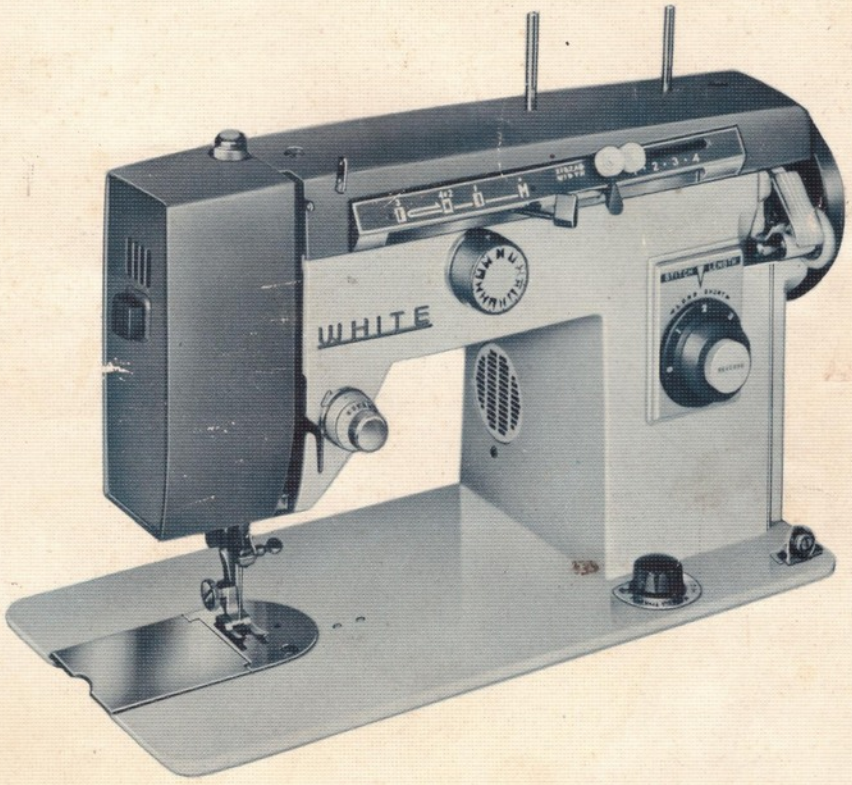
SERVICE MANUAL

for WHITE Sewing Machine



WHITE Sewing Machine

CLEVELAND, OHIO · 44111

CANADA: White Sewing Machine Company Toronto, Ontario.

This service manual was planned to assist the sewing machine service man in making field adjustments on WHITE MODEL 167 with a minimum of trouble. For common complaints, see pages 15 and 16.

Present fittings should not be disturbed unless absolutely necessary. First determine what adjustment is required and then how the adjustment can be made before disassembly is started.

Before starting any major corrections, keep the following points in mind:

60% of service problems are caused by a defective needle and dirty mechanism.

20% of service problems are the result of a rough spot on needle plates and shuttles.

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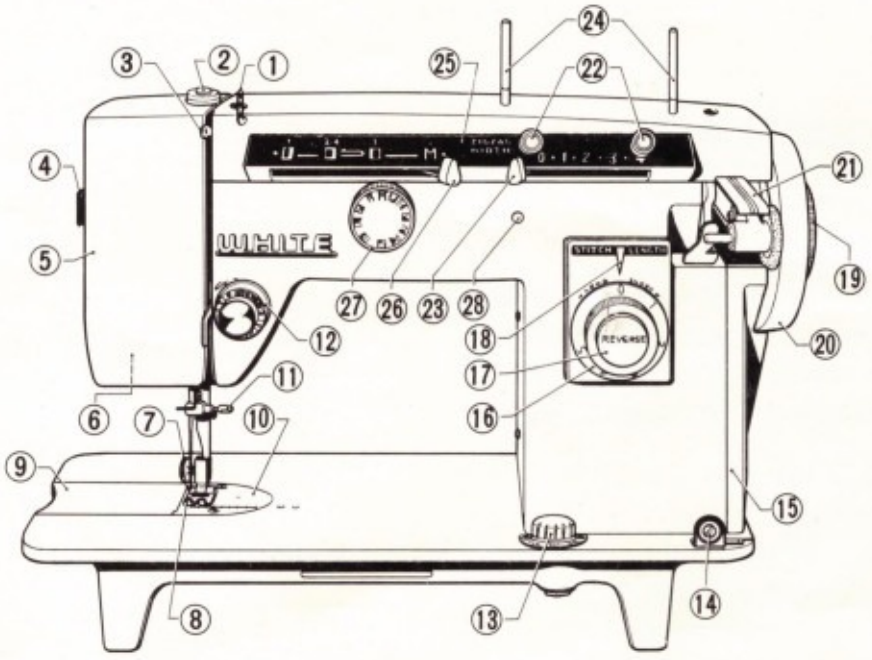


Fig. 1

1. Arm thread guide
2. Pressure release darner
3. Take-up lever
4. Light switch
5. Face plate
6. Bulb
7. Presser foot thumb screw
8. Presser foot
9. Needle plate seam guide
10. Needle plate
11. Needle clamp and screw
12. Tension regulator
13. Drop feed knob
14. Bobbin winder thread guide
15. Motor cover plate
16. Stitch length dial
17. Reverse push button
18. Stitch length indicator
19. Wheel clutch
20. Hand wheel
21. Bobbin winder
22. Zig-zag stop knobs
23. Stitch width lever
24. Spool pins
25. Front panel
26. Button hole change lever
27. Pattern selector dial
28. Hole plug

1. TO ADJUST THE HEIGHT OF THE FEED DOG

(A) "HIGH" position

The height of the feed dog should be "1/32" of an inch above the needle plate at its highest point, when the drop feed knob is at the "HIGH" position.

