

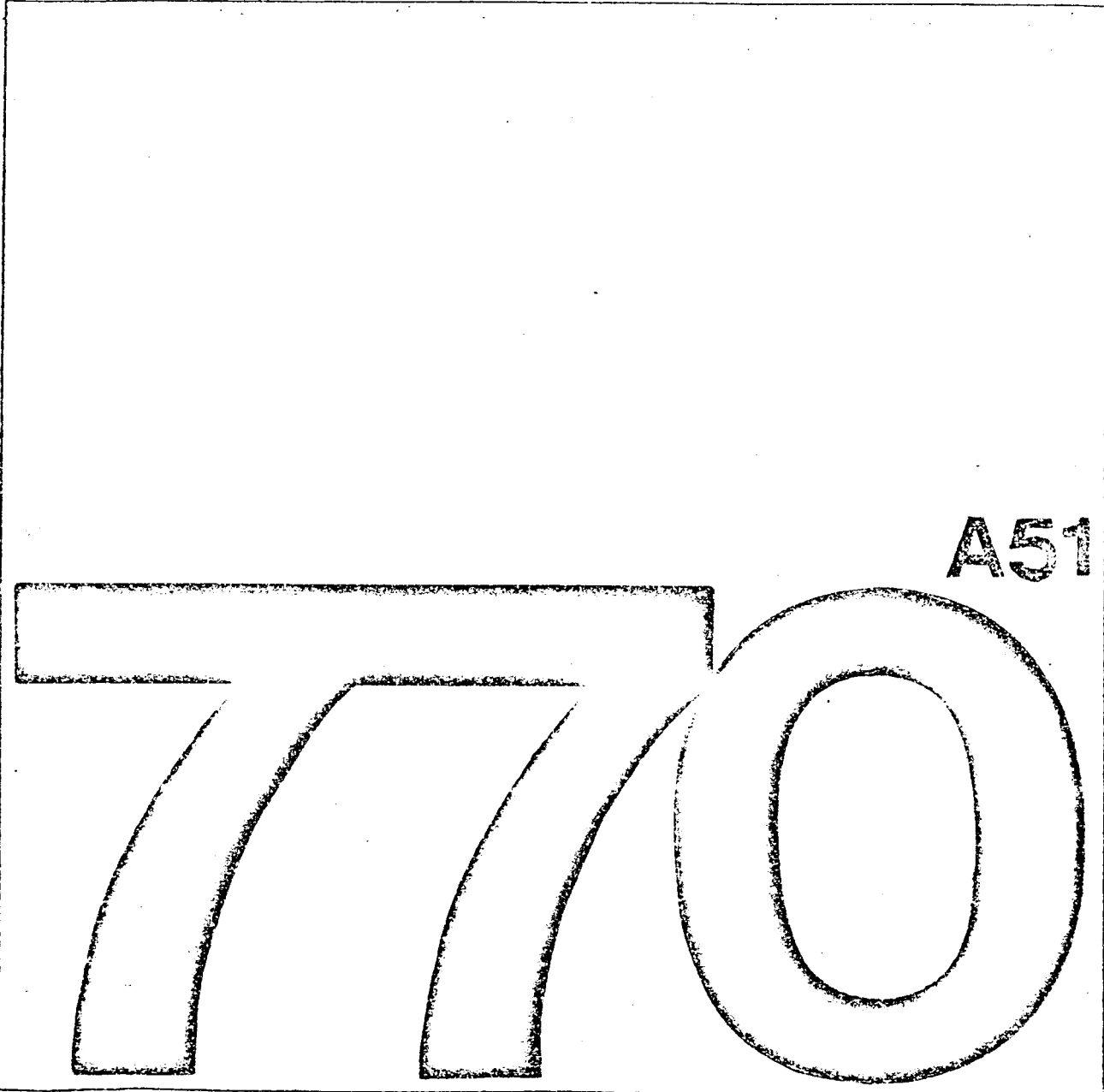
SINGER
770A51

SINGER
INDUSTRIAL PRODUCTS

Service Manual

PRELIMINARY EDITION

Form 30 - 477 G (671) - 677



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Description

770 A 51 AND 770 A 91

770A51 and 770A91 Machines are high speed, drop feed, variable top feed lockstitch machines designed for general stitching operations on a range of light to medium weight fabrics.

General Characteristics

The additional variable top feed facility eliminates puckering of the material and ensures that the plies of material being sewn finish out even. This feature allows the upper or lower material layer to be gathered while the lower or upper layer is being fed at a normal pace.

A thumb screw on the bottom of the machine arm serves the adjustment of the top feed.

A indicator with indicator plate located in the field of view of the operator shows the exact variation of the top feed.

A device for the momentary actuation of the top feed by means of a foot pedal is projected.

Further features, which apply to all 770 A machines, are as follows:

Sewing hook is automatically lubricated from enclosed oil reservoir with oil level indicator in surface of machine bed.

All bearings are self lubricated.

Link take-up made of light alloy material with permanently sealed ball and needle bearings.

Arm shaft mounted in permanently sealed ball bearings and driven from bed shaft by timing belt.

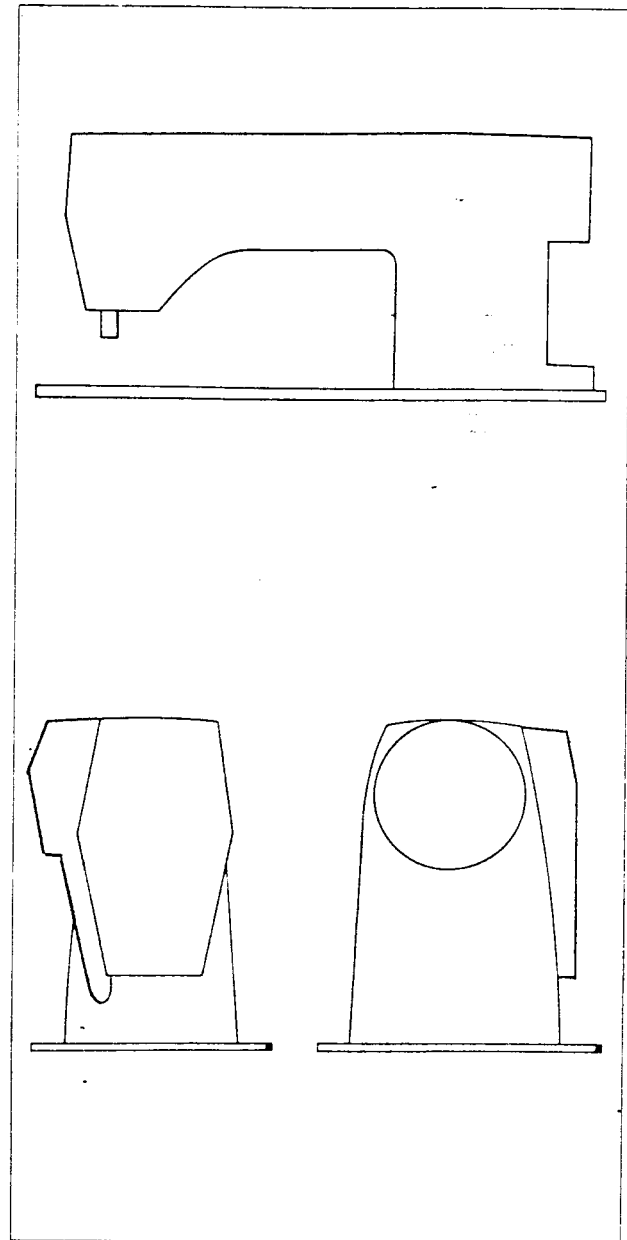
Bed shaft mounted in sintered metal oil saturated bearings is main drive shaft.

New drive system prevents operator contact with driving belt.

Graduated stitch length indicator and separate adjustment for forward and reverse feed stitch lengths.

Built-in bobbin winder.

Cover on machine bed protects mechanisms from dust and dirt and supports knee lifter.



Specifications: 770A 51 and 770 A 91 †

| | |
|------------------------------|---------------------|
| Needle Bar Stroke | 1.196" (30.37 mm) |
| Take-Up Stroke | 2.14" (54.36 mm) |
| Clearance under Presser Foot | 9/32" (7.0 mm) |
| Sewing Capacity | 13/64" (5 mm) |
| Maximum Stitch Length | |
| Forward and Reverse | 5 SPI* |
| Stitch Type (FST) | 301 |
| Bed Size: Length | 18 3/4" (476.8 mm) |
| Width | 7" (177.8 mm) |
| Space at Right of Needle | 10 7/16" (265.1 mm) |
| Oil | Type "C" |
| Needle Catalogue | 1955 |
| Needle Thread | Left Twist |
| Bobbin Thread | Left or Right Twist |

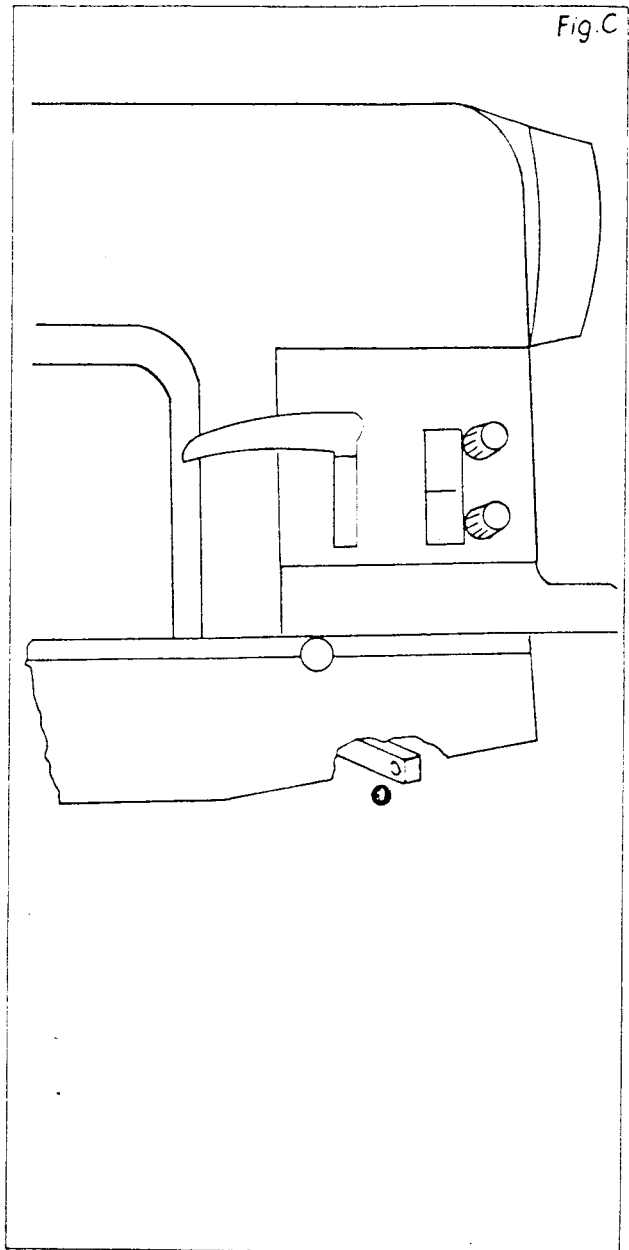
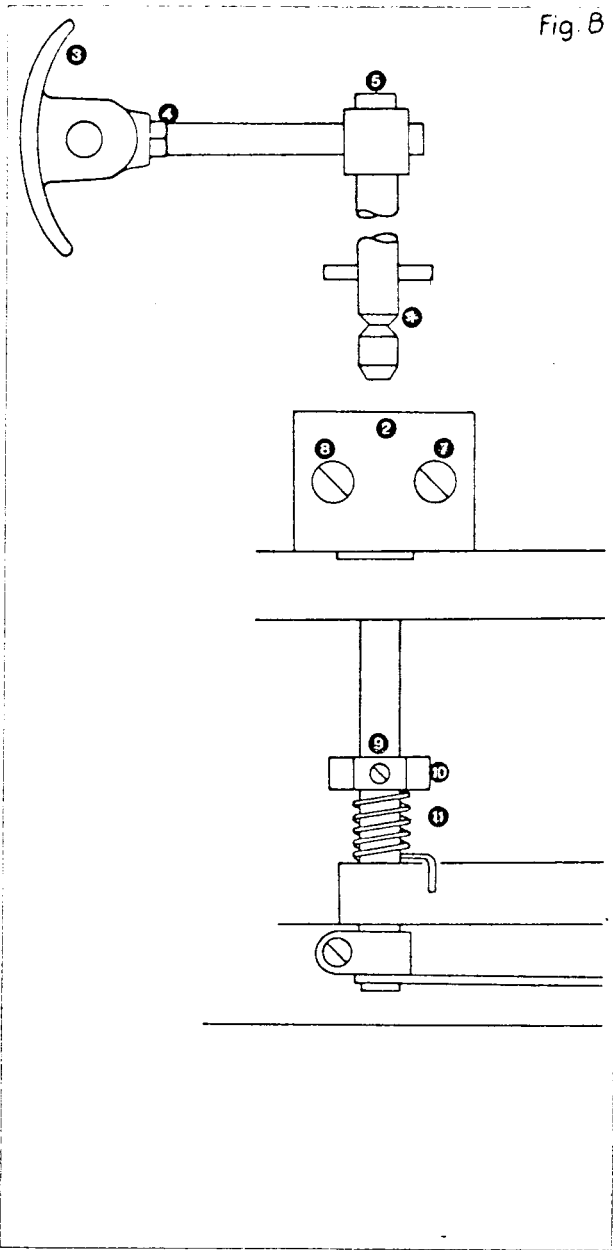
* Depending on Fittings used and Materials sewn.

† Equipped with UTT

Installation and Operation

This section of the manual contains the general information for installing and operating Class 770 A machines

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Lubrication Figs. ABCD

Moving parts are mounted in or on permanently sealed pre-lubricated ball or needle bearings or "Super Oilite" bushings and require no manual lubrication with the following exceptions.

Hook Figs. BCD

Reservoir supplies oil to sewing hook race and is filled through oil fill hole ❶ indicated opposite. Use Singer Oil Type C. Capacity 3.4 fl. oz. = 100 ccm.

Check oil level at indicator window ❷ daily before starting machine. As oil level decreases, the red area in indicator window ❷ becomes larger (from left to right).

To test hook lubrication

Thread machine and sew about three yards (3 metres) of scrap material.

Remove material. Pay no attention at this time to stitching quality or amount of oil spray.

Remove bed slide.

Run machine for approximately one minute to establish a uniform rate of oil flow. Without stopping machine, hold a piece of white paper underneath hook for 10 seconds without moving paper.

Remove paper and inspect. There should be a spray pattern ❸ as shown opposite.

If there is no trace of oil or an excess of oil on test paper . . .

Turn in screw ❹ to increase amount of oil supplied to hook.

Back screw ❹ out to decrease amount of oil supplied.

Normal adjustment is made by turning screw ❹ in all the way, then backing it out again about 8 turns. Less than 8 turns may be required if continuous runs are being made or material with considerable sizing is being stitched.

If the oil flow is still not satisfactory

Remove needle and bobbin case.

Remove position finger and hook as instructed on page 46.

Loosen filter screw ❺ and check oil filter complete.

