

# Service Manual

**SINGER**<sup>\*</sup>  
INDUSTRIAL PRODUCTS

# 212

**U141A**

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## DESCRIPTION OF MACHINES

High speed two needles, long arm, lock stitch, compound feed, vertical axis hook, flat bed machine, for corsets, overalls and clothing generally.

### GENERAL FEATURES

The compound feeding mechanism which consists of a needle feed and drop feed, prevents slipping of the upper and lower plies of material when being stitched, and assists in two or more plies being fed evenly to the end of seam.

Vertical axis hook with metered lubrication. Hooks can be removed without disturbing the hook shafts.

Adjustable feed driving eccentric located on hook driving shaft, produces a uniform stitch length at all speeds.

Feed reversing mechanism, controlled by hand or foot.

Arm shaft, hook shaft, and belt driven bed shaft are mounted in ball bearings at rear and in automatically lubricated plain bearings at front.

Plunger for changing length of stitch is on top surface of bed.

Sleeve type take-up.

Belt drive.

Knee lifter.

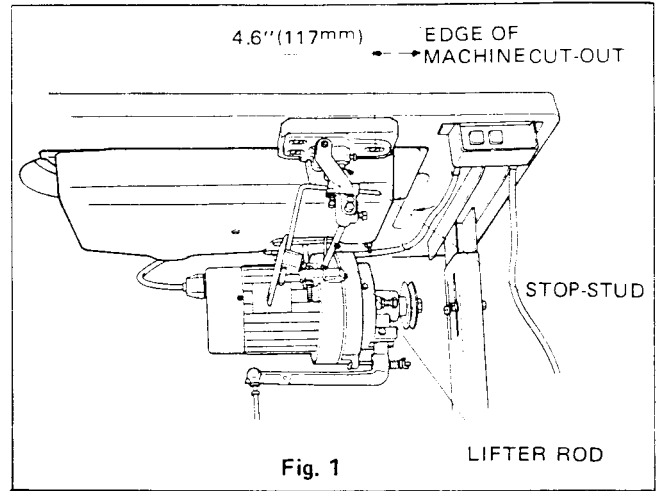
Federal stitch type 301.

## SPECIFICATIONS

Needle bar stroke	1-5/16" (33.34 mm)
Take-up stroke	2.079" (52.8 mm)
Clearance under presser foot	1/4" (6.35 mm)
Maximum stitch length	6 SPI (4.2 mm)
Maximum speed	4,000 SPM
Bed length	20-3/8" (517.5 mm)
Bed width	7" (177.8 mm)
Space at right of needle	9-5/8" (244.5 mm)
Needle	Cat. No. 1901
Oil	Type "A" or "C"

## INSTALLATION

Fasten drip pan to table with its right edge in line with machine belt slot in table. Fasten knee lifter bracket in location shown in Fig. 1. Assemble it so that lifter rod does not strike drip pan. Screw slots in bracket provide necessary adjustment. Set stop-stud to stop the action of knee lifter as soon as presser foot is raised enough to trip hand lever.



## LUBRICATION

For the lubrication of the machine, only SINGER OIL "TYPE A or C", supplied by THE SINGER COMPANY, should be used. In order to insure proper function of the machine and to prevent any excess wear of the moving parts and bearings, the machine should be oiled regularly. In case of continuous use, it should be oiled even more often if it is used to produce long seams and run steadily.

Fill machine arm reservoir to high mark on oil sight gauge as indicated in Fig. 2.

The machine arm reservoir contains an oil vibrating pump which releases oil only when the machine is operating.

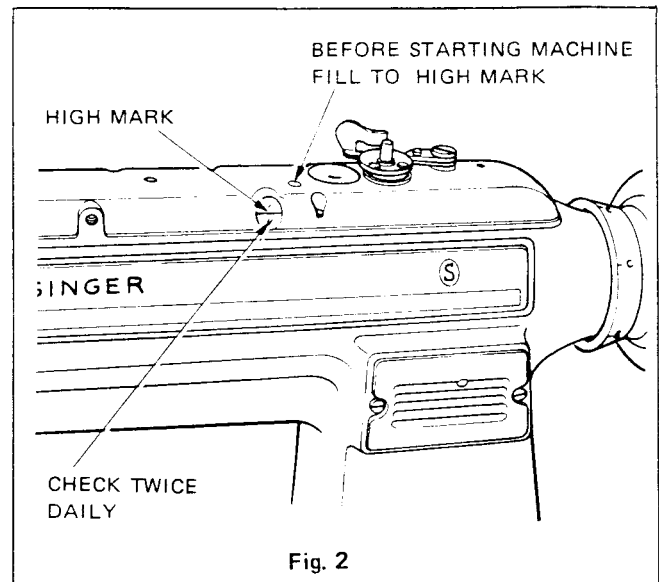
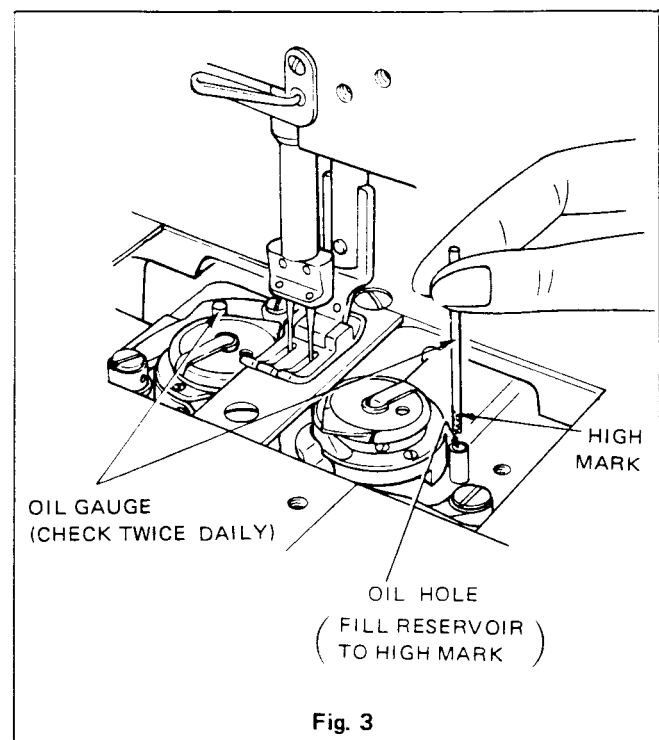


Fig. 3 shows the oil filler hole for hook saddle reservoirs. Remove oil gauges as shown in Fig. 3 and fill hook saddle reservoirs to full mark on gauges.

To lubricate the hook gears and opener gears, a generous supply of oil should be applied AT LEAST TWICE DAILY to the two oil holes.



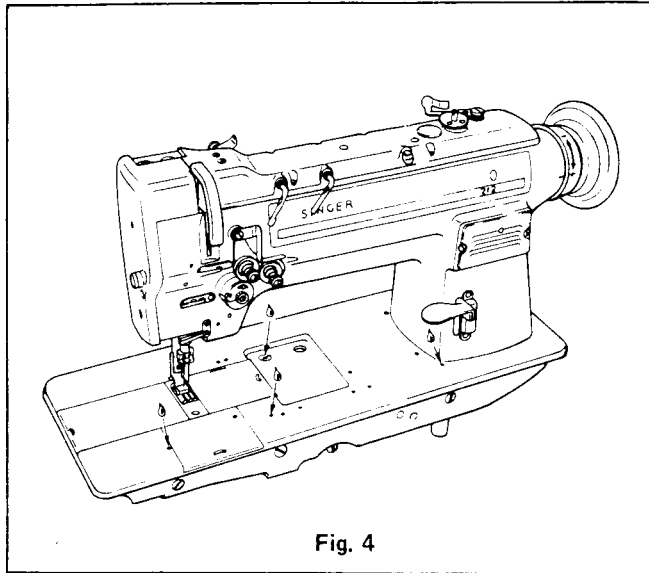


Fig. 4

Fig. 4 shows the areas of the bed surface to where oil should be applied.

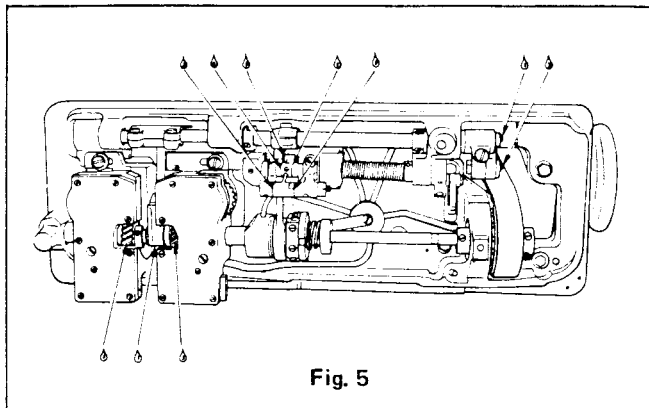


Fig. 5

Fig. 5 shows the areas of bottom of the bed to where oil should be applied.

