

ENGLISH

**DDL-9000C-S Multi-layered section
detection sensor (asm.)
INSTRUCTION MANUAL**

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Congratulations on your purchase of a part for the JUKI industrial sewing machines.

Be sure to read "Safety precautions" and the Instruction Manual for the sewing machine for which the purchased part is to be used, carefully before putting the purchased part into use.

A Function

This is the device intended to be fitted to the DDL-9000C-S (digital type).

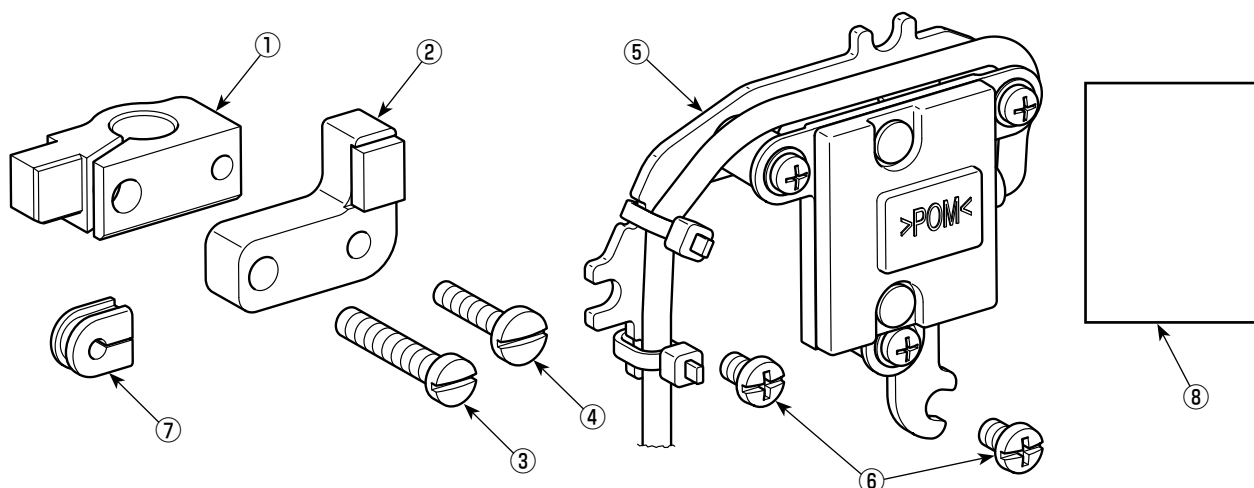
Sewing parameters can be automatically changed over appropriately at multi-layered sections of material by fitting the multi-layered section detection sensor to the sewing machine.

The multi-layered section detection setting can be stored in memory on a pattern-by-pattern basis.

Sewing parameters that can be changed over	S003 : Pitch S047 : Sewing speed S048 : Feed locus S050 : Feed dog height
Detectable material thickness	Max. 10 mm
Detection resolution	0.1 mm

- * Multi-layered section of material that is less than 2 mm in thickness is likely to be affected by the feed dog height. Stable detection, therefore, cannot be carried out. It is not possible to detect two or more multi-layered sections thickness of which are different. In this case, the one-touch changeover function by means of the hand switch should be used.
- * The multi-layered section detection function is disabled while the one-touch changeover function by means of the hand switch is carried out.

B Description of parts supplied with the device



No.	Part number	Part name	Qty
①	23610108	Presser bar holder	1
②	40188614	Multi-layered section sensor magnet base (asm.)	1
③	SS7112420SP	Clamping screw of presser bar holder	1
④	SS7091810SP	Setscrew of multi-layered section sensor magnet base (asm.)	1
⑤	40188623	Multi-layered section sensor (asm.)	1
⑥	SM4040655SP	Setscrew of multi-layered section sensor (asm.)	2
⑦	40139753	Cord fixture	1
⑧	40188624	Instruction manual	1

© Version of sewing machine software

	Version
Panel software	01.02.01-02
Main software	01.03.01-07

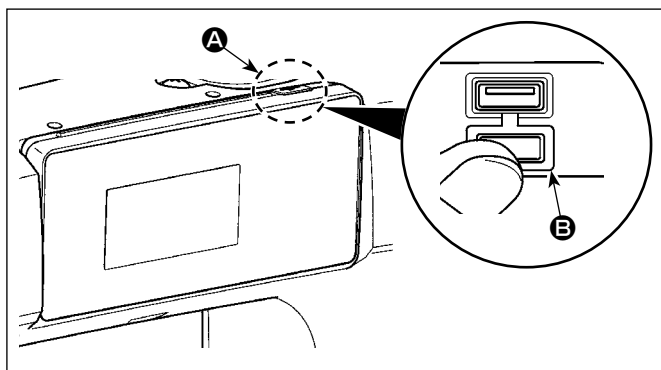
The multi-layered section detection sensor can be used with the panel software and main software versions described on the left.

