

NA-P1510, P2210 INSTRUCTION MANUAL

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I. MECHANICAL SECTION (WITH REGARD TO THE SEWING MACHINE)

1. SPECIFICATIONS

1	Sewing area	X (lateral) directionY (longitudinal) directionNA-P1510 :150 mm×100 mmNA-P2210 :220 mm×100 mm		
2	Max. sewing speed	2,800 sti/min (When sewing pitch is 3 mm or less)		
3	Stitch length	0.1 to 12.7 mm (Min. resolution : 0.05 mm)		
4	Feed motion of feeding frame	Intermittent feed (2-shaft drive by stepping motor)		
5	Needle bar stroke	41.2 mm		
6	Needle	GROZ-BECKERT 134, 135x17, ORGAN needle DPx5, DPx17		
7	Lift of feeding frame	Max. 25mm (Pneumatic type only Max.30mm)		
8	Intermediate presser stroke	4 mm (Standard) (0 to 10 mm)		
9	Lift of intermediate presser	20 mm		
10	Intermediate presser DOWN position variable	Standard 0 to 3.5 mm (Max. 0 to 7.0 mm)		
11	Shuttle	Double-capacity semi-rotary hook		
12	Lubricating oil	New Defrix Oil No. 2 (Supplied by oiler)		
13	Memory of pattern data	Main body, Media • Main body : Max. 999 patterns (Max. 8,000 stitches/pattern) • Media : Max. 999 patterns (Max. 8,000 stitches/pattern)		
14	Temporary stop facility	Used to stop machine operation during a stitching cycle.		
15	Enlarging / Reducing facility	Allows a pattern to be enlarged or reduced on the X axis and Y axis independently when sewing a pattern. Scale : 1% to 400% times (0.1% steps)		
16	Enlarging / Reducing method	Pattern enlargement / reduction can be done by increasing / decreasing either stitch length or the number of stitches. (Increasing/decreasing stitch length only can be performed when pattern button is selected.)		
17	Max. sewing speed limitation	200 to 2,800 sti/min (Scale : 100 sti/min steps)		
18	Pattern selection facility	Pattern No. and selection method (Main body : 1 to 999, Media : 1 to 999)		
19	Sewing counter	UP/DOWN method (0 to 9,999)		
20	Memory back-up	In case of a power interruption, the pattern being used will automatically be stored in memory.		
21	2nd origin setting facility	Using jog keys, a 2nd origin (needle position after a sewing cycle) can be set in the desired position within the sewing area. The set 2nd origin is also stored in memory.		
22	Sewing machine motor	Servo-motor		
23	Dimensions	1,200mm (W) x 710mm (L) x 1,200mm (H) (Excluding thread stand)		
24	Mass (gross mass)	Machine head 69kg		
25	Power consumption	700 VA		
26	Operating temperature range	5°C to 35°C		
27	Operating humidity range	35 % to 85 % (No dew condensation)		
28	Line voltage	Rated voltage ±10% 50 / 60 Hz		
29	Air pressure used	Standard 0.35 to 0.4 MPa (Max. 0.55 MPa)(Pneumatic type only)		
30	Needle highest position stop facility	After the completion of sewing, the needle can be brought up to its highest position.		
31	Noise	 Equivalent continuous emission sound pressure level (LpA) at the workstation: A-weighted value of 82 dB; (Includes KpA = 2.5 dB); according to ISO 10821- C.6.3 -ISO 11204 GR2 at 2,800 sti/min. *1 Sound power level (LwA); A-weighted value of 91 dB; (Includes KwA = 2.5 dB); according to ISO 10821- C.6.3 -ISO 3744 GR2 at 2,800 sti/min *1 Time required for sewing: 2.2 sec, using Pattern No. 102 		

^{*1} "sti/min" is an abbreviation for "stitches per minute."

2. CONFIGURATION



- Machine head
- Wiper switch
- Temporary stop switch
- 4 Feeding frame
- **6** Intermediate presser
- 6 Thread stand
- Operation panel
- 8 Power switch
 - (also used as the emergency stop switch)
- Ontrol box
- Foot pedal
- Manual pedal (Excluding pneumatic type)

Air regulator (for pneumatic type only)



3. INSTALLATION

3-1. Installing the electrical box



Insert supplied screws **1**, plain washers **2** and spring washers **3**, which come with the sewing machine as accessories, into the corresponding holes in the sewing machine table from above and secure them by tightening washers **5**, spring washers **6** and four nuts **4** on the underside of the table.

3-2. Installing and connecting the power switch



Installing the power switch
 Fix power switch ① under the machine table with wood screws ②.

Fix the cable with staples ③ supplied with the machine as accessories in accordance with the forms of use.

3-3. Installation of the sewing machine head

WARNING :

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



1) Fit the holes of hinges (2) to the holes of table and fix as shown in the figure.





At this time, pass a bundle of the cables at the rear part of the sewing machine through the slot portion in the table in prior.



Tilt the sewing machine to allow four support rods **3** to be fitted into four holes **2** in the table .

3-4. Installing the drain receiver and the head support rubber



3-5. Safety switch



3-6. Installing the throat plate auxiliary cover



WARNING : Be careful not to bump your head or any other parts of your body against the throat plate auxiliary cover when you bend over your work.



- Temporarily fix throat plate auxiliary cover supports A 2 and B 3 to the machine bed with setscrews (M5) 6.
- 2) Move the cloth feed base to the rear, and place throat plate auxiliary cover ① from between lower plate ⑦ and throat plate
 ③ . At this time, be careful not to bend lower plate ⑦ .
- 3) Fix throat plate auxiliary cover ① with throat plate auxiliary cover setscrews ③ and plain washer ④ .
- 4) Temporarily fix throat plate auxiliary cover support ① to the machine bed with setscrews (M6) ②.
- 5) Temporarily fix throat plate auxiliary cover base (3) to throat plate auxiliary cover support (1) with setscrews (2) and nuts (large) (3).
- 6) Fix throat plate auxiliary cover ① with throat plate auxiliary cover setscrews ⑤ and nuts (large) ⑥.