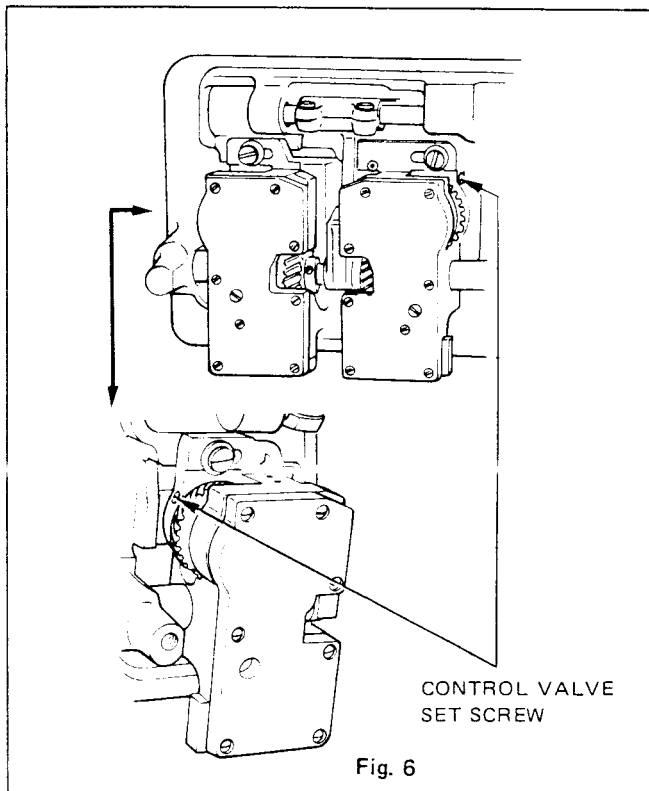


Fig. 6

## HOOK LUBRICATION

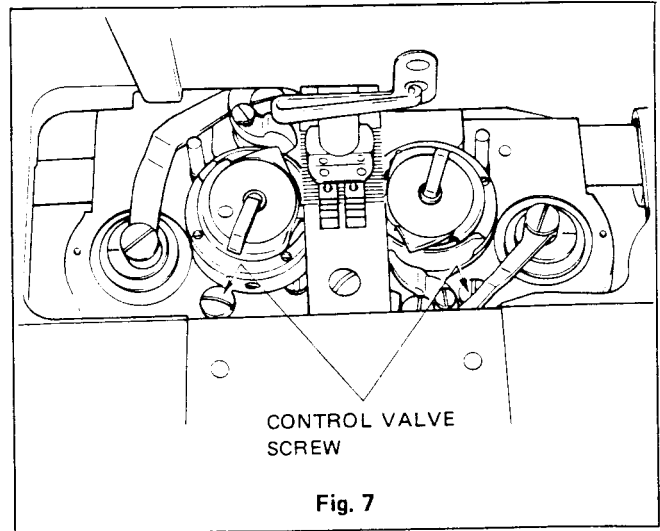
The bobbin case raceway is lubricated by oil pumped from the hook saddle reservoir while the machine is operating. The amount of oil received by hook raceway is very important. To check this, first remove bobbin case. Then with the machine running, hold a small piece of white paper near the hook for about 10 seconds. A distinct spray of oil should be visible on the paper.

If there is no trace of oil or an excess of oil on the paper, proceed with the following steps:

1. Tip machine and loosen control valve set screw shown in Fig. 6 and return machine to upright position.

2. Turn control valve screw shown in Fig. 7 clockwise for more oil; counterclockwise for less oil. Re-tighten control valve set screw.

A short test run of at least a minute should be made between adjustments to insure uniform oil flow. After each adjustment of oil control valve screw, oil control valve set screw should be securely tightened.



## SPEED

Maximum speed for machine 212U141 is 4000 stitches per minute.

## NEEDLES

For machine 212U141, use Singer Needles, Catalog 1901.

Size of needle for a particular operation is determined by size of thread and type of material to be sewn.

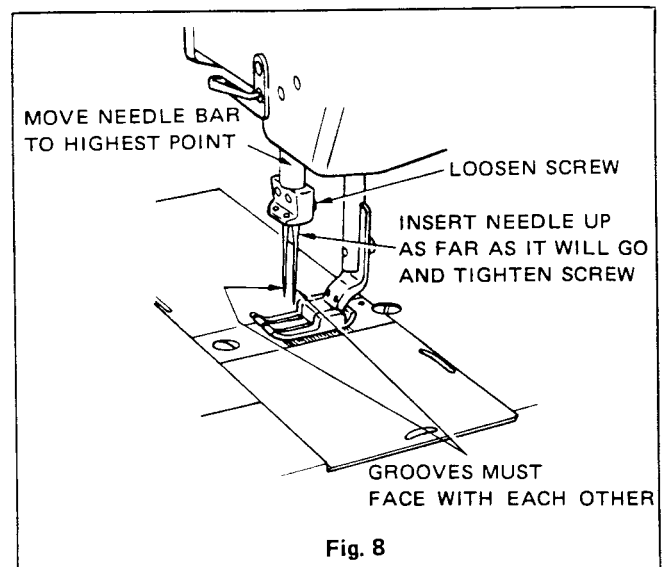
Orders for needles should state quantity required, size number and catalog number.

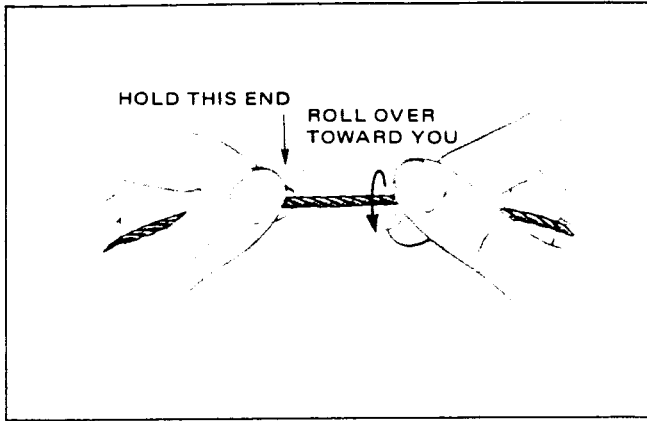
For example:

100 Needles, Size 14, Catalog 1901

## SETTING THE NEEDLES

Turn the machine pulley over toward you until the needle bar moves up to its highest point. Loosen the set screws in the needle holder and put the needles up into the holder as far as they will go, the inside needle or the one nearest the upright part of the arm having its long groove toward the left, and the outside needle or the one farthest from the upright part of the arm having its long groove toward the right, the eyes of both needles being directly in line with the arm of the machine, then tighten the set screws.





## THREAD

It is recommended that left twist thread be used in both needles.

Either left or right twist thread can be used in bobbin.

To determine thread twist, hold thread as shown in Fig. 9. With left hand holding one end of thread, twirl other end with thumb and forefinger of right hand over toward you. If left twist thread, strands will wind tighter. If right twist thread, strands will unwind or separate.

## UPPER THREADING

Turn machine pulley over toward you until needle bar is at highest position.

Draw about 2 inches of thread through needle eye to start sewing.

Pass thread through threading points as indicated in Fig. 10.

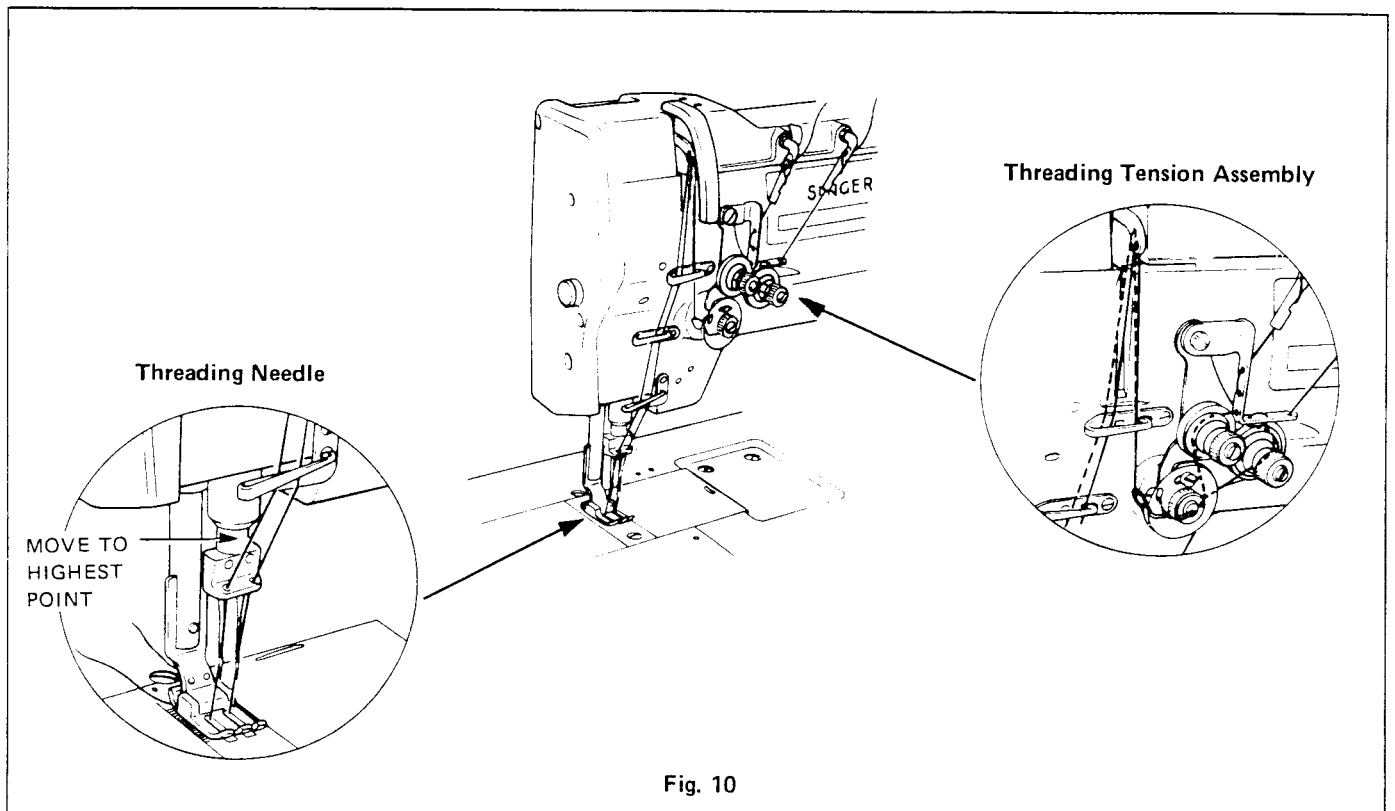


Fig. 10

## LOWER THREADING

### BOBBIN REMOVAL

1. Open slide plates in bed of machine
2. Turn machine pulley over toward you until needle bar reaches highest position.
3. Raise bobbin latches and lift out bobbins as indicated in Fig. 11.

