

**JUKI**

Fully Automatic Belt-Loop  
Attaching Machine

**MOL-103P**

# **INSTRUCTION MANUAL**

---

**No.03**

**BE103P20B0A**

## CONTENTS

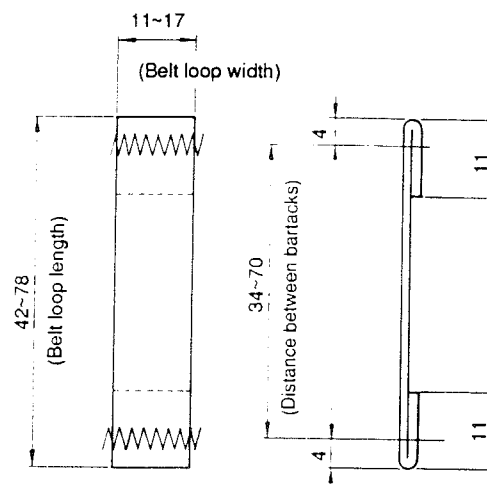
1. SPECIFICATIONS .....	1
2. OPERATION PREPARATION .....	1
3. CONTROL SWITCHES .....	2
4. SEQUENCE OF OPERATION .....	3
5. HOW TO SET THE BELT-LOOP .....	4
6. ADJUSTING THE STITCH SIZE .....	4
7. SETTING THE BELT-LOOP LENGTH .....	4
8. SETTING THE BELT-LOOP WIDTH .....	5
9. THE BELT-LOOP JOINT DETECTION .....	6
10. HOW TO REPLACE FOLDER SHAFT AND HOW TO ADJUST THE FOLDING PRESSURE: .....	6
11. THE WORK CLAMP FOOT AND WIPER POSITIONING .....	8
12. POSITIONS OF EACH BELT-LOOP SUPPLY UNIT .....	9
13. ELECTRICAL COMPONENTS .....	12
(1) The microswitch .....	12
(2) Connectors layout .....	14
(3) Power supply connection .....	15
(4) Wiring diagram .....	16
14. AIR PRESSURE .....	17
(1) Solenoid valve .....	17
(2) Wiring and piping diagram .....	17
(3) How to operate the switches on the control circuit board .....	18
(4) How to adjust the cutting length after joint detection .....	18
15. TROUBLES AND CORRECTIVE MEASURES .....	19

## CAUTIONS IN OPERATION

1. Don't put your hand under the needle when you turn "ON" the power switch or operate the machine.
2. Don't put your hand into the thread take-up cover while the machine is running.
3. Don't forget to cut off the power supply before you tilt the machine head backwards or replace the V-belt.
4. Never bring your fingers or hair close to, or place anything on the handwheel, V-belt, bobbin winder wheel or motor during operation. It may lead to serious personal injuries.
5. If your machine is provided with a belt cover, finger guard and eye guard, never operate your machine with any of them removed.

## 1. SPECIFICATIONS

Machine head	: High Speed, 1-Needle, Cylinder Bed, Lockstitch, Bartacking Industrial Sewing Machine (JUKI LK-1850)
Sewing speed	: 2,000 s.p.m.
Sewing size	: Bartack width: 1.8 to 3 mm Bartack length: 8 to 16 mm
Number of stitch	: 28, 36, 42
Needle used	: DP x 17 #19 to 21
Presser foot lift	: 18 mm
Belt loop length	: 42 to 78 mm
Belt loop width	: 11 to 17 mm
Ordinary bartacking	: Manual switchover (Arm length changes according to belt loop lengths)
Air pressure used	: 5 kg/cm <sup>2</sup>
Production capacity	: 8-H (5-loop per trousers, 36-stitch bartacking) 1 machine/person 900 pcs 2 machines/person 1,400 pcs
Belt loop stitching size	:



## 2. OPERATION PREPARATION

- (1) Air pressure
  - 1) Set to 5 kg/cm<sup>2</sup>.
- (2) Voltage
  - 1) Operate within  $\pm 10\%$  of the rated voltage.
  - 2) Make earthing.
- (3) Lubrication
  - 1) Oil where painted in red.
- (4) Rotating direction
  - 1) In the arrow direction facing the machine pulley. (Fig.)
- (5) The motor pulley will be supplied with a V belt of the following size:
  - 48-inch belt for 50 Hz area,
  - 47-inch belt for 60 Hz area,

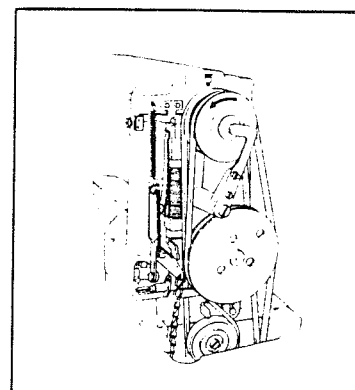
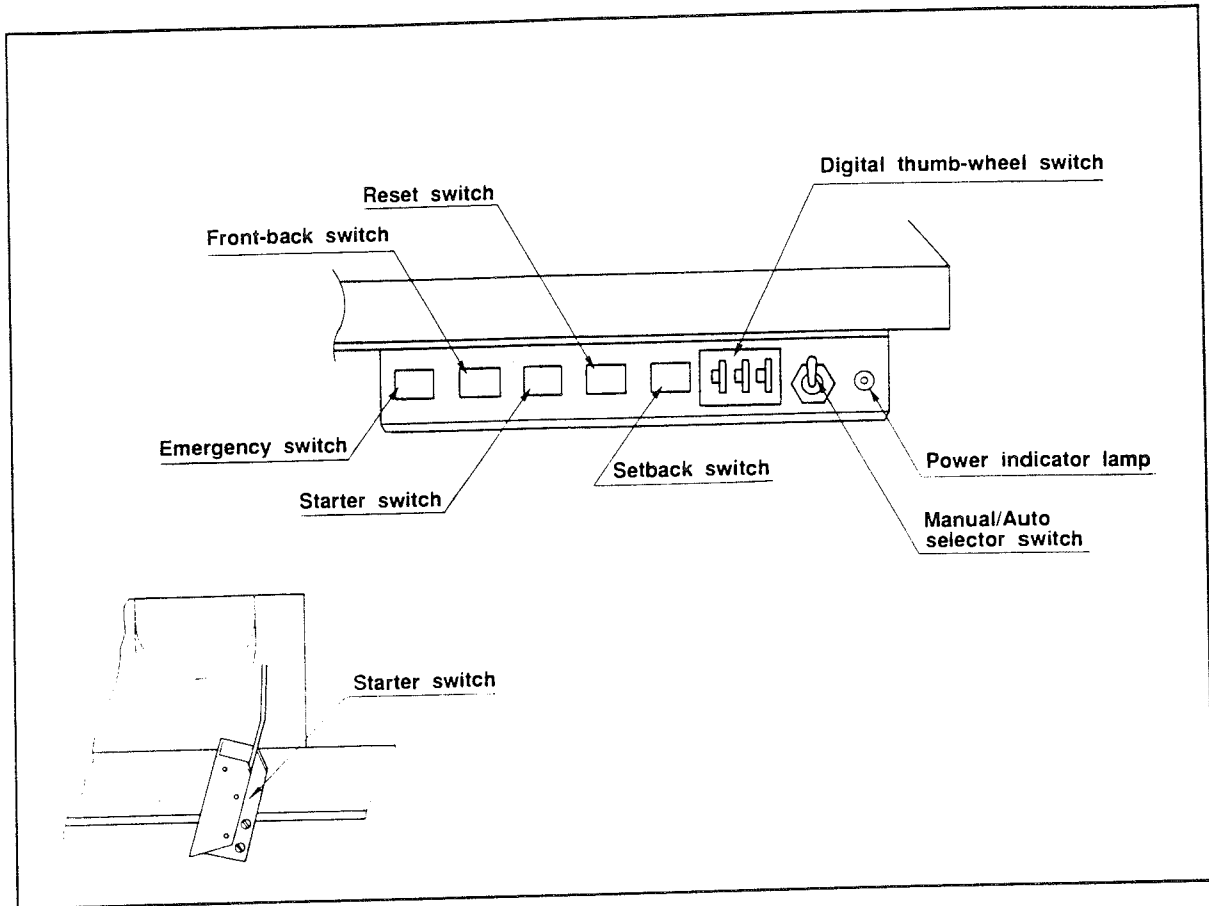


Fig.

