

DP-2100/IP-420 INSTRUCTION MANUAL

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CONTENTS

1. SPECIFICATIONS	. 1
1-1 Specifications of the machine head	1
1-2 Specifications of the control box	1
2. CONFIGURATION	. 2
2-1 Sewing machine main unit	2
3 INSTALLATION	3
3-1 Caution at the time of set-up	3
3-2 Assembling the nedal section of the stand	٠. ۵
3-3 Assembling the table	5
3-4 Connecting the power cable	.6
3-5 Installing the sewing machine main unit	6
3-6 Installing the cover	7
3-7 Installing the stopper for tilt prevention	7
3-8 Installing the operation panel	7
3-9 Connecting the cords	8
3-10 Installing the throat plate auxiliary plate	9
3-11 Installing the thread guide rod	9
3-12 Installing the thread stand	10
3-13 Assembling the table for work (WORK TOP TABLE)	10
4 PREPARATION BEFORE OPERATION	11
4-1 Attaching the needle	11
4-2 Threading the needle-thread	11
4-3 Winding the bobbin thread	12
4-4 Setting the bobbin into the bobbin case	12
4-5 Attaching and removing the bobbin case	13
4-6 Adjusting the thread tension	13
4-7 Adjusting the thread take-up spring	13
4-8 Adjusting the stitch guide	13
	17
5.1 DREFACE	14
5-2 BASIC OPERATION OF THE OPERATION PANEL (IP-420)	18
(1) Configuration of IP-420	.18
(2) Buttons used in common	19
6. OPERATION OF THE SEWING MACHINE (SEMI-AUTOMATIC BASIC VOLUME)	20
6-1 Data input screen	20
6-2 Sewing screen	22
6-3 Details data input screen	23
6-4 Feed amount	25
6-5 Basic operation of the sewing machine	26
(1) Prepare the materials	26
(2) Turn ON the power switch	26

(4) Select left/right alternate sewing. <left alternate="" right="" selection="" sewing=""></left>	27
(5) Perform sewing.	
6-6 Basic change of the set value	30
(1) Changing the sewing speed <max. setting="" sewing="" speed=""></max.>	
 (2) Changing the peedle thread tension (3) Changing the peedle thread tension 	30
(3) Changing the shirring amount < Shirring amount setting>	31
(4) Changing the shirring amount of auxiliary feed <auxiliary amount="" feed="" setting="" shirring=""></auxiliary>	
6-7 Creating the pattern <pattern creation=""></pattern>	33
6-8 Deleting the pattern <pattern deletion=""></pattern>	34
7. OPERATION OF THE SEWING MACHINE (SEMI-AUTOMATIC APPLICATION VOLUME)	
7-1 Correcting the pattern	36
(1) Changing the needle thread tension of specified step < Compensation thread tension setting>	
(2) Changing the pitch of specified step <compensation pitch="" setting=""></compensation>	37
(3) Increasing/decreasing the shirring amount of all steps <shirring amount="" decrease<br="" increase="">setting></shirring>	
(4) Increasing/decreasing the shirring amount immediately after changeover of step <compens< td=""><td>ation</td></compens<>	ation
shirring amount setting>	39
(5) Adding the step <step addition=""></step>	
(6) Deleting the step <step deletion=""></step>	
(7) Changing the start position of program < start position change>	44 n
function>	, 46
(9) Changing the top notch position of program <top change="" notch="" position=""></top>	47
(10) Naming the pattern <data name="" setting=""></data>	49
7-2 Copying the pattern <pattern copy=""></pattern>	50
(1) Pattern copy in semi-automatic mode <copy semi-automatic="" to=""></copy>	50
(2) Pattern copying from semi-automatic to fully-automatic <copy fully-automatic="" to=""></copy>	51
7-3 Creating the new pattern <new creation="" pattern=""></new>	52
7-4 Using the other functions	54
(1) Directly calling the pattern from the sewing screen <direct pattern="" selection=""></direct>	54
(2) Adjust the STEP SELECTION button to the shape of sleeve <measure function=""></measure>	54
8. OPERATION OF THE SEWING MACHINE (FULLY-AUTOMATIC B	ASIC
VOLUME)	55
8-1 Data input screen	55
8-2 Sewing screen	57
8-3 Detailed data input screen	58
8-4 Feed amount	03
8-5 Basic operation of the sewing machine	61
(1) Drepare the metericle	01
(1) Frepare the materials	10 13
(3) Calling the pattern <pattern no.="" selection=""></pattern>	61
(4) Selecting left/right alternate sewing <left alternate="" right="" selection="" sewing=""></left>	62
(5) Performing sewing	62
8-6 Changing the basic set value	64
(1) Changing the sewing machine speed <max. setting="" sewing="" speed=""></max.>	64
(2) Changing the pitch <pitch setting=""></pitch>	65
(3) Changing the needle thread tension <needle setting="" tension="" thread=""></needle>	65
(4) Unanging the shirring amount <shirring amount="" setting=""></shirring>	
(3) Granging the shifting amount of auxiliary leed <auxiliary amount="" leed="" setting="" shifting=""></auxiliary>	00 72
	07
o-ه veleting the pattern < Pattern deletion>	69

9. OPERATION OF THE SEWING MACHINE (FULLY-AUTOMATIC	71
Q-1 Correcting the pattern	···· / 71
(1) Changing the length of specified step < length between steps setting	/ 71
(1) Changing the needle thread tension of specified step <compensation setting<="" td="" tension="" thread=""><td>>72</td></compensation>	>72
(3) Changing the pitch of specified step <compensation pitch="" setting=""></compensation>	73
(4) Increasing/decreasing the shirring amount of all steps <shirring amount="" decrease<="" increase="" td=""><td></td></shirring>	
Setting>	75 ation
(3) increasing/decreasing the shiring amount immediately after changeover of step < compens shirring amount setting>.	allon
(6) Adding the step <step addition=""></step>	77
(7) Deleting the step <step deletion=""></step>	79
(8) Changing gent's/ladies' wear classification <gent's ladies'="" selection=""></gent's>	81
(9) Changing the size <size change=""></size>	82
(10) Setting the onset value of grading < Grading value setting >	03 84
 (12) Mirroring the program of one sleeve and creating the program of the other one <mirroring function=""></mirroring>	85
(13) Changing the top notch position of program <top change="" notch="" position=""></top>	87
(14) Naming the pattern <data name="" setting=""></data>	88
9-2 Copying the pattern <pattern copy=""></pattern>	89
(1) Pattern copy in the fully-automatic <copy fully-automatic="" to=""></copy>	89
(2) Pattern copy from fully-automatic to semi-automatic <copy semi-automatic="" to=""></copy>	91
9-3 Creating a new pattern <new creation="" pattern=""></new>	92
9-4 Using other functions	94
 (1) Directly calling the pattern from sewing screen <direct pattern="" selection=""></direct> (2) Re-registering the length between steps <measure function=""></measure> 	94 95
10. OPERATION OF THE SEWING MACHINE (MANUAL BASIC	
VOLUME)	96
10-1 Data input screen	96
10-2 Sewing screen	97
10-3 Details data input screen	98
10-4 Basic operation of the sewing machine	99
(1) Prepare the materials	99
(2) Turn the power ON	99
(3) Perform sewing.	99
10-5 Changing the basic set value	100
(1) Changing the sewing speed <max. setting="" sewing="" speed=""></max.>	100
 (2) Changing the pitch <pitch setting=""></pitch>	101 102
11. OPERATION OF THE SEWING MACHINE (MANUAL APPLICATIO	DN N
VOLUME)	103
, 11-1 Changing the detailed set value	103
(1) Changing the operating mode of auxiliary pedal < Auxiliary pedal operation selection>	103
(2) Changing the auxiliary feed operating mode <auxiliary feed="" mode="" selection=""></auxiliary>	104
(3) Setting the auxiliary feed interlock mode <auxiliary feed="" interlock="" mode="" setting=""></auxiliary>	106
(4) Setting the range of shirring amount <shirring amount="" range="" setting=""></shirring>	108
(5) Setting the compensation thread tension < Compensation thread tension setting>	109
12. USING COUNTER	110
12-1 Setting procedure of the counter	110
12-2 Count-up releasing procedure	113

13. REGISTERING AND THE PATTERN TO DIRECT BUTTON AND	
RELEASING THE PATTERN FROM DIRECT BUTTON	113
13-1 How to register	113
13-2 How to release	114
13-3 Register state at the time of your purchase	115
14. CHANGING SEWING MODE	115
15. CHANGING MEMORY SWITCH DATA	116
15-1 Changing procedure of memory switch data	116
15-2 Memory switch data list	117
15-3 Explanation of compensation thread tension	124
(1) Explanation of compensation tension manual (numerical value)	124
(2) Explanation of compensation tension manual (level)	126
15-4 Explanation of the shirring smoothing function	
(1) Explanation of the motion of shirring smoothing function	131
(2) Setting of the shirring smoothing function	132
15-5 Explanation of the size class	
(1) Explanation of the size class	133
6. ERROR CODE LIST	136
7. USING COMMUNICATION FUNCTION	140
17-1 Handling possible data	140
17-2 Performing communication by using the media	140
17-3 Performing communication by using USB	140
17-4 Take-in of the data	141
18. INFORMATION FUNCTION	144
18-1 Observing the maintenance and inspection information	144
18-2 Inputting the inspection time	
18-3 Releasing procedure of the warning	147
18-4 Observing the production control information	148
(1) When displaying from the information screen	148
(2) When displaying from the sewing screen	149
18-5 Performing setting of the production control information	150
18-6 Observing the working measurement information	153
19. PERFORMING FORMATTING OF THE MEDIA	156
20. TRIAL SEWING FUNCTION	157
20-1 Performing trial sewing	157
21. PERFORMING KEY LOCK	159
22. DISPLAYING VERSION INFORMATION	161
23. USING CHECK PROGRAM	162
23-1 Displaying the check program screen	162
23-2 Performing the auxiliary pedal setting	163
23-3 Performing checking of A/D value of auxiliary pedal	164

23-4 Performing LCD check	164
23-5 Performing touch panel compensation	
23-6 Performing the input signal check	
23-7 Performing the output signal check	169
24 COMMUNICATION SOBEEN OF MAINTENANCE DEDSONNEL	
24. COMMONICATION SCREEN OF MAINTENANCE PERSONNEL	-
	1/1
24-1 Data which are possible to be handled	
24-2 Displaying maintenance personnel level	
25. INFORMATION SCREEN OF THE MAINTENANCE PERSONNEL LEVEL	173
25-1 Display of error record	173
25-2 Display of the cumulative working information	174
26. MAINTENANCE	175
26-1 Beplacing procedure of feed belt	175
(1) Replacing the top feed belt	
(2) Replacing the bottom feed belt	
(3) Replacing the bottom feed roller	176
26-2 Changing the amount of alternate vertical movement of walkingfoot	and
presser foot	177
(1) When making equal the amount of alternate vertical movement of walking foot and press	er foot
(2) When making the amount equal to 1.5 mm)	178
26-3 Adjusting the height of the walking foot and the presser foot	179
(1) Adjusting the height of walking foot	179
(2) Adjusting the height of presser foot	179
26-4 Adjusting the needle and the hook	180
(1) Adjusting the height of needle bar	
(2) Adjusting the thread trimmer	180 181
(1) Adjusting the thread trimmer cam timing	181
(2) Adjusting the initial position of the moving knife	
(3) Adjusting the initial position of the thread trimmer solenoid	182
(4) Adjusting the position of the moving knife and the counter knife	
26-6 Greasing parts	
27. OTHERS	184
27-1 Troubles in sewing and the corrective measures	184
28. DRAWING OF THE TABLE	185
28-1 Slant table	
28-2 Work top table	186
28-3 Edge stopper Δ	197
20 0 Euge Stopper A	100
20-4 Luge slopper D	100

1-1 Specifications of the machine head

Sewing speed	Max. 3,500 sti/min (*1)
Feed system	Intermittent belt feed by direct drive of stepping motor
Stitch length	Both top and bottom 1.5 to 6 mm
Stitch length adjustment system	Panel input
Stitch length adjustment minimum resolution	0.1 mm
Needle bar stroke	30.7 mm
Needle	DPX17 #10 to #14
Hook	Full-rotary non-lubricated horizontal-axis hook
Presser foot lift	By hand lifter : 5.5 mm, by auto-lifter : 10 mm
Amount of alternate vertical movement of presser foot/walking foot	Max. 3.5 mm
Adjustment of amount of alternate vertical movement of presser/walking foot	Slot stop position adjustment
Lubrication	Non-lubrication
Number of programs that can be inputted	99 programs
Number of steps that can be inputted (per program)	30 steps
Data mirroring	Provided
Right/left alternate sewing	Possible
Data record	Main body, Media
Noise	 Equivalent continuous emission sound pressure level (L_pA) at the workstation : A-weighted value of 84.5 dB; (Includes K_pA = 2.5 dB); according to ISO 10821- C.6.2 -ISO 11204 GR2 at 3,400 sti/min for the sewing cycle, 6.7s ON and 7.5s OFF (Pattern : check_mode4). Sound power level (LwA) ; A-weighted value of 89.5 dB; (Includes KwA = 2.5 dB); according to ISO 10821- C.6.3 -ISO 11204 GR2 at 3,400 sti/min for the sewing cycle, 6.7s ON and 7.5s OFF (Pattern : check_mode4).

*1. The maximum sewing speed is limited in accordance with the amount of alternate vertical movement of presser foot and walking foot, and stitch length.

Limitation by the amount of alternate vertical movement of presser and walking foot

Max. sewing speed (sti/min)	Amount of vertical movement of walking foot (mm)	Amount of vertical movement of presser foot (mm)
3,500	Less than 0.3	(2.7)
2,600	Not less than 0.3 to 1.5	(1.5)
2,000	Not less than 1.5 to 2.5	(2.5)
1,600	Not less than 2.5 to 3.5	(3.5)

Limitation by stitch length

Max. sewing speed (sti/min)	Stitch length (mm)
3,500	1.5 to 4.0
2,500	4.1 to 6.0

1-2 Specifications of the control box

Power voltage	3-phase 200V/220V/240V	Single phase 220V/230V/240V
Frequency	50Hz/60Hz	
Rated current	2.6A/2.4A/2.2A	2.8A/2.6A/2.5A
Operating tempera- ture/humidity	0 to 40°C, Less than 90%	

2. CONFIGURATION

2-1 Sewing machine main unit



- Sewing machine head
- **2** Operation panel
- Control box
- Auxiliary table (WORK TOP TABLE)
- **6** Power switch
- 6 Main pedal
- Auxiliary pedal
- Thread stand
- **③** Shirring release switch

3. INSTALLATION

3-1 Caution at the time of set-up

1) Transporting procedure of the sewing machine



Hold and transport the sewing machine with two persons as shown in the illustration.



2) Caution when placing the sewing machine



Do not put protruding articles such as the screwdriver and the like at the location where the sewing machine is placed.

3) Removing the air vent cap



Be sure to remove the red rubber cap as shown in the illustration before operating the sewing machine. When transporting the machine head only, attach this rubber cap to the machine head.

3-2 Assembling the pedal section of the stand



- 1) Assemble the lower strut to the stand using square nut **()** (wide width).
- 2) Put bush ④ to the pedal ⑧ and pass it through shaft ⑤ together with shaft bearing plate ⑧. Then fix with pedal shaft bearing ②.
- 3) Fix pedal shaft bearing 2 using square nut 1 (narrow width).
- 4) Assemble the whole pedal after fully drawing it up in the left direction in the illustration.

[When using with 1-pedal]

There is the short shaft for 1-pedal in the accessories. Remove the small pedal and shaft bearing plate and replace the shaft with the shaft for 1-pedal. Then the machine can be used even with 1-pedal.

3-3 Assembling the table



- 1) Fix hinge seats (5) and machine head supporting rubbers (6) on table (1) with the nails. (Use 2 pcs. each of nail for fixing hinge seats (5) and 1 pc. each of nail for fixing machine head supporting rubbers.)
- 2) Attach felts 1 to machine head supporting rubbers 6.
- 3) Attach machine head supporting rubbers (3) to table (1).
- 4) Fix stopper plate (9) to the rear side of table (1).
 Caution) Be sure to install stopper plate (9) before installing control box (2).
- 5) Fix control box **2** and power switch **3**, and fix the power cable with the staples.
- 6) Fix power switch ③ under the machine table witch wood screw ④. Fix the cable with staple ⑤ supplied with the machine as accessories in accordance witch the forms of use.
- 7) Temporarily fix the side strut so that it is put between auxiliary pedal sensor **(1)** and sensor plate **(1)**.
- 8) Connect pedal (large) and pedal sensor **(**) with connecting rod (long). Adjust the inclination of connecting rod at the position of adjusting plate **(**).
- 9) Connect pedal (small) and auxiliary pedal sensor **(1)** with connecting rod (short). Adjust the inclination of connecting rod at the position of auxiliary pedal sensor and securely tighten the screw.
- 10) Install head supporting rod 4 on table 1.

3-4 Connecting the power cable

Connect the cable in accordance with the specifications.

Connection of 3-phase 200V/220V/240V



3-5 Installing the sewing machine main unit



WARNING :

To prevent possible accidents caused by the fall of the sewing machine, perform the work by two persons or more when the machine is moved.



Insert hinges **1** into the holes in the frame and place the machine head on the table.

3-6 Installing the cover



WARNING :

When tilting/raising the sewing machine head, perform the work so as not to allow your fingers to be caught in the machine. In addition, to avoid possible accidents caused by abrupt start of the machine, turn OFF the power to the machine before starting the work.



- Slowly tilt the machine head and install bottom cover
- and bottom feed cover 2.

3-7 Installing the stopper for tilt prevention



Install stopper plate A **1** and stopper plate B **2** for tilt prevention.

3-8 Installing the operation panel



Fix panel installing plate 2 to the base on the frame. Install operation panel 1 with a magnet and pass the cable through the hole in the table.



When the panel is installed in the state that it is excessively tilted in the direction A, the work table comes in contact with the panel and the panel may be damaged. Install the panel so that it is not excessively tilted.

3-9 Connecting the cords







Terminal	No. of poles	Name of cable	
CN38	White 4 poles	Power cable of main motor	
CN21	White 9 poles	Encoder cable of main motor	
CN25	Red 2 poles	Top feed fan cord	
CN26	Red 2 poles	Bottom feed fan cord	
CN56	White 10 poles	Feed motor cord	
CN57	White 6 poles	Auxiliary feed motor cord	
CN53	White 6 poles	Head relay cord 1	
CN52	White 4 poles	Head relay cord 2	
CN51	White 2 poles	Presser lifter cord	
CN55	10 poles	DATA p.c.b. cord	
CN62	Yellow 4 poles		
CN54	Red 4 poles		
CN34	26 poles		

- Remove the auxiliary pedal cord and insert the cord into the control box from the cord inserting port. Pass the auxiliary pedal cord through the rear side of the auxiliary pedal and insert it into the control box from hole **A** located on the lower side of the pedal sensor.
- 2) Fix the auxiliary pedal cord with the sticker (small) so that the cord does not move.
- Connect CN38, 21, 25, and 26 to PWR p.c.b. CN25 and 26 can be connected to either one. Connect others to MAIN p.c.b.