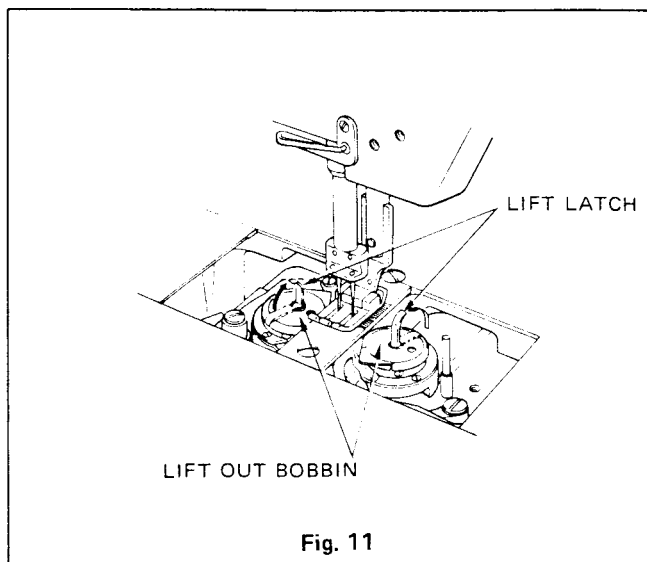


Fig. 11

### BOBBIN WINDING

Place bobbin on spindle as far as it will go.

Pass the thread from the thread unwinder through threading points as shown in Fig. 12.

Wind end of thread around the bobbin a few times. Press latch against bobbin, then start the machine.

The bobbin winder will stop automatically when the amount of thread for which it is regulated is wound upon the bobbin. For more thread on bobbin, loosen screws and swing latch away from bobbin, for less thread on bobbin, swing latch toward bobbin.

Tighten screws.

If the thread does not wind evenly, loosen lock nut and turn tension bracket up or down, as required, then tighten lock nut.

Bobbins can be wound while the machine is sewing.

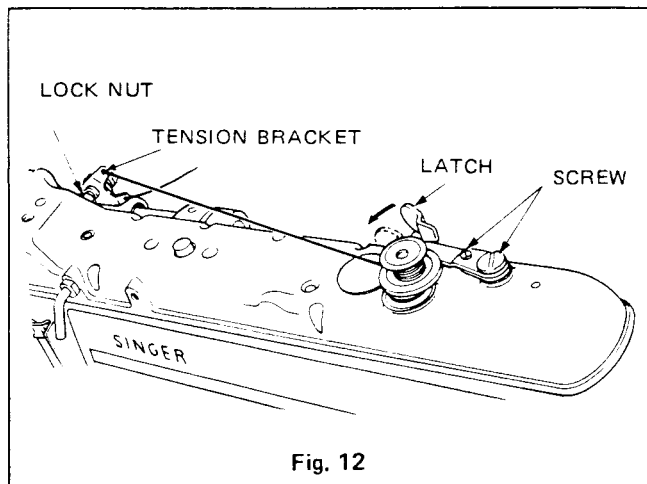


Fig. 12

### TO REPLACE THE BOBBIN AND THREAD THE BOBBIN CASES

The following instructions apply to both bobbin cases:

Hold the bobbin between the thumb and forefinger of the right hand with the thread from the bobbin as shown in Fig. 13, place it on the center stud of the bobbin case, then push down the latch as shown. Draw the thread into the slot 1 in the edge of the bobbin case and back of the projection 2, leaving a loose end of thread about two inches long above the slide. When closing the slides, leave just enough space for the threads to pass through.

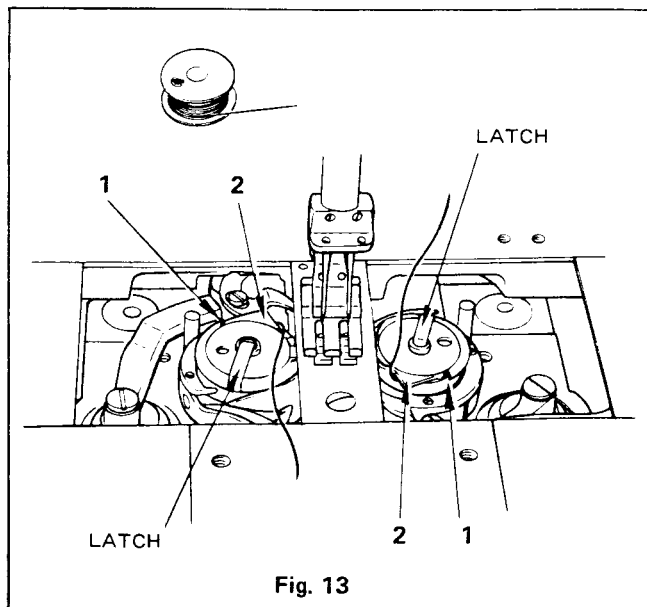


Fig. 13



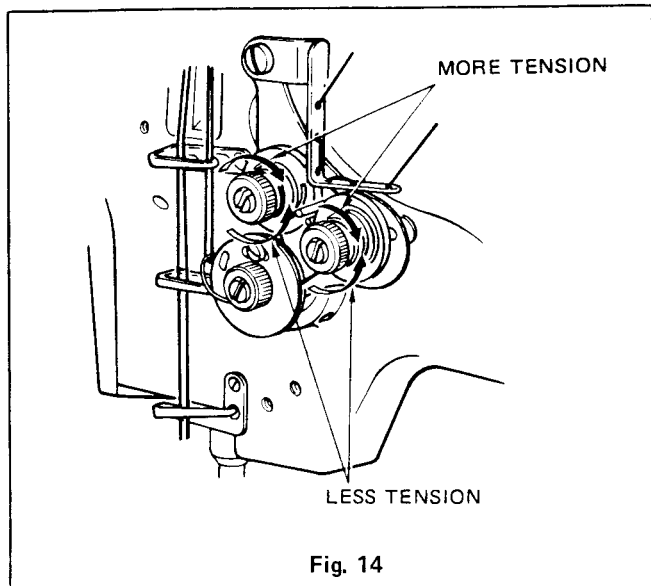


Fig. 14

## THREAD TENSIONS

Tension on thread should be as light as possible yet sufficient to correctly set stitches in material.

### NEEDLE THREAD TENSION

Regulate needle thread tension only when presser foot is down. To increase tension, turn thumb nut shown in Fig. 14, clockwise. To decrease tension turn thumb nut counterclockwise.

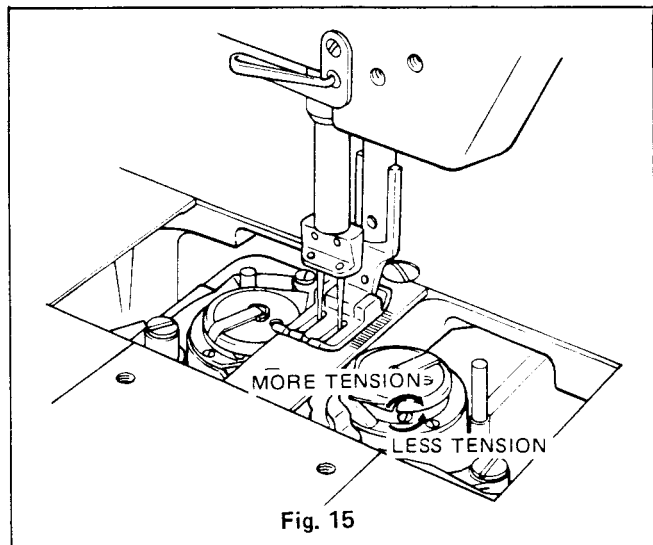


Fig. 15

### BOBBIN THREAD TENSION

Bobbin thread tension is regulated by the screw nearest to the center of tension spring on the outside of the bobbin case shown in Fig. 15. Turn machine pulley slowly until screw is accessible. To increase tension, turn screw inward. To decrease tension, turn screw outward.

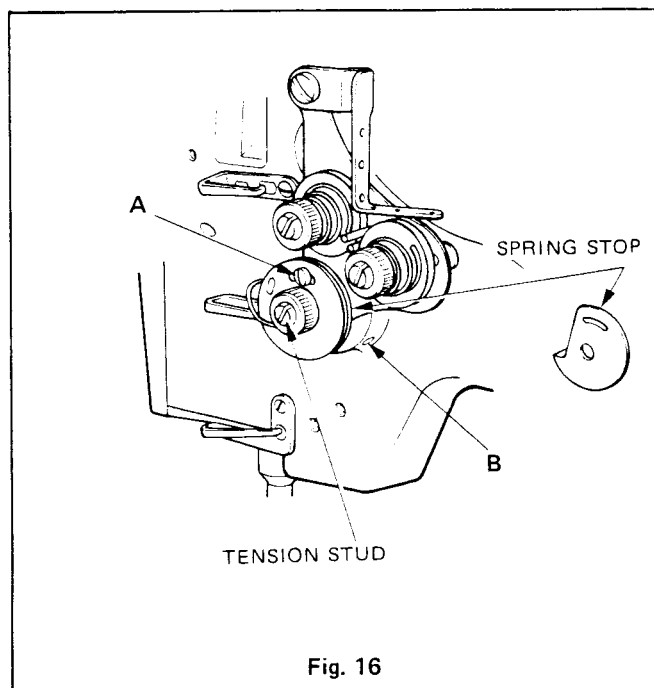


Fig. 16

### THREAD CONTROLLER

The thread controller should draw up slack thread before needle point enters fabric to prevent needle from penetrating thread.