To adjust the height:

1. Set the drop feed knob at the "HIGH" position and turn the hand wheel to bring the feed dog to the highest position.
2. Loosen set screw (A) Fig. 2 and adjust the feed dog by hand moving the drop feed body (B) up or down on feed-lifting shaft (C) until feed dog comes to a height of 1/32 of an inch.
3. Tighten screw (A) securely.

(B) "LOW" position

The height of the feed dog should be 1/64 of an inch above the needle plate at its highest position, when the drop feed knob is at the "LOW" position. The proper height can be obtained automatically by the correct adjustment in the "HIGH" position as stated in the above (A).

(C) "DOWN" position

The feed dog should be kept below the needle plate.

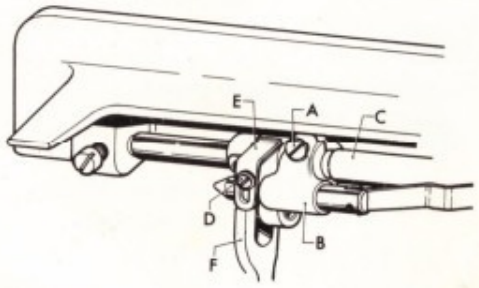


Fig. 2

To adjust the amount of drop:

1. Set the drop feed knob at the "DOWN" position, raising the feed dog to the highest point in this position.
2. Loosen set screw (D) adjust the height by sliding stop plate (E) up or down so that the feed dog will be below the needle plate and yet the bottom of the feed dog will not hit against the shuttle race at the lowest point.
3. Tighten set screw (D).

2. SIDEWISE POSITION OF FEED DOG

Improper sidewise position of feed dog in the needle plate slots may cause noise and improper feeding.

TO CORRECT THIS:

1. Loosen set screw (A) at both ends of feed rocking shaft.
2. Loosen set screw (B).
3. Adjust the feed dog position in the slots of the needle plate, by moving the shaft bearings (C) sidewise as desired.
4. Tighten screw (A) to lock the shaft bearings (C) leaving only a minimum side clearance in feed shaft.
5. Tighten screw (B) after making certain feed rock arm (D) and feed fork move smoothly together.

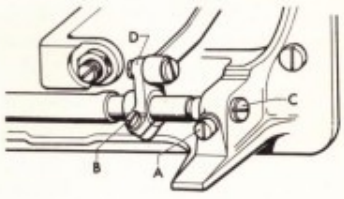


Fig. 3

3. LENGTHWISE POSITION OF THE FEED DOG

With stitch regulating dial set at 5 there should be an equal amount of clearance between the feed dog and the ends of the needle plate slots, when the hand wheel is turned.

1. Set stitch regulating dial to "5".
2. Loosen screw (B) Fig. 3.
3. Move feed arm (F) Fig. 2 back or forth for positioning feed dog.
4. Tighten screw (B) Fig. 3 securely.

4. TIMING OF THE FEED TO THE TAKE-UP LEVER

With the longest stitch on the stitch regulator dial and two layers of cloth under the presser foot, turn balance wheel slowly. The correct timing is when the cloth starts to move when the needle bar has reached its highest position and starts to move down. If the feed timing is incorrect it will produce imperfect stitches. To correct, the following adjustments are required:

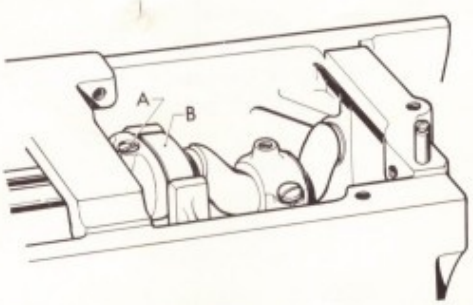


Fig. 4

1. Remove arm top cover.
2. Put identifying mark on shaft and cam face to record original position.
3. Loosen screw (A) Fig. 4.
4. When the feed dog starts to move early, (starts to feed before the needle bar reaches its highest point) adjust by moving the cam (B) slightly away from you. Tighten screw (A) securely.
5. If the feeding is too late, move the cam (B) toward you. Tighten screw (A) securely.
6. Recheck the timing while turning the balance wheel.

5. UNIFORMITY OF FORWARD AND REVERSE STITCHES

The stitch length should be uniform on both the forward and reverse stitches. This is important especially in buttonholing.

