Service Manual

SINGER®

MACHINE

1669U 101
102
200
300
400
500

CONTENTS

1. PREFACE

This service manual is to explain the methods to be used for adjusting various parts of the machine and intended for use by mechanics and service personnel.

When adjusting the machine, it is recommended that you make reference not only to this "Service Manual" but also to the "Operator's Guide" and "Parts List" furnished with the machine.

2. NOTES ON SAFETY

- When exchanging gauge parts (e.g. needle, presser foot, needle plate, feed plate, bobbin) or when changing setting condition of the machine, during threading, when the machine is left unattended or during service work, be sure to turn main switch off or disconnect the main plug. In case it is necessary to check the machine or perform service work with the main switch on, care should be taken not to press the foot start inadvertently.
- General service work must be carried out only by appropriately trained persons.
- Repair, conversion and special maintenance work must be carried out only by technicians or persons with appropriate training.
- When safety devices have been removed, be sure to replace them and make sure they perform properly after completion of adjustment or service work.
- Work on electrical equipment must be carried out by electricians or appropriately trained persons.
- When exchanging parts, be sure to use Singer approved parts.
- When exchanging gauge parts (e.g. needle, presser foot, needle plate, feed plate, bobbin), be sure to use correct parts.
- Singer shall not be liable for any damages caused by modifications made on the part of the user.
- Work on parts and systems under electric current is not permitted, except as specified in regulations EN50110.
- Commissioning of the sewing head is prohibited until such time as the entire sewing unit is found to comply with EC regulations.

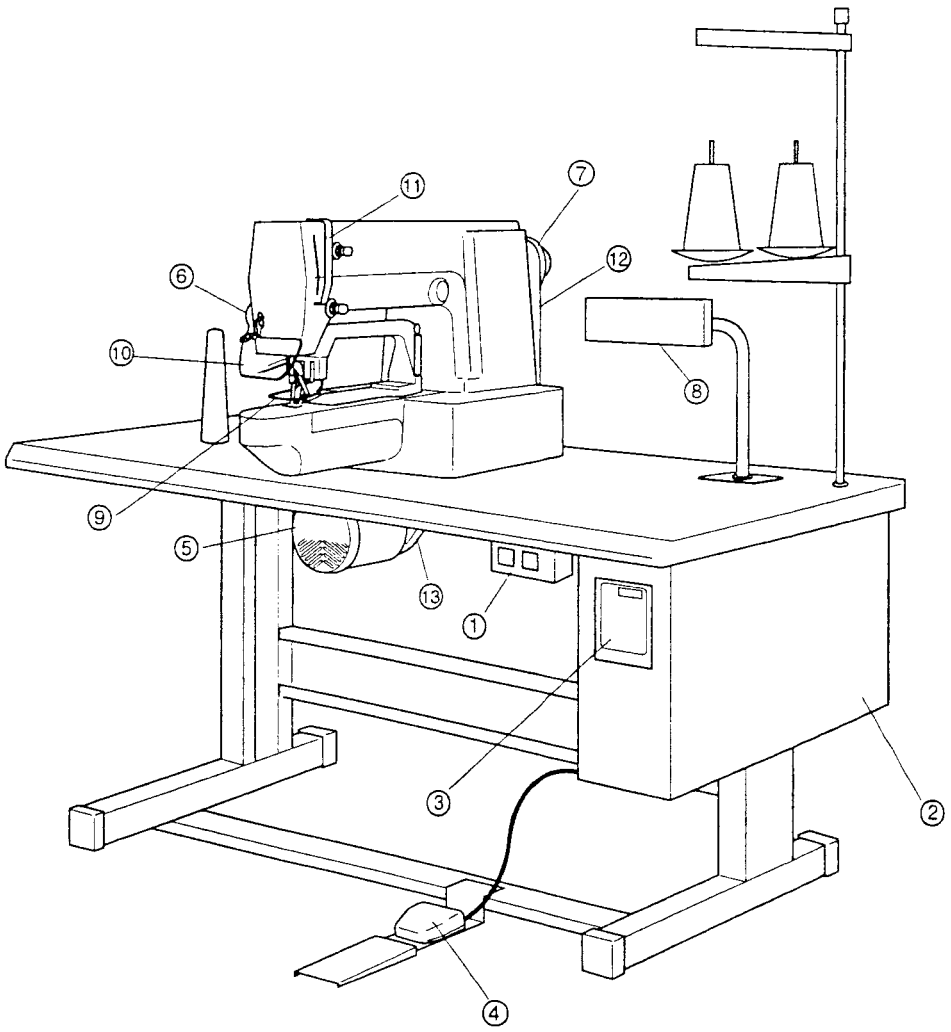
3. MEANINGS OF THE SYMBOLS

Danger spot!
Items requiring special attention

Danger of injury to operative or service staff.
Be sure to observe and adhere to these safety notes

Earth

4. PRINCIPAL PARTS



① Power switch ② Control box ③ Control panel ④ Foot switch
⑤ Motor ⑥ Manual tension releasing lever ⑦ Machine pulley
⑧ Table top console

Safety device

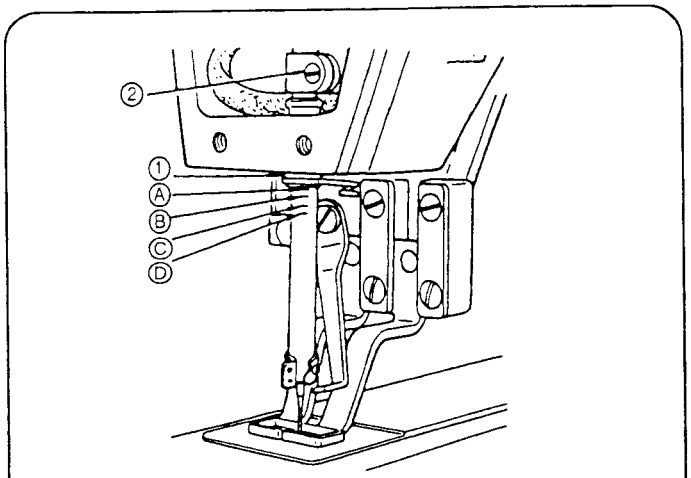
⑨ Finger guard ⑩ Eye guard ⑪ Thread take-up lever guard
⑫ Belt cover ⑬ Motor cover

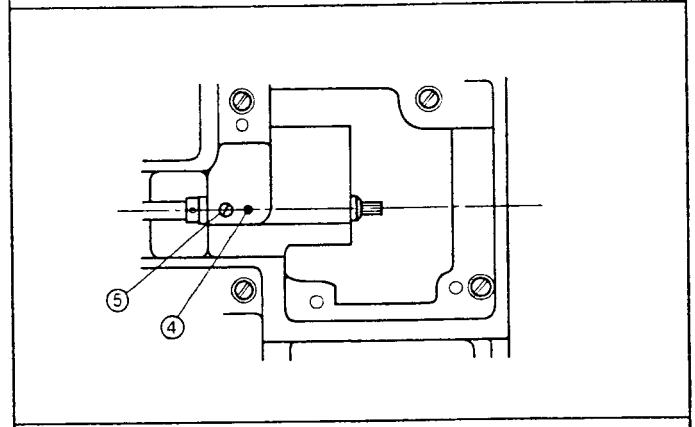
5. SPECIFICATION

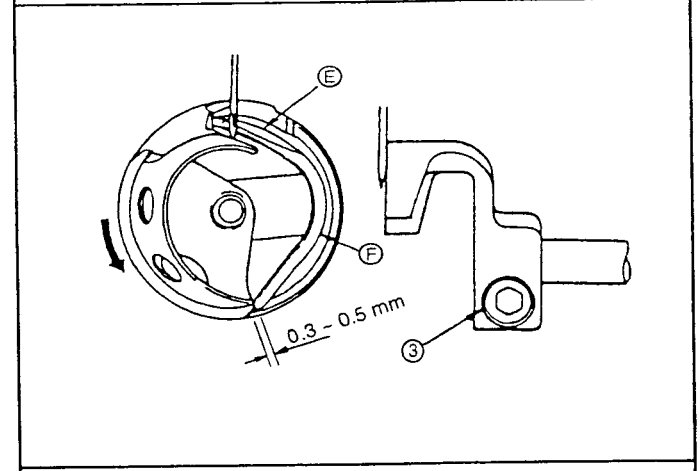
Stitch type	Single needle lockstitch
* Maximum speed	2700 SPM (stitch length 3.5 max.)
Sewing area (X-Y)	30.0 X 30.0mm
Feed system	Intermittent feed (pulse motor drive)
Stitch length	0.1 ~ 10.0mm
No. of stitches	Option (21, 28, 29, 36 and 42 already input)
Maximum No. of stitches	10,000 stitches
Clamp lift system	Electro-magnetic solenoid
Clamp foot lift	Max. 17 mm
Shuttle hook	Oscillating shuttle hook (1.7 times hook is used in 101. Standard hook is used in other machines)
Wiper	Standard fitting
Thread trimmer	Standard fitting
Bobbin counter	Indicates when to change bobbin
Data memorizing system	EEP ROM
No. of patterns memorized	22 patterns already input. (Additional patterns up to 64 max. can be input. Total No. of stitches 10,000 max.)
Motor	3 phase induction motor, 400W
Weight	Machine head approximately 51kg
	Control box 11kg
Electrical rating	Single phase 100V~115V, 3 phase 200V~240V
Application	For bar tacking on men's suit, slacks, jeans, work clothes, light weight underwear and other apparel.

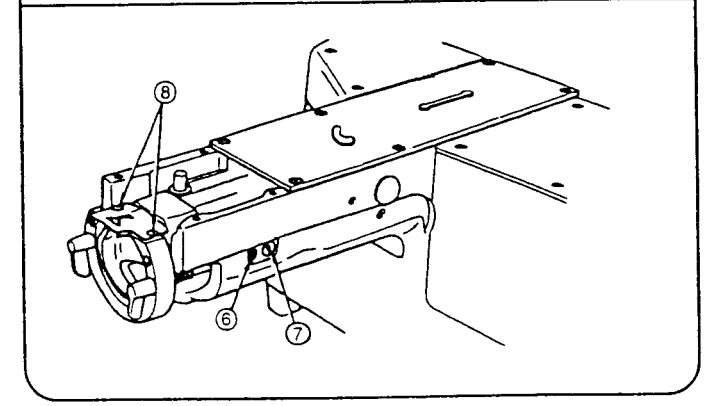
* Maximum efficient speed is determined upon nature of operation and type of material being sewn.

6. ADJUSTMENT OF NEEDLE AND SHUTTLE









1. **To Adjust Needle Bar Height**

   Turn driving wheel by hand until needle bar is at its lowest point. Loosen needle bar connecting link screw ② and move needle bar up or down until the highest mark Ⓐ on needle bar aligns with lower end of needle bar lower bushing ①. If Catalog No. 3355-01 needle is used, align mark Ⓒ on needle bar with lower end of needle bar lower bushing.

2. **To Adjust Timing of Needle and Shuttle**

   Raise needle bar from its lowest point by turning driving wheel with hand and align the second mark Ⓑ on needle bar with end of needle bar lower bushing ①. Loosen screw ③ and turn shuttle body in the arrow direction so that the center of needle aligns with shuttle point. If Catalog No. 3355-01 needle is used, align mark Ⓓ on needle bar with lower end of needle bar lower bushing.

3. **To Adjust Needle and Shuttle Driver**

   Turn driving wheel by hand and align shuttle point with the center of needle. Loosen screw ④ and turn oscillating shaft bushing adjusting stud ⑤ so that needle contacts with shuttle driver. If shuttle driver does not properly contact needle, needle and shuttle point will interfere causing damage to the parts. If the contact is too heavy, it will cause skip stitching.

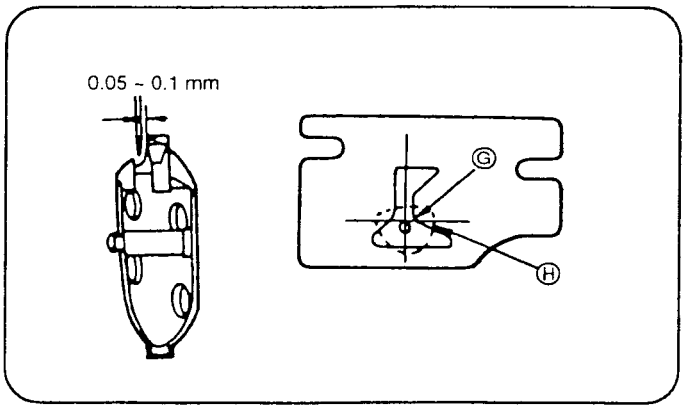
4. **Adjustment of Shuttle Body and Driver Rotational Direction Clearance**

   Tap part Ⓔ and Ⓕ, and adjust so that clearance between shuttle body and driver in the rotational direction is 0.3 ~ 0.5mm.

5. **To Adjust Clearance Between Needle and Shuttle Point**

   Turn driving wheel by hand and align shuttle point with the center of needle. Loosen set screw ⑥ and turn shuttle race body adjusting stud ⑦ so that clearance between needle and shuttle point is 0.05 ~ 0.1mm.

Switch off the machine.

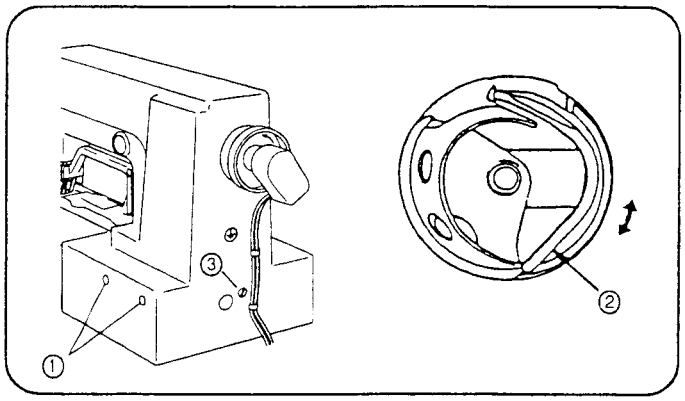


6. To Adjust Shuttle Bobbin Cap Location

Loosen two screws ⑧, move and adjust shuttle bobbin cap so that needle location at penetration is equal in the left and right direction, and back of needle is even with corner Ⓖ in the back and forth direction. Care must be taken as when shuttle bobbin cap is out of position either in left and right or back and forth direction, needle thread will be caught in shuttle. If there should be any bruises at location Ⓗ, this will be causes for bobbin thread breakage and so remove bruises with emery cloth and polish with green rouge.

