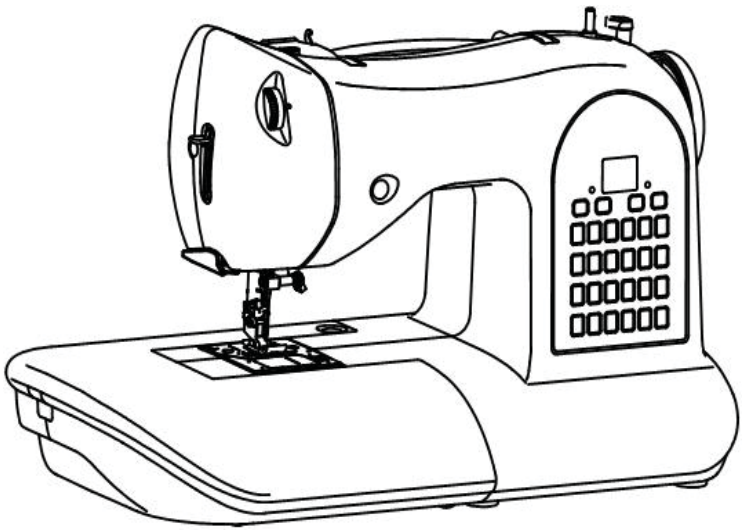
SINGER

160 model



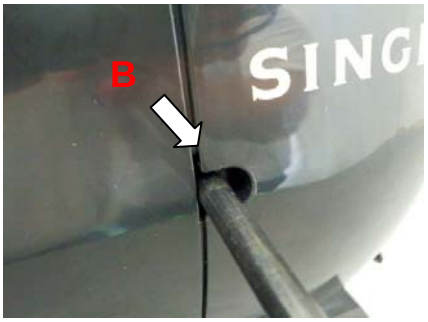
Service Manual

104 73 23-26
26 Sep 2011

(1) Face cover side

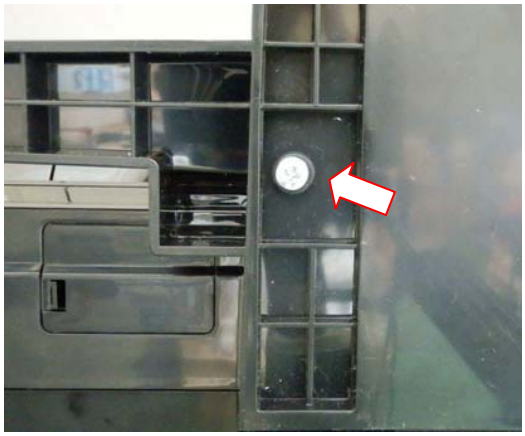
Remove screw A.

Remove screw B.



1. Disassembling of covers –continued--

(2) Bottom side

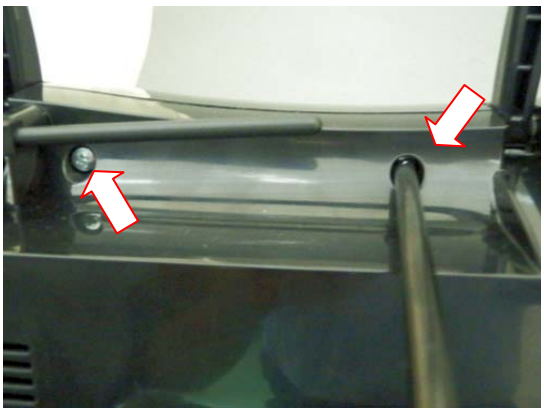


Remove a screw on front cover.

Remove a screw inside of access hole of front cover.
Don't remove screws above and below the access hole

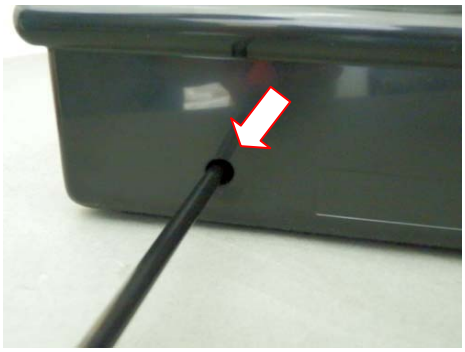
Remove cap for fine adjustment on assembly.

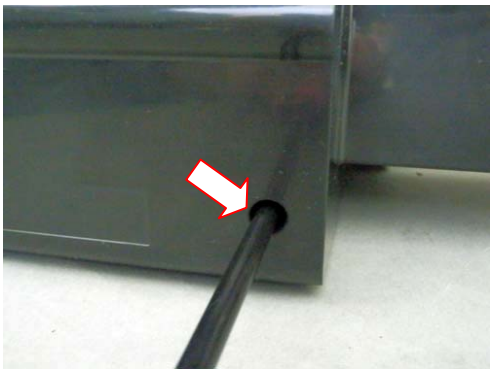
(3) Back cover side



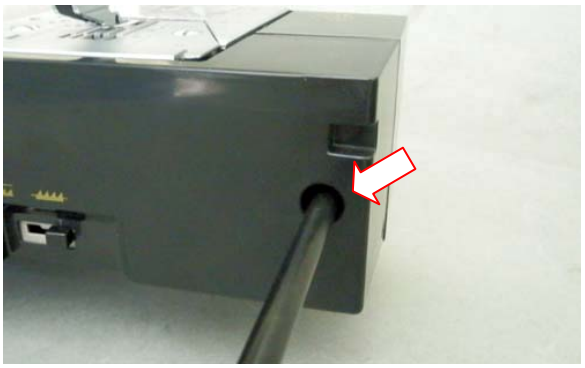
Remove two self-tapping screws.

Remove two self-tapping screws

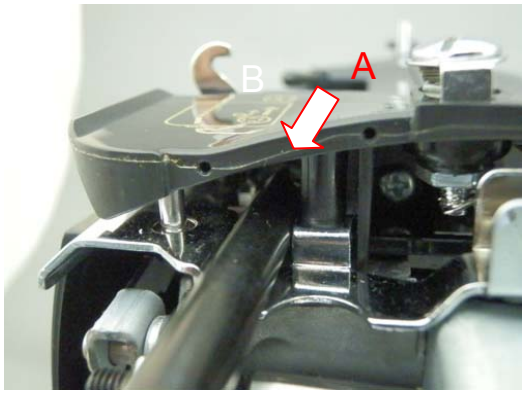


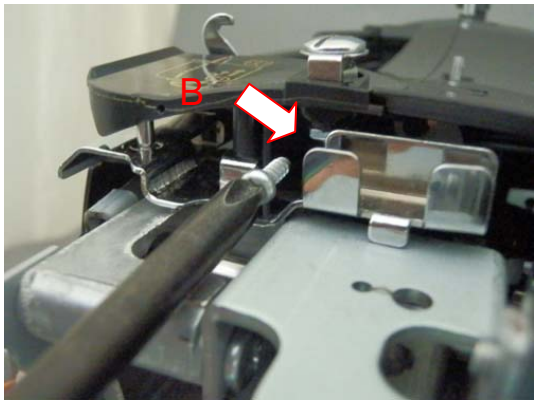


Remove self-tapping screw.



1. Disassembling of covers –continued--



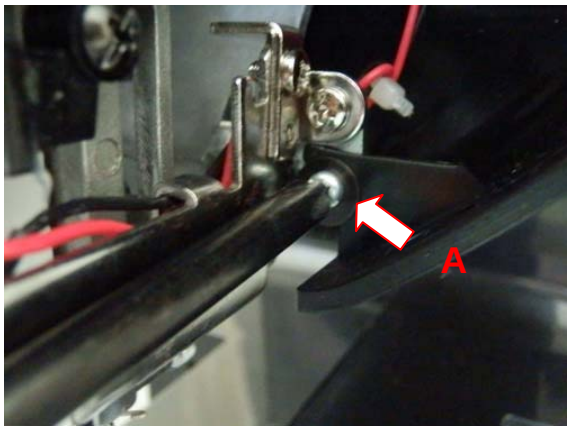


Remove screws (A & B) on pre-tension unit.

Pre-tension unit is removed.

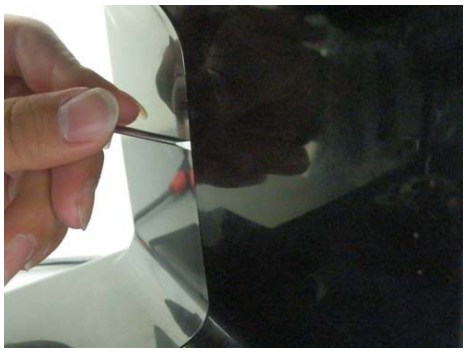
(4) Front cover side

Loosen screw A.



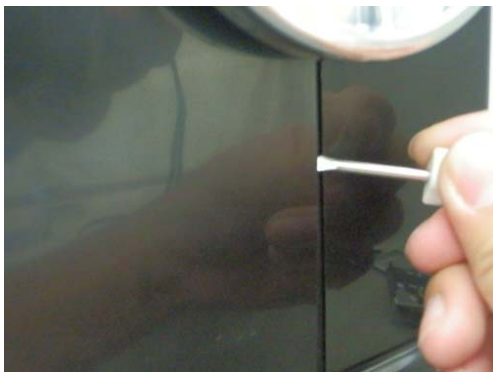
1. Disassembling of covers –continued--

Open back and front covers.
Push up front cover to open by inserting small screw driver between front and back covers.



Open mating portion of front and back covers by pushing back cover with small screw driver.

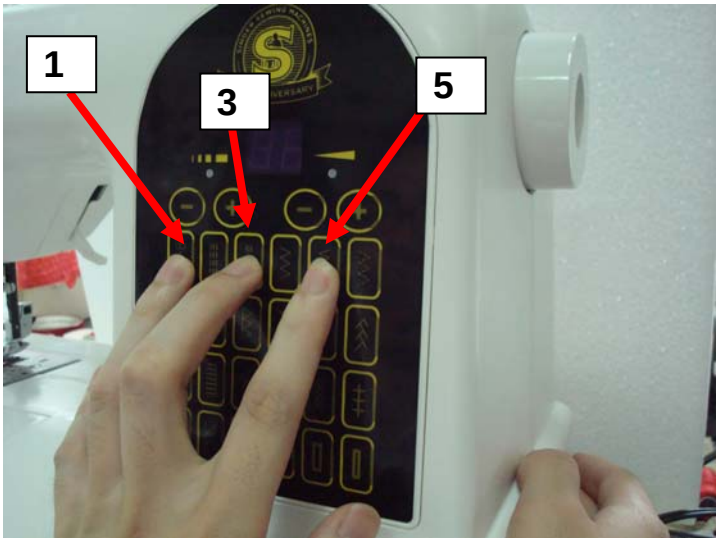
Open front cover with small screw driver.