(Caution) 1. Refer to the Instruction Manual for the sewing machine you have purchased for how to check the software versions.

2. If the software versions of your sewing machine are not ready for the device, it is necessary to purchase the software of relevant versions from JUKI distributor in your area.

©-1 How to install the software

Software installation procedure by means of the USB thumb drive is described below:



① Position of the USB connector

1. USB thumb drive insertion position

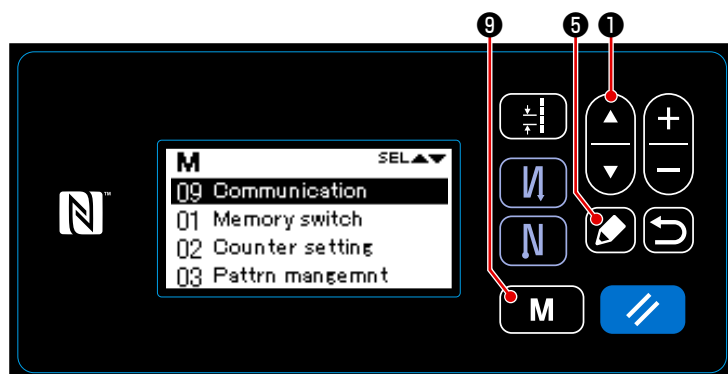
The USB connector is provided on top **A** of the operation panel.

To use a USB thumb drive, remove connector cover **B** and insert the USB thumb drive into the USB connector.

* In the case a USB thumb drive is not used, the USB connector should be protected with connector cover **B** without exceptions. If dust or the like enters the USB connector, a failure can be caused.

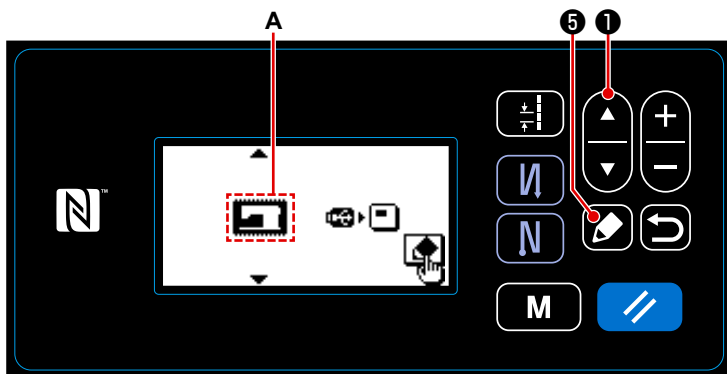
② Precautions to be taken when handling USB devices

- Do not connect to the USB connection terminal other than the USB memory. It may cause failure.
- 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 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.
- Never forcefully insert a USB thumb drive into the USB connector while carefully checking the orientation of the USB thumb drive. Forceful insertion of the USB thumb drive can cause failure.
- JUKI does not compensate for loss of data stored on the USB device caused by using it with this sewing machine.
- In principle, connect only one USB thumb drive to the operation panel. When two or more devices/media are connected/inserted, the machine will only recognize one of them. Refer to the USB specifications.
- Do not turn the power OFF while the data on the USB flash drive is being accessed.

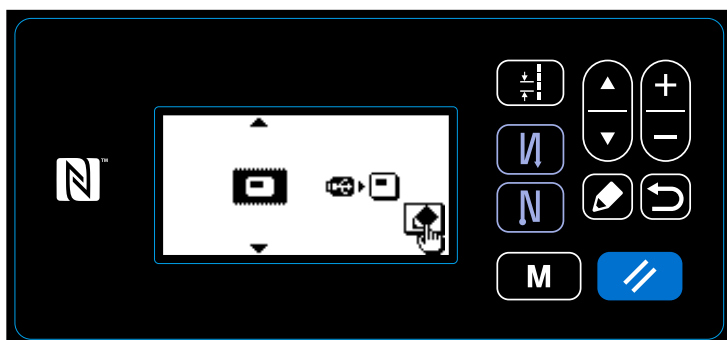


③ Selecting the communication function

1. Keep **M** **9** held pressed for three seconds on the sewing screen to display the mode screen.
2. Select "09 Communication" by pressing **09** **5**. Then, press **01** **1** to display the data type selection screen.