4) Fix the cords connected to MAIN p.c.b. with cord clamp A.

Handling the cords

- When fixing the cords, connect them with the sewing machine tilted, and bundle with clip band ●.
- When the machine head is returned to its home position, fix the cords with cord fixing plate 2 in the state that there is the slack in the cords.



Caution : When tilting the sewing machine, make sure that the head support bar is attached to the table.

3-10 Installing the throat plate auxiliary plate



Loosen two screws **2**, insert throat plate auxiliary plate **1** and fix it.

Adjust the height so that the top surface of throat plate auxiliary plate aligns with that of the throat plate. If the height is not proper, material flops and the feed amount is not settled.

3-11 Installing the thread guide rod



Securely insert thread guide rod ① so that two side holes of it faces the front in the direction of the operator.

3-12 Installing the thread stand



- 1) Assemble the thread stand unit and set it to the hole located on the upper right side of the table.
- Tighten lock nut
 os that the thread stand unit does not move.
- When ceiling wiring is possible, pass the power cable through the inside of thread stand rod 2.

3-13 Assembling the table for work (WORK TOP TABLE)



- 1) Install edge guide A ② and B ③ on table for work ① with 3 pcs. each of wood screw ⑦.
- 2) Temporarily tighten base A (5) and base B (6) on the table with screws (10).
- 3) Temporarily tighten adjusting plate (4) with 8 screws (8) and 4 screws (9).
- 4) Place table for work () on the base and temporarily tighten it with screw ().
- 5) Tighten screws (3), (9) and (10) while checking the whole position.
- 6) Loosen screw $\mathbf{0}$ and tighten it in accordance with the height you desire.

There are the standard size and the long one for the adjusting plate.

When you desire to make the table for work higher, replace the standard size plate with the long size one.

4. PREPARATION BEFORE OPERATION

4-1 Attaching the needle



WARNING :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

rection **B**.

hole is reached.

4) Securely tighten screw 2.

exactly to the left in direction D.

1) Turn the handwheel until the needle bar reaches

2) Loosen screw 2, and hold needle 1 with its indented part A facing exactly to the right in di-

3) Insert the needle fully into the hole in the needle

5) Check that long groove **()** of the needle is facing

bar in the direction of the arrow until the end of

the highest point of its stroke.



4-2 Threading the needle-thread

WARNING :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



4-3 Winding the bobbin thread





- Pass the bobbin thread pulled out from the spool rested on the right side of the thread stand following the order as shown in the figure on the left. Then, wind clockwise the end of the bobbin thread on the bobbin several times. (In case of the aluminum bobbin, after winding clockwise the end of the bobbin thread, wind counterclockwise the thread coming from the bobbin thread tension several times to wind the bobbin thread with ease.)
 Press the bobbin winder trip latch **1** in the direction.
- 3) Press the bobbin winder trip latch ② in the direction of A and start the sewing machine. The bobbin rotates in the direction of C and the bobbin thread is wound up. The bobbin winder spindle ① automatically as soon as the winding is finished.
- 4) Remove the bobbin and cut the bobbin thread with the thread cut retainer **3**.
- 5) To adjust the winding amount of the bobbin thread, loosen the setscrew ④ and move the bobbin winder adjusting plate ⑤ to the direction
 - of **A** or **B**. Then, tighten the setscrew **4**. To the direction of **A** : Decrease To the direction of **B** : Increase
- 6) In case that the bobbin thread is not wound evenly on the bobbin, loosen the nut ③ and turn the bobbin thread tension to adjust the height of the thread tension disk ⑦.
 - It is the standard that the center of the bobbin is as high as the center of the thread tension disk.

• Move the position of the thread tension disk 🕐 to the direction of A as shown in the figure on the left when the winding amount of the bobbin thread on the lower part of the bobbin is excessive and to the direction of B as shown in the figure on the left when the winding amount of the bobbin thread on the upper part of the bobbin is excessive.

- After the adjustment, tighten the nut 6.
- 7) To adjust the tension of the bobbin winder, turn the thread tension nut (3).
 - 1. When winding the bobbin thread, start the winding in the state that the thread between the bobbin and thread tension disk 🕖 is tense.



- 2. When winding the bobbin thread in the state that sewing is not performed, remove the needle thread from the thread path of thread take-up and remove the bobbin from the hook.
- 3. There is the possibility that the thread pulled out from the thread stand is loosened due to the influence (direction) of the wind and may be entangled in the handwheel. Be careful of the direction of the wind.

4-4 Setting the bobbin into the bobbin case



- 1) Install the bobbin in the bobbin case so that the thread wound direction is clockwise.
- Pass the thread through thread slit (A), and pull the thread in direction (B). By so doing, the thread will pass under the tension spring and come out from notch (B).
- Check that the bobbin rotates in the direction of the arrow when thread is pulled.

4-5 Attaching and removing the bobbin case



(4-6 Adjusting the thread tension



4-7 Adjusting the thread take-up spring



4-8 Adjusting the stitch guide



For attaching and removing the bobbin case, slide cover ① up or down to perform it.



- 1. When attaching the bobbin case, insert it until it will go no further. If it is insufficient, the bobbin case may | fall off during sewing.
- 2. Be sure to close the cover when starting the sewing machine. There is a danger of rolling cloth in the bobbin case or the like.

[Adjusting the needle thread tension]

- Turn clockwise (direction A) thread tension nut No. 1

 and the length of thread remaining at the needle tip after thread trimming will be shortened.
- 2) Turn it counterclockwise (direction **B**) and the length of thread will be lengthened.
- 3) Thread tension of thread tension No. 2 2 is set with the operation panel.
 For the details, refer to <u>"6-6 (3) Changing the needle thread tension" p. 31</u>.

[Adjusting the bobbin thread tension]

- 1) Turn clockwise (direction **C**) thread tension screw **3** and the bobbin thread tension is increased.
- 2) Turn it counterclockwise (direction **D**) and the tension is decreased.

[Changing the stroke amount of thread take-up spring ①]

- 1) Loosen setscrew (2) in the thread tension base.
- 2) Turn clockwise (direction **A**) the whole thread tension and the stroke amount is increased.
- 3) Turn it counterclockwise (direction **B**) and the stroke amount is decreased.

[When changing the pressure of thread take-up spring $oldsymbol{0}$]

- Put a thin screwdriver in the slot of thread tension rod
 and turn it with screw 2 tightened.
- Turn clockwise (direction C) the thread tension rod and the pressure is increased and turn it counterclockwise (direction D) and the pressure is decreased.
- When setscrew 2 is loosened, fine adjustment A - B direction of stitch guide 1 position can be performed. After the adjustment, securely tighten setscrew 2.
- When setscrew ③ is loosened, fine adjustment
 A B and C D direction of stitch guide ① position can be performed. After the adjustment, securely tighten setscrew ⑤.
- When setscrew (1) is loosened, fine adjustment
 E F direction of stitch guide (1) position can be performed. After the adjustment, securely tighten setscrew (1).

5. HOW TO USE THE OPERATION PANEL

5-1. PREFACE

1) Kind of sewing data handled with IP-420

Pattern name	Description	
Vector format data	File that extension is ".VDT"	
	Read from media. Max. 99 patterns can be used.	
Parameter data	File that extension is ".EPD"	
	Read from media. Max. 99 patterns can be used.	

2) To use the data for DP-2100 (VDT data and EPD data)

Insert a medium into the IP-420 and select pattern No. xxx from VDT data or EPD data.

3) Folder structure of the media

Store each file in the directories below of the media.



4) CompactFlash (TM)

■ Inserting the CompactFlash (TM)



- Turn the label side of the CompactFlash(TM) to this side (place the notch of the edge to the rear.) and insert the part that has a small hole into the panel.
- After completion of setting of the media, close the cover. By closing the cover, it is possible to access. If the media and the cover come in contact with each other and the cover is not closed, check the following matters.
 - Check that the media is securely pressed until it goes no further.
 - Check that the inserting direction of the media is proper.
- 1. When the inserting direction is wrong, panel or media may be damaged.
- 2. Do not insert any item other than the CompactFlash (TM).
- 3. The media slot in the IP-420 accommodates to the CompactFlash (TM) of 2 GB or less.
- 4. The media slot in the IP-420 supports the FAT16 which is the format of the Compact-Flash (TM). FAT32 is not supported.
- 5. Be sure to use the CompactFlash (TM) which is formatted with IP-420. For the formatting procedure of the CompactFlash (TM), see "19. Performing formatting of the media", p.156.

Removing the CompactFlash (TM)



 Hold the panel by hand, open the cover, and press the media 2 removing lever 1. The media is eject.



2) When the media **2** is drawn out as it is, removing is completed.

5) USB port

Inserting a device into the USB port



Slide the top cover and insert the USB device into the USB port. Then, copy data to be used from the USB device onto the main body.

After completion of copying the data, remove the USB device.

Disconnecting a device from the USB port



Remove the USB device. Put the cover back in place.

CAUTION:

Cautions when using the media

• Do not wet or touch it with wet hands. Fire or electric shock will be caused.

- Do not bend, or apply strong force or shock to it.
- Never perform disassembling or remodeling of it.
- Do not put the metal to the contact part of it. Data may be disappeared.
- Avoid storing or using it in the places below.
 Place of high temperature or humidity / Place of dew condensation /
 Place with much dust / Place where static electricity or electrical noise is likely to occur

- ① Precautions to be taken when handling USB devices
- Do not leave the USB device or USB cable connected to the USB port while the sewing machine is in operation. The machine vibration can damage the port section resulting in loss of data stored on the USB device or breakage of the USB device or sewing machine.
- Do not insert/remove a USB device during reading/writing a program or sewing data. It may cause data breakage or malfunction.
- When the storage space of a USB device is partitioned, only one partition is accessible.
- Some type of the USB device may not be properly recognized by this sewing machine.
- JUKI does not compensate for loss of data stored on the USB device caused by using it with this sewing machine.
- When the panel displays the communication screen or pattern data list, the USB drive is not recognized even if you insert a medium into the slot.
- For USB devices and media such as CF cards, only one device/medium should be basically connected/inserted to/into the sewing machine. When two or more devices/media are connected/inserted, the machine will only recognize one of them. Refer to the USB specifications.
- Insert the USB connector into the USB terminal on the IP panel until it will go no further.
- Do not turn the power OFF while the data on the USB flash drive is being accessed.
- 2 USB specifications
 - Conform to USB 1.1 standard
 - Applicable devices *1 ----- Storage devices such as USB memory, USB hub, FDD and card reader
 - Not-applicable devices__CD drive, DVD drive, MO drive, tape drive, etc.
- Format supported _____FD (floppy disk) FAT 12

Others (USB memory, etc.), FAT 12, FAT 16, FAT 32

• Applicable medium size _FD (floppy disk) 1.44MB, 720kB

Others (USB memory, etc.), 4.1MB ~ (2TB)

- Recognition of drives _____For external devices such as a USB device, the device which is recognized first is accessed. However, when a medium is connected to the built-in media slot, the access to that medium will be given the highest priority. (Example: If a medium is inserted into the media slot even when the USB memory has already been connected to the USB port, the medium will be accessed.)
- Restriction on connection _ Max. 10 devices (When the number of storage devices connected to the sewing machine has exceeded the maximum number, the 11th storage device and beyond will not be recognized unless they are once disconnected and re-connected.)
- Consumption current ____ The rated consumption current of the applicable USB devices is 500 mA at the maximum.
- *1: JUKI does not guarantee operation of all applicable devices. Some device may not operate due to a compatibility problem.

5-2. BASIC OPERATION OF THE OPERATION PANEL (IP-420)

(1) Configuration of IP-420



Symbol	Name	Description
0	TOUCH PANEL, LCD display section	
0	READY key	Change-over of the data input screen and the sewing screen is performed.
8	INFORMATION key	Change-over of the data input screen and the information screen is performed.
4	COMMUNICATION key	Change-over of the data input screen and the communication screen is performed.
Ø	MODE CHANGEOVER key	Change-over of the data input screen and the mode change-over screen which performs various details setting.
6	Contrast control	
0	Brightness control	
8	CompactFlash (TM) eject button	
9	CompactFlash (TM) slot	
Ø	Cover detection switch	
0	Connector for external switch	
Ø	Connector for control-box connection	

Lightly press the target key on the touch panel with a fingertip to operate the IP-420. If you poperate with any means other than your fingertip, the IP-420 can malfunction or the glass surface of the touch panel can be scratched or break.

(2) Buttons used in common

Buttons that perform common operation in the respective screens of IP-420 are as described below.

Symbol	Name	Description	
×	CANCEL button	Pop-up screen is closed. In case of the data change screen, the data during changing can be cancelled.	
_	ENTER button	Data changed are determined.	
	UP SCROLL button	This button scrolls button or display upward.	
•	DOWN SCROLL button	SCROLL button This button scrolls button or display downward.	
1/	RESET button	This button releases error and the like.	
Nob	NUMERAL INPUT button	Ten keys are displayed and input of number can be performed.	
	CHARACTER INPUT button	Character input screen is displayed.	

6. OPERATION OF THE SEWING MACHINE (SEMI-AUTOMATIC BASIC VOLUME)

6-1 Data input screen



No.	Button	Name of button	Description
0		PATTERN SELECTION button	Pattern No. being selected at present is displayed on the button and when the button is pressed, PATTERN No. CHANGE screen is displayed.
2	P	DIRECT SELECTION button	When the button is pressed, the list screen of pattern Nos. which are registered in DIRECT SELECTION button is displayed.
8		LEFT/RIGHT/ALTERNATE SEWING SELECTION button	Changeover method of program (for right sleeve and left sleeve) during sewing is selected.
4	\bigcirc	STEP SELECTION button	When the button is pressed, the step becomes in the state of selection.
6	10	SHIRRING AMOUNT FOR AUXILIARY FEED button	When the button is pressed, shirring amount for auxiliary feed change screen is displayed.
6	40123456 ▶	SHIRRING AMOUNT button	When the button is pressed, shirring amount of the step being selected is changed.

No.	Button	Name of button	Description
0	No	PATTERN NEW REGISTER button	When the button is pressed, pattern No. new register screen is displayed.
8	N	PATTERN COPY button	When the button is pressed, sewing data copy screen is displayed.
9	000	LETTER INPUT button	When the button is pressed, letter input screen is displayed.
Ø	6	NEEDLE THREAD TENSION SETTING button	When the button is pressed, needle thread tension change screen is displayed.
0	80	DISK RISE button	When the button is pressed, thread tension disk No. 1 rises. (Turn OFF the base tension during U011 waiting.)
Ø		STEP DETAILS button	When the button is pressed, list of sewing data corre- sponding to the step being selected is displayed.
ß	No	SEWING DATA DISPLAY but- ton	List of sewing data corresponding to the pattern No. be- ing selected is displayed.
12	C	READY key	Changeover of data input screen and sewing screen is performed.
Ð	i	INFORMATION key	Changeover of data input screen and information screen is performed.
C	((_))	COMMUNICATION key	Changeover of data input screen and communication screen is performed.
Ð	М	MODE key	Changeover of data input screen and mode changeover screen to perform various details setting is performed.

Symbol	Display	Name of display	Description
۵		PATTERN No. display	Pattern No. is displayed.
6		ALTERNATE SEWING display	This is displayed when alternate sewing is selected.
O		LEFT/RIGHT SLEEVE display	R display : Program for right sleeve is called.
			L display : Program for left sleeve is called.
D	3	SHIRRING AMOUNT display	Shirring amount is displayed.
9		SHIRRING AMOUNT FOR AUXILIARY FEED display	Shirring amount of auxiliary feed is displayed.
6		SHIRRING AMOUNT IN- CREASE/DECREASE SET VALUE display	Shirring amount increase/decrease set value is displayed.
G		PATTERN NAME display	Pattern name is displayed.

6-2 Sewing screen



No.	Button	Name of button	Description
13	0 L] o	Max. SEWING SPEED SETTING button	When the button is pressed, max. sewing speed setting screen is displayed.
Ð	աստոսո	MEASURE button	When the button is pressed, length of each step is measured during sewing and is reflected to icon display shape of step selection button.
20	1	COUNTER SETTING button	When the button is pressed, bobbin/No. of pcs. counter setting screen is displayed. This screen is displayed when setting at <u>"12. USING COUNTER" p. 110</u> .
4	V.2.3 <u> </u>	COUNTER SELEC- TION button	When the button is pressed, bobbin/No. of pcs. counter is changed over. This screen is displayed when setting at <u>"12. USING COUNTER" p. 110</u> .
2	+	+ button	When the button is pressed, the numeral is increased.
23	1	– button	When the button is pressed, the numeral is decreased.

Symbol	Display	Name of display	Description
•		SHIRRING AMOUNT display	Shirring amount is displayed.
0	Image: Shirking amount for Counter display		Shirring amount of auxiliary feed is displayed.
0		AUXILIARY FEED display	display : This is displayed when bobbin counter is used.
(3)		COUNTER SET VALUE display	Counter set value is displayed.

6-3 Details data input screen



No.	Button	Name of button	Description
2	×	CANCEL button	When the button is pressed, the step details button is closed.
23		STEP FEED button	When the button is pressed, the selected step advances by one.
2	▼	STEP RETURN button	When the button is pressed, the selected step returns by one.
Ø		DETAILS SELECTION SCREEN FEED button	When the button is pressed, the details selection screen scrolls forward.
Ø	•	DETAILS SELECTION SCREEN RETURN button	When the button is pressed, the details selection screen scrolls backward
2)	0 © S007	COMPENSATION THREAD TENSION SETTING button	When the button is pressed, pattern deletion screen is displayed.
23	0.0	COMPENSATION PITCH SET- TING button	When the button is pressed, compensation thread tension setting screen is displayed.
ூ	5009	START POSITION CHANGE	When the button is pressed, mirroring screen is displayed. is displayed.
80	5010	MIRRORING button AMOUNT	When the button is pressed, mirroring screen is displayed.
6)	0/ 0 1 S011	COMPENSATION SHIRRING AMOUNT button	When the button is pressed, compensation shirring amount setting screen is displayed.
62	© © S012	TOP NOTCH POSITION CHANGE button	When the button is pressed, top notch position change screen is displayed.
63	S013	STEP ADDITION button	When the button is pressed, step addition setting screen is displayed.
84		STEP DELETION button	When the button is pressed, step deletion screen is displayed.

Symbol	Display	Name of display	Description
0		COMPENSATION THREAD	Set value of compensation thread tension is displayed.
	5007	TENSION display	
۵		COMPENSATION PITCH display	Set value of compensation pitch is displayed.
0		COMPENSATION AMOUNT display	Set value of compensation shirring amount is displayed.

6-4 Feed amount

The explanation is given for the feed amount of the sewing machine.





Pitch setting screen



Feed amount on the operation consists of the three kinds of feed amounts, bottom feed amount (pitch), main feed amount (pitch + shirring amount) and auxiliary feed amount (pitch + shirring amount + shirring amount for auxiliary feed).

In case of **A**, when pitch ($\underline{8004}$) is set to 2.0, bottom feed belt **①** moves 2.0 mm per rotation of the sewing machine (1 stitch).