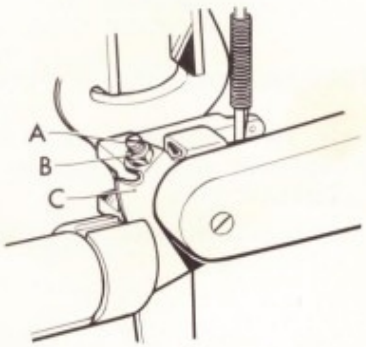


Fig. 5

1. Set stitch regulating dial to 1 and zig-zag control lever to 2 to 3.
   Check the difference of the stitch spacing in forward against reverse sewing.
2. Loosen nut (B) which is on stitch regulator body inside arm casting.
   Turn screw (A) clockwise, when the stitch spacing in forward stitching is wider than that in reverse stitching.
3. Loosen the screw (A) when the reverse stitch spacing in wider than that of the forward stitch spacing.
4. Recheck the uniformity of stitches. Repeat adjustments until you get good results.
5. Tighten the nut (B) securely.

Note: It would be easier to adjust the nut (B) and screw (A) with stitch regulating dial at 0 position.

6. DIRECTION OF PRESSER BAR ADJUSTMENT

If the position of presser bar is not kept properly in line, it caused needle breakage by hitting the presser foot.

1. Lift presser foot and open the face plate.
2. Loosen screw (A).
3. Adjust the presser bar, turning it right or left, so that the edges of the presser foot will be parallel with feed dog slots on needle plate.
4. Tighten the screw (A) securely.

7. ADJUSTMENT OF THE HEIGHT OF PRESSER BAR

Improper height of presser bar causes imperfect feeding.

1. Lift presser foot and open face plate.
2. Loosen screw (A) in Fig. 6 slightly.
3. Adjust the height of presser foot, so it will be 1/4 to 9/32 of an inch from the surface of needle plate.
4. Turn hand wheel toward you slowly and check to see the needle clamp screw does not hit presser foot. Tighten screw (A) in Fig. 6 securely.

As the position and the height of presser bar are correlated to each other, always check both of them when adjusting either the height or the position of presser bar.

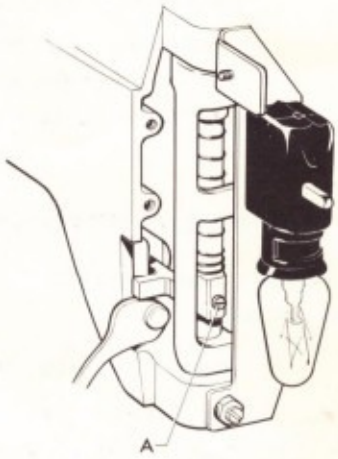


Fig. 6

8. THE HEIGHT OF NEEDLE BAR ADJUSTMENT

Improper height of needle bar causes imperfect stitching such as skipping of stitches and thread breakage.

1. Remove the bobbin case.
2. Turn the hand wheel toward you by hand until needle bar reaches its lowest point. The tip of the needle should just protrude through U-shaped slot in hook, as shown in Fig. 7.
3. Adjust the height of needle bar, loosening the screw (A) in Fig. 8.
4. After adjustment of the height, tighten screw (A) securely.

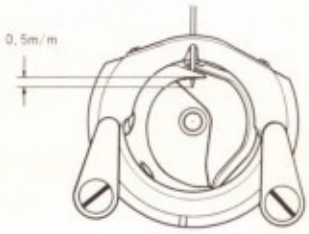


Fig. 7

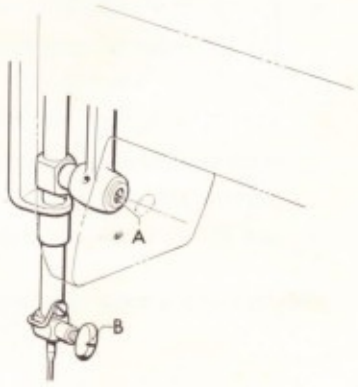


Fig. 8

9. ADJUSTMENT OF NEEDLE BAR AND HOOK TIMING

Improper timing of needle bar and hook causes no stitch to form.

1. Remove the bobbin case and race front.
2. Timing is correct if hook point comes to the needle center when needle is about 3/32 of an inch from the lowest position on its upward swing. The timing is set and fixed by a drive pin in this machine. There is no need to adjust the timing.

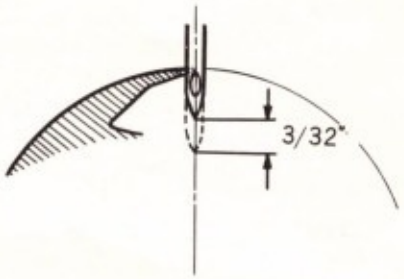


Fig. 9

10. ADJUSTMENT OF CLEARANCE BETWEEN NEEDLE AND HOOK

To make perfect stitching, the needle should be as close to the hook as possible, yet clear of the hook.

1. Remove race front and bobbin case.
2. Turn hand wheel to bring needle point to the hook point.
3. Holding hook in race by hand, check clearance by pressing needle toward hook with a screw driver.
4. There are two methods of adjustment :
   a) Loosen screw (A) Fig. 10 and adjust clearance by moving race body right or left. Tighten screw (A) securely.
   b) Loosen set screw (A) Fig. 11 for zigzag width vertical rod inside arm casting. Holding needle bar securely, shift race body right or left to adjust clearance.

