

mitsubishi

Industrial Sewing Machine

Technical Information

Model LT2-250
(Auto-changer)

**Double-Needle
Lockstitch, Needle Feed,
Automatic Corner-Stitching
Machine with
Automatic Undertrimmer**

ET-020A



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SPECIFICATIONS

●Sewing machine head

Model	LT2-250-M1ATW		LT2-250-A1AT	LT2-250-B1AT	
Application	Light to medium-heavy		Medium-heavy	Medium-heavy to heavy	
Max. speed spm	3,500	3,000	3,000	3,000	2,500
Stitch length mm (inch)	4 (5/32)	5 (3/16)	5 (3/16)	6 (15/64)	7 (9/32)
Presser foot stroke Automatic/manual mm (inch)	9/7 (11/32 / 9/32)				
Needle	DP x 5 #14, 135 x 5 #14, 134 Nm 90		DP x 5 #16, 135 x 5 #16, 134 Nm 100	DP x 5 #18, 135 x 5 #18, 134 Nm 110	
Hook (for thread trimmer use)	Horizontal type standard hook with bobbin case (with thread slack pre- vention spring)		Horizontal type large-sized hook with bobbin case (with thread slack prevention spring)		
Bobbin	Aluminum bobbin for thread trimmer use				
Lubrication system	Automatic lubrication				
Compensation sewing	Provided				
Touchback	Provided				
Wiper	Provided		Not provided		
Needle gauge mm (inch)	Standard—6.4 (1/4), Optional—3.2, 4.8, 8, 9.5, 12.7 (1/8, 3/16, 5/16, 3/8, 1/2)				

- Note: ● For feed dog, throat plate, slider plate, bobbin case and bobbin, use those for thread trimmer application.
● Bobbin should be of good quality that is not deformed.

●Applicable Equipment

Table	TLT-A353-T3 TLT-A363-T3	TLT-B353-T3 TLT-B363-T3
Motor	CA-Z402E	CB-Z402E
Control box	LE-MDF	

●Control Panel

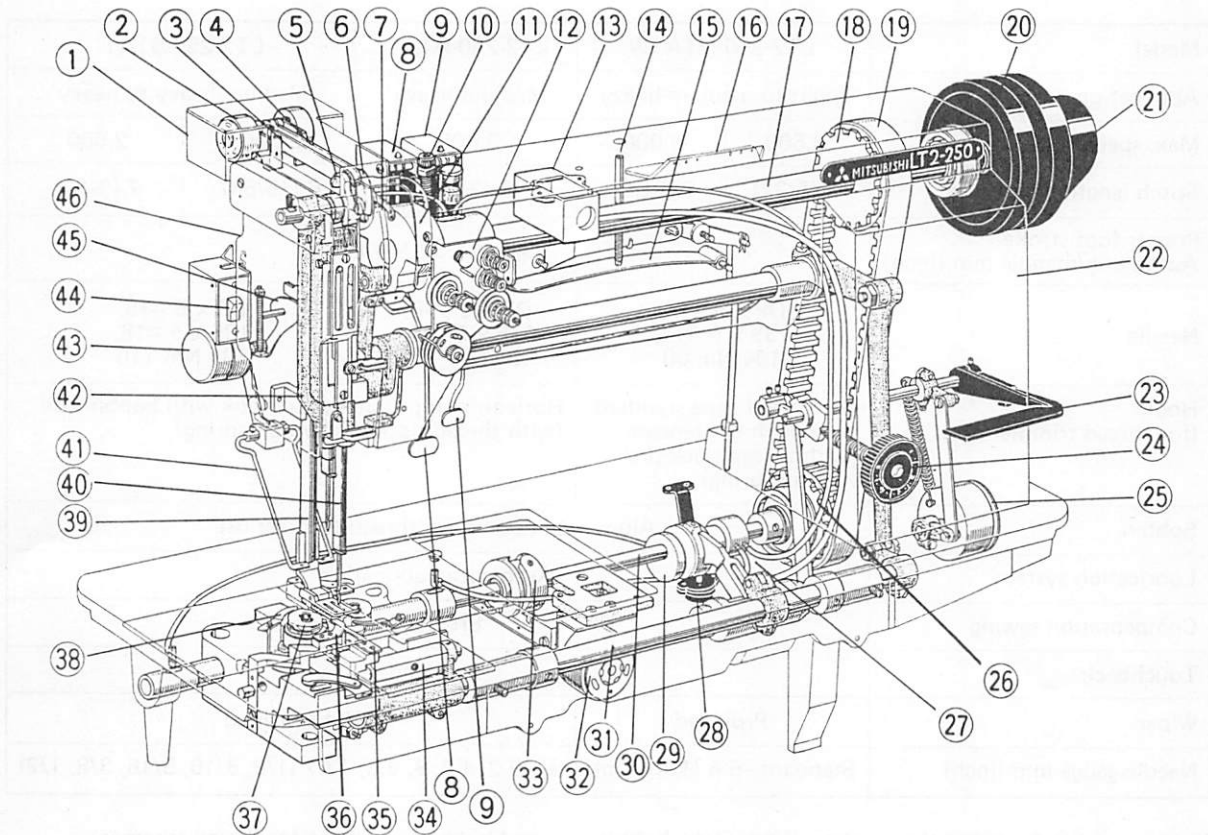
Model	LE-CNA
Backtacking	4-dial system (0 to 9 stitches), start and end
Number of corner-stitching steps	Max. 8
Number of corner stitches	0 to 9 stitches
Process return	Possible
Continuous single-needle stitching	Possible for right and left needles

●Auto-Changer Kit

Model	LE-CNA-KM (Standard)	LE-CNA-KA (Option)
Automatic presser foot lifter	LE-FM-2 (Electromag- netic type)	LE-FA (Pneumatic type)
Control panel	LE-CNA	
Knee switch	LE-FM-CFT	

