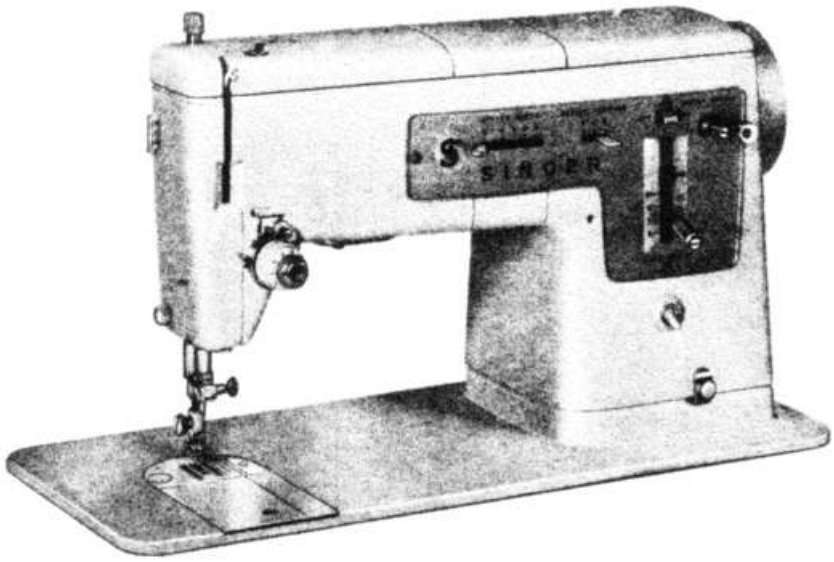
Supplement to
Form 20732
Machines 347 and 348
(666)

SINGER*
Service Manual
Machines
347 and 348



THE SINGER COMPANY

Insert in Form 20732, Swing Needle Service Manual

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DESCRIPTION

Machines of Class 348 are for straight, zigzag and ornamental stitching.

Machines of Class 347 are for straight and zigzag stitching only.

Belt driven lockstitch machines with built-in motor, built-in light and an "ON-OFF" power and light switch.

Belt driven horizontal rotating hook on a vertical axis, located in front of the needle, makes two revolutions per stitch.

Class 348 machine is fitted with a removable cam (8 additional cams included in attachment set.)

Class 347 machine is fitted with one built-in zigzag stitch cam only.

Single needle (347 and 348) or two needle (348 only) stitching, using Needle Catalog 2020 - threaded from front to rear.

Stitch width (bight) selector, located on front of arm, regulates the width of the zigzag or ornamental stitch up to approximately 5/32 inch width. Straight stitching is accomplished with the stitch width selector in "0" position

Needle position selector, located on front of arm, enables the needle to be set in LEFT, CENTER or RIGHT needle position.

Reversible feed – graduated stitch length indicator plate provides for fine adjustments of stitch lengths above 20 and positive locked setting on maximum stitch length.

Numerically graduated thread tension device, with central spacing disc for two threads. (Machine 347 utilizes same tension assembly, although it produces single needle stitching only.)

Presser bar pressure indicator with a graduated sight window located on face plate.

Semi-automatic bobbin winder partially enclosed in arm adjacent to hand wheel.

Bed dimensions: 16-1/2 inches long, 7 inches wide.

Height: from bottom of bed to top of arm top cover: 11-1/2 inches.

Weight: approximately 20 lbs. (including motor and light).

Working space at right of needle: 7-1/8 inches.

Speed range: 900 to 1100 R. P. M.

Maximum stitch length: 6 per inch.

Needle bar stroke: 1-3/16 inches.

Presser bar lift: 19/64 inch.

INSPECTION AND LUBRICATION

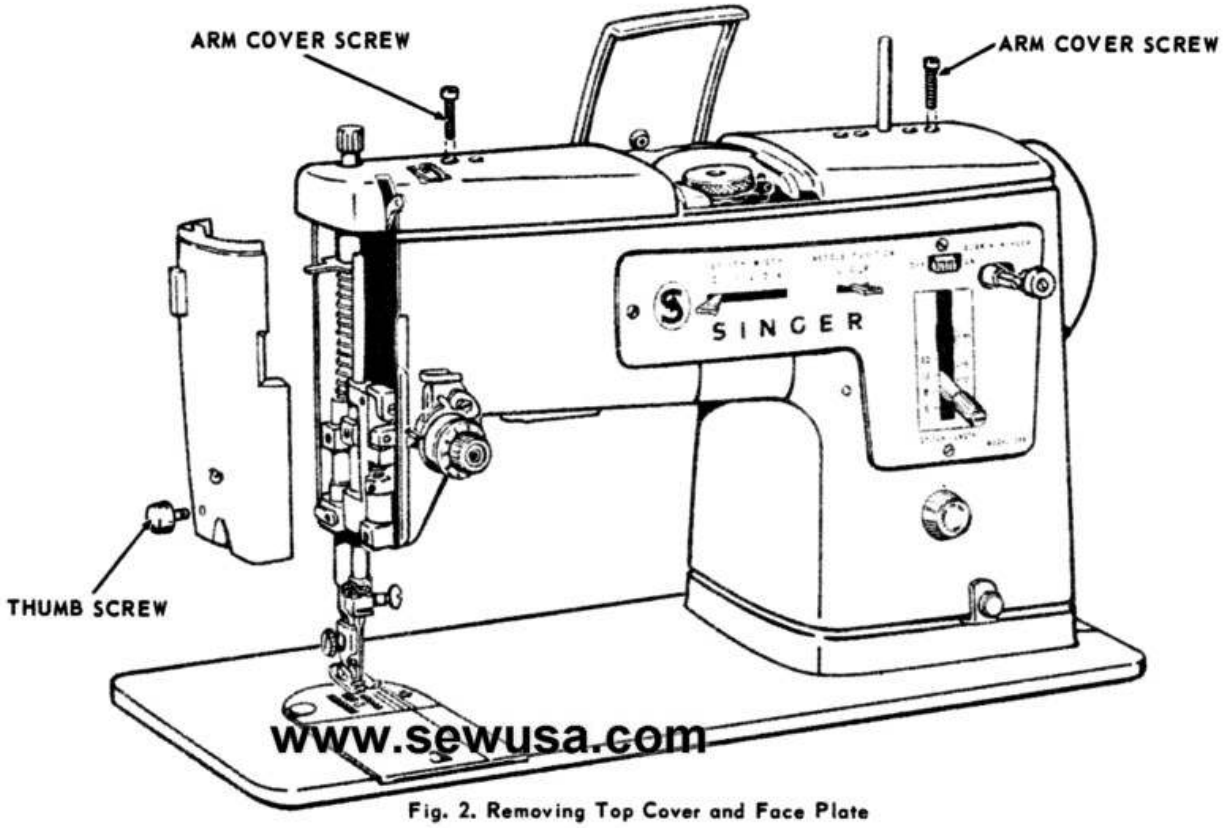


Fig. 2. Removing Top Cover and Face Plate

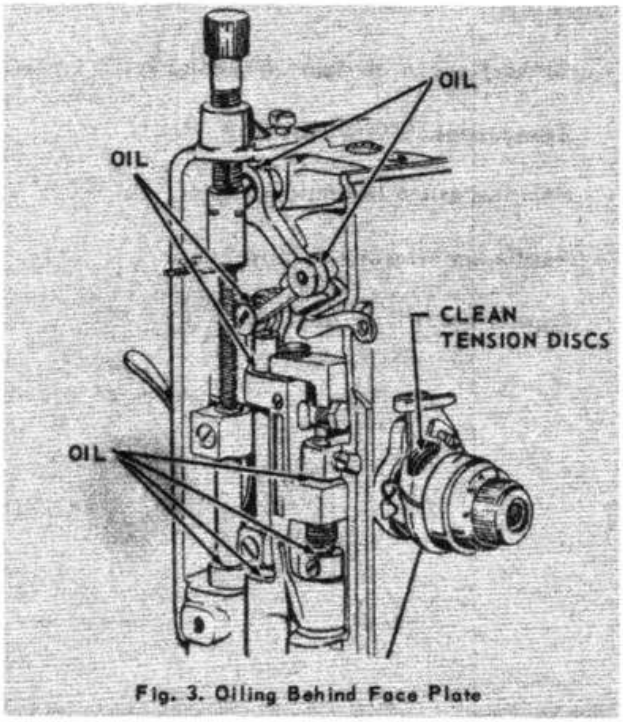


Fig. 3. Oiling Behind Face Plate

Before any extensive inspection is undertaken to find causes of faulty operation, machine should be thoroughly cleaned and lubricated.

Using the lint brush, clean out lint, fluff and other foreign particles which may have gathered around the hook, feed dog and bobbin case.

Remove bobbin case and clean in varsol.

Remove face plate thumb screw, Fig. 2, and remove face plate. Clean out any lint or waste that may have collected around the needle bar and presser bar.

Raise presser bar lifter and, by using the lint brush, clean out any dust or other matter from between the thread tension discs.

Remove arm top cover by first removing the two arm top cover screws, Fig. 2 (Note: It will be necessary to raise disc cover plate on Machine 348 before removing top cover.) Wipe out any oil or grease that might have accumulated inside top cover.

Oil each of the places indicated and apply gear lubricant to the indicated gears, as shown in Figs. 2 through 5. THE MOTOR REQUIRES NO LUBRICATION.

Replace arm top cover and face plate.

Tilt machine back, remove screw from bottom cover and remove cover. Wipe out any oil or grease that might have accumulated inside cover. Apply oil to each of the places indicated in Fig. 6, then replace bottom cover.

Note: Under extreme conditions, if the grease or dirt has become hard or tacky, apply several drops of varsol in all main shaft bearings and functional bearing points while machine is limbering up. Continue applying varsol into machine until it runs freely. Then wipe dry and relubricate with Singer oil. Wipe away all excess oil.