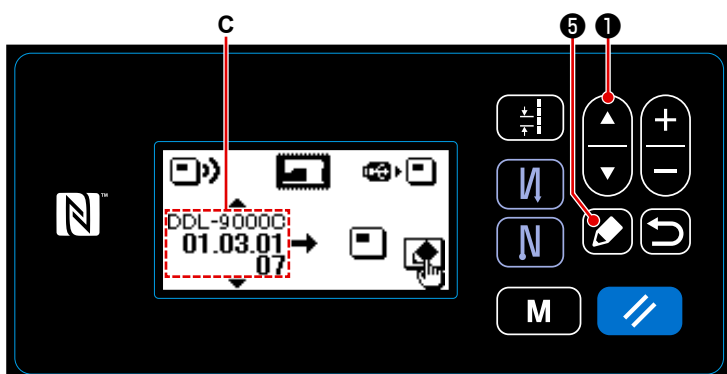
<Data type selection screen> (Main software re-write screen)



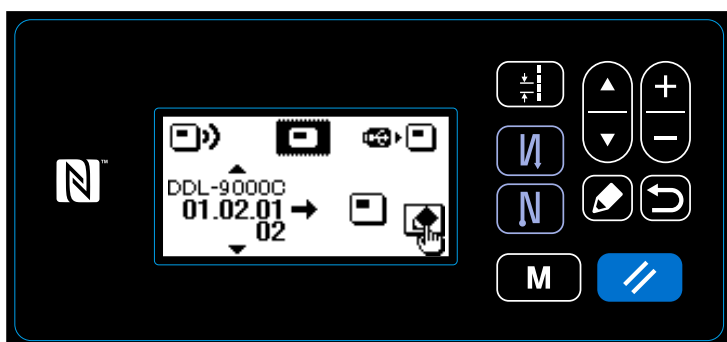
<Data type selection screen> (Panel software re-write screen)

④ Selecting the communication data and communication direction

1. Select the communication data **A** by pressing **1**.
2. Press **5** to display the software selection screen.



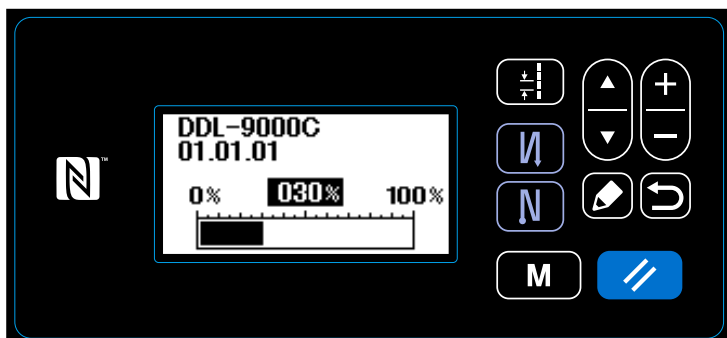
<Software selection screen> (Main software re-write screen)



<Software selection screen> (Panel software re-write screen)

⑤ Selecting the target data number

1. Select the source data number **C** by pressing **1**.
2. Press **5** to display the during-communication screen and write the data.



3. While a program is being written, the screen of such a situation is displayed.
4. After such a writing of a program is completed, the screen giving you instructions to turn off the sewing machine is displayed. Turn off then machine.
5. When you turn on the sewing machine again, the written program is executed.

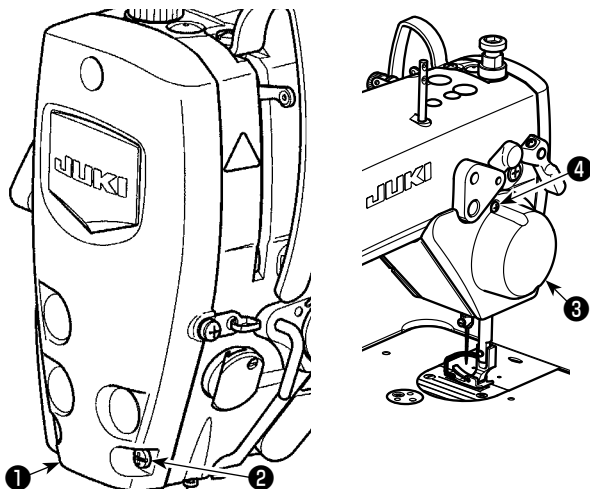
Ⓓ How to install the multi-layered section detection sensor to the sewing machine