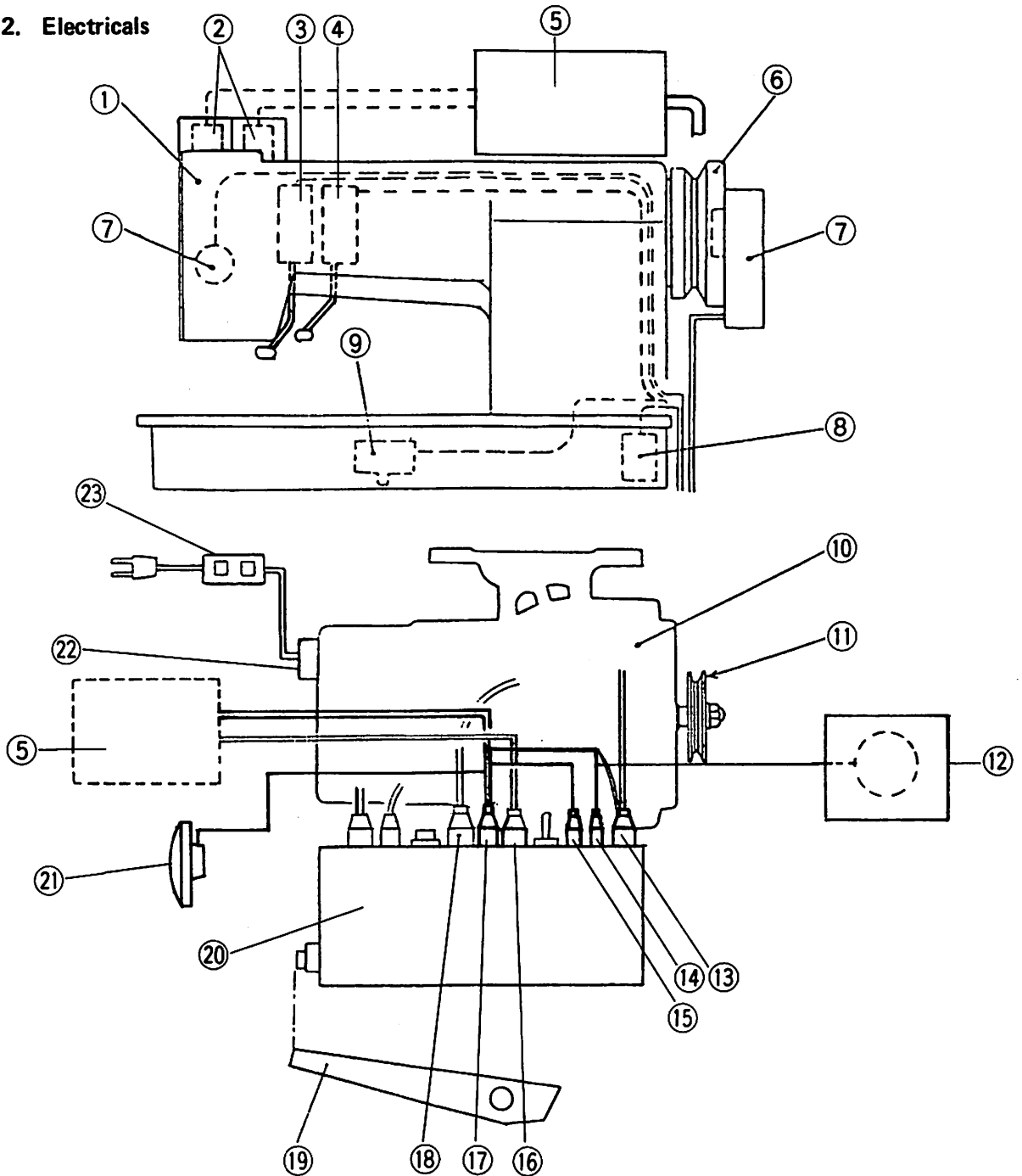
NAME OF MAJOR PARTS

1. Sewing machine head



- | | | |
|------------------------------------|---------------------------------|------------------------|
| 1 Solenoid cover | 17 Arm shaft | 33 Thread trimmer cam |
| 2 Needle selection solenoid | 18 Timing belt pulley (upper) | 34 Feed bar |
| 3 Lever (left) | 19 Timing belt | 35 Movable knife |
| 4 Lever (right) | 20 Balance wheel | 36 Fixed knife |
| 5 Cam (left) | 21 Synchronizer | 37 Bobbin case |
| 6 Cam (right) | 22 Arm | 38 Opener |
| 7 Take-up lever | 23 Reverse-stitch lever | 39 Presser foot |
| 8 Touchback switch | 24 Stitch length adjusting dial | 40 Needle bar |
| 9 Compensation stitching switch | 25 Reverse-stitch solenoid | 41 Wiper |
| 10 Lubricant adjusting screw | 26 Timing belt pulley (lower) | 42 Needle bar guide |
| 11 Crank | 27 Lubricator | 43 Wiper solenoid |
| 12 Needle thread tension regulator | 28 Filter | 44 Wiper switch |
| 13 Oil tank | 29 Feed rock cam | 45 Presser foot lifter |
| 14 Pressure adjusting screw | 30 Hook shaft | 46 Face plate |
| 15 Pressure plate spring | 31 Feed rock shaft | |
| 16 Thread guide | 32 Thread trimmer solenoid | |

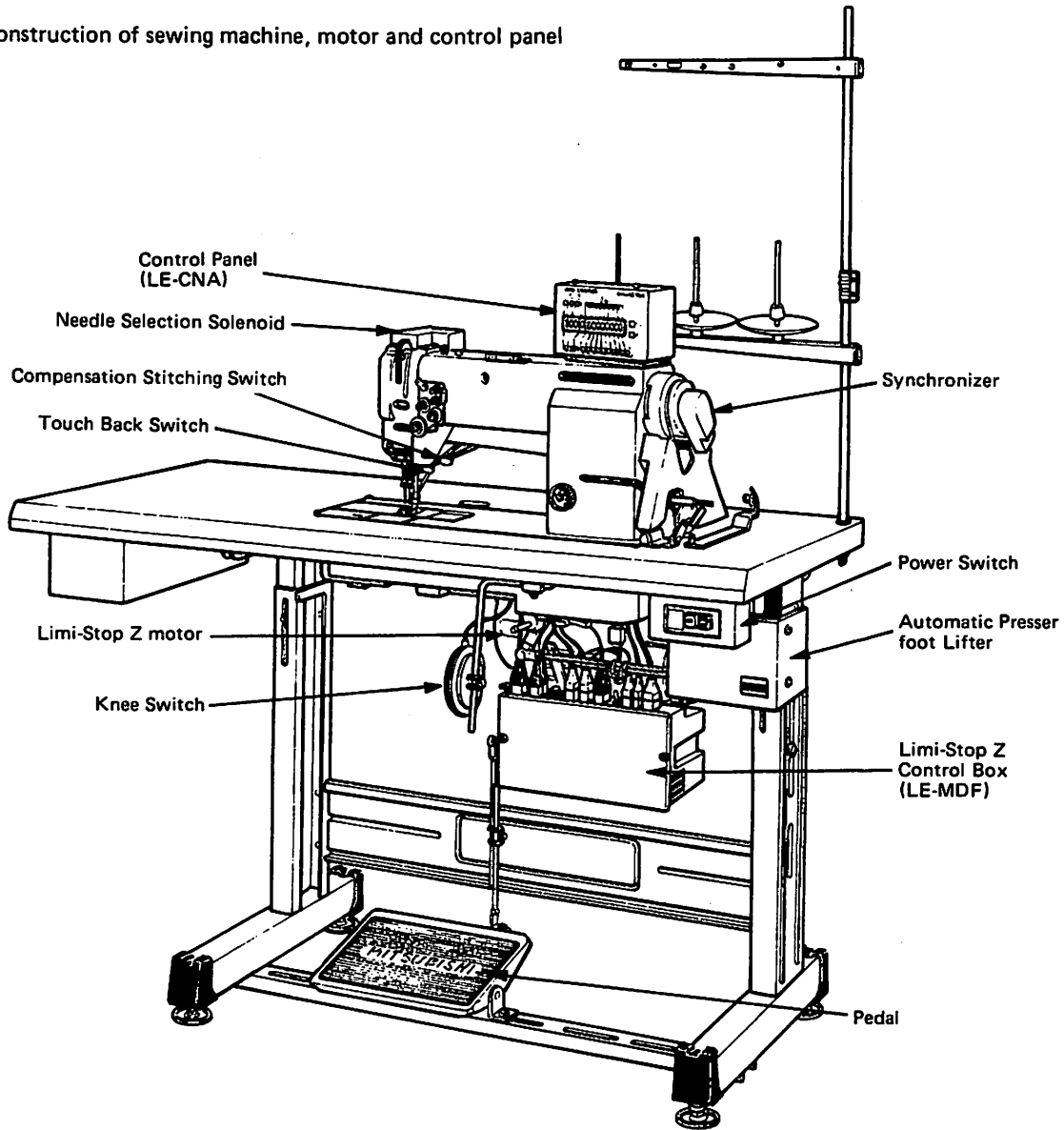
2. Electricals



- | | | |
|-----------------------------------|---|----------------------------|
| 1 Sewing machine | 9 Thread trimmer solenoid | 16 Operation box connector |
| 2 Needle change solenoid | 10 Motor | 17 Option 1 connector |
| 3 Touchback switch | 11 Drive pulley | 18 Synchronizer connector |
| 4 Compensation stitching switch | 12 Automatic presser foot lifter
(LE-FM-2) | 19 Pedal |
| 5 Control panel (LE-CNA) | 13 Machine connector | 20 Control box (LE-MDF) |
| 6 Balance wheel | 14 Presser foot connector | 21 Knee switch (LE-FM-CFT) |
| 7 Synchronizer | 15 Option 2 connector | 22 Phase reversing plug |
| 8 Reverse-stitch control solenoid | | 23 Power switch |

PREPARATION FOR OPERATION

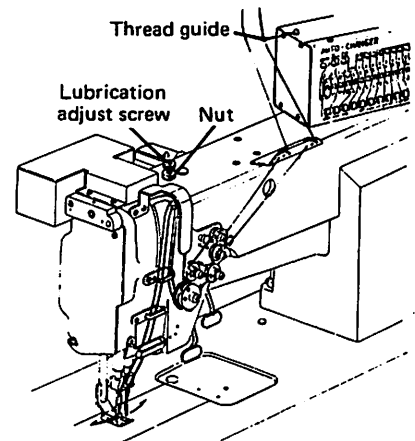
- Construction of sewing machine, motor and control panel



1 Threading with needle thread

Pass only the right-hand needle thread through the thread guide as shown in the right figure.

For other details of threading, refer to the description on page 6 of Instruction Manual of LT2-230/250.