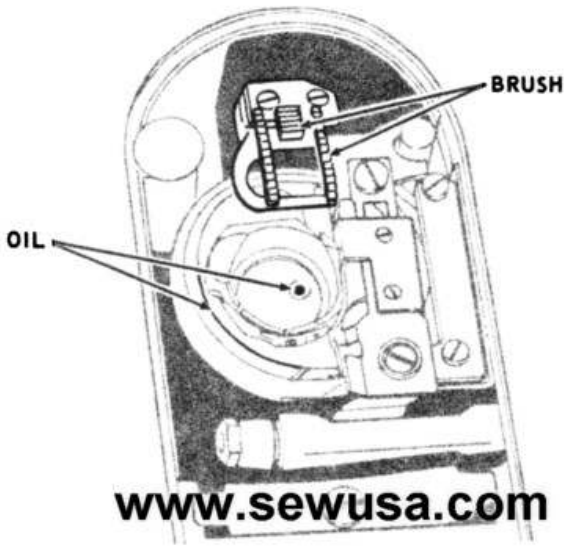


Fig. 4. Oiling the Hook

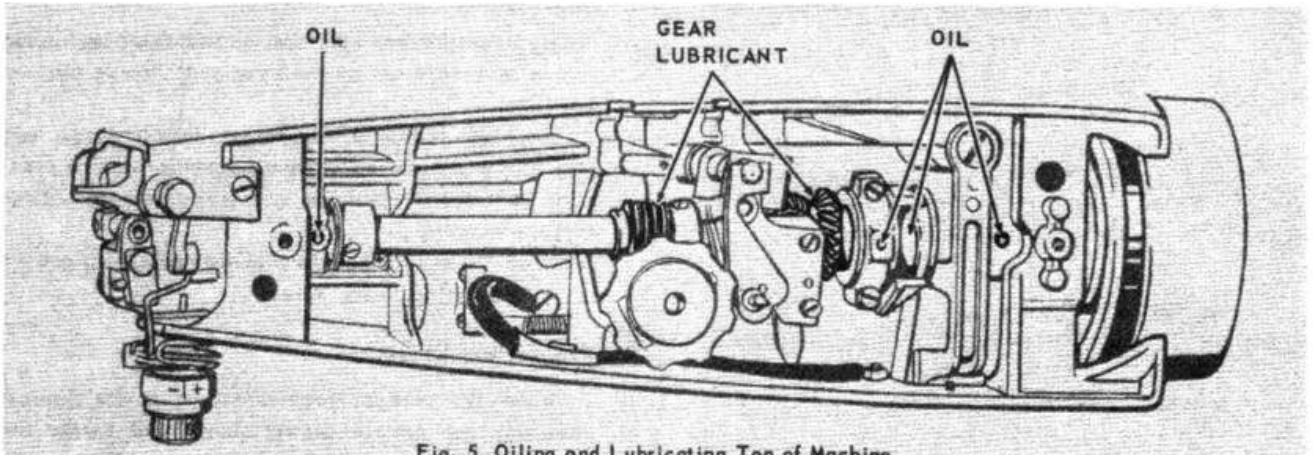


Fig. 5. Oiling and Lubricating Top of Machine

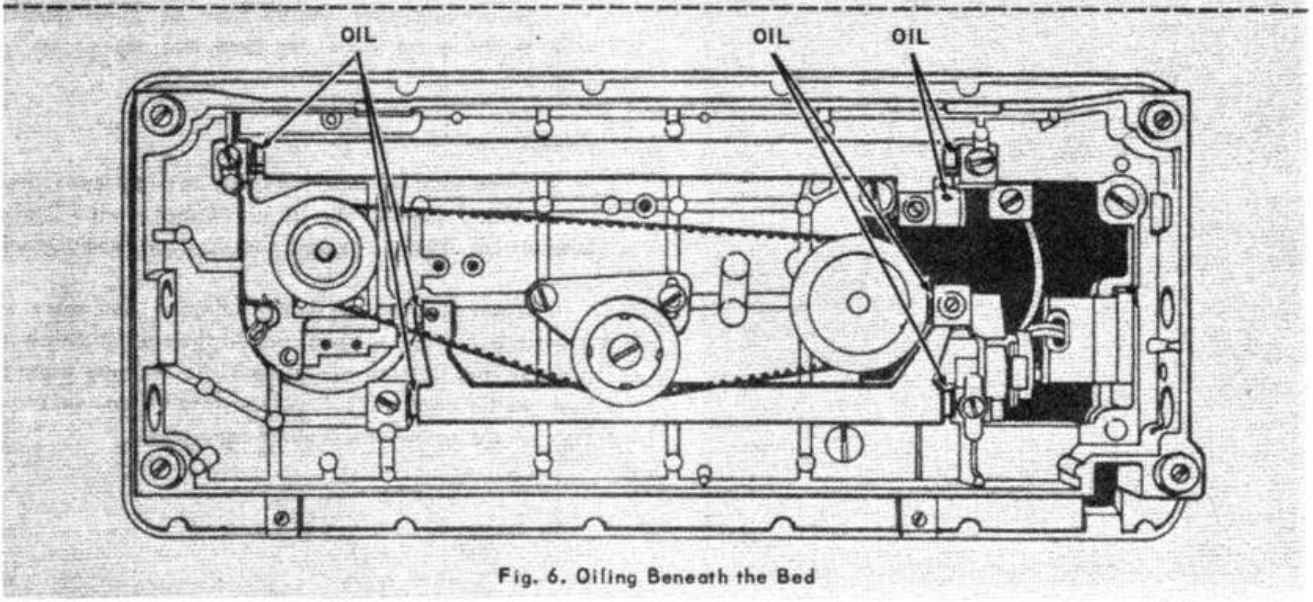


Fig. 6. Oiling Beneath the Bed

PRESSER BAR

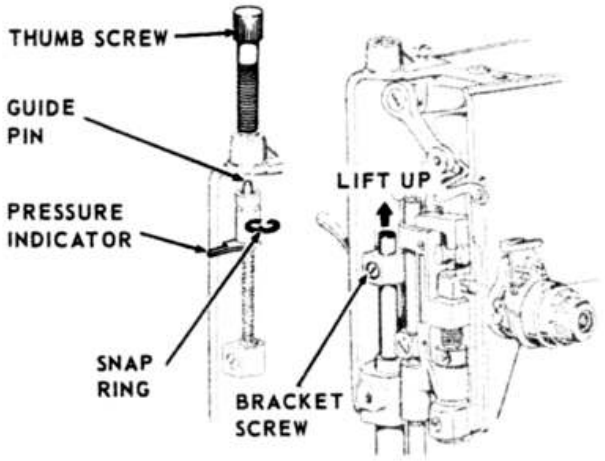


Fig. 7. Presser Bar Assembly

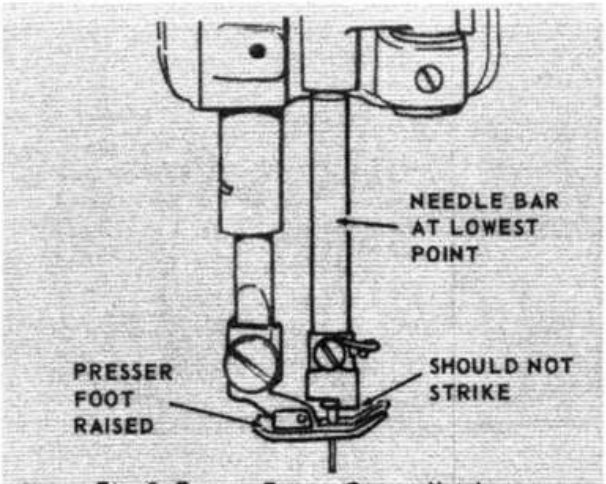


Fig. 8. Presser Foot at Correct Height

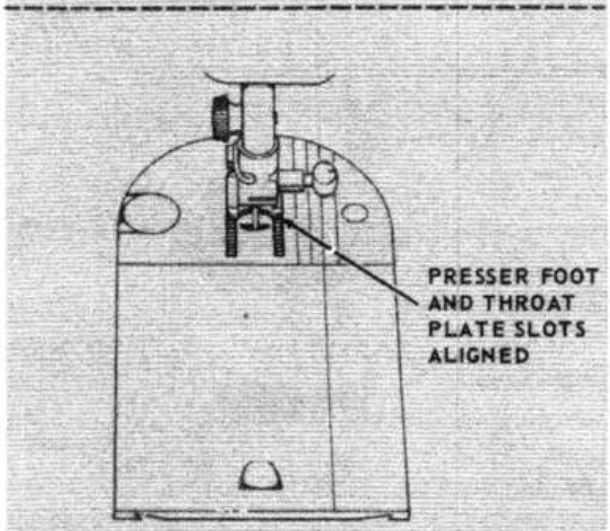


Fig. 9. Presser Foot Correctly Aligned

Removal

Remove arm top cover, face plate, presser foot thumb screw and presser foot.

Lower presser bar lifter. Remove pressure indicator snap ring, Fig. 7, and remove pressure regulating thumb screw.

Using tweezers or similar tool, compress the guide spring and raise guide pin up through indicator and out of machine. Then remove spring and indicator.

Loosen guide bracket set screw, Fig. 7, and lift presser bar up and out.

Replacement

Replace presser bar, spring, indicator and guide pin in reverse order of their removal. Raise presser bar lifter.

Replace pressure regulating thumb screw and turn screw clockwise until a bare minimum of pressure is exerted upon the pressure indicator. Then replace snap ring.

Note: Snap ring should slip into retaining groove of regulating thumb screw.

Presser Bar Height

When the presser foot is raised to its highest position, the needle clamp should not strike the presser foot, as shown in Fig. 8.

The presser foot should also be in alignment with throat plate slots and feed dog, as shown in Fig. 9.

Adjustment

Reduce presser bar pressure to light pressure.

Position needle bar at its lowest point. Place presser bar lifter in raised position and remove face plate.

Loosen bracket set screw, Fig. 7, and raise or lower presser bar as required. At the same time align presser foot with throat plate slots, making certain that needle does not rub side of foot. Then, securely tighten set screw and replace face plate.

NEEDLE BAR

Removal

Remove arm top cover, face plate, needle and needle clamp.

Loosen needle bar clamping screw, Fig. 10, and lift needle bar up through rocker frame and out of machine.

Replacement

Insert needle bar down through rocker frame and needle bar clamp.

Replace needle clamp and needle and adjust needle bar as instructed below. Then replace arm top cover and face plate.

To Centralize Needle in Needle Hole

When needle bar is correctly centralized, the needle will enter the center of the throat plate needle hole when machine is set for straight stitching in center needle position.

Adjustment

Remove arm top cover and face plate. Install round hole throat plate and insert a size 11 needle into needle clamp.

Remove light shield screw, Fig. 11. Lower the light, remove light bulb and remove shield.

Loosen rocker driving arm clamping screw, Fig. 12, using a 1/4 inch wrench.

Insert thumb of right hand through light fixture opening and press driving arm, as shown in Fig. 12, toward face plate end of machine. At the same time, press in on rocker bracket assembly until point of needle is located directly at center of throat plate needle hole. While holding assembly in this position, securely tighten clamping screw.

Replace light shield, bulb, arm top cover and face plate.

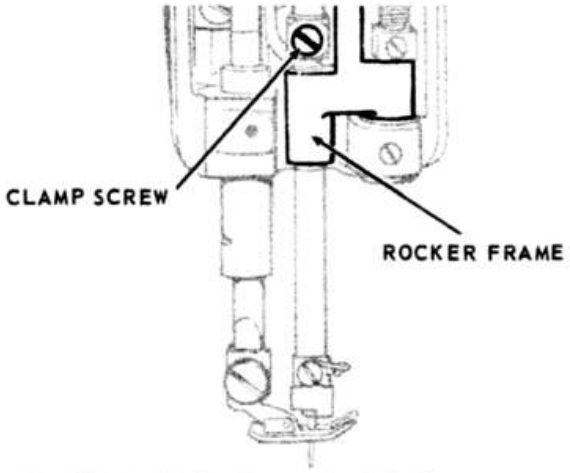


Fig. 10. Needle Bar Removal and Replacement

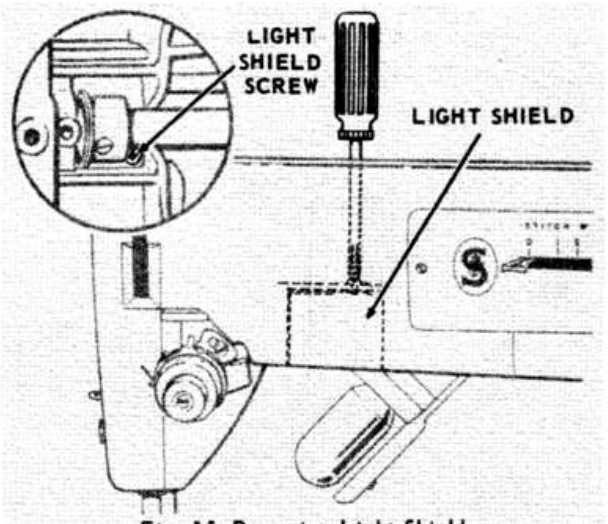


Fig. 11. Removing Light Shield

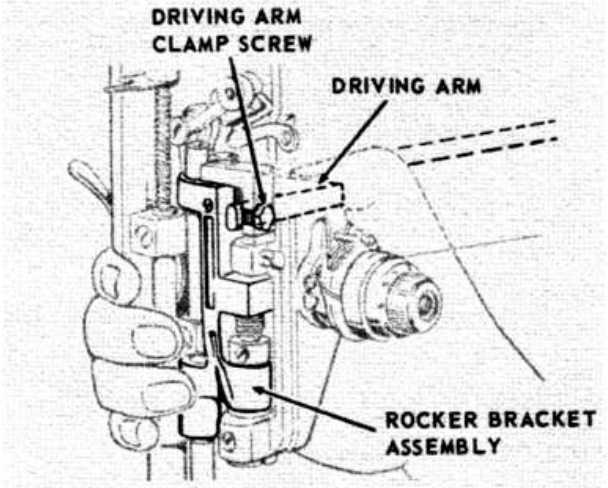


Fig. 12. Centralizing Needle

Needle Bar (Continued)

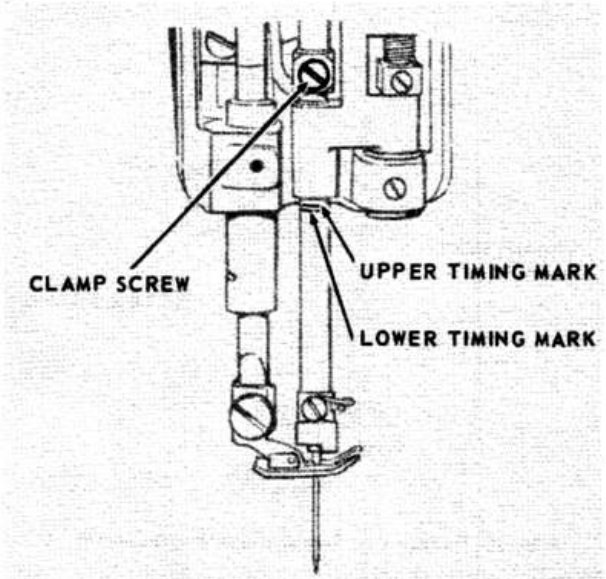


Fig. 13. Setting Needle Bar Height

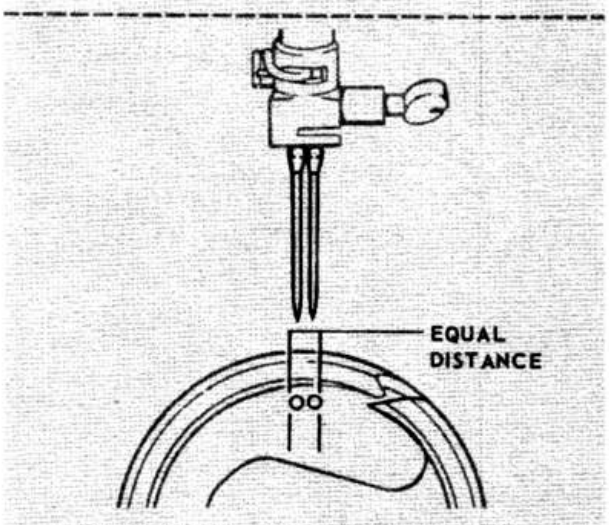


Fig. 14. Relation of Needles to Hook Radius

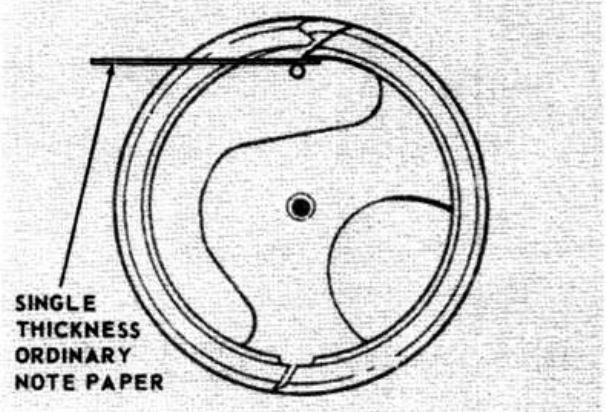


Fig. 15. Distance Between Needle and Hook Point

To Set Height and Radial Position of Needle Bar

When needle bar is at its lowest point, the upper timing mark on needle bar should be aligned with bottom of rocker frame, as shown in Fig. 13. When two needles are inserted in the machine, the distance between the hook radius and each needle should be equal, as shown in Fig. 14.

Adjustment

Remove face plate, throat plate, bobbin case and feed dog. Insert two needles up into the needle clamp. Set stitch width selector at **O** and needle position selector at **L** .

Turn hand wheel over toward operator until needle bar is at its lowest point, loosen clamping screw, Fig. 13, and raise or lower needle bar as required.

While maintaining correct needle bar height, make certain needle bar is correctly turned, then tighten clamping screw.

Replace feed dog, throat plate, bobbin case and face plate. Check for alignment of feed dog teeth in throat plate slots.

To Position Needle To or From the Hook Point

With needle bar set at correct height, as instructed above, set needle position selector at **C** and stitch width selector at **0.**

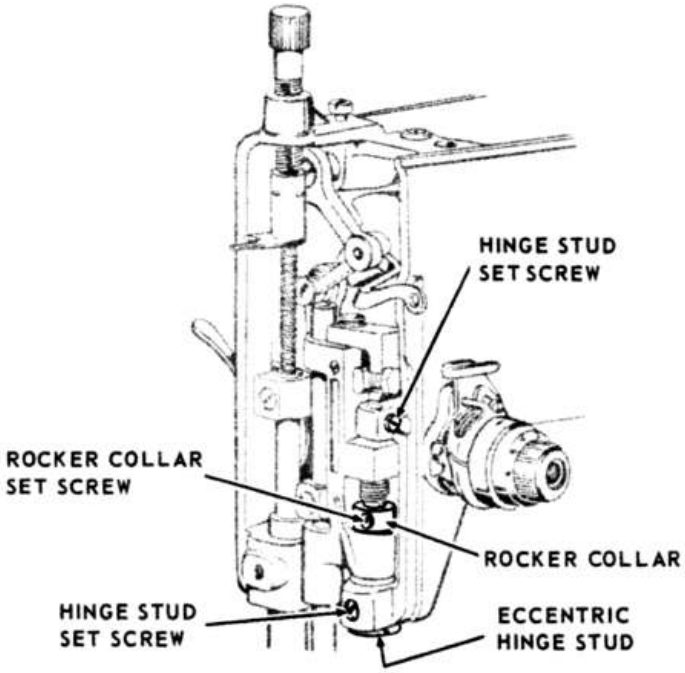


Fig. 16. Positioning Needle from Hook

Remove face plate, presser foot, throat plate, bobbin case and feed dog. Insert a size 11 needle into the needle clamp.

Turn hand wheel over toward operator until point of hook is directly behind needle. At this position, the distance between needle and hook point should be no more than a single thickness of ordinary note paper, as shown in Fig. 15.

Adjustment

Loosen the two hinge stud set screws and the rocker collar set screw, Fig. 16.

Using an offset screwdriver, turn eccentric hinge stud, Fig. 16. clockwise or counterclockwise, as required, to bring needle into correct position from point of hook. Tighten the two hinge stud set screws.

Turn rocker collar counterclockwise until sufficient spring tension is obtained and then tighten collar set screw.

To Time the Pendulum Movement of Needle Bar

Remove arm top cover, insert general purpose throat plate and place Disc No. 1 (zigzag stitch) on disc spindle. Set needle position selector at C and stitch width selector at 4.