WARNING :

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

Ⓓ-1



Ⓓ-1 Removing the face plate and the AT cover

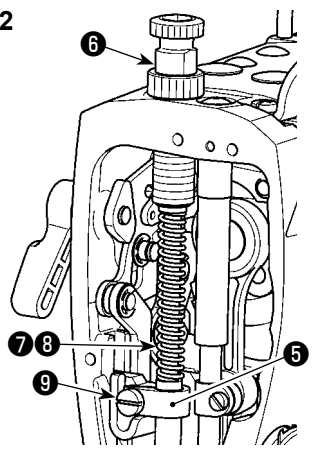
1. Loosen setscrews ② (three pieces) to remove the face plate ①.
2. Loosen setscrews ④ (two pieces) to remove the AT cover ③.

Ⓓ-2 Removing the presser bar holder

1. Remove the presser spring regulator ⑥, the presser adjustment spring ⑦ and the presser guide rod ⑧.
2. Loosen clamping screw ⑨ to remove the presser bar holder ⑤.

* Replace the presser bar holder with the part supplied with the device following the below-stated steps of procedure.

Ⓓ-2



Ⓓ-3 Installing the presser bar holder and multi-layered section sensor magnet base (asm.)

1. Install presser bar holder ⑩ and multi-layered section sensor magnet base (asm.) ⑪.

Fix presser bar holder ⑩ with tightening screw ⑫ (shank length : 24 mm). (Fix multi-layered section sensor magnet base (asm.) ⑪ together using the same tightening screw.)

Fix multi-layered section sensor magnet base (asm.) ⑪ with setscrew ⑬ (shank length : 18 mm).

* Lower presser bar lifter lever ⑭. Adjust it in this state.

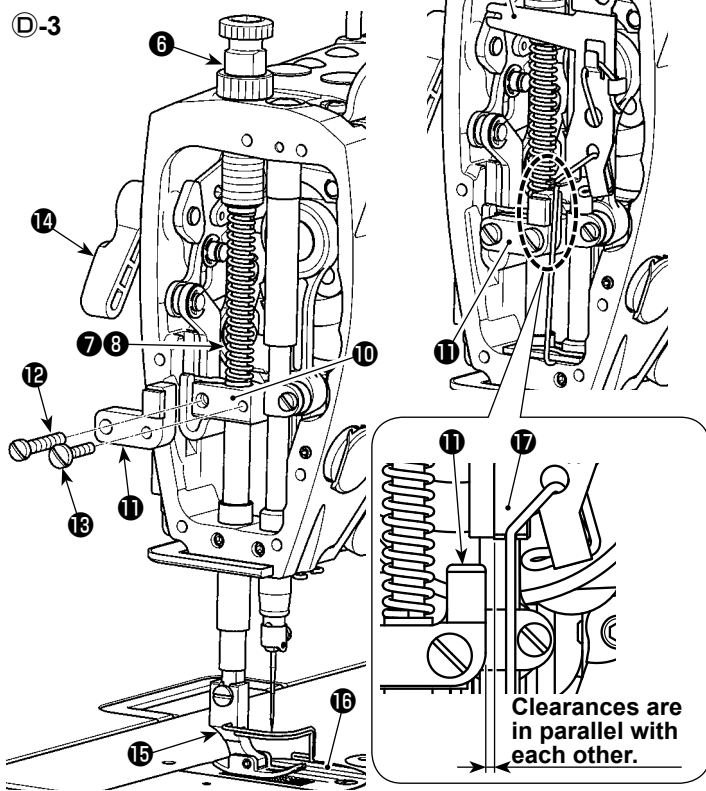
* Adjust the orientation of presser foot ⑮ so that presser foot ⑮ is in parallel with the feed dog groove in throat plate ⑯.