Left-hand and right-hand shapes of throat plate auxiliary cover support ① are different. So,) be careful.



- 1. Be careful so as not to mistake the direction of throat plate auxiliary cover support.
- Fix the throat plate auxiliary cover ① so that is higher than the throat plate ③ (within 0.3 mm). When it is lower than the throat plate ③ , needle breakage or the like due to the defective feed will be caused.
- Confirm by putting a ruler or the like that the throat plate auxiliary cover

 is horizontally installed. If not, throat plate auxiliary cover
 and lower plate
 come in contact partially with each other, and abnormal worn-out will be caused.

3-7. Installing the panel



- 1) Open cover **1** and remove cable **2** once. Then connect it again to the panel on the top surface of the table after passing it through the hole in the table.
- 2) Fix operation panel installing plate 3 to an optional place on the table with two wood screws 4.



Install the panel at the position where X-move cover or head grip does not interfere with it since breakage of the panel will be caused.

3-8. Attaching the pedal chain (For S specification only)



Connect the machine **1** and manual pedal **3** with chain 2.



3-9. Installing the thread stand



- 1) Assemble the thread stand, and put it in the hole in the top left corner of the machine table.
- 2) Tighten locknut 1 to fix the thread stand.
- 3) When ceiling wiring is possible, pass the power cord through spool rest rod 2.

3-10. Raising the machine head

WARNING :

When tilting or raising the sewing machine, be careful not to get your fingers caught between the sewing machine and table. In addition, be sure to turn the power off before tilling/raising the sewing machine so as to protect against accidents resulting from unintentional starting.



[When using area 1510]

To raise the sewing machine, carefully raise it until bed support rubber ③ comes in contact with the table while holding section ④ into which the sewing machine bed is to be inserted by hand. For the S type, remove chain ④ from manual pedal ● first, and perform the work.

- Be sure to raise the machine head at the leveled place so as to prevent the sewing machine from falling.
 - 2. When raising the machine head, move feeding frame beforehand to the right-hand side until it goes no further, and fix it with tape or the like. When the machine head is raised in the state that moving or fixing is insufficient, breakage of X-move cover or X-move rail will be caused. Besides, feeding frame which is tilted to the left-hand side by the self-weight interferes with the intermediate presser or the like and breakage of the components will be caused.

[When using area 2210]

- 1) Remove throat plate auxiliary cover 6 from the sewing machine.
- 2) Hold inserting section A of the machine bed by hand, and quietly raise it until bed support rubber ③ comes in contact with the table.
- 3) After returning the sewing machine to its home position, refer to "I-3-6. Installing the throat plate auxiliary cover" p.6, and install the throat plate auxiliary cover.
 - 1. Be sure to raise the machine head at the leveled place so as to prevent the sewing machine from falling.
 - 2. When raising the sewing machine without removing throat plate auxiliary cover ③, the throat plate auxiliary cover interferes with the table, bend or breakage of the throat plate auxiliary cover, tilt of the sewing machine, etc. will result.

3. When raising the machine head, move feeding frame beforehand to the right-hand side until it goes no further, and fix it with tape or the like. When the machine head is raised in the state that moving or fixing is insufficient, breakage of X-move cover or X-move rail will be caused. Besides, feeding frame which is tilted to the left-hand side by the self-weight interferes with the intermediate presser or the like and breakage of the components will be caused.

3-11. Connecting the cord





[How to open the control box]

Remove four screws **①** fixing the rear cover of the electrical box. Holding the rear cover with your hand, slowly detach it.



[How to close the control box]

 Tighten four screws
 with great care to prevent the cables from being caught between the rear cover and the main body of the electrical control box.

[Right side face of the electrical control box] Power switch cable:

Insert the X1 as shown at left ②. Loosen screw③ and secure the FG wire with ③.

Main motor cable: Insert the X4 into ④.

[Left side of the electrical control box]

FG wire coming from the machine head:

Loosen screw (3) on the left side face of the electrical control box. Secure the FG wire at that position.

In addition, secure the FG wire with its crimp terminal facing upward. (If the FG wire is secured with its crimp terminal facing downward, it will be caught under the cover when attaching the cover.)



[Front face of the electrical control box]

Connector numbers are shown on the board located on the front surface of the electrical control box. Connect the cables respectively to the connectors while matching the indication label number of the cable with the connector number.

At this time, it is recommended to connect the connectors following the order described below to connect them without mistake.

- Center row: X27, T2, X26, X7, X5, X8, X20, T1, X21 (Portion in a blue oval)
- 2 Lower row: X23, X25, X22, X24, X18, X19FG



Secure the cables that are connected with the FG wire in such a way that each cable is connected independently to earth line () as shown in a red oval.



In addition, group the cables at the upper portion of guide metal fitting **1** located on the right side of the electrical control box and bundle them with cable clip band **3**.

Upper left row:XH, IN1, IN2, ES, YH, PH, BRK, SF

Close the cover of the electrical control box while bundling the cables with a cable clip band to prevent them from being stretched.

3-12. Installing the motor cover



Install motor cover **①** on the machine main unit with screws supplied with the machine as accessories.

3-13. Managing the cord



1) Secure the cords with cable clip bands at some locations while slackening the cords to such an extent that they are not applied with stress even when the machine head is tilted as shown in the figure.



 Bundle the cables that are put into the electrical control box respectively at approximately two locations and secure with cable clip bands. Then, close the cover of the electrical control box.

3-14. Connecting the pneumatic components (Pneumatic type only)



When using the air-driven type model, connect the pneumatic components as described below.

Install regulator ① to installing plate ②, and install it to the stand with screw ③, washer ④ and nut ⑤.



- 2) Install solenoid valve asm. (3) on solenoid valve installing plate (6) in the direction as shown in the figure, using screw (7) supplied as accessories.



3) Fix the air tube using cable clip ④ supplied with the machine as accessories. (For the setscrew, use setscrew ❶ fixing the motor cover.)



5) Connect the air tubes coming from the machine head to tube A () and tube B (), as air tubes 1A and 2A to the former and 1B and 2B to the latter, using supplied joints () and ().