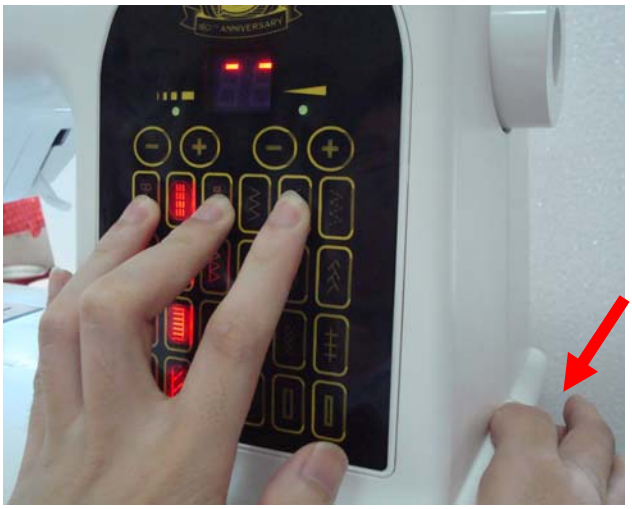


Remove front cover.

This test mode is used to operate machine without threading, while sensors for thread breakage, presser foot lever and bobbin thread are deactivated.

1. While pushing three switch buttons 1, 3 & 5 at control panel at the same time, turn on sewing machine.





2 . Release three switch buttons after beep sound is heard.

Machine runs with any desired button selected by using foot control.

2. Test mode -- continued --

1. Push bobbin winder to the right

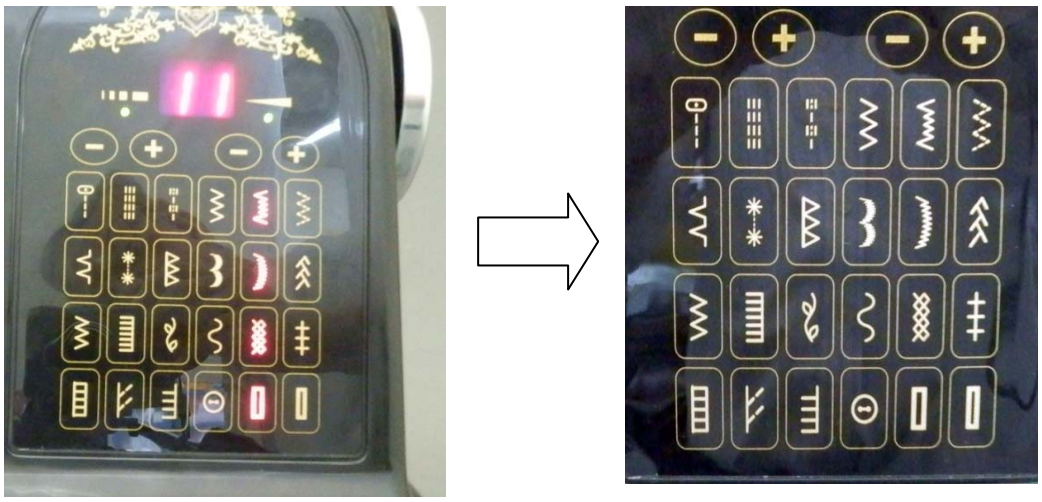
2. Push and hold reverse switch in place.

3. Turn on power switch.

4. Release bobbin winder while pushing reverse switch, just after power switch is turned on.
Note: See next page

2. Test mode -- continued --

Release bobbin winder by the time when LED is lit at extreme right line.



After entering test mode, the machine beeps and LED turns off.

Test mode

*Test mode 1 (Button ①)

Maximum zigzag width at 7 mm

No feed

*Test mode 2 (Button ②)

2.4 mm feed

Needle in the center position

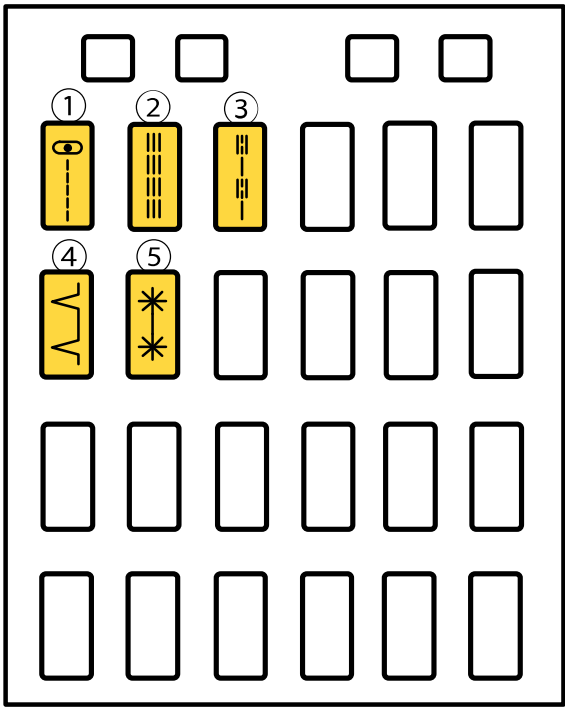
*Test mode 3 (Button ③)

For aging (shaking down)

Zigzag width at 7 mm

2.4 mm feed forward and backward

Note: use foot controller for running machine.

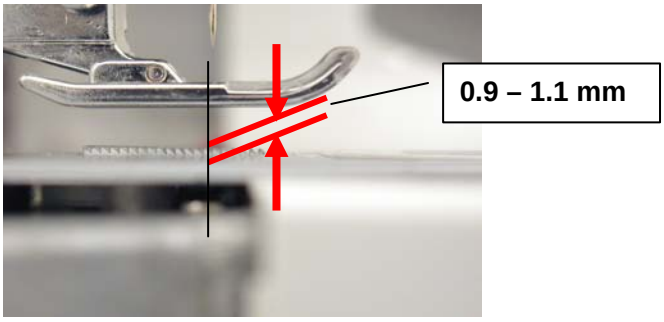


3. Adjustment of feed dog height

Model
160

Checking:

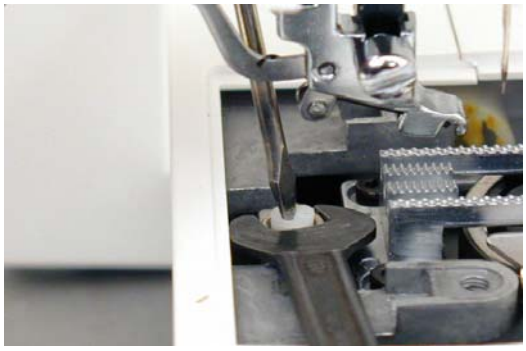
1. Move feed dog to its highest position by turning hand wheel.
Check to see if feed dog height is as illustrated below.



Adjustment:

1. Remove needle plate. Loosen nut with wrench.

2. Adjust height by turning screw as illustrated. Tighten nut securely after adjustment.



Note: Make this checking before checking **"Needle timing to shuttle"** and **"Feed-dog timing (vertical motion)**". Use needle Singer 90/14.

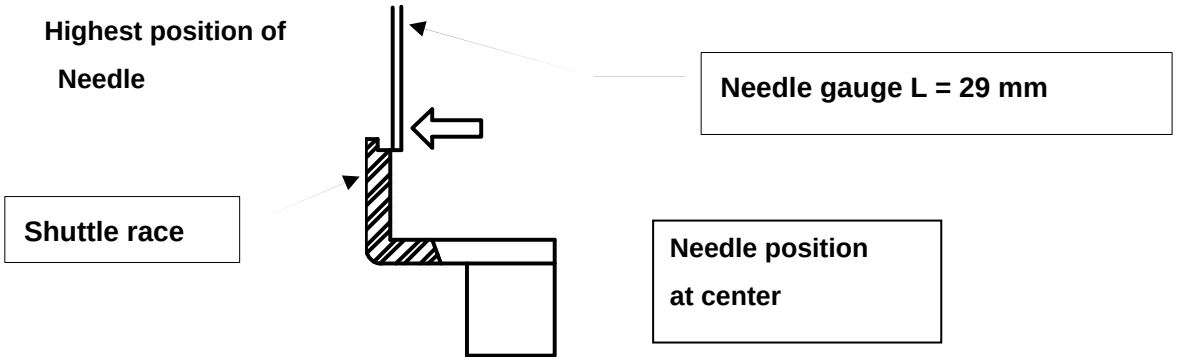
Checking:

1. Select straight stitch at center needle position.

2. Remove presser foot and needle plate, and then remove bobbin case.

3. Replace needle with special needle gauge (L=28.5 mm).

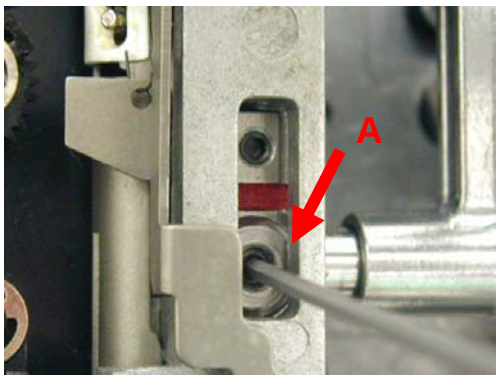
4. Lower the needle gauge to its lowest position by turning hand wheel by hand. Check to see if the bottom of the needle gauge aligns with shuttle race pushing the needle lightly as shown by arrow mark.



Adjustment:

1. Remove face cover.

2. Loosen screw (A) of needle bar clamp using hex screw driver and adjust the height of needle bar.



3. Tighten the screw (A) securely after adjustment. Replace needle gauge with normal needle #90/14.

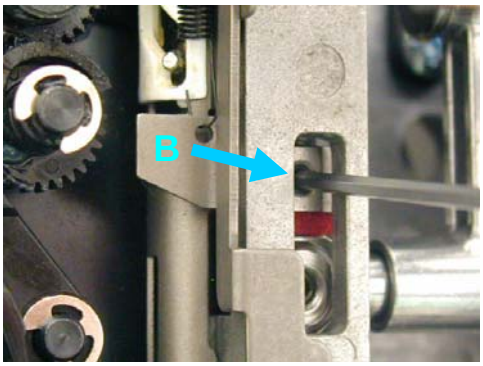
4. Check to see if needle threader operates correctly and there is not interference in vertical movement of needle bar.

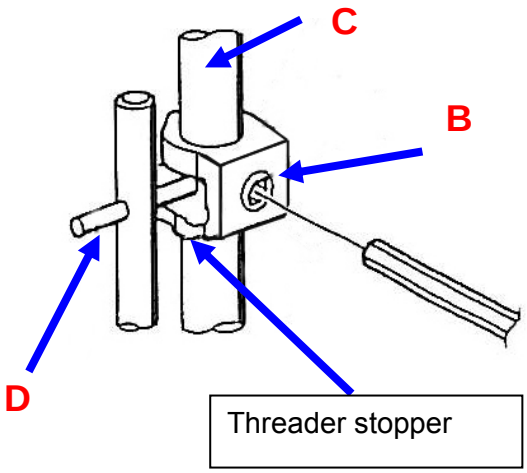
1. Use needle Singer 90/14.