Oil wick should be replaced whenever it has become clogged by lint or dirt from oil. An excess of oil sometimes indicates that oil wick has become detached from filter screw ❺ or that filter screw is not securely tightened. Repair or replace as required.

Inspect all oil passages in shaft and bushing to see that they have not become clogged with lint or dirt. Just plain dirt can prevent oil from reaching its objective.

To test oil flow while hook is removed from machine, hold test paper under end of hook shaft (with machine running at full speed) for 10 seconds. Oil streak should then be about 1/16 inch (1.5 mm) wide.

When correct flow is obtained, replace sewing hook and position finger, as instructed on page 46.

Make certain oil shield ❶ is in place as shown. It is provided to prevent excess oil from reaching underside of throat plate.

Re-test oil flow. When hook lubrication is satisfactory, replace all parts removed earlier.

Head End Fig. A

Oil the links (5) daily prior to starting the machine. Start the machine for a short run to allow the oil to reach the areas needing lubrication. Then wipe excess oil from the links (5).

Using the hole (2) (marked red) on top of the machine arm, oil the take-up lever link pin and the presser bar guide block (3) with a few drops of oil on a weekly basis.

The hole (1) in the needle bar frame should be filled with oil on a quarterly basis. Using the access hole (4), the foam rubber cushion should be oiled on the same basis. The take-up mechanism does not need to be oiled.

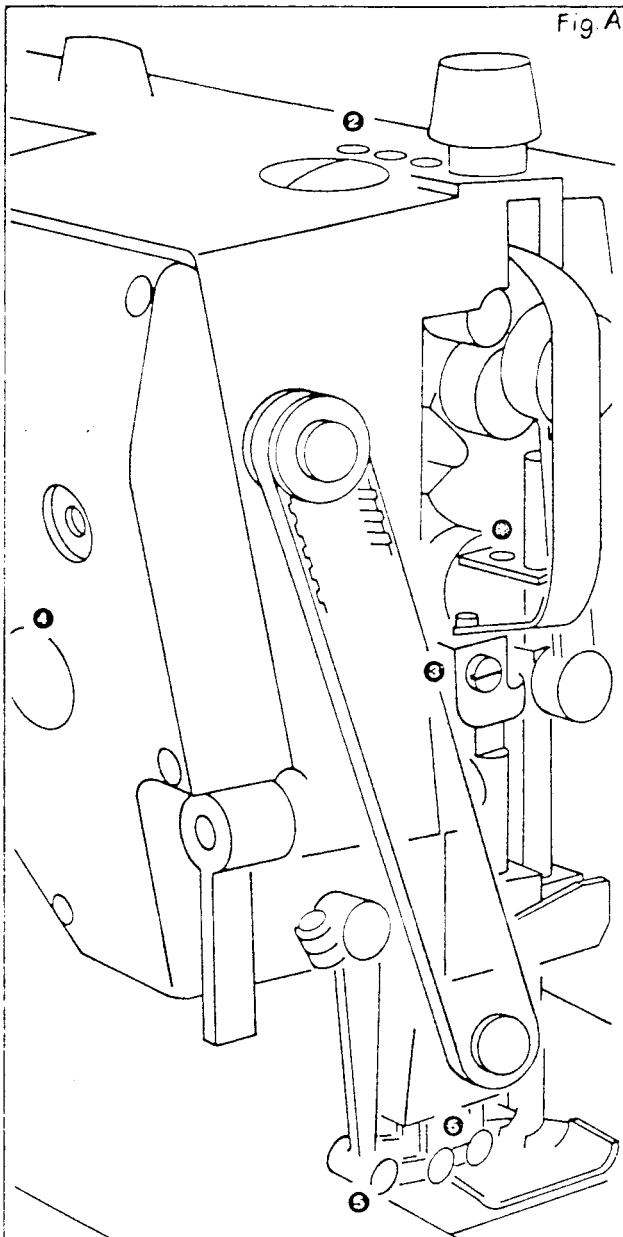


Fig. A

Oil linkage (3) daily when starting to sew. Using access opening (2) marked red, oil take-up stud and presser bar guide (4) weekly with a few drops of oil.

Fill opening (1) within the needle bar frame on a quarterly basis and saturate foam cushion with oil using access opening (2).

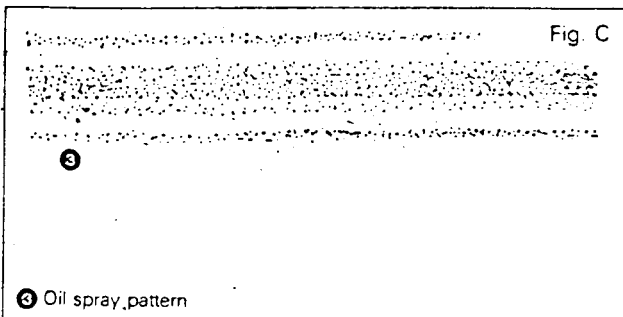


Fig. C

3 Oil spray pattern

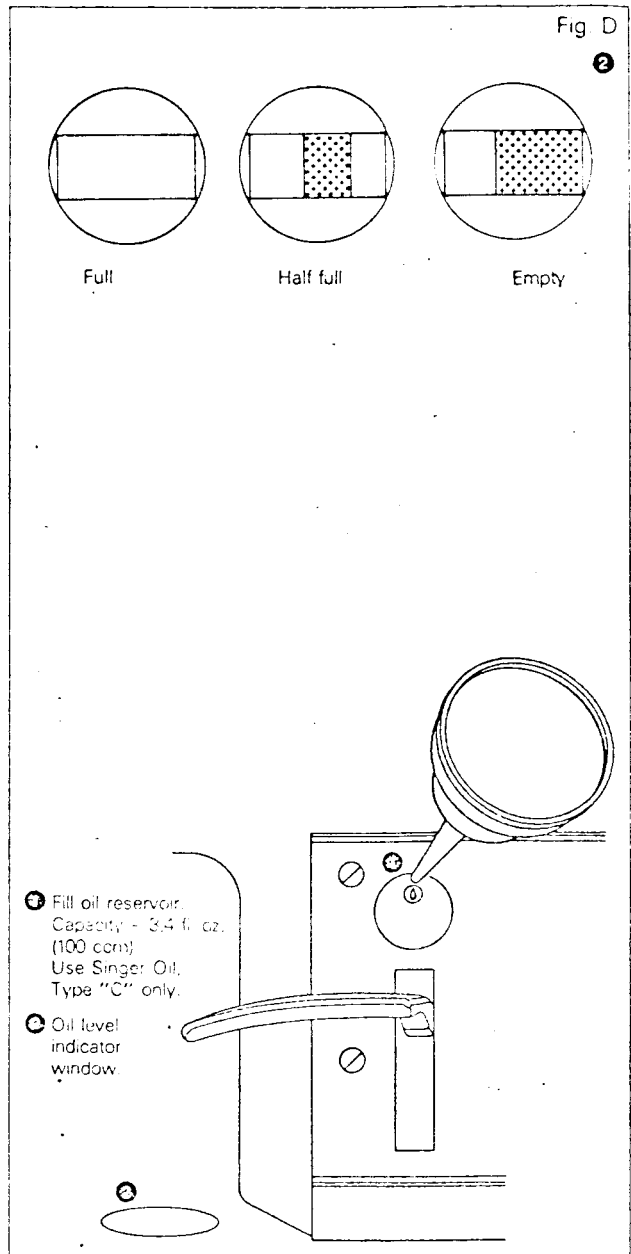


Fig. D

Full

Half full

Empty

- 1 Fill oil reservoir. Capacity - 3.4 fl. oz. (100 cc's). Use Singer Oil, Type "C" only.
- 2 Oil level indicator window.

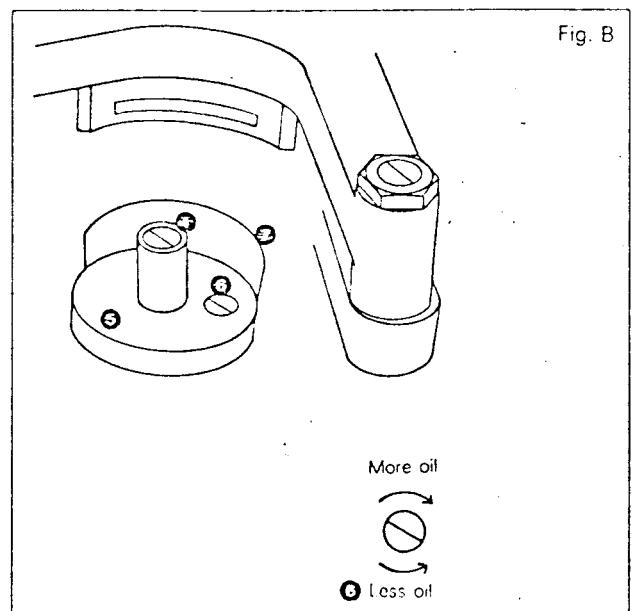


Fig. B

More oil

3 Less oil

Needles Fig. A

Use Singer needles Catalog No. 1901 for 770A⁵ and 770A⁹ machines.

The needle Cat. No. 1943 can also be used with these machines. This needle has a supplementary shoulder which prevents needle flatter.

Needle size is determined by type of material to be sewn, and size of thread.

Use left twist thread in the needle and either left or right twist thread in the bobbin. Set the needle as illustrated opposite.

Presser Foot Pressure Fig. B

The pressure on the material should be as light as possible, while still sufficient to ensure correct feeding.

The amount of pressure exerted on the presser foot can be regulated by turning the screw (1) on top of the machine arm in to increase the pressure and out to decrease the pressure.

The pressure of the feeding foot on the material can be increased by turning screw (2) in and, vice versa, decreased by turning it out.

Stitch Length Fig. C

Stitch length can be regulated while the machine is in operation. Turn lower regulating screw (1) in or out to obtain desired stitch length in forward feed.

Upper regulating screw (2) sets the stitch length in reverse feed. (Observe Page 30 for Setting Foot Controlled Reverse Feed.)

For reverse feeding simply depress hand lever (3). Machine returns to forward stitching when hand lever is released.

Thread Tension

For normal stitching, tension on needle and bobbin threads should be balanced with needle and bobbin threads locked in the center of the material thickness.

When needle thread tension is too high or bobbin tension too low, needle thread cannot be pulled down into material as required. Stitching results are poor and the needle thread lies on the top of the material.

When bobbin thread tension is too high and needle thread tension too low, the condition is reversed. Stitching is just as poor and bobbin thread lies on bottom of the material.

To Regulate Needle Thread Tension Fig. D

Before the initial needle thread tension adjustment is made obtain the correct tension on bobbin thread.

Tension on needle thread should be just enough to set stitch correctly in material. Regulate needle thread tension only when presser foot is down. Needle thread tension is automatically released when presser foot is raised.

Having lowered presser foot, turn thumb nut (1) on the front of tension.

To Regulate Bobbin Thread Tension Fig. E

For average sewing, tension on bobbin thread should be very light.

To regulate tension on bobbin thread, remove bobbin case and turn screw (1) in tension spring.

When the tension on the bobbin thread has been correctly adjusted for ordinary stitching, the required stitch can usually be obtained to suit the work in process by varying the tension on the needle thread.

PRESSURE OF BOBBIN BRAKE SPRING (Fig. A)

Turn in screw (2) when the bobbin tends to over-spill, i.e. when the bobbin threads lays loosely in the bobbin case.

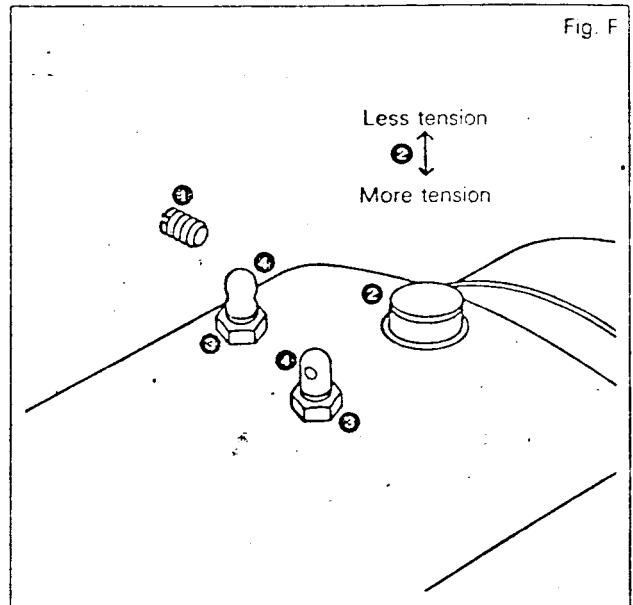
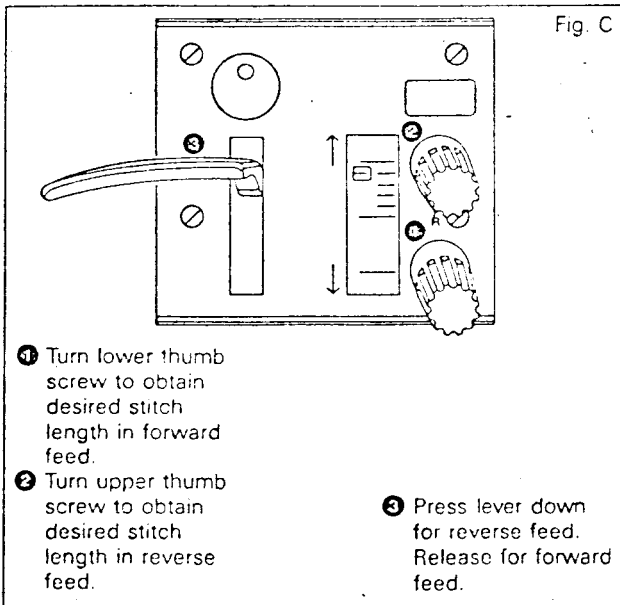
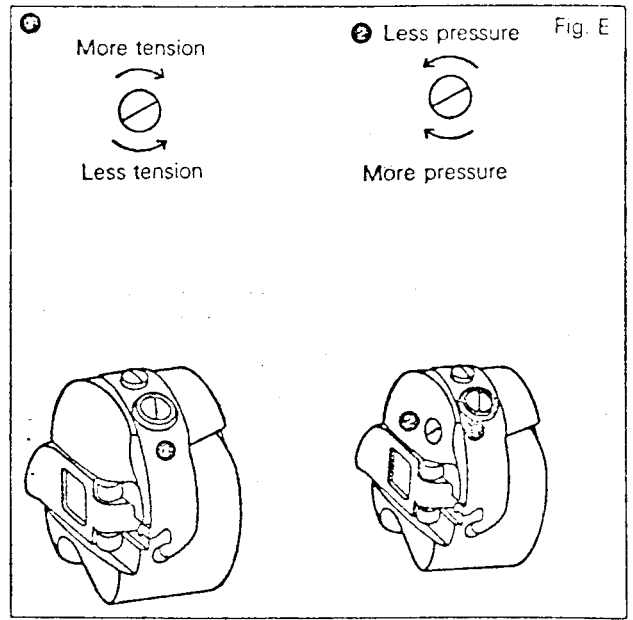
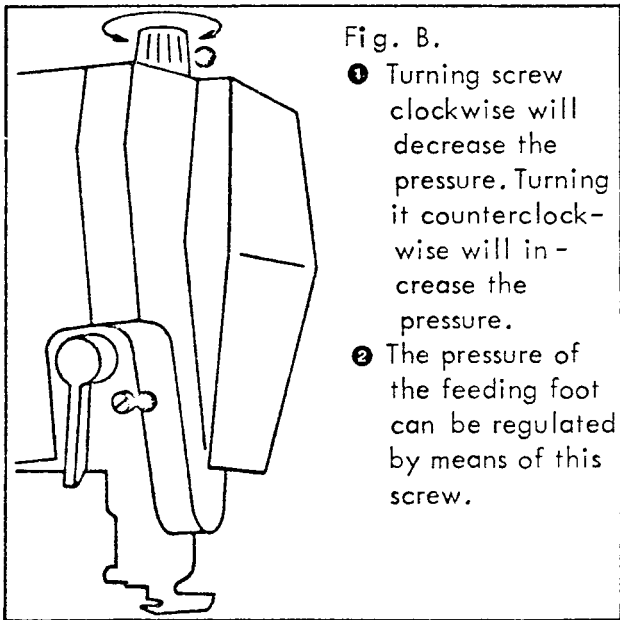
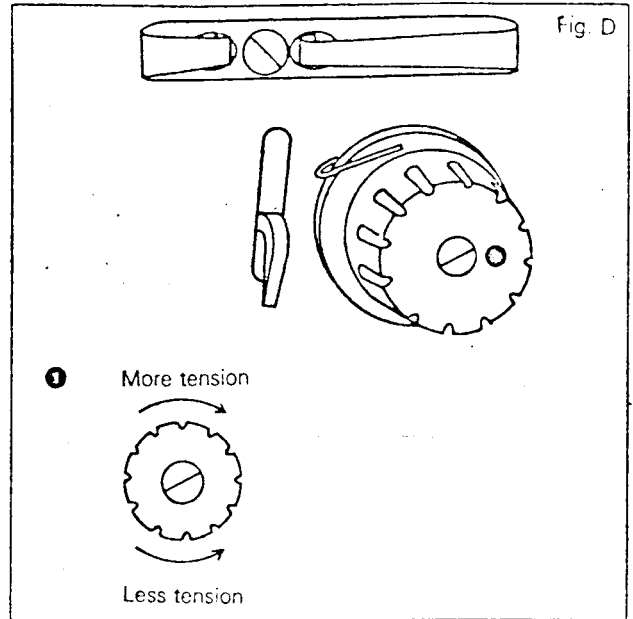
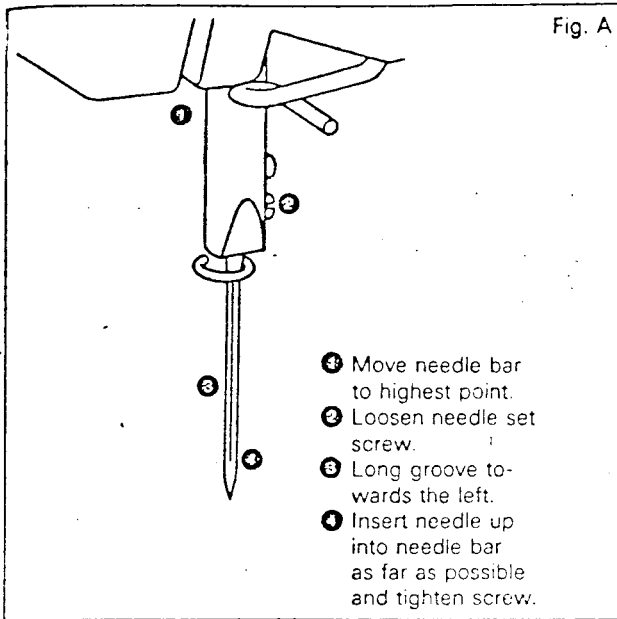
To Regulate Bobbin Winder Thread Tension Fig. F

