② Adjust the distance from the top edge of Eye to Tip of Rotary Hook to 1.0~1.5mm when Tip of Rotary Hook aligns with the center of Needle.  
 The adjustment is made by loosening Screw(H) and moving Needle Bar up and down.



\* Clearance between Rotary Hook and Bobbin Case Opener

- ① Adjust the clearance between Rotary Hook(F) and Bobbin Case Opener(I) to 0.2mm when Bobbin Case Opener is most backward to the arrow direction.

The adjustment is made by loosening Screw(J) and moving Bobbin Case Opener left and right.



\* Adjustment at the change of Needle Bite Size

☆ To widen Needle Bite Size

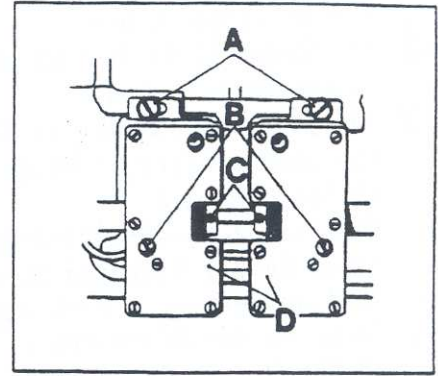
- ① Loosen Screws (A), (B) and (C) and move Rotary Hook Base (D) left and right.
- ② Install Throat Plate.
- ③ Screw in Needle Clamps securely.
- ④ Install Needles.
- ⑤ Adjust the timing between Needle and Rotary Hook. (Refer to 8-2.)

After adjustment of clearance between tip of Rotary Hook and Needle, tighten Screws (A), (B) and (C).

☆ To narrow Needle Bite Size

- ① Install Throat Plate.
- ② Screw Needle Clamps into Needle Bar securely.
- ③ Install Needles. (Make sure the height and parallelism of needles.)
- ④ Adjust timing between Needle and Rotary Hook. (Refer to 8-2.)

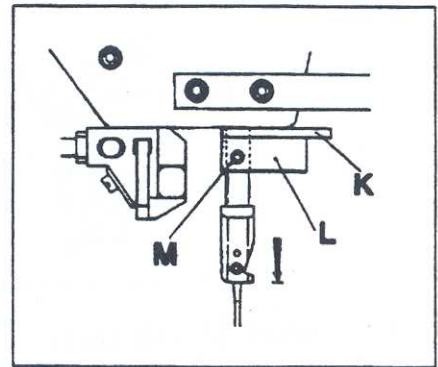
At this time, set Rotary Hook Base (D) with Screws (A), (B) and (C).



### 8-3 Application of Gauge (For Needle and Rotary Hook)

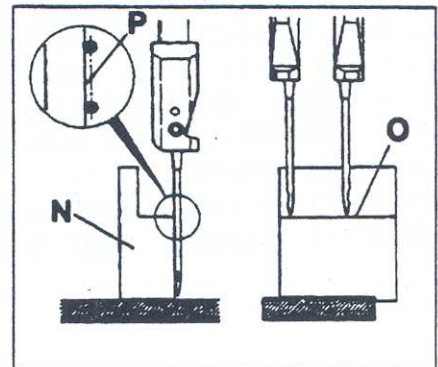
\* Timing Gauge for Needle and Rotary Hook

- ① Lower Needle Bar to the lowest position.
- ② With Gauge (K) (No.46-1001-4-806) upper and Gauge (L) (No.46-1001-4-805) lower, put them on Needle Bar.
- ③ Applying Gauge (K) against the undersurface of Arm and applying Gauge (L) against (K), tighten Screw (M).
- ④ Draw out Gauge (K). (The thickness of Gauge is 2.4mm.)
- ⑤ Turn Pully to the rotary direction of machine until Gauge (L) contacts with the undersurface of Arm. (Needles rise 2.4mm from the bottom.)
- ⑥ Align Tip of Rotary Hook with the center of Needle.



\* Needle Height Gauge

- ① Apply Gauge (N) (No.46-1001-4-800) against the right side of Throat Plate.
- ② Bring Needle Bar to its highest position.
- ③ After loosening Screw (H) (Refer to 8-2.), make the tips of needles even with surface (O) by moving Needle Bar up and down, then tighten Screw (H) tentatively.
- ④ Apply Needles against the surface (P) of Gauge and check the parallelism.
- ⑤ Tighten Screw (H) securely.

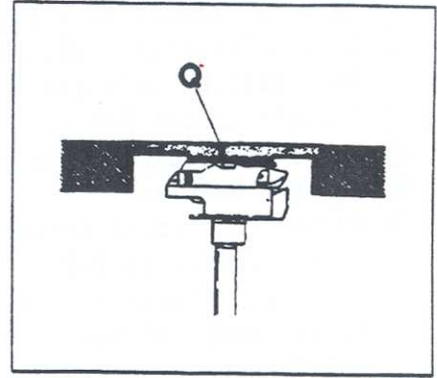


\* Rotary Hook Height Gauge

- ① Remove Throat Plate.
- ② Put Gauge(Q) (No.46-1001-4-803, 46-1001-4-804) on the machine bed.
- ③ Applying the surface of Rotary Hook(F) against the undersurface of Gauge(Q), tighten Screw(G). (Refer to 8-2.)

When using No.46-1001-4-803, the clearance between Rotary Hook and Throat Plate is 0.75 mm. (median between 0.6~0.9mm)

- ※ Gauge No.46-1001-4-803 is for standard thread (0.75mm), and Gauge No.46-1001-4-804 is for thick thread (0.9mm)



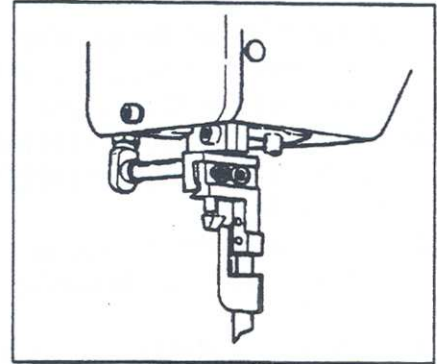
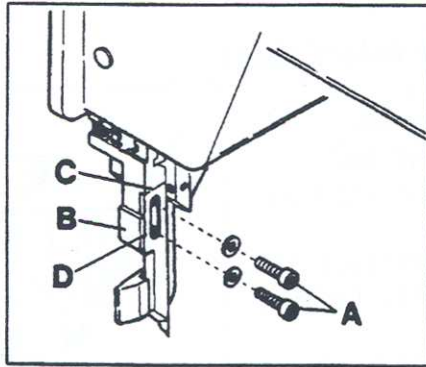
**8-4 Replacement of Center Knife**

- ① Remove Screw(A).
- ② Install new Center Knife.

Note 1 : Installation should be made by applying Center Knife to the part (C) and (D) of Center Knife Holder(B) and then tightening Screw(A).

Note 2 : Pay attention to the direction of Center Knife and not to damage the tip.

Note 3 : Keep screws other than Screw(A) untouched without fail.



**8-5 Replacement of Tab Knife**

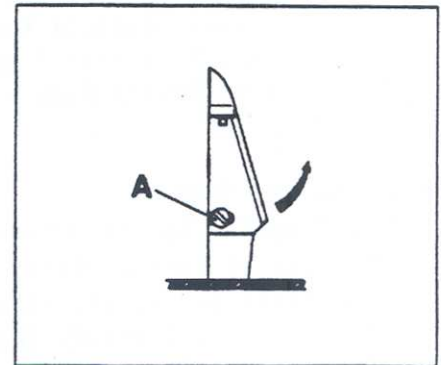
- ① Move Carriage all the way backward by pressing "REAR" of "CARRIAGE FEED" Switch on Control Panel.
- ② Press "TAB MAN." Switch. (Tab Knives appear above the table.)

- ③ Loosen Screw(A) and remove Tab Knife.
- ④ Install new Tab Knife.

Make the left endsurface of Tab Knife flush with the left endsurface of Tab Knife Support and lower Tab Knife to the stepped part of Support without gap, then tighten Screw(A).

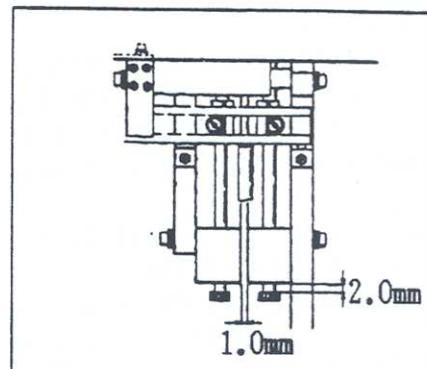
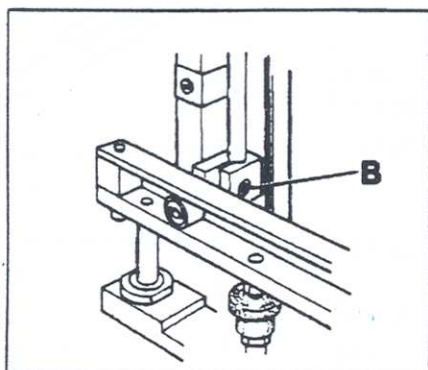
- ⑤ Press "TAB MAN." Switch again. (Tab Knife lowers.)