2. Select straight stitch at center needle position.

3. Raise needle to its highest position by turning hand wheel toward you.

4. Lowering needle threader lever, check and see if hook is inserted into needle hole.





Adjustment

1. Remove face cover.

2. Turning hand wheel by hand, raise needle bar to its highest position.

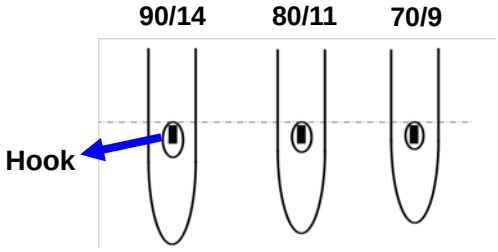
3. Loosen screw (B) of threader stopper.

4. Insert hook into the upper side of needle hole moving the needle bar (C).

5. While holding the above situation, tighten the screw (B) attaching the threader stopper onto stopper pin (D).

6. The direction of threader stopper should be facing toward you so that it may not hit the needle support bracket.

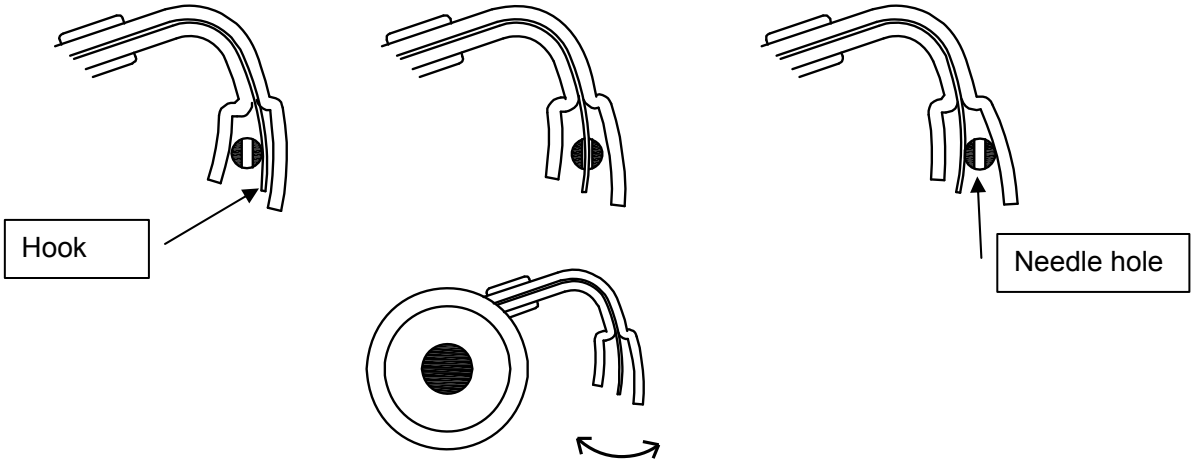
＊ Insert the hook into the upper side of needle hole at all times as the smaller needle size, the shorter needle hole.



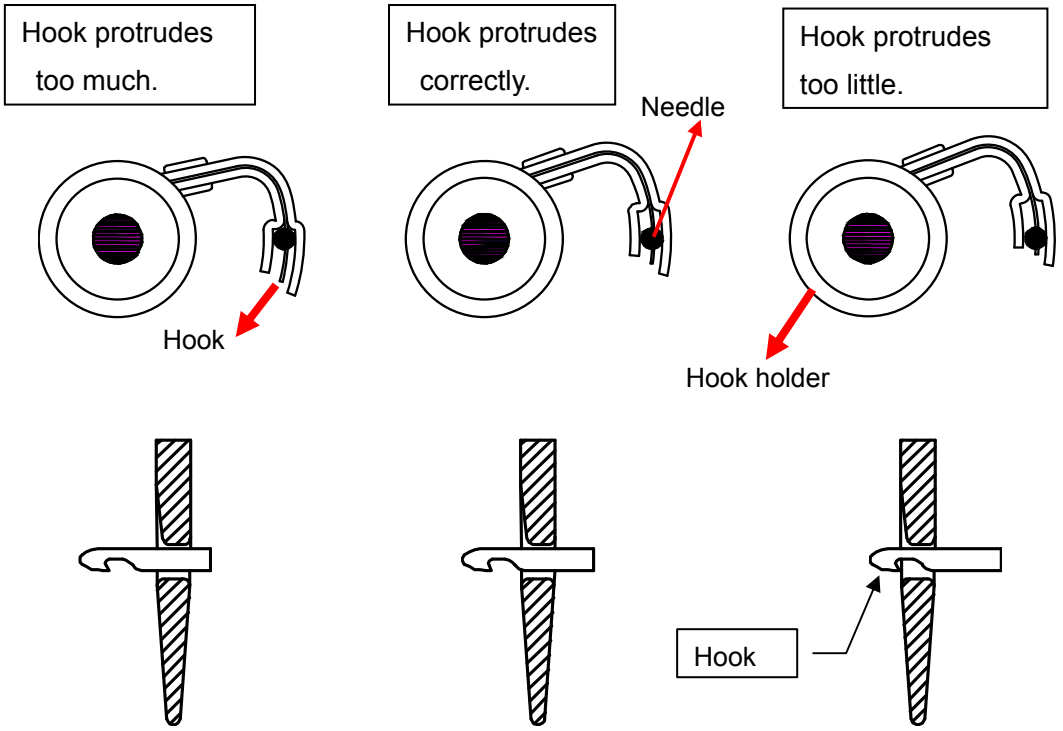
Insert the hook into the upper side of needle hole.

5. Needle threader height --continued--

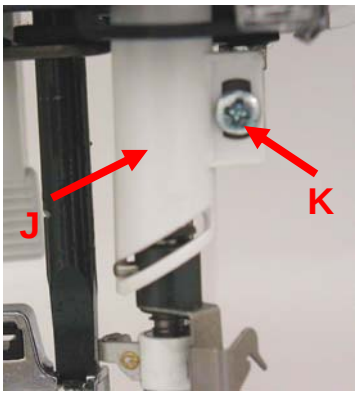
7. If the direction of insert hook is deviated from correct position, adjust the hook position with the small screw driver in the accessory.

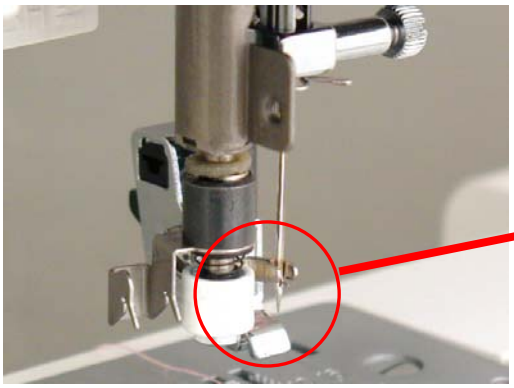


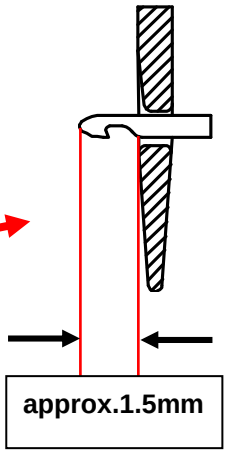
8. If hook protrudes from needle hole too much or little, it may affect threading condition.



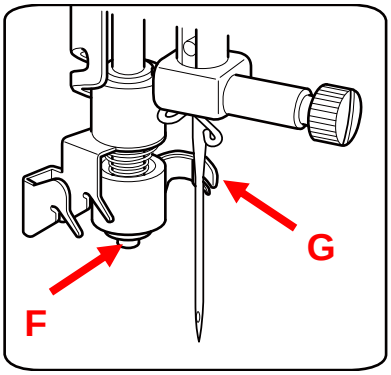
Remove screw (K) and outer pipe (J). Pull down the threading lever to its lowest position. Check and see if hook protrudes approx. 1.5mm from needle.

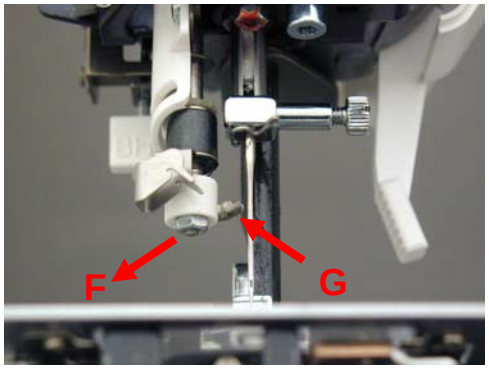






Loosen nut (F) under threader support shaft and turn hook portion (G) in either way for adjustment. Tighten the nut (F) securely after adjustment.

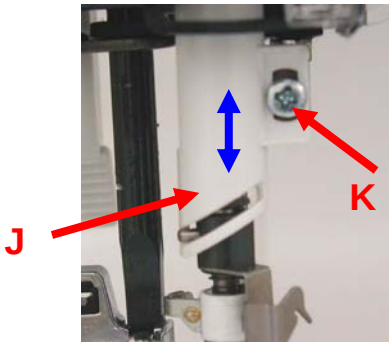


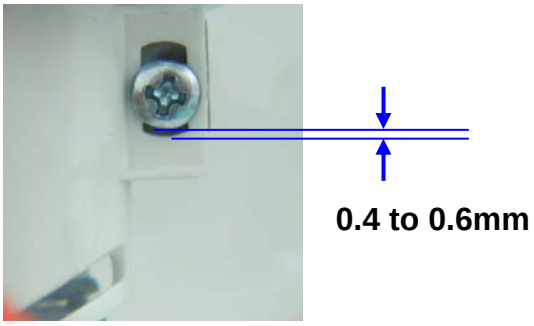


Reassemble outer pipe (J) to correct position.

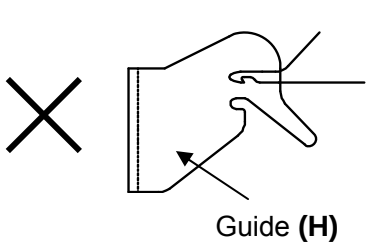
5. Needle threader height -- continued --

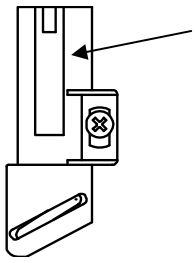
9. If twin thread guide (H) is located much higher or lower than hook portion, needle is not threaded.
   After checking hook position, adjust position of outer pipe (J) so that there may be a clearance **0.4 to 0.6 mm** between screw (K) and bottom of long hole.



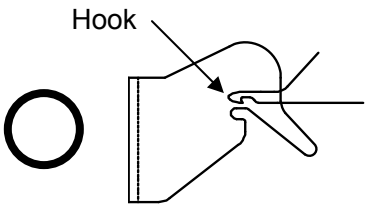


Position of twin thread guide and hook is shown below with threading lever lowered.