2 Adjustment of lubrication to thread take up lever

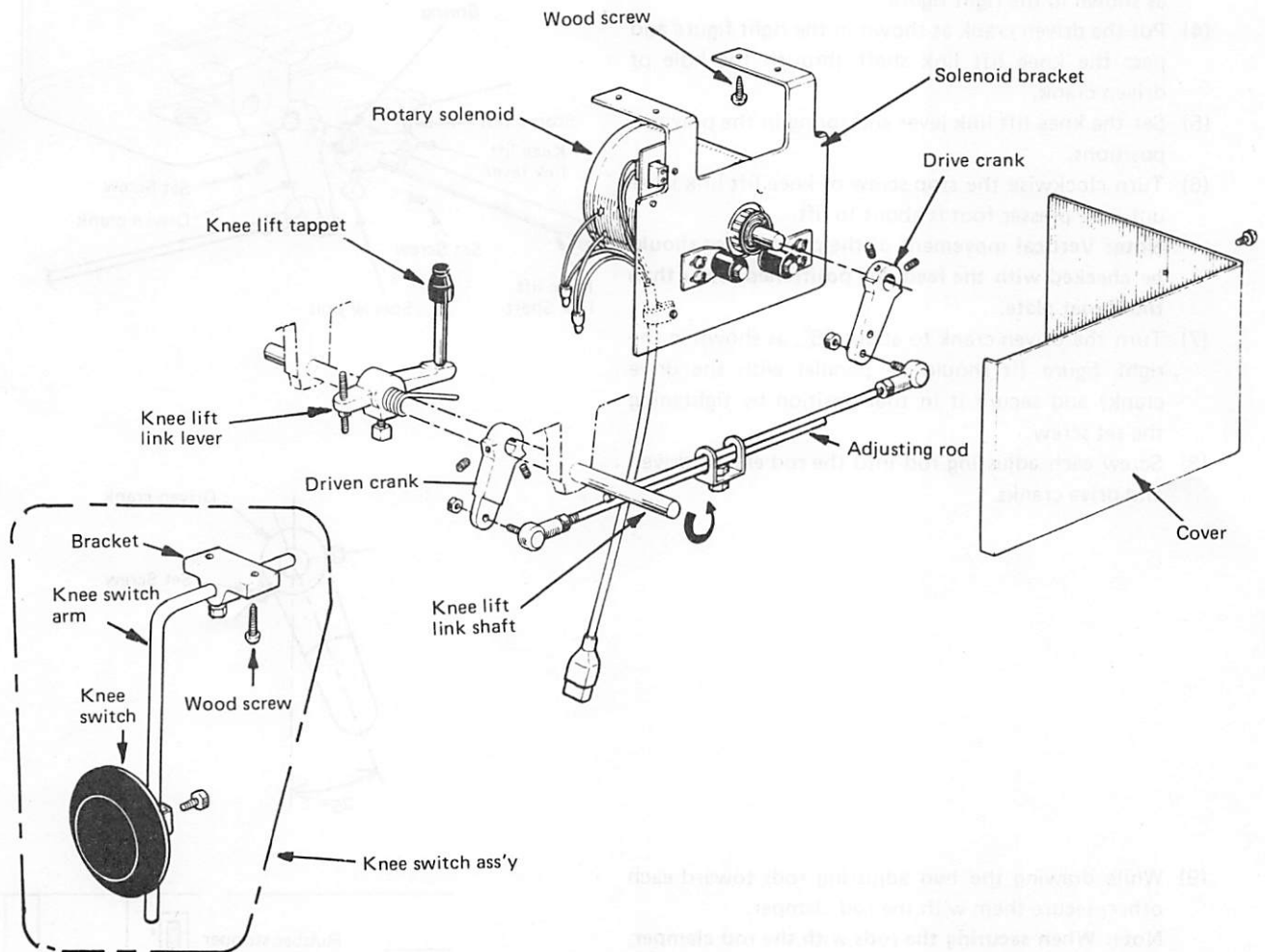
To restrict oiling to the takeup lever and needle bar, loosen the nut shown in the right figure and turn clockwise the lubrication adjust screw.

- (1) Lubrication adjust screw fully tightened Min. oiling to takeup lever
- (2) Lubrication adjust screw returned (counter-clockwise) by 4 turns from the fully tightened position Max. oiling to takeup lever

PREPARATION FOR OPERATION

3 Installation of solenoid-driven presser foot lifter and knee switch

(Assembly breakdown schema)

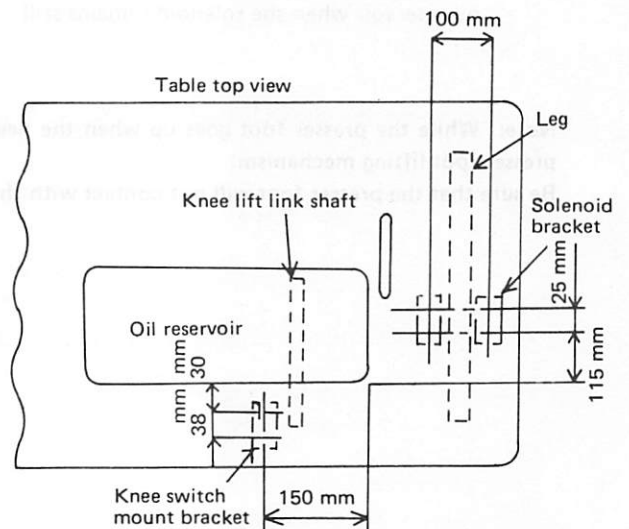


(Installation of knee switch)

- (1) Install the bracket to the table, as illustrated using wood screws. (See the right figure)
- (2) Install the knee switch arm and knee switch to the bracket.

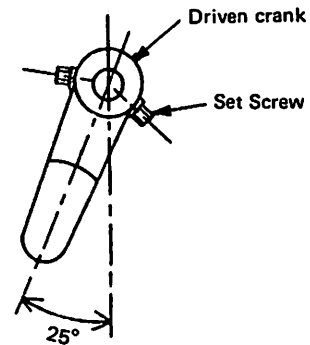
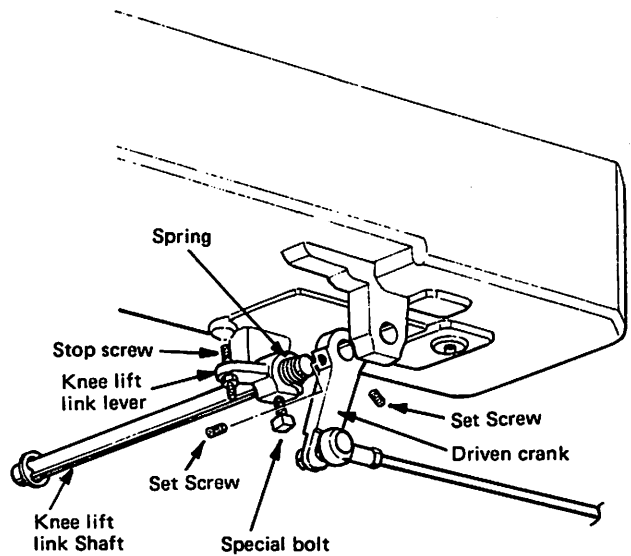
(Installation of solenoid-driven presser foot)

- (1) Install the solenoid bracket to the table, as illustrated using wood screws. (See the right figure)
- (2) Remove the knee switch pad from the knee lift link shaft (the lift pad is not used).

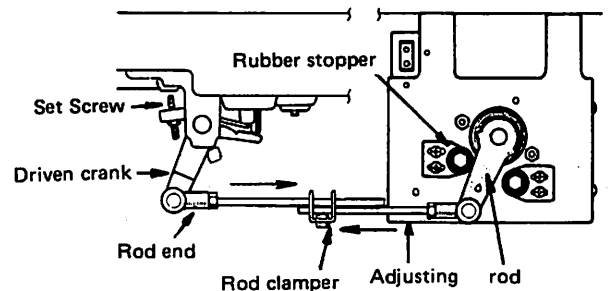


PREPARATION FOR OPERATION

- (3) Loosen the special bolt used to secure the knee lift link lever to the knee lift link shaft and remove the spring. Then draw the knee lift link shaft backward, as shown in the right figure.
- (4) Put the driven crank as shown in the right figure and pass the knee lift link shaft through the hole of driven crank.
- (5) Set the knee lift link lever and spring in the previous positions.
- (6) Turn clockwise the stop screw of knee lift link lever until the presser foot is about to lift.
Note: Vertical movement of the presser foot should be checked with the feed dog positioned lower than the throat plate.
- (7) Turn the driven crank to about 25° , as shown in the right figure (it should be parallel with the drive crank) and secure it in that position by tightening the set screw.
- (8) Screw each adjusting rod into the rod end of driven and drive cranks.



- (9) While drawing the two adjusting rods toward each other, secure them with the rod clamber.
Note: When securing the rods with the rod clamber, make sure the drive crank is in contact with the left rubber stopper.
- (10) Be sure to loosen the stop screw of knee lift link lever so that it does not come into contact with the oil reservoir when the solenoid remains still.



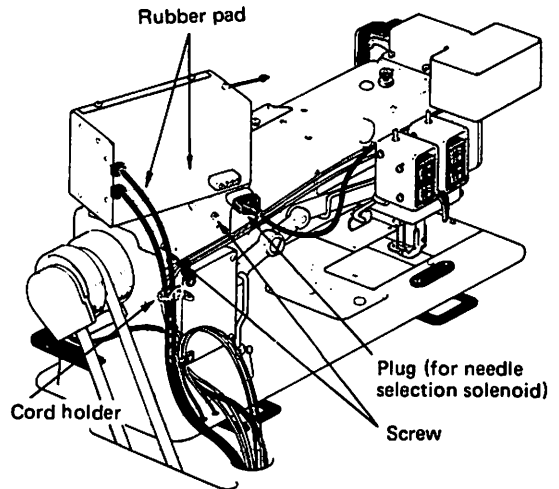
Note: While the presser foot goes up when the needles stop at DOWN position, after assembling the automatic presser foot lifting mechanism.