Loosen set screw (1) and push down on tension assembly (2) to increase tension or raise tension assembly (2) to decrease tension.

Securely tighten set screw (1).

Thread guides (3) for bobbin winder can be raised or lowered after loosening lock nut (3).

Securely tighten lock nut (3).



Threading

Needle Fig. A

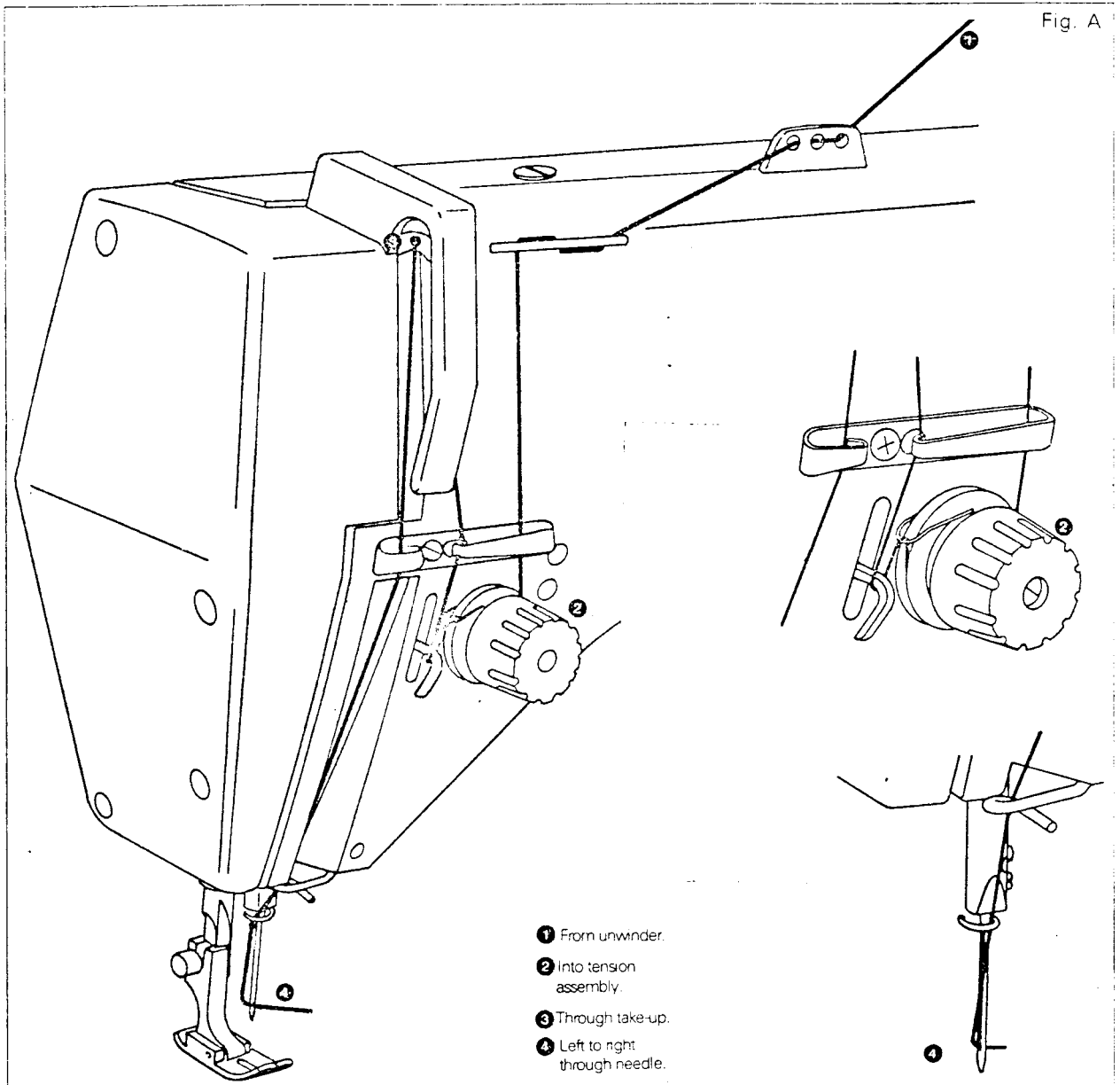
1. Raise needle to highest position.
2. Lead thread from unwinder through the threading points shown.
3. Pass thread from left to right through eye of needle
4. Lay about two inches (50 mm) of thread back under presser foot.

Winding Bobbin Fig. F

1. Lead thread from unwinder through points shown ①
2. Press lever ② in direction shown to engage bobbin winder.

Bobbin Case Figs. BCDE

1. Open latch and pull bobbin case from hook.
2. Release latch and bobbin will drop out.
3. Hold bobbin case with thread slot near top.
4. Insert full bobbin, draw thread down under spring and up into delivery eye.
5. Holding latch replace bobbin case on stud. Release latch and press in bobbin case.



- ① From unwinder.
- ② Into tension assembly.
- ③ Through take-up.
- ④ Left to right through needle.

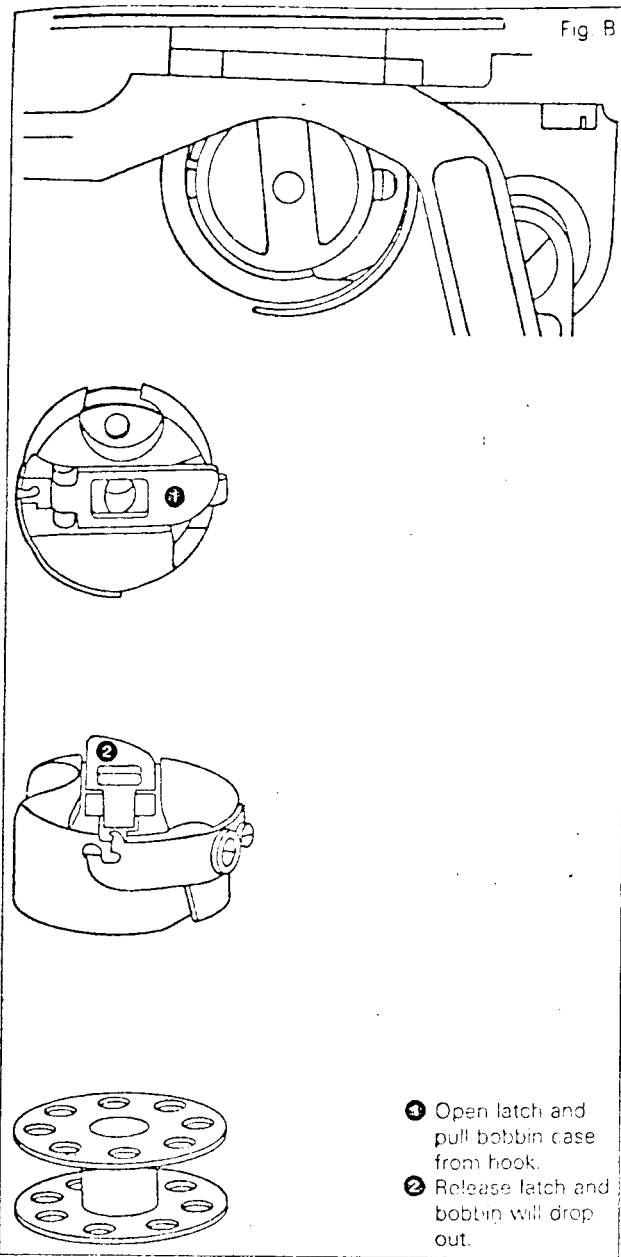


Fig B

- 1 Open latch and pull bobbin case from hook.
- 2 Release latch and bobbin will drop out.

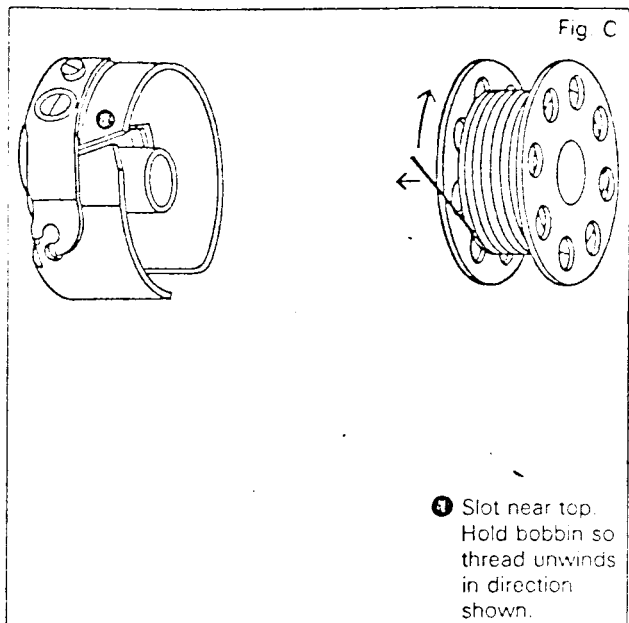


Fig C

- 1 Slot near top. Hold bobbin so thread unwinds in direction shown.

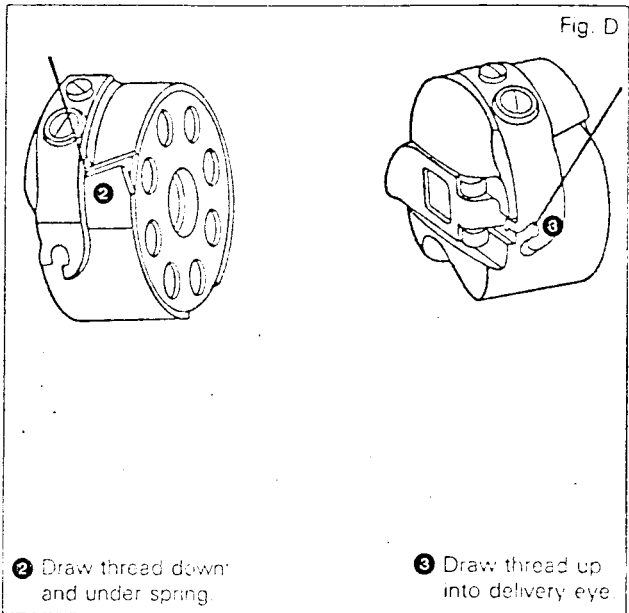


Fig D

- 2 Draw thread down and under spring
- 3 Draw thread up into delivery eye

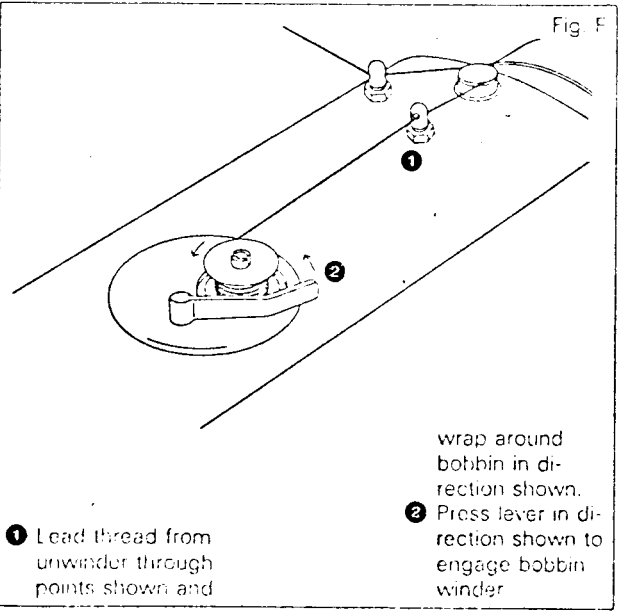


Fig E

- 1 Lead thread from unwinder through points shown and
 - 2 Press lever in direction shown to engage bobbin winder
- wrap around bobbin in direction shown.