In case of **B**, when shirring amount is set to 3, main feed belt **2** moves 2.3 mm per rotation of the sewing machine (1 stitch).

This means that set value "1" of shirring amount (main feed) is in steps of 0.1 mm and when the set value is converted to mm, $3 \times 0.1 = 0.3$ mm is calculated. This value is added to pitch (bottom feed) and the total value becomes the moving amount of the main feed belt.

Main feed amount = pitch + shirring amount 2.3 mm = 2.0 mm + 0.3 mm

In case of **C**, when shirring amount for auxiliary feed is set to 2, auxiliary feed belt **③** moves 2.5 mm per rotation of the sewing machine (1 stitch).

This means that set value "1" of shirring amount for auxiliary feed (auxiliary feed) is in steps of 0.1 mm and when the set value is converted to mm, $2 \times 0.1 =$ 0.2 mm is calculated. This value is added to the main feed amount and the total value becomes the moving amount of the auxiliary belt.

Auxiliary feed amount = main feed amount + shirring amount for auxiliary feed 2.5 mm = 2.3 mm + 0.2 mm

6-5 Basic operation of the sewing machine

(1) Prepare the materials.

Caution

Prepare right and left sleeves and garment body.

(2) Turn ON the power switch



When the power is turned ON first, the language selection screen is displayed. Set the language you use. (It is possible to change with Memory switch U026.)



Auto-lifter does not work until the screen moves to the sewing screen or the new creation screen. After it has worked, it works in all screens. So, be careful.

(3) Calling the pattern <Pattern No. selection>



Two programs (for right sleeve and left sleeve) are entered in one pattern. Further, the respective programs consist of single or plural steps (sewing data between the respective notches are stored).

1) Press PATTERN SELECTION button





(4) Select left/right alternate sewing. <Left/right alternate sewing selection>



Press LEFT/RIGHT ALTERNATE SEWING button



5 to select the program changeover method



(for right sleeve and left sleeve).



Alternate sewing, right : Left/right alternate sewing starting from the right sleeve



Alternate sewing, left : Left/right alternate sewing starting from the left sleeve



Right sleeve only : Right sleeve sewing only



Left sleeve only : Left sleeve sewing only

(5) Perform sewing.







- 1) Press READY key () 6.
- Display is changed over from data input screen
 A to sewing screen B.

- Set sleeves and garment body to the sewing machine.
 - * When temporarily setting the shirring amount to
 "0" during sewing, press SHIRRING RELEASE switch C.

When the switch is pressed, LED lights up and the shirring amount is set to "0". When the switch is pressed twice, LED goes off and the shirring amount returns to the shirring amount of the selected step.



- 4) Check LEFT/RIGHT ALTERNATE SEWING but
 - ton \bigcirc whether or not the set materials

correspond with the called program (for right sleeve/left sleeve).

- 5) Start sewing.
- 6) When sewing is performed up to the next notch, stop the sewing machine once.

- 7) Press once knee switch **1**. Step of the program advances by one (A).
- 0 P 3 Α 3 V.2.3. \$
- Repeat procedure 5) through 7) until the end of sewing.

9) Perform thread trimming with pedal (3).

6-6 Basic change of the set value

(1) Changing the sewing speed <Max. sewing speed setting>

O





(2) Changing the pitch <Pitch setting>



1) Press MAX. SEWING SPEED SETTING button



• in the sewing screen.

2) Press MAX. SEWING SPEED CHANGE button



change "speed set value" A .

3) Press ENTER button ₿.

1) Press SEWING DATA DISPLAY button O.


2) Press "+"/ "-" buttons



3) Press ENTER button **B**.

(3) Changing the needle thread tension <Needle thread tension setting>



1) Press NEEDLE THREAD TENSION SETTING

O.

button 🔞

2) Change "needle thread tension set value" A by pressing numeric keys 0 to 9 2 or VA buttons 🗾 🕄 (📫 ④). 3) Press ENTER button **[**



(4) Changing the shirring amount <Shirring amount setting>



1) Press STEP SELECTION button



2) Press "+"/ "-" buttons 2 to change shirring amount set value A.

(5) Changing the shirring amount of auxiliary feed <Auxiliary feed shirring amount setting>



1) Press STEP SELECTION button



2 to

- 1 to select step.
- 2) Press "+"/ "-" buttons

change shirring amount set value for auxiliary feed **A**.

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6-7 Creating the pattern <Pattern creation>

The way of correcting the sample pattern and creating the pattern with ease is explained in the basic volume.

- 1) Prepare the materials.
- 2) Turn ON the power.





- Call a sample pattern where the sewing products and number of steps are the same.
 Refer to <u>"6-5 (3) Calling the pattern" p. 26</u>.
- Change the pitch.
 Refer to <u>"6-6 (2) Changing the pitch" p. 30</u>.
- Select left/right alternate sewing.
 Refer to <u>"6-5 (4) Select left/right alternate</u> sewing" p. 27.
- 6) Press READY key () ①
- 7) Perform sewing.
- 8) Stop the sewing machine at each notch and perform checking of shirring amount.
- 9) When notches do not fit properly, press "+"/ "-"

buttons 📫 🗾 🛿 after thread trimming

on the way to change shirring amount set value **A**. Then perform re-sewing.

Refer to <u>"6-6 (4) Changing the shirring</u> amount" p. 32.

10) When the sleeve material on the outlet seam

side delays, press "+"/ "--" buttons

3 after thread trimming on the way to change

set value of shirring amount for auxiliary feed B. Then perform re-sewing.

Refer to <u>"6-6 (5) Changing the shirring</u> amount of auxiliary feed" p. 32.

11) When the program for one sleeve is completed, sew the other sleeve and correct the program.

6-8 Deleting the pattern <Pattern deletion>







6) Press CANCEL button 🔀 🗿.

5) Press ENTER button []

7. OPERATION OF THE SEWING MACHINE (SEMI-AUTOMATIC APPLICATION VOLUME)

7-1 Correcting the pattern

(1) Changing the needle thread tension of specified step <Compensation thread tension setting>



- This is the function to add the needle thread tension of the specified step to the overall needle thread tension as much as "compensation needle thread tension set value".
- 1) Press STEP SELECTION button



- to select the step.
- 2) Press STEP DETAILS button 0.
- 3) Press COMPENSATION THREAD TENSION



4) Change "compensation thread tension set value"





Ø

5) Press ENTER button

6) Press CANCEL button

(2) Changing the pitch of specified step <Compensation pitch setting>

6

- * The state that is possible to change the step on the sewing screen is the state that step 1 is selected before starting sewing.
- * This is the function to add the pitch of the specified step to the overall pitch as much as the compensation pitch set value.









<Shirring amount increase/decrease setting>



1) Press SEWING DATA DISPLAY button



2) Press "+"/ "-" buttons



change shirring amount increase/decrease set value ${\bf A}.$

3) Press ENTER button **3**.

(4) Increasing/decreasing the shirring amount immediately after changeover of step <Compensation shirring amount setting>





(5) Adding the step <Step addition>

4) Press "+"/ "-" buttons



change compensation shirring amount set value **A** and number of stitches of compensation shirring amount **B**.



- Compensation shirring amount is the shirring amount to add to the shirring amount of the step after changeover at the time of step changeover.
- Number of stitches of shirring amount compensation is the number of stitches of the section of number of stitches to add the compensation shirring amount from the step changeover.
- 5) Press ENTER button **[**
- 6) Press CANCEL button



- Press READY key to change over the screen to data input screen A.
- 2) Press STEP SELECTION button



2 to select the step which is one before the step addition position.

3) Press STEP DETAILS button (3)





4) Press DOWN SCROLL button **(**).







5) Press STEP ADDITION button 6

6) Press ENTER button 4



- 7) Press SHIRRING AMOUNT buttons

 4 5 6 7 8 ▶
 Ø to change shirring amount set value A.
- 8) Press ENTER button 4.



(6) Deleting the step <Step deletion>



9) Press CANCEL button 🔀 3.

- Press READY key
 O
 to change over the screen to data input screen A.
- 2) Press STEP SELECTION button



- to select the step to be deleted.
- 3) Press STEP DETAILS button







4) Press DOWN SCROLL button **• (4**).

5) Press STEP DELETION button

6

6) Press ENTER button [] 6).



4.

7) Press CANCEL button

(7) Changing the start position of program <Start position change>

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1) Press READY key () 1 to change over the

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- screen to data input screen A.
- 2) Press STEP SELECTION button



to select the step which is the start position you desire.

- 3) Press STEP DETAILS button (3).
- 4) Press START POSITION CHANGE button







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5) Press ENTER button **[]**

6) Press CANCEL button (6).

(8) Mirroring the program of one sleeve and creating the program of the other sleeve <Mirroring function>





1) Press READY key (1 to change over the

0.

screen to data input screen A.

2) Press STEP DETAILS button

5010

6

4) Press ENTER button 4.



5) Press CANCEL button

6

(9) Changing the top notch position of program <Top notch position change>



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1 to change over the

2 to select the step which is the top notch position you desire.

۱)

- 3) Press STEP DETAILS button (3)
- 4) Press TOP NOTCH POSITION CHANGE button





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6) Press CANCEL button X ().

5) Press ENTER button **[]**

(10) Naming the pattern <Data name setting>



7-2 Copying the pattern <Pattern copy>

(1) Pattern copy in semi-automatic mode <Copy to semi-automatic>





7) Press CANCEL button



When the number of patterns that have been registered of fully-automatic is 99 patterns, the display is automatically changed over and copied to semi-automatic.

(2) Pattern copying from semi-automatic to fully-automatic <Copy to fully-automatic>





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10)

SAMPLE-9

SAMPLE-10

5) Press SEMI AUTO/FULL AUTO CHANGEOVER

🕒 to display FULL-AUTO 6) Input the pattern No. of copy destination with ten keys 0 to 9 6. It is possible to retrieve the pat6tern No. which has not been used yet

button 🔯 🔿

8) Press CANCEL button



When the number of patterns that have been registered of fully-automatic is 99 patterns, the display is automatically changed over and copied to semi-automatic.

7-3 Creating the new pattern <New pattern creation>

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- 1) Press READY key • to change over the screen to data input screen A.
- 2) Press PATTERN NEW REGISTER button



2.







- 3) Input the pattern No. of copy destination with ten keys 0 to 9 3. It is possible to retrieve pattern No. which has not been registered yet with \checkmark buttons \checkmark 4 and \ddagger 6.
- 4) Press ENTER button 6
- 5) Change the pitch. Refer to "6-6 (2) Changing the pitch" p. 30.
- 6) Select left/right alternate sewing. Refer to "6-5 (4) Select left/right alternate sewing" p. 27.
- 7) Press SHIRRING AMOUNT button 1 2 3 4 5 6 To input shirring amount.
- 8) Press STEP DETERMINATION button 8 to determine the input data.
- 9) Repeat procedures 7) and 8).

- 10) After inputting shirring amount of the last step,
 - press ENTER button g and the program

of inputted sleeve is registered to the pattern. At this time, the program of the other sleeve is automatically created by means of mirroring.

7-4 Using the other functions

(1) Directly calling the pattern from the sewing screen < Direct pattern selection>



When registering the patterns which are frequently used to the DIRECT SELECTION button, pattern selection can be simply performed from the operating screen by only pressing the button.

- For the way of registering the pattern to DIRECT SELECTION button, refer to "13. REGISTER-**ING AND THE PATTERN TO DIRECT BUT-**TON AND RELEASING THE PATTERN FROM DIRECT BUTTON" p. 113
- 1) Press DIRECT SELECTION button **P**

07) 2) Press PATTERN SELECTION button



of the pattern to be called.

(2) Adjust the STEP SELECTION button to the shape of sleeve <Measure function>



1) Press MEASURE button



When you desire to release the measure after pressing MEASURE button, change over from the sewing screen to the edit screen once.

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- 2) Perform sewing. Refer to "6-5 (5) Perform sewing" p. 28.
- 3) Data of the length of measured step is reflected

to STEP SELECTION button



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8. OPERATION OF THE SEWING MACHINE (FULLY-AUTOMATIC BASIC VOLUME)

8-1 Data input screen



No.	Button	Name of button	Description
0	05>	PATTERN SELECTION button	Pattern No. being selected at present is displayed on the button and when the button is pressed, pattern No. change screen is displayed.
2	P	DIRECT SELECTION button	When the button is pressed, list screen of pattern Nos. which have been registered to the direct selection button.
€		LEFT/RIGHT ALTERNATE SEWING SELECTION button	Method of changeover of program (for right sleeve and left sleeve) during sewing is selected.
4	0	STEP SELECTION button	When the button is pressed, step is in the selective state.
6] 0	SHIRRING AMOUNT FOR AUXILIARY FEED button	When the button is pressed, shirring amount for auxiliary feed change screen is displayed.
6	40123456	SHIRRING AMOUNT button	When the button is pressed, shirring amount of step being selected is changed.

No.	Button	Name of button	Description
0	No	PATTERN NEW REGISTER button	When the button is pressed, pattern No. new register screen is displayed.
8	N	PATTERN COPY button	When the button is pressed, sewing data copy screen is displayed.
0	ooc	LETTER INPUT button	When the button is pressed, letter input screen is displayed.
0	6	NEEDLE THREAD TENSION SETTING	When the button is pressed, needle thread tension change screen button is displayed.
0	TO	DISK RISE button	When the button is pressed, thread tension disk No. 1 rises. (Turn OFF the base tension during U011 waiting.)
Ø		STEP DETAILS button	When the button is pressed, list of sewing data corresponding to the step being selected is displayed.
₿	N	SEWING DATA DISPLAY but- ton	List of sewing data corresponding to the pattern No. being selected is displayed.
Û	C	READY key	Changeover of data input screen and sewing screen is performed.
Ð	i	INFORMATION key	Changeover of data input screen and information screen is performed.
C	((_))	COMMUNICATION key	Changeover of data input screen and communication screen is performed.
Û	Μ	MODE key	Changeover of data input screen and mode changeover screen to perform various details setting is performed.

Symbol	Display	Name of display	Description
4	<u>(6</u>)	PATTERN No. display	Pattern No. is displayed.
B		ALTERNATE SEWING dis- play	This is displayed when alternate sewing is selected.
G		LEFT/RIGHT SLEEVE display	R display : Program for right sleeve is called.
			L display : Program for left sleeve is called.
D		SHIRRING AMOUNT display	Shirring amount is displayed.
9	1	SHIRRING AMOUNT FOR AUXILIARY FEED display	Shirring amount of auxiliary feed is displayed.
9		SHIRRING AMOUNT IN- CREASE/DECREASE SET VALUE display	Shirring amount increase/decrease set value is displayed.
G		PATTERN NAME display	Pattern name is displayed.
0	SAMPLE-5	STEP LENGTH/TOTAL LENGTH display	Step length/total length are displayed.
0		SEWING SIZE display	Sewing size is displayed.

8-2 Sewing screen



No.	Display	Name of button	Description
₿	0 0	FULL AUTO INTERRUPTION button	When the button is pressed, fully-automatic is interrupted and measuring is stopped.
₽	2	MAX. SEWING SPEED SET- TING button	When the button is pressed, max. sewing speed setting screen is displayed.
20	Intututu	MEASURE button	When the button is pressed, length of each step is measured during sewing and reflected to the icon display shape of step selection button.
2)	1	COUNTER SETTING button	When the button is pressed, bobbin/No. of pcs. counter setting screen is displayed. This screen is displayed when setting at <u>"12. USING COUNTER" p. 110</u> .
Ø	₩2.3	COUNTER SELECTION button	When the button is pressed, bobbin/No. of pcs. counter is changed over. This screen is displayed when setting at <u>"12. USING COUNTER" p. 110</u> .
23	+	"+" button	When the button is pressed, the numeral is increased.
24	1	"–" button	When the button is pressed, the numeral is decreased.
Symbol	Display	Name of display	Description
0		SHIRRING AMOUNT display	Shirring amount is displayed.
ß		SHIRRING AMOUNT FOR AUXILIARY FEED display	Shirring amount of auxiliary feed is displayed.
•		COUNTER display	display : This is displayed when bobbin counter is used.
۵	V23.	COUNTER SET VALUE dis- play	Set value of counter is displayed.

8-3 Detailed data input screen



No.	Button	Name of button	Description
Ø	×	CANCEL button	When the button is pressed, step details screen is closed.
Ø		STEP FEED button	When the button is pressed, selection step advances by one.
Ø	-	STEP RETURN button	When the button is pressed, selection step returns by one.
Ø		DETAILS SELECTION SCREEN FEED button	When the button is pressed, details selection screen scrolls forward.
29	•	DETAILS SELECTION SCREEN RETURN button	When the button is pressed, details selection screen scrolls backward.

No.	Button	Name of button	Description
0	255.0 	LENGTH BETWEEN STEPS SETTING button	When the button is pressed, length between steps setting screen is displayed.
•	0.0	GRADING VALUE SETTING button	When the button is pressed, grading value setting screen is displayed.
Ð	0 () () () () () () () () () () () () ()	COMPENSATION THREAD TENSION SETTING button	When the button is pressed, compensation thread tension setting screen is displayed.
•	0.0	COMPENSATION PITCH SET- TING button	When the button is pressed, compensation pitch setting screen is displayed.
84	5 009	START POSITION CHANGE button	When the button is pressed, start position change screen is displayed.
69	5010	MIRRORING button	When the button is pressed, mirroring screen is displayed.
60	0/ 0	COMPENSATION SHIRRING AMOUNT SETTING button	When the button is pressed, compensation shirring amount setting screen is displayed.
9	© © S012	TOP NOTCH POSITION CHANGE button	When the button is pressed, top notch position change screen is displayed.
6 3	S013	STEP ADDITION button	When the button is pressed, step addition screen is displayed.
69		STEP DELETION button	When the button is pressed, step deletion screen is displayed.

Symbol	Display	Name of display	Description
0	(550) -Q ¹ 5005	LENGTH BETWEEN STEPS display	Set value of length between steps is displayed.
0		GRADING VALUE display	Grading value is displayed.
•	0 6 8007	COMPENSATION THREAD TENSION display	Set value of compensation thread tension is displayed.
e		COMPENSATION PITCH dis- play	Set value of compensation pitch is displayed.
8	0/ D 	COMPENSATION SHIRRING AMOUNT display	Set value of compensation shirring amount is displayed.

8-4 Feed amount

The explanation is given for the feed amount of the sewing machine.



Feed amount on the operation consists of the three kinds of feed amounts, bottom feed amount (pitch), main feed amount (pitch + shirring amount) and auxiliary feed amount (pitch + shirring amount + shirring amount for auxiliary feed).

In case of A, when pitch (S004) is set to 2.0, bottom feed belt 1 moves 2.0 mm per rotation of the sewing machine (1 stitch).

In case of **B**, when shirring amount is set to 3, main 00 đ °°ċ feed belt 2 moves 2.3 mm per rotation of the sewing machine (1 stitch). This means that set value "1" of shirring amount (main feed) is in steps of 0.1 mm and when the set value S001 S002 is converted to mm, $3 \times 0.1 = 0.3$ mm is calculated. \$ This value is added to pitch (bottom feed) and the \sim total value becomes the moving amount of the main feed belt. Δ Main feed amount = pitch + shirring amount (()) M

Pitch setting screen



2.3 mm = 2.0 mm + 0.3 mm

In case of C, when shirring amount for auxiliary feed is set to 2, auxiliary feed belt 3 moves 2.5 mm per rotation of the sewing machine (1 stitch).