   Tighten screw (A) Fig. 11. Make certain in this case that zigzag width vertical rod (B) Fig. 12 is set in a proper lengthwise position so that zigzag regulating rod (C) Fig. 12 zigzag regulating arm (D) Fig. 12 and zigzag regulating slide (E) Fig. 12 will be smooth operating and will not bind.
5. The correct position of shuttle race reciprocating arm (D) Fig. 10 is obtained when the side edge of reciprocating arm is about 1/16 of an inch from the end surface of race axis. (see Fig. 10) This position is important for smooth motion of race. Therefore, in case the adjustment of needle and hcok clearance gives the position of reciprocating arm substantial amount of displacement, it is recommended to set this position properly first, then adjust hook/needle clearance by the above procedure (b) and finally make a micro-adjustment by the procedure (a).

Note: Always check race inclination after this adjustment. See the following paragraph.

11. ADJUSTMENT OF RACE BODY ANGLE

Angle of race body may cause breakage of needle hitting against race top spring.

1. The angle can be checked by the clearance between needle and race top ring.
2. Check if needle clears the left side of the notch of race top springs by about 1/64 of an inch.
3. To correct, loosen screw (A) Fig. 10 and correct the position of race body by turning it to right or left.
4. Tighten the screw (A) Fig. 10 securely.

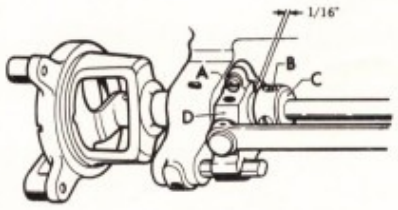


Fig. 10

Note: Always check the clearance between needle and hook after this adjustment. See the preceding paragraph.

12. ZIGZAG MOVEMENT IN STRAIGHT STITCHING

If needle swings making zigzag movement in straight stitching, with zigzag lever at 0 correct as follows:

1. Set the zigzag width lever at 0 position. Loosen width lever set screw (A) Fig. 14 to disconnect lever from zigzag regulating arm (B).
2. Loosen stopper set screw (C) Fig. 14 slightly.
3. Find a right position for non-zigzag movement by moving zigzag width stopper (E) along the slot, while turning hand wheel slowly.
4. Tighten the screw (C) securely.
5. Set zigzag width lever at 0 position. After making certain that there is no clearance between pin (D) and fork (B) tighten screw (A) securely to connect width lever with the zigzag mechanism.

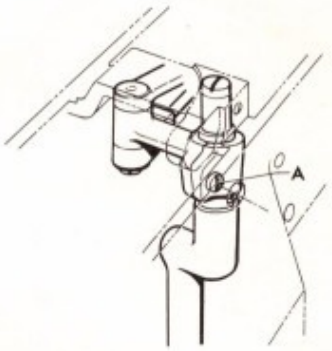


Fig. 11

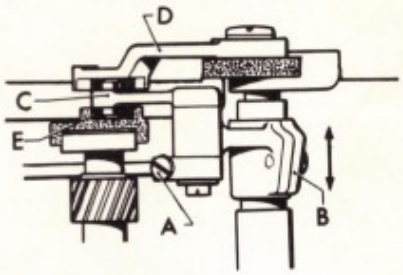


Fig. 12

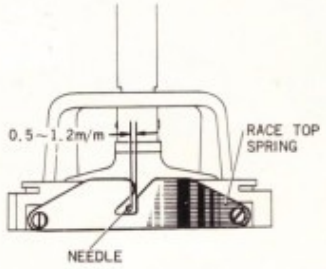


Fig. 13

13. NEEDLE ENTRY ON RIGHT AND LEFT SIDES OF NEEDLE HOLE

Set the needle position to "RICHT" (with buttonhole control lever at 1 position). Turn hand wheel to bring stitch regulator body to the extreme right position of its swing motion (see Fig. 15). Check if needle either makes no sidewise movement or makes very slight movement when you move zigzag width lever from 0 to the maximum width.

Set the needle position to "LEFT" (with buttonhole control lever at M position). Turn hand wheel to bring stitch regulator body to the extreme left position of its swing motion (see Fig. 16). Check that needle makes no sidewise movement or only makes slight movement when you move zigzag width lever from 0 to maximum.

In case the needle fails to satisfy the above standard' there may be poor zigzag pattern and buttonhole stitches. Correct it by the following procedures:

RIGHT POSITION..... First, make adjustment of the right position.

1. Set buttonhole control lever to 1.
2. Turn hrnd wheel to move zigzag width regulator (C) Fig. 15 to the extreme right position.
3. Loosen screw (A) Fig. 15 and adjust the position of regulator support (B) until you obtain correct needle movement while sliding zigzag width lever from 0 to 3, the maximum, and back to 0. In this case, keep buttonhole control lever to 1 position, which may get out of the position by itself during this adjustment.
4. Tighten screw (A) securely.

LEFT POSITION..... After adjustment of right position, go about the left.

1. Set buttonhole control lever to M position
2. Allow zigzag width regulator to take the extreme left position of its swing movement by turning hand wheel.
3. Loosen screw (A) Fig. 16. Turn stop pin (B) Fig. 16 to right or left until needle stops swinging when you move zigzag width lever from 0 to maximum, and back to 0.
4. Tighten screw (A) securely.

Note: After this adjustment, always make needle center position adjustment, as stated in next paragraph.