Switch off the machine.

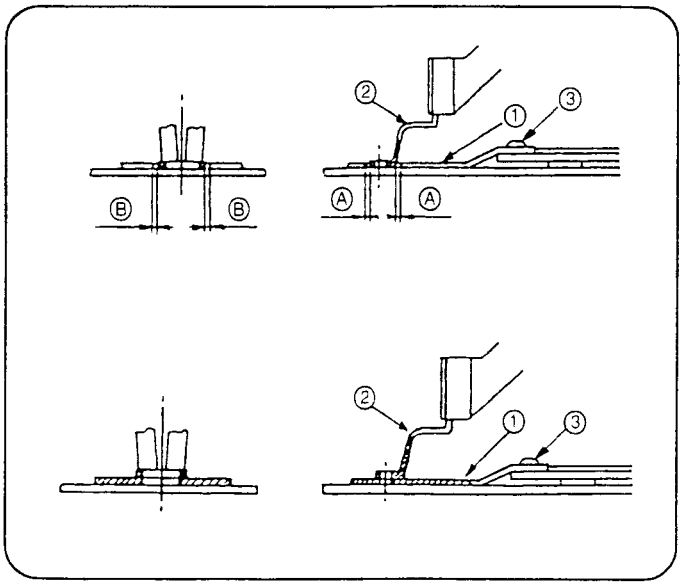
7. ADJUSTMENT OF OSCILLATING SHAFT GEAR BACKLASH



Loosen set screw ①, turn and adjust oscillating rock shaft eccentric hinge pin ③ so that when shuttle driver ② is turned by hand in the rotating direction, play at the end of driver is less than 0.05mm.

Switch off the machine.

8. ADJUSTMENT OF FEED PLATE LOCATION



For Light Material

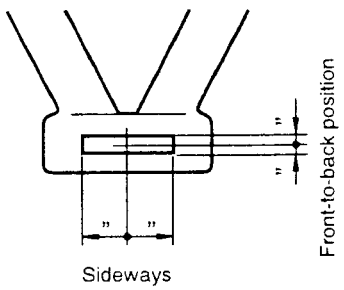
Loosen screws ③ and adjust so that each of the clearances Ⓐ (front and back direction) and each of the clearances Ⓑ (left and right direction) between opening in feed plate ① and arch clamp foot ② are even.

For Heavy Material

Loosen screws ③ and adjust so that openings in feed plate ① and arch clamp foot ② match both in front and rear, left and right direction.

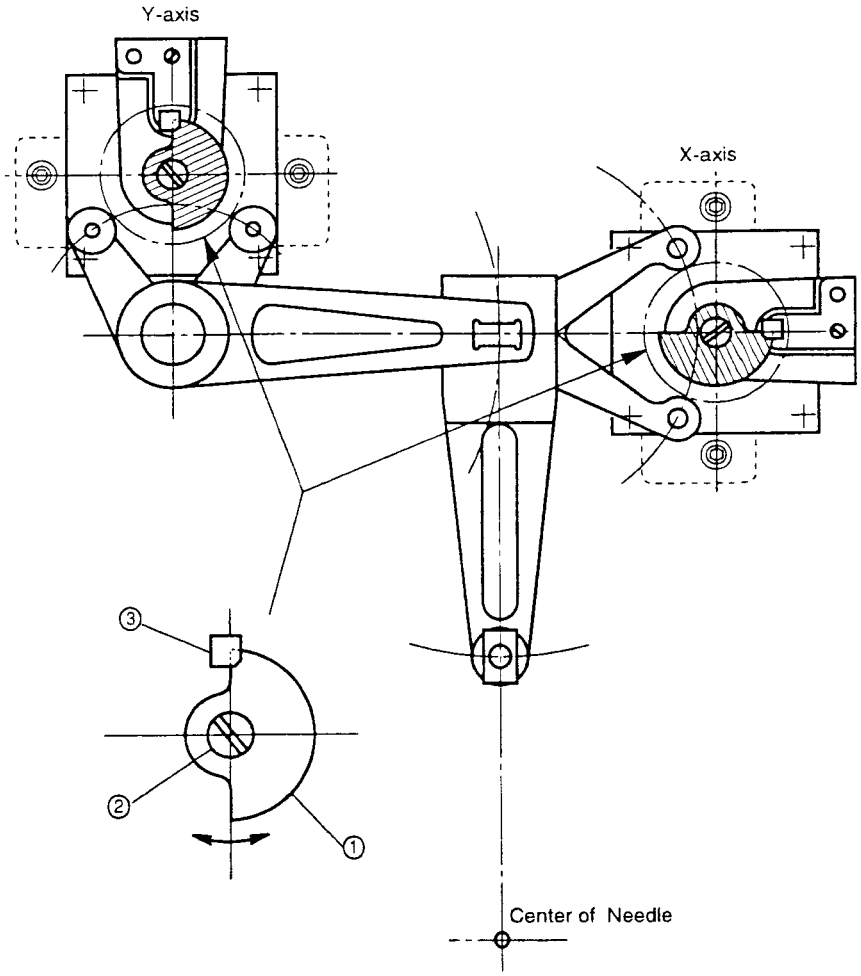
Switch off the machine.

9. TO ADJUST POSITION OF PRESSER FOOT



Turn machine pulley to bring down the needle into needle hole and position the presser foot so that the clearance between the presser foot and needle is equal front to back and sideways. Under this condition, loosen sensor screw ② and turn original position reflector ① until the notch on the original position reflector ① is at the center of sensor ③. (Both X-axis sensor and Y-axis sensor)

Switch off the machine.



10. TO ADJUST POSITION OF CAM BRACKET

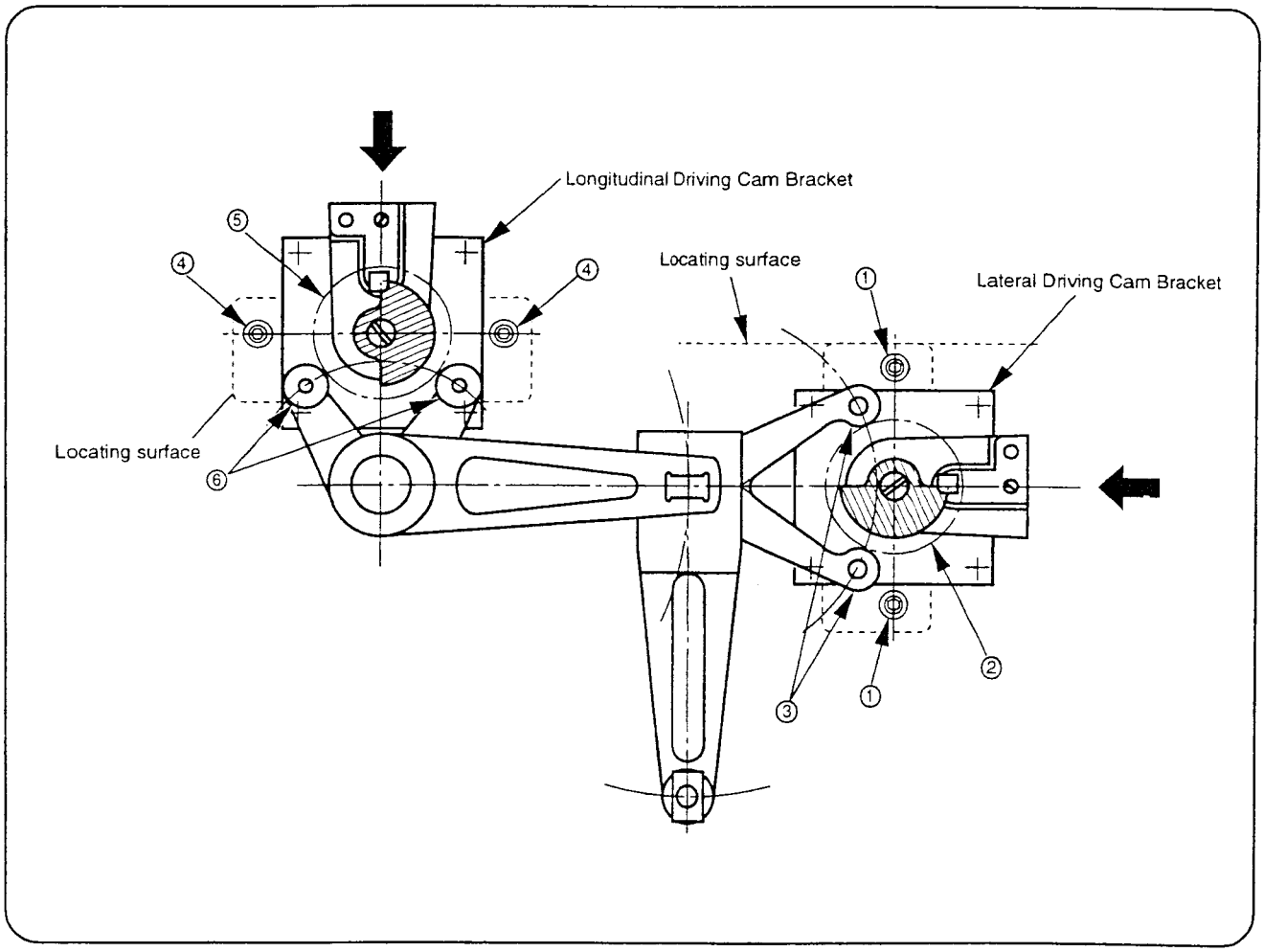
1. Lateral Driving Cam Bracket

Loosen lateral driving cam bracket screw ① (2 places) and push bracket in the direction shown with arrow mark (➡) parallel to the locating surface (machined surface). Then tighten screw ① making sure that there is no play between lateral driving cam ② and roller ③ .

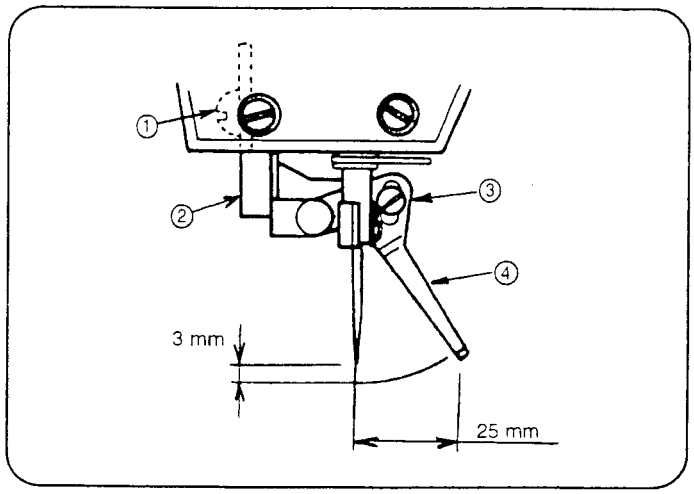
2. Longitudinal Driving Cam Bracket

Loosen longitudinal driving cam bracket screw ④ (2 places) and push bracket in the direction shown with arrow mark(➡) parallel to the locating surface (machined surface). Then tighten screw ④ making sure that there is no play between longitudinal driving cam ⑤ and roller ⑥.

Switch off the machine.



11. ADJUSTMENT OF WIPER HEIGHT (101, 102)

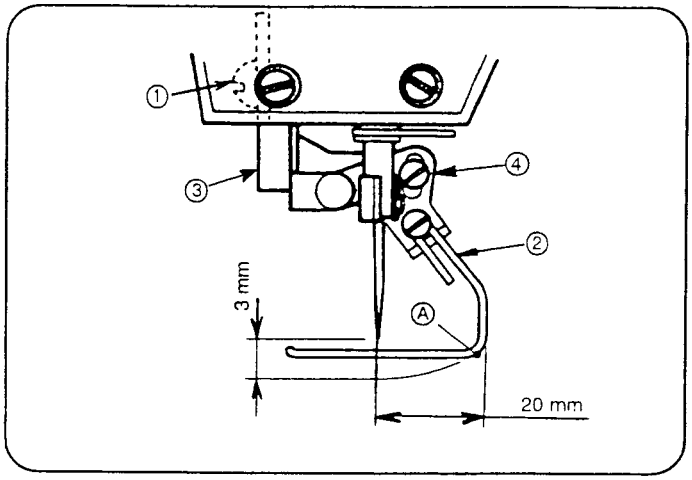


Loosen screw ① and move wiper bracket ② up or down, as required, so that clearance between wiper and needle point is 3.0mm when wiper passes the needle point. Tighten screw.

Loosen screw ③ and move wiper ④ to the left or right, as required, so that the distance between wiper point and needle point is 25mm. Tighten screw ③.

Switch off the machine.

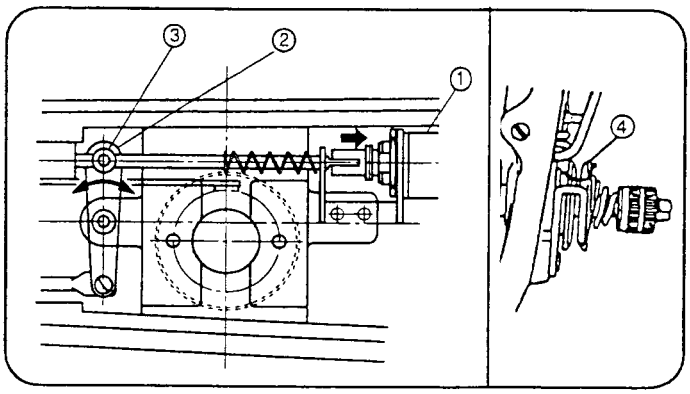
(200, 300, 500)



Loosen screw ① and move bracket ③ up or down, as required so that the clearance between portion A of finger guard ② and the needle point is 3 mm when portion A of finger guard passes the needle point.

Then, loosen screw ④ and move finger guard ② to the left or right, as required, so that the distance between portion A and the needle point is 20 mm when the clamp is in down position.