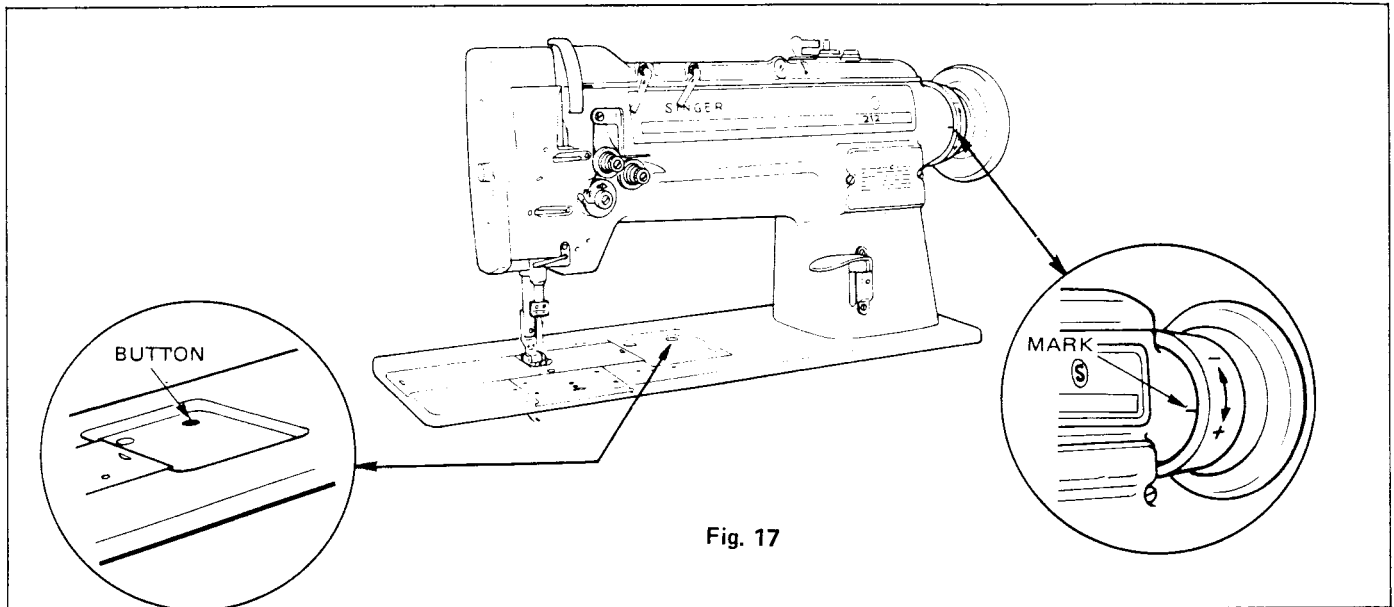
To adjust thread controller, loosen set screw A, shown in Fig. 16. Turn thread controller spring stop counterclockwise for more controller action on thread or clockwise for less action. Tighten set screw A.

Thread controller action TENSION should be increased for heavy thread and decreased for light thread.

To adjust thread controller action tension, loosen set screw B shown in Fig. 16. Turn tension stud slightly counterclockwise for more tension or clockwise for less tension. Tighten set screw B.

## STITCH LENGTH REGULATION

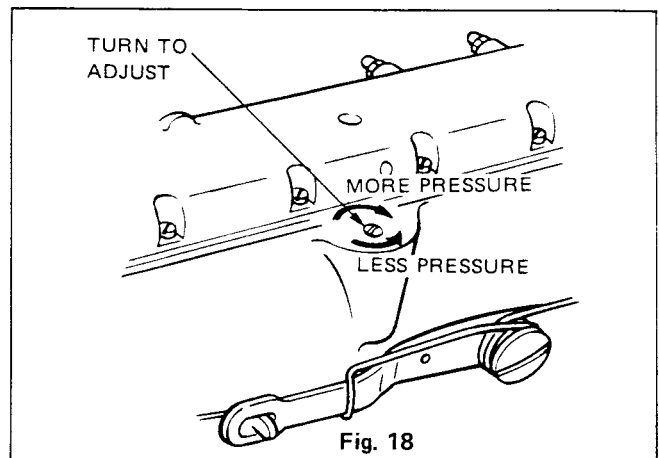
1. With machine OFF, depress button shown in Fig. 27 on bed surface. NEVER DEPRESS BUTTON WHEN MACHINE IS ON.
2. Turn machine pulley over toward you slowly until button drops (snaps) into position.
3. Turn machine pulley in direction (+) when a longer stitch is desired (less SPI) and in direction (-) when a shorter stitch is desired (more SPI).
4. Release button. NEVER START MACHINE UNTIL BUTTON IS RELEASED.



## PRESSURE ON MATERIAL

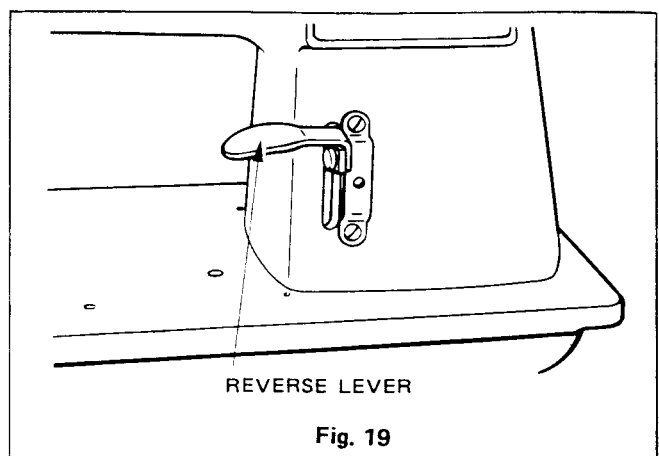
Pressure of presser foot on material should be as light as possible while being sufficient to insure correct feeding.

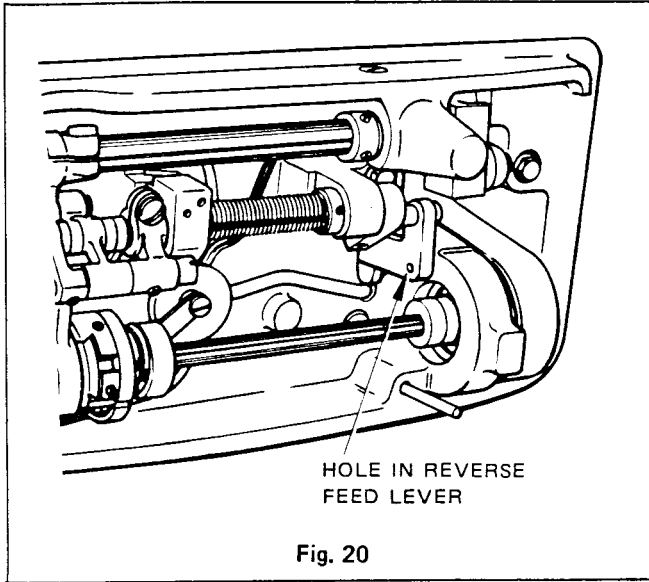
Pressure is regulated by screw shown in Fig. 18 at rear of machine arm. Turn screw downward to increase pressure or upward to decrease pressure.



## REVERSE FEED MECHANISM

To reverse feed direction by hand, push reverse lever completely down in order to have same stitch length as in forward stitching position.





To reverse the feed with foot treadle, the foot treadle chain should be connected to hole in reverse feed lever shown in Fig. 20.

Release hand lever or foot treadle only when you wish to resume forward stitching.

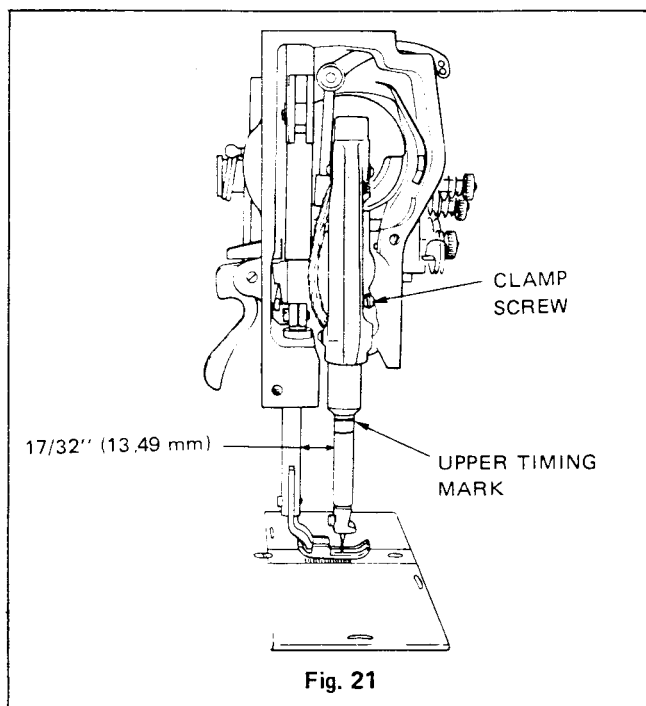
## ADJUSTMENTS

### SETTING NEEDLE BAR 211U157

When needle bar is at lowest position of its cycle, the correct gauge distance from throat plate seat to needle stop in needle bar is .991 inch (25.16 mm).

Needle bar is correctly set when, at the lowest position of its cycle, the upper timing mark is just visible at lower edge of needle bar frame as shown in Fig. 21.