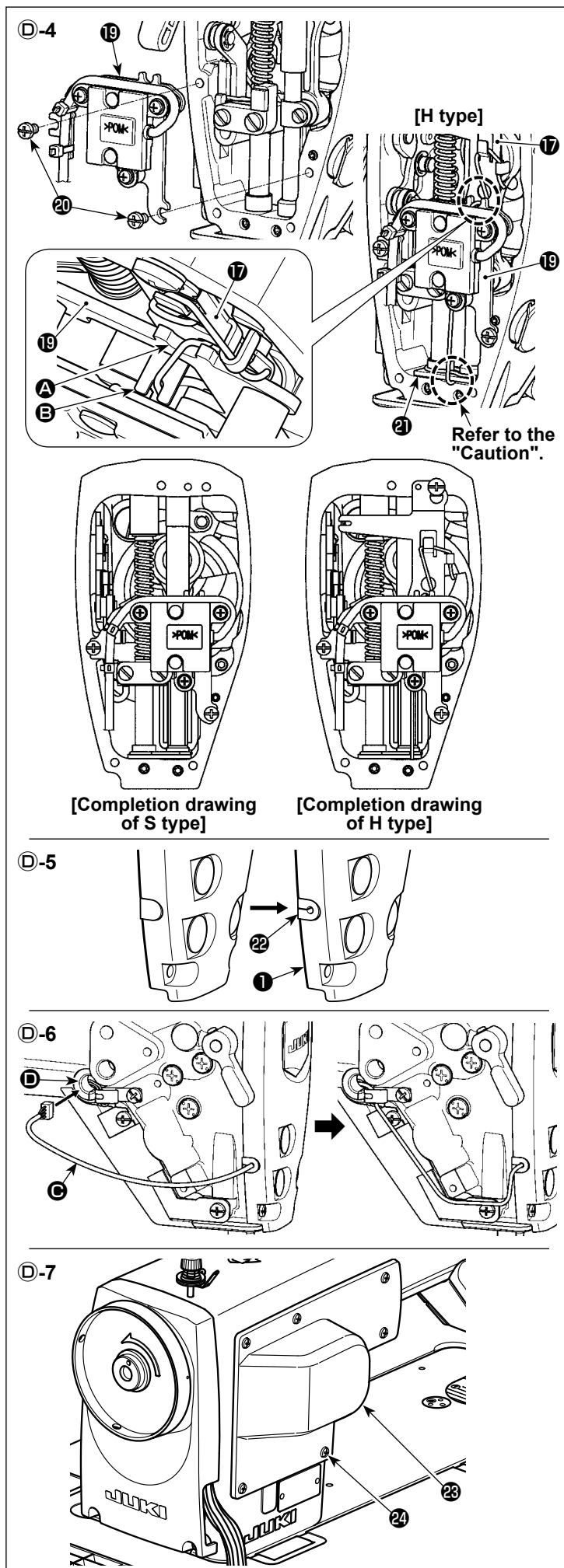
2. Return presser spring regulator ⑥, presser adjustment spring ⑦ and presser guide rod ⑧ to their home positions.

* Only for the H type, face plate portion lubrication oil wick (asm.) ⑰ is attached. Loosen setscrew ⑱. Adjust the angle of face plate portion lubrication oil wick (asm.) ⑰ so that multi-layered section sensor magnet base (asm.) ⑪ is in parallel with the clearance in face plate portion lubrication oil wick (asm.) ⑰.

(Caution) Check to make sure that multi-layered section sensor magnet base (asm.) ⑪ does not interfere with face plate portion lubrication oil wick (asm.) ⑰ when moving the presser bar up and down. (Only for the H type)

Ⓓ-3





D-4 Installing the multi-layered section sensor (asm.)

1. Fix multi-layered section sensor (asm.) **19** supplied with the device on the face plate portion of sewing machine arm with setscrews **20** (two pieces) (shank length : 6 mm).

* Only for the H type, put the oil wicks in guide **A** of multi-layered section sensor (asm.) **19** and in guide **B** of face plate portion lubrication oil wick (asm.) **17**, and route the oil wicks appropriately.

(Caution) Tuck the bottom end of oil wick under felt **21** inside the face plate portion of sewing machine arm.
(Only for the H type)

D-5 Replacing the cord fixture

1. Replace the existing cord fixture with cord fixture **22** supplied with the device.
2. Pull the cable of multi-layered section sensor (asm.) **19** through the hole in cord fixture **22**. Then, fix face plate **1** on the sewing machine arm.

* Be sure to place a packing between the sewing machine arm and face plate **1**.