Be sure that the presser foot will not contact with the needles or needle socket.

PREPARATION FOR OPERATION

4 Installation of control panel

- (1) Install the control panel on the top of machine head, as shown in the right figure.
(To install, while lightly holding down the control panel on the top of machine head to slightly compress the rubber pads, tighten screws.)
- (2) Plug the needle selection solenoid cord into the corresponding receptacle provided in the control panel.
- (3) Bind all cords with the furnished cord holder, as shown in the right figure.

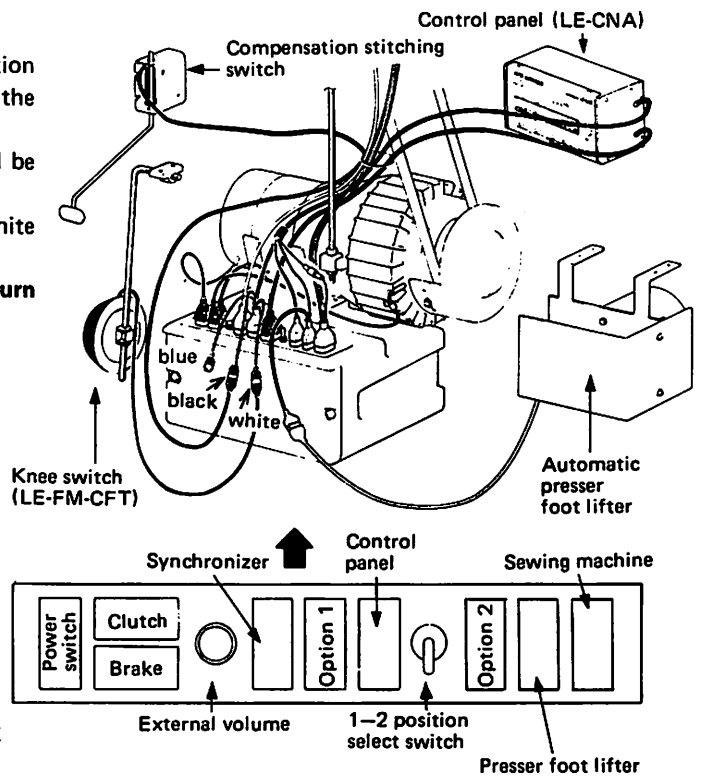


5 External wiring

Connect the automatic presser foot lifter, compensation stitch switch, knee switch and control panel to the control box, as shown in the right figure.

- (1) The compensation stitching switch cable should be connected to 2-pin black connector.
- (2) The knee switch should be connected to 2-pin white connector.

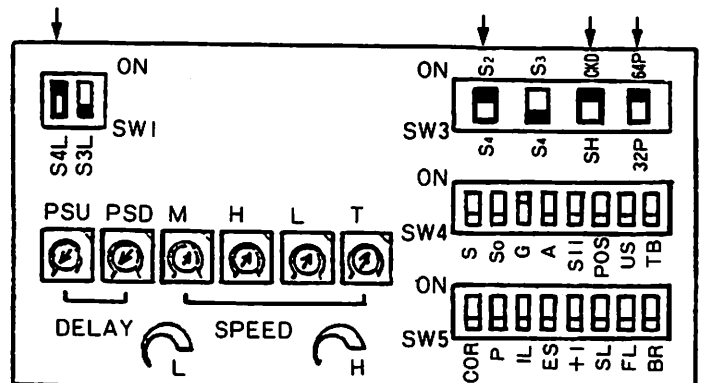
Note: Before plugging or unplugging, be sure to turn off the power switch for safety.



6 Setting of DIP switches in the control box

Set the DIP switches S4L, S2, CKD and 64P in the control box to "ON", as shown in the right figure.

The delay control VR "PSD" should be set to the position fully turned counter-clockwise.



PREPARATION FOR OPERATION

7 Power cable connection

1. Connector

Each connector (plug) should be completely set to the corresponding receptacle after checking the mating direction.

2. Lamp leads

- (1) For installation of a work lamp to the sewing machine, lamp leads are provided at the back of motor.

Remove the insulation tape and insulator from the lamp leads and connect them to the wires of lamp. After the connection, be sure to protect the connected wires with insulation tape.

- (2) For work lamp, use that of 6V 15–20W.
- (3) When lamp is not used, properly insulate two lamp leads.

3. Power cable

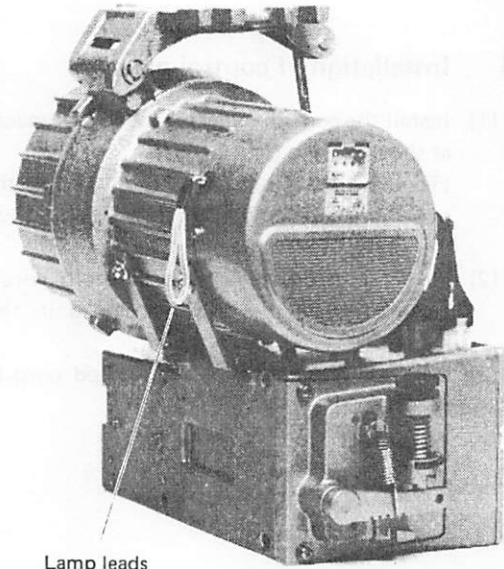
(The power cable connection is same as standard clutch motor cable connection.)

- (1) When a three-phase motor is used, connect U phase to the red lead, V phase to the white lead, and W phase to the black lead. The green lead should be grounded to the "GND" terminal without fail.
- (2) The power fuse should be that having a rating of 10A for three-phase power source, and 20A for single-phase power source.
- (3) The fuse used in the control box should be that having a rating of 8A.

4. Direction of rotation

Direction of rotation of the motor can be reversed by inverting the phase reversing plug in the motor end cover (remove the plug, turn it 180° and set to the plug socket again).

For single-phase motor, operate the switch after the motor has completely stopped (it will take about 2 min). Be sure to fully set the plug in the socket.



8 Adjustment of needle bar stop position

When the pedal is kicked down by heel, the machine stops with the timing mark (B) positioned in line with the first timing mark (C) on the balance wheel. All sewing machines have been factory-adjusted.

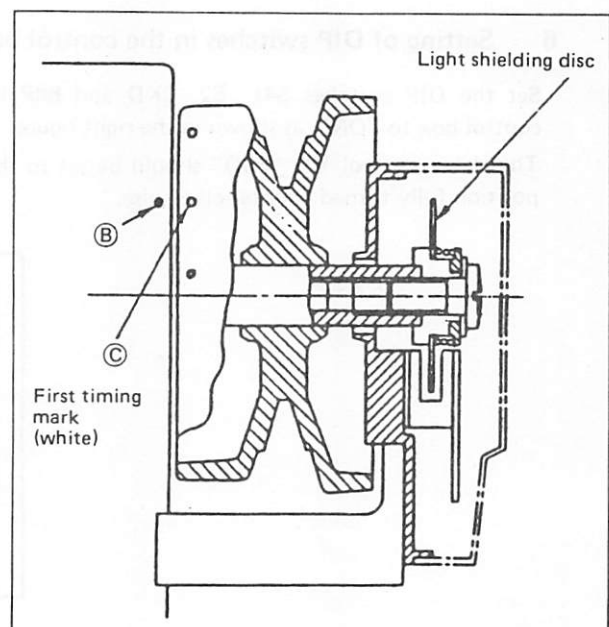
However, if the timing marks deviate larger than 3mm from each to other, adjust light shielding disc position as follows:

(Preparation for adjustment)

1. Disconnect the plug (12 pins) of cable led from the machine head.
2. Remove the synchronizer cover.
3. Run the machine and stop with the needle at UP position. After the completion of the preparation, start the following adjustment:

