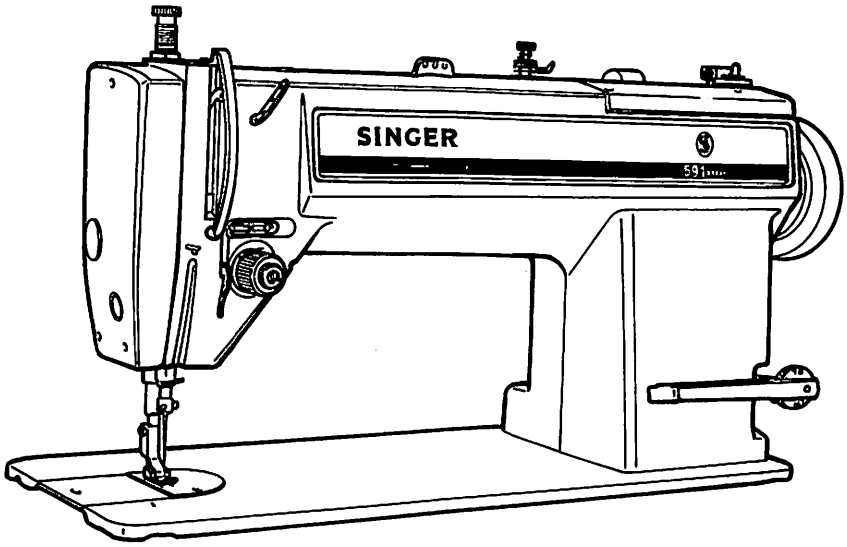
SINGER*

591 Service Manual

CONTENTS



DESCRIPTION

Class 591 Machines are high speed, rotary hook, fully automatic lubricated long arm flat bed lockstitch machines with drop feed in 'D' varieties, compound feed in 'C' varieties and hand operated reverse feeding mechanism. Recommended for general stitching operations on a range of light to heavyweight fabrics.

GENERAL FEATURES

- Federal stitch type 301.
- Balanced horizontal axis rotating hook.
- Pendant link feed with feed leveling hinge pin.
- Dial type stitch regulator on feed reverse lever.
- Improved thread take-up lever guard.
- Fully automatic lubricating system.
- Adjustable eccentric for matching the feed of the needle and feed dog. (Compound feed machines)
- Knee lifter mechanism is integral with the machine base and oil reservoir.
- Arm top cover with oil flow indicator and bobbin winder.
- The arm is provided with a seat for mounting a light fixture.

SPECIFICATIONS

Needle bar stroke:	30.5mm – 591D200A, 591C200A 36.5mm – 591D300A, 591D308A, 591C300A
Clearance under presser foot: (Maximum lift of presser foot when raised with knee lifter – 12.7mm)	7.2mm – 591D200A, 591C200A 7.9mm – 591D300A, 591D308A, 591C300A
Maximum stitch length:	6 S.P.I. – 591D200A, 591C200A 5 S.P.I. – 591D300A, 591C300A 3.2 S.P.I. (Reverse 4 S.P.I.) – 591D308A
Maximum speed:	5,500 S.P.M. – 591D200A 5,000 S.P.M. – 591D300A, 591C200A 4,500 S.P.M. – 591C300A 3,000 S.P.M. – 591D308A
Oil:	SINGER* Type "C" Oil
Bed size:	476mm x 178mm

TO SET NEEDLE BAR AT CORRECT HEIGHT

PREPARATION:

Remove face plate, slide plate and throat plate. See that needle is correctly set in needle bar.

On drop feed varieties, lower end of bushing A, Fig. 2, must be set as shown in Fig. 2. To reset bushing, loosen screw B.

On compound feed varieties, this dimension is automatically obtained when needle bar frame is assembled.

CHECK:

When needle bar is at its lowest point (during rotation of machine pulley), UPPER TIMING MARK on needle bar should be level with lower end of bushing.

Check timing of hook as instructed on page 5.

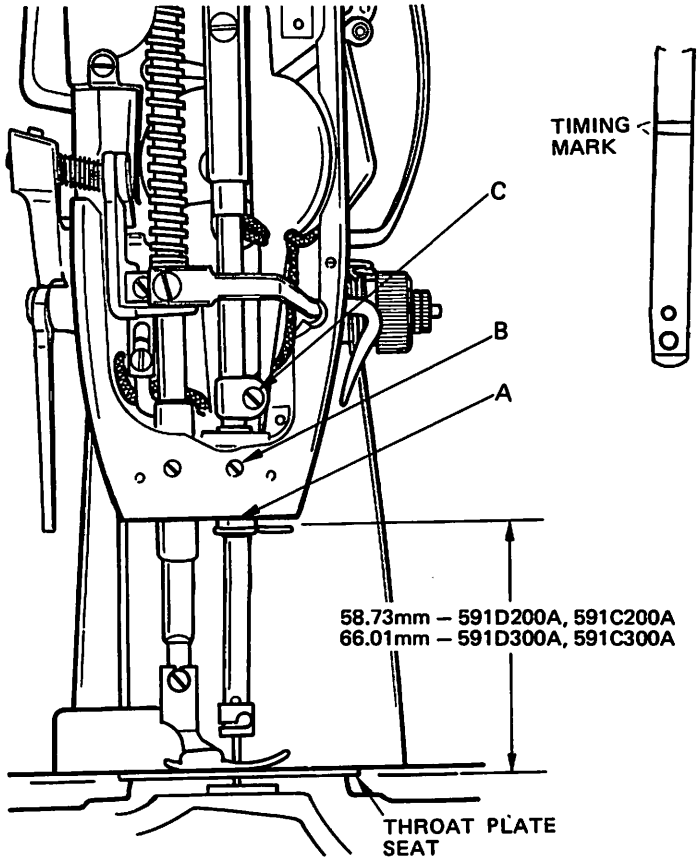


Fig. 2

SETTING:

Loosen clamping screw C, Fig. 2. Raise or lower needle bar so that UPPER TIMING MARK is level with lower end of bushing. Then securely tighten screw C.

Replace throat plate and slide plate.

When replacing the face plate, make certain that the screw holes in the face plate gasket are aligned with the respective screw holes in the face plate; avoiding injury to the gasket and consequent oil leakage.

TO SET CHECK SPRING HEIGHT

PREPARATION:

Thread the machine and place a lightweight material under presser foot.

CHECK:

Turn machine pulley over toward operator slowly. When take-up lever begins to rise, check spring D, Fig. 3 makes a slight dip and a return to its higher position. Later, as take-up lever approaches top of stroke, check spring D should be drawn all the way down; setting the stitch. As lever descends, check spring D returns to rest.

SETTING:

Loosen screw E, Fig. 3. Turn stud F, Fig. 3 (at the same time turning entire tension assembly) either over toward left to lower check spring and decrease its movement, or over toward right to raise check spring and increase its movement. Securely tighten set screw E.

NOTE: Under certain conditions of tacking, it may be necessary to set the check spring higher than it is otherwise normally set.

CAUTION: Check spring height setting must be checked each time a different foot is applied to machine.

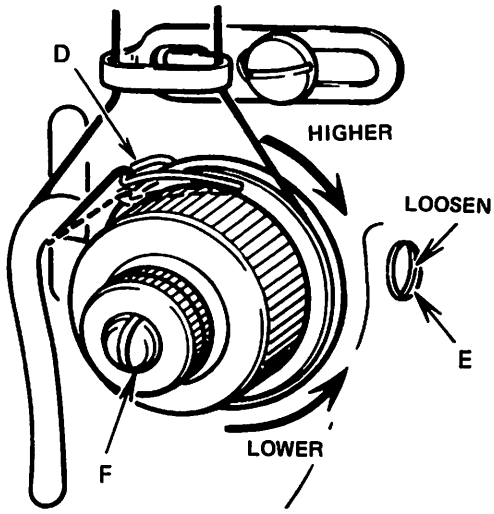


Fig. 3

TO SET CHECK SPRING TENSION

PREPARATION:

Thread the machine. Securely tighten set screw E, Fig. 4. Make certain thumb nut is on stud F, Fig. 4.

CHECK:

Tension on check spring D. Fig. 4, should be sufficient to ensure action at top speed; but still light enough to permit itself to be drawn all the way down (as take-up lever approaches height of stroke) before any thread is drawn through the tension discs.

SETTING:

Using a large screwdriver in slot of stud F, turn stud either over toward left to decrease tension or over to right to increase it, as shown.

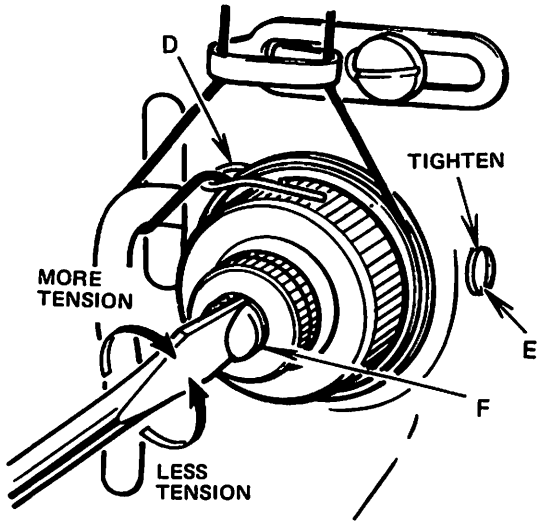


Fig. 4

NOTE: The tension on the check spring may require different settings depending upon the size of thread used. Heavier thread requires more tension to ensure correct thread control.