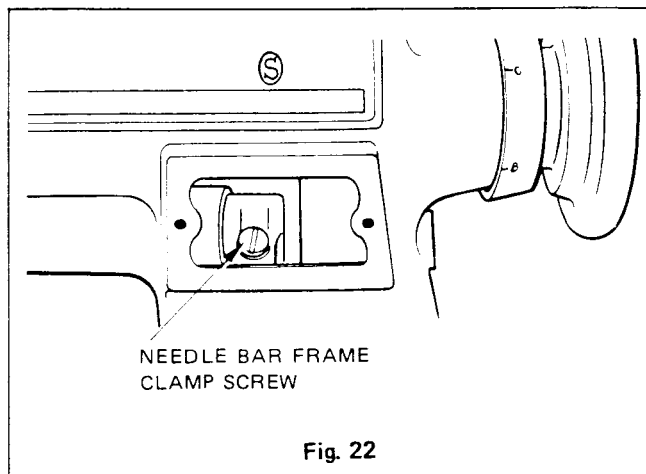
If needle bar is not correctly set, loosen needle bar connecting stud clamp screw shown in Fig. 21 and correct needle bar position. Re-tighten needle bar connecting stud clamp screw.



### DISTANCE OF NEEDLE BAR FROM PRESSER BAR

The distance between needle bar and presser bar (after regulating stitch length so that there is no feed movement) should be  $.17/32''$  (13.49 mm) as shown in Fig. 21.

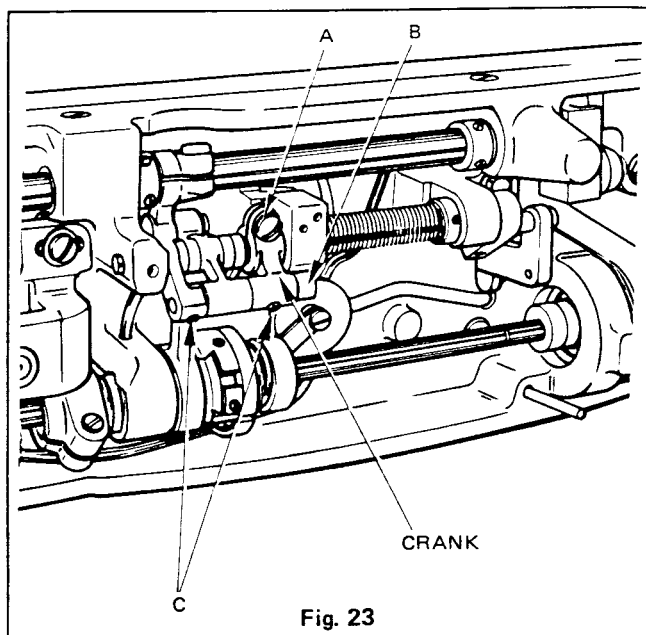
If the distance between needle bar and presser bar is more or less than .551 inch (14.0 mm), first turn machine pulley over toward you until needle bar is at highest position. Remove cover plate from front of machine arm. Loosen needle bar frame clamp screw shown in Fig. 22. Move needle bar frame forward or backward to correct its position. Re-tighten clamp screw.



### ADJUSTING FEED REVERSING MECHANISM

Adjust stitch length to 6 stitches per inch on the 212U141 machine. Loosen screw A and adjust crank shown in Fig. 23 so that the above stitch length can be obtained.

When you depress the reversing lever, the eccentric head of the bearing pin B should rest against the bearing block. Loosen set screws C and turn bearing pin B until the stitch length is the same in reverse feed as in forward feed. Tighten all screws.



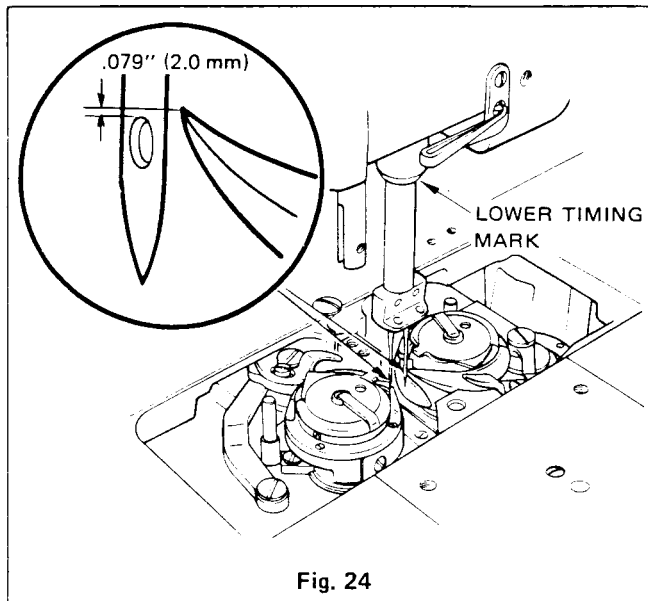


Fig. 24

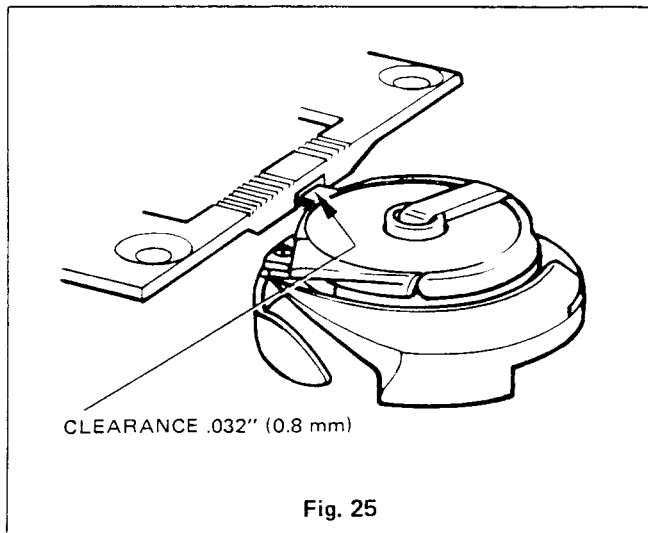


Fig. 25

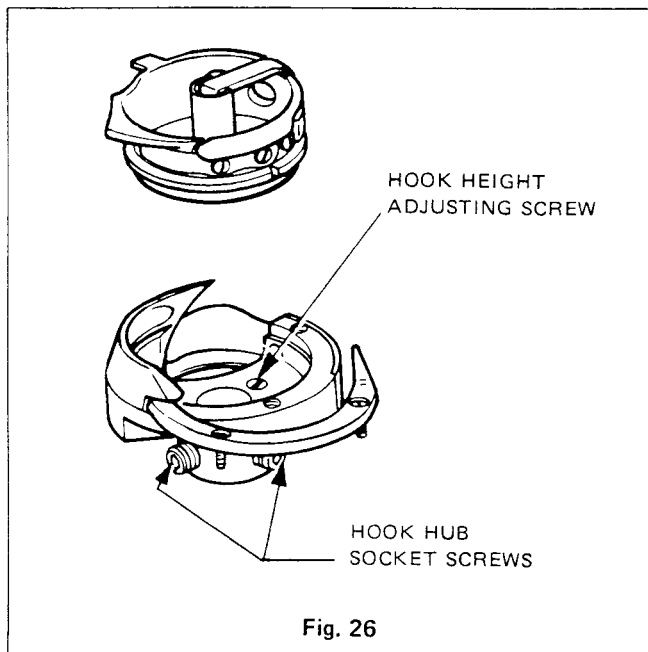


Fig. 26

## ADJUSTMENT OF SEWING HOOK HEIGHT

When lower timing mark on needle bar is just visible at lower end of needle bar frame on upward stroke of needle, the hook should pass about .079 inch (2.0 mm) above upper edge of needle eye as shown in Fig. 24.

And the clearance between bobbin case stop finger and throat plate should be .032 inch (0.8 mm), as shown in Fig. 25.

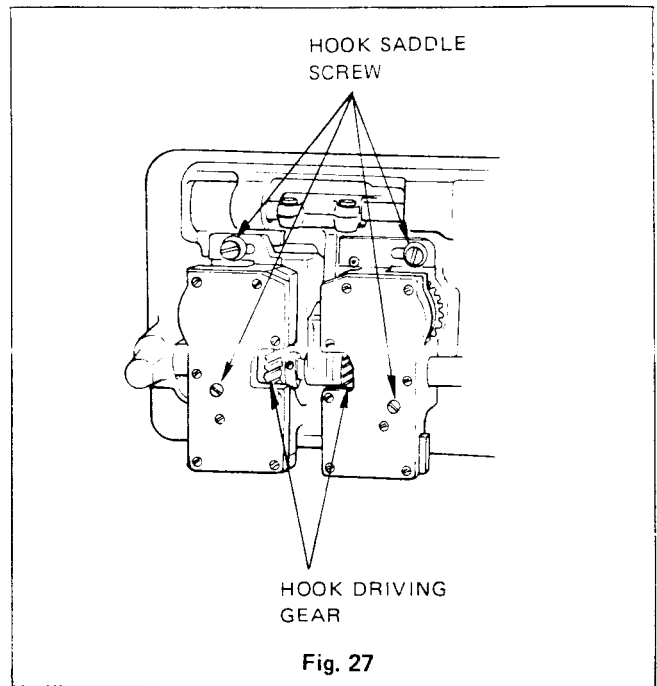
## TO ADJUST HEIGHT OF SEWING HOOK

To adjust height of sewing hook, first fasten throat plate to bed of machine and place bobbin case stop finger in sewing position. Pass a .032 inch (0.8 mm) shim between bobbin case stop finger and throat plate. If shim is too tight or too loose, turn machine pulley over toward you so that the hook hub socket screws shown in Fig. 26 are accessible with a socket wrench. Loosen both screws and remove cloth washer from bobbin case. Turn hook until one of the holes is in line with hook height adjusting screw. To raise hook, turn hook height adjusting screw downward. To lower hook, turn hook height adjusting screw up. Retighten socket screws and turn hook height adjusting screw again just enough to leave a light tension. Check sewing hook timing.