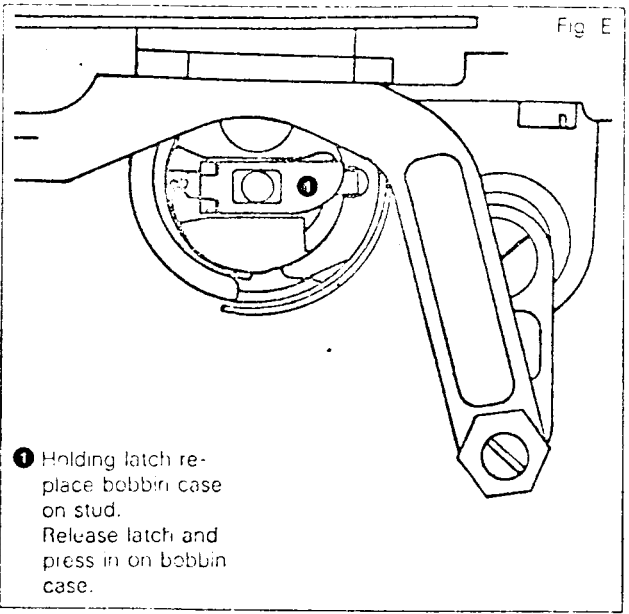


Fig F

- 1 Holding latch replace bobbin case on stud. Release latch and press in on bobbin case.

General Information

Positioning the Machine Figs. A, D

Release the positioning lock ① to hold the machine in a tilted state.

Tilting the Machine and Removal of the „V” Belt Figs. A, B, C and D

1. Remove chain.
2. Tilt the machine in handwheel direction.
3. Remove "V" belt from machine pulley.
4. Return machine to sewing position and then tilt to the rear. To resume sewing, replace "V" belt when machine is tilted as instructed in item 2.

Cleaning

Using short bristled brush (not point of scissors or shears), remove lint or other waste from around the hook, from between the feed rows and underside of the throat plate and from other operating parts.

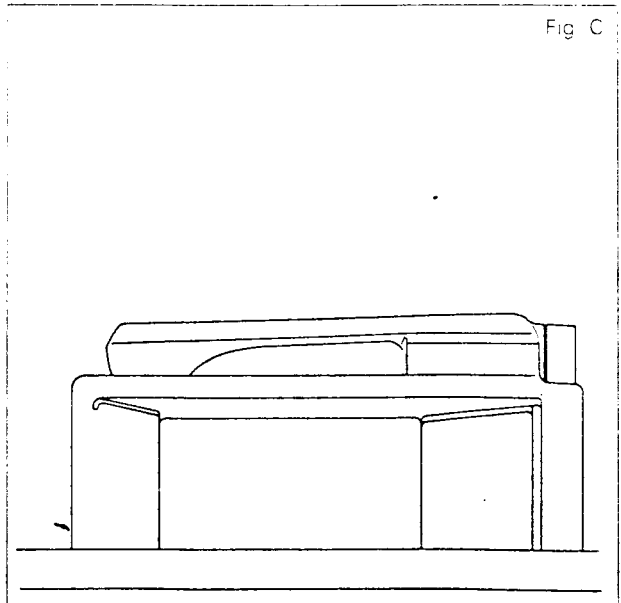
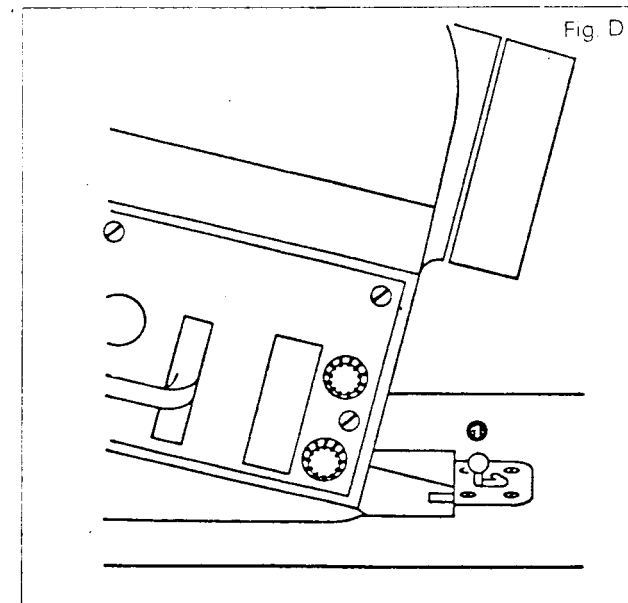
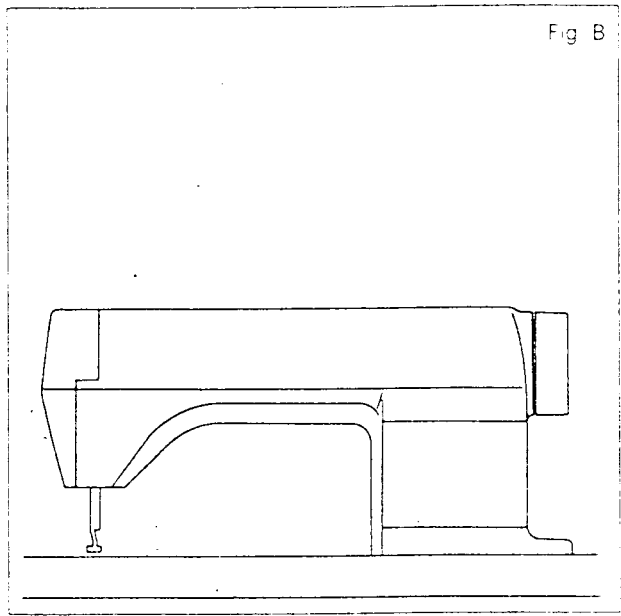
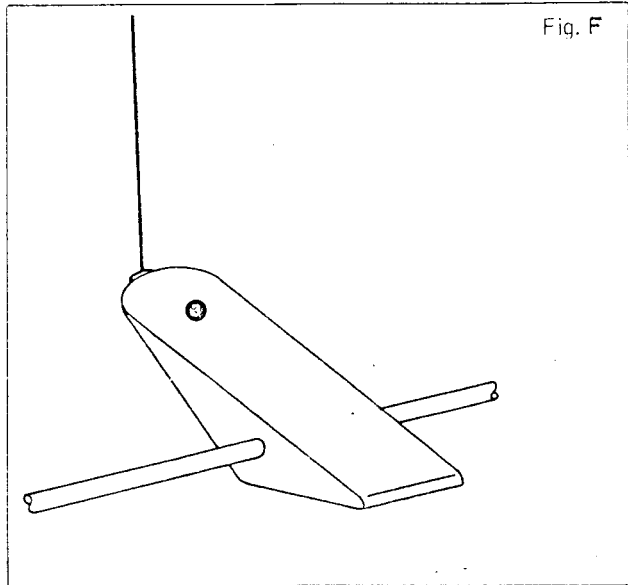
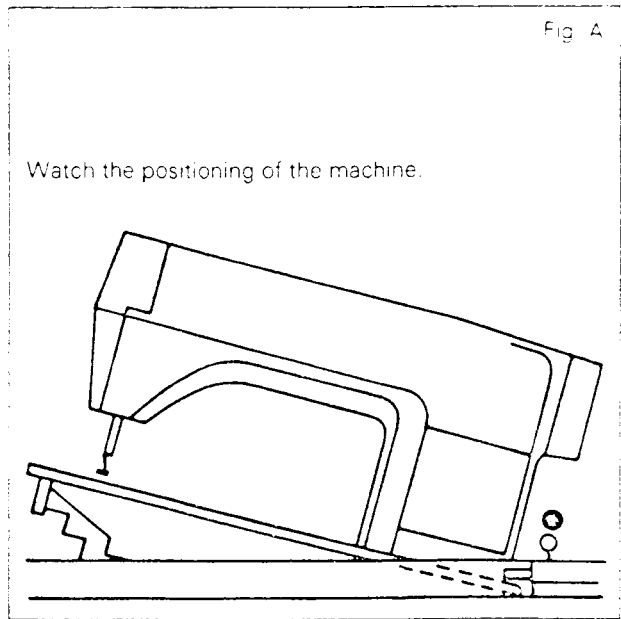
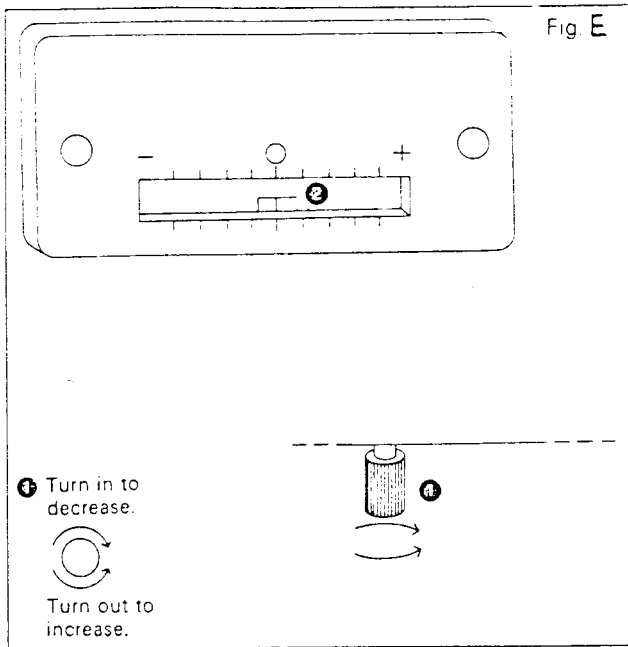
ADJUSTMENT OF THE UPPER FEED (Figs. A & B)

By means of screw (1) the upper feed can be adjusted independently from the drop feed. Turn screw (1) clockwise to increase the feeding stroke of the upper feed as compared to that of the drop feed. The indicator (2) will move in direction (+). Turn screw (1) counter-clockwise to decrease the feeding stroke. The indicator will then move in direction (-).

Actuate the foot treadle (3) when a momentary increase of the feeding stroke is desired.

NOTE:

Prior to the adjustment of the upper feed, the stitch length desired should be adjusted as instructed on page 10.



Timing

Timing the machine consists of first adjusting the feed to establish the correct rotational relationship between the arm shaft and hook driving shaft. The next adjustment establishes the radial position of the rotating hook relative to the movement of the needle bar and thread take-up lever, to ensure that the loop of thread formed by the needle will be correctly taken by the point of the hook at the proper time.

All machines are correctly timed before leaving the factory. If, however, this timing has been disturbed for any reason or it is necessary to check the timing, this should be done in the order given on the following pages.

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| Top Feed | 18 |
| Synchronising Top and Drop Feeds | 18 |
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Drop Feed Figs. A, B, C.

1. Remove face plate.
2. Ensure that screw (8) marked "Z" in the "V" belt pulley is in the groove of the bed shaft (5).
3. Turn handwheel until timing mark on crank (1) is aligned with the timing mark on the take-up lever link (2).
4. Loosen set screws (3) in timing belt pulley (4) and turn bed shaft (5) until the center of the timing mark range "A" on the "V" belt pulley is opposite the mark in the machine bed.
5. When all timing marks are aligned retighten set screws (3) in the timing belt pulley (4).

Top Feed Figs. A, D and E.

1. Check feed dog setting as instructed on this page.
2. Set stitch length to "0".
3. Check if the screw marked P in the eccentric (9) is seated in the groove of shaft (10).
4. Turn handwheel until the mark on crank (1) and the mark on the take-up lever link pin (2) are facing each other.
5. Loosen the set screws in the timing belt pulley (11) and turn shaft (10) until the mark on the eccentric (9) is opposite the mark on the connecting rod (12).
6. Securely tighten the set screws in the timing belt pulley (15).
7. Align the mark of the eccentric (9) with the mark on the connecting rod (12) by turning the handwheel.
9. Keep the handwheel position and adjust the eccentric shaft (16) by turning the timing belt pulley (15) that the arrow on the eccentric shaft (16) points vertically down. (Bottom dead center.)
10. Tighten screws (14) in the timing belt pulley (15).

SYNCHRONISING TOP AND DROP FEEDS

After the top and drop feeds have been properly adjusted and after the respective feed reversing mechanisms have been set in accordance with the instructions on page 32, these feeding elements should then be synchronized.