- 6) Connect air tube () coming from the regulator, tube A () and tube B () respectively to the locations shown in the figure.
- 7) Insert CN1 cable of solenoid valve cable (40048529). (The rest of the cables are not used. Use the machine with those cables bundled.) Connect the opposite-side connector of solenoid valve cable (10278419) and to the supplied cable (40278419) and to the connector V1 of the electrical control box.

3-15. Installing the air hose (Pneumatic type only)



Connecting the air hose
 Connect the air hose to the regulator.

2) Adjustment of air pressure
Open air cock ①, pull up and turn air adjustment
knob ② and adjust so that air pressure indicates
0.35 to 0.4 MPa (Max. 0.55 MPa). Then lower the
knob and fix it.

* Close air cock 1 to expel air.

3-16. Cautions for the compressed air supply (source of supply air) facility

As large as 90 % of failures in pneumatic equipment (air cylinders, air solenoid valves) are caused by "contaminated air."

Compressed air contains lots of impurities such as moisture, dust, deteriorated oil and carbon particles. If such "contaminated air" is used without taking any measures, it can a cause of troubles, inviting reduction in productivity due to mechanical failures and reduced availability.

Be sure to install the standard air supply facility shown below whenever the machine provided with pneumatic equipment is used.

Standard air supply facility to be prepared by the user



Cautions for main piping

- Be sure to slope main piping by a falling gradient of 1 cm per 1 m in the direction of air flow.
- Caution
- If the main piping is branched off, the outlet port of the compressed air should be provided at the top part of the piping using a tee in order to prevent drain settling inside the piping from flowing out.
- Auto drains should be provided at all lower points or dead ends in order to prevent the drain from settling in those parts.

3-17. Installing the eye protection cover



WARNING :

Be sure to attach this cover to protect the eyes from the disperse of needle breakage.



Use eye protection cover ① after securely attaching it on face plate cover ③ with screw ②.

3-18. Correcting the main shaft



Turn ON the power to the sewing machine. Keep **1** held pressed (for approximately five seconds) on the screen.

On the next screen, press 2.



Electrical value: 25 deg. Calibration value: 334 deg. Mechanical value: 52 deg. On the next screen, press "I08" ③ to display the spindle angle mounting screen.



Turn hand pulley ④ of the sewing machine to bring needle bar ⑤ to its upper end position.



In this state, press ENTER key 6.



- O1/08
 Encrypt
 Image protection
 ON

 Range protection
 0
 0
 0

 Sowing machine type selection
 2
 0
 0

 Thread Clamp type selection
 6
 0
 0

 Sowing material type
 0
 0
 0

 Speed of frame moving
 2
 0
 0

 Speed of frame frame moving
 2
 0
 0
 0

 Speed of frame frame moving
 2
 0
 0
 0
 0

 Speed of frame frame frame moving
 2
 0
 0
 0
 0
 0

 Speed of frame fram

- 1) Turn On the power to the sewing machine.
- 2) Keep **1** held pressed (for approximately 10 seconds) on the input screen.

3) On the next screen, press 2.

4) On the next screen, press "K02" 3.



- 5) Select "1" if the model of your sewing machine is "1510", or "2" if it is "2210".
- 6) Finally, press **(4)** to confirm your selection.

3-20. Setting the time



1) Press 1 on the input screen.

2) Press 2.



3) Set the year and month by pressing ${f 3}$.

4) Then, press ④ to display the H (hour) and M (minute) respectively. In this state, set the time of day by pressing ⑤ . Press ⑥ to confirm the setting.

5) Press () to return to the input screen.

4. PREPARATION OF THE SEWING MACHINE

4-1. Lubrication



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



Check that the place between lower line **B** and upper line **A** is filled with oil. Fill there with oil using the oiler supplied with the machine as accessories when oil is short.

The oil tank which is filled with oil is only for lubricating to the hook portion. It is possible to reduce the oil amount when the number of rotation used is low and the oil amount in the hook portion is excessive. (Refer to "II-1-9. Amount of oil supplied to the hook" p.35.)

- 1. Do not lubricate to the places other than the oil tank and the hook of Caution 2 below. Trouble of components will be caused.
- When using the sewing machine for the first time or after an extended period of disuse, l use the machine after lubricating a small amount of oil to the hook portion. (Refer to "II 1-2. Adjusting the needle-to-shuttle relation" p.29.)

4-2. Attaching the needle

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



Loosen setscrew **①** and hold needle **②** with the long groove facing toward you. Then fully insert it into the hole in the needle bar, and tighten setscrew **①**.



4-3. Needle size and gauge

When changing the needle size, it is necessary to adjust the hook and to replace the gauge.

(1) Adjustment

In the standard delivery state, the hook has been factory-adjusted to DP × 5 #14 needle for the S type and to DP × 17 #18 needle for the H type.

When changing the thickness of the needle, perform the adjustment of "II-1-2. Adjusting the needle-to-shuttle relation" p.29.

When changing the length of the needle, perform the adjustment of "II-1-1. Adjusting the height of the needle bar (Changing the length of the needle)" p.29.



When the adjustment of hook and driver is not fit to the thickness of the needle, sewing troubles such as stitch skipping and the like or abrasion of the blade point of hook will be caused.

(2) Gauge

When changing the needle size, replace the gauge with the optional gauge of the correspondence table.

Needle	Needle hole guide		Intermediate presser		Inner hook pres	ser
						Dimension A
N u m b e r (Thickness)	Part No.	Needle hole diameter (øA)	Part No.	Dimension (øA × øB × H × L)	Part No.	Dimension A
#09 to #11 (Knit)	B242621000C	ø1.6	B1601210D0E	ø1.6 × ø2.6 × 5.7 × 37.0	14103253	0.8
#11 to #14	B242621000A	ø1.6	40023632 *1	ø2.2 × ø3.6 × 5.7 × 38.5	14103352 *1	1.3
#14 to #18	B242621000B	ø2.0				
#18 to #21	B242621000D	ø2.4				
#21 to #25	B242621000F	ø3.0	B1601210D0BA	ø2.7 × ø4.1 × 5.7 ×38.5	14103659	1.7
			or		or	
			B1601210D0CA	ø3.5 × ø5.5 × 5.7 ×38.5	B1817210DAD	1.9

*1 There is a case where the sewing quality is increased by changing the gauge to other gauge in accordance with the sewing conditions. Example 1 : When stitch skipping occurs with the needle #14, change the intermediate presser from 14103352 to 14103253. Example 2 : When stitches are not well tightened with the needle #19, change the intermediate presser from 40023632 to

B1601210D0BA.