### 3. CONTROL SWITCHES

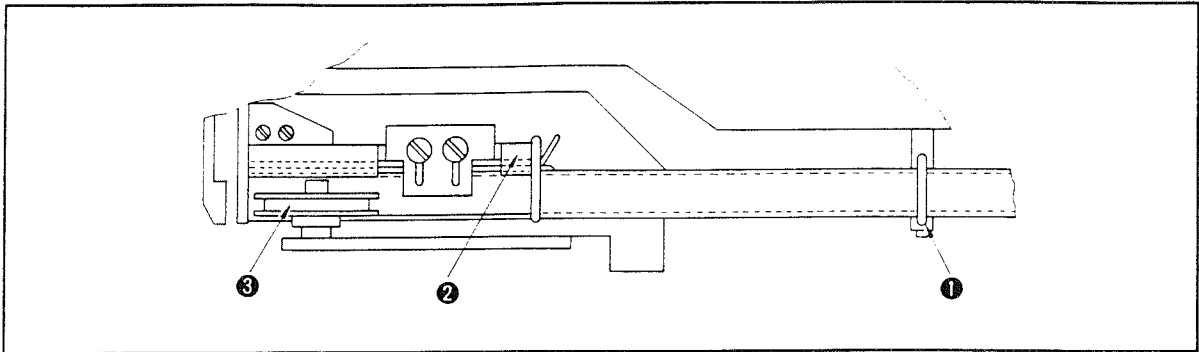


Name	SW No.	When	Function of switches
Emergency SW	BS-12	(Before pressing Starter) (Before starting machine) (In operation)	Lowens the work clamp foot, and switches to manual operation. Stop machine starting. Stops machine with the work clamp foot lowered.
Front-back SW	BS-7		Forwards or retreats the work clamp foot lowered by the emergency switch.
Starter SW	BS-8		Restarts machine after depressing the emergency switch and resumes auto operation.
Reset SW	BS-15		Raises the work clamp foot lowered by the emergency switch and switches to auto operation.
Setback SW	BS-11		Reruns belt loop setting.
Digital thumb-wheel SW			Determines the length of belt loop to be fed. (Adjustable from 1 to 200 mm).
Manual/Auto selector SW	TS-10	(MANUAL) (AUTO)	Switches to ordinary bartacking. Switches to auto operation.
Starter SW	BS-6		Starts machine.

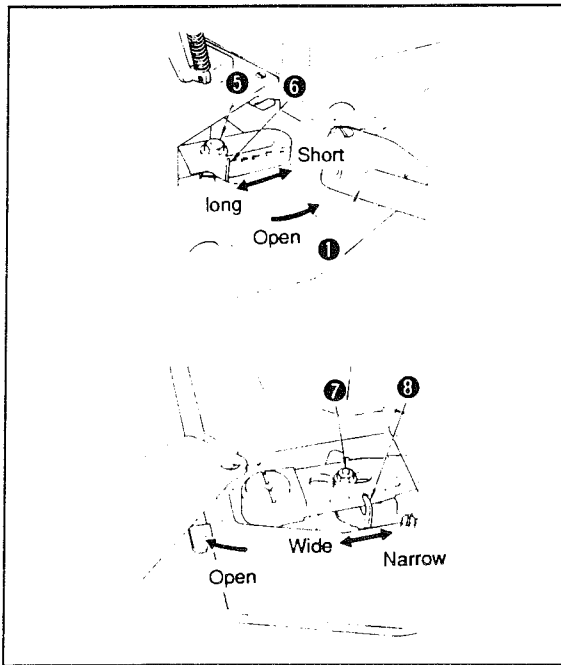


## 5. HOW TO SET THE BELT-LOOP

- 1) Pass the belt-loop through belt guide ①.
- 2) Place it under adjusting binder ②.
- 3) Lift feed roller ③ to insert the belt-loop under it.

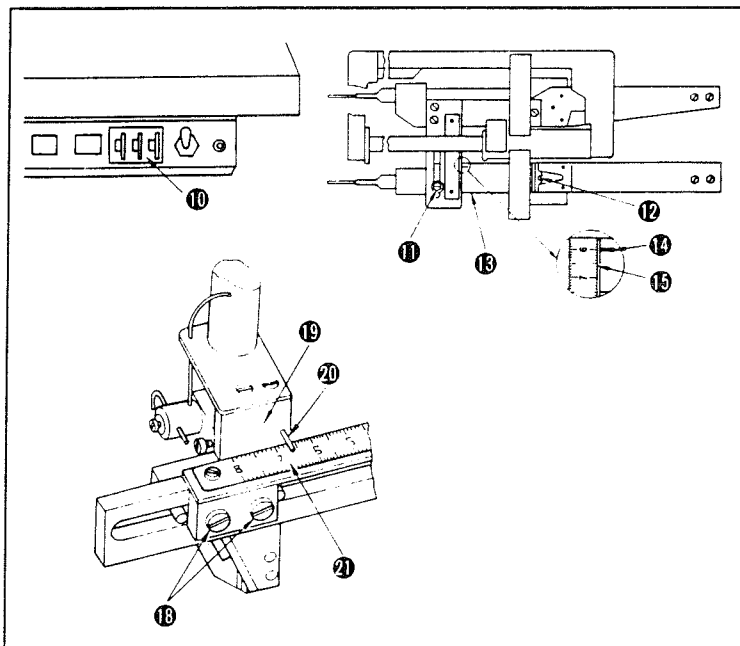


## 6. ADJUSTING THE STITCH SIZE



- (1) The bartack length
  - 1) Loosen nut ⑤ on the feed across regulator.
  - 2) Move lever ⑥ forward to lengthen, or move it back to shorten.
  - 3) After adjusting, tighten nut ⑤ securely.
- (2) The bartack width
  - 1) Loosen nut ⑦ on the feed regulator.
  - 2) Move lever ⑧ to the left to widen, or move it to the right to narrow.
  - 3) After adjusting, tighten nut ⑦ securely.

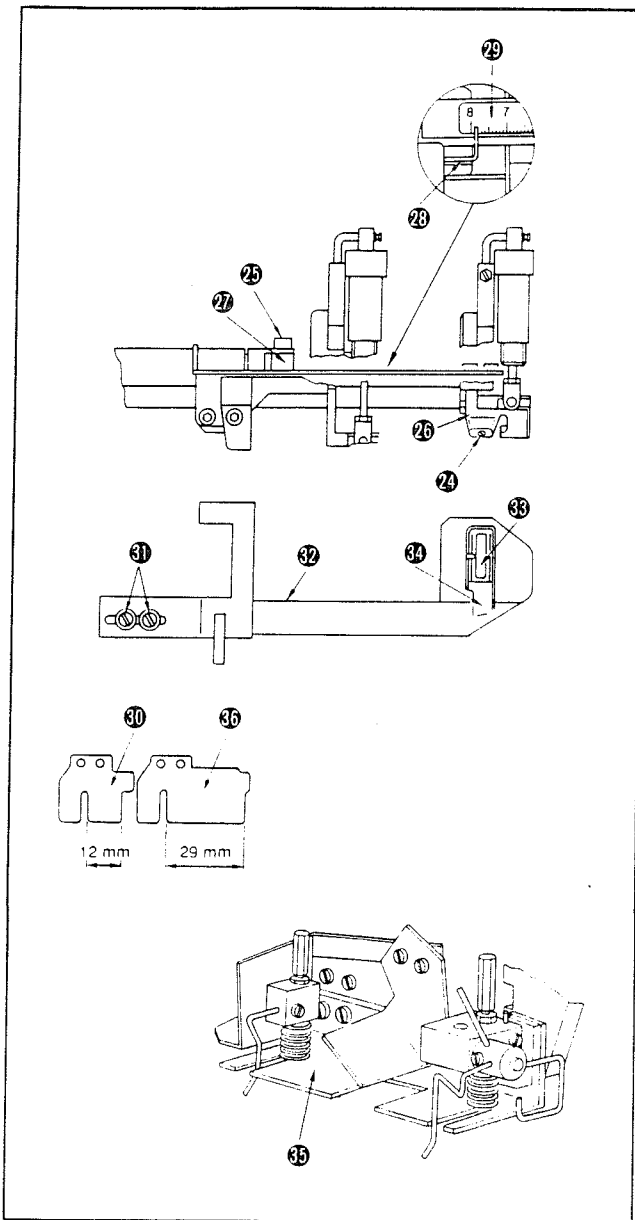
## 7. SETTING THE BELT-LOOP LENGTH



Set the desired belt-loop length in the following order:

- (1) The digital belt-loop feed switch
 

Adjust the belt-loop feed amount by switch ⑩.
- (2) The belt-loop folder shaft
  - 1) Loosen setscrews ⑪, ⑫.
  - 2) Move front folder shaft sleeve ⑬ to set pointer line ⑭ to the desired value on scale ⑮.
- (3) The belt-loop receiver
  - 1) Loosen setscrews ⑱.
  - 2) Move adjusting arm ⑲ to set pointer ⑳ to the desired value on scale ㉑.



- (4) The front work clamp foot
  - 1) Loosen setscrews 24, 25.
  - 2) Move front work clamp foot base 26 and adjusting plate 27 to set indicator 29 to the desired value on the scale.
- (5) The feed plate
  - 1) Loosen setscrews 31.
  - 2) Align needle hole 33 on the feed plate with that on front work clamp foot 34.
- (6) Belt-loop rear receiver plate
 

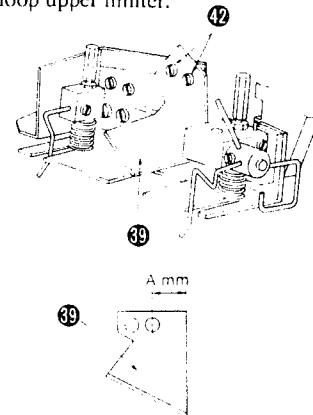
Select one of belt-loop rear receiver plates 35 that is suited to the length of belt-loops to be sewn.