This means that set value "1" of shirring amount for auxiliary feed (auxiliary feed) is in steps of 0.1 mm and when the set value is converted to mm, $2 \times 0.1 =$ 0.2 mm is calculated. This value is added to the main feed amount and the total value becomes the moving amount of the auxiliary belt.

Auxiliary feed amount = main feed amount + shirring amount for auxiliary feed 2.5 mm = 2.3 mm + 0.2 mm

Sewing screen

8-5 Basic operation of the sewing machine







- (1) Prepare the materials.
- 1) Prepare left and right sleeves, and garment body.

(2) Turn the power ON.

- 1) Turn the power switch ON.
- 2) Data input screen is displayed after the display of the initial screen.



Auto-lifter does not move until the screen moves to the sewing screen | or the new creation screen. After it | has worked, it works in all screens. | So, be careful.

(3) Calling the pattern <Pattern No. selection>

Two programs (for right sleeve and left sleeve) are entered in one pattern. Further, the respective programs consist of single or plural steps (sewing data between the respective notches are stored).

1) Press PATTERN SELECTION button



SAMPLE-7

4

2) Press UP/DOWN SCROLL buttons

② to display PATTERN No. [●] SAMPLE-7

button $\boldsymbol{3}$ of the pattern to be called.

3) Press PATTERN No. button

4) Press ENTER button

8

(4) Selecting left/right alternate sewing <Left/right alternate sewing selection>

Α

В



(5) Performing sewing





Press LEFT/RIGHT ALTERNATE SEWING button



to select program changeover method (for

right sleeve and left sleeve).



Alternate sewing, right : Left/right alternate sewing starting from the right sleeve



Alternate sewing, left : Left/right alternate sewing starting from the left sleeve



Right sleeve only : Right sleeve sewing only



Left sleeve only : Left sleeve sewing only

1) Press READY key 🜔 2.

 Display changes over from data input screen A to sewing screen B.









- 3) Set sleeves and garment body to the sewing machine.
 - * When temporarily setting the shirring amount to "0" during sewing, press SHIRRING RELEASE switch C.

When the switch is pressed, LED lights up and the shirring amount is set to "0". When the switch is pressed twice, LED goes off and the shirring amount returns to the shirring amount of the selected step.

4) Check LEFT/RIGHT ALTERNATE button



• whether the set materials and the called program (for right sleeve/left sleeve) correspond with each other.

- 5) Start sewing.
- 6) When sewing is performed up to the next notch, the step automatically changes over.

- When the step is not automatically changed over, press knee switch
 once. Step of the program advances by one (A).
- * When the step is not automatically changed over, perform the register of the length of step.
 Refer to <u>"9-4 (2) Re-registering the length between steps" p. 95.</u>
- Repeat procedures 5) through 7) until the end of sewing.
- 9) When temporarily interrupting the fully-automatic during sewing, press FULL AUTO IN-

When starting again, press again FULL AUTO

TERRUPTION button 3 . Measuring is

stopped and the full-auto mode is interrupted.

INTERRUPTION button





8-6 Changing the basic set value

(1) Changing the sewing machine speed <Max. sewing speed setting>



1) Press MAX. SEWING SPEED SETTING button

10) Perform thread trimming with pedal 6.





2) Press MAX. SEWING SPEED CHANGE button





₿.

to change "speed set value" A .

3) Press ENTER button

(2) Changing the pitch <Pitch setting>



(3) Changing the needle thread tension <Needle thread tension setting>



 Press NEEDLE THREAD TENSION SETTING button 0.



- 2) Change "needle thread tension set value" A by pressing numeric keys 0 to 9 2 or $\checkmark \blacktriangle$ buttons 🚺 🕄 (📫 🌒).
- 3) Press ENTER button 6

(4) Changing the shirring amount <Shirring amount setting>



1) Press STEP SELECTION button

select the step.



1 to

(5) Changing the shirring amount of auxiliary feed <Auxiliary feed shirring amount setting>



1) Press STEP SELECTION button to

select the step.

2) Press "+"/ "-" buttons 🛿 to Ŧ

change shirring amount for auxiliary feed set value A.
8-7 Creating the pattern <Pattern creation>

The way of correcting the sample pattern and creating the pattern with ease is explained in the basic volume.





- 1) Prepare the materials.
- 2) Turn the power ON.
- Call a sample pattern where the sewing product and number of steps are the same.
 Refer to <u>"8-5 (3) Calling the pattern" p. 61</u>.
- Change the pitch.
 Refer to <u>"8-6 (2) Changing the pitch" p. 65</u>.
- Select left/right alternate sewing.
 Refer to <u>"8-5 (4) Selecting the left/right alternate sewing" p. 62</u>.
- 6) Press READY key () 1.
- 7) Start sewing.
- Stop the sewing machine at each notch and perform checking of shirring amount.
- 9) When notches do not correspond with each

other, press "+"/ "-" buttons

after thread trimming on the way to change shirring amount set value **A**, and perform re-sewing. Refer to <u>"8-6 (4) Changing the shirring</u> <u>amount" p. 66</u>.

10) When the sleeve material on the outlet seam

side delays, press "+"/ "–" buttons 📫

 after thread trimming on the way to change shirring amount for auxiliary feed set value B, and perform re-sewing.

Refer to <u>"8-6 (5) Changing the shirring</u> amount of auxiliary feed" p. 66.

- 11) When the program of one sleeve is completed, sew the other sleeve and correct the program.
- 12) When the program is completed, press MEA-

SURE button



When you desire to release the mea-) sure after pressing MEASURE button, | change over from the sewing screen | to the edit screen once.

13) Start sewing.

14) When sewing is performed up to the next notch, stop the sewing machine once.



- 15) Press knee switch **6** once. Step of the program advances by one. (**A**)
- 16) Repeat procedures 13) through 15) until the end of sewing.



17) Perform thread trimming with pedal 6.

8-8 Deleting the pattern <Pattern deletion>







6) Press CANCEL button 🔀 6.



9. OPERATION OF THE SEWING MACHINE (FULLY-AUTOMATIC APPLICATION VOLUME)

9-1 Correcting the pattern

(1) Changing the length of specified step <Length between steps setting>



- The state that can be changed in the sewing screen is the state that step 1 is selected before starting sewing.
- 1) In the state that step 1 is selected, press STEP



2) Press STEP FEED/RETURN buttons



2 to select the step to be changed.

.

3) Press LENGTH BETWEEN STEPS SETTING



- 4) Change "length between steps" A by pressing numeric keys 0 to 9 0 or **v** buttons
- 5) Press ENTER button Ø.



6) Press CANCEL button

(2) Changing the needle thread tension of specified step <Compensation thread tension setting>







8.

3) Press COMPENSATION THREAD TENSION





(3) Changing the pitch of specified step <Compensation pitch setting>



- * The state that can be changed in the sewing screen is the state that step 1 is selected before starting sewing.
- In the state that step 1 is selected, press STEP
 DETAILS button .

 $\hat{\mathbf{v}}$ 2) Press STEP FEED/RETURN buttons -2 to select the step to be changed. 0 0.0 3) Press COMPENSATION PITCH button ₿. 255.0 0 0.0 ٦ 6 0/ Μ (()) 4) Change "compensation pitch set value" A by pressing numeric keys 0 to 9 4 or \checkmark $\hat{\mathbf{v}}$ buttons 🞽 🗿 (🛟 🔞). When inputting the minus numeral in) 1 the ten key pop-up screen, press the | minus button after inputting "0" and | input the numeral. J 7 8 9 × Α 4 5 6 11.7 5) Press ENTER button **2**. 4 2 3 1 0 Ø 1 Ġ Ġ 6) Press CANCEL button ک $\hat{\mathbf{v}}$ 8 8. 255.0 0 0.2 Ô ŧ 0/ £ ٦Æ Μ

(4) Increasing/decreasing the shirring amount of all steps <Shirring amount increase/decrease setting>



(5) Increasing/decreasing the shirring amount immediately after changeover of step <Compensation shirring amount setting>





(6) Adding the step <Step addition>





6) Press CANCEL button



- Press READY key to change over the screen to data input screen A.
- 2) Press STEP SELECTION button



2 to select the step which is one before the step addition position.

3) Press STEP DETAILS button



4) Change over the display with SCROLL buttons









5) Press ENTER button .



6) Press SHIRRING AMOUNT buttons

	<mark>∢ 4</mark>	5	6	7	8 🕨	0	to change shirring
amount set value B .							

7) Press ENTER button **[**] **(**].

8) Press CANCEL button 🔀



(7) Deleting the step <Step deletion>



- 1) Press READY key to change over the screen to data input screen A.
- 2) Press STEP SELECTION button



- 2 to select the step to be deleted.
- 3) Press STEP DETAILS button 🗔 3.

- $\hat{0}$ 0/ 00 • 301 Δ 6]]]014 M
- 4) Change over the display with SCROLL buttons



and press STEP DELETION

6.

5) Press ENTER button





6) Press CANCEL button



(8) Changing gent's/ladies' wear classification <Gent's/ladies' selection>





1) Press SEWING DATA DISPLAY button 10.

2) Press GENT'S/LADIES' SELECTION button



- **2** to change the selection.
- 3) Press ENTER button 3.



4) Check the contents 4.

(9) Changing the size <Size change>







1) Press SEWING DATA DISPLAY button

2) Press "+"/ "-" buttons 2 to change the size.

₿.

3) Press ENTER button

4) Check set value (4).

(10) Setting the offset value of grading <Grading value setting>

Grading is the way to enlarge or reduce the basic pattern and develop the size. Here, increased or decreased value per size when the size is changed can be set at every step.







(11) Changing the start position of program <Start position change>



- 1) Press READY key • to change over the screen to data input screen.
- 2) Press STEP SELECTION button



2 to select the step you desire to set the start position.

3) Press STEP DETAILS button (3).





4) Press START POSITION CHANGE button









6) Press CANCEL button

5) Press ENTER button



6

When the start position is changed, simultaneously the shirring amount data of each step move together.

(12) Mirroring the program of one sleeve and creating the program of the other one <Mirroring function>



- 1) Press READY key 1 to change over the screen to data input screen.
- 2) Press STEP DETAILS button 2.







أ⊘ 6 255.0 5.0 0 Ô \oplus ۸ 0.0 ¥ ł 3009 Μ 0

3) Press MIRRORING button



4) Press ENTER button 4.

5) Press CANCEL button 🔀



(13) Changing the top notch position of program <Top notch position change>



- 1) Press READY key (1 to change over the) screen to data input screen.
- 2) Press STEP SELECTION button



2 to select the step you desire to set the top notch position.

- 3) Press STEP DETAILS button 0.





4) Press DOWN SCROLL button 🗸 🕘.



5) Press TOP NOTCH POSITION CHANGE button





(14) Naming the pattern <Data name setting>



- 1) Press READY key **()** to change over the screen to data input screen **A**.
- 2) Press LETTER INPUT button



- 88 -



- 3) It is possible to input the character by pressing CHARACTER button (a) you desire to input. As many as 14 characters of characters (A to Z and 0 to 9) and symbols (+, , _, /, , #, , and ,) and symbols (+, , _, /, , #, , and ,) can be inputted (B). Cursor can be moved with CURSOR LEFT MOVE button
 And CURSOR RIGHT MOVE button
- 4) Press ENTER button
- 5) The inputted letter is displayed at pattern name display section **C**.

9-2 Copying the pattern <Pattern copy>

(1) Pattern copy in the fully-automatic <Copy to fully-automatic>



Press READY key to change over the screen to data input screen A.

0

2) Press PATTERN COPY button



- 3) Press PATTERN No. button SAMPLE-9
 3) to select the pattern of copy source.
- 4) Press COPY DESTINATION INPUT button



- 5) Input the pattern No. of copy destination with ten keys 0 to 9 5. It is possible to retrieve the pattern No. which has not been used yet with
 - \checkmark buttons (\checkmark 6 and \ddagger 7).
- 6) Press ENTER button 3.

7) Press CANCEL button



* When the number of registered patterns of fullyautomatic is 99 patterns, the display is automatically changed over and the pattern is copied to semi-automatic.



(2) Pattern copy from fully-automatic to semi-automatic <Copy to semi-automatic>





8) Press CANCEL button



* When the number of registered patterns of fullyautomatic is 99 patterns, the display is automatically changed over and the pattern is copied to semi-automatic.

9-3 Creating a new pattern <New pattern creation>

The way to newly create a pattern is explained in the application volume.







- 5) Change pitch and basic size. Refer to "8-6 (2) Changing the pitch" p. 65. Refer to "9-1 (9) Changing the size" p. 82.
- 6) Select left/right alternate sewing. Refer to "8-5 (4) Selecting the left/right alternate sewing" p. 62.
- 7) Press SHIRRING AMOUNT button 1 2 3 4 5 6 8 to input the shirring amount.

[In case of manual inputting]

8) Press STEP DETERMINATION button



- to determine the inputted data. 9) Change "length between steps" B by pressing
 - numeric keys 0 to 9 0 or ▼▲ buttons **__** (**__**).

₿.

10) Press ENTER button

- [In case of teaching inputting]
- 8) Set the materials and perform sewing.
- 9) The sewing machine stops at the changeover position of the step.
- 10) Press the knee switch.
- 11) Repeat procedures 7) through 10).



12) Press ENTER button

If after registering

the length between steps, the program of inputted sleeve is registered to the pattern. At this time, the program of the other sleeve is automatically created by mirroring.

9-4 Using other functions

(1) Directly calling the pattern from sewing screen <Direct pattern selection>



When the patterns which are frequently used are registered to the direct selection button, it is possible to select the patterns with ease from the operating screen by pressing the button only.

- * For the way of registering the pattern to the direct selection button, refer to <u>"13. REGISTER-ING AND THE PATTERN TO DIRECT BUT-TON AND RELEASING THE PATTERN FROM DIRECT BUTTON" p. 113</u>.
- 1) Press DIRECT SELECTION button **P**.
- Press PATTERN SELECTION button 2 to be called.
- 3) Press "+"/"-" buttons
 3) The size.
- 4) Press ENTER button

(2) Re-registering the length between steps <Measure function>



1) Press MEASURE button





When you desire to release the mea-) sure after pressing MEASURE button, | change over from the sewing screen | to the edit screen once.

- 2) Start sewing.
- 3) When sewing is performed up to the next notch, stop the sewing machine once.
- Press knee switch (5) once. Step of the programs advances by one. (A)
- 5) Repeat procedures 2) through 4) until the end of sewing.



6) Perform thread trimming with pedal (6).

10. OPERATION OF THE SEWING MACHINE (MANUAL BASIC VOLUME)

10-1 Data input screen



No.	Button	Name of button	Description
0	6	NEEDLE THREAD TENSION SETTING button	When the button is pressed, needle thread tension change screen is displayed.
0	<u>To</u>	DISK RISE button	When the button is pressed, thread tension disk No. 1 rises. (Turn OFF the base tension during 10111 waiting.)
₿	(Ca	MANUAL DETAILS SETTING button	When the button is pressed, manual sewing details set- ting screen is displayed.
4	+	SHIRRING AMOUNT FOR AUXILIARY FEED "+" button	When the button is pressed, shirring amount for auxiliary feed is added by "+1".
6	.	SHIRRING AMOUNT FOR AUXILIARY FEED "-" button	When the button is pressed, shirring amount for auxiliary feed is subtracted by "-1".
6	0	SHIRRING AMOUNT display	Existing shirring amount of feed is displayed.
0	0	SHIRRING AMOUNT FOR AUXILIARY FEED display	Existing shirring amount of auxiliary feed is displayed.
8		SHIRRING AMOUNT LEVEL display	Existing shirring amount of feed is displayed on level.

No.	Button	Name of button	Description
9	C	READY key	Changeover of data input screen and sewing screen is performed.
0	i	INFORMATION key	Changeover of data input screen and information screen is performed.
0	(())	COMMUNICATION key	Changeover of data input screen and communication screen is performed.
Ø	М	MODE key	Changeover of data input screen and mode changeover screen to perform various details setting is performed.

10-2 Sewing screen



No.	Button	Name of button	Description
ß	1	COUNTER VALUE CHANGE	When the button is pressed, bobbin/No. of pcs. counter setting screen is displayed. This screen is displayed when setting at <u>"12. USING COUNTER" p. 110</u> .
1	¥.2.s	COUNTER CHANGEOVER button	When the button is pressed, bobbin/No. of pcs. counter is changed over. This screen is displayed when setting at "12. USING COUNTER" p. 110.
¢	0.0	SEWING LENGTH display	Sewing length when sewing is displayed. When thread trimming is performed, display is cleared to "0".

10-3 Details data input screen



No.	Button	Name of button	Description
0		AUXILIARY PEDAL OPERA-	When the button is pressed, auxiliary pedal operation
		TION MODE SELECTION but-	mode selection screen is displayed.
	S050	ton	
2		AUXILIARY FEED MODE SE-	When the button is pressed, auxiliary feed operation
	5051	LECTION button	mode selection screen is displayed.
8	20 ▲★ \$052	BASE PITCH SETTING button	When the button is pressed, base pitch setting screen is displayed.
4		AUXILIARY FEED INTERLOCK	When the button is pressed, auxiliary feed interlock mode
	S.	MODE SETTING button	setting screen is displayed.
	S053		* 1 Display/Non display is changed over according to the contents of setting of S051 .
6		SHIRRING AMOUNT RANGE	When the button is pressed, shirring amount range setting
	5054	SETTING button	screen is displayed.
6	0	COMPENSATION THREAD	When the button is pressed, compensation thread tension
	6 5055	TENSION CHANGE button	setting screen is displayed.

10-4 Basic operation of the sewing machine

(1) Prepare the materials.

Prepare left and right sleeves, and garment body.

(2) Turn the power ON.



(3) Perform sewing.





- 1) Turn the power switch ON.
- 2) Data input screen is displayed after the initial screen was displayed.



1) Press READY switch () 1 to change over



- When the shirring amount level in the manual screen is the pedal neutral state (state that the pedal is not depressed) and not "0", refer to "23-2 Performing the auxiliary pedal setting" p. 163 and perform readjustment.
- 2) Input set value with SHIRRING AMOUNT FOR

AUXILIARY FEED buttons

- Set sleeves and garment body on the sewing machine.
- 4) Start sewing.



- 5) Adjust the shirring amount with auxiliary pedal 3.
- Perform thread trimming with pedal ④ at the end of sewing.

10-5 Changing the basic set value)

(1) Changing the sewing speed <Max. sewing speed setting>



1) Press MAX. SEWING SPEED SETTING button





2) Press MAX. SEWING SPEED CHANGE button



the sewing speed.

3) Press ENTER button **3**.

(2) Changing the pitch <Pitch setting>



Press MANUAL DETAILS SETTING button

 Image: Optimized and the set of the

2.0

2.

2) Press BASE PITCH SETTING button



- 3) Change "base pitch set value" A by pressing numeric keys 0 to 9 3 or ▼▲ buttons
- 4) Press ENTER key 6.