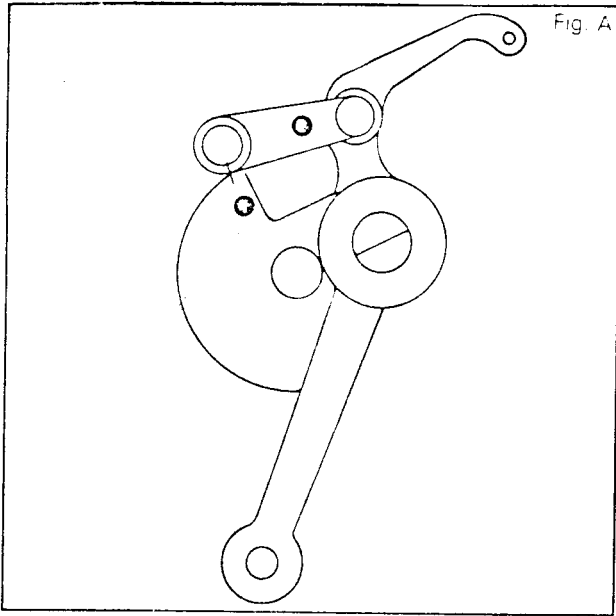


Fig. A

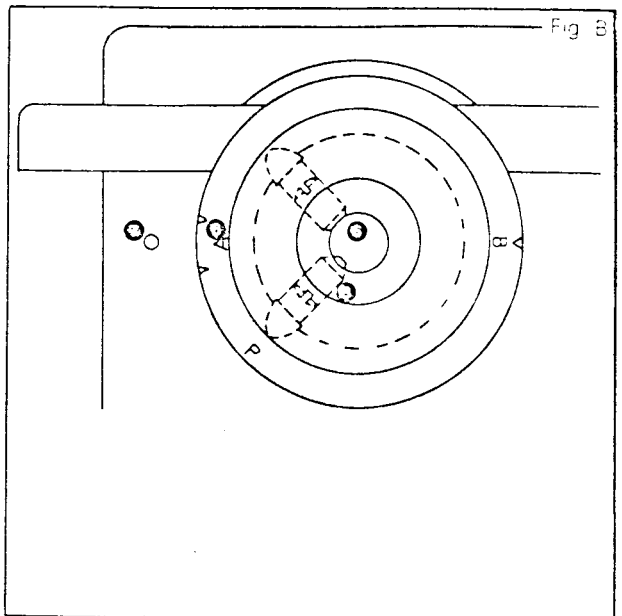


Fig. B

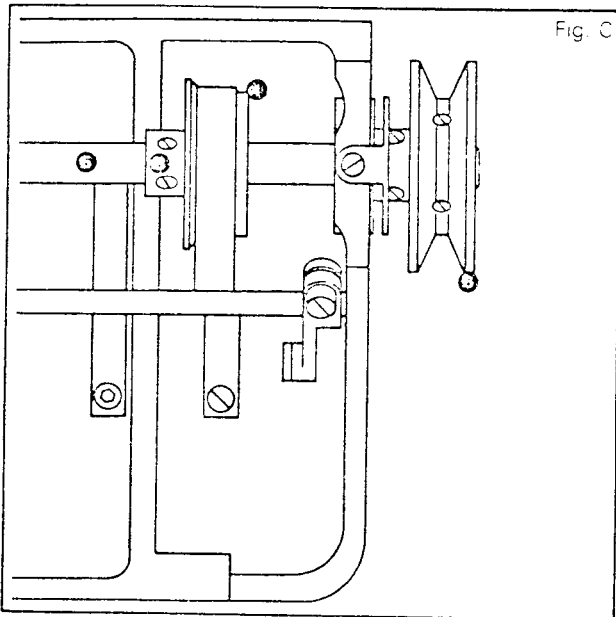


Fig. C

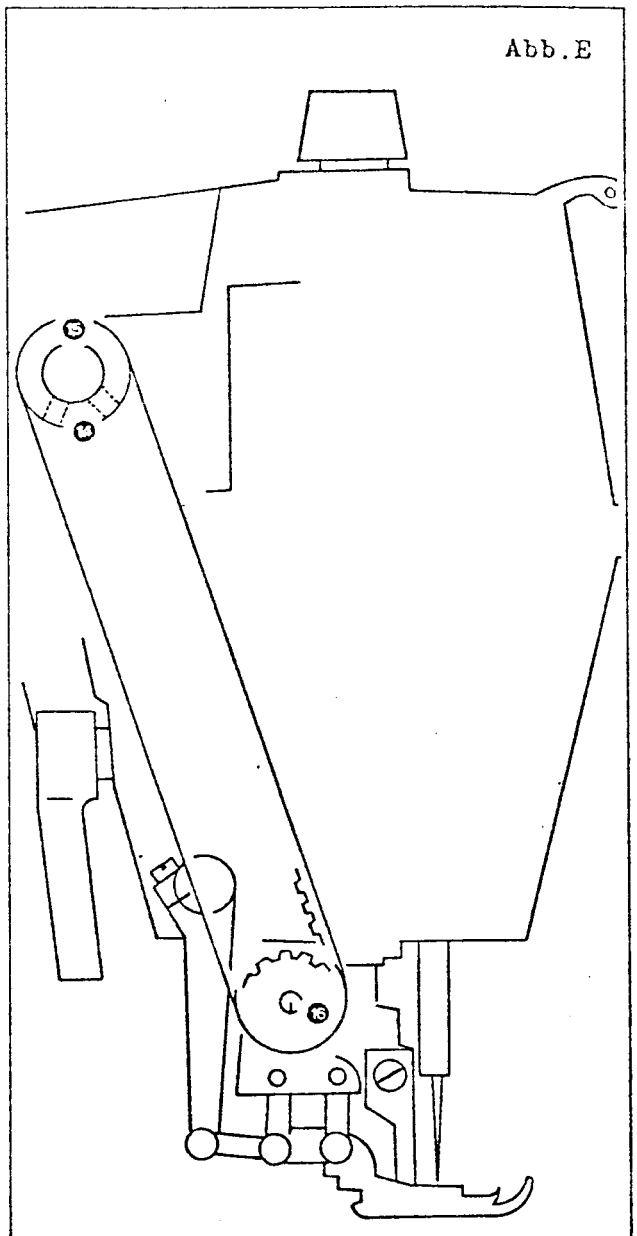


Abb. E

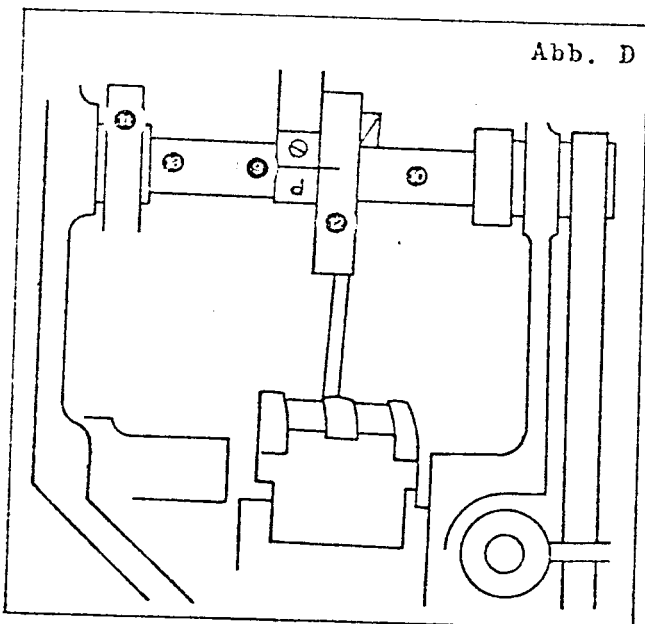
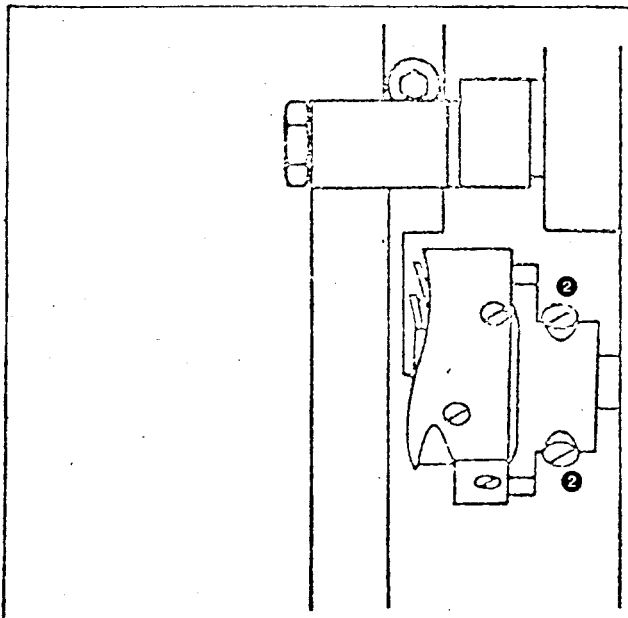
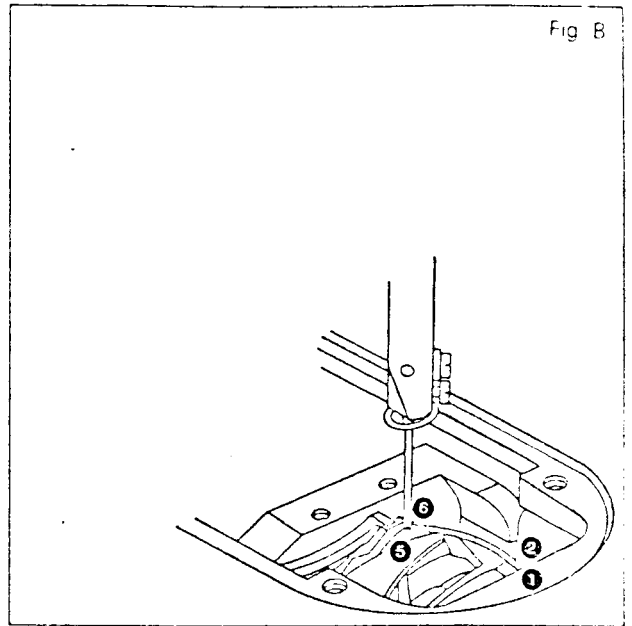
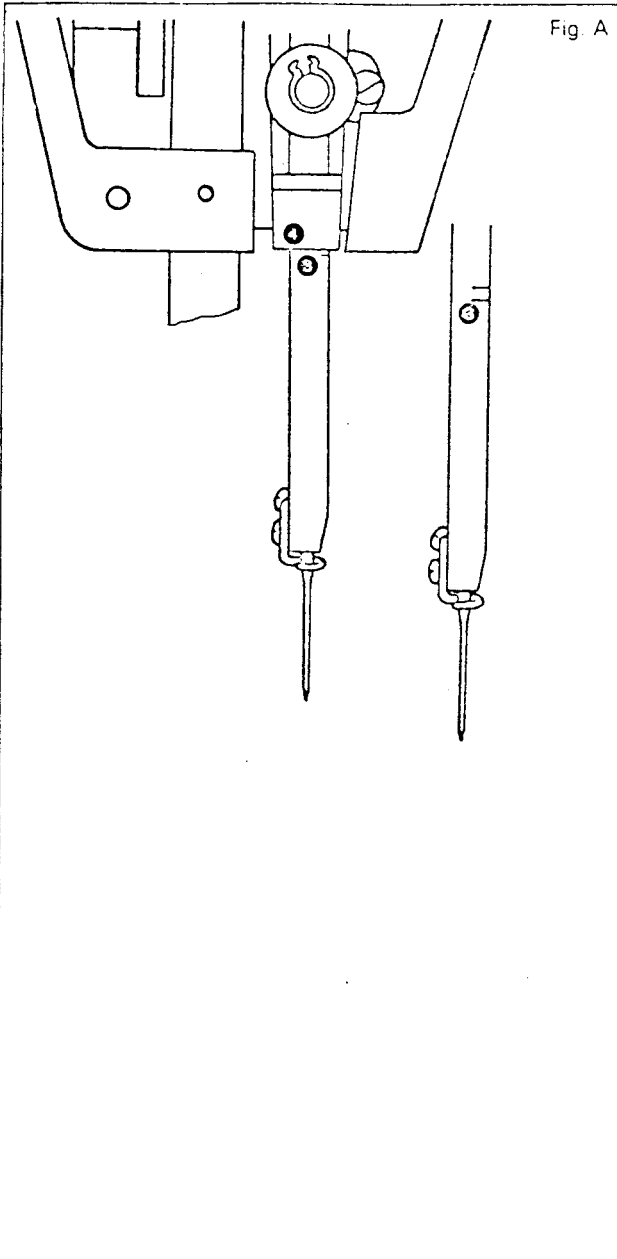


Abb. D

Timing the Hook Figs. A, B, and C

When timing the hook care should be taken that the clearance between the needle and hook point not be changed.

1. Remove throat plate, feed dog, and presser foot.
2. Insert a new needle.
3. Turn oil shield ❶ so that hook set screws ❷ are accessible.
4. Loosen hook set screws ❷.
5. Turn hand wheel until needle bar is at bottom dead center position.
6. Turn hand wheel in direction of machine rotation until lower mark ❸ is even with lower edge of needle bar frame ❹.
7. Set hook point ❺ to center line of needle ❻.
8. Retighten hook set screws ❷.
9. Return oil shield ❶ to its original position.
10. Replace throat plate, feed dog, and presser foot.



Setting

The information in this section of the manual is intended to provide a quick reference on the settings of the various mechanisms in the machine.

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Check Spring

Height Fig. A

Thread the machine.

Turn machine pulley in direction of rotation. When take-up lever begins to rise, check spring ① should make a slight dip then return to its original position. As take-up lever approaches the top of its stroke, setting the stitch, the check spring should be drawn all the way down.

As take-up lever descends, the check spring should return to its original position.

To increase or decrease the height of the check spring, loosen set screw ②. Turn stud ④ together with entire tension assembly either toward left to lower spring and decrease its movement, or toward right to raise the spring and increase its movement.

Securely tighten set screw ②.

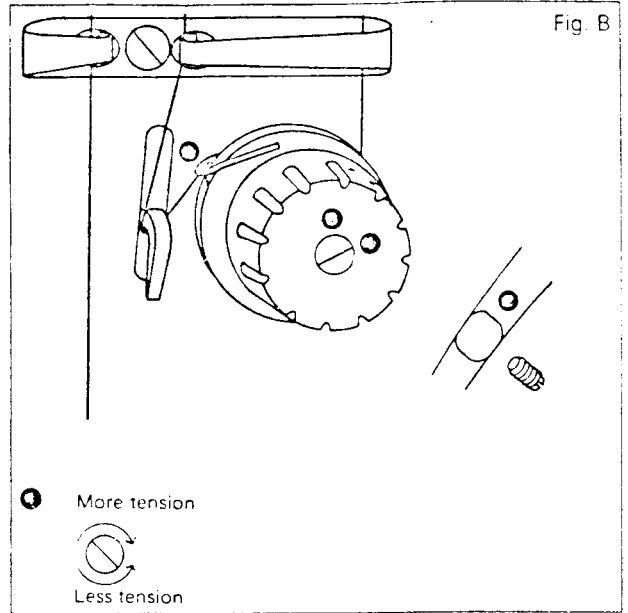
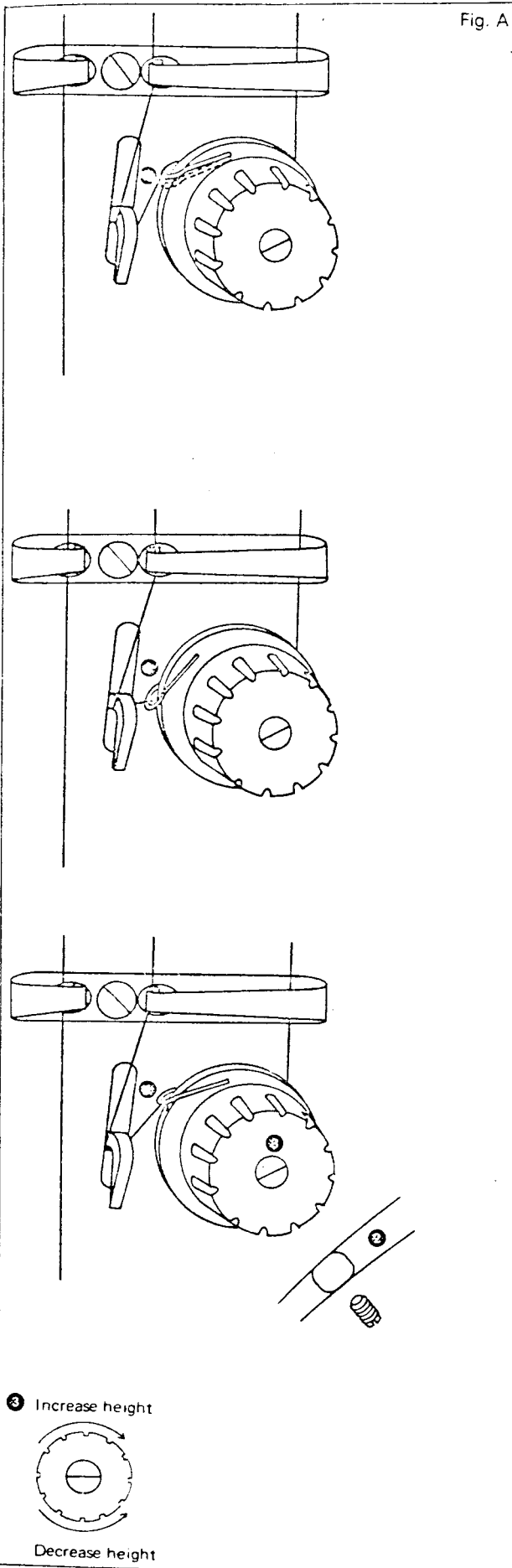
Tension Fig. B

Thread the machine.

Tension on check spring ① should be sufficient to ensure action at top speed, but still light enough to permit spring to be drawn all the way down, (as take-up lever approaches the top of its stroke), before any thread is drawn through the tension discs.