12. TO ADJUST TENSION RELEASING BAR SOLENOID

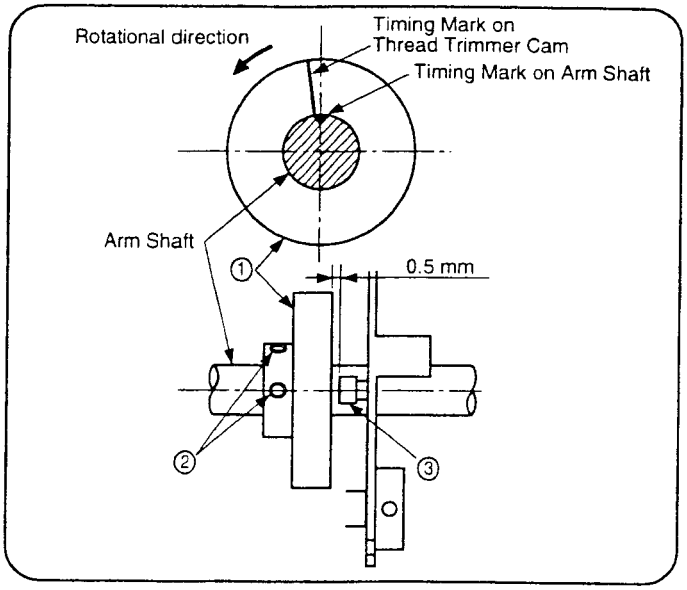


Loosen set screw ③ and adjust opening plate ② so that tension disc ④ is opened approximately 1mm when tension releasing bar solenoid ① is moved to the end of its stroke in the direction shown with arrow mark.

Note: Check to see that tension disc ④ is not relaxed when tension releasing bar solenoid ① returns to its original position by means of return spring.

Switch off the machine.

13. TO ADJUST POSITION OF THREAD TRIMMER CAM



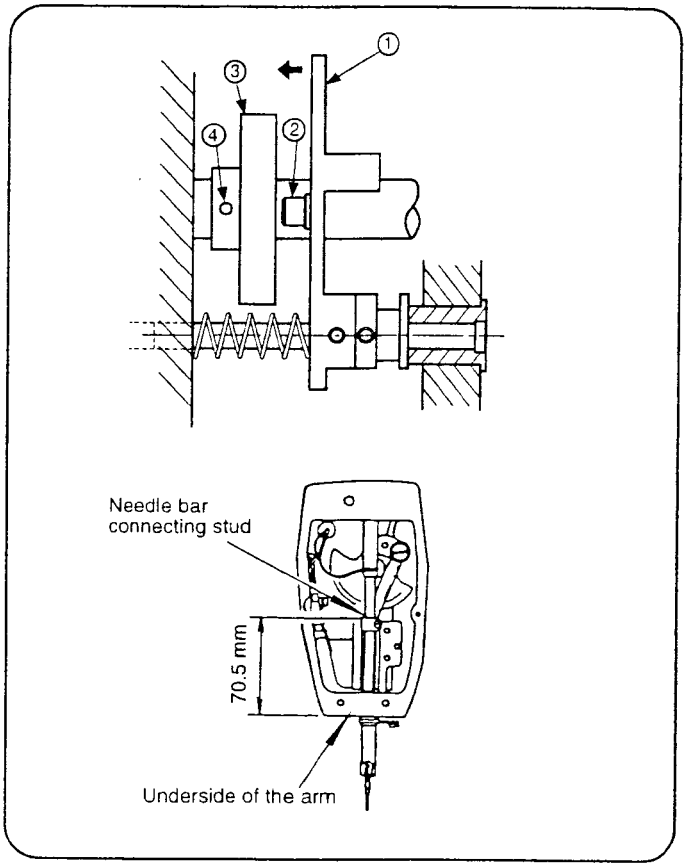
1. Rotational direction

Loosen set screw ② and align timing mark on the arm shaft with timing mark on thread trimmer cam. Then tighten set screw.

2. Axial direction

Loosen set screw ② and adjust the position of cam so that there is a clearance of 0.5mm between trimmer cam ① and roller ③.

TO ADJUST POSITION OF THREAD TRIMMER CAM (CLOSE ADJUSTMENT)

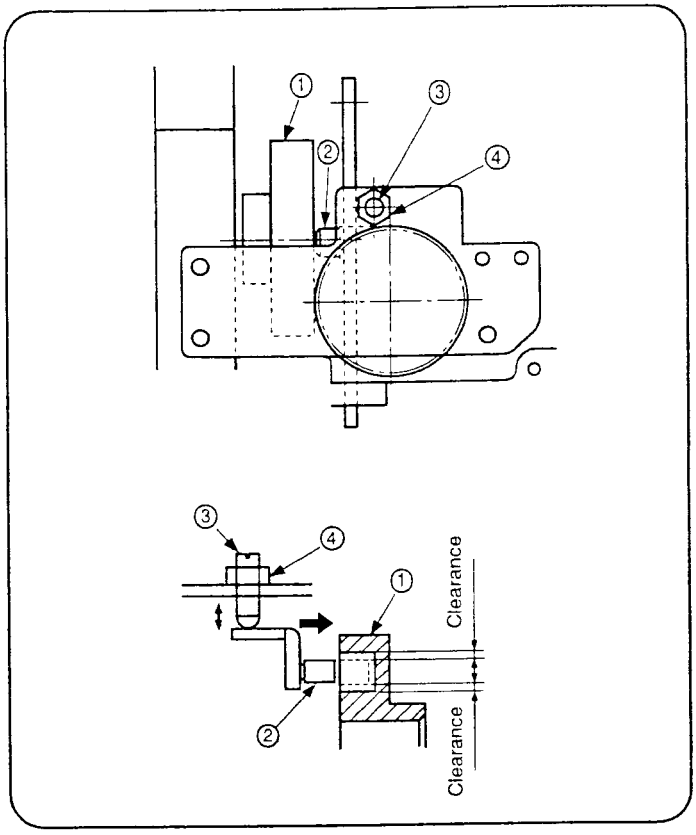


Thread trimming timing is adjusted by aligning timing mark on the arm shaft with the timing mark of thread trimmer cam ③.

For a closer adjustment, preform the following measure. Push knife bar operating lever ① in the direction indicated by arrow at the machine upper stop position and hold it so that roller ② is in the groove of thread trimmer cam ③. Adjust thread trimmer cam ③ closely by loosing set screw ④ so that stationary knife and movable knife will be disengaged when the clearance between the underside of the arm and the upper edge of needle bar connecting stud is 70.5 mm (on the lowering stroke of needle bar), turning machine pulley to the correct turning direction.

Switch off the machine.

14. TO ADJUST HEIGHT OF ROLLER

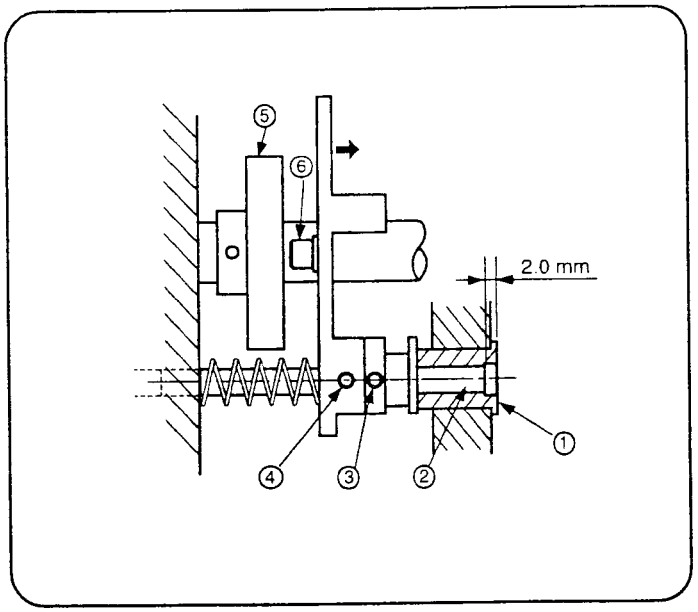


Loosen nut ④ and adjust the height of roller ② by turning adjusting screw ③ so that roller ② goes into the groove (wide groove section) in the thread trimmer cam ① smoothly when needle bar comes down to its lowest point.

After the adjustment, secure adjusting screw ③ with nut ④ so that it will not rotate.

Switch off the machine.

15. TO ADJUST POSITION OF SHAFT

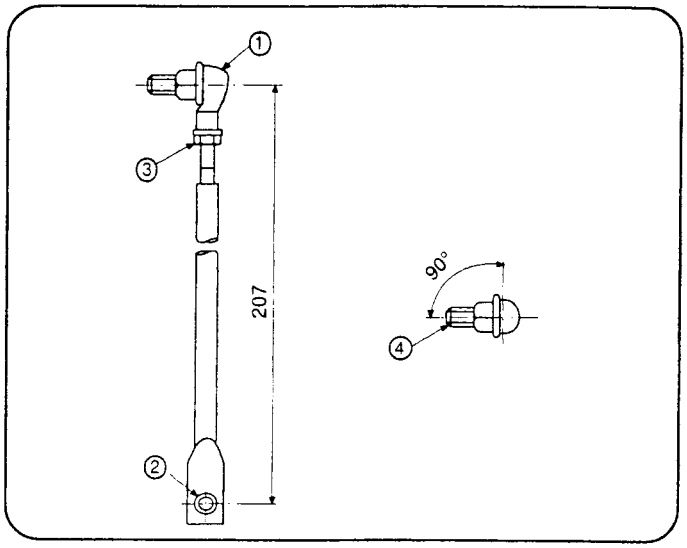


Loosen screw ③ (2 places) and ④ and adjust the position of shaft so that the rear end of shaft ② is located 2.0mm inside from the face end of bushing ① when the roller ⑥ is out of engagement with thread trimmer cam ⑤.

Note: Be sure to set the shaft without clearance between bushing ①, collar and lever.

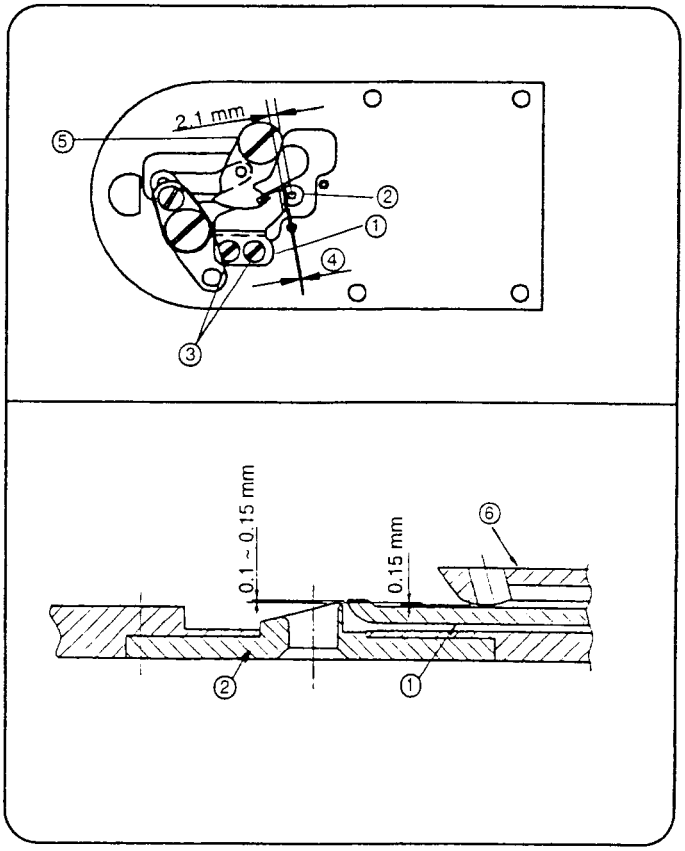
Switch off the machine.

16. TO ADJUST LENGTH OF KNIFE BAR OPERATING LEVER CONNECTING ROD



Loosen nut ③ and adjust rod end bearing ① so that the distance between the center of rod end bearing ① and the center of connecting rod screw hole ② is 207mm. Also adjust rod end bearing so that rod end bearing screw ④ is square to connecting rod screw hole ② when viewed from top and tighten nut ③.

17. ADJUSTMENT OF KNIFE POSITION



Loosen stationary knife screw ③ and move stationary knife ① so that clearance between the knife and the center of needle hole ② in throat plate is 2.1mm.

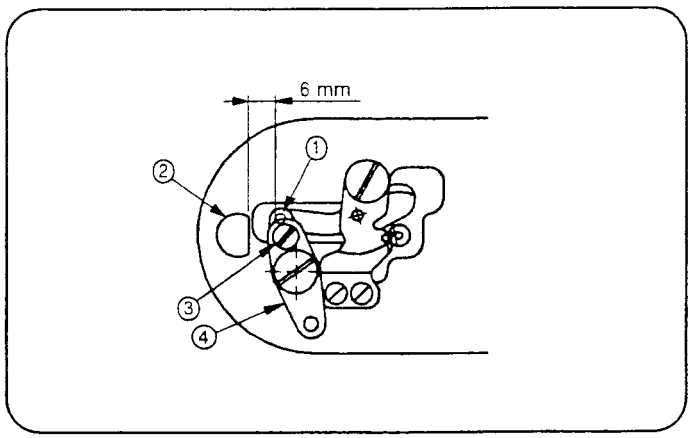
Size of needle hole	Clearance between stationary knife and center of needle hole	(for reference) Clearance ⓐ between stationary knife and edge of needle hole
ø 1.6	2.1mm	0.6 mm
ø 2.0	2.1mm	0.6 mm
ø 2.5	2.1mm	0.3 mm

Adjust height of stationary knife ① so it is 0.1 ~ 0.15 mm higher than throat plate needle hole ② higher edge. Adjust height of movable knife ⑥ using movable knife hinge screw adjusting washer ⑤ so that it is 0.15 mm higher than the high edge of throat plate needle hole. Adjusting washers ⑤ are available in thicknesses shown in table below.

Part No.	Adjusting washer thickness
418314-004	0.5 ± 0.02 mm
418314-003	0.45 ± 0.02 mm
418314-002	0.4 ± 0.02 mm
418314-001	0.35 ± 0.02 mm

Switch off the machine.