  - 30 G515812200A is used for the sewing of belt-loops of which length is 42 to 65 mm.
  - 36 G515812200B is used for the sewing of belt-loops of which length is 60 to 78 mm.
- (7) Belt-loop upper limiter
 

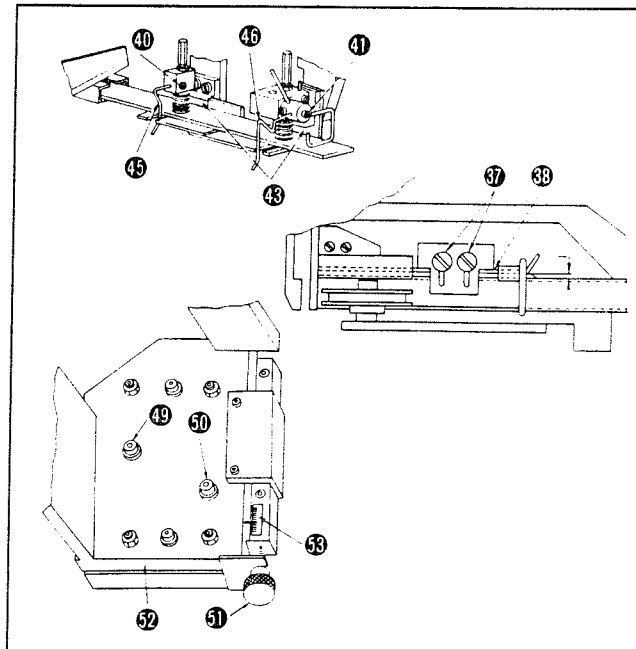
Select one of belt-loop upper limiters 39 that is suited to the length of belt-loops to be sewn.

Belt-loop length	A mm	Part No.
42 ~ 54 mm		Not used
55 ~ 62 mm	4	G5671103000
63 ~ 70 mm	12	G5672103000
71 ~ 78 mm	20	G5673103000

Remove screws 42, and replace the belt-loop upper limiter.



## 8. SETTING THE BELT-LOOP WIDTH



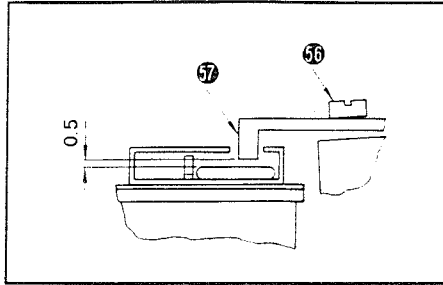
Set the desired belt-loop width in the following order:

- (1) Adjusting binder
  - 1) Loosen setscrews 47.
  - 2) Set guide 48 so that about 1 mm clearance is provided in the belt-loop width.
- (2) The belt-loop guides
  - 1) Loosen setscrews 40, 41.
  - 2) Set belt-loop guides 45, 46 so that the belt-loop contacts both sides of belt-loop receiver 43.
- (3) The belt-loop supply unit
  - 1) Loosen setscrews 49, 50.
  - 2) Turn belt-loop supply unit shift knob 51 to move supply unit base 52.

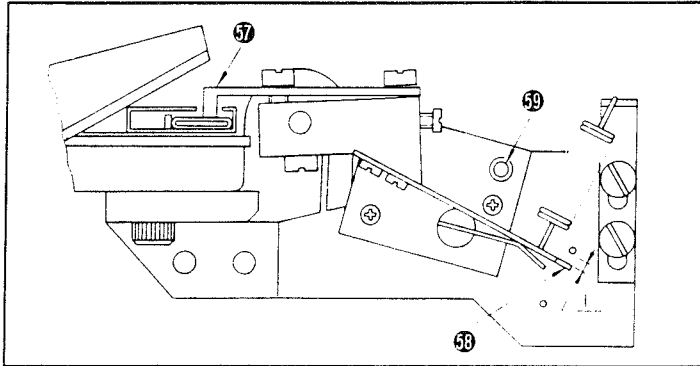
(The scale 53 is for positioning purpose.)

## 9. THE BELT-LOOP JOINT DETECTION

When the belt-loop thickness changes, make adjustment as follows.

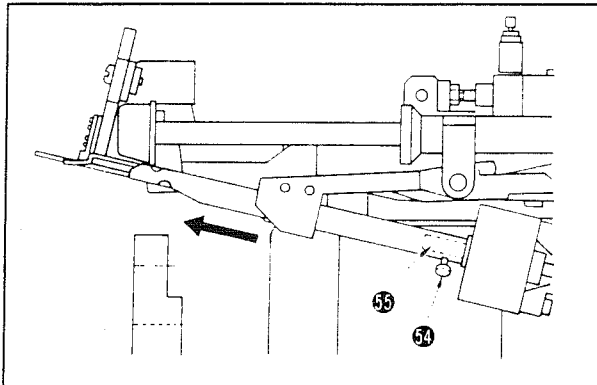


- 1) Turn adjusting screw 56 so that adjusting plate 57 positions about 0.5 mm over the belt-loop thickness.

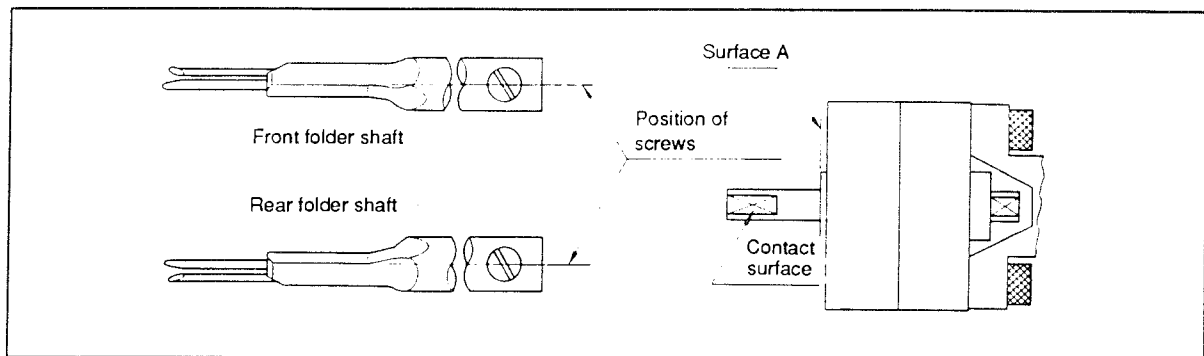


- 2) Adjust so that the adjusting plate is raised 1 mm or more by the end of detector lever 58 when the thicker part of a joint passes under the adjusting plate. The LED 59 should go off instantly.

## 10. HOW TO REPLACE FOLDER SHAFT AND HOW TO ADJUST THE FOLDING PRESSURE



- (1) Turn the main switch and air supply OFF.
- (2) Loosen setscrew 54 of the folder shaft.
- (3) Move the folder shaft in the direction of the arrow to detach it from rotor shaft 55, then remove it in the opposite direction from the arrow.



- (4) To install the front or rear folder shaft, align the screw to the contact surface, press the end of the folder shaft against surface A, and tighten the screw. (Be careful not to reverse the front and rear folder shafts.)

(5) There are three different intervals of the folder pins.

Select one according to the belt-loop thickness, referring to the table shown at right.

Folder pin interval	Loop thickness
2.0 mm (for extra light-weight material)	~ 1.0 mm
2.5 mm (for light-weight material)	1.0 ~ 1.8 mm
3.2 mm (for standard)	1.6 ~ 2.3 mm
4.0 mm (for heavy-weight material)	2.0 ~

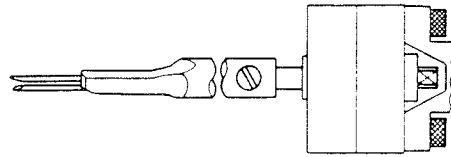
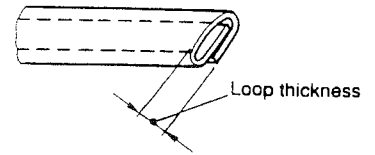
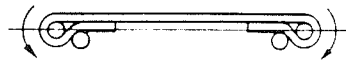