*** (;)**.

(3) Changing the needle thread tension <Needle thread tension setting>



1) Press NEEDLE THREAD TENSION CHANGE





- 2) Change "needle thread tension set value" A by pressing numeric keys 0 to 9 2 or ▼▲ buttons 1 3 (1 0).
- 3) Press ENTER button **[]**
11. OPERATION OF THE SEWING MACHINE (MANUAL APPLICATION VOLUME)

11-1 Changing the detailed set value

(1) Changing the operating mode of auxiliary pedal <Auxiliary pedal operation selection>

Changing from interlock mode ${\bf A}$ to step mode ${\bf B}$

"What is the interlock mode like ?"

It is the mode that "shirring amount" changes with the interlock of the depressing amount of auxiliary pedal.

"What is step mode like ?"

It is the mode that "shirring amount" increases by +1 when depressing the front-part of auxiliary pedal and "shirring" amount decreases by -1 when depressing the back-part of auxiliary pedal.



- 1) Press MANUAL DETAILS SETTING button
- * **A** is the interlock mode screen.



2) Press AUXILIARY PEDAL OPERATING MODE

SELECTION button



(2) Changing the auxiliary feed operating mode <Auxiliary feed mode selection>



1) Press MANUAL DETAILS SETTING button





2) Press AUXILIARY FEED MODE SELECTION





- 3) Select the auxiliary feed operating mode.
- **] :**
 - Fixed value can be manually inputted by numeral and set.



- Fixed value can be manually inputted by ratio (%) and set.
- Operation interlocking the shirring amount is performed. Setting is performed by numeral inputting with <u>"11-1 (3) Auxiliary feed interlock mode setting" p. 106</u>.
- Operation interlocking the shirring amount is performed.
 Setting is performed by ratio (%) inputting with <u>"11-1 (3) Auxiliary feed interlock mode setting" p. 106.</u>

9



- 4) Press ENTER button
- 5) Press CANCEL button

(3) Setting the auxiliary feed interlock mode <Auxiliary feed interlock mode setting>

It is the setting when \mathbb{F} or \mathbb{F} of the previous item 3) is selected at "11-1 (2) Changing the operating mode of auxiliary feed".



1) Press MANUAL DETAILS SETTING button



2) Press AUXILIARY FEED INTERLOCK MODE





3) Perform the auxiliary feed interlock mode setting.

1. Press shirring amount range setting button

3 of LV.1. Enter the upper limit value by pressing numeric keys 0 to 9 5 or ▼▲ buttons 🔼 **† (**). 6 (



2. Then, press auxiliary feed shirring amount set-

0 4 of LV.1 Enter auxiliary feed ting button

J

shirring amount by pressing numeric keys

to

Similarly, set the value of LV.2, LV.3, LV.4 and LV.5.

Display A in the screen shows as follows :

- When shirring amount is 4 to 5, auxiliary feed shirring amount value is 0%.
- · When shirring amount is 6 to 10, auxiliary feed shirring amount value is 10%.
- · When shirring amount is 11 to 15, auxiliary feed shirring amount value is 25%.
- · When shirring amount is 15 to 20, auxiliary feed shirring amount value is 30%.
- · When shirring amount is 21 to 35, auxiliary feed shirring amount value is 35%.
- When inputting ratio (%), the set value is corrected by 5% unit.
- 4) Press ENTER button
- 5) Press CANCEL button



(4) Setting the range of shirring amount <Shirring amount range setting>

It is the setting when the interlock mode is selected at "11-1 (1) Changing the operating mode of auxiliary pedal".



Press DETAILS SETTING button ()
 Press SHIRRING AMOUNT RANGE SETTING button button ()

- 3) Input the lower limit value of shirring amount
 - range with **t** buttons **3**.
- 4) Input the upper limit value of shirring amount

range with 📫 🎽 buttons 4.

5) Press ENTER button **[**]

6) Press CANCEL button



(5) Setting the compensation thread tension <Compensation thread tension setting>





1) Press MANUAL DETAILS SETTING button



2) Press COMPENSATION THREAD TENSION



3) Change "needle thread tension set value" A by pressing numeric keys 0 to 9 3 or ▼▲ buttons 1 4 (1 5).



4) Press ENTER button **G**.



Ø.

12. USING COUNTER

12-1 Setting procedure of the counter



1) Display the counter setting screen.

When MODE key **M** is pressed, COUN-

TER SETTING button 12.3.

2 is displayed.

When this button is pressed, the counter setting screen is displayed.

2) Selection of kinds of counters

This sewing machine has two kinds of counters, i. e., sewing counter and No. of pcs. counter. Press SEWING COUNTER KIND SELECTION



the counter kind selection screen. The kinds of the respective counters can be set separately.



[Sewing counter]



Every time the sewing is performed, the existing value is counted up. When the existing value is equal to the set value, the count-up screen is displayed.



Every time the sewing is performed, the existing value is counted down. When the existing value is reached to "0", the count-up screen is displayed.





[No. of pcs. counter]



Every time the sewing of one sleeve (every time thread trimming is performed in case of manual sewing), existing value is counted up. When the existing value is equal to the set value, the count-up screen is displayed.

DOWN counter V2.3.

Every time the sewing of one sleeve (every time thread trimming is performed in case of manual sewing), existing value is counted down. When the existing value becomes "0", the count-up screen is displayed.









3) Change of counter set value

In case of the sewing counter, press SEWING

COUNTER SET VALUE CHANGE button



●, and in case of the No. of pcs. counter, press NO. OF PCS. COUNTER SET VALUE CHANGE

button 50

2, and the set value input screen

is displayed. Here, input the set value. (Refer to screen **A**.)

4) Change of counter existing value

In case of the sewing counter, press SEWING COUNTER EXISTING VALUE CHANGE button



press NO. OF PCS. COUNTER EXISTING VAL-

UE CHANGE button 4 and the existing

value input screen is displayed. Here, input the existing value.

(Refer to screen B.)

12-2 Count-up releasing procedure



When count-up condition is reached during sewing work, the count-up screen is displayed and the

buzzer beeps. Press CLEAR button C 1 to re-

set the counter and the screen returns to the sewing screen. Then the counter starts counting again.

13. REGISTERING AND THE PATTERN TO DIRECT BUTTON AND RELEASING THE PATTERN FROM DIRECT BUTTON

Register the pattern No. which are frequently used with the direct buttons for use.

Once the patterns are registered, the pattern selection can be performed with ease by pressing only the button.

13-1 How to register



1) Display the direct pattern register screen.



tern register button P 2 is displayed on the

screen.

When this button is pressed, the direct pattern register screen is displayed.





2) Select the button to be registered.

Direct patterns can be registered up to 30 patterns. 30 direct buttons ③ are displayed on the screen. When the button located on the position you desire to register is pressed, the pattern No. list screen is displayed.

3) Select the pattern No. to be registered.

Select the pattern No. you desire to register from among pattern No. buttons ④. When the selected button is pressed twice, the selection is released.

4) Register the direct pattern.

When ENTER button **5** is pressed, the

register of direct pattern is finished and the direct pattern No. register screen is displayed. The registered pattern No. is displayed on the direct button.

13-2 How to release



1) Select the pattern No. to be released.

After displaying the pattern No. list screen at the item 2) of how to register the pattern No., select the pattern No. you desire to release from among the registered pattern Nos. using pattern No. buttons **1**.

2) Release the direct pattern.

When ENTER button

2 is pressed, the

release of the direct pattern is finished and the direct pattern No. register screen is displayed.

13-3 Register state at the time of your purchase

Pattern Nos. 1 to 10 have been registered at the time of your purchase.

14. CHANGING SEWING MODE



1) Display the sewing mode selection screen.



2) Select the sewing mode.

Press MODE SELECTION button



select the sewing mode you desire to sew.

* Image of the button of the sewing mode selection button changes according to the sewing mode which is selected at present.

When semi-automatic sewing is selected



When fully-automatic sewing is selected :



When manual sewing is selected :



3) Determine the sewing mode.

When MODE key **M •** is pressed, the sewing mode data input screen is displayed.

15. CHANGING MEMORY SWITCH DATA

15-1 Changing procedure of memory switch data



1) Display the memory switch data list screen.

When MODE key **M (**) is pressed, MEMO-

RY SWITCH button 2 Is displayed on the

screen.

When this button is pressed, the memory switch data list screen is displayed.

2) Select the memory switch button you desire to change.

Press UP/DOWN SCROLL button

• 💌

and select the data item buttonyou desire to change.

3) Change the memory switch data.

There are data items to change numerals and those to select pictographs in the memory switch data. No. in pink color such as 10003 is put on the data items to change numerals and the set value can be changed with ten keys and +/- buttons displayed in the change screen.

No. in blue color such as **U001** is put on the data items to select pictographs and the pictographs displayed in the change screen can be selected.

For the details of memory switch data, refer to "15-2 Memory switch data list" p.117.



When inputting the minus numeral in) the ten key pop-up screen, press the | minus button after inputting "0" and | input the numeral.

1) Level 1

Memory switch data (level 1) are the motion data that the sewing machine has in common and the data that operate on all sewing patterns in common.

No.	Item	Setting range	Edit unit	Initial display
U001	Reverse stitching at the sewing start selection			Without
	Select from among three kinds of without, single and double.			
	: Without : Single : Double			
U002	Reverse stitching at the sewing end selection			Without
	Select from among three kinds of without, single and double.			
	: Without N : Single N : Double			
U003	Number of stitches of reverse stitching	0 to 19	1 stitch	5 stitches
	Number of stitches at the sewing start			
	and that at the sewing end are set.			
U004	Reverse stitching speed	200 to	10sti/min	800sti/min
	Speed of the reverse stitching at the sewing	3000		
	start and the sewing end is set.			
U005	Needle position at the time of stop			DOWN
	Needle position at the time of temporary stop during sewing			
	is selected.			
	V			
U006	Number of stitches of soft start setting	0 to 9	1 stitch	0 stitch
	Number of stitches of soft start at the $\int \sqrt{\sqrt{2}3}$.			
	sewing start is set.			
U007	Soft start speed setting	200 to	10sti/min	800sti/min
	Speed of soft start at the sewing start is	2000		
	set.			
U008	Condensation sewing selection			Without
	Select from among four kinds of without, start only, end only			
	and both start and end.			
	: Without 🛛 📕 📘 : Start			
	End Both : End			
U009	Number of stitches of condensation	0 to 9	1 stitch	0 stitch
	Number of stitches of condensation sew-			
	ing is set.		10.111.1	
0010		200 to	10sti/min	800sti/min
	Speed of condensation sewing is set.	2000		
U011	Base tension in waiting state	0 to 200	1	20
	Base tension in waiting state (except dur-			
	ing sewing) is set.			
				1

No.	Item	Setting range	Edit unit	Initial display
U012	Compensation tension mode selection			Manual
	Select from among manual (numerical value), manual (level) and automatic.			numerical value)
	🐞 🖑 : Numerical value 🐞 📶 : Level			
	i Automatic			
	For setting procedure of the manual (numerical value),			
	refer to <u>"15-3 (1) Explanation of compensation tension</u> manual (numerical value)" p.124.			
U013	Compensation tension manual (level) setting	– 200 to	1	Level 1)
	This item is displayed when "manual (level)" is selected in	200		I evel 2)
	tion tension value for each level is set.			20
	→ Refer to <u>"15-3 (2) Explanation of compensation ten-</u> sion manual (level) p.126.			Level 3) 30
U014	Compensation tension automatic setting This item is displayed when "automatic" is selected in	Shirring amount		
	U012 Compensation tension mode selection. Compensa-	- 4 to 35		
	\rightarrow Befer to "15-3 (3) Explanation of compensation	tension value		
	thread tension automatic" p.129	– 200 to 200		
U015	Shirring smoothing function setting			Unused
	→ Refer to <u>"15-4 Explanation of the shirring smoothing</u> function" p.131.			
	Number of stitches of shirring smoothing function setting	1 to 20	1 stitch	1 stitch
	smoothing function is set.			
	Shirring smoothing function shirring amount setting	1 to 35	1	1
	Shirring amount of shirring smoothing function			
U016	Data storing function at the time of sewing			Storing
	Whether storing data or not when data is changed in the sewing screen is selected			
	* By setting, storing/no storing of partial shirring amount,			
	compensating partial shirring amount, or stop detailed			
	: No storing			
U017	Sound output at the time of changeover of step selection			No sound
	Whether buzzer sounds or not when step is changed over is selected.			
	🌀 🍳 » : No sound 🏾 🌀 📢 » : Sound			
U018	Auxiliary pedal use selection			Use (2)
	Use of auxiliary pedal is selected.			
	: Unused			
	Shirring amount changes according to the depressing amount of auxiliary pedal.			
	Shirring amount increases by +1 by depressing the front part of auxiliary pedal and decreases by -1 by depressing the back part of auxiliary pedal.			
	→ Refer to <u>"11-1 Changing the detailed set value" p.103</u> for the manual mode			

Image release switch use selection Use of shirring release switch is selected. Use d as shirring release withing Image release Image release Image release Image release Image release Image release Image release Image release built Image release release Image release release Image release release Image release release Image release release release release Image release release release release Image release release release release Image release	No.	Item	Setting range	Edit unit	Initial display
Use of shirring release switch is selected. shirring release Signature : Unused Signature : Used as shirring release Signature : Used as reverse feed stitching Signature : Used both as shirring release and thread trimming prohibition * Iso as the switch is used as the reverse stitching one, stirring release button is displayed on the panel when the display setting is performed with Stope Reverse stitching in button display setting is performed with Stope Reverse stitching in button display setting. * This setting will become invalid for the manual mode. US20 Knee switch uses selection Whather knee switch for step changeover is used or not is selected. Signature Screen changeover function at the time of change of pitch selection Whether shiring amount interlock function at the time of thange of pitch selection No change-over Whether shiring amount at the lime of thread trimming is performed at the selection No change-over Whether shiring amount interlock function at the time of change of pitch selection No change-over Whether schiring amount at the lime of thread trimming is performed at the selection Whether axiliary feed input tip performed with offset numerical value or stato is selected.	U019	Shirring release switch use selection			Used as
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Image: State of the set					
Image: Construction of the service		Used both as shirring release and thread			
Image: Set 1: Used both as reverse stitching and thread trimming prohibition • In case the switch is used as the reverse stitching one, shirring release button is displayed on the panel when the display setting is performed with K026 Reverse stitching button display setting is performed with K026 Reverse stitching button display setting is performed with step changeover is used or not is selected. Use IO20 Knee switch use selection Use Use IO21 Shirring amount interlock function at the time of change of pitch selection No change-over IO221 Shirring amount set to each step at the time of change of pitch selected. No change-over IO222 Screen changeover function at the time of thread trimming is performed at the step other than the last set is selected. No change-over IU222 Screen changeover function at the time of thread trimming is performed with offset numerical value or % ratio is selected. No change-over IU233 Auxiliary feed input mode selection Numerical value IU233 Stort promod with offset numerical value or % ratio is selected. Numerical value value IU234 Shirring amount increase/decrease input mode 0 to 200 1					
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U025 Start position change way selection Interlocked Whether the change of start position is interlocked with shirring data or only the start position moves is selected. Interlocked		\ominus 🚔 : Numerical value 😂 🐞 : Ratio			
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		data or only the start position moves is selected.			data
• Interlocked with shirring data		• • • • Interlocked with shirring data			
: Only start position moves.		, 😡 : Only start position moves.			

No.		Ite	Setting range	Edit unit	Initial display		
U026	Language se	lection				No	
	Language to b	e indicated in t	he panel is selec	ted.			selection
	日本語	English	中文繁體字	中文简体字			
	Japanese	English	Chinese (traditional)	Chinese (simplified)			
	Español	Italiano	Français	Deutsch			
	Spanish	Italian	French	German			
	Português	Português	Tiếng Việt	한국어			
	Portuguese	Portuguese	Vietnamese	Korean			
	Indonesia	Русский					
	Indonesian	Russian					

2) Level 2

Memory switch data (level 2) can be edited when pressing MODE switch for as long as 6 seconds.

No.	Item	Setting range	Edit unit	Initial display
K001	Presser position after thread trimming selection			UP
	Position of the presser after thread trimming is set.			
	Southern Street			
K002	Max. sewing speed setting	200 to	10sti/min	3500sti/
	Max. sewing speed of the sewing machine is set.	3500		min
K003	Sewing speed at low speed setting Min. sewing speed of the sewing machine is set.	200 to 400	5sti/min	200sti/min
K004	Sewing speed of thread trimming setting Sewing speed at the time of thread	100 to 250	5sti/min	160sti/min
K005	This function is set when hand lamp flickers.	0 to 8	1	0
	0 : Without flicker reduction function			
	1 : Less effective \rightarrow 8 : more effective			
K006	Rotation start pedal stroke setting	1.0 to 5.0	0.1mm	3.0mm
	Stroke from the neutral position of pedal to sewing machine rotation start position is set.			
K007	Pedal low speed section	1.0 to 10.0	0.1mm	6.0mm
	Section from pedal neutral position to sewing machine acceleration start position is set.			
K008	Pedal presser lifting start position	– 1.0 to	0.1mm	– 2.1mm
	Section from pedal neutral position to cloth presser lifting start position is set.	- 6.0		
K009	Thread trimming start pedal stroke	– 1.0 to	0.1mm	– 5.1mm
	Section from pedal neutral position to thread trimming start position is set.	- 6.0		
K010	Pedal max. number of rotation reach stroke	1.0 to 15.0	0.1mm	15.0mm
	Section from pedal neutral position to max. number of rotation reach position is set.			
K011	Pedal neutral position compensation	– 15 to 15	1	- 1
	Compensation value of neutral point of pedal is set.			
K012	Auto-lifter lifting holding time	10 to 600	10sec	60sec
	Waiting time of lifting the presser lifter is set.			
K013	Pedal curve selection function			Straight
	Curve of the number of rotation of the sewing machine in			line
	terms of pedal depressing amount is selected.			
	0 : Straight line 1 : Square			
	2 : Square root			
	Number of rotation Pedal stroke			

No.	Item	Setting range	Edit unit	Initial display
K014	Reverse rotation to lift needle after thread trimming function selection			Ineffective
	Sewing machine is rotated in the reverse direction after thread trimming, and needle bar is lifted near to its upper dead point.			
	: Ineffective			
K015	Reverse stitching at the sewing start A/M changeover function selection			Speed by
	Designation of sewing speed of reverse stitching at the sew- ing start is selected.			operation
	: In accordance with the speed by manual operation of pedal or the like			
	: In accordance with the speed set by U004 Reverse stitching speed			
K016	Stop function immediately after reverse stitching at the			Without
	Function to make the sewing machine stop once when re- verse stitching at the sewing start is completed			function
	: Without function			
K017	Condensation/EBT changeover speed Initial speed at the time of start of EBT (reverse stitching at the sewing end) is set.	0 to 250	10sti/min	170sti/min
K018	Retry function selection Function to make the sewing machine rotate again in the normal direction with max. torque after rotating the machine in the reverse direction once when the sewing machine is locked is selected. Image: Selected in the term of the term of the term of t			Without retry func- tion
K019	Sewing machine start-up curve selection			Normal
	Start-up curve of the sewing machine is selected.			curve
	: Normal curve // : More sharp curve			
K020	Presser position at the time of stop of the sewing ma- chine selection			DOWN
	Position of the presser foot when the sewing machine tem- porarily stopped is selected.			
	: DOWN : UP			
K021	Size class setting Initial value (size country class, gents'/ladies' selection, and basic size) when creating a			Japan Gentlemen No. 6
	Hew pattern is set. → Refer to <u>"15-5 Explanation of the size</u> class", p.133			3%
K022	Initial pitch setting	1.5 to 6.0	0.1mm	2.0mm
	Initial value of pitch when creating a new pat- tern is set.			
K023	Bottom feed amount compensation value setting	-1.0 to 1.0	0.1mm	0mm
	Compensation value of set value and actual			

No.	Item	Setting range	Edit unit	Initial display
K024	Top feed amount compensation value setting	-1.0 to 1.0	0.1mm	0mm
	Compensation value of set value and actual value of top feed amount is set.			
K025	Thread tension curve selection			Standard
	Inclination of thread tension curve is selected.			
	The standard St			
K026	Reverse stitching button display selection			Non-
	Display of reverse stitching button in the sewing screen is selected.			display
	: Non-display			
K027	Dish-rise timing setting	0 to 40	1	18
	Disk-rise timing from the start of thread trim- ming is set.			
K028	Length of remaining thread setting	0 to 40	1	5
	Length of remaining needle thread at the time of thread trimming is set. When the set value is changed, the disk-close timing from the disk-rise			



15-3 Explanation of compensation thread tension

The sewing machine is capable of changing over the setting procedure of compensation tension in the data input screen and the step details setting in the sewing screen by selection of the compensation tension mode.