To adjust the tension, securely tighten set screw ② and ensure thumb ③ nut is on tension stud ④.

Using a screwdriver in slot of tension stud ④, turn stud toward left to decrease tension or to right to increase it. Tension on the check spring may require different settings depending upon the size of thread used.



Feed Dog Figs. A,B,C,D.

Centralizing

Feed dog should not contact edges of throat plate slots during its movement but should be located centrally in relation to the front, rear, and sides of throat plate slots. Before making any unnecessary adjustments to the feed dog, check that it lies parallel to the throat plate slots. Align by loosening feed dog screws, positioning feed dog as required then retightening feed dog screws.

Lateral Setting Fig. A.

1. Loosen pinch screw ① in feed bar crank ②.
2. Shift feed bar ③ to right or left as required insuring that the feed bar ④ does not contact the position finger ⑤.
3. Retighten pinch screw ①.
4. Check axial play at pendant link ④ and when necessary adjust feed lifting shaft ⑤ laterally to minimize play.

Lengthwise Setting Fig. A.

1. Set machine for maximum stitch length.
2. Loosen pinch screw ① on feed bar crank ②.
3. Position feed dog as required.
4. Tighten pinch screw ①.

Height Figs. ACD.

When feed dog is at its highest position, approximately the full depth (.040-.043 inch, 1 mm) of all the teeth should project above the top surface of the throat plate.

To adjust:

1. Loosen lock nut ⑥.
2. Turn eccentric stud ⑦ until feed dog is at correct height.
3. Tighten lock nut ⑥.

Levelling Figs. ACD

The feed dog should be level at the top of its feed path.

To adjust:

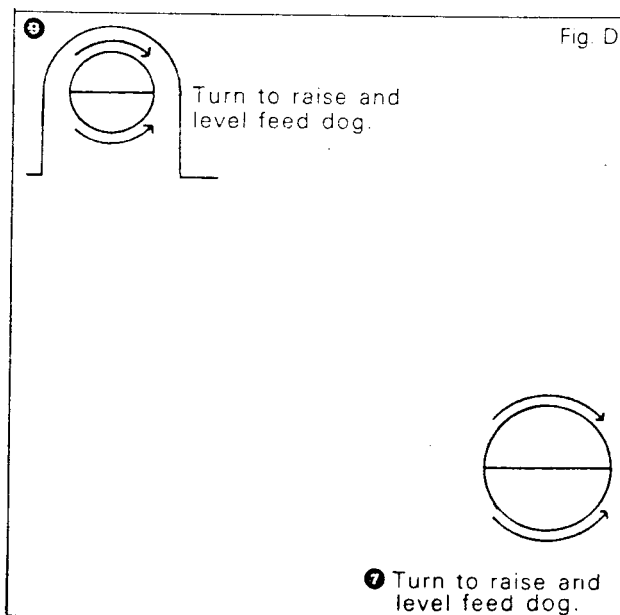
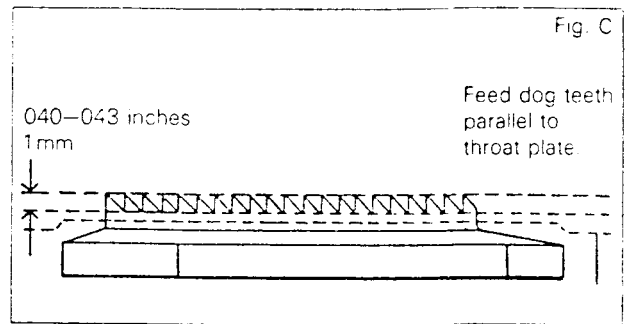
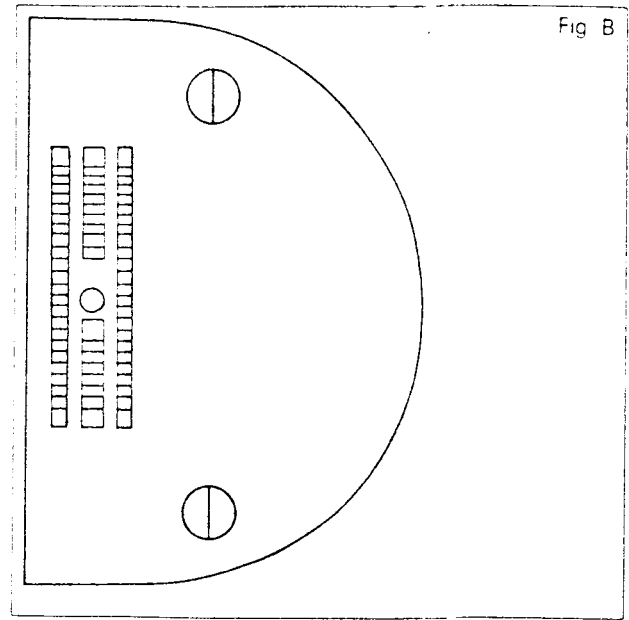
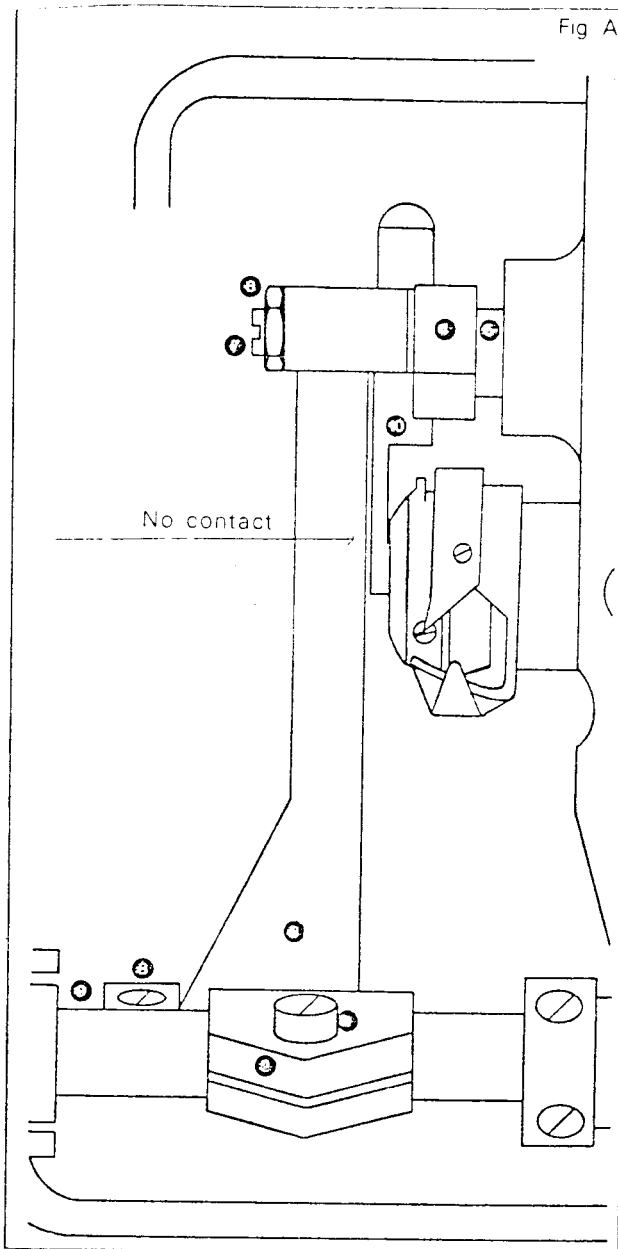
1. Loosen set screw ⑧.
2. Turn eccentric pin ⑦ to level feed dog.
3. Tighten set screw ⑧.

Check feed dog height.

Note: It may be necessary to set feed dog height and level in conjunction with each other.

VIBRATING PRESSER FOOT (Fig. E)

1. In order to adjust the vibrating presser foot (3) in the feeding direction its feeding stroke must be set equal to that of the feed dog.
2. Set machine to maximum stitch length.
3. Loosen screw (2) and adjust vibrating presser foot (3) as required.
4. Tighten screw (2) and by turning the hand-wheel ensure that the vibrating presser foot does not strike the presser foot.



Hook Figs. A.C.D.E

Clearance between needle and hook point.

The point of the rotating hook should pass the needle as closely as possible without striking or deflecting it.

There should be an approximate clearance of .005 inch (.12 mm), about the thickness of a sheet of notepaper, between the two.

In normal sewing the entire "flat" of the hook point, not only the end of the hook point should clear the needle.

To adjust clearance:

1. Remove throat plate and feed dog.
2. Remove screw ① and position finger ②.
3. Loosen bushing set screw ④.
4. Move entire hook and bushing assembly as required by tapping very lightly to the right with a brass drift pin on the end of the hook shaft bushing (not on the bobbin case base), or prying to the left by placing a screwdriver in the groove for the oil guard and using it as a lever.
5. Tighten bushing set screw ④.
6. Replace position finger ② and screw ① and reset.
7. Insure that the needle guard ③ on the bobbin case holder ⑤ prevents the needle from contacting the hook point at any time. The correct relationship is shown opposite.

If large needles are being used and the needle guard is deflecting the needle too far to the left, it may be necessary to string the needle guard.

To do so, remove hook as instructed on page 46.

Remove a slight amount of metal from the needle guard by rubbing it along a 1/8 inch (3 mm) wide strip of very fine emery cloth.

Extreme care must be taken to avoid removing too much metal as this might cause the needle to strike the hook point.

Replace hook as instructed on page 46.

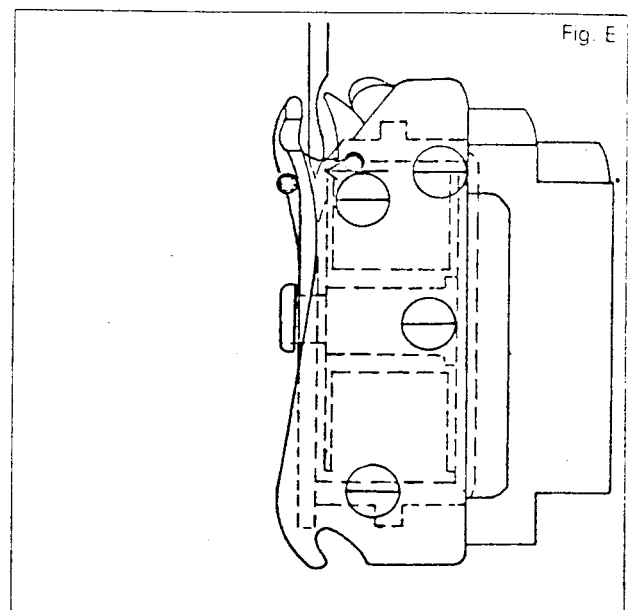
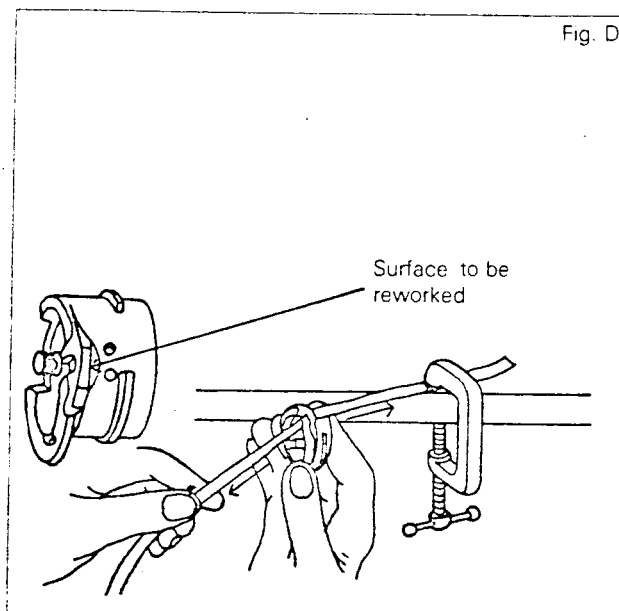
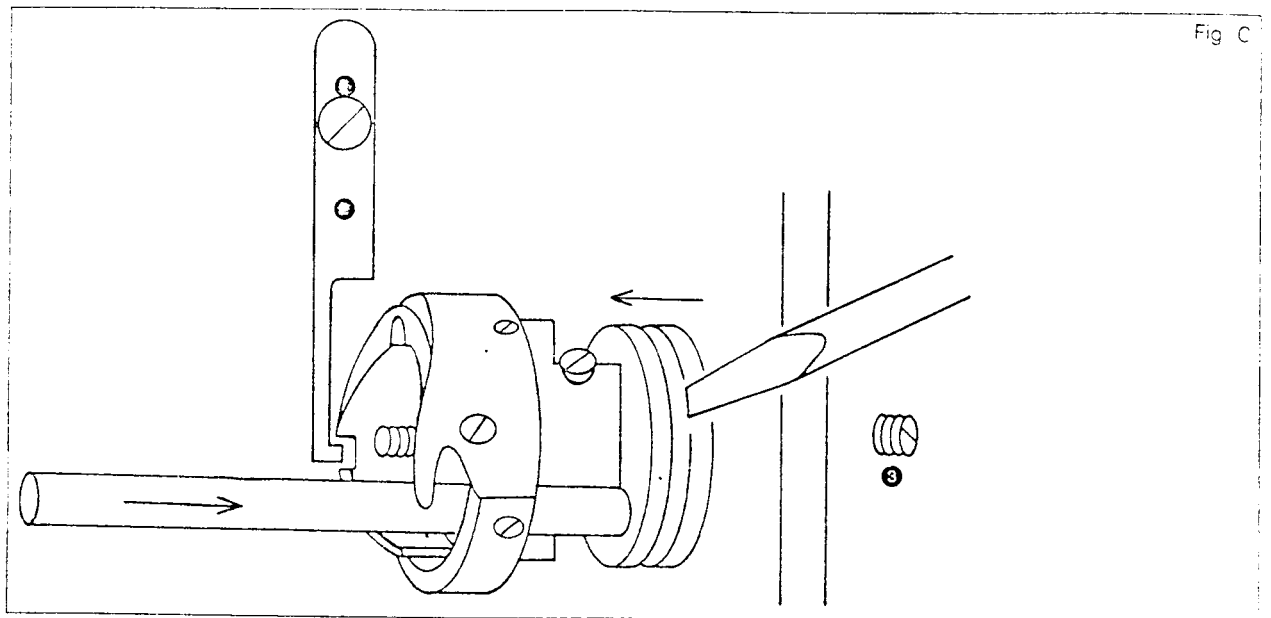
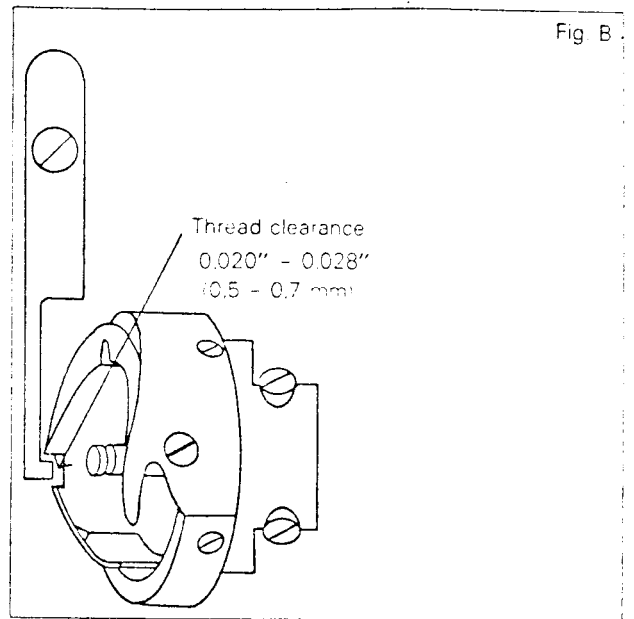
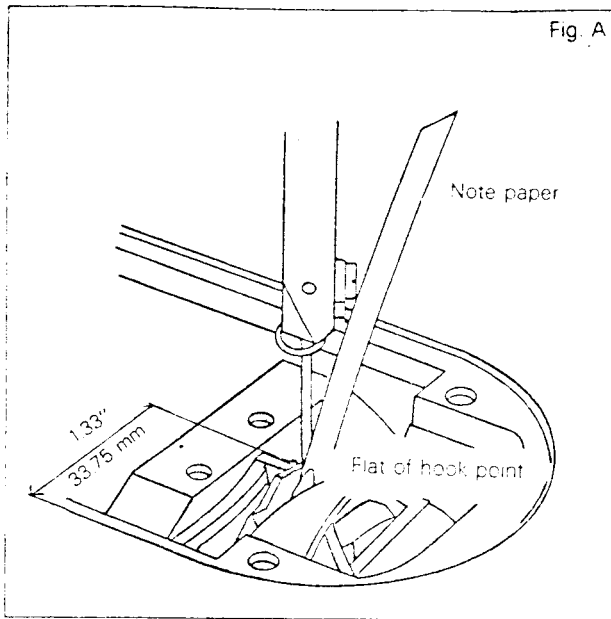
Recheck hook timing as instructed on page 18.