Fig. A



Belt-loop folding direction

Fig. B

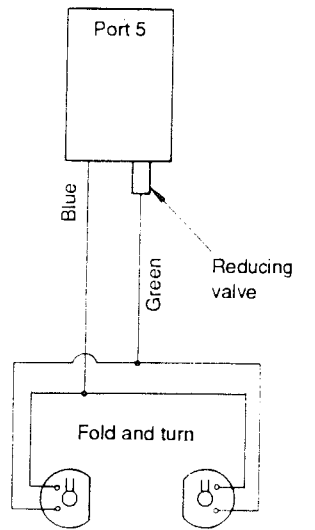


Fig. C

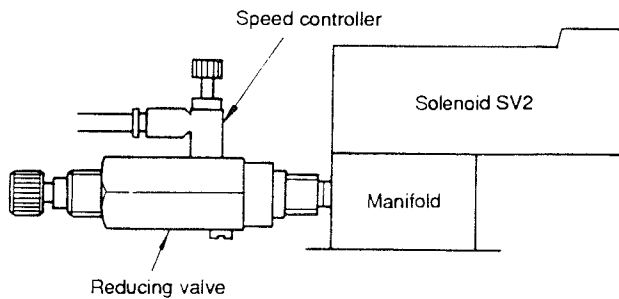


Fig. D

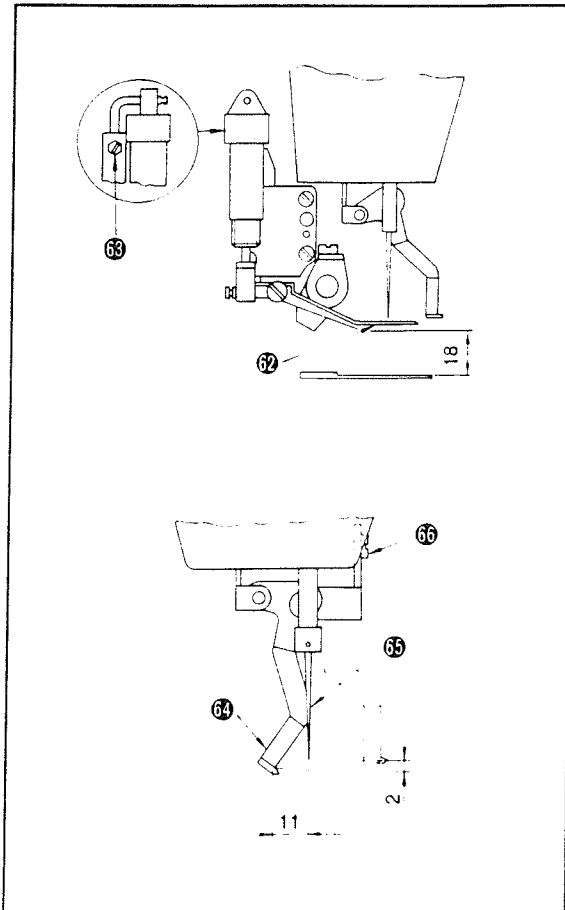
(6) The folder shaft (Fig. A) is actuated by the reducing valve (Fig.C) to fold a belt-loop as shown in Fig. B. When a belt-loop is set on the folder shaft, the folder shaft pauses, the work clamp foot comes down, the belt-loop is sewn, and the folder shaft returns to its home position (reverses) to stand by.

(7) Although the load applied when the folder shaft returns to its home position (reverses) to standby is low, the inertial force produced at that time may cause **damage** to the rotary actuator shaft. To avoid this, it is necessary to adjust the returning speed of the rotary actuator.

(8) The speed controller (Fig. D) mounted on the A port air reducing valve of solenoid SV2 (Fig. C) controls the rotational speed of the folder shaft by regulating the exhaust air speed when air is supplied through the B port with the solenoid switches (when the folder shaft returns).

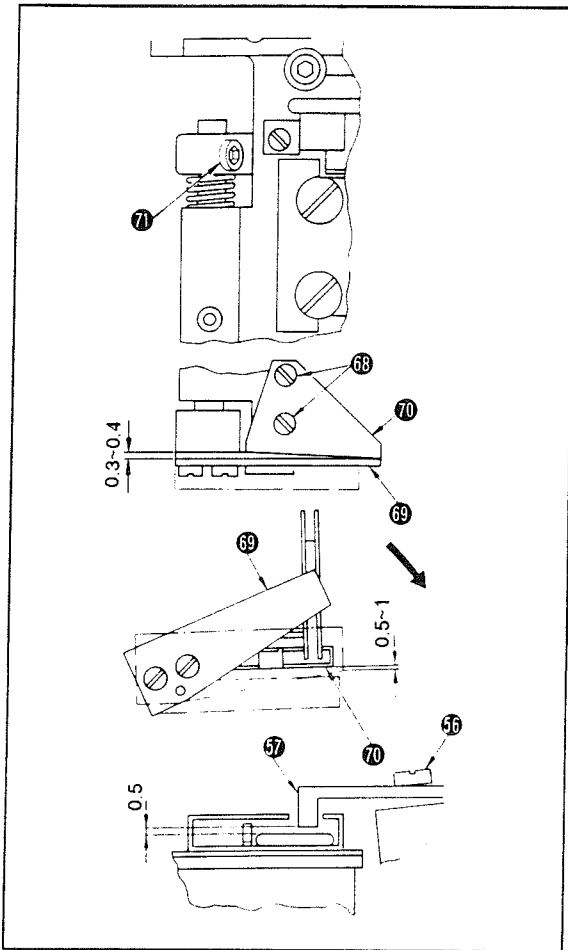
- (9) The speed is controlled when the folder shaft returns (reverses) to its standby position so that no adverse effect is exerted on the system cycle time.
- (10) When adjusting the reducing valve according to belt-loop materials, be sure to adjust the speed controller accordingly at the same time. For instance, when you loosen the reducing valve to sew belt-loops of stiff materials such as 15 oz. to 16 oz. denim, make sure to also loosen the speed controller knob. (Normally, the speed controller knob is given one turn when the reducing valve knob is given one turn).
- (11) Be careful not to tighten the speed controller knob too much, or else the folder shaft may fail to resume the correct angle in its standby position, resulting in belt-loop folding failure.

## 11. THE WORK CLAMP FOOT AND WIPER POSITIONING



- (1) The work clamp foot  
The work clamp foot **62** rises up to 18 mm.  
(Adjustment)  
Loosen setscrew **63** to make this adjustment.
- (2) The wiper
  - 1) The swung out position of wiper **64** is 11<sup>±1</sup> mm away from needle **65**.
  - 2) The clearance between the needle point and wiper is 2 mm.  
(Adjustment)  
Loosen setscrew **66** to make this adjustment.

## 12. POSITIONS OF EACH BELT-LOOP SUPPLY UNIT

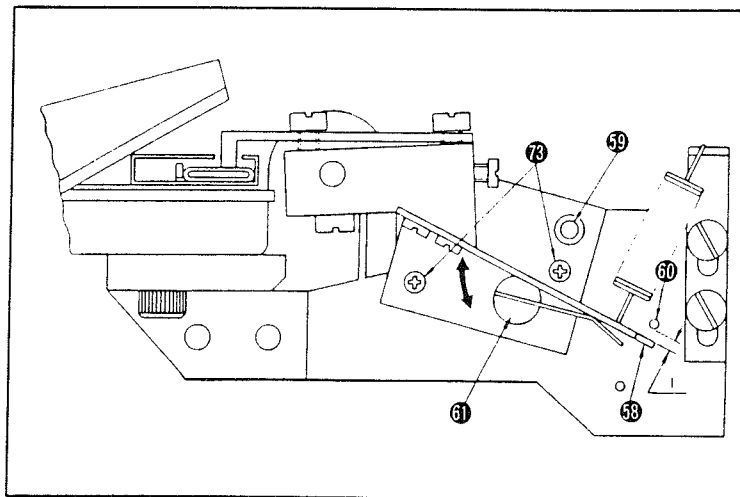


### (1) Knives

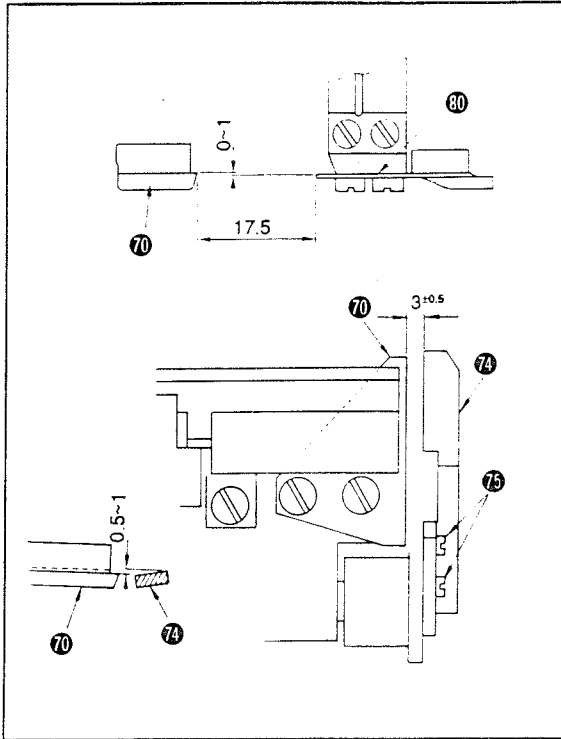
- 1) The clearance between moving knife 69 and the fixed knife 70 should be 0.3 mm to 0.4 mm when engaged. Adjustment is made by loosening setscrews 68 to move fixed knife 70.
- 2) The down position of moving knife 69 is 0.5 to 1 mm below fixed knife 70. Adjustment is made by turning moving knife 69 in the arrow direction after loosening setscrew 71.