(1) Explanation of compensation tension manual (numerical value)

Compensation thread tension manual (numerical value) is the way to directly input numerical value when inputting the compensation thread tension value that can be set to each step. Next, the setting procedure is explained.



1) Display the memory switch list screen.

When MODE key **M 1** is pressed, MEMO-

RY SWITCH button 2 is displayed on the

screen. When this button is pressed, the memory switch list screen is displayed.



2) Select Compensation tension mode.

Press UP/DOWN SCROLL buttons





3 to select Compensation thread ten-

sion selection button

tension mode selection screen is displayed.



Make the compensation tension manual (numerical value) effective.

Select EFFECTIVE button 🚳 🖑



4) Determine the compensation tension manual (numerical value)

When ENTER button

6 is pressed, the

compensation tension mode selection screen is closed and selection of the compensation tension mode is completed. And, the screen returns to the memory switch list screen.



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When READY switch M 3 is pressed, data input screen is displayed. Press STEP DETAILS SETTING button 2 to open the step details screen.

5) Select the setting screen of Compensation tension manual (numerical value).

Press Compensation thread tension setting but-



9 in the screen to display compen-

sation thread tension pop-up screen.



6) Set the compensation tension manual (numerical value).

Input the compensation tension value for the step to be selected with numerical value. The inputted numerical value is added to or subtracted from the needle thread tension value in motion as the offset value.

When ENTER button

 ${f 0}$ is pressed, the

compensation thread tension pop-up screen is closed to determine the compensation tension setting value.

And, the screen returns to the step details screen.

(2) Explanation of compensation tension manual (level)

Compensation thread tension manual (level) is the way to perform inputting with the level selection when inputting the compensation thread tension value that can be set to each step. Next, the setting procedure is explained.



1) Display the memory switch list screen.

When MODE key	Μ	0	is pressed, MEM-
ORY SWITCH butte	on 🔤	<u>⊫</u>	2 is displayed on

the screen. When this button is pressed, the memory switch list screen is displayed.

2) Select Compensation tension mode.

Press UP/DOWN SCROLL buttons





3 to select Compensation thread ten-

sion mode selection button 🕸 🖑



Compensation tension mode selection screen is displayed.







3) Make the compensation tension manual (level) effective.

Select EFFECTIVE button 🚳 -



4) Determine the compensation tension manual (level).

When ENTER button

6 is pressed, the

compensation tension mode selection screen is closed and selection of the compensation tension mode is completed. And, the screen returns to the memory switch list screen.

5) Select Compensation tension mode.

Press UP/DOWN SCROLL buttons



to select Compensation tension



tension mode selection screen is displayed.

6) Set the level value of compensation thread tension manual (level).

Press LEVEL 1 button 1 O to input the set
value.
Press LEVEL 2 button 2 10 to input the set
value.
Press LEVEL 3 button 3 to input the set
value.
When the setting is completed, press ENTER
button with to close the compensation ten-

sion mode selection screen. Then the selection of compensation thread tension manual (level) is completed.

And, the screen returns to the memory switch list screen.



When MODE key



 ${f B}$ is pressed, the data

input screen is displayed. Press STEP DETAILS

SETTING button



details screen.

7) Select Compensation tension manual (level) setting screen.

Press Compensation thread tension setting but-

ton in the screen to display the com-

pensation thread tension pop-up screen.

8) Set the compensation tension manual (level). Select the level of compensation thread tension for the step to be selected.

Compensation thread tension value set to the selected level is added to or subtracted from the needle thread tension value as the offset value.

.

When ENTER button

 $\ensuremath{{\rm I}}$ is pressed, the

compensation thread tension pop-up screen is closed and the compensation thread tension set value is determined. And, the screen returns to the step details screen.

(3) Explanation of compensation thread tension automatic

Compensation thread tension automatic is the way to automatically assign the compensation thread tension value based on the shirring amount to which the compensation thread tension value that can be set for each step is set. Next, the setting procedure is explained.





5) Select compensation tension automatic setting.

Press UP/DOWN SCROLL buttons



3 to select Compensation thread ten-

sion automatic button 🚳 🍕 🕖. Compensation

tension mode selection screen is displayed.

- 6) Set the compensation thread tension automatic value.
- Press shirring amount range setting button
 4 5 of LV.1. Enter the upper limit value by pressing numeric keys 0 to 9 9 or
 buttons 1 0 (1 0).
- 2. Then, press compensation thread tension setting
 - button 0 0 of LV.1. Enter the compensa-

tion thread tension value by pressing numeric



Similarly, input the value of LV.2, LV.3, LV.4 and LV.5 with buttons, (1) to (1).

Setting example on the left-hand illustration is :

- In case shirring amount is 4 to 5, compensation thread tension is – 3.
- In case shirring amount is 6 to 10, compensation thread tension is +5.
- In case shirring amount is 11 to 15, compensation thread tension is +11.
- In case shirring amount is 16 to 20, compensation thread tension is +21.
- In case shirring amount is 21 to 35, compensation thread tension is +28.
- * When the setting is completed, press ENTER

button 📜 🚯 to close the compensation ten-

sion automatic setting screen. And, the screen returns to the memory switch list screen.

- * When MODE key **M (b)** is pressed, the data input screen is displayed.
- * In case the compensation thread tension automatic is selected, even when STEP DETAILS

SETTING button \bigcirc is pressed and the

step details screen is opened, the compensation

15-4 Explanation of the shirring smoothing function

The sewing machine is equipped with the smoothing function to control the sudden change of shirring amount at the time of changeover of the step. The value which is set here is reflected to each step of all pattern data.

(1) Explanation of the motion of shirring smoothing function

Motion of shirring smoothing function is explained below.



Example) When all steps are 4

Smoothing function set value (Number of stitches) 2 stitches (Shirring amount) 3

When the shirring amount of step 1 at the start of sewing is changed over to 6, first, the shirring amount is changed over to 3.

Next, after the motion of 2 stitches, the shirring amount is changed over to 6 (3+3).

When step 1 is changed to step 2, the shirring amount becomes 9 (6+3) immediately after the changeover and the shirring amount is changed over to 11 which has been set in step 2 after the motion of 2 stitches. Hereafter, similarly, the shirring amount changes \pm 3 at the time of changeover, further, the shirring amount changes \pm 3 after the motion of 2 stitches, and the function performs the motion until the shirring amount which has been set in the step is reached.

* When the fully-automatic mode is selected, the shirring amount in terms of the position of changeover is symmetrically divided in front and rear since the changeover of step is automatically performed.

(2) Setting of the shirring smoothing function

Setting procedure of the shirring smoothing function is explained.





6) Determine the setting of shirring smoothing function.

When ENTER button

Is pressed, the

shirring smoothing function setting screen is closed and the setting is determined. And, the screen returns to the memory switch list screen.

When MODE key M 9 is pressed, the data

input screen is displayed.

15-5 Explanation of the size class

When the fully-automatic mode is selected, it is possible to perform the setting of country class, basic size, and gents'/ladies' at the time of creating a new pattern, the size display at the time of grading changes according to the country class which has been set here.



The value which is set here is the value which becomes the initial value when creating a pattern. Even when the value here is changed, the contents of the pattern which has been already created do not change. However, only when the size country class is changed, I the display of size changes.

(1) Explanation of the size class

Setting procedure of the size class is explained here.



1) Display the memory switch list screen.

When MODE key **M 1** is held pressed more

than 6 seconds, MEMORY SWITCH button



button is pressed, the memory switch list screen is displayed.



5) Set the basic size.

Press **t** buttons **t** to input the basic size. For the size of country class, refer to the size development.

6) Set the grading ratio (%).

Press **t** buttons **t** to input the grading ratio. The inputted ratio (%) becomes the offset value of the grading for each step when a new pattern is created.

7) Determine the size class setting.

When ENTER button is pressed, the size class setting screen is closed and the setting is determined. And, the screen returns to the memory switch screen.

(2) Size development

Size development for the respective country classes is shown below.

Â							à			
	2									
32	104	34	36	06	03	44	44	34	34	02
34	110	36	38	08	05	46	46	36	36	03
36	116	38	40	10	07	48	48	38	38	04
38	122	40	42	12	09	50	50	40	40	05
40	128	42	44	14	11	52	52	42	42	06
42	134	44	46	16	13	54	54	44	44	07
44	140	46	48	18	15	56	56	46	46	08
46	146	48	50	20	17	58	58	48	48	09
48	152	50	52	22	19	60	60	50	50	10
50	158	52	54	24	21	62	62	52	52	11
52	164	54	56	26	23	64	64	54	54	12
54	170	56	58	28	25	66	66	56	56	13
56	176	58	60	30	27	68	68	58	58	14
58	182	60	62	32	29	70	70	60	60	15
60	188	62	64	34	31	72	72	62	62	16

16. ERROR CODE LIST

Error code	Pictograph	Description of error	How to recover	Place of recovery
E000		Contact of initialization of main shaft EEP-ROM of MAIN p.c.b. When data is not written in EEP-ROM or data is broken, data is	Turn OFF the power.	
		automatically initialized and the initialization is informed.		
E001		Contact of initialization of main EEP-ROM of MAIN p.c.b.	Turn OFF	
		When data is not written in EEP-ROM or data is broken, data is automatically initialized and the initialization is informed.	the power.	
E003		Main shaft motor encoder defectiveness	Turn OFF	
		Angle counter of needle UP detection has exceeded the value equivalent to 1.1 turns.	the power.	
		Angle counter of needle DOWN detection has exceeded the value equivalent to 1.1 turns.		
E004		Main shaft motor needle DOWN detection defectiveness	Turn OFF	
		Angle counter of needle UP detection has not exceeded the value	the power.	
		Angle counter of needle DOWN detection has exceeded the value equivalent to 1.1 turns.		
E005		Main shaft motor needle UP detection defectiveness	Turn OFF	
		Angle counter of needle UP detection has exceeded the value equivalent to 1.1 turns.	the power.	
		Angle counter of needle DOWN detection has exceeded the value equivalent to 1.1 turns.		
E006		Contact of initialization of machine head EEP-ROM of the	Turn OFF	
		When data is not written in EEP-ROM or data is broken, data is automatically initialized and the initialization is informed.	the power.	
E007		Main shaft motor-lock	Turn OFF	
		When large needle resistance sewing product is sewn	the power.	
E011		External media not inserted	Possible	Previous
		External media is not inserted.	to recover by reset.	screen
E012		Read error	Possible	Previous
	4	Data read from external media cannot be performed.	to recover by reset.	screen
E013		Write error	Possible	Previous
		Data write from external media cannot be performed.	to recover by reset.	screen
E014	-	Write protect	Possible	Previous
		External media is in the write prohibition state	to recover by reset.	screen

Error code	Pictograph	Description of error	How to recover	Place of recovery
E015	_	Format error Format cannot be performed.	Possible to recover by reset.	Previous screen
E016		External media capacity over Capacity of external media is short.	Possible to recover by reset.	Previous screen
E022	No.	File No. error Designated file is not in media.	Possible to recover by reset.	Previous screen
E029		Media slot release error Lid of media slot is open.	Possible to recover by reset.	Previous screen
E062	No	Sewing data error When sewing data is broken or revision is old.	Turn OFF the power.	
E302		Confirmation of tilt of machine head When tilt of machine head sensor is OFF.	Turn OFF the power.	
E303		Main shaft semilunar plate sensor error Semilunar plate of sewing machine motor is abnormal.	Turn OFF the power.	
E702		Abnormality of control CPU performed processing other than supposed.	Turn OFF the power.	
E703		Panel is connected to the machine other than supposed. (Machine type error) When machine type code of system is improper in case of initial communication.	Possible to rewrite program after pressing down communi- cation switch.	Communication screen
E704	R – V – L	Nonagreement of system version When version of system software is improper in case of initial communication.	Possible to rewrite program after pressing down communi- cation switch.	Communication screen
E731		Main motor hole sensor defectiveness or position sensor defectiveness When motor hole sensor error signal (UVWE) is de- tected with the motor locked (2 seconds or more have passed at 20 sti/min or less).	Turn OFF the power.	

Error code	Pictograph	Description of error	How to recover	Place of recovery
E733		Reverse rotation of main shaft motor	Turn OFF	
		When motor has continued to rotate 40 times or more in the reverse direction as against the control direction at 500 sti/min or more during motor running (excluding at the time of holding).	the power.	
E801		Phase-lack of power	Turn OFF	
		When 400 ms or more of power phase-lack signal (PHE) is detected after 2 seconds of phase-lack observation invalid time passed from turning ON the power.	the power.	
E802		Power instantaneous cut detection	Turn OFF	
		When power instantaneous cut detection signal (PWF) is detected.	the power.	
E810		Solenoid power short-circuit	Turn OFF	
		When solenoid power short-circuit signal (PWSH) (CPLD inter- nal signal) is detected while power phase-lack signal (PHE) is not detected after 2 seconds of phase-lack observation invalid time passed from turning ON the power.	the power.	
E811		Overvoltage	Turn OFF	
		When power overvoltage signal (OVL) which is output when input power is 280V or more is detected.	the power.	
E813		Low voltage	Turn OFF	
		When low voltage signal (LVL) which is output when input power is 150V or less is detected.	the power.	
E903		Abnormality of stepping motor power	Turn OFF	
		When stepping motor power abnormality signal (LVPMP) which is output when the stepping motor power, 48V, fluctuates -15% or more when turning ON the power is detected.	the power.	
E915		Abnormality of communication between operation	Turn OFF	
	((••))	panel and main CPU When abnormality occurs in data communication.	the power.	
E916		Abnormality of communication between main CPU	Turn OFF	
	((••))	and main shaft CPU When abnormality occurs in data communication.	the power.	
E917		Failure of communication between operation panel	Possible	Previous
	((m))	and personal computer	to recover	screen
	W ² 9	When abnormality occurs in data communication.	by reset.	
E918		Abnormality of heat sink temperature for MAIN p.c.b.	Turn OFF	
	2	When temperature of heat sink for MAIN p.c.b. is 85°C or more.	the power.	
Error code	Pictograph	Description of error	How to recover	Place of recovery
------------	------------	--	------------------------	-------------------
E920		CPLD writing abnormality When 1 bit each is written in the test port and it does not agree with Verfy when turning ON the power.	Turn OFF the power.	
E922		Main shaft motor control impossible When the number of rotation of measuring exceeds 50 ms or more than the upper limit value (3,500 sti/min).	Turn OFF the power.	
E924		Main shaft drive trouble When motor driver error signal (GTRE) is detected while motor overcurrent signal (OCL1) is not detected with the motor locked (2 seconds or more have passed at 20 sti/min or less).	Turn OFF the power.	
E941		CPLD reading abnormality When input signal from CPLD is read twice and they do not agree with each other even when trying 10 ms or more when turning ON the power.	Turn OFF the power.	
E942		Main shaft EEP-ROM trouble When data writing to EEP-ROM cannot be performed.	Turn OFF the power.	
E943		Main EEP-ROM trouble When data writing to EEP-ROM cannot be performed.	Turn OFF the power.	
E946		Head EEP-ROM trouble When data writing to EEP-ROM cannot be performed.	Turn OFF the power.	

17. USING COMMUNICATION FUNCTION

Communication function can download the sewing data created with other sewing machine . In addition, the function can upload the aforementioned data to the media or personal computer. As the means of communication, a media slot and USB are prepared.

17-1 Handling possible data

Data name	Pictograph	Extension	Description of data
Vector format data	№ VDT	VD00 🛆 🛆 🛆 .VDT	File that extension is ".VDT" Read from media. Max. 99 patterns can be used.
Parameter data		DP00 🛆 🛆 🛆 .EPD	File that extension is ".EPD" Read from media. Max. 99 patterns can be used.

 $\Delta \Delta \Delta$: file No.

17-2 Performing communication by using the media

For handling way of the media, read "5-1. PREFACE" p.14.

17-3 Performing communication by using USB



Data can be sent/received to/from a personal computer or the like, by means of a USB cable.



17-4 Take-in of the data



1) Display the communication screen.

When communication switch



seat section is pressed in the data input screen, the communication screen is displayed.

2) Select the kind of data.



municated. The selected button is displayed in reverse video.

3) Determine the kind of data.

When ENTER button (1) is pressed, the kind of data selection screen is closed and the selection of the kind of data has been completed.



4) Select the communication procedure. There are four communication procedures as described below.



Writing data from panel to media



🔳 👐 🗲

Writing data from panel to personal computer (server)

Select the button of communication procedure you desire.

When the vector format data 2 is selected to ed in the kind of data, it cannot be selected to write the data to the media from 2 panel, and to write the data to personal computer (serv-

er) from **I B anel**.

Vector format data is converted to the parameter data at the time of writing the data to the panel.

	(_))			((**))		
9—	00	} ■	• → [
	(–))					
)		×	Ŋ	
		7 8 4 5 1 2	3 9 5 6 2 3 4]]] <u>]</u>		-0
	U	i	(•))	Μ		
	(•]))			((**)		-0
	00	ĵ> ■	• →			
			_ +			
r	U	i	((_))	Μ		
	<u>M669</u>					
		Data is be	eing read.			— A
	C	i	((_))	Μ		

5) Select the data No.

When (9) is pressed, the writing file selec-

tion screen is displayed.

Input the file No. of the data you desire to write. For the file No., input the numerals of the part Δ $\Delta \Delta$ of VD00 $\Delta \Delta \Delta$.VDT of the file name. Designation of the pattern No. of writing destination can be performed in the same way. When the writing destination is the panel, pattern Nos. which have not been registered are displayed.