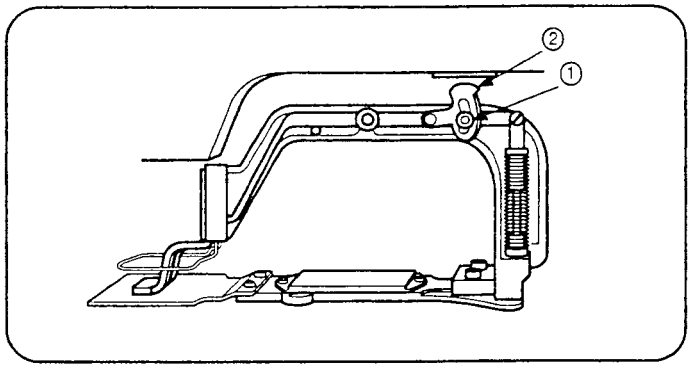
18. TO TIME THREAD TRIMMER



Loosen screw ③ and adjust trimmer by moving lever (upper) ④ to the left or right so that there is a clearance of 6mm between the outside dia. of lever (lower) pin ① and flat section of guide pin ② when the trimmer is out of action (waiting).

Switch off the machine.

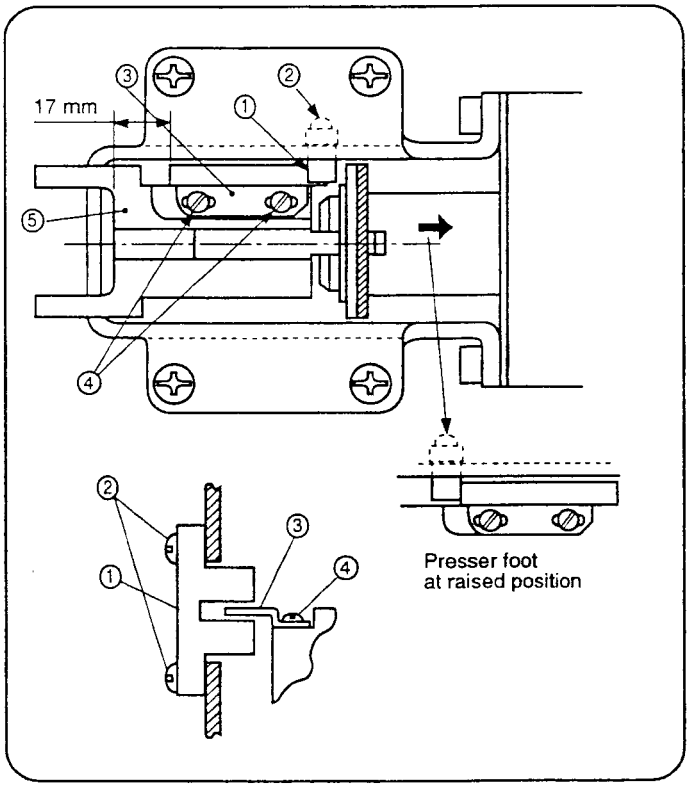
19. ADJUSTMENT OF CLAMP FOOT HEIGHT



Loosen socket head bolt ① and adjust clamp foot height by moving arch clamp foot lifting lever adjusting plate ② up or down. Maximum clamp foot lift amount is 17mm from throat plate upper surface.

Switch off the machine.

20. TO ADJUST SENSOR



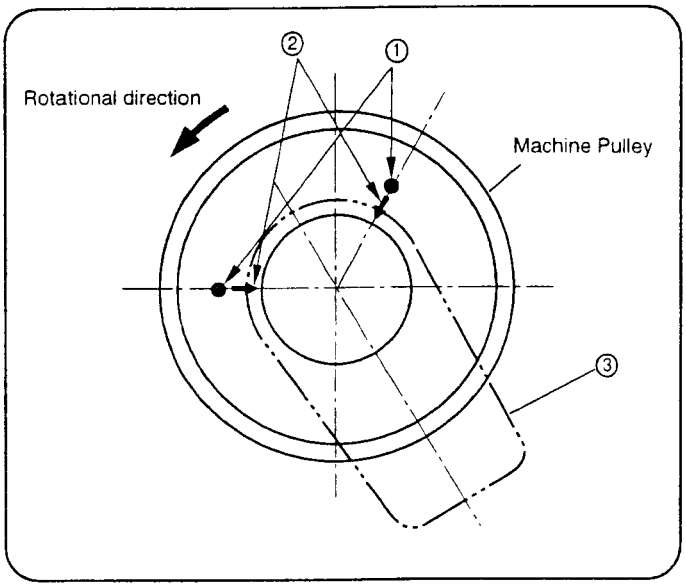
Loosen screw ④ and adjust sensor by moving sensor perceive plate ③ front to back so that there is a clearance of 17mm between sensor perceive plate ③ and the point end of foot lifting block ⑤.

After the adjustment, make sure that sensor perceive plate ③ does not shield sensor ④ when presser foot is raised.

Note: After adjustment, make sure that sensor perceive plate ③ does not interfere with sensor ①. In case interference condition exists, loosen screw ② and adjust by moving sensor ① up and down.

Switch off the machine.

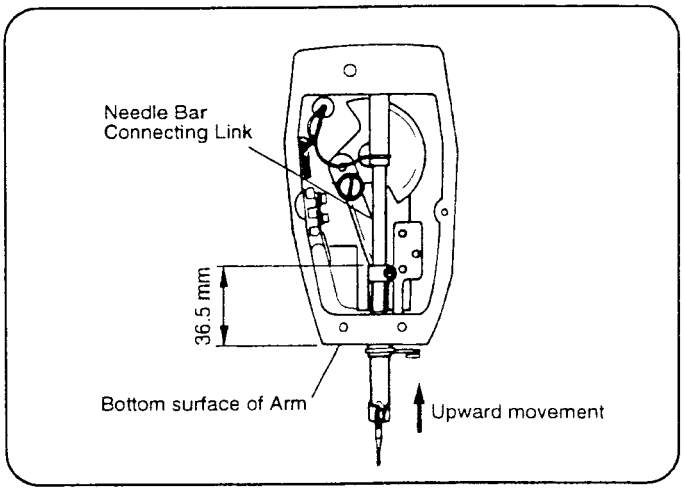
21. TO INSTALL SYNCHRONIZER



Align synchronizer set screw ② (2 places) with the timing mark ① (2 places) provided on the machine pulley and fasten synchronizer ③ with set screws.

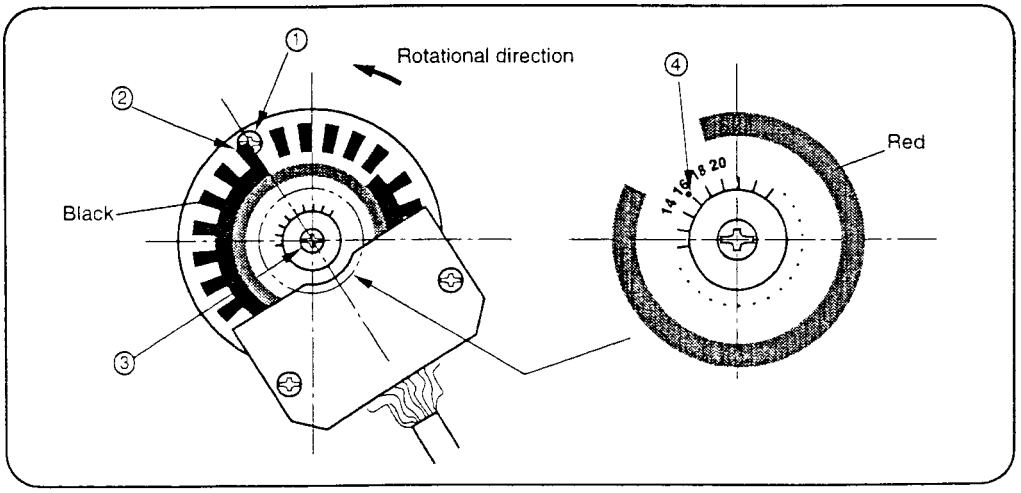
Switch off the machine.

22. TO ADJUST SYNCHRONIZER



Fix arm shaft so that when machine pulley is rotated in its normal operating direction and needle bar is on its upward stroke, the distance between bottom surface of arm and upper end of needle bar connecting link is 36.5mm. While maintaining this setting condition, loosen set screw ③ and adjust synchronizer by turning reflector (black) on the synchronizer until the face end ② of reflector (black) is aligned with the centerline of cross slotted screw ①. Tighten set screw ③ after the adjustment. Then align the red timing mark ④ with the graduation "16" by turning the reflector (red).

Switch off the machine.



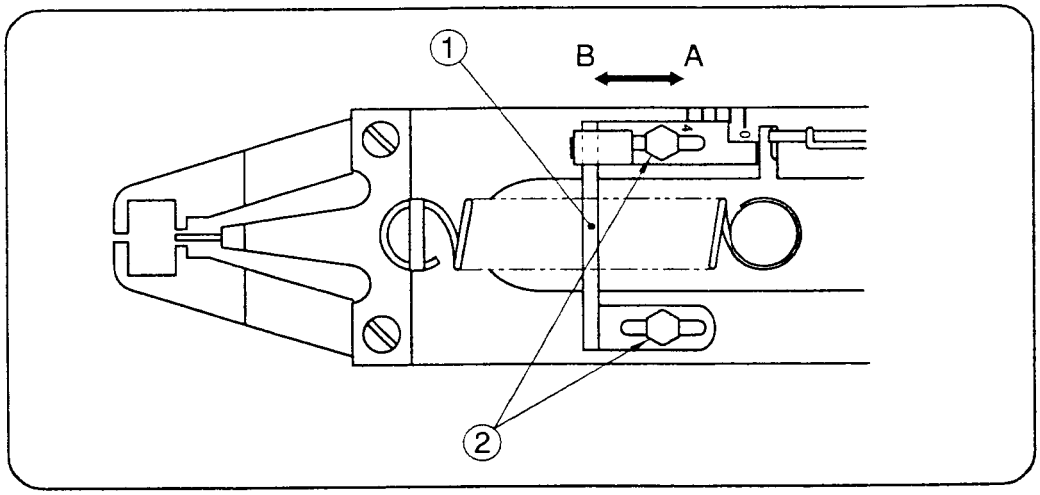
23. ADJUSTMENT OF BUTTONHOLE SEWING MACHINE (1669U 200)

1. Specification (1669U 200)

Stitch type	Single needle lockstitch
*Maximum speed	2,700 SPM
Sewing area (X - Y)	3.0 X 8.0
Feed system	Intermitted feed (pulse motor)
Stitch length	0.1 ~ 10.0 mm
No. of needle	Option (21,28,&36 already input)
Max. No. of stitch	10,000 stitches
Clamp lift system	Electro-magnetic solenoid
Clamp foot lift	12 mm (17 mm max.)
Shuttle hook	Standard hook
Wiper	Standard fitting
Thread trimmer	Standard fitting
Bobbin counter	Indicates when to change bobbin
Data memorizing	EEP-ROM
No. of pattern (memorized)	22 patterns already input. (Only 3 pattern Nos. 10, 11 and 12 of the 25 patterns can be sewn.) (Additional patterns up to 64 max. can be input. Total No. of stitches 10,000 max.)
Motor	3 phase induction motor, 400 W
Weight	Machine head approximately 51kg, Control box 11 kg
Electrical rating	Single phase 100 ~ 115 V, 3 phase 200 ~ 240 V

* Maximum efficient speed is determinded upon nature of operation and type of material being sewn.

2. Adjustment of closing Amount of clamp foot (left and right)



• Adjustment of closing Amount of clamp foot (left and right)

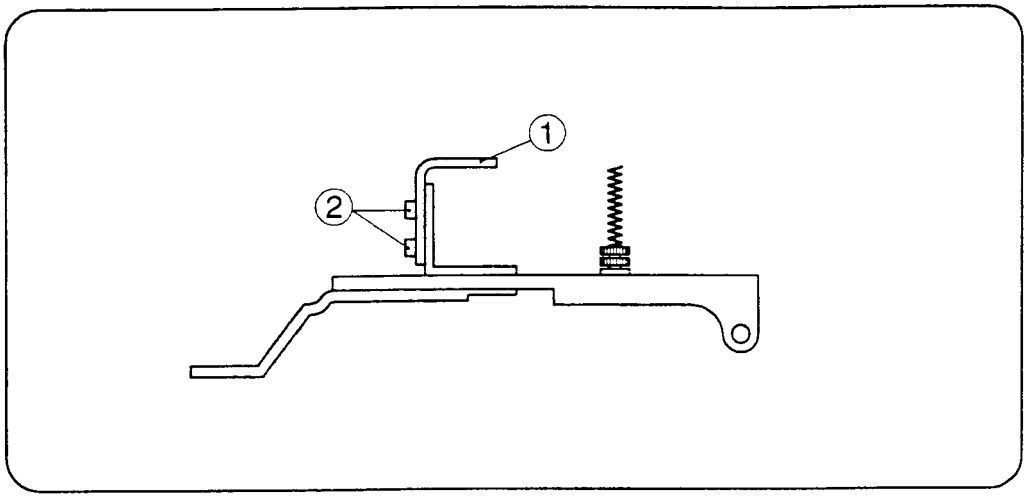
Loosen bolts ②and adjust closing amount of left and right clamp foot by moving arch clamp lifting plate (lower) ① in the direction indicated by arrow. To decrease closing amount, move arch clamp lifting plate (lower) in direction A and to increase the amount, move it in direction B.

Note: Closing amount is set to 1mm when the machine is shipped from the factory.

3. Adjustment of Clamp Foot Height

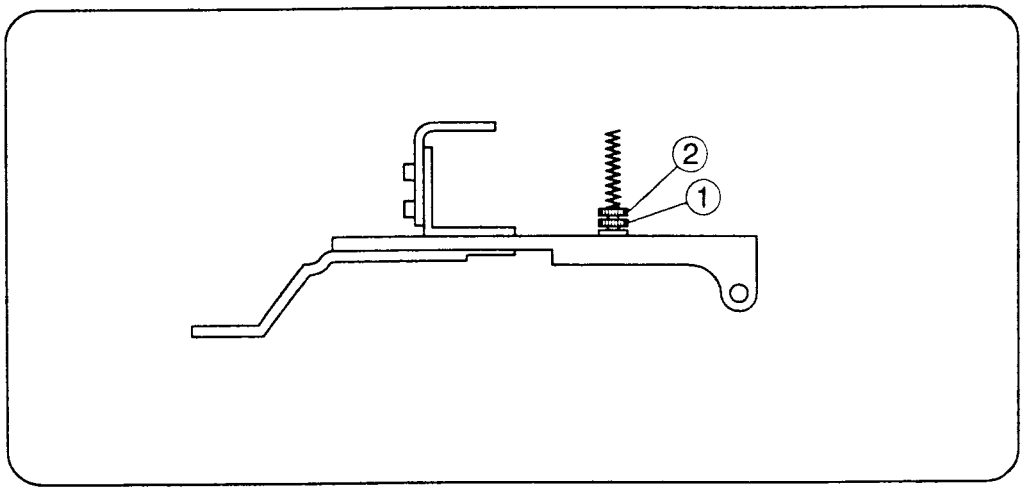
Loosen set screw ② and adjust height by moving arch clamp lifting plate ① up or down as required. Maximum clamp foot lift is 17mm from the throat plate surface.