### (2) The belt-loop joint detection

- 1) The height of adjusting plate 57 is 0.5 mm up the belt-loop thickness. Adjustment is made by turning screw 56.

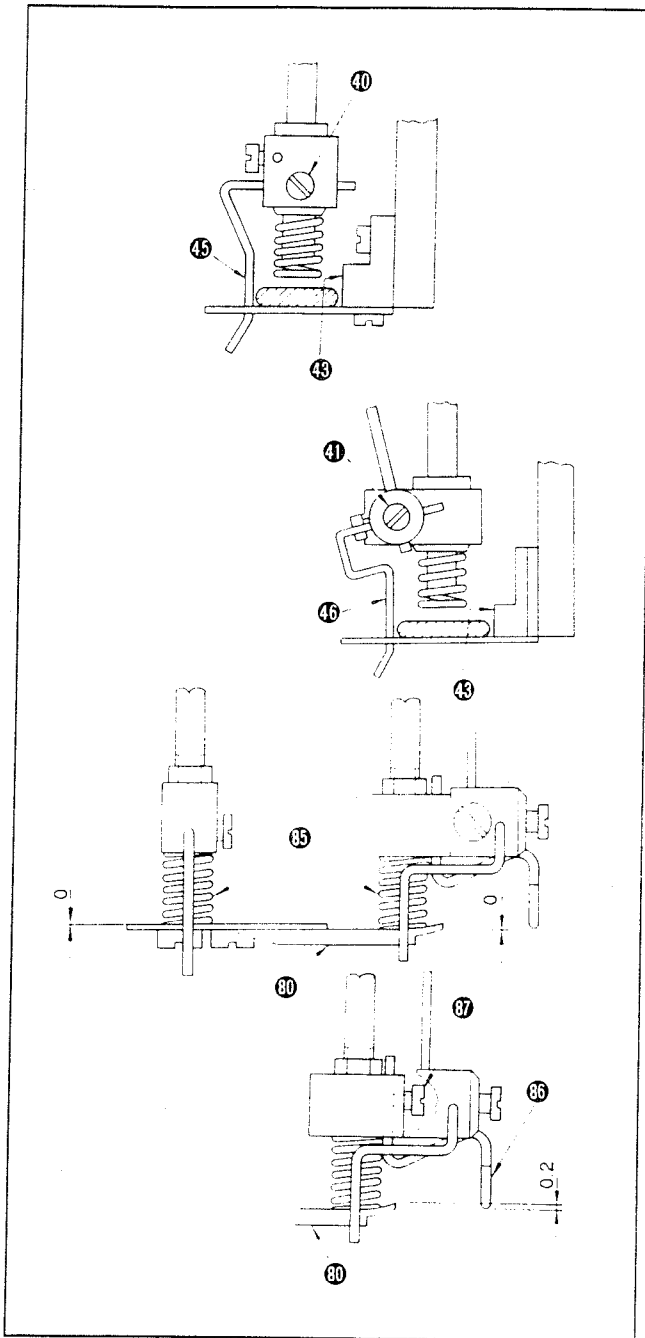


- 2) The detector switch 61 should be ON and LED 59 be off when detector lever 58 lowers 1 mm down from pin 60. Adjustment is made by loosening setscrews 73 and moving detector switch 61 in the direction as arrowed.



(3) Belt-loop feed

- 1) The step between the top of belt-loop receiver 80 and the top of fixed knife 70 is 0 to 1 mm.
  - 2) The distance between the rear end of receiver 80 and fixed knife 70 is 17.5 mm.
  - 3) The clearance between belt-loop lower limiter 74 and fixed knife is  $3 \pm 0.5$  mm.
  - 4) The step between belt-loop lower limiter 74 and the top of fixed knife 70 is 0.5 to 1 mm.
- Adjustment is made after loosening setscrews 75.



(4) The belt-loop lateral position

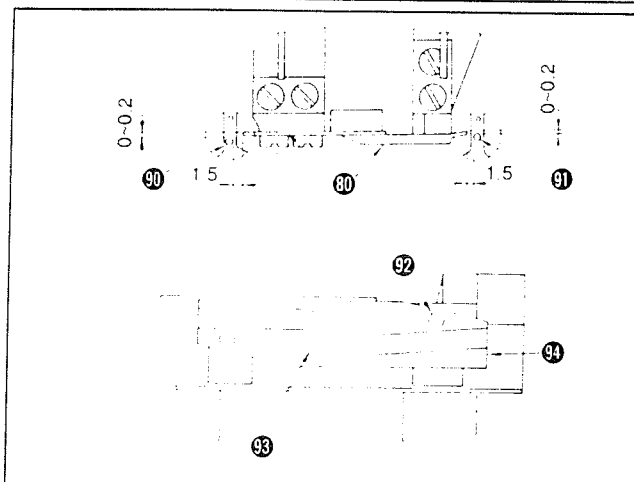
- 1) Before clamping the belt loop, the distance between belt-loop guide 45, 46 and the side of belt loop receiver 43 is the same with the belt-loop width.

Adjustment is made after loosening setscrews 40, 41.

- 2) The clearance between the top of belt-loop receiver 80 and belt-loop presser springs 85, when lowered, is 0 mm.

- 3) The step between belt-loop presser pin 86 and belt-loop receiver 80 is 0.2 mm.

Adjustment is made after loosening setscrew 87.

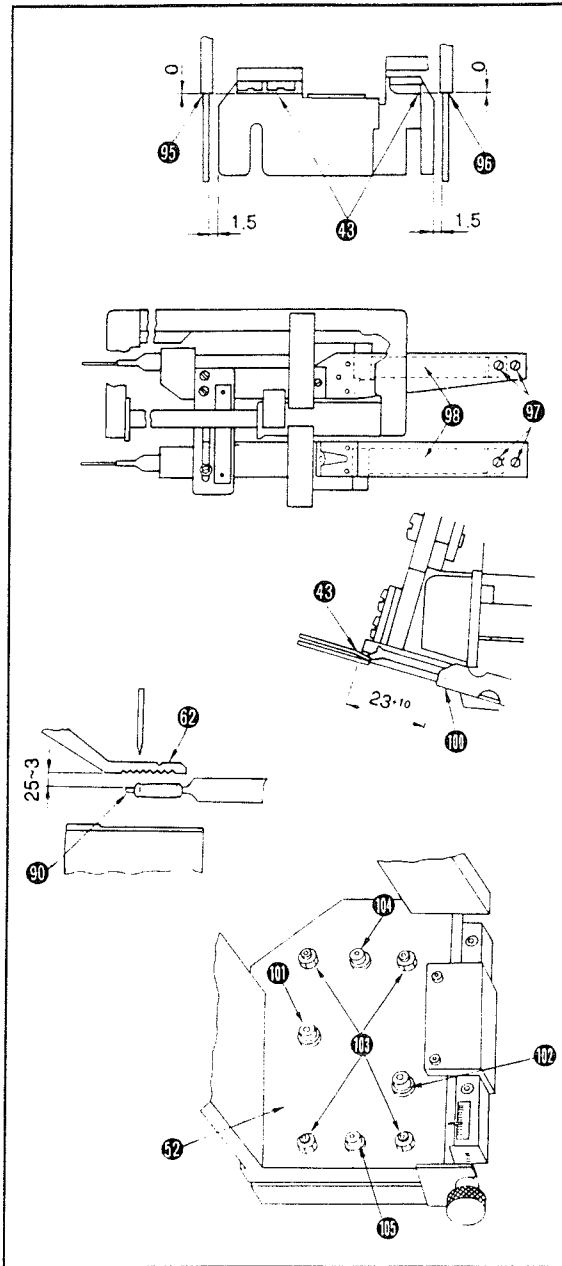


(5) The belt-loop folder

(Situation) When the belt-loop folder shaft has advanced:

- 1) The step between lower folder pins 90, 91 and the top of belt-loop receiver 80 is 0 to 0.2 mm. Adjustment is made by loosening setscrew 92 and raising or lowering rear section 94 of supply cam 93.

- 2) The clearance between lower folder pins 90, 91 and belt-loop receiver 80 is 1.5 mm.



3) The fork ends 95 , 96 of each folder pin is flush with the side of belt loop receivers 43 .

Adjustment is made by loosening setscrews 97 and moving rotor bases 98 .

(6) Belt-loop supply

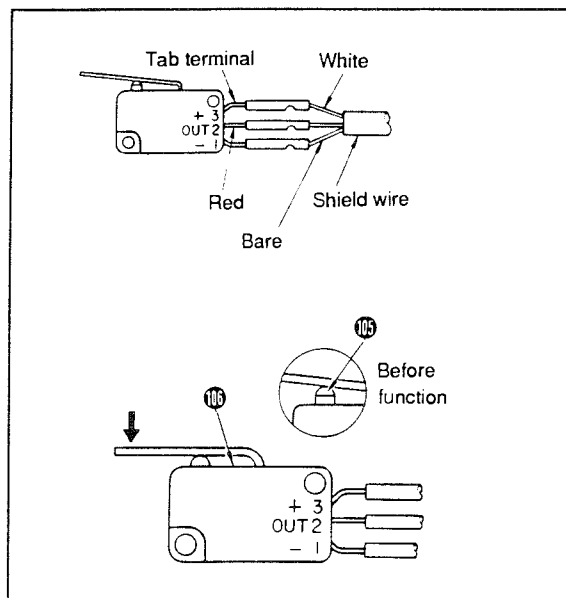
1) The initial position of belt-loop folder shaft 100 is 23 mm ± 0.1 mm away from the side of the belt-loop receivers 43 .