Turn hand wheel over toward operator and observe movement of needle bar. When the movement is correctly timed, the needle should begin and end its pendulum movement at approximately the same distance above the throat plate, as shown in Fig. 17, and reach its peak ascent at center.

Adjustment

Insert straight stitch throat plate and check centralization of needle, as instructed on page 7.

Replace straight stitch throat plate with general purpose throat plate and set stitch width selector lever at 4.

Loosen one of the worm gear set screws, Fig. 18, and turn hand wheel over toward operator until needle is at its lowest point in right position. Then loosen the other worm gear set screw.

Turn disc, as required, until disc follower, Fig. 18, is at center of high point on zigzag stitch disc. Then tighten one of the worm gear set screws.

Recheck pendulum movement and, if satisfactory, tighten the other worm gear set screw. Replace arm top cover.

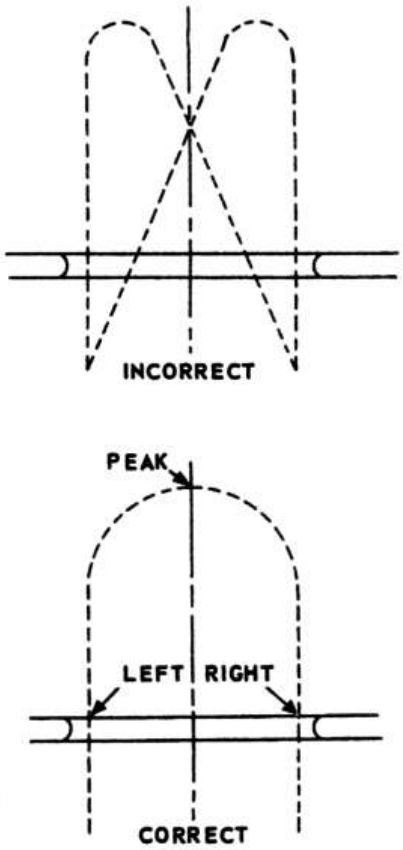


Fig. 17. Pendulum Movement

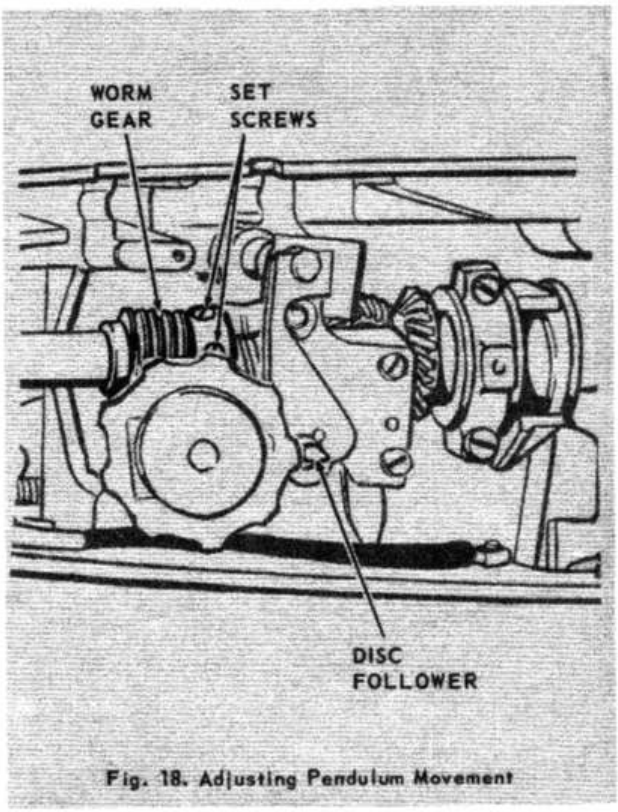


Fig. 18. Adjusting Pendulum Movement

ROTATING HOOK

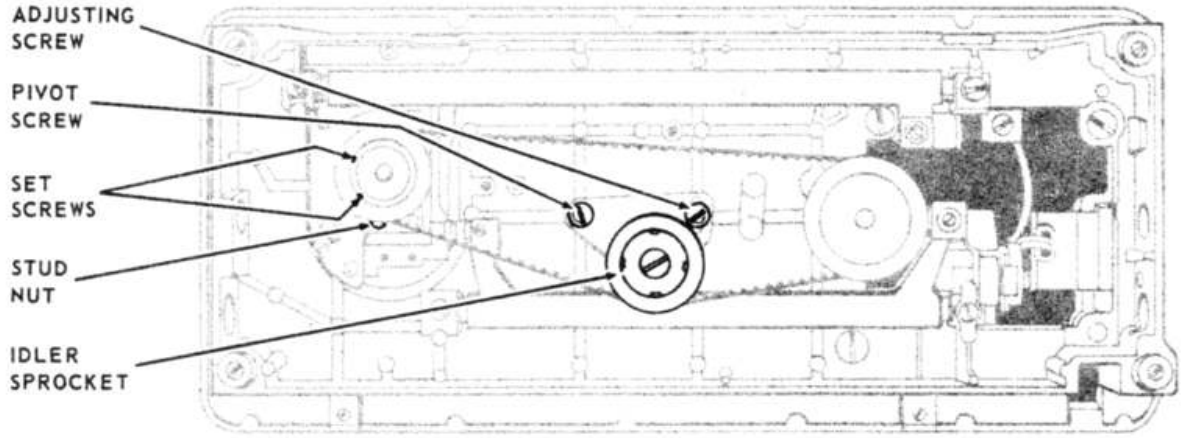


Fig. 19. Removing Hook Shaft Sprocket

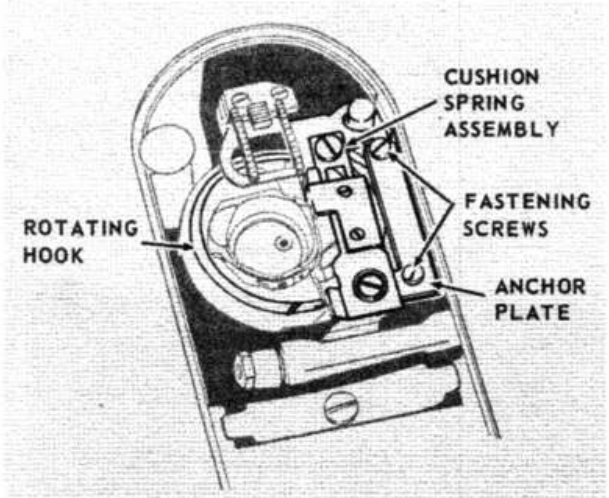


Fig. 20. Removing the Hook

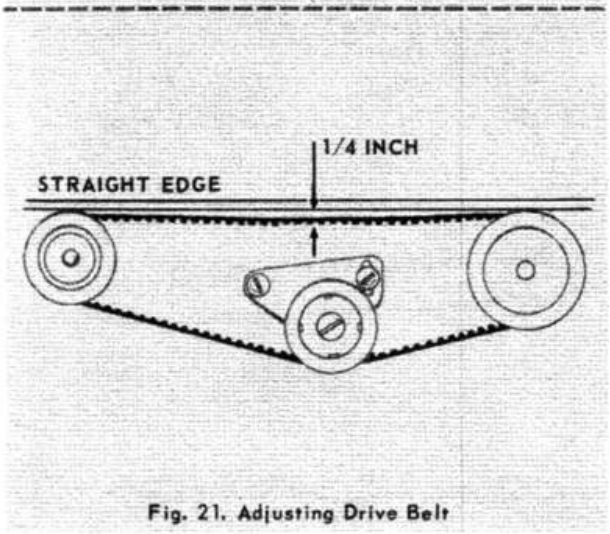


Fig. 21. Adjusting Drive Belt

If it should become necessary to remove the rotating hook assembly for any reason such as damage to the hook point, remove and replace the assembly as instructed below.

Removal

Remove needle, presser foot, slide plate, throat plate, bobbin case, feed dog and bottom cover.

Remove idler sprocket adjusting screws, Fig. 19. (For convenience, the pivot screw can also be removed but it is not necessary.)

Loosen the two set screws in hook shaft sprocket, Fig. 19, and remove sprocket with belt from hook shaft.

Remove position finger stud nut, Fig. 19.

Remove the two fastening screws, Fig. 20, from the cushion spring anchor plate and remove plate. Then lift the rotating hook, complete with position finger and cushion spring assembly, up and out of machine.

Replacement

Insert rotating hook, complete with position finger and cushion spring assembly, into machine.

Replace stud nut, Fig. 19, on position finger stud and tighten nut.

Replace anchor plate and fasten with the two screws.

With drive belt around upright arm shaft sprocket and hook shaft sprocket, replace hook shaft sprocket on shaft. Tighten the two set screws, Fig. 19, making certain they are seated in groove of hook shaft.

Replace idler sprocket adjusting screw but do not tighten at this time. The sprocket should be resting on the belt.

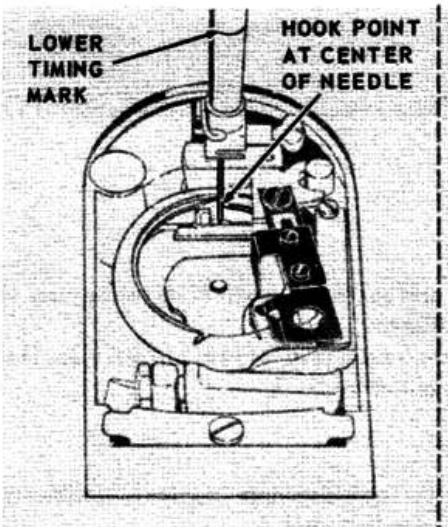


Fig. 22. Hook Correctly Timed

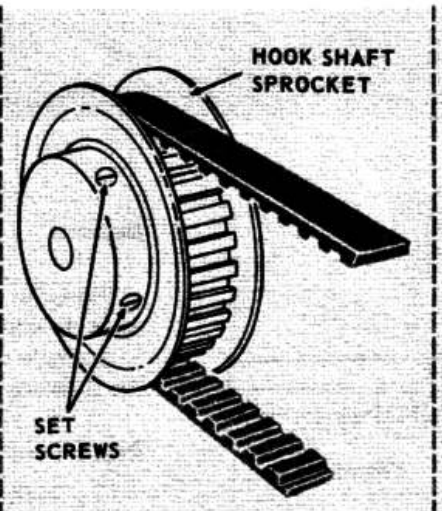


Fig. 23. Timing the Hook

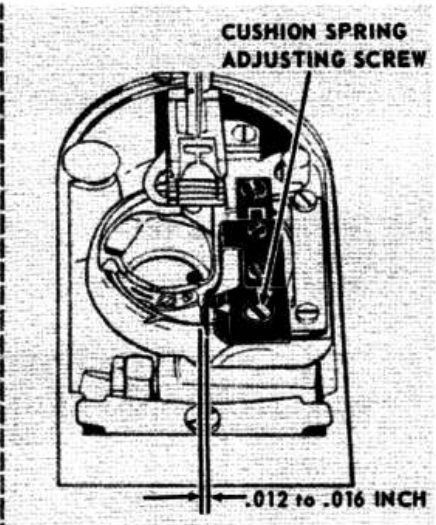


Fig. 24. Thread Clearance

Adjust the amount of belt deflection by placing a straight edge across the top of the hook sprocket and upright arm sprocket, as shown in Fig. 21. Press down on belt until a deflection of approximately 1/4 inch has been obtained. Then, while holding belt down in correct position, securely tighten the idler sprocket adjusting screw.

Retime the hook and adjust thread clearance, as instructed on page 11.

To Eliminate End Play or Binding in Hook Shaft

The rotating hook shaft should turn freely, without any binding or end play.

Adjustment

Loosen sprocket set screws, Fig. 19. Then, while pressing downward on hook from top of bed, move sprocket in or out until correct adjustment is obtained. Securely tighten set screws and check hook timing.

Timing the Rotating Hook

Place needle position selector at **C** and stitch width selector at **0.** Turn hand wheel over toward operator until lower timing mark on needle bar is aligned with lower edge of needle bar frame during upward stroke of the needle. At this position, the point of the hook should be at center of needle and the underside of the hook point is approximately 1/16 inch above the top of needle eye, as shown in Fig. 22.

Adjustment

Check needle bar height and needle bar pendulum movement, as instructed on pages 8 and 9.

With face plate, presser foot, throat plate, bobbin case and bottom cover removed, set needle position selector at **C** and stitch width selector at **0.** (Feed dog is removed in Fig. 22 to show point of hook.)

Loosen the two set screws in hook shaft sprocket, as shown in Fig. 23. While maintaining the correct position of needle bar (lower timing mark aligned with bottom of needle bar frame), rotate hook clockwise or counterclockwise until point of hook is at center of needle. Then, without disturbing position of hook or needle bar, press sprocket firmly against bushing and tighten the set screws.

Replace bottom cover, face plate, bobbin case, throat plate and presser foot.

To Adjust Thread Clearance

With slide plate opened and throat plate removed, rotate hook point to "cast-off" position, as shown in Fig. 24.

Using a narrow feeler gauge, if available, check clearance between heel of bobbin case and cushion spring. The clearance should be from .012 to .016 inch, as shown in Fig. 24.

If a feeler gauge is not available, the thickness of four pieces of ordinary note paper is approximately .016 inch.

Adjustment

Loosen cushion spring adjusting screw, Fig. 24, and insert a .016 inch feeler gauge (or four pieces of note paper) between heel of bobbin case and cushion spring. Hold spring up against gauge (or paper) while securely tightening adjusting screw. If there should be excessive noise in the hook area, it may be necessary to reduce the clearance to .012 inch (or three pieces of note paper).

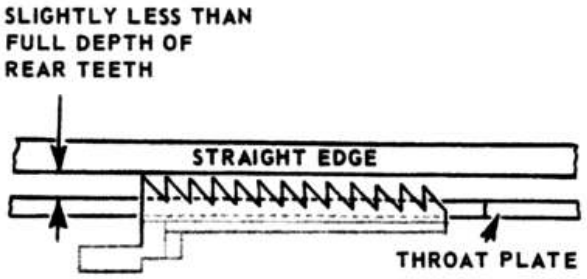


Fig. 25. Feed Dog at Correct Height

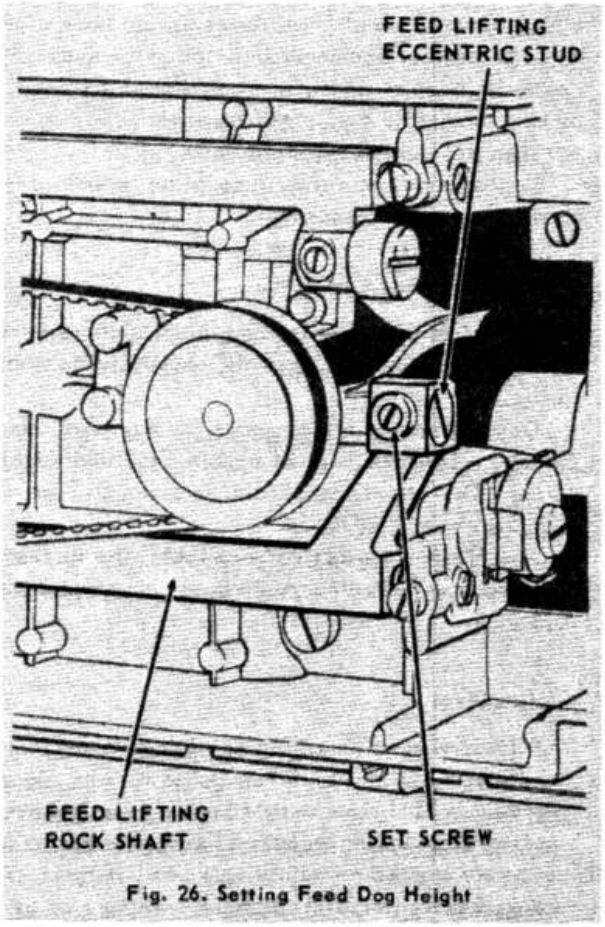


Fig. 26. Setting Feed Dog Height

Removal

Remove presser foot, open slide plate and remove throat plate.