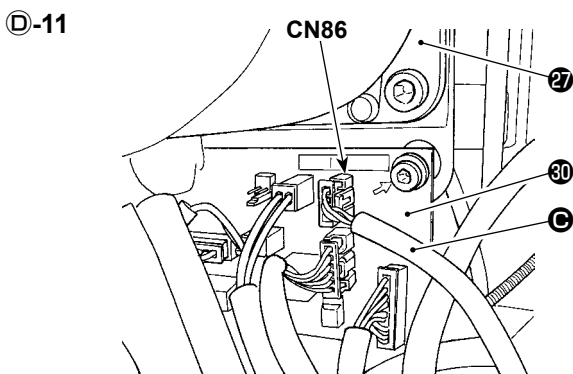
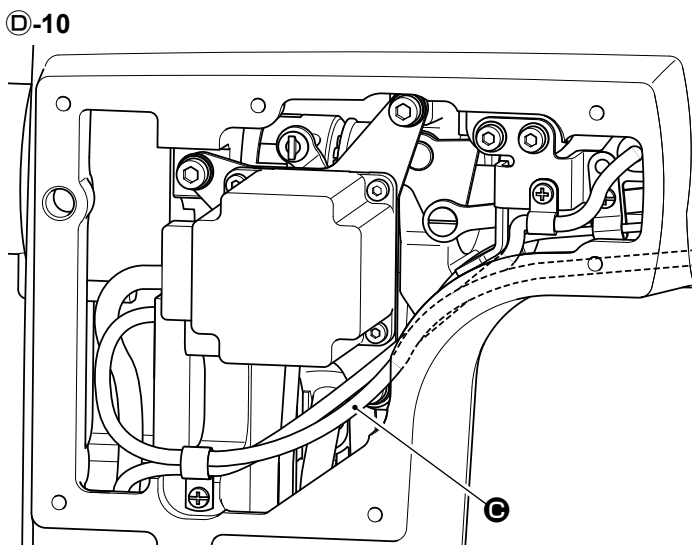
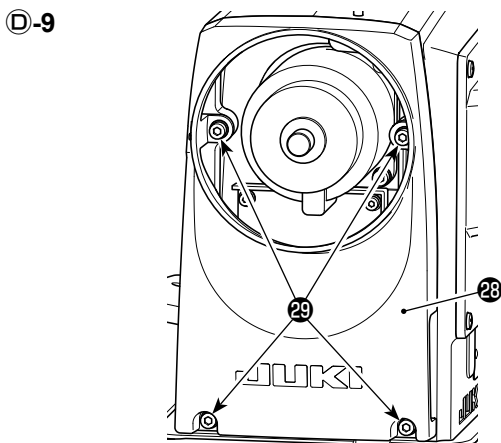
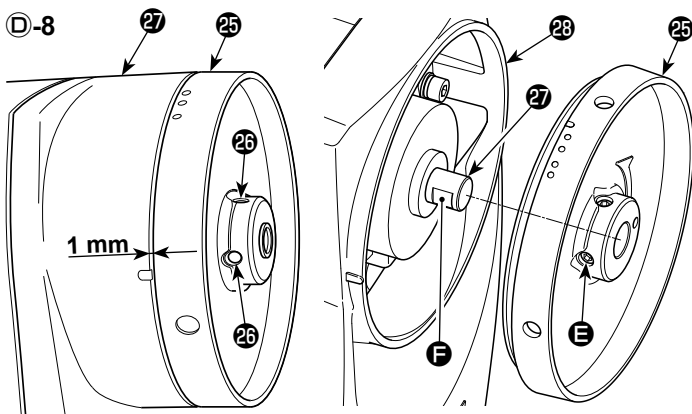
D-6 Wiring the cable of multi-layered section sensor

1. Pass cable **C** of multi-layered section sensor (asm.) **19** inside the arm through cable hole **D** in the sewing machine arm.

(Caution) Do not forcibly pull cable **C** when wiring and arranging the cable inside the machine arm. Forcibly pulling the cable can cause a sensor fault.

D-7 Removing the side plate

1. Loosen setscrews **24** (six pieces) to remove the side plate **23**.



D-8 Removing the side plate

1. Loosen setscrews **26** (two pieces) to remove the handwheel **25**.

[Precautions to be taken when re-assembling the handwheel]

- ① Align the position of 1st screw **E** in terms of the direction of rotation of handwheel **25** with the position of flat section **F** of main shaft motor **27**.
- ② Adjust the clearance provided between handwheel **25** and pulley cover **28** to 1 mm.

(Caution) If a clearance is too much, this can be a possible cause of entanglement of the thread from the thread stand.

D-9 Removing the pulley cover

1. Loosen setscrews **29** (four pieces) to remove the pulley cover **28**.

D-10 Wiring and arranging the cable inside the sewing machine arm

1. Wire and arrange cable **C** of multi-layered section sensor (asm.) **19** as illustrated in the figure on the left.

(Caution) Take care not to allow cable **C** to come in contact with the movable components.