2) The clearance between the top of folder pin 96 and work clamp foot 62 is 2.5 to 3 mm.

(Adjustment)

Slightly loosen four nuts which are used to retain adjusting screws 103 . Also, slightly loosen fixing bolts 101 and 102 . Then, remove base fixing bolts 104 and 105 . Now adjust four adjusting screws 103 vertically by turning each of them.

### 13. ELECTRICAL COMPONENTS



(1) The microswitch

1) Connection of the tab terminal

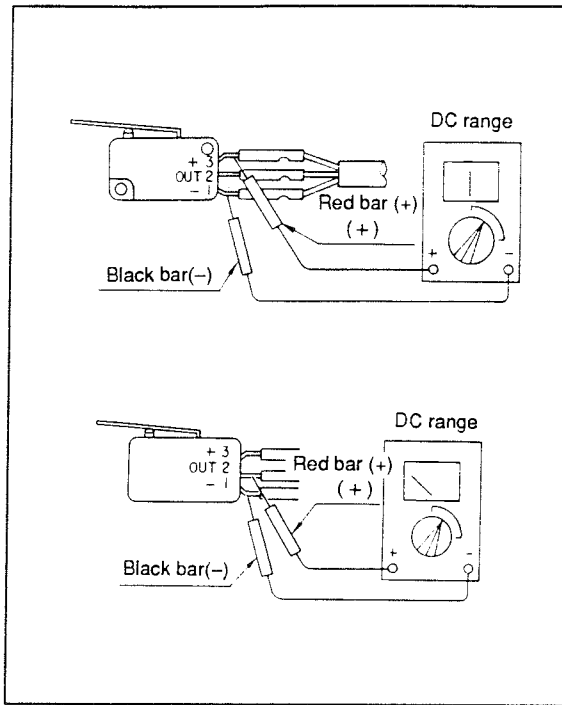
Bare wire to 1

Red wire to 2

White wire to 3

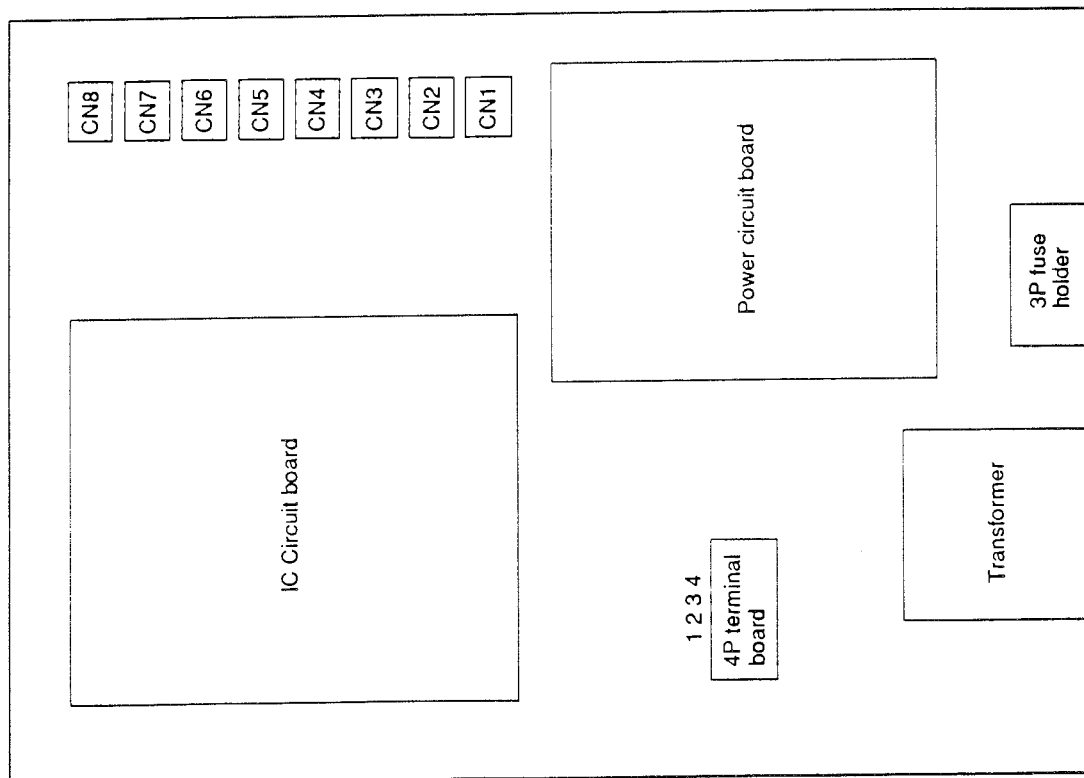
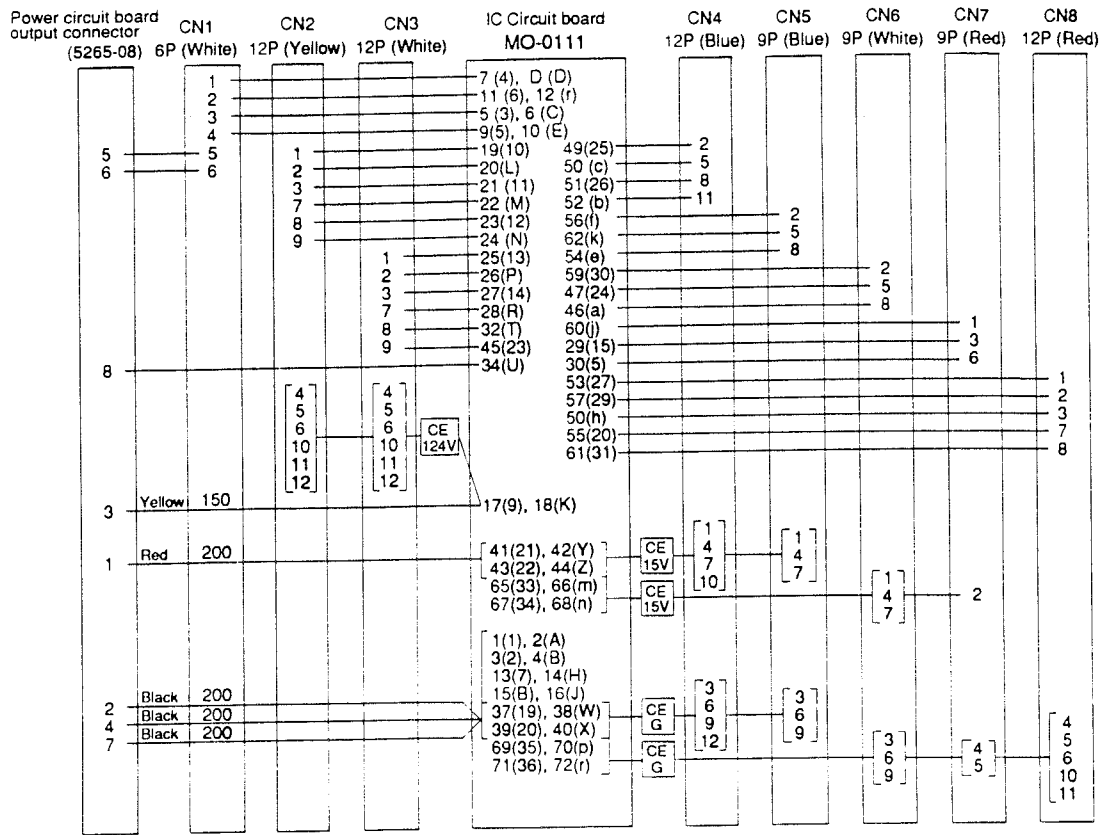
2) Function

The microswitch turns ON when stepped part 105 of the actuator enters end 106 of the switch.