TO SET PRESSER BAR AT CORRECT HEIGHT

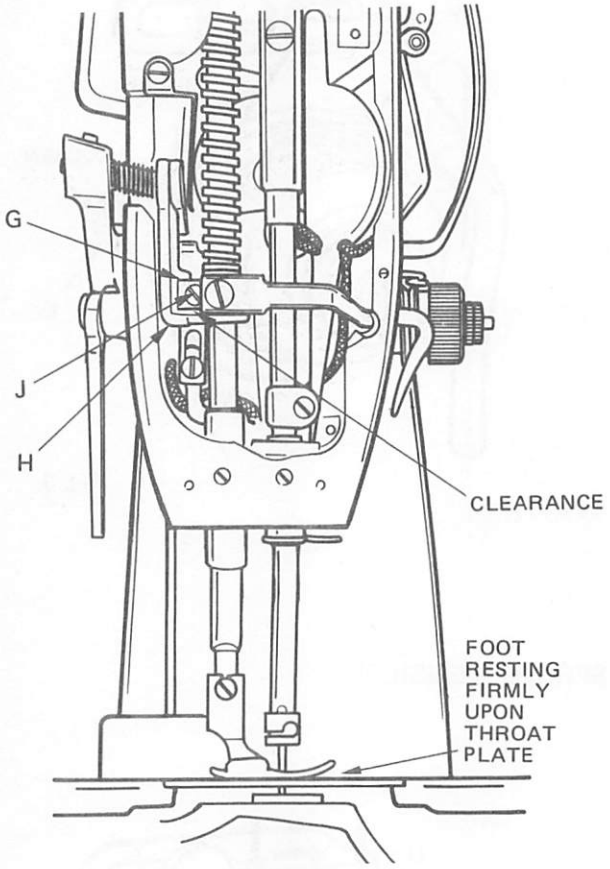


Fig. 5

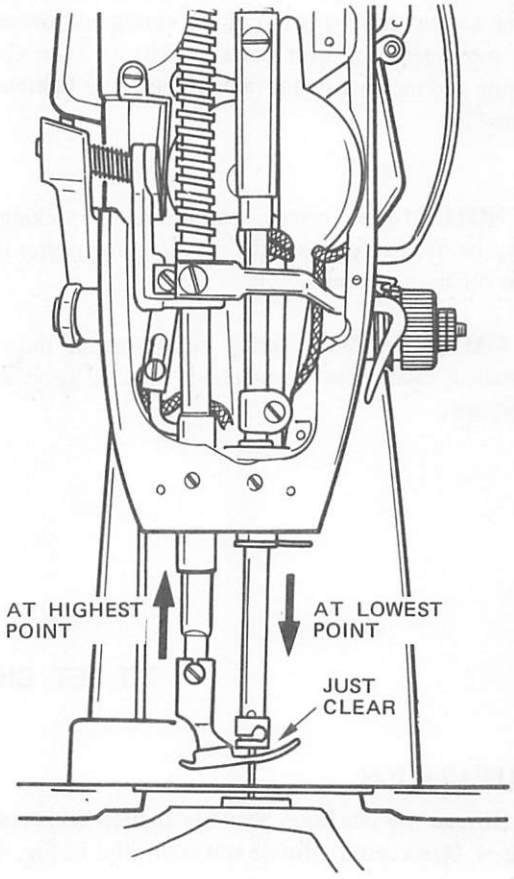


Fig. 6

PREPARATION:

Remove face plate and slide plate.

CHECK:

1. When presser foot rests firmly upon throat plate (with feed dog below throat plate) there should still be some clearance between guide bracket G, Fig. 5 and lifting lever link H, as shown in Fig, 5.

2. When presser foot is at its highest point and needle bar is at its lowest, top of presser foot should clear lower end of needle bar, as shown in Fig. 6.

SETTING:

Loosen clamping screw J, Fig. 5. Raise or lower guide bracket G, as required. Securely tighten screw J.

CAUTION: Whenever guide bracket has been moved on presser bar, inspect the check spring for correct setting, as instructed on pages 2 and 3.

TO TIME THE SEWING HOOK AND ALSO SET THE SEWING HOOK SIDEWISE IN RELATION TO THE NEEDLE

PREPARATION:

Remove presser foot, slide plate, throat plate and feed dog.

On compound feed varieties, set stitch length to zero (setting feed to zero is not required on drop feed machine).

CHECK:

When lower timing mark on needle bar is level with lower end of lower needle bar bushing A as shown in Fig. 7, the point of the sewing hook should be at the center of the needle, as shown in Fig. 7.

Also, when point of sewing hook passes needle, clearance between hook point K, Fig. 8 and needle should be approximately equal to thickness of a piece of ordinary notepaper (about .13mm), as shown in Fig. 9.

NOTE: Not only point of sewing hook but entire "FLAT" of hook point should clear scarf on needle blade. Normally, a .5mm clearance is provided between hub of hook and oil retaining collar.

SETTING:

Loosen two set screws L, Fig. 7 in hub of hook. Then retighten one of the set screws very lightly so that the sewing hook can still be turned on the shaft.

Hold shaft immovable and turn hook as required to bring point of hook to center of needle as shown in Fig. 7 and at the same time adjust clearance between needle and hook point as shown in Fig. 9.

Tighten set screws L lightly, turn machine pulley to make certain the sewing hook is correctly set in relation to the needle. Then securely tighten set screws L.

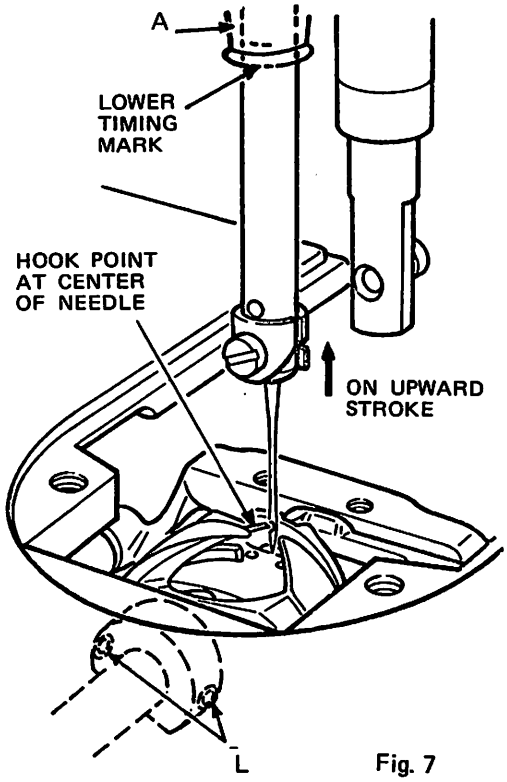


Fig. 7

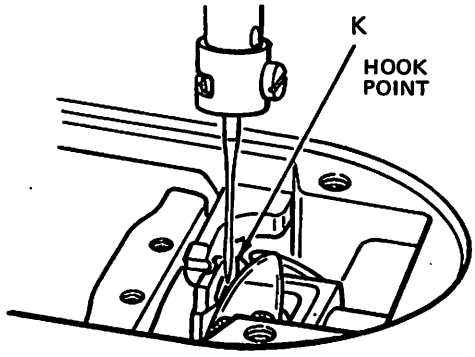


Fig. 8

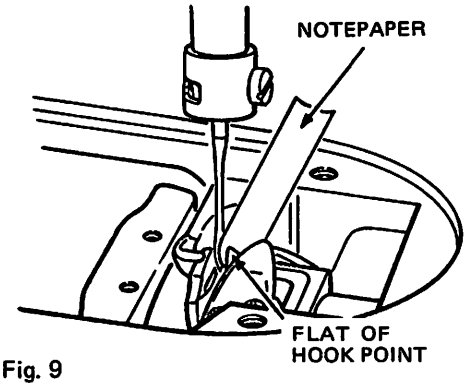


Fig. 9

FEED REVERSE LEVER

Before the machine leaves the factory, the spring tension of the feed reverse lever is set at an appropriate tension for easy and comfortable sewing operation.

If it is necessary to adjust the feed reverse lever spring tension, tip machine back and loosen feed reverse lever spring retainer screw Y3 holding the spring retainer Z3 on the machine leg. Move spring retainer Z3 up or down, as required, and firmly tighten screw Y3.

The lighter the tension, the easier it is to operate the feed reverse lever, however the tension should be set a little heavier for maximum stitch length and high speed sewing.

Normally, the 591D200A/C200A machines are adjusted to sew a maximum stitch length of 4.2mm (6 s.p.i.) and 591D300A/C300A machines to sew 5.1mm (5 s.p.i.). This however, can be changed to 5.1 mm if desired, by turning over the feed regulating dial stopper C4 on the underside of the feed reverse lever, as shown in Fig. 10.

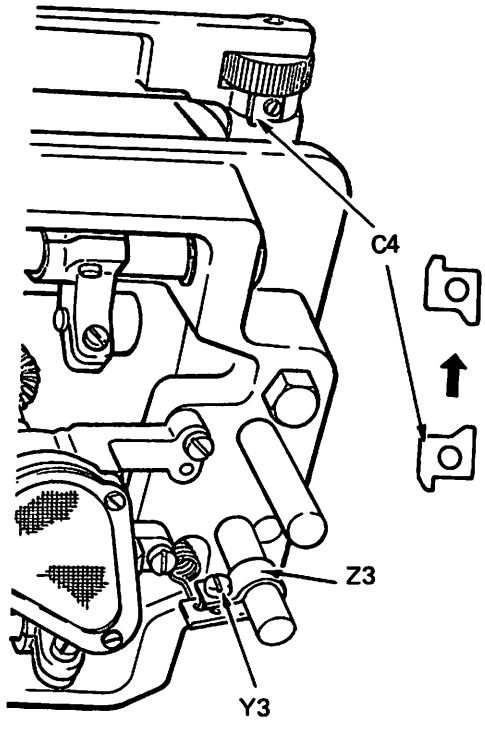


Fig. 10

NOTE: The 591C200A machine can not sew a maximum stitch length of 4.2mm when fitted with standard fittings.

CAUTION: Make sure the feed dog clears the front and rear edges of the throat plate slots when maximum stitch length is changed to 5.1mm.

TO TIME THE FEED

Before the machine leaves the factory, the feed and feed lifting eccentric is set for average sewing conditions; having the timing screw (screw M which appears immediately after set screw N, Fig. 11, when feed eccentric is rotated toward the operator) align on the timing mark provided for it on the arm shaft. (Timing line on shaft for drop feed is at top when needle bar is in DOWN position, whereas timing mark for compound feed is at top when needle bar is in Up position.)

The timing screw M, Fig. 11, on the feed and feed lifting eccentric should be securely tightened after it has been aligned on the timing mark on the arm shaft. The set screw N, should also be securely tightened.

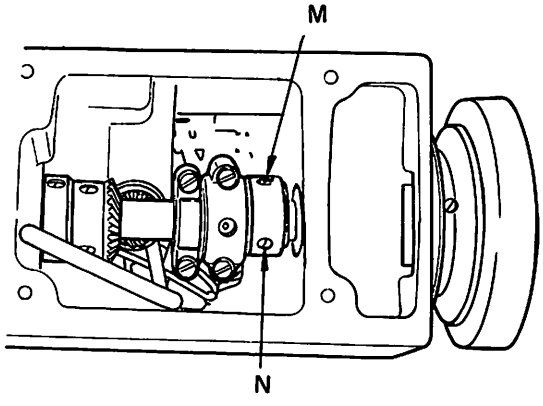


Fig. 11

If for any reason, it is necessary to alter the timing of feed and feed lifting eccentric, the eccentric should be adjusted and locked in desired setting with the timing screw M and the set screw N.