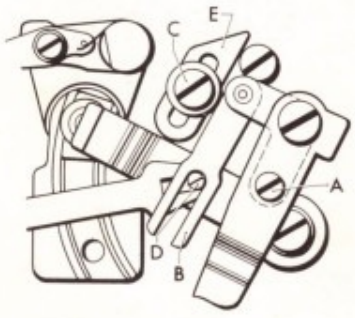
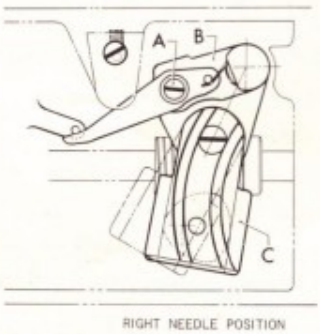


Fig. 14



RIGHT NEEDLE POSITION

Fig. 15

LEFT NEEDLE POSITION

Fig. 16

14. ADJUSTMENT OF LEFT NEEDLE POSITION

Set zigzag width at 0 and replace zigzag needle plate with a straight stitch needle plate. Check if needle enters in the center of the needle hole on needle plate by turning hand wheel slowly.

If it does not, correct as follows :

1. Remove hole plug cover (28, Fig. 1)
2. Loosen set screw (A) Fig. 12 and move needle bar to right or left by hand so that needle enters exactly at center of the hole.
3. Tighten screw (A) Fig. 12 securely.
4. Replace hole plug cover.

After this adjustment, be sure to check the adjustment of needle entry on right and left sides described in the preceding paragraph.

15. BACKLASH OF ZIGZAG CAM GEARS

Too much backlash play in gears may cause noise. To correct this :

1. Loosen screw (A) inserting a screwdriver into hole on arm backside.
2. Put a screwdriver in slot of zigzag cam gear bearing (B) and turn bearing to the right to eliminate backlash. (The slot is on arm underside)
3. Tighten screw (A) securely.

The gears should be in mesh so that there is no backlash, yet not too tight to cause the machine to be binding. Bearing (B) is eccentric and turning it to right allows zigzag cam gear to shift slightly toward hand wheel, resulting in tighter mesh of gears.

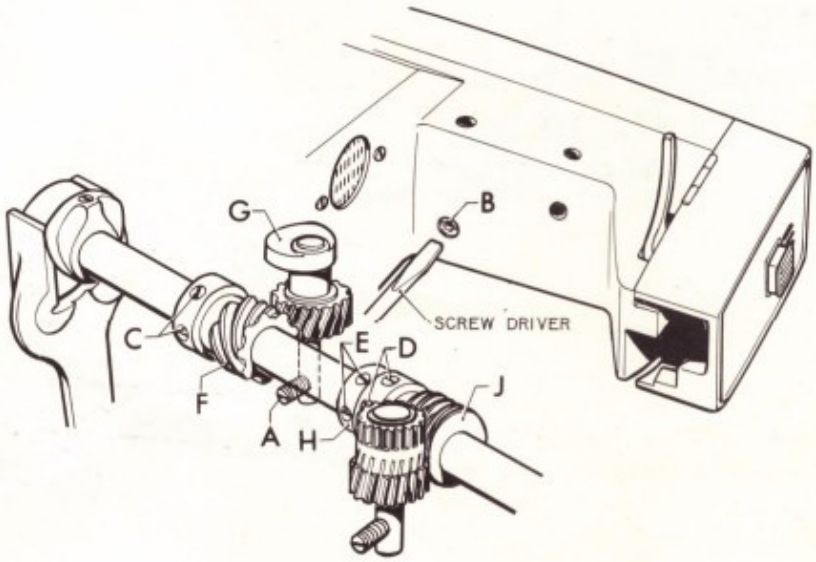


Fig. 17

16. TIMING NEEDLE BAR FOR ZIGZAG STITCHING

If needle bar is not timed correctly for zigzag stitching, needle will move sidewise while in the fabric, distorting the pattern and bending the needle.

To correct:

1. Remove the arm top cover and set zigzag width at 4
2. In case needle swings in fabric on its way down, loosen screws (C) Fig. 17 (two screws) and holding zigzag drive gear with a screwdriver held on screw (C) turn hand wheel away from you.
3. In case needle swings on its way upward, turn hand wheel toward you, holding screw (C) with a screwdriver.
4. Tighten screw (C) securely, making certain there is no excess backlash or too tight mesh between zigzag drive gear (F) and cam gear (G).

Note: The assembly standards for this machine allows tolerance of 0.5 milimeter for needle swing in the fabric in the case of needle upward travel, while it allows no tolerance in the case of the downward travel. (see Fig. 18)

17. BACKLASH OF AUTOMATIC PATTERN CAM GEARS

Pattern cam is driven by zigzag driver gear located under the cam assembly. To eliminate too much backlash of this gear:

1. Set zigzag width lever to ist widest position to detach cam contact finger from decorative cam contour.
2. Loosen set screw (A) slightly and tap cam fram (B) to shift it backward (away from you). This eliminates backlash play but too much shift causes too tight mesh of gears under the cam assembly.
3. Tighten screw (A) firmly.