For the other special gauges, ask our sales distributors. 2. When using the gauge that is not fit for the thickness of the needle, needle breakage, abrasion of components such as inner hook and the like, sewing trouble such as stitch skipping and the like will be caused.

Example : When sewing the sports shoes with a big size needle guide or inner hook presser, needle thread loop becomes unstable and stitch skipping or thread breakage may occur.

4-4. Threading the machine head



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



4-5. Installing and removing the bobbin case

WARNING :



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

In addition, be sure to close the hook cover when re-starting the sewing machine so as to prevent personal injury or death.



- 1) Open hook cover 1 .
- 2) Raise latch ③ of bobbin case ②, and remove the bobbin case.
- When entering bobbin case, insert it with the latch tilted until "click" sounds.

If it is not fully inserted, bobbin case
2 may slip off during sewing.

4-6. Installing the bobbin

WARNING :

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



- 1) Set the bobbin **1** into bobbin case **2** in the direction shown in the figure.
- 2) Pass the thread through thread slit ③ of bobbin case ④, and pull the thread as it is. By so doing, the thread will pass under the tension spring and be pulled out from thread hole ④.
- Pass the thread through thread hole of the horn section, and pull out the thread by 2.5 cm from the thread hole.



If the bobbin is installed in the bobbin case orienting the reverse direction, the bobbin thread pulling out will result in an inconsistent state.

 If the bobbin thread tension is not consistent due to thread overflow in the hook resulting from bobbin idling or other problem, bend claw (3) of the bobbin case slightly inward. This can prevent the bobbin from idling.

4-7. Adjusting the thread tension



Adjusting the needle thread tension

Vy T 0 TH. 1 × NO. 123 123 x 3.0 X% 100.0% 3 2 Y 3.0 6 5 4 B 100.0% 8 9 1 U 8 A D_ 2300 1 0 \$ T C PNo. P023 1-22 \leftarrow Ð \bigcirc ((()))

If thread tension controller No. 1 **1** is turned clockwise, the length of remaining thread on the needle after thread trimming will be shorter. If it is turned counterclockwise, the length will be longer. Shorten the length to an extent that the thread is not

Adjust needle thread tension from the operation panel and bobbin thread tension with **2**.

slipped off.

Select THREAD TENSION button 6 100
 in the sewing screen.

 Set a needle thread tension using PLUS/ MINUS (+/-) button ^(c). There is a setting range of 0 to 200. When the set value is increased, the tension becomes higher.

 * When the set value is 50 at the time of standard delivery, the thread tension is adjusted so that H type is 2.35N and S type is 1.47N (spun thread #50).
 (When thread tension No. 1 is released.)

4-8. Intermediate presser height

 When raising the intermediate presser height, turn the pulley by hand to lower the needle bar, and confirm that the needle bar does not interfere with the intermediate presser. (When using DP × 5 needle, use the sewing machine with the height of 3.5 mm or less.)
 Take care not to get your hands and fingers caught in the feeding frame or intermediate presser.



Press INTERMEDIATE PRESSER SETTING button (2) and adjust with TEN keys (3) so that the clearance between the bottom end of intermediate presser and the cloth is 0.5 mm (thickness of thread used).





 Setting range of the intermediate presser is up to the standard of 3.5 mm. However, when using DP × 17 needle for H type or the like, the setting range can be changed up to max. 7 mm with memory switch U112.

2. When increasing the height of intermediate presser or making the needle size thicker, confirm the clearance between the wiper and the components. Wiper cannot be used unless the clearance is secured. Turn OFF the intermediate presser or change the set value of the memory switch U51.

4-9. Adjusting the thread take-up spring

1) Adjusting the stroke

Loosen setscrew ② , and turn thread tension asm. ③ .

Turning it clockwise will increase the moving amount and the thread drawing amount will increase.

2) Adjusting the pressure

To change the pressure of the thread take-up spring ①, insert a thin screwdriver into the slot of thread tension post ④ while screw ② is tightened, and turn it. Turning it clockwise will increase the pressure of the thread take-up spring. Turning it counterclockwise will decrease the pressure.

5. OPERATION OF THE SEWING MACHINE



WARNING : Be extremely careful not to depress the PEDAL switch erroneously so as to prevent accidents due to unintentional starting of the sewing machine.

5-1. Sewing

Take care not to get your hands and fingers caught in the feeding frame or intermediate presser when they are in operation.

In addition, be careful not to allow your hands and fingers to hit against the work clamp since it moves at a high speed.

For the 2-pedal unit



- 1) Set a workpiece on the sewing machine.
- Depress the pedal switch (2), and the feeding frame will come down. Depress it again, and the feeding frame will go up.
- Depress the pedal switch
 after the feeding frame has come down and the sewing machine will start sewing.
- 4) After the sewing machine completes sewing, the needle point will return to the start point and the feeding frame will go up.

5-2. Needle thread clamp device

By actuating the needle thread clamp device, trouble of sewing at the high-speed start (needle thread slip-off, stitch skipping or needle thread stain) is prevented, and can reduce gathering (bird's nest) of needle thread on the wrong side of cloth while keeping stable sewing. When mounting the IP-420, changeover of motion

ON/OFF is performed with 4 key.

When the needle thread clamp device is OFF, the machine automatically operates at slow-start.

If the memory switch U35 is in the OFF state, the needle thread clamp device will not operate. In addition, the ____ key will be inoperative.

* Matters that demand special attention when using the needle thread clamp device

Refer the respective types and the contents of the memory switches that can be set to the list below.