- ⑥ Move Carriage toward operator by pressing "FRONT" of "CARRIAGE FEED" Switch.



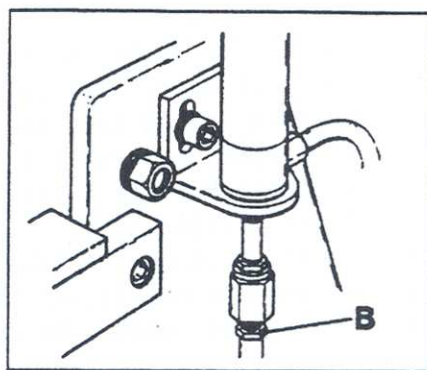
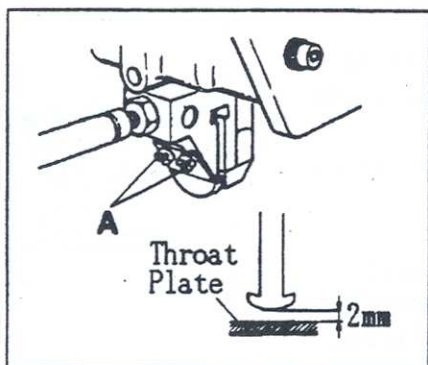
### 8-6 Adjustment of Tab Knife

Provide a clearance of 2.0mm between Fixing Bar and Tab Knife Holder when Tab Knife is uppermost position. The adjustment is made by loosening Screw(B). Provide a clearance of 1.0mm between Holder(Rear) and Holder(Front) when Movable Tab Knife returns to the home position. The adjustment is made by loosening Nut of Tab Knife Cylinder.



### 8-7 Replacement of Needle Thread Trimming Knife

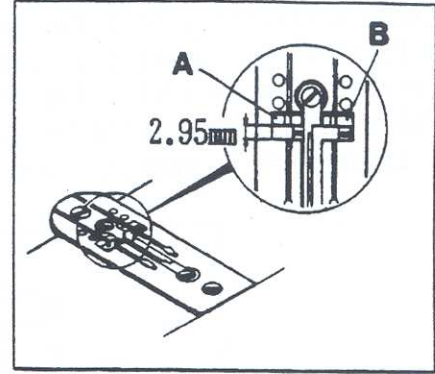
- ① Loosen Screw(A) and remove Needle Thread Trimming Knife.
  - ② Install new Needle Thread Trimming Knife, applying it to Pick-up, tighten Screw(A).
- ※ Adjust the height of Pick-up 2mm above the surface of Throat Plate when Pick-up lowers to the lowest point. The adjustment is made by loosening Nut(B) of Universal Joint. When sewing thicker material, it should be higher than 2mm.



### 8-8 Replacement of Bobbin Thread Trimming Fixed Knives

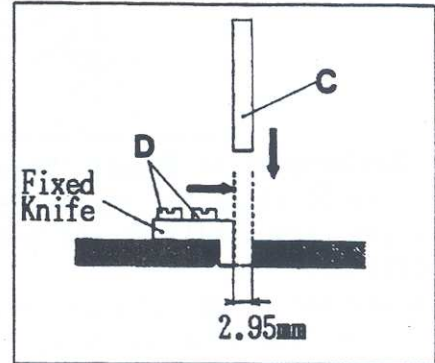
- ① Remove Throat Plate.
- ② Remove Fixed Knives(A) and (B) installed on the underside of Throat Plate.
- ③ Install new Fixed Knives to Throat Plate. Fix engagement pressure by using Gauge. When the Gauge is not available, fix the clearance to 2.95mm as shown in the illustration.

As for the back and forth positions of them, install them so that the right endsurface of slit of Throat Plate aligns with the right endsurface of slit of Fixed Knife.



#### \* Application of Bobbin Thread Trimming Knife Gauge

- ① Remove Throat Plate.
- ② Remove Throat Plate and insert Gauge(C) between Fixed Knife and Throat Plate.
- ③ Loosen Screw(D) of Fixed Knife, apply Fixed Knife against Gauge(C) then tighten Screw(D). (Take care left and right position.)



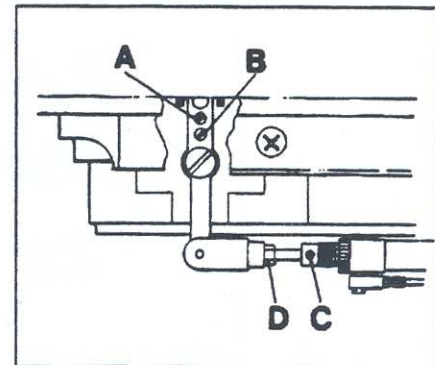
### 8-9 Replacement of Bobbin Thread Trimming Movable Knife

- ① Remove Throat Plate.
- ② Swing two Slide Plates and bring down Sewing Head. At this time, take care not clamp Slide Plate between Sewing Head and Table.
- ③ Remove Screw(A) of Movable Knife, loosen Screw (B) and remove Movable Knife.
- ④ Install new Movable Knife.

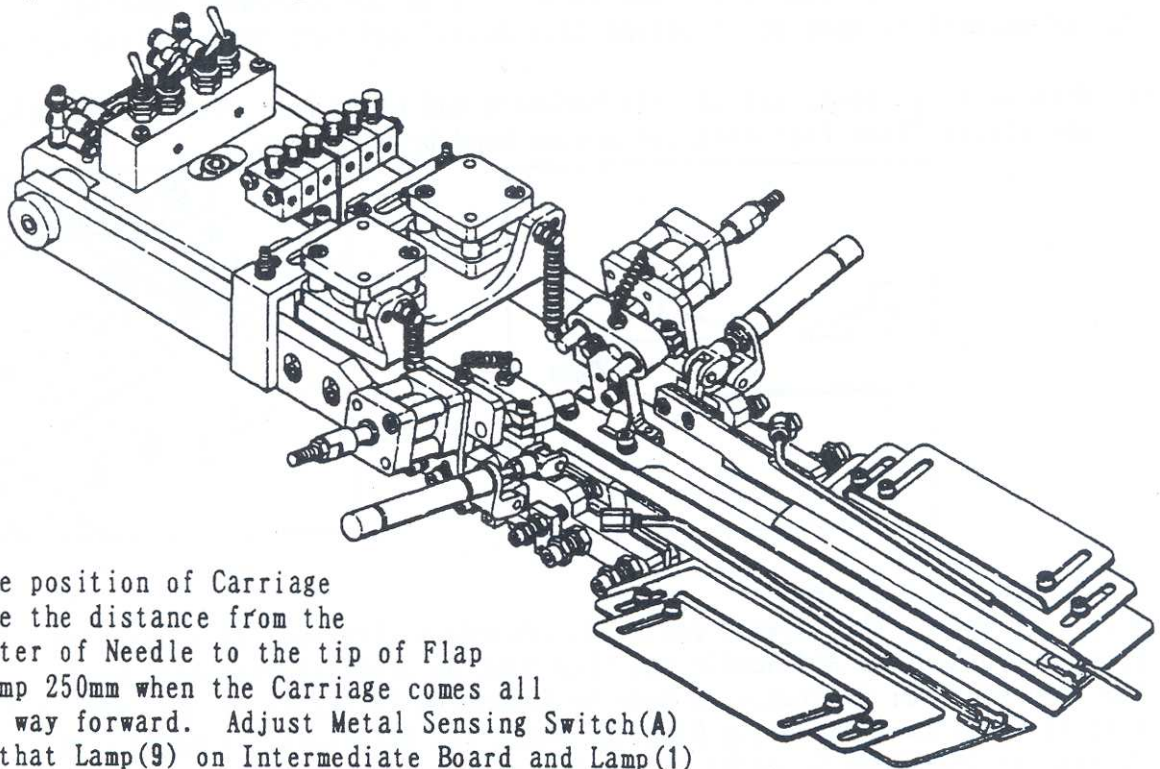
Install the Knife so that the trimming position becomes highest (after the knife moves) and not comes out above the surface of Throat Plate.

- ※ The adjustment of moving amount of Movable Knife is made by loosening Screw(C) and moving Collar left and right. Adjust by turning Nut(D), so that Movable Knife does not interfere with Throat Plate when Movable Knife returns. (Cylinder Rod extends.)

Note: Take care not to damage the tip of Center Knife when installing and removing.



## 8-10 Adjustment of Carriage



\* Home position of Carriage  
 Make the distance from the center of Needle to the tip of Flap Clamp 250mm when the Carriage comes all the way forward. Adjust Metal Sensing Switch(A) so that Lamp(9) on Intermediate Board and Lamp(1) on Control Board light.

\* Parallelism between Needle and Clamp Foot  
 Adjust Clamp Foot(Left) and (Right) to be parallel with Needle.