NOTE: Whenever the timing of the feed is changed, sewing hook should be checked for necessary adjustment also as instructed on page 5.

TO SET FEED DOG AT CORRECT HEIGHT

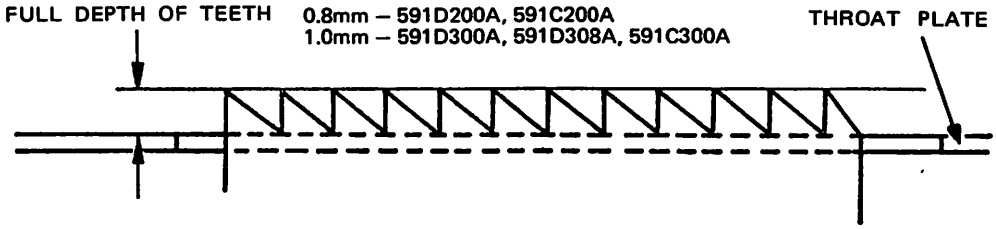


Fig. 12

When the feed dog is at its highest position, approximately the full depth of all the teeth should project above the top surface of the throat plate, as shown in Fig. 12.

Before checking the height of the feed dog, set the machine for the longest stitch.

To adjust, loosen the clamping screw P, Fig. 13 and raise or lower the feed dog (which is fastened to the feed bar Q, Fig. 13) as required. Then securely tighten screw P.

The feed dog should be level at the top of its feed path. If not, tip machine back and loosen feed bar hinge pin clamping screw A4 just enough to turn feed bar hinge pin (eccentric) B4, Fig. 13. Insert screwdriver into access hole in end of bed and turn hinge pin B4 as required to level the feed dog. Securely tighten clamping screw A4. Check feed dog height.

If it is found necessary to adjust the feed dog height due to the material being sewn and/or exchanging the feed dog and throat plate, it should be adjusted in the manner explained above.

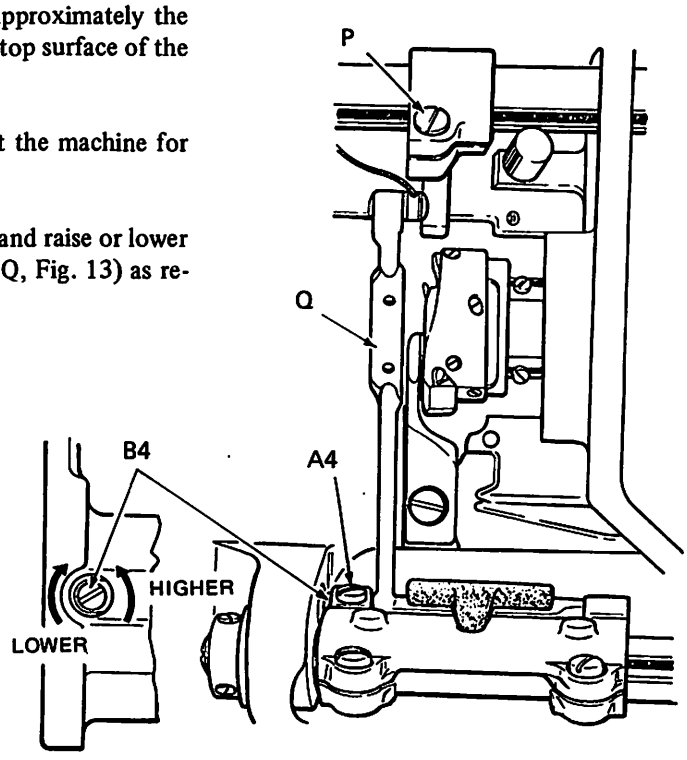


Fig. 13

NOTE: Feed dog should not contact edges of the throat plate slots during its movement but should be located centrally in relation to the front, rear and sides of throat plate slots.

INSTRUCTIONS
FOR
REMOVAL AND REPLACEMENT
OF
PRINCIPAL ASSEMBLIES

CAUTION TO MECHANICS

Machines of Class 591 are made with extreme precision in machining and assembly, and the "Superfinish" process provides microscopically smooth bearing surfaces. Therefore, special care should be taken not to permit any misalignment of parts or to cause any scratches or nicks on the bearing surfaces by careless assembly or handling of parts. Any such damage might render the machine incapable of the long, trouble-free service for which it is designed.

TO REMOVE THE SEWING HOOK

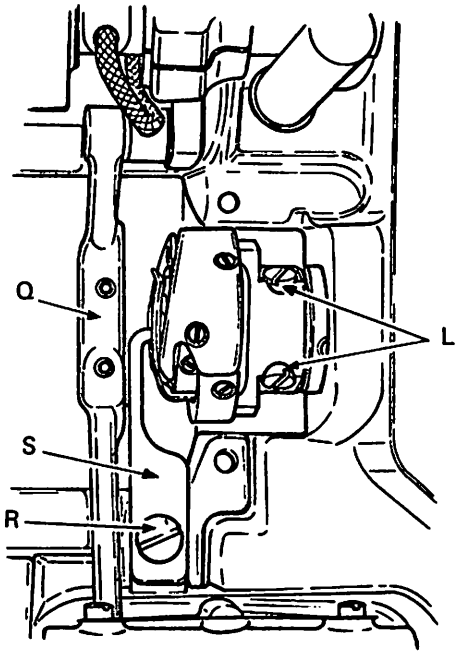


Fig. 14

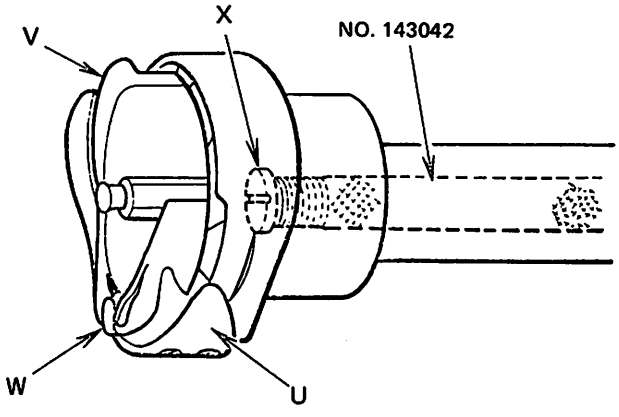


Fig. 15

Remove the needle, slide plate, throat plate and bobbin case. Remove the screw R, Fig. 14 and the bobbin case holder position bracket S, Fig. 14. Loosen the two set screws L, Fig. 14 in the hub of the hook and turn the machine pulley over toward the operator until the feed bar Q is raised to its highest point.

Turn the sewing hook until the thread guard U, is at the bottom, as shown in Fig. 15. Turn the bobbin case holder V, Fig. 15 until the notch W is also near the bottom, as shown in Figs. 15 and 16. The sewing hook can then be removed from the hook shaft.

TO REPLACE OIL FILTER 143042

While the sewing hook is off the shaft, it is advisable to replace the oil filter 143042, Fig. 15 in the end of the hook shaft. Unscrew the filter from the center of the shaft at X, Fig. 15 and replace with a complete new filter 143042.

TO REPLACE THE SEWING HOOK

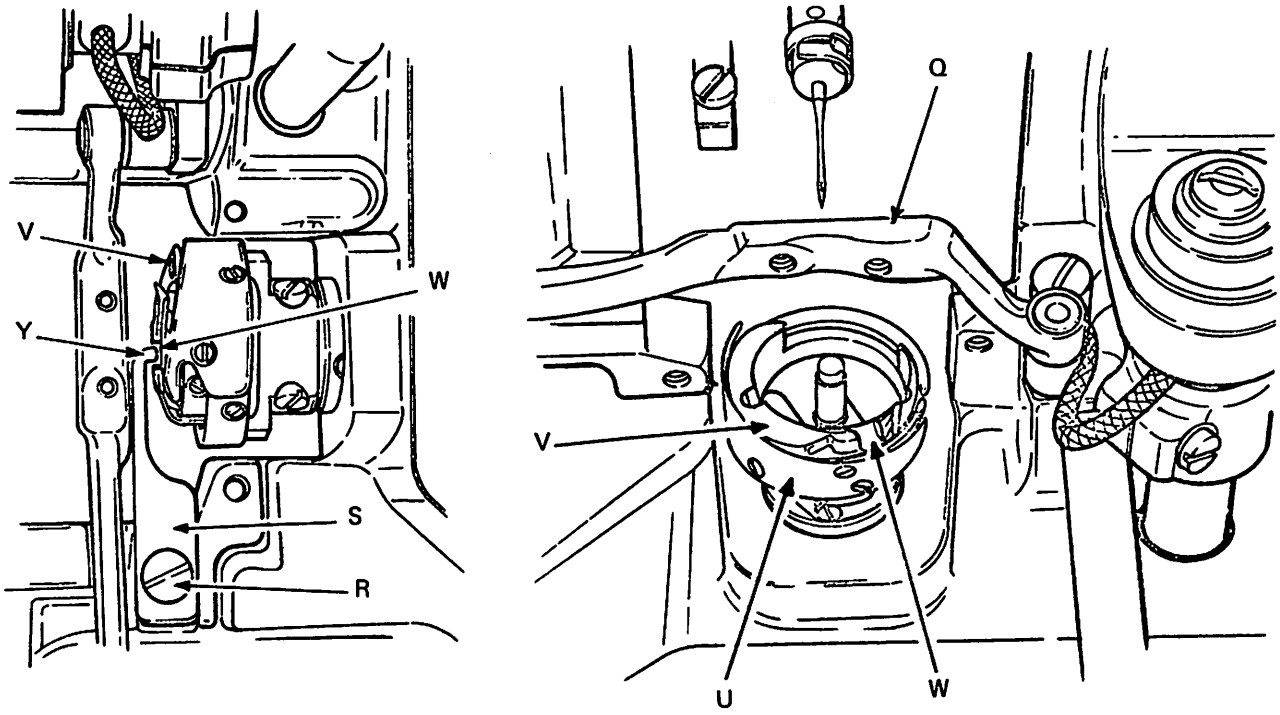


Fig. 16

When placing a new sewing hook on the shaft, have the sewing hook thread guard U at the bottom and the bobbin case holder V turned to the position shown in Fig. 16, so that the hook will clear the feed bar Q.