Sewing machine	Thread clamp	Memory switch	
type	unit type	U069	U070
NA-P1510	H type	1: H type thin thread (standard)(#50 to #8) 0: Front	
NA-P2210		2 : H type intermediate 1 : Rear (standard)	
		3 : H type thick thread (#5 to #2)	

[Memory switch settings]

Change the set value of memory switch U069 in accordance with the thickness of needle thread. The memory switch of the H type has been factory-set to "1: H type thin thread" at the time of shipment. The recommended value is "Set value: 1" for the thread counts #50 to #8 or "Set value: 3" for the thread counts #5 to #2.(The value will change in accordance with the kind and thickness of the actual thread and the kinds of materials to be sewn. Set the value by adjusting to the state of needle thread on the wrong side of materials.)

In addition, it is possible to select the thread clamp position by means of memory switch U070. When the thread slipping off from the needle eyelet at the beginning of sewing or stitch skipping from the first stitch occurs, set the set value to 0 : Front and use the machine.

(1) When with thread clamp (motion), use the sewing machine after adjusting the needle thread length at the start of sewing to 40 to 50 mm. When the needle thread length is too long, the needle thread end held with the needle thread clamp may be rolled in the seams.



- In case of with the needle thread clamp, the standard of the length of needle thread is 40 to 50 mm.
 - To prevent the thread from slipping off from the needle eyelet at the beginning of sewing or to prevent stitch skipping from the first stitch
 - \rightarrow Adjust the length of needle thread longer within the range.
 - To prevent stitch skipping within the second to tenth stitches from the beginning of sewing
 - \rightarrow Adjust the length of needle thread shorter within the range.
- When the needle thread is excessively long or is handled by hand after thread changing or the like, turn OFF NEEDLE THREAD CLAMP button
- 3) When needle thread held with the needle thread clamp is rolled in the seams, when error has occurred, or when needle thread is held entangled with the needle thread clamp, do not forcibly draw the cloth, but cut the connected needle thread with scissors or the like. The seams cannot be broken because of the needle thread at the start of sewing.
- (2) When the thread clamp is used, and bobbin thread at the sewing start appears on the right side of material, reduce thread tension at the sewing start (2 to 3 stitches) and bobbin thread becomes less conspicuous.

[Example of setting] Tension of 1 to 2 stitches at the sewing start is "20" when sewing tension setting is "35".

- * For setting of tension at the start of sewing, see of "CHAPTER II. 2-3. Normal Pattern Operation"
 - **p.7**.
 - 1. Thread may be entangled at the beginning of sewing depending on the pattern. If the thread is still entangled by the needle thread clamp device even after you have carried out the adjustment (1) or (2), use the sewing machine with the needle thread clamp device turned OFF.
 - 2. In the state that thread waste is caught in the needle thread clamp device section, a thread clamp fault can occur.

Remove thread waste referring to "II-1-6. Needle thread clamp device" p.34.

II. MAINTENANCE OF SAWING MACHINE

1. MAINTENANCE

1-1. Adjusting the height of the needle bar (Changing the length of the needle)

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



- * Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state.
- 1) Bring needle bar 1 down to the lowest position of its stroke. Loosen needle bar connection screw 2 and adjust so that the upper marker line 3 engraved on the needle bar aligns with the bottom end of the needle bar bushing lower 4.
- 2) As illustrated in the above figure, change the adjusting position in accordance with the needle count.

After the adjustment, turn the pulley to check for an extra load.

1-2. Adjusting the needle-to-shuttle relation

WARNING :

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

Relation between the needle and the marker lines on the needle bar



- Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state.
- Turn handwheel by hand to ascend the needle bar 1.

Adjust so that lower marker line ② on the ascending needle bar aligns with the bottom end of the needle bar bushing lower.







2) Loosen setscrew ① in the driver. Drawing bobbin case opening lever hook ② toward you, open it to the right and left until bobbin case opening lever ③ comes off.



At this time, be careful not to let shuttle **4** come off and fall.

- 3) Adjust so that the point of shuttle 4 meets the center of needle 5, and that a clearance of 0 mm is provided between the front end face of driver
 (and needle as the front end face of driver receives needle to prevent the needle from being bent. Then tighten setscrew 1.
- 4) Loosen shuttle race screw ②, and adjust the longitudinal position of the shuttle race. To do this adjustment, turn shuttle race adjusting shaft ③ clockwise or counterclockwise to provide a 0.05 to 0.1 mm clearance between needle ⑤ and the blade point of shuttle ④.
- After adjusting the longitudinal position of shuttle race, further adjust to provide a 7.5 mm clearance between the needle and the shuttle race. Then, tighten screw ♥ of shuttle race.
- 6) When changing the number of needle from the number at the time of standard delivery or using a new driver, perform the adjustment of the height of driver.

[Adjustment of height of driver]

- Adjust so that the blade point of inner hook 4 meets the center of needle 5 and tighten setscrew 1.
- 2) Bend the needle guard section of driver (3) in the direction of arrow A so that the protruding amount from the bottom end of the needle guard section of driver (3) to the tip of needle (5) is 0 to 0.5 mm when the blade point of inner hook (4) is out by 0.5 mm from the right end of needle (5).
- 3) Bend rear end B of driver (i) in the direction B so that the clearance between rear end B of driver
 (i) and inner hook (i) is 0.3 to 0.6 mm.
- 4) Perform adjustment of steps 3) to 5) above.
 - When making the needle size thicker, confirm the clearance between the needle tip or the intermediate presser and the wiper. Wiper cannot be used unless the clearance is secured. In this case, turn OFF the wiper switch, or change the set value of memory switch U105.
 - 2. When the height of the needle guard of the driver is not proper, abrasion of the blade point of inner hook or stitch skipping will be caused.

I

1-3. Height and angle of the work clamp



WARNING :

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

(1) Height of the work clamp (S type)



- Loosen screws ② located on the right and left sides of feed bracket ①. Moving cloth presser stopper ③ to the direction B will increase the height of feeding frame.
- After the adjustment of the height of the feeding frame, securely tighten the screws 2.