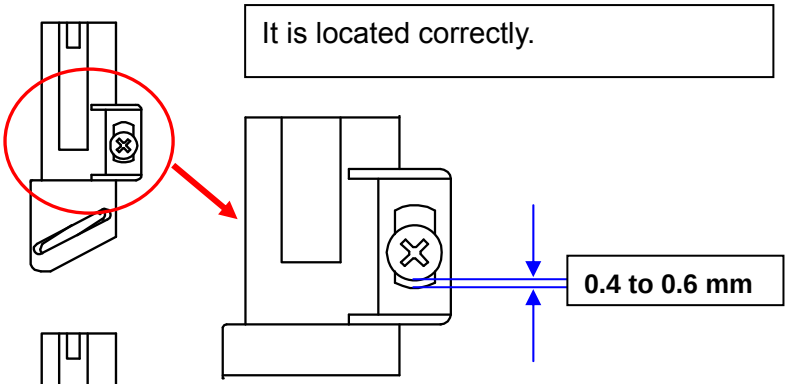


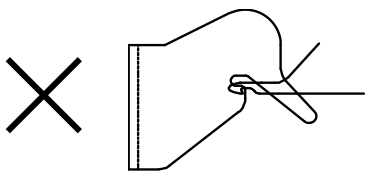


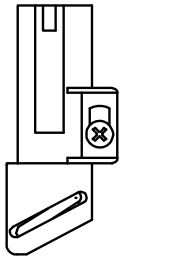
thread guide is locates too low.



It is located correctly.

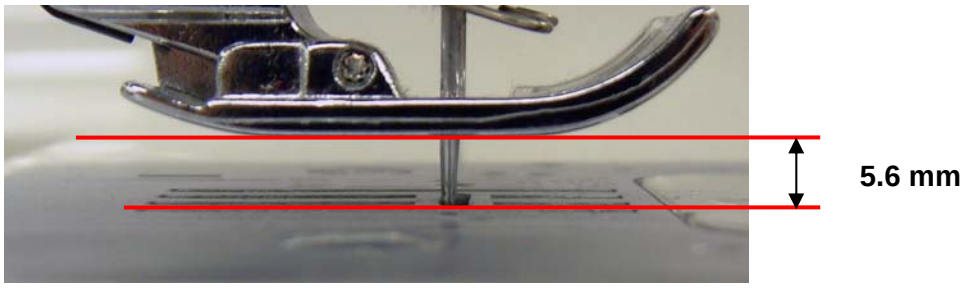






It is located too high.

Checking



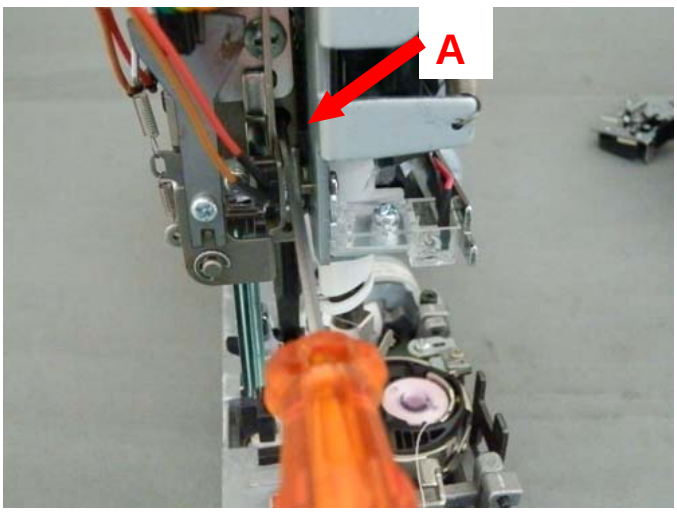
1. Lower the feed dog below the needle plate.

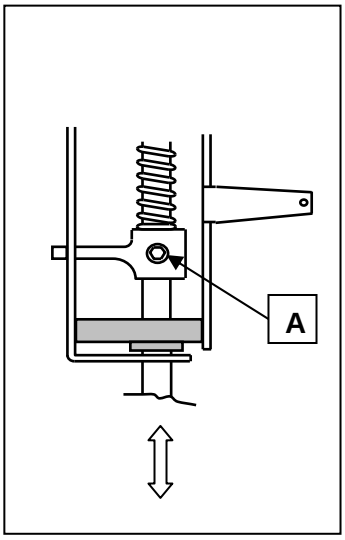
2. Raise the presser foot lever.

3. Check and see if clearance between needle plate and presser foot is about 5.6 mm.

Adjustment

1. Remove the face cover, and Raise the presser foot lever.
2. Loosen the screw (A) and adjust the presser foot height moving the presser bar.
3. Tighten the screw securely after checking the presser foot is parallel with the holes for feed dog on the needle plate.

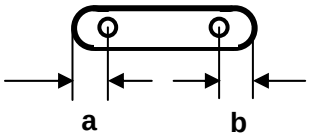




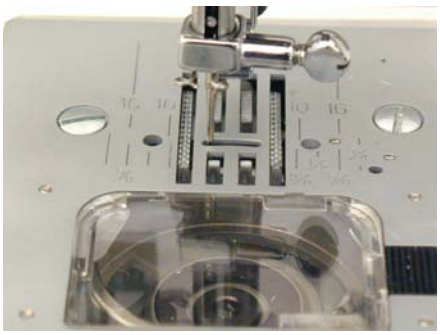
Checking:

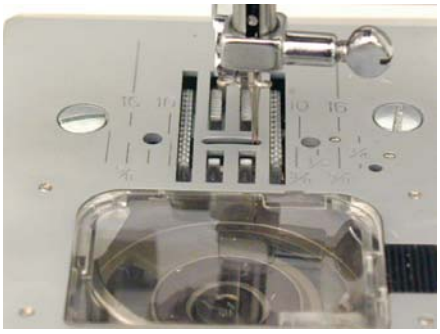
1. Set test mode at 1.

2. Turn hand wheel by hand and see if needle leaves the same clearance at both right and left end of needle plate hole.



a＝b





Adjustment:

1. Loosen screw (A) and adjust needle position.

8. Clearance between needle and shuttle

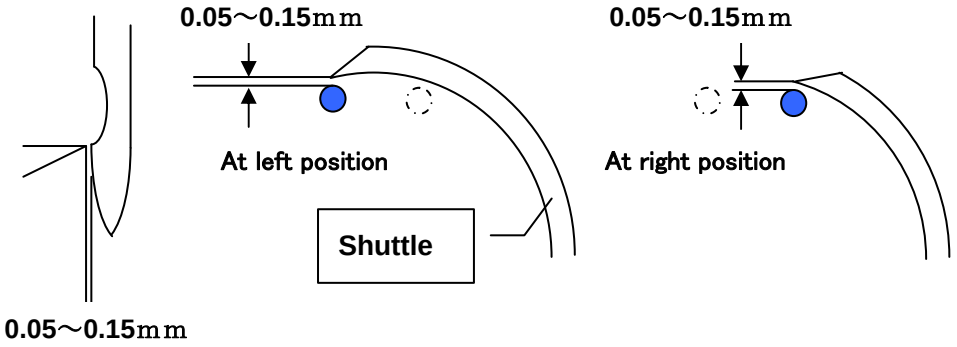
Note: Set machine at test mode and select mode 1 for needle at L/C/R positions. Make this checking before checking **"Needle timing to shuttle"**.

Checking:

1. Remove needle plate, bobbin case and face cover.

2. Shift shuttle hook at the rear of needle by turning hand wheel.

Check to see if needle clearance to shuttle is within 0.05 to 0.15 mm.



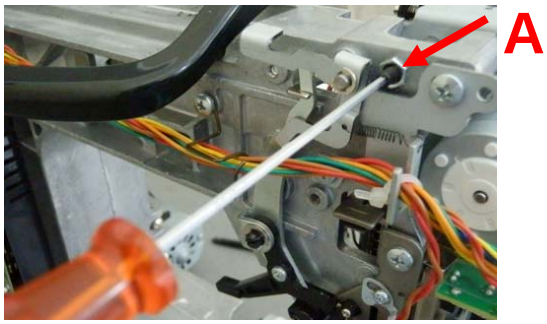
At left position

At right position

Adjustment:

1. Turn screw (A) to either direction as illustrated and adjust needle position by moving support shaft back and forth.

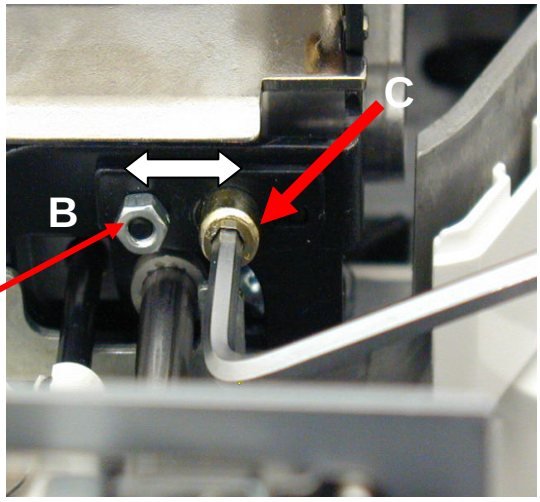
To decrease clearance, turn screw to counter-clockwise.

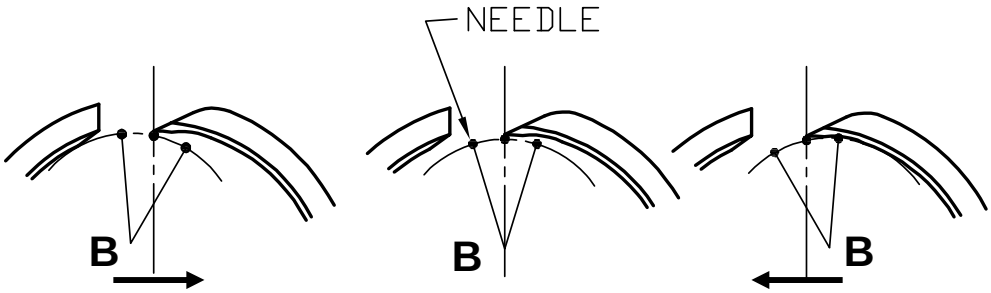


2. If needle clearance to shuttle at right and left position is not same, adjust position of fulcrum (B) for needle swing support.
Loosen bolt (C) located under bottom of support plate and adjust position of fulcrum.

Position of fulcrum (B) for needle swing support.

Do not loosen this screw.





If needle touches with shuttle at left side, adjust position of fulcrum (B) for needle swing support to the right.

If it touches at right side, adjust position of fulcrum (B) for needle swing support to the left.

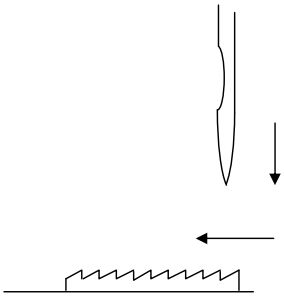
3. After adjustment, tighten the bolt (C) securely.