## ADJUSTMENT OF DISTANCE BETWEEN SEWING HOOK AND NEEDLE

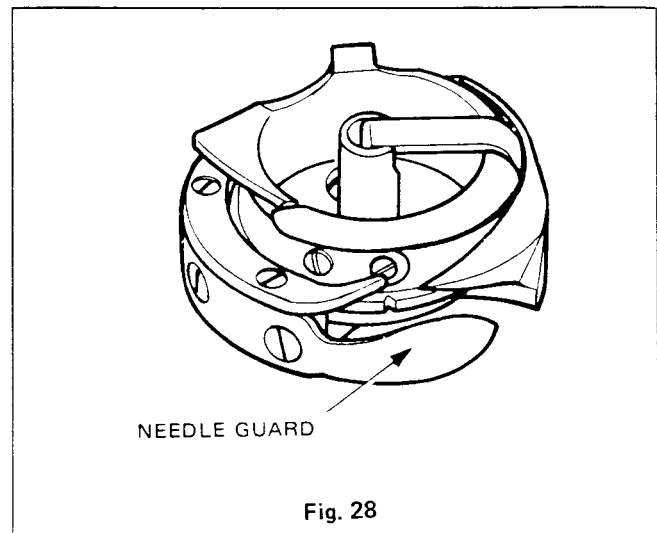
To prevent hook point from dividing strands of thread, it should pass as near to the needle as possible without hitting it.

Turn machine pulley over toward you until sewing hook point is in the position nearest to needle. Tip machine and loosen hook saddle screws shown in Fig. 27. Adjust hook saddle until hook point is as close to needle as possible without hitting it. Retighten hook saddle screws. BE SURE HOOK DRIVING GEAR SHOWN IN FIG. 27 IS CORRECTLY SET WITH RELATION TO FACE OF HOOK SADDLE. USE .008 INCH (0.2 mm) SHIM.



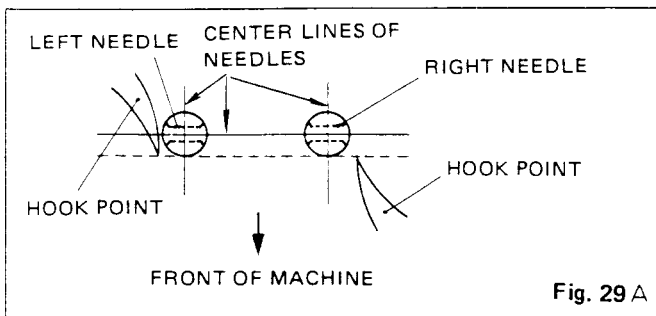
## NEEDLE GUARD

The function of the needle guard shown in Fig. 46 is to prevent hook point from striking needle, if needle is deflected after penetrating material. The needle guard can be bent with a pair of pliers, if necessary, but care should be taken to prevent guard from interfering with normal path of needle.

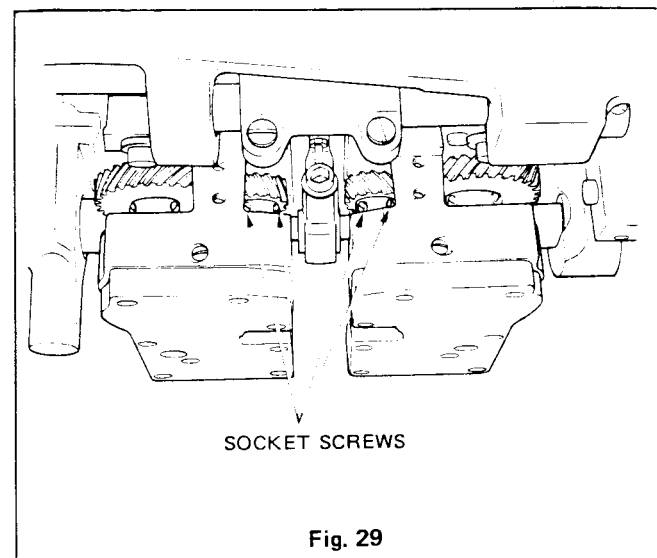


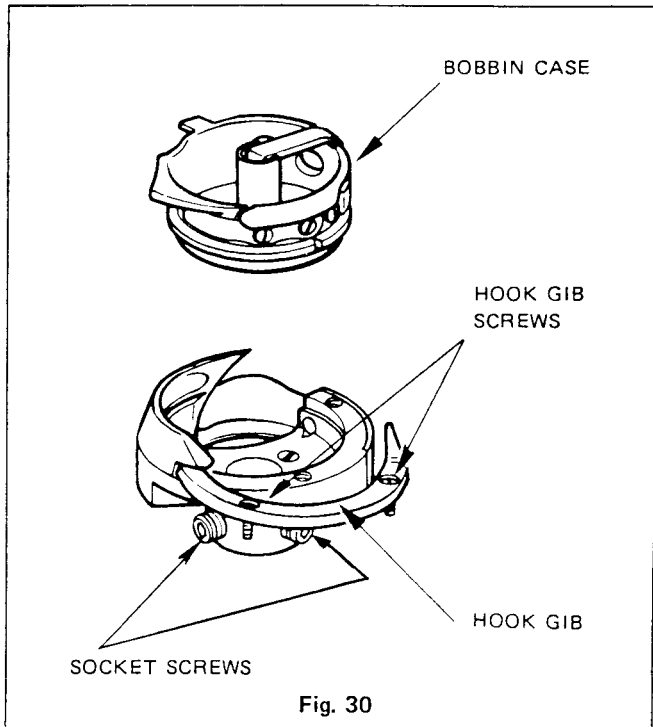
## TIMING THE SEWING HOOK

Set feed driving eccentric to eight stitches per inch. Remove throat plate and turn machine pulley over toward you until lower timing mark on needle bar is just visible at lower edge of needle bar frame on upward stroke of needle. With needle in this position, sewing hook is correctly timed if hook points are as shown on Fig. 29A.



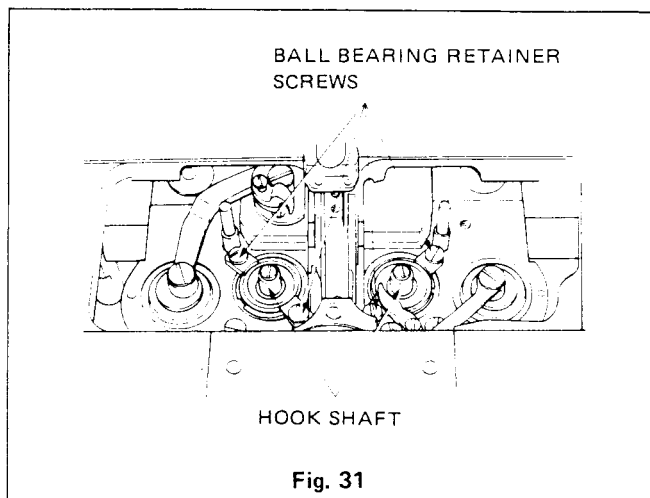
If sewing hook is not correctly timed, loosen socket screws shown in Fig. 29 and turn hook to proper timing position as specified above. Tighten socket screws.





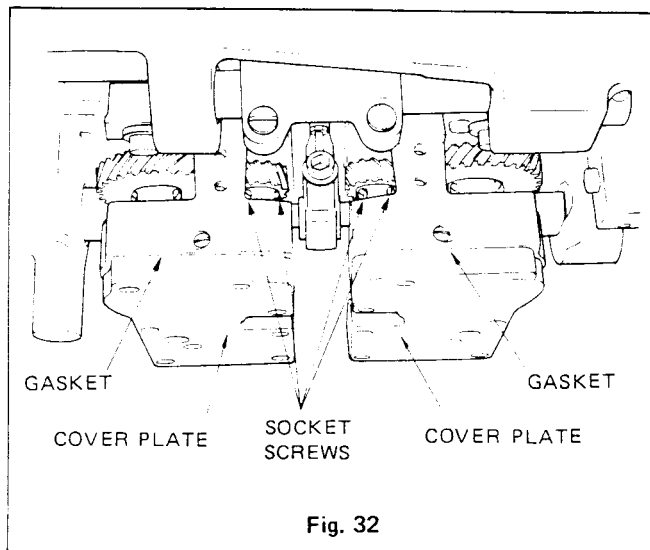
## REMOVING BOBBIN CASE FROM SEWING HOOK

Remove hook gib screws, indicated in Fig. 30, from sewing hook. Lift off hook gib and remove bobbin case.



## REMOVING SEWING HOOK FROM MACHINE

Remove presser foot, throat plate and feed dog. Loosen hook hub socket screws shown in Fig. 30. Lift hook off end of shaft.



## REMOVING HOOK SHAFT

To remove hook shaft, first remove ball bearing retainer screws directly under hook shown in Fig. 31. Tip machine back and loosen hook shaft gear hub socket screws shown in Fig. 32. Lift out shaft from top end. If shaft does not lift out easily, loosen screws in cover plate of hook saddle just enough, at first, to permit the oil to drain out. Then remove cover plate completely, being careful not to damage the gasket. Tap the end of hook shaft.

## TIMING BOBBIN CASE OPENER

Turn machine pulley over toward you until lower timing mark on needle bar is even with edge of needle bar frame on upward stroke of needle. When needle bar is in this position, reference mark A should line up with reference mark B on hook saddle, as indicated in Fig. 33. If opener shaft is out of time, tip machine back and loosen socket screws shown in Fig. 34. Return machine to upright position and turn opener driving shaft with screw drive in cap screw shown in Fig. 33. Tighten socket screws in opener driving gear hub.