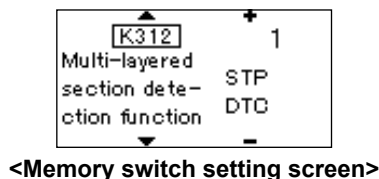
D-11 Connection to the INT PCB

1. Connect cable **C** of multi-layered section sensor (asm.) **19** to the connector (CN86) of INT PCB **30** under main shaft motor **27**.

* At the final step of procedure, attach the parts which have been detached back to their home positions.

E How to operate the operation panel

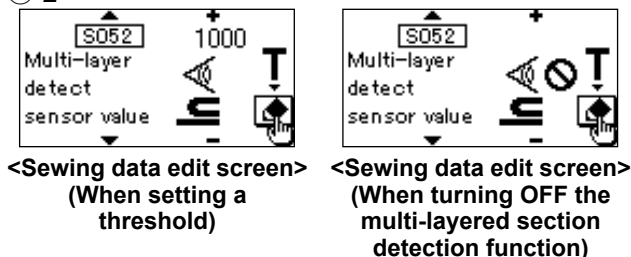
E-1



E-1 Setting the multi-layered section detection function

1. Open the memory switch setting screen. Set [K312 Multi-layered section detection function] to "1". (0 : Multi-layered section detection function is disabled; 1 : Multi-layered section detection function is enabled)

E-2



E-2 Setting the threshold for the multi-layered section detection

1. Open the sewing data edit screen. Set [S052 multi-layered section detection sensor value] (threshold to detect the multi-layered section). (Data setting range : 1000 to 3000, or OFF (OFF : Multi-layered section is not detected))
2. Teaching of the lower layer of multi-layered section is started by pressing 5.

(Caution) In the case the multi-layer stitching pattern is selected, [S052 Multi-layered section detection sensor value] is not displayed.

3. Carry out teaching of thickness of the lower layer (thinner section) of multi-layered section of material. Place the lower layer (thinner section) of multi-layered section of material under the presser foot.
4. The upper layer teaching screen is displayed by pressing 5.

* Teaching is terminated and the screen is restored to the sewing data edit screen by pressing

6.

5. Carry out teaching of thickness of the upper layer (thicker section) of multi-layered section of material. Place the upper layer (thicker section) of multi-layered section of material under the presser foot.

6. When you press 5, [S052 Multi-layered section detection sensor value] is changed to the value intermediate between the thickness of lower layer and that of upper layer of multi-layered section of material, and the screen is restored to the sewing data edit screen.

* The threshold is automatically calculated. However,

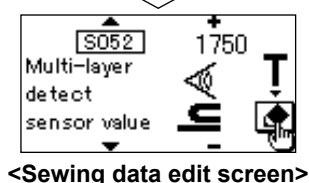
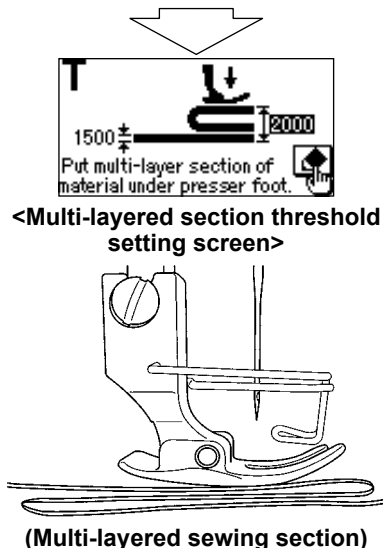
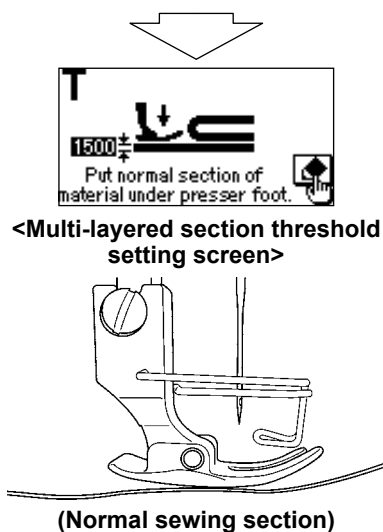
it can be manually adjusted 2. (If the value is decreased, the detection speed of the multi-layered section of material will be increased.)

* Teaching is terminated and the screen is restored to the sewing data edit screen by pressing

6.