Note: After adjustment, be sure to follow **"Needle timing to shuttle".**

As horizontal and vertical feed motion is unitized on this model, adjustment of feed timing is as follows:

Checking:

1. Bring needle bar to its highest position by turning hand wheel.
2. Check to see if feed dog starts to move when needle starts to go down by turning hand wheel towards you.



Feed dog starts to move a little bit earlier than when needle starts to go down.

Adjustment:

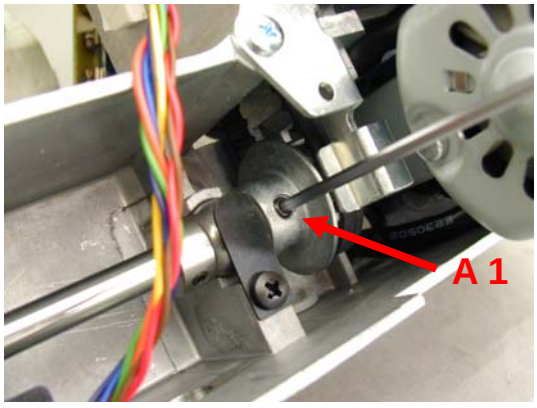
1. Adjust the angle of timing gear to lower shaft with 2 screws (A1 & A2) on timing gear loosened and hex driver inserted into one of the screws by turning main shaft with hand wheel,.

If feed-dog motion too early → Turn hand wheel towards you.

If feed-dog motion too late → Turn hand wheel away from you.

2. Tighten one of two screws temporarily and check feed-dog motion.

3. After adjustment, tighten screws (A1 & A2) securely.



10. Needle timing to shuttle hook

Model
160

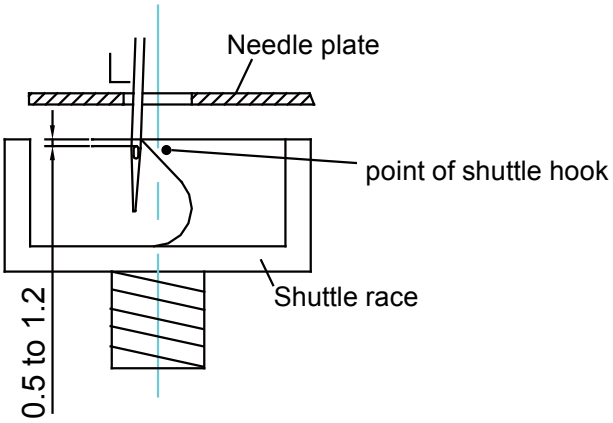
Check "Feed timing (vertical movement)" and "Needle height" beforehand.

Checking

1. Set machine at test mode and select mode 1.

2. Remove needle plate. Check to see if needle is not bent.

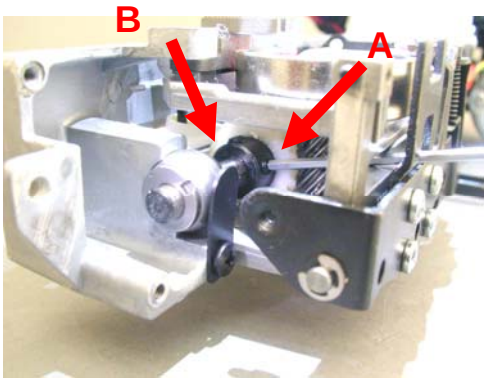
3. Move needle to left position by turning hand wheel. Raise needle from its lowest position slowly and check if distance is as illustrated below when point of shuttle hook aligns with right side of needle.



Adjustment

1. Remove front cover. Loosen two screws (A & B) on gear and adjust position of gear as illustrated below.

With one screw tightened temporarily, check to see if the distance is as illustrated above. Adjust it by turning main shaft with hand wheel, with screws loosened and hex driver inserted into one of the screws.



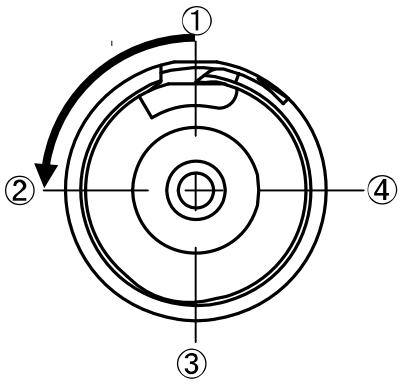
2. Tighten screws securely after adjustment.

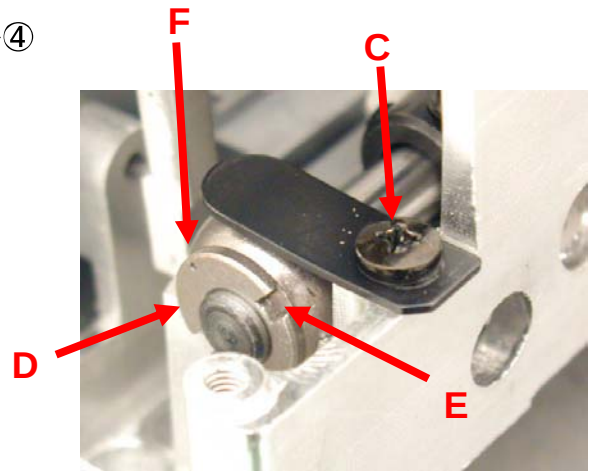
Meshing condition of shuttle race gear and lower shaft gear

1. Check meshing condition of gears after adjustment.

Check play of the gear at 4 positions –each 90 degree angle of 1 rotation of shuttle race.

No play on 2 positions to save too loose condition – play on other 2 positions to save too tight condition.





2. Adjustment of play between shuttle gear and lower shaft gear is made by turning eccentric ball bushing (D).

*loosen screw (C) on pressing plate so that the ball bushing (D) may be turned.

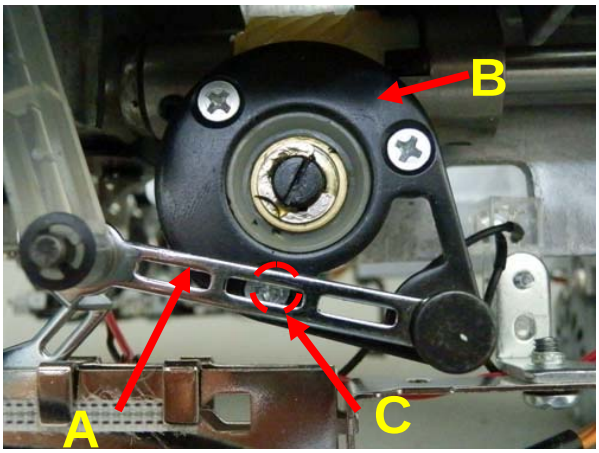
*Turn the ball bushing (D) in either way by using concave portion.

*The ball bushing is to be placed with mark (F) positioned at upper side within angle of 180 degrees

3. Tighten the screw (C) securely after adjustment.

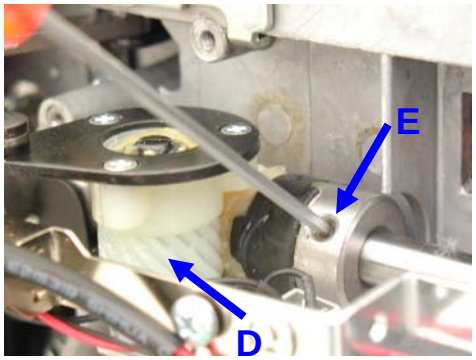
Checking

1. Bring needle bar to its lowest position.
2. Check to see if arm of take-up lever (A) is located at position (C) where one of 3 screws on take-up operating gear plate (B) is hidden by the arm,



Adjustment

1. Loosen two hex screws on main shaft gear (E) which is engaged with take-up operating gear (D).
2. While inserting screw driver into accessible hex screw, turn main shaft gear (E) in either way to get correct timing of take-up lever to needle.



3. Tighten 2 screws securely after adjustment.

12. Adjustment of meshing position of gears for take-up lever

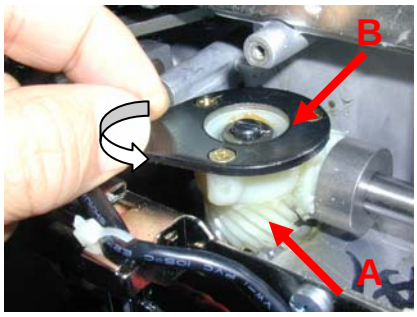
Model
160

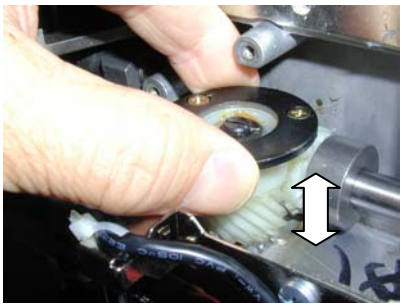
Checking

1. If excessive noise is generated from take-up lever, there should be a problem in meshing of take-up operating gear (A) with main shaft gear.
2. Remove front cover and check play of gear (A) by turning take-up operating gear (B) by hand:

   There should not be play at 4 positions of the gear and it should not be tightened too much.

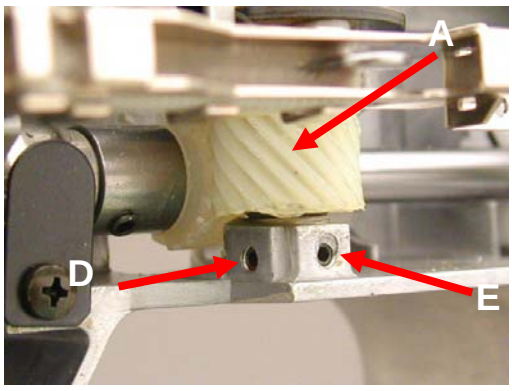
3. Also check to see if there is no play of gear (A) vertically.

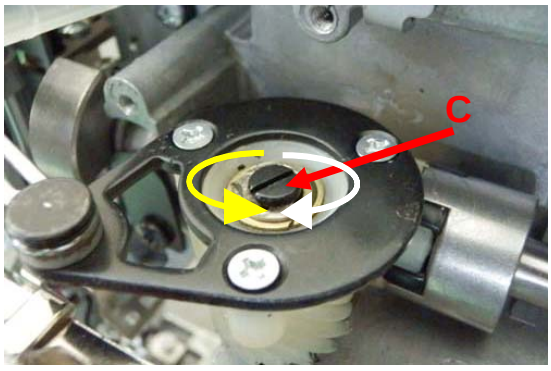




Adjustment

1. Loosen screws (D & E) fixing eccentric gear shaft (C).
2. Adjust by turning gear shaft (C) slightly while pushing it with screw driver as shown, since the gear shaft tends to pop up.