Place the hook in position on the shaft and turn the bobbin case holder V until the notch W is at the top, as shown in sketch at left above. Replace the bobbin case holder position bracket S, making certain that the finger Y (see above) enters the notch W at the top of the bobbin case holder. Then securely fasten the position finger by means of the screw R.

Replace the needle. Time the sewing hook, as instructed on page 5. Replace the bobbin case, throat plate and slide plate.

TO REMOVE AND REPLACE THE HOOK SHAFT

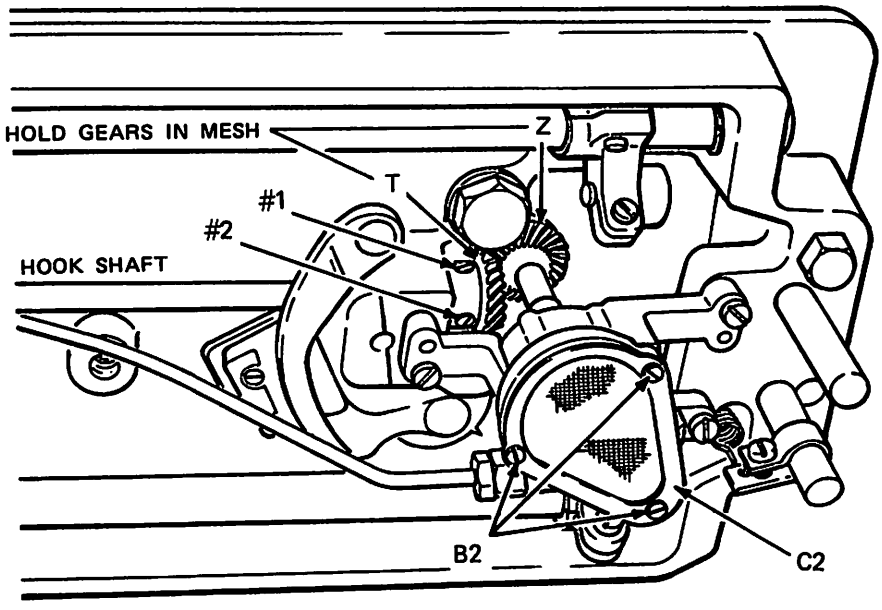


Fig. 17

Remove and replace the hook shaft in the following manner:

1. Remove the sewing hook, as instructed on page 8.

2. Mark the two lower bevel gears Z and T, Fig. 17, with chalk or crayon, on one tooth of one gear and the corresponding space for that tooth in the other gear. This is important, as these gears may become separated during removal of shaft. These marks will then make it possible to obtain the original mating position of the gears.

3. Loosen the two set screws #1 and #2 in hook shaft bevel gear. While holding the two gears Z and T in mesh, as instructed in Fig. 17, withdraw the old hook shaft and INSERT THE NEW SHAFT.

4. Make certain that set screw #1 seats over flat on the hook shaft. Remove all end shake from hook shaft, pushing gear T, Fig. 17 toward the hook on the shaft. Securely tighten first set screw #1, then securely tighten the second screw #2.

5. Replace the sewing hook, as instructed on page 9.

6. Time the sewing hook as instructed on page 5.

NOTE: Set screw #1 is the first of the two set screws to appear on the hub of the bevel gear T as the machine pulley is turned over toward operator.

THE OIL PUMP

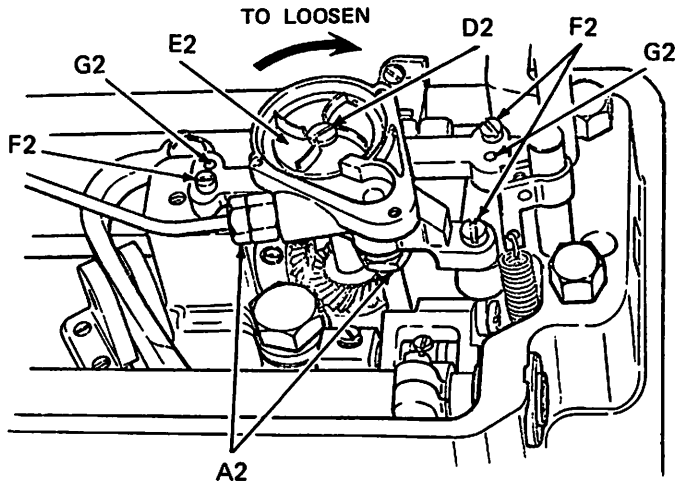


Fig. 18

TO REMOVE

1. Loosen the two oil pipe clamping sleeve nuts A2, Fig. 18.
2. Remove the three screws B2, Fig. 17.
3. Remove the screen frame, screen and oil pump cover C2, Fig. 17.
4. Remove the locking screw D2, Fig. 18.
5. Remove the impeller E2, by turning it over toward the RIGHT (clockwise) to loosen it, as instructed in Fig. 18.

CAUTION: The impeller E2 is designed to be screwed to the shaft by means of a LEFT-HAND THREAD and must be turned over toward the right to be loosened. Avoid damage to this impeller, as the efficient automatic lubrication of the machine is dependent upon it.

6. Remove the three screws F2.
7. Carefully pull the oil pump body off the lower end of the upright arm shaft.

TO REPLACE

1. Place oil pump body on underside of machine bed, so that position pins G2, slip into proper holes in machine casting, as shown above.
2. Replace and securely tighten the three screws F2. Make certain that machine turns freely as screws are tightened.
3. Carefully replace impeller E2, turning it over toward the LEFT to screw it on arm shaft (see CAUTION above).
4. Make certain that impeller E2 is not so tight that it will bind arm shaft. Make certain also that impeller clears both top and bottom of interior of oil pump body, then lock it in position by means of locking screw D2.
5. Replace pump cover, screen and frame C2 and three screws B2, Fig. 17. Securely tighten screws B2.
6. Replace two oil pipes in oil pump body, as shown above, and securely tighten sleeve nuts A2.

TO REMOVE AND REPLACE THE UPRIGHT ARM SHAFT (See Fig. 19)

REMOVAL:

If it is found necessary to remove the upright arm shaft H2, it should be removed in the following manner:

1. Remove oil pump as instructed on page 11.

2. Follow the instructions in Steps 2 and 3 for removal of hook shaft on page 10 except that, instead of removing hook shaft, merely remove hook shaft bevel gear T, Fig. 17.

3. Remove arm top cover.

4. Mark the two bevel gears J2, with chalk or crayon on one tooth of one gear and the corresponding space between the teeth of the other gear so that these gears may be reassembled in their original relative positions without difficulty, if necessary.

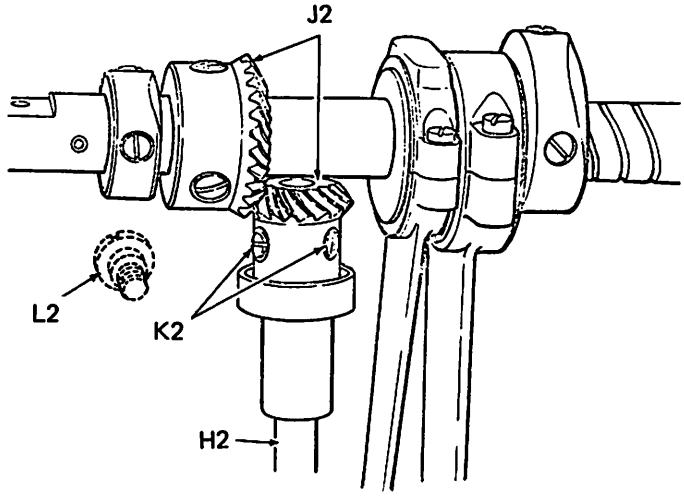


Fig. 19

5. Loosen set screws K2 in bevel gear at upper end of upright arm shaft. To loosen set screws K2, remove screw L2 in the rear of the arm and insert screwdriver through the hole.

6. Make certain bevel gear at lower end of upright arm shaft is fastened securely. Then while holding upper bevel gears J2 in mesh, draw upright arm shaft down and out of machine.

REPLACEMENT:

1. Before installing upright arm shaft, make certain it has the bevel gear Z, Fig. 17, correctly fastened at the lower end of shaft.

2. Insert upright arm shaft up through upper bevel gear, as shown in Fig. 19.

3. Turn shaft so that one of the two set screws K2 will bear upon the upper gear flat on the shaft and tighten the set screws K2.

4. Replace and set hook shaft bevel gear as instructed in Step 5 on page 10.

5. Replace oil pump, as instructed on page 11.

6. Replace top cover.

TO REMOVE AND REPLACE THE NEEDLE BAR (See Fig. 20)
(On Drop Feed Machines)

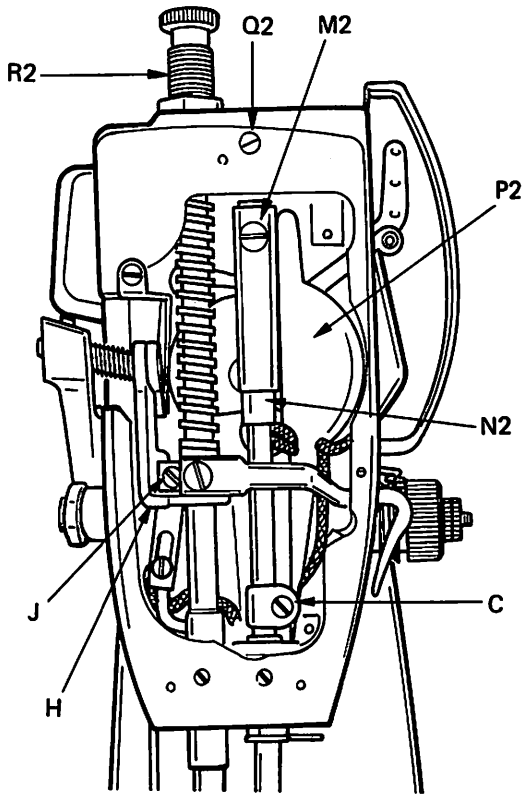


Fig. 20

Remove the needle bar in the following manner:

1. Remove needle, needle set screw and needle bar thread guard.
2. Remove face plate.
3. Loosen clamping screw C.
4. Loosen screw M2 sufficiently to allow needle bar to pass, then slip needle bar up through both needle bar bushings and out of machine.