☆ Big adjustment

The adjustment is made by loosening Screw(B) of Clamp Foot Adjustment Block and turning Adjusting Screw(C).

☆ Fine adjustment

The adjustment is made by loosening Lock Nut (D) of Clamp Foot Connecting Arm and Adjusting Screw(E), then turning Screw(F).

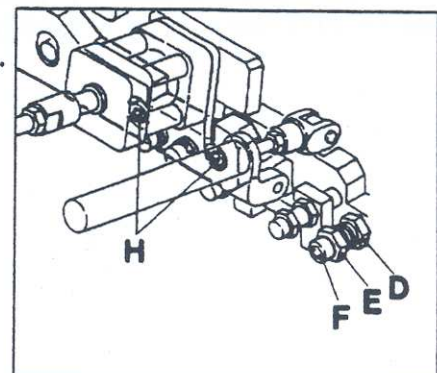
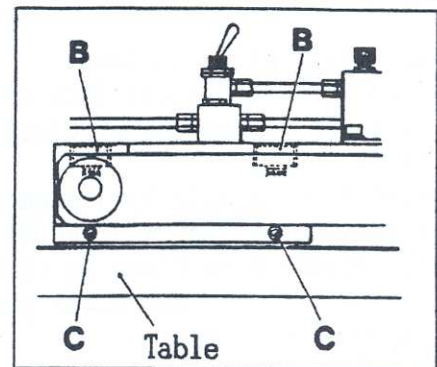
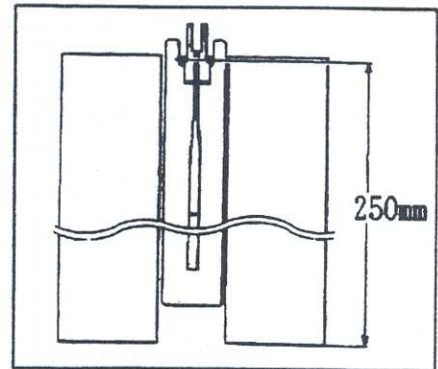
※ After Adjustment, check the parallelism between Needle and Clamp Foot following the order below:

- ① Move Carriage forward (to this way).
- ② Clamp the fabric with Clamp Foot by treading Pedal.
- ③ Press button of "EMERGENCY STOP" on Control Panel.
- ④ Press "FRONT", "REAR" of "CARRIAGE FEED" Switch on Control Panel and check the action.

\* Pressure of Clamp Foot

Either when Carriage is in the forward or when backward, the pressure must be the same in the front and in the rear at the time Clamp Foot lowers.

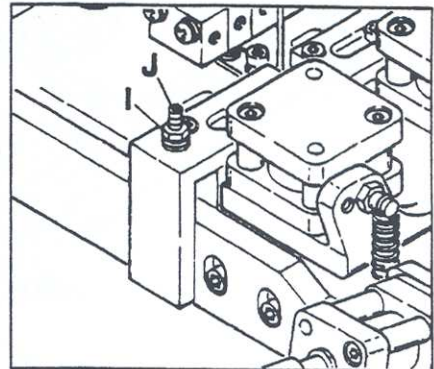
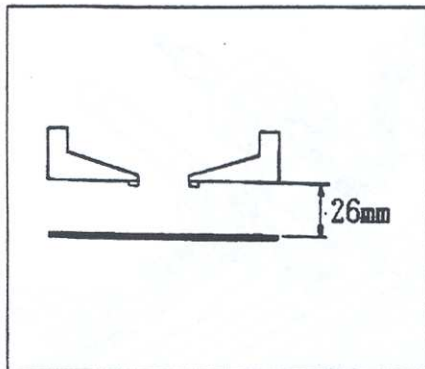
The adjustment is made by loosening Screw(H) of Clamp Foot Connecting Arm.



\* Height of Clamp Foot

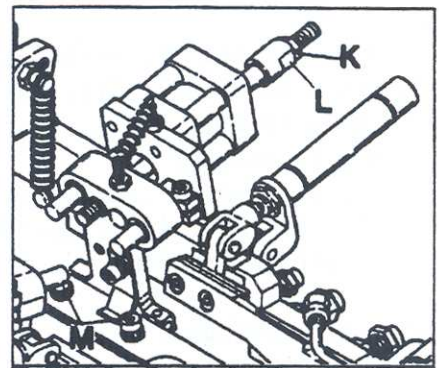
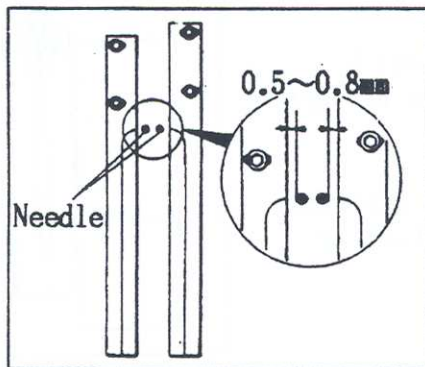
Make the height of Clamp Foot 26mm when it is in the uppermost position. The adjustment is made by loosening Lock Nut (I) and turning Adjusting Screw (J).

Note: With Carriage moves all the way backward and Clamp Foot rises, be careful not strike Clamp Foot when the sewing head brought down.



\* Needle and Brush Blade

With Carriage on the forward position, provide a clearance of 0.5~0.8mm between Brush Blade and Needle and they must be parallel with each other. The adjustment of clearance is made by loosening Nut (K) of Air Cylinder and turning Clamp Foot Adjusting Block (L) while the adjustment of parallelism is made by loosening Screw (M) of Brush Blade.



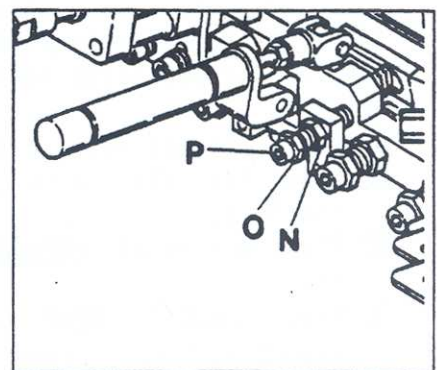
\* Adjustment of Flap Clamp

Align the right endsurface of Flap Clamp with the right endsurface of Clamp Foot when it lowers.

Adjustment is made by loosening Lock Nut (N) and by turning Adjusting Screw (O).

Also adjust Flap Clamp so that Flap Clamp Rubber is parallel to Brush Blade and it presses the flap evenly.

The adjustment is made by loosening Lock Nut (N) and turning Adjusting Screw (O) and Screw (P).





### 8-11 Adjustment of Patch Guide

- ① With Patch Guide at the lowest position, the clearance between Patch Guide and Clamp Foot must be 0.7mm and they must be parallel with each other.

The adjustment is made by loosening Screw(A) and moving Mount Block(B) left and right. Screw(C) is for micro adjustment of left and right position and tilt of Patch Guide.

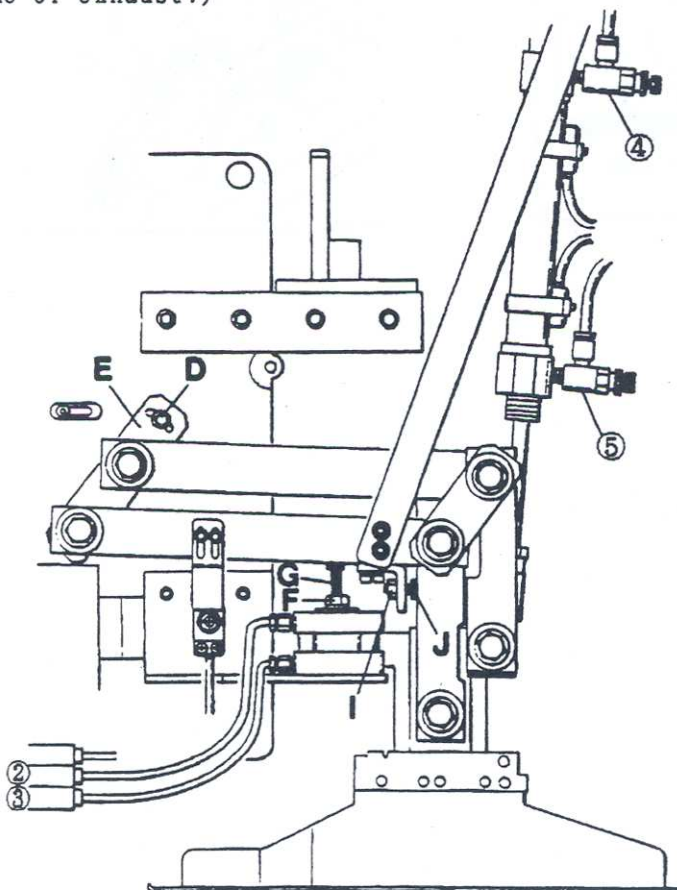
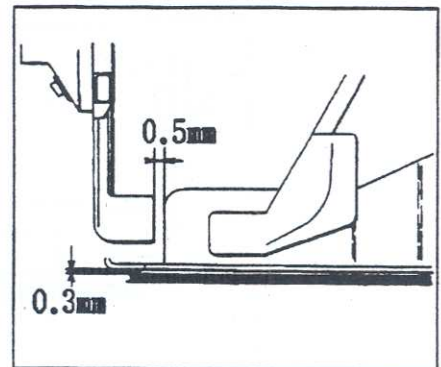
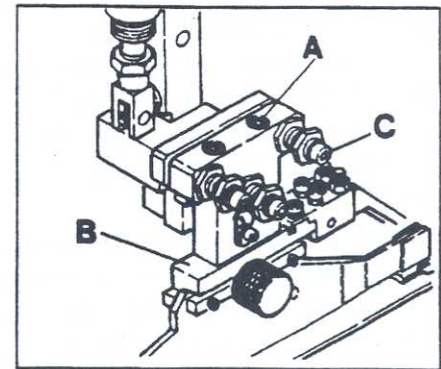
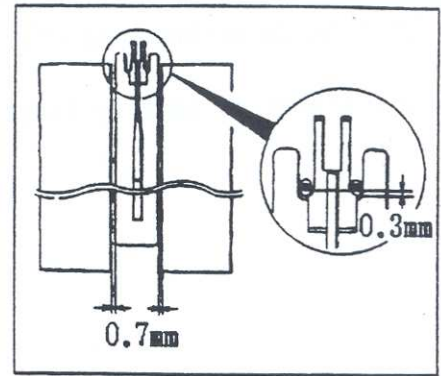
- ② Adjust so that Slide Plate is parallel to Patch Guide.