Note: Clamp foot lift is set to 12mm when the machine is shipped from the factory.



4. Adjustment of Clamp Foot Spring Tension

Loosen adjusting nut (lower) ① and adjust spring tension by turning adjusting nut (upper) ②. The pressure on the fabric should be as light as possible, while still sufficient to insure proper feeding.



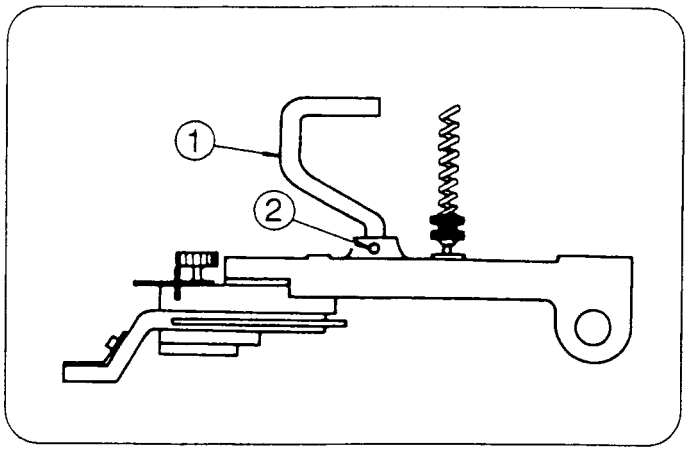
24. ADJUSTMENT OF BUTTON SEWING MACHINE (1669U 400)

1. Specification (1669U 400)

Stitch type	Single needle lockstitch
*Maximum speed	2,500 SPM
Sewing area (X - Y)	6.5 X 6.5
Feed system	Intermitted feed (pulse motor)
Stitch length	0.1 ~ 10.0 mm
Needle	3355-01 (#14)
Applicable size of button	Outside diameter : 8.7 ~ 31.8 mm Sewing size:2.5 ~ 6.5 mm
No. of needle	Option (9,11,13,15,16,18,19,20,22,24,26,&27 already input)
Max. No. of stitch	10,000 stitches
Clamp lift system	Electro-magnetic solenoid
Clamp foot lift	13 mm
Shuttle hook	Standard hook
Wiper	Standard fitting
Thread trimmer	Standard fitting
Bobbin counter	Indicates when to change bobbin
Data memorizing	EEP-ROM
No. of pattern (memorized)	27 patterns already input. (Additional patterns up to 64 max. can be input. Total No. of stitches 10,000 max.)
Motor	3 phase induction motor, 400 W
Weight	Machine head approximately 51kg, Control box 11 kg
Electrical rating	Single phase 100 ~ 115 V, 3 phase 200 ~ 240 V

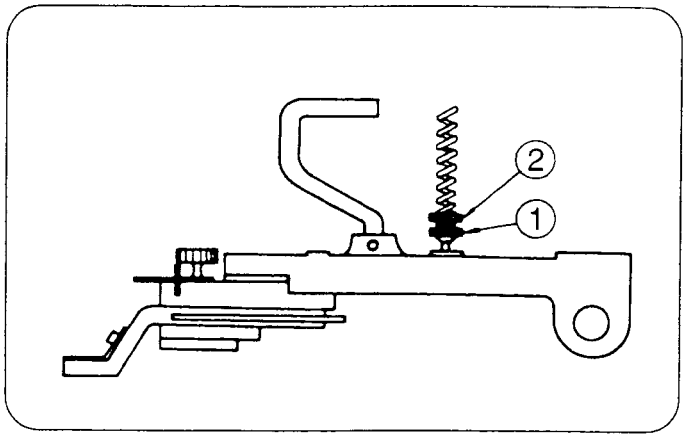
* Maximum efficient speed is determinded upon nature of operation and type of material being sewn.

4. Adjustment of Button Clamp Height



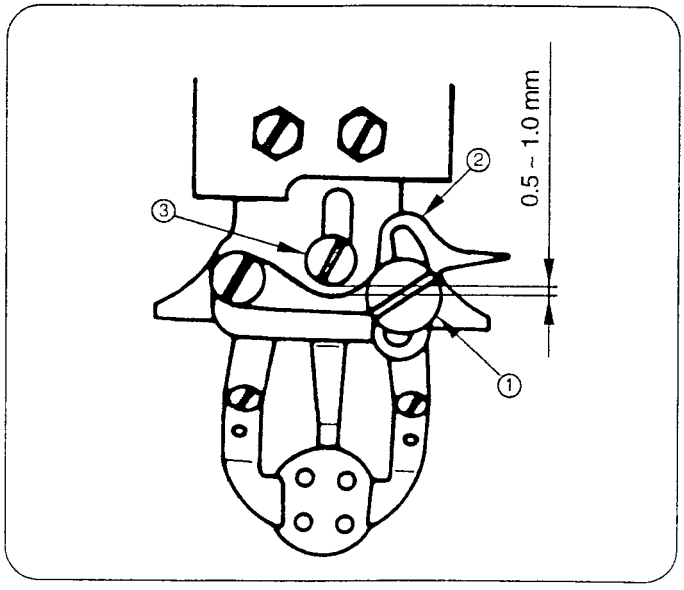
- Loosen screw and adjust the height by moving button clamp arm hook ① up or down as required. Maximum button clamp lift above throat plate surface is 13mm.

5. Adjustment of Button Clamp Spring Pressure



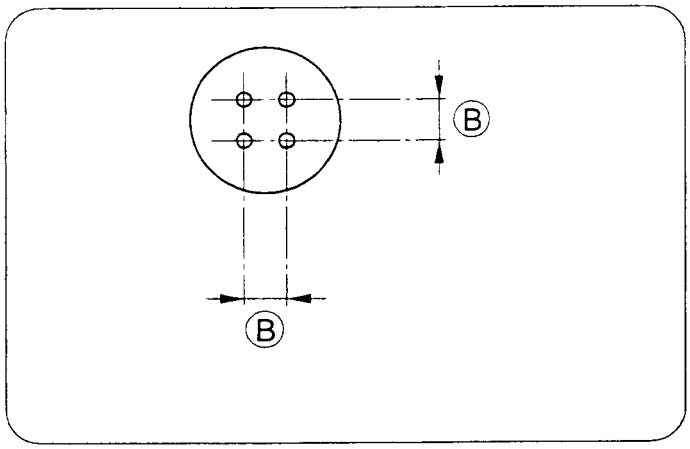
- Loosen adjusting nut (lower) ① and adjust spring pressure by turning adjusting nut (upper) ②. The pressure on the fabric should be as light as possible, while still sufficient to insure proper feeding.

6. Adjustment of Button Clamp Spreader Adjusting Plate



- Loosen adjusting plate screw ① and adjust clamp spreader adjusting plate ② so that clearance between adjusting plate ② and screw ③ will be 0.5 ~ 1.0mm when button is set in the button clamp and tighten adjusting plate screw ①.

7. Combination of Throat Plate Needle Hole Bushing and Feed Plate in Relation to Distance between Button Holes.



Distance between button holes Ⓑ mm	Throat plate needle hole bushing P/N	Feed plate P/N
2.5 ~ 3.5	418962 (standard)	557131-003 (standard)
	418973 (optional)	557131-003 (standard)
	418310 (optional)	557131-001 (optional)
3.5 ~ 4.5	418962 (standard)	557131-004 (optional)
	418973 (optional)	557131-004 (optional)
	418310 (optional)	557131-002 (optional)
4.5 ~ 6.5	418962 (standard)	557131-005 (optional)
	418973 (optional)	557131-005 (optional)
	418310 (optional)	557131-003 (standard)

Note: Throat plate needle hole bushing P/N 418973 (1.6 ø needle hole with boss)

Throat plate needle hole bushing P/N 418310 (2.0 ø)

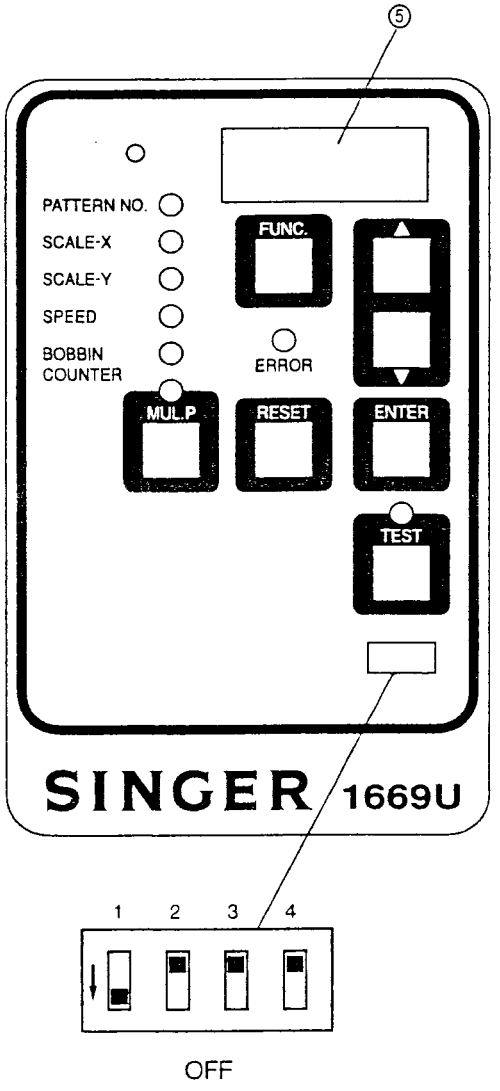
25. CHECK MODE

• Purpose of "check mode"

To make an electrical check on the sewing machine.

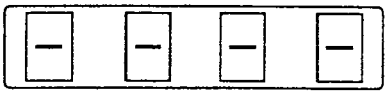
• Items to be checked in "check mode"

1. Output to foot pedal
2. Rotation of sewing machine motor
3. Operation of pulse motor to return to its original position
4. Operation of pulse motor
5. Operation of thread trimmer solenoid
6. Operation of presser foot lifter solenoid
7. Operation of thread releaser solenoid
8. Operation of closing clamp foot solenoid (1669U200)
9. Output to synchronizer and feed sensor (X-axis and Y-axis)



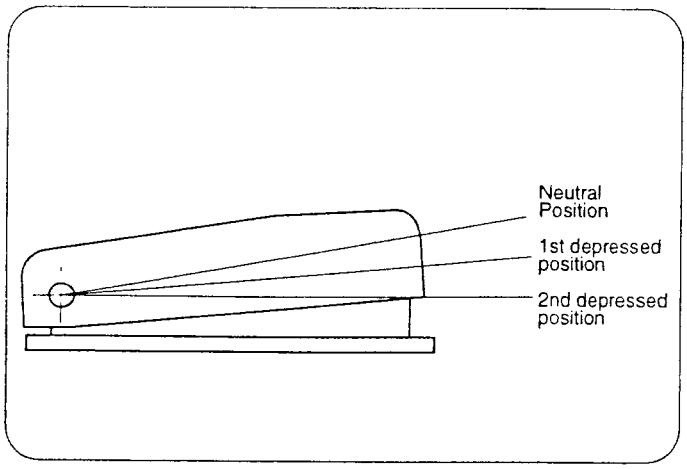
• How to activate "check mode"

1) Turn main switch off.
2) Press DIP switch "1" on the frond side of control box toward 'OFF' side ('Off' position).
3) Turn main switch on.
   The display window ⑤ shows the following.



• How to end "check mode"

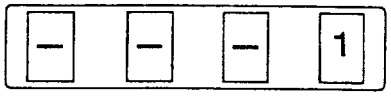
1) Turn main switch off.
2) Press DIP switch "1" on the front side of control box toward the numerical side ('On' position).
3) Turn main switch on.
   The system returns to normal sewing mode.



1. To check input to foot pedal

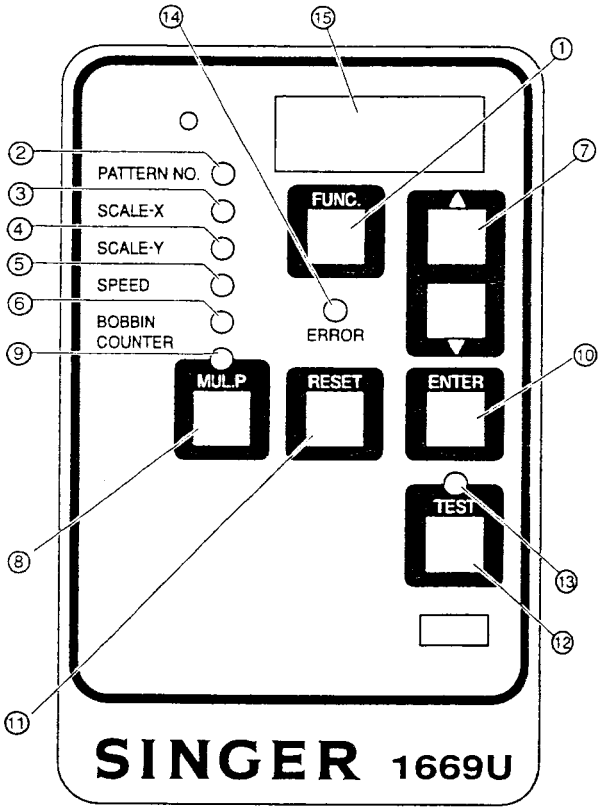
When foot pedal is pressed, the following appears on display window ⑮.

- Neutral Position



- 1st depressed position

- 2nd depressed position



2. To check rotation of sewing machine motor

- Press "FUNC." key ①. The sewing machine motor starts to rotate putting the machine into operation.
- Press "RESET" key ⑪. The sewing machine motor stops.