Remove the two screws at rear of feed dog. Then lift feed dog out of machine.

Replacement

To replace feed dog into machine, follow the reverse steps for its removal.

To Set Feed Dog Height

Set stitch length regulator at 12 to 15 stitches per inch. Turn hand wheel over toward operator until feed dog is at its highest point.

When correctly set, slightly less than a full depth of rear teeth should project above the throat plate, as shown in Fig. 25.

Adjustment

Set stitch length regulator at 12 to 15 stitches.

Raise feed dog to its highest point and remove bottom cover.

Loosen feed lifting rock shaft eccentric stud set screw, Fig. 26. Turn feed eccentric stud, as required, to raise or lower feed dog to correct height.

While maintaining this setting, securely tighten set screw.

Then check for end play or binding in the feed lifting rock shaft.

To Eliminate End Play or Binding in Feed Lifting Rock Shaft

Loosen the two set screws holding the two feed lifting rock shaft screw centers, see Fig. 27. Tighten the two screw centers equally allowing the feed lifting rock shaft to ride freely without end play or binding.

Then securely tighten the two set screws.

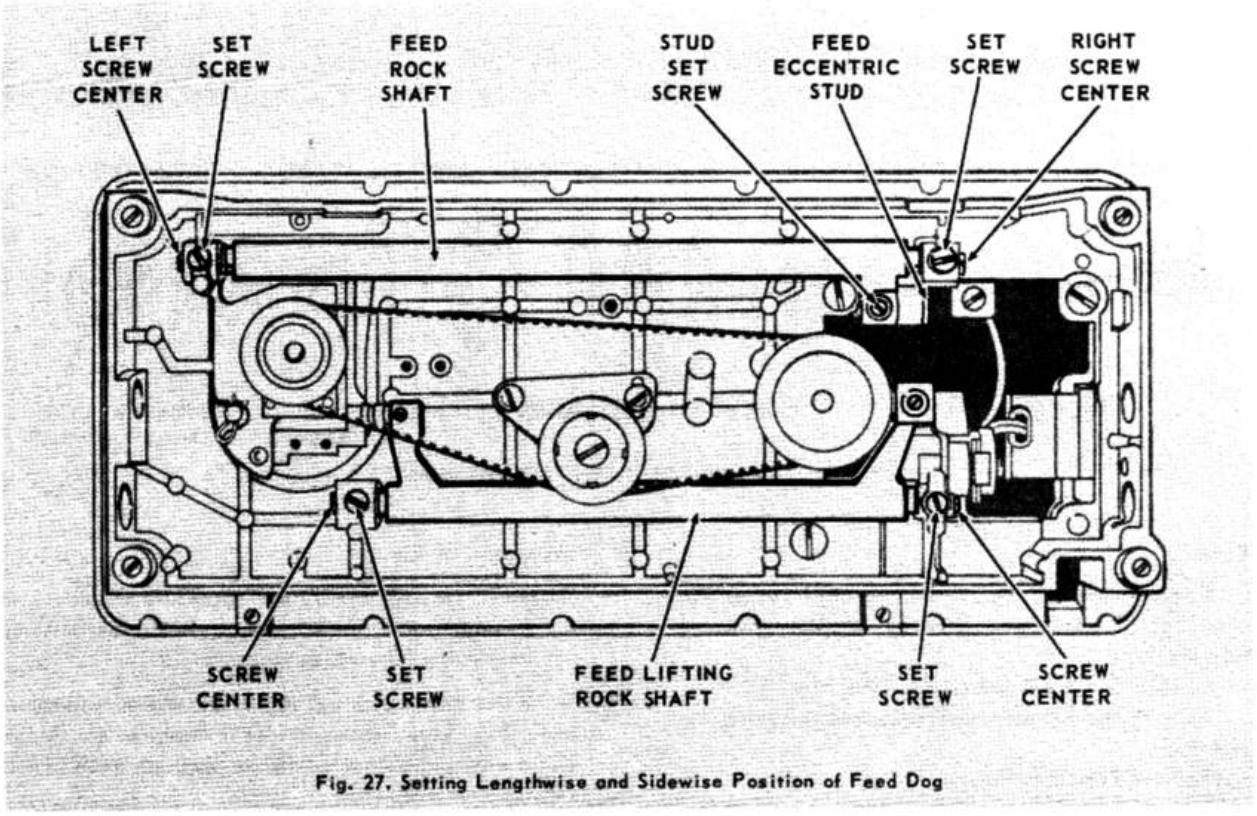


Fig. 27. Setting Lengthwise and Sidewise Position of Feed Dog

To Position Feed Dog in Throat Plate Slots

Lengthwise Setting

When correctly set, the feed dog on its return stroke should move as close as possible to front of throat plate slots without striking throat plate.

Adjustment

Loosen feed rock shaft eccentric stud set screw, Fig. 27. Turn feed eccentric stud, as required, to position feed dog as close as possible to front of throat plate slots without striking throat plate.

Maintain this setting and securely tighten set screw.

Sidewise Setting

The feed dog should be located centrally (along the bed) in feed slots of throat plate.

Adjustment

Loosen the two set screws holding the two feed rock shaft screw centers, Fig. 27.

To move feed dog toward the left, loosen feed rock shaft left screw center and tighten right screw center.

To move feed dog toward right, loosen feed rock shaft right screw center and tighten left screw center.

When feed dog is correctly centralized in throat plate, make certain that the screw centers hold the feed rock shaft firmly without end play or binding. Then tighten the two set screws.

Note: Should feed shaft still bind after making the correct adjustments, check feed bar assembly as instructed on page 25.

NEEDLE THREAD TENSION ASSEMBLY

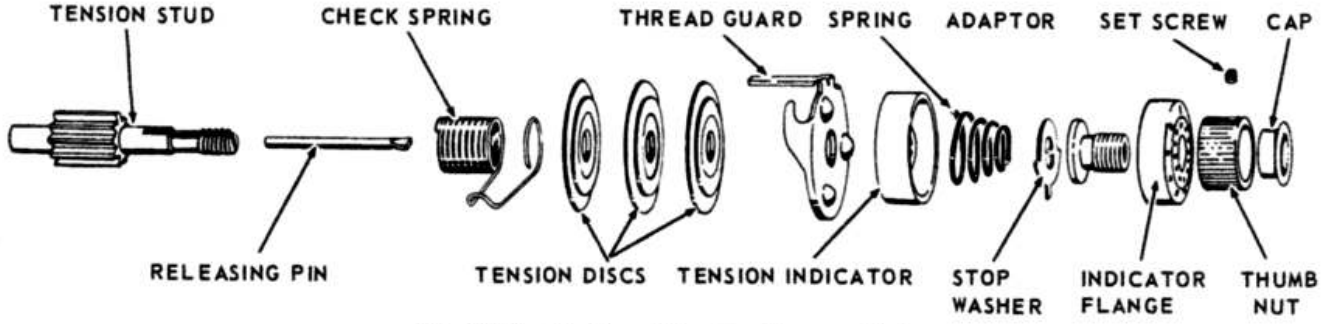


Fig. 28. Needle Thread Tension Disassembled

Removal

Remove arm top cover, loosen stud set screw, see Fig. 30, and remove entire tension assembly from machine.

Loosen thumb nut set screw. (See Fig. 28.)

Turn thumb nut counterclockwise, removing nut and cap.

Remove indicator flange.

Turn adaptor counterclockwise and remove it from the tension stud.

Remove stop washer, spring and tension indicator.

Then as a unit, remove thread guard, tension discs and take-up spring.

Replacement

Make certain that releasing pin is in place, as shown in Fig. 29.

Place tension discs on thread guard.

Align coils of take-up spring with holes in discs and thread guard and place this assembly on stud, as shown in Fig. 29.

Note: Tail of take-up spring should enter one of the grooves in rear of stud. Refer to instructions for setting take-up spring, page 15.

Insert stud, with spring, discs and thread guard assembly, into machine with extension on thread guard entering hole provided in machine head. Then tighten stud set screw.

Replace tension indicator, Fig. 30, on stud with open side out and indicator markings at top.

Replace spring and stop washer with extension on washer at the top.

Replace adaptor on stud.

Replace indicator flange making certain that stop on inside surface of flange contacts the right side of the washer extension when dial is set for zero (0) tension.

Adjust needle thread tension, take-up spring stroke and take-up spring tension as instructed. Then replace arm top cover.

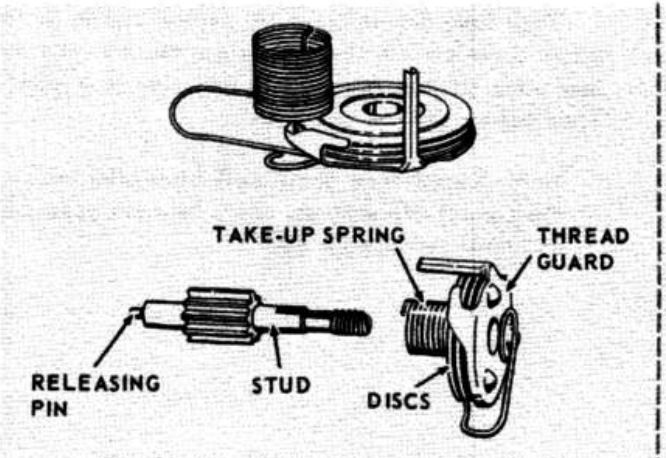


Fig. 29. Aligning Spring and Discs on Stud.

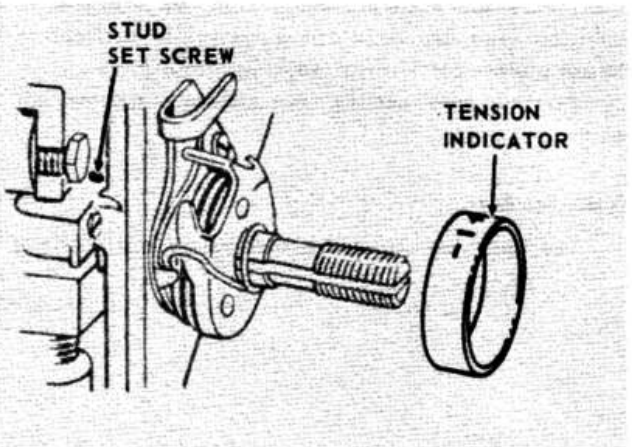


Fig. 30. Assembling Thread Tension

Needle Thread Tension

With presser bar lowered and thread tension indicator set at zero (0), there should be a slightly perceptable tension on the needle thread.

Adjustment

Lower presser bar, loosen thumb nut set screw, Fig. 28, and remove thumb nut with cap.

Remove indicator flange.

Place #50 mercerized thread between tension discs, as shown in Fig. 31. Hold thread at both ends and pull back and forth through the discs. At the same time, turn adaptor, as required, to obtain the correct amount of tension.

Replace flange with stop on inside of flange contacting the right side of stop washer extension.

Hold flange in position, replace thumb nut and tighten nut against flange.

Replace cap and tighten thumb nut set screw. Then recheck needle thread tension.

Take-up Spring Stroke

The take-up spring should complete its action and be at rest against take-up spring stop as point of needle enters the material.

Adjustment

Loosen slack thread regulator set screw, Fig. 32. Move regulator down to the right to complete take-up spring action earlier (shorter stroke) or up to the left to complete action later (longer stroke). Then securely tighten set screw.

Take-up Spring Tension

With tension on needle thread set between 4 and 6, the tension on the take-up spring should be just sufficient to take up slack of needle thread until point of needle reaches material.

Adjustment

The end of the take-up spring should be positioned in top groove of stud sprocket and be in line with thread guard extension to obtain normal tension under average sewing conditions.

Set thread tension indicator at zero (0) tension. Turn hand wheel until stud set screw, Fig. 30, is accessible, loosen set screw and remove entire tension assembly.

To increase tension, move end of take-up spring, Fig. 33, toward right into next groove of sprocket; to decrease tension, move end of spring toward left.

Replace entire assembly into machine with take-up spring resting on take-up spring stop, Fig. 32. Recheck tension and then tighten stud set screw.