- 3) If the feed bracket is moved to its forward end for adjusting the work clamp height etc., when the power to the sewing machine is in the OFF state, top end of wiper interferes with head of work clamp foot setscrew . So, be careful.
- As long as the power to the sewing machine is in the ON state, no interference between top end of wiper and head of work clamp foot setscrew
 occurs when the feed bracket is moved within its X-Y movable range.

(2) Height of the work clamp (L type)



WARNING :

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



- Loosen screws ② located on the right and left sides of feed bracket ①. Moving cloth presser stopper ③ to the direction B will increase the height of feeding frame.
- After the adjustment of the height of the feeding frame, securely tighten the screws 2.

(3) Angle of the work clamp



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



If the feeding frame is in parallel to the throat plate, the pressure of the front side of the feeding frame is likely to drop. Consequently, be sure to adjust the inclination of the feeding frame so that the front side of the feeding frame is slightly lower than its rear side.

- Loosen screw ① and nut ③. Turning adjustment screw ② clockwise will lower the front side of the feeding frame.
- 2) After the adjustment of the degree of angle, tighten screw **1** and nut **3**.

If the feeding frame is excessively tilted, troubles may result such as the feeding frame fails to go up. As reference of the adjustment, the rear end of the feeding frame should be approximately 3 mm above the throat plate surface when the front end of the feeding frame meets the throat plate surface.

1-4. Adjusting the vertical stroke of the intermediate presser

▲^{₩/}

WARNING :

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



- ^t Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state.
- 1) Remove face cover.
- 2) Turn handwheel to make the needle bar come down to its lowest point.
- 3) Loosen hinge screw **1** and move it to the direction **A** to increase the stroke.
- 4) When marker dot (2) is aligned with the right side of the outer periphery of washer (2), the vertical stroke of the intermediate presser becomes 4 mm. And, when marker dot (2) is aligned with the right side of the outer periphery of the washer, it becomes 7 mm. (The vertical stroke of the intermediate presser is factory-set to 4 mm at the time of delivery.)

By removing the rubber plug in the face plate cover, adjustment can be performed without removing the face plate cover.

1-5. The moving knife and counter knife

WARNING :

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



- Loosen adjusting screw ① so that a clearance of 18.5 mm is provided between the front end of the throat plate and the top end of thread trimmer lever, small ③. To adjust, move the moving knife in the direction of arrow.
- 2) Loosen setscrew (5) so that a clearance of 1.0 mm is provided between needle hole guide (2) and counter knife (4). To adjust, move the counter knife.



After the origin retrieval, press the SET READY key on the Operation panel to verify that a clearance of 0.5 mm or more is provided between the top end of moving knife and the top end of needle thread clamp. If a clearance of 0.5 mm or more cannot be secured, adjust the position of moving knife within 18.5 \pm 0.5 mm to secure the specified clearance.

1-6. Needle thread clamp device

WARNING : Turn OFF t

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





When thread is caught at top end ① of the thread clamp, thread clamp becomes incomplete and sewing trouble at the sewing start will be caused. Thread waste and lint are likely to accumulate in the sections which are shown in the circles. The sections should therefore be periodically cleaned by removing the throat plate and by blowing air through hole ③ by removing rubber plug ②.

1-7. Thread breakage detector plate



- Adjust so that thread breakage detector plate 1 is always in contact with thread take-up spring 2 in the absence of needle thread. (Slack : approx. 0.5 mm)
- Whenever the stroke of thread take-up spring has been changed, be sure to readjust thread breakage detector plate . To make this adjustment, loosen screw .



Adjust so that thread breakage detector plate **1** does not touch any adjacent metallic parts other than thread take-up spring **2**.

1-8. Draining waste oil)



When polyethylene oiler **①** becomes filled with oil, remove polyethylene oiler **①** and drain the oil.

1-9. Amount of oil supplied to the hook Loosen setscrew **1** and remove setscrew **1**. 1) When screwing in adjustment screw 2, 2) the amount of oil of oil pipe, left 4 can be 4 reduced. 3) After the adjustment, screw in setscrew **1** and fix it. 1. The state of standard delivery is the ſ L position where **3** is lightly screwed I in and returned by 4 turns. I 2. When reducing the amount of oil, I I do not screw in the screw at once. I I Observe the state for approximate-I ly half a day at the position where **③** is screwed in and returned by I 2 turns. If reducing is excessive, L worn-out of the hook will result. J

1-10. Replenishing the designated places with grease



When the sewing machine has been used for one year, the pop-up error screen notifying the time to replenish grease for the specified greasing locations will be displayed.

Once this error screen is displayed, press ENTER button

replenish grease.

When the screen is restored to the information display screen after the completion of greasing, the time for replacement of the oil will return to the default setting.

(1) Location where exclusive grease is provided

Two different types of JUKI Grease A **1** and B **2** and an exclusive coupling and setscrew for JUKI Grease B are provided at the location as shown in the illustration. Add grease periodically (when the grease runout warning No. E220 is displayed on the panel or once a year) to points to be applied with grease.

If grease has decreased due to cleaning of the sewing machine or any other reasons, be sure to immediately add grease.

Do not use Grease A and Grease B with mixed. Be sure to use the specified grease without fail. The grease filling coupling and setscrew should be used when applying JUKI Grease B. They should not be used for JUKI Grease A.





When the grease runs short, be sure to purchase new grease.

		Spare parts No.
JUKI Grease A	10g tube	40006323
	100g tube	23640204
JUKI Grease B	10g tube	40013640

WARNING :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start or the sewing machine. In addition, attach the covers which have been removed before operation back in place.

(2) Points to be applied with JUKI Grease A



Use grease tube A (part number: 40006323) supplied with the unit for adding grease to any points other than the points specified below. If any grease other than the specified one is used, the related components can be damaged.

Adding grease to the oscillating rock shaft gear section



 \circ

O

 Tilt the sewing machine and remove grease cover ①.