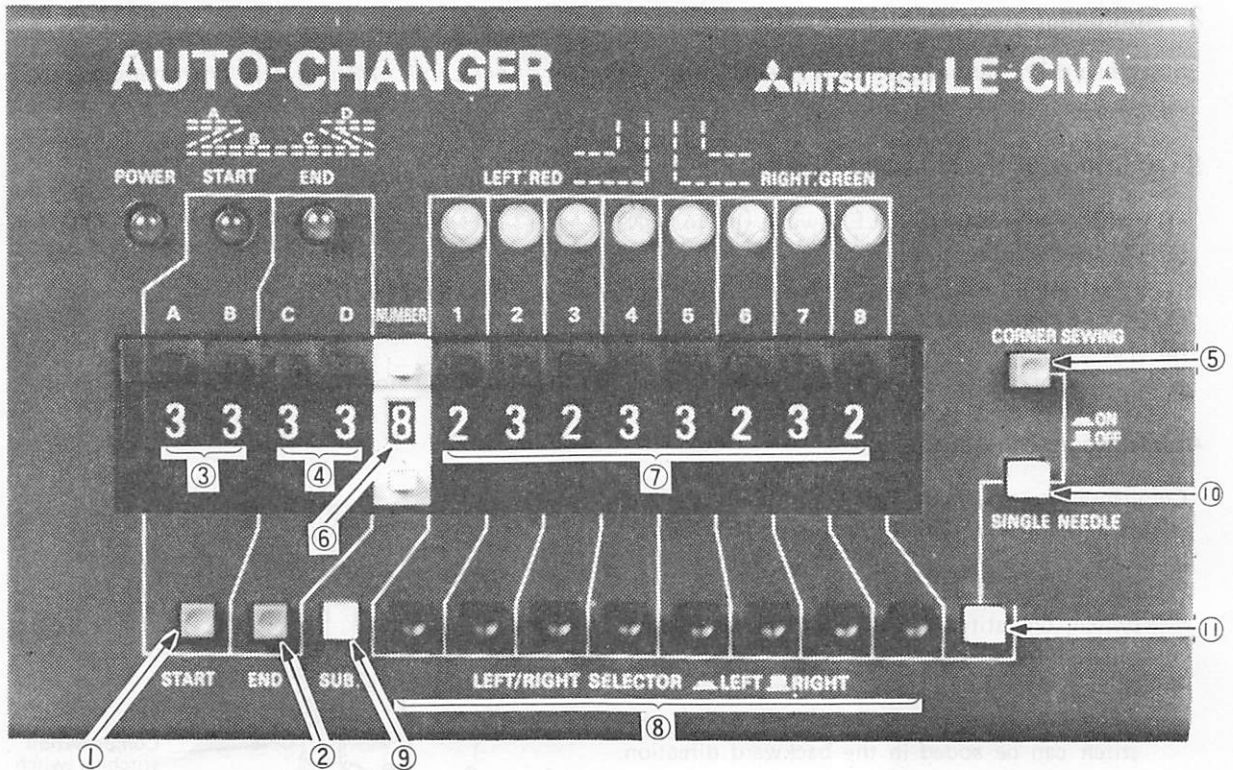
(Adjustment)

1. While holding the light shielding disc by one hand, loosen set screw A and turn the balance wheel to bring the timing mark (B) in line with timing mark (C). After the adjustment, be sure to tighten the set screw.
2. Repeat pedaling operation (toe down and heel down) several times to make sure the needle can stop exactly at all times.
3. Then set the plug (12 pins) coming from the machine head into the receptacle.

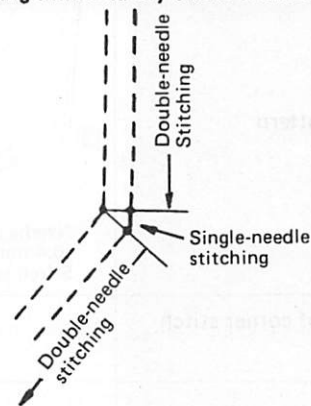






OPERATION FOR AUTOMATIC CORNER STITCHING

1 Setting of switches and counters on the control panel



- (1) Set the start backtacking "START" switch ① to "ON" and set number of forward stitch "A" and backward stitch "B" on counter ③ .
- (2) Set the end backtacking "END" switch ② to "ON" and set number of forward stitch "C" and backward stitch "D" on counter ④ .
- (3) Set the "CORNER SEWING" switch ⑤ to "ON".
Note: When this switch is "OFF", usual double-needle stitching is possible.
- (4) Set the "NUMBER" (number of corner stitching steps) within a range from 1 step to 8 steps on counter ⑥ .
 - The number of the next corner stitching steps is displayed by LED.
 - When all preset steps are completed, the counter is reset to "1".
- (5) Set number of stitches to be completed with single-needle stitching in each step on counter ⑦
Note: When number of single-needle stitches is set to "0", deep pedal heeling down causes single-needle one stitch and, after the fabric is turned, double-needle stitching immediately starts without single-needle stitching. (See the right figure)





- (6) Set the direction of turn at each end of corner stitching step on LEFT/RIGHT SELECTOR switch. (Maximum eight turns may be set.)
 - The direction of turn is displayed by LED colour
 - For leftward turn (), set switch  red LED will light.
 - For rightward turn (), set switch  green LED will light.

OPERATION FOR AUTOMATIC CORNER STITCHING

2 Retracing of corner stitching step

Every one depression of the "SUB" switch causes retracing of one corner stitching step. When steps are retraced, be sure to check the position by LED.

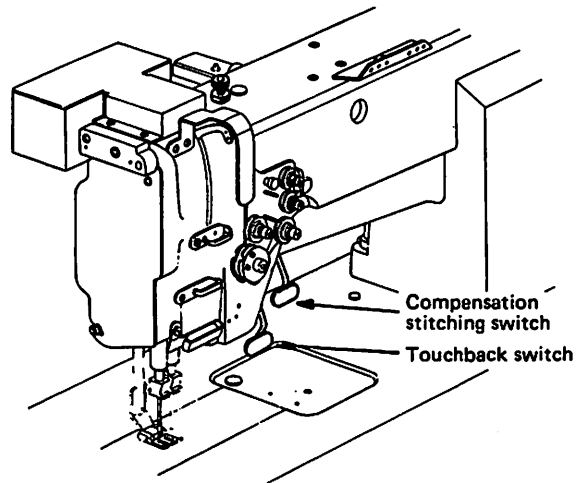
3 Continuous single-needle stitching

- (1) Set the "SINGLE NEEDLE" switch (10) to "ON".
- (2) To select the left needle or the right needle, set switch (11).
 - To stop the left needle, depress switch  red LED will flicker.
 - To stop the right needle, depress switch  green LED will flicker.
- (3) Toe down the pedal to start continuous single-needle stitching.
- (4) To disengage continuous single-needle stitching, set the switch (10) to "OFF" and toe down the pedal.

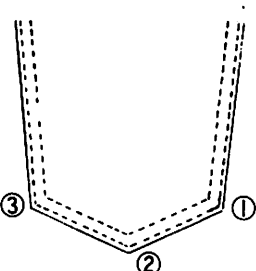
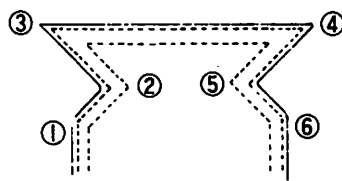
4 Compensation stitching

Compensation stitching is made before starting corner stitching, or when one stitch is added in corner stitching.

- (1) By once depressing the compensation stitch switch, one stitch can be added in the forward direction.
- (2) By depressing the compensation stitch switch while holding down the touchback switch, one stitch can be added in the backward direction.



5 Example of corner stitching patterns

Stitching pattern	 <p>Needle gauge 1/4" (6.4 mm) Stitch length: 3.2 mm</p>			 <p>Needle gauge 1/4" (6.4 mm) Stitch length: 3.2 mm</p>					
	NUMBER of corner stitching steps			NUMBER of corner stitching steps					
Step	1	2	3	1	2	3	4	5	6
Number of corner single-needle stitches	1	1	1	1	2	5	5	2	1
Corner stitching direction	LEFT	LEFT	LEFT	LEFT	RIGHT	LEFT	LEFT	RIGHT	LEFT

OPERATION FOR AUTOMATIC CORNER STITCHING

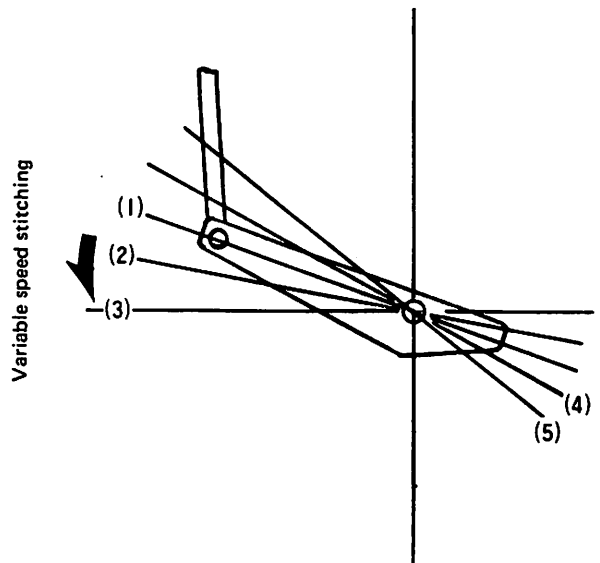
6 Stitching procedure

(Standard specification Pedal is deeply heeled down for corner stitching.)