Replace feed dog and throat plate.

Position Finger Fig. B

Set position finger so that thread can easily pass through and the bobbin case base is still properly held in place. If necessary the position finger, once removed from the machine, can be formed carefully to achieve the proper setting.

Top surface of position finger must be kept level with top surface of bobbin case base.



Needle Bar Height Fig. A

1. Turn handwheel until needle bar is at the bottom dead center of its stroke.
2. Loosen pinch screw ❶.
3. Set needle bar so that the upper mark ❷ is in line with bottom edge of needle bar bushing ❸.
4. Retighten pinch screw ❶.

Presser Bar Fig. B C

When the presser foot is raised there should be a clearance between the presser foot and the throat plate as follows:

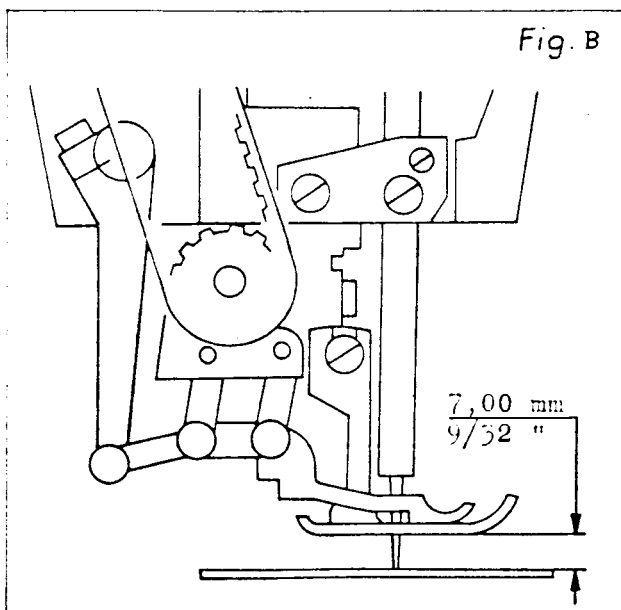
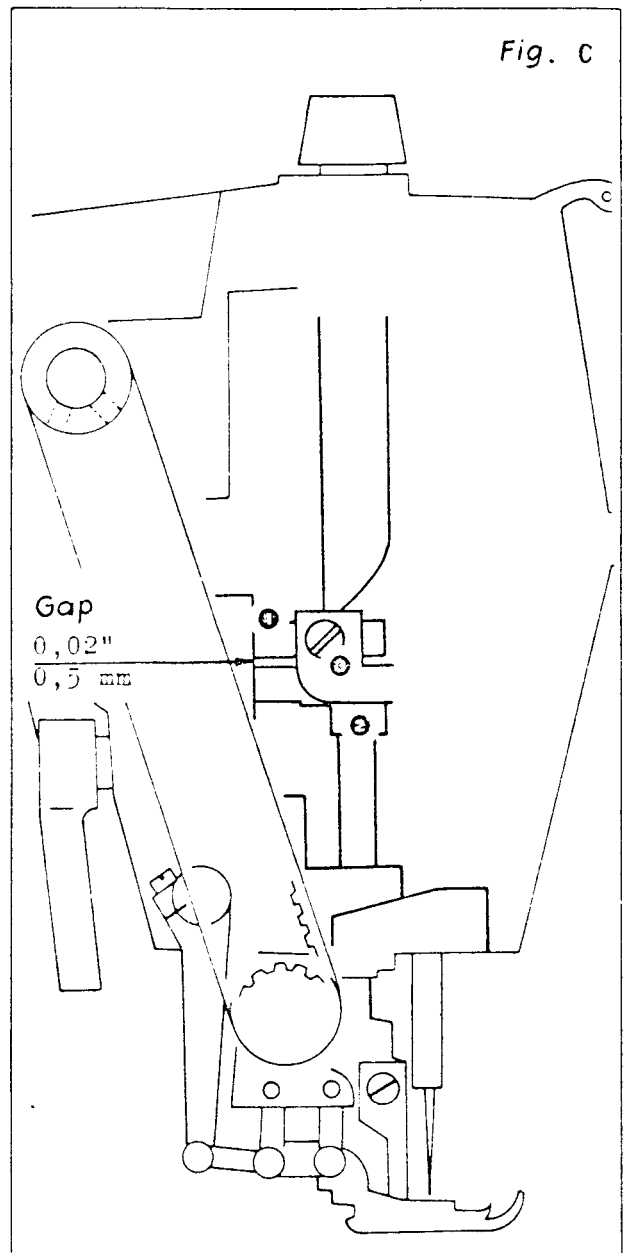
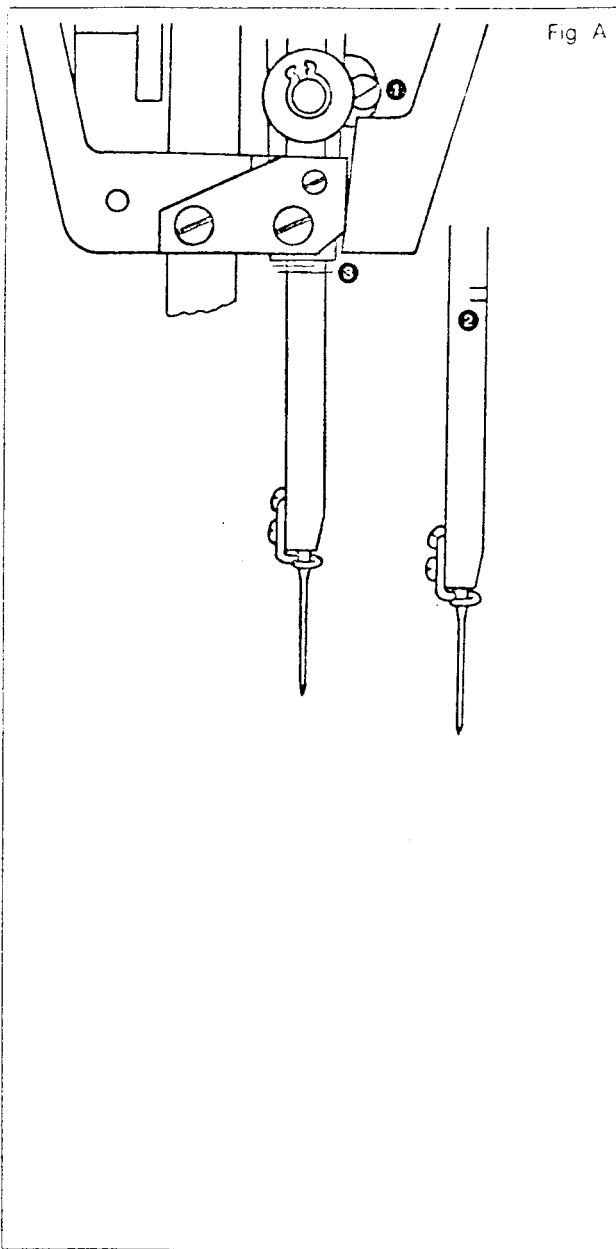
| | |
|---------|--------------------|
| 770A 51 | 9/32 inch (7.0 mm) |
| 770A 91 | 9/32 inch (7.0 mm) |

There should be a clearance of approximately 0.02 inches (0.5 mm) between presser bar position guide ❶ and lifting element ❷ when the presser foot rests firmly on the throat plate (with feed dog below throat plate).

ADJUSTING THE PRESSER BAR HEIGHT

Lower presser foot.

Loosen clamping screw ❸ and raise or lower guide ❶ as required. Turn presser bar so that the needle is centralized between the toes of the presser foot, then tighten screw ❸.



Feed Reversing Mechanism Figs. A,B

1. Turn stitch length regulating screws ❶ in as far as they will go.
2. Remove adjustable spring ❷.
3. Loosen pinch screw ❸.
4. Set stitch length regulating frame ❹ in a position where no feed rocking motion exists.
5. Retighten pinch screw ❸.
6. Replace adjustable spring ❷.
7. Check zero setting at feed dog.
8. Loosen pinch screw ❺ in feed reversing lever ❹.
9. Set feed reversing lever ❹ parallel to indicator ❷.
10. Retighten pinch screw ❸.
11. Set stitch length regulating screws ❶ for longest stitch lengths in forward and reverse feed.
12. Limit forward and reverse stitch lengths with stop screws ❻ and ❼ so that the feed dog being used in the machine does not strike the throat plate at maximum machine speed.

UPPER FEED REVERSING MECHANISM (Figs. A, B & C)

1. Set forward stitch length to "0" by means of the lower thumb screw (1).
2. Remove rear face plate.
3. Remove arm cover plates.
4. Check whether the marks on the clamping cranks (8) and (9) are in line with the respective marks on the hollow shaft (10).
5. Adjust clamping cranks (8) and (9) if so required.
6. Turn thumb screw (11) until the adjustment ranges (12) and (13) are equal.
7. Loosen set screw (14).
8. Loosen pinch screw (15) and adjust setting frame (16) that the vibrating presser foot will not show any feeding movement or that the links in the setting frame are on the same height.
9. Tighten pinch screw (15).
10. Loosen set screw (17) and adjust mark (18) in accordance with indicator lever (20).
11. Tighten set screw (17).
12. Set indicator (21) on front side of arm to "0" by removing the indicator plate (22), loosening screw (23) and shifting part (24) left or right as might be required.
13. Tighten screw (23) and replace indicator plate (22).
14. Set for maximum forward stitch length by means of thumb nut (1).
15. Adjust stop screw (25) such that a distance of 1.5 mm between this screw and the machine housing is ensured.
16. Tighten pinch screw (14).
17. Mount rear face plate and replace arm covers.