(Caution) 1. The screen is restored to the sewing data edit screen after the completion of teaching of the multi-layered section of material. If you press 5 again, however, setting the multi-layered section detection will be required again. Press 6 to return to the sewing screen.

2. If the threshold is extremely decreased, false detection can be caused. So, carefully set the threshold.

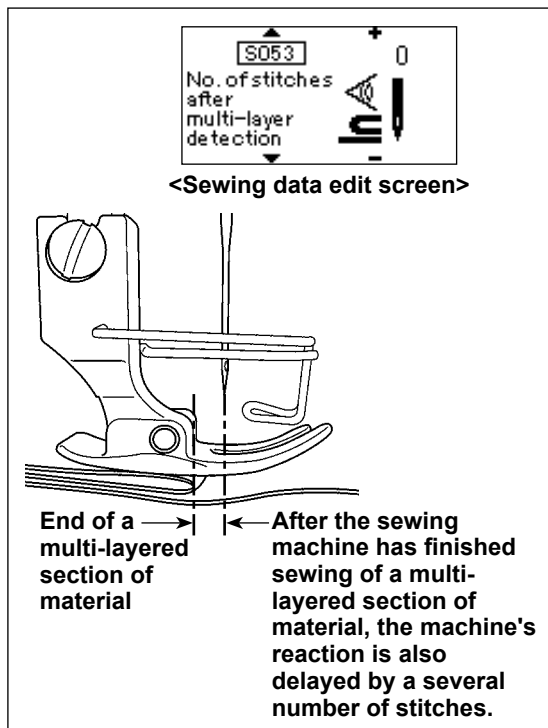


③-3 Multi-layered section detection number of stitches setting function

In the case the multi-layered section detection is enabled, the sewing parameter is automatically returned to the setting for the normal section of material if the material thickness becomes smaller than the "threshold". However, the sewing-parameter changeover timing can be changed by setting the multi-layered-section detection number of stitches.

Once the multi-layered-section detection number of stitches is set, the threshold returns to the value for the normal section of material when the aforementioned set number of stitches is reached after the detection of a multi-layered section of material, even if the sewing is started from the multi-layered section.

It should be noted, however, that the sewing parameter returns to the one for the normal section of material if the material thickness falls below the "threshold" for the multi-layered section detection, even within the range of the set multi-layered-section detection number of stitches.



[How to set]

1. Open the sewing data edit screen. Set [S053 The number of stitches to be sewn after detection of multi-layered section of material]. (Data setting range : 0 to 200 stitches)

- (Caution) 1. If the number of stitches is set "0", the sewing parameters for sewing the multi-layered section of material will be employed for sewing until the material thickness becomes smaller than the threshold of multi-layered section detection.
2. In the case the multi-layer stitching pattern is selected, [S053 The number of stitches to be sewn after detection of multi-layered section of material] is not displayed.
 3. After the end of multi-layered section of material is fed, the multi-layered section detection function detects the flat section of material to return the sewing conditions to those for the flat section. However, this reaction sometimes delays according to the sewing conditions. If such a delay occurs, it can be corrected by setting the number of stitches of the multi-layered section detection.

③-4 Sewing data after the detection of multi-layered section of material

Data to be employed after the detection of multi-layered section of material will be the parameters of one-touch changeover.

Adjust the sewing data number described below.

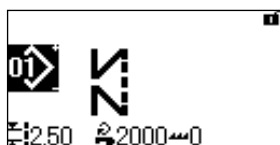
Data No.	Item name	Input range			
S001	Shape	Free 	Constant dimension 	Multi-layered 	Polygonal shape
S061 (*1)	Limit on sewing speed	150 to U096 / Common setting S047		—	150 to U096 / Common setting S047
S062 (*1)	Pitch	-5.00 to 5.00 / Common setting S003		—	-5.00 to 5.00 / Common setting S003
S065 (*1)	Correction of feed dog height	-4 to 8		—	-4 to 8
S066 (*1)	Feed locus	S / A / C / B /		—	S / A / C / B /

*1 This is the one-touch type changeover parameter.

③-5 Sewing

While the sewing machine is engaged in the sewing of multi-layered section of material (or in the sewing using the one-touch changeover parameters), stitch pitch, sewing speed and feed dog height are displayed in the reverse video.

After the completion of sewing, the display of those items will return to the normal video.



<Sewing screen>
(For normal sewing)



<Sewing screen> (During the sewing
of multi-layered section of material)