- (1) Shallowly toe down the pedal to lift the presser foot.
- (2) Put fabrics in position.
- (3) For start backtacking and double-needle stitching, toe down the pedal.
- (4) Corner stitching is accomplished in the order ② ~ ⑤ shown below (stitching is repeated for the preset number of steps).

Note: When the present number of steps is completed, the counter is reset to "1".

- (5) When the knee switch is set to "ON", end backtacking is done and the threads are trimmed.
- (6) When the knee switch is held at "ON", the presser foot goes up.
- (7) Remove the fabrics.



- (1) Neutral
- (2) Shallow toe down (inching)
- (3) Deep toe down
- (4) Shallow heel down (presser foot goes up)
- (5) Deep heel down (corner stitching)

Operation

Stitching	① Start backtacking and double needle stitching	② Single-needle stitching with fixed number of stitches → Presser foot goes up.	③ Fabrics are turned → Presser foot goes down.	④ Single-needle stitching with fixed number of stitches	⑤ Double-needle stitching	⑥ End backtacking and thread trimming
Pedal operation	Pedal toe down	Pedal deeply → heel down	Continued → Neutral	Pedal toe down		Knee switch "ON"
Stitching pattern						

Note: Do not turn off the power during corner stitching.

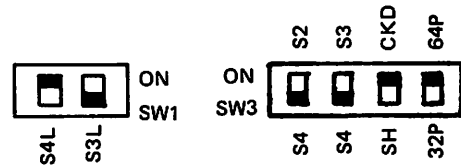
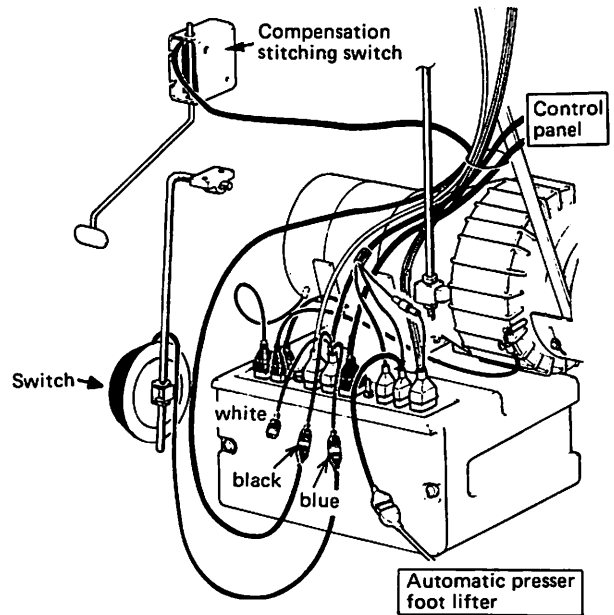
If the power is turned off during corner stitching, double-needle stitching may not be resumed by toeing down the pedal. If the power is interrupted by mistake, start and continue single-needle stitching as in 3 on the previous page described to resume double-needle stitching.

AUTOMATIC CORNER STITCHING SPECIAL OPERATION PROCEDURE

● Besides the previously described standard operation procedure, automatic corner stitching may be made in the following way:

1 Corner stitching . . . Knee switch operation . . .

- (1) For this operation, the automatic presser foot lifter, compensation stitch switch, knee switch and control panel should be wired as shown in the right figure.
- (2) Set the DIP switches "S4L", "CKD" and "64P" in the control box to "ON" as shown in the right figure.
- (3) For corner stitching, perform the following operation in the following order:
 Corner stitching . . . Knee switch operation
 Thread trimming . . . Deep pedal heeling down
 Presser lifter UP . . . Shallow pedal heeling down



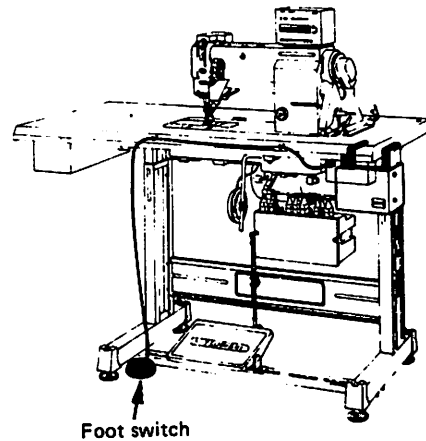
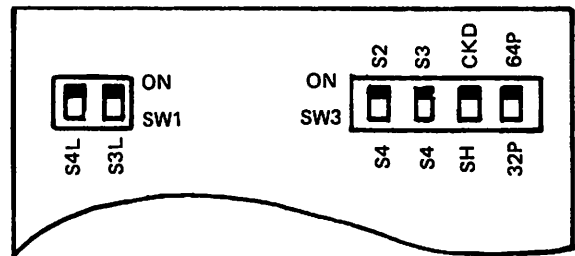
Stitching	① Start backtacking and double needle stitching	② Single-needle stitching with fixed number of stitches → Presser foot goes up.	③ Fabrics are turned → Presser foot goes down.	④ Single-needle stitching with fixed number of stitches	⑤ Double-needle stitching	⑥ End backtacking and thread trimming
Pedal operation	Pedal toe down	Knee switch ON →	Continued → Neutral	Pedal toe down		Pedal deeply heel down
Stitching pattern						

AUTOMATIC CORNER STITCHING SPECIAL OPERATION PROCEDURE

2 Corner stitching . . . Shallow pedal heeling operation

- (1) The wiring does not differ from that for standard corner stitching.
- (2) The DIP switches "S4L", "S3L", "S2", "S3", "CKD" and "64P" in the control box should be set to "ON", as shown in the right figure.
- (3) Install the foot switch (option), as shown in the next figure. The foot switch is used to lift the presser foot in the middle of stitching.
- (4) For corner stitching, perform the following operation in the following order:

- Corner stitching . . . Shallow pedal heeling down
- Thread trimming . . Knee switch operation
- Presser foot lifting at start of stitching
- Knee switch operation or shallow pedal heeling
- Presser foot lifting in the middle of shallow stitching
- Foot switch operation



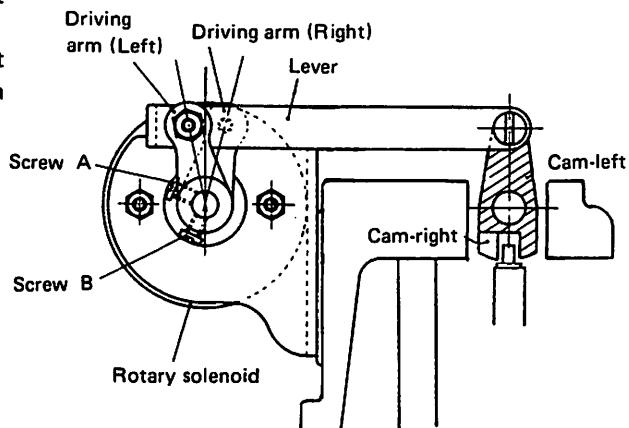
Stitching	① Start back-tacking and double needle stitching	② Single-needle stitching with fixed number of stitches → Presser foot goes up.	③ Fabrics are turned → Presser foot goes down.	④ Single-needle stitching with fixed number of stitches	⑤ Double-needle stitching	⑥ End backtacking and thread trimming
Pedal operation	Pedal toe down	Pedal shallow → heel down	Continued → Neutral	Pedal toe down		Knee switch "ON"
Stitching pattern						

Note: Foot switch (LE-CFT-3) is optionally available.

HOW TO USE THE SEWING MACHINE HEAD

1 Needle bar changing mechanism

- If changing needle bars does not go well, remove the solenoid cover and check the cams for their normal position.
- For regular double-needle stitching, the cams (left and right) are to be set perpendicularly.
- If they get out of position largely, loosen the set screws; **A** on rotary solenoid shaft and **B** on driving arm, and adjust them correctly.



2 Others

For adjusting the machine body and thread trimmer, refer to the separate technical information LT2-230/250.

SETTING THE DIP SWITCHES IN CONTROL PANEL (LE-CNA)

As the following DIP switches are provided in the control panel LE-CNA, utilize them according to their purposes.

For reference, all these switches are turned OFF when shipped.

(1) CSH switch

When turned ON With the compensation stitching switch ON, compensation stitching can be done continuously at a low speed.