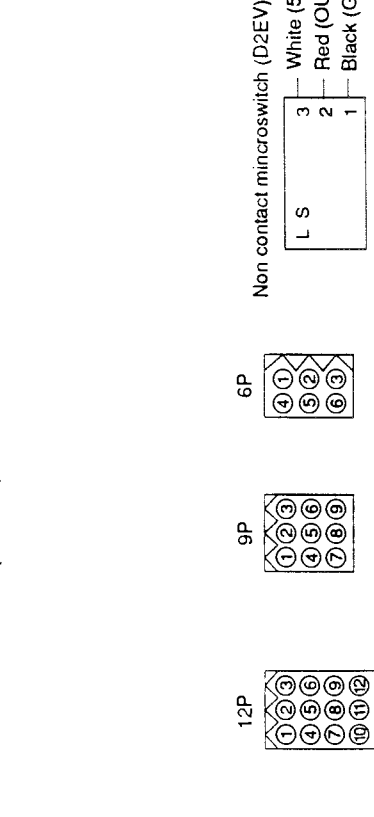
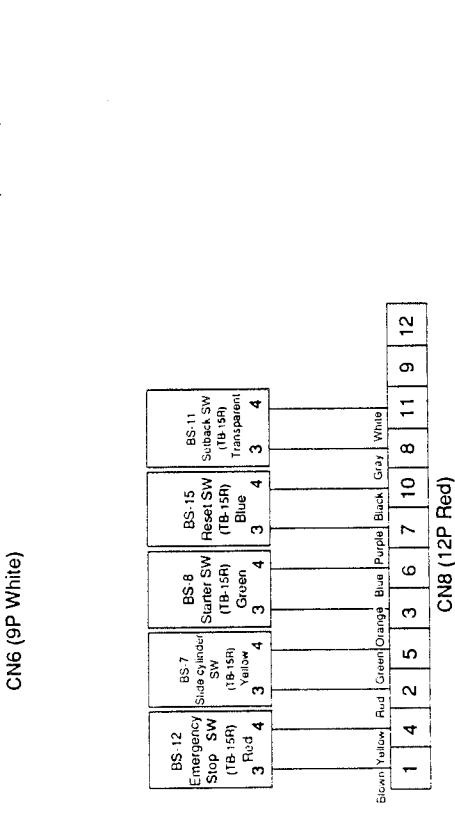
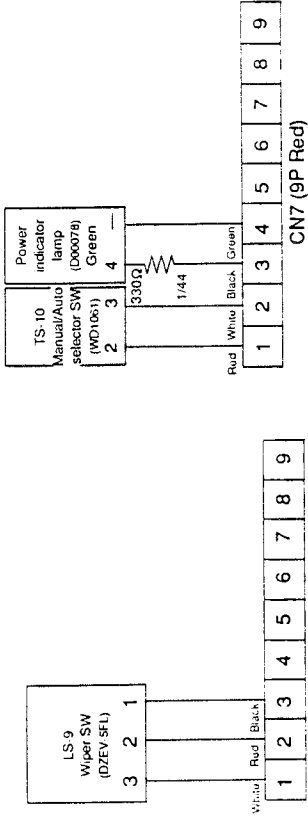
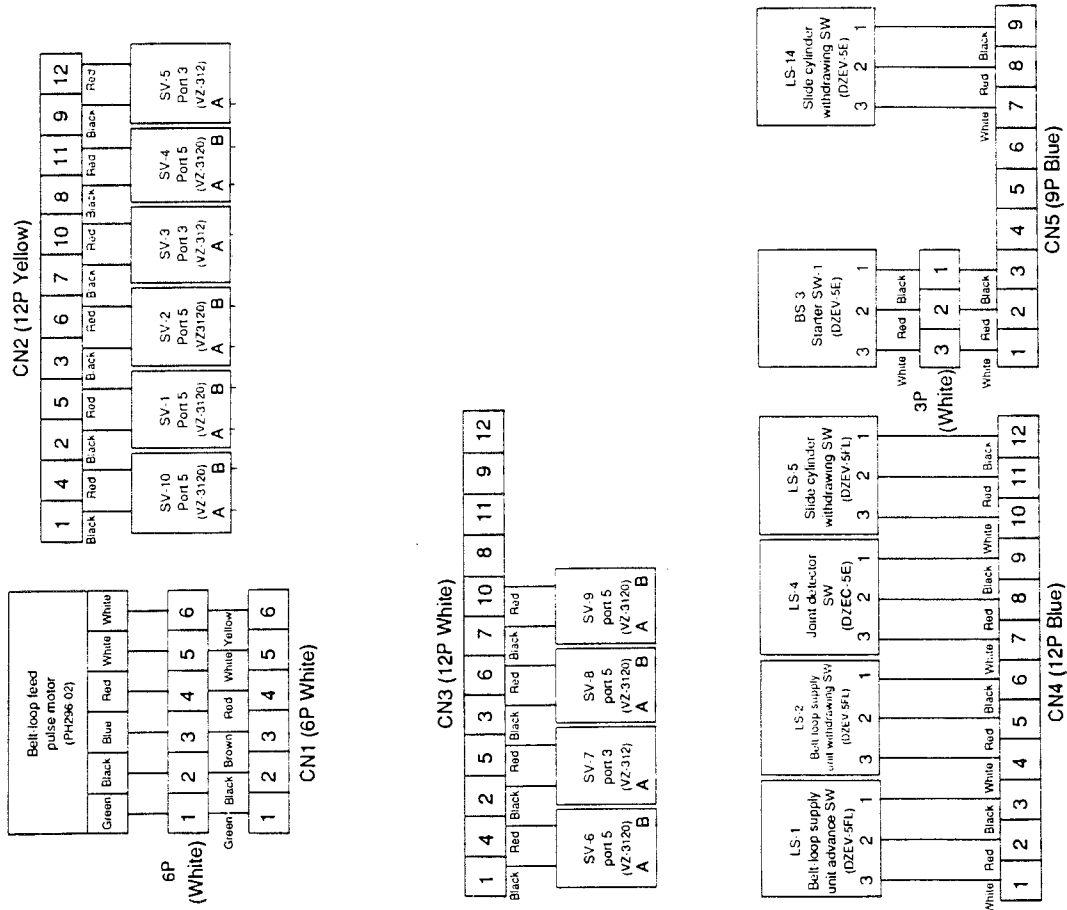
- 3) Checking the power supply
  - (I) Cut off the air supply to the machine and turn on the power switch.
  - (II) Set the tester to the DC (10 V) range.
  - (III) The tester should indicate about 5 V (more than 3 V) when contacting the black (negative) bar with the bare wire and the red (positive) bar with the white wire.
- 4) Checking the output
  - (I) Cut off the air supply to the machine and turn on the power switch.
  - (II) Set the tester to the DC (10 V) range.
  - (III) The tester should indicate 0 V when contacting the black (negative) bar with the bare wire and the red (positive) bar with the red wire as the microswitch is ON (the actuator is depressed). (When OFF, 3 to 5 V should be indicated.)