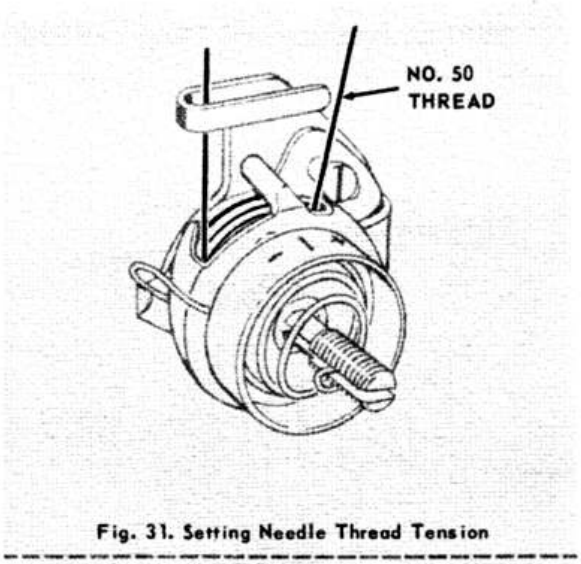


Fig. 31. Setting Needle Thread Tension

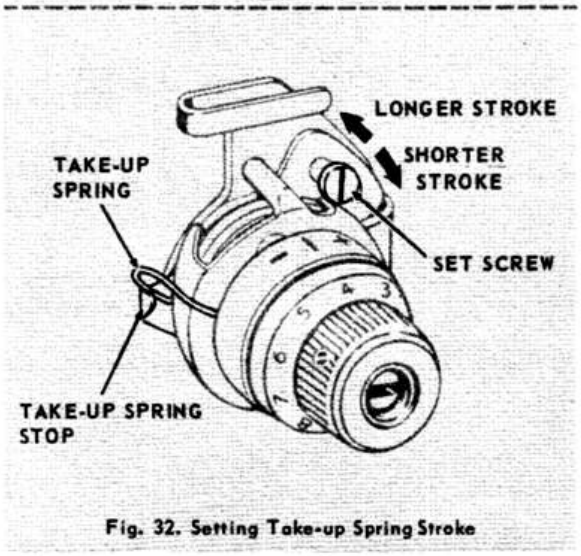


Fig. 32. Setting Take-up Spring Stroke

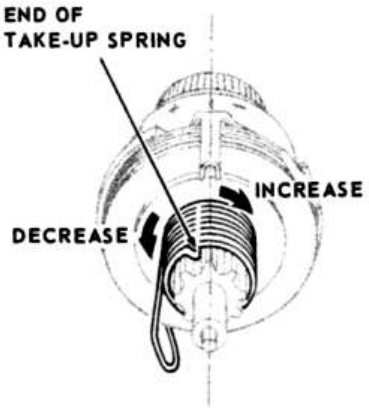


Fig. 33. Setting Take-up Spring Tension

NEEDLE BAR ROCKER FRAME AND NEEDLE THREAD TAKE-UP ASSEMBLY

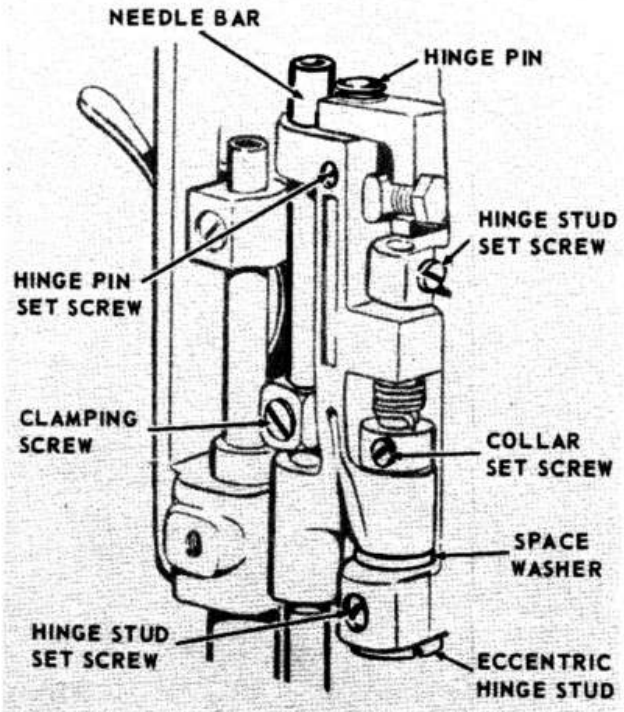


Fig. 35. Removing and Replacing Take-up

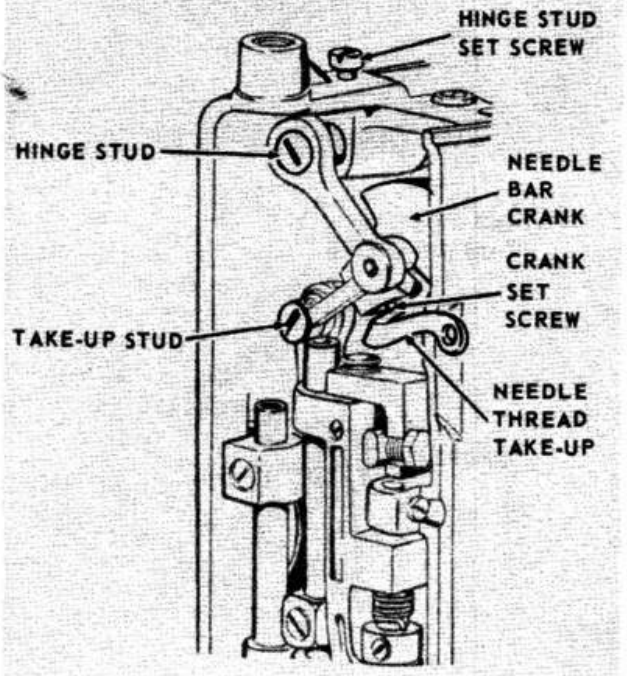


Fig. 34. Removing and Replacing Rocker Frame

NEEDLE BAR ROCKER FRAME

Removal

Remove needle and face plate. Loosen hinge pin set screw, Fig. 34, and remove hinge pin.

Loosen the two eccentric hinge stud set screws and the collar set screw.

Remove eccentric hinge stud and remove needle bar rocker frame with needle bar from machine.

To remove needle bar from rocker frame, loosen clamp screw, Fig. 34, and slide needle bar out.

Replacement

Replace needle bar rocker frame in its reverse order for removal making certain that spacing washer, Fig. 34, is in place before inserting eccentric stud.

Then check needle bar adjustments as instructed on pages 7 and 8.

NEEDLE THREAD TAKE-UP

Removal

Remove arm top cover and face plate.

Remove needle bar as instructed on page 7.

Remove presser bar as instructed on page 6. (It is not necessary to remove the presser bar itself; only the spring, guide pin and pressure indicator.)

Loosen hinge stud set screw, Fig. 35. Then, through access hole in top of casting, loosen the needle bar crank set screw.

Withdraw needle thread take-up with link, hinge stud and take-up stud from machine.

Replacement

Replace needle thread take-up in reverse order of its removal.

Tighten needle bar crank set screw firmly against flat on take-up stud. Then, while turning hand wheel over toward operator, slowly tighten the hinge stud set screw.

Replace needle bar, presser bar spring, indicator, guide pin and presser bar thumb screw, as instructed on pages 6 through 8.

CAM STACK AND STITCH WIDTH SELECTOR ASSEMBLY

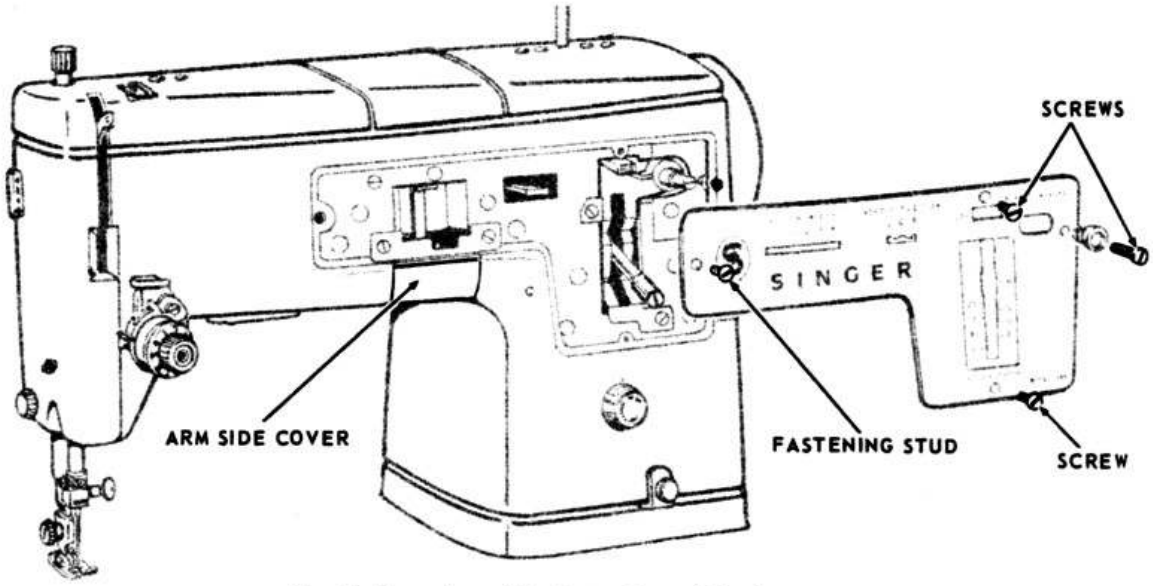


Fig. 36. Removing and Replacing Control Panel

Removal

Remove arm top cover and raise stitch length regulator to notch in area above **20.** From inside machine arm, remove spring clamp from control panel fastening stud shown in Fig. 36. Then remove the three screws from control panel and remove panel from machine.

Remove the two screws holding the arm side cover and remove cover.

Remove light bracket screw, lower light assembly and draw assembly toward left until bracket clears the casting. (Refer to Removal and Replacement of Light Fixture as instructed on page **28.**)

Remove circlip from bottom of cam stack shaft, Fig. 37, and remove cam stack set screw. Then lift entire cam stack assembly from machine.

Slide stitch width selector, Fig. 37, from fork of driving arm and remove assembly through opening in machine arm.

Replacement

Replace cam stack assembly into machine arm. Insert stitch width selector assembly through opening in front of arm. Slide stud of stitch width assembly into fork of driving arm.

Install lever up onto lower end of cam stack shaft, inserting circlip to hold it into place.

Replace light fixture, arm side cover, front control panel and arm top cover.

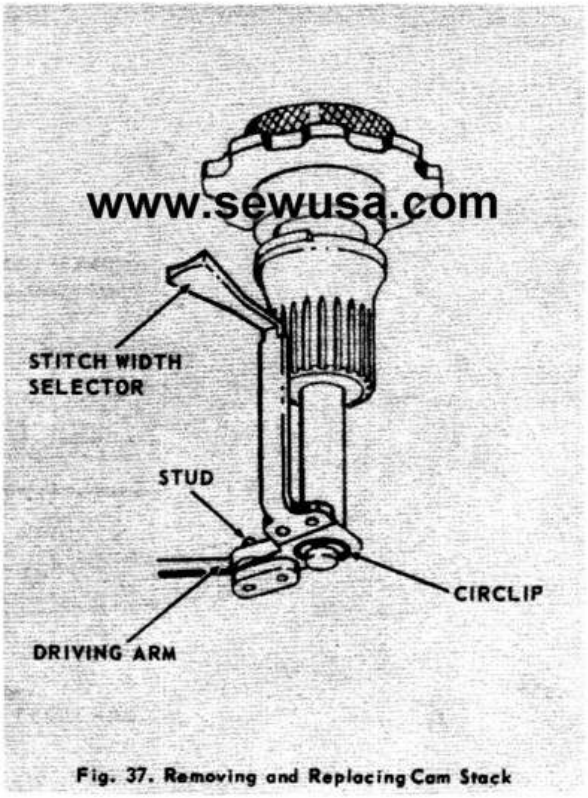


Fig. 37. Removing and Replacing Cam Stack

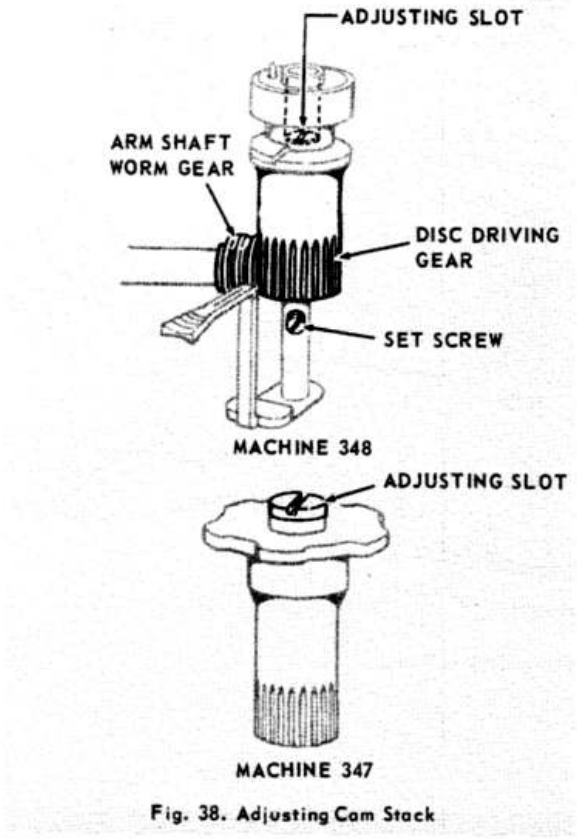


Fig. 38. Adjusting Cam Stack

Adjusting the Cam Stack

Remove arm top cover, set needle position selector at **C** and stitch width selector at **0**. Then check for excessive backlash or binding between the arm shaft worm gear, Fig. 38, and disc driving gear.

To Remove Backlash or Binding in Gears

Remove front control panel, as previously instructed, and loosen cam stack set screw, Fig. 38.

Insert screwdriver in adjusting slot of disc spindle and turn spindle counterclockwise to bring high point of eccentric toward arm shaft gear. Then "back-off" until there is no binding and only a minimum amount of backlash.

Tighten cam stack set screw, replace front panel and adjust stitch width selector for maximum width of zigzag stitch.

To Adjust Stitch Width Selector

Set stitch width selector at **4**. Loosen screw stud, Fig. 39. Press needle bar driving arm toward front of machine, as indicated in Fig. 39, and at the same time, tighten screw stud.

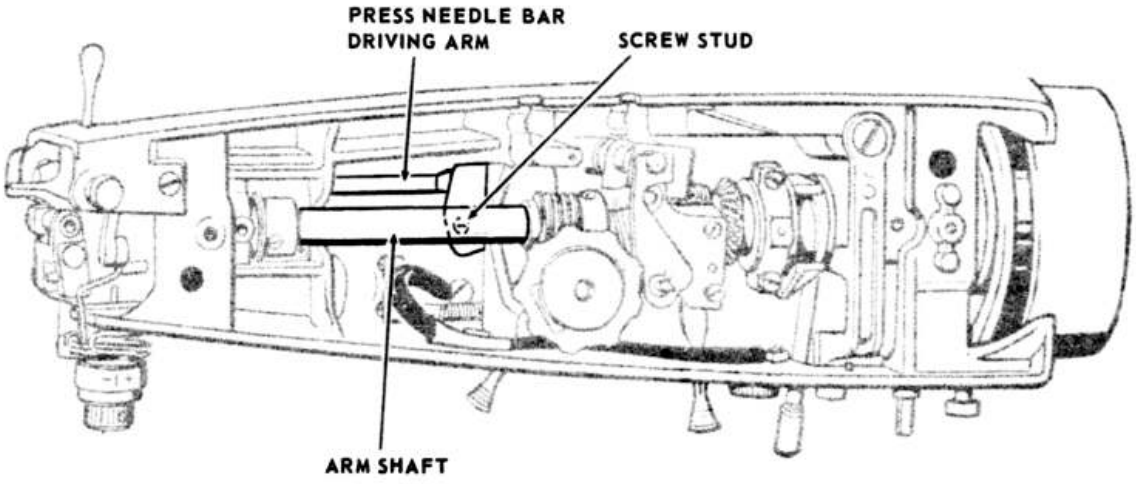


Fig. 39. Adjusting Stitch Width Selector

NEEDLE POSITION SELECTOR AND NEEDLE DRIVING ARM ASSEMBLY

Removal

Remove cam stack and stitch width selector assembly as instructed on page 17.

Remove face plate and loosen collar set screw, Fig. 40.

Remove lever spring screw, as shown in Fig. 41, push needle position selector bracket counterclockwise, slide selector lever, complete with spring, toward the right and then remove lever from machine.

Lift out bight amplitude bracket hinge pin, Fig. 41, to disengage bracket from needle position bracket hinge pin.

Loosen hinge pin set screw, Fig. 40, and remove hinge pin from needle bar rocker bracket, disengaging bracket from needle bar rocker assembly.

Move bight amplitude bracket assembly, Fig. 41, and driving arm, as required, until driving arm becomes disengaged from fork of bracket assembly.

Slide driving arm toward left and remove from machine through face plate end. Then remove bight amplitude bracket assembly from machine.

Remove needle position selector bracket, Fig. 41, by sliding it off hinge pin.

Replacement

Replace needle position selector bracket on hinge pin.

Replace bight amplitude bracket assembly with fork at upper end fitting around needle position selector bracket hinge pin.