The adjustment is made by loosening Screw(D) and moving Adjusting Lever(E) of Patch Guide left and right.

- ③ When Patch Guide lowers it should be 0.3mm above the surface of Slide Plate. (This varies according to the materials to be sewn.) The adjustment is made by loosening Nut(F) and turning Adjusting Screw(G).

- ④ Provide a clearance of 0.5mm between Patch Guide and Needle Thread Mount Block(H). The adjustment is made by loosening Nut(I) and turning Adjusting Screw(J) to fix the position of Patch Guide.

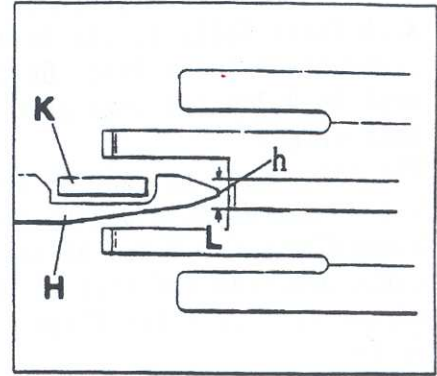
- ⑤ The up-down movement of Patch Guide must be smooth. The adjustment is made by Speed controller②,③,④, and ⑤ which uses "Meter Out". ("Meter Out" is used for speed control at the time of exhaust.)



### 8-12 Adjustment of Needle Thread Mount Block

Adjust Needle Thread Mount Block(H) so that its tip(h) does not come out of the thickness(L) of Patch Guide without interfering Center Knife (K).

The adjustment is made by loosening Screw(M).



### 8-13 Adjustment of Jumping Guide

#### \* Height of Jumping Guide

The clearance between the surface of Patch Guide(Lower) and Jumping Guide is 1.5 mm. --- standard ---

As the material becomes thicker the clearance should be larger.

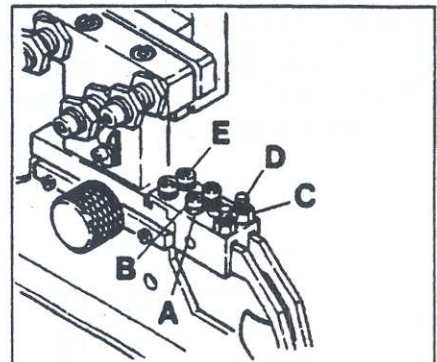
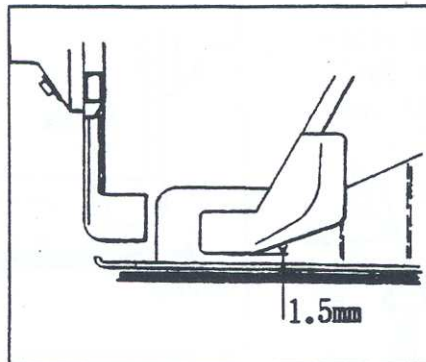
To increase the clearance, loosen Nut(A) and screw in Screw(B), and to decrease screw it out.

Adjust so that Jumping Guide does not hit Needle Head when Jumping Guide is raised manually with the needle at the lowest position.

The adjustment is made by loosening Nut(C) and using Spring Plunger(D).

The left and right clearance between needle should be equal.

The adjustment is made by loosening Screw(E) of Jumping Guide Block.

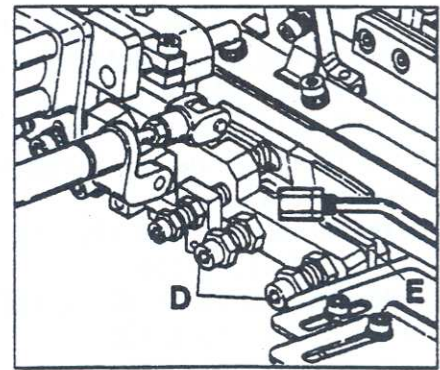
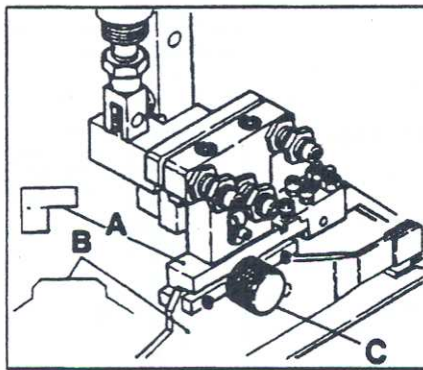


### 8-14 Conversion between Single Welting and Double Welting

- ① Change Patch Guide.
- ② Apply surface(A) of Patch Guide against sur face(B) of Mount Block and tighten Fixing Knob(C).
- ③ Loosen Screw(D) and remove Clamp Foot Spacer(E).
- ④ For single welting, insert Clamp Foot Spacer(E) to the right seen from operator, and for double welting to the left.
- ⑤ Tighten Screw(D).

Because of the gap between Screw(D) and the hole of Clamp Foot, Screw(D) must be tightened in the condition of holding up the tip of Clamp Foot.

Bite Size	Welting	Patch Guide		Spacer	
		Size	No.	Thickness	No.
10mm	S(Single)	17.5mm	48-1125-5-803	3.25mm	46-1001-4-594
10	D(Double)	"	48-1125-5-804	"	"
10	S	18.5	48-1125-5-805	3.75	48-1125-5-622
10	D	"	48-1125-5-806	"	"
12	S	22	48-1125-5-807	4.5	46-1001-4-595
12	D	"	48-1125-5-808	"	"
14	S	27	48-1125-5-809	6.0	46-1001-5-214
14	D	"	48-1125-5-810	"	"
16	S	30	48-1125-5-811	7.0	46-1001-5-284
16	D	"	48-1125-5-812	"	"
16	S	31	48-1125-5-813	"	"
16	D	"	48-1125-5-814	"	"
18	S	35	48-1125-5-815	8.0	46-1001-5-286
18	D	"	48-1125-5-816	"	"
20	S	39	48-1125-5-817	9.0	46-1001-5-288
20	D	"	48-1125-5-818	"	"



### 8-15 Adjustment at the change of Patch Guide

Make each adjustments referring to the table below.

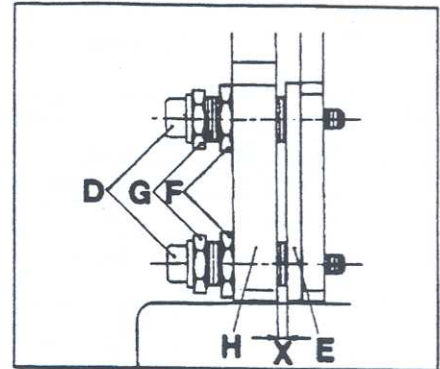
Bite Size	Size of Patch Guide	Thickness of Spacer (E)	Clearance		
			X(left-right)	Y(left)	X(right)
10mm	17.5mm	3.25mm	adjust	0	0
"	18.5mm	3.75mm	"	0	0
12mm	22.0mm	4.5mm	"	3.5mm	2.25mm

**\* Adjustment of Clearance(X)**

Loosen Lock Nut(F), Adjusting Screw(G) and Screw(D), adjust the clearance between Clamp Foot Connecting Arm(H) and Clamp Foot Spacer according to the thickness of fabric.

**\* Adjustment of Clearance(Y) and (Z)**

Loosen Screw(I) of Clamp Foot Shaft and Screws(J) of Clamp Foot Positioner and adjust the clearance between Clamp Arm(K) and Carriage Block(L).