(2) Connector layout



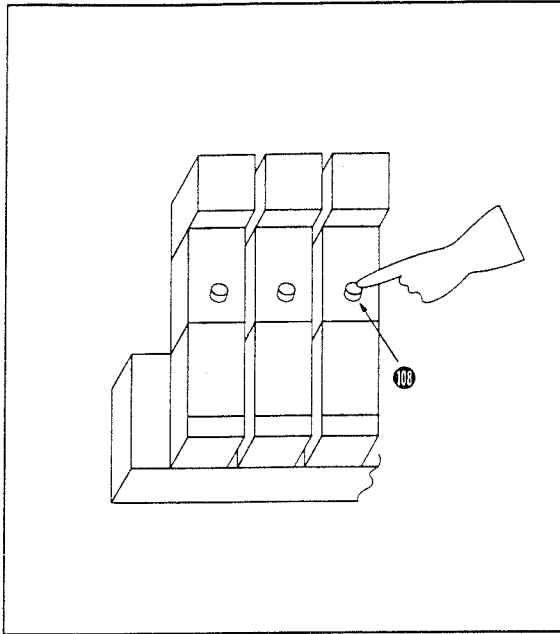


(4) Wiring diagram



CN (Connector) pin layout

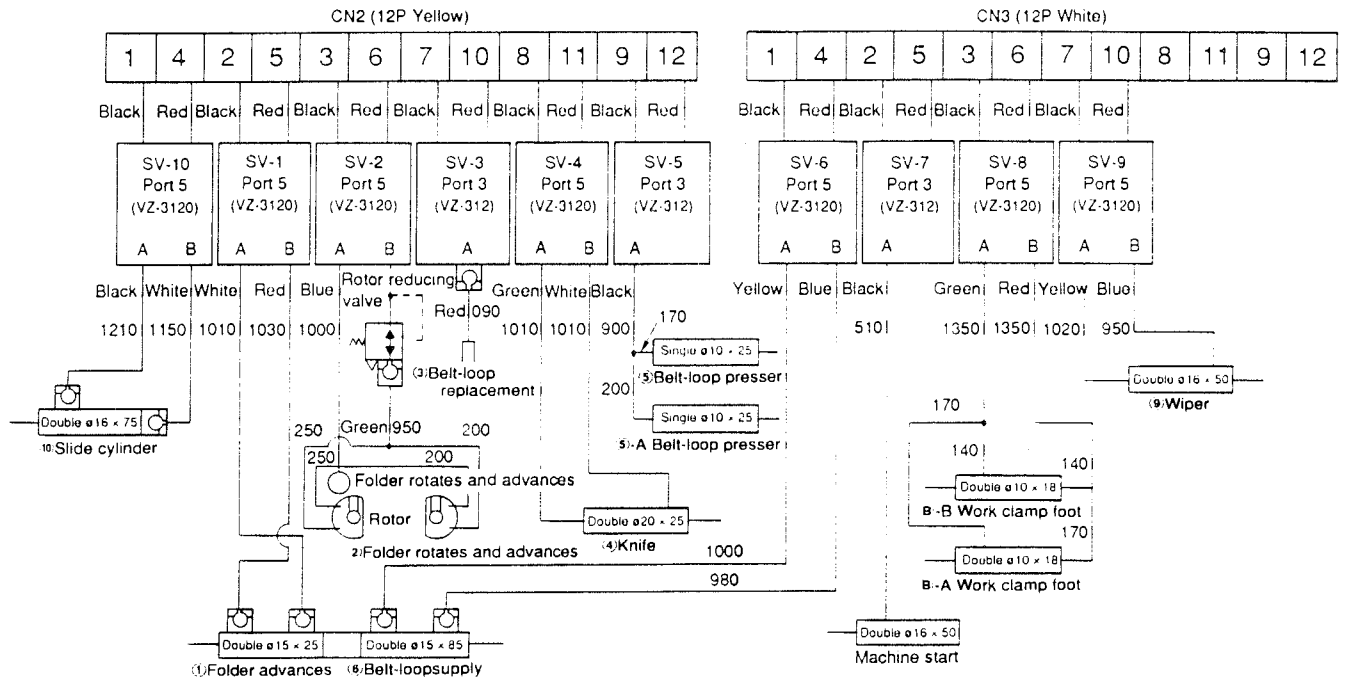
## 14. AIR PRESSURE



### (1) Solenoid valve

- 1) Checking the solenoid valve switchover.
  - (I) Turn off the power supply and let the air in.
  - (II) Depress manual button ⑩ on the solenoid valve to test the manual operation.

### (2) Wiring and piping diagram



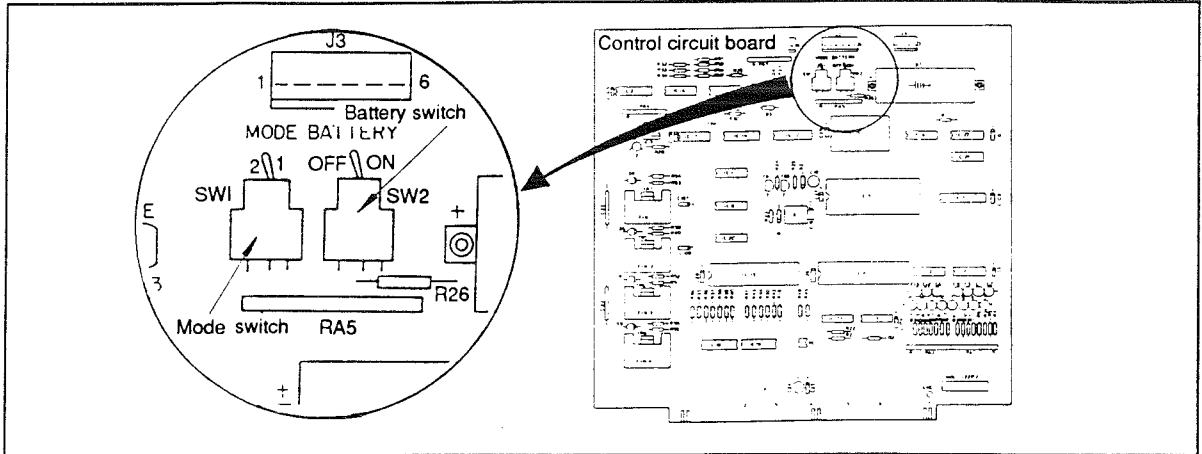
(3) How to operate the switches on the control circuit board

Set the mode switch to "1" when the machine has one starter switch (standard specification).

Set the mode switch to "2" when the machine has two starter switches (optional specification).

The battery switch serves as the battery back switch of the RAM for storing the bobbin thread consumption, and will store the bobbin thread consumption for more than a week when set to "on".

Set the battery switch to "off" absolutely, when the circuit board is removed in control box.

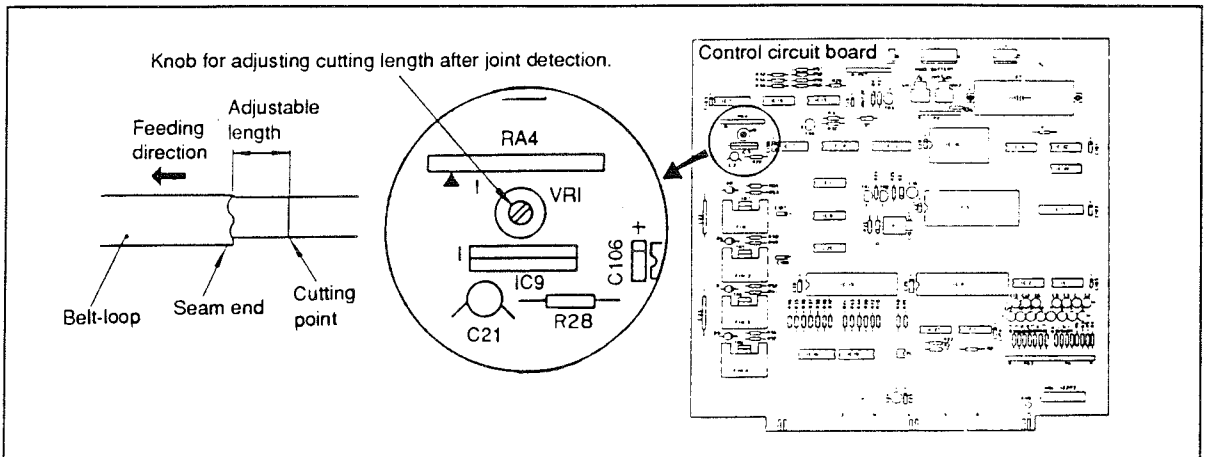


(4) How to adjust the cutting length after joint detection

The knives will be actuated to cut the belt-loop strip upon detection of the belt loop joint end.

The knob, located on the control circuit board, is used to adjust the cutting length after joint detection.

Turn the knob clockwise to increase the cutting length and counterclockwise to decrease the cutting length.



## 15. TROUBLES AND CORRECTIVE MEASURES

Troubles	Causes	Corrective Measures
1. Needle breaks.	(1) Slow slide return. (2) Improper wiper work position.	1. Adjust speed controller properly. 2. See P.7 (2) Wiper.
2. Thread is too long at start.	(1) Improper wiper work position.	1. See P.7 (2) Wiper.
3. Work clamp foot won't rise when main switch ON.	(1) LS-9 wiper switch incorrectly set. (2) LS-5 slide cylinder withdrawing switch incorrectly set.	1. Set properly. 2. Set properly.
4. 2nd bartacking is incorrect.	(1) LS-14 slide cylinder withdrawing switch improperly set.	1. Set properly.
5. Belt-loop is too short to be set or too long.	(1) Incorrect belt-loop length setting. (2) Belt-loop subjected to resistance.	1. See P.4 (1) Belt-loop feed digital switch. 2. Eliminate resistance.
6. Belt-loop joint is not detected.	(1) Improper detector setting. (2) LS-4 joint detector switch incorrectly set.	1. See P.6 Belt-loop joint detection. 2. Same as above.
7. Belt-loop is not cut sharply.	(1) Knife is worn. (2) Improper fixed knife setting. (3) Knife is chipped.	1. Sharpen knife. 2. See P.8 (1) Knife 3. Sharpen or replace.
8. Belt-loop end goes under receiver.	(1) Incorrect belt-loop lower limiter setting. (2) Defective belt-loop.	1. See P.8 Belt-loop feeding 3), 4). 2. Replace belt-loop.
9. Belt-loop is not set straight on receiver.	(1) Incorrect belt loop upper limiter and limiter pin setting. (2) Defective belt-loop.	1. See P.9 belt-loop feeding 5), 6). 2. Replace the belt loop.
10. Belt-loop won't pass straight through rear folder shaft pin.	(1) Incorrect folder shaft pin position.	1. See P.10 Belt-loop folder 1).
11. Belt-loop won't pass straight through front folder shaft pin.	(1) Incorrect folder shaft pin position. (2) Incorrect belt-loop presser setting.	1. See P.10 Belt-loop folder 1). 2. See P.9 Belt-loop lateral position 3).
12. Work clamp foot won't go down when belt-loop supplied.	(1) LS-1 belt-loop supply switch set incorrectly.	1. Set correctly.
13. Belt-loop is not set.	(1) LS-2 belt-loop supply switch set incorrectly.	1. Set correctly.
14. Machine won't start when operating AUTO.	(1) LS-2 belt-loop supply switch set incorrectly.	1. Set correctly.

# JUKI

## JUKI CORPORATION

HEAD OFFICE  
3-2-1 KOKURYO-CHO.  
CHOFU-CITY TOKYO 182 JAPAN

BUSINESS OFFICE  
1-23-3 KABUKI-CHO  
SHINJUKU-KU. TOKYO 160. JAPAN

PHONE : 03(3205)1188, 1189, 1190  
FAX : 03(3203)8260, (3205)9131  
TELEX : J22967, 232-2301

---

To order or for further information, please contact :

---

Please do not hesitate to contact our distributors or agents in your area for further information when necessary  
\* The description covered in this instruction manual is subject to change for improvement of the commodity without notice.