NOTE: If it becomes necessary to remove upper needle bar bushing N2, first remove screw M2 and take-up lever oil guard P2. Then loosen set screw Q2 and drive bushing N2 down and out of head of machine. Use a 10mm driving pin.

Before replacing needle bar, replace upper needle bar bushing N2, by driving it down into hole provided for it in head of the machine. Make certain top of bushing N2 is level with top of arm. Tighten set screw Q2.

Replace the needle bar in the following manner:

1. Slip needle bar down through both bushings in head of the machine. Tighten screw C.
2. Replace needle bar thread guard, needle set screw and needle.
3. Set needle bar at correct height as instructed on page 2.
4. Replace oil guard P2 and fasten it securely to bushing with set screw M2.
5. Replace face plate.

TO REMOVE AND REPLACE THE PRESSER BAR

To remove the presser bar:

1. Remove presser foot, face plate and presser bar pressure regulating thumb screw R2, with presser bar guide from head of the machine.
2. Loosen clamping screw J about one turn (just enough to make it loose).
3. Slide presser bar up through lifting lever link H, Fig. 20, and bushing and out of machine.

To replace the presser bar:

1. Slip presser bar down through lifting lever link H, Fig. 20 and lower presser bar bushing.

2. Replace presser foot and presser bar pressure regulating thumb screw R2 with presser bar guide.

3. Set presser bar at correct height, as instructed on page 4, and tighten screw J.

NEEDLE THREAD TAKE-UP

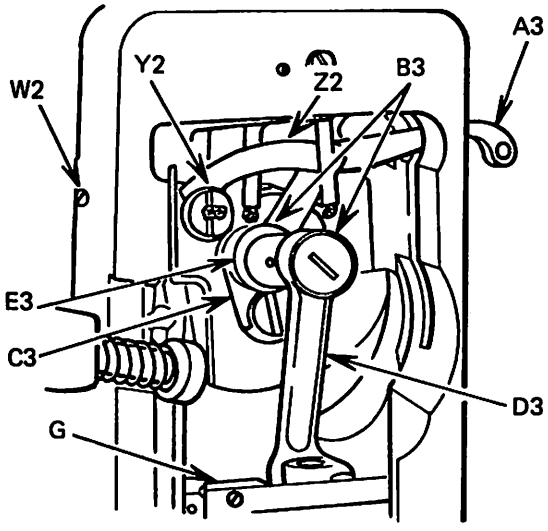


Fig. 21

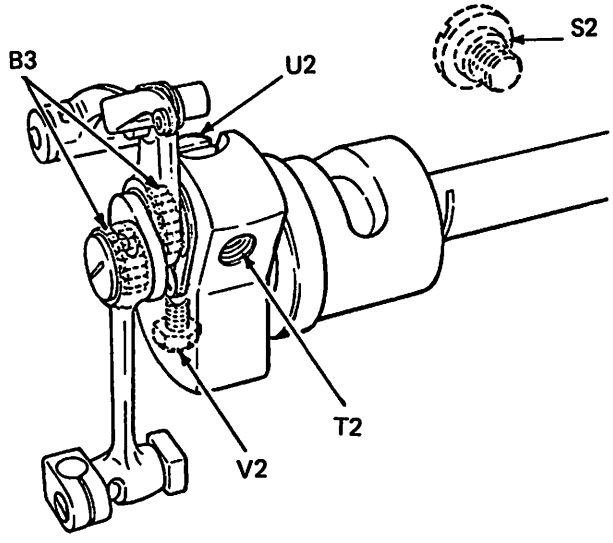


Fig. 22

To remove the needle thread take-up:

1. Remove face plate and arm hole plug S2, Fig. 22, from machine.

2. Remove needle bar, upper needle bar bushing (drop feed), needle bar frame (compound feed) Fig. 37, page 24 and presser bar pressure regulating thumb screw R2, Fig. 20, page 13.

3. Turn machine pulley as required to reach screw T2, Fig. 22, in needle bar crank through hole left by removal of plug S2. Loosen set screw T2.

4. Using wrench 545945 (through same hole) and turning machine pulley as required, loosen the large hexagon head clamping screw U2, Fig. 22 on needle bar crank.

CAUTION: DO NOT DISTURB the smaller hexagon head position screw V2, Fig. 22, which holds the needle bar crank at its correct position on the horizontal arm shaft.

5. Loosen small set screw W2, Fig. 21, in the rear of the arm of the machine.

6. Remove holder screw H3. Pulling gently, draw entire oil wick holder assembly out of the head of the machine as instructed on page 17.

7. Pull out the end of the oil wick, leading out from stud Y2, from the oil tube K3 shown in Fig. 25.

8. While holding back the needle thread take-up link inside the head at Z2, Fig. 21, pull upon the head of stud Y2, taking care not to pull loose its wick, until the stud is removed.

9. Back the end of the take-up A3, Fig. 21 toward the inside of the machine, turning the machine pulley as required until the take-up is free of the slot provided for it.

10. The needle thread take-up link assembly (including parts B3, Z2, A3, C3, D3 and E3) can now be pulled free of the needle bar crank.

To replace the needle thread take-up:

1. Make sure that the wearing plate C3 is in place and undamaged on the face of the needle bar crank, as shown in Fig. 21.

2. Place the needle thread take-up link Z2 and take-up A3 in the head of the machine so that the stud E3, Fig. 21 in the center of the linkage slips into the hole provided for it in the needle bar crank, as shown in Fig. 21.

3. Slip the upper end of the take-up A3 through the slot provided for it in the head of the machine.

4. Insert stud Y2 and its oil wick through needle thread take-up lever link Z2 and into its hole in the machine casting so that the flat on the stud faces the rear of machine. DO NOT INSERT THE STUD TO ITS FULL DEPTH AT THIS TIME. There should be about .25 to .38mm side play of the take-up lever link Z2 on the stud, until final adjustment is made in Step 17.

5. Remove arm plug screw J3, and with the tip of a screwdriver, push the end of oil wick leading from stud Y2 into oil tube K3 so that wick is slack over edge of tube at point L3 to insure free passage of oil (Fig. 25).

6. Replace oil wick holder as instructed in items 3 and 4 under "TO INSTALL NEW OIL WICK HOLDER", pages 17 and 18. Replace arm plug screw J3.

7. Turn the set screw W2 inward lightly against the flat on the stud Y2. DO NOT TIGHTEN screw W2 until final adjustment is made in Step 17.

8. Turn machine pulley as required to make set screw T2 in needle bar crank accessible through hole at S2, Fig. 22 in rear of machine head.

9. Insert a screwdriver through this hole and, while turning stud E3 by hand to find its flat, turn set screw T2 until it bears tightly upon the flat.

10. Turn screw T2 back, just enough to "break it loose".

11. Test for side play by pushing take-up lever A3 gently right and left; there should be .025 to .05mm side shake between lever and wearing plate.

12. Move thread take-up crank inward or outward in needle bar crank, as required, to obtain clearance.

13. Using wrench 545945, through same hole and turning machine pulley as required, tighten hexagon head screw U2 lightly.

14. Loosen set screw T2.

15. Securely tighten clamping screw U2.

16. Securely tighten set screw T2.

17. Push hinge stud Y2 fully into machine casting and securely tighten set screw W2.

18. Turn machine pulley slowly, by hand, at least one complete revolution; testing take-up for binding, end shake and noise. If binding occurs, recheck clearance between take-up and wearing plate C3 and between hinge stud Y2 and machine casting.

19. Replace presser bar pressure regulating thumb screw R2, Fig. 20, page 13.

20. Replace and adjust upper needle bar bushing (drop feed), needle bar frame (compound feed) and needle bar with their accessories, as instructed on pages 2 and 13.

21. Replace and securely tighten arm hole plug S2.

22. Replace the face plate as instructed on page 2.

TO REMOVE AND REPLACE ARM SIDE SHIELD WICK, NEEDLE BAR WICK AND NEEDLE BAR CONNECTING STUD WICK (See Fig. 23)
(On Drop Feed Machines)

Arm side shield wick may be removed, after removing the face plate and the screw F3. Lift arm side shield G3 up and out of machine.

When replacing arm side shield wick, make sure that lower end of wick drops into oil pool beneath needle bar crank and that the two upper wick loops are located as close as possible to the needle bearing at B3, Fig. 24, without touching them. Then securely tighten screw F3.

To remove needle bar wick and connecting stud wick, move take-up lever A3, so that it does not interfere with removal of oil guard P2. Then remove face plate and screw M2; lift take-up oil guard P2, with the top wicks, up and out of machine.

When replacing the oil guard P2, which carries the needle bar wick and connecting stud wick, make sure that lower end of the stud wick drops into oil pool behind lower needle bar bushing and that the loop of needle bar wick is placed behind the needle bar, as shown in Fig. 23.

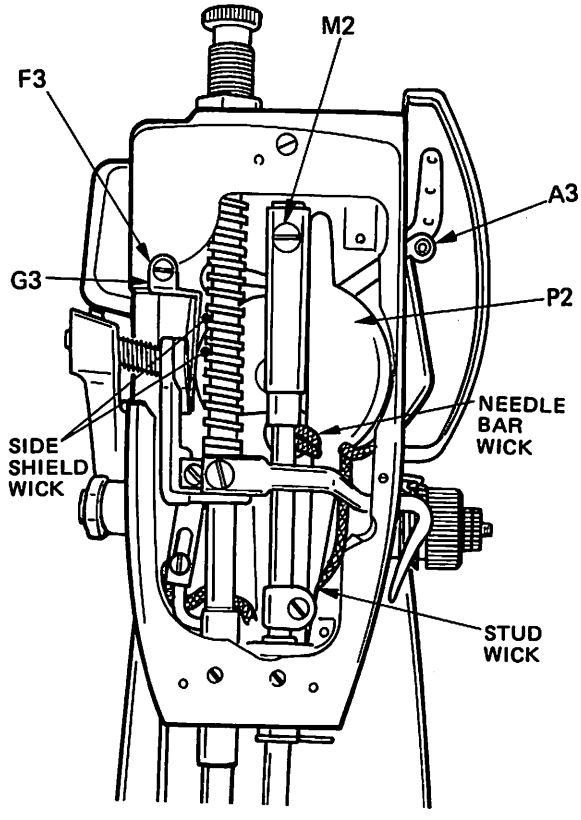


Fig. 23

TO REMOVE OIL WICK HOLDER (See Fig. 24)

Oil wick holder includes two oil wick leaders (see Fig. 25) and an oil wick for the needle bar link and for the two sets of needle bearings in the thread take-up as shown in Fig. 24. It is removed in the following manner:

1. Remove face plate, needle bar and upper needle bar bushing or needle bar frame, from the machine, as instructed on pages 13 or 24.