3. Tighten the screw (D) and then screw (E) securely after adjustment.

Checking:

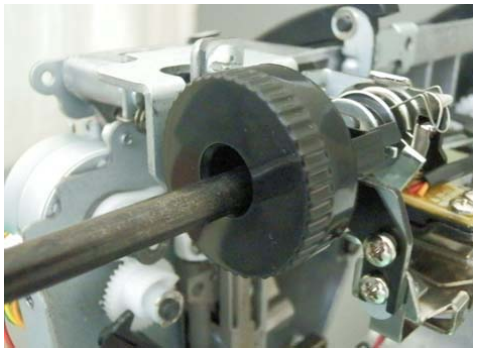
1. Set thread tension at the center of “AUTO” position.
2. Pull thread between tension discs and check thread tension value with two twisted Polyester #50 thread.
3. Measured value should be 40 to 50 g.

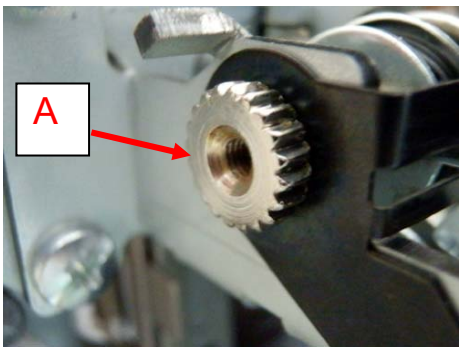
* Bobbin thread tension should be 16 to 18 gr.

* For actual sewing, sew zigzag stitch and check balance of upper and lower threads.

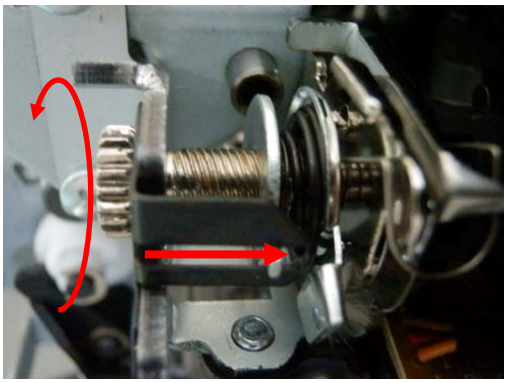
Adjustment:

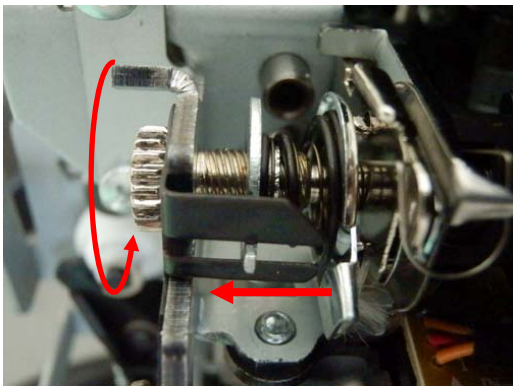
1. Remove front cover.
2. Memorize current position of tension dial and pull out it.





3. Set the tension as you like by rotating long screw A, which looks like a gear wheel, clockwise and anticlockwise.





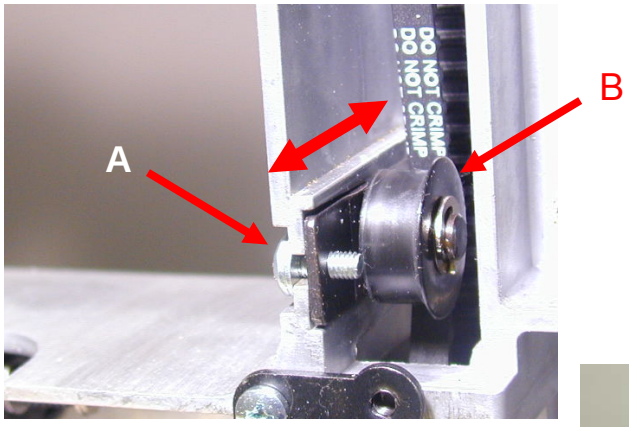
Rotate it clockwise to make the tension stronger and anticlockwise to make the tension weaker.

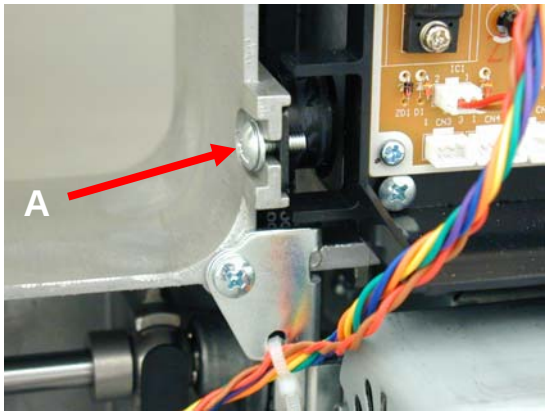
Note: This checking is needed before and after adjusting “Needle timing to shuttle”.

1. Timing belt is engaged with gears on main and lower shafts.
Too weak tension may result in slippage between shuttle gear and lower shaft gear due to thread jamming, bunching and fabric snagging.
Too strong tension may result in incorrect operation due to increased machine torque.

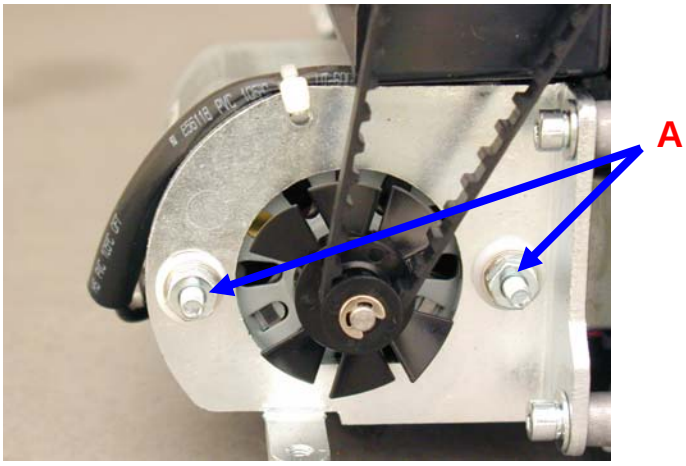
2. Loosen screw (A) on arm frame for idler pulley (B) and shift the position of idler pulley (B) for adjustment.

3. After adjustment, tighten screw (A) securely.





Note: Be sure to recheck “Needle Timing to shuttle” after adjustment.



Adjustment:

1. Remove the front cover.
2. Loosen two nuts (A) and adjust belt tension so that belt may be bent about 5 mm when it is pushed by pressure of 100g between upper shaft and motor.
3. Tighten the two nuts after checking the belt tension.

1. Remove needle plate.

2. Loosen screw (A) and adjust the position of retaining bracket in direction as illustrated by arrow in fig.1 so that the projection of bobbin case may be positioned against the plate spring in fig.2.

3. Place needle plate into position、check clearance between projection of bobbin case when move bobbin case in reverse rotation. Clearance is 1 to 2 mm.

Fig.1

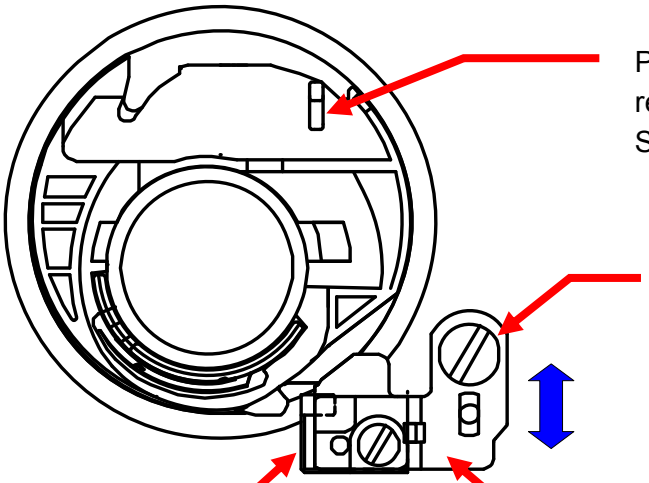


Fig.2

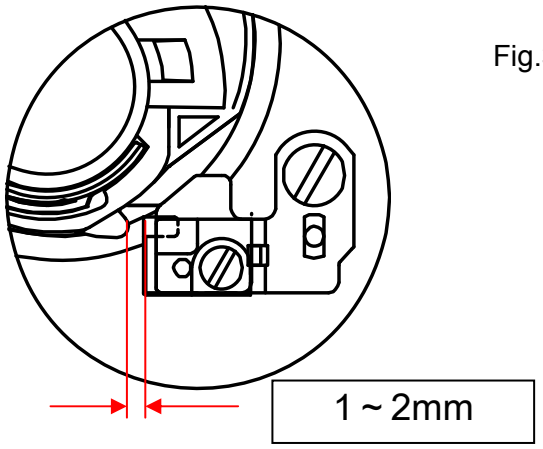
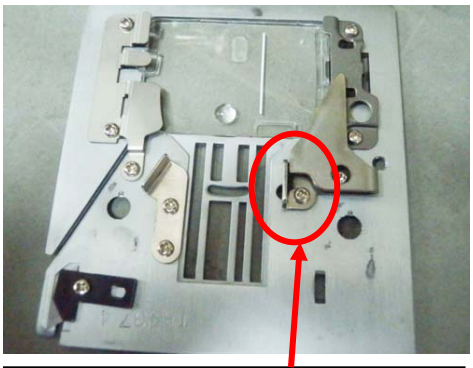


Fig.3



Retainer for reverse rotation

4. Tighten the fixing screw (A) securely.

(A) Checking meshing position of gears

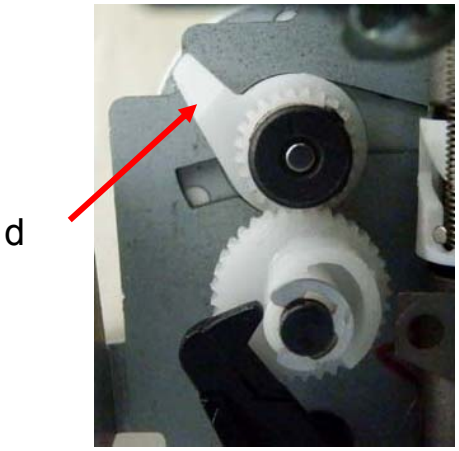
This procedure is needed only when disassembling and re-assembling cams.

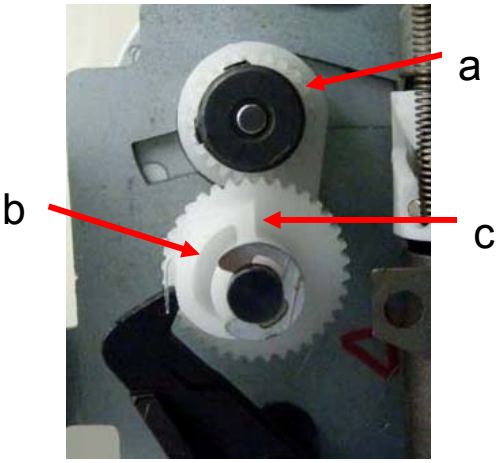
Checking

1. Remove face cover and turn off power switch.

2. Rotate gear (a) clockwise until it stops with long projection (d) touched with shaft.

3. Check to see if end (c) of zigzag cam (b) aligns with center of gear (a).





Disassembling and re-assembling

If meshing position of two gears is not correct, remove zigzag cam (b) from shaft and insert it into correct position.