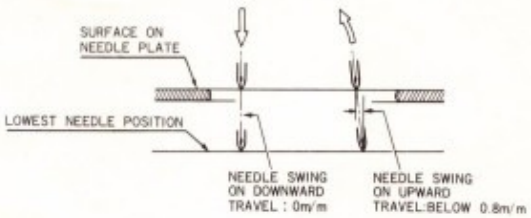


Fig. 18

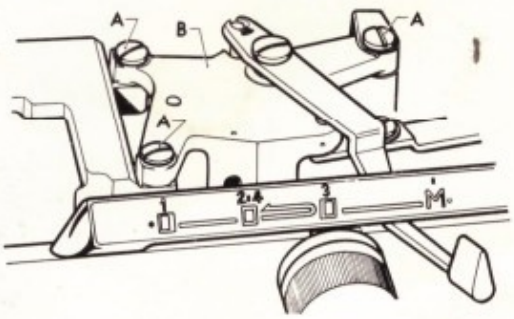


Fig. 19

18. CAMS AND CAM FOLLOWERS

If the cams and cam follower are not relatively in their proper position good automatic decorative pattern stitching cannot be obtained.

1. Turn automatic pattern selecting dial knob to get cam follower (F) to contact against any one of the cams, except the buttonhole cam (top cam). For easier adjustment, it is recommended to set it to a cam in the upper part of cam cluster.
2. Check to see if follower tip touches a cam contour in such a way that it clears the top and bottom surfaces of the adjoining cams with an equal space (see Fig. 21).
3. In case of failure, remove pattern selecting knob by loosening two set screws (A) Fig. 20.
4. Loosen screw (B) Fig. 20 and this allows you to move selector assembly (G) up and down freely. Re-position the assembly to bring cam follower to the proper position in relation to the cams.
5. Tighten screws (B) Fig. 20 securely and replace pattern selecting knob. In this case, first turn knob shaft (H) Fig. 20 to bring up positioning mark (C) Fig. 20 on pattern selecting cam (J) to the top position. Keeping this mark (C) in line with the red indicator on selector assembly (G) replace selecting knob with the symbol M set against the red indicator.
6. Tighten screws (A) making sure that there is no axial play on selecting dial knob.

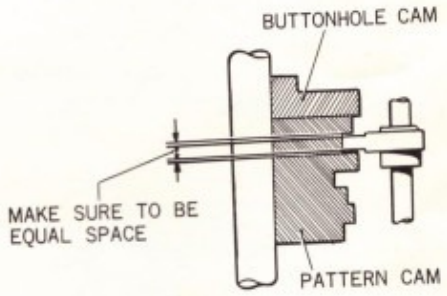


Fig. 21

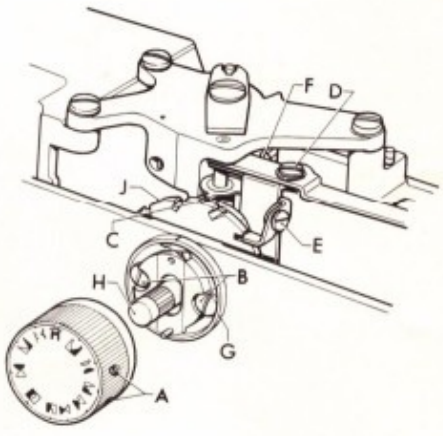


Fig. 20

19. RELEASE OF CAM FOLLOWER FROM CAMS

Cam follower should first detach from the contour of cams and then shift to select a cam. In this machine, follower detaches completely only when zigzag width control lever is set to No. 4 and therefore before twisting pattern selecting knob, width control lever must be moved to No. 4.

1. Set zigzag control lever to No. 4
2. Set buttonhole lever to the 2-4 position
3. Check to see if follower tip clears buttonhole cam contour by 0.1 to 0-2 milimeters, as shown in Fig. 22.
4. In case of failure, loosen set screw (D) Fig. 20 and adjust the horizontal position of follower. Tighten set screw (D). (During this adjustment keep zigzag width lever to No. 4)
5. Twist pattern selecting knob to move can follower down to the cam for the pattern 2-4. As shewn in Fig. 23. cam follower should barely touch the part of this cam contour which is most protruding. Turn selecting konb and check to see that follower tip moves up and down without being prevented by hitting this part of cam contour. If follower clears this part of this particular cam, it will clear all other cams.

Pattern selecting konb is always locked, except when zigzag width lever is at No. 4. This locking action is provided by stopper (K) Fig. 20 wedging into notches of pattern selecting cam (J) Fig. 20. In case there is poor release of this stopper (K) with zigzag width lever at No. 4 or there is too early a release before width lever reaches No. 3½, correct as follows:

1. Loosen set screw (E) Fig. 20
2. Adjust the position of stopper (K)
3. Tighten set screw (E) making cartain that stopper touches no part of notch of selecting cam (J) yet stays into notch, when pattern selecting dial is in any latched position of its rotation.