Insert driving arm through face plate end of machine with right end of arm entering fork at bottom of bight amplitude bracket, as shown in Fig. 41.

Insert bight amplitude bracket hinge pin through holes provided for it in the bight amplitude bracket and needle position selector bracket.

Replace needle position selector lever and spring, fitting large fork in groove around needle position selector hinge pin and small fork in groove around bight amplitude bracket hinge pin.

Replace needle bar rocker bracket hinge pin, Fig. 40, and tighten hinge pin set screw. Rotate collar counterclockwise and tighten collar set screw.

Replace cam stack and stitch width selector assembly as instructed on page 17. Then refer to instructions covering adjustments of the needle bar, pages 7 through 9.

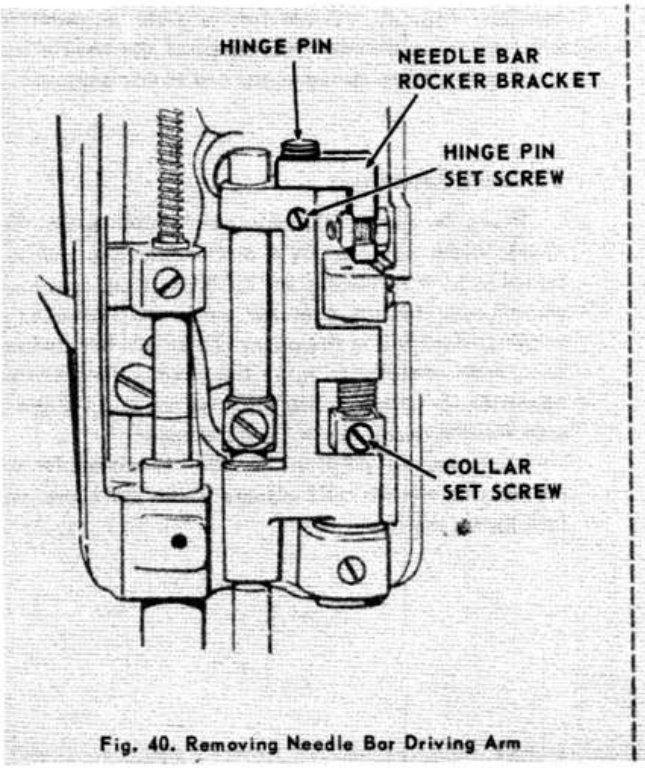


Fig. 40. Removing Needle Bar Driving Arm

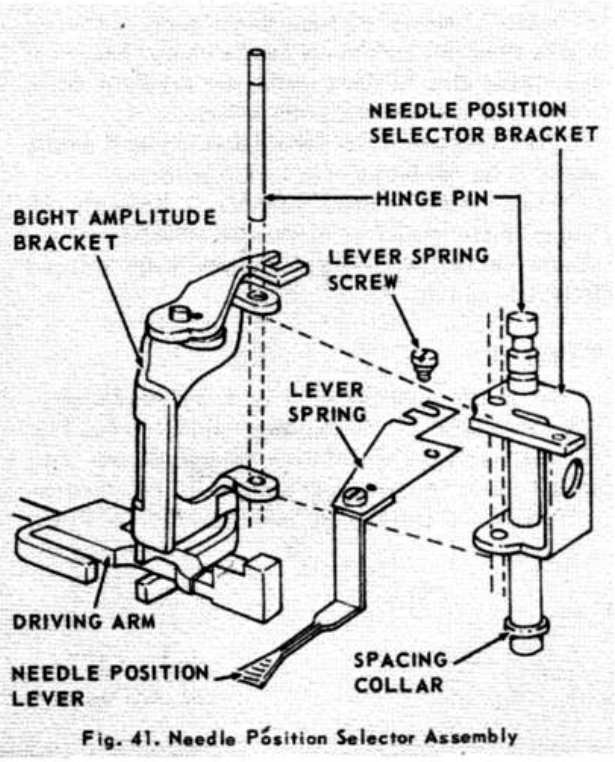


Fig. 41. Needle Position Selector Assembly

Needle Position Selector and Needle Driving Arm Assembly (continued)

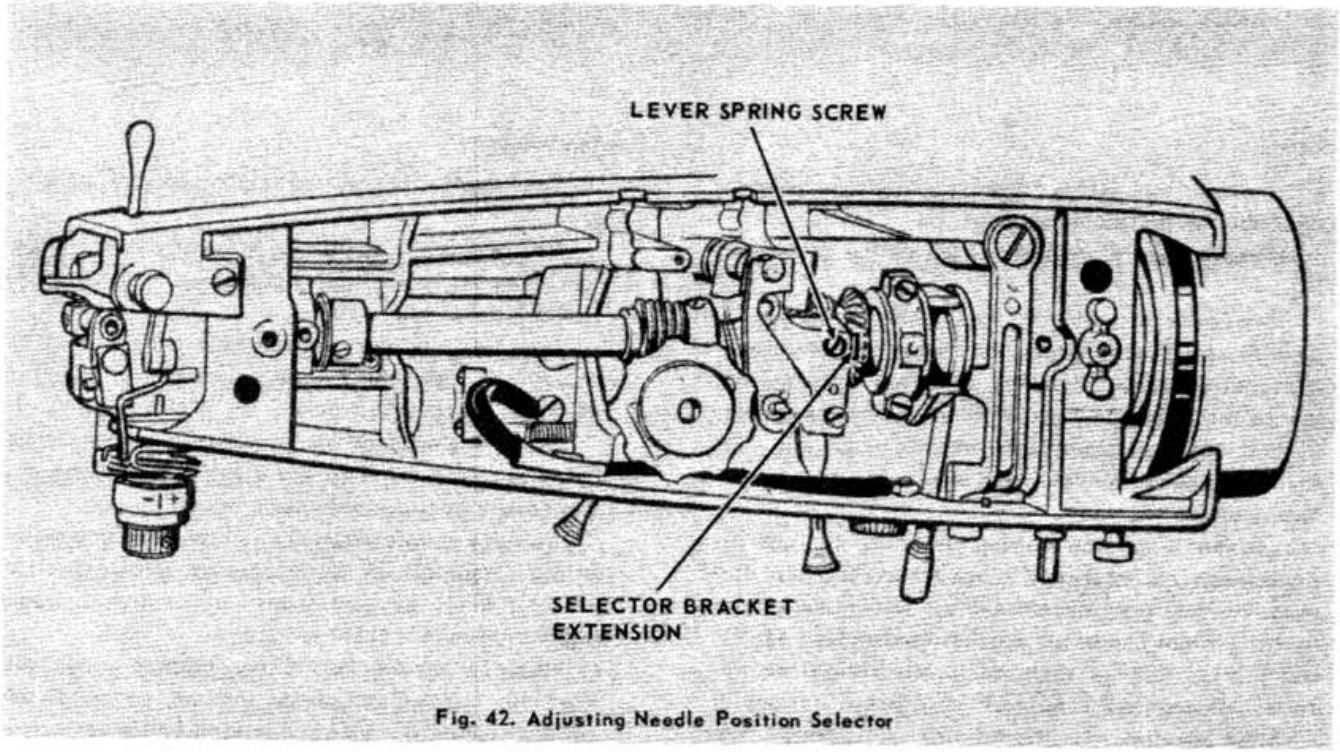


Fig. 42. Adjusting Needle Position Selector

Adjustment

Insert a general purpose throat plate and insert a size #9 needle up into the needle clamp. Then with the zigzag disc on the spindle, set needle position selector at **L** and stitch width selector at **4**.

Turn hand wheel over toward operator until needle bar is at its lowest point in LEFT position.

When needle position selector is correctly adjusted, there should be a minimum movement of the needle bar while moving the stitch width selector from right to left.

To Adjust

Set stitch width selector at **4** and needle position selector at **L**. Loosen lever spring screw, Fig. 42, and turn hand wheel over toward operator until needle bar is at its lowest point in LEFT position.

Then move stitch width lever slowly from **1** to **4**, and, at the same time, move selector bracket extension, Fig. 43, toward left or right as required, until there is minimum movement of the needle bar.

Tighten lever spring screw and check adjustment.

To Check Adjustment

Place a sheet of paper over throat plate. Set stitch width selector at **4** and needle position selector at **L**. With needle in LEFT position, turn hand wheel over toward operator until needle makes a slight perferation in the paper. Then turn hand wheel away from operator to raise the needle. Repeat this operation at stitch width settings of **0, 1, 2** and **3** with needle remaining in LEFT position.

When needle position bracket is correctly adjusted, the needle will always enter the same perferation in the paper.

HORIZONTAL ARM SHAFT

Removal

Remove needle bar rocker frame and needle thread take-up, as instructed on page **16.**

Remove hand wheel and flanged bushing assembly, as instructed on page **23.**

Loosen set screw in arm shaft collar, Fig. 43, and loosen set screws in arm shaft worm gear.

Remove connecting rod cap and loosen timing screw in bevel gear and feed lifting eccentric. Then loosen the timing screw in the feed eccentric.

Using a 1/2 inch drift pin, or another shaft of the same diameter, force arm shaft through feed eccentric, bevel gear and feed lifting eccentric and worm gear. Make certain that drift pin (or shaft) is inserted through these parts so that mesh between bevel gears are not disturbed. Withdraw shaft through face plate end of machine.

Replacement

Hold bevel gear in mesh with upright arm shaft gear and insert horizontal arm shaft into machine through collar, worm gear, bevel gear and feed lifting eccentric and feed eccentric.

While pushing needle bar crank toward hand wheel end, bring collar against bushing and securely tighten collar set screw against flat on arm shaft.

Hold bevel gear firmly in mesh with upright arm shaft gear (without backlash or binding). Then tighten bevel gear and feed lifting eccentric timing screw against timing groove in arm shaft.

Place feed eccentric gently against feed forked connection and tighten timing screw against timing groove in arm shaft.

Replace connecting rod cap and securely tighten the two screws.

Replace hand wheel and flanged bushing assembly, as instructed on page **23.**

Replace needle thread take-up and needle bar rocker frame assemblies, as instructed on page **16.**

Adjust needle bar mechanism, as instructed on pages **7** and **8,** and adjust the cam stack, as instructed on page **18.**

Adjustment for Binding or End Play

Should horizontal arm shaft bind, first make certain that mesh between arm shaft worm gear and disc driving gear is not too tight. For adjustment, refer to page **18.**

If additional adjustment for end play or binding is required, loosen collar set screw, Fig. 43, push needle bar crank toward hand wheel end of machine, place collar firmly against bushing and then tighten set screw.

If binding still persists, check placement of bevel gear and feed lifting eccentric and feed eccentric as instructed in Replacement of Arm Shaft.

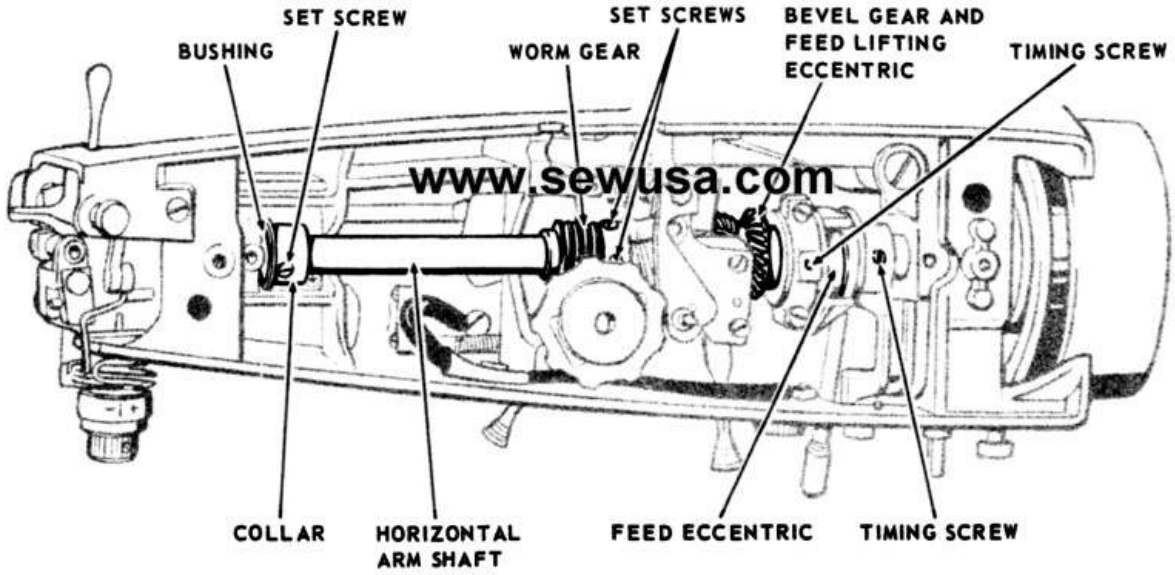


Fig. 43. Removal and Replacement of Horizontal Arm Shaft

UPRIGHT ARM SHAFT

CAUTION: Do not remove the upright arm shaft from this machine. If this becomes necessary, return the machine to the factory.

The two bevel gears have been lapped together at the factory and should be kept in mesh throughout all other removals and replacements.

Adjustment for End Play

End play in the upright arm shaft may be due to excessive clearance between the shaft sprocket and the lower bushing.

To Adjust

Remove arm top cover, bottom cover and front control panel.

Remove the upper screw, Fig. 44, in the backing plate while holding the light lead retaining clip and nut located inside the machine arm. Then remove the lower screw. Remove backing plate from casting, allowing it to hang on regulator lever.

Insert a screwdriver through regulator opening in machine arm, as shown in Fig. 45. Turn hand wheel until set screw in upright arm shaft bevel gear becomes accessible, and loosen set screw 1/4 turn.

Then, while pressing down on the bevel gear, press the arm shaft sprocket up (from underside of machine) against the lower bushing and securely tighten the bevel gear set screw.

Replace backing plate, lead retaining clip and nut, front control panel, arm top cover and bottom cover.