3. To check operation of pulse motor to return to its original position

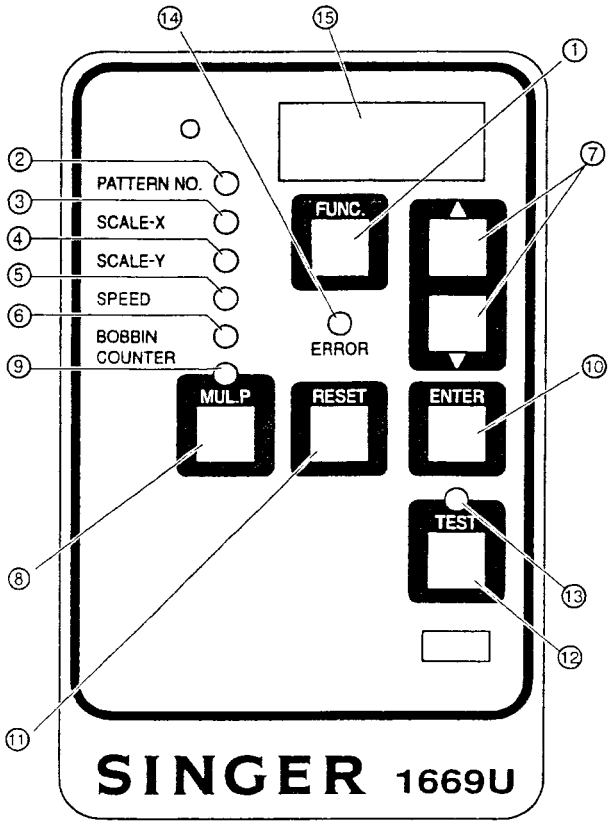
- Press "▲" key ⑦. Feed (clamp mechanism) will move to its original position.

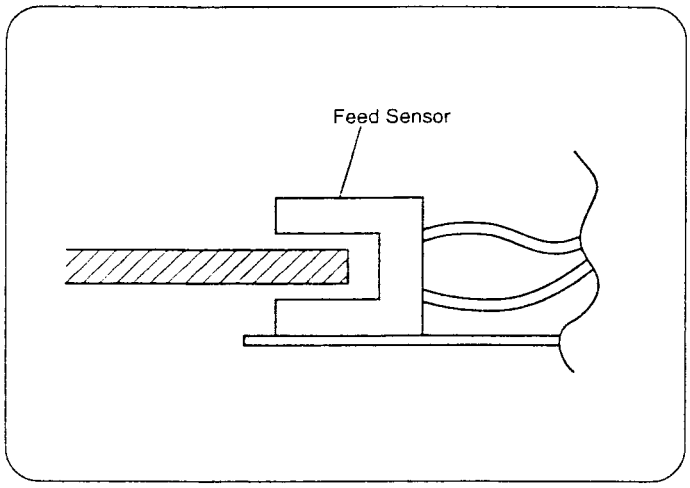
4. To check operation of pulse motor

- Press "TEST" key ⑫. Pulse motor for X-axis and Y-axis feed goes into operation.
  Both X-axis and Y-axis feeding take place for 30 pulses (approximately 3mm at presser foot section).
- Press "RESET" key ⑪. Pulse motor stops.
- When re-checking the feed, be sure to press "▲" key ⑦ and return feed to the original position before pressing the "TEST" key ⑫.

5. To check operation of thread trimmer solenoid

- Press "MUL.P" key ⑧. Thread trimmer solenoid is turned on and goes into operation.
  The solenoid is turned off automatically after approx. 2 seconds.





6. To check operation of presser foot lifter solenoid

- Press "RESET" key ⑪. Presser foot lifter solenoid is turned on and goes into operation.

7. To check operation of thread releaser solenoid

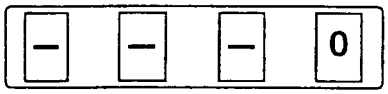
- Press "▼" key ⑦. Thread releaser solenoid is turned on and goes into operation.
  The solenoid is turned off automatically after approx. 2 seconds.

8. To check operation of closing clamp foot solenoid (1669U200)

- Press "ENTER" key ⑩. Closing clamp foot solenoid will be activated. The solenoid is turned off automatically after approx. 2 seconds.

9. To check input to synchronizer and feed sensor

1) Press "TEST" key ⑫.
2) The display window ⑮ shows the following.



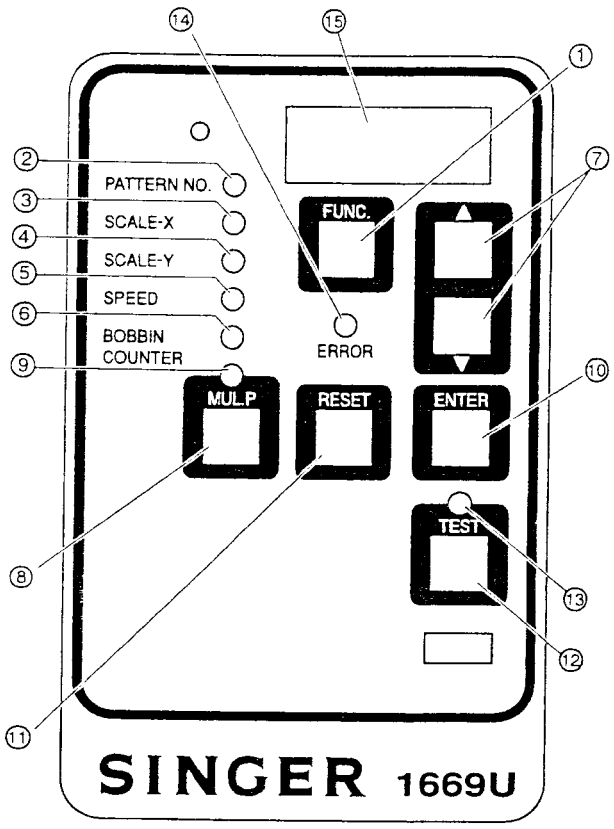
9.1. X-axis feed sensor

1) Press "FUNC." key ①.
2) When the sensor is shut off,SCALE-X LED ③ goes out and stop buzzing.

9.2. Y-axis feed sensor

1) Press "FUNC." key ①.
2) The display window ⑮ shows the following.

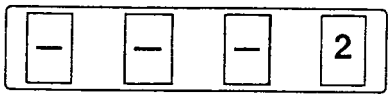
3) When the sensor is shut off,SCALE-Y LED ④ goes out and stop buzzing.



9.3. Foot lifting sensor

1) Press "FUNC." key ① .

2) The display window ⑮ shows the following.

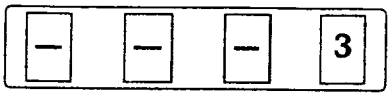


3) When the sensor is shut off, ERROR LED goes out and stop buzzing.

9.4. Synchronizer

1) Press "FUNC." key ① .

2) The display window ⑮ shows the following.



3) Needle-up sensor
When needle rises up to its up position by turning machine pulley by hand, PATTERN NO. LED ② lights up.
(When the notch on the back reflector is above the sensor.)

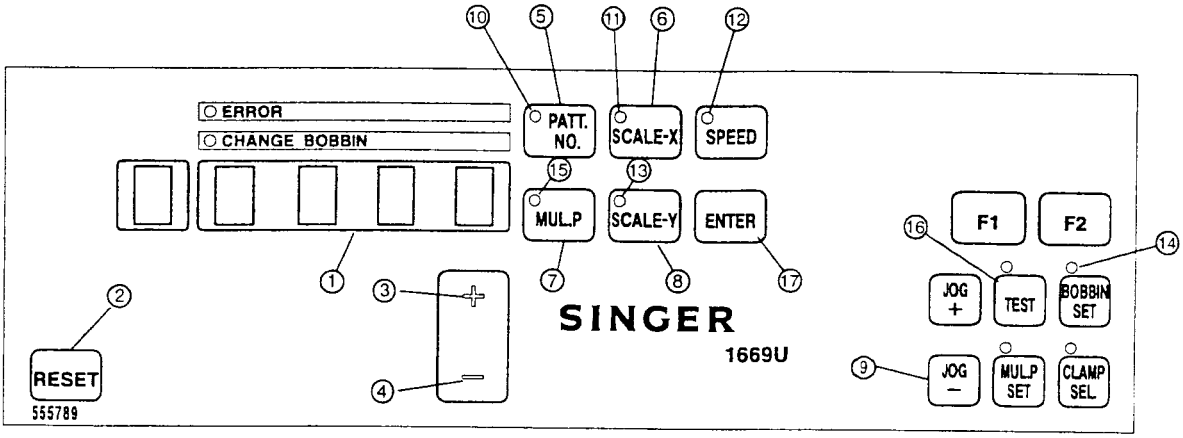
4) Pulse motor timing
When the notch on the red reflector is above the sensor, SPEED LED ⑤ lights up.

5) Tachogenerator
When machine pulley is turned by hand, BOBBIN COUNTER LED ⑥ lights up.
(Periphery of the black reflector)

9.5 Press FUNC key ① . The display window ⑮ changes to "0".

9.6 Press RESET key ⑪ .The System returns to item 1.(To check input to foot pedal)

26. TABLE TOP CONSOLE CHECK MODE (OPTION)



• Purpose of "check mode"

To make an electrical check on the sewing machine.

• Items to be checked in "check mode"

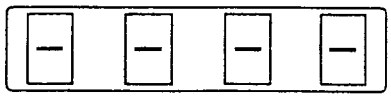
1. Output to foot pedal
2. Rotation of sewing machine motor
3. Operation of pulse motor to return to its original position
4. Operation of pulse motor
5. Operation of thread trimmer solenoid
6. Operation of presser foot lifter solenoid
7. Operation of thread releaser solenoid
8. Operation of closing clamp foot solenoid
9. Output to synchronizer and feed sensor (X-axis and Y-axis)

• How to activate "check mode"

1) Turn main switch on.

2) While pressing key [JOG −] ⑨, press key [RESET] ②.

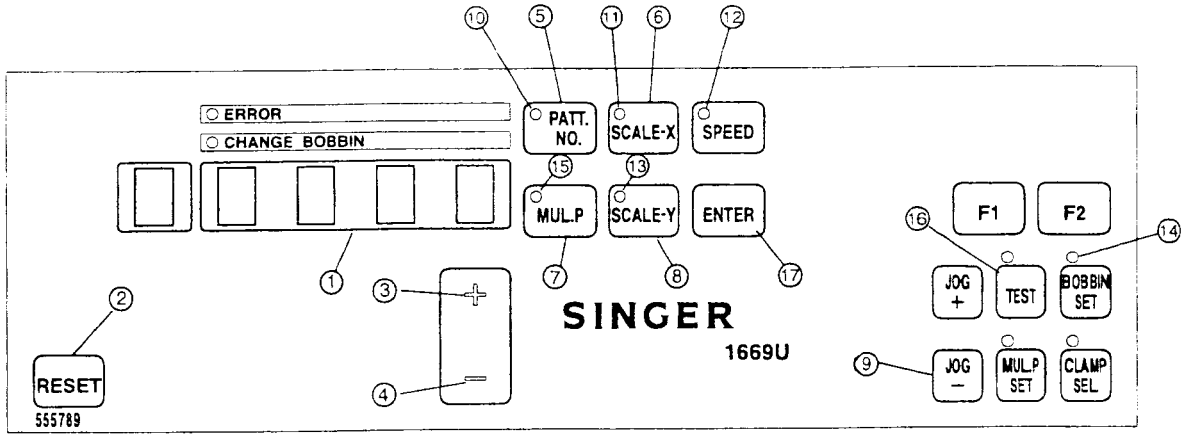
3) The display window ① shows the following.

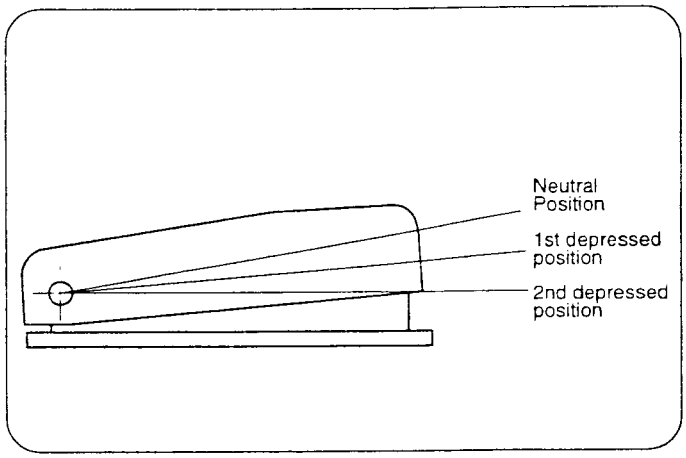


• How to end "check mode"

1) Turn main switch off.

2) Turn main switch on. The system returns to normal sewing mode.

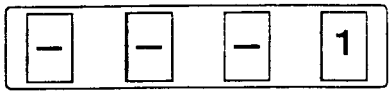




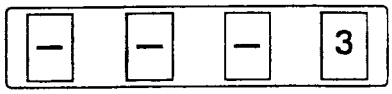
1. To check input to foot pedal

When foot pedal is pressed, the following appears on display window ①.

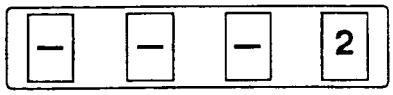
- Neutral Position



- 1st depressed position



- 2nd depressed position



2. To check rotation of sewing machine motor

- Press [PATT. NO.] key ⑤. The sewing machine motor starts to rotate putting the machine into operation.
- Press [RESET] key ②. The sewing machine motor stops.

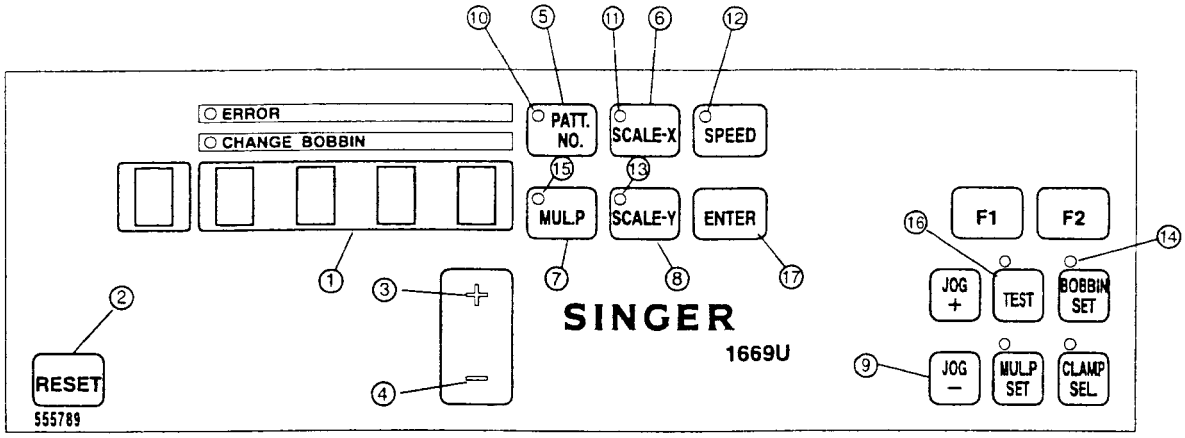
3. To check operation of pulse motor to return to its original position (Only PROM Ver2.0 can be used)

- Press [+] key ③. Feed (clamp mechanism) will move to its original position.