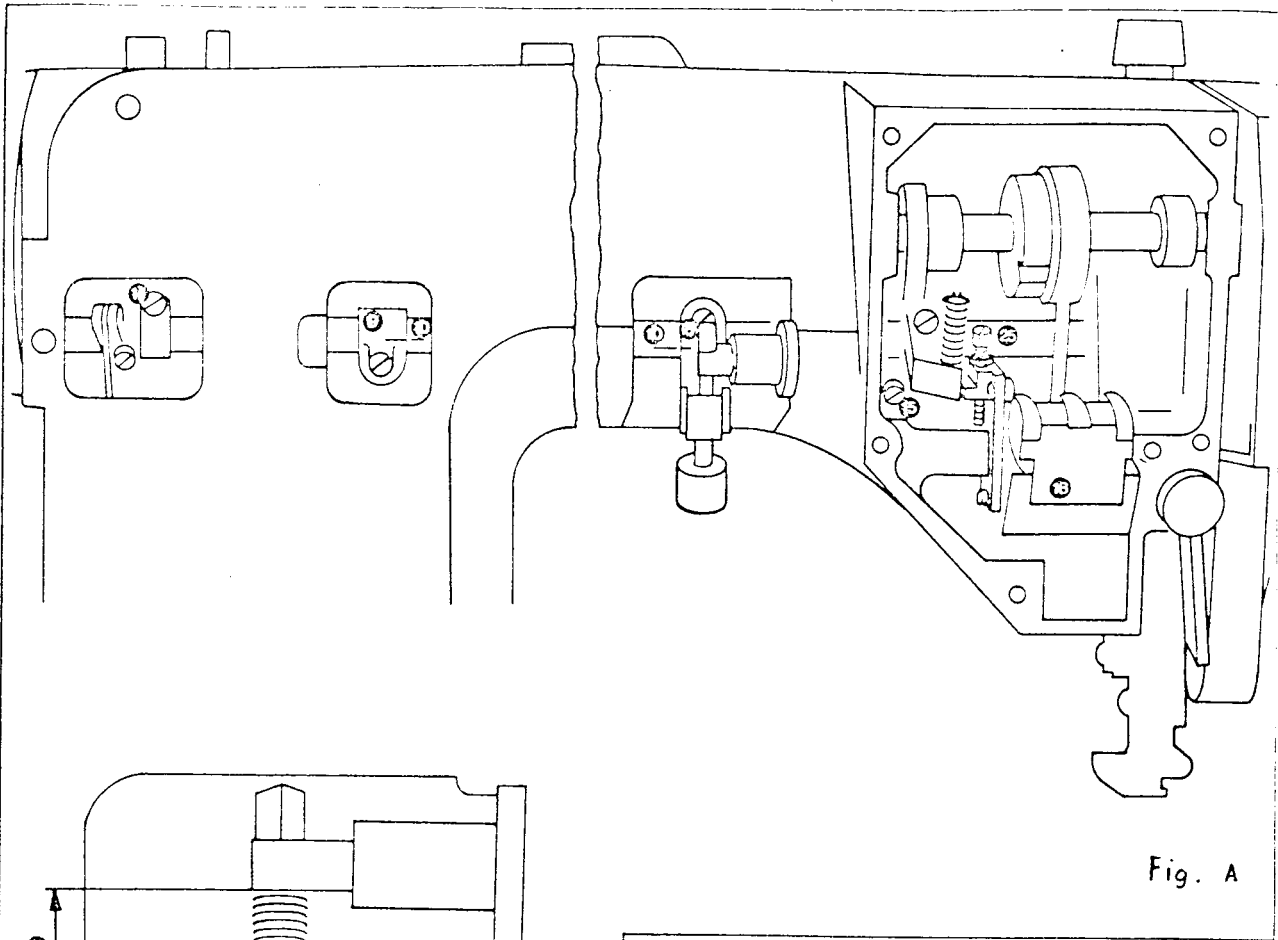


Fig. A

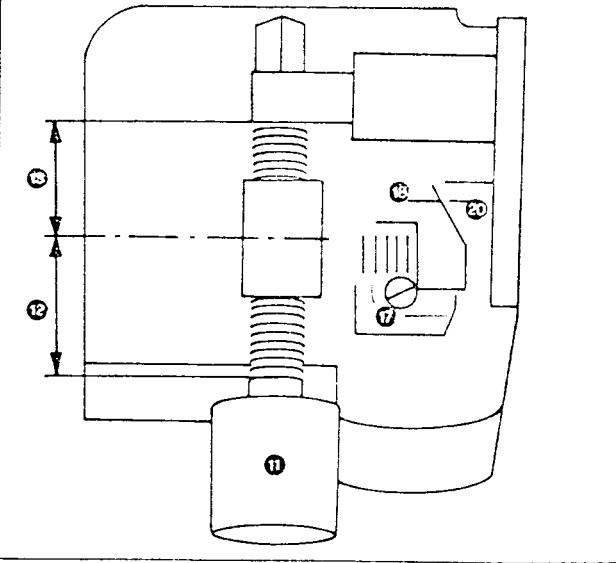


Fig. C

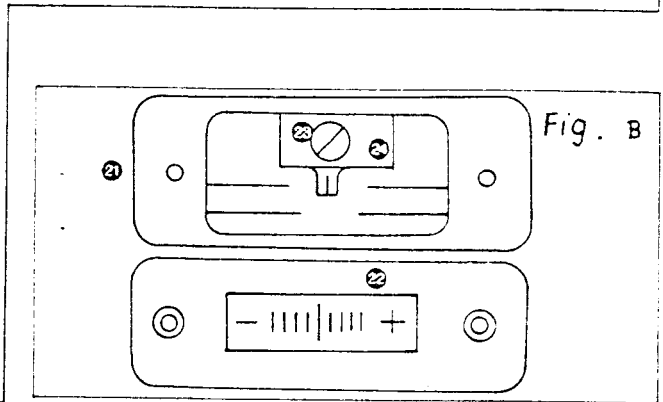


Fig. B

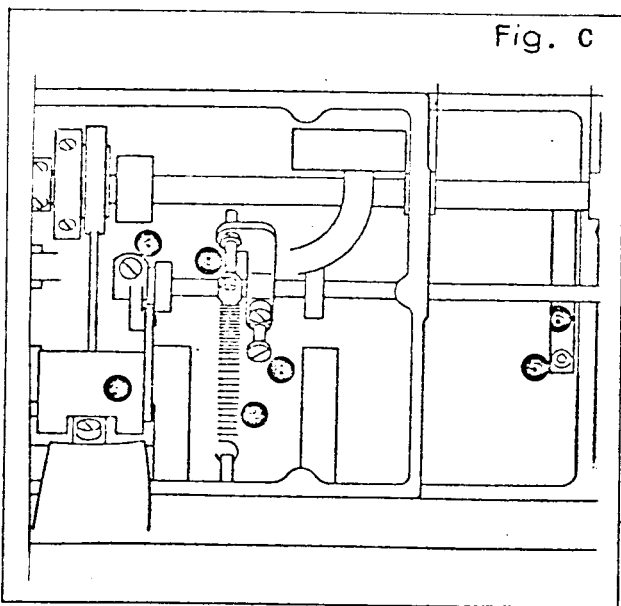
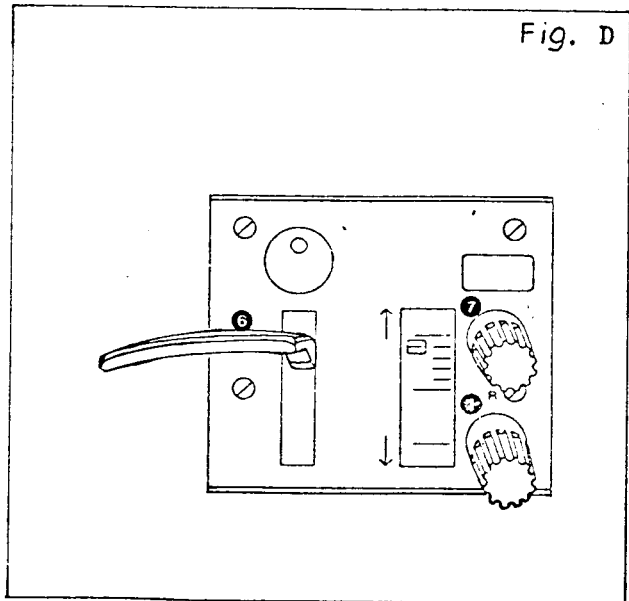


Fig. D

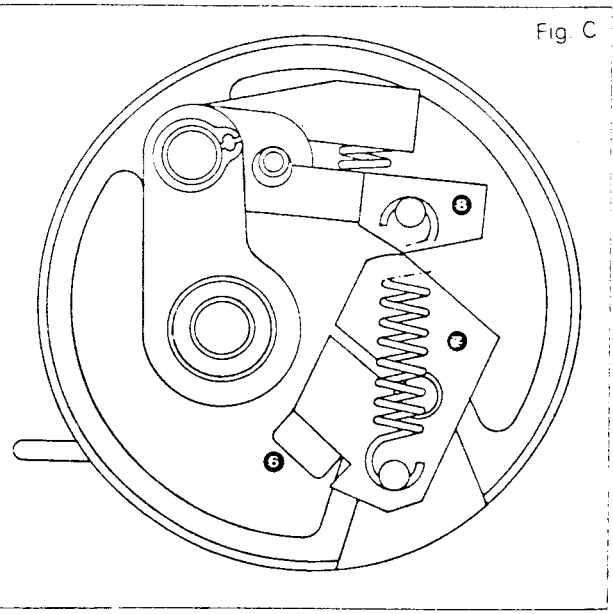
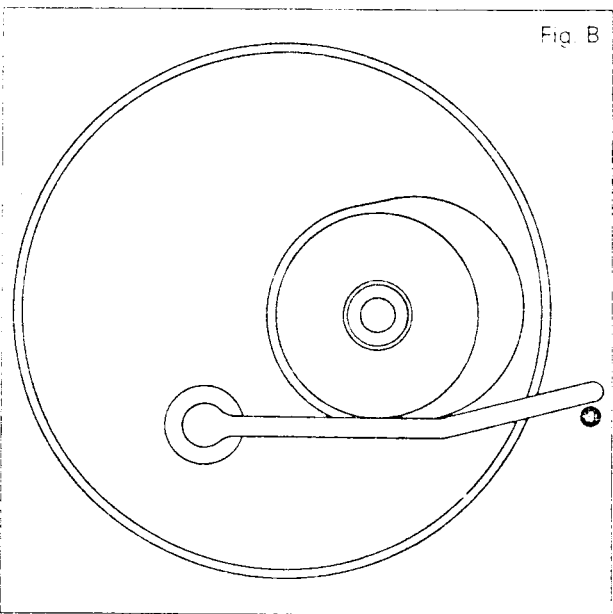
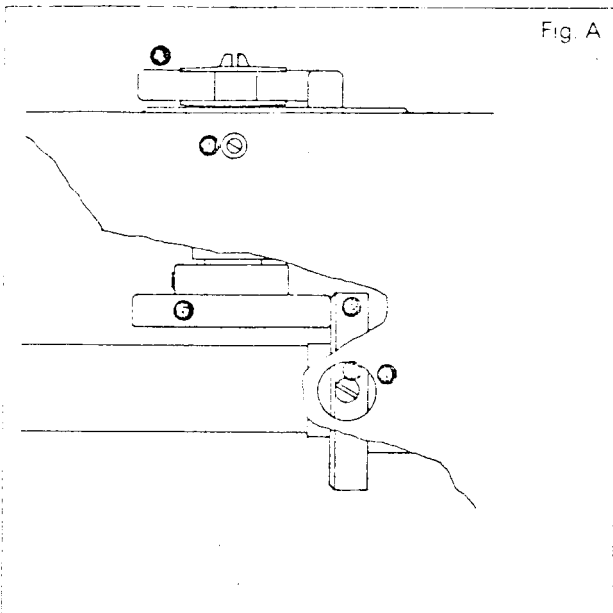


Bobbin Winder Drive Wheel Fig. A

1. Loosen screws ① in bobbin winder drive wheel ② through opening ③ in rear of machine arm.
2. Press lever ④ to engage bobbin winder.
3. Shift bobbin winder drive wheel ② so that it contacts bobbin winder friction wheel ⑤.
4. Tighten screws ①.

Bobbin Winder Figs. A, B and C

1. Loosen screw ①.
2. Remove entire bobbin winder from machine arm.
3. Place empty bobbin on bobbin winder spindle.
4. Press lever ④ in until its inner edge is even with the outside diameter of bobbin as illustrated.
5. Loosen pinch screw ②.
6. Turn engaging segment ③ so that it is just released by lever ④.
7. Tighten pinch screw ②.
8. Replace bobbin winder in machine arm.
9. Tighten screw ①.

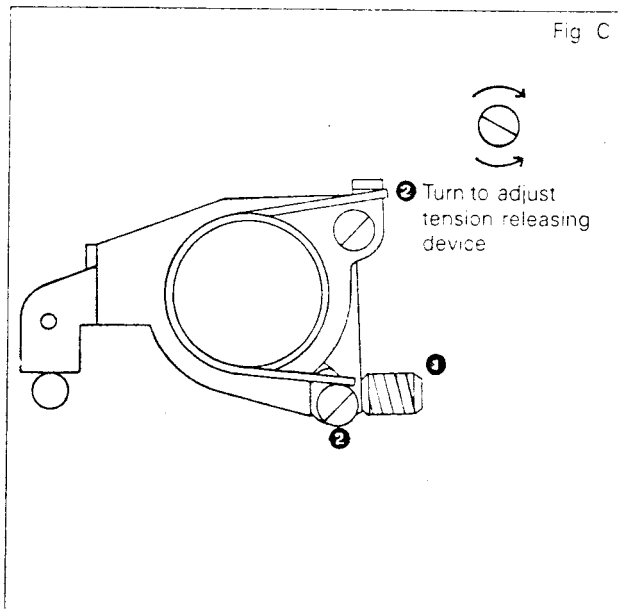
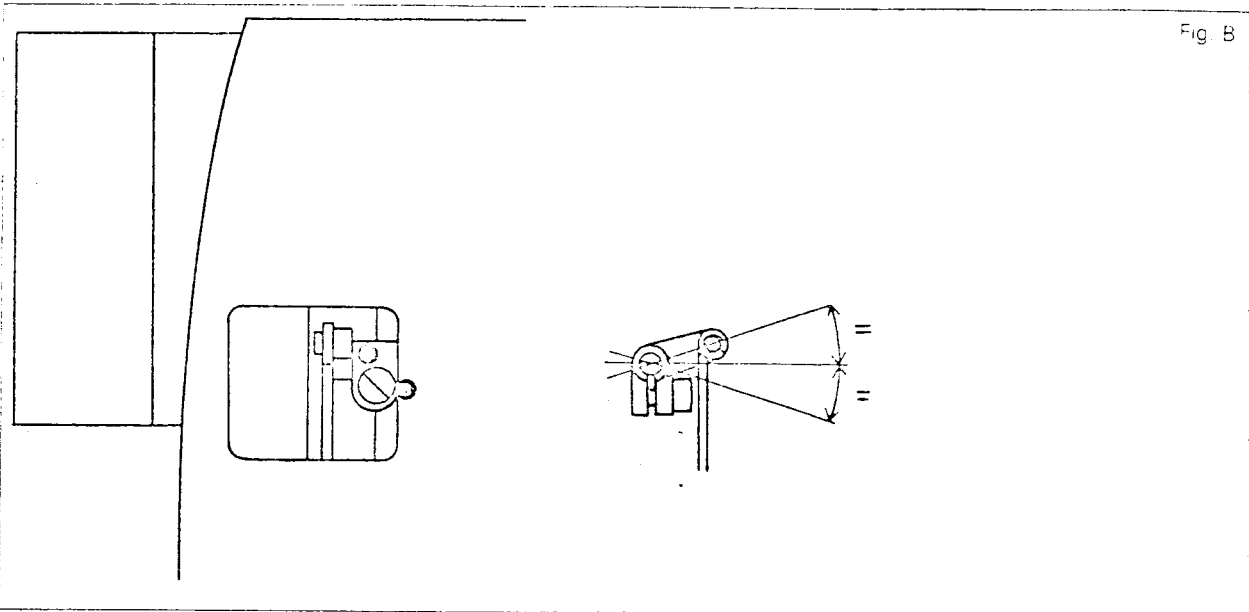
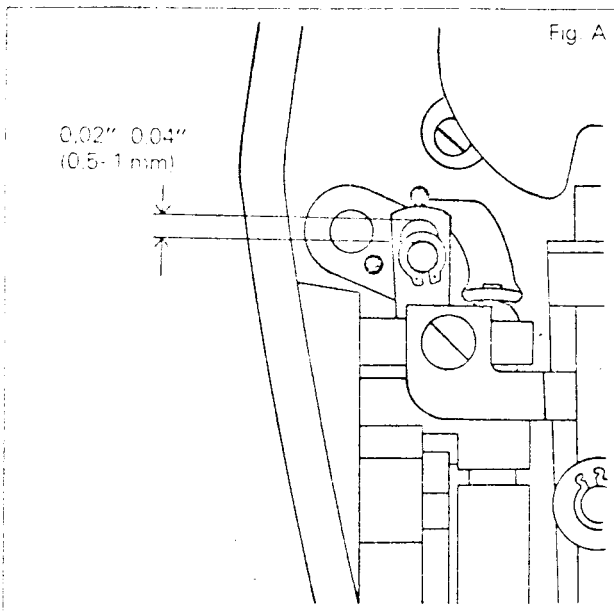


Knee Lifter Shaft Figs. A,B.

When the presser foot is resting on the throat plate (and the feed dog is below the throat plate) the clearance between the end of the slot in link ❶ and the pin in crank ❷ should be 0.02 to 0.04 inches (0.5 mm - 1.0 mm). This distance can be adjusted after loosening pinch screw ❸ in crank ❹. At the same time the angle through which crank ❹ turns when raising the presser foot with the knee lifter should be adjusted so that it is equally divided on both sides of the horizontal center line of the knee lifter shaft as illustrated in the diagram. Retighten pinch screw ❸.

Tension Releasing Device Fig. C.

To adjust the tension releasing device, raise the presser foot manually, loosen set screw ❶ and turn the pin ❷ until the tension discs separate and the tension is released. Retighten set screw ❶.



Adjustment of the Needle Bar Frame

Frame Fig. A

The adjustment of the needle bar frame serves the exact centering of the needle in the stitching hole of the throat plate.

- 1 Remove the plate and presser foot
- 2 Insure that the throat plate is properly seated in the machine bed
- 3 Insert a new needle
- 4 Loosen screw ① and ②
- 5 Shift the needle bar frame to the front or back for the necessary adjustment
- 6 Tighten screw ①
- 7 Tighten screw ②
- 8 For the lateral adjustment of the needle bar frame loosen the screw ③ and ④
- 9 Turn set screw ⑤ counter-clockwise to shift the needle bar frame to the left or clockwise if it is to be shifted to the right
- 10 Tighten screw ③
- 11 Tighten screw ④
- 12 Replace presser foot and face plate