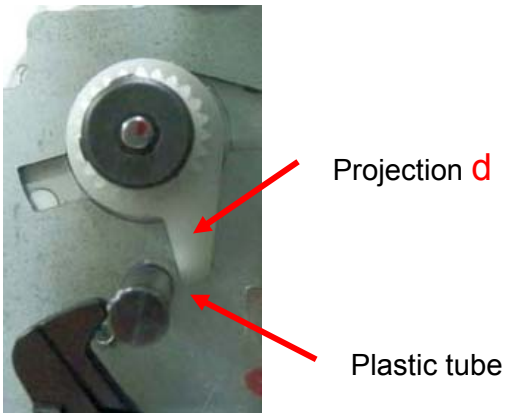
(B) Origin point positioning of zigzag bight

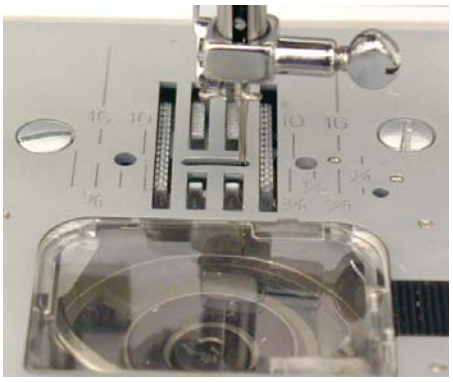
1. Loosen two screws of motor's pinion gear (a) with interlocked together. Set test mode 4.
Test mode 4 is to check if step motor works appropriately at zigzag stitching.
*See next page.

2. You see motor shaft spin around by pushing reverse switch in test mode 4, and it is in exciting position while spinning around by pushing reverse switch several times.
Rotate movable pinion gear (a) clockwise until its projection(d) reaches stopper, and tighten available screw securely.

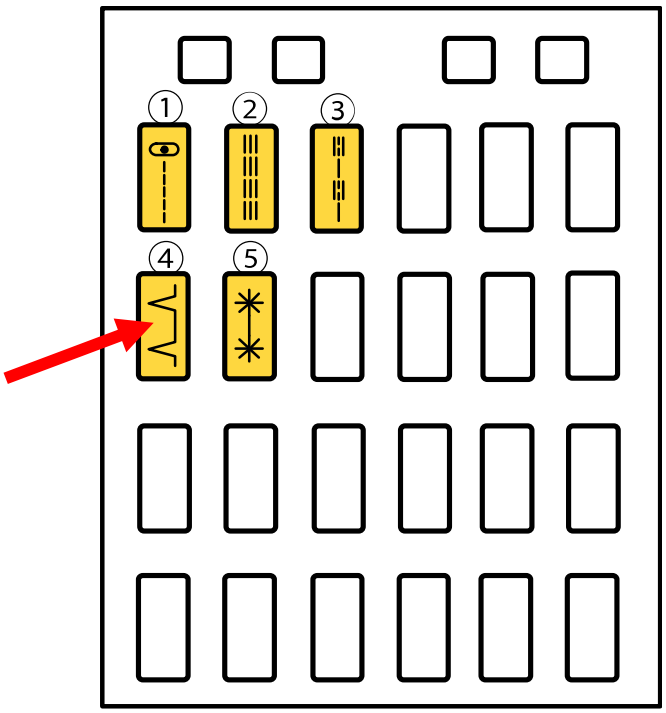
3. Power off and tighten remaining screw by rotating pinion gear (a) anticlockwise moderately.

Note: Unlike other models, this one does not have switch for origin point positioning.
It is designed so that motor shaft is in exciting position when projection(d) of pinion gear(a) reaches stopper for origin point positioning.





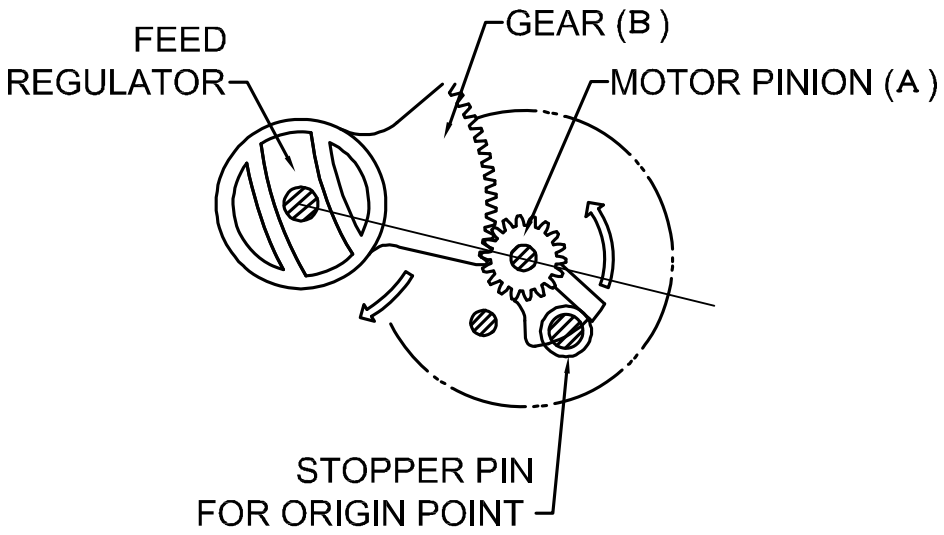
Enter test mode referring to Sec. 2. After entering it, push pattern switch 4. Raise needle and push reverse button.



(A) Checking meshing position of gears

This procedure is needed only when disassembling and re-assembling cams.

Rotate motor gear clockwise to touch it with stopper pin and mesh these gears so that feed regulator gear may be positioned with full two gears below line from feed regulator to motor gear



（B）Origin point positioning of stitch length

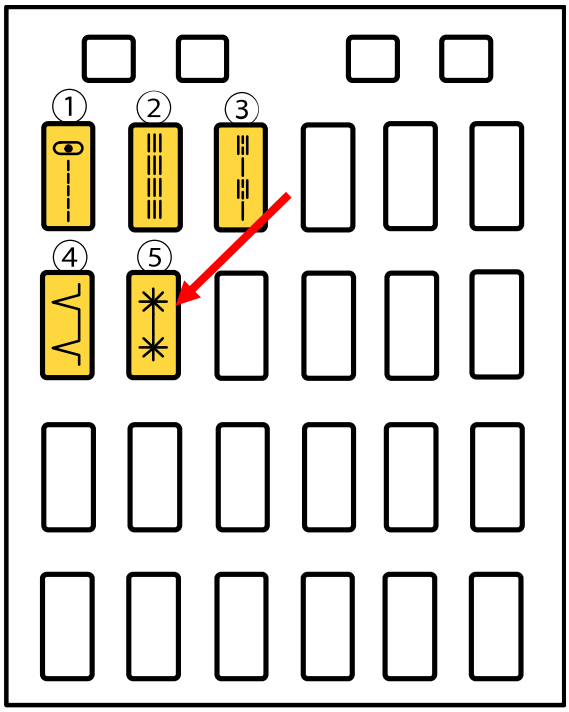
Step motor rotates 7.5 degrees with one pulse, but ratio of motor gear vs. feed regulator gear is 1：6.25. This amount of rotation makes feed regulator rotate 1.2 degree.

This amount of rotation makes stitch length vary by 0.2 mm. 0.2 mm stitch pitch moves at each of 7.5 degree exciting position.

In case of large deviation, adjust as follows:

Setting

1. Turn off power switch.
2. Loosen two screws on motor gear. The motor gear will become free from motor shaft.
3. Turn on machine and set test mode. See Sec.2. Select pattern switch 5 as illustrated .
4. Rotate projection(1) of motor gear until it touches with stopper pin.
5. Push pattern button ④ several times so that motor shaft will be held at one of exciting position. Be sure that two screws of pinion gear are loosened.
6. Keep this condition and tighten temporarily one of screw of pinion gear.
7. Turn off the machine and tighten another screw of pinion gear.



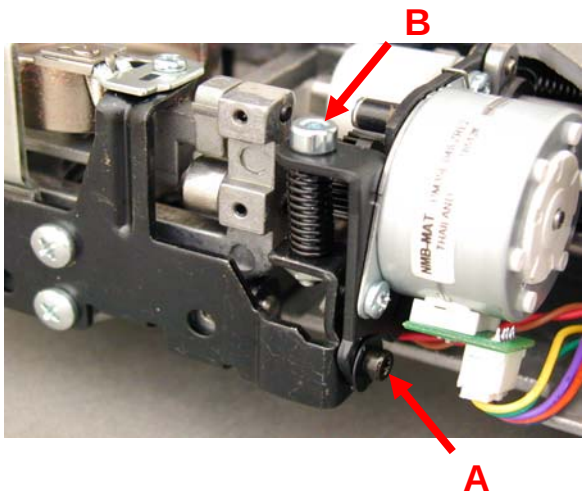
This completes point positioning.

(C) Stitch balance

If forward and reverse pitch is not balanced due to imperfect zero feed adjustment, adjust by changing position of motor.

Adjustment

1. Set machine at mode 2. [Zero feed]
2. Loosen fixing bolt (A) on motor bracket using 2.5 mm hex driver.
3. Turn position adjusting bolt (B) on motor bracket in either direction using 3.0 mm hex driver. running machine with a little thick paper placed under presser foot.



4. After adjustment of Feed Zero with needle only, re-check feed balance of actual patterns under following conditions.
   *Fabric: Demo swatch
   *Thread: Coats & Clark #60
   *Presser foot: Satin foot
   *Actual patterns to be checked:

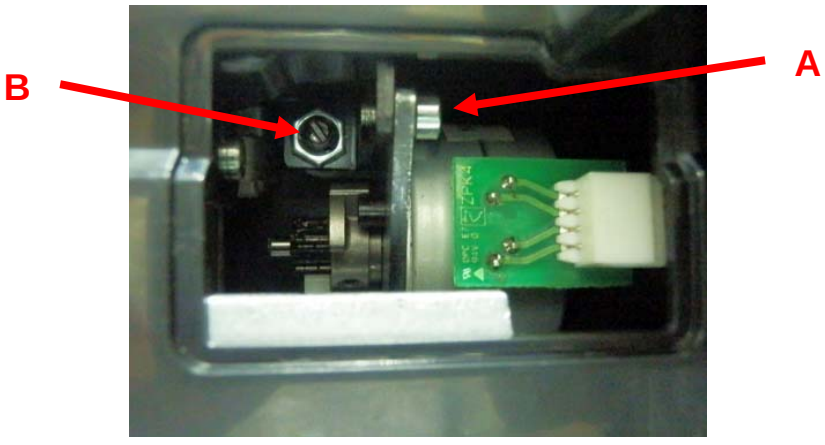
5. Make fine adjustment to obtain feed balance for each pattern.
6. Tighten fixing bolt (A) on motor bracket securely after adjustment.