2. Remove upper section of presser bar, as instructed on page 14.

3. Remove holder screw H3.

4. Pulling gently, draw entire oil wick holder assembly out of the head of the machine.

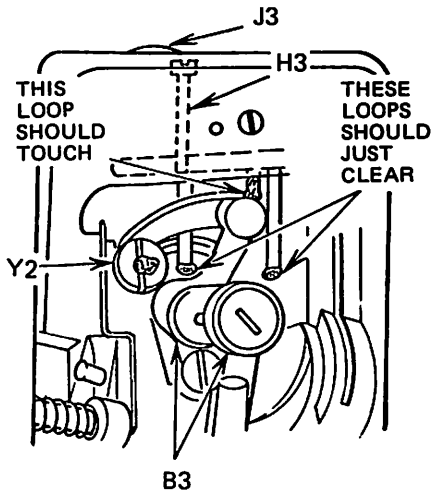
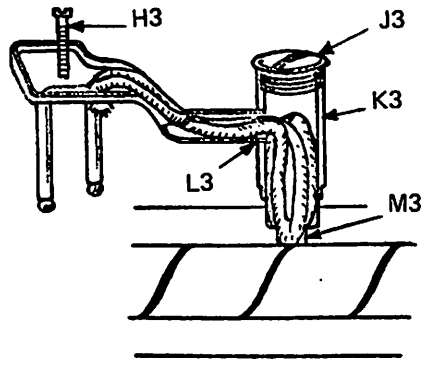


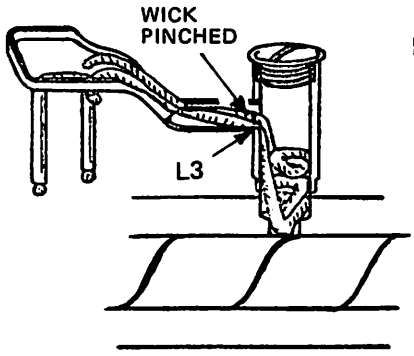
Fig. 24

TO INSTALL NEW OIL WICK HOLDER



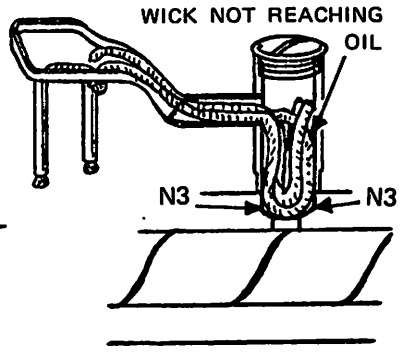
CORRECT INSTALLATION

Fig. 25



INCORRECT INSTALLATION

Fig. 26



INCORRECT INSTALLATION

Fig. 27

1. Remove old oil wick holder as instructed above.

2. Remove top arm plug screw J3, Fig. 25.

3. Insert two oil wick leaders into oil tube K3, as shown in Fig. 25 so that wick is slack over edge of oil tube K3 at point L3, Fig. 25. This will insure free passage of oil. Use tweezers through the screw hole at J3 to loop the wick and bring it into positive contact with the arm shaft approximately at point M3 shown in Fig. 25.

NOTE: DO NOT FORCE the wick leaders down too tightly against the edge L3 of oil tube, as shown in Fig. 26, as this will decrease the flow of oil from the arm shaft to the needle bar link and take-up bearings.

CAUTION: If the bottom of either oil wick leader is caught on the ledge as shown at N3, Fig. 27, no oil can be taken up by the wick to be carried to the needle bar link and thread take-up bearing, where it is needed. Make sure that the oil wick leaders are pushed all the way down into the smaller hole, without jamming, until they touch the arm shaft, as shown in Fig. 25.

4. When oil wick leaders are correctly installed, replace holder screw H3, Fig. 25.

5. Adjust the three oil wick loops in holder (see Figs. 24 and 25), so that two of the loops come as close as possible to, without touching, the two sets of needle bearings B3 while the third wick loop makes positive contact with the thread take-up, as shown in Fig. 24.

6. Securely tighten holder screw H3.

7. Replace arm plug screw J3.

8. Replace upper section of presser bar, upper needle bar bushing or needle bar frame and needle bar, as instructed on pages 13, 14 and 24.

9. Replace face plate, as instructed on page 2.

THE ARM SHAFT

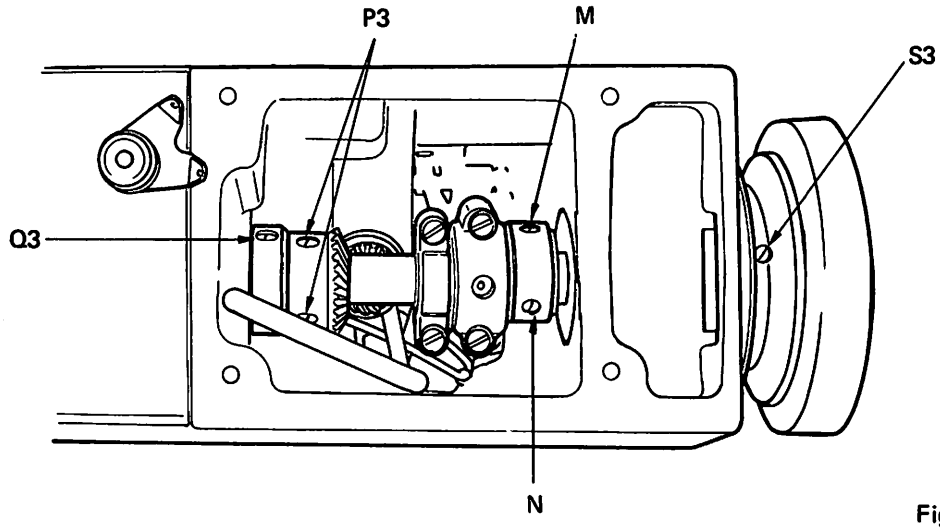


Fig. 28

REMOVAL (See Figs. 28 to 30)

1. Remove the face plate.

2. Remove the arm side shield and wick and the thread take-up oil guard, as instructed on pages 16 and 17.

3. Remove the needle bar, upper needle bar bushing or needle bar frame, presser foot and presser bar, as instructed on pages 13, 14 and 24.

4. Remove entire thread take-up lever assembly, as instructed on pages 14 and 15.

5. Loosen the four screws in the arm top cover and remove the arm top cover.

6. Remove the feed timing screw M, Fig. 28 and loosen the set screw N, Fig. 28, in the feed and feed lifting eccentric.

7. Loosen the two set screws P3 in the bevel gear and the two set screws Q3 in the thrust collar.

8. Loosen the two set screws S3, Fig. 28 and remove the machine pulley.

9. Turn the needle bar crank until it is in the position shown at T3, Fig. 30, to prevent crank from disturbing the three wick loops in holder U3, Fig. 30 during removal of arm shaft.

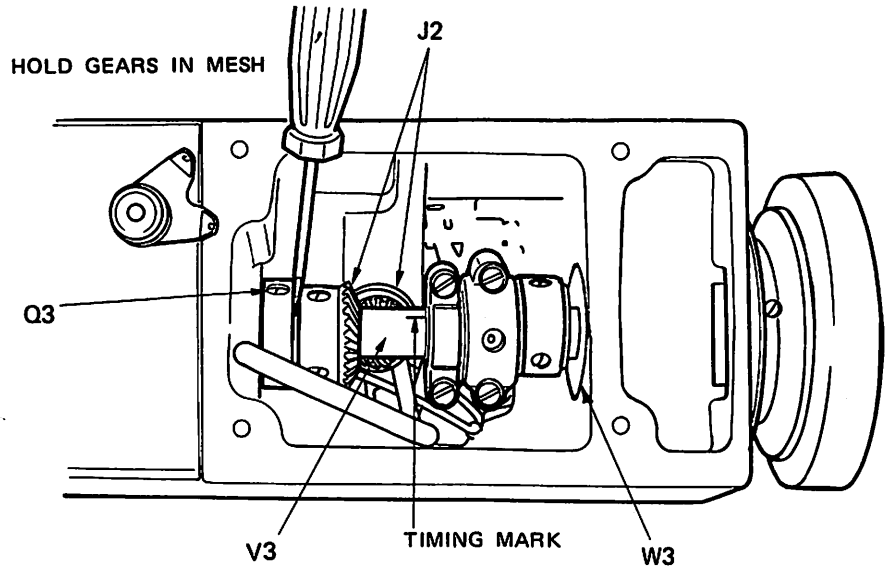


Fig. 29

CAUTION: The feed timing bevel gears at J2, Fig. 29 have been lapped together at the factory and should be kept in mesh (as instructed in Fig. 29) throughout the removal and replacement of the arm shaft.

10. While maintaining needle bar crank T3 at position shown in Fig. 30, hold these gears in mesh by holding the blade of a large screwdriver between thrust collar and bevel gear as shown in Fig. 29; then push the end of the arm shaft V3, Fig. 29 through the bushing W3, Fig. 29.

11. Using another shaft (or a drift pin of the same diameter as the arm shaft on these machines), push the arm shaft V3 further through the machine (still keeping the gears at J2 in mesh). This temporary shaft must be pushed sufficiently far into the machine to hold the entire gear and feed eccentric mechanism in position upon it until the new arm shaft is installed. When inserting the temporary shaft (or a drift pin), make certain that every care is taken to avoid injury to the oil seal and ring in the arm shaft bushing (back) and consequent oil leakage.

12. Finally grasp the needle-bar-crank-end of the arm shaft firmly at the face plate end and pull the arm shaft straight out of the machine.