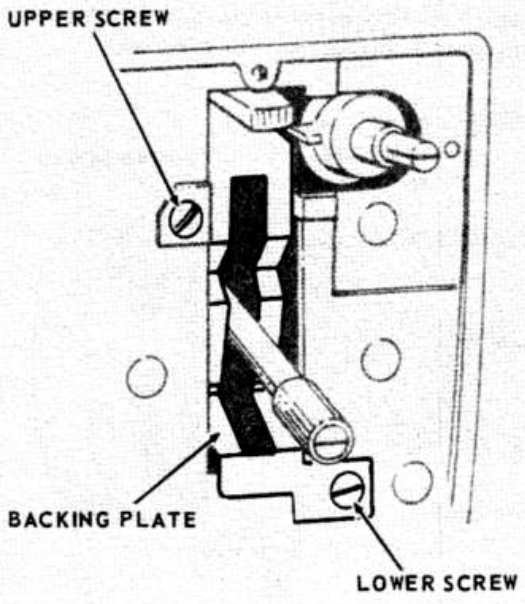


Fig. 44. Removing Backing Plate

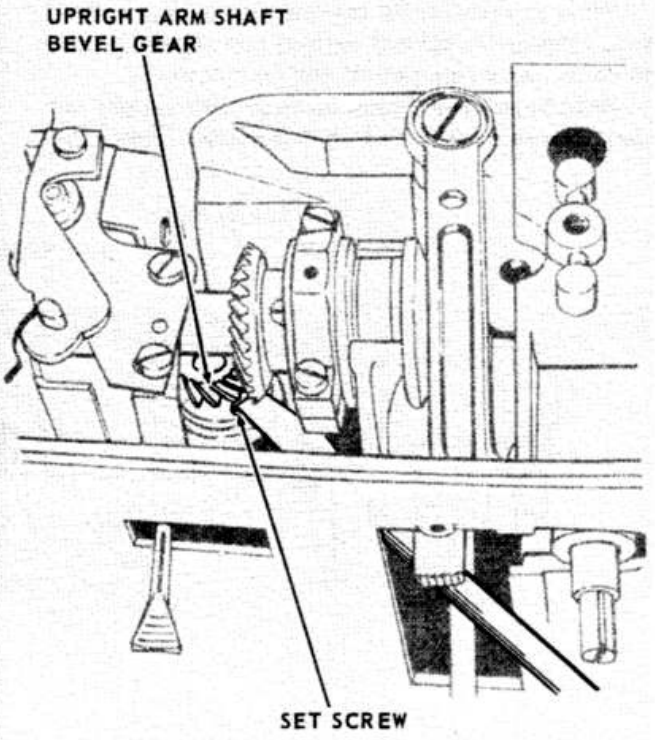


Fig. 45. Adjustment for End Play

HAND WHEEL AND FLANGED BUSHING

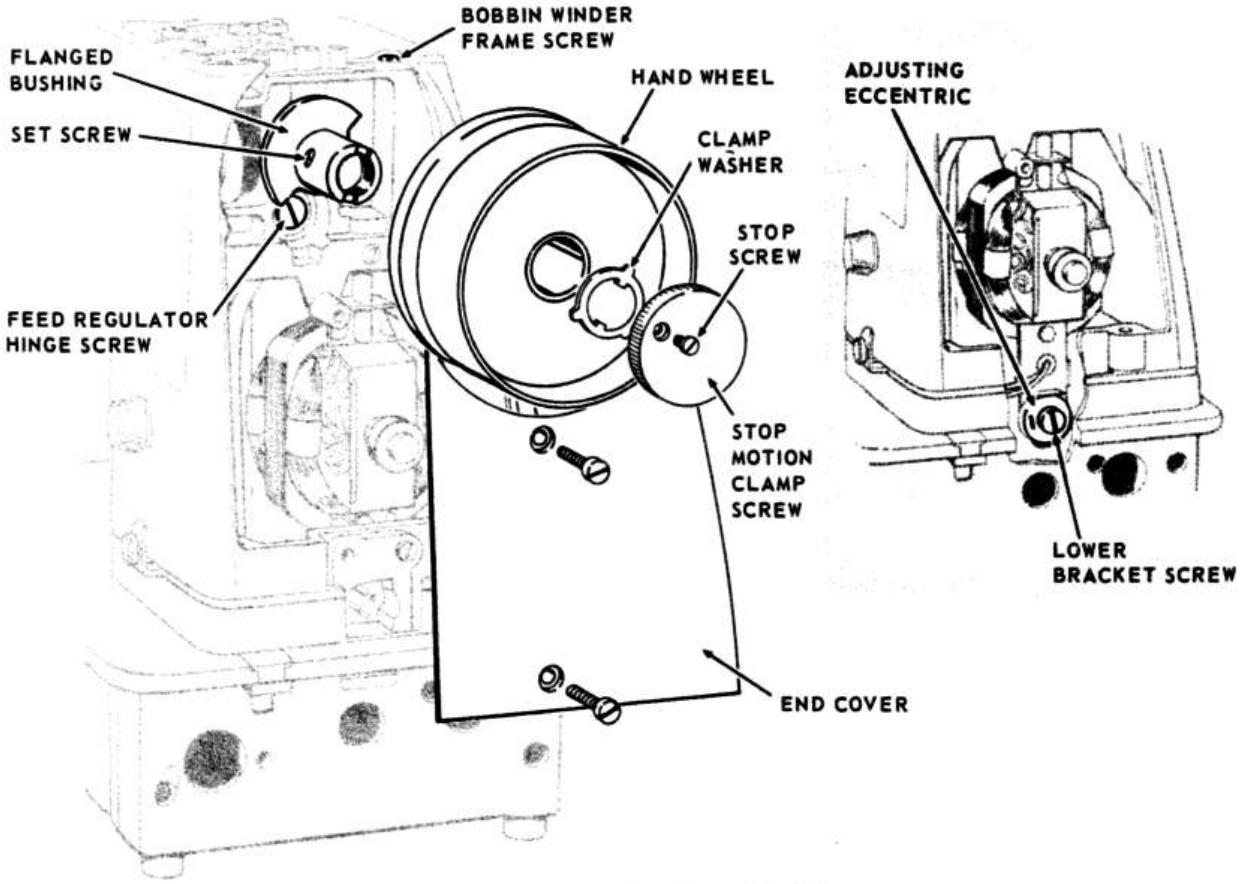


Fig. 46. Removing and Replacing Hand Wheel

Removal

Remove arm top cover, remove the two screws in arm end cover and remove end cover.

Insert a screwdriver through opening in end of casting (see inset, Fig. 46), and loosen lower motor bracket screw. Then, using the screwdriver, turn adjusting eccentric to its highest point, allowing maximum slack in motor belt.

Loosen stop screw, Fig. 46, and turn it out sufficiently so stop motion clamp screw may be removed.

Remove stop motion clamp screw, clamp washer and hand wheel from flanged bushing.

Remove set screw from flanged bushing and slide bushing from arm shaft.

Replacement

Replace flanged bushing on arm shaft, align holes in bushing with holes in shaft and then insert and tighten set screw.

With motor belt in groove of hand wheel, place belt around motor pulley and then slide hand wheel onto flanged bushing.

Replace clamp washer, making certain that flanges on inside of washer fit into the grooves of the bushing. Then replace stop motion clamp screw and tighten stop screw.

Adjust motor belt tension by turning the adjusting eccentric and tighten motor bracket screw. Then replace arm end cover and top cover.

Note: If stitching mechanism is not released when stop motion clamp screw is loosened, remove clamp screw and rotate washer 180°. Then replace clamp screw.

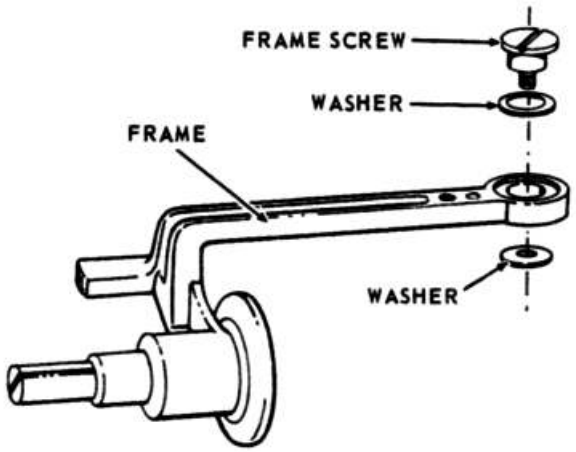


Fig. 47. The Bobbin Winder

BOBBIN WINDER

Removal

Remove arm top cover, front control panel and stitch regulator backing plate. Be certain to hold nut and retaining clip located behind upper screw in backing plate.

Remove bobbin winder frame screw, see Fig. 46, and remove bobbin winder assembly from machine arm, taking care to remove the washer from below assembly.

Replacement

Replace bobbin winder in reverse order of its removal.

Replace backing plate, front control panel and arm top cover.

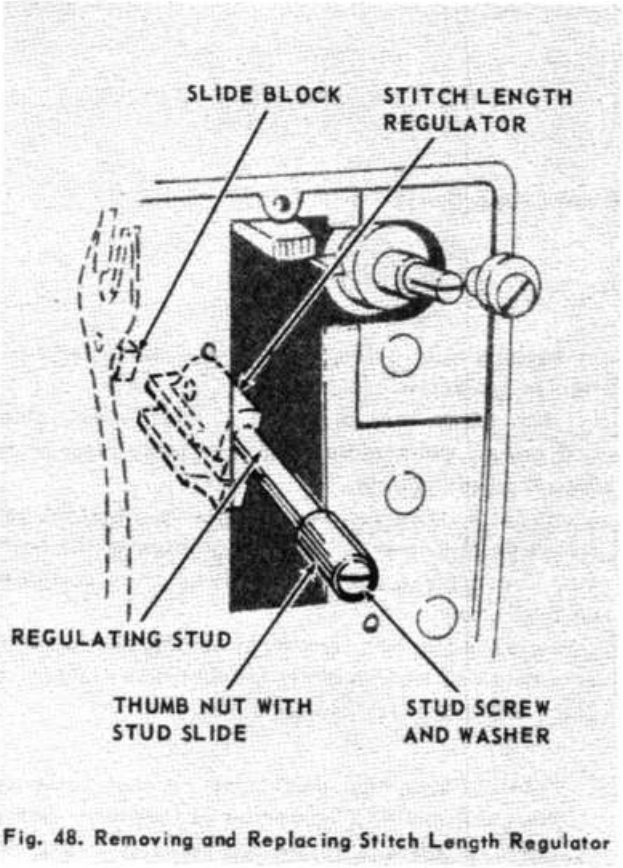


Fig. 48. Removing and Replacing Stitch Length Regulator

STITCH LENGTH REGULATOR

Removal

Remove hand wheel, as instructed on page 23, but do not remove the flanged bushing. Remove front control panel.

Remove feed regulator stud screw and washer, Fig. 48. Slide regulating thumb nut with stud slide out of regulating stud.

Remove the two screws holding the stitch regulator backing plate and remove backing plate from machine arm. Be certain to hold nut and retaining clip located behind upper screw in backing plate.

Remove feed regulator hinge screw, see Fig. 46, and pull regulator with stud out of machine arm.

Replacement

Install regulator with stud into machine arm, making certain that regulator fits onto slide block of feed forked connection, as shown in Fig. 48.

Replace regulator hinge screw through arm casting and into stitch regulator.

Replace backing plate and backing plate screws.

Replace thumb nut and stud slide, washer and stud screw.

Replace hand wheel, as instructed on page 23, and replace front control panel.

FEED LIFTING ROCK SHAFT

Removal

Remove bottom cover and loosen idler sprocket adjusting screw.

Loosen the two set screws in upright arm shaft sprocket and remove sprocket from shaft.

Remove snap ring, Fig. 49, from feed lifting eccentric stud.

Loosen set screw **A** and remove eccentric stud **B** disengaging feed lifting rock shaft from connecting rod.

Loosen set screw **C** and turn screw center **D** out as far as possible. Then move feed lifting rock shaft toward right and out of machine.

Replacement

Replace feed lifting rock shaft in the reverse order of its removal. Adjust feed dog height as instructed on page **12**, and check for end play or binding, as instructed on page **12**.

Replace sprocket on upright arm shaft, and replace hook driving belt.

Adjust amount of belt deflection, as instructed under "Replacement of Rotating Hook", page **10**. Then retime the rotating hook as instructed on page **11**.

Replace bottom cover.

FEED ROCK SHAFT

Removal

Remove throat plate and feed dog.

Remove feed lifting rock shaft, as previously instructed.

Loosen set screw **E**, Fig. 49, and remove eccentric stud **F**, disengaging feed rock shaft from feed forked connection.

Loosen set screw **G**, remove screw center **H** and remove feed rock shaft with feed bar from machine.

Replacement

Replace feed rock shaft, with feed bar assembly, into machine in reverse order of its removal.

Replace feed lifting rock shaft, as previously instructed, and replace feed dog and throat plate.

Check and adjust feed dog, as instructed on pages **12** and **13**.

Replace bottom cover.

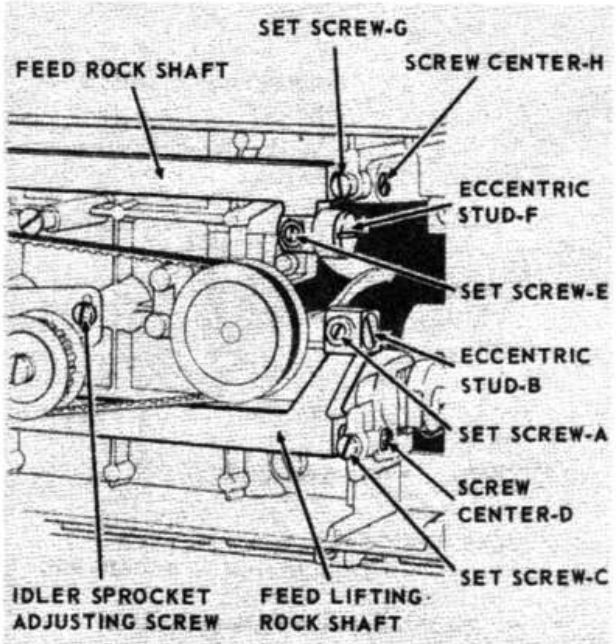


Fig. 49. Removing and Replacing Feed Rock Shafts

FEED BAR ASSEMBLY

Removal

Remove feed rock shaft, as instructed above.

Loosen the two screw center nuts, Fig. 50, and the two screw centers. Then remove feed bar from feed rock shaft.

Replacement

Replace feed bar in reverse order of its removal. Tighten screw centers equally so that feed bar rides freely without end play or binding. Then, while maintaining this setting, tighten the two screw center nuts.

Replace feed rock shaft, as instructed above.

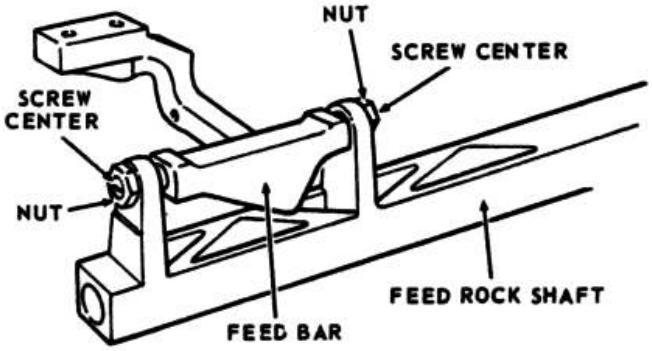


Fig. 50. Feed Bar Assembly

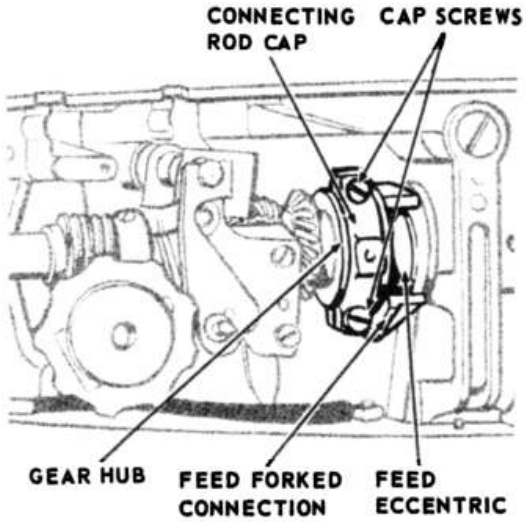


Fig. 51. Feed Lifting Rock Shaft Connecting Rod and Feed Forked Connection

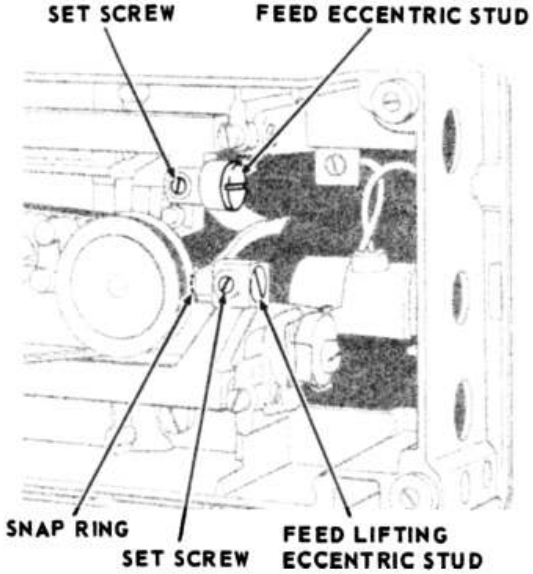


Fig. 52. Connections under Machine Bed

FEED LIFTING ROCK SHAFT CONNECTING ROD

Removal

Remove arm top cover and bottom cover.