4. To check operation of pulse motor

- Press [TEST] key ⑯. Pulse motor for X-axis and Y-axis feed goes into operation.

  Both X-axis and Y-axis feeding take place for 30 pulses (approximately 3mm at presser foot section).
- Press [RESET] key. Pulse motor stops.
- When re-checking the feed, be sure to press [+] key ③ and return feed to the original position before pressing the [TEST] key ⑯. (Only PROM Ver2.0 can be used)



5. To check operation of thread trimmer solenoid

- Press [—] key ④. Thread trimmer solenoid is turned on and goes into operation.

  The solenoid is turned off automatically after approx. 2 seconds.

6. To check operation of presser foot lifter solenoid

- Press [SCALE-X] key ⑥. Presser foot lifter solenoid is turned on and goes into operation.

  The solenoid is turned off automatically after approx. 2 seconds.

7. To check operation of thread releaser solenoid

- Press [MUL.P] key ⑦. Thread releaser solenoid is turned on and goes into operation.

  The solenoid is turned off automatically after approx. 2 seconds.

8. To check operation of closing clamp foot solenoid (1669U200)

- Press [ENTER] key ⑰. Closing clamp foot solenoid will be activated. The solenoid is turned off automatically after approx. 2 seconds.

Press [—] key ④. Thread trimmer solenoid is turned on and goes into operation.

The solenoid is turned off automatically after approx. 2 seconds.

9. To check input to synchronizer and feed sensor

- Press [SCALE-Y] key ⑧.

9.1 X-axis sensor

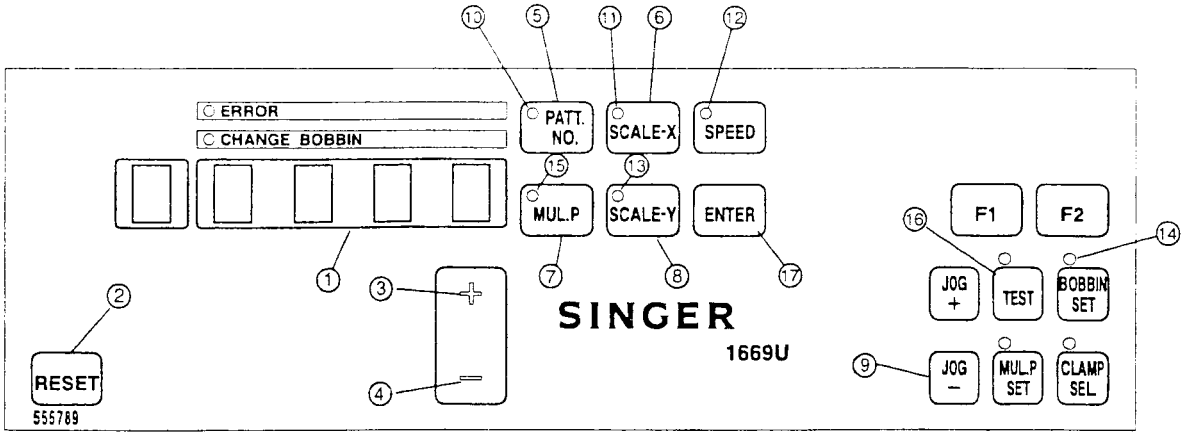
- Press [SCALE-X] key ⑥.

  When the sensor is shut off,SCALE-X LED ⑪ goes out and stop buzzing.

9.2 Y-axis sensor

- Press [SCALE-Y] key ⑧.

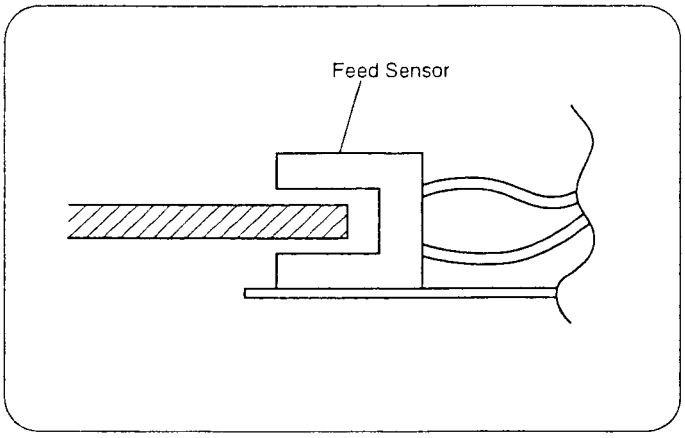
  When the sensor is shut off,SCALE-Y LED ⑬ goes out and stop buzzing.



9.3 AFL sensor

- Press [PATT. NO.] key ⑩.

When the sensor is shut off, MUL.P LED ⑮ goes out and stop buzzing.



9.4 Synchronizer

1) Press [MULP] key ⑦.
2) Needle -up sensor

   When needle rises up to its up position by turning machine pulley by hand, PATT.NO LED ⑩ lights up.
   (When the notch on the black reflector is above the sensor.)

3) Pulse motor timing

   When the notch on the red reflector is above the sensor, SPEED LED ⑫ lights up.

4) Tachogenerator

   When machine pully is turned by hand, BOBBIN SET LED ⑭ lights up.
   (Periphery of the black reflector)

9.5 Press [RESET] key ②. The system returns to item 1.(To check input to foot pedal)

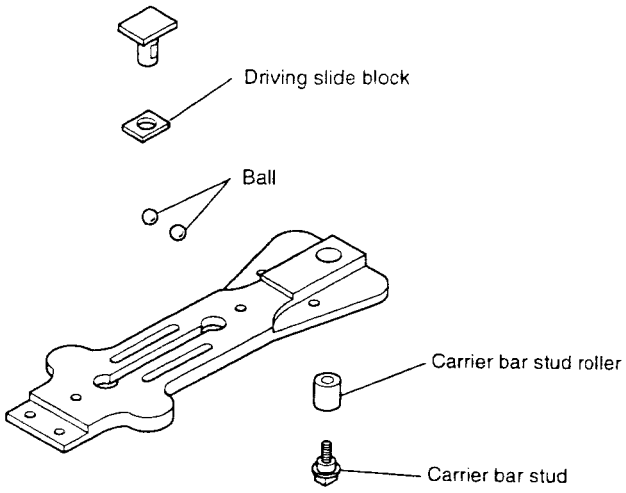
27. ERROR CODE NUMBERS

• In case the machine should malfunction, the system buzzes and error code number appears on the display window.

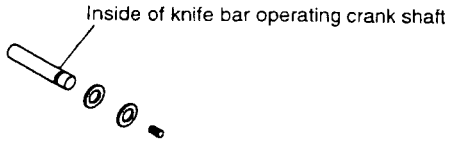
Error Code No.	Contents of Error Message	Corrective Measure
E-10	Needle bar out of its upper stop position when starting the machine or feeding.	Raise needle bar to its upper stop position by turning machine pulley.
E-21	Pattern data is not for 1669 or incorrect.	With main switch off, check EEP- ROM for poor contact or change EEP-ROM.
E-23	Data cannot be written into EEP-ROM.	With main switch off, check EEP- ROM for poor contact or change EEP-ROM.
E-24	No pattern data contained in EEP- ROM that corresponds to the fitting No. being set.	With main switch off, change fitting No. or change EEP-ROM.
E-30	Arm shaft does not rotate or signal for synchronizer has not been input.	With main switch off, eliminate abnormality of the machine or check synchronizer for poor contact.
E-31	Presser foot does not operate properly or signal for presser foot lifter sensor has not been input.	With main switch off, check presser foot for malfunction or check sensor for poor connection.
E-32	X-axis feed mechanism is in abnormal condition or signal for X-axis feed sensor has not been input.	With main switch off, eliminate abnormality or check sensor for poor connection.
E-33	Y-axis feed mechanism is in abnormal condition or signal for Y-axis feed sensor has not been input.	With main switch off, eliminate abnormality or check sensor for poor connection.

28. GREASING POINTS

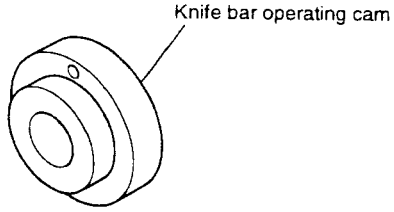
1. Feed Plate Carrier Bar



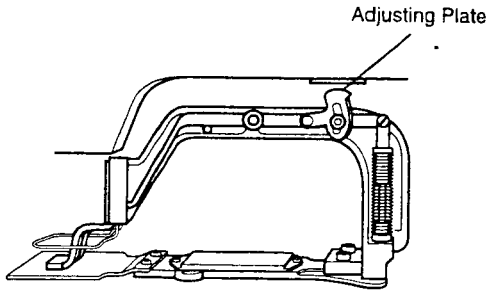
2. Knife Bar Operating Crank Shaft



3. Knife Bar Operating Cam



4. Arch Clamp Foot Lifting Lever Adjusting Plate



29. TROUBLE-SHOOTING GUIDE

Trouble	Cause	Correction
1. Skipped stitches	1. Improper timing of needle and shuttle body.	Adjust timing and clearance. (see page 4)
	2. Hook or burr on needle point or needle bent.	Replace needle.
	3. Improperly set needle.	Insert needle into needle bar as far as it will go with long groove to the front.
	4. Improper feed timing.	Adjust synchronizer (see page 12)
	5. Improper clearance between needle and shuttle driver.	Readjust clearance between needle and shuttle driver. (see page 4)
2. Needle breakage	1. Needle interferes with shuttle body.	Adjust clearance between needle and shuttle body. (see page 4)
	2. Needle bent.	Replace needle.
	3. Needle size too small.	Replace with needle suited for size of thread used and material being sewn.
	4. Needle interferes with shuttle driver.	Adjust setting of shuttle driver. (see page 4)
	5. Needle interferes with clamp foot.	Adjust setting of clamp foot. (see page 5)
	6. Wiper interferes with needle.	Adjust height of wiper. (see page 8)
	7. Needle interferes with movable knife.	Adjust setting of knife bar operating cam (see page 8) and timing of knife (see page 10).
3. Thread breakage	1. Shuttle body and shuttle driver marred.	Remove mar with oil stone and polish with polishing compound or replace with new part.
	2. Insufficient clearance between shuttle driver and shuttle body.	Adjust clearance. (see page 4)
	3. Throat plate needle hole bushing marred.	Remove and buff or replace.
	4. Needle interfering with clamp foot.	Adjust setting of clamp foot. (see page 5)
	5. Needle thread tension too tight.	Adjust needle thread tension.
	6. Thread take-up spring tension too strong.	Adjust spring tension.
	7. Thread take-up spring stroke excessive.	Adjust amount of stroke.