### 8-16 Adjustment at the change of Needle Bite Size

To change the needle bite size, follow the next procedure.

- ① Loosen both left and right Screws(I) of Clamp Foot Shaft and Screw(J) of Clamp Foot Positioner respectively, and adjust clearances(Y) and (Z) between Clamp Foot Arm(K) and Carriage Block(L). (Refer to 8-15)
- ② Change Clamp Foot Spacer(E) to the most suited one. (Refer to 8-14)
- ③ Change Needle Head.  
(Refer to 8-2, Adjustment of the Timing between Needle and Rotary Hook.)
- ④ Change Throat Plate.
- ⑤ Change Bobbin Thread Trimming Fixed Knife and Bobbin Thread Trimming Movable Knife.  
(Refer to 8-8, 8-9)
- ⑥ Change Patch Guide to the most suited one.  
(Refer to 8-11, 8-15)
- ⑦ Change Jumping Guide Block and Jumping Guide Shaft. (Refer to 8-13)
- ⑧ Change Tab Finger. (Refer to 8-5, 8-6)
- ⑨ Make trial sewing and check sewing performance and movement of each parts.

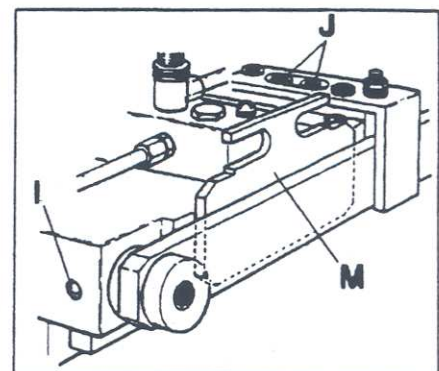
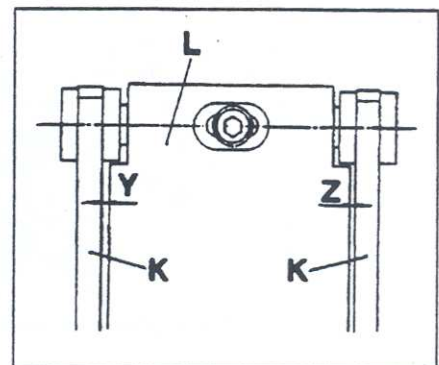
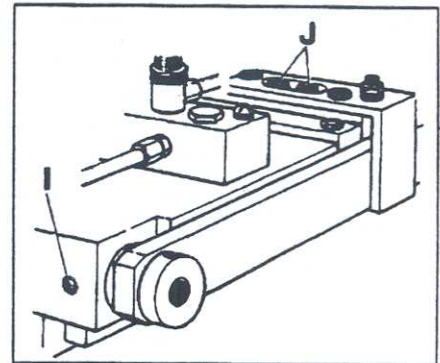
**\* Application of Clamp Foot Positioning Gauge**

Insert Gauge(M) (No.46-1001-4-801, 46-1001-4-802) between Clamp Foot Arm(K) and Carriage Block(L) and remove the clearance between them, tighten Screw(I) and (J).

Note: According as the change of needle bite size and the width of Patch Guide, Gauge(M) must be changed.

Thickness No.46-1001-4-801: 2.75mm

No.46-1001-4-802: 4.5mm



## 9. Adjustment of Sewing Operation

### 9-1 Tab Knife position

- ① Correct — standard position
- ② Incorrect angle — slanted
- ③ Misalignment — shifted to the left or right

\* The adjustment is made as follows:

② Incorrect angle

Adjust the position by loosening Screw(A) of Tab Knife Shaft Holder and turning Tab Knife Shaft(B).

※ Tightening torque should be 120kgf·cm.  
If this torque is not observed, the movement of Tab Knife Shaft might become heavy.

③ Misalignment (shifted to the left or right)

☆ Start end

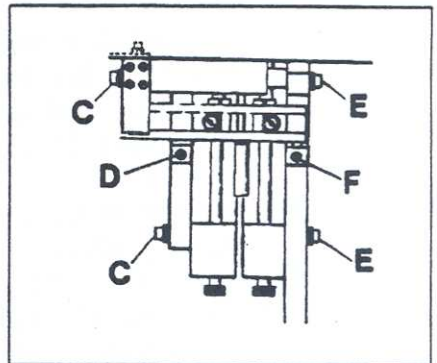
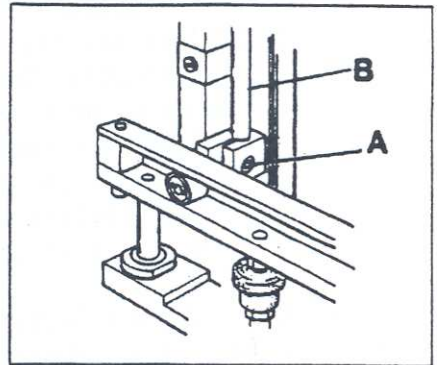
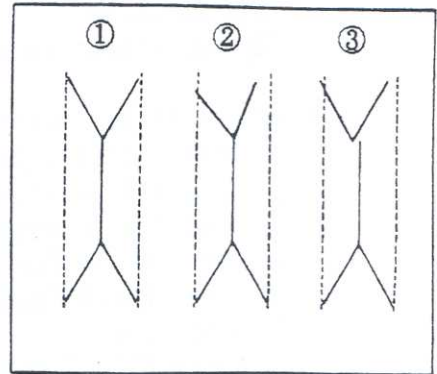
When the position of start end is shifted, correction is made by loosening Screw(C) of Tab Knife Holder(Rear) and turning Adjusting Knob(D).

To shift the start end to the left, turn it clockwise and to the right, turn it counterclockwise.

☆ Finish end

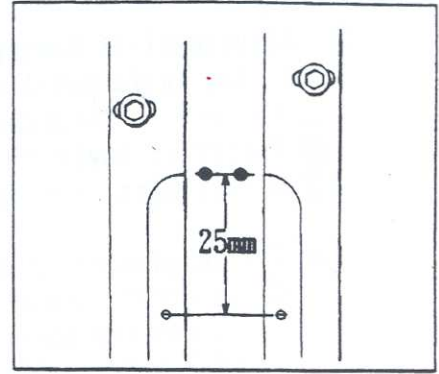
When the position of finish end is shifted, the correction is made by loosening Screw (E) of Tab Knife Holder(Front) and turning Adjusting Screw(F).

To shift to the left, turn it clockwise and to the right, turn it counterclockwise.



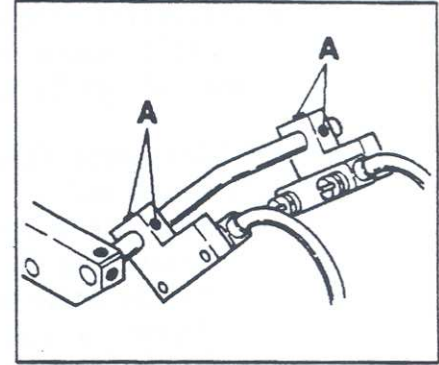
## 9-2 Adjustment of Optics Sensor

- \* Optics Sensor position: rear-front  
The standard position of Optics Sensor is 25mm from the center of Needle to the operator.  
Set the center of optical axis (red dotted) to this position.  
The adjustment is made by loosening Screw(A).

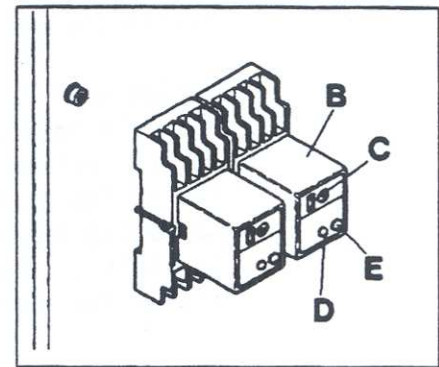


- \* Optics Sensor position: left-right
  - ① Move Carriage forward until it reaches forward standard position.
  - ② Load fabric under Clamp Foot.
  - ③ Lower Clamp Foot.
  - ④ Lower Patch Guide. (Brush Blade enters.)
  - ⑤ Load flap.
  - ⑥ Lower Flap Clamp.
  - ⑦ Press "EMERGENCY STOP" Switch.
  - ⑧ Aim optical axis (red dotted) of Optics Sensor at Reflective Sheet on Brush Blade.

The adjustment is made by loosening Screw(A).  
Note: Take care that Flap Clamp does not interrupt optical axis, and also take care that the position of 25mm from the center of Needle does not shift.