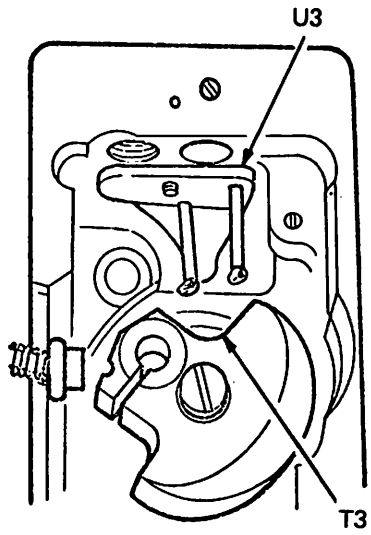


Fig. 30

REPLACEMENT (See Fig. 31)

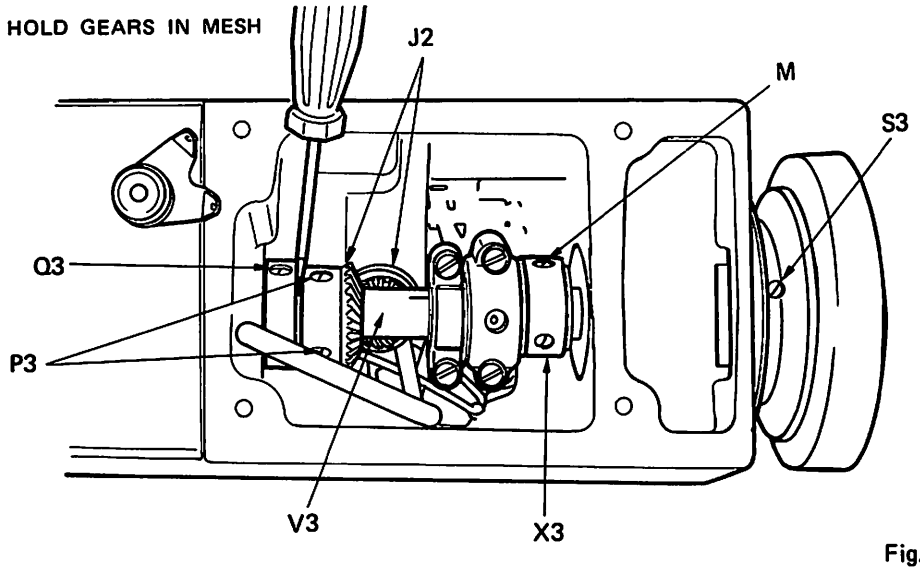


Fig. 31

1. Insert the machine-pulley-end of the arm shaft into the arm shaft bushing at the head of the machine arm.

2. Make certain that the needle bar crank is turned to the position shown in Fig. 30, clearing the three wick loops in holder U3.

3. While still holding the bevel gears at J2 in mesh, with a screwdriver, as shown in Fig. 31, push the arm shaft V3 straight through the machine arm, thrust collar, bevel gear, and feed and feed lifting eccentric X3. When installing the new arm shaft, make certain that every care is taken to avoid injury to the ring and the oil seal in the arm shaft bushing (back).

4. Replace machine pulley on the arm shaft, pushing it on until it contacts the oil seal and with the two set screws S3 located over the two grooves on the shaft. Then pull out machine pulley approximately 1mm and securely tighten set screws S3. (When machine pulley is correctly set in position, the end of the arm shaft should be located approximately 1mm inside the outer surface of the hub of the machine pulley.) Test the arm shaft for freedom in rotation.

5. Move feed and feed lifting eccentrix X3 toward machine pulley and securely tighten feed timing screw M.

6. Place the first finger of one hand on one side of the arm shaft and the first finger of the other hand on the other side of the arm shaft so that both fingers contact the bevel gear (on vertical shaft) that mates with the gear J2, Fig. 31. Feel for slight backlash. If there is no backlash, loosen two set screws P3. Lightly tap bevel gear away from mating gear until there is just a slight amount of backlash. Then securely tighten set screws P3 in bevel gear. Re-check the backlash.

7. Turn machine pulley over toward operator until the two set screws Q3 in the thrust collar which also serve as a balance weight are at the top. Align and securely tighten the upper set screw Q3 (set screw which appears immediately after the first set screw when machine pulley is rotated over toward operator) on the timing mark provided for it on the arm shaft.

   (Timing line on shaft for drop feed is at top when needle bar is in the DOWN position. Whereas timing mark for compound feed is at top when needle bar is in the UP position.)

   Then securely tighten the other set screw Q3.

8. Check the adjustment and timing of parts disturbed and correct where necessary, according to the instructions on pages 2 through 7.

9. Replace thread take-up, as instructed on pages 15 and 16.

10. Replace presser bar and presser foot, as instructed on page 14.

11. Replace the upper needle bar bushing, or needle bar frame and the needle bar, as insturcted on pages 13 and 24.

12. Replace thread take-up oil guard P2, Fig. 23, page 16.

13. Replace arm side shield wick, as instructed on page 16.

14. Replace arm top cover and tighten its four screws.

15. Replace face plate and tighten its three screws (on drop feed) and two screws (on compound feed), as instructed on page 2.

THE BOBBIN WINDER

REMOVAL:

1. Remove arm top cover.

2. Remove bobbin winder spring D4, Fig. 32.

3. Remove bobbin winder bracket screw stud E4 and bobbin winder assembly F4 from arm top cover.

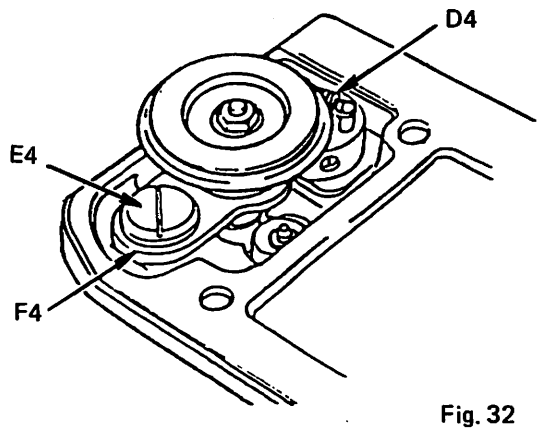


Fig. 32

REPLACEMENT:

1. Replace bobbin winder assembly F4 and tighten screw stud E4. Check bobbin winder assembly for freedom in movement.

2. Replace bobbin winder spring D4.

3. Check that the bobbin winder bracket G4 comes into contact with the actuating cam H4, Fig. 33, and spindle J4 lightly contact the eccentric bobbin winder stopper K4 and quickly stop its rotation when bobbin winder is released from engagement at completion of thread winding. If the sprindle is not in contact, or if it is pressing too strongly against the stopper, turn stopper as required, until spindle is in proper contact with the stopper.

4. Replace arm top cover.

5. Engage bobbin winder for thread winding, turn machine pulley and check that bobbin winder pulley L4 is properly in contact with machine pulley to rotate the bobbin winder spindle J4. If adjustment is necessary, move machine pulley inward or outward as required, so that bobbin winder pulley will just sufficiently press against the machine pulley to rotate the bobbin winder spindle.

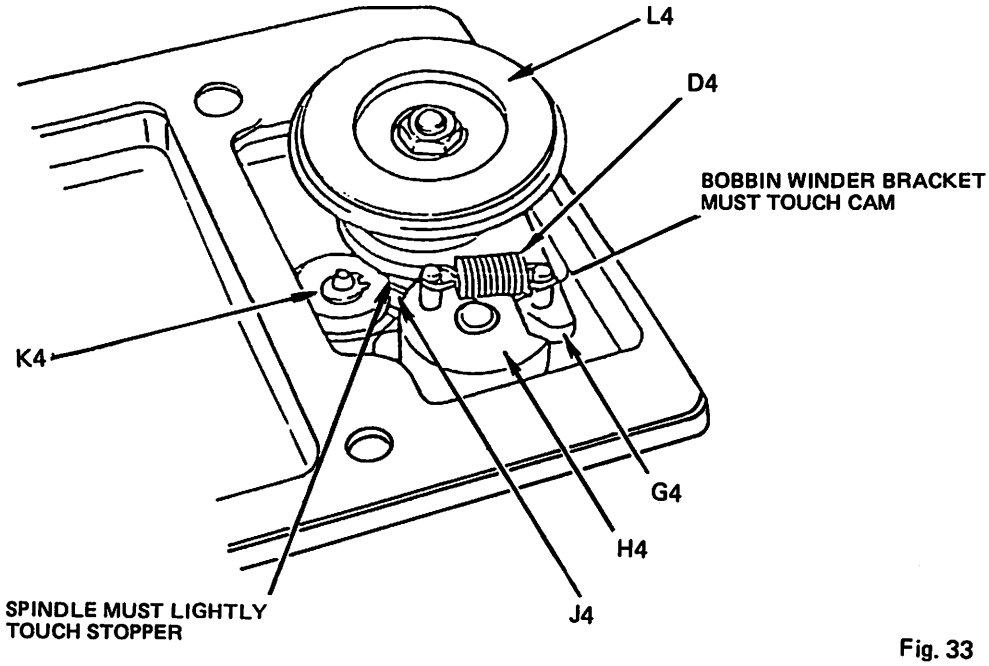


Fig. 33

SERVICE INSTRUCTIONS FOR COMPOUND FEED SYSTEM 591C CLASS MACHINES

Servicing instructions for 591D Class Machines also apply to the 591C Class with the exception of the following special instructions.

NEEDLE BAR FRAME DRIVING LINKAGE ADJUSTMENT

1. Set machine feed to zero.

2. Adjust cranks A and B to position shown in Fig. 34. i.e. Pin of crank B is approximately 7.45mm from bottom surface of the bed.