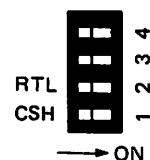
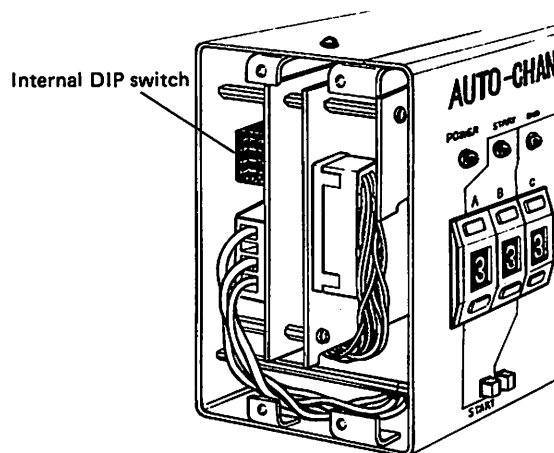
When turned OFF With the compensation stitching switch ON, compensation stitching can be done stitch by stitch at a low speed.

(2) RTL switch

When turned ON Even if thread trimming is done, the process of corner stitching remains at it stands without returning to the first step.

Used when more than one corner stitching patterns are applied to one stitching work.

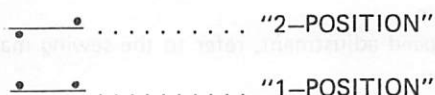
When turned OFF If thread trimming is done, the process of corner stitching returns to its first stage.



HOW TO USE THE CONTROL BOX (LE-MDF)

1 "1-2 POSITION" select switch operations

Needle stop position can be switched between "1-POSITION" and "2-POSITION" by operating the select switch on the switch panel.



NOTE: When automatic corner stitching, the select switch must be set at "2-POSITION".

When the thread trimmer signal is ON with the "1-2 POSITION" select switch set at "1-POSITION", thread is trimmed with one turn of the sewing machine.

2 Adjusting the stitching speed

1. Adjusting the maximum stitching speed (pedal fully pressed down by toe)

For setting the maximum stitching speed, two variable resistors are provided: one is in the control box, and the other on the control box panel.

The variable resistor on the control box panel permits change of the maximum stitching speed within the range preset by the other variable resistor (internal variable resistor "H").

The internal variable resistor "H" has been factory-adjusted as follows:

Poles	Internal VR "H" setting	External VR setting
2 poles	3000 spm	Max. speed ~ 250 spm

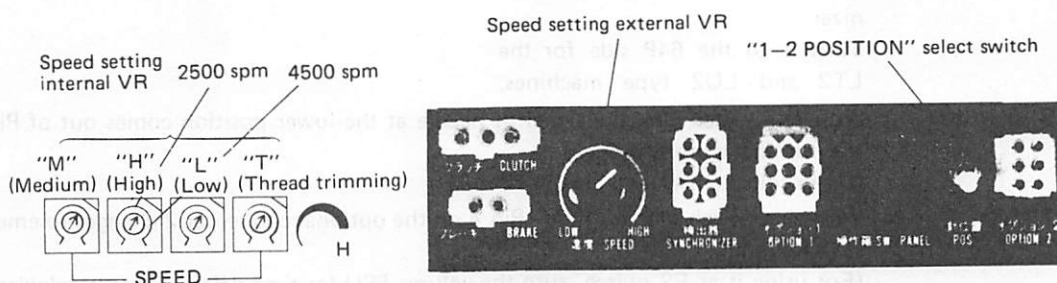
To change the external variable resistor setting range, the setting of internal variable resistor "H" must be change.

For reference, two marks (2500 rpm and 4500 rpm) are put on the internal variable resistor "H", as shown following.

When fine speed setting is required, use a tachometer or other suitable instrument.

CAUTION:

- (1) Stitching speed faster than that set on the two variable resistors cannot be achieved by increasing motor pulley diameter over a certain diameter.



(2) Adjusting the positioning speed (low and corner stitching speed)

..... (inching speed when the pedal is pressed down lightly.)

The positioning speed (low and corner stitching speed) can be adjusted by changing the setting of internal variable resistor "L".

The speed increases when the variable resistor is turned clockwise, and decreases when turned counter-clockwise.

The positioning speed is adjusted within a range from 160 rpm to 320 spm (it has been factory-adjusted at 250 spm).

HOW TO USE THE CONTROL BOX (LE-MDF)

(3) Adjusting the thread trimming speed

The thread trimming speed can be adjusted by changing the setting of internal variable resistor "T". The speed increases when the variable resistor is turned clockwise, and decreases when turned clockwise.

It has been factory-adjusted at 200 spm.

For change of the thread trimming speed adjustment, refer to the sewing machine setting up procedure or consult with our service agency.

(4) Adjusting the backtacking speed

When an optional switch panel, LD-C4, is used for backtacking, the backtacking speed (medium speed) can be set on internal variable resistor "M".

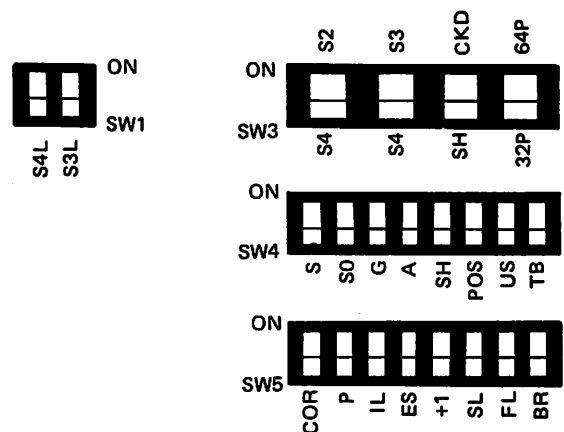
3 Optional function

With DIP switches and optional external connectors, optional function can be applied to the sewing machines for a upright working and other automatic machines. For further details, please consult with a shop for sewing machines.

(1) DIP switches.

Set the DIP switches referring to the following descriptions and the right figures.

- 1 S4L: The switch to forbid commanding of high speed operation through the optional connector 1.
- 2 S3L: The switch to forbid lifting of the presser foot by shallow pedal heeling operation.
- 3 S4/S3: With this switch ON, the signal of shallow pedal heeling operation comes out of Pin 9 on the optional connector 1.
- 4 S4/S2: With this switch ON, the signal of deep pedal heeling operation comes out of Pin 9 on the optional connector 1.
- 5 32P/64P: The switch to change over PG pulse number set on the synchronizer.
Turn it to the 64P side for the LT2 and LU2 type machines.
- 6 SH/CKD: With this switch ON, the signal of needle at the lower position comes out of Pin 6 on the optional connector 2.
(Open collector output: max. -10 mA)
- 7 ES: With this switch ON, a role of Pin 4 on the optional connector 2 changes to emergency stop function.
(For using it as ES switch, turn the volume PSU for time delay counterclockwise to the end position.)
- 8 S, P, BR: Machine with automatic undertrimmer, changing over of timing.
- 9 G: Gain switch (Keep it ON)
- 10 A: The high speed switch for upright machines. (Not necessary for the volume attached externally)
- 11 SH: The switch for one-shot function.
- 12 POS: 1-2 position (Thread trimming motion)
- 13 US: Needle lifting by the touchback switch.
- 14 TB: Back solenoid motion at thread trimming.



HOW TO USE THE CONTROL BOX (LE-MDF)

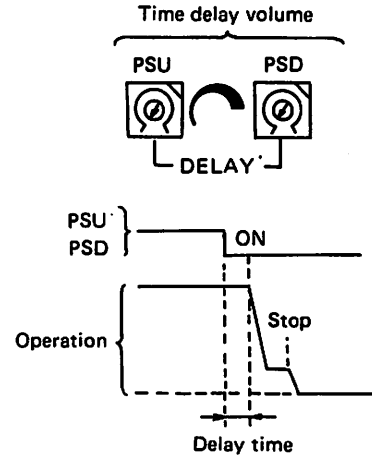
- 15 COR: Compensation stitching. (High speed switch)
- 16 IL: Releasing of interlock for thread trimming
- 17 +1] Slow start switch
- 18 SL]
- 19 FL: Releasing of automatic presser lifting by S₂.