- \* Optics Sensor Sensitivity Adjustment
  - ① Check the lateral and longitudinal position once again.
  - ② Turn Variable Resistor(C) of Amplifier Unit(B) on Control Box counterclockwise fully to the end stop. Red Lamp(D) lights.
  - ③ Slowly turn it clockwise until Red Lamp(D) goes off.
  - ④ Continue to turn it clockwise until Red Lamp(D) lights.
  - ⑤ Further continue to turn it clockwise until Green Lamp(E) lights.
  - ⑥ Turn Variable Resistor(C) another 90° from the position Green lamp(E) lights.  
-- The sensitivity adjustment is completed. --
  - ⑦ Check of Optics Sensor.  
Move Carriage backward gradually by pressing "REAR" of "CARRIAGE FEED" Switch.  
When Optics Sensor senses the edge of flap, Red Lamp(D) goes off and Green Lamp(E) changes to red. -- In this condition the adjustment is correct.



# 1 O. Diagnosis of Trouble

## 10-1 Listing of sewing troubles and their correction

<u>Trouble</u>	<u>Cause</u>	<u>Correction</u>
* Breakage of needle thread	☆ Needle distortion, blunt needle point	☆ Replace Needle.
	☆ Wrong installation of needle	☆ Correct the installation
	☆ Misthreading	☆ Refer to standard threading.
	☆ Too strong tension of needle thread	☆ Refer to paragraph of sewing performance.
	☆ Improper clearance between Rotary Hook and Bobbin Case Opener	☆ Refer to paragraph of timing between Needle and Rotary Hook.
	☆ Improper timing between Needle and Rotary Hook	☆ Refer to paragraph of timing between Needle and Rotary Hook.
* Breakage of bobbin thread	☆ Misthreading	☆ Refer to the standard threading.
	☆ Too strong tension of bobbin thread	☆ Readjust to the correct tension.
	☆ Sticking of oil and chips on Bobbin Case	☆ Remove chips and wipe off the oil.
* Uneaven stitches	☆ Needle distortion, blunt needle point	☆ Replace the Needle.
* Skip stitches	☆ Needle distortion, blunt needle point	☆ Replace the Needle.
	☆ Wrong installation of needles	☆ Refer to the paragraph of installing Needles.
	☆ Misthreading	☆ Refer to the paragraph of threading Needle Thread.
	☆ Improper timing between Needle and Rotary Hook.	☆ Refer to the paragraph of Adjustment of timing between Needle and Rotary Hook.
	☆ Thread Take-up Spring is weak or its actuating range is too narrow.	☆ Refer to the paragraph of Sewing Performance.
* Weak tightening of thread	☆ Weak needle thread tension	☆ " "
	☆ Weak bobbin thread tension	☆ " "
* Needle breakage	☆ Wrong installation of Needle	☆ Refer to the paragraph of installation of Needle.
	☆ Needle distortion, blunt needle point	☆ Replace Needle.
	☆ Improper timing between Needle and Rotary Hook	☆ Refer to the paragraph of Adjustment of timing between Needle and Rotary Hook.

## 10-2 Listing of Sewing Head Troubles and their Correction

### ① Power supply cannot be turned on

Is circuit breaker open? . . . . . yes → Close the circuit breaker.

↓

no

↓

Is the voltage correct at the . . . . . no → Replace Voltage Regulator.  
Voltage Regulator?

↓

no

↓

Replace Power Board.

### ② Air Cylinder does not work

Do the corresponding lamps on . . . . . no → Replace Control Board.  
Control Board light?

↓

yes

↓

Does the lamp of Pneumatic Valve . . . . . no → Replace Pneumatic Valve.  
light?

↓

yes

↓

Replace Air Cylinder.

### ③ Metal Sensing Switch does not work.

Is the position of switch is proper? . . no → Adjust the position.

↓

yes

↓

Does the lamp of Metal Sensing . . . . . no → Replace the switch.  
Switch light?

↓

yes

↓

Replace Control Board.

### ④ Treadle Switch does not work.

Are the position of IC and Magnet . . . no → Adjust the position.  
proper?

↓

yes

↓

Does the lamp on Control Board . . . . . no → Replace Treadle Switch Unit.  
light?

↓

Replace Control Board.



## 1. Adjustment of Patch Loader

### 1-1 Adjusting the timing of Needle Plate

Adjust so that Metal Sensing Switch(K) actuated when the bottom of Patch Guide reaches 5mm above Slide Plate by loosening Screw(L) and moving Sensing Plate. When it senses, Lamp(14) on Intermediate Board and Lamp(20) on Control Board light up.

Note: If this timing is not proper, needles keeps projecting condition and might strike against Slide Plate causing needle breakage and machine cannot be operated.

### 1-2 Adjusting the position of Patch Space

Adjust the height of Patch Space(M) to catch the flap securely by Needle Plate and make it parallel to Patch Guide.

The adjustment is made by loosening Screw(N).

For the Right Patch Loader, make the distance from the left endsurface of Patch Guide to the left end of Patch Space Rubber(O) 25mm when Air Cylinder is in the most forwarded position.

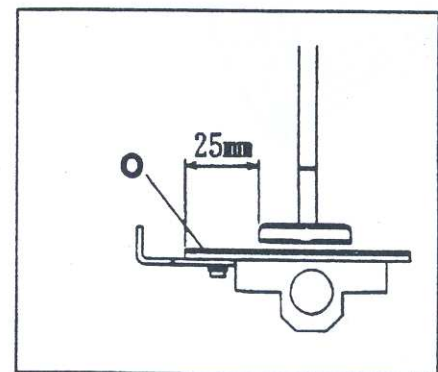
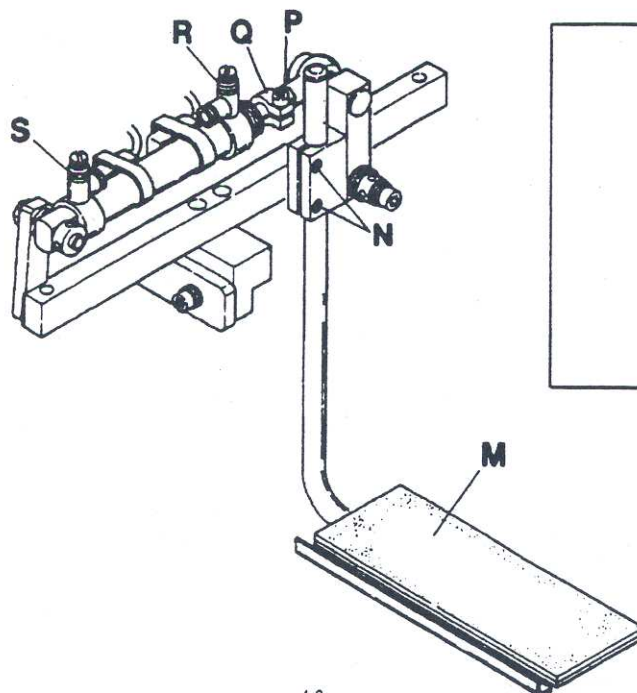
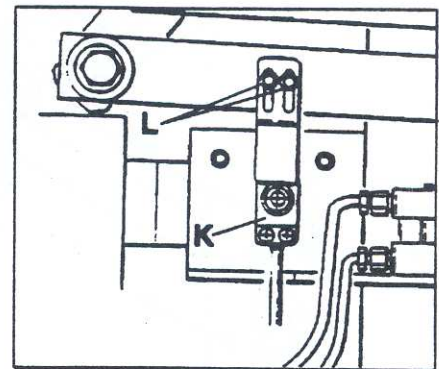
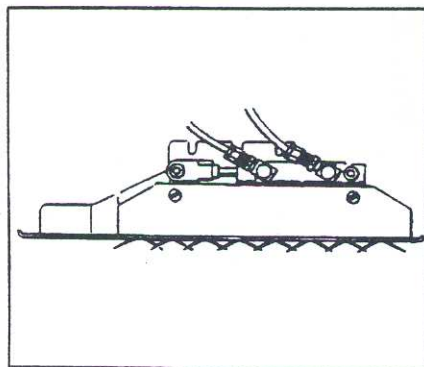
In case of Left Patch Loader, make the distance from right endsurface to right end of Patch Space Rubber(O) 25mm.)

The adjustment is made by loosening Nut(P) on Cylinder.

The adjustment of the stand-by position of Patch Space(M) is made by Collar(Q).

The adjustment of going speed is made by Speed Controller(R) so that it may not lift the flap.

And the adjustment of retruning speed is made by Speed Controller(S).