6) Determine the data No.

When ENTER button 📜 🛈 is pressed, the

data No. selection screen is closed and the selection of the data No. has been completed.

7) Start communication.

When communication button ((...)



pressed, the data communication starts. The communication screen \bf{A} is displayed during communication and the screen returns to the communication screen after the end of communication.

Do not open the cover during reading the data.
 Data may not be read in.

18. INFORMATION FUNCTION

There are three functions below in the information function.

- Oil replacement (grease-up) time, needle replacement time, cleaning time, etc. can be specified and the warning notice can be performed after the lapse of the specified time.
 Refer to <u>"18-1 Observing the maintenance and inspection information" p.144</u> and <u>"18-2 Inputting the maintenance and inspection time" p.146</u>.
- Speed can be checked at a glance and the target achieving consciousness as a line or group is increased as well by the function to display the target output and the actual output.
 Refer to <u>"18-4 Observing the production control information" p.148</u> and <u>"18-5 Performing setting of the production control information" p.150</u>.
- Information on machine working ratio, pitch time, machine time and machine speed can be displayed from the working state of the sewing machine.
 Refer to <u>"18-6 Observing the working measurement information" p.153</u>.

18-1 Observing the maintenance and inspection information



1) Display the information screen.

When information key

of the switch

seat section is pressed in the data input screen, the information screen is displayed.

2) Display the maintenance and inspection information screen.

Press maintenance and inspection information-

screen display button 🌠 2 in the information

screen.





Information on the following three items is displayed in the maintenance and inspection information screen.

- Needle replacement : (1,000 stitches)
- Cleaning time (hour) :





• Oil replacement time (hour) : (Grease-up time)



6 is

The interval to inform of the inspection for each item in button (3) is displayed at (4), and remaining time up to the replacement is displayed at (5). In addition, remaining time up to the replacement can be cleared.

3) Perform clearing remaining time up to the replacement.

When button ③ of the item you desire to clear is pressed, the time of replacement clear screen

is displayed. When CLEAR button

pressed, the remaining time up to the replacement is cleared.





18-2 Inputting the inspection time





4) Display the threading diagram.

When threading button displayed in the maintenance and inspection screen is pressed, the needle thread threading diagram is displayed. Observe it when performing threading.

1) Display the information screen (maintenance personnel level).

When information key

of the switch

seat section is pressed in the data input screen for approximately three seconds, information screen (maintenance level) is displayed.In case of the maintenance personnel level, the pictograph located on the upper left side changes from blue to orange, and five buttons are displayed.

2) Display the maintenance and inspection information screen.

Press maintenance and inspection information

screen display button 🧏

in the informa-

tion screen.

 For the two buttons displayed in the bottom stage at the time of the maintenance personnel level, refer to <u>"24 COMMUNICATION</u> <u>SCREEN OF MAINTENANCE PERSONNEL</u> <u>LEVEL" p.171</u>.





The same information as that in the normal maintenance and inspection information screen is displayed in the maintenance and inspection information screen.

When button ③ of the item you desire to change the inspection time is pressed, the inspection time input screen is displayed.

3) Input the inspection time.

Input the inspection time.

When the inspection time is set to "0", the warning function stops.

When clear button C (4) is pressed, the val-

ue returns to the initial value.

The initial values of the inspection time of respective items are as follows.

• Needle replacement : 0 (1,000 stitches)

Cleaning time

- : 0 (hour)
- Oil replacement time : 1,028 (hour)
- (Grease-up time) * Grease-up time is the time that 30 days/month, 5 days/week and 8 hours/day are converted to 6 months.

The calculating method is $\left(\frac{30 \text{ days} \times 6 \text{ months}}{7 \text{ days}}\right)$

When ENTER **G** button is pressed, the inputted value is determined.

18-3 Releasing procedure of the warning



When the designated inspection time is reached, the warning screen is displayed.

In case of clearing the inspection time, press CLEAR

button C 2. The inspection time is cleared and

the pop-up is closed. In case of not clearing the

inspection time, press CANCEL button 🔀 🕕 and

close the pop-up. Every time one sewing is completed, the warning screen is displayed until the inspection time is cleared.

Warning Nos. of the respective items are as follows.

- Needle replacement : A201
- Cleaning time : A202
- Oil replacement time : A203
 (Grease-up time)

18-4 Observing the production control information

It is possible to designate the start, display the number of pieces of production from the start to the existing time, display the number of pieces of production target, etc. in the production control screen. There are two kinds of display ways for the production control screen.

(1) When displaying from the information screen





1) Display the information screen.

When information key 📋 🕕 of the switch

seat section is pressed in the data input screen, the information screen is displayed.

2) Display the production control screen.

Press production control screen display button

1 2 in the information screen. The produc-

tion control screen is displayed.

Information on the following 5 items is displayed in the production control screen.

- Existing target value Number of pieces of the target of products at the present time is automatically displayed.
- ② : Factual results value Number of pieces of the sewn products is automatically displayed.
- ③ : Final target value

Number of pieces of the final target of products is displayed. Input the number of pieces referring to <u>"18-5 Performing setting of the production</u> control information" p.150.

④: Pitch time

Time (second) required for one process is displayed. Input the time (unit : second) referring to <u>"18-5 Performing setting of the production</u> <u>control information" p.150</u>.

(5) : Number of times of thread trimming Number of times of thread trimming per process is displayed. Input the number of times referring to <u>"18-5 Performing setting of the production</u> <u>control information" p.150</u>.

(2) When displaying from the sewing screen





1) Display the sewing screen.

When READY key () 1 of the switch seat

section is pressed in the data input screen, the sewing screen is displayed.

2) Display the production control screen.

When information key **1 2** of the switch seat section is pressed in the sewing screen, the production control screen is displayed.



The contents of display and the functions are common to <u>"18-4 (1) When displaying from the infor-</u> mation screen" p.148.

18-5 Performing setting of the production control information







 Display the production control screen.
 Display the production control screen referring to <u>"18-4 Observing the production control infor-mation" p.148</u>.

2) Input the final target value.

First, input the number of pieces of the target of production in the process to which sewing is performed from now on. When final target value

button 3 is pressed, the final target value

input screen is displayed.

Input the value you desire with ten keys or UP/ DOWN buttons.

After the input, press ENTER button

6.

3) Input the pitch time.

Next, input the pitch time required for one

process. When PITCH button



6.

aforementioned item 1) is pressed, the pitch time input screen is displayed.

Input the value you desire with ten keys or UP/ DOWN buttons.

After the input, press ENTER button







4) Input the number of times of thread trimming.

Next, input the number of times of thread trimming per process.

When number of times of thread trimming button

Sin the previous page is pressed, the

number of times of thread trimming input screen is displayed.

Input the value you desire with ten keys or UP/ DOWN buttons.

After the input, press ENTER button [] 6.

- * When the input value is "0", count of the number of times of thread trimming is not performed. Use this function by connecting the external switch.
- 5) Start the count of number of pieces of production.

When START button 🚺 💿 is pressed, the count of number of pieces of production is started.

6) Stop the count.

Display the production control screen referring to "18-4 Observing the production control information" p.148.

When the count is being performed, STOP

switch 😡 🛽 is displayed. When STOP button



After the stop, START button 🚺 🕢 is displayed at the position of STOP button. When continuing the count, press START button again. The counted value is not cleared until CLEAR

button C O is pressed.



7) Clear the counted value.

When clearing the counted value, set the count

to the stop state and press CLEAR button

9.

The value to be cleared is the present target value **①** and actual results value **①** only.

(Note)

CLEAR button is displayed only in case of stop state.

When CLEAR button is pressed, the clear confirmation screen is displayed.



When CLEAR button **C (b** is pressed in the clear confirmation screen. the counted value is cleared.

18-6 Observing the working measurement information





1) Display the information screen.

When information key

i O of the switch

seat section is pressed in the data input screen, the information screen is displayed.

Display the working measurement screen.
 Press working measurement screen display but-

ton (2) in the information screen. The

working measurement screen is displayed.



Information on the following 5 items are displayed in the working measurement screen.

- (1): The information is automatically displayed from the time of start of measuring the working ratio.
- ②: The information is automatically displayed from the time of start of measuring the machine speed.
- (3): The information is automatically displayed from the time of start of measuring the pitch time.
- ④: The information is automatically displayed from the time of start of measuring the machine time.
- (5) : Number of times of thread trimming is Input the number of times referring to item 3) on the next page.







3) Input the number of times of thread trimming.

Next, input the number of times of thread trimming per process. When number of times of

thread trimming button 5 in the previous

page is pressed, the number of times of thread trimming input screen is displayed.

Input the value you desire with ten keys or UP/ DOWN buttons.

After the input, press ENTER button



When the input value is 0, count of the number of times of thread trimming is not performed. Use this function by connecting the external switch.

4) Start the measurement.

When START button 🚺 4 is pressed, measurement of each data is started.

5) Stop the count.

Display the working measurement screen referring to 1) and 2) of <u>"18-6 Observing the working measurement information" p.153</u>. STOP switch

 STOP switch
 Image: Comparison of the stop o

again. The measured value is not cleared until CLEAR button **C 6** is pressed.



6) Clear the counted value.

When clearing the counted value, set the count

C

to the stop state and press CLEAR button

6.

(Note)

CLEAR button is displayed in case of the stop state only.

When CLEAR button C 6 is pressed, the

clear confirmation screen is displayed.



When CLEAR button **C (**) is pressed in the clear confirmation screen, the counted value is cleared.

19. PERFORMING FORMATTING OF THE MEDIA

To re-format a medium, the IP-420 has to be used. The IP-420 is not able to read any medium which is formatted on a personal computer.



 When two or more media are connected to the sewing machine, the medium to be formatted is determined by the predetermined priority order.

 High
 ←
 Low

 Caution
 CF(TM) slot
 USB device 1 ← USB device 2 ←

 When a CompactFlash (TM) is inserted in the CF(TM) slot, the CompactFlash (TM) will be formatted according to the priority order as shown above.

 Refer to the USB specifications for the priority order of access.

20. TRIAL SEWING FUNCTION

Data created with PM-1 (sewing data creation and edit software) can be sewn on trial by on-line connection of the personal computer with the sewing machine.



Connect the personal computer with IP-420 and transmit data to the sewing machine after creation of data with PM-1. When IP-420 becomes the data input screen, automatically the trial sewing screen is displayed. For the operating procedure of PM-1, see HELP of PM-1 or the like.

20-1 Performing trial sewing



1) Receive the trial sewing data from PM-1. When the trial sewing data (vector format data) is transmitted from PM-1, the screen on the left side is displayed, and the transmitted data is displayed in the center of the screen.

The display corresponds with the length between steps set with PM-1.

2) Edit the vector parameter.

Vector format data transmitted from PM-1 is converted to the parameter that can be set with the sewing machine. Thereby, it is possible to perform the same edit as the normal pattern.

- When STEP DETAILS button () is pressed, the step details setting screen is displayed.
- When SEWING DATA DISPLAY button is pressed, the sewing data setting screen is displayed.



3) Perform trial sewing.

When READY switch () 3 is pressed, the

trial sewing screen is displayed. Trial sewing can be performed in this state.

4) Register the data to the pattern.

When the data which has been sewn on trial is registered to the panel, press REGISTER button

displayed in the trial sewing screen, and the register screen is displayed. Enter the pattern No. you want to register by pressing numeric keys
to
to
fo

5) Determine the register of the data.

When ENTER button [] ③ is pressed, the register screen is closed and the register has been completed.

6) Display the data input screen.

After completion of the register, automatically the data input screen **A** is displayed.

21. PERFORMING KEY LOCK



1) Display the key lock screen.

Press M	key for three seconds, and the
---------	--------------------------------

KEY LOCK button 2 is displayed on the

screen. When this button is pressed down, the key lock screen is displayed.

The existing setting state is displayed on the KEY LOCK button.





2) Select and determine the key lock state.

Select the key lock state button 1

```
key lock setting screen, and press [] 4.
```

3 in the

Then the key lock setting screen is closed and the key lock state is set.



3) Close the mode screen and display the data input screen.

When the mode screen is closed and the data

input screen is displayed, pictograph



showing the key lock state is displayed on the right-hand side of the pattern No. display.

Besides, only the buttons which are possible to be used even in the key lock state are displayed.

- 6 TC C oodØ 6 A oĮ P 10 Α 1 0 $\underline{}$ \sim 2 3 4 5 🕨 **∢**−1 0 1 Μ
- * State that key lock 2 is set A

22. DISPLAYING VERSION INFORMATION







1) Display the version information screen.

Press M 1 key for three seconds, and the

VERSION INFORMATION button

🔤 🛛 is

displayed on the screen. When this button is pressed down, the version information screen is displayed.

The version information on the sewing machine you use is displayed on the version information scren, and it is possible to check it.

- $(\ensuremath{\underline{1}})$: Version information on panel program
- (2): Version information on main program
- ③: Version information on servo program

When CANCEL button

3 is pressed, the

version information screen is closed and the mode screen is displayed.

2) Display the detail display screen.

When you press detail display screen button

(4), and the panel-program detail screen

appears on the display.

- (4): Module name
- (5): RVL
- 6: Checksum

When you press cancel button X (5, the de-

tail display screen is closed to show the version information screen.

When you press mode key



tail display screen is closed to show data entry screen which is being selected.

23. USING CHECK PROGRAM

23-1 Displaying the check program screen



Press M • key for three seconds, and CHECK

PROGRAM button 🛃 2 is displayed on the

screen. When this button is pressed down, the check program screen is displayed.



There are 5 items below in the check program.

D01 Auxiliary pedal setting Refer to <u>"23-2 Performing the auxiliary pedal set-</u> ting" p.163.

1002 Checking of A/D value of auxiliary pedal Refer to <u>"23-3" Performing checking of A/D value</u> of auxiliary pedal" p.164.

1003 LCD check

Refer to **<u>"23-4 Performing LCD check" p.164</u>**.

1004 Touch panel compensation Refer to <u>"23-5 Performing touch panel compen-</u> sation" p.165.

1005 Input signal check Refer to <u>"23-6 Performing the input signal" p.167</u>.

D06 Output signal check Refer to <u>"23-7 Performing the output signal"</u> p.169.

23-2 Performing the auxiliary pedal setting





1) Display the auxiliary pedal setting screen.

When AUXILIARY PEDAL SETTING but-

ton vin the check program screen is

pressed, the auxiliary pedal setting screen is displayed.

- 2) Perform the auxiliary pedal setting.
- Auxiliary pedal release position setting : Release the auxiliary pedal and press AUXIL-IARY PEDAL RELEASE POSITION SETTING
 - button 2 When the display is determined,



Auxiliary pedal front-part depressing position setting :

Depress the front-part of auxiliary pedal and press AUXILIARY PEDAL FRONT-PART DE-

PRESSING POSITION SETTING button

- When the display is determined, press
- 6 to determine the data.
- Auxiliary pedal back-part depressing position setting :

Depress the back-part of auxiliary pedal and press AUXILIARY PEDAL BACK-PART DE-

5 to complete the setting. The screen

PRESSING POSITION SETTING button

- 4. When the display is determined, press
- 6 to determine the data.
- When all settings are completed, press CANCEL button returns to the check program screen.
- * Error occurs when CANCEL button is pressed unless the difference of each setting item is 5 or more,

23-3 Performing checking of A/D value of auxiliary pedal





23-4 Performing LCD check



1) Display the check screen of A/D value of auxiliary pedal.

When CHECK button

of A/D value of

auxiliary pedal of the check program screen is pressed, the A/D value of auxiliary pedal check screen is displayed.

2) Perform checking of A/D value of auxiliary pedal.

When the auxiliary pedal is depressed, A/D value corresponding to the depressing amount is displayed.

After checking, press CANCEL button



The screen returns to the check program screen.

1) Display the LCD check screen.

When LCD CHECK button

On the

check program screen is pressed, the LCD check screen is displayed.



2) Check whether any dot of LCD is omitted.

The screen of LCD check screen is displayed by one color only. Check in this state whether any dot is omitted or not.

After checking, press CANCEL button



The LCD check screen is closed and the check program screen is displayed.

23-5 Performing touch panel compensation



1) Display the touch panel compensation screen.

When TOUCH PANEL COMPENSATION but-

ton **I** on the check program screen is

pressed, the touch panel compensation screen is displayed.



2) Press the lower left position.

Press red circle • ③ located at the lower left position on the screen.

When finishing the compensation, press CAN-









3) Press the lower right position.

Press red circle • • • located at the lower right position on the screen.

When finishing the compensation, press CAN-



4) Press the upper left position.

Press red circle • • • located at the upper left position on the screen.

When finishing the compensation, press CAN-



5) Press the upper right position.

Press red circle • 6 located at the upper right position on the screen.

When finishing the compensation, press CAN-





6) Store the data.

When 4 points have been pressed, the screen showing power-OFF prohibition is displayed since the compensation data are to be stored.

Do not turn OFF the power while this screen is being displayed.

When the power is turned OFF, the compensated data are not stored.

When storing is finished, the check program screen is automatically displayed.

23-6 Performing the input signal check



- 1) Display the input signal check screen.
 - When INPUT SIGNAL CHECK button

of the check program screen is pressed, the input signal check screen is displayed.



2) Perform the input signal check.

Input state of the input signal can be checked in the input signal check screen.

Input state is displayed as **2** with every input signal.

Display of ON/OFF state is shown as below :



6 kinds of the input signals are displayed as below.

No.	Pictograph	Description of sensor
01 ♥		Step changeover switch
02 🖉	(b)>ri	Shirring release switch
03		Needle UP position detection
04	222 0 222	Needle DOWN position detection
05	\bigcirc	Head tilt sensor
06		Semilunar plate detection

23-7 Performing the output signal check



1) Display the output signal check screen.

When OUTPUT SIGNAL CHECK button



• of the check program screen is pressed, the output signal check screen is displayed.



2) Perform the output signal check. Output state of the various output signals can be

checked in the output signal check screen. Output state is displayed as ② with every output signal.

Display of ON/OFF state is shown as below.



Press UP/DOWN buttons		•	🕄 to
check the output signal you de	sire to	chec	k.

9 kinds of the output signals are displayed as below.

No.	Pictograph	Description of sensor
5₹		Shirring release LED
02 🖉	À	Buzzer
03		Top feed stepping motor
04		Bottom feed stepping motor
05		Auxiliary feed stepping motor
06 💐		Stepping motor current
07	O	Stepping motor OFF
88		Presser lifter solenoid
09 💐	≫	Thread trimmer solenoid

24. COMMUNICATION SCREEN OF MAINTENANCE PERSONNEL LEVEL

For the communication screen, the level which is normally used and the one which is used by the maintenance personnel are different in the kinds of data to be handled.

24-1 Data which are possible to be handled

In case of the maintenance personnel level, it is possible to use 5 different kinds of data in addition to the normal two kinds. The respective data formats are as below.