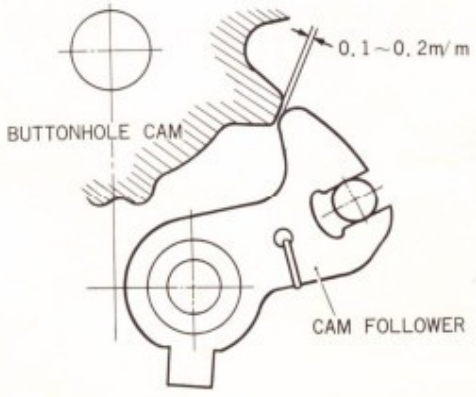


Fig. 22

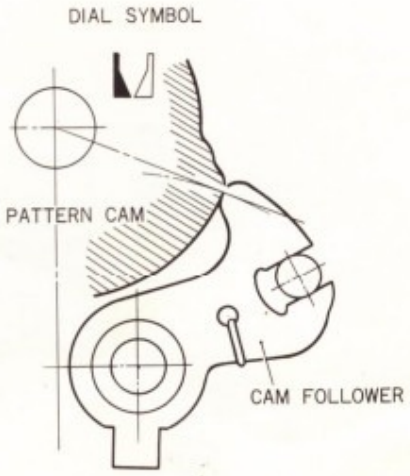


Fig. 23

20. TIMING AUTOMATIC PATTERN CAM

If automatic decorative pattern cams are not timed correctly in relation to needle there may be distortion of decorative pattern stitches and needle breakage caused by needle shifting sidewise in the fabric.

To time cams :

1. Set pattern selecting knob to the symbol ⌊⌋ , and buttonhole lever to M position.
2. Turn hand wheel until cam follower contacts the widest portion of the cam as shown in Fig. 23.
3. The timing is correct if needle point is at the same level with the surface of needle plate, on its way upward at the right side of needle plate slot, and the sidewise movement of needle point form its lowest position to the position at needle plate level is less than 0.8 milimeter. (see Fig. 24)
4. Turn hand wheel until needle goes to the left position and returns to the right at needle plate level on its way downward. Timing is correct if needle makes no sidewise movement from this position until it reaches the lowest position. (see Fig. 25)
5. In case the sidewise movement on the upward way of needle is more than 0.8 milimeter, loosen screw (D) Fig. 17 and holding worm gear with a screwdriver held in one of the screws, turn hand wheel toward you.
6. In case needle makes any sidewise movement on its way downward, as described in the above 4, holding worm gear by a screwdriver, turn hand wheel away from you.
7. Tighten screw (D) Fig. 17 making sure that worm gear keeps contact with the side of collar (H) Fig. 17.

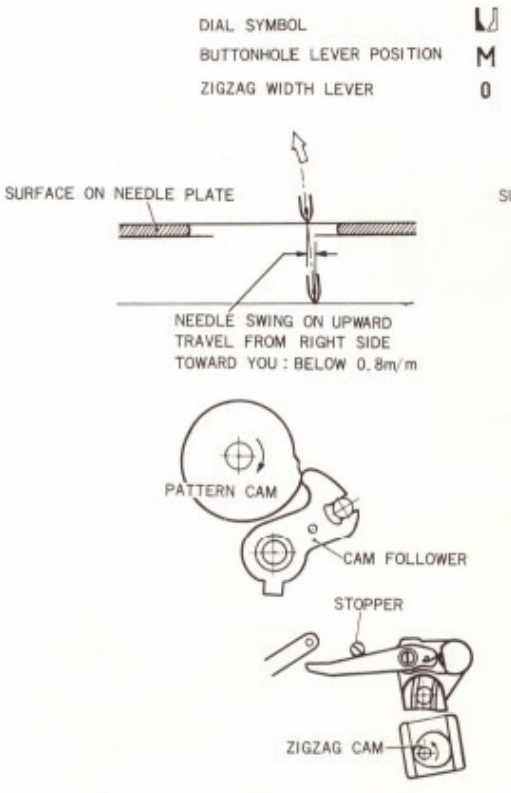


Fig. 24

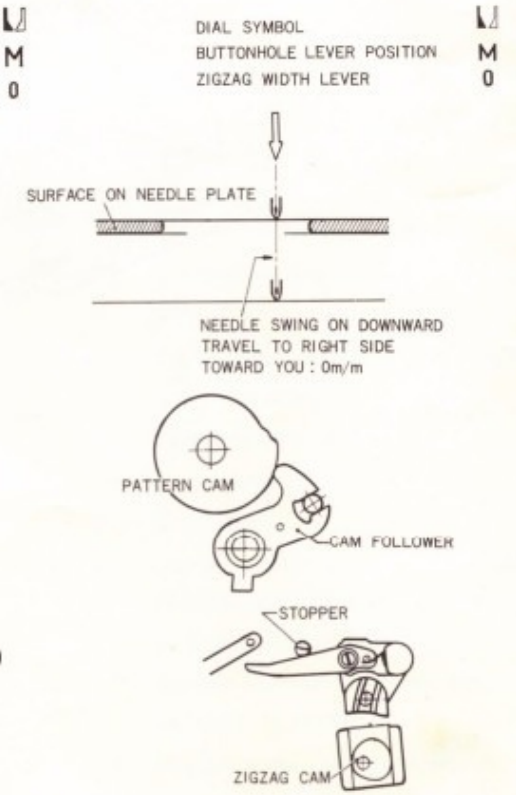


Fig. 25

21. BUTTONHOLE BAR TACK FEEDING

In bar tack sewing of the buttonholes, the machine should feed the material very slightly. In case of failure, correct it as follows :

1. Move arm top cover
2. Set buttonhole lever to the 2-4 position.
3. Set pattern selecting knob to M position
4. Set stitch length knob somewhere between O and 1.
5. Place a piece of a paper under presser foot, and start running the machine.
6. In case the paper is fed forward too much, loosn look nut (A) and tighten nut (B) (lower nut) until the paper almost stops being fed. In case there is too much feeding in reverse direction, loosen nut (B).
7. Tighten nut (A) to lock nut (B).