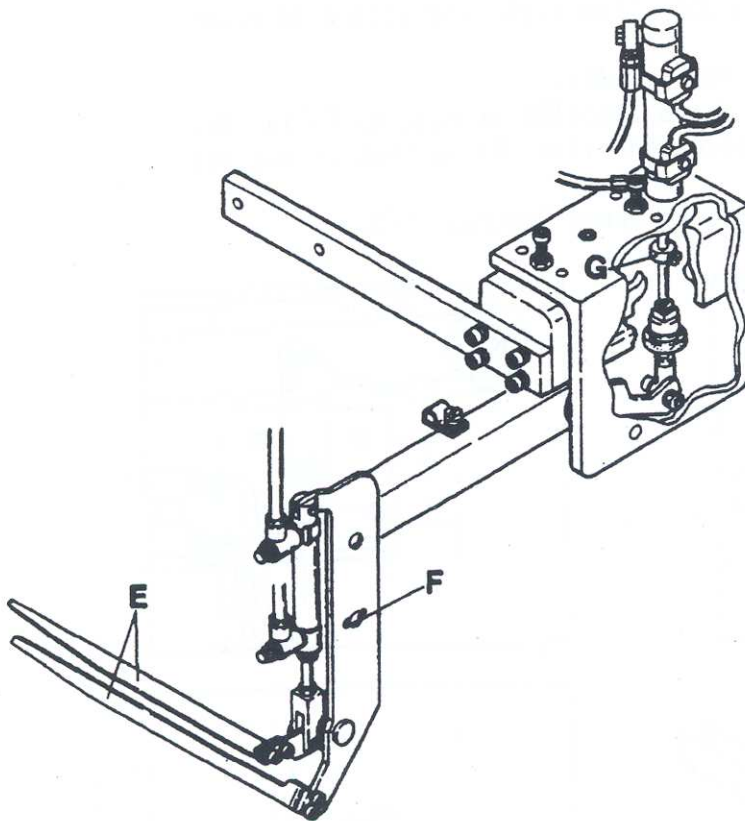
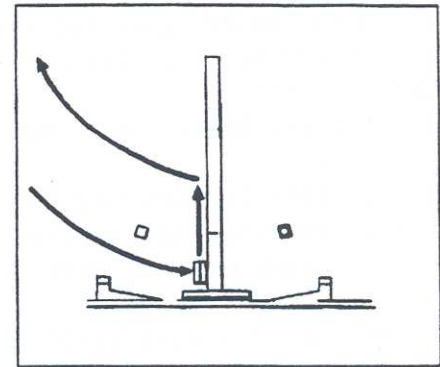
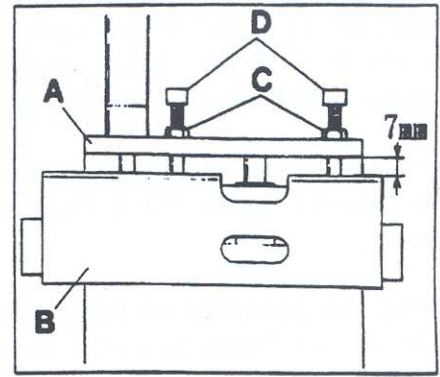
## 1 2. Adjustment of Flap Loader

- ※ Adjust the clearance between Flap Loader Basement (Upper) (A) and Flap Loader Basement (Lower) (B) to 7mm when Cylinder for Flap Loader Basement (Upper) operates.

Adjustment is made by loosening Lock Nut (C) and using Adjusting Screw (D).

- ※ Adjust so that Flap Nipper (E) passes between Flap Clamp and Clamp Foot when it moves clamping flap. The adjustment is made by loosening Screw (F). Bring Flap Nipper (E) as close to Patch Guide as possible.

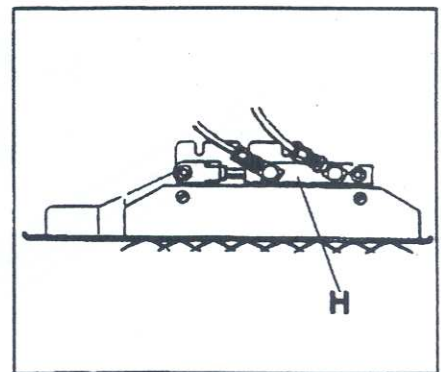
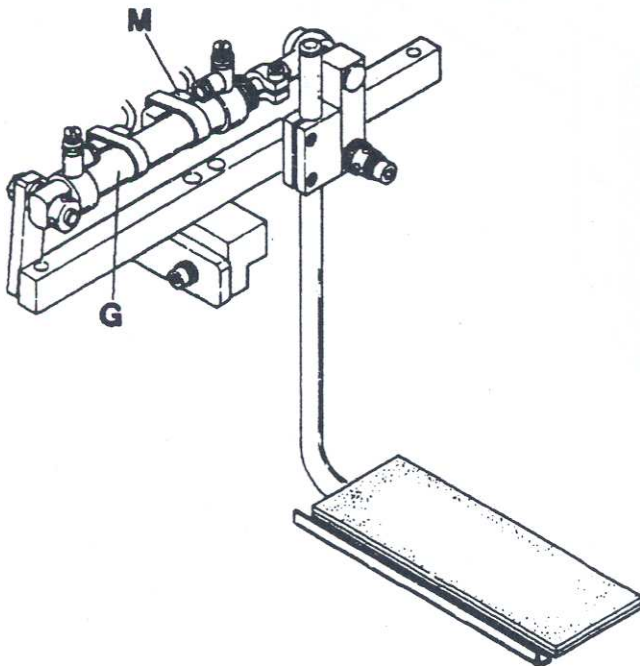
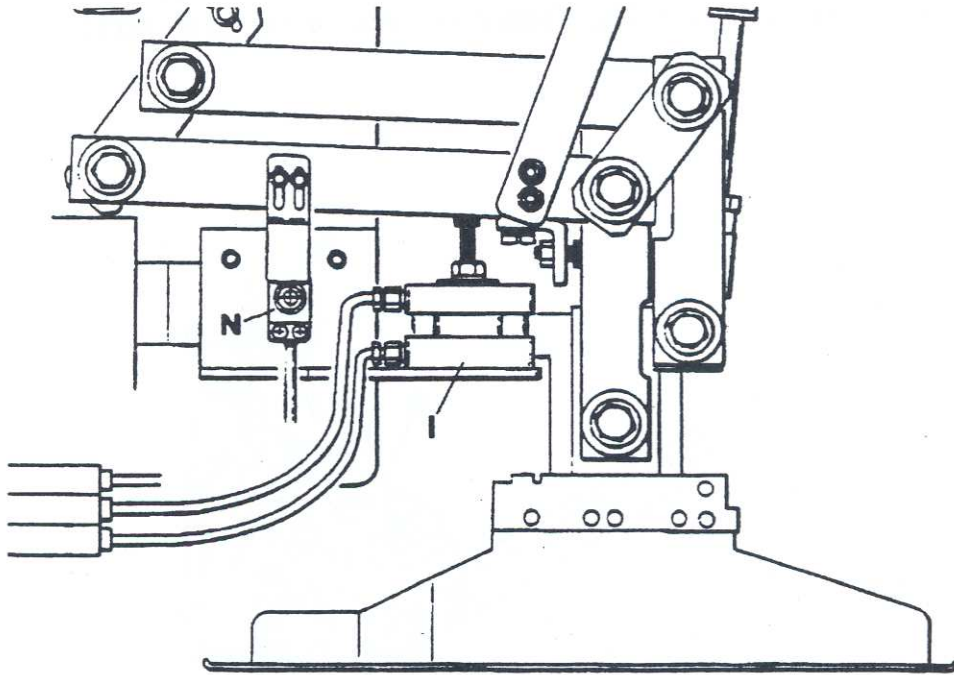
The adjustment is made by Stop Collar (G).



### 13. Operation Sequence of Patch Loader and Flap Loader

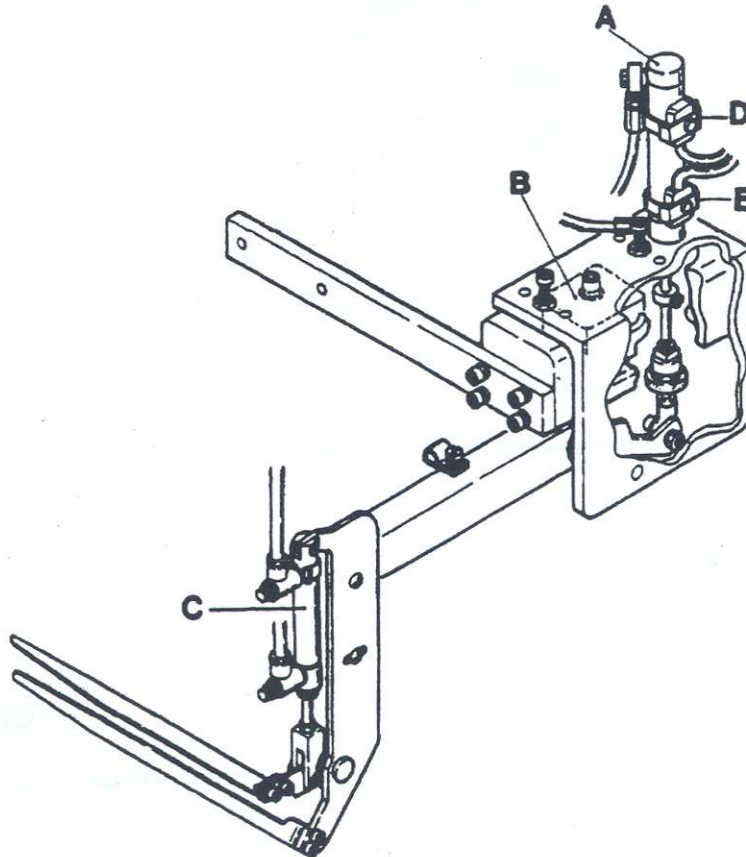
#### 13-1 Patch Loader

1. Press Knee Switch.
2. Air Cylinder(G) operates and Patch Space swings toward the center.
3. Metal Sensing Switch(M) actuates.  
(If this switch does not actuate, error display "CENTER SW." appears.)
4. Air Cylinder(I) operates and Patch Guide lowers.
5. Metal Sensing Switch(N) of Needle Plate actuates.  
(If this switch does not actuate, error display "NEEDLE PLATE SW." appears.)
6. Air Cylinder(H) operates and Needle Plate lowers.
7. The machine stops during the period of "PIN TIMER".
8. Air Cylinder(I) operates and patch Guide rises.
9. Air Cylinder(G) operates and patch Space returns to the home position.