1

J

- Apply JUKI Grease A onto the gear section of oscillating rock shaft and the periphery of the hook driving shaft.
- 3) Apply JUKI Grease A also onto the felt surface of grease cover **①**.





Adding grease to the needle bar upper and lower bushings section, slide block section and intermediate presser bar lower bushing section





- 1) Open the frame cover to remove intermediate presser auxiliary spring B **1**.
- Apply JUKI Grease A onto periphery of needle bar ②. Turn the sewing machine by hand to apply grease onto the entire periphery of the needle bar.

Turn needle bar upper bushing grease cover ③ in the direction of arrow A to add grease through the grease inlet. After completion of the procedure, turn the needle bar upper bushing grease cover in the direction of arrow B to return to its home position.

Remove setscrew **4** from the needle bar lower bushing grease hole. Put JUKI Grease A through hole **5** and tighten setscrew **4** to fill inside the busing with the grease.

- Apply JUKI Grease A also onto groove section () of the slide block.
- 4) Apply JUKI Grease A onto periphery of intermediate presser bar **⑦**.

Remove setscrew ③ from the intermediate presser bar bushing grease hole. Put JUKI Grease A through inlet ④. Tighten screw ③ to fill inside the bushing with JUKI Grease A.



- 1. Do not wipe off the grease applied onto the periphery of needle bar inside the frame. If the grease has decreased due to cleaning, air blow or other reasons, apply grease again without exceptions.
- 2. When operating the sewing machine, turn the needle bar upper bushing grease cover in direction B to close grease inlet **①**.

(3) Points to be applied with JUKI Grease B



Use grease tube B (part number: 40013640) supplied with the unit for adding grease to any points other than the points specified below. If any grease other than the specified one is used, the related components can be damaged.

Adding grease onto the eccentric cam section



- 1) Open crank rod cover 1.
- Remove setscrew ③ from the grease inlet cover located at periphery of crank rod ②.
- 3) Fill coupling ④ with grease through JUKI Grease B tube ⑤.
- 4) Sink screw **()** supplied with the unit into the coupling to add the grease.
- 5) After adding the grease, securely tighten setscrew ③ which has been removed.



Adding grease onto the oscillating rock shaft pin section



- Tilt the machine head and remove the grease cover ①.
- Fill coupling supplied with the unit with grease through JUKI Grease B tube .
- 3) Remove setscrew (3) in oscillator gear (2) and screw in joint (4) into the screw hole.
- Sink screw supplied with the unit into the coupling to add the JUKI Grease B.
- 5) Securely tighten setscrew ③ which has been removed after replenishing with the grease.

Grease supplement to the face plate section



- 1) Open the face plate cover.
- 2) Add the JUKI Grease B onto the felt sections (3 locations), peripheral shoulder screw, fulcrums
 to and guide groove section 3.

Grease supplement to X guide shaft bearing



1) Apply JUKI Grease B onto X guide shaft **1** and presser plate **2**.

(4) Applying grease to other sections

Adding grease to X-feed gear section





Grease film on the feed gear is likely to run out when using the machine for sewing such a sewing shape that has continuous reverse-feed stitching as shown in the figure at the left. To keep the grease film on the feed gear, carry out the following two steps of procedure.

- Add JUKI-specified grease TEMPLEX N2 (JUKI part number: 13525506) to the gear section approximately at least once a month.
- ② Use the machine with the retainer correction mode (U91) activated. Another preventive measure is to manually move the feed gear in a complete stroke before turning the power ON, so as to spread the grease over the entire tooth surface of the gear to cover it with a grease film.

For the sewing shape as shown in the figure, only a part of the gear is continuously used. Apply the grease to the mesh of the gear which is used for sewing.

1-11. Troubles and corrective measures (Sewing conditions)

Trouble	Cause	Corrective measures	Page
 The needle thread slips off at the start of bar-tacking. 	 Stitches are slipped at the start. The needle thread remaining on the needle after thread trimming is too short. The bobbin thread is too short. Needle thread tension at 1st stitch is too high. Thread clamp is unstable (material is apt to be expanded, thread is hard to slide, thread is thick, etc.). Pitch at 1st stitch is too small. 	 Adjust the clearance between the needle and the shuttle to 0.05 to 0.1 mm. Set soft-start sewing at the start of bartacking. Correct the thread tension release timing of the thread tension controller No. 2. Increase the tension of the thread take-up spring, or decrease the tension of the thread take-up spring, or decrease the tension of the bobbin thread. Increase the clearance between the needle hole guide and the counter knife. Decrease the tension at 1st stitch. Decrease the number of rotation at 1st stitch at the sewing start. (Extent of 600 to 1,000 rpm) Increase the number of stitches of thread clamp to 3 to 4 stitches. Make the pitch at 1st stitch longer. Decrease the needle thread tension at 1st stitch. 	29 25,26 25 33 25 27 27 27 27 27
2. Thread often breaks or synthetic fiber thread splits finely.	 The shuttle or the driver has scratches. The needle hole guide has scratches. The needle strikes the intermediate presser foot. Fibrous dust is in the groove of the shuttle race. The needle thread tension is too high. The tension of the thread take-up spring is too high. The synthetic fiber thread melts due to heat generated on the needle. When taking up thread, thread is pierced with needle tip. 	 Take it out and remove the scratches using a fine whetstone or buff. Buff or replace it. Correct the position of the intermediate presser foot. Take out the shuttle and remove the fibrous dust from the shuttle race. Reduce the needle thread tension. Reduce the tension. Use silicone oil. Lower the needle bar height from the engraved marker line by a half of the line to as much as the line. Check the rough state of needle tip. Use the ball-pointed needle. 	33 25 26 43 29
 The needle often breaks. 	 The needle is bent. The needle strikes the intermediate presser foot. The needle is too thin for the material. The driver excessively bends the needle. 	 Replace the bent needle. Correct the position of the intermediate presser foot. Replace it with a thicker needle according to the material. Correctly position the needle and the shuttle. 	21 33 29
4. Threads are not trimmed.(Bobbin thread only)	 The counter knife is dull. The difference in level between the needle hole guide and the counter knife is not enough. The moving knife has been improperly positioned. The last stitch is skipped. Bobbin thread tension is too low. Flopping of cloth 	 Replace the counter knife. Increase the bend of the counter knife. Correct the position of the moving knife. Correct the timing between the needle and the shuttle. In crease the bobbin thread tension. Lower the intermediate presser height of the last stitch. 	33 29 25