3. Adjust eccentric stud C shown in Fig. 35 to a mean position, i.e. when slot is in a vertical direction.

4. Clamp eccentric stud C in this position.

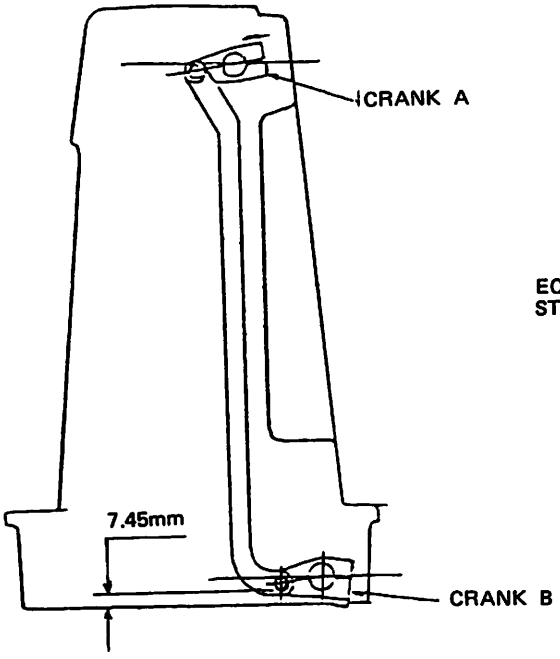


Fig. 34

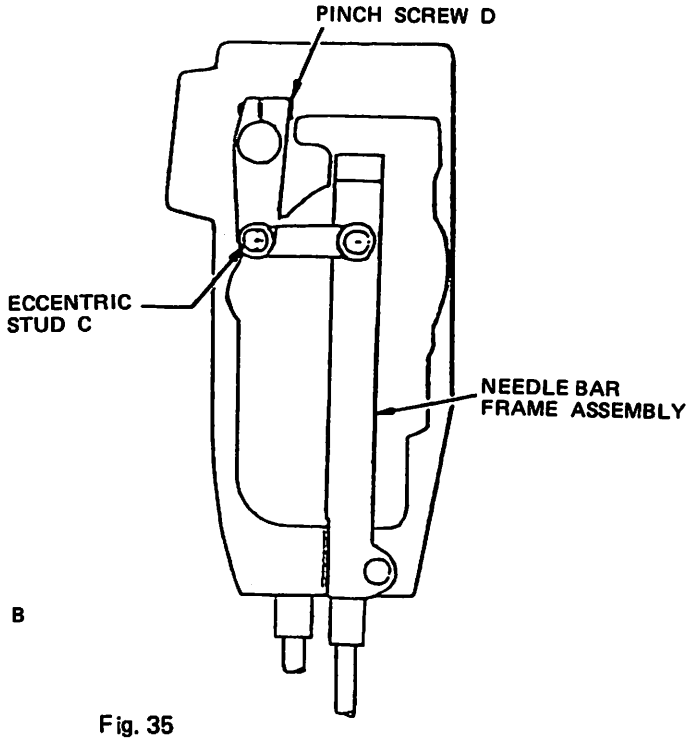


Fig. 35

5. Remove compound feed fittings (throat plate and feed dog) and replace with a conventional throat plate (with needle hole) Fig. 36.

6. Position needle bar frame assembly to center needle into hole of throat plate and tighten pinch screw D.

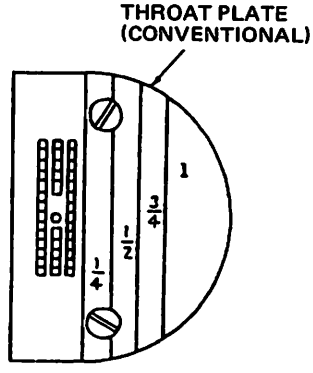


Fig. 36

7. Replace conventional throat plate with compound feed fittings (throat plate and feed dog) Fig. 37.

8. Set feed dog as instructed on page 7 and ensure that the lengthwise setting is such that needle dips into center of hole in feed dog at zero stitch setting.

9. Set feed to maximum setting for fittings being used.

10. Manually rotate machine pulley slowly. Check that feed dog and needle are feeding in unison. If required, alter position of eccentric stud C, Fig. 35, to either speed up or slow down movement of needle.

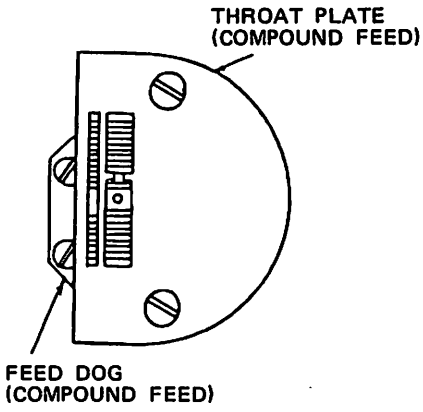


Fig. 37

TO REMOVE AND REPLACE ARM SIDE SHIELD WICK, NEEDLE BAR WICK AND NEEDLE BAR CONNECTING STUD WICK (See Fig. 38)

Arm side shield wick may be removed, after removing the face plate and screw F3. Lift arm side shield G3 up and out of machine.

When replacing arm side shield wick, make sure that lower end of wick drops into oil pool beneath needle bar crank and that the two upper loops are located as close as possible to needle bearings B3, Fig. 24, without touching them. Then securely tighten screw F3.

To remove needle bar wick and connecting stud wick, move take-up lever so that it does not interfere with removal of oil guard P2. Then remove screw M2, and remove lower end from under tab of felt retainer R2. Now lift oil guard P2, with the top wicks, up and out of machine.

When replacing the oil guard P2, which carries the needle bar wick and connecting stud wick, make sure that lower end of the stud wick drops into oil pool behind lower needle bar bushing and that the loop of needle bar wick is placed behind the needle bar. Before tightening securing screw M2, ensure that lower end of guard is trapped under the tab of felt retainer.

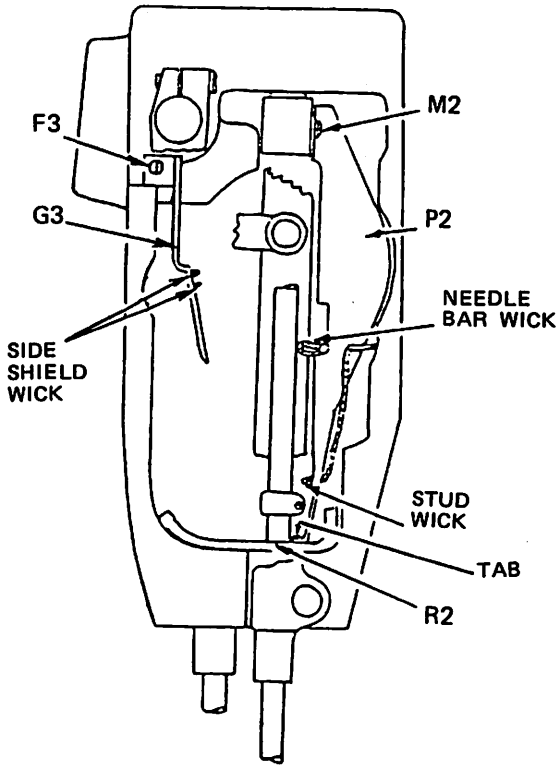


Fig. 38

TO REMOVE AND REPLACE NEEDLE BAR FRAME ASSEMBLY AND NEEDLE BAR (See Fig. 39)

Remove the two retaining rings A which secure the needle bar frame connecting link B. The link can now be removed from the eccentric stud C and the needle bar frame stud. From the front of the machine, remove the pivot securing ring H. Move needle bar to top of stroke. The frame assembly G should now be moved toward operator position in order to move the frame from the stabilizer E. In this position the total assembly G can be withdrawn from the front of the machine and needle bar can be removed from frame assembly G.

When replacing the frame, the wick and wick retainer F should be removed from the connecting link B to prevent damaging the wick and also to make assembly of connecting link B easier. When connecting link B is assembled and the two retaining rings are secured, place the wick on top of the connecting link ensuring that it touches both studs; the wick retainer F should now be positioned. Make sure that the lower tab engages the lower side of connecting link B.

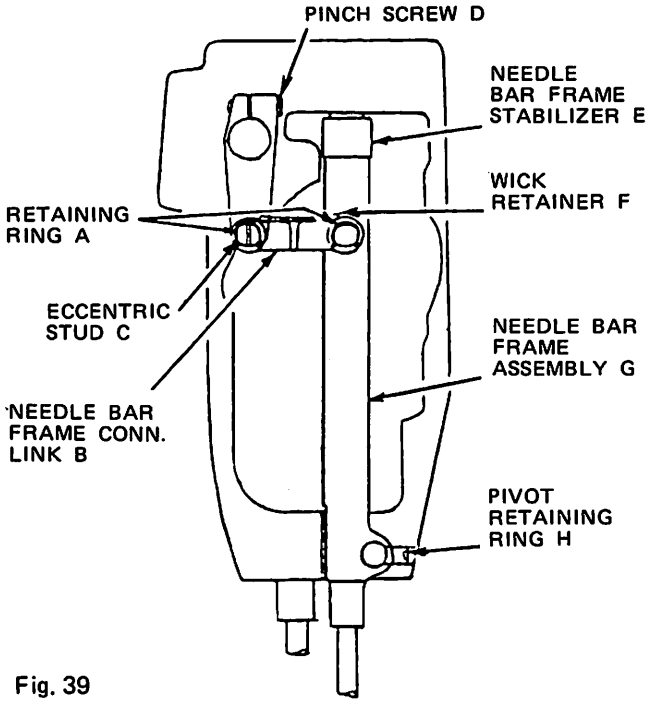


Fig. 39

TO REMOVE AND REPLACE COMPOUND FEED CONNECTING ROD

Loosen clamping screws B and remove the two drive pins C.

NOTE: There is no need to remove the retaining rings D from the drive pins.

The compound feed connecting rod can now be removed through the bed of the machine.

When replacing the connecting rod A, ensure that the crank B (see Fig. 34) is correctly positioned on the feed drive shaft to give the correct alignment of drive pins C.

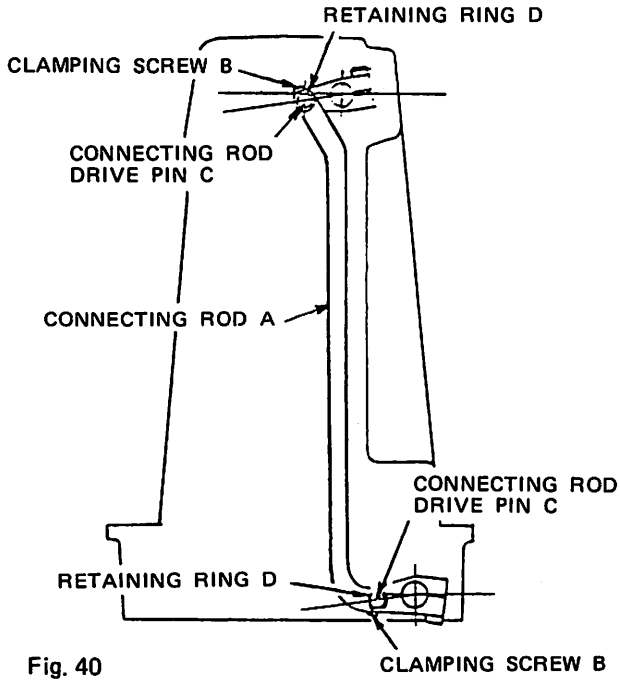


Fig. 40