Remove the two cap screws, Fig. 51, and remove connecting rod cap.

From bottom of machine, loosen the idler sprocket adjusting screw and the two set screws in the upright arm shaft sprocket. Then remove sprocket.

Remove snap ring, Fig. 52, from feed lifting eccentric stud. Loosen set screw and remove feed lifting eccentric stud. Then remove connecting rod out through bottom of machine.

Replacement

Insert connecting rod into upright arm, from bottom of machine, with upper portion of rod fitting around lower half of gear hub, as shown in Fig. 51.

Replace cap over top half of gear hub and fasten cap to connecting rod with the two cap screws.

Align bottom of connecting rod with feed lifting rock shaft, replace eccentric stud and snap ring, and tighten set screw.

Adjust feed dog height as instructed on page **12.**

Replace sprocket on upright arm shaft and replace hook driving belt.

Adjust amount of belt deflection, as instructed under "Replacement" of rotating hook, page **10.** Then retime the hook as instructed on page **11.**

Replace bottom cover and arm top cover.

FEED FORKED CONNECTION

Removal

Remove arm top cover and bottom cover.

Remove stitch length regulator, as instructed on page **24.**

Loosen set screw, Fig. 52, remove feed eccentric stud and remove feed forked connection out through bottom of machine.

Replacement

Insert feed forked connection into upright arm, from bottom of machine, with fork fitting around feed eccentric, as shown in Fig. 51.

Align bottom of feed forked connection with feed rock shaft, replace feed eccentric stud and tighten set screw.

Replace stitch length regulator as instructed on page **24.**

Check and adjust feed dog as instructed on pages **12** and **13.**

Replace bottom cover and arm top cover.

Removal

Remove hand wheel as instructed on page 23 (do not remove flanged bushing), and remove bottom cover.

Remove the screw holding the three-pin receptacle to the casting. Then slide the receptacle downward until it hangs freely.

Loosen set screw holding the bracket post pin, Fig. 53, and raise post pin until it clears the upper portion of the motor bracket.

Remove lower bracket screw, Fig. 53, adjusting eccentric and insulating bushing. Then remove motor with wiring and three-pin receptacle out of machine through opening in end of arm.

Remove solder-less connector A, Fig. 54, from the motor, switch and light leads.

Remove shroud from back of receptacle, depress spring lock on terminal pin B, see Fig. 54 and inset, and push terminal pin out of receptacle. Then pull motor lead with pin out through opening in shroud.

Replacement

Replace motor lead with terminal pin through shroud and push pin into the receptacle. (The spring lock will depress as the pin is being inserted into the receptacle, and will spring out when pin is fully inserted.)

Using a wire nut connector, connect motor, switch and light leads together, as shown in Fig. 54, and tape to insure against connector working loose.

Replace motor and receptacle into machine, and from the bottom, slide receptacle up into place, insert fastening screw into screw hole toward the right and fasten to machine.

Replace hub of adjusting eccentric through hole in lower portion of motor bracket, place insulating bushing on hub of eccentric, insert lower bracket screw and fasten bracket to machine casting. It is not necessary to tighten bracket screw at this time as belt adjustment will have to be made later.

Return machine to upright position, lower the bracket post pin down through the bracket and tighten the set screw.

Replace hand wheel as instructed on page 23, and replace bottom cover.

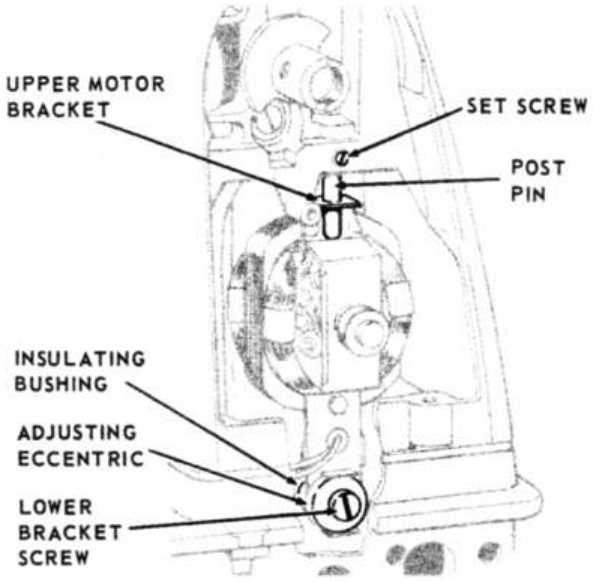


Fig. 53. Removing the Motor

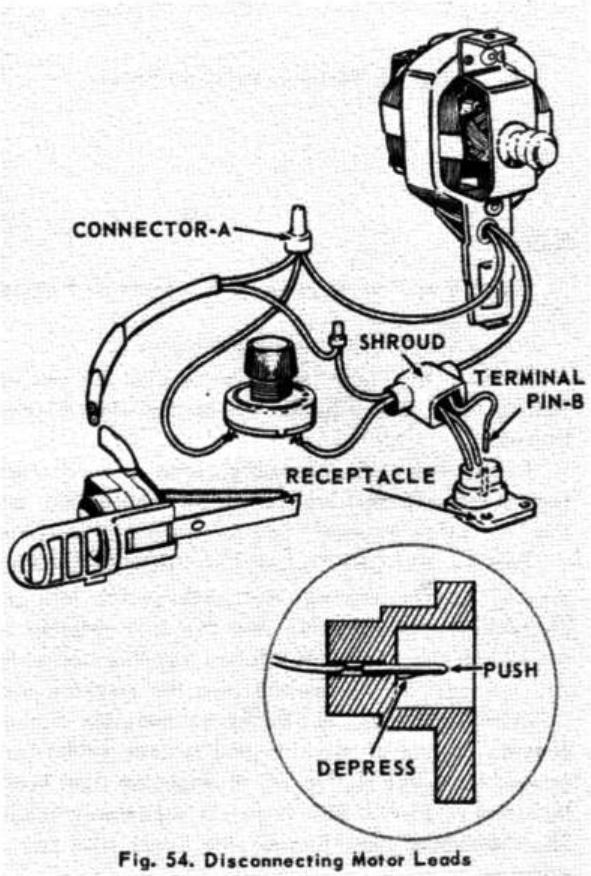


Fig. 54. Disconnecting Motor Leads

LIGHT FIXTURE

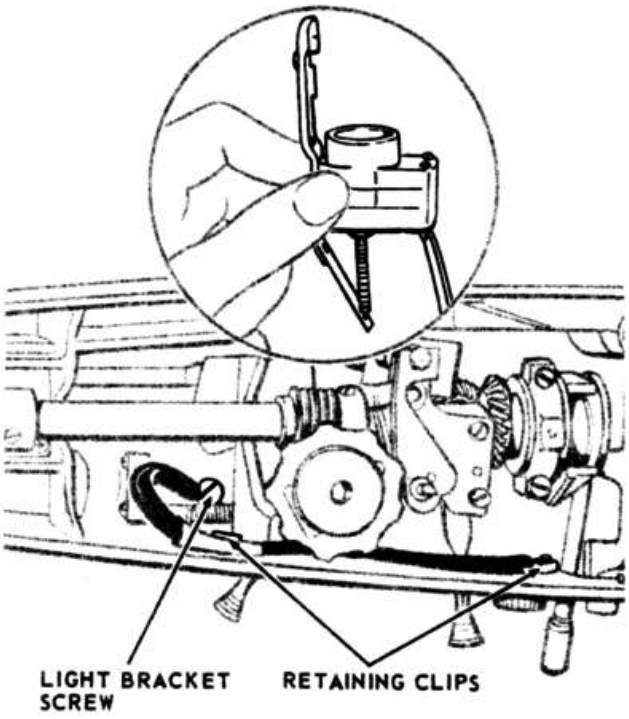


Fig. 55. Removing the Light Fixture

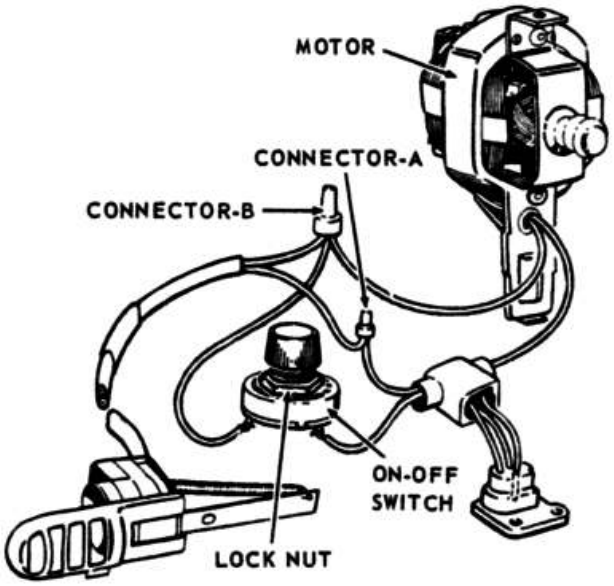


Fig. 56. Disconnecting Light Leads

Removal

Remove end cover plate, arm top cover, Fashion Disc and light bulb.

Place stitch width selector lever at 0.

Remove the light lead from behind the two retaining clips, see Fig. 55, and remove light bracket screw.

Lower the light assembly, draw the assembly toward the left until bracket clears the casting, and then lift entire assembly upward and out of machine.

Remove "ON-OFF" button from "POWER-LIGHT" switch, remove lock nut and push switch into arm of machine. Make certain that the lead retainer on the switch does not drop into the machine bed while you are pushing the switch into the machine arm.

Draw light leads out as far as possible through opening in end of machine and remove solder-less connectors **A** and **B**, Fig. 56, disengaging light leads from motor, switch and three-pin receptacle leads. Then withdraw light fixture with leads from top of machine.

Note: It is advisable to tag leads for reference when replacing light fixture.

Replacement

Insert light leads down through top of arm. Connect light leads to motor, swtich and three-pin receptacle leads. Secure leads with wire nut connectors. See Fig. 56.

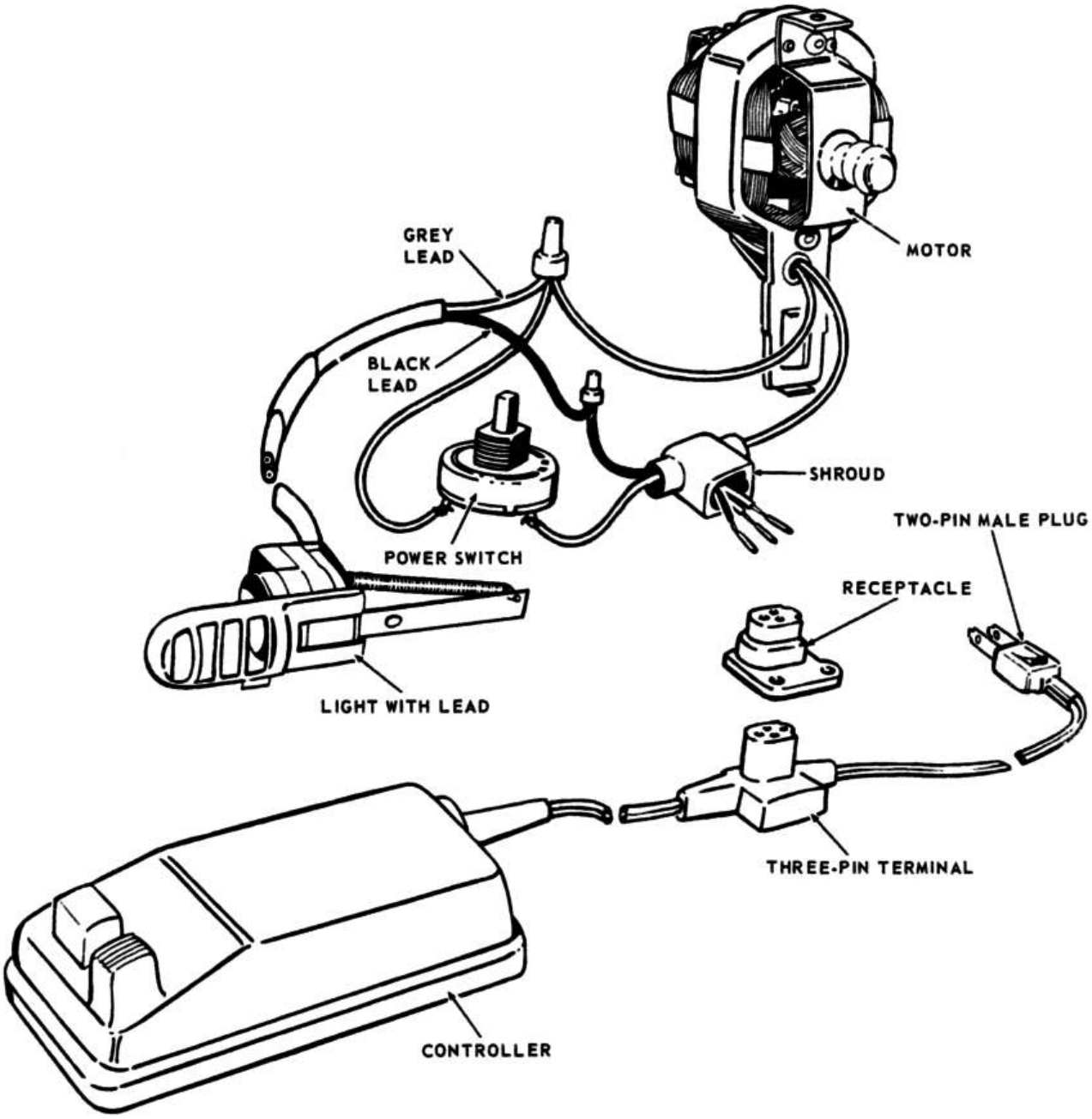
Note: For reference, see wiring diagram on page **29.**

Replace switch, with lead retaining plate, into hole provided for it in machine arm. Then, after making certain that light lead is in groove of retaining plate, replace and tighten the lock nut, and replace "ON-OFF" button.

Install light fixture into machine in reverse order of its removal and place light leads behind the two retaining clips.

Replace end cover plate, Fashion Disc, light bulb and arm top cover.

WIRING DIAGRAM



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