Note : Never touch these nuts except for adjustment of the above bar tack feeding.

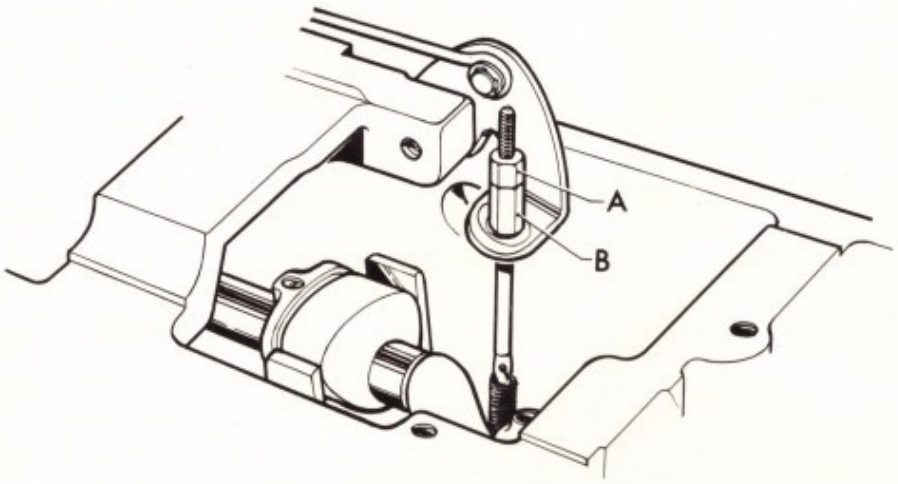


Fig. 26

COMPLAINTS AND REMEDIES

IF MACHINE BINDS OR IS NOISY

1. There may be bits of thread, lint or dirt in shuttle race. Remove bobbin case and bobbin, shuttle race cover and shuttle, and clean with brush or pointed stick.
2. Belt tension may be too tight or too loose. Adjust by positioning motor on arm of machine.
3. Poor grade of oil has been used or machine has been improperly oiled. Oil machine with non-acid, nongumming oil.
4. Some part may have been left unscrewed or loosened. Adjust or tighten bearing positions.

IF UPPER THREAD BREAKS

1. Inferior thread is being used. Thread is knotty.
2. The needle is too fine for the threed.
3. Tension is too tight.
4. Needle is not set correctly in needle clamp, or needle may be bent.
5. Needle is too sharp or point is blunt. Replace with new one.
6. Feed dog does not move material properly, or is prevented by dirt, bits of thread or lint, from moving freely. Clean feed dog and adjust stitch length or height of feed dog.
7. The needle plate hole has sharp edges. Smooth with fine emery cloth.
8. Shuttle has rought spot. Use emery cloth to smooth.
9. Machine is not started with take-up lever and needle at highest positions.

IF LOWER THREAD BREAKS

1. Inferior thread.
2. Tension on bobbin case is too tight.
3. Sharp or rough spot may have been developed in needle plate hole. Smooth with fine emery cloth or replace.
4. Feed dog teeth are too sharp. Smooth with stone.

SKIPPED STITCHES

1. Needle is set too high or too low, is bent, or is not installed properly with flat side facing point of hook.
2. Needle is not correct size for thread. Consult thread guide in instruction book.
3. Inferior or wrong type needle is being used.
4. Auxiliary regulating tension spring is bent or out of position. See tension adjustment.

IF NEEDLE BREAKS

1. Needle too low, bent or incorrectly set.
2. Too thin a needle is used when sewing heavy material.
3. Thetop tension is too tight.
4. The tension of the auxiliary spring is too tight.
5. Operator pulls on material, forcing it ahead of machine feed, causing needle to strike needle plate.
6. Shuttle race is displaced and comes too close to needle.
7. Needle bargate loose on pivots.

IF POOR FEEDING

1. Thread and lint may prevent proper feed dog action. Remove needle plate and clean the feed dog.
2. Teeth on feed dog are dull. Replace with new feed dog.
3. Feed dog unit has dropped and teeth are not sufficiently high above needle plate surface. Push button marked "UP" and check for correct height.
4. Check pressure on presser foot.

IF MATERIAL PULLS OR PUCKERS

1. Tensions are too tight. Loosen tensions.
2. Pressure on presser foot is too great.
3. Presser foot is not screwed on presser bar properly, or presser foot is bent so it does not rest evenly on feed dog. Be sure presser foot set screw is tightened with screw driver.

IF STITCHING IS BED

1. Poor thread.
2. Tensions are not properly adjusted.
3. Dirt or dirt beneath bobbin case tension spring does not permit smooth tension operation. Remove and clean.
4. Blunt or bent needles are used. Replace with new needle.
5. Bobbin is bent and does not turn freely.
6. Bobbin is wound unevenly with humped-up thread, preventing bobbin from turning freely.
7. Drop of oil may de needed on shuttle spindle.

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