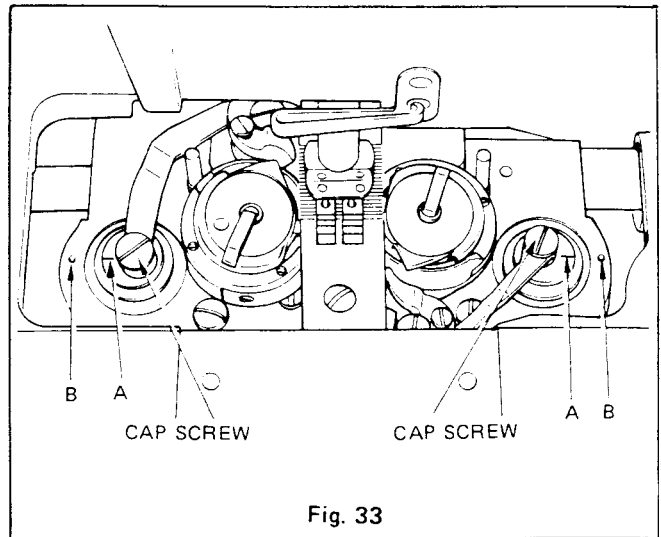


Fig. 33

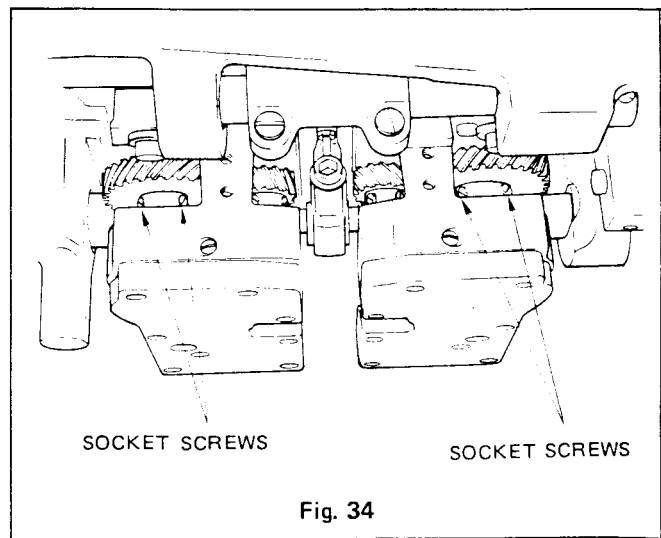


Fig. 34

## ADJUSTING BOBBIN CASE OPENER

The bobbin case opener, shown in Fig. 35, should be set so that it turns the bobbin case enough to make a sufficient opening for the free passage of thread between throat plate and bobbin case.

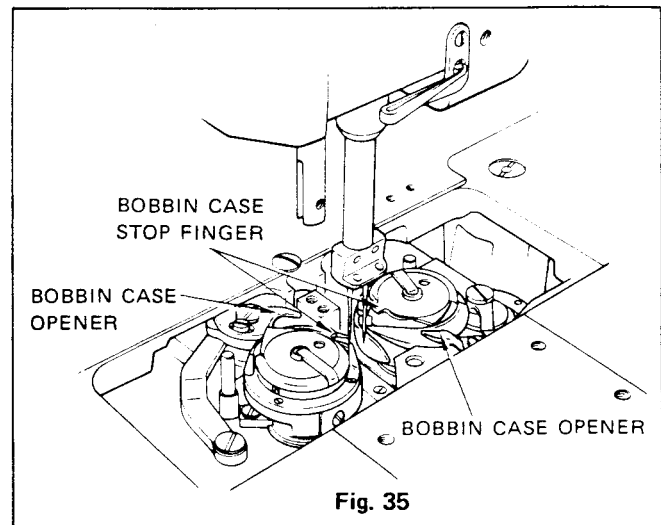


Fig. 35



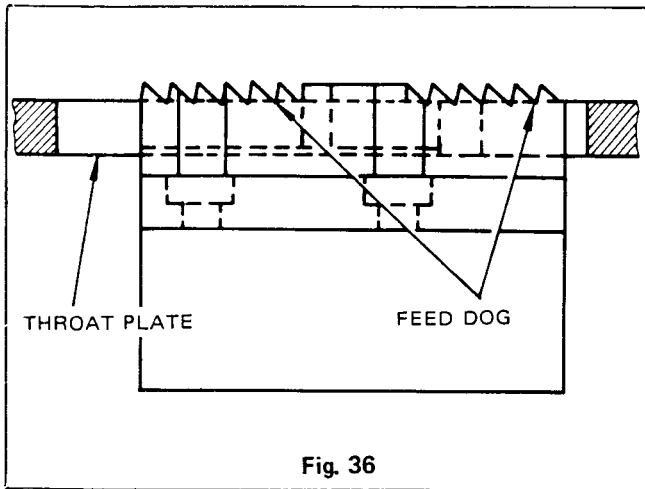


Fig. 36

## FEED DOG ADJUSTMENT

Before adjusting feed dog, regulate stitch length for longest stitch. If feed dog is correctly adjusted, all teeth should rise evenly and completely above throat plate as shown in Fig. 36.

If adjustment is required, first remove throat plate, then tip machine back and turn machine pulley over toward you until feed dog is at its highest position. Loosen fork screw shown in Fig. 37 and raise or lower feed dog to correct position. Re-tighten fork screw.

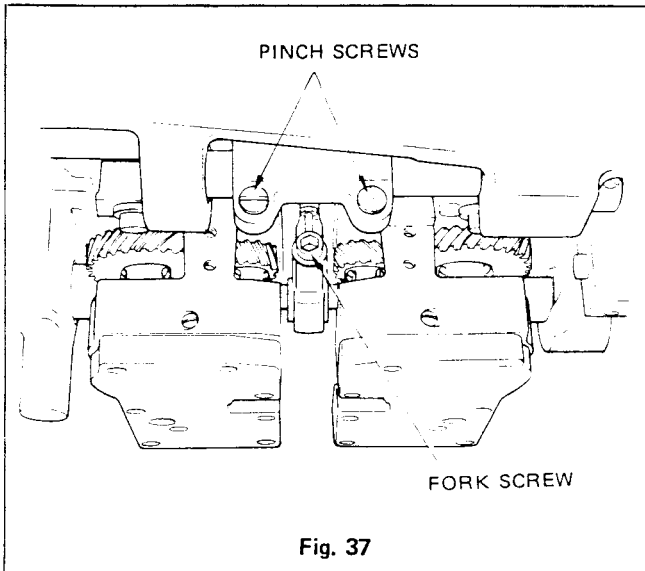


Fig. 37

Feed dog should be set so that when needle is at lowest position of cycle, it will be slightly in front of center point of needle hole in feed dog. If needle is not correctly located in needle hole, tip machine back to loosen pinch screws shown in Fig. 37 and adjust feed dog to correct position. Prior to above adjustment, check needle bar to presser bar setting.

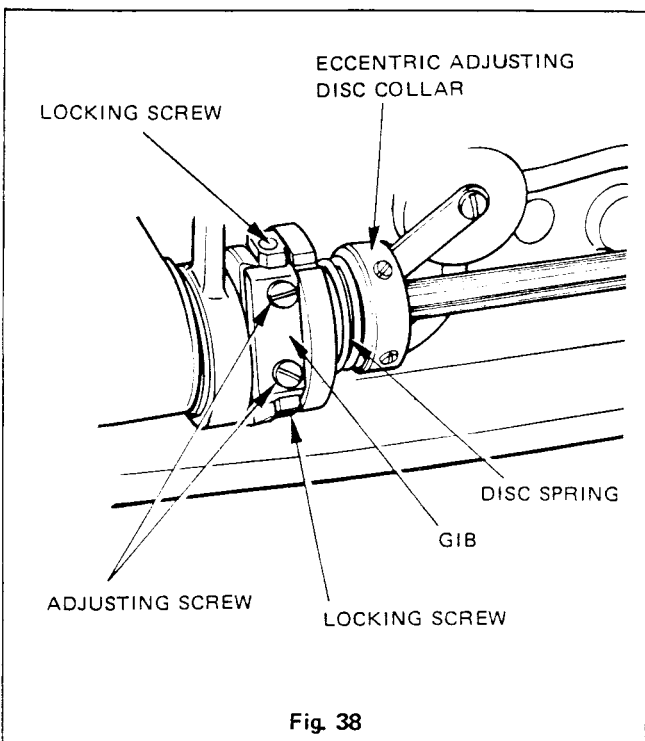


Fig. 38

## FEED ECCENTRIC ADJUSTMENT

The feed eccentric is provided with a gib which can be adjusted to take up unnecessary play between feed eccentric and eccentric body. To adjust gib, first loosen two locking screws beside gib and turn in two adjusting screws in gib until all play is eliminated and eccentric fits snugly into slot of eccentric body. Securely tighten two locking screws.

The feed driving eccentric adjusting disc spring provides pressure against feed eccentric cam to prevent it from moving out of position while the machine is operating. The disc spring collar may be moved to right or left to adjust spring pressure. Normally, collar is set flush with hub of eccentric body.