Data name	Pictograph	Extension	Description of data
Adjustment data	í?"	Model name+00 <u>∧</u> ∧ ∧.msw Example) DP00001.msw	Data of memory switches 1 and 2
All sewing machine data		Model name+00 <u>∧</u> ∧ ∧.msp Example) DP00001.msp	All data which are held by sewing machine
Panel program data		BP+RVL(6 digits).hed BP+RVL(6 digits).p(2 digits) BM+RVL(6 digits).i(2 digits)	Program data and display data of panel
Main program data		MA+RVL(6 digits).prg	Program data of main
Servo program data		MT+RVL(6 digits).prg	Program data of servo

 $\Delta \Delta \Delta$: File No.

24-2 Displaying maintenance personnel level



1) Display the communication screen of the maintenance personnel level.

When key () is pressed as long as three seconds, the image located at the upper left position is changed to orange color () 2 and the communication screen of the maintenance

personnel level is displayed. For the operating procedure, refer to <u>"17-4 Take-</u>

in of the data" p.141.



* When the adjustment data or the all sewing machine data is selected, the display becomes as shown on the right-hand side and it is not necessary to specify No. on the panel side.

25. INFORMATION SCREEN OF THE MAINTENANCE PERSONNEL LEVEL

25-1 Display of error record





1) Display the information screen of the maintenance personnel level.

When INFORMATION key



seat section is pressed for approximately three seconds in the data input screen, the information screen of the maintenance personnel level is displayed. In case of the maintenance personnel level, the pictograph located at the upper left position changes from blue color to orange color, and 5 buttons are displayed.

2) Display the error record screen.

Press ERROR RECORD SCREEN DISPLAY

button

2 in the information screen. The

error record screen is displayed.



Error record of the sewing machine you use is displayed in the error record screen, and you can check the error.

- 3 : Order that error has occurred.
- 4 : Error code
- Cumulative current-carrying time (hour) at the time of occurrence of error

When CANCEL button



record screen is closed and the information screen is displayed.



3) Display the details of error.

When you desire to know the details of error,

press ERROR button 20 E916 1 428 6 you

desire to know. The error detail screen is displayed.

Pictograph (3) corresponding to the error code is displayed in the error detail screen.

Refer to "16. ERROR CODE LIST" p.136.

25-2 Display of the cumulative working information



1) Display the information screen of the maintenance personnel level.

When INFORMATION key



seat section is pressed for approximately three seconds in the data input screen, the information screen of the maintenance personnel level is displayed. In case of the maintenance personnel level, the pictograph located at the upper left position changes from blue color to orange color, and 5 buttons are displayed.

2) Display the cumulative working information screen.

Press CUMULATIVE WORKING INFORMATION

SCREEN DISPLAY button (of the infor-

mation screen. The cumulative working information screen is displayed.

Information on the following 4 items are displayed in the cumulative working information screen.

- S: Cumulative working time (hour) of the sewing machine is displayed.
- Number of cumulative times of thread trimming is displayed.
- Cumulative current-carrying time (hour) of the sewing machine is displayed.
- 6 : Number of cumulative stitches is displayed.(Unit : X1,000 stitches)

When CANCEL button

is pressed, the

cumulative working information screen is closed and the information screen is displayed.
26. MAINTENANCE

26-1 Replacing procedure of feed belt



WARNING : Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

- Caution : The standard of the time of replacement is one year although it depends on the frequency of use. Replace the belt with a new one when it is observed that feed force is excessively deteriorated or the like.
- Caution : Perform periodical cleaning approximately once a week since dust is collected inside the top feed cover and the belt rolls the dust resulting in feed trouble or short life of the belt.

(1) Replacing the top feed belt



- 1) Remove ten cover setscrews 1) and remove cover R (2) and cover F (3).
- 2) Loosen intermediate presser foot screw (1) and remove intermediate presser foot (1).
- Loosen walking foot setscrew ④ and remove walking foot ⑤ and auxiliary walking foot ⑥.
- 4) Remove main feed belt and auxiliary feed belt(a), and replace them with new ones.
- 5) Put walking foot rod (9) between (5) and (6), and fix with screw (4).
- 6) After adjusting the belt tension, attach cover R2) and cover F 3).
- Belt tension adjusting procedure
- (1) Main feed belt :

Move tension adjustment plate L (2) to the left or right to adjust the belt.

• The tension is increased in the right-hand direction (direction A) and decreased in the left direction.

(2) Auxiliary feed belt :

Move tension adjustment plate S (B) to the left or right to adjust the belt.

• When it is opened on both sides (direction B), the tension is increased, and when it is closed, the tension is decreased.

- (3) Adjusting the belt tension value :
 - 1) Main feed belt :

The belt has to be bent by 3 mm when it is pressed with a load of 1.3N (130gf).

2) Auxiliary feed belt :

The belt has to be bent by 3 mm when it is pressed with a load of 0.4N (40gf).



Feed pitch error will be caused unless the tension is proper.







(2) Replacing the bottom feed belt

- Turn presser lever (5), raise walking foot (6), and remove throat plate auxiliary plate (1), hook cover asm. (2), frame cover (3) and bottom feed cover (4).
- Loosen setscrews (3) in the bottom feed tension plate.
- 3) Replace bottom feed belt 🕐 with a new one.
- Adjusting procedure of the belt tension
 Adjust bottom feed tension plate

 to the left or right to adjust the tension.

(Tension is increased in direction **A**.) Belt tension value :

The belt has to be bent by 3 mm when it is pressed with a load of 1.5N (150gf).



Feed pith error will be caused unless the tension is proper.

 After adjustment of the tension, attach throat plate auxiliary plate 1 and the various covers.

(3) Replacing the bottom feed roller

- Turn presser lever (5), raise feed foot (6), and remove throat plate auxiliary plate (1), hook cover asm. (2), frame cover (3) and bottom feed cover (4).
- Loosen inner hook presser setscrews ① and remove inner hook presser ②.
- Remove bottom feed roller
 and replace it with a new one. Slightly apply the exclusive grease supplied as accessories (Part No. : 40006323) inside the roller.
- 4) Make sure of the bottom feed belt tension.
- 5) After adjusting the tension, attach throat plate auxiliary plate **1** and various covers.

26-2 Changing the amount of alternate vertical movement of walking foot and presser foot



WARNING :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

(1) State of walking foot and presser foot at the time of delivery

Cam rod position	Top feed arm lowest position	
Amount of alternate vertical movement of walking foot	0.2 to 0.3 mm	
Clearance at lower dead point of walking foot	0.1mm	
Amount of alternate vertical movement of presser foot	Approximately 2.7 mm	
Clearance at lower dead point of presser foot	0.1mm	

(2) Relation between amount of alternate vertical movement and max. sewing speed

	1	2	3	4
Amount of vortical movement of walking fact (mm)	Less than 0.3	Up to	Up to	Up to
		1.5	2.5	3.5
Amount of vertical movement of presser foot (mm)	2.7	1.5	2.5	3.5
Max. sewing speed (sti/min)	3500	2600	2000	1600



When changing the amount of alternate vertical movement, change max. sewing speed.

When it is not changed, components breakage or damage occurs and the life of the machine is excessively shortened.

WARNING : Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

(1) When making equal the amount of alternate vertical movement of walking foot and presser foot (When making the amount equal to 1.5 mm)







- 1) Bring the needle bar to its lower dead point.
- Turn presser lever①, raise walking foot ②, and insert "thickness gauge" of 1.6 to 1.7 mm or the like between the top feed belt and the bottom feed belt.



In case of 1.5 mm, thickness of 1.6 to 1.7 mm is settled since the compressed amount of belt slightly varies due to the presser pressure.

- 3) Remove stopper plug 3.
- 4) Insert a hexagonal wrench key from hole A, and loosen top feed arm clamp screw (4).
- 5) Tighten clamp screw ④ after checking that presser foot ⑤ has come down.
- (Caution
- Remove the thrust of top feed arm (i) and drive shaft arm (i).
 Set the tightening torque to 5.8N⋅m (60Kgf ⋅ cm).
- 6) Turn presser lever **①** and remove the thickness gauge which has been inserted in step 2).



(2) When making 2.5 mm the amount of alternate vertical movement

(When the amount is already made equal to 1.5 mm, perform from item 1) below. When the amount is not made equal to 1.5 mm, perform first "(1) When making equal the amount of alternate vertical movement" of the aforementioned item.

- 1) Turn top feed arm cover (8).
- 2) Loosen stopper screw (9) and remove the stopper.
- 3) Loosen top feed hinge screw \mathbf{O} .
- 4) Turn cam rod **①**, adjust the position to the engraved marker line on top feed arm **②**, and tighten hinge screw **①**.

When turning the cam rod and bringing the top feed arm to its top end, the amount of alternate vertical movement becomes 3.5 mm.

26-3 Adjusting the height of the walking foot and the presser foot



WARNING :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

(1) Adjusting the height of walking foot



- 1) Bring the needle bar to its upper dead point.
- Remove stopper plug 1.
- 3) Insert a hexagonal wrench key into the hole from which the stopper plug has been removed, and loosen walking foot bar bracket clamp screw 2.
- 4) Move walking foot (3) up or down in the range of 0.1 to 1.0 mm and tighten screw 2.

1. Clearance between top and bot-) tom feed belts (dimension A) is 0.1 | to 1.0 mm. If the clearance is more than the specified dimension, components come in contact with each other.

2. When tightening screw 2, be careful of the parallel of walking foot 6 and presser foot 4. Bend of material or feed trouble will be caused.



(2) Adjusting the height of presser foot

- 1) Bring the needle bar to its lower dead point.
- 2) Remove face plate **5**.
- Loosen presser foot bar bracket clamp screw 6.
- 4) Move upward presser foot (4) in the range of 0.1 to 0.5 mm and tighten screw (6).



- 1. Clearance between the bottom surface of presser foot and the needle hole guide has been factory-adjusted to 0.1 mm at the time of delivery.
- When the clearance becomes larger than the specified value, feed force is deteriorated. So, be careful.

26-4 Adjusting the needle and the hook



WARNING : Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.









(1) Adjusting the height of needle bar

- Remove throat plate auxiliary plate 1 and hook cover asm. 2.
- 2) Remove hook base 3.
- Bring needle bar to its lower dead point, and loosen needle bar bracket clamp screw 5.
- Adjust needle bar engraved marker line A to bottom end (i) of needle bar lower bushing, and tighten clamp screw (i).

(2) Adjusting the hook

- Loosen three setscrews in the hook, turn the handwheel, and adjust needle bar engraved marker line B to bottom end G of needle bar bushing.
- Adjust blade point f of hook to the center of needle so that the clearance between the blade point and the needle is 0.04 to 0.1mm (standard). Then tighten the setscrews in the hook.
- 3) Put bottom feed belt (9) to hook base (3), and assemble it to the hook shaft base. At this time, adjust the clearance between the bottom surface of the feed foot (bottom surface of top feed belt) and the top surface of the bottom feed belt to 0.1 mm at the upper dead point of the needle bar.
 - 1. When the clearance is excessively smaller than the specified value, the blade point of hook is damaged, and the clearance is excessively larger, stitch skipping will be caused.
 - 2. Fit counter knife guard **(1)** located inside the hook base to the inside of counter knife **(1)** since lift trouble will be caused.
 - RP hook (dry hook) rolls thread waste or cloth dust, and there is a possibility of breakdown or sewing trouble. Periodically perform cleaning of the hook.



26-5 Adjusting the thread trimmer



WARNING :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

(1) Adjusting the thread trimmer cam timing





- 1) Turn the handwheel to the position where the thread take-up lever comes a little before its upper dead point.
- 2) Turn ON the thread trimmer solenoid and slide the roller to the thread trimmer cam to engage them with each other referring to <u>"23-7 Performing the output signal check" p.169</u>, and slide the roller to the thread trimmer cam to engage with each other.
- 3) In the state as it is, turn the handwheel in the normal operating direction and in the reverse direction. Then turn the handwheel until the handwheel stops.



- When the aforementioned normal timing is improper, adjust it with the procedure below.
- Remove the bottom cover and loosen thread trimmer cam setscrews **()**.
- Adjust engraved marker dot (colorless ①) on the handwheel to engraved marker dot ② on the pulley cover.
- 3) Pressing drive block (3) to the right-hand, engage cam (4) with roller (5).
- Turn cam ④ only in the reverse direction of the rotating direction of the hook driving shaft without turning hook driving shaft ⑤.
- 5) Press cam 4 to roller 5 at the position where cam 4 does not turn and tighten cam setscrews 7.

(2) Adjusting the initial position of the moving knife

The initial position of the moving knife is the position where engraved marker dot **①** on the hook shaft base aligns with V groove **②** on the moving knife base.

I

At this time, end () of the cam roller is higher by 1.7 mm than hook driving shaft center ().



1) Adjusting the engraved marker dot

Loosen knife drive arm clamp screw (4), turn knife drive arm (5) so that engraved marker dot (1) aligns with V groove (2), and tighten the clamp screw.

When V groove ② in terms of engraved) marker dot ① slips in the right-hand | direction, the blade section of moving | knife does not completely pass the | blade section of counter knife. As a | result, handling failure or thread trimming failure will be caused.



- Adjusting the position of the cam roller
 Loosen stopper lock nut (3), turn the stopper, and
 tighten cam roller (6) at the position of 11.8 mm.
 (Refer to the illustration on the left side.)
 - When the position of cam roller (is excessively higher as against hook driving shaft (i), the moving knife rocking stroke is decreased and thread trimming failure will be caused.
 On the contrary, the position is ex-
 - 2. On the contrary, the position is excessively lower, the rocking stroke is increased and the length of remaining needle thread is shortened or the blade point is damaged.

(3) Adjusting the initial position of the thread trimmer solenoid

Adjust the initial position so that the clearance between slide arm **①** and drive shaft arm **②** is 0.1 to 0.5 mm when the thread trimmer solenoid performs suction.





- Remove the bottom cover, press drive block 3 by finger in the direction of arrow mark A. At this time, loosen setscrews 4 and adjust so that the clearance is 0.1 to 0.5 mm.
- 2) Take the finger off, and check that there is a clearance between cam roller (5) and edge (6) of the thread trimmer cam.
- Secure an approximate clearance of 0.5 mm between slide arm ● and E ring ●.



(4) Adjusting the position of the moving knife and the counter knife

Install moving knife **1** by making it come in contact with the moving knife base. Install counter knife **4** together with knife pressure adjustment plate **5**.





- Loosen counter knife setscrew 3, adjust so that moving knife eyeend blade section 1 and counter knife blade section 4 come in contact with each other in parallel, slightly press knife pressure adjustment plate 5 in the direction A, and tighten with the setscrew.
- When they are not in parallel, remaining of thread end will be caused.
 When the knife pressure is low, thread trimming failure will be caused. When it is excessively high, it is related to the damage of the blade point of counter knife.

26-6 Greasing parts



WARNING :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

Periodically perform grease-up every 6 months as a standard .

For the grease, use the exclusive grease (Part No. : 40006323) supplied as accessories.

In addition, for the places to be greased, refer to the Engineer's Manual for DP-2100.

27. OTHERS

27-1 Troubles in sewing and the corrective measures

Troubles	Causes	Corrective measures
1. Thread breakage	 Thread path, needle point, hook blade point or bobbin case resting on the throat plate has sharp edges or burrs. 	 Remove the sharp edges or burrs on the blade point of hook using a fine emery paper. Buff up the bobbin case resting groove on the throat plate.
	 Needle thread tension is too high or too low. 	 Adjust the needle thread tension.
	③ Needle comes in contact with the blade point of hook.	 Refer to "Adjusting the needle and the hook".
	(4) Thread take-up spring works excessively or the stroke of the spring is too small.	 Decrease the tension of the thread take-up spring and increase the stroke of the spring.
	(5) Timing between the needle and the hook is excessively advanced.	 Refer to "Adjusting the needle and the hook".
	6 Bobbin idling amount is too large.	 Increase the spring pressure.
2. Stitch skipping	① The clearance provide between the needle and the blade point of hook is too large.	 Refer to "Adjusting the needle and the hook".
	 Timing between the needle and the hook is excessively advanced or retarded. 	 Refer to "Adjusting the needle and the hook".
	③ Pressure of the presser foot is too low.	 Tighten the presser spring regulator.
	④ Height of the walking foot or presser foot is too high.	 Refer to "Adjusting the height of the walking foot and the presser foot".
3. Loose stitches	① Bobbin thread is not put in the fork end of the thread tension spring of the bobbin case.	 Thread the bobbin case properly.
	⑦ Thread path has been poorly finished.	 Grind the thread path using a fine emery paper. Buff up the thread path.
	3 Bobbin fails to move smoothly.	 Replace the bobbin.
	④ Bobbin thread tension is too low.	 Adjust the bobbin thread tension.
	(5) Bobbin has been improperly wound.	 Refer to "Winding a bobbin".
4. Thread slips off the needle eyelet simultaneously with	① Returning force of the thread take-up spring is too strong.	 Refer to "Threading the machine head".
thread trimming.	⑦ Thread tension given by the thread tension controller No. 1 is too high.	 Refer to "Threading the machine head".
	③ Position of the counter knife is improper.	 Refer to "Adjusting the thread trimmer".
 Needle thread is not rimmed. Bobbin thread is trimmed. 	① Stitch skipping at the last stitch (Clearance provided between the needle and the hook is excessive.)	 Refer to "Adjusting the needle and the hook".
6. Both needle thread and	1 Thread trimming timing is improper.	 Adjust the thread trimming timing.
bobbin thread are not	2 Breakage of the knife	 Replace the knife.
trimmea.	 Pressure of the knife is insufficient. 	 Adjust the pressure of the knife.
	④ Moving amount of the moving knife is insuf- ficient.	• Adjust the initial position of the moving knife.
7. Thread is not cut sharply.	① Thread trimming timing is improper.	 Adjust the thread trimming timing.
	 Pressure of the knife is insufficient. 	 Adjust the pressure of the knife.
	③ The knife has a blunt blade.	 Replace the knife.
8. Material bends.	1 Top feed belt is bent.	 Adjust the walking foot.
	2 Height of the main walking foot and the	• Make the height of the main walking foot and the auxil-
	auxiliary walking foot is improper.	iary walking foot same.
	 (3) Auxiliary feed shirring amount set value is improper. 	 Adjust the set value.
9. Feed pitch is not obtained.	① Feed belt has been worn out.	 Replace the belt.
	 Walking foot is excessively raised. 	$\circ~$ Refer to "Adjusting the height of the walking foot".
	③ Belt tension is too low.	• Adjust to the proper tension value.
10.Shirring is not performed.	1) Feed belt has been worn out.	 Replace the belt.
	 Walking foot is excessively raised. 	$\circ~$ Refer to "Adjusting the height of the walking foot".
	③ Belt tension is too low.	 Adjust to the proper tension value.
	④ Set value is too small.	 Adjust to the optimum set value.
11. Shirring is excessively performed.	① Set value is too large.	 Adjust to the optimum set value.

28. DRAWING OF THE TABLE

28-1 Slant table



X - X

20

21







W - W (6 places)





▲ 4 x ø3.4 on the bottom surface, depth 20 (Drill a hole at the time of set-up.) JUKI logotype • Jointless at the joining of slant section ø24 drilled hole **Ø** ø18 drilled hole G 2 x ø3.5 depth 10 **G** 3 x ø13 drilled hole 2 x ø3.5 depth 10

28-2 Work top table



Part No. : 40013086

28-3 Edge stopper A



Part No. : 40013087