Adjustment without removing front and rear covers

1. Lay machine on its back and remove cap with small screw driver.

2. Loosen screw (A) with L-shaped 5 mm hex driver.
Turn screw (B) in either direction with minus screw driver and confirm whether adjustment is correctly done after setting up machine in position. Repeat this process until desired feed balance is obtained.

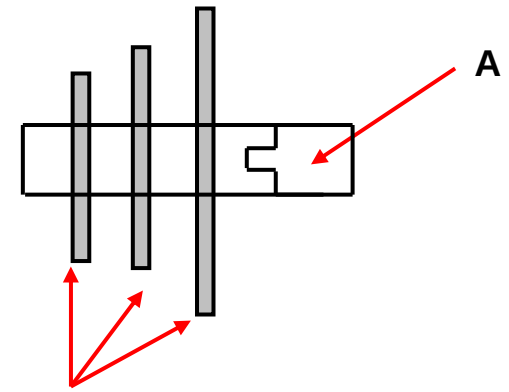
* Turn the screw (B) clockwise to adjust reverse stitch
* Turn the screw (B) counter clockwise to adjust forward stitch

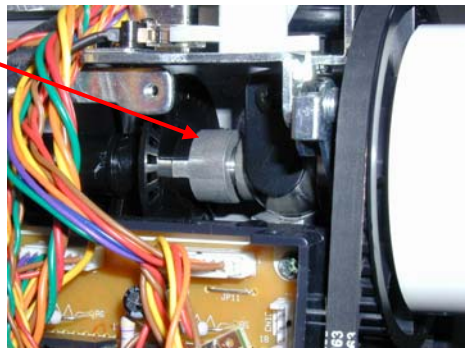


Needle always stops at high position. This is controlled by sensor cam and sensor located on main shaft.

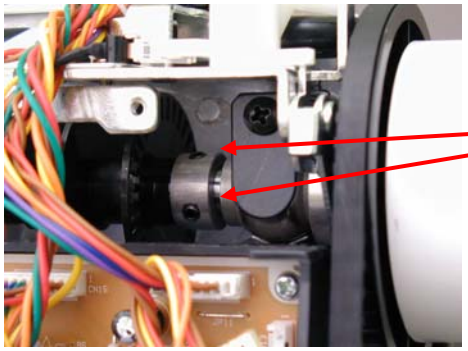
Adjustment:

1. Raise needle to its highest position.
2. Loosen two screws (B1 & B2) on collar (A) fixing sensor cam.
3. Turn collar (A) in either direction until needle stops at its highest position.
4. Check to see if take-up lever stops at the position for threading easy after adjustment.
5. If there is no problem, tighten two screws (B1 & B2) securely.





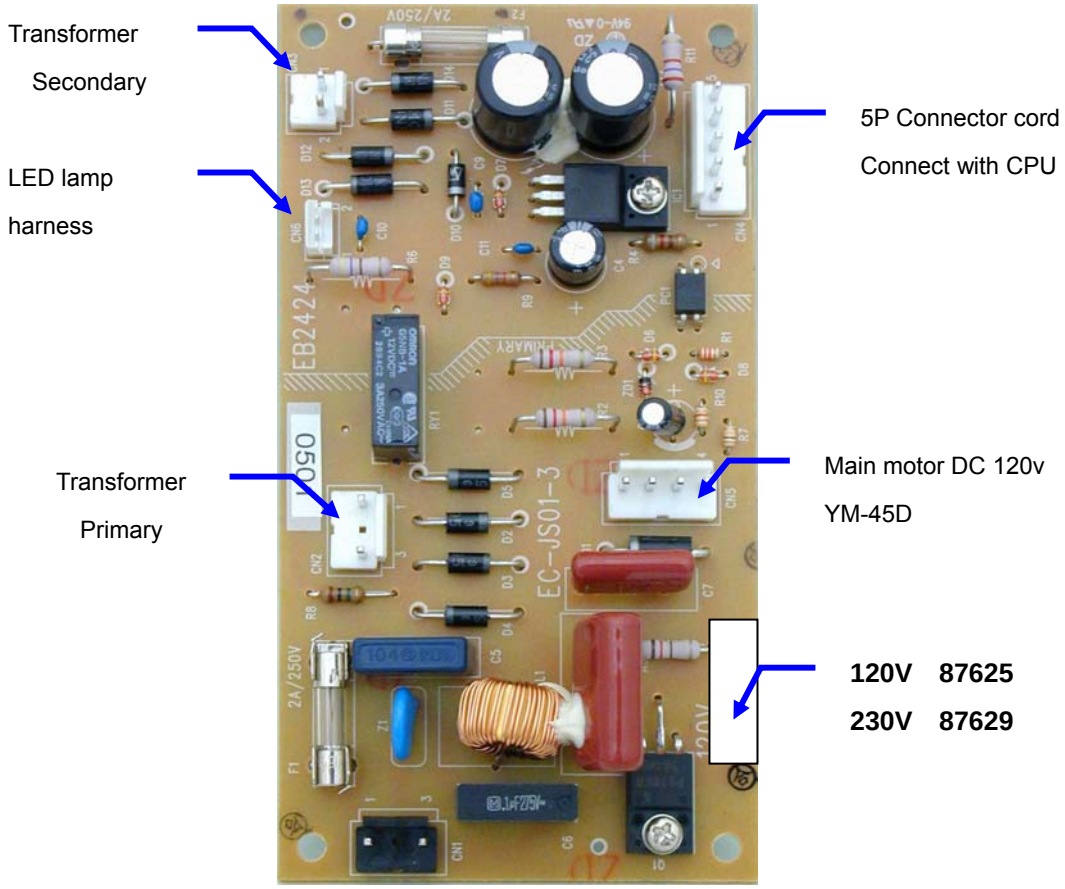
(Front View)



AC Power Board

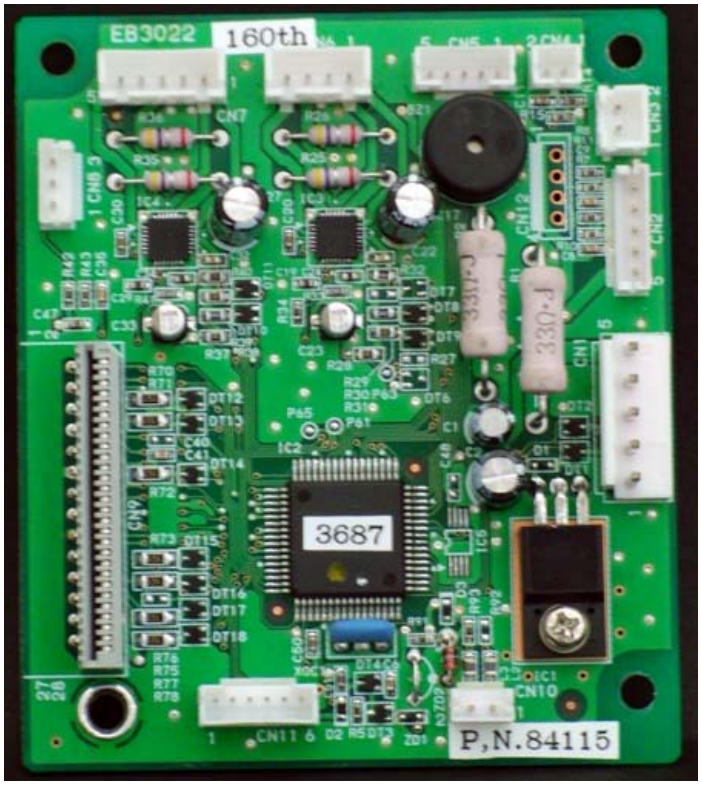
87625 is for 120V spec. and **87629** is for 230V spec.
Be sure to check number printed on board.

87625 & 87629



CPU Board Model 160

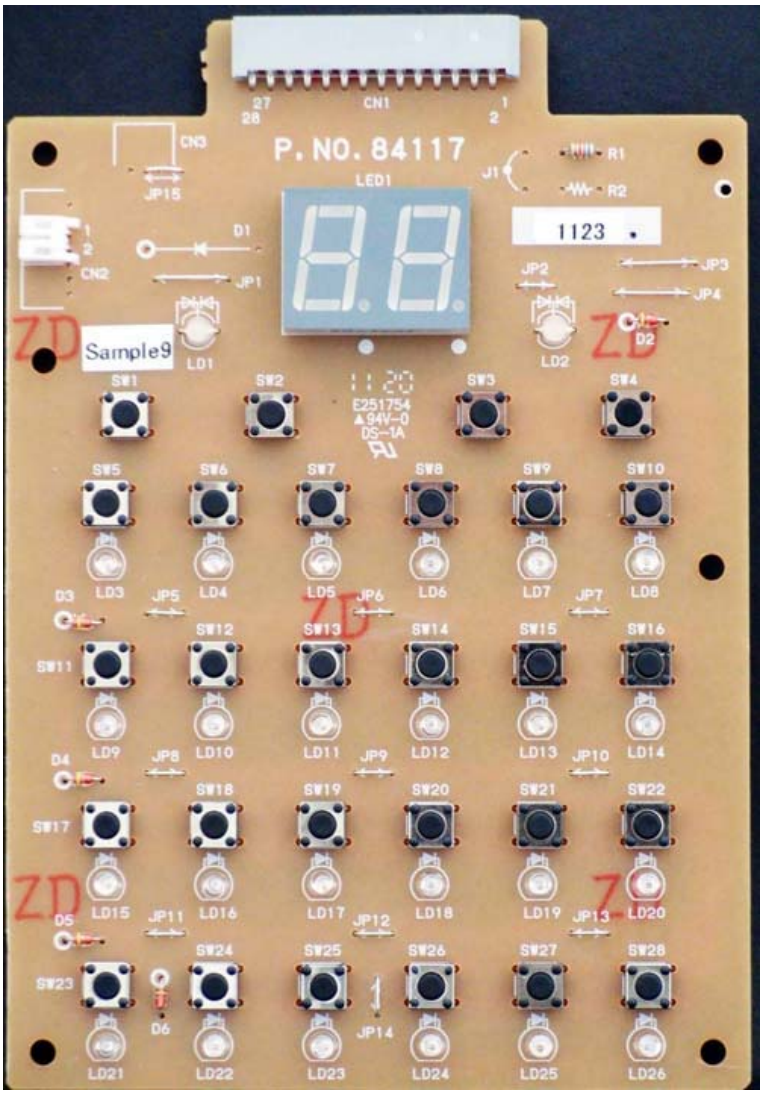
84115



Switch Board Model 160

Check number printed on board.

84117



21. Wiring diagram

Model
160

Model 160