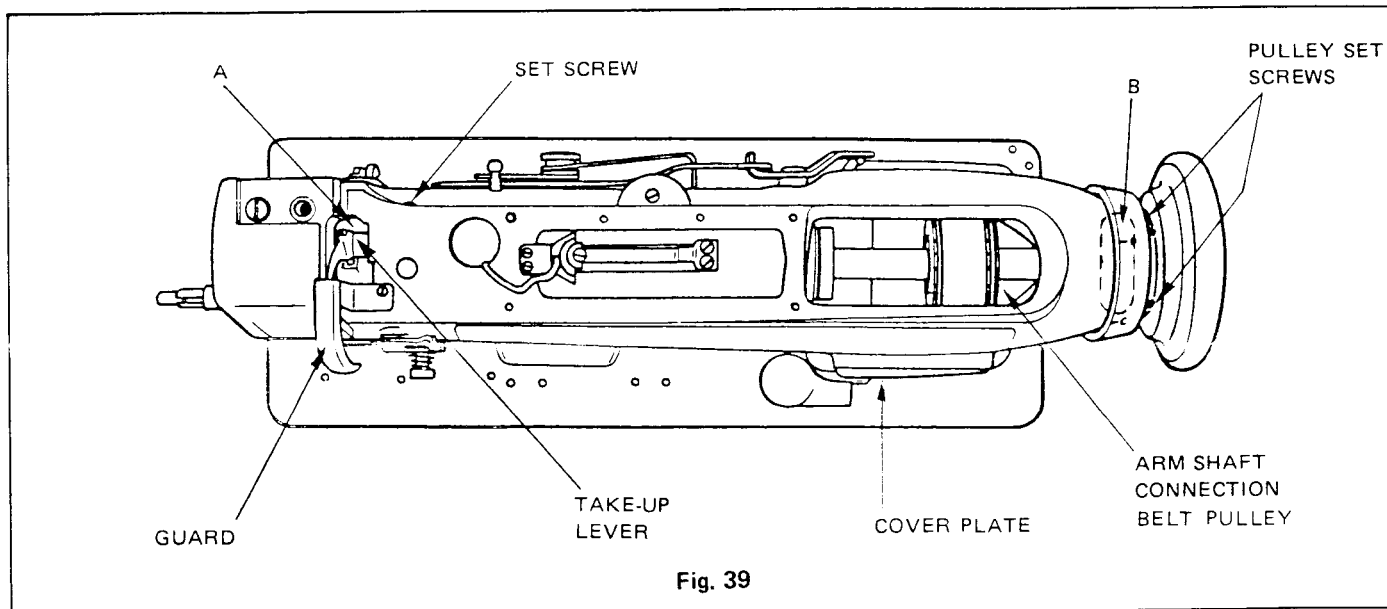


Fig. 39

### REMOVAL OF TAKE-UP LEVER

Remove arm top cover and face plate. Loosen take-up lever hinge stud set screw shown in Fig. 39. Remove take-up lever hinge stud and take-up guard. Lift take-up lever out through slot A in top of arm shown in Fig. 39.

### REMOVAL OF NEEDLE BAR ROCK FRAME

Remove face plate and arm top cover. Loosen take-up lever hinge stud set screw shown in Fig. 39. Extract take-up lever hinge stud, take-up guard and take-up lever. Remove cover from front of machine arm.

Loosen needle bar frame shaft clamp screw shown in Fig. 40. Pull needle bar rock frame with its shaft from machine.

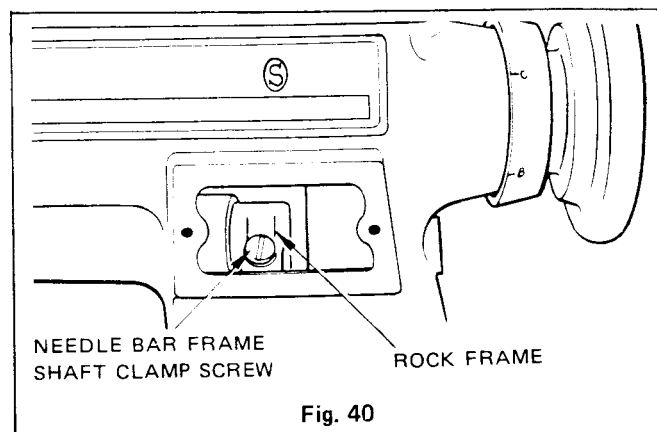


Fig. 40

### REPLACEMENT OF ARM SHAFT CONNECTION BELT

Remove needle, to avoid damage, before proceeding to replace belt. Tip machine and slide belt off lower pulley shown in Fig. 41. Loosen two set screws in machine pulley and remove pulley and ball bearing. Lift belt up and draw it around arm shaft through space at B indicated in Fig. 39.

Replace belt through ball bearing space of B. After placing belt over arm shaft connection belt pulley, replace machine pulley with ball bearing. To remove all end play from shaft, tighten set screws in machine pulley and (holding needle bar crank in place) tap machine pulley into position with palm of hand. Tighten machine pulley set screws.

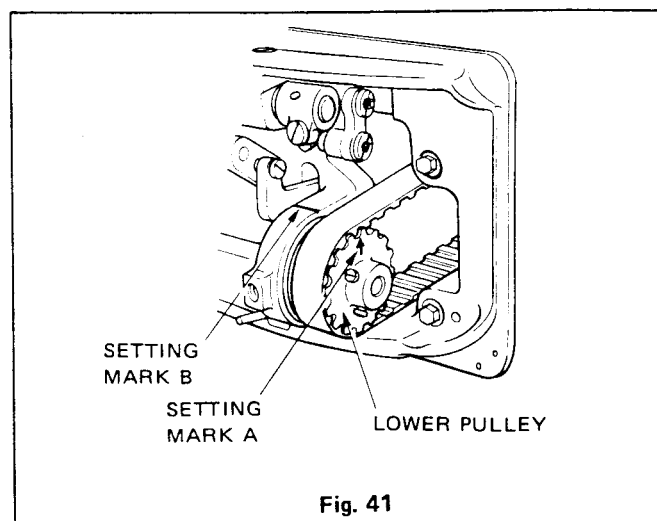


Fig. 41

INFORMATION FOR REFERENCE PURPOSE  
 SKETCH OF SEWING MACHINE TABLE

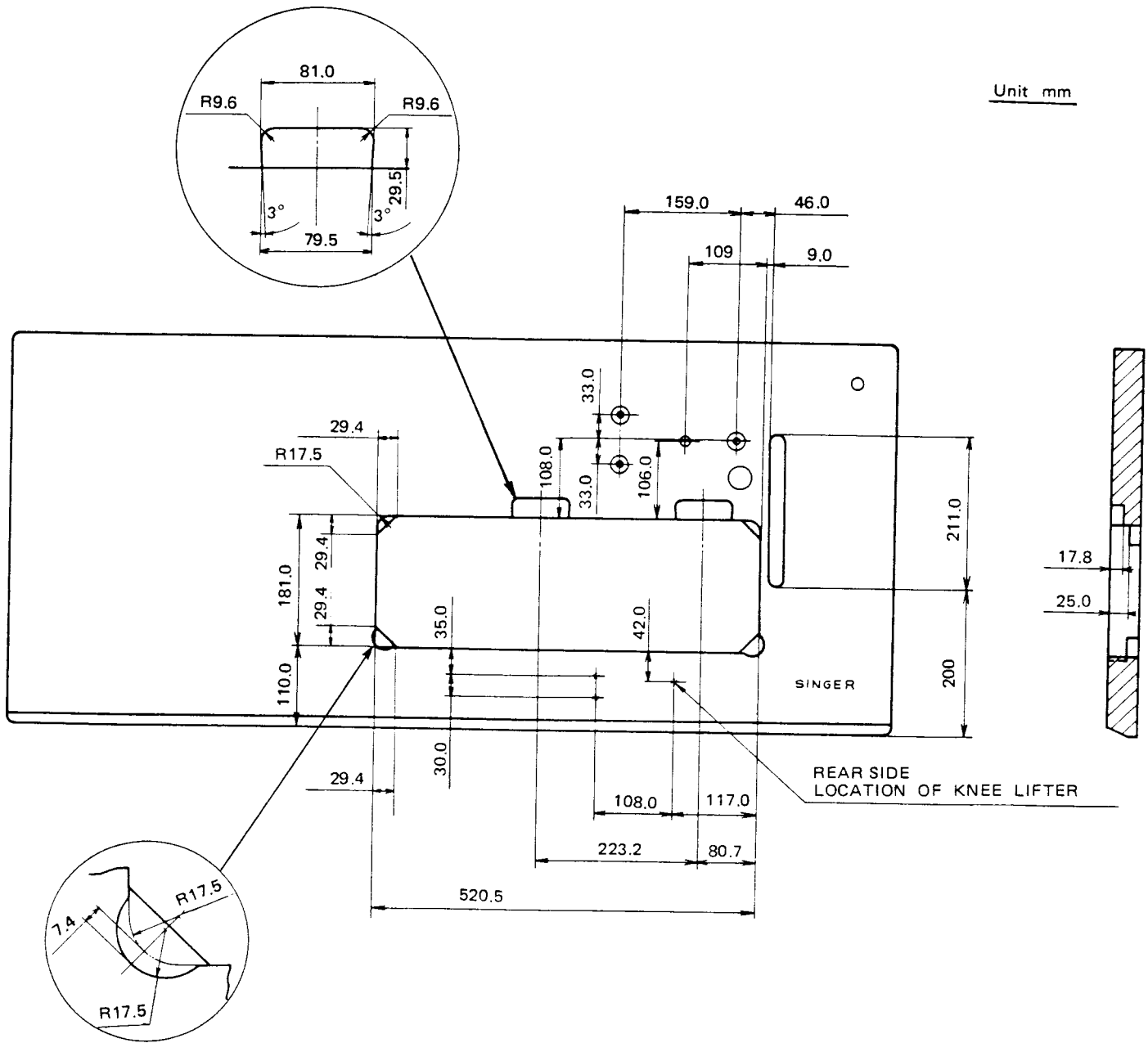


Fig. 42

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