Trouble	Cause	Corrective measures	Page
5. Stitch skipping often occurs.	 The motions of the needle and shuttle are not properly supproprized 	 Correct the positions of the needle and shuttle. 	29
	 2) The clearance between the needle and shuttle is too large. 3) The needle is bent. 4) The driver excessively bonds the 	 Correct the positions of the needle and shuttle. Replace the bent needle. Correctly position the driver. 	29 21 20
	 (a) The diver excessively bends the needle. (b) Length of needle thread remaining after thread trimming is too long. (In the case of stitch skipping within the 2nd to 10th stitch from the beginning of sewing) 	 Reduce the thread take-up spring pressure or increase the thread tension applied by the thread tension controller No. 1. 	25,26
6. The needle thread comes out on the wrong side of the material.	 The needle thread tension is not high enough. The tension release mechanism fails to work properly. The needle thread after thread trimming is too long 	 Increase the needle thread tension. Check whether or not the tension disc No. 2 is released during bar-tracking. Increase the tension of the thread tonsion controllor No. 1 	25 25
	 4 Number of stitches is too few. 5 When sewing length is short (End of needle thread protrudes on the warms side of sewing product) 	 Turn OFF the thread clamp. Turn OFF the thread clamp. 	27 27
	(6) Number of stitches is too few.	 Use the lower plate, the hole of which is larger than the presser. 	
7. Thread end of the 1st stitch	① Stitch skipping at the 1st stitch	 Adjust the hook timing faster by a 1/2 stitch. 	
comes out on the right side of the material	(2) Needle used and thread used are thick in terms of the inner diameter of the intermediate presser	 Increase the inner diameter of intermediate presser. 	22
indendi.	 Intermediate presser is not properly positioned in terms of the needle. 	 Adjust the eccentricity between intermediate presser and needle so that needle enters in the center of intermediate presser. 	
8. Threads break at time of thread trimming.	 The moving knife has been improperly position. 	• Correct the position of the moving knife.	33
9. The thread clamp is entangled with needle thread.	 The needle thread at the sewing start is too long. 	 Tighten thread tension controller No. 1 and make the length of needle thread 40 to 50 mm. 	27
10. Uneven length of the needle thread	 The tension of thread take-up spring is too low. 	 Increase the tension of the thread take- up spring. 	26
11. The length of needle thread	 The tension of thread tension controller No. 1 is too low. 	 Increase the tension of thread tension controller No. 1. 	25
does not become short.	② The tension of thread take-up spring is too high.	 Decrease the tension of thread take-up spring. 	26
	③ The tension of thread take-up spring is too low and motion is unstable.	 Increase the tension of thread take-up spring and lengthen the stroke as well. 	26
12. The knotting section of bobbin thread at 2nd	 Idling of bobbin is large. The bobbin thread tension is too low. 	 A just the position of the moving knife. Increase the bobbin thread tension. 	33 25
stitch at the sewing start appears on the right side.	I he needle thread tension at 1st stitch is too high.	 Decrease the needle thread tension at 1st stitch. Turn OFF the thread clamp. 	25 27
13. Wiper fails to work. (Return is defective.)	 Needle entry of the last needle is the same as that of the sewing start, and the resistance of thread and cloth is large. 	 Shift the needle entry point of the last needle. 	

2. OPTIONAL

2-1. Table of Needle hole guide

Needle used	Needle hole guide			
Size	Part No.	Needle hole diameter	Application	
#09 to #11	B242621000C	ø 1.6	For knits (OP)	
#11 to #14 *1	B242621000A	ø 1.6	For light-weight to medium-weight materials (S type)	
#14 to #18 *2	B242621000B	ø 2.0	For medium-weight to heavy-weight materials (H type)	
#19 to #21	B242621000D	ø 2.4	For heavy-weight materials (OP)	
#1010#21	B242621000F	ø 3.0		
#22 to #25	B242621000G	ø 3.0 (with a counterbore)	For extra heavy-weight materials (OP)	
#18 to #25	B242621000H	ø 3.0 (eccentric hole)	For heavy-weight materials to prevent skip- stitching (OP)	

Needle used	Intermediate presser		
Size	Part No.	Size (øA × øB × H × L)	
#09 to #11	B1601210D0E (OP)	ø 1.6 × ø 2.6 × 5.7 × 37.0	
#11 to #14 *1	40023632 (Standard)	ø 2.2 × ø 3.6 × 5.7 × 38.5	
#14 to #18 *2	B1601210D0FA (OP)	ø 2.2 × ø 3.6 × 8.7 × 41.5	
#18 to #21	B1601210D0BA (OP)	ø 2.7 × ø 4.1 × 5.7 × 38.5	
#22 to #25		a 2 5 × a 5 5 × 5 7 × 29 5	
#18 to #25	D1001210D0CA (OP)	0 3.3 ^ 0 3.3 ^ 0.1 * 30.5	



* ¹ : Standard installed needle (DP \times 5 #14)

- * ² : Standard installed needle (DP × 17 #18)
- \cdot S type : Applicable count of thread : #80 to #20
- · H type : Applicable count of thread : #50 to #02
- \cdot (OP) means the optional.

2-2. Silicon oil tank



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



If you want to apply silicon oil or the like to the thread, use the silicon oil tank asm. 40097301 that is available as an optional device.

Secure the silicon oil tank asm. with supplied setscrews ① (SM4041055SP) and ② (SM4042055SP). To secure setscrew ②, tighten thread guide collar ③ (11315108), silicon oil tank thread guide ④ (40010414) and thread guide setscrew washer ⑤ (WP0501046SC) jointly. Install silicon oil tank thread guide ④ (40010414) so that it is positioned in parallel with silicon oil tank base ⑥ (40096982).