	0	1 Needle	2 Needles
SL	OFF	ON	ON
+1	OFF	OFF	ON

(2) Internal variable resistors

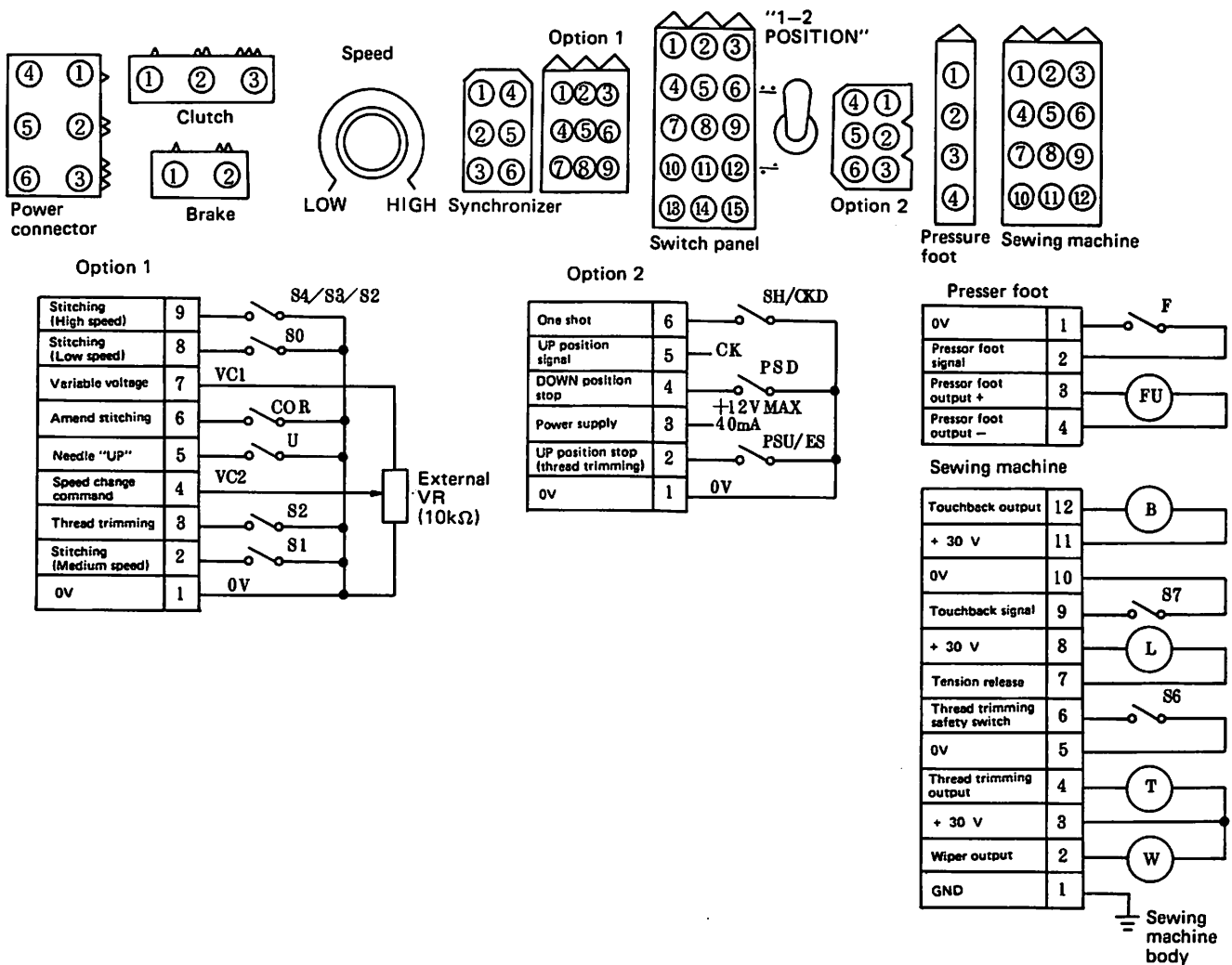
The time delay volume is provided within the LE-MDF type machine to get time delay with range of 0.05 ~ 3 sec.

The machine stops delaying by set time after the signal of PSU; stop preferentially at the up position and of PSD; at the down position, which are input by sensing the end of clothing with a photo switch or the like. For reference, it has been turned counterclockwise to the end (min.) at the factory.



(3) Option connector

Various external controls can be used by connecting external signal to the option connector. For contacts necessary for input signal, use reliable one.



HOW TO USE THE CONTROL BOX (LE-MDF)

- Note: (1) Function of Pin 9 of option connector 1 and Pin 2, 6 of option connector 2 are changed over with internal DIP switch. refer to 3 (1)
- (2) Take care not to drive more than 40 mA from 112V power source of option connector 2.
- (4) Reverse stitch with touchback
Operation with touchback (S₇) is applicable only during running.

4 Adjusting the pedaling forces

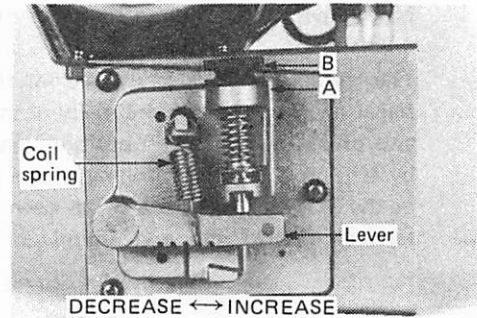
1. Adjusting the pedal pressing down force

Force necessary to pressing down the pedal can be changed by changing position of the spring hooked to the lever.



Note that too faint pedal pressing down force may make variable the lever stop position, resulting in malfunction.

2. Adjusting the pedal kicking back force

To adjust, loosen nut "A" and turn bolt "B" to adjust the spring pressure. After the adjustment, be sure to tighten the nut "A".



TROUBLESHOOTING TABLE

Item	Trouble	Cause	Remedy	Refer to
A	The motor does not run at all while the power is turned on (buzz is not heard).	The motor is not fed with the power supply.	1. Check the power supply connection. 2. Check the power switch and phase reversing plug for contact condition.	7 on page 8. 7 on page 8.
		Motor winding is open.	Replace the motor.	
B	The sewing machine runs though the motor control lever is not operated.	Control box is trouble.	Replace the control box.	
C	The sewing machine does not run at all.	The pedal switch and its lever are misaligned and S1 is not actuated.	Adjust the pedal switch and its lever.	4 on page 18.
		Clutch connector is disconnected.	Check the clutch connector setting.	
D	The motor runs in the reverse direction.	—	Remove the phase reversing plug, turn it 180° and set again.	7 on page 8.
E	Needle does not stop at DOWN position.	The pedal switch and its lever are misaligned and S1 remains closed.	Adjust the pedal switch and its lever.	4 on page 18.
		Synchronizer is trouble.	Replace the synchronizer.	8 on page 8.
F	The sewing machine is not braked, but stops after running with inertia.	Brake does not work.	1. Check the brake connector. 2. Replace the control box.	
G	The sewing machine stops with needle at UP position.	S2 is closed.	Adjust the pedal switch and/or its lever.	4 on page 18.
		Position switch is set at  position.	Set the position switch to  position.	1 on page 15.
		Synchronizer is installed improperly.	Adjust position of the synchronizer.	8 on page 8.
H	The pedal switch cannot be fully pressed down by toe.	Stopper and pedal switch are misaligned.	Properly align the stopper and pedal switch.	4 on page 18.

Item	Trouble	Cause	Remedy	Refer to
I	The motor runs faintly and stops.	Single-phase operation.	Check the power supply line (particularly, switch and plug).	
J	Needles do not stop at the same position at all times.	VR in the control box is not properly set. Brake gap is wide.	Properly set the VR in the control box. Correct the gap.	2 on page 15.
K	Corner stitching is impossible (inching is impossible).	Lever switch does not function.	Check alignment of the lever.	4 on page 18.
		DIP switches in the control box are set improperly.	Set the DIP switches properly by following the right column.	6 on page 7. (1 on page 12 and 2 on page 13.)
		Corner stitching switch is not close.	Close the corner stitching switch.	1 on page 9.
		Step setting is "0" or "9".	Properly set the steps (1-8 steps).	1 on page 9.
		The control box or the operation panel is defective.	Replace the control box or the operation panel.	
L	Single needle stitching is impossible.	The operation panel is defective.	Replace the operation panel.	
		Connector is disconnected.	Check the connector.	5 on page 7.
		Needle select mechanism is misaligned.	Adjust the needle select mechanism.	1 on page 14.
M	Corner stitching does not stop.	Synchronizer is trouble.	Replace the synchronizer.	
N	Automatic presser foot lifter does not work.	Connector is disconnected.	Check the connector.	5 on page 7.
		Automatic presser foot lifter mechanism is misaligned.	Adjust the mechanism.	
		DIP switch S3L is set at "ON".	Set the S3L to "OFF".	3 on page 16.
O	Double needle stitching does not occur even when corner stitching is completed.	Needle select solenoid is misaligned.	Align the solenoid.	1 on page 14.
		The operation panel is trouble.	Replace the operation panel.	

Item	Trouble	Cause	Remedy	Refer to
P	Single needle operation occurs through corner stitching is completed.	Needle select solenoid does not return to the original position.	Align the needle select solenoid.	1 on page 14.
Q	The sewing machine does not stop with the needles at UP position, but goes on running.	Synchronizer is trouble.	Replace the synchronizer.	8 on page 8.
R	The presser foot does not goes up after the needles stop at UP position.	Refer to the description at item N.		
		Operation panel is trouble.	Replace the operation panel.	
S	While number of stitches and needle select setting are changed, corner stitching does not correspondingly change.	Operation panel is trouble.	Replace the operation panel.	
T	Pedal heeling down is heavy.	Pedal switch lever part is not properly adjusted.		4 on page 18.



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