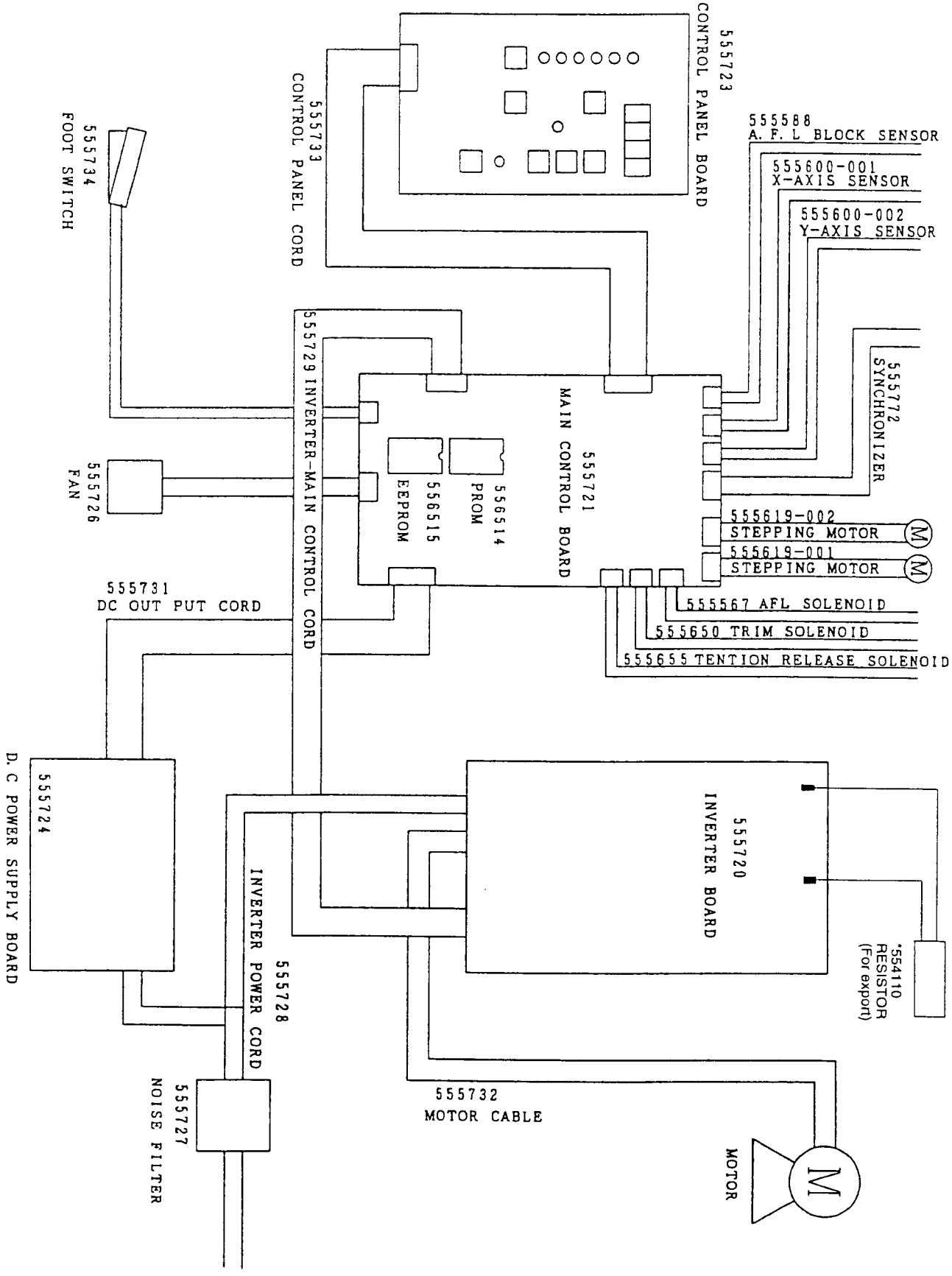
Trouble	Cause	Correction
4. Needle thread jams in the shuttle race	1. Shuttle race cap improperly positioned.	Adjust setting of shuttle race cap. (see page 5)
	2. Ⓐ portion of shuttle body rounded. 	Replace with new part.
	3. Lints adhering to raceway of shuttle race body.	Remove shuttle race body and clean out raceway.
	4. Improper timing of needle and shuttle body.	Adjust timing. (see page 4)
5. Thread breaks when trimming	1. Thread trimming takes place before needle thread tension is released.	Adjust timing of tension releasing bar. (see page 8)
	2. Mar on movable knife.	Remove mar with oil stone taking care not to damage cutting edge and polish with polishing compound.
	3. Mar on shuttle race cap.	Remove mar or replace with new part.
	4. Inproper height and setting of stationary knife.	Adjust height and setting of stationary knife. (see page 10)
	5. Thread handling area of throat plate needle hole bushing marred.	Polish with polishing agent or replace with new part.
	6. Improper setting and timing of movable knife.	Adjust setting of knife bar operating cam (see page 8) and movable knife (see page 10).
6. Malfunction of thread trimmer (Needle thread or bobbin thread cannot be trimmed when clamp foot is in its up position at end of cycle. Also trimmed thread ends are either extremely long or short)	1. Knife dull.	
	1-1 Worn stationary and movable knives.	Replace with new knives.
	1-2 Improper engagement of movable and stationary knives.	Adjust setting of knives. (see page 10)
	1-3 Excessive vertical play of movable knife.	Replace movable knife or hinge screw.
	2.Movable knife does not spread the needle thread.	
	2-1 Improper setting of knife bar operating cam.	Adjust setting of knife bar operating operating cam. (see page 8)
	2-2 Improper timing of movable knife.	Adjust timing of knife. (see page 10)
	2-3 Insufficient brake pressure.	Adjust brake. (see page 5)
	3. Skip stitches at last stitch.	Adjust timing of needle and shuttle body and also clearance between needle and shuttle body. (see page 4)
	4. Incorrect machine stop position.	Adjust synchronizer. (see page12)

Trouble	Cause	Correction
	4-1 Insufficient machine belt tension.	Adjust machine belt tension. (tension pulley)
7. Poor stitch tightness	1. Improper feed timing.	Adjust synchronizer (see page 12)
	2. Needle thread tension too loose.	Increase needle thread tension.
8. Poor sewing performance with synthetic thread	1. Sewing speed fast.	Reduce machine speed to 1800 S.P.M.
	2. Needle size too large.	Replace with smaller size needle or needle for synthetic thread.
	3. Fusing of thread caused by heating.	Use silicone oil.
	4. Frayed thread.	Polish all thread handling areas with polishing compound.
9. Thread end pulls out of needle eye (Thread end pulls out of needle eye before any stitch is formed)	1. Skip stitches at first stitch.	
	1-1 Improper timing of needle and shuttle body.	Adjust timing of needle and shuttle body and also clearance between needle and shuttle body. (see page 4)
	1-2 Improper feed timing.	Adjust synchronizer (see page 12)
	1-3 Improper sewing speed.	Reduce the speed at the start of sewing. (slow start)
	2. Needle thread end too short.	
	2-1 Improperly adjusted pre-tension.	Adjust pre-tension.
	2-2 Improper timing of tension release.	Adjust timing of tension releasing bar. (see page 8)
	2-3 Thread take-up spring stroke excessive.	Adjust amount of take-up spring stroke.
	2-4 Improper setting and timing of movable and stationary knives.	Adjust setting and timing of knives. (see page 10)
	3. Bobbin thread end too short.	
	3-1 Improper setting and timing of movable and stationary knives.	Adjust setting and timing of knives. (see page 10)
	3-2 Shuttle race cap marred.	Remove mar or replace with new part.
	3-3 Bobbin thread tension too tight.	Adjust bobbin thread tension.
	4. Thread spillage due to racing of bobbin.	Use bobbin and bobbin case made for 1669U machine.
10. Machine motor rotates in reverse direction.	1. Incorrect wiring of motor cables.	Among 3 motor cables to terminals U, V and W on inverter, change wiring of 2 cables. (For example, change cable U for V.)
	2. Defective inverter board	Change inverter board.

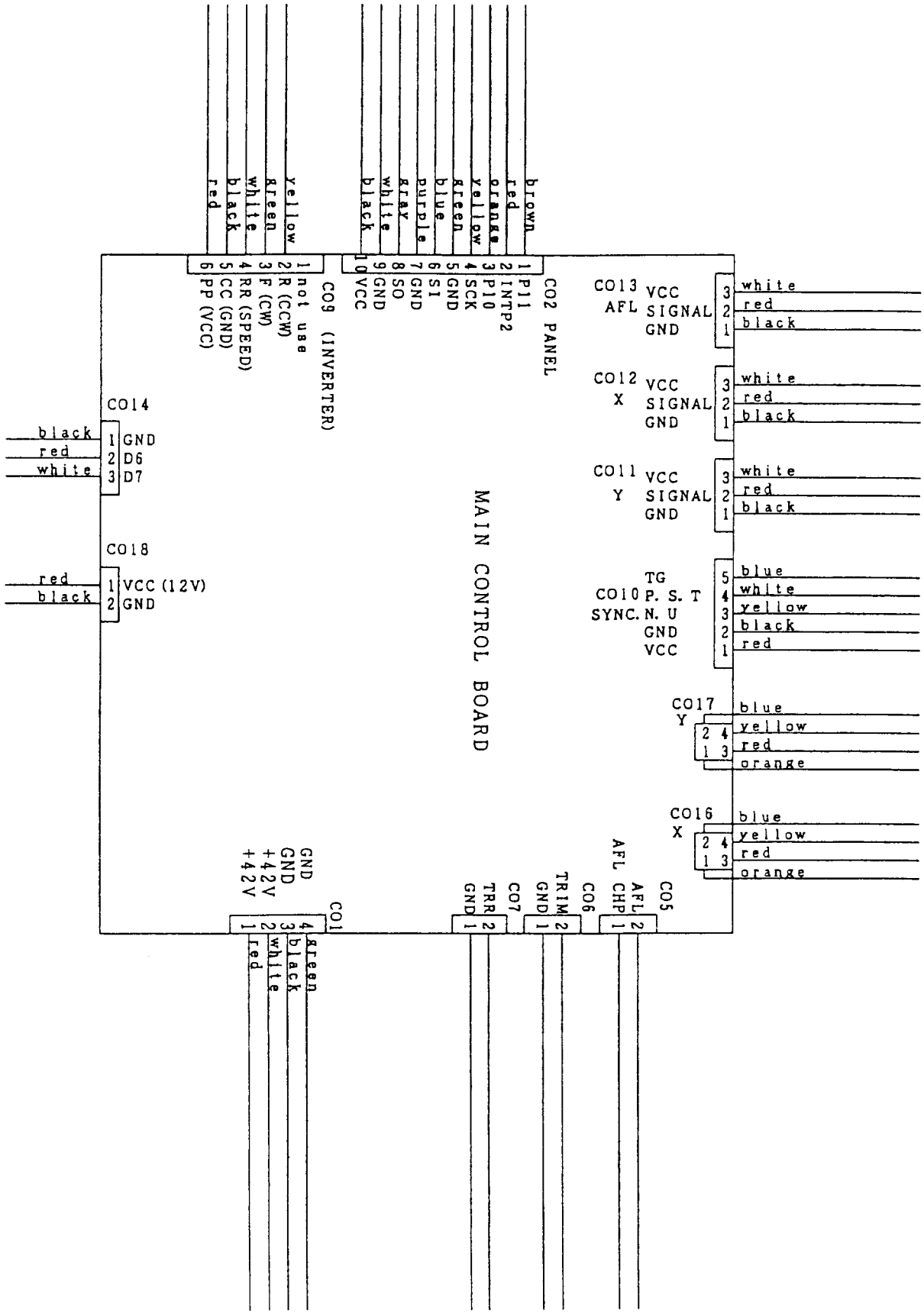
Trouble	Cause	Correction
11. Machine does not run when foot switch is pressed. (Presser foot does not come down.)	1. Defective foot switch.	Change foot switch.
	2. Defective main control board. board. (Input to foot switch cannot be received.)	Change main control.
12. Machine does not rotate when foot switch is pressed. (Presser foot can be raised or lowered.)	1. Defective foot switch. (2 step depressed switch)	Change foot switch.
	2. Defective main control board. (Failure in motor speed output.)	Change main control board.
	3. Defective inverter board.	Change inverter board.
13. Machine does not get up to speed.	1. Incorrect setting of speed.	Reset speed. (It is possible to set speed for each pattern.)
	2. Defective main control board. (Failure in motor speed output.)	Change main control panel.
	3. Defective inverter board.	Change inverter board.
14. Machine does not stop.	1. Defective main control board. (Failure in motor speed output.)	Change main control board.
	2. Defective inverter board.	Change inverter board.
15. E-32 or E33 appears when returning to original position.	1. Shield plate fastened to pulse motor became loose.	Check fitting condition and adjust if required.
	2. Incorrect connection of sensor. (CO11 and CO1 connected the other way around.)	Check connection and rewire if required.
	3. Defective feed sensor	Change sensor
	4. Defective main control board. (Sensor input failure)	Change main control
	5. Defective pulse motor.	Change pulse motor.
16. Pattern gets out of shape.	1. Defective EEP-ROM. (Pattern data get out of shape.)	Change EEP-ROM.
	2. Defective pulse motor. (Breakage of pulse motor cable, etc.)	Change pulse motor.
	3. Defective synchronizer (Signal for activating pulse motor out of time or has not been input.)	Change synchronizer.
	4. Defective main control board. (Cannot read data on main control board or pulse motor output failure.)	Change main control board.
	5. Torque when moving in X direction is too large.	Adjust position of feed cam bracket. (see page 7)
	6. Torque when moving in Y direction is too large	Adjust position of feed cam bracket. (see page 7)

Trouble	Cause	Correction
	7. Improper adjustment of original position reflector.	Adjust position of original position reflector. (see page 6)
17. Each solenoid dose not function.	1. Defective solenoid.	Change solenoid.
	2. Defective main control (Solenoid output failure.)	Change main control board.
	3. Defective DC power supply board. (Output current dropsdown.)	Change DC power supply board.
18. Operation of panel not possible	1. Control panel board defective. (Defective switches)	Change control panel board.
	2. Defective control panel cord. (Breakage, etc.)	Change control panel cord.
	3. Defective main control board. (Panel communication system failure.)	Change main control board.
19. No message appears on the display.	1. Defective control panel board. (Defective LED, etc.)	Change control pane board
	2. Defective control panel cord. (Breakage, etc.)	Change control panel cord.
	3. Defective main control board. (Power source section defective.)	Change main control board.
	4. Defective DC power supply board. (Output voltage poor.)	Change DC power supply board.

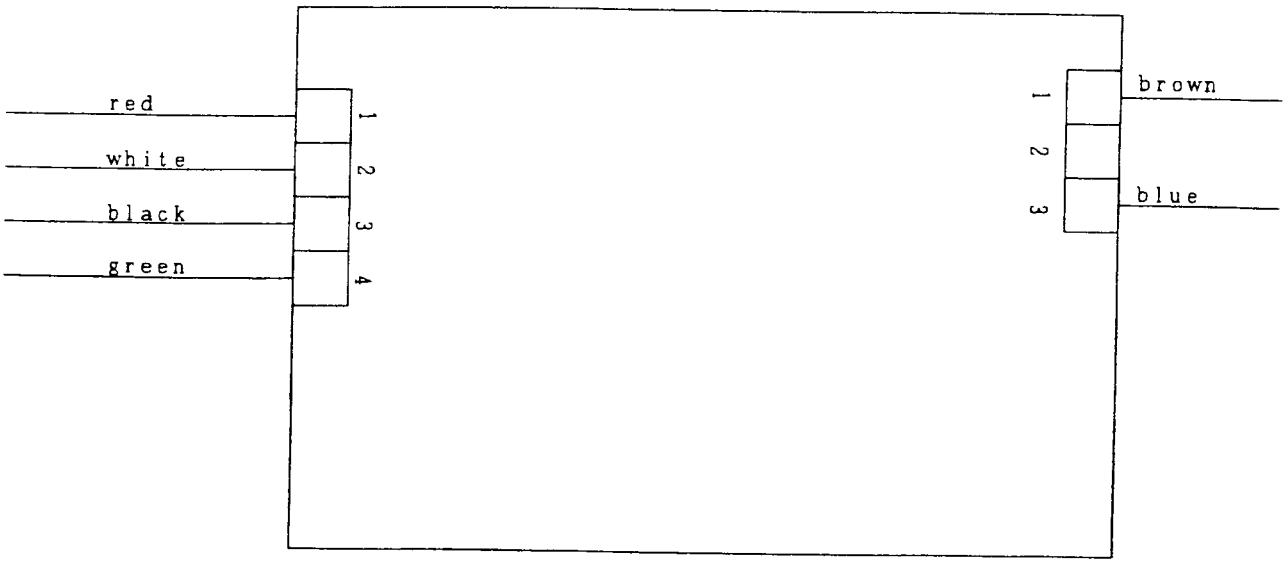
30. CONTROL BOX DIAGRAM



31. MAIN CONTROL BOARD DIAGRAM



32. D. C POWER SUPPLY BOARD DIAGRAM



33. INVERTER BOARD DIAGRAM