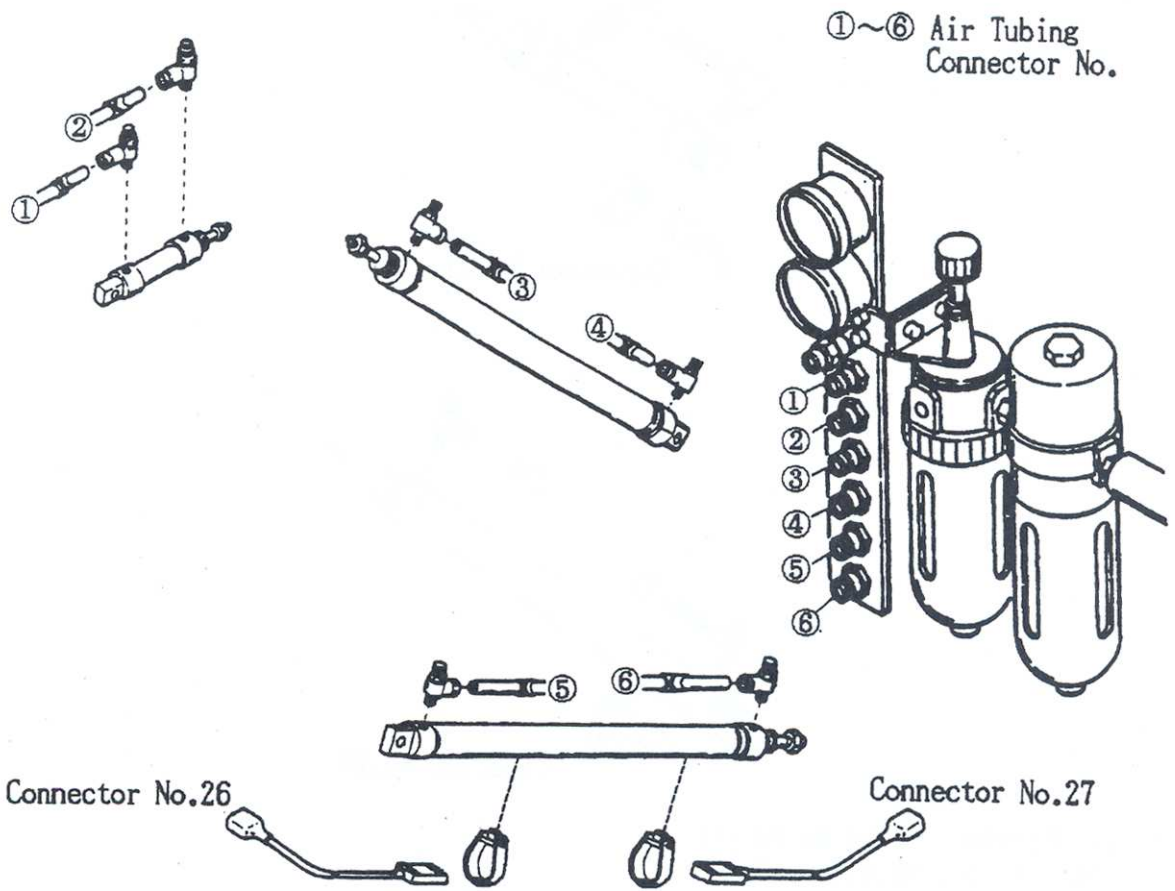
### 13-2 Flap Loader

1. Press Knee Switch.
2. Air Cylinder(C) operates and Flap Nipper clamps flap.
3. Air Cylinder(A) operates and Flap Loader lowers.
4. Metal Sensing Switch(E) actuates.  
(If this switch does not actuate, error display "F.L.DOWN SW." appears.)
5. Air Cylinder(B) operates and whole unit of Flap Loader is lowered.
6. Flap Nipper moves to the loading position of Clamp Foot.  
The loading position is fixed by Metal Sensing Switch(D).  
(If this signal is not inputted, error display "F.L. UNDER SW" appears.)
7. Flap Clamp hold flap.
8. Air Cylinder(C) is released and it becomes in the condition of not clamping flap.
9. Air Cylinder(B) operates and whole unit of Flap Loader rises.
10. Air Cylinder(A) operates and Flap Loader returns to the home position.

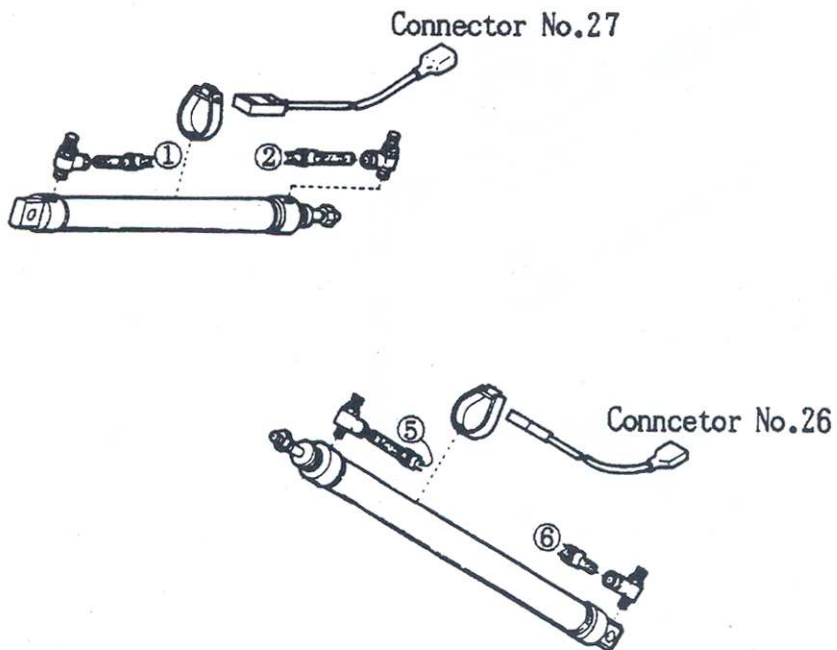


1 4. Stacker

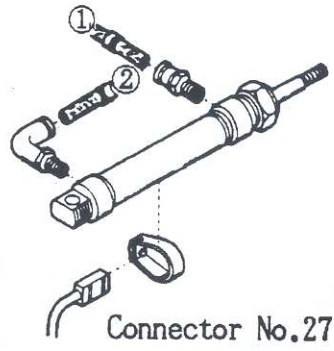
14-1 Coat Stacker (MODE No.84→0)



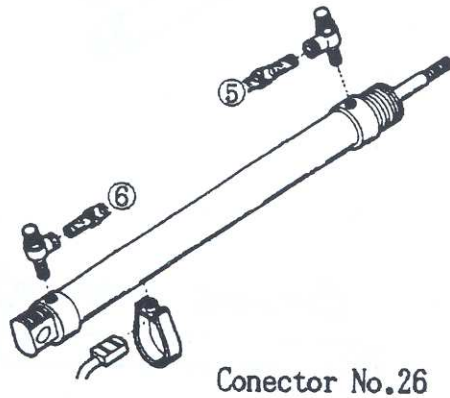
14-2 Trouser Stacker (MODE No.84→1)



14-3 Remover (MODE No.84→2)



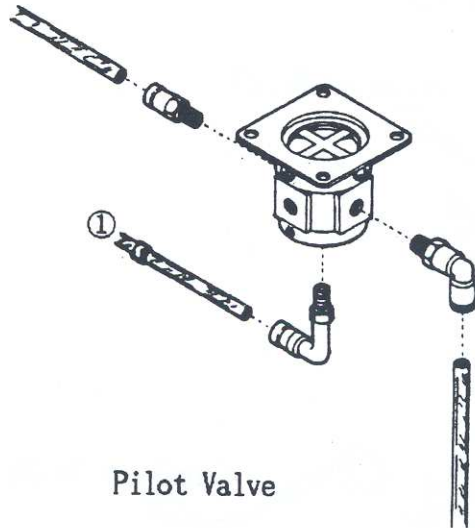
Connector No.27



Conector No.26

14-4 Air Ejector (MODE No.84→3)

\* AE TIMER = MODE No.15 0~9



Pilot Valve